

Features

“Master + slave” system for multiple load dimming

- Suitable for incandescent and halogen lighting loads (with or without transformer or electronic supply)
- Compatible with energy saving (CFL or LED) dimmable lamps and with all types of electromagnetic transformers
- 0-10 V driving. Master Dimmer Type 15.10 is able to drive up to 32 Slaves Dimmer Type 15.11
- Use with 4 wire connection
- “Soft” On and Off transitions
- Selectable operating modes with or without previous light level memory (15.10)
- Staircase timer function, with “switch-off early warning” signalled by lamps dimming (15.10)
- Linear dimming
- Thermal protection against overload, thermo-fuse for extreme protection and short-circuit protection (15.11)
- 230 V AC supply, 50/60 Hz with automatic recognition of frequency

Screw terminal



* When the total load exceeds 6 A, it is necessary to switch it through an external contactor

For outline drawing see page 9

“Master Dimmer” output specifications

Driving signal (Output mode automatically configures to match input mode of the connected Driver)

Contact configuration A

“Slave Dimmer” output specifications

Power max. W

Power min. W

Nominal lamp ratings:

230 V incandescent or halogen W

Toroidal electromagnetic transformers for LV halogen W

Ecore electromagnetic transformers for LV halogen W

Electronic transformers (ballasts) for LV halogen W

Dimmable compact fluorescent (CFL) W

Dimmable 230 V LED W

Dimmable electronic transformers for LV LED W

Supply specifications

Nominal voltage (U_N) V AC (50/60 Hz)

Operating range

Stand-by power consumption W

Dimming operating modes

Technical data

Dimming speed (total dimming time) s

Delay setting (staircase function) min

Max no. of illuminated push-button (≤ 1 mA)

Ambient temperature range °C

Protection category

Approvals (according to type)

NEW 15.10



- “Master” dimmer
- 0-10 V/1-10 V output, usable both for driving one or more 15.11, or for directly controlling Drivers and luminaires with 0-10 V /1-10 V inputs
- Multi-function (with or without memory, including specific “memory for CFL” function)
- Dimming speed setting
- Staircase timer function, with “switch-off early warning” signalled by lamps dimming
- 6 A output relay contact*
- 17.5 mm wide, modular

NEW 15.11



- “Slave” dimmer
- 1-10 V input, driven by 15.10 or by other 0-10 V/1-10 V output devices
- Maximum lamp load 400 W
- 100 W load with energy saving dimmable lamps (LED and CFL)
- Leading and trailing edge dimming methods
- “Transformer” function (for use with electromechanical transformers)
- Minimum dimming level setting
- 17.5 mm wide, modular

0-10 V, +35 mA max
(Active current sourcing mode)

1-10 V, -35 mA max
(Passive current sinking mode)

1 NO (6 A/230 V AC)*

—

—

—

400

3

400 ⁽¹⁾

400 ⁽²⁾

400 ⁽²⁾

400 ⁽¹⁾

100 ⁽³⁾

100 ^{(3) or (1)}

100 ⁽¹⁾

230

(0.8...1.1) U_N

0.5

0.5

Trailing edge (☼)
Leading edge (☼) and (☼)

—

—

—

-10...+50 ⁽⁴⁾

IP 20

IP 20



Note ⁽¹⁾ Select “trailing edge” (☼) position on the front selector.

⁽²⁾ Select “transformer” (☼) position on the front selector. Preferably, no more than 2 transformers.

⁽³⁾ Select “leading edge” (☼) position on the front selector, and set the appropriate minimum dimming value (dependent on lamp type).

⁽⁴⁾ With lamp load > 300 W (> 75 W for CFL or LED lamps), adequate ventilation must be provided - a gap of 9 mm on both side of the dimmer is suggested. Use the plastic separator type 022.09.

Features

Electronic step relay and dimmer for control of lighting levels

- Suitable for incandescent and halogen lighting loads (with or without transformer or electronic supply)
- Version compatible with energy saving (CFL or LED) dimmable lamps and with all types of electromagnetic transformers (15.81)
- Version compatible with 230 V LED dimmable lamps (15.51/15.91)
- Use with 3 or 4 wire connection
- "Soft" On and Off transitions
- Two selectable operating modes: with or without previous light level memory
- Step (15.51 only) or linear dimming
- Thermal protection against overload
- Thermo-fuse for extreme protection (15.81)
- 230 V AC supply, 50 or 60 Hz (15.51), 50/60 Hz with automatic recognition of frequency (15.81, 15.91)

Screw terminal



For outline drawing see page 9

Output data		15.91	15.51	15.81
Rated voltage	V AC	230	230	230
Power max.	W	100	400	500
Power min.	W	3	10	3
Nominal lamp ratings:				
230 V incandescent or halogen W		100	400	500 ⁽¹⁾
Toroidal electromagnetic transformers for LV halogen W		—	300 ⁽²⁾	500 ⁽³⁾
E-core electromagnetic transformers for LV halogen W		—	—	500 ⁽³⁾
Electronic transformers (ballasts) for LV halogen W		—	400 ⁽⁴⁾	500 ⁽¹⁾
Dimmable compact fluorescent (CFL) W		—	—	100 ⁽⁵⁾
Dimmable 230 V LED W		50 ⁽⁶⁾	50 ⁽⁷⁾	100 ⁽⁵⁾
Dimmable electronic transformers for LV LED W		50 ⁽⁶⁾	50 ⁽⁷⁾	100 ⁽¹⁾
Supply specifications		15.91	15.51	15.81
Nominal voltage (U _N)	V AC (50/60 Hz)	230	230 ⁽⁸⁾	230
Operating range		(0.8... 1.1)U _N	(0.8... 1.1)U _N	(0.8... 1.1)U _N
Stand-by power consumption	W	0.4	0.7	0.5
Dimming operating mode		Leading edge	Trailing edge	Trailing edge (☼) Leading edge (☼) and (☼)
Technical data		15.91	15.51	15.81
Ambient temperature range	°C	-10...+50 ⁽⁹⁾	-10...+50 ⁽⁹⁾	-10...+50 ⁽¹⁰⁾
Protection category		IP 20	IP 20	IP 20
Approvals (according to type)		CE EAC	CE EAC	CE EAC

Note

- ⁽¹⁾ Select "incandescent lamp" (☼) position on the front selector.
- ⁽²⁾ One transformer only. Power-up only with the lamp load connected.
- ⁽³⁾ Select "transformer" (☼) position on the front selector. Preferably, no more than 2 transformers.
- ⁽⁴⁾ One transformer only.
- ⁽⁵⁾ Select "CFL" (☼) position on the front selector, and set the appropriate minimum dimming value (dependent on lamp type).
- ⁽⁶⁾ Only if lamps or electronic transformers are compatible with leading edge method.
- ⁽⁷⁾ Only if lamps or electronic transformers are compatible with trailing edge method.
- ⁽⁸⁾ Specific 60 Hz version available (see ordering information).
- ⁽⁹⁾ It is not recommended to mount more than one dimmer in the same wall box, unless adequate ventilation is provided or the lamp load is less than 100 W (15.51) or 50 W (15.91).
- ⁽¹⁰⁾ With lamp load > 300 W (> 75 W for CFL or LED lamps), adequate ventilation must be provided - a gap of 9 mm on both side of the dimmer is suggested. Use the plastic separator type 022.09.

Not compatible with illuminated push-buttons.



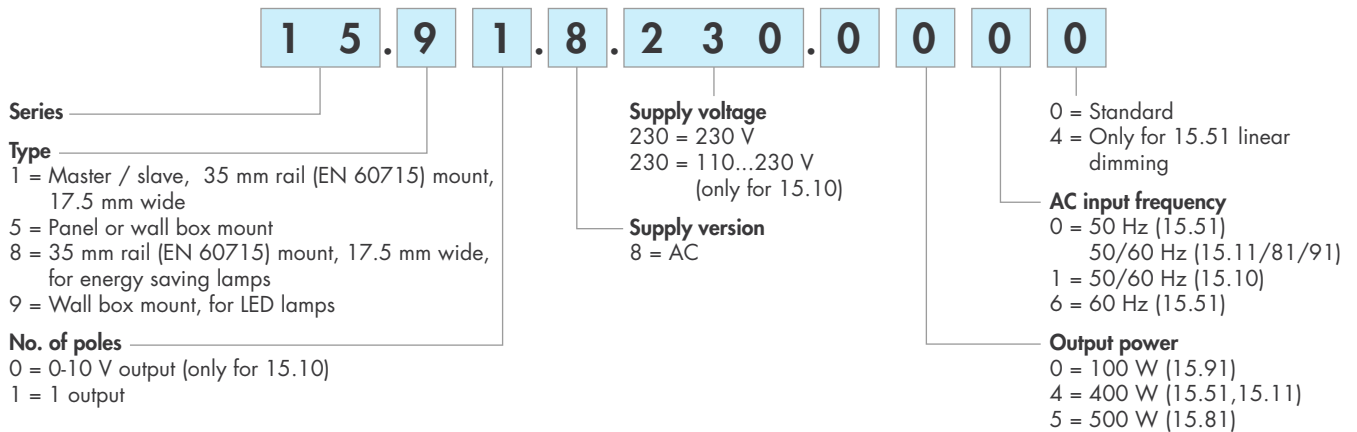
- For mounting within residential wall boxes
- Maximum lamp load 100 W
- Two operating modes
- Leading edge dimming method
- Compatible with LED dimmable lamps

- Box or panel mount
- Maximum lamp load 400 W
- Two operating modes
- Two different types for linear and step dimming
- Trailing edge dimming method

- 17.5 mm modular
- Maximum lamp load 500 W
- Multi-function
- Leading and trailing edge dimming methods (depending on the function)
- Compatible with energy saving dimmable lamps

Ordering information

Example: type 15.91, Dimmer, 230 V AC.



Codes

15.10.8.230.0010 master dimmer, 50/60 Hz
 15.11.8.230.0400 slave dimmer, 50/60 Hz
 15.51.8.230.0400 step dimming, 50Hz
 15.51.8.230.0404 linear dimming, 50Hz
 15.51.8.230.0460 step dimming, 60Hz
 15.81.8.230.0500 linear dimming, 50/60Hz
 15.91.8.230.0000 linear dimming, 50/60Hz

Technical data

EMC specifications								
Type of test		Reference standard	15.51/15.91	15.10/11/81				
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV					
	air discharge	EN 61000-4-2	8 kV					
Radiated electromagnetic field	(80...1,000 MHz)	EN 61000-4-3	3 V/m	10 V/m				
Fast transients (burst)	on supply terminals	EN 61000-4-4	4 kV					
	on pushbutton connection	EN 61000-4-4	4 kV					
Voltage pulses on supply terminals (surge 1.2/50µs)	differential mode	EN 61000-4-5	2 kV					
	on supply terminals	EN 61000-4-6	3 V					
Radiofrequency common mode voltage (0.15...80 MHz)	on pushbutton connection	EN 61000-4-6	3 V					
Voltage dips	70 % U _N , 40 % U _N	EN 61000-4-11	10 cycles					
Short interruptions		EN 61000-4-11	10 cycles					
Radiofrequency conducted emissions	0.15...30 MHz	EN 55014	class B					
Radiated emissions	30...1,000 MHz	EN 55014	class B					
Terminals		solid cable	stranded cable					
Max. wire size	mm ²	1 x 6 / 2 x 4	1 x 4 / 2 x 2.5					
	AWG	1 x 10 / 2 x 12	1 x 12 / 2 x 14					
Screw torque	Nm	0.8						
Wire strip length	mm	9						
Other data			15.10	15.11	15.51	15.81	15.91	
Power lost to the environment	without load	W	0.5	0.5	0.7	0.5	0.4	
	with rated load	W	1.7	2.5	2.2	2.6	1.2	
Max cable length for push-button connection	m	100	100	100	100	100	100	
Max cable length for Master and Slaves connection	m	100 (keep separate from power cables)						

Signaling

LED (15.10 only)	Condition
	Stand-by, output voltage <1V
	Active, output voltage ≥1V
	Short circuit or overload, output disabled
	Timing, staircase function

LED (15.11 only)	Condition
	Stand-by, input voltage <1V
	Active, input voltage ≥1V
	Short circuit or overload, output disabled
	Overtemperature, output disabled

Functions - Type 15.10 and 15.11

Type Linear dimming

15.10

Operating mode without memory: at switch-off, the light level is not memorized.

Long control pulse: The light level is progressively raised or lowered in linear way. The lowest value depending on the "minimum dimming level" regulator setting (on 15.11).

Short control pulse: Alternately switches between On and Off (maximum light level and the off state).

Operating mode with memory: the previous light level is memorized.

Long control pulse: The light level is progressively raised or lowered in linear way. The lowest value dependent on the "minimum dimming level" regulator setting (on 15.11).

Short control pulse: Alternately switches between On and Off. When switching On, the light level assumes the value set during the previous On state.

Operating mode with memory: the previous light level is memorized, specific for CFL Lamp.

Long control pulse: The light level is progressively raised or lowered in linear way. The lowest value dependent on the "minimum dimming level" regulator setting (on 15.11).

Short control pulse: Alternately switches between On and Off. When switching On, the light level reach the full value for a very short time (in order to guarantee the correct lamp turn-on), then immediately assumes the value set during the previous On state.

Staircase relay with early warning
On initial impulse the output closes and the timing starts for the pre-set duration. After the timing period (T), the output power is reduced to 50% for 10 seconds; then in the last 30 seconds it will be further reduced to the final shutdown.
During the pre-set and 40 second warning time, it is possible, by a further impulse, to extend the time by the full pre-set value.

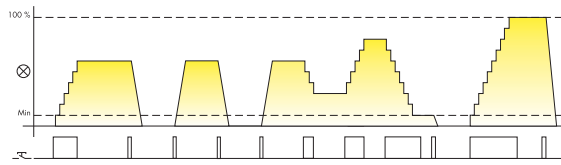
Type of load - Type 15.11

Type of load	Selector setting	Regulator setting
<ul style="list-style-type: none"> • Incandescent lamps • 230 V halogen lamps • 12/24 V halogen and LED lamps with electronic transformer/ballast 	<p>(Trailing Edge)</p>	<p>It is suggested to set the "minimum dimming level" at the lowest value, so that the complete dimming range is available. But if it is necessary to avoid too low a level of illumination, a higher value can be set.</p>
<ul style="list-style-type: none"> • Dimmable compact fluorescent lamps (CFL) • Dimmable LED lamps 	<p>(Leading Edge)</p>	<p>It is suggested to initially set the "minimum dimming level" at an intermediate value and then if necessary, readjust for a level found to be compatible with the lamp being used.</p>
<ul style="list-style-type: none"> • 12/24 V halogen lamps with toroidal or E-core electromagnetic transformer 	<p>(Leading Edge)</p>	<p>It is suggested to set the "minimum dimming level" at the lowest value, so that the complete dimming range is available. But if it is necessary to avoid too low a level of illumination, a higher value can be set.</p>

Functions - Types 15.51 and 15.91

Type Step dimming

Operating mode 1 (with memory): the previous light level is memorized.

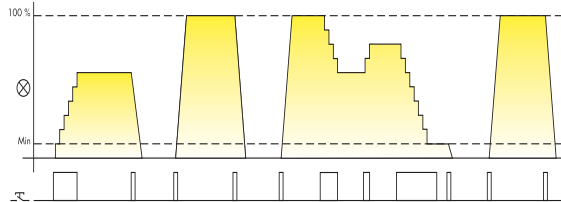


Long control pulse: The light level is progressively raised or lowered through a maximum of 10 incremental steps.

Short control pulse: Alternately switches between On and Off. When switching On, the light level assumes the value set during the previous On state.

15.51...0400

Operating mode 2 (without memory): on switch off, the light level is not memorized.

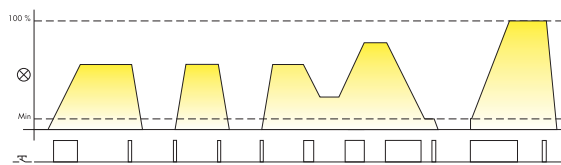


Long control pulse: The light level is progressively raised or lowered through a maximum of 10 incremental steps.

Short control pulse: Alternately switches On or Off between the maximum light level and the off state.

Type Linear dimming

Operating mode 3 (with memory): the previous light level is memorized.



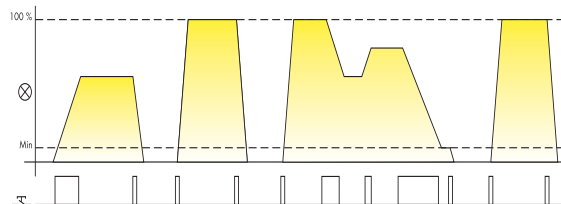
Long control pulse: The light level is progressively raised or lowered.

Short control pulse: Alternately switches between On and Off. When switching On, the light level assumes the value set during the previous On state.

15.51...0404

15.91...0000

Operating mode 4 (without memory): on switch off, the light level is not memorized.



Long control pulse: The light level is progressively raised or lowered.

Short control pulse: Alternately switches On or Off between the maximum light level and the off state.

Operating mode setup

Type 15.51

On **15.51** operating mode 1 or 3 (with memory) is preset, but it is possible to change it using the following sequence:

- remove the supply voltage;
 - press the control button;
 - apply the supply to the relay, keeping the button closed for 3 second;
 - on button release, the light will flash twice to indicate the selection of operating mode 2 or 4, or flash once for operating mode 1 or 3.
- Repeating the above steps will alternately change between operating modes.

Type 15.91

On **15.91** operating mode 4 (without memory) is preset, but it is possible to change it using the following sequence:

- remove the supply voltage;
 - press the control button;
 - apply the supply to the relay, keeping the button closed for 3 second;
 - on button release, the light will flash twice to indicate the selection of operating mode 3, or flash once for operating mode 4.
- Repeating the above steps will alternately change between operating modes.

Thermal protection and signaling

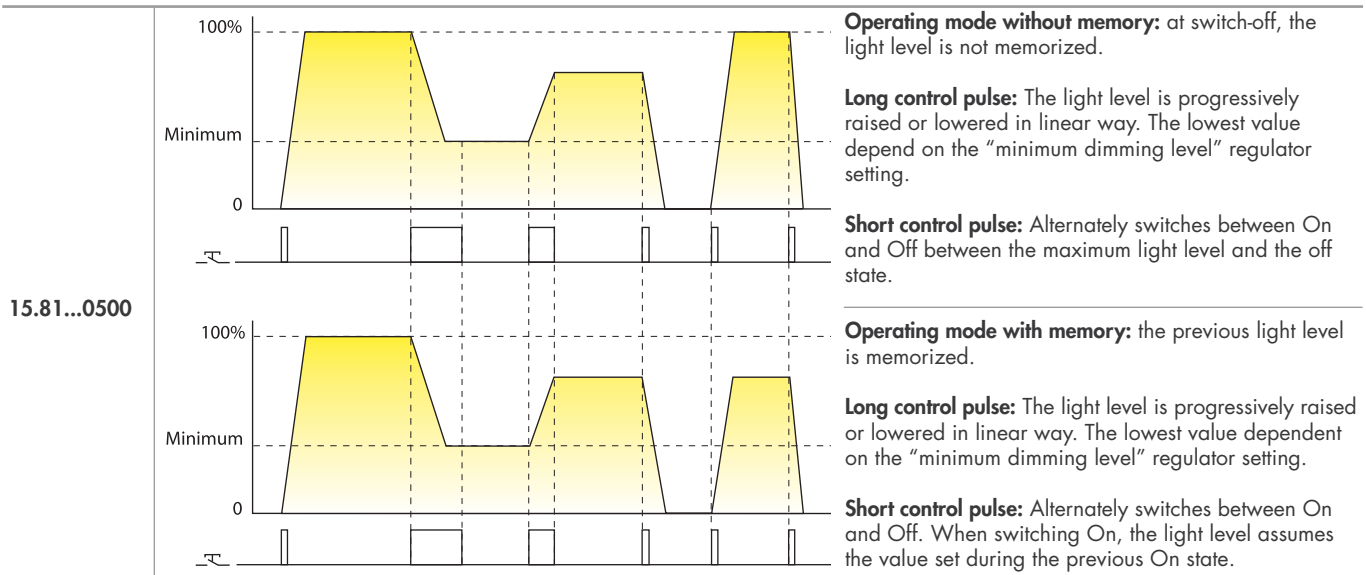
LED (15.81 type only)	Supply voltage	Thermal protection
	OFF	—
	ON	—
	ON	ALARM

ALARM

The internal thermal protection (active on all dimmer types) will detect an unsafe temperature, due to overload or incorrect installation, and will turn the dimmer output off. It is possible to turn the dimmer on, by push button, only when the temperature reduces to a safe level (after 1 to 10 minutes, depending on installation conditions) and after removing the cause of the overload.

Functions - Type 15.81

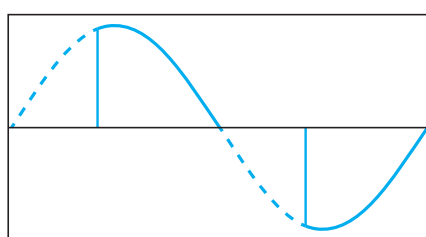
Type Linear dimming



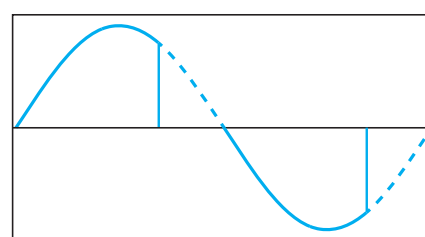
15.81...0500

Type of load	Selector setting		Regulator setting
	With memory (M)	Without memory (M)	
<ul style="list-style-type: none"> Incandescent lamps 230 V halogen lamps 12/24 V halogen lamps with electronic transformer/ballast 			It is suggested to set the "minimum dimming level" at the lowest value, so that the complete dimming range is available. But if it is necessary to avoid too low a level of illumination, a higher value can be set.
<ul style="list-style-type: none"> Dimmable compact fluorescent lamps (CFL) Dimmable LED lamps 			It is suggested to initially set the "minimum dimming level" at an intermediate value and then if necessary, readjust for a level found to be compatible with the lamp being used.
<ul style="list-style-type: none"> 12/24 V halogen lamps with toroidal or E-core electromagnetic transformer 			It is suggested to set the "minimum dimming level" at the lowest value, so that the complete dimming range is available. But if it is necessary to avoid too low a level of illumination, a higher value can be set.

Leading edge dimming

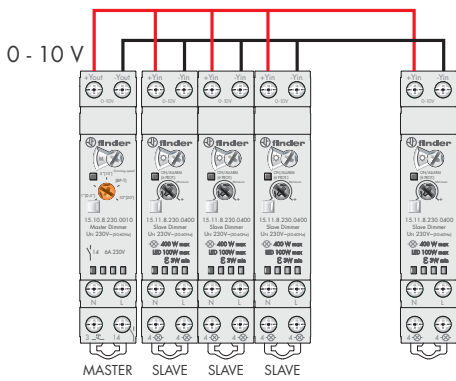


Trailing edge dimming



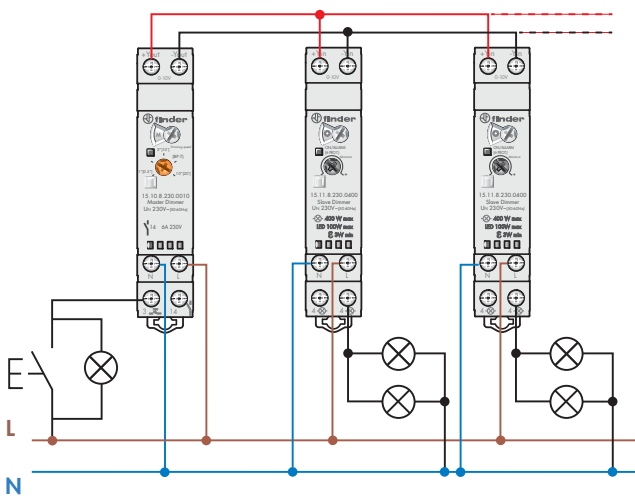
Light dimming is realized with "phase cutting technology", which works by "cutting off" part of the mains voltage waveform in order to reduce the RMS voltage fed to the lamp. When the "cut off" part is at the beginning of each half cycle the dimming method is called Leading Edge. When it is towards the end of each half cycle, it is called Trailing Edge. These 2 methods are suitable for dimming different lamp types: Trailing Edge is, in general, more suitable for electronic transformers for low voltage lamps (halogen or LED). Leading Edge is better suited for electromagnetic transformers for LV lamps, 230 V CFL and 230 V LED lamps. Both methods are, however, suitable for dimming 230 V halogen and incandescent lamps. In consideration of the different lamp types actually available on the market, it is suggested to refer to the technical specification indicated in page 1 and, if given, to the lamp manufacturer's recommendation.

Wiring diagrams - Types 15.10 and 15.11

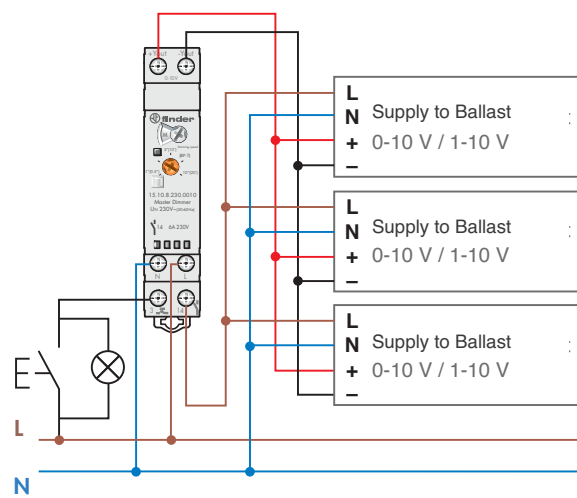


This new system is modular, adaptable to every need and allows control of multiple lamps through a single control device called the "Master Dimmer" Type 15.10.8.230.0010. The Master Dimmer, produces a 0 - 10 V signal proportional to the dimming value needed: 0 V corresponds to 0% (light off); 5V equals 50%, 10 V corresponds to the maximum brightness (100% on). The 0 - 10 V output signal terminals Yout + / Yout - of the "Master Dimmer" must be connected to terminals + Yin / Yin - of one or more 15.11.8.230.0400, called the "Slave Dimmers", which have the task of changing the voltage applied to the lamps and therefore their brightness.

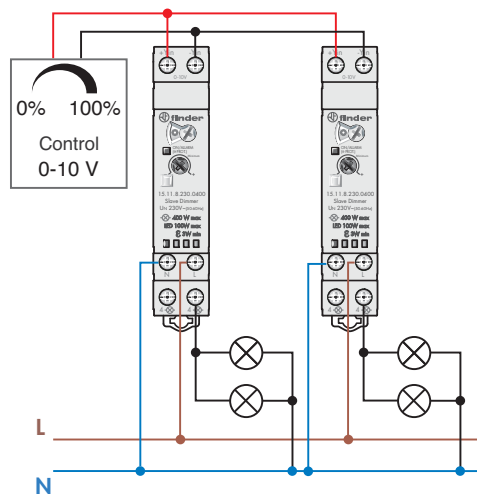
The result is a flexible system that offers a range of solutions from the minimum configuration of a Master Dimmer and a Slave Dimmer, up to the maximum configuration of a Master Dimmer and 32 Slave Dimmers. Each slave can drive a different lamp type, depending on the appropriate methodology, "Leading Edge" or "Trailing Edge". It can regulate halogen lamps, dimmable LED lamps, dimmable CFL lamps, electronic transformers, and electromagnetic transformers. For example, one Master Dimmer can control a Slave Dimmer with LED lamps and at the same time a second Slave Dimmer with halogen lamps, and a third with electronic transformers.



MASTER DIMMER TYPE 15.10 AND SLAVE DIMMER TYPE 15.11
It is recommended that the Master controls from one to a maximum of 32 Slave units. The push-buttons (including illuminated push-buttons Max. 15) serve as the ON / OFF (momentary push), or when pressed for a longer time they adjust the brightness level. Each Slave can drive a different load type.



MASTER DIMMER + 0 - 10 V ELECTRONIC TRANSFORMER OR BALLAST
Using only the Master Dimmer it is possible to control electronic transformers or ballasts with a 0 - 10 V / 1 - 10 V input (observing correct polarity). For 1 - 10 V applications it is suggested to supply the Ballast Live from terminal 14. This will ensure that the supply to the Ballast is cut-off for a signal < 1 V. Note: Check that the rated current of the Ballast does not exceed the 6 A 230 V AC rating of terminal 14.

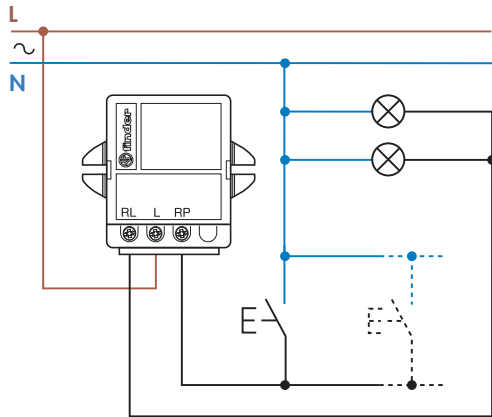


BMS 0 - 10 V OUTPUTS + SLAVE DIMMERS
In the case of Home Automation or Building Automation systems you can use just the Slave Dimmer Type 15.11 directly controlled by the 0 - 10 V output of the building management system (BMS), or by 0 - 10 V rotary regulators.

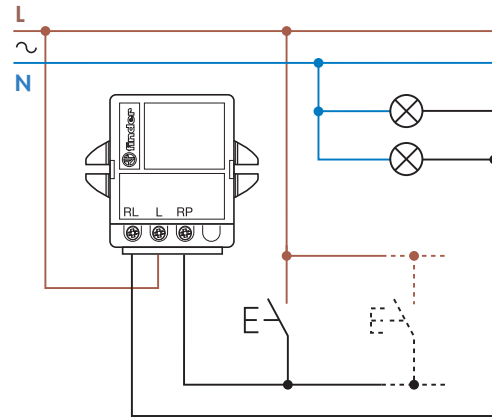
Wiring diagrams - Types 15.51, 15.81 and 15.91

Note: remember to maintain a ground/earth connection for class 1 light fittings.

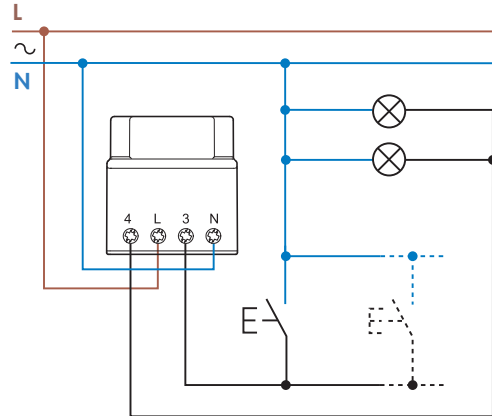
Type 15.51 - 3 wire connection



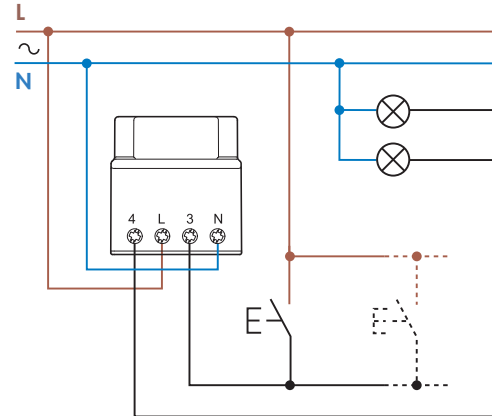
Type 15.51 - 4 wire connection



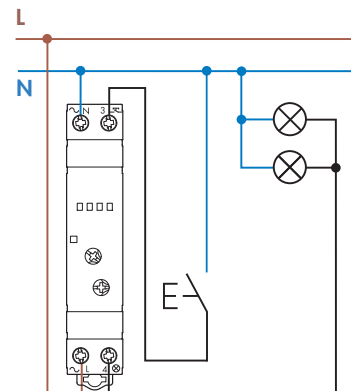
Type 15.91 - 3 wire connection



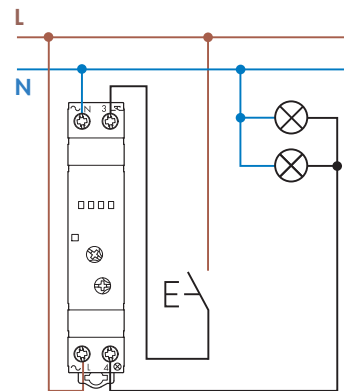
Type 15.91 - 4 wire connection



Type 15.81 - 3 wire connection

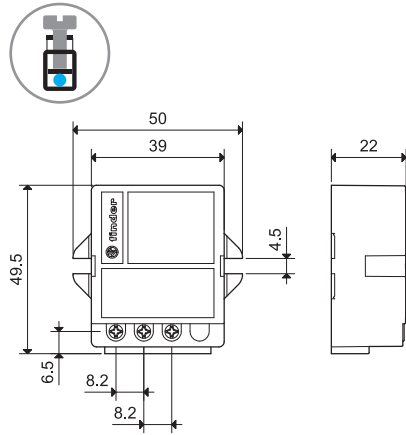


Type 15.81 - 4 wire connection

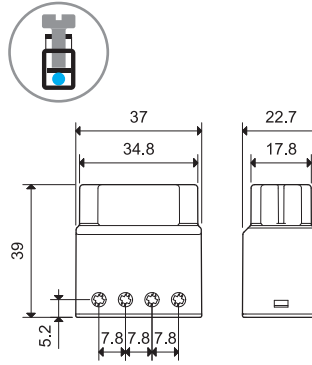


Outline drawings

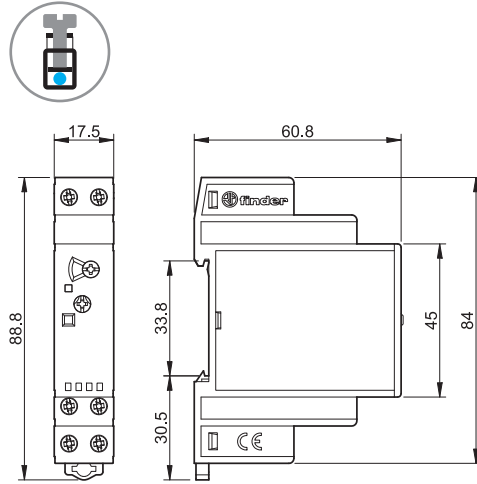
15.51
Screw terminal



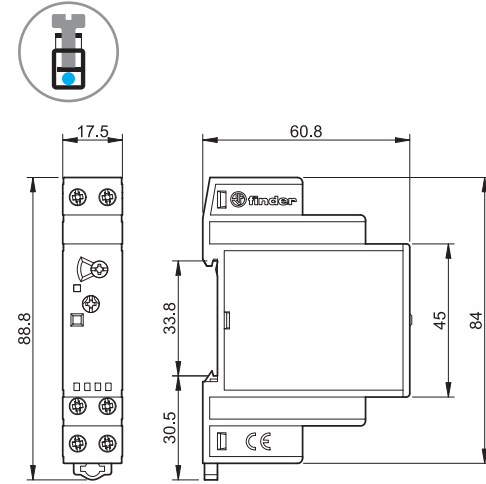
15.91
Screw terminal



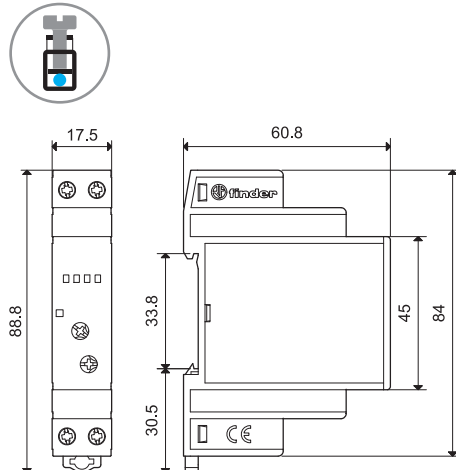
15.10
Screw terminal



15.11
Screw terminal



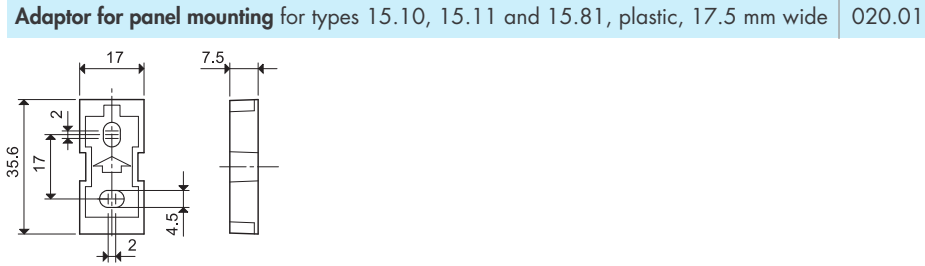
15.81
Screw terminal



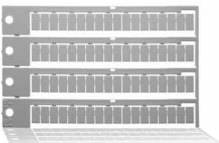
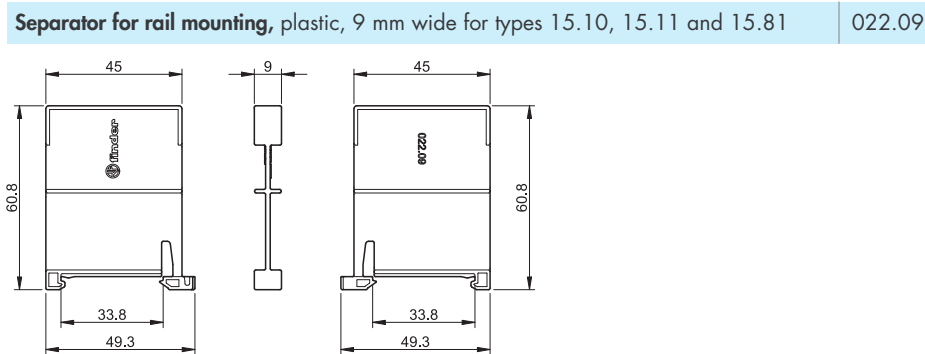
Accessories



020.01



022.09



060.72

Sheet of marker tags for types 15.10, 15.11 and 15.81, plastic, 72 tags, 6x12 mm | 060.72



022.18



8-way jumper link for type 15.10 and 15.11 connection, 17.5 mm wide | 022.18 (blue)
Rated values | 10 A - 250 V

