

Thermal overload relays - For use with TeSys K contactors		
Type of product	Range	Pages
Adjustable thermal overload relays For motors TeSys LRK	From 0.16 to 16 A	B11/2
Adjustable thermal overload relays For unbalanced loads TeSys LRK	From 0.8 to 16 A	B11/3
Thermal overload relays Class 10 A - For use with TeSys Deca contactors		
TeSys Deca adjustable thermal overload relays For motors	From 0.16 to 140 A	B11/4
TeSys Deca adjustable thermal overload relays For unbalanced loads	From 0.16 to 140 A	B11/4
Thermal overload relays Class 20 - For use with TeSys Deca contactors		
TeSys Deca adjustable thermal overload relays For motors	From 0.63 to 80 A	B11/6
TeSys Deca adjustable thermal overload relays For unbalanced loads	From 0.63 to 32 A	B11/6
Electronic thermal overload relays - For use with TeSys Deca contactors		
TeSys Deca adjustable electronic overload relay, Multi-class, multi-scale	From 0.1 to 150 A	B11/10
Electronic overload relays - For use with TeSys Giga contactors		
TeSys LR9G electronic overload relays To protect against overload, phase imbalance, phase loss and ground fault	From 28 to 630 A	B11/11
Electronic over current relays - For machine protection		
Predefined or adjustable starting times, Manual reset	From 1.5 to 34 A	B11/15
Automatic, electric or manual reset	From 0.5 to 50 A	B11/15

3-pole thermal overload relays for TeSys K contactors

These overload relays are designed for the protection of motors. They are compensated and phase failure sensitive. Resetting can either be manual or automatic.

Direct mounting: under the contactor for versions with screw clamp terminals only; pre-wired terminals, see pages B11/24 and B11/26.

Separate mounting: using terminal block LA7K0064 (see below).

On the front face of the overload relay:

- selection of reset mode: Manual (marked H) or Automatic (marked A),
- red pushbutton: Trip Test function,
- blue pushbutton: Stop and manual Reset,
- yellow trip flag indicator: overload relay tripped.

Protection by magnetic circuit breaker GV2LE, see pages coordination tables chapter A6.

Class 10 A (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)

Relay setting range	Fuses to be used with selected relay			Reference
	Maximum rating			
	Type			
	aM	gG	BS88	
A	A	A	A	
0.11...0.16	0.25	0.5	–	LR2K0301
0.16...0.23	0.25	0.5	–	LR2K0302
0.23...0.36	0.5	1	–	LR2K0303
0.36...0.54	1	1.6	–	LR2K0304
0.54...0.8	1	2	–	LR2K0305
0.8...1.2	2	4	6	LR2K0306
1.2...1.8	2	6	6	LR2K0307
1.8...2.6	4	8	10	LR2K0308
2.6...3.7	4	10	16	LR2K0310
3.7...5.5	6	16	16	LR2K0312
5.5...8	8	20	20	LR2K0314
8...11.5	10	25	20	LR2K0316
10...14	16	32	25	LR2K0321
12...16	20	40	32	LR2K0322

Overload relays for unbalanced loads

Class 10 A: to order, replace the prefix LR2 by LR7 in the references selected from above (only applicable to overload relays LR2K0305 to LR2K0322).

Example: LR7K0308.



PB1237931F

LR2K0307

TeSys Protect

TeSys Protect accessory for LRK Thermal overload relays

Product references



LA7K0064

Accessory for TeSys LRK Thermal overload relay

Description	Type of connection	Reference
Terminal block for separate clip-on mounting of the overload relay on 35 mm rail	Screw clamp	LA7K0064

TeSys Protect

Deca Thermal overload relays

Product references

3-pole differential thermal overload relays for Deca contactors - Class 10A

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)	BS88 (A)			
Class 10 A ⁽¹⁾ for connection by screw clamp terminals or connectors						
0.10...0.16	0.25	2	–	D09...D38	LRD01	0.124
0.16...0.25	0.5	2	–	D09...D38	LRD02	0.124
0.25...0.40	1	2	–	D09...D38	LRD03	0.124
0.40...0.63	1	2	–	D09...D38	LRD04	0.124
0.63...1	2	4	–	D09...D38	LRD05	0.124
1...1.6	2	4	6	D09...D38	LRD06	0.124
1.6...2.5	4	6	10	D09...D38	LRD07	0.124
2.5...4	6	10	16	D09...D38	LRD08	0.124
4...6	8	16	16	D09...D38	LRD10	0.124
5.5...8	12	20	20	D09...D38	LRD12	0.124
7...10	12	20	20	D09...D38	LRD14	0.124
9...13	16	25	25	D12...D38	LRD16	0.124
12...18	20	35	32	D18...D38	LRD21	0.124
16...24	25	50	50	D25...D38	LRD22	0.124
23...32	40	63	63	D25...D38	LRD32	0.124
30...38	40	80	80	D32 and D38	LRD35	0.124
Class 10 A ⁽¹⁾ for connection by EverLink[®] BTR screw connectors ⁽²⁾						
9...13	16	25	25	D40A...D65A	LRD313	0.375
12...18	20	32	35	D40A...D65A	LRD318	0.375
17...25	25	50	50	D40A...D65A	LRD325	0.375
23...32	40	63	63	D40A...D65A	LRD332	0.375
30...40	40	80	80	D40A...D65A	LRD340	0.375
37...50	63	100	100	D40A...D65A	LRD350	0.375
48...65	63	100	100	D50A and D65A	LRD365	0.375
62...80	80	125	125	D80A	LRD380	0.375
Class 10 A ⁽¹⁾ for connection by screw clamp terminals or connectors						
17...25	25	50	50	D80 and D95	LRD3322	0.510
23...32	40	63	63	D80 and D95	LRD3353	0.510
30...40	40	100	80	D80 and D95	LRD3355	0.510
37...50	63	100	100	D80 and D95	LRD3357	0.510
48...65	63	100	100	D80 and D95	LRD3359	0.510
55...70	80	125	125	D80 and D95	LRD3361	0.510
63...80	80	125	125	D80 and D95	LRD3363	0.510
80...104	100	160	160	D80 and D95	LRD3365	0.510
80...104	125	200	160	D115 and D150	LRD4365	0.900
95...120	125	200	200	D115 and D150	LRD4367	0.900
110...140	160	250	200	D150	LRD4369	0.900
80...104	100	160	160	⁽³⁾	LRD33656	1.000
95...120	125	200	200	⁽³⁾	LRD33676	1.000
110...140	160	250	200	⁽³⁾	LRD33696	1.000

Class 10 A ⁽¹⁾ for connection by lugs

Select the appropriate overload relay with screw clamp terminals or connectors from the table above and add one of the following suffixes:

- figure 6 for relays LRD01 to LRD35 and relays LRD313 to LRD380.
- **A66** for relays LRD3322 to LRD3363.

Relays LRD43●● are suitable, as standard, for use with lug-clamps.

Thermal overload relays for use with unbalanced loads

Class 10 A ⁽¹⁾ for connection by screw clamp terminals or lugs

In the references selected above, change the prefix **LRD** (except **LRD43●●**) to **LR3D**.

Example: **LRD02** becomes **LR3D02**.

Example with **EverLink[®]** connectors: **LRD340** becomes **LR3D340**.

Example with lugs: **LRD3806** becomes **LR3D3806**.

⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_{r} : class 10 A: between 2 and 10 seconds.

⁽²⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/45).

⁽³⁾ Independent mounting of the contactor.

Please check the availability of your variant in the index page B11/16. The **SEARCH** function of your viewer can be used.



LRD01



LRD3355



LRD4365



LRD3366

Overload relays

TeSys Protect

Deca Thermal overload relays

Product references



LRD3

3-pole differential thermal overload relays for Deca contactors - Class 10 A

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Classes 10 A ⁽¹⁾ for connection by spring terminals (only for direct mounting beneath the contactor)					
1...1.6	2	4	6	D09...D38	LRD063
1.6...2.5	4	6	10	D09...D38	LRD073
2.5...4	6	10	16	D09...D38	LRD083
4...6	8	16	16	D09...D38	LRD103
5.5...8	12	20	20	D09...D38	LRD123
7...10	12	20	20	D09...D38	LRD143
9...13	16	25	25	D12...D38	LRD163
12...18	20	35	32	D18...D38	LRD213
16...24	25	50	50	D25...D38	LRD223

Class 10 A with connection by EverLink® BTR screw connectors ⁽²⁾ and control by spring terminals

23...32	40	63	63	D40A...D65A	LRD3323
37...50	63	100	100	D40A...D65A	LRD3503
48...65	63	100	100	D50A and D65A	LRD3653
62...80	80	125	125	D80A	LRD3803

Thermal overload relays for use with unbalanced loads

Classes 10 A ⁽¹⁾ for connection by BTR screw connectors ⁽²⁾ and control by spring terminals

In the references selected above, replace **LRD3** with **LR3D3**.
Example: **LRD3803** becomes **LR3D3803**.

Thermal overload relays for use on 1000 V supplies

Classes 10 A ⁽¹⁾ for connection by screw clamp terminals

For relays LRD06 to LRD35 only, for an operating voltage of 1000 V, and only for independent mounting, the reference becomes **LRD33...A66**.
Order an **LA7D3064** terminal block separately, see page B11/9.

Standard relay	Relay for 1000 V network
LRD32	LRD3353A66

- (1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_{sc} : class 10 A: between 2 and 10 seconds.
(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/45).
Please check the availability of your variant in the index page B11/16. The **SEARCH** function of your viewer can be used.



TeSys Protect

Deca Thermal overload relays

Product references

3-pole differential thermal overload relays for Deca contactors - Class 20

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.



LRD05L...LRD32L



LR2D35L

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Classes 20 ⁽¹⁾ for connection by screw clamp terminals					
0.63...1	2	4	-	D09...D38	LRD05L
1...1.6	2	4	6	D09...D38	LRD06L
1.6...2.5	4	6	10	D09...D38	LRD07L
2.5...4	6	10	16	D09...D38	LRD08L
4...6	8	16	16	D09...D38	LRD10L
5.5...8	12	20	20	D09...D38	LRD12L
7...10	12	20	20	D09...D38	LRD14L
9...13	16	25	25	D12...D38	LRD16L
12...18	20	35	32	D18...D38	LRD21L
17...24	25	50	50	D25...D38	LRD22L
23...32	40	63	63	D25...D38	LRD32L

Class 20 ⁽¹⁾ for connection by EverLink® BTR screw connectors ⁽²⁾					
9...13	20	32	35	D40A...D65A	LRD313L
12...18	25	40	40	D40A...D65A	LRD318L
17...25	32	50	50	D40A...D65A	LRD325L
23...32	40	63	63	D40A...D65A	LRD332L
30...40	50	80	80	D40A...D65A	LRD340L
37...50	63	100	100	D40A...D65A	LRD350L
48...65	80	125	125	D50A and D65A	LRD365L

Classes 20 ⁽¹⁾ for connection by screw clamp terminals					
17...25	32	50	50	D80 and D95	LR2D3522
23...32	40	63	63	D80 and D95	LR2D3553
30...40	40	100	80	D80 and D95	LR2D3555
37...50	63	100	100	D80 and D95	LR2D3557
48...65	80	125	100	D80 and D95	LR2D3559
55...70	100	125	125	D80 and D95	LR2D3561
63...80	100	160	125	D80 and D95	LR2D3563

Class 20 ⁽¹⁾ for connection by lugs

For relays LRD05L to LRD32L and relays LRD313L to LRD365L, select the appropriate overload relay with screw clamp terminals or connectors from the table above and add the suffix 6.

Example: **LRD05L** becomes **LRD05L6**.

Thermal overload relays for use with unbalanced loads

Class 20 ⁽¹⁾ for connection by screw clamp terminals or lugs

For relays LRD05L to LRD32L and relays LR2D3522 to LR2D3563, select the appropriate overload relay with screw clamp terminals or connectors from the table above and change the prefix LRD or LR2D to **LR3D**.

Example: **LRD05L** becomes **LR3D05L**.

⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :

class 20: between 6 and 20 seconds

⁽²⁾ BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/45).

Please check the availability of your variant in the index page B11/16. The **SEARCH** function of your viewer can be used.

Overload relays

TeSys Protect

Deca Thermal overload relays

Product references

3-pole differential thermal overload relays for Deca contactors - Class 20

- for use with fuses or magnetic circuit breakers ref. GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For mounting beneath contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Class 20 ⁽¹⁾ with connection by EverLink[®] BTR screw connectors ⁽²⁾ and control by spring terminals					
9...13	20	32	35	D40A...D65A	LRD313L3

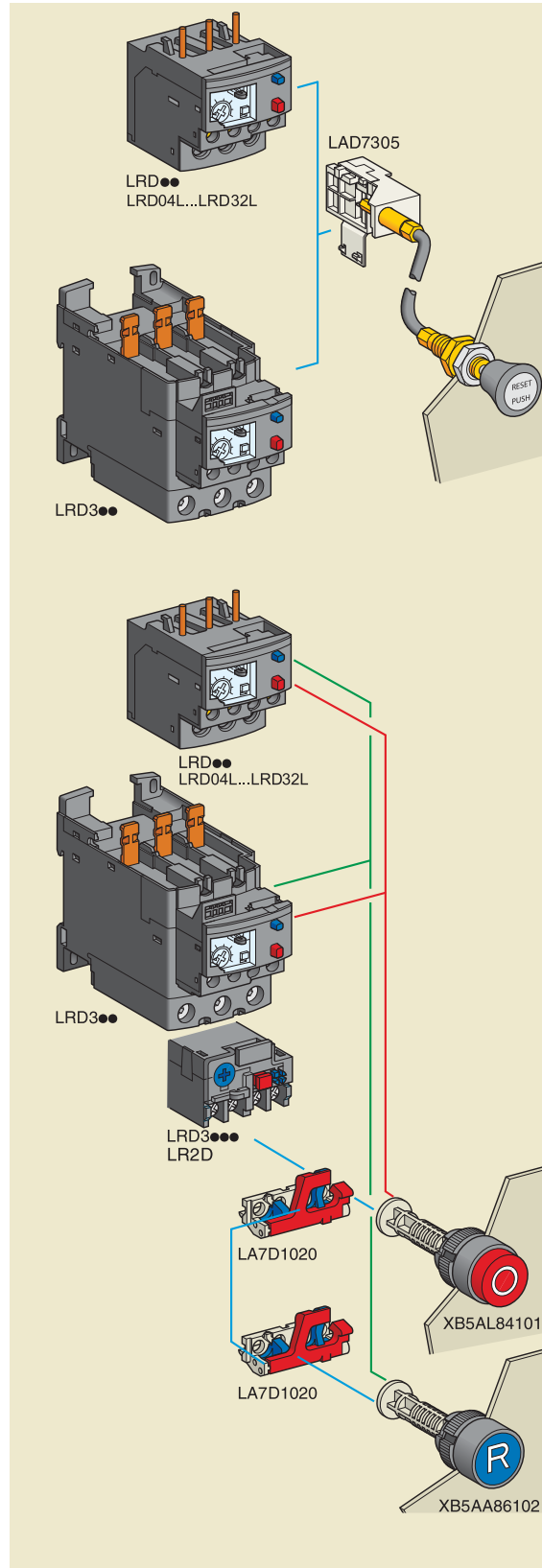
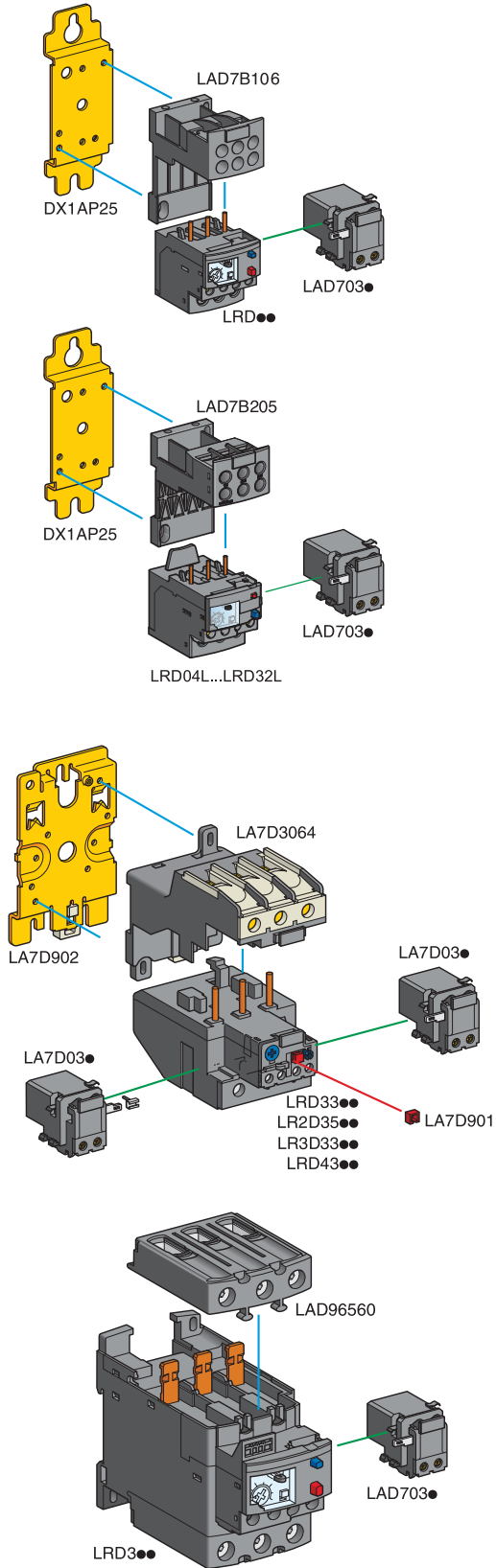
(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :

- class 10: between 4 and 10 seconds,
- class 10 A: between 2 and 10 seconds,
- class 20: between 6 and 20 seconds.

(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/45).



Overload relays

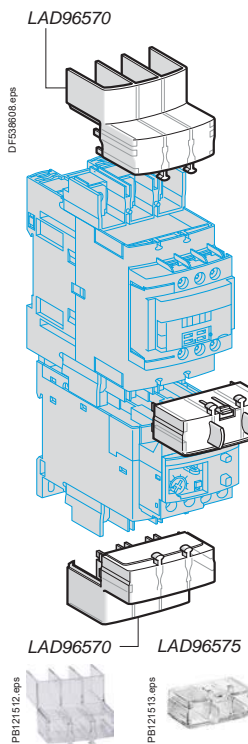
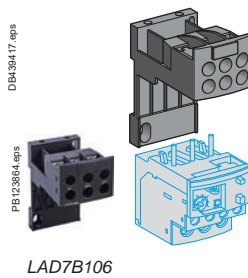
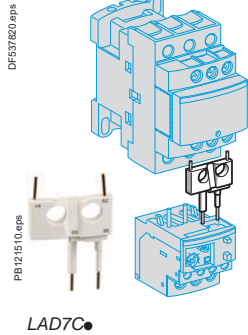


Overload relays

TeSys Protect

TeSys Deca accessories for Deca Thermal overload relays

Product references



Separate components for relays

Description	For use with	Sold in lots of	Unit reference
Pre-wiring kit allowing direct connection of the N/C contact of relay LRD01...35 or LR3D02...D35 to the contactor	LC1D09...D18 LC1D25...D38	10 10	LAD7C1 ⁽¹⁾ LAD7C2 ⁽¹⁾
Terminal block ⁽²⁾ for clip-on mounting on 35 mm rail (AM1DP200) or screw fixing; for fixing centres, see pages B11/31 to B11/33	LRD01...35 and LR3D02...D35 LRD05L...LRD32L, LR3D05L...LR3D32L LRD33●●, LR3D33●●, LR2D35●●, LR3D35●●	1 1 1	LAD7B106 LAD7B205 LA7D3064 ⁽³⁾
EverLink® terminal block for independent mounting	LRD3●●, LR3●●L and LR3D3●●	1	LAD96560
Size 4 Allen key, insulated, 1000 V	LRD3●●, LR3●●L and LR3D3●●	5	LADALLEN4
Terminal block adapter for mounting a relay beneath an LC1D115 or D150 contactor	LRD33●●, LR3D33●●, LR3D35●●	1	LA7D3058 ⁽³⁾
Mounting plates ⁽⁴⁾ for screw fixing on 110 mm centres	LRD01...35, LR3D02...D35, LRD05L...LRD32L, LR3D05L...LR3D32L LRD3●●●, LR3D3●●●, LR2D35●●	10 1	DX1AP25 LA7D902
Marker holders, snap-in 8 x 18 mm	LRD3●●	100 100	LAD90 LA7D903
Bag of 400 blank legends (self-adhesive, 7 x 16 mm)	All relays	1	LA9D91
Remote Stop or electrical reset device ⁽⁵⁾	LRD01...35, LR3D02...D35, LRD05L...32L, LR3D05L...D32L and LRD313...LRD380	1	LAD703● ⁽⁶⁾
Remote tripping or electrical reset device ⁽⁵⁾	All relays except LRD01...35, LR9D01...32, LRD05L...32L, LR3D05L...D32L, LR3D02...D35, LR9D01...32, LRD3●●, LRD3●●L and LR3D3●●	1	LA7D03● ⁽⁶⁾
Block of insulated terminals	LR9D	2	LA9F103 ⁽⁷⁾
IP 20 cover for lug type terminals for independent mounting	LRD3256...3806	1	LAD96570
IP 20 cover for lug type terminals for mounting with contactor LC1D40A6...D65A6	LRD3256...3806	1	LAD96575
Terminal block for lug type terminals for independent mounting	LRD3256...3806	1	LAD96566

Remote control

"Reset" function

Description	For use with	Sold in lots of	Unit reference
By flexible cable (length = 0.5 m)	LRD01...35, LR3D02...D35, LR3D05L...D32L and LRD313...LRD380, LRD05L...LRD32L	1	LAD7305 ⁽⁸⁾
	All relays except LRD01...35, LR3D02...D35, LRD3●●, LRD05L...32L, LR3D05L...D32L, LRD3●●L, LR3D3●●, LR9D01	1	LA7D305

"Stop" and/or "Reset" functions

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

Adapter for door mounting	LRD33●●, LR2D	1	LA7D1020
Operating heads for spring return pushbutton	Stop	All relays	1 XB5AL84101
	Reset	All relays	1 XB5AA86102

- (1) These pre-wiring kits cannot be used with reversing contactors.
- (2) Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.
- (3) To order a terminal block for connection by lugs, the reference becomes LA7D30646.
- (4) Remember to order the terminal block corresponding to the type of relay.
- (5) The time for which the coil of remote tripping or electrical resetting device LA7D03 or LAD703 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 20 s with a rest time of 300 s. Minimum pulse time: 200 ms.
- (6) Reference to be completed by adding the code indicating the 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.	---							

- (7) Only one terminal block can be mounted below LR9D.
- (8) Not compatible with 3-pole relays fitted with spring terminals.

Overload relays

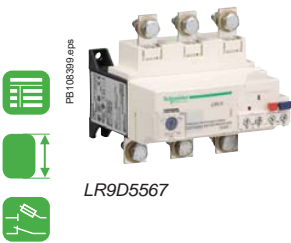
TeSys Protect

Deca Electronic thermal overload relays

Product references



LR9D0 and LR9D32



LR9D5567



LAD7B205



LAD7B205 mounted on LR9D01



LR9D67

Electronic thermal overload relays for Deca contactors

- for use with fuses or magnetic circuit breakers
- compensated relays, with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting ⁽¹⁾.

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference
	aM	gG		
A	A	A		
Classes 5.10.20.30 ⁽¹⁾ selectable for direct connection on Deca contactors or connection using connectors				
0.1...0.5			D09...D38	LR9D01
0.4...2			D09...D38	LR9D02
1.6...8			D09...D38	LR9D08
6.4...32			D09...D38	LR9D32
Classes 10 or 10 A ⁽¹⁾ for connection using bars or connectors				
60...100	100	160	D115...D150	LR9D5367
90...150	160	250	D115...D150	LR9D5369
Classes 20 ⁽¹⁾ for connection using bars or connectors				
60...100	125	160	D115...D150	LR9D5567
90...150	200	250	D115...D150	LR9D5569

Separate components for relays

Description	For use with	Sold in lots of	Unit reference
Terminal block ⁽²⁾ For clips-on mounting on 35 mm rails (AM1DP200) or screws fixing; for fixing centres, see pages B11/35 to B11/37	LR9D01, LR9D02, LR9D08, LR9D32	1	LAD7B205

Electronic overload relays for balanced or unbalanced loads

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference
	aM	gG		
A	A	A		
Classes 10 or 20 ⁽¹⁾ selectable for direct connection using bars or connectors				
60...100	100	160	D115...D150	LR9D67
90...150	160	250	D115...D150	LR9D69

⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R :

- class 5: between 0.5 and 5 seconds
- class 10: between 4 and 10 seconds
- class 10 A: between 2 and 10 seconds
- class 20: between 6 and 20 seconds
- class 30: between 9 and 30 seconds.

⁽²⁾ Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.

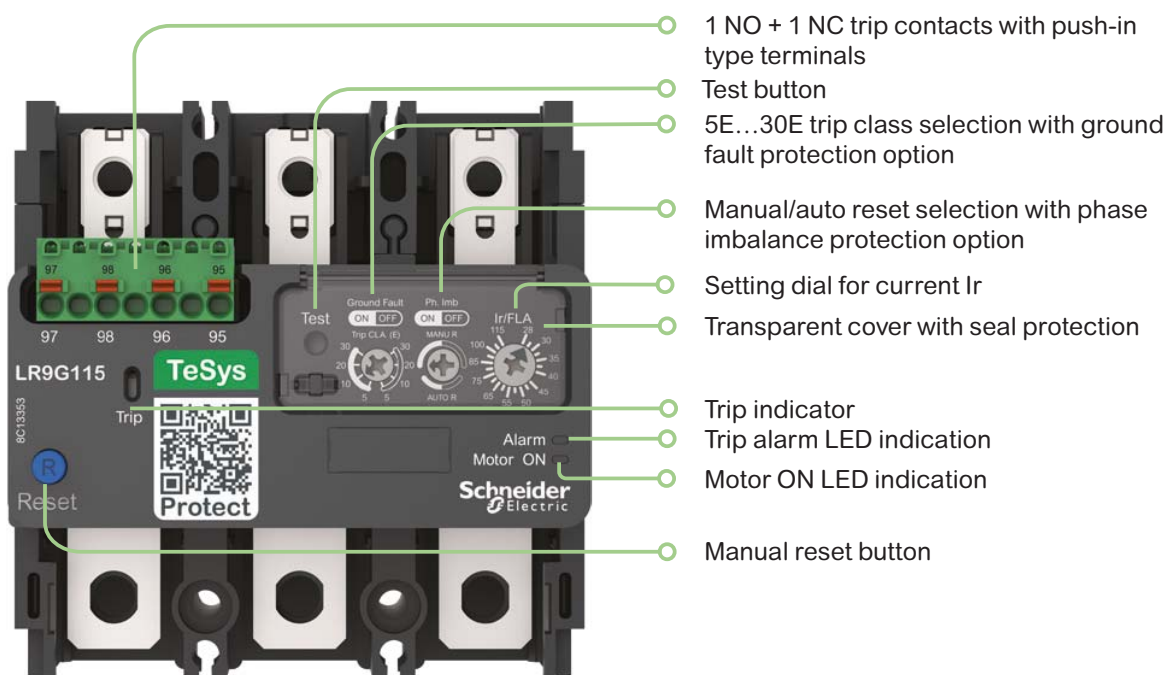
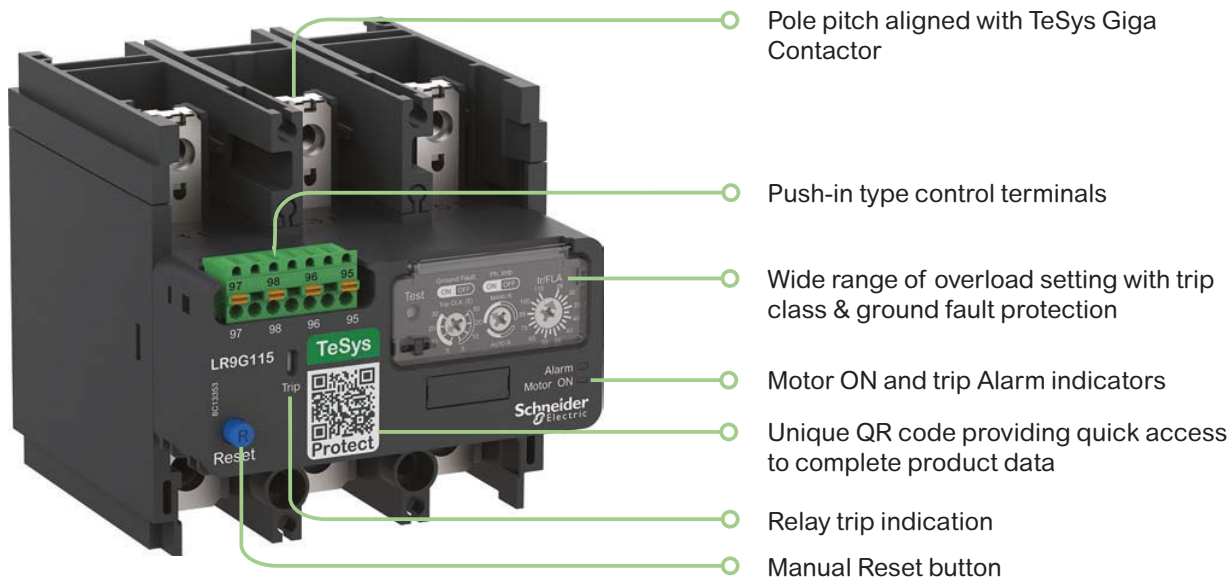
Overload relays

TeSys Protect

Giga Electronic overload relays

Introduction

> Intelligent design for greater advantages



Overload relays

TeSys Protect

Giga Electronic overload relays

Description

> Perfect selection for your motor protection

Range

- A comprehensive range of TeSys Giga Electronic overload relays in 3 sizes
- Direct mounting of relay with contactors saving in panel space and installation time



28...115 A and 57...225 A



125...500 A



160...630 A

Overload relays

- Advanced electronic monitoring with high accuracy
- Thermal compensation for ambient temperatures up to 60 °C
- Wide range of current settings, 0.25...1 I_r setting
- Direct and separately mountable to manage panel design
- Pole pitch alignment with contactors, enabling direct mounting
- Push-in terminals for quick and easy control wiring options
- 4 references covering the complete range means less inventory
- Manual and auto reset to suit your needs
- Multiple reset options: Manual, Automatic & Remote
- Protection against phase loss
- Selectable protection against imbalanced load
- Selectable protection against ground fault
- ON status and overload alarm signaling by LED
- TRIP indicator

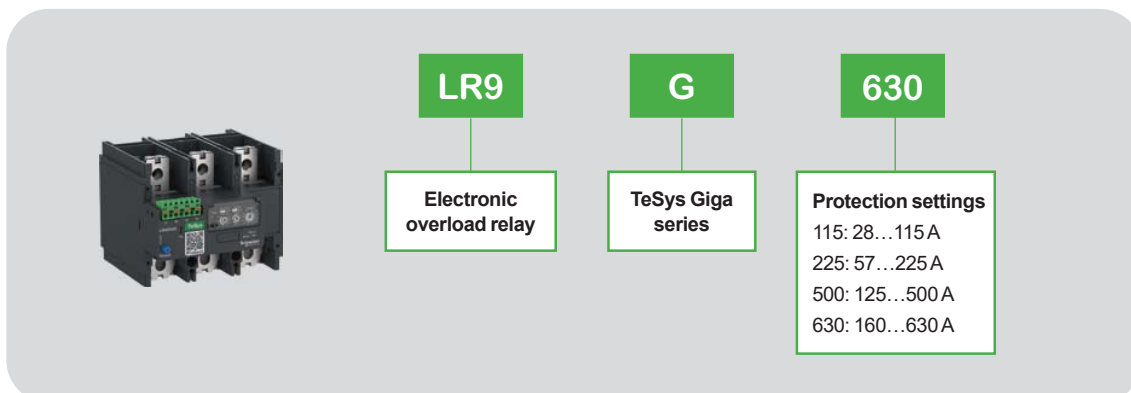
Certifications

- Multiple standards
- International certifications

Trip class

- Selectable, from class 5E to class 30E to suit different application needs

> Product references – coding principle



TeSys Protect

Giga Electronic overload relays

Product references



LR9G225



Direct mounting
with TeSys Giga Contactor



LA9G3650



LA9G82



LA9G3704

TeSys Giga Electronic overload relays

- Electronic overload relay
- Suitable for independent mounting or direct mounting with TeSys Giga contactors
- Ergonomic rotary switches for thermal and protection settings
- Trip class selection: 5E/10E/20E/30E
- Overload, phase imbalance, phase loss and ground fault protections
- Manual and auto reset options
- LED indicator for Motor ON and pre-trip alarm
- Thermal memory and compensation
- Push-in terminals for control connections

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1G	Reference
	aM /gG/aR	kA		
A	A			
Class 5E...30E				
28...115	125 aM	100	LC1G115...225	LR9G115
57...225	250 aM	100	LC1G115...225	LR9G225
125...500	630 aM	100	LC1G265...500	LR9G500
	630 gG	80		
	630 aR	25		
160...630	800 aR	100	LC1G630	LR9G630
	800 aR	80		
	800 aR	25		

Overload relay accessories

Mounting and wiring accessories

Description	Reference
Mounting base for alignment of LR9G115-225 with LC1G115-225 ⁽²⁾	LA9G3650
Mounting base for alignment of LR9G500 with LC1G265-330 ⁽²⁾	LA9G3651
Mounting base for alignment of LR9G500 with LC1G400-500 ⁽²⁾	LA9G3652
Mounting base for alignment of LR9G630 with LC1G630-800 ⁽²⁾	LA9G3653
Push-in connection adapter	LA9G82

Front protection cover

Description	Compatible with contactors	Quantity	Reference
Front protection cover ⁽³⁾	LR9G115 / LR9G225	1	LA9G3704
	LR9G500	1	LA9G3705
	LR9G630	1	LA9G3706

⁽²⁾ Used for independent mounting of Overload Relay beneath contactor to align main power pole connections.

⁽³⁾ Used to cover main power connection terminals between contactor and overload with direct mounting option.



TeSys Protect

Giga Electronic overload relays

Product references



PB121733.eps

LAD703●

Remote Reset control device

Description	Quantity	Reference
Remote electrical reset device ⁽¹⁾	1	LAD703● ⁽²⁾
Remote Reset function control by flexible cable (length = 0.5 m)	1	LAD7305

⁽¹⁾ The time for which the coil of remote electrical reset device LAD703● 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 rest time of 300 s. Minimum pulse time: 200 ms.

⁽²⁾ Reference to be completed by adding the coil voltage code.



PB121732.eps

LAD7305

Standard control circuit voltages

Volts	24	110	220/230
~ 50/60 Hz	B	F	M
Consumption, inrush and sealed: < 100 VA			
---	B	F	M
Consumption, inrush and sealed: < 100 W.			



TeSys Protect

LR97, LT47 Electronic over current relays

Product references



PB111974.eps

LR97D07●●



PB111927.eps

LT4730●●●

LR97D electronic over current relays

Relay setting range	Usable range ⁽¹⁾	For use with contactor ⁽²⁾	Relay supply voltage	Reference ⁽³⁾
A				
A				
0.3...1.5	0.3...1.3	LC1 D09...D38	~ 200...240 V	LR97D015M7
			~ 100...120 V	LR97D015F7
			~/~ 24 V	LR97D015B
			~/~ 48 V	LR97D015E
1.2...7	1.2...6	LC1 D09...D38	~ 200...240 V	LR97D07M7
			~ 100...120 V	LR97D07F7
			~/~ 24 V	LR97D07B
			~/~ 48 V	LR97D07E
5...25	5...21	LC1 D09...D38	~ 200...240 V	LR97D25M7
			~ 100...120 V	LR97D25F7
			~/~ 24 V	LR97D25B
			~/~ 48 V	LR97D25E
20...38	20...34	LC1 D25...D38	~ 200...240 V	LR97D38M7
			~ 100...120 V	LR97D38F7
			~/~ 24 V	LR97D38B
			~/~ 48 V	LR97D38E

LT47 electronic over current relays

Relay setting range	Usable range ⁽¹⁾	Relay supply voltage	Reference
A			
A			
LT47 relay with manual/electric reset			
0.5...6	0.5...5	~ 200...240 V	LT4706M7S
		~ 100...120 V	LT4706F7S
		~/~ 24 V	LT4706BS
3...30	3...25	~ 200...240 V	LT4730M7S
		~ 100...120 V	LT4730F7S
		~/~ 24 V	LT4730BS
5...60	5...50	~ 200...240 V	LT4760M7S
		~ 100...120 V	LT4760F7S
		~/~ 24 V	LT4760BS
		~/~ 48 V	LT4760ES
LT47 relay with automatic reset			
0.5...6	0.5...5	~ 200...240 V	LT4706M7A
		~/~ 24 V	LT4706BA
3...30	3...25	~ 200...240 V	LT4730M7A
		~ 100...120 V	LT4730F7A
		~/~ 24 V	LT4730BA
		~/~ 48 V	LT4730EA
5...60	5...50	~ 200...240 V	LT4760M7A
		~/~ 24 V	LT4760BA

Accessories (to be ordered separately)

Description	For use with	Sold in lots of	Unit reference
Pre-wiring kits allowing connection of the LR97D relay N/C contact directly to the contactor	LC1 D09...D18	10	LAD7C1
	LC1 D25...D38	10	LAD7C2
Terminal block for clip-on mounting on 35 mm rail (AM1 DP200)	LR97D	1	LAD7B106

⁽¹⁾ To allow adjustment of the tripping sensitivity, see adjustment method (page B11/44).

⁽²⁾ Please see chapter B8.

⁽³⁾ If a pre-wiring kit is used, it is no longer possible to electrically wire signalling of tripped status.



Overload relays


TeSys Protect

Thermal and electronic overload relays

Product references

DPER01	LR3D076	LR97D015F7	LRD123	LRD340
DPER21	LR3D07L	LR97D015M7	LRD126	LRD3406
DPER32	LR3D08	LR97D07B	LRD12L	LRD340L
DPER35	LR3D086	LR97D07E	LRD14	LRD340L6
ER1XA2M	LR3D08L	LR97D07F7	LRD143	LRD35
LA7D03B	LR3D10	LR97D07M7	LRD146	LRD350
LA7D03F	LR3D106	LR97D25B	LRD14L	LRD3503
LA7D03M	LR3D10L	LR97D25E	LRD1508	LRD3506
LA7D03Q	LR3D12	LR97D25F7	LRD1510	LRD350L
LA7D1020	LR3D126	LR97D25M7	LRD1512	LRD356
LA7D1064	LR3D12L	LR97D38B	LRD1514	LRD365
LA7D305	LR3D14	LR97D38E	LRD1516	LRD3653
LA7D3058	LR3D146	LR97D38F7	LRD1521	LRD3656
LA7D3064	LR3D14L	LR97D38M7	LRD1522	LRD365L
LA7D30646	LR3D16	LR9D5367	LRD1530	LRD365L6
LA7D903	LR3D166	LR9D5369	LRD1532	LRD380
LA7K0064	LR3D16L	LR9D5567	LRD16	LRD3803
LA9D730	LR3D21	LR9D5569	LRD163	LRD3806
LA9D91	LR3D216	LR9D67	LRD166	LRD4365
LAD703B	LR3D21L	LR9D69	LRD16L	LRD4367
LAD703E	LR3D22	LR9G115	LRD16L6	LRD4369
LAD703F	LR3D226	LR9G225	LRD21	LRD488C
LAD703M	LR3D22L	LR9G500	LRD213	LT4706BA
LAD703Q	LR3D313	LR9G630	LRD216	LT4706BS
LAD7305	LR3D318	LA9G3650	LRD21L	LT4706F7S
LAD7B105	LR3D32	LA9G3651	LRD21L6	LT4706M7A
LAD7B1056	LR3D325	LA9G3652	LRD22	LT4706M7S
LAD7B106	LR3D326	LA9G3653	LRD223	LT4730BA
LAD7B205	LR3D32L	LA9G82	LRD226	LT4730BS
LAD7C1	LR3D332	LA9G3704	LRD22L	LT4730EA
LAD7C2	LR3D3322	LA9G3705	LRD22L6	LT4730F7A
LR2D3522	LR3D3353	LA9G3706	LRD313	LT4730F7S
LR2D3553	LR3D3355	LRD01	LRD313L	LT4730M7A
LR2D3555	LR3D3363	LRD02	LRD318	LT4730M7S
LR2D3557	LR3D3365	LRD03	LRD318L	LT4760BA
LR2D3559	LR3D340	LRD04	LRD32	LT4760BS
LR2D3561	LR3D35	LRD046	LRD325	LT4760ES
LR2D3563	LR3D350	LRD04L6	LRD3256	LT4760F7S
LR2K0301	LR3D3522	LRD05	LRD325L	LT4760M7A
LR2K0302	LR3D3553	LRD056	LRD326	LT4760M7S
LR2K0303	LR3D3555	LRD05L	LRD32L	
LR2K0304	LR3D3557	LRD06	LRD32L6	
LR2K0305	LR3D3559	LRD063	LRD3312	
LR2K0306	LR3D3561	LRD066	LRD3314	
LR2K0307	LR3D3563	LRD06L	LRD332	
LR2K0308	LR3D365	LRD07	LRD3322	
LR2K0310	LR3D380	LRD073	LRD3323	
LR2K0312	LR3D3803	LRD076	LRD332L	
LR2K0314	LR3D3806	LRD07L	LRD3353	
LR2K0316	LR3D4365	LRD07L6	LRD3353A66	
LR2K0321	LR3D4367	LRD08	LRD3355	
LR2K0322	LR3D4369	LRD083	LRD3357	
LR3D02	LR7K0305	LRD086	LRD3357A66	
LR3D03	LR7K0306	LRD08L	LRD3359	
LR3D04	LR7K0308	LRD08L6	LRD3359A66	
LR3D046	LR7K0310	LRD10	LRD3361	
LR3D05	LR7K0312	LRD103	LRD3363	
LR3D056	LR7K0314	LRD106	LRD3365	
LR3D06	LR7K0316	LRD10L	LRD33656	
LR3D066	LR97D015B	LRD10L6	LRD33676	
LR3D07	LR97D015E	LRD12	LRD33696	

Overload
relays

This document is current.  Click on the product reference to get the most recent availability status (hyperlink to [se.com](https://www.se.com) product datasheet).
If your product variant is no longer available, please consult your distributor or regional sales office.

Technical Data for Designers

Contents

Motor and machine protection	B11/18 to B11/23
TeSys LRK - thermal overload protection:	
> characteristics	B11/24 to B11/25
> dimensions and schemes	B11/26
Deca - thermal overload protection:	
> characteristics	B11/27 to B11/30
> dimensions	B11/31 to B11/33
> schemes	B11/33
Deca - electronic thermal overload protection:	
> characteristics	B11/34 to B11/37
> dimensions	B11/38
> schemes	B11/39
Giga - electronic overload relays:	
> characteristics	B11/40 to B11/42
> dimensions and diagram	B11/43
LR97, LT47 - electronic over current relays:	
> characteristics	B11/44 to B11/47
> dimensions and schemes	B11/48

Introduction

Exceeding the operating limits of an electric motor will lead, eventually, not only to destruction of the motor itself but also of the mechanisms it drives.

This type of load can be the cause of electrical or mechanical faults.

■ **Electrical faults:**

- overvoltage, voltage drop, imbalance and phase failure which cause variations in the current drawn,
- short-circuits which can cause the current to reach levels capable of destroying the load.

■ **Mechanical faults:**

- locked rotor,
- brief or prolonged overload which leads to an increase in the current drawn by the motor, and therefore overheating.

The cost of these faults must take into account loss of production, loss of raw materials, repair of the production tool, poor quality of production and delays in delivery.

These faults can also have dramatic consequences on the safety of persons in direct or indirect contact with the motor.

To prevent these faults, protection measures are necessary. They make it possible to isolate the equipment to be protected from the mains supply by measuring variations in electrical values (voltage, current, etc.).

Each motor starter must therefore have:

■ **short-circuit protection**, to detect and break, as quickly as possible, abnormal currents generally greater than 10 times the rated current (I_n).

■ **overload protection**, to detect increases in current up to about $10 I_n$ and switch off the starter before overheating of the motor and conductors damages the insulation.

This protection is provided by specific devices such as fuses, circuit breakers and thermal overload relays, or by more integrated devices offering several types of protection.

Causes, effects and consequences of various faults

There are two types of fault:

- Internal faults within the motor
- External faults: these are located outside the electric motor but their consequences can lead to damage inside the motor.

Faults	Causes	Effects	Consequences on the motor and on the machine
Short-circuit	Contact between several phases, or between one phase and neutral or between several turns of the same phase.	<ul style="list-style-type: none"> ■ Current peak ■ Electrodynamical forces on the conductors 	Destruction of windings
Overvoltage	<ul style="list-style-type: none"> ■ Lightning ■ Electrostatic discharge ■ Operation 	Dielectric breakdown in the windings	Destruction of the windings due to loss of insulation
Phase imbalance and phase failure	<ul style="list-style-type: none"> ■ Opening of a phase ■ Single-phase load upstream of the motor ■ Short-circuit between the turns of the same winding 	<ul style="list-style-type: none"> ■ Reduction of usable torque, efficiency and speed ■ Increase in losses ■ Starting impossible if phase failure 	Overheating ⁽¹⁾
High starting frequency	<ul style="list-style-type: none"> ■ Failure of the automation system ■ Too many manual control operations ■ Numerous fault trips 	High stator and rotor temperature rise due to the frequent start current	Overheating ⁽¹⁾ Consequences on the process
Voltage variations	<ul style="list-style-type: none"> ■ Instability of the mains voltage ■ Connection of heavy loads 	<ul style="list-style-type: none"> ■ Reduction of usable torque ■ Increase in losses 	Overheating ⁽¹⁾
Harmonics	<ul style="list-style-type: none"> ■ Pollution of the mains supply by variable speed drives, inverters, etc... 	<ul style="list-style-type: none"> ■ Reduction of usable torque ■ Increase in losses 	Overheating ⁽¹⁾
Long starting time	<ul style="list-style-type: none"> ■ Resistive torque too high (load too heavy) ■ Voltage drop 	Increase in starting time	Overheating ⁽¹⁾
Jamming	<ul style="list-style-type: none"> ■ Mechanical problem (crusher) ■ Seizures 	Overcurrent	Overheating ⁽¹⁾ Consequences on the process
No-load running	<ul style="list-style-type: none"> ■ Pump running empty ■ Mechanical break in drive to the load 	Drop in current drawn	Consequences on the process
Frequency fluctuations	<ul style="list-style-type: none"> ■ Overload of a supply powered by limited independent sources ■ Faulty alternator speed regulator 	<ul style="list-style-type: none"> ■ Increase in losses ■ Interferes with synchronous devices (clock, recorder, ...) 	–
Overload	<ul style="list-style-type: none"> ■ Increase in resistive torque ■ Voltage drop ■ Drop in power factor 	Increase in current consumption	Overheating ⁽¹⁾
Loss of machine excitation	<ul style="list-style-type: none"> ■ Significant drop in excitation current ■ Break in rotor winding 	<ul style="list-style-type: none"> ■ Increase in active power ■ Drop in power factor 	Significant overheating of rotor and cage
Phase-Earth fault	<ul style="list-style-type: none"> ■ Accidental Phase-Earth contacts ■ Accidental Phase-machine casing contacts (casing connected to earth) 	<ul style="list-style-type: none"> ■ Overvoltage developed in the mains supply ■ Rise in earth potential (safety of persons) 	Consequences on safety of persons

⁽¹⁾ Then, in the longer or shorter term, depending on the seriousness of the fault and/or its frequency, short-circuit and destruction of the windings.

Protection functions

Short-circuit protection

General

A short-circuit results in a very rapid rise in current which can reach several hundred times the value of the operational current. The consequences of a short-circuit are dangerous to both equipment and persons. It is therefore imperative to use protection devices to detect the fault and very quickly break the circuit.

Two types of protection are commonly used:

- fuses (cutout) which break the circuit by melting, which then requires their replacement,
 - magnetic trip circuit breakers, often more simply called "magnetic circuit breakers", which only require re-setting to put them back into service.
- Short-circuit protection can also be built-into multifunction devices such as motor circuit breakers and contactor-breakers.

The main characteristics of short-circuit protection devices are:

- their breaking capacity: this is the highest prospective short-circuit current value that a protection device can break at a given voltage.
- their making capacity: this is the highest current value that the protection device can make at its rated voltage in specified conditions.

The making capacity is equal to k times the breaking capacity.

PB111630.eps



Fuse carrier
Ref. LS1D32

PB114116.eps



Switch disconnectors
Ref. GS2N3

Fuses (cutouts)

Fuses provide individual phase protection (single-pole), with a high breaking capacity in a compact size:

- mounted either in fuse carriers,
- or in isolators, replacing the original links or shunt bars.

For motor protection, aM type fuses are used. Their design characteristics allow them to conduct the high magnetising currents that occur when motors are switched on. They are therefore unsuitable for overload protection (unlike gG type fuses). This is why an overload relay must be included in the motor power supply circuit.

PB121671.eps



Deca Magnetic circuit
breaker
Ref. GV2L

PB114909.eps



Deca Magnetic circuit
breaker
Ref. GV4LE

Magnetic circuit breakers

These circuit breakers protect installations against short-circuits, within the limit of their breaking capacity.

Magnetic circuit breakers provide omnipole breaking as standard.

For relatively low short-circuit currents, the operation of a circuit breaker is faster than that of fuses.

This protection conforms to standard IEC 60947-2.

The thermal and electrodynamic effects are also limited, therefore ensuring better protection of cables and equipment.

TeSys Protect Overload relays

Motor and machine protection



FB121684.tif

Deca Thermal overload relay
Ref. LRD08



FB121503.eps

Current measurement relay
Ref. RM4JA

Protection functions

Overload protection

General

An overload condition is the most frequently encountered fault. The symptoms are a rise in the current drawn by the motor and thermal effects. A rapid return to normal operating conditions is important.

The actual operating conditions (ambient temperature, operating altitude and type of standard duty) are essential to determine the operating values of the motor (power, current) and to be able to select effective overload protection. These operational values are given by the motor manufacturer.

According to the level required, protection can be provided by:

- overload relays and thermal overload relays (bi-metallic or electronic type) which protect motors in the event of:
 - overload, by monitoring the current drawn by each phase,
 - phase imbalance or failure, by their differential mechanism.
- relays with PTC thermistor probes (Positive Temperature Coefficient).
- overtorque relays,
- multifunction relays.

Overload relays

These relays protect motors against overload. They must allow the temporary overload that occurs on starting and must only trip if the starting time is abnormally long.

The overload relay will be selected according to the length of the starting time (tripping class) and the motor rating.

These relays have a thermal memory (except for certain electronic overload relays, indicated by their manufacturers) and can be connected:

- either in series with the load,
- or to current transformers placed in series with the load.

Bi-metallic thermal overload relays

Combined with a contactor, these relays protect the line and the equipment against small and prolonged overloads. They must be protected against strong overcurrent by a circuit breaker or fuses.

These relays may be used on an a.c. or d.c. system and are generally:

- 3-pole,
- compensated, i.e. insensitive to ambient temperature variations,
- with manual or automatic reset,
- graduated with a "motor FLC" scale: allowing direct setting to the full load current as shown on the motor rating plate.

They can also be sensitive to phase failure: this is known as 'differential'. This function conforms to standards IEC 60947-4-1 and 60947-6-2.

This type of relay is extremely reliable and is a relatively low cost device.

Electronic thermal overload relays

Electronic thermal overload relays have the advantage of electronics which allow a more complex thermal image of the motor to be created.

They can be combined with products having complementary functions, such as:

- temperature sensing via PTC probes,
- protection against jamming and overtorque,
- protection against phase reversal,
- earth fault protection,
- protection against no-load running,
- alarm function.

TeSys Protect

Overload relays

Motor and machine protection



PS111974_0ps

Instantaneous electronic overcurrent relays
Ref. LR97D07



PS121504_0ps

T controller
Ref. LTMR08MBD

Protection functions *(continued)*

Overload protection *(continued)*

Relays for use with PTC thermistor probes

With direct sensing of the stator windings, these relays can be used to protect motors against:

- overload,
- a rise in ambient temperature,
- a ventilation circuit fault,
- a high starting frequency,
- mechanical shocks, etc.

Overload (or overtorque) relays

These relays protect the drive line in the event of a locked rotor, seizure or mechanical shocks. This is an additional protection.

Unlike thermal overload relays, these relays do not have a thermal memory. They have definite time characteristics (adjustable current threshold and time delay).

The overtorque relay can be used as overload protection for motors with long starting times or very frequent starting (for example, lifting hoists).

Multifunction relays

■ Overcurrent relays are limited when it is necessary to take into account problems associated with voltage, temperature or special applications. New production or maintenance management needs have prompted manufacturers to offer products which provide not only adaptable protection, but also complete management of the motor and its load.

They incorporate:

- current and voltage sensors (T controllers),
- hybrid analog and digital electronic technology,
- the use of communication buses for data exchange and control,
- powerful motor modelling algorithms,
- integrated application programs whose parameters can be set.

These products make it possible to reduce installation and operating costs by reducing maintenance and downtime.

T controllers:

The multifunction relay is separate from the power line and incorporates inputs and outputs. It can be used in conjunction with a contactor up to 810 A.

Protection relay selection table

Relay type	Motor protection		Machine protection	Motor and machine protection	
	Thermal overload relay Ref. LR2K, LRD, LRD3, LR9D ⁽¹⁾ , LR9G	Relays for use with PTC probes Ref. LT3S	Overtorque relays Ref. LR97D, LT47	Ultra controller Ref. LUTM	T controller Ref. LTMR
Causes of overheating	⁽²⁾		⁽²⁾	⁽²⁾	⁽³⁾
Slight overload	■	■	■	■	■
Locked rotor	■	■	■	■	■
No-load running	■	■	■	■	■
Supply phase failure	■	■	LR97D	■	■
Ventilation fault	■	■	■	■	With probes
Abnormal temperature rise	■	■	■	■	With probes
Shaft bearing seizure	■	■	■	■	With probes
Insulation fault	■	■	■	■	■
Protracted starting time	■	■	■	■	■
Severe duty	■	■	■	■	With probes
Voltage variation	■	■	■	■	■
Frequency fluctuations	■	■	■	■	■
Loss of machine excitation	■	■	■	■	■

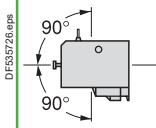
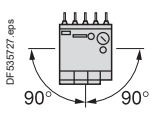
- Ideally suited
- Possible solution
- Not suitable (no protection)

⁽¹⁾ For motor circuit breaker ref. GV2ME.
⁽²⁾ Protection based on current.
⁽³⁾ Protection based on current and voltage.

TeSys Protect

LRK Thermal overload relay

Characteristics

Environment						
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.				
Product certifications		UL, CSA, CCC, EAC, CB, UKCA certification				
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact			
Ambient air temperature around the device	Storage	°C	-40...+70			
	For normal operation (IEC 60947)	°C	-20...+55 (without derating)			
	Operating limit	°C	-30...+60 (with derating) ⁽¹⁾			
Maximum operating altitude	Without derating	m	2000			
Operating positions		 <p>Vertical axis</p> <p>Without derating</p>	 <p>Horizontal axis</p> <p>With derating ⁽¹⁾</p>			
Flame resistance	Conforming to 60695-2-11	°C	850			
Shock resistance, hot state (1/2 sine wave, 11 ms)	Conforming to IEC 60068-2-27, N/C contact		10 gn			
	Conforming to IEC 60068-2-27, N/O contact		10 gn			
Vibration resistance, hot state 5 to 300 Hz	Conforming to IEC 60068-2-6, N/C contact		2 gn			
	Conforming to IEC 60068-2-6, N/O contact		2 gn			
Cabling Screw clamp terminals			Minimum	Maximum	Maximum to IEC 60947	
		Solid cable	mm ²	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5
		Flexible cable without cable end	mm ²	1 x 0.75	2 x 4	2 x 2.5
		Flexible cable with cable end	mm ²	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5
Tightening torque	Philips head n° 2 - Ø6	N.m	0.8			
Mounting			Directly under the contactor or reversing contactor			
Connections			<p>Made automatically when mounted under the contactor, as follows:</p> <ul style="list-style-type: none"> ■ contactor terminal A2 connected to overload relay terminal 96 on all products, ■ contactor terminal 14 connected to overload relay terminal 95 on products with 3 P + N/O. <p>When using 3 P + N/C, or 4 P contactors, or the N/O auxiliary contact marked 13-14, at a voltage other than the coil voltage, break off the link marked 14.</p>			

Auxiliary contact characteristics			
Number of contacts		1 N/C + 1 N/O	
Conventional thermal current	A	6	
Short-circuit protection	Conforming to IEC 60947 gG fuse or circuit breaker GB2CB●●	A	6 max.
Maximum power of the controlled contactor coils (sealed) (Occasional operating cycles of contact 95-96)	a.c.	V	24 48 110 220/230 400 415/440 600/690
		VA	100 200 400 600 600 600 600
	d.c.	V	24 48 110 220 250 – –
		W	100 100 50 45 35 – –
Maximum operational voltage	a.c., category AC-15	V	690
	d.c., category DC-13	V	250

(1) Please consult your Regional Sales Office.
(2) Very low safety voltage.



Overload relays

TeSys Protect

LRK Thermal overload relays

Characteristics

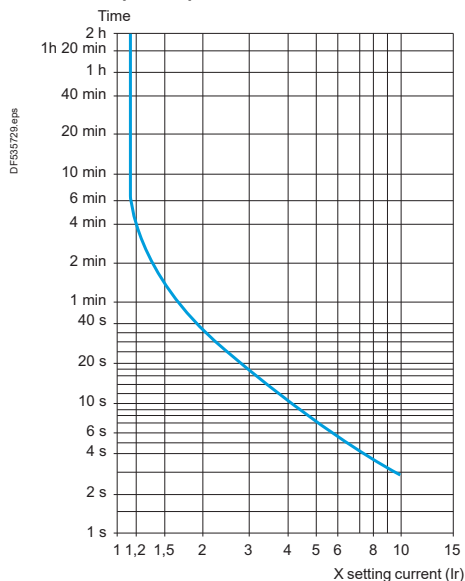
Electrical characteristics of the power circuit			
Rated operational voltage (Ue)	Up to	V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	V	690
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600
Rated impulse withstand voltage (Uimp)		kV	6
Frequency limits of the operational current		Hz	Up to 400
Power dissipated per pole		W	2

Operating characteristics			
Tripping threshold	Conforming to IEC 60947-4-1	A	1.14 ± 0.06 I _r
Sensitivity to phase failure	Conforming to IEC 60947		Yes
Reset	Manual or automatic		Selected by means of a lockable and sealable switch on the front of the relay
Signalling	On front of relay		Trip indicator
Reset-Stop function			Pressing the Reset-Stop button: - actuates the N/C contact - has no effect on the N/O contact
Test function	By pushbutton		Pressing the Test button enables: - checking of the control circuit wiring - simulation of overload tripping (actuation of both N/C and N/O contacts, and of the trip indicator)
Short-circuit protection and coordination			See pages A5/12 and A5/30

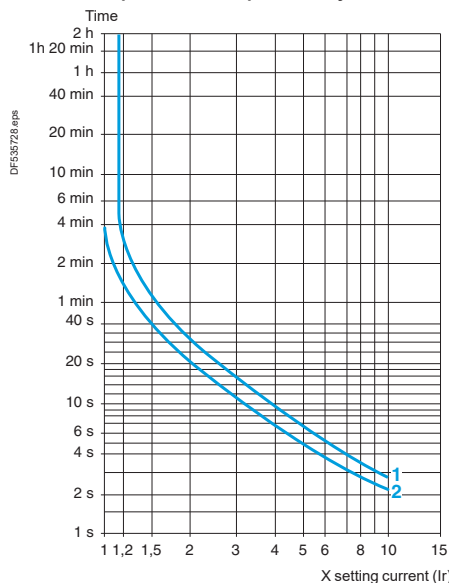
Tripping curves

Average operating time related to multiples of the current setting (Class 10 A)

Balanced 3-phase operation, from cold state



Balanced operation with 2 phases only, from cold state



Setting: at lower end of scale

Setting: at upper end of scale

Ref.



Overload relays

TeSys Protect

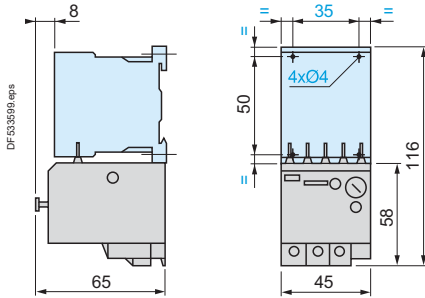
LRK Thermal overload relays

Dimensions, mounting, schemes

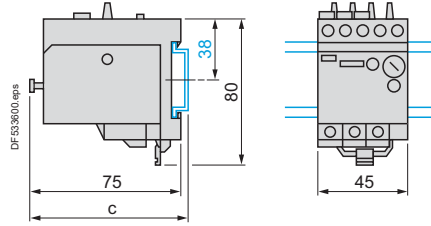
Dimensions, mounting

LR2K

Direct mounting beneath the contactor



Separate mounting with terminal block LA7K0064 on 35 mm rail (AM1DP200 or AM1DE200)

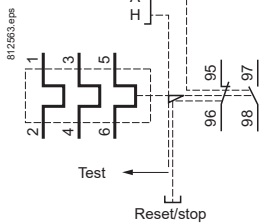


AM1	c
DP200	78.5
DE200	86

Schemes

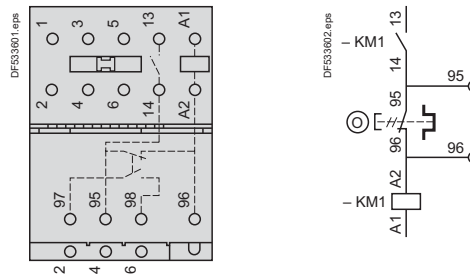
LR2K

Ref.

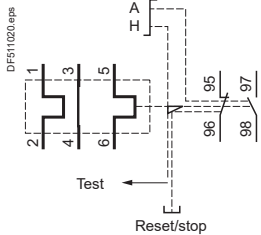


LR2K + LC0K

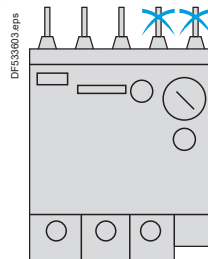
Pre-wiring scheme



LR7K



Note: If pre-wiring is not required, break off the 2 links located on the thermal overload relay.



Overload relays

TeSys Protect

Deca Thermal overload relays

Characteristics



Ref. LRD08



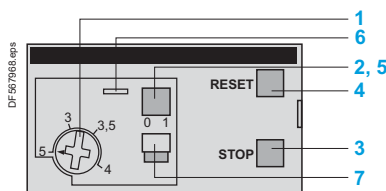
Ref. LRD05L...32L



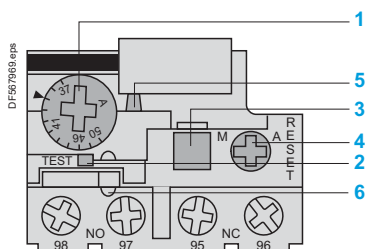
Ref. LRD365



Ref. LRD33●●



Ref. LRD01...35, LRD05L...32L
LRD313...LRD365



Ref. LRD3361...4369, LR2 D3561...3563

Introduction

3-pole Deca thermal overload relays are designed to protect a.c. circuits and motors against:

- overloads
- phase failure
- excessively long starting times
- prolonged stalled rotor condition.

Power connection

Product references LRD01 to LRD35

LRD01 to 35 relays are designed for connection by screw clamp terminals. They can be supplied for connection by spring terminals or by lugs ⁽¹⁾.

Product references LRD04 to LRD32L

These relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs ⁽¹⁾.

Product references LRD313 to LRD380

These relays are for connection by BTR screw connectors (hexagon socket head). The screws are tightened by means of a size 4, insulated Allen key.

This type of connection uses the **EverLink**® system with creep compensation ⁽²⁾ (Schneider Electric patent).

This technique makes it possible to achieve accurate and durable tightening torque.

These relays are also available for connection by lugs ⁽¹⁾.

Product references LRD3361 to 4369, LR2D3561 to D3563

Product references LRD3361 to 4369 and LR2D3561 to D3563 relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs ⁽¹⁾.

Description

Deca 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.

- 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.

Product references LRD01 to 35, LRD05L to 32L and LRD313 to LRD380 relays are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

(1) Connection by lugs meets the requirements of certain Asian markets and is suitable for applications subject to strong vibration, such as railway transport.
(2) Creep: normal crushing phenomenon of copper conductors, that is accentuated over time.



Overload relays

TeSys Protect

Deca Thermal overload relays

Characteristics

Environment			
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1 UL 60947-5-1, CSA C22.2 n° 60947-5-1, EN 50495 ⁽¹⁾ , GB/T 14048.4, GB/T 14048.5
Product certifications			UL ⁽²⁾ , CSA ⁽²⁾ , UKCA IEC, CCC ⁽³⁾ , EAC, ATEX ⁽¹⁾ ABS, BV ⁽⁴⁾ , DNV-GL ⁽⁵⁾ , LRoS ⁽⁶⁾ , RINA ⁽⁷⁾ , RMRS ⁽⁸⁾ , EU RO Mutual recognition ⁽⁹⁾
Degree of protection (front face)	Conforming to IEC 60529		Protection against direct finger contact IP20
Climatic withstand			Conforming to IACS E10
Ambient air temperature around the device	Storage	°C	-60...+70
	Normal operation, without derating (IEC 60947-4-1)	°C	-20...+60
	Minimum /maximum operating temperatures (with derating)	°C	-20...+70
Operating positions without derating	In relation to normal vertical mounting plane		Any position. When mounting on a vertical rail, use a stop.
Flame resistance	Conforming to 60695-2-11	°C	850
Shock resistance	Permissible acceleration conforming to IEC 60068-2-27		15 gn - 11 ms
Vibration resistance ⁽¹⁰⁾	Permissible acceleration conforming to IEC 60068-2-6		6 gn except LRD05L...LRD32L: 3 gn
Dielectric strength at 50 Hz	Conforming to IEC 60947-1	kV	1.89 (product Ui 690 V), 2.2 (product Ui 1000 V)
Impulse withstand voltage	Conforming to IEC 60947-1	kV	6

Electrical characteristics of power circuit										
Relay type		LRD01 ...16, LR3D02 ...16	LRD05L ...32L	LRD21 ...35, LR3D21 ...35	LRD313 ...365 LR3D 313 ...38	LRD313L ...365L	LRD3322 ...33696 LR3D3322 ... 33696	LR2D 3522 ... 3563	LRD 4365 ... 4369	
Tripping class	Conforming to UL 60947-4-1, IEC 60947-4-1	10 A	20	10 A	10 A	20	10 A	20	10 A	
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V						690		1000 ⁽¹¹⁾
	Conforming to UL, CSA	V						600		600 except LRD 4369
Rated impulse withstand voltage (Uimp)		kV								
		6								
Rated operational voltage (Ue)		V								
		690								
Frequency limits	Of the operating current	Hz								
		0...400								
Setting range	Depending on model	A	0.1...13	0.63...32	12...38	9...80	9...65	17...140	17...80	80...140

Auxiliary contact characteristics								
Conventional thermal current		A	5					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	120	240	380	480	500	600
	d.c. supply, DC-13	A	3	1.5	0.95	0.75	0.72	0.12
Protection against short-circuits	By gG, BS fuses. Maximum rating or by GB2	V	125	250	440			
		A	0.22	0.1	0.06			
		A	4					

(1) For relays LRD01 to LRD380, LRD3322 to LRD3365, LRD04L to LRD32L, LRD4365 to LRD4369, LRD33656 to LRD33696.

(2) Except for relays LRD4369.

(3) CCC: Except for LRD/LR3D04L to LRD/LR3D32L, LR2D3522 to LR2D3563.

(4) BV: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D313 to LRD/LR3D380, LR2D3522 to LR2D3563.

(5) DNV-GL: except for LRD04L to LRD32L.

(6) LRoS: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D380.

(7) RINA: for LRD/LR3D01 to LRD/LR3D35.

(8) RMRS: for LRD/LR3D313 to LRD/LR3D380.

(9) EU RO Mutual Recognition: for LRD/LR3D313 to LRD/LR3D380, LRD313L to LRD365L.

(10) In case of vibration above 3gn on Deca Green contactor directly mounted with LRD, it is recommended to mount the devices separately by screws on metal plate.

(11) 750 V for LRD33656, LRD33676, LRD33696.

Ref.

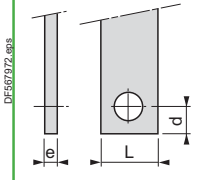
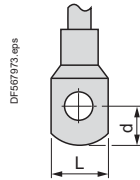



Overload relays

TeSys Protect

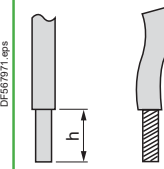
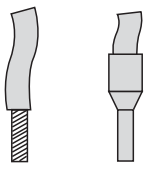

Deca Thermal overload relays

Characteristics

Power circuit connection characteristics											
Relay type			LRD01 ...16, LR3D01 ...16	LRD04L ...21L	LRD22L ...32L	LRD21 ...35, LR3D21 ...35	LRD 313 ...365 LR3D 313 ...380	LRD 313L ...365L	LRD 3322 ...33696 LR3D 3322 ... 33696	LRD2D 35223563	LRD 4365 ...4369
Connection to screw clamp terminals											
Flexible cable without cable end	1 conductor	mm ²	1.5...10			1.5...10	1...35	1...35	4...35		4...50
Flexible cable with cable end	1 conductor	mm ²	1...4		1...6	1...6 except LRD21: 1...4	1...35	1...35	4...35		4...35
Solid cable without cable end	1 conductor	mm ²	1...6		1.5...10	1.5/10 except LRD21: 1/6	1...35	1...35	4...35		4...50
Tightening torque		N.m	1.7		2.5	2.5	1...25: 5 35: 8	1...25: 5 35: 8	9	9	9
Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L)											
Flexible cable without cable end	1 conductor	mm ²	1.5...4	-	-	1.5...4	-	-	-	-	-
Flexible cable with cable end	1 conductor	mm ²	1.5...4	-	-	1.5...4	-	-	-	-	-
Connection by bars or lugs											
											
Relay type			LRD016...166 LRD04L6 ... 16L6	LRD216...356 LRD21L6 ... 32L6	LRD3136 ... 3806	LRD313L6 ... 365L6	LRD3322A66 ... 3365A66				
Pitch	Without spreaders	mm	14.5	17.5	17.5	17.5	21.5				
Bars or cables with lugs	e	mm	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6				
	L	mm	≤ 8	≤ 8	≤ 13.5	≤ 13.5	≤ 16				
	L'	mm	≤ 9.5	≤ 9.5	≤ 16.5	≤ 16.5	≤ 16				
	d		≤ 7	≤ 7	≤ 10	≤ 10	≤ 12				
Screws			M4	M4	M6	M6	M10				
Tightening torque		N.m	1.7	2.5	6	6	11.3				

Control circuit connection characteristics

Connection to screw clamp terminals or spring terminals

Bare cables											
											
Relay type			LRD01 ...16, LR3D01 ...16	LRD04L ...21L	LRD22L ...32L	LRD21 ...35, LR3D21 ...35	LRD 313 ...365 LR3D 313 ...380	LRD 313L ...365L	LRD3322 ...33696 LR3D 3322 ... 33696	LRD2D 3522 ... 3563	LRD 4365 ...4369
Connection to screw clamp terminals ⁽¹⁾	Solid cable without cable end	mm ²	2 x 1...2.5								
	Flexible cable without cable end	mm ²	2 x 1...2.5								
	Flexible cable with cable end	mm ²	2 x 1...2.5								
Tightening torque		N.m	1.7								
Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L)	Solid cable	mm ²	1...2.5	-	-	1...2.5	-	-	-	-	-
	Flexible cable without cable end	mm ²	1...2.5	-	-	1...2.5	-	-	-	-	-

(1) For relays **LRD313 to 380**: BTR hexagon socket head screws, EverLink® system.
In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B11/21).

TeSys Protect

Deca Thermal overload relays

Characteristics

Operating characteristics

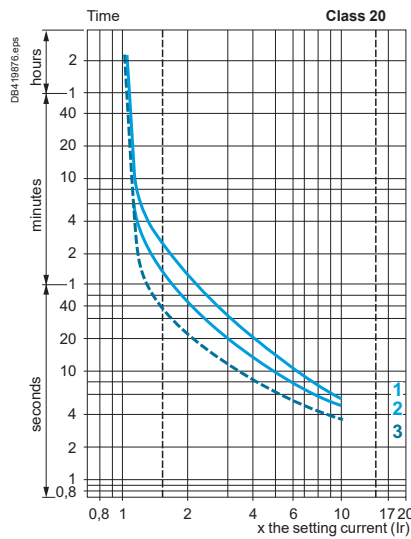
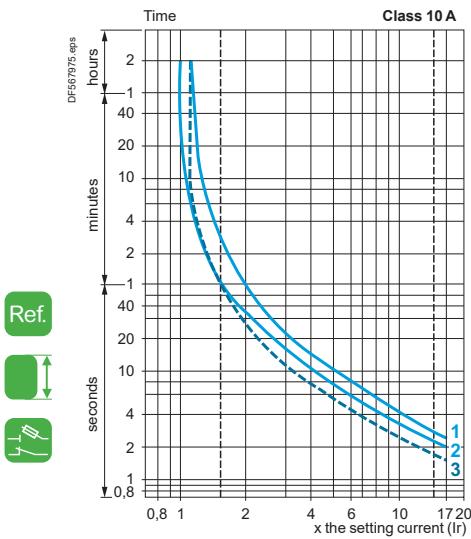
Relay type	LRD01 ...16, LR3D02 ...16	LRD04L... LRD32L	LRD21 ...35, LR3D21 ...35	LRD313 ...365 LR3D 313 ...380	LRD313L ...365L	LRD3322 ...33696 LR3D3322 ... 33696	LR2D 3522 ... 3563	LRD 4365 ...4369
Temperature compensation	°C		-20...+60					
Tripping threshold	Conforming to IEC 60947-4-1		A		1.14 ±0.06 I _r			
Sensitivity to phase failure	Tripping current 130 % of I _r on two phases, the third phase at 0.							

Tripping curves

Average operating time related to multiples of the setting current

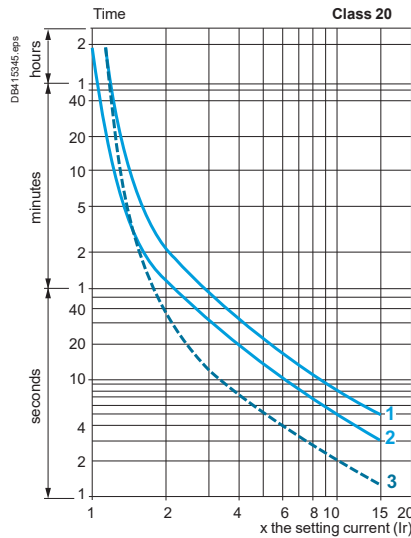
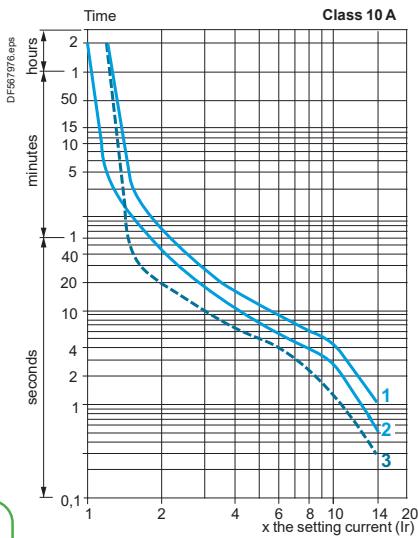
LRD01 to LRD35, LR2D and LRD3322 to LRD4369

LRD04L to LRD32L and LR2D3522 to LR2D3563



LRD313 to LRD380

LRD313L to LRD365L



Overload relays

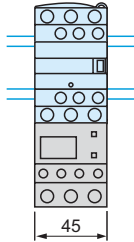
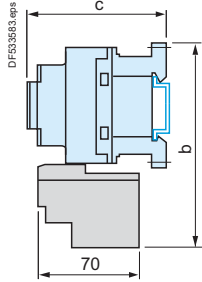
- 1 Balanced operation, 3-phase, without prior current flow (cold state).
- 2 2-phase operation, without prior current flow (cold state).
- 3 Balanced operation, 3-phase, after a long period at the set current (hot state).

TeSys Protect

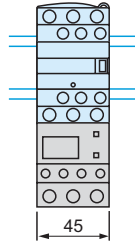
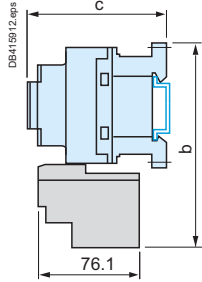
Deca Thermal overload relays

Dimensions, mounting

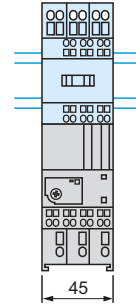
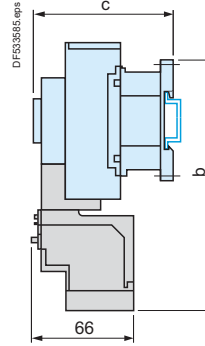
LRD01...35 ⁽¹⁾
Direct mounting beneath contactors with screw clamp connections



LRD04...32L ⁽¹⁾
Direct mounting beneath contactors with screw clamp connections



LRD063...223
Direct mounting beneath contactors with spring terminal connections

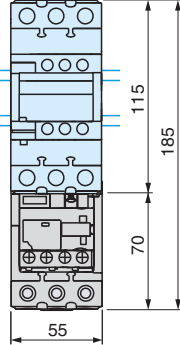
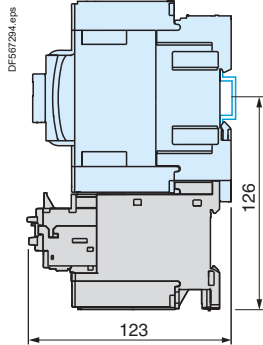


LC1	D09...D18	D25...D38
b	123	137
c	See pages B11/28 and B8/100	

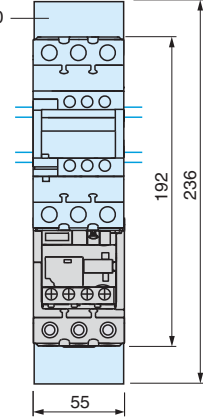
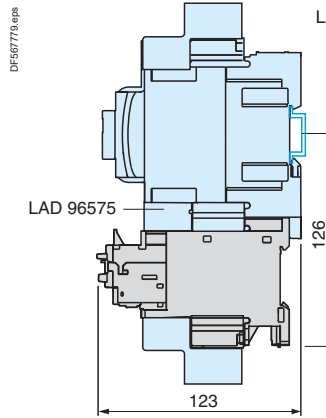
LC1	D09...D18	D25...D38
b	123	137
c	See pages B11/28 and B8/100	

LC1	D093...D253
b	168
c	See pages B11/28 and B8/100

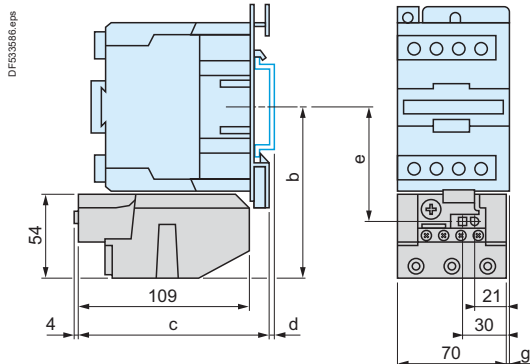
LRD313...380 ⁽¹⁾
Direct mounting beneath contactors LC1D40A...D80A with screw clamp connections or EverLink® connectors



LRD3256...3806 ⁽¹⁾
Direct mounting beneath contactors LC1D40A6...D80A6 with lugs



LRD33...
Direct mounting beneath contactors LC1D80...D95



AM1	DL201	DL200
d	7	17

	Control circuit AC				
	b	c	e	g (tri)	g (tetra)
LC1D80	115.5	124	76.9	9.5	22
LC1D95	115.5	124	76.9	9.5	-
Control circuit DC					
LC1D80, D95	115.5	179.4	76.9	9.5	22

⁽¹⁾ In case of vibration above 3 gn on Deca Green contactor directly mounted with LRD, it is recommended to mount the devices separately by screws on metal plate.



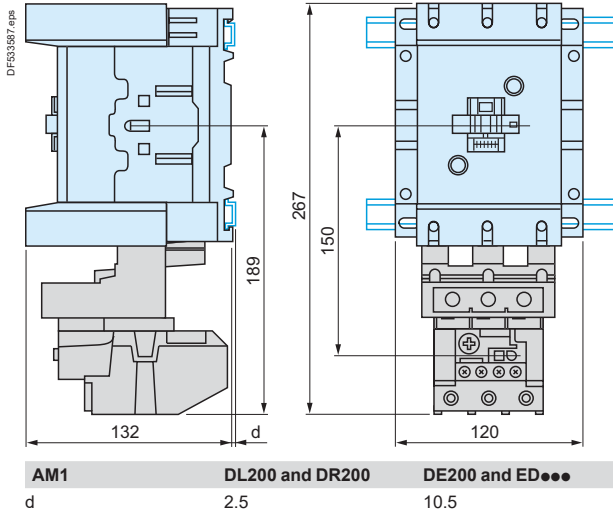
TeSys Protect

Deca Thermal overload relays

Dimensions, mounting

LRD4●●●

Direct mounting beneath contactors LC1D115 and D150

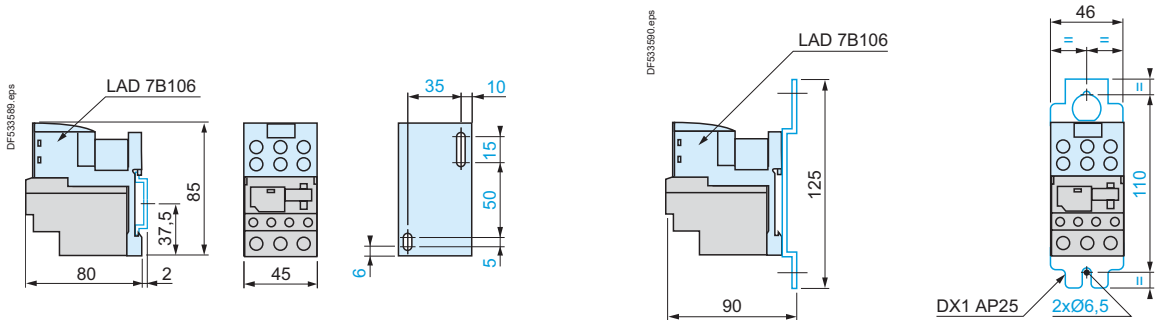


LRD01...35

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200

Independent mounting on 110 mm centres

Ref.



LRD313...380

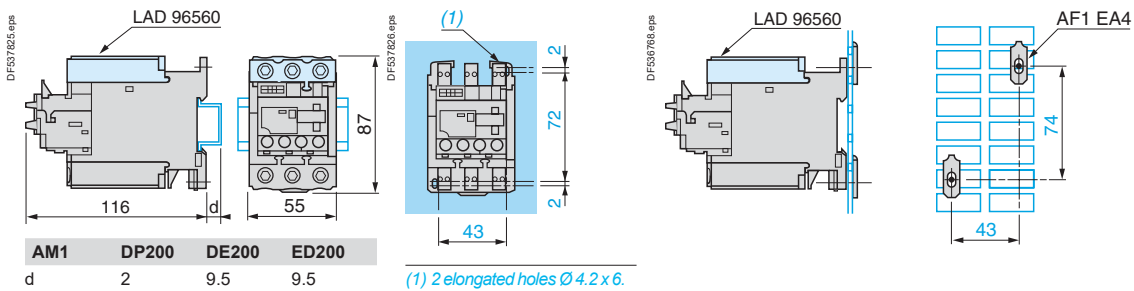
Mounting on rail AM1D●200 or ED200

Panel mounting

Mounted on plate AM1P

With terminal block LAD96560

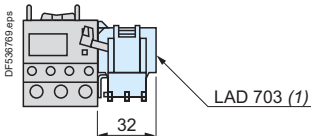
Outgoing terminal block not shown



LRD01...35 and LRD313...380

Remote tripping or electrical reset

Overload relays



(1) Can only be mounted on RH side of relay LRD01...35 and LRD313...380.

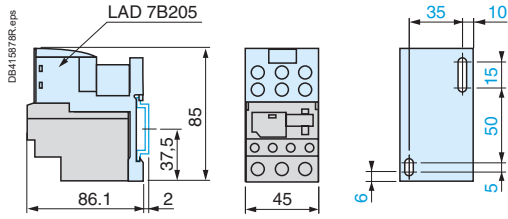
TeSys Protect

Deca Thermal overload relays

Dimensions, mounting and schemes

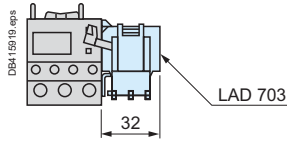
LRD04L...32L

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



	AM1	DP200	DE200
d		2	9.5

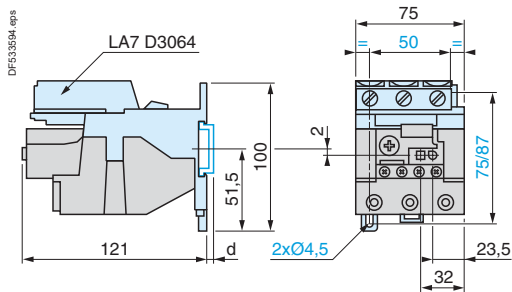
Remote tripping or electrical reset



(1) Can be mounted on RH or LH side of relay LR2D15.

LRD3... and LR2D35...

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



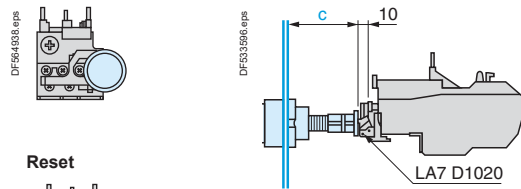
	AM1	DP200	DE200
d		2	9.5

LRD3...

Adapter for door mounted operator

LA7D1020

Stop

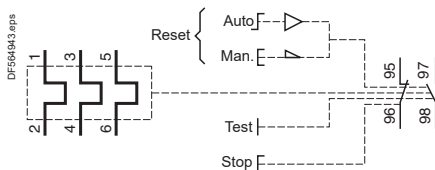


Reset



c: adjustable from 17 to 120 mm

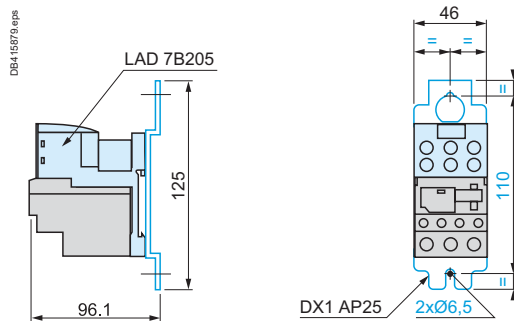
LRD..., LRD3... and LR2D...



References:
pages B11/4 to B11/7

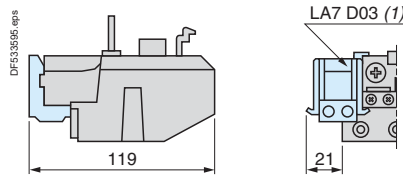
Characteristics:
pages B11/27 to B11/30

Independent mounting on 110 mm centres



LRD3..., LR2D35... and LR9D

Remote tripping or electrical reset



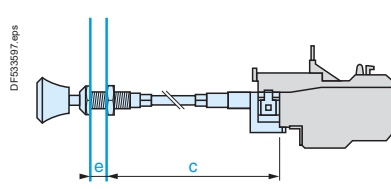
(1) Can be mounted on RH or LH side of relay LRD3..., LR2D35... or LR9D.

LRD, LRD313...380, LRD04...32L

"Reset" by flexible cable

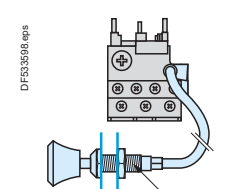
LA7D305 and LAD7305

Mounting with cable straight

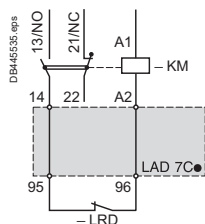


e: up to 20 mm / c: up to 550 mm

Mounting with cable bent



Pre-wiring kit LAD7C1, LAD7C2



Ref.

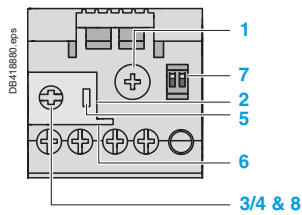


Overload relays

TeSys Protect

Deca Electronic overload relays

Characteristics



LR9D01...32

Product references LR9D01, 02, 08 and 32

These self-powered electronic thermal overload relays are designed for direct mounting to contactors LC1D09 through LC1D38.

In addition to the protection provided by the Deca thermal overload relays (see page B11/31), they offer the following additional features:

- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits

- 1 Adjustment dial Ir.
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 5/10/20/30 dials.
- 8 Reset mode selector.

Environment

Relay type		LR9D01, 02, 08, 32	
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4	
Product certifications		CCC, CSA, UL, CB, UKCA certification	
Degree of protection	Conforming to IEC 60529 and VDE 0106	IP 20 on front panel	
Ambient air temperature around the device (Conforming to IEC 60255-8)	Storage	°C	-55 to +80
	Normal operation	°C	-25 to +70
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 60068-2-27	15 g (11ms)	
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6	6 g (10-150 Hz)	
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV	6
Surge withstand, common mode	Conforming to IEC 61000-4-5	kV	2
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3 and NF C 46-022	V/m	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	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					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	24	48	110	220	380	600
		VA	100	200	400	600	600	600
	d.c. supply, DC-13	V	24	48	110	220	-	-
		W	100	100	50	45	-	-
Protection against short-circuits	By gG or BS fuses or by circuit breaker GB2	A	5					
Cabling Flexible cable without cable end	1 or 2 conductors	mm ² (AWG)	1 to 2.5 (18 to 14)					
	Tightening torque	Nm (lb-in)	0.8 (7)					

TeSys Protect

Deca Electronic overload relays

Characteristics

Electrical characteristics of power circuit

Relay type		LR9D01	LR9D02	LR9D08	LR9D32
Tripping class	Conforming to IEC/EN 60947-4-1	5, 10, 20, 30			
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	10, 20, 30			
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V AC 1000			
Rated operational voltage (Ue)	Conforming to IEC 60947-4-1	V AC 690			
	Conforming to UL/CSA	V AC 600			
Rated impulse withstand voltage		kV 6			
Frequency limits	Of the operating current	Hz 50...60			
Setting range		A 0.1...0.5	0.4...2	1.6...8	6.4...32
Power circuit connections	Wire size - 1 or 2 conductors	mm² (AWG) 1 to 16 (14 to 6)			
	Tightening torque	Nm (lb-in) 3.1 (28)			

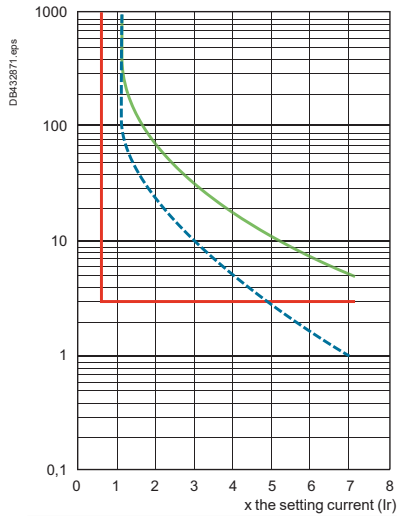
Operating characteristics

Consumption		mW < 300
Tripping thresholds	Conforming to IEC 60947-4-1	A 1.25 I _n
Sensitivity to phase unbalance	Conforming to IEC 60947-4-1	Phase difference > 40%, tripping in 3 s
Current setting ratio		5:1
Automatic reset time		min. 1.5...4

LR9D01, 02, 08, 32 tripping curves

Class 5 Trip curve

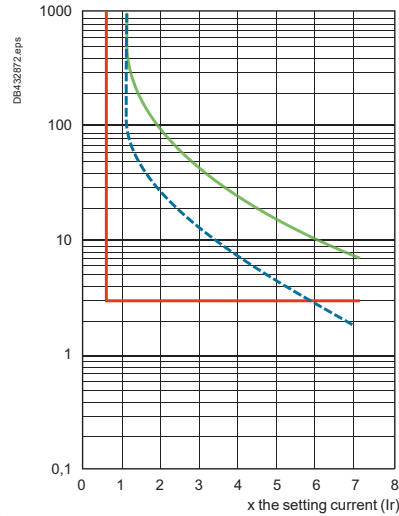
Tripping time in seconds



— Cold status
— Hot status
— Phase low and Phase unbalance

Class 10 Trip curve

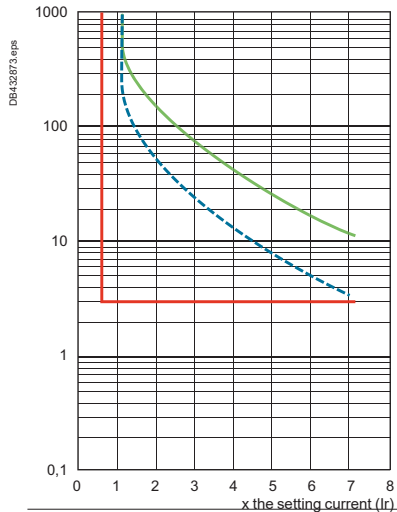
Tripping time in seconds



— Cold status
— Hot status
— Phase low and Phase unbalance

Class 20 Trip curve

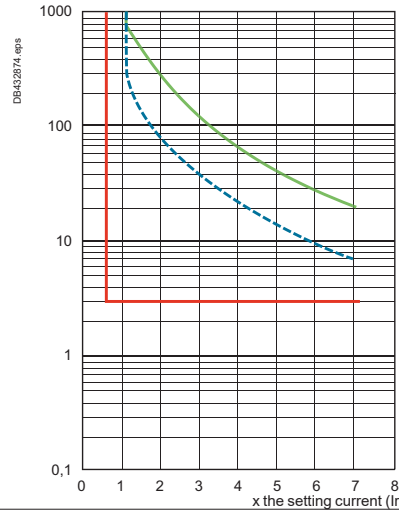
Tripping time in seconds



— Cold status
— Hot status
— Phase low and Phase unbalance

Class 30 Trip curve

Tripping time in seconds



— Cold status
— Hot status
— Phase low and Phase unbalance

References:
page B11/10

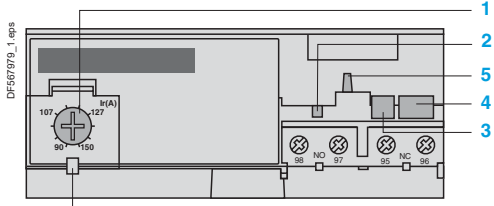
Dimensions, mounting:
page B11/38

Schemes:
page B11/39

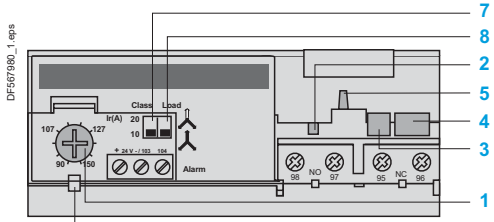
TeSys Protect

Deca Electronic overload relays

Characteristics



LR9D5367...D5569



LR9D67 and D69

Description: LR9D5367...LR9D5569, LR9D67, LR9D69

These electronic thermal overload relays are designed for use with contactors LC1D115 and D150.

In addition to the protection provided by Deca thermal overload relays (see page B11/27), 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 Adjustment dial Ir.
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 10/class 20 selector switch.
- 8 Selector for balanced load /unbalanced load

Environment

Relay type		LR9D5367...LR9D5569, LR9D67, LR9D69	
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4	
Product certifications		UL, CSA, CCC, ABS, BV, DNV-GL, UKCA	
Degree of protection	Conforming to IEC 60529	IP 20 on front panel with protective covers LA9D11570 or D11560	
Climatic withstand		according to IACS E10	
Ambient air temperature around the device (Conforming to IEC 60255-8)	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 IEC60028-2-27		13 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		2 gn - 5...300 Hz
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV	6
Surge withstand	Conforming to IEC 61000-4-5	kV	6
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3	V/m	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	kV	2
Electromagnetic compatibility	EN 50081-1 and 2, EN 50082-2		Meets requirements

Electrical characteristics of auxiliary contacts

Conventional thermal current		A	5					
Max. sealed consumption of the 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	–
Protection against short-circuits	By gG or BS fuses or by circuit breaker GB2	A	5					
Cabling Flexible cable without cable end	1 or 2 conductors	mm ²	Minimum c.s.a.: 1 Maximum c.s.a.: 2.5					
		Tightening torque	Nm	1.2				

(1) For operating temperatures up to 70 °C, please consult your Regional Sales Office.

Ref.



Overload relays

TeSys Protect

Deca Electronic overload relays

Characteristics

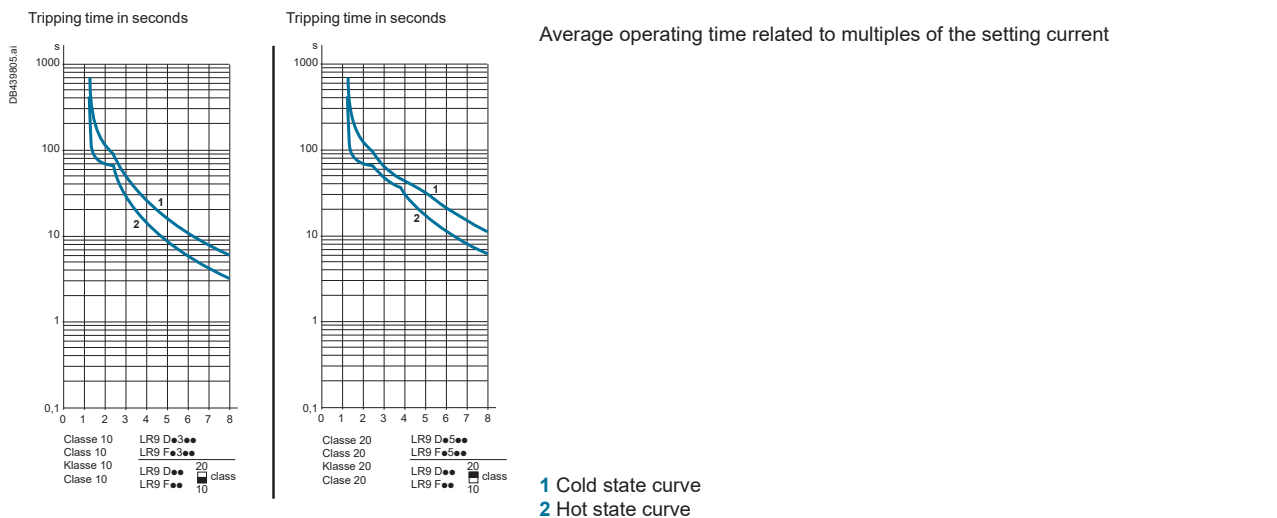
Electrical characteristics of power circuit			
Relay type		LR9D5367...LR9D5569, LR9D67, LR9D69	
Tripping class	Conforming to IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1		10 or 20
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	1000
	Conforming to UL, CSA	V	600
Rated impulse withstand voltage (Uimp)		kV	8
Frequency limits	Of the operating current	Hz	50...60 ⁽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	Conforming to IEC 60947-4-1		
	Alarm	A	1.05 ±0.06 In
	Trip	A	1.12 ±0.06 In
Sensitivity to phase failure	Conforming to IEC 60947-4-1		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	mm ²	0.5...1.5
Tightening torque		N.m	0.45

⁽¹⁾ For other frequencies and for applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

LR9D5367...LR9D5569, LR9D67, LR9D69 tripping curves

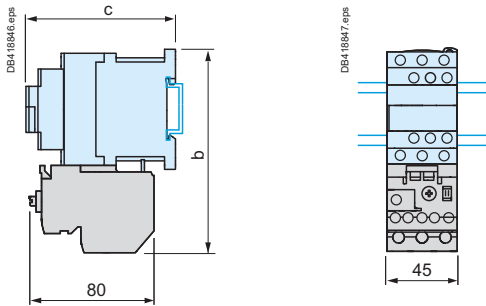


TeSys Protect

Deca Electronic overload relays

Dimensions, mounting

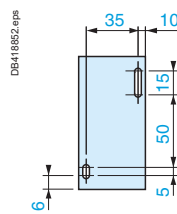
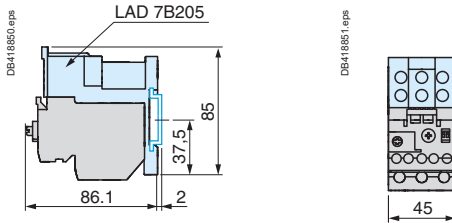
LR9D01, 02, 08, 32



LC1	D09...D18	D25...D38
b	130	140
c	See pages B8/65 and B8/66	

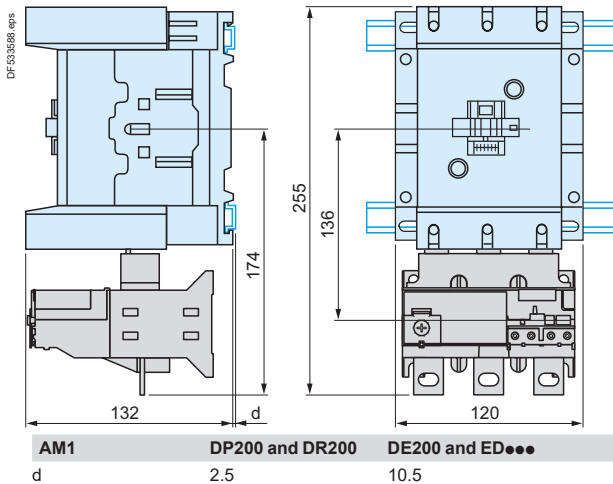
LR9D01...32

Ref.



LR9D53●●, LR9D55●●, LR9D67, LR9D69

Direct mounting beneath contactors LC 1D115 and D150

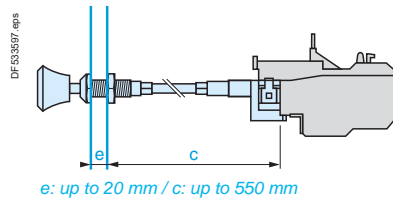


LR9D

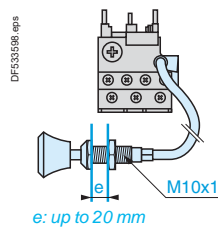
“Reset” by flexible cable

LA7D305 and LAD7305

Mounting with cable straight



Mounting with cable bent



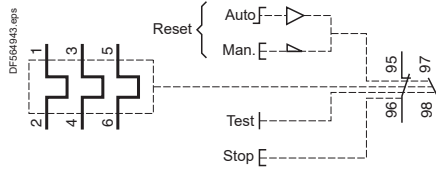
Overload relays

TeSys Protect

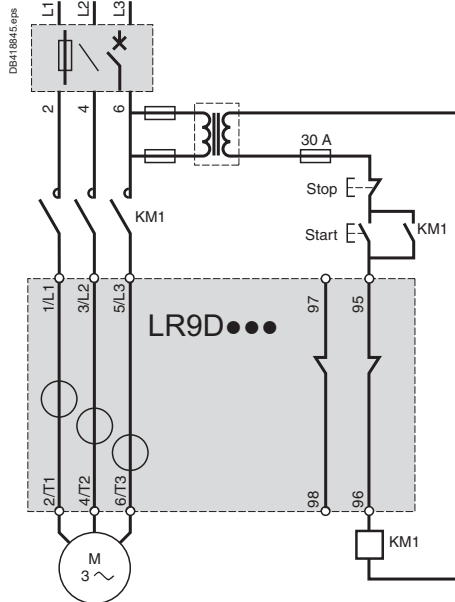
Deca Electronic overload relays

Schemes

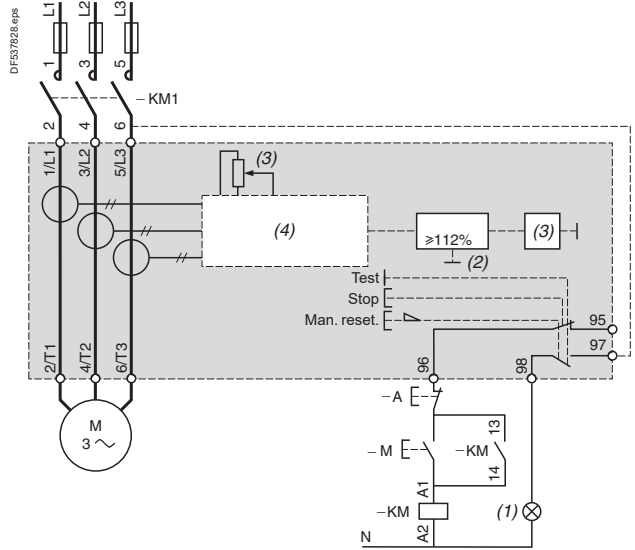
LR9D01, 02, 08, 32



LR9D01, 02, 08, 32, LR9 D110S

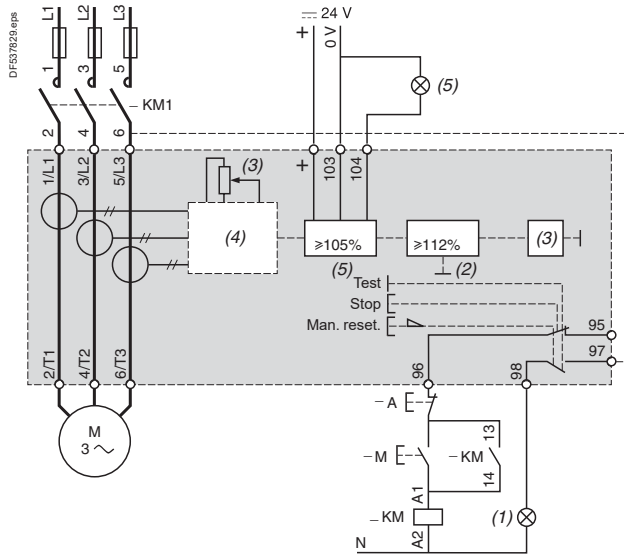


LR9D5●●●



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

LR9D67 and LR9D69



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

TeSys Protect

Giga Electronic overload relays

Characteristics

Environment					
Contactor type		LR9G115	LR9G225	LR9G500	LR9G630
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4			
Product certifications		CB Scheme, CCC, cULus, UKCA, ATEX, EU-RO-MR by DNV			
Degree of protection	Conforming to IEC 60529 / VDE 0106	IP 20 on front of relay with accessories LA9G37●●			
Climatic withstand		according to IACS E10			
Ambient air temperature around the device (conforming to IEC 60255-8)	Storage	°C	-55...+80		
	Normal operation	°C	-25...+60		
Maximum operating altitude	Without derating	m	3000		
Net weight		kg	1.2	1.7	2.8
Operating positions without derating	In relation to normal vertical mounting plane / floor mounting	Any position			
Shock resistance 11 ms	Permissible acceleration conforming to IEC 60068-2-27	15 gn			
Vibration resistance 5 to 300 Hz	Permissible acceleration conforming to IEC 60068-2-6	6 gn			
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947-4-1	kV	8		
Surge withstand	Conforming to IEC 61000-4-5	kV	4		
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8 (in air) 6 (in direct mode)		
Resistance to radiated radio-frequency disturbance	Conforming to IEC 61000-4-3	V/m	20		
Resistance to fast transient currents	Conforming to IEC 61000-4-4	kV	4		
Electromagnetic compatibility		EN 50081-1 and 2, EN 50082-2			
		Conforming			



Ref.







TeSys Protect

Giga Electronic overload relays

Characteristics

Power circuit - Electrical characteristics						
Relay type			LR9G115	LR9G225	LR9G500	LR9G630
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1 Over-voltage category III, degree of pollution: 3	V	1000			
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947-1	kV	8			
Rated operational current (Ie)		A	28 to 630			
Short-circuit protection and coordination			See pages A5/7 to A5/8, A5/23 to A5/26 and A5/38 to A5/39.			
Frequency limits of the operating current		Hz	50 / 60			
Power circuit connections	Width of terminal lug	mm	18	18	30	48
	Clamping screw		M8	M8	M10	M12
	Tightening torque	N.m	18	18	35	58

Auxiliary contact electrical characteristics									
Conventional thermal current		A	5						
Short-circuit protection	By gG fuses	A	6						
Connection (Push-in type)	Flexible cable	1 conductor with cable end	mm² 	Min.	Max.				
				0.25	2.5				
	Solid cable	2 conductors with Dual Sleeve	mm² 	0.5	1				
		1 conductor	mm² 	0.2	2.5				
		Stripping length	mm 	10	10				
Rated operational contact power	a.c. supply AC-15	V	24	48	120	240	380	480	500
		A	4	4	3	1.5	0.95	0.75	0.72
		VA	96	192	360	360	361	360	360
	d.c. supply DC-13	V	24	48	125	250	–	–	–
		A	2	0.7	0.22	0.11	–	–	–
		W	48	33.6	27.5	27.5	–	–	–
Maximum operational voltage	a.c., category AC-15	V	500	500	500	500	500	500	500
	d.c., category DC-13	V	250	250	250	250	250	250	250



TeSys Protect

Giga Electronic overload relays

Characteristics

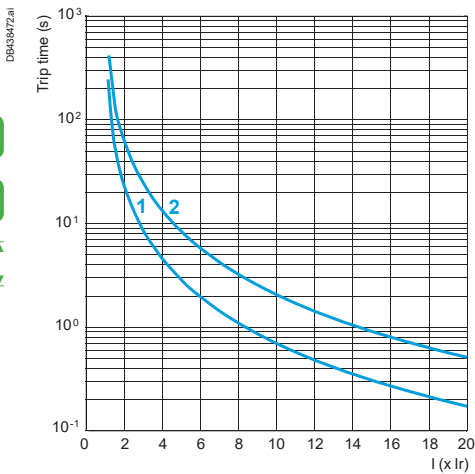
Operating characteristics			
Tripping class	Conforming to IEC 60947-4-1		5E/10E/20E/30E
Operating temperature			°C -40...+60 ⁽¹⁾
Reset			auto and manual
Trip alarm and fault indication			On front of relay
Test function			On front of relay
Tripping thresholds	Conforming to IEC 60947-4-1	Alarm Tripping	≥ 90% of permissible thermal state 1.2 ± 0.05 I _r
Sensitivity to phase loss	Conforming to IEC 60947-4-1		Tripping in 4 s ± 1 s in the event of phase loss
Phase imbalance	Conforming to IEC 60947-1		Tripping in 5 s ± 1 s if imbalance ratio ≥ 40 % according to Annex T5.5
Ground fault	Conforming to IEC 60947-4-1		I _g = 0.75 I _r Tripping 1 s ± 20 % if I ≥ 1.1 I _g
Adjustment (nominal motor current)			Setting dial on front of relay (64 settings)
Security sealing			Yes

(1) Adjustment of dial setting(s): -25...+60 °C.

LR9G tripping curves

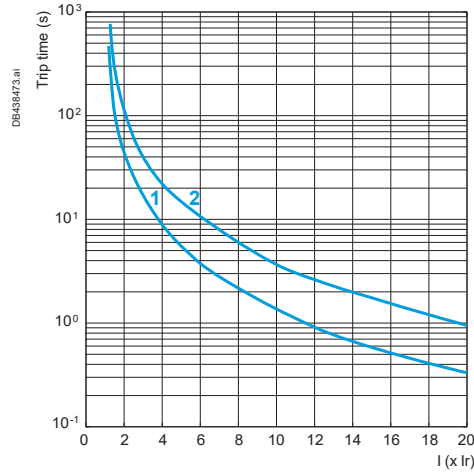
Average operating times depending on multiples of the setting current

Class 5E



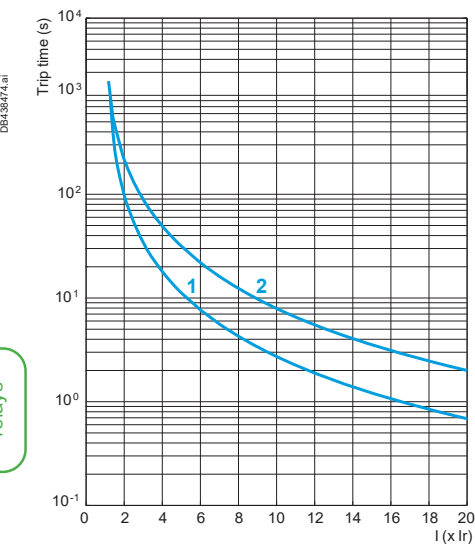
- 1 Hot state
- 2 Cold state

Class 10E



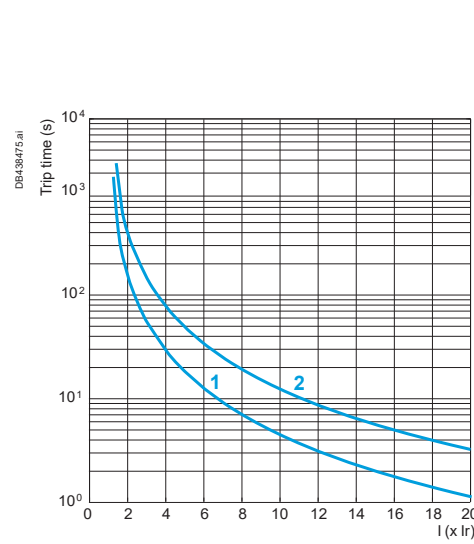
- 1 Hot state
- 2 Cold state

Class 20E



- 1 Hot state
- 2 Cold state

Class 30E



- 1 Hot state
- 2 Cold state

Introduction:
pages B11/11 to B11/12

References:
pages B11/13 to B11/14

Dimensions:
page B11/43



Overload relays

TeSys Protect

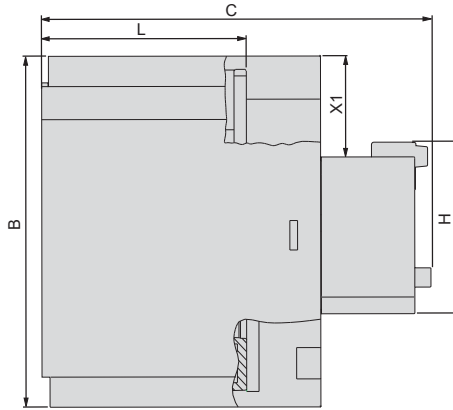
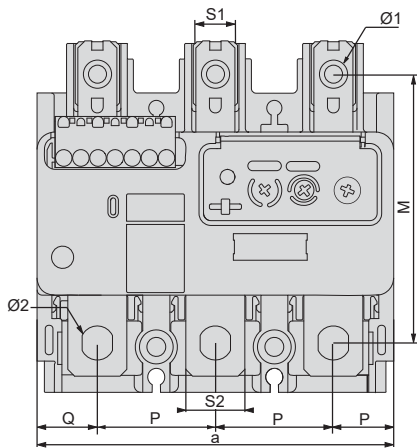
Giga Electronic overload relays

Dimensions and diagram

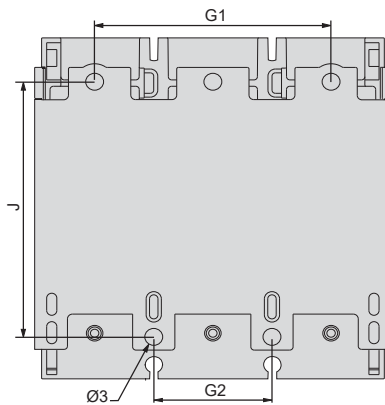
Dimensions

LR9G115...630

DB438392.ai



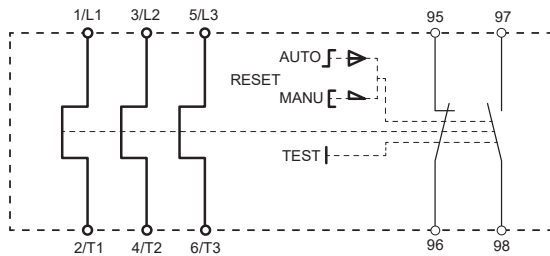
DB438402.ai



LR9G	115-225	500	630
a	105.7	140	210
b	109.55	115.65	149.45
c	126.2	139.2	185.9
G1	70	119.3	186.2
G2	35	45	70
J	80.1	68.25	86
M	78	83	100
H	52	52	52
L	66	79	107
P	35	45	70
Q	18	25	35
S1	11.5	22.5	22.5
S2	17.5	30.5	50
Ø1	8.3	10.6	13
Ø2	9	10.6	13
Ø3	5.3	5.3	8.5
X1	30	33	50

Diagram

DB438512.ai



TeSys Protect

LR97, LT47 Electronic over current relays

Characteristics

Introduction



LR97D



LT47

Ref.



LR97D and LT47 electronic over current relays have been developed to satisfy machine protection requirements. These relays have definite time characteristics: current threshold and time based function. They are particularly recommended for providing mechanical protection on machines with high resistive torque, high inertia and with strong probability of jamming under steady state conditions. They can be used for motor protection in the case of long starting times or frequent starting. The LR97D relay also incorporates two fixed time protection functions, one of 0.5 seconds against locked rotor and one of 3 seconds against phase failure. LR97D and LT47 can be used to provide mechanical shock protection. In this case, setting the O-Time knob to minimum will ensure tripping in 0.3 seconds. LR97D is designed to be directly connected downstream of the Deca contactor. LT47 provides two current transformers, to be crossed by the motor power cables.

Applications

- LR97D and LT47 relays are particularly suitable for the following machines:
- Monitoring function for excessively long starting time on machines with a risk of difficult starting:
 - Machines with high resistive torque, high inertia machines.
 - Monitoring of machines during steady state operation: overtorque detection function
 - Machines with strong risk of jamming, machines with torque build-up over time,
 - Mechanical failure monitoring,
 - Faster detection of malfunctioning on machines where the motor is oversized in relation to its thermal protection I²t.
 - Motor protection for specific applications:
 - Machines with long starting times,
 - Machines with high on-load factor: more than 30 to 50 starts/hour,
 - Machine with fluctuating load from a steady state, where the thermal image of a thermal overload relay (thermal memory) is unsuitable in relation to actual overheating of the motor.
- Examples of machines:**
- Conveyors, crushers and mixers,
 - Fans, pumps and compressors,
 - Centrifuges and spin-dryers,
 - Presses, shearing machines, saws, broaching machines, sanders and lifting hoists.

Operation

Because of their two separate time settings, LR97D and LT47 relays can be combined with the motor-starter function:

D-Time: starting time, O-Time: trip time during steady state.

The D-Time function is only available during the motor starting phase. During this phase the overload detection function is inhibited in order to allow starting. Under steady state conditions, when the motor current is greater than the setting current due to an overload or single-phasing, the red LED lights up and the internal relay switches its contact after a time preset by the O-Time knob.

The red LED stays on, indicating that the relay has tripped.

The relays are simple to set, in 5 easy steps:

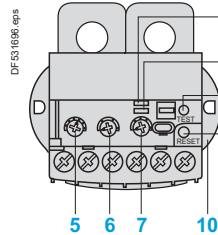
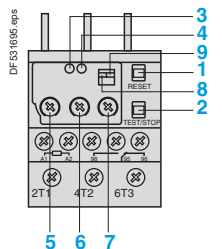
- Adjust the 3 knobs to maximum (Load, D-Time and O-Time),
- Adjust the D-Time knob to the value corresponding to the motor starting time.
- When the motor reaches steady state, adjust the Load knob (turn the knob counter-clockwise until the red LED starts to flicker).
- Slowly turn the Load knob clockwise until the LED goes out.
- Set the required tripping time, using the O-Time knob.

Description

Description

LR97D●●●●●

LT47●●●●●



- 1 RESET knob
- 2 TEST/STOP knob
- 3 Ready/Run Indicator
- 4 Relay tripped indicator
- 5 Current setting
- 6 Adjustment of starting time

- 7 Adjustment of tripping time
- 8 Manual/Auto adjustment
- 9 Single-phase/3-phase adjustment
- 10 Retractable fixing lugs

Status signalling

LR97D●●●●●

LT47●●●●●

To assist fast diagnostics, two LEDs (one green and one red) allow signalling of the operating status:

Status	LED signal	
	Green LED	Red LED
Voltage	On	Off
Starting		
Steady state	On	Off
Overload	On	
Trip	Over-current	Off
	Rotor locked	On
Phase failure	L1	Off
	L2	Off
	L3	Off

Condition	LED signal	
	Green LED	Red LED
Voltage	On	Off
Starting		
Steady state	On	Off
Overload	On	
Trip	Off	On

Overload relays

TeSys Protect

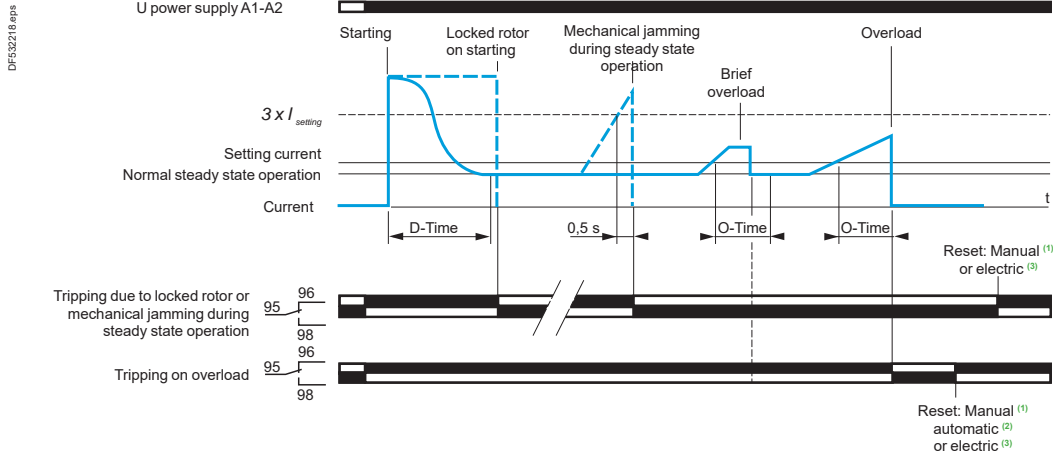
LR97, LT47 Electronic over current relays

Characteristics

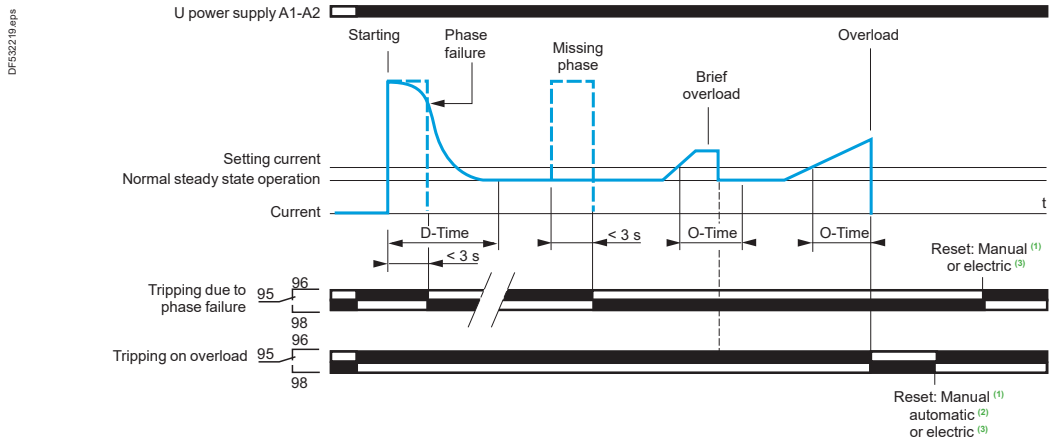
Curves

LR97D

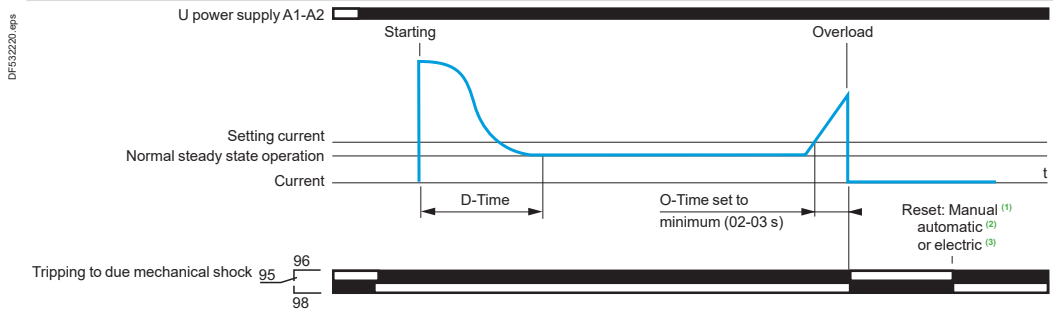
Overload protection Protection against locked rotor and mechanical jamming under steady state conditions



Overload protection Protection against phase failure during starting and during steady state operation



Mechanical shock protection



(1) By Reset button.

(2) Fixed time of 120 s. Selectable by dip switch. Function not available in the event of tripping due to locked rotor/mechanical jamming ($I > 3 \times I_{setting}$) or phase failure.

(3) By brief interruption of power supply, minimum 0.1 s.

TeSys Protect

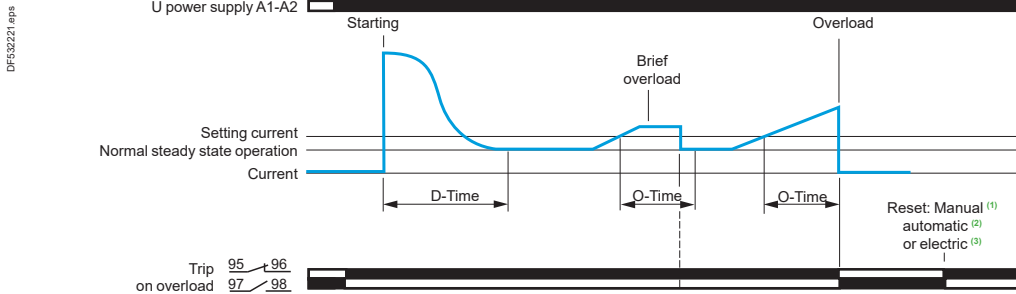
LR97, LT47 Electronic over current relays

Characteristics

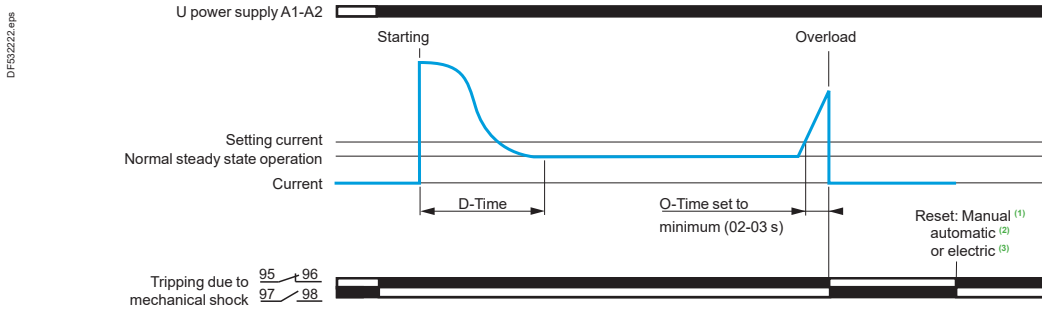
Curves

LT47

Overload protection



Mechanical shock protection



- (1) By Reset button.
- (2) Only available on version with automatic reset (LT47●●●●A). Time adjustable from 1 to 120 s with the R-Time knob.
- (3) By brief interruption of power supply, minimum 0.1 s.

Characteristics

Environment

Relay type		LR97D●●●●	LT47●●●●
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5	IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Product certifications		UL, CSA, CCC, EAC	UL, CSA, CCC, EAC
Degree of protection	Conforming to IEC 60529	IP 20 (front face)	IP 20 (front face)
Ambient air temperature around the device	Storage	°C - 30...+ 80	- 30...+ 80
	Normal operation without derating (IEC 60947-4-1)	°C - 25...+ 60	- 25...+ 60
Maximum operating altitude	m	2000	2000
Operating positions without derating	In relation to normal vertical mounting plane	Any position	Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-27	15 gn - 11 ms	15 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6	4 gn	4 gn
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV 2	2
Surge withstand	Conforming to IEC 61000-4-5	kV 6	6
Resistance to electrostatic discharge	In open air	kV 8 (level 3)	8 (level 3)
	In direct mode	kV 6 (level 3)	6 (level 3)
Immunity to radiated radio-frequency disturbance		V/m 10 (level 3)	10 (level 3)
Immunity to fast transient currents		kV 2	2
Conducted emissions	Conforming to EN 55011	Class A	Class A
Conducted HF disturbance	Conforming to EN 61000-4-6	V 10	10

TeSys Protect

LR97, LT47 Electronic over current relays

Characteristics

Characteristics											
Auxiliary contact characteristics											
Relay type			LR97D●●●●●				LT47●●●●●				
Contact type			1 NO/NC				1 N/O + 1N/C				
Conventional thermal current	A		3				3				
Maximum hold consumption of controlled contactor coils (occasional operating cycles of contact 95-96)	Conforming to IEC 60947		V	~ 24	~ 48	~ 110	~ 220	~ 24	~ 48	~ 110	~ 220
			VA	70	140	360	360	70	140	360	360
			V	~ 24	~ 48	~ 110	~ 220	~ 24	~ 48	~ 110	~ 220
			W	55	55	28	28	55	55	28	28
Short-circuit protection	By gG, BS fuses. Maximum rating or GB2 circuit breaker		A				3				
Connection by cable or lug-clamps											
Flexible cable without cable end	1 or 2 conductors	Min.	mm²	1 x 0.75			1 x 1				
		Max.	mm²	2 x 2.5			2 x 2.5				
Flexible cable with cable end	1 or 2 conductors	Min.	mm²	1 x 0.34			1 x 1				
		Max.	mm²	1 x 1.5 + 1 x 2.5			2 x 2.5				
External Ø of lugs			mm	7			7				
Ø of screw			mm	M3			M3.5				
Tightening torque			N.m	0.6...1.2			0.8...1.7				
Electrical characteristics of power circuit											
Relay type			LR97D015●● to LR97D25●●		LR97D38●●		LT47●●●●●				
Setting range	Depending on model		A		0.3...38		0.5...60				
Tripping class					Adjustable		Adjustable				
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1		V		690		690				
	Conforming to UL, CSA		V		600		600				
Rated impulse withstand voltage (Uimp)			kV		6		6				
Frequency limits	Of the operating current		Hz		50...60		50...60				
Connection by cable or lug-clamps											
Flexible cable without cable end	1 conductor	Min.	mm²	1.5	2.5	-					
		Max.	mm²	10	10	-					
Flexible cable with cable end	1 conductor	Min.	mm²	1	1	-					
		Max.	mm²	4	6	-					
External Ø of lugs			mm	10	12	-					
Ø of screw			mm	M4	M4	-					
Tightening torque			N.m	2	2	-					
Operating characteristics											
Relay type			LR97D●●●●●		LT47●●●●S		LT47●●●●A				
Adjustment	Current		A		"Load" knob		"Load" knob		"Load" knob		
	Time	D-time knob	s		0.5...30		0.5...30		-		
		O-time knob	s		0.2/0.3...10		0.2/0.3...10		0.2/0.3...30		
		R-time knob	s		-		-		1...120		
Reset	Manual				Reset button		Reset button		Reset button		
	Automatic				120 s fixed		-		R-time knob: 1-120 s		
	Electrical				By interruption of power supply (minimum 0.1 s)		By interruption of power supply (minimum 0.1 s)		By interruption of power supply (minimum 0.1 s)		
Protection functions											
Overload $I_{max} > I_{setting}$	Tripping				On starting	Steady state	On starting	Steady state	-		
					Inhibited during D-time	After O-time	Inhibited during D-time	After O-time	After O-time		
Locked rotor, mechanical jamming $I > 3 \times I_{setting}$	Tripping				After D-time	< 0.5 s	Inhibited during D-time	After O-time	After O-time		
					< 3 s	< 3 s	Inhibited during D-time	After O-time	After O-time		
Sensitivity to phase failure	Tripping				< 3 s	< 3 s	Inhibited during D-time	After O-time	After O-time		
Status and fault signalling (see table page 245/17/2)					2 LEDs		2 LEDs		2 LEDs		
TEST/STOP function	Test				No load		No load		No load		
	Stop				Under load		Under load		Under load		
Sealing					Yes		Yes		Yes		

Ref.



Overload relays

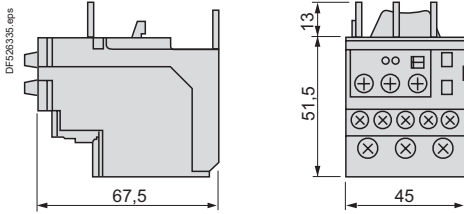
TeSys Protect

LR97, LT47 Electronic over current relays

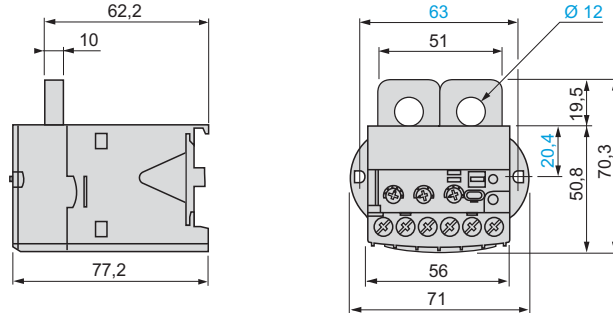
Dimensions, mounting, schemes

Dimensions

LR97D●●●●



LT47●●●●

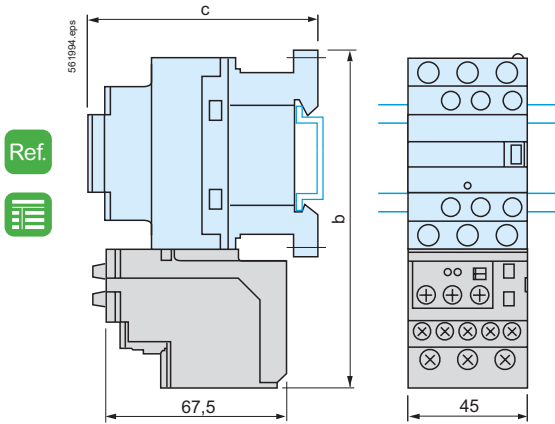


Mounting

LR97D●●●●

Direct mounting beneath the contactor

LT47●●●●

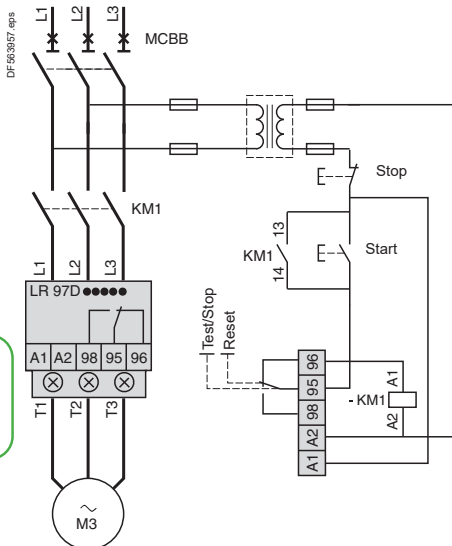


LC1	D09...D18	D25...D38
b	123	137
c	See pages B8/76 and B8/77	

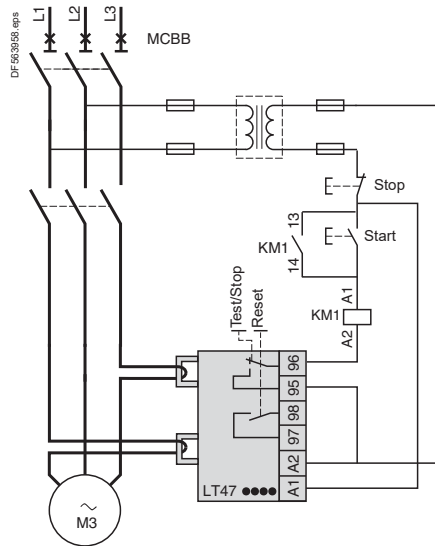
Note: Can be mounted on \perp rail.

Schemes

LR97D●●●●



LT47●●●●



Easy TeSys Protect

Thermal Overload Relays



TOR Com. Ref	Possible I _{max} Calibration	Compatible with Contactor (size 1 & 2) Com. Ref.						
		LC1E06	LC1E09	LC1E12	LC1E18	LC1E25	LC1E32	LC1E38
LRE01	0.10...0.16 A	■	■	■	■	■	■	■
LRE02	0.16...0.25 A	■	■	■	■	■	■	■
LRE03	0.25...0.40 A	■	■	■	■	■	■	■
LRE04	0.40...0.63 A	■	■	■	■	■	■	■
LRE05	0.63...1 A	■	■	■	■	■	■	■
LRE06	1...1.6 A	■	■	■	■	■	■	■
LRE07	1.6...2.5 A	■	■	■	■	■	■	■
LRE08	2.5...4 A	■	■	■	■	■	■	■
LRE10	4...6 A	■	■			■	■	■
LRE12	5.5...8 A		■	■	■	■	■	■
LRE14	7...10 A		■	■	■	■	■	■
LRE16	9...13 A			■	■	■	■	■
LRE21	12...18 A				■	■	■	■
LRE22	16...24 A					■	■	■
LRE32	23...32 A					■	■	■
LRE35	30...38 A							■

Common characteristics

- > Class: 10 A.
- > Operating voltage: max. 690 V AC.

Accessories

- > LAEB1 Terminal block (see page C-7)
- > LAEB3 Terminal block (see page C-7)
- > LAEB5 Connection Block (see page C-7)

Easy TeSys Protect

Thermal Overload Relays



TOR Com. Ref	Possible I _{max} Calibration	Compatible with Contactor (size 3 & 4) Com. Ref.				
		LC1E40	LC1E50	LC1E65	LC1E80	LC1E95
LRE322	17...25 A	■	■	■	■	■
LRE353	23...32 A	■	■	■	■	■
LRE355	30...40 A	■	■	■	■	■
LRE357	37...50 A		■	■	■	■
LRE359	48...65 A			■	■	■
LRE361	55...70 A				■	■
LRE363	63...80 A				■	■
LRE365	80...104 A					■



TOR Com. Ref	Possible I _{max} Calibration	Compatible with Contactor (size 5, 6, 7, 8 & 9) Com. Ref.							
		LC1E120	LC1E160	LC1E200	LC1E250	LC1E300	LC1E400	LC1E500	LC1E630
LRE480	51...81A	■	■	□	□	□	□	□	□
LRE481	62...99A	■	■	□	□	□	□	□	□
LRE482	84...135A	■	■	□	□	□	□	□	□
LRE483	124...198A		□	■	□	□	□	□	□
LRE484	146...234A			□	■	■	■	□	□
LRE485	174...279A			□	■	■	■	□	□
LRE486	208...333A				■	■	■	□	□
LRE487	259...414A					■	■	□	□
LRE488	321...513A						□	■	□
LRE489	394...630A							□	■

Note:

- means the relay can match with contactor both in electrical and mechanical.
- means the relay can match with contactor only in electrical (can not directly mounting).

Easy TeSys Protect Thermal Overload Relays

Presentation

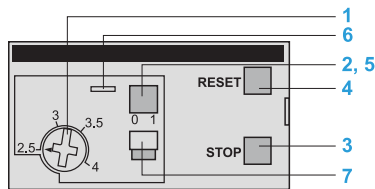


Easy TeSys thermal overload relays are designed to protect a.c. circuits and motors against:

- overloads
- phase failure
- Long starting time
- prolonged stalled rotor condition.

The thermal relay controls permanently the current driven by the motor. When this current exceeds the setting it's auxiliary contacts will change state, causing the motor to stop.

Description



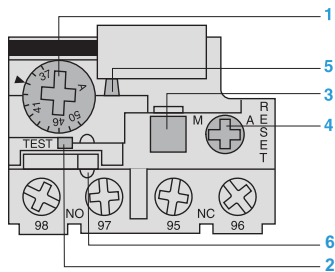
LRE●●, LRE48●

- 1 Adjustment dial I_r.
- 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.



LRE3●●

LRE relays are supplied with the selector in the manual position, protected by a cover.

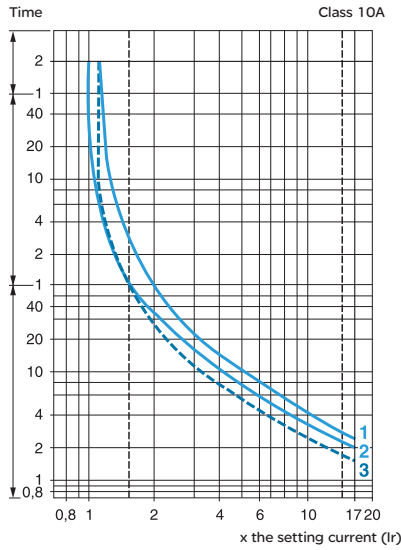
Deliberate action is required to move it to the automatic position.

Power Circuit Characteristics										
Relay type	Ref.	LRE 01...21	LRE 22...35	LRE 322...365	LRE 480...482	LRE 483	LRE 484	LRE 485...487	LRE 488	LRE 489
	Size	1		2	3			4		
Tripping class	Conforming to IEC 60947-4-1	10 A								
Rated insulation voltage	Conforming to IEC 60947-4-1	V 690								
Rated impulse withstand voltage (Uimp)		kV 6								
Frequency limits	Of the operating current	Hz 50...60								
Setting range	Depending on model	A 0.1...18	16...38	17...104	51...630					
Power Circuit Connections										
Connection by screw clamp terminals		Minimum/maximum c.s.a.								
	Flexible cable without cable end 1 conductor	mm ² 1.5...6	2.5...10	4...35	-					
	Flexible cable with cable end 1 conductor	1...4	1.5...6	4...35	-					
	Solid cable without cable end 1 conductor	1...6	2.5...10	4...35	-					
	Tightening torque	N.m 1.7	2.5	9	-					
Connection by bars or lugs										
Pitch	Without spreaders	mm -			34.8	40	48	48	55	80
Bars or cables with lugs	Cross section	-			3X18	3X20	3X25	4X25	5x30	6X40
Screws	Type	-			M8	M8	M10	M10	M10	M12
	Tightening torque	N.m -			27.5	27.5	35	35	35	58
Auxiliary Contact Characteristics										
Conventional thermal current		A 5								
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply	V 110	120	220	240	380	480	500	600	
		A 3.27	3	1.63	1.5	0.95	0.75	0.72	0.12	
Protection against short-circuits	By gG, maximum rating or by GB2	A 5								
Connection by screw clamp terminals		Minimum/maximum c.s.a.								
	Flexible cable without cable end 1 conductor	mm ² 2 x 1...2.5								
	Flexible cable with cable end 1 conductor	2 x 1...2.5								
	Solid cable without cable end 1 conductor	2 x 1...2.5								
	Tightening torque	N.m 1.7								
Environment										
Conforming to standard		IEC 60947-4-1, IEC 60947-5-1								
Product certifications		EAC								
Degree of protection	Conforming to IEC 60529							IP00		
Protective treatment	Conforming to IEC 60068	"TH"								
Ambiant air temperature	Storage	°C -60...+80								
	Normal operation without derating (IEC 60947-4-1)	-20...+60								
	Minimum/maximum operating temperature (with derating) ⁽¹⁾	-20...+70								
Operating positions without derating	In relation to normal vertical mounting plane	Any position								
Flame resistance	Conforming to IEC 60068-2-1	°C 850								
Shock resistance	Permissive acceleration conforming to IEC 60068-2-7	6 gn - 11 ms								
Vibration resistance	Permissive acceleration conforming to IEC 60068-2-6	3 gn								
Dielectric strenght at 50 Hz		kV 6								
Impulse withstand voltage		6								
Operating Characteristics										
Temperature compensation		°C -20...+60								
Tripping threshold	Conforming to IEC 60947-4-1	A 1.14 ± 0.06 I _r								
Sensitivity to phase failure	Conforming to IEC 60947-4-1	Tripping current 130 % of I _r on two phase, the last one at 0								

(1) Contact your regional sales.

Tripping Curves

Average operating time related to multiples of the setting current



- 1 *Balanced operation, 3-phase, without prior current flow (cold state).*
- 2 *2-phase operation, without prior current flow (cold state).*
- 3 *Balanced operation, 3-phase, after a long period at the set current (hot state).*

Easy TeSys Protect

Thermal Overload Relays

3-pole Thermal Overload Relays



LRE00



LRE30



LRE48

Differential Thermal Overload Relays

for Use with Fuses or Magnetic Circuit-breakers GV2 L and GV3 L

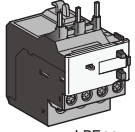
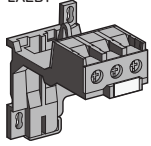
- Compensated relays with manual or automatic reset,
- with relay trip indicator,
- for a.c.

Relay setting range (A)	Fuses to be used with selected relay		For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)			
Class 10 A ⁽¹⁾ for connection by screw clamp terminals					
0.10...0.16	0.25	2	E06...E38	LRE01	0.130
0.16...0.25	0.5	2	E06...E38	LRE02	0.130
0.25...0.40	1	2	E06...E38	LRE03	0.130
0.40...0.63	1	2	E06...E38	LRE04	0.130
0.63...1	2	4	E06...E38	LRE05	0.130
1...1.6	2	4	E06...E38	LRE06	0.130
1.6...2.5	4	6	E06...E38	LRE07	0.130
2.5...4	6	10	E06...E38	LRE08	0.130
4...6	8	16	E06...E38	LRE10	0.130
5.5...8	12	20	E09...E38	LRE12	0.130
7...10	12	20	E09...E38	LRE14	0.130
9...13	16	25	E12...E38	LRE16	0.130
12...18	20	35	E18...E38	LRE21	0.130
16...24	25	50	E25...E38	LRE22	0.130
23...32	40	63	E25...E38	LRE32	0.130
30...38	40	80	E38	LRE35	0.130
17...25	25	50	E40...E95	LRE322	0.470
23...32	40	63	E40...E95	LRE353	0.470
30...40	40	100	E40...E95	LRE355	0.470
37...50	63	100	E50...E95	LRE357	0.460
48...65	63	100	E65...E95	LRE359	0.460
55...70	80	125	E80...E95	LRE361	0.480
63...80	80	125	E80...E95	LRE363	0.480
80...104	80	160	E95	LRE365	0.520
Class 10 A ⁽¹⁾ directly connected by connector					
51...81	100	125	E120...E160	LRE480	2.2
62...99	125	160	E120...E160	LRE481	2.2
84...135	160	200	E120...E160	LRE482	2.2
124...198	200	250	E200	LRE483	2.1
146...234	250	315	E250...E400	LRE484	2.2
174...279	315	315	E250...E400	LRE485	2.2
208...333	400	400	E250...E400	LRE486	2.2
259...414	400	500	E300...E400	LRE487	2.4
321...513	500	800	E500	LRE488	3.2
394...630	630	1000	E630	LRE489	3.9

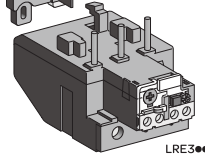
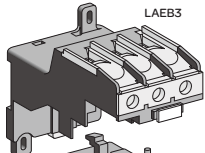
⁽¹⁾ Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current I_R : class 10 A: between 2 and 10 seconds.

Easy TeSys Protect Thermal Overload Relays

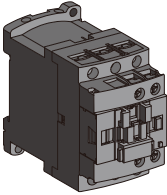
LAEB1



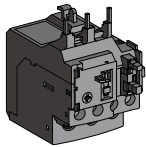
LRE●●



LRE3●●



LAEB5



Separate components for relays

Description	For use with	Sold in lots of	Unit reference	
Terminal block For clip-on mounting on rail or screwing fixing	LRE01...LRE35	1	LAEB1	
	LRE322...LRE365	1	LAEB3	
Connection Block allowing direct connection of LRE01-35 to DC contactor	LC1 E06..E25 BD LC1 E32..E38 BD	1	LAEB5	

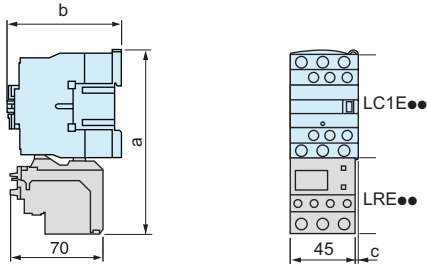
Easy TeSys Protect

Thermal Overload Relays

Direct Connection to Easy TeSys Contactors

LRE01...E35

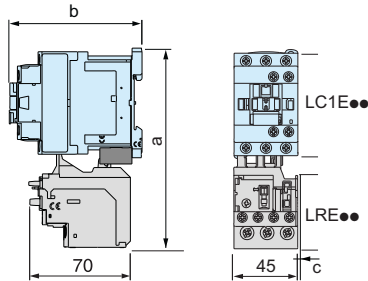
Direct mounting under LC1E06...38 contactors with screw clamp connections (Contact with AC supply)



With contactor	LC1E06...E18	LC1E25	LC1E32/E38
a	128	137	137
b	84	92	92
c	0	0	11

LRE01...E35

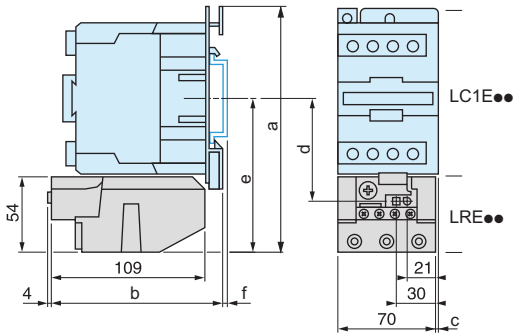
Direct mounting under LC1E06...38 contactors with LAEB5 and screw clamp connections (Contact with DC supply)



With contactor	LC1E06...E18	LC1E25	LC1E32/E38
a	137	137	151
b	93	93	99
c	2	2	2

LRE3

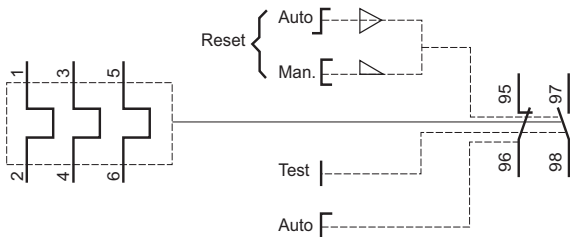
Direct mounting under LC1E40...95 contactors with screw clamp connections



With contactor on DIN rail	AM1-DL201	AM1-DL200
f	7	17

With contactor	LC1E40	LC1E50	LC1E65	LC1E80	LC1E95
a	175	175	175	180	180
b	119	119	119	124	124
c	4.5	4.5	4.5	9.5	9.5
d	72.4	72.4	72.4	76.9	76.9
e	111	111	111	115.5	115.5

Electrical Diagram all Relays



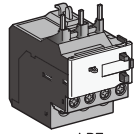
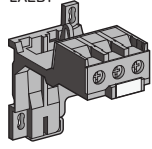
Easy TeSys Protect Thermal Overload Relays Connection to a Terminal Block

LRE01...E35 connected to LAEB1 Terminal Block

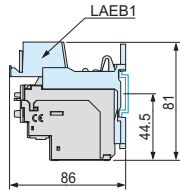
Independent mounting on 50 mm centres; or on rail AM1 DP200 or DE200

Independent mounting on 110 mm centres

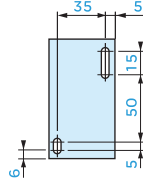
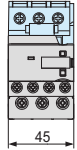
LAEB1



LRE01...E35



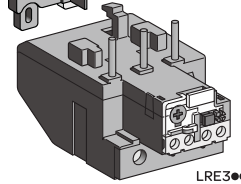
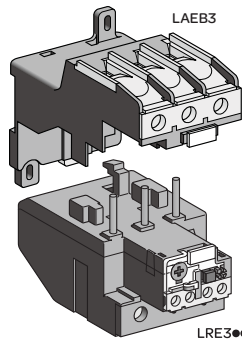
Mounting on DIN rail AM1D000



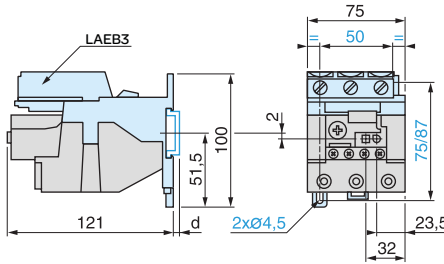
Mounting customer back plate

LRE322...E365, Connected to LAEB3 Terminal Block

Independent mounting on 50 mm centres; or on rail AM1 DP200 or DE200



LRE322...E365



Mounting on DIN rail AM1D000

	AM1-DP200	AM1-DE200
d	2	9.5

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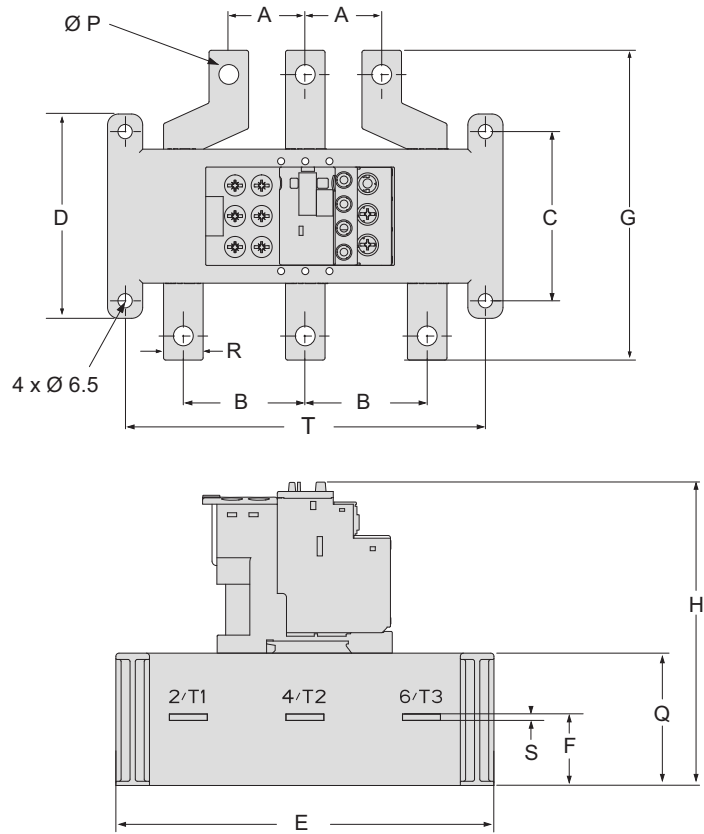
Thermal Overload Relays

Independent Mounting and Connection

LRE48●

Independent Mounting on Mounting Plate

LRE48●: separate mounting (without accessory).



(mm)

Dimensions and Mounting		A	B	C	D	E	F	G	H	P	Q	R	S	T
Range (A)														
LRE480	51...81	34.8	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE481	62...99							10		20				
LRE482	84...135							12		25				
LRE483	124...198	40	48	77	93	180	32.5	134	134	12	63	25	4	164
LRE484	146...234	40						20						
LRE485	174...279	40						25						
LRE486	208...333	48	76	77	93	180	32.5	134	134	12	63	25	4	164
LRE487	259...414	48						20						
LRE488	321...513	48						25						
LRE489	394...630	80	80	77	93	180	32.5	134	134	12	63	25	4	164
LRE480	51...81	34.8	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE481	62...99	34.8	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE482	84...135	34.8	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE483	124...198	40	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE484	146...234	40	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE485	174...279	40	55.5	77	93	180	32	141	134	9	63	18	3	164
LRE486	208...333	48	55.5	77	93	180	32.5	134	134	12	63	25	4	164
LRE487	259...414	48	55.5	77	93	180	32.5	134	134	12	63	25	4	164
LRE488	321...513	55	76	77	93	242	43	140	148	14	77	30	5	222
LRE489	394...630	80	80	77	93	242	43.5	150	148	14	77	40	6	222

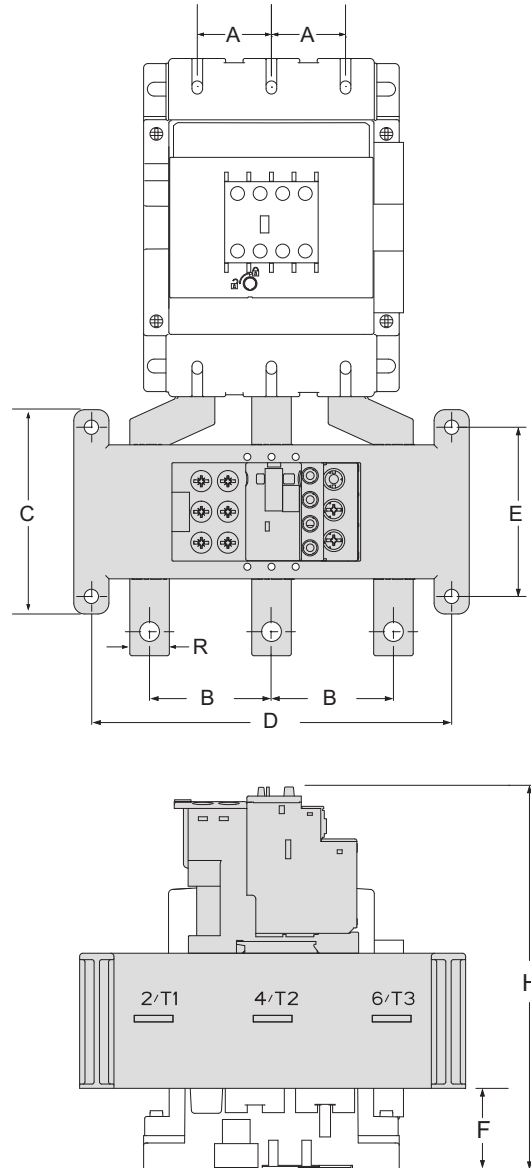
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Thermal Overload Relays

Independent Mounting and Connection

LRE48●
Independent Mounting on Mounting Plate

LRE48●: with direct mounting under contactors LC1E120...630 .



(mm)

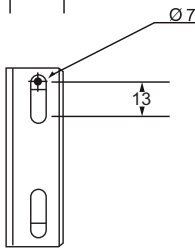
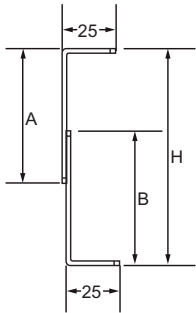
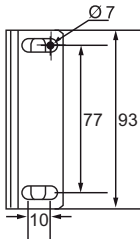
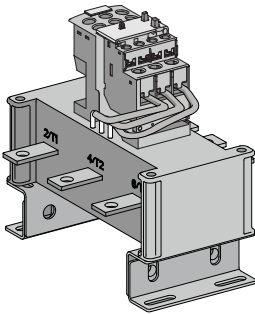
Dimensions and Mounting		A	B	C	D	E	F	H		
Range (A)										
LRE480	51...81	34.8	55.5	93	164	77	38	180		
LRE481	62...99									
LRE482	84...135									
LRE483	124...198	40					76	222	82	223
LRE484	146...234									
LRE485	174...279	48					80	222	113	255
LRE486	208...333									
LRE487	259...414	55	80	222	125	264				
LRE488	321...513									
LRE489	394...630									

Easy TeSys Protect

Thermal Overload Relays

Independent Mounting and Connection

CDB500412



Accessories for LRE48X Thermal Overload Relay

Relay mounting with Contactor directly

Relay	Contactor	Mounting support	
		cat No.	weight (Kg)
LRE480	LC1E120...160	LAES1	0.32
LRE481	LC1E120...160	LAES1	0.32
LRE482	LC1E120...160	LAES1	0.32
LRE483	LC1E200	LAES2	0.45
LRE484	LC1E250...300	LAES2	0.45
LRE485	LC1E250...300	LAES2	0.45
LRE486	LC1E250...300	LAES2	0.45

Dimension	LAES1	LAES2	
A (mm)	34	70	
B (mm)	30	70	
H (mm)	34-42	75-90	107-122

