

### 1.1.4 7SR45 Non-Directional Overcurrent Protection



#### Description

The 7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay is developed using the latest generation of hardware technology and is available in multiple variants depending on the CT, binary input/binary output, power supply and communication configuration. 7SR45 is a member of Siemens Reyrolle® protection devices Argus product family.

The 7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay is housed in a 4U high, size 4 non draw-out case and provides protection, monitoring, instrumentation, and metering with integrated input and output logic and fault reports.

The relay functionality can be configured via a front USB port for local PC connection or rear electrical RS485 (optional) port for remote connection. By using the Reydisp Evolution software, the user can update the settings and view the fault records (trip log) and the event records (event log).

7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay supports the IEC 60870-5-103 and Modbus communication protocols.

7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay can indicate the trip with local and remote flag indicator.

#### Function Overview

##### Protection

50	Instantaneous Overcurrent Protection
50N/G	Instantaneous Derived/Measured Earth Fault Protection
51	Time Delayed Overcurrent Protection
51N/G	Time Delayed Derived/Measured Earth Fault Protection
50LC/SOTF	Switch-On-To-Fault

##### Features

Password Protection  
Self Monitoring  
Trip Timers  
Healthy shut-down below operating ranges  
Remote reset (binary input based) of flag with/without CT power and Auxiliary power  
Two Settings Groups

#### User Interface

16 Character x 2 Line Backlit LCD  
Menu Navigation Keys  
9 non-programmable LEDs  
Local Flag Indicator

#### Monitoring Functions

Primary/Secondary Current Phases and Earth  
Binary Input/Binary Output Status  
Time and Date  
Fault Records (Trip Log)  
Event Records (Event Log)

#### Hardware

4 CT (1 A or 5 A, via ordering option)  
4 BI, 4 BO  
1 Local Flag indication  
1 Remote Flag output  
1 Pulse Output  
9 LEDs  
Rear RS485 communication port  
Auxiliary Power input

#### Data Storage and Communication

Front USB port + Rear RS485 port (optional)  
Protocols - IEC60870-5-103, Modbus RTU  
Fault Records (Trip Log)  
Event Recording (Event Log)  
Time Synchronism  
Viewing and Changing Settings  
Battery Profiling

#### Application

7SR45 Self Powered/Dual Powered Relay is a numerical overcurrent and earth fault protection relay primarily intended for secondary distribution electrical networks.

The 7SR45 Dual Powered Non-Directional Overcurrent and Earth Fault Relay is designed to operate with/without an auxiliary supply. The 7SR45 Dual Powered Non-Directional Overcurrent and Earth Fault relay is powered primarily from the auxiliary voltage even though all other power sources are available.

In the absence of auxiliary voltage, the relay is powered by CT input.

The relay offers definite-time and inverse-time overcurrent and earth fault protection functions in accordance to IEC and ANSI standards.

7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay are built-in with a capacitor discharge pulse output for low-energy trip coil of the circuit breaker. Changeover binary outputs are also available for trip via an auxiliary powered shunt trip coil.

7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay are targeted for the following applications:

- Protection Relay for Ring Main Units (RMU)
- Back up protection relay for the medium voltage applications
- Protection applications in remote locations where auxiliary supply is not available.
- Control and relay panels refurbishment of old electromechanical protection relays

## Functional Diagram

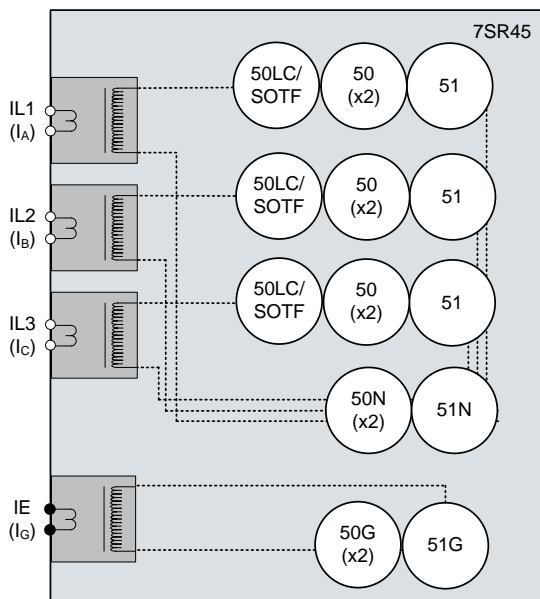


Fig1. Functional Diagram of 7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay

### 50/51 Phase Overcurrent Fault

50 INST/DTL and 51 IDMTL/DTL elements provide overcurrent protection, each with independent settings for pickup current, time-multiplier (51) and time-delays. User can select IEC or ANSI time current characteristics.

The IDMT curve has a user selectable reset characteristic, either DTL or IEC/ANSI decaying to improve the grading with electromechanical protection.

### 50G/51G/50N/51N Measured/Derived Earth fault

Two earth fault measurement modes are available. One mode directly measures the earth current from an independent CT (50G/51G) and the second mode derives the residual current internally from the 3 line CTs (50N/51N).

50G/50N INST/DTL and 51G/51N IDMTL/DTL elements provide earth fault protection, each with independent settings for pickup current, time-multiplier (51G/51N) and time-delays. User can select IEC or ANSI time current characteristics.

The IDMT curve has a user programmable reset characteristic either DTL or IEC/ANSI decaying to improve grading with electromechanical protection.

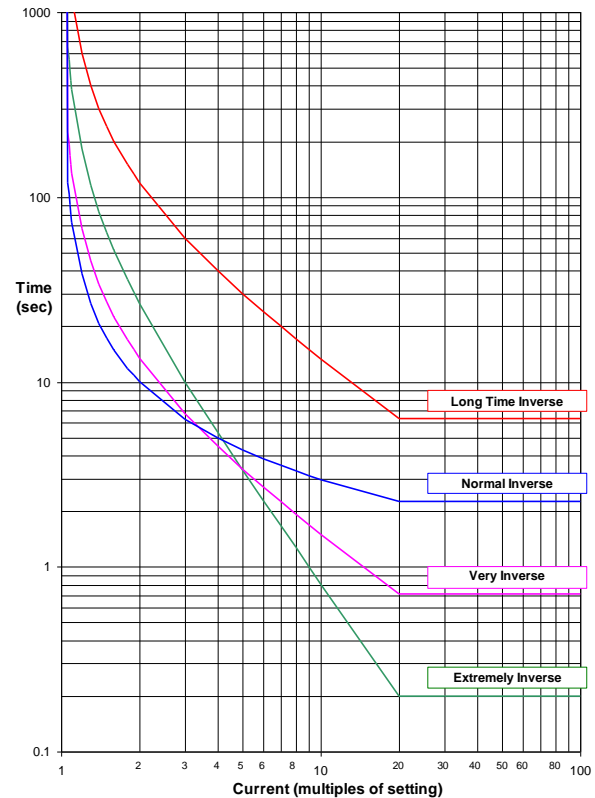


Fig2. IEC Overcurrent Curves

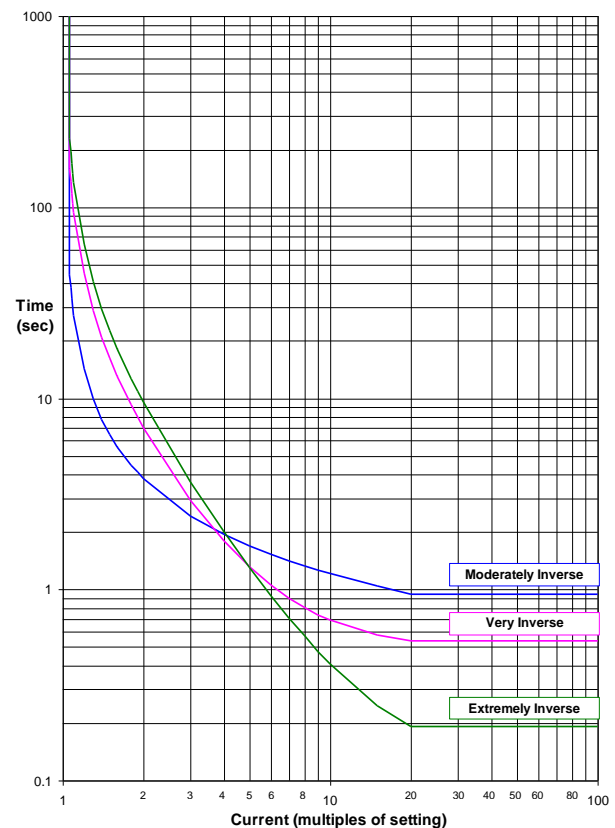


Fig3. ANSI Overcurrent Curves

## 50LC / SOTF

SOTF functionality provides high speed tripping if a fault is still present on the feeder after the reclosure of the circuit breaker (Close-on-to-Fault) or if earthing clamps are left connected after maintenance.

The following graph shows the SOTF operating time depending on the fault currents.

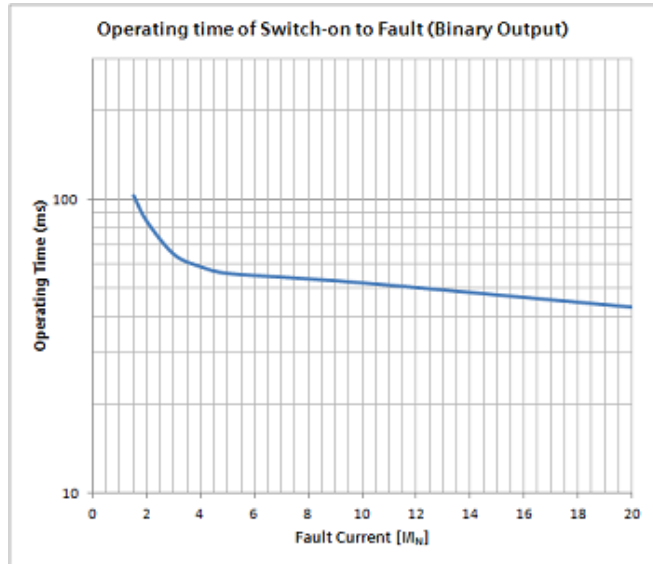


Fig4. Operating Time for Single Phase Fault with binary output

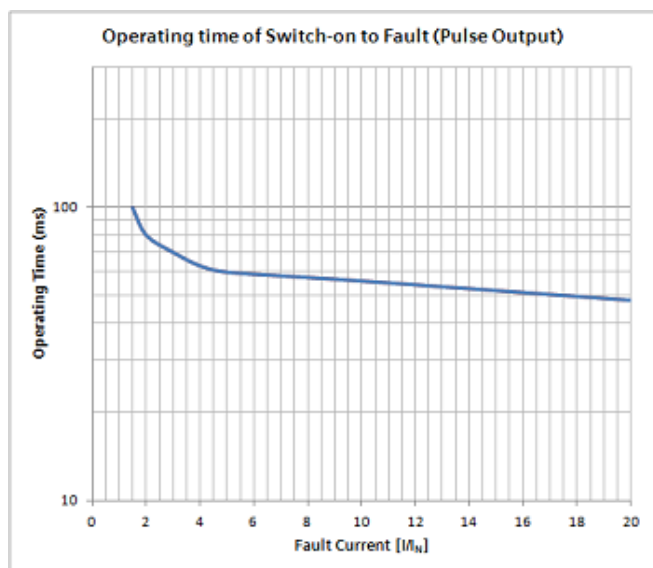


Fig5. Operating Time for Single Phase Fault with pulse output

**NOTE:** Multi-phase faults will result in shorter operating time.

### Sensitivity

In case absence of auxiliary voltage, the sensitivity of the relay is the minimum phase current required for the relay to energize, detect a fault and trip as per the configuration.

The sensitivity of 7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay is 20 % of nominal current for single phase and 13 % of nominal current in three phases. The PROTECTION HEALTHY LED and

TRIP READY LED TURN ON when the relay is TRIP ready at the above mentioned current levels.

The following graphs show the sensitivity of the relay and corresponding operating time for different start up currents.

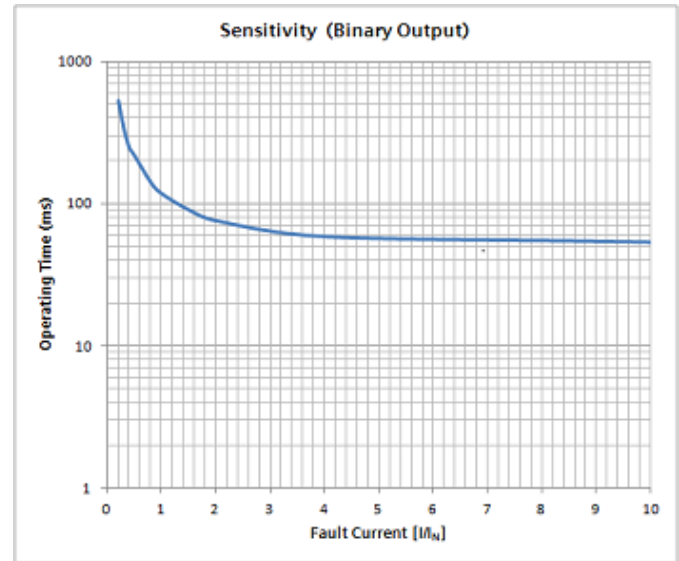


Fig6. Sensitivity for Single Phase Fault with binary output

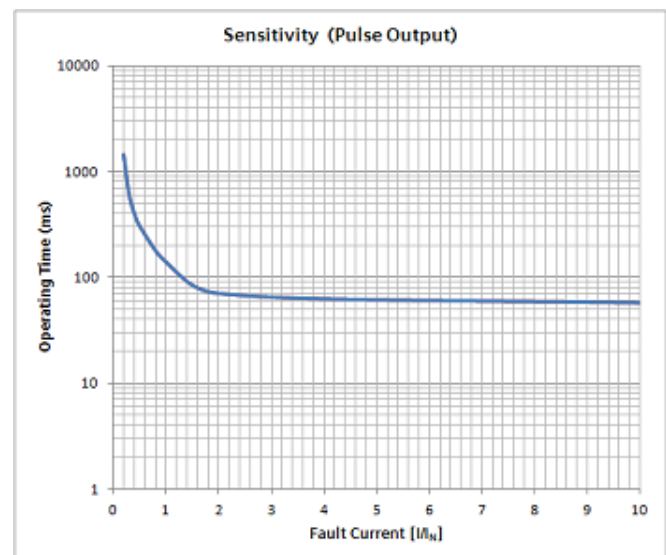


Fig7. Sensitivity for Single Phase Fault with pulse output

**NOTE:** Multi-phase current will improve the sensitivity.

## Data Acquisition - Via Communication Interface

### Sequence of Event Records (Event Log)

Up to 100 events can be stored and time tagged to 1 ms resolution. The events are stored on first-in-first-out basis. The events are available through the communication interface.

### Fault Records (Trip Log)

The last 10 fault records are displayed on the relay fascia and are also available through the communication interface with time and date of trip, measured quantities and type of fault.

## Real Time Clock

The time and date can be set and is maintained while the Relay is de-energised by a coin cell battery.

## Communications

The relay offers a USB port as standard on the front of all units. All of the relay functions can be set on a PC using Reydisp Evolution software via the USB port. The connection is made with a USB cable and operates with a 'plug and play' connection, so no pre-setting of the relay is required.

The front port can be switched off or set to use either the Modbus RTU or IEC60870-5-103 protocols for testing purposes.

A rear RS485 electrical connection is optionally available on the relay for system interface connections.

An internal terminating resistor is provided, which can be connected into the circuit by adding a wire loop between the relevant terminals.

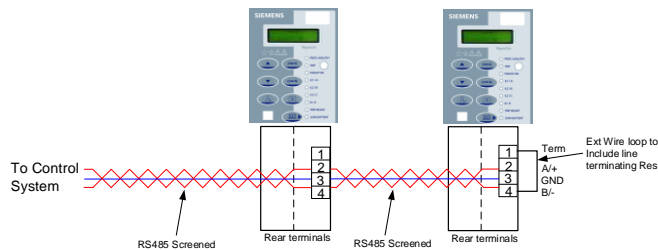


Fig8. Typical RS485 connection

The rear RS485 can be user selected to be OFF, IEC60870-5-103 or Modbus RTU.

## Construction

The relay is housed in a non draw-out 4U high, size 4 case.

The rear connection comprises of user friendly pluggable type terminals for pulse and flag output, binary inputs, binary outputs, RS485 communication and auxiliary input.

The CT terminals are suitable for ring type lug connection to provide a secure and reliable termination.



Fig9. 7SR4501 Front view



Fig10. 7SR4501Rear view



Fig11. 7SR4502 Front view



Fig12. 7SR4502 Rear view

## User Interface

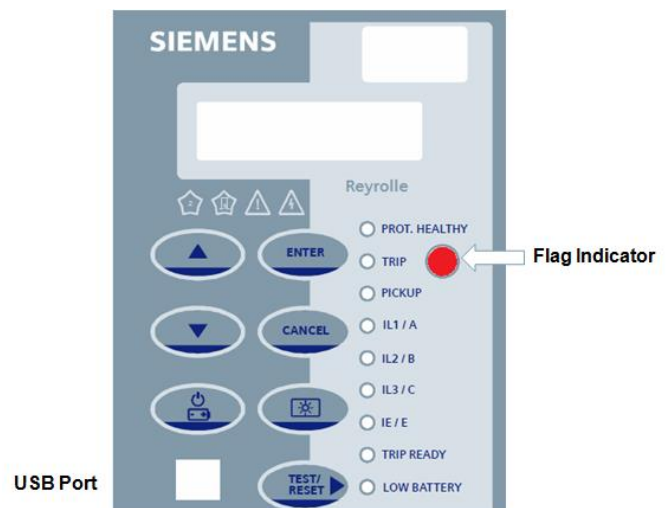


Fig13. User Interface

The operator interface is designed to provide a user friendly method of viewing menus, entering settings, and retrieving data from the relay. Five buttons are provided for navigation around the menu structure. Additionally, two buttons are provided for battery ON/OFF and Backlight ON/OFF functionality.

### LCD

A 2 line by 16 character liquid crystal display with power save operation indicates the relay identifier, settings, instrumentation, and fault data.

### LEDs

9 non-programmable LEDs are available eliminating the need for expensive panel mounted pilot lights and associated wiring. Each LED shows clear indication of the associated functions state and has a label for identification.

### Flag Indicator

1 local flag indicator is provided and configured for the trip indication.

## Relay Information

The device is identified by the rating label on the front fascia of the housing. The user can also give the device its own identity by editing the 'Relay Identifier' displayed on the LCD.

## Power

7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay can be powered in the following modes and their priority is as follows:

- Auxiliary Power Supply
- CT Power
- USB Power
- Battery Power

## Indication of Conformity



### Low Voltage Directive:

**2006/95/EC** Directive of the European Parliament and of the Council of 12 December 2006 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (**until 19.04.2016**)

**2014/35/EU** Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits; Official Journal of the EU L96, 29/03/2014, p. 357–374 (**from 20.04.2016**)

### EMC Directive:

**2004/108/EC** Directive of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility (**until 19.04.2016**)

**2014/30/EU** Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility; Official Journal of the EU L96, 29/03/2014, p. 79–106 (**from 20.04.2016**)

## Technical Data

For full technical data, refer to the Technical Specification Section of the User Manual.

### Technical Data Overview

Product Family	Non Directional Self Powered /Dual Powered Overcurrent and Earth Fault Relay
Case and LEDs	Non draw-out Polycarbonate case (Size 4 standard, Non draw-out design), 9 non-programmable LEDs
Measuring Inputs (Current)	1 A or 5 A (ordering option), 50 Hz/60 Hz
Auxiliary voltage	24 V-60 V DC 60 V-240 V AC/DC
Communication	Front communication port : USB (IEC 60870-5-103 or Modbus RTU) Rear communication port: RS485 (IEC 60870-5-103 or Modbus RTU)
Protection Functions	50, 50G/N, 51, 51G/N, 50LC/SOTF
Binary Input and Binary Output	4 BI and 4 BO
Remote flag	24 V, 0.01 Ws
Local flag	Mechanical Flag Indicator <ul style="list-style-type: none"><li>• Normal – Green colour</li><li>• Trip – Red colour</li></ul>
Pulse output	24 V, 0.1 Ws pulse output
Overvoltage	Category III
Pollution Degree	2
Altitude above sea level	Maximum up to 2000 m

### Sensitivity

Minimum phase current for relay operation	20 % of nominal current in single phase 13 % of nominal current in three phases
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### Mechanical Specifications

Design	Panel mounting, Non draw-out Polycarbonate moulded case
Enclosure	IP 52 (front panel) IP 40 (enclosure sides) IP 20 (rear side) Depth is 203 mm
Weight	1.8 kgs (appx)

### Terminal Blocks

Auxiliary Power Supply	3 position (Terminal X3), M3 screw-type plug-in terminals suitable for 2.5 mm <sup>2</sup> cable
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Current Inputs	8 position (Terminal X1), M4 Screw-type Barrier Terminal block suitable for 2.5 mm <sup>2</sup> / 4 mm <sup>2</sup> cable
Binary Input	4 position (Terminal X2), 4 position (Terminal X5) for additional binary inputs M3 screw-type plug-in terminals suitable for 2.5 mm <sup>2</sup> cable
Binary Output	5 position (Terminal X2), 5 position (Terminal X6) for additional binary outputs M3 screw-type plug-in terminals suitable for 2.5 mm <sup>2</sup> cable
Pulse Output	2 position (Terminal X2), M3 screw-type plug-in terminals suitable for 2.5 mm <sup>2</sup> cable
Remote Flag	2 position (Terminal X2), M3 screw-type plug-in terminals suitable for 2.5 mm <sup>2</sup> cable
Front Communication Port	USB, Type B
Rear Communication Port	4 position (Terminal X4), M3 screw-type plug-in terminals suitable for 2.5 mm <sup>2</sup> cable
Ground Terminal	M3 ring type terminals suitable for 2.5 mm <sup>2</sup> /4 mm <sup>2</sup> cable

## Inputs and Outputs

### Auxiliary Supply

Rated Voltage	60 V - 240 V AC/DC, 50/60 Hz $\pm$ 5% Tolerance – 20 % to +10 % 24 V - 60V DC, Tolerance – 20 % to +10 % (ordering option)
Allowable superimposed AC component	15 % of DC voltage
Typical Power consumption (DC) Typical Power consumption (AC)	< 7 W < 12 VA
Max Interruption time (Collapse to Zero)	$\leq$ 20 ms (19.2 V DC) $\leq$ 20 ms (48 V DC) $\leq$ 500 ms (230 V AC)

### Current Inputs

Quantity	3 x Phase and 1 x Earth
Rated Current (In)	1 A or 5 A (ordering option)
Measuring Range	0.2xIn to 20xIn
Instrumentation	$\pm$ 5 % (Typical) ( $\geq$ 0.13xIn to 2xIn) $\pm$ 3% ( $>$ 2xIn to 20xIn)
Frequency	50 Hz (Range: 45 Hz to 55 Hz) 60 Hz (Range: 54 Hz to 66 Hz)

Burden @ In	$\leq$ 3.0 VA per phase and $\leq$ 0.2 VA earth for 1 A CT input $\leq$ 3.5 VA per phase and $\leq$ 0.2 VA earth for 5 A CT input
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### Binary Inputs

Number	2 or 4	
	19 V DC	Range 24 V - 66 V DC
	88 V AC/DC	Range 88 V - 265 V
	Range	DC 88 V - 265 V DC AC 68 V - 265 V AC
Maximum AC/DC current for operation	3.5 mA	
Pick Up Delay	User selectable 0 to 600 s (up to 10 mins)	
Drop Off Delay	User selectable 0 to 600 s (up to 10 mins)	

### Binary Outputs

Number	2 or 4 (2 NO contact and 2 C/O contact)
Operating Voltage	Potential free
Operating Mode	User selectable - BO 1 and BO 2 Self or Hand /Electrical Reset BO 3 and BO 4 Self Reset (Operated only with Auxiliary input is present)
Operating Time from energizing Binary Input	< 20 ms
Making Capacity: Carry continuously Make and carry (L/R $\leq$ 40 ms and V $\leq$ 300 V AC)	5 A AC or DC 20 A AC or DC for 0.5 s 30 A AC or DC for 0.2 s
Breaking Capacity ( $\leq$ 5 A and $\leq$ 250 V): AC Resistive AC Inductive DC Resistive DC Inductive	1250 VA 250 VA at p.f. $\leq$ 0.4 75 W 30 W at L/R $\leq$ 40 ms 50 W at L/R $\leq$ 10 ms
Disengaging time	< 20 ms

### Front Communication Port

Quantity	1
Electrical connection	USB, Type B
Protocol Support	Modbus RTU, IEC 60870-5-103

### Rear Communication Port

Quantity	1 (Optional)
Electrical connection	RS485, 2 wire electrical, twisted pair
Protocol Support	Modbus RTU, IEC 60870-5-103
Rate	Data Transfer rate: 1200 - 57600 bps

## Data Storage

Fault Record (Trip Log)	10 records
Events (Event Log)	100 events (1 ms resolution)

## Mechanical Tests

Test	Standard
Vibration	IEC60255-21-1, Response and Endurance, Class I
Shock and Bump	IEC 60255-21-2 Shock response and withstand, Class I Bump, Class I
Seismic	IEC 60255-21-3, Class I
Degree of Protection	IEC 60529, IP52 front, IP20 rear
Contact	IEC 60255-1 (Ref: Std IEC 61810-1)
Electrical Endurance Test	IEC 60255-1 (Ref: Std IEC 61810-1) (10000 operations at 250 V, 5 A)

## Electrical Tests

Test	Standard
Insulation Resistance	IEC 60255-27# Insulation resistance >100 M Ohms at 500 V DC Test Duration: > 5 s
Impulse Voltage Withstand	IEC 60255-27# 5 kV, 1.2/50 µs, 0.5 J 5 +ve, -ve pulses (Between all terminals and case earth and any two independent circuits) ^
High Voltage (Dielectric)	IEC 60255-27# 2 kV AC RMS for 1 min (Between any terminal and earth, independent circuits) ^ 1 kV AC RMS for 1 min (across normally open contacts)
High Frequency Disturbance	IEC 60255-26 2.5 kV (CM)*, 1.0 kV (DM) 1 MHz
Electrostatic Discharge	IEC 60255-26 8 kV air discharge 6 kV contact discharge
Electrical Fast Transient or Burst	IEC 60255-26 ± 2 kV, 5 kHz
Surge Immunity	IEC 60255-26 4 kV (CM), 2 kV (DM) 1.2/50 µs
Radiated Immunity	IEC 60255-26 80 MHz to 1.0 GHz and 1.4 GHz to 2.7 GHz Field strength: 10 V/m (RMS) Amplitude Modulated: 80 % AM
Conducted Radio	IEC 60255-26

Frequency Interference	150 kHz to 80 MHz, 10 V (RMS) Class III
Power Frequency Magnetic Field	IEC 60255-26 30 A/m applied 1 min, 300 A/m applied for 3 s
Radiated Emissions	IEC 60255-26 CISPR 11, Class A
Conducted Emissions	IEC 60255-26 CISPR 11, Class A
Thermal Withstand Continuous 1 s	IEC 60255-27# 2 x I <sub>n</sub> 50 A (1 A) 150 A (5 A)
Functional performance	IEC 60255-151 and IEC 60255-1
Maximum Allowable Temperature	IEC 60255-6 Max. temperature limit +100°C
Gradual shutdown/Start-up test	IEC 60255-26 Shut down/start up ramp 60 s Power off 5 min

\* **NOTE:** Between each independent port and earth

# **NOTE:** All aspect of IEC 60255-5 have been covered under IEC 60255-27

^ **NOTE:** Flag Output and Pulse Output X3 are excluded between any terminals and earth.

## Climatic Environmental Tests

### Temperature

IEC 60068-2-1/IEC 60068-2-2

Ambient Operating Temperature	-10°C to + 60°C
Permissible Temporary Operating Temperature, (Tested for 16 h)	-40°C to + 70°C
Storage Temperature (Non-operational)	-25°C to + 70°C

### Humidity

IEC 60068-2-30/IEC 60068-2-78

Damp heat test, Cyclic	+25...55°C, RH > 93% 6 cycles
Damp heat test, Steady State	10 days at 95% RH, +40°C

### **NOTE: Cold test at -40°C:**

The device was kept in non-energized condition at -40° C for 16 hours. Energized at the end of 16 hours (@ -40°C ) and accuracy test was performed and found to be within limits. The LCD was blank at -40°C.

After accuracy test at -40° C, temperature was ramped up to room temperature and accuracy test was found within limits.

## Product Safety Test

Clearances and Creepage Distances	IEC/EN 60255-27: Edition 2 ≥ 4 mm
IP Rating	IEC/EN 60255-27: Edition 2 IP52 (Front side) IP20 (Rear side)
Impulse Voltage	IEC/EN 60255-27: Edition 2 5 kV, 5 +ve, -ve pulses
AC Dielectric Voltage	IEC/EN 60255-27: Edition 2 2 kV AC, 50 Hz, 1 min
Insulation Resistance	IEC/EN 60255-27: Edition 2 500 V DC, > 5 s, > 100 M ohm
Protective Bonding Resistance	IEC/EN 60255-27: Edition 2 < 12 V AC/DC, 1 min, < 0.1 Ohm
Protective Bonding Continuity	IEC/EN 60255-27: Edition 2
Flammability	IEC/EN 60255-27: Edition 2
Single Fault Condition	IEC/EN 60255-27: Edition 2

## Performance

### 50 Instantaneous & DTL OC&EF

Operation	Non directional
Elements	Phase, Derived Earth, Measured Earth
Setting Range Is (50/50N/50G)	0.2, 0.3, ..... 20.0xIn
Time Delay	0,0.01,....600 s
Operate Level Iop	100% Is, ±5%
Reset level	> 0.2xIn to 0.9xIn setting: ≥ 90% Iop > 1xIn to 20xIn setting: ≥ 94% Iop
Basic Operate time (with auxiliary power / load current): 50, 50G, 50N	2xIs 25 ms, ±15 ms, 5xIs 20 ms, ±15 ms
Operate time delay	Tbasic+Td, ± 1% or ± 30 ms
Inhibited by	Binary Input
Disengaging time	< 50 ms *

\* **NOTE:** With Auxiliary power supply

### 51 Time Delayed OC&EF

Operation	Non directional
Elements	Phase, Derived Earth, Measured Earth
Setting Range Is (51)	0.2, 0.21... 2.0xIn
Setting Range Is (51G,51N)	0.1,0.11... 0.8xIn
Time Multiplier	0.01,0.02.....10
Time Delay (DTL)	0.00, 0.01... 15 s
Operate Level	110% Is, ±5% or ±2% x In
Reset level	≥ 90 % Iop
Minimum Operate time (with auxiliary power /	

load current) IEC	$t_{op} = \frac{K}{\left[\frac{I}{I_s}\right]^x - 1} \times T_m$
ANSI	$t_{op} = \left[ \frac{A}{\left[\frac{I}{I_s}\right]^p - 1} + B \right] \times T_m$ ± 5% or ± 50 ms
Follower Delay	0.00, 0.01... 20 s
Reset	IEC/ANSI decaying, 0, 1... 60 s
Inhibited by	Binary Input

### 50LC / SOTF (Switch-On-To-Fault)

Operate level	100% Is, ±5%
Setting range	1,2,...20xIn
Disengaging time	< 50 ms

### Real Time Digital Simulation Test (RTDS)

Trip Response at different fault currents	Fault Current: 1.1, 2, 3, 5, 10 times of set value
Influence on Accuracy	<b>Influence of DC components</b> DC content at first peak : 100% Decay time: 25 ms, 50 ms, 100 ms  <b>Immunity to inrush current</b> 2 <sup>nd</sup> harmonic content : up to 28%  <b>Relay behaviour at primary CT saturation</b> Fault currents: 10 A, 20 A, 40 A
Trip response at recurring faults	Fault Current: 2 times and 5 times of set value. Delay between recurring faults: 300 ms, 1 s, 2 s

### Inrush Response Test

Test Conditions	Simulated Inrush current with 15 % 2 <sup>nd</sup> harmonic content
Test Result	The relay does not operate until fault current peak reaches 3 times the setting value



## Case Dimensions

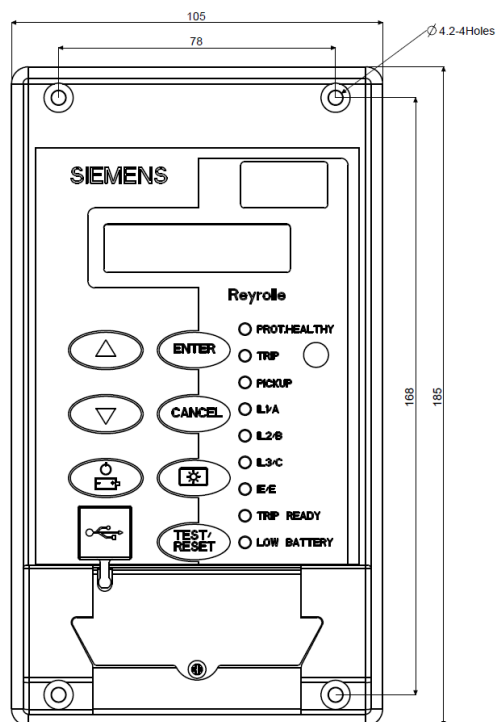


Fig14. Front View

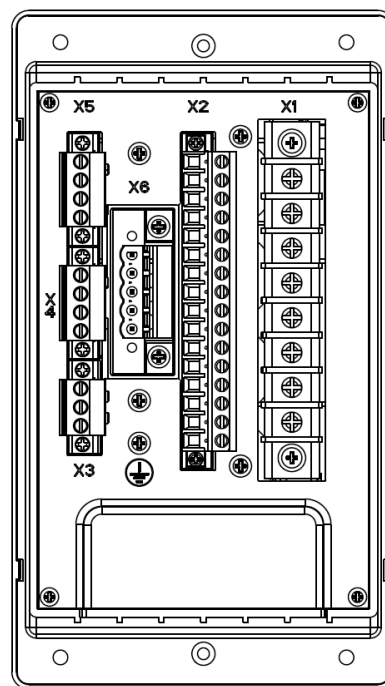


Fig15. Rear View

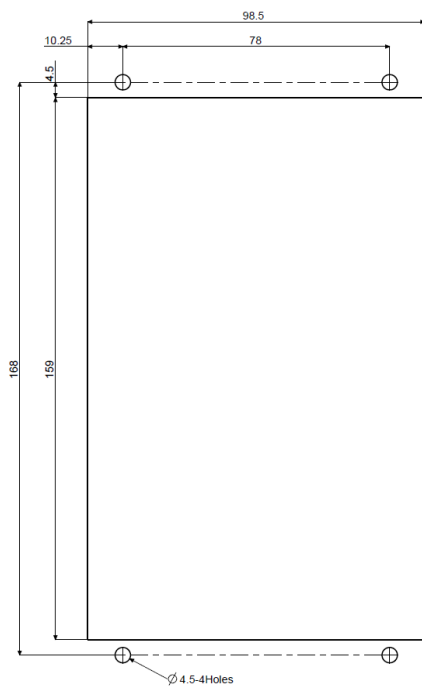


Fig16. Panel cut-out View

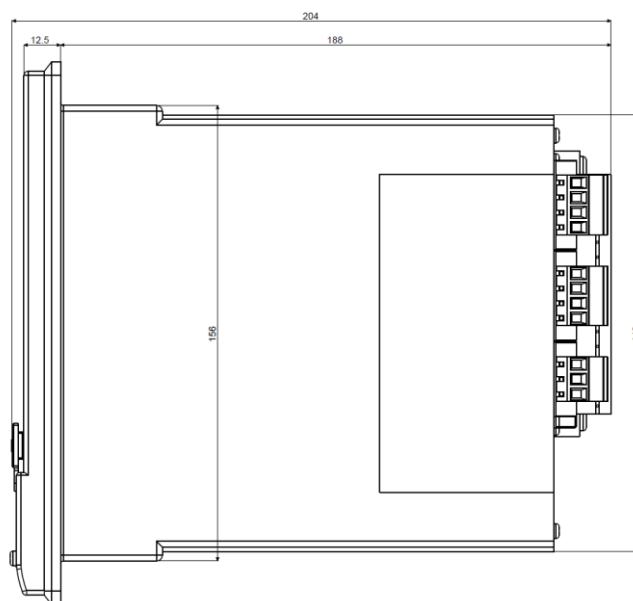
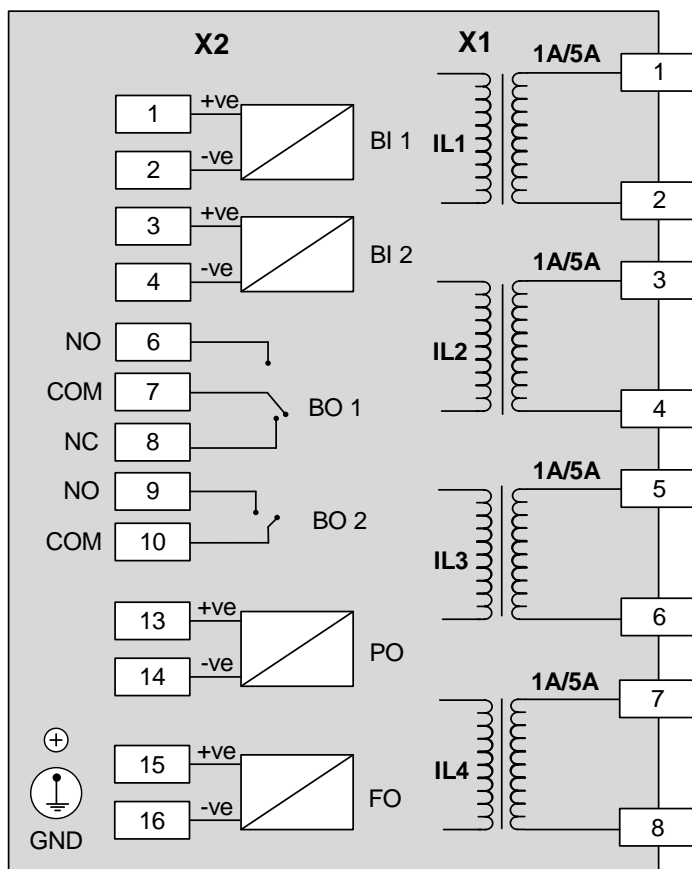


Fig17. Side View

## 7SR4501 Terminal/Wiring Diagram



## 7SR4501 Terminal Label

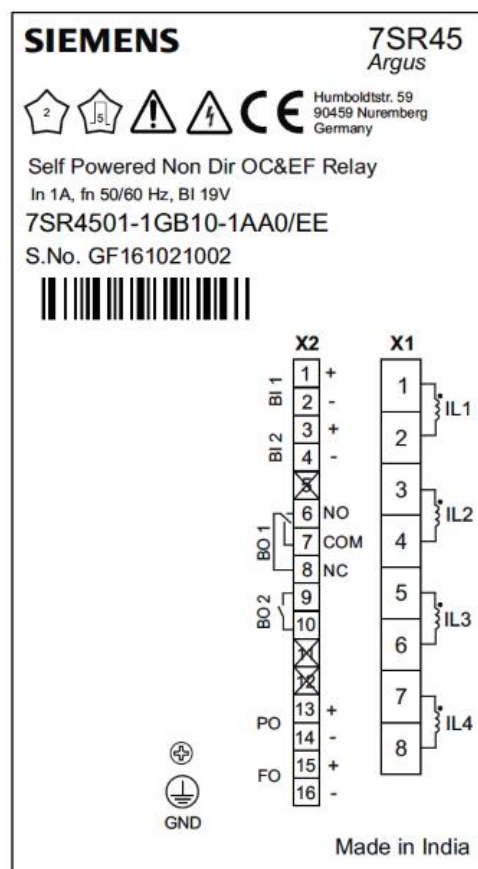
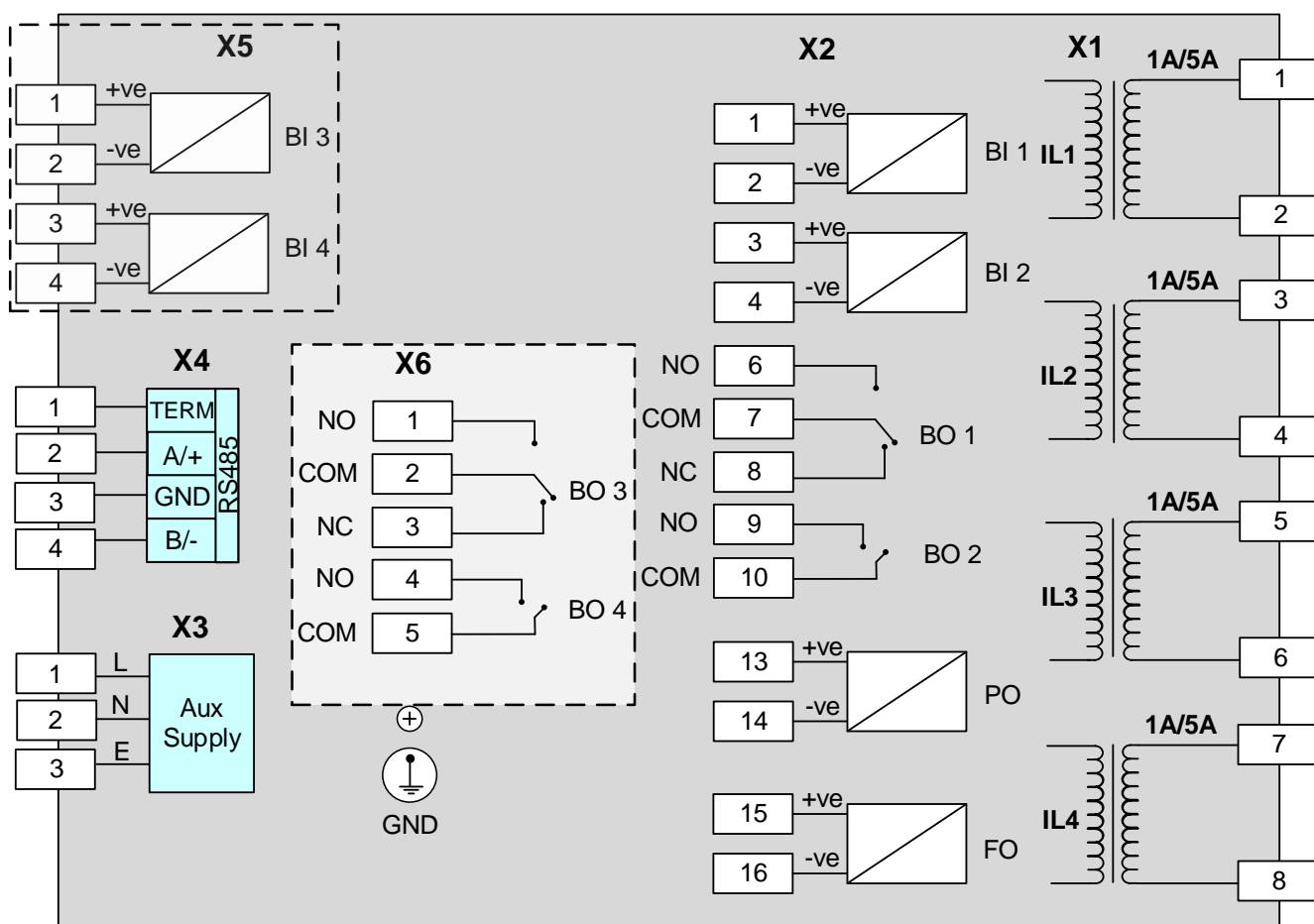
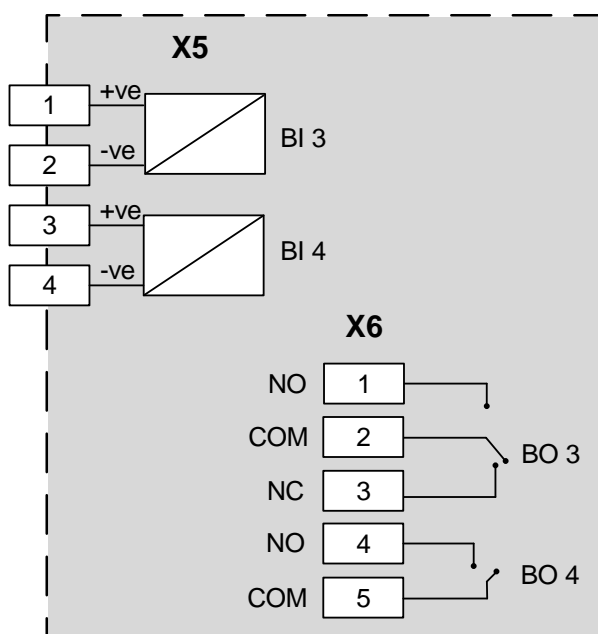


Fig18. Terminal Diagram of Self Powered Non-Directional Overcurrent and Earth Fault Relay

## 7SR4502 Terminal/Wiring Diagram



Additional 2BI 2BO options are not available for the Basic variant.



### 7SR4502 Terminal Label

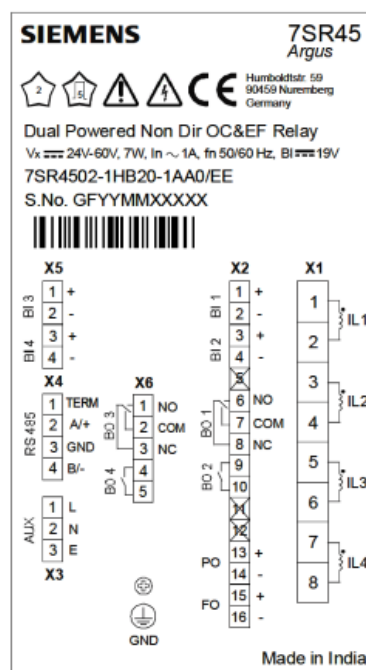


Fig19. Terminal Diagram of Dual Powered Non-Directional Overcurrent and Earth Fault Relay

## Ordering Information – 7SR45 Argus

### Product description Variants

#### 7SR45 Argus

Nondirectional  
Overcurrent  
and Earth  
Fault Relay

#### Case, I/O and fascia

Size 4 Moulded Case, 4 CT<sup>1)</sup>, 2 BI/2 BO, pulse output, 9 LEDs

Size 4 Moulded Case, 4 CT<sup>1)</sup>, 4 BI/4 BO, pulse output, 9 LEDs

#### Measuring Input

1 A, 50/60Hz

5 A, 50/60Hz

#### Auxiliary Voltage

**Self Powered (CT Powered : BI Threshold 19VDC)**

Dual powered (CT Powered + Aux. Powered : 24-60VDC, BI threshold 19VDC)

Dual powered (CT Powered + Aux. Powered : 60-240VAC/DC, BI threshold 88VAC/DC)

#### Front Fascia

Standard Version

Standard Version - with Trip Flag Indicator

#### Communication Options

Front port : USB

Front Port : USB and Rear Port : RS-485 supporting

IEC60870-5-103 and Modbus RTU (user selectable setting)

#### Protection Function Packages - Standard version

50 Instantaneous phase fault overcurrent

50G/50N Instantaneous earth fault

51 Time delayed phase fault overcurrent

51G/51N Time delayed earth fault

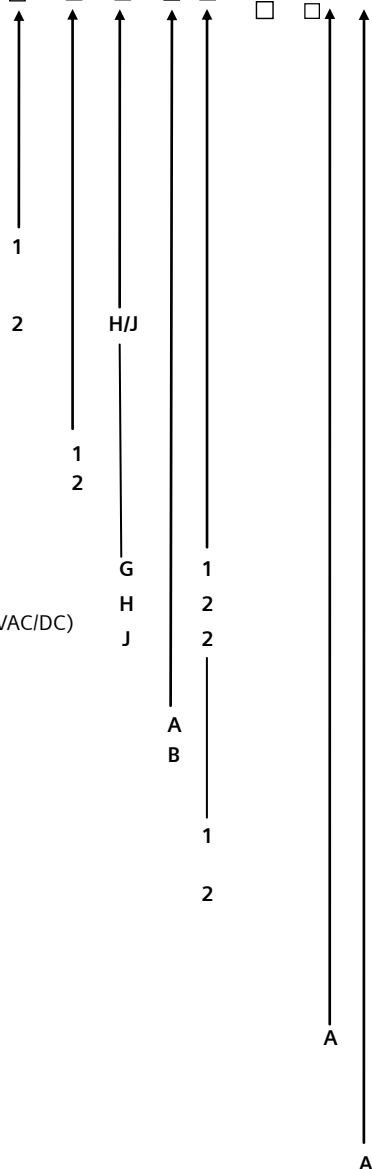
50LC/SOTF Switch-On-To-Fault

#### Additional functionality

No additional functionality

### Order No.

1 2 3 4 5 6 7 - 8 9 10 11 12 - 13 14 15 16  
7 S R 4 5 0 ☐ - ☐ ☐ ☐ ☐ 0 - 1 A A 0



6) 4CT is configured as 3PF + EF

Use the following ordering information to order 7SR45 Self Powered/Dual Powered Non-Directional Overcurrent and Earth Fault Relay battery spares.

Variants	Description
7XG1900-1AA00-1000	Main Battery CR123A
7XG1900-2AA00-1000	RTC Battery CR1632
7XG1900-3AA00-1000	Main Battery CR123A + RTC Battery CR1632