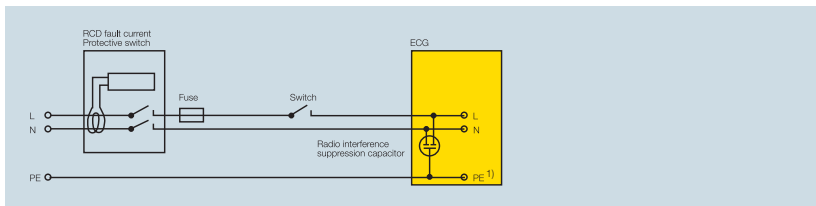


Installation and operating instructions



The following installation and operating instructions have been included to help you to get the most out of your ECGs.

Requirements

The requirements to be met by lighting systems with luminaires operated with ECGs fall into the following categories:

1. Fault currents/RCD
2. Rating for automatic line protection systems/in-rush currents
3. ECGs in three-phase operation
(overvoltages/undervoltages/missing neutral conductor)
4. ECGs in emergency lighting systems
(voltage ranges and switch-on times)
5. Power factor/compensation
6. Permissible cable lengths
7. Faults in infrared controls/transmission systems
(IR remote control, sound transmission, audio frequency ripple control, paging systems)
8. Dimming
9. Luminaires for ECGs
10. Ambient and ECG temperatures
11. ECGs for outdoor lighting
12. Wiring of the ECGs
13. Life and reliability of ECGs

For more detailed information see the Technical Guides at www.osram.com/ecg-downloads



1) Grounding requirements (PE):

- For Protection Class I equipment the protective earth (PE) must make contact with the casing via a serrated washer
- For dimmable ECGs the earth conductor must always be connected to reduce radio interference

Installation and operating instructions

1. Fault currents/RCD

Problem:

For ECGs with protective earth (PE) both the high short-duration in-rush current and the small leakage current from the interference suppression capacitors in the ECGs can trigger the residual current detector.

Solution:

- Distribute luminaires across 3 phases and use 3-phase RCDs
- Use surge-current-resistant short-delay RCDs
- If permissible, use 30 mA RCDs
- Connect a maximum of 45 ECGs per phase and RCD
- For a 3-phase RCD, a maximum of $3 \times 45 = 135$ ECGs can be connected

2. Rating for automatic line protection systems

In a choke/starter circuit the lamps do not all ignite simultaneously; in an ECG circuit all the fluorescent lamps ignite simultaneously.

On switch-on at peak voltage, the storage capacitors of electronic control gear cause a high but very brief current pulse.

In this case, the simultaneous charging of these capacitors in ECG operation can mean a higher system switch-on current than with a choke/starter circuit.

This reduces the maximum number of luminaires allowed per automatic line protection unit (see tables on the following pages).

For example, the maximum number of luminaires allowed on a 10 A circuit breaker reduces from 15 luminaires with 2x58 W lamps with conventional control gear in a twin circuit to 8 luminaires in an ECG circuit.



Installation and operating instructions

Ratings for automatic line protection systems

10 A circuit breaker

Maximum permissible number of ECGs for operating T8 fluorescent lamps (L 18W, L 36W, L 58W) with an N circuit breaker 10 A, single-pole, type B (made by Siemens)

	ECG type 1-lamp	Max. no. of ECGs	LLG 1-lamp uncomp.	LLG 1-lamp parallel comp.	ECG type 2-lamp	Max. no. of ECGs	LLG 2-lamp DUO
L 18W	QTP8 1x18	36	27	32	QTP8 2x18	25	23
	QTIS e 1x18	17	27	32	QTIS e 2x18	17	23
	QT-FIT8 1x18	17	27	32	QT-FIT8 2x18	8	23
L 36W	QTP8 1x36	25	23	32	QTP8 2x36	17	23
	QTIS e 1x36	17	23	32	QTIS e 2x36	5	23
	QT-FIT8 1x36	17	23	32	QT-FIT8 2x36	8	23
L 58W	QTI 1x28/54	26	15	20	QTI 2x28/54	19	15
	QTP8 1x58	17	15	20	QTP8 2x58	8	15
	QTIS e 1x58	8	15	20	QTIS e 2x58	5	15
	QT-FIT8 1x58	17	15	20	QT-FIT8 2x58	8	15

	ECG type 3-lamp	Max. no. of ECGs		ECG type 4-lamp	Max. no. of ECGs
L 18W	QTP8 3x18, 4x18	17		QTP8 3x18, 4x18	17
	QTIS e 3x18, 4x18	8		QTIS e 3x18, 4x18	8
	QTP8 3x18, 4x18	8		QTIS e 3x18, 4x18	8
L 36W	QT-FIT8 3x36	8		-	-

16 A circuit breaker

Maximum permissible number of ECGs for operating T8 fluorescent lamps (L 18W, L 36W, L 58W) with an N circuit breaker 16 A, single-pole, type B (made by Siemens)

	ECG type 1-lamp	Max. no. of ECGs	LLG 1-lamp uncomp.	LLG 1-lamp parallel comp.	ECG type 2-lamp	Max. no. of ECGs
L 18W	QTP8 1x18	59	43	51	QTP8 2x18	31
	QTIS e 1x18	28	43	51	QTIS e 2x18	28
	QT-FIT8 1x18	28	43	51	QT-FIT8 2x18	18
L 36W	QTP8 1x36	41	43	51	QTP8 2x36	28
	QTIS e 1x36	28	43	51	QTIS e 2x36	8
	QT-FIT8 1x36	28	43	51	QT-FIT8 2x36	13
L 58W	QTI 1x28/54	41	24	33	QTI 2x28/54	31
	QTP8 1x58	28	24	33	QTP8 2x58	13
	QTIS e 1x58	13	24	33	QTIS e 2x58	8
	QT-FIT8 1x58	28	24	33	QT-FIT8 2x58	13

	ECG type 3-lamp	Max. no. of ECGs		ECG type 4-lamp	Max. no. of ECGs
L 18W	QTP8 3x18, 4x18	28		QTP8 3x18, 4x18	28
	QTIS e 3x18, 4x18	13		QTIS e 3x18, 4x18	13
	QT-FIT8 3x18, 4x18	13		QTIS e 3x18, 4x18	13
L 36W	QT-FIT8 3x36	13		-	-

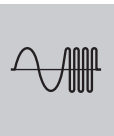


Installation and operating instructions

Ratings for automatic line protection systems

When using the values given in these tables please note the following:

- In ECG operation the load data relates to switching on at peak voltage
- Circuit breaker type and characteristics:
The specified load from fluorescent lamps and the associated control gear applies to N circuit breakers of Type 5 SN1–6 and 5 SX with B characteristics. If the above circuit breaker types with C characteristics are used the number of permitted luminaires for ECG operation can be doubled (note in particular VDE 0100 Part 410)
- Circuit breaker design:
The specified loading is for single-pole circuit breakers. When multi-pole circuit breakers are employed (2-pole, 3-pole) the number of permitted luminaires is reduced by 20 %
- Lamp switch-on:
The specified load applies:
 - to the joint and group-wise starting of the relevant number of luminaires in the case of “choke operation”
 - to the maximum permissible number of luminaires switched together (with one switching operation)
- Circuit impedance:
The specified loading applies with reference to a line impedance of 800 m Ω .
(This corresponds to a 15 m long cable with a diameter of 1.5 mm² from the distribution board to the first luminaire and a further distance of 20 m to the middle of the circuit. At a line impedance of 400 m Ω , the permitted values are reduced by 10 %, and by 20 % for a line impedance of 200 m Ω)



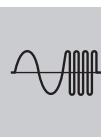
Inrush currents for ECGs Measured at $U_N = 230 V_{AC}$

ECGs	Ip/A	T _H /μs	Max. no. of ECGs on circuit breakers		ECG	Ip/A	T _H /μs	Max. no. of ECGs on circuit breakers	
			10 A	16 A				10 A	16 A
QUICKTRONIC® INTELLIGENT dimmable (DALI/DIM) for T5 and T8 fluorescent lamps					QUICKTRONIC® INTELLIGENT QTl				
QTi (DALI) 1x14/24 DIM	25	175	17	28	QTi 1x14/24/21/39 GII	-	-	17	28
QTi (DALI) 1x18 DIM	25	175	17	28	QTi 1x28/54/35/49 GII	-	-	17	28
QTi (DALI) 1x21/39 DIM	25	175	17	28	QTi 1x35/49/80 GII	-	-	8	13
QTi (DALI) 1x28/54 DIM	25	175	17	28	QTi 2x14/24/21/39 GII	-	-	8	13
QTi (DALI) 1x35/49/80 DIM	30	225	12	19	QTi 2x28/54/35/49 GII	-	-	8	13
QTi (DALI) 1x36 DIM	25	175	17	28	QTi 2x35/49/80	60	230	5	9
QTi (DALI) 1x58 DIM	25	175	17	28					
QTi (DALI) 2x14/24 DIM	35	180	12	19	QUICKTRONIC® T5 for HO (T5) fluorescent lamps				
QTi (DALI) 2x18 DIM	35	180	12	19	QTP5 1x14-35	24	230	17	28
QTi (DALI) 2x21/39 DIM	45	205	8	13	QTP5 2x14-35	40	200	12	19
QTi (DALI) 2x28/54 DIM	45	205	8	13	QTP5 1x24-39	24	230	17	28
QTi (DALI) 2x35/49 DIM	45	205	8	13	QTP5 1x49	24	230	17	28
QTi (DALI) 2x36 DIM	45	205	8	13	QTP5 1x54	40	200	12	19
QTi (DALI) 2x58 DIM	45	205	8	13	QTP5 1x80	40	200	12	19
QTi (DALI) 2x35/49/80 DIM	60	230	5	9	QTP5 2x24-39	40	200	12	19
QTi (DALI) 3x14/24 DIM	35	180	12	19	QTP5 2x49	53	190	8	13
QTi (DALI) 4x14/24 DIM	45	205	8	13	QTP5 2x54	53	190	8	13
QTi (DALI) 3x18 DIM	25	175	17	28	QTP5 3x14/4x14	-	-	8	13
QTi (DALI) 4x18 DIM	35	180	12	19	QT-FQ 2x80	39	230	5	9



Inrush currents for ECGs Measured at $U_N = 230 V_{AC}$

ECG	Ip/A	T _H /μs	Max. no. of ECGs on circuit breakers		ECG	Ip/A	T _H /μs	Max. no. of ECGs on circuit breakers	
			10 A	16 A				10 A	16 A
QUICKTRONIC® DIMMABLE with 1-10 V interface for T8 fluorescent lamps					Quicktronic® QT-FIT8 for T8 fluorescent lamps				
HF 1x18/230-240 DIM	14	140	37	61	QT-FIT8 1x18	15	200	17	28
HF 1x36/230-240 DIM	17	170	25	41	QT-FIT8 1x36	15	200	17	28
HF 1x58/230-240 DIM	20	210	17	28	QT-FIT8 1x58	15	200	17	28
					QT-FIT8 2x18	15	200	8	13
HF 2x18/230-240 DIM	25	165	17	28	QT-FIT8 2x36	15	200	8	13
HF 2x36/230-240 DIM	25	165	17	28	QT-FIT8 2x58	15	200	8	13
HF 2x58/230-240 DIM	40	230	8	13	QT-FIT8 3x18, 4x18	15	200	8	13
					QT-FIT8 3x36	15	200	8	13
QUICKTRONIC® PROFESSIONAL for T8 fluorescent lamps					QUICKTRONIC® for FC (T5) ring lamps				
QTP8 1x18/230-240	14	140	36	59	QT-FC 1x55/230-240 S	28	230	8	13
QTP8 1x36/230-240	17	155	25	41					
QTP8 1x58/230-240	20	210	17	28	QUICKTRONIC® for OSRAM DULUX® L				
					QTP-DL 1x18-24	13	320	17	28
QTP8 2x18/230-240	17	155	25	41	QTP-DL 1x36-40	13	320	17	28
QTP8 2x36/230-240	20	210	17	28	QTP-DL 1x55 Gen II	24	230	17	28
QTP8 2x58/230-240	28	230	8	13					
					QTP-DL 2x18-24	13	320	17	28
QTP8 3x18, 4x18/230-240	20	210	17	28	QTP-DL 2x36-42	23	250	12	19
					QTP-DL 2x55 Gen II	28	230	8	13
QUICKTRONIC® QTIS e for T8 fluorescent lamps					QUICKTRONIC® DALI and QUICKTRONIC® DIMMABLE with 1-10 V interface for T/E compact fluorescent lamps				
QTIS e 1x18	20	210	17	28	QTi (DALI)-T/E 1x18-57 DIM	30	225	12	19
QTIS e 1x36	20	210	17	28					
QTIS e 1x58	28	230	8	13	QTi (DALI)-T/E 2x18-42 DIM	45	205	8	13
QTIS e 2x18	20	210	17	28					
QTIS e 2x36	48	260	5	8					
QTIS e 2x58	48	260	5	8					
QTIS e 3x18, 4x18	28	230	8	13					



Inrush currents for ECGs Measured at $U_N = 230 V_{AC}$

ECG	I_p/A	$T_H/\mu s$	Max. no. of ECGs on circuit breakers		ECG	I_p/A	$T_H/\mu s$	Max. no. of ECGs on circuit breakers	
			10A	16A				10A	16A
QUICKTRONIC® MULTIWATT QT-M					DULUXTRONIC® for OSRAM DULUX S/E, D/E, T/E with integrated lampholder				
QTP-M 1x26-42 S	15	200	17	28	DT-S/E 5-11/220-240	6.2	110	33	52
QTP-M 2x26-32 S	25	250	11	19	DT-D/E 10-13/220-240	8	120	22	35
QTP-M 2x26-42/220-240 S	28	230	8	13	DT-T/E 18/230-240	3.5	590	15	25
QUICKTRONIC® for OSRAM DULUX S/E, D/E and T/E					POWERTRONIC®				
QTP-D/E 1x10-13	7	150	25	41	PTo 35/220-240	30	150	15	26
QTP-T/E 1x18	16	160	25	41	PTo 50/220-240 3DIM	40	250	7	13
QTP-D/E 2x10-13	20	200	17	28	PTo 70/220-240 3DIM	40	250	7	13
QTP-T/E 2x18	20	200	17	28	PTo 100/220-240 3DIM	60	250	5	8
QUICKTRONIC® ECONOMIC					PTo 150/220-240 3DIM	70	250	4	7
QT-ECO 1x4-16/220-240	10	75	68	112	PTi 20/220-240 S/I/B	12	300	19	33
QT-ECO 1x18-21/220-240	13	100	36	59	PTi 35/220-240 S/B MINI	25	210	17	28
QT-ECO 1x18-24/220-240	13	100	36	59	PTi 35/220-240 S/I	30	150	15	26
QT-ECO 1x26/220-240	14	120	30	50	PTi 35/220-240 SNAP	30	150	15	26
QT-ECO 2x5-11/220-240	12	100	51	84	PTi 2x35/220-240 S/I	40	250	7	13
QT-ECO T/E 2x18/220-240	11	150	35	56	PTi 70/220-240 S/I	40	250	7	13
QT-ECO T/E 2x26/220-240	16	200	23	37	PTi 70/220-240 SNAP	40	250	7	13
QUICKTRONIC® for FM (T2) fluorescent lamps					PTi 2x70/220-240 S/I	70	250	4	7
QT-FM 1x6/230-240	7.5	190	36	59	PTi 100/220-240 S/I	60	250	5	8
QT-FM 1x8/230-240	7.5	190	36	59	PTi 150/220-240 S/I	70	250	4	7
QT-FM 1x11/230-240	7.5	190	36	59	PT-FIT 35/220-240 S/I/B	30	150	15	26
QT-FM 1x13/230-240	7.5	190	36	59	PT-FIT 70/220-240 S/I/B	40	250	7	13
By using EBN-OS the number of POWERTRONIC ECGs per circuit breaker can be increased significantly. See also page 10.98.									
ECG type					No. without EBN-OS on a 16 A circuit breaker, type B		Approx. no. with EBN-OS on a 16 A circuit breaker, type B		
PTi 20/220-240					33		82		
PTi 35/220-240					26		65		
PTi 70/220-240					13		32		
PTi 100/220-240					8		20		
PTi 150/220-240					7		17		
PTi 2x35/220-240					13		32		
PTi 2x70/220-240					7		17		
PTi-FIT 35/220-240					26		65		
PTi-FIT 70/220-240					13		32		



Installation and operating instructions

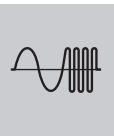
2a) Maximum permitted number of ECGs connected to automatic line protection systems

Maximum permitted no. of HALOTRONIC® units on an automatic circuit breaker

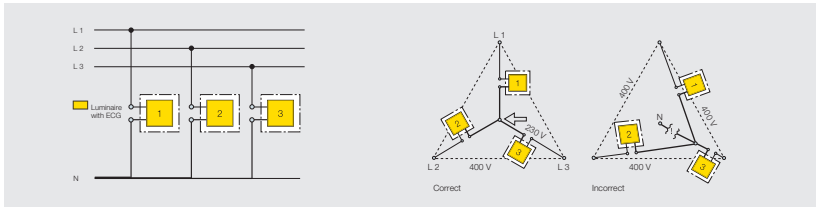
Circuit breaker	Characteristic	
	B 10	B 16
HALOTRONIC®		
HTI DALI 105	23	38
HTL 105	23	38
HTL 225	11	18
HTM 70	37	59
HTM 105	23	38
HTM 150	16	26
HTN 75 I/S	33	53
ET-PARROT 70	37	59
ET-PARROT 105	23	38

Maximum permitted no. of OPTOTRONIC® units on an automatic circuit breaker

ECG	Ip/A	T _H /μs	Max. no. of ECGs on circuit breakers	
			10A	16A
OPTOTRONIC®				
OT 6/200-240/10 CE	15	120	30	48
OT 12 LE	8	170	44	70
OT 15	8.3	210	60	100
OT 50	31	200	7	12
OT 50 E	35	180	7	12
OT 6/200-240/24 CE	15	120	30	48
OT 20	14	104	25	41
OT 20 S	45	150	7	11
OT 75	40	190	7	2
OT 75 E	34	200	7	12
OTI DALI 75	–	–	–	–
OT EASY 60	30	170	12	19
OT 9/200-240/350	15	120	30	48
OT 9/100-120/350	25	90	–	–
OT 9/200-240/350 DIM	15	170	30	48
OT 18/200-240/700 DIM	15	170	30	48
OT 35/200-240/700	30	200	7	11



Installation and operating instructions



The diagram above shows the wiring for luminaires or luminaire groups in 3-phase circuits and with a common neutral conductor. If the common neutral conductor is interrupted in a 3-phase star configuration and voltage is present, then luminaires

or groups of luminaires operated with electronic control gear may be exposed to unacceptably high voltages and the ECG itself may be destroyed.

3. ECGs in 3-phase operation

Overvoltages/undervoltages/no neutral conductor

1. Check whether the line voltage is within the application range of the ECG (DC/AC range from 198 V to 254 V).
2. The line connection should only be made to the luminaire terminal. For luminaires or groups of luminaires in 3-phase circuits.
3. Make absolutely sure that the neutral conductor is correctly connected to all the ECG luminaires and that it is making proper contact.
4. Cables should only be disconnected or connected when no voltage is present.
5. For 3x230/240 V supply networks in triangular circuit arrangements, protection by way of common disconnection of the phase conductor is necessary.

Important:

- In new systems the loads must not be connected when the insulation resistance is measured with 500 V DC, since according to VDE 0100 T600 Section 9 the test voltage is also applied between the neutral conductor (N) and all three external lines (L1, L2, L3). In existing systems it is sufficient, without disconnecting the loads, to conduct an insulation test between the external conductors (L1, L2, L3) and the protective earth (PE). The neutral conductor (N) and the protective earth (PE) must not be electrically connected in any way when this is done. For this insulation measurement (500 V DC to ground) the neutral conductor disconnection terminal may only be opened with the line voltage switched off.
- Before the equipment is put into operation make sure that the N conductor is correctly connected.
- During operation do not disconnect the N conductor under any circumstances.



Installation and operating instructions

4. ECGs in emergency lighting systems with DC voltage

Permitted battery voltage	Upper limit	Lower limit ¹⁾
QUICKTRONIC® INTELLIGENT DALI...DIM	264 V	154 V
QUICKTRONIC® INTELLIGENT DIM	264 V	154 V
QUICKTRONIC® INTELLIGENT GII	276 V	176 V
QUICKTRONIC® DIMMBAR (HF ... DIM)	264 V	154 V
QUICKTRONIC® PROFESSIONAL T5	276 V	176 V
QUICKTRONIC® PROFESSIONAL T8	276 V	154 V
QUICKTRONIC® PROFESSIONAL DL	276 V	154 V
QUICKTRONIC® PROFESSIONAL (D/E, T/E)	276 V	154 V
QUICKTRONIC® FIT T8	264 V	185 V
QUICKTRONIC® INSTANT START economic	Not permitted for dc operation	
QUICKTRONIC® Professional Multiwatt	276 V	176 V
QUICKTRONIC MULTIWATT®	264 V	176 V
QUICKTRONIC® FM	Not permitted for dc operation	
QUICKTRONIC® ECONOMIC	254 V	176 V
DULUXTRONIC®	254 V	176 V
QUICKTRONIC® ENDURA S	290 V	176 V
HALOTRONIC® ³⁾	275 V	176 V
OPTOTRONIC®	Not permitted for dc operation	
POWERTRONIC® ²⁾	Not permitted for dc operation	

Switch-on times	Maintained Supply is switched from AC to DC	Non-maintained Emergency luminaires are on from cold
QUICKTRONIC® INTELLIGENT DALI...DIM	< 0.6 s	< 0.6 s
QUICKTRONIC® INTELLIGENT DIM	< 0.6 s	< 0.6 s
QUICKTRONIC® INTELLIGENT GII	< 0.3 s	< 1 s
QUICKTRONIC® DIMMBAR (HF ... DIM)	< 0.6 s	< 0.6 s
QUICKTRONIC® PROFESSIONAL T5	< 0.3 s	< 1 s
QUICKTRONIC® PROFESSIONAL T8	< 0.5 s	< 2 s
QUICKTRONIC® PROFESSIONAL DL	< 1.0 s	< 1 s
QUICKTRONIC® PROFESSIONAL DL55 GII	< 0.3 s	< 1 s
QUICKTRONIC® PROFESSIONAL D/E, T/E	< 1 s	< 1 s
QUICKTRONIC® FIT T8	< 0.5 s	< 1 s
QUICKTRONIC® INSTANT START economic	–	–
QUICKTRONIC® Professional Multiwatt	< 0.3 s	< 1 s
QUICKTRONIC MULTIWATT®	< 0.5 s	< 1 s
QUICKTRONIC® FM	–	–
QUICKTRONIC® ECONOMIC	< 0.5 s	< 2 s
DULUXTRONIC®	< 0.5 s	< 2 s
QUICKTRONIC® ENDURA S	< 0.5 s	< 0.5 s
HALOTRONIC® ³⁾	< 0.5 s	< 0.5 s
POWERTRONIC® ²⁾	–	–

1) The lamps must be ignited at over 198 V however

2) If POWERTRONIC® is switched on from cold, it takes 1 to 2 minutes for the lamp to reach 70 % of the luminous flux

3) For suitable types see page 12.100



Installation and operating instructions

5. Power factor/compensation

The power factor λ for an electrical load is the ratio of the effective power ($P_{\text{eff}} = \text{voltage} \times \text{effective current}$) to the apparent power ($P_{\text{app}} = \text{voltage} \times \text{current}$). This value is affected both by the phase displacement $\cos \varphi$ between the current and the voltage and by the current distortion ε .

$$\lambda = \frac{P_{\text{eff}}}{P_{\text{app}}} = \varepsilon \cdot \cos \varphi$$

In contrast to CCG (inductive, 50 Hz), there is hardly any phase displacement ($\cos \varphi=0.95$) with ECG (high frequency) so compensation is not required. However distortion in the sine-wave current supply occurs during operation of electronic control gear. Generally speaking, these distortions are classified by integer multiples of the line frequency (harmonics).

The harmonic content of the line current is strictly controlled by national and international standards IEC 61000-3-2). OSRAM ECGs have integrated active electronic harmonic filters for this purpose, which ensure a value for ε of more than 0.95 and therefore a power factor λ greater than 0.9 (exceptions are identified).

6. Permissible cable lengths

QUICKTRONIC®:

When ECGs are used in luminaires the cables, if correctly routed within the luminaires, produce little interference. When ECGs are used in master/slave circuits the maximum permissible cable length between the ECG and the lamp must not be exceeded.

HALOTRONIC®:

The maximum 12 V cable length must be less than 2 m to comply with radio interference limit values. This means that luminaires can be installed within a radius of 2 m around HALOTRONIC®. The recommended minimum cross-section is 1 mm².

Cable routing:

The power supply cable should not be routed alongside the HALOTRONIC® casing nor alongside the high-frequency 12 V secondary cable.

This avoids high-frequency interference on the power supply cable.

Instruments for measuring the secondary voltage:

An instrument for measuring the secondary voltage must be a true RMS meter and have a bandwidth greater than or equal to 250 kHz (–3 dB). Any other instrument will give false readings.

OPTOTRONIC®:

Maximum low-voltage cable length from OPTOTRONIC® to the LED module:

	Max. cable length in AC operation
OT 6/200-240/10 CE	10 m
OT 6/200-240/24 CE	10 m
OT 8/200-240/24	10 m
OT 12/220-240/10 LE	10 m
OT 15/220-240/10	10 m
OT 20/220-240/24	10 m
OT 20/120-240/24 S	10 m
OT 50/220-240/10 E	10 m
OT 50/220-240/10	10 m
OT 65/220-240/24 3DIM E	10 m
OT 75/220-240/24 E	10 m
OT 75/220-240/24	10 m
OT EASY 60/220-240/24 RGB+W	10 m
OTi DALI 75/220-240/24 1-4 channel	10 m
OT 9/200-240/350	10 m
OT 9/100-120/350 E	10 m
OT 9/200-240/350 DIM	10 m
OT 9/10-24/350 DIM	10 m
OT 18/200-240/700 DIM	10 m
OT 35/200-240/700	10 m
OT 42/220-240/350 E	2 m

The cable lengths are determined by the interference suppression threshold values.

Cable routing:

For reasons of interference suppression, the power cable should not be laid parallel to the casing and/or the secondary cable. This will avoid high-frequency coupling effects.

Measurement of the secondary voltage:

Standard multimeters with appropriate accuracy can be used.

POWERTRONIC®:

The maximum cable lengths between the lamp and POWERTRONIC® depend on the type of cable and how it is routed.

The following maximum cable lengths can be used as guidelines:

	Max. cable length in AC operation
PTo 35/220-240	1.5 m
PTo 50/220-240 3DIM	1.5 m
PTo 70/220-240 3DIM	1.5 m
PTo 100/220-240 3DIM	1.5 m
PTo 150/220-240 3DIM	1.5 m
PTi 20/220-240 S/B	0.5 m
PTi 20/220-240 I	1.5 m
PTi 35/220-240 S/B MINI	0.5 m
PTi 35/220-240 S/I	1.5 m
PTi 35/220-240 SNAP	1.5 m
PTi 2x35/220-240 S/I	1.5 m
PTi 70/220-240 S/I	1.5 m
PTi 70/220-240 SNAP	1.5 m
PTi 2x70/220-240 S/I	1.5 m
PTi 100/220-240 S/I	1.5 m
PTi 150/220-240 S/I	1.5 m
PT-FIT 35/220-240 S/I/B	1.5 m
PT-FIT 70/220-240 S/I/B	1.5 m
PTg 1000/400	0.8 m



Installation and operating instructions

7. Faults in infrared control/ transmission systems

Fluorescent lamps have an emission in the wavelength range which is also used for infrared transmission and which can be affected by the lamp. Since the IR receivers used are largely non-selective, interference may occur in the IR system. The operating frequency of the ECGs is between 20 and 120 kHz. The light emitted from the fluorescent lamp is modulated at twice the operating frequency. Interference is produced by signals in the same frequency range.

Exception: Interference is not expected with POWERTRONIC®, HALOTRONIC® or OPTOTRONIC®.

IR remote control:

Systems operating at a sufficiently high carrier frequency (400 to 1500 kHz) are unlikely to suffer interference.

Sound transmission:

Up to now the carrier signal frequency for sound transmission has been 95 kHz and higher, which has led to serious disturbance from the 3rd, 5th and 7th harmonics of the ECG operating frequency ranges (20 to 120 kHz in normal operation and up to 100 kHz with dimming). Headphone manufacturers have adopted higher and higher frequencies such as 2.3 MHz and 2.8 MHz.

Simultaneous interpreting systems also operate in the 95 kHz to 250 kHz range so it is best not to use the first 6 transmission channels, particularly channel 1, of the 32 available channels since these are likewise affected by the harmonics of the basic ECG frequencies.

High-frequency ripple control:

The carrier frequencies used are around 120 kHz. Transmission can be adversely affected by radio interference suppression capacitors which are included in all ECGs and other electronic loads, such as the power supplies of PCs.

Paging systems:

Generally only HF paging systems (operating in the MHz range) should be used. If inductive paging systems are used (25 to 40 kHz) reliable operation is not possible.

Electronic merchandise security systems:

In many shops nowadays, merchandise such as DVDs, hi-fi equipment and clothing is protected against theft by electronic security systems.

These systems typically operate with resonance frequencies in the kHz range (e.g. a pulse is emitted which causes an amorphous metal in the security tag to resonate; one of the largest suppliers uses a security system that operates at 58 kHz).

In unfavorable conditions, these systems may suffer from interference if the operating frequency is between 30 kHz and 150 kHz.

Such interference can be eliminated by increasing the distance between the luminaires and the transmitting/receiving system and by using luminaires with metallic louvers.

8. Dimming

a) QUICKTRONIC® units that can be dimmed have the letters ...DIM in their references. They are dimmed via the 1-10 V interface (QTi-...DIM), via the DALI interface (QTi DALI ... DIM) or via Touch DIM® (also with QTi DALI ... DIM), see p. 10.18 f. For special technical data such as wiring and associated control components, please refer to the technical guides for QUICKTRONIC® DIMMABLE (for the 1-10 V interface) or QUICKTRONIC® DALI DIMMABLE (for the DALI interface and Touch DIM®).

Allow new lamps to burn in for 100 hours at 100 % luminous flux since only after this time will they exhibit stable values. A master/slave circuit (one ECG for two separate luminaires with wiring) is not generally permitted for dimmable ECGs.

b) HALOTRONIC® can be controlled with various dimmers (see p. 10.99) or dimming modules (see p. 10.103) depending on type. Since the interface between the dimmer and the electronic transformer is not standardized, there may be malfunctions in individual cases.

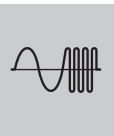
c) POWERTRONIC® PTo 3 DIM units enable metal halide lamps with ceramic burners and also sodium vapor lamps to be dimmed. Dimming is performed via the DALI interface, StepDIM 2-stage phase control or autonomously via the internal AstroSense control system of the ECG. Details on dimming HID lamps can be found in "Technical information on power reduction for high-intensity discharge lamps" (www.osram.com).

d) OPTOTRONIC® cannot be dimmed with conventional dimmers. There are special dimming modules to be connected on the secondary side (p. 10.112)

9. Luminaires with ECGs

The following general points apply to luminaires with electronic control gear:

- The temperature limits of the electronic control gear as regards ambient temperature and measuring point temperature on the ECG must not be exceeded (see 10. Ambient and ECG temperatures).
- The maximum permissible radio interference suppression values (EN 55015) must not be exceeded. Make sure the protective conductor and the function earth are correctly connected. Running the lamp cables and protective conductor together (e.g. NYM cables) may lead to problems due to high-frequency interference.
- After being installed or replaced, the lamps must be burned in at full load for 100 hours to stabilize the discharge process.



Installation and operating instructions

10. Ambient and ECG temperatures

The temperature ranges specified for the relevant control gear must be maintained to enable the ECG to operate reliably. Generally speaking, low operating temperatures increase the life of ECGs.

When ECGs are built into luminaires the measuring point temperature t_c on the casing is the crucial parameter. The maximum permissible value specified for the ECG concerned must not be exceeded.

11. ECGs for outdoor luminaires

Electronic control gear has been developed for indoor use (IP 20).

ECGs for high-intensity discharge lamps (PTo) and operating devices for LED modules (OT...E) have been designed for outdoor applications.

They are specially equipped for such applications; for example they are protected against moisture, ac voltage peaks and vibrations (wind load, rail vehicles). When using ECGs in outdoor luminaires it must be remembered that the ECG may be exposed to humidity.

1. For luminaires of protection type 5 (protected against water jets, IP65 for example) standard ECGs can be used since moisture cannot penetrate this type of luminaire, so there is little chance of ECG corrosion.
2. For luminaires of protection type 3 (protected against splash water, IP43 for example) it is likely that water droplets will penetrate and thus cause corrosion and failure of unprotected standard ECGs. In cases of doubt (e. g. bollard luminaires, outdoor displays), additional protective measures should be taken such as using OUTKIT (see p. 10.104).

12. Wiring of ECGs

Parallel connection of HALOTRONIC® and OPTOTRONIC® (with the exception of OT 50 [E] and OT 75 [E]) is not permitted on the secondary side. Series connection of HALOTRONIC® and OPTOTRONIC® to increase the voltage or for voltage matching is not permitted on the secondary side. Lamp-side switching or dimming is not permitted. The only permitted loads for electronic transformers are low-voltage halogen lamps. For details see the Technical Guides.

13. Lifetime and reliability of ECGs

The failure rate of electronic components depends not only on the component specification and quality but to a large extent on the operating temperature. The electronic operating devices from OSRAM are designed so that at the maximum permissible device temperature ($t_{c,max}$) a failure rate of less than 0.2 percent per 1,000 hours of operation can be expected.

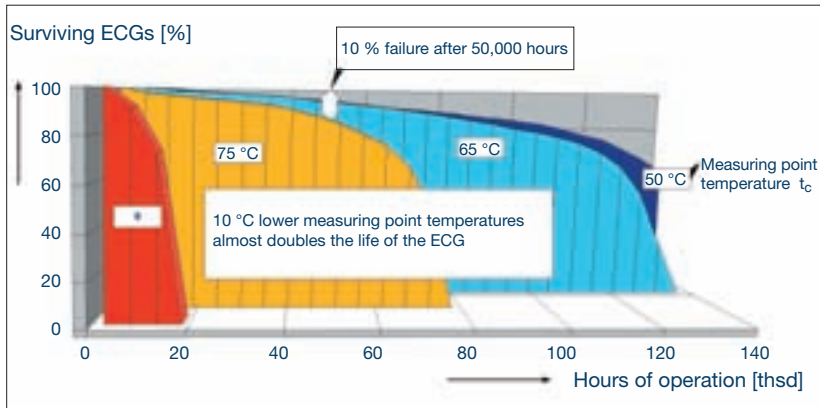
This corresponds to an ECG life of 50,000 hours at a percentage ECG failure rate of 10 %. In actual practice it can be assumed that at a temperature 10 °C less than the maximum permitted temperature (t_c) the life of an ECG is doubled

The following have different lifetimes:

1. 30,000 hours for QUICKTRONIC® QT-ECO and QTIS e, DULUXTRONIC®, HALOTRONIC®, HTM MOUSE® and HTN at a failure rate of <10 %
2. 60,000 hours for QT ENDURA at a failure rate of <10 %
3. Between 30,000 and 50,000 hours for OPTOTRONIC® depending on version at a failure rate of <10 %
4. 60,000 hours for POWERTRONIC® PTo at a failure rate of <8 %
40,000 hours for POWERTRONIC® PTi at a failure rate of <10%

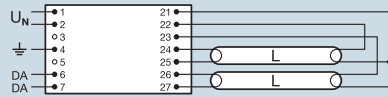
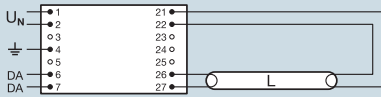
Subject to change without notice. Errors and omission excepted. This catalog information supersedes all previous information.

Special applications, such as operation in corrosive atmospheres, strong vibrations, impermissible voltage conditions etc., may necessitate further protection measures.



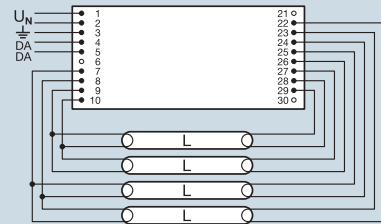
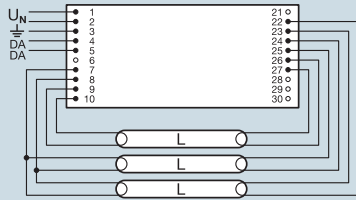
* If the maximum permissible temperature at the t_c point is exceeded the failure rate may increase dramatically.

Wiring diagrams for dimmable (DALI) ECGs



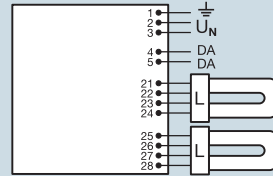
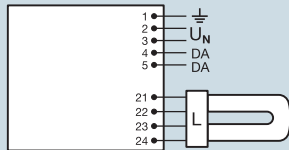
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 QTi DALI 1x28/54 DIM, QTi DALI 1x35/49/80 DIM,
 QTi DALI 1x18 DIM, QTi DALI 1x36 DIM,
 QTi DALI 1x58 DIM

QTi DALI 2x14/24 DIM, QTi DALI 2x21/39 DIM,
 QTi DALI 2x28/54 DIM, QTi DALI 2x35/49 DIM,
 QTi DALI 2x35/49/80 DIM, QTi DALI 2x18 DIM,
 QTi DALI 2x36 DIM, QTi DALI 2x58 DIM



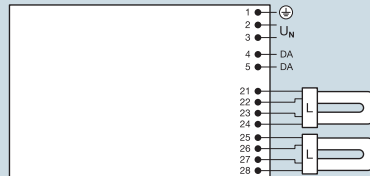
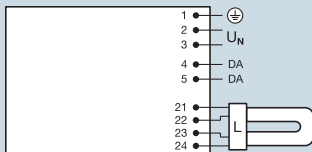
QTi DALI 3x14/24 DIM
 QTi DALI 3x18 DIM

QTi DALI 4x14/24 DIM
 QTi DALI 4x18 DIM



QTi DALI-T/E 1x18-57 DIM

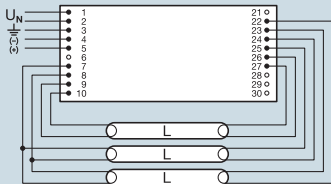
QTi DALI-T/E 2x18-42 DIM



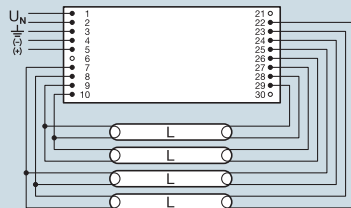
QT DALI-T/E 1x14-17 DIM HE

QT DALI-T/E 2x14-17 DIM HE

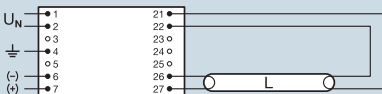
Wiring diagrams for dimmable (1-10 V) ECGs



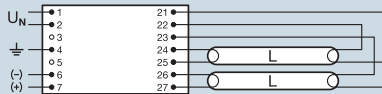
QTi 3x14/24/220-240 DIM
QTi 3x18/220-240 DIM



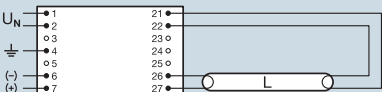
QTi 4x14/24/220-240 DIM
QTi 4x18/220-240 DIM



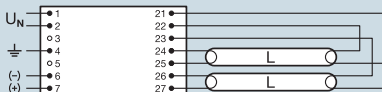
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QTi 1x28/54/220-240 DIM, QTi 1x35/49/80/220-240 DIM,
QTi 1x18/220-240 DIM, QTi 1x36/220-240 DIM,
QTi 1x58/220-240 DIM



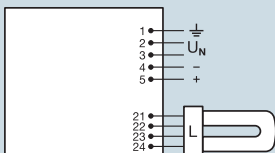
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QTi 2x28/54/220-240 DIM, QTi 2x35/49/220-240 DIM,
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QTi 2x36/220-240 DIM, QTi 2x58/220-240 DIM



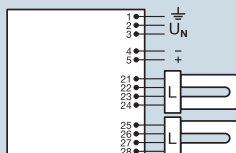
HF 1x18/230-240 DIM, HF 1x36/230-240 DIM,
HF 1x58/230-240 DIM



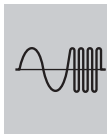
HF 2x18/230-240 DIM, HF 2x36/230-240 DIM,
HF 2x58/230-240 DIM



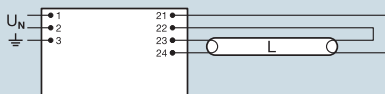
QTi-T/E 1x18-57 DIM



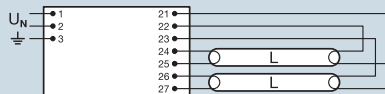
QTi-T/E 2x18-42 DIM



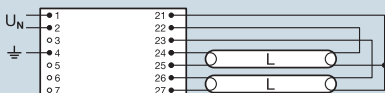
Wiring diagrams for non-dimmable (T5) ECGs



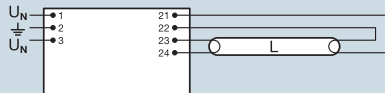
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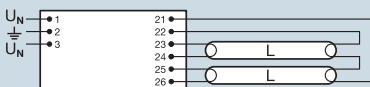
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QTi 2x28 /54/35/49 GII



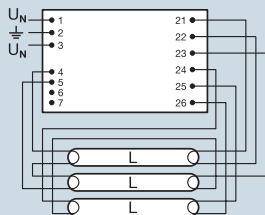
QTi 2x35/49/80



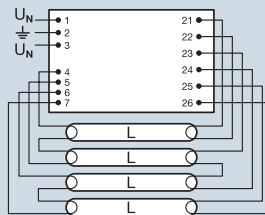
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QTP5 1x80



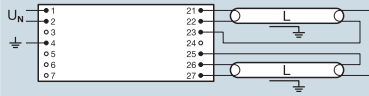
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QTP5 2x49, QTP5 2x54



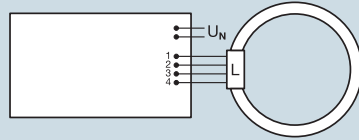
QTP5 3x14
QTP5 4x14



Wiring diagrams for non-dimmable (T5) ECGs

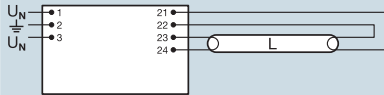


QT-FQ 2x80

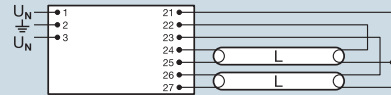


QT-FC 1x55/230-240 S

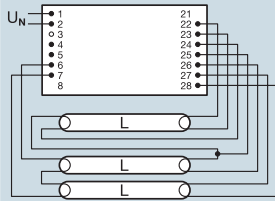
Wiring diagrams for non-dimmable (T8) ECGs



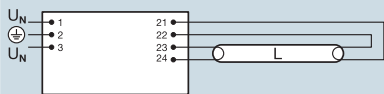
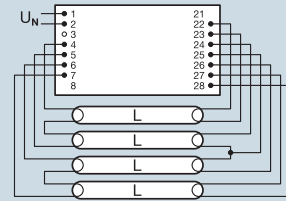
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QTP8 1x58/230-240



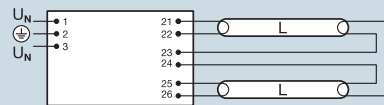
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QTP8 2x58/230-240



QTP8 3x/4x18/230-240



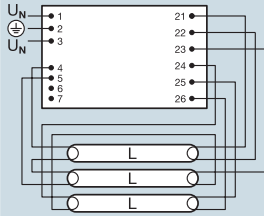
QT-FIT8 1x18, QT-FIT8 1x36, QT-FIT8 1x58-70



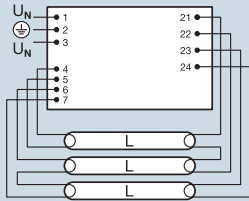
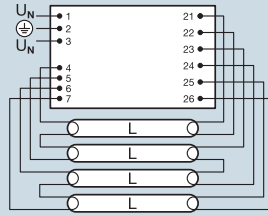
QT-FIT8 2x18, QT-FIT8 2x36, QT-FIT8 2x58-70



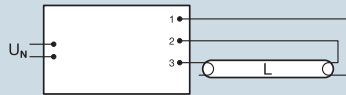
Wiring diagrams for non-dimmable (T8) ECGs



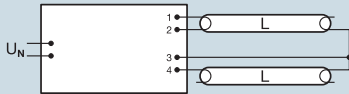
QT-FIT8 3x/4x18



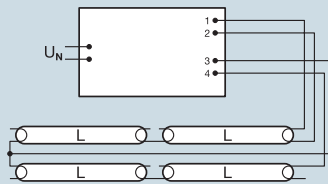
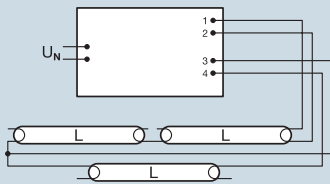
QT-FIT8 3x36



QTIS e 1x18/220-240, QTIS e 1x36/220-240,
QTIS e 1x58/220-240

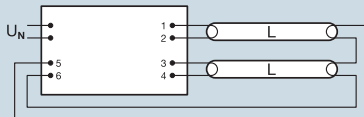
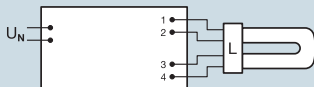


QTIS e 2x18/220-240, QTIS e 2x36/220-240,
QTIS e 2x58/220-240



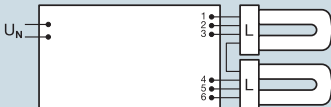
QTIS e 3x/4x18/220-240

Wiring diagrams for non-dimmable (CFL) ECGs



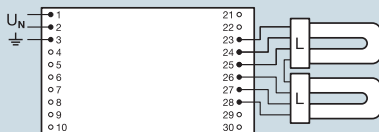
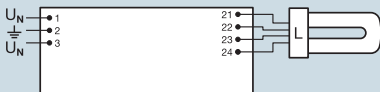
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 QT-ECO 1x18-24/220-240 S, QT-ECO 1x26/220-240 S,
 QT-ECO 1x4-16/220-240 L, QT-ECO 1x4-16/220-240 S

QT-ECO 2x5-11/220-240 S



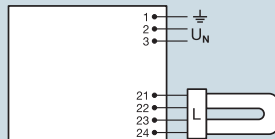
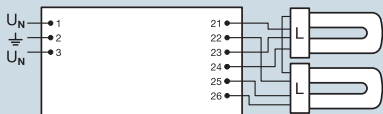
QT-ECO T/E 2x18/220-240
 QT-ECO T/E 2x26/220-240

QTP-DL 1x18-24
 QTP-DL 1x36-40



QTP-DL 1x55 GII

QTP-DL 2x18-24
 QTP-DL 2x36-40

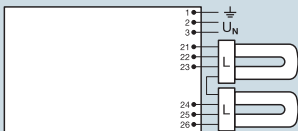


QTP-DL 2x55 GII

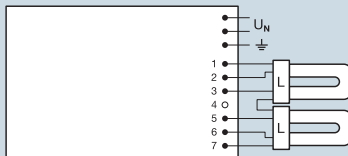
QTP-D/E 1x10-13
 QTP-T/E 1x18



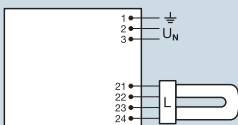
Wiring diagrams for non-dimmable (CFL) ECGs



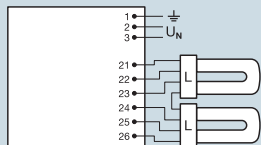
QTP-D/E 2x10-13
QTP-T/E 2x18



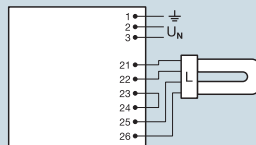
QT-M 2x26-42/220-240 S



QTP-M 1X26-42 S



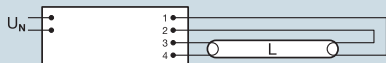
QTP-M 2X26-32 S



QT-T/E 1x14-17 HE

QT-T/E 2x14-17 HE

Wiring diagrams for non-dimmable (T2) ECGs



QT-FM 1x11/230-240 L, QT-FM 1x11/230-240 LB,
QT-FM 1x13/230-240 L, QT-FM 1x13/230-240 LB,
QT-FM 1x6/230-240 L, QT-FM 1x8/230-240 L,
QT-FM 1x8/230-240 LB

Overview of ECGs (cable lengths in meters, wiring by PIN)

		Wiring													
		Sequence	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	Type					
QUICKTRONIC® INTELLIGENT DALI-/1...10-V interface															
QTi (DALI) 1x14/24/220-240 DIM	21-27	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 1x18/220-240 DIM	21-24	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 1x21/39/220-240 DIM	21-24	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 1x28/54/220-240 DIM	21-24	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 1x35/49/80/220-240 DIM	21-24	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 1x36/220-240 DIM	21-24	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 1x58/220-240 DIM	21-24	1.5	1.5	-	-	-	1	1		W1					
QTi (DALI) 2x14/24/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x18/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x21/39/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x28/54/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x35/49/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x36/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x58/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
QTi (DALI) 2x35/49/80/220-240 DIM	21-27	1.5	1.5	1.5	1	1	1	1		W1					
Wiring															
		Sequence	PIN 7	PIN 8	PIN 9	PIN 10	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	PIN 28	PIN 29	Type
QUICKTRONIC® (DALI)															
QTi (DALI) 3x18 DIM	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-	-	W1	
QTi (DALI) 4x18 DIM	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	W1	
QTi (DALI) 3x14/24 DIM	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-	-	W1	
QTi (DALI) 4x14/24 DIM	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	W1	
Wiring															
		Sequence	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	PIN 28	Type				
QUICKTRONIC® DALI-/1...10-V interface for T/E (T4/Ø 12 mm) fluorescent lamps															
QTi (DALI)-T/E 1x18-57 DIM	21-24	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	W				
QTi (DALI)-T/E 2x18-42 DIM	21-28	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	W				
Wiring															
		Sequence	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	Type					
QUICKTRONIC® INTELLIGENT															
QTi 1x14/24/21/39 GII	21-24	2	2	1	1	-	-	-		W1					
QTi 1x28/54/35/49 GII	21-24	2	2	1	1	-	-	-		W1					
QTi 1x35/49/80 GII	21-24	2	2	1	1	-	-	-		W1					
QTi 2x14/24/21/39 GII	21-27	2	2	2	1	1	1	1		W1					
QTi 2x28/54/35/49 GII	21-27	2	2	2	1	1	1	1		W1					
QTi 2x35/49/80	21-27	2	2	2	1	1	1	1		W1					
QT-FQ 2x80	21-27	0.5	0.5	0.5	-	1.5	1.5	1.5		W1					

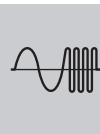


Overview of ECGs (cable lengths in meters, wiring by PIN)

	Wiring									Type		
	Sequence	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27				
QUICKTRONIC® DE LUXE DIMMABLE												
HF 1x18/230-240 DIM	21-27	2	2	-	-	-	1.5	1.5		W		
HF 1x36/230-240 DIM	21-27	2	2	-	-	-	1.5	1.5		W		
HF 1x58/230-240 DIM	21-27	2	2	-	-	-	1.5	1.5		W		
HF 2x18/230-240 DIM	21-27	2	2	2	1.5	1.5	1.5	1.5		W		
HF 2x36/230-240 DIM	21-27	2	2	2	1.5	1.5	1.5	1.5		W		
HF 2x58/230-240 DIM	21-27	2	2	2	1.5	1.5	1.5	1.5		W		
QUICKTRONIC® for T5 lamps												
QTP5 1x14-35	21-24	2	2	1	1	-	-	-		W1		
QTP5 2x14-35	21-24	2	2	1	1	2	2	-		W1		
QT-FQ 2x80	21-27	0.5	0.5	0.5	-	1.5	1.5	1.5		W1		
QTP5 1x24-39	21-24	2	2	1	1	-	-	-		W1		
QTP5 1x49	21-24	2	2	1	1	-	-	-		W1		
QTP5 1x54	21-24	2	2	1	1	-	-	-		W1		
QTP5 1x80	21-24	2	2	1	1	-	-	-		W1		
QTP5 2x24-39	21-26	2	2	1	1	2	2	-		W1		
QTP5 2x49	21-26	2	2	1	1	2	2	-		W1		
QTP5 2x54	21-26	2	2	1	1	2	2	-		W1		
Wiring												
QTP5 3x14, 4x14	Sequence	PIN 4	PIN 5	PIN 6	PIN 7	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	Type
	-	1.5	1.5	1	1	1.5	1.5	1.5	1.5	1	1	W1
QUICKTRONIC® PROFESSIONAL												
	Wiring	Sequence	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	PIN 28	Type	
QTP8 1x18/230-240	21-24	3	3	1.5	1.5	-	-	-	-	-	W1	
QTP8 1x36/230-240	21-24	3	3	1.5	1.5	-	-	-	-	-	W1	
QTP8 1x58/230-240	21-24	3	3	1.5	1.5	-	-	-	-	-	W1	
QTP8 2x18/230-240	21-27	3	3	3	1.5	1.5	1.5	1.5	-	-	W1	
QTP8 2x36/230-240	21-27	3	3	3	1.5	1.5	1.5	1.5	-	-	W1	
QTP8 2x58/230-240	21-27	3	3	3	1.5	1.5	1.5	1.5	-	-	W1	
QTP8 3x18/4x18/230-240 ¹⁾	21-31	1	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	W1	
QUICKTRONIC® FIT 8												
QT-FIT8 1x18	21-24	2	2	1	1	-	-	-	-	-	-	
QT-FIT8 1x36	21-24	2	2	1	1	-	-	-	-	-	-	
QT-FIT8 1x58-70	21-24	2	2	1	1	-	-	-	-	-	-	
QT-FIT8 2x18	21-27	2	2	1.5	1.5	1	1	-	-	-	-	
QT-FIT8 2x36	21-26	2	2	1.5	1.5	1	1	-	-	-	-	
QT-FIT8 2x58-70	21-26	2	2	1.5	1.5	1	1	-	-	-	-	
Wiring												
QT-FIT8 3x18, 4x18	Sequence	PIN 4	PIN 5	PIN 6	PIN 7	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	Type
QT-FIT8 3x36	-	1.5	1.5	1	1	1.5	1.5	1.5	1.5	1	1	-
	-	2	2	2	2	2	2	1	1	-	-	-
QUICKTRONIC® INSTANT START economic												
	Wiring	Sequence	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	Type	
QTIS e 1x18/220-240	1-3	2	2	1	-	-	-	-	-	-	W1	
QTIS e 1x36/220-240	1-3	2	2	1	-	-	-	-	-	-	W1	
QTIS e 1x58/220-240	1-3	2	2	1	-	-	-	-	-	-	W1	
QTIS e 2x18/220-240	1-4	2	2	1	1	-	-	-	-	-	W1	
QTIS e 2x36/220-240	1-4	2	2	1	1	-	-	-	-	-	W1	
QTIS e 2x58/220-240	1-4	2	2	1	1	-	-	-	-	-	W1	
QTIS e 3x/4x18/220-240	1-4	2	2	1	1	-	-	-	-	-	W1	

For the latest data go to
www.osram.com
1) PIN 29, 30, 31: 1.5 m

M: Type Metalluk
W: Type WAGO 250
W1: Type WAGO 251 mini
W2: Type WAGO 251



Overview of ECGs (cable lengths in meters, wiring by PIN)

Tender documents

	Wiring									
	Sequence	PIN 21	PIN 22	PIN 23	PIN 24	PIN 25	PIN 26	PIN 27	PIN 28	Type
QUICKTRONIC® for compact fluorescent lamps										
QTP-DL 1x18-24	21-27	1	1	-	-	-	2	2	-	W1
QTP-DL 1x36-40	21-27	1	1	-	-	-	2	2	-	W1
QTP-DL 1x55 GII	21-27	2	2	1	1	-	-	-	-	W1
QTP-DL 2x18-24	21-30	-	-	1	1	1	1	2	2	W1
QTP-DL 2x36-40	21-30	-	-	1	1	1	1	2	2	W1
QTP-DL 2x55 GII	21-27	1	1	2	2	1	1	-	-	W1
QTP-D/E 1x10-13	21-24	2	2	1	1	-	-	-	-	W
QTP-T/E 1x18	21-24	2	2	1	1	-	-	-	-	W
QTP-D/E 2x10-13	21-26	2	2	2	2	1	1	-	-	W
QTP-T/E 2x18	21-26	2	2	2	2	1	1	-	-	W
	Wiring									
	Sequence	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	Type
QUICKTRONIC® for compact fluorescent lamps										
QTP-M 1x 26-42 S	21-24	2	2	1	1	-	-	-	-	W
QTP-M 2x 26-32 S	21-26	2	2	2	2	1	1	-	-	W
QT-M 2x26-42/220-240	1-7	2	2	2	-	2	1	1	-	M
QT-FC 1x55/230-240 S	1-4	2	2	1	1	-	-	-	-	M
QUICKTRONIC ECONOMIC® for (compact) fluorescent lamps										
QT-ECO 1x4-16	1-4	1	1	0.5	0.5	-	-	-	-	W
QT-ECO 1x18-21	1-4	1	1	0.5	0.5	-	-	-	-	W
QT-ECO 1x18-24	1-4	1	1	0.5	0.5	-	-	-	-	W
QT-ECO 1x26	1-4	1	1	0.5	0.5	-	-	-	-	W
QT-ECO 2x5-11	1-6	1	1	1	1	0.5	0.5	-	-	W
QT-ECO T/E 2x18	1-6	1	1	1	1	0.5	0.5	-	-	W
QT-ECO T/E 2x26	1-6	1	1	1	1	0.5	0.5	-	-	W

Tender documents

The tender documents are available in pdf format at <http://www.osram.com/ecg-tender>



For the latest data go to www.osram.com

M:1 Type Metalluk
S:1 Stelvio MRT15
W:1 Type WAGO 250
W1: Type WAGO 251 mini
W2: Type WAGO 251