

HF-MATCHBOX electronic ballasts for 'TL', 'TL'5 and compact fluorescent lamps

Lamp control gear



HF-M Linear



HF-M Square



HF-M Linear (pcb)



HF-M Square (pcb)

Definition

Compact, lightweight, high-frequency electronic ballast for 'TL' (4-18 W), 'TL'5 (14-24 W) and compact fluorescent PL (5-24 W) lamps.

Description

The HF-MATCHBOX is a new generation of electronic energy-saving ballasts for systems up to 25 W. As well as saving energy, they enhance design freedom for the Original Equipment Manufacturer:

- Instant start: flicker-free starting, ideal for lighting applications with infrequent switching (up to three times per day); optimum lifetime of lamps compared to electromagnetic gear circuits is achieved in applications with long burning hours (IEC cycle)
- Energy savings of more than 25% (at equal luminous flux) compared with electromagnetic gear
- Multi-lamp ballast: one type can be used to drive a single lamp of different types and wattages, e.g. a 'TL' 6 or 8 W, or a PL-S 7 or 9 W lamp can be connected to the HF-M 109 TL/PLS ballast
- Compact power IC gives the ballast compact dimensions and low weight compared to electromagnetic ballasts that this design replaces
- Fixing centres for mounting remain same as equivalent electromagnetic ballasts

HF-MATCHBOX ballasts can be supplied either as an enclosed ballast or open printed circuit board ready for building into a luminaire, in doing so ensuring optimum safety and lowest cost.

Applications

HF-MATCHBOX ballasts are designed for areas where the lighting is switched on and off infrequently

- Typical areas of application in indoor residential situations include living rooms, kitchens (under cupboards), studies (desktop), bedrooms, halls, staircases and garages
- Typical outdoor residential situations include driveways, porches, front doors and galleries.

Philips quality

This implies optimum quality with regard to:

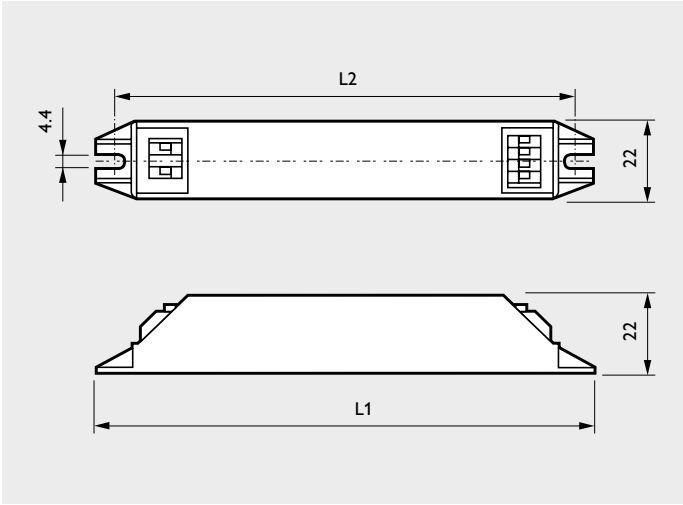
- System supplier: As manufacturer of lamps and electronic control gear, Philips ensures that, from the earliest development stage, optimum lamp/ballast performance is maintained
- International standards: Philips HF electronic ballasts comply with relevant international rules and regulations.

Compliances and approvals

- RFI < 30 MHz: EN 55015
- Harmonics: EN 61000-3-2
- Immunity: EN 61547
- Safety: IEC 928
- Performance: IEC 929
- Quality standard: ISO 9001
- Environmental standard: ISO 14001
- Approval marks: ENEC (pending)
- CE marking.

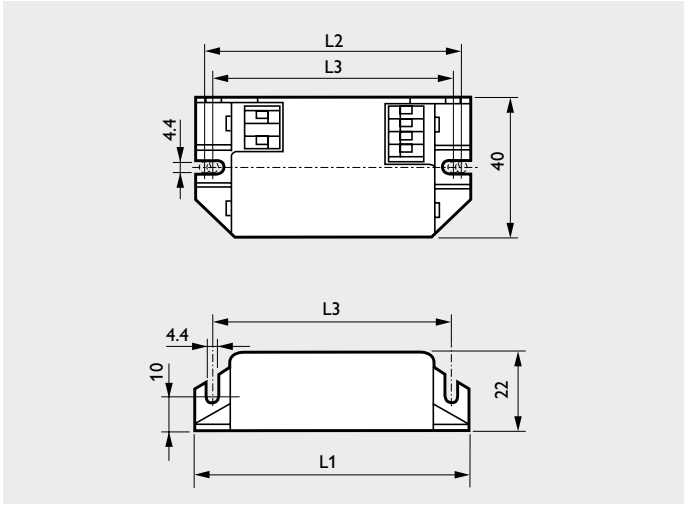


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HF-M Linear

Type	L1	L2	L3	L	W	H
HF-M Linear housing						
HF-M 105	144	132	-			
HF-M 109	144	132	-			
HF-M 114	144	132	-			
HF-M 121	184	172	-			
HF-M 124	184	172	-			
HF-M Square housing						
HF-M 105	80	75	70			
HF-M 109	80	75	70			
HF-M 114	80	75	70			
HF-M 118	80	75	70			
HF-M 124	94	89	84			
HF-M Linear pcb						
HF-M 105				120	18	20
HF-M 109				120	18	20
HF-M 114				120	18	20
HF-M 121				160	18	20
HF-M 124				160	18	20
HF-M Square pcb						
HF-M 105				56	36	20
HF-M 109				56	36	20
HF-M 114				56	36	20
HF-M 118				56	36	20
HF-M 124				70	36	20



HF-M Square

Dimensions in mm



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Technical data in relation to energy saving

Lamp	Ballast type		Energy efficiency index	System power W	Lamp power W	Power factor	Mains current mA	Lamp current mA
	Square	Linear						
TL 4W	HF-M 105 TL/PLS SH/SP	HF-M 105 TL/PLS LH/LP	A2	4.6	3.5	0.64	31	166
TL 6W	HF-M 109 TL/PLS SH/SP	HF-M 109 TL/PLS LH/LP	A2	6.8	5.5	0.62	47	163
TL 8W	HF-M 109 TL/PLS SH/SP	HF-M 109 TL/PLS LH/LP	A2	8.3	7.0	0.64	56	153
TL 13W	HF-M 114 TL/TL5/PL SH/SP	HF-M 114 TL/TL5/PL LH/LP	A2	14.4	12.3	0.63	98	154
TLD 15W	HF-M 124 TL/TL5/PL SH/SP	-	A3	17.4	14.9	0.61	120	314
TLD 18W	HF-M 124 TL/TL5/PL SH/SP	-	A2	19.0	16.9	0.62	17	310
TLD 15W	-	HF-M 124 TL/TL5/PL LH/LP	A3	17.0	14.7	0.61	119	302
TLD 18W	-	HF-M 124 TL/TL5/PL LH/LP	A2	18.4	16.2	0.62	127	297
TL5 14W HE	HF-M 114 TL/TL5/PL SH/SP	HF-M 114 TL/TL5/PL LH/LP	A2	14.7	12.8	0.64	100	157
TL5 21W HE	-	HF-M 121 TL5 LH/LP	A2	23.7	21.3	0.64	157	168
TL5C 22W HO	HF-M 124 TL/TL5/PL SH/SP	-	A2	23.6	21.7	0.64	155	279
TL5 24W HO	HF-M 124 TL/TL5/PL SH/SP	-	A2	23.8	21.6	0.64	159	272
TL5C 22W HO	-	HF-M 124 TL/TL5/PL LH/LP	A2	22.7	20.9	0.64	150	269
TL5 24W HO	-	HF-M 124 TL/TL5/PL LH/LP	A2	23.0	20.8	0.64	155	265
PLS 5W	HF-M 105 TL/PLS SH/SP	HF-M 105 TL/PLS LH/LP	A2	5.3	4.1	0.65	35	160
PLS 7W	HF-M 109 TL/PLS SH/SP	HF-M 109 TL/PLS LH/LP	A2	7.0	5.8	0.62	49	162
PLS 9W	HF-M 109 TL/PLS SH/SP	HF-M 109 TL/PLS LH/LP	A2	8.5	7.2	0.64	58	151
PLS 11W	HF-M 114 TL/TL5/PL SH/SP	HF-M 114 TL/TL5/PL LH/LP	A2	13.1	11.4	0.62	91	163
PLC 10W	HF-M 114 TL/TL5/PL SH/SP	HF-M 114 TL/TL5/PL LH/LP	A2	10.3	8.7	0.60	74	184
PLC 13W	HF-M 114 TL/TL5/PL SH/SP	HF-M 114 TL/TL5/PL LH/LP	A2	13.3	11.5	0.63	92	162
PLC 18W	HF-M 118 PLC/PLT SH/SP	-	A2	18.1	15.8	0.63	123	202
PLT 18W	HF-M 118 PLC/PLT SH/SP	-	A2	18.6	16.3	0.63	127	200
PLL 18W	HF-M 124 TL/TL5/PL SH/SP	-	A3	17.3	14.9	0.61	119	316
PLL 24W	HF-M 124 TL/TL5/PL SH/SP	-	A2	23.6	21.7	0.64	156	280
PLL 18W	-	HF-M 124 TL/TL5/PL LH/LP	A3	16.8	14.6	0.61	117	301
PLL 24W	-	HF-M 124 TL/TL5/PL LH/LP	A2	23.0	20.9	0.64	153	268

Technical data for installation

Mains operation

Rated mains voltage	230-240 V
with tolerances for safety: +/- 10%	207-264 V
tolerances for performance: +6% -8%	212-254 V
Mains frequency	50/60 Hz
Operating frequency	< 30 kHz

DC voltage operation during emergency back-up

Required battery voltage for guaranteed ignition	198-254 V
Required battery voltage for burning lamps	176-254 V

Lifetime

10 years operation at 2500 hr/yr with 10% failures	25 000 hr
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Ignition time

< 0.1 s

Overvoltage protection

up to 264 V

Max t_{case}

75°C

Lamp end-of-life detection/shut-off

yes

Automatic restart after lamp replacement or voltage dip

no; manual restart required

Cable capacity

to be advised

Insulation resistance test

not permitted

Temperature range to ignite lamp (ignition aid is not required)

-10 to +40°C

Hum and noise level

inaudible

Supply options

HF-MATCHBOX ballasts can be ordered either encased or as printed circuit board.

Encased ballasts are supplied fitted with plastic housings, and are either linear or square in shape. Encased ballasts are delivered in cardboard cartons.

Printed circuit boards (pcb's) have the same shape as the housings, and are supplied in multiple boards. Multiple boards will be supplied either in returnable containers (for high-volume customers) or in cardboard cartons.

A detailed 'Instructions for use' is included in the packing of the printed circuit boards.

'HF-MATCHBOX' is a trademark of Koninklijke Philips Electronics N.V.

Colour coding

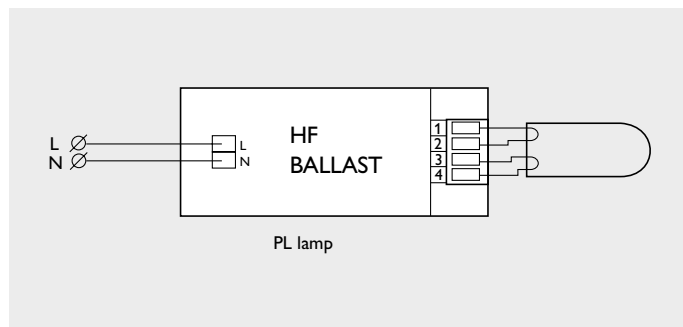
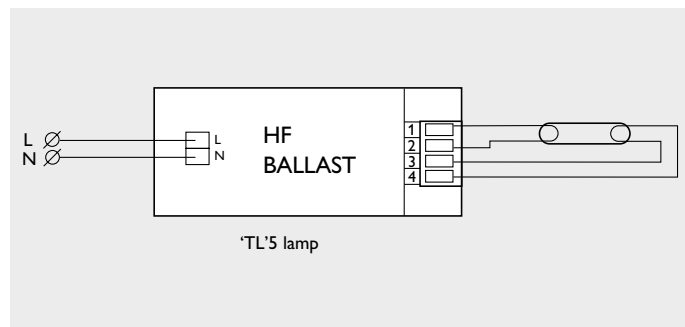
Type	Mains terminal colour code
HF-M 105	Orange/black/orange
HF-M 109	Orange/blue/orange
HF-M 114	Orange/grey/orange
HF-M 118	Orange/orange/orange
HF-M 121	Orange/grey/orange
HF-M 124	Orange/orange/orange

To facilitate physical identification of pcb's, mains connector terminals are colour-coded. The central connector terminal is coloured according to type.

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Connection wiring is greatly simplified by the use of insert contacts
 Wire cross-section on mains side: 0.5-1.5 mm²
 Wire cross-section on lamp side: 0.5-1.5 mm²
 Strip length: 8-9 mm

Distance between mains wires and lamp wires: > 5 cm
 Length of lamp wires:
 Keep wires to terminals 1 and 2 as short as possible (< 30 cm)
 Keep wires to terminals 3 and 4 shorter than 150 cm



Wiring diagrams

Ordering and packing data

Ballast	Ordering number	1 Piece		Bulk packing						EOC
		EAN Code	Weight	Qty	Dimensions	Volume	Weight gross	EAN code		
			kg	pcs	l x w x h cm	m ³	kg			
HF-M 105 TL/PLS LH	9137 004 16803	8711500 536785	0.036	50	23.0 × 16.0 × 13	0.005	1.9	8711500 536792	53678530	
HF-M 105 TL/PLS SH	9137 004 16503	8711500 536723	0.035	50	21.5 × 17.5 × 13	0.005	1.8	8711500 536730	53672330	
HF-M 105 TL/PLS LP	9137 004 17403	8711500 536907	0.020	432	59.5 × 34.5 × 22	0.045	10.6	8711500 536914	53690730	
HF-M 105 TL/PLS SP	9137 004 17103	8711500 536846	0.020	540	59.5 × 34.5 × 22	0.045	12.8	8711500 536853	53684630	
HF-M 109 TL/PLS LH	9137 004 16903	8711500 536808	0.036	50	23.0 × 16.0 × 13	0.005	1.9	8711500 536815	53680830	
HF-M 109 TL/PLS SH	9137 004 16603	8711500 536747	0.035	50	21.5 × 17.5 × 13	0.005	1.8	8711500 536754	53674730	
HF-M 109 TL/PLS LP	9137 004 17503	8711500 536921	0.020	432	59.5 × 34.5 × 22	0.045	10.6	8711500 536938	53692130	
HF-M 109 TL/PLS SP	9137 004 17203	8711500 536860	0.020	540	59.5 × 34.5 × 22	0.045	12.8	8711500 536877	53686030	
HF-M 114 TL/PLS LH	9137 004 17003	8711500 536822	0.036	50	23.0 × 16.0 × 13	0.005	1.9	8711500 536839	53682230	
HF-M 114 TL/PLS SH	9137 004 16703	8711500 536761	0.035	50	21.5 × 17.5 × 13	0.005	1.8	8711500 536778	53676130	
HF-M 114 TL/PLS LP	9137 004 17603	8711500 536945	0.020	432	59.5 × 34.5 × 22	0.045	10.6	8711500 536952	53694530	
HF-M 114 TL/PLS SP	9137 004 17303	8711500 536884	0.020	540	59.5 × 34.5 × 22	0.045	12.8	8711500 536891	53688430	
HF-M 118 PLC/PLT SH	9137 004 16303	8711500 746160	0.037	50	21.5 × 17.5 × 13	0.005	1.8	8711500 746177	74616030	
HF-M 118 PLC/PLT SP	9137 004 16403	8711500 746184	0.022	540	59.5 × 34.5 × 22	0.045	17.3	8711500 746191	74618430	
HF-M 121 TL5 LH	9137 004 18303	8711500 536464	0.048	50	23.0 × 20.0 × 13	0.006	2.5	8711500 536471	53646430	
HF-M 121 TL5 LP	9137 004 18403	8711500 536488	0.025	216	59.5 × 34.5 × 22	0.045	7.0	8711500 536495	53648830	
HF-M 124 TL/TL5/PL LH	9137 004 18003	8711500 536402	0.048	50	23.0 × 20.0 × 13	0.006	2.5	8711500 536419	53640230	
HF-M 124 TL/TL5/PL SH	9137 004 17903	8711500 536389	0.041	50	23.0 × 20.0 × 13	0.006	2.2	8711500 536396	53638930	
HF-M 124 TL/TL5/PL LP	9137 004 18203	8711500 536440	0.025	216	59.5 × 34.5 × 22	0.045	7.0	8711500 536457	53644030	
HF-M 124 TL/TL5/PL SP	9137 004 18103	8711500 536426	0.024	432	59.5 × 34.5 × 22	0.045	12.1	8711500 536433	53642360	