

EM SELFTEST G2, 220 – 240 V

SELFTEST version

Product description

- Emergency lighting supply unit with self-test function
- For linear and compact fluorescent lamps
- Low-profile casing (21 x 30 mm cross-section)
- 5-year guarantee

Properties

- Non maintained operation
- Self-test as per IEC 62034
- 1 or 3 h rated duration
- Operating time selectable with plug (duration link)
- Compatible with all electronic ballasts
- 5-pole technology: 4-pole lamp changeover and delayed power switching for the ballast
- High-frequency ac operation of the lamp
- Power control technology ensures maximum emergency ballast lumen factors (EBLF) for all lamps
- Gentle on the lamp thanks to preheated lamp start and 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
- Standard and high ballast lumen factor for 1-hour types
- Electronic multi-level charge system
- „Rest mode“ function
- Automatic commissioning
- Automatic function and duration test at time of low risk
- Two-colour status display LED
- Deep discharge protection
- Very low energy consumption from the battery after activation of the deep discharge protection
- Short-circuit-proof battery connection
- Polarity reversal protection for battery
- Self-test:
 - Status of the battery
 - Status of the lamp
 - Charge condition
 - Function test
 - Duration test



Batteries

- High-temperature cells
- NiCd or NiMH batteries
- D- Cs- or LA cells
- 4-year design life
- 1-year guarantee
- For battery compatibility refer to chapter „Ballast-Lumen-Factor (BLF)“



Standards, page 13

For wiring diagrams and installation examples, page 16

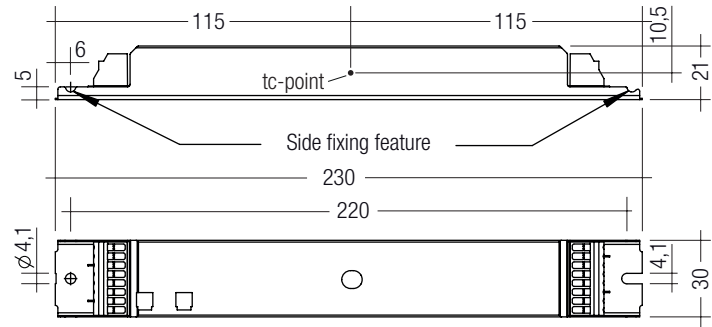


EM SELFTEST G2, 220 – 240 V

SELFTEST version

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 1 h	10 h
Battery charging time 3 h	15 h
Discharge current, Standard BLF	1 A
Discharge current, High Output BLF	2.2 A
Time to light	1.2 s from detection of emergency event
Leakage current (PE)	0.5 mA
Ambient temperature t_a	-5 ... +60 °C
Max. casing temperature t_c	+70 °C
Mains voltage changeover threshold	according to EN 60598-2-22
Min. lamp starting temperature (emergency operation)	-5 °C
Type of protection	IP20
Rest mode max. number of emergency units	100
Rest mode max. wiring distance	1,000 m



Note: Control gear supplied with duration link in 3 hours position. Remove duration link for 1 hour duration. Duration link must be set before battery and mains connection.

Ordering data

Type [®]	Article number	Battery type	Number of cells	Packaging, carton	Packaging, pallet	Weight per pc.
Rated operating time 1/3 h, Standard BLF						
EM 03 ST G2	89800198	NiCd	3	10 pc(s).	700 pc(s).	0.156 kg
EM 04 ST G2	89800201	NiCd	4	10 pc(s).	700 pc(s).	0.156 kg
EM 05 ST G2	89800204	NiCd	5	10 pc(s).	700 pc(s).	0.156 kg
EM 06 ST G2	89800207	NiCd	6	10 pc(s).	700 pc(s).	0.156 kg
EM 03 ST NiMH G2	89800336	NiMH	3	10 pc(s).	700 pc(s).	0.156 kg
EM 04 ST NiMH G2	89800337	NiMH	4	10 pc(s).	700 pc(s).	0.156 kg
EM 05 ST NiMH G2	89800338	NiMH	5	10 pc(s).	700 pc(s).	0.156 kg
EM 06 ST NiMH G2	89800339	NiMH	6	10 pc(s).	700 pc(s).	0.156 kg
Rated operating time 1 h, High Output						
EM 13 HO ST G2	89800229	NiCd	3	10 pc(s).	700 pc(s).	0.156 kg
EM 14 HO ST G2	89800232	NiCd	4	10 pc(s).	700 pc(s).	0.156 kg
EM 15 HO ST G2	89800235	NiCd	5	10 pc(s).	700 pc(s).	0.156 kg
EM 16 HO ST G2	89800238	NiCd	6	10 pc(s).	700 pc(s).	0.156 kg
EM 13 HO ST NiMH G2	89800340	NiMH	3	10 pc(s).	700 pc(s).	0.156 kg
EM 14 HO ST NiMH G2	89800341	NiMH	4	10 pc(s).	700 pc(s).	0.156 kg
EM 15 HO ST NiMH G2	89800342	NiMH	5	10 pc(s).	700 pc(s).	0.156 kg
EM 16 HO ST NiMH G2	89800343	NiMH	6	10 pc(s).	700 pc(s).	0.156 kg

Specific technical data

Type ^①	Charge current / Battery charging time		
	Initial charge / duration	Fast recharge / duration	Trickle charge, continuously
Rated operating time 1 h, Standard BLF			
EM 03 ST G2	130 mA / 20 h	210 mA / 10 h	50 mA
EM 04 ST G2	130 mA / 20 h	210 mA / 10 h	50 mA
EM 05 ST G2	130 mA / 20 h	210 mA / 10 h	50 mA
EM 06 ST G2	130 mA / 20 h	210 mA / 10 h	50 mA
EM 03 ST NiMH G2	130 mA / 20 h	210 mA / 10 h	130 mA / 4 min. – 0 mA / 16 min.
EM 04 ST NiMH G2	130 mA / 20 h	210 mA / 10 h	130 mA / 4 min. – 0 mA / 16 min.
EM 05 ST NiMH G2	130 mA / 20 h	210 mA / 10 h	130 mA / 4 min. – 0 mA / 16 min.
EM 06 ST NiMH G2	130 mA / 20 h	210 mA / 10 h	130 mA / 4 min. – 0 mA / 16 min.
Rated operating time 3 h, Standard BLF			
EM 03 ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 04 ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 05 ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 06 ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 03 ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
EM 04 ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
EM 05 ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
EM 06 ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
Rated operating time 1 h, High Output			
EM 13 HO ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 14 HO ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 15 HO ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 16 HO ST G2	300 mA / 20 h	330 mA / 15 h	130 mA
EM 13 HO ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
EM 14 HO ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
EM 15 HO ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.
EM 16 HO ST NiMH G2	300 mA / 20 h	330 mA / 15 h	200 mA / 4 min. – 0 mA / 16 min.

^① EM = Emergency

RoHS

ACCES-
SORIES

Test switch EM3

Product description

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



Ordering data

Type	Article number	Packaging, bag	Packaging, carton	Weight per pcs.
Test switch EM 3	89899956	25 pc(s).	200 pc(s).	0.013 kg

ACCES-
SORIES

Status indication bi-colour LED

Product description

- Two-colour status display LED
- Green: system OK, red: fault
- Plug connection



Ordering data

Type	Article number	Packaging, bag	Packaging, carton	Weight per pcs.
LED EM bi-colour, 1.0 m CON	89800273	25 pc(s).	200 pc(s).	0.015 kg
LED EM bi-colour, high brightness HO 1.0 m CON	89800275	25 pc(s).	200 pc(s).	0.015 kg
LED EM bi-colour, 0.6 m CON	89800474	25 pc(s).	200 pc(s).	0.005 kg
LED EM bi-colour, high brightness HO 0.6 m CON	89800475	25 pc(s).	200 pc(s).	0.005 kg
LED EM bi-colour, 0.3 m CON	89800274	25 pc(s).	200 pc(s).	0.005 kg
LED EM bi-colour, high brightness HO 0.3 m CON	89800276	25 pc(s).	200 pc(s).	0.005 kg

Ballast lumen factor (BLF) in %

EM SELFTTEST G2 for linear lamps, 3 or 1 h

Duration	1/3 h Standard BLF							
	3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
Type	EM 03 ST G2	EM 04 ST G2	EM 05 ST G2	EM 06 ST G2	EM 03 ST NiMH G2	EM 04 ST NiMH G2	EM 05 ST NiMH G2	EM 06 ST NiMH G2
Art. no.	89800198	89800201	89800204	89800207	89800336	89800337	89800338	89800339
Lamp type	Wattage							
	BLF in emergency lighting mode in % for rated operating time							
T5	6 W							
	8 W	32.4	40.0			32.4	40.0	
	13 W							
ECO T5	13 W		22.0				22.0	
	20 W		15.4				15.4	
	25 W				16.8			16.8
	32 W				13.4			13.4
	45 W				8.1			8.1
	50 W				5.8			5.8
	73 W				4.1			4.1
T5 FH	14 W		24.0			24.0		
	21 W			18.0			18.0	
	28 W				15.0			15.0
	35 W				11.0			11.0
T5 FO	24 W		15.6			15.6		
	39 W				10.0			10.0
	49 W				6.7			6.7
	54 W				5.3			5.3
	80 W				4.2			4.2
T8	15 W		17.0			17.0		
	18 W		18.0			18.0		
	30 W							
	36 W		11.0			11.0		
	38 W							
	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	3	Accu-NiCd 3A 55	28002773	3 h								
	Side by side	3	Accu-NiCd 3B 55	89800384	3 h								
	Stick	4	Accu-NiCd 4A 55	89800089		3 h							
	Side by side	4	Accu-NiCd 4B 55	89800385		3 h							
	Stick + Stick	2 + 2	Accu-NiCd 4C 55	28002775		3 h							
	Stick	5	Accu-NiCd 5A 55	28002774		3 h							
	Stick + Stick	2 + 3	Accu-NiCd 5C 55	89800090		3 h							
NiMH 2.2Ah Cs cells	Stick + Stick	3 + 3	Accu-NiCd 6C 55	89800388			3 h						
	Stick	3	Accu-NiMH 3A	28002088	1 h			1 h					
	Stick	4	Accu-NiMH 4A	28002089		1 h			1 h				
	Stick	5	Accu-NiMH 5A	28002090		1 h				1 h			
	Stick	6	Accu-NiMH 6A	28002091			1 h					1 h	
NiMH 4 Ah LA cells	Stick + Stick	3 + 3	Accu-NiMH 6C	28002092			1 h					1 h	
	Stick	3	Accu-NiMH 4Ah 3A CON	89800441				3 h					
	Stick	4	Accu-NiMH 4Ah 4A CON	89800442					3 h				
	Stick + Stick	2 + 2	Accu-NiMH 4Ah 4C CON	89800438					3 h				
	Stick + Stick	2 + 3	Accu-NiMH 4Ah 5C CON	89800439						3 h			
Stick + Stick	3 + 3	Accu-NiMH 4Ah 6C CON	89800440									3 h	

Ballast lumen factor (BLF) in %

EM SELFTEST G2 for compact lamps, 3 or 1 h

Lamp type	Wattage	1/3 h Standard BLF							
		3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
Type		EM 03 ST G2	EM 04 ST G2	EM 05 ST G2	EM 06 ST G2	EM 03 ST NiMH G2	EM 04 ST NiMH G2	EM 05 ST NiMH G2	EM 06 ST NiMH G2
Article no.		89800198	89800201	89800204	89800207	89800336	89800337	89800338	89800339
BLF in emergency lighting mode in % for rated operating time									
TC-DD	10 W								
	16 W		23.6				23.6		
	21 W		15.4				15.4		
	28 W		13.7				13.7		
	38 W				10.3				10.3
	55 W				5.9				5.9
TC-SEL	7 W								
	9 W	18.3	27.6			18.3	27.6		
	11 W	17.4	31.0			17.4	31.0		
TC-DEL	10 W								
	13 W	18.6	25.6			18.6	25.6		
	18 W		17.0				17.0		
	26 W		14.4				14.4		
TC-TEL [®]	13 W	17.0 / 10.9	25.2 / 17.1			17.0 / 10.9	25.2 / 17.1		
	18 W		17.5 / 14.1	17.8 / 21.0			17.5 / 14.1	17.8 / 21.0	
	26 W [®]		11.5 / 10.0	13.0	14.0		11.5 / 10.0	13.0	14.0
	32 W [®]			14.0 / 5.6	x / 8.0			14.0 / 5.6	x / 8.0
	42 W				7.4 / 7.3				7.4 / 7.3
	57 W								
T5c	22 W		16.9				16.9		
	40 W				7.4				7.4
	55 W				5.1				5.1
TC-F	18 W		18.0				18.0		
	24 W			21.0				21.0	
	36 W			13.0				13.0	
TC-L	18 W		17.4				17.4		
	24 W			17.0				17.0	
	36 W			12.0				12.0	
	40 W			8.8				8.8	
	55 W				5.4				5.4
TC-R	14 W		20.0				20.0		
	17 W		15.0				15.0		

Technology and capacity	Design	Number of cells	Type	Article number	Assignable batteries				
NiCd 4 Ah D cells	Stick	3	Accu-NiCd 3A 55	28002773	3 h				
	Side by side	3	Accu-NiCd 3B 55	89800384	3 h				
	Stick	4	Accu-NiCd 4A 55	89800089		3 h			
	Side by side	4	Accu-NiCd 4B 55	89800385		3 h			
	Stick + Stick	2+2	Accu-NiCd 4C 55	28002775		3 h			
	Stick	5	Accu-NiCd 5A 55	28002774		3 h			
	Stick + Stick	2+3	Accu-NiCd 5C 55	89800090		3 h			
NiMH 2.2 Ah Cs cells	Stick + Stick	3+3	Accu-NiCd 6C 55	89800388			3 h		
	Stick	3	Accu-NiMH 3A	28002088	1 h			1 h	
	Stick	4	Accu-NiMH 4A	28002089		1 h		1 h	
	Stick	5	Accu-NiMH 5A	28002090		1 h			1 h
	Stick	6	Accu-NiMH 6A	28002091		1 h			1 h
NiMH 4 Ah LA cells	Stick + Stick	3+3	Accu-NiMH 6C	28002092		1 h			1 h
	Stick	3	Accu-NiMH 4Ah 3A CON	89800441			3 h		
	Stick	4	Accu-NiMH 4Ah 4A CON	89800442				3 h	
	Stick + Stick	2+2	Accu-NiMH 4Ah 4C CON	89800438				3 h	
	Stick + Stick	2+3	Accu-NiMH 4Ah 5C CON	89800439					3 h
	Stick + Stick	3+3	Accu-NiMH 4Ah 6C CON	89800440					3 h

[®] The first figure is related to non-amalgam lamps, the second figure is related to amalgam lamps (e.g. 14 / 9.5).

[®] For best performance of 26W and 32W TC lamps, and especially amalgam filled lamps, we recommend the use of EM 06 ST G2 resp. EM 16 HO ST G2.

Ballast lumen factor (BLF) in %

EM SELFTTEST G2 for linear lamps, 1 h High Output

Lamp type	Wattage	1 h High Output BLF							
		3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
Type		EM 13 HO ST G2	EM 14 HO ST G2	EM 15 HO ST G2	EM 16 HO ST G2	EM 13 HO ST NiMH G2	EM 14 HO ST NiMH G2	EM 15 HO ST NiMH G2	EM 16 HO ST NiMH G2
Art. no.		89800229	89800232	89800235	89800238	89800340	89800341	89800342	89800343
BLF in emergency lighting mode in % for rated operating time									
T5	6 W								
	8 W	58.0	68.0			58.0	68.0		
	13 W								
ECO T5	13 W		47.0				47.0		
	20 W		33.0				33.0		
	25 W				41.0				41.0
	32 W				32.7				32.7
	45 W				31.6				31.6
	50 W				22.6				22.6
T5 FH	73 W				16.0				16.0
	14 W		46.0				46.0		
	21 W			41.0				41.0	
	28 W				39.0				39.0
T5 FO	35 W				28.6				28.6
	24 W		33.4				33.4		
	39 W				34.3				34.3
	49 W				23.0				23.0
	54 W				18.2				18.2
T8	80 W				14.4				14.4
	15 W		37.6				37.6		
	18 W		39.8				39.8		
	30 W								
	36 W		21.0				21.0		
	38 W								
58 W			18.0					18.0	
70 W									

Technology and capacity	Design	Number of cells	Type	Article number	Assignable batteries					
NiCd 4 Ah D cells	Stick	3	Accu-NiCd 3A 55	28002773	1 h					
	Stick	4	Accu-NiCd 4A 55	89800089		1 h				
	Side by side	4	Accu-NiCd 4B	89895977		1 h				
	Stick + Stick	2 + 2	Accu-NiCd 4C 55	28002775		1 h				
	Stick	5	Accu-NiCd 5A 55	28002774			1 h			
	Stick + Stick	2 + 3	Accu-NiCd 5C 55	89800090			1 h			
NiMH 4 Ah LA cells	Stick + Stick	3 + 3	Accu-NiCd 6C	89895963			1 h			
	Stick	3	Accu-NiMH 4Ah 3A CON	89800441			1 h			
	Stick	4	Accu-NiMH 4Ah 4A CON	89800442				1 h		
	Stick + Stick	2 + 2	Accu-NiMH 4Ah 4C CON	89800438				1 h		
	Stick + Stick	2 + 3	Accu-NiMH 4Ah 5C CON	89800439					1 h	
	Stick + Stick	3 + 3	Accu-NiMH 4Ah 6C CON	89800440						1 h

Ballast lumen factor (BLF) in %

EM SELFTEST G2 for compact lamps, 1 h High Output

	Duration	1 h High Output BLF							
		Cells	3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells
Type		EM 13 HO ST G2	EM 14 HO ST G2	EM 15 HO ST G2	EM 16 HO ST G2	EM 13 HO ST NiMH G2	EM 14 HO ST NiMH G2	EM 15 HO ST NiMH G2	EM 16 HO ST NiMH G2
Article no.		89800229	89800232	89800235	89800238	89800340	89800341	89800342	89800343
Lamp type	Wattage	BLF in emergency lighting mode in % for rated operating time							
TC-DD	10 W								
	16 W								
	21 W								
	28 W								
	38 W								
	55 W								
TC-SEL	7 W								
	9 W	46.3	42.8			46.3	42.8		
	11 W	44.0	48.0			44.0	48.0		
TC-DEL	10 W								
	13 W	43.0	53.0			43.0	53.0		
	18 W		39.3				39.3		
	26 W		29.8				29.8		
	TC-TEL [®]	13 W	39.3 / 38.0	52.2 / 48.0			39.3 / 38.0	52.2 / 48.0	
	18 W		37.3 / 35.3				37.3 / 35.3		
	26 W [®]		28.0 / 25.0				28.0 / 25.0		
	32 W [®]			28.5 / 9.1				28.5 / 9.1	
	42 W			15.0 / 18.0				15.0 / 18.0	
	57 W								
T5c	22 W		36.2				36.2		
	40 W				25.4				25.4
	55 W				17.5				17.5
TC-F	18 W		31.0				31.0		
	24 W			40.3				40.3	
	36 W			25.0				25.0	
TC-L	18 W		33.0				33.0		
	24 W			37.4				37.4	
	36 W			30.6				30.6	
	40 W			22.5				22.5	
	55 W								
TC-R	14 W		52.7				52.7		
	17 W		39.5				39.5		

Technology and capacity	Design	Number of cells	Type	Article number	Assignable batteries				
NiCd 4 Ah D cells	Stick	3	Accu-NiCd 3A 55	28002773	1 h				
	Stick	4	Accu-NiCd 4A 55	89800089		1 h			
	Side by side	4	Accu-NiCd 4B	89895977		1 h			
	Stick + Stick	2+2	Accu-NiCd 4C 55	28002775		1 h			
	Stick	5	Accu-NiCd 5A 55	28002774		1 h			
	Stick + Stick	2+3	Accu-NiCd 5C 55	89800090		1 h			
	Stick + Stick	3+3	Accu-NiCd 6C	89895963		1 h			
NiMH 4 Ah LA cells	Stick	3	Accu-NiMH 4Ah 3A CON	89800441			1 h		
	Stick	4	Accu-NiMH 4Ah 4A CON	89800442			1 h		
	Stick + Stick	2+2	Accu-NiMH 4Ah 4C CON	89800438			1 h		
	Stick + Stick	2+3	Accu-NiMH 4Ah 5C CON	89800439				1 h	
	Stick + Stick	3+3	Accu-NiMH 4Ah 6C CON	89800440					1 h

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

[®] For best performance of 26W and 32W TC lamps, and especially amalgam filled lamps, we recommend the use of EM 06 ST G2 resp. EM 16 HO ST G2.

Emergency Ballast Lumen Factor (EBLF) in %^①

EM SELFTTEST G2, 3 or 1 h

	Duration	1/3 h Standard BLF							
		3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
Type	EM 03 ST G2	EM 04 ST G2	EM 05 ST G2	EM 06 ST G2	EM 03 ST NiMH G2	EM 04 ST NiMH G2	EM 05 ST NiMH G2	EM 06 ST NiMH G2	
Article no.	89800198	89800201	89800204	89800207	89800336	89800337	89800338	89800339	
Lamp type	Wattage	EBLF in emergency lighting mode in % for rated operating time							
T5	6 W								
	8 W	29.0	36.0			29.0	36.0		
	13 W								
ECO T5	13 W		19.7				19.7		
	20 W		13.9				13.9		
	25 W				14.9				14.9
	32 W				11.9				11.9
	45 W				7.3				7.3
	50 W				5.9				5.9
	73 W				4.1				4.1
T5 FH	14 W		22.0				22.0		
	21 W			17.0				17.0	
	28 W				14.0				14.0
	35 W				10.5				10.5
T5 FQ	24 W		14.1				14.1		
	39 W				9.1				9.1
	49 W				6.4				6.4
	54 W				5.7				5.7
	80 W				4.2				4.2
T8	15 W		16.0				16.0		
	18 W		16.5				16.5		
	30 W								
	36 W		10.2				10.2		
	38 W								
	58 W			6.5				6.5	
	70 W				3.7				3.7
TC-DD	10 W								
	16 W		20.0				20.0		
	21 W		13.9				13.9		
	28 W		12.2				12.2		
	38 W				8.9				8.9
	55 W				5.5				5.5
TC-SEL	7 W								
	9 W	13.6	21.8			13.6	21.8		
	11 W	16.0	28.0			16.0	28.0		
TC-DEL	10 W								
	13 W	13.9	21.3			13.9	21.3		
	18 W		15.5				15.5		
	26 W		13.0				13.0		
TC-TEL [®]	13 W	14.3 / 8.2	21.8 / 9.7			14.3 / 8.2	21.8 / 9.7		
	18 W		14.5 / 8.6	15.3 / 14.1			14.5 / 8.6	15.3 / 14.1	
	26 W [®]		10.4 / 8.5	9.7	11.9		10.4 / 8.5	9.7	11.9
	32 W [®]			12.8 / 4.8	x / 7.7			12.8 / 4.8	x / 7.7
	42 W				7.2 / 6.7				7.2 / 6.7
	57 W								
T5c	22 W		14.7				14.7		
	40 W				7.7				7.7
	55 W				4.4				4.4
TC-F	18 W		16.5				16.5		
	24 W			19.5				19.5	
	36 W			12.0				12.0	
TC-L	18 W		15.3				15.3		
	24 W			15.5				15.5	
	36 W			10.5				10.5	
	40 W			8.4				8.4	
	55 W				4.8				4.8
TC-R	14 W		18.2				18.2		
	17 W		13.3				13.3		

^① According to EN 61347-2-7: 2006

[®] The first figure is related to non-amalgam lamps, the second figure is related to amalgam lamps (e.g. 14 / 9.5).

[®] For best performance of 26W and 32W TC lamps, and especially amalgam filled lamps, we recommend the use of EM 06 ST G2 resp. EM 16 HO ST G2.

Emergency Ballast Lumen Factor (EBLF) in %^①

EM SELFTTEST G2, 1 h High Output

	Duration	1 h High Output BLF							
		3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
Type		EM 13 HO ST G2	EM 14 HO ST G2	EM 15 HO ST G2	EM 16 HO ST G2	EM 13 HO ST NiMH G2	EM 14 HO ST NiMH G2	EM 15 HO ST NiMH G2	EM 16 HO ST NiMH G2
Article no.		89800229	89800232	89800235	89800238	89800340	89800341	89800342	89800343
Lamp type	Wattage	EBLF in emergency lighting mode in % for rated operating time							
T5	6 W								
	8 W	46.0	54.5				46.0	54.5	
	13 W								
ECO T5	13 W		35.0					35.0	
	20 W		25.0					25.0	
	25 W				32.5				32.5
	32 W				25.9				25.9
	45 W				22.3				22.3
	50 W				18.0				18.0
	73 W				12.5				12.5
T5 FH	14 W		40.0					40.0	
	21 W			33.5				33.5	
	28 W				34.5				34.5
	35 W				25.8				25.8
T5 FQ	24 W		25.4					25.4	
	39 W				22.3				22.3
	49 W				15.7				15.7
	54 W				14.0				14.0
	80 W				10.3				10.3
T8	15 W		33.6					33.6	
	18 W		34.7					34.7	
	30 W								
	36 W		17.5					17.5	
	38 W								
	58 W			15.5				15.5	
	70 W								
TC-DD	10 W								
	16 W								
	21 W								
	28 W								
	38 W								
	55 W								
TC-SEL	7 W								
	9 W	27.2	43.6			27.2	43.6		
	11 W	35.0	45.0			35.0	45.0		
TC-DEL	10 W								
	13 W	25.0	34.5			25.0	34.5		
	18 W		25.1				25.1		
	26 W		21.1				21.1		
TC-TEL [®]	13 W	28.6 / 15.5	35.5 / 15.5			28.6 / 15.5	35.5 / 15.5		
	18 W		23.5 / 10.1				23.5 / 10.1		
	26 W [®]		21.0 / 12.5				21.0 / 12.5		
	32 W [®]			22.5 / 7.8				22.5 / 7.8	
	42 W			16.0 / 9.3				16.0 / 9.3	
	57 W								
T5c	22 W		26.5				26.5		
	40 W				18.9				18.9
	55 W				10.8				10.8
TC-F	18 W		26.0				26.0		
	24 W			35.7				35.7	
	36 W			22.0				22.0	
TC-L	18 W		27.5				27.5		
	24 W			34.1				34.1	
	36 W			23.1				23.1	
	40 W			18.5				18.5	
	55 W								
TC-R	14 W		44.4				44.4		
	17 W		32.5				32.5		

^① According to EN 61347-2-7: 2006

[®] The first figure is related to non-amalgam lamps, the second figure is related to amalgam lamps (e.g. 14 / 9.5).

[®] For best performance of 26W and 32W TC lamps, and especially amalgam filled lamps, we recommend the use of EM 06 ST G2 resp. EM 16 HO ST G2.

Lamp current in emergency operation in mA

EM SELFTTEST G2, 3 or 1 h

	Duration	1/3 h Standard BLF							
		3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
	Cells	EM 03 ST G2	EM 04 ST G2	EM 05 ST G2	EM 06 ST G2	EM 03 ST NiMH G2	EM 04 ST NiMH G2	EM 05 ST NiMH G2	EM 06 ST NiMH G2
	Article no.	89800198	89800201	89800204	89800207	89800336	89800337	89800338	89800339
Lamp type	Wattage	Lamp current in emergency operation in mA for rated operating time							
T5	6 W								
	8 W	31.5	40.0			31.5	40.0		
	13 W								
ECO T5	13 W		34.0				34.0		
	20 W		34.2				34.2		
	25 W				24.0				24.0
	32 W				20.3				20.3
	45 W				17.2				17.2
	50 W				12.9				12.9
	73 W				15.4				15.4
T5 FH	14 W		26.0				26.0		
	21 W			22.0				22.0	
	28 W				19.0				19.0
	35 W				15.0				15.0
T5 FQ	24 W		32.9				32.9		
	39 W				19.2				19.2
	49 W				14.0				14.0
	54 W				12.0				12.0
	80 W				15.2				15.2
T8	15 W		42.0				42.0		
	18 W		38.0				38.0		
	30 W		26.3				26.3		
	36 W								
	38 W								
	58 W			22.8				22.8	
	70 W				13.0				13.0
TC-DD	10 W								
	16 W		29.5				29.5		
	21 W		34.2				34.2		
	28 W		22.9				22.9		
	38 W				21.8				21.8
	55 W				20.5				20.5
TC-SEL	7 W								
	9 W	35.8	44.5			35.8	44.5		
	11 W	28.0	32.0			28.0	32.0		
TC-DEL	10 W								
	13 W	26.8	30.4			26.8	30.4		
	18 W		31.4				31.4		
	26 W		20.0				20.0		
TC-TEL [®]	13 W	27.0 / 26.0	32.5 / 31.8			27.0 / 26.0	32.5 / 31.8		
	18 W		31.9 / 31.4	32.4 / 32.3			31.9 / 31.4	32.4 / 32.3	
	26 W		26.7	29.9	29.9		26.7	29.9	29.9
	32 W			21.0 / 19.0	x / 17.0			21.0 / 19.0	x / 17.0
	42 W				14.0 / 12.0				14.0 / 12.0
	57 W								
T5c	22 W		30.1				30.1		
	40 W				16.4				16.4
	55 W				16.3				16.3
TC-F	18 W		40.0				40.0		
	24 W			42.0				42.0	
	36 W			26.0				26.0	
TC-L	18 W		41.4				41.4		
	24 W			36.0				36.0	
	36 W			25.0				25.0	
	40 W			16.0				16.0	
	55 W				16.4				16.4
TC-R	14 W		20.9				20.9		
	17 W		15.4				15.4		

[®] The first figure is related to non-amalgam lamps, the second figure is related to amalgam lamps (e.g. 15/16).

Lamp current in emergency operation in mA

EM SELFTTEST G2, 1 High Output

Lamp type	Wattage	1 h High Output BLF							
		3 cells	4 cells	5 cells	6 cells	3 cells	4 cells	5 cells	6 cells
Type		EM 13 HO ST G2	EM 14 HO ST G2	EM 15 HO ST G2	EM 16 HO ST G2	EM 13 HO ST NiMH G2	EM 14 HO ST NiMH G2	EM 15 HO ST NiMH G2	EM 16 HO ST NiMH G2
Article no.		89800229	89800232	89800235	89800238	89800340	89800341	89800342	89800343
Lamp current in emergency operation in mA for rated operating time									
T5	6 W								
	8 W	69.7	84.8			69.7	84.8		
	13 W								
ECO T5	13 W		68.2				68.2		
	20 W								
	25 W				58.0				58.0
	32 W								
	45 W								
	50 W								
	73 W				40.2				40.2
T5 FH	14 W		61.5				61.5		
	21 W			51.7				51.7	
	28 W				52.9				52.9
	35 W								
T5 FQ	24 W								
	39 W								
	49 W								
	54 W								
	80 W				37.2				37.2
T8	15 W								
	18 W								
	30 W								
	36 W		49.7				49.7		
	38 W								
	58 W			53.5				53.5	
	70 W								
TC-DD	10 W								
	16 W								
	21 W								
	28 W								
	38 W								
	55 W								
TC-SEL	7 W								
	9 W								
	11 W	52.2	68.9			52.2	68.9		
TC-DEL	10 W								
	13 W	46.8	62.3			46.8	62.3		
	18 W								
	26 W								
TC-TEL [®]	13 W	x / 50.6	x / 64.0			x / 50.6	x / 64.0		
	18 W								
	26 W		52.5 / 55.1				52.5 / 55.1		
	32 W			57.3				57.3	
	42 W			x / 44.9				x / 44.9	
	57 W								
T5c	22 W								
	40 W								
	55 W								
TC-F	18 W		83.8				83.8		
	24 W								
	36 W								
TC-L	18 W		81.3				81.3		
	24 W								
	36 W								
	40 W			50.9				50.9	
	55 W								
TC-R	14 W		43.3				43.3		
	17 W								

[®] The first figure is related to non-amalgam lamps, the second figure is related to amalgam lamps (e.g. 15 / 16).

Standards

- EN 61347-2-7
- EN 60925
- EN 55015
- EN 61000-3-2
- EN 61000-3-3
- EN 61547
- EN 60068-2-64
- EN 60068-2-29
- EN 60068-2-30
- according to EN 50172
- according to EN 60598-2-22
- according to EN 62034

Commissioning

After installation of the luminaire and initial connection of the mains supply and battery supply to the EM ST G2 the unit will commence charging the batteries for 20 hours (initial charge). 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 hours).

Testing:**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 30 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 (3 hr. resp. 1 hr.) 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.

Test switch

An optional test switch can be wired to each EM ST G2. 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

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.

Status indication

System status is indicated by a bi-colour LED.

LED indication	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 / lamp 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
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
Binary transmission of address via green/red LED	Address identification	During address identification mode
Green and red off	DC mode	Battery operation (emergency mode)

Technical data batteries

Accu-NiCd

4.2 / 4.5 Ah

Battery voltage/cell	1.2 V
Cell type	D
Case temperature range to ensure 4 years design life	+5 °C to +55 °C
Max. short term temperature (reduced life-time)	70 °C
Max. number discharge cycles	4 cycles per year plus 4 cycles during commissioning
Max. storage time	6 months

Accu-NiMH

2.2 Ah

Battery voltage/cell	1.2 V
Cell type	Cs
Case temperature range to ensure 4 years design life	+5 °C to +50 °C
When used with EM xx ST G2	+5 °C to +55 °C
When used with EM xx ST NiMH G2	70 °C
Max. short term temperature (reduced life-time)	70 °C
Max. number discharge cycles	4 cycles per year plus 30 cycles during commissioning
Max. storage time	12 months

4.0 Ah

Battery voltage/cell	1.2 V
Cell type	LA
Case temperature range to ensure 4 years design life	+5 °C to +45 °C
When used with EM xx ST G2	+5 °C to +50 °C
When used with EM xx ST NiMH G2	70 °C
Max. short term temperature (reduced life-time)	70 °C
Max. number discharge cycles	4 cycles per year plus 30 cycles during commissioning
Max. storage time	12 months

For further informations refer to corresponding battery datasheet.

Storage, installation and commissioning

Relevant information about storage conditions, installation and commissioning are provided in the battery datasheets.

Mechanical details

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

- LED bi-colour status indicator
- Green / red
 - Mounting hole 6.5 mm diameter, 1 – 1.6 mm thickness
 - Lead length 0.3 m / 1.0 m
 - Insulation rating: 90 °C
 - Plug connection

- Test switch
- Mounting hole 7.0 mm diameter
 - Lead length 0.55 m
 - Plug connection

- Battery leads
- Quantity: 1 red and 1 black
 - Length: 1.3 m
 - Wire type: 0.5 mm² 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 receptacles at each end and insulating covers to connect the separate sticks together.

Rest Mode / Inhibit Mode

Emergency operation is automatically started when the mains supply is switched off. If the Rest Mode is activated, the discharging of the battery will be minimized by switching off the lamp. If the Inhibit Mode has been activated before the mains supply is switched off, Rest Mode will be automatically activated if the mains supply is switched off within 15 minutes. Rest Mode and Inhibit Mode can be initiated by applying a short pulse between 9.5 and 22.5 V_{DC} in amplitude for a period of 150 to 1,000 ms. This pulse shall be applied to terminals marked Rest. After a mains reset the EM ST G2 exits the Rest Mode. Rest Mode and Inhibit Mode can both be disabled by applying a voltage pulse of 1,000 to 2,000 ms to the terminals marked as Rest to send the RE-LIGHT/ RESET INHIBIT command.

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

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.

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.

Life-time

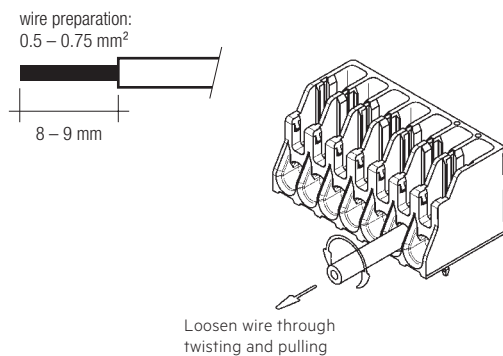
Average life-time 50,000 hours under rated conditions with a failure rate of less than 10 %. Average failure rate of 0.2 % per 1000 operating hours.

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



Note:

Basic insulation between supply and battery circuit.

IDC interface



- solid wire with a cross section of 0.5 mm² according to the specification from IDC terminals

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.

Duration link selection

Duration	Usage duration link
3 h	 With link
1 h	 Without link

Control gear supplied with duration link in 3 hours position.

The position of the link will only be read on first power up. If it is changed afterwards both the battery and mains supply must be disconnected for 10 seconds to enable the EM ST G2 to read the new link position on reconnection of the battery and mains. It will lead to a false battery failure indication if the link is changed after installation without this reset.

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 5 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 ST G2 module when considering ballast loading.

The LED and test switch wiring should be routed separately and kept as far away as possible from the high frequency lamp leads to avoid coupling.

To avoid the damage of the control gear, the wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.).

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	B10	B13	B16	B20	C10	C13	C16	C20	Inrush current	
Installation Ø	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²	1.5 mm ²	1.5 mm ²	1.5 mm ²	2.5 mm ²	I _{max}	time
EM 03 ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 04 ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 05 ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 06 ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 03 ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 04 ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 05 ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 06 ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 13 HO ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 14 HO ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 15 HO ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 16 HO ST G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 13 HO ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 14 HO ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 15 HO ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs
EM 16 HO ST NiMH G2	90	130	130	130	180	260	260	260	10 A	120 µs

EM FLT1 filter

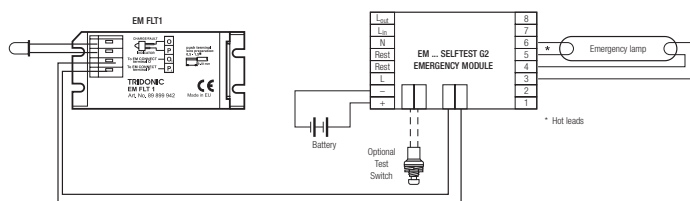
When the EM ST G2 is used in a remote application, where the lamp leads and LED indicator leads are routed together in close proximity, it is possible to have electrical interference picked up in the indicator leads.

Under certain conditions this interference can cause a lock-up of the EM ST G2 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 ST G2 unit. To be effective the filter must be connected close to the EM ST G2 module.

For further information please contact Tridonic.

Circuit diagram with EM FLT1 filter



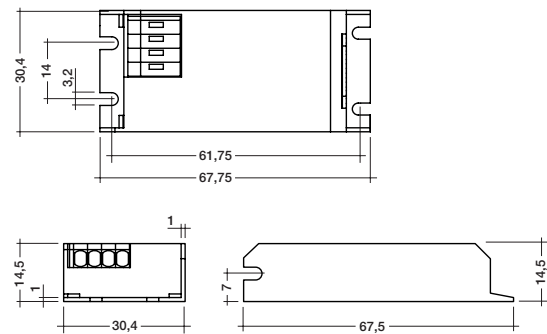
Technical data:

Push wire terminals 0.5–1.5 mm² solid conductor

Ordering data

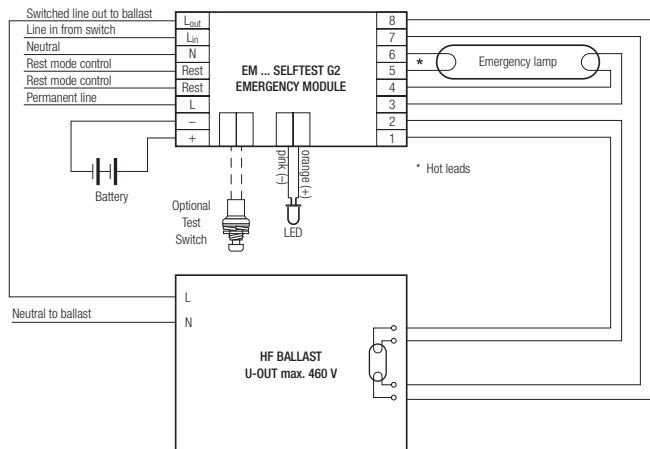
Type	Article number	Packaging, carton	Packaging, pallet	Weight per pcs.
EM FLT1	89899942	50 pc(s).	1,000 pc(s).	0.022 kg

EM FLT1 filter

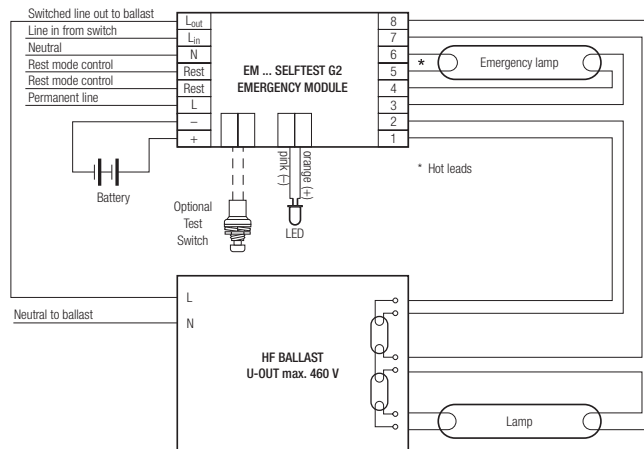


EM ... SELFTEST G2 emergency module wiring diagrams

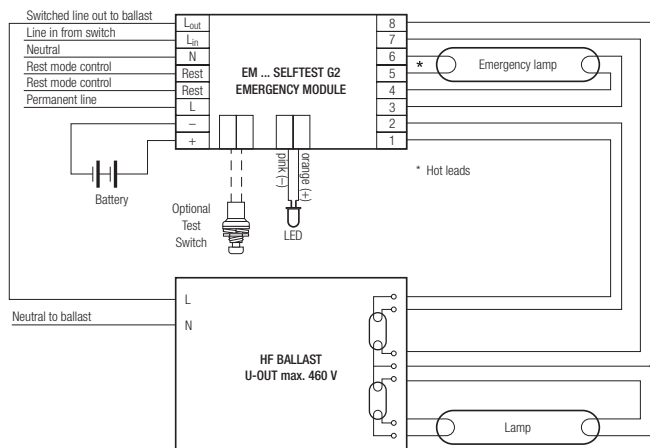
Not for use with magnetic ballasts and switch start circuits



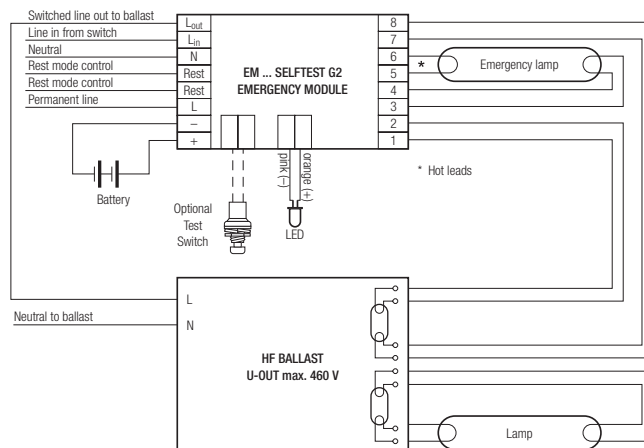
Wiring diagram for single lamp high frequency ballasts



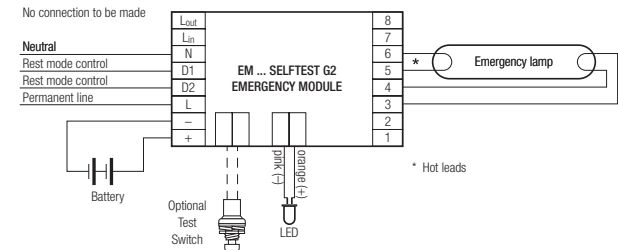
Wiring diagram for twin lamp high frequency ballasts with 6 terminals



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

Additional information

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

Guarantee conditions at www.tridonic.com → Services

Life-time declarations are informative and represent no warranty claim. No warranty if device was opened.