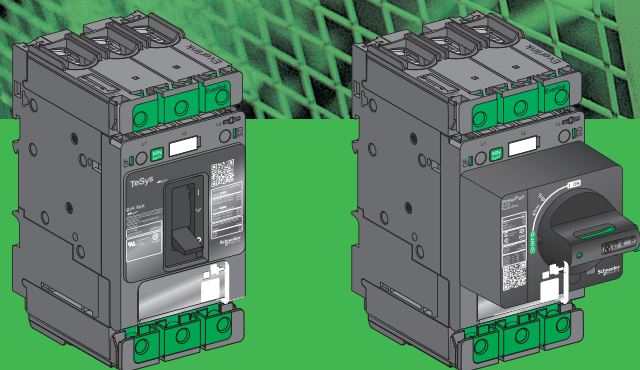


TeSys BV4

Catalog 2020
Motor Circuit Protectors



schneider-electric.com/TeSys

Life Is On

Schneider
Electric

Courtesy of Steven Engineering, Inc - (800) 258-9200
sales@steveneng.com - www.stevenengineering.com



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Endorsing eco-friendly products in the industry



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Product

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manufactured products
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Schneider Electric products are subject to RoHS requirements at a worldwide level, even for the many products that are not required to comply with the terms of the regulation. Compliance certificates are available for products that fulfill the criteria of this European initiative, which aims to eliminate hazardous substances.

REACH

Schneider Electric applies the strict REACH regulation to its products at a worldwide level, and discloses extensive information concerning the presence of SVHC (Substances of Very High Concern) in all of its products.

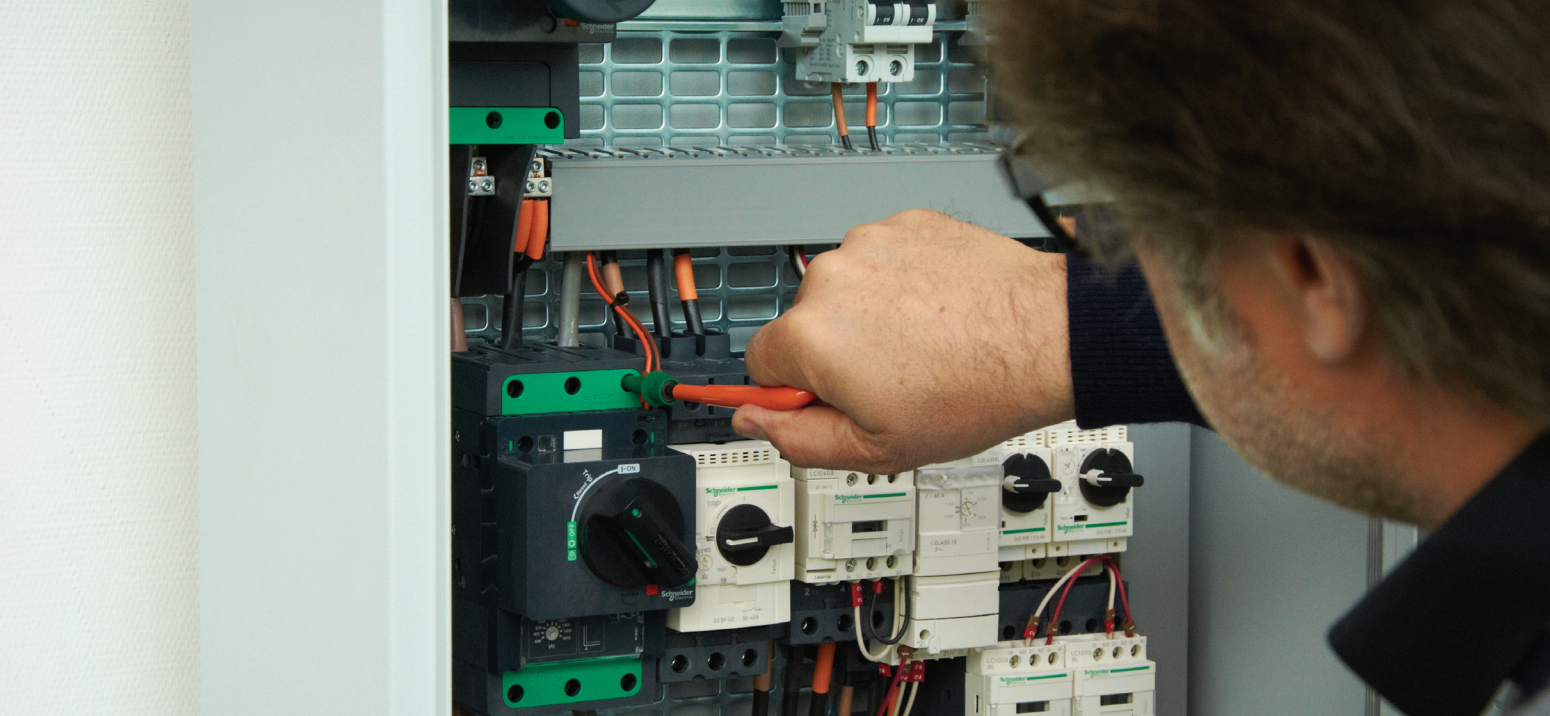
PEP: Product Environmental Profile

Schneider Electric publishes a complete set of environmental data, including carbon footprint and energy consumption data for each of the lifecycle phases on all of its products, in compliance with the ISO 14025 PEP ecopassport program. PEP is especially useful for monitoring, controlling, saving energy, and/or reducing carbon emissions.

EoLI: End of Life Instructions

Available at the click of a button, these instructions provide:

- Recyclability rates for Schneider Electric products.
- Guidance to mitigate personnel hazards during the dismantling of products and before recycling operations.
- Parts identification for recycling or for selective treatment, to mitigate environmental hazards / incompatibility with standard recycling processes.



TeSys™ BV4

Motor circuit protectors

New motor control and protection, completing an established product family

TeSys™ range is the result of more than 90 years of Schneider Electric expertise and leadership.

We are proud to introduce a new family member: the TeSys™ BV4 motor circuit protector, which adds a magnetic-only, UL 489 Recognized circuit protector for UL 60947-4-1 Type D combination ratings to our existing motor control offer. The new TeSys BV4 is a compact and robust motor circuit protector up to 115 A with combination short-circuit current ratings (SCCR) up to 100 kA at 480 V.

The TeSys BV4 motor circuit protector is also equipped with patented EverLink™ power connections and may be equipped with a wide range of accessories, including auxiliary contacts, undervoltage trip, shunt trip, and rotary handles.



TeSys GV2
range
1993



TeSys GV3
range
2007



New TeSys
BV4/GV4 ranges
2018



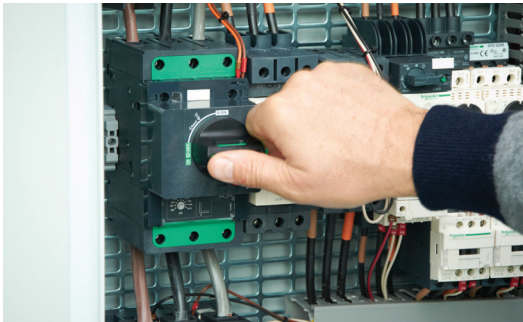
New TeSys BV4

The safety of your applications is our first concern



I Design and build machines.

Optimize your solution.



- Choose the starter solution for your needs. Listed Type D combination with Square D™ NEMA Type S starters, NEMA TeSys N starters, and TeSys IEC motor starters.
- Adjustable settings for motor inrush increase flexibility
- Compact size reduces panel space requirements.
- DIN rail and panel mount ready
- Secure connections with dual wire EverLink power terminations



I Design and build motor control centers.

Win more projects and ensure profitable margin.

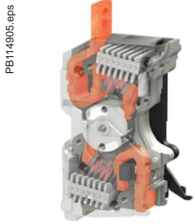


- Save time cabling with EverLink connectors and spring-type auxiliaries.
- Same frame from 2–115 A up to 100 kA SCCR at 480 V
- Save space with compact footprint.
- Adaptability and retrofit opportunity with options for DIN rail or panel mounting
- Extended rotary handle with accurate “Trip” indication

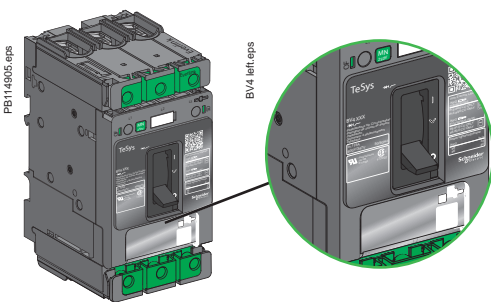
| Contents | Page |
|-----------------------------------|-------|
| Introduction | 2–5 |
| References | 6–14 |
| Technical Characteristics | 15–16 |
| Electrical Characteristics | 17 |
| Auxiliary Contact Characteristics | 18 |
| Curves | 19–24 |
| Dimensions | 25–27 |
| Schematics | 28 |
| Product Reference Index | 29 |

Introduction—TeSys BV4

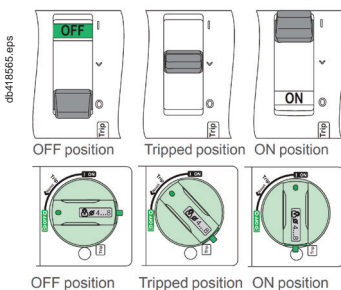
Characteristics



Dual-break rotating contacts



TeSys BV4 motor circuit protector



Handle position indicator

Master Range: TeSys

TeSys™ is an innovative motor control and management solution from the global market leader. TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.

Introduction

TeSys BV4 motor circuit protectors protect electrical circuits from damage caused by short circuits. The TeSys BV4 motor circuit protector is designed to provide branch circuit protection for motor circuits when applied with the specified motor starter per the UL Type D combination ratings.

TeSys BV4 motor circuit protectors are available with magnetic trip units with a wide range of selectable instantaneous trip points that meet NEC installation requirements and with a short-circuit current rating up to 100 kA at 480 Vac. See the UL Type D combination motor controller ratings for the BV4 motor circuit protector for combination details and short-circuit current ratings.

Dual-break rotating contacts

All TeSys BV4 motor circuit protectors are equipped with dual-break rotating contacts that reduce the amount of peak current during a short-circuit fault. This reduces the let-through currents and enhances equipment protection.

Internal operating mechanism

TeSys BV4 motor circuit protectors have an over-center toggle mechanism providing quick-make, quick-break operation. The operating mechanism is also trip-free, which allows tripping even when the motor circuit protector handle is held in the "ON" position.

Internal cross-bars provide common opening and closing of all poles with a single "ON" position.

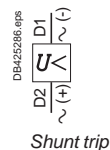
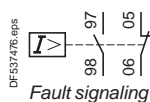
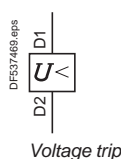
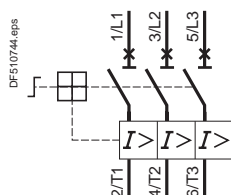
TeSys BV4 motor circuit protectors have an integral push-to-trip button in the cover to manually trip the motor circuit protector. This should be used as part of a preventive maintenance program.

Handle position indication

The motor circuit protector handle can assume any of three positions: ON, tripped, or OFF.

The tripped position provides positive visual indication that the motor circuit protector has tripped.

The motor circuit protector can be reset by first pushing the handle to the extreme "OFF" position. Power can then be restored to the load by pushing the handle to the "ON" position.



Basic functions

Short-circuit protection (magnetic motor circuit protector)

Protects the installation against short circuit by an instantaneous trip of the circuit protector. The trip is obtained by means of a magnetic element incorporated in the motor circuit protector.

The magnetic tripping threshold is field adjustable, and can be set within a range suitable for the motor load based on current NEC guidelines.

Contact position indication

Because it is suitable for isolation, in the open position the BV4 motor circuit protector provides an adequate isolation distance and accurately indicates the position of the moving contacts by the position of the operators.

Additional functions

Provided by additional modules.

Undervoltage protection

Using the undervoltage release accessory, the BV4 motor circuit protector trips in an undervoltage condition, protecting against sudden starting of the machine when normal voltage is restored. The motor circuit protector must be manually reset to restart the motor.

Remote opening

The BV4 motor circuit protector can be remotely tripped with the addition of a shunt trip.

Handle padlocking

When the front mount or through-the-panel handle is used, the operators on both open-mounted and enclosed motor circuit protectors can be locked in the off position, "O," with up to 3 padlocks.

Indicating contacts

Indicating contacts provide remote information about the motor circuit protector status and can therefore be used for indication, electrical interlocking, relays, etc.

Introduction—TeSys BV4

TeSys protection components

Motor circuit protectors BV4

EverLink technology for TeSys BV4

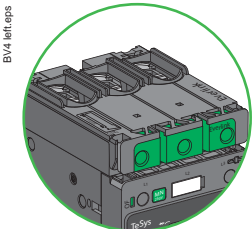
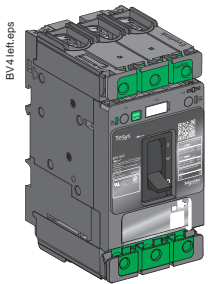
TeSys BV4 motor circuit protectors feature a cable connection method with patented EverLink creep-compensating technology built directly into the terminal:

- EverLink connectors save space and time during panel assembly.
- EverLink connectors reduce the risk of loose bare cables resulting from creep.

No overheating connections—EverLink creep-compensated terminals for BV4

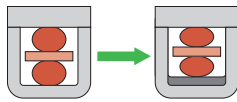
The EverLink patented technology for terminals reduces the risk of loose bare cables due to copper creeping. Vibration withstand is improved and periodic re-tightening is no longer needed.

EverLink. The clamp connectors that don't need re-tightening.



EverLink terminals,
with BTR screws

Creeping phenomenon

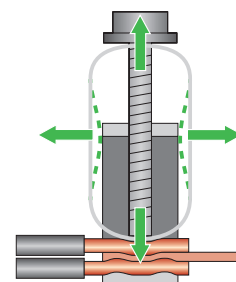
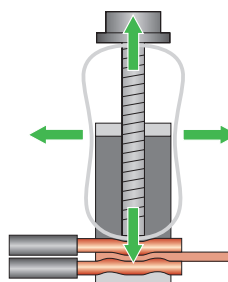
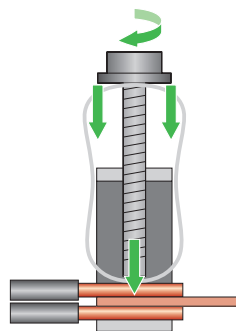


Copper conductors are subject to creep over time, reducing the contact pressure in conventional clamps.

With EverLink connectors, force is applied on the conductors and on a spring during tightening.

The spring pressure and crimping of the conductors on the contact plate maintains the cables.

The spring compensates for cable conductor creep. Tightening force is assured.

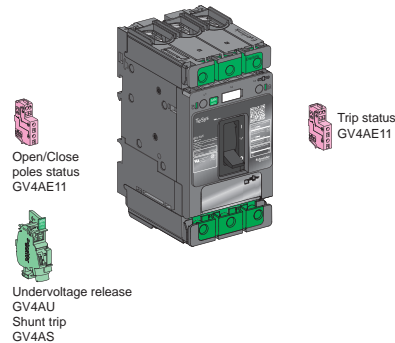


Introduction—TeSys BV4

TeSys protection components

Motor circuit protectors BV4

Auxiliary functions provided by add-on blocks



BV4

Auxiliary contact add-on blocks

For control, alarms, and automatic actions:

- **Real time** indication of the position of the motor circuit protector contacts
- **Trip indication**
- **Alarming**

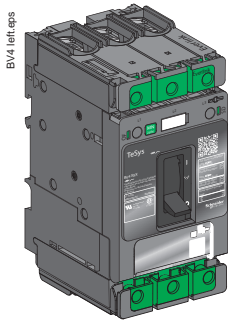
Trip coils

For remote tripping of the motor circuit protector:

- **Shunt trip / MX** trips the motor circuit protector when powered.
- **Undervoltage release / MN** trips the motor circuit protector when voltage is lost.

TeSys protection components

TeSys BV4 overview



Protection

The magnetic trip setting is made using the dial.

Short circuit protection (li)

- Magnetic protection with an adjustable pick-up.
- Settings are made in amperes.
- Brief time delay before tripping (~100 ms) to let through motor inrush currents
- Instantaneous trip level is adjustable with 9 different trip setpoints to meet National Electrical Code® (NEC®) requirements.

Standards and certifications

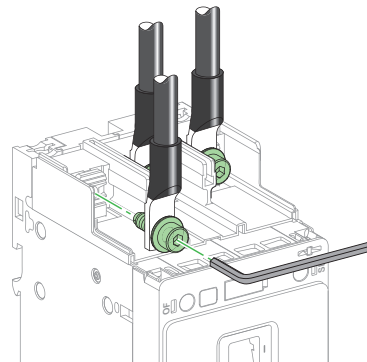
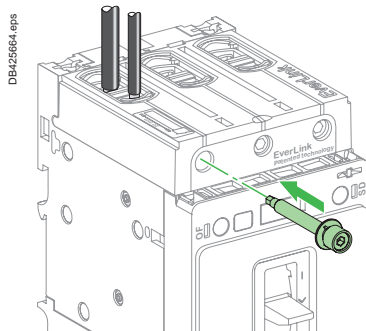
UL 489, CSA C22.2 No. 5

Power connections

TeSys BV4 motor circuit protectors come as standard with dual wire EverLink power connectors with creep ⁽¹⁾ compensation for bare copper cables. This Schneider Electric patented technology makes it possible to achieve accurate and durable tightening torque while avoiding cable creep.

Torque limiting breakaway bits are available and can be used to tighten the power connections to the appropriate torque, particularly in the field. See page 14.

EverLink connectors can be field interchanged with connection accessories for use with bars or cables with compression lugs.



Mounting

TeSys BV4 motor circuit protectors can be mounted on a backplate or on a DIN rail (35 or 75 mm).

Handle

TeSys BV4 motor circuit protectors come as standard with a toggle handle.

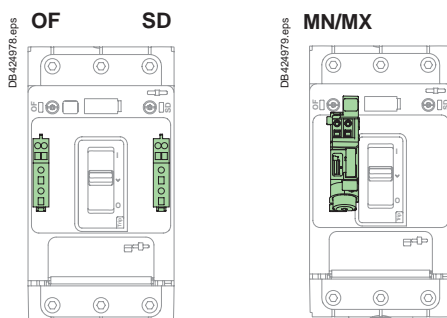
It is possible to equip the toggle version with a direct mount rotary handle, a through-the-door front rotary extension, or a side mount rotary extension.

Auxiliaries

TeSys BV4 motor circuit protectors can be equipped with an open/close (OF) contact and a trip indication (SD) contact. These contacts are common point changeover types, with a normally open (NO) and a normally closed (NC) contact.

TeSys BV4 motor circuit protectors may also be equipped with an MN (undervoltage release) or MX (shunt trip) coil.

Auxiliaries have spring connections for cables up to 1.5 mm² (16 AWG).

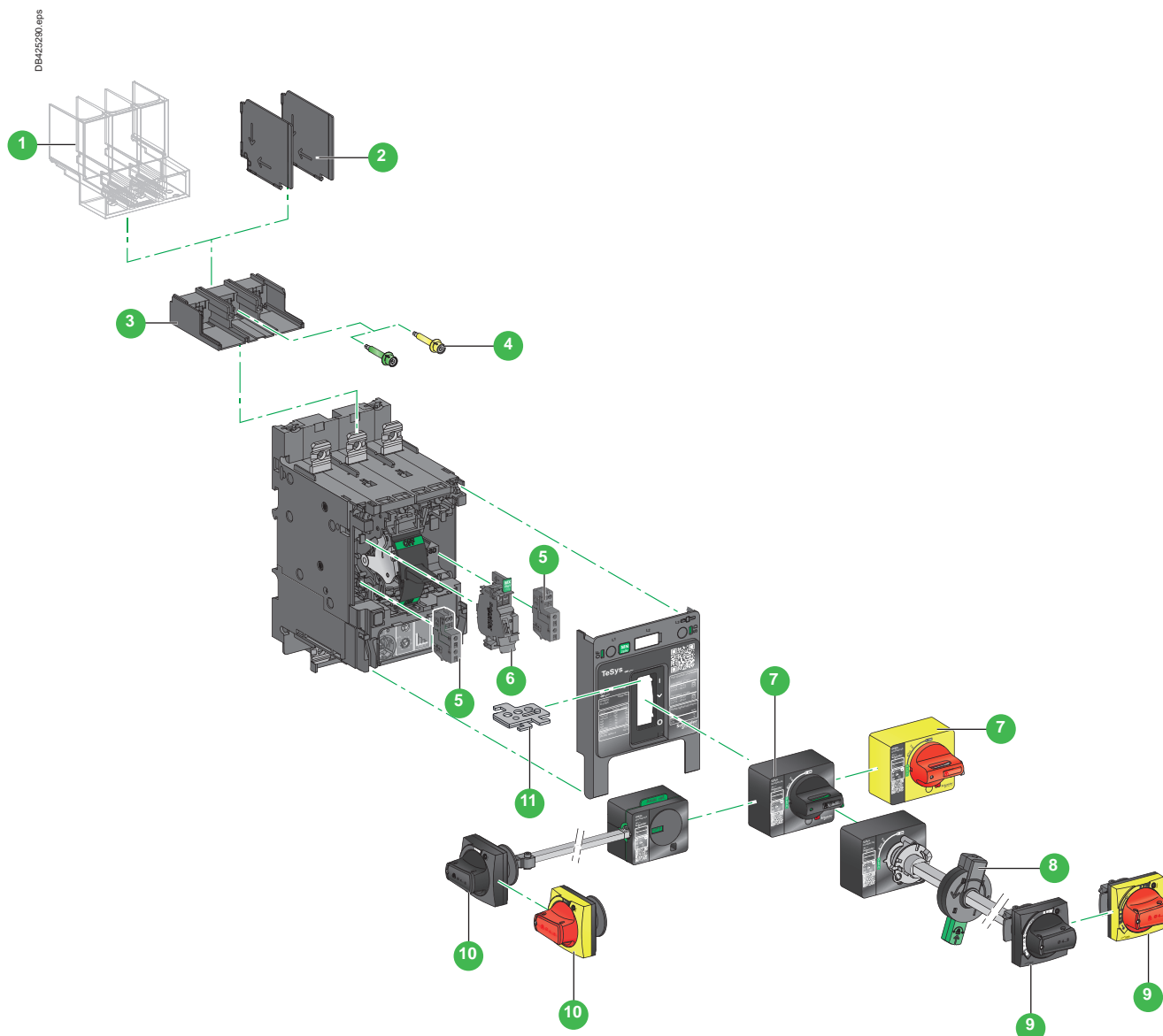


⁽¹⁾ Creep: normal crushing phenomenon of conductors, that is accentuated over time.

References—TeSys BV4, 2–115 A

TeSys protection components

TeSys BV4 overview



- ① Long terminal shield **LAD96590**
- ② Interphases barriers **LV426920**
- ③ Crimp lug connector **GV4LUG**
- ④ Torque limiting breakaway bits **LV42699●**
- ⑤ Auxiliary contact block for OF or SD function **GV4AE11**
- ⑥ - MN undervoltage release **GV4AU●●**
- MX shunt trip **GV4AS●●**
- ⑦ Direct mounting black or red on yellow bezel rotary handle **GV4ADN01/ GV4ADN02**
- ⑧ Open door shaft operator (for front extended rotary handle) **LV426937**
- ⑨ Front extended rotary handle kit with red handle on yellow bezel or black handle **GV4APN01/ GV4APN02 /GV4APN04**
- ⑩ Side rotary handle kit with red handle on yellow bezel or black handle **LV426935/LV426936**.
- ⑪ Toggle locking device **29370**

References—TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector BV4

per UL 60947-4-1 Type D combinations

Construction Type D uses three separate devices to achieve the four branch motor circuit functions required by the NEC. The disconnecting means and motor branch circuit protection are achieved using a UL 489 instantaneous trip motor circuit protector. The motor controller and motor overload relay used are UL 60947-4-1 contactors and UL 60947-4-1 overload relays. Schneider Electric has various products that meet this construction type, as listed in the following tables. The use of UL 60947-4-1 starters, the combination of a UL 60947-4-1 contactor, and a UL 60947-4-1 overload relay also meets construction Type D. When selecting TeSys BV4 motor circuit protectors, consult the UL Type D combination tables at www.ul.com/sccr for specific motor controller combinations using the TeSys BV4, ratings, and conditions of acceptability.

Disconnecting means and motor branch circuit protection using a UL 489 instantaneous trip motor circuit protector, a UL 60947-4-1 contactor, and a UL 60947-4-1 overload relay

| UL 489 motor circuit protector | UL 60947-4-1 contactor | UL 60947-4-1 overload relay |
|--------------------------------|---|--|
| TeSys BV4 | TeSys D TeSys F TeSys N Type S | TeSys LRD bimetal overload relay TeSys LR9D electronic overload relay TeSys LR9F electronic overload relay TeSys T motor management system Motor Logic™ solid state overload relay Melting alloy overload relay |

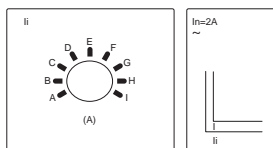
Disconnecting means and motor branch circuit protection using a UL 489 instantaneous trip motor circuit protector and a UL 60947-4-1 starter

| UL 489 motor circuit protector | UL 60947-4-1 starter |
|--------------------------------|--|
| TeSys BV4 | TeSys N with Motor Logic overload relay Type S with Motor Logic overload relay Type S with TeSys T motor management system Type S with adapted bimetal overload relay |

BV4 motor circuit protector selection (1)

| Frame | Motor circuit protector ampacity (In) | Adjustable instantaneous trip (Ii) | Protection level | |
|-----------|---------------------------------------|------------------------------------|------------------|------------|
| | | | Standard fault | High fault |
| TeSys BV4 | 2 | 12–28 | BV4T002D | BV4T002J |
| | 3.5 | 21–49 | BV4T003D | BV4T003J |
| | 7 | 42–98 | BV4T007D | BV4T007J |
| | 13 | 53–195 | BV4T013D | BV4T013J |
| | 25 | 110–360 | BV4T025D | BV4T025J |
| | 50 | 176–650 | BV4T050D | BV4T050J |
| | 80 | 320–1150 | BV4T080D | BV4T080J |
| | 115 | 600–1150 | BV4T115D | BV4T115J |

(1) See UL Listed combination ratings in accordance with UL 60947-4-1 Type D Construction, published on www.UL.com/sccr.



Circuit Breaker Ratings

| Rating | Position | | | | | | | | |
|--------|----------|------|-----|------|-----|------|------|------|------|
| | A | B | C | D | E | F | G | H | I |
| 2 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 |
| 3.5 | 21 | 24.5 | 28 | 31.5 | 35 | 38.5 | 42 | 45.5 | 49 |
| 7 | 42 | 49 | 56 | 63 | 70 | 77 | 84 | 91 | 98 |
| 13 | 53 | 71 | 89 | 106 | 124 | 142 | 160 | 177 | 195 |
| 25 | 110 | 141 | 173 | 204 | 235 | 266 | 298 | 329 | 360 |
| 50 | 176 | 235 | 295 | 354 | 413 | 472 | 532 | 591 | 650 |
| 80 | 320 | 424 | 528 | 631 | 735 | 839 | 943 | 1046 | 1150 |
| 115 | 600 | 669 | 738 | 806 | 875 | 944 | 1013 | 1081 | 1150 |

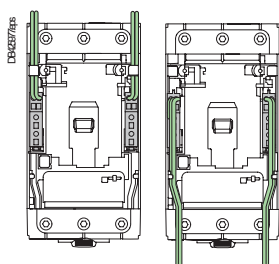
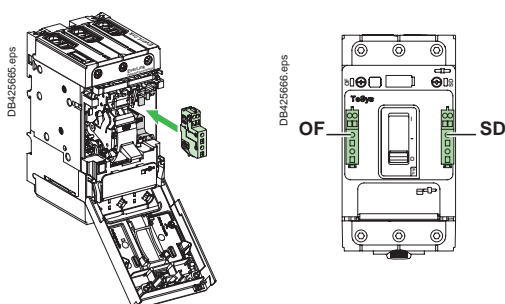
References—TeSys BV4, 2–115 A

TeSys protection components

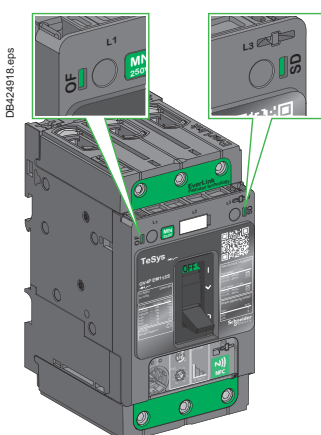
Auxiliary contact block



GV4AE11 auxiliary contact block



Pluggable auxiliary contact, OF or SD dependent on cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of auxiliary contact block in OF or SD cavity

Auxiliary contact blocks

Auxiliary contacts give an indication of the motor circuit protector status. They can be used for remote visual signaling, alarming, electrical locking, and relay activation. An auxiliary contact block provides one changeover contact with a common point for Open/Closed (OF) or Trip Alarm (SD) function, depending on the cavity where it is inserted.

Auxiliary contact—Open/Closed OF function

Indicates Open/Closed position of the motor circuit protector contacts.

Auxiliary contact—Trip Alarm SD function

- Indicates that the motor circuit protector has tripped due to:
 - electrical fault (short circuit)
 - shunt trip
 - undervoltage release
 - "push-to-trip" button.
- Resets when the motor circuit protector is reset.

Electrical characteristics

| | | | | | | |
|----------------------------------|-----------------------|----------------|------|------|------|------|
| Rated thermal current (A) | | 5 | | | | |
| Minimum load | | 2 mA at 17 Vdc | | | | |
| Utilization cat. (IEC 60947-5-1) | | AC12 | AC15 | DC12 | DC13 | DC14 |
| Operational current (A) | 24 Vac/Vdc | 5 | 5 | 5 | 2.5 | 1 |
| | 48 Vac/Vdc | 5 | 5 | 2.5 | 1.2 | 0.2 |
| | 110–127 Vac / 110 Vdc | 5 | 4 | 0.6 | 0.35 | 0.05 |
| | 220/240 Vac | 5 | 3 | — | — | — |
| | 250 Vdc | — | — | 0.3 | 0.05 | 0.03 |
| | 380/440 Vac | 5 | 2.5 | — | — | — |
| | 660/690 Vac | 5 | 0.11 | — | — | — |

Pilot duty B600 according UL 60947 and CSA C22.2 No.14

Installation and connection

- Auxiliary contact blocks snap into left (for OF function) and right (for SD function) cavities behind the front accessory cover of the motor circuit protector. Their presence is visible on the front face through green flags.
- One model serves for all indication functions depending on where it is fitted in the motor circuit protector.
- Each NO and NC spring terminal may be connected by one 0.5–1.5 mm² (20–16 AWG) flexible copper wire and by two for the common point.
- Wires can be routed out of any of the four corners of the motor circuit protector under the accessory cover.

| Description | Maximum number | Mounting | Type of contacts | Sold in lots of | Reference |
|---|-----------------|------------------|------------------|-----------------|-----------|
| Auxiliary contact block for OF or SD indication | 2 (1 OF + 1 SD) | Internal plug-in | NO + NC | 1 | GV4AE11 |

Electrical characteristics of indication contacts

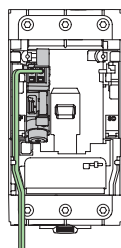
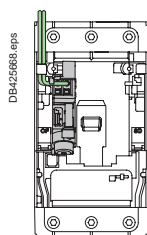
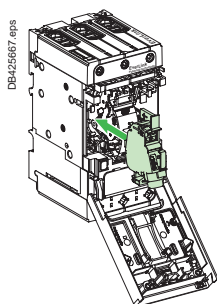
| | | | | | | |
|----------------------------------|-----------------------|-------------------|------|-------------------------|------|------|
| Rated thermal current (A) | | 5 | | | | |
| Minimum load | | 5 mA at 17 Vdc | | | | |
| Utilization cat. (IEC 60947-5-1) | | AC12 | AC15 | DC12 | DC13 | DC14 |
| Operational current (A) | 24 Vac/Vdc | 5 | 5 | 5 | 2.5 | 1 |
| | 48 Vac/Vdc | 5 | 5 | 2.5 | 1.2 | 0.2 |
| | 110–127 Vac / 110 Vdc | 5 | 4 | 0.6 | 0.35 | 0.05 |
| | 220/240 Vac | 5 | 3 | — | — | — |
| | 250 Vdc | — | — | 0.3 | 0.05 | 0.03 |
| | 380/440 Vac | 5 | 2.5 | — | — | — |
| 660/690 Vac | | 5 | 0.11 | — | — | — |
| UL 489, CSA C22.2 No. 5 | | Ampere Rating (A) | | Pilot Duty Standard (A) | | |
| 48 Vac | | 5 | | — | | |
| 120 Vac | | 5 | | 3 | | |
| 240 Vac | | 5 | | 1.5 | | |
| 480 Vac | | 5 | | 0.75 | | |
| 600 Vac | | — | | 0.6 | | |
| 48 Vdc | | 2.5 | | — | | |
| 110 Vdc | | 0.8 | | — | | |
| 250 Vdc | | 0.3 | | — | | |

TeSys protection components

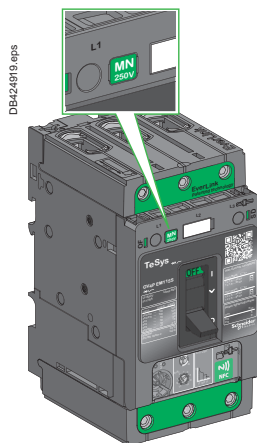
MX shunt trip, MN undervoltage release



GV4AS137 shunt trip



MN or MX plugged into cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of MN undervoltage release in device cavity, rated voltage is visible through the window.

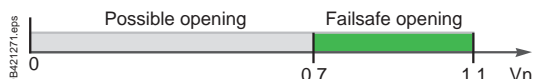
MX shunt trip, MN undervoltage release

MX and MN trip the motor circuit protector on a control signal. They are mainly used for remote and emergency-off commands.

It is advised to test the system every six months.

MX shunt trip

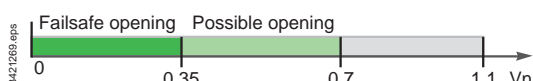
- Trips the motor circuit protector when the control voltage rises above 70% of its rated voltage (V_n)
- Impulse type ≥ 20 ms or maintained control signals. Shunt trip 110–130 Vac is suitable for ground-fault protection when combined with a Class I groundfault sensing element.
- Continuous duty rated coil except for MX 24 Vac/Vdc, where continuous activation may generate minor disturbances in sensitive environments



Opening conditions of the MX release

MN undervoltage release

- Trips the motor circuit protector when the control voltage drops below 35% of its rated voltage
- Between 35–70% of the rated voltage opening is possible but not guaranteed.
- Above 70% of the rated voltage, opening does not take place.
- Continuous duty rated coil
- Device closing is possible only if the voltage exceeds 85% of the rated voltage. If an undervoltage condition exists, operation of the closing mechanism of the motor circuit protector will not permit the main contacts to touch, even momentarily. This is commonly called "Kiss Free."



Opening conditions of the MN release



Closing conditions of the MN release

Installation and connection

Accessories snap into cavities under the motor circuit protector front accessory cover. Spring-type terminals help ensure a fast and reliable connection to 0.5–1.5 mm² (20–16 AWG) flexible copper wire (one per terminal).

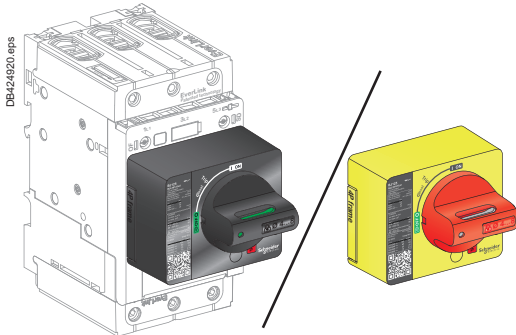
Operation

The motor circuit protector must be locally reset after trip by shunt trip (MX) or undervoltage release (MN). Tripping by MX or MN has priority over manual closing; in the presence of a standing trip order, such an action does not result in the main contacts closing, even temporarily.

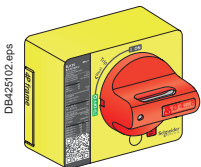
| Description | Maximum number | Mounting | Voltage | Reference |
|-------------------------|----------------|-------------------|---|-----------|
| MX shunt trip | 1 | Internal, plug-in | 24 V~ 50/60 Hz, 24 V--- | GV4AS027 |
| | | | 48 V~ 50/60 Hz, 48 V--- | GV4AS057 |
| | | | 110–130 V~ 50/60 Hz 125 V--- | GV4AS137 |
| | | | 220–240 V~ 50 Hz, 208–240 V~ 60 Hz, 277 V 60 Hz | GV4AS287 |
| | | | 380–415 V~ 50 Hz, 440–480 V~ 60 Hz | GV4AS487 |
| | | | | |
| MN undervoltage release | 1 | Internal, plug-in | 24 V~ 50/60 Hz, 24 V--- | GV4AU027 |
| | | | 48 V~ 50/60 Hz, 48 V--- | GV4AU057 |
| | | | 110–130 V~ 50/60 Hz 125 V--- | GV4AU137 |
| | | | 220–240 V~ 50 Hz, 208–240 V~ 60 Hz | GV4AU247 |
| | | | 277 V~ 60 Hz | GV4AU286 |
| | | | 380–415 V~ 50 Hz | GV4AU415 |
| | | | 440–480 V~ 60 Hz | GV4AU486 |

TeSys protection components

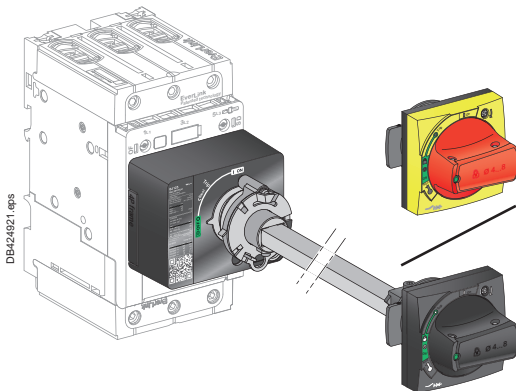
Rotary handles



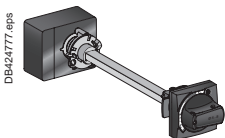
Direct mounting rotary handle



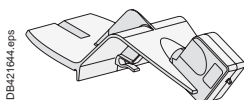
GV4ADN02 direct mounting rotary handle



Front extended rotary handle (door-mounting)



GV4APN01 front extended rotary handle kit



GVAPL01 laser tool

Direct mounting rotary handles

Installation

The direct mounting rotary handle is mounted with 3 screws on the front accessory cover.

Operation

The direct mounting rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I), and tripped (Trip)
- access to the "push-to-trip" button
- visibility and access to the trip unit.

Device padlocking

The motor circuit protector may be locked in the OFF position by using one to three padlocks (not supplied) or in the ON position after customer modification of the rotary handle before installation, padlock shackle Ø4–8 mm (3/16–5/16 in.). Locking in the ON position does not prevent the motor circuit protector from tripping if a fault occurs. In this case, the handle remains in the ON position after the motor circuit protector trips. Unlocking is required for the handle to go to the tripped then the OFF position.

Variations: door locking

Built-in door locking functionality can be activated by the customer to prevent opening the door when the motor circuit protector is ON or in Trip position. For exceptional situations, door locking can be temporarily disabled with a tool by qualified personnel to open the door when the motor circuit protector is closed.

| Description | Type | Degree of protection | Reference |
|-------------------------------|--|----------------------|-----------|
| Direct mounting rotary handle | Black handle | IP40 | GV4ADN01 |
| | Red handle on yellow bezel (VDE standard, for machine control) | IP40 | GV4ADN02 |

Front extended rotary handles

Installation

The door-mounted (extended) rotary handle consists of:

- a unit that has to be screwed on the front accessory cover of the motor circuit protector
- a handle mechanism and front plate assembly that is always secured in the same position on the door, whether the motor circuit protector is installed vertically or horizontally
- an adjustable extension shaft.

The handle mechanism is secured with a nut (Ø22 mm) to make assembly easier. The Laser Square tool (GVAPL01) can be used to accurately align the hole on the door with the motor circuit protector. See page 12.

Operation when the door is closed

The door-mounted handle makes it possible to operate a motor circuit protector installed in an enclosure from the front. The door-mounted operating handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I), and tripped (Trip)
- visibility and access to the trip unit when the door is open
- degree of protection of the handle on the door: IP54 or IP65 per IEC 529.

Mechanical door locking when device is closed

A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the motor circuit protector is in the ON or tripped positions.

Door locking can be temporarily disabled with a tool by qualified personnel to open the door without opening the motor circuit protector. This operation is not possible if the handle is locked by a padlock.

Device and door padlocking

Padlocking locks the motor circuit protector handle and disables door opening:

- standard situation, in the OFF position, using 1 to 3 padlocks, shackle Ø4–8 mm (3/16–5/16 in.). Padlocks are not supplied.
- the black handle can be padlocked in the ON and OFF positions after modification of the door handle (to be done by the customer during installation). Locking in the ON position does not prevent the motor circuit protector from tripping if a fault occurs. In this case, the handle remains in the ON position after the motor circuit protector trips. Unlocking is required for the handle to go to the tripped then the OFF position.

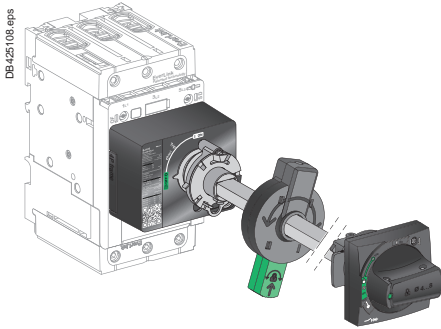
Shaft length

The shaft length is the distance between the back of the motor circuit protector and the door:

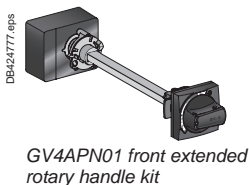
- minimum shaft length is 214 mm (8.43 in.)
- maximum shaft length is 627 mm (24.69 in.)
- shaft length must be adjusted.

TeSys protection components

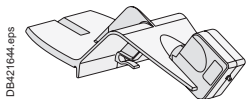
Rotary handles



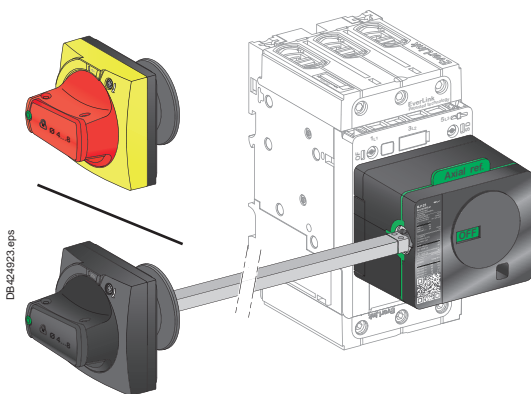
Open door shaft operator mounted on front extended rotary handle assembly



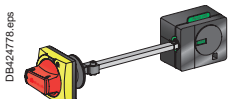
GV4APN01 front extended rotary handle kit



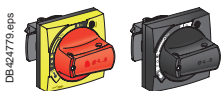
GVAPL01 laser tool



Side extended rotary handle (cover mounting)



LV426936 side rotary handle kit



LV426998, LV426997 universal handles

Front extended rotary handles (cont.)

Operation when the door is open

An open door shaft operator can be used to operate the motor circuit protector when the door is open. This accessory complies with UL 60947-4-1.

The indication of the three positions OFF (O), ON (I), and tripped (Trip) is visible on the motor circuit protector.

The motor circuit protector itself may be locked in OFF position when the door is open by 1 padlock / lockout hasp, shackle Ø4–8 mm (3/16–5/16 in.).

| Description | Type | Degree of protection | Reference |
|--|----------------------------|------------------------|-----------|
| Front extended rotary handle kit | Black handle | IP54 (NEMA 12) | GV4APN01 |
| | Red handle on yellow bezel | IP54 (NEMA 12) | GV4APN02 |
| | | IP65 (NEMA 12, 3R, 4X) | GV4APN04 |
| Open door shaft operator | | | LV426937 |
| Laser tool | | | GVAPL01 |
| BV4 universal handle (spare for front ext. & side rotary handle) | Black handle | IP54 (NEMA 12) | LV426997 |
| | Red handle on yellow bezel | IP54 (NEMA 12) | LV426998 |
| | | IP65 (NEMA 12, 3R, 4X) | LV426999 |

Side rotary handles (left or right)

Installation

The side-mounted rotary handle consists of:

- a unit that has to be screwed on the front accessory cover of the motor circuit protector
- a handle and front plate assembly on the side (left or right) of the enclosure
- an adjustable extension shaft.

The handle mechanism is secured with a nut (Ø22 mm) to make assembly easier.

Operation

The side-mounted rotary handle makes it possible to operate motor circuit protectors installed in an enclosure from the side. The side-mounted rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I), and tripped (Trip). Moreover, the position is visible on the motor circuit protector itself.
- visibility and access to the trip unit when the door is open
- degree of protection of the handle on the side: IP54 or IP65 per IEC 529.

Device padlocking

The motor circuit protector may be locked in the OFF position, or, for the black rotary handle only, in the ON position after modification of the side handle (to be done by the customer during installation), by using one to three padlocks, padlock shackle Ø4–8 mm (3/16–5/16 in.). Padlocks are not supplied.

Locking in the ON position does not prevent the motor circuit protector from tripping if a fault occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required to go to the tripped then the OFF position.

Shaft length

The shaft length is the distance between the side of the motor circuit protector and the side of the enclosure:

- minimum shaft length is 45 mm (1.77 in.).
- maximum shaft length is 480 mm (18.90 in.).
- shaft length must be adjusted.

| Description | Type | Degree of protection | Reference |
|--|--|-------------------------------|-----------|
| Side rotary handle kit | Black handle | IP54 (Type 12) | LV426935 |
| | Red handle on yellow bezel (VDE standard, for machine control) | IP54 (Type 12) ⁽¹⁾ | LV426936 |
| BV4 universal handle (spare for front ext. & side rotary handle) | Black handle | IP54 (NEMA 12) | LV426997 |
| | Red handle on yellow bezel | IP54 (NEMA 12) | LV426998 |
| | | IP65 (NEMA 12, 3R, 4X) | LV426999 |

⁽¹⁾ IP65 possible with LV426935 kit (Black handle not used) + LV426999 Red handle on yellow bezel universal handle.

TeSys protection components

Locks and sealing accessories

Handle padlocking devices

Padlocking systems can receive up to three padlocks with diameters of 5–8 mm (3/16–5/16 in.) or 4–8 mm (3/16–5/16 in.) for rotary handles. Padlocks not supplied. Locking in the OFF position provides isolation per IEC 60947-2.

Direct rotary handle padlocking

By padlock – No accessory required

- Lock in OFF position
- Lock in ON position with simple mechanism modification

Front extended / side rotary handle padlocking

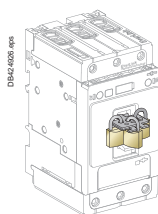
By padlock – No accessory required

- Lock in OFF position
 - Lock in ON position with simple mechanism modification (black handle only)
- Door opening prevented

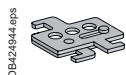
Toggle handle padlocking

By padlock – removable toggle locking device required **29370**

- Lock in OFF position



3 padlocks mounted on 29370 toggle locking device



29370 removable toggle locking device

| Description | Reference |
|---|--------------|
| Removable toggle locking device for 1 to 3 padlocks | 29370 |

Sealing devices

| Control type | <ul style="list-style-type: none"> ■ Front removal ■ Access to auxiliaries | <ul style="list-style-type: none"> ■ Access to settings and test connector |
|---------------|--|---|
| Toggle | | |
| Rotary handle | | |

| Description | Reference |
|--|-----------------|
| Bag of 6 leads + 6 sealing accessories | LV429375 |



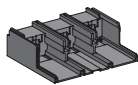
LV429375 leads + sealing accessories

References—TeSys BV4, 2–115 A

TeSys protection components

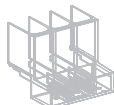
Cabling, test accessories, softwares

DB424534.eps



GV4LUG
crimped lug connector

DB424781.eps



LAD96590
transparent terminal shield

DB424782.eps



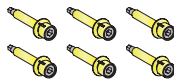
LV426920
interphase barriers

DB424832.eps



LV426990
9 N•m green throwaway bits

DB425331.eps



LV426992
5 N•m yellow throwaway bits

Crimp lug/busbar connection

| Description | Sold in lots of | Reference |
|---|-----------------|-----------------|
| Crimped lug connector + screws | 1 | GV4LUG |
| Transparent terminal shield for crimped lug connector | 1 | LAD96590 |
| Interphase barriers | 6 | LV426920 |

Limited torque throwaway bits

| Description | Sold in lots of | Reference |
|------------------------------------|-----------------|-----------------|
| Green: 9 ±0.9 N•m (80 ±8 lb-in) | 6 | LV426990 |
| Yellow: 5 ±0.5 N•m (44 ±4.4 lb-in) | 6 | LV426992 |

Note: Single use torque-limiting breakaway bits are available for field use to properly tighten power terminals when a torque wrench is not available.

Technical Characteristics—TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector TeSys BV4

| Environment | | | | |
|--|---------------------------------------|-----------------------------|---------|--|
| Circuit breaker type | | | | BV4 |
| Conforming to standards | | | | UL 489 CSA C22.2 No. 5 |
| Product certifications | | | | UL, CSA |
| Protective treatment | | | | “TH” |
| Degree of protection (front face) | Conforming to IEC 60529 | Open mounted | | IP40 front face except on connection area. Connection area: - IP20 with EverLink connector - IP40 with crimp lug connector and terminal shield. |
| | | In enclosure ⁽¹⁾ | | DRH = IP40 ERH = IP54 or IP65 |
| Shock resistance | Conforming to IEC 60068-2-27 | | | 15g - 11 ms |
| Vibration resistance | Conforming to IEC 60068-2-6 | | | 2.0–13.2 Hz and amplitude ±1 mm 13.2–100 Hz acceleration 0.7 g |
| Ambient air temperature | Storage | | °C (°F) | -50 to +85 (-67 to 185) |
| | Operation | | °C (°F) | -25 to +70 (-13 to 158) |
| Temperature compensation | | | °C (°F) | Non applicable |
| Flame resistance | Conforming to IEC 60695-2-11 | | °C | 960 |
| Maximum operating altitude | | | m | 2000 without derating. Up to 5000 with derating |
| Suitable for isolation | Conforming to IEC 60947-1 § 7-1-6 | | | Yes |
| Resistance to mechanical impact | | | J | IK07 (2J) |
| Sensitivity to phase failure | | | | No |
| Technical characteristics | | | | |
| Rated voltage | Conforming to CSA C22.2 No. 1, UL 489 | | V | 600 Y / 347 |
| Rated operational frequency | Conforming to UL 489, CSA | | Hz | 50/60 |
| Total power dissipated per pole | | | W | 6.1 |
| Mechanical durability (C.O.: Closing, Opening) | | | C.O. | 40000 |
| Electrical durability for AC-3/415 V duty (C.O.: Closing, Opening) | 415 V In | | C.O. | 5000 |
| Duty class (maximum operating rate) | | | C.O./h | 25 |
| Maximum conventional rated thermal current (I _{th}) | Conforming to UL 489 | | A | 115 |
| Rated duty | Conforming to UL 489 | | | Continuous duty |

(1) DRH = with Direct Rotary Handle
ERH = with Extended Rotary Handle

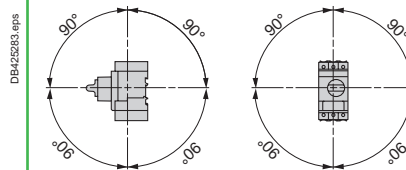
TeSys protection components

Motor circuit protector TeSys BV4

Mounting characteristics

Operating position

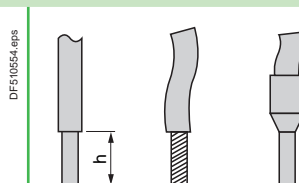
Without derating, in relation to normal vertical mounting plane ⁽¹⁾



Power connection characteristics

Power connection by bare cables (EverLink connector)

Bare cables



Connection to screw clamp terminals (Max. number of conductors x c.s.a.)

Solid cable

mm²
(AWG)

Min.
Cu 1 x 1.5 + 1 x 2.5
(Cu 2 x 14)

Max.

Cu 1 x 70 + 1 x 95
(Cu 1 x 2/0 + 1 x 3/0)

Flexible cable without cable end

mm²
(AWG)

Cu 1 x 1.5 + 1 x 2.5
(Cu 2 x 6)

Cu 1 x 50 + 1 x 70
(Cu 1 x 1/0 + 1 x 2/0)

Flexible cable with cable end

mm²
(AWG)

Cu 1 x 1.5 + 1 x 2.5
(Cu 2 x 6)

Cu 1 x 50 + 1 x 70
(Cu 1 x 1/0 + 1 x 2/0)

Tightening torque

N•m
(lb-in)

5 (44) ≤ 10 mm² / 8 AWG
9 (80) ≥ 16 mm² / 6 AWG

Stripping length (h)

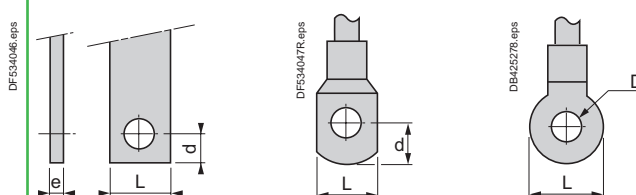
Solid cable

mm
(in.)

20
(0.79)

Power connection by bars or lugs

Bars or lugs



Pitch

Without spreaders

mm
(in.)

27
(1.06)

With spreaders

mm
(in.)

35
(1.38)

Bars or cables with lugs

e

mm
(in.)

≤ 8
(≤ 0.31)

L

mm
(in.)

≤ 20
(≤ 0.79)

d

mm
(in.)

≤ 7
(≤ 0.28)

D

mm
(in.)

6.4
(≤ 0.25)

M6 Screws

Tightening torque

N•m
(lb-in)

5 (44) ≤ 10 mm² / 8 AWG
9 (80) ≥ 16 mm² / 6 AWG

⁽¹⁾ When mounting on a vertical rail, install a stop to prevent any slippage.

Electrical Characteristics—TeSys BV4, 2–115 A

TeSys protection components

Voltage releases

| Characteristics of electric trips | | | | | | | | | |
|--|----------------------------------|-----------------------|------------------------------------|--------------|---------------------|---------------------------------|-------------|-----------------|-----------------|
| Type of trip | | | GV4AU●●● MN (undervoltage release) | | | | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | = Ue | | | | | | |
| Operational voltage (Ue) | Conforming to IEC 60947-1 | V | 24 V AC/DC | 48 V AC/DC | 110–130 Vac 125 Vdc | 208–240 V 60 Hz 220–240 V 50 Hz | 277 V 60 Hz | 380–415 V 60 Hz | 440–480 V 60 Hz |
| Inrush consumption | ~ | VA | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA | < 7 VA | < 7 VA | < 7 VA |
| Sealed consumption | ~ | VA | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA < 2 W | < 7 VA | < 7 VA | < 7 VA | < 7 VA |
| Operating time | Conforming to IEC 60947-1 | ms | < 50 | | | | | | |
| On-load factor | | | 100 % | | | | | | |
| Cabling (spring connection) | Number of conductors | | 1 per terminal | | | | | | |
| | Solid cable | mm ² | No solid cable allowed | | | | | | |
| | Flexible cable without cable end | mm ² (AWG) | Cu 0.5 – 1.5 (Cu 20 – 16) | | | | | | |
| | Flexible cable with cable end | mm ² | No cable with cable end allowed | | | | | | |
| Tightening torque | | N•m | NA | | | | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 20000 | | | | | | |

| Characteristics of electric trips | | | | | | | |
|--|----------------------------------|-----------|---------------------------------|------------------|------------------------|------------------------------------|------------------------------------|
| Type of trip | | | GV4AS●●● MX (Shunt trip) | | | | |
| Rated insulation voltage (Ui) | Conforming to IEC 60947-1 | V | = Ue | | | | |
| Operational voltage (Ue) | Conforming to IEC 60947-1 | V | 24 V AC/DC | 48 V AC/DC | 110–130 Vac 125 Vdc | 208–240 V 60 Hz 220–240 V 50 Hz | 380–415 V 50 Hz 440–480 V 60 Hz |
| Inrush consumption | ~ --- | VA | < 6 VA < 10 W | < 6 VA < 10 W | < 6 VA < 10 W | < 6 VA | < 6 VA |
| Sealed consumption | ~ --- | VA | < 4 VA < 1 W | < 4 VA < 1 W | < 4 VA < 1 W | < 4 VA | < 4 VA |
| Operating time | Conforming to IEC 60947-1 | ms | < 50 | | | | |
| On-load factor | | | 100 % | | | | |
| Cabling (spring connection) | Number of conductors | | 1 per terminal | | | | |
| | Solid cable | mm² | No solid cable allowed | | | | |
| | Flexible cable without cable end | mm² (AWG) | Cu 0.5 – 1.5 (Cu 20 – 16) | | | | |
| | Flexible cable with cable end | mm² | No cable with cable end allowed | | | | |
| Tightening torque | | N•m | NA | | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 20000 | | | | |

Auxiliary Contact Characteristics

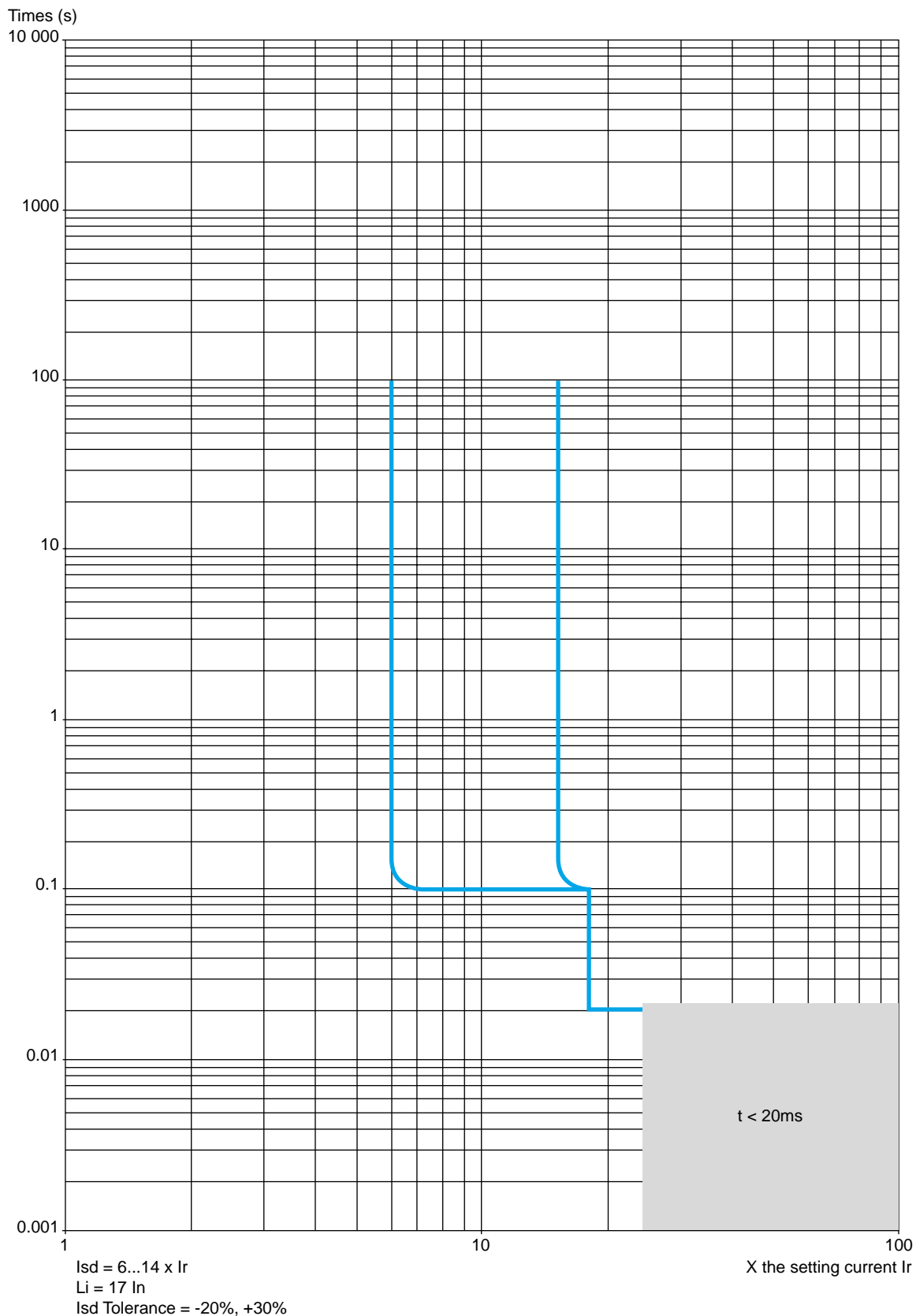
TeSys protection components

Auxiliary contacts

| Auxiliary contact characteristics | | | | | | | | | |
|--|---|-----------------------|--------------------------------------|------|---------|---------|---------|---------|-----|
| Type of contacts | | | Auxiliary contact block GV4AE11 | | | | | | |
| Rated insulation voltage(Ui) | Conforming to IEC 60947-1 | V | 690 | | | | | | |
| | Conforming to CSA C22.2 No. 14, UL 60947 | V | — | | | | | | |
| Conventional thermal current (Ith) | Conforming to IEC 60947-5-1 | A | 5 | | | | | | |
| | Conforming to CSA C22.2 No. 14, UL 60947 | A | 5 | | | | | | |
| Mechanical durability (C.O.: Close - Open) | | C.O. | 40 000 | | | | | | |
| Operational power and current conforming to IEC 60947-5-1 ac operation | Rated operational voltage (Ue) | V | 24 | 48 | 110/127 | 230/240 | 380/440 | 660/690 | |
| | Operational power (AC12) | VA | 120 | 240 | 635 | 1200 | 2200 | 3450 | |
| | Occasional breaking and making capacities | kVA | 1.2 | 2.4 | 6.35 | 12 | 22 | 34.5 | |
| | Operational current (Ie) | AC-12 | A | 5 | 5 | 5 | 5 | 5 | |
| | | AC-15 | A | 5 | 5 | 4 | 3 | 2.5 | 0.1 |
| | | | | | | | | | |
| | | | | | | | | | |
| Operational power and current conforming to IEC 60947-5-1 dc operation | Rated operational voltage (Ue) | V | 24 | 48 | 110 | 250 | | | |
| | Operational power (DC12) | W | 120 | 120 | 66 | 75 | | | |
| | Occasional breaking and making capacities | W | 1200 | 1200 | 660 | 750 | | | |
| | Rated operational current (Ie) | DC-12 | A | 5 | 2.5 | 0.6 | 0.3 | | |
| | | DC-13 | A | 2.5 | 1.2 | 0.35 | 0.05 | | |
| | | DC-14 | A | 1 | 0.2 | 0.05 | 0.03 | | |
| | | | | | | | | | |
| Low power switching reliability of contact | | | 10 ⁻⁶ at 17 V / 2 mA | | | | | | |
| Minimum operational conditions dc operation | | V | 17 | | | | | | |
| | | mA | 2 | | | | | | |
| Short-circuit protection | | | 5 A fuse conforming to IEC 60947-5-1 | | | | | | |
| Spring terminals cabling | Number of conductors | | 1 per hole | | | | | | |
| | Solid cable | mm ² | — | | | | | | |
| | Flexible cable without cable end | mm ² (AWG) | Cu 0.5 – 1.5 (Cu 20 – 16) | | | | | | |
| | Flexible cable with cable end | mm ² | — | | | | | | |

Curves - TeSys BV4, 2–115 A
TeSys protection components
Motor circuit protector TeSys BV4

Tripping Curves for BV4T002, BV4T003, BV4T007

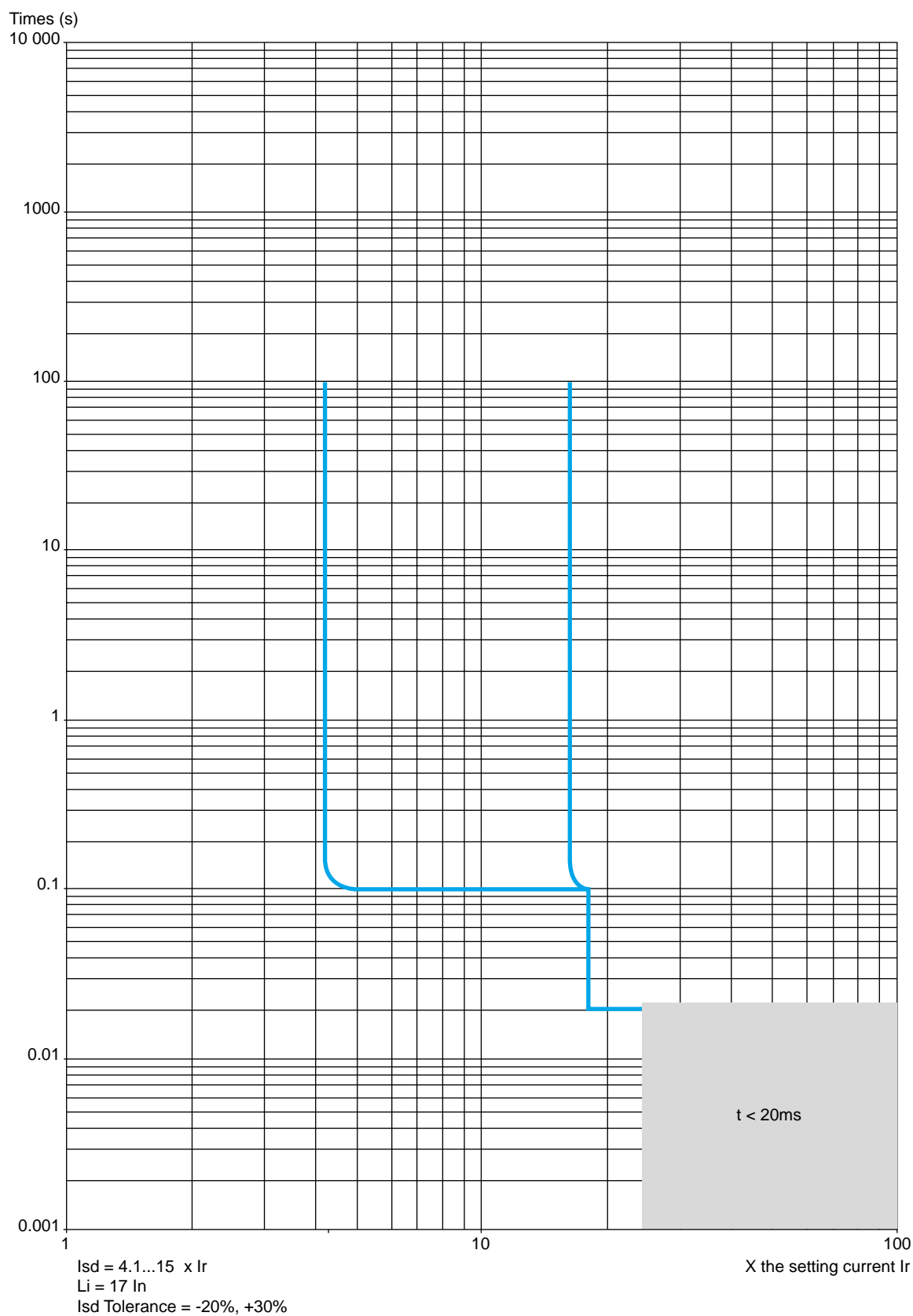


Curves - TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector TeSys BV4

Tripping Curves for BV4T013

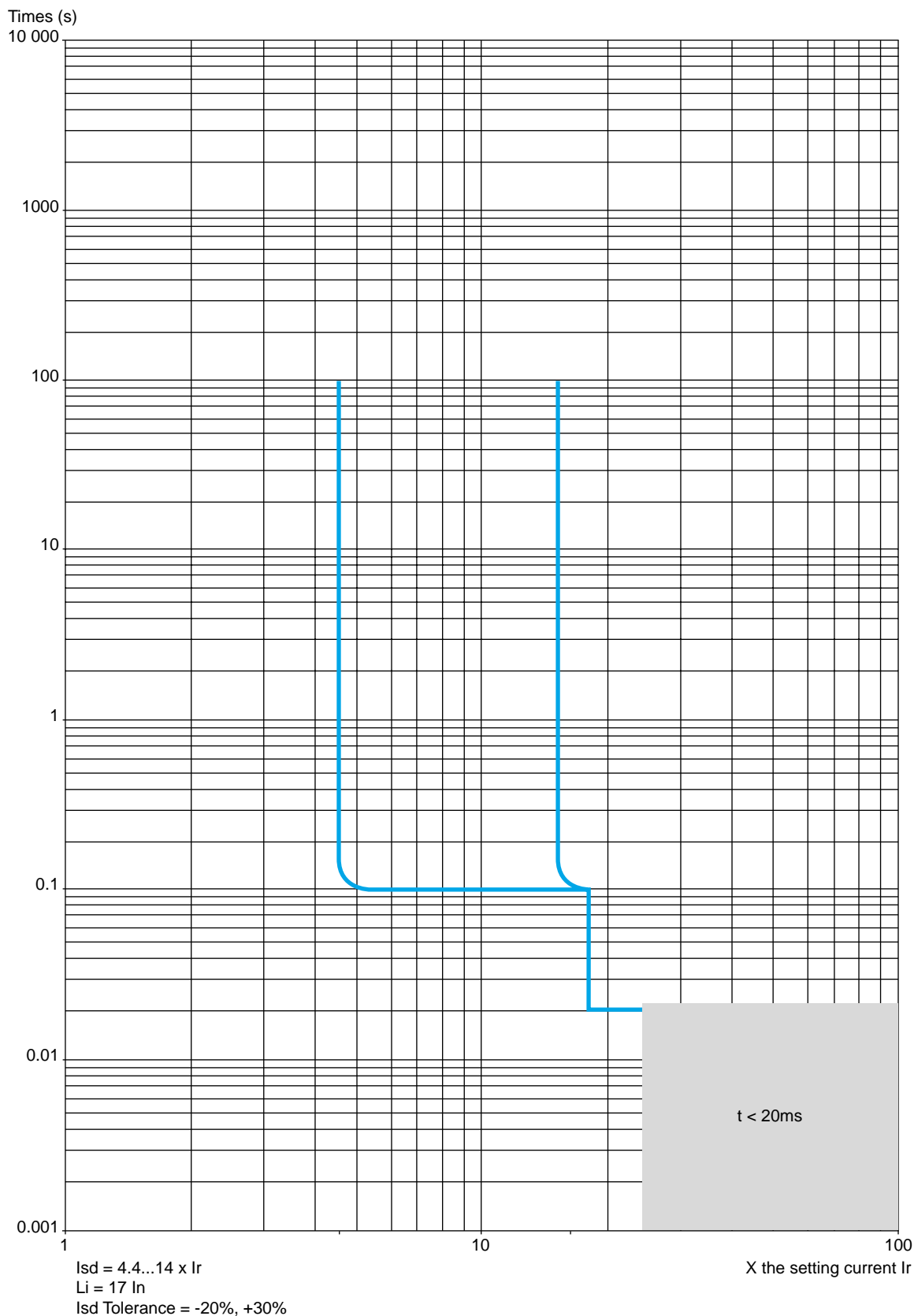


Curves - TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector TeSys BV4

Tripping Curves for BV4T025

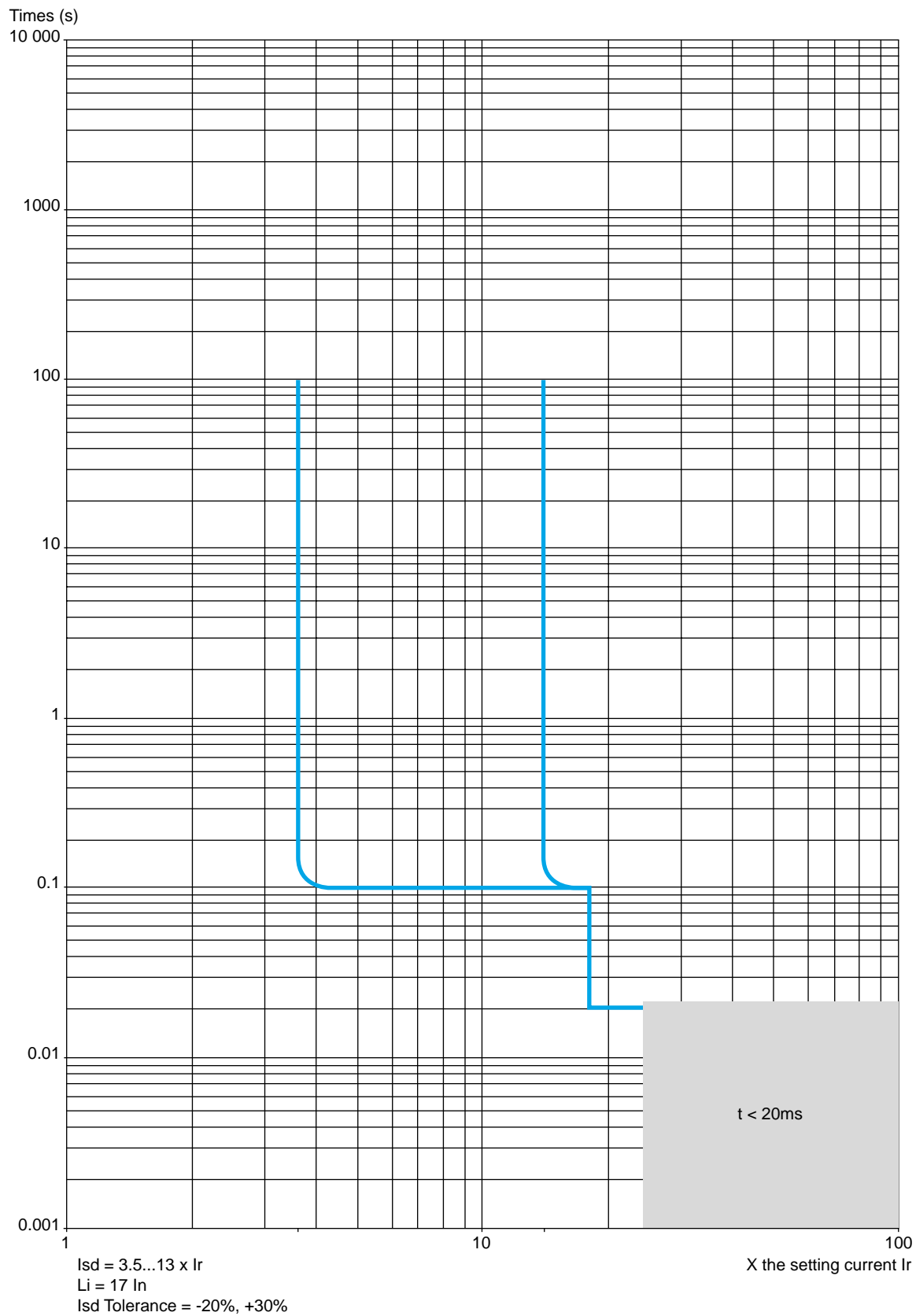


Curves - TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector TeSys BV4

Tripping Curves for BV4T050

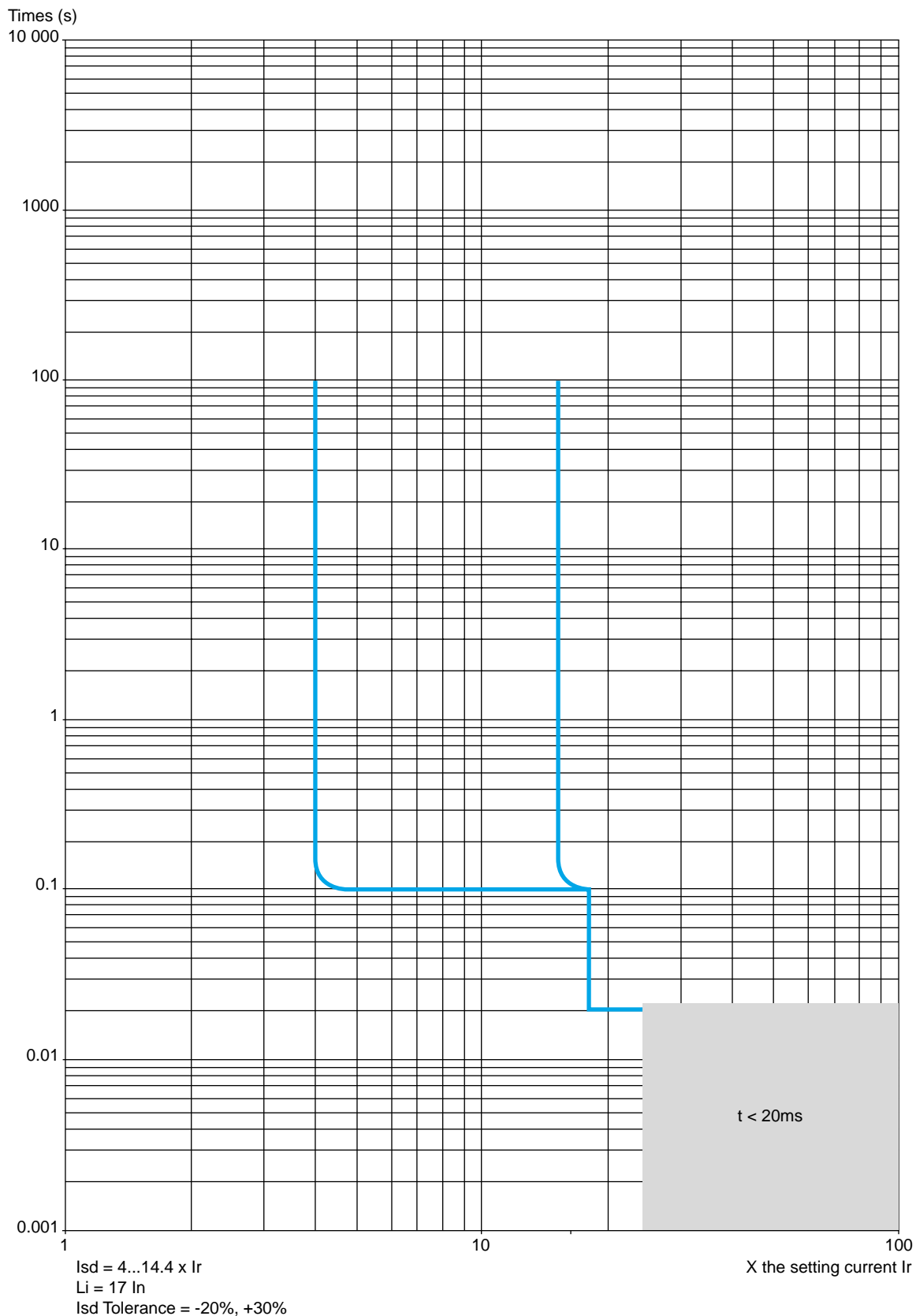


Curves - TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector TeSys BV4

Tripping Curves for BV4T080

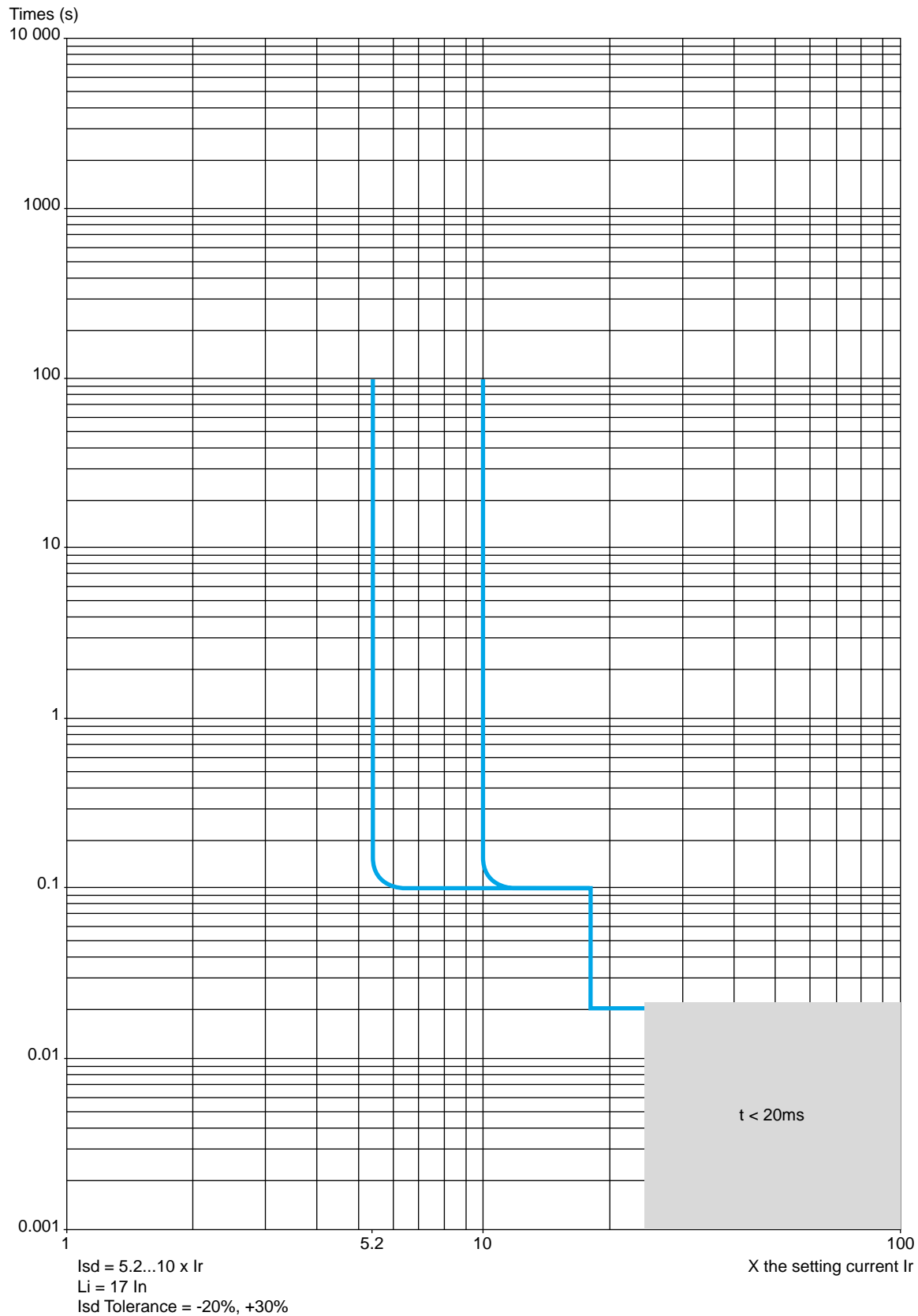


Curves - TeSys BV4, 2–115 A

TeSys protection components

Motor circuit protector TeSys BV4

Tripping Curves for BV4T115



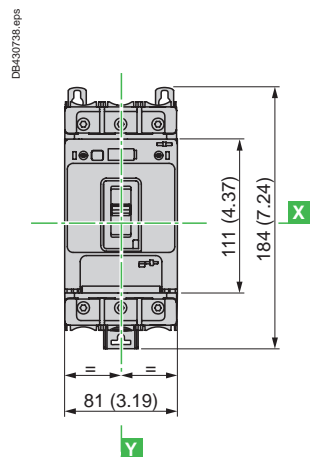
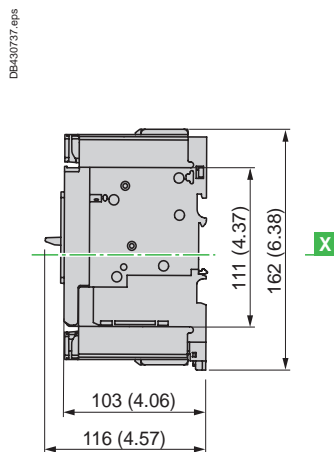
Dimensions, mounting—TeSys BV4, 2–115 A

TeSys protection components

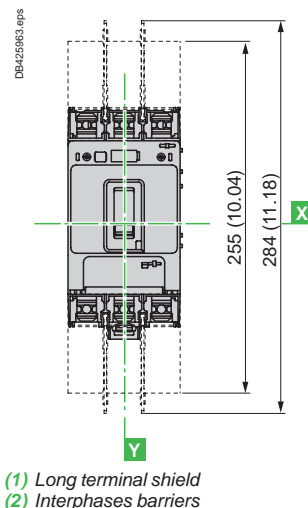
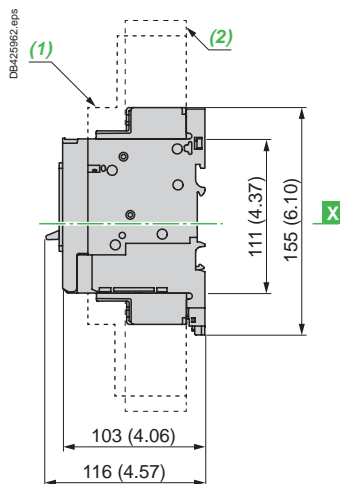
Motor circuit protector TeSys BV4

BV4 with toggle

With EverLink connector



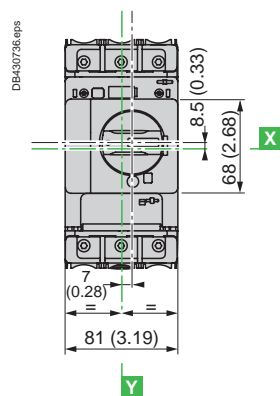
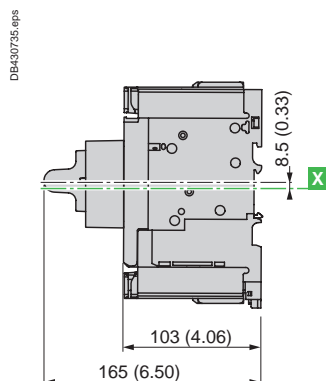
With crimp lug connector



- (1) Long terminal shield
- (2) Interphases barriers

BV4 with GV4ADN01, GV4ADN02 direct mounting rotary handle

Dimensions



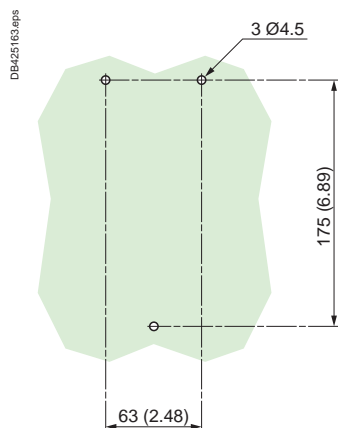
Dimensions, mounting—TeSys BV4, 2–115 A

TeSys protection components

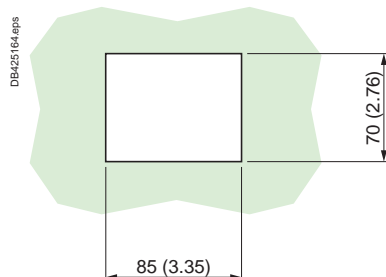
Motor circuit protector TeSys BV4

BV4

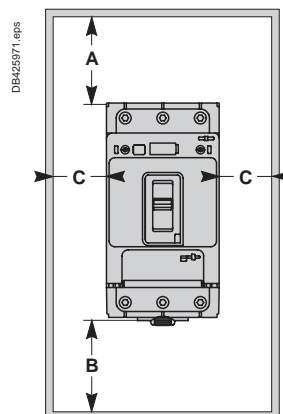
Panel mounting with M4 screws



Door cut-out for rotary handle



Minimum safety clearance



Toggle-type, rotary handle-type:
identical clearance values.

Safety clearance mm (in.)

| | Painted sheet metal | | | Bare sheet metal | | |
|----------------------|---------------------|---|---|------------------|---|-------------|
| | A | B | C | A | B | C |
| No accessory | 30 (1.18) | 0 | 0 | 40 (1.57) | 0 | 5 (0.20) |
| Interphase barriers | 0 | 0 | 0 | 0 | 0 | 5 (0.20) |
| Long terminal shield | 0 | 0 | 0 | 0 | 0 | 5 (0.20) |

Minimum safety clearances to bare busbars with operating voltage ≤ 600 V / 347 Vac

| ≤ 60 mm (2.36 in.) between busbars | | > 60 mm (2.36 in.) between busbars | |
|---------------------------------------|----------------------|---------------------------------------|---------------------|
| Line side | Load side | Line side | Load side |
| 200 mm (7.87 in.) | 100 mm (3.94 in.) | 120 mm (4.72 in.) | 60 mm (2.36 in.) |

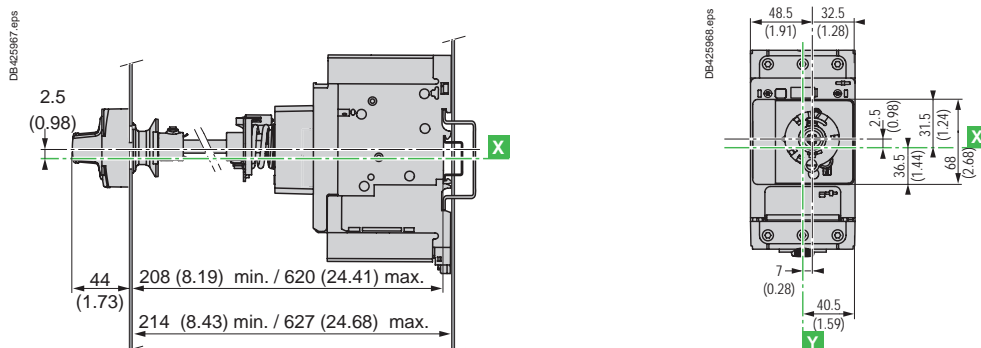
Dimensions, mounting—TeSys BV4, 2–115 A

TeSys protection components

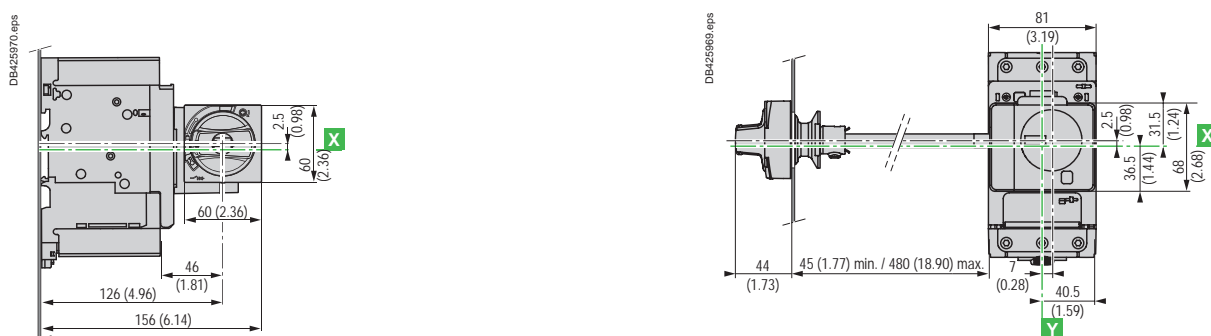
Motor circuit protector TeSys BV4

BV4 with extended rotary handle

Front extended rotary handle GV4APN01, GV4APN02, GV4APN04



Side (left or right) extended rotary handle LV426935, LV426936

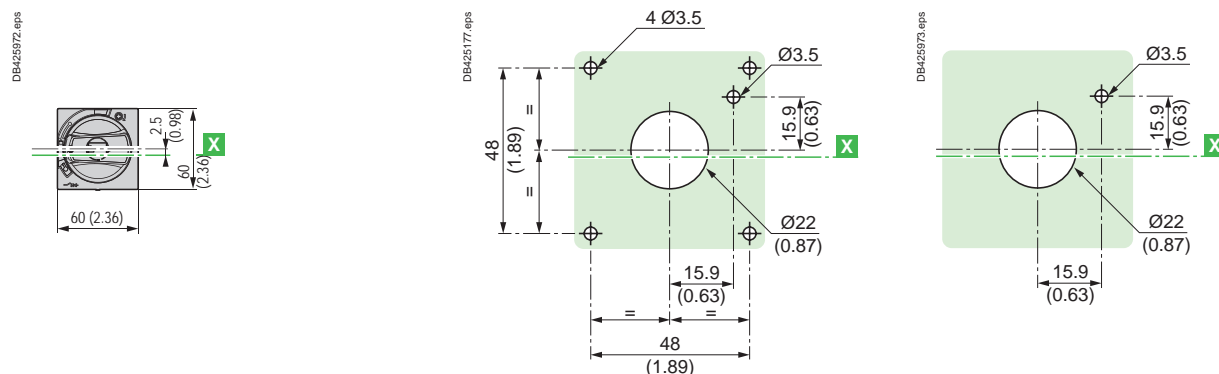


Front and side extended rotary handle, door/side panel cut-out

Front and side extended rotary handle

IP65, door panel cut-out

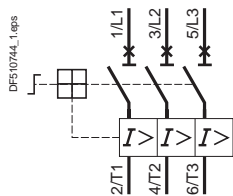
IP54, door/side panel cut-out



TeSys protection components
Motor circuit protector TeSys BV4

Magnetic motor circuit protectors

BV4



Accessories

Electrical trips

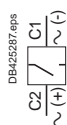
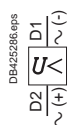
MN GV4AU●●●

MX GV4AS●●●

GV4AE11 auxiliary contacts

Used as OF contact

Used as SD contact



| Symbols | | L | |
|----------|--------|----------|----|
| 29370 | 13 | LAD96590 | 14 |
| B | | LV426920 | 14 |
| | | LV426935 | 12 |
| | | LV426936 | 12 |
| | | LV426937 | 12 |
| | | LV426990 | 14 |
| | | LV426992 | 14 |
| | | LV426997 | 12 |
| | | LV426998 | 12 |
| | | LV426999 | 12 |
| | | LV429375 | 13 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| BV4T002D | 8 | | |
| BV4T002J | 8 | | |
| BV4T003D | 8 | | |
| BV4T003J | 8 | | |
| BV4T007D | 8 | | |
| BV4T007J | 8 | | |
| BV4T013D | 8 | | |
| BV4T013J | 8 | | |
| BV4T025D | 8 | | |
| BV4T025J | 8 | | |
| BV4T050D | 8 | | |
| BV4T050J | 8 | | |
| BV4T080D | 8 | | |
| BV4T080J | 8 | | |
| BV4T115D | 8 | | |
| BV4T115J | 8 | | |
| G | | | |
| GV4ADN01 | 11 | | |
| GV4ADN02 | 11 | | |
| GV4AE11 | 9 | | |
| GV4APN01 | 12 | | |
| GV4APN02 | 12 | | |
| GV4APN04 | 12 | | |
| GV4AS027 | 10, 11 | | |
| GV4AS057 | 10, 11 | | |
| GV4AS137 | 10, 11 | | |
| GV4AS287 | 10, 11 | | |
| GV4AS487 | 10, 11 | | |
| GV4AU027 | 10, 11 | | |
| GV4AU057 | 10, 11 | | |
| GV4AU137 | 10, 11 | | |
| GV4AU247 | 10, 11 | | |
| GV4AU286 | 10, 11 | | |
| GV4AU415 | 10, 11 | | |
| GV4AU486 | 10, 11 | | |
| GV4LUG | 14 | | |
| GVAPL01 | 12 | | |



Schneider Electric USA, Inc.

800 Federal Street
Andover, MA 01810
USA

www.se.com

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0680CT1701R06/20 06/2020

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