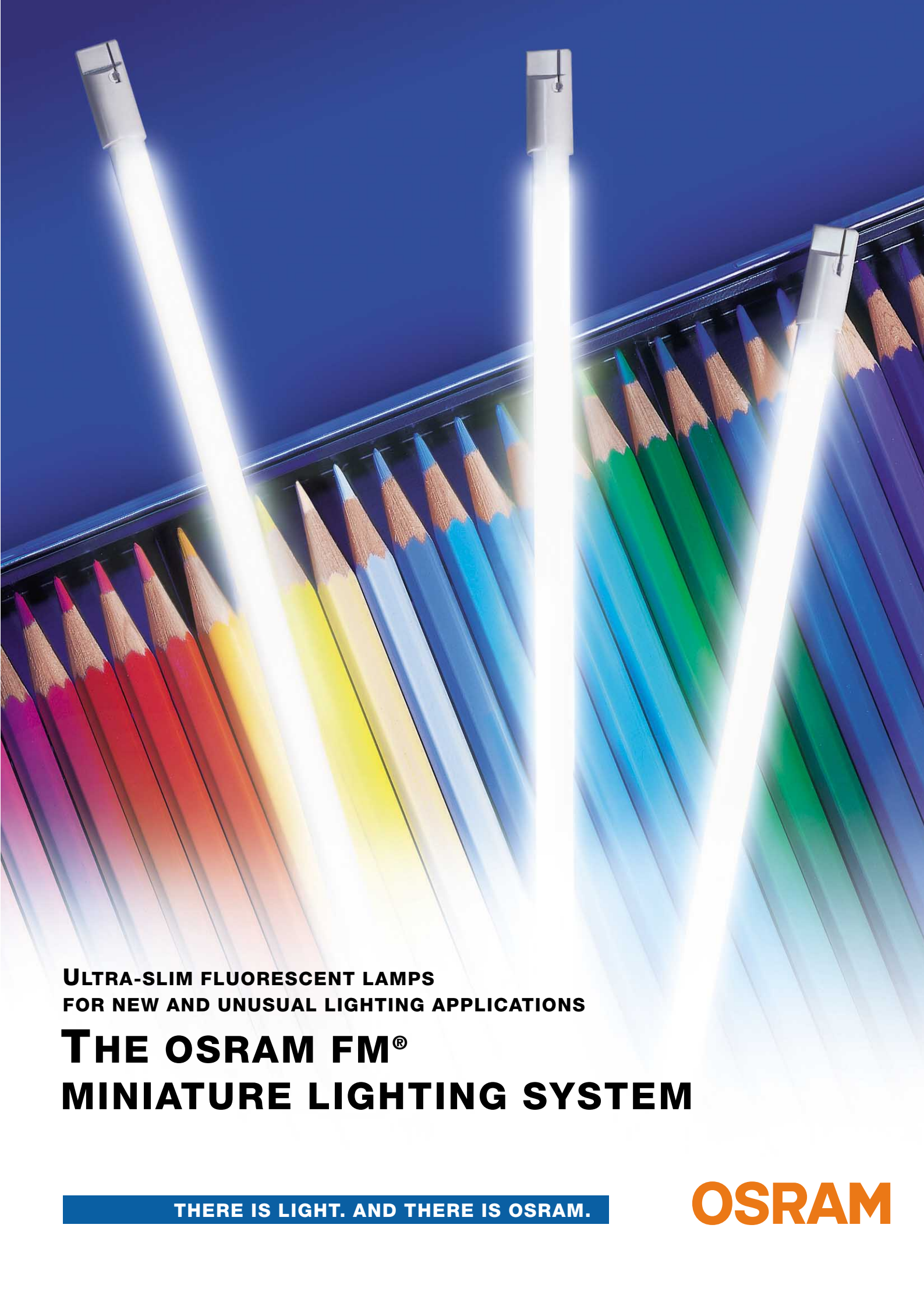




**ULTRA-SLIM FLUORESCENT LAMPS
FOR NEW AND UNUSUAL LIGHTING APPLICATIONS**

THE OSRAM FM® MINIATURE LIGHTING SYSTEM

THERE IS LIGHT. AND THERE IS OSRAM.

OSRAM

**OSRAM FM® - THE
MINIATURE SYSTEM FOR
INNOVATIVE LIGHTING**

**SMALL DIMENSIONS WITH
A BIG FUTURE IN A WIDE
RANGE OF APPLICATIONS**

The dimensional and photometric advantages of the FM® miniature lighting system open up a wealth of new applications in high-quality object and effect lighting. Particularly for displaying goods and for trade fairs and exhibitions.

**TUBE DIAMETER
OF ONLY 7 MM**

Thanks to their tube diameter of only 7 mm, FM® lamps generate a luminance which is unusually high for fluorescent lamps. The light from these lamps is therefore exceptionally brilliant.

**EXCELLENT COLOUR
RENDERING**

The LUMILUX® fluorescent material ensures excellent colour rendering (Group 1 B). FM® lamps are available in the following colour temperatures: 3000, 4000 and 6000 K.

HIGH LUMINOUS EFFICACY

OSRAM FM® lamps come in four wattages: 6, 8, 11 and 13 W, and in lengths from 218 to 523 mm. This constitutes a versatile range of high-performance miniature lamps. What's more, they have a high luminous efficacy of over 50 lm/W.



Photo: tielsa®-die exklusive Küche

Shelf lighting as you've never seen it before. FM® lamps are built into the undersides of the shelves to provide unobtrusive light without the need for surface mounted fittings.

*Create an impression:
the FM® system can be used to
produce eye-catching effects.*



PERFECT FOR MODERN ILLUMINATED ACRYLIC DISPLAYS

The extra thin FM® fluorescent lamps are ideal as light sources for illuminated acrylic displays. With their diameter of only 7 mm, they direct a high proportion of their luminous flux at the edges of the plexiglass sheets which act as a light guide.

As part of a system with the extremely low-profile QUICKTRONIC®-FM® electronic control gear, they allow designers to produce exceptionally shallow fittings yet still able to accommodate the lamp, its control gear and the lampholders.

Display cabinets in stores, on trade fair stands or in museums are another important area in which this miniature lighting system can be used. But wherever they are used – in mirror lights, built-in furniture luminaires, picture lights, in ultra compact tubetrack systems or in desktop lights – FM® lamps offer enormous scope for creating lighting solutions which are as unconventional as they are reliable and economical.

ECG Board and circuit

Conventional bulky box-type signs look really dated. With FM® lamps, extremely low-profile illuminated displays are possible. The ECG can be easily incorporated in the fitting.



PERFECTLY MATCHED: LAMP AND ECG

FM® miniature fluorescent lamps need a high lamp voltage. This means that they can only be operated reliably from electronic control gear. OSRAM has developed the slim, low-profile QUICKTRONIC® QT-FM® control gear specifically for these lamps.

TWO VERSIONS

There is a choice of the slim casing version with cable clamps, terminal cover and through-wiring for normal applications, or the ultra-slim space-saving circuit board version with insulating foil and a depth of only 13 mm for extra small lighting systems.



*Showing the way:
the FM® system provides new
ways of saving energy
in display, emergency and
advertising lighting.*



Compared with traditional double-capped tubular lamps, the FM® system offers more uniform illumination, lower power consumption and reduced thermal load.

ECG Board





INTEGRATED THREEFOLD SAFETY SHUTDOWN

The integrated threefold safety shutdown system features overtemperature protection to prevent the lamp from overheating. It will reliably shut down the lamp at the end of its life.

ENERGY-SAVING OPERATION

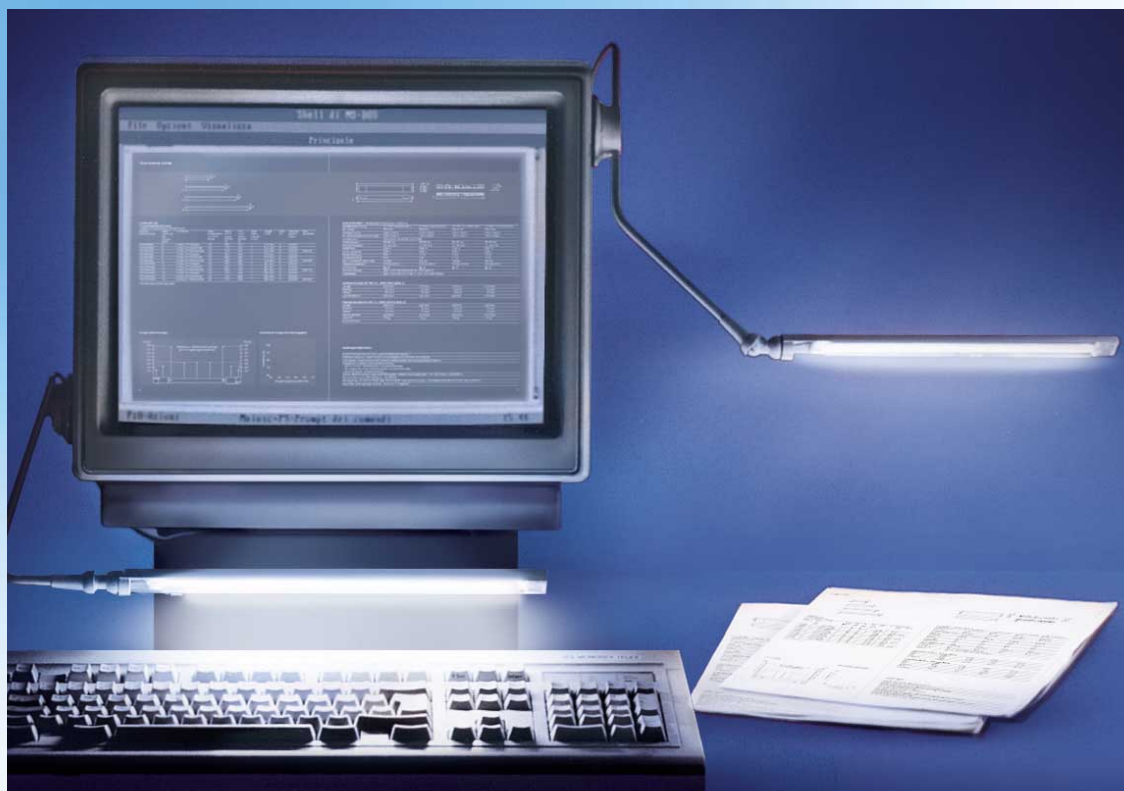
The high luminous efficacy of the FM® lamp and the low power loss of the QUICKTRONIC® ECG make the FM system an economic solution for all areas of application in which miniaturised lighting is an important factor. Compared with conventional lighting with incandescent lamps, OSRAM FM® lamps can achieve energy savings of up to 80%.

HIGH SAFETY STANDARDS

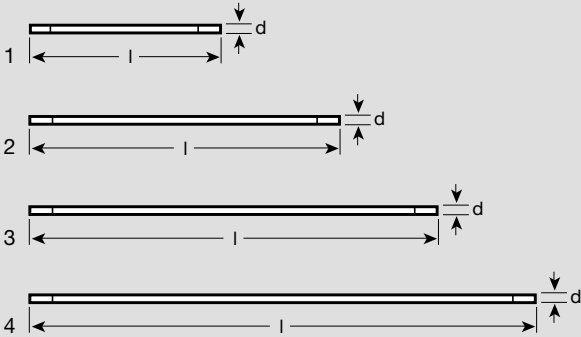
With its high safety standards, the FM® system is ideal for luminaires built into furniture. QT-FM® ECG is CE marked to show it meets all European standards governing safety, operation and electromagnetic compatibility.



Employee-friendly: luminaires with FM® lamps take up very little space and bring clarity to the workplace.



TECHNICAL DATA

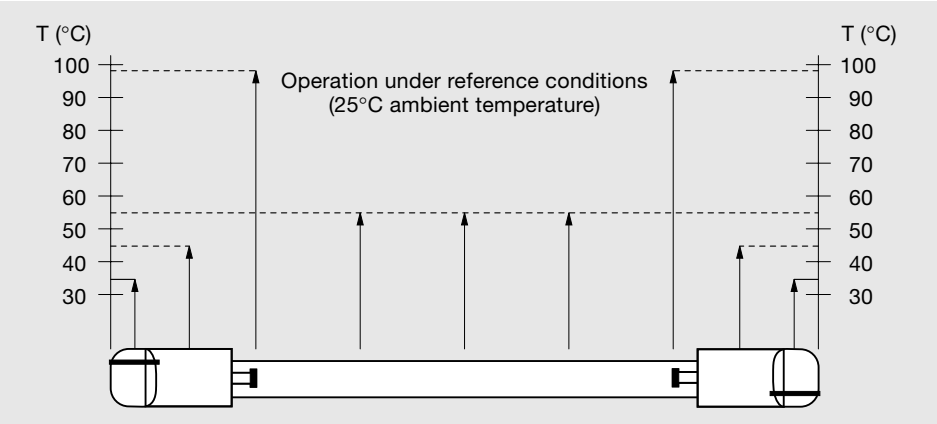


LUMILUX® FM®
7 mm tube diameter
LUMILUX® Model, W 4.3 base

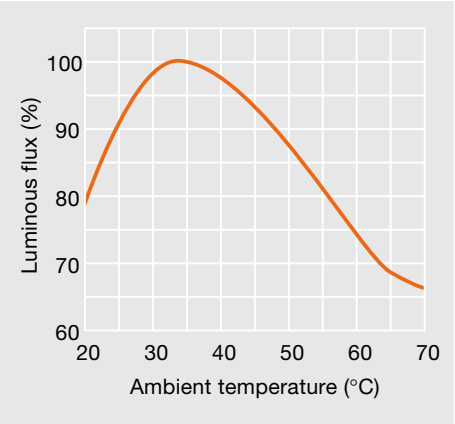
Lamp reference	Rated lamp wattage Watt	Colour appearance	Colour rendering group	Rated luminous flux (25°C) lm	Max. luminous flux (33°C)* lm	Tube diameter d mm	Length l mm	Fig. no.	Standard pack	EAN 40 50300
FM 6W/860	6	LUMILUX® Daylight	1B	250	310	7	218.3±1	1	20/200	
FM 6W/840	6	LUMILUX® Coolwhite	1B	275	330	7	218.3±1	1	20/200	
FM 6W/830	6	LUMILUX® Warmwhite	1B	275	330	7	218.3±1	1	20/200	338132
FM 8W/860	8	LUMILUX® Daylight	1B	420	500	7	319.9±1	2	20/200	
FM 8W/840	8	LUMILUX® Coolwhite	1B	450	540	7	319.9±1	2	20/200	
FM 8W/830	8	LUMILUX® Warmwhite	1B	450	540	7	319.9±1	2	20/200	338156
FM 11W/860	11	LUMILUX® Daylight	1B	570	680	7	421.5±1	3	20/200	
FM 11W/840	11	LUMILUX® Coolwhite	1B	620	750	7	421.5±1	3	20/200	
FM 11W/830	11	LUMILUX® Warmwhite	1B	620	750	7	421.5±1	3	20/200	338170
FM 13W/860	13	LUMILUX® Daylight	1B	710	860	7	523.1±1	4	20/200	
FM 13W/840	13	LUMILUX® Coolwhite	1B	770	930	7	523.1±1	4	20/200	
FM 13W/830	13	LUMILUX® Warmwhite	1B	770	930	7	523.1±1	4	20/200	338194

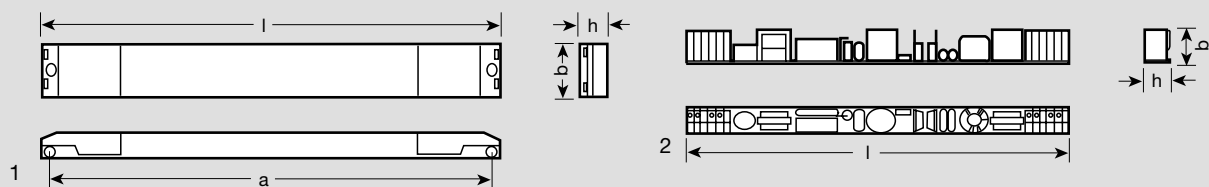
* For information, not for measurements

Temperature distribution



Luminous flux with ambient temperature





QUICKTRONIC® – single lamp design with casing

Reference	QT-FM 1x6/230–240 L	QT-FM 1x8/230–240 L	QT-FM 1x11/230–240 L	QT-FM 1x13/230–240 L
For lamp	FM 6 W	FM 8 W	FM 11 W	FM 13 W
Line voltage	230 V–240 V	230 V–240 V	230 V–240 V	230 V–240 V
Permissible voltage fluctuations	198 V–254 V	198 V–254 V	198 V–254 V	198 V–254 V
Lamp start	Warm start within 2 s			
Line frequency	50–60 Hz	50–60 Hz	50–60 Hz	50–60 Hz
Operating frequency	approx. 45 kHz	approx. 45 kHz	approx. 45 kHz	approx. 45 kHz
Line current	0.04 A	0.05 A	0.06 A	0.07 A
Power factor	0.97 c	0.97 c	0.97 c	0.97 c
System wattage	9 W	11 W	14 W	16 W
Lamp wattage	6 W	8 W	11 W	13 W
Max. luminous flux (830, 840)	330 lm	540 lm	750 lm	930 lm
Temperature range	5°C to 50°C	5°C to 50°C	5°C to 50°C	5°C to 50°C
Approval marks	CE	CE	CE	CE
Radio interference suppression	Complies with DIN VDE 0875/CISPR 14/EN 55015			
Harmonics	Complies with DIN VDE 0712 Part 23 /IEC 355-2/EN 60929			

Note: Not suitable for DC operation. Isolate from mains supply for lamp replacement to ensure reliable starting of new lamps.

Casing version QT-FM® 1 x.../230-240 L (Fig. 1)

Length l	276 mm	276 mm	276 mm	276 mm
Width b	32 mm	32 mm	32 mm	32 mm
Height h	16 mm	16 mm	16 mm	16 mm
Fixing centres a	263 mm	263 mm	263 mm	263 mm

Board version QT-FM® 1 x.../230-240 LB (Fig. 2)

Length l	225 mm	225 mm	225 mm	225 mm
Width b	18 mm	18 mm	18 mm	18 mm
Height h	13 mm	13 mm	13 mm	13 mm
Standard pack	20	20	20	20
Weight	130 g	130 g	130 g	130 g
EAN 40 50300				

Ballast specifications

QUICKTRONIC® for miniature fluorescent lamps FM® (T2)

Fully electronic silent control gear for OSRAM FM® lamps

Optimised warm start, high resistance to voltage transients, no off period necessary

Integrated safety shutdown

- if the lamp electrodes stop emitting
- if the temperature of the lamp electrodes rises excessively
- if the lamp wattage rises

Active electronic harmonic filter to counter mains pollution according to IEC 555-2 or EN 60555-2

Radio interference suppressed according to VDE 0875 or EN 55015

For luminaires with ∇ and ∇/∇ or ∇ and ∇/∇ labels according to EN 60598/DIN VDE 0710 and DIN VDE 0711

Maximum cable length between lamp and ECG: tested up to 1 m

OSRAM INFORMATION SERVICE FOR OTHER MATTERS RELATING TO THE FM® SYSTEM

Operating and installation instructions

For luminaire manufacturers and users interested in lighting technology, OSRAM can offer detailed technical product documentation for the miniature lighting system. Here you'll find a great deal of useful information on designs and applications.

To obtain the information you need, contact your regional OSRAM sales office.

HEAD OFFICE GERMANY

OSRAM GmbH
Hellabrunner Straße 1
81543 München
Tel.: +49-89-62 13-0
Fax: +49-89-62 13-20 20

INTERNATIONAL ADDRESSES

Albania
(supported by OSRAM Greece)

Argentina
OSRAM Argentina S.A.C.I.
Ramos Mejia 2456
1643 Beccar
Pcia. de Buenos Aires
Tel.: +54-11-47 19-80 00
Fax: +54-11-47 19-80 01

Australia
OSRAM Australia Pty Ltd
Level 11, 423 Pennant Hills Road
P.O. Box 673
Pennant Hills NSW 2120
Tel.: +61-2-94 81-83 99
Fax: +61-2-94 81-84 68

Austria
OSRAM Österreichische
Glühlampenfabrik GmbH
Lemböckgasse 49/C/5
1230 Wien
Postfach 1 62
1231 Wien
Tel.: +43-1-6 80 68
Fax: +43-1-6 80 68-7

Baltic provinces:
Estonia, Latvia, Lithuania
(supported by OSRAM Finland)

Belgium
N.V. OSRAM S.A.
Mercuriusstraat 28
1930 Zaventem Zuid 7
Tel.: +32-2-7 19 29 11
Fax: +32-2-7 20 99 75

Bosnia-Herzegovina
(supported by OSRAM Croatia)

Brazil
OSRAM do Brasil Lâmpadas Elétricas Ltda.
Av. dos Autonomistas, 4229
06090-901 Osasco-SP
Tel.: +55-11-36 84 74 08
Fax: +55-11-36 85 94 95

Bulgaria
OSRAM EOOD
Nikola Obreschkov 1, Wh. A., App. 1
1113 Sofia / Bulgaria
Tel.: +359-2-73 02 42
Fax: +359-2-73 02 42

Canada
OSRAM SYLVANIA INC.
2001 Drew Road
Mississauga
Ontario L5S 1S4
Tel.: +1-905-6 73 61 71
Fax: +1-905-6 73 62 90

Chile
OSRAM Chile Ltda.
Santa Elena de Huechuraba 1135 B
Huechuraba, Santiago de Chile
Tel.: +56-2-7 40 09 39
Fax: +56-2-7 40 04 66

China
OSRAM Foshan Lighting Co. Ltd.
East-West Highway, Xiebian
Dali Town, Nanhai City
Guangdong, 528231 P.R.C.
Tel.: +86-757-64 82-111
Fax: +86-757-64 82-222

OSRAM Shanghai Rep. Office
Harbour Ring Plaza No. 18
Xi Zang Middle Road
Room 2802, 2803 A
Shanghai, 200001 P.R.C.
Tel.: +86-21-53 85 28 48
Fax: +86-21-64 82 12 19

Colombia
OSRAM de Colombia
Diagonal 109 # 21-05 Oficina 614
Santafé de Bogotá
Tel.: +57-1-612 28 67
Fax: +57-1-612 28 67

Croatia
OSRAM d.o.o.
Ozaljska 93
10000 Zagreb
Tel.: +385-1-363-70 00
Fax: +385-1-363-76 45

Czech Republic
OSRAM spol. s.r.o., Praha
Tylovo náměstí 3/15
12000 Praha 2
Tel.: +420-2-219 87-100
Fax: +420-2-219 87-120

Denmark
OSRAM A/S
Dybendalsvaenget 3
Postboks 259
2630 Tåstrup
Tel.: +45-44-77 50-00
Fax: +45-44-77 50-55

Ecuador
OSRAM del Ecuador S.A.
Casilla 09-01-8410
Guayaquil
Tel.: +593-4-89 36 09
Fax: +593-4-89 35 58

Finland
OY OSRAM AB
Valuraudankuja 3
00700 Helsinki
Tel.: +358-9-3 74 21 00
Fax: +358-9-3 74 22 48

France
OSRAM SAS
5 Rue d'Altort
BP 1 09
67124 Molsheim Cedex
Tel.: +33-388-49 75 99
Fax: +33-388-49 75 97

Great Britain
OSRAM Ltd.
East Lane, P.O. Box 17
Wembley, Middlesex HA9 7PG
Tel.: +44-208-9 04 43 21
Fax: +44-208-9 01 12 22

Greece
OSRAM A.E.
Athinon Av. 56
10441 Athen
Tel.: +30-1-5 20 18 00
Fax: +30-1-5 22 72 00

Hong Kong
OSRAM Prosperity Co. Ltd.
Attn. Mr. Ludwig Molderings
Rm 1409 Harbour Centre
25 Harbour Road, Wanchai
Hong Kong
Tel.: +852-25 11 22 68
Fax: +852-25 11 20 38

Hungary
OSRAM KFT.
Kis-Buda Center
Frankel Leó út 30-34
1023 Budapest
Pf.: 700/61
1535 Budapest
Tel.: +36-1-3 26-48 68
Fax: +36-1-3 26-41 45

Iceland
Jóhann Ólafsson & Co. h/f
43 Sundaborg 13
104 Reykjavik
Tel.: +354-533 19 00
Fax: +354-533 19 30

India
OSRAM India Ltd.
Signature Towers, 11th Floor,
Tower-B,
South City-I, Gurgaon
122001 Haryana/India
Tel.: +91-124-638 31-80
Fax: +91-124-638 31-82

Indonesia
PT OSRAM Indonesia
Jalan Pasar Kemis km-1
Desa Keroncong
Kecamatan Jatiwangung
15000 Tangerang
Tel.: +62-21-5 90 01 27
Fax: +62-21-5 90 05 59

Italy
OSRAM Società Riunite
OSRAM Edison-Clerici S.p.A.
Via Savona 105
Casella Postale 1 41 06
20144 Milano
Tel.: +39-02-42 49-1
Fax: +39-02-42 49-380

Japan
Mitsubishi Electric OSRAM Ltd.
OSRAM-MELCO Ltd.
Tobu Yokohama Bldg.No. 3 (4F) 8-29
Kita-Saiwai 2-chome, Nishi-ku
220-0004 Yokohama
Tel.: +81-45-3 23 51-20
Fax: +81-45-3 23 51-55

OSRAM Ltd.
Tobu Yokohama Bldg.No. 3 (5F) 8-29
Kita-Saiwai 2-chome, Nishi-ku
220-0004 Yokohama
Tel.: +81-45-3 23 51-01
Fax: +81-45-3 23 51-10

Korea
OSRAM Korea Co., Ltd., Seoul
3rd. Fl. Ye-Sung Bldg. 150-30
Samsung-Dong, Kangnam-Ku
Seoul 135-090
Tel.: +82-2-5 54 41 12
Fax: +82-2-5 56 16 44

Macedonia
(supported by OSRAM Greece)

Malaysia
OSRAM (Malaysia) Sdn Bhd
7.05-7.06 Amoda Building
22 Jalan Imbi
55100 Kuala Lumpur
Tel.: +60-3-2 45 95-33
Fax: +60-3-2 45 95-35

Mexico
OSRAM de México, S.A. de C.V.
Camino a Tepalcapa No. 8
Col. San Martin
54900 Tultitlán/Edo. de México
Tel.: +52-5-8 99-18 00
Fax: +52-5-8 99-19 00

Netherlands
OSRAM Nederland B.V.
Vennootsweg 15
2404 CG Alphen a/d Rijn
Postbus 3 32
2400 Alphen a/d Rijn
Tel.: +31-172-48 38 38
Fax: +31-172-44 30 25

Norway
OSRAM Fabrikken A/S
Drammensveien 35
0271 Oslo
Postboks 2824/Solli
0204 Oslo
Tel.: +47-23 27 67-00
Fax: +47-23 27 67-40

Philippines
OSRAM Philippines
724 Moriones Street
Corner Juan Luna
Tondo, Manila
Tel.: +63-2-24-397-14/-17
Fax: +63-2-24-397-19

Poland
OSRAM sp. z o.o.
ul. Wiertnicza 117
02-952 Warszawa
Tel.: +48-22-6 51 78 69
Fax: +48-22-6 42 14 18

Portugal
OSRAM Empresa de
Aparelhagem Eléctrica Lda.
Rua das Quintinhas, Lote 12
2799-522 Carnaxide
Tel.: +351-21-4 16 58 60
Fax: +351-21-4 17 12 59

Romania
OSRAM Romania S.R.L.
Sos. Pipera Nr. 41 Sector 2
Bucaresti
Tel.: +40-1-2 33 02-12
Fax: +40-1-2 33 02-14

Russia
Rep. Office OSRAM GmbH
Ul. Malaja Kaluschskaja 27
117071 Moscow
Tel.: +7-095-9 58 12-72
Fax: +7-095-9 58 12-83

Singapore
OSRAM Singapore Pte. Ltd.
159 Sin Ming Road
#05-04 Amtech Building
575625 Singapore
Tel.: +65-5 52 01 10
Fax: +65-5 52 71 17

Slovak Republic
OSRAM Slovakia a.s., Nové Zámky
Komárňanská cesta 7
94093 Nové Zámky
Tel.: +421-817-64 64-111
Fax: +421-817-64 64-880

Slovenia
(supported by OSRAM Austria)

South Africa
OSRAM (Pty.) Ltd., Midrand
260, 15th Road
1685 Randjespark
Private BAG X 206
1683 Midrand
Tel.: +27-11-8 05 17-77
Fax: +27-11-8 05 17-11

Spain
OSRAM, S.A.
Calle de la Solana, 47
28850 Torrejón de Ardoz (Madrid)
Tel.: +34-91-6 55 52 00
Fax: +34-91-6 77 92 40

Sweden
OSRAM AB
Rudanvägen 1
Box 5 04
13625 Haninge
Tel.: +46-8-7 07 44-00
Fax: +46-8-7 07 44-40

Switzerland
OSRAM AG
In der Au 6
Postfach 6 38
8401 Winterthur/Töss
Tel.: +41-52-2 09 91 91
Fax: +41-52-2 09 99 99

Taiwan
OSRAM Taiwan Co. Ltd.
Sung Chiang Road, 7th Floor
P.O. Box 46304
Taipei
Tel.: +886-2-25 08 35 02
Fax: +886-2-25 09 67 82

Thailand
OSRAM Thailand Co., Ltd.
100/45, 24th Floor
Sathorn Nakorn Tower
North Sathorn Road
Khwaeng Silom
Khet Bangrak, Bangkok 10500
Tel.: +66-2-6 36 74-75
Fax: +66-2-6 36 74-77

Turkey
OSRAM AMPUL TIC. A.S.
Barbaros Bulvari
Mürbasan Soka
AEG Binasi
80700 Istanbul/Besiktas
Tel.: +90-212-2 16 32 98
Fax: +90-212-2 66 52 32

Ukraine
OSRAM Kiev
Rep. Office OSRAM GmbH
Ul. Vorovskogo, 36
01054 Kiev
Tel.: +380-44-2 46 93 14
Fax: +380-44-2 46 99 91

United Arab Emirates
OSRAM Middle East FZE
New High Rise Building
4th Floor, LOB 14
P.O. Box 17476
Jebel Ali, Dubai
Tel.: +971-4-88 13-767
Fax: +971-4-88 13-769

USA
OSRAM SYLVANIA INC.
100 Endicott Street
Danvers, MA 01923
Tel.: +1-978-777-19 00
Fax: +1-978-777-12 47

Vietnam
OSRAM Singapore Pte. Ltd.
Rep. Office Vietnam
PDD Office Building, 8th Floor
162 Pasteur Street
Ho Chi Minh City
Tel.: +84-8-22 85-41
Fax: +84-8-22 85-42

Yugoslavia
OSRAM Belgrad
Rep. Office OSRAM GmbH
c/o SIEMENS d.o.o.
Knez Mihailova 30/II
11000 Beograd
Tel.: +381-11-30 30-860
Fax: +381-11-30 30-853

Internet
<http://www.osram.de>
<http://www.osram.com>
<http://www.osram.de/lightatwork/>
<http://www.osram.com/lightatwork/>

THERE IS LIGHT. AND THERE IS OSRAM.

OSRAM