

TRIDONIC

▼ enlightening your ideas

ZRM

Ignitors for high-intensity discharge lamps



Enlightening your ideas

“I’d like light that I can depend on.”



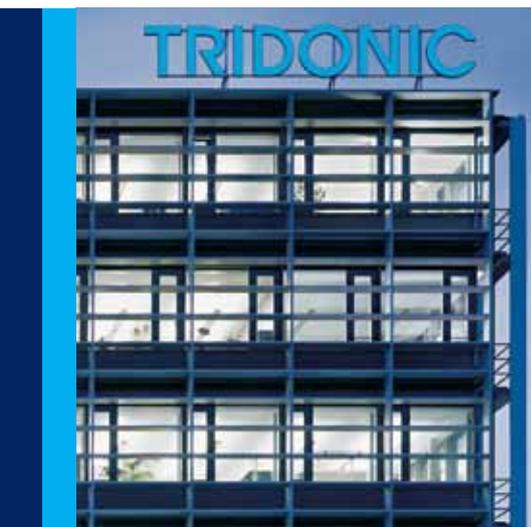
We put all our energy into your light.

Tridonic has been involved in the quest for perfect light for more than 50 years. Our focus is on achieving better lighting with more and more advanced components, improving the reliability and safety of lighting systems still further and making a real contribution to climate protection. It is our unique expertise that enables us to achieve our prime objective, namely helping you install lighting solutions that are unbeatable in terms of economy and functionality.

What drives us above all is our great passion for light and lighting. In combination with our experience and in-depth knowledge of the lighting industry, this passion has led to an ever expanding portfolio of products – from lighting components, lighting management systems and LEDs. In combination with our service expertise this motivates us to support you in all phases of the project as a partner you can rely on. Wherever you are in the world. With a total of 2,000 employees in 30 separate branch offices and a dense network of established sales partners, Tridonic is always nearby – at any of 73 locations throughout the world.

▼ Facts and figures:

- 2,000 employees
- Headquarters in Dornbirn (A)
- 30 separate branch offices
- A presence on six continents
- More than 570 inventions
- More than 2,000 patents
- New products account for more than 40 % of the total



Quality

Tridonic is synonymous throughout the world for products that combine reliability with state-of-the-art functionality.



Expertise

Our in-depth know-how and extensive knowledge of the lighting industry make us your expert in all aspects of light and lighting.



Close customer contact

You are our focus. We want not only to supply you with the best possible equipment but also to support you every step of the way.



Our innovative product range includes suitable ignitors for high-intensity discharge lamps. The special feature of these ignitors is that the ignition voltage is generated without placing a high-voltage load on the choke. This ensures maximum reliability for you.

Tridonic supports you at every level – with innovative products and its wealth of experience. Why don't you opt for peace of mind too? Go for quality Tridonic products that operate reliably even under extreme climatic conditions, at high temperatures, with large temperature fluctuations or in heavy snowfalls.

- ▶ **Tridonic ignitors are characterised by minimal self-heating, which in turn gives luminaire designers extra creative freedom. Reliable and created to meet your individual requirements.**



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Ignitor matrix

Range

Metal halide lamps (HI)										
Output in W	35	70	100	150	250	400	1,000	1,800	2,000	3,500
Standard superimposed-pulse ignitors										
ZRM 2-ES/C	▲ ¹		▲ ¹							▲
ZRM 2,5-ES/C ▲	▲	▲	▲	▲						
ZRM 4,5-ES/C △	▲	▲	▲	▲	▲					
ZRM 6-ES/C	△	△	△	△	△	▲				
ZRM 6-ES/C 400										
ZRM 12-ES/C △	△	△	△	△	△	▲				
ZRM 12-ES/C 400								▲ ⁴	▲	
ZRM 20-ES/B						△	▲ ⁵	▲		
ZRM 20-ES/B 400									△	▲
Digital superimposed-pulse ignitors with timers										
ZRM 2-ES/CT	▲ ¹		▲ ¹							▲
ZRM 2,5-ES/CT ▲	▲	▲	▲	▲						
ZRM 4,5-ES/CT △	▲	▲	▲	▲	▲					
ZRM 6-ES/CT △	△	△	△	△	▲					
ZRM 12-ES/CT △	△	△	△	△	△	▲				
powerPULSE pulse ignitor with timer and regulated ignition voltage										
ZRM 2300 powerPULSE		▲ ¹		▲ ¹						
ZRM 4000 powerPULSE	▲	▲	▲	▲	▲	▲	▲	▲ ⁵		
ZRM 4000/400 powerPULSE							▲ ⁴	▲		
Pulse ignitor with timer										
ZRM 2300 C201		▲ ¹		▲ ¹						
ZRM 4000 C201	▲	▲	▲	▲	▲	▲	▲			
ZRM 4000 B101										
Standard pulse ignitors										
ZRM 1000 A004					▲ ³	▲ ³	▲ ³			
ZRM 1000 A005					△	△	△			
ZRM 1200/400 A001							△		△	△

Key: ▲ recommended △ usable

Sodium vapour lamps (HS) [W]										
Output in W	35	50	70	100	150	250	400	650	750	1,000
Standard superimposed-pulse ignitors										
ZRM 2-ES/C	▲	▲ ¹								
ZRM 2,5-ES/C ▲		▲ ²	▲	▲	▲					
ZRM 4,5-ES/C △		△	▲	▲	▲	▲				
ZRM 6-ES/C				△	△	△	▲			
ZRM 6-ES/C 400								▲	△	
ZRM 12-ES/C △							▲		▲	
ZRM 12-ES/C 400										
ZRM 20-ES/B										
ZRM 20-ES/B 400										
Digital superimposed-pulse ignitors with timers										
ZRM 2-ES/CT	▲	▲ ¹								
ZRM 2,5-ES/CT		▲	▲	▲	▲					
ZRM 4,5-ES/CT		△	▲	▲	▲	▲				
ZRM 6-ES/CT			△	△	△	▲				
ZRM 12-ES/CT			△	△	△	△	▲		▲	
powerPULSE pulse ignitor with timer and regulated ignition voltage										
ZRM 4000 powerPULSE			▲	▲	▲	▲	▲	▲		
ZRM 4000/400 powerPULSE							▲	▲		
Pulse ignitor with timer										
ZRM 2300 C201		▲	▲ ¹							
ZRM 4000 C201				▲	▲	▲	▲	▲		▲
ZRM 4000 B101				▲	▲	▲	▲			

¹ for lamps with an ignition voltage < 2.5 kV_p

² for 70 W sodium lamps with an ignition voltage of 4 kV_p to 5 kV_p

³ lamps with an ignition voltage < 1,000 V

⁴ 400 V lamps with 10.5 A lamp current

⁵ 230 V lamps with 17.3 A lamp current

The ignitors are described in detail on the following pages.

General information about Tridonic ignitors

Metal halide lamps and sodium vapour lamps which do not have an internal starter need a high ignition voltage in order to start.



Depending on the type of lamp in question, an ignition voltage of 800 V to 8,000 V is needed in order to start a cold lamp. The ignitors used to achieve this are divided into two basic groups depending on the circuit principle chosen, namely superimposed-pulse ignitors and ignitor systems that use pulse technology.

Superimposed-pulse ignitors and pulse ignitors

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 in the case of C201 type ignitors.

Ignitor range

The innovative range of ignitors from Tridonic includes standard ignitors suitable for all commercially available high-intensity discharge lamps with wattages from 35 W to 3,500 W. The appropriate ignitor is chosen primarily based on the lamp manufacturer's specifications.

Cable lengths to lamp

The height of the ignition pulse diminishes as it travels from the ignitor towards the lamp as the length of the cable or the capacitance of the cable increases. It is vital to adhere to the ignition voltage range in order to reliably start a lamp throughout its service life.

Ignition behaviour

Reliable ignition depends on the following factors:

- Number of ignition pulses
- Height and width of ignition pulse
- Phase displacement of ignition pulses
- Adequate supply voltage

The ignition voltage is limited by the lampholder, lamp socket and lamp specification.

Ignition voltage

The ignition voltage is equivalent to the amplitude of the relevant ignition pulse. Depending on the lamp and ignitor, the ignition voltage varies from 800 V to 5,000 V.

Ignition energy

The energy of an ignition pulse is proportional to the surface area of the envelope of the ignition pulse. The high ignition energy of Tridonic ignitors improves the restriking performance of hot lamps.

Switch-on voltage and switch-off voltage

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 high-quality narrow-tolerance components, the switch-off voltage reaches the high value of 185 V.

Minimal increase in temperature

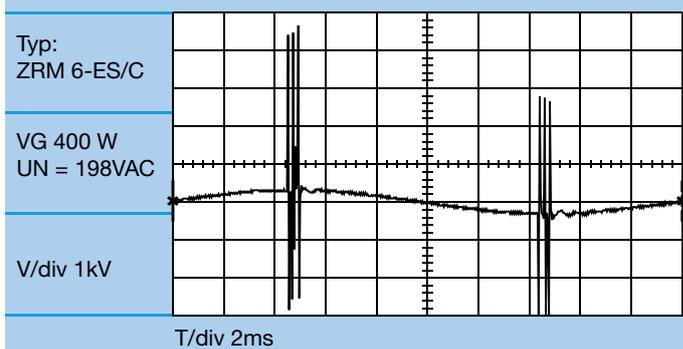
The increase in temperature in the ignitor determines its area of application and is therefore an important criterion. Tridonic ignitors are characterised by minimal self-heating, which in turn gives luminaire designers extra creative freedom.

Most Tridonic ignitors are designed for a maximum housing temperature (tc point) of 105 °C which must not be exceeded in service.

▼ At a glance:

- ___ Mains voltage range:
220 V -10% to 240 V +10%
- ___ Mains frequency: 50/60 Hz
- ___ Safety according to EN 61347-2-1
- ___ Operating principle according to EN 60927
- ___ Electronic, silent operation
- ___ Compact design
- ___ High reliability
- ___ Minimum intrinsic consumption
- ___ Low self-heating
- ___ Wear-free and maintenance-free
- ___ Higher ignition energy
- ___ Easy to install

Superimposed-pulse ignitors of wave power (resolution 2 ms/div)



Standard superimposed-pulse ignitors

A compact designed circuit is used to control the ignition process. This means that superimposed-pulse ignitors from Tridonic are characterised by high system reliability.

Superimposed-pulse ignitors

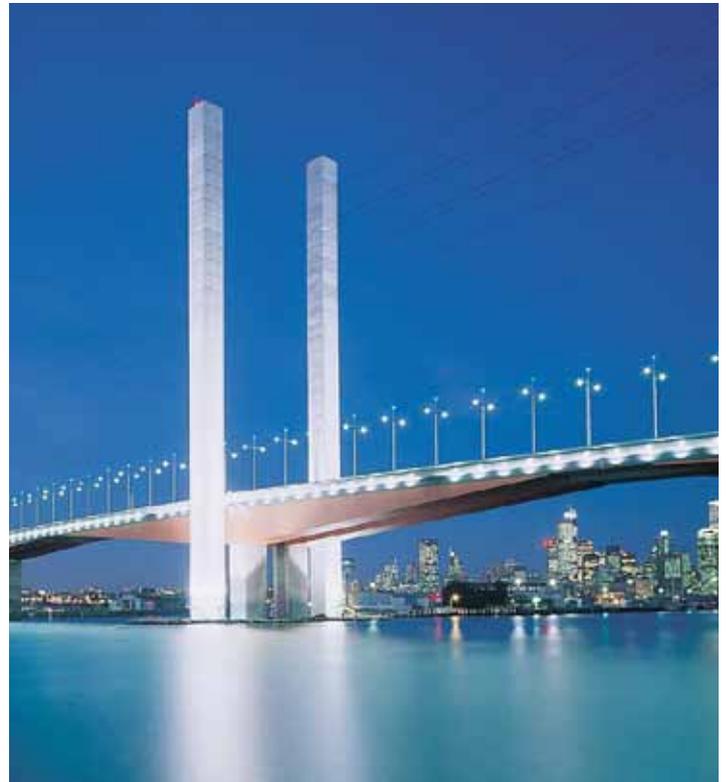
In ignitors that operate on the superimposed principle, the ignition voltage is generated by an integrated pulse transformer. This transforms the mains voltage to the ignition voltage of up to 5 kV_p required by the lamp.

The ignition voltage is superimposed on the mains voltage. This results in a defined number of ignition pulses having a predetermined width and height – as required by lamp manufacturers – per half wave.

The lamp current flows through the pulse transformer. The ignition voltage is produced by discharging a capacitor across the pulse transformer. 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.



100 % compliance with the tolerance limits of the ignition pulse is guaranteed because ignition characteristics do not depend on external components. Furthermore, the high voltage is applied exclusively to the ignitor and light source without placing a high-voltage load on the choke. This extends the choke's service life considerably.



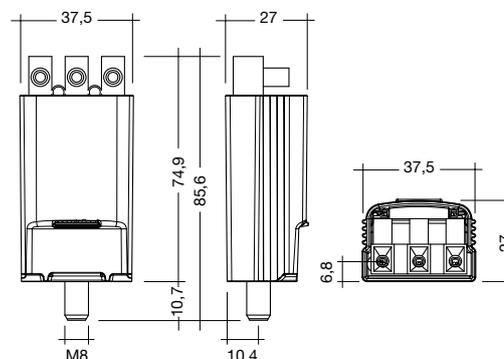
Ideally, a superimposed-pulse ignitor is fitted in the luminaire. The distance to the lamp is limited to 1.5 m max. to ensure reliable lamp starting and therefore maximum flexibility when installing luminaires.

Tridonic superimposed-pulse ignitors are available as ZRM ES/C type standard ignitors without a timer, as ZRM ES/CT versions with an integrated digital timer, pulse-pause ignition mode and automatic reset.

Standard superimposed-pulse ignitors

Type ZRM ES/C (230 V) 35 W – 400 W

ZRM ES/C standard superimposed-pulse ignitors without a timer are impressively robust and reliable. This product range is characterised by excellent machining quality, premium electronic components and small dimensions. Their application area covers metal halide lamps with wattages from 35 W to 400 W and sodium vapour lamps with wattages from 70 W to 400 W.



Superimposed-pulse ignitors - 230-V-Model

Type	ZRM 2-ES/C	ZRM 2.5-ES/C	ZRM 4.5-ES/C
Article number	87500080	87500081	87500082
Permitted input voltage (V)	198 – 264	198 – 264	198 – 264
Mains frequency (Hz)	50 – 60	50 – 60	50 – 60
Ignition voltage (kV _p)	1.8 – 2.5	4.0 – 5.0	4.0 – 5.0
Max. permitted lamp current I _B (A)	2.0	3.0	4.6
Output of sodium vapour lamp (W)	35 – 70	100 – 250*	100 – 400
Output of metal halide lamp (W)	70**	35 – 250	35 – 400
Self-heating (approximate) at I _B = 0.54 A (35 W) (K)	0.2	0.1	0.1
I _B = 1.0 A (70 W) (K)	2.5	2.5	1.0
I _B = 1.2 A (100 W) (K)	–	4.0	2.0
I _B = 1.8 A (150 W) (K)	–	9.5	6.5
I _B = 3.0 A (250 W) (K)	–	27.0	14.0
I _B = 4.6 A (400 W) (K)	–	–	33.5
Losses in W			
I _B = 0.54 A (35 W) (W)	0.05	0.06	0.03
I _B = 1.0 A (70 W) (W)	0.20	0.21	0.11
I _B = 1.2 A (100 W) (W)	–	0.31	0.15
I _B = 1.8 A (150 W) (W)	–	0.72	0.35
I _B = 3.0 A (150 W) (W)	–	2.10	1.0
I _B = 4.6 A (400 W) (W)	–	–	2.5
Switch off/on voltage (V)	160 – 198	185 – 198	185 – 198
Permitted load capacitance (pF)	20 – 300	20 – 100	20 – 100
Max. cable length to lamp (m)	4	1.5	1.5
Max. permitted housing temperature t _c (°C)	105	105	105
Min. permitted ambient temperature t _a (°C)	-30	-30	-30
Weight (kg)	0.13	0.13	0.13

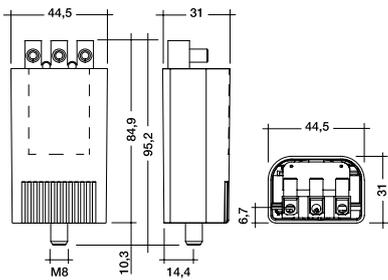
* suitable for HST-DE 70 W sodium vapour lamps

** for 70 W metal halide lamps with an ignition voltage < 2.5 kV_p

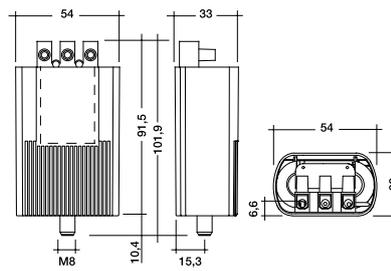
Standard superimposed-pulse ignitors

Type ZRM ES/C (230 V) 35 W – 400 W

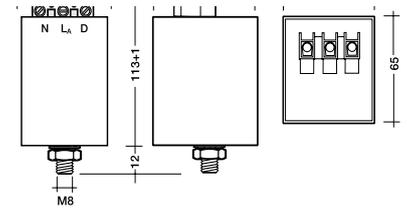
ZRM ES/C standard superimposed-pulse ignitors without a timer are impressively robust and reliable. This product range is characterised by excellent machining quality, premium electronic components and small dimensions. Their application area covers metal halide lamps with wattages from 35 W to 400 W and sodium vapour lamps with wattages from 70 W to 400 W.



Picture 1



Picture 2



Picture 3

Standard superimposed-pulse ignitors – 230-V-Model

Type	ZRM 6-ES/C	ZRM 12-ES/C	ZRM 20-ES/B
Article number	87500083	87500084	20826280
Picture	1	2	7
Permitted input voltage (V)	198 – 264	198 – 264	198 – 264
Mains frequency (Hz)	50 – 60	50 – 60	50 – 60
Ignition voltage (kV _p)	4.0 – 5.0	4.0 – 5.0	3.5 – 5.0
Max. permitted lamp current I _B (A)	5.0	12.0	20.0
Output of sodium vapour lamp (W)	70 - 400	250 – 1,000	1,000
Output of metal halide lamp (W)	35 - 400	250 – 1,000	1,000 – 2,000
Self-heating (approximate) I _B = 3.0 A (250 W) (K)	9.9	2.9	–
I _B = 4.6 A (400 W) (K)	22.2	5.9	–
I _B = 6.2 A (600 W) (K)	–	10.3	–
I _B = 7.0 A (750 W) (K)	–	13.2	–
I _B = 10.3 A (1000 W) (K)	–	27.2	–
I _B = 16.2 A (2000 W) (K)	–	–	26.0
Losses in W at I _B = 3.0 A (250 W) (W)	1.0	0.35	–
I _B = 4.6 A (400 W) (W)	2.4	0.82	–
I _B = 6.2 A (600 W) (W)	–	1.54	–
I _B = 7.0 A (750 W) (W)	–	2.02	1.8
I _B = 10.3 A (1,000 W) (W)	–	4.68	–
I _B = 16.2 A (2,000 W) (W)	–	–	5.9
Switch off/on voltage (V)	185 – 198	185 – 198	185 – 198
Permitted load capacitance (pF)	20-100	20 – 100	20 – 200
Max. cable length to lamp (m)	1.5	1.5	3
Max. permitted housing temperature t _c (°C)	105	105	105
Max. permitted housing temperature t _a (°C), remaining housing temperature (°C)	105	105	100
Min. permitted ambient temperature t _a (°C)	-30	-30	-30
Weight (kg)	0.21	0.28	0.75



Picture 1



Picture 2



Picture 3

Standard superimposed-pulse ignitors – 400-V-Model

Type	ZRM 6-ES/C 400	ZRM 12-ES/C 400	ZRM 20-ES/B 400
Article number	87500094	87500095	20826425
Picture	1	2	3
Permitted input voltage (V)	360 – 466	342 – 440	342 – 490
Mains frequency (Hz)	50 – 60	50 – 60	50 – 60
Ignition voltage (kV _p)	4.0 – 5.0	4.0 – 5.0	4.0 – 5.0
Max. permitted lamp current I _B (A)	6.0	12.7	20.0
Output of sodium vapour lamp (W)	600 – 750	600 – 1,000	–
Output of metal halide lamp (W)	–	1,000 – 2,000	2,000 – 3,500
Self-heating (approximate) I _B = 3.6 A (600 W) (K)	14.3	4.0	–
I _B = 4.5 A (750 W) (K)	21.8	5.8	–
I _B = 10.3 A (2000 W) (K)	–	27.2	10.5
I _B = 18.0 A (3500 W) (K)	–	–	28.0
Losses in W at I _B = 3.6 A (600 W) (W)	1.4	0.51	–
I _B = 4.5 A (750 W) (W)	2.3	0.72	–
I _B = 10.3 A (2000 W) (W)	–	4.68	2.9
I _B = 18.0 A (3500 W) (W)	–	–	9.3
Switch off/on voltage (V)	300 – 360	340 – 342	340 – 342
Permitted load capacitance (pF)	20 – 200	20 – 200	20 – 200
Max. cable length to lamp (m)	3	3	3
Max. permitted housing temperature t _c (°C)	105	105	105
Max. permitted housing temperature t _a (°C), remaining housing temperature (°C)	105	105	100
Min. permitted ambient temperature t _a (°C)	-30	-30	-30
Weight (kg)	0.21	0.28	0.75

Superimposed-pulse ignitors with a digital timer

The lamp has time to cool down in the pauses after ignition.

Lamps go out and are started again – this cycle repeats until the lamp is replaced. These down-times are associated with a significant safety risk that is made worse by the fact that it is difficult to localise faulty lamps.

Digital ignitor with an integrated timer

The ZRM ES/CT superimposed-pulse ignitor with an integrated digital timer and pulse-pause ignition solves this problem. As soon as annoying flickering starts to occur, the timer automatically stops the ignition process.

Pulse-pause ignition

Instead of constantly sending ignition pulses to a lamp until it starts, the ignitor generates pulses in a patented two-part rhythm, thus creating optimum conditions for starting sodium vapour lamps and metal halide lamps.

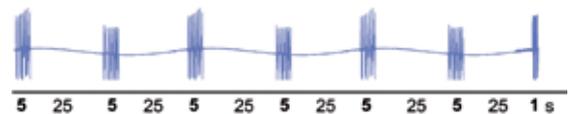
The lamp has time to cool down in the pauses after ignition. This leads to much faster restarts for hot lamps. Thanks to pulse-pause admission, actual ignition times account for only 10% of the total ignition time. This reduces the downtime of the system by 90%.



ZRM 4,5 ES/CT



Standard ignitor ignition sequence

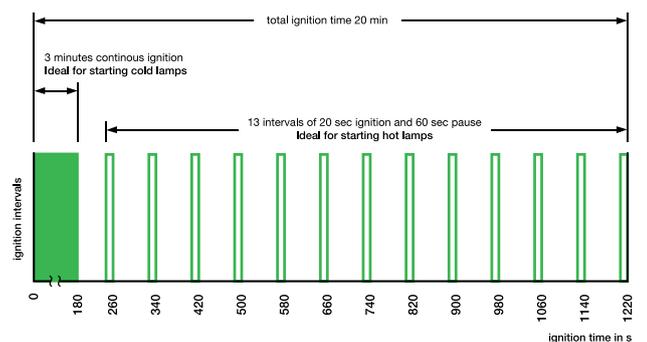


ZRM ES/CT ignition sequence in pulse-pause mode



High-precision lamp management thanks to microcontroller

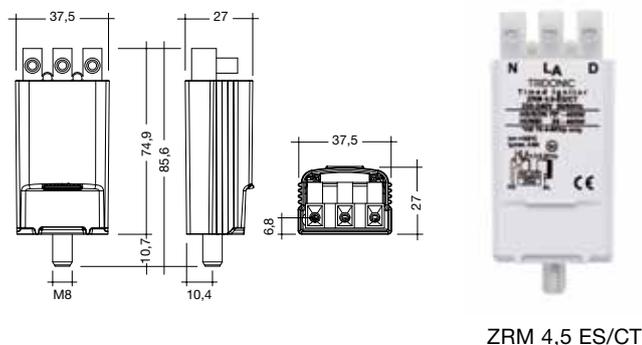
The microcontroller chip in the integrated timer of super-imposed-pulse ignitors digitally controls the logic for ignition and automatic shutdown. An automatic reset function is also integrated. This reset function is needed for lighting systems that operate 24 hours a day (tunnels, factories).



▼ At a glance:

- ___ High-quality lighting solutions
- ___ No annoying flickering
- ___ No interference with radio and TV reception, computer displays, air traffic control, alarm systems
- ___ Reduced expenditure on maintenance work

Superimposed-pulse ignitors for special applications



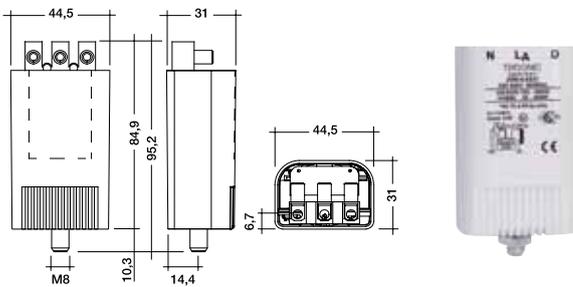
Superimposed-pulse ignitors for special applications

Tridonic's innovative product range also includes ignitors with supplementary impedances and power changeover switches in order to save energy in street lighting systems. These simple measures make it possible to exploit the considerable potential energy savings that can be achieved with street lighting.

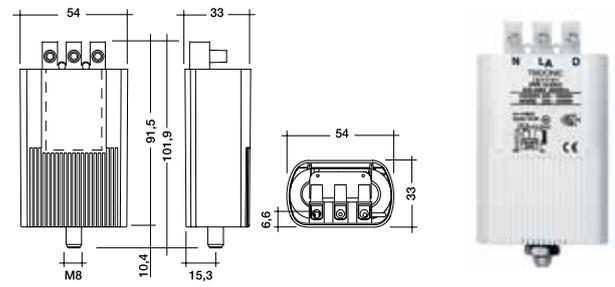
Superimposed-pulse ignitors – 230-V-Model

Type	ZRM 2-ES/CT	ZRM 2.5-ES/CT	ZRM 4.5-ES/CT
Article number	87500085	87500086	87500087
Permitted input voltage (V)	198 – 264	198 – 264	198 – 264
Mains frequency (Hz)	50 – 60	50 – 60	50 – 60
Ignition voltage (kV _p)	1.8 – 2.5	4.0 – 5.0	4.0 – 5.0
Max. permitted lamp current I _B (A)	1.0	3.0	4.6
Output of sodium vapour lamp (W)	35 – 70*	70 – 250	70 – 400
Output of metal halide lamp (W)	70*	35 – 250	35 – 400
Self-heating (approximate) at I _B = 0.54 A (35 W) (K)	0.2	0.1	0.1
I _B = 1.0 A (70 W) (K)	2.5	2.5	1.0
I _B = 1.8 A (150 W) (K)	–	9.5	6.5
I _B = 3.0 A (250 W) (K)	–	27.0	14.0
I _B = 4.6 A (400 W) (K)	–	–	33.5
Losses in W at I _B = 0.54 A (35 W) (W)	0.05	0.06	0.03
I _B = 1.0 A (70 W) (W)	0.2	0.21	0.11
I _B = 1.8 A (150 W) (W)	–	0.72	0.35
I _B = 3.0 A (250 W) (W)	–	2.1	1.0
I _B = 4.6 A (400 W) (W)	–	–	2.5
Type of ignition	digital	digital	digital
Switch off/on voltage (W)	185 – 198	185 – 198	185 – 198
Permitted load capacitance (pF)	20 – 300	20 – 100	20 – 100
Max. cable length to lamp (m)	4	1.5	1.5
Max. permitted housing temperature t _c (°C)	105	105	105
Min. permitted ambient temperature t _a (°C)	-30	-30	-30
Weight (kg)	0.13	0.13	0.13
Reset function (s)	< 1	< 1	< 1

* for sodium vapour lamps with an ignition voltage < 2.5 kV_p



Picture 1



Picture 2

Superimposed-pulse ignitors – 230-V-Model

Type	ZRM 6-ES/CT	ZRM 12-ES/CT
Article number	87500088	87500089
Picture	1	2
Permitted input voltage (V)	198 – 264	198 – 264
Mains frequency (Hz)	50 – 60	50 – 60
Ignition voltage (kV _p)	4.0 – 5.0	4.0 – 5.0
Max. permitted lamp current I _B (A)	5.0	12.0
Output of sodium vapour lamp (W)	70 – 400	250 – 1,000
Output of metal halide lamp (W)	35 – 400	250 – 1,000
Self-heating (approximate) at I _B = 1.8 A (150 W) (V)	3.7	–
I _B = 3.0 A (250 W) (V)	9.9	2.9
I _B = 4.6 A (400 W) (V)	22.2	5.9
I _B = 6.2 A (600 W) (V)	–	10.3
I _B = 7.0 A (750 W) (V)	–	13.2
I _B = 10.3 A (1,000 W) (V)	–	27.2
Losses in W at I _B = 1.8 A (150 W) (V)	0.35	–
I _B = 3.0 A (250 W) (V)	1.0	0.35
I _B = 4.6 A (400 W) (V)	2.4	0.82
I _B = 6.2 A (600 W) (V)	–	1.54
I _B = 7.0 A (750 W) (V)	–	2.02
I _B = 10.3 A (1,000 W) (V)	–	4.68
Type of ignition	digital	digital
Switch off/on voltage (W)	185 – 198	185 – 198
Permitted load capacitance (pF)	20 – 100	20 – 200
Max. cable length to lamp (m)	1.5	3.0
Max. permitted housing temperature t _c (°C)	105	105
Min. permitted ambient temperature t _a (°C)	-30	-30
Weight (kg)	0.21	0.28
Reset function (s)	<1	<1

Ignitor systems using pulse technology

Compared with superimposed-pulse ignitors, in pulse ignitors the high-voltage pulse is produced in conjunction with the choke.

To achieve this, the ignitor uses a separate tap on the choke, specially developed for pulse technology and designed for high ignition voltages. Because the high-voltage pulse for the ignition process is generated in the choke it is possible to achieve very high ignition energy. Nevertheless, in the case of systems that use conventional pulse technology, the output voltage is highly dependent on the mains voltage and this reduces the permissible cable length – depending on the cable capacitance.

ZRM powerPULSE added-value system

Tridonic's ZRM powerPULSE digital system compensates for this effect. As with systems that use conventional pulse technology, the choke is included in the system. But a microprocessor in the actual ignitor generates the ignition pulse.

This ensures on the one hand that the choke and luminaire wiring are not overloaded if there is a mains overvoltage. On the other hand, 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.

Digital convenience

The benefits of pulse-pause technology are evident in the ZRM powerPULSE ignitor as this ignitor reduces the restart time by up to 50% and EMC interference in the ignition phase by up to 90% (see Figure 1)

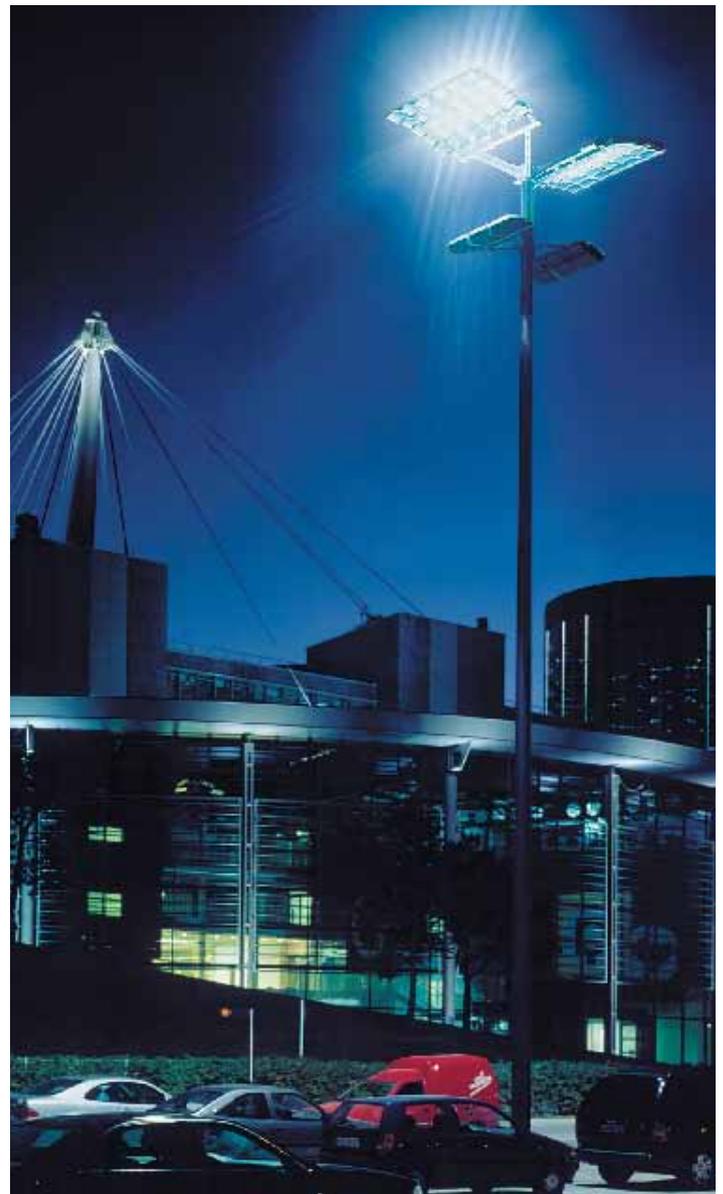


Photo: Sill GmbH

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

Also suitable for high-performance lamps

The technical advantages of ZRM powerPULSE ignitors are especially beneficial when operating lamps with wattages up to 2,000 W in a 400 V system. In applications such as greenhouse lighting, the ZRM 4000/400 powerPULSE model is a particularly attractive alternative because of its silent operation and the long cable lengths that it makes possible.

Mechanically versatile

With dimensions of just 37.5 mm x 76.5 mm x 31.6 mm, the plastic housing with IP30 protection is compact. This makes it possible to incorporate.

ZRM powerPULSE also offers several flexible fixing options. The robust M8 aluminium bolt is suitable for both standard installation as well as lateral fixing. The high-quality screw terminal is designed for flexible cables as well as for rigid wires – up to 2 x 1.5 mm² per pole.

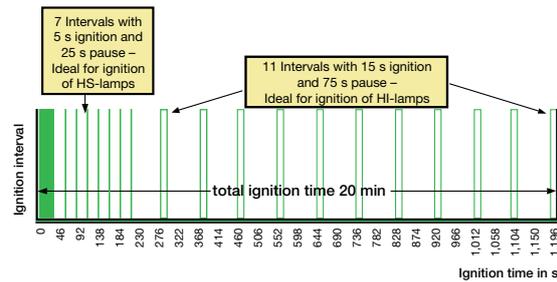
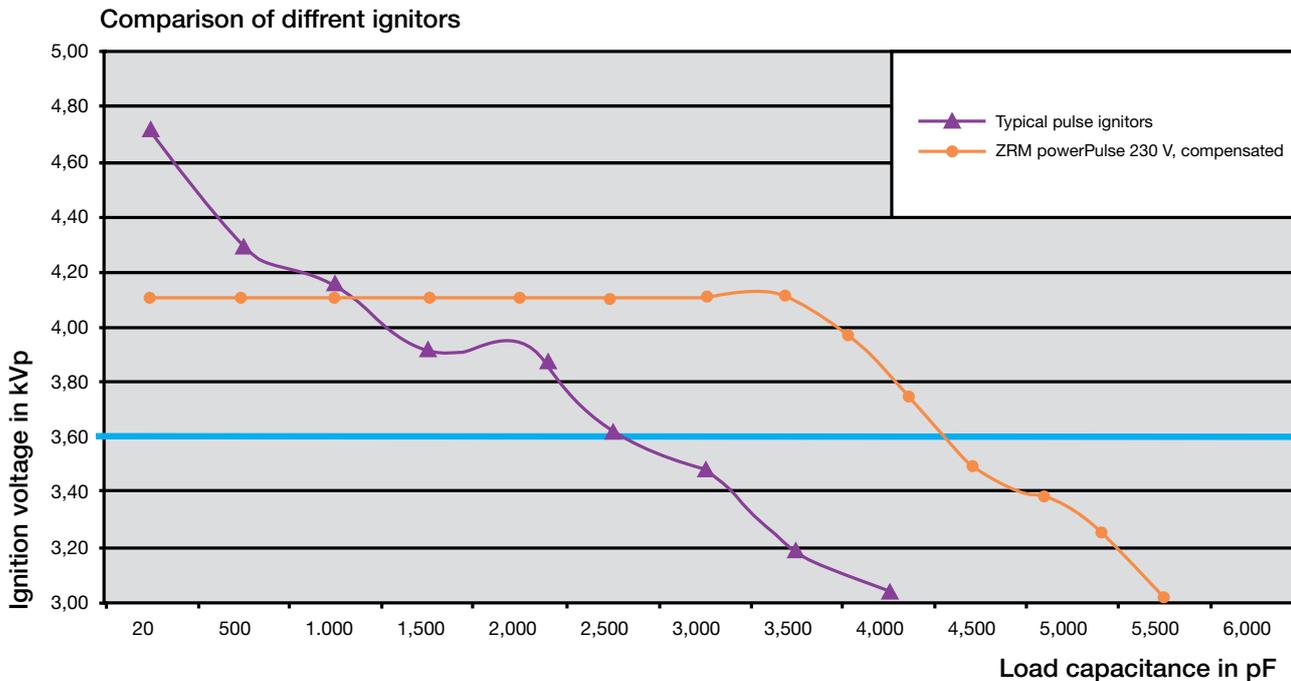


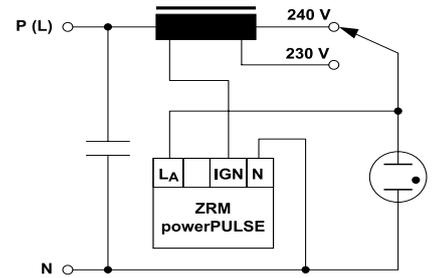
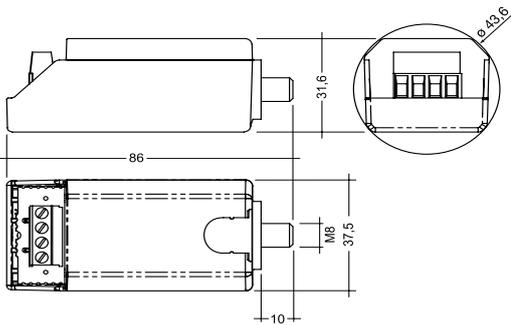
Figure 1



Digital Pulse ignitors ZRM powerPULSE

Digital ZRM powerPULSE ignitors are characterised by their regulated ignition voltage.

The three-start counter automatically stops the ignition process if the lamp is faulty. Because of their automatic reset function after ignition has been suppressed for 3 hours, these ignitors are among others suitable for use in areas such as tunnel applications or for lighting systems that operate round-the-clock, e.g. production plant in the automotive industry.

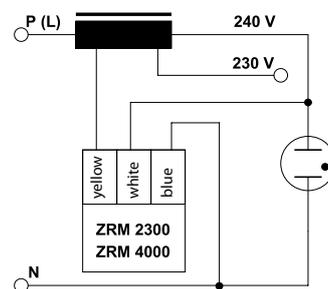
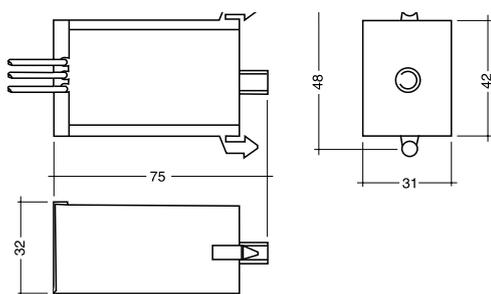


Pulse ignitors – 230-V-Model		
Type	ZRM 4000 powerPULSE	ZRM 4000/400 powerPULSE
Article number	86458458	86458459
Permitted input voltage (V)	198 – 264	342 – 484
Mains frequency (Hz)	50/60	50/60
Ignition voltage (kV _p)	4.1	4.1
Output of sodium vapour lamp (W)	70* – 1,000	600 – 700
Output of metal halide lamp (W)	35 – 1,800	1800 – 2,000
Losses at 240 V Voltage (W)	0.90	1.50
Pulse width 90 % ignition voltage (µs)	>10	>10
Number pulses per half wave	1	1
Phase displacement of ignition pulses	72 / 252	72 / 252
On voltage (W)	198	342
Permitted load capacitance (pf)	4,000	4,000
Min. cable length to lamp (m)	0.2	0.2
Max. cable length to lamp (m)	40	40
Max. permitted housing temperature t _c (°C)	+85	+85
Max. permitted ambient temperature t _a (°C)	°C	+80
Min. permitted ambient temperature t _a (°C)	-30	-30
Weight (kg)	52	58

* for sodium vapour lamps HST-DE 70 W

pulse ignitors type ZRM 2300 und ZRM 4000

ZRM 2300 and ZRM 4000 standard ignitors are fitted with preassembled cables and snap-in or screw fasteners. They also have an integrated timer for pulse-pause mode and automatic shut-down (type C201 only). They can be used with metal halide lamps with wattages from 35 W to 1,000 W and sodium vapour lamps with wattages from 50 W to 1,000 W.

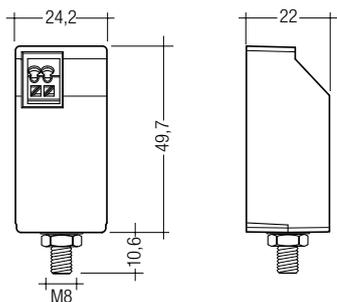


Pulse ignitors – 230-V-Model

Type	ZRM 2300 C201	ZRM 4000 B101	ZRM 4000 C201
Article number	87500000	87500002	87500001
Permitted input voltage (V)	198 – 254	198 – 254	198 – 254
Mains frequency (Hz)	50	50	50
Ignition voltage (kV _p)	2.3	4.5	4.5
Output of sodium vapour lamp (W)	50 – 70	100 – 1000	100 – 1,000
Output of metal halide lamp (W)	–	35 – 1,000	35 – 1,000
Losses (W)	–	–	–
Pulse width 90 % ignition voltage (µs)	2	2	2
Number pulses per half wave	1	1	1
Phase displacement of ignition pulses	60 – 90 / 240 – 270	60 – 90 / 240 – 270	60 – 90 / 240 – 270
On voltage (W)	198	198	198
Cut-off voltage (W)	160	160	160
Disconnection of the ignition function	digital	analog	digital
Type of ignition	Pulse/Pause	continuous	Pulse/Pause
Permitted load capacitance (pf)	1,300	1,300	1,300
Max. cable length (m)	see data sheet	see data sheet	see data sheet
Max. permitted ambient temperature t _a (°C)	80	80	80
Min. permitted ambient temperature t _a (°C)	-40	-40	-40
Weight (kg)	45	44	48

Standard pulse ignitors ZRM-A

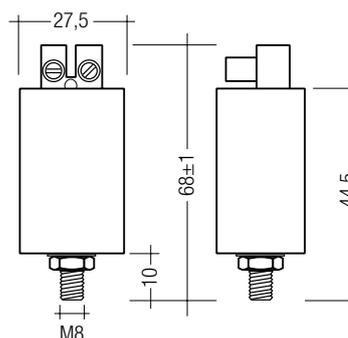
The ZRM-A standard pulse ignitor is designed for chokes without a pulse tap. They can be used with metal halide lamps with wattages from 400 W to 1000 W for ignition voltages of less than 900 V.



Picture 1



Picture 1



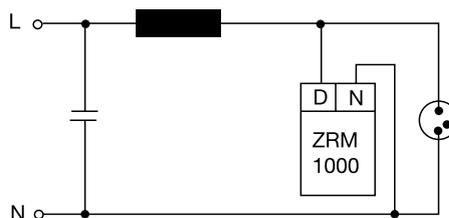
Picture 2



Picture 2

Pulse Ignitors – 230-V-Model

Type	ZRM 1000 A004	ZRM 1000 A005
Article number	24032939	87500110
Picture	1	2
Permitted input voltage (V)	198 – 264	198-264
Mains frequency (Hz)	50 – 60	50 – 60
Ignition voltage (kV _p)	0.65 – 0.90	0.85-1.1
Self-heating during ignition (K)	8.0	3
Losses during ignition (W)	1.6	0.6
Pulse width at 560 V/900 V (μs)	420 – 460	500-550
Number pulses per half wave	1	1
Phase displacement of ignition pulses (°el)	60 – 90	60 – 90
Permitted load capacitance (pF)	20 – 4,000	20 – 10,000
Max. cable length to lamp (m)	40	100
Max. permitted housing temperature t _c (°C)	90	95
Min. permitted ambient temperature t _a (°C)	-30	-30
Weight (kg)	0.02	0.05



Sustainability throughout the company

ecolution is synonymous with a strategy of holistic sustainability here which runs like a thread through all the divisions of our company.

ecolution defines the basic behaviour and the thinking of Tridonic. Over the entire creation and life cycle of our products the focus is very much on environmental friendliness and economy. We see the constant improvement of sustainability and the extension of the existing boundaries as special challenges. This is our driving force. We are setting new standards here, which go far beyond environmental protection pure and simple and take our responsibilities very seriously – for the benefit of our employees, our customers, the environment and society in general, both now and with regard to future developments.

Low maintenance – high efficiency

The long life and robustness of our entire LED product range reduce maintenance costs and their high efficiency also reduces power consumption. This not only reduces the operating costs of lighting solutions over their entire life but also offers significant benefits in protecting natural

resources as a result of lower energy consumption, lower emissions and a reduction in the burden on the environment due to the disposal of old neon tubes. LED converters and controllers from Tridonic optimise the efficiency of your LED systems by ensuring optimum operation of your LED modules thanks to narrow tolerances and low power losses. TALEX converters and TALEX controls are perfectly matched to the unique properties of LED light sources, irrespective of which manufacturer they come from.

Our contribution to the environment

With our extra robust, durable and application-specific TALEX range of LED converters, LED controllers, LED engines, LED chains and LED modules we, together with our customers, are making a valuable contribution to the sensible use of available resources and the reduction of CO₂ emissions. Comparable systems with conventional light sources would consume far more energy and materials.

▼ ecolution stands for:

- action now to safeguard the environment and the climate in future
- savings in natural resources
- efficient products and energy saving lighting control concepts
- use of recyclable materials
- increased return on investment
- eco-friendly production and packaging



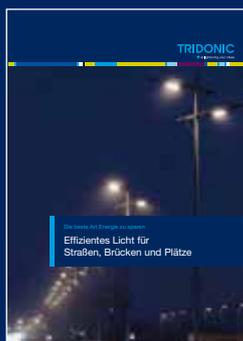
ecolution

An initiative of TRIDONIC

At Tridonic our daily quest is to create perfect light. 2,000 experts on five continents are working tirelessly to control, regulate and operate lighting in exactly the way you want it. We have been doing this for more than 50 years with enormous passion and in cooperation with you. **We put all our energy into your light.**

Go to led.tridonic.com to find your personal contact at Tridonic.

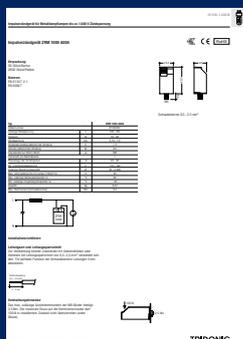
Further information and ordering data:



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Energy efficiency in street
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