SIEMENS

SIPROTEC 7SJ601
Numerical Overcurrent Relay

Protection Systems

Catalog
LSA 2.1.16 · 1997

SIPROTEC 7SJ601 (Version V2.1) Numerical Overcurrent Relay

- Distribution protection
  - Definite-time overcurrent protection (I>>, I>/50, I_E>>, I_E>/50N) and/or inverse-time overcurrent protection (I>>, I_p/51, I_E>> I_{Ep}/51N, optional IEC or ANSI time characteristics)
  - Reverse interlocking
- Metering (operational measurement)
- Circuit-breaker / Trip contact testing
- Monitoring and self-diagnostics
  - Hardware
  - Software
- 30 event logs with time stamp
- Hardware
  - Local HMI
  - LCD display for setting parameters and analysis
  - Housing Flush-mounting housing 1/6 19 inch 7XP20 Surface-mounting housing 1/6 19 inch 7XP20
  - Auxiliary voltages 24, 48 V DC 60, 110, 125 V DC 220, 250 V DC , 115 V AC 230 V AC

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Fig. 1
SIPROTEC 7SJ601 numerical overcurrent relay

Protection functions

50	I>>, I>
50N	I_E>>, I_E>
51	I_p
51N	I_{Ep}

SIPROTEC 7SJ601 (Version V2.1)
Numerical Overcurrent Relay

Description

Fig. 2
Front view surface mounting case, terminals on the side

Fig. 3
Rear view flush mounting case

Wide range of applications

The SIPROTEC 7SJ601 is a numerical overcurrent relay which, in addition to its primary use in radial distribution power systems and motor protection, can also be employed as backup for line, transformer and generator differential protection.

It provides definite-time and inverse-time overcurrent protection.

Construction

The device contains all the components needed for

- acquisition and evaluation of measured values
- operation and display (local MMI)
- output of signals and trip commands
- input and evaluation of binary signal
- auxiliary voltage supply

The nominal CT currents applied to the SIPROTEC 7SJ601 can be 1 A or 5 A.

Two different cases are available. The flush-mounting or cubicle version has terminals at the rear. The surface-mounting version has terminals at the front.

Improved measurement technique

The SIPROTEC 7SJ601 relay operates fully numerical with enhanced algorithms. Due to the numerical processing of measured values, the influence of higher-frequency transient phenomena and transient DC components is largely suppressed.

Continuous self-monitoring

The hardware and software in the SIPROTEC 7SJ601 device are continuously self-monitored. This ensures a very high level of availability and reduces the need for routine testing.

Convenient setting

The menu driven HMI is used for setting parameters. These parameters are stored in a non-volatile memory so that the settings are retained even if the supply voltage is cut off.

Circuit-breaker / Trip contact testing

The trip and reclose command contacts can be activated via the keyboard. This facilitates testing of the trip and close circuits without the need for additional test equipment.

Status of inputs and outputs

For easy commissioning the status of each binary input, relay or LED can be displayed via HMI.

Event logging with time stamp

The SIPROTEC 7SJ601 device supplies detailed data for the analysis of faults and for checking on operating conditions.

- Event logs
  The last 3 event logs can always be displayed. If a new fault occurs, the oldest will be overwritten. These logs give a detailed description of the fault in the power system and the reaction of the SIPROTEC 7SJ601, with 1ms resolution. Each record is time stamped and assigned a sequential number.
- Operation indications
  This log records up to 30 internal events in the relay with 1ms resolution. These events include setting changes and resets to the relay, binary input activity and other relay internal activities.

Definite-time overcurrent protection

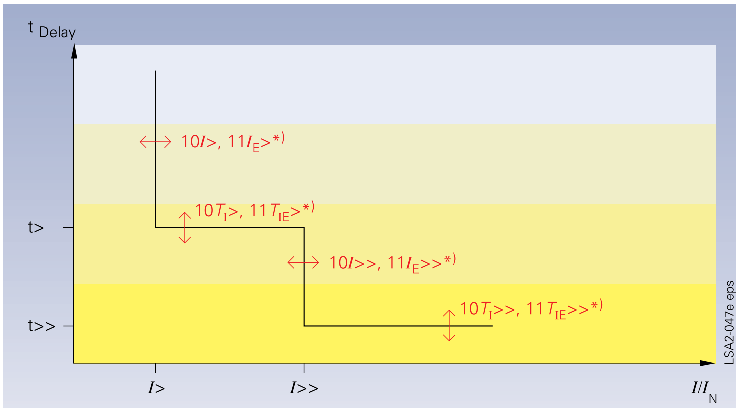

Fig. 4
Tripping characteristic of the definite-time overcurrent protection function $I>>$, $I>$, $I_E>>$, $I_E>$

The definite-time overcurrent function is based on phase-selective measurement of the three phase currents.

The earth (ground) current I_E (Gnd) is calculated from the three line currents I_{L1} (A), I_{L2}(B), and I_{L3}(C).
The definite-time overcurrent protection for the three phase currents has a low-set overcurrent element ($I>$) and a high-set overcurrent element ($I>>$). Intentional trip delays can be parameterized from 0.00 to 60.00 seconds for the low-set and high-set overcurrent elements.

Tripping characteristics of the inverse-time overcurrent function acc. to **IEC**

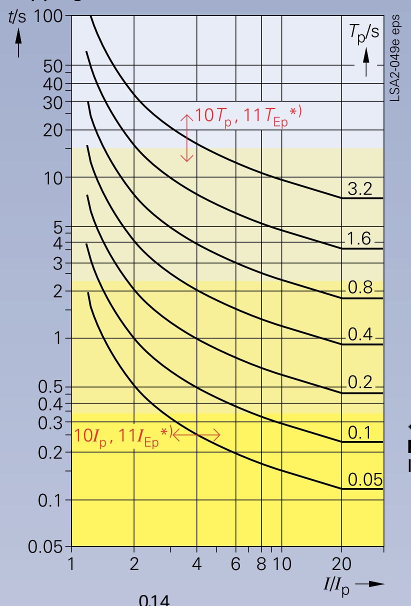

Fig. 5
Inverse

$$t = \frac{0.14}{(I/I_p)^{0.02} - 1} \cdot T_p$$

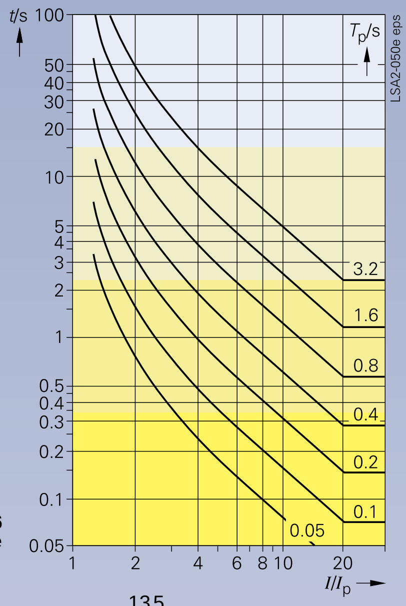

Fig. 6
Very inverse

$$t = \frac{13.5}{(I/I_p) - 1} \cdot T_p$$

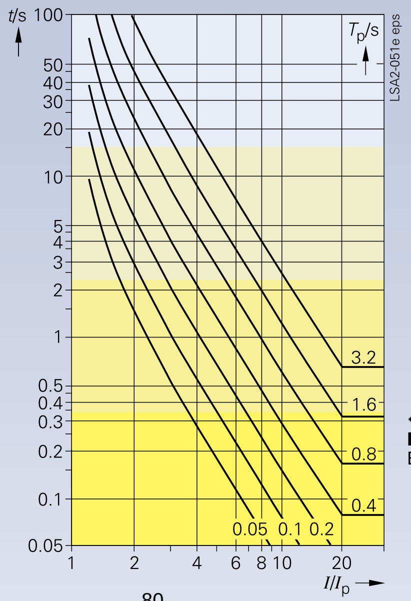

Fig. 7
Extremely inverse

$$t = \frac{80}{(I/I_p)^2 - 1} \cdot T_p$$

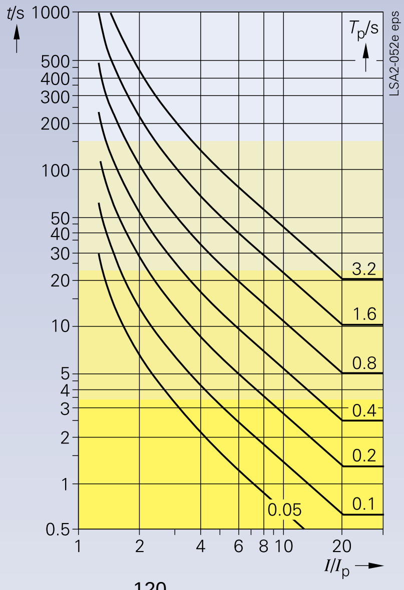

Fig. 8
Long inverse

$$t = \frac{120}{(I/I_p) - 1} \cdot T_p$$

With regard to the inverse-time overcurrent protection function (51), the tripping time depends on the magnitude of the current (see Figs. 5 to 8, 10 to 13, 15 to 18).
The following tripping characteristics are available:

Characteristic of the inverse-time overcurrent acc. to IEC 255-3

- inverse
- very inverse
- extremely inverse
- long inverse

- t = tripping time in s
- I = measured current
- I_P = pickup value 0.1 to 4 I/I_N
- T_p = time multiplier

Note for Figs.5 to 8:
Scope of I/I_p from 1.1 to 20

Tripping characteristic of definite-time overcurrent protection

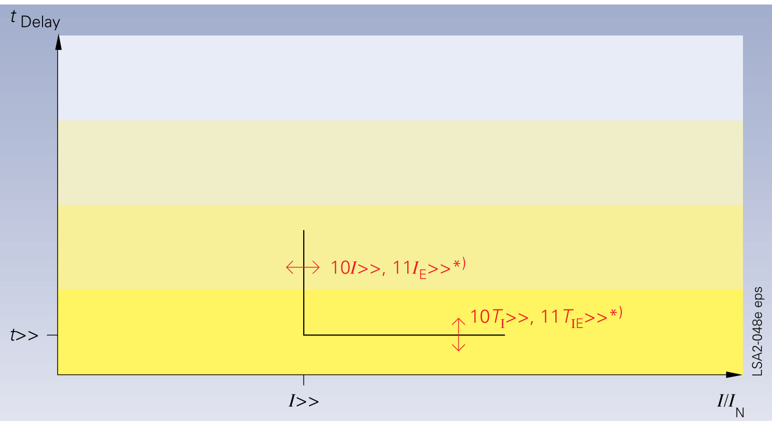

Fig. 9
Tripping characteristic of definite-time stage I>>, I_E>> (50)

*) Device parameter

Characteristic of inverse-time overcurrent protection acc. to **ANSI/IEEE**

- inverse
- short inverse
- long inverse
- moderately inverse
- very inverse
- extremely inverse
- definite inverse
- *I* squared *T*

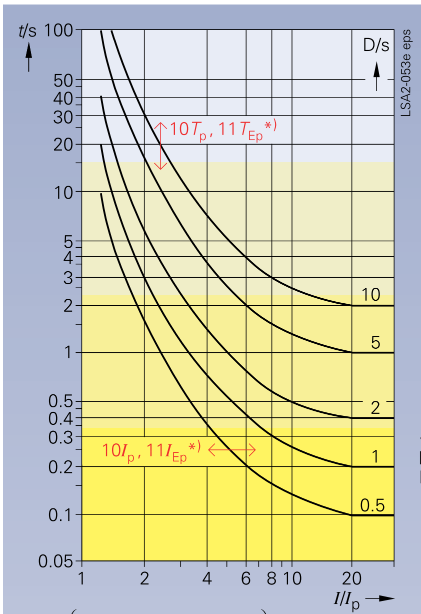

Fig. 10
Inverse

$$t = \left(\frac{8.9341}{(I/I_p)^{2.0938} - 1} + 0.17966 \right) \cdot D$$

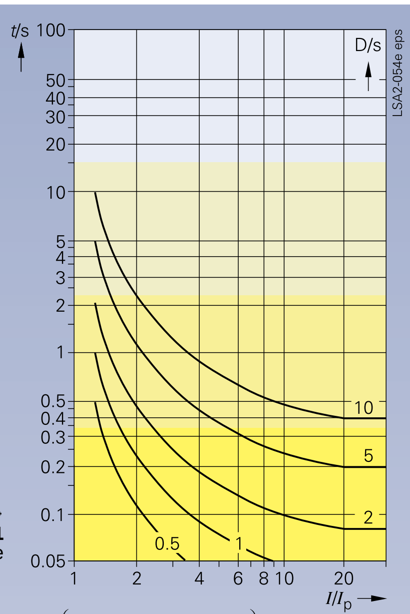

Fig. 11
Short inverse

$$t = \left(\frac{0.2663}{(I/I_p)^{1.2969} - 1} + 0.03393 \right) \cdot D$$

- t = tripping time in s
- I = measured current
- I_P = parameterizable pickup value 0.1 to 4 I/I_N
- D = time multiplier

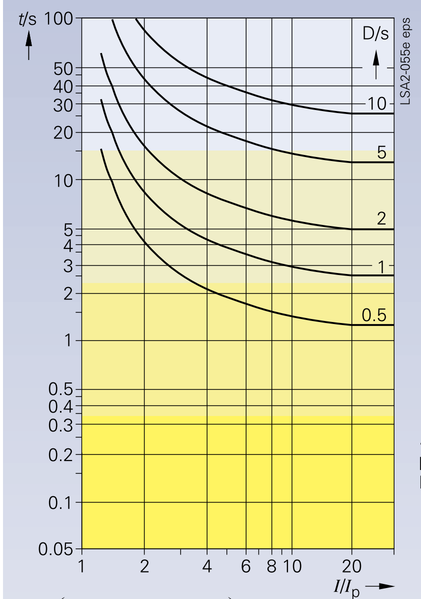

Fig. 12
Long inverse

$$t = \left(\frac{5.6143}{(I/I_p) - 1} + 2.18592 \right) \cdot D$$

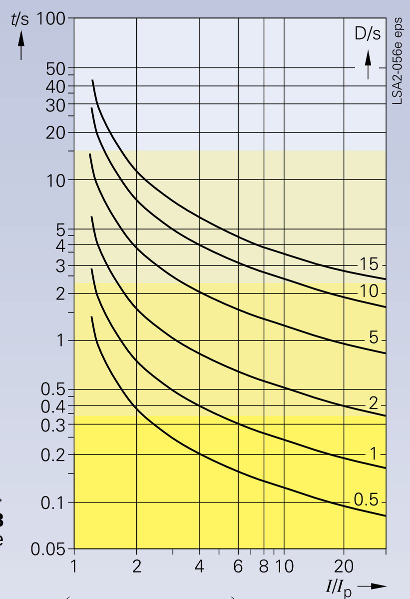

Fig. 13
Moderately inverse

$$t = \left(\frac{0.0103}{(I/I_p)^{0.02} - 1} + 0.0228 \right) \cdot D$$

Note for Figs. 10 to 12:
Scope of I/I_P from 1.1 to 20

Tripping characteristic of definite-time overcurrent protection

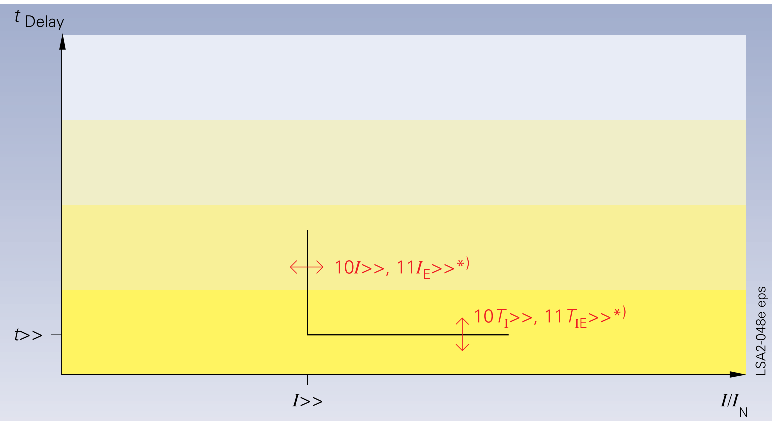

Fig.14
Tripping characteristic of definite-time stage
I>>, I_E>> (50)

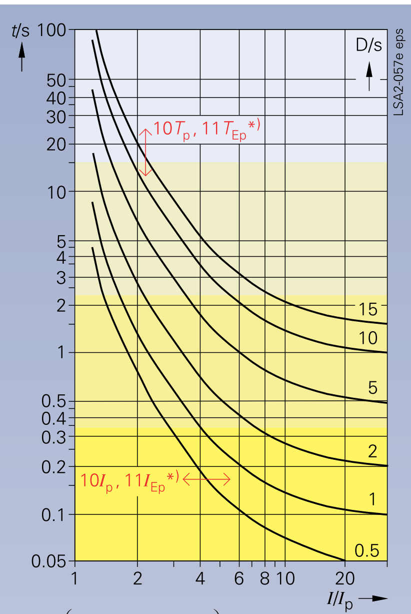

Fig. 15
Very inverse

$$t = \left(\frac{3.922}{(I/I_p)^2 - 1} + 0.0982\right) \cdot D$$

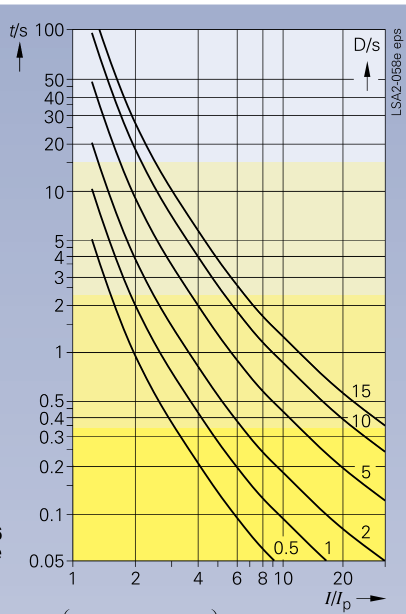

Fig. 16
Extremely inverse

$$t = \left(\frac{5.64}{(I/I_p)^2 - 1} + 0.0243\right) \cdot D$$

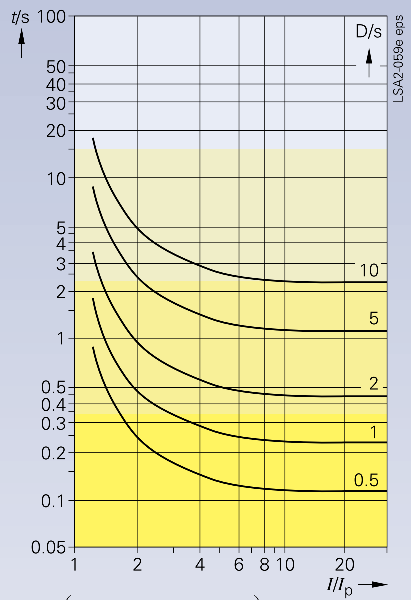

Fig. 17
Definite inverse

$$t = \left(\frac{0.4797}{(I/I_p)^{15625} - 1} + 0.21359\right) \cdot D$$

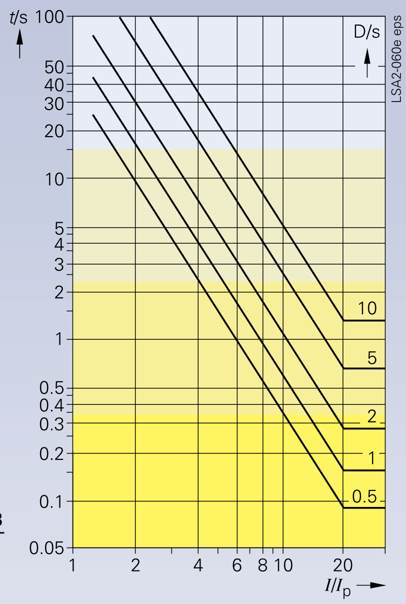

Fig. 18
I squared *T*

$$t = \left(\frac{50.7 \cdot D + 10.14}{(I/I_p)^2}\right)$$

Note for Fig. 18:
Scope of I/Ip from 1.1 to 20

*) Device parameter

SIPROTEC 7SJ601 (Version V2.1) Numerical Overcurrent Relay

Typical applications CT circuits

Busbar protection

(Reverse interlocking)

Reverse interlock principle involves the blocking of the high-speed overcurrent protection on the supply feeder, to the auxiliary bus, if any of the load feeder overcurrent relays are in pickup. If a fault is not present on any of the associated load feeders, the supply's high-speed overcurrent protection will not be blocked, providing reliable protection for bus faults.

In this manner, selective high-speed overcurrent relaying can be applied to the supply and load feeders to provide coordinated bus protection. The relays, through contact input and output interconnection, can discriminate and operate selectively for various types of faults and locations, tripping only the affected parts of the system.

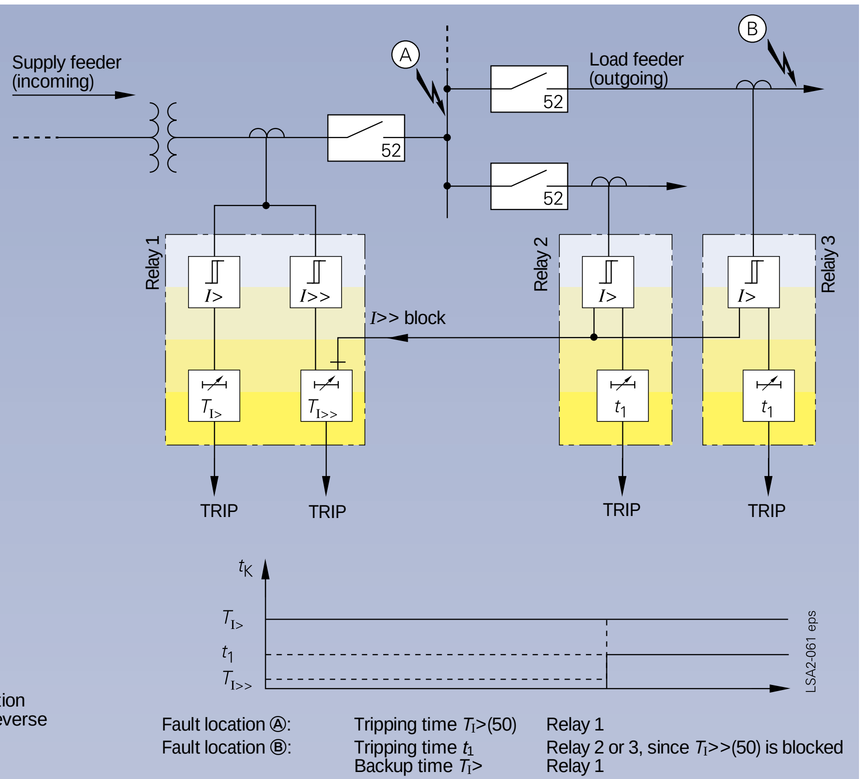

Fig. 19
Busbar protection by means of reverse interlocking

CT circuits

(standard connection)

- measured I_{L1} (A), I_{L2} (B), I_{L3} (C)
- calculated I_E (Gnd)

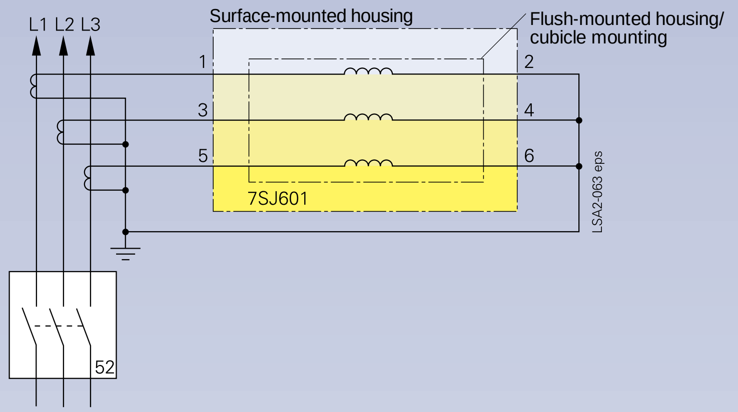

Fig. 20
Three CT circuit with measurement of the phase currents

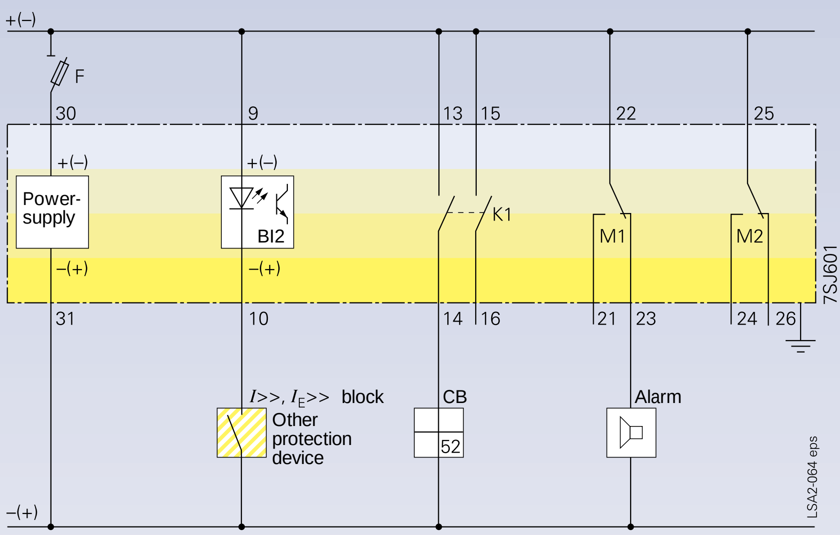

Fig. 21
Typical DC schematics

Scope of functions

Multiple applications

- Overhead line and cable protection
- Motor protection (short-circuit protection)
- Transformer protection (main or backup protection)
- Generator protection (backup protection)
- Busbar protection (reverse interlocking)
- Less wiring
- Reliable and available, internal hardware and software monitoring, current transformer monitoring, trip-circuit monitoring
- Reduced testing due to self diagnostics and numerical technology
- “Easy” commissioning
- Simplified parameterization

Additional functions

- Metering functions
  - currents
- Event (operational indications) recording
  - status indications
  - event log
  - fault log records

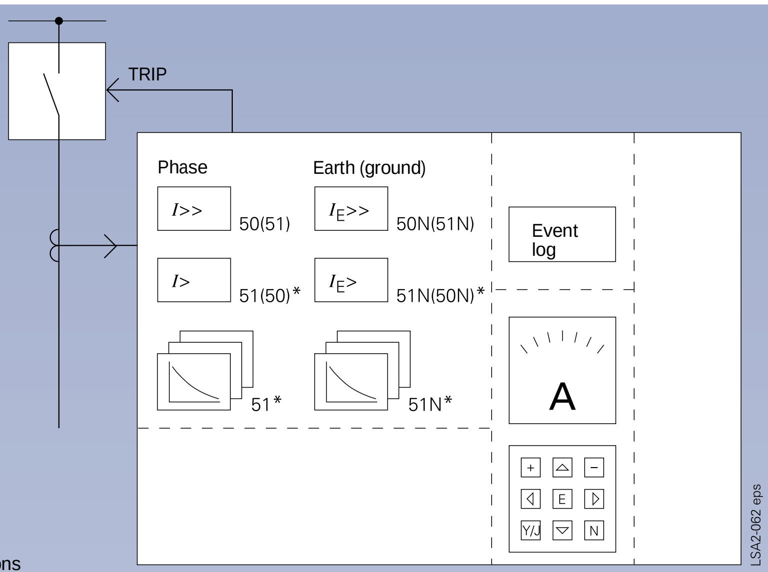

Fig. 22
Scope of functions

*) Options

SIPROTEC 7SJ601 (Version V2.1)
Numerical Overcurrent Relay

Technical data

CT circuits	Rated current I_N	1 A or 5 A
	Rated frequency f_N	50 Hz or 60 Hz
	Power consumption Current input at I_N = 1 A at I_N = 5 A	 < 0.1 VA < 0.2 VA
	Overload capability current path Thermal (rms)	 100 x I_N for ≤ 1s 30 x I_N for ≤ 10s 4 x I_N continuous
	Dynamic (pulse current)	250 x I_N one half cycle
Power supply via integrated DC/DC converter	Rated auxiliary voltage V_{aux}/permissible variations	24/48 V DC/19 to 58 V DC 60/110/125 V DC/48 to 150 V DC 220/250 V DC/176 to 300 V DC 115 V AC/88 to 133 V AC 230 V AC/176 to 265 V AC
	Superimposed AC voltage, peak to peak at rated voltage at limits of admissible voltage	 ≤ 12 % ≤ 6 %
	Power consumption Quiescent Energized	 Approx. 2 W Approx 4 W
	Bridging time during failure/ short-circuit of auxiliary voltage	≥ 50 ms at V_{rated} ≥ 110 V AC/DC ≥ 20 ms at V_{rated} ≥ 24 V DC
Heavy-duty (command) contacts	Command (trip) relays, number	1
	Contacts per relay	2 NO
	Switching capacity Make Break	 1000 W/ VA 30 W/ VA
	Switching voltage	250 V
	Permissible current Continuous For 0.5s	 5 A 30 A
Signal contacts	Signal/alarm relays	2
	Contacts per relay	1 CO
	Switching capacity Make Break	 1000 W/ VA 30 W/ VA
	Switching voltage	250 V
	Permissible current	5 A
Binary inputs	Number	1
	Operating voltage	24 to 250 V DC
	Current consumption, energized, independent of operating voltage	Approx: 2.5 mA
	Pick-up threshold, reconnectable by solder bridges Rated aux. voltage 24/48/60 V DC	 $V_{pick-up}$ ≥ 17 V DC $V_{drop-off}$ < 8 V DC
	110/125/220/250 V DC	$V_{pick-up}$ ≥ 74 V DC $V_{drop-off}$ < 45 V DC
Insulation tests	Standards	IEC 255-5, ANSI/IEEE C37.90.0
	High-voltage test (routine test) Except DC voltage supply input and RS485 Only DC voltage supply input and RS485	 2 kV (rms), 50 Hz 2.8 kV DC
	Impulse voltage test (type test) all circuits, class III	5 kV (peak), 1.2/50 µs, 0.5 J; 3 positive and 3 negative shots at intervals of 5 s

EMC tests, immunity (type tests)	Standards	IEC 255-6; IEC 255-22 (product standard) EN 50082-2 (generic standard), DIN VDE 0435 Part 303
	High frequency IEC 255-22-1, class III and DIN VDE 0435 Part 303, class III	2.5 kV (peak), 1 MHz, τ=15 µs, 400 shots/s, duration 2 s
	Electrostatic discharge IEC 255-22-2, class III and EN 61000-4-2, class III	4 kV/6 kV contact discharge, 8 kV air discharge, both polarities, 150 pF, R_i=330 Ω
	Radio-frequency electromagnetic field	
	Non-modulated, IEC 255-22-3 (report), class III	10 V/m, 27 MHz to 500 MHz
	Amplitude modulated, IEC 1000-4-3, class III	10 V/m, 80 MHz to 1000 MHz, 80% AM, 1 kHz
	Pulse modulated, IEC1000-4-3/ENV 50204, class III	10 V/m, 900 MHz, repetition frequency 200 Hz, duty cycle 50%
	Fast transients IEC 255-22-4 and IEC 61000-4-4, class III	2 kV, 5/50 ns, 5 kHz, burst length 15 ms, repetition rate 300 ms, both polarities, R_i = 50Ω, duration 1 min
	Conducted disturbances induced by radio-frequency fields, amplitude modulated IEC 1000-4-6, class III	10 V, 150 kHz to 80 MHz, 80% AM, 1 kHz
	Power frequency magnetic field IEC 1000-4-8, class IV IEC 256-6	30 A/m continuous, 50 Hz 300 A/m for 3 s, 50 Hz 0.5 mT; 50 Hz
	Oscillatory surge withstand capability ANSI/IEEE C37.90.1 (common mode)	2.5 kV to 3 kV (peak), 1 MHz to 1.5 MHz, decaying oscillation,50 shots per s, duration 2 s, R_i = 150 Ω to 200 Ω
	Fast transient surge withstand capability ANSI/IEEE C37.90.1 (commom mode)	4 kV to 5 kV, 10/150 ns, 50 shots per s, both polarities, duration 2 s, R_i = 80 Ω
	Radiated electromagnetic interference ANSI/IEEE C37.90.2	10 V/m to 20 V/m, 25 MHz to 1000 MHz, amplitude and pulse modulated
	High frequency test Document 17C (SEC) 102	2.5 kV (peak, alternating polarity), 100 kHz, 1 MHz, 10 MHz and 50 MHz, decaying oscillation,R_i = 50 Ω
EMC tests, emission (type tests)	Standard	EN 50081-* (generic standard)
	Conducted interference voltage, aux. voltage CISPR 22, EN 55022, DIN VDE 0878 Part 22, limit value class B	150 kHz to 30 MHz
	Interference field strength CISPR 11, EN 55011, DIN VDE 0875 Part 11, limit value class A	30 MHz to 1000 MHz
Mechanical stress tests Vibration and shock during operation	Standards	Acc. to IEC 255-21and IEC 68-2
	Vibration IEC 255-21-1, class1 IEC 68-2-6	Sinusoidal 10 Hz to 60 Hz: ± 0.035 mm amplitude, 60 Hz to 150 Hz: 0.5 *g* acceleration Sweep rate 1 octave/min 20 cycles in 3 orthogonal axes
	Shock IEC 255-21-2, class 1	Half sine, acceleration 5 *g*, duration 11 ms, 3 shocks in each direction of 3 orthogonal axes
	Seismic vibration IEC 255-21-3, class 1 IEC 68-3-3	Sinusoidal 1 Hz to 8Hz: ± 3.5 mm amplitude (horizontal axis) 1 Hz to 8 Hz: ± 1.5 mm amplitude (vertical axis) 8 Hz to 35 Hz: 1 *g* acceleration (horizontal axis) 8 Hz to 35 Hz: 0.5 *g* acceleration (vertical axis) Sweep rate 1 octave/min 1 cycle in 3 orthogonal axes
Vibration and shock during transport	Vibration IEC 255-21-1, class 2 IEC 68-2-6	Sinusoidal 5 Hz to 8 Hz: ± 7.5 mm amplitude; 8Hz to 150 Hz: 2 *g* acceleration Sweep rate 1 octave/min 20 cycles in 3 orthogonal axes
	Shock IEC 255-21-2, class 1 IEC 68-2-27	Half sine, acceleration 15 *g*, duration 11 ms, 3 shocks in each direction of 3 orthogonal axes
	Continuous shock IEC 255-21-2, class 1, IEC 68-2-27	Half sine, acceleration 10 *g* duration 16 ms, 1000 shocks in each direction of 3 orthogonal axes

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Technical data

Climatic stress tests

Recommended temperature during service	- 5° C to + 55° C (25° F to 131° F), > 55° C (131° F) decreased display contrast
Permissible temperature during service during storage during transport (Storage and transport with standard works packaging)	 - 20° C to + 70° C (- 4° F to 158° F) - 25° C to + 55° C (-13° F to 131° F) - 25° C to + 70° C (- 13° F to 158° F)
Permissible humidity	Mean value per year ≤ 75% relative humidity, on 30 days per year 95%relative humidity, condensation not permissible

We recommend to arrange the devices in such a way that they are kept from direct sun and from changes in temperature that might induce condensation.

Design

Housing 7XP20	For dimensions refer to dimension drawings pages 14 and 15
Weight Flush mounting /cubicle mounting Surface mounting	 Approx. 4 kg Approx. 4.5 kg
Degree of protection acc. to EN 60529 Housing Terminals	 IP51 IP21

Definite-time overcurrent protection (50, 50N)

Setting range/steps Overcurrent pick-up phase $I>$ earth $I_E>$ phase $I>>$ earth $I_E>>$	 I/I_N = 0.1 to 25.0 (steps 0.1), or ∞ = 0.1 to 25.0 (steps0.1), or ∞ I/I_N = 0.1 to 25.0 (steps 0.1, or ∞ = 0.1 to 25.0 (steps 0.1), or ∞
Delay times T for $I>$, $I_E>$, $I>>$ and $I_E>>$ The set times are pure delay times	 0.00 s to 60.00 s (steps 0.01 s)
Pick-up times $I>$, $I>>$, $I_E>$, $I_E>>$ at 2 x setting value, without meas. repetition at 2 x setting value, with meas. repetition	 Approx. 35 ms Approx. 55 ms
Reset times $I>$, $I>>$, $I_E>$, $I_E>>$	 Approx. 65 ms at 50 Hz Approx. 95 ms at 60 Hz
Reset ratios	Approx. 0.95
Overshot time	Approx. 55 ms
Tolerances Pick-up values $I>$, $I>>$, $I_E>$, $I_E>>$ Delay times T	 5% of setting value 1% of setting value or 10 ms
Influence variables Auxiliary voltage in range $0.8 \leq V_{aux}/V_{auxN} \leq 1.2$ Temperature in range $0° C \leq \Theta_{amb} \leq 40° C$ $(32° F \leq \Theta_{amb} \leq 104° F)$ Frequency in range $0.98 \leq f/f_N \leq 1.02$ Frequency in range $0.95 \leq f/f_N \leq 1.05$ Harmonics up to 10% of 3rd harmonic up to 10% of 5th harmonic	 ≤ 1 % ≤ 0.5 % / 10 K ≤ 1,5 % ≤ 2,5 % ≤ 1 % ≤ 1 %

Inverse-time overcurrent protection (51/51N)

Setting range/steps	
Overcurrent pick-up phase I_p earth I_{Ep}	I/I_N = 0.1 to 4.0 (steps 0.1) = 0.1 to 4.0 (steps 0.1)
Time multiplier for I_p, I_{Ep} (IEC characteristic) (ANSI characteristic)	T_p 0.05 to 3.20 s D 0.5 to 15.0 s
Overcurrent pick-up phase $I>>$ earth $I_E>>$	I/I_N = 0.1 to 25.0 (steps 0.1), or ∞ I/I_N = 0.1 to 25.0 (steps 0.1), or ∞
Delay time T for $I>>$, $I_E>>$ Tripping characteristics acc. to IEC Pick-up threshold Drop-off threshold Drop-off time	0.00 s to 60.00 s (steps 0.01 s) see page 3 Approx. 1.1 x I_p Approx. 1.03 x I_p Approx. 50 ms at 50 Hz Approx. 60 ms at 60 Hz
Tolerances Pick-up values Delay time for $2 \leq I/I_p \leq 20$ and $0.5 \leq I/I_N \leq 24$	 5% 5% of theoretical value ± 2% current tolerance; at least 30 ms

Inverse-time overcurrent protection (51/51N) (cont'd)

Influence variables	
Auxiliary voltage in range	
$0.8 \leq V_{aux}/V_{auxN} \leq 1.2$	≤ 1 %
Temperature in range	
-5° C ≤ Θ_{amb} ≤ + 40° C	≤ 0,5 % / 10 K
-32° F ≤ Θ_{amb} ≤ + 104° F	
Frequency in range	
$0.95 \leq f/f_N \leq 1.05$	≤ 8 % referred to theoretical time value
Tripping characteristic acc. to ANSI/IEEE	see pages 4 and 5
Pick-up threshold	Approx. 1.06 x I_p
Drop-off threshold	Approx. 1.01 x I_p
Tolerances	
Pick-up thresholds	5 %
Delay time	5% of theoretical value ± 2 % of current tolerance at least 30 ms
Influence variables	
Auxiliary voltage in range	
$0.8 \leq V_{aux}/V_{auxN} \leq 1.2$	≤ 1 %
Temperature in range	
0° C ≤ Θ_{amb} ≤ + 40° C	≤ 0,5 % / 10 K
-32° F ≤ Θ_{amb} ≤ + 104° F	
Frequency in range	
$0.95 \leq f/f_N \leq 1.05$	≤ 8 % referred to theoretical time value

Additional functions

Operational value measurements	
Operational current values	I_{L1}, I_{L2}, I_{L3}
Measurement range	0% to 240% I_N
Tolerance	3% of rated or measured value
Fault event data storage	Storage of annunciations of the last 3 faults
Time assignment	
Resolution for operational annunciations	1 s
Resolution for fault event annunciations	1 ms
Max. time deviation	0.01 %

CE-conformity, regulations

The product meets the stipulations of the guideline of the council of the European Communities for harmonization of the legal requirements of the member states on electro-magnetic compatibility (EMC guideline 89/336/EEC).
The product conforms with the international standard of the IEC 255 series and the German national standard DIN VDE 57 435,Part 303.The unit has been developed and manufactured for use in industrial areas in accordance with the EMC standard. The unit has not been designed for use in living quarters as defined in standard EN 50081.
This conformity is the result of a test that was performed by Siemens AG in accordance with article 10 of the guideline and the EN 50081-2 and EN 50082-2 basic specifications.

SIPROTEC 7SJ601 (Version V2.1) Numerical Overcurrent Relay

Selection and ordering data

Designation	Order No.
7SJ601 numerical overcurrent relay	**7SJ601□ – □□A□□ – 0□A0**
<u>Rated current</u>	
1 A	**1**
5 A	**5**
<u>Rated auxiliary voltage for integrated converter</u>	
DC 24, 48 V	**2**
DC 60, 110, 125 V	**4**
DC 220, 250, AC 115 V	**5**
AC 230 V	**6**
<u>Housing</u>	
with 7XP20 housing	
Surface mounting, terminals on the side	**B**
Flush mounting/cubicle mounting	**E**
<u>Language</u>	
English	**0**
German	**1**
Spanish	**2**
French	**3**
<u>Rated frequency</u>	
50 Hz	**0**
60 Hz	**1**
<u>Tripping characteristics</u>	
Definite Time I>>, I>, I_E>>, I_E>	**U**
Definite/Inverse I>>, I_p, I_E>>, I_{Ep} (IEC)	**J**
Definite/Inverse I>>, I_p, I_E>>, I_{Ep} (ANSI)	**A**

<u>In addition we offer:</u>

SIPROTEC 7SJ600,
Functionality of SIPROTEC 7SJ601 plus

- Overload protection
- Negativ sequence protection
- Fault recording
- Additional event logs
- 2 additional binary inputs
- 1 additional trip relay
- RS485 port
- Operating and analysis software

See Catalog LSA 2.1.15, Order N°.: E50001-K5712-A251-A1-7600

Circuit diagram

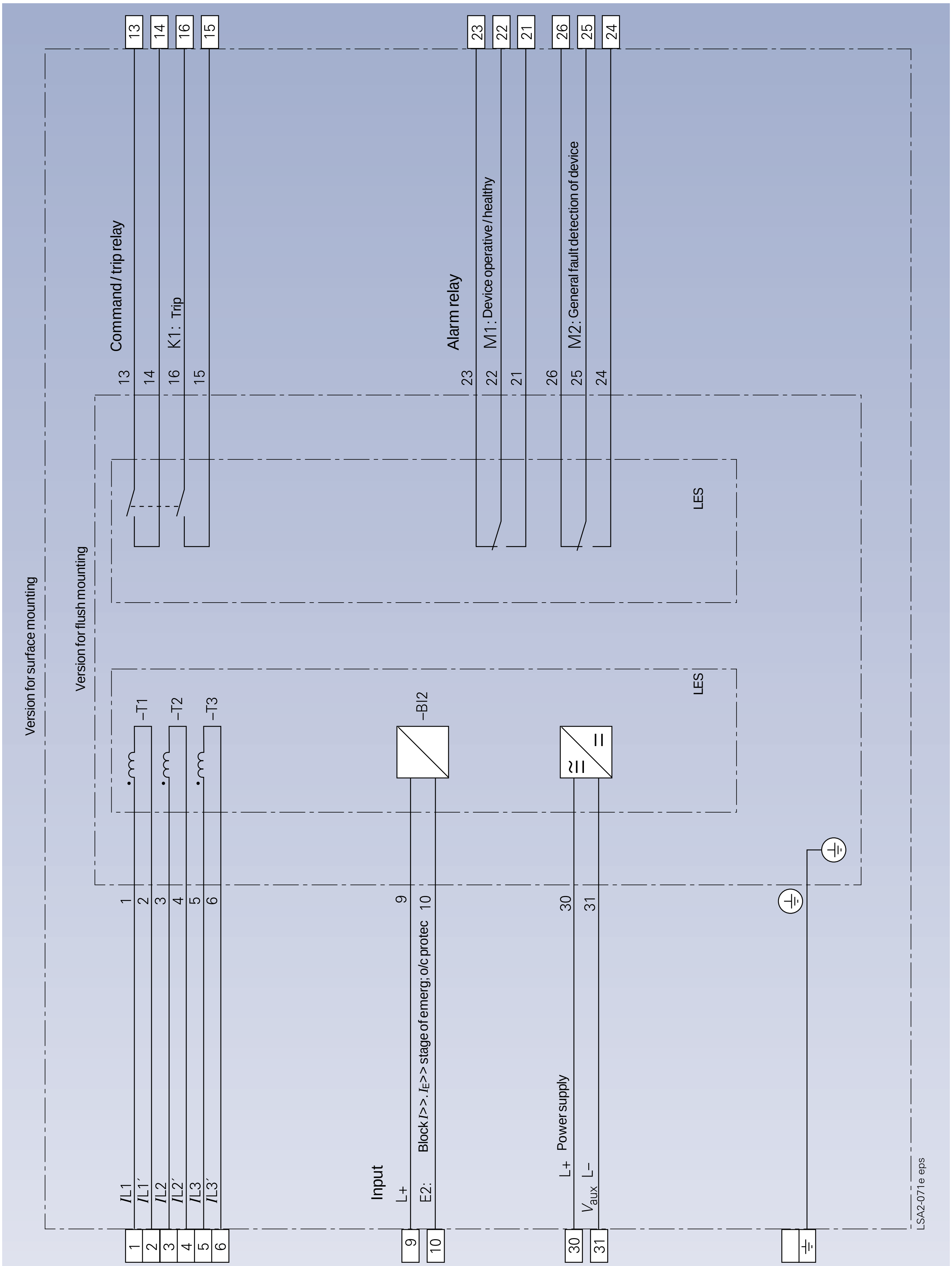


Fig. 23
Connection circuit diagramm for the 7SJ601 numerical overcurrent relay

SIPROTEC 7SJ601 (Version V2.1)
Numerical Overcurrent Relay

Dimension drawings in mm (inch)

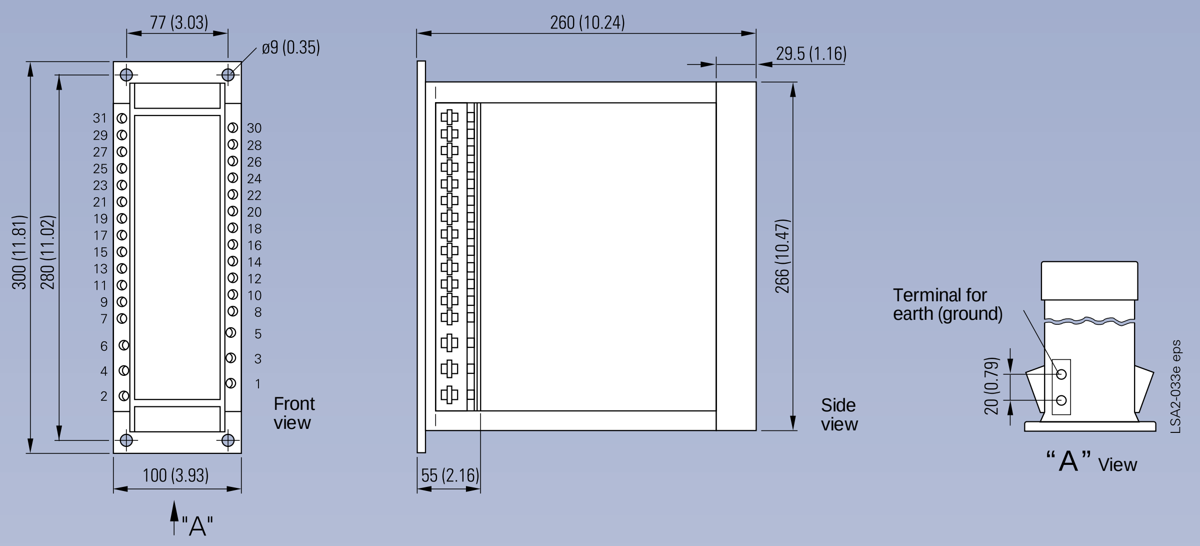


Fig. 24
7SJ601 with 7XP20 housing
for panel surface mounting
terminals on the side

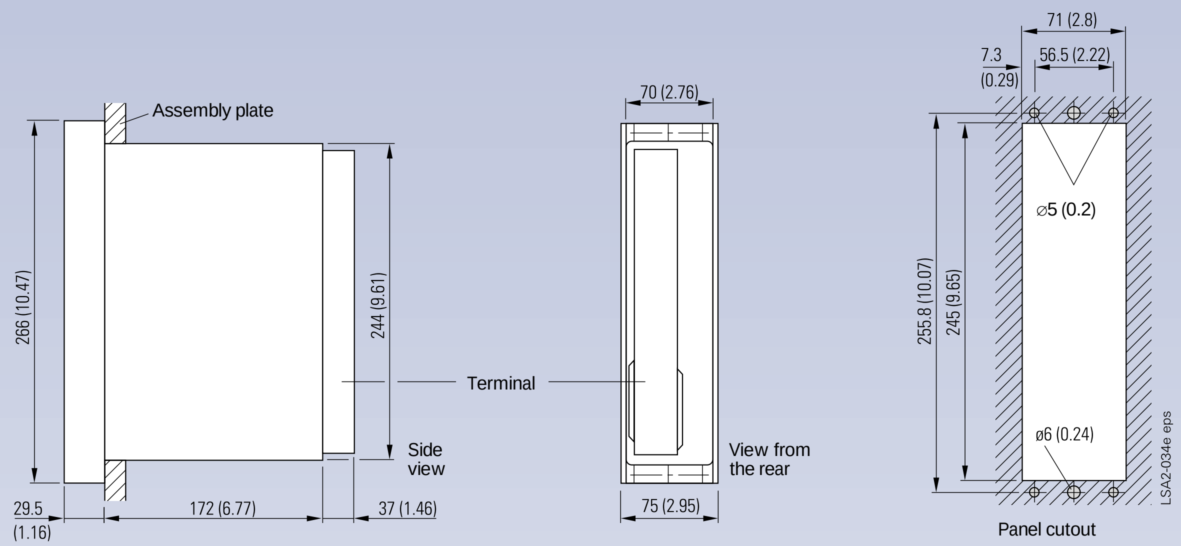
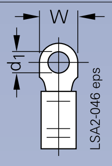


Fig. 25
7SJ601 with 7XP20 housing
for flush mounting /cubicle mounting,
terminals on the rear

Terminals



	Wire size	Fittings	Order No. (manufacturer)	Order No. (Siemens)
Contacts 1 to 6				
Ring-cable lugs	Crimp spring contacts[1)] from Grote & Hartmann (type DFK 2)			
d_1 = 6 mm (0.24 in)	0.5 to 1 mm^2 one-sided locating spring	3000 Stck.	26456.331.042	W53073-A2508-C1
$W_{max.}$ = 13 mm (0.51 in)	1.5 to 2.5 mm^2 one-sided locating spring	2500 Stck.	26457.331.042	W53073-A2509-C1
Wire size 2.7 to 6.6 mm^2 (AWG 12 to 10)	2.5 to 4 mm^2 double-sided locating spring	2000 Stck.	26473.331.042	W53073-A2510-C1
Voltage contacts 7 to 31				
Ring-cable lugs	Crimp spring contacts[1)] from Weidmüller			
d_1 = 4 mm (0.2 in)	0.5 to 1mm ^{2}	3000 Stck.	162 552	W73073-A2502-C1
	1.5 to 2.5 mm^2	2500 Stck.	162 550	W73073-A2503-C1
$W_{max.}$ = 9 mm (0.36 in)				
Wire size 1 to 2.6 mm^2 (AWG 16 to 14)				

1) only for panel flush mounting

Conditions of Sale and Delivery
Export Regulations, Trademarks, Dimensions

Conditions of Sale and Delivery

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■

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