R2A PRO-DALI 2W EM -NM or M

Product description

- LED emergency module suitable for direct installation in ceilings
- Complete set with integrated electronics, LED module, heat sink, optics and battery
- Includes click-in multi-lens option for anti-panic,(open area) escape route (corridor) and spot illumination
- DALI interface and automatic test function
- Small size ceiling hole, 40 – 43 mm diameter, 80 mm height

Properties

- Output power 1.5 W
- Luminous flux: 200 lm
- Very low stand-by power loss
- Maintained and non-maintained variants
- Maintained variant is DALI switchable (on/off)
- 3 h rated duration (separate variants)
- Plug-in Lithium Iron Phosphate battery with strain-relief
- 5 years guarantee electronic (LED Driver)
- 3 years guarantee battery

Standards, page 4

Wiring diagrams and installation examples, page 4

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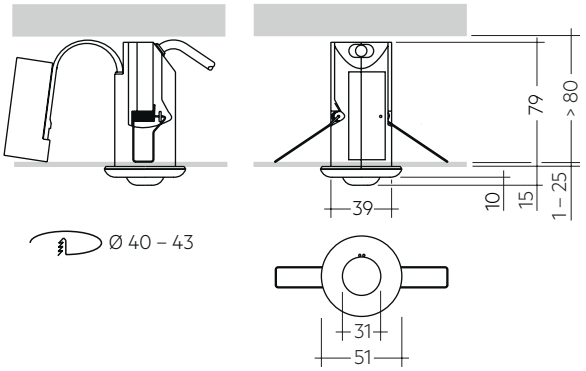
SELV EL-T RoHS

Technical data

Rated supply voltage AC	220 – 240 V
Input voltage range AC (tolerance for safety)	198 – 264 V
Input voltage range AC (tolerance for performance)	198 – 254 V
Mains frequency	50 / 60 Hz
Overvoltage protection	320 V (for 48 h)
Time to light (emergency operation)	< 0.5 s from detection of emergency event
THD normal operation (maintained operation, at 230 V, 50 Hz, charging)	75 %
Output current tolerance	± 5 %
LF current ripple	± 5 %
Ambient temperature ta	+5 … +30 °C
Mains voltage changeover threshold	According to EN 60598-2-22
Type of protection	IP20
Impact protection rating①	IK03
Protection class	II
Colour temperature	6,500 K
Colour tolerance	Mac Adams 3
Colour rendering index CRI	> 80
Nominal life-time	50,000 h
EoF_L	1



Ordering data

Type	Article number	Operating mode	Rated duration	Number of cells	Packaging, carton	Weight per pc.
EM R2A PRO NM 132 2W	**89800544**	Non-maintained	3 h	2	1 pc(s).	0.23 kg
EM R2A PRO M 132 2W	**89800545**	Maintained	3 h	2	1 pc(s).	0.23 kg

Typical Emergency Lighting Spacings for R2A Downlights

Escape 1 lux

	Escape Route 2W		
	Mounting Height	Centre to End	Centre to Centre
1 lux	2.0 m	4.40 m	10.00 m
	2.5 m	4.75 m	11.65 m
	3.0 m	4.80 m	12.75 m
	3.5 m	5.05 m	13.45 m
	4.0 m	5.20 m	13.60 m

Open Areas 0.5 lux

	Anti-Panic 2W		
	Mounting Height	Centre to End	Centre to Centre
0.5 lux	2.0 m	3.45 m	9.70 m
	2.5 m	3.80 m	10.85 m
	3.0 m	3.75 m	11.90 m
	3.5 m	3.80 m	12.90 m
	4.0 m	3.70 m	13.85 m

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ACCES-SORIES

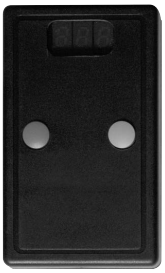
Addressing tool

Product description

- Provides simple addressing for all PRO units
- Uses the bi-colour LED for device identification

Properties

- Takes standard 9 V battery
- Easy two button operation
- Belt clip
- Auto power off to conserve battery
- Bright 7 segment LED display



Ordering data

Type	Article number	Packaging, carton	Weight per pc.
EM PRO addressing tool	**89899836**	1 pc(s).	0.08 kg

ACCES-SORIES

Lithium Iron Phosphate Battery pack 1.5 – 3.0 Ah

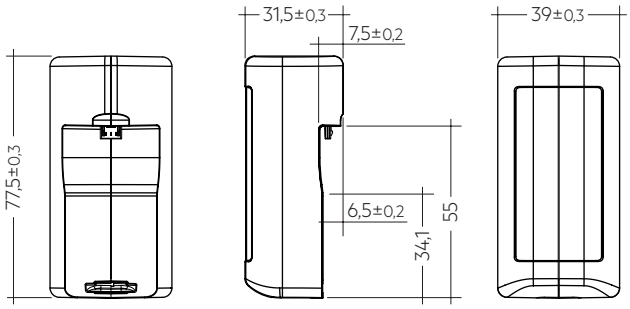
Batteries

Product description

- Lithium Iron Phosphate replacement battery pack for use with EM ready2apply emergency lighting units
- 8-year design life (at up to 30 °C ambient)
- 3-year guarantee

Properties

- Certified quality manufacturer
- Casing material made of polycarbonate
- Charge efficiency > 90 %
- Low self discharge
- Compact micro USB type B connector providing polarity safe battery connection
- Protection and monitoring circuit built into battery enclosure
- Deep discharge protection
- Suitable for emergency lighting equipment as per IEC 60598-2-22



Ordering data

Type	Article number	Packaging, carton	Weight per pc.
Battery pack 1.5 Ah			
PACK-LiFePO4 1,5Ah R2A	**89800555**	1 pc(s).	0.062 kg
Battery pack 3.0 Ah			
PACK-LiFePO4 3,0Ah R2A	**89800556**	1 pc(s).	0.104 kg

1. Standards

acc. to EN 50172
EN 55015
EN 60068-2-29
EN 60068-2-30
EN 60068-2-64
EN 60598-1
EN 60598-2-2
EN 60598-2-22
EN 61000-3-2
EN 61347-1
EN 61347-2-7
EN 61347-2-13
EN 61547
acc. to EN 62034
EN 62384
EN 62386-101
EN 62386-102
EN 62386-202
IEC 62133 (related to Lithium Iron battery)
UN 38.3 (related to Lithium Iron battery)
EN 62031
EN 62471

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 PRO is defined to meet this requirement.

2.2 Expected life-time

2.2.1 Electronics

Average life-time 50,000 hours under rated conditions with a failure rate of less than 10 %. Average failure rate of 0.2 % per 1000 operating hours.

Expected life-time

Type	ta	25 °C	30 °C
EM R2A PRO	life-time	> 50,000 h	50,000 h

2.2.2 Life-time, lumen maintenance and failure rate for LED module

The light output of an LED module decreases over the life-time, this is characterized with the L value.
L70 means that the LED module will give 70 % of its initial luminous flux. This value is always related to the number of operation hours and therefore defines the life-time of an LED module.

As the L value is a statistical value the lumen maintenance may vary over the delivered LED modules.
The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the inital luminous flux, respectivly 90 % will be above 70 % of the initial value.

Life-time declarations are informative and represent no warranty claim.

ta temperature	L90 / B50	L80 / B50	L70 / B10
25 °C	50,000 h	–	50,000 h
35 °C	–	50,000 h	–

2.3 Storage conditions

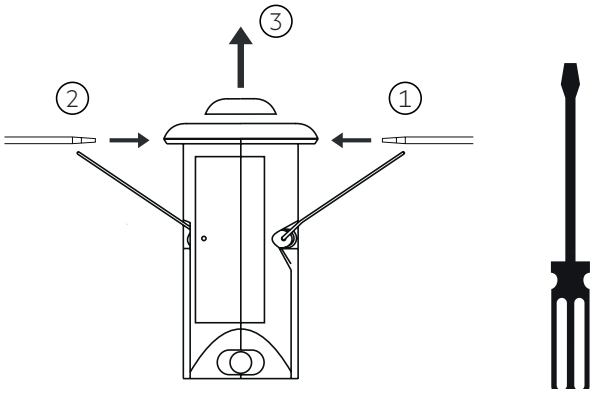
- Humidity 45 % up to max. 85 %, not condensed (max. 56 days/year at 85 %)
- Storage time / temperature: max. 6 months at -20 °C up to +45 °C (< 3 months at +45 °C)

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

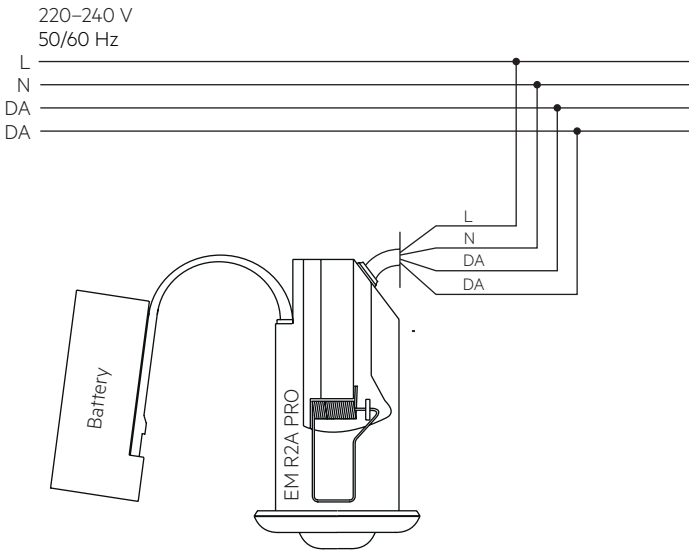
3. Installation / Wiring

3.1 Lens assembly

- Wear gloves when mounting the lens
- Take care of the mounting direction of the escape route lens
- Use screwdriver for replacing/removing lens
  1. + 2. Push lens clips with screwdriver via openings on both sides
  3. Remove lens



3.2 Wiring diagrams



Note: Battery must be connected before mains connection.

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6. Interfaces / communication

6.1 Control input (DALI DT1)

The control input is non-polar for digital control signals (DALI). The control signal is not SELV. Control cable has to be installed in accordance to the requirements of low voltage installations.

7. Functions

7.1 Status indication

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

LED indiction	Status	Comment
Permanent green	System OK	AC 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	DALI Inhibit	Switching into DALI inhibit mode via controller
Binary transmission of address via green/red LED	Address identification	During address identification mode
Green and red off	DC mode	Battery operation (emergency mode)

7.2 Testing

DALI Control
A DALI command from a suitable control unit can be used to initiate function and duration tests at individually selected times. Status flags are set for report back and data logging of results.

When a DALI bus has not been connected or when a DALI bus is connected but the DALI default DELAY and INTERVAL times have not been re-set by sending appropriate DALI commands, then the EM R2A PRO will conduct self-tests in accordance with the default times set within the EEPROM . These default times are factory pre-set, in accordance with the DALI standard EN 62386-202, to conduct an automatic function test every 7 days and a duration test every 52 weeks. Since the DELAY time is factory pre-set to Zero, all units are tested at the same time. Test times can be changed with a command over the DALI bus.

The DELAY and INTERVAL time values must be re-set when the emergency system test times are to be scheduled by a DALI control and monitoring system.
Note that once the default values have been set to Zero, tests will only be conducted following a command from the control system. If the DALI bus is disconnected the EM R2A PRO does not revert to self-testing mode.

Note: If the battery is connected the DALI communication is only possible after power reset.

Addressing
The EM R2A PRO includes the EZ easy addressing system which allows addressing and identification by using the bi-colour LED in conjunction with the EM PRO addressing tool. Binary address codes given by the LED can be simply converted to the DALI addresses 0 to 63. For single handed addressing using this method it is necessary to send a broadcast ident command every 3 to 9 seconds. During this command the LEDs will be switched off and the indication LED will flash the 6 bit binary address preceded by a 3 second start indication period.

Commissioning
After installation of the luminaire and initial connection of the mains supply and battery supply to the EM R2A PRO the unit will commence charging the batteries for 20 hours (initial charge). Afterwards the module will conduct a commissioning test for the full duration. The 20 hours recharge occurs also if a new battery is connected or the module exits the rest mode condition. The following automatic commissioning duration test is only performed when a battery is replaced and fully charged (after 20 hrs) and the interval time is not set to zero, otherwise the system is expected to perform the testing.

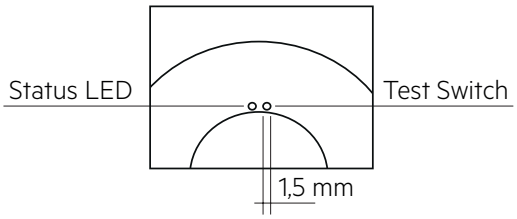
Functional test
The time of day and frequency of the 5 seconds function test can be set by the DALI controller. The default setting is a 5 seconds test on a weekly basis.

Duration test
The time of day and frequency of the duration test can be set by the DALI controller. The default setting is a duration test conducted every 52 weeks.

For 2 h operation:
The first commissioning duration test has a time of 120 minutes, subsequent through life tests are conducted for 90 minutes. When the battery is changed or disconnected and re-connected the unit will next conduct a 120 minute test.

Test switch
Test switch is integrated in the bezel. This can be used to to:
- initiate a 5 seconds function test: press 200 ms < T < 1 s
- execute function test as long as switch pressed: press > 1 s
- reset selftest timer (adjust local timing): press > 10 s

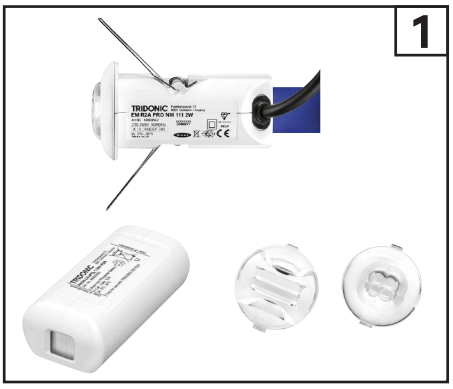
To initiate a test use a suitable tool, refer to drawing below.

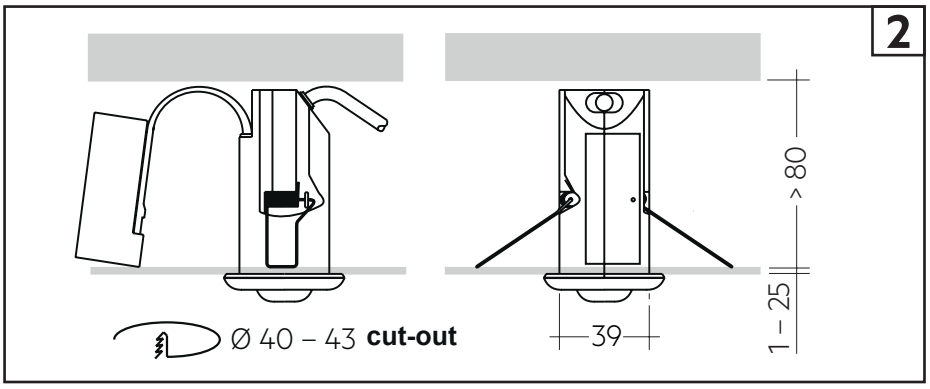


Timer reset functionality
The timer for function and duration test can be set to a particular time of the day by either pressing the test switch for longer than 10 seconds or cycling the unswitched line supply 5 times within 1 minute. The timer adjustment will enable the test start time to be defined 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.

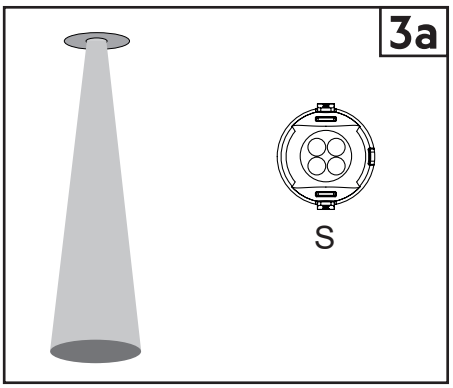
Prolong time
Prolong time can be set by the DALI controller. This is the delay time between return of the mains supply and the end of the emergency operation. The default prolong time is set as 0 minutes as specified within the DALI standard.
Indicator LED will stay off for the duration of the prolong time.

Mounting instruction R2A EM

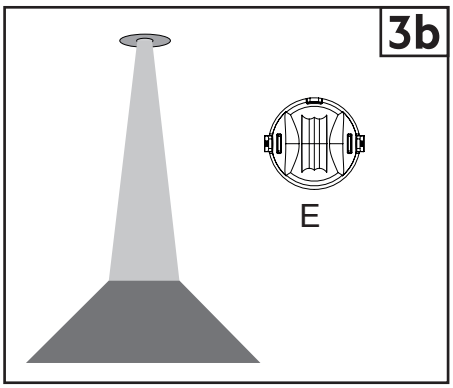




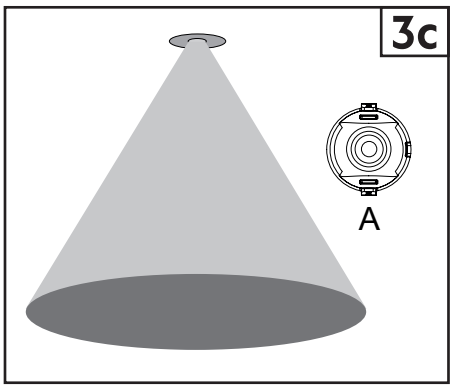
Dimensions in mm



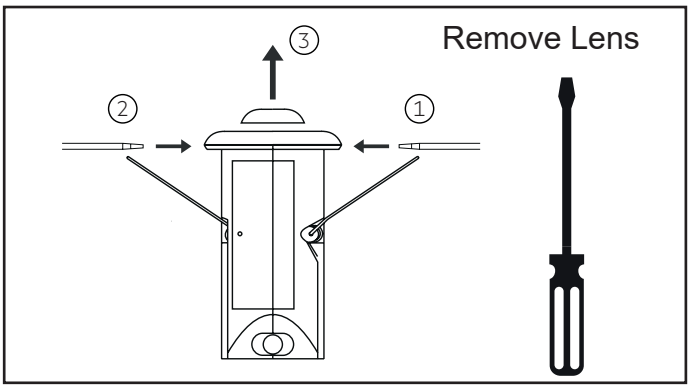
(S) Spot

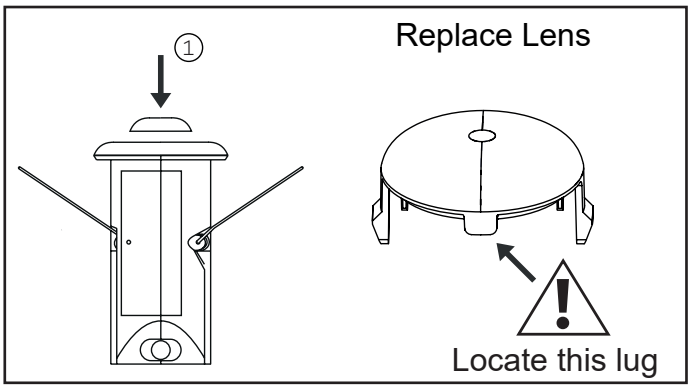


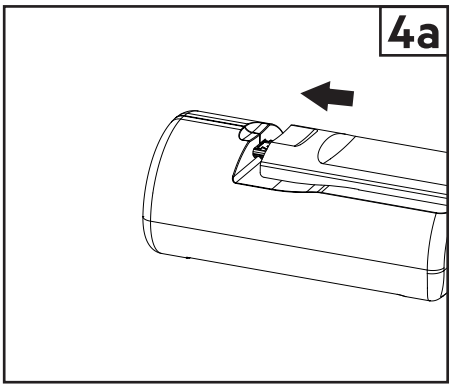
(E) Escape route (corridors)

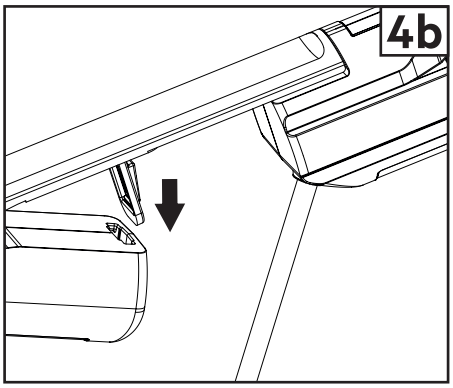


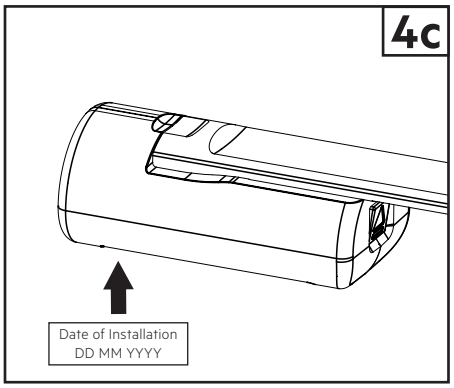
(A) Anti-panic (open areas)











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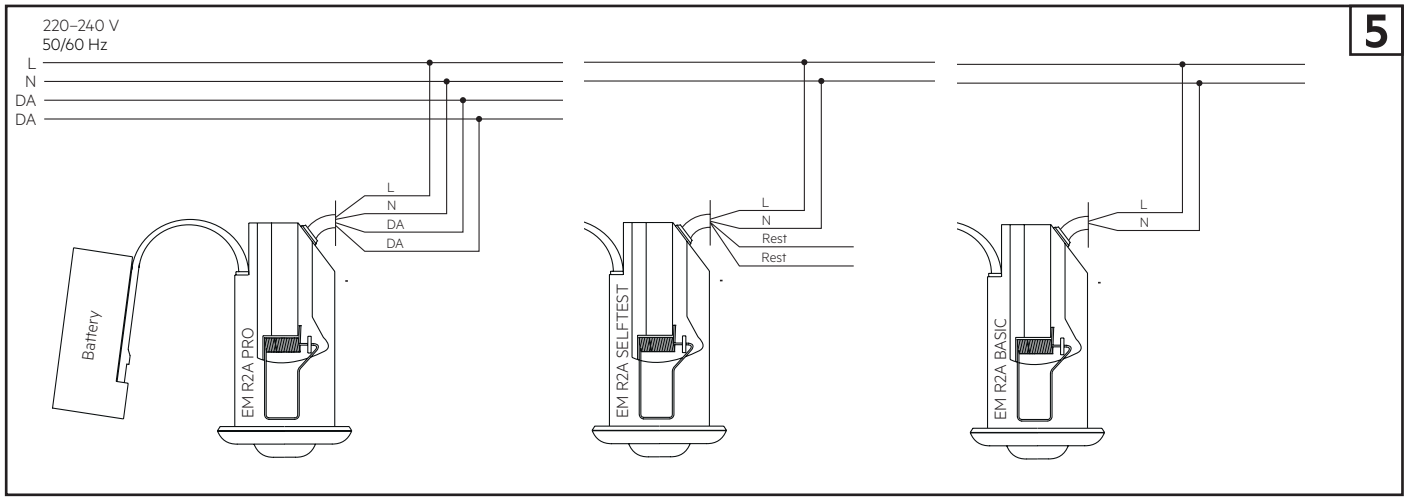
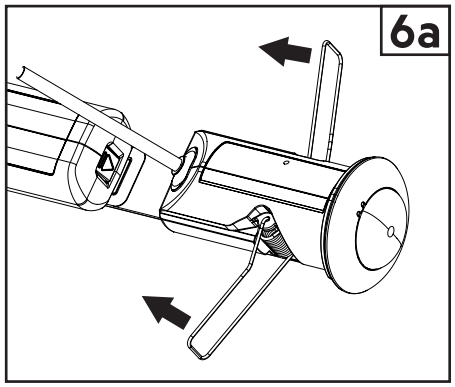
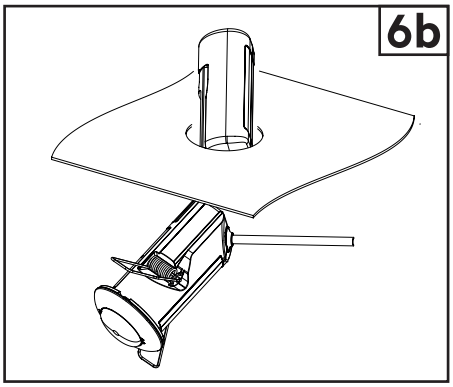
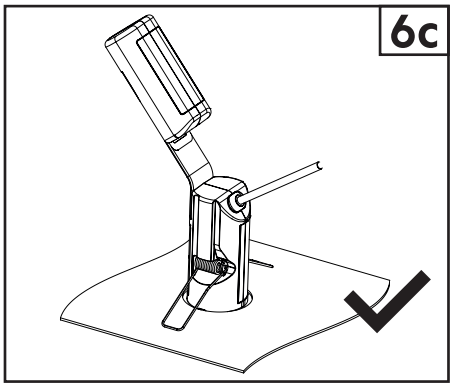
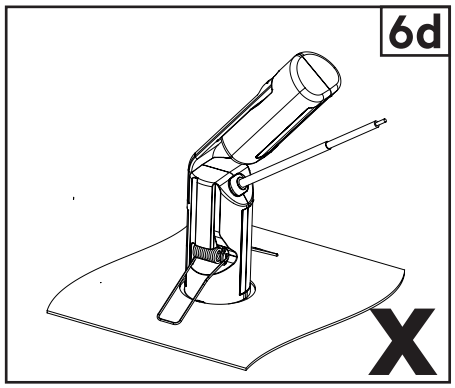


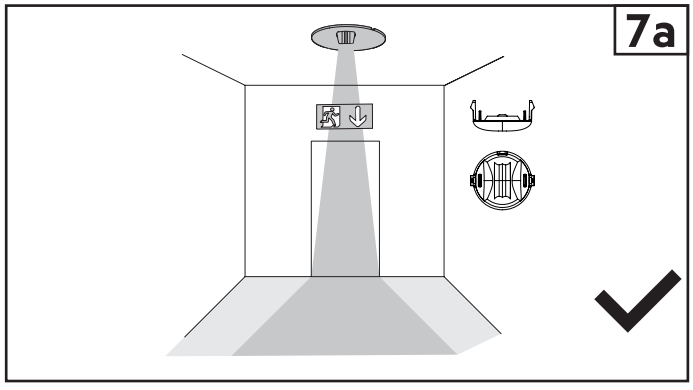


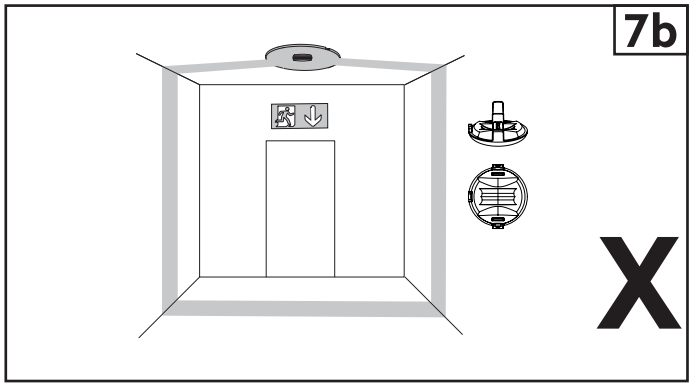






Safety note
Any modification may be carried out exclusively by qualified personnel and according to application provisions and regulations. The luminaire must always be disconnected from the mains whenever it is being worked on. The manufacturer shall not be liable for any damage resulting from inappropriate modifications to the luminaire or faulty installation.
A strain relief is required for proper connection of the cable.





(E) Escape (corridor) correct Lens alignment