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## Switch Disconnecter

**Description**

For use as a switch disconnecter in all types of circuit. Complies with: BS EN 60 947-3 all ratings

**Technical Data**

Utilisation Category AC22B

**In : 25, 32A**

Shrouded cable clamps  
Connection capacity:  
10mm<sup>2</sup> - Rigid conductor  
6mm<sup>2</sup> - Flexible conductor

**In : 40, 63, 80A**

Cable clamps  
Connection capacity:  
25mm<sup>2</sup> - Rigid conductor  
16mm<sup>2</sup> - Flexible conductor

**In : 100A**

Cable clamps  
Connection capacity:  
50mm<sup>2</sup> - Rigid conductor  
35mm<sup>2</sup> - Flexible conductor

All switches have a green / red indication on the handle giving positive contact indication.

Designation	Characteristics	Width in ■ 17.5mm	Pack qty	Cat Ref.
 Single Pole	1 x 25A 250V~	1	12	<b>SB125</b>
	 1 x 25A 250V~ with pilot light	1	1	<b>SB125V</b>
	1 x 32A 250V~	1	12	<b>SB132</b>
	 1 x 32A 250V~ with pilot light	1	1	<b>SB132V</b>
	1 x 40A 250V~	1	12	<b>SB140</b>
	1 x 63A 250V~	1	12	<b>SB163</b>
	1 x 80A 250V~	1	12	<b>SB180</b>
	1 x 100A 250V~	1	6	<b>SB199</b>
 Double Pole	2 x 25A 250V~	1	1	<b>SB225</b>
	 2 x 25A 250V~ with pilot light	1	1	<b>SB225V</b>
	2 x 32A 250V~	1	1	<b>SB232</b>
	 2 x 32A 250V~ with pilot light	1	1	<b>SB232V</b>
	2 x 40A 250V~	2	1	<b>SB240</b>
	2 x 63A 250V~	2	1	<b>SB263</b>
	2 x 80A 250V~	2	1	<b>SB280</b>
	2 x 100A 250V~	2	1	<b>SB299</b>
 Triple Pole	3 x 25A 400V~	2	1	<b>SB325</b>
	3 x 32A 400V~	2	1	<b>SB332</b>
	3 x 40A 400V~	3	1	<b>SB340</b>
	3 x 63A 400V~	3	1	<b>SB363</b>
	3 x 80A 400V~	3	1	<b>SB380</b>
	3 x 100A 400V~	3	1	<b>SB399</b>
	Four Pole with Indicator	4 x 25A 400V~	2	1
 4 x 32A 400V~	2	1	<b>SB432F</b>	
4 x 40A 400V~	4	1	<b>SB440F</b>	
4 x 63A 400V~	4	1	<b>SB463F</b>	
4 x 80A 400V~	4	1	<b>SB480F</b>	
4 x 100A 400V~	4	1	<b>SB499F</b>	
Locking device			1	<b>MZN175</b>

SB140

SB232

SB140

## 2 way / Centre-off Changeover Modular Switches



SF118F

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>Switches, 2 ways Single pole</b>	1 x 25A 250V~	1	12	<b>SF118F</b>



<b>1 x N/O 1 x N/C Double pole</b>	2 x 25A 250V~	1	12	<b>SF115</b>
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<b>Changeover Double pole</b>	2 x 25A 250V~	2	6	<b>SF218F</b>
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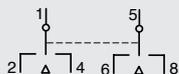


SF219F

<b>Switches, Centre-off changeover Single pole</b>	1 x 25A 250V~	1	12	<b>SF119F</b>
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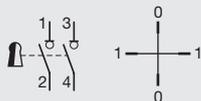


<b>Double pole</b>	2 x 25A 250V~	2	6	<b>SF219F</b>
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SK606

<b>Lockable rotary switch on off (4 positions)</b>	10A 400Vac	3	1	<b>SK606</b>
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Modular  
Devices

## Latching Relays

### Description

Latching relays - operate when impulsed by a signal voltage. The impulse can be provided via a pushbutton or pushswitch. The first pulse operates the relay and latches it into its set (opposite) state, the next operation of the pushbutton returns the relay into its reset (original) state.

### Auxiliary contacts (EPN050, EPN051)

Are available for remote signalling and centralised control applications and can be easily combined with the latching relays.

connection: 10mm<sup>2</sup> flexible  
6mm<sup>2</sup> rigid



EPN510



EPN540

Designation	Type	Coil	Power circuit AC1	Width in 17.5mm	Pack qty.	Cat Ref.
Latching relays	1 NO	230V 50 Hz	16A - 250V~	1	12	<b>EPN510</b>
		24V 50 Hz	16A - 250V~	1	1	<b>EPN513</b>
	2 NO	230V 50 Hz	16A - 250V~	1	1	<b>EPN520</b>
		24V 50 Hz	16A - 250V~	1	1	<b>EPN524</b>
		12V 50Hz	16A - 250V	1	1	<b>EPN521</b>
	1 NC + 1 NO	230V 50 Hz	16A - 250V~	1	1	<b>EPN515</b>
		24V 50 Hz	16A - 250V~	1	1	<b>EPN518</b>
		12V 50 Hz	16A - 250V~	1	1	<b>EPN519</b>
	2 NC + 2 NO	230V 50 Hz	16A - 250V~	2	1	<b>EPN525</b>
		24V 50 Hz	16A - 250V~	2	1	<b>EPN528</b>
		12V 50 Hz	16A - 250V~	2	1	<b>EPN529</b>
	4 NO	230V 50 Hz	16A - 400V~	2	1	<b>EPN540</b>
		24V 50 Hz	16A - 400V~	2	1	<b>EPN541</b>

Designation	Power circuit	Width in 17.5mm	Pack qty.	Cat Ref.
Auxiliary contact	2A - 250V~	1/2	1	<b>EPN051</b>
Auxiliary contact for centralised control	24V - 230V~	1/2	1	<b>EPN050</b>

## Relays

### Description

To provide command of low power circuits max 16A; associated with push buttons, switches, time switches etc to provide for remote control applications.

The relays will accept an auxiliary contact for remote signalling applications. (EP071)

For the command of ELV circuits use interface relays EN145 and EN 146.

For the command of high power circuits (20, 40 63 amps) use contactors as shown on page 4.6.



ER120

Designation	Type	Coil AC voltage	Power circuit AC1	Width in 17.5mm	Pack qty.	Cat Ref.
<b>Relays</b>	1 NC + 1 NO	230V 50 Hz	16A - 250V~	1	12	<b>ER120</b>
		24V 50 Hz	16A - 250V~	1	12	<b>ER123</b>
		12V 50 Hz	16A - 250V~	1	12	<b>ER124</b>
	2 NC + 2 NO	230V 50 Hz	16A - 250V~	2	1	<b>ER135</b>
		24V 50 Hz	16A - 250V~	2	1	<b>ER138</b>
		12V 50 Hz	16A - 250V~	1	2	<b>ER139</b>
<b>Auxiliary contacts</b>			2A - 250V~	1/2	1	<b>EP071</b>

Modular Devices

## Interface Relays

### Description

To interface between low voltage and extra low voltage circuits to ensure galvanic isolation to 4kV.

### Application

Interface between fire alarm, burglar alarm and other ELV systems and main distribution circuits.

### Connection:

flexible 4mm<sup>2</sup>  
rigid 6mm<sup>2</sup>



EN145

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>Interface relays</b> <b>ELV/LV 1 way</b> 	Coil voltage: 10 to 26V ac/dc output: 1 changeover contact max. 5A 230V~ min. 10mA - 12V dc	1	6	<b>EN145</b>
<b>LV/ELV 1 way</b> 	Coil voltage: 230V~ 50Hz output: 1 changeover contact max. 5A 230V~ min. 10mA - 12V dc	1	6	<b>EN146</b>

## Contactors

### Description

For the remote switching and control of power circuits (20A-63A AC1)

### Technical data

The choice of contactor depends upon a number of parameters, e.g.

- The nature of the supply.
- The power it is switching.
- The characteristics of the load.
- The control voltage required.
- Number of operations

All contactors ratings are for AC1 loads only – if the load differs from AC1 the contactor may need de-rating.

**The use of LZ060 (heat dissipation inserts) between all contactors installed or between contactors and adjacent devices is recommended.**

### Options

- Contact choice
- Normally open (NO)
  - Normally closed (NC)

**ES237 and ES238 are low noise versions**

### Auxiliary

20A contactors will accept auxiliary, EP071 contact.



ESN463



LZ060

Designation	Type	Coil AC voltage	Power circuit AC1	Width in ■ 17.5mm	Pack qty.	Cat Ref.
	<b>2 NO</b>	230V 50 Hz	20A - 250V~	1	12	<b>ES220</b>
		<b>*Low noise devices</b>	20A - 250V~	1	1	<b>ES237*</b>
			40A - 400V~	3	1	<b>ES240</b>
			63A - 400V~	3	1	<b>ES263</b>
		24V 50 Hz	20A - 250V~	1	1	<b>ES224</b>
	<b>2 NC</b>	230V 50 Hz	20A - 250V~	1	12	<b>ES230</b>
		<b>3 NO</b>	230V 50 Hz	20A - 400V~	2	6
			40A - 400V~	3	1	<b>ES340</b>
	<b>3 NO + 1 NC</b>	230V 50 Hz	40A - 400V~ Auxiliary contact 1 NC (10A)	3	1	<b>ES345</b>
			63A - 400V~ Auxiliary contact 1 NC (10A)	3	1	<b>ES365</b>
		<b>4 NO</b>	230V 50 Hz	20A - 400V~	2	6
	<b>*Low noise devices</b>		20A - 400V~	2	1	<b>ES238*</b>
		24V 50 Hz	20A - 400V~	2	1	<b>ES424</b>
230V 50Hz		40A - 400V~	3	1	<b>ES440</b>	
		230V 50Hz	63A - 400V~	3	1	<b>ES463</b>
	<b>4 NC</b>	230V 50 Hz	20A - 400V~	2	6	<b>ES430</b>
			40A - 400V~	3	1	<b>ES480</b>
			63A - 400V~	3	1	<b>ES490</b>
	<b>2 NC + 2 NO</b>	230V 50 Hz	63A - 250V~	3	1	<b>ES470</b>
<b>Auxiliary for 20A contactors</b>			2A - 250V~	1/2	1	<b>EP071</b>
<b>Heat dissipation insert</b>				1/2	10	<b>LZ060</b>

## Override Contactors

### Override contactors

Manual override facility allows temporary override, with automatic return at next coil energisation. Permanent off can also be selected.  
ET201 low noise version.

### Technical data

The choice of contactor depends upon a number of parameters, e.g.

- The nature of the supply.
- The power it is switching.
- The characteristics of the load.
- The control voltage required.
- Number of operations

All contactors ratings are for AC1 loads only – if the load differs from AC1 the contactor may need de-rating.

**The use of LZ060 (heat dissipation inserts) between all contactors installed or between contactors and adjacent devices is recommended.**

### Options

Contact choice

- Normally open (NO)
- Normally closed (NC)

LZ060 heat dissipation inserts.

### Auxiliary

20A contactors will accept auxiliary, EP071 contact.



ET341



EP071



LZ060

Designation	Type	Coil AC voltage	Power circuit AC1	Width in ■ 17.5mm	Pack qty.	Cat Ref.
Override contactor low noise recommended for domestic use	<b>2 NO</b>	230V 50 Hz	16A - 250V~	1	1	<b>ET201</b>
	<b>2 NO</b>	230V 50 Hz	20A - 250V~	1	12	<b>ET221</b>
	<b>3 NO</b>	230V 50 Hz	20A - 400V~	2	6	<b>ET321</b>
			40A - 400V~	3	1	<b>ET341</b>
	<b>4 NO</b>	230V 50 Hz	20A - 400V~	2	6	<b>ET421</b>
			40A - 400V~	3	1	<b>ET441</b>
<b>Auxiliary for 20A contactors</b>			2A - 250V~	1/2	1	<b>EP071</b>
<b>Heat dissipation insert</b>				1/2	10	<b>LZ060</b>

## Electromechanical Time Switches

**Description**

Electromechanical time switches  
1 and 2 channel.  
For hourly, daily or weekly  
programming.  
To control lighting, heating,  
ventilation, household  
appliances etc.  
To save energy and to improve  
comfort.

**Technical data**

- Programming by captive segments.
- Manual override:
- For 1 module products:
  - Automatic
  - Permanent ON
- For 3 module products:
  - Automatic
  - Permanent ON
  - Permanent OFF

**Minimum switching time:**

- 15 min for daily dial
- 2h for weekly dial

**Connection:**

Protected tunnel terminals.  
1-4mm<sup>2</sup>

<i>Designation</i>	<i>Characteristics</i>	<i>Width in 17.5mm</i>	<i>Pack qty.</i>	<i>Cat Ref.</i>
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**1 Channel time switches**

**Quartz**

Without supply failure reserve

Voltage supply:  
230V~ 50Hz  
Output:  
For 3 module products  
1 changeover contact  
16A 250V~ AC1  
For 1 module products  
1 N.O. contact  
16A 250V~ AC1



EH010

Daily dial		1	1	<b>EH010</b>
		3	1	<b>EH110</b>

**Quartz**

With supply failure reserve  
200 hours after being  
connected for 120 hours

Voltage supply:  
230V~ 50/60Hz  
Output:  
For 3 modules products  
1 changeover contact  
16A 250V~ AC1  
For 1 module products  
1 N.O. contact  
16A 250V~ AC1



EH171

Daily dial		1	1	<b>EH011</b>
		3	1	<b>EH111</b>
Weekly dial		3	1	<b>EH171</b>

## Electromechanical and Digital Timers - Selection Guide

Range: Electromechanical Time Clocks 1 Channel:			Digital Time Clocks 1 Channel:		2 Channels	4 Channels
						
1 mod: EH010, EH011	3 mod: EH110 EH111 EH171		1 mod: EG071 EG010	2 mod: EG103 EG103V EG103E	2 mod: EG203 EG203E	4 mod: EG400
	Electromechanical		Digital			
Programming Cycle	1 Channel		1 Channel		2 Channels	4 Channels
	1 mod	3 mod	1 mod	2 mod	2 mod	4 mod
24 hours	EH010 EH011	EH110 EH111	EG010			
24 hours + 7 days						
7 days		EH171	EG071	EG103 EG103V EG103E	EG203 EG203E	
Annual						EG400

**Modular  
Devices**

**Applications:**



Heating



Lighting



Immersion Heater



Power Outlets



Ventilation



Air-Conditioning



Refrigerator



Alarm

## Digital Time Switches

Use : domestic and commercial buildings.

For the control of lighting, heating, household appliances, shop windows, signage etc., to improve comfort and to save energy.

### EG103 and EG203

(basic version)

Product set at current time and date when delivered.

Automatic change of Summer / Winter time.

### Programming key:

- To allow easy back up and re-installation of the program to

allow permanent program overrides.

- Programming per day or group of days
- 56 ON / OFF programme steps
- Permanent ON/OFF overrides
- Temporary ON/OFF overrides bar graph indication showing the daily profile
- Possibility of locking the keyboard with EG004
- Programming without the need to be energised

### EG103E/V and EG203E

(evolution versions)

Same characteristics as EG103 and EG203 plus more:

- Holidays mode: forcing ON or

OFF between two dates

- Presence simulation - random switching
- Backlit screen
- Impulse programming capability (1s to 30 min)

### Connection:

EG010 / EG 071 : 0.5 to 4mm<sup>2</sup>, EG 103 and EG 203/E :

1 to 6mm<sup>2</sup> flexible, 1.5 to 10mm<sup>2</sup> rigid,

### Operating voltage:

230~ 50/60 Hz (except EG103V - 12/24V AC/DC)



EG103



EG203E



EG005

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>1 Channel digital time switch</b> (daily cycle) (not compatible with program key)	5 adjustable pre-recorded Programs 6 switchings per day (3 on and 3 off) Output: 1 changeover contact 16A - 250V~ AC1 3 year reserve	1	1	<b>EG010</b>
<b>1 Channel digital time switch</b> (weekly cycle) (not compatible with program key)	Output : 1 changeover contact μ 16 A - 250V~ AC 1 Capacity 20 program steps 3 year reserve	1	1	<b>EG071</b>
<b>1 Channel digital time switch</b> (weekly cycle - basic version)	Output : 1 changeover contact μ 16 A - 250V~ AC 1 Delivered with key EG005	2	1	<b>EG103</b>
<b>2 Channel digital time switch</b> (weekly cycle - basic version)	Output : 2 changeover contact μ 16 A - 250V~ AC 1 Delivered with key EG005	2	1	<b>EG203</b>
<b>1 Channel digital time switch</b> (weekly cycle) evolution version	Output : 1 changeover contact μ 16 A - 250V~ AC 1 Delivered with key EG005	2	1	<b>EG103E</b>
<b>1 channel digital time switch</b> (weekly cycle) evolution version	Output : 1 changeover contact μ 16 A - 250V~ AC 1 Operating voltage 12/24V AC/DC Delivered with key EG005	2	1	<b>EG103V</b>
<b>2 Channel digital time switch</b> (weekly cycle) evolution version	Output : 2 changeover contacts μ 16 A - 250V~ AC 1 Delivered with key EG005	2	1	<b>EG203E</b>
<b>PC Interface and software tool</b>	RS232 interface between PC and key interface module with software on CD		1	<b>EG003</b>
	USB Connection		1	<b>EG003U</b>
<b>Locking key</b> (yellow colour)	To prevent unauthorised re-programming of all EG time clocks (except EG010/EG071 and EG400)		1	<b>EG004</b>
<b>Spare programming key</b> (grey colour)	for timers EG103, EG103V EG 203, EG103E, EG203E		1	<b>EG005</b>
<b>DIN rail storage module for keys</b>	For 3 keys EG005 or EG004		1	<b>EG006</b>

## 4 Channel Digital Time Switches

### 4 channel digital time switch weekly and annual cycle

In commercial premises timed programming often requires the use of multi-circuit equipment with large programming capacities for a weekly or annual cycle, the EG400 digital time switch is a compact modular unit (4 mod.) which replaces electromechanical clocks efficiently.

### Applications:

- Command of lighting circuits.
- Control of heating.
- Ventilation control.
- Bell.
- Alarm.

### Functions:

- Summer/winter time pre-programmed.
- Permanent on/off override.
- Override with automatic return to auto-mode.

- On/off override programmable from date to date.
- Groups of days and channels to save program steps.
- Work on impulse, maximum duration 59 seconds.
- 15 special weekly cycles

### Connection:

- 1mm<sup>2</sup> to 4mm<sup>2</sup> - flexible
- 1.5mm<sup>2</sup> to 6mm<sup>2</sup> - rigid

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>4 channel digital time switch Weekly/annual cycle</b> Program setting: 1 minute increments  capacity: 408 program steps	Voltage rating: 230V~ 50/60 Hz Outputs: 3 changeover contacts 10A - 250V~ AC1 1 NO contact: 10A - 250V~ AC1 Supply failure reserve: 100hrs Lithium battery total of 100 hrs	4	1	<b>EG400</b>



EG400

Programming key			1	<b>EG002</b>
PC interface and software tool	RS232 interface between PC and key interface module with software on CD, serial port connection		1	<b>EG003</b>
	USB connection		1	<b>EG003U</b>



EG002

## Light Sensitive Switch

**Description**

A photo-electric cell measures the light level and in conjunction with the relay provides on/off control of a circuit.

This device controls lighting circuits in relation to ambient light, based on user settings.

Front cover sealability

**Applications**

Street lighting, display lighting, illuminated signs etc.

**Connection:**

Protected cable clamps

Capacity:

Rigid: 1.5 to 10mm<sup>2</sup>

Flexible: 1 to 6mm<sup>2</sup>

On board LED shows status of changeover contact.

**Technical data**

4 position override switch allowing:

- Auto: normal operating mode
- On: permanently switched on
- Off: permanently switched off
- Test: setting mode for easy adjustment.



EE100 complete with surface photo electric cell

<i>Designation</i>	<i>Characteristics</i>	<i>Width in 17.5mm</i>	<i>Pack qty.</i>	<i>Cat Ref.</i>
Light sensitive switch Sensitivity: 2 ranges 5 to 50 lux	<b>Voltage rating:</b> 230V~ - 50/60 Hz Output: 1 changeover AC1 contact	3	1	<b>EE100</b>
50 to 2000 lux	16A AC1 - 230V~			
Delivered with: A separate surface <b>Photo-electric cell (EE003)</b>	Maximum distance: 50m between photocell and controller			
	Must be used in conjunction with a suitably rated contactor (see page 4.29) where load conditions demand			

## Light Sensitive Programmer

**Description**

To control the lighting installation in relation to time and ambient light.

It is a weekly programmer associated with a light sensitive switch.

**Working principle**

The user programmes both on/off periods and a desired light level. The cell measures the light level within the on period. Depending on the light level (below or above the programmed threshold, the output will be switched on/off.

20 program steps  
1 minute switching increments

**Programming function**

Programming by keys and display on LCD screen. On/off override facility, permanent working. Display and control of the programme. Test setting for easy adjustment

Modular Devices

*Designation*

*Characteristics*

Width in ■  
17.5mm

Pack  
qty.

**Cat Ref.**



EE171 complete with surface photo electric cell

**Light sensitive programmer**

Sensitivity: 2 ranges  
5 to 50 lux  
50 to 2000 lux

Delivered with:  
A separate surface  
**Photo-electric cell (EE003)**

Voltage rating:  
230V~ 50/60 Hz

Output: c/o contact  
16A AC1 - 250V~  
maximum distance:  
50m between photocell and controller

Must be used in conjunction with a suitably rated contactor (see page 4.29) where load conditions demand

**Replacement photo electric cell (flush)**

for EE100 and EE171

1

**EE002**

**Replacement photo electric cell (surface)**

for EE100 and EE171

1

**EE003**

## Emergency Lighting Module

**Application:**

For both residential and commercial applications

Installed in a consumer unit or distribution board, the lamp can be configured to light automatically in the event of power failure.

It can also be withdrawn from its base, thereby acting as a mini torch with an operating duration of 1 hour 30 mins

*Designation*

Width in ■  
17.5mm

Pack  
qty.

**Cat Ref.**



EE960

Emergency lighting module

3

1

**EE960**

## Timers - Selection Guide

**Range:  
Timers**

**Delay timers**



**EM001N**



**EM002**  
Pre-warning  
switch off  
notice



**EZ001**  
Delay on



**EZ002**  
Delay off



**EZ003**  
Adjustable  
time on



**EZ004**  
Timer



**EZ005**  
Symmetrical  
flasher



**EZ006**  
Multi-function

Typical area of application

Areas of use	Residential 	Communal / Landlords Areas 	Commercial 	Industrial 
Applications				
Communal Stairwells and landlord areas 		EM001N + EM002		
External Lighting 	EM001N EM001N + EM002			
Landlords areas Bathrooms 	EZ002 EZ006			
Heating overrides 			EZ001 EZ006	
Shop windows Signage 			EZ005 EZ006	
Timer function 	EZ004 EZ006			
Door closing mechanisms 	EZ004 EZ006			
Alarm bell 			EZ004 + EZ006 EZ006	
Variation of alarm frequency 			EZ005 EZ006	

## Delay Timers

### Description

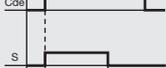
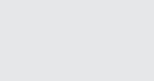
To provide all types of automatic control i.e. lighting, ventilation, watering, machine pre-heating, automatic door and visual audible indication, cycle control etc.

### Applications

For timing and automation in domestic and commercial premises. The input signal can be via various switching devices (pushbutton, latching switch, timeclock etc.) and the timed output used to control the application.

### Technical data

Voltage range:  
12 V AC/DC  
24 to 48V DC  
24 to 230V AC  
Adjustable: Time delay from 0.1s to 10hrs.  
Led indicator  
Complies with EN 60669-2-1  
Terminal capacity:  
6mm<sup>2</sup> max flexible  
1.5 - 10mm<sup>2</sup> rigid

Designation	Characteristics	Width in ■ 17.5mm	Pack qty.	Cat Ref.
 <p>Delay on</p> 	1 c/o contact 10A / 230V~ AC1 Time delay T: 0.1s to 10hr	1	1	<b>EZ001</b>
 <p>Delay off</p> 	1 c/o contact 10A / 230V~ AC1 Time delay T: 0.1s to 10hr	1	1	<b>EZ002</b>
 <p>Adjustable time on</p> 	1 c/o contact 10A / 230V~ AC1 Time delay T: 0.1s to 10hr	1	1	<b>EZ003</b>
 <p>Timer</p> 	1 c/o contact 10A / 230V~ AC1 Time delay T: 0.1s to 10hr	1	1	<b>EZ004</b>
 <p>Symmetrical flasher</p> 	1 c/o contact 10A / 230V~ AC1 Time delay T: 0.1s to 10hr	1	1	<b>EZ005</b>
<p>Multifunction 6 individual functions including: D - Delay on C - Delay off E - Adjustable time on B - Adjustable time off A - Timer F - Symmetrical flasher</p>	1 c/o contact 10A - 230V~ AC1 Time delay T: 0.1s. to 10hr	1	1	<b>EZ006</b>

Modular  
Devices

## Time Lag Switches

**Description**

To provide control of lighting circuits with automatic switch-off after a pre-set time (e.g.: staircase, corridors). Command signal via impulse.

**Technical data**

- Time delay setting by rotating dial on front of device.
- 30s to 10min

**EM001N time lag switch**

For lighting circuits (medium or high daily use)  
Characteristic: compact design equipped with a 2 position switch permanent/timed lighting implementation facility.

**Note:** This range is only suitable for use with momentary pushbuttons, non latching switches.

**EM002 switch off notice add-on block**

Incorporating pre-warning of switch-off improves the safety for users / pre-warning of switch-off at the end of the time delay, light intensity reduction by 50% for a period of 24 sec. prior to final switch off.  
**Use only on incandescent lighting circuits.**



EM001N

Designation	Characteristics	Width in 17.5 mm	Pack qty.	Cat Ref.
Time lag switch  24 sec. to 12 min.	Voltage rating: 230V; - 50/60 Hz Restart facility 2 function switch: • Permanent • Timed Output: 1 changeover contact 16 A - 230V; AC 1 10A - 2300W - incandescent 10A - 2300W - halogen 230V	1	6	<b>EM001N</b>

**Note:** Heat dissipation insert (LZ060) recommended between EM001N and EM002 (if fitted)



EM002

<b>Add-on block pre-warning switch off notice</b>	Voltage rating: 230V; - 50/60 Hz Restart facility Pre-warning of switch-off by decrease of output Voltage (50% for 24 sec.) Switch off notice: 24 secs Output power: 1000W - incandescent 1000W - halogen Not suitable for use with discharge lamp	2	1	<b>EM002</b>
---	--	---	---	--------------

## Pushbuttons - Impulse

**Description**  
Pushbuttons to actuate loads either directly or via contactors etc.

**Technical data**  
Modular pushbuttons

- Without light  
With grey button, red/green optional
- With light  
With red, green button

**Light technology**  
LED

**Connection**  
Cage terminals

**Capacity**  
10mm<sup>2</sup> rigid conductor.  
6mm<sup>2</sup> flexible conductor.

Standard : BS EN 60947-5-1

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
-------------	-----------------	-----------------	-----------	----------

**Pushbuttons (Impulse)**

16A – 250V~  
**Without indicator light**



SVN311



Contacts: 1 NO

1

12

**SVN311**



Contacts: 2 NO

1

12

**SVN331**



Contacts: 2 NO  
Double Pushbutton

1

12

**SVN371**



SVN391



Contacts: 1 NC

1

12

**SVN321**



Contacts: 2 NC

1

12

**SVN341**



Contacts: 1 NO + 1 NC

1

12

**SVN351**



Contacts: 1 NO + 1 NC  
Double Pushbutton

1

12

**SVN391**

**Pushbuttons (Impulse)**

**With indicator light**



SVN411



Contacts: 1 NO : Green

1

12

**SVN411**



Contacts: 2 NO : Red

1

12

**SVN432**



Contacts: 1 NC : Red

1

12

**SVN422**



Contacts: 2 NC : Green

1

12

**SVN441**



Contacts: 1 NO + 1 NC

1

12

**SVN452**



SVN422

Modular Devices

## Pushbuttons - Latching

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>Pushbuttons (latching)</b>				
<b>16A – 250V~ Without indicator light</b>				
	Contacts: 1 NO	1	12	<b>SVN312</b>
	Contacts: 2 NO	1	12	<b>SVN332</b>
	Contacts: 1 NC	1	12	<b>SVN322</b>
	Contacts: 2 NC	1	12	<b>SVN342</b>
	Contacts: 1 NO + 1 NC	1	12	<b>SVN352</b>
<b>With indicator light</b>				
	Contacts: 1 NO : Green	1	12	<b>SVN413</b>
	Contacts: 2 NO : Green	1	12	<b>SVN433</b>

## Indicator Lights

### Modular indicator lights

Available with red, green, amber, blue, colourless lens

**Light technology**  
LED

### Options

DIN rail mountable

### Connection

Cage terminals

### Capacity

10mm<sup>2</sup> rigid conductor.  
6mm<sup>2</sup> flexible conductor.

Standard : BS EN 62094-1

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>Indicator lights</b>				
<b>230V~</b>				
	<b>With light</b> : Green	1	12	<b>SVN121</b>
	Red	1	12	<b>SVN122</b>
	Orange	1	12	<b>SVN123</b>
	Blue	1	12	<b>SVN124</b>
	Clear	1	12	<b>SVN125</b>
	Red & Green Double Indicator	1	12	<b>SVN126</b>
	Red Triple Indicator	1	12	<b>SVN127</b>
<b>12/48V</b>				
	Green	1	12	<b>SVN131</b>
	Red	1	12	<b>SVN132</b>



SVN122

Transformers, Bells and Buzzers

**Description**  
Provide separated extra low voltage 8, 12, 24V~.

**Technical data**  
Secondary voltages: 8V, 12V, 24V~  
Bell transformers are short-circuit protected.  
Bells/buzzers:  
Max. continuous duty ≤ 30 minutes.

**Connection capacities:** 6mm<sup>2</sup>  
Cable clamp type

**Output:**  
Bells: 85 dBA  
Buzzers: 78 dBA

When a bell transformer is installed in an enclosure with mains voltage equipment, 230V cable should be used on the secondary side of the transformer or extra low voltage cable should be sheathed within the enclosure.

**Note:** The transformers have a higher no load voltage. The stated voltages correspond to the voltages on nominal load.

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
<b>Safety transformers</b>	<b>230V/12-24V~</b> 50Hz <b>25VA</b> 50/60 Hz	4	1	<b>ST312</b>
	<b>230V/12-24V~</b> 50Hz <b>16VA</b> 50/60 Hz	4	1	<b>ST313</b>
	<b>230V/12-24V~</b> 50Hz <b>40VA</b> 50/60 HZ	4	1	<b>ST314</b>
	<b>230V/12-24V~</b> 50Hz <b>60VA</b> 50/60 Hz	6	2	<b>ST315</b>
<b>Bell transformers</b>	<b>230V/8V~</b> 50/60 Hz <b>4VA</b> - 8-12V : 0.33A	2	6	<b>ST301</b>
	<b>230V/8-12V~</b> 50/60 Hz <b>8VA</b> - 12V : 0.67A	2	6	<b>ST303</b>
	<b>230V/8-12V~</b> 50/60 Hz <b>16VA</b> - 12V : 1.33A	3	1	<b>ST305</b>
<b>Bells</b>	<b>8/12V~</b> 5VA - 0.33A	1	12	<b>SU212</b>
	<b>230V~</b> 6.5VA - 0.03A	1	12	<b>SU213</b>
<b>Buzzers</b>	<b>8/12V~</b> 4VA - 0.33A	1	12	<b>SU214</b>
	<b>230V~</b> 6.5VA - 0.03A	1	12	<b>SU215</b>



ST313



ST301



SU212

## Thermostats

### Description

Electronic thermostats for any application requiring temperature control (from cold room to steam room).

### Applications

EK081 fixed ambient probe for night temperature regulation.  
 EK083 used as floor probe to limit floor temperature.  
 EK083 used to control hot water temperature (with its collar) in case of probe disconnection.

3 working modes are possible (selected by wiring):

1. Permanent off
2. Permanent on
3. Cyclic operation 1 minute in every 4.

Output status is displayed by an LED.

### EK187

#### Electronic thermostat suitable for heating control

Two adjustable temperature levels are selected by external signals (operation by time switch or digital programmer). Additionally there is an adjustable low level temperature for frost protection etc. In the event of probe disconnection the heating system is switched on one minute in every four.

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
 <p><b>Multi-range thermostats</b>                      Delivered without probe associate with EK081 or EK083 probes</p>	Voltage rating: 230V~ - 50/60 Hz Output: 1 changeover contact 2A AC1 - 230V~ 4 ranges: -30 to 0°C 0 to +30°C +30 to +60°C +60 to +90°C To associate with contactors (page 4.29)	3	1	<b>EK186</b>
 <p><b>Multi-order thermostat</b>                      Delivered without probe associate with EK081 or EK082 probes</p> <p>Accuracy <math>\pm 0.2^\circ\text{C}</math></p>	Voltage rating: 230V~ - 50/60 Hz Output: 1 changeover contact 2A AC1 - 230V~ Temperature level 1 (comfort) Adjustable 5 - 30°C Temperature level 2 (night setting) Adjustable 2 - 8°C less than Level 1 setting Temperature level 3 (frost setting) Adjustable 5 - 30°C To associate with contactors (page 4.29)	3	1	<b>EK187</b>
 <p><b>Fixed ambient probe</b></p>	Can be associated with: EK186, EK187 thermostats EG502 programmable thermostat		1	<b>EK081</b>
 <p><b>Adjustable ambient probe</b>                      The probe is equipped with a potentiometer for the correction of the set temperature (<math>\pm 3^\circ\text{C}</math>)</p>	Can be associated with: EK187 thermostat EG502 programmable thermostat		1	<b>EK082</b>
 <p><b>Universal probe</b>                      Removable collar</p>	Can be associated with: EK186 thermostat EG502 programmable thermostat		1	<b>EK083</b>

EK187

EK081

EK082

EK083

## Programmable Thermostat

### Programmable thermostat description

To save energy by managing the heating system according to the periods of occupation.

It is a weekly programmer associated with a 3 setting thermostat:

- "Comfort",
- "Reduced",
- "Anti-frost"

**Connection:** protected cable clamps

Capacity: 1.5 to 10 mm<sup>2</sup> rigid

Capacity: 1 to 6 mm<sup>2</sup> flexible

### Thermostatic function

- Adjustable comfort and reduced temperature
- Fixed anti-frost temperature
- Display of state of output,
- Display of selected mode,
- Push button selection of working mode:
- Automatic cycle comfort T° / reduced T°
- Permanent comfort temperature
- Permanent reduced temperature
- Permanent anti-frost temperature.

### Probes

EG502 can be associated with:

- EK081 fixed ambient probe,
- EK082 adjustable ambient probe
- EK083 universal probe (see page 4.20)



EG502

Description	Characteristics	Width in ■ 17.5 mm	Pack qty.	Cat Ref.
<b>Programmable thermostat</b> Delivered without probe  Associate with EK081, EK082, EK083 probes	Voltage rating: 230V; 50 Hz  Output: 1 changeover contact 2A – 250V; AC1 2 temperature settings "comfort" and "reduced" adjustable from + 8°C to + 28°C, Anti-frost temperature setting + 8°C (constant)	4	1	<b>EG502</b>

## Analogue Voltmeters, Ammeters

**Analogue voltmeters**  
For domestic and commercial installations

- Single phase: direct connection
- Three phase: use of a voltmeter selector switch SK602 see page 4.24.

Frequency: 50 Hz

**Connection capacity:**  
Rigid conductor 10mm<sup>2</sup>  
Flexible conductor 6mm<sup>2</sup>

**Analogue ammeters**  
For domestic and commercial installations  
indirect reading via current transformers: 50-100-150-250-400A

Designation	Characteristics	Width in 17.5 mm	Pack qty.	Cat Ref.
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SM500

<b>Voltmeter</b>	Accuracy: 2% Consumption: 2.5VA	4	1	<b>SM500</b>
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<b>Ammeter</b>	Accuracy: 2% connection via a Current transformer (CT) (page 4.23) 0 - 50A	4	1	<b>SM050</b>
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SM050

	0 - 100A	4	1	<b>SM100</b>
	0 - 150A	4	1	<b>SM150</b>
	0 - 250A	4	1	<b>SM250</b>
	0 - 400A	4	1	<b>SM400</b>

## Digital Voltmeters, Ammeters

### Digital voltmeters

SM501  
For domestic and commercial installations  
• Three phase: use of a voltmeter selector switch SK602

### Digital ammeters

SM151, SM401, SM601: reading via a current transformer (see below)



SM501



SM401

Designation	Characteristics	Width in 17.5 mm	Pack qty.	Cat Ref.
<b>Digital voltmeters</b> 220/230V ; 50/60 Hz accuracy: ± 1% consumption: 4 VA  scale: 0 - 500V	Voltage rating:	4	1	<b>SM501</b>
<b>Digital ammeters</b>	Voltage rating: 220/230V ; 50/60 Hz Accuracy: ± 1% Consumption: 4 VA			
- Reading via CT 150/5A (SR150)	Scale: 0 - 150A	4	1	<b>SM151</b>
- Reading via CT 400/5A (SR400)	Scale: 0 - 400A	4	1	<b>SM401</b>
- Reading via CT 600/5A (SR600)	Scale: 0 - 600A	4	1	<b>SM601</b>

Modular Devices

## Current Transformers (C.T)

Current transformers are used to feed analogue and digital ammeters and kilowatt hour meters.

The current on the secondary circuit (0 - 5A) is proportional to the current on primary circuit class: 1

Can be mounted on copper bar or on cable  
Can be mounted on DIN rail



SR300

Designation	Characteristics	Pack qty.	Cat Ref.
<b>Current transformers (CT)</b>	Ratio:		
	50/5	1	<b>SR051</b>
	100/5	1	<b>SR101</b>
	150/5	1	<b>SR150</b>
	200/5	1	<b>SR200</b>
	250/5	1	<b>SR250</b>
	300/5	1	<b>SR300</b>
	400/5	1	<b>SR400</b>
	600/5	1	<b>SR600</b>

## Selector Switches for Voltmeters and Ammeters

<b>Description</b> For use with Voltmeters and Ammeters.	<b>Applications</b> Complies with IEC 947-3 BS EN 60947-3. Terminal capacity: 1- 6mm <sup>2</sup> - Flexible 1.5 - 10mm <sup>2</sup> - Rigid	Isolating voltage 500Vac Nominal current 10-20A
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Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
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**Voltmeter selector**  
 20A 400Vac  
 3Ph&N  
 3 readings between phases  
 3 readings between phase & neutral  
 null position (no reading)

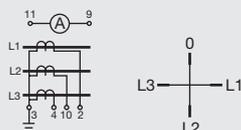


SK602

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
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**Ammeter selector**  
 20A 400Vac  
 4 positions  
 use in 3Ph&N  
 reading by phase  
 null position (no reading)  
 should be used with current transformer (CT)  
 (see page 4.23)

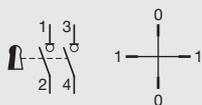


SK603

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
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**Lockable rotary switch**  
 10A 400Vac  
 on off (4 positions)



SK606

kiloWatt Hour Meters

**Description**

kiloWatt hour meters measure the active energy used in an electrical installation. The range provides meters with pulsed outputs (except EC110) for remote indication or linking into an energy management system as standard. kWh meters can be used for local metering of installations or monitoring individual machines.  
 2 options on resettable meters:  
 • Total counter (non resettable)  
 • Resettable counter (shows energy used since last reset)

**Technical data**

3 types  
 • 32A (direct connection) single phase  
 • 80A (direct connection) three phase  
 • For other single / dual tariff products (via a CT)

Pulse duration = 60ms ± 10ms three phase

Pulse duration = 15ms single phase

Complies with IEC 1036 (class 2)

**Displays**

7 digit LCD type  
 pulsed output - 1 pulse = 100 Wh

Designation	Characteristics	Width in 17.5mm	Pack qty.	Cat Ref.
-------------	-----------------	-----------------	-----------	----------



EC050

**kiloWatt hour meter single phase**  
 Voltage 230V - 50Hz  
 Direct connection  
 In = 320mA - 32A

Total counter  
 Non - resettable counter

1

1

**EC050**

Use of heat dissipation inserts (cat. ref. LZ060) are recommended on each side of direct connection meters

**kiloWatt hour meter single phase**  
 Voltage 230V - 50Hz  
 Direct connection  
 In = 320mA - 32A

Non - resettable  
 Total counter  
 with pulsed output  
 1 pulse = 100Wh

1

1

**EC051**

Use of heat dissipation inserts (cat. ref. LZ060) are recommended on each side of direct connection meters



EC111

**kiloWatt hour meter single phase**  
 Voltage 230V - 50Hz  
 Direct connection  
 In = 320mA - 32A

Total counter  
 Resettable counter  
 With pulsed output  
 1 pulse = 100 Wh

3

1

**EC111**

Use of heat dissipation inserts (cat. ref. LZ060) are recommended on each side of direct connection meters



EC120

**kiloWatt hour meter single phase**  
 Voltage 230V - 50Hz  
 Connection via a current Transformer (In/5A)  
 Ratio of 100/5  
 See page 4.23 for C.T.

Total counter  
 Resettable counter  
 With pulsed output  
 1 pulse = 100 Wh

3

1

**EC120**

Auto correction in the case of reversed CT polarity

**kiloWatt hour meter single phase - dual tariff**  
 Voltage 230V - 50Hz  
 Connection via a current Transformer (In/5A)  
 Ratio of 100/5  
 See page 4.23 for C.T.

Total counter  
 Resettable counter  
 With pulsed output  
 1 pulse = 100 Wh

3

1

**EC121**

Auto correction in the case of reversed CT polarity

kiloWatt Hour Meters



EC320



EC321

<i>Designation</i>	<i>Characteristics</i>	<i>Width in 17.5mm</i>	<i>Pack qty.</i>	<i>Cat Ref.</i>
<b>kiloWatt hour meter three phase</b> Voltage 3 x 230/400V - 50-60Hz Direct connection In = 800mA - 80A	Total counter Resettable counter With pulsed output 1 pulse = 100 Wh	7	1	<b>EC310</b>

Use of heat dissipation inserts (cat. ref. LZ060) are recommended on each side of direct connection meters

<b>kiloWatt hour meter three phase</b> Voltage 3 x 230/400V - 50-60Hz Connection via a current Transformer (In/5A) From 50A to 1500A See page 4.23 for CT's	Total counter Resettable counter With pulsed output 1 pulse = 100 Wh	4	1	<b>EC320</b>
---	---	---	---	--------------

Balanced or unbalanced network selection also possible (i.e. 3 wire or 4 wire application) auto correction in the case of reversed CT polarity

<b>kiloWatt hour meter three phase - dual tariff</b> Voltage 3 x 230/400V - 50-60Hz Connection via a current Transformer (In/5A) From 50A to 1500A See page 4.23 for CT's	Total counter Resettable counter With pulsed output 1 pulse = 100 Wh	4	1	<b>EC321</b>
---	---	---	---	--------------

Balanced or unbalanced network selection also possible (i.e. 3 wire or 4 wire application) auto correction in the case of reversed CT polarity

## Hours Counter

**Description**

To measure the total operating time of any circuit/load non resettable

**Application Example**

- Total time of plant running
- Connection in parallel with contactor coil
- Recording of lighting hours for relamping purposes

*Designation*

*Characteristics*

*Width in 17.5mm*

*Pack qty.*

**Cat Ref.**

Hours counter

Voltage ratings:  
230V - 50 Hz

2

1

**EC100**



EC100

## Latching Relays

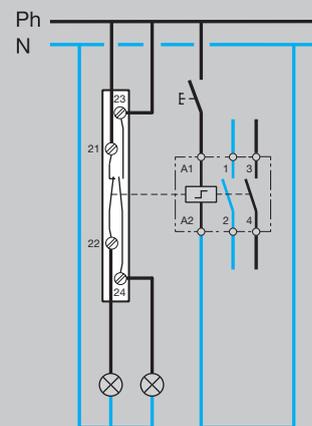
### Technical Characteristics

	EPN510 EPN515 EPN520	EPN513 EP5N18 EP5N24	EPN519	EPN525 EPN540	EPN528 EPN541	EPN529
<b>Voltage</b>	230V	24V	12V	230V	24V	12V
<b>Start consumption</b>	24VA	24VA	24VA	48VA	47VA	TBC
<b>Contact rating</b>				16A 250V~*		
<b>AC1</b>						
<b>Electrical endurance</b>	150,000 operations					
<b>AC1 - 16A</b>						
<b>Mechanical endurance</b>	500,000 operations					
<b>Current in open position</b>	8 mA					
<b>Max duration of voltage supply to coil</b>	1 h					
<b>Min duration of current supply to coil</b>	0.1 s					
<b>Working temperature</b>	-5 to +40°C					
<b>Storage temperature</b>	-40 to +80°C					
<b>Connections</b>						
Coil						
Flexible	0.5 to 4mm <sup>2</sup>					
Rigid	1 to 6mm <sup>2</sup>					
<b>Power</b>						
Flexible	1 to 6mm <sup>2</sup>					
Rigid	1.5 to 10mm <sup>2</sup>					

\*400V~ for the **EPN540** and **EPN541**.

### Auxiliary Contacts (EPN051)

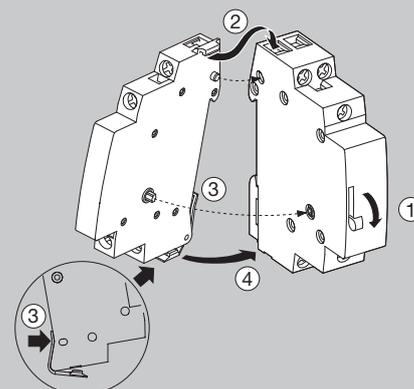
The range of latching relays have been designed for use with an auxiliary contact. The devices simply clip on the side of the relay.



### Technical Characteristics

	EPN	EPN051
<b>Voltage</b>	(a) 24 to 230V	-
<b>Contact Rating</b>	-	2A / 250V
<b>I<sub>min</sub> / 230V</b>	-	15 mA
<b>Connection</b>		
Flexible	6mm <sup>2</sup>	
Rigid	10mm <sup>2</sup>	

(a) : Voltage dependant on associated relay



**Heating**

The choice of the contactor depends on the mechanical resistance (number of operations) and on the electrical heating load i.e. resistive elements, infra-red element, convectors.

**Choice of Contactors**

The choice of contactor is dependant upon many parameters i.e. operating voltage, size of contacts, number of operations, ambient temperature, type of load supplied etc.

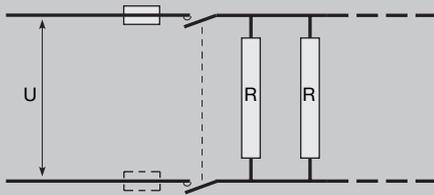
**Type of Load**

Loads are categorised into various AC ratings, (AC1, AC2, AC3 etc.) and the higher the AC rating the more inductive the load becomes. All Hager contactor ratings are given at AC1, therefore they must be de-rated if used on other types of AC load.

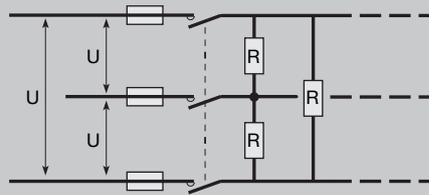
**Heat Dissipation Inserts**

The ambient temperature around a contactor can affect its life expectancy, therefore, we strongly recommend that heat dissipation inserts (LZ060) are fitted between all contactors and adjacent devices. Please consult your Local Regional Office, if you require help selecting a suitable contactor.

**Single Phase**



**Three Phase**



	50,000	100,000	150,000	200,000	300,000	Single phase 230V	Three phase*400V
	4.4	4.4	3.9	3.5	2.9	ES220 - ES230	
	7.8	5.9	5	4.4	3.7	ESN240	
Maximum	12	8.8	7.7	6.6	5.9	ESN263	
load*	12	10.5	8.5	6.5	5.8		ESN320 - ESN430
in kW	23.2	17.7	15	13.1	10.8		ESN340

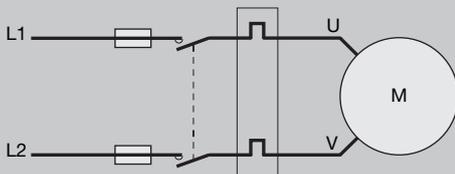
\* On three phase configuration the maximum load per phase corresponds to the values states divided by 3.

**Example:**

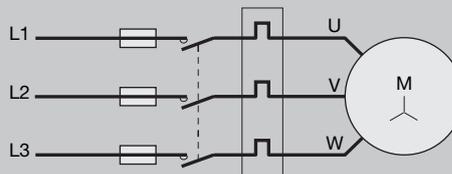
Function of a heating installation 200 days/annum, 100 operations per day (1 opening + 1 closing = 2 operations)  
 Mechanical life = 10 years  
 Total number of operations: 200 x 100 x 10 = 200,000  
 in that case select an ES240 to control a load of 4.4 kW (single phase 230V)

**Motors**

**Single Phase 230V**



**Three Phase 400V**



	Single phase with capacitor	Three phase (AC3 cat.)	Choice of contactor according to control diagram	
	230V	400V	2 wires	3 wires
Maximum	1.1		ES220	
load	2.2		ESN240	
in kW		4		ESN320 - ESN420
		7.5		ESN340 - ES345
		15		ESN365

**Requirements of use**

**Influence of working temperature:**

Derating factor between 40°C and 50°C : 0.9

Example: Heating with convector

The maximum load of ES220 is 4.4kW for 50,000 operations and for

a temperature <40°C.

between 40°C and 50°C, the load is 4.4 x 0.9 i.e. 3.96kW

**Close fitting:**

**It is necessary to put a heat dissipation insert (reference LZ060) between each contactor.**

**Technical Characteristics**

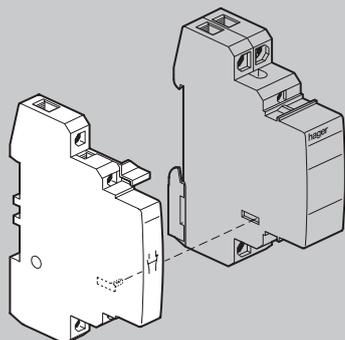
		Contactors									Relays	Interface Relay	
		ET201	ESN320	ES240	ESN263	ES224	ESN424	ER120	ER123	ER124		EN146	EN145
		ES220	ESN340	ESN365									
		ET221	ESN420										
		ES230	ESN345	ES463B									
		ESN430		ESN470									
		ES237	ES238	ES440B	ESN490			ER135	ER138	ER139			
			ES441										
			ESN480										
Command voltage	V	230	230	230	230	24	24	230	24	12	230	10 to 26	
Frequency	%	+10/ -15 } For all products										50/60Hz and ...	
Hz		50											
Starting consumption	VA	15	20	50	50	15	20	15/20	15/20	15/20	5	(a)	
Maintained consumption	VA	5	5	7	7	5	5	5	5	5	5	(a)	
Max perm.													
Current AC1	A	20	20	40	63	20	20	16	16	16	5	5	
Insulation voltage	V	250	400	400	400	400	250	250	250	250	250	250	250
Mech. endurance		1,000,000											
Working temperature	°C	-10/ +50 } For all products											
Storage temperature	°C	-40/ +80											
Connection													
Control flexible	mm <sup>2</sup>	0.5 to 4	0.5 to 4	1 to 2.5	1 to 2.5	0.5 to 4	0.5 to 4						
rigid	mm <sup>2</sup>	1 to 6	1 to 6	1.5 to 4	1.5 to 4	1 to 6	1 to 6						
Power flexible	mm <sup>2</sup>	1 to 6	1 to 6			1 to 6	0.5 to 4	0.5 to 4					
rigid	mm <sup>2</sup>	1.5to10	1.5to10	4to25	4to25	1.5to10	1.5to10	1.5to10	1.5to10	1.5to10	1to6	1to6	

**Note:** (a) Power consumption of EN145 and EN146

Control Voltage	Start and Maintained Consumption
12V DC	0.5W
24V DC	1.5W
12V AC	1VA
24V ac	2VA

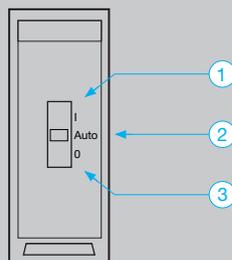
**Auxiliary Contacts**

Auxiliary contacts are available for 20A contactors to indicate remotely the status of the main contacts - Cat Ref. EP071



**20A Relays and contactors with manual override**

1. Permanently on
2. Automatic
3. Permanently off



**Contactor Selection**

The table below indicates the number of lamps that can be connected to each pole of the contactor on 230V 50Hz circuits.

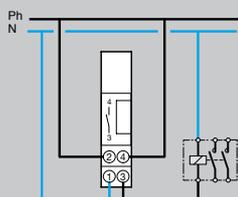
Type		16A	20A	40A	63A				
<b>Incandescent Lamps</b>									
Tungsten filament and halogen 230V	40 W	45	50	100	120				
	60 W	30	35	75	105				
	75 W	24	28	65	90				
	100 W	18	21	45	65				
	150 W	12	14	33	45				
	200 W	9	10	25	35				
	300 W	5	6	16	23				
	500 W	3	4	10	14				
1000 W	1	2	5	7					
Halogen 12 or 24V with transformer electronic	20 W	70	80	160	240				
	50 W	28	40	80	120				
	75 W	19	26	52	78				
	100 W	14	20	40	60				
	150 W	9	13	26	39				
<b>Fluorescent Tubes</b>									
Single with starter non compensated	15 W	29	50	110	150				
	18 W	25	42	80	130				
	30 W	25	35	70	110				
	36 W	24	30	60	90				
	58 W	14	20	40	60				
Single with starter in parallel	15 W	25	C Max. 112 µF	30	C Max. 135 µF	45	C Max. 202 µF	60	C Max. 270 µF
	18 W	25	112 µF	30	135 µF	45	202 µF	60	270 µF
	30 W	20	90 µF	25	112 µF	40	180 µF	55	247 µF
	36 W	20	90 µF	25	112 µF	40	180 µF	55	247 µF
	58 W	15	67 µF	17	76 µF	22	99 µF	40	180 µF
Double with starter compensated	2 X 18 W	2.7 µF	40	45	90	140			
	2 X 20 W	2.7 µF	40	45	90	140			
	2 X 36 W	3.4 µF	22	26	50	100			
	2 X 40 W	3.4 µF	22	26	50	100			
	2 X 58 W	5.3 µF	12	13	23	50			
	2 X 65 W	5.3 µF	12	13	23	50			
Single with electronic ballast	18 W	30	35	60	80				
	36 W	26	30	32	45				
	58 W	15	17	25	30				
Double with electronic ballast	2 X 18 W	15	17	30	40				
	2 X 36 W	13	15	16	22				
	2 X 58 W	8	9	12	15				
Compact fluorescent with electromagnetic ballast, without compensation	7 W	50	55	100	130				
	10 W	45	50	90	115				
	18 W	40	42	65	90				
	26 W	25	27	50	80				
Compact fluorescent with electronic supply incorporated	11 W	80	85	110	150				
	15 W	60	63	100	130				
	20 W	50	52	70	110				
	23 W	40	42	60	100				
<b>Discharge Lamps</b>									
High pressure mercury without compensation	50 W	11	12	36	50				
	80 W	9	10	27	38				
	125 W	7	8	19	26				
	250 W	3	3	10	14				
	400 W	1	2	7	10				
High pressure mercury with parallel compensation	50 W	9	C Max. 63 µF	10	C Max. 70 µF	25	C Max. 175 µF	30	C Max. 210 µF
	80 W	7	49 µF	8	56 µF	21	147 µF	25	175 µF
	125 W	5	50 µF	6	60 µF	14	140 µF	17	170 µF
	250 W	3	54 µF	3	54 µF	7	126 µF	9	162 µF
	400 W	1	25 µF	2	50 µF	4	100 µF	6	150 µF
Mixed	100 W	9		10	22	33			
	160 W	6		7	19	27			
	250 W	3		4	11	15			
	400 W	1		2	8	11			
High pressure sodium vapour or metal halide without compensation	70 W	9		10	20	30			
	150 W	5		6	10	15			
	250 W	3		4	6	10			
	400 W	1		2	4	6			
High pressure sodium vapour or metal halide with compensation	70 W	5	C Max. 60 µF	6	C Max. 72 µF	15	C Max. 180 µF	20	C Max. 240 µF
	150 W	3	54 µF	3	54 µF	9	162 µF	16	198 µF
	250 W	1	32 µF	2	64 µF	5	160 µF	7	224 µF
	400 W	1	/	1	50 µF	3	150 µF	5	250 µF

**Technical Specifications**

	<b>EH011</b>	<b>EH010</b>	<b>EH111</b>	<b>EH110</b>	<b>EH171</b>	<b>EG103</b>	<b>EG103E</b>	<b>EG103V</b>	<b>EG203</b>	<b>EG203E</b>	<b>EG400</b>
Width in 17.5mm	1	1	3	3	3	2	2	2	2	2	4
Version	Daily	Daily	Daily	Daily	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly & Annual
Voltage supply	230V 50/60Hz	230V 50Hz	230V 50/60Hz	230V 50Hz	230V 50/60Hz	230V AC 50/60Hz					
Consumption	0.5VA	0.5VA	0.5VA	0.5VA	0.5VA	0.5VA	6VA	0.8VA	6VA	6VA	2 VA
Output	1 NO Contact Volt free	1 NO Contact Volt free	1 c/o Contact Volt free	1 c/o Contact Volt free	c/o Contact Volt free	1 volt free Changeover Contact	1 volt free Changeover Contact	1 volt free Changeover Contact	2 volt free Changeover Contact	2 volt free Changeover Contact	3 volt free Changeover Contact
<b>Switching capacity</b>											
AC1	16A/ 250V	16A/ 250V	16A/ 250V	16A/ 250V	16A/ 250V	16A AC1 /250V 4A DC1/ 12V					
Inductive load cos 0.6	4A/ 250V	4A/ 250V	4A/ 250V	4A/ 250V	2.5A/ 250V	10A/ 250V	10A/ 250V	10A/ 250V	10A/ 250V	10A/ 250V	10A/ 250V
Incandescent lamp	900W	900W	900W	900W	900W	2300W	2300W	2300W	2300W	2300W	2300W
Halogen lighting 230V	-	-	-	-	-	2300W	2300W	2300W	2300W	2300W	2300W
Compensated fluorescent tubes // (max. 45µF)	-	-	-	-	-	400w	400w	400w	400w	400w	400W
Non compensated fluorescent tubes compen. in series	-	-	-	-	-	1000W	1000W	1000W	1000W	1000W	1000W
Compact fluorescent tubes	-	-	-	-	-	500W	500W	500W	500W	500W	500W
Minimum current AC1	-	-	-	-	-	100mA/ 250V	100mA/ 250V	-	100mA/ 250V	100mA/ 250V	100mA/ 250V
DC 1	-	-	-	-	-	-	-	100mA/ 12V	-	-	-
Galvanic insulation between power supply and output	-	-	-	-	-	< 4 KV					
<b>Characteristics</b>											
Technology	Quartz	Quartz	Quartz	Quartz	Quartz	-	-	-	-	-	-
Dial	24h	24h	24h	24h	7 days	-	-	-	-	-	-
Minimum switching	5 min	5 min	5 min	5 min	2h	-	-	-	-	-	-
Programming capacity	-	-	-	-	-	56 steps	102 steps				
Minimum time between 2 steps	-	-	-	-	-	1 min					
Working accuracy	1s per day	1s per day	1s per day	1s per day	1s per day	+/-1.5 sec/24h	+/-1.5 sec/24h	+/-1.5 sec/24h	+/-1.5 sec/24h	+/-1.5 sec/24h	+/-1.5 sec/24h
Supply failure reserve	200h	no	200h	no	200h	5 years lithium bat.	5 years lithium bat	5 years lithium bat	5 years lithium bat	5 years lithium bat	100 hrs lithium bat
Reached in	120h	120h	120h	120h	120h	-	-	-	-	-	-
Manual switch type	ON Auto ON	OFF Auto ON	OFF Auto ON	OFF Auto ON	OFF Auto ON	-	-	-	-	-	-
Protection degree	-	-	-	-	-	IP20	IP20	IP20	IP20	IP20	IP20
<b>Environment</b>											
Working temperature	-10°C to + 45°C	-10°C to + 45°C	-10°C to + 45°C	-10°C to + 45°C	-10°C to + 45°C	-5°C to + 45°C	-5°C to + 45°C	-5°C to + 45°C	-5°C to + 45°C	-5°C to + 45°C	-5°C to + 45°C
Storage temperature	-100°C to + 50°C	-100°C to + 50°C	-100°C to + 50°C	-100°C to + 50°C	-100°C to + 50°C	-20°C to + 70°C					
Connection											
Flexible	0.5 to 4mm	0.5 to 4mm	0.5 to 4mm	0.5 to 4mm	0.5 to 4mm	1.5 to 10mm <sup>2</sup>	1 to 4mm <sup>2</sup> 1.5 - 6mm <sup>2</sup>				
Rigid	-	-	-	-	-	1 to 6mm <sup>2</sup>	-				

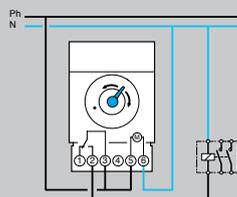
**EH010 - EH011**

230 VM ± 510 % 50/60 Hz



**EH110 - EH111 - EH171**

230 V ± 10% 50/60 Hz



# Modular - 1 Channel Electronic Time Switch Weekly Cycle

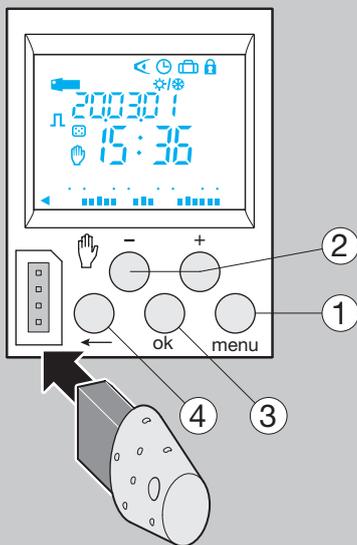
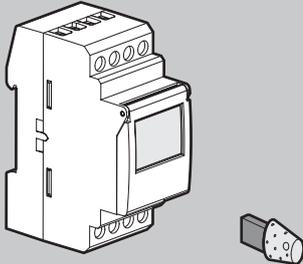
## 1 Channel Electronic Time Switches Weekly Cycle

### EG103

**EG103E** with override entry,

**EG103V** with 12-24V voltage supply

### 1 Channel



### Keys

- ① Menu : Selection of operating mode
- Auto** : Mode of running according to the program selected.
- Prog** : New for programming mode.
- Prog** : Modif to modify an existing program.
- ◀ : Checking of the program.
- 🕒 : Modification of time, date and selection of the winter / summer time change mode .
- 📅 : Holidays.
- ② + and - : Navigation or setting of values.
- 👤 : In auto, mode, selection of overrides, waivers or random operation
- ③ OK : To validate flashing information on display.
- ④ ◀... : To return to the previous step.

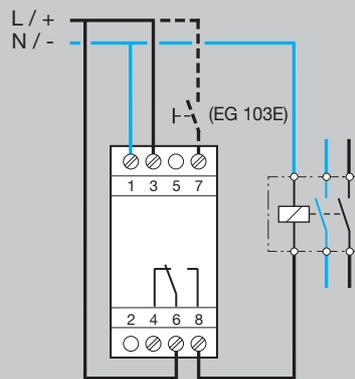
You may return into auto mode at any moment using menu.  
If no action is taken for 1 min, the switch returns into auto mode.

## Major characteristics

- Product delivered with current time and date set
- Automatic change of winter / summer time 🕒/🕒
- Programming key 🗑️
  - For permanent waivers
  - For program copy or save
- Programming for day or group of days
- 56 program steps On, Off
- Impulses ⏏ (1 sec to 30 min)\*
- Permanent overrides On or Off (👤 permanent light on)
- Temporary overrides On or Off (👤 flashing)
- Holiday mode 📅 : overrides On or Off between two dates\*
- Simulation of presence 🏠 \*
- Display bar graph of daily profile
- Keyboard locking possible 🔒
- Programmable with power off
- Back lit display\*

\* Evolution models E or V only

## Connection Diagram

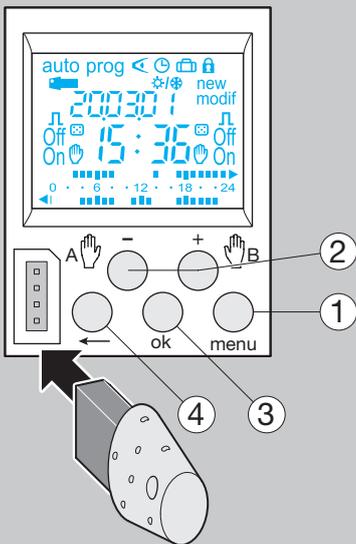
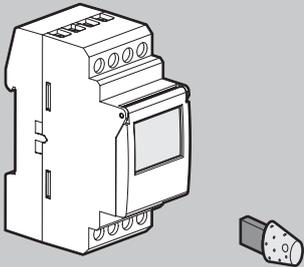


### EG103, EG103E EG103V

## 2 Channel Electronic Time Switch Weekly Cycle

2 channel electronic time switches weekly cycle.  
**EG203**  
**EG203E**

### 2 Channel



#### Keys

- ① Menu : Selection of operating mode
- Auto : Mode of running according to the program selected.
- Prog : New for programming mode.
- Prog : Modif to modify an existing program.
- ◀ : Checking of the program.
- 🕒 : Modification of time, date and selection of the winter / summer time change mode .
- 📅 : Holidays.
- ② +and- : Navigation or setting of values.
- A 🖱 - : In auto, mode, selection of overrides,
- B 🖱 - : Waivers or random operation
- ③ ok : To validate flashing information on display.
- ④ ◀... : To return to the previous step.

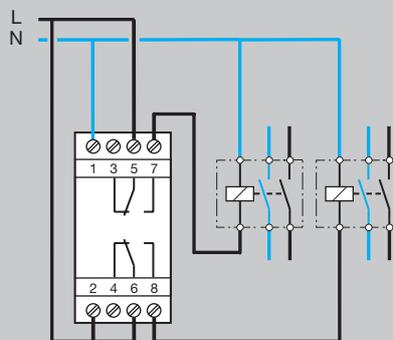
You may return into auto mode at any moment using menu.  
 If no action is taken for 1 min, the switch returns into **auto** mode.

#### Major characteristics

- Product delivered with current time and date set
- Automatic change of winter / summer time 🕒/🕒
- Programming key 🖱
  - For permanent waivers
  - For program copy or save
- Programming for day or group of days
- 56 program steps On, Off
- Impulses ⏏ (1 sec to 30 min)\*
- Permanent overrides On or Off (🖱 permanent light on)
- Temporary overrides On or Off (🖱 flashing)
- Holiday mode 📅 : overrides On or Off between two dates\*
- Simulation of presence 🏠 \*
- Display bar graph of daily profile
- Keyboard locking possible 🔒
- Programmable with power off
- Back lit display\*

\* evolution models E only

#### Connection diagram



**EG203, EG203E**

## Digital Time Switch - EG010

### Technical Specifications

#### Electrical Characteristics

- Voltage supply : 230V +10/ -10% 50/60 Hz
- Consumption: 1VA
- Output : 1 changeover contact  
16A - 250V ;AC1  
3A - 250V cosw = 0.6  
1000W incandescent lighting

#### Functional Characteristics

- 5 adjustable pre-recorded programs
- Accuracy: +/- 6 min / year
- Supply failure reserve: total of 3 years

#### Environment

- Working temperature: -10 to +50°C
- Storage temperature: -10 to +60°C

#### Connection Capacity

- 1 to 4mm<sup>2</sup>

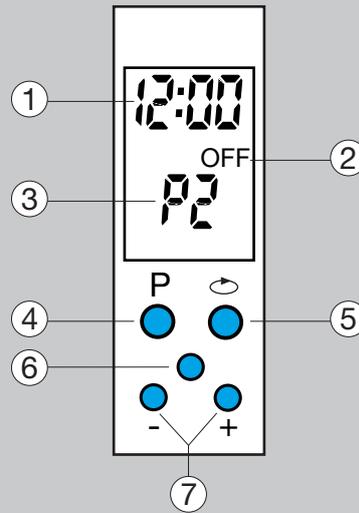
#### Main Characteristics

- Easy to program: 5 programs are pre-recorded. The user just have to select the program which corresponds to its use and modify time switches if necessary.

The 5 pre-registered programs are as follows

P	Prog
P0	OFF
P1	ON
P2	6.00 — 23.00
P3	6.00 8.00 — 17.00 23.00
P4	6.00 8.00 11.00 13.00 17.00 23.00

### Product Presentation



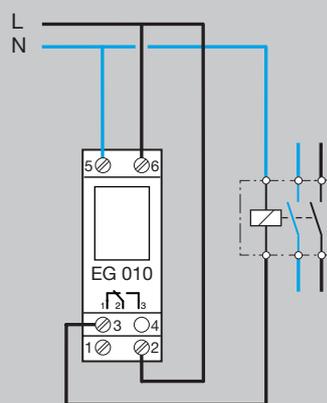
#### Display

- ① Time
- ② Circuit Status
- ③ Program Selection

#### Buttons

- ④ P to select the program to apply
- ⑤ Reset
- ⑥ ↻ to scroll program steps
- ⑦ + and - : to input time

### Electrical Connection



## Digital Time Switch - EG071

### Technical Specifications

#### Electrical Characteristics

- Voltage supply : 230V +10/ -10% 50/60 Hz
- Consumption: 1VA
- Output : 1 changeover contact  
16A - 250V ;AC1  
3A - 250V cosw = 0.6  
1000W incandescent lighting

#### Functional Characteristics

- 20 program steps
- Each program step can be applied to one of several days
- Accuracy: +/- 6 min / year
- Supply failure reserve: total of 3 years

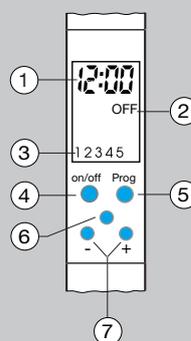
#### Environment

- Working temperature: -10 to +50°C
- Storage temperature: -10 to +60°C

#### Connection Capacity

- 1 to 4mm<sup>2</sup>

### Product Presentation



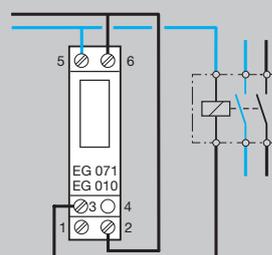
#### Display

- ① Time
- ② Circuit Status
- ③ Days of the week

#### Buttons

- ④ ON / OFF : to select the circuit status
- ⑤ Reset
- ⑥ Prog: to program the device and scroll program steps
- ⑦ To input time and day

### Electrical Connection



**Delay Timers**

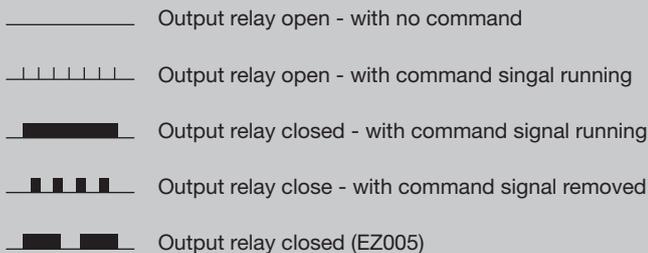
Delay timer devices are used to control a variety of processes where the requirement is for switching circuits on, off or delaying the on or off switching for a pre-set period of time. Typical device types are...

- Delay on - intended to delay the starting or switching of a circuit for a set period of time following the command signal e.g. to delay the starting of motor loads where a large number of motors are to be started by the same switch to reduce the effects of the starting currents.
- Delay off - intended to delay the stopping or switching off of a circuit for a set period of time following the removal of the command signal e.g. to overrun an extractor following the switching off of a process that creates fumes.
- Adjustable time on - intended to switch on for a set period, the command signal must remain on throughout the set period e.g. to switch on two sets of heaters with one set (the boost) switching off after the set period.
- Impulse timer - intended to switch on for a set period, the command signal length is not important e.g. to boost a time clock controlled circuit such as a water storage heater.
- Symmetrical timer - intended to toggle a circuit on and off in regular time patterns e.g. to run an extractor intermittently.

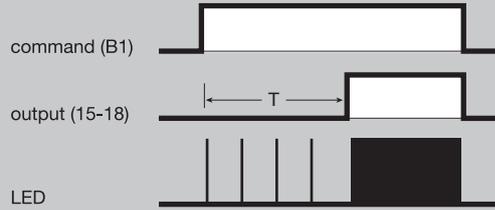
Multifunction timer - 6 individual functions

- A = Timer.
- B = Delay off (output relay opens either at end of command or after set time period - whichever is shorter).
- C = Delay off.
- D = Delay on.
- E = Delay on (output relay closes either at end of command or after set time period - whichever is shorter).
- F = Symmetrical timer.

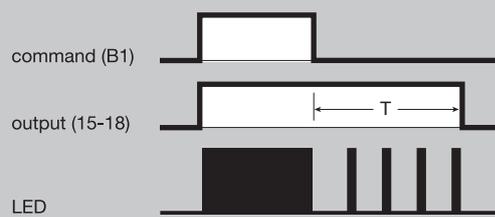
On selection - contact permanently closed  
Off selection - contact permanently open



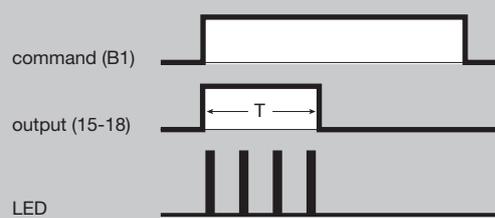
**Delay On  
EZ001 & EZ006 Function D**



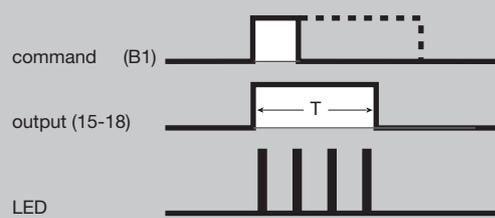
**Delay Off  
EZ002 & EZ006 Function C**



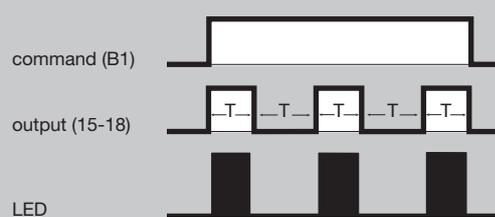
**Adjustable Time On  
EZ003 & EZ006 Function E**



**Impulse Timer  
EZ004 & EZ006 Function A**



**Symmetrical Timer  
EZ005 & EZ006 Function F**



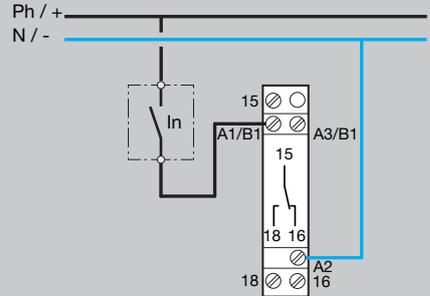
**Technical Specifications**

<b>Product</b>	<b>EZ001, EZ002, EZ003, EZ004, EZ005, EZ006.</b>
<b>Electrical characteristics</b>	
Supply voltage	24-28 Vdc (+10% - 15%) terminals A1 & A2 24-230 Vac (+10% - 15%) terminals A1 & A2 12 Vac & dc (+10% -10%) terminals A3 & A2
Output	1 volt free C/O contact
<b>Life expectancy</b>	
Max load AC1	10A / 230V~ 50,000 cycles
Incandescent	450W~ 100,000 cycles
Fluorescent non comp.	600W~ 50,000 cycles
Inductive load 0.6pf	5A / 230V~ 100,000 cycles
<b>Min power</b>	
AC	100mA at 230V
DC	100mA at 12V
<b>Galvanic isolation</b>	2kV
<b>Standard / Norm</b>	EN60669-2-1
<b>Functional characteristics</b>	
Timer range	0.1s - 10 hours
<b>Min. command period</b>	
AC	50ms
DC	30ms
<b>Operating temperature</b>	
Working	-20°C to +50°C
Storage	-40°C to +50°C
<b>Connection Capacity</b>	
Flexible	1 - 6 mm <sup>2</sup>
Rigid	1.5 - 10 mm <sup>2</sup>

**Functional characteristics**

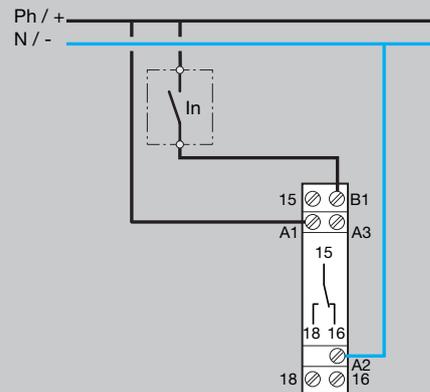
**EZ001, EZ003, EZ005, EZ006 (functions D,E,F)**

CD : Command.  
O : Output.  
T : Time delay.



**EZ002, EZ004, EZ006 (functions A,B,C)**

indicator light (for versions with NO contact).  
ON  
OFF



Modular Devices

**Each time delay bracket is divided into 4 ranges**

Time Delay Brackets	1s to 1h	0.1min to 10h	0.1s to 10min	0.2min to 20h
Ranges	1s to 10s	0.1min to 1min	0.1s to 1s	0.2min to 2min
	0.1min to 1min	1min to 10min	1s to 10s	2min to 20min
	1min to 10min	0.1h to 1h	0.1min to 1min	0.2h to 2h
	0.1h to 1h	1h to 10h	1min to 10min	2h to 20h

**Environment**

working temperature: -10°C to +60°C.  
storage temperature: -20°C to +70°C

**Time Lag Switches**

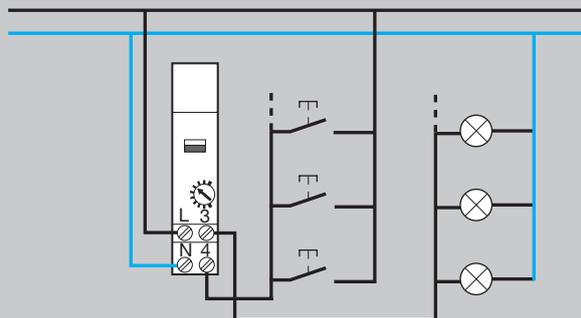
A common area where time delay devices are used is stairways and corridors in multi occupancy buildings where they provide a level of energy efficiency. The EM001N device provides basic time lag control that can be enhanced to offer a pre-warning by adding a EM002 device, suitable only for incandescent and halogen loads up to 1000W.

**Technical Specifications**

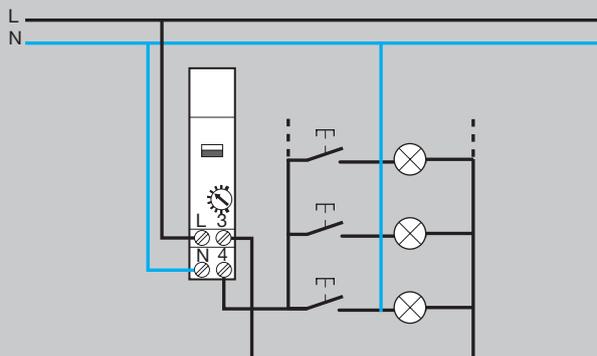
Cat Ref.	EM001N	EM002
<b>Electrical characteristics</b>		
Supply voltage	230V +10 - 15% 50/60 Hz	230V +10 - 15% 50/60 Hz
Consumption	1VA	0.5 W permanent 8 W max.
Size	1	-
<b>Breaking capacity</b>		
AC1	16A 230V AC	4A 230V~
Incandescent	2300W	1000W
Halogen 230V	2300W	1000W
Fero magnetic transformer	1600W	-
Parallel compensated	Capacitor 112µF	-
Fluorescent lamps	1000W	-
Series compensated	3600W	-
Fluorescent lamps		
Electronic transformer	2300W	-
Compact fluorescent lamps with electronic ballast	60 x 7W or 40 x 11W or 32 x 15W or 20 x 23W	-
with conventional ballast	2300W	-
<b>Functional characteristics</b>		
Time delay	30s to 10 min	24s
Retrigger	Yes	-
Max. current in rest position	100 mA	-
Automatic 3/4 recognition	Yes	-
Local command	Automatic / Override ON	-
<b>Environment</b>		
Working temperature	-10 to +55°C	-15 to +55°C
Storage temperature	-20 to +60°C	-25 to +70°C
<b>Connection</b>		
Flexible (mm <sup>2</sup> )	1 to 6	1 to 6
Rigid (mm <sup>2</sup> )	1.5 to 10	1.5 to 10
Connection EM001/EM002	-	2 wires 1.5

**Wiring Diagrams**

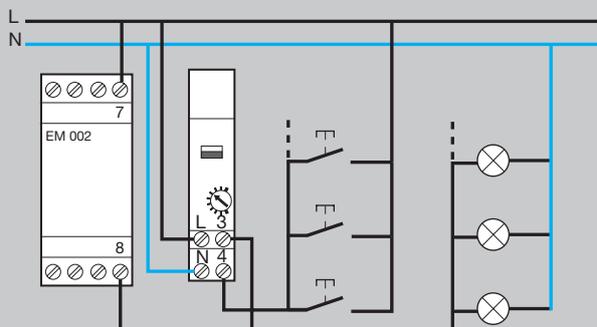
**4-Wire**



**3-Wire**



**Combination EM002 with EM001N**



**Light Sensitive Switches**

Using light sensitive switches can prevent the unnecessary use of lighting circuits where sufficient daylight exists. The benefit of modular devices is the facility to set the ambient lighting level at which the device will operate, and as the device is fitted at the distribution point prevent unauthorised tampering. The remote photocell unit can be mounted up to a distance of 50 metres from the device. Two devices are available the standard EE100 light sensitive switch and an enhanced programmable version the EE171 that allows time clock control also.

**Principle of Operation**

Both devices control lighting systems according to natural illumination;

- The user sets the working level;
- The photo cell measures the external light level

The output of the EE100 is:

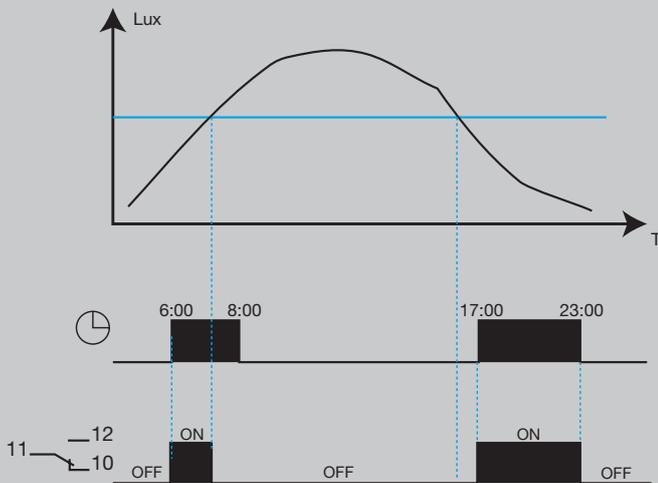
- ON, when the measured level is lower than the pre-set light level
- OFF, when the measured level is higher than the pre-set light level

The output of the EE171 during the programmed ON time period is:

- ON, when the measured level is lower than the pre-set light level
- OFF, when the measured level is higher than the pre-set light level

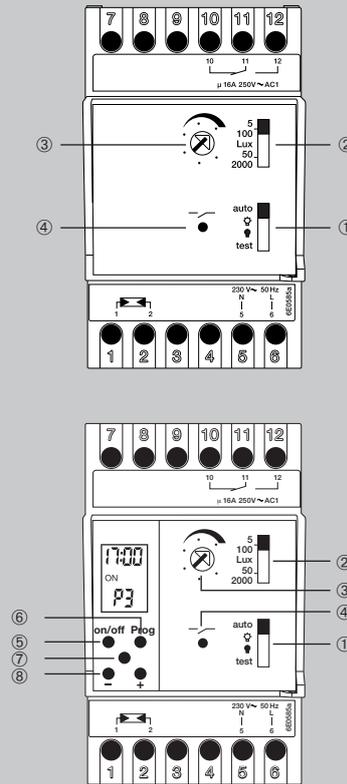
The output of the EE171 during the programmed off time period is:

- OFF, regardless of the lighting level



The light sensitive switches include a built in time delay which avoids unnecessary switching due to temporary factors such as car head-light beams etc...

**Description**

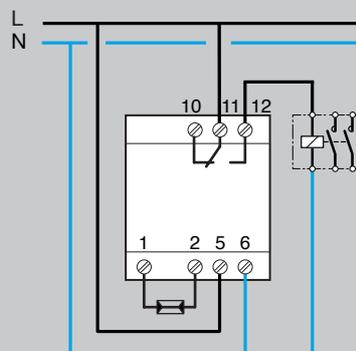


The programmable light sensitive switch EE171 has two main functions:

- Light sensitive switch comprising
  - ① Override selector switch to allow permanent ON or OFF, auto or test mode
  - ② Lighting range selector
  - ③ Potentiometer to set light level
  - ④ Indicator to show output switching status
- A programmer to establish the automatic operating cycle

The programmer comprises 4 keys:

- ⑤ **ON / OFF** to choose whether the circuit is on or off.
- ⑥ **Prog** to set the program and scroll program steps
- ⑦ **Reset**
- ⑧ **+** and **-** to change settings



**Mounting the Cell**

To ensure correct operation of the light sensitive switch, the cell must not be influenced by artificial light or direct solar radiation and should be sheltered from dust and humidity. In case of disconnection of the link between the cell and the light sensitive switch, the output of the device will be switched on. Make sure the light sensitive switch is unplugged before connecting the cell.

Cells	EE002	EE003
<b>Type</b>	Flush mounting	Surface mounting
<b>Dimensions (mm)</b>	89 x 48 x 32	25 x 25 x 20 hole O 25mm
<b>Connection</b>	cable 1 m 2 x 0.75mm <sup>2</sup>	0.75 to 4mm <sup>2</sup>
<b>Protection class</b>	IP54	IP54
<b>Working &amp; storage temperature</b>	-30°C to +60°C	-30°C to +60°C

**Adjustment of the Working Level**

The test position of the override selector 1 makes setting the preset level easier by removing the ON and OFF delay.

Select the sensitivity range which suits your application (selector 1) 5 to 100 lux (low light level) application examples; public lighting, shop windows, signals...

50 to 2000 lux (high light level) application examples; controls of shades

At the appropriate moment of the day, put the selector 1 in test position; turn the potentiometer 2 up to the switching point (the indicator 4 lights); put the selector back to position 'auto' the normal operating mode of the device.

**Technical Specification**

Electrical specification

- Voltage rating: 230V - + 10/-15% 50Hz
- Consumption: 1.5VA max
- Output: 1 voltage free changeover contact,
- max breaking capacity: AC1 16A 250V~
- incandescent lamp: 2000W 230V~
- halogen lamp: 1000W 230V~
- fluorescent lamp: uncompensated: 1000W 230V~
- compensated in series (10µF): 1000W 230V~
- // compensated (15µF): 200W 230V~
- duo: 1000W 230V~

**Functional Characteristics**

- 2 sensitivity range 5 to 100 lux, 50 to 2000 lux
- Weekly cycle\*
- 8 pre defined programs\*
- Program setting: 1 minute increments\*
- Accuracy: + 6 min. / annum\*
- Operating reserve: lithium battery total of 3 years supply failure\*
- On and Off delay: 15 to 60s
- Working temperature: -30°C to +60°C (cell)  
-10°C to +50°C (modular device)
- Storage temperature: -20°C to +60°C
- Protection class (cell): IP54
- Insulation class (cell): II

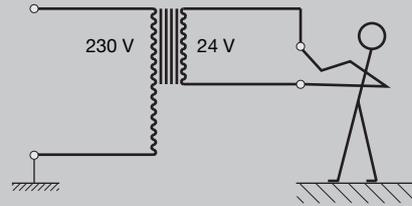
**Connection Capacity**

- Modular device: 0.5 to 4mm<sup>2</sup>
- Cell: 0.75 to 2.5mm<sup>2</sup>  
max. length between cell and modular device: 50m  
mounting of the cell with 2 screws: 2.5mm

\* items marked EE171 only.

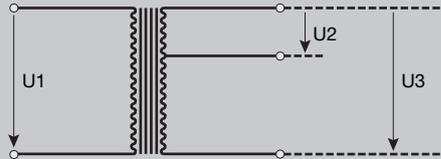
**Safety Transformers**

These transformers are designed to ensure personal safety, their primary winding are electrically separated from their secondary windings and they are intended to feed safety extra low voltage circuits  $U \leq 50V$ . A thermal overload, in the primary windings, ensures that if a short circuit or an overload occurs in the output it will not damage the device.



**Bell Transformers**

Bell transformers are similar to safety transformers but the secondary voltages do not exceed 24 volts, they are also similarly protected against short circuits and overloads, by thermal protection in the primary winding.



**Compliance with the Standards**

The bell and safety transformers conform with EN 60742 (BS 3535). Where transformers are to be used in a common enclosure with other devices heat dissipation inserts LZ060 should be used.

**Technical Specification**

Reference	ST301	ST303	ST305	ST312	ST313	ST314	ST315
<b>Nominal power</b>	4VA	8VA	16VA	25VA	16VA	40VA	60VA
<b>Designation</b>	Bell	Bell	Bell	Safety	Safety	Safety	Safety
<b>Primary voltage</b>	230 volts	230 volts	230 volts	230 volts	230 volts	230 volts	230 volts
	U2	12 volts In = 0.33A	8 volts In = 1A	8 volts In = 2A	12 volts In = 2.08A	12 volts In = 1.33A	12 volts In = 5.25A
<b>Secondary voltage</b>							
	U3	12 volts In = 0.5A	12 volts In = 0.67A	12 volts In = 1.33A	24 volts In = 1.04A	24 volts In = 0.67A	24 volts In = 1.67A
<b>No load</b>	U2	12 volts	15 volts	12.4 volts	14 volts	15.5 volts	13.6 volts
<b>Secondary voltage</b>							
	U3	18 volts	21.8 Volts	18.5 Volts	29 Volts	29.7 V	27 Volts
<b>Galvanic isolation</b>	4kV	4kV	4kV	4kV	4kV	4kV	4kV
<b>Max functional temperature</b>	35°C	35°C	35°C	35°C	35°C	35°C	35°C
<b>Overload and S/C protection</b>	Thermal cut out in the primary winding						

Number of products that can be operated simultaneously by a transformer

Transformer	Reference	ST301		ST303		ST305		ST312		ST313		ST314		ST315R	
		8V	12V	8V	12V	8V	12V	12V	24V	12V	24V	12V	24V	12V	24V
Power		4	4	8	8	16	16	25	25	16	16	40	40	63	63
Bell	SU212 8/12V	1	1	3	2	5	3	-	-	-	-	-	-	-	-
Buzzer	SU214 8/12V	1	1	3	2	5	3	-	-	-	-	-	-	-	-
Relays	ER124 12V	-	-	-	-	-	-	4	-	2	-	7	-	8	-
	ER139 12V	-	-	-	-	-	-	2	-	1	-	3	-	4	-
	ER123 24V	-	-	-	-	-	-	-	2	-	2	-	7	-	8
	ER138 24V	-	-	-	-	-	-	-	2	-	1	-	3	-	4
Contactors	ES224 24V	-	-	-	-	-	-	-	5	-	3	-	11	-	12
	ES424 24V	-	-	-	-	-	-	-	3	-	2	-	7	-	8
Latching relays	EPN519 12V	-	-	-	-	-	2	3	-	2	-	4	-	4	-
	EPN529 12V	-	-	-	-	-	1	2	-	1	-	3	-	3	-
	EPN513 24V	-	-	-	-	-	-	-	2	-	2	-	3	-	3
	EPN518 24V	-	-	-	-	-	-	-	2	-	2	-	3	-	3
	EPN525 24V	-	-	-	-	-	-	-	2	-	2	-	3	-	3
	EPN528 24V	-	-	-	-	-	-	-	2	-	1	-	3	-	3
	EPN541 24V	-	-	-	-	-	-	-	2	-	1	-	3	-	3

**Technical Specifications**

Electrical characteristics

- Voltage supply: 230V + 10 - 15% 50/60 Hz
- Consumption: 1.5VA
- Output: 1 changeover contact  
2A 230V ~ AC1

**Functional Characteristics**

- 4 temperature ranges
- 30 to 0°C
- 0 to +30°C
- +30 to +60°C
- +60 to +90°C
- Varying accuracy

**Environment**

- Working temperature: -10 to +50°C
- Storage temperature: -20 to +70°C

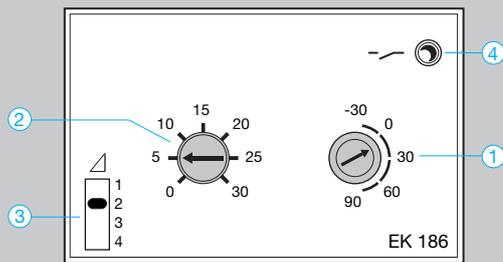
**Connection Capacity**

- Flexible: 1 to 6mm<sup>2</sup>
- Rigid: 1.5 to 10mm<sup>2</sup>
- Probe: Maximum distance 50m

**Main Characteristics**

- **Multiple applications**  
A single device to solve all your problems of regulation or temperature control, from cold room to incubator.
- **Varying accuracy**  
The accuracy can be adapted according to the application. e.g.: low for ambient temperature regulation, high for incubator regulation.
- **Safety feature for probe failure**  
To protect the installation in case of disconnection from the probe, various connections can be made so the thermostat will be:
  - Permanent OFF
  - Permanent ON
  - Cyclical operation: output ON 1 minute in every 4.
- Display  
State of output.

**Product Presentation**



- ① Selection of the range
- ② Adjustment of the temperature setting
- ③ Selection of temperature range
- ④ Display of state of output

**Working Principle**

the EK186 regulates the temperature according to all or nothing principle, it can be associated with different probes, according to the application the accuracy is a function of the temperature range and is selected by a slide switch.

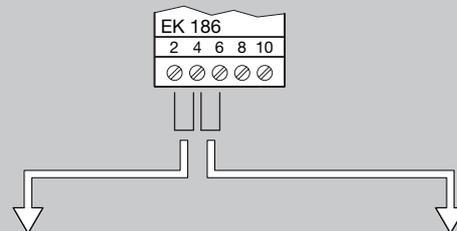
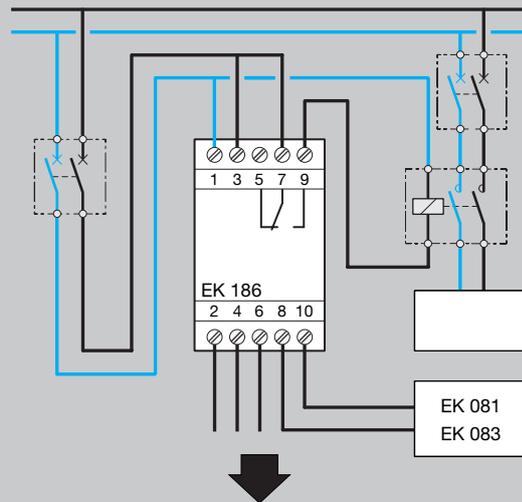
Position on slide switch	The temperature range °C			
	-30 to 0	0 to 30	30 to 60	60 to 90
1	± <b>2.15</b>	± 2.54	± 2.98	± 3.43
2	± 0.15	± <b>0.18</b>	± 0.21	± 0.24
3	± 0.38	± 0.45	± <b>0.53</b>	± 0.61
4	± 1.23	± 1.45	± 1.70	± <b>1.96</b>

**Bold** - Preferential accuracies for each temperature range.

**Example of choice of accuracy**

- Regulation of ambient temperature  
Range : 0 to +30°C  
Accuracy : ± 0.18°C = 2
- Control of hot water outgoing circuit  
Range : 30 to +60°C  
Accuracy : ± 0.53°C = 3

**Electrical Connection**



**Caution**

When the temperature ranges 30 to 60°C and 60 to 90°C are selected and the temperature measured by the probe is below 30°C, the safety feature for probe failure must be "permanent on", until the measured temperature reaches the minimum temperature corresponding to the range (i.e. 30°C for the range 30°C to 60°C and 60°C for the range 60°C to 90°C).

**Electrical characteristics**

- Voltage supply : 230V + 10 - 15% 50/60 Hz
- Consumption : 1.5VA
- Output: 1 changeover contact  
2A 230V;AC1

**Functional Characteristics**

- 3 temperature controllable by external setting
  - Comfort: adjustable from +5 to +30°C
  - Reduced: decrease 2 to 8°C in comparison with comfort setting
  - Dispensation: adjustable from +5 to +30°C
- Accuracy: ±0.2°C

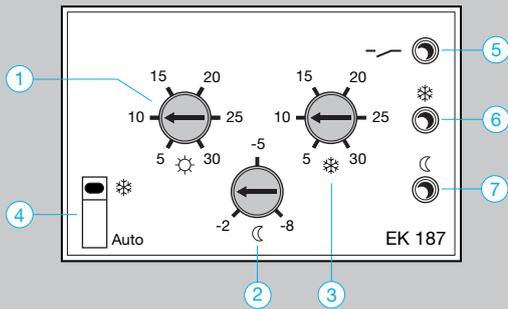
**Environment**

- Working temperature: -10 to +50°C
- Storage temperature: -20 to +70°C

**Connection Capacity**

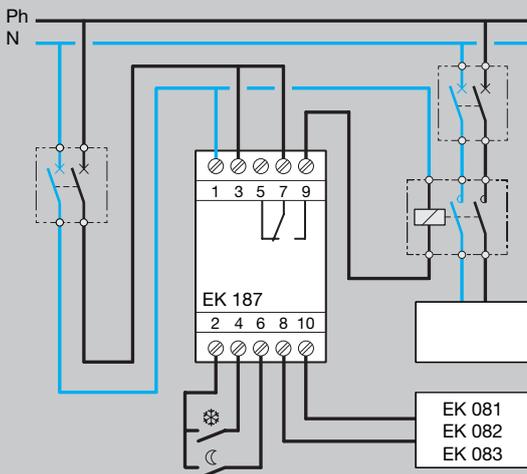
- Flexible: 1 to 6mm<sup>2</sup>
- Rigid: 1.5 to 10mm<sup>2</sup>
- Probe: maximum distance 50m

**Product Presentation**



- ① Reference setting: comfort TO
- ② Decrease in comparison with reference setting: reduced to TO
- ③ Dispensation setting
- ④ Dispensation setting override
- ⑤ Display of state of output i.e. contact position
- ⑥ Pilot light indicating the regulation in comparison with a dispensation setting
- ⑦ Pilot light indicating the regulation in comparison with a reduced setting

**Electrical Connection**



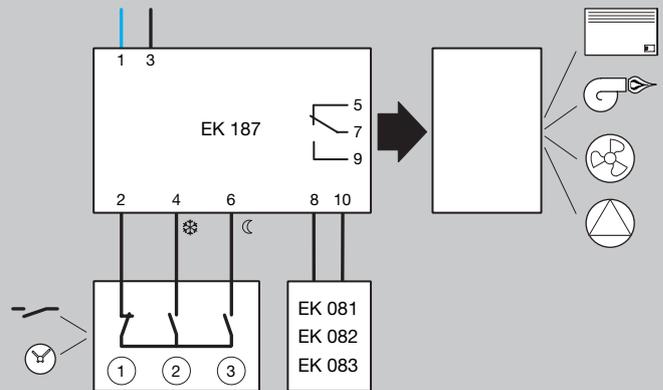
**Main Characteristics**

- **Temperature settings controllable by external setting** when associating a digital time switch, it is possible to regulate the heating in relation with a program established by the user.
- **2 wires link** between the probe and the unit, enables the easy replacement of the ambient thermostats of an existing installation.
- **Safety feature for "probe failure"** in case of probe disconnection, the output will be switched 1 minute in every 4; so that in case of disconnection during winter, it will protect the installation from frost.
- **Display** of state of the output and of the setting.

**Working Principle**

EK187 adjusts the temperature under the "all or nothing" principle it is associated to an ambient probe and thus works in closed loop the temperature settings are selected by external settings (contacts free of potential)

EK187 is thus generally associated to a time switch or a digital time switch in the case of absence of external signal, EK187 regulates the heating in comparison with the reference setting, a switch enables the override of the dispensation setting



①								
②								
③								

Modular Devices

**Technical Specifications**

Electrical characteristics

- Voltage supply: 230V + 10 - 15% 50 Hz
- Consumption: 4VA
- Output: 1 changeover contact  
2A 240V ~AC1

**Functional Characteristics**

- Adjustment of temperature setting “comfort and reduced temp.”  
From +8 to +28°C
- Fixed anti-frost temperature setting: +8°C
- Fixed accuracy: ±0.2°C
- Weekly cycle
- Programming capacity: 24 program steps
- Program setting: 1 minute increments
- Accuracy: ±5 min./annum
- Supply failure reserve: 24h  
Loss of time setting only, program still in memory

**Environment**

- Working temperature: -5 to +45°C
- Storage temperature: -20 to +60°C

**Connection Capacity**

- Flexible: 1 to 6mm<sup>2</sup>
- Rigid: 1.5 to 10mm<sup>2</sup>
- Probe: Maximum distance 50m

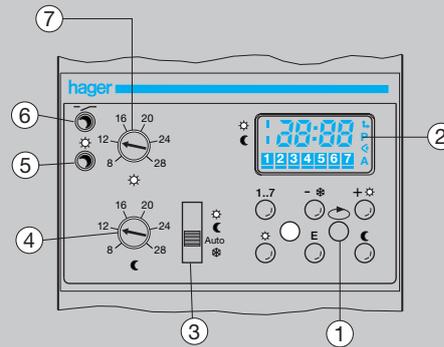
**Main Characteristics**

- **Simplified summer/winter time setting**  
Summer/winter time setting is obtained by pressing two separate keys
- **No loss of program in event of unlimited power failure**  
Loss of time setting only, program still in memory
- **Override**
  - Permanent: “comfort, reduced, anti-frost” temperature setting:
  - With automatic return to: “comfort and reduced” temperature setting:
- **2 wires link**  
Between the probe and the unit, this enables the easy replacement of the ambient thermostats in an existing installation
- **Display Mode**  
Allows program to be checked without risk of alteration
- **Groups of days**  
Days can be grouped in order to save program steps (so, a common setting for several days counts only as 1 program step)

**Working Principle**

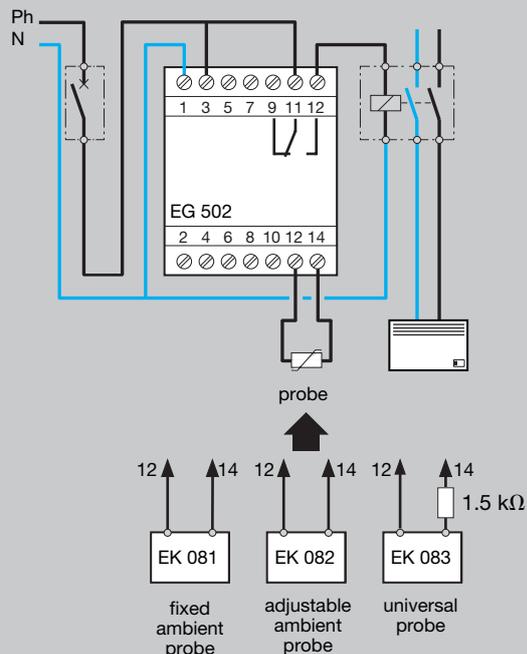
The programmable thermostat regulates the heating thanks to 2 temperature settings: “comfort” and “reduced”, according to a program established by the user; in cases of long absence, it is possible to maintain an anti-frost temperature

**Product Presentation**

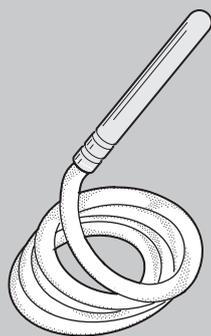


- ① programming of automatic cycle “comfort temperature”, “reduced temperature”, the principle of programming is similar to EG100.
- ② LCD screen
- ③ Facility for permanent override of “comfort temperature”, “reduced temperature”, or “anti-frost”
- ④ Adjustment of the reduced temperature setting
- ⑤ Display of setting (comfort or reduced)
- ⑥ Display of state of output
- ⑦ Adjustment of the comfort temperature setting

**Electrical Connection**



**EK083 Universal Probe**



- To associate with EK186 thermostat
- To associate with EK187 thermostat and EK618 time programmable thermostat (for those applications insert in series with the probe a resistance of 1500Ω)

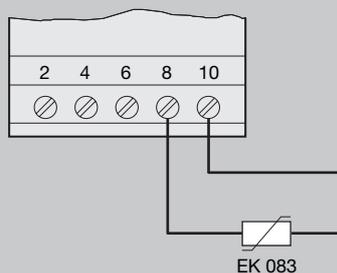
EK083: 10 kOhms at 25°C  
cable length: 4m

**Environment**

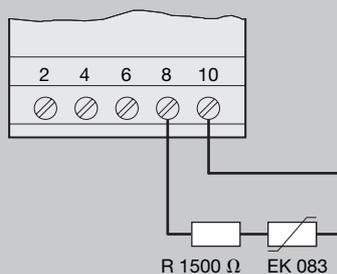
- Working temperature: -30 to +90°C
- Stacking temperature: -30 to +100°C

**Electrical connection**

- Associated with EK186



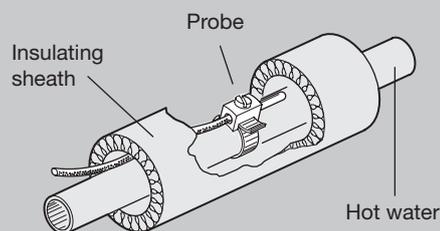
- Associated with EK187 - EK618



**Examples of Applications**

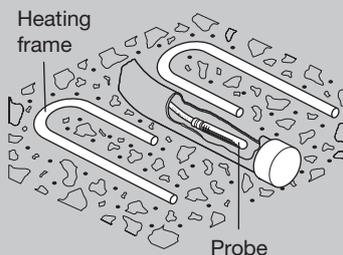
**Use with the clamp collar**

- For the control of hot water

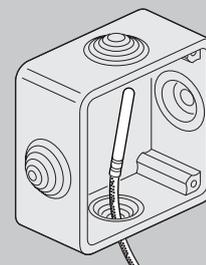


**Use with the clamp collar**

- Protected by a sheath for the control of floor temperature



- Used as an external probe in a weatherproof box.



**Resistance of probes according to temperature**

Temperature	EK083	EK081*	EK081** EK082
T (°C)	R (KΩ)	R (KΩ)	R (KΩ)
+90	0.91	On a wall	-
+80	1.25	1.25	2.83
+70	1.75	1.75	3.33
+50	3.60	3.60	5.18
+30	8.06	8.06	9.64
+25	10	10	11.58
+20	12.49	12.49	14.07
+15	15.71	15.71	17.28
+10	19.90	19.90	21.48
+5	25.39	25.39	26.98
+0	32.65	32.65	34.23
-5	42.31	-	-
-10	55.29	-	-
-15	72.89	-	-
-20	96.97	-	-
-25	130.24	-	-
-30	176.68	-	-

Face value at 25°C

Note: \* Association with EK186

\*\* Association with EK187 and EK618

## Digital Voltmeters, Ammeters & Hours Counter

### Technical Specification

- Working voltage : 230 V~ 50/60 Hz - resolution : 1 unit
- Update of the display: 3 / seconds
- Input impedance > 1 MV for the voltmeter SM501
- Isolating resistance : 10 MV
- Maximum voltage: 660 V - number of digits : 3

### Connection

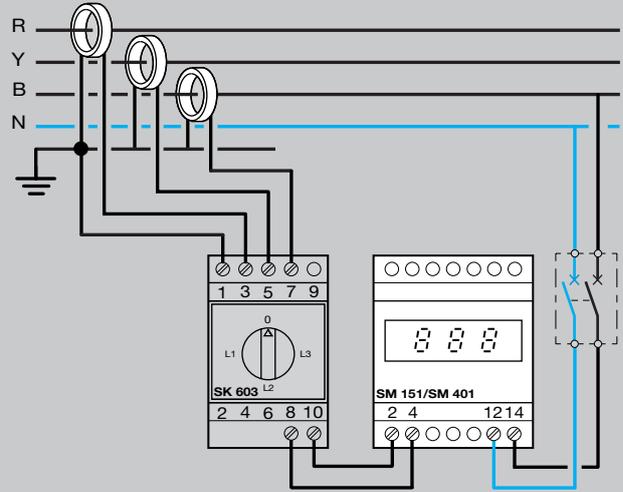
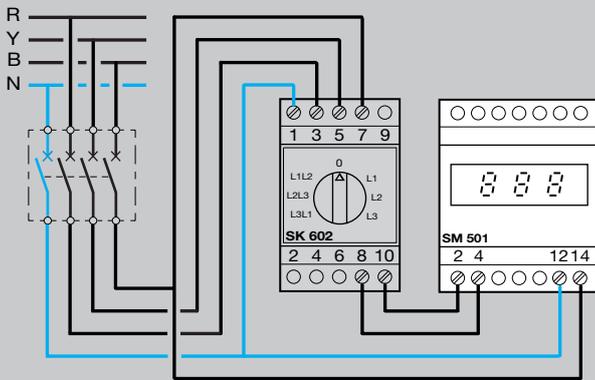
- Flexible: 6mm<sup>2</sup>
- Rigid: 10mm<sup>2</sup>

### Environment

- Working temperature: -10 to +55 °C
- Storage temperature : -40 to +70 °C

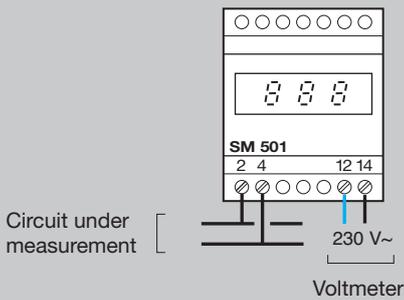
Cat Ref.	Product	Range	Consump.	Accuracy %	Ref. Temp °C	Accuracy Variation °C	Maximum continuous	Momentary maximum	Frequency Hz	Isolating voltage
SM501	Voltmeter	500V	≤4.5 VA	± 1	23 ± 1°C	± 0.03% / °C	1.2 Un	2 Un / 5 sec.	45-65	2kV/50Hz - 1 min
SM151	Ammeter	0-150A	≤1 VA	± 1	23 ± 1°C	± 0.03% / °C	2 In	10 In / 5 sec.	45-65	2kV/50Hz - 1min
SM401	with CT	0-400A								

### Electrical Connection

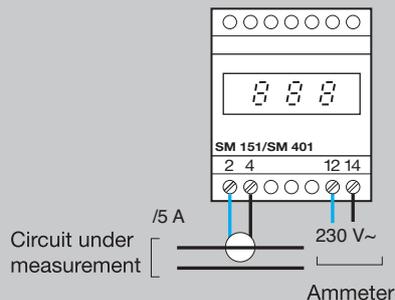


### Electrical Connection

#### SM501



#### SM151, SM401



### Hours Counter

#### Technical Specifications

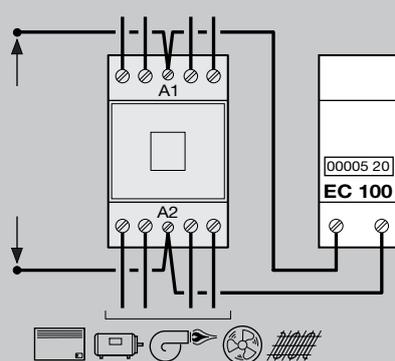
#### Electrical Characteristics

- Working voltage: 230V~

#### Electrical Connection

- Connection in parallel on the command of the receiver (contactor coil)

### Electrical Connection



**Technical specification**

**Environment**

- T° working: -25 to +50 °C
- T° storage: -40 to +80 °C

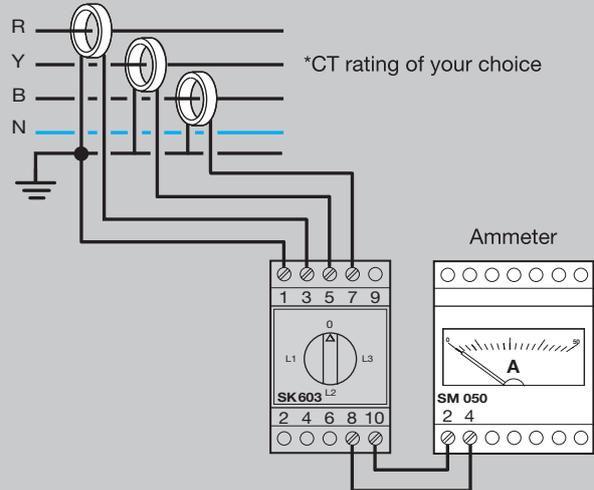
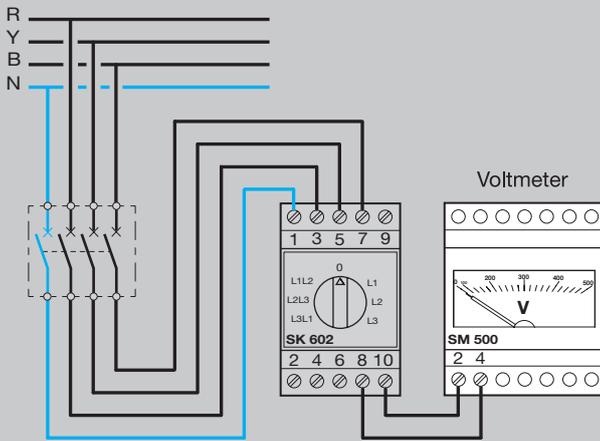
**Connection**

- Flexible: 1 to 6mm<sup>2</sup>
- Rigid: 1.5 to 10mm<sup>2</sup>

Cat Ref.	Product	Range	Consump.	Accuracy %	Ref. Temp °C	Accuracy Variation °C	Maximum permanent overload	Momentary overload	Frequency Hz	Isolating voltage
SM500	Voltmeter	500V	≤3 VA	1.5	23 ± 2°C	± 0.03% / °C	1.2Un	2Un / 5 sec.	45 - 65	2kV/50H z-1min
SM050	Ammeter	0-50A	≤1.1 VA	1.5	23 ± 2°C	± 0.03% / °C	1.2Un	10Un / 5 sec.	45 - 65	2kV/50H z-1min
SM100	with CT	0-100A								
SM150		0-150A								
SM250		0-250A								
SM400		0-400A								

Modular Devices

**Electrical Connection**



**Current Transformers (CT)**

**Technical Specification**

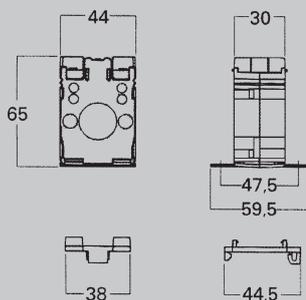
- Secondary current: 0 - 5 A
- Frequency: 50/60 Hz
- Maximum permanent overload: 1,2 In
- Working T°: -25 to +50 °C
- Storage T°: -40 to +80 °C

**Accuracy Class / VA**

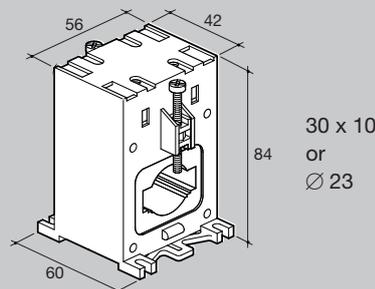
Cat Ref.	Rating	Accuracy %		
		0.5	1	3
SR051	50A	-	1.25	1.5
SR101	100A	2	2.5	3.5
SR150	150A	-	-	1.5
SR200	200A	-	2	3
SR250	250A	-	2	3
SR300	300A	4	8	12
SR400	400A	8	12	15
SR600	600A	12	15	15

**Range of CT's**

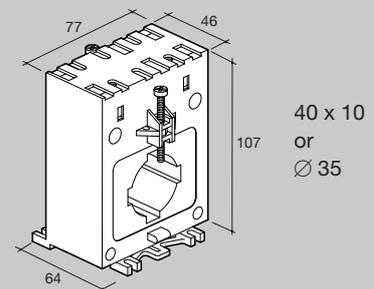
SR051, SR101, for cable Ø 21  
Max busbar 20 x 5mm



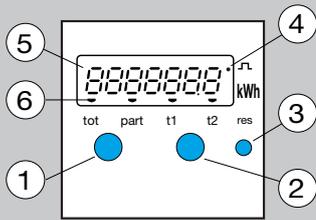
SR 150, SR 200, SR 250, for cable B 23 max  
busbar 30 x 10 max



SR 300, SR 400, SR600, for cable B 35 max  
maximum busbar 40 x 10 max

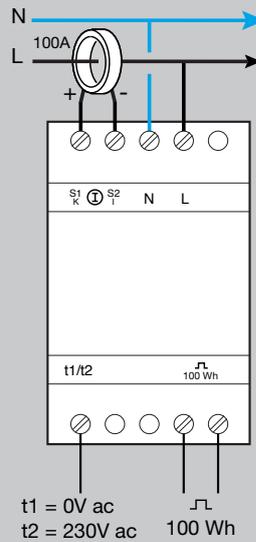


**Technical Specifications EC120 / EC121**  
**Product Presentation**

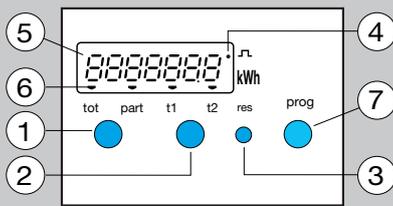


- ① Tot. / part. to select display of total or partial consumption.
- ② t1 / t2 to select display of tariff 1 or 2 (EC121 only)
- ③ Res to reset the partial counter.
- ④ LED flashing every 10Wh.
- ⑤ 7 digit display.
- ⑥ Indication of operating mode.

**Electrical Connection**

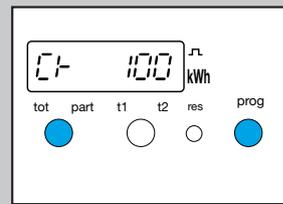


**Technical Specifications EC320 / EC321**  
**Product Presentation**



- ① tot. / part. to select display of total or partial consumption.
- ② t1 / t2 to select display of tariff 1 or 2 (EC321 only).
- ③ Res to reset the partial counter.
- ④ LED flashing every 10Wh.
- ⑤ 7 digit display.
- ⑥ Indication of operating mode.
- ⑦ Prog to set the counter (to select the ratio of the CT and the type of network).

**Current Transformers (C.T.) To set the C.T. ratio**

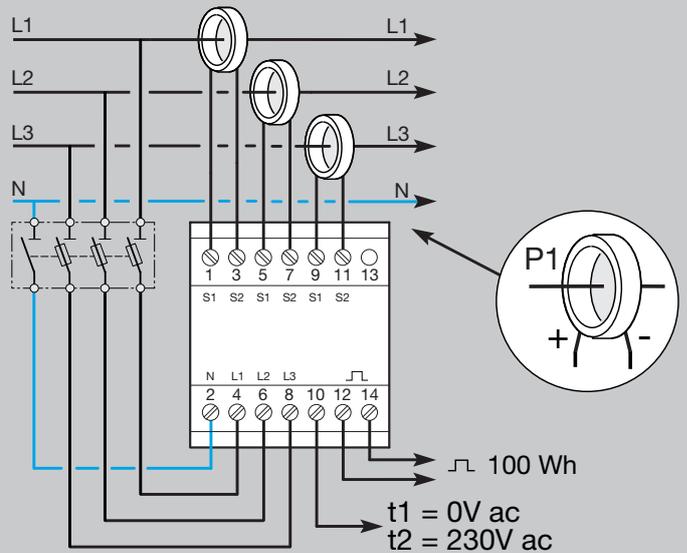


1. Press key Δ for 3 seconds, the counter will display the ratio in memory (CT primary current. 100A pre-registered).
2. Press successively key ⏏ to scroll the different ratios. The display will flash.
3. To register the ratio press key Δ. The display will stop flashing.
4. To switch back to the consumption display, press key Δ for 3 seconds.
5. Available CT ratios are 50 / 100 / 150 / 200 / 250 / 300 / 400 / 600 / 800 / 1000 / 1250 / 1500 : 5

**Electrical connection: - ec320 / EC321**

According to the type of network, different connections are possible:

- 4 wires (3 phase + neutral) with 3 CT or 1 CT
- 3 wires (3 phases) with 3CT or 1 CT
- 2 wires (2 phases) with 2 CT



Voltage input	EC050	EC051	EC120	EC121	EC310	EC320	EC321
Working Voltage	230V ~ ± 20%						
Frequency	50/60Hz ± 2Hz						
Consumption	≤ 7VA		≤ 15VA				
<b>Current Input</b>							
Measurement	Single phase direct		Single phase with CT		Three phase with CTs		
Primary current	32A		100A		80A		1500A
Secondary current	-		5A		-		5A
<b>Electrical Characteristics</b>							
IP rating	IP40						
Insulation	Insulation class II						
<b>Accuracy</b>							
Class	Class 1			Class 2			
<b>Functional Characteristics</b>							
Direct reading:	Unit = 0.1kWh						
Display capacity	99 999.9 digital						
Instant consumption	Flashing LED 10Wh						
<b>Pulse output</b>							
1 Pulse =	-	100Wh duration 100ms	100Wh duration 15ms	100Wh duration 60ms			
<b>Environment</b>							
Working temperature	-5°C to +45°C						
Storage temperature	-20°C to +70°C						
Relative humidity	85% without condensation						
<b>Connection capacity</b>							
Flexible	1 to 6mm <sup>2</sup>						
Rigid	1.5 to 10mm <sup>2</sup>						
Installation: for connection with flexible wires, use ferrules							
<b>Size</b>							
Module width	1 mod of 17.5mm		3 mods of 17.5mm		4 mods of 17.5mm		

Saving of measurement are made regularly in case of power failure

# Tebis TX - Building Automation

Established for over 15years, Tebis provides an alternative and simplistic approach to control.

Tebis utilises a bus-based approach to control, offering benefits such as increased Flexibility, Functionality, Future proofing and Safety.

Tebis differs from a conventional installation in that there are two distinct circuits; one for power and one for control. With a conventional installation power and switching are combined, which can often be complex when multi-way switching is required.

Wiring simplicity is achieved with Tebis, as the only devices cabled on the LV (240V ac) side are the loads. All controls for these loads are connected to the bus circuit, which is rated at 30V DC.



**Flexibility**  
The function of any switch can be changed at any time, without the need to touch the wiring.



**Functionality**  
A single load can be controlled from several positions. Conversely several loads can be controlled from one position.



**Future proofing**  
Tebis can work with any brand of pushbuttons giving you the choice both now and in the future. Adding extra control points is simply achieved by extending the control bus.



**Safety**  
The control bus voltage is 30V DC thus increasing the safety of the installation and reducing the risk of electrocution.