HF-P TL5 HO

NEW EII TECHNOLOGY

HF-PERFORMER II
Electronic ballasts (flat) for TL5 lamps

Definition
Flat, Slim, lightweight highfrequency electronic ballast for TL-5 fluorescent lamps, based on EII technology.

Description
- The combination of HF-Performer and TL5 lamps offers opportunities for miniaturization and reduced cost of ownership, thanks to the limited dimensions and the high system efficacy
- Quick programmed start: 0.5 sec, flicker-free warm start, preheating the lamp electrodes; this enables the lamps to be switched on and off without reducing useful life
- Equipped with electrode heating cut-off circuit, ensuring optimal lamp operation with respect to lumen curve of the lamp and reduction in system energy losses
- Smart power: constant light independent of mains voltage fluctuations
- Low energy consumption due to the use of EII technology
- Unit is protected against excessive mains voltages and incorrect connections
- Automatic stop circuit is activated within five seconds in case of lamp failure (Safety stop); once the lamp has been replaced, the ballast resets automatically
- Equipped with terminations suitable for automatic wiring machines

Applications
Typical areas of application include:
- Department stores, shops, supermarkets
- Industrial premises
- Airports, railway stations
- Outdoor lighting
- Office buildings, for example insurance companies, banks, government ministries
- Hospitals
- Hotels
- Suitable for use with infrared remote control systems
- Suitable for emergency installations with VDE 0108 with re-ignition < 0.5 s

Philips quality
This assures optimum quality regarding:
- System supplier As manufacturer of lamps, electronic control gear and lighting control equipment, Philips ensures that, from the earliest development stage, optimum lamp/ballast performance is maintained
- International standards Philips HF electronic regulating ballast's comply with a relevant international rules and regulations

Compliances and approvals
- RFI < 30 MHz — EN 55015
- RFI > 30 MHz — EN 55022 B
- Harmonics — EN 61000-3-2
- Immunity — EN 61547
- Safety — EN 61347-2-3
- Performance — EN 60929
- Vibration & bump tests — IEC 600-68-2-6 Fc, IEC 600-68-2-29 Eb
- Quality standard ISO 9000-2000
- Environmental standard — ISO 14001
- Approval marks ENEC — EMV-VDE
- CE marking
- Temperature declared thermally protected IEC 61347-1 110

HF-PERFORMER II

NEW E II TECHNOLOGY

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Technical data: (all typical values at Vmains = 230V)

Lamp	Qty. of Lamps	Ballast	System Power W	Lamp Power W	Ballast Losses W	NOMINAL * Lamp Lumen lm	CELMA class. EEI
TL5 HO 24W	1	HF-P 1 24-39 TL5 HO EII	28	1x24	4	1750	A2
TL5 HO 24W	2	HF-P 2 24-39 TL5 HO EII	49	2x22	4	1750	A2
TL5 HO 24W	3	HF-P 3/4 24 TL5/PL-L EII	75	3x23	6	1750	A2
TL5 HO 24W	4	HF-P 3/4 24 TL5/PL-L EII	100	4x23	6	1750	A2
TL5 HO 39W	1	HF-P 1 24-39 TL5 HO EII	44	1x40	4	3100	A2
TL5 HO 39W	2	HF-P 2 24-39 TL5 HO EII	86	2x39	8	3100	A2
TL5 HO 49W	1	HF-P 149 TL5 HO EII	56	1x51	5	4300	A2
TL5 HO 49W	2	HF-P 249 TL5 HO EII	109	2x49	10	4300	A2
TL5 HO 54W	1	HF-P 154 TL5 HO EII	61	1x55	6	4450	A2
TL5 HO 54W	2	HF-P 254 TL5 HO EII	120	2x54	11	4450	A2

* Typical values for /830 at 25°C lamp ambient temperature
** PL-L values are published at 25°C lamp ambient temperature

Lamp	Qty. of Lamps	Ballast	Max. Cable cap lp-lp/lp-gnd pF	Oper Freq. kHz
TL5 HO 24W	1	HF-P 1 24-39 TL5 HO EII	150/150	53
TL5 HO 24W	2	HF-P 2 24-39 TL5 HO EII	200/200	53
TL5 H0 24W	3	HF-P 3/4 24 TL5/PL-L EII	150/150	45
TL5 H0 24W	4	HF-P 3/4 24 TL5/PL-L EII	150/150	45
TL5 HO 39W	1	HF-P 1 24-39 TL5 HO EII	150/150	46
TL5 HO 39W	2	HF-P 2 24-39 TL5 HO EII	200/200	45
TL5 HO 49W	1	HF-P 149 TL5 HO EII	150/150	45
TL5 HO 49W	2	HF-P 249 TL5 HO EII	200/200	45
TL5 HO 54W	1	HF-P 154 TL5 HO EII	150/150	52
TL5 HO 54W	2	HF-P 254 TL5 HO EII	200/200	45

1) lp-lp = between lamp wires
lp-lgnd = between lamp wires and ground

Typical wire capacitance 50 pF/m (spacing between wires 0.5 mm)
Typical wire capacitance 72 pF/m (spacing between wires 0.5 mm)

HF-PERFORMER II

NEW E II TECHNOLOGY

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Technical data for installation

Mains operation		
Rated mains voltage		220-240 V
Tolerances for performance	+6%-8%	202-254 V
With tolerances for safety:	+/– 10%	198-264 V
Mains frequency		50/60 Hz
Power factor		> 0.95
DC voltage operation (during emergency back-up)		
Required battery voltage for guaranteed ignition		198 - 254V DC
Required battery voltage for burning lamps		176 - 254V DC
Nominal light output is obtained at a voltage of		220 - 240V DC

Notes:
1. For a continuous DC application, an external fuse should be used in the luminaire.
2. Continuous low DC voltages (< 198 V) can influence the lifetime of the ballast.

Earth leakage current	< 0.5 mA per ballast
Ignition time	0.5 sec.
Constant light operation	In case of AC mains voltage fluctuations, within 202-254 V, the luminous flux changes by a maximum of + 2%
Overvoltage protection	48 hrs at 320 V AC 2 hrs at 350 V AC
Dual fixture master-slave operation	Not advised
Automatic restart after lamp replacement or voltage dip	Yes: tested with a dip down to 30% with a duration of 10 mains cycles
Insulation resistance test	500 V DC from both mains inputs to earth (not between Line and Neutral) Note: Ensure that the neutral is reconnected again after above mentioned test is carried out and before the installation is put in operation
Lamp wiring	The use of 500 V rated components and wiring are required with HF-PERFORMER TL5

Inrush current

Ballast	Max. quantity of ballasts per Miniature Circuit Breaker type B 16 A	Inrush current 1/2 value time at typical mains impedance
HF-P 1 24-39 TL5 HO EII	28	24A/250 µS
HF-P 149 TL5 HO EII	28	24A/250 µS
HF-P 154 TL5 HO EII	28	24A/250 µS
HF-P 2 24-39 TL5 HO EII	15	31A/350 µS
HF-P 3/4 24 TL5/PL-L EII	12	31A/350 µs
HF-P 2 24-39 TL5 HO EII	15	31A/350 µS
HF-P 249 TL5 HO EII	15	31A/350 µS
HF-P 254 TL5 HO EII	15	31A/350 µS

Mains current at 230V

Ballast	Lamp	Qty. of lamps	Input current A
HF-P 1 24-35 TL5 HO EII	TL5 24W	1	0.12
HF-P 2 24-39 TL5 HO EII	TL5 24W	2	0.22
HF-P 3/4 24 TL5/PL-L EII	TL5 24 W	3	0.33
HF-P 3/4 24 TL5/PL-L EII	TL5 24 W	4	0.44
HF-P 3/4 24 TL5/PL-L EII	PL-L 24W	3	0.33
HF-P 3/4 24 TL5/PL-L EII	PL-L 24W	4	0.43
HF-P 1 24-35 TL5 HO EII	TL5 39W	1	0.20
HF-P 2 24-39 TL5 HO EII	TL5 39W	2	0.39
HF-P 149 TL5 HO EII	TL5 49W	1	0.25
HF-P 249 TL5 HO EII	TL5 49W	2	0.49
HF-P 154 TL5 HO EII	TL5 54W	1	0.27
HF-P 254 TL5 HO EII	TL5 54W	2	0.52

HF-PERFORMER II

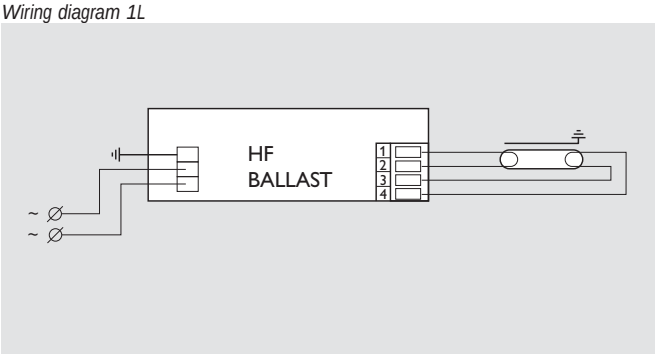
NEW E II TECHNOLOGY

Conversion table for max. quatities of ballasts on other types of Miniature Circuit Breaker

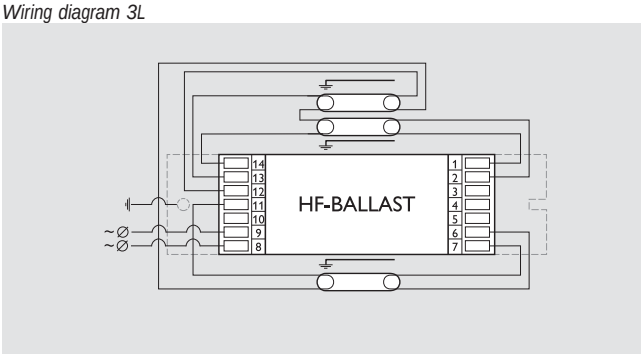
MCB type		Relative number of ballasts
B	16A	100%(see table above)
B	10A	63%
C	16A	170%
C	10A	104%
L, I	16A	108%
L, I	10A	65%
G, U, II	16A	212%
G, U, II	10A	127%
K, III	16A	254%
K, III	10A	154%

Wiring diagrams

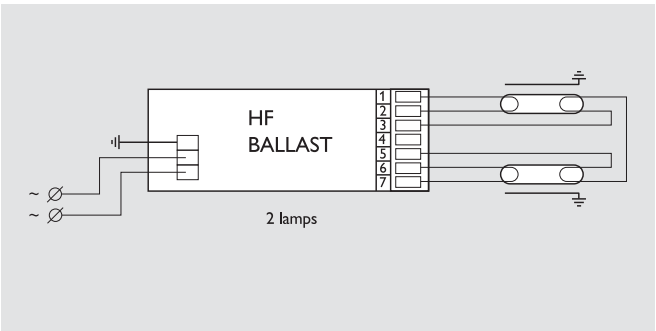
Wiring diagram 1L



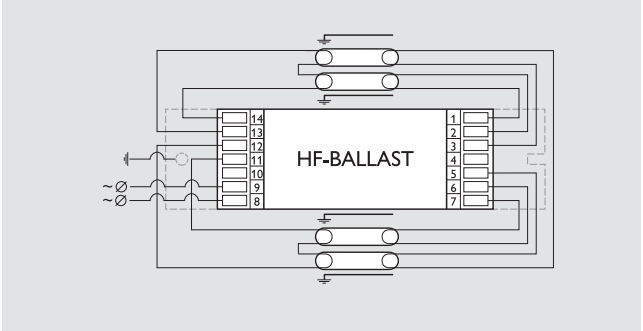
Wiring diagram 3L



Wiring diagram 2L



Wiring diagram 4L



Technical data for design and mounting HF ballasts in fixtures

Temperatures

Temperature range to ignite lamp with ignition aid	–25°C..+50°C
Max t_{case}	75°C

Lifetime of a ballast depends on the temperature of the ballast. This means there is a relation between the Tc point on the ballast and its lifetime. This ballast range has a specified lifetime of 50.000 hrs, with a maximum of 10% failures guaranteed, at a measured T case of 75°C. For more information regarding this subject consult the Philips Application guide to fluorescent lamp control gear

Hum and noise level inaudible

Permitted humidity is tested according to EN61347-1 par. 11. Note that no moisture or condensation may enter the ballast. The ballasts that are thermally protected use a protective method of another type providing equivalent thermal protection

HF-PERFORMER II

NEW E II TECHNOLOGY

Connector type:
Connection wiring is greatly simplified through use of WAGO universal connector. Suitable for both automatic wiring (ALF and ADS) and manual wiring; earth connection can be made via the earth terminal on the mains side.
Please note:
With the HF-P 3 /4 lamp ballasts (24W) earth connection must be made via the housing.

Wire lengths:
For optimal performance, note that following wires need to be kept short:
For one lamp circuits keep wires to terminals 1 and 2 short
For two lamp circuits keep wires to terminals 1, 2, 6 and 7 short
For triple and quad lamp circuits keep wires to terminals 1, 2, 13 and 14 short

Wire cross-section:

Lower connector:	
Mains	Double insert "lower connector" 0.5 mm – 1.0 mm^2
Lamp(s) connector	Double insert "lower connector" 0.5 mm – 1.0 mm^2
Upper connector:	
Mains & Control connector	Double insert "upper connector" 0.5 mm – 0.75 mm^2 (*)
Lamp(s) connector	Double insert "lower connector" 0.5 mm – 0.75 mm^2 (*)

(*) Stranded wire

Notes
1. Data is based on a mains supply with an impedance of 400 mW (equal to 15 m cable of 2.5 mm^2 and another 20 m to the middle of the power distribution), under worst case conditions With an impedance of 800 mWthe number of ballasts can be increased by 10%.
2. Measurements will be verified in real installations; therefore data are subject to change
3. In some cases the maximum number of ballasts is not determined by the MCB but by the maximum electrical load of the lighting installation
4. Note that the maximum number of ballasts is given when these are all switched on the same moment, i.e. by a wall switch.
5. Measurements were carried out on single-pole MCB's. For multi-pole MCB's it is advisable to reduce the number of ballasts by 20%.
6. The maximum number of ballasts which can be connected to one Residual Current Detector of 30 m A is 30.

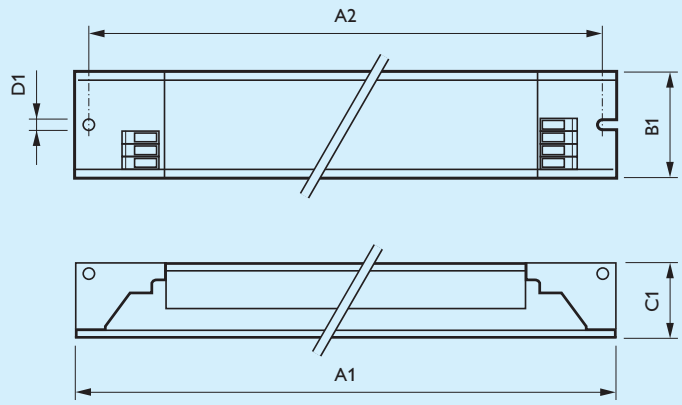
Ordering and packing data

Ballast	Weight kg
HF-P 1 24-39 TL5 HO EII	0.260
HF-P 149 TL5 HO EII	0.260
HF-P 154 TL5 HO EII	0.260
HF-P 2 24-39 TL5 HO EII	0.260
HF-P 249 TL5 HO EII	0.270
HF-P 254 TL5 HO EII	0.270
HF-P 3/4 24 TL5/PL-L EII	0.265

HF-PERFORMER II

NEW E II TECHNOLOGY

Dimension drawings (mm.)



Dimensions in mm

	A1	A2	B1	C1	D1
1 lamp	360	350	30	21	4.2
2 lamps	360	350	30	21	4.2
3/4 lamps	360	350	30	21	4.2
HF-P 280 TL5/PL-L EII	425	415	30	21	4.2