# TeSys protection components

3-pole thermal overload relays, model d

## Differential thermal overload relays for use with fuses

- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c. or d.c.

LRD-08

LRD-21

LRD-33●●

LRD-083

| Relay setting range | Fuses to be used with selected relay aM | gG | BS88 | For use with contactor LC1- | Reference | Weight |
|---|---|---|---|---|---|---|
| **A** | **A** | **A** | **A** | | | kg |
| **Class 10 A** (1) **with connection by screw clamp terminals** | | | | | | |
| 0.10…0.16 | 0.25 | 2 | – | D09…D38 | **LRD-01** | 0.124 |
| 0.16…0.25 | 0.5 | 2 | – | D09…D38 | **LRD-02** | 0.124 |
| 0.25…0.40 | 1 | 2 | – | D09…D38 | **LRD-03** | 0.124 |
| 0.40…0.63 | 1 | 2 | – | D09…D38 | **LRD-04** | 0.124 |
| 0.63…1 | 2 | 4 | – | D09…D38 | **LRD-05** | 0.124 |
| 1…1.7 | 2 | 4 | 6 | D09…D38 | **LRD-06** | 0.124 |
| 1.6…2.5 | 4 | 6 | 10 | D09…D38 | **LRD-07** | 0.124 |
| 2.5…4 | 6 | 10 | 16 | D09…D38 | **LRD-08** | 0.124 |
| 4…6 | 8 | 16 | 16 | D09…D38 | **LRD-10** | 0.124 |
| 5.5…8 | 12 | 20 | 20 | D09…D38 | **LRD-12** | 0.124 |
| 7…10 | 12 | 20 | 20 | D09…D38 | **LRD-14** | 0.124 |
| 9…13 | 16 | 25 | 25 | D12…D38 | **LRD-16** | 0.124 |
| 12…18 | 20 | 35 | 32 | D18…D38 | **LRD-21** | 0.124 |
| 16…24 | 25 | 50 | 50 | D25…D38 | **LRD-22** | 0.124 |
| 23…32 | 40 | 63 | 63 | D25…D38 | **LRD-32** | 0.124 |
| 30…38 | 50 | 80 | 80 | D32 and D38 | **LRD-35** | 0.124 |
| 17…25 | 25 | 50 | 50 | D40…D95 | **LRD-3322** | 0.510 |
| 23…32 | 40 | 63 | 63 | D40…D95 | **LRD-3353** | 0.510 |
| 30…40 | 40 | 100 | 80 | D40…D95 | **LRD-3355** | 0.510 |
| 37…50 | 63 | 100 | 100 | D40…D95 | **LRD-3357** | 0.510 |
| 48…65 | 63 | 100 | 100 | D50…D95 | **LRD-3359** | 0.510 |
| 55…70 | 80 | 125 | 125 | D50…D95 | **LRD-3361** | 0.510 |
| 63…80 | 80 | 125 | 125 | D65 and D95 | **LRD-3363** | 0.510 |
| 80…104 | 100 | 160 | 160 | D80 and D95 | **LRD-3365** | 0.510 |
| 80…104 | 125 | 200 | 160 | D115 and D150 | **LRD-4365** | 0.900 |
| 95…120 | 125 | 200 | 200 | D115 and D150 | **LRD-4367** | 0.900 |
| 110…140 | 160 | 250 | 200 | D150 | **LRD-4369** | 0.900 |
| 80…104 | 100 | 160 | 160 | (2) | **LRD-33656** | 1.000 |
| 95…120 | 125 | 200 | 200 | (2) | **LRD-33676** | 1.000 |
| 110…140 | 160 | 250 | 200 | (2) | **LRD-33696** | 1.000 |
| **Class 10 A** (1) **with spring terminal connections (for direct mounting on the contactor only)** | | | | | | |
| 0.10…0.16 | 0.25 | 2 | – | D09…D38 | **LRD-013** | 0.140 |
| 0.16…0.25 | 0.5 | 2 | – | D09…D38 | **LRD-023** | 0.140 |
| 0.25…0.40 | 1 | 2 | – | D09…D38 | **LRD-033** | 0.140 |
| 0.40…0.63 | 1 | 2 | – | D09…D38 | **LRD-043** | 0.140 |
| 0.63…1 | 2 | 4 | – | D09…D38 | **LRD-053** | 0.140 |
| 1…1.6 | 2 | 4 | 6 | D09…D38 | **LRD-063** | 0.140 |
| 1.6…2.5 | 4 | 6 | 10 | D09…D38 | **LRD-073** | 0.140 |
| 2.5…4 | 6 | 10 | 16 | D09…D38 | **LRD-083** | 0.140 |
| 4…6 | 8 | 16 | 16 | D09…D38 | **LRD-103** | 0.140 |
| 5.5…8 | 12 | 20 | 20 | D09…D38 | **LRD-123** | 0.140 |
| 7…10 | 12 | 20 | 20 | D09…D38 | **LRD-143** | 0.140 |
| 9…13 | 16 | 25 | 25 | D12…D38 | **LRD-163** | 0.140 |
| 12…18 | 20 | 35 | 32 | D18…D38 | **LRD-213** | 0.140 |
| 16…24 | 25 | 50 | 50 | D25…D38 | **LRD-223** | 0.140 |

**Class 10 A** (1) **with connection by lug-clamps**

Select the appropriate overload relay with screw clamp terminals from the table above and add **6** to the end of the reference. Example: **LRD-01** becomes **LRD-016**.

## Thermal overload relays for use with unbalanced loads

**Class 10 A** (1) **with connection by screw clamp terminals**

Change the prefix in the references above from **LRD** (except **LRD-4●●●**) to **LR3-D**. Example: **LRD-01** becomes **LR3-D01.**

## Thermal overload relays for use on 1000 V supplies

**Class 10 A** (1) **with connection by screw clamp terminals**

For relays LRD-01 to LRD-35 only, for an operating voltage of 1000 V, and only for independent mounting, the reference becomes **LRD-33●●A66**. Example: **LRD-12** becomes **LRD-3312A66.**

Order an **LA7-D3064** terminal block separately, see page 24515/3.

(1) Standard IEC 947-4-1 specifies a tripping time for 7.2 times the setting current $I_R$:
class 10 A: between 2 and 10 seconds.
(2) Independent mounting.

Characteristics : pages 24516/2 to 24516/5
Dimensions : pages 24534/2 to 24534/4
Schemes : page 24534/5

# TeSys protection components
3-pole thermal overload relays, model d

## Differential thermal overload relays for use with fuses

- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c. or d.c.
- LR2-D1508 to 2553: independent mounting
  - either by ordering a terminal block **LA7-D1064** or **LA7-D2064**, see page 24515/3,
  - or by ordering the the relay pre-assembled; in this case add the suffix **LA7** to the reference.
  Example: **LR2-D1508** becomes **LR2-D1508LA7**.


LRZ-D15●●

| Relay setting range | Fuses to be used with the selected relay aM | gG | BS88 | For use with contactor LC1 | Reference | Weight |
|---|---|---|---|---|---|---|
| **A** | **A** | **A** | **A** | | | kg |
| **Class 20** (1) **for connection by screw clamp terminals** | | | | | | |
| 2.5…4 | 6 | 10 | 16 | D09…D32 | **LR2-D1508** | 0.190 |
| 4…6 | 8 | 16 | 16 | D09…D32 | **LR2-D1510** | 0.190 |
| 5.5…8 | 12 | 20 | 20 | D09…D32 | **LR2-D1512** | 0.190 |
| 7…10 | 16 | 20 | 25 | D09…D32 | **LR2-D1514** | 0.190 |
| 9…13 | 16 | 25 | 25 | D12…D32 | **LR2-D1516** | 0.190 |
| 12…18 | 25 | 35 | 40 | D18…D32 | **LR2-D1521** | 0.190 |
| 17…25 | 32 | 50 | 50 | D25 and D32 | **LR2-D1522** | 0.190 |
| 23…32 | 40 | 63 | 63 | D25 and D32 | **LR2-D2553** | 0.345 |
| 17…25 | 32 | 50 | 50 | D40…D95 | **LR2-D3522** | 0.535 |
| 23…32 | 40 | 63 | 63 | D40…D95 | **LR2-D3553** | 0.535 |
| 30…40 | 50 | 100 | 80 | D40…D95 | **LR2-D3555** | 0.535 |
| 37…50 | 63 | 100 | 100 | D50…D95 | **LR2-D3557** | 0.535 |
| 48…65 | 80 | 125 | 100 | D50…D95 | **LR2-D3559** | 0.535 |
| 55…70 | 100 | 125 | 125 | D65…D95 | **LR2-D3561** | 0.535 |
| 63…80 | 100 | 160 | 125 | D80 and D95 | **LR2-D3563** | 0.535 |

## Electronic differential thermal overload relays for use with fuses

- Compensated relays,
- with relay trip indicator,
- for a.c. or d.c.,
- for direct mounting on contactor or independent mounting (2).


LRZ-D25●●

| Relay setting range | Fuses to be used with selected relay aM | gG | For direct mounting beneath contactor LC1 | Reference | Weight |
|---|---|---|---|---|---|
| **A** | **A** | **A** | | | kg |
| **Class 10** or **10A** (1) with connection using bars or connectors | | | | | |
| 60…100 | 100 | 160 | D115 and D150 | **LR9-D5367** | 0.885 |
| 90…150 | 160 | 250 | D115 and D150 | **LR9-D5369** | 0.885 |
| **Class 20** (3) with connection using bars or connectors | | | | | |
| 60…100 | 125 | 160 | D115 and D150 | **LR9-D5567** | 0.885 |
| 90…150 | 200 | 250 | D115 and D150 | **LR9-D5569** | 0.885 |

## Electronic thermal overload relays for use with balanced or unbalanced loads

- Compensated relays,
- with separate outputs for alarm and tripping.

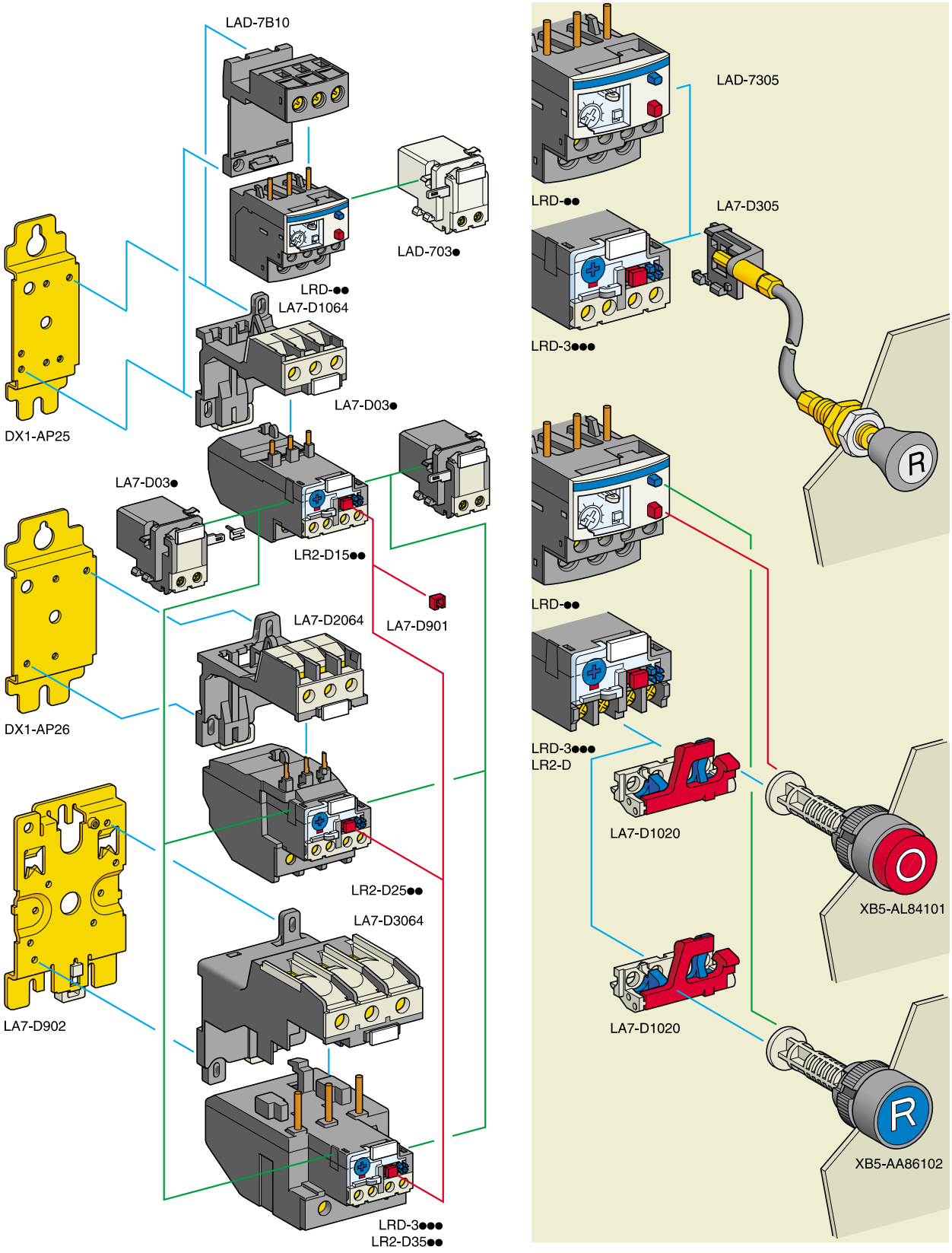

LRZ-D35●●

| Relay setting range | Fuses to be used with the selected relay aM | gG | For direct mounting beneath contactor LC1 | Reference | Weight |
|---|---|---|---|---|---|
| **A** | **A** | **A** | | | kg |
| **Class 10** or **20** (1) selectable with connection using bars or connectors | | | | | |
| 60…100 | 100 | 160 | D115 and D150 | **LR9-D67** | 0.900 |
| 90…150 | 160 | 250 | D115 and D150 | **LR9-D69** | 0.900 |

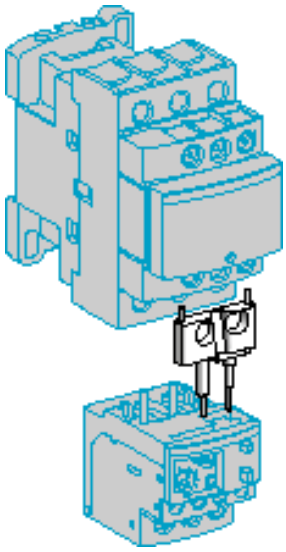
(1) Standard IEC 947-4-1 specifies a tripping time for 7.2 times the setting current $I_R$
class 10: between 4 and 10 seconds,
class 10 A: between 2 and 10 seconds,
class 20: between 6 and 20 seconds.
(2) Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page 24511/8).

**Other versions** Thermal overload relays for resistive circuits in category AC-1.
Please consult your Regional Sales Office.

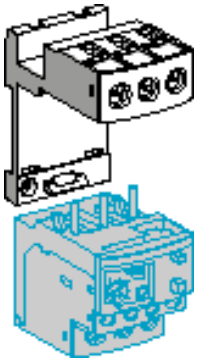
**Characteristics :** pages 24516/2 to 24516/5 **Dimensions :** pages 24534/2 to 24534/4 **Schemes :** page 24534/5


LAD-7B10
LAD-703●
LRD-●●
LA7-D1064
LA7-D03●
DX1-AP25
LA7-D03●
LR2-D15●●
LA7-D2064
LA7-D901
DX1-AP26
LR2-D25●●
LA7-D3064
LA7-D902
LRD-3●●●
LR2-D35●●
LAD-7305
LRD-●●
LA7-D305
LRD-3●●●
R
LRD-●●
LRD-3●●●
LR2-D
LA7-D1020
XB5-AL84101
LA7-D1020
R
XB5-AA86102

# TeSys protection components
3-pole thermal overload relays, model d



LAD-7C●



LAD-7B10

## Accessories (to be ordered separately)

| Description | For use on | Sold in lots of | Unit reference | Weight kg |
|---|---|---|---|---|
| **Pre-wiring kit** allowing direct connection of the N/C contact of relay LRD-01…35 or LR3-D01…D35 to the contactor | LC1-D09…D18 | 10 | **LAD-7C1** | 0.002 |
| | LC1-D25…D38 | 10 | **LAD-7C2** | 0.003 |
| **Terminal blocks** (1) for clip-on mounting on 35 mm rail (AM1-DP200) or screw fixing; for fixing centres, see pages 24534/2 to 24534/4 | LRD-01…35 and LR3-D01…D35 | 1 | **LAD-7B10** | 0.100 |
| | LR2-D15●● | 1 | **LA7-D1064** | 0.100 |
| | LR2-D25●● | 1 | **LA7-D2064** | 0.120 |
| | LRD-3●●●, LR3-D3●●●, LR2-D35●● | 1 | **LA7-D3064 (2)** | 0.370 |
| **Terminal block adapter** for mounting a relay beneath an LC1-D115 or D150 contactor | LRD-3●●●, LR3-D3●●●, LRD-35●● | 1 | **LA7-D3058** | 0.080 |
| **Mounting plates** (3) for screw fixing on 110 mm centres | LRD-01…35, LR3-D01…D35. LR2-D15●● | 10 | **DX1-AP25** | 0.065 |
| | LR2-D25●● | 10 | **DX1-AP26** | 0.082 |
| | LRD-3●●●, LR3-D3●●● LR2-D35●● | 1 | **LA7-D902** | 0.130 |
| **Marker holder** snap in | All relays except LRD-01…35 and LR3-D01…D35 (4) | 100 | **LA7-D903** | 0.001 |
| **Bag of 400 labels** (blank, self-adhesive, 7 x 16 mm) | – | 1 | **LA9-D91** | 0.001 |
| **Stop button locking device** | All relays except LRD-01…35. LR3-D01…D35 and LR9-D | 10 | **LA7-D901** | 0.005 |
| **Remote stop or electrical reset device** (5) | LRD-01…35 and LR3-D01…D35 | 1 | **LAD-703●** (6) | 0.090 |
| **Remote tripping or electrical reset device** (5) | All relays except LRD-01…35 and LR3-D01…D35 | 1 | **LA7-D03●**(6) | 0.090 |
| **Block of insulated terminals** | LR9-D | 2 | **LA9-F103** | 0.560 |

## Remote control

**"Reset" function**

| | | | | | |
|---|---|---|---|---|---|
| **By flexible cable** (length = 0.5 m) | LRD-01…35 and LR3-D01…D35 | | 1 | **LAD-7305** | 0.075 |
| | All relays except LRD-01…35 and LR3-D01…D35 | | 1 | **LA7-D305** | 0.075 |

**"Stop" and/or "Reset" functions**

The terminal protection shroud must be removed and the following 3 products must be ordered separately.

| | | | | | |
|---|---|---|---|---|---|
| **Adapter** for door interlock mechanism | All relays except LRD-01…35 and LR3-D01…D35 | | 1 | **LA7-D1020** | 0.005 |
| **Operating head** for spring return pushbutton | Stop | All relays | 1 | **XB5-AL84101** | 0.027 |
| | Reset | All relays | 1 | **XB5-AA86102** | 0.027 |

(1) Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.
(2) To order a terminal block for connection by lugs, the reference becomes **LA7-D30646**.
(3) Do not forget to order the terminal block corresponding to the type of relay.
(4) For LRD-01…35, see page 24511/9.
(5) The time for which the coil of remote tripping or electrical resetting device **LA7-D03** or **LAD-703** can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time; maximum pulse duration of 20 s with a rest time of 300 s. Minimum pulse time: 200 ms.
(6) Reference to be completed by adding the code indicating control circuit voltage.
Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

| Volts | 12 | 24 | 48 | 96 | 110 | 220/230 | 380/400 | 415/440 |
|---|---|---|---|---|---|---|---|---|
| 50/60 Hz | – | B | E | – | F | M | Q | N |
| Consumption, inrush and sealed: < 100 VA | | | | | | | | |
| ⎓ | J | B | E | DD | F | M | – | – |
| Consumption, inrush and sealed: < 100 W. | | | | | | | | |

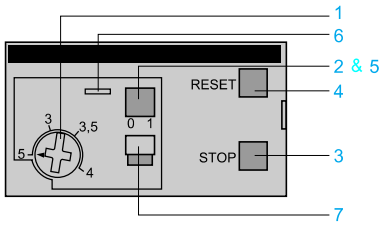
**Illustrations :** page 24515/2
**Dimensions :** pages 24534/2 to 24534/4

# TeSys protection components
3-pole thermal overload relays, model d

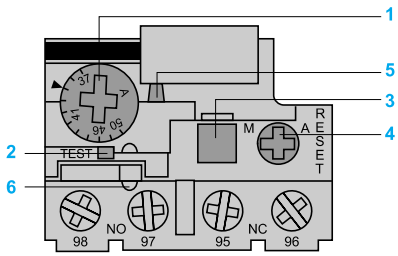
## Description

Model d 3-pole thermal overload relays are designed to protect a.c. circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor.

**LRD-01…35**




**LRD-3322…4369**, **LR2-D**




1 Adjustment dial Ir
2 Test button
Operation of the Test button allows:
- checking of control circuit wiring,
- simulation of relay tripping (actuates both the N/O and N/C contacts).
3 Stop button. Actuates the N/C contact; does not affect the N/O contact.
4 Reset button
5 Trip indicator
6 Setting locked by sealing the cover.
7 Selector for manual or automatic reset. Relays LRD-01 to 35 are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

## Environment

| | | | |
|---|---|---|---|
| **Conforming to standards** | | | IEC 947-1, IEC 947-4-1, NF C 63-650, VDE 0660, BS 4941 |
| **Product certifications** | | | CSA, UL, Sichere Trennung, PTB except LAD-4: UL, CSA. |
| **Degree of protection** | Conforming to VDE 0106 | | Protection against direct finger contact IP 2X |
| **Protective treatment** | Conforming to IEC 68 | | "TH" |
| **Ambient air temperature around the device** | Storage | °C | - 60…+ 70 |
| | Normal operation, without derating (IEC 947-4-1) | °C | - 20…+ 60 |
| | Minimum and maximum operating temperatures (with derating) | °C | - 40…+ 70 |
| **Operating positions without derating** | In relation to normal, vertical mounting plane | | Any position |
| **Shock resistance** | Permissible acceleration conforming to IEC 68-2-7 | | 15 gn - 11 ms |
| **Vibration resistance** | Permissible acceleration conforming to IEC 68-2-6 | | 6 gn |
| **Dielectric strength at 50 Hz** | Conforming to IEC 255-5 | **kV** | 6 |
| **Impulse withstand voltage** | Conforming to IEC 801-5 | **kV** | 6 |

## Auxiliary contact characteristics

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Conventional thermal current** | | **A** | 5 | | | | | |
| **Maximum consumption** of operating coils of controlled contactors (Occasional operating cycles of contact 95-96) | a.c. supply | **V** | 24 | 48 | 110 | 220 | 380 | 600 |
| | | **VA** | 100 | 200 | 400 | 600 | 600 | 600 |
| | d.c. supply | **V** | 24 | 48 | 110 | 220 | 440 | – |
| | | **W** | 100 | 100 | 50 | 45 | 25 | – |
| **Short-circuit protection** | By gG or BS fuse. Max. rating or by **GB2** circuit-breaker | **A** | 5 | | | | | |
| **Connection to screw clamp terminals** | | | Min/max c.s.a. | | | | | |
| Flexible cable without cable end | 1 or 2 conductors | **mm²** | 1/2.5 | | | | | |
| Flexible cable with cable end | 1 or 2 conductors | **mm²** | 1/2.5 | | | | | |
| Solid cable without cable end | 1 or 2 conductors | **mm²** | 1/2.5 | | | | | |
| Tightening torque | | **N.m** | 1.7 | | | | | |
| **Connection to spring terminals** | | | Min/max c.s.a. | | | | | |
| Flexible cable without cable end | 1 or 2 conductors | **mm²** | 1/2.5 | | | | | |
| Solid cable without cable end | 1 or 2 conductors | **mm²** | 1/2.5 | | | | | |

References: pages 24514/2 and 24514/3
Dimensions: pages 24534/2 to 24534/4
Schemes: page 24534/5

# TeSys protection components
3-pole thermal overload relays, model d

## Electrical characteristics of power circuit

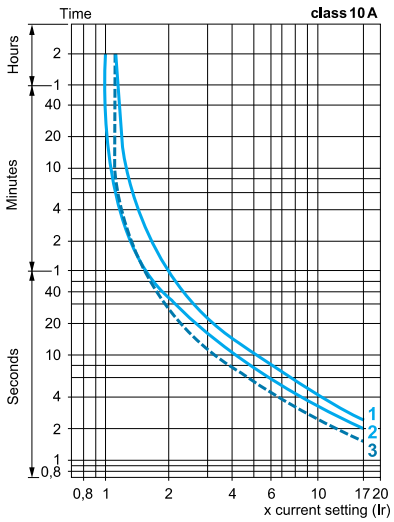
| Relay type | | | LRD-01 to 16 LR3-D01 to D16 | LR2-D15●● | LRD-21 to 35 LR3-D21 to D35 | LR2-D25●● | LRD-3322 to 33696 LR3-D3322 to D33696 | LR2-D35●● | LRD-4365 to 4369 |
|---|---|---|---|---|---|---|---|---|---|
| **Tripping class** | To UL 508, IEC 947-4-1 | | 10 A | 20 | 10 A | 20 | 10 A | 20 | 10 A |
| **Rated insulation voltage** (Ui) | Conforming to IEC 947-4-1 | V | 690 | | 690 | | 1000 | | 1000 |
| | Conforming to UL, CSA | V | 600 | | 600 | | 600 | | 600 except **LRD-4369** |
| **Rated impulse withstand voltage** (Uimp) | | kV | 6 | | 6 | | 6 | | 6 |
| **Frequency limits** | Of the operational current | Hz | 0…400 | | 0…400 | | 0…400 | | 0…400 |
| **Setting range** | Depending on model | A | 0.1…13 | | 12…38 | | 17…104 | | 80…140 |
| **Connection to screw clamp terminals** | | | Min/max c.s.a. | | | | | | |
| Flexible cable without cable end | 1 conductor | mm² | 1.5/10 | | 1.5/10 | | 4/35 | | 4/50 |
| Flexible cable with cable end | 1 conductor | mm² | 1/4 | | 1/6 except **LRD-21**: 1/4 | | 4/35 | | 4/35 |
| Solid cable without cable end | 1 conductor | mm² | 1/6 | | 1.5/10 except **LRD-21**: 1/6 | | 4/35 | | 4/50 |
| Tightening torque | | N.m | 1.7 | 1.85 | 2.5 | | 9 | | 9 |
| **Connection to spring terminals** | | | Min/max c.s.a. | | | | | | |
| Flexible cable without cable end | 1 conductor | mm² | 1.5/4 | – | 1.5/4 | – | – | – | – |
| Solid cable without cable end | 1 conductor | mm² | 1.5/4 | – | 1.5/4 | – | – | – | – |

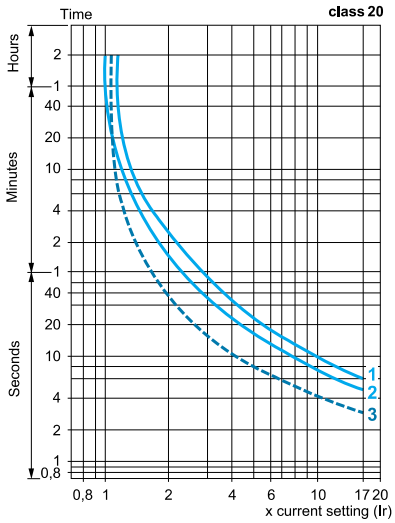
## Operating characteristics

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Temperature compensation** | | °C | - 20…+ 60 | | - 30…+ 60- | | - 30…+ 60 | | - 20…+ 60 |
| **Tripping threshold** | Conforming to IEC 947-4-1 | A | 1.14 ± 0.06 In | | | | | | |
| **Sensitivity to phase failure** | Conforming to IEC 947-4-1 | | Tripping current 30 % of In on one phase, the others at In | | | | | | |

**Tripping curves**

**Average operating time** related to multiples of the current setting




1 Balanced operation, 3-phase, from cold state.
2 Balanced operation, 2-phase, from cold state.
3 Balanced operation, 3-phase, after a long period at the set current (hot state).

References: pages 24514/2 and 24514/3
Dimensions: pages 24534/2 to 24534/4
Schemes: page 24534/5

# TeSys protection components
3-pole electronic thermal overload relays LR9-D

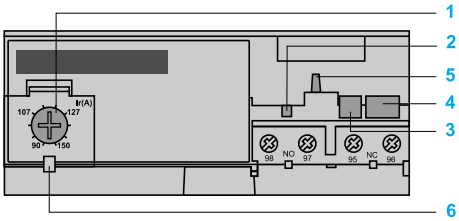
## Description

LR9-D electronic thermal overload relays are designed for use with contactors LC1-D115 and D150.

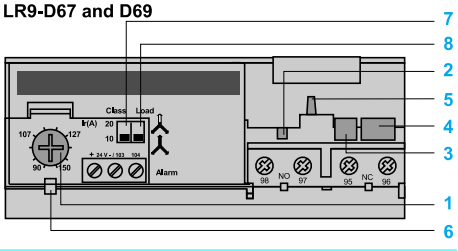
In addition to the protection provided by model d thermal overload relays (see page 24516/2) they offer the following special features:
- Protection against phase imbalance.
- Choice of starting class.
- Protection of unbalanced circuits.
- Protection of single-phase circuits.
- Alarm function to avoid tripping by load shedding.

1 Setting dial Ir
2 Test button
3 Stop button
4 Reset button
5 Trip indication
6 Setting locked by sealing the cover
7 Class 10/class 20 selector
8 Selector for balanced load / unbalanced load

**LR9-D5367…D5569**




**LR9-D67 and D69**




## Environment

| | | | |
|---|---|---|---|
| **Conforming to standards** | | | IEC 947-4-1, 255-8, 255-17, VDE 0660 and EN 60947-4-1 |
| **Product certifications** | | | UL 508 , CSA 22-2 |
| **Degree of protection** | Conforming to IEC 529 and VDE 0106 | | IP 20 on front face<br>with protective covers **LA9-D11570●** or **D11560●** |
| **Protective treatment** | Standard version | | "TH" |
| **Ambient air temperature around the device** (conforming to IEC 255-8) | Storage | **°C** | - 40…+ 85 |
| | Normal operation | **°C** | - 20…+ 55 (1) |
| **Maximum operating altitude** | Without derating | **m** | 2000 |
| **Operating positions** without derating | In relation to normal, vertical mounting plane | | Any position |
| **Shock resistance** | Permissible acceleration conforming to IEC 68-2-27 | | 13 gn - 11 ms |
| **Vibration resistance** | Permissible acceleration conforming to IEC 68-2-6 | | 2 gn - 5 to 300 Hz |
| **Dielectric strength at 50 Hz** | Conforming to IEC 255-5 | **kV** | 6 |
| **Impulse withstand voltage** | Conforming to IEC 1000-4-5 | **kV** | 6 |
| **Resistance to electrostatic discharge** | Conforming to IEC 1000-4-2 | **kV** | 8 |
| **Resistance to radio-frequency conducted disturbances** | Conforming to IEC 1000-4-3 and NF C 46-022 | **V/m** | 10 |
| **Resistance to fast transient currents** | Conforming to IEC 1000-4-4 | **kV** | 2 |
| **Electromagnetic compatibility** | Draft EN 50081-1 and 2, EN 50082-2 | | Meets requirements |

## Electrical characteristics of auxiliary contacts

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Conventional thermal current** | | **A** | 5 | | | | | |
| **Maximum consumption** of operating coils of controlled contactors (Occasional operating cycles of contact 95-96) | a.c. supply | **V** | 24 | 48 | 110 | 220 | 380 | 600 |
| | | **VA** | 100 | 200 | 400 | 600 | 600 | 600 |
| | d.c. supply | **V** | 24 | 48 | 110 | 220 | 440 | – |
| | | **W** | 100 | 100 | 50 | 45 | 25 | – |
| **Short-circuit protection** | By gG or BS fuse or by **GB2** circuit-breaker | **A** | 5 | | | | | |
| **Cabling** Flexible cable without cable end | 1 or 2 conductors | **mm²** | Minimum c.s.a.: 1/maximum c.s.a.: 2.5 | | | | | |
| | Tightening torque | **N.m** | 1.2 | | | | | |

(1) For operation at 70 °C, please consult your Regional Sales Office.

**References:** pages 24514/2 and 24514/3 **Dimensions:** pages 24534/2 to 24534/4 **Schemes:** page 24534/5

# TeSys protection components
3-pole electronic thermal overload relays LR9-D

## Electrical characteristics of power circuit

| | | | |
|---|---|---|---|
| **Relay type** | | | **LR9-D** |
| **Tripping class** | Conforming to UL 508, IEC 947-4-1 | | 10 A or 20 |
| **Rated insulation voltage** (Ui) | Conforming to IEC 947-4-1 | **V** | 1000 |
| | Conforming to UL, CSA | **V** | 600 |
| **Rated impulse withstand voltage** (Uimp) | | **kV** | 8 |
| **Frequency limits** | Of the operational current | **Hz** | 50…60. For other frequencies, consult your Regional Sales Office (1) |
| **Setting range** | Depending on model | **A** | 60…150 |
| **Power circuit connections** | Width of terminal lug | **mm** | 20 |
| | Clamping screw | | M8 |
| | Tightening torque | **N.m** | 18 |

## Operating characteristics

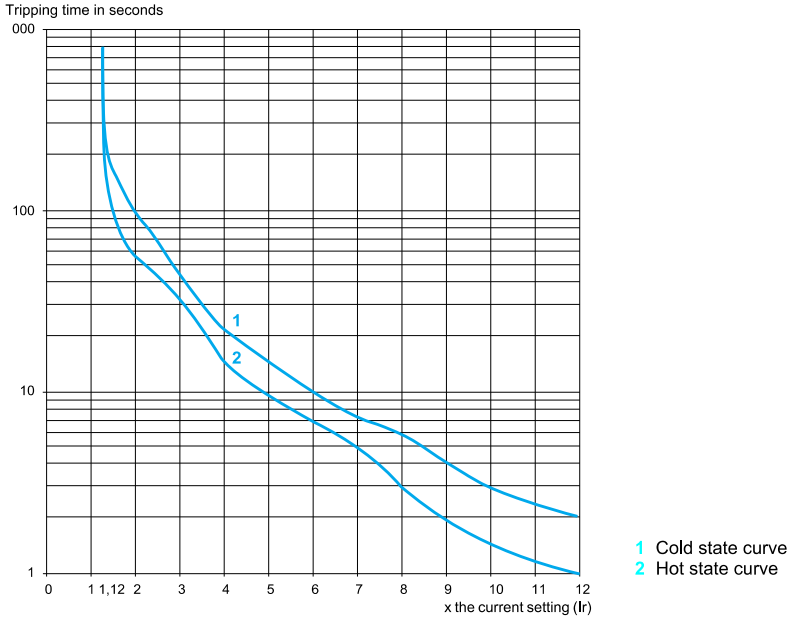
| | | | | |
|---|---|---|---|---|
| **Temperature compensation** | | | **°C** | - 20…+ 70 |
| **Tripping thresholds** | To IEC 947-4-1 | Alarm | **A** | 1.05 ± 0.06 In |
| | | Tripping | **A** | 1.12 ± 0.06 In |
| **Sensitivity to phase failure** | Conforming to IEC 947-4-1 | | | Tripping in 4 s ± 20 % in the event of phase failure |

## Alarm circuit characteristics

| | | | |
|---|---|---|---|
| **Rated supply voltage** | d.c. supply | **V** | 24 |
| **Supply voltage limits** | | **V** | 17…32 |
| **Current consumption** | No load | **mA** | ≤ 5 |
| **Switching capacity** | | **mA** | 0…150 |
| **Protection** | Short-circuit and overload | | Self-protected |
| **Voltage drop** | Closed state | **V** | ≤ 2.5 |
| **Cabling** | Flexible cable without cable end | **mm²** | 0.5…1.5 |
| **Tightening torque** | | **N.m** | 0.45 |

**Tripping curve LR9-D**

**Average operating time** related to multiples of the current setting




1 Cold state curve
2 Hot state curve

(1) For use of these relays with soft start units or variable speed controllers, please consult your Regional Sales Office.

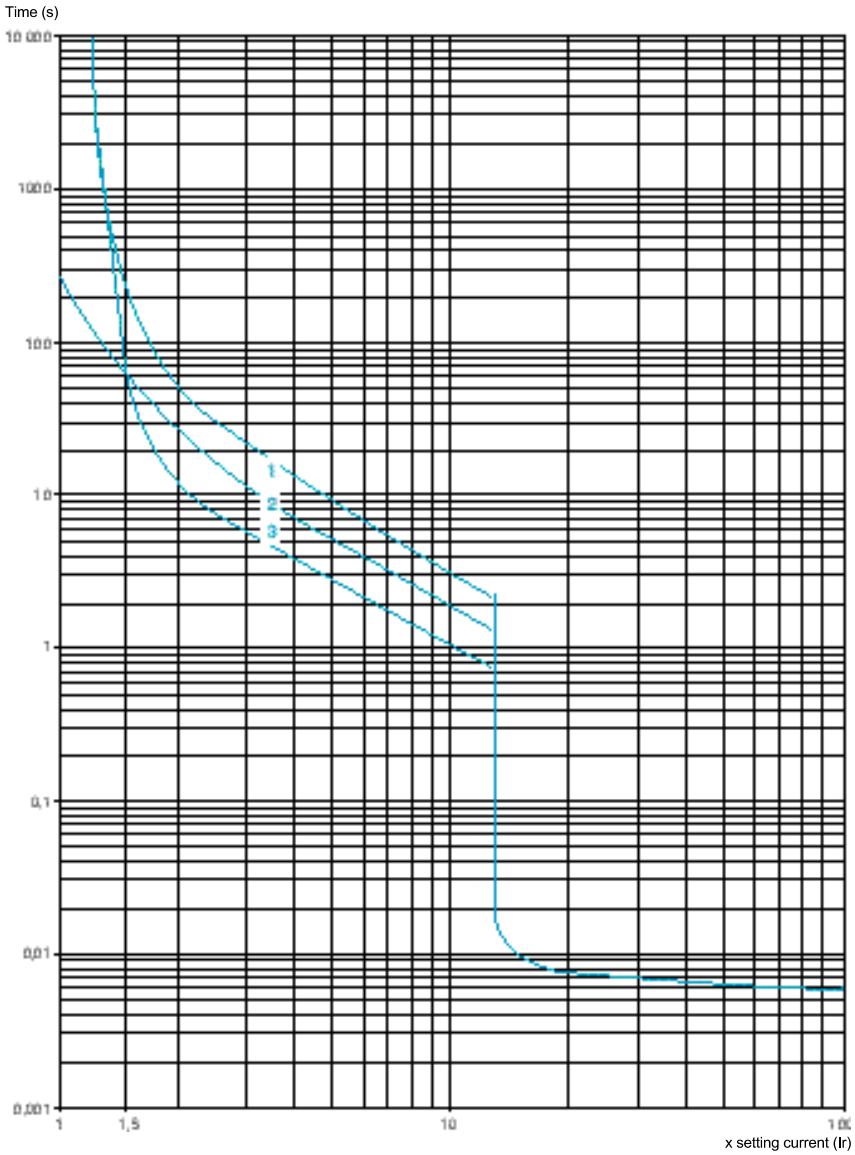
References: pages 24514/2 and 24514/3
Dimensions: pages 24534/2 to 24534/4
Schemes: page 24534/5

# TeSys protection components

Thermal-magnetic motor circuit breakers types GV2-ME and GV2-P

## Thermal-magnetic tripping curves for GV2-ME and GV2-P

Average operating time at 20 °C according to multiples of the setting current




1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

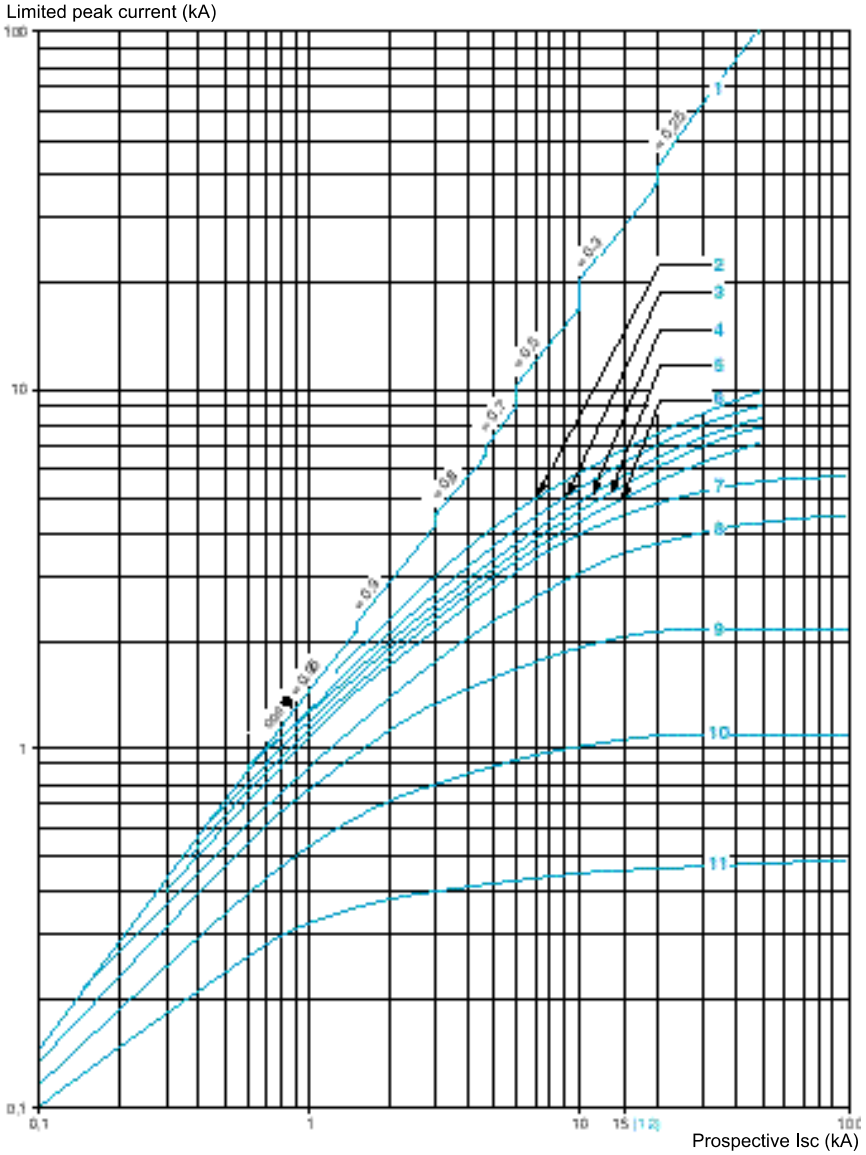
References :
pages 24508/2 to 24508/4
Dimensions :
pages 24538/2 to 24538/4
Schemes :
page 24538/8

## Current limitation on short-circuit for GV2-ME and GV2-P

3-phase 400/415 V

**Dynamic stress**

I peak = f (prospective Isc) at 1.05 Ue = 435 V



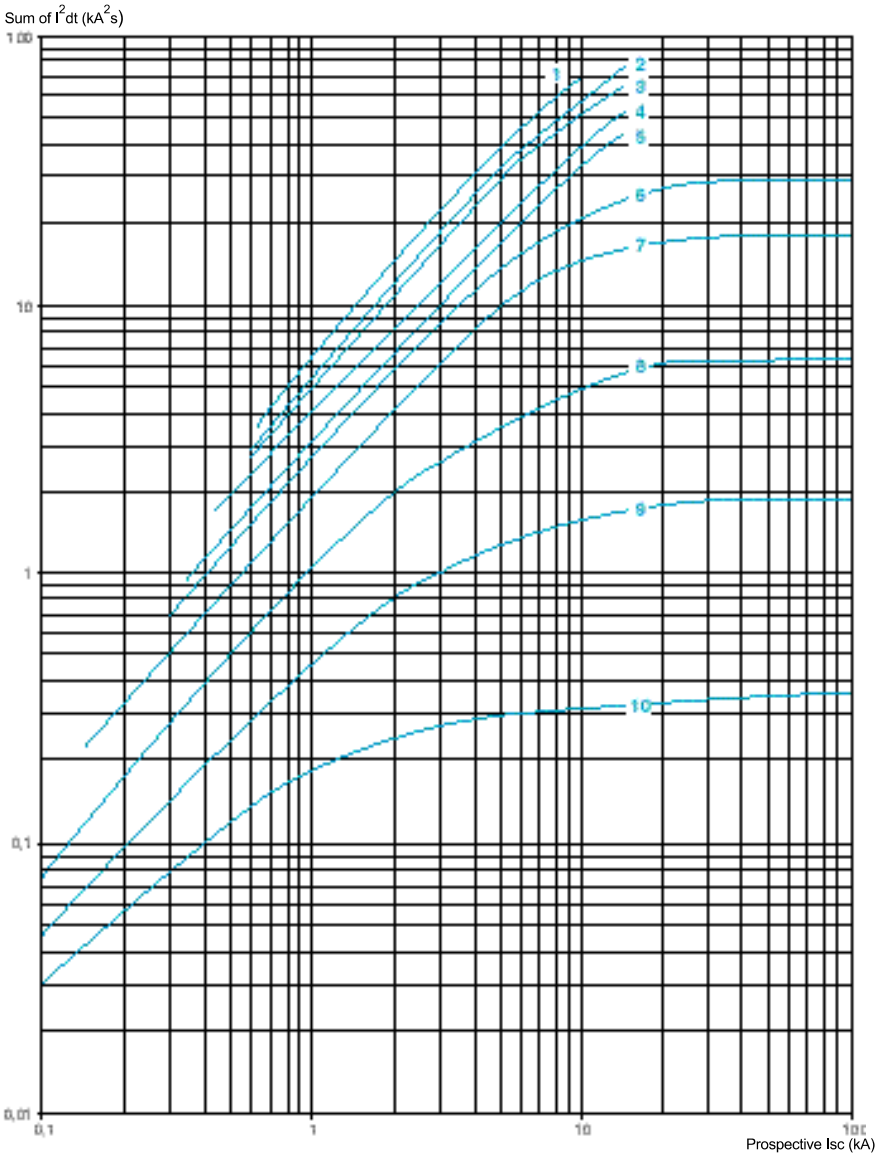

1 Maximum peak current
2 24-32 A
3 20-25 A
4 17-23 A
5 13-18 A
6 9-14 A
7 6-10 A
8 4-6.3 A
9 2.5-4 A
10 1.6-2.5 A
11 1-1.6 A
12 Limit of rated ultimate breaking capacity on short-circuit of GV2-ME (14, 18, 23 and 25 A ratings)

**References :** pages 24508/2 to 24508/4
**Dimensions :** pages 24538/2 to 24538/4
**Schemes :** page 24538/8

## Thermal limit on short-circuit for GV2-ME

**Thermal limit in $KA^2$ s in the magnetic operating zone**

Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V



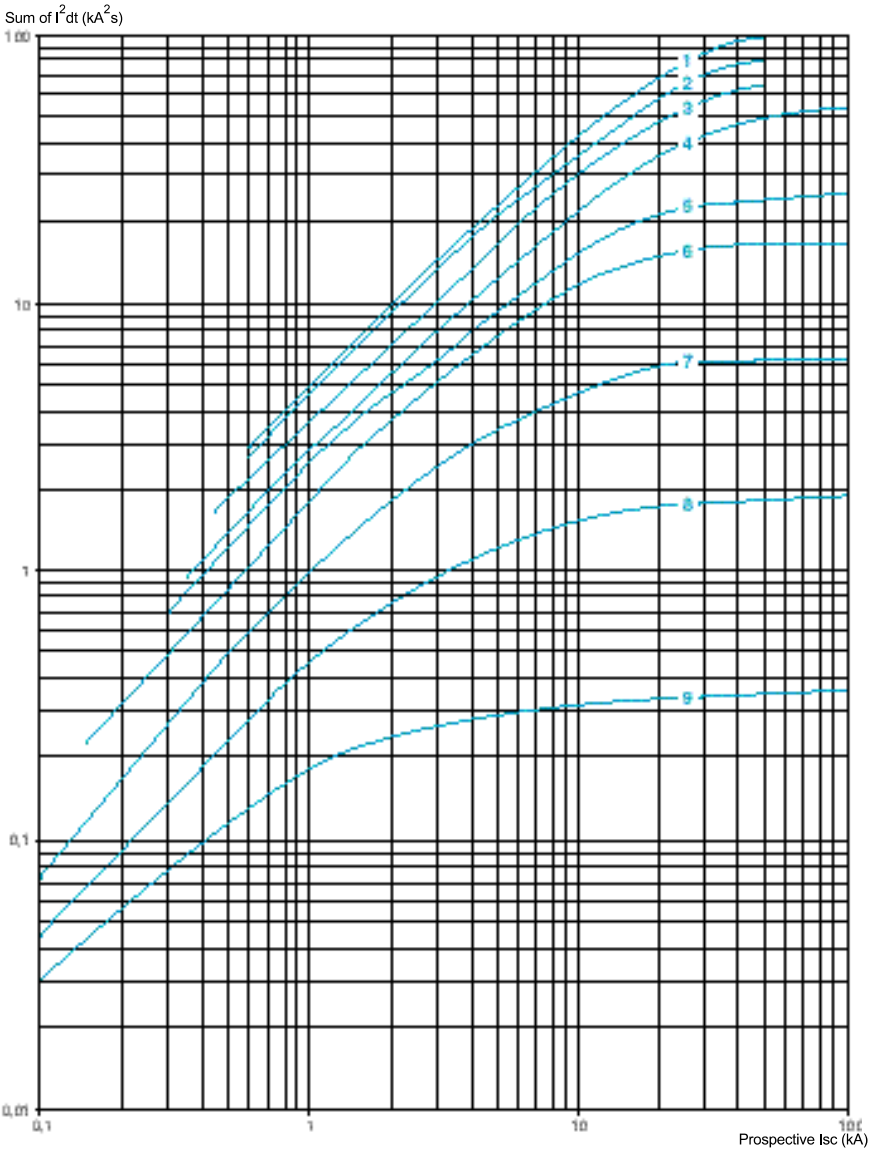

1 24-32 A
2 20-25 A
3 17-23 A
4 13-18 A
5 9-14 A
6 6-10 A
7 4-6.3 A
8 2.5-4 A
9 1.6-2.5 A
10 1-1.6 A

References : pages 24508/2 to 24508/4
Dimensions : pages 24538/2 to 24538/4
Schemes : page 24538/8

## Thermal limit on short-circuit for GV2-P

**Thermal limit in $kA^2$ s in the magnetic operating zone**

Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V



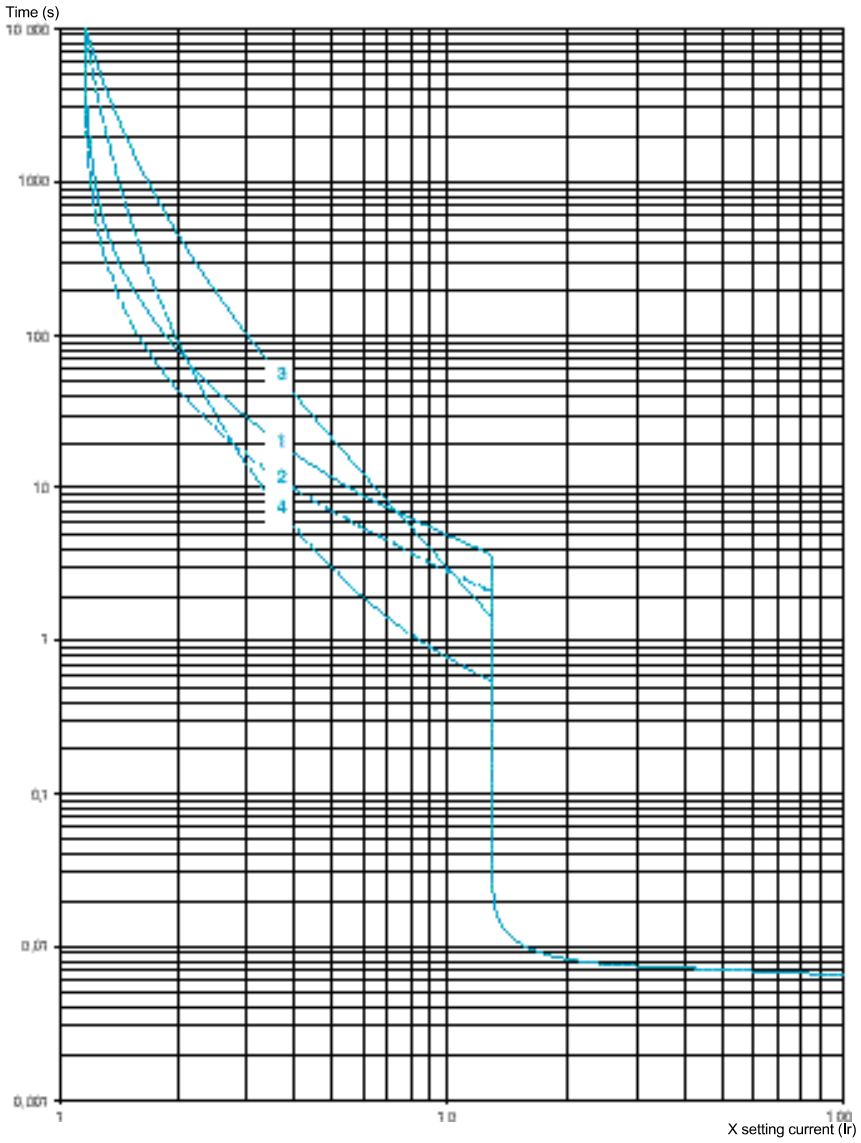

1 24-32 A
2 20-25 A
3 17-23 A
4 13-18 A
5 9-14 A
6 6-10 A
7 4-6.3 A
8 2.5-4 A
9 1.6-2.5 A
10 1-1.6 A

**References :** pages 24508/2 to 24508/4
**Dimensions :** pages 24538/2 to 24538/4
**Schemes :** page 24538/8

# TeSys protection components
Thermal-magnetic motor circuit-breakers type GV3-ME

## Thermal-magnetic tripping curves

Average operating time at 20 °C according to multiples of the setting current.




1 3 poles from cold state, 1.6…16 A rating
2 3 poles from hot state , 1.6…16 A rating
3 3 poles from cold state, 25…80 A rating
4 3 poles from hot state, 25…80 A rating

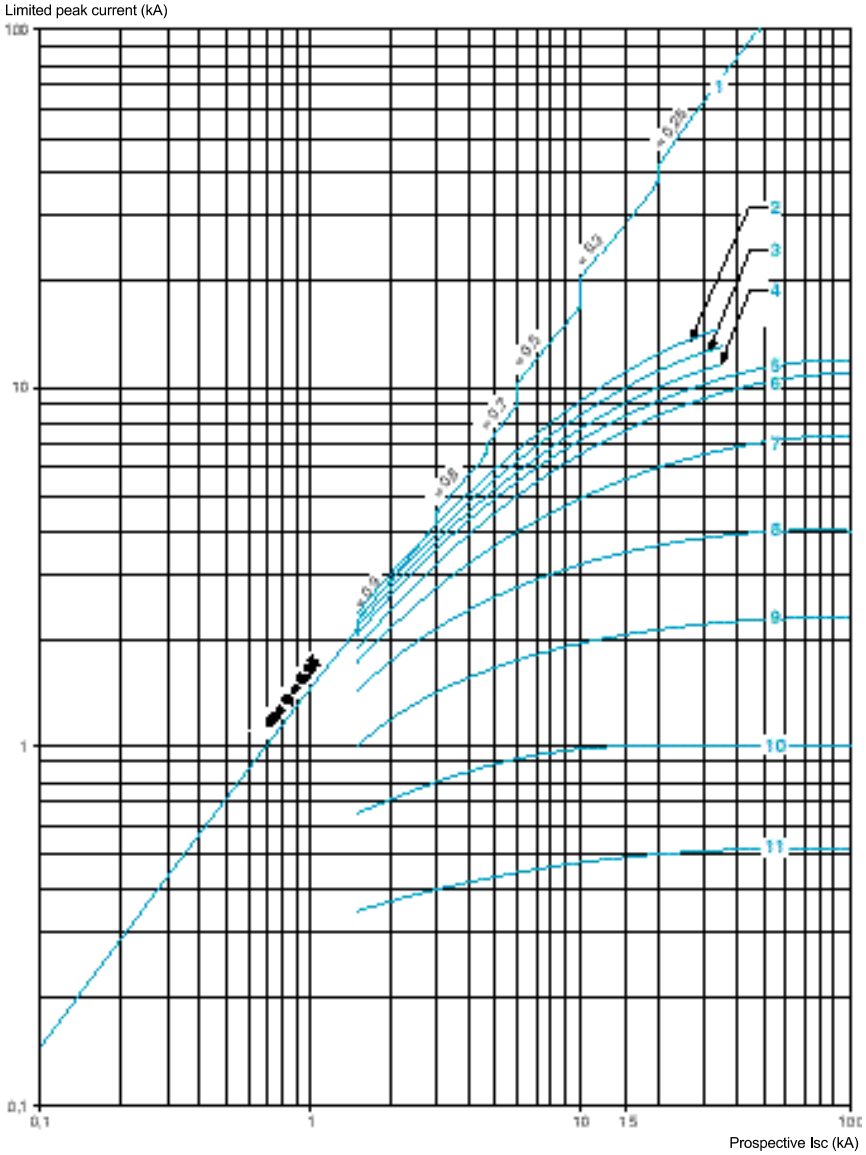
References : page 24508/5
Dimensions : page 24538/5
Schemes : page 24538/9

## Current limitation on short-circuit

3-phase 400/415 V.

**Dynamic stress**

I peak = f (prospective Isc) at 1.05 Ue = 435 V



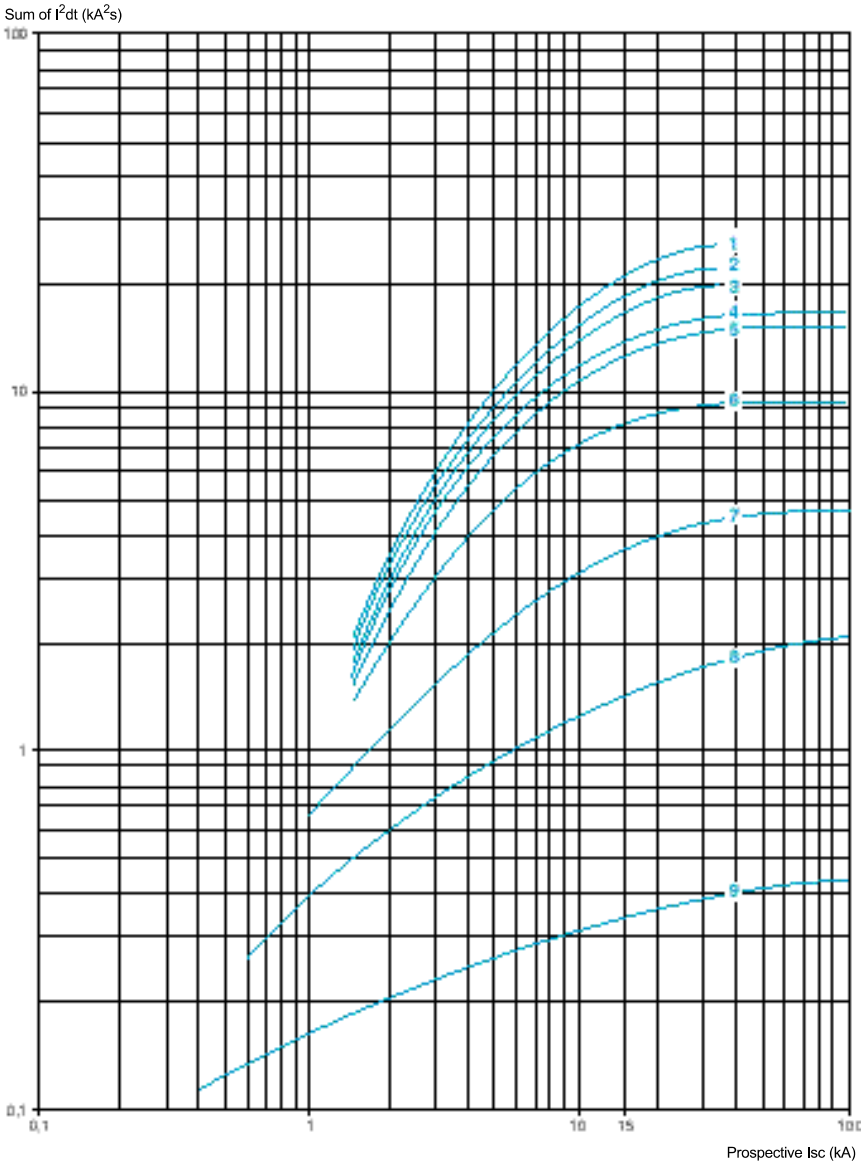

1 Maximum peak current
2 56…80 A
3 40…63 A
4 25…40 A
5 16…25 A
6 10…16 A
7 6…10 A
8 4…6 A
9 2.5…4 A
10 1.6…2.5 A
11 1…1.6 A

**References :** page 24508/5
**Dimensions :** page 24538/5
**Schemes :** page 24538/9

## Thermal limit on short-circuit

**Thermal limit in $kA^2s$ in the magnetic operating zone**

Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V



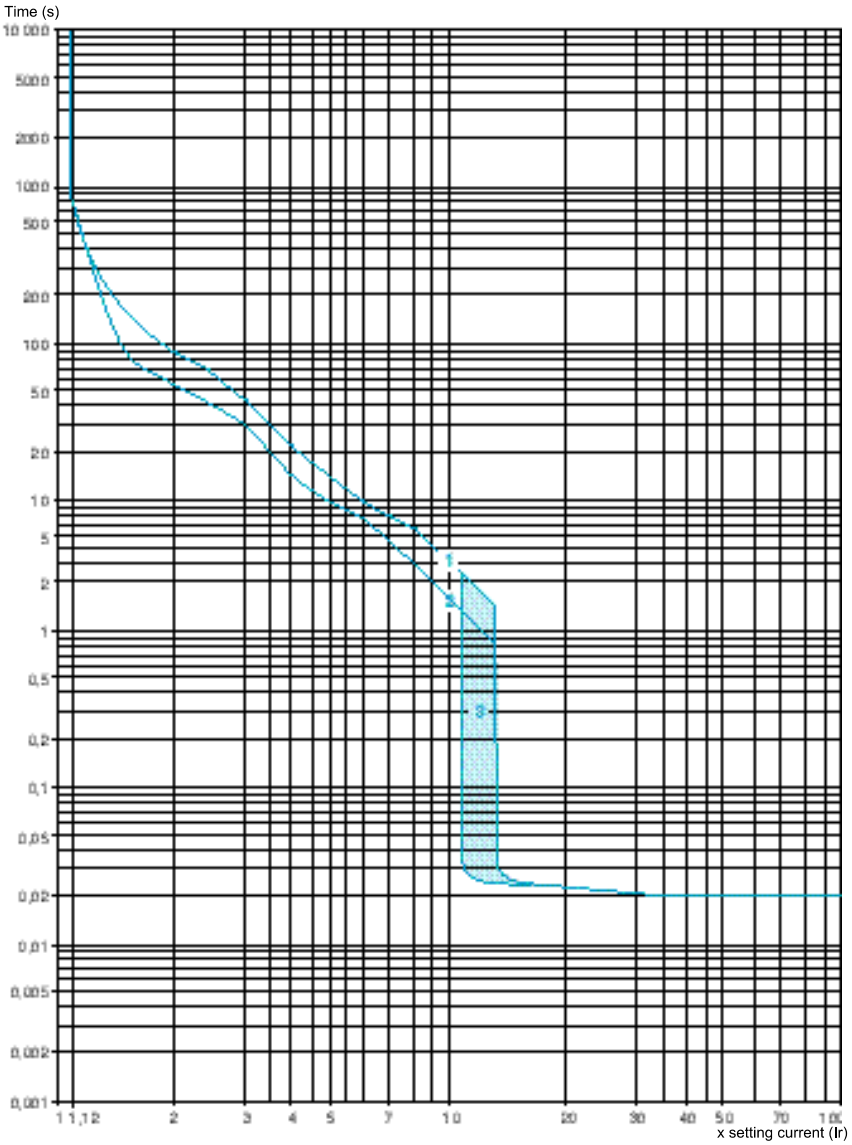

1 56…80 A
2 40…63 A
3 25…40 A
4 16…25 A
5 10…16 A
6 6…10 A
7 4…6 A
8 2.5…4 A
9 1.6…2.5 A

**References :** page 24508/5
**Dimensions :** page 24538/5
**Schemes :** page 24538/9

# TeSys protection components
Thermal-magnetic motor circuit-breakers type GV7-R

## Thermal-magnetic tripping curves for GV7-R

Average operating time at 20 °C according to multiples of the setting current




1 Curve from cold state
2 Curve from hot state
3 12…14 Ir
In the event of total phase failure, tripping occurs after 4 s ± 20 %

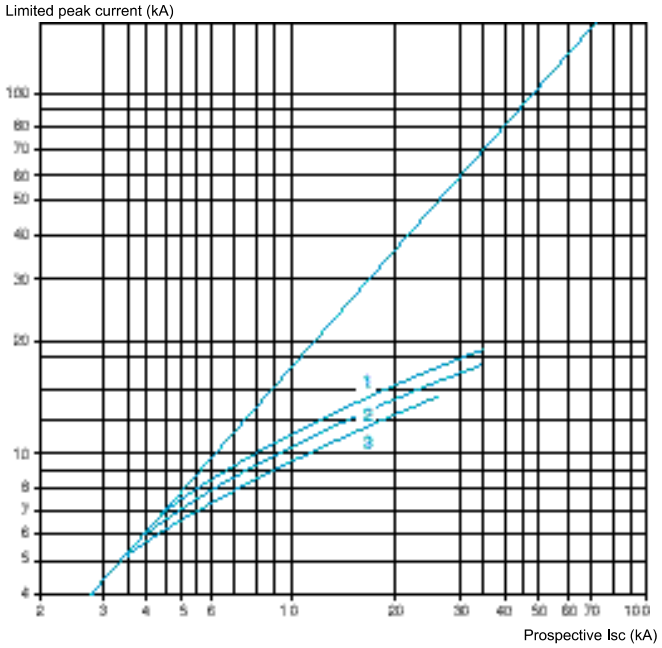
References : page 24508/6
Dimensions : pages 24538/5 to 24538/7
Schemes : page 24538/9

# TeSys protection components
Thermal-magnetic motor circuit-breakers type GV7-R

## Current limitation on short-circuit

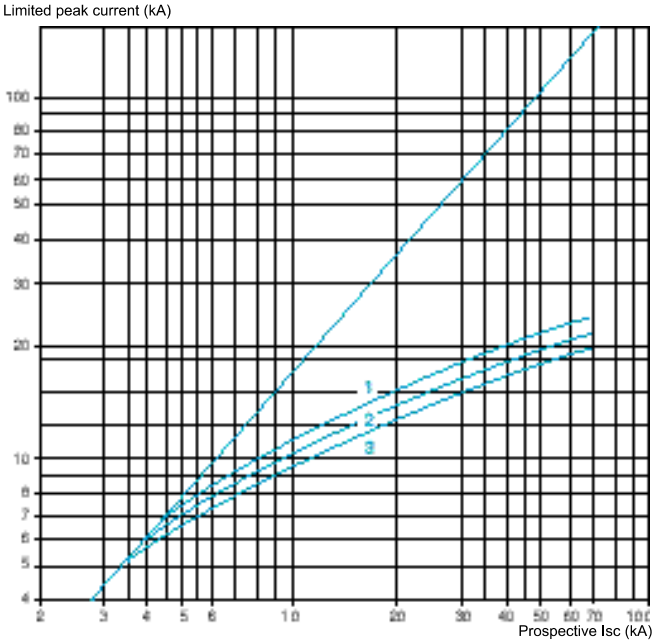
3-phase 400/415 V
**Dynamic stress**
I peak = f (prospective Isc)

**For GV7-RE only**




1 GV7-RE220
2 GV7-RE150
3 GV7-RE100

**For GV7-RS only**




1 GV7-RS220
2 GV7-RS150
3 GV7-RS100

References :
page 24508/6

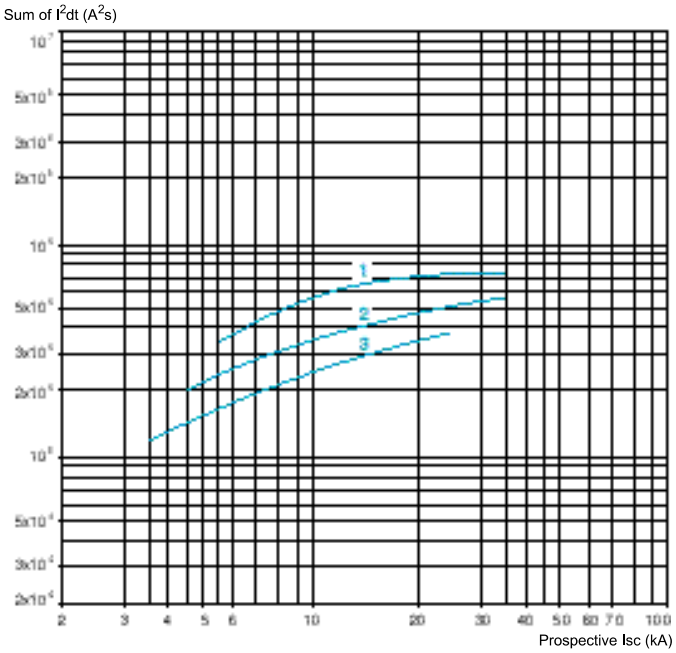
Dimensions :
pages 24538/5 to 24538/7

Schemes :
page 24538/9

## Thermal limit on short-circuit

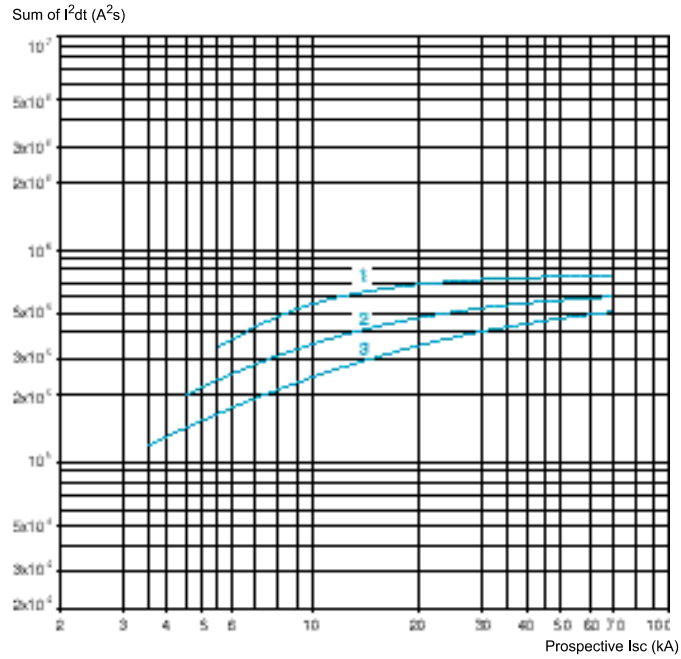
3-phase 400/415 V
**Thermal limit**
Sum of $I^2dt$ = f (prospective Isc)

**For GV7-RE only**




1 GV7-RE220
2 GV7-RE150
3 GV7-RE100

**For GV7-RS only**



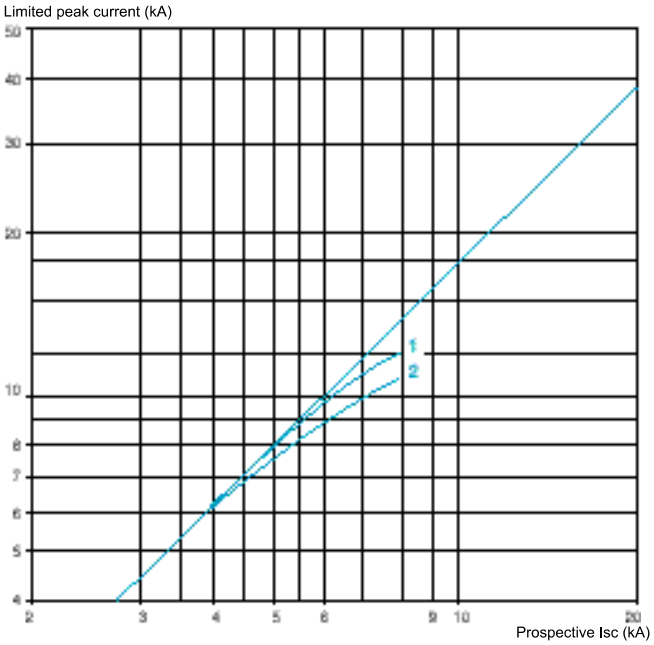

1 GV7-RS220
2 GV7-RS150
3 GV7-RS100

References : page 24508/6
Dimensions : pages 24538/5 to 24538/7
Schemes : page 24538/9

## Current limitation on short-circuit

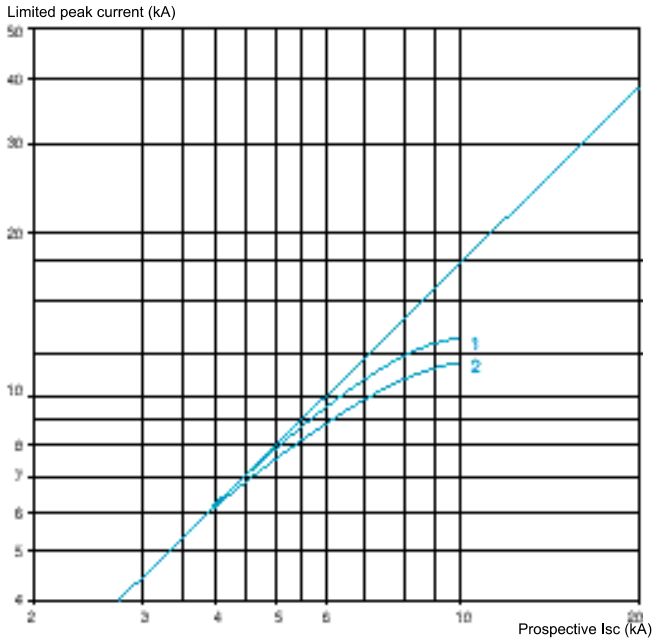
3-phase 690 V
**Dynamic stress**
I peak = f (prospective Isc)

**For GV7-RE only**




1 GV7-RE220
2 GV7-RE150 and GV7-RE100

**For GV7-RS only**



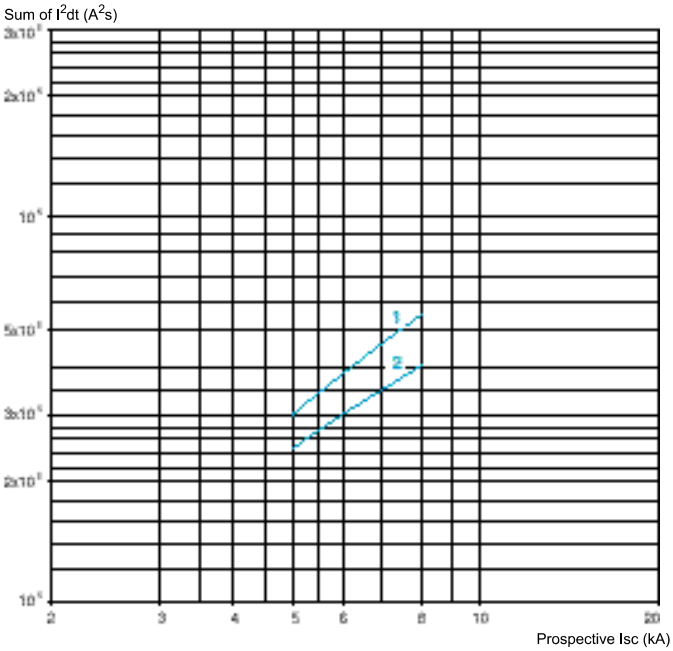

1 GV7-RS220
2 GV7-RS150 and GV7-RS100

**References :** page 24508/6
**Dimensions :** pages 24538/5 to 24538/7
**Schemes :** page 24538/9

## Thermal limit on short-circuit

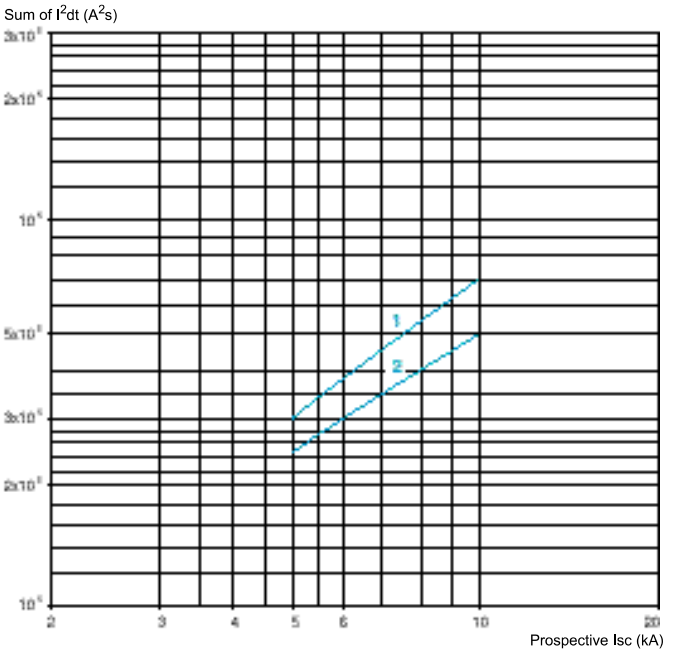
3-phase 690 V
**Thermal limit**
Sum of $I^2dt$ = f (prospective Isc)

**For GV7-RE only**




1 GV7-RE220
2 GV7-RE150 and GV7-RS100

**For GV7-RS only**

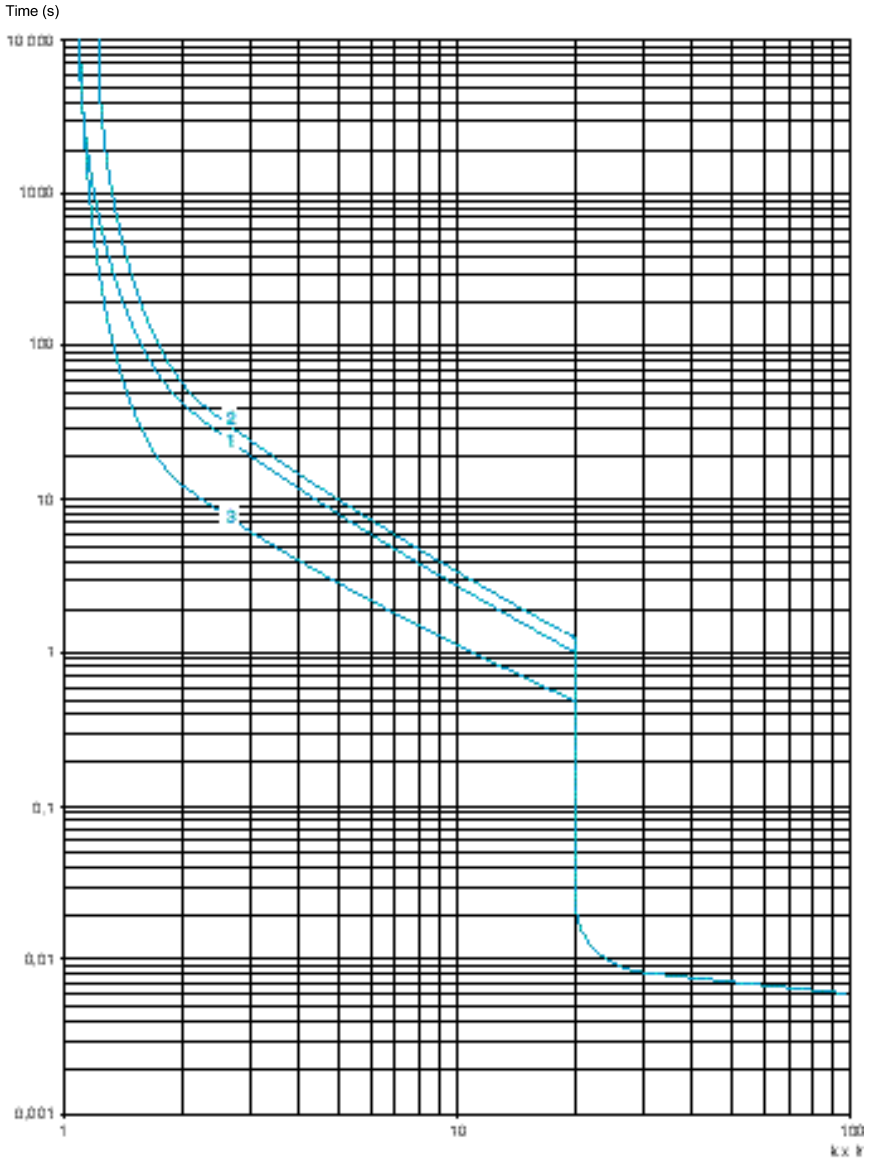



1 GV7-RS220
2 GV7-RS150 and GV7-RS100

**References :** page 24508/6
**Dimensions :** pages 24538/5 to 24538/7
**Schemes :** page 24538/9

# TeSys protection components
Thermal-magnetic motor circuit-breakers type GV2-RT

## Thermal-magnetic tripping curves for GV2-RT



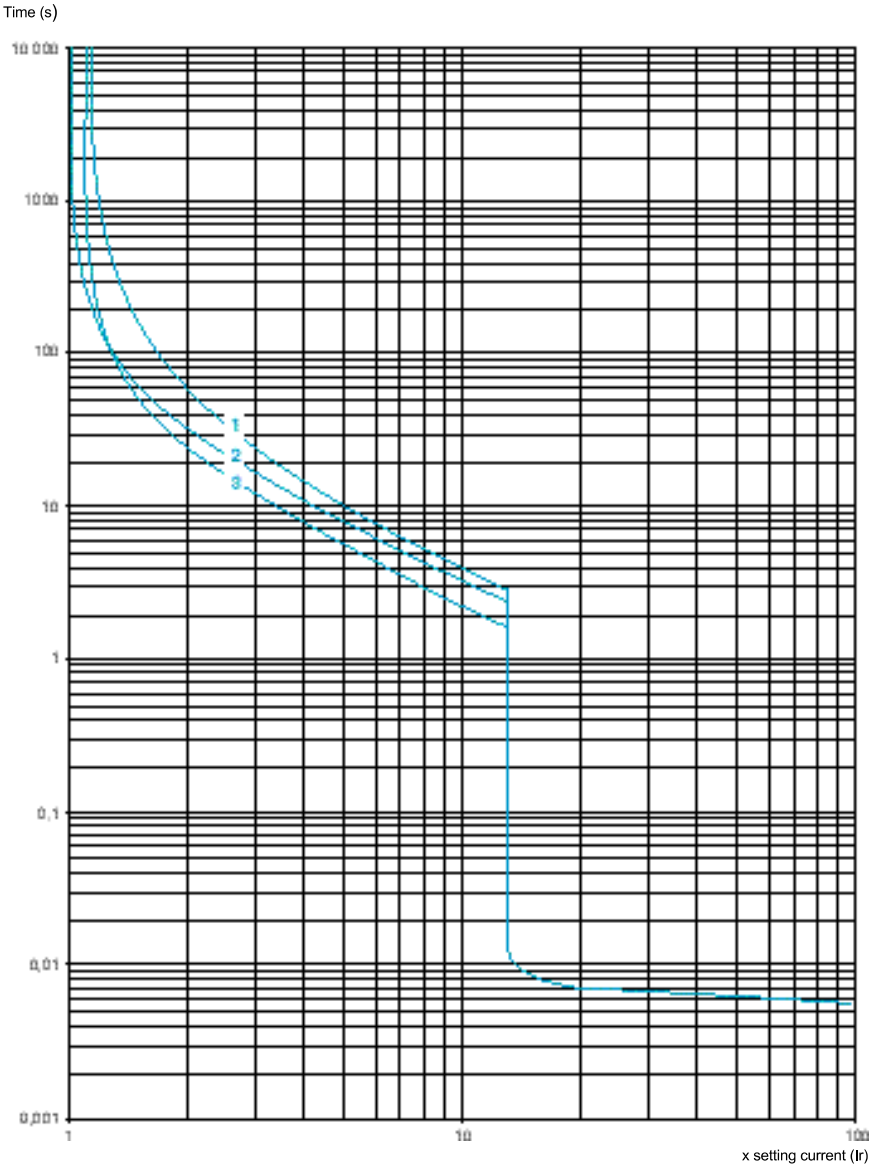

1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

References : page 24508/7
Dimensions : page 24538/4
Schemes : page 24538/8

# TeSys protection components
Magnetic motor circuit-breakers types GV2-L and GV2-LE

## Tripping curves for GV2-L or LE combined with thermal overload relay LRD or LR2-K

Average operating time at 20°C according to multiples of the setting current




1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

References : page 24522/2
Dimensions : pages 24527/2 to 24527/4
Schemes : page 24527/5

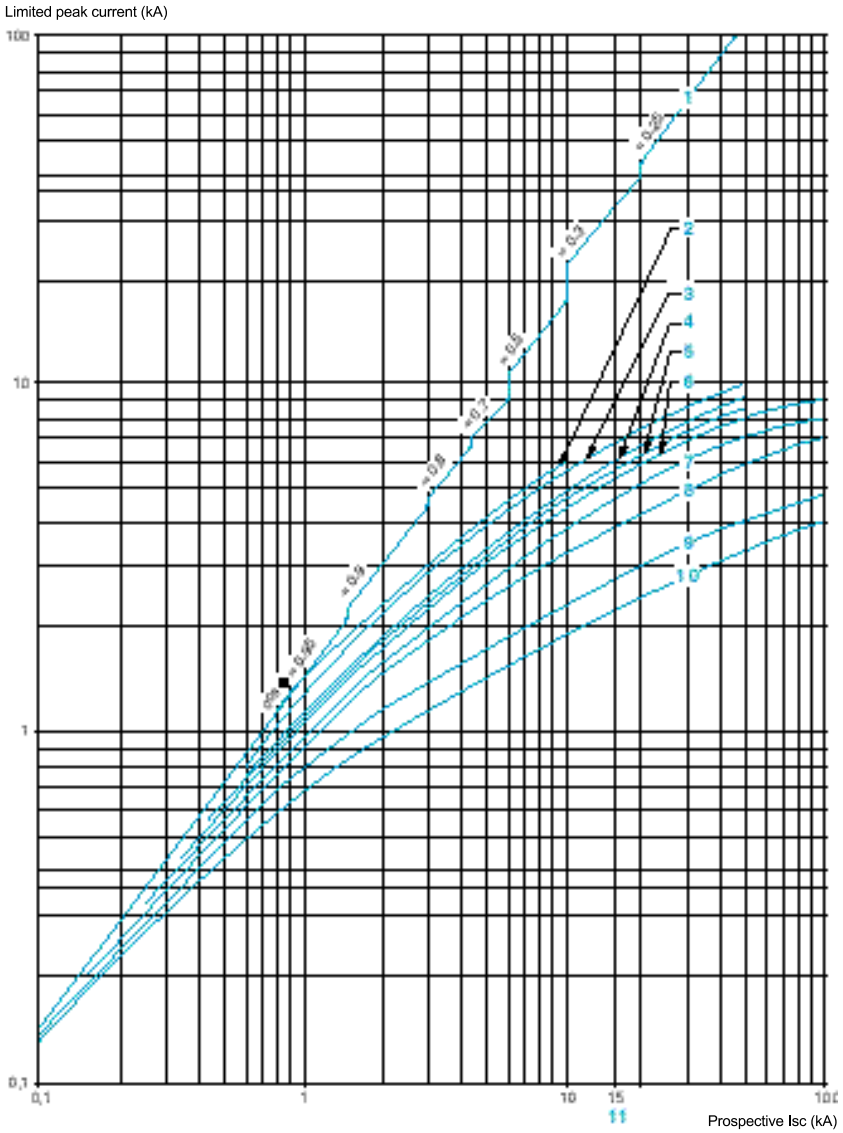
## Current limitation on short-circuit

**For GV2-L and GV2-LE only**

3-phase 400/415 V

**Dynamic stress**

I peak = f (prospective Isc) at 1.05 Ue = 435 V




1 Maximum peak current
2 32 A
3 25 A
4 18 A
5 14 A
6 10 A.
7 6.3 A
8 4 A
9 2.5 A
10 1.6 A
11 Limit of rated ultimate breaking capacity on short-circuit of GV2-LE (14, 18 and 25 A ratings)

References : page 24522/2
Dimensions : pages 24527/2 to 24527/4
Schemes : page 24527/5

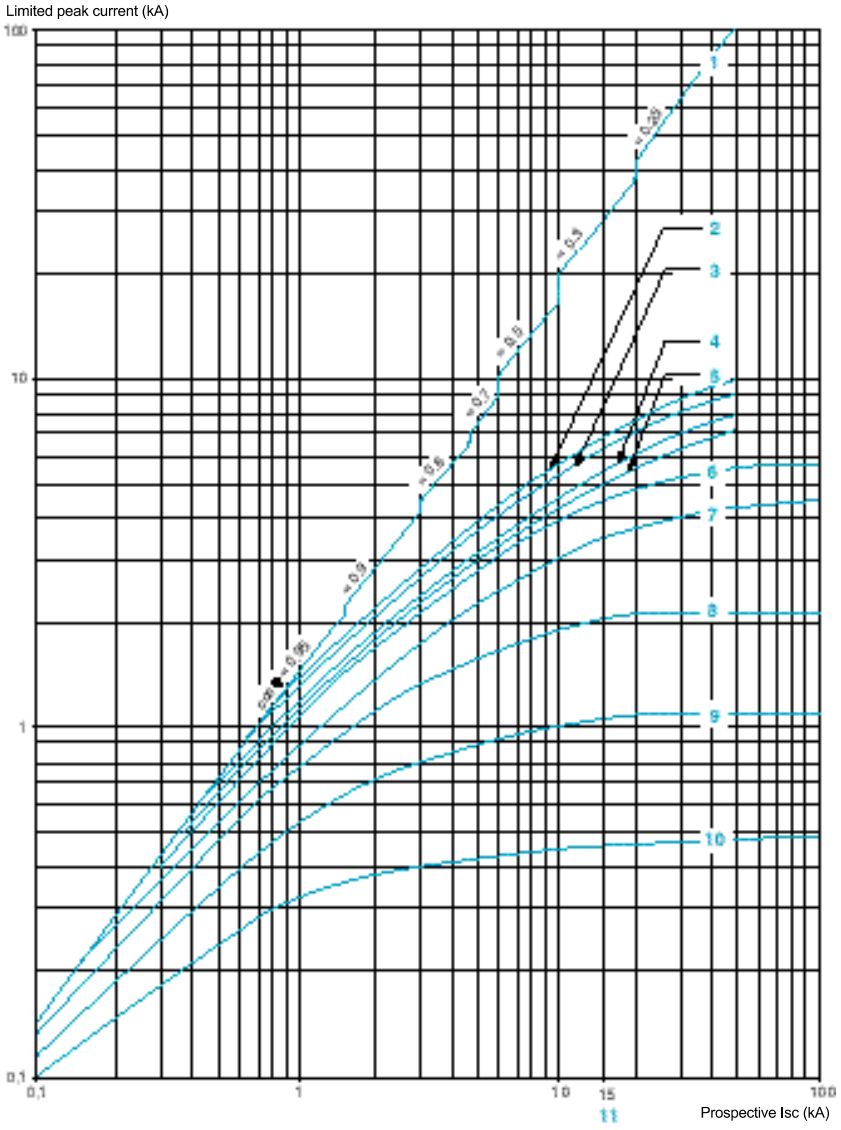
## Current limitation on short-circuit

**For GV2-L and GV2-LE + thermal overload relay LRD or LR2-K**

3-phase 400/415 V

**Dynamic stress**

I peak = f (prospective Isc) at 1.05 Ue = 435 V



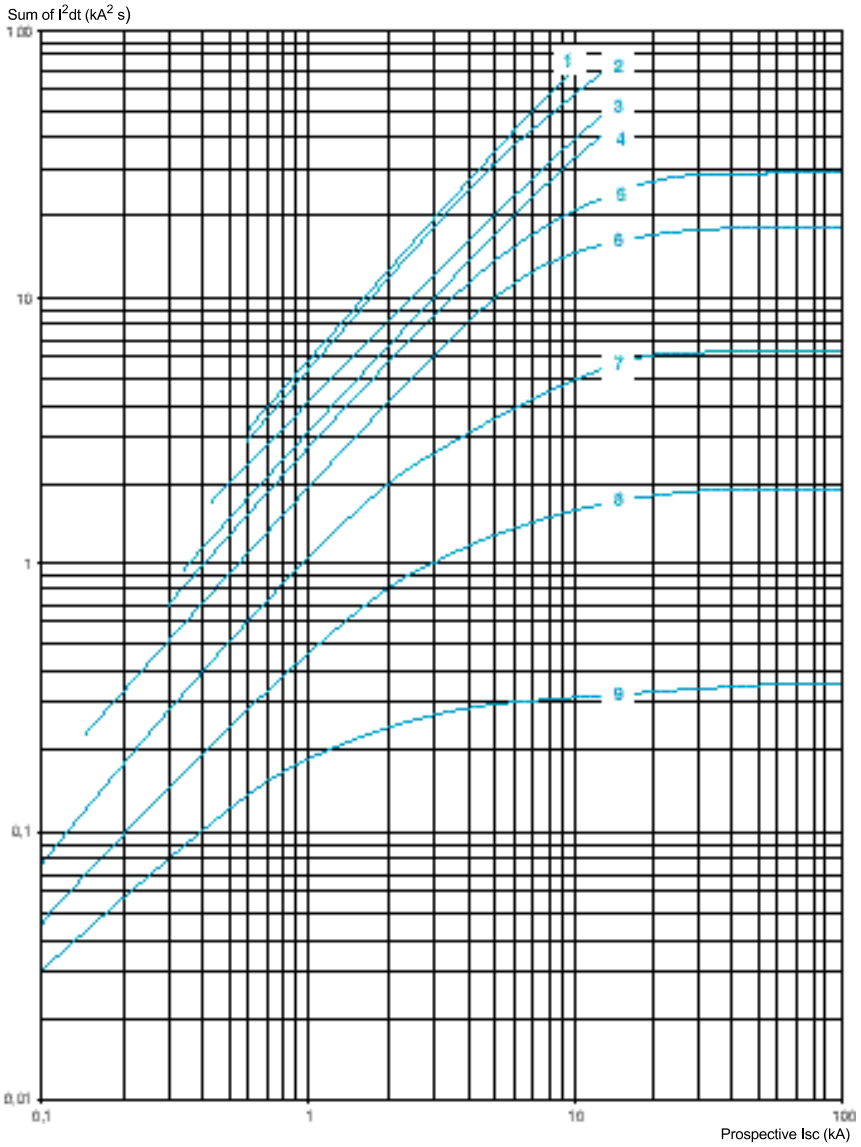

1 Maximum peak current
2 32 A
3 25 A
4 18 A
5 14 A
6 10 A
7 6.3 A
8 4 A
9 2.5 A
10 1.6 A
11 Limit of rated ultimate breaking capacity on short-circuit of GV2-LE (14, 18 and 25 A ratings)

**References :** page 24522/2
**Dimensions :** pages 24527/2 to 24527/4
**Schemes :** page 24527/5

## Thermal limit on short-circuit for GV2-LE only

**Thermal limit in $kA^2$ s in the magnetic operating zone**

Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V



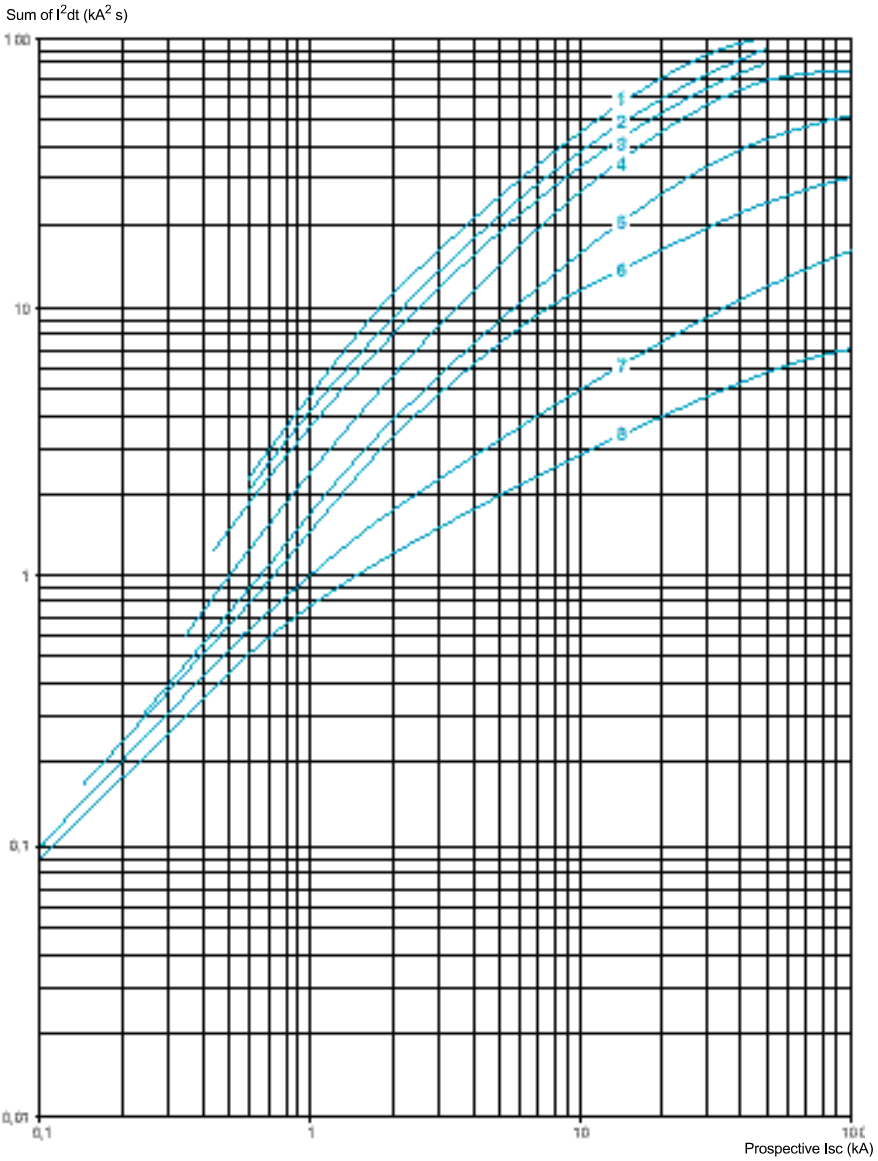

1 32 A
2 25 A
3 18 A
4 14 A
5 10 A
6 6.3 A
7 4 A
8 2.5 A
9 1.6 A

**References :** page 24522/2
**Dimensions :** pages 24527/2 to 24527/4
**Schemes :** page 24527/5

## Thermal limit on short-circuit for GV2-L only

**Thermal limit in $kA^2$ s in the magnetic operating zone**

Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V



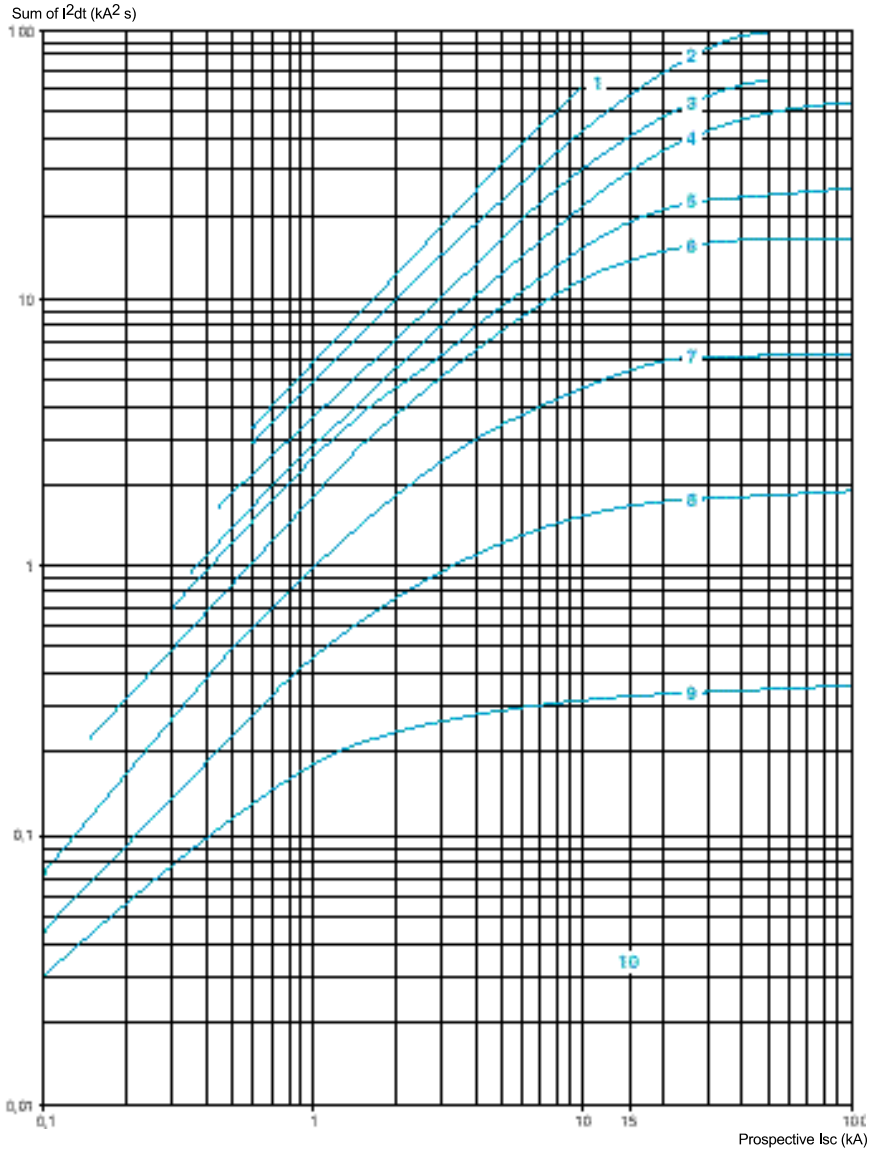

1 25 A and 32 A
2 18 A
3 14 A
4 10 A
5 6.3 A
6 4 A
7 2.5 A
8 1.6 A

## Thermal limit on short-circuit

**For GV2-L and GV2-LE + thermal overload relay LRD or LR2-K**

**Thermal limit in $kA^2$ s in the magnetic operating zone**

Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V



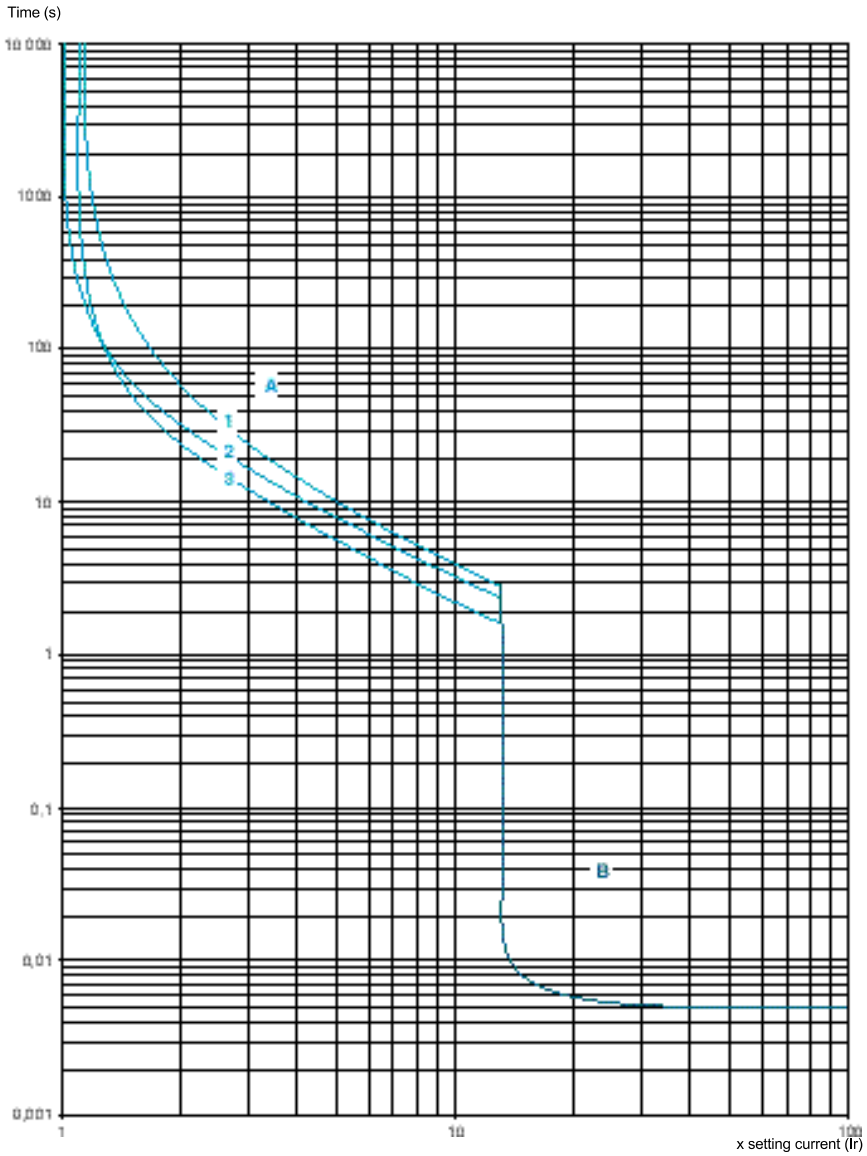

1 32 A (GV2-LE32)
2 25 A and 32 A (GV2-L32)
3 18 A
4 14 A
5 10 A
6 6.3 A
7 4 A
8 2.5 A
9 1.6 A
10 Limit of rated ultimate breaking capacity on short-circuit of GV2-LE (14, 18 and 25 A ratings)

**References :** page 24522/2
**Dimensions :** pages 24527/2 to 24527/4
**Schemes :** page 24527/5

# TeSys protection components
Magnetic motor circuit-breaker type GK3

## Tripping curves for GK3 combined with thermal overload relay LRD-33

Average operating time at 20 °C without prior current flow.




1 3 poles from cold state
2 2 poles from cold state
3 3 poles from hot state

A Thermal overload relay protection zone
B GK3 protection zone

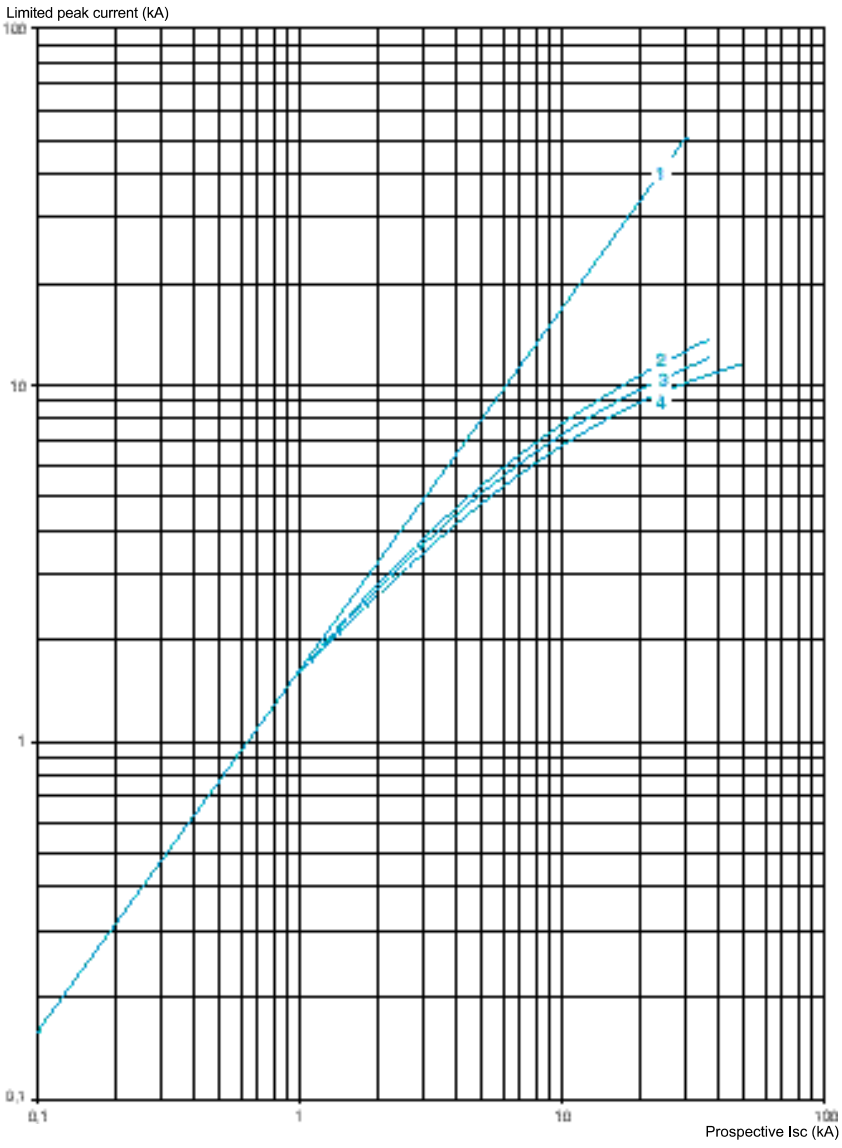
References : page 24522/3
Dimensions : page 24527/4
Schemes : page 24527/5

## Current limitation on short-circuit for GK3 only

3-phase 400/415 V

**Dynamic stress**

I peak = f (prospective Isc) at 1.05 Ue = 435 V

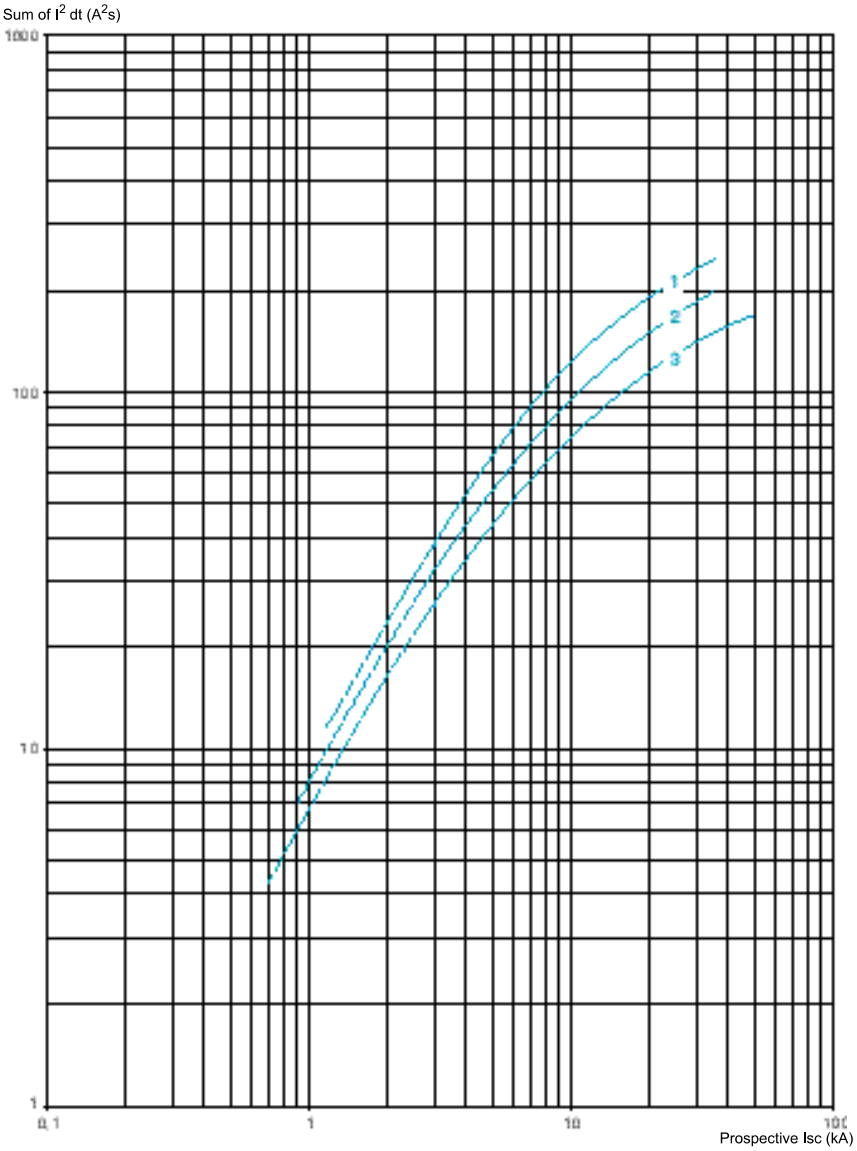



1 Maximum peak current
2 80 A
3 65 A
4 40 A

## Thermal limit on short-circuit for GK3 only

**Thermal limit** in $A^2s$

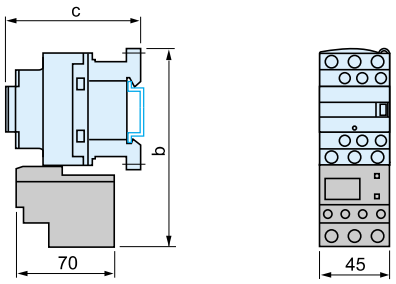
Sum of $I^2dt$ = f (prospective Isc) at 1.05 Ue = 435 V




1 80 A
2 65 A
3 40 A

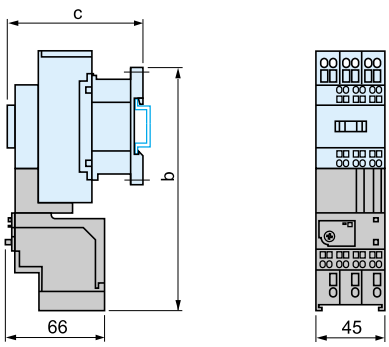
# TeSys protection components
Thermal overload relays, model d

**LRD-01...35**
Direct mounting beneath contactors with screw clamp connections



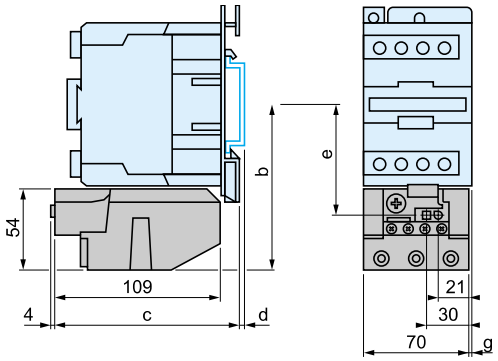

| LC1- | D09...D18 | D25...D38 |
|---|---|---|
| b | 123 | 137 |
| c | see pages 24531/2 and 24531/3 | |

**LRD-013...353**
Direct mounting beneath contactors with spring terminal connections




| LC1- | D093...D383 |
|---|---|
| b | 168 |
| c | see pages 24531/2 and 24531/3 |

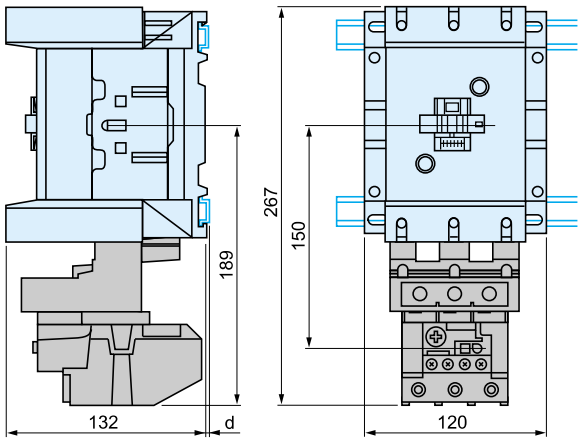
**LRD-3●●●**
Direct mounting beneath contactors
LC1-D40 to D95 and LP1-D40 to D80




| AM1- | DL201 | DL200 |
|---|---|---|
| d | 7 | 17 |

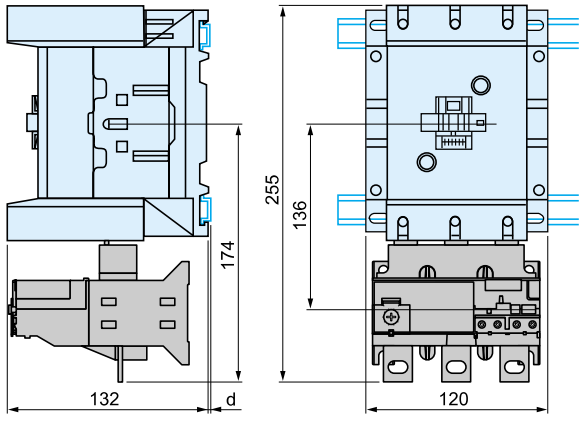
| | b | c | e | g (3P) | g (4P) |
|---|---|---|---|---|---|
| Control circuit: a.c. | | | | | |
| **LC1-D40** | 111 | 119 | 72.4 | 4.5 | 13 |
| **LC1-D50** | 111 | 119 | 72.4 | 4.5 | – |
| **LC1-D65** | 111 | 119 | 72.4 | 4.5 | 13 |
| **LC1-D80** | 115.5 | 124 | 76.9 | 9.5 | 22 |
| **LC1-D95** | 115.5 | 124 | 76.9 | 9.5 | – |
| Control circuit: d.c. | | | | | |
| **LC1-D40, LP1-D40** | 111 | 176 | 72.4 | 4.5 | 13 |
| **LC1-D50** | 111 | 176 | 72.4 | 4.5 | – |
| **LC1-D65, LP1-D65** | 111 | 176 | 72.4 | 4.5 | 13 |
| **LC1-D80, D95, LP1-D80** | 115.5 | 179.4 | 76.9 | 9.5 | 22 |

**LRD-4●●●**
Direct mounting beneath contactors
LC1-D115 and D150




| | AM1-DL200 and DR200 | AM1-DE200 and ED●●● |
|---|---|---|
| d | 2.5 | 10.5 |

**LR9-D**
Direct mounting beneath contactors
LC1-D115 and D150

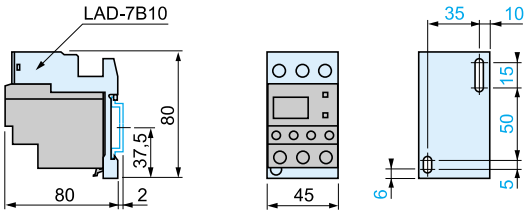



| | AM1-DP200 and DR200 | AM1-DE200 and ED●●● |
|---|---|---|
| d | 2.5 | 10.5 |

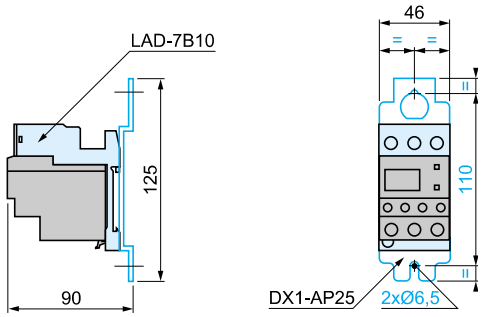
Characteristics: pages 24516/2 to 24516/5
References: pages 24514/2 and 24514/
3 Schemes: page 24534/5

# TeSys protection components
Thermal overload relays, model d

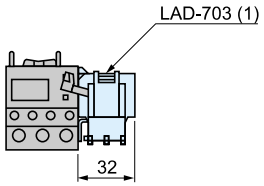
**LRD-01...35**
Independent mounting on 50 mm centres
or on rail AM1-DP200 or DE200




Independent mounting on 110 mm centres

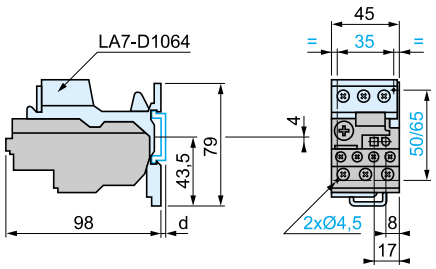



**Remote tripping or electrical reset**



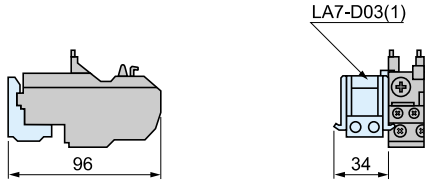

(1) Can only be mounted on RH side of relay LRD-01...35

**LR2-D15●●**
**Independent mounting on 50 mm centres**
**or on rail AM1-DP200 or DE200**



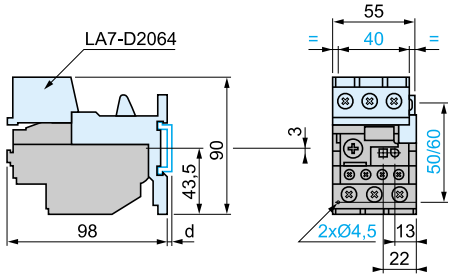

| | AM1-DP200 | AM1-DE200 |
|---|---|---|
| d | 2 | 9.5 |

**Remote tripping or electrical reset**



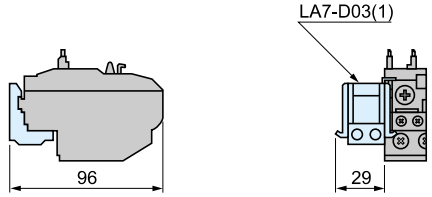

(1) Can be mounted on RH or LH side of relay LR2-D15●●

**LR2-D25●●**
**Independent mounting on 50 mm centres**
**or on rail AM1-DP200 or DE200**




| | AM1-DP200 | AM1-DE200 |
|---|---|---|
| d | 2 | 9.5 |

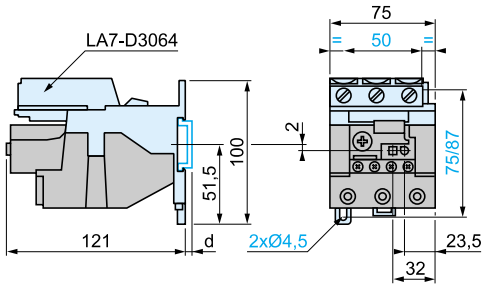
**Remote tripping or electrical reset**




(1) Can be mounted on RH or LH side of relay LR2-D25●●

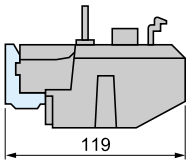
Characteristics: pages 24516/2 to 24516/5 References: pages 24514/2 and 24514/3 Schemes: page 24534/5

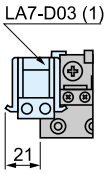
**LRD-3●●● and LR2-D35●●**
Independent mounting on 50 mm centres
or on mounting rail AM1-DP200 or DE200




| | AM1-DP200 | AM1-DE200 |
|---|---|---|
| d | 2 | 9.5 |

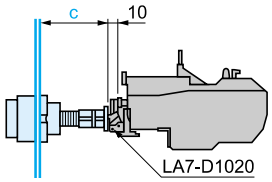
**LRD-3●●●, LR2-D35●● and LR9-D**
Remote tripping or electrical reset



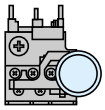

(1) Can be mounted on RH or LH side of relays LRD-3●●●, LR2-D35●● or LR9-D

**LR2-D and LRD-3●●●**
Adapter for door interlock mechanism
LA7-D1020

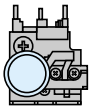



c: adjustable from 17 to 120 mm

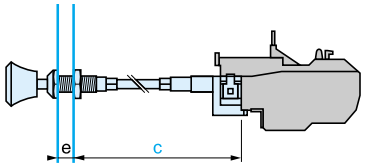
Stop



Reset

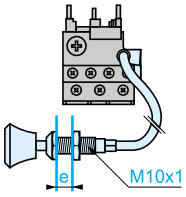


**LRD, LR2-D and LR9-D**
"Reset" by flexible cable
LA7-D305 and LAD-7305
Mounting with cable straight




c: up to 550 mm
e: up to 20 mm

Mounting with cable bent




e: up to 20 mm

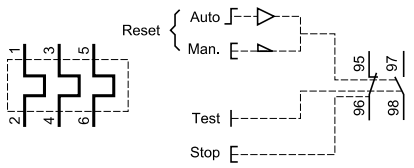
**Characteristics:**
**pages 24516/2 to 24516/5**

**References:**
**pages 24514/2 and 24514/**

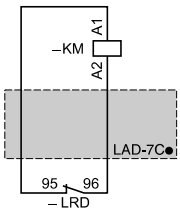
**3**

# TeSys protection components
Thermal overload relays, model d

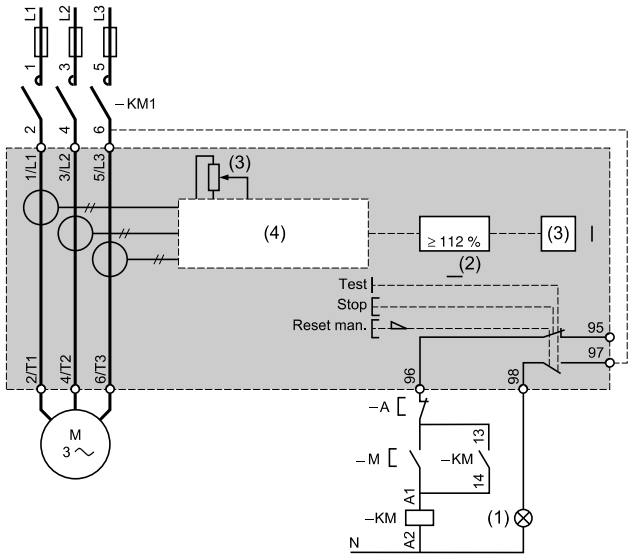
**LRD, LR2-D and LR3-D**




**Pre-cabling kit**
**LAD-7C1, LAD-7C2**

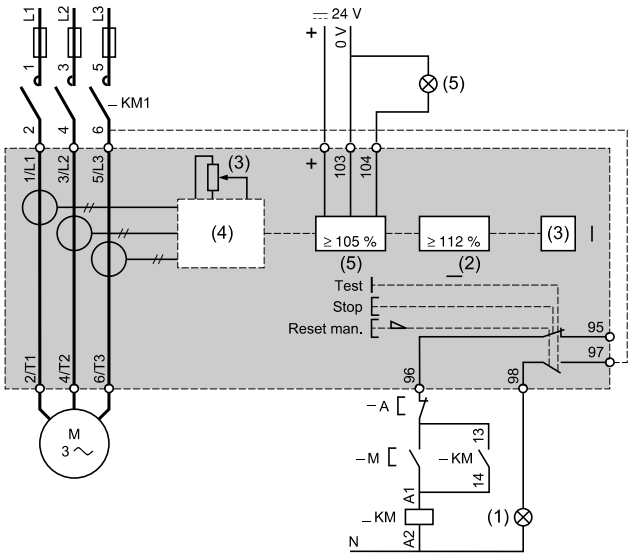



**LR9-D5●●●**




(1) Tripped
(2) Overload
(3) Setting current
(4) Specialised circuit

**LR9-D67 and LR9-D69**




(1) Tripped
(2) Overload
(3) Setting current
(4) Specialised circuit
(5) Alarm

Characteristics: pages 24516/2 to 24516/5
References: pages 24514/2 and 24514/
3 Dimensions: pages 24534/2 to 24534/4