

Solid State Relays

5 - 15 - 25 - 30 - 50 A

77
SERIES



Drying kilns



Heating and
cooling



Lighting control
in corridors (for
hotels, offices
and hospitals)



Bottling plant



Labelling
machines



Packaging
machines



5 A modular SSR, 1 NO AC output

- 17.5 mm housing
- 60 to 240 V AC output (with back to back SCR)
- 5 kV (1.2/50 µs) 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
- 3-phase general purpose
- 35 mm rail (EN 60715) mount

77.01

Screw terminal



* See L77-8 diagram page 17

** See L77-1 and L77-2 diagrams page 16

For outline drawing see page 23

Output specification

Output configuration	
Rated current I_N /Max. peak current* (10 ms)	A
Rated voltage	V AC (50/60 Hz)
Switching voltage range	V AC (50/60 Hz)
Repetitive peak off-state voltage	V_{pk}
Rated load AC7a ($\cos \varphi = 0.8$)	A
Rated load AC15	A
Single phase motor rating (230 V AC)	kW
Nominal lamp rating:	
230 V incandescent/halogen W	
fluorescent tubes with electronic ballast W	
fluorescent tubes with electromagnetic ballast W	
CFL W	
230 V LED W	
LV halogen or LED with electronic ballast W	
LV halogen or LED with electromagnetic ballast W	
Minimum switching current @ 230 V	mA
Typical "OFF-state" leakage current @ 230 V	mA
Max "ON-state" voltage drop @ 25 °C and 5 A/100 mA	V
Power loss @ 5 A	W

Input specification

Nominal voltage (U_N)	V AC (50/60 Hz)	—	230
	V DC	6...24	—
Rated power	VA (50 Hz)/W	—/0.4	3.6/0.3
Operating range	V AC (50/60 Hz)	—	90...265
	V DC	4...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	3	24

Technical data

Electrical life	cycles	10 · 10 ⁶
Operate/release time	ms	20/12
Insulation between input and output (1.2/50 µs)	kV	5
Ambient temperature	°C	-20...+70**
Protection category		IP 20

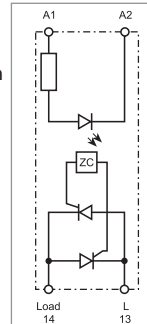
Approvals (according to type)

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

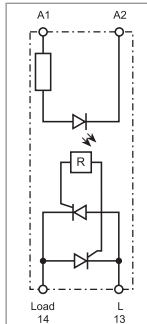
77.01.x.xxx.8051



Random switch-on

Suggested applications:

- Finer control requiring short operate time (specially motor control)
- AC Input phase different from AC Output phase



Simplified circuit diagram

7 - 15 A modular SSR, 1 NO DC output

- 17.5 mm housing
- 2 versions, for 24 and 125 V DC mosfet output
- 4 kV (1.2/50 µs) insulation between Input and Output
- Short circuit protection
- High switching speed
- High endurance
- Silent switching
- Spark and bounce-free switching
- Low control power
- Suitable for railway applications
- 35 mm rail (EN 60715) mount

77.01

Screw terminal



* See L77-3 and L77-4 diagrams page 16

For outline drawing see page 23

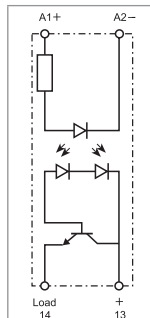
Output specification

Output configuration		1 NO (SPST-NO)	1 NO (SPST-NO)
Rated current I_N /Max. peak current (10 ms)	A	15/160	7/60
Rated voltage	V DC	24	125
Switching voltage range	V DC	16...32	43...140
Rated load DC13	A	5	2.5
DC motor rating	kW	0.2	—
Minimum switching current	mA	100	50
Typical "OFF-state" leakage current	mA	3	6
Max "ON-state" voltage drop @ 25 °C and I_N	V	0.06	0.2
Power loss @ I_N	W	1	1.5
Input specification			
Nominal voltage (U_N)	V DC	6...24	6...24
Rated power	W	0.4	0.4
Operating range	V DC	4...32	4...32
Must drop-out voltage	V DC	3	3
Technical data			
Electrical life	cycles	$10 \cdot 10^6$	$10 \cdot 10^6$
Operate/release time	ms	0.05/2	0.05/2
Insulation between input and output (1.2/50 µs)	kV	4	4
Ambient temperature	°C	-20...+70*	-20...+70*
Protection category		IP 20	IP 20

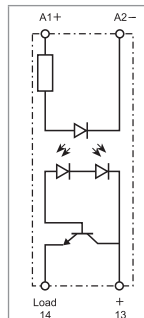
Approvals (according to type)

**77.01.9.024.9024****24 V DC output switching
15 A rated****Applications in Energy,
Automation and Machines:**

- Control of electric, pneumatic and hydraulic electromagnetic valves
- Direct control of loads such as motors and electromagnets

Simplified
circuit diagram**77.01.9.024.9125****110...125 V DC output
switching
7 A rated****Applications in Energy,
Automation and Machines:**

- Control of electric, pneumatic and hydraulic electromagnetic valves
- Direct control of loads such as motors and electromagnets

Simplified
circuit diagram

15 A modular SSR, 1 NO output

- 22.5 mm housing, heat-sink + plastic cover
- 24 to 277 V AC output (with triac)
- 6 kV (1.2/50 µs) 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
- 3-phase general purpose
- "Relay-style" terminal arrangement (input and output terminals on opposite sides)
- 35 mm rail (EN 60715) mount

77.11
Screw terminal



* See L77-9 diagram page 17

** See L77-5 diagrams page 16

For outline drawing see page 23

Output specification

Output configuration		1 NO (SPST-NO)	1 NO (SPST-NO)
Rated current I_N /Max. peak current* (10 ms)	A	15/400*	15/400*
Rated voltage	V AC (50/60 Hz)	230	230
Switching voltage range	V AC (50/60 Hz)	19...305	19...305
Repetitive peak off-state voltage	V_{pk}	800	800
Rated load AC7a (cos φ = 0.8, @ 25 °C)	A	20	20
Rated load AC15	A	15	15
Single phase motor rating (230 V AC)	kW	—	0.75
Nominal lamp rating:			
230 V incandescent/halogen W		4000	2500
fluorescent tubes with electronic ballast W		4000	2500
fluorescent tubes with electromagnetic ballast W		2000	1000
CFL W		3000	1500
230 V LED W		3000	1500
LV halogen or LED with electronic ballast W		3000	1500
LV halogen or LED with electromagnetic ballast W		3000	1500
Minimum switching current @ 250 V	mA	100	100
Typical “OFF-state” leakage current @ 250 V	mA	1	1
Max “ON-state” voltage drop @ 25 °C and 15 A	V	1.55	1.55
Power loss @ 15 A	W	14	14

Input specification

Nominal voltage (U_N)	V AC (50/60 Hz)	—	230	—	230
	V DC	24	—	24	—
Rated power VA (50 Hz)/W		0.4	7.5/0.9	0.4	7.5/0.9
Operating range	V AC (50/60 Hz)	—	40...305	—	40...305
	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 ⁶		10 · 10 ⁶	
Operate/release time ms		< 10/< 10	< 10/< 30	< 1/< 10	< 2/< 25
Insulation between input and output (1.2/50 µs) kV		6		6	
Ambient temperature °C		-20...+80**		-20...+80**	
Protection category		IP 20		IP 20	

Approvals (according to type)



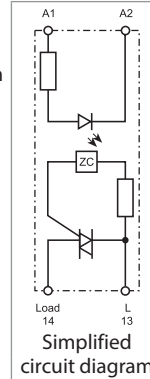
77.11.x.xxx.8250



Zero-crossing switch-on

Suggested applications:

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



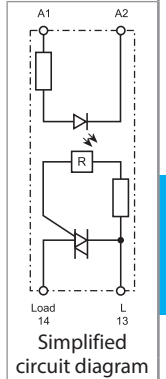
77.11.x.xxx.8251



Random switch-on

Suggested applications:

- Fine controls involving shorter time (specially motor control)



30 A modular SSR, 1 NO output

- 22.5 mm housing, heat-sink + plastic cover
- 60 to 440 V AC output (with back to back SCR)
- 6 kV (1.2/50 μ 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
- 3-phase general purpose
- "Relay-style" terminal arrangement (input and output terminals on opposite sides)
- 35 mm rail (EN 60715) mount

77.31

Screw terminal



* See L77-11 diagram page 18

** See L77-7 diagrams page 17

For outline drawing see page 23

Output specification

Output configuration		1 NO (SPST-NO)	1 NO (SPST-NO)
Rated current I _N /Max. peak current* (10 ms)	A	30/520*	30/520*
Rated voltage	V AC (50/60 Hz)	400	400
Switching voltage range	V AC (50/60 Hz)	48...480	48...480
Repetitive peak off-state voltage	V _{pk}	1100	1100
Rated load AC7a (cos φ = 0.8)	A	30	30
Rated load AC15	A	20	20
Single phase motor rating (230 V AC)	kW	—	1.5
Nominal lamp rating:			
230 V incandescent/halogen W		6000	4500
fluorescent tubes with electronic ballast W		6000	4000
fluorescent tubes with electromagnetic ballast W		3000	1800
CFL W		4000	2500
230 V LED W		4000	2500
LV halogen or LED with electronic ballast W		4000	2500
LV halogen or LED with electromagnetic ballast W		4000	2500
Minimum switching current @ 400 V	mA	300	300
Typical “OFF-state” leakage current @ 400 V	mA	1	1
Max “ON-state” voltage drop @ 25 °C and 30 A			
	V	0.85	0.85
Power loss @ 30 A	W	16	16

Input specification

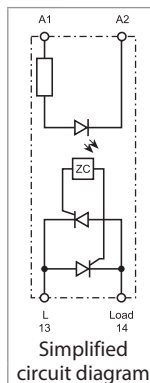
Nominal voltage (U_N)	V AC (50/60 Hz)	24	230	—	230
	V DC	24	—	24	—
Rated power @ U_{MAX}	VA (50 Hz)/W	0.24/0.4	7.5/0.9	0.4	7.5/0.9
Operating range	V AC (50/60 Hz)	16...32	40...280	—	40...280
	V DC	16...32	—	4...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	6/2	6/—	—/2	6/—

Technical data

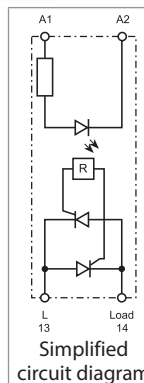
Electrical life	cycles	10 · 10 ⁶		10 · 10 ⁶	
Operate/release time	ms	< 10/< 10	< 10/< 30	< 1/< 10	< 2/< 25
Insulation between input and output (1.2/50 μ s)	kV	6		6	
Ambient temperature	°C	-20...+80**		-20...+80**	
Protection category		IP 20		IP 20	

Approvals (according to type)**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

**77.31.x.xxx.8051****Random switch-on****Suggested applications:**

- Finer control requiring short operate time (specially motor control)



30 A modular SSR, 1 NO output

- 22.5 mm housing, heat-sink + plastic cover
- 60 to 440 V AC output (with back to back SCR)
- 6 kV (1.2/50 µs) 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
- 3-phase general purpose
- "Contactor-style" terminal arrangement (input and output terminals on adjacent sides)
- 35 mm rail (EN 60715) mount

77.31

Screw terminal



* See L77-11 diagram page 18

** See L77-7 diagrams page 17

For outline drawing see page 23

Output specification

Output configuration		1 NO (SPST-NO)	1 NO (SPST-NO)
Rated current I _N /Max. peak current* (10 ms)	A	30/520*	30/520*
Rated voltage	V AC (50/60 Hz)	400	400
Switching voltage range	V AC (50/60 Hz)	48...480	48...480
Repetitive peak off-state voltage	V _{pk}	1100	1100
Rated load AC7a (cos φ = 0.8)	A	30	30
Rated load AC15	A	20	20
Single phase motor rating (230 V AC)	kW	—	1.5
Nominal lamp rating:			
230 V incandescent/halogen W		6000	4500
fluorescent tubes with electronic ballast W		6000	4000
fluorescent tubes with electromagnetic ballast W		3000	1800
CFL W		4000	2500
230 V LED W		4000	2500
LV halogen or LED with electronic ballast W		4000	2500
LV halogen or LED with electromagnetic ballast W		4000	2500
Minimum switching current @ 400 V	mA	300	300
Typical “OFF-state” leakage current @ 400 V	mA	1	1
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_N)	V AC (50/60 Hz)	—	230	—	230
	V DC	24	—	24	—
Rated power 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 ⁶		10 · 10 ⁶	
Operate/release time ms	< 10/< 10	< 10/< 30	< 1/< 10	< 2/< 25
Insulation between input and output (1.2/50 µs) kV	6		6	
Ambient temperature °C	-20...+80**		-20...+80**	
Protection category	IP 20		IP 20	

Approvals (according to type)



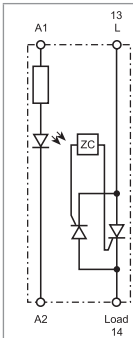
77.31.x.xxx.8070



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

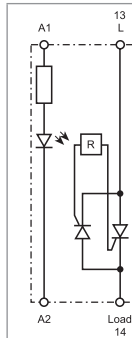
77.31.x.xxx.8071



Random switch-on

Suggested applications:

- Fine controls involving shorter time (specially motor control)



Simplified circuit diagram

25, 40 and 60 A panel Zero-crossing SSR, "hockey puck" style

Type 77.A1.x.xxx.8x50: 25 A

Type 77.B1.x.xxx.8x50: 40 A

Type 77.D1.x.xxx.8x50: 60 A

8250: 24 to 260 VAC switching load voltage

8650: 24 to 660 VAC switching load voltage

- "hockey puck" housing with folding screw cover
- High endurance and switching speed
- Silent switching
- Spark and bounce-free switching
- Low control power
- "Relay-style": input and output terminals on opposite sides
- Mounting on control cabinet sheet metal or on heatsink

77.A1/B1/D1

Screw terminal (plate clamp)



* See L77-13, L77-14 and L77-15 diagrams page 18

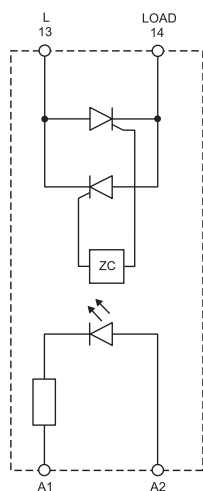
Four outline drawing see page 23

NEW 77.A1.x.xxx.8x50



Zero-crossing switch-on

- Output: 25 A
- Suggested applications: heater control, lamps, solenoid, contactor driver



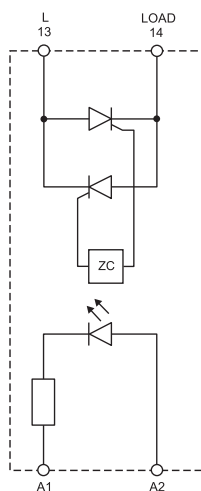
Simplified circuit diagram

NEW 77.B1.x.xxx.8x50



Zero-crossing switch-on

- Output: 40 A
- Suggested applications: heater control, lamps, solenoid, contactor driver



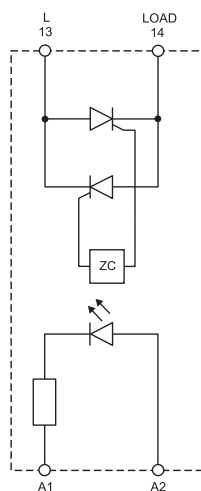
Simplified circuit diagram

NEW 77.D1.x.xxx.8x50



Zero-crossing switch-on

- Output: 60 A
- Suggested applications: heater control, lamps, solenoid, contactor driver



Simplified circuit diagram

Output specification		77...8250		77...8650		77...8250		77...8650		77...8250		77...8650	
Output configuration		1 NO				1 NO				1 NO			
Rated current I _N /Max. peak current (10 ms)		A		25/300		40/500		60/700		60/700		60/700	
Rated voltage		V AC (50/60 Hz)		240	600	240	600	240	600	240	600	240	600
Switching voltage range		V AC (50/60 Hz)		24...280	24...660	24...280	24...660	24...280	24...660	24...280	24...660	24...280	24...660
Repetitive peak off-state voltage		V _{pk}		600	1600	600	1600	600	1600	600	1600	600	1600
Minimum switching current @ 250 V		mA		100		100		100		100		100	
Typical “OFF-state” leakage current @ rated voltage		mA		0.1		0.1		0.1		0.1		0.1	
Max “ON-state” voltage drop @ 25 °C and I _N		V		1.5		1.5		1.5		1.5		1.5	
Power loss @ I _N		W		30		48		72		72		72	
Input specification													
Nominal voltage (U _N)	V AC (50/60 Hz)	—		230		—		230		—		230	
	V DC	24		—		24		—		24		—	
Rated power @ U _{MAX}		VA (50 Hz)/W		—/0.55		5.3/—		0.8		—		0.8	
Operating range	V AC (50/60 Hz)	—		90...280		—		90...280		—		90...280	
	V DC	3...32		—		3...32		—		3...32		—	
Must drop-out voltage		V AC (50/60 Hz)/DC		—/1		15/—		—/1		15/—		—/1	
Technical data													
Electrical life		cycles		—		—		—		—		—	
Operate/release time		ms		10/10		40/20		10/10		40/20		10/10	
Insulation between input and output (1.2/50 μs)		kV		—		—		—		—		—	
Ambient temperature		°C		–30...+80*		–30...+80*		–30...+80*		–30...+80*		–30...+80*	
Protection category				IP 20		IP 20		IP 20		IP 20		IP 20	
Approvals (according to type)		CEUKCAEAC CU[®]US											

80, 100 and 125 A panel Zero-crossing SSR, "hockey puck" style

Type 77.F1.x.xxx.8x50: 80 A

Type 77.G1.x.xxx.8x50: 100 A

Type 77.H1.x.xxx.8x50: 125 A

8250: 24 to 260 VAC switching load voltage

8650: 24 to 660 VAC switching load voltage

- "hockey puck" housing with folding screw cover
- High endurance and switching speed
- Silent switching
- Spark and bounce-free switching
- Low control power
- "Relay-style": input and output terminals on opposite sides
- Mounting on control cabinet sheet metal or on heatsink

77.F1/G1/H1

Screw terminal (plate clamp)



* See L77-16, L77-17 and L77-18 diagrams page 18

For outline drawing see page 23

Output specification		77...8250		77...8650		77...8250		77...8650	
Output configuration		1 NO		1 NO		1 NO		1 NO	
Rated current I _N /Max. peak current (10 ms)		80/800		100/1500		125/2250			
Rated voltage V AC (50/60 Hz)		240	600	240	600	240	600		
Switching voltage range V AC (50/60 Hz)		24...280	24...660	24...280	24...660	24...280	24...660		
Repetitive peak off-state voltage V _{pk}		600	1600	600	1600	600	1600		
Minimum switching current @ 250 V		100		100		100			
Typical “OFF-state” leakage current @ rated voltage		0.1		0.1		0.1			
Max “ON-state” voltage drop @ 25 °C and I _N		1.5		1.5		1.5			
Power loss @ I _N		96		120		150			
Input specification									
Nominal voltage (U _N) V AC (50/60 Hz)		—	230	—	230	—	230		
		V DC	24	—	24	—	24		
Rated power @ U _{MAX} VA (50 Hz)/W		—/0.55	5.3/—	—	—	—	—		
Operating range V AC (50/60 Hz)		—	90...280	—	90...280	—	90...280		
		V DC	3...32	—	3...32	—	3...32		
Must drop-out voltage V AC (50/60 Hz)/DC		—/1	15/—	—/1	15/—	—/1	15/—		
Technical data									
Electrical life cycles		—		—		—			
Operate/release time ms		10/10	40/20	10/10	40/20	10/10	40/20		
Insulation between input and output (1.2/50 μs)		kV		—		—			
Ambient temperature °C		–30...+80*		–30...+80*		–30...+80*			
Protection category		—		—		—			
Approvals (according to type)		CE UKCA EAC cUL [®] US							

25, 50 and 75 A dual phase Random SSR, "hockey puck" style with 2 independent channel

Type 77.A2.9.024.8671: 25 A - 600 V AC

Type 77.C2.9.024.8671: 50 A - 600 V AC

Type 77.E2.9.024.8671: 75 A - 600 V AC

- 2 independent output channel driven by independent low power DC input
- "hockey puck" housing with folding screw cover
- High endurance and switching speed
- Silent switching
- Spark and bounce-free switching
- "contactor-style": input and output terminals on adjacent sides
- Mounting on control cabinet sheet metal or on heatsink

77.A2/C2/E2

Screw terminal (plate clamp)



* See L77-19, L77-20 and L77-21 diagrams page 19

For outline drawing see page 23

Output specification		Simplified circuit diagram	
Output configuration	2 NO	2 NO	2 NO
Rated current I_N /Max. peak current (10 ms) A	25/300	50/500	75/750
Rated voltage V AC (50/60 Hz)	600	600	600
Switching voltage range V AC (50/60 Hz)	24...660	24...660	24...660
Repetitive peak off-state voltage V_{pk}	1200	1200	1200
Minimum switching current @ 600 V mA	—	—	—
Typical "OFF-state" leakage current @ rated voltage mA	5	5	5
Max "ON-state" voltage drop @ 25 °C and I_N V	1.5	1.5	1.5
Power loss @ I_N W	60	120	180
Input specification			
Nominal voltage (U_N) V DC	24	24	24
Rated power @ U_{MAX} W	0.3	0.3	0.3
Operating range V DC	4...32	4...32	4...32
Must drop-out voltage V AC (50/60 Hz)/DC	1	1	1
Technical data			
Electrical life cycles	—	—	—
Operate/release time ms	1/10	1/10	1/10
Insulation between input and output (1.2/50 μ s) kV	—	—	—
Ambient temperature °C	-30...+80*	-30...+80*	-30...+80*
Protection category	—	—	—
Approvals (according to type)			

NEW 77.A2.9.024.8671



Random switch-on

- Output: 25 A/600 V AC
- Suggested applications: heater or motor control

NEW 77.C2.9.024.8671



Random switch-on

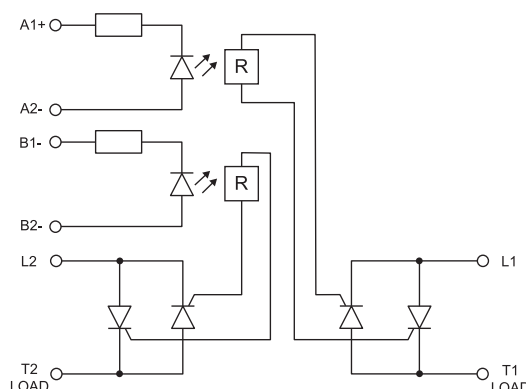
- Output: 50 A/600 V AC
- Suggested applications: heater or motor control

NEW 77.E2.9.024.8671



Random switch-on

- Output: 75 A/600 V AC
- Suggested applications: heater or motor control



Simplified circuit diagram

25 and 40 A three phase Random SSR, "hockey puck" style

Type 77.A3.x.xxx.8671: 25 A - 600 V AC

Type 77.B3.x.xxx.8671: 40 A - 600 V AC

- High endurance and switching speed
- Silent switching
- Spark and bounce-free switching
- Low control power
- "contactor-style": input and output terminals on adjacent sides
- Mounting on control cabinet sheet metal or on heatsink

NEW 77.A3.x.xxx.8671



Random switch-on

- Output: 25 A/600 V AC
- Suggested applications: heater or motor control

NEW 77.B3.x.xxx.8671

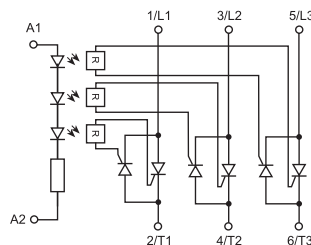


Random switch-on

- Output: 40 A/600 V AC
- Suggested applications: heater or motor control

77.A3/B3

Screw terminal (plate clamp)



Simplified circuit diagram

* See L77-22 and L77-23 diagrams page 19

For outline drawing see page 23

Output specification					
Output configuration		3 NO		3 NO	
Rated current I _N /Max. peak current (10 ms)	A	25/300		40/500	
Rated voltage	V AC (50/60 Hz)	600		600	
Switching voltage range	V AC (50/60 Hz)	24...660		24...660	
Repetitive peak off-state voltage	V _{pk}	1600		1600	
Minimum switching current @ 600 V	mA	—		—	
Typical “OFF-state” leakage current @ rated voltage	mA	10		10	
Max “ON-state” voltage drop @ 25 °C and I _N	V	1.6		1.6	
Power loss @ I _N	W	90		144	
Input specification					
Nominal voltage (U _N)	V AC (50/60 Hz)	—	230	—	230
	V DC	24	—	24	—
Rated power @ U _{MAX}	VA (50 Hz)/W	—/0.7	5.3/—	1.12	—
Operating range	V AC (50/60 Hz)	—	90...280	—	90...280
	V DC	4...32	—	4...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	1	15	1	15
Technical data					
Electrical life	cycles	—		—	
Operate/release time	ms	1	10/20	1	10/20
Insulation between input and output (1.2/50 μs)	kV	—		—	
Ambient temperature	°C	–30...+80*		–30...+80*	
Protection category		—		—	
Approvals (according to type)		   			

60 and 80 A three phase Random SSR, "hockey puck" style**Type 77.D3.x.xxx.8671:** 60 A - 600 V AC**Type 77.F3.x.xxx.8671:** 80 A - 600 V AC

- High endurance and switching speed
- Silent switching
- Spark and bounce-free switching
- Low control power
- "contactor-style": input and output terminals on adjacent sides
- Mounting on control cabinet sheet metal or on heatsink

77.D3/F3

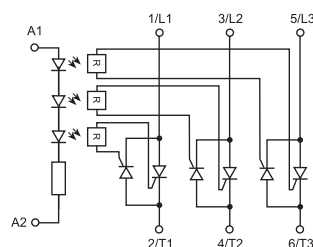
Screw terminal (plate clamp)

**NEW 77.D3.x.xxx.8671****Random switch-on**

- Output: 60 A/600 V AC
- Suggested applications: heater or motor control

NEW 77.F3.x.xxx.8671**Random switch-on**

- Output: 80 A/600 V AC
- Suggested applications: heater control



Simplified circuit diagram

* See L77-24 and L77-25 diagrams page 19

For outline drawing see page 23

Output specification					
Output configuration		3 NO		3 NO	
Rated current I _N /Max. peak current (10 ms)	A	60/700		80/1280	
Rated voltage	V AC (50/60 Hz)	600		600	
Switching voltage range	V AC (50/60 Hz)	24...660		24...660	
Repetitive peak off-state voltage	V _{pk}	1600		1600	
Minimum switching current @ 600 V	mA	—		—	
Typical “OFF-state” leakage current @ 600 V	mA	10		10	
Max “ON-state” voltage drop @ 25 °C and I _N		1.6		1.6	
Power loss @ I _N	W	216		288	
Input specification					
Nominal voltage (U _N)	V AC (50/60 Hz)	—	230	—	230
	V DC	24	—	24	—
Rated power @ U _{MAX}	VA (50 Hz)/W	—/0.7	5.3/—	1.12	—
Operating range	V AC (50/60 Hz)	—	90...280	—	90...280
	V DC	4...32	—	4...32	—
Must drop-out voltage	V AC (50/60 Hz)/DC	1	15	1	15
Technical data					
Electrical life	cycles	—		—	
Operate/release time	ms	1	10/20	1	10/20
Insulation between input and output (1.2/50 μs)	kV	—		—	
Ambient temperature	°C	–30...+80*		–30...+80*	
Protection category		—		—	
Approvals (according to type)		   			

Ordering information DIN rail SSR

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	
Series																		
Type/rated current																		
0 = 5/7/15 A output (77.01)																		
1 = 15 A output (77.11)																		
3 = 30 A output (77.31)																		
No. of poles/mounting																		
1 = 1 pole, modular housing																		
(plastic or heat sink/plastic), DIN rail mounting																		
Input version																		
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																		
77.01.9.024.8050/17.5 mm 5 A																		
77.01.8.230.8051/17.5 mm 5 A																		
77.01.9.024.8051/17.5 mm 5 A																		
77.01.9.024.9125/17.5 mm 7 A																		
77.01.9.024.9024/17.5 mm 15 A																		
77.11.8.230.8250/22.5 mm 15 A																		
77.11.9.024.8250/22.5 mm 15 A																		
77.11.8.230.8251/22.5 mm 15 A																		
77.11.9.024.8251/22.5 mm 15 A																		
77.31.8.230.8050/22.5 mm 30 A																		
77.31.8.024.8050/22.5 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																		

A
8

B
0

C
5

D
0

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
 (rated voltage)
 80 = 230 V AC (77.01), 400 V AC (77.31)
 82 = 230 V AC (77.11)
 9024 = 24 V DC
 9125 = 110...125 V DC

D

Ordering information hockey puck SSR

Example: 77 series modular SSR, 1 output 25 A AC, input voltage 230 V AC, relay style terminals arrangement, zero-crossing switch-on.

	7	7	.	A	.	1	.	8	.	2	3	0	.	8	2	5	0	
Series																		
Type/rated current																		
A = 25 A output																		
B = 40 A output																		
C = 50 A output																		
D = 60 A output																		
E = 75 A output																		
F = 80 A output																		
G = 100 A output																		
H = 125 A output																		
No. of poles/mounting																		
1 = 1 phase, heat-sink or directly panel mounting																		
("hockey puck")																		
2 = 2 phases																		
3 = 3 phases																		
Input version																		
8 = AC (50/60 Hz)																		
9 = DC																		
Supply voltage																		
See "input specification"																		
Codes/Module width																		
1 phase 25 - 40 - 60 - 80 - 100 - 125 A																		
77.x1.8.230.8250/"hockey puck"																		
77.x1.9.024.8250/"hockey puck"																		
77.x1.8.230.8650/"hockey puck"																		
77.x1.9.024.8650/"hockey puck"																		
2 phases 25 - 50 - 75 A																		
77.x2.9.024.8671/"hockey puck"																		
3 phases 25 - 40 - 60 - 80 A																		
77.x3.8.230.8671/"hockey puck"																		
77.x3.9.024.8671/"hockey puck"																		

A
8

B
2

C
5

D
0

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
 (rated voltage)
 82 = 230 V AC
 86 = 600 V AC

Technical data

Insulation			77.01.8xxx		77.01.9xxx		77.11		77.31		
			Dielectric strength	Impulse (1.2/50 μs)	Dielectric strength	Impulse (1.2/50 μs)	Dielectric strength	Impulse (1.2/50 μs)	Dielectric strength	Impulse (1.2/50 μs)	
Between input and output			2500 V AC	5 kV	3000 V AC	4 kV	3000 V AC	6 kV	3000 V AC	6 kV	
Between input and ground (heat-sink)			—	—	—	—	3000 V AC	6 kV	3000 V AC	6 kV	
Between output and ground (heat-sink)			—	—	—	—	2500 V AC	4 kV	4000 V AC	6 kV	
EMC specifications		Reference standard	77.01.8.230		77.01.9.024		77.11		77.31		
			230 V AC		24 V DC		24 V DC	230 V AC	24 V AC/DC	230 V AC	
Electrostatic discharge	contact discharge	EN 61000-4-2	4 kV		4 kV		4 kV		4 kV		
	air discharge	EN 61000-4-2	8 kV		8 kV		8 kV		8 kV		
Radiated electromagnetic field (80...1000 MHz)		EN 61000-4-3	30 V/m		20 V/m		20 V/m		30 V/m		
Fast transients on supply terminals (burst 5/50 ns, 5 and 100 kHz)		EN 61000-4-4	1 kV		1 kV		1 kV	3 kV	1 kV	3 kV	
Voltage pulses on supply terminals (surge 1.2/50 μs)	common mode	EN 61000-4-5	—		—		3 kV	3 kV	3 kV	3 kV	
	differential mode	EN 61000-4-5	1 kV		0.5 kV		0.5 kV	1.5 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		10 V		10 V		10 V		
Terminals			77.01.x.xxx		77.01.9.xxx		77.11		77.31		
 Screw torque			Nm	0.8	0.8		0.8		0.8		
Max. wire size			solid cable	stranded cable	solid cable	stranded cable	solid cable	stranded cable	solid cable	stranded cable	
			mm²	1 x 6 / 2 x 4	1x4/2x25	1 x 6 / 2 x 4	1x4/2x25	1 x 6 / 2 x 4	1 x 6 / 2 x 4	1 x 6 / 2 x 4	1 x 6 / 2 x 4
			AWG	1x10/2x12	1x12/2x14	1x10/2x12	1x12/2x14	1x10/2x12	1x10/2x12	1x10/2x12	
Wire strip length			mm	9		9		9		9	
Other data											
Power lost to the environment			without output current	W	0.5		0.9		0.9		
			with rated current	W	4.0		4.0		14		16

			77.X1	77.X2	77.X3
			Dielectric strength	Dielectric strength	Dielectric strength
Between Input and output			4 kV	4 kV	4 kV
Between input and ground (heat-sink)			4 kV	2.5 kV	2.5 kV
Terminals					
 Screw torque	Input side	Nm	1.5	0.5	0.5
	Output side	Nm	2.2	2.2	2.2
	On heatsink with thermal pad or paste	Nm	2.2	2.2	2.2

77.X1 wiring cross section area		
Load current (A)	Cross section area of wire (mm ²)	Wire size (AWG)
15-20	2.5	12
20-35	4	10
25-32	6	10
32-50	10	8
50-65	16	6
65-85	25	4

Note: if the wire cross section area is bigger than 25 mm², we suggest to use 2 smaller cross section wires and connect them back to back superimposed (in parallel).

Input specification

77.01

Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC)	Input current
		AC		DC			
		U _{min}	U _{max}	U _{min}	U _{max}		
U _N		U _{min}	U _{max}	U _{min}	U _{max}		I _N at U _N
V		V	V	V	V	V	mA
24	9.024	—	—	4	32	3.0	18
230	8.230	90	265	—	—	24	15

77.11

Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC)	Input current
		AC		DC			
		U _{min}	U _{max}	U _{min}	U _{max}		
U _N		U _{min}	U _{max}	U _{min}	U _{max}		I _N at U _N
V		V	V	V	V	V	mA
24	9.024	—	—	4	32	2	11
230	8.230	40	305	—	—	6	25

77.31

Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC)	Input current
		AC		DC			
		U _{min}	U _{max}	U _{min}	U _{max}		
U _N		U _{min}	U _{max}	U _{min}	U _{max}		I _N at U _N
V		V	V	V	V	V	mA
24	8.024	16	32	—	—	6	10
24	9.024	—	—	4	32	2	11
230	8.230	40	280	—	—	6	25

77.x1.x.xxx.8x50

Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC)	Input current
		AC		DC			
		U _{min}	U _{max}	U _{min}	U _{max}		
U _N		U _{min}	U _{max}	U _{min}	U _{max}		I _N at U _N
V		V	V	V	V	V	mA
24	9.024	—	—	3	32	1.25	25
230	8.230	90	280	—	—	1.25	35

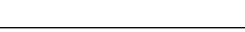
77.x2.9.024.8671

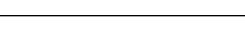
Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC)	Input current
		AC		DC			
		U _{min}	U _{max}	U _{min}	U _{max}		
U _N		U _{min}	U _{max}	U _{min}	U _{max}		I _N at U _N
V		V	V	V	V	V	mA
24	9.024	—	—	4	32	1.5	25

77.x3.x.xxx.8671

Nominal voltage	Input code	Operating range				Must drop-out voltage (AC/DC)	Input current
		AC		DC			
		U _{min}	U _{max}	U _{min}	U _{max}		
U _N		V	V	V	V	V	I _N at U _N
V		V	V	V	V	V	mA
24	9.024	—	—	4	32	1.6	35
230	8.230	90	280	—	—	1.6	30

Led indication

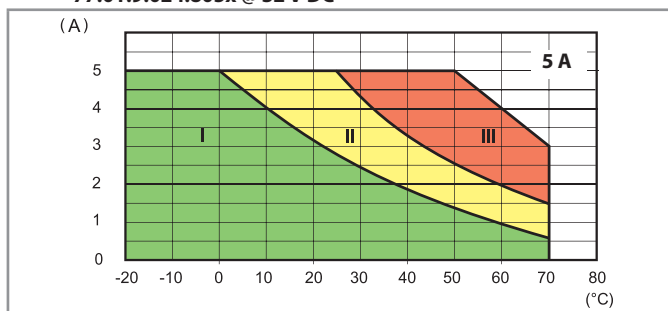
LED	Supply voltage
	OFF
	ON

LED (77.01.9.024.9xxx only)	Short circuit*
	NO
	YES

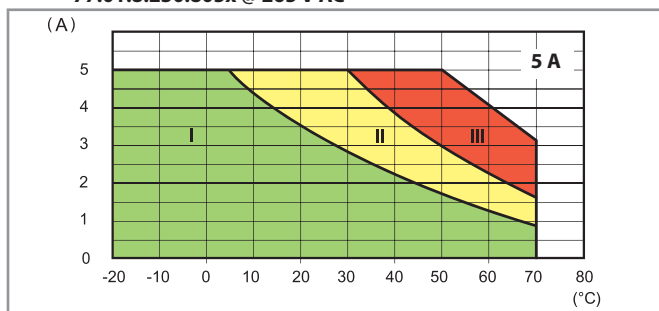
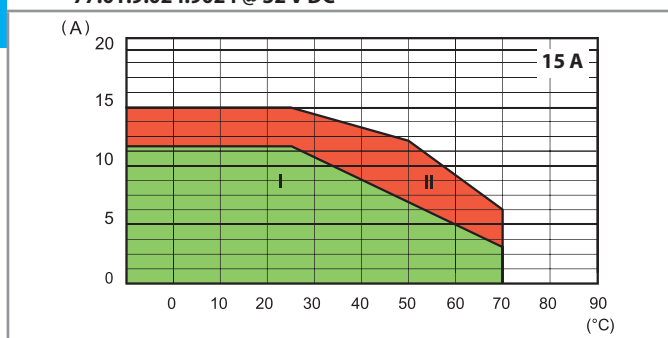
*To restore normal operation it is necessary to disconnect the power, resolve the short circuit and then restore power.

D

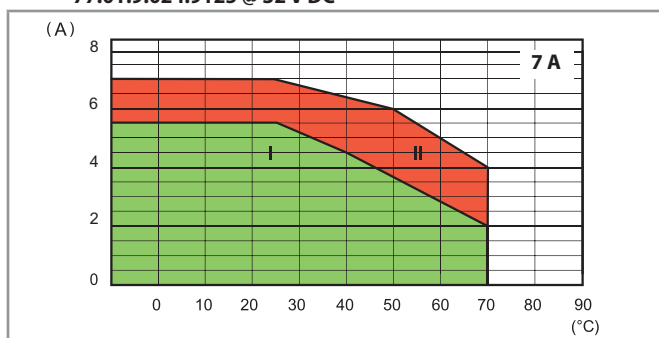
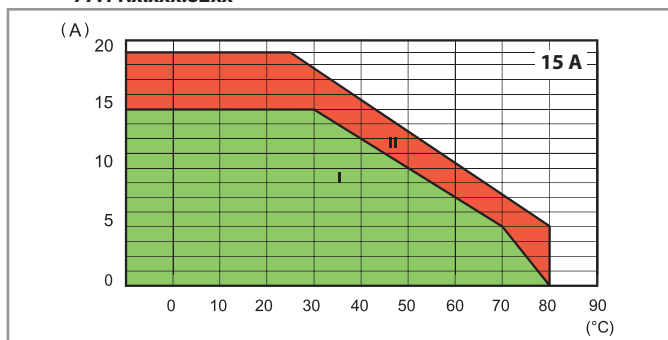
Output specification

L77-1 Output RMS current v ambient temperature
77.01.9.024.805x @ 32 V DC

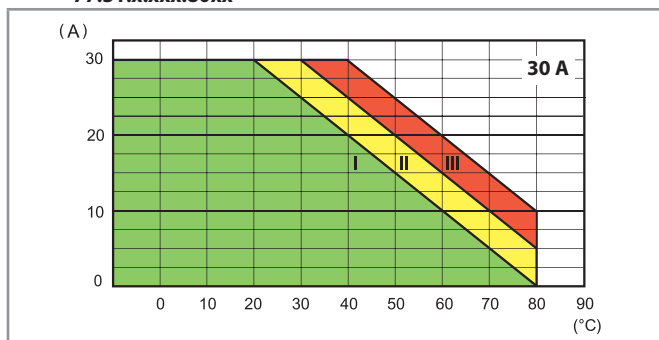
- I - Modular SSR installed as a group (without gap)
 II - Modular SSR installed as a group (9 mm gap between each SSR)
 III - Modular SSR installed individually in free air (without a significant influence from nearby components)

L77-2 Output RMS current v ambient temperature
77.01.8.230.805x @ 265 V AC**L77-3 Output DC current v ambient temperature**
77.01.9.024.9024 @ 32 V DC

- I - Modular SSR installed as a group (without gap)
 II - Modular SSR installed individually in free air, or with a gap ≥ 9 mm, which implies a not significant influence from nearby components

L77-4 Output DC current v ambient temperature
77.01.9.024.9125 @ 32 V DC**L77-5 Output RMS current v ambient temperature**
77.11.x.xxx.82xx

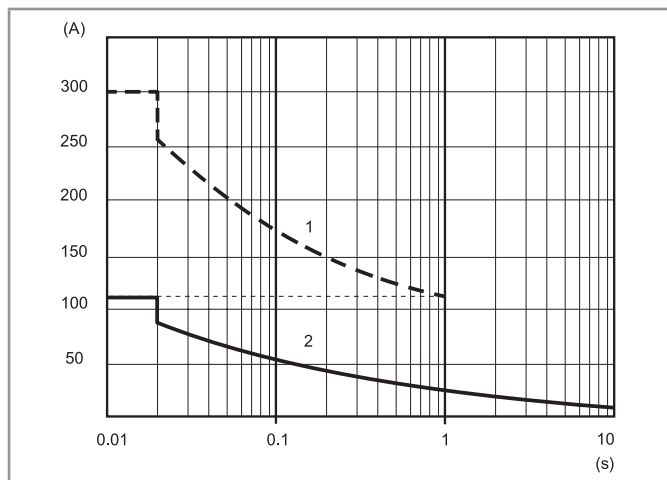
- I - Modular SSR installed as a group (without gap)
 II - Modular SSR installed individually in free air, or with a gap ≥ 20 mm, which implies a not significant influence from nearby components

L77-7 Output RMS current v ambient temperature
77.31.x.xxx.80xx

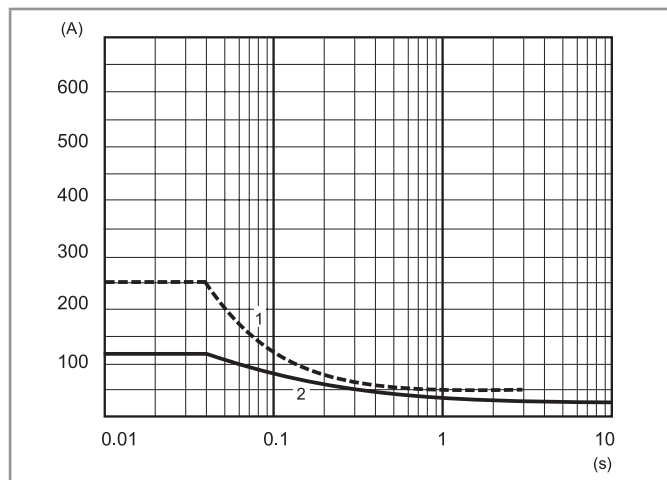
- I - Modular SSR installed as a group (without gap)
 II - Modular SSR installed as a group (20 mm gap between each SSR)
 III - Modular SSR installed individually in free air, or with a gap ≥ 40 mm, which implies a not significant influence from nearby components

Output specification

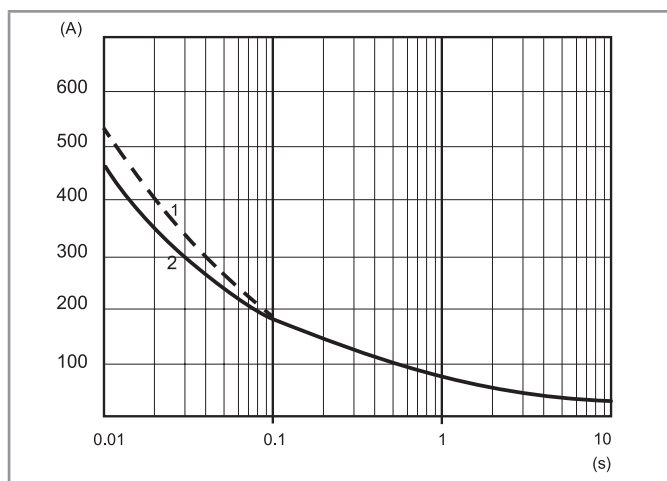
L77-8 Inrush peak current (AC) v inrush time
77.01.x.xxx.80xx



L77-9 Inrush peak current (AC) v inrush time
77.11.x.xxx.82xx

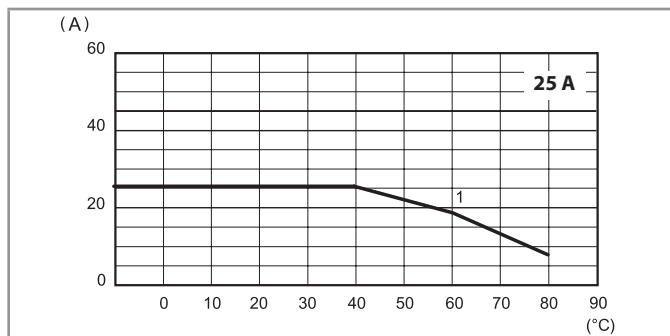


L77-11 Inrush peak current (AC) v inrush time
77.31.x.xxx.80xx

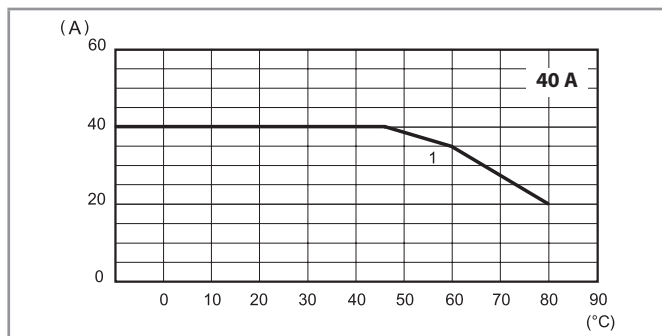


- 1 - "Cold" conditions** (ambient temperature = 23 °C, no output current during the last 15 minutes)
2 - "Hot" conditions (ambient temperature = 50 °C, rated output current)

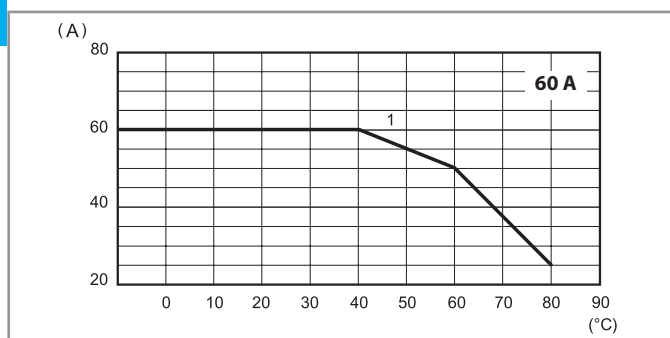
Output specification

L77-13 Output RMS current v ambient temperature
77.A1.x.xxx.8x50

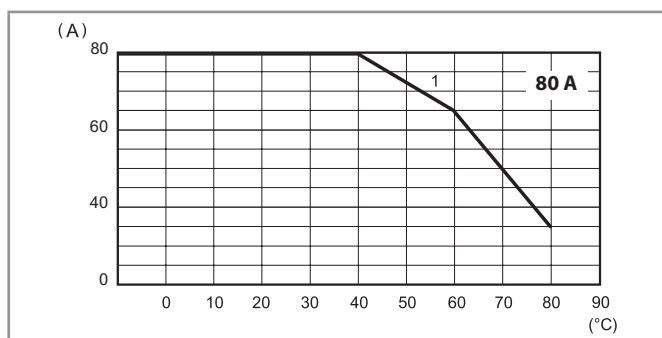
1 - Installation on heat-sink (2 K/W)

L77-14 Output RMS current v ambient temperature
77.B1.x.xxx.8x50

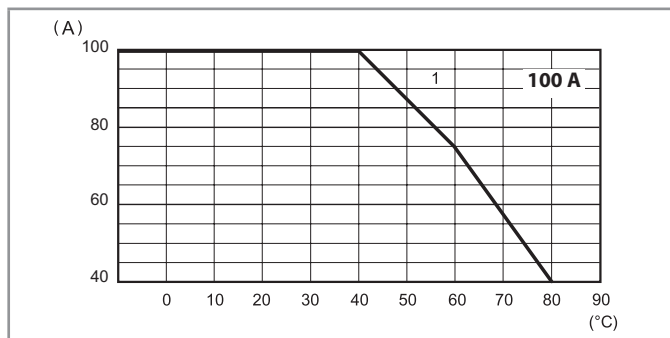
1 - Installation on heat-sink (0.9 K/W)

L77-15 Output RMS current v ambient temperature
77.D1.x.xxx.8x50

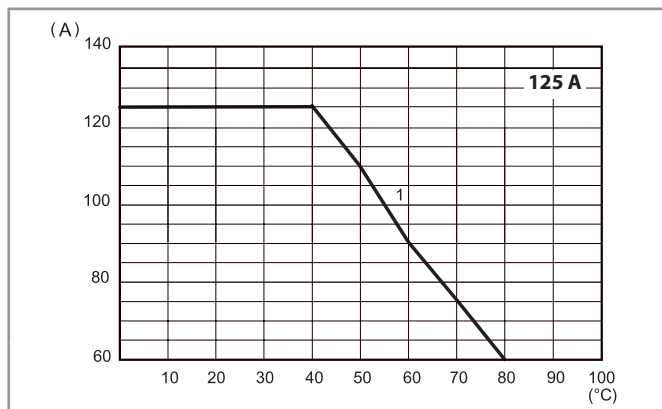
1 - Installation on heat-sink (0.7 K/W)

L77-16 Output RMS current v ambient temperature
77.F1.x.xxx.8x50

1 - Installation on heat-sink (0.5 K/W)

L77-17 Output RMS current v ambient temperature
77.G1.x.xxx.8x50

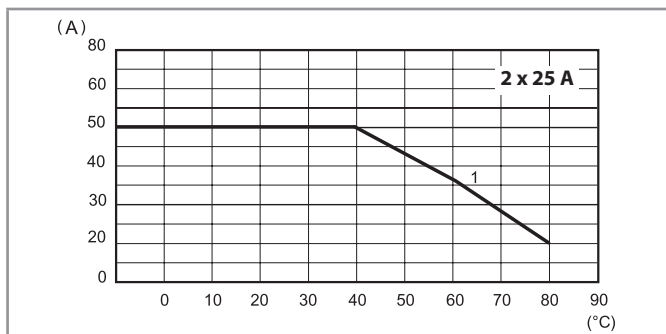
1 - Installation on heat-sink (0.45 K/W)

L77-18 Output RMS current v ambient temperature
77.H1.x.xxx.8x50

1 - Installation on heat-sink (0.35 K/W)

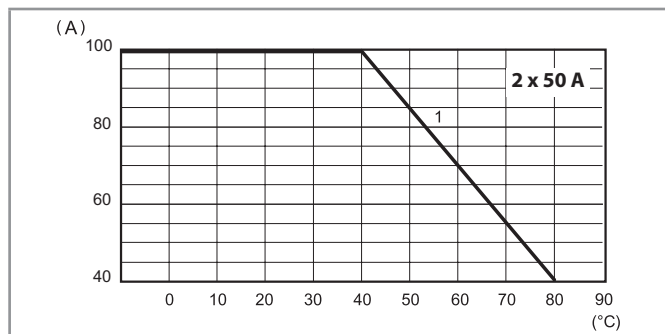
Output specification

L77-19 Output RMS current v ambient temperature
77.A2.9.024.8671



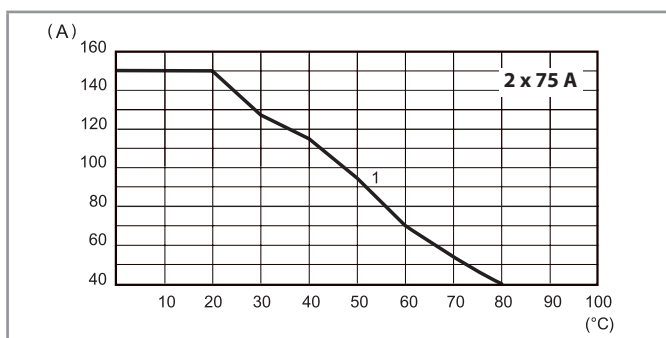
1 - Installation on heat-sink (0.9 K/W)

L77-20 Output RMS current v ambient temperature
77.C2.9.024.8671



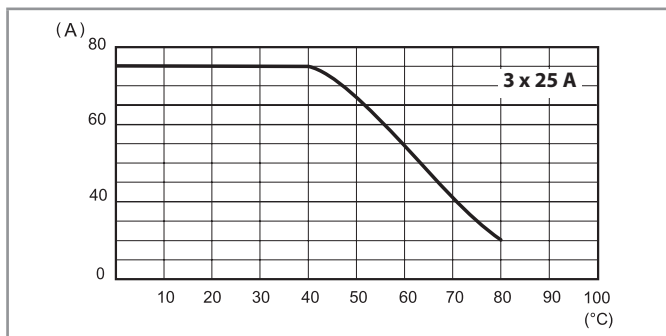
1 - Installation on heat-sink (0.45 K/W)

L77-21 Output RMS current v ambient temperature
77.E2.9.024.8671



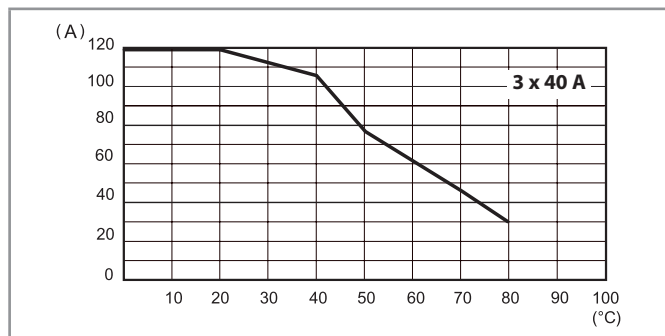
1 - Installation on heat-sink (0.45 K/W)

L77-22 Output RMS current v ambient temperature
77.A3.x.xxx.8671



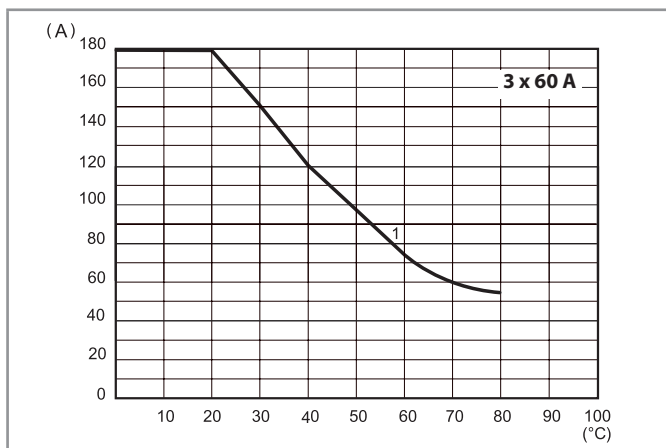
1 - Installation on heat-sink (0.7 K/W)

L77-23 Output RMS current v ambient temperature
77.B3.x.xxx.8671



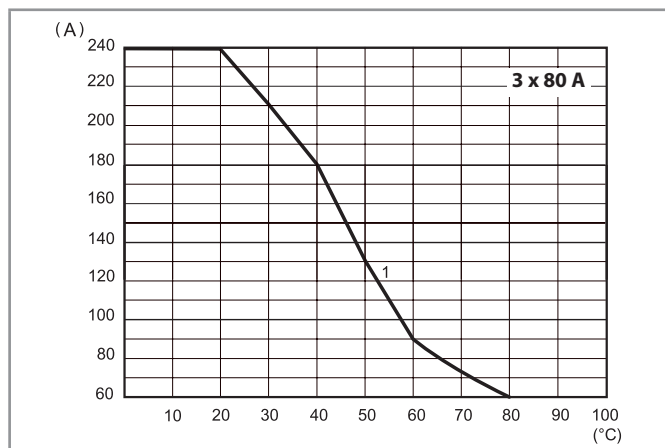
1 - Installation on heat-sink (0.5 K/W)

L77-24 Output RMS current v ambient temperature
77.D3.x.xxx.8671



1 - Installation on heat-sink (0.45 K/W)

L77-25 Output RMS current v ambient temperature
77.F3.x.xxx.8671



1 - Installation on heat-sink (0.35 K/W)

Output specification

Max recommended switching frequency (Cycles/Hour, with 50% Duty-cycle)							
Load	77.01.9xxx	77.01.9xxx	77.11	77.31	77.25	77.45	77.55
5 A 230 V (AC1)	5000	—	—	—	—	—	—
5 A 24 V DC L/R = 20 ms	—	3600	—	—	—	—	—
1 A (AC15)	10000	—	—	—	—	—	—
0.5 A (AC15)	20000	—	—	—	—	—	—
15 A 305 V cos φ = 0.8	—	—	1800	—	—	—	—
15 A 305 V cos φ = 0.5	—	—	1200	—	—	—	—
30 A 480 V cos φ = 0.8	—	—	—	1800	—	—	—
30 A 480 V cos φ = 0.5	—	—	—	1200	—	—	—
25 A 230 V cos φ = 0.7	—	—	—	—	1800	—	—
40 A 230 V cos φ = 0.7	—	—	—	—	—	1800	—
50 A 230 V cos φ = 0.7	—	—	—	—	—	—	1800

Other data

	77.01.8xxx	77.01.9xxx	77.11	77.31	77.25	77.45	77.55
Critical rising voltage dv/dt without input control (gate open) @ $T_j = 125^\circ\text{C}$	> 1000 V/ μs	> 1000 V/ μs	> 500 V/ μs > 10 V/ μs (with di/dt = 20 A/ms)	> 1000 V/ μs	300 V/ μs (.8250) 500 V/ μs (.8650)	500 V/ μs (.8250) 1000 V/ μs (.8650)	1000 V/ μs (.8250) 1000 V/ μs (.8650)
Critical rising current di/dt @ $T_j = 125^\circ\text{C}$	> 50 A/ μs	> 50 A/ μs	> 50 A/ μs	> 150 A/ μs	—	—	—
I²t for fusing @ $t_p = 10$ ms	450 A ² s	450 A ² s	1000 A ² s*	1350 A ² s**	450 A ² s	1250 A ² s	1350 A ² s

Suggested fuse (depending on application) for short-circuit protection (Ultra-Fast acting types for semiconductors):

* 20 A, 660 V AC, 10 x 38 mm, 200 kA, 360 A²s.** 30 A, 660 V AC, 10 x 38 mm, 200 kA, 1000 A²s.

Max recommended switching frequency (Cycles/Hour, with 50% Duty-cycle)						
Load	77.A1.x.xxx	77.B1.x.xxx	77.D1.x.xxx	77.F1.x.xxx	77.G1.x.xxx	77.H1.x.xxx
25 A 230 V cos φ = 0.7	1800	—	—	—	—	—
40 A 230 V cos φ = 0.7	—	1800	—	—	—	—
60 A 230 V cos φ = 0.7	—	—	1800	—	—	—
80 A 230 V cos φ = 0.7	—	—	—	1800	—	—
100 A 230 V cos φ = 0.7	—	—	—	—	1800	—
125 A 230 V cos φ = 0.7	—	—	—	—	—	1800

Other data

	77.A1.x.xxx	77.B1.x.xxx	77.D1.x.xxx	77.F1.x.xxx	77.G1.x.xxx	77.H1.x.xxx
Critical rising voltage dv/dt without input control (gate open) @ $T_j = 125^\circ\text{C}$	500 V/ μs	500 V/ μs	500 V/ μs	500 V/ μs	500 V/ μs	500 V/ μs
I²t for fusing @ $t_p = 10$ ms	450 A ² s	1250 A ² s	2450 A ² s*	3200 A ² s**	11 250 A ² s	25 000 A ² s

Max recommended switching frequency (Cycles/Hour, with 50% Duty-cycle)			
Load	77.A2.x.xxx	77.C2.x.xxx	77.E2.x.xxx
25 A 230 V cos φ = 0.7	1800	—	—
50 A 230 V cos φ = 0.7	—	1800	—
75 A 230 V cos φ = 0.7	—	—	1800

Other data

	77.A2.x.xxx	77.C2.x.xxx	77.E2.x.xxx
Critical rising voltage dv/dt without input control (gate open) @ $T_j = 125^\circ\text{C}$	500 V/ μs	500 V/ μs	500 V/ μs
I²t for fusing @ $t_p = 10$ ms	450 A ² s	2110 A ² s	2810 A ² s*

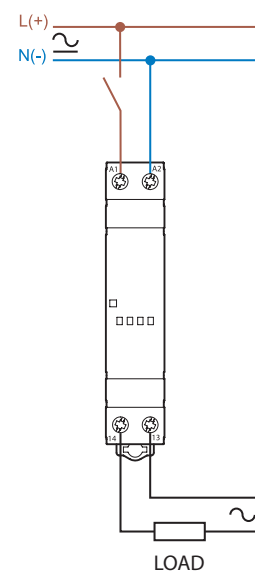
Max recommended switching frequency (Cycles/Hour, with 50% Duty-cycle)				
Load	77.A3.x.xxx	77.B3.x.xxx	77.D3.x.xxx	77.F3.x.xxx
25 A 230 V cos φ = 0.7	1800	—	—	—
40 A 230 V cos φ = 0.7	—	1800	—	—
60 A 230 V cos φ = 0.7	—	—	1800	—
80 A 230 V cos φ = 0.7	—	—	—	1800

Other data

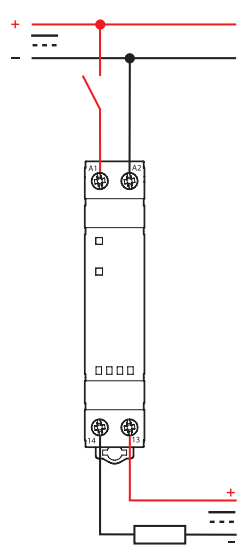
	77.A3.x.xxx	77.B3.x.xxx	77.D3.x.xxx	77.F3.x.xxx
Critical rising voltage dv/dt without input control (gate open) @ $T_j = 125^\circ\text{C}$	500 V/ μs	500 V/ μs	500 V/ μs	500 V/ μs
I²t for fusing @ $t_p = 10$ ms	450 A ² s	1250 A ² s	2450 A ² s*	8190 A ² s**

Wiring diagrams

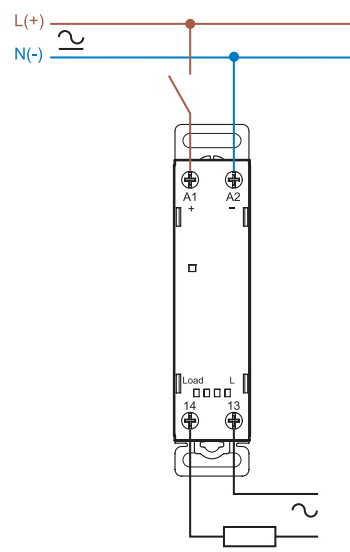
Single-phase connection
(77.01...802x)



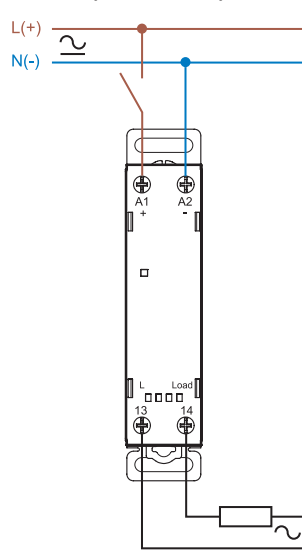
Single-phase connection DC
(77.01...9x2x)



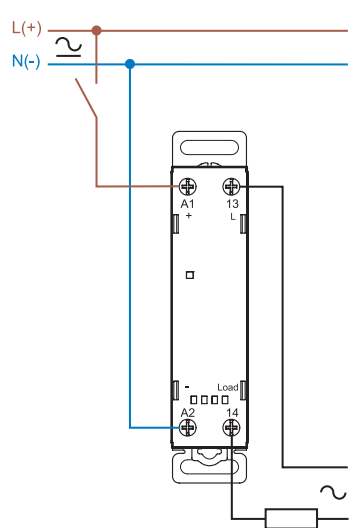
Single-phase connection
(77.11)



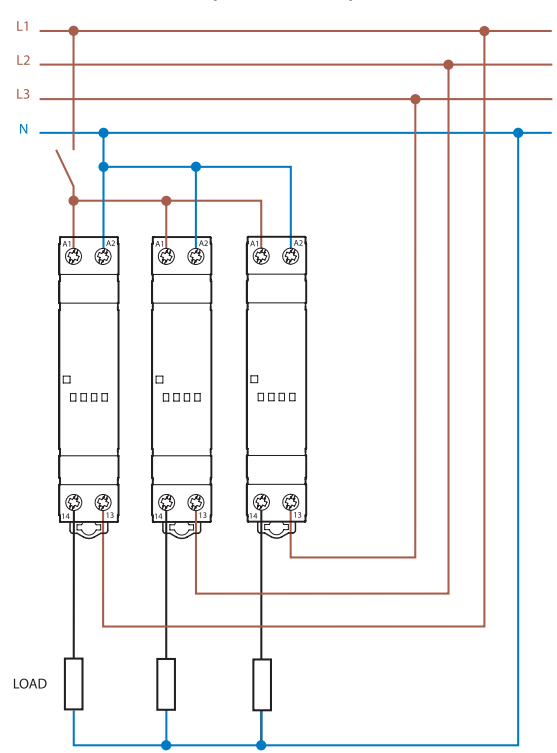
Single-phase connection
(77.31...805x)



Single-phase connection
(77.31...807x)



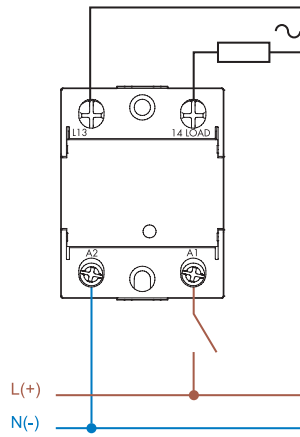
Example of three-phase connection
(with 3 x 77.01)



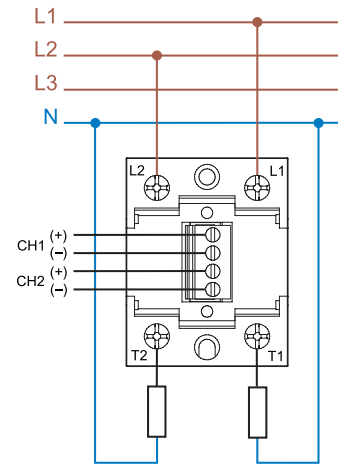
Note: this connection can be used with all 77 series types.

Wiring diagrams

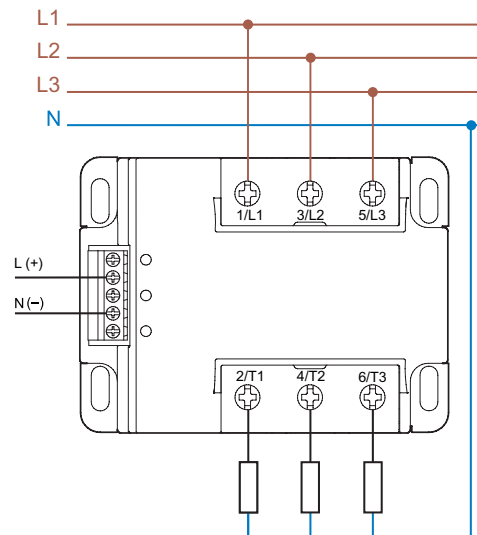
**Single-phase connection
(77.x1)**



**Dual phase connection
(77.x2)**

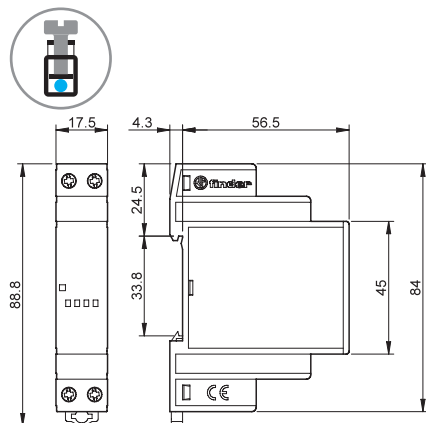


**Three phase connection
(77.x3)**

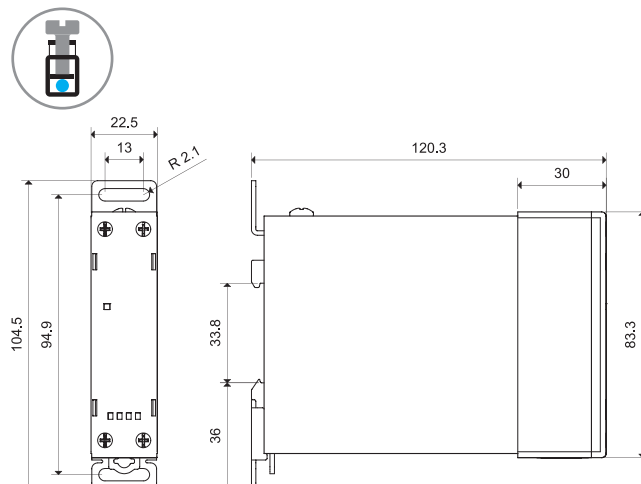


Outline drawings

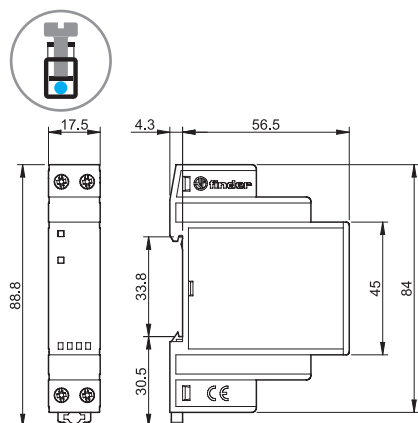
Type 77.01
Screw terminal



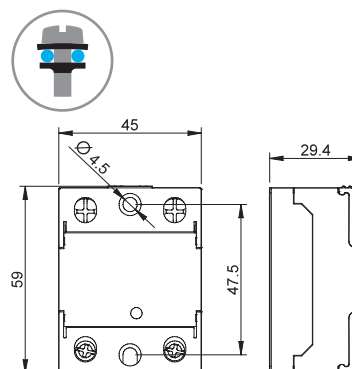
Types 77.11/31
Screw terminal



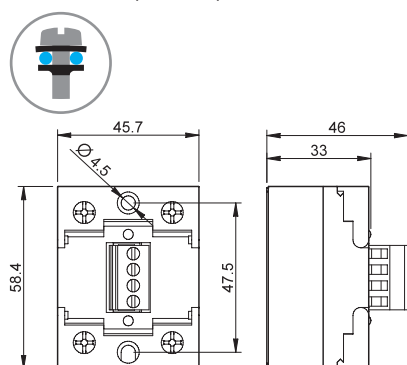
Type 77.01 DC
Screw terminal



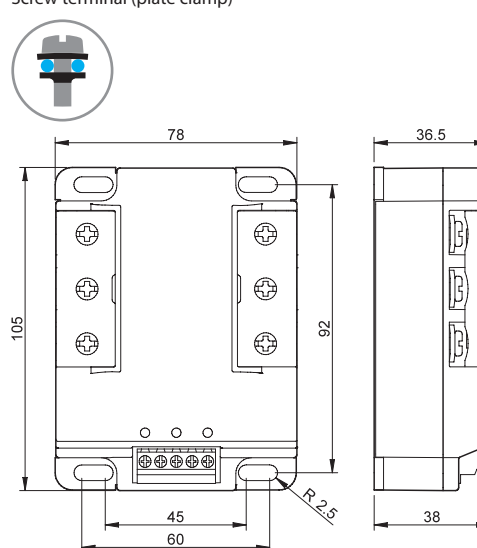
Type 77.x1
Screw terminal (plate clamp)



Type 77.x2
Screw terminal (plate clamp)



Type 77.x3
Screw terminal (plate clamp)



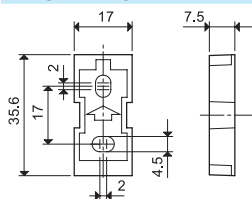
Accessories



020.01

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

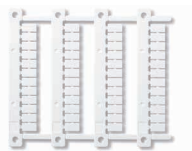
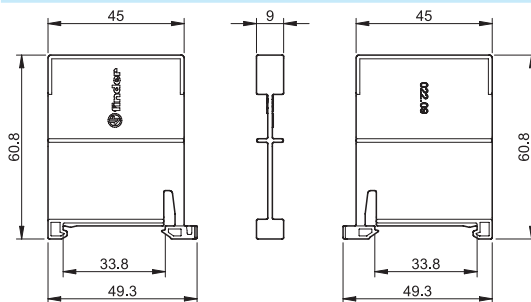
020.01



022.09

Separator for rail mounting, plastic, 9 mm wide

022.09



060.48

Sheet of marker tags (CEMBRE Thermal transfer printers) for all relays (48 tags), 6 x 12 mm

060.48