

Description

The SVS09 power distribution system with integral signalling module optimises DC 24 V distribution at the machine-oriented field level in automated process control, production plants and power plants. Offering 10-plug-in sockets for electronic and thermal-magnetic circuit breakers and an integrated alarm handling function for single and group signalisation, the SVS09 distribution board can be cascaded on the master-slave principle to meet specific requirements. This cascading allows transducers, actuators, valves, distributed PLCs, intelligent terminals etc. to be clustered into distinct function groups and to be conveniently incorporated into the plant's overall alarm monitoring scheme. Particularly for applications with a great number of sensors/actuators, the SVS09 offers possibilities for cost- and space-saving in the design of control cabinets.

Each load circuit that is interrupted by an overload or short circuit trip always generates a single alarm. In addition, a group alarm for the entire SVS09 cascade is induced which will be acknowledged by means of a command element (momentary switch, relay, PLC) either locally in the control cabinet or remotely in the control room. Acknowledging the group alarm immediately reactivates the group signalling function of the SVS09 cascade remobilising it for new incoming short-circuit or overload messages.

The power distribution system SVS09 is mounted on a symmetrical rail and accommodates 10 electronic or thermal-magnetic circuit breakers. All terminals (line entry DC +24 V, GND (-) for self-supply, load outputs L(+), signalling and acknowledgment) are spring-loaded terminals.

Suitable for the following E-T-A circuit breaker types:

electronic circuit breaker	ESS20-003..
electronic circuit protector	ESX10-103..
thermal-magnetic circuit breakers	2210-S211 (also with intermediate position)
	3600-P10, 3900-P10

Features and benefits

- integral distribution, protection and signalling functions
- power distribution and selective protection of DC 24 V load circuits from one source
- single signalling with manual reset on the protective device
- group signalling and acknowledgement by means of momentary switch/signal (local/remote)
- ease of signalling integration into signal concept of the entire system
- cascading of several SVS09 systems on the master-slave principle
- ease of configuration with wire bridges on the master SVS09

Ordering information

Type No.

SVS09 power distribution system for ESS20-003, ESX10-103, 2210-S211, 3600-P10, 3900-P10

- for short circuit limited DC 24 V applications
- max. continuous load per SVS09 system: 30 A
- max. continuous load per load output: 4 A

Version

max. number of circuit breakers on the power distribution system

10 10 circuit breakers (F1...F10)

Assembly version, load output

C10 standard: completely fitted with spring-loaded terminals (max. 1.5 mm², without wire end ferrule)

C20 option: completely fitted with screw terminals (max. 1,5 mm², without wire end ferrule)

SVS09 - 10 - C10 ordering example

Accessory: signalling module SIGMO-09-1xx, see Accessories



SVS09-10-C10

Technical data (T_{amb} = 25 °C, U_S = DC 24 V)

Application

modular power distribution system for short circuit limited DC 24 V applications

Line entry

rated voltage DC 24 V (19...28 V)
residual ripple 5 % max.
total current max. 30 A
DC 24 V (+) = X 21:1+, X21:2+
GND (-) = X 22:4-, X22:3-
(for self-supply of circuit breakers)

F positions

10 ways for circuit breakers, suitable for types ESS20-003, ESX10-103, 2210-S211, 3600-P10, 3900-P10
SVS09-10 / 10-way / F1...F10
load output / way terminal block X24

Load outputs per position

rated voltage: DC 24 V (19...28 V)
current: max. 4 A¹⁾
number: 1 protected load output L(+) via circuit breaker (Fx)

Single signalisation²⁾

10 x single signalisation for 10 x F(x)
terminal block X23, contacts 30-40, 31-41, 32-42, ...
potential-free make contacts (N/O)
error indication: contact open
OK indication: contact closed
Empty way: contact closed
reset: manually on plugged-in circuit breaker

Group signalisation²⁾

1 x group signalisation pro SVS09-cascade (1 master + 5 slaves)
terminal block master X22, contact 13-23,
potential-free contact
error indication: contact closed
OK indication: contact open
configuration as Local/Remote-group signal

Acknowledgment of group signalisation¹⁾

1 x acknowledgment instruction per SVS09-cascade (1 master + 5 slaves) acknowledgment only on the master
terminal block master X22, contact 10-11,
terminal potential-free break contact (N/C) or bridge with bridge: master, acknowledgment locally, momentary switch on SVS09 (module SIGMO)
break contact N/C: master, acknowledgment locally and remote (momentary switch, relay, external PLC)

1) When mounted side-by-side or fully fitted with thermal-magnetic circuit breaker types 2210, 3600 or 3900, each breaker should only carry 80 % of its rating or a higher rating should be chosen.

2) For failure signalisation and for cascading functions on the master-slave principle the plug-in type signalisation module SIGMO-09-1xx is required. See accessories.

Technical data (T_{amb} = 25 °C, U_S = DC 24 V)

Configuration master/slave and group signal¹⁾

configuration of master/slave functions of a SVS09-cascade on the master SVS09 via bridges ³⁾ on terminal block X22	
X22: 20-21	master/slave-marking: with bridge = master without bridge = slave
X22: 13-23	group signal locally/remote pre-adjustment = only locally, LED on master-SVS09 terminal of external indication element = locally and remote
X22: 10-11	acknowledgment of group signal locally/remote with bridge = master, acknowledgment locally with break contact = master, acknowledgment locally and remote without bridge = slave, no acknowledgment

Cascading several SVS09 systems

cascading possible with 1 x master M and max. 5 slaves S1...S5	
Loop through the following 4 lines:	
24 V (+) supply voltage	M-X21:2+ → S1-X21:1+ → S1-X21:2+ → S2-X21:1+...
GND (-) self-supply circuit breaker/signalisation	M-X22:3- → S1-X22:4- → S1-X22:3- → S2-X22:4-...
S (+) group signalisation (+)	M-X22:12 → S1-X22:11 → S1-X22:12 → S2-X22:11...
S (-) group signalisation (-)	M-X22:22 → S1-X22:21 → S1-X22:22 → S2-X22:21...

Termination

C10	pcb spring-loaded terminals (standard) line entry DC 24 V on terminal block X21 line (+) terminals 1+ und 2+, connection capability (cable cross section) with and without wire end ferrule 0.25 - 10 mm ² stripped length 12 mm
	configuration, GND (-) (self-supply) and group signal on terminal block X22 5x double level terminal block
	single signalisation on terminal block X23 10x double level terminal block
	load outputs on terminal block X24 5x double level terminal block connection capability (cable cross section) with and without wire end ferrule 0.25 - 1.5 mm ² stripped length 7 mm
	plug-in type signalisation module SIGMO-09-1xx 50-pole Card Edge socket board
C20	pcb screw terminals (option)

General data

- Mounting: symmetrical rail to EN 50022 - 35 x 7.5
- Temperature range: 0...50 °C (without condensation)
- Storage temperature: -20...+70 °
- Housing material: plastic
- Protection class

terminals	IP20 DIN 40050
pcb	IP00 DIN 40050 (double-lacquered)
- Insulation voltage: DC 250 V (pcb)
- Dimensions: see drawings
(tolerances to DIN ISO 286 part 1 IT13)
- Mass: SVS09-10 approx. 380 g

2) The plug-in type signalisation module SIGMO-09-1xx is required for failure signalisation and for the cascading functions on the master/slave principle. See accessories.

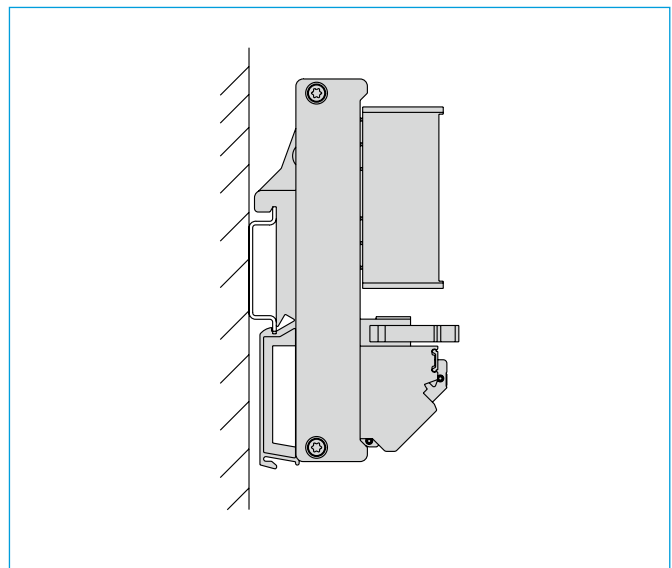
3) The SVS09 power distribution system is supplied without wire bridges and can thus be integrated into existing SVS09 cascade as a slave unit without further configuration.

The user inserts wire bridges on terminal block X22 of the master.

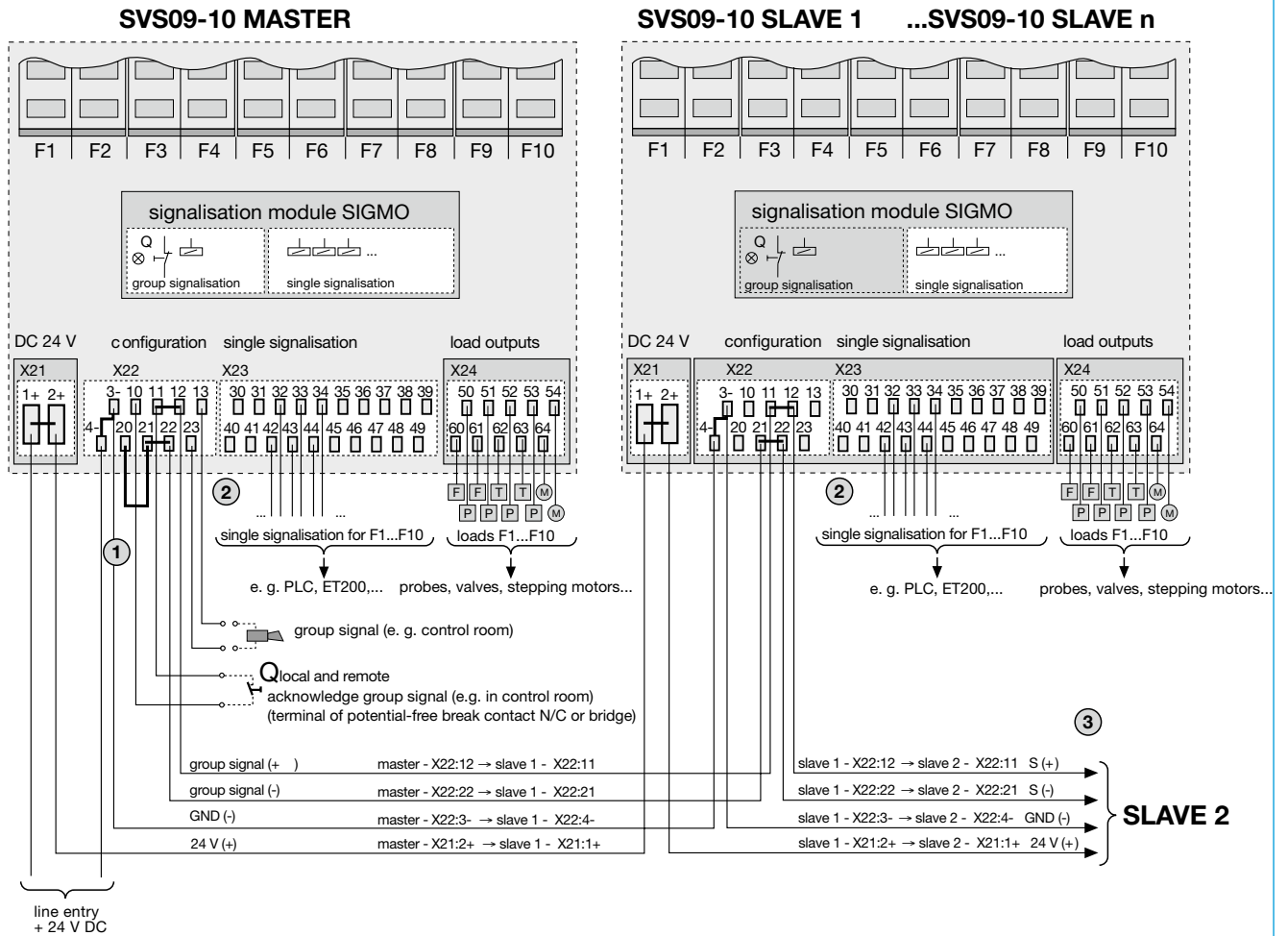
Reference notes:

- The power distribution system must be installed by qualified personnel only.
- Only after expert installation may the assembly be connected to a power supply.
- The assembly is only suitable for use at safety extra-low voltage (DC 24 V).
- Connection to higher or not reliably disconnected voltages may be hazardous or cause damage.
- The max. total current of the SVS09 system must not be exceeded.
- In each load circuit the cable cross sections and the current rating of the protective device must be selected according to the rating of the connected load.
- The technical data of the circuit breakers used must be observed.
- According to "Machinery Directive 98/37/EG and EN 60204-1, Machine Safety" special precautions have to be taken in machinery (e. g. use of a safety PLC) to prevent inadvertent start-up of machinery parts. In the event of a failure (short circuit/overload) the load circuit will be disconnected by the circuit breaker.
- After tripping of the circuit breaker and before reset the cause of tripping (short circuit or overload) must be remedied.
- The international standards (e. g. DIN VDE 0100 for Germany) must be observed with respect to installation and selection of cables.

Mounting position



Power distribution system with overcurrent protection and integral signalling logic



1 Configuration master / slave

terminal block X22

X22 20-21 master / slave marking
with bridge: master
without bridge: slave: (factory setting)

X22 10-11 acknowledgment of group signalisation
with bridge: = master: acknowledgment locally
break contact N/C: = master: acknowledgment locally + remote (momentary switch, PLC ...external)
without bridge: = slave: (no acknowledgment on slave (factory setting))

2 Fault signalisation

single signal: terminal block X23
terminals 30-40, 31-41, 32-42, 33-43, 34-44, 35-45, 36-46, ...
potential-free contact
fault: contact open
OK: contact closed
empty way: contact closed

group signal: terminal block X22
locally LED on master
remote terminals 13-23, potential-free contact
fault: contact closed
OK: contact open

3 Cascading

master → slave 1 → ... slave n

loop-through of 4 lines

24 V (+) LINE (supply voltage)
M-X21:2+ → S1-X21:1+ X21:2+ → S2-X21:1+ X21:2+ → S3 ...
S (+) group signalisation (+)
M-X22:12 → S1-X22:11 X22:12 → S2-X22:11 X22:11 → S3...
S (-) group signalisation (-)
M-X22:22 → S1-X22:21 X22:22 → S2-X22:21 X22:22 → S3 ...
GND (-) self-supply circuit breaker / plug-in type SIGMO module
M-X22:3- → S1-X22:4- X22:3- → S2-X22:4- X22:3- → S3 ...

Configuration instruction

General information

- Application individually (1 SVS09-10 as master) or as cascade (1 master + max. 5 slaves)
- Any configuration with wire bridges will **only** be done on the master.
- The minimum configuration with a master and local signalisation and acknowledgment directly on the SVS09 power distribution system requires wiring of two bridges: X22:20-21 for master identification and X22:10-11 for group acknowledgment.
- Configuration of a cascade is always carried out **only** on the master with cascades consisting of several SVS09 mounted side-by-side. No adjustments are required on the slaves.
- Devices for status indication and acknowledgment for external signalisation must be connected only to the master. Should several external display elements be required (e. g. LED, acoustic signal), these must also be connected only to the corresponding signal outputs of the master.
- Unused slots do not have to be bridged, they have no influence on the signalisation of the installed circuit breakers. Unused slots forward to OK indication to the signalisation outputs.
- The SVS09 power distribution system invariably requires a plugged-in signalisation module SIGMO-09-xxx (on separate order).

Individual application

Minimal configuration: 1 master with local group signalisation and acknowledgment

step	configuration
1	mounting: mount SVS09 on the symmetrical rail
2	connect DC +24 V (+) supply: on terminal block DC 24 V, +24 V to terminal 1+
3	connect GND (-) supply: ¹⁾ on terminal block X22, GND (-) to terminal 4-
4	master identification: bridge terminals 20-21 on terminal block X22
5	group signal locally: pre-adjustment. In the event of group failure the red LED is always lighted (only) on the master.
6	group acknowledgment locally: bridge terminals 10-11 on terminal block X22 acknowledgment manually with red momentary switch on SVS09 (module SIGMO)
7	single signalisation: connect single signalisation for F1 through F10 on terminal block X23, F1: terminals 30-40, F2: terminals 31-41, F3: terminals 32-42 ... F10: terminals 39-49 signal: potential-free contact: fault = contact open, OK = contact closed, empty way: contact closed
8	loads: on terminal block X24: connect loads to be protected to terminals 50 through 64

1 master with local and external (remote) group signalisation and acknowledgment

step	configuration
1	mounting: mount SVS09 on the symmetrical rail
2	DC +24 V (+) supply: on terminal block DC 24 V, connect +24 V to terminal 1+
3	GND (-) supply: ¹⁾ on terminal block X22, connect GND (-) to terminal 4-
4	master identification: bridge terminals 20-21 on terminal block X22
5	group signal locally and remote: on terminal block X22, connect to external display element to terminals 13-23 (e.g. LED, relay, acoustic signal). In addition the red LED is always lighted on the master with group signal signal: potential-free contact: fault = contact closed, OK = contact open
6	group acknowledgment locally or remote: on terminal block X22, connect a command element to the terminals 10-11, e.g. momentary switch, relay, PLC signal (potential-free break contact N/C)
7	single signalisation: on terminal block X23, connect single signalisation for F1 through F10 F1: terminals 30-40, F2: terminals 31-41, F3: terminals 32-42, ... F10: terminals 39-49 signal: potential-free contact: fault = contact open, OK = contact closed, empty way: contact closed
8	loads: on terminal block X24: connect loads to be protected to terminals 50 through 64

¹⁾ GND (-) potential serves for self-supply of SVS09 (circuit breaker and SIGMO-module)

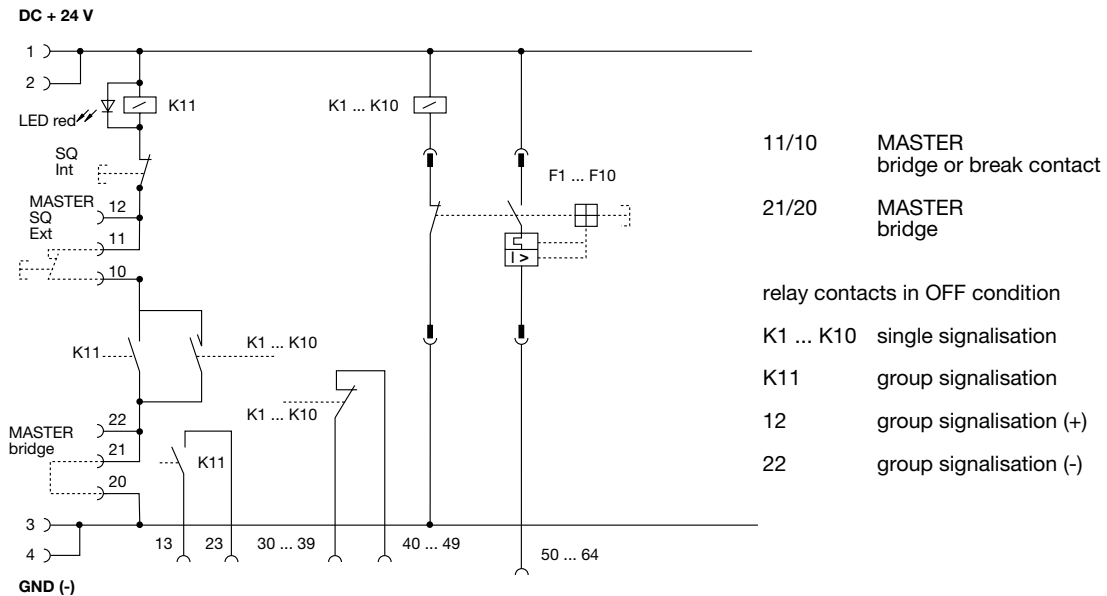
Cascading: 1 master and several (n) slaves (max. 5)

1 master + n slaves: with local group signalisation and acknowledgment	
step	configuration
1	mounting: mount all SVS09 onto symmetrical rail
2	DC +24 V (+) supply: terminal block DC 24 V - on the master: connect +24 V (+) to terminal 1+ and lead through to terminal 2+ for slave 1 - on slave 1: connect +24 V (+) of master to terminal 1+ and lead through to terminal 2+ for slave 2 - on slave n: connect +24 V (+) of slave (n-1) to terminal 1+ - additional slaves: always lead through +24 V (+) of terminal 2+ for next slave, terminal 1+
3	GND (-) supply: ¹⁾ terminal block X22 - on the master: connect GND (-) to terminal 4- and lead through at terminal 3- for slave 1 - on slave 1: connect GND (-) of master to terminal 4- and lead through at terminal 3- for slave 2 - on slave n: connect GND (-) of slave (n-1) to terminal 4- - additional slaves: always lead through GND (-) of terminal 3- for next slave, terminal 4-
4	master identification: bridge terminals 20-21 on the SVS09-master, on terminal block X22 Note: no adjustments on the slaves required!
5	group signal locally: pre-adjustment. In the event of group fault the red LED is always lighted (only) on the master.
6	group acknowledgment locally: bridge terminals 10-11 on SVS09-master, terminal block X22 acknowledgment manually with red momentary switch on SVS09-master (module SIGMO) Note: no adjustments on the slaves required!
7	single signalisation: on terminal block X23, connect single signalisation for F1 through F10 F1: terminals 30-40, F2: terminals 31-41, F3: terminals 32-42, ... F10: terminals 39-49 signal: potential-free contact: fault = contact open, OK = contact closed, empty way: contact closed
8	loads: on terminal block X24: connect loads to be protected to terminals 50 through 64

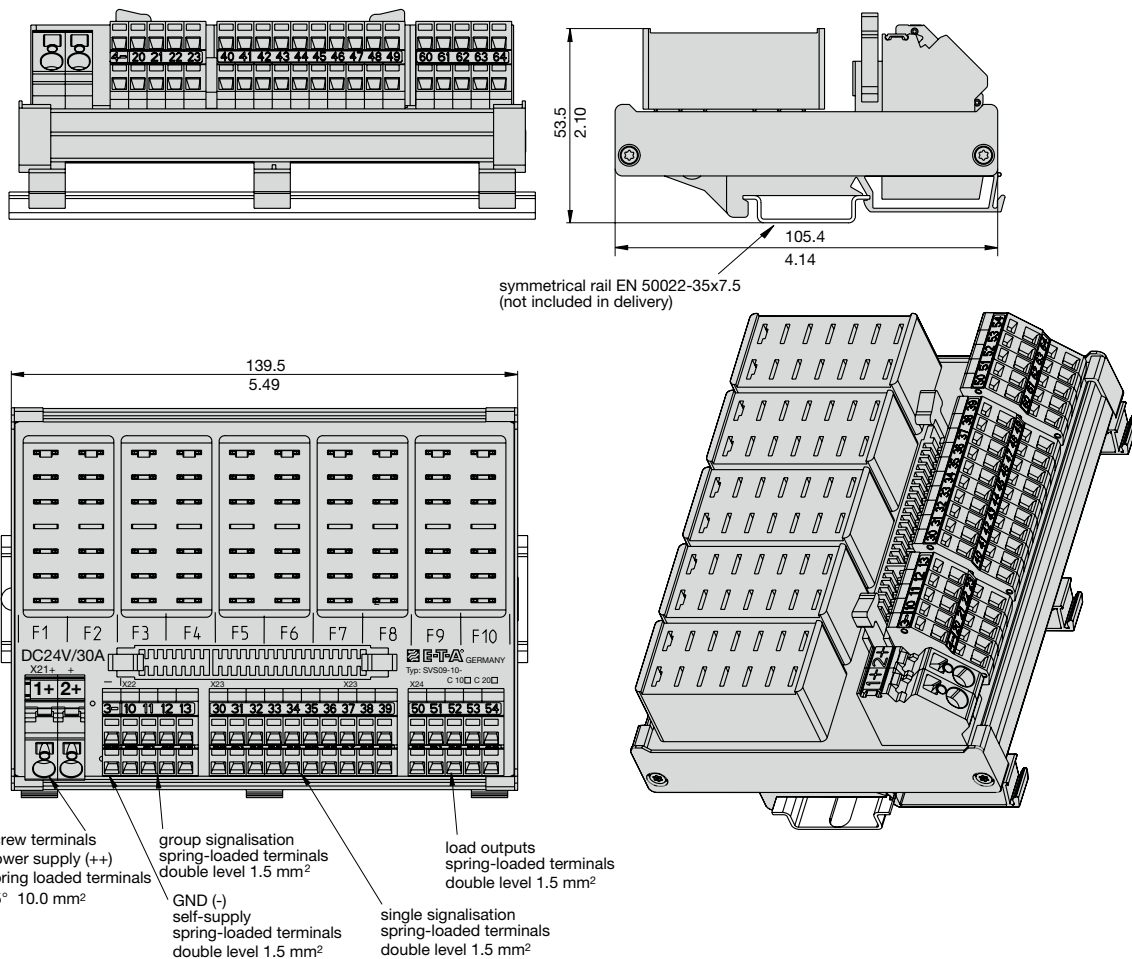
1 master + n slaves: with local and external (remote) group signalisation and acknowledgment	
step	configuration
1	mounting: mount all SVS09 onto the symmetrical rail
2	DC +24 V (+) supply: terminal block DC 24 V - on the master: connect +24 V (+) to terminal 1+ and lead through terminal 2+ for slave 1 - on slave 1: connect +24 V (+) of master to terminal 1+ and lead through terminal 2+ for slave 2 - on slave n: connect +24 V (+) of slave (n-1) to terminal 1 - additional slaves: always lead through +24 V (+) of terminal 2+ for next slave, terminal 1+
3	GND (-) supply: ¹⁾ terminal block X22 - on the master: connect GND (-) to terminal 4- and lead through at terminal 3- for slave 1 - on slave 1: connect GND (-) of master to terminal 4- and lead through at terminal 3- for slave 2 - on slave n: connect GND (-) of slave (n-1) to terminal 4- - additional slaves: always lead through GND (-) of terminal 3- for next slave, terminal 4-
4	master identification: bridge terminals 20-21 on the SVS09-master, on terminal block X22 Note: no adjustments on the slaves required!
5	group signal locally and remote: connect an external display element (e.g. LED, relay, acoustic signal) on master, terminal block X22, to terminals 13-23. In addition the red LED is always lighted in the event of group signal. signal: potential-free contact: fault = contact closed, OK = contact open Note: no adjustments on the slaves required, group acknowledgment is valid for the entire cascade.
6	group acknowledgment locally or remote: connect a command element on master, terminal block X22, to terminals 10-11, e. g. momentary switch, relay, PLC signal (potential-free break contact N/C) Note: no adjustments on the slaves required, group acknowledgment is valid for the entire cascade.
7	single signalisation: on terminal block X23, connect single signalisation for F1 through F10 F1: terminals 30-40, F2: terminals 31-41, F3: terminals 32-42, ... F10: terminals 39-49 signal: potential-free contact: fault = contact open, OK = contact closed, empty way: contact closed
8	loads: on terminal block X24: connect loads to be protected to terminals 50 through 64

¹⁾ GND (-) potential serves for self-supply of the SVS09 (circuit breaker and SIGMO module)

Schematic diagram



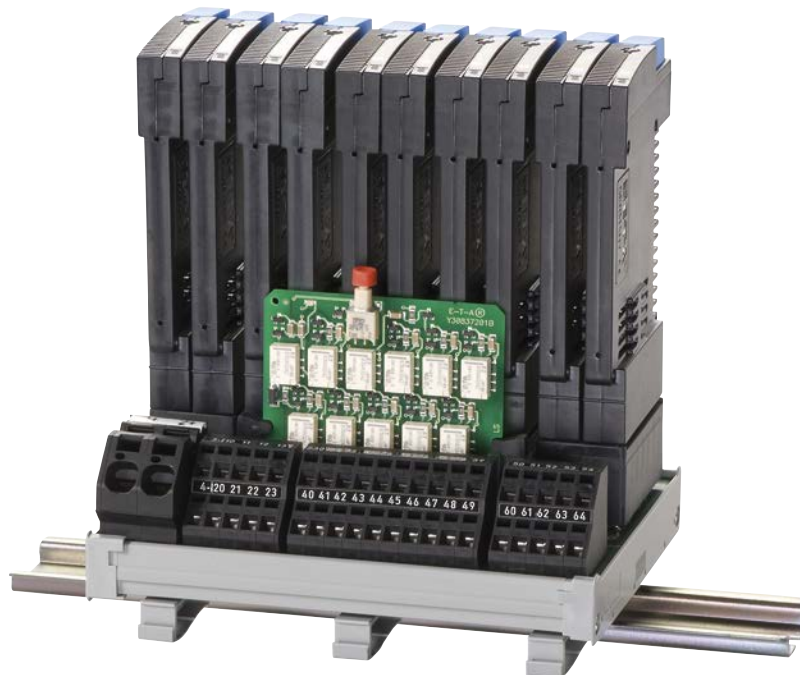
Dimensions SVS09-10-C10



This is a metric design and millimeter dimensions take precedence ($\frac{mm}{inch}$)

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Application example: SVS09-10-C10 fitted with ESS20-003



Plug-on module (circuit breaker / signalisation module SIGMO-09-1xx)
to be ordered separately

Application example: SVS09 cascade with 1 master and 1 slave

SVS09-10-C10 master fitted with 10 x ESS20-003
SVS09-10-C10 slave fitted with 5 x 2210-S2 and 5 x 3600



Accessories

Application

Plug-in type signalisation module for the power distribution system SVS09 for group signalisation and acknowledgment for an isolated SVS09 application or a cascade. The SIGMO module ensures a group fault to be indicated after each trip of a circuit breaker on the SVS09. Fault indication can be – depending on the configuration¹⁾ – locally on the power distribution system (red LED) or locally and externally (remotely), e. g. by means of an acoustic signal in the control room. Acknowledgment of the group signal can also be only locally via a momentary switch on the power distribution system, or locally and remotely, e. g. via a momentary switch in the control room. Acknowledgment of the group signal re-activates the group signalisation, so that it is released again and ready for new error messages. The single signalisation and the tripped circuit breaker will be manually reset by actuating the push button of the circuit after remedy of the failure.

Note: Proper function of the signalisation module SIGMO-09-1xx is ensured only in connection with the power distribution system SVS09-10-Cxx.

¹⁾ see power distribution system SVS09, basic schematic diagram and configuration instruction

Ordering information

Type No.

SIGMO signalisation module for SVS09 power distribution system

- plug-in type signalisation module
- DC 24 V-applications
- supply via SVS09

Version for power distribution system

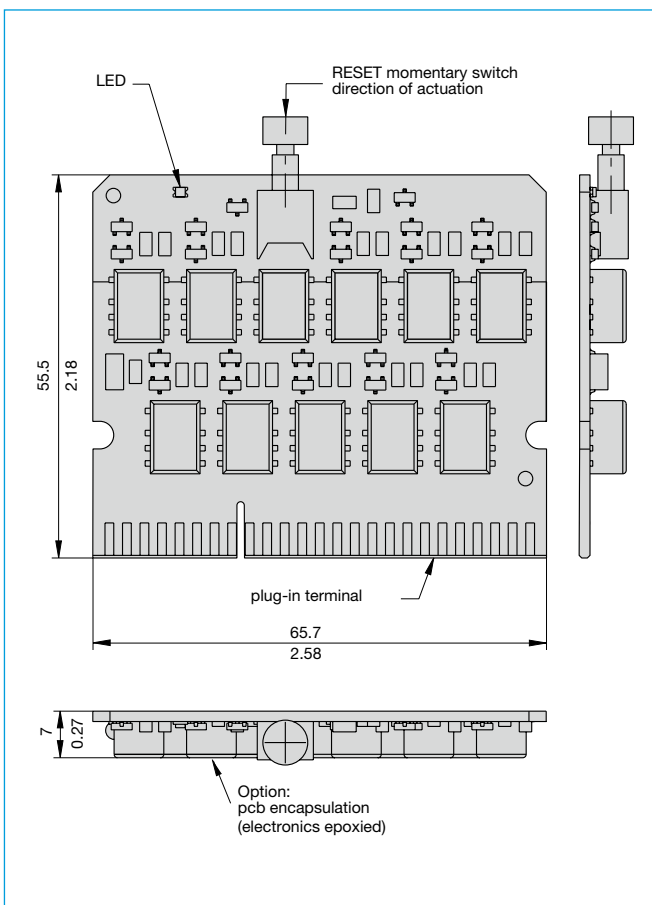
09 SVS09-10 for circuit breakers (F1...F10)

Pcb version

- 100** standard: plug-in type signalisation module for circuit breaker (F1...F10)
pcb populated, open,
- 120** option: plug-in type signalisation module for circuit breaker (F1...F10)
pcb populated, encapsulated

SIGMO - 09 - 100 ordering example

Signalisation module SIGMO-09-1xx



Technical data ($T_{amb} = 25\text{ °C}$, $U_S = \text{DC } 24\text{ V}$)

Voltage supply

rated voltage: DC 24 V (19...28 V)
residual ripple 5 % max.
supply via SVS09

Current load

normal operation without trip: 0 mA
max. 150 mA with 10-way fault on SVS09 (all relays loaded)

Contacts

min. 10 V / 10 mA
max. 28 V / 200 mA...

Status indication and actuation

LED red: lighted in the event of group fault
momentary switch red: for local acknowledgment of group signalisation
remote acknowledgment: terminal of an external command (momentary switch, relay, PLC signal)
rupture capacity 28 V / 20 mA
integral free-wheeling diode in SIGMO module

Reverse polarity protection

Protected against reverse polarity of potentials DC 24 V (+) and GND (-) on the SVS09. No function if connected reversely

This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.