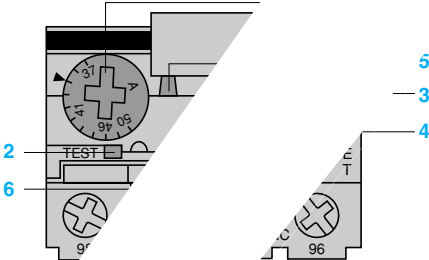


ation components
ad relays, model d

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

LRD-3322...4369, LR2-D



N/O an
ot affer

re supplied with the selector in the manual position,
o the automatic position.

Environment

Conforming to standards

Product certifications

Degree of protection	C
Protective treatment	Co.
Ambient air temperature around the device	Storage Normal Minimum (with derat.
Operating positions without derating	In relation
Shock resistance	Permiss
Vibration resistance	Permiss
Dielectric strength at 50 Hz	Conf C 25
Impulse withstand voltage	Conf IEC 801-5

Auxiliary contact character

Conventional thermal current

Maximum consumption of operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply
	d.c. supply

Short-circuit protection

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

Connection to screw 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

		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
(-1)	°C	- 20...+ 60
es	°C	- 40...+ 70
		Any position
3-2-7		15 gn - 11 ms
3-2-6		6 gn
	kV	6
	kV	6

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	—

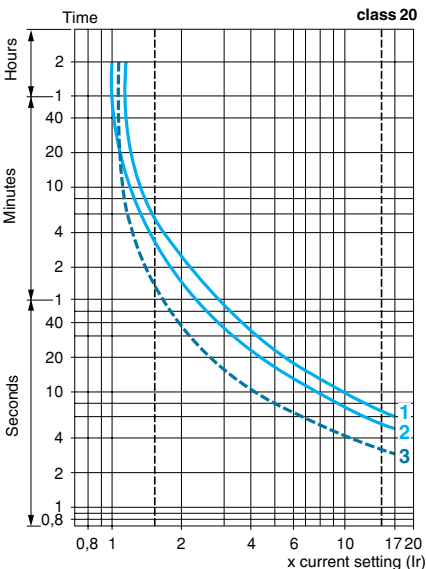
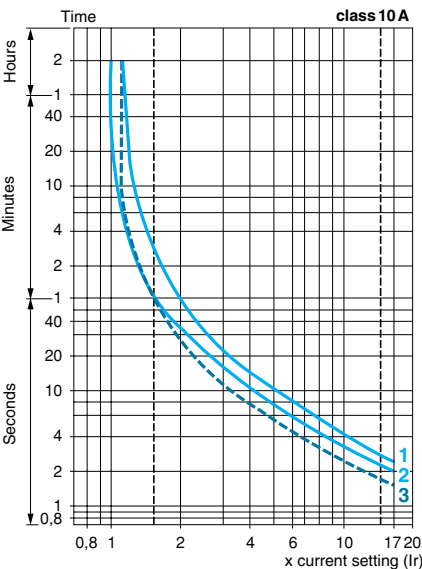
Electrical characteristics of power circuit

Relay type			LRD-01 to 16 LR3-D01 to D16	LR2-D15●●	LRD-21 to 35 LR3-D21 to D35	LR2-D25●●	LRD-3322 to 33696 LR3-D3322 to D33696	LR2-D35●●	LRD-4365 to 4369
Tripping class	To UL 508, EN 60947-4-1		10 A	20	10 A	20	10 A	20	10 A
Rated insulation voltage (Ui)	Conforming to EN 60947-4-1	V	690		690		1000		1000
	Conforming to UL, CSA	V	600		600		600		600 except LRD-4369
Rated impulse withstand voltage (Uimp)		kV	6		6		6		6
Frequency limits	Of the operational current	Hz	0...400		0...400		0...400		0...400
Setting range	Depending on model	A	0.1...13		12...38		17...104		80...140
Connection to screw clamp terminals Flexible cable without cable end	1 conductor	mm²	Min/max c.s.a. 1.5/10		1.5/10		4/35		4/50
	Flexible cable with cable end	mm²	1/4		1/6 except LRD-21: 1/4		4/35		4/35
	Solid cable without cable end	mm²	1/6		1.5/10 except LRD-21: 1/6		4/35		4/50
	Tightening torque	N.m	1.7		1.85		2.5		9
Connection to spring terminals Flexible cable without cable end	1 conductor	mm²	Min/max c.s.a. 1.5/4		1.5/4		—		—
	Solid cable without cable end	mm²	1.5/4		1.5/4		—		—

Operating characteristics

Temperature compensation		°C	- 20...+ 60	- 30...+ 60-	- 30...+ 60	- 20...+ 60
Tripping threshold	Conforming to EN 60947-4-1	A	1.14 ± 0.06 In			
Sensitivity to phase failure	Conforming to EN 60947-4-1		Tripping current 30 % of In on one phase, the others at In			
Tripping curves						

Average operating time
related to multiples of the
current setting



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

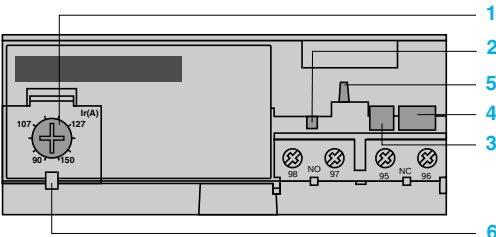
Description

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

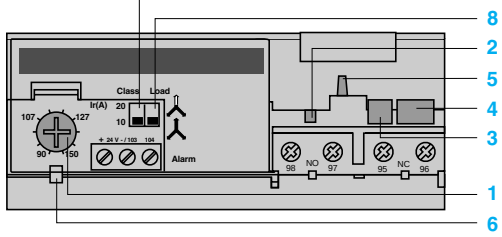
In addition to the protection provided by model d thermal overload relays (see page 2/108) they offer the following special features:

- 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



Environment

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

Electrical characteristics of auxiliary contacts

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

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

Electrical characteristics of power circuit

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

Operating characteristics

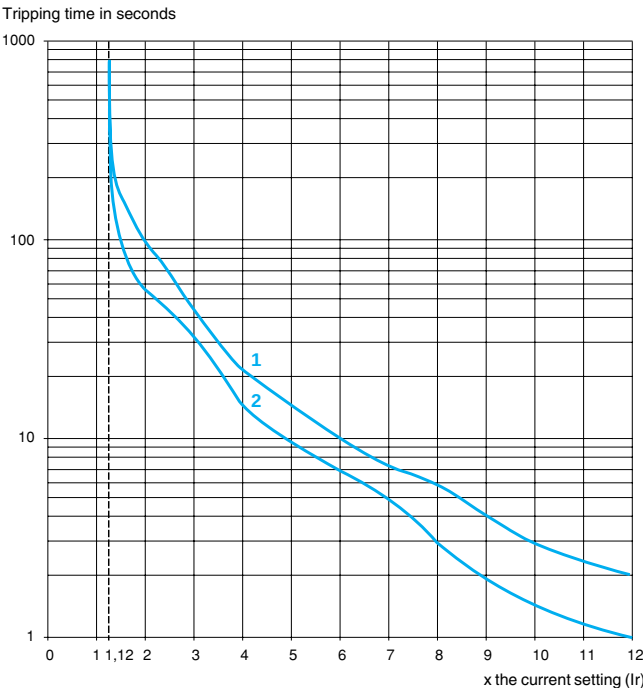
Temperature compensation		°C	- 20...+ 70	
Tripping thresholds	To EN 60947-4-1	Alarm	A	1.05 ± 0.06 In
		Tripping	A	1.12 ± 0.06 In
Sensitivity to phase failure	Conforming to EN 60947-4-1			Tripping in 4 s ± 20 % in the event of phase failure

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

Tripping curve LR9-D

Average operating time related to multiples of the current setting



1 Cold state curve
2 Hot state curve

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

2



LRD-08



LRD-21



LRD-33●●



LRD-083

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	Fuses to be used with selected relay			For use with contactor LC1-	Reference	Weight
A	aM	gG	BS88			kg

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

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

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

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

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

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

Thermal overload relays for use with unbalanced loads

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

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

Thermal overload relays for use on 1000 V supplies

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

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

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

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			
A	A	A	A	LC1		kg

Class 20 (1) for connection by screw clamp terminals

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

Electronic differential thermal overload relays for use with fuses. 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			
A	A	A	LC1		kg

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

60...100	100	160	D115 and D150	LR9-D5367	0.885
90...150	160	250	D115 and D150	LR9-D5369	0.885

Class 20 (3) with connection using bars or connectors

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

Electronic thermal overload relays for use with balanced or unbalanced loads

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

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

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

60...100	100	160	D115 and D150	LR9-D67	0.900
90...150	160	250	D115 and D150	LR9-D69	0.900

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

class 10: between 4 and 10 seconds,

class 10 A: between 2 and 10 seconds,

class 20: between 6 and 20 seconds.

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



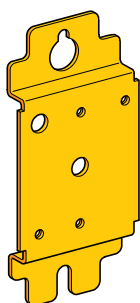
LR2-D1508



LR2-D2508



LR2-D3508

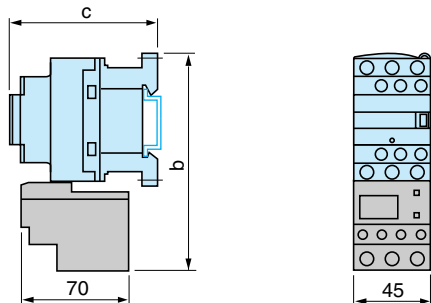


DX1-AP26



LRD-01...35

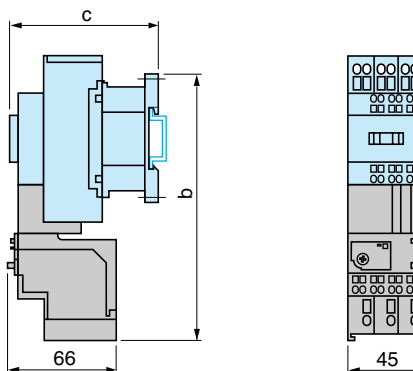
Direct mounting beneath contactors with screw clamp connections



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

LRD-013...353

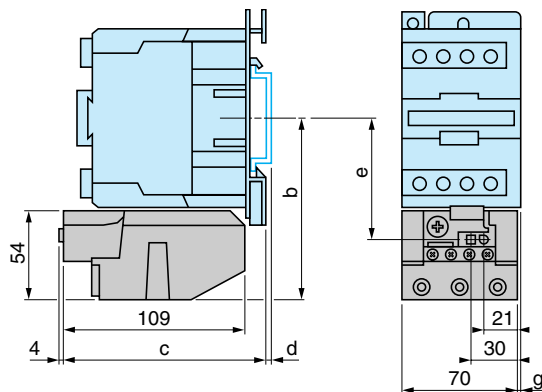
Direct mounting beneath contactors with spring terminal connections



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

LRD-3●●●

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



AM1-	DL201	DL200
d	7	17

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

Control circuit: a.c.

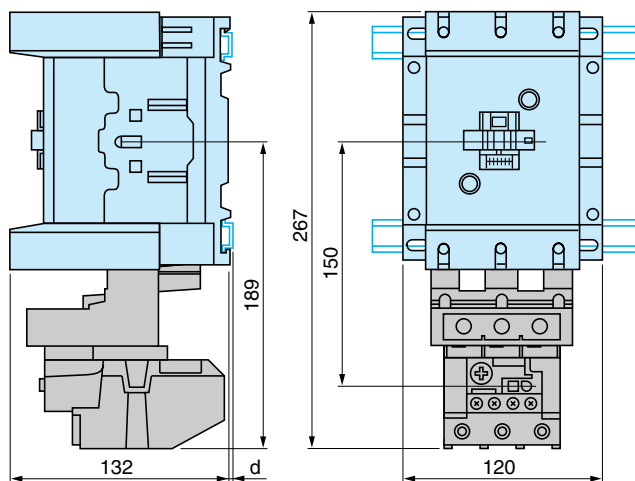
LC1-D40	111	119	72.4	4.5	13
LC1-D50	111	119	72.4	4.5	–
LC1-D65	111	119	72.4	4.5	13
LC1-D80	115.5	124	76.9	9.5	22
LC1-D95	115.5	124	76.9	9.5	–

Control circuit: d.c.

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

LRD-4●●●

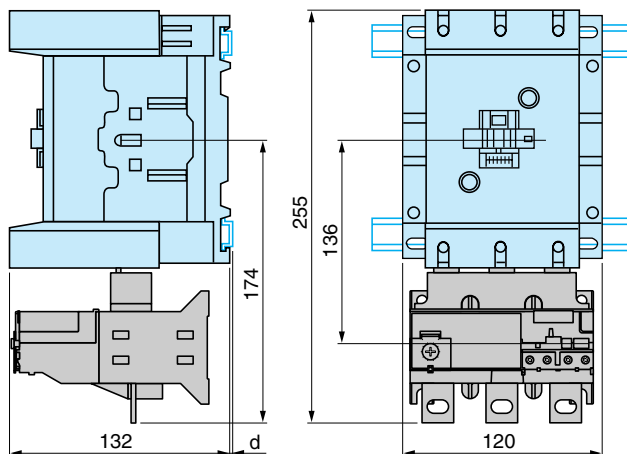
Direct mounting beneath contactors
LC1-D115 and D150



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

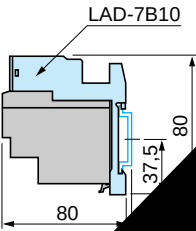
LR9-D

Direct mounting beneath contactors
LC1-D115 and D150

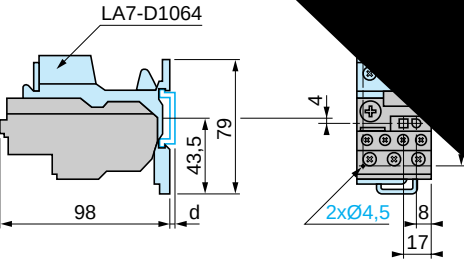


	AM1-DP200 and DR200	AM1-DE200 and ED●●●
d	2.5	10.5

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

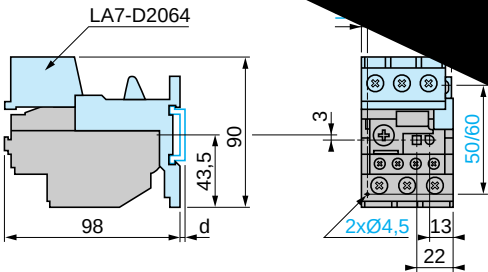


(1) Can only be mounted on rail AM1-DP200 or DE200
LR2-D15●●
Independent mounting on 50 mm centres
or on rail AM1-DP200 or DE200



	AM1-DP200	AM1-DE200
d	2	9.5

LR2-D20●●
Independent mounting on 50 mm centres
or on rail AM1-DP200 or DE200



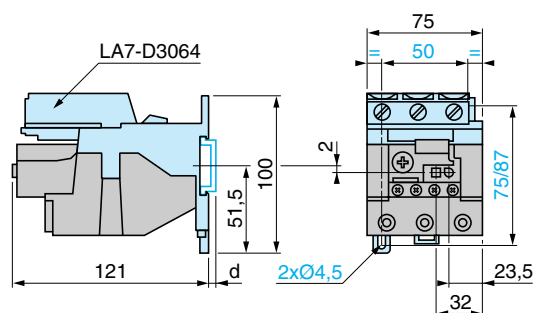
	AM1-DP200	AM1-DE200
d	2	9.5

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

2

LRD-3●●● and LR2-D35●●

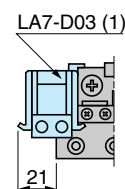
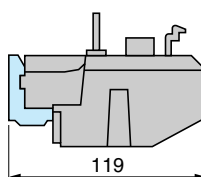
Independent mounting on 50 mm centres
or on mounting rail AM1-DP200 or DE200



	AM1-DP200	AM1-DE200
d	2	9.5

LRD-3●●●, LR2-D35●● and LR9-D

Remote tripping or electrical reset

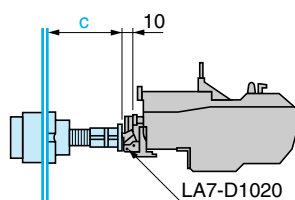


(1) Can be mounted on RH or LH side of relays LRD-3●●●, LR2-D35●● or LR9-D

2.3

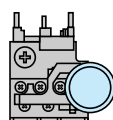
LR2-D and LRD-3●●●

Adapter for door interlock mechanism
LA7-D1020

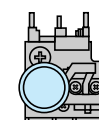


c: adjustable from 17 to 120 mm

Stop

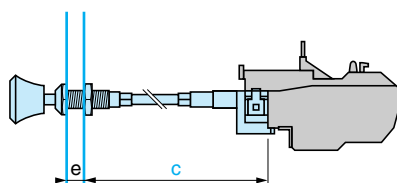


Reset



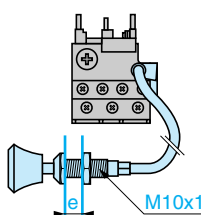
LRD, LR2-D and LR9-D

ERD, ER2-D and ER3-D
 "Reset" by flexible cable
 LA7-D305 and LAD-7305
 Mounting with cable straight



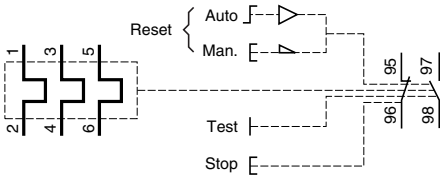
c:	up to 550 mm
e:	up to 20 mm

Mounting with cable bent

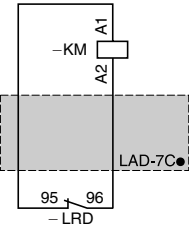


e: up to 20 mm

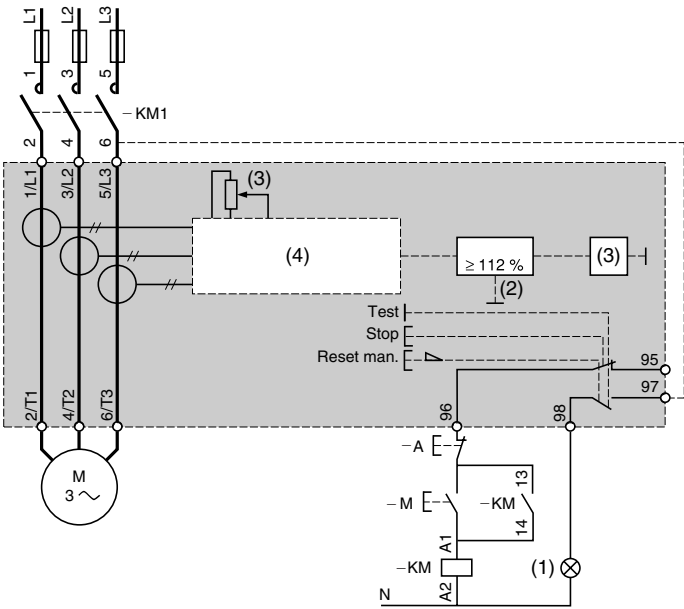
LRD, LR2-D and LR3-D



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

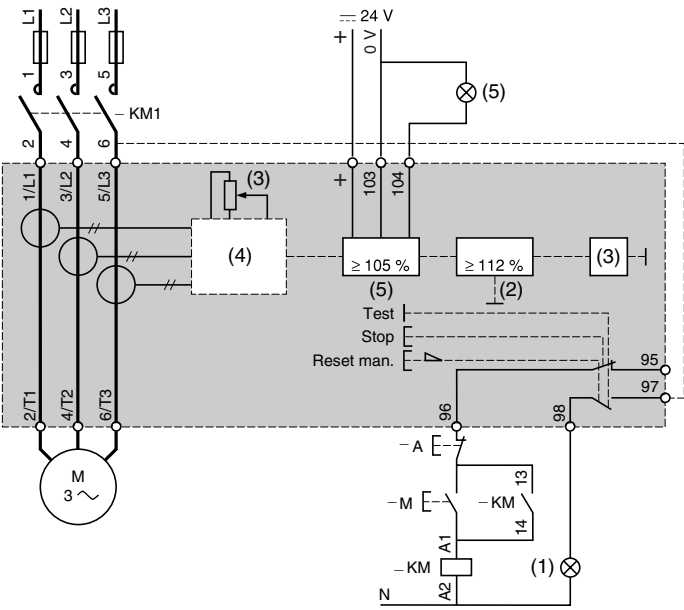


LR9-D5●●●



- (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