

# TeSys

## TeSys LRD Thermal overload relays

### Characteristics



LRD10



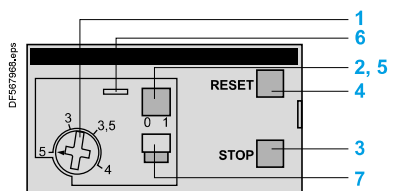
LRD04L...32L



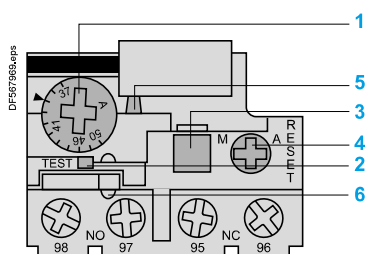
LRD365



LRD33●●



LRD01...35, LRD04L...32L  
LRD313...LRD365



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

### Introduction

3-pole TeSys D 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

#### 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 <sup>(1)</sup>.

#### LRD04 to LRD32L

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

#### 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**<sup>®</sup> system with creep compensation <sup>(2)</sup> (Schneider Electric patent).

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

These relays are also available for connection by lugs <sup>(1)</sup>.

#### LRD3361 to 4369, LR2D3561 to D3563

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



### Description

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

- 1 Adjustment dial I<sub>r</sub>.
- 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.

LRD01 to 35, LRD04L 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.

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

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 <sup>(1)</sup> , GB/T 14048.4, GB/T 14048.5
Product certifications			UL <sup>(2)</sup> , CSA <sup>(2)</sup> IEC, CCC <sup>(3)</sup> , EAC, ATEX <sup>(1)</sup> ABS, BV <sup>(4)</sup> , DNV-GL <sup>(5)</sup> , LRoS <sup>(6)</sup> , RINA <sup>(7)</sup> , RMRS <sup>(8)</sup> , EU RO Mutual recognition <sup>(9)</sup>
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 60068-2-7		15 gn - 11 ms
Vibration resistance <sup>(10)</sup>	Permissible acceleration conforming to IEC 60068-2-6		6 gn except LRD04L...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, LR3D01 ...16	LRD04L ...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						1000 <sup>(11)</sup>		
	Conforming to UL, CSA	V						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	
		V	125	250	440				
		A	0.22	0.1	0.06				
Protection against short-circuits	By gG, BS fuses. Maximum rating or by GB2	A	4						

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

<sup>(2)</sup> Except for relays LRD4369.

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

<sup>(4)</sup> BV: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D313 to LRD/LR3D380.

<sup>(5)</sup> DNV-GL: except for LRD04L to LRD32L.

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

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

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

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

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

<sup>(11)</sup> 750 V for LRD33656, LRD33676, LRD33696.

Ref.



Overload relays

# TeSys

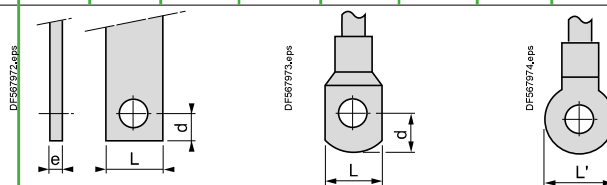
## TeSys LRD Thermal overload relays

### 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	LR2D 3522 ... ...3563	LRD 4365 ...4369
Connection to screw clamp terminals										
Flexible cable without cable end	1 conductor	mm <sup>2</sup> 1.5...10			1.5...10	1...35	1...35	4...35		4...50
Flexible cable with cable end	1 conductor	mm <sup>2</sup> 1...4		1...6	1...6 except <b>LRD21:</b> 1...4	1...35	1...35	4...35		4...35
Solid cable without cable end	1 conductor	mm <sup>2</sup> 1...6		1.5...10	1.5/10 except <b>LRD21:</b> 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 <sup>2</sup> 1.5...4		-	1.5...4	-	-	-	-	-
Flexible cable with cable end	1 conductor	mm <sup>2</sup> 1.5...4		-	1.5...4	-	-	-	-	-

Connection by bars or lugs

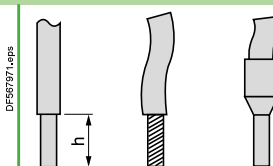


Relay type		LRD016...166 LRD04L6 ...16L6	LRD216...356 LRD21L6 ...32L6	LRD3136 ...3806	LRD313L6 ...365L6	LRD3322A66 ...3365A66
Pitch	Without spreaders	mm 14.5	17.5	17.5	17.5	21.5
Bars or cables with lugs	e	mm ≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
	L	mm ≤ 8	≤ 8	≤ 13.5	≤ 13.5	≤ 16
	L'	mm ≤ 9.5	≤ 9.5	≤ 16.5	≤ 16.5	≤ 16
	d	mm ≤ 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	LR2D 3522 ... 3563	LRD 4365 ...4369
Connection to screw clamp terminals <sup>(1)</sup>	Solid cable without cable end	mm <sup>2</sup> 2 x 1...2.5								
	Flexible cable without cable end	mm <sup>2</sup> 2 x 1...2.5								
	Flexible cable with cable end	mm <sup>2</sup> 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 <sup>2</sup> 1...2.5			1...2.5	-				
	Flexible cable without cable end	mm <sup>2</sup> 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 B8/28).

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### Characteristics

#### Operating characteristics

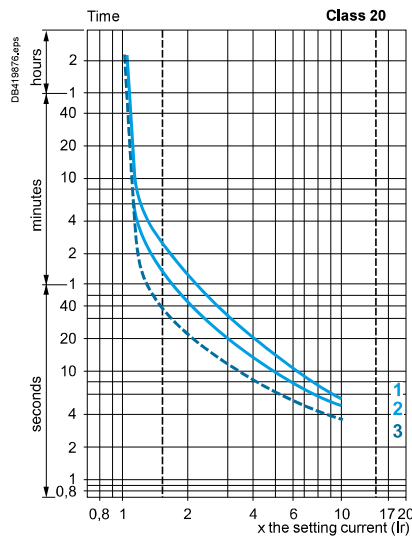
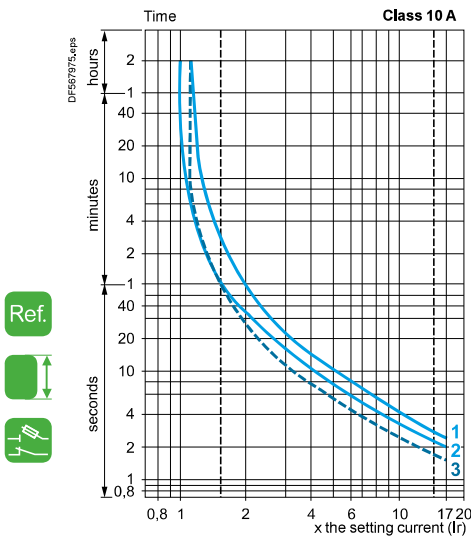
Relay type	LRD01 ...16, LR3D01 ...16	LRD04L... LRD32L	LRD21 ...35, LR3D21 ...35	LRD313 ...365 LR3D 313 ...380	LRD313L ...365L	LRD3322 ...33696 LR3D3322 ...33696	LR2D 3522 ... 3563	LRD 4365 ...4369
Temperature compensation	°C		-20...+60					
Tripping threshold	Conforming to IEC 60947-4-1		A		1.14 ±0.06 I <sub>r</sub>			
Sensitivity to phase failure	Tripping current 130 % of I <sub>r</sub> on two phases, the third phase at 0.							

#### Tripping curves

Average operating time related to multiples of the setting current

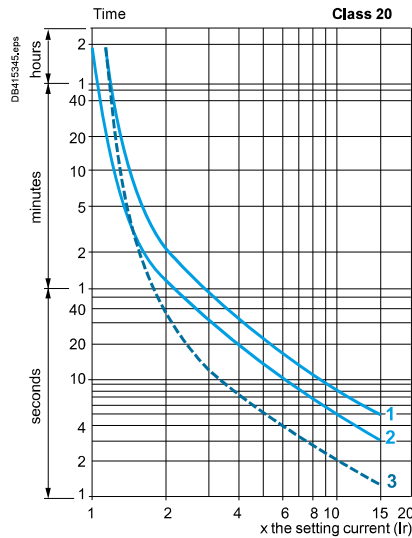
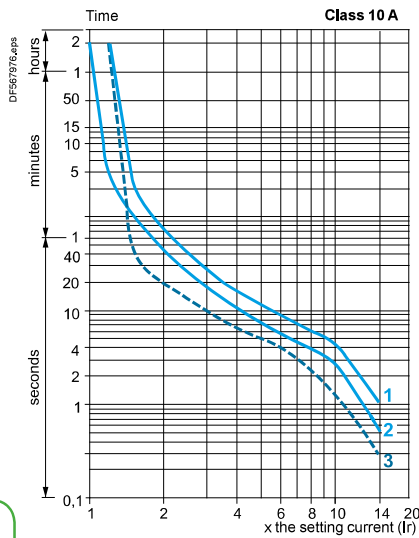
LRD01 to LRD35, LR2D and LRD3322 to LRD4369

LRD04L to LRD32L and LR2D3522 to LR2D3563



LRD313 to LRD380

LRD313L to LRD365L



Overload relays

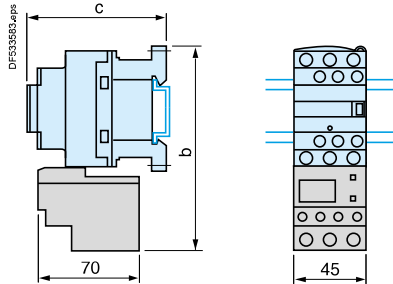
- 1 Balanced operation, 3-phase, without prior current flow (cold state).
- 2 2-phase operation, without prior current flow (cold state).
- 3 Balanced operation, 3-phase, after a long period at the set current (hot state).

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## TeSys LRD Thermal overload relays

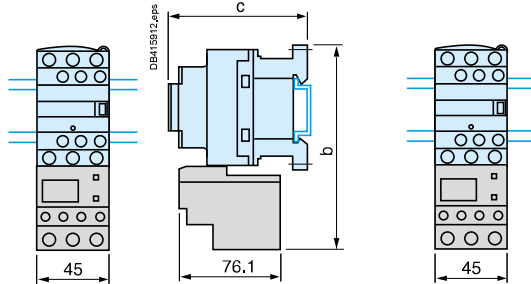
### Dimensions, mounting

**LRD01...35** <sup>(1)</sup>  
Direct mounting beneath contactors with screw clamp connections



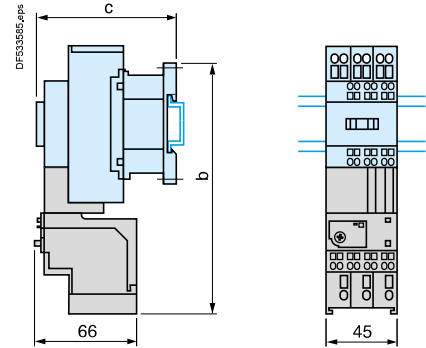
LC1	D09...D18	D25...D38
b	123	137
c	See pages B11/32 and B8/73	

**LRD04...32L** <sup>(1)</sup>  
Direct mounting beneath contactors with screw clamp connections



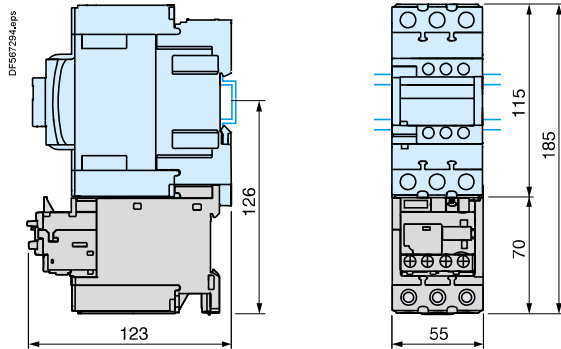
LC1	D09...D18	D25...D38
b	123	137
c	See pages B11/32 and B8/73	

**LRD013...223**  
Direct mounting beneath contactors with spring terminal connections

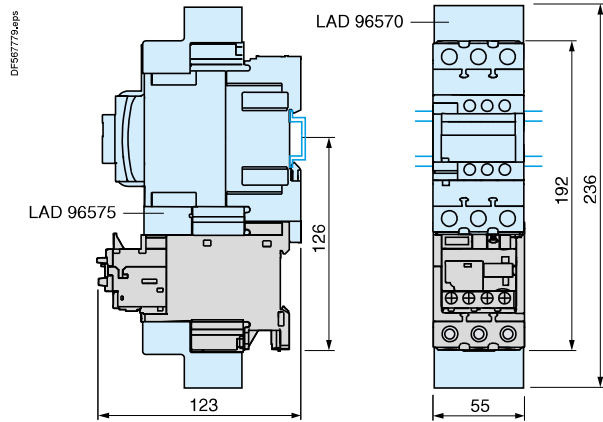


LC1	D093...D253
b	168
c	See pages B11/32 and B8/73

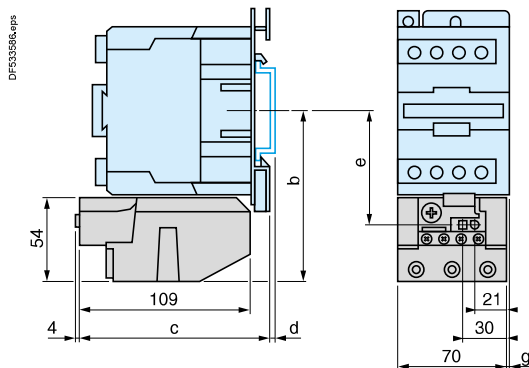
**LRD313 ...380** <sup>(1)</sup>  
Direct mounting beneath contactors LC1D40A...D80A with screw clamp connections or EverLink® connectors



**LRD3136 ...3806** <sup>(1)</sup>  
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

<sup>(1)</sup> In case of vibration above 3 gn on TeSys D Green contactor directly mounted with LRD, it is recommended do mount the devices separately by screws on metal plate.



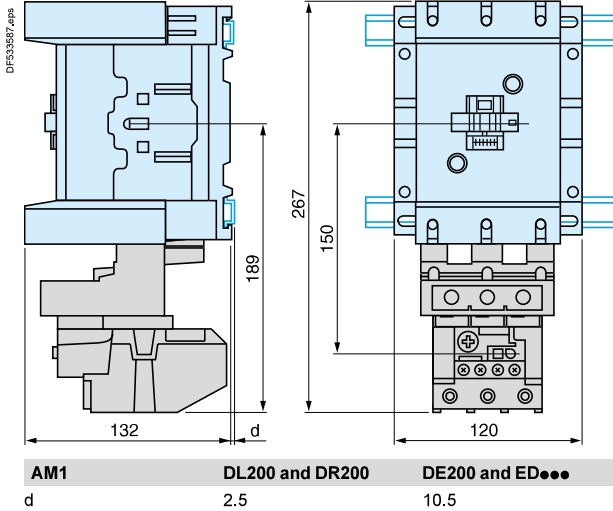
# TeSys

## TeSys LRD Thermal overload relays

### Dimensions, mounting

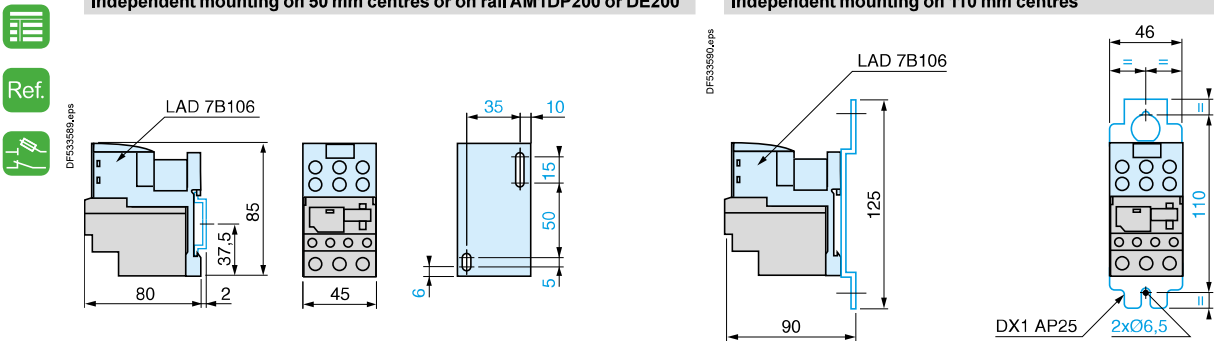
#### LRD4●●●

Direct mounting beneath contactors LC1D115 and D150



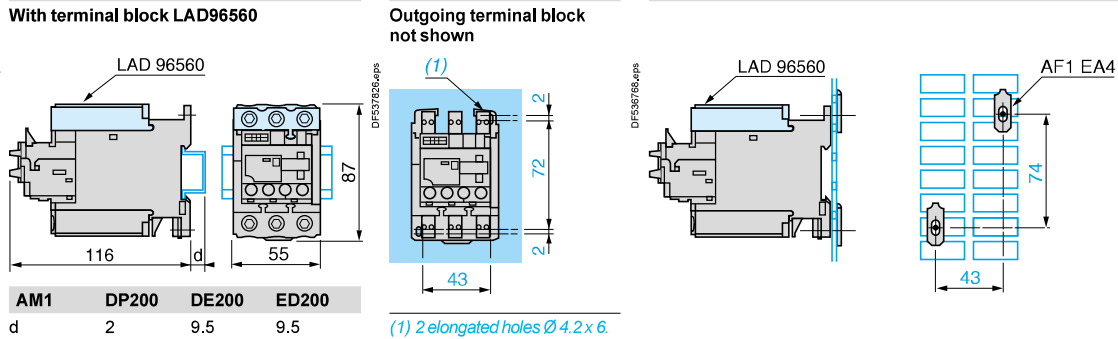
#### LRD01...35

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200      Independent mounting on 110 mm centres



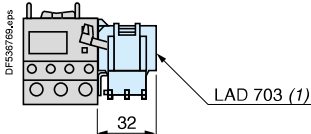
#### LRD313...380

Mounting on rail AM1D●200 or ED200      Panel mounting      Mounted on plate AM1P



#### LRD01...35 and LRD313...380

Remote tripping or electrical reset



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

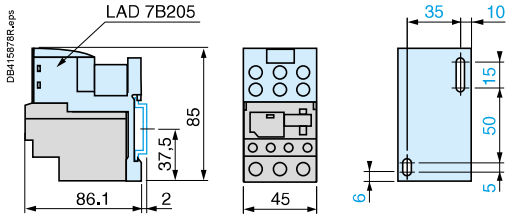
# TeSys

## TeSys LRD Thermal overload relays

### Dimensions, mounting and schemes

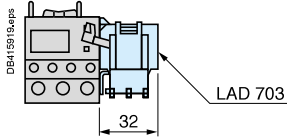
#### LRD04L...32L

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



	AM1	DP200	DE200
d	2	9.5	

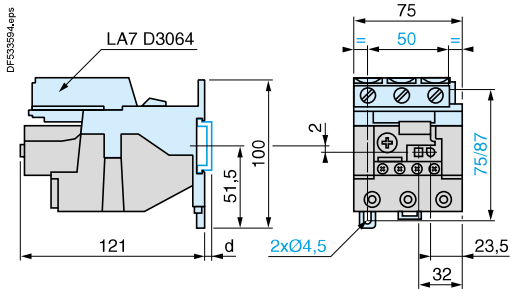
Remote tripping or electrical reset



(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



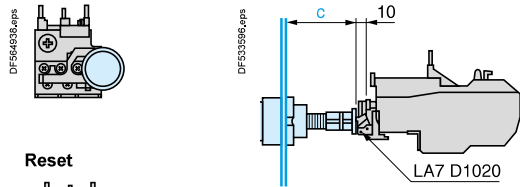
	AM1	DP200	DE200
d	2	9.5	

#### LRD3...

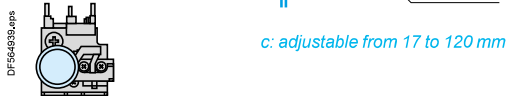
Adapter for door mounted operator

LA7D1020

Stop

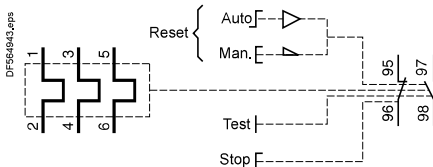


Reset

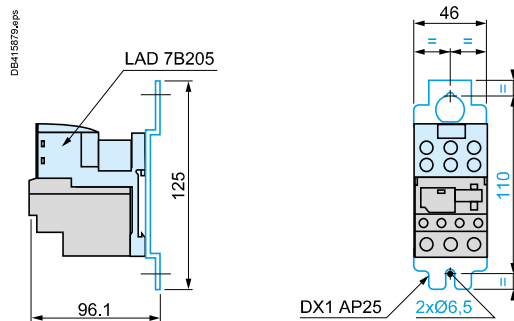


c: adjustable from 17 to 120 mm

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

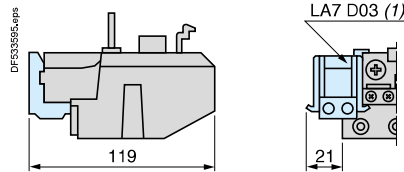


Independent mounting on 110 mm centres



#### LRD3..., LR2D35... and LR9D

Remote tripping or electrical reset



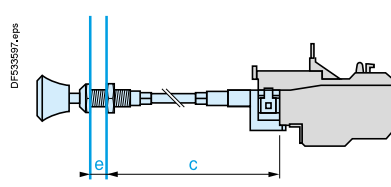
(1) Can be mounted on RH or LH side of relay LRD3..., LR2D35... or LR9D.

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

"Reset" by flexible cable

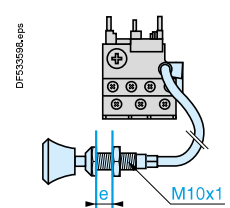
LA7D305 and LAD7305

Mounting with cable straight



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

Mounting with cable bent



#### Pre-wiring kit LAD7C1, LAD7C2

