Over- and undercurrent relay varimeter
IL 9277, IP 9277, SL 9277, SP 9277

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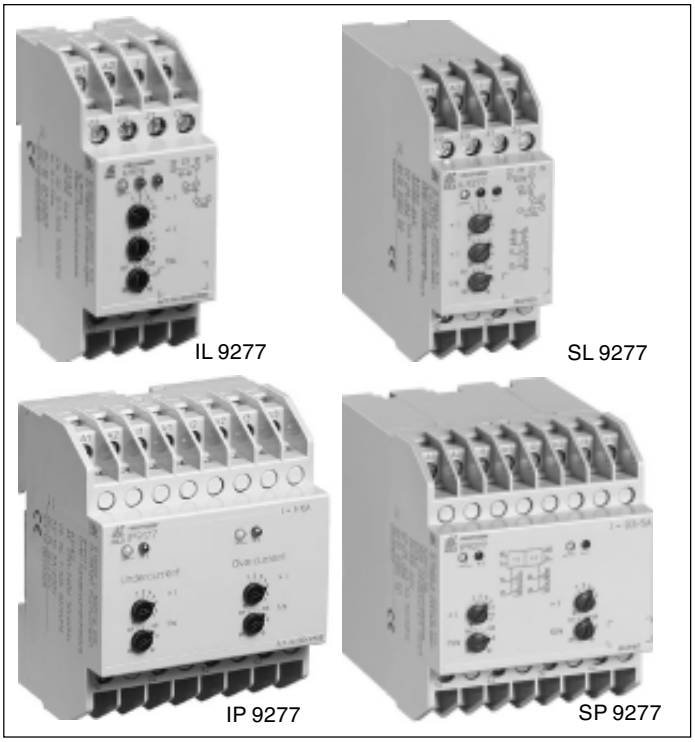
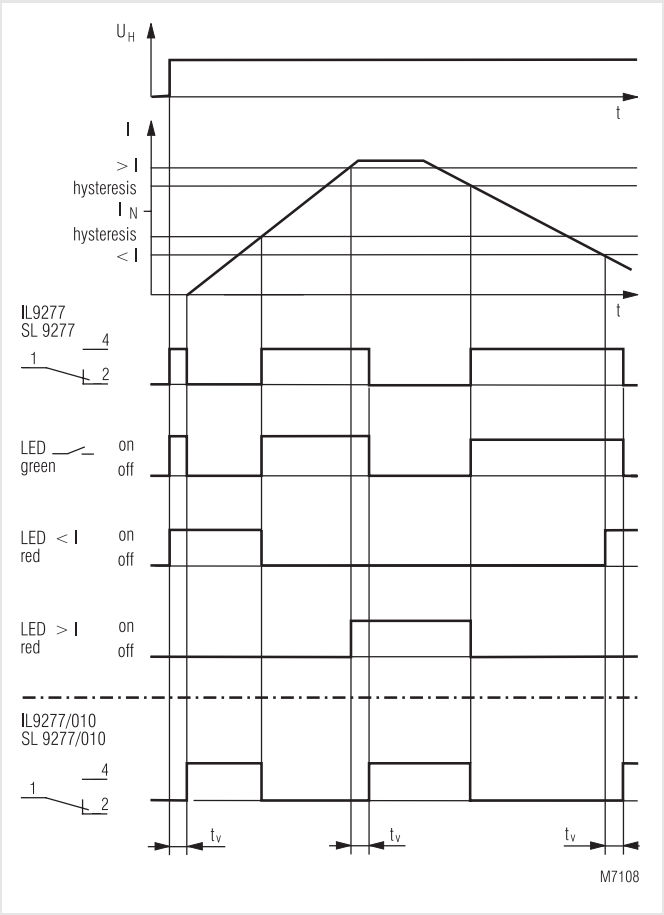


- According to IEC/EN 60 255, DIN VDE 0435-303
- Devices available in 2 enclosure versions:
  I-model, e.g. IL _ _ _ _, depth 61 mm
  with terminals at the bottom for installations systems and industrial distribution systems according to DIN 43 880
  S-model, e.g. SL _ _ _ _, depth 100 mm
  with terminals at the top for cabinets with mounting plate and cable duct
- IP 9277, SP 9277: 3-phase
  IL 9277, SL 9277: single phase
- Detects over- and undercurrent
- Measuring ranges from 0,1 ... 15 A
- IL 9277, SL 9277 with 4 programmable ranges
- Settable 0,1 ... 1 I_N
- Separate setting for over- and undercurrent
- Fixed hysteresis approx. 4 %
- Settable time delay
- IP 9277, SP 9277 with separate settable time delay for over- and undercurrent
- Closed circuit operation
- Optionally open circuit operation
- LED indicators for over-, under- and normal current
- Auxiliary supply and measuring input galvanic separated
- IL 9277, SL 9277 with one output relay for over- and undercurrent
- IP 9277, SP 9277 with separate output relays for over- and undercurrent
- Width IL 9277, SL 9277: 35 mm
  IP 9277, SP 9277: 70 mm

Function diagram IL 9277, SL 9277



Approvals and marking

CE

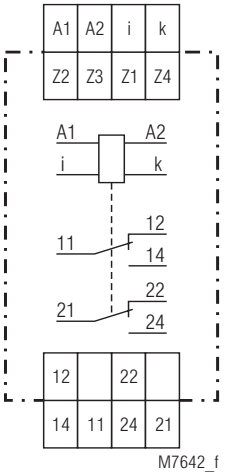
Applications

Over- and undercurrent detection in single phase or 3-phase voltage systems

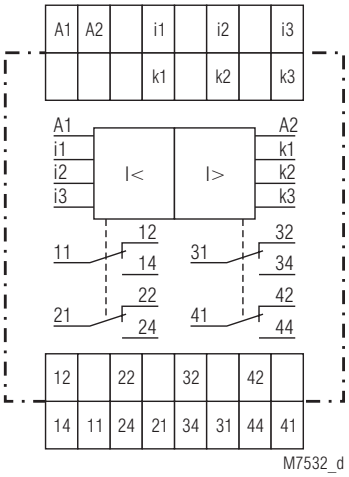
Indicators

LED green:	current within limits
LED red I_{max}:	overcurrent
LED red I_{min}:	undercurrent

Circuit diagram

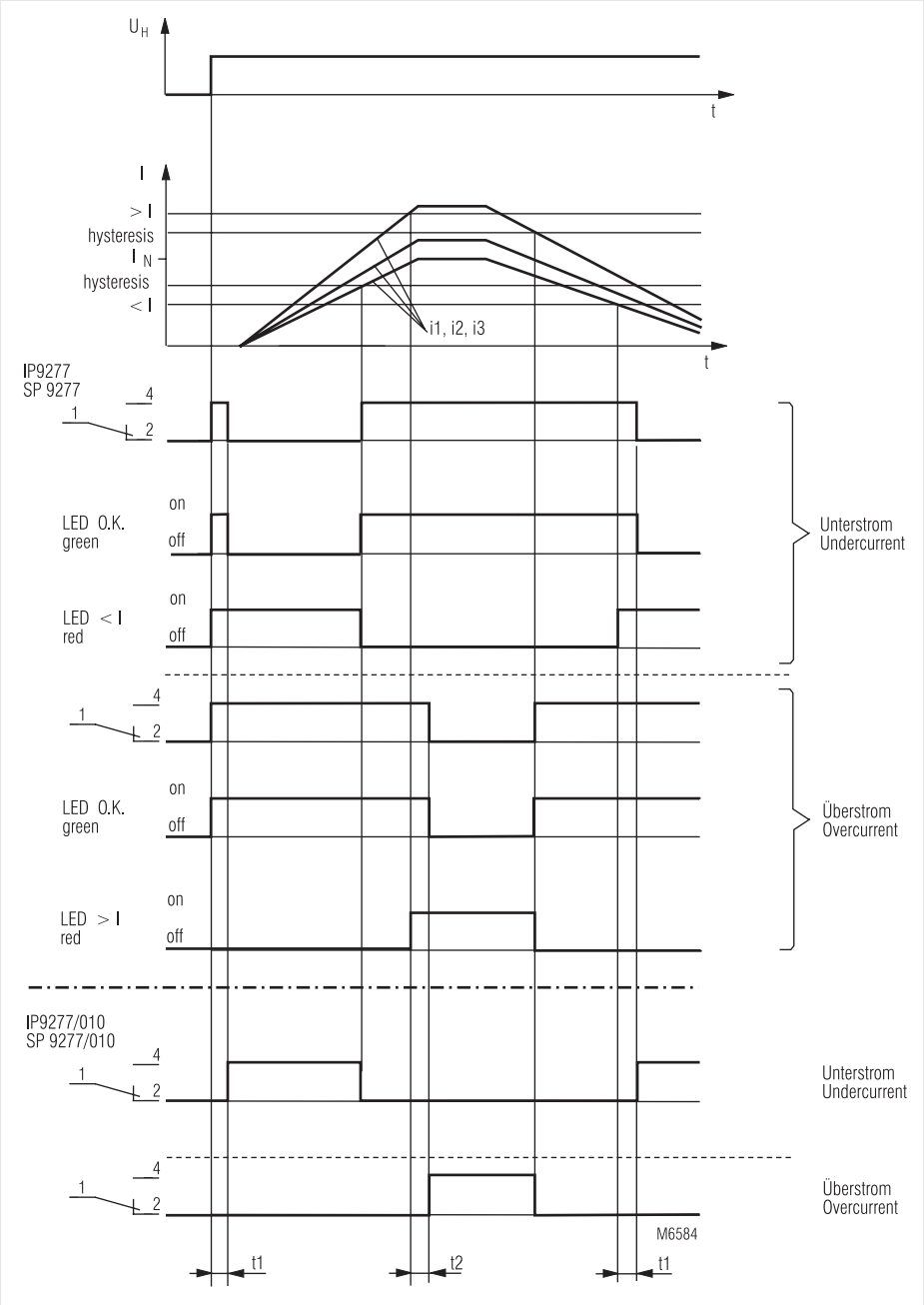


IL 9277.12, SL 9277.12



IP 9277.39, SP 9277.39

Function diagram IP 9277, SP 9277



Technical data

Input

Measuring ranges

IL 9277, SL 9277:	programmable by bridges: AC 0,1 ... 1 A (bridge Z1-Z2) AC 0,5 ... 5 A (bridge Z1-Z3) AC 1 ... 10 A (bridge Z1-Z4) AC 1,5 ... 15 A (bridge Z1-Z3-Z4)
IP 9277, SP 9277:	optionally: AC 0,1 ... 1 A; 0,5 ... 5 A; 1 ... 10 A; 1,5 ... 15 A;
Nominal frequency of measuring current:	50 / 60 Hz
Maximum continuous measuring current	
IL 9277, SL 9277:	20 A at 50° ambient temperature
IP 9277, SP 9277:	20 A at 40° ambient temperature 15 A at 50° ambient temperature
Max. overload:	30 A for 3 sec
Temperature influence:	≤ 0,05 % / K
Reaction time:	see characteristic switching delay

Technical data

Setting ranges

Response value:	infinite variable within measuring range
Hysteresis:	approx. 4 % of setting value, fixed
Setting accuracy:	≤ ± 10 % of setting value
Repeat accuracy:	≤ ± 1 %
Switching delay t_v:	0,1 ... 20 sec settable

Auxiliary circuit

Auxiliary voltage U_H

IL 9277, SL 9277:	AC/DC 24 V AC 115 ... 127 V, AC 220 ... 240 V, AC 400 ... 440 V
IP 9277, SP 9277:	AC/DC 24 V AC 115, 127 V AC 220 ... 240 V, AC 400 ... 440 V
Voltage range	
at AC:	0,8 ... 1,1 U_H
at DC:	0,8 ... 1,25 U_H

Technical data

Nominal consumption
IL 9277, SL 9277
at AC 230 V: 3,2 VA
at DC 24 V: 0,8 W
IP 9277, SP 9277
at AC 230 V: 7,2 VA
at DC 24 V: 1 W
Nominal frequency: 50 / 60 Hz
Frequency range: ± 5 %

Output

Contacts
IL 9277.12, SL 9277.12: 2 changeover contacts
IP 9277.39, SP 9277.39: 2 x 2 changeover contacts
Thermal current I_{th}: 5 A
Switching capacity
to AC 15
NO contact: 5 A / AC 230 V IEC/EN 60 947-5-1
NC contact: 1 A / AC 230 V IEC/EN 60 947-5-1
Electrical life IEC/EN 60 947-5-1
to AC 15 at 1 A, AC 230 V
NO contact: 2 x 10^5 switching cycles
Short circuit strength
max. fuse rating: 10 A gL IEC/EN 60 947-5-1
Mechanical life: > 50 x 10^6 switching cycles

General data

Operating mode: Continuous operation
Temperature range: - 20 ... + 60°C
Clearance and creepage distances
overvoltage category/
contamination level: IEC 60 664-1

	IP/SP-devices	IL/SL-devices
supply - contacts	4 kV / 2	4 kV / 2
supply - measuring circuit	6 kV / 2	4 kV / 2
measuring circuit - measuring circuit	6 kV / 2	-
measuring circuit - contacts	6 kV / 2	4 kV / 2
measuring circuit, max. voltage:	3 AC 400/690V	AC 230/400 V
(The contacts are not designed for voltage systems with 400/690 V)		
contacts, max. voltage:	AC 230/400V	AC 230/400V

EMC
Electrostatic discharge: 8 kV (air) IEC/EN 61 000-4-2
HF irradiation: 10 V / m IEC/EN 61 000-4-3
Fast transients: 4 kV IEC/EN 61 000-4-4
Surge voltages
between
wires for power supply: 1 kV IEC/EN 61 000-4-5
between wire and ground: 2 kV IEC/EN 61 000-4-5
Interference suppression: Limit value class B EN 55 011
Degree of protection: Housing: IP 40 IEC/EN 60 529
Terminals:IP 20 IEC/EN 60 529
Housing: Thermoplastic with V0 behaviour according to UL subject 94
Vibration resistance: Amplitude 0,35 mm
frequency 10 ... 55 Hz IEC/EN 60 068-2-6
Climate resistance: 20 / 060 / 04 IEC/EN 60 068-1
Terminal designation: EN 50 005
Wire connection: 2 x 2,5 mm^2 solid or
2 x 1,5 mm^2 stranded ferruled
DIN 46 228-1/-2/-3/-4
Wire fixing: Flat terminals with self-lifting clamping piece IEC/EN 60 999-1
Mounting: DIN rail IEC/EN 60 715
Weight
IL 9277: 130 g
SL 9277: 150 g
IP 9277: 220 g
SP 9277: 270 g

Technical data

Dimensions

Width x height x depth
IL 9277: 35 x 90 x 61 mm
SL 9277: 35 x 90 x 100 mm
IP 9277: 70 x 90 x 61 mm
SP 9277: 70 x 90 x 100 mm

Standard types

IL 9277.12 AC 220 ... 240 V
Article number: 0049306 stock item
SL 9277.12 AC 220 ... 240 V
Article number: 0054111
- Single phase
- 4 programmable ranges up to 15 A
- Closed circuit operation
- Auxiliary voltage U_H: AC 220 ... 240 V
- 2 changeover contacts
- Width 35 mm

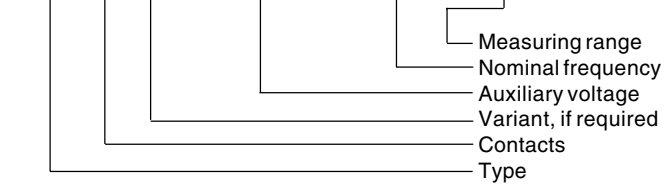
IP 9277.39 0,5 ... 5 A AC 220 ... 240 V
Article number: 0049308 stock item
SP 9277.39 0,5 ... 5 A AC 220 ... 240 V
Article number: 0056075
- 3-phase
- Range 0,5 ... 5 A
- Closed circuit operation
- Auxiliary voltage U_H: AC 220 ... 240 V
- 2 changeover contacts each for over- and undercurrent
- Width 70 mm

Variants

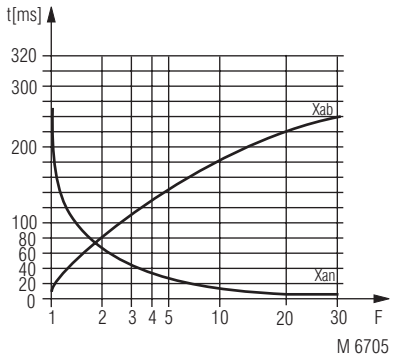
IL 9277.12/010, SL 9277.12/010: single phase current relay open circuit operation
IP 9277.39/010, SP 9277.39/010: 3-phase current relay open circuit operation
IP 9277.39/002, SP 9277.39/002: 3-phase current relay undercurrend closed circuit operation
overcurrent open circuit operation

Ordering example for variants

IP 9277 .39 /___ AC 220 ... 240 V 50 / 60 Hz 10 A



Characteristics



Switching delay
The characteristic shows the switching delay depending on the values of X_{an} - X_{ab} when switching the current on or off. A slow current change reduces the delay.

$$F = \frac{\text{I applied}}{\text{I setting}}$$