LIGHTING SOLUTIONS

Component Systems for Lighting Applications

STANDARD TECHNOLOGY
HIGH LEVEL STANDARD
HIGH QUALITY

For Discharge Lamps
Ballasts, Control Gear Units, Ignitors, Power Switches, Capacitors and Lampholders

For Fluorescent Lamps
Ballasts, Capacitors, Lampholders, Starter Lampholders, Terminal Blocks and Accessories

For Incandescent Lamps
Transformers and Lampholders

For Emergency Lighting
Emergency lighting modules, Rechargable Batteries and Supports

LIGHT TECHNOLOGY PRODUCTS

Vossloh-Schwabe is not merely a manufacturer of top-quality components for the lighting industry, but above all a competent and innovative partner when it comes to providing the growing lighting market with cost-effective all-round solutions.

Featuring a future-proof component structure that already now satisfies both the requirements of energy-efficient lighting and European standards, VS' unique product range includes magnetic and electronic ballasts, state-of-the-art control systems (LiCS), LED lighting systems and matching operating devices.

Employing in excess of 1,000 people in more than 20 countries, Vossloh-Schwabe is represented all over the world. As a subsidiary of the Japanese Panasonic Group, VS can draw on extensive resources for R&D as well as for international expansion activities. A highly motivated work-force, comprehensive market knowledge, profound industry expertise as well as eco-awareness and environmental responsibility show Vossloh-Schwabe to be a reliable partner for the provision of optimum and cost-effective lighting solutions.

Vossloh-Schwabe's dedication to delivering superior quality is reflected in its ISO 9001 certification.

Vossloh-Schwabe is ready to embark on a collaborative journey into an economically illuminated future.

LED components are just as much a part of our product range as light control systems. Our extensive range of powerful LED modules, LED drivers, LiCS controllers and sensors is presented in our separate **Innovative Systems** catalogue.

We'll be happy to help you dimension your lighting project. Contact us.

PUMA Headquarters

Porsche Museum

PUMA Headquarters, Herzogenaurach

As the secret "capital of sport", the little German town of Herzogenaurach is home to the headquarters of the sport lifestyle company PUMA. Covering a total surface area of 50,000 square metres, the complex is made up of three buildings that are positioned so as to create a large central square, the PUMA Plaza.

The main aim of the lighting concept developed for the new PUMA corporate headquarters was to deliver optimum quality of light, enable maximum flexibility in using the available space and yield the greatest possible energy savings. No less than 985 electronic DALI ballasts and 4,650 standard electronic ballasts made by Vossloh-Schwabe went into implementing the lighting system.

The inner courtyard features additional red and white effect lighting in the form of ground-level linear markings created using LEDs made by Vossloh-Schwabe. These LEDs enable digital lighting sequences to flow over the square. To complement the clear-cut, rectilinear forms that characterise the entire building complex, a number of slender light columns, made of square aluminium sections, were installed to round off the courtyard's stylish appearance.

Photos: Markus Bollen

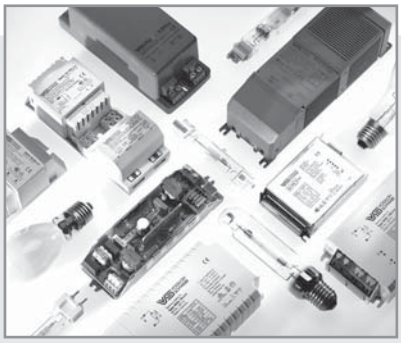
Porsche Museum, Stuttgart

The name "Porsche" both stands for a long tradition of outstanding quality and the excitement of high-octane driving. The Porsche Museum in Stuttgart constitutes a fitting presentation venue that does the brand image every justice. The architectural flagship thus serves to make the "Porsche experience" available to everyone.

The lighting installed in the Porsche Museum forms a crucial element of the exhibition space created for around 80 vehicles. It was important to ensure every detail of these high-end cars was clearly visible. In this regard, direct and reflecting lighting had to be reduced to an absolute minimum so as to neither irritate visitors, nor detract from the brilliant gloss of the bodywork.

This forms another instance in which Vossloh-Schwabe products have helped to add to the enjoyment of each and every visitor. Built-in electronic ballasts and electronic DALI safety converters ensure flicker-free, efficient light.

ELECTRONIC AND ELECTROMAGNETIC



ELECTRONIC AND ELECTRO-MAGNETIC OPERATING DEVICES

For high-pressure sodium lamps (HS), metal halide lamps (HI) and mercury vapour lamps (HM)

Electronic ballasts
Modern discharge lamps operate very efficiently in combination with electronic ballasts. The numerous advantages of using electronic ballasts to operate high-pressure discharge lamps are listed in more detail on the product pages.

With the help of temperature and service-life tests, VS electronic ballasts guarantee a high degree of reliability. The quality of the electronic ballasts is ensured by continuous in-circuit tests and function tests like burn-in tests.

Magnetic ballasts
The electrical specifications of VS' range of ballasts comply with lamp-specific requirements. Vossloh-Schwabe attaches great importance to ensuring the impedance value of electromagnetic ballasts is kept within particularly narrow tolerances. This advantage, which is achieved by individual adjustment of the air gap during the automated production and testing process of every ballast, decisively contributes to optimising light output, light colour and service life of discharge lamps.

The range includes ballasts with variable voltage tapping points and varying degrees of inherent heating as well as encapsulated devices.

2 Ballasts for Discharge Lamps

For high-pressure sodium lamps (HS), metal halide lamps (HI) and mercury vapour lamps (HM)

Electronic ballasts, accessories	**8–18**
Dimmable electronic ballasts	16-17
Luminaire protection device SP 230/10K	18
Control gear units for HS and HI lamps	**19–21**
Electromagnetic ballasts	**22–47**
For HS and HI lamps	22-37
For HM and HI lamps	38-41
For power reduction	42-47
Technical details for discharge lamps	**89–131**
General technical details	394-401
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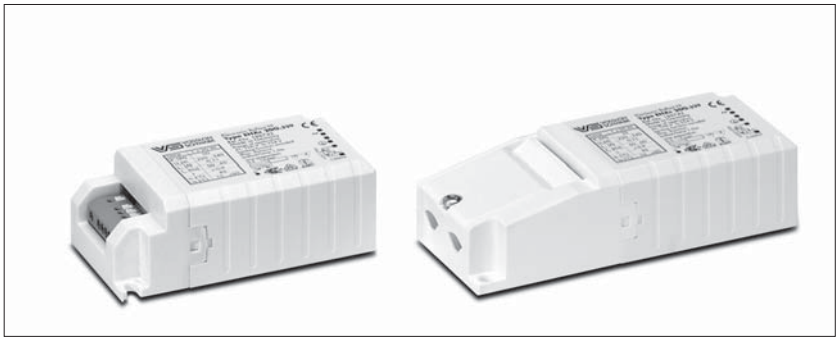
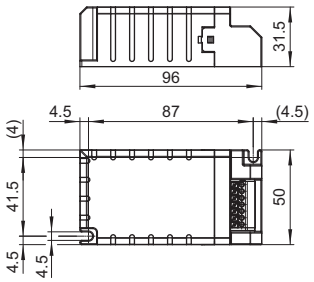
Compact Electronic Ballasts for HI Lamps 20 and 35 W

Shape: K35

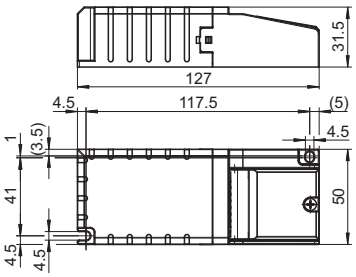
Casing: heat-resistant polyamide, encapsulated with polyurethane
(EHXc 35G.327 B and EHXc 35G.327 I)
For ceramic discharge tube lamps (C-HI)
Power factor: > 0.9
Operation frequency: 135 Hz
Push-in terminals: 0.5–1.5 mm²
Constant power consumption
Protection against "no load" operation
For luminaires of protection class I and II
Degree of protection: IP20
Permissible load capacity: 120 pF
RFI-suppressed
Fixing brackets for screws M4
for base mounting
No flickering of defective lamps



K35



K35 with cord grip



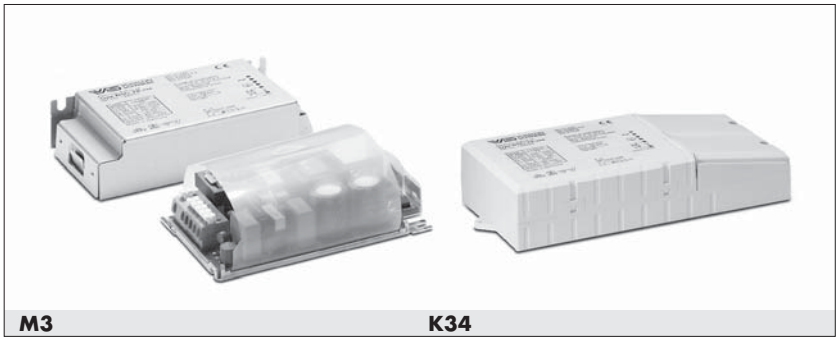
Lamp				Electronic ballast									System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V –10%+6%	Mains current A	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Ignition voltage kV	Weight g	Output W
Electronic built-in ballasts													
20	HI	GU6.5, G8.5, GX8.5, GX10, G12	1 x 20	EHXc 20.329 B	**188991**	220-240	0.11	A2	-15 to 60	max. 75	2-4	130	23
35	HI	GU6.5, G8.5, GX8.5, GX10, G12	1 x 39	EHXc 35G.327 B	**188993**	220-240	0.2	A2	-15 to 45	max. 80	2-4	180	43.5
Independent electronic ballasts with cord grip													
20	HI	GU6.5, G8.5, GX8.5, GX10, G12	1 x 20	EHXc 20.329 I	**188992**	220-240	0.11	A2	-15 to 60	max. 75	2-4	145	23
35	HI	GU6.5, G8.5, GX8.5, GX10, G12	1 x 39	EHXc 35G.327 I	**188994**	220-240	0.2	A2	-15 to 45	max. 80	2-4	195	43.5

Circuit diagrams see page 96

Electronic Ballasts for HI Lamps 35, 50 and 70 W

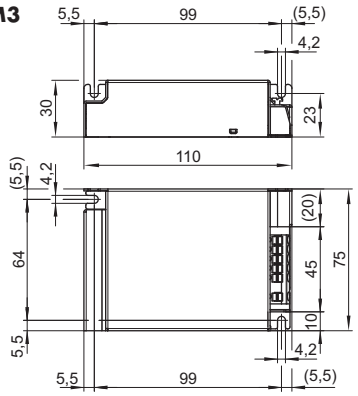
Shape: M3/K34

Casing: aluminium (M3),
heat-resistant polycarbonate (K34)
For ceramic discharge tube lamps (C-HI)
Power factor: ≥ 0.95
Ignition voltage: max. 5 kV
Operation frequency: 173 Hz
Push-in terminals with lever opener: 0.75–2.5 mm²
Total harmonic distortion: < 10%
Temperature protection
Constant power consumption
Protection against "no load" operation
For luminaires of protection class I (metal casing)
For luminaires of protection class I and II
(plastic casing)
Degree of protection: IP20
Permissible load capacity: 20–120 pF
RFI-suppressed
Fixing brackets for screws M4
for base mounting
No flickering of defective lamps

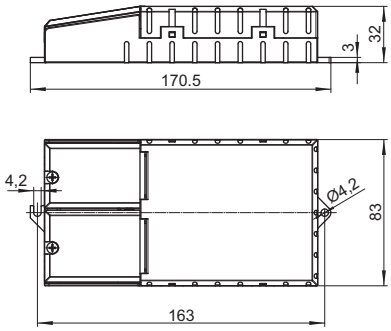


M3 **K34**

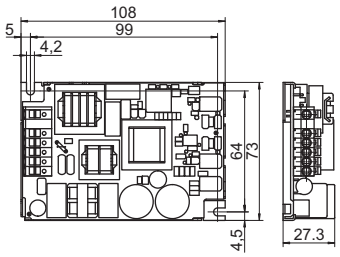
M3



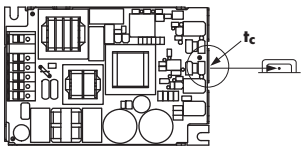
K34 with cord grip



M3 built-in PCB



t_c point definition



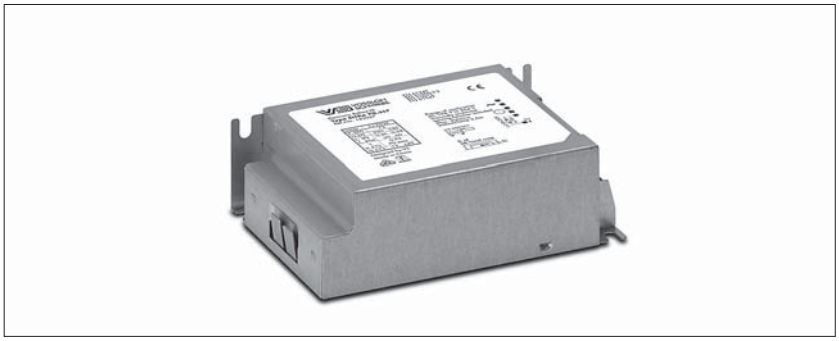
Lamp				Electronic ballast								System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V ±10%	Mains current A	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Weight g	Output W
Electronic built-in ballast (with cap)												
35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	1 x 39	EHXc 35.325	**183033**	220 - 240	0.20-0.18	A2	-20 to 65	max. 80	220	43
50	HI	G8.5, G12	1 x 50	EHXc 50.358	**183028**	220 - 240	0.26-0.24	A2	-20 to 60	max. 80	220	55
70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXc 70.326	**183036**	220 - 240	0.36-0.34	A2	-20 to 55	max. 80	220	80
Built-in PCB – Electronic built-in ballasts (without cap)												
35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	1 x 39	EHXc 35.325	**183034**	220 - 240	0.20-0.18	A2	-20 to 65	max. 80	180	43
50	HI	G8.5, G12	1 x 50	EHXc 50.358	**183030**	220 - 240	0.26-0.24	A2	-20 to 60	max. 80	180	55
70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXc 70.326	**183037**	220 - 240	0.36-0.34	A2	-20 to 55	max. 80	180	80
Independent electronic ballasts with cord grip												
35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	1 x 39	EHXc 35.325	**183035**	220 - 240	0.20-0.18	A2	-20 to 65	max. 75	260	43
50	HI	G8.5, G12	1 x 50	EHXc 50.358	**183029**	220-240	0.26-0.24	A2	-20 to 60	max. 70	260	55
70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXc 70.326	**183038**	220 - 240	0.36-0.34	A2	-20 to 55	max. 75	260	80

Circuit diagrams see page 96

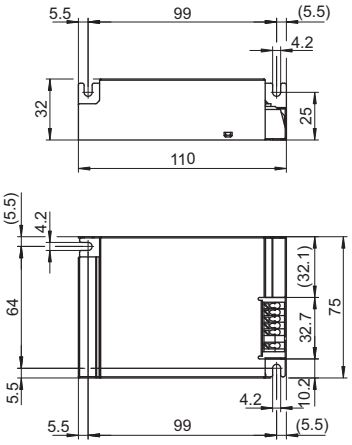
Electronic Ballasts for HI Lamps 35 and 70 W

Shape: M3.1 EffectLine

Casing: metal
For ceramic discharge tube lamps (C-HI)
Power factor: ≥ 0.95
Ignition voltage: max. 5 kV
Operation frequency: 173 Hz
Push-in terminals with lever opener: 0.5–1.5 mm²
Total harmonic distortion: < 10%
Temperature protection
Constant power consumption
Protection against "no load" operation
For luminaires of protection class I
Degree of protection: IP20
Permissible load capacity: 20–120 pF
RFI-suppressed
Life-time at $t_{c\ max.}$ = 30,000 hrs
Fixing brackets for screws M4
for base mounting



M3.1 EffectLine



Lamp				Electronic ballast								System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V ±10%	Mains current A	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Weight g	Output W
35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	1 x 39	EHXe 35.356	**183026**	220–240	0.20–0.18	A2	–15 to 65	max. 80	220	43
70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXe 70.357	**183027**	220–240	0.36–0.34	A2	–15 to 50	max. 80	220	80

Circuit diagrams see page 96

Independent Electronic Ballasts for HI Lamps 20–70 W

Shape: K36

Casing: heat-resistant polycarbonate
Easy connection by plug-in connector
primary: GST18 1-coded/black with locking
secondary: ST18-3BF lockable
For ceramic discharge tube lamps (C-HI)
Power factor: 0.95
Ignition voltage: max. 5 kV
Operation frequency: 173 Hz
Total harmonic distortion: < 10%
Temperature protection
Constant power consumption
Protection against "no load" operation
For luminaires of protection class I and II
Degree of protection: IP20
Permissible load capacity: 20–120 pF
RFI-suppressed
Fixing brackets for screws M4
for base mounting

Additional technical features

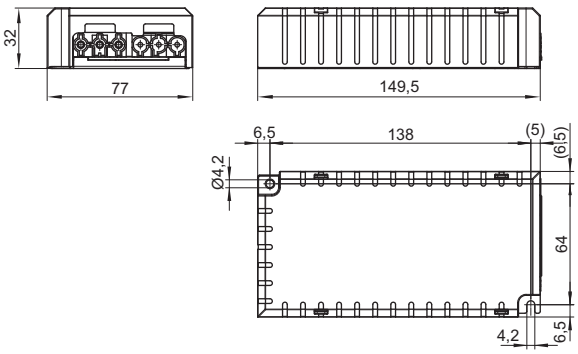
The electronic ballast is protected against transient mains peaks up to 2.5 kV.

Overheating protection with VS thermal cut-out system with automatic reset which evaluates the temperature of the ballast.

At lamp operation voltage of > 140 V the electronic ballast will switch itself off.

Inrush current limiter

K36



	Lamp				Electronic ballast								System
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V ±10%	Mains current A	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Weight g	Output W
new	20	HI	G8.5, G12	1 x 20	EHXc 20.370	**183097**	220–240	0.12–0.10	A2	–20 to 55	max. 75	250	24
new	35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	1 x 39	EHXc 35.371	**183098**	220–240	0.20–0.18	A2	–20 to 55	max. 75	250	43
new	50	HI	G8.5, G12	1 x 50	EHXc 50.372	**183032**	220–240	0.26–0.24	A2	–20 to 55	max. 75	250	55
new	70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXc 70.373	**183099**	220–240	0.36–0.34	A2	–20 to 50	max. 75	250	80

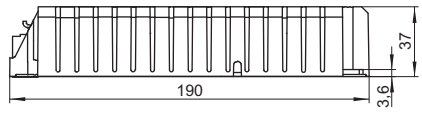
Circuit diagrams see page 96

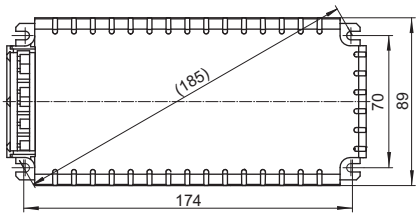
Electronic Ballasts for HI Lamps 2 x 35 and 2 x 70 W

Shape: K32

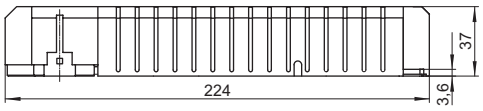
Casing: heat-resistant polycarbonate
For ceramic discharge tube lamps (C-HI)
Power factor: 0.98
Ignition voltage: max. 5 kV
Operation frequency: 176 Hz
Push-in terminals with lever opener: 0.75–2.5 mm²
Total harmonic distortion: < 10%
Temperature protection: a lamp is switched off in the event of overheating
Constant power consumption
Protection against "no load" operation
For luminaires of protection class I and II
Degree of protection: IP20
Permissible load capacity: 20–100 pF
RFI-suppressed
Fixing brackets for screws M4 for base mounting
Separate ignition channels enable independent lamp operation

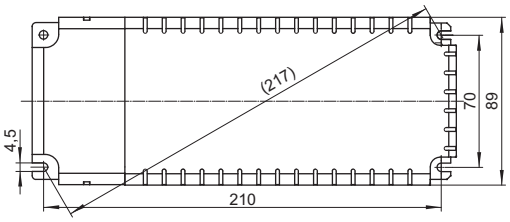
K32





K32 with cord grip



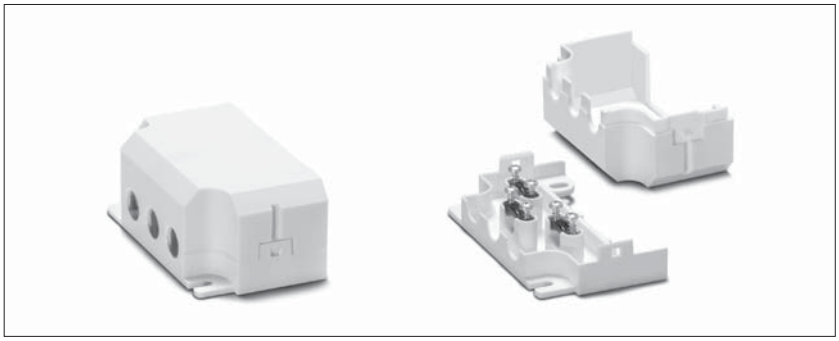


Lamp				Electronic ballast								System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V –10%+6%	Mains current A	Energy-efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Weight g	Output W
Electronic built-in ballasts												
2x35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	2 x 39	EHXc 235.316	**188223**	220–240	0.4–0.36	A2	–25 to 50	max. 80	405	86
2x70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	2 x 73	EHXc 270.317	**188224**	220–240	0.74–0.68	A2	–25 to 45	max. 80	440	160
Independent electronic ballasts with cord grip												
2x35	HI	GU6.5, G8.5, GU8.5, GX8.5, G12, E27	2 x 39	EHXc 235.316	**188455**	220–240	0.4–0.36	A2	–25 to 50	max. 80	455	86
2x70	HI	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	2 x 73	EHXc 270.317	**188456**	220–240	0.74–0.68	A2	–25 to 45	max. 80	490	160

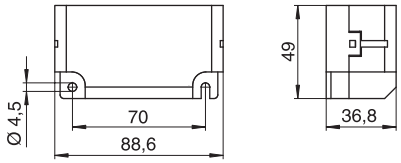
Circuit diagrams see page190

Cord Grip for Electronic Built-in Ballasts

For shape K31 and K32



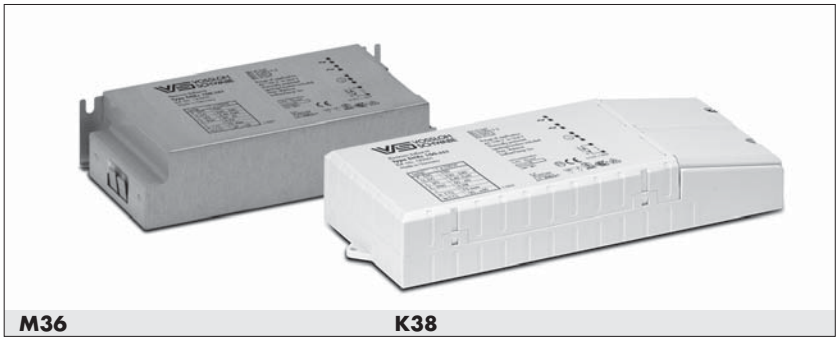
By using the cord grip electronic built-in ballasts for metal halide lamps become independent ballasts.
Material: heat-resistant polycarbonate
For use with electronic built-in ballasts with casing K31 and K32
For mains leads:
H03VV-F 3X0.75 or NYM 3X1.5 mm²
For lamp leads: SIHY-Cu 3X1 mm²
or SIHSI-Cu 3X1 mm²
Weight: 50 g
Unit: 20 pcs.
By turning the cable clamp by 180° the lead diameter can be reduced to 5 mm.
Ref. No.: 188080



Electronic Ballasts for HI Lamps 100 and 150 W

Shape: M36/K31/K38

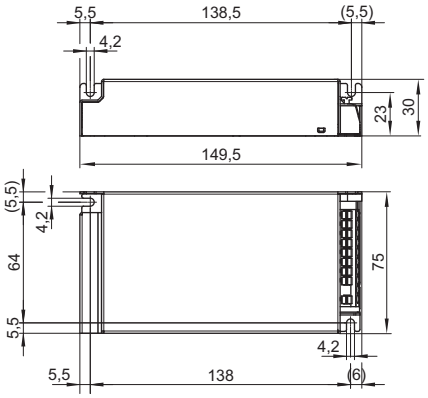
Casing: aluminium (M36),
heat-resistant polycarbonate (K31, K38)
For ceramic discharge tube lamps (C-HI)
Power factor: 0.98
Ignition voltage: max. 5 kV
Operation frequency: 170 Hz
Push-in terminals with lever opener: 0.75–2.5 mm²
Total harmonic distortion: < 10%
Temperature protection
Constant power consumption
Protection against "no load" operation
For luminaires of protection class I and II
Degree of protection: IP20
Permissible load capacity: 20–240 pF
RFI-suppressed
Fixing brackets for screws M4
for base mounting



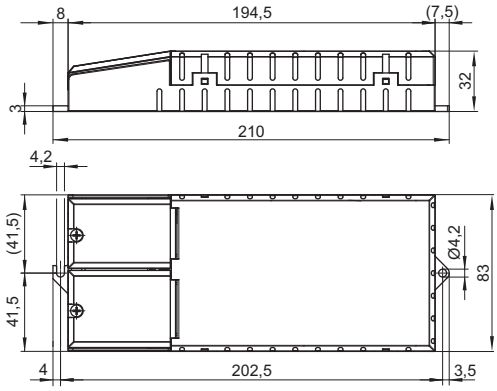
M36 **K38**

K31

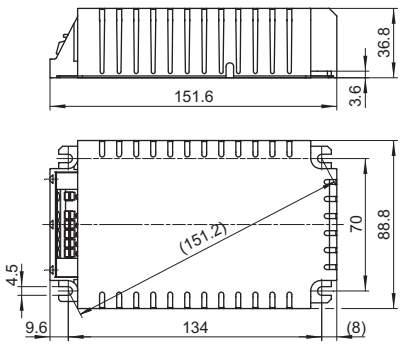
M36



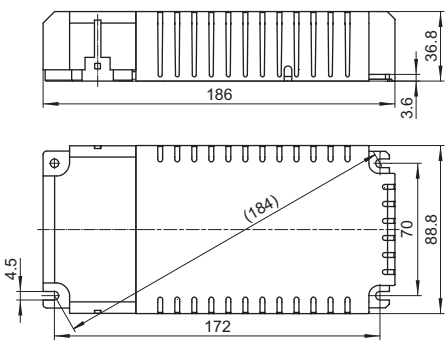
K38



K31



K31 with cord grip



Electronic Ballasts for HI Lamps 100 and 150 W

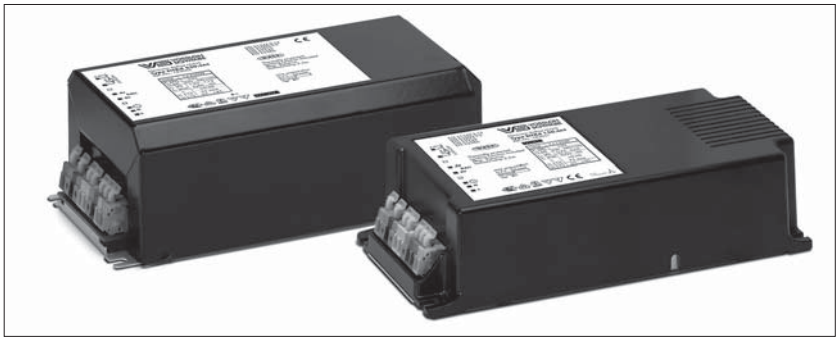
Shape: M36 and K31, K38

Lamp				Electronic ballast									System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V ±10%	Mains current A	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Weight g	Output W
Electronic built-in ballasts													
100	HI	G12, E40	1 x 100	EHXc 100.353	**183000**	220-240	0.49-0.45	A2	-20 to 50	max. 75	M36	306	108
150	HI	G12, PGX12-2, E27, E40, RX7s	1 x 147	EHXc 150G.334	**183046**	220-240	0.73-0.67	A2	-20 to 45	max. 85	K31	540	160
Independent electronic ballasts with cord grip													
100	HI	G12, E40	1 x 100	EHXc 100.353	**183001**	220-240	0.49-0.45	A2	-20 to 45	max. 75	K38	350	108
150	HI	G12, PGX12-2, E27, E40, RX7s	1 x 147	EHXc 150G.334	**183047**	220-240	0.73-0.67	A2	-20 to 45	max. 85	K31	582	160

Circuit diagrams see page 96

Dimmable Electronic Built-in Ballasts for HI and HS Lamps 50–250 W

Shape: K40/K41 and M42

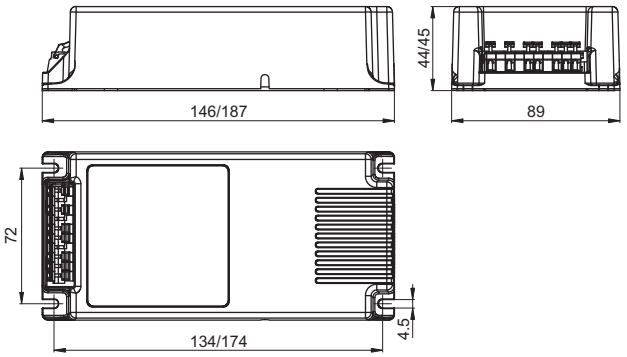


For dimmable metal halide lamps and
dimmable high pressure sodium lamps
Casing: aluminium (M42),
heat-resistant polycarbonate (K40/K41)
Dimming range: acc. to lamp specification
Dimming via digital microcontroller
Dimming interface: DALI or MidNight
For use with open or closed-loop control units
Suitable MidNight Controller 186240 (for installation in the distribution board) or 186241 (as a mobile controller) are available on request.
Power factor: 0.98
Ignition voltage: max. 4.5 kV
Operation frequency: 81 Hz
Push-in terminals with lever opener: 0,75–2,5 mm²

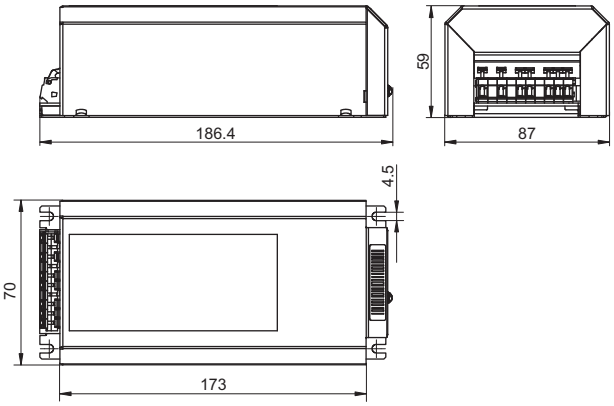
Total harmonic distortion: < 10%
Degree of protection: IP20
Permissible load capacity: 250 pF
Constant power consumption
Protection against "no load" operation
RFI-suppressed
Electromagnetic immunity category
in acc. with IEC 61000-4-11: class B
Spectral power ratio (HF-Ripple): < 1.5%
in acc. with IEC 61167
EOL shutdown at the end of the lamp's service life
Transient mains peak protection
The ballast outputs (to the lamp) are short-circuit-proof.
Max. lamp lead length: 2.5 m

Temperature monitoring
For luminaires of protection class I and II
Fixing brackets for screws M4
for base mounting
Compatible with IEC 62386
(DALI version for HID)

K40/K41



M42

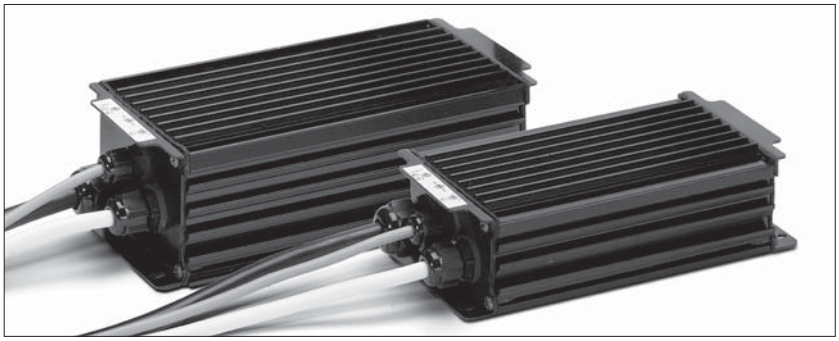


Lamp				Electronic ballast									System
Output W	Type	Base*	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V ±10%	Mains current A	Energy-efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Weight g	Output W
DALI/MidNight (Dual) – Casing K40, K41 and M42													
50	HI/HS	G8.5, G12, E27	1 x 50	EHXd 50.360	**183048**	220–240	0.27–0.22	A2	–25 to 80	max. 85	K40	380	55
70	HI/HS	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXd 70.361	**183049**	220–240	0.37–0.31	A2	–25 to 75	max. 85	K40	380	80
100	HI/HS	G12, E40	1 x 100	EHXd 100.362	**183050**	220–240	0.50–0.43	A2	–25 to 65	max. 75	K41	520	107
150	HI/HS	G12, G22, PGX12-2, Fc2, E27, E40, RX7s	1 x 150	EHXd 150.363	**183051**	220–240	0.76–0.64	A2	–25 to 55	max. 80	K41	520	161
250	HI/HS	Fc2, E40, RX7s	1 x 250	EHXd 250.364	**183052**	220–240	1.25–1.07	A2	–25 to 45	max. 60	M42	930	267

Circuit diagrams see page 96

* Please ensure that lamps are only dimmed if specified as "dimmable" by the manufacturer.

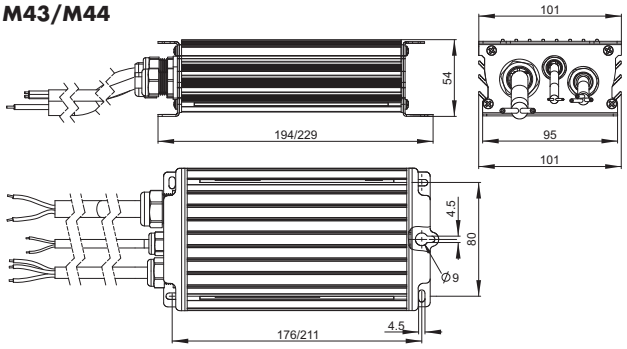
Independent Dimmable Electronic Ballasts IP65 for HI and HS Lamps 50–250 W



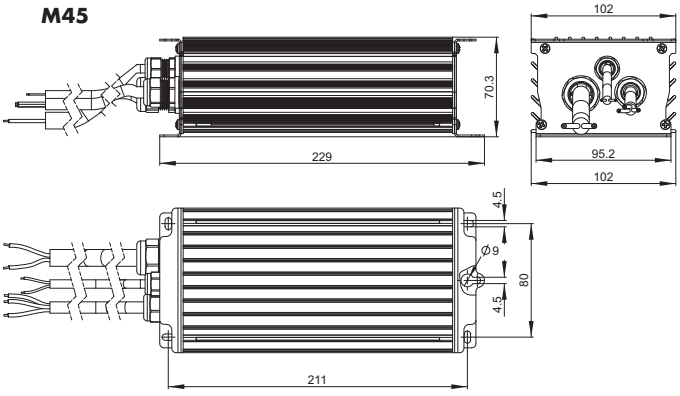
Shape: M43/M44 and M45

For dimmable metal halide lamps and dimmable high pressure sodium lamps
Casing: aluminium
Dimming range: acc. to lamp specification
Dimming via digital microcontroller
Dimming interface: DALI or MidNight
For use with open or closed-loop control units
Suitable MidNight Controller 186240 (for installation in the distribution board) or 186241 (as a mobile controller) are available on request.
Constant power consumption
Protection against "no load" operation
RFI-suppressed
Electromagnetic immunity category in acc. with IEC 61000-4-11: class B
Spectral power ratio (HF-Ripple): < 1.5% in acc. with IEC 61167
Power factor: 0.98
Ignition voltage: max. 4.5 kV
Operation frequency: 81 Hz
Leads: Mains: H05VV-F 3X1.5 mm²
DALI: YSLY-0Z 2X0.75 mm²
Lamp: X-SIHF 2X1.5 mm²
Lead lengths: 60 cm
Total harmonic distortion: < 10%
Degree of protection: IP65
Permissible load capacity: 250 pF
EOL shutdown at the end of the lamp's service life
Transient mains peak protection
The ballast outputs (to the lamp) are short-circuit-proof.
Temperature monitoring
For luminaires of protection class I and II
Fixing brackets for screws M4 for base mounting
Compatible with IEC 62386 (DALI version for HID)

M43/M44



M45



Lamp				Electronic ballast									System
Output W	Type	Base*	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V ±10%	Mains current A	Energy-efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Weight g	Output W
DALI/MidNight (Dual) – Casing M43, M44 and M45													
50	HI/HS	G8.5, G12, E27	1 x 50	EHXd 50.360	**183060**	220-240	0.27-0.22	A2	-25 to 80	max. 85	M43	1000	55
70	HI/HS	G8.5, GU8.5, GX8.5, G12, PG12-2, E27, RX7s	1 x 73	EHXd 70.361	**183061**	220-240	0.37-0.31	A2	-25 to 75	max. 85	M43	1000	80
100	HI/HS	G12, E40	1 x 100	EHXd 100.362	**183062**	220-240	0.50-0.43	A2	-25 to 65	max. 75	M44	1200	107
150	HI/HS	G12, G22, PGX12-2, Fc2, E27, E40, RX7s	1 x 150	EHXd 150.363	**183063**	220-240	0.76-0.64	A2	-25 to 80	max. 80	M44	1200	161
250	HI/HS	Fc2, E40, RX7s	1 x 250	EHXd 250.364	**183064**	220-240	1.25-1.07	A2	-25 to 65	max. 65	M45	1500	267

Circuit diagrams see page 96

* Please ensure that lamps are only dimmed if specified as "dimmable" by the manufacturer.

Luminaire Protection Device SP 230/10K

For electronic devices

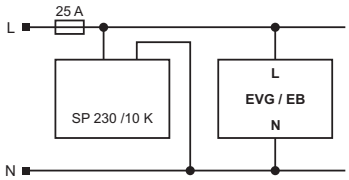
When electronic components form part of lighting systems, it is often necessary to protect such components against power-supply interruptions and electric overloads (power surges).

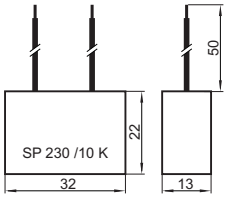
These can be caused by switching inductive loads or by atmospheric discharges such as lightning striking the mains or the ground. A further cause can be induced voltages from neighbouring cables when working with leading-edge phase-cutting controls.

Suitable for luminaires of protection class I and II
Solid connecting wire: 0.75 mm²
Lead length: 50 mm

The SP230/10K protection unit reduces overvoltages at the connection terminals of electronic components. The remaining residual voltage is then reduced to a respective protective level, based on the discharge current (see diagram below).

Wiring diagram

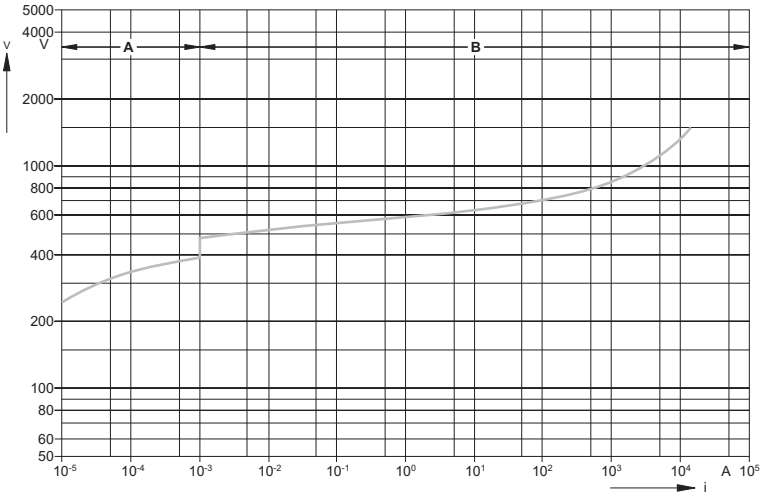




	Type	Best.-Nr.	Voltage AC 50, 60 Hz V ±10%	Impulse voltage U_{OC} (V)	Impulse discharge current I_N (8/20 µs) (A)	Protection level at discharge current of 1,000 A (V)	Min. ambient temperature t_a (°C)	Casing temperature t_c (°C)	Weight g
new	SP 230/10 K	**147230**	220-240	max. 10,000	max. 10,000	≤ 850	-30	max. 80	20

Bandwidth of the standard impulse: tr = 20 µs
The protection unit can withstand at least 10 spikes of 5 kA.

Residual voltage, based on the discharge current (B)
A = Leak current | B = Protection levels



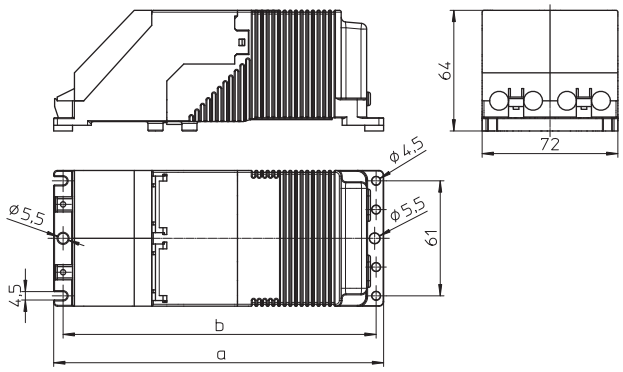
Source: Epcos Databook 2011

Control Gear Units for HS and HI Lamps 35 to 150 W

Compact plastic casing
Shape: 64 x 72 mm

For high pressure sodium lamps (HS),
metal halide lamps (HI)
and ceramic discharge lamps (C-HI)
Compact control gear unit with ballast with patented, intelligent thermal cut-out with automatic reset (which evaluates the temperature and current of the ballast), digital timer ignitor with IPP^{++} technology and compensation capacitor with thermal fuse
As individual components no longer need to be wired, there is a significant reduction in assembly time and costs.

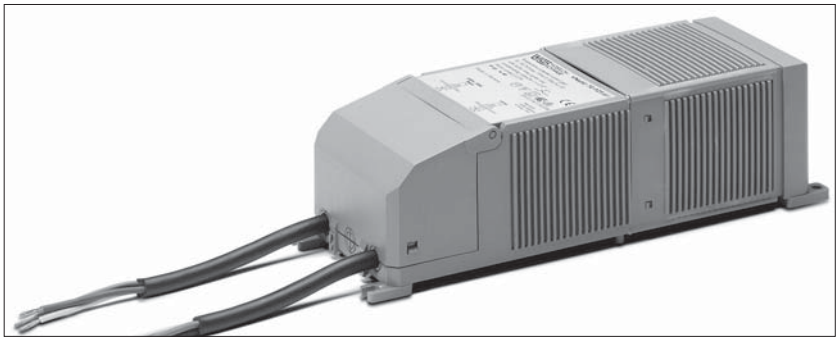
Protection class II
Degree of protection: IP40
Permissible load capacity: 20–1000 pF
Lead length to the lamp: max. 10 m
tw 130
Push-in terminals: 0.5–2.5 mm²
Cord grips for mains and lamp leads
Further outputs and voltages on request

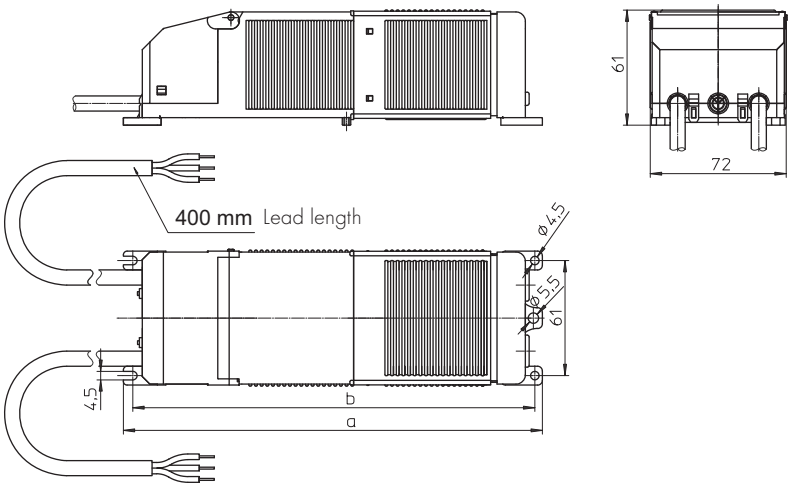


Lamp			Control gear unit									
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	Mains current A	a mm	b mm	Weight kg	t_a °C	Power factor λ	Energy efficiency*
230 V, 50 Hz												
35	HS, HI	0.53	VNaHJ 35PZTG.568	**536199**	230, 50	0.210	175	166	1.32	55	0.92	EEI=A3
70	HS, HI	0.98	VNaHJ 70PZTG.566	**535657**	230, 50	0.380	175	166	1.32	45	0.91	EEI=A3
100	HS, HI	1.20	VNaHJ 100PZTG.571	**536200**	230, 50	0.560	214	205	1.85	45	0.85	EEI=A3
150	HS, HI	1.80	VNaHJ 150PZTG.567	**535695**	230, 50	0.720	214	205	2.25	45	0.91	EEI=A3
240 V, 50 Hz												
35	HS, HI	0.53	VNaHJ 35PZTG.568	**536201**	240, 50	0.210	175	166	1.32	55	0.94	EEI=A3
70	HS, HI	0.98	VNaHJ 70PZTG.566	**536202**	240, 50	0.370	175	166	1.32	40	0.94	EEI=A3
100	HS, HI	1.20	VNaHJ 100PZTG.571	**536203**	240, 50	0.560	214	205	1.85	40	0.86	EEI=A3
150	HS, HI	1.80	VNaHJ 150PZTG.567	**536204**	240, 50	0.730	214	205	2.25	40	0.91	EEI=A3
220 V, 60 Hz												
35	HS, HI	0.53	VNaHJ 35PZTG.574	**536205**	220, 60	0.220	175	166	1.32	60	0.98	EEI=A3
70	HS, HI	0.98	VNaHJ 70PZTG.575	**536207**	220, 60	0.370	175	166	1.32	50	0.97	EEI=A3
150	HS, HI	1.80	VNaHJ 150PZTG.576	**536209**	220, 60	0.800	214	205	2.25	45	0.98	EEI=A3

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Control Gear Units IP65 for HS and HI Lamps 35 to 150 W





Encapsulated unit in compact plastic casing
Shape: 61x72 mm

For high pressure sodium lamps (HS), metal halide lamps (HI) and ceramic discharge lamps (C-HI)
Compact control gear unit with ballast with patented, intelligent thermal cut-out with automatic reset (which evaluates the temperature and current of the ballast), digital timer ignitor with IPP^{++} technology and compensation capacitor with thermal fuse
As individual components no longer need to be wired, there is a significant reduction in assembly time and costs.

Protection class II
Degree of protection: IP65
Permissible load capacity: 20–1000 pF
Lead length to the lamp: max. 10 m
tw 130

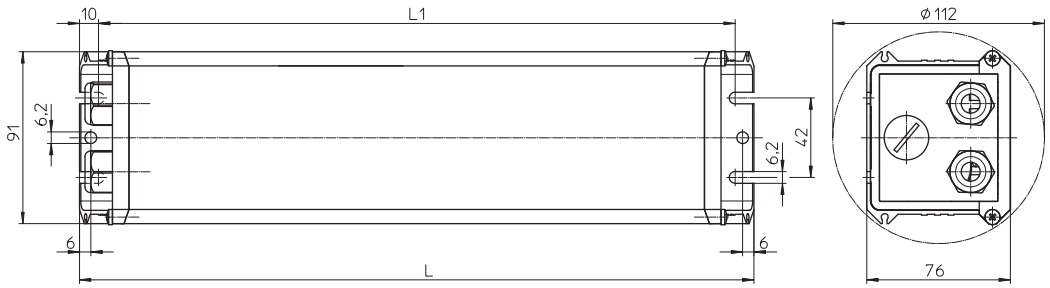
Lamp			Control gear unit									
Output W	Type	Current A	Type	**Ref. No.**	Voltage V, Hz	Mains current A	a mm	b mm	Weight kg	t_a °C	Power factor λ	Energy efficiency*
230 V, 50 Hz												
35	HS, HI	0.53	VNaHJ 35PZTG.050	**533391**	230, 50	0.240	222	214	1.95	60	0.96	EEI=A3
50	HS	0.76	VNaH 50PZTG.058	**543733**	230, 50	0.290	222	214	1.95	60	0.94	EEI=A3
70	HS, HI	0.98	VNaHJ 70PZTG.051	**533392**	230, 50	0.370	222	214	1.95	50	0.97	EEI=A3
100	HS, HI	1.20	VNaHJ 100PZTG.078	**533393**	230, 50	0.560	249	240	2.25	55	0.90	EEI=A3
150	HS, HI	1.80	VNaHJ 150PZTG.052	**533394**	230, 50	0.740	249	240	2.75	50	0.94	EEI=A3
240 V, 50 Hz												
35	HS, HI	0.53	VNaHJ 35PZTG.053	**534107**	240, 50	0.240	222	214	1.95	60	0.96	EEI=A3
70	HS, HI	0.98	VNaHJ 70PZTG.054	**534109**	240, 50	0.370	222	214	1.95	50	0.97	EEI=A3
150	HS, HI	1.80	VNaHJ 150PZTG.055	**534115**	240, 50	0.730	249	240	2.75	50	0.95	EEI=A3
220 V, 60 Hz												
35	HS, HI	0.53	VNaHJ 35PZTG.041	**534122**	220, 60	0.220	222	214	1.95	70	0.98	EEI=A3
70	HS, HI	0.98	VNaHJ 70PZTG.067	**534111**	220, 60	0.370	222	214	1.95	50	0.97	EEI=A3
150	HS, HI	1.80	VNaHJ 150PZTG.068	**534117**	220, 60	0.800	249	240	2.25	45	0.98	EEI=A3

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Control Gear Units for HS and HI Lamps 250 and 400 W

Shape: 76 x 91 mm

For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Fully wired slim, weather-proof control gear unit
with ballast with thermal cut-out with automatic reset,
capacitor, timer ignitor and connection terminal
Suitable for installation in or on pylons
Frontal cable feed using a PG thread fitting
Front access to terminals
Screw-fixed end cap
Screw terminals: 0.75–2.5 mm²
For luminaires of protection class I
Degree of protection: IP54
Permissible load capacity: 20–1000 pF
Distance to the lamp: max. 10 m
tw 130
With connection for protective earth conductor



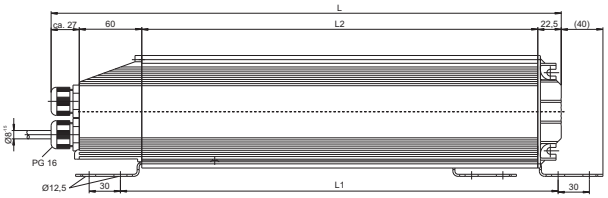
Lamp				Control gear unit							
Output W	Type	Current A	Mains current A	Type	**Ref. No.**	Voltage AC V, Hz	L mm	L1 mm	Weight kg	Power factor λ	Energy efficiency*
250	HS, HI	3.0	1.3	VNaHJ 250PZT.745	**531476**	230, 50	322	302	4.30	> 0.94	EEI=A3
400	HS, HI	4.45	2.0	VNaHJ 400PZT.743	**531475**	230, 50	357	337	5.62	> 0.91	A2

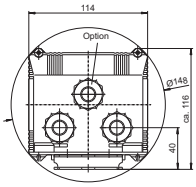
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballast Units for HS and HI Lamps 600 to 2000 W

Shape: 114x116 mm

For high-pressure sodium vapour lamps (HS) and metal halide lamps (HI)
Slim, weather-proof ballast unit fully wired with ballast, capacitor and connection terminal
Suitable for installation in or on pylons
With connection for protective earth conductor
Frontal cable feed using a PG thread fitting
Front access to terminals or fuses
Optional additional third PG connection for mains feed-through wiring
Screw-fixed end cap
Diverse mounting options using an assembly plate or rail
Screw terminals: 0.75–10 mm²
For luminaires of protection class I
tw 130





Degree of protection: IP54

Lamp				Ballast unit								
Output W	Type	Current A	Mains current A	Type	**Ref. No.**	Voltage AC V, Hz	L mm	L1 mm	L2 mm	Weight kg	Power factor λ	Energy efficiency*
600	HS	6.2	3.1	VNaH 600.02	**531182**	230 - 240, 50	452	375	335	9.6	> 0.90	A2
1000	HS	10.3	5.0	VNaHJ 1000.61	**531472**	230 - 240, 50	487	410	370	11.6	> 0.90	A2
	HI	9.5	4.9									A2
2000	HI	8.8	5.7	VJ 2000.05	**531193**	380 - 400, 50	570	500	460	15.2	> 0.90	A2
2000	HI	10.3	6.0	VJD 2000.63	**531474**	380 - 400, 50	627	550	510	20.2	> 0.90	A2

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Degree of protection: IP65
Fully encapsulated ballast unit with leads

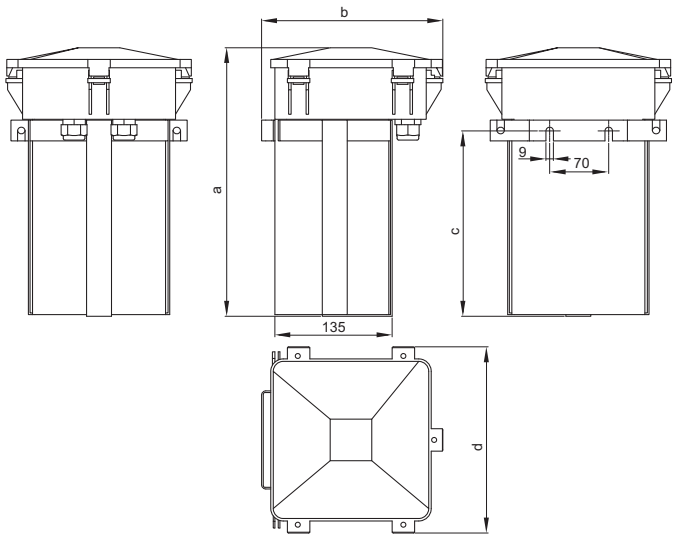
Lamp				Ballast unit								
Output W	Type	Current A	Mains current A	Type	**Ref. No.**	Voltage AC V, Hz	L mm	L1 mm	L2 mm	Weight kg	Power factor λ	Energy efficiency*
1000	HS	10.3	5.0	VNaHJ 1000.61	**531480**	220, 50	487	410	370	11.6	> 0.90	A2
	HI	9.5	4.9									A2
2000	HI	10.3	6.0	VJD 2000.63	**531481**	380, 50	627	550	510	20.2	> 0.90	A2

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballast Units for HS and HI Lamps 1000 to 2000 W

Encapsulated in a plastic casing

For high-pressure sodium vapour lamps (HS) and metal halide lamps (HI)
Fully encapsulated ballast unit in a self-extinguishing, fibre-glass-reinforced polyamide casing consisting of a ballast, capacitor, fuse and a ready-to-use, pre-wired connection terminal.
Cable feed using a PG thread fitting
Screw terminals: 0.75–10 mm²
Protection class II
tw 130



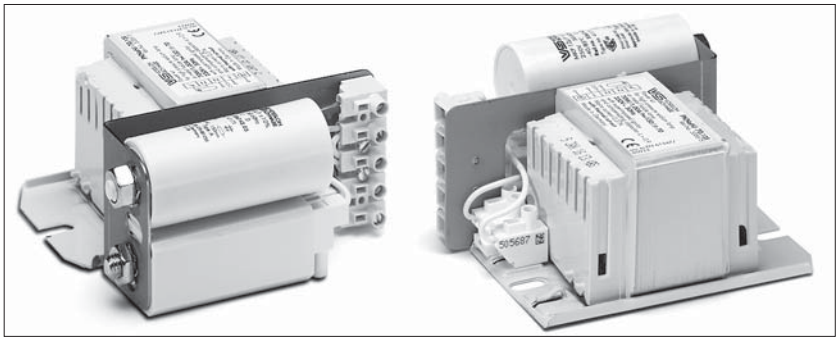
Degree of protection: IP65
With double insulation

	Lamp				Ballast unit									
	Output W	Type	Current A	Mains current (A)	Type	Ref. No.	Voltage AC V, Hz	a mm	b mm	c mm	d mm	Weight kg	Power factor λ	Energy efficiency*
	230/240 V, 50 Hz and 380/400/415 V, 50 Hz													
new	1000	HS HI	10.3/11.3 9.5	5.75 4.9	VNaHJ 1000.75	**554313**	230/240, 50	288	217	–	220	15	> 0.90	A2 A2
new	2000	HI	8.8/9.2	5.7	VJ 2000.76	**554314**	380/400/415, 50	320	217	225	225	21	> 0.90	A2
new	2000	HI	10.3/11.3	6.0	VJD 2000.77	**554315**	380/400/415, 50	320	220	225	225	23	> 0.90	A2
new	2000	HI	12.2	6.0	VJD 2000I.78	**554316**	380/400/415, 50	320	220	225	225	25	> 0.90	A2
	220 V, 60 Hz and 380 V, 60 Hz													
new	1000	HS HI	10.3/11.3 9.5	5.75 4.9	VNaHJ 1000.75	**554904**	220, 60	288	217	–	220	15	> 0.90	A2 A2
new	2000	HI	8.8/9.2	5.7	VJ 2000.76	**554905**	380, 60	320	220	225	225	21	> 0.90	A2
new	2000	HI	10.3/11.3	6.0	VJD 2000.77	**554906**	380, 60	320	220	225	225	23	> 0.90	A2
new	2000	HI	12.2	6.0	VJD 2000I.78	**554909**	380, 60	320	220	225	225	25	> 0.90	A2

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

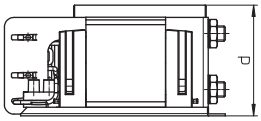
Compact Assembly Kits for HS and HI Lamps 35 to 150 W

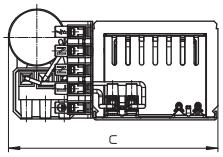
Ballast shape: 53 x 66 mm

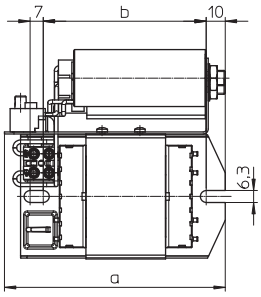


For high pressure sodium lamps (HS),
metal halide lamps (HI)
and ceramic discharge lamps (C-HI)
Compact assembly kit with ballast with or without patented, intelligent thermal cut-out with automatic reset (which evaluates the temperature and current of the ballast), superimposed ignitor and compensation capacitor
With luminaire terminal block:
- screw terminal 0.75–2.5 mm²

With earth terminal
Permissible load capacity: 20–100 pF
Lead length to the lamp: max. 1.5 m
tw 130
On request:
- Further outputs and voltages
- With digital timer ignitor
- For pulse ignition system







As individual components no longer need to be wired, there is a significant reduction in assembly time and costs.

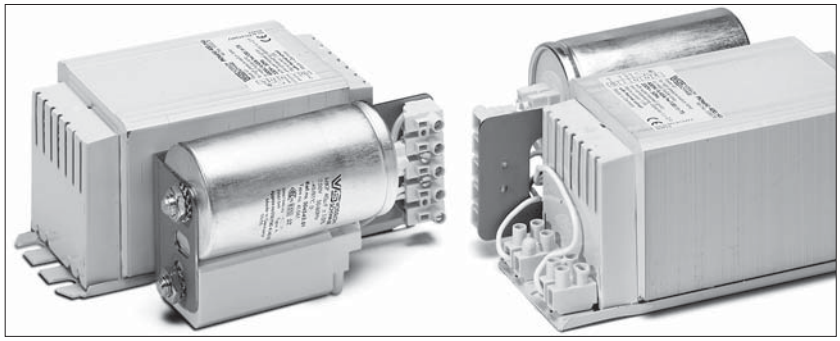
Especially suitable for change of lamp technology from HM to HS.

Lamp			Assembly kit											
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	Mains current A	Temperature protection	a mm	b mm	c mm	d mm	Weight kg	Power factor λ	Energy efficiency*
230 V, 50 Hz														
35	HS, HI	0.53	PKNaHJ 35.008	**546797**	230, 50	0.22	yes	117	86	108	54	1.2	> 0.90	EEI=A3
50	HS	0.76	PKNaH 50PZT.992	**543378**	230, 50	0.30	yes	117	86	111	59	1.4	> 0.90	EEI=A3
70	HS, HI	0.98	PKNaHJ 70.128	**538675**	230, 50	0.37	yes	117	86	111	59	1.4	> 0.90	EEI=A3
				538685			no							EEI=A3
100	HS, HI	1.20	PKNaHJ 100.941	**538676**	230, 50	0.56	yes	117	86	111	59	1.6	> 0.90	EEI=A3
				538686			no							EEI=A3
150	HS, HI	1.80	PKNaHJ 150.620	**538677**	230, 50	0.74	yes	151	120	115	63	2.2	> 0.90	EEI=A3
				538687			no							EEI=A3
220 V, 60 Hz														
35	HS, HI	0.53	PKNaHJ 35.008	**547285**	220, 60	0.23	yes	117	86	108	54	1.2	> 0.90	EEI=A3
				543401			no							
70	HS, HI	0.98	PKNaHJ 70.653	**547287**	220, 60	0.37	yes	117	86	111	59	1.4	> 0.90	EEI=A3
				538680			no							
100	HS, HI	1.20	PKNaHJ 100.271	**538681**	220, 60	0.56	no	117	86	111	59	1.6	> 0.90	EEI=A3
150	HS, HI	1.80	PKNaHJ 150.679	**538682**	220, 60	0.74	no	151	120	115	63	2.2	> 0.90	EEI=A3
220/240 V, 60 Hz														
100	HS, HI	1.20	PKNaHJ 100.345	**543295**	220/240, 60	0.60	no	117	86	111	60	1.6	> 0.90	EEI=A3
150	HS, HI	1.80	PKNaHJ 150.301	**543299**	220/240, 60	0.80	no	151	120	115	63	2.2	> 0.90	EEI=A3

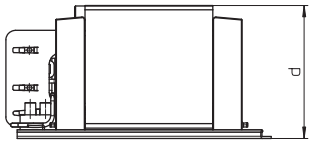
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

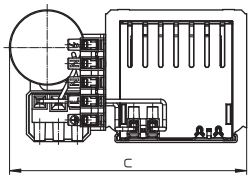
Compact Assembly Kits for HS and HI Lamps 250 and 400 W

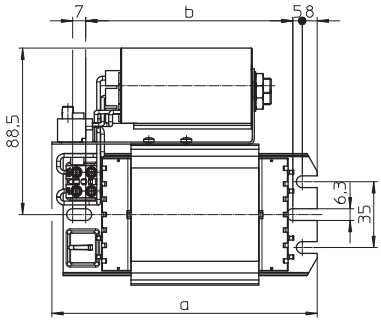
Ballast shape: 71x75 mm



For high pressure sodium lamps (HS),
metal halide lamps (HI)
and ceramic discharge lamps (C-HI)
Compact assembly kit with ballast with or without thermal cut-out with automatic reset, superimposed ignitor and compensation capacitor
With luminaire terminal block:
screw terminal 0.75–2.5 mm²
With earth terminal
Permissible load capacity: 20–100 pF
Lead length to the lamp: max. 1.5 m
tw 130
On request:
Further outputs and voltages
With digital timer ignitor
For pulse ignition system







As individual components no longer need to be wired, there is a significant reduction in assembly time and costs.

Especially suitable for change of lamp technology from HM to HS.

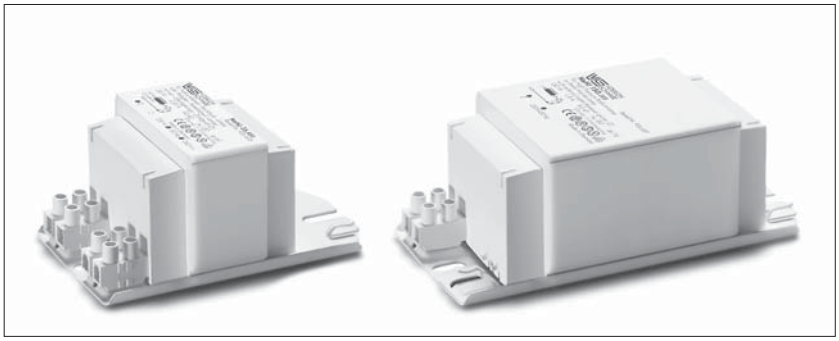
Lamp			Assembly kit											
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	Mains current A	Temperature protection	a mm	b mm	c mm	d mm	Weight kg	Power factor λ	Energy efficiency*
230 V, 50 Hz														
250	HS, HI	3.00	PKNaHJ 250.741	**538678**	230, 50	1.20	yes	141	110	128	73	3.2	> 0.90	A2
				538688			no							A2
400	HS, HI	4.45	PKNaHJ 400.743	**538679**	230, 50	1.80	yes	171	140	129	73	5.2	> 0.90	A2
				538689			no							A2
220 V, 60 Hz														
250	HS, HI	3.00	PKNaHJ 250.742	**538683**	220, 60	1.20	no	141	110	126	71	3.2	> 0.90	A2
400	HS, HI	4.45	PKNaHJ 400.744	**538684**	220, 60	1.80	no	171	140	129	71	5.2	> 0.90	A2

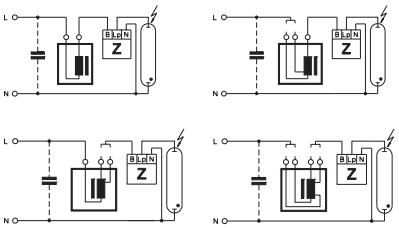
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

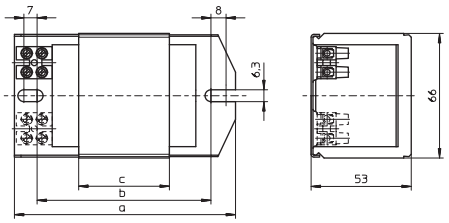
Standard Ballasts for HS and HI Lamps 35 to 70 W

Shape: 53 x 66 mm

For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Vacuum-impregnated with polyester resin
Screw terminals: 0.5–2.5 mm²
Protection class I
tw 130
Ballasts for pulse ignition system on request







Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
35	HS, HI	0.53	NaHJ 35.485	**526517**	220/230, 50	108	86	36	1.07	60	0.40	EEI=A3	6	0.22/0.21
35	HS, HI	0.53	NaHJ 35.485	**161367**	230/240, 50	108	86	36	1.07	60	0.40	EEI=A3	6	0.22/0.21
35	HS, HI	0.53	NaHJ 35.638	**161371**	220, 60	108	86	36	1.07	50	0.41	EEI=A3	5	0.23
50	HS	0.76	NaH 50.486	**161379**	230/240, 50	108	86	36	1.07	65	0.37	EEI=A3	8	0.30/0.29
50	HS	0.76	NaH 50.654	**161399**	220, 60	108	86	36	1.07	60	0.36	EEI=A3	8	0.31
50	HS	0.76	NaHJ 70/50.157	**160613**	230, 50	108	86	42	1.23	55	0.37	EEI=A3	8	0.30
70	HS, HI	0.98								70	0.37	EEI=A3	12	0.38
70	HS, HI	0.98	NaHJ 70.300	**174961**	220, 50	108	86	36	1.07	75	0.40	EEI=A3	12	0.40
70	HS, HI	0.98	NaHJ 70.128	**533568**	230, 50	108	86	36	1.07	70	0.36	EEI=A3	12	0.38
70	HS, HI	0.98	NaHJ 70.128	**539434**	230/240, 50	108	86	36	1.07	70/75	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.158	**161662**	240, 50	108	86	42	1.23	70	0.36	EEI=A3	12	0.37
70	HS, HI	0.98	NaHJ 70.128	**538407**	240, 50	108	86	36	1.07	75	0.37	EEI=A3	12	0.37
70	HS, HI	0.98	NaHJ 70.653	**161392**	220, 60	108	86	36	1.07	60	0.42	EEI=A3	10	0.40

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

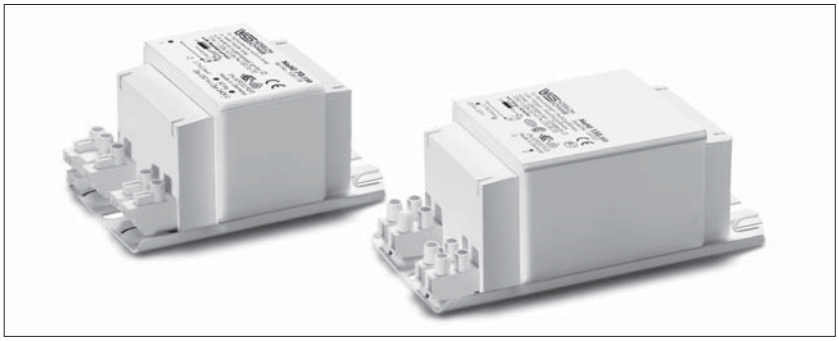
Standard Ballasts for HS and HI Lamps 70 to 250 W

Shape: 53 x 66 mm

Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
70	HS, HI	0.98	NaHJ 100/70.703	**161469**	230, 50	145	120	55	1.55	60	0.37	EEI=A3	12	0.38
100	HS, HI	1.20								70	0.43	EEI=A3	12	0.55
70	HS, HI	0.98	NaHJ 100/70.519	**161158**	230/240, 50	145	120	75	2.03	50	0.36	A2	12	0.38/0.37
100	HS, HI	1.20								60	0.42	EEI=A3	12	0.55/0.53
70	HS, HI	0.98	NaHJ 100/70.709	**161471**	220, 60	145	120	55	1.55	50	0.39	EEI=A3	10	0.40
100	HS, HI	1.20								60	0.44	EEI=A3	10	0.57
100	HS, HI	1.20	NaHJ 100.126	**507671**	220, 50	108	86	42	1.24	75	0.44	EEI=A3	12	0.55
100	HS, HI	1.20	NaHJ 100.941	**161707**	230/240, 50	108	86	42	1.24	75/80	0.42	EEI=A3	12	0.55/0.53
100	HS, HI	1.20	NaHJ 100.271	**530195**	220, 60	108	86	42	1.24	75	0.45	EEI=A3	10	0.57
150	HS, HI	1.80	NaHJ 150.159	**533602**	220, 50	145	120	64	1.80	75	0.41	EEI=A3	20	0.80
150	HS, HI	1.80	NaHJ 150.620	**533565**	230, 50	145	120	64	1.80	70	0.40	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.620	**534540**	240, 50	145	120	64	1.80	75	0.40	EEI=A3	20	0.74
150	HS, HI	1.80	NaHJ 150.679	**526196**	220, 60	145	120	55	1.55	75	0.44	EEI=A3	16	0.80
150	HS, HI	1.80	NaHJ 150.679	**537793**	220, 60	117	92	55	1.55	75	0.44	EEI=A3	16	0.80
250	HS, HI	3.00	NaHJ 250.204	**529087**	220, 50	160	135	95	2.50	80	0.42	EEI=A3	32	1.32
250	HS, HI	3.00	NaHJ 250.160	**160597**	220, 50	180	155	110	2.84	75	0.41	EEI=A3	32	1.32
250	HS, HI	3.00	NaHJ 250.915	**161686**	230, 50	180	155	110	2.84	80	0.40	EEI=A3	32	1.26
250	HS, HI	3.00	NaHJ 250.340	**504109**	230/240, 50	180	155	110	2.84	80	0.39	EEI=A3	32	1.26/1.21
250	HS, HI	3.00	NaHJ 250.340	**178177**	240, 50	180	155	110	2.84	80	0.39	EEI=A3	32	1.21
250	HS, HI	3.00	NaHJ 250.163	**529072**	220, 60	160	135	95	2.50	70	0.42	A2	25	1.35
250	HS, HI	3.00	NaHJ 250.163	**160604**	220, 60	180	155	95	2.50	70	0.42	A2	25	1.35

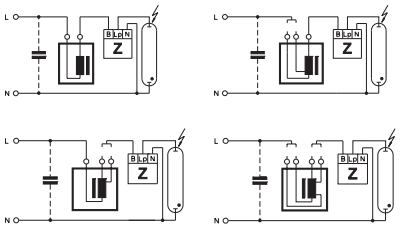
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballasts with Thermal Cut-out for HS and HI Lamps 35 to 150 W

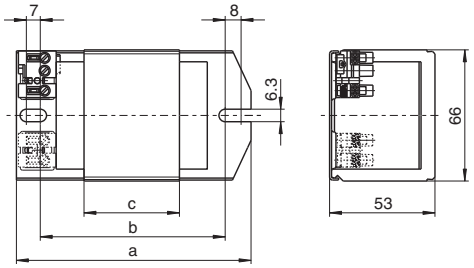


Shape: 53 x 66 mm

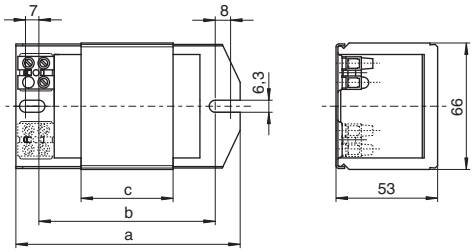
For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Vacuum-impregnated with polyester resin
With VS-patented, intelligent temperature switch
with automatic reset (evaluates the
temperature and current of the ballast)
Protection class I
tw 130
Ballasts for pulse ignition system on request



A Push-in terminals: 0.5–1.5 mm²



B Screw terminals: 0.5–2.5 mm²



Lamp			Ballast											Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	Drawing	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
Push-in terminals: 0.5–1.5 mm²															
35	HS, HI	0.53	NaHJ 35.209	**543737**	230/240, 50	A	108	86	36	1.07	35	0.36	A2	6	0.22
35	HS, HI	0.53	NaHJ 35.485	**506122**	230/240, 50	A	108	86	36	1.07	60	0.40	EEI=A3	6	0.22/0.21
35	HS, HI	0.53	NaHJ 35.638	**509170**	220, 60	A	108	86	36	1.07	50	0.41	EEI=A3	5	0.23
50	HS	0.76	NaH 50.206	**543738**	230, 50	A	108	86	48	1.39	45	0.35	A2	8	0.30
50	HS	0.76	NaHJ 70/50.157	**507341**	230, 50	A	108	86	42	1.23	55	0.37	EEI=A3	8	0.30
70	HS, HI	0.98									70	0.37	EEI=A3	12	0.38
50	HS	0.76	NaHJ 70/50.520	**538361**	230, 50	A	117	92	55	1.55	45	0.36	EEI=A3	8	0.30
70	HS, HI	0.98									55	0.36	EEI=A3	12	0.38
70	HS, HI	0.98	NaHJ 70.128	**535191**	230, 50	A	108	86	36	1.07	70	0.36	EEI=A3	12	0.38
70	HS, HI	0.98	NaHJ 70.226	**543741**	230, 50	A	108	86	48	1.39	50	0.37	A2	12	0.38
70	HS, HI	0.98	NaHJ 70.128	**533572**	230/240, 50	A	108	86	36	1.07	70/75	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.653	**509169**	220, 60	A	108	86	36	1.07	60	0.42	EEI=A3	10	0.40
70	HS, HI	0.98	NaHJ 100/70.703	**507342**	230, 50	A	145	120	55	1.55	60	0.37	EEI=A3	12	0.38
100	HS, HI	1.20									70	0.43	EEI=A3	12	0.55
100	HS, HI	1.20	NaHJ 100.213	**543739**	230, 50	A	117	92	55	1.55	55	0.41	A2	12	0.55
100	HS, HI	1.20	NaHJ 100.670	**506120**	230/240, 50	A	117	92	55	1.55	70	0.42	EEI=A3	12	0.55/0.53
100	HS, HI	1.20	NaHJ 100.941	**539492**	230/240, 50	A	108	86	42	1.23	75/80	0.42	EEI=A3	12	0.55/0.53
100	HS, HI	1.20	NaHJ 150/100.973	**507343**	230, 50	A	145	120	75	2.02	55	0.41	A2	12	0.55
150	HS, HI	1.80									75	0.41	EEI=A3	20	0.57
150	HS, HI	1.80	NaHJ 150.620	**535216**	230, 50	A	145	120	64	1.80	70	0.40	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.620	**538543**	230/240, 50	A	145	120	64	1.80	70/75	0.40	EEI=A3	20	0.77/0.74
150	HS, HI	1,80	NaHJ 150.355	**509100**	230/240, 50	A	145	120	75	2.02	65	0.39	EEI=A3	20	0.77/0.74
150	HS, HI	1.80	NaHJ 150.679	**509171**	220, 60	A	145	120	75	2.02	65	0.42	EEI=A3	16	0.80

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballasts with Thermal Cut-out for HS and HI Lamps 35 to 250 W

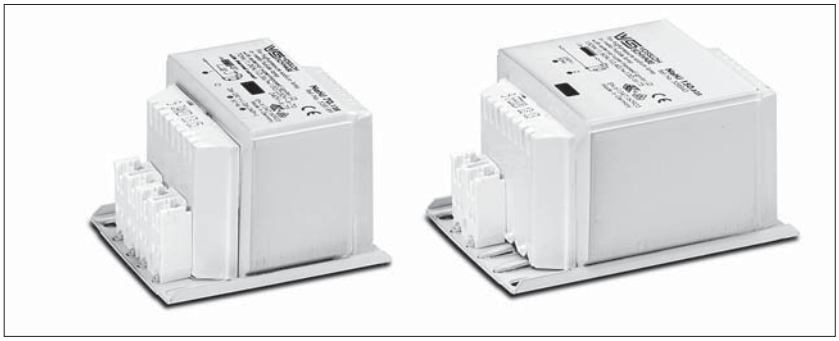
Shape: 53 x 66 mm

Lamp			Ballast											Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	Drawing	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
Screw terminals: 0.5–2.5 mm²															
35	HS, HI	0.53	NaHJ 35.485	**503010**	230/240, 50	B	108	86	36	1.07	60	0.40	EEI=A3	6	0.22/0.21
35	HS	0.53	NaH 50/35.797	**539515**	230, 50	B	108	86	36	1.07	45	0.40	EEI=A3	6	0.22
50	HS	0.76									70	0.37	EEI=A3	8	0.30
50	HS	0.76	NaH 50.486	**507498**	230/240, 50	B	108	86	36	1.07	65	0.37	EEI=A3	8	0.30
50	HS	0.76	NaHJ 70/50.695	**507697**	230/240, 50	B	108	86	48	1.39	50	0.37	EEI=A3	8	0.30/0.29
70	HS, HI	0.98								.	70	0.37	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.128	**536582**	230, 50	B	108	86	36	1.07	70	0.36	EEI=A3	12	0.38
70	HS, HI	0.98	NaHJ 70.158	**169722**	230/240, 50	B	108	86	42	1.23	70	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.128	**538830**	230/240, 50	B	108	86	36	1.07	70/75	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.158	**546817**	240, 50	B	108	86	42	1.23	70	0.36	EEI=A3	12	0.37
70	HS, HI	0.98	NaHJ 100/70.703	**504131**	230, 50	B	117	92	55	1.55	60	0.37	EEI=A3	12	0.38
100	HS, HI	1.20								.	70	0.43	EEI=A3	12	0.55
100	HS, HI	1.20	NaHJ 100.941	**543349**	230, 50	B	108	86	42	1.23	75	0.42	EEI=A3	12	0.55
100	HS, HI	1.20	NaHJ 100.941	**502799**	230/240, 50	B	108	86	42	1.23	75/80	0.42	EEI=A3	12	0.55/0.53
100	HS, HI	1.20	NaHJ 150/100.973	**504135**	230, 50	B	145	120	75	2.02	55	0.41	A2	12	0.55
150	HS, HI	1.80									75	0.41	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.355	**539270**	220, 50	B	145	120	75	2.02	65	0.39	EEI=A3	20	0.80
150	HS, HI	1.80	NaHJ 150.620	**536593**	230, 50	B	145	120	64	1.80	70	0.40	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.995	**169721**	230/240, 50	B	145	120	75	2.02	70	0.40	EEI=A3	20	0.77/0.74
150	HS, HI	1,80	NaHJ 150.620	**538831**	230/240, 50	B	145	120	64	1.80	70/75	0.40	EEI=A3	20	0.77/0.74
150	HS, HI	1.80	NaHJ 150.620	**537763**	240, 50	B	130	105	64	1.80	75	0.40	EEI=A3	20	0.74
150	HS, HI	1.80	NaHJ 150.679	**526616**	220, 60	B	145	120	75	2.02	65	0.42	EEI=A3	16	0.80
250	HS, HI	3.00	NaHJ 250.915	**505054**	230, 50	B	180	155	110	2.84	80	0.40	EEI=A3	32	1.26
250	HS, HI	3.00	NaHJ 250.340	**542349**	230/240, 50	B	180	155	110	2.84	80	0.39	EEI=A3	32	1.26
250	HS, HI	3.00	NaHJ 250.340	**508723**	240, 50	B	180	155	110	2.84	80	0.39	EEI=A3	32	1.26

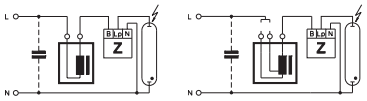
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

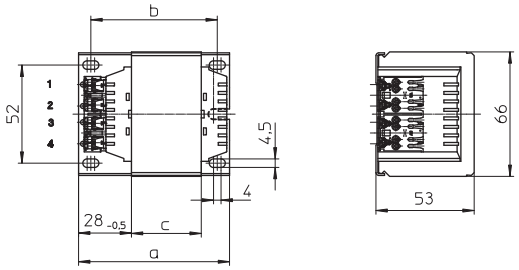
Compact Ballasts for HS and HI Lamps 35 to 150 W

Shape: 53 x 66 mm



For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Vacuum-impregnated with polyester resin
Push-in terminals: 0.5–1 mm²
IDC terminals for leads H05V-U 0.5
Protection class I
Ballasts with screw terminals on request





Lamp			Ballast											Capacitor	
Output	Type	Current	Type	**Ref. No.**	Voltage AC	a	b	c	Weight	Δt	tw	Power factor	Energy efficiency*	C_P	I_N
W		A			V, Hz	mm	mm	mm	kg	K	°C	λ		µF	A
35	HS, HI	0.53	NaHJ 35.485	**538807**	230/240, 50	80	67	36	1.07	60	130	0.40	EEI=A3	6	0.22/0.21
70	HS, HI	0.98	NaHJ 70.128	**538810**	230, 50	80	67	36	1.07	70	130	0.36	EEI=A3	12	0.38
70	HS, HI	0.98	NaHJ 70.128	**538823**	230/240, 50	80	67	36	1.07	70/75	130	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.653	**538828**	220, 60	80	67	36	1.07	60	130	0.42	EEI=A3	10	0.40
150	HS, HI	1.80	NaHJ 150.620	**538834**	230, 50	107	94	64	1.80	70	130	0.40	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.625	**538843**	240, 50	107	94	64	1.80	75	130	0.40	EEI=A3	20	0.74
150	HS, HI	1.80	NaHJ 150.679	**542557**	220, 60	107	94	64	1.80	75	130	0.44	EEI=A3	16	0.80

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

With Thermal Cut-out

Thermal cut-out with automatic reset

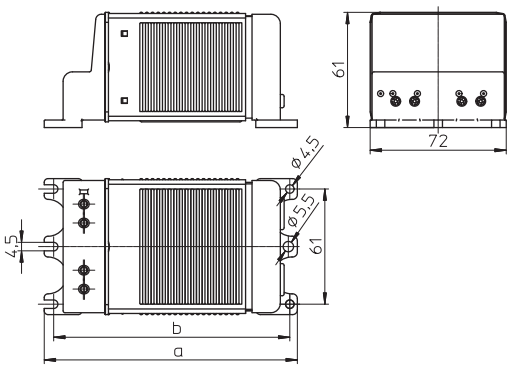
Lamp			Ballast											Capacitor	
Output	Type	Current	Type	**Ref. No.**	Voltage AC	a	b	c	Weight	Δt	tw	Power factor	Energy efficiency*	C_P	I_N
W		A			V, Hz	mm	mm	mm	kg	K	°C	λ		µF	A
35	HS, HI	0.53	NaHJ 35.485	**538258**	230/240, 50	80	67	36	1.07	60	130	0.40	EEI=A3	6	0.22/0.21
70	HS, HI	0.98	NaHJ 70.128	**538189**	230/240, 50	80	67	36	1.07	70/75	130	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.128	**539223**	230/240, 50	80	67	36	1.07	70/75	140	0.36	EEI=A3	12	0.38/0.37
70	HS, HI	0.98	NaHJ 70.653	**538537**	220, 60	80	67	36	1.07	60	130	0.42	EEI=A3	10	0.40
100	HS, HI	1.20	NaHJ 100.581	**539081**	230/240, 50	107	94	64	1.80	60	130	0.42	EEI=A3	12	0.55/0.53
150	HS, HI	1.80	NaHJ 150.159	**548260**	220, 50	107	94	64	1.80	75	130	0.41	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.620	**538262**	230, 50	107	94	64	1.80	70	130	0.40	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.620	**539306**	230, 50	107	94	64	1.80	70	140	0.40	EEI=A3	20	0.77
150	HS, HI	1.80	NaHJ 150.620	**538264**	240, 50	107	94	64	1.80	75	130	0.40	EEI=A3	20	0.74
150	HS, HI	1.80	NaHJ 150.620	**539286**	240, 50	107	94	64	1.80	75	140	0.40	EEI=A3	20	0.74
150	HS, HI	1.80	NaHJ 150.679	**539311**	220, 60	107	94	64	1.80	75	130	0.44	EEI=A3	16	0.80

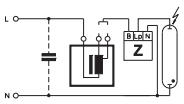
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballasts with Thermal Cut-out for HS and HI Lamps 35 to 150 W, Protection Class II

Encapsulated ballast in compact plastic casing
Shape: 61 x 72 mm

For high pressure sodium lamps (HS), metal halide lamps (HI) and ceramic discharge lamps (C-HI)
With cable holder
Thermal cut-out with automatic reset
Screw terminals: 0.5–2.5 mm²
Protection class II
tw 130

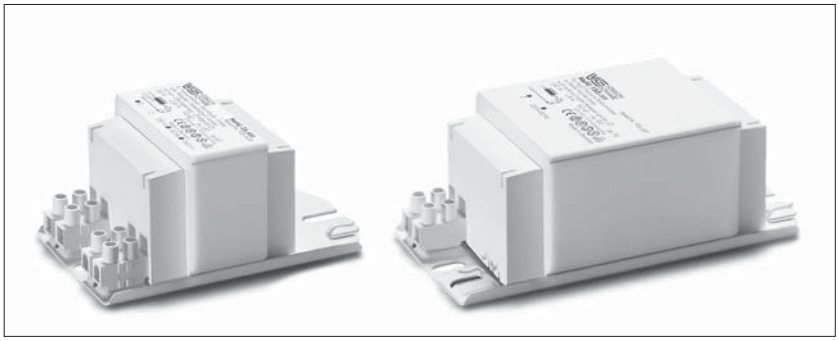




Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	Weight kg	Δt K	Power factor λ	Energy efficiency*		C_P µF	I_N A
35	HS	0.53	NaHZ 50/35.797	**539609**	230, 50	134	125	1.60	45	0.40	EEI=A3		6	0.22
50	HS	0.76							70	0.37	EEI=A3		8	0.30
50	HS	0.76	NaHJZ 70/50.520	**533395**	230, 50	134	125	1.60	45	0.36	EEI=A3		8	0.30
70	HS, HI	0.98							65	0.36	EEI=A3		12	0.38
70	HS, HI	0.98	NaHJZ 100/70.519	**533396**	230, 50	161	152	2.10	45	0.36	EEI=A3		12	0.38
100	HS, HI	1.20							60	0.42	EEI=A3		12	0.55
100	HS, HI	1.20	NaHJZ 150/100.466	**533398**	230, 50	161	152	2.30	45	0.41	A2		12	0.85
150	HS, HI	1.80							70	0.39	EEI=A3		20	0.77

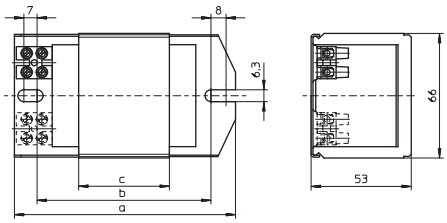
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

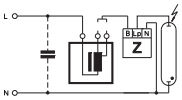
Ballasts with Thermal Cut-out and Thermal Fuse for HS and HI Lamps 35 to 150 W, Protection Class II



With double insulation
Shape: 53 x 66 mm

For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Thermal cut-out with automatic reset
Screw terminals: 0.5–2.5 mm²
Protection class II
tw 130





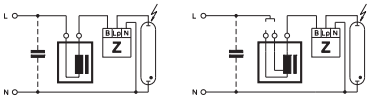
	Lamp			Ballast										Capacitor	
	Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
new	35	HS, HI	0.53	NaHZ 50/35.797	**553806**	230, 50	108	92	36	1.07	45	0.40	EEI=A3	6	0.22
	50	HS	0.76								70	0.37	EEI=A3	8	0.30
new	50	HS	0.76	NaHJZ 70/50.785	**509490**	230, 50	108	92	42	1.24	50	0.35	A2	8	0.30
	70	HS, HI	0.98								70	0.38	A2	12	0.38
new	70	HS, HI	0.98	NaHJZ 100/70.786	**509491**	230, 50	145	120	69	1.83	55	0.38	EEI=A3	12	0.38
	100	HS, HI	1.20								65	0.41	EEI=A3	12	0.55
new	100	HS, HI	1.20	NaHJZ 150/100.787	**509492**	230, 50	145	120	69	1.83	50	0.39	EEI=A3	12	0.85
	150	HS, HI	1.80								75	0.41	EEI=A3	20	0.77

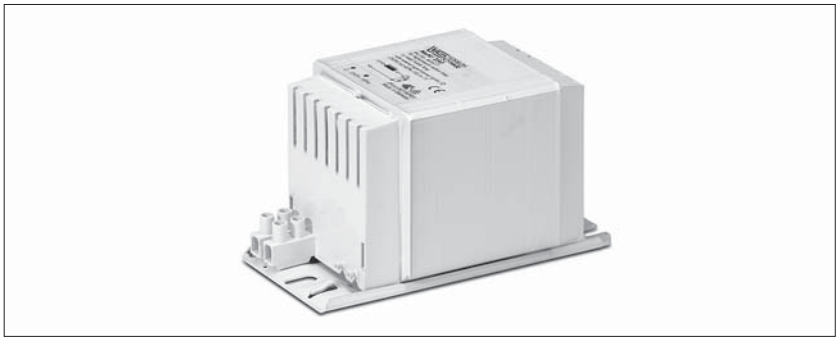
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

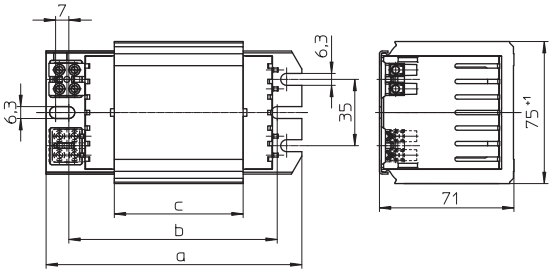
Ballasts for HS and HI Lamps 150 to 400 W

Shape: 71x75 mm

For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Vacuum-impregnated with polyester resin
Screw terminals: 0.75–2.5 mm²
Protection class I
tw 130
Ballasts for pulse ignition system on request







Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HS, HI	3.00	NaHJ 250.741	**536147**	220, 50	135	115	68	2.85	70	0.42	A2	32	1.35
250	HS, HI	3.00	NaHJ 250.741	**536148**	230, 50	135	115	68	2.85	75	0.40	A2	32	1.30
250	HS, HI	3.00	NaHJ 250.741	**536149**	240, 50	135	115	68	2.85	75	0.39	A2	32	1.25
250	HS, HI	3.00	NaHJ 250.742	**536150**	220, 60	135	115	68	2.85	70	0.42	A2	25	1.40
400	HS, HI	4.45	NaHJ 400.743	**536142**	220, 50	165	145	103	4.1	70	0.45	A2	45	2.10
400	HS, HI	4.45	NaHJ 400.743	**535142**	230, 50	165	145	103	4.1	75	0.44	A2	45	2.00
400	HS, HI	4.45	NaHJ 400.743	**536143**	240, 50	165	145	103	4.1	75	0.40	A2	45	1.85
400	HS, HI	4.45	NaHJ 400.744	**536144**	220, 60	165	145	103	4.1	70	0.44	A2	40	2.05

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

With Thermal Cut-out

Thermal cut-out with automatic reset

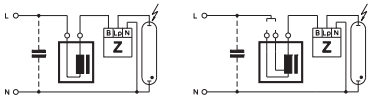
Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
150	HS, HI	1.80	NaHJ 150.216	**543740**	230, 50	135	115	68	2.85	45	0.40	A2	20	0.77
250	HS, HI	3.00	NaHJ 250.741	**539274**	220, 50	135	115	68	2.85	70	0.42	A2	32	1.35
250	HS, HI	3.00	NaHJ 250.741	**544210**	230, 50	135	115	68	2.85	65	0.40	A2	32	1.30
250	HS, HI	3.00	NaHJ 250.741	**536151**	230, 50	135	115	68	2.85	75	0.40	A2	32	1.30
250	HS, HI	3.00	NaHJ 250.741	**537726**	230/240, 50	135	115	68	2.85	75	0.40	A2	32	1.30/1.25
250	HS, HI	3.00	NaHJ 250.741	**536152**	240, 50	135	115	68	2.85	75	0.39	A2	32	1.25
400	HS, HI	4.45	NaHJ 400.743	**548259**	220, 50	165	145	103	4.1	70	0.44	A2	45	2.10
400	HS, HI	4.45	NaHJ 400.743	**536145**	230, 50	165	145	103	4.1	75	0.44	A2	45	2.00
400	HS, HI	4.45	NaHJ 400.743	**538204**	230, 50	165	145	103	4.1	65	0.41	A2	45	2.00
400	HS, HI	4.45	NaHJ 400.743	**539209**	230/240, 50	165	145	103	4.1	75	0.41	A2	45	2.00/1.85
400	HS, HI	4.45	NaHJ 400.743	**543986**	240, 50	165	145	103	4.1	70	0.40	A2	45	1.85
400	HS, HI	4.45	NaHJ 400.743	**536146**	240, 50	165	145	103	4.1	75	0.40	A2	45	1.85
400	HS, HI	4.45	NaHJ 400.744	**538620**	220, 60	165	145	103	4.1	70	0.44	A2	40	2.05

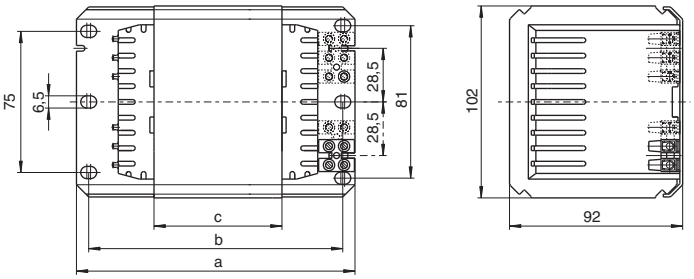
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballasts for HS and HI Lamps 250 to 600 W

Shape: 92x102 mm

For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Vacuum-impregnated with polyester resin
Screw terminals: 0.75–2.5 mm²
Protection class I
tw 130
Ballasts for pulse ignition system on request





Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HS, HI	3.00	NaHJ 250.003	**179743**	220, 50	133	120	44	3.53	70	0.41	EEI=A3	32	1.32
250	HS, HI	3.00	NaHJ 250.727	**178771**	230, 50	133	120	44	3.53	70	0.39	EEI=A3	32	1.26
250	HS, HI	3.00	NaHJ 250.727	**500976**	240, 50	133	120	44	3.53	70	0.39	EEI=A3	32	1.21
250	HS, HI	3.00	NaHJ 250.011	**500401**	220, 60	133	120	44	3.53	65	0.43	A2	25	1.35
400	HS, HI	4.45	NaHJ 400.006	**179740**	220, 50	148	135	68	5.20	70	0.44	A2	45	2.00
400	HS, HI	4.45	NaHJ 400.006	**178790**	230, 50	148	135	68	5.20	70	0.44	A2	45	1.95
400	HS, HI	4.45	NaHJ 400.737	**500402**	240, 50	148	135	68	5.20	75	0.43	A2	45	1.90
400	HS, HI	4.45	NaHJ 400.012	**500403**	220, 60	148	135	68	5.20	70	0.44	A2	40	2.00
400	HI	3.50	J 400.027	**505782**	230/240, 50	148	135	68	5.20	60	0.45	A2	35	1.64/1.59
600	HS	6.20	NaH 600.010	**179742**	220, 50	173	160	96	6.80	70	0.44	A2	65	2.90
600	HS	6.20	NaH 600.005	**533484**	230/240, 50	173	160	96	6.80	70	0.44	A2	65	2.90/2.85
600	HS	6.20	NaH 600.140	**529560**	220, 60	173	160	96	6.80	65	0.46	A2	55	3.00

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

With Thermal Cut-out

Thermal cut-out with automatic reset

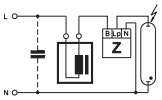
Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HS, HI	3.00	NaHJ 250.727	**500969**	230/240, 50	133	120	44	3.53	70	0.39	EEI=A3	32	1.26/1.21
250	HS, HI	3.00	NaHJ 250.011	**508744**	220, 60	133	120	44	3.46	65	0.43	A2	25	1.35
400	HS, HI	4.45	NaHJ 400.737	**179424**	230/240, 50	148	135	68	5.20	70/75	0.43	A2	45	1.95/1.90
400	HI	3.50	J 400.027	**509613**	230/240, 50	148	135	68	5.20	60	0.45	A2	35	1.64/1.59
400	HS, HI	4.45	NaHJ 400.012	**508741**	220, 60	148	135	68	5.20	70	0.44	A2	40	2.00
600	HS	6.20	NaH 600.005	**179454**	230/240, 50	173	160	96	6.80	70	0.44	A2	65	2.90/2.85

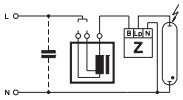
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

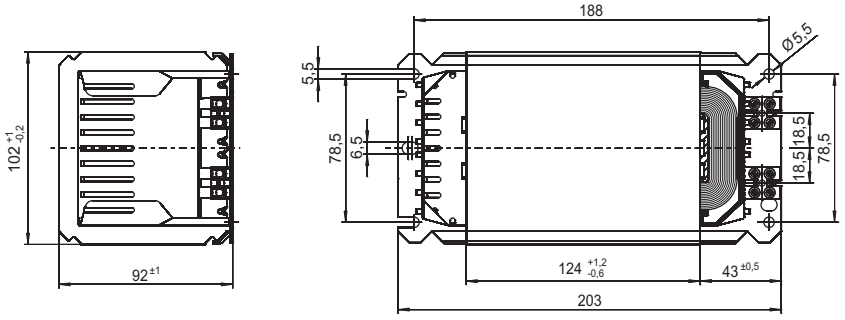
Ballasts for HS and HI Lamps 1000 W

Shape: 92 x 102 mm

For high pressure sodium lamps (HS)
and metal halide lamps (HI)
Vacuum-impregnated with polyester resin
Screw terminals: 0.75 - 2.5 mm²
Protection class I
tw 130
Ballasts for pulse ignition system on request







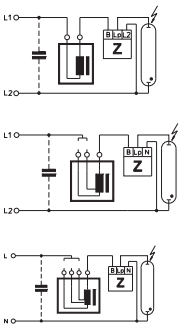
Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
1000	HS	10.30	NaHJ 1000.089	**534487**	220, 50	203	188	124	8.90	80	0.47	A2	100	5.1
	HI	9.50								70	0.51	A2	85	5.0
1000	HS	10.30	NaHJ 1000.089	**539212**	220/230, 50	203	188	124	8.90	80	0.45	A2	100	5.1
	HI	9.50								70	0.49	A2	85	5.0
1000	HS	10.30	NaHJ 1000.089	**528548**	230, 50	203	188	124	8.90	80	0.45	A2	100	5.1
	HI	9.50								70	0.49	A2	85	5.0
1000	HS	10.30	NaHJ 1000.089	**544787**	230/240, 50	203	188	124	8.90	85	0.45	A2	100	5.1
	HI	9.50								70	0.46	A2	85	5.0
1000	HS	10.30	NaHJ 1000.089	**536140**	240, 50	203	188	124	8.90	85	0.42	A2	100	4.8
	HI	9.50								75	0.46	A2	85	4.9
1000	HS	10.30	NaHJ 1000.089	**528536**	220, 60	203	188	124	8.90	75	0.46	A2	100	5.1
	HI	9.50								60	0.50	A2	85	5.0

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

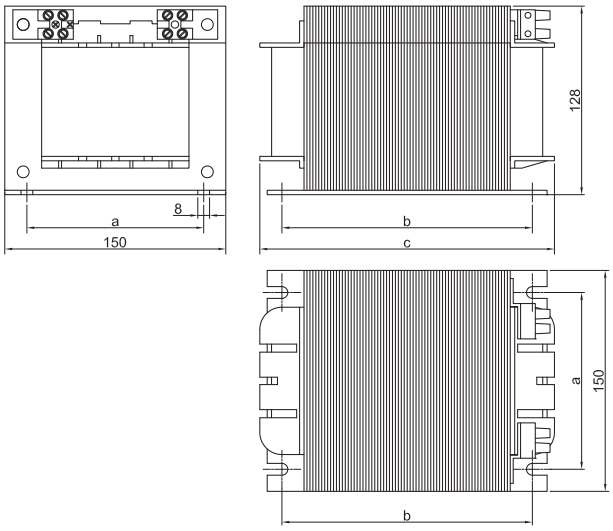
Ballasts for HI Lamps up to 2500 W

Shape: 150x150 mm

For metal halide lamps (HI)
Vacuum impregnated with polyester resin
Screw terminals: 0.75–4 mm²
For luminaires of protection class I
tw 130



For Short Arc Lamps



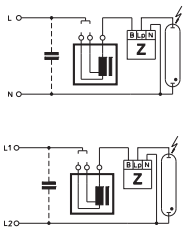
	Lamp			Ballast										Capacitor	
	Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
new	2000	HI	8.8	J 2000.71	**554303**	380/400, 50	122	175	200	15	75	0.60	A2	37	6
new	2000	HI	8.8	J 2000.72	**554304**	380/400/415, 50	122	135	160	14	70	0.58	A2	37	6
new	2000	HI	8.8	J 2000.73	**554305**	380, 60	122	175	200	15	75	0.53	A2	30	6
new	2000	HI	10.3/11.3	JD 2000.81	**554270**	380/400, 50	122	175	200	15	80	0.53	A2	60	6
new	2000	HI	10.3/11.3	JD 2000.81	**554306**	380/400/415, 50	122	135	160	14	75	0.52	A2	60	6
new	2000	HI	10.3/11.3	JD 2000.83	**554283**	380, 60	122	175	200	15	75	0.54	A2	50	6
new	2000	HI	12.2	JD 2000II.91	**554307**	380/400, 50	122	175	200	16	80	0.46	A2	70	6
new	2000	HI	12.2	JD 2000II.92	**554308**	380, 60	122	175	200	16	75	0.45	A2	60	6
new	2000	HI	16.5	JD 2000I.85	**554309**	230/240, 50	122	135	160	14	80	0.57	A2	125	10.5
new	2000	HI	16.5	JD 2000I.86	**554310**	220, 60	122	135	160	14	80	0.57	A2	105	10
	For Short Arc Lamps 1200 and 2500 W														
new	1200	HI	13.8	J 1200.95	**554311**	208, 60 230/245, 50	122	105	130	11	–	0.40	A2 A2	150	6
new	2500	HI	25.6	J 2500.96	**554312**	208, 60 230/245, 50	122	175	200	16	–	0.44	A2 A2	260	12.3

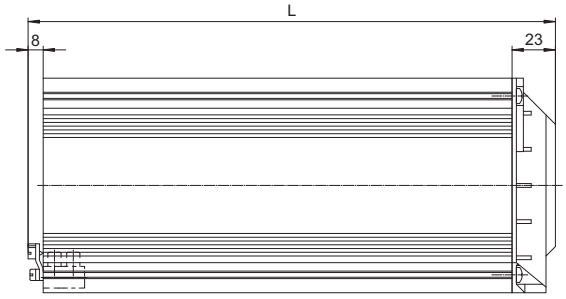
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

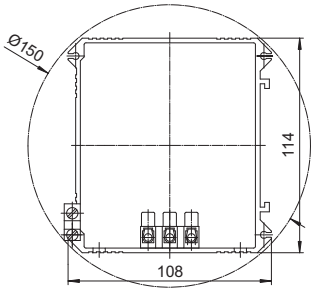
Encapsulated Ballasts for HS Lamps 1000 W and HI Lamps 1000 and 2000 W

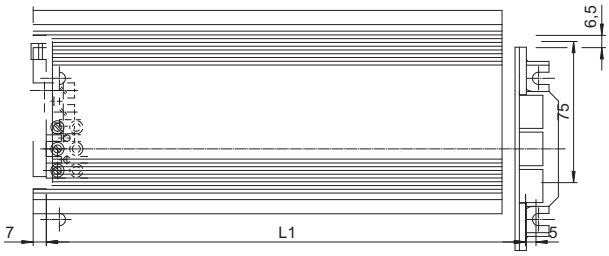
Shape: 108 x 114 mm

For high-pressure sodium vapour lamps (HS) and metal halide lamps (HI)
Corrosion-proof due to fully encapsulation of the ballast in an aluminium casing
Specifically designed for installation in pylons
Diverse mounting options
Screw terminals: 0.75–10 mm²
For luminaires of protection class I
tw 130
With connection for protective earth conductor







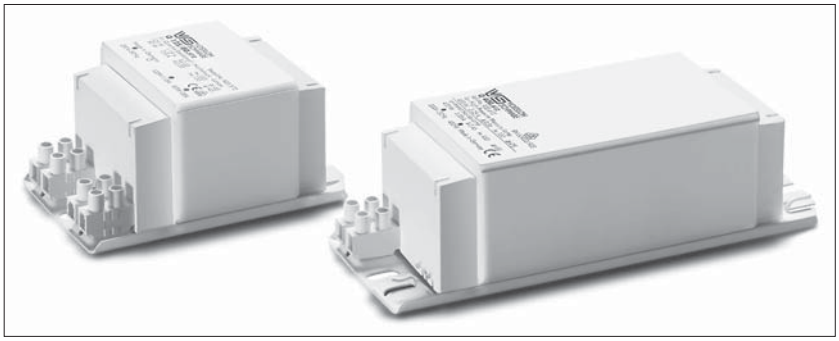


Lamp			Ballast									Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	L mm	L1 mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
1000	HS	10.3	NaH 1000G.46	**531018**	230/240, 50	216	185	10.3	65	0.44	A2	100	5.1
1000	HI	9.5	J 1000G.41	**531017**	230/240, 50	216	185	10.2	70	0.48	A2	85	5.1
2000	HI	10.3	J 2000G.40	**531024**	380/400, 50	313	290	19.7	70	0.50	A2	60	6
2000	HI	8.8	J 2000G.42	**531021**	360/380/400, 50	261	235	13.8	90	0.62	A2	37	6

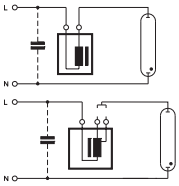
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

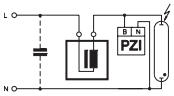
Ballasts for HM and HI Lamps 50 to 400 W

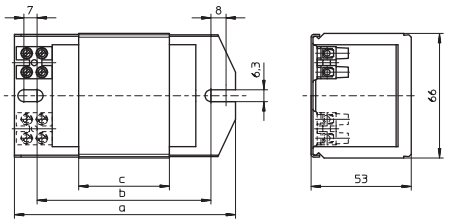
Shape: 53 x 66 mm



For mercury vapour lamps (HM) and
metal halide lamps (HI) with ignition voltage 1 kV
Vacuum-impregnated with polyester resin
Screw terminals: 0.5–2.5 mm²
Protection class I
tw 130







Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
50	HM	0.61	Q 50.501	**167100**	220, 50	108	86	36	1.07	55	0.44	EEI=A3	7	0.28
50	HM	0.61	Q 50.550	**167213**	230, 50	108	86	36	1.07	55	0.44	EEI=A3	7	0.27
50	HM	0.61	Q 50.508	**167125**	240, 50	108	86	36	1.07	65	0.42	EEI=A3	7	0.26
50	HM	0.61	Q 50.535	**167185**	220, 60	108	86	36	1.07	50	0.44	EEI=A3	6	0.28
50	HM	0.61	Q 80/50.596	**167311**	230, 50	108	86	36	1.07	55	0.43	EEI=A3	7	0.27
80	HM	0.80								70	0.51	EEI=A3	8	0.41
50	HM	0.61	Q 80/50.592	**167306**	220, 60	108	86	36	1.07	50	0.44	EEI=A3	6	0.28
80	HM	0.80								60	0.53	EEI=A3	7	0.43
80	HM	0.80	Q 80.587	**167302**	220, 50	108	86	36	1.07	65	0.52	EEI=A3	8	0.43
80	HM	0.80	Q 80.588	**167304**	230, 50	108	86	36	1.07	70	0.51	EEI=A3	8	0.41
80	HM	0.80	Q 80.510	**167132**	240, 50	108	86	36	1.07	60	0.48	EEI=A3	8	0.40
80	HM	0.80	Q 80.584	**167299**	220, 60	108	86	36	1.07	55	0.51	EEI=A3	7	0.43
80	HM	0.80	Q 125/80.611	**167326**	230, 50	108	86	42	1.23	50	0.49	EEI=A3	8	0.41
125	HM	1.15								70	0.54	EEI=A3	10	0.60
80	HM	0.80	Q 125/80.511	**167136**	240, 50	108	86	48	1.39	50	0.48	EEI=A3	8	0.40
125	HM	1.15								70	0.52	EEI=A3	10	0.58
125	HM	1.15	Q 125.549	**169947**	220, 50	108	86	36	1.07	70	0.56	EEI=A3	10	0.63
125	HM	1.15	Q 125.568	**167263**	230, 50	108	86	36	1.07	75	0.54	EEI=A3	10	0.60
125	HM	1.15	Q 125.512	**167140**	240, 50	108	86	48	1.39	65	0.51	EEI=A3	10	0.58
125	HM	1.15	Q 125.598	**502818**	220, 60	108	86	36	1.07	60	0.57	EEI=A3	10	0.65
250	HM	2.13	Q 250.513	**167144****	220, 50	145	120	75	2.10	75	0.58	EEI=A3	18	1.26
250	HM	2.13	Q 250.528	**167367****	230, 50	145	120	75	2.10	75	0.56	EEI=A3	18	1.20
250	HM	2.13	Q 250.703	**507256****	240, 50	145	120	75	2.10	75	0.53	EEI=A3	18	1.15
250	HM	2.13	Q 250.606	**533705****	220, 60	145	120	64	1.80	70	0.58	A2	15	1.30
400	HM	3.25	Q 400.616	**528236****	220, 50	160	135	95	2.50	80	0.60	EEI=A3	25	2.00
400	HM	3.25	Q 400.561	**167250****	220, 50	180	155	110	2.88	75	0.60	A2	25	2.00
400	HM	3.25	Q 400.612	**167330****	230, 50	180	155	110	2.88	75	0.56	EEI=A3	25	1.90
400	HM	3.25	Q 400.669	**167374****	240, 50	180	155	110	2.88	75	0.54	EEI=A3	25	1.85
400	HM	3.25	Q 400.613	**167335****	220, 60	180	155	110	2.88	65	0.60	EEI=A3	25	2.00
400	HM	3.25	Q 400.613	**508245****	220, 60	180	155	95	2.50	75	0.60	EEI=A3	25	2.00

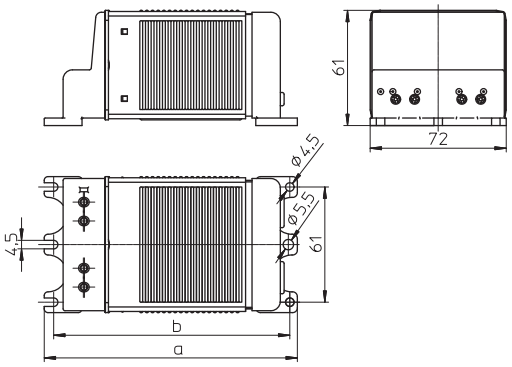
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

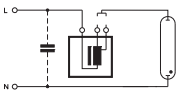
** Suitable for metal halide lamps (HI) with ignition voltage 1 kV in combination with pulse ignitor PZI 1000/1 K (see page 60)

Ballasts with Thermal Cut-out for HM Lamps 50 to 125 W, Protection Class II

Encapsulated ballast in compact plastic casing
Shape: 61 x 72 mm

For mercury vapour lamps (HM)
With cable holder
Thermal cut-out with automatic reset
Screw terminals: 0.5–2.5 mm²
Protection class II
tw 130





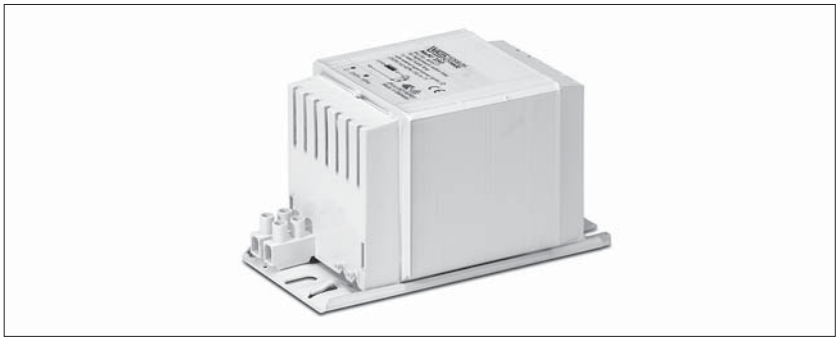
Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	Weight kg	Δt K	Power factor λ	Energy efficiency*		C_P µF	I_N A
50	HM	0.61	QZ 80/50.551	**533399**	230, 50	134	125	1.2	50	0.43	EEI=A3		7	0.27
80	HM	0.80							65	0.51	EEI=A3		8	0.41
80	HM	0.80	QZ 125/80.553	**533400**	230, 50	134	125	1.6	45	0.50	EEI=A3		8	0.41
125	HM	1.15							60	0.53	EEI=A3		10	0.60

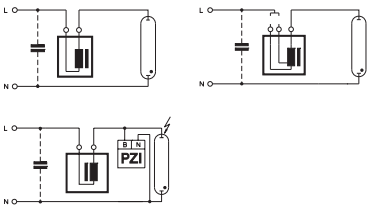
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

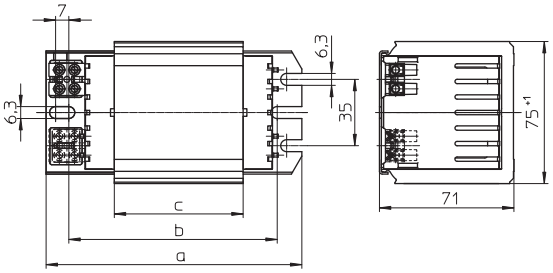
Ballasts for HM and HI Lamps 250 and 400 W

Shape: 71x75 mm

For mercury vapour lamps (HM) and
metal halide lamps (HI) with ignition voltage 1 kV
Vacuum-impregnated with polyester resin
Screw terminals: 0.75–2.5 mm²
Protection class I
tw 130







Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HM	2.13	Q 250.800	**536260****	230/240, 50	135	115	68	2.85	55	0.53	EEI=A3	18	1.3
400	HM	3.25	Q 400.715	**537869****	220, 50	135	115	68	2.85	70	0.59	A2	25	2.0
400	HM	3.25	Q 400.801	**536258****	230, 50	135	115	68	2.85	75	0.58	EEI=A3	25	2.0
400	HM	3.25	Q 400.801	**538034****	230, 50	135	115	68	2.85	65	0.58	EEI=A3	25	2.0
400	HM	3.25	Q 400.801	**537703****	230/240, 50	135	115	68	2.85	75	0.58	EEI=A3	25	2.0/1.85
400	HM	3.25	Q 400.732	**537873****	220, 60	135	115	68	2.85	70	0.59	A2	25	2.0

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

** Suitable for metal halide lamps (HI) with ignition voltage 1 kV in combination with pulse ignitor PZI 1000/1 K (see page 60)

With Thermal Cut-out

Thermal cut-out with automatic reset

Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HM	2.13	Q 250.800	**536261****	230/240, 50	135	115	68	2.85	55	0.53	EEI=A3	18	1.3
400	HM	3.25	Q 400.801	**536259****	230, 50	135	115	68	2.85	75	0.58	EEI=A3	25	2.0

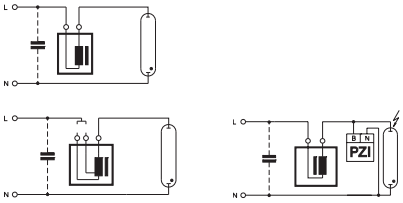
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

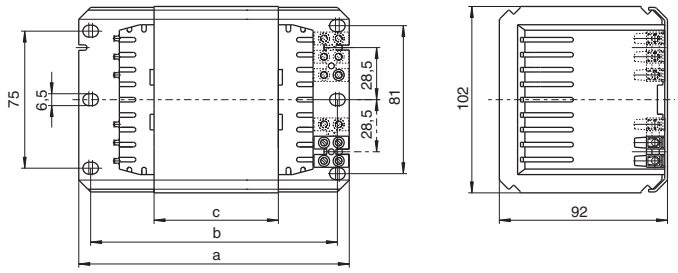
** Suitable for metal halide lamps (HI) with ignition voltage 1 kV in combination with pulse ignitor PZI 1000/1 K (see page 60)

Ballasts for HM and HI Lamps 250 to 1000 W

Shape: 92 x 102 mm

For mercury vapour lamps (HM) and
metal halide lamps (HI) with ignition voltage 1 kV
Vacuum-impregnated with polyester resin
Screw terminals: 0.75–2.5 mm²
Protection class I
tw 130





Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HM	2.13	Q 250.417	**504467****	230/240, 50	133	120	44	3.53	50	0.52	EEI=A3	18	1.20
400	HM	3.25	Q 400.001	**504474****	230/240, 50	133	120	44	3.53	65	0.56	EEI=A3	25	1.80
700	HM	5.40	Q 700.035	**528521**	230/240, 50	173	160	96	6.90	60	0.56	EEI=A3	40	3.40
1000	HM	7.50	Q 1000.097	**537103****	220, 50	173	160	96	6.90	75	0.61	EEI=A3	60	4.80
1000	HM	7.50	Q 1000.096	**538540****	230, 50	173	160	96	6.90	65	0.60	EEI=A3	60	4.80
1000	HM	7.50	Q 1000.096	**528761****	230, 50	173	160	96	6.90	65	0.60	EEI=A3	60	4.80
1000	HM	7.50	Q 1000.145	**528886****	240, 50	173	160	96	6.90	75	0.58	EEI=A3	60	4.60
1000	HM	7.50	Q 1000.311	**526715****	220, 60	173	160	96	6.90	70	0.61	EEI=A3	50	5.00

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

** Suitable for metal halide lamps (HI) with ignition voltage 1 kV in combination with pulse ignitor PZI 1000/1 K (see page 60)

With Thermal Cut-out

Thermal cut-out with automatic reset

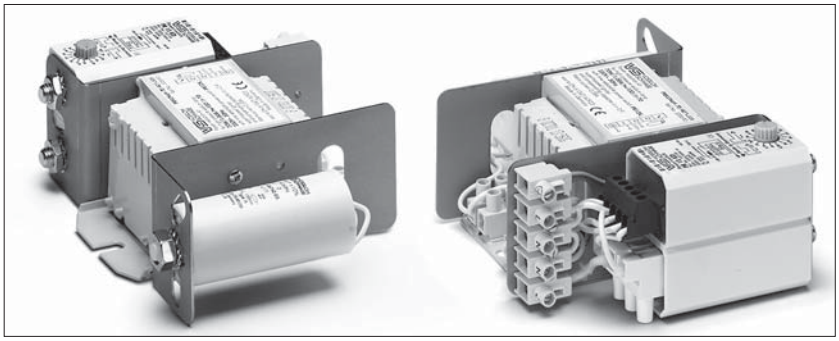
Lamp			Ballast										Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
250	HM	2.13	Q 250.417	**508746****	230/240, 50	133	120	44	3.53	50	0.52	EEI=A3	18	1.20
400	HM	3.25	Q 400.001	**505002****	230/240, 50	133	120	44	3.53	65	0.56	EEI=A3	25	1.80

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

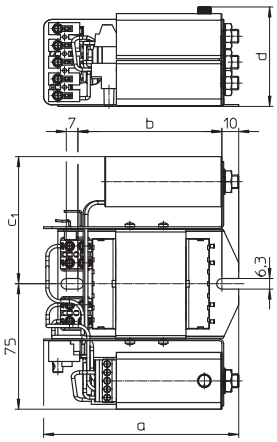
** Suitable for metal halide lamps (HI) with ignition voltage 1 kV in combination with pulse ignitor PZI 1000/1 K (see page 60)

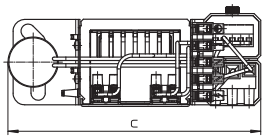
Compact Power Reduction Kits for HS Lamps 50 to 150 W

Ballast shape: 53 x 66 mm



For high pressure sodium lamps (HS)
Compact power reduction kit with ballast with or without patented, intelligent thermal cut-out with automatic reset (which evaluates the temperature and current of the ballast), ignitor, power switch and compensation capacitor
With luminaire terminal block:
screw terminal 0.75–2.5 mm²
With earth terminal
Permissible load capacity: 20–100 pF
Lead length to the lamp: max. 1.5 m
tw 130
Further outputs and voltages on request
With digital timer ignitor on request





As individual components no longer need to be wired, there is a significant reduction in assembly time and costs.

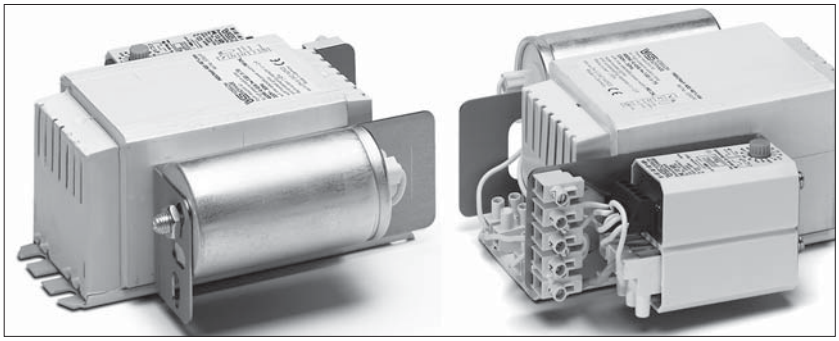
Lamp			Power reduction kit												
Output	Type	Current	Type	**Ref. No.**	Voltage AC V, Hz	Mains current A	Temperature protection	a mm	b mm	c mm	c1 mm	d mm	Weight kg	Power factor λ	Energy efficiency*
Power reduction without control phase – Intelligent power switch PR 12 K LC (Light Control)															
70/40%	HS	0.98	PRKUNaH 70/40%.525	**543384**	220, 50	0.38	no	117	86	151	76	60	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**543388**	220, 50	0.56	no	123	92	151	76	60	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**543385**	220, 50	0.77	no	151	120	154	79	60	2.3	> 0.90	EEI=A3
50/40%	HS	0.76	PRKUNaH 50/40%.021	**544760**	230, 50	0.30	yes	117	86	151	76	56	1.5	> 0.90	EEI=A3
70/40%	HS	0.98	PRKUNaH 70/40%.525	**543742**	230, 50	0.38	yes	117	86	151	76	60	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**543743**	230, 50	0.55	yes	123	92	151	76	60	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**543744**	230, 50	0.77	yes	151	120	154	79	60	2.3	> 0.90	EEI=A3
Power reduction without control phase – Power switch PR 12 KD with selectable switching time															
70/40%	HS	0.98	PRKUNaH 70/40%.525	**539328**	220, 50	0.38	no	117	86	151	76	60	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**539330**	220, 50	0.56	no	123	92	151	76	60	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**539332**	220, 50	0.77	no	151	120	154	79	60	2.3	> 0.90	EEI=A3
70/40%	HS	0.98	PRKUNaH 70/40%.525	**538690**	230, 50	0.38	yes	117	86	151	76	60	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**538691**	230, 50	0.56	yes	123	92	151	76	60	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**538692**	230, 50	0.77	yes	151	120	154	79	60	2.3	> 0.90	EEI=A3
70/40%	HS	0.98	PRKUNaH 70/40%.525	**538700**	220, 60	0.38	no	117	86	151	76	60	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**538701**	220, 60	0.56	no	123	92	151	76	60	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**538702**	220, 60	0.77	no	151	120	154	79	60	2.3	> 0.90	EEI=A3
Power reduction with control phase – Power switch PU 12 K															
70/40%	HS	0.98	PRKUNaH 70/40%.525	**539329**	220, 50	0.38	no	117	86	151	76	56	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**539331**	220, 50	0.56	no	123	92	151	76	56	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**539333**	220, 50	0.77	no	151	120	154	79	56	2.3	> 0.90	EEI=A3
70/40%	HS	0.98	PRKUNaH 70/40%.525	**538695**	230, 50	0.38	yes	117	86	151	76	56	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**538696**	230, 50	0.56	yes	123	92	151	76	56	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**538697**	230, 50	0.77	yes	151	120	154	79	56	2.3	> 0.90	EEI=A3
70/40%	HS	0.98	PRKUNaH 70/40%.525	**538705**	220, 60	0.38	no	117	86	151	76	56	1.5	> 0.90	EEI=A3
100/40%	HS	1.20	PRKUNaH 100/40%.522	**538706**	220, 60	0.56	no	123	92	151	76	56	1.7	> 0.90	EEI=A3
150/40%	HS	1.80	PRKUNaH 150/40%.142	**538707**	220, 60	0.77	no	151	120	154	79	56	2.3	> 0.90	EEI=A3

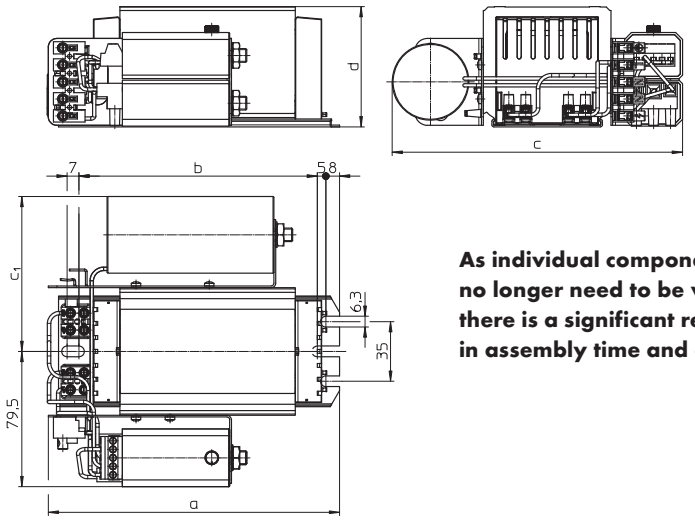
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Compact Power Reduction Kits for HS Lamps 250 and 400 W

Ballast shape: 71x75 mm

For high pressure sodium lamps (HS)
Compact power reduction kit with ballast with or without thermal cut-out with automatic reset, superimposed ignitor, power switch and compensation capacitor
With luminaire terminal block:
screw terminal 0.75–2.5 mm²
With earth terminal
Permissible load capacity: 20–100 pF
Lead length to the lamp: max. 1.5 m
tw 130
Further outputs and voltages on request
With digital timer ignitor on request





As individual components no longer need to be wired, there is a significant reduction in assembly time and costs.

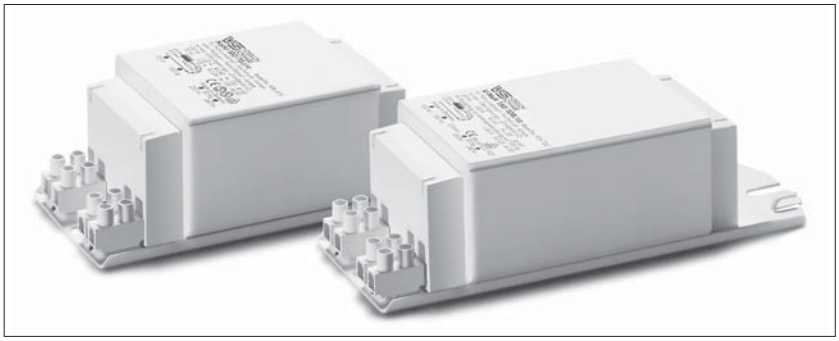
Lamp			Power reduction kit												
Output	Type	Current	Type	**Ref. No.**	Voltage AC	Mains current	Temperature protection	a	b	c	c1	d	Weight	Power factor	Energy efficiency*
W		A			V, Hz	A		mm	mm	mm	mm	mm	kg	λ	
Power reduction without control phase – Intelligent power switch PR 12 K LC (Light Control)															
250/40%	HS	3.00	PRKUNaH 250/40%.936	**543386**	220, 50	1.26	no	141	110	171	91	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.906	**543389**	220, 50	1.95	no	171	140	171	91	71	5.3	> 0.90	A2
250/40%	HS	3.00	PRKUNaH 250/40%.936	**543745**	230, 50	1.26	yes	141	110	171	91	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.906	**543746**	230, 50	1.95	yes	171	140	171	91	71	5.3	> 0.90	A2
Power reduction without control phase – Power switch PR 12 KD with selectable switching time															
250/40%	HS	3.00	PRKUNaH 250/40%.758	**546585**	220, 50	1.26	no	171	140	171	91	71	5.3	> 0.90	EEI=A3
250/40%	HS	3.00	PRKUNaH 250/40%.936	**539334**	220, 50	1.26	no	141	110	171	91	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.906	**539335**	220, 50	1.95	no	171	140	171	91	71	5.3	> 0.90	A2
250/40%	HS	3.00	PRKUNaH 250/40%.936	**538693**	230, 50	1.26	yes	141	110	171	91	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.906	**538694**	230, 50	1.95	yes	171	140	171	91	71	5.3	> 0.90	A2
250/40%	HS	3.00	PRKUNaH 250/40%.983	**538703**	220, 60	1.26	no	141	110	165	86	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.937	**538704**	220, 60	1.95	no	171	140	171	91	71	5.3	> 0.90	A2
Power reduction with control phase – Power switch PU 12 K															
250/40%	HS	3.00	PRKUNaH 250/40%.936	**539336**	220, 50	1.26	no	141	110	171	91	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.906	**539337**	220, 50	1.95	no	171	140	171	91	71	5.3	> 0.90	A2
250/40%	HS	3.00	PRKUNaH 250/40%.936	**538698**	230, 50	1.26	yes	141	110	171	91	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.906	**538699**	230, 50	1.95	yes	171	140	171	91	71	5.3	> 0.90	A2
250/40%	HS	3.00	PRKUNaH 250/40%.983	**538708**	220, 60	1.26	no	141	110	165	86	71	3.3	> 0.90	EEI=A3
400/40%	HS	4.45	PRKUNaH 400/40%.937	**538709**	220, 60	1.95	no	171	140	171	91	71	5.3	> 0.90	A2

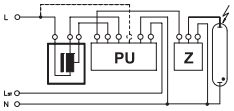
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

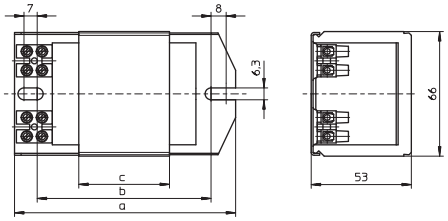
Ballasts for Power Reduction of HS Lamps 70 to 250 W

Shape: 53 x 66 mm

For high pressure sodium lamps (HS)
Vacuum-impregnated with polyester resin
Screw terminals: 0.5–2.5 mm²
Protection class I
tw 130







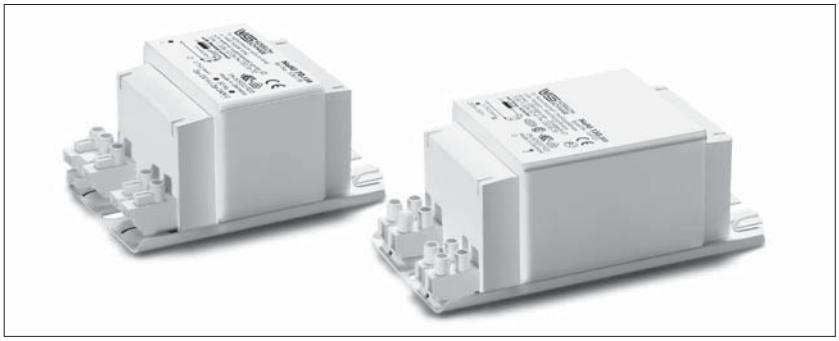
Lamp		Ballast										Capacitor	
Output W	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
70 (42)	0.98	UNaH 70/40%.501	**534128**	220, 50	108	86	42	1.23	65	0.39	EEI=A3	12	0.40
70 (42)	0.98	UNaH 70/40%.525	**535348**	230, 50	108	86	42	1.23	70	0.38	EEI=A3	12	0.38
70 (42)	0.98	UNaH 70/40%.691	**161460**	220, 60	108	86	48	1.39	60	0.42	EEI=A3	10	0.40
100 (60)	1.20	UNaH 100/40%.452	**533947**	220, 50	117	92	55	1.52	65	0.43	EEI=A3	12	0.55
100 (60)	1.20	UNaH 100/40%.522	**535347**	230, 50	117	92	55	1.52	70	0.42	EEI=A3	12	0.55
100 (60)	1.20	NaHJ 100/70.709	**161471**	220, 60	145	120	55	1.55	60/50	0.44	EEI=A3	10	0.57
150 (90)	1.80	UNaH 150/40%.453	**533948**	220, 50	145	120	75	2.03	75	0.42	EEI=A3	20	0.80
150 (90)	1.80	UNaH 150/40%.142	**535333**	230, 50	145	120	75	2.03	75	0.40	EEI=A3	20	0.77
150 (90)	1.80	UNaH 150/40%.717	**161475**	220, 60	145	120	75	2.03	70	0.44	EEI=A3	20	0.77
250 (150)	3.00	UNaH 250/40%.454	**533949**	220, 50	180	155	110	2.88	80	0.42	EEI=A3	32	1.32
250 (150)	3.00	UNaH 250/40%.983	**169892**	220, 60	145	120	75	2.03	75	0.40	EEI=A3	32	1.32

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

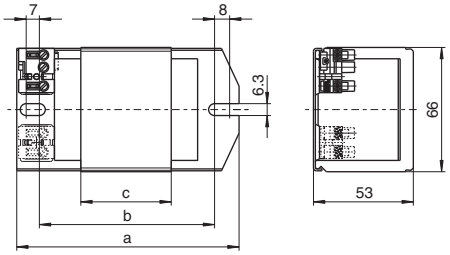
Ballasts with Thermal Cut-out for Power Reduction of HS Lamps 50 to 150 W

Shape: 53×66 mm

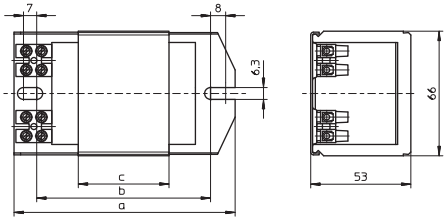
For high pressure sodium lamps (HS)
Vacuum-impregnated with polyester resin
Thermal cut-out with automatic reset
Protection class I
tw 130

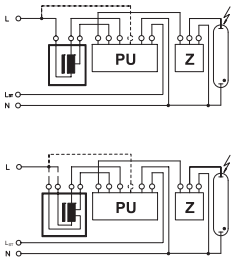


A Push-in terminals: 0.5–1.5 mm²



B Screw terminals: 0.5–2.5 mm²





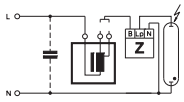
Lamp		Ballast											Capacitor	
Output W	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	c mm	Drawing	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
With push-in terminals: 0.5–1.5 mm²														
70 (42)	0.98	UNaH 70/40%.525	**544728**	230, 50	108	86	42	A	1.23	70	0.38	EEI=A3	12	0.38
100 (60)	1.20	UNaH 100/40%.522	**544730**	230, 50	117	92	55	A	1.55	70	0.42	EEI=A3	12	0.55
150 (90)	1.80	UNaH 150/40%.142	**544729**	230, 50	145	120	75	A	2.10	75	0.40	EEI=A3	20	0.77
150 (101)	1.80	UNaH 150/100.722	**539050**	230/240, 50	160	135	95	A	2.50	65/50	0.41	EEI=A3	20	0.77
150 (101)	1.80	UNaH 150/100.722	**507627**	230/240, 50	180	155	95	A	2.50	65/50	0.41	EEI=A3	20	0.77
With screw terminals: 0.5–2.5 mm²														
50 (33)	0.76	NaH 50/35.797	**539515**	230, 50	108	86	36	B	1.07	70/45	0.37	EEI=A3	6	0.22
70 (44)	0.98	NaHJ 70/50.695	**503136**	230, 50	108	86	48	B	1.34	70/50	0.37	EEI=A3	12	0.38
100 (64)	1.20	NaHJ 100/70.703	**504131**	230, 50	117	92	55	B	1.55	70/60	0.43	EEI=A3	12	0.55
150 (101)	1.80	NaHJ 150/100.973	**504135**	230, 50	145	120	75	B	2.10	75/55	0.41	EEI=A3/A2	20	0.77

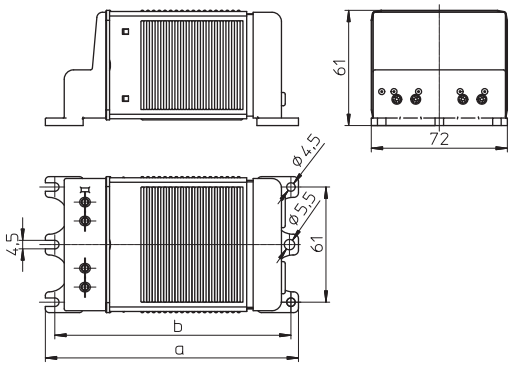
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

Ballasts with Thermal Cut-out for Power Reduction of HS Lamps 70 to 150 W, Protection Class II

Encapsulated ballast in compact plastic casing
Shape: 61 x 72 mm

For high pressure sodium lamps (HS)
With cable holder
Thermal cut-out with automatic reset
Screw terminals: 0.5–2.5 mm²
Protection class II
tw 130





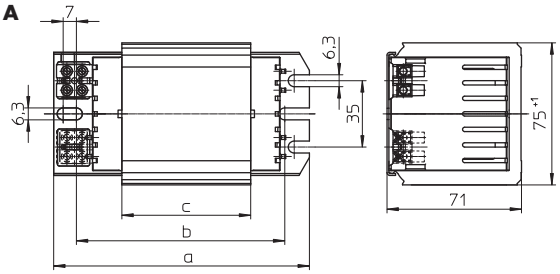
Lamp			Ballast									Capacitor	
Output W	Type	Current A	Type	**Ref. No.**	Voltage AC V, Hz	a mm	b mm	Weight kg	Δt K	Power factor λ	Energy efficiency*	C_P µF	I_N A
70 (44)	HS	0.98	NaHJZ 70/50.520	**533395**	230, 50	134	125	1.60	65/45	0.36	EEI=A3	12	0.38
100 (64)	HS	1.20	NaHJZ 100/70.519	**533396**	230, 50	161	152	2.10	60/45	0.42	EEI=A3	12	0.55
150 (101)	HS	1.80	NaHJZ 150/100.466	**533398**	230, 50	161	152	2.30	70/45	0.39	EEI=A3	20	0.77

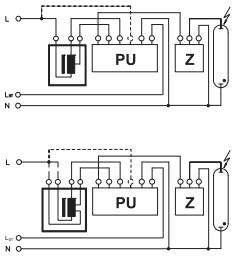
* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

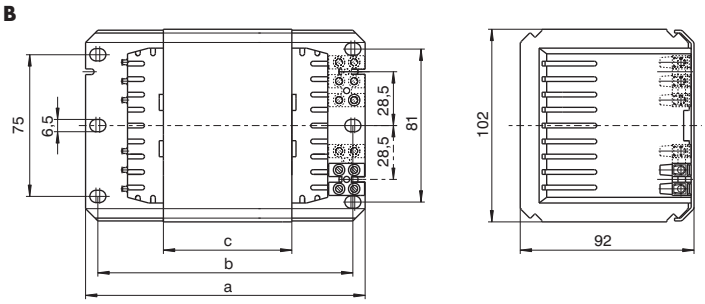
Ballasts for Power Reduction of HS Lamps 250 to 600 W

Shape: 71x75 mm
Shape: 92x102 mm

For high pressure sodium lamps (HS)
Vacuum-impregnated with polyester resin
Screw terminals: 0.75–2.5 mm²
Protection class I
tw 130







Lamp			Ballast											Capacitor	
Output	Type	Current	Type	**Ref. No.**	Voltage AC	Drawing	a	b	c	Weight	Δt	Power factor	Energy efficiency*	C_P	I_N
W		A			V, Hz		mm	mm	mm	kg	K	λ		µF	A
250 (150)	HS	3.00	UNaH 250/40%.746	**539283**	220, 50	A	135	115	68	2.85	75	0.42	EEI=A3	32	1.35
250 (150)	HS	3.00	UNaH 250/40%.936	**543747**	230, 50	A	135	115	68	2.85	75	0.40	EEI=A3	32	1.30
250 (150)	HS	3.00	UNaH 250/40%.747	**539517**	220, 60	A	135	115	68	2.85	75	0.42	EEI=A3	25	1.40
400 (240)	HS	4.45	UNaH 400/40%.892	**538592**	220, 50	A	165	145	103	4.13	75	0.44	A2	45	2.10
400 (240)	HS	4.45	UNaH 400/40%.906	**543748**	230, 50	A	165	145	103	4.13	75	0.42	A2	45	2.00
400 (240)	HS	4.45	UNaH 400/40%.937	**538715**	220, 60	A	165	145	103	4.13	75	0.44	A2	40	2.05
600 (360)	HS	6.20	UNaH 600/40%.060	**539384**	230/240, 50	B	173	160	108	6.80	75	0.44	A2	65	2.80

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

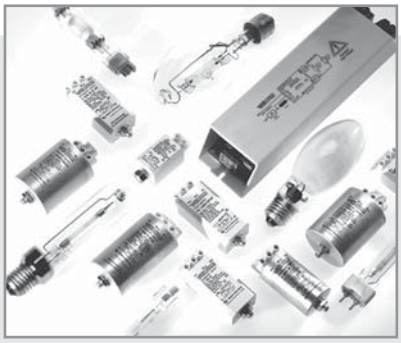
With Thermal Cut-out

Thermal cut-out with automatic reset

Lamp			Ballast											Capacitor	
Output	Type	Current	Type	**Ref. No.**	Voltage AC	Drawing	a	b	c	Weight	Δt	Power factor	Energy efficiency*	C_P	I_N
W		A			V, Hz		mm	mm	mm	kg	K	λ		µF	A
250 (150)	HS	3.00	UNaH 250/40%.936	**538711**	230, 50	A	135	115	68	2.85	75	0.40	EEI=A3	32	1.30
400 (240)	HS	4.45	UNaH 400/40%.906	**538710**	230, 50	A	165	145	103	4.13	75	0.42	A2	45	2.00

* Step 2: EEI = A3, minimum EU energy efficiency requirements as of 2012 | Step 3: A2, minimum EU energy efficiency requirements as of 2017

SUPERIMPOSED, PULSE AND INSTANT RESTRIKE



ELECTRONIC IGNITORS

Superimposed ignitors
Superimposed ignitors work independently of ballasts and generate defined ignition pulses during every half-wave within the stipulated voltage ranges. As the mains frequency only plays a subordinate role, these systems work equally well at 50 Hz and 60 Hz.

Superimposed ignitors should be mounted near the lampholder. The clearance needed between the ignitor and the lamp is determined by the respective maximum load capacitance, which is specified for each ignitor in the technical details. The capacitive load of the cable is dependent on its physical properties and wiring layout; this value usually ranges between 70–100 pF per metre.

Pulse ignitors
As pulse ignitors use the winding of an inductive ballast to generate the requisite pulse voltage, such ballasts must be designed to withstand these high ignition voltages.

Instant restrike ignitors
Instant restrike ignitors are a special type of ignitor for high-pressure discharge lamps. In comparison to superimposed and pulse ignitors, instant restrike ignitors have a very specified field of application. However, safety-relevant lighting systems, e.g. in power plants, stadiums, but also in television studios, make instant re-ignition of hot high-pressure discharge lamps necessary.

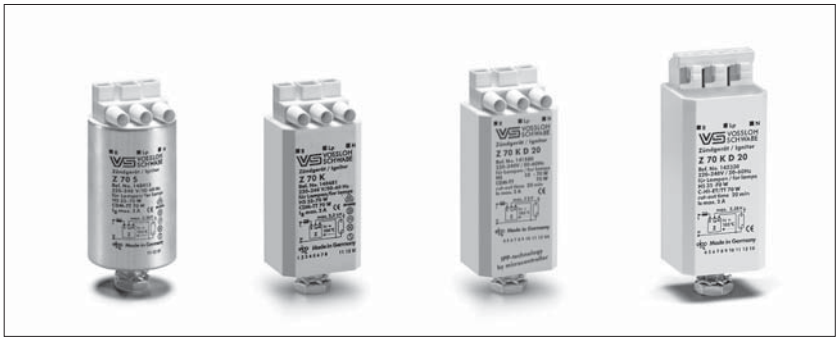
On the following pages, Vossloh-Schwabe presents an extensive range of ignitors for all areas of application.

2 Ignitors and Accessories for Discharge Lamps

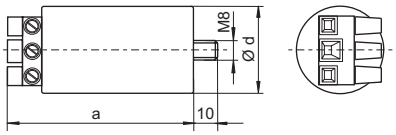
Electronic superimposed ignitors	**50–58**
Pulse ignitors	**59–60**
Instant restrike ignitors	**61–62**
Electronic power switches	**63**
Electronic superimposed ignitors with power switch	**64**
Switch units for electronic operating devices with 1–10 V interface	**65**
Start-up switches	**66–67**
Electronic discharge units	**68**
Technical details for discharge lamps	**89–131**
General technical details	394-401
Glossary	402-404

Electronic Superimposed Ignitors for HS Lamps up to 70 W

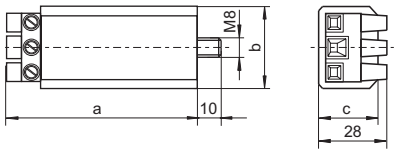
Standard version or with automatic switch-off
For high pressure sodium lamps (HS) and ceramic discharge lamps C-HI-TT/ET with base E27
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II



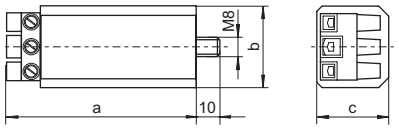
Al casing



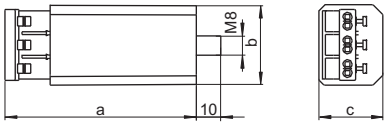
PC casing – K



PC casing – K D20



PC casing – with push-in terminals

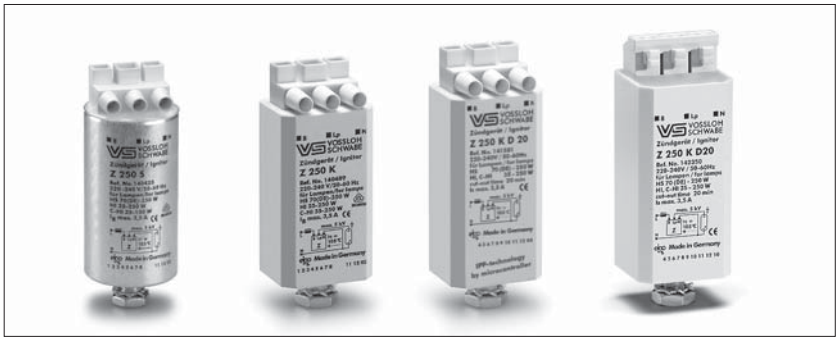


Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al) with screw terminals: 0.75–4 mm²													
Z 70 S	**140413**	220–240	2	< 0.6	< 5	1.8–2.3	20–200	–	35	76	–	–	135
Plastic casing (PC) with screw terminals: 0.75–4 mm²													
Z 70 K	**140481**	220–240	2	< 0.6	< 5	1.8–2.3	20–200	–	–	78	34	27	125
Z 70 K D20	**141580***	220–240	2	< 0.6	< 5	1.8–2.3	20–200	1216/50–60	–	80	34	30	145
Plastic casing (PC) with push-in terminals: 0.5–2.5 mm²													
Z 70 K	**142320**	220–240	2	< 0.6	< 5	1.8–2.3	20–200	–	–	81	34	27	125
Z 70 K D20	**142330***	220–240	2	< 0.6	< 5	1.8–2.3	20–200	1216/50–60	–	83	34	30	145

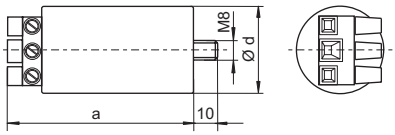
* With IPP technology

Electronic Superimposed Ignitors for HS Lamps 70 (DE) to 250 W and HI Lamps 35 to 250 W

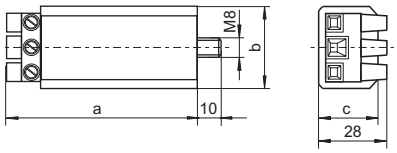
Standard version or with automatic switch-off
For high pressure sodium lamps (HS), metal halide lamps (HI) and ceramic discharge lamps (C-HI)
Phasing of the ignition voltage: 60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II



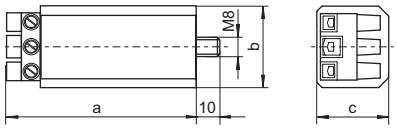
Al casing



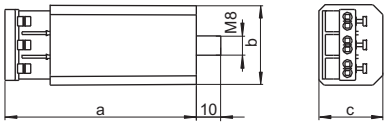
PC casing – K



PC casing – K D20



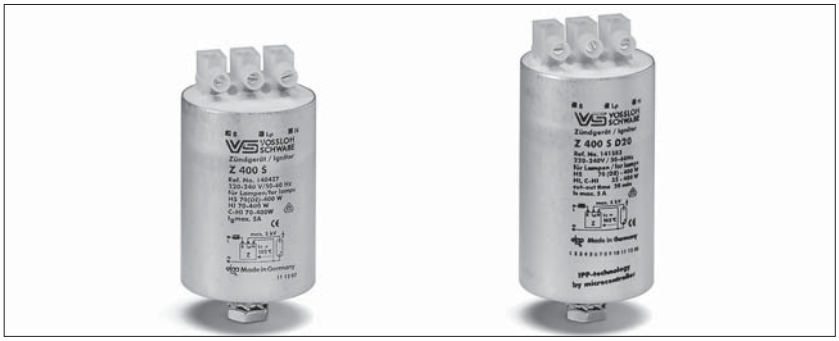
PC casing – with push-in terminals



Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al) with screw terminals: 0.75–4 mm²													
Z 250 S	**140425**	220–240	3.5	< 1.8	< 20	4–5	20–100	–	35	76	–	–	140
Plastic casing (PC) with screw terminals: 0.75–4 mm²													
Z 250 K	**140489**	220–240	3.5	< 1.8	< 20	4–5	20–100	–	–	78	34	27	130
Z 250 K D20	**141581***	220–240	3.5	< 1.8	< 20	4–5	20–100	1216/50–60	–	80	34	30	145
Plastic casing (PC) with push-in terminals: 0.5–2.5 mm²													
Z 250 K	**142340**	220–240	3.5	< 1.8	< 20	4–5	20–100	–	–	81	34	27	130
Z 250 K D20*	**142350***	220–240	3.5	< 1.8	< 20	4–5	20–100	1216/50–60	–	83	34	30	145

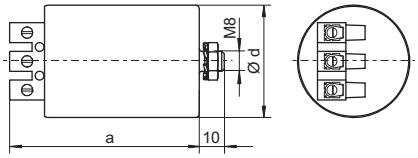
* With IPP technology

Electronic Superimposed Ignitors for HS Lamps 70 (DE) to 400 W and HI Lamps 35 to 400 W



Standard version or with automatic switch-off
For high pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Screw terminals: 0.75–4 mm²
Fastening: male nipple with pre-assembled
washer and nut
For luminaires of protection class I and II

Al casing

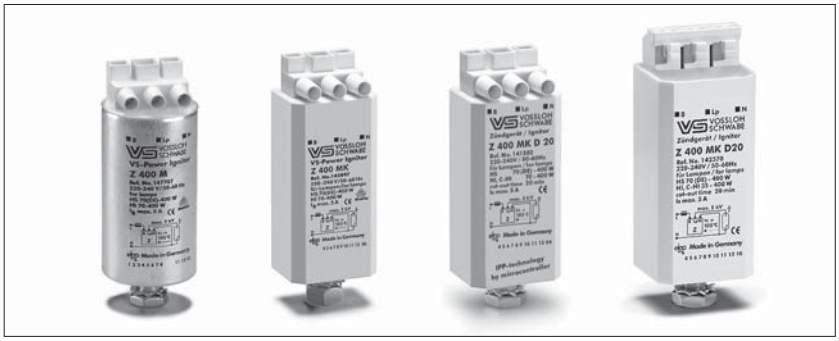


Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)													
Z 400 S	**140427**	220–240	5	< 3	< 25	4–5	20–100	–	45	76	–	–	250
Z 400 S D20	**141583***	220–240	5	< 3	< 25	4–5	20–100	1216/50–60	45	90	–	–	280

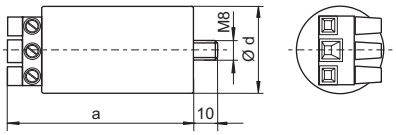
* With IPP technology

Electronic Superimposed Ignitors for HS Lamps 70 (DE) to 400 W and HI Lamps 35 to 400 W

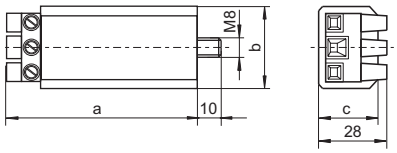
Standard version or with automatic switch-off
Compact shape
For high pressure sodium lamps (HS), metal halide lamps (HI) and ceramic discharge lamps (C-HI)
Ignition voltage: 4–5 kV
Phasing of the ignition voltage: 60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II
For luminaires of protection class I (140594, 147707)



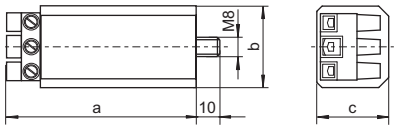
Al casing



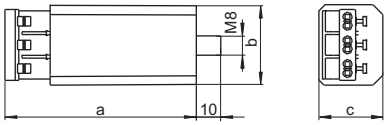
PC casing – K



PC casing – K D20



PC casing – with push-in terminals



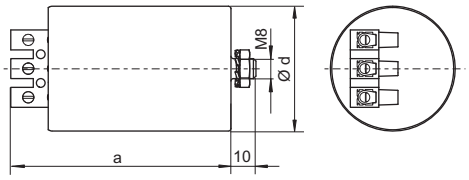
Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al) with screw terminals: 0.75–4 mm²													
Z 400 M	**140594**	220–240	5	< 3	< 35	4–5	20–50	–	35	76	–	–	140
Z 400 M VS-Power	**147707****	220–240	5	< 3	< 35	4–5	20–50	–	35	76	–	–	140
Z 400 M S	**140693**	220–240	5	< 3	< 35	4–5	20–50	–	35	76	–	–	140
Plastic casing (PC) with screw terminals: 0.75–4 mm²													
Z 400 M K	**140597**	220–240	5	< 3	< 35	4–5	20–50	–	–	78	34	27	130
Z 400 M K VS-Power	**142897****	220–240	5	< 3	< 35	4–5	20–50	–	–	78	34	27	130
Z 400 M K D20	**141582***	220–240	5	< 3	< 35	4–5	20–50	1216/50–60	–	80	34	30	145
Plastic casing (PC) with push-in terminals: 0.5–2.5 mm²													
Z 400 M K	**142360**	220–240	5	< 3	< 35	4–5	20–50	–	–	81	34	27	130
Z 400 M K VS-Power	**142361****	220–240	5	< 3	< 35	4–5	20–50	–	–	81	34	27	130
Z 400 M K D20	**142370***	220–240	5	< 3	< 35	4–5	20–50	1216/50–60	–	83	34	30	145

Recommended for outdoor lighting
* With IPP technology
** Not suitable for C-HI lamps

Electronic Superimposed Ignitors for HS Lamps 600 and 750 W

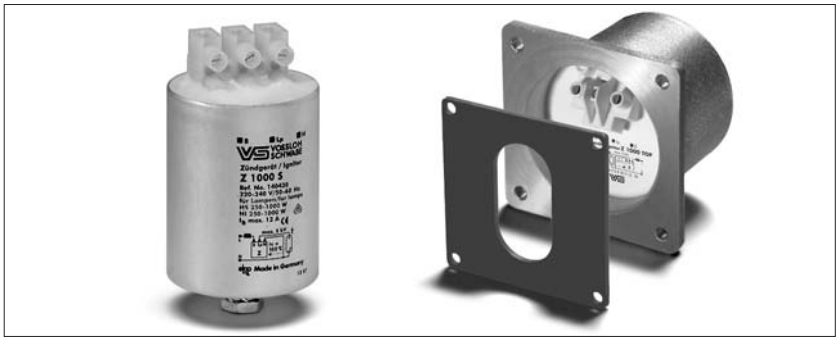
Standard version
For high pressure sodium lamps (HS)
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Screw terminals: 0.75–4 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II

Al casing



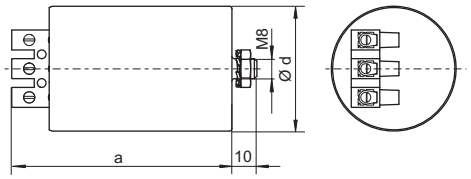
Type	Ref. No.	Voltage AC 50 - 60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)													
Z 750 S	**146990**	220 - 240	8	< 3	< 20	4 - 5	20 - 100	–	50	90	–	–	360

Electronic Superimposed Ignitors for HS and HI Lamps 250 to 1000 W

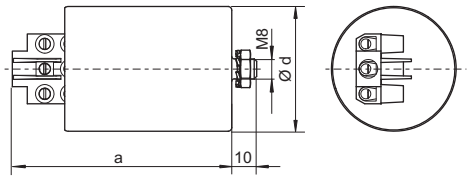


Standard version or with automatic switch-off
For high pressure sodium lamps (HS)
and metal halide lamps (HI)
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Screw terminals: 0.75–2.5 mm²
(Z 1000 S: 0.75–4 mm²)
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II

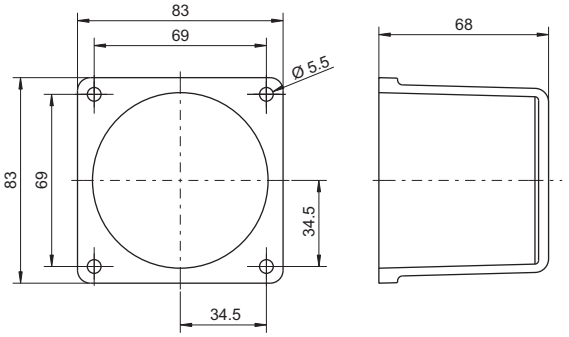
Al casing



Al casing – D20



Z 1000 TOP



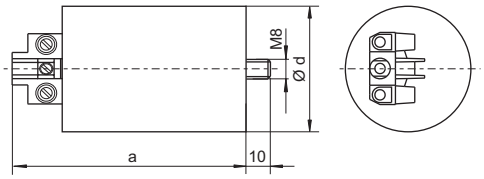
Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)													
Z 1000 S	**140430**	220–240	12	< 6	< 35	4–5	20–100	–	50	80	–	–	340
Z 1000 TOP	**140607****	220–240	12	< 6	< 35	4–5	20–100	–	–	83	83	68	620
Z 1000 S D20	**141584***	220–240	12	< 6	< 35	4–5	20–100	1216/50–60	50	80	–	–	340

* With IPP technology
** For flange-mounting with gasket for degree of protection IP55

Electronic Superimposed Ignitors for HS and HI Lamps up to 1000 W

Standard version
For high pressure sodium lamps (HS)
and metal halide lamps (HI)
For long lead lengths
Max. permitted casing temperature: 105 °C
Screw terminals: 0.75–2.5 mm²
Fastening: male nipple with pre-assembled washer and nut

Al casing



For HS and HI lamps 150 to 1000 W
Phasing of the ignition voltage: 60–90 °el
For luminaires of protection class I

Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)													
Z 1000 L	**140471***	220–240	12	< 6	< 35	4–5	20–2000	–	50	97	–	–	340

* Not suitable for HI lamps types NDL, WDL or for HS lamps types S, de-Luxe, Comfort or similar

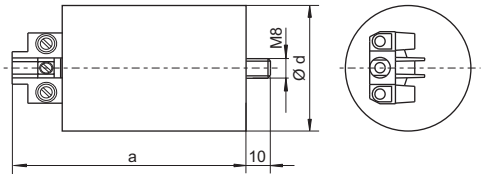
For HS lamps 600 to 1000 W/400 V and HI lamps 1000 W/400 V
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
For luminaires of protection class I and II

Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)													
Z 1000 S/400 V	**140496**	380–415	6	< 3.3	< 28	4–5	20–2000	–	45	100	–	–	295

Electronic Superimposed Ignitors for Projection Lamps up to 1200 W

Standard version
For high-pressure discharge lamps
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Screw terminals: 0.75–2.5 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I

Al casing



Type	Ref. No.	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)													
Z 1200/2.5	**140608***	220–240	15	< 7.5	< 40	2–2.5	20–200	–	50	87	–	–	330
Z 1200/9	**140609****	220–240	15	< 10	< 40	7–8	20–50	–	50	135	–	–	650

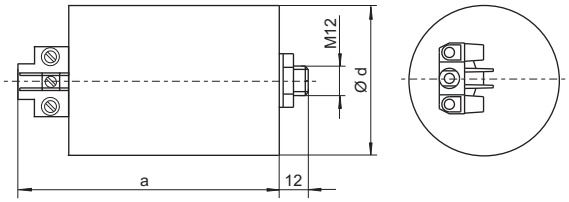
* For lamps, e.g. HSR, MSR, SN

** For lamps, e.g. HMI, HTI, CDI, RSI, CSR

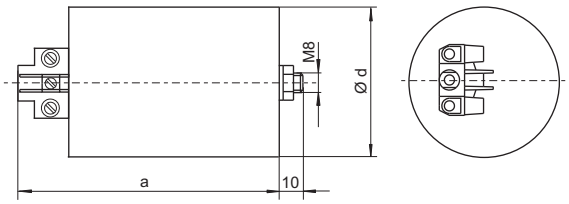
Electronic Superimposed Ignitors for HI Lamps up to 3500 W

Standard version
For metal halide lamps (HI)
Phasing of the ignition voltage:
60–90 °el and 240–270 °el
Max. permitted casing temperature: 105 °C
Screw terminals: 0.75–2.5 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II

A



B

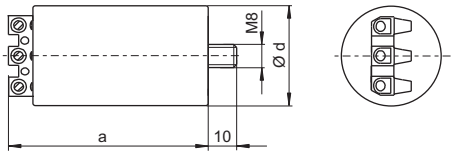


Type	**Ref. No.**	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage kV	Load capacity pF	Switch-off time sec./Hz	Drawing	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)														
Z 2000 S	**140432**	220–240	20	< 6	< 30	4–5	20–100	–	A	65	96	–	–	640
Z 2000 S/400 V	**140497**	380–415	12	< 5	< 32	4–5	20–2000	–	B	50	98	–	–	340
Z 3500 S/400 V	**140499**	380–415	20	< 7	< 35	4–5	20–100	–	A	65	96	–	–	650

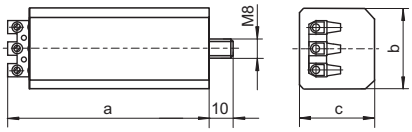
Pulse Ignitors for HS and HI Lamps up to 1000 W

With automatic switch-off
For high pressure sodium lamps (HS), metal halide lamps (HI) and ceramic discharge lamps (C-HI)
Max. permitted casing temperature: 95 °C
Screw terminals: 0.75–2.5 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I
This pulse ignitor is only for use with ballasts that have a dedicated tapping, as this determines the size of the ignition voltage.

Al casing



PC casing



For HS lamps 50 to 1000 W, HI lamps 35 to 1000 W and C-HI lamps 35 to 400 W

Type	Ref. No.	Voltage AC 50–60 Hz V	Number of ignition pulses per mains period	Ignition voltage kV	Load capacity pF	Programmed switch-off time sec./Hz	Casing a mm	b mm	c mm	Weight g
Plastic casing (PC)										
PZ 1000 K D20	**142784***	220–240 ±10%	≥ 2	1.8–2.3/4–5	20–1000	1216/50–60	74	34	27	100

With IPP technology

* Suitable ballasts (type: NaHJ...PZT) are available on request

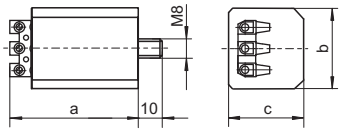
For HS lamps 600 to 1000 W/400 V and HI lamps 1000 W/400 V

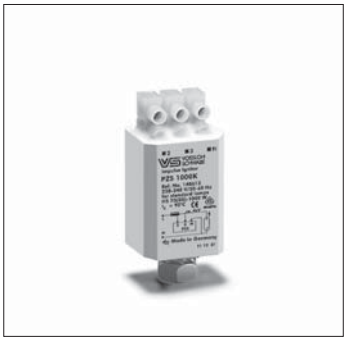
Type	Ref. No.	Voltage AC 50–60 Hz V	Number of ignition pulses per mains period	Ignition voltage kV	Load capacity pF	Programmed switch-off time sec./Hz	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Aluminium casing (Al)											
PZ 1000/400 V A5	**142783***	380–420	≥ 1	4–5	20–800	300/50	40	80	–	–	155

* Suitable ballasts (type: NaHJ...PZT) are available on request

Pulse Ignitors for HS Lamps 50 to 1000 W

Standard version
For standard high pressure sodium lamps (HS)
Max. permitted casing temperature: 95 °C
Screw terminals: 0.5–1.5 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I



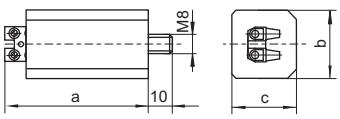


Type	Ref. No.	Voltage AC 50–60 Hz V	Number of ignition pulses per mains period	Ignition voltage kV	Load capacity pF	Programmed switch-off time sec.	Casing d (Ø) mm	a mm	b mm	c mm	Weight g
Plastic casing (PC)											
PZS 1000 K	**140613**	220–240	approx. 1/sec.	approx. 4	20–4000	–	–	50	28	27	50

Not suitable for HS lamps types Plus, Super, XL, HO
Suitable ballasts (type: NaH...P) are available on request

Pulse Ignitors for HI Lamps 250 to 2000 W, Ignition Voltage up to 1 kV

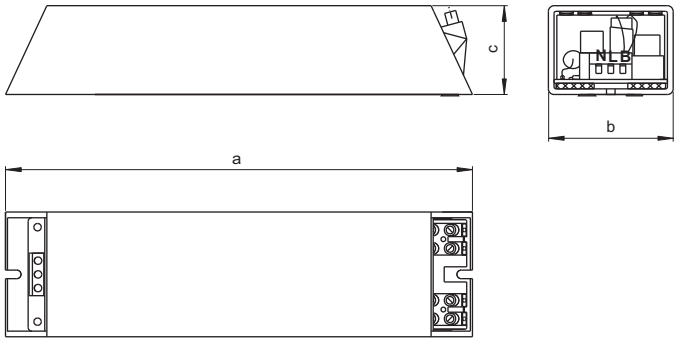
Standard version
For metal halide lamps (HI)
with ignition voltage of 0.9 kV
Max. permitted casing temperature: 95 °C
Screw terminals: 0.5–2.5 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I



Type	Ref. No.	Voltage AC 50–60 Hz V	Number of ignition pulses per mains period	Ignition voltage kV	Load capacity pF	Programmed switch-off time sec.	Casing a mm	b mm	c mm	Weight g
Plastic casing (PC)										
PZI 1000/1 K	**140617**	220–240	≥ 1	0.7–0.9	max. 10000	–	57	28	27	50

Suitable ballasts see page 38, 40 und 41

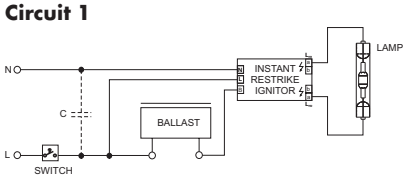
Instant Restrike Ignitors for High-pressure Discharge Lamps up to 600 W



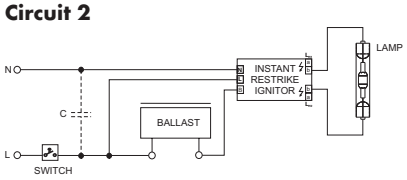
For high pressure sodium lamps (HS), metal halide lamps (HI), ceramic discharge lamps (C-HI) and projection lamps in accordance with the lamp table shown below
For installation as a symmetric ignition device (whereby the ignition voltage is split equally over both lamp electrodes)
For installation in luminaires of protection class I
Max. permitted ambient temperature t_a: 60 °C
Mains connection: screw terminal 3-poles, 0.75–2.5 mm²
Lamp connection: screw terminal 0.75–2.5 mm² for circuit 1 and 2
Fastening: 2 mounting slots for screws M4
Material: plastic casing made of ABS

CAUTION
Defective lamps must be replaced immediately

Circuit 1



Circuit 2

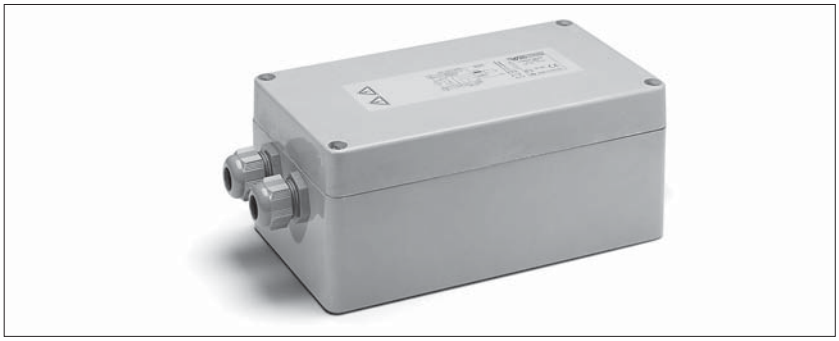


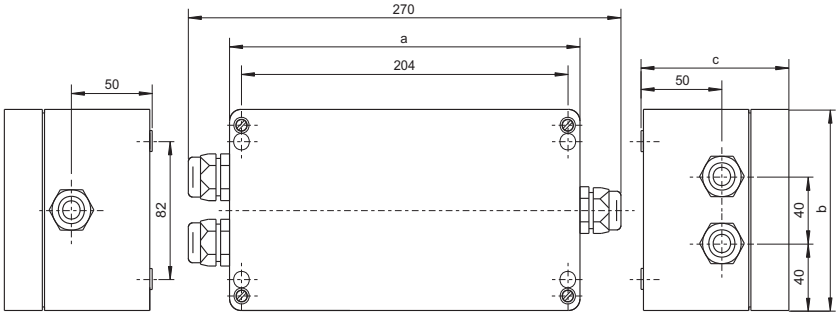
Type	**Ref. No.**	Voltage AC 50–60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage* kV	Ignition time sec.	Load capacity pF	Casing a mm	b mm	c mm	Weight g
HZ 600 K	**147790**	230 ±10%	8	< 4	< 10	20–30	approx. 6	5–30	247	66	47	1000

* Depending on the respective circuit; the ignition voltage is split equally over both lamp electrodes

Lamp table						
Circuit 1				**Circuit 2**		
Lamp type	Base	VS lampholder type	Catalogue page	Lamp type	Base	VS lampholder type
CDM-TD 70 W	RX7s	306	86	HBO 50 W	SFa8-2	–
HCI-TS 70 W	RX7s	306	86	MSR 125 HR	GZX9.5	–
HI 70 W (DE)	RX7s	306	86	HBO 200 W	SFc10-4	–
HS 70 W (DE)	RX7s	306	86	HBO 200 W	SFc10-4	–
RCI-TS 70 W	RX7s	306	86	MSR 200 HR	GZX9.5	–
HS 150 W (DE)	RX7s	306	86	HTI 250 W	FaX1.5	–
HMI 200 W	X515	–		HMI 400 W/SE	GZZ9.5	–
HMI 200 W/X	GZY9.5	–		HMP 400 W	FaX1.5	–
MSI 200 W	GZY9.5	–		HTI 400 W	FaX1.5	–
RSI 200 W	X515	–		RSI 400 W	GZX9.5	–
HS 250 W (DE)	Fc2	025	86–87	HBO 500 W	SFcY13-5	–
HS 400 W (DE)	Fc2	025	86–87	HMP 575 W	SFc10-4 / G22	–
MSR 400 HR	GZZ9.5	–		HMI 575 W	SFc10-4	–
MSI 575 W	SFc10	–		RSI 575 W	G22	–
MSR 575 HR	G22	–		HTI 600 W	FaX1.5	–

Instant Restrike Ignitors for High-pressure Discharge Lamps 1000 W/230 V and 2000 W/400 V

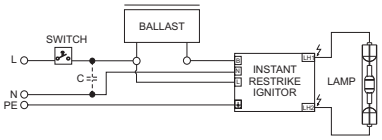




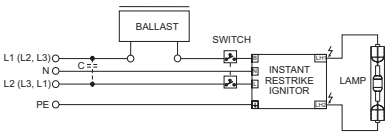
For high pressure sodium lamps (HS), metal halide lamps (HI), ceramic discharge lamps (C-HI) in accordance with the lamp table shown below
For installation as a symmetric ignition device (whereby the ignition voltage is split equally over both lamp electrodes)
Degree of protection: IP65
For installation in luminaires of protection class I
Max. permitted ambient temperature t_a: 60 °C
Mains connection: screw terminal 3-poles, max. 4 mm²
Earth connection: screw terminal max. 4 mm²
Lamp connection: screw terminal max. 4 mm²
Fastening: 4 holes Ø 6.3 mm in the base of casing
Material: casing made of fibreglass-reinforced polyester

CAUTION
Defective lamps must be replaced immediately

Circuit diagram HZ 1000 K/230V



Circuit diagram HZ 2000 K/400 V



Type	**Ref. No.**	Voltage AC 50-60 Hz V	Max. lamp current A	Internal loss W	Inherent heating K	Ignition voltage* kV	Ignition time sec.	Load capacity pF	Casing a mm	b mm	c mm	Weight g
HZ 1000 K	**147791**	230 ±10%	12	< 5	< 10	36	approx. 6	5-50	218	120	92	3745
HZ 2000 K/400 V	**147793**	400 ±10%	12	< 5	< 10	36	approx. 6	5-30	218	120	92	3745

* The ignition voltage is split equally over both lamp electrodes

Lamp table HZ 1000 K								
Lamp type	Lamp manufacturer	Base	VS lampholder type	Catalogue page	Lamp type	Base	VS lampholder type	Catalogue page
CDM-TD 150 W	Philips	RX7s	306	86	HI 400 W (DE)	Fc2	025	86-87
HCI-TS 150 W	Osram	RX7s	306	86	HS 400 W (DE)	Fc2	025	86-87
HI 150 W (DE)		RX7s	306	86	HI 1000 W (DE)	Fc2	025	86-87
HS 150 W (DE)		RX7s	306	86	HS 1000 W (DE)	Cable, K12s-7	211	88
HI 250 W (DE)		Fc2	025	86-87	–	–	–	–
HS 250 W (DE)		Fc2	025	86-87	–	–	–	–

Lamp table HZ 2000 K/400 V				
Lamp type	Base	VS lampholder type	Catalogue page	Note
HI 2000 W (DE)	Cable, K12s-7	211	88	not suitable for HRI-TS 2000 W/N/L, HQI-TS 2000 W/N/L

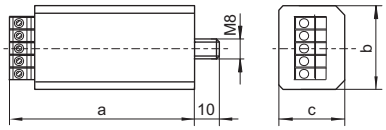
Electronic Power Switches for HS Lamps up to 600 W and HM Lamps up to 700 W

For high pressure sodium lamps (HS)
and mercury vapour lamps (HM)
For power reduction by using ballasts
with multiple voltage tapping and
superimposed ignitors
PR 12 K LC and PR 12 K D are also suitable for
power switching of LED drivers and electronic ballasts.
Casing: PC
Max. permitted casing temperature t_c: 80 °C
Screw terminals: 0.75–2.5 mm²
Fastening: male nipple with pre-assembled
washer and nut
For luminaires of protection class I and II
Circuit diagrams for power reduction
see pages 106–107.

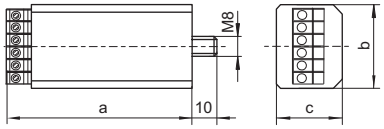
Advantages of PR 12 K LC

- intelligent, auto-adaptive concept
- eliminates the time-consuming task of continually adjusting the times of power-reduced operation to suit constantly changing day-night cycles
- removes the need for making adjustments due to daylight-saving times
- easy programming via dial
- no additional control line necessary
- optimal suitable for the supplementary integration into existing luminaires
- suitable for luminaires of protection class I and II

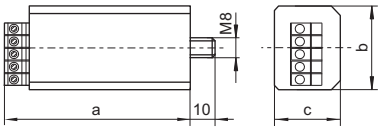
PU 12 K/PR 12 KD/PR 12 K LC



PU 120 K



PU 121 K



Type	Ref. No.	Voltage AC V, Hz	Max. contact current A	λ	Inherent heating K	Integrated delay switching	Control phase for power reduction (circuitry logic)	Casing a mm	b mm	c mm	Weight g
Power reduction with control phase											
PU 12 K	**140621**	230, 50 / 220, 60	8/0.5	12/1	< 25	–	disconnect or connect	74	34	27	100
PU 120 K	**140622***	230, 50 / 220, 60	8/0.5	12/1	< 10	327 sec.	disconnect	74	34	27	100
PU 121 K	**140623***	230, 50 / 220, 60	8/0.5	12/1	< 25	327 sec.	connect	74	34	27	100
Power reduction without control phase											
PR 12 K LC	**142170****	220–230 ±10%, 50 220 ±10%, 60	8/0.5	12/1	< 12	selectable	without control phase	76	34	31	100
PR 12 K D	**142150*****	220–230 ±10%, 50 220 ±10%, 60	8/0.5	12/1	< 12	selectable	without control phase	76	34	31	100

* For full-load lamp start

** Time of power-reduced operation selectable, starting point of switching-time changes automatically to suit constantly changing day-night cycles

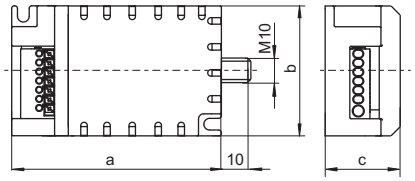
*** Power reduction after a constant switching-time (delay switching);
swichting-time selectable: 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 hrs at 50 Hz

Electronic Superimposed Ignitors with Power Switch for HS Lamps 50 to 250 W

For ignition and power reduction of high pressure sodium lamps (HS)
Casing: PC
Control voltage: 230 V ±10%
Response/cut-out voltage: 170–198 V
Phasing of the ignition voltage: 60–90 °el and 240–270 °el
Max. permitted casing temperature t_c: 80 °C
Push-in terminals: 0.75–1.5 mm²
Fastening: male nipple with pre-assembled washer and nut
For luminaires of protection class I and II

Applicable for positive switch logic allowing for terminal pin assignment of power switch

- Full load lamp start is guaranteed
- Switching to power reduced operation after delay time of approx. 5 min.



Type	**Ref. No.**	Voltage AC	Max. lamp current	Number of ignition pulses per mains period	Internal loss	Inherent heating	Ignition voltage	Load capacity	Programmed switch-off time	Casing a	b	c	Weight
		V, Hz	A		W	K	kV	pF	sec./Hz	mm	mm	mm	g
HS lamps 50 and 70 W													
ZPU 70 K D20	**142098**	230, 50/220, 60	2	4	< 2	< 15	1.8–2.3	20–200	1216/50–60	96	50	32	240
HS lamps 70 (DE) to 250 W													
ZPU 250 K D20	**142099**	230, 50/220, 60	3	6	< 2	< 15	4–5	20–50	1216/50–60	96	50	32	240

Circuit diagrams see page 107

Switch Units for Electronic Operating Devices with 1–10 V Interface

Vossloh-Schwabe's switch units are designed to enable one-step power reduction of lamps (FL, CFL, LED, HS, HI and C-HI) with the help of the respective electronic ballast or converter.

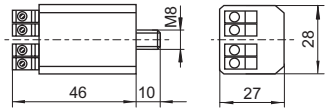
To this end, the switch units utilises the 1–10 V interface of the control gear unit. The switch unit is mainly intended for outdoor luminaires in systems with or without a control phase.

Shape: 56×28×27 mm
Casing: PC
Screw terminals: 0.75–2.5 mm²
Max. permissible casing temperature t_C: 80 °C
Min. permissible ambient temperature t_a: –30 °C
Fastening: plastic male nipple with pre-assembled washer and nut

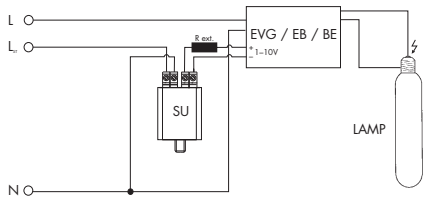
Power reduction SU 1–10 V K for lighting systems featuring an L_{ST} control phase
The switch unit employs a positive switching to reduce power, i.e. power is reduced when the control phase is switched off (L_{ST} = 0 V).
The 1–10 V interface of the electronic ballast is addressed at the moment that power reduction is effected.

Power reduction PR 1–10 V K LC for lighting systems without a control phase
This switch unit can be used to effect power reduction in lighting systems that do not feature a control phase.

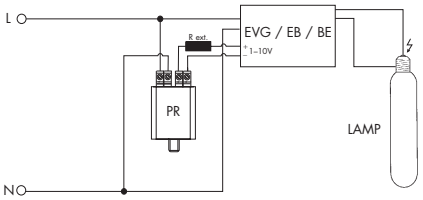
The 1–10 V interface is addressed on the basis of the fundamental operating principle used by Vossloh-Schwabe's PR 12 K LC power switch (details of which can be made available on request). This power switch is capable of determining the starting time of reduced-power operation over the measured operating time of a lighting system. As a result, it is no longer necessary to spend valuable time modifying the power-reduction unit to suit the continually changing day-night cycle; changing the clocks in line with daylight saving measures in the summer and winter is equally unnecessary. The 1–10 V interface of the electronic ballast is addressed as soon as the system is switched to reduced power.



Circuit diagram SU 1–10 V K



Circuit diagram PR 1–10 V K LC



Type	**Ref. No.**	Control voltage L_{ST} V, 50/60 Hz	Externally (on site) connected resistor ($R_{ext.}$) kΩ (min. 0.1 W)	Self-heating K	Weight g
For lighting systems with control phase					
SU 1–10 V K	**149992**	220–240 V ±10%	1–70	< 10	50
For lighting systems without control phase					
PR 1–10 V K LC	**149993**	–	1–70	< 10	50

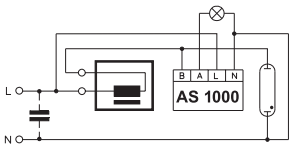
Start-up Switches for HS and HI Lamps 35 to 1000 W and HM Lamps 50 to 700 W

To bridge a phase of darkness during the starting-up period of high-pressure discharge lamps and also after a brief interruption of the power supply until the high-pressure discharge lamps are restarted

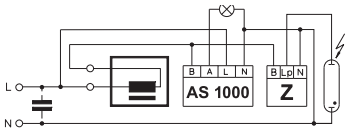
For mercury vapour lamps (HM),
high-pressure sodium lamps (HS),
metal halide lamps (HI) and
ceramic discharge lamps (C-HI)
For HS, HI and C-HI lamps only if used together with a superimposed ignitor
Nominal voltage/frequency:
220–230 V ± 10%/50–60 Hz
240 V ± 10%/50 Hz
Max. permitted casing temperature t_c: 85 °C
Screw terminals: 0.75–2.5 mm²
Fastening: male nipple with pre-assembled washer and nut
Max. wattage of incandescent lamp: 1000 W
Automatic switch-off at 60% of the discharge lamp's luminous flux

During the ignition and start-up period, the start-up switch activates an incandescent lamp to provide a basic level of lighting. After a brief interruption in the supply voltage during the re-ignition of the discharge lamp, the integrated control electronics also bridges the phase of darkness by switching on the auxilliary lighting. The incandescent lamp is automatically switched off when the discharge lamp has achieved a sufficient luminous flux (approx. 60%).

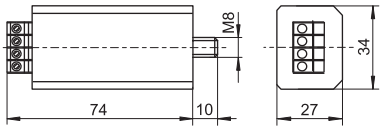
Circuit for HM lamps



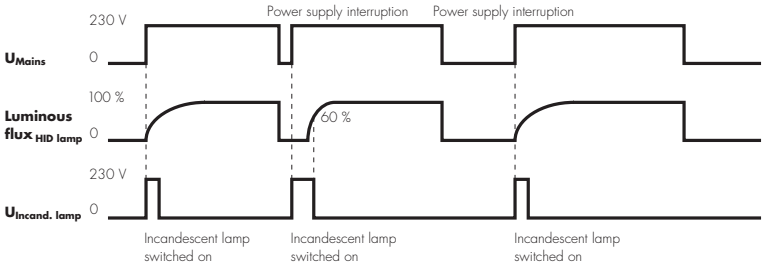
Circuit for HS and HI lamps



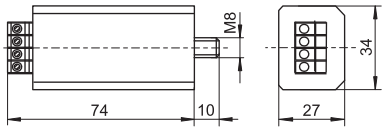
AS 1000 K
Casing: PC
Weight: 100 g
Internal loss: < 0.8 W
Inherent heating: < 10 K
Type: AS 1000 K
Ref. No.: 140627



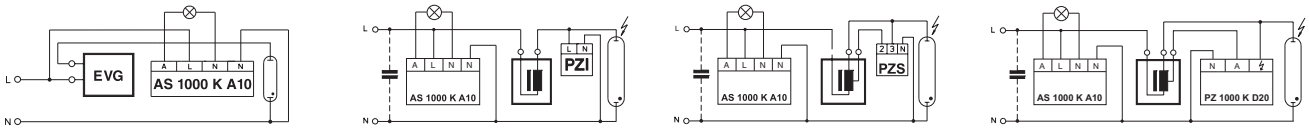
The time diagram shows some typical switching examples of a luminaire equipped with a high-pressure discharge lamp, incandescent lamp and start-up switch AS 1000 K.



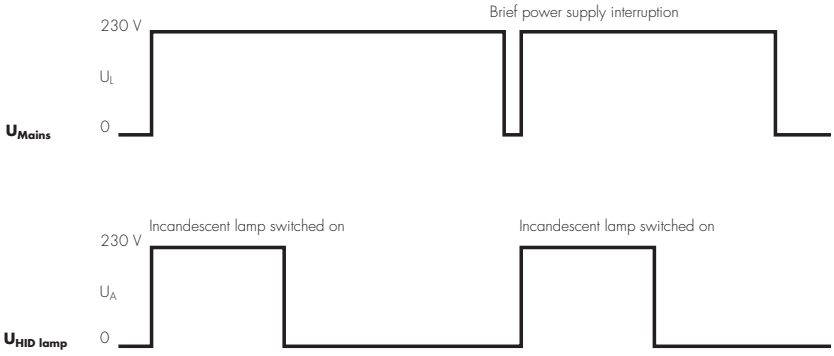
AS 1000 K A10
Specially for using with electronic ballasts or pulse ignitors for high-pressure discharge lamps
Casing: PC
Delayed switching: 655 sec. (50 Hz)
For luminaires of protection class I and II
Max. contact current: 6 A at λ 0.5, 10 A at λ 1
Internal loss: < 1 W
Inherent heating: < 12 K
Weight: 100 g
Type: AS 1000 K A10
Ref. No.: 141193



Circuit with electronic ballast



The time diagram shows some typical switching examples of a luminaire equipped with a high-pressure discharge lamp, incandescent lamp and start-up switch AS 1000 K A10.



Electronic Discharge Units for Parallel Connected Capacitors 0.1 to 100 µF

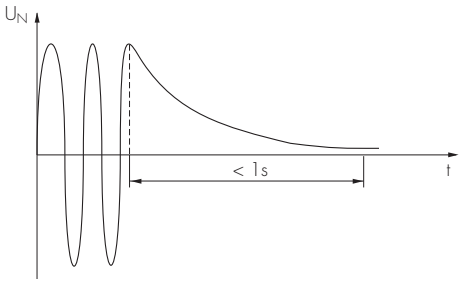
On luminaires with parallel compensation and designed for plug connection to the mains supply, the plugs retain their charge for a relatively long time after disconnection from the power supply. The discharge resistors built into the compensation capacitor are designed for stationary lamps and when disconnected from the mains permit a voltage reduction to 50 V after 1 minute at the earliest.

According to European standard EN 60598-1, the compensation capacitor on mobile lamps must be discharged to 34 V within 1 second. Until now so-called discharge chokes built like conventional ballasts have been used for this purpose. These conventional discharge chokes are connected in parallel to the compensation capacitor and after disconnection from the power supply rapidly discharge the capacitor owing to their low ohmic resistance.

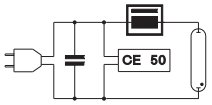
In their rated operating conditions, conventional discharge chokes exhibit a considerable inductive reactance which diminishes the effect of the compensation capacitor particularly if it has a low capacitance.

Furthermore, conventional discharge chokes cause considerable losses and feature high weight.

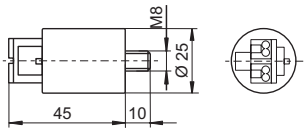
With the aid of the electronic discharge unit CE 50, it is possible to discharge a capacitor with a capacitance of up to 100 µF to 34 V within 1 second, i.e. within the time specified in EN 60598-1.



Thanks to its high reliability, low inherent losses, small dimensions and low weight, the CE 50 represents an inexpensive solution to the problem of capacitor discharge.



CE 50
All electronic, wear resistant switching element
Casing: aluminium
Nominal voltage: 34–264 V
Nominal frequency: 50–60 Hz
Internal loss: < 0.5 W
Inherent heating: < 6 K
Max. permitted casing temperature: 95 °C
Push-in terminals: 1 mm²
Fastening: male nipple with pre-assembled washer and nut
Weight: 40 g
Type: CE 50
Ref. No.: 140537



WARM START, DIMMABLE AND INSTANT START

ELECTRONIC BALLASTS

Operating fluorescent lamps with electronic ballasts yields numerous advantages with regard to efficiency and convenience. Further details are provided on the respective product pages and the technical appendix.

The brightness of fluorescent lamps can also be regulated with the help of dimmable electronic ballasts. Adjusting lamp wattage leads to a further reduction of energy consumption and of the associated costs. The corresponding ELXd units from Vossloh-Schwabe enable conventional 1–10 V control units to be connected via a bipolar 1–10 V dimmer interface.

Moreover, Vossloh-Schwabe's product range also contains electronic ballasts that can be dimmed using conventional light sensors or polarity-independent dimmer interfaces via DALI-compatible control units. Both interfaces (1–10 V and DALI) were developed in accordance with EN 60929. Under consideration of the maximum current of the respective control unit, it is also possible to operate several electronic ballasts in parallel.

3 Electronic Ballasts for TC and T Lamps

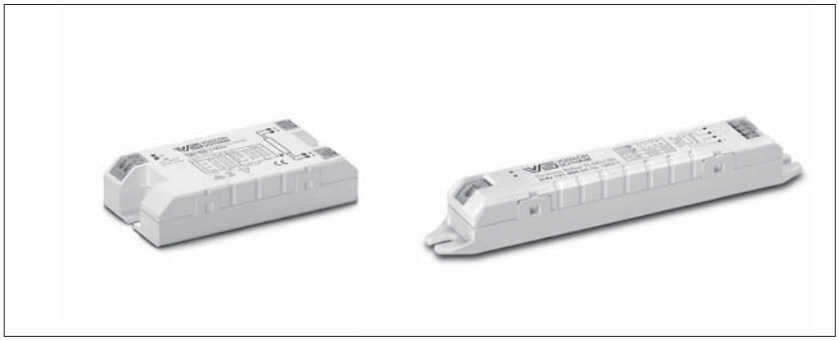
Electronic ballasts for compact fluorescent lamps **134–150**
ELXs – Warm start 134
ELXc – Warm start – Linear casing shape 135
ELXd – Dimmable – Linear casing shape 136–137
ELXc – Warm start – Compact casing shape 138–146
ECO EffectLine 144
ELXd – Dimmable – Compact casing shape 147–150

Electronic ballasts for tubular fluorescent lamps **151–163**
ELXs – Warm start 151
ELXc – Warm start – Linear casing shape 152–159
EffectLine and EffectLine II 156–157
New T5 EffectLine 158
ECO EffectLine 159
ELXd – Dimmable – Linear casing shape 160–163

Accessories for dimmable electronic built-in ballasts **164**

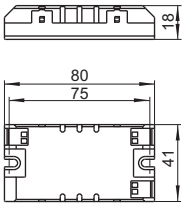
Technical details for fluorescent lamps **243–271**
General technical details 394–401
Glossary 402–404

ELXs – Warm Start for Compact Fluorescent Lamps

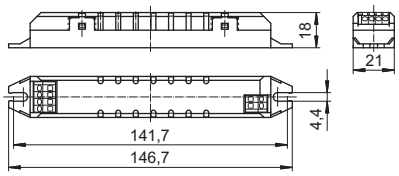


Electronic built-in ballasts
Casing: heat-resistant polyamide
Power factor: approx. 0.6
(depending on the lamp output)
DC voltage operation: 198–264 V
Push-in terminals with lever opener: 0.5–1.5 mm²
RFI-suppressed
For luminaires of protection class I and II
Degree of protection: IP20
Fixing slots for screws M4
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved
acc. to EN 61347 Test 2

K20



K21



◯ **T5** ◉ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◯ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

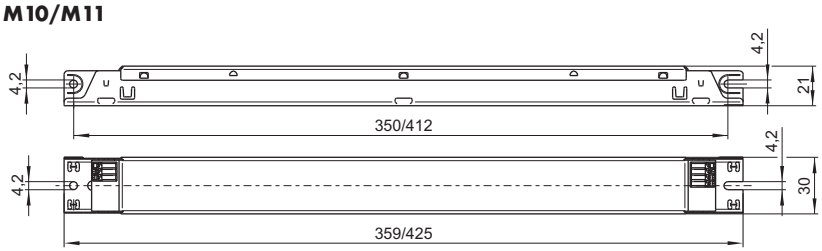
Lamp				Electronic ballast							System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W
5	TC-SEL	2G7	1 x 5.0	ELXs 116.900	**188661**	220-240	A3	-15 to 55	max. 75	K20	6.1
				ELXs 116.903	**188662**	220-240	A3	-15 to 55	max. 75	K21	6.1
7	TC-SEL	2G7	1 x 6.4	ELXs 116.900	**188661**	220-240	A2	-15 to 55	max. 75	K20	7.5
				ELXs 116.903	**188662**	220-240	A2	-15 to 55	max. 75	K21	7.5
9	TC-SEL	2G7	1 x 8.0	ELXs 116.900	**188661**	220-240	A2	-15 to 55	max. 75	K20	8.8
				ELXs 116.903	**188662**	220-240	A2	-15 to 55	max. 75	K21	8.8
10	TC-DEL	G24q-1	1 x 9.3	ELXs 116.900	**188661**	220-240	A2	-15 to 55	max. 75	K20	10.2
	TC-DD	GR10q	1 x 9.3	ELXs 116.900	**188661**	220-240	A2	-15 to 55	max. 75	K20	10.3
	TC-DEL	G24q-1	1 x 9.3	ELXs 116.903	**188662**	220-240	A2	-15 to 55	max. 75	K21	10.2
	TC-DD	GR10q	1 x 9.3	ELXs 116.903	**188662**	220-240	A2	-15 to 55	max. 75	K21	10.3
11	TC-SEL	2G7	1 x 10.8	ELXs 116.900	**188661**	220-240	A2	-15 to 55	max. 75	K20	11.8
				ELXs 116.903	**188662**	220-240	A2	-15 to 55	max. 75	K21	11.8
13	TC-DEL/-TEL	G24q-1/GX24q-1	1 x 12.5	ELXs 121.901	**188663**	220-240	A2	-15 to 55	max. 80	K20	15.5
				ELXs 121.904	**188664**	220-240	A2	-15 to 55	max. 80	K21	15.5
16	TC-DD	GR10q	1 x 13.2	ELXs 116.900	**188661**	220-240	A3	-15 to 55	max. 75	K20	15.1
				ELXs 116.903	**188662**	220-240	A3	-15 to 55	max. 75	K21	15.1
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 15.3	ELXs 121.901	**188663**	220-240	A2	-15 to 55	max. 80	K20	16.9
				ELXs 121.904	**188664**	220-240	A2	-15 to 55	max. 80	K21	16.9
	TC-F/-L	2G10/2G11	1 x 16.0	ELXs 124.902	**188665**	220-240	A2	-15 to 55	max. 85	K20	17.9
				ELXs 124.905	**188666**	220-240	A2	-15 to 55	max. 85	K21	17.9
22	T-R5	2GX13	1 x 19.1	ELXs 124.902	**188665**	220-240	A2	-15 to 55	max. 85	K20	21.2
				ELXs 124.905	**188666**	220-240	A2	-15 to 55	max. 85	K21	21.2
24	TC-F/-L	2G10/2G11	1 x 20.0	ELXs 124.902	**188665**	220-240	A2	-15 to 55	max. 85	K20	21.4
				ELXs 124.905	**188666**	220-240	A2	-15 to 55	max. 85	K21	21.4
			1 x 20.8	ELXs 126.906	**188667**	220-240	A2	-15 to 55	max. 85	K20	22.9
				ELXs 126.907	**188668**	220-240	A2	-15 to 55	max. 85	K21	22.9
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 21.5	ELXs 126.906	**188667**	220-240	A2	-15 to 55	max. 85	K20	23.4
				ELXs 126.907	**188668**	220-240	A2	-15 to 55	max. 85	K21	23.4

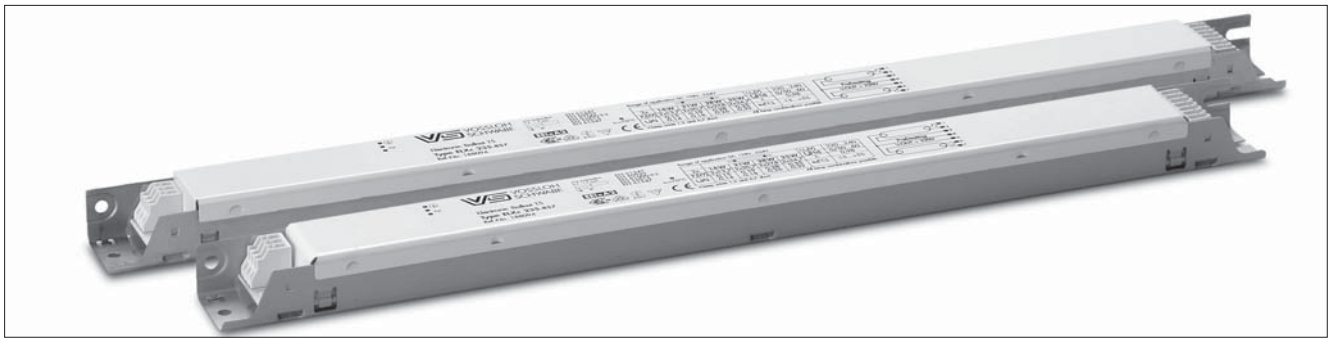
Circuit diagrams see pages 255–259

ELXc – Warm Start for TC-F, TC-L Lamps

Electronic built-in ballasts
Casing: metal
Power factor: > 0.96
DC voltage
for operation: 176–264 V
for ignition: 198–264 V
(ELXc 180.866, 280.538: DC voltage cannot be reduced to 176 V)
Push-in terminals: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved acc. to EN 61347 Test 2

M10/M11





◯ **T5** ◉ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◯ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

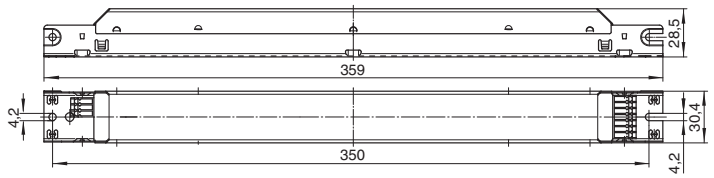
Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	TC-F/-L	2G10/2G11	1 x 16.0	ELXc 140.862	**188140**	220-240	A2	-15 to 55	max. 70	M10	19.0	109.0
2x18	TC-F/-L	2G10/2G11	2 x 16.0	ELXc 240.863	**188616**	220-240	A2 BAT	-15 to 55	max. 70	M10	35.0	105.3
24	TC-F/-L	2G10/2G11	1 x 22.0	ELXc 140.862	**188140**	220-240	A2	-15 to 55	max. 70	M10	27.0	109.0
2x24	TC-F/-L	2G10/2G11	2 x 22.0	ELXc 240.863	**188616**	220-240	A2 BAT	-15 to 55	max. 70	M10	51.0	106.8
36	TC-F/-L	2G10/2G11	1 x 32.0	ELXc 140.862	**188140**	220-240	A2	-15 to 55	max. 70	M10	35.0	101.0
2x36	TC-F/-L	2G10/2G11	2 x 32.0	ELXc 240.863	**188616**	220-240	A2 BAT	-15 to 55	max. 70	M10	71.0	98.7
40	TC-L	2G11	1 x 40.0	ELXc 140.862	**188140**	220-240	A2	-15 to 55	max. 70	M10	46.0	104.0
2x40	TC-L	2G11	2 x 40.0	ELXc 240.863	**188616**	220-240	A2 BAT	-15 to 55	max. 70	M10	89.0	103.6
55	TC-L	2G11	1 x 55.0	ELXc 180.866	**188144**	220-240	A2 BAT	-15 to 55	max. 70	M10	62.0	107.3
2x55	TC-L	2G11	2 x 50.0	ELXc 254.865	**188618**	220-240	A2 BAT	-15 to 50	max. 70	M10	112.0	92.9
			2 x 55.0	ELXc 280.538	**188619**	220-240	A2 BAT	-15 to 50	max. 70	M11	120.0	100.0
80	TC-L	2G11	1 x 80.0	ELXc 180.866	**188144**	220-240	A2 BAT	-15 to 55	max. 70	M10	87.0	97.6
2x80	TC-L	2G11	2 x 80.0	ELXc 280.538	**188619**	220-240	A2 BAT	-15 to 50	max. 70	M11	175.0	100.0

Circuit diagrams see pages 255–259

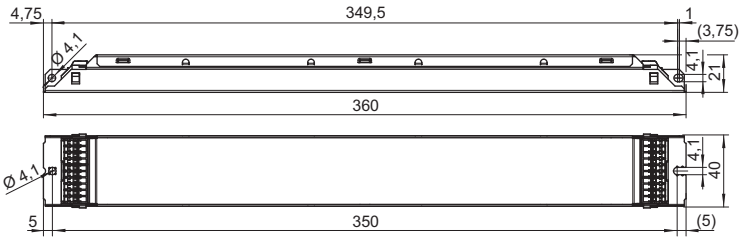
ELXd – Dimmable for TC-F, TC-L Lamps

Electronic built-in ballasts
Casing: metal
Dimming range:
approx. 1–100% of lamp power
Power factor: ≥ 0.95 at 100% operation
DC voltage
for operation: 154–276 V (M22, M23, M24)
for operation: 176–264 V (M9)
for ignition: 198–264 V
Push-in terminals: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
Fixing holes for screws M4
for lateral or base mounting
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved acc. to EN 61347 Test 2

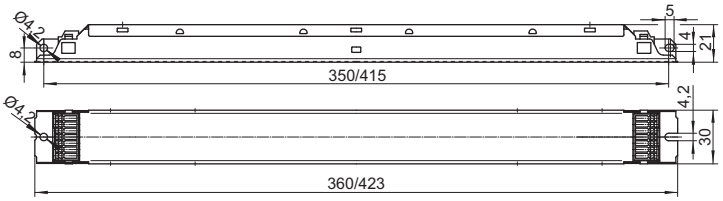
M9



M23



M22/M24



ELXd – Dimmable 1–10 V for TC-F, TC-L lamps

Control voltage: DC 1–10 V
acc. to EN 60929 with earth leakage current 0.5 mA
(protected if connected to mains voltage)
For use with open- or closed-loop control units

○ T5 ◉ TC ◉ BUILT-IN ◉ 1–10 V
○ T8 ○ INDEPENDENT ○ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energie efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	TC-F/-L	2G10/2G11	1 x 16.0	ELXd 118.718	**188873**	220 - 240	EEI=A1	10 to 50	max. 70	M9	18.0	94.0
2x18	TC-F/-L	2G10/2G11	2 x 16.0	ELXd 218.719	**188874**	220 - 240	EEI=A1	10 to 50	max. 70	M9	36.0	90.6
24	TC-F/-L	2G10/2G11	1 x 22.0	ELXd 118.718	**188873**	220 - 240	EEI=A1	10 to 50	max. 70	M9	27.0	96.6
			1 x 23.0	ELXd 124.607	**188336**	220 - 240	A1 BAT	10 to 50	max. 75	M22	26.0	100.0
2x24	TC-F/-L	2G10/2G11	2 x 22.0	ELXd 218.719	**188874**	220 - 240	EEI=A1	10 to 50	max. 70	M9	52.0	100.8
			2 x 23.0	ELXd 224.608	**188337**	220 - 240	A1 BAT	10 to 50	max. 75	M24	49.0	100.0
3x24	TC-F/-L	2G10/2G11	3 x 24.0	ELXd 324.623	**188597**	220 - 240	A1 BAT	10 to 50	max. 75	M23	73.4	100.0
4x24	TC-F/-L	2G10/2G11	4 x 24.0	ELXd 424.624	**188598**	220 - 240	A1 BAT	10 to 50	max. 75	M23	97.6	100.0
36	TC-F/-L	2G10/2G11	1 x 32.0	ELXd 136.720	**188875**	220 - 240	A1 BAT	10 to 50	max. 70	M9	37.3	93.5
2x36	TC-F/-L	2G10/2G11	2 x 32.0	ELXd 236.721	**188876**	220 - 240	EEI=A1	10 to 50	max. 70	M9	72.0	92.6
40	TC-L	2G11	1 x 38.0	ELXd 139.609	**188338**	220 - 240	A1 BAT	10 to 50	max. 75	M22	42.0	100.0
2x40	TC-L	2G11	2 x 38.0	ELXd 239.610	**188339**	220 - 240	A1 BAT	10 to 50	max. 75	M24	82.0	100.0
55	TC-L	2G11	1 x 51.0	ELXd 158.722	**188877**	220 - 240	EEI=A1	10 to 50	max. 70	M9	56.0	92.5
			1 x 54.0	ELXd 154.611	**188340**	220 - 240	A1 BAT	10 to 50	max. 75	M22	59.0	100.0
2x55	TC-L	2G11	2 x 54.0	ELXd 254.612	**188341**	220 - 240	A1 BAT	10 to 50	max. 75	M24	115.0	100.0
80	TC-L	2G11	1 x 80.0	ELXd 180.613	**188342**	220 - 240	A1 BAT	10 to 50	max. 75	M22	88.0	100.0

Circuit diagrams see pages 255–259

ELXd – Dimmable with push key or DALI for TC-F, TC-L lamps

Complete implementation of the DALI-standard:
addressable, memory store for scenes and groups,
revertive information communication, physical and
RND-selection, standardized lamp characteristic
Low-power design ensures very low standby
power consumption
standby power consumption: ≤ 0.2 W

○ T5 ◉ TC ◉ BUILT-IN ○ 1–10 V
○ T8 ○ INDEPENDENT ◉ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energie efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	TC-F/-L	2G10/2G11	1 x 16.0	ELXd 118.615	**188344**	220-240	A1 BAT	10 to 50	max. 75	M22	19.0	100.0
2x18	TC-F/-L	2G10/2G11	2 x 16.0	ELXd 218.616	**188345**	220-240	A1 BAT	10 to 50	max. 75	M24	37.0	100.0
24	TC-F/-L	2G10/2G11	1 x 23.0	ELXd 124.600	**188329**	220-240	A1 BAT	10 to 50	max. 75	M22	26.0	100.0
2x24	TC-F/-L	2G10/2G11	2 x 23.0	ELXd 224.601	**188330**	220-240	A1 BAT	10 to 50	max. 75	M24	49.0	100.0
3x24	TC-F/-L	2G10/2G11	3 x 23.0	ELXd 324.626	**188600**	220-240	A1 BAT	10 to 50	max. 75	M23	73.4	100.0
4x24	TC-F/-L	2G10/2G11	4 x 23.0	ELXd 424.628	**188602**	220-240	A1 BAT	10 to 50	max. 75	M23	97.6	100.0
36	TC-F/-L	2G10/2G11	1 x 32.0	ELXd 136.617	**188346**	220-240	A1 BAT	10 to 50	max. 75	M22	36.0	100.0
2x36	TC-F/-L	2G10/2G11	2 x 32.0	ELXd 236.618	**188347**	220-240	A1 BAT	10 to 50	max. 75	M24	69.0	100.0
40	TC-L	2G11	1 x 38.0	ELXd 139.602	**188331**	220-240	A1 BAT	10 to 50	max. 75	M22	42.0	100.0
2x40	TC-L	2G11	2 x 38.0	ELXd 239.621	**188350**	220-240	A1 BAT	10 to 50	max. 75	M24	82.0	100.0
55	TC-L	2G11	1 x 54.0	ELXd 154.603	**188332**	220-240	A1 BAT	10 to 50	max. 75	M22	59.0	100.0
2x55	TC-L	2G11	2 x 54.0	ELXd 254.604	**188333**	220-240	A1 BAT	10 to 50	max. 75	M24	115.0	100.0
80	TC-L	2G11	1 x 80.0	ELXd 180.605	**188334**	220-240	A1 BAT	10 to 50	max. 75	M22	88.0	100.0

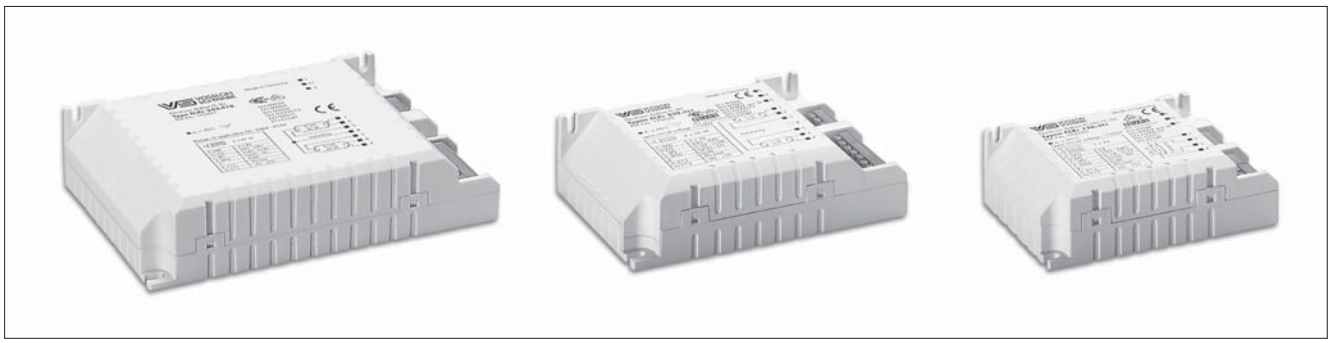
Circuit diagrams see pages 255–259

ELXc – Warm Start for Compact Fluorescent Lamps

Electronic ballasts
Casing: heat-resistant polyamide (K2, K3)
or heat-resistant polycarbonate (K2.1, K4)
DC voltage
for operation: 176–264 V
for ignition: 198–264 V
(ELXc 242.837: DC voltage cannot
be reduced to 176 V)

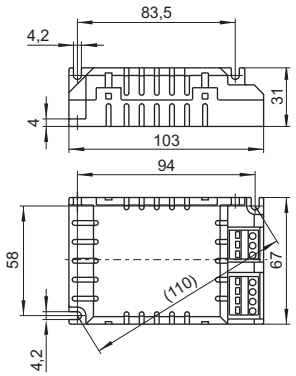
Power factor: > 0.96 (K2.1: 0.98)
Push-in terminals with lever opener: 0.5–1.5 mm²
RFI-suppressed
Constant power consumption
For luminaires of protection class I
Degree of protection: IP20
Fixing brackets for screws M4
for lateral or base mounting

For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved acc. to
EN 61347 Test 2

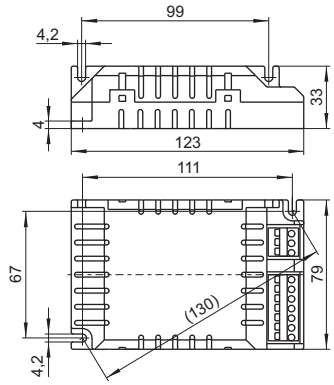


Electronic built-in ballasts

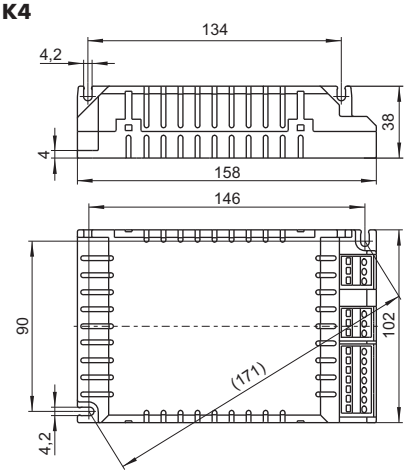
K2



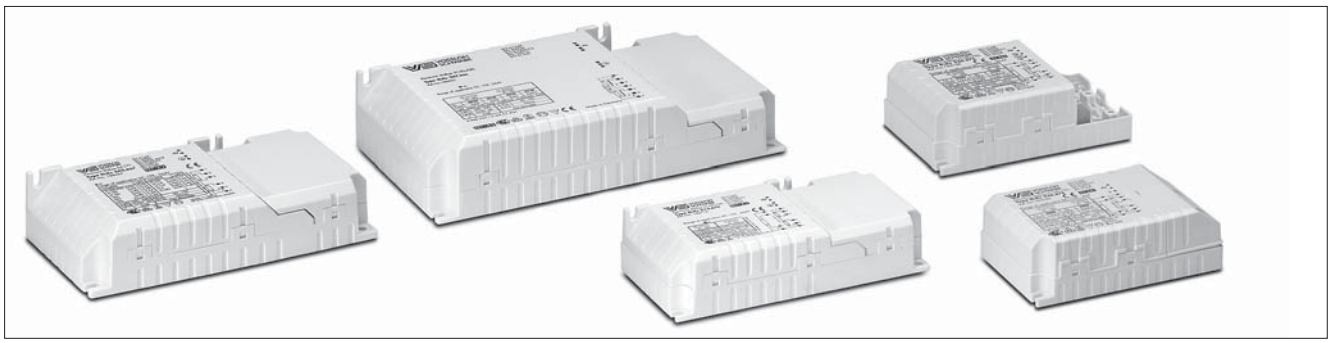
K3



K4

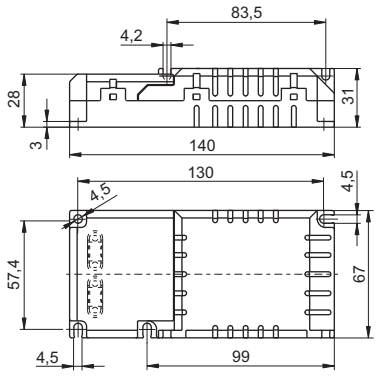


ELXc – Warm Start for Compact Fluorescent Lamps

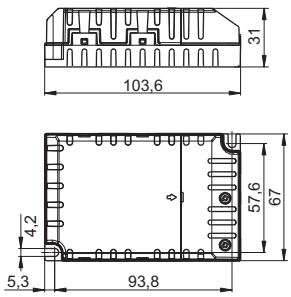


Independent electronic ballasts

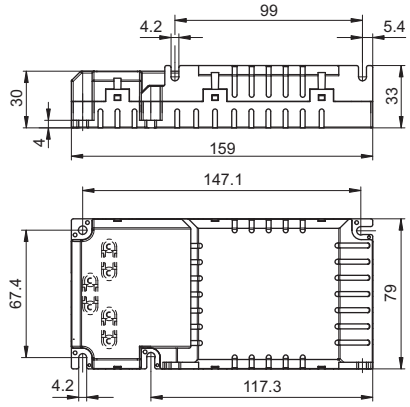
K2 with cord grip



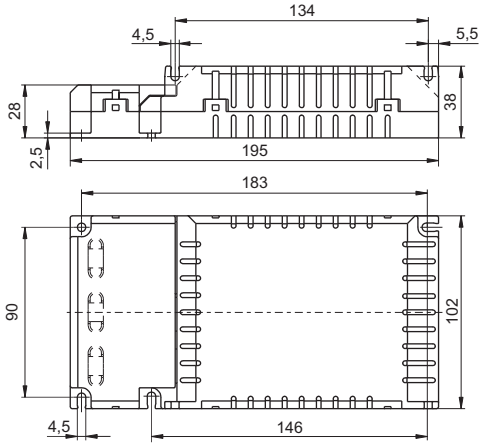
K2.1 with cord grip

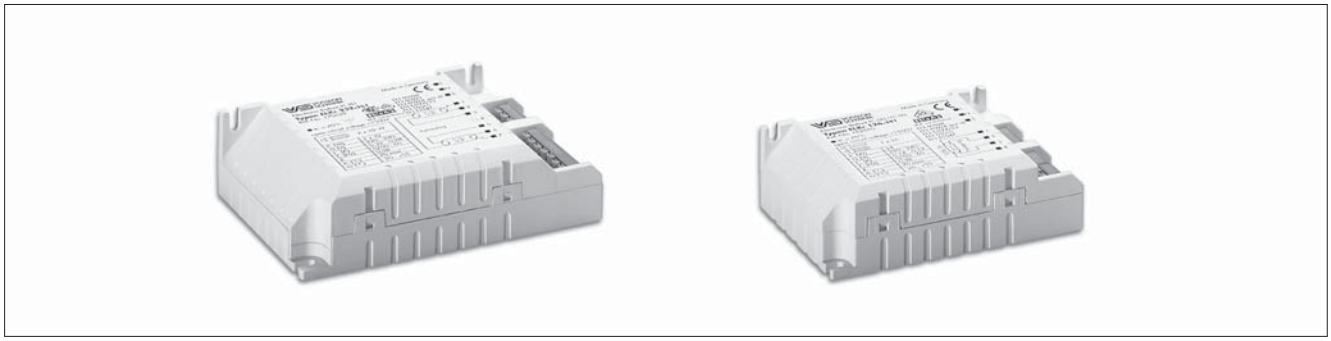


K3 with cord grip



K4 with cord grip





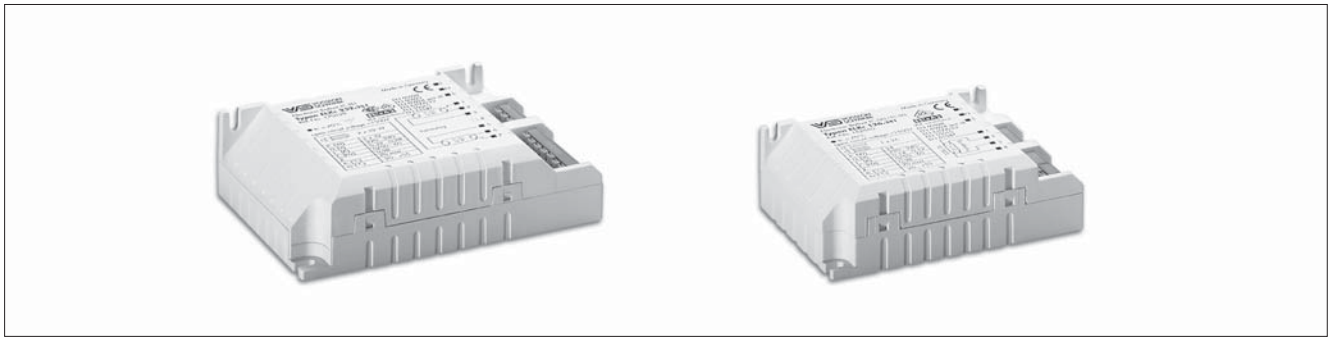
ELXc – Warm start for compact fluorescent lamps
Built-in ballasts

ELXc 213.870, 218.871, 142.872,
242.837, 155.378 have a second earth terminal
to ground the luminaires for example

○ **T5** ◉ **TC** ◉ **BUILT-IN** ○ **1–10 V**
○ **T8** ○ **INDEPENDENT** ○ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energie efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
9	TC-SEL	2G7	1 x 8.0	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	10.7	102.9
2x9	TC-SEL	2G7	2 x 8.0	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	19.4	102.9
10	TC-DEL	G24q-1	1 x 9.5	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	10.9	99.2
2x10	TC-DEL	G24q-1	2 x 9.5	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	20.5	98.8
11	TC-SEL	2G7	1 x 11.0	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	14.7	110.1
2x11	TC-SEL	2G7	2 x 11.0	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	27.9	116.1
13	TC-DEL/-TEL	G24q-1/GX24q-1	1 x 12.5	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	15.0	102.9
2x13	TC-DEL/-TEL	G24q-1/GX24q-1	2 x 12.5	ELXc 213.870	**188698**	220-240	A2 BAT	-20 to 50	max. 65	K2	28.1	110.9
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXc 218.871	**188699**	220-240	A2 BAT	-20 to 50	max. 65	K2	21.0	104.8
	TC-F/-L	2G10/2G11	1 x 16.0	ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	18.0	102.0
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXc 218.871	**188699**	220-240	A2 BAT	-20 to 50	max. 65	K2	38.0	100.7
	TC-F/-L	2G10/2G11	2 x 16.0	ELXc 242.837	**188643**	220-240	A2 BAT	-20 to 50	max. 65	K3	35.0	104.3
				ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	34.0	98.0
22	T-R5	2GX13	1 x 22.0	ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	26.0	103.0
				ELXc 128.869	**188589**	220-240	A2 BAT	-20 to 50	max. 70	K2	25.0	96.7
22+40	T-R5	2GX13	1 x 22+40	ELXc 242.837	**188643**	220-240	A2 BAT	-20 to 50	max. 65	K3	68.0	100.0
2x22	T-R5	2GX13	2 x 22.0	ELXc 242.837	**188643**	220-240	A2 BAT	-20 to 50	max. 65	K3	48.5	105.8
24	TC-F/-L	2G10/2G11	1 x 22.0	ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	27.0	105.0
			1 x 22.5	ELXc 128.869	**188589**	220-240	A2	-20 to 50	max. 70	K2	25.0	95.8
2x24	TC-F/-L	2G10/2G11	2 x 22.0	ELXc 242.837	**188643**	220-240	A2 BAT	-20 to 50	max. 65	K3	48.5	106.2
				ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	47.0	102.0
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	26.0	104.0
2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXc 242.837	**188643**	220-240	A2 BAT	-20 to 50	max. 65	K3	53.0	106.1
				ELXc 142.872	**188700**	220-240	A2 BAT	-20 to 50	max. 65	K2	53.0	105.0

Circuit diagrams see pages 255-259



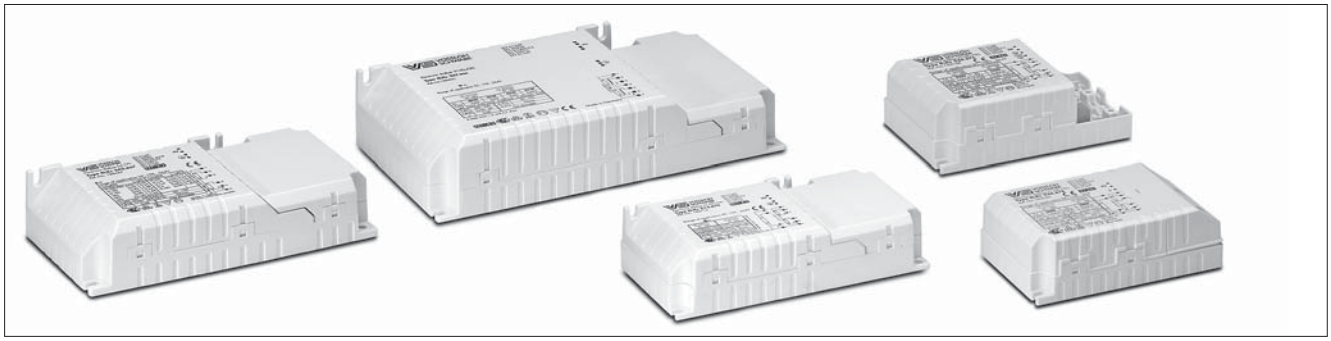
ELXc – Warm start for compact fluorescent lamps
Built-in ballasts

ELXc 213.870, 218.871, 142.872,
242.837, 155.378 have a second earth terminal
to ground the luminaires for example

◯ **T5** ◉ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◯ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energie efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
28	TC-DD	GR10q	1 x 26.0	ELXc 128.869	**188589**	220–240	A2 BAT	–20 to 50	max. 70	K2	32.0	98.1
32	TC-TEL	GX24q-3	1 x 32.0	ELXc 142.872	**188700**	220–240	A2 BAT	–20 to 50	max. 65	K2	33.0	102.0
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXc 242.837	**188643**	220–240	A2 BAT	–20 to 50	max. 65	K3	70.5	104.8
36	TC-F/-L	2G10/2G11	1 x 32.0	ELXc 142.872	**188700**	220–240	A2 BAT	–20 to 50	max. 65	K2	34.0	105.0
2x36	TC-F/-L	2G10/2G11	2 x 32.0	ELXc 242.837	**188643**	220–240	A2 BAT	–20 to 50	max. 65	K3	70.5	101.8
38	TC-DD	GR10q	1 x 36.0	ELXc 142.872	**188700**	220–240	A2 BAT	–20 to 50	max. 65	K2	38.0	95.0
2x38	TC-DD	GR10q	2 x 36.0	ELXc 242.837	**188643**	220–240	A2 BAT	–20 to 50	max. 65	K3	79.2	101.3
40	TC-L	2G11	1 x 40.0	ELXc 142.872	**188700**	220–240	A2 BAT	–20 to 50	max. 65	K2	43.0	99.0
	T-R5	2GX13	1 x 40.0	ELXc 142.872	**188700**	220–240	A2 BAT	–20 to 50	max. 65	K2	41.0	96.0
2x40	TC-L	2G11	2 x 40.0	ELXc 242.837	**188643**	220–240	A2 BAT	–20 to 50	max. 65	K3	88.0	101.3
	T-R5	2GX13	2 x 40.0	ELXc 242.837	**188643**	220–240	A2 BAT	–20 to 50	max. 65	K3	88.0	101.1
42	TC-TEL	GX24q-4	1 x 42.0	ELXc 142.872	**188700**	220–240	A2 BAT	–20 to 50	max. 65	K2	45.0	99.0
2x42	TC-TEL	GX24q-4	2 x 43.0	ELXc 242.837	**188643**	220–240	A2 BAT	–20 to 50	max. 65	K3	94.5	100.6
55	TC-L	2G11	1 x 55.6	ELXc 155.378	**188680**	220–240	A2 BAT	–20 to 50	max. 70	K3	60.0	102.4
	T-R5	2GX13	1 x 55.6	ELXc 155.378	**188680**	220–240	A2 BAT	–20 to 50	max. 70	K3	60.0	101.2
60	T-R5	2GX13	1 x 60.6	ELXc 155.378	**188680**	220–240	A2	–20 to 50	max. 70	K3	66.0	109.5
80	TC-L	2G11	1 x 80.5	ELXc 155.378	**188680**	220–240	A2 BAT	–20 to 50	max. 70	K3	88.0	101.3

Circuit diagrams see pages 255–259



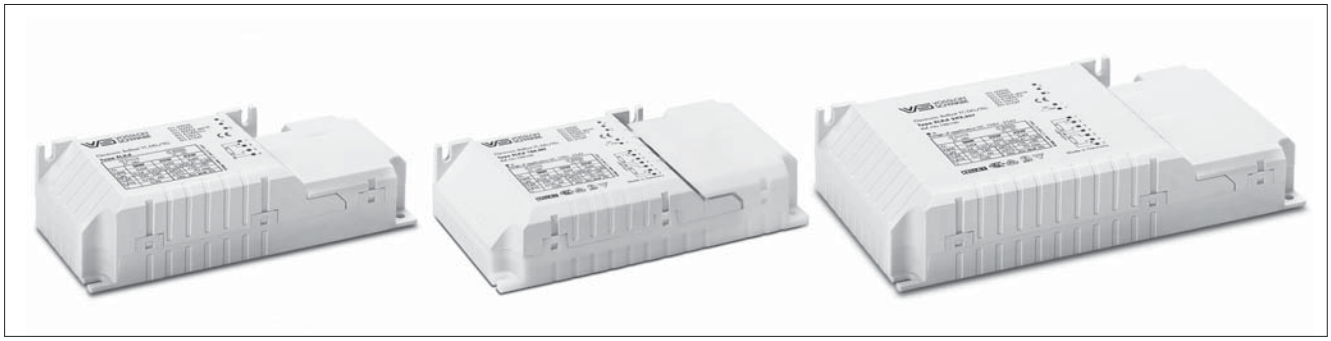
ELXc – Warm start for compact fluorescent lamps – Independent ballasts

For ELXc 257.836 a
loop-through of the mains supply is possible
ELXc 213.870, 218.871, 142.872,
242.837, 155.378 have a second earth terminal
to ground the luminaires

◯ **T5** ◉ **TC** ◯ **BUILT-IN** ◯ **1–10 V**
◯ **T8** ◉ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
9	TC-SEL	2G7	1 x 8.0	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	10.7	102.9
2x9	TC-SEL	2G7	2 x 8.0	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	19.4	102.9
10	TC-DEL	G24q-1	1 x 9.5	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	10.9	99.2
2x10	TC-DEL	G24q-1	2 x 9.5	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	20.5	98.8
11	TC-SEL	2G7	1 x 11.0	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	14.7	110.1
2x11	TC-SEL	2G7	2 x 11.0	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	27.9	116.1
13	TC-DEL/-TEL	G24q-1/GX24q-1	1 x 12.5	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	15.0	102.9
2x13	TC-DEL/-TEL	G24q-1/GX24q-1	2 x 12.5	ELXc 213.870	**188712**	220-240	A2 BAT	-20 to 50	max. 65	K2	28.1	110.9
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXc 218.871	**188713**	220-240	A2 BAT	-20 to 50	max. 65	K2	21.0	104.8
	TC-F/-L	2G10/2G11	1 x 16.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	18.0	102.0
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXc 218.871	**188713**	220-240	A2 BAT	-20 to 50	max. 65	K2	38.0	100.7
	TC-F/-L	2G10/2G11	2 x 16.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	35.0	104.3
				ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	34.0	98.0
22	T-R5	2GX13	1 x 22.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	26.0	103.0
				ELXc 128.869	**188590**	220-240	A2 BAT	-20 to 50	max. 70	K2	25.0	96.7
22+40	T-R5	2GX13	1 x 22+40	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	68.0	100.0
2x22	T-R5	2GX13	2 x 22.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	48.5	105.8
24	TC-F/-L	2G10/2G11	1 x 22.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	27.0	105.0
	TC-F/-L	2G10/2G11	1 x 22.5	ELXc 128.869	**188590**	220-240	A2	-20 to 50	max. 70	K2	25.0	95.8
2x24	TC-F/-L	2G10/2G11	2 x 22.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	48.5	106.2
				ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	47.0	102.0
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	26.0	104.0
new				ELXc 226.878	**183040**	220-240	A2 BAT	-20 to 55	max. 65	K2.1	28.0	104.0
new				ELXc 226.878	**183108***	220-240	A2 BAT	-20 to 55	max. 65	K2.1	28.0	104.0
new	2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXc 226.878	**183040**	220-240	A2 BAT	-20 to 55	max. 65	K2.1	50.0	101.0
new					ELXc 226.878	**183108***	220-240	A2 BAT	-20 to 55	max. 65	K2.1	50.0	101.0
					ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	53.0	106.1
					ELXc 257.836	**188400**	220-240	A2 BAT	-20 to 50	max. 70	K4	52.0	106.2
					ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	53.0	105.0

Circuit diagrams see pages 255-259
* Without cover cap on cord grip = built-in version



ELXc – Compact warm start for compact fluorescent lamps – Independent ballasts

For ELXc 257.836 a
loop-through of the mains supply is possible
ELXc 213.870, 218.871, 142.872,
242.837, 155.378 have a second earth terminal
to ground the luminaires for example

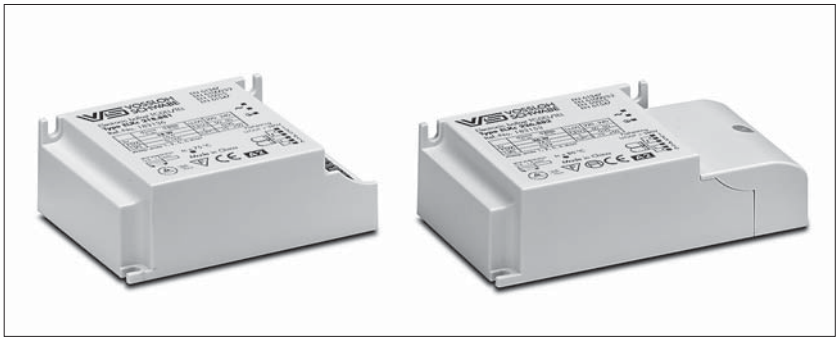
◯ **T5** ◉ **TC** ◯ **BUILT-IN** ◯ **1–10 V**
◯ **T8** ◉ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
28	TC-DD	GR10q	1 x 26.0	ELXc 128.869	**188590**	220-240	A2 BAT	-20 to 50	max. 70	K2	32.0	98.1
32	TC-TEL	GX24q-3	1 x 32.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	33.0	102.0
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	70.5	104.8
				ELXc 257.836	**188400**	220-240	A2 BAT	-20 to 50	max. 70	K4	70.0	109.4
36	TC-F/-L	2G10/2G11	1 x 32.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	34.0	105.0
2x36	TC-F/-L	2G10/2G11	2 x 32.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	70.5	101.8
38	TC-DD	GR10q	1 x 36.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	38.0	95.0
2x38	TC-DD	GR10q	2 x 36.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	79.2	101.3
40	TC-L	2G11	1 x 40.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	43.0	99.0
	T-R5	2GX13	1 x 40.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	41.0	96.0
2x40	TC-L	2G11	2 x 40.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	88.0	101.3
	T-R5	2GX13	2 x 40.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	88.0	101.1
42	TC-TEL	GX24q-4	1 x 42.0	ELXc 142.872	**188714**	220-240	A2 BAT	-20 to 50	max. 65	K2	45.0	99.0
2x42	TC-TEL	GX24q-4	2 x 43.0	ELXc 242.837	**188687**	220-240	A2 BAT	-20 to 50	max. 65	K3	94.5	100.6
				ELXc 257.836	**188400**	220-240	A2 BAT	-20 to 50	max. 70	K4	94.0	104.9
55	TC-L	2G11	1 x 55.6	ELXc 155.378	**188681**	220-240	A2 BAT	-20 to 50	max. 70	K3	60.0	102.4
	T-R5	2GX13	1 x 55.6	ELXc 155.378	**188681**	220-240	A2 BAT	-20 to 50	max. 70	K3	60.0	101.2
57	TC-TEL	GX24q-5	1 x 57.0	ELXc 170.833	**188683**	220-240	A2 BAT	-20 to 50	max. 65	K3	63.0	105.0
2x57	TC-TEL	GX24q-5	2 x 57.0	ELXc 257.836	**188400**	220-240	A2 BAT	-20 to 50	max. 70	K4	130.0	100.0
60	T-R5	2GX13	1 x 60.6	ELXc 155.378	**188681**	220-240	A2	-20 to 50	max. 70	K3	66.0	109.5
70	TC-TEL	GX24q-6	1 x 70.0	ELXc 170.833	**188683**	220-240	A2 BAT	-20 to 50	max. 65	K3	77.0	110.0
80	TC-L	2G11	1 x 80.5	ELXc 155.378	**188681**	220-240	A2 BAT	-20 to 50	max. 70	K3	88.0	101.3

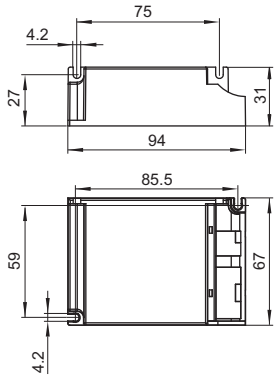
Circuit diagrams see pages 255-259

ELXc – ECO EffectLine Warm Start for Compact Fluorescent Lamps

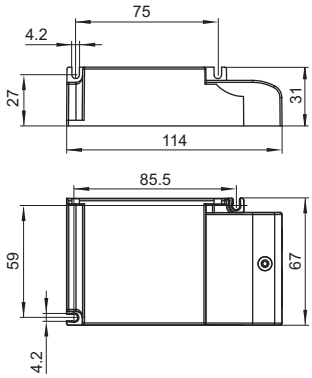
Electronic ballasts
Casing: PC, white
Mains voltage: 198–264 V
Push-in terminals: 0.5–1.5 mm²
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved acc. to EN 61347 Test 1



K1.1



K1.1 with cord grip



ELXc – Warm start for compact fluorescent lamps – Built-in ballasts

◯ T5 ◉ TC ◉ BUILT-IN ◯ 1–10 V
◯ T8 ◯ INDEPENDENT ◯ DALI/PUSH

	Lamp				Electronic ballast							System	
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10 %	Energy efficiency	Power factor	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Output W	Luminous factor %
new	18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXc 118.879	**183134**	220–240	A2	> 0.95	-10 to 50	max. 70	19.5	100
new	2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXc 218.881	**183136**	220–240	A2	> 0.95	-15 to 50	max. 75	38.0	100
new	26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXc 126.880	**183135**	220–240	A2	> 0.95	-10 to 50	max. 75	28.0	100
new	2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXc 226.882	**183137**	220–240	A2	> 0.95	-15 to 50	max. 80	53.5	100

Preliminary data

ELXc – Compact warm start for compact fluorescent lamps – Independent ballasts

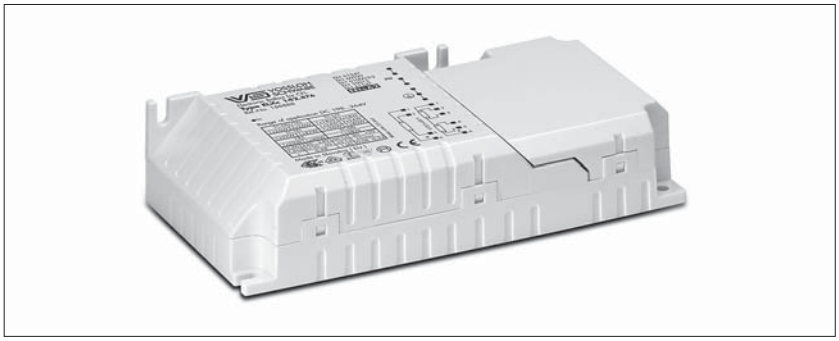
◯ T5 ◉ TC ◯ BUILT-IN ◯ 1–10 V
◯ T8 ◉ INDEPENDENT ◯ DALI/PUSH

	Lamp				Electronic ballast							System	
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10 %	Energy efficiency	Power factor	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Output W	Luminous factor %
new	18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXc 118.879	**183150**	220–240	A2	> 0.95	-10 to 50	max. 70	19.5	100
new	2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXc 218.881	**183152**	220–240	A2	> 0.95	-15 to 50	max. 75	38.0	100
new	26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXc 126.880	**183151**	220–240	A2	> 0.95	-10 to 50	max. 75	28.0	100
new	2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXc 226.882	**183153**	220–240	A2	> 0.95	-15 to 50	max. 80	53.5	100

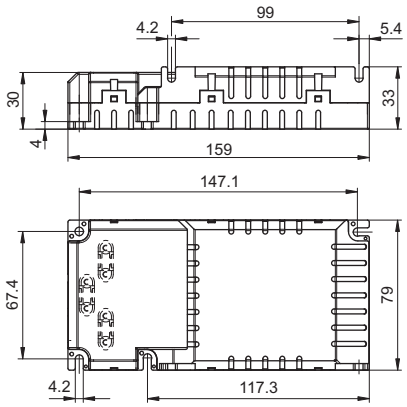
Preliminary data

ELXc – Warm Start for Compact Fluorescent Lamps

Independent electronic ballasts
Casing: heat-resistant polyamide (K3)
Power factor: > 0.96
DC voltage
for operation: 176–264 V
for ignition: 198–264 V
Push-in terminals with lever opener: 0.5–1.5 mm²
Mains and earth through-wiring on primary side is possible
Existing terminals: 2 x L; 2 x N; 3 x PE
RFI-suppressed
Constant power consumption
For luminaires of protection class I
Degree of protection: IP20
Fixing brackets for screws M4
for lateral or base mounting
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved acc. to EN 61347 Test 2



K3 with cord grip



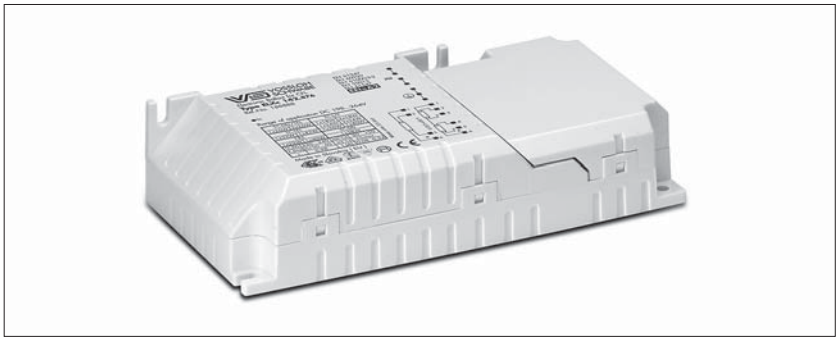
◯ **T5** ◉ **TC** ◯ **BUILT-IN** ◯ **1–10 V**
◯ **T8** ◉ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
9	TC-SEL	2G7	1 x 8.0	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	10.7	102.9
2x9	TC-SEL	2G7	2 x 8.0	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	19.4	102.9
10	TC-DEL	G24q-1	1 x 9.5	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	10.9	99.2
2x10	TC-DEL	G24q-1	2 x 9.5	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	20.5	98.8
11	TC-SEL	2G7	1 x 11.0	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	14.7	110.1
2x11	TC-SEL	2G7	2 x 11.0	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	27.9	116.1
13	TC-DEL/-TEL	G24q-1/GX24q-1	1 x 12.5	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	15.0	102.9
2x13	TC-DEL/-TEL	G24q-1/GX24q-1	2 x 12.5	ELXc 213.874	**188886**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	28.1	110.9
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXc 218.875	**188887**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	21.0	104.8
	TC-F/-L	2G10/2G11	1 x 16.0	ELXc 142.876	**188888**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	18.0	102.0
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXc 218.875	**188887**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	38.0	100.7
	TC-F/-L	2G10/2G11	2 x 16.0	ELXc 242.877	**188889**	220 – 240	A2	-20 to 50	max. 65	K3	35.0	104.3
				ELXc 142.876	**188888**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	34.0	98.0
22	T-R5	2GX13	1 x 22.0	ELXc 142.876	**188888**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	26.0	103.0
22+40	T-R5	2GX13	1 x 22+40	ELXc 242.877	**188889**	220 – 240	A2	-20 to 50	max. 65	K3	68.0	100.0
2x22	T-R5	2GX13	2 x 22.0	ELXc 242.877	**188889**	220 – 240	A2	-20 to 50	max. 65	K3	48.5	105.8
24	TC-F/-L	2G10/2G11	1 x 22.0	ELXc 142.876	**188888**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	27.0	105.0
2x24	TC-F/-L	2G10/2G11	2 x 22.0	ELXc 242.877	**188889**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	48.5	106.2
				ELXc 142.876	**188888**	220 – 240	A2 BAT	-20 to 50	max. 65	K3	47.0	102.0

Circuit diagrams see pages 255–259

ELXc – Warm Start for Compact Fluorescent Lamps

ELXc – Warm start for compact fluorescent lamps – Independent ballasts



○ T5 ◉ TC ○ BUILT-IN ○ 1–10 V
○ T8 ◉ INDEPENDENT ○ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	26.0	104.0
2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXc 242.877	**188889**	220-240	A2 BAT	-20 to 50	max. 65	K3	53.0	106.1
				ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	53.0	105.0
32	TC-TEL	GX24q-3	1 x 32.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	33.0	102.0
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXc 242.877	**188889**	220-240	A2 BAT	-20 to 50	max. 65	K3	70.5	104.8
36	TC-F/-L	2G10/2G11	1 x 32.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	34.0	105.0
2x36	TC-F/-L	2G10/2G11	2 x 32.0	ELXc 242.877	**188889**	220-240	A2 BAT	-20 to 50	max. 65	K3	70.5	101.8
38	TC-DD	GR10q	1 x 36.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	38.0	95.0
2x38	TC-DD	GR10q	2 x 36.0	ELXc 242.877	**188889**	220-240	A2 BAT	-20 to 50	max. 65	K3	79.2	101.3
40	TC-L	2G11	1 x 40.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	43.0	99.0
	T-R5	2GX13	1 x 40.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	41.0	96.0
2x40	TC-L	2G11	2 x 40.0	ELXc 242.877	**188889**	220-240	A2	-20 to 50	max. 65	K3	88.0	101.3
	T-R5	2GX13	2 x 40.0	ELXc 242.877	**188889**	220-240	A2	-20 to 50	max. 65	K3	88.0	101.1
42	TC-TEL	GX24q-4	1 x 42.0	ELXc 142.876	**188888**	220-240	A2 BAT	-20 to 50	max. 65	K3	45.0	99.0
2x42	TC-TEL	GX24q-4	2 x 43.0	ELXc 242.877	**188889**	220-240	A2 BAT	-20 to 50	max. 65	K3	94.5	100.6

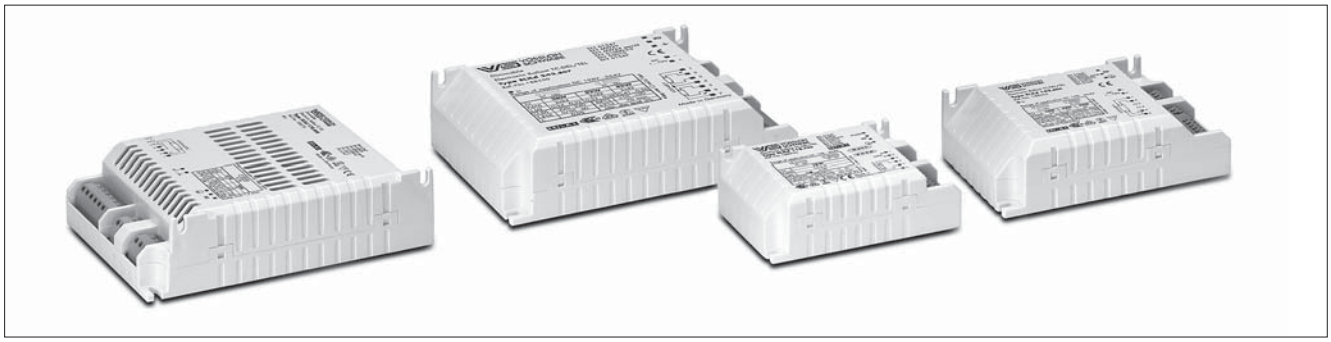
Circuit diagrams see pages 255-259

ELXd – Dimmable for TC-DEL, TC-TEL Lamps

Electronic ballasts
Casing: heat-resistant polycarbonate
Dimming range:
approx. 3–100% of lamp power
Push-in terminals with lever opener: 0.5–1.5 mm²
RFI-suppressed

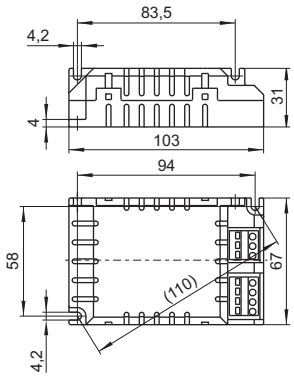
Degree of protection: IP20
For luminaires of protection class I
Fixing brackets for screws M4
for lateral or base mounting
For lighting systems with
high switching frequency (> 5/day)

EOL shut down approved
acc. to EN 61347 Test 2

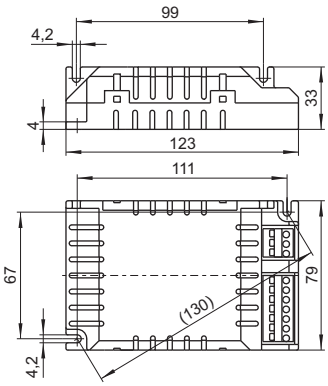


Electronic built-in ballasts

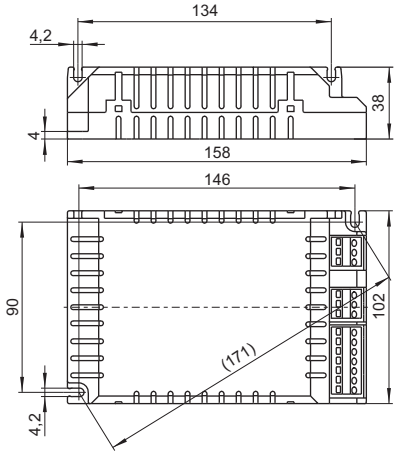
K2



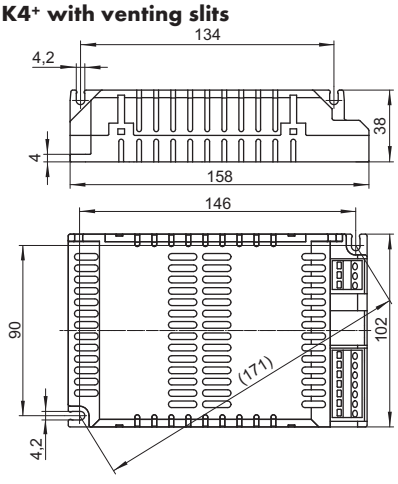
K3



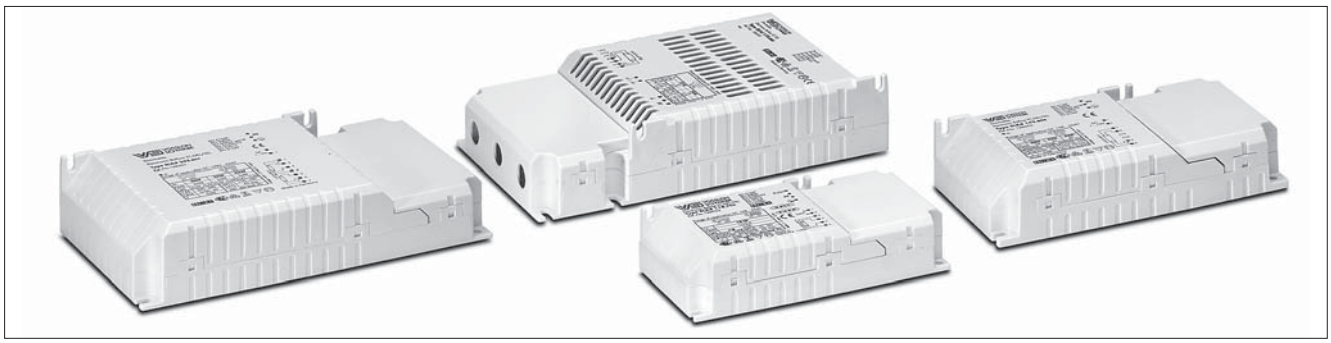
K4



K4⁺ with venting slits

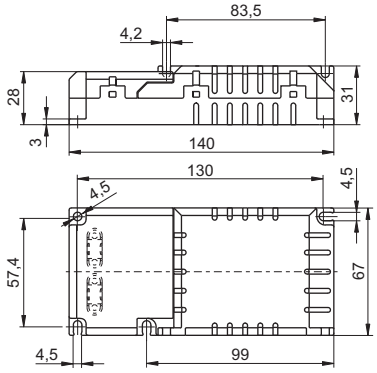


ELXd – Dimmable for TC-DEL, TC-TEL Lamps

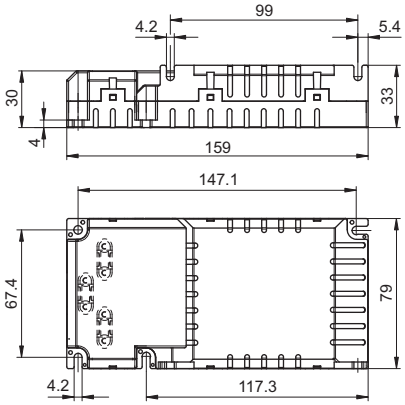


Independent electronic ballasts

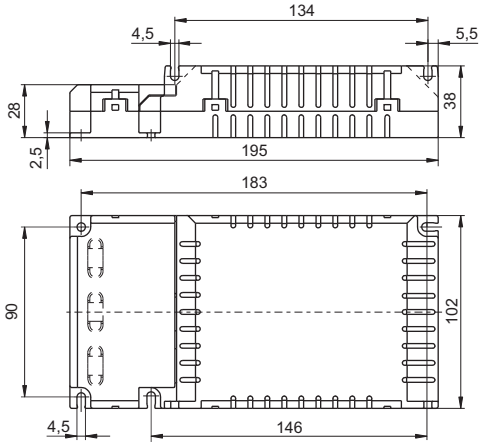
K2 with cord grip



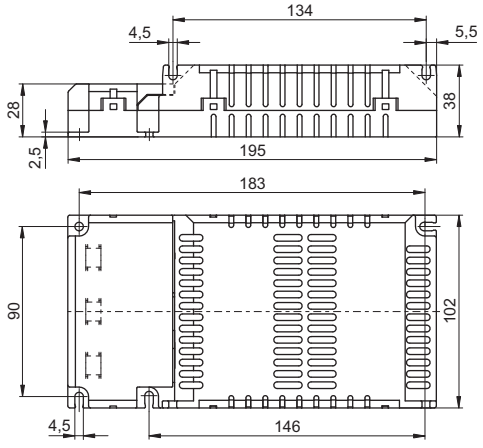
K3 with cord grip



K4 with cord grip



K4⁺ with cord grip and venting slits



ELXd – Dimmable 1–10 V for TC-DEL, TC-TEL lamps

Electronic built-in ballasts
Casing: K3, K4 and K4+ with venting slits
Control voltage: DC 1–10 V acc. to EN 60929 with earth leakage current 0.5 mA (protected if connected to mains voltage)
For use with open- or closed-loop control units
Power factor: 0.98 at 100% operation

DC voltage
for operation: 176–264 V
for ignition: 198–264 V

○ T5 ◉ TC ◉ BUILT-IN ◉ 1–10 V
○ T8 ○ INDEPENDENT ○ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXd 118.802	**188564**	220-240	A1 BAT	5 to 55	max. 70	K3	21.0	100.0
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXd 218.803	**188549**	220-240	A1 BAT	5 to 55	max. 70	K4	38.0	100.0
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXd 142.806	**188565**	220-240	A1 BAT	10 to 50	max. 70	K3	27.0	100.0
2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXd 242.807	**188550**	220-240	A1 BAT	10 to 50	max. 70	K4	53.0	100.0
				ELXd 226.801	**188431**	220-240	A1 BAT	10 to 50	max. 70	K3	54.0	100.0
32	TC-TEL	GX24q-3	1 x 32.0	ELXd 142.806	**188565**	220-240	A1 BAT	10 to 50	max. 70	K3	36.0	100.0
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXd 242.807	**188550**	220-240	A1 BAT	10 to 50	max. 70	K4	71.0	100.0
42	TC-TEL	GX24q-4	1 x 43.0	ELXd 142.806	**188565**	220-240	A1 BAT	10 to 50	max. 70	K3	46.0	100.0
2x42	TC-TEL	GX24q-4	2 x 43.0	ELXd 242.807	**188550**	220-240	A1 BAT	10 to 50	max. 70	K4	92.0	100.0
57	TC-TEL	GX24q-5	1 x 57.0	ELXd 170.808	**188276**	220-240	A1 BAT	10 to 55	max. 60	K4+	62.0	100.0
70	TC-TEL	GX24q-6	1 x 70.0	ELXd 170.808	**188276**	220-240	A1 BAT	10 to 55	max. 60	K4+	77.0	100.0

Circuit diagrams see pages 255–259

ELXd – Dimmable 1–10 V for TC-DEL, TC-TEL lamps

Independent electronic ballasts
Casing with cord grip: K3, K4 and K4+ with venting slits
Control voltage: DC 1–10 V acc. to EN 60929 with earth leakage current 0.5 mA (protected if connected to mains voltage)
For use with open- or closed-loop control units
Power factor: 0.98 at 100% operation

DC voltage
for operation: 176–264 V
for ignition: 198–264 V

○ T5 ◉ TC ○ BUILT-IN ◉ 1–10 V
○ T8 ◉ INDEPENDENT ○ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXd 118.802	**188694**	220-240	A1 BAT	5 to 55	max. 70	K3	21.0	100.0
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 16.5	ELXd 218.803	**188696**	220-240	A1 BAT	5 to 55	max. 70	K4	38.0	100.0
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 24.0	ELXd 142.806	**188695**	220-240	A1 BAT	10 to 50	max. 70	K3	27.0	100.0
2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXd 242.807	**188697**	220-240	A1 BAT	10 to 50	max. 70	K4	53.0	100.0
				ELXd 226.801	**188490**	220-240	A1 BAT	10 to 50	max. 70	K3	54.0	100.0
32	TC-TEL	GX24q-3	1 x 32.0	ELXd 142.806	**188695**	220-240	A1 BAT	10 to 50	max. 70	K3	36.0	100.0
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXd 242.807	**188697**	220-240	A1 BAT	10 to 50	max. 70	K4	71.0	100.0
42	TC-TEL	GX24q-4	1 x 43.0	ELXd 142.806	**188695**	220-240	A1 BAT	10 to 50	max. 70	K3	46.0	100.0
2x42	TC-TEL	GX24q-4	2 x 43.0	ELXd 242.807	**188697**	220-240	A1 BAT	10 to 50	max. 70	K4	92.0	100.0
57	TC-TEL	GX24q-5	1 x 57.0	ELXd 170.808	**188495**	220-240	A1 BAT	10 to 55	max. 60	K4+	62.0	100.0
70	TC-TEL	GX24q-6	1 x 70.0	ELXd 170.808	**188495**	220-240	A1 BAT	10 to 55	max. 60	K4+	77.0	100.0

Circuit diagrams see pages 255–259

ELXd – Dimmable with push key or DALI for TC-DEL, TC-TEL lamps

Electronic ballasts
PUSH: dimmable with usual push key and sensor
DALI: poles are not polarity sensitive (protected if connected to mains voltage) for use with DALI compatible control units
Automatic restart after lamp has been changed
Power factor: > 0.95 at 100% operation
DC voltage
for operation: 176–264 V
for ignition: 198–264 V
Standby power consumption: ≤ 0.5 W

Complete implementation of the DALI-standard: addressable, memory store for scenes and groups, revertive information communication, physical and RND-selection, standardized lamp characteristic
Low-power design ensures very low standby power consumption
Compatible with IEC 62386

Electronic built-in ballasts

○ T5 ◉ TC ◉ BUILT-IN ○ 1–10 V
○ T8 ○ INDEPENDENT ◉ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
14	TC-TEL	GR14q-1	1 x 16.7	ELXd 117.715	**188864**	220–240	A1 BAT	10 to 50	max. 65	K2	18.0	103.8
2x14	TC-TEL	GR14q-1	2 x 14.0	ELXd 217.717	**188866**	220–240	A1 BAT	10 to 60	max. 70	K3	33.8	95.9
17	TC-TEL	GR14q-1	1 x 20.0	ELXd 117.715	**188864**	220–240	A1 BAT	10 to 50	max. 65	K2	22.0	105.3
2x17	TC-TEL	GR14q-1	2 x 17.0	ELXd 217.717	**188866**	220–240	A1 BAT	10 to 60	max. 70	K3	40.7	95.2
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXd 118.705	**188952**	220–240	A1 BAT	10 to 50	max. 65	K2	20.2	105.5
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 18.0	ELXd 218.707	**188954**	220–240	A1 BAT	10 to 50	max. 70	K3	40.0	100.1
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 25.0	ELXd 142.709	**188923**	220–240	A1 BAT	10 to 50	max. 65	K2	27.5	106.8
2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXd 242.711	**188974**	220–240	A1 BAT	10 to 50	max. 70	K3	56.0	97.9
32	TC-TEL	GX24q-3	1 x 32.0	ELXd 142.709	**188923**	220–240	A1 BAT	10 to 50	max. 65	K2	34.5	106.3
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXd 242.711	**188974**	220–240	A1 BAT	10 to 50	max. 70	K3	69.0	97.6
42	TC-TEL	GX24q-4	1 x 42.0	ELXd 142.709	**188923**	220–240	A1 BAT	10 to 50	max. 65	K2	45.0	103.8
2x42	TC-TEL	GX24q-4	2 x 42.0	ELXd 242.711	**188974**	220–240	A1 BAT	10 to 50	max. 70	K3	90.0	99.1

Circuit diagrams see pages 255–259

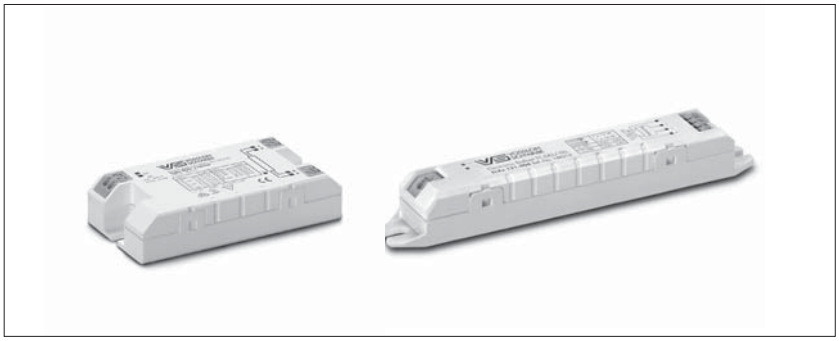
Independent electronic ballasts

○ T5 ◉ TC ○ BUILT-IN ○ 1–10 V
○ T8 ◉ INDEPENDENT ◉ DALI/PUSH

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
14	TC-TEL	GR14q-1	1 x 16.7	ELXd 117.715	**188865**	220–240	A1BAT	10 to 50	max. 65	K2	18.0	103.8
2x14	TC-TEL	GR14q-1	2 x 14.0	ELXd 217.717	**188867**	220–240	A1BAT	10 to 60	max. 70	K3	33.8	95.9
17	TC-TEL	GR14q-1	1 x 20.0	ELXd 117.715	**188865**	220–240	A1BAT	10 to 50	max. 65	K2	22.0	105.3
2x17	TC-TEL	GR14q-1	2 x 17.0	ELXd 217.717	**188867**	220–240	A1BAT	10 to 60	max. 70	K3	40.7	95.2
18	TC-DEL/-TEL	G24q-2/GX24q-2	1 x 16.5	ELXd 118.705	**188953**	220–240	A1BAT	10 to 50	max. 65	K2	20.2	105.5
2x18	TC-DEL/-TEL	G24q-2/GX24q-2	2 x 18.0	ELXd 218.707	**188955**	220–240	A1BAT	10 to 60	max. 70	K3	40.0	100.1
26	TC-DEL/-TEL	G24q-3/GX24q-3	1 x 25.0	ELXd 142.709	**188924**	220–240	A1BAT	10 to 50	max. 65	K2	27.5	106.3
2x26	TC-DEL/-TEL	G24q-3/GX24q-3	2 x 24.0	ELXd 242.711	**188975**	220–240	A1BAT	10 to 50	max. 70	K3	56.0	97.9
32	TC-TEL	GX24q-3	1 x 32.0	ELXd 142.709	**188924**	220–240	A1BAT	10 to 50	max. 65	K2	34.8	106.3
2x32	TC-TEL	GX24q-3	2 x 32.0	ELXd 242.711	**188975**	220–240	A1BAT	10 to 50	max. 70	K3	69.0	97.6
42	TC-TEL	GX24q-4	1 x 42.0	ELXd 142.709	**188924**	220–240	A1BAT	10 to 50	max. 65	K2	45.0	103.8
2x42	TC-TEL	GX24q-4	2 x 42.0	ELXd 242.711	**188975**	220–240	A1BAT	10 to 50	max. 70	K3	90.0	99.1

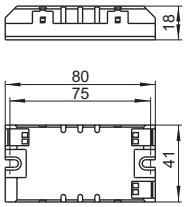
Circuit diagrams see pages 255–259

ELXs – Warm Start for T5 and T8 Lamps

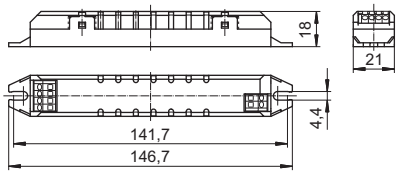


Electronic built-in ballasts
Casing: heat-resistant polyamide
Power factor: approx. 0.6
(depending on the lamp output)
DC voltage operation: 198–264 V
Push-in terminals with lever opener: 0.5–1.5 mm²
RFI-suppressed
For luminaires of protection class I and II
Degree of protection: IP20
Fixing slots for screws M4
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved
acc. to EN 61347 Test 2

K20



K21



(●) T5 ( ) TC (●) BUILT-IN ( ) 1–10 V
(●) T8 ( ) INDEPENDENT ( ) DALI/PUSH

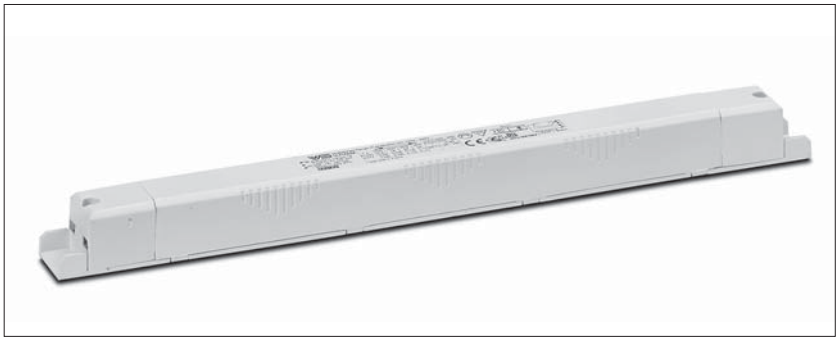
Lamp				Electronic ballast							System
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W
For T5 lamps											
4	T5	G5	1 x 4.6	ELXs 116.900	**188661**	220–240	A3	–15 to 55	max. 75	K20	5.9
			1 x 4.6	ELXs 116.903	**188662**	220–240	A3	–15 to 55	max. 75	K21	5.9
6	T5	G5	1 x 6.0	ELXs 116.900	**188661**	220–240	A2	–15 to 55	max. 75	K20	7.5
			1 x 6.0	ELXs 116.903	**188662**	220–240	A2	–15 to 55	max. 75	K21	7.5
8	T5	G5	1 x 7.1	ELXs 116.900	**188661**	220–240	A2	–15 to 55	max. 75	K20	8.6
			1 x 7.1	ELXs 116.903	**188662**	220–240	A2	–15 to 55	max. 75	K21	8.6
13	T5	G5	1 x 12.0	ELXs 116.900	**188661**	220–240	A2	–15 to 55	max. 75	K20	13.1
			1 x 12.0	ELXs 116.903	**188662**	220–240	A2	–15 to 55	max. 75	K21	13.1
14	T5	G5	1 x 14.1	ELXs 121.901	**188663**	220–240	A2	–15 to 55	max. 80	K20	16.3
			1 x 14.1	ELXs 121.904	**188664**	220–240	A2	–15 to 55	max. 80	K21	16.3
21	T5	G5	1 x 19.1	ELXs 121.901	**188663**	220–240	A2	–15 to 55	max. 80	K20	21.8
			1 x 19.1	ELXs 121.904	**188664**	220–240	A2	–15 to 55	max. 80	K21	21.8
24	T5	G5	1 x 20.1	ELXs 124.902	**188665**	220–240	A2	–15 to 55	max. 85	K20	21.5
			1 x 20.1	ELXs 124.905	**188666**	220–240	A2	–15 to 55	max. 85	K21	21.5
For T8 lamps											
14	T8	G13	1 x 13.5	ELXs 124.902	**188665**	220–240	A2	–15 to 55	max. 85	K20	16.2
			1 x 13.5	ELXs 124.905	**188666**	220–240	A2	–15 to 55	max. 85	K21	16.2
15	T8	G13	1 x 14.1	ELXs 124.902	**188665**	220–240	A2	–15 to 55	max. 85	K20	17.6
			1 x 14.1	ELXs 124.905	**188666**	220–240	A2	–15 to 55	max. 85	K21	17.6
16	T8	G13	1 x 12.0	ELXs 116.900	**188661**	220–240	A2	–15 to 55	max. 75	K20	13.4
			1 x 12.0	ELXs 116.903	**188662**	220–240	A2	–15 to 55	max. 75	K21	13.4
18	T8	G13	1 x 15.9	ELXs 124.902	**188665**	220–240	A2	–15 to 55	max. 85	K20	18.5
			1 x 15.9	ELXs 124.905	**188666**	220–240	A2	–15 to 55	max. 85	K21	18.5

Circuit diagrams see pages 255–259

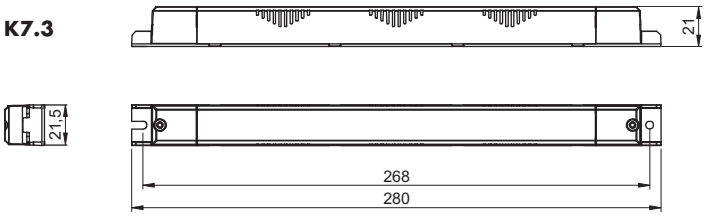
new

ELXc – Warm Start for T5 and T8 Lamps

Slim independent ectronic ballasts
With cord grip for leads:
H03VVH2-F 2 x 0.75 mm²
Preheating with adjustable lamp output
Casing: heat-resistant polyamide
DC voltage operation: 198–255 V
Push-in terminals: 0.5–1.5 mm²
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
Fixing slots for screws M4
Automatic restart after lamp has been changed
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved
acc. to EN 61347 Test 2



K7.3



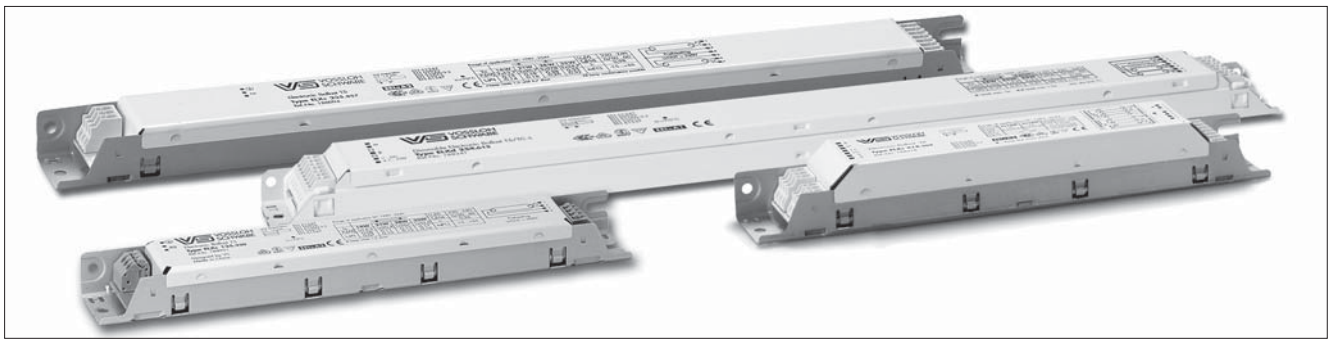
(●) **T5** ( ) **TC** ( ) **BUILT-IN** ( ) **1–10 V**
(●) **T8** (●) **INDEPENDENT** ( ) **DALI/PUSH**

	Lamp				Electronic ballast								System	
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10 %	Mains current mA	Energy efficiency	Power factor	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Output W	Luminous factor %
	For T5 lamps													
new	14	T5	G5	1 x 13.2	ELXc 135.225	**183103**	220-240	60-80	A2	> 0.90	-25 to 50	max. 90	16,3	101,0
new	21	T5	G5	2 x 20.7	ELXc 135.225	**183103**	220-240	80-100	A2	> 0.92	-25 to 50	max. 90	23,1	100,0
new	28	T5	G5	1 x 27.8	ELXc 135.225	**183103**	220-240	110-130	A2	> 0.95	-25 to 50	max. 90	30,1	100,0
new	35	T5	G5	2 x 34.7	ELXc 135.225	**183103**	220-240	150-180	A2	> 0.95	-25 to 50	max. 90	36,9	98,0
	For T8 lamps													
new	15	T8	G13	1 x 13.5	ELXc 136.226	**183104**	220-240	60-80	A2	> 0.93	-25 to 50	max. 90	15,8	105,0
new	18	T8	G13	1 x 16.0	ELXc 136.226	**183104**	220-240	80-100	A2	> 0.93	-25 to 50	max. 90	18,1	102,0
new	30	T8	G13	1 x 24.0	ELXc 136.226	**183104**	220-240	110-130	A2	> 0.95	-25 to 50	max. 90	33,8	105,0
new	36	T8	G13	1 x 32.0	ELXc 136.226	**183104**	220-240	150-180	A2	> 0.95	-25 to 50	max. 90	34.5	97,0

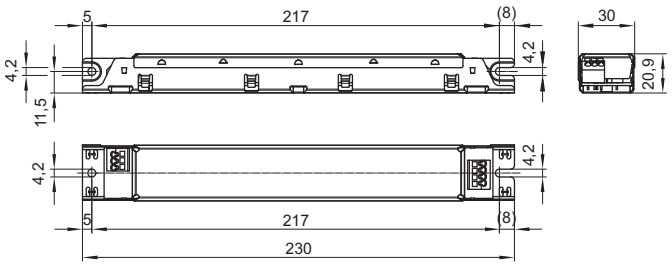
ELXc – Warm Start for T5 and T8 Lamps

Electronic built-in ballasts
Casing: metal
Power factor: ≥ 0.95
RFI-suppressed
For luminaires of protection class I

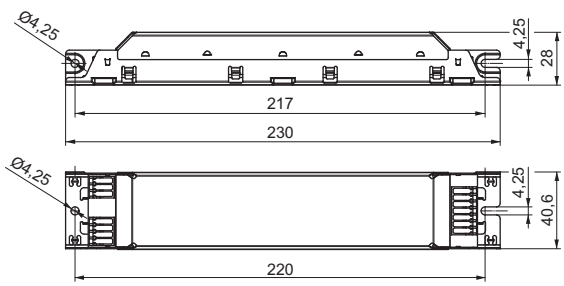
Degree of protection: IP20
For lighting systems with
high switching frequency (> 5/day)



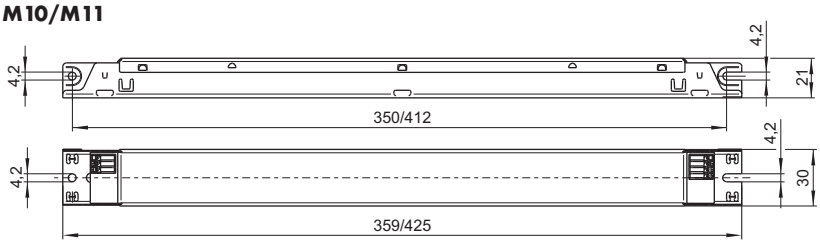
M6



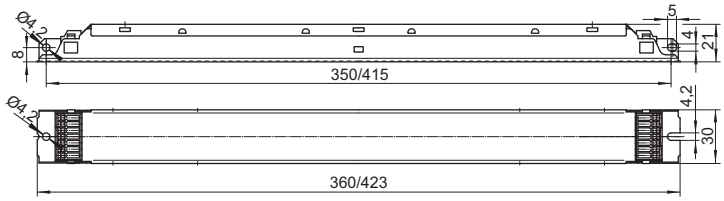
M8



M10/M11



M22/M24



ELXc – Warm start for T5 lamps with lamp detection

DC voltage
for operation: 176–276 V
for ignition: 198–264 V
Push-in terminals: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5

EOL shut down approved
acc. to EN 61347 Test 2
Automatic lamp detection (T5 HO/HE)
Optimum pre-heating of the filament ensures
lamps can be ignited within 1 second.

◉ **T5** ○ **T8** ○ **TC** ◉ **BUILT-IN** ○ **INDEPENDENT** ○ **1–10 V** ○ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
14	T5	G5	1 x 14.0	ELXc 139.632	**188945**	220–240	A2 BAT	–20 to 50	max. 75	M22	16.0	100.0
2x14	T5	G5	2 x 14.0	ELXc 239.635	**188948**	220–240	A2 BAT	–20 to 50	max. 75	M22	31.0	100.0
21	T5	G5	1 x 21.0	ELXc 139.632	**188945**	220–240	A2 BAT	–20 to 50	max. 75	M22	24.0	100.0
2x21	T5	G5	2 x 20.5	ELXc 239.635	**188948**	220–240	A2 BAT	–20 to 50	max. 75	M22	45.0	100.0
24	T5	G5	1 x 23.0	ELXc 139.632	**188945**	220–240	A2 BAT	–20 to 50	max. 75	M22	26.0	100.0
2x24	T5	G5	2 x 23.0	ELXc 239.635	**188948**	220–240	A2 BAT	–20 to 50	max. 75	M22	50.0	100.0
28	T5	G5	1 x 28.0	ELXc 154.633	**188946**	220–240	A2 BAT	–20 to 50	max. 75	M22	32.0	100.0
2x28	T5	G5	2 x 28.0	ELXc 254.636	**188949**	220–240	A2 BAT	–20 to 50	max. 75	M22	61.0	100.0
35	T5	G5	1 x 35.0	ELXc 154.633	**188946**	220–240	A2 BAT	–20 to 50	max. 75	M22	38.0	100.0
			1 x 35.0	ELXc 180.634	**188947**	220–240	A2 BAT	–20 to 50	max. 75	M22	38.0	100.0
2x35	T5	G5	2 x 35.0	ELXc 254.636	**188949**	220–240	A2 BAT	–20 to 50	max. 75	M22	76.0	100.0
			2 x 35.0	ELXc 280.637	**188950**	220–240	A2 BAT	–20 to 50	max. 75	M24	75.0	100.0
39	T5	G5	1 x 38.0	ELXc 139.632	**188945**	220–240	A2 BAT	–20 to 50	max. 75	M22	41.0	100.0
2x39	T5	G5	2 x 38.0	ELXc 239.635	**188948**	220–240	A2 BAT	–20 to 50	max. 75	M22	81.0	100.0
49	T5	G5	1 x 49.0	ELXc 154.633	**188946**	220–240	A2 BAT	–20 to 50	max. 75	M22	53.0	100.0
			1 x 49.0	ELXc 180.634	**188947**	220–240	A2 BAT	–20 to 50	max. 75	M22	53.0	100.0
2x49	T5	G5	2 x 49.0	ELXc 254.636	**188949**	220–240	A2 BAT	–20 to 50	max. 75	M22	105.0	100.0
			2 x 49.0	ELXc 280.637	**188950**	220–240	A2 BAT	–20 to 50	max. 75	M24	104.0	100.0
54	T5	G5	1 x 54.0	ELXc 154.633	**188946**	220–240	A2 BAT	–20 to 50	max. 75	M22	58.0	100.0
2x54	T5	G5	2 x 54.0	ELXc 254.636	**188949**	220–240	A2 BAT	–20 to 50	max. 75	M22	115.0	100.0
80	T5	G5	1 x 80.0	ELXc 180.634	**188947**	220–240	A2 BAT	–20 to 50	max. 75	M22	85.0	100.0
2x80	T5	G5	2 x 80.0	ELXc 280.637	**188950**	220–240	A2 BAT	–20 to 50	max. 75	M24	165.0	100.0

Circuit diagrams see pages 255–259

ELXc – Warm Start for T5 and T8 Lamps

DC voltage
for operation: 176–264 V
for ignition: 198–264 V
(ELXc 135.856, 235.857, 149.858, 154.864, 180.866, 270.206; 280.538:
DC voltage cannot be reduced to 176 V)
Push-in terminals: 0.5–1 mm²

For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
EOL shut down approved
acc. to EN 61347 Test 2 (for T5)
EOL shut down (for T8)

(●) **T5** (○) **TC** (●) **BUILT-IN** (○) **1–10 V**
(●) **T8** (○) **INDEPENDENT** (○) **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
For T5 lamps – Casing: M8, M10 and M11												
14	T5	G5	1 x 14.0	ELXc 135.856	**188093**	220–240	A2 BAT	-15 to 55	max. 70	M10	17.0	110.7
2x14	T5	G5	2 x 14.0	ELXc 235.857	**188094**	220–240	A2 BAT	-15 to 55	max. 70	M10	33.4	107.0
3x14	T5	G5	3 x 14.0	ELXc 414.868	**188438**	220–240	A2 BAT	-15 to 55	max. 70	M8	48.0	105.4
4x14	T5	G5	4 x 14.0	ELXc 414.868	**188438**	220–240	A2 BAT	-15 to 55	max. 70	M8	63.0	102.3
21	T5	G5	1 x 21.0	ELXc 135.856	**188093**	220–240	A2 BAT	-15 to 55	max. 70	M10	24.0	107.4
2x21	T5	G5	2 x 21.0	ELXc 235.857	**188094**	220–240	A2 BAT	-15 to 55	max. 70	M10	50.2	110.6
24	T5	G5	1 x 22.5	ELXc 140.862	**188140**	220–240	A2 BAT	-15 to 55	max. 70	M10	27.0	114.0
2x24	T5	G5	2 x 22.5	ELXc 240.863	**188616**	220–240	A2 BAT	-15 to 55	max. 70	M10	51.0	107.4
3x24	T5	G5	3 x 22.5	ELXc 424.223	**183039**	220–240	A2 BAT	-15 to 55	max. 75	M8	78.0	103.7
4x24	T5	G5	4 x 22.5	ELXc 424.223	**183039**	220–240	A2	-15 to 55	max. 75	M8	101.7	103.5
28	T5	G5	1 x 28.0	ELXc 135.856	**188093**	220–240	A2 BAT	-15 to 55	max. 70	M10	32.0	104.9
2x28	T5	G5	2 x 28.0	ELXc 235.857	**188094**	220–240	A2 BAT	-15 to 55	max. 70	M10	60.6	106.2
new 3x28	T5	G5	3 x 27.9	ELXc 328.224	**183094**	220–240	A2	-15 to 55	max. 70	M8	89.9	100.0
35	T5	G5	1 x 35.0	ELXc 135.856	**188093**	220–240	A2 BAT	-15 to 55	max. 70	M10	39.5	102.7
2x35	T5	G5	2 x 35.0	ELXc 235.857	**188094**	220–240	A2 BAT	-15 to 55	max. 70	M10	74.5	102.5
39	T5	G5	1 x 38.0	ELXc 140.862	**188140**	220–240	A2 BAT	-15 to 55	max. 70	M10	43.0	107.0
2x39	T5	G5	2 x 38.0	ELXc 240.863	**188616**	220–240	A2 BAT	-15 to 55	max. 70	M10	82.0	97.9
49	T5	G5	1 x 49.0	ELXc 149.858	**188095**	220–240	A2 BAT	-15 to 55	max. 70	M10	54.0	102.5
2x49	T5	G5	2 x 49.0	ELXc 249.859	**188617**	220–240	A2 BAT	-15 to 50	max. 70	M10	113.0	106.6
54	T5	G5	1 x 54.0	ELXc 154.864	**188142**	220–240	A2 BAT	-15 to 55	max. 65	M10	59.0	101.1
2x54	T5	G5	2 x 54.0	ELXc 254.865	**188618**	220–240	A2 BAT	-15 to 50	max. 70	M10	119.0	106.0
80	T5	G5	1 x 80.0	ELXc 180.866	**188144**	220–240	A2 BAT	-15 to 55	max. 70	M10	87.0	97.6
2x80	T5	G5	2 x 80.0	ELXc 280.538	**188619**	220–240	A2 BAT	-15 to 50	max. 70	M11	175.0	97.2
For T8 lamps – Casing: M8												
3x18	T8	G13	3 x 16.0	ELXc 418.204	**188744**	220–240	A2 BAT	-15 to 55	max. 70	M8	56.0	100.8
4x18	T8	G13	4 x 16.0	ELXc 418.204	**188744**	220–240	A2 BAT	-15 to 55	max. 70	M8	71.5	98.9
3x36	T8	G13	3 x 32.0	ELXc 336.214	**188595**	220–240	A2 BAT	-15 to 50	max. 65	M8	105.0	99.4

Circuit diagrams see pages 255–259

ELXc EffectLine – Warm start

Warm start for T5 and T8 lamps – Casing: M6, M8 and M10

DC voltage
for operation: 176–264 V
for ignition: 198–264 V
(not possible for T8)
Push-in terminals with lever opener: 0.5–1.5 mm²
EOL shut down approved
acc. to EN 61347 Test 2 (for T5)
EOL shut down (for T8)

◉ **T5** ◯ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◉ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
For T5 lamps – Casing: M6 and M10												
14	T5	G5	1 x 14.3	ELXc 135.220	**188921**	220–240	A2 BAT	-15 to 55	max. 70	M6	17.0	104.8
2x14	T5	G5	2 x 14.3	ELXc 235.221	**188922**	220–240	A2 BAT	-15 to 55	max. 70	M10	34.5	101.9
21	T5	G5	1 x 20.4	ELXc 135.220	**188921**	220–240	A2 BAT	-15 to 55	max. 70	M6	23.3	106.9
2x21	T5	G5	2 x 21.4	ELXc 235.221	**188922**	220–240	A2 BAT	-15 to 55	max. 70	M10	48.3	104.9
28	T5	G5	1 x 26.7	ELXc 135.220	**188921**	220–240	A2 BAT	-15 to 55	max. 70	M6	29.9	107.5
2x28	T5	G5	2 x 28.7	ELXc 235.221	**188922**	220–240	A2 BAT	-15 to 55	max. 70	M10	62.1	109.0
35	T5	G5	1 x 32.6	ELXc 135.220	**188921**	220–240	A2 BAT	-15 to 55	max. 70	M6	36.5	103.0
2x35	T5	G5	2 x 35.6	ELXc 235.221	**188922**	220–240	A2 BAT	-15 to 55	max. 70	M10	78.2	100.8
For T8 lamps – Casing: M8												
18	T8	G13	1 x 16.0	ELXc 136.207	**188704**	220–240	A2 BAT	-20 to 55	max. 60	M8	18.4	105.0
2x18	T8	G13	2 x 16.0	ELXc 236.208	**188705**	220–240	A2 BAT	-20 to 50	max. 60	M8	35.2	106.0
36	T8	G13	1 x 32.0	ELXc 136.207	**188704**	220–240	A2 BAT	-20 to 55	max. 60	M8	35.4	97.0
2x36	T8	G13	2 x 32.0	ELXc 236.208	**188705**	220–240	A2 BAT	-20 to 50	max. 60	M8	69.7	98.0
58	T8	G13	1 x 50.0	ELXc 158.209	**188706**	220–240	A2 BAT	-20 to 50	max. 60	M8	52.6	106.0
2x58	T8	G13	2 x 50.0	ELXc 258.210	**188707**	220–240	A2	-20 to 50	max. 65	M8	109.9	105.0

Circuit diagrams see pages 255–259

Warm start for T8 lamps – Casing: M8

For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
EOL shut down

◯ **T5** ◯ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◉ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	T8	G13	1 x 16.0	ELXc 136.207	**188708**	220–240	A2 BAT	-20 to 55	max. 60	M8	18.4	105.0
2x18	T8	G13	2 x 16.0	ELXc 236.208	**188709**	220–240	A2 BAT	-20 to 50	max. 60	M8	35.2	106.0
36	T8	G13	1 x 32.0	ELXc 136.207	**188708**	220–240	A2 BAT	-20 to 55	max. 60	M8	35.4	97.0
2x36	T8	G13	2 x 32.0	ELXc 236.208	**188709**	220–240	A2 BAT	-20 to 50	max. 60	M8	69.7	98.0
58	T8	G13	1 x 50.0	ELXc 158.209	**188710**	220–240	A2 BAT	-20 to 50	max. 60	M8	52.6	106.0
2x58	T8	G13	2 x 50.0	ELXc 258.210	**188711**	220–240	A2	-20 to 50	max. 65	M8	109.9	105.0

Circuit diagrams see pages 255–259

ELXc EffectLine II – Warm start

Warm start for T8 lamps – Casing: M8

DC voltage
for operation: 176–264 V
(DC voltage can be reduced to 176 V for 2 hours)
for ignition: 198–264 V
IDC terminals: 0.5–1 mm²
For the automatic luminaire wiring:
IDC/push-in terminals for leads H05V-U 0.5
EOL 2 shut down

◯ **T5** ◯ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◉ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	T8	G13	1 x 16.0	ELXc 136.216	**188868**	220–240	A2 BAT	–20 to 55	max. 65	M8	19.8	105.7
2x18	T8	G13	2 x 16.0	ELXc 236.217	**188869**	220–240	A2 BAT	–20 to 60	max. 70	M8	38.0	101.6
36	T8	G13	1 x 32.0	ELXc 136.216	**188868**	220–240	A2 BAT	–20 to 55	max. 65	M8	34.4	97.5
2x36	T8	G13	2 x 32.0	ELXc 236.217	**188869**	220–240	A2 BAT	–20 to 60	max. 70	M8	71.9	110.6
58	T8	G13	1 x 50.0	ELXc 158.218	**188870**	220–240	A2 BAT	–20 to 60	max. 65	M8	56.0	100.8
2x58	T8	G13	2 x 50.0	ELXc 258.219	**188871**	220–240	A2	–20 to 55	max. 70	M8	110.0	101.0

Circuit diagrams see pages 255–259

Warm start for T8 lamps – Casing: M8

DC voltage
for operation: 176–264 V
(DC voltage can be reduced to 176 V for 2 hours)
for ignition: 198–264 V
Push-in terminals with lever opener: 0.5–1.5 mm²
EOL 2 shut down

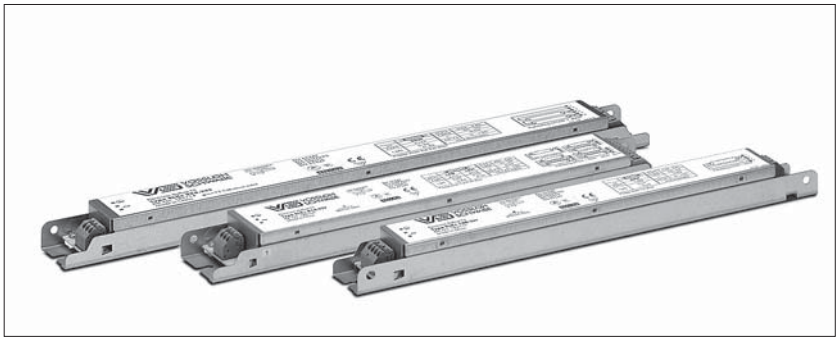
◯ **T5** ◯ **TC** ◉ **BUILT-IN** ◯ **1–10 V**
◉ **T8** ◯ **INDEPENDENT** ◯ **DALI/PUSH**

Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
18	T8	G13	1 x 16.0	ELXc 136.216	**188912**	220–240	A2 BAT	–20 to 55	max. 65	M8	19.8	105.7
2x18	T8	G13	2 x 16.0	ELXc 136.217	**188913**	220–240	A2 BAT	–20 to 60	max. 60	M8	38.0	101.6
36	T8	G13	1 x 32.0	ELXc 136.216	**188912**	220–240	A2 BAT	–20 to 55	max. 65	M8	34.4	97.5
2x36	T8	G13	2 x 32.0	ELXc 236.217	**188913**	220–240	A2 BAT	–20 to 60	max. 70	M8	71.9	110.6
58	T8	G13	1 x 50.0	ELXc 158.218	**188914**	220–240	A2 BAT	–20 to 60	max. 65	M8	56.0	100.8
2x58	T8	G13	2 x 50.0	ELXc 258.219	**188915**	220–240	A2	–20 to 50	max. 70	M8	110.0	101.0

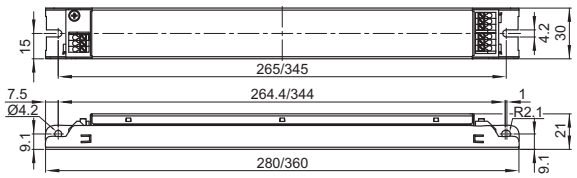
Circuit diagrams see pages 255–259

ELXc – Warm Start
New T5 EffectLine

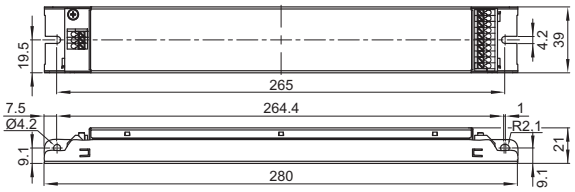
Electronic built-in ballasts
Casing: metal
DC voltage
for operation: 176–264 V
for ignition: 198–264 V
Push-in terminals with lever opener: 0.5–1 mm²
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
For lighting systems with
high switching frequency (> 5/day)
Automatic restart after lamp has been changed
Suitable for use in luminaires for emergency
lighting systems acc. to VDE 0108
EOL shut down approved acc. to EN 61347 Test 1



M7.1 / M10.2



M7.2



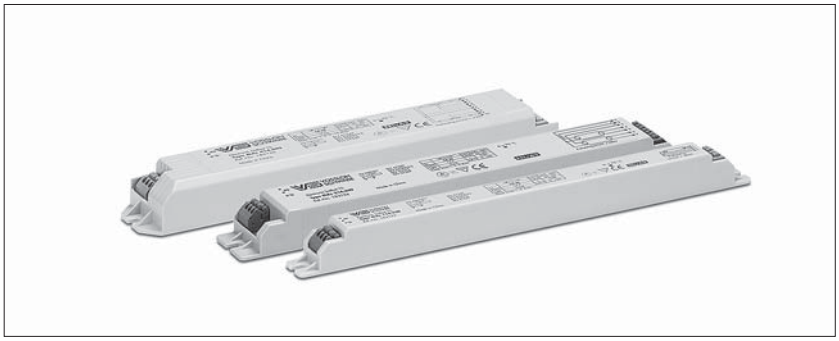
● **T5** ○ **TC** ● **BUILT-IN** ○ **1–10 V**
○ **T8** ○ **INDEPENDENT** ○ **DALI/PUSH**

	Lamp				Electronic ballast										System	
	Output	Type	Base	Power consumption	Type	**Ref. No.**	Voltage AC 50, 60 Hz	Energy efficiency	Power factor	Ambient temperature	Casing temperature	Casing	L	W	Output	Luminous factor
	W			W			V±10 %			t_a (°C)	t_c (°C)		mm	mm	W	%
new	14	T5 HE	G5	1 x 14.0	ELXc 228.229	**183111**	220-240	EEI=A2	> 0.90	0 to 50	max. 75	M7.1	280	30	16,5	100
new					ELXc 135.231	**183113**	220-240	EEI=A2	> 0.90	0 to 50	max. 75	M7.1	280	30	16,5	100
new	2x14	T5 HE	G5	2 x 14.0	ELXc 228.229	**183111**	220-240	EEI=A2	> 0.92	0 to 50	max. 75	M7.1	280	30	31,0	100
new	3x14	T5 HE	G5	3 x 14.0	ELXc 414.227	**183109**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.2	280	39	48,0	100
new	4x14	T5 HE	G5	4 x 14.0	ELXc 414.227	**183109**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.2	280	39	63,0	100
new	21	T5 HE	G5	1 x 21.0	ELXc 228.229	**183111**	220-240	EEI=A2	> 0.90	0 to 50	max. 75	M7.1	280	30	24,0	100
new					ELXc 135.231	**183113**	220-240	EEI=A2	> 0.92	0 to 50	max. 75	M7.1	280	30	24,0	100
new	2x21	T5 HE	G5	2 x 21.0	ELXc 228.229	**183111**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	47,5	100
new	24	T5 HO	G5	1 x 24.0	ELXc 239.233	**183115**	220-240	EEI=A2	> 0.90	0 to 50	max. 75	M7.1	280	30	28,0	100
new	2x24	T5 HO	G5	2 x 24.0	ELXc 239.233	**183115**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	53,5	100
new	3x24	T5 HO	G5	3 x 24.0	ELXc 424.228	**183110**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.2	280	39	76,0	100
new	4x24	T5 HO	G5	4 x 24.0	ELXc 424.228	**183110**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.2	280	39	100,0	100
new	28	T5 HE	G5	1 x 28.0	ELXc 228.229	**183111**	220-240	EEI=A2	> 0.92	0 to 50	max. 75	M7.1	280	30	31,0	100
new					ELXc 135.231	**183113**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	32,0	100
new	2x28	T5 HE	G5	2 x 28.0	ELXc 228.229	**183111**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	61,0	100
new					ELXc 328.230	**183112**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.2	280	39	61,0	100
new	3x28	T5 HE	G5	3 x 28.0	ELXc 328.230	**183112**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.2	280	39	94,0	100
new	35	T5 HE	G5	1 x 35.0	ELXc 135.231	**183113**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	38,0	100
new	2x35	T5 HE	G5	2 x 35.0	ELXc 235.232	**183114**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M10.2	360	30	74,0	100
new	39	T5 HO	G5	1 x 39.0	ELXc 239.233	**183115**	220-240	EEI=A2	> 0.92	0 to 50	max. 75	M7.1	280	30	43,5	100
new	2x39	T5 HO	G5	2 x 39.0	ELXc 239.233	**183115**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	83,0	100
new	49	T5 HO	G5	1 x 49.0	ELXc 149.234	**183116**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	51,0	100
new	2x49	T5 HO	G5	2 x 49.0	ELXc 249.235	**183117**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M10.2	360	30	108,0	100
new	54	T5 HO	G5	1 x 54.0	ELXc 254.236	**183118**	220-240	EEI=A2	> 0.92	0 to 50	max. 75	M7.1	280	30	58,0	100
new	2x54	T5 HO	G5	2 x 54.0	ELXc 254.236	**183118**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	113,0	100
new	80	T5 HO	G5	1 x 80.0	ELXc 180.237	**183119**	220-240	EEI=A2	> 0.95	0 to 50	max. 75	M7.1	280	30	86,0	100

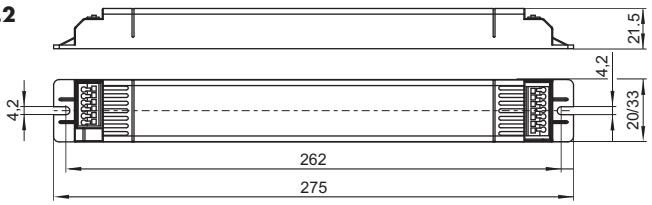
Preliminary data

ELXc – ECO EffectLine Warm Start for T5 and T8 Lamps

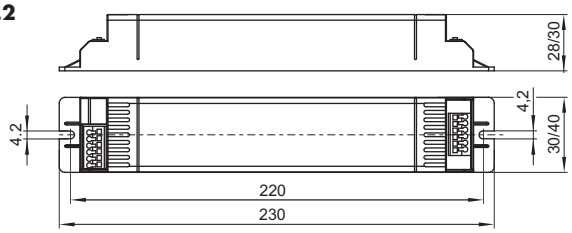
Electronic built-in ballasts
Casing: PC, white
DC voltage: 198–264 V
Push-in terminals with lever opener: 0.5–1.5 mm²
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
For lighting systems with
high switching frequency (> 5/day)
EOL shut down approved acc. to EN 61347 Test 1
(for T5 lamps); EOL shut down (for T8 lamps)



K7.1 / K7.2



K5.1 / K5.2



T5 **T8** **TC** **BUILT-IN** **INDEPENDENT** **1–10 V** **DALI/PUSH**

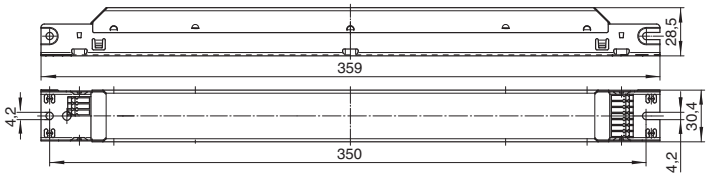
	Lamp				Electronic ballast										System	
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10 %	Energy efficiency	Power factor	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	W mm	H mm	Output W	Luminous factor %
	For T5 lamps															
new	14	T5 HE	G5	1 x 14.8	ELXc 114.238	**183122**	220–240	A2	> 0.95	0 to 50	max. 75	K7.1	20	21.5	17.0	100
new	2x14	T5 HE	G5	2 x 14.5	ELXc 214.240	**183124**	220–240	A2	> 0.95	0 to 50	max. 75	K7.2	33	21.5	33.0	100
new	4x14	T5 HE	G5	4 x 14.0	ELXc 414.242	**183126**	220–240	A2	> 0.95	0 to 50	max. 75	K5.2	40	30	64.0	100
new	28	T5 HE	G5	1 x 28.5	ELXc 128.239	**183123**	220–240	A2	> 0.95	0 to 50	max. 75	K7.1	20	21.5	31.5	100
new	2x28	T5 HE	G5	2 x 26.5	ELXc 228.241	**183125**	220–240	A2	> 0.95	0 to 50	max. 75	K7.2	33	21.5	59.0	95
	For T8 lamps															
new	18	T8	G13	1 x 15.5	ELXc 118.243	**183127**	220–240	A2	> 0.95	-15 to 50	max. 70	K5.1	30	28	18.5	98
new	2x18	T8	G13	2 x 15.5	ELXc 218.246	**183130**	220–240	A2	> 0.96	-15 to 50	max. 70	K5.1	30	28	35.0	98
new	4x18	T8	G13	4 x 15.5	ELXc 418.249	**183133**	220–240	A2	> 0.98	-15 to 50	max. 70	K5.2	40	30	69.0	97
new	36	T8	G13	1 x 30.5	ELXc 136.244	**183128**	220–240	A2	> 0.96	-15 to 50	max. 70	K5.1	30	28	34.0	95
new	2x36	T8	G13	2 x 31.0	ELXc 236.247	**183131**	220–240	A2	> 0.98	-15 to 50	max. 70	K5.2	40	30	68.0	97
new	58	T8	G13	1 x 48.0	ELXc 158.245	**183129**	220–240	A2	> 0.96	-15 to 50	max. 70	K5.1	30	28	53.5	96
new	2x58	T8	G13	2 x 49.5	ELXc 258.248	**183132**	220–240	A2	> 0.98	-15 to 50	max. 80	K5.2	40	30	107.0	100

Preliminary data

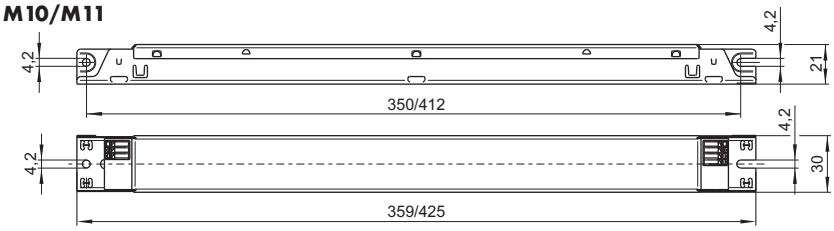
ELXd – Dimmable for T5 and T8 Lamps

Electronic built-in ballasts
Casing: metal
Power factor: ≥ 0.95 at 100% operation
DC voltage
for operation: 154–276 V (M22, M23, M24)
for operation: 176–264 V (M9)
for ignition: 198–264 V
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
RFI-suppressed
For luminaires of protection class I
Degree of protection: IP20
For lighting systems with
high switching frequency (> 5/day)
Suitable for use in luminaires for emergency lighting systems acc. to VDE 0108

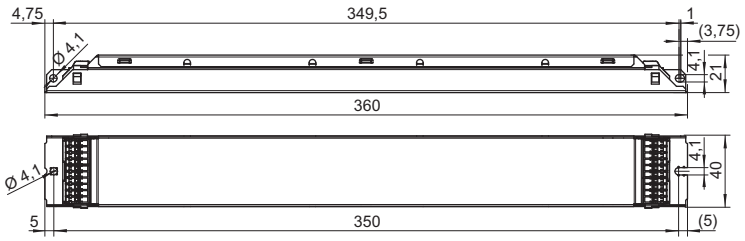
M9



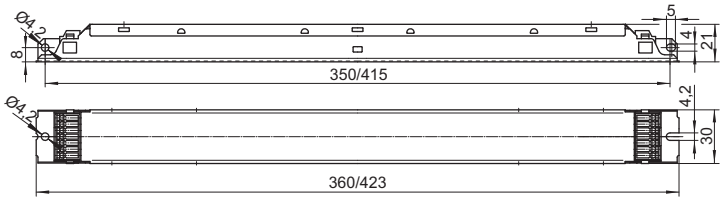
M10/M11



M23



M22/M24



ELXd – Dimmable 1–10 V with lamp detection

Dimming range:
approx. 1–100% of lamp power
(*3-100 %: ELXd 135.823, 235.735, 118.718, 218.719, 136.720, 236.721, 158.722, 258.723)
Control voltage: DC 1-10 V acc. to EN 60929
with earth leakage current 0.5 mA
(protected if connected to mains voltage)

For use with open- or closed-loop control units
Push-in terminals: 0.5-1 mm²
EOL shut down approved
acc. to EN 61347 Test 2 (for T5)
EOL 2 shut down (for T8)

(●) **T5** ( ) **TC** (●) **BUILT-IN** (●) **1–10 V**
(●) **T8** ( ) **INDEPENDENT** ( ) **DALI/PUSH**

	Lamp				Electronic ballast							System	
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
	T5 lamps - Casing: M10, M22, M23 and M24												
	14	T5	G5	1 x 14.0	ELXd 135.823	**188717***	220-240	A1 BAT	10 to 55	max. 65	M10	17.0	99.5
					ELXd 124.607	**188336**	220-240	A1 BAT	10 to 50	max. 75	M22	16.0	100.0
new	2x14	T5	G5	2 x 13.6	ELXd 235.735	**183059***	220-240	A1 BAT	10 to 50	max. 70	M11	33.4	98.7
				2 x 14.0	ELXd 224.608	**188337**	220-240	A1 BAT	10 to 50	max. 75	M24	31.0	100.0
	3x14	T5	G5	3 x 14.0	ELXd 324.623	**188597**	220-240	A1 BAT	10 to 50	max. 75	M23	45.3	100.0
	4x14	T5	G5	4 x 14.0	ELXd 424.624	**188598**	220-240	A1 BAT	10 to 50	max. 75	M23	60.4	100.0
	21	T5	G5	1 x 21.0	ELXd 135.823	**188717***	220-240	A1 BAT	10 to 55	max. 65	M10	24.0	99.0
					ELXd 139.609	**188338**	220-240	A1 BAT	10 to 50	max. 75	M22	23.0	100.0
new	2x21	T5	G5	2 x 20.5	ELXd 235.735	**183059***	220-240	A1 BAT	10 to 50	max. 70	M11	47.0	95.1
				2 x 21.0	ELXd 239.610	**188339**	220-240	A1 BAT	10 to 50	max. 75	M24	45.0	100.0
	24	T5	G5	1 x 23.0	ELXd 124.607	**188336**	220-240	A1 BAT	10 to 50	max. 75	M22	26.0	100.0
	2x24	T5	G5	2 x 23.0	ELXd 224.608	**188337**	220-240	A1 BAT	10 to 50	max. 75	M24	50.0	100.0
	3x24	T5	G5	3 x 23.0	ELXd 324.623	**188597**	220-240	A1 BAT	10 to 50	max. 75	M23	73.4	100.0
	4x24	T5	G5	4 x 23.0	ELXd 424.624	**188598**	220-240	A1 BAT	10 to 50	max. 75	M23	97.6	100.0
	28	T5	G5	1 x 28.0	ELXd 135.823	**188717***	220-240	A1 BAT	10 to 55	max. 65	M10	32.0	98.6
					ELXd 154.611	**188340**	220-240	A1 BAT	10 to 50	max. 75	M22	31.0	100.0
new	2x28	T5	G5	2 x 27.3	ELXd 235.735	**183059***	220-240	A1 BAT	10 to 50	max. 70	M11	62.1	97.6
				2 x 28.0	ELXd 254.612	**188341**	220-240	A1 BAT	10 to 50	max. 75	M24	61.0	100.0
	35	T5	G5	1 x 35.0	ELXd 135.823	**188717***	220-240	A1 BAT	10 to 55	max. 65	M10	38.0	95.0
					ELXd 180.613	**188342**	220-240	A1 BAT	10 to 50	max. 75	M22	38.0	100.0
new	2x35	T5	G5	2 x 33.9	ELXd 235.735	**183059***	220-240	A1 BAT	10 to 50	max. 70	M11	76.9	96.7
				2 x 35.0	ELXd 249.614	**188343**	220-240	A1 BAT	10 to 50	max. 75	M24	75.0	100.0
					ELXd 280.630	**188604**	220-240	A1 BAT	10 to 50	max. 75	M24	75.0	100.0
	39	T5	G5	1 x 38.0	ELXd 139.609	**188338**	220-240	A1 BAT	10 to 50	max. 75	M22	42.0	100.0
	2x39	T5	G5	2 x 38.0	ELXd 239.610	**188339**	220-240	A1 BAT	10 to 50	max. 75	M24	82.0	100.0
	49	T5	G5	1 x 49.0	ELXd 180.613	**188342**	220-240	A1 BAT	10 to 50	max. 75	M22	54.0	100.0
	2x49	T5	G5	2 x 49.0	ELXd 249.614	**188343**	220-240	A1 BAT	10 to 50	max. 75	M24	104.0	100.0
					ELXd 280.630	**188604**	220-240	A1 BAT	10 to 50	max. 75	M24	104.0	100.0
	54	T5	G5	1 x 54.0	ELXd 154.611	**188340**	220-240	A1 BAT	10 to 50	max. 75	M22	59.0	100.0
	2x54	T5	G5	2 x 54.0	ELXd 254.612	**188341**	220-240	A1 BAT	10 to 50	max. 75	M24	115.0	100.0
	80	T5	G5	1 x 80.0	ELXd 180.613	**188342**	220-240	A1 BAT	10 to 50	max. 75	M22	88.0	100.0
	2x80	T5	G5	2 x 80.0	ELXd 280.630	**188604**	220-240	A1 BAT	10 to 50	max. 75	M24	165.0	100.0
	T8 lamps - Casing: M9 and M23												
	18	T8	G13	1 x 16.0	ELXd 118.718	**188873***	220-240	EEI=A1	10 to 50	max. 70	M9	21.0	102.1
	2x18	T8	G13	2 x 16.0	ELXd 218.719	**188874***	220-240	EEI=A1	10 to 50	max. 70	M9	41.5	104.6
	3x18	T8	G13	3 x 16.0	ELXd 318.622	**188596**	220-240	A1 BAT	-20 to 50	max. 75	M23	53.6	100.0
	4x18	T8	G13	4 x 16.0	ELXd 418.625	**188599**	220-240	A1 BAT	-20 to 50	max. 75	M23	69.3	100.0
	36	T8	G13	1 x 32.0	ELXd 136.720	**188875***	220-240	A1 BAT	10 to 50	max. 70	M9	37.3	101.6
	2x36	T8	G13	2 x 32.0	ELXd 236.721	**188876***	220-240	EEI=A1	10 to 50	max. 70	M9	72.0	98.9
	58	T8	G13	1 x 50.0	ELXd 158.722	**188877***	220-240	A1 BAT	10 to 50	max. 70	M9	55.0	101.3
	2x58	T8	G13	2 x 50.0	ELXd 258.723	**188878***	220-240	EEI=A1	10 to 50	max. 75	M9	109.0	96.5

Circuit diagrams see pages 255-259

ELXd – Dimmable with push key or DALI with lamp detection

Dimming range:
approx. 1–100% of lamp power
PUSH: dimmable with usual push key
DALI: poles are not polarity sensitive (protected if connected to mains voltage) for use with DALI compatible control units
Push-in terminals: 0.5–1 mm²
EOL shut down approved
acc. to EN 61347 Test 2 (for T5)
EOL 2 shut down (for T8)
standby power consumption: ≤ 0.2 W

Complete implementation of the DALI-standard: addressable, memory store for scenes and groups, revertive information communication, physical and RND-selection, standardized lamp characteristic
Low-power design ensures very low standby power consumption
Compatible with IEC 62386

(●) **T5** ( ) **TC** (●) **BUILT-IN** ( ) **1–10 V**
( ) **T8** ( ) **INDEPENDENT** (●) **DALI/PUSH**

	Lamp				Electronic ballast							System	
	Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
	For T5 lamps – Casing: M10, M11, M22, M23 and M24												
new	14	T5	G5	1 x 13.7	ELXd 135.724	**188932**	220-240	A1 BAT	10 to 50	max. 65	M10	16.4	102.6
				1 x 14.0	ELXd 124.600	**188329**	220-240	A1 BAT	10 to 50	max. 75	M22	16.0	100.0
new	2x14	T5	G5	2 x 13.6	ELXd 235.725	**188933**	220-240	A1 BAT	10 to 50	max. 70	M11	33.4	96.7
				2 x 14.0	ELXd 224.601	**188330**	220-240	A1 BAT	10 to 50	max. 75	M24	31.0	100.0
	3x14	T5	G5	3 x 14.0	ELXd 324.626	**188600**	220-240	A1 BAT	10 to 50	max. 75	M23	45.3	100.0
	4x14	T5	G5	4 x 14.0	ELXd 424.628	**188602**	220-240	A1 BAT	10 to 50	max. 75	M23	60.4	100.0
new	21	T5	G5	1 x 20.7	ELXd 135.724	**188932**	220-240	A1 BAT	10 to 50	max. 65	M10	24.3	102.7
				1 x 21.0	ELXd 139.602	**188331**	220-240	A1 BAT	10 to 50	max. 75	M22	23.0	100.0
new	2x21	T5	G5	2 x 20.5	ELXd 235.725	**188933**	220-240	A1 BAT	10 to 50	max. 70	M11	47.0	97.6
				2 x 21.0	ELXd 239.621	**188350**	220-240	A1 BAT	10 to 50	max. 75	M24	45.0	100.0
	24	T5	G5	1 x 23.0	ELXd 124.600	**188329**	220-240	A1 BAT	10 to 50	max. 75	M22	26.0	100.0
	2x24	T5	G5	2 x 23.0	ELXd 224.601	**188330**	220-240	A1 BAT	10 to 50	max. 75	M24	50.0	100.0
	3x24	T5	G5	3 x 23.0	ELXd 324.626	**188600**	220-240	A1 BAT	10 to 50	max. 75	M23	73.4	100.0
	4x24	T5	G5	4 x 23.0	ELXd 424.628	**188602**	220-240	A1 BAT	10 to 50	max. 75	M23	97.6	100.0
new	28	T5	G5	1 x 27.8	ELXd 135.724	**188932**	220-240	A1 BAT	10 to 50	max. 65	M10	32.0	104.1
				1 x 28.0	ELXd 154.603	**188332**	220-240	A1 BAT	10 to 50	max. 75	M22	31.0	100.0
new	2x28	T5	G5	2 x 27.3	ELXd 235.725	**188933**	220-240	A1 BAT	10 to 50	max. 70	M11	62.1	95.1
				2 x 28.0	ELXd 254.604	**188333**	220-240	A1 BAT	10 to 50	max. 75	M24	61.0	100.0
new	35	T5	G5	1 x 34.7	ELXd 135.724	**188932**	220-240	A1 BAT	10 to 50	max. 65	M10	40.0	107.5
				1 x 35.0	ELXd 180.605	**188334**	220-240	A1 BAT	10 to 50	max. 75	M22	38.0	100.0
new	2x35	T5	G5	2 x 33.9	ELXd 235.725	**188933**	220-240	A1 BAT	10 to 50	max. 70	M11	76.9	98.7
new				2 x 35.0	ELXd 280.631	**188605**	220-240	A1 BAT	10 to 50	max. 75	M24	74,0	100,0
					ELXd 249.606	**188335**	220-240	A1 BAT	10 to 50	max. 75	M24	75.0	100.0
	39	T5	G5	1 x 38.0	ELXd 139.602	**188331**	220-240	A1 BAT	10 to 50	max. 75	M22	42.0	100.0
	2x39	T5	G5	2 x 38.0	ELXd 239.621	**188350**	220-240	A1 BAT	10 to 50	max. 75	M24	82.0	100.0
	49	T5	G5	1 x 49.0	ELXd 180.605	**188334**	220-240	A1 BAT	10 to 50	max. 75	M22	54.0	100.0
new	2x49	T5	G5	2 x 49.0	ELXd 280.631	**188605**	220-240	A1 BAT	10 to 50	max. 75	M24	101,0	100,0
					ELXd 249.606	**188335**	220-240	A1 BAT	10 to 50	max. 75	M24	104.0	100.0
	54	T5	G5	1 x 54.0	ELXd 154.603	**188332**	220-240	A1 BAT	10 to 50	max. 75	M22	59.0	100.0
	2x54	T5	G5	2 x 54.0	ELXd 254.604	**188333**	220-240	A1 BAT	10 to 50	max. 75	M24	115.0	100.0
	80	T5	G5	1 x 80.0	ELXd 180.605	**188334**	220-240	A1 BAT	10 to 50	max. 75	M22	88.0	100.0
	2x80	T5	G5	2 x 80.0	ELXd 280.631	**188605**	220-240	A1 BAT	10 to 50	max. 75	M24	165.0	100.0

Circuit diagrams see pages 255–259

ELXd – Dimmable with push key or DALI with lamp detection

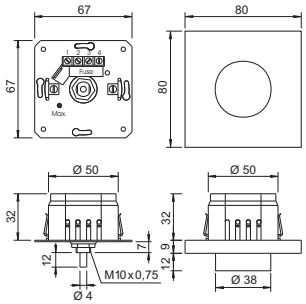
◯ T5 ◯ TC ◉ BUILT-IN ◯ 1–10 V
◉ T8 ◯ INDEPENDENT ◉ DALI/PUSH

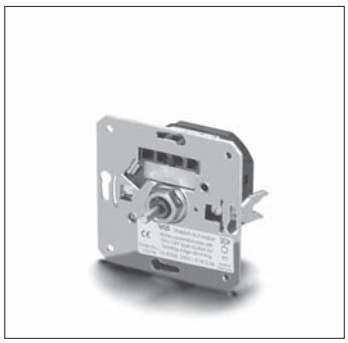
Lamp				Electronic ballast							System	
Output W	Type	Base	Power consumption W	Type	**Ref. No.**	Voltage AC 50, 60 Hz V±10%	Energy efficiency	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Casing	Output W	Luminous factor %
For T8 lamps – Casing: M22, M23 and M24												
18	T8	G13	1 x 16.0	ELXd 118.615	**188344**	220-240	A1 BAT	-20 to 50	max. 75	M22	19.0	100.0
2x18	T8	G13	2 x 16.0	ELXd 218.616	**188345**	220-240	A1 BAT	-20 to 50	max. 75	M24	37.0	100.0
3x18	T8	G13	3 x 16.0	ELXd 318.627	**188601**	220-240	A1 BAT	-20 to 50	max. 75	M23	53.6	100.0
4x18	T8	G13	4 x 16.0	ELXd 418.629	**188603**	220-240	A1 BAT	-20 to 50	max. 75	M23	69.3	100.0
36	T8	G13	1 x 32.0	ELXd 136.617	**188346**	220-240	A1 BAT	-20 to 50	max. 75	M22	36.0	100.0
2x36	T8	G13	2 x 32.0	ELXd 236.618	**188347**	220-240	A1 BAT	-20 to 50	max. 75	M24	69.0	100.0
58	T8	G13	1 x 50.0	ELXd 158.619	**188348**	220-240	A1 BAT	-20 to 50	max. 75	M22	56.0	100.0
2x58	T8	G13	2 x 50.0	ELXd 258.620	**188349**	220-240	A1 BAT	-20 to 50	max. 75	M24	108.0	100.0

Circuit diagrams see pages 255-259

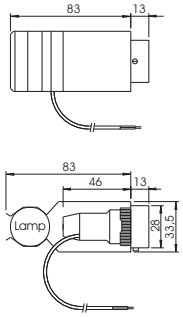
Accessories for Dimmable Electronic Ballasts

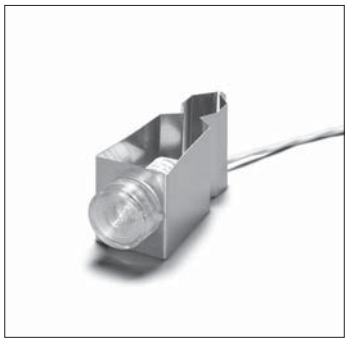
Manual controller
Dimmer for EB with low-voltage interface 1–10 V
Dimensions: 67x67x51 mm
Push-button change-over switch with stud 4 mm
for installation in flushtype boxes with Ø 55 mm
Max. 50 EBs per dimmer
Weight: 60/30 g, unit: 25 pcs.
Without cover plate
Ref. No.: 172778
Cover plate with rotary knob
Dimensions: 80x80x9 mm
Ref. No.: 172775 white



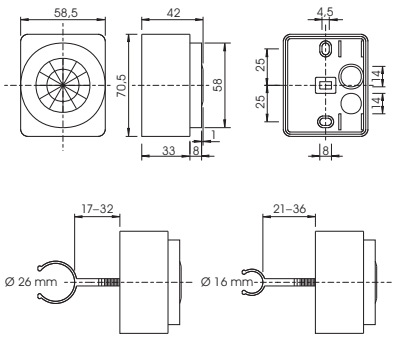


Light sensor
Constant light control with clamp
fastening for fluorescent lamps T8 (T26)
and compact fluorescent lamps
Dimensions: 33.5x40x96 mm
With connection lead: 2x0.24 mm²
Length: 800 mm
Max. 50 EBs per light sensor
Weight: 55 g, unit: 60 pcs.
Ref. No.: 172776

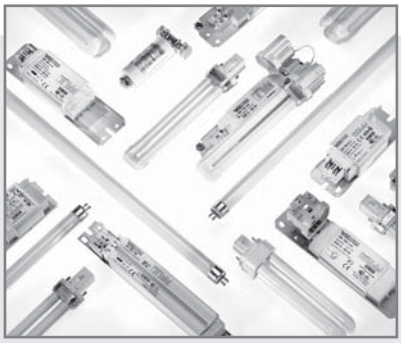




Multi sensor
Dimensions: 58.5x70.5x42 mm
With the sensor the lighting can be kept
on a pre-defined level
With integrated motion detector
Max. 50 EBs per multi sensor
Weight: 125 g, unit: 25 pcs.
Ref. No.: 172777



RELIABLE AND DURABLE



ELECTROMAGNETIC BALLASTS

The following chapter presents Vossloh-Schwabe's broad range of electromagnetic ballasts for compact fluorescent lamps and tubular fluorescent lamps. The variety of available performance properties and shapes satisfies the most diverse design requirements.

Vossloh-Schwabe's electromagnetic ballasts are characterized by extremely tight impedance-value tolerances, which are achieved by individual adjustment of the air gap during the automated production and testing process of the ballasts. This optimises both light output as well as the service life of fluorescent lamps.

3 Electromagnetic Ballasts for TC and T Lamps

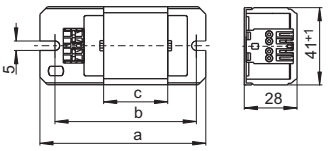
Electromagnetic ballasts for compact fluorescent lamps **168–172**
Standard ballasts 168-171
Ballasts 120 V, 60 Hz 172

Electromagnetic ballasts for tubular fluorescent lamps **173–176**
Standard ballasts 173-175
Ballasts 120 V, 60 Hz 176

Technical details for fluorescent lamps **243–271**
General technical details 394-401
Glossary 402-404

Standard Ballasts
5–16 W, 230/240/220 V

For compact fluorescent lamps
Shape: 28 x 41 mm



Vacuum-impregnated with polyester resin
Push-in terminal for leads: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
tw 130
Protection class I

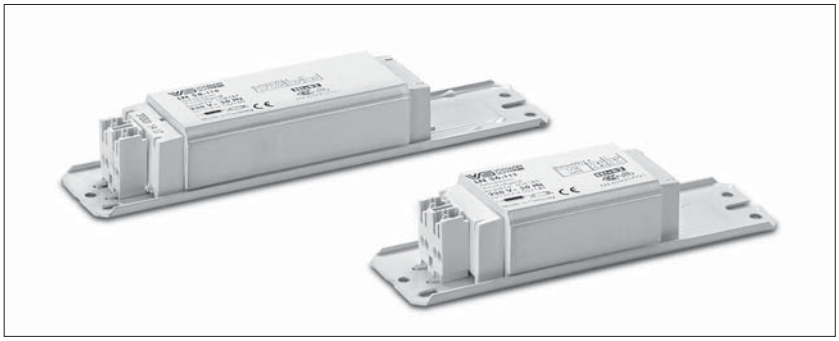
Lamp				Ballast									Capacitor	
Output W	Type	Base	Current mA	Type	**Ref. No.**	Voltage V, Hz	a mm	b mm	c mm	Weight kg	$\Delta t/\Delta t_{an.}$ K	Energy efficiency*	C_P µF	Current mA
230 V, 50 Hz														
5	TC-S	G23	180	L 7/9/11.307	**163694**	230, 50	85	75	34	0.32	60/85	B2	2.0	50
2x5	TC-S	G23	180	LN 13.805	**169647**	230, 50	85	75	34	0.32	50/85	B1	2.0	70
				LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B2	2.0	70
7	TC-S	G23	175	L 7/9/11.307	**163694**	230, 50	85	75	34	0.32	60/85	B2	2.0	50
2x7	TC-S	G23	160	LN 13.805	**169647**	230, 50	85	75	34	0.32	50/85	B1	2.0	70
				LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B2	2.0	70
9	TC-S	G23	170	L 7/9/11.307	**163694**	230, 50	85	75	34	0.32	60/85	B1	2.0	60
2x9	TC-S	G23	140	LN 13.805	**169647**	230, 50	85	75	34	0.32	50/85	B1	2.0	70
				LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B2	2.0	80
10	TC-D	G24d-1	190	LN 13.805	**169647**	230, 50	85	75	34	0.32	50/85	B1	2.0	70
				LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B2	2.0	70
	TC-DD	GR10q	180	LN 13.805	**169647**	230, 50	85	75	34	0.32	50/85	B1	2.0	70
				LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B2	2.0	70
11	TC-S	G23	155	L 7/9/11.307	**163694**	230, 50	85	75	34	0.32	60/85	B1	2.0	80
13	TC-D/TC-T	G24d-1/GX24d-1	175	LN 13.805	**169647**	230, 50	85	75	34	0.32	50/85	B1	2.0	80
				LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B2	2.0	80
16	TC-DD	GR8/GR10q	195	LN 16.316	**163730**	230, 50	85	75	34	0.32	60/125	B1	2.0	100
240 V, 50 Hz														
5	TC-S	G23	180	L 7/9/11.411	**164335**	240, 50	85	75	34	0.32	60/85	B2	2.0	50
2x5	TC-S	G23	180	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B2	2.0	70
7	TC-S	G23	175	L 7/9/11.411	**164335**	240, 50	85	75	34	0.32	60/85	B2	2.0	50
2x7	TC-S	G23	160	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B2	2.0	70
9	TC-S	G23	170	L 7/9/11.411	**164335**	240, 50	85	75	34	0.32	60/85	B1	2.0	60
2x9	TC-S	G23	140	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B2	2.0	80
10	TC-D	G24d-1	190	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B2	2.0	70
	TC-DD	GR10q	180	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B2	2.0	70
11	TC-S	G23	155	L 7/9/11.411	**164335**	240, 50	85	75	34	0.32	60/85	B1	2.0	80
13	TC-D/TC-T	G24d-1/GX24d-1	175	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B1	2.0	80
16	TC-DD	GR8/GR10q	195	LN 16.417	**164358**	240, 50	85	75	34	0.32	60/130	B1	2.0	100
220 V, 60 Hz														
5	TC-S	G23	180	L 7/9/11.207	**163305**	220, 60	85	75	34	0.32	35/65	–	2.0	70
2x5	TC-S	G23	180	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	90
7	TC-S	G23	175	L 7/9/11.207	**163305**	220, 60	85	75	34	0.32	35/65	–	2.0	70
2x7	TC-S	G23	160	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	90
9	TC-S	G23	170	L 7/9/11.207	**163305**	220, 60	85	75	34	0.32	35/65	–	2.0	70
2x9	TC-S	G23	140	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	90
10	TC-D	G24d-1	190	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	80
	TC-DD	GR10q	180	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	80
11	TC-S	G23	155	L 7/9/11.207	**163305**	220, 60	85	75	34	0.32	35/65	–	2.0	80
13	TC-D/TC-T	G24d-1/GX24d-1	165	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	110

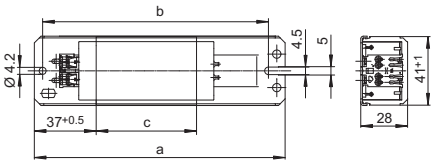
* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

Standard Ballasts 18–58 W, 230 V

For compact fluorescent lamps
Shape: 28 x 41 mm

Vacuum-impregnated with polyester resin
Push-in terminal for leads: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
tw 130
Protection class I





Lamp				Ballast								Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	Energy efficiency*	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K		µF	mA
230 V, 50 Hz														
18	TC-D/TC-T	G24d-2/GX24d-2	220	LN 18I.940	**508922**	230, 50	85	75	34	0.32	50/120	B1	2.0	110
				LN 18I.319	**163763**	230, 50	85	75	34	0.32	60/140	B1	2.0	110
	TC-F/TC-L	2G10/2G11	370	LN 18.510	**164572**	230, 50	155	140	92	0.80	40/65	B1	4.5	120
				LN 18.131	**530941**	230, 50	150	140	60	0.55	55/95	B2	4.5	120
				L 18.934**	**534621**	230, 50	150	140	45	0.43	70/150	–	4.5	120
	T-U	2G13	370	LN 18.131	**530941**	230, 50	150	140	60	0.55	55/95	B2	4.5	120
				L 18.934**	**534621**	230, 50	150	140	45	0.43	70/150	–	4.5	120
2x18	TC-F/TC-L	2G10/2G11	400	LN 2x18.135	**532155**	230, 50	150	140	45	0.43	65	B1	4.0	210
				L 36.334	**530007**	230, 50	150	140	60	0.55	60/155	B1	4.0	210
22	T-R	G10q	400	LN 30.530	**164680**	230, 50	155	140	92	0.80	45/65	B2	4.5	200
24	TC-F/TC-L	2G10/2G11	345	LN 24/26.804	**534490**	230, 50	150	140	60	0.55	55/110	B2	4.5	150
				L 18.934**	**534621**	230, 50	150	140	45	0.43	70/150	–	4.5	150
26	TC-D/TC-T	G24d-3/GX24d-3	325	LN 18.131	**530941**	230, 50	150	140	60	0.55	55/95	B1	3.5	140
				LN 26.813	**509502**	230, 50	110	100	45	0.41	55/145	B2	3.5	140
				L 18.934**	**534621**	230, 50	150	140	45	0,43	70/150	–	3,5	140
28	TC-DD	GR8/GR10q	320	LN 18.510	**164572**	230, 50	155	140	92	0.80	40/65	B1	3.5	150
				LN 18.131	**530941**	230, 50	150	140	60	0.55	55/95	B1	3.5	150
				L 18.934**	**534621**	230, 50	150	140	45	0.43	70/150	–	3.5	150
new 32	T-R	G10q	450	LN 36.570	**169779**	230, 50	155	140	92	0.80	35/90	B2	4.0	220
36	TC-F/TC-L	2G10/2G11	430	LN 36.570	**169779**	230, 50	155	140	92	0.80	35/90	B1	4.5	210
				LN 36.511	**164590**	230, 50	155	140	92	0.80	35/95	B1	4.5	210
				LN 36.130	**527191**	230, 50	150	140	60	0.55	50/140	B2	4.5	210
				LN 36.149	**529029**	230, 50	150	140	60	0.55	55/150	B2	4.5	210
				L 36.132**	**535977**	230, 50	150	140	45	0.43	65	–	4.5	210
36/40	T-U/T-R	2G13/G10q	430	LN 36.570	**169779**	230, 50	150	140	92	0.80	35/90	B1	4.5	210
				LN 36.149	**529029**	230, 50	150	140	60	0.55	55/150	B2	4.5	210
				L 36.132**	**535977**	230, 50	150	140	45	0.43	65	–	4.5	210
38	TC-DD	GR10q	430	LN 36.570	**169779**	230, 50	155	140	92	0.80	35/90	B1	4.5	210
				LN 36.149	**529029**	230, 50	150	140	60	0.55	55/150	B2	4.5	210
				L 36.132**	**535977**	230, 50	150	140	45	0.43	65	–	4.5	210
58	T-U	2G13	670	LN 58.568	**169389**	230, 50	233	220	160	1.31	35/95	B1	7.0	320
new				LN 58.990	**509349**	230, 50	190	180	110	0.95	50/130	B2	7.0	320
				LN 58.116	**508186**	230, 50	190	180	92	0.80	55/160	B2	7.0	320
				L 58.718**	**169658**	230, 50	190	180	92	0.80	60/170	–	7.0	320

* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

** Ballasts without CE mark for markets outside of the EU

Standard Ballasts
18–58 W, 240 V

For compact fluorescent lamps
Shape: 28 x 41 mm

Lamp				Ballast									Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	Energy efficiency*	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K		µF	mA
240 V, 50 Hz														
18	TC-D/TC-T	G24d-2/GX24d-2	220	LN 18I.418	**164353**	240, 50	85	75	34	0.28	60/130	B1	2.0	110
	TC-F/TC-L	2G10/2G11	370	LN 18.507	**164566**	240, 50	155	140	92	0.80	35/60	B1	4.5	120
				LN 18.162	**533043**	240, 50	150	140	60	0.55	60/110	B2	4.5	120
				L 18.936**	**534627**	240, 50	150	140	45	0.43	70/140	–	4.5	120
	T-U	2G13	370	LN 18.507	**164566**	240, 50	155	140	92	0.80	35/60	B1	4.5	120
				LN 18.162	**533043**	240, 50	150	140	60	0.55	60/110	B2	4.5	120
				L 18.936**	**534627**	240, 50	150	140	45	0.43	70/140	–	4.5	120
2x18	TC-F/TC-L	2G10/2G11	400	LN 2x18.135	**535778**	240, 50	150	140	45	0.43	65	B1	4.0	210
				L 36/40.443	**530008**	240, 50	150	140	60	0.55	65/155	B1	4.0	210
				LN 36.201	**527196**	240, 50	150	140	60	0.55	55/140	B1	4.0	210
				LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.0	210
21	TC-DD	GR10q	260	LN 21.293	**547145**	240, 50	105	95	45	0,41	55	B1	3,0	120
24	TC-F/TC-L	2G10/2G11	345	LN 18.507	**164566**	240, 50	155	140	92	0.80	35/60	B1	4.5	150
				LN 18.162	**533043**	240, 50	150	140	60	0.55	60/110	B2	4.5	150
				L 18.936**	**534627**	240, 50	150	140	45	0.43	70/140	–	4.5	150
26	TC-D/TC-T	G24d-3/GX24d-3	325	LN 18.162	**533043**	240, 50	150	140	60	0.55	60/110	B1	4.5	150
				LN 26.238	**545405**	240, 50	105	95	45	0.41	55/145	B2	3.5	140
28	TC-DD	GR8/GR10q	320	LN 18.162	**533043**	240, 50	150	140	60	0.55	60/110	B1	3.5	150
				L 18.936**	**534627**	240, 50	150	140	45	0.43	70/140	–	3.5	150
32	T-R	G10q	450	LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.0	220
36	TC-F/TC-L	2G10/2G11	430	LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.5	210
				LN 36.201	**527196**	240, 50	155	140	60	0.55	55/140	B2	4.5	210
				L 36/40.443**	**164438**	240, 50	150	140	60	0.55	65/155	–	4.5	210
36/40	T-U/T-R	2G13/G10q	430	LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.5	210
				LN 36.201	**527196**	240, 50	150	140	60	0.55	55/140	B2	4.5	210
				L 36/40.443**	**164438**	240, 50	150	140	60	0.55	65/155	–	4.5	210
38	TC-DD	GR10q	430	LN 36.201	**527196**	240, 50	150	140	60	0.55	55/140	B2	4.5	210
				L 36/40.443**	**164438**	240, 50	150	140	60	0.55	65/155	–	4.5	210
58	T-U	2G13	670	LN 58.506	**164560**	240, 50	233	220	160	1.31	35/85	B1	7.0	320
new				LN 58.192	**507936**	240, 50	190	180	110	0.95	50/150	B2	7.0	320
				LN 58.722	**534252**	240, 50	190	180	92	0.80	60/180	B2	7.0	320

* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

** Ballasts without CE mark for markets outside of the EU

Standard Ballasts
18–58 W, 220 V

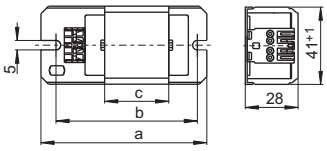
For compact fluorescent lamps
Shape: 28 x 41 mm

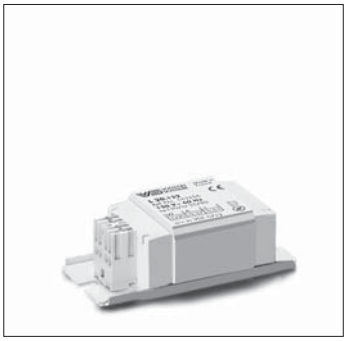
Lamp				Ballast									Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	Energy efficiency*	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K		µF	mA
220 V, 50 Hz														
18	TC-F/TC-L	2G10/2G11	370	L18.933	**534624**	220,50	150	140	45	0.43	70/160	–	4.5	120
	T-U	2G13	370	L18.933	**534624**	220,50	150	140	45	0.43	70/160	–	4.5	120
2x18	TC-F/TC-L	2G10/2G11	400	L 36.158	**530252**	220,50	150	140	45	0.43	65	–	4.0	210
24	TC-F/TC-L	2G10/2G11	345	L18.933	**534624**	220,50	150	140	45	0.43	70/160	–	4.5	150
26	TC-D/TC-T	G24d-3/GX24d-3	325	L18.933	**534624**	220,50	150	140	45	0.43	70/160	–	3.5	140
28	TC-DD	GR8/GR10q	320	L18.933	**534624**	220,50	150	140	45	0.43	70/160	–	3.5	150
36	TC-F/TC-L	2G10/2G11	430	L 36.158	**530252**	220,50	150	140	45	0.43	65	–	4.5	210
36/40	T-U/T-R	2G13/G10q	430	L 36.158	**530252**	220,50	150	140	45	0.43	65	–	4.5	210
38	TC-DD	GR10q	430	L 36.158	**530252**	220,50	150	140	45	0.43	65	–	4.5	210
58	T-U	2G13	670	L 58.625	**164828**	220,50	190	180	92	0.80	55/155	–	7.0	320
220 V, 60 Hz														
18	TC-D/TC-T	G24d-2/GX24d-2	220	L 18I.602	**164779**	220, 60	85	75	34	0.32	45/110	–	2.0	110
	TC-F/TC-L	2G10/2G11	370	L 18.121	**532149**	220, 60	110	100	45	0.42	65/145	–	4.0	150
				L 18.121	**528582**	220, 60	150	140	45	0.43	65/145	–	4.0	150
				L 18.249	**538801**	220, 60	150	140	34	0.32	75/140	–	4.0	150
	T-U	2G13	370	L 18.121	**532149**	220, 60	110	100	45	0.42	65/145	–	4.0	150
				L 18.121	**528582**	220, 60	150	140	45	0.43	65/145	–	4.0	150
				L 18.249	**538801**	220, 60	150	140	34	0.32	75/140	–	4.0	150
2x18	TC-F/TC-L	2G10/2G11	400	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	210
24	TC-F/TC-L	2G10/2G11	345	L 18.121	**532149**	220, 60	110	100	45	0.42	65/145	–	4.0	190
				L 18.121	**528582**	220, 60	150	140	45	0.43	65/145	–	4.0	190
				L 18.249	**538801**	220, 60	150	140	34	0.32	75/140	–	4.0	190
26	TC-D/TC-T	G24d-3/GX24d-3	325	L 18.121	**532149**	220, 60	110	100	45	0.42	65/145	–	3.0	160
				L 18.121	**528582**	220, 60	150	140	45	0.43	65/145	–	3.0	160
				L 18.249	**538801**	220, 60	150	140	34	0.32	75/140	–	3.0	160
28	TC-DD	GR8/GR10q	320	L 18.121	**532149**	220, 60	110	100	45	0.42	65/145	–	3.0	155
				L 18.249	**538801**	220, 60	150	140	34	0.32	75/140	–	3.0	155
36	TC-F/TC-L	2G10/2G11	430	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	210
36/40	T-U/T-R	2G13/G10q	430	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	220
38	TC-DD	GR10q	430	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	220
58	T-U	2G13	670	L 58.657	**164870**	220, 60	195	180	92	0.80	55/140	–	6.0	320

* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

Ballasts
5–20 W
120 V/60 Hz

For compact fluorescent lamps
Shape: 28 x 41 mm



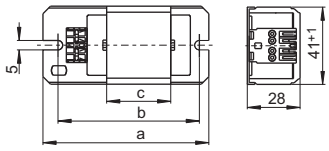


Vacuum-impregnated with polyester resin
Push-in terminal for leads: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
tw 130
Protection class I

Lamp				Ballast								Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K	µF	mA
120 V, 60 Hz													
5	TC-S	G23	180	L 7/9.209	**163318**	120, 60	85	75	34	0.32	25/40	3.0	90
7	TC-S	G23	175	L 7/9.209	**163318**	120, 60	85	75	34	0.32	25/40	3.0	90
9	TC-S	G23	170	L 7/9.209	**163318**	120, 60	85	75	34	0.32	25/40	3.0	90
18	TC-F/TC-L	2G10/2G11	370	L 20.122	**163256**	120, 60	85	75	34	0.32	35/80	5.0	150
20	T-U	2G13	370	L 20.122	**163256**	120, 60	85	75	34	0.32	35/80	5.0	190

Standard Ballasts
4–13 W
230/240/220 V

For fluorescent lamps
Shape: 28 x 41 mm



Vacuum-impregnated with polyester resin
Push-in terminal for leads: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
tw 130
Protection class I

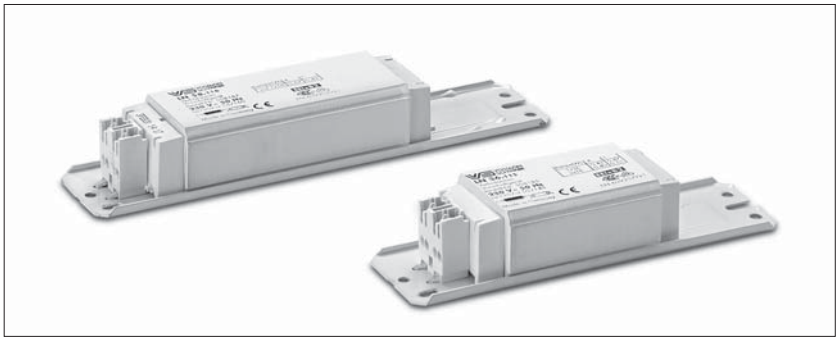
Lamp				Ballast									Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	Energy efficiency*	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K		µF	mA
230 V, 50 Hz														
4	T5 (T16)	G5	170	L 4/6/8.304	**163683**	230, 50	85	75	34	0.32	55/85	B2	2.0	40
2x4	T5 (T16)	G5	155	L 4/6/8.304	**163683**	230, 50	85	75	34	0.32	55/85	B1	2.0	50
6	T5 (T16)	G5	160	L 4/6/8.304	**163683**	230, 50	85	75	34	0.32	55/85	B1	2.0	50
2x6	T5 (T16)	G5	175	LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B1	2.0	65
8	T5 (T16)	G5	145	L 4/6/8.304	**163683**	230, 50	85	75	34	0.32	55/85	B1	2.0	60
2x8	T5 (T16)	G5	155	LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B1	2.0	85
13	T5 (T16)	G5	165	LN 13.313	**163711**	230, 50	85	75	34	0.32	55/80	B1	2.0	80
240 V, 50 Hz														
4	T5 (T16)	G5	170	L 4/6/8.404	**164326**	240, 50	85	75	34	0.32	55/80	B2	2.0	40
2x4	T5 (T16)	G5	155	L 4/6/8.404	**164326**	240, 50	85	75	34	0.32	55/80	B1	2.0	50
6	T5 (T16)	G5	160	L 4/6/8.404	**164326**	240, 50	85	75	34	0.32	55/80	B1	2.0	50
2x6	T5 (T16)	G5	175	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B1	2.0	65
8	T5 (T16)	G5	145	L 4/6/8.404	**164326**	240, 50	85	75	34	0.32	55/80	B1	2.0	60
2x8	T5 (T16)	G5	155	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B1	2.0	85
13	T5 (T16)	G5	165	LN 13.413	**164342**	240, 50	85	75	34	0.32	60/90	B1	2.0	80
220 V, 60 Hz														
4	T5 (T16)	G5	170	L 4/6/8.218	**532644**	220, 60	85	75	34	0.32	60/80	–	2.0	40
2x4	T5 (T16)	G5	155	L 4/6/8.218	**532644**	220, 60	85	75	34	0.32	60/80	–	2.0	50
6	T5 (T16)	G5	160	L 4/6/8.218	**532644**	220, 60	85	75	34	0.32	60/80	–	2.0	50
2x6	T5 (T16)	G5	175	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	65
8	T5 (T16)	G5	145	L 4/6/8.218	**532644**	220, 60	85	75	34	0.32	60/80	–	2.0	60
2x8	T5 (T16)	G5	155	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	85
13	T5 (T16)	G5	165	L 13.210	**520992**	220, 60	85	75	34	0.32	45/80	–	2.0	80

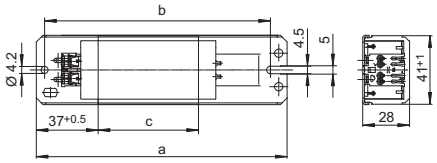
* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

Standard Ballasts 14–65 W, 230 V

For fluorescent lamps
Shape: 28 x 41 mm

Vacuum-impregnated with polyester resin
Push-in terminal for leads: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
tw 130
Protection class I





Lamp				Ballast									Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	Energy efficiency*	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K		µF	mA
230 V, 50 Hz														
14	T8 (T26)	G13	395	LN 18.510	**164572**	230, 50	155	140	92	0.80	40/65	B2	4.5	150
15	T8 (T26)	G13	310	LN 15.329	**163861**	230, 50	150	140	60	0.55	50/80	B2	3.5	120
2x15	T8 (T26)	G13	340	LN 30.801	**169645**	230, 50	150	140	60	0.55	55/110	B2	4.0	185
				L 30.347**	**164033**	230, 50	150	140	60	0.55	60/150	–	4.0	185
16	T8 (T26)	G13	200	LN 16.316	**163730**	230, 50	85	75	34	0.32	60/125	B1	2.0	90
18/20	T8 (T26)/T12 (T38)	G13	370	LN 18.510	**164572**	230, 50	155	140	92	0.80	40/65	B1	4.5	120
				LN 18.131	**530941**	230, 50	150	140	60	0.55	55/95	B2	4.5	120
				L 18.934**	**534621**	230, 50	150	140	45	0.43	70/150	–	4.5	120
2x18/20	T8 (T26)/T12 (T38)	G13	400	LN 2x18.135	**532155**	230, 50	150	140	45	0.43	65	B1	4.0	210
				L 36.334	**530007**	230, 50	150	140	60	0.55	60/155	B1	4.0	210
25	T12 (T38)	G13	290	L 25.346	**164013**	230, 50	150	140	60	0.55	45/80	B1	3.5	130
30	T8 (T26)	G13	365	LN 30.801	**169645**	230, 50	150	140	60	0.55	55/110	B2	4.5	180
36-1	T8 (T26)	G13	556	L 36l.342	**538072**	230, 50	195	180	110	0.87	50/120	B2	6.5	250
36/40	T8 (T26)/T12 (T38)	G13	430	LN 36.570	**169779**	230, 50	155	140	92	0.80	35/90	B1	4.5	210
				LN 36.511	**164590**	230, 50	155	140	92	0.80	35/95	B1	4.5	210
				LN 36.130	**527191**	230, 50	150	140	60	0,55	50/140	B2	4.5	210
				LN 36.149	**529029**	230, 50	150	140	60	0.55	55/150	B2	4.5	210
				L 36.132**	**535977**	230, 50	150	140	45	0.43	65	–	4.5	210
38	T8 (T26)	G13	430	LN 36.570	**169779**	230, 50	155	140	92	0.80	35/90	B1	4.5	210
				LN 36.511	**164590**	230, 50	155	140	92	0.80	35/95	B1	4.5	210
				LN 36.149	**529029**	230, 50	150	140	60	0.55	55/150	B2	4.5	210
				L 36.132**	**535977**	230, 50	150	140	45	0.43	65	–	4.5	210
58/65	T8 (T26)/T12 (T38)	G13	670	LN 58.568	**169389**	230, 50	233	220	160	1.31	35/95	B1	7.0	320
new				LN 58.990	**509349**	230, 50	190	180	110	0.95	50/130	B2	7.0	320
				LN 58.116	**508186**	230, 50	190	180	92	0.80	55/160	B2	7.0	320
				L 58.718**	**169658**	230, 50	190	180	92	0.80	60/170	–	7.0	320

* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

** Ballasts without CE mark for markets outside of the EU

Standard Ballasts
15–75 W, 240/220 V

For fluorescent lamps
Shape: 28 x 41 mm

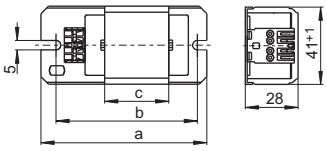
Lamp				Ballast									Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	Energy efficiency*	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K		µF	mA
240 V, 50 Hz														
2x15	T8 (T26)	G13	340	LN 30.806	**533067**	240, 50	150	140	60	0.55	55/130	B2	4.0	185
16	T8 (T26)	G13	200	LN 16.417	**164358**	240, 50	85	75	34	0.32	60/130	B1	2.0	90
18/20	T8 (T26)/T12 (T38)	G13	370	LN 18.507	**164566**	240, 50	155	140	92	0.80	35/60	B1	4.5	120
				LN 18.162	**533043**	240, 50	150	140	60	0.55	60/110	B2	4.5	120
				L 18.936**	**534627**	240, 50	150	140	45	0.43	70/140	–	4.5	120
2x18/20	T8 (T26)/T12 (T38)	G13	400	LN 2x18.135	**535778**	240, 50	150	140	45	0.43	65	B1	4.0	210
				L 36/40.443	**530008**	240, 50	150	140	60	0.55	65/155	B1	4.0	210
				LN 36.201	**527196**	240, 50	150	140	60	0.55	55/140	B1	4.0	210
				LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.0	210
30	T8 (T26)	G13	365	LN 30.806	**533067**	240, 50	150	140	60	0.55	55/130	B2	4.5	180
36/40	T8 (T26)/T12 (T38)	G13	430	LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.5	210
				LN 36.201	**527196**	240, 50	150	140	60	0.55	55/140	B2	4.5	210
				L 36/40.443**	**164438**	240, 50	150	140	60	0.55	65/155	–	4.5	210
38	T8 (T26)	G13	430	LN 36.505	**164555**	240, 50	155	140	92	0.80	40/95	B1	4.5	210
				LN 36.201	**527196**	240, 50	150	140	60	0.55	55/140	B2	4.5	210
				L 36/40.443**	**164438**	240, 50	150	140	60	0.55	65/155	–	4.5	210
58/65	T8 (T26)/T12 (T38)	G13	670	LN 58.506	**164560**	240, 50	233	220	160	1.31	35/85	B1	7.0	320
new				LN 58.192	**507936**	240, 50	190	180	110	0.95	50/150	B2	7.0	320
				LN 58.722	**534252**	240, 50	190	180	92	0.80	60/180	B2	7.0	320
new	70/75	T8 (T26)/T12 (T38)	G13	670	LN 75.170	**533650**	240, 50	190	180	110	0.95	50/150	B2	6.0	320
220 V, 50 Hz														
18/20	T8 (T26)/T12 (T38)	G13	370	L 18.933	**534624**	220, 50	150	140	45	0.43	70/160	–	4.5	120
2x18/20	T8 (T26)/T12 (T38)	G13	430	L 36.158	**530252**	220, 50	150	140	45	0.43	65	–	4.0	210
36/40	T8 (T26)/T12 (T38)	G13	430	L 36.158	**530252**	220, 50	150	140	45	0.43	65	–	4.5	210
38	T8 (T26)	G13	430	L 36.158	**530252**	220, 50	150	140	45	0.43	65	–	4.5	210
58/65	T8 (T26)/T12 (T38)	G13	670	L 58.625	**164828**	220, 50	190	180	92	0.80	55/155	–	7.0	320
220 V, 60 Hz														
15	T8 (T26)	G13	310	L 15.007	**537744**	220, 60	150	140	45	0.43	55/80	–	3.0	120
2x15	T8 (T26)	G13	350	L 30.006	**537750**	220, 60	150	140	45	0.43	60/120	–	4.0	185
18/20	T8 (T26)/T12 (T38)	G13	370	L 18.121	**532149**	220, 60	110	100	45	0.42	65/145	–	4.0	190
				L 18.121	**528582**	220, 60	150	140	45	0.43	65/145	-	4.0	190
				L 18.149	**538801**	220, 60	150	140	34	0.32	75/140	–	4.0	190
2x18/20	T8 (T26)/T12 (T38)	G13	430	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	220
30	T8 (T26)	G13	365	L 30.006	**537750**	220, 60	150	140	45	0.43	60/120	–	4.0	180
36/40	T8 (T26)/T12 (T38)	G13	430	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	220
38	T8 (T26)	G13	430	L 36.120	**509373**	220, 60	150	140	45	0.43	60/170	–	4.0	230
58/65	T8 (T26)/T12 (T38)	G13	670	L 58.657	**164870**	220, 60	195	180	92	0.80	55/140	–	6.0	320

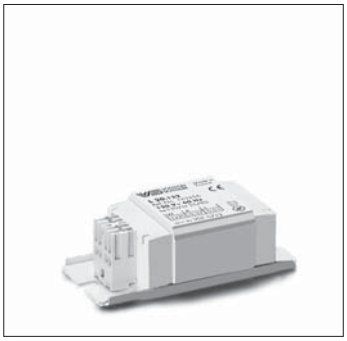
* Energy efficiency: EEI=B2 and EEI=B1, valid until 2017

** Ballasts without CE mark for markets outside of the EU

Ballasts
14–20 W
120 V/60 Hz

For fluorescent lamps
Shape: 28 x 41 mm





Vacuum-impregnated with polyester resin
Push-in terminal for leads: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
tw 130
Protection class I

Lamp				Ballast								Capacitor	
Output	Type	Base	Current	Type	**Ref. No.**	Voltage	a	b	c	Weight	$\Delta t/\Delta t_{an.}$	C_P	Current
W			mA			V, Hz	mm	mm	mm	kg	K	µF	mA
120 V, 60 Hz													
14	T8 (T26)	G13	395	L 14.139	**170117**	120, 60	85	75	34	0.32	55/90	7.0	175
15	T8 (T26)	G13	350	L 15.308	**163702**	120, 60	85	75	34	0.32	35/65	7.0	170
18/20	T8 (T26)/T12 (T38)	G13	370	L 20.122	**163256**	120, 60	85	75	34	0.32	35/80	5.0	190

COMPACT AND VERSATILE

VS LAMPHOLDERS FOR COMPACT FLUORESCENT LAMPS

Vossloh-Schwabe provides a broad range of lampholders for single-ended compact fluorescent lamps, with regard to which the numerous fixing methods make just about any luminaire design possible.

As compact fluorescent lamps generate considerably less heat in comparison to incandescent lamps, the advantages provided by thermoplastics can be fully utilized for lampholder design.

Almost all VS lampholders for compact fluorescent lamps are made of thermoplastic PBT and therefore bear the T marking T140, which refers to the maximum base temperature in accordance with EN 61199 (VDE 0715 T9). The use of this highly heat-resistant material was born of close cooperation between Vossloh-Schwabe and the world's leading lamp manufacturers that also use PBT for producing lamp bases. In connection with fatigue-resistant, stainless steel lamp mounting springs, harmonizing the casing material ensures a permanent and secure lamp fit.

3 Lampholders and Accessories for TC Lamps

G24, GX24 lampholders **180–187**

2G7 lampholders **187–188**

G23 lampholders **188–191**

GR8, GR10q, GRY10q-3, GRZ10d, GRZ10t lampholders **191–192**

2G10 lampholders **192**

2G11/2GX11 lampholders **193–194**

Accessories **195–197**

GX53-1 lampholders, accessories **198–199**

Technical details for fluorescent lamps **243–271**
General technical details 394-401
Glossary 402-404

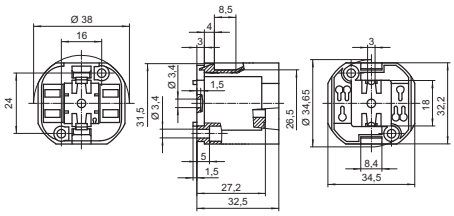
G24, GX24 Lampholders

For single-ended compact fluorescent lamps TC-D, TC-T, TC-DEL, TC-TEL

The drawings and photos contained in this chapter only show lampholders for lamps with base G24q-1. Further drawings of lamp bases can be found on page 266.

When mounting the lampholder it has to be considered that the TC-T and TC-TEL lamp is wider than the lampholder. When using the central hole for mounting additional depressions for anti-rotation pips have to be provided.

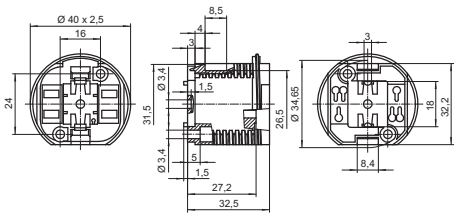
G24, GX24 lampholders
Plain casing
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Central fixing hole for screw M3
Rotation stop
For cover caps (see p. 336–338)



Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71501	**527735**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	13	500
71502	**527736**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	13	500
71503	**527737**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	13	500
71511	**527739**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	14.5	500
71512	**527740**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	14.5	500
71513	**527741**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	14.5	500
71519	**527745**	GX24q-3/-4*	TC-TEL	26, 32 / 42	14.5	500
71514	**527742**	GX24q-4	TC-TEL	42	14.5	500
71515	**527743**	GX24q-5	TC-TEL	57	15.1	500
71516	**527744**	GX24q-6	TC-TEL	70	15.1	500

* Lampholder 527745 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

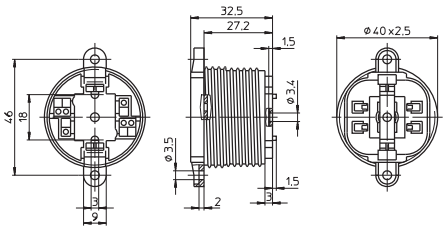
G24, GX24 lampholders
External thread 40x2.5 IEC 60399
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Central fixing hole for screw M3
Rotation stop
For cover caps (see p. 336–338)
For screw rings (see p. 353)



Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71001	**527502**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	12.7	500
71002	**527503**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	12.7	500
71003	**527504**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	12.7	500
71011	**527506**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	15.2	500
71012	**527507**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	15.2	500
71013	**527508**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	15.2	500
71019	**527512**	GX24q-3/-4*	TC-TEL	26, 32 / 42	15.2	500
71014	**527509**	GX24q-4	TC-TEL	42	15.2	500
71015	**527510**	GX24q-5	TC-TEL	57	15.8	500
71016	**527511**	GX24q-6	TC-TEL	70	15.8	500

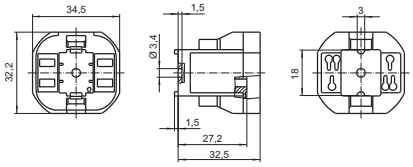
* Lampholder 527512 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

G24, GX24 lampholders
External thread 40x2.5 IEC 60399
Casing: PBT GF, white T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Front fixing holes for screws M3
Central fixing hole for screw M3
Rotation stop
For cover caps (see p. 336–338)
For screw rings (see p. 353)



Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
35812	**101410**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	18	500
35842	**106262**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	18	500
35862	**101448**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	18	500
35912	**106912**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	19.5	500
35942	**502555**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	19.5	500
35962	**502556**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	19.5	500

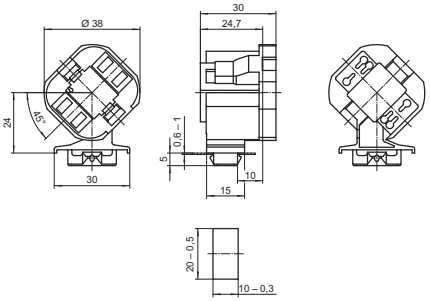
G24, GX24 lampholders
Profiled shape
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5 – 1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5 – 1 mm² (starter circuit)
Central fixing hole for screw M3
Rotation stop



Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71101	**527529**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	8.5	500
71102	**527530**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	8.5	500
71103	**527531**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	8.5	500
71111	**527533**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	10.9	500
71112	**527534**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	10.9	500
71113	**527535**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	10.9	500
71119	**527539**	GX24q-3/-4*	TC-TEL	26, 32 / 42	10.9	500
71114	**527536**	GX24q-4	TC-TEL	42	10.9	500
71115	**527537**	GX24q-5	TC-TEL	57	11.1	500
71116	**527538**	GX24q-6	TC-TEL	70	11.1	500

* Lampholder 527539 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

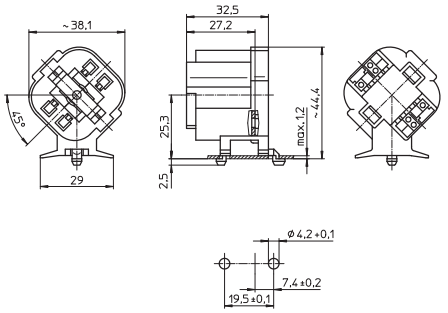
G24, GX24 push-fit lampholders
Lamp position: 45°
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5 – 1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5 – 1 mm² (starter circuit)
Push-fit foot for cut-out 10 x 20 mm
for wall thickness 0.6 – 1 mm
Foot with facility for cable routing



Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71301	**527585**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	10.2	500
71302	**527586**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	10.2	500
71303	**527587**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	10.2	500
71311	**527589**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12.1	500
71312	**527590**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12.1	500
71313	**527591**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12.1	500
71319	**527596**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12.1	500
71314	**527592**	GX24q-4	TC-TEL	42	12.1	500
71315	**527594**	GX24q-5	TC-TEL	57	12.6	500
71316	**527595**	GX24q-6	TC-TEL	70	12.6	500

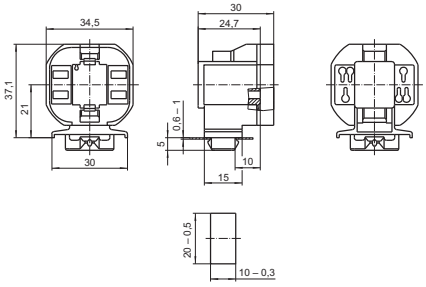
* Lampholder 527596 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

G24 push-fit lampholders
Lamp position: 45°
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Split pins for wall thickness up to 1.2 mm



Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
35814	**106893**	G24d-1	TC-D	10, 13	14.3	500
35844	**107617**	G24d-2	TC-D	18	14.3	500
35864	**107618**	G24d-3	TC-D	26	14.3	500
35914	**107861**	G24q-1	TC-DEL	10, 13	15	500
35944	**108575**	G24q-2	TC-DEL	18	15	500
35964	**108576**	G24q-3	TC-DEL	26	15	500

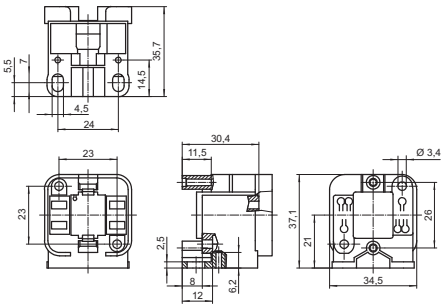
G24, GX24 push-fit lampholders
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Push-fit foot for cut-out 10x20 mm
for wall thickness 0.6–1 mm
Foot with facility for cable routing

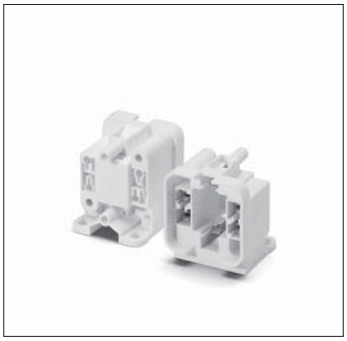


Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71801	**528029**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	10.2	500
71802	**528030**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	10.2	500
71803	**528031**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	10.2	500
71811	**528033**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12.1	500
71812	**528034**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12.1	500
71813	**528035**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12.1	500
71819	**528039**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12.1	500
71814	**528036**	GX24q-4	TC-TEL	42	12.1	500
71815	**528037**	GX24q-5	TC-TEL	57	12.7	500
71816	**528038**	GX24q-6	TC-TEL	70	12.7	500

* Lampholder 528039 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

G24, GX24 surface-mounted lampholders
Casing: PBT GF, white, T140, Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Base fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Base oblong holes for screws M4
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST2.9-C/F
and ST4.2-C/F
Front fixing holes for screws M3

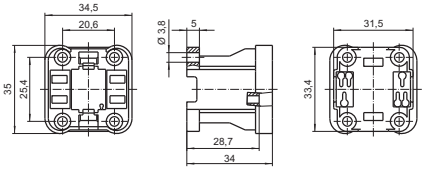




Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71701	**527790**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	13.2	500
71702	**527791**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	13.2	500
71703	**527792**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	13.2	500
71711	**527794**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	15.2	500
71712	**527795**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	15.2	500
71713	**527796**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	15.2	500
71719	**527800**	GX24q-3/-4*	TC-TEL	26, 32 / 42	15.2	500
71714	**527797**	GX24q-4	TC-TEL	42	15.2	500
71715	**527798**	GX24q-5	TC-TEL	57	15.8	500
71716	**527799**	GX24q-6	TC-TEL	70	15.8	500

* Lampholder 527800 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

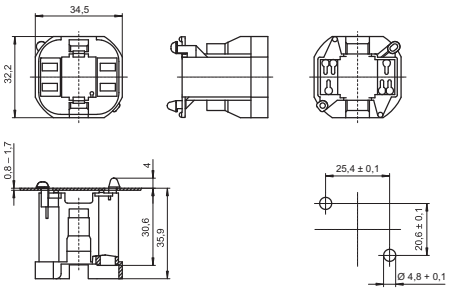
G24, GX24 surface-mounted lampholders
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Front fixing holes for screws M3

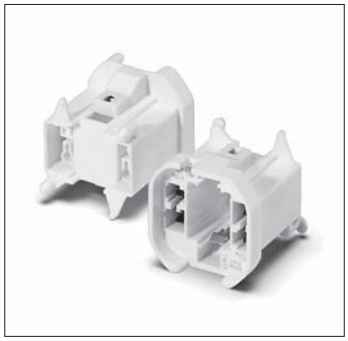


Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71201	**527556**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	12	500
71202	**527557**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	12	500
71203	**527558**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	12	500
71211	**527560**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12.9	500
71212	**527561**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12.9	500
71213	**527562**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12.9	500
71219	**527566**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12.9	500
71214	**527563**	GX24q-4	TC-TEL	42	12.9	500
71215	**527564**	GX24q-5	TC-TEL	57	13.5	500
71216	**527565**	GX24q-6	TC-TEL	70	13.5	500

* Lampholder 527566 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

G24, GX24 push-fit lampholders
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Base split pins for wall thickness 0.8–1.7 mm

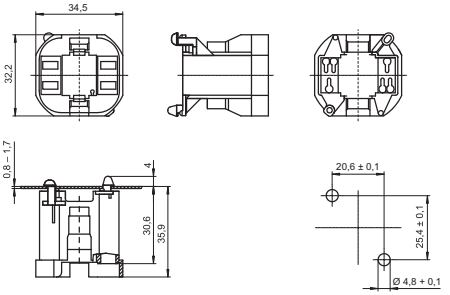


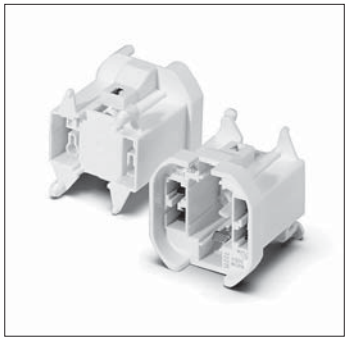


Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
71601	**527762**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	10.5	500
71602	**527763**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	10.5	500
71603	**527764**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	10.5	500
71611	**527766**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12	500
71612	**527768**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12	500
71613	**527769**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12	500
71619	**527773**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12	500
71614	**527770**	GX24q-4	TC-TEL	42	12	500
71615	**527771**	GX24q-5	TC-TEL	57	12.6	500
71616	**527772**	GX24q-6	TC-TEL	70	12.6	500

* Lampholder 527773 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42W.

G24, GX24 push-fit lampholders
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Base split pins for wall thickness 0.8–1.7 mm

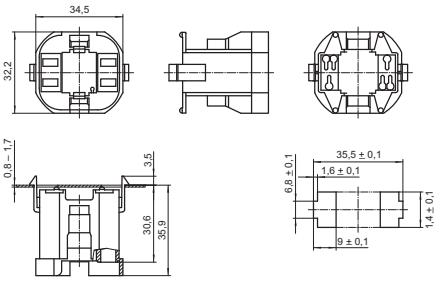




Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
72201	**530458**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	10.5	500
72202	**530459**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	10.5	500
72203	**530460**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	10.5	500
72211	**530462**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12	500
72212	**530463**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12	500
72213	**530464**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12	500
72219	**530468**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12	500
72214	**530465**	GX24q-4	TC-TEL	42	12	500
72215	**530466**	GX24q-5	TC-TEL	57	12.6	500
72216	**530467**	GX24q-6	TC-TEL	70	12.6	500

* Lampholder 530468 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42W.

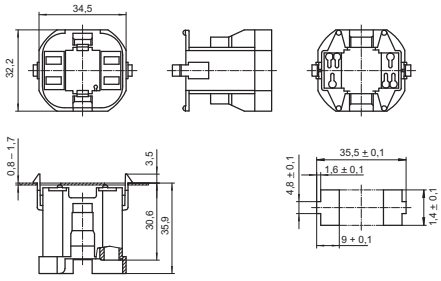
G24, GX24 push-fit lampholders
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Rear split pins for wall thickness 0.8–1.7 mm
Width of split pin: 6.5 mm

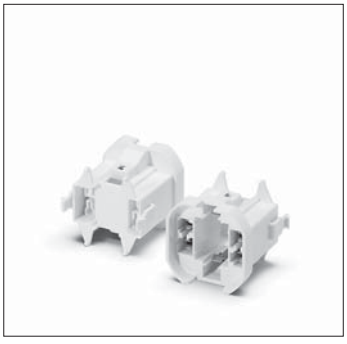


Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
72001	**528089**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	10.4	500
72002	**528090**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	10.4	500
72003	**528091**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	10.4	500
72011	**528093**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12.3	500
72012	**528094**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12.3	500
72013	**528095**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12.3	500
72019	**528099**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12.3	500
72014	**528096**	GX24q-4	TC-TEL	42	12.3	500
72015	**528097**	GX24q-5	TC-TEL	57	12.9	500
72016	**528098**	GX24q-6	TC-TEL	70	12.9	500

* Lampholder 528099 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

G24, GX24 push-fit lampholders
Casing: PBT GF, white, T140
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
In addition for G24q, GX24q lampholders:
push-in terminals: 0.5–1 mm² (starter circuit)
Rear split pins for wall thickness 0.8–1.7 mm
Width of split pin: 4.5 mm

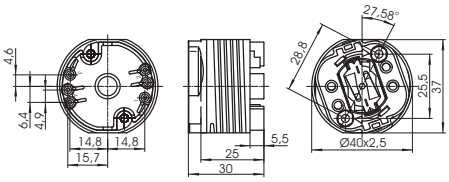




Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
72101	**528116**	G24d-1/GX24d-1	TC-D/TC-T	10, 13 / 13	10.4	500
72102	**528117**	G24d-2/GX24d-2	TC-D/TC-T	18 / 18	10.4	500
72103	**528118**	G24d-3/GX24d-3	TC-D/TC-T	26 / 26	10.4	500
72111	**528120**	G24q-1/GX24q-1	TC-DEL/TC-TEL	10, 13 / 13	12.3	500
72112	**528121**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	12.3	500
72113	**528122**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	12.3	500
72119	**528126**	GX24q-3/-4*	TC-TEL	26, 32 / 42	12.3	500
72114	**528123**	GX24q-4	TC-TEL	42	12.3	500
72115	**528124**	GX24q-5	TC-TEL	57	12.9	500
72116	**528125**	GX24q-6	TC-TEL	70	12.9	500

* Lampholder 528126 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

G24, GX24 rotary lock lampholders
External thread 40×2.5 IEC 60399
Casing: PBT GF, white, T120
Nominal rating: 1/500
Push-in twin terminals: 0.5–0.75 mm² (lamp circuit)
Push-in terminals: 0.5–0.75 mm² (starter circuit)
Front fixing holes for screws M3
For screw rings (see p. 353)



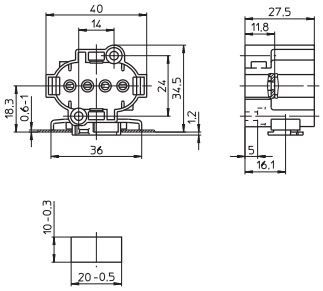
Type	**Ref. No.**	Base	Lamp	Output (W)	Weight (g)	Unit (pcs.)
45940	**507993**	G24q-2/GX24q-2	TC-DEL/TC-TEL	18 / 18	20.2	500
45960	**507994**	G24q-3/GX24q-3	TC-DEL/TC-TEL	26 / 26, 32	20.2	500
45930	**507992**	G24q-3/GX24q-3/-4*	TC-DEL/TC-TEL	26 / 26, 32 / 42	20.2	500
45980	**507995**	GX24q-4	TC-TEL	42	20.2	500

* Lampholder 507992 may only be used in luminaires that are operated with electronic ballasts that have been certified according to the applicable standards and that cover the luminaire performance range of 26, 32 and 42 W.

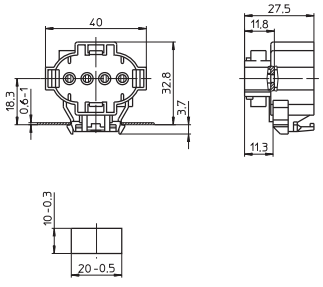
2G7 Lampholders

For single-ended compact fluorescent lamps TC-SEL

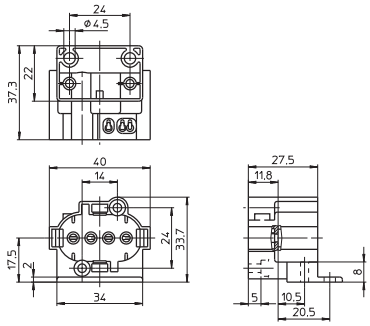
2G7 push-fit lampholder
Casing: PBT GF, white, T140, nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Rear fixing hole for self-tapping screw
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Locking of the lampholder by a 15° turn
Weight: 13.7 g, unit: 500 pcs.
Type: 35610
Ref. No.: 109235

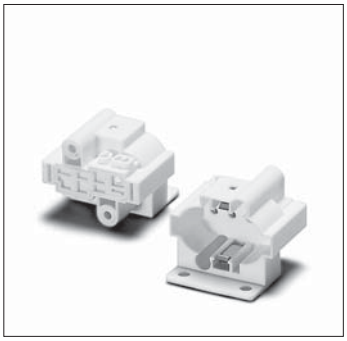


2G7 push-fit lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Push-fit foot for cut-out 10×20 mm
for wall thickness 0.6–1 mm
Weight: 18 g, unit: 500 pcs.
Type: 35613
Ref. No.: 500574

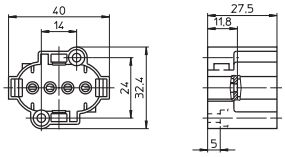


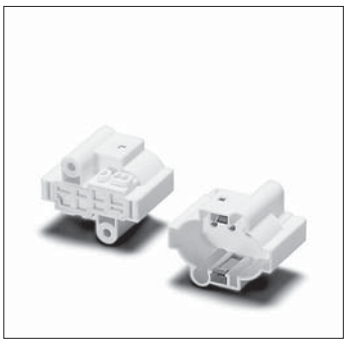
2G7 surface-mounted lampholder
Casing: PBT GF, white, T140, nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Fixing holes for screws M4
Lateral and rear fixing holes for self-tapping
screws acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 18.1 g, unit: 500 pcs.
Type: 35611
Ref. No.: 109238





2G7 surface-mounted lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 14 g, unit: 500 pcs.
Type: 35612
Ref. No.: 109240



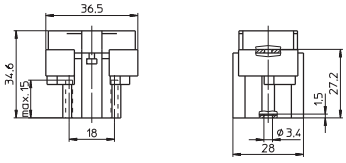


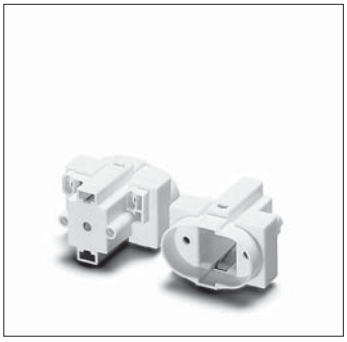
G23 Lampholders

For single-ended compact fluorescent lamps TC-S

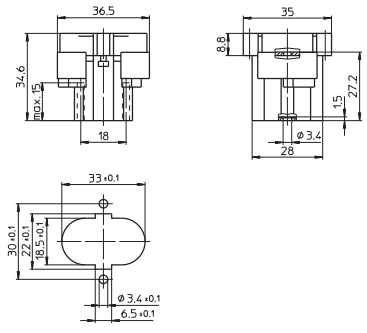
If the central hole is used for mounting,
make sure there is no risk of rotation.

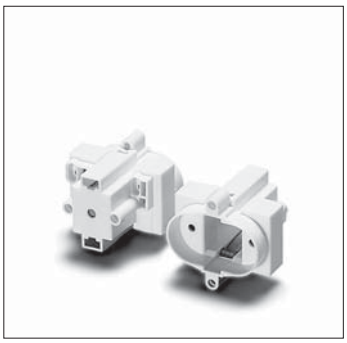
G23 surface-mounted lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST2.9-C/F
Central fixing hole for screw M3
Weight: 11.6 g, unit: 500 pcs.
Type: 35002
Ref. No.: 101290



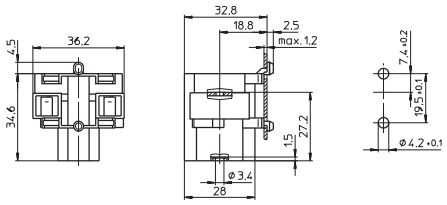


G23 lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Front and rear fixing holes for self-tapping
screws acc. to ISO 1481/7049-ST2.9-C/F
Central fixing hole for screw M3
Weight: 9 g, unit: 500 pcs.
Type: 35003
Ref. No.: 101294

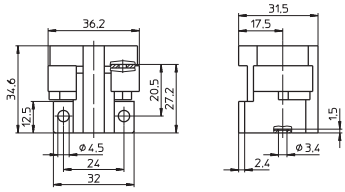




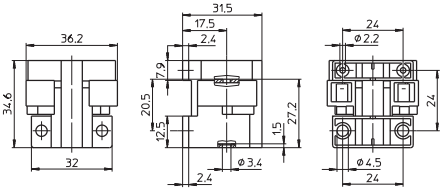
G23 push-fit lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Split pins for wall thickness up to 1.2 mm
Central fixing hole for screw M3
Weight: 12 g, unit: 500 pcs.
Type: 35004
Ref. No.: 101298



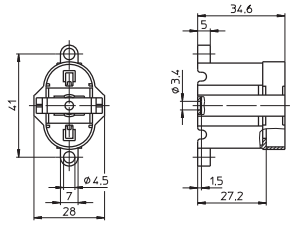
G23 surface-mounted lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Fixing holes for screws M4
Central fixing hole for screw M3
Weight: 12.4 g, unit: 500 pcs.
Type: 35006
Ref. No.: 101306



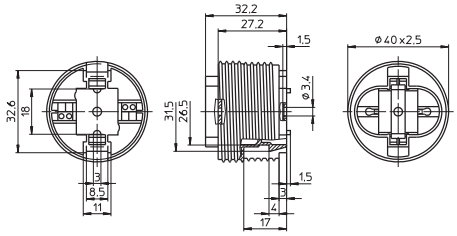
G23 lampholder
For push-fit on track
Casing: PBT GF, white, T140, nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Lateral fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST2.9-C/F
Fixing holes for screws M4
Central fixing hole for screw M3
Weight: 14 g, unit: 500 pcs.
Type: 35007
Ref. No.: 101310



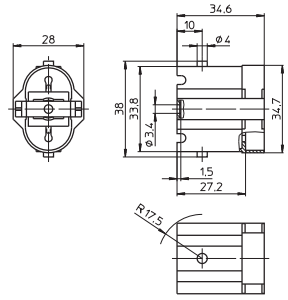
G23 surface-mounted lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Fixing holes for screws M4
Central fixing hole for screw M3
Weight: 11.1 g, unit: 500 pcs.
Type: 35008
Ref. No.: 101314



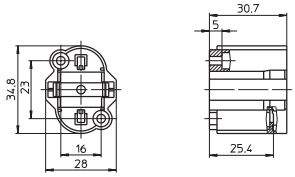
G23 lampholder, for cover caps (see p. 336–338)
External thread 40×2.5 IEC 60399
Casing: PBT GF, white, T140, nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Central fixing hole for screw M3
When using the central hole for mounting
additional depressions for anti-rotation pips
have to be provided.
For screw rings (see p. 353)
Weight: 16.3 g, unit: 500 pcs.
Type: 35010
Ref. No.: 101320

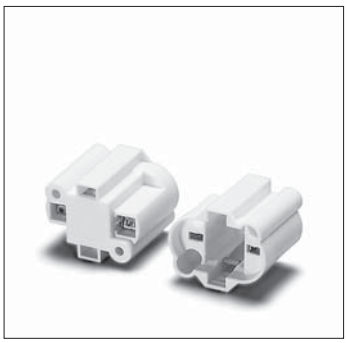


G23 lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Lateral pivots for bracket 105820 (see p. 195)
Central fixing hole for screw M3
Weight: 11 g, unit: 500 pcs.
Type: 35011
Ref. No.: 101324

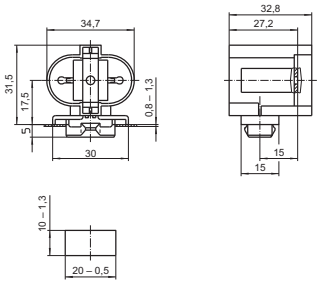


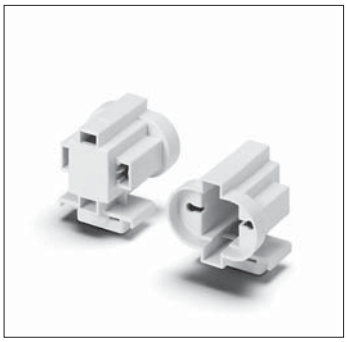
G23 surface-mounted lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Front fixing holes for screws M3
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Weight: 11.9 g, unit: 500 pcs.
Type: 35012
Ref. No.: 108898



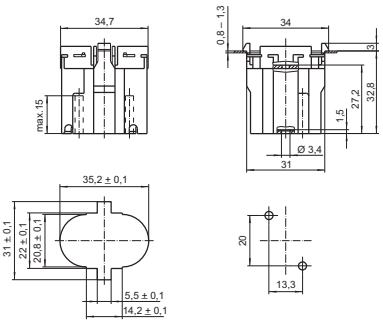


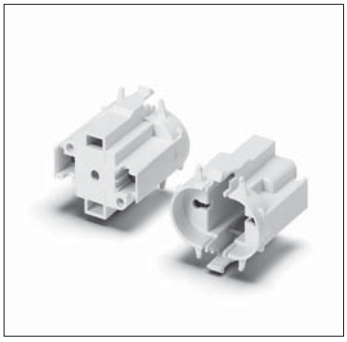
G23 push-fit lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Push-fit foot for wall thickness 0.8–1.3 mm
Central fixing hole for screw M3
Weight: 11 g, unit: 500 pcs.
Type: 35051
Ref. No.: 101344



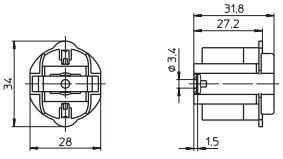


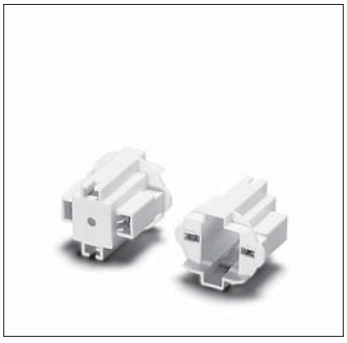
G23 push-fit lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Front split pins for wall thickness 0.8–1.3 mm
Central fixing hole for screw M3
Weight: 12 g, unit: 500 pcs.
Type: 35052
Ref. No.: 101346



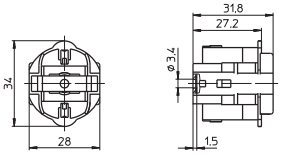


G23 lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Central fixing hole for screw M3
Particularly suitable for narrow mounting
(e.g. for insertion into tube systems)
Weight: 8 g, unit: 500 pcs.
Type: 35201
Ref. No.: 101364





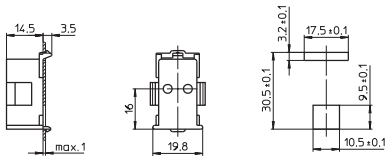
G23 lampholder
Casing: PBT GF, white, T140
Nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Central fixing hole for screw M3
Particularly suitable for narrow mounting
(e.g. for insertion into tube systems)
Weight: 8.2 g, unit: 500 pcs.
Type: 35202
Ref. No.: 101367



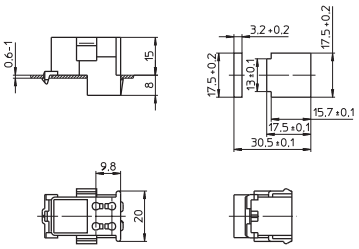
GR8, GR10q, GRY10q-3, GRZ10d, GRZ10t Lampholders

For single-ended compact fluorescent lamps TC-DD

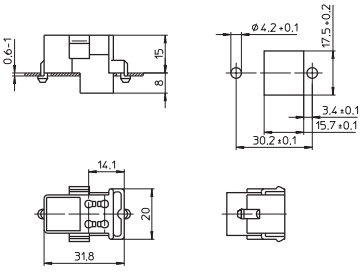
GR8 push-fit lampholder
Casing: PC, white
Nominal rating: 2/250
Base and front push-in terminals: 0.5–1 mm²
Fixing clips for wall thickness up to 1 mm
Weight: 5.4 g, unit: 500 pcs.
Type: 35100
Ref. No.: 101358

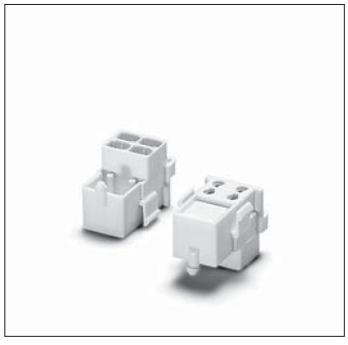


GR10q push-fit lampholder
Casing: PC, white, T110
Nominal rating: 2/250
Base push-in terminals: 0.5–1 mm²
Base fixing clip for wall thickness 0.6–1 mm
Weight: 6.2 g, unit: 1000 pcs.
Type: 35500
Ref. No.: 108927

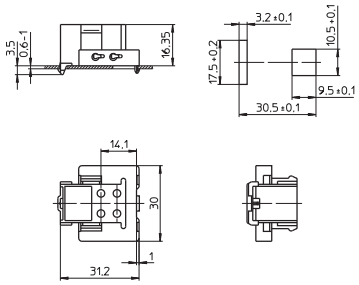


GR10q push-fit lampholder
Casing: PC, white, T110
Nominal rating: 2/250
Base push-in terminals: 0.5–1 mm²
Base split pins for wall thickness 0.6–1 mm
Weight: 6.2 g, unit: 1000 pcs.
Type: 35510
Ref. No.: 108928

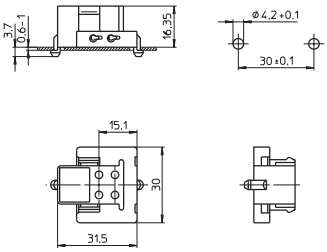




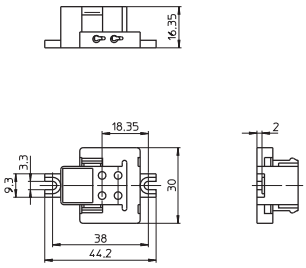
GR10q push-fit lampholder
Material: PBT, white, T110
Nominal rating: 2/250
Lateral push-in terminals: 0.5–1 mm²
Base fixing clip for wall thickness 0.6–1 mm
Weight: 7.2 g, unit: 1000 pcs.
Type: 35530
Ref. No.: 108932



GR10q push-fit lampholder
Material: PBT, white, T110
Nominal rating: 2/250
Lateral push-in terminals: 0.5–1 mm²
Base split pins for wall thickness 0.6–1 mm
Weight: 7.2 g, unit: 1000 pcs.
Type: 35540
Ref. No.: 108933



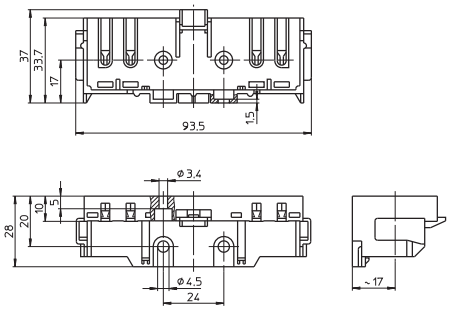
GR10q surface-mounted lampholder
Material: PBT, white, T110
Nominal rating: 2/250
Lateral push-in terminals: 0.5–1 mm²
Fastening slots for screws M3
Weight: 7.4 g, unit: 1000 pcs.
Type: 35550
Ref. No.: 108934

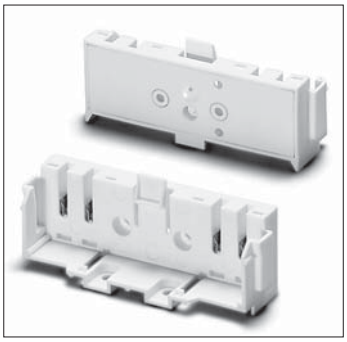


2G10 Lampholders

For single-ended compact fluorescent lamps TC-F

2G10 surface-mounted lampholder, with lamp lock
Casing: PBT GF, white, T140, nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Lateral lamp insertion
Front fixing holes for cheese-head screws M3
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Base fixing holes for screws M4
Weight: 25.5 g, unit: 250 pcs.
Type: 36300
Ref. No.: 101521

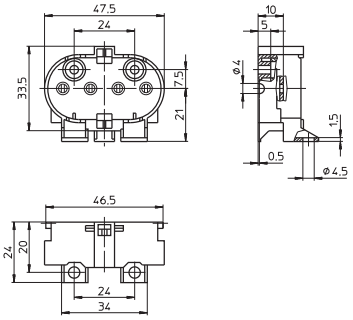




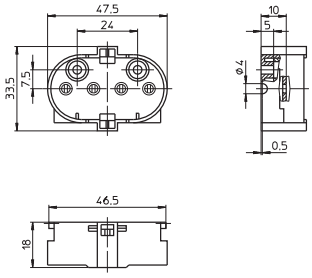
2G11/2GX11 Lampholders

For single-ended compact fluorescent lamps TC-L

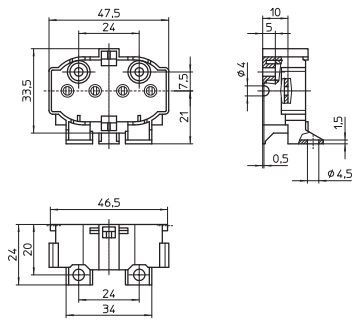
2G11 surface-mounted lampholder
Casing: PBT GF, white, T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Lateral pivots for bracket 105824 (see p. 195)
Base fixing holes for screws M4
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 13.7 g, unit: 500 pcs.
Type: 36050
Ref. No.: 101485

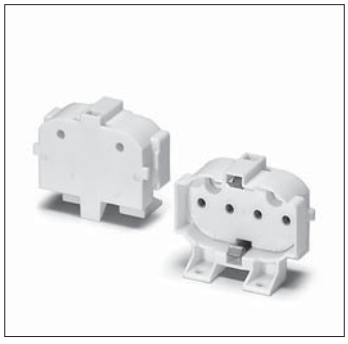


2G11 surface-mounted lampholder
Casing: PBT GF, white, T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Lateral pivots for bracket 105824 (see p. 195)
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 12.7 g, unit: 500 pcs.
Type: 36051
Ref. No.: 101489

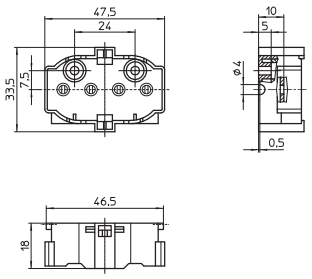


2GX11 surface-mounted lampholder
Casing: PBT GF, white, T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Lateral pivots for bracket 105824 (see p. 195)
Base fixing holes for screws M4
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 13.7 g, unit: 500 pcs.
Type: 36020
Ref. No.: 546609

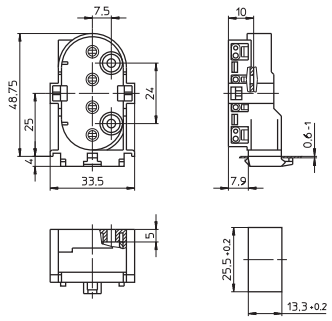




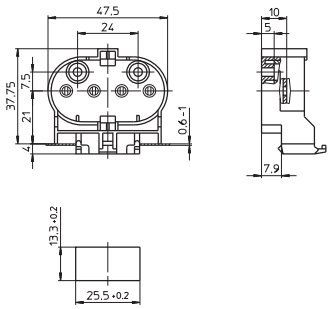
2GX11 surface-mounted lampholder
Casing: PBT GF, white, T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Lateral pivots for bracket 105824 (see p. 195)
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 12.7 g, unit: 500 pcs.
Type: 36021
Ref. No.: 546612



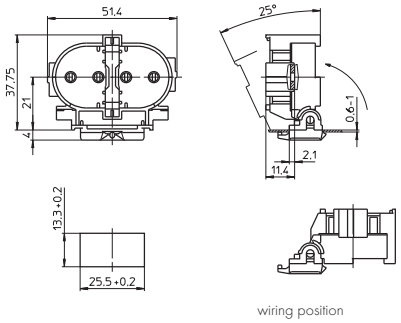
2G11 push-fit lampholder
Casing: PBT GF, white, T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Lamp position: vertical
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Weight: 14.3 g, unit: 500 pcs.
Type: 36052
Ref. No.: 101491

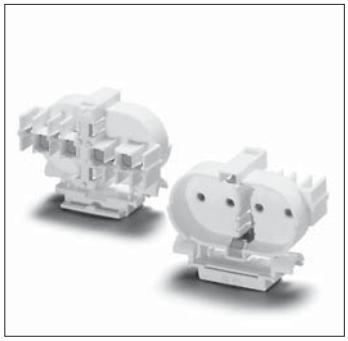


2G11 push-fit lampholder
Casing: PBT GF, white, T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm² (lamp circuit)
Push-in terminals: 0.5–1 mm² (starter circuit)
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST4.2-C/F
Front fixing holes for screws M3
Option for base wiring
Weight: 14.1 g, unit: 500 pcs.
Type: 36053
Ref. No.: 101493

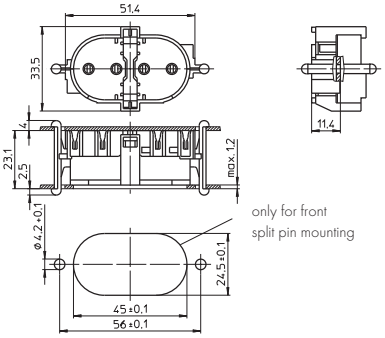


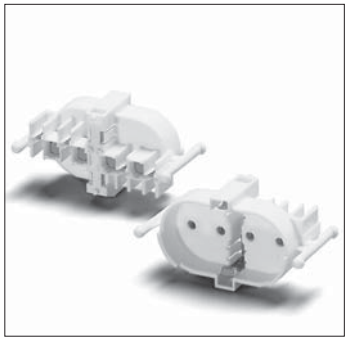
2G11 push-fit lampholder
For the automatic luminaire wiring
Casing: PBT GF, white, T140
Nominal rating: 2/250
IDC terminals for leads H05V-U 0.5
The lampholder is wired in its horizontal position
before being brought into its vertical service position,
to assist lamp changes, it can be swiveled by 25°
Weight: 12 g, unit: 500 pcs.
Type: 36010
Ref. No.: 500105





2G11 built-in lampholder
For the automatic luminaire wiring
Casing: PBT GF, white, T140
Nominal rating: 2/250
IDC terminals for leads H05V-U 0.5
Front and rear split pins
for wall thickness up to 1.2 mm
Weight: 10.5 g, unit: 500 pcs.
Type: 36011
Ref. No.: 500106



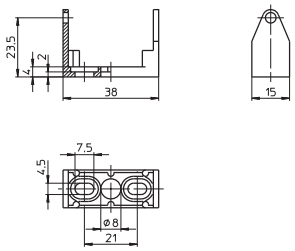


Accessories

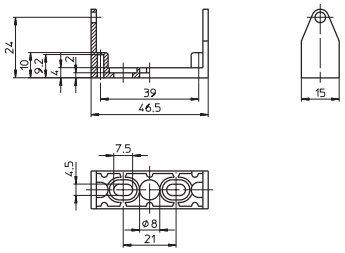
For single-ended compact fluorescent lamps

The luminaire manufacturer is responsible
for the right choice of accessories.
Cover caps for G24/GX24 lampholders
(see p. 336–338)

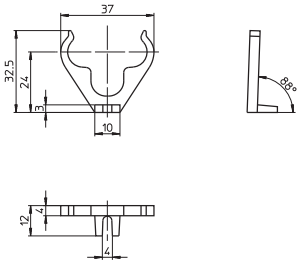
Bracket
For G23 lampholder 101324 (see p. 190)
To swivel the lampholder when changing the lamp
Material: PC, white
Oblong holes for screws M4
Weight: 3.1 g, unit: 500 pcs.
Type: 97515
Ref. No.: 105820

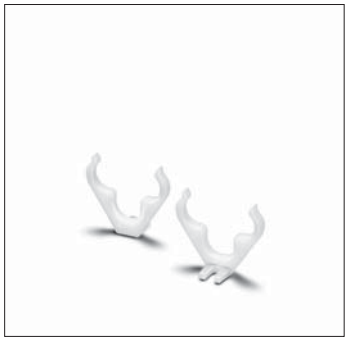


Bracket
For 2G11 lampholders 101485 and 101489
(see p. 193)
To swivel the lampholder when changing the lamp
Material: PC, white
Oblong holes for screws M4
Base fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST2.9-C/F
Weight: 3.7 g, unit: 500 pcs.
Type: 97516
Ref. No.: 105824



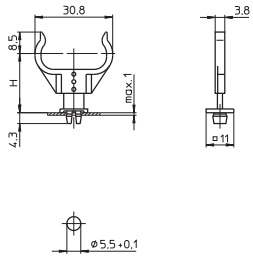
Lamp support for TC-D, TC-DEL lamps
Material: PC, white, UV-stabilised
Lamp position: 45°
Fixing foot with slot for screw M3.5
Weight: 1.5 g, unit: 500 pcs.
Type: 97031
Ref. No.: 105448





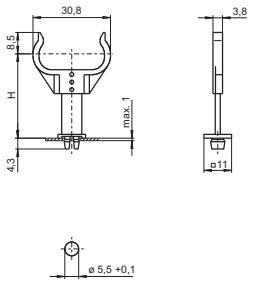
Lamp supports for TC-S, TC-SEL lamps
Height adjustable H: 17.5/20.5/23.5 mm
Push-fit foot for cut-out Ø 5.5 mm
for wall thickness up to 1 mm
Weight: 0.4/0.8/0.8 g, unit: 500 pcs.
Type: 35060

Ref. No.: 105775	foot, PC, white
Ref. No.: 105776	bracket, PC, crystal-clear, UV-stabilised
Ref. No.: 106416	bracket, PC, white, UV-stabilised



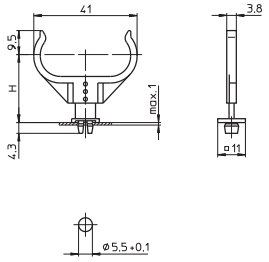
Lamp supports for TC-S, TC-SEL lamps
Height adjustable H: 27.5/30.5/33.5 mm
Push-fit foot for cut-out Ø 5.5 mm
for wall thickness up to 1 mm
Weight: 0.7/0.8/0.8 g, unit: 500 pcs.
Type: 35061

Ref. No.: 105931 foot, PC, white
Ref. No.: 105776 bracket, PC, crystal-clear, UV-stabilised
Ref. No.: 106416 bracket, PC, white, UV-stabilised



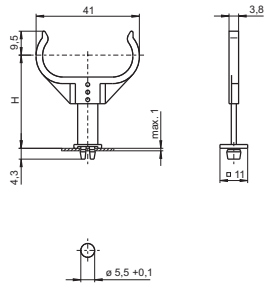
Lamp supports for TC-L lamps
Height adjustable H: 21/24/27 mm
Push-fit foot for cut-out Ø 5.5 mm
for wall thickness up to 1 mm
Weight: 0.4/1.3/1.1 g, unit: 500 pcs.
Type: 35760

Ref. No.: 105775 foot, PC, white
Ref. No.: 105777 bracket, PC, crystal-clear, UV-stabilised
Ref. No.: 106417 bracket, PC, white, UV-stabilised

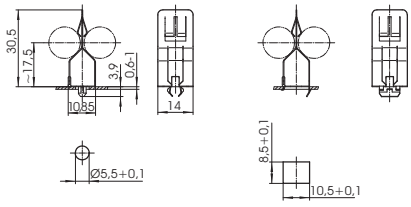


Lamp supports for TC-L lamps
Height adjustable H: 31/34/37 mm
Push-fit foot for cut-out Ø 5.5 mm
for wall thickness up to 1 mm
Weight: 0.7/1.3/1.1 g, unit: 500 pcs.
Type: 35761

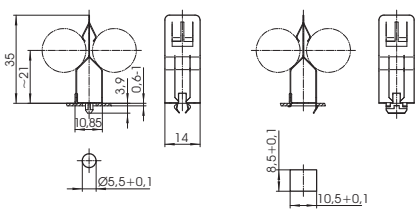
Ref. No.: 105931 foot, PC, white
Ref. No.: 105777 bracket, PC, crystal-clear, UV-stabilised
Ref. No.: 106417 bracket, PC, white, UV-stabilised



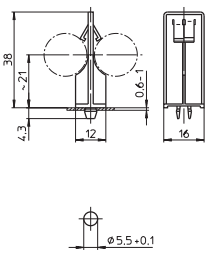
Lamp supports for TC-S, TC-SEL lamps
Material: stainless steel
Weight: 1.3 g, unit: 500 pcs.
Type: 93056 push-fit foot for Ø 5.5 mm
Ref. No.: 509522
Type: 93057 push-fit foot for 8.5x10.5 mm
Ref. No.: 509521



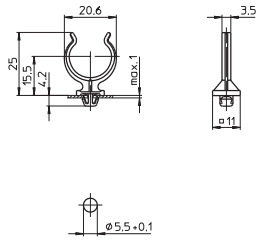
Lamp supports for TC-F, TC-L lamps
Material: stainless steel
Weight: 1.5 g, unit: 500 pcs.
Type: 93058 push-fit foot for Ø 5.5 mm
Ref. No.: 509520
Type: 93059 push-fit foot for 8.5x10.5 mm
Ref. No.: 509519



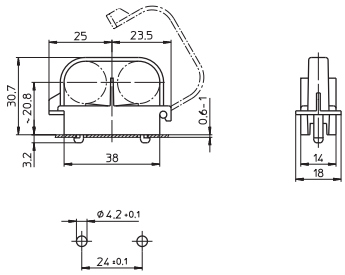
Lamp supports for TC-F, TC-L lamps
For wall thickness 0.6–1 mm
Material: PC, white, UV-stabilised
Weight: 1.3 g, unit: 500 pcs.
Type: 97638 push-fit foot for Ø 5.5 mm
Ref. No.: 105981

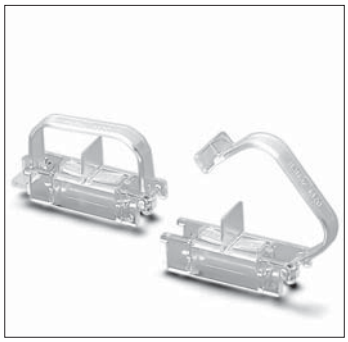


Lamp support for TC-L lamps
Material: PC, white, UV-stabilised
Push-fit foot for cut-out Ø 5.5 mm
for wall thickness up to 1 mm
Weight: 0.7 g, unit: 500 pcs.
Type: 36060
Ref. No.: 108878



Lamp support for TC-L lamps
Material: PC, crystal-clear, UV-stabilised
Lockable
Base split pins for wall thickness 0.6–1 mm
Weight: 4 g, unit: 500 pcs.
Type: 36061
Ref. No.: 101497

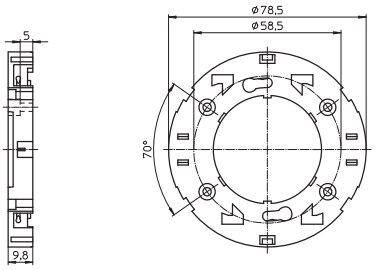


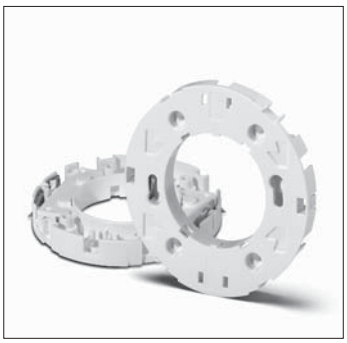


GX53-1 Lampholders, Accessories

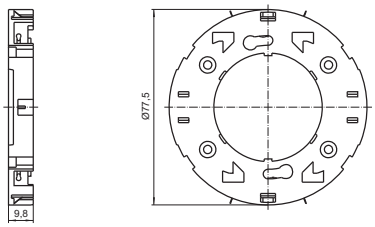
For single-ended compact fluorescent lamps with integrated ballasts

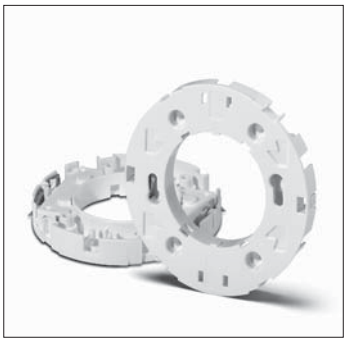
GX53-1 lampholder
Casing: PC, white, T100, nominal rating: 2/250
Push-in terminals for through-wiring
for single-core leads: 0.5–1 mm²
for stranded leads:
0.75 mm², tinned lead ends
Fixing holes for screws M3
Weight: 12.8 g, unit: 200 pcs.
Type: 11000
Ref. No.: 530878



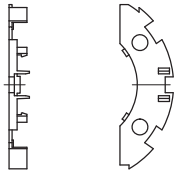


GX53-1 lampholder
Fixing springs for installation into furniture panels
Casing: PC, white, T100, nominal rating: 2/250
Push-in terminals for through-wiring
for single-core leads: 0.5–1 mm²
for stranded leads:
0.75 mm², tinned lead ends
Cut-out: Ø 78$^{+0.2}$ mm
Weight: 13.2 g, unit: 200 pcs.
Type: 11010
Ref. No.: 530879

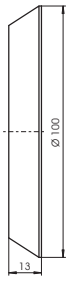




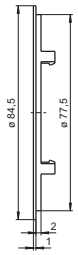
Cord grip/cover plate for GX53-1 lampholders
For leads H03VVH2-F 2X0.75, tinned lead ends
For luminaires of protection class II
Material: PC, white
Weight: 1.6 g, unit: 200 pcs.
Type: 97278
Ref. No.: 504939



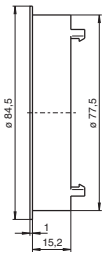
Surface-mounted installation ring
For wood or furniture panels
Material: PC, white
Weight: 10.4 g, unit: 100 pcs.
Type: 97277
Ref. No.: 504938



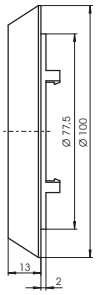
Surface-mounted installation ring, flat
For built-in into furniture panels
Material: PC, white
Weight: 2.1 g, unit: 200 pcs.
Type: 97272
Ref. No.: 504933



Surface-mounted installation ring, high
For built-in into furniture panels
Material: PC, white
Weight: 5.7 g, unit: 100 pcs.
Type: 97281
Ref. No.: 505118



Surface-mounted installation ring
For built-in into furniture panels
Material: PC, transparent
Weight: 12.5 g, unit: 100 pcs.
Type: 97280
Ref. No.: 505003



LAMPHOLDERS FOR T5, T8, T12 AND T2 LAMPS

VS LAMPHOLDERS FOR DOUBLE-ENDED FLUORESCENT LAMPS

Vossloh-Schwabe's comprehensive range of lampholders for double-ended fluorescent lamps covers all major fixing methods. Push-through, push-fit and built-in lampholders with split pins or catches are available just as models with screw and push fittings.

High-grade materials for the contacts and thermoplastics for the casings guarantee reliable contacts and a long service life of the components.

Special G13 lampholders for the USA and Canada can be found under **www.unvlt.com**.

3 Lampholders and Accessories for T Lamps

G5 lampholders **202–209**
G5 lampholders, accessories 202–206
G5 twin lampholder 207
G5 lampholders, degree of protection IP54/IP65/IP67 207–208
2GX13 lampholders, accessories 209

G13 lampholders **210–229**
G13 push-through lampholders 210–212
G13 push-fit lampholders 213–215
G13 push-fit twin lampholders, accessories 216–217
G13 built-in lampholders 217–221
G13 surface-mounted lampholders 221–222
Accessories for T8 and T12 lamps 222–224
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W4.3 x 8.5d lampholders **231**

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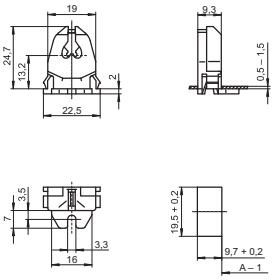
G5 Lampholders, Accessories

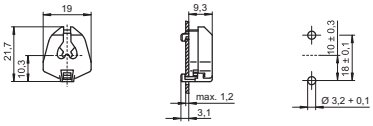
For fluorescent lamps T5 (T16)

Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C

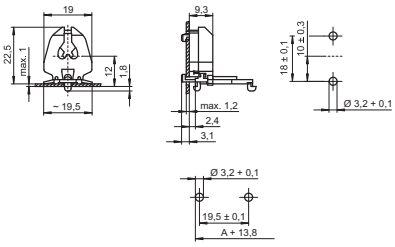
G5 push-through/surface-mounted lampholder
Lamp axis push-through lampholder: 13.2 mm
Lamp axis surface-mounted lampholder: 15.2 mm
Casing: PC, white, T110
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.5–1.5 mm
Fixing slot for screw M3
Weight: 3.2 g, unit: 1000 pcs.
Type: 09105
Ref. No.: 100305



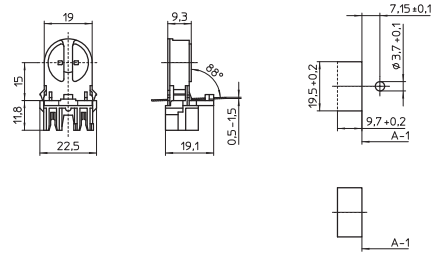
G5 built-in lampholder
Casing: PC, white, T110
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 2.6 g, unit: 1000 pcs.
Type: 09205
Ref. No.: 100310



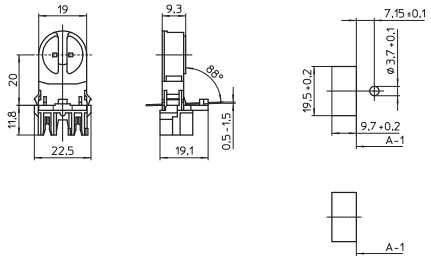
G5 built-in/push-fit lampholder
Lamp axis: 12 mm
Casing: PC, white, T110
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Base split pins for wall thickness up to 1 mm
Weight: 2.9 g, unit: 1000 pcs.
Type: 09210
Ref. No.: 106455



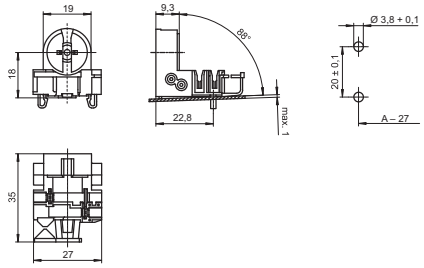
G5 push-through lampholders
For the automatic luminaire wiring
Casing: PBT GF, white, frontplate: PC, white
Rotor: PBT GF, white, T140, lamp axis: 15 mm
Nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Lateral fixing clips for wall thickness 0.5–1.5 mm
Weight: 5 g, unit: 1000 pcs.
Type: 09420/ 09421
Ref. No.: 532377 with stop
Ref. No.: 532378 without stop



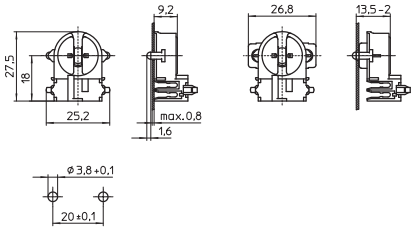
G5 push-through lampholders
For the automatic luminaire wiring
Casing: PBT GF, white, frontplate: PC, white
Rotor: PBT GF, white, T140, lamp axis: 20 mm
Nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Lateral fixing clips for wall thickness 0.5–1.5 mm
Weight: 5.6 g, unit: 1000 pcs.
Type: 09422/09423
Ref. No.: 532379 with stop
Ref. No.: 532380 without stop

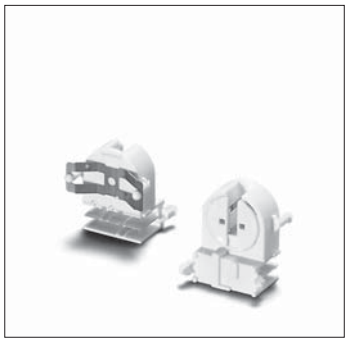


G5 push-fit lampholder
For the automatic luminaire wiring
Lamp axis: 18 mm
Casing: PC, white, rotor: PBT GF, white, T130
Nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Lateral push-in twin terminals: 0.5–1 mm²
Weight: 5.5 g, unit: 1000 pcs.
Type: 09900
Ref. No.: 534644

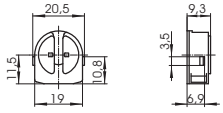


G5 built-in lampholders
For the automatic luminaire wiring
Casing: PC, white, rotor: PBT GF, white, T130
Nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Rear split pins for wall thickness up to 1.2 mm
Weight: 3.7/4.1 g, unit: 1000 pcs.
Type: 09145
Ref. No.: 501533
Type: 09146 with spring adjustment
Ref. No.: 501534

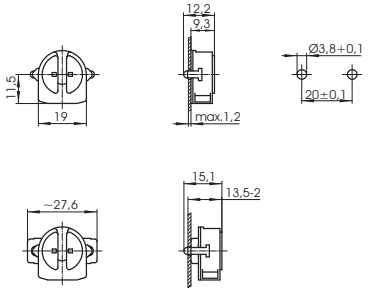




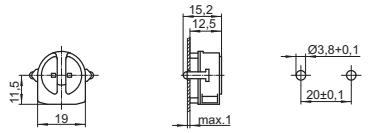
G5 built-in lampholder
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Lateral fixing clips
Weight: 2.8 g, unit: 1000 pcs.
Type: 09404
Ref. No.: 505732



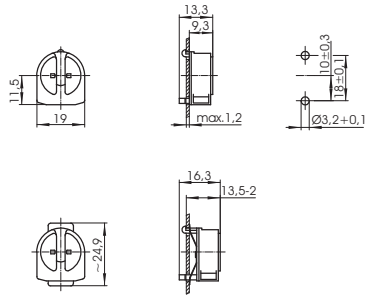
G5 built-in lampholders
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 2.9/3.3 g, unit: 1000 pcs.
Type: 09405
Ref. No.: 505733
Type: 09406 with spring adjustment
Ref. No.: 505734



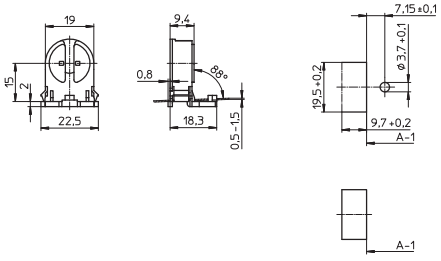
G5 built-in lampholder
Lampholder thickness: 12.5 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1 mm
Weight: 3 g, unit: 1000 pcs.
Type: 09407
Ref. No.: 508590



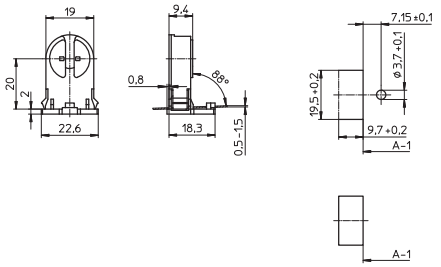
G5 built-in lampholders
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 2.9/3.2 g, unit: 1000 pcs.
Type: 09415
Ref. No.: 505735
Type: 09416 with spring adjustment
Ref. No.: 505736



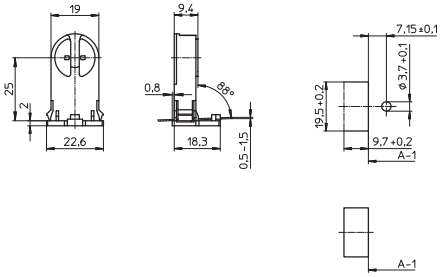
G5 push-through lampholders
Lamp axis: 15 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.5–1.5 mm
Weight: 3.5/3.4 g, unit: 1000 pcs.
Type: 09420/09421
Ref. No.: 505737 with stop
Ref. No.: 505739 without stop



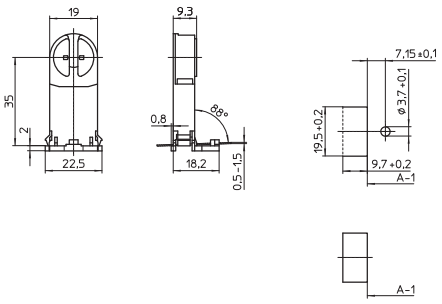
G5 push-through lampholders
Lamp axis: 20 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.5–1.5 mm
Weight: 4.1 g, unit: 1000 pcs.
Type: 09432/09433
Ref. No.: 545933 with stop
Ref. No.: 545935 without stop



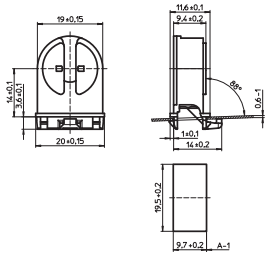
G5 push-through lampholders
Lamp axis: 25 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.5–1.5 mm
Weight: 4.5 g, unit: 1000 pcs.
Type: 09434/09435
Ref. No.: 545937 with stop
Ref. No.: 545939 without stop



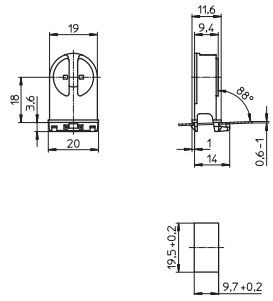
G5 push-through lampholders
Lamp axis: 35 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.5–1.5 mm
Weight: 4.6 g, unit: 1000 pcs.
Type: 09426/09427
Ref. No.: 505745 with stop
Ref. No.: 505746 without stop



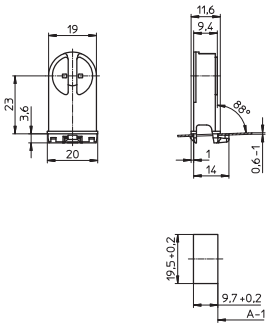
G5 push-fit lampholder
Lamp axis: 14 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear fixing clips for wall thickness 0.6–1 mm
Base or lateral wiring
Weight: 3.3 g, unit: 1000 pcs.
Type: 09440
Ref. No.: 505747



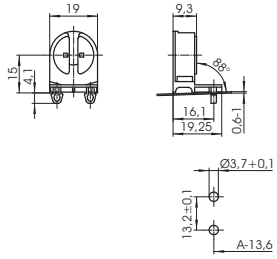
G5 push-fit lampholder
Lamp axis: 18 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear fixing clips for wall thickness 0.6–1 mm
Base or lateral wiring
Weight: 3.9 g, unit: 1000 pcs.
Type: 09446
Ref. No.: 545894



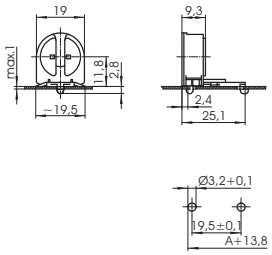
G5 push-fit lampholder
Lamp axis: 23 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear fixing clips for wall thickness 0.6–1 mm
Base or lateral wiring
Weight: 4.2 g, unit: 1000 pcs.
Type: 09447
Ref. No.: 545896



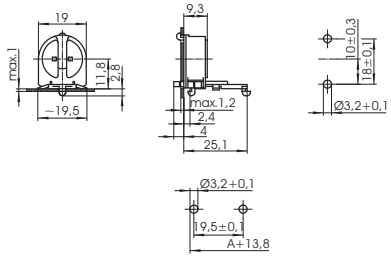
G5 push-fit lampholder
Lamp axis: 15 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Base split pins for wall thickness 0.6–1 mm
Weight: 3.4 g, unit: 1000 pcs.
Type: 09450
Ref. No.: 505750



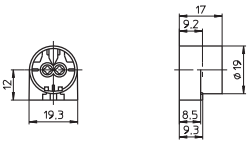
G5 push-fit lampholder
Lamp axis: 11.8 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Base split pins for wall thickness up to 1 mm
Lateral wiring
Weight: 3.1 g, unit: 1000 pcs.
Type: 09460
Ref. No.: 505751



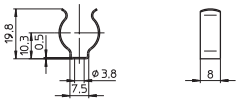
G5 built-in/push-fit lampholder
Lamp axis: 11.8 mm
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Base split pins for wall thickness up to 1 mm
Lateral wiring
Weight: 3.2 g, unit: 1000 pcs.
Type: 09465
Ref. No.: 508314



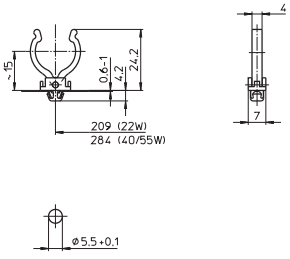
G5 lampholder
For push-fit onto the lamp
Casing: PBT GF, white, T130
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Pin support for reliable contact
Lamp support 109685 (see below)
Weight: 3.7 g, unit: 1000 pcs.
Type: 09170
Ref. No.: 109686



Lamp support for lamps Ø 16 mm
Material: zinc-coated polished steel
Fixing hole for screw M3.5
Weight: 1.3 g, unit: 1000 pcs.
Type: 94088
Ref. No.: 109685



Lamp support for lamps Ø 16 mm
Material: PC, white, UV-stabilised
Push-fit foot for cut-out Ø 5.5 mm
Weight: 1 g, unit: 500 pcs.
Type: 84001
Ref. No.: 500757

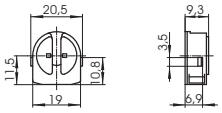


G5 Twin Lampholder

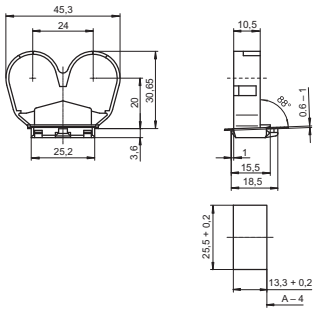
For fluorescent lamps T5 (T16)

Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C

G5 built-in lampholder
Casing: PBT GF, white, rotor: PBT GF, white
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Lateral fixing clips
Weight: 2.8 g, unit: 1000 pcs.
Type: 09404
Ref. No.: 505732



Push-fit bracket
For two G5 built-in lampholders 505732
Material: PC, white
Lamp axis: 20 mm
Distance between two lamp axes: 24 mm
Push-fit foot for wall thickness 0.5–1 mm
Weight: 3.5 g, unit: 1000 pcs.
Type: 97677
Ref. No.: 507562



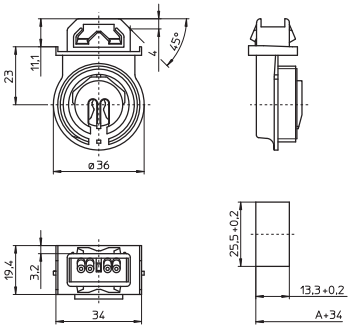
G5 Lampholders, Degree of Protection IP54/IP65/IP67

For fluorescent lamps T5 (T16)
For luminaires of protection class I and II

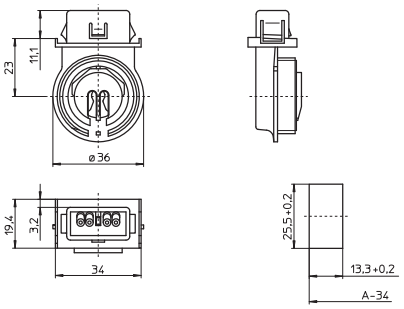
Lampholders protected against dust and splashing water (IP54)
Lampholders protected against dust and jet of water (IP65)
Dust and watertight lampholders (IP67)

Pin support for reliable contact
With spring adjustment
Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C

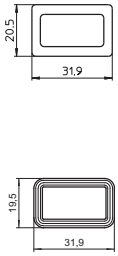
G5 push-fit lampholder for metal casing
Casing: PC, white, interior part: PBT GF
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Push-fit foot for wall thickness: 1.4–2 mm
Weight: 11.3 g, unit: 250 pcs.
Type: 84101 system 153
Ref. No.: 529832

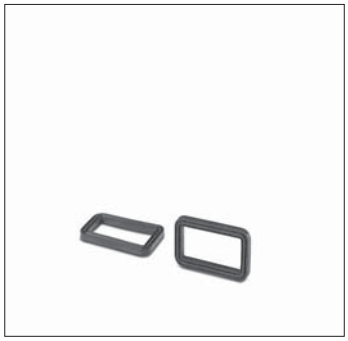


G5 push-fit lampholder for plastic casing
Casing: PC, white, interior part: PBT GF
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Push-fit foot for wall thickness: 0.4–1 mm
Weight: 11.6 g, unit: 250 pcs.
Type: 84104 system 154
Ref. No.: 530535

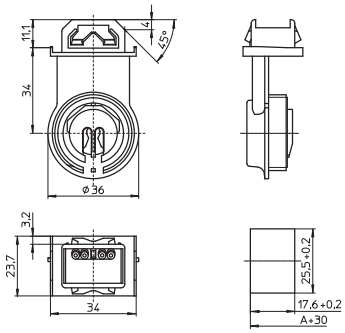


Foot gaskets for systems 153 and 154
Weight: 0.5/0.7/0.7 g
Unit: 1000 pcs.
Type: 98002 degree of protection IP67
Ref. No.: 108947 material: PE foam
Type: 98087 degree of protection IP67
Ref. No.: 503773 material: EPDM, black
Type: 98003 degree of protection IP54
Ref. No.: 108266 material: EPDM, black

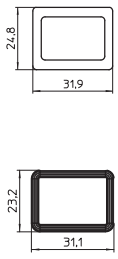


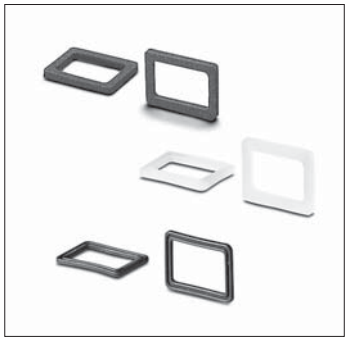


G5 push-fit lampholder
Casing: PC, white, interior part: PBT GF
T140, nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Push-fit foot for wall thickness: 1.4–2 mm
Weight: 12.7 g, unit: 250 pcs.
Type: 84108 system 151
Ref. No.: 534073

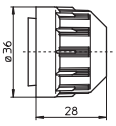


Foot gaskets for system 151
Weight: 1/1.1/1.1 g
Unit: 1000 pcs.
Type: 98004 degree of protection IP65
Ref. No.: 108267 material: cellular rubber, black
Type: 98011 degree of protection IP67
Ref. No.: 504078 material: silicone, transparent
Type: 98008 degree of protection IP67
Ref. No.: 546254 profiled foot gasket, material: EPDM, black





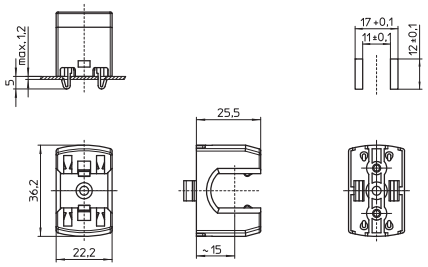
Screw ring for systems 151, 153 and 154
Ring: PBT GF, white, gasket: silicone
Weight: 11.8 g, unit: 250 pcs.
Type: 84103
Ref. No.: 529836



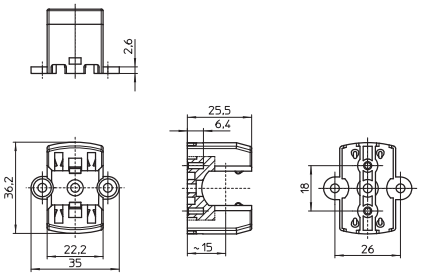
2GX13 Lampholders, Accessories

For fluorescent lamps T-R5 (T-R16)

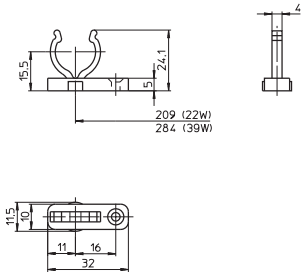
2GX13 push-fit lampholder
Lamp axis: 15 mm
Casing: PC, white, T110
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Base push-fit studs for
wall thickness up to 1.2 mm
Weight: 10 g, unit: 500 pcs.
Type: 58110
Ref. No.: 546656



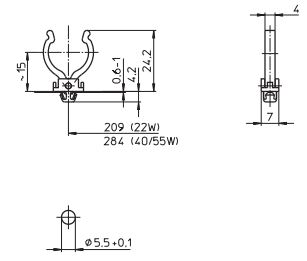
2GX13 surface-mounted lampholder
Lamp axis: 15 mm
Casing: PC, white, T110
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Rear fixing holes for self-tapping screws
acc. to ISO 1481/7049-ST2.9-C/F
Lateral fixing holes for screws M3
Weight: 10.6 g, unit: 500 pcs.
Type: 58100
Ref. No.: 546655



Lamp support for lamps Ø 16 mm
Material: PC, white, UV-stabilised
Fixing hole for screw M3
Fixing hole for self-tapping screw
acc. to ISO 1481/7049-ST4.2-C/F
Weight: 1 g, unit: 500 pcs.
Type: 84000
Ref. No.: 109532



Lamp support for lamps Ø 16 mm
Material: PC, white, UV-stabilised
Push-fit foot for cut-out Ø 5.5 mm
Weight: 1 g, unit: 500 pcs.
Type: 84001
Ref. No.: 500757

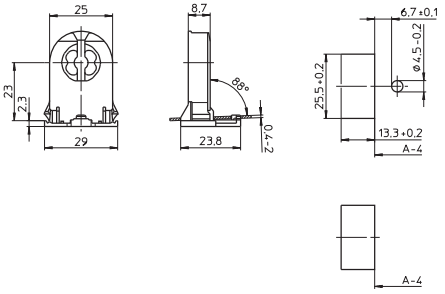


G13 Push-through Lampholders

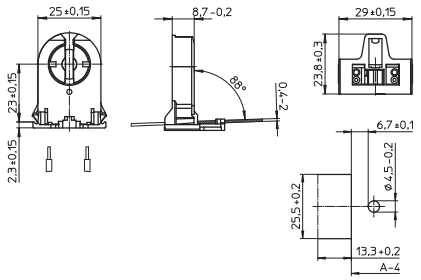
For fluorescent lamps T8 (T26), T12 (T38)

Lampholders with integrated starter holder have
push-in twin terminals for the lamp circuit and
push-in terminals for the the starter circuit.
Pin support for reliable contact
Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C

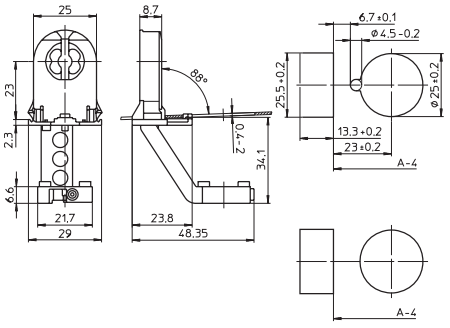
G13 push-through lampholders for lamps T8 and T12
Lamp axis: 23 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 6 g, unit: 1000 pcs.
Type: 27700/27701
Ref. No.: 109330 with stop
Ref. No.: 109331 without stop



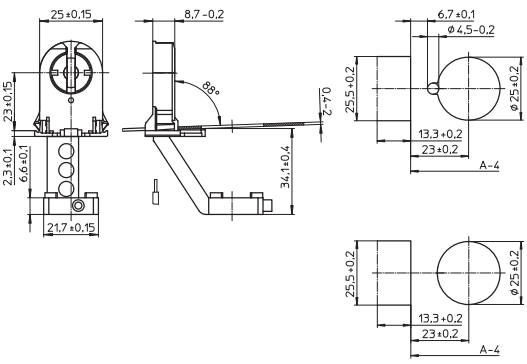
G13 Rotoclic push-through lampholders
for lamps T8 and T12
Lamp axis: 23 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 6.8 g, unit: 1000 pcs.
Type: 27700/27701
Ref. No.: 546641 with stop
Ref. No.: 546642 without stop



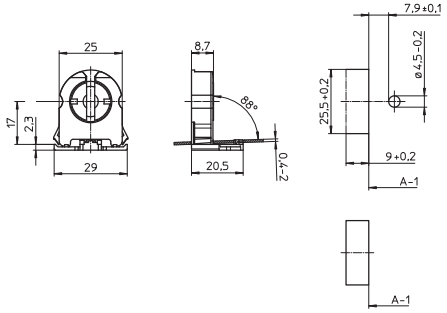
G13 push-through lampholders for lamps T8
With starter attachment
Lamp axis: 23 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 10.4 g, unit: 500 pcs.
Type: 27800/27801
Ref. No.: 109332 with stop
Ref. No.: 109335 without stop



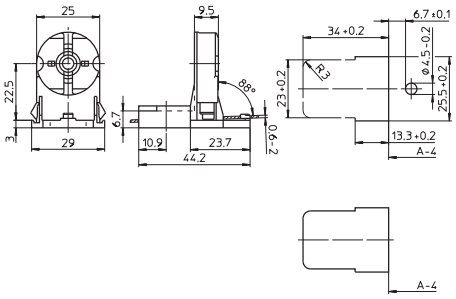
G13 Rotoclic push-through lampholders
for lamps T8, with starter attachment
Lamp axis: 23 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 10.4 g, unit: 500 pcs.
Type: 27800/27801
Ref. No.: 546647 with stop
Ref. No.: 546648 without stop



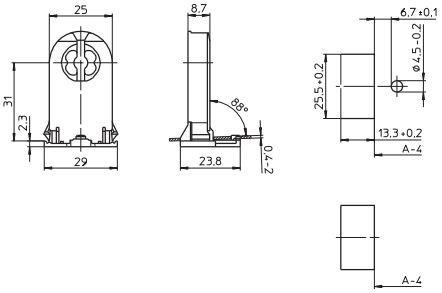
G13 push-through lampholders for lamps T8, T12
Lamp axis: 17 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 5,4 g, unit: 1000 pcs.
Type: 26300/26310
Ref. No.: 551271 with stop
Ref. No.: 551272 without stop



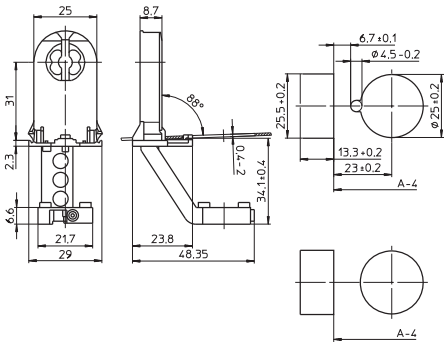
G13 push-through lampholders for lamps T8 and T12
With starter attachment
Lamp axis: 22.5 mm
Casing: PC, white, rotor: PBT, white
T130, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.6–2 mm
Weight: 9.5 g, unit: 500 pcs.
Type: 27820/27821
Ref. No.: 100579 with stop
Ref. No.: 100581 without stop



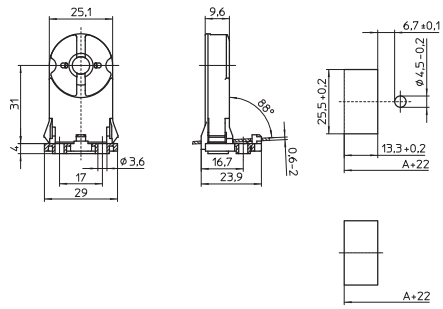
G13 push-through lampholders for lamps T8 and T12
Lamp axis: 31 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 7.8 g, unit: 1000 pcs.
Type: 28500/28501
Ref. No.: 109338 with stop
Ref. No.: 109339 without stop



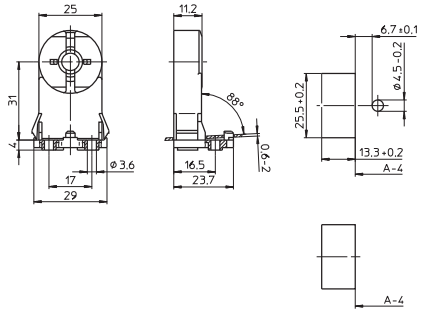
G13 push-through lampholders for lamps T8 and T12
With starter attachment
Lamp axis: 31 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 10.3/10.1 g, unit: 500 pcs.
Type: 28600/28601
Ref. No.: 109340 with stop
Ref. No.: 109341 without stop



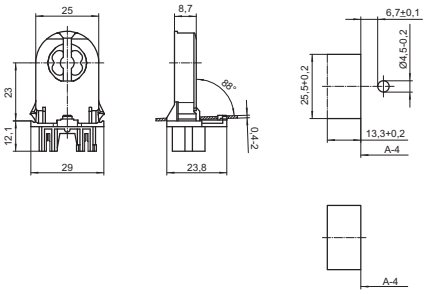
G13 push-through lampholders for lamps T8 and T12
Lamp axis: 31 mm
Casing: PC, white, rotor: PBT GF, white
T130, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.6–2 mm
Weight: 9.6 g, unit: 500 pcs.
Type: 28740/28741
Ref. No.: 542983 with stop
Ref. No.: 542984 without stop



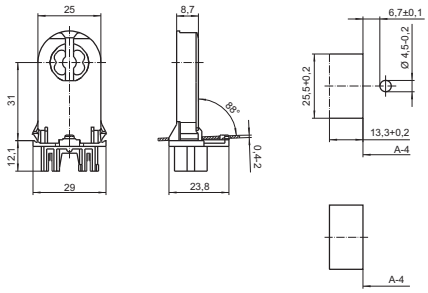
G13 push-through lampholders for lamps T8 and T12
Lamp axis: 31 mm
Casing: PC, white, rotor: PBT, white
T130, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.6–2 mm
Weight: 9.9 g, unit: 1000 pcs.
Type: 28500/28501
Ref. No.: 100591 with stop
Ref. No.: 100593 without stop



G13 push-through lampholders for lamps T8 and T12
For the automatic luminaire wiring
Lamp axis: 23 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 7.7/7.5 g, unit: 1000 pcs.
Type: 27780/27781
Ref. No.: 526019 with stop
Ref. No.: 526020 without stop



G13 push-through lampholders for lamps T8 and T12
For the automatic luminaire wiring
Lamp axis: 31 mm
Casing: PC, white, frontplate: PBT GF, white
T140, nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Lateral fixing clips for wall thickness 0.4–2 mm
Weight: 8.8/8.6 g, unit: 1000 pcs.
Type: 28580/28581
Ref. No.: 526021 with stop
Ref. No.: 526022 without stop



G13 Push-fit Lampholders

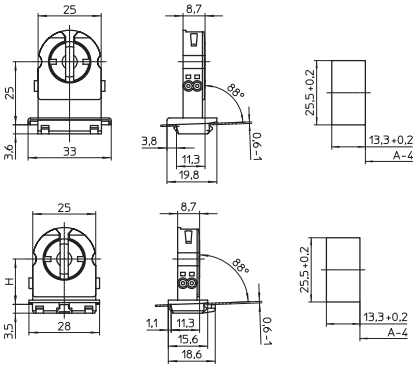
For fluorescent lamps T8 (T26), T12 (T38)

Lampholders with integrated starter holder
are equipped with big rotor and have
push-in twin terminals for the lamp circuit and
push-in terminals for the the starter circuit.
Pin support for reliable contact

Casing: PC, white, frontplate/rotor: PBT GF, white
Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C
T-Marking acc. to IEC
IP50 version: push-fit foot with gasket

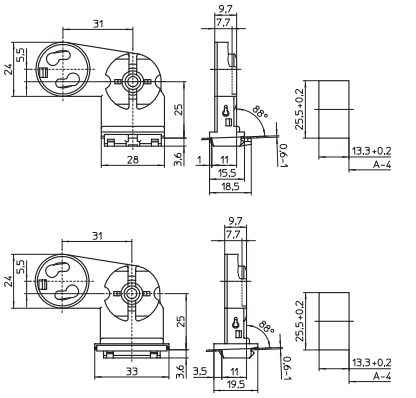
G13 Rotoclic push-fit lampholders for lamps T8 and T12
T140, nominal rating: 2/500, suitable for Top Test
Lateral push-in terminals: 0.5–1 mm²
Push-fit foot for luminaire cut-out 13.3x25.5 mm
with wall thickness 0.6–1 mm
Lampholder foot/luminaire: IP40 (537135: IP50)
Weight: 5.9/5.9/6/6 g, unit: 1000 pcs.
Type: 24100/24110/24170/24150

Ref. No.: 537132 lamp axis H: 25 mm
Ref. No.: 537135 lamp axis H: 25 mm, IP50
Ref. No.: 537150 lamp axis H: 21 mm
Ref. No.: 537144 lamp axis H: 18 mm



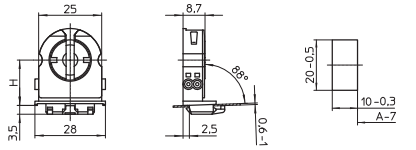
G13 push-fit lampholders with starter attachment
for lamps T8 and T12, lamp axis H: 25 mm
T130, nominal rating: 2/500
Lateral push-in terminals: 0.5–1 mm²
Push-fit foot for luminaire cut-out 13.3x25.5 mm
with wall thickness 0.6–1 mm
Lampholder foot/luminaire: IP40 (100540: IP50)
Weight: 10.4/12 g, unit: 1000/500 pcs.
Type: 27200/27201

Ref. No.: 100536 IP40
Ref. No.: 100540 IP50



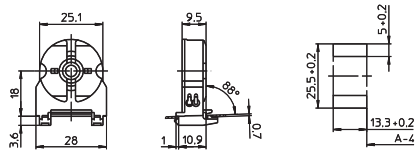
G13 Rotoclic push-fit lampholders for lamps T8 and T12
T140, nominal rating: 2/500, suitable for Top Test
Lateral push-in terminals: 0.5–1 mm²
Push-fit foot for luminaire cut-out 10x20 mm
with wall thickness 0.6–1 mm
Lampholder foot/luminaire: IP40
Weight: 5.7/6 g, unit: 1000 pcs.
Type: 24120/24160

Ref. No.: 537138 lamp axis H: 25 mm
Ref. No.: 537147 lamp axis H: 21 mm

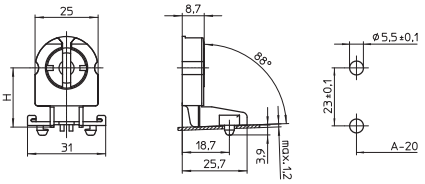


G13 push-fit lampholders for lamps T8
Lamp axis: 18 mm
T130, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Push-fit feet for luminaire cut-out 13.3x25.5 mm
with wall thickness 0.7 mm
Weight: 6 g, unit: 1000 pcs.
Type: 27151

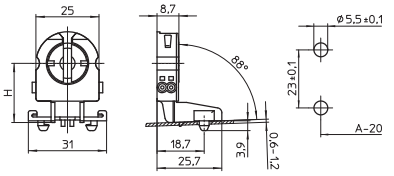
Ref. No.: 100532



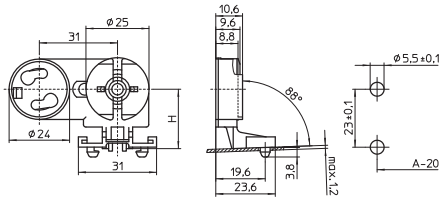
G13 Rotoclic push-fit lampholders for lamps T8
T140, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Base split pins for wall thickness up to 1.2 mm
Lampholder foot/luminaire: IP40
Weight: 5.9/5.7 g, unit: 1000 pcs.
Type: 24360/24350
Ref. No.: 537155 lamp axis H: 30 mm
Ref. No.: 537153 lamp axis H: 23.5 mm

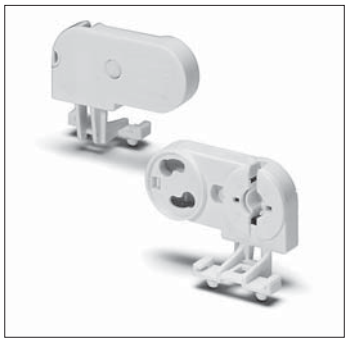


G13 Rotoclic push-fit lampholders for lamps T8
T140, nominal rating: 2/500
Suitable for Top Test
Lateral push-in terminals: 0.5–1 mm²
Base split pins for wall thickness up to 1.2 mm
Lampholder foot/luminaire: IP40
Weight: 6/5.8/5.3 g, unit: 1000 pcs.
Type: 23360/23350/23370
Ref. No.: 537160 lamp axis H: 30 mm
Ref. No.: 537157 lamp axis H: 23.5 mm
Ref. No.: 539128 lamp axis H: 18 mm

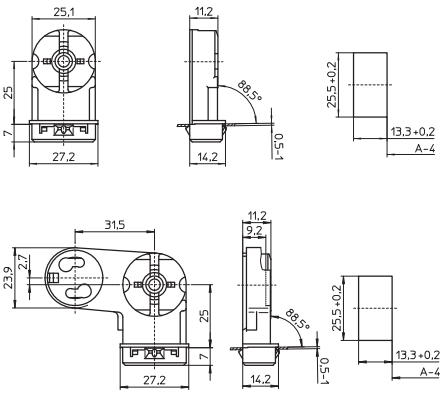


G13 push-fit lampholders with starter attachment for lamps T8
T130, nominal rating: 2/250
Base push-in terminals: 0.5–1 mm²
Base split pins for wall thickness up to 1.2 mm
Lampholder foot/luminaire: IP40
Weight: 9.7/9.5 g, unit: 1000 pcs.
Type: 27460/27450
Ref. No.: 100559 lamp axis H: 30 mm
Ref. No.: 100557 lamp axis H: 23.5 mm

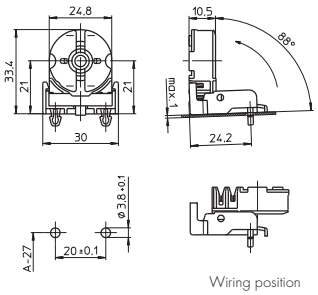




G13 push-fit lampholders for lamps T8 and T12
Lamp axis H: 25 mm
T130, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Push-fit foot for luminaire cut-out 13.3x25.5 mm with wall thickness 0.5–1 mm
Lampholder foot/luminaire: IP40
Weight: 5/11 g, unit: 500 pcs.
Type: 28100/28200
Ref. No.: 100585
Ref. No.: 100588 with starter attachment

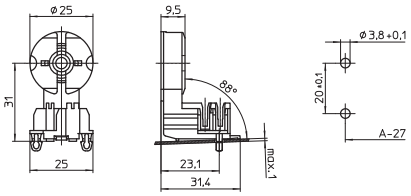


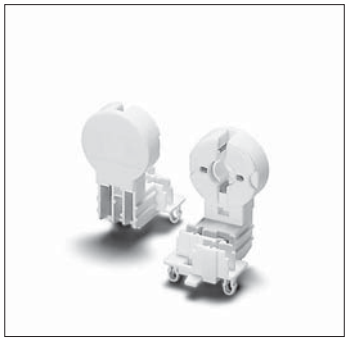
G13 push-fit lampholder for lamps T8
For the automatic luminaire wiring
Lamp axis: 21 mm
T130, nominal rating: 2/250
IDC terminals for leads H05V-U 0.5
Base split pins for wall thickness up to 1 mm
The lampholder is wired in its horizontal position
before being brought into its vertical service position
Weight: 6.7 g, unit: 1000 pcs.
Type: 48230
Ref. No.: 108730



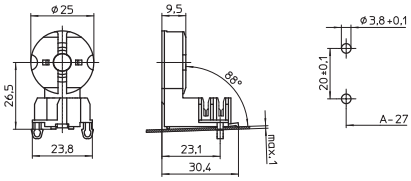
Wiring position

G13 push-fit lampholder for lamps T8
For the automatic luminaire wiring
Lamp axis: 31 mm
T130, nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Base split pins for wall thickness up to 1 mm
Weight: 7.2 g, unit: 1000 pcs.
Type: 28310
Ref. No.: 506007

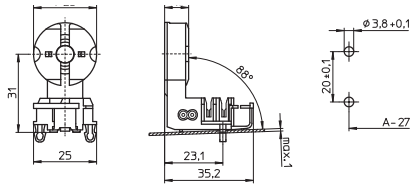




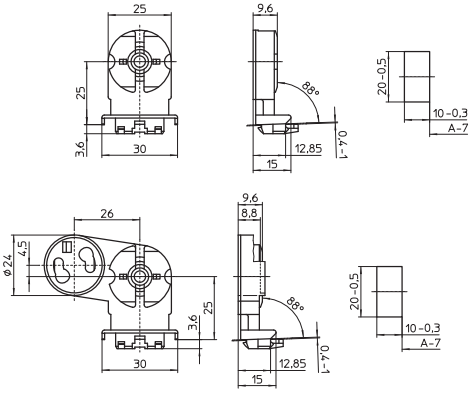
G13 push-fit lampholder for lamps T8
For the automatic luminaire wiring
Lamp axis: 26.5 mm
T130, nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Base split pins for wall thickness up to 1 mm
Weight: 7.1 g, unit: 1000 pcs.
Type: 28315
Ref. No.: 504202



G13 push-fit lampholder for lamps T8
For the automatic luminaire wiring
Lamp axis: 31 mm
T130, nominal rating: 2/500
IDC terminals for leads H05V-U 0.5
Lateral push-in twin terminals: 0.5–1 mm²
Base split pins for wall thickness up to 1 mm
Front cable holder for up to 3 individual conductors
Weight: 8 g, unit: 1000 pcs.
Type: 28330
Ref. No.: 508423



G13 push-fit lampholders
Lamp axis: 25 mm
T130, nominal rating: 5/500
Lateral and base push-in terminals: 0.5–1 mm²
Push-fit foot for luminaire cut-out 10×20 mm
for wall thickness 0.4–1 mm
Weight: 6/8.5 g, unit: 500 pcs.
Type: 28921/28920
Ref. No.: 108438 for lamps T8 and T12
Ref. No.: 108437 for lamps T8
with starter attachment

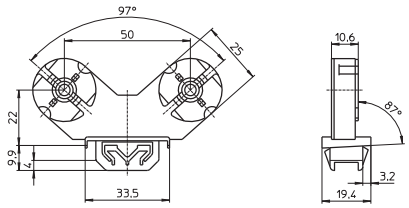


G13 Push-fit Twin Lampholders, Accessories

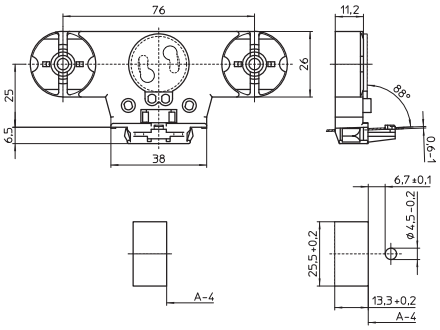
For fluorescent lamps T8 (T26), T12 (T38)

Casing: PC, white, rotor: PBT GF, white
Pin support for reliable contact
Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C

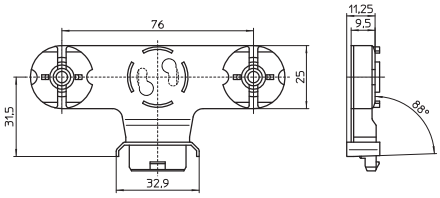
G13 twin lampholder for lamps T8
Lamp axis: 22 mm
Distance between two lamp axes: 50 mm
T130, nominal rating: 2/500
Base wiring
Push-in terminals: 0.5–1 mm²
Push-fit foot for wall thickness 1 mm
Weight: 14 g, unit: 400 pcs.
Type: 22900
Ref. No.: 108984



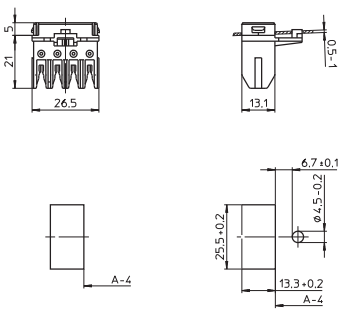
G13 twin lampholders for lamps T8 and T12
Lamp axis: 25 mm
Distance between two lamp axes: 76 mm
T130, nominal rating: 2/500
Base push-in twin terminals: 0.5–1 mm² (lamp circuit)
Base push-in terminals: 0.5–1 mm² (starter circuit)
Push-fit foot for wall thickness 0.6–1 mm
Weight: 21 g, unit: 200/500 pcs.
Type: 22604/22602 without starter attachment
Ref. No.: 108816 with stop
Ref. No.: 100487 without stop
Type: 22600/22601 with starter attachment
Ref. No.: 100484 with stop
Ref. No.: 100486 without stop



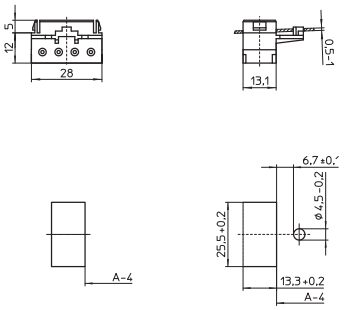
G13 twin lampholders for lamps T8 and T12
Lamp axis: 31.5 mm
Distance between two lamp axes: 76 mm
T130, nominal rating: 2/500
For wiring inserts 108777/108778
and 545261/545262
Weight: 17 g, unit: 250 pcs.
Type: 22800/22801
Ref. No.: 108773 with starter attachment
Ref. No.: 108775 without starter attachment



Wiring inserts with push-fit foot
For G13 twin lampholders 108773/108775
Material: PC, white
Push-in terminals: 0.5 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Weight: 5.3 g, unit: 500 pcs.
Type: 22850/22851
Ref. No.: 108777 with stop
Ref. No.: 108778 without stop



Wiring inserts with push-fit foot
For G13 twin lampholders 108773/108775
Material: PC, white
Push-in terminals: 0.5–1 mm²
Weight: 4.4 g, unit: 500 pcs.
Type: 22860/22861
Ref. No.: 545261 with stop
Ref. No.: 545262 without stop



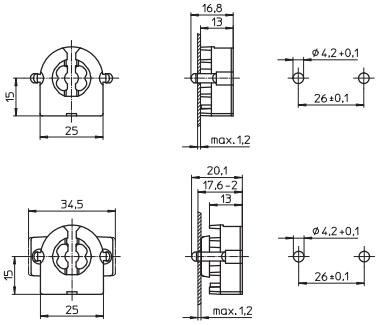
G13 Built-in Lampholders

For fluorescent lamps T8 (T26), T12 (T38)

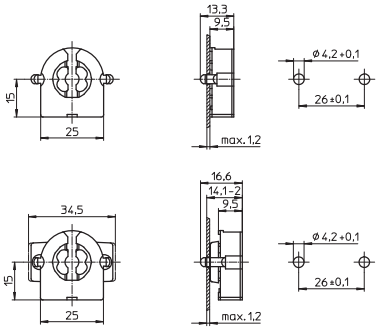
Lampholders with integrated starter holder
are equipped with big rotor and have
push-in twin terminals for the lamp circuit and
push-in terminals for the the starter circuit.
Pin support for reliable contact
(except for type 485)

Casing: PC, white, frontplate/rotor: PBT GF, white
Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C
T-Marking acc. to IEC

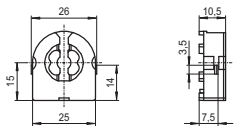
G13 built-in lampholders for lamps T8 and T12
Lampholder thickness: 13 mm
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 4.6/5.4 g, unit: 1000 pcs.
Type: 47105/47106
Ref. No.: 509152
Ref. No.: 509154 with spring adjustment



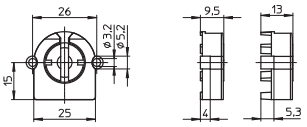
G13 built-in lampholders for lamps T8 and T12
Lampholder thickness: 9.5 mm
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 4.4/5.1 g, unit: 1000 pcs.
Type: 47505/47506
Ref. No.: 509162
Ref. No.: 509164 with spring adjustment



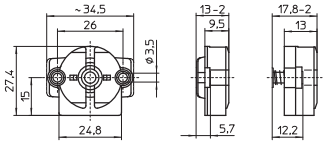
G13 built-in lampholder for lamps T8 and T12
Lampholder thickness: 10.5 mm
T140, nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Weight: 4.6 g, unit: 1000 pcs.
Type: 47304
Ref. No.: 509156



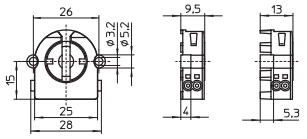
G13 Rotoclic built-in lampholders for lamps T8 and T12
T140, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Fixing holes Ø 3.2 mm
Weight: 5 g, unit: 1000 pcs.
Type: 49100/49500
Ref. No.: 537165 lampholder thickness: 13 mm
Ref. No.: 537173 lampholder thickness: 9.5 mm



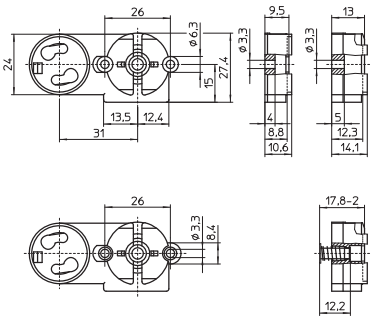
G13 built-in lampholders with spring adjustment
for lamps T8 and T12
T130, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Fixing holes for screws M3
Weight: 6/5.5 g, unit: 1000 pcs.
Type: 47102/47502
Ref. No.: 101681 lampholder thickness: 13 mm
Ref. No.: 101740 lampholder thickness: 9.5 mm



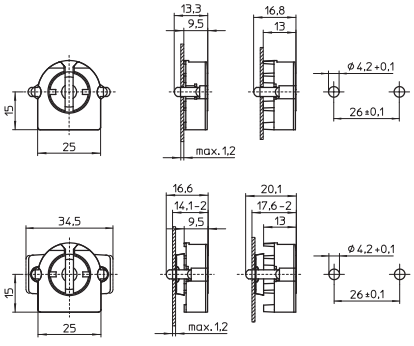
G13 Rotoclic built-in lampholders for lamps T8 and T12
T140, nominal rating: 2/500
Lateral push-in terminals: 0.5–1 mm²
Suitable for Top Test
Fixing holes Ø 3.2 mm
Weight: 5/4.7 g, unit: 1000 pcs.
Type: 59100/59500
Ref. No.: 537181 lampholder thickness: 13 mm
Ref. No.: 537205 lampholder thickness: 9.5 mm



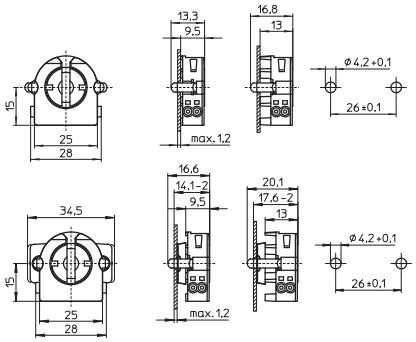
G13 built-in lampholders with starter attachment
for lamps T8 and T12
T130, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Fixing holes for screws M3
Weight: 8.7/10.3/8 g, unit: 1000 pcs.
Type: 47200/47402 lampholder thickness: 13 mm
Ref. No.: 101706
Ref. No.: 101708 with spring adjustment
Type: 47600 lampholder thickness: 9,5 mm
Ref. No.: 101765



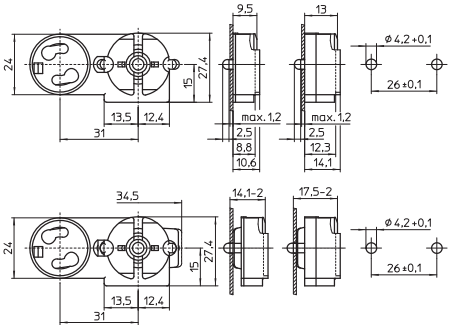
G13 Rotoclic built-in lampholders for lamps T8 and T12
T140, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 5.1/5.9/5/5.5 g, unit: 1000 pcs.
Type: 49105/49106 lampholder thickness: 13 mm
Ref. No.: 537166
Ref. No.: 537167 with spring adjustment
Type: 49505/49506 lampholder thickness: 9.5 mm
Ref. No.: 537174
Ref. No.: 537175 with spring adjustment

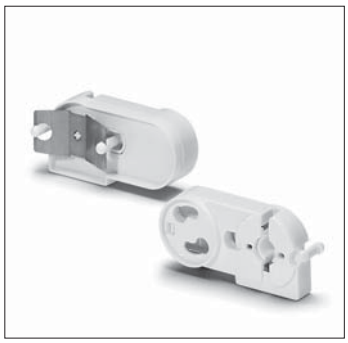


G13 Rotoclic built-in lampholders for lamps T8 and T12
T140, nominal rating: 2/500
Lateral push-in terminals: 0.5–1 mm², suitable for Top Test
Rear split pins for wall thickness up to 1.2 mm
Weight: 5.1/5.9/5/5.5 g, unit: 1000 pcs.
Type: 59105/59106 lampholder thickness: 13 mm
Ref. No.: 537182
Ref. No.: 537183 with spring adjustment
Type: 59505/59506 lampholder thickness: 9.5 mm
Ref. No.: 537206
Ref. No.: 537207 with spring adjustment

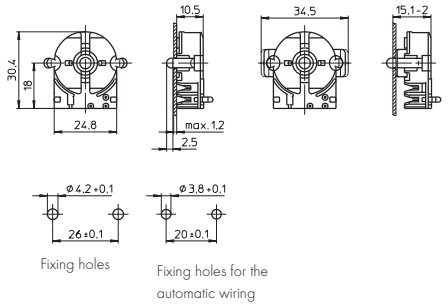


G13 built-in lampholders with starter attachment
for lamps T8 and T12, T130, nominal rating: 2/500
Base push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 9/9.5/8/8.5 g, unit: 1000 pcs.
Type: 47205/47206 lampholder thickness: 13 mm
Ref. No.: 101712
Ref. No.: 101716 with spring adjustment
Type: 47605/47606 lampholder thickness: 9.5 mm
Ref. No.: 101769
Ref. No.: 101773 with spring adjustment

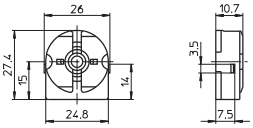




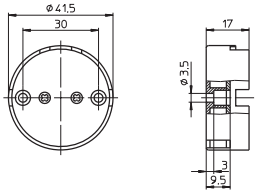
G13 built-in lampholders for lamps T8
For the automatic luminaire wiring
T130
Nominal rating: 2/500, lampholder thickness:
10.5 mm, IDC terminals for leads H05V-U 0.5
Rear split pins for wall thickness up to 1.2 mm
Weight: 5/5.5 g, unit: 1000 pcs.
Type: 48205/48206
Ref. No.: 507133
Ref. No.: 507134 with spring adjustment



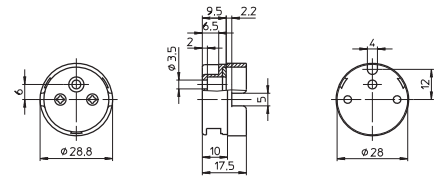
G13 built-in lampholder for lamps T8 and T12
Lampholder thickness: 10.7 mm
T130
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lateral fixing clips
Weight: 4.7 g, unit: 1000 pcs.
Type: 47504
Ref. No.: 101745



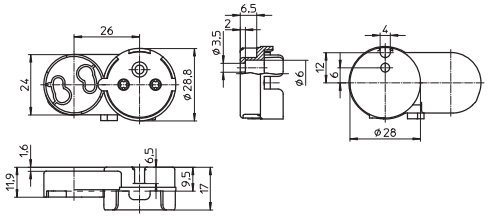
G13 lampholder
For push-fitting onto lamps T12
Lampholder thickness: 9.5 mm
Casing: PC, white, T110
Front cover plate: PBT GF, white
Nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Fixing holes for screws M3
Weight: 10.5 g, unit: 1000 pcs.
Type: 47700
Ref. No.: 101781



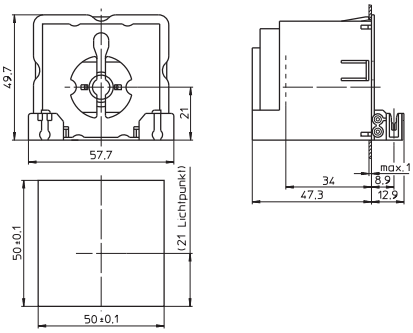
G13 lampholder
For push-fitting onto lamps T8
Lampholder thickness: 9.5 mm
Casing: PC, white, T110
Front cover plate: PBT GF, white
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Fixing hole for screw M3
Weight: 5.3 g, unit: 1000 pcs.
Type: 47900
Ref. No.: 101784

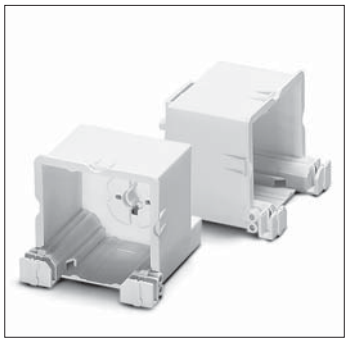


G13 lampholder with starter attachment
For push-fitting onto lamps T8
Lampholder thickness: 9.5 mm
Casing: PC, white, T110
Front cover plate: PBT GF, white
Nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Fixing hole for screw M3
Weight: 8.1 g, unit: 1000 pcs.
Type: 47920
Ref. No.: 101785

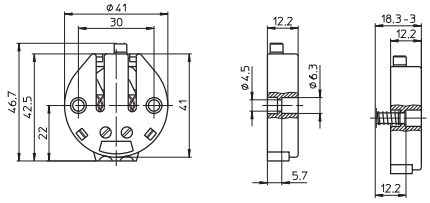


Endbox with integrated G13 lampholder
for lamps T8 and T12
For recessed luminaires in modular ceilings
T130, nominal rating: 2/500
Push-in terminals: 0.5–0.75 mm², single-core
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Clip fixing for wall thickness up to 1 mm
Weight: 20.8 g, unit: 200 pcs.
Type: 48300
Ref. No.: 109487

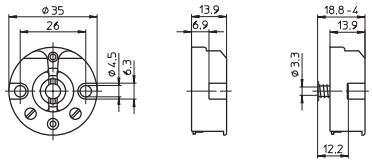




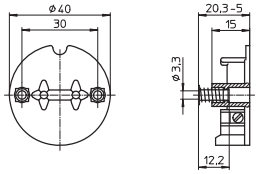
G13 built-in lampholder with lamp lock
for lamps T8 and T12
Contacts on both sides
Casing: PBT GF, white, T130, nominal rating: 2/500
Screw terminals: 0.5–2.5 mm²
Fixing holes for screws M3
Weight: 12.9/18 g, unit: 500 pcs.
Type: 46100/46101
Ref. No.: 101643
Ref. No.: 101647 with spring adjustment



G13 built-in lampholders for lamps T8 and T12
Casing: PC, white, T110
Nominal rating: 2/500
Screw terminals: 0.5–2.5 mm²
Fixing holes for screws M3
5 rotation stops
Weight: 9/10.6 g, unit: 1000 pcs.
Type: 48500/48501
Ref. No.: 101787
Ref. No.: 101789 with spring adjustment



G13 built-in lampholder with spring adjustment
for lamps T8 and T12
Contacts on both sides
Casing: PBT GF, white, T130
Nominal rating: 2/500
Screw terminals: 0.5–2.5 mm²
Fixing holes for screws M3
Front lamp insertion
Weight: 14 g, unit: 500 pcs.
Type: 49401
Ref. No.: 101812

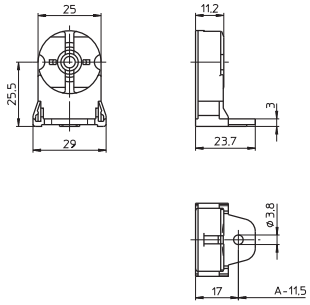


G13 Surface-mounted Lampholders

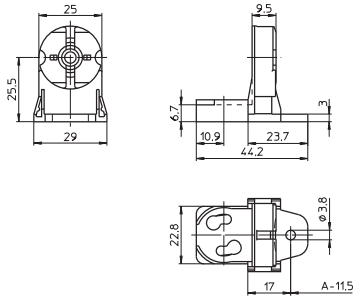
For fluorescent lamps T8 (T26), T12 (T38)

Pin support for reliable contact
(except for type 485)
Max. permitted temperature T_m
on the rear side of the lampholder: 110 °C

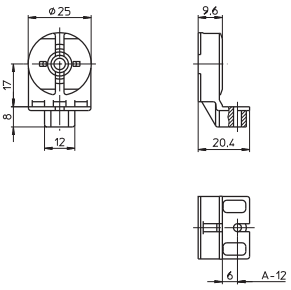
G13 surface-mounted lampholder for lamps T8 and T12
Lamp axis: 25.5 mm
Casing: PC, white, rotor: PBT GF, white, T130
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Fixing hole: Ø 3.8 mm
Weight: 7.2 g, unit: 500 pcs.
Type: 27722
Ref. No.: 100572



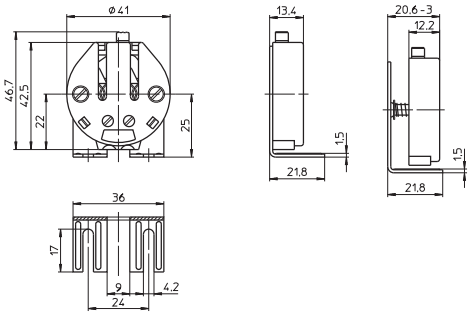
G13 surface-mounted lampholder with starter attachment
for lamps T8 and T12
Lamp axis: 25.5 mm
Casing: PC, white, rotor: PBT GF, white, T130
Nominal rating: 2/500
Push-in twin terminals: 0.5–1 mm²
Fixing hole: Ø 3.8 mm
Weight: 9.5 g, unit: 500 pcs.
Type: 27822
Ref. No.: 100583



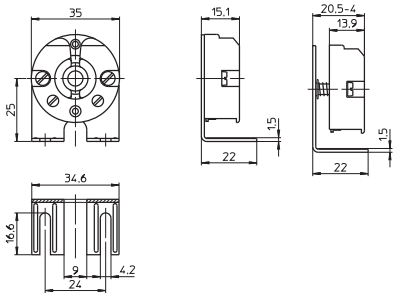
G13 surface-mounted lampholder for lamps T8
Lamp axis: 17 mm
Casing: PC, white, rotor: PBT GF, white, T130
Nominal rating: 2/250
Push-in twin terminals: 0.5–1 mm²
Fixing hole for self-tapping screw
acc. to ISO 1481/7049-ST3.5-C/F
Weight: 5.4 g, unit: 1000 pcs.
Type: 27356
Ref. No.: 100551

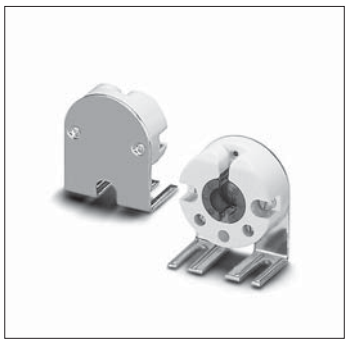


G13 surface-mounted lampholders with lamp lock
for lamps T8 and T12, lamp axis: 25 mm
Contacts on both sides
Casing: PBT GF, white, T130
Screw terminals: 0.5–2.5 mm², nominal rating: 2/500
Bracket: zinc-coated polished steel
Fixing slots for screws M4
Weight: 35/36 g, unit: 500 pcs.
Type: 46102/46103
Ref. No.: 101651
Ref. No.: 101655 with spring adjustment



G13 surface-mounted lampholders
for lamps T8 and T12
Lamp axis: 25 mm, casing: PC, white, T110
Screw terminals: 0.5–2.5 mm², nominal rating: 2/500
Bracket: zinc-coated polished steel
Fixing slots for screws M4
5 rotation stops
Weight: 26/28.1 g, unit: 500 pcs.
Type: 48502/48503
Ref. No.: 101791
Ref. No.: 101793 with spring adjustment



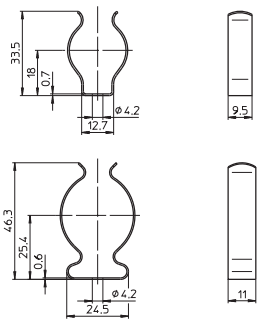


Accessories

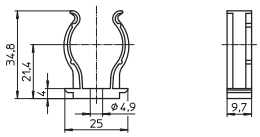
For lampholders for fluorescent lamps T8 (T26), T12 (T38)

The luminaire manufacturer is responsible for
the right choice of accessories.

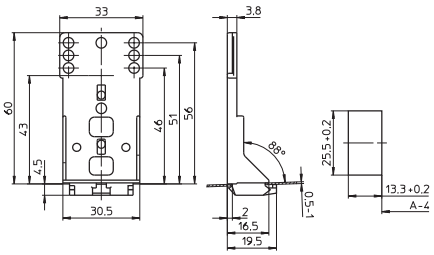
Lamp supports
Fixing hole for screw M4
Weight: 4.3/6.8 g, unit: 500 pcs.
Type: 20400 for lamps T8
Ref. No.: 100442 material: zinc-coated
polished steel
Type: 20401 for lamps T12
Ref. No.: 100444 material: CrNi-steel



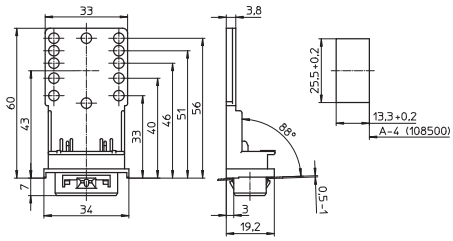
Lamp supports for lamps T8
Material: PC, crystal-clear
Fixing hole for screw M4
Weight: 2 g, unit: 1000 pcs.
Type: 20501
Ref. No.: 100448

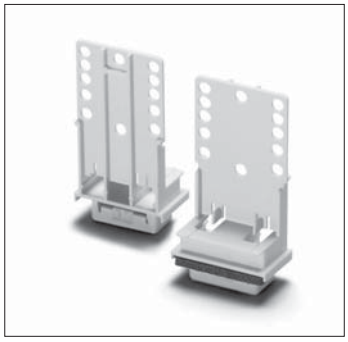


Push-fit bracket
For G13 built-in lampholder 537174, 537206
(see p. 218–219) and starter holder 101627
and 109792 (see p. 235–236), material: PC, white
Lamp axis optional: 46/51/56 mm
or 43 mm (lateral lamp insertion)
Push-fit foot for wall thickness 0.5–1 mm
Option for lateral or base wiring
Weight: 5.3 g, unit: 1000 pcs.
Type: 97532
Ref. No.: 105843

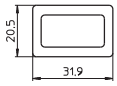


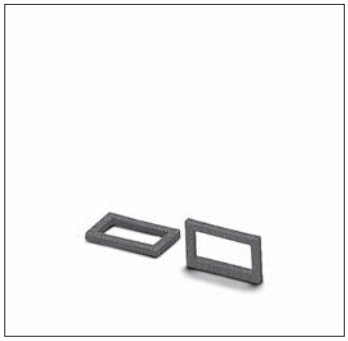
Push-fit bracket
For G13 built-in lampholder 537181, 537166, 537174
(see p. 218), 537206 and 507133 (see p. 219)
Material: PC, grey
Lamp axis optional: 33/40/46/51/56
or 43 mm (lateral lamp insertion)
Push-fit foot for wall thickness 0.5–1 mm
Weight: 6 g, unit: 1000 pcs.
Type: 97044
Ref. No.: 108780



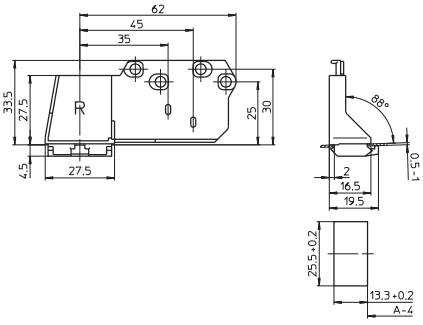


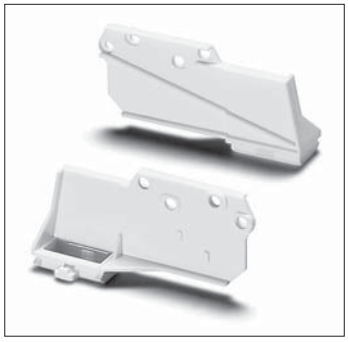
Foot gasket for degree of protection IP50
For push-fit bracket 108780
Material: EPDM, black
Weight: 0.7 g
Type: 98003
Ref. No.: 108266



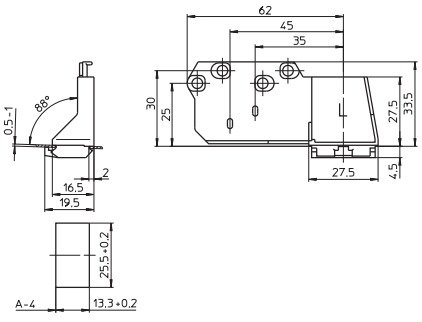


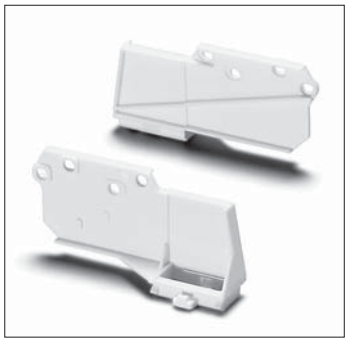
Push-fit bracket, right
For G13 built-in lampholders 101769, 537174
and 537206 (see p. 218–219)
Material: PC, white
Lamp axis optional: 25/45 mm, distance
between two lamp axes optional: 30/35 mm
Push-fit foot for wall thickness 0.5–1 mm
Option for lateral or base wiring
Weight: 6.6 g, unit: 1000 pcs.
Type: 97533
Ref. No.: 105845



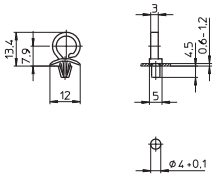


Push-fit bracket, left
For G13 built-in lampholders 537174, 537206
(see p. 218–219)
Material: PC, white
Lamp axis optional: 25/45 mm, distance
between two lamp axes optional: 30/35 mm
Push-fit foot for wall thickness 0.5–1 mm
Option for lateral or base wiring
Weight: 6.7 g, unit: 1000 pcs.
Type: 97534
Ref. No.: 105847

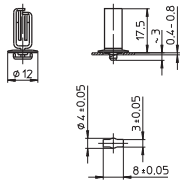




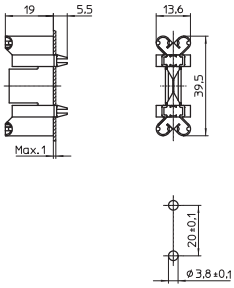
Cable holder
Material: PA, white
Push-fit foot for cut-out Ø 4 mm
for wall thickness 0.6–1.2 mm
Weight: 0.2 g, unit: 5000 pcs.
Type: 97147
Ref. No.: 109086



Cable holder
For the automatic luminaire wiring
and manual wiring
Material: PC, white
Degree of protection IP50
Weight: 0.5 g, unit: 5000 pcs.
Type: 97117
Ref. No.: 108845



Cable holder
For the automatic luminaire wiring
and manual wiring
Material: PA, white
Weight: 2.1 g, unit: 7500 pcs.
Type: 0607
Ref. No.: 159968



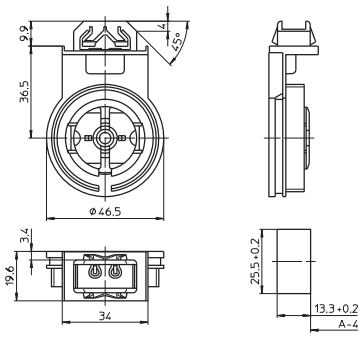
G13 Lampholders, Degree of Protection IP54

For fluorescent lamps T8 (T26), T12 (T38)
For luminaires of protection class I and II

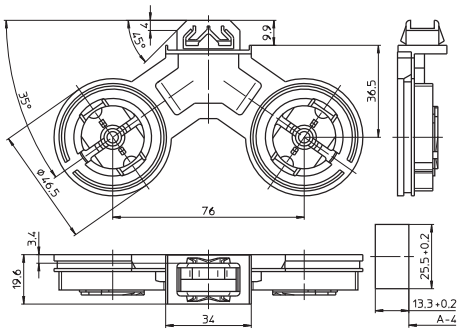
Lampholders protected against dust and splashing water (IP54)
To convert luminaires from IP20 to IP54
Pin support for reliable contact
With spring adjustment

Max. permitted temperature T_m on the rear side of the lampholder: 110 °C

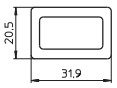
G13 push-fit lampholder for lamps T8/T12
Casing: PC, white, interior part: PBT GF, white
Rotor: PBT GF, white, T140
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Fixing clips for wall thickness 0.7 mm
Screw rings see page 229
Weight: 17.1 g, unit: 500 pcs.
Type: 84171 system 161
Ref. No.: 107957

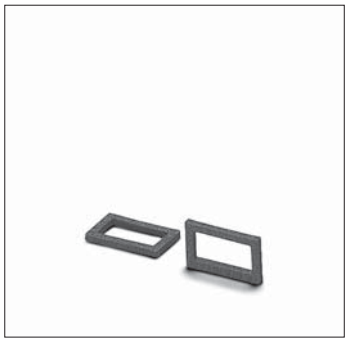


G13 push-fit twin lampholder for lamps T8/T12
Casing: PC, white, interior part: PBT GF, white
Rotor: PBT GF, white, T140
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Fixing clips for wall thickness 0.7 mm
Screw rings see page 229
Weight: 33.6 g, unit: 250 pcs.
Type: 84173 system 162
Ref. No.: 107959



Food gasket for degree of protection IP54
For lampholder systems 161, 162
Material: EPDM, black
Weight: 0.7 g
Type: 98003
Ref. No.: 108266





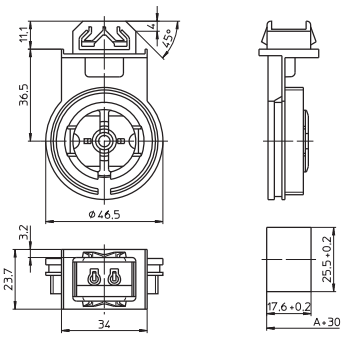
G13 Lampholders, Degree of Protection IP65/IP67

For fluorescent lamps T8 (T26), T12 (T38)
For luminaires of protection class I and II

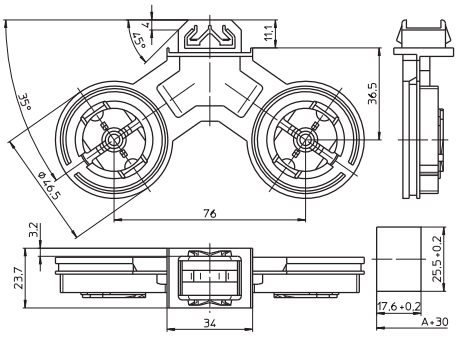
Lampholders protected against dust and jet of water (IP65)
Dust and watertight lampholders (IP67)
Pin support for reliable contact with spring adjustment

Max. permitted temperature T_m on the rear side of the lampholder: 110 °C

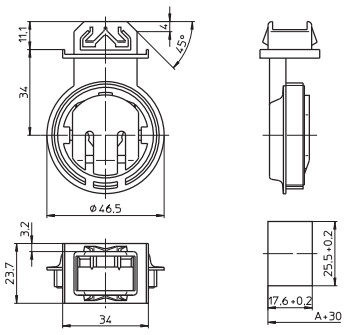
G13 push-fit lampholders for lamps T8/T12
Casing: PC, interior part: PBT GF
Rotor: PBT GF, white, T140
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Fixing clips for wall thickness 1.4–2 mm
Screw rings see page 229
Weight: 17.3 g, unit: 500 pcs.
Type: 84172 system 163
Ref. No.: 107958 casing white
Ref. No.: 108666 casing grey



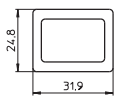
G13 push-fit twin lampholders for lamps T8/T12
Casing: PC, interior part: PBT GF
Rotor: PBT GF, white, T140
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Fixing clips for wall thickness 1.4–2 mm
Screw rings see page 229
Weight: 34.2 g, unit: 250 pcs.
Type: 84174 system 164
Ref. No.: 107960 casing white
Ref. No.: 108669 casing grey

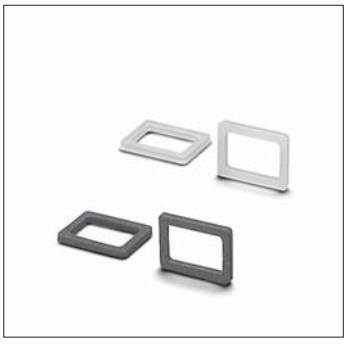


G13 push-fit lampholders for lamps T8/T12
Casing: PC, interior part: PBT GF, T140
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Fixing clips for wall thickness 1.4–2 mm
With slot insertion
Screw rings see page 229
Weight: 14.5 g, unit: 250 pcs.
Type: 84175 system 165
Ref. No.: 108608 casing white
Ref. No.: 108614 casing grey

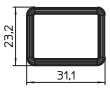


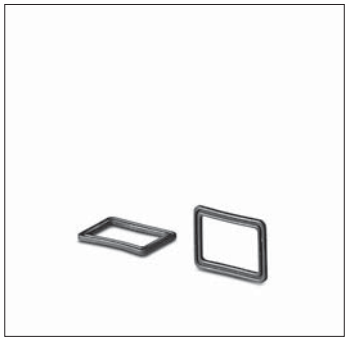
Foot gaskets
For lampholder systems 163, 164, 165
Weight: 1/1.1 g
For degree of protection IP65
Material: cellular rubber
Type: 98004
Ref. No.: 108267
For degree of protection IP67
Material: silicone, transparent
Type: 98011
Ref. No.: 504078



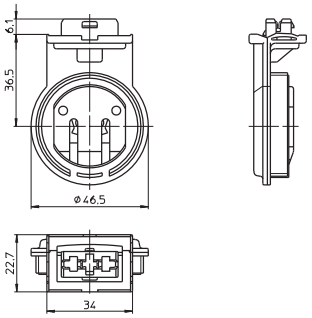


Profiled foot gasket
For degree of protection IP67
For lampholder systems 163, 164, 165
Material: EPDM, black
Weight: 1.1 g, unit: 1000 pcs.
Type: 98008
Ref. No.: 546254

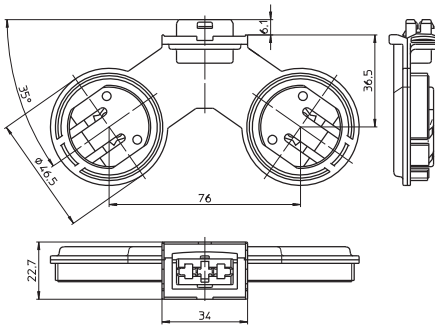




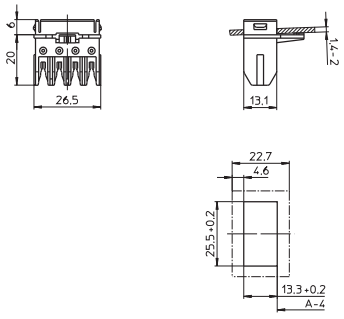
G13 lampholder for lamps T8/T12
Casing: PC, interior part: PBT GF, T140
Nominal rating: 2/500
With slot insertion
For wiring insert 108819
Screw rings see page 229
Weight: 15.1 g, unit: 500 pcs.
Type: 84180 system 167
Ref. No.: 108948 casing white



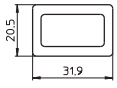
G13 twin lampholder for lamps T8/T12
Casing: PC, interior part: PBT GF, T140
Nominal rating: 2/500
With slot insertion
For wiring insert 108819
Screw rings see page 229
Weight: 30.6 g, unit: 250 pcs.
Type: 84181 system 168
Ref. No.: 108994 casing white

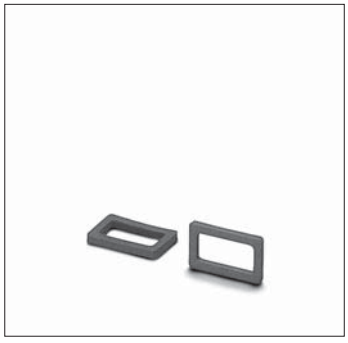


Wiring insert with push-fit foot
For lampholder systems 167, 168
Material: PC, grey
Push-in terminals: 0.5 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Push-fit foot for wall thickness 1.4–2 mm
Weight: 5.1 g, unit: 500 pcs.
Type: 22852
Ref. No.: 108819

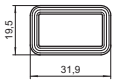


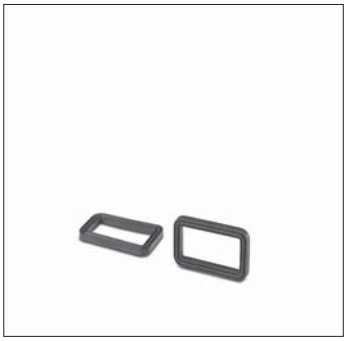
Foot gasket for degree of protection IP67
For lampholder systems 167, 168
Material: PE foam
Weight: 0.5 g
Type: 98002
Ref. No.: 108947



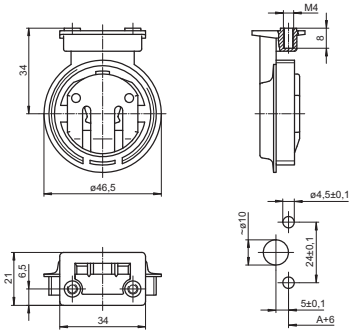


Foot gasket, profiled shape
For degree of protection IP67
For lampholder systems 167, 168
Material: EPDM, black
Weight: 0.7 g, unit: 1000 pcs.
Type: 98087
Ref. No.: 503773

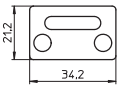


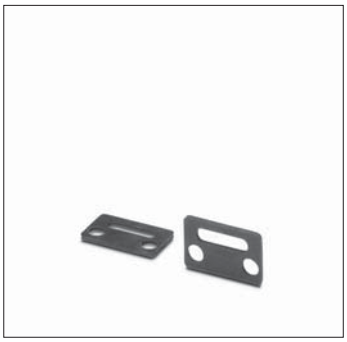


G13 lampholder for lamps T8/T12
Casing: PC, white, interior part: PBT GF, T140
Nominal rating: 2/500
Screw fixing foot with tapped holes M4
Screw rings see page 229
With slot insertion
Weight: 14 g, unit: 250 pcs.
Type: 84105 system 152
Ref. No.: 521123



Foot gasket for degree of protection IP65/IP67
For lampholder system 152
Material: EPDM, black
Weight: 1.4 g, unit: 1000 pcs.
Type: 98085
Ref. No.: 106094

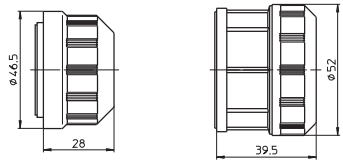




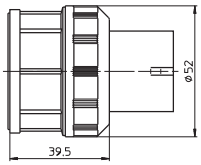
Screw Rings for G13 Lampholders, Degree of Protection IP54, IP65, IP67

For lampholder systems 152, 161, 162, 163, 164, 165, 167, 168

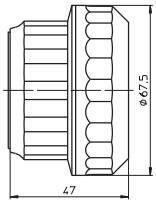
Screw rings
Ring: PBT GF, gasket: silicone
Weight: 17/20 g, unit: 500/250 pcs.
Type: 84122 for lamps T8
Ref. No.: 103710 white
Ref. No.: 103709 grey
Type: 84123 for lamps T12 or
for lamps T8 with protection tube Ø 38 mm
Ref. No.: 103712 white
Ref. No.: 103711 grey

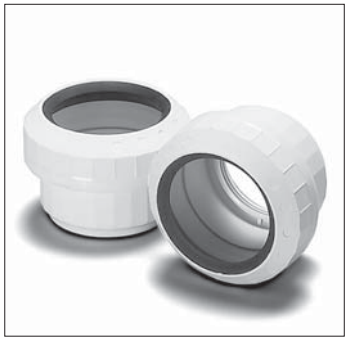


Screw rings with heat dissipator
For lamps T8 with
plastic protection tube Ø 38 mm
Ring: PBT GF
Gasket: silicone, shell: aluminium
Weight: 40 g, unit: 250 pcs.
Type: 84154
Ref. No.: 103744 white
Ref. No.: 103743 grey



Screw rings
For protection tube Ø 50 mm
Ring: PBT GF
Gasket: EPDM
Weight: 43.8 g, unit: 125 pcs.
Type: 84159 not suitable for system 152
Ref. No.: 103750 white
Ref. No.: 103749 grey

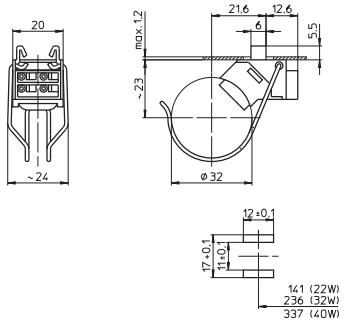




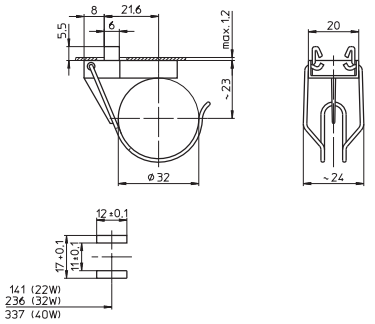
G10q Lampholders, Accessories

For fluorescent lamps T-R

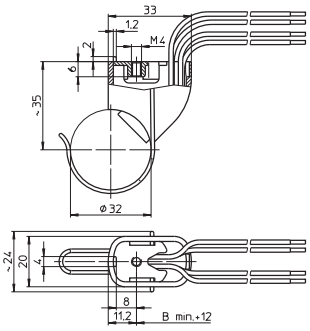
G10q push-fit lampholder
Casing: PC, white, T110
Spring bracket Ø 32 mm: CrNi-steel
Nominal rating: 2/500
Push-in terminals: 0.5–1 mm²
Lamp axis: 23 mm
Push-fit foot for wall thickness up to 1.2 mm
Weight: 8.4 g, unit: 500 pcs.
Type: 40100
Ref. No.: 101528



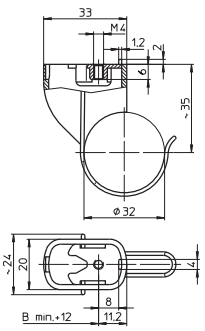
Lamp support for T-R lamps
For lampholder 101528
Material: PC, white
Spring bracket Ø 32 mm: CrNi-steel
Lamp axis: 23 mm
Push-fit foot for wall thickness up to 1.2 mm
Weight: 4.4 g, unit: 500 pcs.
Type: 40150
Ref. No.: 101532



G10q surface-mounted lampholder
Casing: PC, white, T110
Spring bracket Ø 32 mm: CrNi-steel
Nominal rating: 2/250
Connection leads: H05V2-U 1X0.75,
max. 105 °C, length: 270 mm
Lamp axis: 35 mm
Fixing plates with tapped holes M4
Weight: 25 g, unit: 250 pcs.
Type: 58016
Ref. No.: 102409



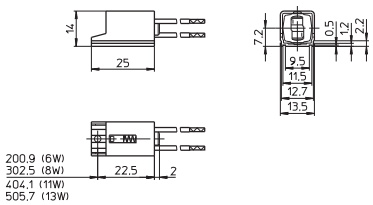
Lamp support for T-R lamps
For lampholder 102409
Material: PC, white
Spring bracket Ø 32 mm: CrNi-steel
Lamp axis: 35 mm
Fixing plates with tapped holes M4
Weight: 8 g, unit: 500 pcs.
Type: 58001
Ref. No.: 102407



W4.3 x 8.5d Surface-mounted Lampholder

For fluorescent lamps T2 (T7)

W4.3 x 8.5d surface-mounted lampholder
Casing: PC, white, T110
Nominal rating: 2/250
Leads: H05V-K 1X0.5 max. 90 °C,
length: 450 mm, ferrules on bare end of core
Fixing hole: Ø 2.6 mm
Spring-mounted insert for reliable contact
Weight: 10.3 g, unit: 500 pcs.
Type: 09000
Ref. No.: 107536



OPTIMUM START WITH COMPONENTS MADE BY VS

STARTER HOLDERS AND TERMINAL BLOCKS, ACCESSORIES

Vossloh-Schwabe provides a comprehensive range of miscellaneous accessories for operating fluorescent lamps.

Starter holders
Starters are needed for lamp circuits operated with electromagnetic ballasts. VS provides a number of starter holders with various designs for this purpose. Almost all starter holders are made of polycarbonate and qualify for a T110 temperature rating.

Terminal blocks
Furthermore, Vossloh-Schwabe's product range also includes connection terminals, some of which feature the VDE-approved IDC method in addition to the well-known and installation-friendly push-in connectors. The connection terminals therefore make it possible to automate luminaire wiring and thus wire up several terminals using a single cable.

The range is rounded off by built-in rocker switches.

3 Starter Holders and Terminal Blocks, Accessories

Starter holders, accessories **234–237**

Terminal blocks, accessories **238–242**

Built-in rocker switches **242**

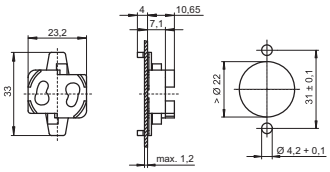
Technical details for fluorescent lamps **243–271**
General technical details 394–401
Glossary 402–404

Starter Holders, Accessories

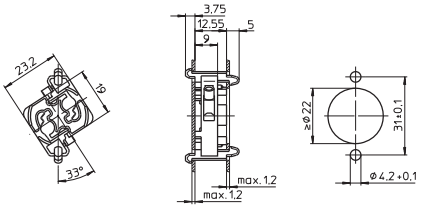
For starters acc. to DIN VDE 0712 part 101, IEC 60155

Starter holders with central studs, suitable for luminaires of protection class II, are available on request.

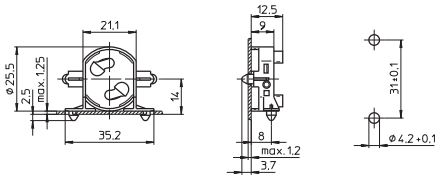
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Weight: 2.1 g, unit: 1000 pcs.
Type: 02113
Ref. No.: 535131



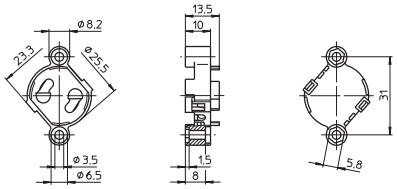
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm², single-core
Front and rear split pins for wall thickness up to 1.2 mm
Rear of starter holder/luminaire: IP40
Weight: 2.8 g, unit: 1000 pcs.
Type: 02110
Ref. No.: 109784



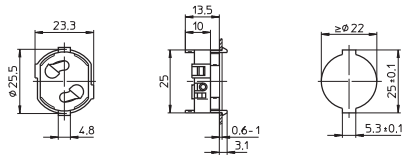
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Lateral split pins for wall thickness up to 1.25 mm
Rear of starter holder/luminaire: IP40
Weight: 3.7 g, unit: 1000 pcs.
Type: 02120
Ref. No.: 100064



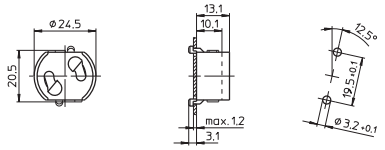
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Fixing holes for screws M3
Weight: 3.8 g, unit: 1000 pcs.
Type: 02150
Ref. No.: 100069



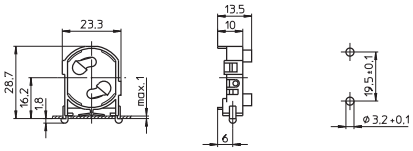
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Front split pins, flat
for wall thickness 0.6–1 mm
Weight: 3.1 g, unit: 1000 pcs.
Type: 02170
Ref. No.: 106818



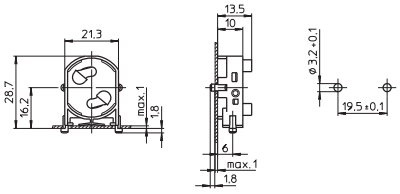
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Rear split pins for wall thickness up to 1.2 mm
Rear of starter holder/luminaire: IP40
Weight: 3.3 g, unit: 1000 pcs.
Type: 43000
Ref. No.: 101627



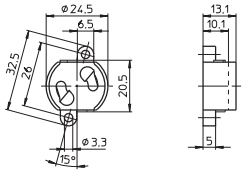
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Lateral split pins for wall thickness up to 1 mm
Rear of starter holder/luminaire: IP40
Weight: 3.4 g, unit: 1000 pcs.
Type: 43010
Ref. No.: 101629



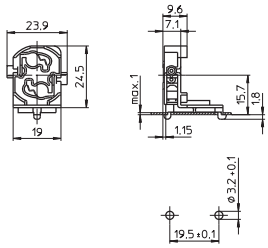
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Rear and lateral split pins
for wall thickness up to 1 mm
Rear of starter holder/luminaire: IP40
Weight: 3.5 g, unit: 1000 pcs.
Type: 43020
Ref. No.: 108671



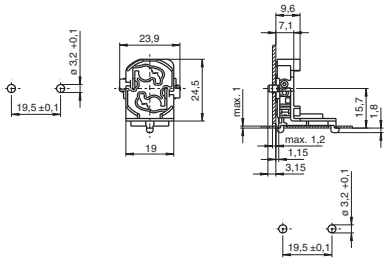
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Fixing holes for screws M3
Weight: 3.7 g, unit: 1000 pcs.
Type: 43100
Ref. No.: 101631



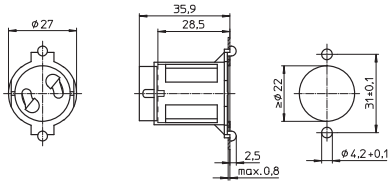
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm², single-core
Lateral split pins for wall thickness up to 1 mm
Rear of starter holder/luminaire: IP40
Weight: 3.7 g, unit: 1000 pcs.
Type: 43200
Ref. No.: 109790



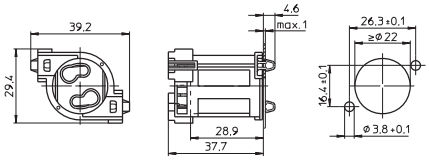
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm², single-core
Rear split pins for wall thickness up to 1.2 mm
Lateral split pins for wall thickness up to 1 mm
Rear of starter holder/luminaire: IP40
Weight: 3.7 g, unit: 1000 pcs.
Type: 43210
Ref. No.: 109792

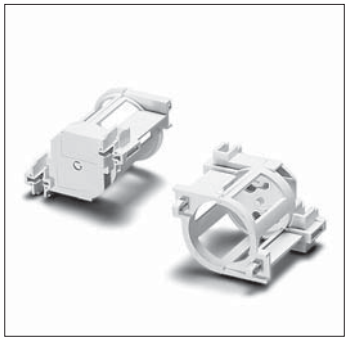


Starter holder with integrated extension piece
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
Front split pins for wall thickness up to 0.8 mm
Weight: 5.4 g, unit: 1000 pcs.
Type: 43300
Ref. No.: 101636

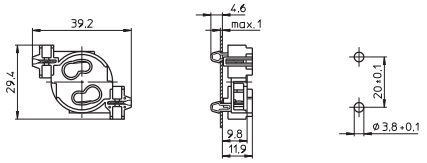


Starter holder with integrated extension piece
Material: PC, white
For the automatic luminaire wiring
T110, nominal rating: 2/250
IDC terminals for leads H05V-U 0.5
Front split pins for wall thickness up to 1 mm
Weight: 5.4 g, unit: 1000 pcs.
Type: 43500
Ref. No.: 108454

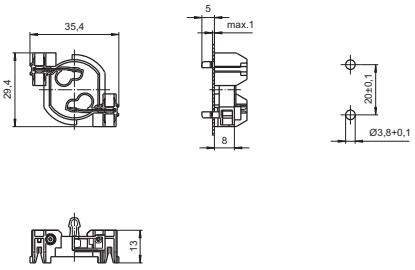




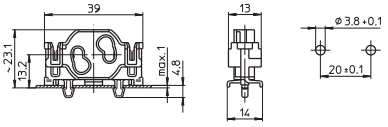
Starter holder
Material: PC, white
For the automatic luminaire wiring
T110, nominal rating: 2/250
IDC terminals for leads H05V-U 0.5
Rear split pins for wall thickness up to 1 mm
Weight: 3.2 g, unit: 1000 pcs.
Type: 43510
Ref. No.: 107723



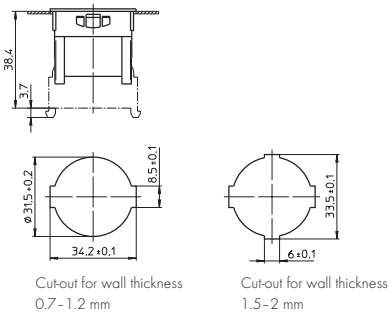
Starter holder
Material: PC, white
T110, nominal rating: 2/250
Push-in terminals: 0.5–1 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Rear split pins for wall thickness up to 1 mm
Weight: 3 g, unit: 1000 pcs.
Type: 43520
Ref. No.: 530079



Starter holder
Material: PA, white
T110, nominal rating: 2/250
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Lateral split pins for wall thickness up to 1 mm
Weight: 3 g, unit: 1000 pcs.
Type: 43410
Ref. No.: 107445



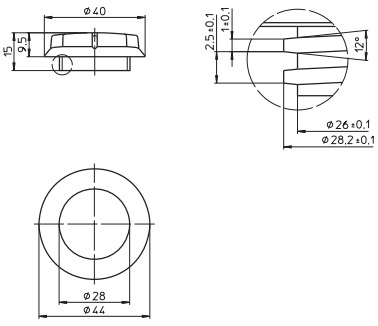
Extension piece
For front clip-in fixing into luminaire metal sheets
For use with starter holder 109784 (see p. 234)
For screw caps type 97065
Material: PC, white
Weight: 3.5 g, unit: 500 pcs.
Type: 97064
Ref. No.: 105482



Cut-out for wall thickness
0.7–1.2 mm

Cut-out for wall thickness
1.5–2 mm

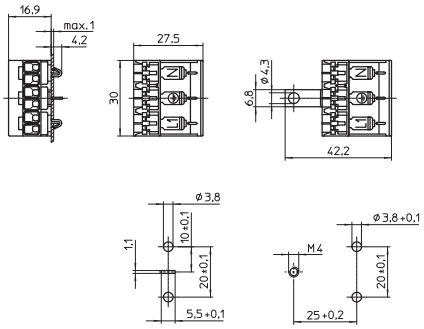
Screw caps for degree of protection IP54/IP65/IP67
For extension piece 105482
Material: PP
Gasket: EPDM cellular rubber
Weight: 3.2/4/3.2/0.3 g, unit: 500 pcs.
Type: 97065 screw cap
Ref. No.: 105483 white
Ref. No.: 109575 grey
Ref. No.: 105484 black
Type: 98086 gasket
Ref. No.: 106095

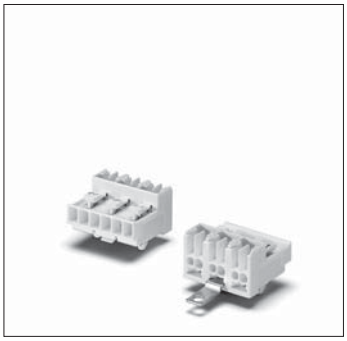


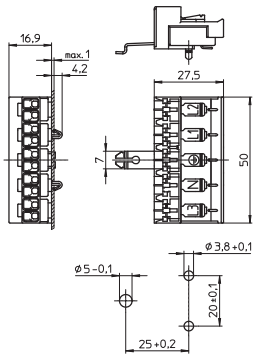
Terminal Blocks, Accessories

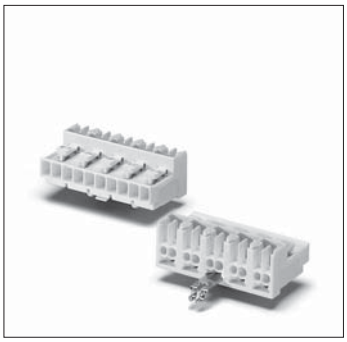
Suitable only for solid conductors on the secondary connection

Terminal blocks
Casing: PC, white, T85
Nominal rating: 450 V
Primary connection with release button:
push-in twin terminals 0.5–2.5 mm²/16 A
Secondary connection:
push-in twin terminals 0.5–1.5 mm²/16 A
and 0.5–2.5 mm²/16 A
Connection for X2 RFI-suppression capacitor:
0.5–0.75 mm², capacitor's pins must be
insulated (stripped lead ends: 8^{+1} mm)
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5/6 A
Base split pins for wall thickness 0.6–1 mm



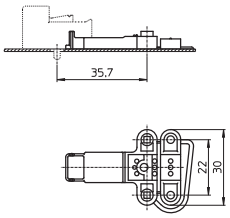




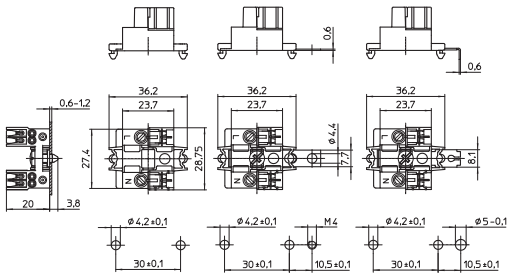


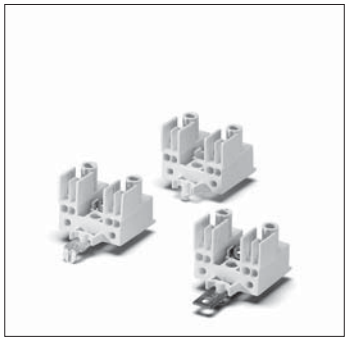
Type	**Ref. No.**	Number of poles	Earth-contact connection	Mark	Weight (g)	Unit (pcs.)
41500	**533312**	3-poles	not earthed	N, L2, L1	9.2	500
41510	**533313**	3-poles	earth spike	N, PE, L1	9.4	500
41520	**533314**	3-poles	earth strap M4	N, PE, L1	10	500
41530	**534948**	3-poles	earth finger	N, PE, L1	10	500
41540	**533315**	5-poles	not earthed	L3, L2, L4, N, L1	15.1	500
41550	**533316**	5-poles	earth spike	L3, L2, PE, N, L1	15.3	500
41560	**533317**	5-poles	earth strap M4	L3, L2, PE, N, L1	16	500
41570	**534954**	5-poles	earth finger	L3, L2, PE, N, L1	16	500

Push-in cord grip
For terminal blocks type 415
For leads with insulation max. Ø 10.5 mm
Conductor fixed with self-tapping screws
acc. to ISO 1481/7049-ST2.9-C/F
Material: PA, white
Weight: 2.2 g, unit: 500 pcs.
Type: 97734
Ref. No.: 535474



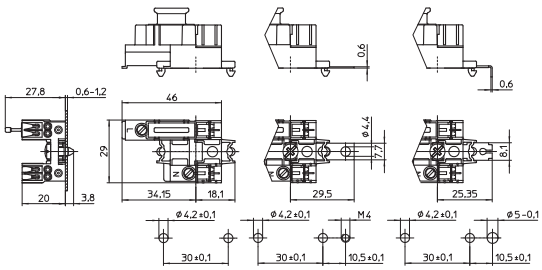
Terminal blocks
Casing: PC, white, T85
Nominal rating: 450 V
Primary connection:
screw terminals 2.5 mm²
Secondary connection:
push-in twin terminals 1.5 mm²
(with IDC contacts: 1 mm²)
push-in terminal 0.5 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Base split pins for wall thickness 0.6–1.2 mm

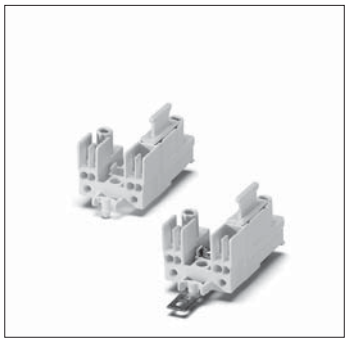




Type	**Ref. No.**	IDC	Number of poles	Earth-contact connection	Weight (g)	Unit (pcs.)
40660	**543793**	no	3-poles	not earthed	5.7	1000
40662	**543795**	no	3-poles	earth strap M4	8.4	1000
40666	**543800**	no	3-poles	earth finger	8.3	1000
40661	**543794**	yes	3-poles	not earthed	6	1000
40663	**543796**	yes	3-poles	earth strap M4	8.7	1000
40667	**547801**	yes	3-poles	earth finger	8.6	1000

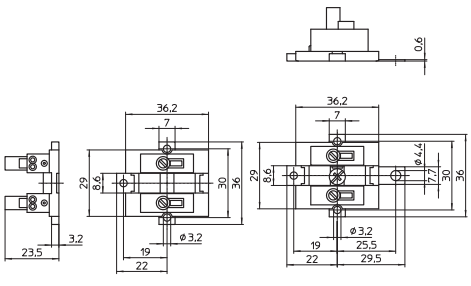
Terminal blocks with fuse holder
Material: PC, white, T70
nominal rating: 250 V
Primary connection: screw terminals 2.5 mm²
Secondary connection:
push-in twin terminals 1.5 mm²
(with IDC contacts: 1 mm²)
push-in terminal 0.5 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
With retaining clip for fuses 5×20 mm
With integrated fuse on request
Base split pins for wall thickness 0.6–1.2 mm

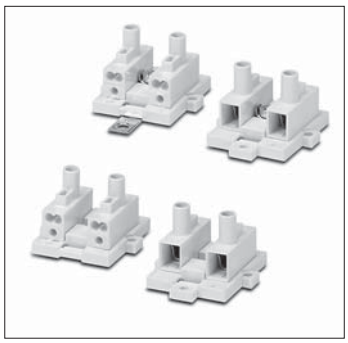




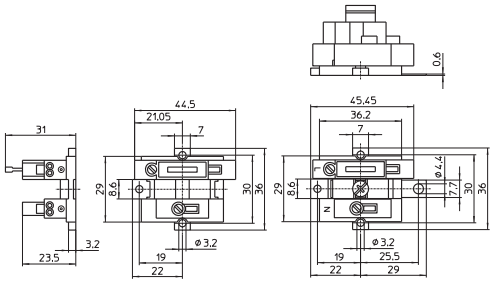
Type	**Ref. No.**	IDC	Number of poles	Earth-contact connection	Weight (g)	Unit (pcs.)
40670	**543802**	no	3-poles	not earthed	8.7	1000
40672	**543805**	no	3-poles	earth strap M4	11.5	1000
40676	**543809**	no	3-poles	earth finger	14.1	1000
40671	**543803**	yes	3-poles	not earthed	9.0	1000
40673	**543806**	yes	3-poles	earth strap M4	11.8	1000
40677	**543810**	yes	3-poles	earth finger	14.4	1000

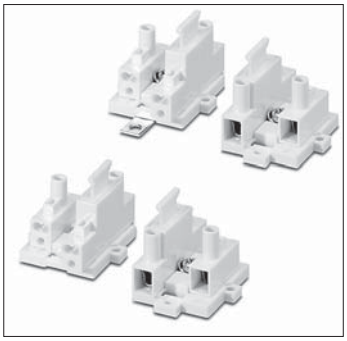
Terminal blocks
Material: PC, white, T85, nominal rating: 400 V
Primary connection: screw terminals 2.5 mm²
Secondary connection:
push-in twin terminals 1.5 mm²
push-in terminal 0.5 mm²
Fixing holes for screws M3
Weight: 7.7/10.6 g, unit: 1000 pcs.
Type: 40650/40651
Ref. No.: 533860
Ref. No.: 533861 with earth strap for screw M4



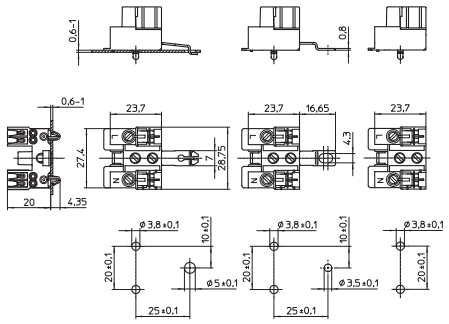


Terminal blocks with fuse holder
Material: PC, white, T70, nominal rating: 250 V
Primary connection: screw terminals 2.5 mm²
Secondary connection:
push-in twin terminals 1.5 mm²
push-in terminal 0.5 mm²
Fixing holes for screws M3
Weight: 11.2/14.1 g, unit: 1000 pcs.
Type: 40655/40656
Ref. No.: 533865
Ref. No.: 533866 with earth strap for screw M4



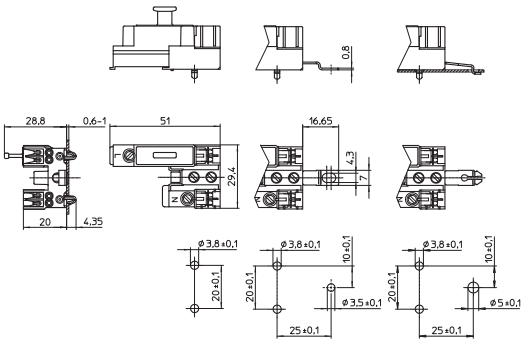


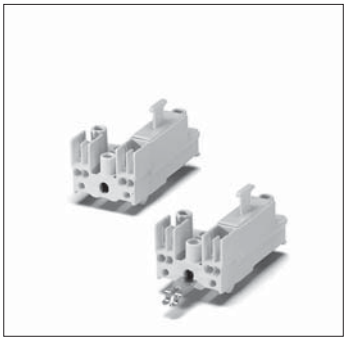
Terminal blocks
Casing: PC, grey, T85
Nominal rating: 450 V
Primary connection:
screw terminals 2.5 mm²
Secondary connection:
push-in twin terminal 1.5 mm²
(with IDC contacts: 1 mm²)
push-in terminal 0.5 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
Base split pins for wall thickness 0.6–1.2 mm



Type	**Ref. No.**	IDC	Number of poles	Earth-contact connection	Weight (g)	Unit (pcs.)
40560	**543770**	no	3-poles	not earthed	8	1000
40562	**543772**	no	3-poles	earth strap M4	8.7	1000
40566	**543777**	no	3-poles	earth finger	8.8	1000
40561	**543771**	yes	3-poles	not earthed	8.3	1000
40563	**543773**	yes	3-poles	earth strap M4	9	1000
40567	**543778**	yes	3-poles	earth finger	9.1	1000

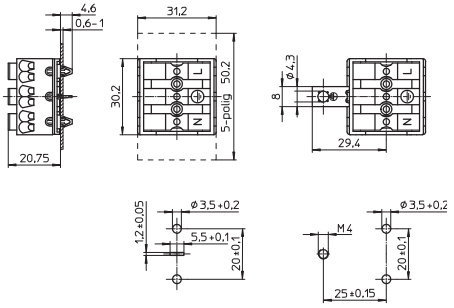
Terminal blocks with fuse holder
Material: PBT, grey, T70
Nominal rating: 250 V
Primary connection: screw terminals 2.5 mm²
Secondary connection:
push-in twin terminals 1.5 mm²
(with IDC contacts: 1 mm²)
push-in terminal 0.5 mm²
For the automatic luminaire wiring:
IDC terminals for leads H05V-U 0.5
With retaining clip for fuses 6x25 mm
With integrated fuse on request
Base split pins for wall thickness 0.6–1.2 mm

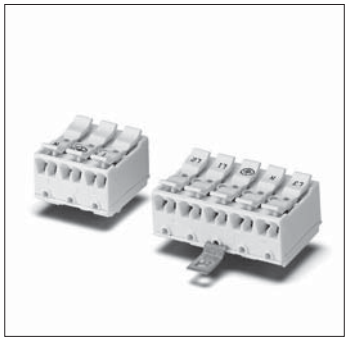




Type	**Ref. No.**	IDC	Number of poles	Earth-contact connection	Weight (g)	Unit (pcs.)
40570	**543781**	no	3-poles	not earthed	11	500
40572	**543783**	no	3-poles	earth strap M4	11.7	500
40576	**543787**	no	3-poles	earth finger	11.8	500
40571	**543782**	yes	3-poles	not earthed	11.3	500
40573	**543784**	yes	3-poles	earth strap M4	12	500
40577	**543788**	yes	3-poles	earth finger	12.1	500

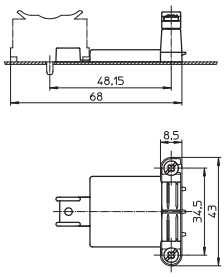
Terminal blocks
Casing: PC, white, T95
Nominal rating: 16/250
Primary and secondary connection
with release button:
push-in twin terminals 0.5–1.5 mm²
push-in terminals 0.75 mm²
Fixing holes for screws M3
Base split pins



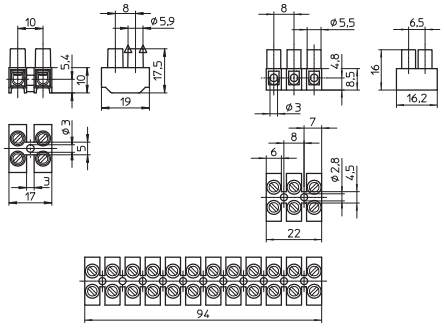


Type	**Ref. No.**	Number of poles	Earth-contact connection	Mark	Weight (g)	Unit (pcs.)
40710	**509534**	3-poles	earth spike	N PE L	13.2	500
40711	**530829**	3-poles	with earth strap M4	N PE L	14.8	500
40712	**529596**	3-poles	not earthed	N PE L	13	500
40730	**509535**	5-poles	earth spike	L3 N PE L1 L2	17.4	500
40731	**530831**	5-poles	with earth strap M4	L3 N PE L1 L2	19	500

Push-in cord grip
For terminal blocks type 407
For leads with insulation Ø 9.5–12.5 mm
Conductor fixed with screws
Material: PC, white
Weight: 6.2 g, unit: 500 pcs.
Type: 80016
Ref. No.: 525893



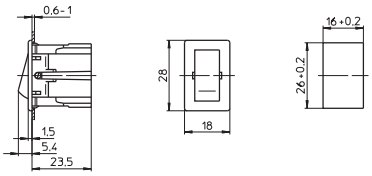
Terminal blocks
Casing: PA, white
Primary and secondary connection:
screw terminals



Type	**Ref. No.**	Number of poles	Nominal rating	Cconnection primary/secondary	T-Marking	Weight g	Unit pcs.
41600	**537484**	2-poles	24 A / 450 V	0.5–2.5 mm²	T85	5.2	2000
41600	**544000**	2-poles	24 A / 450 V	0.5–2.5 mm²	T180	5.6	2000
41663	**542503**	3-poles	24 A / 450 V	0.5–2.5 mm²	T110	5.3	2000
41672	**544011**	12-poles	24 A / 450 V	0.5–2.5 mm²	T110	21.3	2000

Built-in Rocker Switches

Built-in rocker switch 1-pole
For cut-out 16x26 mm
Casing: PC, white, T100
Contact pillar and rocker: PBT, white
Terminal: nichrome steel
Nominal rating: 6(2)/250~
Push-in terminals: 0.5–1 mm²
Lateral fixing clips for wall thickness 0.6–1 mm
Weight: 7.2 g, unit: 500 pcs.
Type: 20200
Ref. No.: 100437



3 Components for Fluorescent Lamps

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Ballasts for fluorescent lamps

The operation of a fluorescent lamp depends on a ballast that stabilises the lamp's preheat current after connection to the mains and, in conjunction with the starter, also supplies the required lamp ignition voltage after preheating. After ignition, the ballast then serves to limit the lamp current. As fluorescent lamps are characterised by a negative characteristic current-voltage curve, lamp current stabilisation is essential with regard to both the lamp's stable operation and a long service life, which is also dependent on compliance with the starting conditions (preheat current and ignition voltage). Unfavourable starting conditions cause damage to the electrodes every time the lamp is started and thus reduce the lamp's service life. Furthermore, care should be taken to prevent crossdischarge in the electrode area during preheating, which also shortens lamp service life.

Electromagnetic (inductive) ballasts have to be operated in conjunction with starters for lamp ignition and capacitors for blind current compensation. In addition, capacitors for RFI suppression will also be required for certain circuits. Electronic ballasts do not require any additional components.

Electronic ballasts (EB)

VS electronic ballasts are designed for mains voltages of 220 V to 240 V (exceptions are devices for the North American market where the nominal mains voltage is 120 V or 277 V) and are used to operate fluorescent lamps at high frequencies. The lamps are ignited with an internally generated ignition voltage, thereby removing the need for an external starter. The power factor (λ) > 0.95 also removes the need for compensation, unlike with electromagnetic ballasts. The only exceptions are low-output ELXs models, which attain a power factor of 0.6. Luminaires fitted with electronic ballasts are characterised by low energy consumption as they draw substantially less system power than conventional, inductive applications. This is firstly because the lamp consumes less power to achieve the same luminous flux and secondly because the internal loss of an electronic ballast only amounts to approx. 8% to 10% of the lamp's output. Furthermore, thanks to their modern circuitry, the power input of VS electronic ballasts remains constant even in the event of mains voltage fluctuations, thus ensuring permanently low energy consumption.

VS electronic ballasts permit a broad range of applications. For instance, the VS product range includes many ballast types for multiple lamp operation. These ballasts reduce installation and component costs and thus enable particularly efficient luminaires. Twin-lamp electronic ballasts permit so-called master-slave operation. The lamps of two single-lamp luminaires are operated by a twin-lamp electronic ballast that is built into the so-called master luminaire. The lamp of the slave luminaire is electrically connected to the electronic ballast.

Multi-lamp electronic ballasts also provide an interesting advantage in that several lamps of different ratings can be connected. Electronic ballasts of this kind simplify storage and logistics.

The use of electronic ballasts makes a lighting system both more convenient and efficient to operate:

- reduced power consumption (up to 30%) at undiminished light output
- 50% longer service life
- stabilised lamp output
- overvoltage protection
- no stroboscopic effect
- flicker-free lamp start
- no need for a starter or capacitor
- low wiring effort
- no radiated electromagnetic interference
- low self-heating due to minimal power loss
- automatic shutdown of defective lamps
- automatic restart once the lamp has been changed (except ELXe series)

Vossloh-Schwabe electronic ballasts are developed on the basis of the latest technological and component standards and are produced using state-of-the-art technology, whereby consideration is taken of our customers' quality standards in our quality assurance system.

Assembly Instructions for Electronic Ballasts

For mounting and installing of electronic ballasts for fluorescent lamps

Mandatory regulations

EN 61347-1	Lamp controlgear – part 1: general and safety requirements
EN 61347-2-3	Lamp controlgear – part 2-3: particular requirements for a.c. supplied electronic ballasts for fluorescent lamps
EN 60929	AC-supplied electronic ballasts for tubular fluorescent lamps
DIN VDE 0100	Erection of low voltage installations
EN 60598-1	Luminaires – part 1: general requirements and tests
EN 61000-3-2	Electromagnetic compatibility (EMC) – part 3: maximum values – main section part 2: maximum values for mains harmonics (device input current up to and including 16 A per conductor)
EN 55015	Maximum values and methods of measurement for RFI suppression in electrical lighting installations and similar electrical appliances
EN 61547	Installations for general lighting purposes – EMC immunity requirements

Descriptions of VS electronic ballasts (EBs)

ELXs ballasts
The family of ELXs ballasts forms a perfect alternative to magnetic ballasts. ELXs ballasts have the same fixing hole centres as standard electromagnetic ballasts. The lamp is ignited after a preheating time (warm start) of 1.5 seconds. These ballasts are dimensioned to take system outputs (lamp output plus power loss of the electronic ballast) of up to 25 W. The power factor of these ballasts amounts to approx. 0.6. The average service life of these ballasts totals 30,000 hours with a failure rate of ≤ 0.2% per 1,000 operating hours.

ELXe ballasts (instant start)
With this ballast family, the lamps ignite immediately after connection to the mains by applying an ignition voltage of max. 1,500 V to the gas discharge path of the lamp. The ignition time totals approx. 0.5 seconds. As this puts a severe strain on the electrodes, the realistic number of lamp starts is limited to max. 10,000 ignitions up to the end of the lamp's service life. For that reason, ELXe ballasts should only be used for applications demanding fewer than five lamp ignitions per day (e.g. in production sites, warehouses or department stores). The power factor of this device is approx. 0.98. As there is no need for preheating, ELXe ballasts usually require one connection per electrode for lamp operation. This makes them suitable for use in explosion protected luminaires. In addition, they are very energy-efficient as there are no lamp electrode losses. The average service life of these ballasts totals 50,000 hours with a failure rate of ≤ 0.2% per 1,000 operating hours.

ELXc ballasts (warm start)
In contrast to the ELXs series, ELXc ballasts have a power factor of better than 0.95 and cover the complete capacity range.
ELXc ballasts ensure the lamp is started following a defined lamp electrode preheating period of approx. 1–2.5 seconds using a fixed ignition voltage. This particularly gentle lamp start makes over 20,000 lamp starts possible. ELXc ballasts should be used for applications with high switching frequencies (e.g. hotels or offices) where energy savings as well as low maintenance costs are desired. The average service life of these ballasts totals 50,000 hours with a failure rate of ≤ 0.2% per 1,000 operating hours. The average life of the series ECO-EffectLine: 30.000 hours and New T5 EffectLine: 50.000 hours with a failure rate of ≤ 0.2% per 1,000 operating hours.

ELXd ballasts (dimmable)
These are warm start ballasts with an additional dimming function that is controlled via an interface fitted to the ballast. The interface of these ballasts can be either analogue (1–10 Volt) or digital (DALI; PUSH); the interface enables lighting to be ideally adjusted to suit the given need. Control components can also be used as long as they comply with the respective standard (Annex to IEC/EN 60929). The power factor for these ballasts is > 0.95 at 100% lamp operation. When using ELXd ballasts in a lighting system, an energy saving of 75% can be achieved if, for instance, the control inputs of the ballasts are coupled with movement detectors and light sensors. The average service life of these ballasts totals 50,000 hours with a failure rate of ≤ 0.2% per 1,000 operating hours.

To guarantee trouble-free operation and a long service life of the various types of electronic ballast, attention should be paid to the regulations and mounting instructions (page 245–252). In addition, the installation instructions for lighting systems must be observed when installing luminaires with electronic ballasts.

Mounting and installation instructions can be obtained from Vossloh-Schwabe on request or can be found online at **www.vossloh-schwabe.com**.

Mechanical mounting

Surface — Solid, flat surface for good heat dissipation required.
Avoid mounting on protruding surfaces.

Mounting location
Electronic ballasts must be protected against moisture and heat.
Installation in external luminaires: water protection rate of ≥ 4
(e.g. IP54 required)

Fastening — With M4 screws in the designated holes

Heat transfer — If the ballast is destined for installation in a luminaire, sufficient heat transfer must be ensured between the ballast and the luminaire casing.
Electronic ballasts should be mounted with the greatest possible clearance to heat sources or lamps. During operation, the temperature measured at the t_c point of the ballast must not exceed the specified maximum value.

Supplement for independent electronic ballasts

Mounting position — Any

Clearance — Min. of 0.10 m from walls, ceilings, insulation
Min. of 0.10 m from other electronic ballasts
Min. of 0.25 m from sources of heat (lamp)

Surface — Solid; device must not be allowed to sink into insulation materials

Technical specifications

Operating voltage range
AC: 220 to 240 V (±10%)
DC: please observe the specifications on the individual product pages

Ignition time — ELXe ballasts t < 0.5 seconds (instant start)

Preheat time — ELXc, ELXs and ELXd ballasts t = 0.5 or 1.5 to 2.5 seconds (warm start)

Leak current — ≤ 0.5 mA per electronic ballast

Product features

Overheating — VS EBs for fluorescent lamps are not protected against overheating

Overvoltage protection
AC: up to 48 hours at U_{NAC} = 320 V and up to 2 hours at U_{NAC} = 350 V
DC: no disorders occur with input voltages of up to U_{NDC} 285 V. U_{NDC} voltages in excess of 288 V destroy the ballast.

Shutdown of defective lamps
During starting operation, the electronic ballast will detect whether a lamp is connected. If no lamp is present, the ballast will cancel the starting operation. Deactivated lamps or interrupted electrodes are detected and lead to the high-frequency supply being switched off after an unsuccessful ignition attempt. Changing a lamp during operation will lead to the high-frequency supply being switched off.

EOL effect

Up to now, it has not been possible to conclusively reproduce the end-of-life effect under laboratory conditions. However, it can be qualitatively described for fluorescent lamps as follows: when the emitter material of the cathode (i.e. the filament in conventional bi-pin lamps) has been fully consumed or has otherwise lost its emitting power, the emission of electrons is hampered, which leads to a voltage drop at the cathode. Frequent cold starts accelerate active emitter loss.

Operating a lamp with a constant current (an electronic ballasts (EB) provides a near-constant current) results in high dissipation losses that also cause the lamp base and lampholder to heat up and can even cause damage to both. This is often referred to as the EOL effect; from an electrical point of view, this is manifested in the so-called "partial rectifier effect".

The EOL cut-out ensures that a ballast is safely switched off and the lamp base does not overheat at the end of a lamp's service life.

EN 61347-2-3 (A1:2004) describes three possible tests.
The first are now in widespread use and are described in more detail here.
The third test is not conducted at VS.

1. EOL Test 1 (61347-2-3:2000 + A1:2004 + A2:2006 17.2)
   Asymmetric pulse test
2. EOL Test 2 (61347-2-3:2000 + A1:2004 + A2:2006 17.3)
   Asymmetric power test
3. EOL Test 3 (61347-2-3:2000 + A1:2004 + A2:2006 17.4)
   Exposed filament test

The first two tests attempt to simulate the rectifier effect:

- Test 1 pulse switching of rectifing effect
- Test 2 by applying a DC voltage that is constantly higher than required by the lamp.

VS EBs are capable of suitably assessing the altered voltage signal in comparison to normal operation so as to meet EOL requirements.

Protection against transient mains peaks

Values are in compliance with EN 61547 (interference immunity)
(1 kV for AC and 0.5 kV for DC and control conductors).

Electrical installation

Wiring

The wiring between the mains, electronic ballast and lamp must comply with the respective circuit diagram. Note: with ELXe models, one side of the lamp electrode is never connected to the electronic ballast.
The electronic ballast must be earthed using a toothed washer or similar (protection class I, ignition help, compliance with RFI/BCI standards).
To ensure compliance with RFI-suppression limits, mains conductors should not be wired in parallel to high-frequency carrying lamp conductors; maximum clearance should be ensured and all conductors marked with an * must be kept short. As a general rule, a maximum conductor length should not be exceeded when using conventional conductors (see table on page 256–259 for precise details). Luminaire must be tested for compliance with the RFI suppression limits stipulated by EN 55015.

Conductors must not exceed 3 m in length in the event of master-slave operation.

Dimmable electronic ballasts are unsuitable for master/slave operation.

Through-wiring of mains voltage

ELXc 257.836 (188400) devices permit through-wiring of mains voltage
The following list specifies the maximum No. of devices that may be connected to the first device:

- 2 x 57 W = max. 3 devices
- 2 x 42 W = max. 4 devices
- 2 x 32 W = max. 5 devices
- 2 x 26 W = max. 7 devices

Mains power can be through-wired with the following devices:

- ELXc 213.874: max. 39 devices
- ELXc 218.875: max. 31 devices
- ELXc 142.876: max. 23 devices
- ELXc 242.877: max. 11 devices

The number of devices always refers to maximum-load operation. In addition, the maximum number of devices per installed automatic fuse must be strictly observed.

It is permissible to connect the protective conductor of the ballast by attaching the ballast to metal conductors that are connected to the protective conductor. In doing so, care must be taken to ensure the protective conductor is contacted in accordance with EN 60598. If, however, a ballast is fitted with a connection terminal for a protective conductor without through-wiring and if this is to be used to connect the protective conductor, this connection terminal may only be used for the ballast itself.

Cord grip

EBs with cord grip can be used with the following conductors, for instance:

Designation	**Lead type**
Mains lead	H03VV-F 3X0.75 mm² or NYM 3X1.5 mm²
Control lead	H03VV-F 2X0.5 mm²
Mains and control lead in one lead	H03VV-F 5X0.75 mm²
Lamp lead	H05VV-F 4X1 mm² or 5X1 mm²

Connection terminals for automatic luminaire wiring (ALF connections)

- Use copper (not stranded) wire
- Rquired diameter for push-in connection 0.5–1 mm²
- Stripped lead length 8–9 mm
- Required diameter for IDC 0.5 mm², max. Ø 2 mm including insulation, no wire stripping required; mounting requires a special tool

Push-in terminals

The integrated terminals can be used with flexible or rigid leads with a crosssection of 0.5–1.5 mm². The stripped lead length ranges between 8.5–9.5 mm for a 3.5 mm terminal grid.

Error current

Impulse-resistant leak-current protection must be installed. Distribute the luminaires to phases L1, L2 and L3; install tri-phase FI switches. If permissible, install FI switches with 30 mA leak current; connect no more than 15 luminaires as FI switches can be triggered at half the leak current value.

Tri-phase connection of luminaires with EB

- Prior to operating newly installed lighting systems: check the mains voltage is appropriate to the electronic ballast's mains voltage range (AC, DC).
- The N-type conductor must be properly connected to all luminaires or ballasts.
- Conductors can only be connected or disconnected if the ballast is disconnected from the mains. Attention: N-type conductors must never be disconnected individually or as the first element.
- Insulation resistance test: from L to PE (L and N must not be connected)
- The neutral conductor must be reconnected after completion of the test.

Power factor/compensation

Luminaires with electronic ballasts do not require compensation:
power factor ≥ 0.95.
For ELXc ballast models 116.900, 116.903, 121.901, 121.904, 124.902, 124.905, 126.906 and 126.907: power factor ≥ 0.6.

Selection of automatic cut-outs

Dimensioning automatic cut-outs

High transient currents occur when an EB is switched on because the capacitors have to load. Lamp ignition occurs almost simultaneously. This also causes a simultaneous high demand for power. These high currents when the system is switched on put a strain on the automatic conductor cut-outs, which must be selected and dimensioned to suit.

Release reaction The release reaction of the automatic conductor cut-outs comply with VDE 0641, part 11, for B and C characteristics.

No. of electronic ballasts (see the table on pages 256–259)

The maximum number of VS ballasts applies to cases where the devices are switched on simultaneously. Specifications apply to single-pole fuses. The number of permissible ballasts must be reduced by 20% for multi-pole fuses. The considered circuit impedance equals 400 mΩ (approx. 20 m of conductor [2.5 m^2] from the power supply to the distributor and a further 15 m to the luminaire). Doubling circuit impedance to 800 mΩ increases the possible number of ballasts by 10%.

EB output voltage Electronic ballasts bear the information "U_{OUT}" on their type plates. All subsequently connected components must be designed for this EB output voltage. When using T5 lamps, any components connected to the output side of the EB must be approved for a voltage of ≥ 430 V (especially lampholders). This also applies to dimmable T5 EBs.

Lamps and dimmed operation

For lighting systems with dimmable electronic ballasts, Vossloh-Schwabe recommends that fluorescent lamps always be replaced as a full complement to maintain uniform lighting levels and colour impressions. New lamps must be burnt in at maximum brightness for approx. 100 hours.
Without restrictions, VS electronic ballasts can be used to operate ECO T5 fluorsecent lamps (except for with types ELXc 135.856 and ELXc 235.857) and T8 fluorescent lamps. A two-lamp dimmable electronic ballast can only be used with lamps of a single lamp manufacturer. The following EBs are restricted in their suitability for dimmer operation of amalgam lamps: ELXd 118.802, 218.803, 142.806, 242.807.

Dimming interface

DC 1–10 V according to EN 60929 with power source 0.5 mA (protected in the event of mains voltage connection); designed to enable connection of control and regulation units. Dimming range: 3–100% of lamp power

DALI (Digital Addressable Lighting Interface) dimming interface

Polarity reversible dimmer interface – protected in accordance with EN 60929 given mains voltage supply – for connecting control devices that work according to the standard digital protocol. Dimming range: 1–100% of the lamp's rating

Potential interference with IR systems

Operating lamps at frequencies of 20 to 50 kHz can cause interference with infrare systems (remote controls, sound transmission, personal pager systems). Countermeasures: optical filters, switching to infrared systems with higher carrier frequencies (over 400 kHz).

Electromagnetic Compatibility (EMC)

Vossloh-Schwabe's electronic ballast range was developed in accordance with valid EMC standards (interference, interference immunity and mains harmonics) and specially designed to ensure safe compliance with the limiting values.
It is assumed that that any remarks regarding conductor wiring and conductor length in the instructions for installing electronic ballasts in luminaires or for independent ballasts will be observed.

Vossloh-Schwabe electronic ballasts are also tested in commercially available luminaires in addition to the CISPR 30 sample luminaires.

- ELXs devices: The ELXs device family was developed for system ratings of ≤ 25 W on the basis of the limiting values prescribed for this in EN 61000-3-2. Vossloh-Schwabe's ELXs devices all bear the VDE EMC mark and comply with the limiting values laid down by EN 61000-3-2.
  It is possible to use several ELXs ballasts in a luminaire if a separate connection terminal is available for each lamp circuit.

Mains harmonics: the maximum values laid down in EN 61547 (Interference Immunity) are satisfied.

Additional information

Information on the installation of electronic ballasts for optimising EMC

To ensure good radio interference suppression and the greatest possible operating safety, the following points should be observed when installing electronic ballasts:

- Conductors between the EB and the lamp (HF conductors) must be kept short (reduction of electromagnetic interference). High-potential lamp conductors must be kept as short as possible, in particular with tubular lamps. Lamp conductors of this kind are labelled with an * in the wiring diagram on the type plate (see page 256–259).
- Mains and lamp conductors must be kept separate and if possible should not be laid in parallel to one another. The distance between HF and mains conductors should be as large as possible, ideally > 5 cm. (This prevents the induction of interference between the mains and lamp conductors.)
- The mains conductor within the luminaire must be kept short (to reduce the induction of interference).
- Devices must be properly earthed. EBs require secure contacts to the luminaire casing or must be earthed using a PE connection. This PE connection should be effected using an independent conductor to achieve better dissipation of the leak current. EMC improves at frequencies greater than 30 MHz.
- The mains conductor must not be laid too close to the EB or the lamp (this is especially important in the event of through-wiring).
- Mains and lamp conductors must not be crossed. Should this be impossible to avoid, conductors should be crossed at right angles to one another to avoid inducing interference between mains and HF conductors.
- Should conductors be wired through metal parts, such conductors must always be additionally shielded (e.g. with an insulating sleeve or grommet).

Temperature

Reference point temperature t_c

The safe operation of electronic ballasts is dependent on the maximum permissible temperature not being exceeded at the measuring point. Vossloh-Schwabe has determined a casing temperature measuring point – $t_{c\ max.}$ – on all EB casings. To avoid shortening the service life or diminishing operating safety, the stipulated maximum temperature must not be exceeded at this t_c point. This point is determined by testing the convertor during normal, IEC-standardised operation at the specified ambient temperature (t_a), which is also indicated on the type plate. As both the design-related ambient temperature and the ballast's inherent heat, as determined by the installed load, are subject to great variation, the casing temperature should be tested at the t_c point under real installation conditions.

Ambient temperature t_a

The ambient temperature – as specified on every EB – denotes the permissible temperature range within the luminaire.

Reliability and service life

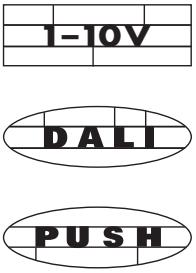
If the max. temperature at the t_c reference point (as specified on the type plate and the technical documentation of the ballast) is not exceeded, the defined service life can be expected to be achieved, assuming a switching cycle of 165 minutes on and 15 minutes off.
See page 246 for service life details regarding the various electronic ballast families.

Emergency lighting

All Vossloh-Schwabe EBs that are suitable for DC voltage operation can be used in emergency lighting systems. Consideration must, however, be taken of system requirements.

VS Dimmable Electronic Ballasts

Vossloh-Schwabe's range of electronic ballasts is rounded off by dimmable ballasts for fluorescent lamps The standardised interfaces "1–10 V" and "DALI" are used for this purpose. Coupled with sensors, electronic ballasts fitted with a "1–10 V" interface make it easy to create intelligent luminaires and room lighting systems, whereby the luminaires are "programmed" via the wiring to the control units, i.e. via the hardware.



The digital interface "DALI" (Digital Addressable Lighting Interface) constitutes a further development of the "1–10 V" analogue interface. This digital interface was jointly developed by leading manufacturers of electronic ballasts in order to create a uniform standard for the lighting industry. The uniform interface and telegram definition dictates the function of a DALI operating device or DALI consumer and ensures exchangeability of operating devices made by various manufacturers.

Each VS DALI ballast is additionally fitted with the so-called PUSH function. The data input DA (DALI & PUSH) is used as a control input for both signal structures, with the exception of devices featuring separate inputs. When used as a DALI ballast, control is effected via the DALI protocol; when used as a PUSH ballast, control is effected via a push key and is achieved via current flow times of differing duration.

VS DALI electronic ballasts provide the convenience of a bus system that is both easy to install and operate.

Due to the working principle involved, dimming compact fluorescent lamps causes a negligible drop in colour temperature. However, sudden larger changes in the dimmer setting can temporarily cause greater variation in colour temperature. The dimmer function is optimised to minimise this subjective visual change in colour temperature when the dimmer setting is suddenly subjected to larger change.

VS DALI electronic ballasts are characterised by the following performance feature

- Two-strand, potential-free, polarity-independent control input
- Dimmer curve analogue to the light sensitivity of the human eye
- Addressing options: total system, group-wise or individually
- Scene memory
- Feedback in the event of defective lamps

These features ensure a number of advantages for lighting systems

- No group wiring needed
- Each DALI ballast can be individually addressed
- No need for scene memory modules
- Synchronised scene transitions
- Operating devices provide reports on lamp status
- Simple integration into facility management systems

DALI and PUSH must not be used at the same time!

Switching mains voltage to the DALI conductors within a DALI system will lead to the destruction of both the DALI power supply and the DALI master!

PUSH function characteristic

- Just one key for dimming and ON/OFF
- Polarity- and phase-independent control
- Control input with large working voltage range
- Suitable for multi-layer control
- Fully DC-compatible – no functional restrictions during DC operation
- After disconnection from the primary voltage the ballast will reproduce the last stored lighting level
- Soft start
- Automatic recognition of DALI and PUSH signals

PUSH operating voltage ranges during control signal input

EB type	ELXd 117.715, ELXd 217.717, ELXd 118.705, ELXd 218.707, ELXd 142.709, ELXd 242.711	All other DALI/PUSH ballasts
AC	220–240 V ±10%	10–230 V
DC	198–264 V	–
	Failing to observe these working voltage ranges can lead to non-recognition of the signals; exceeding the maximum voltages can lead to the destruction of the data inputs.	

PUSH control signals (key activation)

Short push	(80 ms < t < 460 ms)	(0 ms < t < 500 ms)
	Is used to switch between ON/OFF lighting states. After the device is switched on, the last selected lighting level is restored and the next dimming direction will be upwards.	
Long push	(460 ms < t < 10 s)	(500 ms < t < ∞)
	Is used to dim upwards or downwards; a long push will change the dimming direction. Thus, a long push will reverse the dimming direction until the upper or lower limit is reached. If the light was off, a long push will switch it on and the dimmer will start at the lowest light intensity.	
Push to synchronise	(t > 10 s)	long – short – long
	Light is dimmed to the preset factory level and the next dimming direction will be upwards.	Starting situation: luminaires are switched off. The "long – short – long" combination first switches the lamp on, then off and finally on again, after which it gets gradually brighter. The EBs will be synchronised again after this procedure.
Synchronisation	Any 1-key dimmer that does not feature a central control module (as each ballast will have its own controls) can develop asynchronous behaviour (e.g. children might play with the key). The system will then be out of sync, i.e. some lamps will be on, others off or the dimming direction will differ from lamp to lamp.	
	Two methods of synchronisation can be used: • Push the key for more than 10 seconds, after which the light will be dimmed to a preset level and the next dimming direction will be upwards. • Start with a long push of the key so that all lamps are switched on. Follow with a short push to turn the system off. The system will now be resynchronised.	

Wiring examples for PUSH function

Note **Not permissible**: N-type conductors must not be used as PUSH potentials for multi-phase systems. Example: if the PUSH key is not activated, the series connection of the internal resistors of the DA inputs will approach the delta voltage of 400 V (voltage between L2 and L3) (Fig. 1).

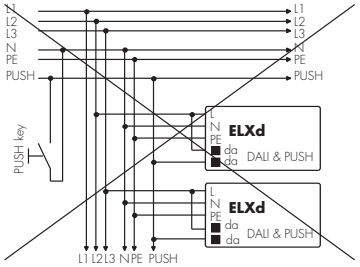


Fig. 1
N conductor must not be used as a PUSH potential

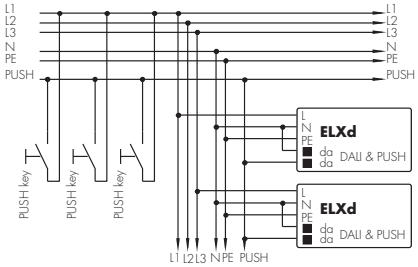


Fig. 2
Standard application for T5 and T8 lamps

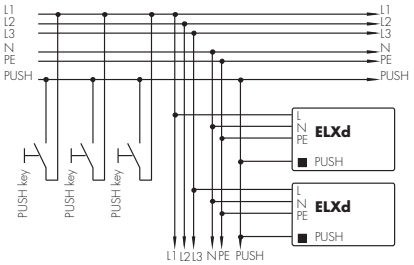


Fig. 3
Standard application for TC lamps

General information on PUSH and DALI

Mains voltage and interface conductors must not be wired in parallel to the lamp conductors so as to avoid capacitive bridging of the mains filter.

If more than one device is operated with a single key during PUSH operation, asynchronous behaviour can occur, which will require manual resynchronisation using the method described. Should this be unacceptable, a DALI control module will have to be used instead. It is recommended not to control more than four devices using a single key.

When using dimmable devices, new lamps should generally be burnt in for at least 100 hours at full brightness before they are dimmed. This process can become necessary again should the lamps be physically relocated 0(e.g. transport).

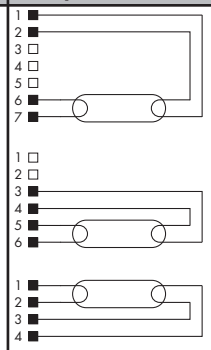
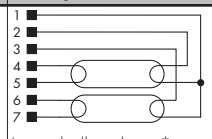
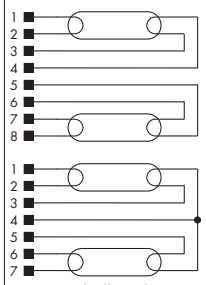
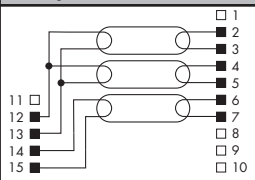
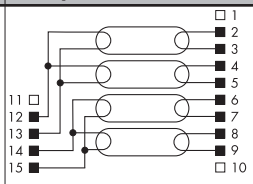
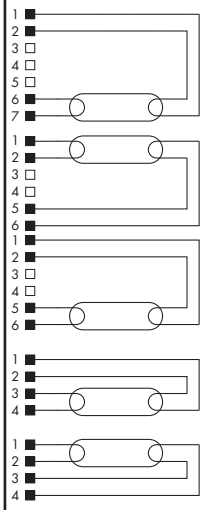
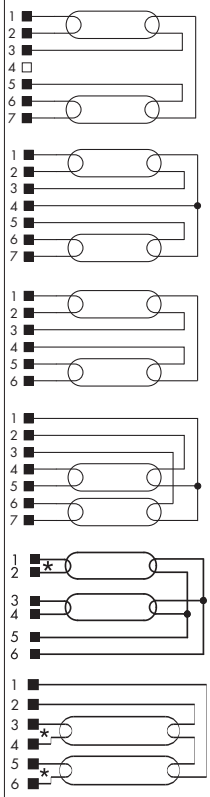
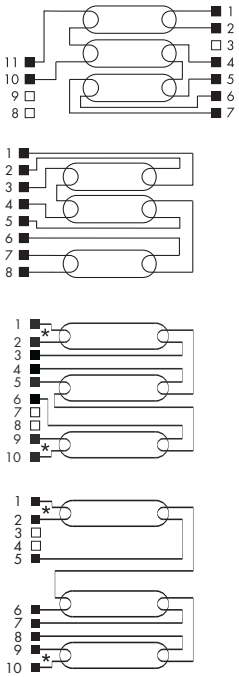
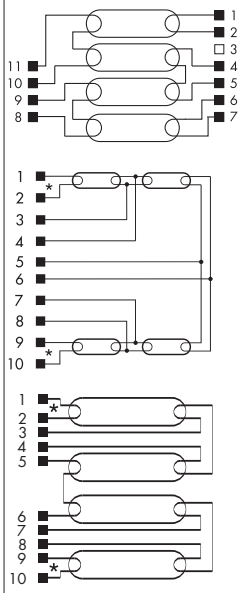
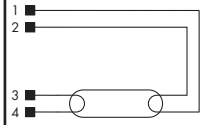
After initial operation of a DALI system (address assignment, luminaire allocation, group formation, scene settings) it is recommended to disconnect the primary voltage of the DALI control units at the circuit breaker for at least 3 seconds and then to reconnect it. The devices will detect this disconnection from the mains and store the settings.

DALI devices with a PUSH function must be operated with a control module (DALI control module or key pad with PUSH function). DALI devices with a PUSH function must not be operated with an open or bridged DALI/PUSH input.

To ensure the ballast does not distort and misinterpret signals when operated in PUSH mode, connected PUSH buttons must not feature a control lamp.

Circuit diagrams for Vossloh-Schwabe electronic ballasts

The circuit diagrams shown here are wiring examples for Vossloh-Schwabe electronic ballasts, whereby the number and configuration of the contacts differ. See the table on page 256–259 for details.

EB	1 lamp	2 lamps	3 lamps	4 lamps
ELXd		 Linear ballast shape*  Compact ballast shape		
ELXc				
ELXs				

* ELXc devices can also be wired under observation of the circuit diagram on the ballast.

Explanation of circuit diagrams for Vossloh-Schwabe electronic ballasts (see page 255)

Electronic ballasts		Lamp	Electronic ballasts															Max. lead length		Operation	Output	THD	Possible quantity of EB/automatic cut-outs			
Ref. No.	Type	Quantity	Terminals															hot*	cold	frequency	voltage		B	B	C	C
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				U_{OUT}					
																		(m/pf)	(m/pf)	kHz	V	%	(10A)	(16A)	(10A)	(16A)
ELXc																										
183039	ELXc 424.223	3	x*	x*	–	x	x	x	x	–	–	x	x	–	–	–	–	1/100	2/200	44	400	< 10	9	14	14	22
		4	x*	x*	–	x	x	x	x	x	x	x	x	–	–	–	–	1/100	2/200	44	400	< 10	9	14	14	22
183040	ELXc 226.878	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	45	300	< 10	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	45	300	< 10	11	18	18	30
183094	ELXc 328.224	3	x*	x*	x	x	x	x	x*	x*	x	x	–	–	–	–	–	1/100	1.5/150	43	250	< 10	10	16	17	28
183103	ELXc 135.225	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	48	250	< 10	11	18	18	30
183104	ELXc 136.226	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	44	250	< 10	11	18	18	30
183108	ELXc 226.878	1	x	x	–	–	x*	x*	–		–	–	–	–	–	–	–	1/100	1.5/150	45	300	< 10	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	45	300	< 10	11	18	18	30
183109	ELXc 414.227	3	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	45	350	< 15	7	12	12	20
		4	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	45	350	< 15	7	12	12	20
183110	ELXc 424.228	3	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	47	350	< 15	7	12	12	20
		4	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	47	350	< 15	7	12	12	20
183111	ELXc 228.229	1	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	47	350	< 15	9	15	15	25
		2	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	47	350	< 20	9	15	15	25
183112	ELXc 328.230	2	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	45	350	< 15	7	12	12	20
		3	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	45	350	< 15	7	12	12	20
183113	ELXc 135.231	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	47	400	< 15	11	18	18	30
183114	ELXc 235.232	2	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	1/100	2/200	46	400	< 15	9	15	15	25
183115	ELXc 239.233	1	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	47	350	< 15	7	12	12	20
		2	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	47	350	< 15	7	12	12	20
183116	ELXc 149.234	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	47	250	< 15	9	15	15	25
183117	ELXc 249.235	2	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	1/100	2/200	47	350	< 15	7	12	12	20
183118	ELXc 254.236	1	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	48	350	< 15	7	12	12	20
		2	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	48	350	< 15	7	12	12	20
183119	ELXc 180.237	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	46	350	< 15	9	15	15	25
183122	ELXc 114.238	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183123	ELXc 128.239	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183124	ELXc 214.240	2	x	x	x	x	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183125	ELXc 228.241	2	x	x	x	x	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	4	7	7	12
183126	ELXc 414.242	4	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	45	430	< 20	4	7	7	12
183127	ELXc 118.243	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	390	< 20	8	17	17	28
183128	ELXc 136.244	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	390	< 20	8	17	17	28
183129	ELXc 158.245	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	390	< 20	4	7	7	12
183130	ELXc 218.246	2	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	45	390	< 20	8	17	17	28
183131	ELXc 236.247	2	x*	x*	x	x	x	x	–	–	–	–	–	–	–	–	–	1/100	2/200	45	390	< 20	4	7	7	12
183132	ELXc 258.248	2	x*	x*	x	x	x*	x*	x	–	–	–	–	–	–	–	–	1/100	2/200	45	390	< 20	2	5	5	8
183133	ELXc 418.249	4	x*	x*	x	x	x	x	x	x	x*	x*	–	–	–	–	–	1/100	2/200	45	390	< 20	4	7	7	12
183134	ELXc 118.879	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183135	ELXc 126.880	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183136	ELXc 218.881	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	4	7	7	12
183137	ELXc 226.882	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	4	7	7	12
183150	ELXc 118.879	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183151	ELXc 126.880	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	8	17	17	28
183152	ELXc 218.881	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	4	7	7	12
183153	ELXc 226.882	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	2/200	45	380	< 20	4	7	7	12
188093	ELXc 135.856	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	44	330	< 10	11	18	18	30
188094	ELXc 235.857	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	45	330	< 10	9	15	15	25
188095	ELXc 149.858	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	28	330	< 10	11	18	18	30
188140	ELXc 140.862	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	250	< 10	11	18	18	30
188142	ELXc 154.864	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	34	300	< 10	9	15	15	25
188144	ELXc 180.866	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	45	300	< 10	9	15	15	25
188400	ELXc 257.836	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	47	350	< 10	7	12	12	20
188438	ELXc 414.868	3	x*	x*	–	x	x	x	x	–	–	x	x	–	–	–	–	1/100	2/200	45	400	< 10	7	12	12	20
		4	x*	x*	–	x	x	x	x	x	x	x	x	–	–	–	–	1/100	2/200	45	400	< 10	7	12	12	20
188589	ELXc 128.869	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	1.5/150	54	450	< 10	11	18	18	30
188590	ELXc 128.869	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	1.5/150	54	450	< 10	11	18	18	30
188595	ELXc 336.214	3	x	x	x	x	x	x	x*	x*	–	–	–	–	–	–	–	1/100	2/200	70	370	< 10	6	11	11	18
188616	ELXc 240.863	2	x*	x*	x	–	x	x	x	–	–	–	–	–	–	–	–	1/100	2/200	46	360	< 15	7	12	12	20
188617	ELXc 249.859	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	43	480	< 10	7	12	12	20

Electronic ballasts		Lamp	Electronic ballasts															Max. lead length		Operation	Output	THD	Possible quantity of			
Ref. No.	Type	Quantity	Terminals															hot*	cold	frequency	voltage		EB/automatic cut-outs			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				U_{OUT}		B	B	C	C
ELXc																										
188618	ELXc 254.865	2	x*	x*	x	–	x	x	x	–	–	–	–	–	–	–	–	1/100	2/200	43	390	< 10	7	12	12	20
188619	ELXc 280.538	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	50	420	< 10	–	10	–	10
188643	ELXc 242.837	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	43	440	< 15	7	12	12	20
188680	ELXc 155.378	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/100	1.5/150	47	250	< 15	7	12	12	20
188681	ELXc 155.378	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/100	1.5/150	47	250	< 15	7	12	12	20
188682	ELXc 170.833	1	x*	x*	–	–	–	x	x	–	–	–	–	–	–	–	–	1/100	1.5/150	44	350	< 10	7	12	12	20
188683	ELXc 170.833	1	x*	x*	–	–	–	x	x	–	–	–	–	–	–	–	–	1/100	1.5/150	44	350	< 10	7	12	12	20
188687	ELXc 242.837	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	43	440	< 15	7	12	12	20
188698	ELXc 213.870	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	42	250	< 20	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	42	250	< 20	11	18	18	30
188699	ELXc 218.871	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	35	350	< 12	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	35	350	< 12	11	18	18	30
188700	ELXc 142.872	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	44	480	< 15	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	44	480	< 15	11	18	18	30
188704	ELXc 136.207	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	–	–	48	350	< 20	11	18	18	30
188705	ELXc 236.208	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	45	250	< 20	11	18	18	30
188706	ELXc 158.209	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	–	–	33	250	< 20	9	15	15	25
188707	ELXc 258.210	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	48	350	< 20	7	12	12	19
188708	ELXc 136.207	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	–	–	48	350	< 20	11	18	18	30
188709	ELXc 236.208	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	45	250	< 20	11	18	18	30
188710	ELXc 158.209	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	–	–	33	250	< 20	9	15	15	25
188711	ELXc 258.210	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	48	350	< 20	7	12	12	19
188712	ELXc 213.870	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	42	250	< 20	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	42	250	< 20	11	18	18	30
188713	ELXc 218.871	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	35	350	< 12	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	35	350	< 12	11	18	18	30
188714	ELXc 142.872	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	44	480	< 15	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/100	1.5/150	44	480	< 15	11	18	18	30
188744	ELXc 418.204	3	x*	x*	–	x	x	x	x	–	–	x	x	–	–	–	–	1/100	2/200	44	480	< 10	7	12	12	20
		4	x*	x*	–	x	x	x	x	x	x	x	x	–	–	–	–	1/100	2/200	44	480	< 10	7	12	12	20
188868	ELXc 136.216	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	47,5	430	< 20	17	28	28	46
188869	ELXc 236.217	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	45	430	< 10	8	13	13	21
188870	ELXc 158.218	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	34	430	< 10	12	19	19	31
188871	ELXc 258.219	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	52	430	< 10	8	13	13	21
188886	ELXc 213.874	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	44	250	< 10	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	44	250	< 10	11	18	18	30
188887	ELXc 218.875	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	37	350	< 10	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	37	350	< 10	11	18	18	30
188888	ELXc 142.876	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	44	480	< 10	11	18	18	30
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	44	480	< 10	11	18	18	30
188889	ELXc 242.877	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	45	480	< 10	7	12	12	20
		2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	45	480	< 10	7	12	12	20
188912	ELXc 136.216	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	47,5	430	< 20	17	28	28	46
188913	ELXc 236.217	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	45	430	< 10	17	28	28	46
188914	ELXc 158.218	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	34	430	< 10	17	28	28	46
188915	ELXc 258.219	2	x*	x*	x	x	x*	x*	–	–	–	–	–	–	–	–	–	1/75	1.5/100	52	430	< 10	17	28	28	46
188921	ELXc 135.220	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	41	300	<10	11	18	18	30
188922	ELXc 235.221	2	x	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	2/150	41	300	< 10	11	18	18	30
188945	ELXc 139.632	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/75	2/150	42-85	330	< 15	17	28	29	47
188946	ELXc 149.633	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/75	2/150	42-85	330	< 10	17	28	29	47
188947	ELXc 180.634	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/75	2/150	42-85	330	< 10	8	13	13	22
188948	ELXc 239.635	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/75	2/150	42-85	330	< 10	8	13	13	22
188949	ELXc 249.636	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/75	2/150	42-85	330	< 7	8	13	13	22
188950	ELXc 280.637	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/75	2/150	45-70	330	< 10	5	9	9	15
ELXd																										
183059	ELXd 235.735	2	x*	x+	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	42	300	< 5	10	17	18	28
188276	ELXd 170.808	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	50-90	470	< 10	7	12	12	20
188329	ELXd 124.600	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	76-120	430	< 10	17	28	28	46
188330	ELXd 224.601	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	53-120	430	< 10	17	28	28	46
188331	ELXd 139.602	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	85-120	430	< 10	17	28	28	46
188332	ELXd 154.603	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	83-120	430	< 10	17	28	28	46
188333	ELXd 254.604	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	44-120	430	< 10	8	13	13	21
188334	ELXd 180.605	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	91-120	430	< 10	12	19	19	31

Electronic ballasts		Lamp	Electronic ballasts															Max. lead length		Operation	Output	THD	Possible quantity of			
Ref. No.	Type	Quantity	Terminals															hot*	cold	frequency	voltage		EB/automatic cut-outs			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				U_{OUT}		B	B	C	C
ELXd																										
188335	ELXd 249.606	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	44-120	430	< 10	8	13	13	21
188336	ELXd 124.607	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	76-120	430	< 10	17	28	28	46
188337	ELXd 224.608	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	53-120	430	< 10	17	28	28	46
188338	ELXd 139.609	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	85-120	430	< 10	17	28	28	46
188339	ELXd 239.610	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	53-120	430	< 10	17	28	28	46
188340	ELXd 154.611	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	83-120	430	< 10	17	28	28	46
188341	ELXd 254.612	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	44-120	430	< 10	8	13	13	21
188342	ELXd 180.613	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	91-120	430	< 10	12	19	19	31
188343	ELXd 249.614	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	44-120	430	< 10	8	13	13	21
188344	ELXd 118.615	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	51-120	300	< 10	17	28	28	46
188345	ELXd 218.616	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	51-120	300	< 10	12	19	19	31
188346	ELXd 136.617	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	48-120	430	< 10	17	28	28	46
188347	ELXd 236.618	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	48-120	430	< 10	17	28	28	46
188348	ELXd 158.619	1	x	x	–	–	–	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	46-120	430	< 10	17	28	28	46
188349	ELXd 258.620	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	46-120	430	< 10	8	13	13	21
188350	ELXd 239.621	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	53-120	430	< 10	17	28	28	46
188431	ELXd 226.801	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	50-90	470	< 10	7	12	12	20
188490	ELXd 226.801	2	x	x	x	x	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	50-90	470	< 10	7	12	12	20
188495	ELXd 170.808	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	50-90	470	< 10	7	12	12	20
188549	ELXd 218.803	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.75/75	60-99	300	< 10	11	18	18	30
188550	ELXd 242.807	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.75/75	45-95	400	< 10	7	12	12	20
188564	ELXd 118.802	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	60-105	400	< 10	11	18	18	30
188565	ELXd 142.806	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	40-95	400	< 10	11	18	18	30
188596	ELXd 318.622	3	–	x*	x*	x*	x*	x*	x*	–	–	–	–	x*	x*	x*	x*	0.5/50	–	45-120	430	< 10	17	28	28	46
188597	ELXd 324.623	3	–	x*	x*	x*	x*	x*	x*	–	–	–	–	x*	x*	x*	x*	0.5/50	–	67-120	430	< 10	8	13	13	21
188598	ELXd 424.624	4	–	x*	x*	x*	x*	x*	x*	x*	x*	–	–	x*	x*	x*	x*	0.5/50	–	45-120	430	< 10	8	13	13	21
188599	ELXd 418.625	4	–	x*	x*	x*	x*	x*	x*	x*	x*	–	–	x*	x*	x*	x*	0.5/50	–	45-120	430	< 10	12	19	19	31
188600	ELXd 324.626	3	–	x*	x*	x*	x*	x*	x*	–	–	–	–	x*	x*	x*	x*	0.5/50	–	67-120	430	< 10	8	13	13	21
188601	ELXd 318.627	3	–	x*	x*	x*	x*	x*	x*	–	–	–	–	x*	x*	x*	x*	0.5/50	–	45-120	430	< 10	17	28	28	46
188602	ELXd 424.628	4	–	x*	x*	x*	x*	x*	x*	x*	x*	–	–	x*	x*	x*	x*	0.5/50	–	45-120	430	< 10	8	13	13	21
188603	ELXd 418.629	4	–	x*	x*	x*	x*	x*	x*	x*	x*	–	–	x*	x*	x*	x*	0.5/50	–	45-120	430	< 10	12	19	19	31
188604	ELXd 280.630	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	44-120	430	< 10	5	9	9	15
188605	ELXd 280.631	2	x	x	x	x*	x*	x*	x*	–	–	–	–	–	–	–	–	1/100	1.5/150	44-120	430	< 10	5	9	9	15
188694	ELXd 118.802	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	60-105	400	< 10	11	18	18	30
188695	ELXd 142.806	1	x	x	–	–	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.75/75	40-95	400	< 10	11	18	18	30
188696	ELXd 218.803	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.75/75	60-99	300	< 10	11	18	18	30
188697	ELXd 242.807	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.75/75	45-95	400	< 10	7	12	12	20
188717	ELXd 135.823	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1.0/75	1.5/100	45	420	< 10	30	50	30	50
188864	ELXd 117.715	1	–	–	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	1.5/150	47-80	400	< 10	10	15	15	25
188865	ELXd 117.715	1	–	–	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	1.5/150	47-80	400	< 10	10	15	15	25
188866	ELXd 217.717	2	x*	x*	x*	x*	x*	x*	x*	–	–	–	–	–	–	–	–	0.5/50	1.5/150	34-94	250	< 10	11	18	18	30
188867	ELXd 217.717	2	x*	x*	x*	x*	x*	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.5/50	34-94	250	< 10	11	18	18	30
188873	ELXd 118.718	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1.5/150	2.0/200	55-113	300	< 5	15	24	25	40
188874	ELXd 218.719	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1.5/150	2.0/200	42-114	400	< 5	17	27	28	46
188875	ELXd 136.720	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1.5/100	2.0/200	47-105	300	< 5	15	24	25	40
188876	ELXd 236.721	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1.5/100	2.0/200	42-107	400	< 5	17	27	27	44
188877	ELXd 158.722	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1.5/100	2.0/200	47-105	300	< 8	15	24	25	40
188878	ELXd 258.723	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1.5/150	2.0/200	45-110	400	< 10	11	18	19	31
188923	ELXd 142.709	1	–	–	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.5/50	41-104	400	< 10	8	12	12	20
188924	ELXd 142.709	1	–	–	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.5/50	41-104	400	< 10	8	12	12	20
188932	ELXd 135.724	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/200	43	330	< 10	11	17	18	29
188933	ELXd 235.725	2	x*	x*	x	x	x	x*	x*	–	–	–	–	–	–	–	–	1/100	2/200	43	330	< 5	10	17	18	28
188952	ELXd 118.705	1	–	–	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.5/50	47	250	< 10	13	20	21	34
188953	ELXd 118.705	1	–	–	x*	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.5/50	47	250	< 10	13	20	21	34
188954	ELXd 218.707	2	x*	x*	x*	x*	x*	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.5/50	41	250	< 10	12	20	21	33
188955	ELXd 218.707	2	x*	x*	x*	x*	x*	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.5/50	41	250	< 10	12	20	21	33
188974	ELXd 242.711	2	x*	x*	x*	x*	x*	x*	x*	–	–	–	–	–	–	–	–	0.5/50	0.5/50	40	250	< 10	12	20	21	33
188975	ELXd 242.711	2	x*	x*	x	x*	x*	x*	–	–	–	–	–	–	–	–	–	0.5/50	0.5/50	40	250	< 10	12	20	21	33
ELXs																										
188661	ELXs 116.900	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	43	250	–	27	43	44	72
188662	ELXs 116.903	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	43	250	–	27	43	44	72
188663	ELXs 121.901	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	40	250	–	54	86	88	148
188664	ELXs 121.904	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	40	250	–	54	86	88	148

Electronic ballasts		Lamp	Electronic ballasts															Max. lead length		Operation	Output	THD	Possible quantity of			
Ref. No.	Type	Quantity	Terminals															hot*	cold	frequency	voltage		EB/automatic cut-outs			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15				U_{OUT}		B	B	C	C
ELXs																										
188665	ELXs 124.902	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	47	250	–	54	86	88	148
188666	ELXs 124.905	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	47	250	–	54	86	88	148
188667	ELXs 126.906	1	x*	x*	x	x	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	42	250	–	27	43	44	72
188668	ELXs 126.907	1	x	x	x*	x*	–	–	–	–	–	–	–	–	–	–	–	1/100	2/150	42	250	–	27	43	44	72

Electromagnetic ballasts

Electromagnetic (inductive) ballasts are active components that in conjunction with starters preheat the lamp electrodes, supply the ignition voltage and stabilise lamp currents during operation. Series or parallel capacitors are required to compensate blind current.

For installation in luminaires, consideration must be taken of the mains voltage and mains frequency, the dimensions and maximum thermal values as well as any potential noise generation. To fulfil these special requirements, Vossloh-Schwabe provides a large variety of different ballasts.

VS magnetic ballasts have been optimised with regard to their magnetic fields and loads so that usually so that noise cannot usually be perceived. However, the luminaire design can cause magnetic vibrations to affect large areas. When designing luminaires, it might therefore be necessary to fit a concertina section or grooves to prevent vibrations from spreading and thus from noise being generated.

The service life of an inductive ballast is mainly determined by the material chosen for the winding insulation. The maximum winding temperature denotes the temperature (tw) that the insulation will withstand for a period of 10 years given continuous operation under rated conditions. This maximum winding temperature must not be exceeded in real conditions to ensure the ballast can achieve its full service life. The winding temperature of the ballast that is measured in the luminaire is made up of the ambient temperature of the luminaire, the thermal conditions within the luminaire and the power loss of the ballast. The Δt marking on the ballast type plate provides a measure of the power loss of the ballast. In addition to this, the power loss of ballast-lamp circuits is measured in accordance with EN 50294. This test method forms the basis for the CELMA energy classification of ballasts and is also applied in European Regulation 245/2009/EG "Definition of eco-design requirements regarding fluorescent lamps without an integrated ballast, high-pressure discharge lamps as well as ballasts and luminaires in their operation and the invalidation of Directive 2000/55/EC" (see pages 269–271 for further details).

As a result of their design features, inductive ballasts cause leak current that is discharged via the earth conductor of the luminaire. The maximum permissible leak current for protection class I luminaires is 1 mA, a value of which all Vossloh-Schwabe electronic ballasts fall clearly short. Values of max. 0.1 mA are measured per electromagnetic ballast. However, as these values accumulate with the number of installed ballasts, this should be taken into account when dimensioning the F1 protective switch.

Starters for fluorescent lamps

As mentioned above, the operation of fluorescent lamps also requires starters in addition to ballasts. A distinction is made between glow starters, which are also available with automatic cut-outs, and electronic starters. The correct choice of voltage and power range is crucial. Starters are available for 220–240 V and for 110–127 V mains voltage. The latter are also required for twin-lamp operation (e.g. 2x18 W at 230 V).

Operating SL-series VS ballasts (100–127 V) depends on the use of a 220–240 V starter as these operating devices are high-reactance transformers that supply higher voltages to the lamp. Starters should only be used with starter contacts with a hardness value of at least HB 100.

Assembly Instructions for Electromagnetic Ballasts

For mounting and installing of electromagnetic ballasts for fluorescent lamps

Mandatory regulations

DIN VDE 0100	Erection of low voltage installations
EN 60598-1	Luminaires – part 1: general requirements and tests
EN 61347-1	Operating devices for lamps – part 1: general and safety requirements
EN 61347-2-8	Operating devices for lamps – part 2-8: special requirements for ballasts for fluorescent lamps
EN 60921	Ballasts for fluorescent tube lamps – performance requirements
EN 50294	Methods for measuring the total input power of ballast-lamp circuits
EN 55015	Maximum values and methods of measurement for RFI suppression in electrical lighting installations and similar electrical appliances
EN 61000-3-2	Electromagnetic Compatibility (EMC) – part 3: maximum values – main section part 2: maximum values for mains harmonics (device input current up to and including 16 A per conductor)
EN 61547	Installations for general lighting purposes – EMC immunity requirements

Technical specifications

Operating voltage range	VS ballasts can be operated at the specified mains voltage within a tolerance range of ±10%
Leak current	≤ 0.1 mA per ballast
Error current	Impulse-resistant leak-current protection must be installed. Distribute the luminaires to phases L1, L2 and L3; install tri-phase FI switches. If permissible, install FI switches with 30 mA leak current; connect no more than 15 luminaires as FI switches can be triggered at half the leak current value.
Power factor	Inductive ballasts: $\lambda \leq 0.5$ Parallel-compensated ballasts: $\lambda \geq 0.85$

Compensation VS recommends the use of parallel capacitors owing to their technical advantages and power balance.

Possible interference with IR systems
Are not known to occur

Mechanical mounting

Mounting position
Any

Mounting location
Ballasts are designed for installation in luminaires or comparable devices.
Independent ballasts do not need to be installed in a casing.

Fastening Preferably using screws Ø 4 mm

Maximum temperatures
The stipulated winding temperature (tw 130, tw 140 and tw 150, respectively) must not be exceeded during normal operation. The corresponding maximum values (232°C, 248°C and 264°C, respectively) must be observed during anomalous operation. These values must be checked by measuring resistance during operation.

Temperature increase
The lamp current flowing through the ballast generates a power loss that leads to an increase in winding temperature. The Δt values for normal and abnormal operation provide a measure of this temperature increase. The Δt values are ascertained using standardised connections for measurement and are provided on the ballast type plate in Kelvin.

Example: Δt = 55 K/140 K:
The first Δt value indicates the temperature increase for normal operation at the lamp's operating current. The second value, 140 K in this case, denotes the temperature increase of the winding that results from the current that flows when the lamp's discharge path is short-circuited. The current that flows in this state is the preheat current through the lamp's electrodes.

Electromagnetic compatibility (EMC)

Interference Interference voltage measurements have to be taken at the connection terminals for luminaires with magnetic ballasts as these are systems that operate with lamp voltages of under 100 Hz. These low-frequency interference voltages are generally not critical with magnetic ballasts.

Interference immunity
Thanks to the robust design and choice of materials, magnetic ballasts provide a high degree of interference immunity and are not impaired by admissible mains power interference.

Mains Harmonics After every zero crossing of the lamp current, fluorescent lamps experience a re-ignition peak as the lamps go out for a brief (imperceptible) moment. These re-ignition peaks generate mains harmonics that are smoothed by the ballast's impedance. The right design, i.e. determining the operating point of the magnetic ballast, ensures mains harmonics are limited to the maximum values permitted by EN 61000-3-2. VS electromagnetic ballasts all comply with the stipulated maximum values.

Selection of automatic cut-outs for VS electromagnetic ballasts

Dimensioning automatic cut-outs

When a ballast is switched on, high transient current peaks occur due to parasite capacitances that can accumulate with the number of luminaires. These high system switch-on currents put a strain on the automatic conductor cut-outs. For this reason, only surge-current-proof automatic cut-outs should be used for lighting systems.

Release reaction The release reaction of the automatic conductor cut-outs comply with VDE 0641, part 11, for B and C characteristics.

No. of ballasts The following values are meant as guidelines only and may vary depending on the respective lighting system. The maximum number of VS ballasts applies to cases where the devices are switched on simultaneously. Specifications apply to single-pole fuses. The number of permissible ballasts must be reduced by 20% for multi-pole fuses. The considered circuit impedance equals 400 mΩ (approx. 20 m of [2.5 m²] conductor from the power supply to the distributor and a further 15 m to the luminaire). Doubling circuit impedance to 800 mΩ increases the possible number of ballasts by 10%. The values quoted in the following tables are guidelines and can be affected by system-specific factors.

Possible number of ballasts connected to automatic cut-outs for compact fluorescent lamps (single lamp operation)

Lamp output	10 A (B)		16 A (B)	
W	Inductive	Parallel compensation	Inductive	Parallel compensation
5/7/8/9/10/11/13	50	90	80	130
18 (TC-L)	27	32	43	51
18 (TC-D)	40	65	65	110
24	25	32	40	51
26	27	32	43	51
36	23	32	37	51

Possible number of ballasts connected to automatic cut-outs for tubular and U-shaped fluorescent lamps (single lamp operation)

Lamp output	10 A (B)		16 A (B)	
W	Inductive	Parallel compensation	Inductive	Parallel compensation
4/6/8/10	50	90	80	130
13	45	80	70	115
15/18/20	27	32	43	51
30/36/38/40	23	32	37	51
58/65	15	20	22	32
70	13	18	20	30

Reliability and service life

Provided the specified maximum values for the winding temperature are complied with, a service life of 10 years can be expected. Failure rate: ≤ 0.025%/1,000 hours.

Electrical installation

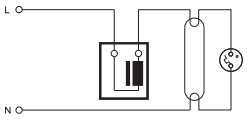
Connection terminals (combination terminals)

- Use copper (not stranded) wire
- Required diameter for push-in connection 0.5–1 mm²
- Stripped lead length 8 mm
- Required cross-section for IDC zone 0.5 mm²; max. Ø 2 mm including Insulation, no wire stripping required; mounting requires a special tool

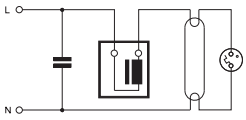
Push-in terminals The integrated terminals can only be used with rigid leads. Rigid leads: 0.5–1.5 mm². The stripped lead length totals 8 mm.

Wiring The wiring between the mains, ballasts and lamps must comply with the respective circuit diagram.

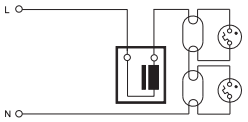
Circuit diagrams for the operation of fluorescent lamps with Vossloh-Schwabe electromagnetic ballasts



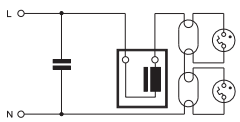
Inductive single circuit



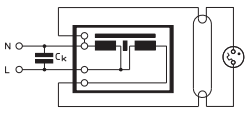
Parallel-compensated single circuit



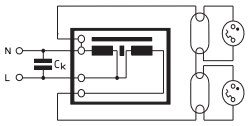
Inductive tandem circuit



Parallel-compensated tandem circuit



Parallel-compensated single circuit with high-reactance transformer



Parallel-compensated tandem circuit with high-reactance transformer

Connection terminals
In the interest of ensuring firm contacts and long component service life, Vossloh-Schwabe uses only top-quality materials for plastic or metal parts during the production of connection terminals. These quality features apply to both Vossloh-Schwabe's luminaire connection terminals as well as to the terminals fitted to ballasts and lampholders.

Notes on connection terminals on electronic ballasts
Vossloh-Schwabe electronic ballasts are fitted with installation-friendly push-in connectors. In addition, many models for linear fluorescent lamps are also available with IDC terminals (for solid conductors 0.5 mm²) and supplementary push-in terminals (for solid conductors 0.5–1 mm²), stripped length 8–9 mm. IDC terminals permit automated luminaire wiring and testing using the ALF system and are thus particularly efficient.

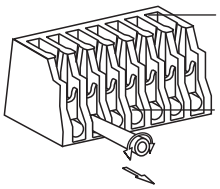
Notes on connection terminals on electromagnetic ballasts
Standard issue Vossloh-Schwabe electromagnetic ballasts are fitted with installation-friendly IDC/push-in terminals (combination terminals) or push-in terminals. The terminals are designed for use with solid conductors with cross-sections of 0.5 –1 mm² (combination terminals) or up to 1.5 mm² (push-in terminals) and are approved for current loads of up to 6 A (combination terminal) and 16 A (push-in terminal). The lead stripping length totals 7 – 9 mm for push-in terminals; leads do not need to be stripped for IDC terminals.
On request, many ballasts can also be provided with screw terminals (current load up to 16 A) for conductor cross-sections of 0.5 to 2.5 mm².

Notes on connection terminals on lampholders
Vossloh-Schwabe usually equips lampholders for T and TC lamps as well as starter lampholders with installation-friendly push-in terminals for solid conductors of 0.5 –1 mm². Most lampholders are fitted with twin push-in terminals and thus permit through-wiring. The required lead stripping length amounts to 8 – 9 mm for all types.

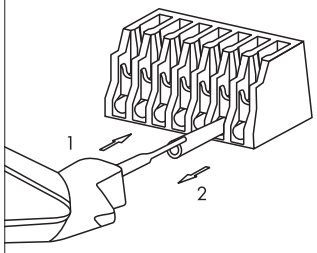
IDC terminals
In order to fully exploit the vast potential for rationalisation offered by automated wiring and testing with the ALF system, a totally new component family was developed that is equipped with the VDE-tested IDC terminal technology. This technology has already been used very successfully on a large scale in other branches of industry. This connection technology dispenses with the stripping of conductors that is required for the push-in, screw or crimping methods. The tried-and-tested IDC terminal technology has created the foundation for efficient automation as it ensures both high connection quality and rapid contacting. Components equipped in this fashion make it possible to through-wire several terminals with a single conductor. This constitutes a further economic advantage as it significantly reduces the required conductor lengths. Furthermore, this design principle makes it possible to use adapters to simply and reliably make electrical contact from above for a VDE-compatible final luminaire inspection.

ALF connection
Height: 12 mm

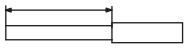
Release by twisitng and pulling the conductor at the same time



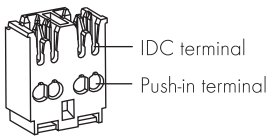
1. Insert release tool above the conductor
2. Pull out the conductor



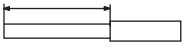
Stripping the conductor fpr push-in terminal 0.5 – 1 mm²: 8 – 9 mm



IDC/Push-in terminal for electromagnetic ballasts



Stripping the conductor for push-in terminal 0.5 – 1 mm²: 7 – 9 mm



Lampholders for Fluorescent Lamps

Lampholders for compact fluorescent lamps
Vossloh-Schwabe produces the majority of lampholders for TC lamps using PBT, a thermoplastic material. This highly heat-resistant material is responsible for the T140 temperature rating. Leading lamp manufacturers also use PBT for the lamp bases they produce. This material harmonisation in conjunction with fatigue-free, stainless steel lamp mounting springs ensures a permanently secure lamp fit.

Lampholders for double-ended fluorescent lamps
VS lampholders for T lamps are characterised by a number of technical features that guarantee a high degree of reliability and safety. The heat-resistant PBT rotor with which most VS lampholders are fitted is a recognised trademark. In addition to the lampholders with the field-tested large rotor, VS also provides a new generation of lampholders featuring innovative "Rotoclic" rotor technology. This new VS technology constitutes a further milestone in the development of highly heat-resistant rotor systems.

Among the special features of this new technology is a T140 temperature rating thanks to a front plate made entirely of PBT as well as a clearly audible click when the lamp is inserted or replaced. As a result, the motion of turning the lamp from "replacement" to "operating" position is aided acoustically.

In addition to this, VS produces a further series of lampholders with a rotor-like function, whose front plates are also made of highly heat-resistant PBT and have similarly been given a T140 temperature rating.

The maximum permissible temperature at the back of all lampholders is T_m 110 °C. Another key feature common to all VS lampholders is a highly effective support for the lamp pin that reliably prevents any base pin deflection, even with older lamps, and guarantees a durable and firm contact.

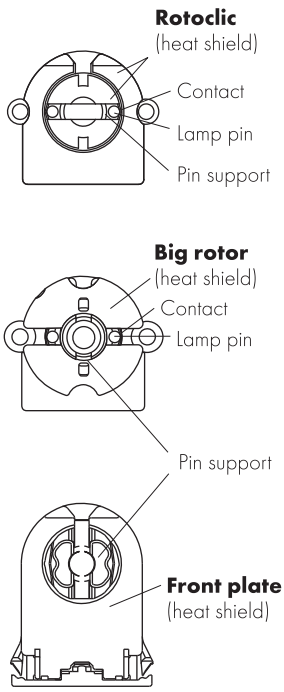
Push-through lampholders
Push-through lampholders are inserted from below through a cut-out in the luminaire casing and are secured by lateral catches. This type of lampholder is frequently used in luminaires on which the lampholder remains visible from the outside, e.g. in so-called strip lighting. The electrical leads are laid beneath the sheet metal level. Luminaire directive EN 60598-1 Para. 8.2 must be observed with regard to the luminaire.

Push-fit lampholders
This lampholder type, which is frequently found in surface-mounted ceiling and built-in luminaires, is pushed into the luminaire casing from above. The lampholder foot should protrude by no more than 4 mm to match the usual height of the spacing cams in the luminaire casing. These lampholders are mostly wired above the luminaire casing to the side of the lampholder. However, there are also lampholders on which the wiring runs through the lampholder foot, with the leads laid beneath the luminaire casing.

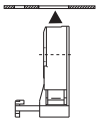
Built-in lampholders
This design is also predominantly used for recessed ceiling and surface-mounted luminaires. However, unlike push-fit lampholders, built-in lampholders are usually fitted at the ends of the luminaire boxes. In addition to the usual fixing with split pins attached to the rear, there are also countless versions with fixing clips, push-fit studs or screw-in holes, which are also available with spring-loaded length compensation. Built-in lampholders offer luminaire designers a wealth of scope regarding the choice of lamp position in relation to the reflector. This enables great variation in light distribution as the lampholder does not dictate the distance of the centre of the lamp from the metal casing.

Surface-mounted lampholders
The fastening system of surface-mounted lampholders usually consists of screws or rivets above a fixing level, along which the wiring is also laid. As this type of installation is usually too costly nowadays for large unit numbers, these lampholders are used almost exclusively for special applications, e.g. displays or illuminated advertisements.

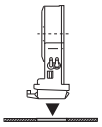
VS lampholders for the UL market and UL approved leads are available for all common lamp types. Further information can be found at www.unvlt.com.



Push-through lampholder

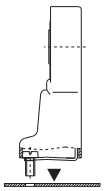


Push-fit lampholder

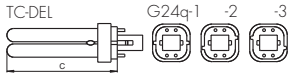
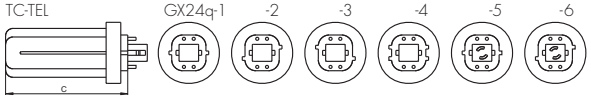
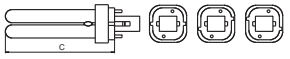
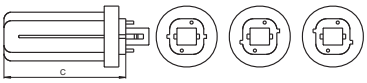
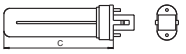
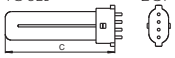
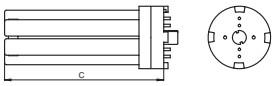
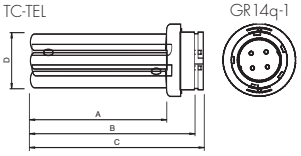
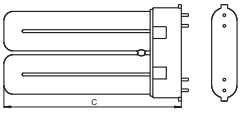
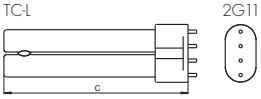


Built-in lampholder

Surface-mounted lampholder

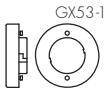
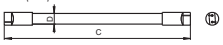
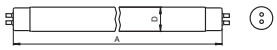
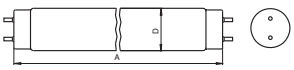
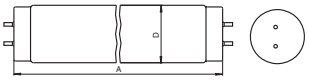


Lamp Table – Fluorescent Lamps

Lamp type/lamp base	Base	Output (W)	Max. length (C) acc. to IEC			
TC-DEL G24q-1 -2 -3 	G24q-1	10 13	95 130			
	G24q-2	18	140			
	G24q-3	26	160			
TC-TEL GX24q-1 -2 -3 -4 -5 -6 	GX24q-1	13	90			
	GX24q-2	18	110			
	GX24q-3	26 32	130 145			
	GX24q-4	42	155			
	GX24q-5	57	191			
	GX24q-6	70	219			
TC-D G24d-1 -2 -3 	G24d-1	8 10 13	73* 95 130			
	G24d-2	18	140			
	G24d-3	26	160			
TC-T GX24d-1 -2 -3 	GX24d-1	13	90			
	GX24d-2	18	110			
	GX24d-3	26	130			
TC-S G23 	G23	5 7 9 11	85 115 145 215			
TC-SEL 2G7 	2G7	5 7 9 11	85 115 145 215			
TC-TEL 2G8-1 	2G8-1	60 85 120	167 208 285			
TC-TEL GR14q-1 			A	B	C	D
	GR14q-1	14 17	99.7 121.7	120 142	126.6 148.6	41* 41*
TC-DD 			A	B		
	GR8	16 28	138 205	141 207		
	GR10q	10 16 21 28 38	92 138 138 205 205	95 141 141 207 207		
	GRY10q-3	55	205	205*		
	GRZ10d	18	137	141*		
	GRZ10t	30	202	206*		
TC-F 2G10 	2G10	18 24 36	122 165 217			
TC-L 2G11 	2G11	18 24 34 36 40 55 80	225 320 533* 415 535 535 565			

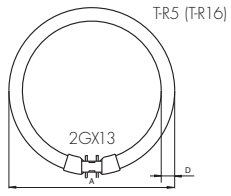
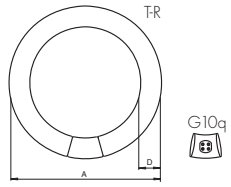
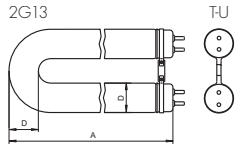
*not included in IEC standard (non-committal specifications)

Lamp Table – Fluorescent Lamps

Lamp type/lamp base	Base	Output (W)	Ø D (mm)	Length A/C (mm) acc. to IEC 60081/ 60901 (for circular lamps B)
 GX53-1	GX53-1	7 9		
T2 (T7)  W4.3	W4.3x8.5d	6 8 11 13	7 7 7 7	219.3 320.9 422.5 524.1
T5 (T16)  G5	G5	4 6 8 13 14 20 21 24 25 28 32 34 35 39 45 49 50 54 73 80	16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16	135.9 212.1 288.3 516.9 549.0 549.0 849.0 549.0 1149.0 1149.0 1449.0 849.0 1449.0 849.0 1449.0 1449.0 1449.0 1149.0 1449.0 1449.0
T8 (T26)  G13	G13	10 14 15 16 16 18 20*1 23 30 32 33 34 36 36 38 50 51 58 70	26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26 26	470.0*2 360.0*2 437.4 589.8 720.0*2 589.8 438.0*2 970.0*2 894.6 1199.4 1149.0 1047.0*2 1199.4 970.0*2 1047.0 1500.0 1500.0 1500.0 1763.8
T12 (T38)  G13	G13	20 25 30 40 65 75 80*1 85 85*1 100 100*1 115 125 140 140*1 160*1	38 38 38 38 38 38 38 38 38 38 38 38 38 38 38 38	589.8 970.0 894.6 1199.4 1500.0 1763.8 1500.0 2374.3 1763.8 2374.3 1800.0*2 1200.0*2 2374.3 1500.0*2 1800.0*2 1800.0*2

*1 UV solarium lamps
*2 Not included in IEC standard (non-committal specifications)

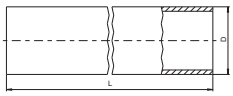
Lamp Table – Fluorescent Lamps

Lamp type/lamp base	Base	Output (W)	Ø D (mm)	A (mm)
	2GX13	22 40 55 60	16 16 16 16	230.0 305.0 305.0 379.0
	G10q	22 32 40 60	29 29 29 30	215.9 304.8 406.4 408.8*
	2G13-92	18 36 58	26 26 26	304* 566, 601* 566, 759*

* Not yet included in IEC standard (non-committal specifications)

Tube lengths of plastic and glass protective tube

Ø D (mm)	Length L (mm)
$38^{\pm 0.5}$	$L = A - 20^{\pm 1}$
$50^{\pm 0.8}$	$L = A - 30^{\pm 1}$



Key to lamp designations

TC-S	Tube Compact-Single
TC-SEL	Tube Compact-Single Electronic
TC-D	Tube Compact-Double
TC-DEL	Tube Compact-Double Electronic
TC-T	Tube Compact-Triple
TC-TEL	Tube Compact-Triple Electronic
TC-Q	Tube Compact-Quad
TC-QEL	Tube Compact-Quad Electronic
TC-DD	Tube Compact-Double D-Shape
TC-L	Tube Compact-Long
TC-F	Tube Compact-Flat
T2 (T7)	Tube Ø 2/8" (7 mm)
T5 (T16)	Tube Ø 5/8" (16 mm)
T8 (T26)	Tube Ø 8/8" (26 mm)
T12 (T38)	Tube Ø 12/8" (38 mm)
T-U	Tube, U-Shape
T-R	Tube, Ring-Shape
T-R5 (T-R16)	Tube, Ring-Shape Ø 5/8" (16 mm)

Energy efficiency classification

The commission's regulation (EC) No. 245/2009 dated 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to defining ecodesign requirements for fluorescent lamps without integrated ballast, high-pressure discharge lamps and for ballasts and luminaires needed for their operation, and repealing Directive 2000/55/EC of the European Parliament and of the Council (official title), has created a legal framework in the EU that defines fundamental requirements for operating efficient lighting technology products.

Although the Regulation predominantly applies to general lighting, it is also product-orientated and thus independent of any specific application. The efficiency and performance requirements (specifications governing performance features) apply to fluorescent lamps without integrated ballast, high-pressure discharge lamps as well as ballasts and luminaires needed to operate these lamps. A brief overview of the requirements governing fluorescent lamps is provided in the following table (excerpt from the CELMA guide).

Stage	Requirements governing	
1 13.04.2010	**Ballasts**	• Non-dimmable ballasts: minimum EEI = B2 • Dimmable ballasts: minimum EEI = A1 • Standby losses ≤ 1 W • Non-dimmable ballasts for new lamps not designed for use with existing ballasts: minimum EEI = A3 • Ballasts must be labelled (for instance: EEI = A2)
Interim stage 13.09.2010	**Luminaires**	• Luminaire standby losses = sum of ballast limiting values (No. of installed ballasts) • After 18 months: technical information must be made available, both online and in luminaire documentation (for luminaires > 2,000 Lumens).
2 13.04.2012	**Ballasts**	• Standby losses ≤ 0.5 W
	Luminaires	• Luminaire standby losses = sum of ballast limiting values (No. of installed ballasts) • Luminaire designs must permit integration of 3rd-stage ballasts. Exceptions: luminaires > IP4X
at the latest by **13.04.2014**	**Revision of the regulation** Technological progress as well as the sum of the experience gained during the implementation of the Regulation will be taken into consideration during the revision process.	
3 13.04.2017	**Ballasts**	• New ballast limiting values calculated using specified formula (see page 271) • That constitutes a ban on EEI = A3, B1 and B2 ballasts (magnetic ballasts can only be produced for higher lamp ratings – permitted classes are A2, A2 BAT and only A1 BAT for dimmable ballasts) • Ballasts labels shortened to A2, A2 BAT or A1 BAT ("EEI =" will be dropped; this means labelled ballasts can be clearly dated.
	Luminaires	• All luminaire designs must permit the integration of 3rd-stage ballasts.

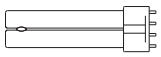
Energy efficiency classification

The following table taken from Regulation 245/2009/EC provides an overview of (1st- and 2nd-stage) ballast requirements, ordered according to efficiency values:

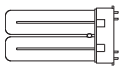
Lamp data					Ballast efficiency (P_{Lamp}/P_{Input}) (non-dimmable ballasts)				
Type	Nominal output W	ILCOS-Code	Typical rating 50 Hz W	HF W	A2 BAT %	A2 %	A3 %	B1 %	B2 %
T8	15	FD-15-E-G13-26/450	15	13.5	87.8	84.4	75.0	67.9	62.0
	18	FD-18-E-G13-26/600	18	16	87.7	84.2	76.2	71.3	65.8
	30	FD-30-E-G13-26/900	30	24	82.1	77.4	72.7	79.2	75.0
	36	FD-36-E-G13-26/1200	36	32	91.4	88.9	84.2	83.4	79.5
	38	FD-38-E-G13-26/1050	38.5	32	87.7	84.2	80.0	84.1	80.4
	58	FD-58-E-G13-26/1500	58	50	93.0	90.9	84.7	86.1	82.2
	70	FD-70-E-G13-26/1800	69.5	60	90.9	88.2	83.3	86.3	83.1
TC-L	18	FSD-18-E-2G11	18	16	87.7	84.2	76.2	71.3	65.8
	24	FSD-24-E-2G11	24	22	90.7	88.0	81.5	76.0	71.3
	36	FSD-36-E-2G11	36	32	91.4	88.9	84.2	83.4	79.5
TC-F	18	FSS-18-E-2G10	18	16	87.7	84.2	76.2	71.3	65.8
	24	FSS-24-E-2G10	24	22	90.7	88.0	81.5	76.0	71.3
	36	FSS-36-E-2G10	36	32	91.4	88.9	84.2	83.4	79.5
TC-D/ TC-DE	10	FSQ-10-E-G24q=1 FSQ-10-I-G24d=1	10	9.5	89.4	86.4	73.1	67.9	59.4
	13	FSQ-13-E-G24q=1 FSQ-13-I-G24d=1	13	12.5	91.7	89.3	78.1	72.6	65.0
	18	FSQ-18-E-G24q=2 FSQ-18-I-G24d=2	18	16.5	89.8	86.8	78.6	71.3	65.8
	26	FSQ-26-E-G24q=3 FSQ-26-I-G24d=3	26	24	91.4	88.9	82.8	77.2	72.6
TC-T/ TC-TE	13	FSM-13-E-GX24q=1 FSM-13-I-GX24d=1	13	12.5	91.7	89.3	78.1	72.6	65.0
	18	FSM-18-E-GX24q=2 FSM-18-I-GX24d=2	18	16.5	89.8	86.8	78.6	71.3	65.8
	26	FSM-26-E-GX24q=3 FSM-26-I-GX24d=3	26.5	24	91.4	88.9	82.8	77.5	73.0
TC-DD/ TC-DDE	10	FSS-10-E-GR10q FSS-10-L/P/H-GR10q	10.5	9.5	86.4	82.6	70.4	68.8	60.5
	16	FSS-16-E-GR10q FSS-16-I-GR10q FSS-10-L/P/H-GR10q	16	15	87.0	83.3	75.0	72.4	66.1
	21	FSS-21-E-GR10q FSS-21-I-GR10q FSS-21-L/P/H-GR10q	21	19	89.4	86.4	79.2	73.9	68.8
	28	FSS-28-E-GR10q FSS-28-I-GR10q FSS-28-L/P/L-GR10q	28	26	89.7	86.7	81.3	78.2	73.9
	38	FSS-38-E-GR10q FSS-38-L/P/L-GR10q	38.5	36	92.3	90.0	85.7	84.1	80.4
TC	5	FSD-5-I-G23 FSD-5-E-2G7	5.4	5	72.7	66.7	58.8	49.3	41.4
	7	FSD-7-I-G23 FSD-7-E-2G7	7.1	6.5	77.6	72.2	65.0	55.7	47.8
	9	FSD-9-I-G23 FSD-9-E-2G7	8.7	8	78.0	72.7	66.7	60.3	52.6
	11	FSD-11-I-G23 FSD-11-E-2G7	11.8	11	83.0	78.6	73.3	66.7	59.6
T5	4	FD-4-E-G5-16/150	4.5	3.6	64.9	58.1	50.0	45.0	37.2
	6	FD-6-E-G5-16/225	6	5.4	71.3	65.1	58.1	51.8	43.8
	8	FD-8-E-G5-16/300	7.1	7.5	69.9	63.6	58.6	48.9	42.7
	13	FD-13-E-G5-16/525	13	12.8	84.2	80.0	75.3	72.6	65.0
T9-C	22	FSC-22-E-G10q-29/200	22	19	89.4	86.4	79.2	74.6	69.7
	32	FSC-32-E-G10q-29/300	32	30	88.9	85.7	81.1	80.0	76.0
	40	FSC-40-E-G10q-29/400	40	32	89.5	86.5	82.1	82.6	79.2

Lamp types

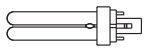
T8



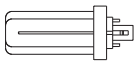
TC-L



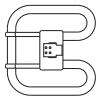
TC-F



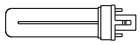
TC-D/TC-DE



TC-T/TC-TE



TC-DD/TC-DDE

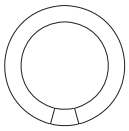


TC

T5

Lamp data					Ballast efficiency (P_{Lamp}/P_{Input}) (non-dimmable ballasts)				
Type	Nominal output W	ILCOS-Code	Typical rating 50 Hz W	HF W	A2 BAT %	A2 %	A3 %	B1 %	B2 %
T2	6	FDH-6-L/P-W4.3x8.5d-7/220		5	72.7	66.7	58.8	–	–
	8	FDH-8-L/P-W4.3x8.5d-7/320		7.8	76.5	70.9	65.0	–	–
	11	FDH-11-L/P-W4.3x8.5d-7/420		10.8	81.8	77.1	72.0	–	–
	13	FDH-13-L/P-W4.3x8.5d-7/520		13.3	84.7	80.6	76.0	–	–
	21	FDH-21-L/P-W4.3x8.5d-7		21	88.9	85.7	79.2	–	–
	23	FDH-23-L/P-W4.3x8.5d-7		23	89.8	86.8	80.7	–	–
T5-E	14	FDH-14-L/P-G5-16/550		13.7	84.7	80.6	72.1	–	–
	21	FDH-21-L/P-G5-16/850		20.7	89.3	86.3	79.6	–	–
	24	FDH-24-L/P-G5-16/550		22.5	89.6	86.5	80.4	–	–
	28	FDH-28-L/P-G5-16/1150		27.8	89.8	86.9	81.8	–	–
	35	FDH-35-L/P-G5-16/1450		34.7	91.5	89.0	82.6	–	–
	39	FDH-39-L/P-G5-16/850		38	91.0	88.4	82.6	–	–
	49	FDH-49-L/P-G5-16/1450		49.3	91.6	89.2	84.6	–	–
	54	FDH-54-L/P-G5-16/1150		53.8	92.0	89.7	85.4	–	–
	80	FDH-80-L/P-G5-16/1150		80	93.0	90.9	87.0	–	–
	95	FDH-95-L/P-G5-16/1150		95	92.7	90.5	84.1	–	–
	120	FDH-120-L/P-G5-16/1450		120	92.5	90.2	84.5	–	–
T5-C	22	FSCH-22-L/P-2GX13-16/225		22.3	88.1	84.8	78.8	–	–
	40	FSCH-40-L/P-2GX13-16/300		39.9	91.4	88.9	83.3	–	–
	55	FSCH-55-L/P-2GX13-16/300		55	92.4	90.2	84.6	–	–
	60	FSCH-60-L/P-2GX13-16/375		60	93.0	90.9	85.7	–	–
TC-LE	40	FSDH-40-L/P-2G11		40	91.4	88.9	83.3	–	–
	55	FSDH-55-L/P-2G11		55	92.4	90.2	84.6	–	–
	80	FSDH-80-L/P-2G11		80	93.0	90.9	87.0	–	–
TC-TE	32	FSMH-32-L/P-GX24q=3		32	91.4	88.9	82.1	–	–
	42	FSMH-42-L/P-GX24q=4		43	93.5	91.5	86.0	–	–
	57	FSM6H-57-L/P-GX24q=5 FSM8H-57-L/P-GX24q=5		56	91.4	88.9	83.6	–	–
	70	FSM6H-70-L/P-GX24q=6 FSM8H-70-L/P-GX24q=6		70	93.0	90.9	85.4	–	–
	60	FSM6H-60-L/P-2G8=1		63	92.3	90.0	84.0	–	–
	62	FSM8H-62-L/P-2G8=2		62	92.2	89.9	83.8	–	–
	82	FSM8H-82-L/P-2G8=2		82	92.4	90.1	83.7	–	–
	85	FSM6H-85-L/P-2G8=1		87	92.8	90.6	84.5	–	–
	120	FSM6H-120-L/P-2G8=1 FSM8H-120-L/P-2G8=1		122	92.6	90.4	84.7	–	–
TC-DD	55	FSSH-55-L/P-GR10q		55	92.4	90.2	84.6	–	–

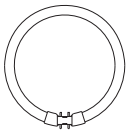
Lamp types



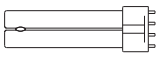
T9-C

T2

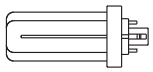
T5-E



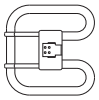
T5-C



TC-LE



TC-TE



TC-DD

At the very latest, the following energy efficiency formula for ballasts will be introduced to coincide with the 3rd stage:

If $P_{Lamp} \leq 5$ W $\quad EBb_{FL} = 0.71$

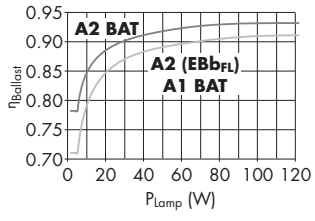
If $5\ W < P_{Lamp} < 100$ W $\quad EBb_{FL} = P_{Lamp}/(2*sqrt(P_{Lamp}/36)+38/36*P_{Lamp}+1)$

If $P_{Lamp} \geq 100$ W $\quad EBb_{FL} = 0.91$

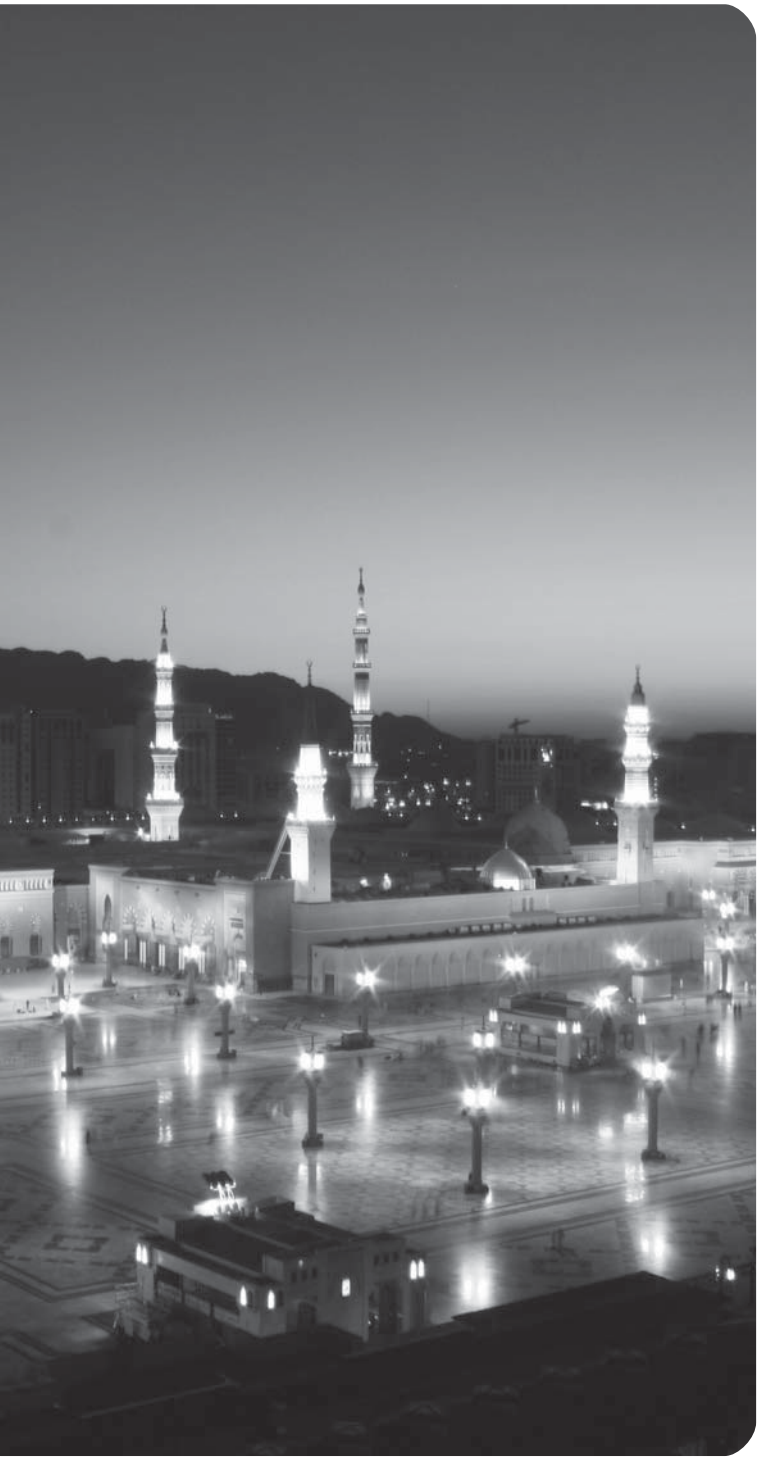
The following limiting values must be observed:

η Ballast	Energy efficiency classes
$\geq EBb_{FL}$	A2 and A1BAT
$\geq 1-0.75*(1-EBb_{FL})$	A2 BAT

The graph illustrates the difference between Classes A2, A1 BAT and A2 BAT (BAT = best available technology).



SYSTEM-OPTIMISING COMPENSATION



PARALLEL CAPACITORS

Capacitors are designed to compensate inductive reactive current of discharge lamps in 50/60 Hz networks when operated with electro-magnetic ballasts. As required by utility companies, capacitors serve to compensate the reactive current generated by the respective ballast. A power factor of $\lambda \geq 0.9$ is achieved.

In addition, capacitors can also be used to compensate or generate phase displacements. Careful selection of the raw materials as well as special thermal treatment of the capacitor coil guarantee a long service-life and stable capacitance.

4 Parallel Capacitors

Parallel capacitors **274–277**

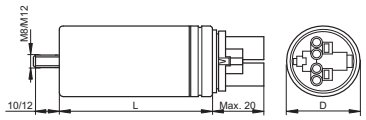
Technical details for parallel capacitors **278–287**
General technical details 394-401
Glossary 402-404

Parallel Connected Capacitors with Break-action Mechanism

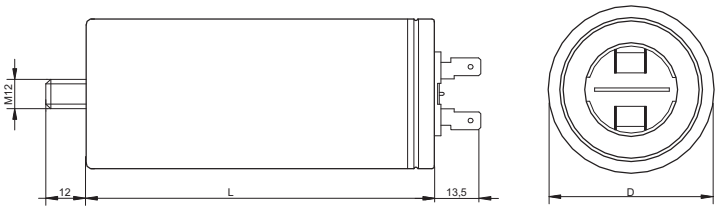
Capacitors type B

Casing: aluminium
Filling material: based on vegetable oil
Fastening: male nipple
with nut and washer included
Discharge resistance
Overpressure protection
On request further capacities or connectors

A Push-in twin terminals 0.5–1 mm²



B Double spade connector 6.3x0.8 acc. to IEC 61210



Parallel Connected Capacitors with Break-action Mechanism

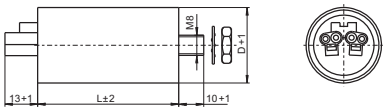
Capacitors type B

Ref. No.	Capacity µF	Temperature range °C	Drawing	Ø (D) mm	Length (L) mm	Male nipple/ length (mm)	Weight g	Unit pcs.
250 V, 50/60 Hz								
536378	2.0	-40 to 100	A	25	63	M8x10	85	100
536379	4.0	-40 to 100	A	25	63	M8x10	85	100
536380	6.0	-40 to 100	A	25	63	M8x10	85	100
536381	8.0	-40 to 100	A	25	78	M8x10	90	100
536382	10.0	-40 to 100	A	30	78	M8x10	95	100
536383	12.0	-40 to 100	A	30	78	M8x10	95	100
536384	13.0	-40 to 100	A	30	78	M8x10	95	100
536385	16.0	-40 to 100	A	35	78	M8x10	100	81
536386	18.0	-40 to 100	A	35	78	M8x10	100	81
536387	20.0	-40 to 100	A	35	78	M8x10	100	81
536388	25.0	-40 to 100	A	40	78	M8x10	110	64
536389	30.0	-40 to 100	A	35	103	M8x10	115	81
536390	32.0	-40 to 100	A	35	103	M8x10	115	81
536391	35.0	-40 to 100	A	40	103	M8x10	130	64
536392	40.0	-40 to 100	A	40	103	M8x10	130	64
536393	45.0	-40 to 100	A	40	103	M8x10	130	64
536394	50.0	-40 to 100	A	45	103	M8x10	160	49
536395	55.0	-40 to 100	A	45	103	M8x10	160	49
536396	60.0	-40 to 100	A	45	103	M8x10	200	49
380–450 V, 50/60 Hz								
536397	13.0	-40 to 85	A	35	103	M8x10	115	81
536398	18.0	-40 to 85	A	40	103	M8x10	130	64
536399	28.0	-40 to 85	A	45	103	M8x10	130	49
536400	32.0	-40 to 85	A	45	103	M8x10	130	49
536401	37.0	-40 to 85	A	50	103	M12x12	220	36
536402	50.0	-40 to 85	A	55	103	M12x12	240	36
536403	55.0	-40 to 85	B	50	128	M12x12	250	36
536404	60.0	-40 to 85	B	55	128	M12x12	250	36
536405	85.0	-40 to 85	B	60	138	M12x12	300	36

Parallel Connected Capacitors 250 V, 50/60 Hz

Capacitors type A

Casing: plastics, white or aluminium
Fastening: male nipple
with nut and washer included
Discharge resistance
Optional: thermal cut-out,
European wide patent
On request with alternative capacities, connection terminals, mounting options, casing materials or with a thermal fuse as well as versions with IDC terminal for the automatic luminaire wiring

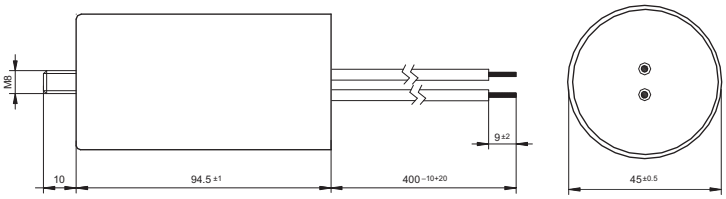


Ref. No.	Capacity µF	Temperature range °C	Ø (D) mm	Length (L) mm	Male nipple/ length (mm)	Push-in twin terminals	Weight g	Unit pcs.
Plastic casing								
500296	2.0	-40 to 85	25	57	M8x10	0.5 - 1 mm²	22	530
500299	2.5	-40 to 85	25	57	M8x10	0.5 - 1 mm²	22	530
500300	3.0	-40 to 85	25	57	M8x10	0.5 - 1 mm²	22	530
500301	3.5	-40 to 85	25	57	M8x10	0.5 - 1 mm²	22	530
500302	4.0	-40 to 85	25	70	M8x10	0.5 - 1 mm²	29	450
500303	4.5	-40 to 85	25	70	M8x10	0.5 - 1 mm²	29	450
500304	5.0	-40 to 85	25	70	M8x10	0.5 - 1 mm²	29	450
500305	6.0	-40 to 85	25	70	M8x10	0.5 - 1 mm²	29	450
506495	7.0	-40 to 85	30	70	M8x10	0.5 - 1 mm²	35	320
502783	8.0	-40 to 85	30	70	M8x10	0.5 - 1 mm²	35	320
504351	9.0	-40 to 85	30	70	M8x10	0.5 - 1 mm²	35	320
508667	10.0	-40 to 85	30	70	M8x10	0.5 - 1 mm²	39	320
506366	12.0	-40 to 85	30	94	M8x10	0.5 - 1 mm²	43	260
508468	15.0	-40 to 85	30	94	M8x10	0.5 - 1 mm²	43	260
508668	16.0	-40 to 85	30	94	M8x10	0.5 - 1 mm²	48	260
500315	18.0	-40 to 85	35	94	M8x10	0.5 - 1.5 mm²	55	190
500316	20.0	-40 to 85	35	94	M8x10	0.5 - 1.5 mm²	62	190
500317	25.0	-40 to 85	40	94	M8x10	0.5 - 1.5 mm²	66	80
500318	30.0	-40 to 85	40	94	M8x10	0.5 - 1.5 mm²	72	100
Aluminium casing								
500319	32.0	-40 to 85	35	135	M8x10	0.5 - 1.5 mm²	70	50
500320	35.0	-40 to 85	40	135	M8x10	0.5 - 1.5 mm²	135	36
500321	40.0	-40 to 85	40	135	M8x10	0.5 - 1.5 mm²	139	36
536406	45.0	-40 to 85	40	135	M8x10	0.5 - 1.5 mm²	139	36
500322	50.0	-40 to 85	45	135	M8x10	0.5 - 1.5 mm²	154	32
500323	55.0	-40 to 85	45	135	M8x10	0.5 - 1.5 mm²	159	32

Parallel Connected Capacitors with Leads 250 V, 50/60 Hz

Capacitors type A

Casing: plastics, white
Fastening: male nipple
with nut and washer included
Discharge resistance
Fixing centres: 20 mm
Optional: thermal cut-out,
European wide patent
On request with alternative capacities,
connection terminals, mounting options,
casing materials or with a thermal fuse
as well as versions with IDC terminal
for the automatic luminaire wiring



Ref. No.	Capacity µF	Temperature range °C	Ø (D) mm	Length (L) mm	Male nipple/ length (mm)	Lead length mm	Weight g	Unit pcs.
Plastic casing								
552774	2.0	-25 to 85	25	57	M8x10	150	22	400
526169	4.0	-25 to 85	28	54	M8x10	250	32	350
526170	6.0	-40 to 85	25	70	M8x10	250	32	320
526171	8.0	-40 to 85	35	57	M8x10	250	35	220
529665	10.0	-40 to 85	30	70	M8x10	200	40	280
536742	12.0	-25 to 85	36	67	M8x10	150	47	120
529666	16.0	-25 to 85	36	92	M8x10	200	52	120
536741	20.0	-40 to 85	35	95	M8x10	150	63	160
508484	25.0	-25 to 85	40	70	M8x10	250	72	80
536743	30.0	-25 to 85	40	92	M8x10	150	82	80
528554	35.0	-25 to 85	45	94.5	M8x10	250	85	60
536813	40.0	-25 to 85	45	94.5	M8x10	400	85	60
528555	45.0	-25 to 85	50	94.5	M8x10	250	90	50

4 Capacitors for Fluorescent and Discharge Lamps

Idle current compensation **279**

Parallel compensation **280**

MPP capacitor technology **280–282**

Assembly instructions – Capacitors **283–284**

Capacitor tables **285–289**

General technical details **394–401**
Glossary 402-404

Compensation of idle current

When using magnetic ballasts a phase shift occurs between the mains voltage and the current drawn. This phase shift is expressed by the power factor λ, which generally ranges between a value of 0.3 and 0.7 with inductive circuits.

As a result of this phase shift, idle current, which does not boost the efficiency of the lighting unit, is also taken up from the power supply network in addition to real power. Power utility companies therefore require an increase of the power factor to values of over 0.85 for systems exceeding a certain rating (usually upwards of 250 W per external conductor).

Compensation capacitors are used to counteract idle current (by increasing the power factor) and can be connected either in parallel or in series.

Thanks to a power factor of approx. 0.95, electronic ballasts do not need to be operated with compensation capacitors.

Compensation using series capacitors

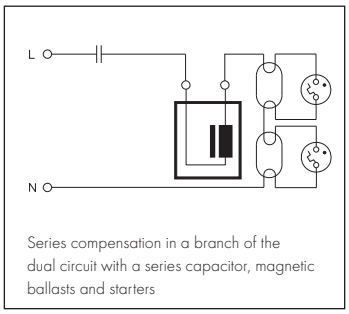
Series compensation employs a so-called dual circuit (two fluorescent lamp circuits connected in parallel), whereby the capacitor, which is connected in a branch of the circuit, over compensates the inductive idle current to such an extent that it covers the idle current of both ballasts. This type of circuit is only used with fluorescent lamps. As series capacitors are dimensioned for nominal-voltage and ballast tolerances, the lamp in the capacitor branch of the dual circuit operates with a higher current and thus also with a higher rating. Apart from differences in lamp brightness, the power loss in the circuit branch with the capacitor will also be greater.

An advantage of the dual circuit is that it prevents the radiated light from flickering.

The higher current in the so-called capacitive lamp circuit causes an up to 14% increase in lamp rating and a reduction of the lamp service life by as much as 20%. This goes hand in hand with substantial technical, ecological and economic disadvantages.

Series capacitors have to meet very high technical requirements to suit various aspects like temperature, nominal voltage, tolerances of the capacitance values, etc.

As defined by EC directive 2000/55/EC (European Standard EN 50294 governing the measurement of total power consumption), a series capacitor is considered to be a part of the ballast. If the system rating of the capacitive circuit containing the lamps and ballasts is then determined in line with the above definition, rating increases of up to 14% will become apparent in comparison to operation without a series capacitor. Experience has shown that this increased power consumption often means devices fall in the directive's "banned" category. It is therefore strongly advised that due consideration be given to the elevated power consumption values common to using series capacitors for compensation purposes.



Series compensation in a branch of the dual circuit with a series capacitor, magnetic ballasts and starters

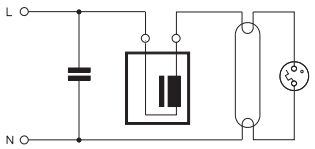
Parallel compensation

During parallel compensation, each lamp circuit is assigned to a capacitor connected in parallel to the mains. Only one capacitor providing sufficient capacitance is needed for luminaires with several lamps. Parallel compensation does not affect current flow through a discharge lamp. The requirements placed on parallel capacitors are clearly lower than those for series capacitors.

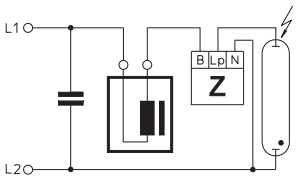
However, parallel compensation can be subject to limitations when using audio-frequency ripple control pulses if the system operates with a connected rating of over 5 kVA and ripple control frequencies of over 300 Hz are used. The respective power utility company should be consulted for advice in such cases.

Parallel compensation is used in fluorescent lamp and high-pressure discharge lamp circuits.

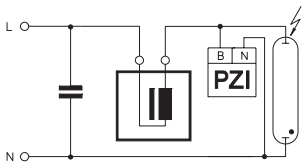
As parallel compensation offers substantial advantages, this has become the accepted method in the last few years.



Parallel compensation of a fluorescent lamp circuit



Parallel compensation of a high-pressure discharge lamp circuit with a superimposed ignitor



Parallel compensation of a high-pressure discharge lamp circuit with a pulse ignitor

Metallised polypropylene film capacitors

Metallised polypropylene film capacitors are designed to compensate the inductive idle current drawn by discharge lamps (fluorescent lamps, high-pressure mercury vapour lamps, high-pressure sodium vapour lamps and metal halide lamps with a ceramic discharge tube) in 50 Hz/60 Hz grids. All Vossloh-Schwabe compensation capacitors for luminaires feature a metallised polypropylene film dielectric. Compensation capacitors help to increase the power factor to values of over λ 0.85 as required by power utility companies.

Construction of metallised polypropylene film capacitors

VS MPP capacitors contain a low-loss metallised polypropylene film dielectric, which is produced by depositing a thin layer of zinc and aluminium or pure aluminium vapour onto one side of the polypropylene film. The contacts at either end of the capacitor coil are created by spraying on a layer of metal and thus guarantee a high current-carrying capacity as well as a low-inductive connection between the terminals and the coils.

All capacitors with a nominal voltage upwards of 280 V are filled with oil or resin after the coils have been inserted and then hermetically sealed. This protects the coils from environmental influences and reduces partial discharge, which contributes to a long service life and stable capacitance. The effects of partial discharge only play a minor role for capacitors with a nominal voltage of under 280 V so that these devices do not need to be filled.

Hermetically sealed, filled capacitors with an overpressure contact breaker should always be used in critical ambient conditions (high humidity, aggressive atmospheres, high temperatures), if the workload and power supply conditions are unknown as well as in situations that demand increased attention to safety.

VS MPP capacitors feature a self-healing dielectric. In the event of a dielectric breakdown in the coil (short circuit), the metal coating vaporises around the breakdown site owing to the high temperature of the transient arc that is produced. Owing to the excess pressure generated during such a breakdown, the metal vapour is pushed outwards away from the centre of the site within the space of just a few microseconds. This creates a coating-free corona around the breakdown site that completely isolates it and means the capacitor remains fully functional during a dielectric breakdown.

The self-healing properties of a capacitor can decrease with time and with constant overloading. This bears the risk of a non-healing breakdown with a permanent short circuit. Therefore self-healing must not be confused with failsafe.

Compensation capacitors are divided into two type families (A and B) in accordance with IEC 61048 A2.

- Type A capacitors defined:
  "Self-healing parallel capacitors; without an (overpressure) contact breaker in the event of failure".
  They are referred to as unsecured capacitors.

- Type B capacitors defined:
  "Self-healing capacitors for series connection in lighting circuits or self-healing parallel capacitors; with an (overpressure) contact breaker in the event of failure".
  These are referred to as hermetically sealed, secured capacitors.

In accordance with the standard, the discharge resistor of both capacitor families must be capable of reducing capacitor voltage to a value of under 50 V in the space of 60 seconds after disconnection from the mains.

Capacitors without a contact breaker, unsecured,
Type A capacitors in accordance with IEC 61048 A2

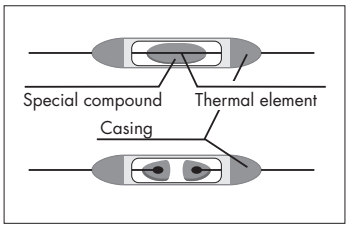
IEC 61048 A2-compliant Type A capacitors are self-healing and require no short-circuit protection for normal operation.

Type A capacitors are not fitted with a specific failsafe mechanism as prescribed by the standards for Type B capacitors. Nevertheless, the requirements laid down in the standard for Type A capacitors, especially with regard to temperature and service life tests, are designed to ensure a sufficient degree of device safety and availability **provided the device was correctly installed and operated under calculable and known ambient operating conditions**.

Even so, in very rare cases these capacitors can still develop erratic behaviour due to overloading or at the end of the device's service life.

For that reason, Type A capacitors should only be integrated into luminaires for operation in ambient conditions that are uncritical with regard to flammable materials. Luminaires should feature protection against secondary damage inside and outside the luminaire in the event of a defect.

Temperature-protected capacitors are a further development of Type A capacitors and are fitted with a thermal fuse that is triggered by overheating as a result of electrical or thermal overloading. They are tested in accordance with IEC 61048 A2 and comply with Type A requirements. Excess temperatures cause the two wire ends of the element inside the fuse to melt into bead shapes that are fully isolated from each other by special insulation.



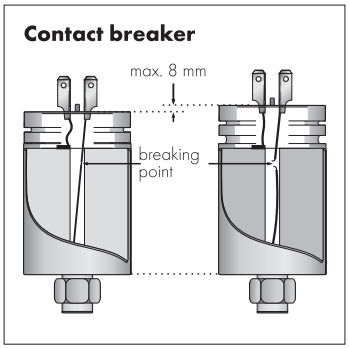
In 99% of all the rare cases of critical capacitor failure, this failure is preceded by a gradual increase in the loss factor, which leads to an increase in the winding temperature and thus triggers the thermal fuse.

Vossloh-Schwabe recommends that preference be given to Type A capacitors with a thermal fuse as a matter of course for reasons of safety.

Type A capacitors predominantly feature a plastic casing.

Capacitors with a contact breaker,
secured Type B capacitors in accordance with IEC 61048 A2

Self-healing capacitors do not require short-circuit protection for normal operation as they automatically regenerate after a dielectric breakdown. However, as a result of frequent self-healing caused by overloading (voltage, current, temperature) or towards the end of the capacitor's service life, overpressure can build up inside the capacitor (due to the decomposition products of the vaporised polypropylene).



In order to prevent the capacitor casing from exploding in such cases, hermetically sealed capacitors in accordance with IEC 61048 A2 (Type B capacitors) are fitted with an overpressure contact breaker. If excess pressure builds up within these capacitors, e.g. due to undue thermal loading or excessive voltages or at the end of the capacitor's service life, a concertina section opens out that causes the casing to expand lengthways. As a result, the wire contacts rupture at a predetermined breaking point, which irreversibly interrupts the current (contact breaker).

This type of overpressure-protected capacitor with a contact breaker is also referred to as a flame- and explosion-proof capacitor with a break-action mechanism.

Type B capacitors with a contact breaker are available in an aluminium casing.

Assembly Instructions for Capacitors

For mounting and installing compensation capacitors

Mandatory regulations

DIN VDE 0100	Erection of low voltage installations
EN 60598	Luminaires – part 1: General requirements and tests
EN 55015	Maximum values and testing methods for radio disturbance of electrical lighting facilities and similar electrical equipment
EN 61000-3-2	Electromagnetic Compatibility (EMC) – part 3: maximum values – main section part 2: maximum values for mains harmonics (ballast input current up to and including 16 A per conductor)
EN 61048	Operating devices for lamps – capacitors for fluorescent lamp circuits and other discharge lamp circuits; general and safety requirements
EN 61049	Operating devices for lamps – capacitors for fluorescent lamp circuits and other discharge lamp circuits; performance requirements

Mechanical mounting

Fastening

Base screw (permissible torque):
- M8x10 – 5 Nm (aluminium casing)
- M8x10 – 2.2 Nm (plastic casing)

Mounting location

Any
Capacitors fitted with overpressure protection require clearance of at least 10 mm above the contacts so ensure the casing can expand unhindered if the contact breaker is triggered.

Heat transfer

Capacitors should be mounted with the greatest possible clearance to heat sources or lamps. During operation, the temperature measured at the t_c point must not exceed the specified maximum value.

t_c point

The t_c point is defined as an arbitrary point on the surface of the capacitor, which is not specifically marked.

UV Radiation

Capacitors should not be installed in an unprotected manner directly next to any sources of light, heat radiation or convection (ballasts, lamps, heating elements, etc.) as both high temperatures and constant exposure to UV radiation can lead to premature ageing. In combination with high temperatures, UV radiation or other substances and influencing factors, chemicals such as ozone and chlorine can lead to accelerated ageing and material embrittlement.

Thermal load

All capacitor casings are made of flame-retardant materials. However, the potting material, oils and the winding material are flammable and consideration must be taken of this fact during installation. The thermal load of an MKP capacitor is approx. 40 MJ/kg.

Safety functions

Type A capacitors are not fitted with any special protective functions in case of defect.
Temperature-protected capacitors are a further development of Type A capacitors and feature a thermal fuse that is triggered by excess temperatures and disconnects the capacitor from the mains.

Type B capacitors are fitted with an overpressure contact breaker in case of defects at the end of the capacitor's service life.

Connection

Parallel capacitors for fluorescent lamps:
- Casing diameter 25–30 mm: push-in terminals for 0.5–1 mm² conductors and IDC terminals for H05V-U 0.5 conductors
- Casing diameter > 30 mm: push-in terminals for 0.5–1 mm² conductors

Parallel capacitors for high-pressure lamps:
- Casing diameter 25–30 mm: push-in terminals for 0.5–1 mm² conductors and IDC terminals for H05V-U 0.5 conductors
- Casing diameter > 30 mm: push-in terminals for 0.5–1.5 mm² conductors

Reliability and service life

Provided the max. specified voltage and current loads, temperature, humidity and mains harmonics values are observed,
- approx. 50,000 hours for overpressure-protected parallel capacitors
- approx. 30,000 hours for parallel capacitors without overpressure protection in a plastic or aluminium casing

A 3–10% decrease in capacitance must be expected in the course of the capacitor's service life.
Failure rate: 1‰ per 1,000 operating hours when maximum voltage, current and temperature values are not exceeded.

Electrical installation

Nominal voltage
250 V, 50/60 Hz; 280 V, 50/60 Hz; 450 V, 50/60 Hz (dependent on type)

Capacitance tolerance
±10% (±5% dependent on type)

Temperature range
-25/-40 °C to +85/+100 °C (dependent on type, details see product page)

Optional thermal fuse

Relative humidity
Class F for Type B capacitors: 75% annual mean, 95% peak value on 30 days
Class G for Type A capacitors: 65% annual mean, 85% peak value on 30 days

Condensation
Impermissible

Capacitors for fluorescent lamp circuits

Lamp		Parallel compensation capacitor (µF ±10% at 250 V)		Series compensation capacitor (µF ±4%)		
Output W	Type	220-240 V/50 Hz µF	220-230 V/60 Hz µF	220 V/50 Hz µF	230 V/50 Hz µF	220 V/60 Hz µF
4	T	2**	2**	–	–	–
6	T	2**	2**	–	–	–
8	T	2**	2**	–	–	–
10	T	2	2	–	–	–
13	T	2	2	–	–	–
14	T	4.5	4.5	–	–	–
15	T	3.5 or 4*	3 or 4*	–	–	–
16	T	2	2	–	–	–
18	T	4.5 or 4*	4**	2.9/440 V	2.8/480 V	2.4/440 V
20	T	4.5 or 4*	4**	2.9/440 V	2.8/480 V	2.4/440 V
23	T	3.5	3	–	–	–
25	T	3.5	3	–	2.3/450 V	–
30	T	4.5	4	3/420 V	2.9/450 V	–
36	T	4.5	4	3.6/420 V	3.4/450 V	3/420 V
36-1m	T	6.5	–	–	–	–
38	T	4.5	4	–	–	–
40	T	4.5	4	3.6/420 V	3.4/450 V	3/420 V
42	T	6.5	–	–	–	–
58	T	7	6	5.7/450 V	5.3/450 V	4.8/420 V
65	T	7	6	5.7/450 V	5.3/450 V	4.8/420 V
70	T	6	–	–	–	–
75	T	6	–	–	–	–
80	T	9	8	–	7.2/420 V	–
85	T	8	6.5	–	8.4/420 V	–
100	T	10	9	–	–	–
115	T	18	16	–	–	–
140	T	14	14	–	–	–
160	T	14	14	–	–	–
16	T-U	2	2	–	–	–
18/20	T-U	4.5 or 4*	4**	2.9/440 V	2.8/480 V	2.4/440 V
36/40	T-U	4.5	4	3.6/420 V	3.4/450 V	3/420 V
58/65	T-U	7	6	–	–	–
22	T-R	5	4.5	–	3.2/440 V	–
32	T-R	5	4.5	–	3.4/450 V	–
40	T-R	4.5	4	3.6/420 V	3.4/450 V	3/420 V
5/7/9/11	TC-S	2**	2**	–	–	–
10	TC-D/TC-T	2	2	–	–	–
13	TC-D/TC-T	2	2	–	–	–
18	TC-D/TC-T	2	2	–	–	–
26	TC-D/TC-T	3.5	3	–	–	–
10	TC-DD	2	2	–	–	–
16	TC-DD	2	2	–	–	–
21	TC-DD	3	3	–	–	–
28	TC-DD	3.5	3	–	–	–
38	TC-DD	4.5	4	–	–	–
18	TC-L/TC-F	4.5 or 4*	4**	–	–	–
24	TC-L/TC-F	4.5	4	–	–	–
34	TC-L/TC-F	4.5	4	–	–	–
36	TC-L/TC-F	4.5	4	–	–	–

*) Two lamps connected to a ballast in series **) Applies to one lamp connected to a ballast or two lamps connected in series

Capacitors for

Lamp		Compensation capacitor (µF ±10%)			
Output W	Type	220/230/240/252 V 50 Hz (µF)	220 V 60 Hz (µF)	380/400/420 V, 50 Hz (µF)	380 V/60 Hz 60 Hz (µF)
high-pressure mercury vapour lamp circuits					
50	HM	7	6		
80	HM	8	7		
125	HM	10	10		
250	HM	18	15		
400	HM	25	25		
700	HM	40	35		
1000	HM	60	50		
high-pressure sodium vapour lamp circuits					
35	HS	6	5		
50	HS	8	8		
70	HS	12	10		
100	HS	12	10		
150	HS	20	16		
250	HS	32	25		
400	HS	45	40		
600	HS	65	55	25	20
750	HS	70	60	25	25
1000	HS	100	85		
metal halide lamp circuits					
35	HI	6	5		
70	HI	12	10		
100	HI	12	10		
150	HI	20	16		
250	HI	32	25		
400	HI	35/45	35/45		
1000	HI	85	75		
2000	HI	125	125		
2000	HI			37	37
2000	HI			60	60
2000	HI			60	60
2000	HI			100	100

Capacitors for low-pressure discharge lamp circuits

Lamp		Compensation capacitor (µF ±10%)
Output W	Type	230 V/50 Hz µF
35	LS	20
55	LS	20
90	LS	26
135	LS	40
180	LS	40

ELECTRONIC AND ELECTRO-MAGNETIC TRANSFORMERS

FOR LOW-VOLTAGE HALOGEN INCANDESCENT LAMPS

The operating voltage of low-voltage halogen lamps is normally 12 V (6 and 24 V are also used for special applications). As a result, transformers are required in order to connect such lamps to the normal mains supply within buildings, whereby international requirements governing building installations specify that safety transformers or converters (electronic transformers) be exclusively used for such purposes nowadays. These devices are designed in such a way as to prevent both personal injury and the outbreak of fire should the lighting system malfunction.

Electronic converters

The following chapter provides an overview of the VS range of electronic converters that feature a whole range of advantages: light and compact, superior efficiency (approx. 95%), short-circuit protection, integrated overheating and overload protection, soft start for longer lamp life, broad part-load range and dimmability.

Electromagnetic safety transformers

The following chapter also provides an overview of Vossloh- Schwabe's range of electromagnetic transformers. The range is split into protection class II transformers and protection class I built-in transformers whose ultra-flat design make them particularly user-friendly. Lamp brightness can be regulated using conventional phase dimmers for low-voltage halogen lamps.

5 Transformers for Low-voltage Halogen Incandescent Lamps

Independent electronic converters **290–293**

Electronic built-in converters **294**

Potentiometer and dimmers **295**

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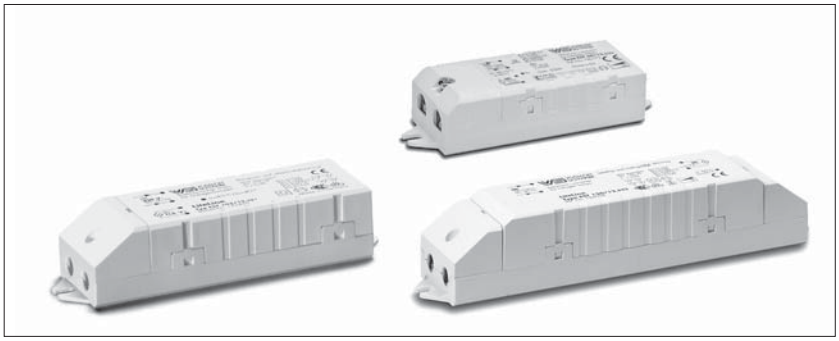
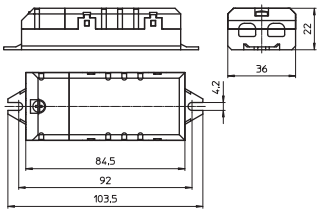
Independent Electronic Converters – LiteLine



Electronic safety converters
for low-voltage halogen incandescent lamps 12 V
Casing: heat-resistant polyamide
Mains frequency: 50–60 Hz
Protection against "no load" operation
Protection against short-circuit:
electronic switch-off with automatic restart
Electronically controlled overload
and temperature protection
Suitable for installation in furniture
and on combustible surfaces
Power factor: > 0.95
Efficiency: ≥ 94%
Dimming: optional with phase-cutting leading-edge or phase-cutting trailing-edge dimmer
Screw terminals: 2.5 mm²
(EST 60/12.635 primary: 4 mm²)
Quantity of screw terminals:
1x2-poles primary
1x2-poles secondary
With integrated cord grip
Protection class II
SELV-equivalent
Degree of protection: IP20
RFI-suppressed

A



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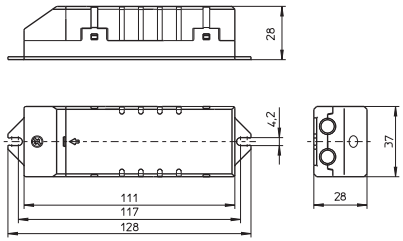

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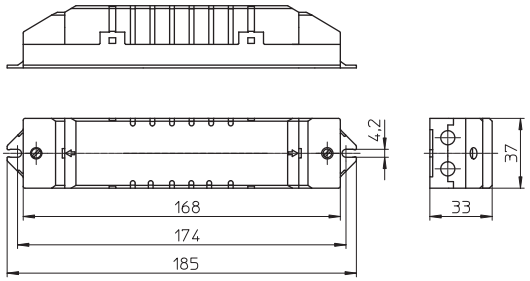
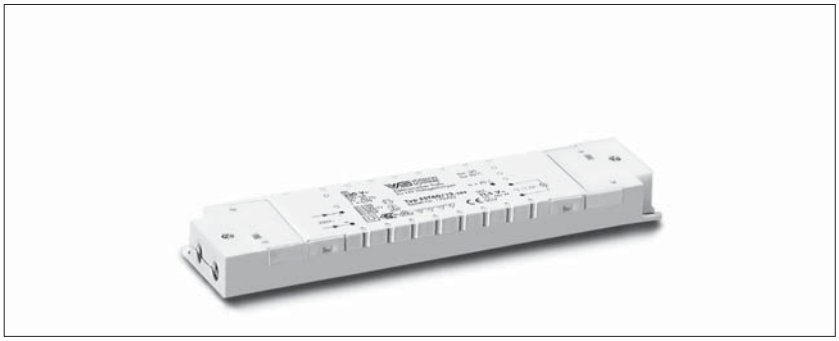


Type	Ref. No.	Capacity range (W)	Voltage (V) prim. (±10%)	sec.	Nominal current A	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Drawing	Weight g
Dimensions: 22x36x103.5 mm									
EST 60/12.635	**186173**	10–60	220–240	10.2–12	0.258–0.260	–20 to 45	max. 85	A	70
Dimensions: 28x37x128 mm									
EST 70/12.380	**186072**	20–70	230–240	11.3–11.7	0.30–0.31	–20 to 45	max. 70	B	85
EST 105/12.381	**186077**	20–105	230–240	11.2–11.7	0.435–0.445	–20 to 40	max. 85	B	95
Dimensions: 33x37x185 mm									
EST 150/12.622	**186098**	50–150	230–240	11.2–11.6	0.595–0.605	–20 to 45	max. 85	C	175

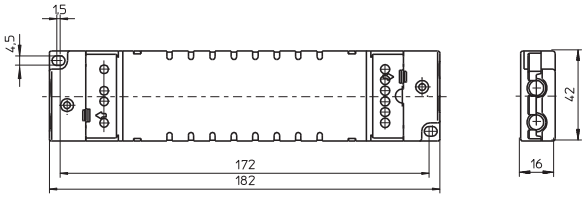
Independent, Super-thin Electronic Converters – FlatLine



Electronic safety converters
for low-voltage halogen incandescent lamps 12 V
Casing: heat-resistant polyamide
Mains frequency: 50–60 Hz
Protection against "no load" operation
Protection against short-circuit:
electronic switch-off with automatic restart
Electronically controlled overload
and temperature protection
Suitable for installation in furniture
and on combustible surfaces
Power factor: 0.98
Efficiency: 95%
Dimming: with phase-cutting trailing-edge dimmer
Screw terminals: 2.5 mm²
Quantity of screw terminals:
- 1x2-poles primary
- 1x2-poles secondary

With integrated cord grip
Protection class II
SELV
Degree of protection: IP20
RFI-suppressed

A



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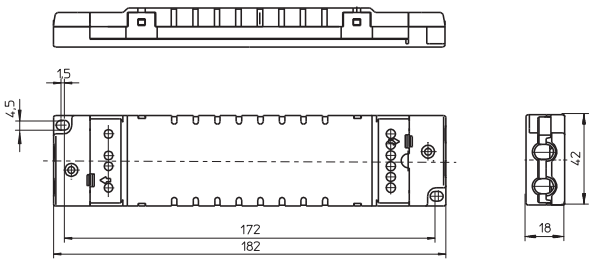
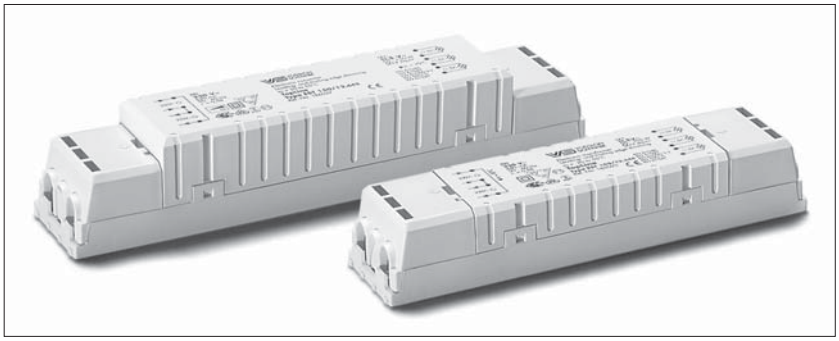


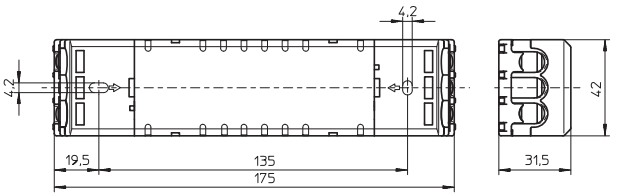
Type	Ref. No.	Capacity range W	Voltage (V) prim. (±10%)	sec.	Nominal current (A)	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Drawing	Weight g
Dimensions: 16x42x182 mm									
EST 60/12.388	**179792**	10–60	230	11.5	0.25	-20 to 50	max. 70	A	100
Dimensions: 18x42x182 mm									
EST 120/12.389	**179793**	20–120	230	11.5	0.50	-20 to 40	max. 70	B	125

Independent Electronic Converters – TopLine



Electronic safety converters for
low-voltage halogen incandescent lamps 12 V
Casing: heat-resistant polyamide
Mains frequency: 50–60 Hz
Protection against "no load" operation
Protection against short-circuit:
electronic switch-off with automatic restart
Electronically controlled overload
and temperature protection
Suitable for installation in furniture
and on combustible surfaces
Power factor: ≥ 0.98
Efficiency: ≥ 94%
Dimming: optional with phase-cutting leading-edge or phase-cutting trailing-edge dimmer
Screw terminals: 2.5 mm²
(EST 200/12.649: 4 mm²)
Quantity of screw terminals:
2 x 2-poles primary
3 x 2-poles secondary
With integrated cord grip
Protection class II
SELV-equivalent
Degree of protection: IP20
RFI-suppressed
Time saving mounting due to click-in endcaps

A



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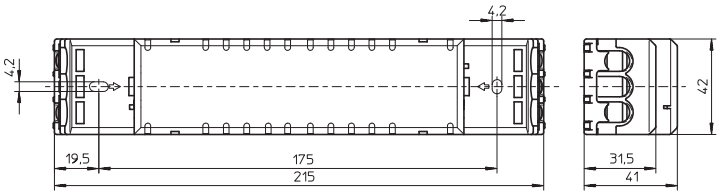
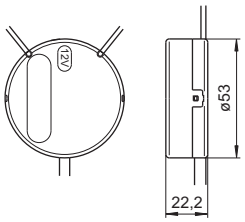


Type	Ref. No.	Capacity range (W)	Voltage (V) prim. (±10%)	sec.	Nominal current A	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Drawing	Weight g
Dimensions: 31.5x42x175 mm									
EST 70/12.643	**186117**	20–70	230–240	11.3–11.8	0.305–0.310	–20 to 55	max. 75	A	145
EST 105/12.644	**186118**	20–105	230–240	11.3–11.8	0.430–0.440	–20 to 55	max. 75	A	165
Dimensions: 41x42x215 mm									
EST 150/12.645	**186119**	50–150	230–240	11.3–11.9	0.615–0.630	–20 to 55	max. 75	B	230
EST 200/12.649	**186068**	35–200	230/240	11.3/11.7	0.81/0.86	–20 to 45	max. 70	B	280

Independent Electronic Converters – DiscLine

Electronic safety converters
for low-voltage halogen incandescent lamps 12 V
Casing: heat-resistant polycarbonate
Mains frequency: 50–60 Hz
Protection against "no load" operation
Protection against short-circuit:
electronic switch-off with automatic restart
Thermal cut-out with automatic reset
Suitable for installation in furniture
and on combustible surfaces
Power factor: 0.98
Efficiency: 95%
Dimming: with phase-cutting trailing-edge dimmer
Primary lead: 2x0.75 mm²,
PVC-insulation, length: 100^{+30} mm
Secondary lead: 0.75 mm²,
PVC-insulation, length: 150 mm
Secondary lead length: max. 2 m
Protection class II
SELV
Degree of protection: IP20
RFI-suppressed

A



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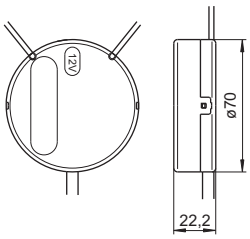
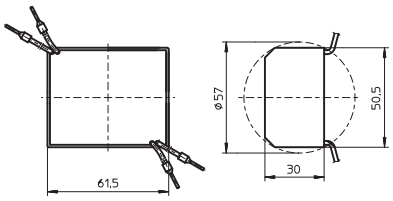


Type	Ref. No.	Capacity range W	Voltage (V) prim. (±10%)	sec.	Nominal current A	Ambient temperature t_a (°C)	Casing temperature t_c (°C)	Drawing	Weight g
Dimensions: Ø 53x22.2 mm									
EST 70/12.601	**186005**	20–70	230	11.5	0.30	–20 to 35	max. 75	A	70
Dimensions: Ø 70x22.2 mm									
EST 105/12.602	**186007**	35–105	230	11.5	0.43	–20 to 35	max. 70	B	100

Electronic Built-in Converters – CapLine

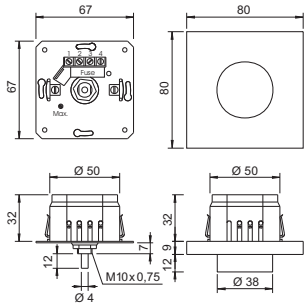


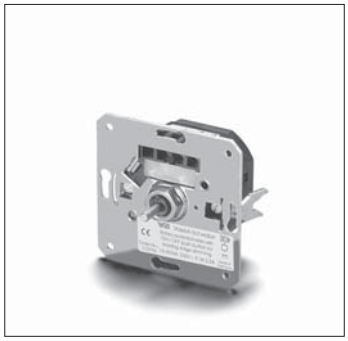
Electronic built-in safety converters
for low-voltage halogen incandescent lamps 12 V
Casing: heat-resistant polyamide,
encapsulated with polyester resin
For installation in plaster depth boxes:
Ø 60 mm, height 65 mm
Dimensions: 30x50.5x61.5 mm
Mains frequency: 50–60 Hz
Protection against "no load" operation
Primary and secondary leads:
stranded conductors 1 mm², Si-insulation,
Ø external: 2 mm, length: 170 mm
Protection against short-circuit:
electronic switch-off with automatic restart
Thermal cut-out with automatic reset
Suitable for installation in furniture
and on combustible surfaces
Power factor: 0.98
Efficiency: 94%
Dimming: with phase-cutting trailing-edge dimmer
SELV
Degree of protection: IP54
RFI-suppressed

Type	**Ref. No.**	Capacity range (W)	Voltage (V) prim. (±10%)	sec.	Nominal current (A)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
EST 75/12G.302	**162400**	20–75	230	11.5	0.32	–20 to 60	max. 85	200

Dimmers for Electronic Converters

Phase-cutting trailing-edge dimmer
Dimmer without cover plate
Dimensions: 67x67x51 mm
Push-button change-over switch with stud 4 mm,
for installation in flushtype boxes with Ø 55 mm
Output: 10–350 W
Weight: 60 g
Unit: 25 pcs.
Ref. No.: 172773





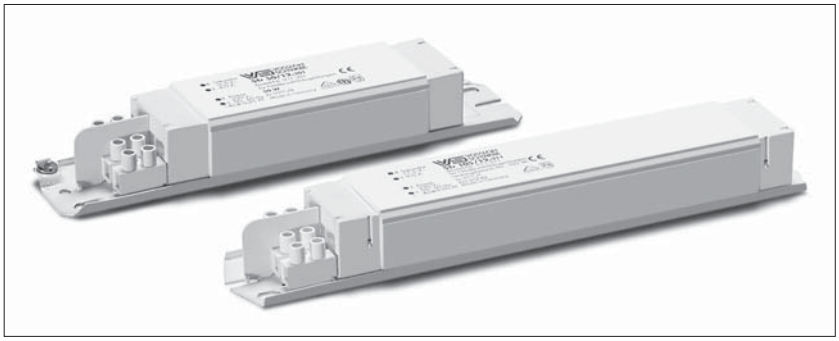
Phase-cutting leading-edge dimmer
Dimmer without cover plate
Dimensions: 67x67x51 mm
Push-button change-over switch with stud 4 mm,
for installation in flushtype boxes with Ø 55 mm
Output: 15–500 W
Weight: 60 g
Unit: 25 pcs.
Ref. No.: 172774

Cover plate with rotary knob
Dimensions: 80x80x9 mm
Colour: white
Weight: 30 g
Unit: 10 pcs.
Ref. No.: 172775

Super-thin Electromagnetic Built-in Transformers 20–105 VA

Shape: 28 x 41 mm

Electromagnetic safety transformers
for low-voltage halogen incandescent lamps 12 V
Vacuum-impregnated with polyester resin
Screw terminals: 0.5–2.5 mm²
Protection class I
For these transformers without thermal cut-out, a slow-acting fuse should be installed in the wiring on site



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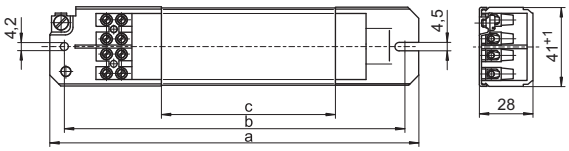

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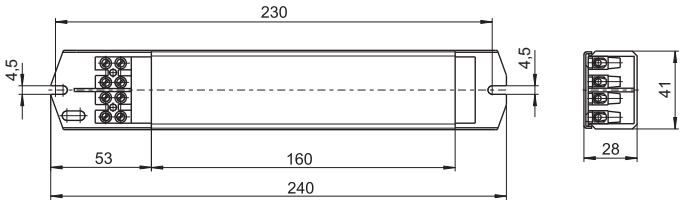
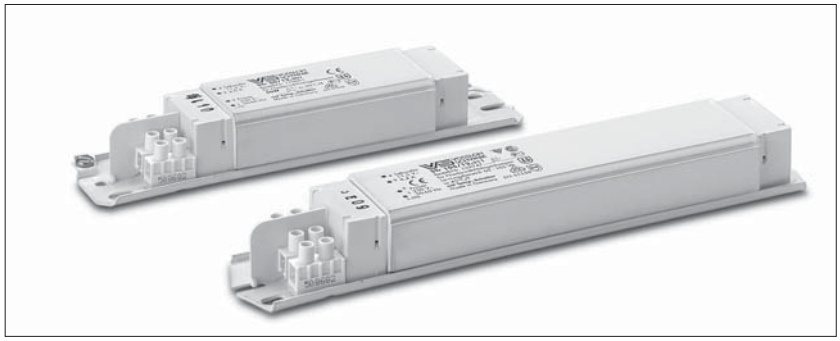


Safety transformers											Primary fuse
Type	**Ref. No.**	Capacity range W	50, 60 Hz V prim.	V sec.	Ambient temperature t_a (°C)	Drawing	a mm	b mm	c mm	Weight kg	AT
220 V/50, 60 Hz											
STr 50/12.207	**500843**	35–50	220	11.5	40/B	A	175	165	83	0.73	0.250
230 V/50, 60 Hz											
STr 20/12.306	**161781**	15–20	230	11.5	60/B	A	155	140	63	0.55	0.125
STr 50/12.301	**161757**	35–50	230	11.5	50/B	A	195	180	92	0.80	0.250
STr 50/12.342	**507181**	35–50	230	11.5	40/B	A	175	165	83	0.73	0.250
STr 60/12.338	**179604**	40–60	230	11.5	50/F	A	195	180	92	0.80	0.315
STr 105/12.311	**170002**	60–105	230	11.5	30/F	B	240	230	160	1.33	0.500
240 V/50, 60 Hz											
STr 50/12.401	**169830**	35–50	240	11.5	45/B	A	195	180	92	0.80	0.250
STr 50/12.422	**502592**	35–50	240	11.5	40/B	A	175	165	83	0.73	0.250
STr 105/12.406	**169125**	60–105	240	11.5	50/H	B	240	230	160	1.33	0.500
127 V/60 Hz											
STr 50/12.109	**525791**	35–50	127	11.5	40/F	A	155	140	63	0.55	0.500

Super-thin Electromagnetic Built-in Transformers with Thermal Cut-out 20–105 VA

Shape: 28 x 41 mm

Electromagnetic safety transformers
for low-voltage halogen incandescent lamps 12 V
Vacuum-impregnated with polyester resin
Screw terminals: 0.5–2.5 mm²
Protection class I
Temperature switch with self-holding protection
against overheating,
no primary fuse necessary



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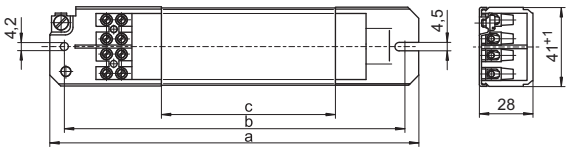

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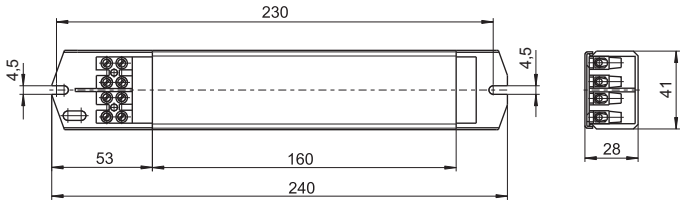


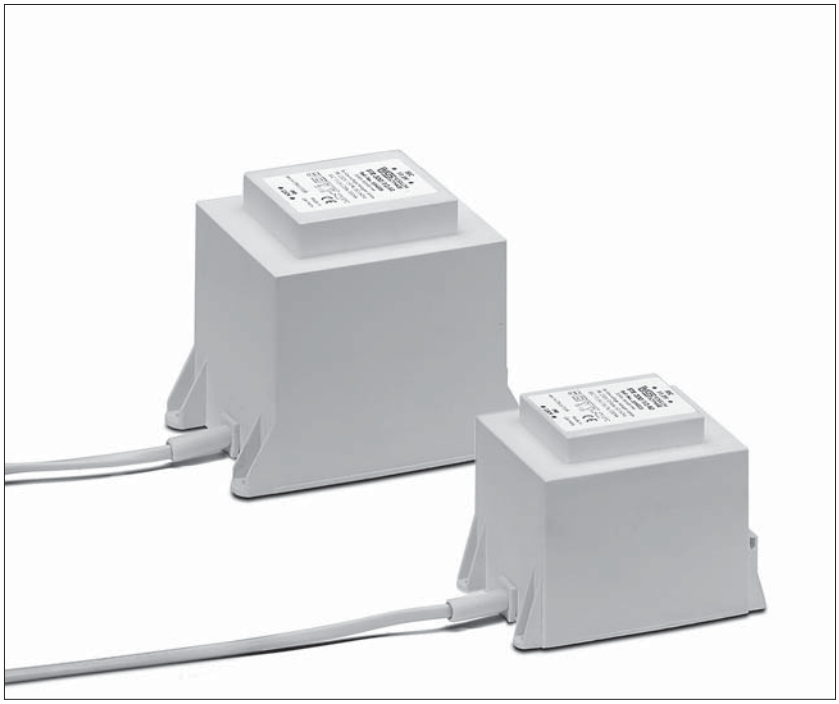
Type	Ref. No.	Capacity range W	50, 60 Hz V prim.	V sec.	Ambient temperature t_a (°C)	Drawing	a mm	b mm	c mm	Weight kg
230 V/50, 60 Hz										
STr 20/12.306	**161860**	15–20	230	11.5	60/B	A	155	140	63	0.55
STr 50/12.337	**179444**	35–50	230	11.5	50/F	A	175	165	83	0.73
STr 50/12.301	**170091**	35–50	230	11.5	50/B	A	195	180	92	0.80
STr 60/12.338	**179608**	40–60	230	11.5	50/F	A	195	180	92	0.80
STr 105/12.311	**169747**	60–105	230	11.5	45/F	B	240	230	160	1.33
240 V/50, 60 Hz										
STr 50/12.401	**169748**	35–50	240	11.5	45/B	A	195	180	92	0.80
STr 105/12.406	**161935**	60–105	240	11.5	50/H	B	240	230	160	1.33
127 V/60 Hz										
STr 50/12.109	**537403**	35–50	127	11.5	40/F	A	155	140	63	0.55

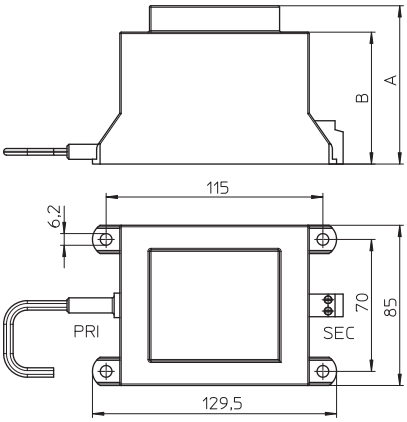
new

Compact Electromagnetic Transformers 70–300 VA

Shape: 85 x 85 mm (200 VA)
Shape: 99 x 85 mm (300 VA)

Built-in electromagnetic safety transformers
for low-voltage halogen incandescent lamps 12 V
Fully encapsulated transformer in a plastic casing
Mains frequency: 50–60 Hz
Built-in primary fuse and temperature switch
Connections
primary: lead
secondary: screw terminals up to 6 mm²
Degree of protection: IP24
Protection class II
Suitable for installation in furniture
and on combustible surfaces



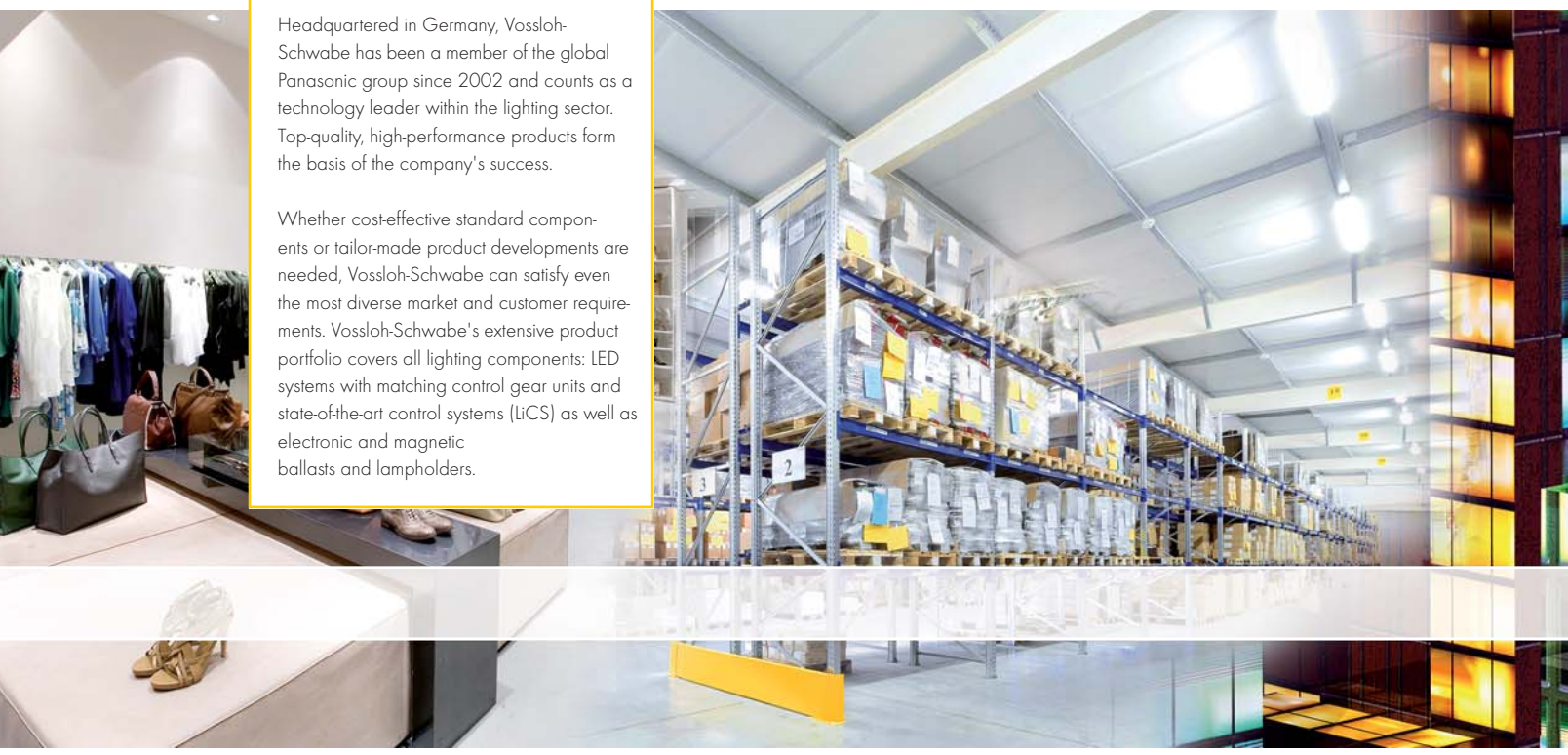


	Type	Ref. No.	Capacity range	Voltage AC V – 10%+6%		Ambient temperature t_a	A	B	Weight
			W	prim.	sec.	°C	mm	mm	kg
	230 V/50, 60 Hz								
new	STr 200/12.40	**554325**	70 – 200	230	12	40	85	70	2.9
new	STr 300/12.41	**554326**	150 – 300	230	12	40	99	84	3.9

Whenever an electric light goes on around the world, Vossloh-Schwabe is likely to have made a key contribution to ensuring that everything works at the flick of a switch.

Headquartered in Germany, Vossloh-Schwabe has been a member of the global Panasonic group since 2002 and counts as a technology leader within the lighting sector. Top-quality, high-performance products form the basis of the company's success.

Whether cost-effective standard components or tailor-made product developments are needed, Vossloh-Schwabe can satisfy even the most diverse market and customer requirements. Vossloh-Schwabe's extensive product portfolio covers all lighting components: LED systems with matching control gear units and state-of-the-art control systems (LiCS) as well as electronic and magnetic ballasts and lampholders.



A member of the Panasonic group Panasonic

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