RoHS

T5 T8 TC-DEL TC-SEL TC-TEL TC-F TC-L TC-DD T5c

EM BASIC lp-2, 220 – 240 V

BASIC version

Product description

- Emergency lighting supply unit for manual testing
- For linear and compact fluorescent lamps
- Low-profile casing (21 x 30 mm cross-section)

Properties

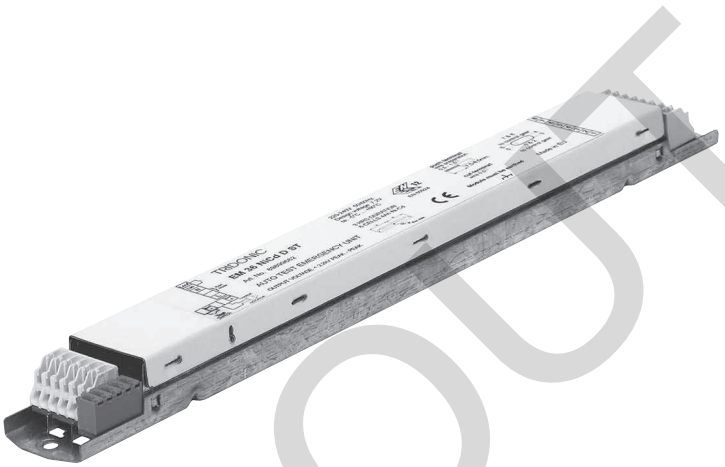
- 1 or 3 h rated duration
- Compatible with all electronic ballasts (dimmable and non-dimmable)
- 5-pole technology: 4-pole lamp changeover and delayed power switching for the ballast
- High-frequency ac operation of the lamp
- Hot restart in emergency mode
- Gentle on the lamp thanks to permanent cathode heating in emergency mode
- 5.5 min. boost start for rapid heating of the lamp, more light in the startup phase and optimum lamp life
- Maximum ballast lumen factors (BLF) for all lamps
- Green charge status display LED
- Electronic multi-level charge system
- Deep discharge protection
- Short-circuit-proof battery connection
- Polarity reversal protection for battery

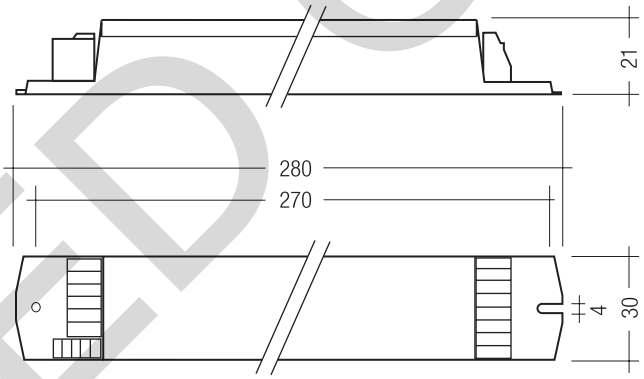
Batteries

- High-temperature cells
- NiCd or NiMH batteries
- D or Cs cells
- Blade terminals for simple connection

Standards, page 7

Wiring diagrams and installation examples, page 9





Technical data

Rated supply voltage	220 – 240 V
Mains frequency	50 / 60 Hz
Mains current	60 mA
Rated power	< 10 W
Overvoltage protection	320 V (for 1 h)
Maximum operating voltage (U-OUT of the ECG)	460 V
Battery charging time	15 h
Battery charging time 3 / 1 h	15 / 10 h
Discharge current	1.1 A
Leakage current (PE)	0.5 mA
Ambient temperature ta	-5 ... +60 °C
Max. casing temperature tc	70 °C
Mains voltage changeover threshold	according to EN 60598-2-22
Min. lamp starting temperature (emergency operation)	-5 °C
Type of protection	IP20

Ordering data

Type	Article number	Number of cells	Packaging, carton	Packaging, pallet	Weight per pc.
Rated operating time 3 h, Standard BLF					
EM 34 BASIC lp-2	**89800037**	4	25 pc(s).	475 pc(s).	0.223 kg
EM 35 BASIC lp-2	**89800038**	5	25 pc(s).	475 pc(s).	0.229 kg
EM 36 BASIC lp-2	**89800039**	6	25 pc(s).	475 pc(s).	0.229 kg
Rated operating time 1 h, Standard BLF					
EM 14 BASIC lp-2	**89800040**	4	25 pc(s).	475 pc(s).	0.229 kg
EM 15 BASIC lp-2	**89800041**	5	25 pc(s).	475 pc(s).	0.229 kg
EM 16 BASIC lp-2	**89800042**	6	25 pc(s).	475 pc(s).	0.229 kg

Specific technical data

Type	Battery charge time	Charge current		
		Initial charge	Fast charge	Trickle charge
Rated operating time 3 h, Standard BLF				
EM 34 BASIC Ip-2	15 h	330 mA	330 mA	130 mA
EM 35 BASIC Ip-2	15 h	330 mA	330 mA	130 mA
EM 36 BASIC Ip-2	15 h	330 mA	330 mA	130 mA
Rated operating time 1 h, Standard BLF				
EM 14 BASIC Ip-2	10 h	130 mA	210 mA	50 mA
EM 15 BASIC Ip-2	10 h	130 mA	210 mA	50 mA
EM 16 BASIC Ip-2	10 h	130 mA	210 mA	50 mA

ACCESSO-RIES

Test switch EM2

Product description

- For connection to the emergency lighting unit
- For checking the device function

Ordering data

Type	Article number	Packaging, bag	Packaging, carton	Weight per pc.
Test switch EM 2	**89805277**	25 pc(s).	600 pc(s).	0.011 kg

ACCESSO-RIES

Status indication green LED

Product description

- A green LED indicates that charging current is flowing into the battery

Ordering data

Type	Article number	Packaging, bag	Packaging, carton	Weight per pc.
LED EM green	**89899605**	25 pc(s).	200 pc(s).	0.011 kg
LED EM green, ultra high brightness	**89899756**	25 pc(s).	800 pc(s).	0.012 kg

Ballast Lumen Factor (BLF) in %

EM BASIC lp-2 for linear lamps, 3 or 1 h

	Duration	3 h			Standard 1 h		
	Cells	4 cells	5 cells	6 cells	4 cells	5 cells	6 cells
	Type	EM 34 BASIC lp-2	EM 35 BASIC lp-2	EM 36 BASIC lp-2	EM 14 BASIC lp-2	EM 15 BASIC lp-2	EM 16 BASIC lp-2
	Article no.	89800037	89800038	89800039	89800040	89800041	89800042
Lamp type	Wattage	BLF in emergency lighting mode in % for rated operating time					
T5	6 W	39			39		
	8 W	40			40		
	13 W	24			24		
T5 FH	14 W	24			24		
	21 W		18			18	
	28 W			15			15
	35 W			11			11
T5 FQ	24 W	13.5			13.5		
	39 W			8.2			8.2
	49 W			6.7			6.7
	54 W			5.3			5.3
	80 W			4.6			4.6
T8	15 W	18			18		
	18 W	18			18		
	30 W	11			11		
	36 W	9.5			9.5		
	38 W		12			12	
	58 W		7.5			7.5	
	70 W			4.5			4.5

Technology and capacity	Design	Number of cells	Type	Article number	Assignable batteries					
NiCd 4 Ah D-cells	Stick	4	**Accu-NiCd 4A 55**	89800089	•					
	Side by side	4	**Accu-NiCd 4B**	89895977	•					
	Stick + Stick	2 + 2	**Accu-NiCd 4C**	89895978	•					
	Stick	5	**Accu-NiCd 5A**	89895973		•				
	Stick + Stick	3 + 2	**Accu-NiCd 5C 55**	89800090		•				
	Stick + Stick	3 + 3	**Accu-NiCd 6C**	89895963			•			
NiMH 2 Ah Cs-cells	Stick	4	**Accu-NiMH C4A**	89899700				•		
	Stick	5	**Accu-NiMH C5A**	89899703					•	
	Stick	6	**Accu-NiMH C6A**	89899706						•
	Stick + Stick	3 + 3	**Accu-NiMH C6C**	89899707						•
NiMH 4 Ah Cs-cells ①	Stick	4	**Accu-NiMH 4 Ah C4A**	89899850	•					
	Stick	5	**Accu-NiMH 4 Ah C5A**	89899851		•				
	Stick	6	**Accu-NiMH 4 Ah C6A**	89899852			•			
	Stick + Stick	3 + 3	**Accu-NiMH 4 Ah C6C**	89899853			•			

Note: 50 °C batteries also available (see seperate datasheet at www.tridonic.com)

① Maximum battery housing temperature 50 °C.

Ballast Lumen Factor (BLF) in %

EM BASIC lp-2 for compact lamps, 3 or 1 h

	Duration	3 h			Standard 1 h		
	Cells	4 cells	5 cells	6 cells	4 cells	5 cells	6 cells
	Type	EM 34 BASIC lp-2	EM 35 BASIC lp-2	EM 36 BASIC lp-2	EM 14 BASIC lp-2	EM 15 BASIC lp-2	EM 16 BASIC lp-2
	Article no.	89800037	89800038	89800039	89800040	89800041	89800042
Lamp type	Wattage	BLF in emergency lighting mode in % for rated operating time					
TC-DD	10W	33			33		
	16W	24			24		
	21W	17			17		
	28W	14			14		
	38W			7.5			7.5
	55W			5.2			5.2
TC-SEL	7W	24			24		
	9W	28			28		
	11W	31			31		
TC-DEL	10W	30			30		
	13W	26			26		
	18W	17			17		
	26W	14.4			14.4		
TC-TEL ②	13W	26			26		
	18W	17.5/16	/20.5 (GE)		17.5/16	/20.5 (GE)	
	26W③	11.5/10.4	/15	/14	11.5/10.4	/15	/14
	32W③		14/5.6	/8.0		14/5.6	/8.0
	42W			7.4/7.3			7.4/7.3
	57W			5.1/5.2			5.1/5.2
T5c	22W	13.5			13.5		
	40W			6.5			6.5
	55W			5.4			5.4
TC-F	18W	18			18		
	24W		21			21	
	36W		13			13	
TC-L	18W	18			18		
	24W		17			17	
	36W		12			12	
	40W		8.8			8.8	
	55W			4.5			4.5

Technology and capacity	Design	Number of cells	Type	Article number	Assignable batteries					
NiCd 4 Ah D-cells	Stick	4	**Accu-NiCd 4A 55**	89800089	•					
	Side by side	4	**Accu-NiCd 4B**	89895977	•					
	Stick + Stick	2 + 2	**Accu-NiCd 4C**	89895978	•					
	Stick	5	**Accu-NiCd 5A**	89895973		•				
	Stick + Stick	3 + 2	**Accu-NiCd 5C 55**	89800090		•				
	Stick + Stick	3 + 3	**Accu-NiCd 6C**	89895963			•			
NiMH 2 Ah Cs-cells	Stick	4	**Accu-NiMH C 4A**	89899700				•		
	Stick	5	**Accu-NiMH C 5A**	89899703					•	
	Stick	6	**Accu-NiMH C 6A**	89899706						•
	Stick + Stick	3 + 3	**Accu-NiMH C 6C**	89899707						•
NiMH 4 Ah Cs-cells ①	Stick	4	**Accu-NiMH 4Ah C 4A**	89899850	•					
	Stick	5	**Accu-NiMH 4Ah C 5A**	89899851		•				
	Stick	6	**Accu-NiMH 4Ah C 6A**	89899852			•			
	Stick + Stick	3 + 3	**Accu-NiMH 4Ah C 6C**	89899853			•			

Note: 50°C batteries also available (see seperate datasheet at www.tridonic.com)

① Maximum battery housing temperature 50 °C.

② The first figure is related to non-amalgam lamps, the second figure is realted to amalgam lamps (e.g. 14/9,5).

③ For best performance of 26W and 32W TC lamps, and especially amalgam filled lamps, we recommend the use of EM 36 BASIC lp-2 resp. EM 16 BASIC lp-2.

Emergency Ballast Lumen Factor (EBLF) in % ①

EM BASIC lp-2 for linear lamps, 3 or 1 h

	Duration	3 h			Standard 1 h		
	Cells	4 cells	5 cells	6 cells	4 cells	5 cells	6 cells
	Type	EM 34 BASIC lp-2	EM 35 BASIC lp-2	EM 36 BASIC lp-2	EM 14 BASIC lp-2	EM 15 BASIC lp-2	EM 16 BASIC lp-2
	Article no.	89800037	89800038	89800039	89800040	89800041	89800042
Lamp type	Wattage	EBLF in emergency lighting mode in % for rated operating time					
T5	6 W	35			35		
	8 W	36			36		
	13 W	22			22		
T5 FH	14 W	22			22		
	21 W		17			17	
	28 W			14			14
	35 W			10.5			10.5
T5 FQ	24 W	12.3			12.3		
	39 W			8.3			8.3
	49 W			6.4			6.4
	54 W			5.7			5.7
	80 W			4.7			4.7
T8	15 W	16.5			16.5		
	18 W	16.5			16.5		
	30 W	9.5			9.5		
	36 W	8			8		
	38 W		10.5			10.5	
	58 W		6.5			6.5	
	70 W			3.7			3.7
TC-DD	10 W	29			29		
	16 W	22.5			22.5		
	21 W	15			15		
	28 W	12.5			12.5		
	38 W			6.5			6.5
	55 W			5.3			5.3
TC-SEL	7 W	22			21.5		
	9 W	25.5			25		
	11 W	28			27.5		
TC-DEL	10 W	21.5			21.5		
	13 W	23			23		
	18 W	15.5			15.5		
	26 W	13			13		
TC-TEL ②	13 W	23			23		
	18 W	16/10.7	/12		16/10.7	/12	
	26 W③	10.4/8.9	/9.2	/11.2	10.4/8.9	/9.2	/11.2
	32 W③		12.8/4.8	/7.7		12.8/4.8	/7.7
	42 W			7.2/6.7			7.2/6.7
	57 W			5.0/3.2			5.0/3.2
T5c	22 W	11.5			11.5		
	40 W			6			6
	55 W			5.5			5.5
TC-F	18 W	16.5			16.5		
	24 W		19.5			19.5	
	36 W		12			12	
TC-L	18 W	16			16		
	24 W		15.5			15.5	
	36 W		10.5			10.5	
	40 W		8.4			8.4	
	55 W			4.8			4.8

① According to EN 61347-2-7: 2006

② The first figure is related to non-amalgam lamps, the second figure is realted to amalgam lamps (e.g. 14/9,5).

③ For best performance of 26W and 32W TC lamps, and especially amalgam filled lamps, we recommend the use of EM 36 BASIC lp-2 resp. EM 16 BASIC lp-2.

Standards
- according to EN 50172
- according to EN 60598-2-22
- EN 61347-2-7
- EN 60929
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61547
- EN 60068-2-64
- EN 60068-2-29
- EN 60068-2-30

Isolation and electric strength testing of luminaires
Electronic devices can be damaged by high voltage. This has to be considered during the routine testing of the luminaires in production.

According to IEC 60598-1 Annex Q (informative only!) or ENEC 303-Annex A, each luminaire should be submitted to an isolation test with 500 V_{DC} for 1 second. This test voltage should be connected between the interconnected phase and neutral terminals and the earth terminal. The isolation resistance must be at least 2 MΩ.

As an alternative, IEC 60598-1 Annex Q describes a test of the electrical strength with 1,500 V_{AC} (or 1,414 x 1,500 V_{DC}). To avoid damage to the electronic devices this test must not be conducted.

Accu-NiCd

Case temperature range to ensure 4 years design life	0 °C to +55 °C
Battery voltage/cell	1.2 V
Capacity D	4.2 / 4.5 Ah
Max. short term temperature (reduced lifetime)	70 °C
Packing quantity	5 pcs. per carton

Accu-NiMh

Case temperature range to ensure 4 years design life	
2.0 Ah Cs	0 °C to +55 °C
4.0 Ah Cs	0 °C to +50 °C
Battery voltage	1.2 V
Capacity Cs	2.0 Ah 4.0 Ah
Max. short term temperature (reduced lifetime)	70 °C
Packing quantity	5 pcs. per carton

Ballast compatibility
The EM BASIC lp-2 emergency units use 5 pole technology and are compatible with most high frequency ballasts on the market, however it is important to check that the U-OUT rating of the ballast does not exceed the value specified under “Technical data”.

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

Note
Basic insulation between supply and battery circuit.

Mechanical details
Channel manufactured from galvanised steel.
Cover manufactured from white pre-coated steel.

LED status indicator
- Green
- Mounting hole 6.5 mm dia
- Lead length 750 mm
- Insulation rating: 90 °C

Test switch
- Mounting hole 7.0 mm dia
- Lead length 550 mm

Battery leads
- Quantity: 1 red and 1 black
- Length: 1300 mm
- Wire type: 0.5 mm^2 solid conductor
- Insulation rating: 90 °C

Battery end termination
Push on 4.8 mm receptacle to suit battery spade fitted with insulating cover

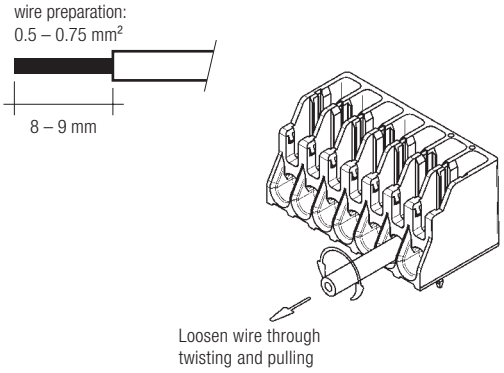
Module end termination
8.0 mm stripped insulation

Two-piece batteries are supplied with a 200 mm lead with 4.8 mm receptacle at each end and insulting covers to connect the separate sticks together.

Electrical connections
An earthed starting aid is recommended. The module should be earthed by the fixings used to attach it to the luminaire.

Wiring

Lamp/ballast/supply



IDC interface
- solid wire with a cross section of 0.5 mm^2 according to the specification from WAGO

Horizontal interface
- solid wire with a cross section of 0.5–0.75 mm^2 according to the specification from WAGO
- solid wire with a cross section of 1.0 mm^2 with an insulation diameter up to 2.5 mm
- strip 9 mm of insulation from the cables
- loosen wire through twisting and pulling

Batteries/LED/Test switch
push terminal with button release: 0.5 mm²
6.5 mm strip

Maximum lamp lead capacitance
terminals 5 and 6 (* hot leads) 100 pF [1)]
terminals 3 and 4 200 pF [1)]

[1)] Note: care should be taken not to exceed the total maximum lamp lead capacitance for HF ballast. Leads should always be kept as short as possible.

Batteries
Connection method: 4.8 x 0.5 mm spade tag welded to end of cell.

For stick packs this connection is accessible after the battery caps have been fitted.

To inhibit inverter operation disconnect the batteries by removing the connector from the battery spade tag.

For battery data see separate data sheet.

Wiring guidelines
To ensure that a luminaire containing high frequency emergency units complies with EN 55015 for radio frequency conducted interference in both normal and emergency mode it is essential to follow good practice in the wiring layout.

Within the luminaire the switched and unswitched 50 Hz supply wiring must be routed as short as possible and be kept as far away as possible from the lamp leads. This means, for example, in a linear T8 or T5 luminaire the mains wiring should be routed along one side of the luminaire body, while the wires to the emergency lamp from the emergency module are routed along the other side.

The high frequency emergency lamp wiring contains “hot” leads at pins 1 and 6, which have high voltage to earth. These should be kept as short as possible and separated from other wiring to minimize coupling. They also have a restriction on capacitance to other wiring and earth of 100 pF, which must be observed to ensure good lamp starting.

With an earth connection of the metal case of the emergency module the noise suppression can be further improved. The wiring of the earth should be kept as short as possible.

Through wiring may affect the emc performance of the luminaire.

With the use of the fifth pole possible compatibility problems between the products can be prevented. Depending on the luminaire wiring the radio suppression in the emergency mode of operation can be further improved.

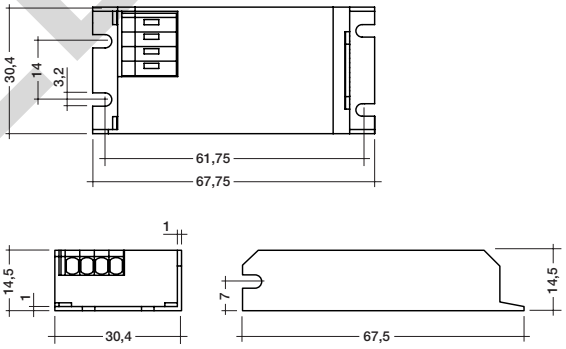
Capacitive loading limits of lamp leads must not be exceeded. Note the capacitance of the emergency lamp leads adds to the capacitance of the leads from the ballast to the EM BASIC lp-2 module when considering ballast loading.

EM FLT1 filter
When the EM BASIC lp-2 is used in a remote appli-cation, where the lamp leads and LED indicator leads are routed together in close proximity, it is possible to have electrical interference picked up in the indicator leads.

Under certain conditions this interference can cause a lock-up of the EM BASIC lp micro-controller.

To overcome this problem in such applications it is necessary to fit the filter EM FLT1 between the indicator LED and the EM BASIC lp-2 unit. To be effective the filter must be connected close to the EM BASIC lp-2 module.

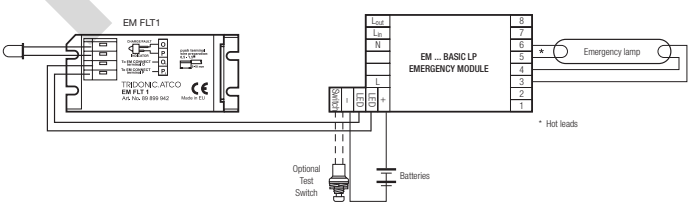
For further information please contact Tridonic.

EM FLT1 filter


Technical data:
Push wire terminals 0.5–1.5 mm² solid conductor

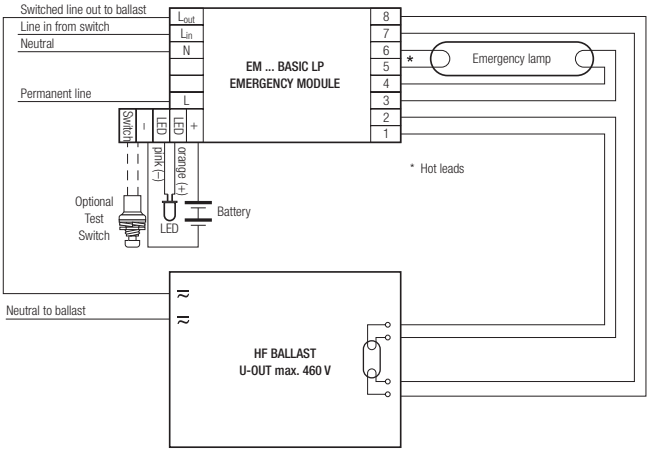
Ordering data

Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
EM FLT1	**89899942**	50 pieces	1,000 pieces	0.022 kg

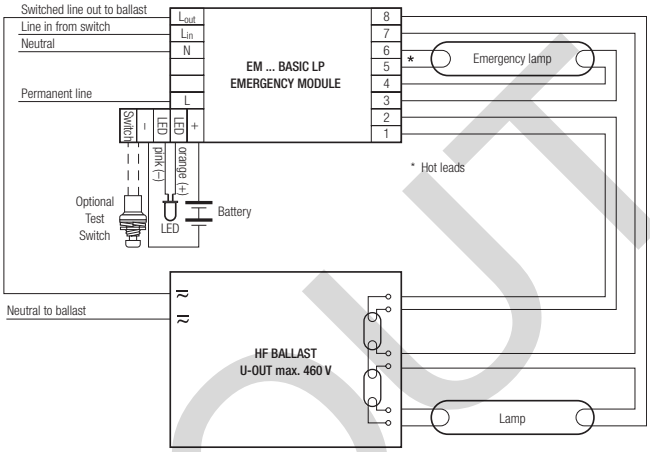
Circuit diagram with EM FLT1 filter


EM ... BASIC lp-2emergency module wiring diagrams

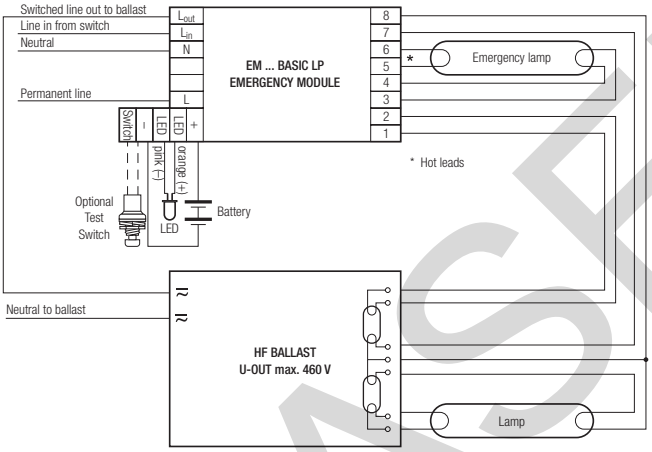
Not for use with magnetic ballasts and switch start circuits



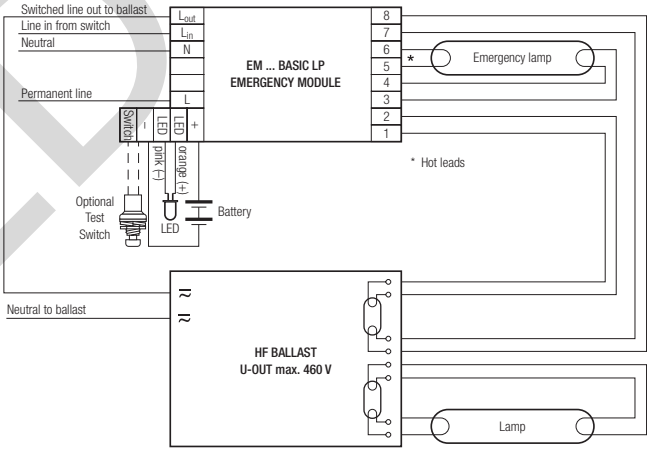
Wiring diagram for single lamp high frequency ballasts



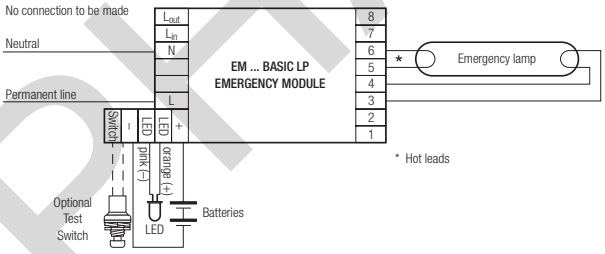
Wiring diagram for twin lamp high frequency ballasts with 6 terminals



Wiring diagram for twin lamp high frequency ballasts with 7 terminals



Wiring diagram for twin lamp high frequency ballasts with 8 terminals



Wiring diagram for non-maintained operation

Note:

All hot leads normally marked with an * should be kept as short as possible. For comprehensive wiring diagrams and instructions consult the Tridonic website www.tridonic.com