



TRIDONIC

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Catalogue 2012

Ignitors and power switches for HID

Overview

Product overview	Page 6
Ignitor matrix	Page 7
Standards	Page 8

Product information

Ignitors and power switches for HID	Page 9
-------------------------------------	--------

Superimposed-pulse ignitors

Capacity range 35 – 400 W

Standard ignitors from ZRM 2-ES/C to ZRM 4.5-ES/C	Page 12
Digital ignitors from ZRM 2-ES/CT to ZRM 4.5-ES/CT	Page 12

Capacity range 35 – 400 / 750 W

Standard ignitor ZRM 6-ES/C	Page 14
Digital ignitor ZRM 6-ES/CT	Page 14
Standard ignitor ZRM 6-ES/C 400	Page 14
Standard ignitor ZRM 6-ES/C 3.5 kV	Page 14

Capacity range 250 – 2,000 W

Standard ignitor ZRM 12-ES/C	Page 16
Digital ignitor ZRM 12-ES/CT	Page 16
Standard ignitor ZRM 12-ES/C 400	Page 16

Capacity range 1,000 – 3,500 W

Standard ignitor ZRM 20-ES/B	Page 18
Standard ignitor ZRM 20-ES/B 400	Page 18

Pulse ignitors

Digital

ZRM 4000 powerPULSE	Page 19
ZRM 4000/400 powerPULSE	Page 19

Standard with timer

ZRM 2300 C201	Page 20
ZRM 4000 C201	Page 20
ZRM 4000 B101	Page 20

Parallel impulse ignitor

ZRM 1000 A004	Page 21
ZRM 1000 A005	Page 21
ZRM 1200/400 A001	Page 22

Ignitors with additional impedance

High-pressure mercury vapour lamp conversion kits ZRM A201W	Page 23
High-pressure mercury vapour lamp conversion kits ZRM B201W	Page 24

Power changeover switches

ZRM U6L Page 25

ZRM U6L-T Page 25

ZRM U6M Page 26

Ignition time bridging

LRM 500 S Page 27

Accessories

ZRM ES/C terminal cover Page 28

Wiring diagrams and installation examples Page 29

Product overview

**Superimposed-pulse ignitors**

Series: ZRM ES/C, ZRM ES/CT, ZRM ES/B

- Standard superimposed-pulse ignitors
- Digital superimposed-pulse ignitors with automatic disconnection circuit and pulse-pause ignition
- For the following wattage ranges:
HI 35 – 3,500 W
HS 35 – 1,000 W

**Pulse ignitors**

Series: ZRM 4000, ZRM powerPULSE, ZRM 1000

- Pulse ignitors for tapped chokes
- Parallel pulser for an ignition voltage < 1,000 V
- Digital ZRM powerPULSE system with regulated ignition voltage and pulse-pause ignition

**Ignitors with additional impedance**

Series: ZRM A201W, B201W

Kits for upgrading from mercury to sodium vapour lamps:

- Integrated reversible thermal controller
- Premounted connecting cable
- Protection class II compatible
- Integrated digital superimposed-pulse ignitor with automatic disconnection
- Pulse-pause ignition: shorter reignition times, minimum downtime
- Suppression of the cycling effect with 3-start counter
- Automatic reset (< 1 s)

**Power changeover switches**

Series: ZRM U6M, ZRM U6L

Energy savings in street lighting:

- Reduction in luminous flux by switching to a lower power level
- Maintenance-free, independent and no-complication control system

Ignitor matrix

Standard superimposed-pulse ignitors											Digital superimposed-pulse ignitors with switch-off function					Pulse ignitors								
	ZRM 2-ES/C	ZRM 2.5-ES/C	ZRM 4.5-ES/C	ZRM 6-ES/C	ZRM 6-ES/C 400	ZRM 6-ES/C 3.5 kV	ZRM 12-ES/C	ZRM 12-ES/C 400	ZRM 20-ES/B	ZRM 20-ES/B 400	ZRM 2-ES/CT	ZRM 2.5-ES/CT	ZRM 4.5-ES/CT	ZRM 6-ES/CT	ZRM 12-ES/CT	ZRM 4000 powerPULSE	ZRM 4000/400 powerPULSE	ZRM 2300 C201	ZRM 4000 C201	ZRM 4000 BT101	ZRM 1000 A004	ZRM 1000 A005	ZRM 1200/400 A001	
Ignition voltage max. kV _p	2.5	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	2.5	5.0	5.0	5.0	5.0	4.1	4.1	2.3	4.5	4.5	0.9	0.9	1.4	
Lamp current I _{max} A	1.0	3.0	4.6	5.0	6.0	5.0	12.0	12.7	20.0	20.0	1.0	3.0	4.6	5.0	12.0	-	-	-	-	-	-	-	-	
Metal halide lamps (HI)	35 W	●	○ ⁶	○			○					●	○ ⁶	○	○	●			●					
	70 W	● ¹	●	● ⁶	○		○				● ¹	●	● ⁶	○	○	●		● ¹	●					
	100 W		●	● ⁶	○			○				●	● ⁶	○	○	●		● ¹	●					
	150 W	● ¹	●	● ⁶	○			○			● ¹	●	● ⁶	○	○	●		● ¹	●					
	250 W		●	● ⁶	○			○				●	● ⁶	○	○	●			●			● ³	● ³	
	400 W			● ⁶	●			○					● ⁶	●	○	●			●			● ³	● ³	
	1,000 W							●		○					●	●			●			● ³	● ³	○
	1,800 W								● ⁴	● ⁵						● ⁴	● ⁵							
	2,000 W								●	●	○						●							○
	3,500 W									●														○
High-pressure sodium lamps (HS)	35 W	●									●													
	50 W	●									●							●						
	70 W	● ¹	● ²	○ ⁶							● ¹	●	○ ⁶			●		● ¹						
	100 W		●	● ⁶	○							●	● ⁶	○	○	●			●	●				
	150 W		●	● ⁶	○							●	● ⁶	○	○	●			●	●				
	250 W		●	● ⁶	○							●	● ⁶	○	○	●			●	●				
	400 W			● ⁶	●								● ⁶	●	○	●			●	●				
	600 W					●		●	○						●	●	●		●					
	750 W					○											●							
	1,000 W							●	○						●	●			●					

- 1 For lamps with ignition voltages < 2.5 kV_p
 - 2 For high-pressure sodium lamps 70 W with ignition voltage 4.0 – 5.0 kV_p
 - 3 For lamps with ignition voltages < 1,000 V
 - 4 400 V lamps with 12.5 A lamp current
 - 5 230 V lamps with 17.3 A lamp current
 - 6 Recommended for outdoor applications
- recommended ○ used for

Standards

			EN 60926	EN 60927	EN 61347-2-1
Series	Type	Page			
Standard superimposed-pulse ignitors	ZRM 2-ES/C	Page 12		•	•
	ZRM 2.5-ES/C	Page 12		•	•
	ZRM 4.5-ES/C	Page 12		•	•
	ZRM 6-ES/C	Page 14		•	•
	ZRM 6-ES/C 400	Page 14		•	•
	ZRM 6-ES/C 3.5 kV	Page 14		•	•
	ZRM 12-ES/C	Page 16		•	•
	ZRM 12-ES/C 400	Page 16		•	•
	ZRM 20-ES/B	Page 18		•	•
	ZRM 20-ES/B 400	Page 18		•	•
Digital superimposed-pulse ignitors with switch-off function	ZRM 2-ES/CT	Page 12		•	•
	ZRM 2.5-ES/CT	Page 12		•	•
	ZRM 4.5-ES/CT	Page 12		•	•
	ZRM 6-ES/CT	Page 14			•
	ZRM 12-ES/CT	Page 16		•	•
Digital pulse ignitors ZRM powerPULSE	ZRM 4000 powerPULSE	Page 19		•	•
	ZRM 4000/400 powerPULSE	Page 19		•	•
Standard pulse ignitors with timer function	ZRM 2300 C201	Page 20	•		
	ZRM 4000 C201	Page 20	•		
	ZRM 4000 B101	Page 20	•		
Parallel pulse ignitor	ZRM 1000 A004	Page 21	•		
	ZRM 1000 A005	Page 21	•		
	ZRM 1200/400 A001	Page 22	•		
Ignitors with additional impedance	ZRM 50/35 A201W	Page 23			•
	ZRM 80/50 A201W	Page 23			•
	ZRM 80/50 B201W	Page 24			•
	ZRM 125/70 A201W	Page 23			•
	ZRM 125/70 B201W	Page 24			•

Ignitors and power switches for HID

Ignitors for generating the ignition voltages needed by metal halide lamps and sodium lamps without internal starters use either superimposed-pulse or pulse technology. The innovative range of ignitors from Tridonic includes standard ignitors suitable for all commercially available high-intensity discharge lamps with wattages from 35 to 3,500 W, which require an ignition voltage between 800 and 5,000 V depending on the type of lamp.

The special feature of superimposed-pulse ignitors is that the ignition voltage is generated without placing a high-voltage load on the choke. Superimposed-pulse technology leads to a reproducible ignition response which does not depend on the control gear used and is unaffected by voltage fluctuations.

Pulse ignitors are operated with chokes tailored specifically for them. Integrated shutdown of defective lamps reduces the load on the chokes to a minimum. Restart attempts in pulse-pause mode reduce the load on the chokes still further.

Tridonic ignitors ensure lamps start reliably even if the mains voltage is as low as 198 V (switch-on voltage). The ignitor is switched-off as soon as the lamp starts to prevent damage to the lamp. Because of the high-quality narrow-tolerance components the switch-off voltage reaches the high value of 185 V.

The increase in temperature in the ignitor determines its area of application and is therefore an important criterion. Tridonic ignitors are characterised by minimal self-heating, which in turn gives luminaire designers extra creative freedom.

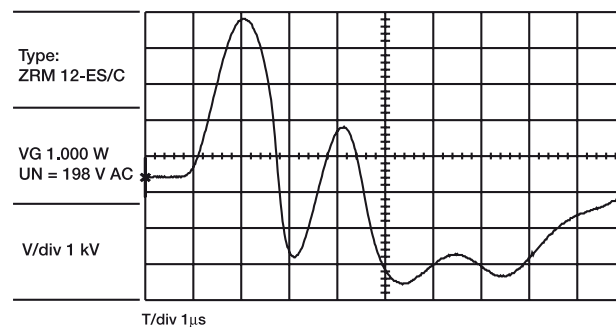
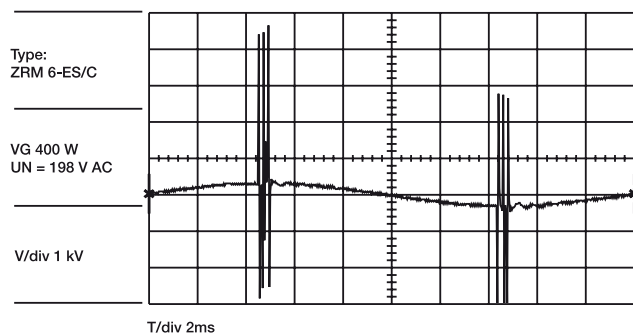
Superimposed-pulse ignitors

In ignitors that operate on the superimposed principle the ignition voltage is generated by an integrated pulse transformer.



This transforms the mains voltage to the ignition voltage of up to 5 kV required by the lamp.

A cleverly designed circuit is used to control the ignition process. This means that superimposed-pulse ignitors from Tridonic have high system reliability and reproducibility of the ignition pulses, which are largely unaffected by fluctuations in the mains voltage.



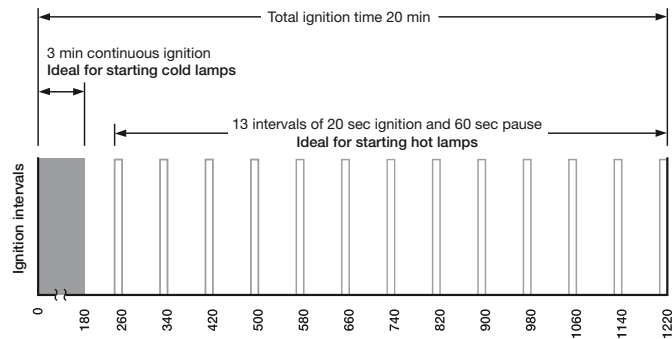
Superimposed-pulse igniters with timers

Sodium lamps and metal halide lamps connected to conventional igniters begin to flicker at the end of their lives. This is avoided by ZRM ES/CT superimposed-pulse igniters with integrated digital timers and pulse-pause ignition.



The ZRM ES/CT igniter does not generate ignition pulses constantly but in a patented two-part rhythm, creating the optimum conditions for igniting the lamps.

The lamp has time to cool down in the pauses after ignition. This leads to much faster restarts for hot lamps. Thanks to pulse-pause ignition the system downtime is reduced considerably.



The μ -chip of the integrated timer in the superimposed-pulse igniter digitally controls the logic for ignition and automatic shutdown. An automatic reset function is also integrated. This reset function is needed for lighting systems that operate 24 hours a day (tunnels, factories).

Ignitor systems using pulse technology

In pulse igniters the high-voltage pulse is produced in conjunction with the choke. The igniter uses a separate tap on the choke, specially developed for pulse technology and designed for high ignition voltages.

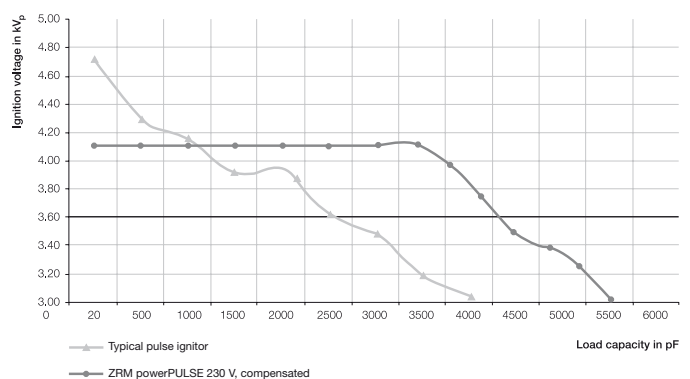


As the high-voltage pulse is generated in the choke for the ignition process it is possible to achieve very high ignition energy.

The digital ZRM powerPULSE from Tridonic compensates for the dependence of the output voltage on the mains voltage by using a microprocessor in the igniter to control the production of the ignition pulse. This ensures that the choke and luminaire wiring are not overloaded if there

is a mains overvoltage. It also ensures that in the event of a mains undervoltage or if there are extremely long connecting cables the required ignition energy is constantly available.

Comparison of various pulse ignitors



The benefits of pulse/pause technology are evident in the ZRM powerPULSE igniter as this igniter reduces the restart time and EMC interference in the ignition phase.

Another feature is the integrated digital three-start counter. This stops the ignition process after three unsuccessful lamp starts to suppress lamp cycling when the lamp comes to the end of its life and avoid overloading the control gear with the high-voltage pulses.

Power changeover switches

Power changeover switches are used predominantly in street lighting to reduce the lighting level by as much as 50 % at off-peak times and therefore also reduce energy costs by a significant amount.



Tridonic offers power changeover switches for lighting systems with or without a control line. If a control line is present then power changeover switch ZRM U6L is used. This is also available with an integrated timer.

The timer ensures that the lamp is operated for a defined period of time at full output during the start phase. This in turn ensures that the life of the lamp is not reduced unnecessarily.

If there is no control line then power changeover switch ZRM U6M is used. The on and off times can be programmed centrally at any time even after installation has been completed. ZRM U6M is suitable for magnetic chokes with power tapping and also for PCIS outdoor DIM electronic ballasts.

Supplementary impedances

Supplementary impedances are used to upgrade existing luminaires with inefficient mercury vapour lamps to energy-efficient sodium vapour lamps.

Only one additional component is needed for the upgrade – the supplementary impedance with integrated digital ignitor. Because the existing choke is retained the upgrade is simple and cost-effective.



Supplementary impedances ZRM A001 and ZRM B001 from Tridonic have enhanced insulation and an integrated cut-out in the event of a lamp fault. They are therefore approved for protection class II applications. The supplementary impedances are available in two casing designs and are equipped with 500 mm long connectionwires.

Ignition time bridging

Since high-intensity lamps require a certain starting time to reach their full output an additional lamp can be used to bridge this starting phase. The additional lamp provides sufficient light until the high-intensity lamp has completed the starting phase. The additional lamp is controlled by LRM 500. As soon as the high-intensity lamp produces enough light (about 90 % of full output) the additional lamp is switched-off.

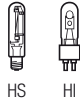


Standards and approval marks

Ignitors and power switches from Tridonic are ENEC certified, carry the CE mark and meet all the relevant European as well as international standards relating to safety, operation and electro-magnetic compatibility (EMC).

Technical information and lamp matrix

The latest technical information is available on the internet at: www.tridonic.com, menu "Technical data", submenu "Data sheets" or "Lamp matrix"



ZRM 2-ES/C to ZRM 4.5-ES/C and ZRM 2-ES/CT to ZRM 4.5-ES/CT
Capacity range 35 – 400 W

Product description

ZRM 2-ES/C, ZRM 2.5-ES/C, ZRM 4.5-ES/C

- Standard superimposed ignitor

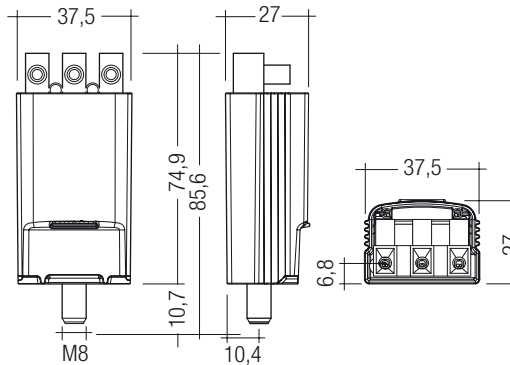
ZRM 2-ES/CT, ZRM 2.5-ES/CT, ZRM 4.5-ES/CT

- Digital superimposed-pulse ignitors with automatic disconnection circuit
- Pulse/pause ignition: Shorter restart times, minimum downtime
- Suppression of the cycling effect with 3-start counter
- Disconnection of the ignition function after 20 min
- Automatic reset (< 1 s)



Note

- ZRM 2-ES/C and ZRM 2-ES/CT only suitable for metal halide lamps and for sodium vapour lamps with an ignition voltage < 2.5 kV_p only
 - ZRM 2.5-ES/C and ZRM 2.5-ES/CT also suitable for sodium vapour lamp HST-DE 70 W
 - ZRM 4.5-ES/C and ZRM 4.5-ES/CT recommended for outdoor applications
- For product data sheet go to www.tridonic.com, or available on request



Technical data

Max. casing temperature	105 °C
Min. ambient temperature	-30 °C
Screw terminal	0.5 – 2.5 mm ²

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
Standard ignitor				
ZRM 2-ES/C	87500080	50 pieces	1,200 pieces	0.13 kg
ZRM 2.5-ES/C	87500081	50 pieces	1,200 pieces	0.13 kg
ZRM 4.5-ES/C	87500082	50 pieces	1,200 pieces	0.13 kg
Digital ignitor				
ZRM 2-ES/CT	87500085	50 pieces	1,200 pieces	0.13 kg
ZRM 2.5-ES/CT	87500086	50 pieces	1,200 pieces	0.13 kg
ZRM 4.5-ES/CT	87500087	50 pieces	1,200 pieces	0.13 kg



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Max. permitted lamp current	Ignition voltage	Lamp wattage		Permitted load capacitance	Max. cable length to lamp (75 pF/m)
						Sodium vapour lamps	Metal halide lamps		
Standard ignitor									
ZRM 2-ES/C	87500080	198 – 264 V	50 / 60 Hz	1.0 A	1.8 – 2.5 kV _p	35 – 70 W	70 W	20 – 300 pF	4.0 m
ZRM 2.5-ES/C	87500081	198 – 264 V	50 / 60 Hz	3.0 A	4.0 – 5.0 kV _p	70 – 250 W	35 – 250 W	20 – 100 pF	1.5 m
ZRM 4.5-ES/C	87500082	198 – 264 V	50 / 60 Hz	4.6 A	4.0 – 5.0 kV _p	70 – 400 W	35 – 400 W	20 – 100 pF	1.5 m
Digital ignitor									
ZRM 2-ES/CT	87500085	198 – 264 V	50 / 60 Hz	1.0 A	1.8 – 2.5 kV _p	35 – 70 W	70 W	20 – 300 pF	4.0 m
ZRM 2.5-ES/CT	87500086	198 – 264 V	50 / 60 Hz	3.0 A	4.0 – 5.0 kV _p	70 – 250 W	35 – 250 W	20 – 100 pF	1.5 m
ZRM 4.5-ES/CT	87500087	198 – 264 V	50 / 60 Hz	4.6 A	4.0 – 5.0 kV _p	70 – 400 W	35 – 400 W	20 – 100 pF	1.5 m

Self-heating:

ZRM 2-ES/C and ZRM 2-ES/CT

at I_b = 0.54 A (35 W) 0.2 K

at I_b = 1.00 A (70 W) 2.5 K

ZRM 2.5-ES/C and ZRM 2.5-ES/CT

at I_b = 0.54 A (35 W) 0.1 K

at I_b = 1.00 A (70 W) 2.5 K

at I_b = 1.20 A (100 W) 4.0 K

at I_b = 1.80 A (150 W) 9.5 K

at I_b = 3.00 A (250 W) 27.0 K

ZRM 4.5-ES/C and ZRM 4.5-ES/CT

at I_b = 0.54 A (35 W) 0.1 K

at I_b = 1.00 A (70 W) 1.0 K

at I_b = 1.20 A (100 W) 2.0 K

at I_b = 1.80 A (150 W) 6.5 K

at I_b = 3.00 A (250 W) 14.0 K

at I_b = 4.60 A (400 W) 33.5 K

Losses:

ZRM 2-ES/C and ZRM 2-ES/CT

at I_b = 0.54 A (35 W) 0.05 W

at I_b = 1.00 A (70 W) 0.20 W

ZRM 2.5-ES/C and ZRM 2.5-ES/CT

at I_b = 0.54 A (35 W) 0.06 W

at I_b = 1.00 A (70 W) 0.21 W

at I_b = 1.20 A (100 W) 0.31 W

at I_b = 1.80 A (150 W) 0.72 W

at I_b = 3.00 A (250 W) 2.10 W

ZRM 4.5-ES/C and ZRM 4.5-ES/CT

at I_b = 0.54 A (35 W) 0.03 W

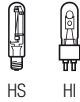
at I_b = 1.00 A (70 W) 0.11 W

at I_b = 1.20 A (100 W) 0.15 W

at I_b = 1.80 A (150 W) 0.35 W

at I_b = 3.00 A (250 W) 1.00 W

at I_b = 4.60 A (400 W) 2.50 W



ZRM 6-ES/C, ZRM 6-ES/CT, ZRM 6-ES/C 400 and ZRM 6-ES/C 3.5 kV
Capacity range 35 – 400 / 750 W

Product description

ZRM 6-ES/C, ZRM 6-ES/C 400 and ZRM 6-ES/C 3.5 kV

- Standard superimposed ignitor

ZRM 6-ES/CT

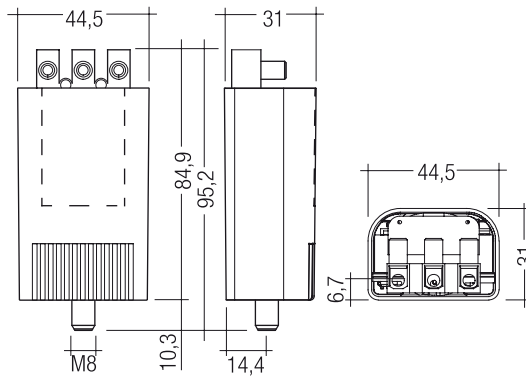
- Digital superimposed-pulse ignitors with automatic disconnection circuit
- Pulse/pause ignition: Shorter restart times, minimum downtime
- Suppression of the cycling effect with 3-start counter
- Disconnection of the ignition function after 20 min
- Automatic reset (< 1 s)

Note

- ZRM 6-ES/C and ZRM 6-ES/CT only suitable for metal halide lamps with an ignition voltage 4 – 5 kV_p
 - ZRM 6-ES/C 400 not suitable for metal halide lamps
 - ZRM 6-ES/C 3.5 kV not suitable for high-pressure sodium lamps
- For product data sheet go to www.tridonic.com, or available on request

Technical data

Max. casing temperature	105 °C
Min. ambient temperature	-30 °C
Screw terminal	2.5 – 6 mm ²



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
Standard ignitor				
ZRM 6-ES/C	87500083	20 pieces	520 pieces	0.21 kg
Digital ignitor				
ZRM 6-ES/CT	87500088	20 pieces	520 pieces	0.21 kg
Standard ignitor 400 Volt				
ZRM 6-ES/C 400	87500094	20 pieces	520 pieces	0.21 kg
Standard ignitor 3.5 kV				
ZRM 6-ES/C 3.5 kV	87500034	20 pieces	520 pieces	0.21 kg



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Max. permitted lamp current	Ignition voltage	Lamp wattage		Permitted load capacitance	Max. cable length to lamp (75 pF/m)
						Sodium vapour lamps	Metal halide lamps		
Standard ignitor									
ZRM 6-ES/C	87500083	198 – 264 V	50 / 60 Hz	5 A	4 – 5 kV _p	70 – 400 W	35 – 400 W	20 – 100 pF	1.5 m
Digital ignitor									
ZRM 6-ES/CT	87500088	198 – 264 V	50 / 60 Hz	5 A	4 – 5 kV _p	70 – 400 W	35 – 400 W	20 – 100 pF	1.5 m
Standard ignitor 400 Volt									
ZRM 6-ES/C 400	87500094	360 – 466 V	50 / 60 Hz	6 A	4 – 5 kV _p	600 – 750 W	–	20 – 200 pF	3.0 m
Standard ignitor 3.5 kV									
ZRM 6-ES/C 3.5 kV	87500034	198 – 264 V	50 / 60 Hz	5 A	3 – 4 kV _p	–	100 – 575 W	20 – 100 pF	1.5 m

Self-heating:

ZRM 6-ES/C and ZRM 6-ES/CT

at I _b = 1.00 A (70 W)	1.1 K
at I _b = 1.20 A (100 W)	1.9 K
at I _b = 1.80 A (150 W)	3.7 K
at I _b = 3.00 A (250 W)	9.9 K
at I _b = 4.60 A (400 W)	22.2 K

ZRM 6-ES/C 400

at I _b = 3.40 A (600 W)	12.9 K
at I _b = 3.62 A (600 W)	14.3 K
at I _b = 4.50 A (750 W)	21.8 K

ZRM 6-ES/C 3.5 kV

at I _b = 1.10 A (100 W)	1.8 K
at I _b = 3.70 A (450 W)	15.0 K
at I _b = 4.60 A (575 W)	22.2 K

Losses:

ZRM 6-ES/C and ZRM 6-ES/CT

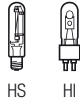
at I _b = 1.00 A (70 W)	0.10 W
at I _b = 1.20 A (100 W)	0.15 W
at I _b = 1.80 A (150 W)	0.35 W
at I _b = 3.00 A (250 W)	1.00 W
at I _b = 4.60 A (400 W)	2.40 W

ZRM 6-ES/C 400

at I _b = 3.40 A (600 W)	1.30 W
at I _b = 3.62 A (600 W)	1.45 W
at I _b = 4.50 A (750 W)	2.33 W

ZRM 6-ES/C 3.5 kV

at I _b = 1.10 A (100 W)	0.13 W
at I _b = 3.70 A (450 W)	1.53 W
at I _b = 4.60 A (575 W)	2.42 W



ZRM 12-ES/C, ZRM 12-ES/CT and ZRM 12-ES/C 400
Capacity range 250 – 2,000 W

Product description

ZRM 12-ES/C and ZRM 12-ES/C 400

- Standard superimposed ignitor

ZRM 12-ES/CT

- Digital superimposed-pulse ignitors with automatic disconnection circuit
- Pulse/pause ignition: Shorter restart times, minimum downtime
- Suppression of the cycling effect with 3-start counter
- Disconnection of the ignition function after 20 min
- Automatic reset (< 1 s)

→ For product data sheet go to www.tridonic.com, or available on request

Technical data

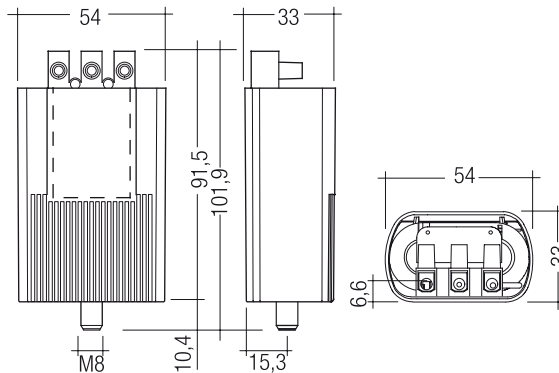
Max. casing temperature	105 °C
Min. ambient temperature	-30 °C
Screw terminal	2.5 – 6 mm ²



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
Standard ignitor				
ZRM 12-ES/C	87500084	20 pieces	400 pieces	0.28 kg
Digital ignitor				
ZRM 12-ES/CT	87500089	20 pieces	400 pieces	0.28 kg
Standard ignitor 400 Volt				
ZRM 12-ES/C 400	87500095	20 pieces	400 pieces	0.28 kg

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Max. permitted lamp current	Ignition voltage	Lamp wattage		Permitted load capacitance	Max. cable length to lamp (75 pF/m)
						Sodium vapour lamps	Metal halide lamps		
Standard ignitor									
ZRM 12-ES/C	87500084	198 – 264 V	50 / 60 Hz	12.0 A	4 – 5 kV _p	250 – 1,000 W	250 – 1,000 W	20 – 200 pF	3 m
Digital ignitor									
ZRM 12-ES/CT	87500089	198 – 264 V	50 / 60 Hz	12.0 A	4 – 5 kV _p	250 – 1,000 W	250 – 1,000 W	20 – 200 pF	3 m
Standard ignitor 400 Volt									
ZRM 12-ES/C 400	87500095	342 – 440 V	50 / 60 Hz	12.7 A	4 – 5 kV _p	600 – 1,000 W	1,000 – 2,000 W	20 – 200 pF	3 m

Self-heating:

ZRM 12-ES/C

at I _b = 4.60 A (400 W)	5.9 K
at I _b = 6.20 A (600 W)	10.3 K
at I _b = 7.00 A (750 W)	13.2 K
at I _b = 10.30 A (1,000 W)	27.2 K
at I _b = 12.00 A (max. W)	36.6 K

ZRM 12-ES/C 400

at I _b = 3.40 A (600 W)	3.5 K
at I _b = 3.62 A (600 W)	4.0 K
at I _b = 4.50 A (750 W)	5.8 K
at I _b = 6.80 A (1,500 W)	12.7 K
at I _b = 10.30 A (2,000 W)	27.2 K
at I _b = 12.70 A (max. W)	36.6 K

ZRM 12-ES/CT

at I _b = 3.00 A (250 W)	2.9 K
at I _b = 4.60 A (400 W)	5.9 K
at I _b = 6.20 A (600 W)	10.3 K
at I _b = 7.00 A (750 W)	13.2 K
at I _b = 10.30 A (1,000 W)	27.2 K
at I _b = 12.00 A (max. W)	36.6 K

Losses:

ZRM 12-ES/C

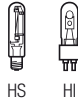
at I _b = 4.60 A (400 W)	0.82 W
at I _b = 6.20 A (600 W)	1.54 W
at I _b = 7.00 A (750 W)	2.02 W
at I _b = 10.30 A (1,000 W)	4.68 W
at I _b = 12.00 A (max. W)	6.73 W

ZRM 12-ES/C 400

at I _b = 3.40 A (600 W)	0.45 W
at I _b = 3.62 A (600 W)	0.51 W
at I _b = 4.50 A (750 W)	0.72 W
at I _b = 6.80 A (1,500 W)	1.86 W
at I _b = 10.30 A (2,000 W)	4.68 W
at I _b = 12.70 A (max. W)	6.73 W

ZRM 12-ES/CT

at I _b = 3.00 A (250 W)	0.35 W
at I _b = 4.60 A (400 W)	0.82 W
at I _b = 6.20 A (600 W)	1.54 W
at I _b = 7.00 A (750 W)	2.02 W
at I _b = 10.30 A (1,000 W)	4.68 W
at I _b = 12.00 A (max. W)	6.73 W



ZRM 20-ES/B and ZRM 20-ES/B 400
Capacity range 1,000 – 3,500 W

Product description

- Standard superimposed ignitor
- For high wattages with very low self heating

Note

- ZRM 20-ES/B 400 not suitable for high-pressure sodium lamps
- For product data sheet go to www.tridonic.com,
or available on request

Technical data

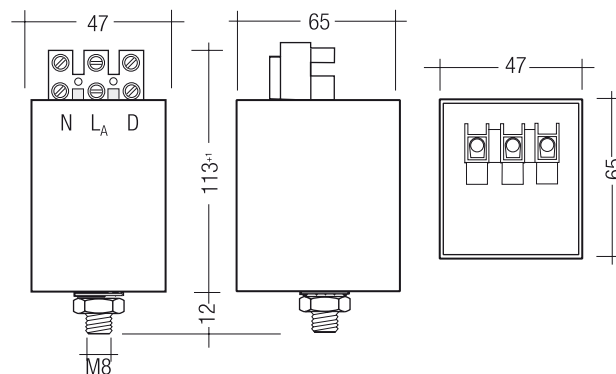
Max. casing temperature	105 °C
Min. ambient temperature	-30 °C
Screw terminal	2.5 – 10 mm ²



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
Standard ignitor				
ZRM 20-ES/B	20826280	15 pieces	360 pieces	0.75 kg
Standard ignitor 400 Volt				
ZRM 20-ES/B 400 V	20826425	15 pieces	360 pieces	0.75 kg

Specific technical data

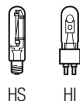
Type	Article number	Permitted input voltage	Mains frequency	Max. permitted lamp current	Ignition voltage	Lamp wattage		Permitted load capacitance	Max. cable length to lamp (75 pF/m)
						Sodium vapour lamps	Metal halide lamps		
Standard ignitor									
ZRM 20-ES/B	20826280	198 – 264 V	50 / 60 Hz	20 A	3.5 – 5 kV _p	1,000 W	1,000 – 2,000 W	20 – 200 pF	3 m
Standard ignitor 400 Volt									
ZRM 20-ES/B 400 V	20826425	342 – 490 V	50 / 60 Hz	20 A	4.0 – 5 kV _p	–	2,000 – 3,500 W	20 – 200 pF	3 m

Self-heating:

ZRM 20-ES/B	
at I _b = 10.30 A (1,000 W)	9.5 K
at I _b = 16.20 A (2,000 W)	26.0 K
ZRM 20-ES/B 400	
at I _b = 16.20 A (2,000 W)	10.5 K
at I _b = 18.00 A (3,500 W)	28.0 K

Losses:

ZRM 20-ES/B	
at I _b = 10.30 A (1,000 W)	1.8 W
at I _b = 16.20 A (2,000 W)	5.9 W
ZRM 20-ES/B 400	
at I _b = 16.20 A (2,000 W)	2.9 W
at I _b = 18.00 A (3,500 W)	9.3 W



ZRM 4000 and 4000/400 powerPULSE
Digital

Product description

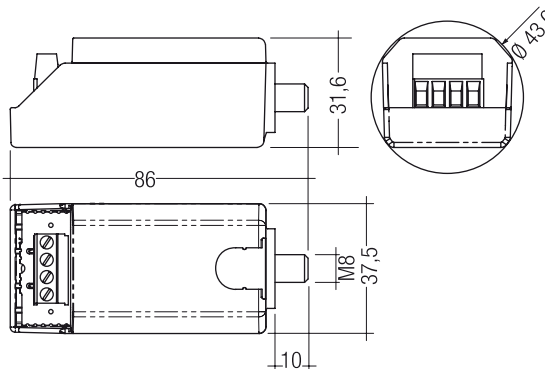
- Innovative digital pulse ignitor
- Pulse/pause ignition: Shorter restart times, minimum downtime
- No annoying flashing
- Silent operation
- Low weight
- Regulated maximum ignition voltage and therefore enhanced safety for the choke
- Also suitable for special sodium vapour lamps (Plus, Super, XL)
- Screw terminals for 2.5 mm²

Note

- ZRM 4000 powerPULSE only suitable for metal halide lamps with an ignition voltage > 2.5 kV_p
- For product data sheet go to www.tridonic.com, or available on request

Technical data

Number of pulses per mains half-wave	1
Pulse width at 90% ignition voltage	> 10 μs
Phase angle of the ignition pulse	72 / 252 °el
Min. cable length to lamp	0.2 m
Max. casing temperature	85 °C
Min. ambient temperature	-30 °C
Screw terminal	0.5 – 2.5 mm ²



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM 4000 powerPULSE	86458458	50 pieces	1,200 pieces	0.052 kg
ZRM 4000/400 powerPULSE	86458459	50 pieces	1,200 pieces	0.058 kg



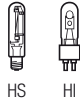
Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Ignition voltage	Losses at nominal voltage	Lamp wattage		Permitted load capacitance	Max. cable length to lamp
						Sodium vapour lamps	Metal halide lamps		
ZRM 4000 powerPULSE	86458458	198 – 264 V	50 / 60 Hz	4.1 kV _p	0.9 W	70 – 1,000 W	35 – 1,800 W	20 – 4,000 pF	40 m
ZRM 4000/400 powerPULSE	86458459	342 – 484 V	50 / 60 Hz	4.1 kV _p	1.5 W	600 – 750 W	1,800 – 2,000 W	20 – 4,000 pF	40 m



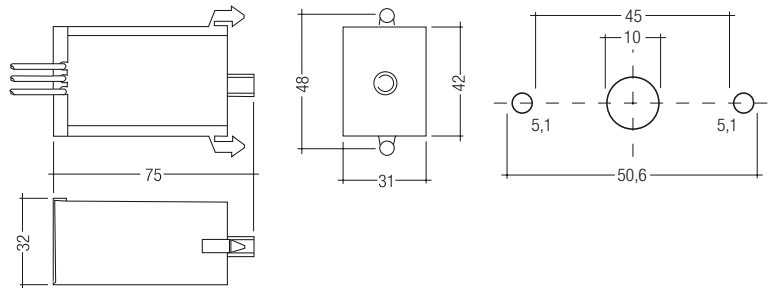
ZRM 2300 and ZRM 4000
Standard with timer

Product description

- Snap-in lugs
- Type of protection IP20
- Connection via flexible wires 3 x 0.75 mm²
- Cable length 340 mm
- Pulse/pause ignition: (ZRM 2300 C201 and ZRM 4000 C201):
pulse: 16 s; pause: 112 s; time-out: 15 min

Note

- ZRM 2300 C201 and ZRM 4000 C201 with digital timer:
disconnection of the ignition function after 15 min
 - ZRM 4000 B101 with analogue timer: disconnection of
the ignition function after 2 – 10 min, not ENEC certified
- For product data sheet go to www.tridonic.com,
or available on request



Technical data

Number of pulses per mains half-wave	1
Pulse width at 90% ignition voltage	> 2 μs
Phase angle of the ignition pulse	60 – 90 °el / 240 – 270 °el
Cable length to lamp	see data sheet
Max. casing temperature	80 °C
Min. ambient temperature	-40 °C

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM 2300 C201	87500000	40 pieces	1,440 pieces	0.045 kg
ZRM 4000 B101	87500002	40 pieces	1,440 pieces	0.053 kg
ZRM 4000 C201	87500001	40 pieces	1,440 pieces	0.053 kg



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Ignition voltage	Lamp wattage		Permitted load capacitance
					Sodium vapour lamps	Metal halide lamps	
ZRM 2300 C201	87500000	198 – 254 V	50 Hz	2.3 kV _p	50 – 70 W	–	see the data sheet
ZRM 4000 B101	87500002	198 – 254 V	50 Hz	4.5 kV _p	100 – 400 W	–	see the data sheet
ZRM 4000 C201	87500001	198 – 254 V	50 Hz	4.5 kV _p	100 – 1,000 W	35 – 1,000 W	see the data sheet



ZRM 1000 A004 and A005
Parallel impulse ignitor

Product description

- Parallel pulse ignitor
- For metal halide lamps
- Compact dimensions
- ZRM 1000 A005 encapsulated

Note

- Only suitable for metal halide lamps with an ignition voltage < 900 V
- For product data sheet go to www.tridonic.com, or available on request

Technical data

Number of pulses per mains half-wave	1
Phase angle of the ignition pulse	60 – 90 °el
Max. casing temperature	90 °C
Min. ambient temperature	-30 °C
Screw terminal	0.5 – 2.5 mm ²

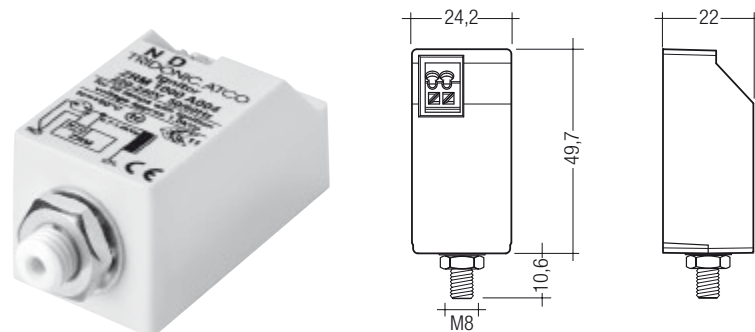


Fig. 1

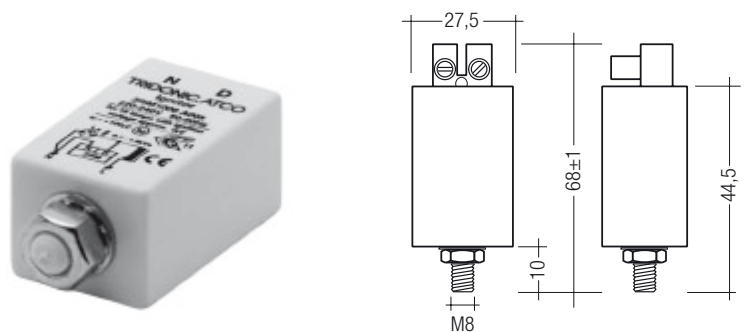


Fig. 2



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Ordering data

Type	Article number	Figure	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM 1000 A004	87500067	1	50 pieces	2,600 pieces	0.02 kg
ZRM 1000 A005	87500110	2	50 pieces	2,600 pieces	0.05 kg

Specific technical data

Type	Article number	Figure	Permitted input voltage	Mains frequency	Self-heating during ignition	Ignition voltage	Losses during ignition	Lamp wattage Metal halide lamps	Permitted load capacitance	Pulse width at 560 V ignition voltage	Max. cable length to lamp
ZRM 1000 A004	87500067	1	198 – 264 V	50 / 60 Hz	8 K	0.65 – 0.9 kV _p	1.6 W	250 – 1,000 W	20 – 4,000 pF	420 – 460 µs	40 m
ZRM 1000 A005	87500110	2	198 – 264 V	50 / 60 Hz	3 K	0.85 – 1.1 kV _p	0.6 W	250 – 1,000 W	20 – 10,000 pF	500 – 550 µs	100 m



ZRM 1200/400 A001
Parallel impulse ignitor

Product description

- Parallel pulse ignitor for 400 V
- For metal halide lamps
- Compact dimensions
- Screw terminals for 2.5 mm²

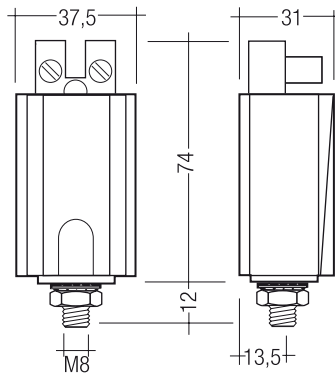
Note

- Only suitable for metal halide lamps with an ignition voltage < 900 V
- For product data sheet go to www.tridonic.com, or available on request



Technical data

Number of pulses per mains half-wave	1
Pulse width at 900 V ignition voltage	400 – 450 µs
Phase angle of the ignition pulse	60 – 90 °el
Min. cable length to lamp	0.2 m
Max. casing temperature	100 °C
Min. ambient temperature	-30 °C
Screw terminal	0.75 – 2.5 mm ²



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM 1200/400 A001	89121941	50 pieces	1,200 pieces	0.17 kg

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Self-heating during ignition	Ignition voltage	Losses during ignition	Lamp wattage Metal halide lamps	Permitted load capacitance	Max. cable length to lamp
ZRM 1200/400 A001	89121941	376 – 440 V	50 / 60 Hz	35 K	1 – 1.4 kV ₀	3.8 W	2,000 W	20 – 10,000 pF	100 m

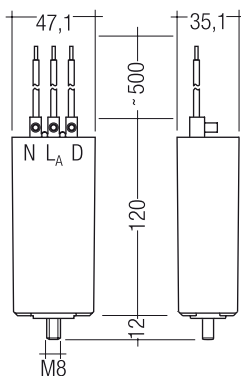


ZRM A201W

High-pressure mercury vapour lamp conversion kits

Product description

- Integrated reversible thermal controller
 - Premounted connecting cable 3 x 1 mm², 8 mm stripped with end sleeves, 500 mm long, double insulation for protection class II applications
 - Protection class II compatible with the use of terminal cover and cable ties
 - Integrated digital superimposed-pulse ignitor with automatic disconnection
 - Pulse/pause ignition: Shorter restart times, minimum downtime
 - Suppression of the cycling effect with 3-start counter
 - Automatic reset (< 1 s)
- For product data sheet go to www.tridonic.com, or available on request



Technical data

Max. casing temperature	105 °C
Min. ambient temperature	-30 °C



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
Standard ignitor				
ZRM 50/35 A201W	22175202	25 pieces	600 pieces	0.53 kg
ZRM 80/50 A201W	22175200	25 pieces	600 pieces	0.53 kg
ZRM 125/70 A201W	22175201	25 pieces	600 pieces	0.53 kg

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Max. permitted lamp current	Temperature rise	Ignition voltage	Losses	Upgrade kit from high-pressure mercury to high-pressure sodium vapour lamps	Permitted load capacitance	Max. cable length to lamp
Standard ignitor										
ZRM 50/35 A201W	22175202	198 – 264 V	50 / 60 Hz	0.53 A	~ 25 K	1.8 – 2.5 kV _p	~ 3.9 W	HM 50 to HS 35 W	200 pF	3 m
ZRM 80/50 A201W	22175200	198 – 264 V	50 / 60 Hz	0.76 A	~ 19 K	1.8 – 2.5 kV _p	~ 3.6 W	HM 80 to HS 50 W	200 pF	3 m
ZRM 125/70 A201W	22175201	198 – 264 V	50 / 60 Hz	1.00 A	~ 30 K	1.8 – 2.5 kV _p	~ 8.7 W	HM 125 to HS 70 W	200 pF	3 m



ZRM B201W

High-pressure mercury vapour lamp conversion kits

Product description

- Integrated reversible thermal controller
- Premounted connecting cable 3 x 1 mm², 8 mm stripped with end sleeves, 500 mm long, double insulation for protection class II applications
- Protection class II compatible with the use of terminal cover and cable ties
- Integrated digital superimposed-pulse ignitor with automatic disconnection
- Pulse/pause ignition: Shorter restart times, minimum downtime
- Suppression of the cycling effect with 3-start counter
- Automatic reset (< 1 s)

→ For product data sheet go to www.tridonic.com,
or available on request

Technical data

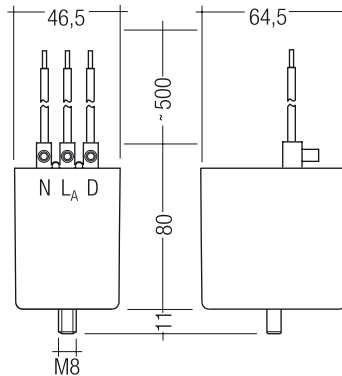
Max. casing temperature	105 °C
Min. ambient temperature	-30 °C



Ignitor matrix, page 7

Standards, page 8

Wiring diagrams and installation examples, page 29



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
Standard ignitor				
ZRM 80/50 B201W	22175203	30 pieces	720 pieces	0.54 kg
ZRM 125/70 B201W	22175204	30 pieces	720 pieces	0.54 kg

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Max. permitted lamp current	Temperature rise	Ignition voltage	Losses	Upgrade kit from high-pressure mercury to high-pressure sodium vapour lamps	Permitted load capacitance	Max. cable length to lamp
Standard ignitor										
ZRM 80/50 B201W	22175203	198 – 264 V	50 / 60 Hz	0.76 A	~ 27 K	1.8 – 2.5 kV _p	~ 3.6 W	HM 80 to HS 50 W	200 pF	3 m
ZRM 125/70 B201W	22175204	198 – 264 V	50 / 60 Hz	1.00 A	~ 50 K	1.8 – 2.5 kV _p	~ 8.7 W	HM 125 to HS 70 W	200 pF	3 m



ZRM U6L / ZRM U6L-T
Energy savings in street lighting

Product description

Switching to a lower power stage reduces the luminous flux. This enables energy savings to be made without affecting the life of the lamp. According to lamp manufacturers, lamps should always be started at 100 % output. In the case of ZRM U6L, this can be achieved with a separate time relay at the central signal transmitter. ZRM U6L/T has a built-in delay. After every interruption in the power supply the lamp is operated at 100 % output for a period of 330 seconds irrespective of the light value selected.

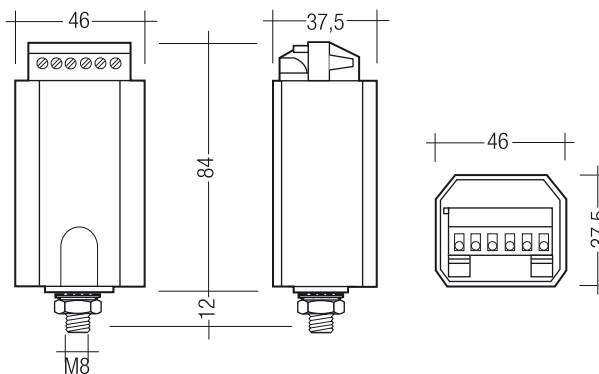
- For product data sheet go to www.tridonic.com, or available on request
- The "Energy saving in street lighting" brochure is available at www.tridonic.com or on request

Technical data

Max. casing temperature	80 °C
Min. ambient temperature	-30 °C
Screw terminal	0.75 – 2.5 mm ²



Wiring diagrams and installation examples, page 29



Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM U6L	87500039	40 pieces	800 pieces	0.185 kg
ZRM U6L/T	87500040	40 pieces	800 pieces	0.185 kg

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Temperature rise	Rated contact voltage	Rated contact current	Switchover delay
ZRM U6L	87500039	198 – 264 V	50 / 60 Hz	8 K	250 V	6 A / cos φ = 0.5; 16 A / cos φ = 1.0	–
ZRM U6L/T	87500040	198 – 264 V	50 / 60 Hz	9 K	250 V	6 A / cos φ = 0.5; 16 A / cos φ = 1.0	330 s



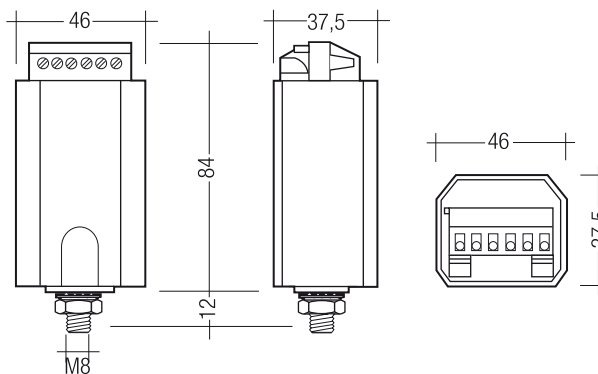
ZRM U6M

Energy savings in street lighting

Product description

The ZRM U6M digital power changeover switch automatically reduces brightness during the night. Changeover is automatically handled by a digital chip. The changeover times can be set centrally via the normal power supply. ZRM U6M therefore operates entirely independently, is maintenance-free and does not require a control line.

- It can be used in any lighting system without an additional control line
 - For changing impedance with tapped chokes or supplementary impedances
 - Digital switchover relay with temporary bridging for interruption-free power reduction
 - Integrated delay circuit for gentle lamp starting at the 100 % output
 - ZRM U6M A001 for magnetic chokes with integrated temporary bridging
 - ZRM U6M A003 for electronic ballasts with control input
- For product data sheet go to www.tridonic.com, or available on request
- The "Energy saving in street lighting" brochure is available at www.tridonic.com or on request



Technical data

Max. casing temperature	80 °C
Min. ambient temperature	-30 °C
Screw terminal	0.75 – 2.5 mm ²

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM U6M A001	87500044	40 pieces	800 pieces	0.23 kg
ZRM U6M A003	87500045	40 pieces	800 pieces	0.23 kg



Wiring diagrams and installation examples, page 29

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Temperature rise	Rated contact voltage	Rated contact current	Switchover delay
ZRM U6M A001	87500044	198 – 264 V	50 / 60 Hz	10 K	250 V	6 A / cos ϕ = 0.5; 16 A / cos ϕ = 1.0	600 s
ZRM U6M A003	87500045	198 – 264 V	50 / 60 Hz	5 K	250 V	6 A / cos ϕ = 0.5; 16 A / cos ϕ = 1.0	600 s



LRM 500 S

Ignition time bridging

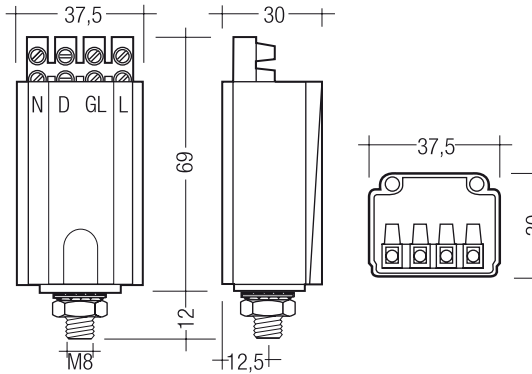
Product description

Since high-intensity lamps require a certain starting time to reach their full output an additional lamp can be used to bridge this starting phase. The additional lamp provides sufficient light until the high-intensity lamp has completed the starting phase. The additional lamp is controlled by LRM 500 S. As soon as the high-intensity lamp produces enough light (about 90 % of full output) the additional lamp is switched-off.

→ For product data sheet go to www.tridonic.com,
or available on request

Technical data

Max. casing temperature	90 °C
Min. ambient temperature	-30 °C
Screw terminal	0.75 – 2.5 mm ²



Wiring diagrams and installation examples, page 29

Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
LRM 500 S	87500041	50 pieces	1,400 pieces	0.15 kg

Specific technical data

Type	Article number	Permitted input voltage	Mains frequency	Temperature rise	Max. HID lamp wattage	Auxiliary lamp wattage	Max. choke voltage
LRM 500 S	87500041	198 – 264 V	50 / 60 Hz	12 K	1,000 W	5 – 500 W	800 V

RoHS

ZRM ES/C terminal cover
Mounting components

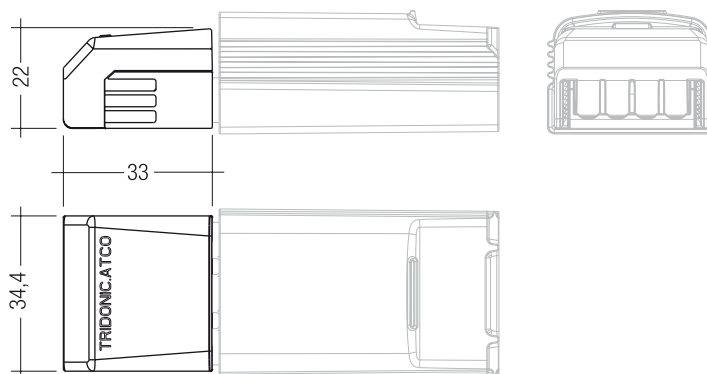
Product description

- Contact protection
- No tools required for installation
- Can be mounted even after the cables have been fitted
- Suitable for:
ZRM 2-ES/C; ZRM 2 ES/CT
ZRM 2.5-ES/C; ZRM 2.5-ES/CT
ZRM 4.5-ES/C; ZRM 4.5-ES/CT
ZRM 6-ES/C; ZRM 6-ES/CT; ZRM 6-ES/C 400; ZRM 6-ES/C 3.5 kV
ZRM 12-ES/C; ZRM 12-ES/CT; ZRM 12-ES/C 400

Technical data

Dimensions L x W x H

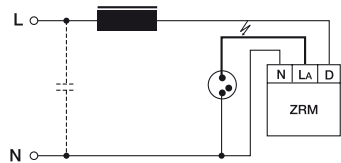
33 x 34.4 x 22 mm



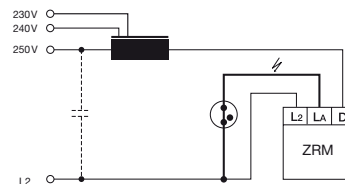
Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
ZRM ES/C Terminal cover	24139100	350 pieces	2,800 pieces	0.01 kg

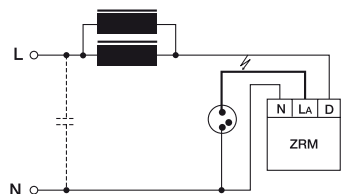
Single-voltage circuit with superimposed-pulse ignitor for sodium vapour lamps and metal halide lamps



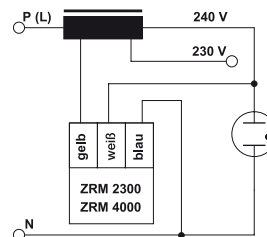
Multi-voltage circuit with superimposed-pulse ignitor for sodium vapour lamps and metal halide lamps



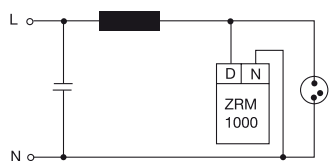
Single-voltage circuit for ECIS 150 1/2 with superimposed-pulse ignitor for sodium vapour lamps and metal halide lamps



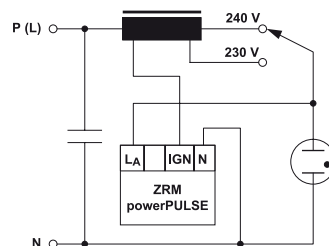
Multi-voltage circuit with pulse ignitors ZRM 2300 and ZRM 4000



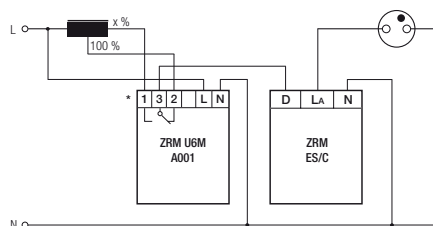
Parallel pulse circuit for metal halide lamps up to 1 kV_p ignition voltage



Multi-voltage circuit with pulse ignitors ZRM 4000 powerPULSE for sodium vapour lamps and metal halide lamps

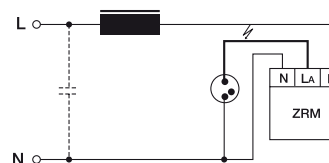


Power changeover for sodium vapour lamps by means of tapped choke and ZRM U6M

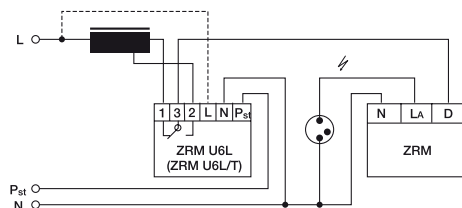


* standby operation: pin 1 and 2 are connected
100 % operation: pin 2 and 3 are connected

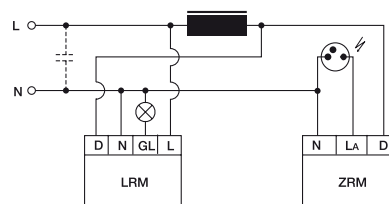
Upgrading from mercury vapour lamps to sodium vapour lamps by means of supplementary impedance



Power changeover for sodium vapour lamps by means of tapped choke and ZRM U6L



Ignition time bridging of metal halide lamps by means of LRM 500 S



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