

## Features

### 5 A modular SSR, 1 NO output

- 17.5 mm housing
- AC output (with back to back SCR)
- 5 kV (1.2/50  $\mu$ s) insulation between Input and Output
- Zero-crossing and random switch-on versions available
- High switching speed
- High endurance
- Silent switching
- Spark and bounce-free switching
- Low control power
- 35 mm rail (EN 60715) mount

77.01  
Screw terminal



\* see L77-3 diagram page 6  
\*\* see L77-1 and L77-2 diagrams page 5

For outline drawing see page 8

### Output specification

Output configuration	1 NO (SPST-NO)
Rated current / Max. peak current (10 ms *) A	5 / 300 *
Rated switching voltage V AC (50/60 Hz)	60...240
Switching voltage range V AC (50/60 Hz)	48...265
Blocking (max. reverse repetitive) voltage V DC	800
Rated load AC7a (cos $\varphi$ = 0.8) A	5
Rated load AC15 A	5
Single phase motor rating (230 V AC) kW	—
230 V lamps rating:	
incandescent W	1,000
compact fluorescent (CFL) W	800
electronic ballast fluorescent tubes W	1,000
electromagnetic ballast compensated fluorescent tubes W	500
Minimum switching current @ 230 V mA	100
Max. "OFF-state" leakage current @ 230 V mA	3.5
Max "ON-state" voltage drop @ 25 °C and 5A/100mA V	0.85 / 1.5

### Input specification

Nominal voltage ( $U_N$ )	V AC (50/60 Hz)	24	110 ... 240	24	110 ... 240
	V DC	12 ... 24	—	12 ... 24	—
Rated power	VA (50 Hz)/W	0.6 / 0.5	3.6 / 0.3	0.6 / 0.5	3.6 / 0.3
Operating range	V AC (50/60 Hz)	16...32	90...265	16...32	90...265
	V DC	9.8...32	—	9.8...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	2.4	24	2.4	24

### Technical data

Electrical life	cycles	10·10 <sup>6</sup>	10·10 <sup>6</sup>
Operate / release time	ms	20 / 12	9 / 8
Insulation between input and output (1.2/50 $\mu$ s)	kV	5	5
Ambient temperature	°C	-20...+70 **	-20...+70 **
Protection category		IP20	IP20

Approvals (according to type)

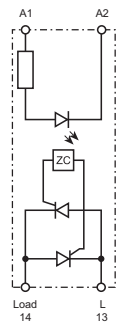
## 77.01.x.xxx.8050



### Zero-crossing switch-on

Suggested applications:

- Lamp inrush current reduction (CFL - Compact Fluorescent energy-saving Lamps and similar)
- Heater control
- Solenoid, contactor driver



Simplified circuit diagram

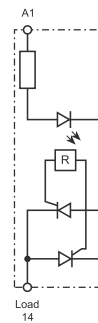
## 77.01.x.xxx.8051



### Random switch-on

Suggested applications:

- Fine controls involving shorter time (specially motor control)
- AC supply phase different from AC output phase
- 3-phase general purpose



Simplified circuit diagram

## Features

### 30 A modular SSR, 1 NO output

- 22.5 mm housing, heat-sink + plastic cover
- AC output (with back to back SCR)
- 6 kV (1.2/50  $\mu$ s) insulation between Input and Output
- Zero-crossing and random switch-on versions available
- High switching speed
- High endurance
- Silent switching
- Spark and bounce-free switching
- Low control power
- "Relay-style" terminal arrangement (input and output terminals on opposite sides)
- 35 mm rail (EN 60715) mount

77.31  
Screw terminal



\* see L77-5 diagram page 6  
\*\* see L77-4 diagrams page 5

For outline drawing see page 8

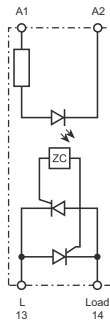
### NEW 77.31.x.xxx.8050



#### Zero-crossing switch-on

Suggested applications:

- Lamp inrush current reduction (CFL - Compact Fluorescent energy-saving Lamps and similar)
- Heater control
- Solenoid, contactor driver



Simplified circuit diagram

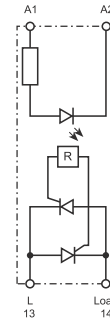
### NEW 77.31.x.xxx.8051



#### Random switch-on

Suggested applications:

- Fine controls involving shorter time (specially motor control)



Simplified circuit diagram

Output specification					
Output configuration		1 NO (SPST-NO)		1 NO (SPST-NO)	
Rated current / Max. peak current (10 ms *) A		30 / 520 *		30 / 520 *	
Rated switching voltage V AC (50/60 Hz)		400		400	
Switching voltage range V AC (50/60 Hz)		40...480		40...480	
Blocking (max. reverse repetitive) voltage V DC		1,100		1,100	
Rated load AC7a (cos $\varphi$ = 0.8) A		30		30	
Rated load AC15 A		20		20	
Single phase motor rating (230 V AC) kW		—		2.5	
230 V lamps rating:	incandescent W	6,000		4,500	
	compact fluorescent (CFL) W	4,000		2,500	
	electronic ballast fluorescent tubes W	6,000		4,000	
electromagnetic ballast compensated fluorescent tubes W		3,000		1,800	
Minimum switching current @ 230 V mA		300		300	
Max. "OFF-state" leakage current@ 230 V mA		5.0 (Typ 1.0)		5.0 (Typ 1.0)	
Max "ON-state" voltage drop @25 °C and 30 A V		0.85		0.85	
Power loss @ 30 A W		16		16	
Input specification					
Nominal voltage (U <sub>N</sub> )	V AC (50/60 Hz)	—	230	—	230
	V DC	24	—	24	—
Rated power @ U <sub>MAX</sub>	VA (50 Hz)/W	0.4	7.5 / 0.9	0.4	7.5 / 0.9
Operating range	V AC (50/60 Hz)	—	40...280	—	40...280
	V DC	4...32	—	4...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	— / 2	6 / —	— / 2	6 / —
Technical data					
Electrical life	cycles	10·10 <sup>6</sup>		10·10 <sup>6</sup>	
Operate / release time	ms	< 10 / <10	< 10 / < 30	< 1 / <10	< 2 / < 25
Insulation between input and output (1.2/50 $\mu$ s)	kV	6		6	
Ambient temperature	°C	-20...+80 **		-20...+80 **	
Protection category		IP20		IP20	
Approvals (according to type)					

## Features

### 30 A modular SSR, 1 NO output

- 22.5 mm housing, heat-sink + plastic cover
- AC output (with back to back SCR)
- 6 kV (1.2/50  $\mu$ s) insulation between Input and Output
- Zero-crossing and random switch-on versions available
- High switching speed
- High endurance
- Silent switching
- Spark and bounce-free switching
- Low control power
- "Contactor-style" terminal arrangement (input and output terminals on adjacent sides)
- 35 mm rail (EN 60715) mount

77.31  
Screw terminal



\* see L77-5 diagram page 6  
\*\* see L77-4 diagrams page 5

For outline drawing see page 8

### Output specification

Output configuration	1 NO (SPST-NO)		1 NO (SPST-NO)	
Rated current / Max. peak current (10 ms *) A	30 / 520 *		30 / 520 *	
Rated switching voltage V AC (50/60 Hz)	400		400	
Switching voltage range V AC (50/60 Hz)	40...480		40...480	
Blocking (max. reverse repetitive) voltage V DC	1,100		1,100	
Rated load AC7a (cos $\varphi$ = 0.8) A	30		30	
Rated load AC15 A	20		20	
Single phase motor rating (230 V AC) kW	—		2.5	
230 V lamps rating:				
incandescent W	6,000		4,500	
compact fluorescent (CFL) W	4,000		2,500	
electronic ballast fluorescent tubes W	6,000		4,000	
electromagnetic ballast compensated fluorescent tubes W	3,000		1,800	
Minimum switching current @ 230 V mA	300		300	
Max. "OFF-state" leakage current@ 230 V mA	5.0 (Typ 1.0)		5.0 (Typ 1.0)	
Max "ON-state" voltage drop @25 °C and 30 A V	0.85		0.85	
Power loss @ 30 A W	16		16	

### Input specification

Nominal voltage (U <sub>N</sub> )	V AC (50/60 Hz)	—	230	—	230
	V DC	24	—	24	—
Rated power @ U <sub>MAX</sub>	VA (50 Hz)/W	0.4	7.5 / 0.9	0.4	7.5 / 0.9
Operating range	V AC (50/60 Hz)	—	40...280	—	40...280
	V DC	4...32	—	4...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	— / 2	6 / —	— / 2	6 / —

### Technical data

Electrical life	cycles	10·10 <sup>6</sup>		10·10 <sup>6</sup>	
Operate / release time	ms	< 10 / <10	< 10 / < 30	< 1 / <10	< 2 / < 25
Insulation between input and output (1.2/50 $\mu$ s)	kV	6		6	
Ambient temperature	°C	-20...+80 **		-20...+80 **	
Protection category		IP20		IP20	

Approvals (according to type)

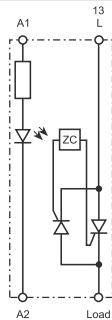
### NEW 77.31.x.xxx.8070



#### Zero-crossing switch-on

Suggested applications:

- Lamp inrush current reduction (CFL - Compact Fluorescent energy-saving Lamps and similar)
- Heater control
- Solenoid, contactor driver



Simplified circuit diagram

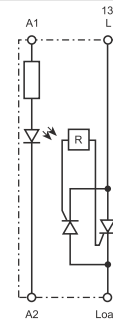
### NEW 77.31.x.xxx.8071



#### Random switch-on

Suggested applications:

- Fine controls involving shorter time (specially motor control)



Simplified circuit diagram

## Ordering information

Example: 77 series modular SSR, 1 output 30 A AC, input voltage 230 V AC, relay style terminals arrangement, zero-crossing switch-on.

**7 7 . 3 1 . 8 . 2 3 0 . 8 0 5 0**

**A B C D**

**D: Switch-on mode**  
0 = Zero-crossing  
1 = Random

**C: Terminals arrangement**  
5 = "Relay style" (input and output on opposite sides)  
7 = "Contactor style" (input and output on adjacent sides)

**AB: Output circuit**  
80 = Normally open, AC

**Series** ————

**Type**  
0 = 5 A output, 17.5 mm plastic housing  
3 = 30 A output, 22.5 mm heat sink / plastic housing

**No. of poles**  
1 = 1 pole

**Input version**  
0 = DC/AC (50/60 Hz)  
8 = AC (50/60 Hz)  
9 = DC

**Supply voltage**  
See "input specification"

**Codes / Module width**

77.01.8.230.8050 / 17.5 mm 5 A  
77.01.0.024.8050 / 17.5 mm 5 A  
77.01.8.230.8051 / 17.5 mm 5 A  
77.01.0.024.8051 / 17.5 mm 5 A  
77.31.8.230.8050 / 22.5 mm 30 A  
77.31.9.024.8050 / 22.5 mm 30 A  
77.31.8.230.8051 / 22.5 mm 30 A  
77.31.9.024.8051 / 22.5 mm 30 A  
77.31.8.230.8070 / 22.5 mm 30 A  
77.31.9.024.8070 / 22.5 mm 30 A  
77.31.8.230.8071 / 22.5 mm 30 A  
77.31.9.024.8071 / 22.5 mm 30 A

## Technical data



Insulation		77.01		77.31			
		Dielectric strength	Impulse (1.2/50 µs)	Dielectric strength	Impulse (1.2/50 µs)		
Between input and output		2,500 V AC	5 kV	3,000 V AC	6 kV		
Between input and ground (heat-sink)		—	—	3,000 V AC	6 kV		
Between output and ground (heat-sink)		—	—	4,000 V AC	6 kV		
EMC specifications		Reference standard		77.01		77.31	
				24 V AC/DC	230 V AC	24 V DC	230 V AC
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV		4 kV		
	air discharge	EN 61000-4-2	8 kV		8 kV		
Radiated electromagnetic field (80 ... 1,000 MHz)		EN 61000-4-3	30 V/m		30 V/m		
Fast transients on supply terminals (burst 5/50 ns, 5 and 100 kHz)		EN 61000-4-4	1 kV	4 kV	1 kV	3 kV	
Voltage pulses on supply terminals (surge 1.2/50 µs)	common mode	EN 61000-4-5	2 kV	4 kV	3 kV	3 kV	
	differential mode	EN 61000-4-5	1 kV	4 kV	0.5 kV	1.5 kV	
Radio-frequency common mode voltage (0.15...230 MHz) on supply terminals		EN 61000-4-6	—		10 V		
Terminals		77.01		77.31			
Screw torque		Nm	0.8		0.8		
Max. wire size			solid cable	stranded cable	solid cable	stranded cable	
			mm <sup>2</sup>	1x6 / 2x4	1x4 / 2x2.5	1x6 / 2x4	1x6 / 2x4
			AWG	1x10 / 2x12	1x12 / 2x14	1x10 / 2x12	1x10 / 2x12
Wire strip length		mm	9		9		
Other data							
Power lost to the environment	without output current	W	0.5		0.9		
	with rated current	W	4.0		16		

**Input specification**

**77.01**

Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC) V	Input current $I_N$ at $U_N$ mA
		AC		DC			
		$U_{min}$ V	$U_{max}$ V	$U_{min}$ V	$U_{max}$ V		
$U_N$ V							
24	0.024	16	32	9.8	32	2.4	25
230	8.230	90	265	—	—	24	15

**Led indication**

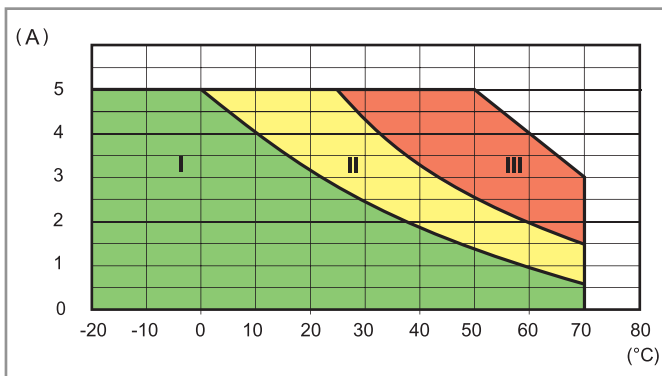
LED	Supply voltage
	OFF
	ON

**77.31**

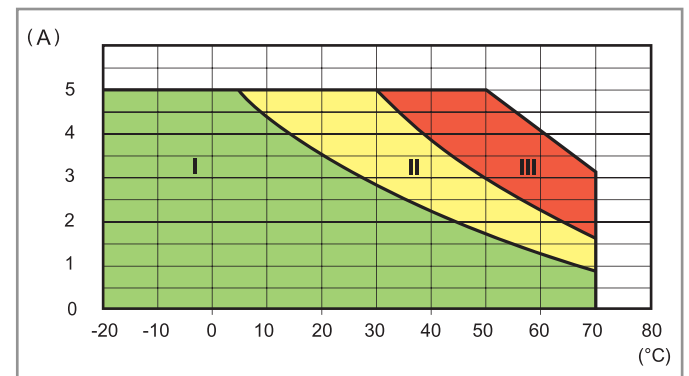
Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC) V	Input current $I_N$ at $U_N$ mA
		AC		DC			
		$U_{min}$ V	$U_{max}$ V	$U_{min}$ V	$U_{max}$ V		
$U_N$ V							
24	9.024	—	—	4	32	2	11
230	8.230	40	280	—	—	6	6.7

**Output specification**

**L77-1 Output RMS current vs. ambient temperature**  
77.01.0.024.805x @ 32 V DC

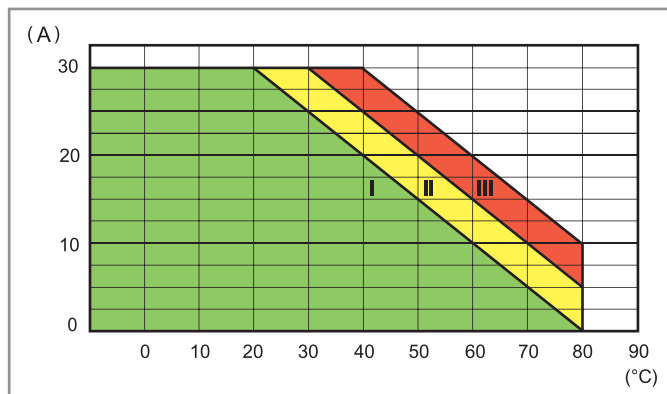


**L77-2 Output RMS current vs. ambient temperature**  
77.01.8.230.805x @ 265 V AC



- I - Modular SSR installed as a group (without gap)
- II - Modular SSR installed as a group (9 mm gap between each SSR)
- III - Modular SSR installed individually in free air (without a significant influence from nearby components)

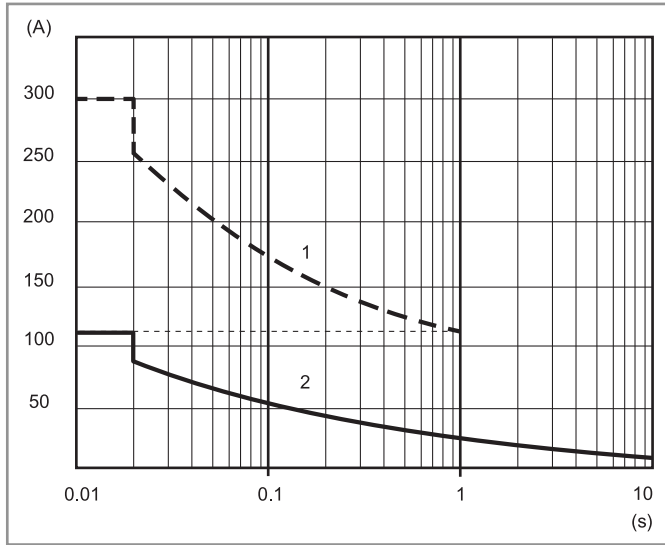
**L77-4 Output RMS current vs. ambient temperature**  
77.31.x.xxx.80xx



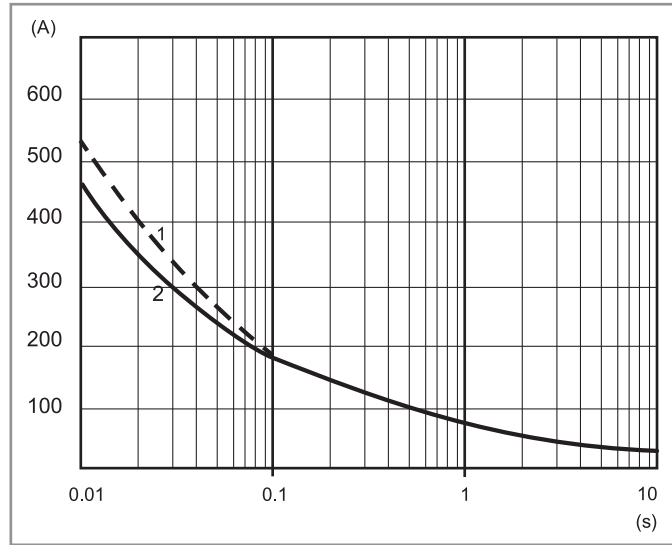
- I - Modular SSR installed as a group (without gap)
- II - Modular SSR installed as a group (20 mm gap between each SSR)
- III - Modular SSR installed individually in free air, or with a gap  $\geq 40$  mm, which implies a not significant influence from nearby components

## Output specification

**L77-3 Inrush peak current (AC) vs. time capacity**  
77.01.x.xxx.80xx



**L77-5 Inrush peak current (AC) vs. time capacity**  
77.31.x.xxx.80xx



1 - "Cold" conditions (ambient temperature = 23 °C, no output current during the last 15 minutes)

2 - "Hot" conditions (ambient temperature = 50 °C, rated output current)

### Max recommended switching frequency (Cycles/Hour, with 50 % Duty-cycle)

Load	77.01	77.31
5 A 230 V (AC1)	5,000	—
1 A (AC15)	10,000	—
0.5 A (AC15)	20,000	—
30 A 480 V $\cos \varphi = 0.8$	—	1,800
30 A 480 V $\cos \varphi = 0.5$	—	1,200

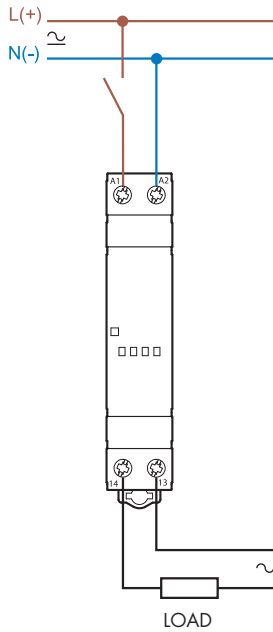
### Other data

	77.01	77.31
<b>Critical rising voltage</b> $dv/dt$ @ $T_j = 125\text{ °C}$	> 1,000 V/ $\mu$ s	> 1,000 V/ $\mu$ s
<b>Critical rising current</b> $di/dt$ @ $tr < 100\text{ ns}$ , $T_j = 125\text{ °C}$	> 50 A/ $\mu$ s	> 150 A/ $\mu$ s
$I^2t$ for fusing @ $tp = 10\text{ ms}$	450 A <sup>2</sup> s	1,350 A <sup>2</sup> s*

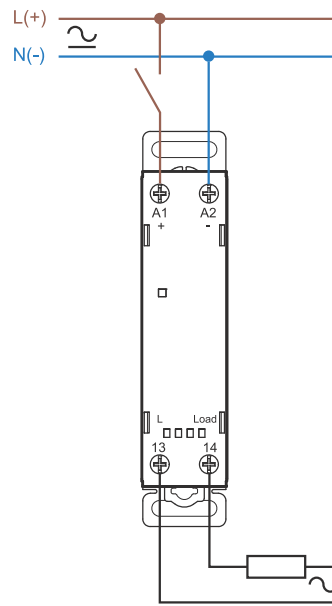
\* Recommended fuse for short-circuit protection: 30 A, 660 V AC, 10x38 mm, 200 kA, 1,000 A<sup>2</sup>s.

**Wiring diagrams**

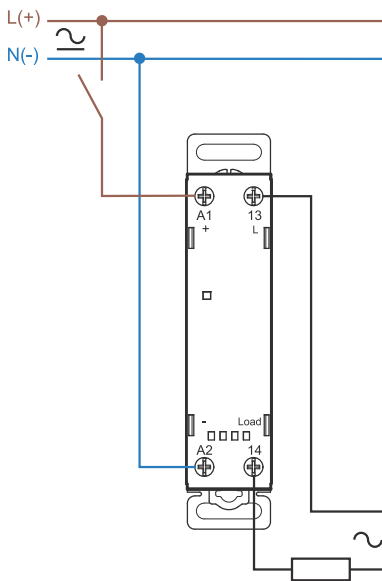
**Single-phase connection (77.01)**



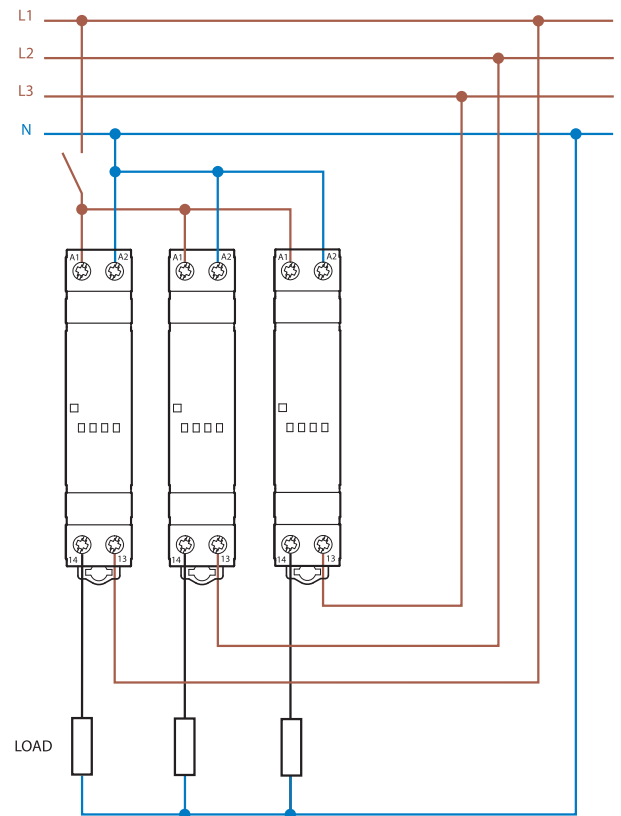
**Single-phase connection (77.31.....5x)**



**Single-phase connection (77.31.....7x)**

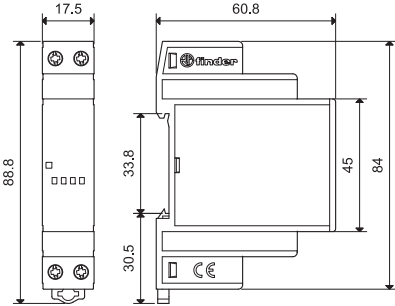


**Example of three-phase connection (with 3 x 77.01.8.230.8051)**

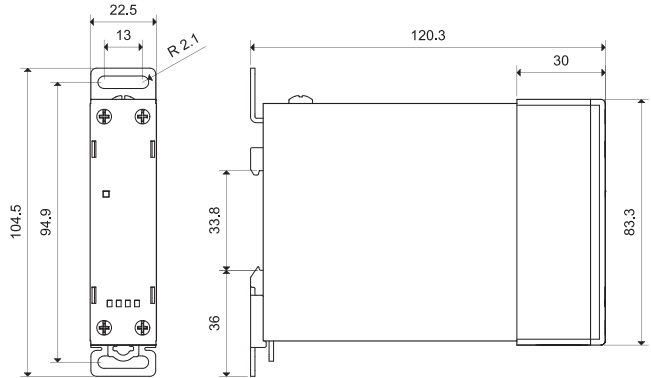


## Outline drawings

77.01  
Screw terminal



77.31  
Screw terminal



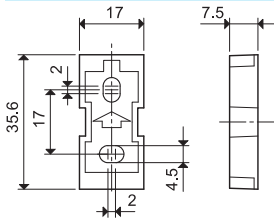
## Accessories



020.01

**Adaptor for panel mounting, plastic, 17.5 mm wide for 77.01 only**

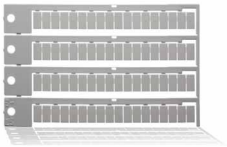
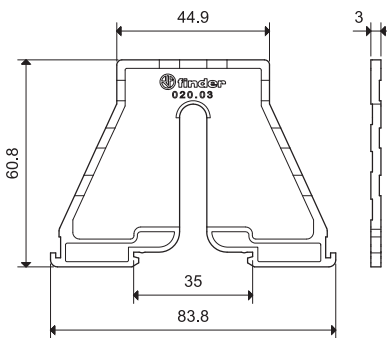
020.01



020.03

**Separator for panel mounting, plastic, 3 mm wide**

020.03



060.72

**Sheet of marker tags, plastic, 72 tags, 6x12 mm**

060.72