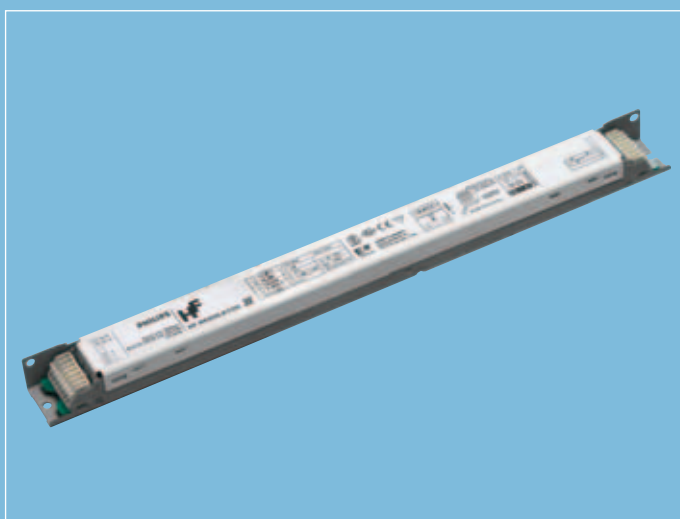


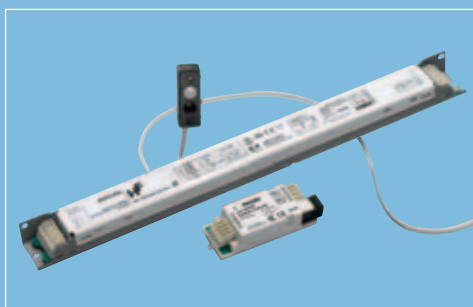
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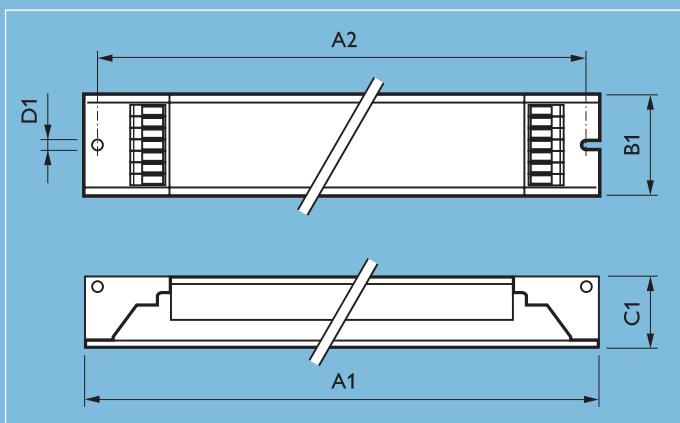
HF-REGULATORII (Touch and DALI)

Touch and Dim



HF-REGULATORII is used in ActiLume systems for automatic light control

Dimensions in mm



PHILIPS

HF-REGULATORII Touch and DALI TL-D

Product description

Flat, lightweight high-frequency electronic regulating ballast, using DALI (Digital Addressable Lighting Interface) or Touch and Dim push button protocol, for TL-D fluorescent lamps. The HF-REGULATORII ballasts incorporate the new Philips EII technology offering full digital input (mains) and output (lamp) management.

Features and benefits

- The lamp power can be regulated from 100% to 1%.
- Flat ballast design, 21 mm high.
- Up to 75% reduction in energy consumption can be achieved by using automatic lighting control systems (e.g. Philips ActiLume luminaire-based system solutions).
- 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. Ideal for areas with a high switching frequency.
- Digital control input according to the industry standard DALI (Digital Addressable Lighting Interface) combined with the Touch and Dim push button protocol.
- Low energy consumption in standby 0.35W due to the new EII technology.
- Increased lamp wire flexibility thanks to the Parasitic Capacitance Compensation (longer lamp wiring possible up to 2 meter).
- Smart power: constant light, independent of mains voltage fluctuations.
- Unit is protected against excessive mains voltages, incorrect connections and incorrect lamp use.
- Striation-free operation, no stroboscopic effects.
- Lamp starts at 1% (DALI 1..100% in 100 ms).
- 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 connectors suitable for automatic wiring machines.

The Philips HF-REGULATORII electronic ballasts are equipped with EII-dim technology. This is a dedicated integrated circuit that ensures independent control of each electrode and, in doing so, takes care that:

- a. lamp life is unaffected by dimming position
- b. lamp burning is stable in every dimming position; and
- c. energy savings, when dimming, are maximised.

Applications

Typical areas of application include:

- DALI installations with daylight linking and/or movement detection (for energy savings)
- DALI installations with remote control systems (combining energy savings with comfort)
- Installations with emergency back-up, according to IEC 60598-2-22/VDE 0108
- Office applications where a simple and easy dimming system or personal light level adjustment is required.

	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	39	21	4.2

Dimensions in mm

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HF-REGULATOR// Touch and DALI TL-D

Examples


- Office buildings: insurance companies, banks, government ministries
 - Cellular or open plan offices
 - Conference rooms, lecture theatres, corridors
- Schools
- Hospitals
- Department stores, shops, supermarkets
- Hotels, restaurants and bars
- Cinemas, museums.

Philips quality

This applies optimum quality with respect to:

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

Compliances and approvals

- RFI<30 MHz: EN 55015
- RFI>30 MHz: EN 55022 limit B
- Harmonics: EN 61000-3-2
- Immunity: EN 61547
- Safety: EN 61347-2-3
- Performance: EN 60929
- Vibration & bump tests: EN 60068-2-6-FC
EN 60068-2-29-Eb
- Quality standard: ISO 9001
- Environmental standard: ISO 14001
- Approval marks: ENEC
EMV-VDE
- Temp. declared thermally protected: EN 61347-1 
- CE marking

Technical data for installation

Mains operation
 Rated mains voltage 220-240 V
 With tolerances for safety: +/- 10% 198-264 V
 Tolerances for performance +6%-8% 202-254 V
 Mains frequency 50/60 Hz

Smart power: with AC mains voltage fluctuations, 202-254 V
 luminous flux varies by ± 2% max.

DC voltage operation (during emergency back-up)

Required battery voltage for guaranteed ignition 198V – 254 V
 Required battery voltage for burning lamps 176V – 254 V
 Nominal light output is obtained at a voltage of 220V – 240 V

Notes:

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

Earth leakage current < 0.5 mA per ballast

Maximum number of ballasts which can be connected to one Residual Current Detector of 30 mA 30

Overvoltage protection 48 hrs at 320 V AC
 2 hrs at 350 V AC

Automatic restart after lamp replacement or voltage dip Yes

Mains current at 230V

Ballast	Lamp type	Qty of Lamps	Input current A
HF-R TD 118 TL-D EII TL-D 18 W		1	0.10
HF-R TD 218 TL-D EII TL-D 18 W		2	0.17
HF-R TD 318 TL-D EII TL-D 18 W		3	-
HF-R TD 418 TL-D EII TL-D 18 W		4	-
HF-R TD 136 TL-D EII TL-D 36 W		1	0.17
HF-R TD 236 TL-D EII TL-D 36 W		2	0.31
HF-R TD 158 TL-D EII TL-D 58 W		1	0.25
HF-R TD 258 TL-D EII TL-D 58 W		2	0.49

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HF-REGULATOR/ Touch and DALI TL-D

Inrush current

Ballast	Qty of Lamps	Max. quantity of ballasts per Miniature Circuit Breaker Type B16 A	Inrush current I/2 value time at typical mains impedance
HF-R TD 118 TL-D EII	1	28	27A/300 µS
HF-R TD 218 TL-D EII	2	12	45A/400 µS
HF-R TD 318 TL-D EII	3	-	-
HF-R TD 418 TL-D EII	4	-	-
HF-R TD 136 TL-D EII	1	28	25A/200 µS
HF-R TD 236 TL-D EII	2	12	32A/300 µS
HF-R TD 158 TL-D EII	1	28	25A/200 µS
HF-R TD 258 TL-D EII	2	12	32A/300 µS

Conversion table for max. quantities of ballasts on other types of Miniature Circuit Breakers

MCB Type	Relative quantity of ballasts	
B	16A	100%(see table on the left)
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%

Insulation resistance test

500 V DC from Line/Neutral to Earth
(not between Line and Neutral)
Note: Ensure that the Neutral is
reconnected again after the above
mentioned test is carried out and
before the installation is put into
operation.

Ignition time

Typical 0.5 sec. quick warm start.

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

Lamps	Qty of Lamps	Ballast	System Power*	Lamp Power*	Ballast Loss*	Efficacy	Lumen Nom.*	CELMA class.
			W	W	W	lm/W	lm	EEI
TL-D 18W	1	HF-R TD 118 TL-D EII	20	16	4	75	1300	AI
TL-D 18W	2	HF-R TD 218 TL-D EII	38	32	6	75	2600	AI
TL-D 18W	3	HF-R TD 318 TL-D EII	-	-	-	-	3900	AI
TL-D 18W	4	HF-R TD 418 TL-D EII	-	-	-	-	5200	AI
TL-D 36W	1	HF-R TD 136 TL-D EII	37	32	5	100	3200	AI
TL-D 36W	2	HF-R TD 236 TL-D EII	71	64	7	100	6400	AI
TL-D 58W	1	HF-R TD 158 TL-D EII	56	50	6	100	5000	AI
TL-D 58W	2	HF-R TD 258 TL-D EII	110	100	10	100	10000	AI

* Typical values for /830 measured at 100% power and ambient temperature of 25°C.

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HF-REGULATOR// Touch and DALI TL-D

Lamp	Qty of Lamps	Ballast	Power Factor	Max cable Cap ¹⁾ Lp-Lp/Lp-Lgnd PF	Tc max °C	Operating Frequency kHz
TL-D 18W	1	HF-R TD 118 TL-D EII	0.96	100/75	75	42..110
TL-D 18W	2	HF-R TD 218 TL-D EII	0.97	100/75	75	42..110
TL-D 18W	3	HF-R TD 318 TL-D EII	-	-	-	-
TL-D 18W	4	HF-R TD 418 TL-D EII	-	-	-	-
TL-D 36W	1	HF-R TD 136 TL-D EII	0.98	100/150	75	42..110
TL-D 36W	2	HF-R TD 236 TL-D EII	0.99	75/50	75	42..110
TL-D 58W	1	HF-R TD 158 TL-D EII	0.99	100/150	75	42..110
TL-D 58W	2	HF-R TD 258 TL-D EII	0.99	75/50	75	42..110

1) Lp-Lp = between lamp wires Typical wire capacitance 50 pF/m (spacing between wires 0.5 mm)

Lp-Lgnd = between lamp wires and ground Typical wire capacitance 72 pF/m (spacing between wires 0.5 mm)

Protected against accidental mains voltage connection

Yes

Control input

Regulating level (lamp power)

1 to 100%

The control input complies with EN 60929 (Annex E) and is compatible with Philips lighting control equipment

Standby power consumption

< 350 mW

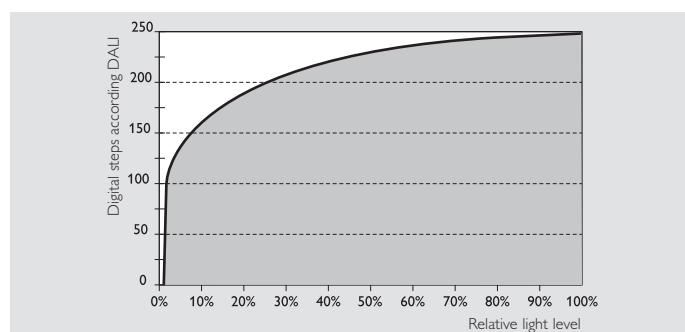
Control input insulation, basic insulation

≥ 1500 V

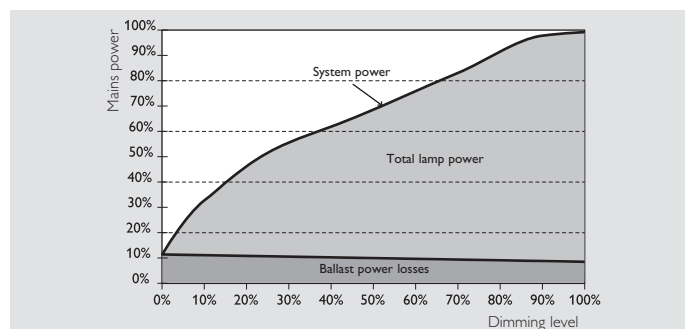
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HF-REGULATOR// Touch and DALI TL-D



Relation between lamp power and digital regulation



Input power vs dimlevel HF-REGULATOR// (DALI/Touch and Dim)

Option 1) DALI

Digital coded input signal according to "Digital Addressable Lighting Interface" protocol, including 16 presets and 64 addresses possibility.

Option 2) Touch and Dim

A short push on the button represents the On/Off command. Personal light levels can be stored in the internal memory by a firm longer push on the push button. Failure proof (non volatile) memory ensures that the ballast always remembers your setting when next time switched on or in case of power failure.

Maximum number of ballasts connected in one circuit 32 Pcs (switched on by one or multiple switches)

Mains input signal	Retractive push-to-make switch
- Ignore status, <0.04 sec.	To avoid reaction on mains spikes!
- Short push, between 0.04 sec. and 0.5 sec.	Switch On/Off
- Long push, between 0.5 sec. and 10 sec.	Dim Up/Down
- Reset push, >10 sec.	Set light to mid value (35% output)

The dim function will toggle after each individual push. Except when the value is lower than 10% it will always dim up, and when the light output is higher than 70% it will always dim down to perform according human perception.

Technical data for design and mounting in fixtures

Temperatures

Temperature range to ignite lamp
With ignition aid 0 °C to +50 °C
at a 70..100% dim input -20 °C to +50 °C

Storage temperature range -25 °C to +80 °C

Stable lamp operation assured > 15 °C

Striation possible < 10 °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. The HF-REGULATOR// ballast for TL-D applications has a specified lifetime of 50,000 hrs with a maximum of 10% failures guaranteed at a measured Tcase of 75 °C.

Class II luminaires This application is not advisable; only with extensive tests on luminaires can the correct operation be verified

EMI precautions have to be taken

Outdoor Ballast IP=23
In outdoor the luminaire has to be sufficiently IP rated
Permitted humidity is tested according to EN 61347-1 par 11
Note that no moisture or condensation may enter the ballast

Ignition aid For optimum ignition the TL-D lamps should be mounted 13 mm from a metal plate
The metal plate should be electrically connected to the ballast housing

Earthing Earthing of the HF ballast in a luminaire is necessary for EMC (electromagnetic compatibility)

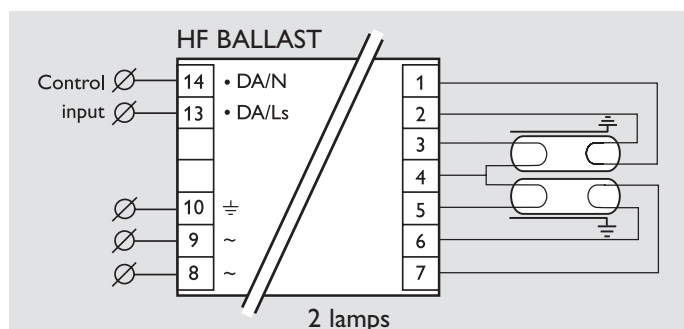
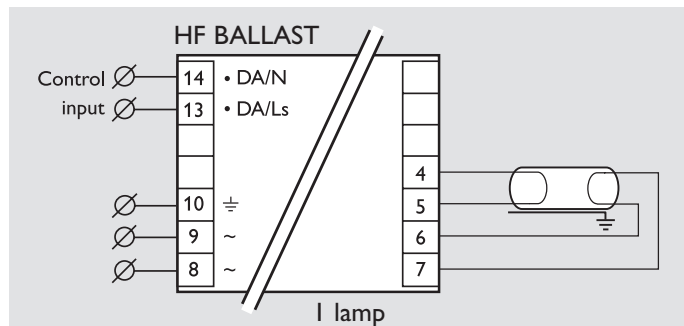
Hum and noise level Inaudible

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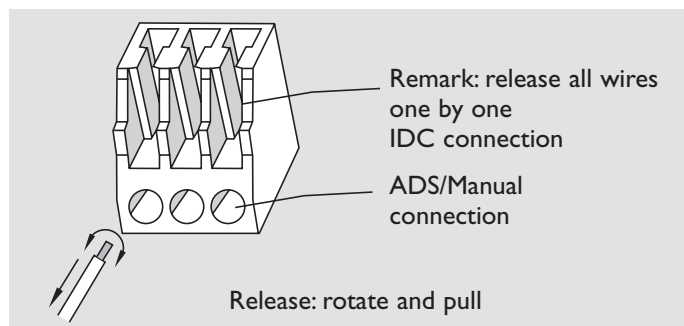
HF-REGULATOR// Touch and DALI TL-D

Wiring diagrams



Connector type

Connection wiring is greatly simplified through use of WAGO 251 universal connector: Suitable for both automatic wiring (ALF and ADS) and manual wiring.



Wire cross-section

ADS manual connection	0.5 mm - 1.0 mm ²
IDC connection	0.5 mm - 0.75 mm ² (*)
*Stranded wire	
Strip length	8.0 - 9.0 mm

Wiring tips

Earth connection to be made via housing or mains connector: Wiring inside fixture should be straight and as short as possible. Lamp wires should not run parallel to mains or control wires to avoid EMC problems. For optimal performance, note that:

- For one lamp ballasts wires 4 and 5 as short as possible, equal in length and a minimum of 50 mm from mains or dim wires. Keep lamp wires 6 and 7 equal in length.
- For two lamp ballasts wires 3, 4 and 5 as short as possible, equal in length and a minimum of 50 mm from mains or dim wires. Keep lamp wires 6 and 7, and 1 and 2 equal in length.

Notes

1. Data based on a mains supply with an impedance of 400 mΩ (equal to 15 m cable of 2.5 mm² and another 20 m to the middle of the power distribution), under worst case conditions. With an impedance of 800 mΩ the 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 based on the assumption that these are all switched on at 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 recommended to reduce the number of ballasts by 20%.
6. First digital regulating steps (DALI) are fixed at 1% light output (dimming specification).
7. For optimum performance care has to be taken for symmetrical wiring.

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HF-REGULATOR// Touch and DALI TL-D

Ordering and packaging data

Ballast	I Piece		Bulk packaging		Dimensions	Volume	Weight	EAN code	EOC
	EAN code	Weight	Qty						
		kg	pcs		lxwxh cm	m³	Gross kg		
HF-R TD 118 TL-D EII	8711500 911728	0.28	12		40.8x20.8x7.6	0.0065	3.4	8711500 911735	911728 30
HF-R TD 218 TL-D EII	8711500 911742	0.30	12		40.8x20.8x7.6	0.0065	3.9	8711500 911773	911742 30
HF-R TD 136 TL-D EII	8711500 909671	0.27	12		40.8x20.8x7.6	0.0065	3.4	8711500 909688	909671 30
HF-R TD 236 TL-D EII	8711500 909695	0.30	12		40.8x20.8x7.6	0.0065	3.9	8711500 909701	909695 30
HF-R TD 158 TL-D EII	8711500 909718	0.27	12		40.8x20.8x7.6	0.0065	3.4	8711500 909725	909718 30
HF-R TD 258 TL-D EII	8711500 909732	0.31	12		40.8x20.8x7.6	0.0065	4.0	8711500 909749	909732 30

Ordering and packaging data

Ballast	I Piece		Bulk packaging		Dimensions	Volume	Weight	EAN code	EOC
	EAN code	Weight	Qty						
		kg	pcs	cm	m³	Gross kg			
HF-R TD 318 TL-D EII									
HF-R TD 418 TL-D EII									

Under development, Introduction Q3 2007



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Data subject to change