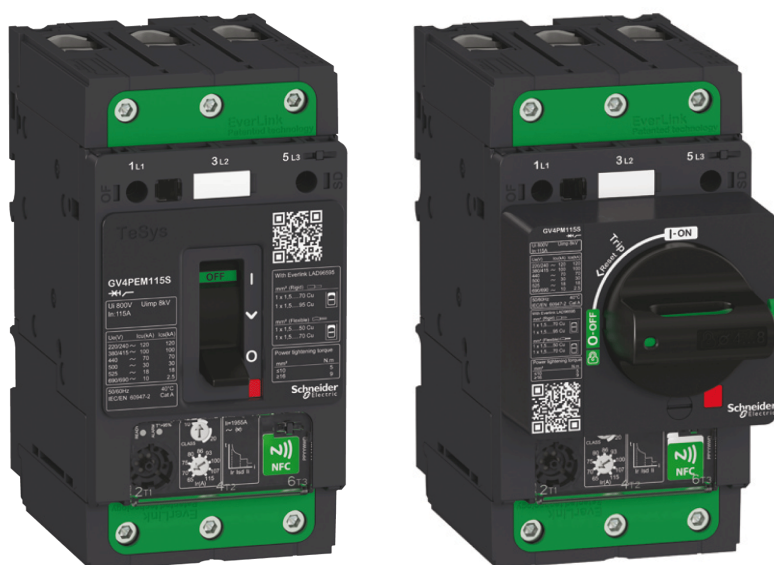


TeSys GV4P Multifunction Motor Circuit Breakers and Manual Motor Protectors User Guide

02/2018



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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book



At a Glance

Document Scope

This guide provides users, installers, and maintenance personnel with technical information needed to operate TeSys GV4P Multifunction devices in compliance with the IEC/EN and UL/CSA standards.

Validity Note

This document applies to TeSys GV4P Multifunction devices.

Convention

In this guide, the term *device* refers to:

- Multifunction motor circuit breaker (IEC standard)
- Multifunction manual motor protector (UL/CSA standards)

Related Documents

Title of Documentation	Reference Number
<i>TeSys™ GV4P Multifunction - Multifunction Motor Circuit Breakers (IEC) - Multifunction Manual Motor Protector (UL/CSA) - Instruction Sheet</i>	<u>EAV91201</u>
<i>TeSys™ GV4P Multifunction - SDx Module for GV4P Multifunction Motor Circuit Breakers - Instruction Sheet</i>	<u>EAV91207</u>

You can download these technical publications and other technical information from our website at <https://www.schneider-electric.com/en/download>

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Chapter 1

Presentation

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Feature Overview	10
Device Overview	11
Ecoreach Software	14
TeSys GV4 Mobile App	15

Feature Overview

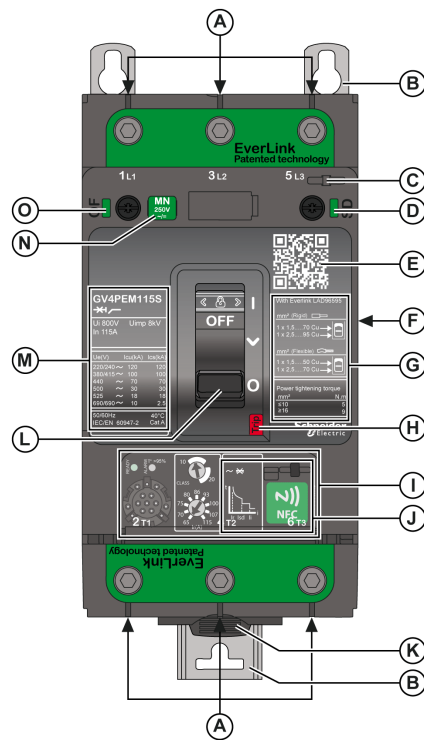
Feature Overview

TeSys GV4P Multifunction devices have the following features:

- Devices rated from 2 to 115 A
- Dual class (10E and 20E)
- Available constructions: 3 poles
- Standard compliance to IEC/EN 60947-2, IEC/EN 60947-4-1, UL/CSA 60947-4-1
- Breaking capacities:
 - 25, 50, 100 kA at 415 Vac (IEC standard)
 - 18, 35, 65 kA at 480 V (UL standard)
- Voltage up to 690 Vac
- Field installable electrical accessories
- Optional terminations
- Optional operating mechanisms
- Optional voltage releases
- Optional auxiliary contacts
- Optional insulation accessories
- Optional locking accessories

Device Overview

Device Description



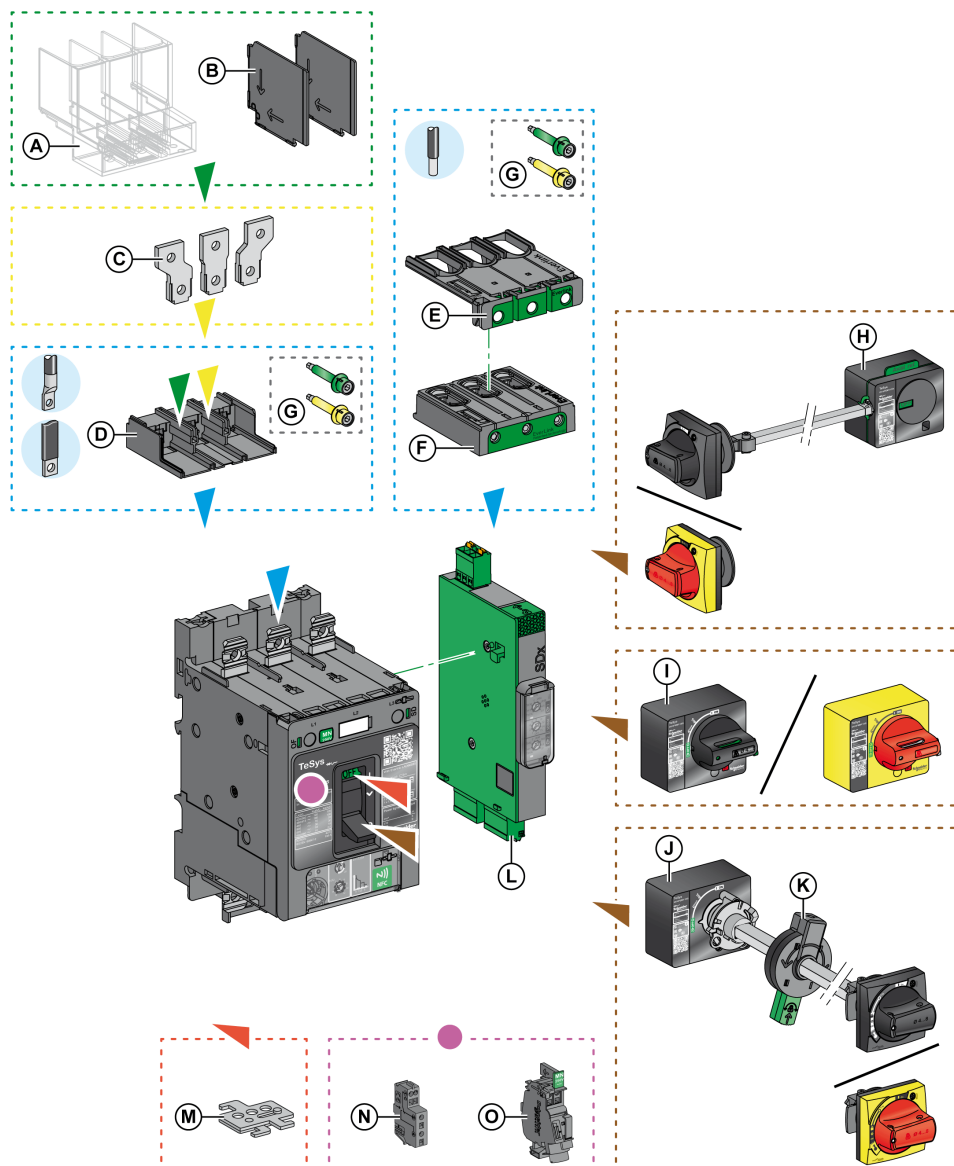
- A Power connection (EverLink™ lug, compression lug / busbar)
- B Panel mounting feet
- C Seal for cover
- D SD presence indicator
- E QR code to device information
- F Device and accessory data labels
- G Termination information
- H Push-to-trip button
- I Trip unit (*see page 18*)
- J NFC wireless communication zone
- K DIN rail lock
- L Toggle handle
- M Device identification, certification marks, and IEC/EN interrupting ratings
- N MN or MX presence indicator
- O OF presence indicator

QR Code

Scan the QR code to get additional information about the device from the Schneider Electric website. To scan the QR code, use a smartphone that is equipped with a camera and installed with a QR code reader.

Accessories

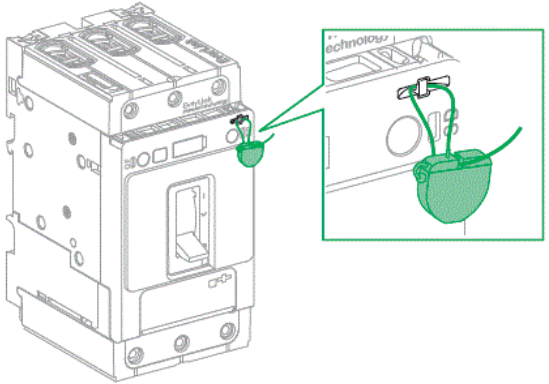
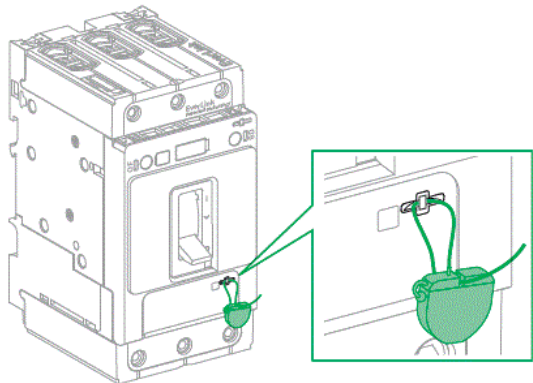
The following accessories are available for the device.



- | | |
|---|---|
| A Long terminal shield | K Open door shaft operator |
| B Interphase barriers | L SDx module |
| C Terminal spreaders | M Removable toggle handle padlocking device (OFF only) |
| D Crimp lug/busbar connector | N OF or SD auxiliary contact |
| E Large spacing cover for EverLink connector | O MN or MX voltage release |
| F EverLink connector | |
| G Torque limiting breakaway bits | |
| H Side rotary handle | |
| I Direct mounted rotary handle | |
| J Extended rotary handle | |

Sealing Accessories

The following sealing accessories can help prevent unauthorized changes to the device.

Seal type	Helps to prevent	Seal image
Seal for cover	<ul style="list-style-type: none"> Opening of the front cover Access to the auxiliaries 	
Seal for settings	<ul style="list-style-type: none"> Access to the adjustment dials (trip class and Ir) <p>NOTE: Advanced protection functions can be set through NFC communication, with the setting cover sealed.</p> <ul style="list-style-type: none"> Access to Ecoreach connection port 	

Ecoreach Software

Overview

Ecoreach software helps you to manage a project as part of testing, commissioning, and maintenance phases of the project life cycle. The innovative features in it provide simple ways to configure, and commission the smart electrical devices.

Ecoreach software automatically discovers the smart devices and allows you to add the devices for an easy configuration. Additionally, when the panels are under operation, any change of settings made can be easily identified and hence provides a system consistency during the operation and maintenance phase.

The Ecoreach software enables the configuration of the TeSys GV4P Multifunction device.

For more information, refer to *Ecoreach Online Help*.

Ecoreach software is available at www.schneider-electric.com.

Key Features

Ecoreach software performs the following actions for the supported devices and modules:

- Create projects by device discovery
- Save Ecoreach projects in Ecoreach cloud repository
- Upload settings to the device and download settings from the device
- Compare the settings between the project and the device
- Generate and print the device settings report

Ecoreach Software and TeSys GV4P Multifunction Device

Use Ecoreach software to access the following information:

- Information about the device
- Display of the protection settings
- Setting of the advanced protection functions

TeSys GV4 Mobile App

Presentation

An Android smartphone with NFC communication and running the TeSys GV4 mobile app can be used to:

- Set the advanced protection of the TeSys GV4P Multifunction device.
- Access the trip and alarm history for day-to-day maintenance.

Downloading the Application

The TeSys GV4 mobile app can be downloaded as follows:

- By flashing the QR code on the front face of the TeSys GV4P Multifunction device to access a landing page. Click the link to go to Google Play Store from which the TeSys GV4 mobile app can be downloaded.
- From Google Play Store for Android smartphones.

The TeSys GV4 mobile app is optimized for a 127 mm (5 in) display screen.

Using the Application

Connecting to TeSys GV4 mobile app with an NFC connection is always possible, even when the device is not powered. It enables you to:

- Read information about the device
- Read and change the protection settings
- Save protection settings and write them to a TeSys GV4P Multifunction device
- Manage the trip and alarm history

For the details on how to connect, refer to the NFC connection procedure ([see page 46](#)).

Chapter 2

Protection Functions

What Is in This Chapter?

This chapter contains the following topics:

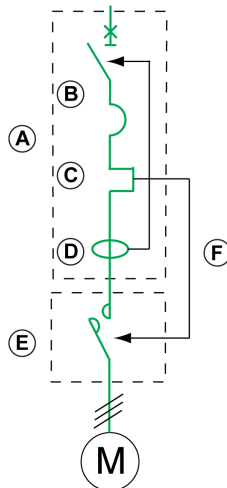
Topic	Page
Protection for Motor-Feeders	18
Overload or Thermal Protection (ANSI 49)	21
Short-Time Delay Protection (ANSI 51)	23
Short-Circuit Protection (ANSI 50)	24
Ground-Fault Protection (ANSI 51N)	25
Phase Unbalance Protection (ANSI 46)	26
Motor Jam Protection (ANSI 48/51LR)	29
Long-Start Motor Protection (ANSI 48/51LR)	31

Protection for Motor-Feeders

Presentation

TeSys GV4P Multifunction devices:

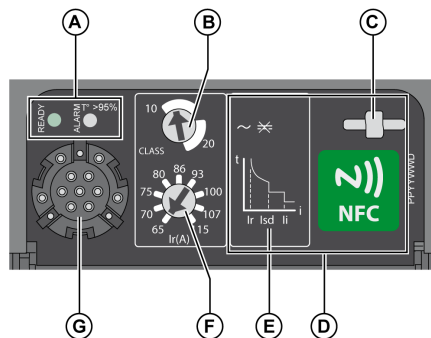
- Provide protections for direct-on-line motor-feeders (direct-on-line starting is the most widely used type of motor-feeder).
- Integrate the basic protections (overload, short-circuit, and phase unbalance) for the motor-feeder and additional advanced protections for motor applications.
- Allow protection and coordination of the motor-feeder components that comply with the requirements of standard IEC/EN 60947-2 and IEC/EN 60947-4-1.
- Can be used to create motor-feeders with two devices.



- A TeSys GV4P Multifunction device
 B Short-circuit protection
 C Overload protection
 D Ground-fault current protection
 E Contactor
 F SDx module option (SDTAM function)

Trip Unit Description

The adjustment dials and indications are accessible after opening the setting cover.



- A Indication LEDs
 B Trip class setting
 C Seal for setting cover
 D NFC wireless communication zone
 E Tripping curve
 F Overload or thermal protection setting (I_r)
 G Ecoreach connection port

Indication LEDs

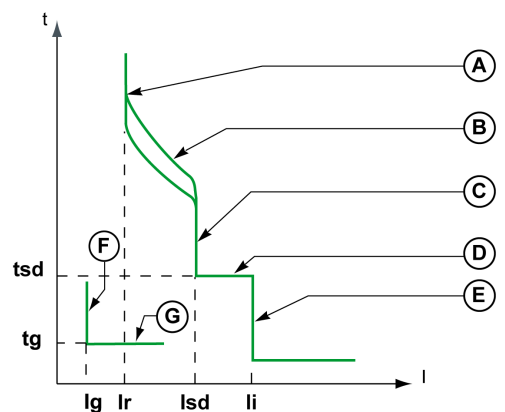


Indication LEDs on the front of the trip unit indicate its operational state.

Indication LED	Description
Green READY LED	Flashes slowly when the device is ready to trip in the event of a fault.
Red ALARM LED	Shows a steady light when the thermal image of the motor is greater than 95% of the permissible temperature rise.

Protection Functions

The following figure and table define the protection functions for trip units:



Item	Parameter	Description	Adjustable	Default activation	Default setting	SDTAM activation
A	I _r	Overload or thermal protection pickup	Yes ⁽¹⁾	Always ON	0.4 x I _n	Yes
B	Class	Trip class	Yes ⁽¹⁾	Always ON	10	Yes
C	I _{sd}	Short-time delay protection pickup	Yes ⁽²⁾	Always ON	13 x I _r	No
D	tsd	Short-time delay protection time delay	No	Always ON	0.1 s	No
E	I _i	Short-circuit protection pickup	No	Always ON	17 x I _n	No
F	I _g	Ground-fault protection pickup	Yes ⁽²⁾	ON	1 x I _n	No
G	t _g	Ground-fault protection time delay	Yes ⁽²⁾	ON	0.1 s	No
–	I _{unbal}	Phase unbalance protection pickup	Yes ⁽²⁾	Always ON	30%	Yes
–	t _{unbal}	Phase unbalance protection time delay during startup	No	Always ON	0.7 s	Yes
–		Phase unbalance protection time delay in steady state	Yes ⁽²⁾	Always ON	4 s	Yes
–	I _{jam}	Motor jam protection pickup	Yes ⁽²⁾	OFF	2 x I _r	Yes
–	t _{jam}	Motor jam protection time delay	Yes ⁽²⁾	OFF	5 s	Yes
–	I _{long}	Long-start motor protection pickup	Yes ⁽²⁾	OFF	1.5 x I _r	No
–	t _{long}	Long-start motor protection time delay	Yes ⁽²⁾	OFF	10 s	No

(1) Parameter adjustable on the trip unit with rotary dials.

(2) Parameter adjustable:

- With the TeSys GV4 mobile app ([see page 46](#)).
- With Ecoreach software ([see page 50](#)).

Each function is reviewed in detail on the following pages.

Setting the Protection

Set the overload or thermal protection pickup (I_r) and trip class (Class) by using the dials on the device.

Set the other protections:

- With the TeSys GV4 mobile app ([see page 46](#)).
- With Ecoreach software ([see page 50](#)).

Reflex Tripping

The system of reflex protection breaks very high fault currents by mechanically tripping the device with a piston actuated directly by the pressure produced in the device from a short-circuit. This piston operates the opening mechanism, resulting in ultra-fast device tripping.

Operating States

The TeSys GV4P Multifunction device considers the application to be operating as soon as the 10% of I_r pickup is crossed in a positive direction by the motor current.

Two operating states are considered:

- Startup state
- Steady state

Startup State

The application is considered to be in startup state according to the following criteria:

- Start: As soon as the 10% of I_r pickup is crossed in a positive direction by the motor current.
- End: As soon as the I_d pickup is crossed in a negative direction or at maximum after a t_d time delay defined as follows:
 - If long-start protection has not been activated (default setting), the I_d pickup equals $1.5 \times I_r$ and the t_d time delay equals 10 s (non-adjustable parameters).
Exceeding the 10 s time delay does not result in tripping.
 - If long-start protection has been activated, the I_d pickup equals I_{long} and the t_d time delay equals t_{long} (adjustable parameters).
Exceeding the t_{long} time delay results in long-start protection tripping.

NOTE: The trip unit filters the subtransient state (first current peak of approximately 20 ms on contactor closing). This current peak is not therefore taken into account when assessing whether the I_d pickup has been crossed.

Steady State

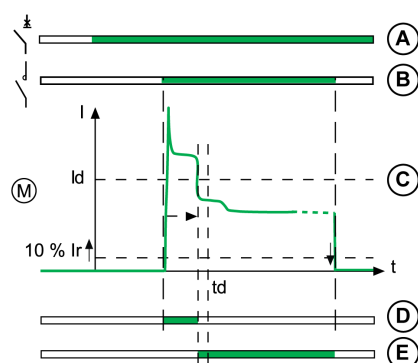
The application is considered to be in steady state according to the following criteria:

- Start: As soon as startup ends.
- End: As soon as the 10% of I_r pickup is crossed in a negative direction by the motor current.

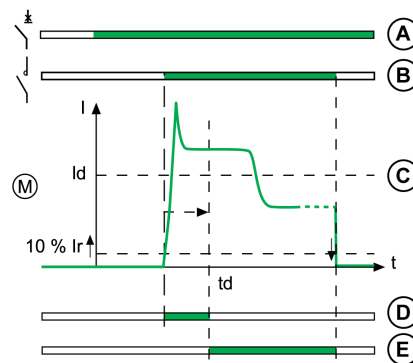
Operating Diagram

The following diagrams show the two cases of transition between startup and steady state:

Operating states with current $I < I_d$ before end of t_d



Operating states with current $I > I_d$ at end of t_d



- A TeSys GV4P Multifunction device status (green: ON position)
- B Contactor status (green: ON position)
- C Current in the motor
- D Operating state: startup state (green: active state)
- E Operating state: steady state (green: active state)

Overload or Thermal Protection (ANSI 49)

Presentation

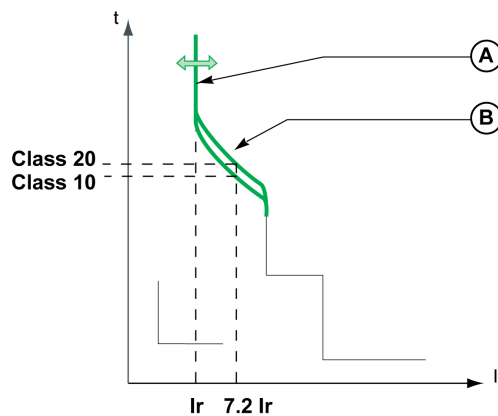
Overload or thermal protection protects all types of motor applications against overload currents.

Operating Principle

Overload or thermal protection is I^2t IDMT (Inverse Definite Minimum Time):

- It incorporates the motor thermal image function.
- It can be configured as the I_r pickup and as the trip class (Class).

Tripping curve:



Item	Parameter	Description
A	I_r	Overload or thermal protection pickup
B	Class	Overload or thermal protection trip class (according to standard IEC/EN 60947-4-1)

NOTE: In presence of a thermal fault, the optional SDx module ([see page 39](#)) can be used to perform the SDTAM function and command contactor opening instead of device tripping.

I_r Pickup Setting Value

The overload or thermal protection pickup (I_r) is set by using a multi-position dial.

The default I_r pickup setting value is $0.4 \times I_n$ (minimum dial value).

The overload or thermal protection tripping range is $1.05\text{--}1.20 \times I_r$ according to standard IEC/EN 60947-4-1.

The following table shows the preset values of the adjustment dial I_r in amperes for each current rating I_n :

$I_n = 2\text{ A}$	$I_n = 3.5\text{ A}$	$I_n = 7\text{ A}$	$I_n = 12.5\text{ A}$	$I_n = 25\text{ A}$	$I_n = 50\text{ A}$	$I_n = 80\text{ A}$	$I_n = 115\text{ A}$
0.8	1.4	2.9	5.0	10	20	40	65
0.9	1.6	3.2	5.6	11	22	44	70
1.0	1.8	3.5	6.3	12	25	48	75
1.1	2.0	3.9	7.0	14	28	52	80
1.2	2.3	4.4	8.0	16	32	57	86
1.4	2.6	5.0	9.0	18	36	62	93
1.6	2.9	5.6	10	20	40	67	100
1.8	3.2	6.3	11	22	45	73	107
2.0	3.5	7.0	12.5	25	50	80	115

Trip Class Setting Value

The trip class (Class) is set by using an adjustment dial:

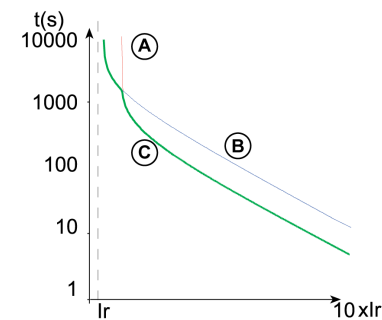
- Class 10E (default value)
- Class 20E

The trip class corresponds to the value of the tripping time delay for a current of $7.2 \times I_r$ according to standard IEC/EN 60947-4-1.

Motor Thermal Image

The model representing heat rise and cooling in a motor load is constructed according to the algorithm for calculating the thermal demand taking account of the iron and copper losses.

The following figure represents the limit curves for the iron and copper components calculated for class 20E:



- A Limit temperature curve for copper
- B Limit temperature curve for iron
- C Tripping curve (low envelope)

Thermal Memory

The trip unit uses a thermal memory function to protect the motor from overheating in case of low amplitude repetitive faults. Electronic protection without thermal memory function does not protect against repetitive faults because the duration of each overload above the pickup setting is too short to cause tripping. However, each overload causes a temperature rise in the installation. The cumulative effect of successive overloads can overheat the system. The thermal memory function remembers and integrates the thermal heating caused by each pickup setting overrun.

The thermal memory function remembers the thermal heating values for 20 minutes before or after tripping.

Example: Comparison of the heat rise calculation without thermal image (diagram A) and with thermal image (diagram B)

Diagram A

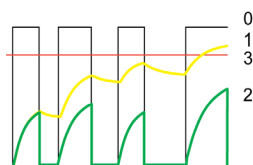
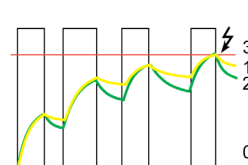


Diagram B



- 0 Load control (cyclical)
- 1 Motor temperature
- 2 Thermal level calculated without thermal image (diagram A), with thermal image (diagram B)
- 3 Overload or thermal protection level

With thermal image, the trip unit adds the thermal effect of successive current pulses. Tripping occurs based on the actual thermal state of the motor.

Cooling Fan

The thermal image of the motor is calculated taking account of the fact that the motor is self-cooled (fan mounted on the shaft end).

Short-Time Delay Protection (ANSI 51)

Presentation

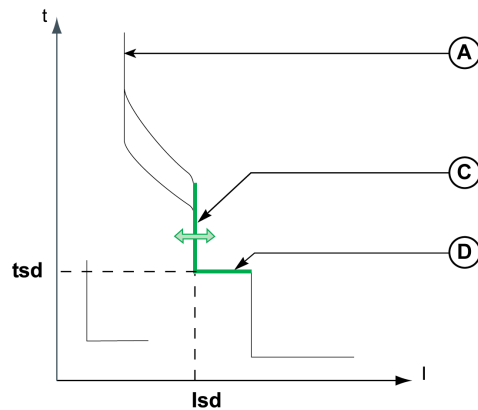
Short-time delay protection protects all types of motor applications against short-circuit currents.

Short-time delay protection lets through motor starting currents but protects cables and motor starter devices and allows not to oversize them (useful for wide range settings circuit breakers).

Operating Principle

Short-time delay protection is definite time. It can be configured as the I_{sd} pickup.

Tripping curve:



Item	Function	Description
A	I_r	Overload or thermal protection pickup
C	I_{sd}	Short-time delay protection pickup
D	t_{sd}	Short-time delay protection fixed time delay

Setting the Short-Time Delay Protection

Set the I_{sd} pickup:

- With the TeSys GV4 mobile app ([see page 46](#)).
- With Ecoreach software ([see page 50](#)).

I_{sd} Pickup Setting Value

The I_{sd} pickup setting value is in multiples of I_r .

The default I_{sd} pickup setting value is $13 \times I_r$ (maximum value).

The pickup setting range is $5\text{--}13 \times I_r$. The increment is $0.5 \times I_r$.

The accuracy range is $\pm 15\%$.

t_{sd} Time Delay Value

The time delay cannot be adjusted.

- The hold time is 60 ms.
- The maximum breaking time is 140 ms.

Short-Circuit Protection (ANSI 50)

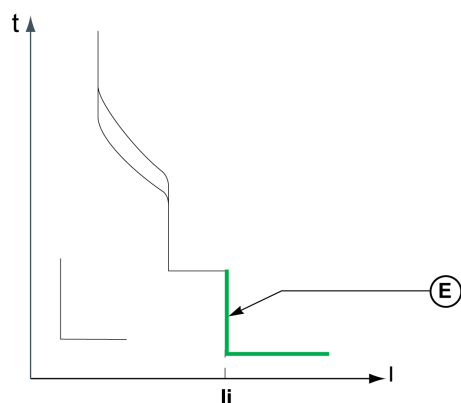
Presentation

Short-circuit protection protects all types of motor applications against very high intensity short-circuit currents.

Operating Principle

Short-circuit protection is fixed: the pickup value is determined by the current rating I_n . Protection is instantaneous.

Tripping curve:



Item	Parameter	Description
E	Ii	Short-circuit protection pickup

Ii Pickup Value

The Ii pickup value is directly determined by the rated current of the device and is equal to $17 \times I_n$.

The accuracy range is $\pm 15\%$.

Rating I_n (A)	2	3.5	7	12.5	25	50	80	115
Ii Short-circuit pickup (A)	34	60	119	213	425	850	1,360	1,955

The hold time is 0 ms.

The maximum breaking time is 20 ms.

Ground-Fault Protection (ANSI 51N)

Presentation

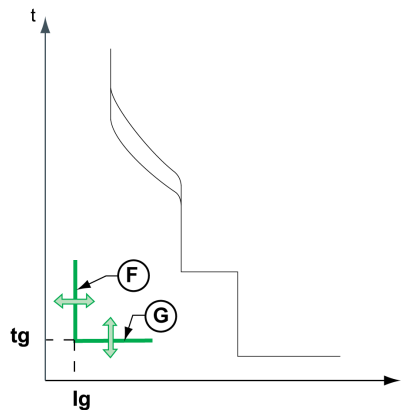
Ground-fault protection protects all types of motor applications against ground-fault currents in a TN-S system.

Ground-fault protection is activated during startup and in steady state.

Operating Principle

Ground-fault protection is definite time. It can be configured as I_g pickup and as t_g tripping time delay.

Tripping curve:



Item	Parameter	Description
F	I_g	Ground-fault protection pickup
G	t_g	Ground-fault protection time delay

Setting the Ground-Fault Protection

Ground-fault protection can be enabled or disabled. The protection is enabled by default.

Set the I_g pickup and t_g time delay:

- With the TeSys GV4 mobile app ([see page 46](#)).
- With Ecoreach software ([see page 50](#)).

I_g Pickup Setting Values

Pickup setting range:

- $0.7-1 \times I_n$ for devices with nominal current from 2 to 50 A
- $0.4-1 \times I_n$ for devices with nominal current from 80 to 115 A

The default I_g pickup setting value is $1 \times I_n$.

The increment is $0.05 \times I_n$.

The accuracy range is $\pm 10\%$.

t_g Time Delay Setting Values

The t_g time delay setting value is in seconds.

The default t_g time delay setting is 0.1 s.

The following table shows t_g setting values in second (s) and the associated hold and breaking times in milliseconds (ms):

Function	Value			
t_g (s)	0.1	0.2	0.3	0.4
Hold time (ms)	80	140	230	350
Maximum breaking time (ms)	140	200	320	500

Phase Unbalance Protection (ANSI 46)

Presentation

Unbalances of the motor phase currents lead to significant heat rise and braking torques that can cause premature deterioration of the motor. These effects are amplified during startup: protection must be almost immediate.

Description

Phase unbalance protection:

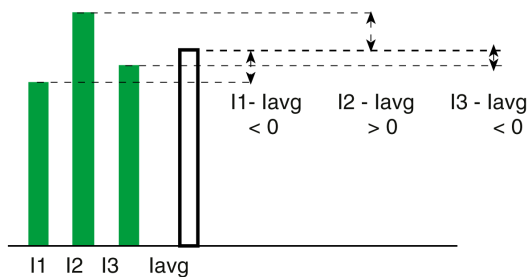
- Calculates the current unbalance for each phase, compared to the average current, expressed as a percentage:

$$I_{avg} = \frac{(I_1 + I_2 + I_3)}{3}$$

$$I_k \text{ unbalance (\%)} = \frac{I_k - I_{avg}}{I_{avg}} \times 100 \text{ where } k = 1, 2, 3$$

- Compares the value of the maximum current unbalance with the lunbal protection pickup.

The following diagram shows a maximum positive unbalance on phase 2:



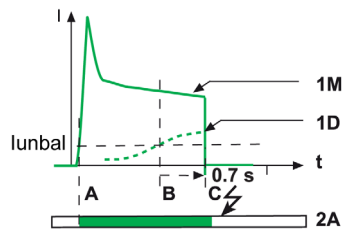
If the maximum current unbalance value is higher than the phase unbalance protection lunbal pickup, the tunbal time delay is actuated.

Phase unbalance protection cannot be deactivated.

Phase unbalance protection is activated during startup and in steady state.

Operating Principle

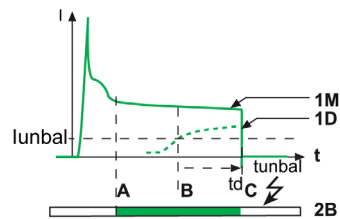
- The current unbalance does not fall below the lunbal pickup before the end of the tunbal time delay: the phase unbalance protection trips. The behavior of the protection differs according to the motor operating conditions:



- 1M** Motor current
1D Maximum unbalance of the motor phase currents
2A Monitoring by phase unbalance protection during startup
 White: Not active
 Green: Active

During startup:

- A:** Activation of startup phase.
- B:** Activation of protection time delay as soon as the pickup is crossed.
- C:** Protection tripped at the end of the fixed time delay of 0.7 s.

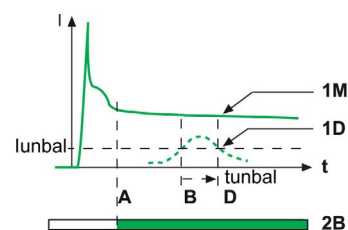


- 1M** Motor current
1D Maximum unbalance of the motor phase currents
2B Monitoring by phase unbalance protection in steady state
 White: Not active
 Green: Active

In steady state:

- A:** Activation of steady state phase.
- B:** Activation of protection time delay as soon as the pickup is crossed.
- C:** Protection tripped at the end of the adjustable time delay.

- The current unbalance falls below the lunbal pickup before the end of the tunbal time delay: the phase unbalance protection does not trip.



- 1M** Motor current
1D Maximum unbalance of the motor phase currents
2B Monitoring by phase unbalance protection in steady state
 White: Not active
 Green: Active

- B:** Activation of protection time delay as soon as the pickup is crossed.
- D:** Time delay is reset.

NOTE: The SDx module (set on SDTAM early tripping protection function) can be used to open the contactor instead of tripping the device.

Setting the Protection

Set the lunbal pickup and the tunbal time delay:

- With the TeSys GV4 mobile app (*see page 46*).
- With Ecoreach software (*see page 50*).

lunbal Pickup Setting Value

The lunbal pickup setting value is expressed as a percentage of the average current.

The pickup setting range is 10–40%. The increment is 1%. The default pickup setting value is 30%.

The accuracy range is +/-20%.

tunbal Time Delay Setting Value

The tunbal time delay setting value is in seconds.

The tunbal time delay setting depends on the operating conditions:

- During startup, the value of the time delay cannot be adjusted and equals 0.7 s.
- In steady state, the setting range is 1–10 s. The increment is 1 s.
The default time delay setting value is 4 s.

Motor Jam Protection (ANSI 48/51LR)

Presentation

Motor jam protection provides additional protection in order to:

- Detect overtorque.
- Monitor mechanical malfunction.
- Detect malfunctions more quickly on machines for which the motor is oversized.

Examples of machines with a significant risk of jamming: conveyors, crushers and kneaders, fans, pumps and compressors.

Description

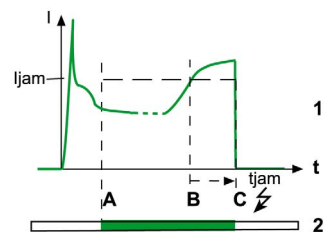
Motor jam protection compares the value of the average motor current I_{avg} with the setting value of the protection I_{jam} pickup. If the average motor current I_{avg} exceeds the I_{jam} pickup, the protection t_{jam} time delay is actuated.

By default, motor jam protection is not active.

After function setting, motor jam protection is:

- Active in steady state.
- Disabled during startup.

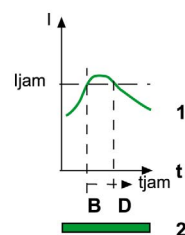
Operating Principle



- 1 Motor current
2 Monitoring by motor jam protection
White: Not active (during startup)
Green: Active (steady state)

The average motor current I_{avg} does not fall back below the protection I_{jam} pickup before the end of the t_{jam} time delay (jammed motor). Motor jam protection trips:

- A: Protection activated (change to steady state).
- B: Activation of protection time delay as soon as the pickup threshold is crossed.
- C: Protection tripped at the end of the time delay.



- 1 Motor current
2 Monitoring by motor jam protection
White: Not active (during startup)
Green: Active (steady state)

The average motor current I_{avg} falls back and stays below the protection I_{jam} pickup before the end of the t_{jam} time delay (occasional overload). Motor jam protection does not trip:

- B: Activation of protection time delay as soon as the pickup threshold is crossed
- D: Time delay is reset.

NOTE: The SDx module (set on SDTAM early tripping protection function) can be used to open the contactor instead of tripping the device.

Setting the Protection

Motor jam protection can be enabled or disabled. The protection is disabled by default.

Set the I_{jam} pickup and the t_{jam} time delay:

- With the TeSys GV4 mobile app ([see page 46](#)).
- With Ecoreach software ([see page 50](#)).

Ijam Pickup Setting Value

The Ijam pickup setting value is in multiples of I_r .

The pickup setting range is $1.5\text{--}8 \times I_r$. The increment is $0.1 \times I_r$. The default pickup setting value is $2 \times I_r$.

The accuracy range is $\pm 10\%$.

tjam Time Delay Setting Value

The tjam time delay setting value is in seconds.

The tjam time delay setting range is $1\text{--}30$ s. The increment is 1 s. The default time delay setting value is 5 s.

Long-Start Motor Protection (ANSI 48/51LR)

Presentation

Long-start motor protection provides additional protection:

- For machines at risk of difficult starting:
 - High inertia machines
 - High resistive torque machines
 - Machines with fluctuating load from steady state

Examples of machines with a significant risk of difficult starting: fans, compressors.

- To avoid no-load starts:
 - Load not present
 - Machines oversized for the application

Description

Long-start motor protection is activated as soon as the average motor current I_{avg} exceeds 10% of the I_r setting value: the protection I_{long} time delay is actuated. Long-start motor protection compares the value of the average motor current I_{avg} with the setting value of the protection I_{long} pickup.

By default, long-start motor protection is not active.

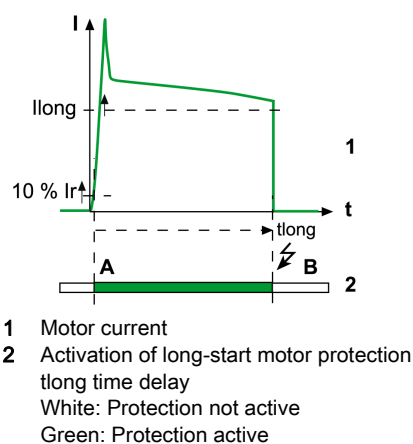
After function setting, long-start motor protection is:

- Active during startup
- Not active in steady state

Operating Principle (Difficult Starting)

On starting, the average motor current I_{avg} overruns the long-start motor protection I_{long} pickup. The protection remains active as long as the average motor current I_{avg} has not fallen below the I_{long} pickup.

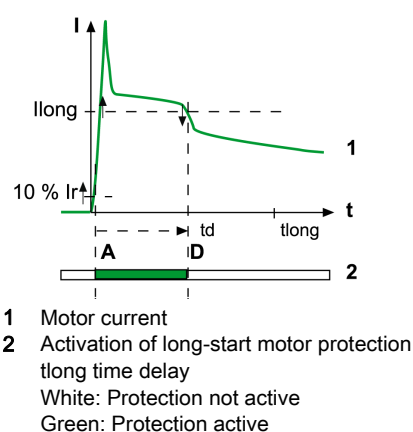
The curve can evolve in one of two ways:



The average motor current I_{avg} has not fallen below the I_{long} pickup before the end of the t_{long} time delay (starting with a too large load).

Long-start motor protection trips:

- **A:** Activation of protection time delay (10% of I_r pickup is exceeded).
- **B:** Protection tripped at the end of the time delay.

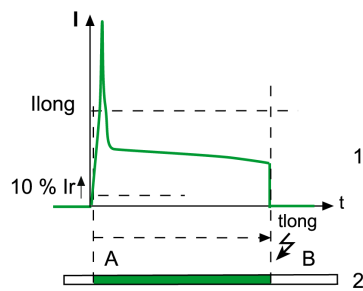


The average motor current I_{avg} falls below the I_{long} pickup before the end of the t_{long} time delay (correct starting). Long-start motor protection does not trip:

- **A:** Activation of protection time delay (10% of I_r pickup is exceeded).
- **D:** Deactivation of protection.

Operating Principle (No-Load Starting)

On starting, the average motor current I_{avg} does not exceed the long-start motor protection I_{long} pickup. The protection remains active as long as the value of the average current I_{avg} has not fallen below 10% of the I_r setting value.



- 1 Motor current
 2 Activation of long-start motor protection time delay
 White: Protection not active
 Green: Protection active

The motor current has not fallen below 10% of the I_r setting value before the end of the t_{long} time delay: long-start motor protection trips.

- **A:** Activation of protection time delay (10% of I_r pickup is exceeded)
- **B:** Protection tripped at the end of the time delay

If the motor current falls back below 10% of the I_r setting value before the end of the protection t_{long} time delay (for example on contactor opening), long-start motor protection does not trip.

NOTE: The trip unit filters the subtransient state (first current peak of approximately 20 ms on contactor closing). This current peak is not therefore taken into account when assessing whether the I_{long} pickup has been crossed.

Setting the Protection

Long-start motor protection can be enabled or disabled. The protection is disabled by default.

Set the I_{long} pickup and t_{long} time delay:

- With the TeSys GV4 mobile app ([see page 46](#)).
- With Ecoreach software ([see page 50](#)).

I_{long} Pickup Setting Value

The pickup setting range is $1.5-8 \times I_r$. The increment is $0.1 \times I_r$. The default pickup setting value is $1.5 \times I_r$. The accuracy range is $\pm 10\%$.

t_{long} Time Delay Setting Value

The t_{long} time delay setting value is in seconds.

The t_{long} time delay setting range is 1–200 s. The increment is 1 s. The default time delay setting value is 10 s.

Chapter 3

Event History

Event History

Overview

All events of trip and alarm detected by the device are logged in the event history.

Event history can be consulted on the TeSys GV4 mobile app.

Events are categorized as trips or alarms:

- A trip is an event generated when the circuit breaker trips.
- An alarm indicates that a threshold is reached.

For a trip, the following information is logged in the event history:

- Name of the trip
- Phase during which trip occurred:
 - Power-up phase
 - Startup state phase
 - Steady state phase

For an alarm, the following information is logged in the event history:

- Name of the alarm
- Counter indicating the number of times the alarm has occurred. It is updated every 15 minutes or after a trip.



Number of Events in Event History

The maximum number of events logged in the history is 16 for the trip and alarms. When the history is full, each new event overwrites the oldest event.

Displaying Event History on TeSys GV4 Mobile App

All events logged in the event history are displayed on the TeSys GV4 mobile app through NFC communication. They are displayed in chronological order, with the most recent event displayed at the top of the list.

A pictogram indicates the type of event:

-  Trip
-  Alarm

The event history can be cleared in the TeSys GV4 mobile app ([see page 49](#)).

List of Trip Events

The following trip events are logged in the event history:

- Ground-fault trip (Ig)
- Overload trip (Ir)
- Short-time delay trip (Isd)
- Short-circuit trip (Ii)
- Phase unbalance trip (Iunb)
- Jam trip (Ijam)
- Long-start trip (Ilong)
- Internal fault

List of Alarm Events

The following alarm events are logged in the event history:

- Overload alarm (T>95%)
- Overload alarm (xx s before trip)
- Overload tripping alarm (SDTAM)
- Internal fault
- Electronic push-to-trip

Chapter 4

Electrical Auxiliary Devices

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Electrical Auxiliary Devices	36
Indication Contacts	37
Voltage Releases	38
SDx Module	39

Electrical Auxiliary Devices

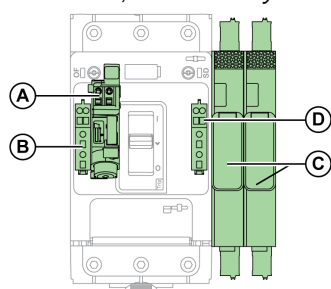
Summary of Electrical Auxiliary Devices

The following table shows electrical auxiliary devices that can be added to devices. They can be installed on site. For more information, see the *TeSys GV4P Multifunction Catalog*.

Electrical auxiliary device	Use
OF auxiliary contact	View the on/off status of the device remotely.
SD auxiliary contact	View the trip status of the device remotely.
MX shunt trip	Send an electrical trip command remotely.
MN undervoltage release	Trip the device when the control voltage drops below a tripping threshold.
SDx module	Provide alarm and fault differentiation for the TeSys GV4P Multifunction device.

Slots for Electrical Auxiliary Devices

The following figures show the available slots for electrical auxiliary devices mounted in the case of or outside the device. One auxiliary can be installed in each slot, except two for the SDx module. For more information, see the *TeSys GV4P Multifunction Catalog*.



- A** MN undervoltage release or MX shunt trip
- B** OF auxiliary contact
- C** SDx modules (two maximum)
- D** SD auxiliary contact

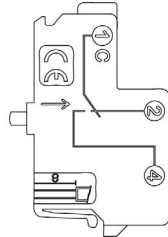
Indication Contacts

Characteristics of Indication Contacts

Use indication contacts to view the status of the device remotely.

Indication contacts are located under the front face of the device, in a compartment that is isolated from the power circuits. When an indication contact is present, a green flag is displayed on the front of the device.

The contacts used for indication contacts are common point changeover contacts.



C(1) Common

NC(2) Normally closed contact. The NC contact is normally closed when the device is in the **O (OFF)** position.

NO(4) Normally open contact. The NO contact is normally open when the device is in the **O (OFF)** position.

NOTE: The indication contact provides either OF or SD indication functions, depending on its location in the device.

Name	Definition
OF open/close indication contact	<p>The OF contact indicates the state of the device, (I (ON) or O (OFF)/Trip).</p> <p>Changeover</p> <ul style="list-style-type: none"> • O (OFF) to I (ON) • I (ON) to O (OFF) • I (ON) to Trip
SD trip indication contact	<p>The SD contact indicates that the device has tripped due to:</p> <ul style="list-style-type: none"> • Operation of the push-to-trip button • Operation of the MX shunt trip or MN undervoltage release • Electrical fault detected by the protection <p>Changeover</p> <ul style="list-style-type: none"> • I (ON) to Trip • Trip to O (OFF)

Operation of the Indication Contacts

The following figures show the position of the indication contacts for each position of the handle and main contacts.

Name	Contact number	Position of the handle and contacts		
Device status	–	OFF	ON	Tripped (by MN/MX, push-to-trip, or protection)
Handle position	–			
Main contact position	–	Open	Closed	Open
OF auxiliary contact position	1-2	Closed	Open	Closed
	1-4	Open	Closed	Open
SD auxiliary contact position	1-2	Closed	Closed	Open
	1-4	Open	Open	Closed

Voltage Releases

Characteristics

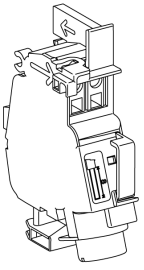
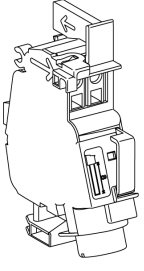
The following voltage release auxiliaries are operated remotely by an electrical trip command:

- MX shunt trip
- MN undervoltage release

NOTE: It is recommended to test the operation of a voltage release at regular intervals, such as every six months.

Voltage release auxiliaries are installed in the case under the front face of the device. The presence and characteristics of a voltage release auxiliary are displayed through a window on the front face.

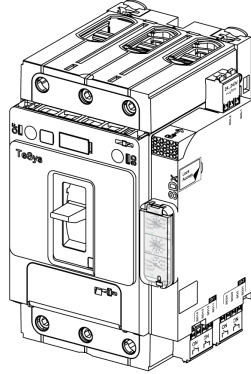
The characteristics of voltage release auxiliaries comply with IEC/EN 60947-2 recommendations.

Name	Image	Description
MN undervoltage release		<ul style="list-style-type: none"> ● Trips the device when the voltage is less than 0.35 times the rated voltage (U_n). <ul style="list-style-type: none"> ○ If the voltage is between 0.35 and 0.7 times the rated voltage (U_n), tripping can occur but is not certain to occur. ○ If the voltage is above 0.7 times the rated voltage (U_n), tripping cannot occur. ● Allows the device to be closed again when the voltage reaches 0.85 times the rated voltage (U_n). <p>Use this type of accessory for failsafe emergency stops.</p>
MX shunt trip		<p>Trips the device when the voltage exceeds 0.7 times the rated voltage (U_n).</p> <p>NOTE: MX shunt trip 110/130 Vac combined with Class I ground-fault sensing element is suitable for ground-fault protection. In this application, the device trips when the voltage exceeds 0.55 times the rated voltage (U_n).</p>

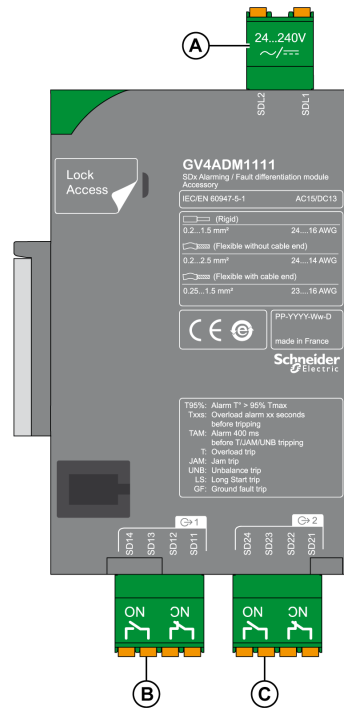
SDx Module

Introduction

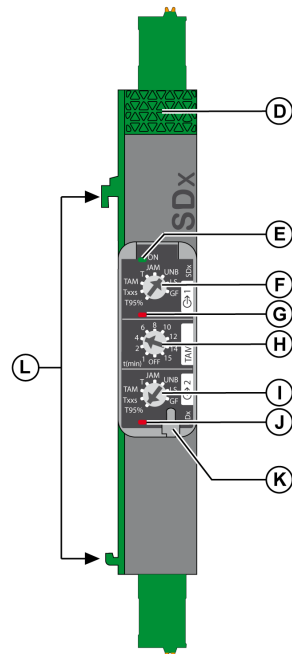
One or two optional SDx modules can be installed on the right side of a TeSys GV4P Multifunction device. The SDx module has two outputs and provides alarms and fault differentiation. The SDx module receives data from the device through an optical link.



Description



- A Power supply
- B Output 1 (1NO+1NC)
- C Output 2 (1NO+1NC)



- D Lock knob
- E SDx module status
OFF: SDx module not powered
Green: SDx module powered
- F Output 1 setting dial
- G Output 1 status LED
OFF: output de-activated
Red: output activated
- H SDTAM mode and automatic reset time setting
- I Output 2 setting dial
- J Output 2 status LED
OFF: output de-activated
Red: output activated
- K Seal for setting cover
- L Clips to attach to device

SDx Module Characteristics

Power supply: 24–240 Vac/Vdc

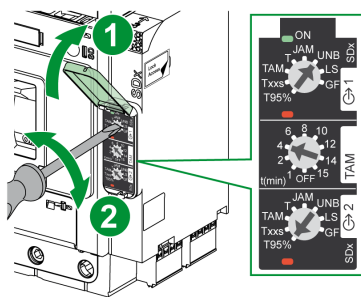
Output characteristics:

- Voltage: 24–250 Vac/Vdc
- Current: 2 mA–5 A maximum
- Power:
 - 2,000 VA maximum
 - 240 W maximum

Output Settings

The function assigned to each output of the SDx module is set by using a setting dial. Each output can be assigned with one of the following indications:

- Overload alarm (T95%): The thermal image of the motor is greater than 95% of the permissible temperature rise.
- Overload alarm xx seconds before tripping (Txxs): In the event of a constant load, the device trips in xx seconds.
- Alarm before tripping (TAM): In the event of a phase unbalance, overload, or on a jam, this output is activated to open the contactor and avoid device tripping. In this case, contact can be manually or automatically reset after an adjustable cooling time (1–15 minutes). If the motor is not stopped after a 400 ms delay, the device trips.
- Overload trip indication (T): The device has tripped due to an overload fault.
- Jam trip indication (JAM): The device has tripped due to a jam.
- Phase unbalance trip indication (UNB): The device has tripped due to an unbalance fault.
- Long-start trip indication (LS): The device has tripped due to a long-start fault.
- Ground-fault trip indication (GF): The device has tripped due to a ground-fault.



T95%	Overload alarm
Txxs	Overload alarm xx seconds before tripping
TAM	Overload alarm just before tripping
T	Overload trip indication
JAM	Jam trip indication
UNB	Phase unbalance trip indication
LS	Long-start trip indication
GF	Ground-fault trip indication

SDT95%, SDTAM, and SDT Operating Modes

Operating modes of the SDT95% output:

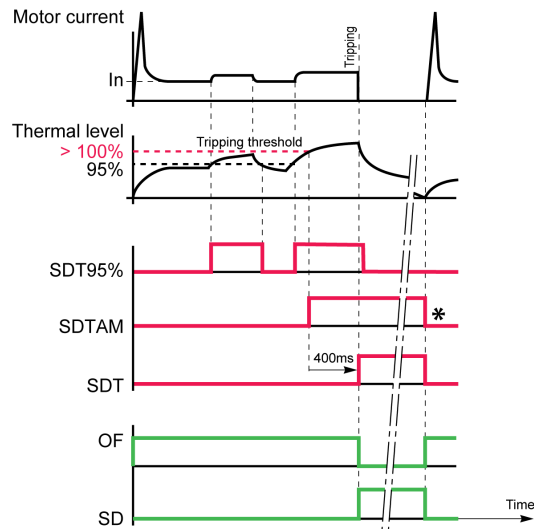
- Turn the output setting dial to **T95%**. The output is activated when thermal image of the motor is greater than 95% of the permissible temperature rise.
- The output is reset in the following cases:
 - With the motor running, when the thermal level of the motor is lower than 95% of the permissible temperature rise.
 - Automatically approximately 2 seconds after tripping.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.

Operating modes of the SDTAM output:

- Turn the output setting dial to **TAM**. The output is activated in the event of a phase unbalance, overload, or a jam. The device trips if the motor is not stopped within 400 ms after output activation. The manual reset mode or cooling time before automatic reset is set by using the **TAM** multi-position dial in the middle of the front face of the SDx module.
- The output is reset in the following cases:
 - When the **TAM** dial setting is **OFF**, the contact is manually reset by turning the SDx module power off and on.
 - When the **TAM** dial setting is 1–15 minutes, the contact is automatically reset after the cooling time.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.

Operating modes of the SDT output:

- Turn the output setting dial to **T**. The output is activated when the device trips due to an overload fault.
- The output is reset in the following cases:
 - After tripping, when the device is reset, closed, and the motor is restarted.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.



- Curves of TeSys GV4P Multifunction device
- Curves of SDx modules
- Curves of auxiliary contacts
- SDT95%** 95% overload
- SDTAM** Overload tripping alarm (TAM output contacts not connected to any contactor)
- SDT** Tripping on thermal fault
- *** After automatic reset after cooling time or manual reset on SDX module

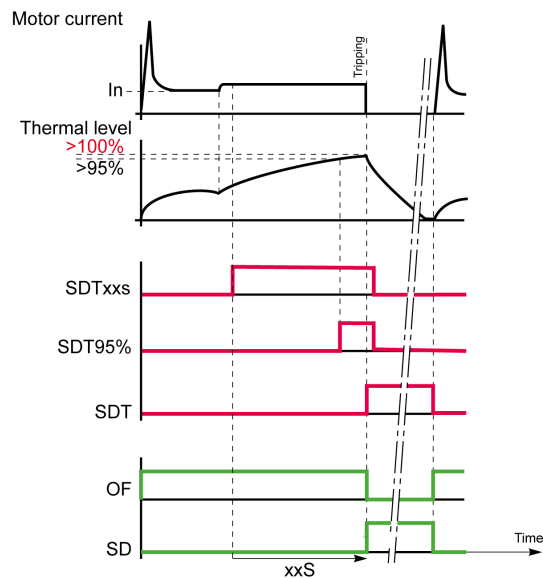
SDTxxs Operating Modes

Operating modes of the SDTxxs output:

- Turn the output setting dial to **Txxs**. The output is activated when the device will trip in xx seconds with a constant load.

NOTE:

- If the output is deactivated and the current increases suddenly and results in device tripping in a time shorter than the SDTxxs value, then the output remains deactivated.
- If the output is activated and the current increases strongly and results in device tripping in a time shorter than the SDTxxs value, then the output remains activated.
- If the output is activated and the current decreases and results in device tripping in a time longer than the SDTxxs value, then the output is deactivated.
- xx is adjustable between 10 to 40 seconds (20 seconds is the default value):
 - With the TeSys GV4 mobile app ([see page 46](#)).
 - With Ecoreach software ([see page 50](#)).
- The output is reset in the following cases:
 - With the motor running, when the tripping condition disappears.
 - Automatically approximately 2 seconds after tripping.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.



— Curves of TeSys GV4P Multifunction device
 — Curves of SDx modules
 — Curves of auxiliary contacts

SDTxxs Overload alarm xx seconds before tripping

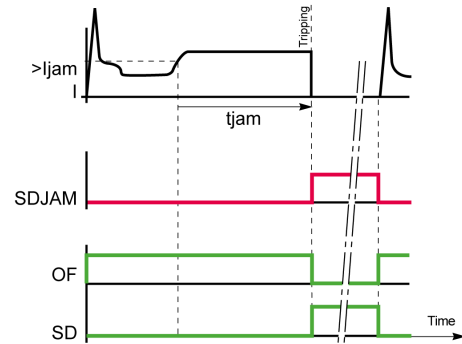
SDT95% 95% overload

SDT Tripping on thermal fault

SDJAM Operating Modes

Operating modes of the SDJAM output:

- Turn the output setting dial to **JAM**. The output is activated when the device trips due to a jam fault.
- The output is reset in the following cases:
 - After tripping, when the device is reset, closed, and the motor is restarted.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.

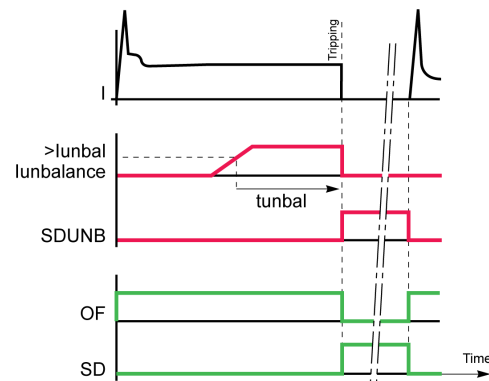


— Curves of TeSys GV4P Multifunction device
 — Curves of SDx modules
 — Curves of auxiliary contacts
SDJAM Tripping on jam fault

SDUNB Operating Modes

Operating modes of the SDUNB output:

- Turn the output setting dial to **UNB**. The output is activated when the device trips due to an unbalance fault.
- The output is reset in the following cases:
 - After tripping, when the device is reset, closed, and the motor is restarted.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.

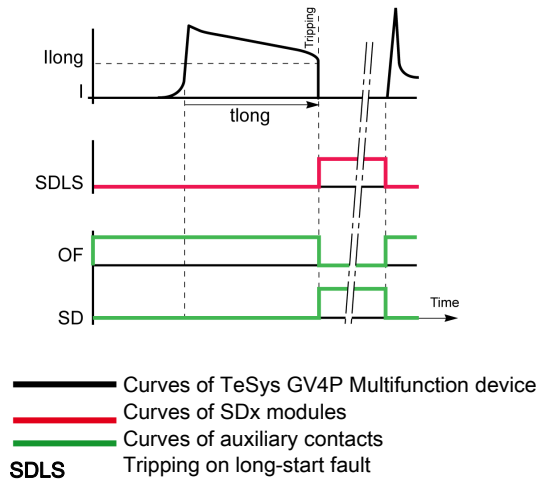


— Curves of TeSys GV4P Multifunction device
 — Curves of SDx modules
 — Curves of auxiliary contacts
SDUNB Tripping on unbalance fault

SDLS Operating Modes

Operating modes of the SDLS output:

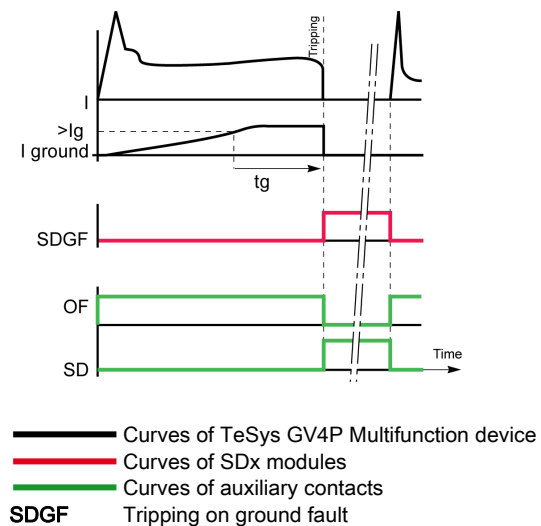
- Turn the output setting dial to **LS**. The output is activated when the device trips due to a long-start fault.
- The output is reset in the following cases:
 - After tripping, when the device is reset, closed, and the motor is restarted.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.



SDGF Operating Modes

Operating modes of the SDGF output:

- Turn the output setting dial to **GF**. The output is activated when the device trips due to a ground fault.
- The output is reset in the following cases:
 - After tripping, when the device is reset, closed, and the motor is restarted.
 - When the SDx module power is turned off and on.
 - When the output setting dial position is changed.



Chapter 5

Settings

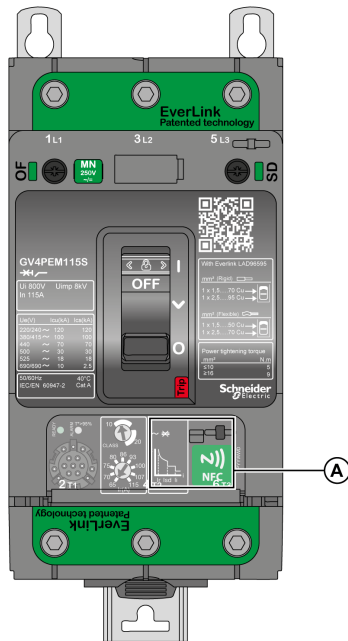
What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
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Settings With the Android TeSys GV4 Mobile App

Description



A NFC wireless communication zone

The TeSys GV4 mobile app works with an Android smartphone which has Near Field Communication (NFC) capability enabled. Using the application through an NFC connection, you can access the protection settings and download data to your smartphone even when the device is not connected to a power supply.

The device uses a passive NFC tag, which does not have a power source. The power supply to a passive NFC tag is from the smartphone that reads it, and therefore it does not emit any electromagnetic waves when NFC communication is not in use.

Prerequisites for Using NFC

The prerequisites for establishing an NFC connection are the following:

- You must have an Android smartphone with the TeSys GV4 mobile app installed.
- The Android smartphone must support NFC functionality.
- You must have physical access to the device.
- Check where the NFC antenna is located on your smartphone. Place and hold the NFC antenna of the smartphone against the NFC wireless communication zone of the TeSys GV4P Multifunction device. During communication, to avoid communication loss, do not move your smartphone.

Scanning the Device

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Ensure that there are no unprotected live exposed connections before performing the NFC actions with TeSys GV4 mobile application.
- Hold smartphone firmly to prevent slipping on the exposed connection while performing NFC actions with TeSys GV4 mobile application.

Failure to follow these instructions will result in death or serious injury.

Follow the steps below to scan the TeSys GV4P Multifunction device.

Step	Action
1	Activate the NFC functionality of your Android smartphone.
2	Start the TeSys GV4 mobile app on your smartphone.
3	Read carefully the safety message that displays then select I UNDERSTAND to confirm.
4	Select SCAN MY DEVICE .
5	<p>Place the NFC antenna of the smartphone against the NFC wireless communication zone of the device and do not move it.</p> <p>NOTE: The NFC antenna of the device is located around the NFC marking on the device (<i>see page 46</i>). The position of the NFC antenna on the smartphone depends on the model of smartphone used. If communication is not established, check where the NFC antenna is located on your smartphone and do the procedure again.</p> <p>Vibration (and beep if sound activated on the smartphone) indicates that the TeSys GV4 mobile app is downloading data and settings of advanced protection functions. The data download is complete when data is displayed on the smartphone.</p> <p>If the operation fails, a message is displayed on the smartphone. Read the message carefully then do the procedure again.</p> <p>NOTE: You must not remove your smartphone from the device while the data download is in progress. If you do, you lose the NFC connection and data is not downloaded.</p>
6	Remove your smartphone from the device. You can use the TeSys GV4 mobile app to consult downloaded data.

Reading, Changing, Saving, and Writing Protection Settings



CAUTION

HAZARD OF EQUIPMENT DAMAGE

- Switch off the motor before modifying the parameters.
- Before restarting the motor, verify that:
 - All the electrical connections are proper.
 - All the drawers and doors are closed properly.
- Restart the motor to apply the changed protection settings to the TeSys GV4P Multifunction device.

Failure to follow these instructions can result in injury or equipment damage.

Follow the steps below to read the protection settings of the device, change and save them in the TeSys GV4 mobile app, and then write them to the device.

Step	Action
1	Scan your device (<i>see page 47</i>).
2	Select the settings tab  to display available protections and the settings for each protection.
3	Select the write icon  to change the settings.
4	Select the protection setting you want to change.
5	Change the value of the protection.
6	Select MODIFY to save the value. Result: The changed value is displayed in orange.
7	Repeat step 4 to 6 for each protection setting you want to change.
8	To save the protection settings, select SAVE , then enter a relevant name for the set of settings and select SAVE . NOTE: A notice appears, indicating that the protection settings have been written successfully in My Settings menu.
9	Select WRITE TO DEVICE .
10	A safety message and the existing and new values of the protection settings are displayed. Changed values are displayed in orange. Read carefully the safety message and check the protection settings, and then select CONTINUE .
11	Place the NFC antenna of the smartphone against the NFC wireless communication zone of the device and do not move it.
12	A message appears, indicating that the protection settings have been written successfully to the device. Select OK .
13	Restart the motor to apply the changed protection settings to the TeSys GV4P Multifunction device.


Settings downloaded from the device through an NFC connection are not automatically refreshed. To get updates, you must scan your device again. Each new set of settings overwrites the previous settings if the previous settings are not saved.

NOTE: From **My Settings** menu, you can do the following:

- Read a set of protection settings
- Modify and overwrites a set of protection settings
- Modify a set of protection settings and save it as a new set
- Write a set of protection settings to a device


Reading/Clearing the Event History

Follow the steps below to read and clear the event history in the device.

Step	Action
1	Scan your device (see page 47).
2	Select the event tab  to display the list of trips and alarms.
3	Select CLEAR ALARMS to clear the event history of the device.
4	Place the NFC antenna of the smartphone against the NFC wireless communication zone of the device and do not move it. Result: The alarms are cleared from the device and in the mobile app.

Displaying Device Information

Follow the steps below to display the information on the TeSys GV4P Multifunction device.

Step	Action
1	Scan your device (see page 47).
2	Select the information tab  to display the device information (for example, serial number, firmware version, commercial reference, access to the product data sheet).

Troubleshooting NFC Communication Issues

The following table lists the common problems that you may encounter while establishing an NFC connection with the device.

Problem description	Probable causes	Solutions
The scan does not start. (No vibration)	The smartphone is out of the NFC wireless communication zone of the device.	Move your smartphone away from the device. Then move your smartphone so that the NFC antenna is in the NFC wireless communication zone and do the scan procedure again.
	Your smartphone has a reinforced case (for example, metallic) which is blocking the signal.	Remove the case of your smartphone and do the scan procedure again.
	Your smartphone does not have NFC capability.	Use another Android smartphone with NFC capability.
	NFC communication is not activated on your smartphone.	Activate NFC communication on your smartphone.
The scan starts (one vibration), but the signal is lost.	The smartphone was moved out of the NFC wireless communication zone of the device before the data transmission finished.	Hold your smartphone away from the device when selecting SCAN MY DEVICE . Then place the antenna of your smartphone against the NFC wireless communication zone of the device and do the scan procedure again. Keep the smartphone in the NFC wireless communication zone until data is displayed on the smartphone.
The data is not transmitted. The message We lost the connection with the device. Please try to place the phone near device NFC area again, till you feel a vibration. is displayed on the smartphone.		

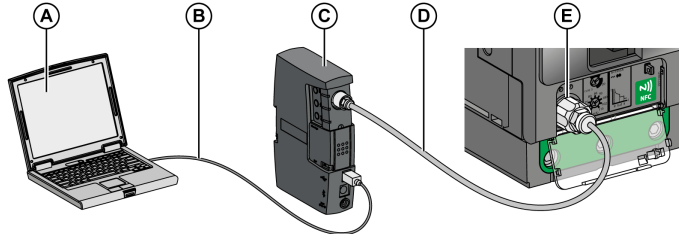
Settings with Ecoreach Software Through Ecoreach Connection Port

Description

Use a PC running Ecoreach software to access the monitoring and control functions of the TeSys GV4P Multifunction device. Connect the PC to the Ecoreach connection port on the device through the USB maintenance interface.

Connection Through USB Maintenance Interface

The following figure shows the connection of a PC to the TeSys GV4P Multifunction device through the USB maintenance interface.



- A PC running Ecoreach software
- B Standard USB cable, delivered in maintenance case TRV00910
- C USB maintenance interface
- D GV4PEM cord for USB maintenance interface
- E Ecoreach connection port on the TeSys GV4P Multifunction device

Prerequisites for Using a USB Connection

The prerequisites for establishing a connection are:

- You must have the USB driver installed on the PC.
- You must have physical access to the device to connect the cable to the Ecoreach connection port.
- You must have a USB cable to connect the USB port of the PC to the USB maintenance interface.

Connecting a PC Running Ecoreach Software to the Device

Follow the steps below to connect a PC to the TeSys GV4P Multifunction device.

Step	Action
1	Connect your PC to the USB maintenance interface by using a standard USB cable.
2	Connect the USB maintenance interface to the Ecoreach connection port on the device by using a GV4PEM cord for USB maintenance interface.
3	Start Ecoreach software on the PC and log in.
4	On the Ecoreach home page, connect to the device. There are different ways to connect Ecoreach software to the device, depending on whether it is the first connection and how the device is discovered. For more information, refer to <i>Ecoreach Online Help</i> .
5	With Ecoreach software connected to the device, you have access to all functions of the software.

Appendices



Appendix A

Wiring Diagrams

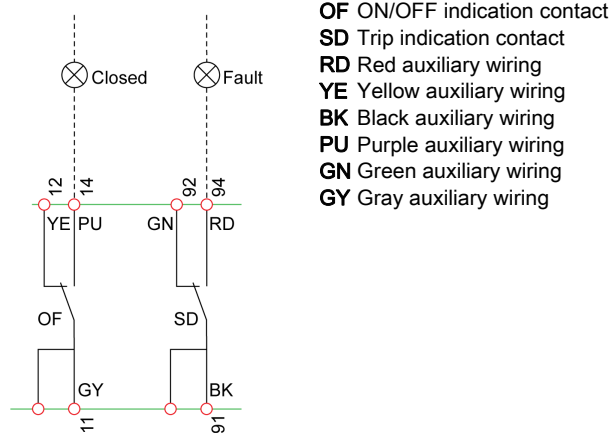
Circuit Breakers

Introduction

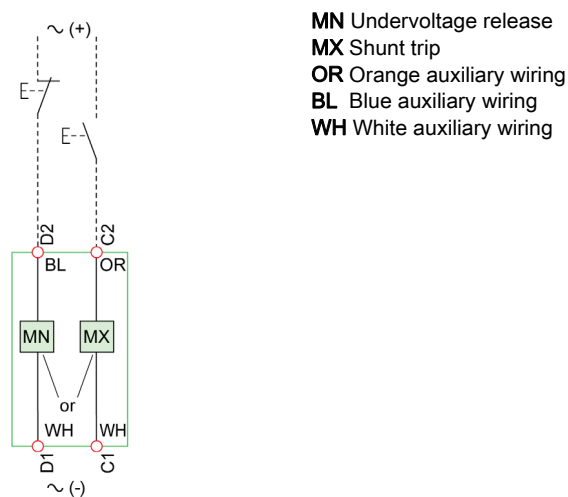
The diagrams are shown with circuits de-energized, all devices open, connected, and charged, and relays in normal position.

Terminals shown in red ● must be connected by the customer.

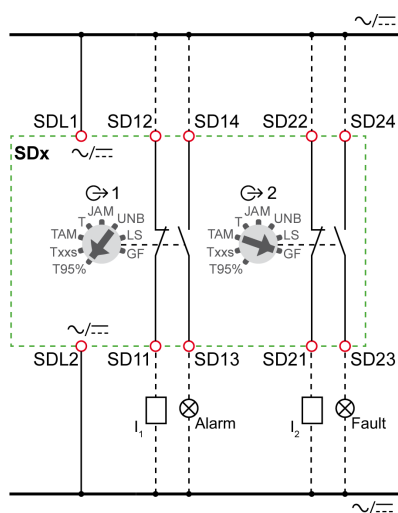
Indication Contacts



Remote Operation



SDx Module



SDx SDx module

I1, I2 PLC digital inputs (used as alarm inputs, for example)



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As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

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