TRIDONIC

EM R2A SELFTEST 48V T

EM ready2apply



Product description

_ Self-contained emergency luminaire for 48 V Stucchi EVO track system
_ Compact design
_ Suitable for anti-panic and escape route illumination
_ Escape route lens can be re-fitted at a 90° increment
_ Emergency lighting function with self-test
_ Max. installation height 6 m
_ EM = Emergency

Properties

_ White or black housing colour options
_ Non maintained operation
_ 3 h rated duration
_ Integrated status LED
_ 5 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)
_ LiFePO4 battery with up to 10 years design lifetime

Website

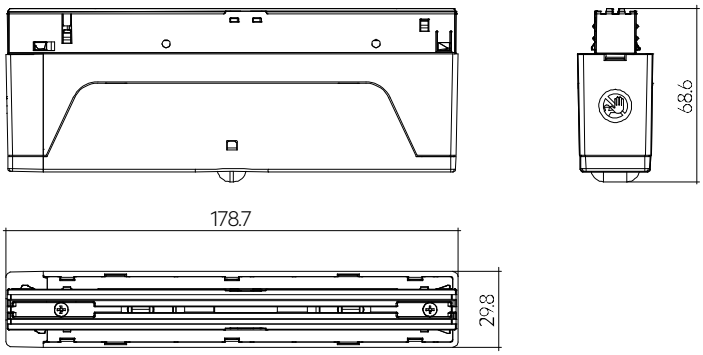
http://www.tridonic.com/89801296



TRIDONIC

EM R2A SELFTEST 48V T

EM ready2apply



Ordering data

Type	Article number	Colour	Packaging, carton	Packaging, pallet	Weight per pc.
EM R2A ST NM 132 48V T AP	**89801296**	White	1 pc(s).	300 pc(s).	0.25 kg
EM R2A ST NM 132 48V T AP BK	**89801304**	Black	1 pc(s).	300 pc(s).	0.25 kg
EM R2A ST NM 132 48V T ER	**89801300**	White	1 pc(s).	300 pc(s).	0.25 kg
EM R2A ST NM 132 48V T ER BK	**89801308**	Black	1 pc(s).	300 pc(s).	0.25 kg

Technical data

DC voltage input	48 V
DC voltage range	46 – 51 V
Mains frequency	0 Hz
Typ. current (48V, 0Hz, full load, charging)	55 mA
Typ. current (48V, 0Hz, full load, charger off)	13 mA
Max. input power	2 W
Output power	1.6 W
Typ. efficiency (full load)	43.2 %
Starting time (Emergency operation)	< 0.5 s from detection of emergency event
Output current tolerance	± 5 %
Mains voltage changeover threshold	According to EN 60598-2-22
Ambient temperature ta	5 … +40 °C
Type of protection	IP20
Impact protection degree	IK03
Protection class	III
Guarantee (conditions at www.tridonic.com)	5 Year(s)
Dimensions L x W x H	179 x 30 x 70 mm

Approval marks

EL-T CE UKCA RoHS

Standards

according to EN 50172, EN 55015, EN 60598-1, EN 60598-2-2, EN 60598-2-22, EN 61000-3-2, EN 61000-3-3, EN 61347-1, EN 61347-2-7, EN 61347-2-13, EN 61547, EN 62384, IEC 62620 (related to Lithium Iron battery), IEC 62133 (related to Lithium Iron battery), UN 38.3 (related to Lithium Iron battery), EN 62031, EN 62471, EN 62034, EN 60068-2-6, according to EN 60068-2-30

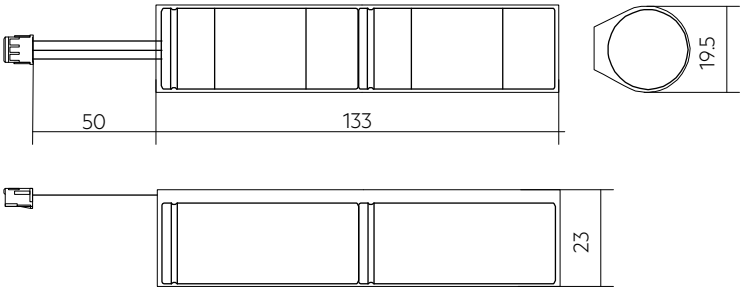
Specific technical data

Type	Number of battery cells	Rated duration	Typ. output current	Typ. forward voltage	Output power
Normal operation					
EM R2A ST NM 132 48V T AP	2	3 h	–	–	–
EM R2A ST NM 132 48V T AP BK	2	3 h	–	–	–
EM R2A ST NM 132 48V T ER	2	3 h	–	–	–
EM R2A ST NM 132 48V T ER BK	2	3 h	–	–	–
Emergency operation					
EM R2A ST NM 132 48V T AP	2	3 h	145 mA	10.7 V	1.55 W
EM R2A ST NM 132 48V T AP BK	2	3 h	145 mA	10.7 V	1.55 W
EM R2A ST NM 132 48V T ER	2	3 h	145 mA	10.7 V	1.55 W
EM R2A ST NM 132 48V T ER BK	2	3 h	145 mA	10.7 V	1.55 W

LiFePO4 Accus 3,0 Ah

Accessory





Product description
_ High temperature LiFePO4 cells for use with EM ready2apply 48V luminaires
_ Up to 10 year design life
_ 5 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)

Properties
_ Environmental friendly technology
_ High energy density
_ Constant high-temperature operation
_ Good charging properties at high temperature
_ Electronic thermal battery management
_ High energy maintenance of the charged battery
_ Long shelf life
_ Integrated electronics
_ Safety features incorporated
_ Certified quality manufacturer
_ In various configurations
_ Simple connection with plug-in system
_ Suitable for emergency lighting equipment as per IEC 60598-2-22

Website
http://www.tridonic.com/28006672

Ordering data

Type	Article number	Number of cells	Capacity	Packaging, carton	Packaging, outer box	Weight per pc.
ACCU-LiFePO4 3.0Ah 2A	**28006672**	1 x 2	3 Ah	5 pc(s).	60 pc(s).	0.095 kg

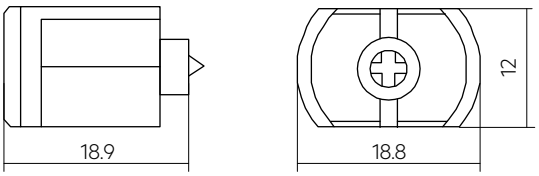
EM r2a 48V lock clip

Accessory



Product description
_ Kit with safety blocks for Multisystem EVO adapter
_ Two colour options white (RAL 9010) or black (RAL 9005)

Website
http://www.tridonic.com/28006705



Ordering data

Type	Article number	Colour	Packaging, carton	Weight per pc.
EM R2A 48V LOCK WH	**28006705**	White	50 pc(s).	0.004 kg
EM R2A 48V LOCK BK	**28006706**	Black	50 pc(s).	0.004 kg

1. Standards

according to EN 50172
EN 55015
EN 60598-1
EN 60598-2-2
EN 60598-2-22
EN 61000-3-2
EN 61000-3-3
EN 61347-1
EN 61347-2-7
EN 61347-2-13
EN 61547
EN 62384
IEC 62620 (related to Lithium Iron battery)
IEC 62133 (related to Lithium Iron battery)
UN 38.3 (related to Lithium Iron battery)
EN 62031
EN 62471
EN 62034
EN 60068-2-6
according to EN 60068-2-30

1.1 Glow-wire test

according to EN 60598-1 with increased temperature of 850 °C passed.

2. Thermal data

2.1 Temperature range

According to the standard IEC 60598-1 a LED Driver for remote installation has a max. case temperature of 90 °C. The ambient temperature range ta for the EM R2A ST 48V is defined to meet this requirement.

2.2 Expected lifetime

Average lifetime 100,000 hours under rated conditions with a failure rate of less than 10 %. Average failure rate of 0.2 % per 1000 operating hours.

Expected lifetime

Type	ta	25 °C	30 °C	40 °C
EM R2A ST 48V	lifetime	> 100,000 h	> 100,000 h	88,000 h

2.3 Storage conditions

- Humidity 5 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)

Note: The devices have to be within the specified temperature range (ta) before they are operated.

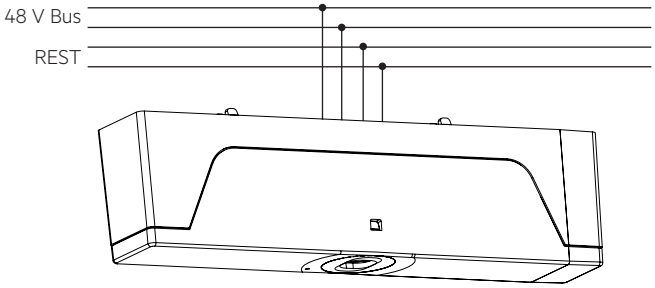
- Store batteries within the specified temperature range in low humidity conditions. Optimal storage conditions are:
  – Temperature: -20 … +35 °C for up to 15 months
  – Relative humidity: 65 % ±5 %
- Avoid atmosphere with corrosive gas
- Disconnect batteries before store or delivery
- Avoid storage of discharged batteries

3. Installation / Wiring



Emergency luminiare – not to be adjusted by unauthorised persons

3.1 Wiring diagrams



EM R2A ST 48V T

Note: Battery must be connected before mains connection.

3.2 Installation

- Remove the end cap.
- Connect the battery plug to the socket on the luminaire.
- Reinsert the end cap.
- Insert the luminaire into the track:
  Align the luminaire's adapter with the track.
  Push the luminaire into place.
  Note: On EM r2a 48V ER version allign lens to the escape route if necessary by rotating the lens. Details see „Lens rotation".
- Install the locking clips (if necessary):
  Insert a locking clip into the track on both sides of the luminaire.
  Rotate the clip body 90° until it lies flat in its final position.
  Use a Philips screwdriver to tighten the screw until the clip cannot move.
  Repeat this step for the second locking clip.

3.2.1 Removal

- Remove the end cap.
- Insert flat-head screwdriver into locking screw on adapter and rotate to release adapter while pulling.

3.2.2 Lens rotation

- Release the lens-locking clips on both sides using a small screwdriver.
- Pull the locking clip and lens out of the luminaire.
- Rotate the lens 90° as required and reinsert it into the luminaire.
- Clean the lens with a soft cloth after adjusting to avoid trapped dirt.

3.2.3 Battery maintenance

- Remove the luminaire from the track.
- Disconnect the battery plug from the socket on the luminaire.
- Slide out the battery.
- Insert the new battery.
- Reconnect the battery plug to the socket on the luminaire.
- Reinsert the end cap.
- Reinstall the luminaire into the track and secure it with the locking clips.

3.3 Compatible track adapter

Adapters are pre-fitted on EM R2A 48V T:
EVO Adapter (Pre Fitted)
9529-166-M/B-E (black)
9529-166-M/W-E (white)

Compatible EVO Tracks:
9500-_ / _ - ST1-E
9500-_ / _ - ST3-E
9500-_ / _ - ST6-E
9500-_ / _ - ST7-E
9500-_ / _ - ST8-E
9500-_ / _ - ST13-E
9500-_ / _ - ST15-E

3.4 Suggested AC / DC driver

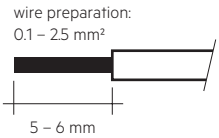
Article number	Type name
28005711	LC 220W 48V DS L
28005712	LC 440W 48V DS L
28005713	LC 660W 48V DS L

U_{OUT} for the AC/DC driver must be 48 V DC.

The track must be powered by a SELV-compliant device on both the 48V and DALI lines.
AC/DC mains changeover voltages must be according to EN 60598-2-22.

3.5 Terminals

For wiring use stranded wire with ferrules or solid wire from 0.1 – 2.5 mm².
For perfect function of the push-wire terminals (WAGO 256) the strip length should be 5 – 6 mm.



Use one wire for each terminal connector only.
Use each strain relief channel for one cable only.

4. Mechanical data

4.1 Housing properties

- Polycarbonate white RAL 9016
- Polycarbonate black RAL 9005

4.2 Battery connection

Battery pack connection
Simple connection with plug-in system (polarity reversal protection)

Module connection
Insert the battery in the designated position in the luminaire, plug the connector into the EM ready2apply 48V and attach the end cap.

5. Electrical data

5.1 Insulation matrix

	Mains	Battery
Mains	–	• •
Battery	• •	–

- • Represents basic insulation
- • • Represents double or reinforced insulation

5.2 Battery charge regime / discharge

EM R2A ST 48V, 3 h

	Type	**EM R2A ST 48V**
	Article no.	**89801296, 89801300 89801304, 89801308**
	Cells	**2 cell**
	Duration	**3 h**
Battery charge time	Initial	20 h
	Recharge	20 h
	Trickle charge	continuously and battery voltage controlled
Typ. charge current[1]	Initial charge	270 mA
	Recharge	270 mA
	Trickle charge	270 mA / 0 mA
Mains power consumption	Initial charge	1.99 W
	Recharge	1.99 W
	Trickle charge	1.99 W / 0 W
Discharge current at 3.2 V (nominal)		610 mA

[1] Automatic recharge when battery voltage falls below 3.4 V.
Charger off (0 mA) when battery voltage exceeds 3.6 V.

Note: Battery protected against operation at excessive temperatures (charging stopped when battery cell temperature < 0 °C or > 60 °C)

5.3 Battery selection for replacement

EM R2A ST 48V, 3 h

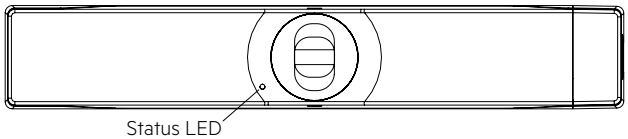
				Type	**EM R2A ST 48V**
				Article no.	**89801296, 89801300 89801304, 89801308**
				Cells	**2 cell**
				Duration	**3 h**
Technology and capacity	Design	Number of cells	**Type**	**Article no.**	**Assignable batteries**
Lithium Iron Phosphate 3.0 Ah	stick	2	**ACCU-LiFePO4 3.0Ah 2A**	**28006672**	•

Note: If the rated duration of operation cannot be reached the battery must be replaced. Remove mains during battery replacement.

6. Functions

6.1 Status indication

System status is indicated by a bi-colour LED. The indication LED is integrated in the bezel.



LED indiction	Status	Comment
Permanent green	System OK	DC mode
Fast flashing green (0,1 sec on – 0,1 sec off)	Function test underway	
Slow flashing green (1 sec on – 1 sec off)	Duration test underway	
Red LED on	Load failure	Open circuit / Short circuit / LED failure
Slow flashing red (1 sec on – 1 sec off)	Battery failure	Battery failed the duration test or function test / Battery is defect or deep discharged / Incorrect battery voltage / Battery is outside of its temperature range for charging (0 – 60 °C)
Fast flashing red (0,1 sec on – 0,1 sec off)	Charging failure	Incorrect charging current
Double pulsing green	Inhibit mode	Switching into inhibit mode via controller
Green and red off	DC mode	Battery operation (emergency mode)

6.2 Testing

Emergency operation can be manually tested by removal of the mains supply.

Commissioning test
A full commissioning test is carried out automatically after permanent connection of the supply for 5 days. The easy commissioning feature will set the initial test day and time to ensure random testing of units.

Functional test
Functional tests are carried out for 5 seconds on a weekly basis under the control of the Micro controller. Initiation and timing of these tests is set during the commissioning of the luminaire.

Duration test
A full duration test is carried out yearly to check the capacity of the batteries.

For a full description of commissioning and test features please refer to application notes.

Timer reset functionality
The timer for function and duration test can be set to a particular time of the day by cycling the unswitched line supply 5 times within 1 minute. The timer adjustment will enable the test start time to be defined manually at time in day when the timer was reset. It will also disable the adaptive test algorithm thereby forcing the unit to perform the test at the same time rather than it being defined by the adaptive algorithm. This function will only work provided the interval time is greater than zero (automatic test mode enabled). The delay timer value set when the unit was commissioned will be reloaded in order to randomise the tests between adjacent units.

Rest mode
Rest mode can be initiated by applying a short pulse of between 9.5 V_{DC} and 22.5 V_{DC} in amplitude for a period of between 150 ms and 1.0 s. This should be applied to terminals marked Rest after the mains supply has been disconnected and whilst the module is in emergency operation. Terminals are not sensitive to polarity.
After a mains reset the EM R2A ST exits the rest mode. The EM R2A ST supports the re-light function.

Pulse/Mode	Standby	Emergency	Rest
150 – 1,000 ms	Inhibit	Rest	–
1,001 – 2,000 ms	Cancel inhibit	–	re-light

6.3 Technical data batteries

Accu Lithium Iron Phosphate

Capacity 3.0 Ah

International designation	IFpR 19/66
Battery voltage/cell	3.2 V
Cell type	18650
Single cell dimensions	
Diameter	18 mm
Height	65 mm
Max. short term temperature (reduced lifetime)	70 °C
Max. number discharge cycles	50 cycles total
Max. storage time	15 months at -20 °C to +25 °C
Packing quantity	1 pc. per carton

Only use Tridonic batteries.

Comply with UN 38.3 and IEC 62133 (safety testing) protected against over charge, over discharge, charging at excessive temperatures, short-circuit and over current.

For battery data see separate data sheet.

7. Optical properties

7.1 Anti panic

EM R2A ST 48V – Max. spacing for >0.5 lux[1]

Height	Centre to end[2]		Centre to centre[3]	
	Trans	Longitudinal	Trans	Longitudinal
2.0 m	3.45 m	3.45 m	9.80 m	9.80 m
2.5 m	3.80 m	3.80 m	11.05 m	11.05 m
3.0 m	4.15 m	4.10 m	12.10 m	12.05 m
3.5 m	4.40 m	4.35 m	12.95 m	12.95 m
4.0 m	4.60 m	4.60 m	13.80 m	13.75 m
5.0 m	4.80 m	4.75 m	15.20 m	15.15 m
6.0 m	2.80 m	2.95 m	16.40 m	16.40 m

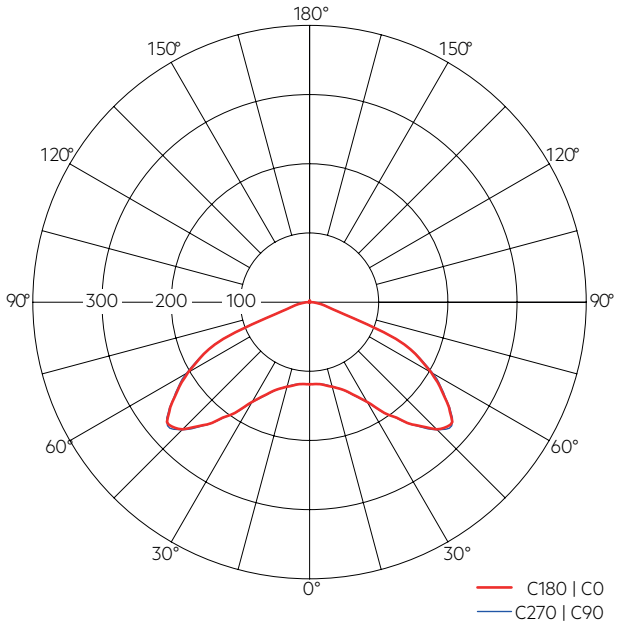
Luminous flux: 212 lm.

[1] Maintainance factor = 0.80, photometric data available on request.

[2] Distance between module and wall.

[3] Distance between two modules.

Light distribution



7.2 Escape route

EM R2A ST 48V – Spacing data for 2m escape route[1]

Height	Centre to end[2]		Centre to centre[3]	
	Max. spacing	Diversity	Max. spacing	Diversity
Transversal > 1 lux				
2.0 m	1.20 m	0.102	3.70 m	0.097
2.5 m	1.25 m	0.159	3.55 m	0.151
3.0 m	1.35 m	0.229	3.35 m	0.218
3.5 m	1.45 m	0.306	3.55 m	0.291
4.0 m	1.45 m	0.415	3.70 m	0.305
5.0 m	1.25 m	0.622	4.10 m	0.594
6.0 m	0.65 m	0.904	4.05 m	0.829
Longitudinal > 1 lux				
2.0 m	6.75 m	0.099	16.45 m	0.100
2.5 m	7.35 m	0.156	18.10 m	0.156
3.0 m	7.80 m	0.225	19.55 m	0.223
3.5 m	7.20 m	0.307	20.70 m	0.303
4.0 m	6.80 m	0.402	21.65 m	0.393
5.0 m	6.00 m	0.621	20.35 m	0.588
6.0 m	2.05 m	0.898	19.05 m	0.784

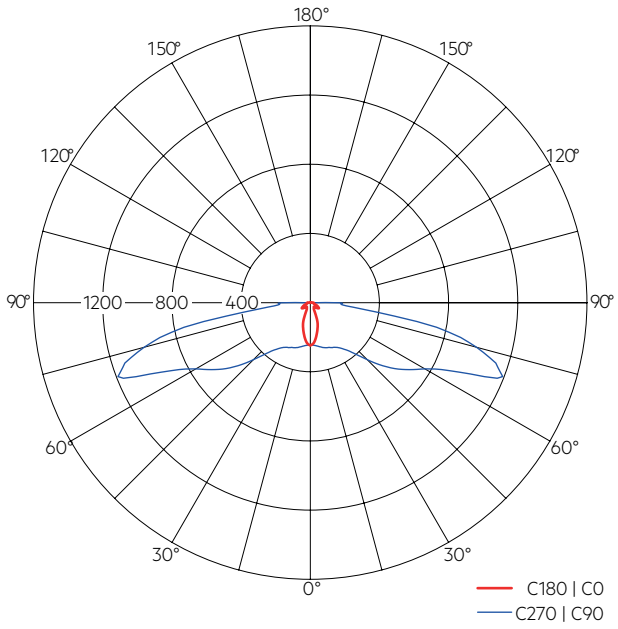
Luminous flux: 206 lm.

[1] Maintainance factor = 0.80, photometric data available on request.

[2] Distance between module and wall.

[3] Distance between two modules.

Light distribution



8. Miscellaneous

8.1 Battery replacement

After a battery replacement and a subsequent full charge cycle (24 h) a duration test is mandatory to prove that with the new battery the rated duration is achieved.



Do not damage battery and other components during battery replacement.

8.2 Black Box data recording

Recording of several parameters only accessable for Tridonic.

8.3 Additional information

Additional technical information at www.tridonic.com → Technical Data

The light source of this luminaire is not replaceable; when the light source reaches its end of life replace the whole luminaire. Lifetime declarations are informative and represent no warranty claim. No warranty if device was opened.