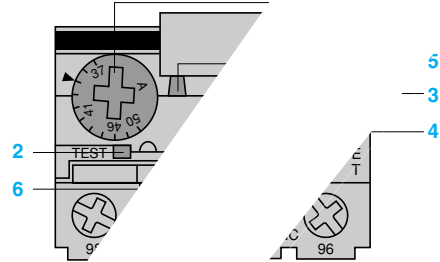


# Protection components

LRD relays, model d

to protect a.c. circuits and motors against  
overcurrent.

LRD-3322...4369, LR2-D



is N/O and  
is not affer

is supplied with the selector in the manual position,  
is not the automatic position.

## Environment

### Conforming to standards

### Product certifications

Degree of protection  
Protective treatment

Ambient air temperature  
around the device

Operating positions  
without derating

Shock resistance

Vibration resistance

Dielectric strength at 50 Hz

Impulse withstand voltage

C  
Co.  
Storage  
Normal  
Minimum  
(with derat.  
In relation  
Permiss  
Permiss  
Conform  
IEC 255  
Conform  
IEC 801-5

EN 60947-1, EN 60947-4-1, NF C 63-650,  
VDE 0660

CSA, UL, Sichere Trennung, PTB except LAD-4:  
UL, CSA.

Protection against direct finger contact IP 2X  
"TH"

°C - 60...+ 70  
°C - 20...+ 60  
°C - 40...+ 70

Any position

15 gn - 11 ms

6 gn

kV 6

kV 6

## Auxiliary contact characteristics

### Conventional thermal current

### Maximum consumption

of operating coils  
of controlled contactors  
(Occasional operating  
cycles of contact 95-96)

### Short-circuit protection

### Connection to spring terminals

Flexible cable without cable end 1 or 2 conductors  
Flexible cable with cable end 1 or 2 conductors  
Solid cable without cable end 1 or 2 conductors  
Tightening torque

### Connection to spring terminals

Flexible cable without cable end 1 or 2 conductors  
Solid cable without cable end 1 or 2 conductors

A	5					
V	24	48	110	220	380	600
VA	100	200	400	600	600	600
	24	48	110	220	440	—
	100	100	50	45	25	—

By gG or BS fuse. Max. rating or by GB2 circuit-

References:  
pages 2/112 and 2/113

Dimensions:  
pages 2/116 to 2/118

Schemes:  
page 2/119

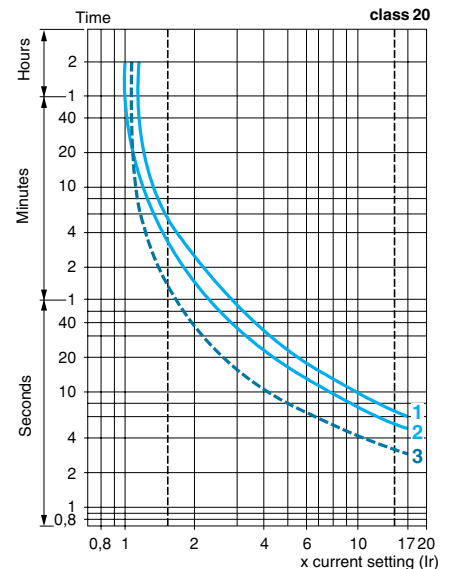
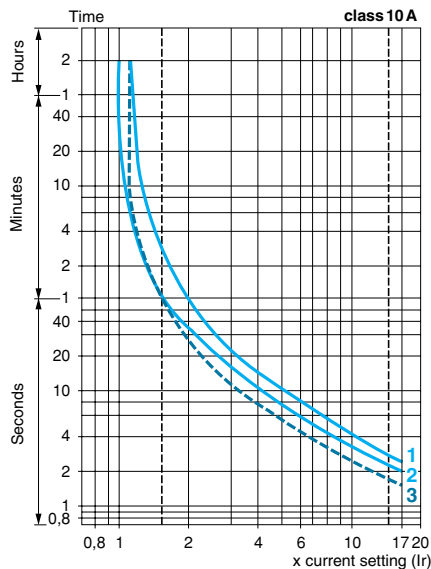
### Electrical characteristics of power circuit

Relay type			LRD-01 to 16 LR3-D01 to D16	LR2-D15●●	LRD-21 to 35 LR3-D21 to D35	LR2-D25●●	LRD-3322 to 33696 LR3-D3322 to D33696	LR2-D35●●	LRD-4365 to 4369
<b>Tripping class</b>	To UL 508, EN 60947-4-1		10 A	20	10 A	20	10 A	20	10 A
<b>Rated insulation voltage (Ui)</b>	Conforming to EN 60947-4-1	<b>V</b>	690		690		1000		1000
	Conforming to UL, CSA	<b>V</b>	600		600		600		600 except LRD-4369
<b>Rated impulse withstand voltage (Uimp)</b>		<b>kV</b>	6		6		6		6
<b>Frequency limits</b>	Of the operational current	<b>Hz</b>	0...400		0...400		0...400		0...400
<b>Setting range</b>	Depending on model	<b>A</b>	0.1...13		12...38		17...104		80...140
<b>Connection to screw clamp terminals</b>	Flexible cable without cable end	1 conductor	<b>mm<sup>2</sup></b> Min/max c.s.a. 1.5/10		1.5/10		4/35		4/50
	Flexible cable with cable end	1 conductor	<b>mm<sup>2</sup></b> 1/4		1/6 except LRD-21: 1/4		4/35		4/35
	Solid cable without cable end	1 conductor	<b>mm<sup>2</sup></b> 1/6		1.5/10 except LRD-21: 1/6		4/35		4/50
	Tightening torque		<b>N.m</b> 1.7		1.85		2.5		9
<b>Connection to spring terminals</b>	Flexible cable without cable end	1 conductor	<b>mm<sup>2</sup></b> 1.5/4		-		1.5/4		-
	Solid cable without cable end	1 conductor	<b>mm<sup>2</sup></b> 1.5/4		-		1.5/4		-

### Operating characteristics

<b>Temperature compensation</b>		<b>°C</b>	-20...+60	-30...+60-	-30...+60	-20...+60
<b>Tripping threshold</b>	Conforming to EN 60947-4-1	<b>A</b>	1.14 ± 0.06 I <sub>n</sub>			
<b>Sensitivity to phase failure</b>	Conforming to EN 60947-4-1		Tripping current 30 % of I <sub>n</sub> on one phase, the others at I <sub>n</sub>			

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



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

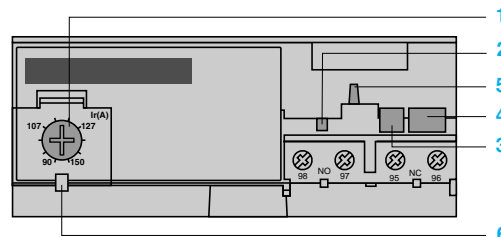
## Description

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

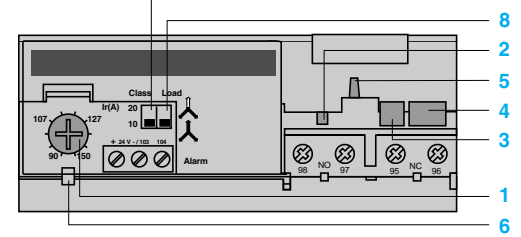
In addition to the protection provided by model d thermal overload relays (see page 2/108) they offer the following special features:

- 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.

LR9-D5367...D5569



LR9-D67 and D69



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

## Environment

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

## Electrical characteristics of auxiliary contacts

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

(1) For operation at 70 °C, please call our Customer information centre on 0870 608 8 608.

### Electrical characteristics of power circuit

<b>Relay type</b>			<b>LR9-D</b>
<b>Tripping class</b>	Conforming to UL 508, EN 60947-4-1		10 A or 20
<b>Rated insulation voltage (Ui)</b>	Conforming to EN 60947-4-1	<b>V</b>	1000
	Conforming to UL, CSA	<b>V</b>	600
<b>Rated impulse withstand voltage (Uimp)</b>		<b>kV</b>	8
<b>Frequency limits</b>	Of the operational current	<b>Hz</b>	50...60. For other frequencies, call our Customer information centre on 0870 608 8 608 (1)
<b>Setting range</b>	Depending on model	<b>A</b>	60...150
<b>Power circuit connections</b>	Width of terminal lug	<b>mm</b>	20
	Clamping screw		M8
	Tightening torque	<b>N.m</b>	18

### Operating characteristics

<b>Temperature compensation</b>		<b>°C</b>	-20...+70
<b>Tripping thresholds</b>	To EN 60947-4-1 Alarm	<b>A</b>	$1.05 \pm 0.06 I_n$
	Tripping	<b>A</b>	$1.12 \pm 0.06 I_n$
<b>Sensitivity to phase failure</b>	Conforming to EN 60947-4-1		Tripping in $4 \text{ s} \pm 20 \%$ in the event of phase failure

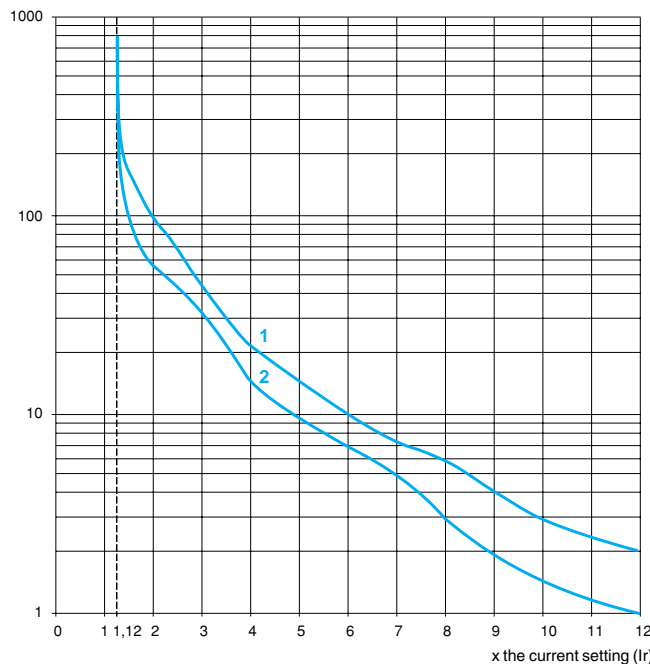
### Alarm circuit characteristics

<b>Rated supply voltage</b>	d.c. supply	<b>V</b>	24
<b>Supply voltage limits</b>		<b>V</b>	17...32
<b>Current consumption</b>	No load	<b>mA</b>	$\leq 5$
<b>Switching capacity</b>		<b>mA</b>	0...150
<b>Protection</b>	Short-circuit and overload		Self-protected
<b>Voltage drop</b>	Closed state	<b>V</b>	$\leq 2.5$
<b>Cabling</b>	Flexible cable without cable end	<b>mm<sup>2</sup></b>	0.5...1.5
<b>Tightening torque</b>		<b>N.m</b>	0.45

### Tripping curve LR9-D

Average operating time related to multiples of the current setting

Tripping time in seconds



1 Cold state curve  
2 Hot state curve

(1) For use of these relays with soft start units or variable speed controllers, please call our Customer information centre on 0870 608 8 608.

### Differential thermal overload relays for use with fuses. Class 10 A tripping

- 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) with connection by screw clamp terminals

0.10...0.16	0.25	2	–	D09...D38	LRD-01	0.124
0.16...0.25	0.5	2	–	D09...D38	LRD-02	0.124
0.25...0.40	1	2	–	D09...D38	LRD-03	0.124
0.40...0.63	1	2	–	D09...D38	LRD-04	0.124
0.63...1	2	4	–	D09...D38	LRD-05	0.124
1...1.7	2	4	6	D09...D38	LRD-06	0.124
1.6...2.5	4	6	10	D09...D38	LRD-07	0.124
2.5...4	6	10	16	D09...D38	LRD-08	0.124
4...6	8	16	16	D09...D38	LRD-10	0.124
5.5...8	12	20	20	D09...D38	LRD-12	0.124
7...10	12	20	20	D09...D38	LRD-14	0.124
9...13	16	25	25	D12...D38	LRD-16	0.124
12...18	20	35	32	D18...D38	LRD-21	0.124
16...24	25	50	50	D25...D38	LRD-22	0.124
23...32	40	63	63	D25...D38	LRD-32	0.124
30...38	50	80	80	D32 and D38	LRD-35	0.124
17...25	25	50	50	D40...D95	LRD-3322	0.510
23...32	40	63	63	D40...D95	LRD-3353	0.510
30...40	40	100	80	D40...D95	LRD-3355	0.510
37...50	63	100	100	D40...D95	LRD-3357	0.510
48...65	63	100	100	D50...D95	LRD-3359	0.510
55...70	80	125	125	D50...D95	LRD-3361	0.510
63...80	80	125	125	D65 and D95	LRD-3363	0.510
80...104	100	160	160	D80 and D95	LRD-3365	0.510
80...104	125	200	160	D115 and D150	LRD-4365	0.900
95...120	125	200	200	D115 and D150	LRD-4367	0.900
110...140	160	250	200	D150	LRD-4369	0.900
80...104	100	160	160	(2)	LRD-33656	1.000
95...120	125	200	200	(2)	LRD-33676	1.000
110...140	160	250	200	(2)	LRD-33696	1.000

#### Class 10 A (1) with spring terminal connections (for direct mounting on the contactor only)

0.10...0.16	0.25	2	–	D09...D38	LRD-013	0.140
0.16...0.25	0.5	2	–	D09...D38	LRD-023	0.140
0.25...0.40	1	2	–	D09...D38	LRD-033	0.140
0.40...0.63	1	2	–	D09...D38	LRD-043	0.140
0.63...1	2	4	–	D09...D38	LRD-053	0.140
1...1.6	2	4	6	D09...D38	LRD-063	0.140
1.6...2.5	4	6	10	D09...D38	LRD-073	0.140
2.5...4	6	10	16	D09...D38	LRD-083	0.140
4...6	8	16	16	D09...D38	LRD-103	0.140
5.5...8	12	20	20	D09...D38	LRD-123	0.140
7...10	12	20	20	D09...D38	LRD-143	0.140
9...13	16	25	25	D12...D38	LRD-163	0.140
12...18	20	35	32	D18...D38	LRD-213	0.140
16...24	25	50	50	D25...D38	LRD-223	0.140

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

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

### Thermal overload relays for use with unbalanced loads

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

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

### Thermal overload relays for use on 1000 V supplies

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

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

Order an **LA7-D3064** terminal block separately, see page 2/115.

(1) Standard IEC 947-4-1 specifies a tripping time for 7.2 times the setting current  $I_R$ :

class 10 A: between 2 and 10 seconds.

(2) Independent mounting.



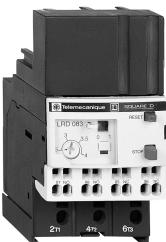
LRD-08



LRD-21



LRD-33●●



LRD-083

### Differential thermal overload relays for use with fuses. Class 20 tripping

- Compensated relays with manual or automatic reset,
  - with relay trip indicator,
  - for a.c. or d.c.
  - LR2-D1508 to 2553: independent mounting
    - either by ordering a terminal block **LA7-D1064** or **LA7-D2064**, see page 2/115,
    - or by ordering the the relay pre-assembled; in this case add the suffix **LA7** to the reference.
- Example: **LR2-D1508** becomes **LR2-D1508LA7**.

Relay setting range	Fuses to be used with the selected relay			For use with contactor	Reference	Weight
	aM	gG	BS88			
<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>			kg

#### Class 20 (1) for connection by screw clamp terminals

2.5...4	6	10	16	D09...D32	<b>LR2-D1508</b>	0.190
4...6	8	16	16	D09...D32	<b>LR2-D1510</b>	0.190
5.5...8	12	20	20	D09...D32	<b>LR2-D1512</b>	0.190
7...10	16	20	25	D09...D32	<b>LR2-D1514</b>	0.190
9...13	16	25	25	D12...D32	<b>LR2-D1516</b>	0.190
12...18	25	35	40	D18...D32	<b>LR2-D1521</b>	0.190
17...25	32	50	50	D25 and D32	<b>LR2-D1522</b>	0.190
23...32	40	63	63	D25 and D32	<b>LR2-D2553</b>	0.345
17...25	32	50	50	D40...D95	<b>LR2-D3522</b>	0.535
23...32	40	63	63	D40...D95	<b>LR2-D3553</b>	0.535
30...40	50	100	80	D40...D95	<b>LR2-D3555</b>	0.535
37...50	63	100	100	D50...D95	<b>LR2-D3557</b>	0.535
48...65	80	125	100	D50...D95	<b>LR2-D3559</b>	0.535
55...70	100	125	125	D65...D95	<b>LR2-D3561</b>	0.535
63...80	100	160	125	D80 and D95	<b>LR2-D3563</b>	0.535

### Electronic differential thermal overload relays for use with fuses. Class 10 A or 20

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

Relay setting range	Fuses to be used with selected relay			For direct mounting beneath contactor	Reference	Weight
	aM	gG	LC1			
<b>A</b>	<b>A</b>	<b>A</b>				kg

#### Class 10 or 10A (1) with connection using bars or connectors

60...100	100	160	D115 and D150	<b>LR9-D5367</b>	0.885
90...150	160	250	D115 and D150	<b>LR9-D5369</b>	0.885

#### Class 20 (3) with connection using bars or connectors

60...100	125	160	D115 and D150	<b>LR9-D5567</b>	0.885
90...150	200	250	D115 and D150	<b>LR9-D5569</b>	0.885

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

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

Relay setting range	Fuses to be used with the selected relay			For direct mounting beneath contactor	Reference	Weight
	aM	gG	LC1			
<b>A</b>	<b>A</b>	<b>A</b>				kg

#### Class 10 A or 20 (1) selectable with connection using bars or connectors

60...100	100	160	D115 and D150	<b>LR9-D67</b>	0.900
90...150	160	250	D115 and D150	<b>LR9-D69</b>	0.900

(1) Standard IEC 947-4-1 specifies a tripping time for 7.2 times the setting current  $I_n$

class 10: between 4 and 10 seconds,

class 10 A: between 2 and 10 seconds,

class 20: between 6 and 20 seconds.

(2) Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page 2/90).

#### Other versions

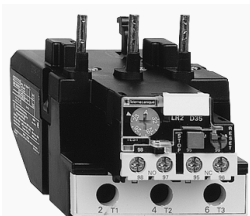
Thermal overload relays for resistive circuits in category AC-1.  
Please call our Customer information centre on 0870 608 8 608.



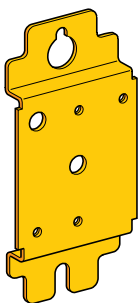
LR2-D1500



LR2-D2500

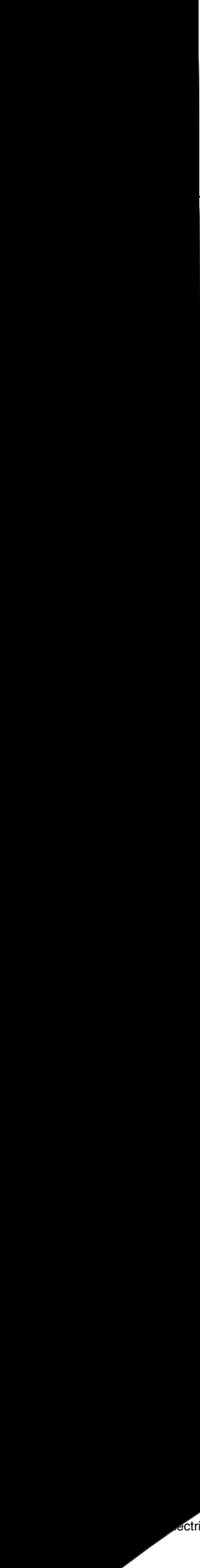


LR2-D3500



DX1-AP26



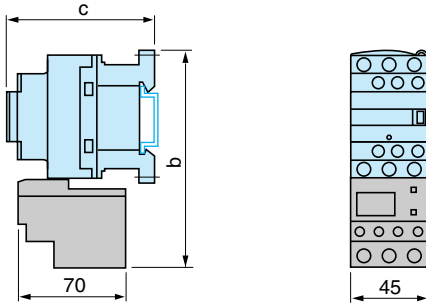




2

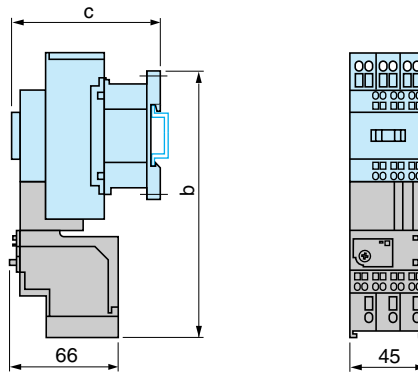
### LRD-01...35

Direct mounting beneath contactors with screw clamp connections



### LRD-013...353

Direct mounting beneath contactors with spring terminal connections



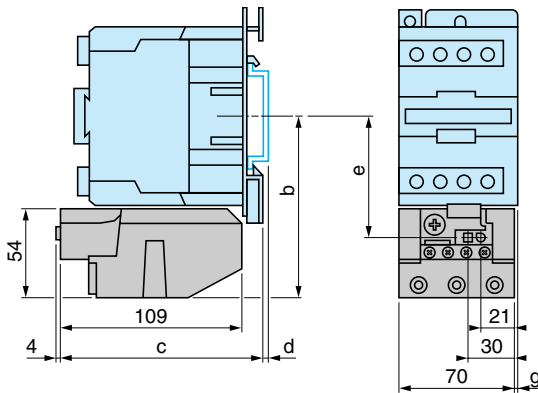
LC1-	D09...D18	D25...D38
b	123	137
c	see pages 2/94 and 2/95	

LC1-	D093...D383
b	168
c	see pages 2/94 and 2/95

2.3

### LRD-3●●●

Direct mounting beneath contactors  
LC1-D40 to D95 and LP1-D40 to D80



AM1-	DL201	DL200
d	7	17

	b	c	e	g (3P)	g (4P)
--	---	---	---	--------	--------

Control circuit: a.c.

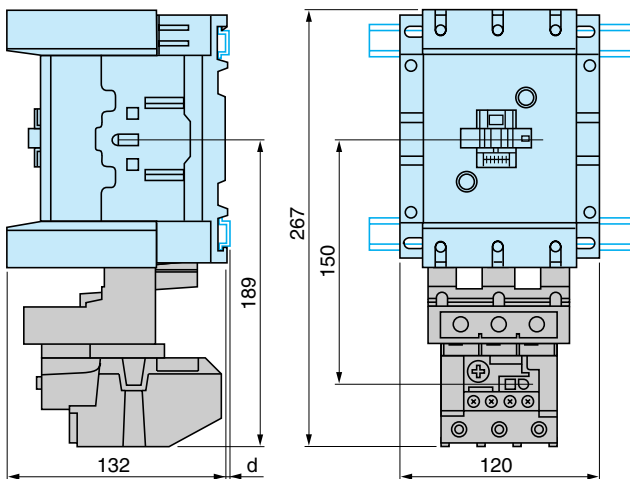
LC1-D40	111	119	72.4	4.5	13
LC1-D50	111	119	72.4	4.5	-
LC1-D65	111	119	72.4	4.5	13
LC1-D80	115.5	124	76.9	9.5	22
LC1-D95	115.5	124	76.9	9.5	-

Control circuit: d.c.

LC1-D40, LP1-D40	111	176	72.4	4.5	13
LC1-D50	111	176	72.4	4.5	-
LC1-D65, LP1-D65	111	176	72.4	4.5	13
LC1-D80, D95, LP1-D80	115.5	179.4	76.9	9.5	22

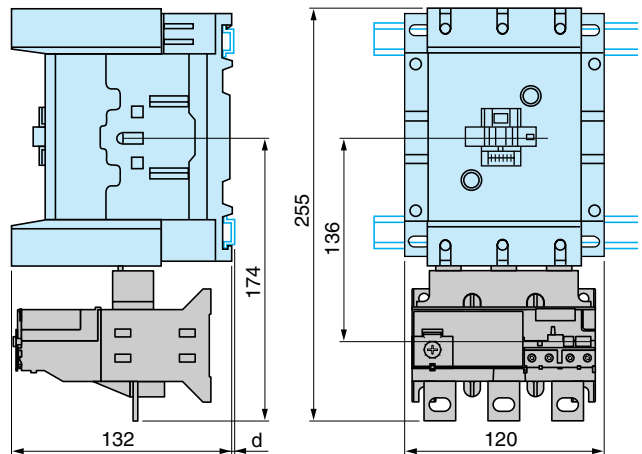
### LRD-4●●●

Direct mounting beneath contactors  
LC1-D115 and D150



### LR9-D

Direct mounting beneath contactors  
LC1-D115 and D150



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

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

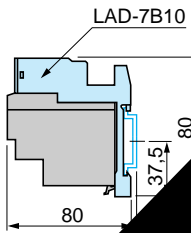
Characteristics:  
pages 2/108 to 2/111

References:  
pages 2/112 and 2/113

Schemes:  
page 2/119

**LRD-01...35**

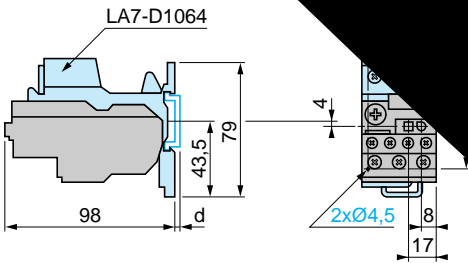
Independent mounting on 50 mm centres  
or on rail AM1-DP200 or DE200



(1) Can only be mounted on rail AM1-DE200

**LR2-D15●●**

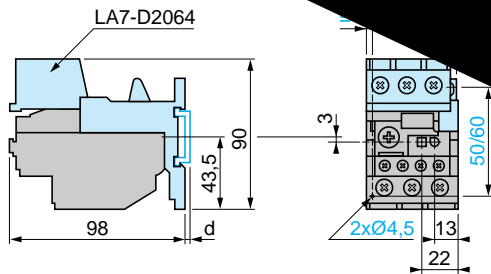
Independent mounting on 50 mm centres  
or on rail AM1-DP200 or DE200



	AM1-DP200	AM1-DE200
d	2	9.5

**LR2-D20●●**

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

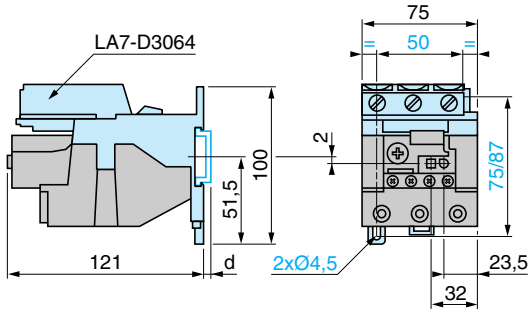


	AM1-DP200	AM1-DE200
d	2	9.5

(1) Can be mounted on RH or LH side of rail

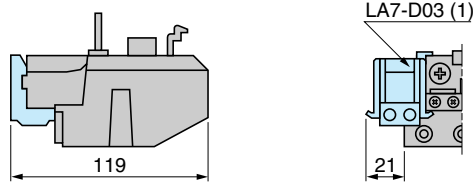
### LRD-3●●● and LR2-D35●●

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



### LRD-3●●●, LR2-D35●● and LR9-D

Remote tripping or electrical reset

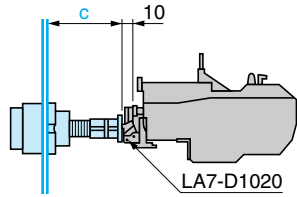


	AM1-DP200	AM1-DE200
d	2	9.5

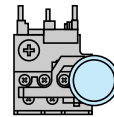
(1) Can be mounted on RH or LH side of relays LRD-3●●●, LR2-D35●● or LR9-D

### LR2-D and LRD-3●●●

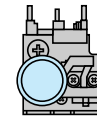
Adapter for door interlock mechanism  
LA7-D1020



Stop



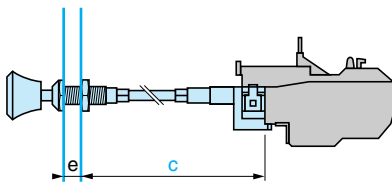
Reset



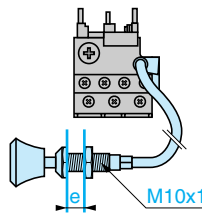
c: adjustable from 17 to 120 mm

### LRD, LR2-D and LR9-D

"Reset" by flexible cable  
LA7-D305 and LAD-7305  
Mounting with cable straight



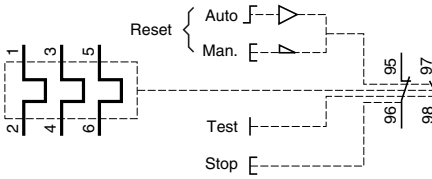
Mounting with cable bent



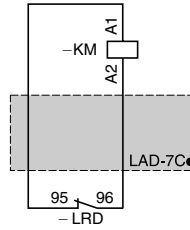
c: up to 550 mm  
e: up to 20 mm

e: up to 20 mm

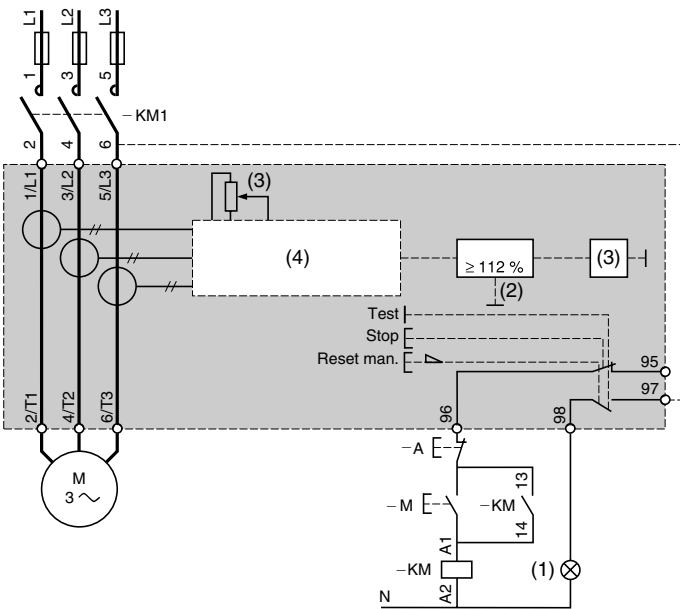
**LRD, LR2-D and LR3-D**



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

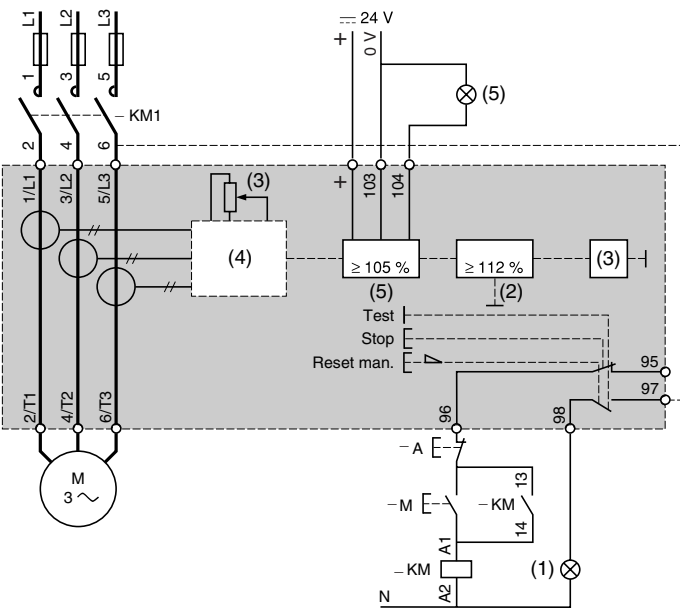


**LR9-D5**



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

**LR9-D67 and LR9-D69**



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

2

2.3