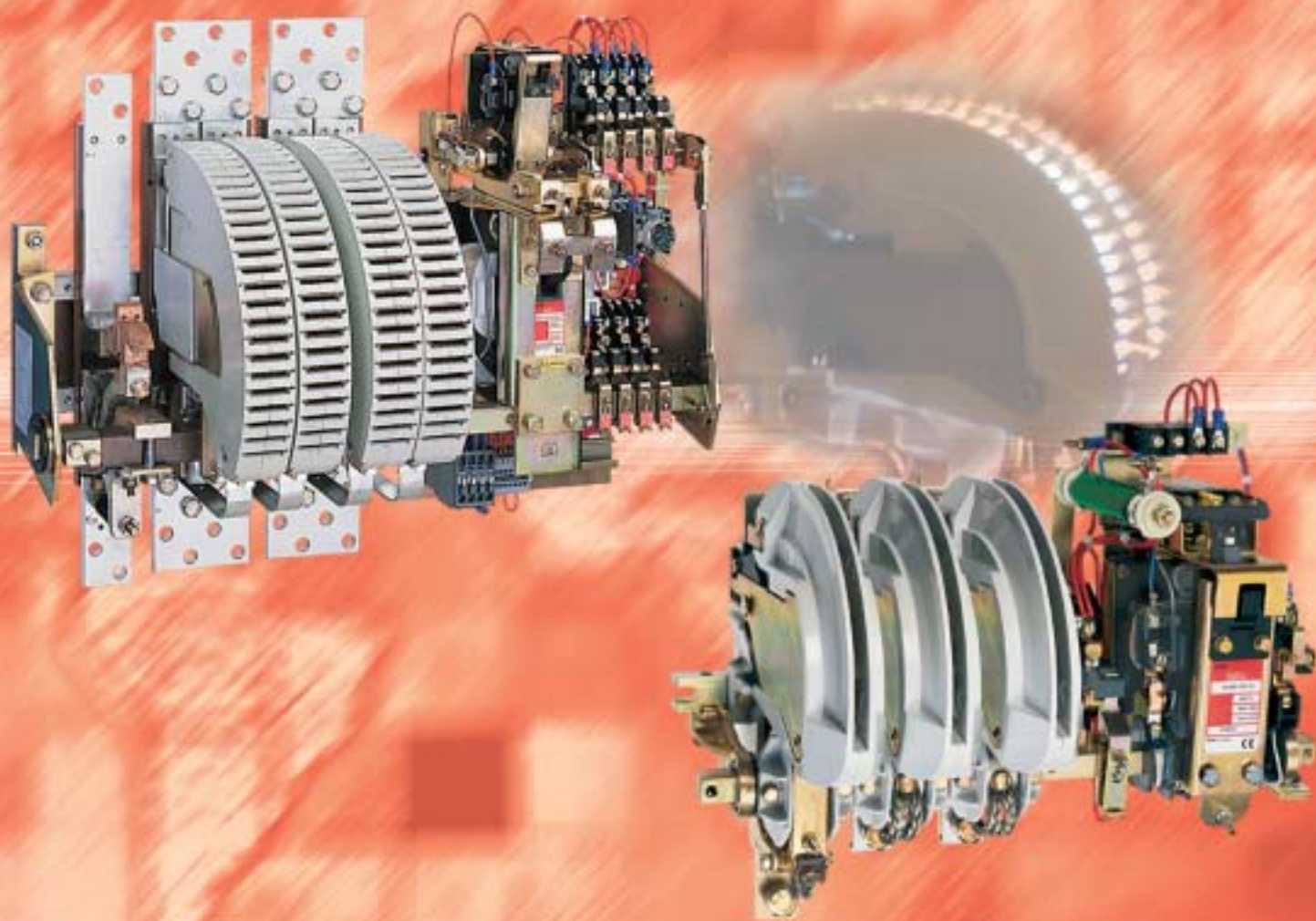






R.. Series Contactors

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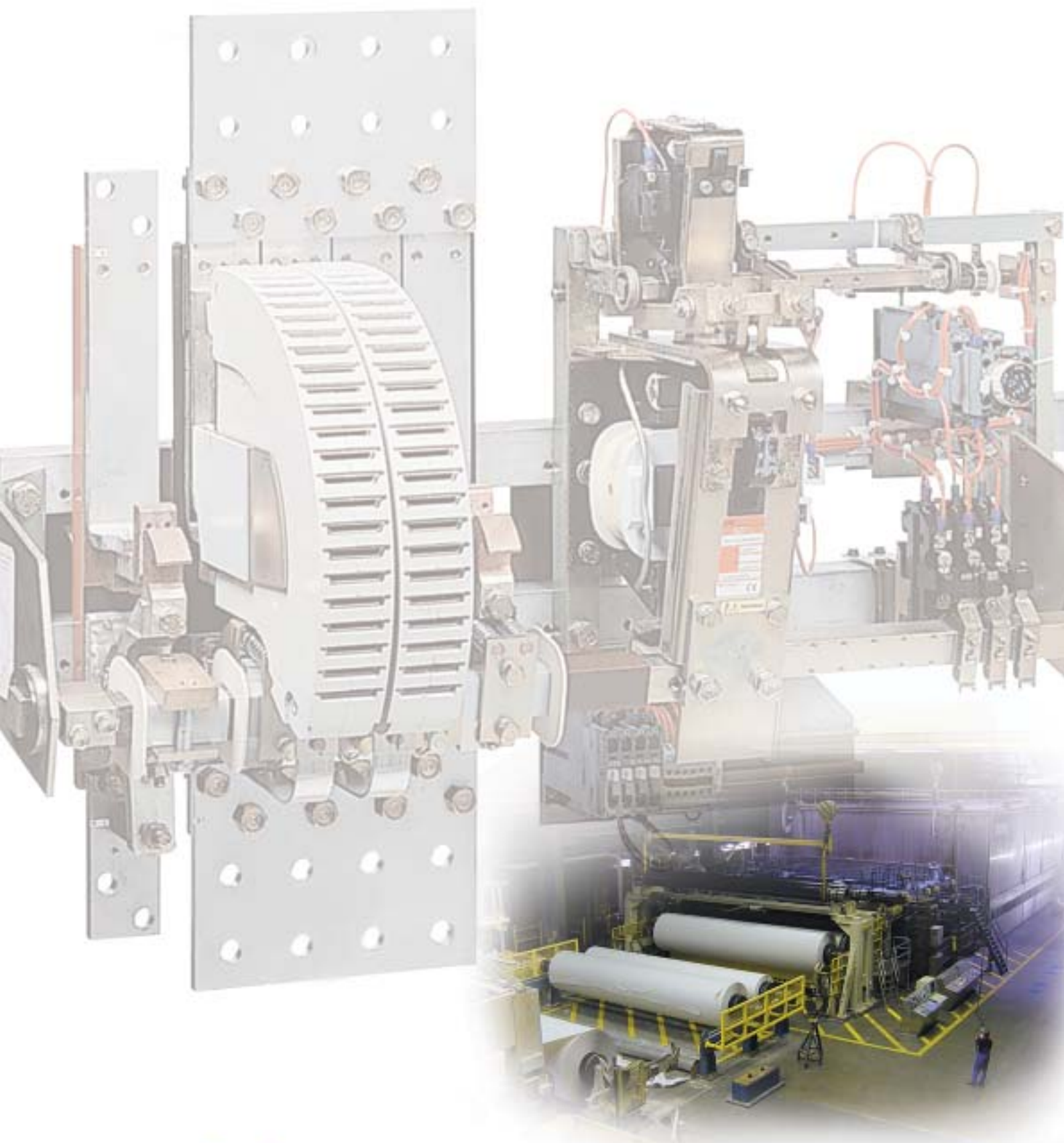
9

As part of its on-going product improvement, ABB reserves the right to modify the characteristics of the products described in this catalogue. The information given is not contractual. For further details please contact the ABB company marketing these products in your country.

"Long-lasting operation for

R.. Series

Control of power circuits



demanding applications"

Contactors

and motors in a.c. and d.c.



refineries and off-shore platforms, energy distribution systems...

R.. Series Contactors

Contactors and Overload Relays

a.c. Circuit Switching

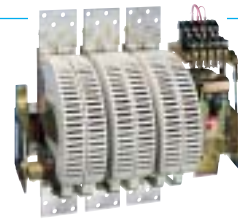


1 to 4 main poles - 500 V a.c.

Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	85 ... 1500 A	IOR...	2/8
a.c. - supply via a rectifier	85 ... 4000 A	IORR...	2/8
d.c. - supply via an economy resistor	85 ... 4000 A	IORE...	2/9
d.c. - direct supply (solid magnetic circuit)	85 ... 2000 A	IORC...	2/10

2



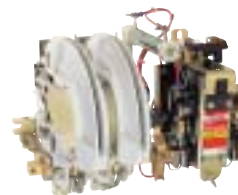
1 to 4 main poles - 1000 V a.c.

Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	63 ... 1500 A	IOR...-MT	2/11
a.c. - supply via a rectifier	63 ... 4000 A	IORR...-MT	2/11
d.c. - supply via an economy resistor	63 ... 4000 A	IORE...-MT	2/12
d.c. - direct supply (solid magnetic circuit)	63 ... 2000 A	IORC...-MT	2/13

2

d.c. Circuit Switching

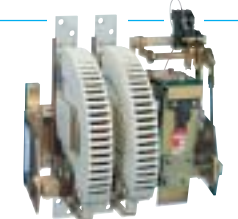


1 or 2 main poles - 440 V d.c.

Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	85 ... 1500 A	IOR...	2/14
a.c. - supply via a rectifier	85 ... 4000 A	IORR...	2/14
d.c. - supply via an economy resistor	85 ... 4000 A	IORE...	2/14
d.c. - direct supply (solid magnetic circuit)	85 ... 800 A	IORC...	2/14

2

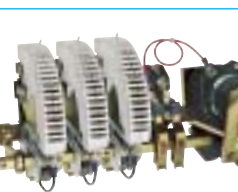


1 to 3 main poles - 1000 V d.c.

Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	63 ... 1500 A	IOR...-CC	2/15
a.c. - supply via a rectifier	63 ... 4000 A	IORR...-CC	2/15
d.c. - supply via an economy resistor	63 ... 4000 A	IORE...-CC	2/15
d.c. - direct supply (solid magnetic circuit)	63 ... 800 A	IORC...-CC	2/15

2



1 to 3 main poles - 1500 V d.c.

Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	63 ... 800 A	IOR...-CC	2/16
a.c. - supply via a rectifier	63 ... 4000 A	IORR...-CC	2/16
d.c. - supply via an economy resistor	63 ... 4000 A	IORE...-CC	2/16
d.c. - direct supply (solid magnetic circuit)	63 ... 800 A	IORC...-CC	2/16

2

a.c./d.c. Circuit Protection



Overload Relays

Add-on auxiliary contacts (1 N.O. / 1 N.C.)

Protection type	Setting	Types	Pages
Thermal magnetic for a.c. circuits 3-pole, 3-poles + Neutral, or 4-pole	0.5 ... 2000 A	RKR...	4/6
Magnetic for d.c. circuits 1-pole	2 ... 3800 A	RCR 1...	4/10

4

Specific Contactors

a.c./d.c.
Switching
N.C./N.O.
Main Poles



1 to 4 N.C./N.O. poles (break before make) - 500 V a.c. or 440 V d.c.

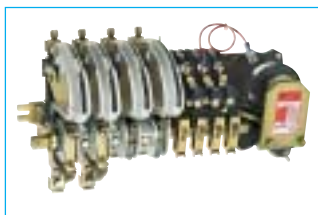
Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	63 ... 315 A	NOR...	2/18
a.c. - supply via a rectifier	63 ... 800 A	NORR...	2/18
d.c. - supply via an economy resistor	63 ... 800 A	NORE...	2/19

Variants on request: main poles for 1000 V a.c. (MT) and 1000/1500 V d.c. (CC)

2

1



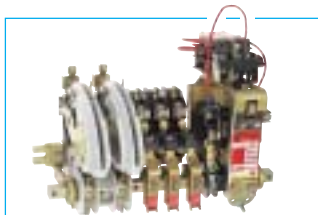
2 to 4 N.C./N.O. poles (make before break) - 230 V a.c. or 48 V d.c.

Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	63 ... 315 A	JOR...	2/21
a.c. - supply via a rectifier	63 ... 800 A	JORR...	2/21
d.c. - supply via an economy resistor	63 ... 800A	JORE...	2/22
d.c. - direct supply (solid magnetic circuit)	63 ... 800 A	JORC...	2/22

2

a.c./d.c.
Switching
Magetical
Latching



1 to 4 main poles - 500 V a.c. or 440 V d.c.

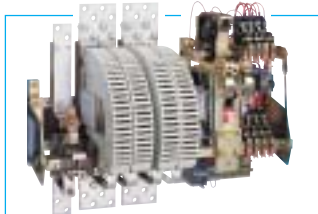
Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - supply via a rectifier	85 ... 550 A	IORR...-AMA	2/24
d.c. - direct supply	85 ... 550 A	IOR...-AMA	2/24

Variants on request: main poles for 1000 V a.c. (MT-AMA) and 1000/1500 V d.c. (CC-AMA)

2

a.c./d.c.
Switching
Mechanical
Latching



1 to 4 main poles - 500 V a.c. or 440 V d.c.

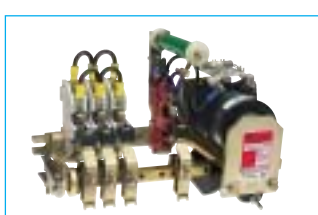
Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	420 ... 2000 A	IOR...-AME	2/26
a.c. - supply via a rectifier	420 ... 2000 A	IORR...-AME	2/26
d.c. - supply via an economy resistor	420 ... 2000 A	IORE...-AME	2/27

Variants on request: main poles for 1000 V a.c. (MT-AME) and 1000/1500 V d.c. (CC-AME)

2

a.c./d.c.
Switching
Control
Circuits



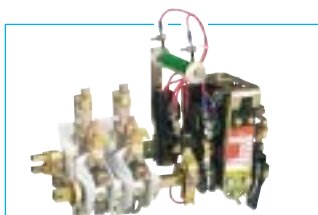
Contactor Relays - 600 V a.c. or d.c.

Up to 15 N.O. or N.C. standard contacts and 4 N.O. + N.C. timed contacts

Control circuit	Contacts	Types	Pages
a.c. - direct supply	adjustable	KOR...	2/59
a.c. - supply via a rectifier	adjustable	KORR...	2/59
d.c. - supply via an economy resistor	adjustable	KORE...	2/59
d.c. - direct supply (solid magnetic circuit)	adjustable	KORC...	2/59

2

a.c./d.c.
Coupling



1 to 3 main poles - 1000 V a.c. or d.c.

Auxiliary contacts on request

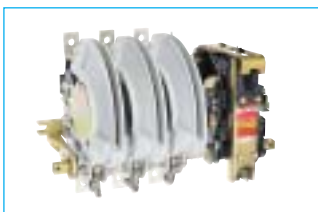
Control circuit	Ratings	Types	Pages
a.c. - direct supply	85 ... 2000 A	LOR...	5/4
a.c. - supply via a rectifier	85 ... 4000 A	LORR...	5/4
d.c. - supply via an economy resistor	85 ... 4000 A	LORE...	5/5
d.c. - direct supply (solid magnetic circuit)	85 ... 800 A	LORC...	5/6

5

R.. Series Contactors

Contactors and Specific Applications

Star-Delta Starting



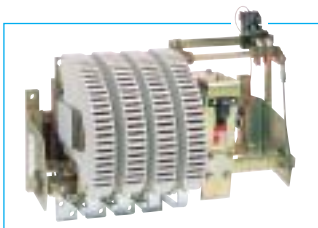
Main, Star and Delta Contactors

3 main poles - Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	85 ... 1250 A	IOR...	2/56
a.c. - supply via a rectifier	85 ... 1250 A	IORR...	2/56
d.c. - supply via an economy resistor	85 ... 1250 A	IORE...	2/56
d.c. - direct supply (solid magnetic circuit)	85 ... 1250 A	IORC...	2/56

2

Slip-Ring Motor Control



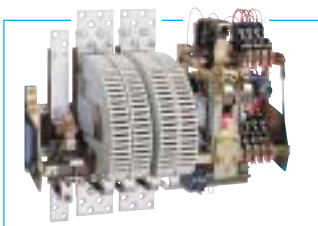
Stator, Rotor Short-Circuit and Acceleration Contactors

2 ... 4 main poles - Up to 3500 V a.c. - Auxiliary contacts on request

Control circuit	Ratings	Types	Pages
a.c. - direct supply	85 ... 3150 A	IOR/FOR	2/57
a.c. - supply via a rectifier	85 ... 3150 A	IORR/FORR	2/57
d.c. - supply via an economy resistor	85 ... 3150 A	IORE/FORE	2/57
d.c. - direct supply (solid magnetic circuit)	85 ... 3150 A	IORC	2/57

2

Alternator Field Discharge



2 or 3 N.O. Main Poles + 1 N.C. Main Pole - 1500 V d.c.

Up to 12 auxiliary contacts

Control circuit	Ratings	Types	Pages
a.c. or d.c.	80 ... 4000 A	AM-CC-JOR	2/58
a.c. or d.c. - with 2 tripping coils	80 ... 4000 A	AMF-CC-JOR	2/58

2

Conformity with Standards

The standards and specifications cited for different types of devices, e.g. IEC, BS, VDE, NFC, EN Publications, should be considered as statements of conformity in the sense of article 10 of the E.E.C. Low Voltage Directive of 19 February 1973.

There is no label on ABB Low Voltage Control Apparatus identifying a national certification organization. The ABB logo figuring on devices, labels and documents certifies the conformity of devices with respect to the applicable standards.

CE marking is proof of conformity with the European Directives concerning the product. It must not be confused with a mark of quality.

CE marking is part of an administrative procedure designed to guarantee the free movement of the product inside the European Community.



As a key element of its business strategy, ABB has committed to a broad program of product development and positioning under the **Industrial^{IT}** umbrella.

Most of the Low Voltage Products have already been **Industrial^{IT}** enabled by the designation of **Control^{IT}**.

Liability

The devices in this catalogue do not endanger safety when they are installed, mounted and used according to their application and in compliance with the installation rules and standards which apply to them.

Quality

ABB has set up a quality assurance organisation in compliance with the requirements of ISO 9001 standard.

ABB factories are ISO 9001 approved.

ABB Low Voltage Control Apparatus meet with a high quality standard. It is developed, manufactured and tested under the sole responsibility of ABB. **Our test platforms benefit from a quality assurance organisation accredited as per standard ISO/IEC 17025.**

In compliance with the regulations set out by the ISO 9000 series standard, ABB sets up and manages the procedures and files relating to product quality and actions having an effect on quality.

Guarantee

The information contained in this catalogue reflects the current state of our knowledge and aims to present our products and their possible applications. Thus, the information does not guarantee certain specific characteristics of products or their aptitude for a specific utilization. All filed legal patents or industrial property rights must be respected.

Sustainable Development

In 1999, ABB extended its Environment Management Programme to all the principles of the Corporate Charter for Sustainable Development. **All concerned factories are ISO 14001 certified.**

Eco-design

Some environmental information is accessible on ABB Website.

 www.abb.com/sustainability  select in left menu: "ABB's environmental policy".

Environmental product declarations can be issued upon customer's request.



Packing

Generally speaking, the diversification of reusable packing satisfies ecological requirements and the specific needs of our customers.

Packing is designed and produced with a continuous concern for respect of the environment.

For instance, polystyrene packing materials are replaced by recyclable wrapping materials with an efficient protection of our products during their transportation.

R.. Series Contactors

Application

R.. series contactors, and variants described in this catalogue, are used for controlling motors, and generally for controlling power circuits, up to 500/1000 **V a.c.** or 440/1000/1500 **V d.c.**

The **R..** series contactors can be used, and adapted, for many industrial applications with high performances and severe operating conditions.

☞ "Overview", pages 1/10, 1/11

Presentation

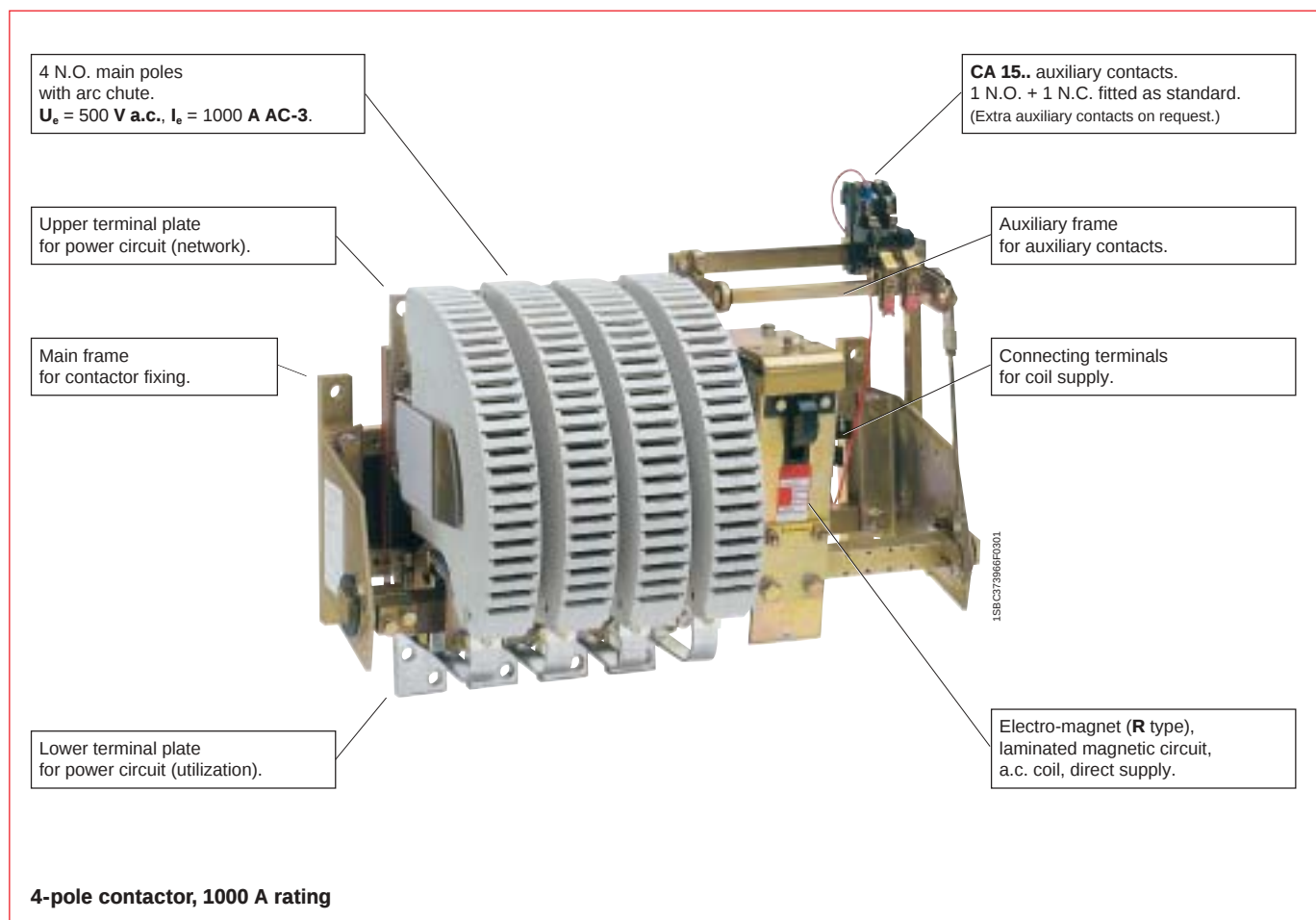
R.. series contactors, and variants (contactors with N.C. + N.O. poles, couplers...) are designed with common standard components.

☞ "Construction", page 1/9 and "Description", pages 2/3 ... 2/5.

With the combination of these elements, and the adaptation possibilities, special versions can be provided.

Based on a simple and sturdy construction this type of contactor is suitable for intensive duty and a high number of operations.

All component parts are easily accessible and removable from the front.



R.. Series Contactors

1

Construction

Each contactor comprises of:

The frame

- 1 main frame for all ratings, between 63 to 4100 A
- 1 auxiliary frame for 800 to 4100 A ratings

The main poles

They are defined by:

- the rated operational voltage U_e
- their number, according to the power circuit
- N.O. or N.C. function, according to the application

The auxiliary contacts

All **R** series contactors have 1 N.O. auxiliary contact (except **AME** mechanically latched version) and 1 N.C. auxiliary contact (except **AMA** magnetically latched and **AME** mechanically latched versions) fitted as standard.

On request, all contactors can be provided with extra auxiliary contacts. ➡ "Auxiliary Contact Allocation", page 2/7

The electro-magnet

1 electro-magnet (2 electro-magnets if necessary) for a.c. operation or d.c. operation.

Different types of electro-magnets and their variants are proposed below.

Supply Source	Utilization	Electro-magnet characteristics				Electro-magnet (standard) Type	Electro-magnet with latching:	
		Magnetic circuit	Coil	Economy resistor	Rectifier		Magnetical Type	Mechanical Type
	50 or 60 Hz Stable supply.	Laminated		–	–	R	RR..-AMA	R..-AME
	50 ... 400 Hz High closing power of the contactor. Fluctuating supply.	Laminated		yes	yes	RR	RR..-AMA	RR..-AME
	–	Laminated		yes	–	RE	R..-AMA	RE..-AME
	High switching frequency. High durability. Low consumption. Coil without inrush peak.	Solid-core		–	–	RC	–	–

Symbols (for details, ➡ page 2/2)

Description	Power circuit	Main poles		Control circuit supply 		Control circuit supply 	
		Operational voltage U_e	Function	a.c. coil direct supply	d.c. coil supply via a rectifier	d.c. coil + economy resistor	d.c. coil direct supply
Contactor		500 V a.c.	N.O.	IOR..	IORR..	IORE..	IORC..
		1000 V a.c.	N.O.	IOR..-MT	IORR..-MT	IORE..-MT	IORC..-MT
		440 V d.c.	N.O.	IOR..	IORR..	IORE..	IORC..
		1000 V d.c.	N.O.	IOR..-CC	IORR..-CC	IORE..-CC	IORC..-CC
Contactor - N.C./N.O. break before make (or N.C. poles only)		500 V a.c.	N.C./N.O.	NOR..	NORR..	NORE..	–
		1000 V a.c.	N.C./N.O.	NOR..-MT	NORR..-MT	NORE..-MT	–
		440 V d.c.	N.C./N.O.	NOR..	NORR..	NORE..	–
		1000 V d.c.	N.C./N.O.	NOR..-CC	NORR..-CC	NORE..-CC	–
Contactor - N.C./N.O. make before break (or N.C. poles only)		500 V a.c.	N.O. }	JOR..	JORR..	JOE..	JORC..
		230 V a.c.	N.C. }				
		48 V d.c.	N.C./N.O.	JOR..	JORR..	JOE..	JORC..
Coupler		1000 V a.c.	N.O.	LOR..	LORR..	LORE..	LORC..
		1000 V d.c.	N.O.	LOR..	LORR..	LORE..	LORC..

* Increased insulation version for 1000 V d.c. $\leq U_e < 1500$ V d.c. Please consult us.

Contactors for specific applications:

- **FOR..** Specific contactor for control of slip-ring motors (➡ page 2/57)
- **AM-CC..** Specific contactor for field discharge of synchronous machines (➡ page 2/58)
- **KOR..** Contactor relay (➡ page 2/59)

>> Detailed Description pages 2/3 ... 2/5

R series contactors with



Alternating current $U_e \text{ max.} = 500 \text{ V a.c.}$

Power AC-3, 400 V			40 kW	80 kW	132 kW	200 kW	300 kW
Control circuit	Coil supply	Type					
	Direct	IOR	R 85	R 170	R 260	R 420	R 550
	Via a rectifier	IORR	RR 85	RR 170	RR 260	RR 420	RR 550
	Via an economy resistor	IORE	RE 85	RE 170	RE 260	RE 420	RE 550
	Direct	IORC	RC 85	RC 170	RC 260	RC 420	RC 550
Current AC-3, 400-415 V			77	150	245	370	550
500 V			A	73	130	245	370
Current AC-1, 40 °C			A	85	170	260	400
							550

Alternating current $U_e \text{ max.} = 1000 \text{ V a.c.}$

Power AC-3, 690 V			80 kW	150 kW	240 kW	540 kW
Control circuit	Coil supply	Type				
	Direct	IOR...-MT	R 63-MT	R 125-MT	R 200-MT	R 500-MT
	Via a rectifier	IORR...-MT	RR 63-MT	RR 125-MT	RR 200-MT	RR 500-MT
	Via an economy resistor	IORE...-MT	RE 63-MT	RE 125-MT	RE 200-MT	RE 500-MT
	Direct	IORC...-MT	RC 63-MT	RC 125-MT	RC 200-MT	RC 500-MT
Current AC-3, 690 V			85	160	260	550
1000 V			A	56	105	180
Current AC-1, 40 °C			A	85	170	260
						550

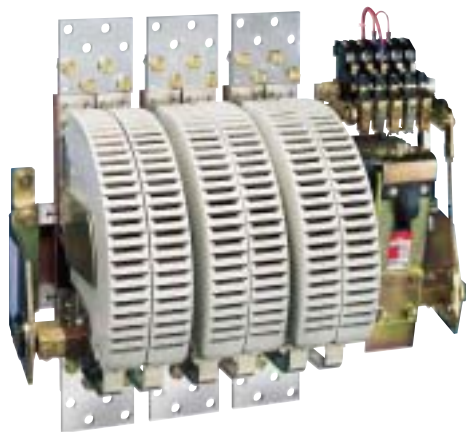
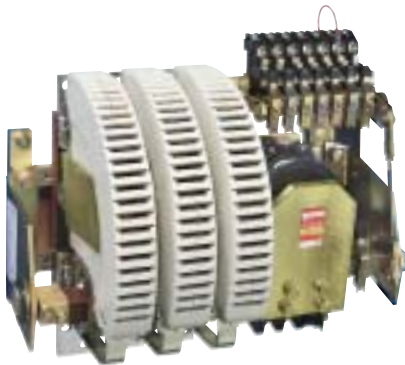
Direct current $U_e \text{ max.} = 1500 \text{ V d.c.}$

Power DC-3, DC-5, 1000 V			68 kW	125 kW	205 kW	500 kW
Control circuit	Coil supply	Type				
	Direct	IOR...-CC	R 63-CC	R 125-CC	R 200-CC	R 500-CC
	Via a rectifier	IORR...-CC	RR 63-CC	RR 125-CC	RR 200-CC	RR 500-CC
	Via an economy resistor	IORE...-CC	RE 63-CC	RE 125-CC	RE 200-CC	RE 500-CC
	Direct	IORC...-CC	RC 63-CC	RC 125-CC	RC 200-CC	RC 500-CC
Current DC-3, DC-5, 1000 V, 2 poles in series			68	125	205	500
with increased insulation: 1500 V, 3 poles in series			A	68	125	205
Current DC-1, 1000 V, 2 poles in series			A	85	170	275
						550

Variants and accessories

- NOR, JOR contactors with N.O. + N.C. main poles and LOR couplers
- CA 12, CA 15 standard auxiliary contacts

variable number of poles



	450 kW	630 kW	710 kW	850 kW	1120 kW		
	R 800 RR 800	R 1000 RR 1000	R 1250 RR 1250	R 1500 RR 1500	– RR 2000	– RR 3150	– RR 4000
	RE 800 RC 800	RE 1000 –	RE 1250 –	RE 1500 –	RE 2000 –	RE 3150 –	RE 4000 –
	800 800 900	1000 1000 1000	1250 1250 1250	1500 1500 1500	2000 2000 2300	– – 3400	– – 4100

	780 kW	1450 kW	1900 kW		
	R 800-MT RR 800-MT	R 1500-MT RR 1500-MT	– RR 2000-MT	– RR 3150-MT	– RR 4000-MT
	RE 800-MT RC 800-MT	RE 1500-MT –	RE 2000-MT –	RE 3150-MT –	RE 4000-MT –
	800 580 800	1500 1100 1500	1950 1500 2000	– – 3000	– – 3800

	720 kW				
	R 800-CC RR 800-CC	R 1500-CC RR 1500-CC	– RR 2000-CC	– RR 3150-CC	– RR 4000-CC
	RE 800-CC RC 800-CC	RE 1500-CC –	RE 2000-CC –	RE 3150-CC –	RE 4000-CC –
	720 720 800	please consult us please consult us 1500	please consult us please consult us 2000 (3 poles in serie)	– – please consult us	– – please consult us

● VM interlock unit

● TP timed auxiliary contacts

● AMA magnetical latching, AME mechanical latching

● RKR thermal magnetic O/L relay (a.c.) or RCR magnetic O/L relay (d.c.)

R.. Series Contactors

Codes for Completing Order Codes

Coil Voltage Code

U_e voltage acc. to the electro-magnet type.

R R..-AME 50 Hz	R R..-AME 60 Hz	Code	RE RE..-AME
RR RR..-AMA RR..-AME 50-60 Hz			RC R..-AMA
V a.c.	V a.c.	R □ .. □	V d.c.
24 ⁽¹⁾	—	0 1	24
—	24 ⁽²⁾	4 2	—
—	—	1 4	30
32 ⁽¹⁾	—	1 5	—
—	—	1 6	36
42	—	0 2	42
48	48	1 7	48
—	110	0 3	60
60	—	1 9	—
—	—	2 0	75
100	115-120	2 2	—
110-115	—	0 4	110
120	—	2 3	120
—	220	0 5	125-130
127	—	2 4	—
—	200	2 6	—
—	208	2 7	185
200	240	2 8	—
210	—	4 5	—
220-230	—	0 6	220
—	—	4 6	230
230-240	—	2 9	240
250	—	4 0	250
380-400	—	0 7	380
400	—	3 9	400
—	440	4 4	—
400-415	500	3 4	—
440	480	3 5	440
500 ⁽³⁾	600	0 8	500 ⁽³⁾
550 ⁽³⁾	—	3 6	550 ⁽³⁾
600 ⁽³⁻⁴⁾	—	3 7	600 ⁽³⁾

Note: In the cases below, select an other coil according to the indicated values for U_e voltage.

- R 800 to R 1500: 42 V min.
R 800..-MT to R 1500..-MT: 42 V min.
R 800..-CC to R 1500..-CC: 42 V min.
- R 800 to R 1500: 48 V min.
R 800..-MT to R 1500..-MT: 48 V min.
R 800..-CC to R 1500..-CC: 48 V min.
- R..-AMA and RR..-AMA: 440 V max.
- RR 85 to RR 4000: 550 V max.
RR 85..-MT to RR 4000..-MT: 550 V max.
RR 85..-CC to RR 4000..-CC: 550 V max.

Coil Frequency Code

(for R, R..-MT, R..-CC and R..-AME types only)

FPL □ □ □ □ □ □ □ □	R □ □ □ □ □
R, R..-MT, R..-AME	1 = 50 Hz 7 = 60 Hz
R..-CC	2 = 50 Hz 8 = 60 Hz

Code for Extra Auxiliary Contacts

Number of CA 12.. or CA 15.. contacts and TP.. timers, according to the electro-magnet type.

R, RR, RE (63 ... 630 A ratings) R..-AMA	Code
TP CA12-1 CA12-2 CA15F CA15O	R. □ □.
NO + NC 2 x NO NO NC	
— — — — —	0 0
— 1 — — —	1 1
— 1 — — 1	1 2
— 1 — — 2	1 3
— — 1 — —	2 0
— 1 — 1 —	2 1
— 2 — — —	2 2
— — 1 1 —	3 0
— 1 1 — —	3 1
— 3 — — —	3 3
— — 2 — —	4 0
— 2 1 — —	4 2
— 1 2 — —	5 1
— — 3 — —	6 0
— 1 — 1 1	6 1
— 1 — 2 2	6 2
— — 1 1 1	6 3
— — 1 2 —	6 4
— — 1 2 2	6 5
— — 1 4 —	6 6
— — 1 3 1	6 7
1 — — — —	6 8
1 1 — — —	6 9
1 1 — — 1	7 0
1 1 — 1 —	7 1
1 1 — — 2	7 2
1 1 — 1 1	7 3
1 1 — 2 2	7 4
1 — 1 — —	7 5
1 — 1 1 —	7 6
1 — 1 1 1	7 7
1 — 1 2 —	7 8
1 — 1 2 2	7 9
1 — 1 4 —	8 0
1 — 1 3 1	8 1
1 2 — — —	8 2
1 — 2 — —	8 3
1 1 1 — —	8 4
1 2 1 — —	8 5
1 1 2 — —	8 6
1 3 — — —	8 7
1 — 3 — —	8 8
1 — — — 2	8 9
1 — — — 3	9 0
1 2 — — 1	9 1

The above tables indicate the main auxiliary contact combinations.
For other combinations, please consult us.

F fixing dimension can change according to the number of CA 15.. auxiliary contacts. ➡ section 8 "Dimensions".

R, RR, RE (ratings ≥ 800 A); RC RR..-AMA, R..-AME, RE..-AME	Code
TP CA15F CA15O	R. □ □.
NO NC	
— — —	0 0
— — 1	0 1
— — 2	0 2
— — 3	0 3
— — 4	0 4
— 1 —	1 0
— 1 1	1 1
— 1 2	1 2
— 2 —	2 0
— 2 2	2 2
— 3 —	3 0
— 3 1	3 1
— 3 2	3 2
— 3 3	3 3
— 4 —	4 0
— 4 1	4 1
— 4 2	4 2
— 4 3	4 3
— 5 —	5 0
— 5 1	5 1
— 6 —	6 0
1 — —	6 1
1 — 1	6 2
1 — 2	6 3
1 — 3	6 4
1 1 —	6 5
1 1 2	6 6
1 1 3	6 7
1 1 4	6 8
1 1 5	6 9
1 1 1	7 1
1 1 2	7 2
1 1 3	7 3
1 1 2	7 5
1 1 2	7 6
1 1 2	7 7
1 1 2	7 8
1 1 3	8 0
1 1 3	8 1
1 1 3	8 2
1 1 4	8 6
1 1 4	8 7
1 1 5	9 1
1 1 6	9 6

Code for Blow-out Coil for d.c. Switching

Coil selection according to the operational current

Rating (A)	63	85	125	170	200	260	315	420	500	550
Code .. □ R..	Operational current (A)									
1	5		40		63		80		100	
2	10		63		80		100		125	
3	25		80		100		160		160	
4	32		100		125		240		250	
5	40		170		260		420		550	
6	85		—		—		—		—	

R.. Series Contactors

Complementary Information

Ordering Details

When placing an order please specify the **Type** and the **Order Code** (☞ "Ordering Details" pages in this catalogue).

In the "Order codes" complete the boxes ☐ by the codes indicated in the opposite tables.

Example : IOR 550-20 contactor - 440 V d.c. circuit switching.

The "Order Code" is indicated in the "Ordering Details" table (for this example ☞ page 2/14).

It must be completed by different codes :

- current frequency for the coil supply: example 50 Hz
- blow-out coils for main poles, acc. to the actual current (d.c. only): 250 A for this example (for 550 A contactor rating)
- operating coil voltage: example 230-240 V
- extra auxiliary contacts, factory mounted (☞ pages 2/6, 2/7),
in this example: 2 x N.O. (CA 12-2 block mounted above the electro-magnet) and 2 N.O. + 2 N.C. (CA 15.. contacts mounted on the frame).

Order Code to be completed: ☞ page 2/14

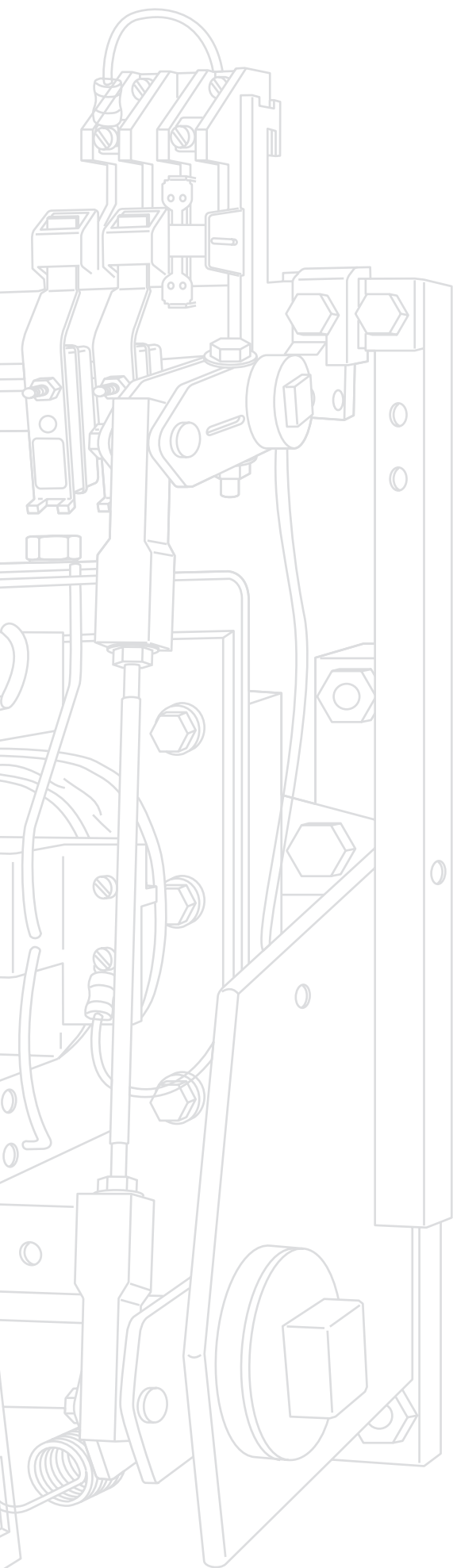
FPL R

- code for coil frequency: 50 Hz 1
- code for blow-out coil rating on main poles: 250 A 4
- code for operating coil voltage: 230-240 V 2 9
- code for extra auxiliary contacts:
1 CA 12-2 + 2 CA 15-F + 2 CA 15-O 6 5

Complete Order Code:

FPL R

Note: With 4 x CA 15.. extra auxiliary contacts, F fixing dimension of the contactor is increased (445 mm in this example instead of 345 mm) ☞ section 8 "Dimensions".



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R.. Series Contactors

Symbols

Type

Type of contactor N.O. poles I N.C./N.O. poles, break before make N N.C./N.O. poles, make before break J Coupler (☞ section 5) L	Mounting Open bar mounted O	Electro-magnet c/w coil + magnetic circuit a.c. operated coil + laminated magnetic circuit R a.c. operated coil + laminated magnetic circuit + rectifier + economy resistor R R d.c. operated coil + laminated magnetic circuit + economy resistor R E d.c. operated coil + solid-core magnetic circuit without economy resistor R C	Operating coil voltage Quote in plain text, acc. to a.c. and d.c. coil voltages available (☞ page 1/12)	Alternative options – MT Poles for 500 V > U _e ≤ 1000 V a.c. switching – CC Poles for d.c. switching as follows, 440 V > U _e ≤ 1000 V: contactor ratings 63 ... 500 A 48 V > U _e ≤ 1000 V: contactor ratings 800 A and above – AMA Magnetically latched contactors (ratings 63 ... 550 A) – AME Mechanically latched contactors (ratings 420 ... 4000 A)	Number of N.C. poles	Number of N.O. poles
Contactor rating 63, 85, 125, 170 ... 1500, 2000 ...						

Explanation of symbols

IOR 170-30 230V-50Hz coil + 1 **CA 12-1** + 3 **CA 15-F**

Open type bar mounted contactor with **R** type electro-magnet and laminated magnetic circuit for a.c. operation, 170 A rating, 3 N.O. main poles, without N.C. pole, 230V-50Hz coil, + one extra **CA 12-1** (N.O. + N.C.) auxiliary contact block, + 3 extra **CA 15-F** (N.O.) auxiliary contacts.

IORE 500-40-MT 125 Vd.c. coil + 1 **CA 12-11** + 1 **TP 40DA**

Open type bar mounted contactor with **RE** type electro-magnet and laminated magnetic circuit for d.c. operation via an economy resistor, 500 A rating, 4 N.O. main poles, without N.C. pole, **-MT** version for max. operating voltage 1000 V a.c., 125 V d.c. coil, + one extra **CA 12-11** (2 N.O. + 2 N.C.) double auxiliary contact block, + one extra **TP 40DA** pneumatic timing block adjustable 0.1 to 40 s, direct timing, N.O. + N.C. auxiliary contacts.

Notes:

- Additions which do not increase the fixing centers of the contactor can be ordered separately and mounted by the user.
- Variations which do affect the contactor features e.g. the fixing centers, must be carried out in our works (☞ page 2/7 and section 8 for "Dimensions").
- Contactor rating must be specified when the TP.. timing block and the CA 15.. auxiliary contact are ordered separately.

Order Codes

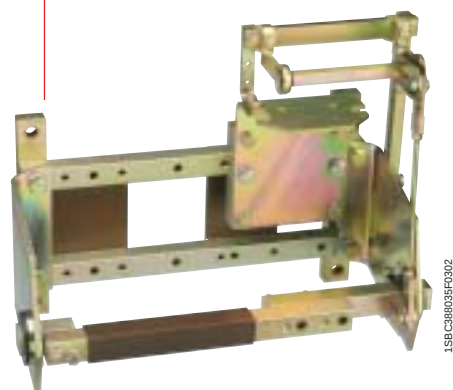
Contactor rating	Code digits for operating coil voltage (☞ page 1/12)										
Equipment type <table><tr><td>I 1</td><td>I ...-MT 2</td></tr><tr><td>L 3</td><td></td></tr><tr><td>N 4</td><td>N ...-MT 5</td></tr><tr><td>J 6</td><td></td></tr><tr><td colspan="2">Parts and sub-assemblies 0</td></tr></table>	I 1	I ...-MT 2	L 3		N 4	N ...-MT 5	J 6		Parts and sub-assemblies 0		Code digits for extra auxiliary contacts (☞ page 1/12)
I 1	I ...-MT 2										
L 3											
N 4	N ...-MT 5										
J 6											
Parts and sub-assemblies 0											
Electro-magnet type <table><tr><td>R / U_e 50 Hz 1</td><td>R ...-CC / U_e 50 Hz 2</td></tr><tr><td>RC 3</td><td>RC ...-CC 4</td></tr><tr><td>RR / U_e 50...400 Hz 5</td><td>RR ...-CC / U_e 50...400 Hz 6</td></tr><tr><td>R / U_e 60 Hz 7</td><td>R ...-CC / U_e 60 Hz 8</td></tr><tr><td>RE 9</td><td>RE ...-CC 0</td></tr></table>	R / U _e 50 Hz 1	R ...-CC / U _e 50 Hz 2	RC 3	RC ...-CC 4	RR / U _e 50...400 Hz 5	RR ...-CC / U _e 50...400 Hz 6	R / U _e 60 Hz 7	R ...-CC / U _e 60 Hz 8	RE 9	RE ...-CC 0	Code digit for blow-out coil rating (☞ "Ordering Details" tables)
R / U _e 50 Hz 1	R ...-CC / U _e 50 Hz 2										
RC 3	RC ...-CC 4										
RR / U _e 50...400 Hz 5	RR ...-CC / U _e 50...400 Hz 6										
R / U _e 60 Hz 7	R ...-CC / U _e 60 Hz 8										
RE 9	RE ...-CC 0										
Operation mode 1 Direct 2 Mechanical latching 3 Magnetical latching											
Number of poles (☞ "Ordering Details" tables)											

R.. Series Contactors

Main Frame and Electro-magnet Description



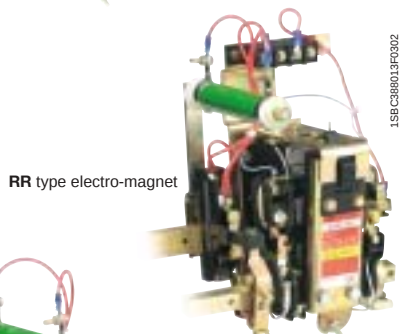
Frame for contactor ratings 63 to 550 A



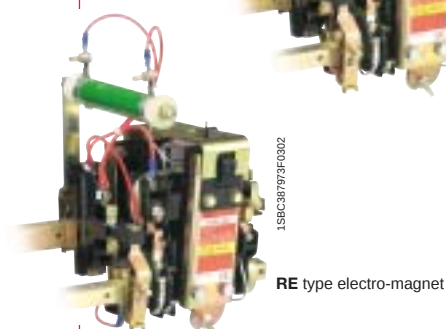
Frame for contactor ratings 800 A and above



R type electro-magnet



RR type electro-magnet



RE type electro-magnet



RC type electro-magnet

The **R** series contactors are built on a **main frame** supporting the **electro-magnet**, the **main poles** and the **auxiliary contacts**.

This design offers a great construction flexibility for the standard contactors as well as for the tailor made versions:

- variable number of poles acc. to requirements
- poles without or with blow-out coils, rated for the current flow in the poles
- N.O. poles
- N.C. poles set "make before break" or "break before make" when combined with N.O. poles
- large number of standard, timed, adjustable N.O. and N.C. auxiliary contacts
- electro-magnets with specific features depending on both the control voltage supply and the utilization characteristics.

All component parts are easily accessible and removable from the front.

Main Frame

The main frame comprises of a fixed bar equipped with two supports c/w two bearings and the moving shaft rotating between the two bearings. The fixed bar carries all the fixed parts including the electro-magnet, poles, and auxiliary contacts. Their corresponding moving parts are placed on the moving shaft.

In addition to the main frame, contactor ratings 800 **A** and above, are equipped with an auxiliary frame on which can be mounted some or all of the auxiliary contacts.

Electro-magnet

The electro-magnet comprises of the magnetic circuit plus the operating coil.

Generally placed on the R.H.S of the frame, the electro-magnet can be, on request, placed either on the frame centre or on the L.H.S of the frame. If required and depending on the application or the contactor construction involved, an additional electro-magnet can be mounted on the frame.

The choice of the electro-magnet depends primarily on the type of control circuit supply available as well as on the composition of the contactor and its intended application.

a.c. Control Circuit Supply

● R type electro-magnet

The magnetic circuit is laminated and the operating coil fed directly from an a.c. supply.

● RR type electro-magnet

The magnetic circuit is laminated and the operating coil fed from an a.c. supply via a rectifier and an economy resistor mounted and pre-wired on the contactor.

This type of electro-magnet provides a high closing power for the operation of the large size contactors fitted with a large number of poles or when the control supply frequency is > 50 **Hz** and < 400 **Hz**.

d.c. Control Circuit Supply

● RE type electro-magnet

The magnetic circuit is laminated and the operating coil fed from a d.c. supply via an economy resistor mounted and pre-wired on the contactor.

● RC type electro-magnet

The magnetic circuit is of the solid-core design and the operating coil fed directly from a d.c. supply.

This type of electro-magnet is suited to high operation endurance rates. No coil inrush current peak on contactor closing.

Alternative Versions

Electro-magnet with latching:

the coil is briefly energized on contactor "latching" and "de-latching".

R.. or **RR..-AMA** types: magnetically latched

R.., **RR..** or **RE..-AME** types: mechanically latched.

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>> Accessories page 2/7

>> Terminal Marking and Positioning .. pages 7/2, 7/3

>> Wiring Diagrams pages 7/4 ... 7/6

>> Dimensions section 8

R.. Series Contactors

Main Pole Description



Cross-section of main pole



Poles with basic standard arc chutes



Poles with de-ion arc chutes

Main Poles

The main poles of the **R** series contactors are of a "butt-contact" pattern without sliding or rolling. Each pole comprises of the **main contacts** (fixed contact and moving contact), the **blow-out coil** and the **arc chute**.

Main Contacts

The main contacts are made of a silver alloy insert brazed on to a hard copper support. The fixed contact is mounted on an insulated support screwed onto the fixed bar, the moving contact is similarly mounted and rotates directly with the moving shaft.

The contact pressure and the contact compression stroke are set separately.

The fixed and moving contacts also have arcing horns fitted to assist with the elongation and breaking of the electric arc. (Not applicable to the coupler poles built without blow-out device.)

On contactor ratings from 1250 **A** to 4000 **A** each pole comprises of a variable number of 800 **A** parallel connected main contacts, according to the rated current of the pole.

The setting of the contact strokes varies depending on the rated operating voltages applicable to the poles, as explained below.

● Operating voltage up to 500 **V a.c.**

One single main contact is set "early make - late break" for on-load making and breaking and is equipped with blow-out device and arc chute. The remaining parallel connected main contacts are set "late make - early break" for making and breaking off-load (they are used as "current carrying contacts" only) no blow-out device and no arc chute fitted on these contacts.

● Operating voltage from 500 to 1000 **V a.c.**

All the main contacts of the pole (including those connected in parallel) are set for on-load making and breaking all together. All are fitted with blow-out devices and arc chutes.

● Operating voltage at 1000/1500 **V d.c.**

For d.c. switching, the contact stroke settings are similar to those mentioned above and are also adjusted depending on the required operating conditions.

Specific construction characteristics are implemented, as follows :

- blow-out coils sized as the actual service current rating on the poles.
- increased insulation at 1000 **V d.c.** $\leq U_e < 1500$ **V d.c.**
- larger number of poles (2 or 3 poles) to be connected in series on the contactor set-up for to improve the breaking and arc extinction depending on U_e rated operating voltage and **L/R** time constant. ➔ pages 2/48, 2/49, 2/52, 2/53.

Blow-out Coil

Depending upon the current value the blow-out coil will comprise of either a number of turns of an insulated wire or of a flat conductor. The coil generated flux is transmitted to the internal faces of the arc chutes via a magnetic core.

The standard blow-out coil is rated to carry the total current flowing through the pole.

For contactor ratings from 63 to 550 **A** used for d.c. switching where the actual current through the pole(s) is below 50% the permissible rated operating current, the corresponding blow-out coil should be rated as the actual service current rating.

Arc Chute

The arc chute is made of a polymer material and fiber-glass compound.

- For operation at voltages up to 500 **V a.c.** or 440 **V d.c.**, the poles of the contactor ratings from 63 to 550 **A** are equipped with basic arc chutes (no extra de-ion arc splitters) .
- For operation at higher voltages, the poles of contactor ratings from 63 to 550 **A** are equipped with arc chutes comprising of built-in de-ion arc splitters which ensure a rapid extinction of the arcs.
- Whatever the operation voltage may be, the poles of contactor ratings 800 **A** and above are equipped with arc chutes comprising of built-in de-ion arc splitters which ensure a rapid extinction of the arcs (not applicable to "current carrying contacts").

Each of the arc chutes internal faces carries a ceramic shield to protect from arcs. The blow-out coil magnetic flux is directed via the magnetic core towards the two lateral steel plates.

Quick and easy removal of the arc chutes allows an instant inspection of the main contacts and where necessary their replacement.

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>> Accessories page 2/7

>> Terminal Marking and Positioning .. pages 7/2, 7/3
>> Wiring Diagrams pages 7/4 ... 7/6
>> Dimensions section 8

R.. Series Contactors

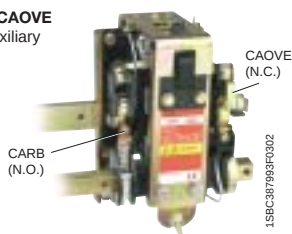
Main Pole Variants

Auxiliary Contact Description



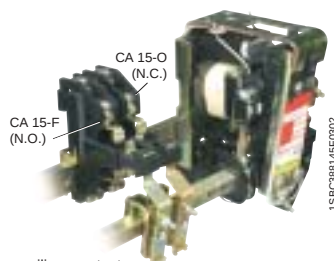
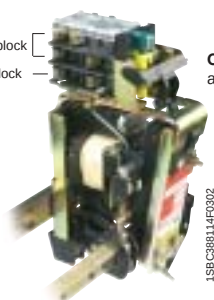
N.C. main pole

CARB and CAOVE
standard auxiliary
contacts

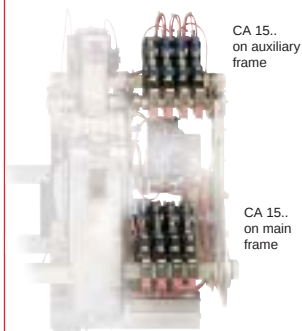


Double block
Single block

CA 12.. standard
auxiliary contacts



CA 15.. auxiliary contacts
on 63 ... 550 A contactor ratings



CA 15.. auxiliary contacts
on 800 ... 4000 A contactor ratings

Main Pole Variants

- **LOR..** couplers: section 5
The main poles have no blow-out devices and no arc chutes. Nevertheless the poles have the same making and breaking capacity as the contactors of equivalent rating but the breaking capacity characteristics are restricted to max. 24 **V a.c./d.c.** power circuits.
- Contactors with N.C. main pole(s) only or combined with N.O. main pole(s):
NOR.. type: N.C. and N.O. main poles mechanically set "break before make" operation.
JOR.. type: N.C. and N.O. main poles mechanically set "make before break" operation.
- **..MT** contactor version up to 1000 **V a.c.**
- **..CC** contactor version up to 1000 **V d.c.** or 1500 **V d.c.** with increased insulation.
Contactor ratings from 63 to 550 **A**: with de-ion arc chute and increased clearing distance between poles.
Contactor ratings from 800 **A** and above with boosted blow-out device ("long pole version").
- Based on the above alternative versions, a specific and increased insulation can be provided on request:
ratings from 63 to 550 **A**, assembled on a bar and shaft made of high insulating material, ratings 800 **A** and above, with insulated protective coating of metal parts, and increased clearance between poles.

Auxiliary Contacts

Standard Auxiliary Contacts

Four types available and suitable for a.c. and d.c. control circuit switching.

- **CARB** auxiliary contact: N.O., generally used for "hold-in". $I_{th} = 6 \text{ A}$.
This contact is fitted on the L.H.S. of the electro-magnet types **R**, **RR**, **RE** for contactor ratings 63 to 550 **A**.
- **CAOVE** auxiliary contact: N.C., and adjustable, generally used for electrical interlocking. $I_{th} = 6 \text{ A}$.
This contact is fitted on the R.H.S. of the electro-magnet types **R**, **RR**, **RE** for contactor ratings 63 to 550 **A**.
- **CA 12-..** 2-pole auxiliary contact blocks: $I_{th} = 12 \text{ A}$
Single blocks **CA 12-1** (N.C.+N.O.)
CA 12-2 (N.O.+N.O.)
Double blocks **CA 12-11** 2 x (N.C.+N.O.)
CA 12-12 (N.C.+N.O.) + (N.O.+N.O.)
CA 12-22 2 x (N.O.+N.O.)

CA 12-.. auxiliary contact blocks are mounted at the upper part of the electro-magnet types **R**, **RR**, **RE** for contactor ratings from 63 to 550 **A**.

R and **RE** electro-magnets can accept 1 single block or 2 single blocks, and alternatively 1 single block + 1 double block.

RR electro-magnet can accept 1 single block or 2 single blocks only, due to the rectifier unit mounted right above.

- **CA 15-..** 1-pole adjustable auxiliary contacts: $I_{th} = 15 \text{ A}$
N.O. contact **CA 15-F**
N.C. contact **CA 15-O**

CA 15-.. auxiliary contacts are mounted on the contactor frame between the main poles and the electro-magnet types **R**, **RR**, **RE** and **RC..** of the contactor ratings from 63 to 550 **A**. For contactor ratings 800 **A** and above, the auxiliary contacts are mounted first on the auxiliary frame directly above the electro-magnet and then on the contactor main frame to the R.H.S. of the electro-magnet.

Timed Auxiliary Contacts

TP.. pneumatic timing block with 1N.O. and 1N.C. electrically independent contacts, $I_{th} = 10 \text{ A}$. Direct or inverse timing, with linear setting scale over a 350° rotation by means of a knurled knob with timing guide marks. Timing ranges from 0.1 to 40 **s** or from 10 to 180 **s**.

The **TP..** timing block is normally mounted on the left-hand bearing support of the contactor ratings from 63 to 550 **A** without increasing the contactor fixing dimension. For contactor ratings 800 **A** and above, the timing block is mounted on the auxiliary frame and takes up space of three **CA 15-..** auxiliary contacts.

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R.. Series Contactors

CA.. Auxiliary Contacts and TP.. Timing Blocks

Auxiliary Contacts Fitted as Standard

R series contactors are equipped as standard with 1N.O. auxiliary contact (except AME types) generally used for "hold-in" plus 1 N.C. adjustable auxiliary contact (except AMA and AME types) generally used for electrical interlocking or signal contact.

Contact types available:  see opposite page.

Extra Auxiliary Contacts, without Increase of Fixing Dimension "F"

On request **R** series contactors can be equipped with extra **CA..** auxiliary contacts and **TP..** timed auxiliary contacts according to the indications given on the opposite page.

- **CA 12-..** 2-pole auxiliary contact blocks

- | | |
|---------------|---|
| Single blocks | CA 12-1 (N.C.+N.O.) |
| | CA 12-2 (N.O.+N.O.) |
| Double blocks | CA 12-11 2 x (N.C.+N.O.) |
| | CA 12-12 (N.C.+N.O.) + (N.O.+N.O.) |
| | CA 12-22 2 x (N.O.+N.O.) |

In the event that 3 **CA 12-..** 2-pole auxiliary contact blocks are required, use 1 single block + 1 double block.
(Only 1 or 2 single blocks for **IORR..** contactors.)

- **CA 15-..** 1-pole adjustable auxiliary contacts:

- | | |
|--------------|----------------|
| N.O. contact | CA 15-F |
| N.C. contact | CA 15-O |

- **TP..** 2-pole pneumatic timing block with 1N.O. and 1N.C. auxiliary contacts.

On ordering please quote:

- timing mode, inverse or direct
- timing range, 0.1 ... 40 s or 10 ... 180 s

Enter into the contactor **FPL...** Order Code, the appropriate two digit code according to the selected auxiliary contact combination.

FPL **R**

Code:  page 1/12

Extra Auxiliary Contacts, with Increased Fixing Dimension "F"

On request **R** series contactors can be equipped with a larger number of factory assembled auxiliary contacts but the contactor basic fixing dimension must be increased.

For example 15 (or more) extra **CA 15..** auxiliary contacts together with 1 **TP..** timing block may be added:

- **CA 15..** 1-pole adjustable auxiliary contacts:

- | | | |
|--------------|----------------|-----------------------------|
| N.O. contact | CA 15-F | please quote "qty" required |
| N.C. contact | CA 15-O | please quote "qty" required |

- **TP..** 2-pole pneumatic timing blocks with 1 N.O. and 1 N.C. auxiliary contacts.

On ordering please quote:

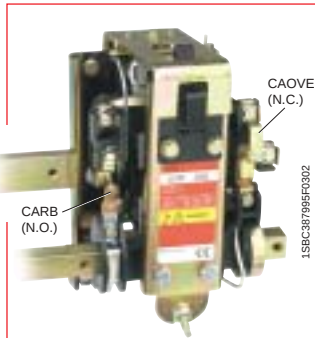
- timing mode, inverse or direct
- timing range, 0.1 ... 40 s or 10 ... 180 s

Depending on the contactor rating and the number of poles, the addition of a larger number of auxiliary contacts could lead to the need of a more powerful electro-magnet (**RR** type) or a second extra electro-magnet.

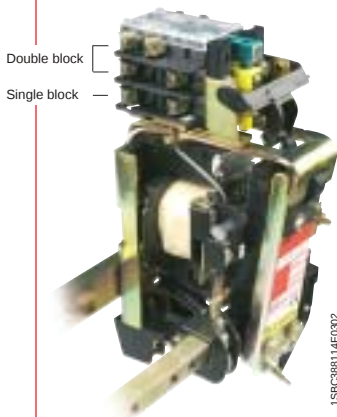
Consult us.

>> Ordering Details pages 3/2, 3/3
>> Technical Data page 2/54

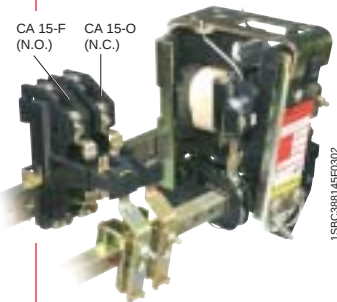
>> Terminal Marking and Positioning section 7
>> Dimensions acc. to the Aux. Contact Number .. section 8



CARB and CAOVE standard auxiliary contacts



CA 12.. standard auxiliary contacts



CA 15.. standard auxiliary contacts



TP.. timed auxiliary contact block (N.O.+ N.C.)

R.. Series Contactors

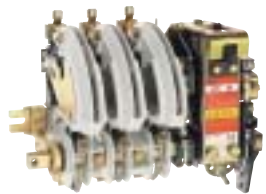
CA.. Standard Auxiliary Contacts and TP.. Timing Block

Auxiliary Contact Allocation

Contactor	Rating	Aux. contacts available		Extra CA.. standard aux. contacts and TP.. timed aux. contacts	
		N.O.	N.C.	Fitted by the user, without an increase in fixing dimension F	Factory fitted, with an increase in fixing dimension F
IOR..	85 ... 550 800 ... 1500	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 3 blocks CA 12.. + 1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	"n" contacts CA 15.. + 1 TP..
IORR..	85 ... 550 800 ... 2000	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 2 blocks CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IORE..	85 ... 550 800 ... 2000	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 3 blocks CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IORC..	85 ... 550 800 ... 1000	1 CA 15-F 1 CA 15-F	1 CA 15-O 1 CA 15-O	1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	
IOR..-MT	63 ... 500 800 ... 1500	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 3 blocks CA 12.. + 1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	"n" contacts CA 15.. + 1 TP..
IORR..-MT	63 ... 500 800 ... 2000	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 2 blocks CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IORE..-MT	63 ... 500 800 ... 2000	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 3 blocks CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IORC..-MT	63 ... 500 800	1 CA 15-F 1 CA 15-F	1 CA 15-O 1 CA 15-O	1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	
IOR..-CC	63 ... 500 800 ... 1500	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 3 blocks CA 12.. + 1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	"n" contacts CA 15.. + 1 TP..
IORR..-CC	63 ... 500 800 ... 2000	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 2 blocks CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IORE..-CC	63 ... 500 800 ... 2000	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 ... 3 blocks CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IORC..-CC	63 ... 500 800	1 CA 15-F 1 CA 15-F	1 CA 15-O 1 CA 15-O	1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	
JOR..	63 ... 315	1 CARB	1 CAOVE	1 block CA 12.. + 1 TP..	"n" contacts CA 15.. + 1 TP..
JORR..	63 ... 315 800	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 block CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
JOE..	63 ... 315 800	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 block CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
JORC..	63 ... 315 800	1 CA 15-F 1 CA 15-F	1 CA 15-O 1 CA 15-O	1 TP.. 1 ... 3 contacts CA 15.. or 1 TP..	
NOR..	63 ... 315	1 CARB	1 CAOVE	1 block CA 12.. + 1 TP..	"n" contacts CA 15.. + 1 TP..
NORR..	63 ... 315 800	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 block CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
NORE..	63 ... 315 800	1 CARB 1 CA 15-F	1 CAOVE 1 CA 15-O	1 block CA 12.. + 1 TP.. 1 ... 2 contacts CA 15.. or 1 TP..	
IOR..-AMA	85 ... 550	1 CARB	—	1 block CA 12.. + 1 TP..	
IORR..-AMA	85 ... 550	1 CARB	—	1 TP..	"n" contacts CA 15.. + 1 TP..
IOR..-AME	420, 550 800 ... 2000	—	—	1 ... 2 contacts CA 15.. + 1 TP.. 1 ... 6 contacts CA 15..	"n" contacts CA 15.. + 1 TP.. —
IORR..-AME	420, 550 800 ... 2000	—	—	1 contact CA 15.. + 1 TP.. 1 ... 5 contacts CA 15..	"n" contacts CA 15.. + 1 TP.. —
IORE..-AME	420, 550 800 ... 2000	—	—	1 contact CA 15.. + 1 TP.. 1 ... 5 contacts CA 15..	"n" contacts CA 15.. + 1 TP.. —

2

IOR.. and IORR.. Contactors - Poles 500 V a.c. a.c. Operated



IOR 85-30

1SBC385429F0301

Application - Description

IOR 85 to IORR 2000 contactors are used for controlling a.c. power circuits up to 500 V, 50/60 Hz.
IOR 85 ... 550 contactors can also be used for controlling d.c. power circuits (→ page 2/14).

The contactor magnetic circuit is of the laminated type and the operating coil of the **IOR..** types is fed directly from an a.c. supply or via a rectifier and an economy resistor for the **IORR..** types.

On 3-pole + Neutral contactors (3 + N), the Neutral pole is rated at 900 A and is always mounted on the L.H.S. of the contactor frame.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Power AC-3			Rated operat. current		No. of poles	Type to be completed with : – coil voltage and frequency in plain text see page 1/12	Order Code to be completed with codes : – extra aux. contacts – coil voltage – coil Hz see p. 1/12	Unit weight without pack ^{ing} kg
380 V 400 V 415 V kW	440 V kW	500 V kW	AC-3 ≤ 440 V A	AC-1 θ ≤ 40 °C A				
40	45	50	77	85	2	IOR 85-20	FPL 721 216 R	3.300
					3	IOR 85-30	FPL 721 316 R	4.000
					4	IOR 85-40	FPL 721 416 R	4.700
80	80	90	150	170	2	IOR 170-20	FPL 751 215 R	4.800
					3	IOR 170-30	FPL 751 315 R	6.200
					4	IOR 170-40	FPL 751 415 R	7.600
132	132	160	245	260	2	IOR 260-20	FPL 781 215 R	7.900
					3	IOR 260-30	FPL 781 315 R	10.30
					4	IOR 260-40	FPL 781 415 R	12.70
200	200	257	370	400	2	IOR 420-20	FPL 811 215 R	10.40
					3	IOR 420-30	FPL 811 315 R	13.50
					4	IOR 420-40	FPL 811 415 R	16.60
300	315	370	550	550	2	IOR 550-20	FPL 841 215 R	19.20
					3	IOR 550-30	FPL 841 315 R	25.00
					4	IOR 550-40	FPL 841 415 R	30.80
450	500	560	800	900	2	IOR 800-20	FPL 861 215 R	38.00
					3	IOR 800-30	FPL 861 315 R	48.00
					4	IOR 800-40	FPL 861 415 R	58.00
630*	630*	710*	1000*	1000	2	IOR 1000-20	FPL 871 215 R	38.00
					3	IOR 1000-30	FPL 871 315 R	48.00
					4	IOR 1000-40	FPL 871 415 R	58.00
710*	750*	900*	1250*	1250	2	IOR 1250-20	FPL 881 215 R	53.00
					3	IORR 1250-30	FPL 881 5315 R	69.00
					3 + N	IORR 1250-39	FPL 881 5615 R	80.00
					4	IORR 1250-40	FPL 881 5415 R	85.00
850*	950*	1120*	1500*	1500	2	IOR 1500-20	FPL 891 215 R	53.00
					3	IORR 1500-30	FPL 891 5315 R	69.00
					3 + N	IORR 1500-39	FPL 891 5615 R	80.00
					4	IORR 1500-40	FPL 891 5415 R	85.00
1120*	1250*	1400*	2000*	2300	2	IORR 2000-20	FPL 901 5215 R	61.00
					3	IORR 2000-30	FPL 901 5315 R	83.00
					3 + N	IORR 2000-39	FPL 901 5615 R	90.00
					4	IORR 2000-40	FPL 901 5415 R	105.0

* Must never exceed 8700 A on making and 6400 A on breaking.

Note: Poles of contactor ratings 1250 A and above are built-up with sets of 800 A main contacts connected in parallel which do not increase the basic making and breaking capacities of the poles.

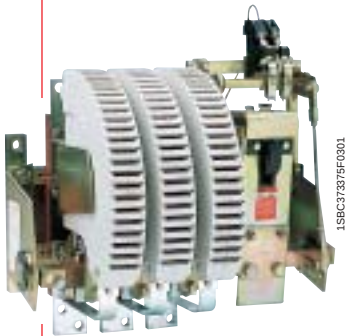
Additions and Variants

- An extra number of **CA..** standard auxiliary contacts or **TP..** timed auxiliary contacts can be added.
→ page 2/7, "Auxiliary Contact Allocation":
 - no increase of fixing dimension F: for ratings **85 ... 550 A**, addition of 1 **TP..** and 1 to 3 **CA 12..**
for ratings **800 A** and above, addition of 1 **TP..** or 1 to 3 **CA 15..**
 - with increased fixing dimension F: for any rating, addition of 1 **TP..** and "n" **CA 15..**
- **IOR..** types (a.c. coil, direct supply) can be supplied as **IORR..** types (a.c. coil, supply via a rectifier).
- Single pole version: please consult us.
- **IORR 3150** and **IORR 4000** types: please consult us.

>> Technical Data pages 2/28 ... 2/33
>> Accessories and Spare Parts section 3

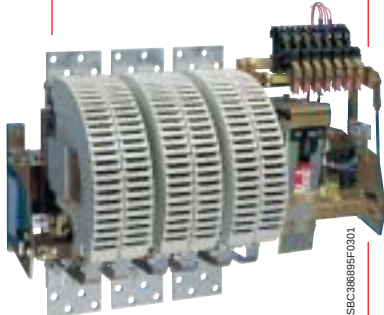
>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

500 V a.c.



IOR 800-30

1SBC373375F0301



IOR 1500-30 (special version)
with 7 x CA15.. auxiliary contacts

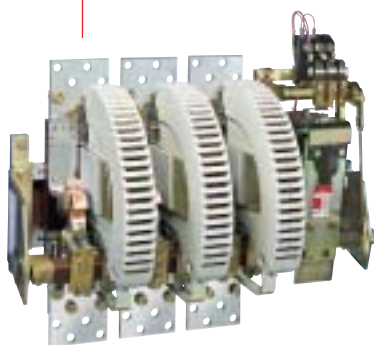
1SBC386959F0301

IORE.. Contactors - Poles 500 V a.c.

d.c. Operated (with Economy Resistor)



IORE 260-20



IORE 1500-30

Application - Description

IORE.. contactors are used for controlling a.c. power circuits up to 500 V, 50/60 Hz.

IORE 85 ... 550 contactors can also be used for controlling d.c. power circuits (see page 2/14).

The contactor magnetic circuit is of the laminated type and the operating coil is fed from a d.c. supply via an economy resistor.

On 3-pole + Neutral contactors (3 + N), the Neutral pole is rated at 900 A and is always mounted on the L.H.S. of the contactor frame.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Power AC-3			Rated operat. current		No. of poles	Type to be completed with : - coil voltage in plain text see page 1/12	Order Code to be completed with codes : - extra aux. contacts - coil voltage see page 1/12	Unit weight without packing kg
380 V	400 V	415 V	AC-3 ≤ 440 V A	AC-1 θ ≤ 40 °C A				
kW	kW	kW						
40	45	50	77	85	2	IORE 85-20	FPL 721 9216 R	3.600
					3	IORE 85-30	FPL 721 9316 R	4.300
					4	IORE 85-40	FPL 721 9416 R	5.000
80	80	90	150	170	2	IORE 170-20	FPL 751 9215 R	5.100
					3	IORE 170-30	FPL 751 9315 R	6.500
					4	IORE 170-40	FPL 751 9415 R	7.900
132	132	160	245	260	2	IORE 260-20	FPL 781 9215 R	8.300
					3	IORE 260-30	FPL 781 9315 R	10.70
					4	IORE 260-40	FPL 781 9415 R	13.10
200	200	257	370	400	2	IORE 420-20	FPL 811 9215 R	10.80
					3	IORE 420-30	FPL 811 9315 R	13.90
					4	IORE 420-40	FPL 811 9415 R	17.00
300	315	370	550	550	2	IORE 550-20	FPL 841 9215 R	19.70
					3	IORE 550-30	FPL 841 9315 R	25.50
					4	IORE 550-40	FPL 841 9415 R	31.30
450	500	560	800	900	2	IORE 800-20	FPL 861 9215 R	38.00
					3	IORE 800-30	FPL 861 9315 R	48.00
					4	IORE 800-40	FPL 861 9415 R	58.00
630*	630*	710*	1000*	1000	2	IORE 1000-20	FPL 871 9215 R	38.00
					3	IORE 1000-30	FPL 871 9315 R	48.00
					4	IORE 1000-40	FPL 871 9415 R	58.00
710*	750*	900*	1250*	1250	2	IORE 1250-20	FPL 881 9215 R	53.00
					3	IORE 1250-30	FPL 881 9315 R	69.00
					3 + N	IORE 1250-39	FPL 881 9615 R	80.00
850*	950*	1120*	1500*	1500	4	IORE 1250-40	FPL 881 9415 R	85.00
					2	IORE 1500-20	FPL 891 9215 R	53.00
					3	IORE 1500-30	FPL 891 9315 R	69.00
1120*	1250*	1400*	2000*	2300	3 + N	IORE 1500-39	FPL 891 9615 R	80.00
					4	IORE 1500-40	FPL 891 9415 R	85.00
					2	IORE 2000-20	FPL 901 9215 R	61.00
					3	IORE 2000-30	FPL 901 9315 R	83.00
					3 + N	IORE 2000-39	FPL 901 9615 R	90.00
					4	IORE 2000-40	FPL 901 9415 R	105.0

* Must never exceed 8700 A on making and 6400 A on breaking.

Note: Poles of contactor ratings 1250 A and above are built-up with sets of 800 A main contacts connected in parallel which do not increase the basic making and breaking capacities of the poles.

Additions and Variants

- An extra number of **CA..** standard auxiliary contacts or **TP..** timed auxiliary contacts can be added.
see page 2/7, "Auxiliary Contact Allocation":
 - no increase of fixing dimension F: for ratings **85 ... 550 A**, addition of 1 **TP..** and 1 to 3 **CA 12..**
for ratings **800 A** and above, addition of 1 **TP..** or 1 to 3 **CA 15..**
 - with increased fixing dimension F: for any rating, addition of 1 **TP..** and "n" **CA 15..**
- **IOR..** types (a.c. coil, direct supply), can be supplied as **IORR..** types (a.c. coil, supply via a rectifier).
- Single pole version: please consult us.
- **IORR 3150** and **IORR 4000** types: please consult us.

>> Technical Data pages 2/28 ... 2/35
>> Accessories and Spare Parts section 3

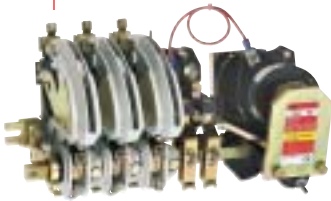
>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

2

500 V a.c.

IORC.. Contactors - Poles 500 V a.c.

d.c. Operated (without Economy Resistor)



IORC 85-30

1SBC387546F0301

Application - Description

IORC.. contactors are mainly used for controlling a.c. power circuits up to 500 V, 50/60 Hz.

IORC 85 ... 550 contactors can also be used for controlling d.c. power circuits (see page 2/14).

The contactor magnetic circuit is of the solid-core type and the operating coil is fed directly from a d.c. supply. The **RC** type electro-magnet is suited to high operation endurance rates. No coil inrush current peak on contactor closing.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

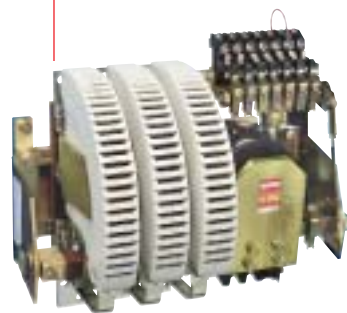
Ordering Details

Power AC-3			Rated operat. current		No. of poles	Type to be completed with : – coil voltage in plain text see page 1/12	Order Code to be completed with codes : – extra aux. contacts – coil voltage see page 1/12	Unit weight without pack ^{ing} kg
380 V	400 V	415 V	AC-3 ≤ 440 V A	AC-1 θ ≤ 40 °C A				
440 V	500 V				2	IORC 85-20	FPL 721 3216 R	4.700
45	50		77	85	3	IORC 85-30	FPL 721 3316 R	5.400
					4	IORC 85-40	FPL 721 3416 R	6.100
80	90		150	170	2	IORC 170-20	FPL 751 3215 R	6.300
					3	IORC 170-30	FPL 751 3315 R	7.700
					4	IORC 170-40	FPL 751 3415 R	9.100
132	160		245	260	2	IORC 260-20	FPL 781 3215 R	9.100
					3	IORC 260-30	FPL 781 3315 R	12.00
					4	IORC 260-40	FPL 781 3415 R	14.40
200	257		370	400	2	IORC 420-20	FPL 811 3215 R	11.90
					3	IORC 420-30	FPL 811 3315 R	15.00
					4	IORC 420-40	FPL 811 3415 R	18.10
300	370		550	550	2	IORC 550-20	FPL 841 3215 R	20.70
					3	IORC 550-30	FPL 841 3315 R	26.50
					4	IORC 550-40	FPL 841 3415 R	32.30
450	560		800	900	2	IORC 800-20	FPL 861 3215 R	41.00
					3	IORC 800-30	FPL 861 3315 R	51.00
630*	710*		1000*	1000	2	IORC 1000-20	FPL 871 3215 R	41.00
					3	IORC 1000-30	FPL 871 3315 R	51.00

* Must never exceed 8700 A on making and 6400 A on breaking.

Additions and Variants

- An extra number of **CA..** standard auxiliary contacts or **TP..** timed auxiliary contacts can be added.
see page 2/7, "Auxiliary Contact Allocation":
 - no increase of fixing dimension F: ratings **85 ... 550 A**, addition of 1 **TP..**
ratings **800 A** and above, addition of 1 **TP..** or 1 to 3 **CA 15..**
 - with increased fixing dimension F: for any rating, addition of 1 **TP..** and "n" **CA 15..**
- Single pole version: please consult us.
- **IORC 1500** and **IORC 2000** types: please consult us.



IORC 800-30
with 8 x CA15.. auxiliary contacts

1SBC387515F0301

>> Technical Data pages 2/28 ... 2/35
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

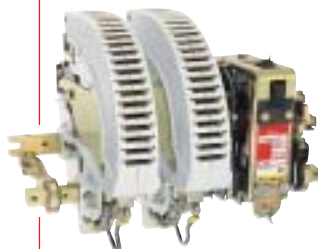
IOR..-MT, IORR..-MT Contactors - Poles 1000 V a.c.

a.c. Operated



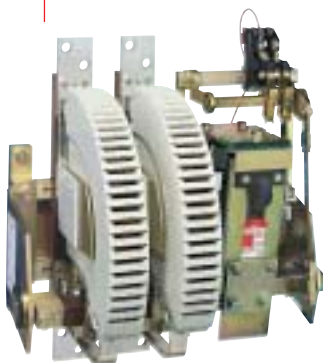
IOR 63-40-MT

1SBC38906F0303



IOR 200-20-MT

1SBC389075F0303



IOR 800-20-MT

1SBC38906F0303

Application - Description

IOR..-MT and **IORR..-MT** contactors are used for controlling a.c. power circuits up to 1000 V, 50/60 Hz. For operating voltage $U_e > 1000$ V, please consult us.

The contactor magnetic circuit is of the laminated type and the operating coil of the **IOR..-MT** types is fed directly from an a.c. supply, or via a rectifier and an economy resistor for the **IORR..-MT** types.

On 3-pole + Neutral contactors (3 + N), the Neutral pole is rated at 900 A and is always mounted on the L.H.S. of the contactor frame.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Power AC-3		Rated operat. current		No. of poles	Type to be completed with : – coil voltage and frequency in plain text see page 1/12	Order Code to be completed with codes : – extra aux. contacts ☐ ☐ – coil voltage ☐ – coil Hz ☐ see p. 1/12	Unit weight without packing kg
690 V kW	1000 V kW	AC-3 ≤ 690 V A	AC-1 $\theta \leq 40$ °C A				
80	80	85	85	2	IOR 63-20-MT	FPL 712 216 R ☐ ☐	3.900
				3	IOR 63-30-MT	FPL 712 316 R ☐ ☐ ☐	4.900
				4	IOR 63-40-MT	FPL 712 416 R ☐ ☐ ☐	5.900
150	150	160	170	2	IOR 125-20-MT	FPL 742 215 R ☐ ☐ ☐	5.900
				3	IOR 125-30-MT	FPL 742 315 R ☐ ☐ ☐	7.900
				4	IOR 125-40-MT	FPL 742 415 R ☐ ☐ ☐	9.900
240	250	260	260	2	IOR 200-20-MT	FPL 762 215 R ☐ ☐ ☐	9.200
				3	IOR 200-30-MT	FPL 762 315 R ☐ ☐ ☐	12.20
				4	IOR 200-40-MT	FPL 762 415 R ☐ ☐ ☐	15.20
540	550	550	550	2	IOR 500-20-MT	FPL 832 215 R ☐ ☐ ☐	19.20
				3	IOR 500-30-MT	FPL 832 315 R ☐ ☐ ☐	25.00
				4	IOR 500-40-MT	FPL 832 415 R ☐ ☐ ☐	30.80
780	850	800	800	2	IOR 800-20-MT	FPL 862 215 R ☐ ☐ ☐	40.00
				3	IOR 800-30-MT	FPL 862 315 R ☐ ☐ ☐	51.00
				4	IOR 800-40-MT	FPL 862 415 R ☐ ☐ ☐	62.00
1450*	1600*	1500*	1500	2	IOR 1500-20-MT	FPL 892 215 R ☐ ☐ ☐	61.00
				3	IORR 1500-30-MT	FPL 892 5315 R ☐ ☐ ☐	81.00
				3 + N	IORR 1500-39-MT	FPL 892 5615 R ☐ ☐ ☐	101.0
1900*	2200*	2000*	2000	4	IORR 1500-40-MT	FPL 892 5415 R ☐ ☐ ☐	101.0
				2	IORR 2000-20-MT	FPL 902 5215 R ☐ ☐ ☐	75.00
				3	IORR 2000-30-MT	FPL 902 5315 R ☐ ☐ ☐	104.0
				3 + N	IORR 2000-39-MT	FPL 902 5615 R ☐ ☐ ☐	129.0
				4	IORR 2000-40-MT	FPL 902 5415 R ☐ ☐ ☐	133.0

* Poles of contactor ratings 1500 A and above are built-up with sets of 800 A main contacts connected in parallel which do not increase the basic making and breaking capacities of the poles.

Additions and Variants

- An extra number of **CA..** standard auxiliary contacts or **TP..** timed auxiliary contacts can be added.
→ page 2/7, "Auxiliary Contact Allocation":
 - no increase of fixing dimension F: for ratings **63 ... 500 A**, addition of 1 **TP..** and 1 to 3 **CA 12..** for ratings **800 A** and above, addition of 1 **TP..** or 1 to 3 **CA 15..**
 - with increased fixing dimension F: for any rating, addition of 1 **TP..** and "n" contacts **CA 15..**
- **IOR..-MT** types (a.c. coil, direct supply) can be supplied as **IORR..-MT** types (a.c. coil, supply via a rectifier).
- **IORR 3150-..-MT** and **IORR 4000-..-MT** types: please consult us.

>> Technical Data pages 2/36 ... 2/41
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

IORE..-MT Contactors - Poles 1000 V a.c. d.c. Operated (with Economy Resistor)



Application - Description

IORE..-MT contactors are used for controlling a.c. power circuits up to 1000 V, 50/60 Hz.
For operating voltages $U_e > 1000$ V, please consult us.

The contactor magnetic circuit is of the laminated type and the operating coil is fed from a d.c. supply via an economy resistor.

On 3-pole + Neutral contactors (3 + N), the Neutral pole is rated at 900 A and is always mounted on the L.H.S. of the contactor frame.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

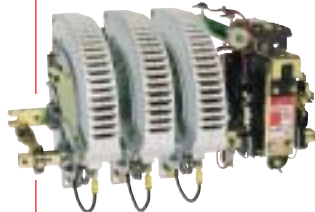
Ordering Details

Power AC-3		Rated operat. current		No. of poles	Type to be completed with : – coil voltage in plain text see page 1/12	Order Code to be completed with codes : – extra aux. contacts ☐ ☐ – coil voltage ☐ see page 1/12	Unit weight without pack ^{ing} kg
690 V kW	1000 V kW	AC-3 A	AC-1 $\theta \leq 40$ °C A				
80	80	85	85	2	IORE 63-20-MT	FPL 712 9216 R ☐ ☐ ☐ ☐	4.200
				3	IORE 63-30-MT	FPL 712 9316 R ☐ ☐ ☐ ☐	5.200
				4	IORE 63-40-MT	FPL 712 9416 R ☐ ☐ ☐ ☐	6.200
150	150	160	170	2	IORE 125-20-MT	FPL 742 9215 R ☐ ☐ ☐ ☐	6.200
				3	IORE 125-30-MT	FPL 742 9315 R ☐ ☐ ☐ ☐	8.200
				4	IORE 125-40-MT	FPL 742 9415 R ☐ ☐ ☐ ☐	10.20
240	250	260	260	2	IORE 200-20-MT	FPL 762 9215 R ☐ ☐ ☐ ☐	9.600
				3	IORE 200-30-MT	FPL 762 9315 R ☐ ☐ ☐ ☐	12.60
				4	IORE 200-40-MT	FPL 762 9415 R ☐ ☐ ☐ ☐	15.60
540	550	550	550	2	IORE 500-20-MT	FPL 832 9215 R ☐ ☐ ☐ ☐	19.70
				3	IORE 500-30-MT	FPL 832 9315 R ☐ ☐ ☐ ☐	25.50
				4	IORE 500-40-MT	FPL 832 9415 R ☐ ☐ ☐ ☐	31.30
780	850	800	800	2	IORE 800-20-MT	FPL 862 9215 R ☐ ☐ ☐ ☐	40.00
				3	IORE 800-30-MT	FPL 862 9315 R ☐ ☐ ☐ ☐	51.00
				4	IORE 800-40-MT	FPL 862 9415 R ☐ ☐ ☐ ☐	62.00
1450*	1600*	1500*	1500	2	IORE 1500-20-MT	FPL 892 9215 R ☐ ☐ ☐ ☐	61.00
				3	IORE 1500-30-MT	FPL 892 9315 R ☐ ☐ ☐ ☐	81.00
				3 + N	IORE 1500-39-MT	FPL 892 9615 R ☐ ☐ ☐ ☐	95.00
				4	IORE 1500-40-MT	FPL 892 9415 R ☐ ☐ ☐ ☐	101.0
1900*	2200*	2000*	2000	2	IORE 2000-20-MT	FPL 902 9215 R ☐ ☐ ☐ ☐	75.00
				3	IORE 2000-30-MT	FPL 902 9315 R ☐ ☐ ☐ ☐	104.0
				3 + N	IORE 2000-39-MT	FPL 902 9615 R ☐ ☐ ☐ ☐	112.0
				4	IORE 2000-40-MT	FPL 902 9415 R ☐ ☐ ☐ ☐	133.0

* Poles of contactor ratings 1500 A and above are built-up with sets of 800 A main contacts connected in parallel which do not increase the basic making and breaking capacities of the poles.

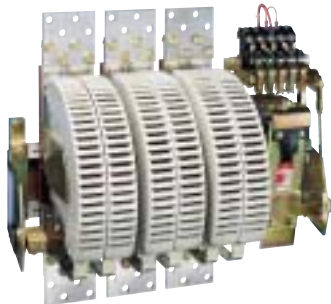
Additions and Variants

- An extra number of **CA..** standard auxiliary contacts or **TP..** timed auxiliary contacts can be added.
→ page 2/7, "Auxiliary Contact Allocation":
 - no increase of fixing dimension F: for ratings **63 ... 500 A**, addition of 1 **TP..** and 1 to 3 **CA 12..**
for ratings **800 A** and above, addition of 1 **TP..** or 1 to 3 **CA 15..**
 - with increased fixing dimension F: for any rating, addition of 1 **TP..** and "n" contacts **CA 15..**
- **IORE 3150-...-MT** and **IORE 4000-...-MT** types: please consult us



IORE 200-30-MT

1SBC387574F0301

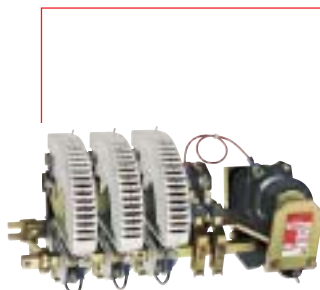


IORE 1500-30-MT
with 5 x CA 15.. auxiliary contacts

1SBC387505F0301

IORC..-MT Contactors - Poles 1000 V a.c.

d.c. Operated (without Economy Resistor)



IORC 63-30-MT

1SB C38754F0301

Application - Description

IORC..-MT contactors are used for controlling a.c. power circuits up to 1000 V, 50/60 Hz.

For operating voltages $U_e > 1000$ V, please consult us.

The contactor magnetic circuit is of the solid-core type and the operating coil is fed directly from a d.c. supply. The **RC** type electro-magnet is suited to high operation endurance rates. No coil inrush current peak on contactor closing.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Power AC-3		Rated operat. current		No. of poles	Type to be completed with : – coil voltage in plain text see page 1/12	Order Code to be completed with codes : – extra aux. contacts ☐ ☐ – coil voltage ☐ see page 1/12	Unit weight without pack ^{ing} kg
690 V kW	1000 V kW	AC-3 A	AC-1 A				
80	80	85	85	2	IORC 63-20-MT	FPL 712 3216 R ☐ ☐ ☐ ☐	5.300
				3	IORC 63-30-MT	FPL 712 3316 R ☐ ☐ ☐ ☐	6.300
				4	IORC 63-40-MT	FPL 712 3416 R ☐ ☐ ☐ ☐	7.300
150	150	160	170	2	IORC 125-20-MT	FPL 742 3215 R ☐ ☐ ☐ ☐	7.000
				3	IORC 125-30-MT	FPL 742 3315 R ☐ ☐ ☐ ☐	8.800
				4	IORC 125-40-MT	FPL 742 3415 R ☐ ☐ ☐ ☐	10.60
240	250	260	260	2	IORC 200-20-MT	FPL 762 3215 R ☐ ☐ ☐ ☐	10.50
				3	IORC 200-30-MT	FPL 762 3315 R ☐ ☐ ☐ ☐	13.10
				4	IORC 200-40-MT	FPL 762 3415 R ☐ ☐ ☐ ☐	15.60
540	550	550	550	2	IORC 500-20-MT	FPL 832 3215 R ☐ ☐ ☐ ☐	20.20
				3	IORC 500-30-MT	FPL 832 3315 R ☐ ☐ ☐ ☐	26.00
				4	IORC 500-40-MT	FPL 832 3415 R ☐ ☐ ☐ ☐	31.80
780	850	800	800	2	IORC 800-20-MT	FPL 862 3215 R ☐ ☐ ☐ ☐	43.00
				3	IORC 800-30-MT	FPL 862 3315 R ☐ ☐ ☐ ☐	54.00

Additions and Variants

- An extra number of **CA..** standard auxiliary contacts or **TP..** timed auxiliary contacts can be added.
☞ page 2/7, "Auxiliary Contact Allocation":
 - no increase of fixing dimension F: for ratings **63 ... 500 A**, addition of 1 **TP..**
for ratings **800 A**, addition of 1 **TP..** or 1 to 3 **CA 15..**
 - with increased fixing dimension F: for any rating, addition of 1 **TP..** and "n" contacts **CA 15..**
- **IORC 1500..-MT** and **IORC 2000..-MT** types: please consult us.

>> Technical Data pages 2/36 ... 2/43
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

R.. Series Contactors - Poles 440 V d.c. IOR.., IORR.., IORE.. and IORC..

a.c. Operated (R, RR) or d.c. Operated (RE, RC)



Application - Description

IOR.., IORR.., IORE.. and IORC.. contactors are used for controlling d.c. power circuits, at voltages $U_e \leq 440 \text{ V d.c.}$ (time constant $L/R \leq 7.5 \text{ ms}$). (For $L/R > 7.5 \text{ ms}$: please consult us.)

For voltages $> 220 \text{ V d.c.}$ connect 2 poles in series (see page 2/48).

For 85 to 550 A contactor ratings, the blow-out coil must be rated as the actual service current rating.

Voltages above 440 V d.c. and up to 1000 V d.c. see page 2/15 and up to 1500 V d.c. see page 2/16.

For d.c. switching, contactor ratings 800 A and above are always offered in the ..-CC version.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Rated operational current $U_e \leq 440 \text{ V d.c.}$		Number of poles	Type to be completed with: – coil voltage and frequency in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage – coil Hz – blow-out coil see p. 1/12	Unit weight without pack ^{ing} kg
DC-1	DC-3/DC-5				
A	A				

IOR.., IORR.. contactors (a.c. operated)

85	68	2	IOR 85-20	FPL 721 021 R	3.300
170	140	2	IOR 170-20	FPL 751 021 R	4.800
275	205	2	IOR 260-20	FPL 781 021 R	7.900
400	350	2	IOR 420-20	FPL 811 021 R	10.40
550	500	2	IOR 550-20	FPL 841 021 R	19.20
800	720	1	IOR 800-10-CC	FPL 861 0115 R	30.00
		2	IOR 800-20-CC	FPL 861 0215 R	40.00
1500	720	1	IOR 1500-10-CC	FPL 891 0115 R	38.00
1500	1400	2	IOR 1500-20-CC	FPL 891 0215 R	55.00
1800	720	1	IOR 2000-10-CC	FPL 901 0115 R	44.00
2000	1400	2	IORR 2000-20-CC	FPL 901 6215 R	63.00

IORE.. contactors (d.c. operated - with economy resistor)

85	68	2	IORE 85-20	FPL 721 921 R	3.600
170	140	2	IORE 170-20	FPL 751 921 R	5.100
275	205	2	IORE 260-20	FPL 781 921 R	8.300
400	350	2	IORE 420-20	FPL 811 921 R	10.80
550	500	2	IORE 550-20	FPL 841 921 R	19.70
800	720	1	IORE 800-10-CC	FPL 861 0115 R	30.00
		2	IORE 800-20-CC	FPL 861 0215 R	40.00
1500	720	1	IORE 1500-10-CC	FPL 891 0115 R	38.00
1500	1400	2	IORE 1500-20-CC	FPL 891 0215 R	55.00
1800	720	1	IORE 2000-10-CC	FPL 901 0115 R	44.00
2000	1400	2	IORE 2000-20-CC	FPL 901 0215 R	63.00

IORC.. contactors (d.c. operated - without economy resistor)

85	68	2	IORC 85-20	FPL 721 321 R	4.700
170	140	2	IORC 170-20	FPL 751 321 R	6.300
275	205	2	IORC 260-20	FPL 781 321 R	9.100
400	350	2	IORC 420-20	FPL 811 321 R	11.90
550	500	2	IORC 550-20	FPL 841 321 R	20.70
800	720	1	IORC 800-10-CC	FPL 861 4115 R	33.00
		2	IORC 800-20-CC	FPL 861 4215 R	43.00

- **IOR..** types (direct a.c. supply), can be supplied as **IORR..** version (a.c. supply via a rectifier).
- Contactors rated 85 to 550 A can be supplied as single pole version, for voltages $\leq 220 \text{ V d.c.}$
- **IORR 3150-..-CC** and **IORR 4000-..-CC** types: please consult us.
- **IORE 3150-..-CC** and **IORE 4000-..-CC** types: please consult us.

>> Technical Data page 2/48
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

R.. Series Contactors - Poles 1000 V d.c. IOR..-CC, IORR..-CC, IORE..-CC, IORC..-CC

a.c. Operated (R, RR) or d.c. Operated (RE, RC)



Application - Description

IOR..-CC, IORR..-CC, IORE..-CC and IORC..-CC contactors are used for controlling d.c. power circuits, at voltages $U_e \leq 1000$ V d.c. (time constant $L/R \leq 7.5$ ms). (For $L/R > 7.5$ ms: please consult us.)

For $U_e \leq 500$ V d.c. contactors can be supplied in single pole version.

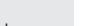
For $U_e \geq 500$ V d.c. connect 2 or 3 poles in series (see page 2/52).

Voltages above 1000 V d.c. and up to 1500 V d.c. (see page 2/16).

For the 63 to 500 A contactor ratings, the blow-out coil must be rated as the actual service current rating.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Rated operational current U _e ≤ 1000 V d.c.		Number of poles	Type to be completed with: – coil voltage and frequency in plain text [] see page 1/12	Order code to be completed with codes: – additions – coil voltage – coil Hz – blow-out coil see p. 1/12		Unit weight without pack ^{ing} kg
DC-1 A	DC-3/DC-5 A					

IOR..-CC, IORR..-CC contactors (a.c. operated)

85	68	2	IOR 63-20-CC	FPL 711 021 R	3.900
		3	IOR 63-30-CC	FPL 711 031 R	4.900
170	125	2	IOR 125-20-CC	FPL 741 021 R	5.900
		3	IOR 125-30-CC	FPL 741 031 R	7.900
275	205	2	IOR 200-20-CC	FPL 761 021 R	9.200
		3	IOR 200-30-CC	FPL 761 031 R	12.20
550	500	2	IOR 500-20-CC	FPL 831 021 R	19.20
		3	IOR 500-30-CC	FPL 831 031 R	25.00
800	720	2	IOR 800-20-CC	FPL 861 0215 R	40.00
		3	IOR 800-30-CC	FPL 861 0315 R	51.00
1500	please consult us	2	IOR 1500-20-CC	please consult us	–
1500	please consult us	3	IORR 1500-30-CC	please consult us	–
1800	please consult us	2	IORR 2000-20-CC	please consult us	–
2000	please consult us	3	IORR 2000-30-CC	please consult us	–

IORE..-CC contactors (d.c. operated - with economy resistor)

85	68	2	IORE 63-20-CC	FPL 711 021 R	4.200
		3	IORE 63-30-CC	FPL 711 031 R	5.200
170	125	2	IORE 125-20-CC	FPL 741 021 R	6.200
		3	IORE 125-30-CC	FPL 741 031 R	8.200
275	205	2	IORE 200-20-CC	FPL 761 021 R	9.600
		3	IORE 200-30-CC	FPL 761 031 R	12.60
550	500	2	IORE 500-20-CC	FPL 831 021 R	19.70
		3	IORE 500-30-CC	FPL 831 031 R	25.50
800	720	2	IORE 800-20-CC	FPL 861 0215 R	40.00
		3	IORE 800-30-CC	FPL 861 0315 R	51.00
1500	please consult us	2	IORE 1500-20-CC	please consult us	–
1500	please consult us	3	IORE 1500-30-CC	please consult us	–
1800	please consult us	2	IORE 2000-20-CC	please consult us	–
2000	please consult us	3	IORE 2000-30-CC	please consult us	–

IORC..-CC contactors (d.c. operated - without economy resistor)

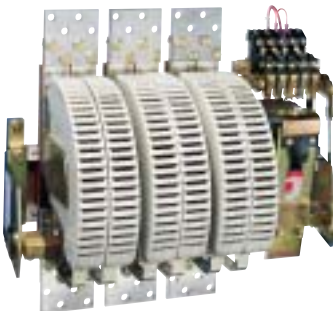
85	68	2	IORC 63-20-CC	FPL 711 421 R	5.300
		3	IORC 63-30-CC	FPL 711 431 R	6.300
170	125	2	IORC 125-20-CC	FPL 741 421 R	7.000
		3	IORC 125-30-CC	FPL 741 431 R	8.800
275	205	2	IORC 200-20-CC	FPL 761 421 R	10.50
		3	IORC 200-30-CC	FPL 761 431 R	13.10
550	500	2	IORC 500-20-CC	FPL 831 421 R	20.20
		3	IORC 500-30-CC	FPL 831 431 R	26.00
800	720	2	IORC 800-20-CC	FPL 861 4215 R	43.00
		3	IORC 800-30-CC	FPL 861 4315 R	54.00

>> Technical Data pages 2/50 ... 2/52
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8



IOR 200-20-CC



IORE 1500-30-CC
with 5 x CA 15.. auxiliary contacts

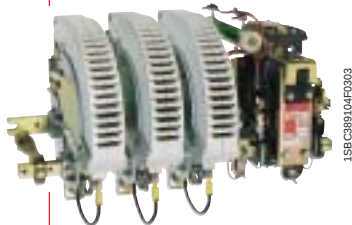
- **IOR..-CC** types (direct a.c. supply), can be supplied as **IORR..-CC** (a.c. supply via a rectifier).
- **IORR3150-...-CC, 4000-...-CC**: please consult us.
- **IORE3150-...-CC, 4000-...-CC**: please consult us.

R.. Series Contactors - Poles 1500 V d.c. CC Version with Increased Insulation

a.c. Operated (R, RR) or d.c. Operated (RE, RC)

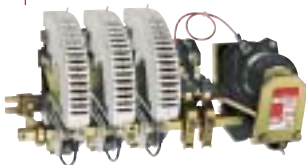


1500 V d.c.



IORE 200-30-CC

1SBC389104R0303



IORC 63-30-CC

1SBC387564R0301

Application - Description

IOR..-CC, IORR..-CC, IORE..-CC and IORC..-CC contactors **with increased insulation**, are used for controlling d.c. power circuits, at voltages $U_e \leq 1500 \text{ V d.c.}$ (time constant $L/R \leq 7.5 \text{ ms}$).

(For operational voltage $U_e > 1500 \text{ V d.c.}$ or time constant $L/R > 7.5 \text{ ms}$: please consult us.)

The poles must be connected in series (→ page 2/52).

For the 63 to 500 A contactor ratings, the blow-out coil will be rated as the actual service current rating.

Auxiliary contacts: 1 N.O. + 1 N.C. available.

Ordering Details

Rated operational current $U_e \leq 1500 \text{ V d.c.}$		Number of poles	Type to be completed with: – coil voltage in plain text, see page 1/12 – "increased insulation version"	Order code For this version with increased insulation, please consult us	Unit weight Please consult us
DC-1 A	DC-3/DC-5 A				

IOR..-CC, IORR..-CC contactors (a.c. operated)

85	68	3	IOR 63-30-CC	version with increased insulation	
170	125	3	IOR 125-30-CC		
275	205	3	IOR 200-30-CC		
550	500	3	IOR 500-30-CC		
800	720	3	IOR 800-30-CC		
1500	please consult us	3	IORR 1500-30-CC		
1800	please consult us	3	IORR 2000-30-CC		

IORE..-CC contactors (d.c. operated - with economy resistor)

85	68	3	IORE 63-30-CC	version with increased insulation	
170	125	3	IORE 125-30-CC		
275	205	3	IORE 200-30-CC		
550	500	3	IORE 500-30-CC		
800	720	3	IORE 800-30-CC		
1500	please consult us	3	IORE 1500-30-CC		
1800	please consult us	3	IORE 2000-30-CC		

IORC..-CC contactors (d.c. operated - without economy resistor)

85	68	3	IORC 63-30-CC	version with increased insulation	
170	125	3	IORC 125-30-CC		
275	205	3	IORC 200-30-CC		
550	500	3	IORC 500-30-CC		
800	720	3	IORC 800-30-CC		



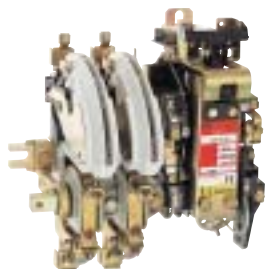
Contactors with increased insulation have specific dimensions.

- **IOR..-CC** types (direct a.c. supply), can be supplied as **IORR..-CC** version (a.c. supply via a rectifier).
- **IORR 3150-...-CC** and **IORR 4000-...-CC** types: please consult us.
- **IORE 3150-...-CC** and **IORE 4000-...-CC** types: please consult us.

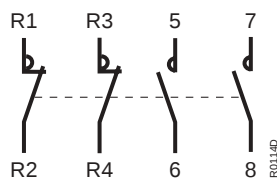
>> Technical Data pages 2/50 ... 2/52
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions please consult us

NOR.., NORR.. and NORE.. Contactors with N.O. + N.C. Main Poles



NOR 63-02



Example : 2 N.C. poles + 2 N.O. poles

Application

NOR.., NORR.., and NORE.. contactors with N.O. + N.C. main poles are used for controlling power circuits up to 500 V, 50/60 Hz.

The contactors rated 63 ... 315 A can be used for d.c. circuit switching for voltages up to 440 V d.c.

For the 800 A rating, use the **NORR..-CC**, **NORE..-CC** versions.

Time constant **L/R** > 7.5 ms: please consult us.

On d.c. operation, for contactors rated 63 ... 315 A, where the actual current rating is below 50 % of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes of the blow-out coils, for use with the Order Code (Ordering details).

At voltages ≥ 220 V d.c., N.O. main poles or N.C. main poles must be connected in series (→ page 2/49).

Example of use : reversing contactor with 2 N.C. poles + 2 N.O. poles.

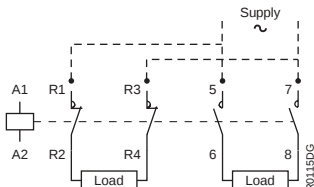
These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising of 2 separate loads with a single supply (→ diagrams below).

When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK before MAKE operation.

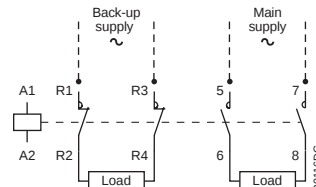


These contactors are not suitable for a reversing starter or star-delta starter, or for controlling a single load from 2 separate supplies.

Block diagrams



Single supply and 2 separate loads



2 separate supplies and 2 separate loads

Description

NOR.., NORR.., and NORE.. types are derived from **IOR.., IORR.. and IORE..** contactors. The main difference is that some or all of the N.O. poles are replaced by N.C. poles.

N.C. poles are usually mounted to the left of the N.O. poles

The N.O. and N.C. poles fitted on **NOR.., NORR.. and NORE..** types are set-up without any mechanical overlap i.e. BREAK before MAKE operation:

- as the electro-magnet closes,
the N.C. pole(s) BREAK before the N.O. pole(s) MAKE.
- as the electro-magnet opens,
the N.O. pole(s) BREAK before the N.C. pole(s) MAKE.

Adjustment of the operation of these poles is a function of the N.C. poles, the N.O. poles being normally adjusted.

The breaking and making capacities of the N.C. poles are identical to those of the N.O. poles.

Electro-magnet

- a.c. operated:

– **NOR..** type

The magnetic circuit is laminated and the coil is fed directly from an a.c. supply.

– **NORR..** type

The magnetic circuit is laminated and the coil is fed from an a.c. supply via a rectifier and an economy resistor which are pre-wired and mounted on the contactor.

- d.c. operated:

– **NORE..** type

The magnetic circuit is laminated and the coil is fed from a d.c. supply via an economy resistor pre-wired and mounted on the contactor.

Auxiliary contacts (→ page 2/7)

1 N.O. + 1 N.C. contacts fitted as standard and available.

Additions (→ page 2/7)

Extra **CA..** auxiliary contacts or **TP..** timed auxiliary contacts can be added.

>> Technical Data pages 2/44 ... 2/47
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Diagrams ... section 7
>> Dimensions section 8

NOR.. and NORR.. Contactors

a.c. Operated



Ordering Details

Rated current AC-1/DC-1 I_e A	Rated operational voltage U_e V a.c. V d.c.	Number of poles N.O. Poles N.C. Poles	Type to be completed with: – coil voltage and frequency in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage – coil Hz see p. 1/12	Unit weight without pack ^{ing} kg
63	500	220 0 1	NOR 63-01	FPL 714 116 R	2.700
		440* 0 2	NOR 63-02	FPL 714 216 R	3.500
		220 1 1	NOR 63-11	FPL 714 316 R	3.400
		440*/220 2 1	NOR 63-21	FPL 714 516 R	4.100
		440* 2 2	NORR 63-22	FPL 714 5616 R	5.100
		440*/220 3 1	NOR 63-31	FPL 714 716 R	4.800
125	500	220 0 1	NOR 125-01	FPL 744 115 R	3.600
		440* 0 2	NORR 125-02	FPL 744 5215 R	5.400
		220 1 1	NOR 125-11	FPL 744 315 R	5.000
		440*/220 2 1	NORR 125-21	FPL 744 5515 R	6.600
		440*/220 3 1	NORR 125-31	FPL 744 5715 R	7.800
200	500	220 0 1	NOR 200-01	FPL 764 115 R	5.800
		440* 0 2	NORR 200-02	FPL 764 5215 R	8.700
		220 1 1	NOR 200-11	FPL 764 315 R	8.200
		440*/220 2 1	NORR 200-21	FPL 764 5515 R	10.80
		440*/220 3 1	NORR 200-31	FPL 764 5715 R	13.00
315	500	220 0 1	NOR 315-01	FPL 804 115 R	7.700
		440* 0 2	NORR 315-02	FPL 804 5215 R	11.40
		220 1 1	NOR 315-11	FPL 804 315 R	10.80
		440*/220 2 1	NORR 315-21	FPL 804 5515 R	14.10
		440*/220 3 1	NORR 315-31	FPL 804 5715 R	17.00
800	500	0 1	NORR 800-01	FPL 864 5115 R	28.60
		0 2	NORR 800-02	FPL 864 5215 R	38.60
		1 1	NORR 800-11	FPL 864 5315 R	38.60
		2 1	NORR 800-21	FPL 864 5515 R	48.60
		2 2	NORR 800-22	FPL 864 5615 R	58.60
		3 1	NORR 800-31	FPL 864 5715 R	58.60

* For 220 V d.c. < U_e < 440 V d.c. connect 2 N.O. poles or 2 N.C. poles in series (☞ page 2/49).

Note:

On d.c. operation, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils. Main poles characteristics: ☞ page 2/49.

Example: **NOR 315-11**, d.c. circuit switching, actual current 100 A.

New order code for the contactor: FPL 804 1312 R

code of the 100 A blow-out coil for both the N.O. and N.C. main poles

The blow-out coil rating of the N.O. main pole may be different from that of the N.C. main pole, please consult us.

Variants

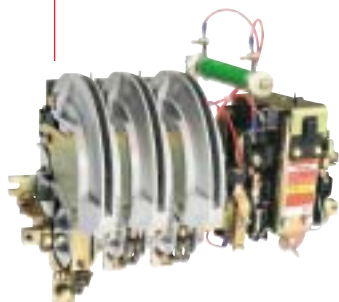
- **NOR..** types (direct a.c. supply), can be supplied as **NORR..** version (a.c. supply via a rectifier).
- Other main pole combinations, please consult us.
- **NOR..-MT, NORR..-MT** types for 500 V a.c. < U_e < 1000 V a.c.
- **NOR..-CC, NORR..-CC** types (☞ page 2/53)
 - 63 ... 200 A ratings: for 440 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)
 - 800 A rating: for 48 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)

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>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

NORE.. Contactors

d.c. Operated (with Economy Resistor)



NORE 200-21

1SB C388949C0304

Ordering Details

Rated current AC-1/DC-1 I _e A	Rated operational voltage U _e V a.c. V d.c.		Number of poles N.O. N.C. Poles Poles		Type to be completed with: – coil voltage in plain text ☐ see page 1/12	Order code to be completed with codes: – extra aux. contacts ☐ ☐ – coil voltage ☐ ☐ ☐ see page 1/12	Unit weight without pack ^{ing} kg
63	500	220	0	1	NORE 63-01 ☐	FPL 714 9116 R ☐ ☐ ☐ ☐	3.000
		440*	0	2	NORE 63-02 ☐	FPL 714 9216 R ☐ ☐ ☐ ☐	3.800
		220	1	1	NORE 63-11 ☐	FPL 714 9316 R ☐ ☐ ☐ ☐	3.700
		440*/220	2	1	NORE 63-21 ☐	FPL 714 9516 R ☐ ☐ ☐ ☐	4.400
		440*	2	2	NORE 63-22 ☐	FPL 714 9616 R ☐ ☐ ☐ ☐	5.200
		440*/220	3	1	NORE 63-31 ☐	FPL 714 9716 R ☐ ☐ ☐ ☐	5.100
125	500	220	0	1	NORE 125-01 ☐	FPL 744 9115 R ☐ ☐ ☐ ☐	3.900
		440*	0	2	NORE 125-02 ☐	FPL 744 9215 R ☐ ☐ ☐ ☐	5.500
		220	1	1	NORE 125-11 ☐	FPL 744 9315 R ☐ ☐ ☐ ☐	5.300
		440*/220	2	1	NORE 125-21 ☐	FPL 744 9515 R ☐ ☐ ☐ ☐	6.600
		440*/220	3	1	NORE 125-31 ☐	FPL 744 9715 R ☐ ☐ ☐ ☐	7.800
200	500	220	0	1	NORE 200-01 ☐	FPL 764 9115 R ☐ ☐ ☐ ☐	6.200
		440*	0	2	NORE 200-02 ☐	FPL 764 9215 R ☐ ☐ ☐ ☐	8.900
		220	1	1	NORE 200-11 ☐	FPL 764 9315 R ☐ ☐ ☐ ☐	8.600
		440*/220	2	1	NORE 200-21 ☐	FPL 764 9515 R ☐ ☐ ☐ ☐	11.00
		440*/220	3	1	NORE 200-31 ☐	FPL 764 9715 R ☐ ☐ ☐ ☐	13.00
315	500	220	0	1	NORE 315-01 ☐	FPL 804 9115 R ☐ ☐ ☐ ☐	8.100
		440*	0	2	NORE 315-02 ☐	FPL 804 9215 R ☐ ☐ ☐ ☐	11.60
		220	1	1	NORE 315-11 ☐	FPL 804 9315 R ☐ ☐ ☐ ☐	11.20
		440*/220	2	1	NORE 315-21 ☐	FPL 804 9515 R ☐ ☐ ☐ ☐	14.30
		440*/220	3	1	NORE 315-31 ☐	FPL 804 9715 R ☐ ☐ ☐ ☐	17.00
800	500	48	0	1	NORE 800-01 ☐	FPL 864 9115 R ☐ ☐ ☐ ☐	28.60
			0	2	NORE 800-02 ☐	FPL 864 9215 R ☐ ☐ ☐ ☐	38.60
			1	1	NORE 800-11 ☐	FPL 864 9315 R ☐ ☐ ☐ ☐	38.60
			2	1	NORE 800-21 ☐	FPL 864 9515 R ☐ ☐ ☐ ☐	48.60
			2	2	NORE 800-22 ☐	FPL 864 9615 R ☐ ☐ ☐ ☐	58.60
			3	1	NORE 800-31 ☐	FPL 864 9715 R ☐ ☐ ☐ ☐	58.60

* For 220 V d.c. < U_e < 440 V d.c. connect 2 N.O. poles or 2 N.C. poles in series (see page 2/49).

Note:

On d.c. operation, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils. Main poles characteristics: see page 2/49.

Example: **NORE 315-11**, d.c. circuit switching, actual current 100 A.

New order code for the contactor: FPL 804 9312 R ☐

code of the 100 A blow-out coil for both the N.O. and N.C. main poles

The blow-out coil rating of the N.O. main pole may be different from that of the N.C. main pole, please consult us.

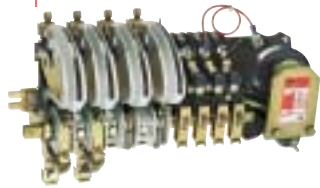
Variants

- Other main pole combinations, please consult us.
- **NORE..-MT** types for 500 V a.c. < U_e < 1000 V a.c.
- **NORE..-CC** types (see page 2/53)
 - 63 ... 200 A ratings: for 440 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)
 - 800 A rating: for 48 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)

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JOR.., JORR.., JORE.. and JORC.. Contactors with Mechanical Overlap of the N.O.-N.C. Main Poles



JORC 63-22
with 4 x CA 15.. auxiliary contacts

Application

JOR.., JORR.., JORE.. and JORC.. contactors with N.O. + N.C. main poles are used for controlling power circuits up to 230 V, 50/60 Hz.

These contactors can be used for d.c. circuit switching, $U_e = 48 \text{ V d.c.}$ (time constant $L/R \leq 1 \text{ ms}$).

On d.c. operation, for contactors rated 63 ... 315 A, where the actual current rating is below 50 % of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes of the blow-out coils, for use with the Order Code (Ordering details).

Examples of use

- field discharge of d.c. machines
- field discharge of synchronous machines
- changeover contactors with two separate loads
- d.c. injection braking of asynchronous motors
- dynamic braking of d.c. motors

These contactors must not be used in place of a pair of changeover contactors switching two different supplies to a common load.

Description

JOR.., JORR.., JORE.. and JORC.. types are derived from **IOR.., IORR.., IORE.. and IORC..** contactors. The main difference is that some or all of the N.O. poles are replaced by N.C. poles. N.C. poles are usually mounted to the left of the N.O. poles.

The N.O. and N.C. poles fitted on **JOR.., JORR.., JORE.. and JORC..** types are set-up with mechanical overlap i.e. MAKE before BREAK operation:

- as the electro-magnet closes,
the N.O. pole(s) MAKE before the N.C. pole(s) BREAK.
- as the electro-magnet opens,
the N.C. pole(s) MAKE before the N.O. pole(s) BREAK.

The main contacts of the N.C. poles and N.O. poles are therefore closed simultaneously for a very short time during the overlap time.

Adjustment of the overlap is a function of the N.C. poles, the N.O. poles being normally adjusted.

Electro-magnet

- a.c. operated:
 - **JOR..** type
The magnetic circuit is laminated and the coil is fed directly from an a.c. supply.
 - **JORR..** type
The magnetic circuit is laminated and the coil is fed from an a.c. supply via a rectifier and an economy resistor which are pre-wired and mounted on the contactor.
- d.c. operated:
 - **JORE..** type
The magnetic circuit is laminated and the coil is fed from a d.c. supply via an economy resistor pre-wired and mounted on the contactor.
 - **JORC..** type
The magnetic circuit is of the solid-core type and the coil is fed directly from a d.c. supply.

Auxiliary contacts (☞ page 2/7)

1 N.O. + 1 N.C fitted as standard and available.

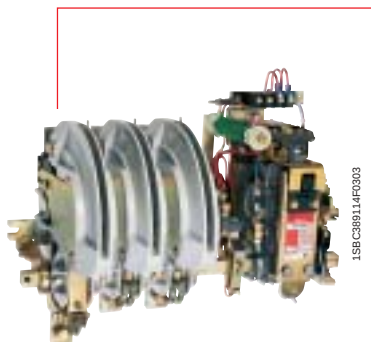
Additions (☞ page 2/7)

Extra **CA..** auxiliary contacts or **TP..** timed auxiliary contacts can be added.

JOR.. and JORR.. Contactors

Mechanical Overlap of the N.O.-N.C. Main Poles

a.c. Operated



JORR 200-21

1SBC385114F0303

Ordering Details

Rated current AC-1/DC-1 I_e A	Rated operational voltage		Number of poles		Type to be completed with: – coil voltage and frequency in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage – coil Hz see p. 1/12	Unit weight without packing kg
	U_e V a.c.	V d.c.	N.O. Poles	N.C. Poles			
63	230	48	1	1	JOR 63-11	FPL 716 316 R	3.400
			2	1	JOR 63-21	FPL 716 516 R	4.100
			2	2	JOR 63-22	FPL 716 616 R	4.900
			3	1	JOR 63-31	FPL 716 716 R	4.800
125	230	48	1	1	JOR 125-11	FPL 746 315 R	5.000
			2	1	JORR 125-21	FPL 746 5515 R	6.600
			2	2	JORR 125-22	FPL 746 5615 R	8.000
			3	1	JORR 125-31	FPL 746 5715 R	7.800
200	230	48	1	1	JOR 200-11	FPL 766 315 R	8.200
			2	1	JOR 200-21	FPL 766 515 R	10.60
			2	2	JORR 200-22	FPL 766 5615 R	13.30
			3	1	JORR 200-31	FPL 766 5715 R	13.00
315	230	48	1	1	JOR 315-11	FPL 806 315 R	10.80
			2	1	JOR 315-21	FPL 806 515 R	13.90
			2	2	JORR 315-22	FPL 806 5615 R	17.40
			3	1	JORR 315-31	FPL 806 5715 R	17.00
800	230	48	1	1	JORR 800-11	FPL 866 5315 R	38.60
			2	1	JORR 800-21	FPL 866 5515 R	48.60
			2	2	JORR 800-22	FPL 866 5615 R	58.60
			3	1	JORR 800-31	FPL 866 5715 R	58.60

Notes:

- The above indicated rated operational voltages are applicable to N.C. poles. For N.O. poles $U_e = 500$ V a.c. / 440 V d.c.
- On d.c. operation, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils.
Example: **JORR 125-11**, d.c. circuit switching, actual current 40 A.
New order code for the contactor: FPL 746 1311 R
code of the 40 A blow-out coil for both the N.O. and N.C. main poles
- The blow-out coil rating of the N.O. main pole may be different from that of the N.C. main pole, please consult us.
- For other main pole combinations, please consult us.

Variant

- JOR.. types (direct a.c. supply), can be supplied as JORR.. version (a.c. supply via a rectifier).

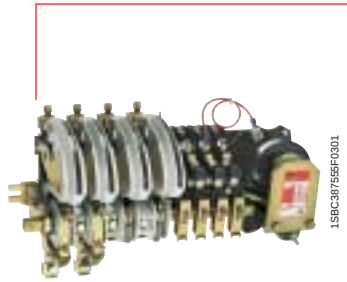
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JORE.. and JORC.. Contactors

Mechanical Overlap of the N.O.-N.C. Main Poles

d.c. Operated



JORE 63-22
with 4 x CA 15.. auxiliary contacts

Ordering Details - d.c. Operated Contactors - With Economy Resistor

Rated current AC-1/DC-1 I_e A	Rated operational voltage U_e V a.c. V d.c.		Number of poles		Type to be completed with: – coil voltage in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage see page 1/12	Unit weight without pack ^{ing} kg
			N.O. Poles	N.C. Poles			
63	230	48	1	1	JORE 63-11	FPL 716 9316 R	3.700
			2	1	JORE 63-21	FPL 716 9516 R	4.400
			2	2	JORE 63-22	FPL 716 9616 R	5.200
			3	1	JORE 63-31	FPL 716 9716 R	5.100
125	230	48	1	1	JORE 125-11	FPL 746 9315 R	5.300
			2	1	JORE 125-21	FPL 746 9515 R	6.600
			2	2	JORE 125-22	FPL 746 9615 R	8.000
			3	1	JORE 125-31	FPL 746 9715 R	7.800
200	230	48	1	1	JORE 200-11	FPL 766 9315 R	8.600
			2	1	JORE 200-21	FPL 766 9515 R	11.00
			2	2	JORE 200-22	FPL 766 9615 R	13.30
			3	1	JORE 200-31	FPL 766 9715 R	13.00
315	230	48	1	1	JORE 315-11	FPL 806 9315 R	11.20
			2	1	JORE 315-21	FPL 806 9515 R	14.30
			2	2	JORE 315-22	FPL 806 9615 R	17.40
			3	1	JORE 315-31	FPL 806 9715 R	17.00
800	230	48	1	1	JORE 800-11	FPL 866 9315 R	38.60
			2	1	JORE 800-21	FPL 866 9515 R	48.60
			2	2	JORE 800-22	FPL 866 9615 R	58.60
			3	1	JORE 800-31	FPL 866 9715 R	58.60

Notes:

- The above indicated rated operational voltages are applicable to N.C. poles. For N.O. poles $U_e = 500 \text{ V a.c.} / 440 \text{ V d.c.}$
 - On d.c. operation, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils.
Example: **JORE 200-11**, d.c. circuit switching, actual current 80 A.
New order code for the contactor: FPL 766 9312 R
code of the 80 A blow-out coil for both the N.O. and N.C. main poles
- The blow-out coil rating of the N.O. main pole may be different from that of the N.C. main pole, please consult us.

- Other main pole combinations, please consult us.

Ordering Details - d.c. Operated Contactors - Without Economy Resistor

Rated current AC-1/DC-1 I_e A	Rated operational voltage U_e V a.c. V d.c.		Number of poles		Type to be completed with: – coil voltage in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage see page 1/12	Unit weight without pack ^{ing} kg
			N.O. Poles	N.C. Poles			
63	230	48	1	1	JORC 63-11	FPL 716 3316 R	4.800
			2	1	JORC 63-21	FPL 716 3516 R	5.500
			2	2	JORC 63-22	FPL 716 3616 R	6.300
			3	1	JORC 63-31	FPL 716 3716 R	6.200
125	230	48	1	1	JORC 125-11	FPL 746 3315 R	6.500
			2	1	JORC 125-21	FPL 746 3515 R	7.900
200	230	48	1	1	JORC 200-11	FPL 766 3315 R	9.700
			2	1	JORC 200-21	FPL 766 3515 R	12.10
315	230	48	1	1	JORC 315-11	FPL 806 3315 R	12.30
			2	1	JORC 315-21	FPL 806 3515 R	15.40
800	230	48	1	1	JORC 800-11	FPL 866 3315 R	41.60
			2	1	JORC 800-21	FPL 866 3515 R	51.60

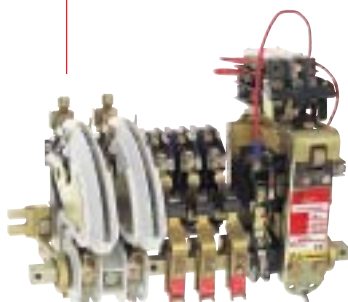
Notes:

- The above indicated rated operational voltages are applicable to N.C. poles. For N.O. poles $U_e = 500 \text{ V a.c.} / 440 \text{ V d.c.}$
 - On d.c. operation, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils.
Example: **JORC 315-11**, d.c. circuit switching, actual current 100 A.
New order code for the contactor: FPL 806 3312 R
code of the 100 A blow-out coil for both the N.O. and N.C. main poles
- The blow-out coil rating of the N.O. main pole may be different from that of the N.C. main pole, please consult us.
- For other main pole combinations, please consult us.

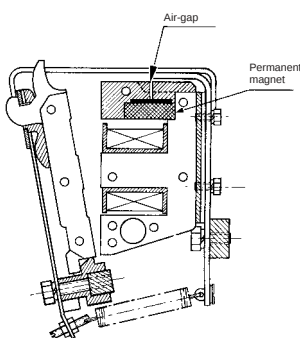
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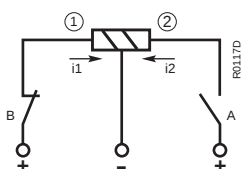
IOR..-AMA and IORR..-AMA Magnetically Latched Contactors



IOR 85-20-AMA with
extra auxiliary contacts
(1 x CA 12.. and 3 x CA 15..).



Electro-magnet of the IOR..-AMA
contactor



Block diagram
(for wiring diagrams → page 7/5)

Application

IOR..-AMA and **IORR..-AMA** magnetically latched contactors are used for controlling power circuits up to 500 V, 50/60 Hz.

They can be used for d.c. circuit switching, $U_e = 440 \text{ V d.c.}$ ($L/R \leq 7.5 \text{ ms}$). (For $L/R > 7.5 \text{ ms}$ please consult us.)

On d.c. operation, where the actual current rating is below 50 % of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating.

The table, page 1/12, indicates the codes of the blow-out coils, for use in the **Order code** (Ordering details). The single pole breaking must not be used for voltages above 220 V d.c. For $U_e > 220 \text{ V d.c.}$ connect 2 poles in series for 2-pole breaking.

Examples of use

- installations where the control circuits are fed from batteries, and it is desirable to reduce the power consumption.
- contactors used in sequence control. In the case of an accidental supply failure one may want to know precisely the state (ON or OFF) of particular contactors at the instant the supply failure occurred.
- contactors which must remain closed for safety reasons, even if the control circuit supply has come off.
- contactors in distribution circuits (the contactor can be used as an isolating switch operated by a signal to the coil).
- protection against accidental failure of the mains supply. The contactor would remain closed whatever the duration of the fault may be.
- contactors which remain almost permanently closed. Coil consumption energy savings are increased compared to standard contactors whose coils remain permanently energized.

Description

IOR..-AMA and **IORR..-AMA** magnetically latched contactors only differ from **IOR..** and **IORR..** standard contactors in the magnetic circuit (fixed and moving) and in the operating coil.

Making and breaking capacities are identical to those of standard contactors of the same rating.

The coil of the **IORR..-AMA** magnetically latched contactor is fed from an a.c. supply via a rectifier pre-wired and mounted on the contactor.

The coil of the **IOR..-AMA** magnetically latched contactor is fed directly from a d.c. supply (no economy resistor).

Construction

A permanent magnet is mounted in the upper leg of the fixed laminated magnetic circuit.

The double-winding coil is always fed from d.c. supply (via rectifier for **IORR..-AMA** type) and has:

- 1 terminal for "De-latching" + marked "A1" (red)
- 1 terminal for "Latching" + marked "A2" (red)
- 1 common terminal – (blue)

Coil windings are only energized at the point of opening and closing of the contactor.

Operation

● Closing of contactor "Latching"

The electro-magnet being open, the coil winding (1) is fed via the contact **B** with a current i_1 . The strength and direction of the magnetic field produced in this winding is the same as that produced by the permanent magnet. Both fields add together ensure that the contactor closes.

Although the coil winding (1) is de-energized, the field of the permanent magnet is sufficient to hold the contactor closed indefinitely.

● Opening of contactor "De-latching"

The electro-magnet being closed, the coil winding (2) is fed via the contact **A** with a current i_2 . The direction of the field produced by current i_2 is reverse to that of the permanent magnet and the resulting flux is not sufficient to maintain the electro-magnet in closed position. Contactor opens.

● On opening and closing of the contactor the coil is immediately de-energized by auxiliary contacts **B** and **A** mounted on the contactor.

Advantages

- Minimal coil consumption on opening allowing the use of standard auxiliary contacts in de-latching control circuit.
- Possibility of supplying the contactor with a manual operating lever for opening.

Auxiliary contact (→ page 2/7)

1 N.O. auxiliary contact fitted as standard is available.

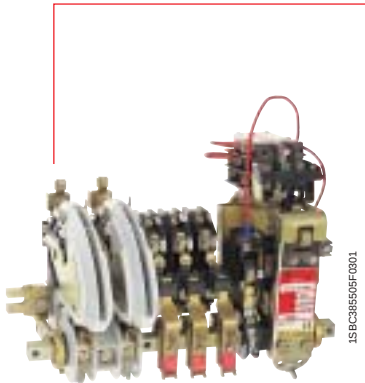
Additions (→ page 2/7)

Extra **CA..** auxiliary contacts, or **TP..** timed auxiliary contacts can be added.

>> **Technical Data** (except mechanical durability and electro-magnet) equivalent to those on pages 2/28, 2/30, 2/48
 >> **Electro-magnet Characteristics** please consult us >> **Terminal Marking and Positioning - Wiring** section 7
 >> **Accessories and Spare Parts** section 3 >> **Dimensions** section 8

IOR..-AMA and IORR..-AMA Magnetically Latched Contactors

a.c. Operated (RR) or d.c. Operated (R)



IOR 85-20-AMA with
extra auxiliary contacts
(1 x CA 12.. and 3 x CA 15..).

Ordering Details - a.c. Operated Contactors

Power AC-3			Rated operat. current		No. of poles	Type to be completed with: – coil voltage in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage see page 1/12	Unit weight without packaging kg
380 V	400 V	415 V	AC-3	AC-1				
440 V	500 V		≤ 440 V	θ ≤ 40 °C				
kW	kW	kW	A	A				
40	45	50	77	85	2	IORR 85-20-AMA	FPL 721 5236 R	3.600
					3	IORR 85-30-AMA	FPL 721 5336 R	4.300
					4	IORR 85-40-AMA	FPL 721 5436 R	5.000
80	80	90	150	170	2	IORR 170-20-AMA	FPL 751 5235 R	5.100
					3	IORR 170-30-AMA	FPL 751 5335 R	6.500
					4	IORR 170-40-AMA	FPL 751 5435 R	7.900
132	132	160	245	260	2	IORR 260-20-AMA	FPL 781 5235 R	8.300
					3	IORR 260-30-AMA	FPL 781 5335 R	10.70
					4	IORR 260-40-AMA	FPL 781 5435 R	13.10
200	200	257	370	400	2	IORR 420-20-AMA	FPL 811 5235 R	10.80
					3	IORR 420-30-AMA	FPL 811 5335 R	13.90
					4	IORR 420-40-AMA	FPL 811 5435 R	17.00
300	315	370	550	550	2	IORR 550-20-AMA	FPL 841 5235 R	19.70
					3	IORR 550-30-AMA	FPL 841 5335 R	25.50

Note: On **d.c. operation**, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils. Main poles characteristics: see page 2/48.
Example: **IORR 420-20-AMA**, d.c. circuit switching, actual current 160 A.

New order code for the contactor: FPL 811 5233 R

— code for the 160 A blow-out coil.

Variants

- **NORR..-AMA** types with N.O. + N.C. main poles, Break before Make operation
- **JORR..-AMA** types with N.O. + N.C. main poles, Make before Break operation
- **IORR..-MT-AMA** types for 500 V a.c. < U_e < 1000 V a.c.
- **IORR..-CC-AMA** types for 440 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)

Ordering Details - d.c. Operated Contactors

Power AC-3			Rated operat. current		No. of poles	Type to be completed with: – coil voltage in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage see page 1/12	Unit weight without packaging kg
380 V	400 V	415 V	AC-3	AC-1				
440 V	500 V		≤ 440 V	θ ≤ 40 °C				
kW	kW	kW	A	A				
40	45	50	77	85	2	IOR 85-20-AMA	FPL 721 1236 R	3.300
					3	IOR 85-30-AMA	FPL 721 1336 R	4.000
					4	IOR 85-40-AMA	FPL 721 1436 R	4.700
80	80	90	150	170	2	IOR 170-20-AMA	FPL 751 1235 R	4.800
					3	IOR 170-30-AMA	FPL 751 1335 R	6.200
					4	IOR 170-40-AMA	FPL 751 1435 R	7.600
132	132	160	245	260	2	IOR 260-20-AMA	FPL 781 1235 R	7.900
					3	IOR 260-30-AMA	FPL 781 1335 R	10.30
					4	IOR 260-40-AMA	FPL 781 1435 R	12.70
200	200	257	370	400	2	IOR 420-20-AMA	FPL 811 1235 R	10.40
					3	IOR 420-30-AMA	FPL 811 1335 R	13.50
					4	IOR 420-40-AMA	FPL 811 1435 R	16.60
300	315	370	550	550	2	IOR 550-20-AMA	FPL 841 1235 R	19.20
					3	IOR 550-30-AMA	FPL 841 1335 R	25.00

Note: On **d.c. operation**, where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils. Main poles characteristics: see page 2/48.
Example: **IOR 550-20-AMA**, d.c. circuit switching, actual current 250 A.

New order code for the contactor: FPL 841 1234 R

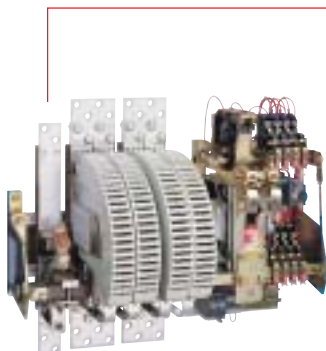
— code for the 250 A blow-out coil.

Variants

- **NOR..-AMA** types with N.O. + N.C. main poles, Break before Make operation
- **JOR..-AMA** types with N.O. + N.C. main poles, Make before Break operation
- **IOR..-MT-AMA** types for 500 V a.c. < U_e < 1000 V a.c.
- **IOR..-CC-AMA** types for 440 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)

>> **Technical Data** (except mechanical durability and electro-magnet) equivalent to those on pages 2/28, 2/30, 2/48
>> **Electro-magnet Characteristics** please consult us >> **Terminal Marking and Positioning - Wiring** section 7
>> **Accessories and Spare Parts** section 3 >> **Dimensions** section 8

IOR..-AME, IORR..-AME and IORE..-AME Mechanically Latched Contactors



Special contactor (AM-CC.. type)
with mechanical latching.
1500 A rating.

Application

IOR..-AME, IORR..-AME and IORE..-AME mechanically latched contactors are used for controlling power circuits up to $\leq 500 \text{ V}$, 50/60 Hz.

They can be used for d.c. circuit switching, $U_e = 440 \text{ V d.c.}$ ($L/R \leq 7.5 \text{ ms}$). (For $L/R > 7.5 \text{ ms}$ please consult us.)

On d.c. operation, for contactors rated 420 and 550 A, where the actual current rating is below 50 % of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating.

The table, page 1/12, indicates the codes of the blow-out coils, for use in the **Order code** (Ordering details).

The single pole breaking must not be used for voltages above 220 V d.c. For $U_e > 220 \text{ V d.c.}$ connect 2 poles in series for 2-pole breaking.

Examples of use

- installations where the control circuits are fed from batteries, and it is desirable to reduce the power consumption.
- contactors used in sequence control. In the case of an accidental supply failure one may want to know precisely the state (ON or OFF) of particular contactors at the instant the supply failure occurred.
- contactors which must remain closed for safety reasons, even if the control circuit supply has come off.
- contactors in distribution circuits (the contactor can be used as an isolating switch operated by a signal to the coil).
- protection against accidental failure of the mains supply. The contactor would remain closed whatever the duration of the fault may be.
- contactors which remain almost permanently closed. Coil consumption energy savings are increased compared to standard contactors whose coils remain permanently energized.

Description

IOR..-AME, IORR..-AME and IORE..-AME mechanically latched contactors differ from **IOR**, **IORR** and **IORE** standard contactors by a double electro-magnet (with closing and tripping coils, electrically separate). Making and breaking capacities are identical to those of standard contactors of the same rating.

The **IOR..-AME** and **IORR..-AME** mechanically latched contactors are a.c. operated. The closing and tripping coils of the **IOR..-AME** types are fed directly from an a.c. supply. For the **IORR..-AME** types, the closing coil only, is fed from an a.c. supply via a rectifier and an economy resistor to limit the current value in control circuit.

The **IORE..-AME** mechanically latched contactors are d.c. operated. The closing coil is fed via an economy resistor to limit the current value in control circuit. The tripping coil is fed directly from a d.c. supply without economy resistor.

On 4-pole contactors, with 3 poles + neutral (3+N), the neutral pole is always rated at 900 A and mounted on the left hand side of the contactor frame.

Construction

A mechanical latch is mounted above the closing electro-magnet. The tripping electro-magnet releases the mechanical latch.

Operation

● Closing of contactor (latching)

Once the closing coil is energized the contactor closes and will remain so indefinitely by the action of the mechanical latch which holds in the moving part of the closing electro-magnet.

The closing coil is de-energized by an electrical interlocking contact mounted on the contactor.

● Opening of contactor (de-latching)

Once the tripping coil is energized, the tripping electro-magnet releases the mechanical latch, de-latching the moving part of the closing electro-magnet, allowing the contactor to open. Once the contactor is open, the tripping coil is de-energized by an electrical interlocking contact mounted on the contactor.

IOR..-AMF, IORR..-AMF and IORE..-AMF variants are designed with 2 tripping coils (double de-latching control).

Auxiliary contacts

The auxiliary contacts fitted as standard are used for de-energization of closing and tripping coils. None are available as standard.

Additions (→ page 2/7)

Extra **CA..** auxiliary contacts or **TP..** timed auxiliary contacts can be added.

>> **Technical Data** (except mechanical durability and electro-magnet) equivalent to those on pages 2/28 to 2/31 and 2/48
>> **Electro-magnet Characteristics** please consult us >> **Terminal Marking and Positioning - Wiring** section 7
>> **Accessories and Spare Parts** section 3 >> **Dimensions** section 8

IOR..-AME and IORR..-AME Mechanically Latched Contactors

a.c. Operated



Ordering Details

Power AC-3			Rated operat. current		No. of poles	Type to be completed with: – coil voltage and frequency in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage – coil Hz see p.1/12	Unit weight without packing kg
380V 400 V 415 V	440 V 500 V	500 V	AC-3 A	AC-1 A				
200	200	257	370	400	2	IOR 420-20-AME	FPL 811 225 R	15.40
					3	IOR 420-30-AME	FPL 811 325 R	18.50
					4	IOR 420-40-AME	FPL 811 425 R	21.50
300	315	370	550	550	2	IOR 550-20-AME	FPL 841 225 R	24.20
					3	IOR 550-30-AME	FPL 841 325 R	30.00
					4	IOR 550-40-AME	FPL 841 425 R	35.80
450	500	560	800	900	2	IOR 800-20-AME	FPL 861 225 R	48.00
					3	IOR 800-30-AME	FPL 861 325 R	58.00
					4	IOR 800-40-AME	FPL 861 425 R	68.00
630*	630*	710*	1000*	1000	2	IOR 1000-20-AME	FPL 871 225 R	48.00
					3	IOR 1000-30-AME	FPL 871 325 R	58.00
					4	IOR 1000-40-AME	FPL 871 425 R	68.00
710*	750*	900*	1250*	1250	2	IOR 1250-20-AME	FPL 881 225 R	63.00
					3	IOR 1250-30-AME	FPL 881 325 R	79.00
					3 + N	IOR 1250-39-AME	FPL 881 625 R	90.00
					4	IOR 1250-40-AME	FPL 881 425 R	95.00
850*	950*	1120*	1500*	1500	2	IOR 1500-20-AME	FPL 891 225 R	63.00
					3	IOR 1500-30-AME	FPL 891 325 R	79.00
					3 + N	IORR 1500-39-AME	FPL 891 5625 R	90.00
					4	IORR 1500-40-AME	FPL 891 5425 R	95.00
1120*	1250*	1400*	2000*	2300	2	IOR 2000-20-AME	FPL 901 225 R	71.00
					3	IORR 2000-30-AME	FPL 901 5325 R	93.00
					3 + N	IORR 2000-39-AME	FPL 901 5625 R	104.0
					4	IORR 2000-40-AME	FPL 901 5425 R	111.0

* Must never exceed 8700 A on making and 6400 A on breaking.

Poles of contactor ratings 1250 A and above are built-up with sets of 800 A main contacts connected in parallel which do not increase the basic making and breaking capacities of the poles.

Note for d.c. switching: where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils. Main poles characteristics: page 2/48.
Example: **IOR 550-20-AME**, d.c. circuit switching, actual current 250 A.

New order code for the contactor: FPL 841 1224 R

code of the 250 A blow-out coil.

Variants

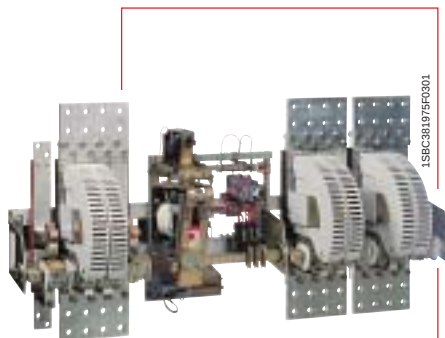
- **IOR..-AME** types (direct a.c. supply), can be supplied as **IORR..-AME** version (a.c. supply via a rectifier)
- **NOR..-AME** types with N.O. + N.C. main poles, Break before Make operation
- **JOR..-AME** types with N.O. + N.C. main poles, Make before Break operation
- **IOR..-MT-AME** types for 500 V a.c. < U_e < 1000 V a.c.
- **IOR..-CC-AME** types for 440 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)
- **IOR..-AMF** types with 2 tripping coils (double de-latching control).

>> **Technical Data** (except mechanical durability and electro-magnet) equivalent to those on pages 2/28 to 2/31 and 2/48
>> **Electro-magnet Characteristics** please consult us >> **Terminal Marking and Positioning - Wiring** section 7
>> **Accessories and Spare Parts** section 3 >> **Dimensions** section 8

IORE..-AME

Mechanically Latched Contactors

d.c. Operated



Special contactor (AM-CC.. type)
with mechanical latching.
3000 A rating.

Ordering Details

Power AC-3 380 V 400 V 415 V			Rated operat. current AC-3 AC-1 ≤ 440 V θ ≤ 40 °C A A		No. of poles	Type to be completed with: – coil voltage in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts – coil voltage see page 1/12	Unit weight without pack ^{ing} kg
440 V kW	500 V kW							
200	200	257	370	400	2	IORE 420-20-AME	FPL 811 9225 R	15.40
					3	IORE 420-30-AME	FPL 811 9325 R	18.50
					4	IORE 420-40-AME	FPL 811 9425 R	21.50
300	315	370	550	550	2	IORE 550-20-AME	FPL 841 9225 R	24.20
					3	IORE 550-30-AME	FPL 841 9325 R	30.00
					4	IORE 550-40-AME	FPL 841 9425 R	35.80
450	500	560	800	900	2	IORE 800-20-AME	FPL 861 9225 R	48.00
					3	IORE 800-30-AME	FPL 861 9325 R	58.00
					4	IORE 800-40-AME	FPL 861 9425 R	68.00
630*	630*	710*	1000*	1000	2	IORE 1000-20-AME	FPL 871 9225 R	48.00
					3	IORE 1000-30-AME	FPL 871 9325 R	58.00
					4	IORE 1000-40-AME	FPL 871 9425 R	68.00
710*	750*	900*	1250*	1250	2	IORE 1250-20-AME	FPL 881 9225 R	63.00
					3	IORE 1250-30-AME	FPL 881 9325 R	79.00
					3 + N	IORE 1250-39-AME	FPL 881 9625 R	90.00
					4	IORE 1250-40-AME	FPL 881 9425 R	95.00
850*	950*	1120*	1500*	1500	2	IORE 1500-20-AME	FPL 891 9225 R	63.00
					3	IORE 1500-30-AME	FPL 891 9325 R	79.00
					3 + N	IORE 1500-39-AME	FPL 891 9625 R	90.00
					4	IORE 1500-40-AME	FPL 891 9425 R	95.00
1120*	1250*	1400*	2000*	2300	2	IORE 2000-20-AME	FPL 901 9225 R	71.00
					3	IORE 2000-30-AME	FPL 901 9325 R	93.00
					3 + N	IORE 2000-39-AME	FPL 901 9625 R	104.00
					4	IORE 2000-40-AME	FPL 901 9425 R	111.00

* Must never exceed 8700 A on making and 6400 A on breaking.

Poles of contactor ratings 1250 A and above are built-up with sets of 800 A main contacts connected in parallel which do not increase the basic making and breaking capacities of the poles.

Note for d.c. switching: where the actual current rating is below 50% of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating. The table, page 1/12, indicates the codes for the blow-out coils. Main poles characteristics: see page 2/48.

Example: **IORE 550-20-AME**, d.c. circuit switching, actual current 250 A.

New order code for the contactor: FPL 841 9224 R

code of the 250 A blow-out coil.

Variants

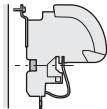
- **NORE..-AME** types with N.O. + N.C. main poles, Break before Make operation
- **JORE..-AME** types with N.O. + N.C. main poles, Make before Break operation
- **IORE..-MT-AME** types for 500 V a.c. < U_e < 1000 V a.c.
- **IORE..-CC-AME** types for 440 V d.c. < U_e < 1000 V d.c. (1500 V d.c. with increased insulation)
- **IORE..-AMF** types with 2 tripping coils (double de-latching control).

>> **Technical Data** (except mechanical durability and electro-magnet) equivalent to those on pages 2/28 to 2/31 and 2/48
>> **Electro-magnet Characteristics** please consult us >> **Terminal Marking and Positioning - Wiring** section 7
>> **Accessories and Spare Parts** section 3 >> **Dimensions** section 8

IOR, IORR, IORE and IORC Contactors

Voltages up to 500 V a.c. - 85 ... 550 A Ratings

Technical Data

Electro-magnet type / Contactor rating		R 85	R 170	R 260	R 420	R 550	
		RR 85	RR 170	RR 260	RR 420	RR 550	
		RE 85	RE 170	RE 260	RE 420	RE 550	
		RC 85	RC 170	RC 260	RC 420	RC 550	
General characteristics							
Number of poles (variable)		1 ... 4					
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1					
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1		V	1000				
Rated impulse withstand voltage U_{imp}		kV	8				
Air temperature (close to contactor)							
– fitted with thermal O/L relay		°C	-20 to +50				
– without thermal O/L relay		°C	-20 to +70				
– for storage		°C	-20 to +80				
Climatic withstand		Standard version for industrial environment and tropical atmospheres (🔗 page 6/6) Special version for very corrosive atmospheres (on request)					
Operating altitude		m	≤ 2000				
Mounting characteristics							
Mounting position		Position 1 (horizontal bar) 					
		Maximum angle of inclination, in any direction: ± 22° 30'					
Mounting distances		🔗 "Dimensions" section 8					
Fixing by screws (not supplied)		2 x M6	2 x M8	2 x M10	2 x M12		
Connecting characteristics							
Types of terminals		Terminal plates for lugs or bars M4 screws, with cable clamp M4 screws, with cable clamp					
Connecting dimensions							
Main poles							
Width of the terminal plates		mm	16	20	25	25	30
Terminal screws (supplied)			M6 x 20	M8 x 20	M10 x 25	–	–
Drilling of the plates (without thread)		mm	–	–	–	1 x Ø11	1 x Ø13
Auxiliary wires (built-in aux. terminals + coil terminals)							
– rigid (solid)		1 or 2 x mm²	1 ... 2.5				
– flexible (without cable end)		1 or 2 x mm²	1 ... 2.5				
Tightening torque (min. value)							
Main poles		Nm	7.4	17.5	35	–	–
Coil terminals		Nm	1.5				
Built-in auxiliary terminals		Nm	1.5				

Note: These characteristics are suitable for AMA and AME contactor versions.

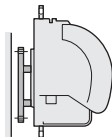
>> Main Pole Utilization Characteristics page 2/30
>> R and RR Electro-magnet Characteristics page 2/32
>> RE and RC Electro-magnet Characteristics page 2/34

>> General Technical Data section 6
>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> Dimensions section 8

IOR, IORR, IORE and IORC Contactors

Voltages up to 500 V a.c. - 800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 800/1000 RR 800/1000 RE 800/1000 RC 800/1000	R 1250/1500 RR 1250/1500 RE 1250/1500 -	- RR 2000 RE 2000 -	- RR 3150 RE 3150 -	- RR 4000 RE 4000 -	
General characteristics							
Number of poles (variable)		1 ... 4*					
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1					
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1		V	1000				
Rated impulse withstand voltage U_{imp}		kV	8				
Air temperature (close to contactor)							
– fitted with thermal O/L relay		°C	-20 to +50				
– without thermal O/L relay		°C	-20 to +70				
– for storage		°C	-20 to +80				
Climatic withstand		Standard version for industrial environment and tropical atmospheres (👉 page 6/6) Special version for very corrosive atmospheres (on request)					
Operating altitude		m	≤ 2000				
Mounting characteristics							
Mounting position		Position 1 (horizontal bar) 					
		Maximum angle of inclination, in any direction: ± 22° 30'					
Mounting distances		👉 "Dimensions" section 8					
Fixing by screws (not supplied)		2 x M12	4 x M12	4 or 6 x M12			
Connecting characteristics							
Types of terminals		Terminal plates for lugs or bars M4 screws, with cable clamp M4 screws, with cable clamp					
Connecting dimensions							
Main poles							
Width of the terminal plates		mm	48	100	150	200	250
Terminal screws (supplied)			–	–	–	–	–
Drilling of the plates (without thread)		mm	2 x Ø13	2 x Ø13/4 x Ø13	8 x Ø9	8 x Ø13	12 x Ø13
Auxiliary wires (built-in aux. terminals + coil terminals)							
– rigid (solid)		1 or 2 x mm²	1 ... 2.5				
– flexible (without cable end)		1 or 2 x mm²	1 ... 2.5				
Tightening torque (min. value)							
Main poles		Nm	–	–	–	–	–
Coil terminals		Nm	1.5				
Built-in auxiliary terminals		Nm	1.5				

* Except for IOR 1250, IOR 1500 contactors, limited to 2 poles. (This limitation is not applicable to the IORR 1250, IORR 1500, IORE 1250, IORE 1500 types)

Note: These characteristics are suitable for AME contactor versions.

>> Main Pole Utilization Characteristics page 2/31
 >> R and RR Electro-magnet Characteristics page 2/33
 >> RE and RC Electro-magnet Characteristics page 2/35

>> General Technical Data section 6
 >> Terminal Marking and Positioning - Wiring Diagrams section 7
 >> Dimensions section 8

IOR, IORR, IORE and IORC Contactors

Voltages up to 500 V a.c. - 85 ... 550 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 85 RR 85 RE 85 RC 85	R 170 RR 170 RE 170 RC 170	R 260 RR 260 RE 260 RC 260	R 420 RR 420 RE 420 RC 420	R 550 RR 550 RE 550 RC 550
Main Pole Utilization Characteristics						
Rated operational voltage U_e max.	V	500				
Rated frequency limits	Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)				
Conventional free-air thermal current I_{th} according to IEC 60947-4-1						
open contactors, $\theta \leq 40^\circ\text{C}$	A	85	170	275	400	550
with conductor cross-sectional area	mm ²	25	70	150	240	400
Rated operational current I_e / AC-1 according to air temperature close to contactor						
$\theta \leq 40^\circ\text{C}$	A	85	170	260	400	550
$\theta \leq 55^\circ\text{C}$	A	76	150	230	350	490
$\theta \leq 70^\circ\text{C}$	A	68	135	205	300	440
with conductor cross-sectional area	mm ²	25	70	150	240	400
Utilization category AC-3 Values for air temperature close to contactor $\leq 55^\circ\text{C}$						
Rated operational current I_e / AC-3						
380-415-440 V	A	77	150	245	370	550
500 V	A	73	130	245	370	550
Rated operational power AC-3						
380-415 V	kW	40	80	132	200	300
440 V	kW	45	80	132	200	315
500 V	kW	50	90	160	257	370
Rated making capacity AC-3 according to IEC 60947-4-1		10 x I_e / AC-3				
Rated breaking capacity AC-3 according to IEC 60947-4-1		8 x I_e / AC-3				
Short-circuit protection for contactors without thermal O/L relay (motor protection excluded)						
$U_e \leq 500\text{ V a.c.}$ - gG type fuses	A	100	200	315	500	630
$U_e \leq 500\text{ V a.c.}$ - L type fuses	A	—	—	—	—	—
Rated short-time withstand current I_{cw} at 40°C ambient temp.						
in free air, from a cold state	1 s A	1150	2250	3800	6000	8400
	10 s A	680	1200	1960	2960	4400
	30 s A	310	680	1040	1480	2200
	1 min. A	230	450	730	1100	1680
	15 min. A	120	250	390	600	840
Maximum breaking capacity at $\cos \varphi = 0.35$ ($\cos \varphi = 0.45$ for $I_e \leq 100\text{ A}$)						
at 500 V	A	584	1040	1960	3700	4480
Impedance per pole	mΩ	1.80	1.20	0.60	0.40	0.35
Max. electrical switching frequency						
— for AC-1	cycles/h	300				
— for AC-3	cycles/h	300				
— for AC-4	cycles/h	150				
Electrical durability		☞ curves page 2/55				
Max. mechanical switching frequency						
	cycles/h	1200				
Mechanical durability in millions of operating cycles						
— R type		10				
— RR, RE types		5				
— RC type		20				

Notes:

These characteristics are suitable for AMA and AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

For d.c. circuit switching (440 V d.c.) ☞ page 2/48.

IOR, IORR, IORE and IORC Contactors

Voltages up to 500 V a.c. - 800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 800/1000 RR 800/1000 RE 800/1000 RC 800/1000	R 1250/1500 RR 1250/1500 RE 1250/1500 -	- RR 2000 RE 2000 -	- RR 3150 RE 3150 -	- RR 4000 RE 4000 -
Main Pole Utilization Characteristics						
Rated operational voltage U _e max.	V	500				
Rated frequency limits	Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)				
Conventional free-air thermal current I_{th} according to IEC 60947-4-1 open contactors, θ ≤ 40 °C						
	A	1000/1100	1300/1600	2400	3400	4250
with conductor cross-sectional area	mm ²	600	1000	2000	3000	4000
Rated operational current I_e / AC-1 according to air temperature close to contactor						
θ ≤ 40 °C	A	900/1000	1250/1500	2300	3400	4100
θ ≤ 55 °C	A	840/930	1150/1350	2030	3000	3600
θ ≤ 70 °C	A	720/800	920/1100	1690	2500	3000
with conductor cross-sectional area	mm ²	600	1000	1500	3000	4000
Utilization category AC-3 Values for air temperature close to contactor ≤ 55 °C						
						
Rated operational current I_e / AC-3						
380-415-440 V	A	800/1000*	1250*/1500*	2000*	—	—
500 V	A	800/1000*	1250*/1500*	2000*	—	—
Rated operational power AC-3						
380-415 V	kW	450/630*	710*/850*	1120*	—	—
440 V	kW	500/630*	750*/950*	1150*	—	—
500 V	kW	560/710*	900*/1120*	1400*	—	—
Rated making capacity AC-3 according to IEC 60947-4-1						
	A	8700				
Rated breaking capacity AC-3 according to IEC 60947-4-1						
	A	6400			—	—
Short-circuit protection for contactors without thermal O/L relay (motor protection excluded)						
U _e ≤ 500 V a.c. - gG type fuses	A	1250	—	—	—	—
U _e ≤ 500 V a.c. - L type fuses	A	—	1600	2500	4000	5000
Rated short-time withstand current I_{cw} at 40°C ambient temp.						
in free air, from a cold state	1 s A	9000	16000	20000	21000	22000
	10 s A	8000	12000	16000	17000	18000
	30 s A	4000	6000	8000	8500	9000
	1 min. A	3000	4500	6000	6500	7000
	15 min. A	1600	2250	3000	3800	4500
Maximum breaking capacity at cos φ = 0.35 (cos φ = 0.45 for I _e ≤ 100 A)						
	at 500 V A	6400				
Impedance per pole	mΩ	0.18	0.13	0.080	0.060	0.045
Max. electrical switching frequency						
— for AC-1	cycles/h	300	120			
— for AC-3	cycles/h	300	120		—	—
— for AC-4	cycles/h	150	—	—	—	—
Electrical durability curves page 2/55						
		—	—	—	—	—
Max. mechanical switching frequency						
	cycles/h	1200	600			
Mechanical durability in millions of operating cycles						
— R type		5	—		—	—
— RR, RE types		5			2	
— RC type		20	—	—	—	—

(*) Make sure, when the power circuit controlled by the contactor is switched-on, that the r.m.s. current peak will not exceed the contactor rated making capacity on AC-3 utilization category and that in case of short-circuit faulty conditions the interrupted current on contactor breaking will not exceed its rated breaking capacity on AC-3 or its max. breaking capacity, as per data in the table above.

Note: These characteristics are suitable for AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

IOR and IORR Contactors

Laminated Magnetic Circuit

a.c. Operated



Electro-magnet Characteristics - IOR Contactors

Electro-magnet type / Contactor rating			R 85	R 170	R 260	R 420	R 550
Rated control circuit voltage U_c							
	50 Hz	V	24 ... 600				
	60 Hz	V	24 ... 600				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50 Hz	VA	260	380	620	1100	1700
	60 Hz	VA	305	440	720	1275	1970
Average holding value	50 Hz	VA	50	70	105	190	250
	60 Hz	VA	55	76	115	210	275
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	30		35	40	
Between coil de-energization and N.O. contact opening		ms	20		25		30

Electro-magnet Characteristics - IORR Contactors

Electro-magnet type / Contactor rating			RR 85	RR 170	RR 260	RR 420	RR 550
Rated control circuit voltage U_c							
	50/60 Hz	V	24 ... 550				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50/60 Hz	VA	290	460	410	350	540
Average holding value	50/60 Hz	VA	25	45		50	65
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	30		40	60	
Between coil de-energization and N.O. contact opening (switch-off the d.c. circuit)		ms	20			25	50

Note: For AMA and AME contactor versions, please consult us.

IOR and IORR Contactors

Laminated Magnetic Circuit

a.c. Operated



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Electro-magnet Characteristics - IOR Contactors (cont.)

Electro-magnet type / Contactor rating			R 800/1000	R 1250/1500			
Rated control circuit voltage U_c							
50 Hz	V		42 ... 600				
60 Hz	V		48 ... 600				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50 Hz	VA	3960				
	60 Hz	VA	4675				
Average holding value	50 Hz	VA	475				
	60 Hz	VA	515				
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	45				
Between coil de-energization and N.O. contact opening		ms	30				

Electro-magnet Characteristics - IORR Contactors (cont.)

Electro-magnet type / Contactor rating			RR 800/1000	RR 1250/1500	RR 2000	RR 3150	RR 4000
Rated control circuit voltage U_c			24 ... 550				
50/60 Hz	V						
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)				2 Poles : 610		3 Poles : 925	
Average pull-in value	50/60 Hz	VA	610	3 and 4 Poles : 925	925	4 Poles : (1)	(1)
Average holding value	50/60 Hz	VA	55	2 Poles : 55		3 Poles : 130	
				3 and 4 Poles : 130	130	4 Poles : (1)	(1)
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	100	90	120	(1)	(1)
Between coil de-energization and N.O. contact opening (switch-off the d.c. circuit)		ms	55	40	30	(1)	(1)

(1) Please consult us

Note: For AME contactor versions, please consult us.

IORE and IORC Contactors

Laminated Magnetic Circuit (RE) - d.c. Operated
Solid Magnetic Circuit (RC) - d.c. Operated



Electro-magnet Characteristics - IORE Contactors

Electro-magnet type / Contactor rating		RE 85	RE 170	RE 260	RE 420	RE 550
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value W		265	330		360	
Average holding value W		30	45		50	
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing ms		30		40	60	
Between coil de-energization and N.O. contact opening ms		20			25	45

Electro-magnet Characteristics - IORC Contactors

Electro-magnet type / Contactor rating		RC 85	RC 170	RC 260	RC 420	RC 550
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value W		25		30	45	
Average holding value W		25		30	45	
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing ms		145	150	135	140	210
Between coil de-energization and N.O. contact opening ms		45		50	80	150

Note: For AME contactor versions, please consult us.

IORE and IORC Contactors

Laminated Magnetic Circuit (RE) - d.c. Operated
Solid Magnetic Circuit (RC) - d.c. Operated



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Electro-magnet Characteristics - IORE Contactors (cont.)

Electro-magnet type / Contactor rating	RE 800/1000	RE 1250/1500	RE 2000	RE 3150	RE 4000
Rated control circuit voltage U_c d.c. V	24 ... 600				
Coil operating limits according to IEC 60947-4-1	0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c	roughly 10 ... 75 %				
Coil consumption (for U_c)		2 Poles : 700		3 Poles : 930	
Average pull-in value W	700	3 and 4 Poles : 930	930	4 Poles : (1)	(1)
Average holding value W	55	2 Poles : 55 3 and 4 Poles : 110	110	3 Poles : 110 4 Poles : (1)	(1)
Operating time (average values for U_c)					
Between coil energization and N.O. contact closing ms	70	80	90	(1)	(1)
Between coil de-energization and N.O. contact opening ms	50	45	35	(1)	(1)

(1) Please consult us

Electro-magnet Characteristics - IORC Contactors (cont.)

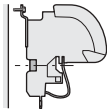
Electro-magnet type / Contactor rating	RC 800/1000				
Rated control circuit voltage U_c d.c. V	24 ... 600				
Coil operating limits according to IEC 60947-4-1	0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c	roughly 10 ... 75 %				
Coil consumption (for U_c)					
Average pull-in value W	75				
Average holding value W	75				
Operating time (average values for U_c)					
Between coil energization and N.O. contact closing ms	250				
Between coil de-energization and N.O. contact opening ms	150				

Note: For AME contactor versions, please consult us.

IOR..-MT, IORR..-MT, IORE..-MT, IORC..-MT Contactors

Voltages up to 1000 V a.c. - 63 ... 500 A Ratings

Technical Data

Electro-magnet type / Contactor rating		R 63-MT RR 63-MT RE 63-MT RC 63-MT	R 125-MT RR 125-MT RE 125-MT RC 125-MT	R 200-MT RR 200-MT RE 200-MT RC 200-MT	R 500-MT RR 500-MT RE 500-MT RC 500-MT	
General characteristics						
Number of poles (variable)		1 ... 4				
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1				
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1		V	1000			
Rated impulse withstand voltage U_{imp}		kV	8			
Air temperature (close to contactor)		°C	-20 to +50			
– fitted with thermal O/L relay		°C	-20 to +70			
– without thermal O/L relay		°C	-20 to +80			
– for storage		°C	-20 to +80			
Climatic withstand		Standard version for industrial environment and tropical atmospheres (👉 page 6/6) Special version for very corrosive atmospheres (on request)				
Operating altitude		m	≤ 2000			
Mounting characteristics						
Mounting position		Position 1 (horizontal bar)  Maximum angle of inclination, in any direction: ± 22° 30'				
Mounting distances		👉 "Dimensions" section 8				
Fixing by screws (not supplied)		2 x M6	2 x M8	2 x M12		
Connecting characteristics						
Types of terminals		Terminal plates for lugs or bars M4 screws, with cable clamp M4 screws, with cable clamp				
Main poles						
Coil terminals						
Built-in auxiliary terminals						
Connecting dimensions						
Main poles						
Width of the terminal plates		mm	16	20	25	30
Terminal screws (supplied)			M6 x 20	M8 x 20	M10 x 25	–
Drilling of the plates (smooth holes)		mm	–	–	–	1 x Ø13
Auxiliary wires						
(built-in aux. terminals + coil terminals)						
– rigid (solid)		1 or 2 x mm ²	1 ... 2.5			
– flexible (without cable end)		1 or 2 x mm ²	1 ... 2.5			
Tightening torque (min. value)						
Main poles		Nm	7.4	17.5	35	–
Coil terminals		Nm	1.5			
Built-in auxiliary terminals		Nm	1.5			

Note: These characteristics are suitable for MT-AMA and MT-AME contactor versions.

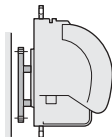
>> Main Pole Utilization Characteristics page 2/38
>> R and RR Electro-magnet Characteristics page 2/40
>> RE and RC Electro-magnet Characteristics page 2/42

>> General Technical Data section 6
>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> Dimensions section 8

IOR..-MT, IORR..-MT, IORE..-MT, IORC..-MT Contactors

Voltages up to 1000 V a.c. - 800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 800-MT RR 800-MT RE 800-MT RC 800-MT	R 1500-MT RR 1500-MT RE 1500-MT –	– RR 2000-MT RE 2000-MT –	– RR 3150-MT RE 3150-MT –	– RR 4000-MT RE 4000-MT –	
General characteristics							
Number of poles (variable)		1 ... 4*					
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1					
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1		V	1000				
Rated impulse withstand voltage U_{imp}		kV	8				
Air temperature (close to contactor)							
– fitted with thermal O/L relay		°C	-20 to +50				
– without thermal O/L relay		°C	-20 to +70				
– for storage		°C	-20 to +80				
Climatic withstand		Standard version for industrial environment and tropical atmospheres (👉 page 6/6) Special version for very corrosive atmospheres (on request)					
Operating altitude		m	≤ 2000				
Mounting characteristics							
Mounting position		Position 1 (horizontal bar) 					
		Maximum angle of inclination, in any direction: ± 22° 30'					
Mounting distances		👉 "Dimensions" section 8					
Fixing by screws (not supplied)		2 x M12	4 x M12	4 or 6 x M12			
Connecting characteristics							
Types of terminals		Terminal plates for lugs or bars					
Main poles		M4 screws, with cable clamp					
Coil terminals		M4 screws, with cable clamp					
Built-in auxiliary terminals							
Connecting dimensions							
Main poles							
Width of the terminal plates		mm	48	100	150	200	250
Terminal screws (supplied)			–	–	–	–	–
Drilling of the plates (smooth holes)		mm	2 x Ø13	4 x Ø13	8 x Ø9	8 x Ø13	12 x Ø13
Auxiliary wires (built-in aux. terminals + coil terminals)							
– rigid (solid)		1 or 2 x mm ²	1 ... 2.5				
– flexible (without cable end)		1 or 2 x mm ²	1 ... 2.5				
Tightening torque (min. value)							
Main poles		Nm	–	–	–	–	–
Coil terminals		Nm	1.5				
Built-in auxiliary terminals		Nm	1.5				

* Except for IOR 1500-MT contactors, limited to 2 poles. (This limitation is not applicable to the IORR 1500..-MT, IORE 1500-MT types)

Note: These characteristics are suitable for MT-AME contactor versions.

>> Main Pole Utilization Characteristics page 2/39
>> R and RR Electro-magnet Characteristics page 2/41
>> RE and RC Electro-magnet Characteristics page 2/43

>> General Technical Data section 6
>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> Dimensions section 8

IOR..-MT, IORR..-MT, IORE..-MT, IORC..-MT Contactors

Voltages up to 1000 V a.c. - 63 ... 500 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 63-MT RR 63-MT RE 63-MT RC 63-MT	R 125-MT RR 125-MT RE 125-MT RC 125-MT	R 200-MT RR 200-MT RE 200-MT RC 200-MT	R 500-MT RR 500-MT RE 500-MT RC 500-MT
Main Pole Utilization Characteristics					
Rated operational voltage U _e max.	V	1000			
Rated frequency limits	Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)			
Conventional free-air thermal current I _{th} according to IEC 60947-4-1					
open contactors, θ ≤ 40 °C	A	85	170	275	550
with conductor cross-sectional area	mm ²	25	70	150	400
Rated operational current I _e / AC-1 according to air temperature close to contactor (U _e max. 690 V)					
θ ≤ 40 °C	A	85	170	260	550
θ ≤ 55 °C	A	76	150	230	490
θ ≤ 70 °C	A	68	135	205	440
with conductor cross-sectional area	mm ²	25	70	150	400
Utilization category AC-3 Values for air temperature close to contactor ≤ 55 °C					
					
Rated operational current I _e / AC-3					
690 V	A	85	160	260	550
1000 V	A	56	105	180	380
Rated operational power AC-3					
690 V	kW	80	150	240	540
1000 V	kW	80	150	250	550
Rated making capacity AC-3 according to IEC 60947-4-1		10 × I _e / AC-3			
Rated breaking capacity AC-3 according to IEC 60947-4-1		8 × I _e / AC-3			
Short-circuit protection for contactors without thermal O/L relay (motor protection excluded)					
U _e ≤ 1000 V a.c. - gG type fuses	A	100	200	315	630
U _e ≤ 1000 V a.c. - L type fuses	A	—	—	—	—
Rated short-time withstand					
1 s	A	1150	2250	3800	8400
current I _{cw} at 40°C ambient temp.	10 s A	680	1280	2080	4400
in free air, from a cold state	30 s A	310	680	1040	2200
	1 min. A	230	450	730	1680
	15 min. A	120	250	390	840
Maximum breaking capacity at cos φ = 0.35 (cos φ = 0.45 for I _e ≤ 100 A)					
at 690 V	A	680	1280	2100	4480
at 1000 V	A	450	850	1450	3050
Impedance per pole	mΩ	1.80	1.20	0.60	0.35
Max. electrical switching frequency					
— for AC-1	cycles/h	300			
— for AC-3	cycles/h	300			
— for AC-4	cycles/h	150			
Max. mechanical switching frequency					
	cycles/h	1200			
Mechanical durability in millions of operating cycles					
— R type		10			
— RR, RE types		5			
— RC type		20			

Note: These characteristics are suitable for MT-AMA and MT-AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

IOR..MT, IORR..MT, IORE..MT, IORC..MT Contactors

Voltages up to 1000 V a.c. - 800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 800-MT RR 800-MT RE 800-MT RC 800-MT	R 1500-MT RR 1500-MT RE 1500-MT –	– RR 2000-MT RE 2000-MT –	– RR 3150-MT RE 3150-MT –	– RR 4000-MT RE 4000-MT –
Main Pole Utilization Characteristics						
Rated operational voltage U _e max.	V	1000				
Rated frequency limits	Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)				
Conventional free-air thermal current I _{th} according to IEC 60947-4-1						
open contactors, θ ≤ 40 °C	A	800	1500	2000	3000	3800
with conductor cross-sectional area	mm ²	500	1000	1500	3000	4000
Rated operational current I _e / AC-1 according to air temperature close to contactor (U _e max. 690 V)						
θ ≤ 40 °C	A	800	1500	2000	3000	3800
θ ≤ 55 °C	A	740	1350	1850	2760	3500
θ ≤ 70 °C	A	640	1100	1600	2400	3000
with conductor cross-sectional area	mm ²	500	1000	1500	3000	4000
Utilization category AC-3 Values for air temperature close to contactor ≤ 55 °C						
						
Rated operational current I _e / AC-3						
690 V	A	800	1500*	1950*	–	–
1000 V	A	580	1100*	1500*	–	–
Rated operational power AC-3						
690 V	kW	780	1450*	1900*	–	–
1000 V	kW	850	1600*	2200*	–	–
Rated making capacity AC-3 according to IEC 60947-4-1						
	A	10 x I _e / AC-3			25000	30000
Rated breaking capacity AC-3 according to IEC 60947-4-1						
	A	8 x I _e / AC-3	–	–	–	–
Short-circuit protection for contactors without thermal O/L relay (motor protection excluded)						
U _e ≤ 1000 V a.c. - gG type fuses	A	1000	–	–	–	–
U _e ≤ 1000 V a.c. - L type fuses	A	–	1600	2500	4000	5000
Rated short-time withstand current I _{cw} at 40°C ambient temp. in free air, from a cold state						
1 s	A	9000	16000	20000	21000	22000
10 s	A	6400	12000	16000	17000	18000
30 s	A	3200	6000	8000	8500	9000
1 min.	A	2100	4500	6000	6500	7000
15 min.	A	1200	2250	3000	3800	4500
Maximum breaking capacity at cos φ = 0.35 (cos φ = 0.45 for I _e ≤ 100 A)						
at 690 V	A	6400			–	–
at 1000 V	A	4650			–	–
Impedance per pole	mΩ	0.18	0.15	0.10	0.075	0.060
Max. electrical switching frequency						
– for AC-1	cycles/h	300	120			
– for AC-3	cycles/h	300	120		–	–
– for AC-4	cycles/h	150	–	–	–	–
Max. mechanical switching frequency						
	cycles/h	1200	600			
Mechanical durability in millions of operating cycles						
– R type		5	–		–	–
– RR, RE types		5			2	
– RC type		20	–	–	–	–

(*) Make sure, when the power circuit controlled by the contactor is switched-on, that the r.m.s. current peak will not exceed the contactor rated making capacity on AC-3 utilization category and that in case of short-circuit faulty conditions the interrupted current on contactor breaking will not exceed its rated breaking capacity on AC-3 or its max. breaking capacity, as per data in the table above.

Note: These characteristics are suitable for MT-AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

IOR..-MT and IORR..-MT Contactors

Laminated Magnetic Circuit

a.c. Operated



Electro-magnet Characteristics - IOR..-MT Contactors

Electro-magnet type / Contactor rating			R 63-MT	R 125-MT	R 200-MT	R 500-MT
Rated control circuit voltage U_c			24 ... 600			
50 Hz	V		24 ... 600			
60 Hz	V		24 ... 600			
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)			
Drop-out voltage in % of U_c			roughly 20 ... 75 %			
Coil consumption (for U_c)						
Average pull-in value	50 Hz	VA	260	380	620	1700
	60 Hz	VA	305	440	720	1970
Average holding value	50 Hz	VA	50	70	105	250
	60 Hz	VA	55	76	115	275
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing		ms	30		35	40
Between coil de-energization and N.O. contact opening		ms	20		25	30

Electro-magnet Characteristics - IORR..-MT Contactors

Electro-magnet type / Contactor rating			RR 63-MT	RR 125-MT	RR 200-MT	RR 500-MT
Rated control circuit voltage U_c			24 ... 600			
50/60 Hz	V		24 ... 600			
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)			
Drop-out voltage in % of U_c			roughly 20 ... 75 %			
Coil consumption (for U_c)						
Average pull-in value	50/60 Hz	VA	290	460	410	540
Average holding value	50/60 Hz	VA	25	45		65
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing		ms	30		40	60
Between coil de-energization and N.O. contact opening (switch-off the d.c. circuit)		ms	20			50

Note: For MT-AMA and MT-AME contactor versions, please consult us.

IOR..-MT and IORR..-MT Contactors

Laminated Magnetic Circuit

a.c. Operated



2

Electro-magnet Characteristics - IOR..-MT Contactors (cont.)

Electro-magnet type / Contactor rating			R 800-MT	R 1500-MT		
Rated control circuit voltage U_c						
	50 Hz	V	42 ... 600			
	60 Hz	V	48 ... 600			
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)			
Drop-out voltage in % of U_c			roughly 20 ... 75 %			
Coil consumption (for U_c)						
Average pull-in value	50 Hz	VA	3960			
	60 Hz	VA	4675			
Average holding value	50 Hz	VA	475			
	60 Hz	VA	515			
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing		ms	45			
Between coil de-energization and N.O. contact opening		ms	30			

Electro-magnet Characteristics - IORR..-MT Contactors (cont.)

Electro-magnet type / Contactor rating			RR 800-MT	RR 1500-MT	RR 2000-MT	RR 3150-MT	RR 4000-MT
Rated control circuit voltage U_c			24 ... 550				
	50/60 Hz	V					
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)				2 Poles : 610		3 Poles : 925	
Average pull-in value	50/60 Hz	VA	610	3 and 4 Poles : 925	925	4 Poles : (1)	(1)
Average holding value	50/60 Hz	VA	55	2 Poles : 55		3 Poles : 130	
				3 and 4 Poles : 130	130	4 Poles : (1)	(1)
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	100	90	120	(1)	(1)
Between coil de-energization and N.O. contact opening (switch-off the d.c. circuit)		ms	55	40	30	(1)	(1)

(1) Please consult us

Note: For MT-AME contactor versions, please consult us.

IORE..-MT and IORC..-MT Contactors

Laminated Magnetic Circuit (RE) - d.c. Operated
Solid Magnetic Circuit (RC) - d.c. Operated



Electro-magnet Characteristics - IORE..-MT Contactors

Electro-magnet type / Contactor rating		RE 63-MT	RE 125-MT	RE 200-MT	RE 500-MT
Rated control circuit voltage U_c d.c. V		24 ... 600			
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)			
Drop-out voltage in % of U_c		roughly 10 ... 75 %			
Coil consumption (for U_c)					
Average pull-in value W		265	330		360
Average holding value W		30	45		50
Operating time (average values for U_c)					
Between coil energization and N.O. contact closing ms		30		40	60
Between coil de-energization and N.O. contact opening ms		20			45

Electro-magnet Characteristics - IORC..-MT Contactors

Electro-magnet type / Contactor rating		RC 63-MT	RC 125-MT	RC 200-MT	RC 500-MT
Rated control circuit voltage U_c d.c. V		24 ... 600			
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)			
Drop-out voltage in % of U_c		roughly 10 ... 75 %			
Coil consumption (for U_c)					
Average pull-in value W		25		30	45
Average holding value W		25		30	45
Operating time (average values for U_c)					
Between coil energization and N.O. contact closing ms		145	150	135	210
Between coil de-energization and N.O. contact opening ms		45		50	150

Note: For MT-AME contactor versions, please consult us.

IORE..-MT and IORC..-MT Contactors

Laminated Magnetic Circuit (RE) - d.c. Operated

Solid Magnetic Circuit (RC) - d.c. Operated



2

Electro-magnet Characteristics - IORE..-MT Contactors (cont.)

Electro-magnet type / Contactor rating	RE 800-MT	RE 1500-MT	RE 2000-MT	RE 3150-MT	RE 4000-MT
Rated control circuit voltage U_c d.c. V	24 ... 600				
Coil operating limits according to IEC 60947-4-1	0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c	roughly 10 ... 75 %				
Coil consumption (for U_c)		2 Poles : 700		3 Poles : 930	
Average pull-in value W	700	3 and 4 Poles : 930	930	4 Poles : (1)	(1)
Average holding value W	55	2 Poles : 55 3 and 4 Poles : 110	110	3 Poles : 110 4 Poles : (1)	(1)
Operating time (average values for U_c)					
Between coil energization and N.O. contact closing ms	70	80	90	(1)	(1)
Between coil de-energization and N.O. contact opening ms	50	45	35	(1)	(1)

(1) Please consult us

Electro-magnet Characteristics - IORC..-MT Contactors (cont.)

Electro-magnet type / Contactor rating	RC 800-MT				
Rated control circuit voltage U_c d.c. V	24 ... 600				
Coil operating limits according to IEC 60947-4-1	0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c	roughly 10 ... 75 %				
Coil consumption (for U_c)					
Average pull-in value W	75				
Average holding value W	75				
Operating time (average values for U_c)					
Between coil energization and N.O. contact closing ms	250				
Between coil de-energization and N.O. contact opening ms	150				

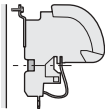
Note: For MT-AME contactor versions, please consult us.

NOR, NORR, NORE and JOR, JORR, JORE, JORC

Contactors with N.C. + N.O. Main Poles

Voltages up to 500 V a.c. - 63 ... 800 A Ratings

Technical Data

Electro-magnet type / Contactor rating		R 63 RR 63 RE 63 RC 63	R 125 RR 125 RE 125 RC 125	R 200 RR 200 RE 200 RC 200	R 315 RR 315 RE 315 RC 315	– RR 800 RE 800 –	
General characteristics							
Number of poles (variable)		1 ... 4					
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1					
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1		V	1000				
Rated impulse withstand voltage U_{imp}		kV	8				
Air temperature (close to contactor)		°C	-20 to +50				
– fitted with thermal O/L relay		°C	-20 to +70				
– without thermal O/L relay		°C	-20 to +80				
– for storage		°C					
Climatic withstand		Standard version for industrial environment and tropical atmospheres (👉 page 6/6) Special version for very corrosive atmospheres (on request)					
Operating altitude		m	≤ 2000				
Mounting characteristics							
Mounting position		Position 1 (horizontal bar) 					
		Maximum angle of inclination, in any direction: ± 22° 30'					
Mounting distances		👉 "Dimensions" section 8					
Fixing by screws (not supplied)		2 x M6	2 x M8	2 x M10	2 x M12		
Connecting characteristics							
Types of terminals		Terminal plates for lugs or bars M4 screws, with cable clamp M4 screws, with cable clamp					
Connecting dimensions							
Main poles							
Width of the terminal plates		mm	16	20	25	25	48
Terminal screws (supplied)			M6 x 20	M8 x 20	M10 x 25	–	–
Drilling of the plates (smooth holes)		mm	–	–	–	1 x Ø11	2 x Ø13
Auxiliary wires							
(built-in aux. terminals + coil terminals)							
– rigid (solid)		1 or 2 x mm ²	1 ... 2.5				
– flexible (without cable end)		1 or 2 x mm ²	1 ... 2.5				
Tightening torque (min. value)							
Main poles		Nm	7.4	17.5	35	–	–
Coil terminals		Nm	1.5				
Built-in auxiliary terminals		Nm	1.5				

Note: These characteristics are suitable for AMA and AME versions of the NOR, NORR, NORE contactors as well as JOR, JORR, JORE contactors.

>> Main Pole Utilization Characteristics page 2/45	>> General Technical Data section 6
>> R and RR Electro-magnet Characteristics page 2/46	>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> RE and RC Electro-magnet Characteristics page 2/47	>> Dimensions section 8

NOR, NORR, NORE and JOR, JORR, JORE, JORC

Contactors with N.C. + N.O. Main Poles

Voltages up to 500 V a.c. - 63 ... 800 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 63 RR 63 RE 63 RC 63	R 125 RR 125 RE 125 RC 125	R 200 RR 200 RE 200 RC 200	R 315 RR 315 RE 315 RC 315	– RR 800 RE 800 RC 800	
Main Pole Utilization Characteristics							
Rated operational voltage U _e max.		V	NOR, NORR, NORE - N.C. or N.O. poles: 500				
			JOR, JORR, JORE, JORC - N.C. poles: 230 - N.O. poles : 500				
Rated frequency limits		Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)				
Conventional free-air thermal current I _{th} according to IEC 60947-4-1 open contactors, θ ≤ 40 °C		A	63	125	200	315	800
with conductor cross-sectional area		mm ²	16	50	95	185	500
Rated operational current I _e / AC-1 according to air temperature close to contactor							
θ ≤ 40 °C		A	63	125	200	315	800
θ ≤ 55 °C		A	56	110	180	280	710
θ ≤ 70 °C		A	50	100	160	250	640
with conductor cross-sectional area		mm ²	16	50	95	185	500
Rated making capacity AC-1 according to IEC 60947-4-1		A	1.5 × I _e / AC-1				
Rated breaking capacity AC-1 according to IEC 60947-4-1		A	1.5 × I _e / AC-1				
Short-circuit protection for contactors without thermal O/L relay (motor protection excluded) U _e ≤ 500 V a.c. - gG type fuses		A	80	160	250	355	1000
Rated short-time withstand current I _{cw} at 40°C ambient temp. in free air, from a cold state		1 s A 10 s A 30 s A 1 min. A 15 min. A	850 500 250 170 90	1700 900 450 310 180	3100 1600 800 560 300	5000 2500 1250 870 460	7500 6000 3000 2000 1200
Impedance per pole		mΩ	1.8	1.2	0.6	0.4	0.18
Max. electrical switching frequency for AC-1		cycles/h	300				
Max. mechanical switching frequency		cycles/h	1200				
Mechanical durability in millions of operating cycles			3				1

Notes :

These characteristics are suitable for AMA and AME versions of the NOR, NORR, NORE contactors as well as JOR, JORR, JORE contactors (except for mechanical durability = 0.2 millions of operating cycles).
For d.c. circuit switching (440 V d.c.)  page 2/49.

>> General Characteristics page 2/44
>> Mounting Characteristics page 2/44
>> Connecting Characteristics page 2/44

>> R and RR Electro-magnet Characteristics page 2/46
>> RE and RC Electro-magnet Characteristics page 2/47
>> Dimensions section 8

NOR, NORR and JOR, JORR Contactors

Laminated Magnetic Circuit

a.c. Operated



Electro-magnet Characteristics - NOR and JOR Contactors

Electro-magnet type / Contactor rating			R 63	R 125	R 200	R 315
Rated control circuit voltage U_c						
50 Hz	V		24 ... 600			
60 Hz	V		24 ... 600			
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)			
Drop-out voltage in % of U_c			roughly 20 ... 75 %			
Coil consumption (for U_c)						
Average pull-in value	50 Hz	VA	260	380	620	1100
	60 Hz	VA	305	440	720	1275
Average holding value	50 Hz	VA	50	70	105	190
	60 Hz	VA	55	76	115	210
Operating time (average values for U_c)						
for N.O. poles of the NOR and JOR						
Between coil energization and contact closing		ms	30		35	40
Between coil de-energization and contact opening		ms	20		25	
for N.C. poles of the NOR						
Between coil energization and contact opening		ms	27		32	37
Between coil de-energization and contact closing		ms	23		28	
for N.C. poles of the JOR						
Between coil energization and contact opening		ms	34		39	45
Between coil de-energization and contact closing		ms	18		22	

Electro-magnet Characteristics - NORR and JORR Contactors

Electro-magnet type / Contactor rating			RR 63	RR 125	RR 200	RR 315	RR 800
Rated control circuit voltage U_c							
50/60 Hz	V		24 ... 550				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50/60 Hz	VA	290	460	410	350	610
Average holding value	50/60 Hz	VA	25	45		50	55
Operating time (average values for U_c)							
for N.O. poles of the NORR and JORR							
Between coil energization and contact closing		ms	30		40	60	100
Between coil de-energization and contact opening		ms	20			25	55
for N.C. poles of the NORR							
Between coil energization and contact opening		ms	27		37	55	85
Between coil de-energization and contact closing		ms	23			28	60
for N.C. poles of the JORR							
Between coil energization and contact opening		ms	34		44	65	105
Between coil de-energization and contact closing		ms	18			23	52

Note: For AMA and AME versions of the NOR, NORR and JOR, JORR contactors, please consult us.

NORE, JORE, JORC Contactors

Laminated Magnetic Circuit (RE) - d.c. Operated

Solid Magnetic Circuit (RC) - d.c. Operated



2

Electro-magnet Characteristics - NORE and JORE Contactors

Electro-magnet type / Contactor rating		RE 63	RE 125	RE 200	RE 315	RE 800
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value	W	265	330		360	700
Average holding value	W	30	45		50	55
Operating time (average values for U_c)						
for N.O. poles of the NORE and JORE						
Between coil energization and contact closing	ms	30		40	60	70
Between coil de-energization and contact opening	ms	20			25	50
for N.C. poles of the NORE						
Between coil energization and contact opening	ms	27		37	57	62
Between coil de-energization and contact closing	ms	23			28	53
for N.C. poles of the JORE						
Between coil energization and contact opening	ms	34		44	65	75
Between coil de-energization and contact closing	ms	18			23	47

Electro-magnet Characteristics - JORC Contactors

Electro-magnet type / Contactor rating		RC 63	RC 125	RC 200	RC 315	RC 800
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value	W	25		30	45	75
Average holding value	W	25		30	45	75
Operating time (average values for U_c)						
for N.O. poles						
Between coil energization and contact closing	ms	145	150	135	140	250
Between coil de-energization and contact opening	ms	45		50	80	150
for N.C. poles						
Between coil energization and contact opening	ms	150	155	140	145	255
Between coil de-energization and contact closing	ms	42		46	75	145

Note : For AME version of the NORE and JORE contactors, please consult us.

>> Coil Voltage Table page 1/12

>> Wiring Diagrams section 7

R.. Series Contactors - Poles 440 V d.c. IOR, IORR, IORE, IORC

85 ... 550 A Ratings

Technical Data for d.c. Circuit Switching

Electro-magnet type / Contactor rating		R 85 RR 85 RE 85 RC 85	R 170 RR 170 RE 170 RC 170	R 260 RR 260 RE 260 RC 260	R 420 RR 420 RE 420 RC 420	R 550 RR 550 RE 550 RC 550
Main poles						
Rated operational voltage U_e	V d.c.	440				
L/R time constant	ms	≤ 7.5 (for L/R >7.5 ms please consult us)				
Conventional free-air thermal current						
I_{th} acc. to IEC 60947-4-1- Open contactors, $\theta \leq 40^\circ C$	A	85	170	275	400	550
with conductor cross-sectional area	mm ²	25	70	150	240	400
Rated operational current I_e						
DC1 category, L/R ≤ 1 ms						
 1 pole	$U_e \leq 220$ V A	85	170	275	400	550
 2 poles in series	$U_e \leq 440$ V A	85	170	275	400	550
DC3 category, L/R ≤ 2 ms						
 1 pole	$U_e \leq 220$ V A	68	140	205	350	500
 2 poles in series	$U_e \leq 440$ V A	68	140	205	350	500
DC5 category, L/R ≤ 7.5 ms						
 1 pole	$U_e \leq 220$ V A	68	140	205	350	500
 2 poles in series	$U_e \leq 440$ V A	68	140	205	350	500
Impedance per pole	m Ω	1.80	1.20	0.60	0.40	0.35
Max. electrical switching frequency	cycles/h	40				
Max. mechanical switching frequency	cycles/h	1200				
Mechanical durability in millions of operating cycles						
– R type		10				
– RR, RE types		5				
– RC type		20				

For ratings ≥ 800 A the contactors are systematically in CC version: $U_e \leq 1000$ V (or 1500 V in version with increased insulation) ➔ page 2/52.

Notes:

The arc switching on d.c. is more difficult than on a.c.

For selecting a contactor, is essential to determine the current, the voltage, an the **L/R time constant of the controlled load**.

For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces: **L/R ≤ 1 ms**; inductive loads such as shunt motor: **L/R ≤ 2 ms**; series motor: **L/R ≤ 7.5 ms**.

The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.

All the **poles** required for breaking must be connected, **in series**, between the load and the source polarity not linked to the earth.

Connection of the poles in series by the user, according to the above diagrams.

The connection of the poles in series helps in the elimination of the arcs.

These characteristics are suitable for AMA and AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

>> General Characteristics page 2/28
>> Mounting Characteristics page 2/28
>> Connecting Characteristics page 2/28

>> R and RR Electro-magnet Characteristics page 2/30
>> RE and RC Electro-magnet Characteristics page 2/32
>> Dimensions section 8

R.. Series Contactors - Poles 440 V d.c. NOR, NORR, NORE

63 ... 800 A Ratings

Technical Data for d.c. Circuit Switching

Electro-magnet type / Contactor rating				R 63 RR 63 RE 63 –	R 125 RR 125 RE 125 –	R 200 RR 200 RE 200 –	R 315 RR 315 RE 315 –	– RR 800-CC RE 800-CC –
Main poles								
Rated operational voltage U _e V d.c.				440				
L/R time constant ms				≤ 7.5 (for L/R >7.5 ms please consult us)				
Conventional free-air thermal current I _{th} acc. to IEC 60947-4-1- Open contactors, θ ≤ 40 °C with conductor cross-sectional area mm ²				63 16	125 50	200 95	315 185	800 500
Rated operational current I _e DC1 category, L/R ≤ 1 ms								
	1 pole	U _e ≤ 220 V	A	63	125	200	315	800
		U _e ≤ 440 V	A	–	–	–	–	800
	2 poles in series	U _e ≤ 440 V	A	63	125	200	315	800
DC3 category, L/R ≤ 2 ms								
	1 pole	U _e ≤ 220 V	A	63	125	200	315	720
		U _e ≤ 440 V	A	–	–	–	–	720
	2 poles in series	U _e ≤ 440 V	A	63	125	200	315	720
DC5 category, L/R ≤ 7.5 ms								
	1 pole	U _e ≤ 220 V	A	63	125	200	315	720
		U _e ≤ 440 V	A	–	–	–	–	720
	2 poles in series	U _e ≤ 440 V	A	63	125	200	315	720
Impedance per pole mΩ				1.80	1.20	0.60	0.40	0.18
Max. electrical switching frequency cycles/h				40				
Max. mechanical switching frequency cycles/h				1200				
Mechanical durability in millions of operating cycles				3				
				1				

The 800 A contactor ratings are systematically in CC version: $U_e \leq 1000\text{ V}$ (or 1500 V in version with increased insulation)  page 2/53.

Notes:

The arc switching on d.c. is more difficult than on a.c.

For selecting a contactor, it is essential to determine the current, the voltage, and the **L/R time constant of the controlled load**.

For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces: **L/R ≤ 1 ms**; inductive loads such as shunt motor: **L/R ≤ 2 ms**; series motor: **L/R ≤ 7.5 ms**. The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.

All the **poles** required for breaking must be connected, **in series**, between the load and the source polarity not linked to the earth.

Connection of the poles in series by the user, according to the above diagrams.

The principle is the same for the N.C. main poles and the N.O. main poles.

The connection of the poles in series helps in the elimination of the arcs.

These characteristics are suitable for AMA and AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

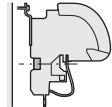
>> General Characteristics page 2/44
>> Mounting Characteristics page 2/44
>> Connecting Characteristics page 2/44

>> R and RR Electro-magnet Characteristics page 2/46
>> RE Electro-magnet Characteristics page 2/47
>> Dimensions section 8

R.. Series Contactors - Poles 1000/1500 V d.c. IOR..-CC, IORR..-CC, IORE..-CC, IORC..-CC

63 ... 500 A Ratings

Technical Data

Electro-magnet type / Contactor rating		R 63-CC RR 63-CC RE 63-CC RC 63-CC	R 125-CC RR 125-CC RE 125-CC RC 125-CC	R 200-CC RR 200-CC RE 200-CC RC 200-CC	R 500-CC RR 500-CC RE 500-CC RC 500-CC
General characteristics					
Number of poles (variable)		1 ... 4			
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1			
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1	V	1000 (1500 with increased insulation)			
Rated impulse withstand voltage U_{imp}	kV	8			
Air temperature					
– close to contactor	°C	-20 to +70			
– for storage	°C	-20 to +80			
Climatic withstand		Standard version for industrial environment and tropical atmospheres (☞ page 6/6) Special version for very corrosive atmospheres (on request)			
Operating altitude	m	≤ 2000			
Mounting characteristics					
Mounting position		Position 1 (horizontal bar)  Maximum angle of inclination, in any direction: ± 22° 30'			
Mounting distances		☞ "Dimensions" section 8			
Fixing by screws (not supplied)		2 x M6		2 x M8	2 x M12
Connecting characteristics					
Types of terminals					
Main poles		Terminal plates for lugs or bars			
Coil terminals		M4 screws, with cable clamp			
Built-in auxiliary terminals		M4 screws, with cable clamp			
Connecting dimensions					
Main poles					
Width of the terminal plates	mm	16	20	25	30
Terminal screws (supplied)		M6 x 20	M8 x 20	M10 x 25	–
Drilling of the plates (smooth holes)	mm	–	–	–	1 x Ø13
Auxiliary wires (built-in aux. terminals + coil terminals)					
– rigid (solid) 1 or 2 x mm ²		1 ... 2.5			
– flexible (without cable end) 1 or 2 x mm ²		1 ... 2.5			
Tightening torque (min. value)					
Main poles	Nm	7.4	17.5	35	–
Coil terminals	Nm	1.5			
Built-in auxiliary terminals	Nm	1.5			

Note: These characteristics are suitable for AMA and AME contactor versions.

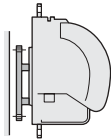
>> Main Pole Utilization Characteristics page 2/52
>> R and RR Electro-magnet Characteristics equivalent to page 2/40
>> RE and RC Electro-magnet Characteristics equivalent to page 2/42

>> General Technical Data section 6
>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> Dimensions section 8

R.. Series Contactors - Poles 1000/1500 V d.c. IOR..-CC, IORR..-CC, IORE..-CC, IORC..-CC

800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating		R 800-CC RR 800-CC RE 800-CC RC 800-CC	R 1500-CC RR 1500-CC RE 1500-CC -	- RR 2000-CC RE 2000-CC -	- RR 3150-CC RE 3150-CC -	- RR 4000-CC RE 4000-CC -
General characteristics						
Number of poles (variable)		1 ... 4*				
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1				
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1	V	1000 (1500 with increased insulation)				
Rated impulse withstand voltage U_{imp}	kV	8				
Air temperature - close to contactor - for storage	°C °C	-20 à +70 -20 à +80				
Climatic withstand		Standard version for industrial environment and tropical atmospheres (☞ page 6/6) Special version for very corrosive atmospheres (on request)				
Operating altitude	m	≤ 2000				
Mounting characteristics						
Mounting position		Position 1 (horizontal bar) 				
		Maximum angle of inclination, in any direction: ± 22° 30'				
Mounting distances		☞ "Dimensions" section 8				
Fixing by screws (not supplied)		2 x M12	4 x M12			4 or 6 x M12
Connecting characteristics						
Types of terminals Main poles Coil terminals Built-in auxiliary terminals		Terminal plates for lugs or bars M4 screws, with cable clamp M4 screws, with cable clamp				
Connecting dimensions						
Main poles						
Width of the terminal plates	mm	48	100	150	200	250
Terminal screws (supplied)		-	-	-	-	-
Drilling of the plates (smooth holes)	mm	2 x Ø13	4 x Ø13	8 x Ø9	8 x Ø13	12 x Ø13
Auxiliary wires (built-in aux. terminals + coil terminals)						
- rigid (solid)	1 or 2 x mm²	1 ... 2.5				
- flexible (without cable end)	1 or 2 x mm²	1 ... 2.5				
Tightening torque (min. value)						
Main poles	Nm	-	-	-	-	-
Coil terminals	Nm	1.5				
Built-in auxiliary terminals	Nm	1.5				

* Except for IOR 1500-CC contactors, limited to 2 poles. (This limitation is not applicable to the IORR 1500-CC, IORE 1500-CC types.)

Note: These characteristics are suitable for AME contactor versions.

>> Main Pole Utilization Characteristics (800 A Rating) page 2/52
 >> R and RR Electro-magnet Characteristics page 2/41
 >> RE and RC Electro-magnet Characteristics page 2/43

>> General Technical Data section 6
 >> Terminal Marking and Positioning - Wiring Diagrams section 7
 >> Dimensions section 8

R.. Series Contactors - Poles 1000/1500 V d.c. IOR..-CC, IORR..-CC, IORE..-CC, IORC..-CC

63 ... 800 A Ratings

Technical Data (cont.)

Electro-magnet type / Contactor rating			R 63-CC RR 63-CC RE 63-CC RC 63-CC	R 125-CC RR 125-CC RE 125-CC RC 125-CC	R 200-CC RR 200-CC RE 200-CC RC 200-CC	R 500-CC RR 500-CC RE 500-CC RC 500-CC	R 800-CC RR 800-CC RE 800-CC RC 800-CC
Main Pole Utilization Characteristics (for ratings > 800 A, please consult us)							
Rated operational voltage U _e		V d.c.	1000 (1500 with increased insulation*)				
L/R time constant		ms	≤ 7.5 (for L/R >7.5 ms please consult us)				
Conventional free-air thermal current							
I _{th} acc. to IEC 60947-4-1- Open contactors, θ ≤ 40 °C with conductor cross-sectional area		A mm ²	85 25	170 70	275 150	550 400	800 500
Rated operational current I _e							
DC1 category, L/R ≤ 1 ms							
	1 pole	U _e ≤ 500 V A	85	170	275	550	800
	2 poles in series	U _e ≤ 1000 V A	85	170	275	550	800
		U _e ≤ 1500 V* A	—	—	—	550	800
	3 poles in series	U _e ≤ 1500 V* A	85	170	275	550	800
DC3 category, L/R ≤ 2 ms							
	1 pole	U _e ≤ 500 V A	68	125	205	500	720
	2 poles in series	U _e ≤ 1000 V A	68	125	205	500	720
		U _e ≤ 1500 V* A	68	125	205	500	720
	3 poles in series	U _e ≤ 1500 V* A	68	125	205	500	720
DC5 category, L/R ≤ 7.5 ms							
	1 pole	U _e ≤ 500 V A	68	125	205	500	720
	2 poles in series	U _e ≤ 1000 V A	68	125	205	500	720
		U _e ≤ 1500 V* A	68	125	205	500	720
	3 poles in series	U _e ≤ 1500 V* A	68	125	205	500	720
Impedance per pole		mΩ	1.80	1.20	0.60	0.35	0.18
Max. electrical switching frequency		cycles/h	40				
Max. mechanical switching frequency		cycles/h	1200				
Mechanical durability in millions of operating cycles							
— R type			10				5
— RR, RE types			5				
— RC type			20				

* Version with increased insulation for $1000\text{ V} \leq U_e \leq 1500\text{ V}$, please consult us.

Notes: The arc switching on d.c. is more difficult than on a.c.

For selecting a contactor, is essential to determine the current, the voltage, and the **L/R time constant of the controlled load**.

For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces: **L/R ≤ 1 ms**; inductive loads such as shunt motor: **L/R ≤ 2 ms**; series motor: **L/R ≤ 7.5 ms**. The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.

All the **poles** required for breaking must be connected, **in series**, between the load and the source polarity not linked to the earth.

Connection of the poles in series by the user, according to the above diagrams. The connection of the poles in series helps in the elimination of the arcs.

These characteristics are suitable for CC-AMA and CC-AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

R.. Series Contactors - Poles 1000/1500 V d.c. NOR..-CC, NORR..-CC, NORE..-CC

63 ... 800 A Ratings

Technical Data

Electro-magnet type / Contactor rating				R 63-CC RR 63-CC RE 63-CC -	R 125-CC RR 125-CC RE 125-CC -	R 200-CC RR 200-CC RE 200-CC -	- RR 800-CC RE 800-CC -
Main Pole Utilization Characteristics							
Rated operational voltage U _e		V d.c.		1000 (1500 with increased insulation*)			
L/R time constant		ms		≤ 7.5 (for L/R >7.5 ms please consult us)			
Conventional free-air thermal current							
I _{th} acc. to IEC 60947-4-1- Open contactors, θ ≤ 40 °C with conductor cross-sectional area		A mm ²		63 16	125 50	200 95	800 500
Rated operational current I _e							
DC1 category, L/R ≤ 1 ms							
	1 pole	U _e ≤ 500 V	A	63	125	200	800
	2 poles in series	U _e ≤ 1000 V U _e ≤ 1500 V*	A A	63 -	125 -	200 -	800 800
	3 poles in series	U _e ≤ 1500 V*	A	63	125	200	800
DC3 category, L/R ≤ 2 ms							
	1 pole	U _e ≤ 500 V	A	63	125	200	720
	2 poles in series	U _e ≤ 1000 V	A	63	125	200	720
	3 poles in series	U _e ≤ 1500 V*	A	63	125	200	720
DC5 category, L/R ≤ 7.5 ms							
	1 pole	U _e ≤ 500 V	A	63	125	200	720
	2 poles in series	U _e ≤ 1000 V	A	63	125	200	720
	3 poles in series	U _e ≤ 1500 V*	A	63	125	200	720
Impedance per pole		mΩ		1.80	1.20	0.60	0.18
Max. electrical switching frequency		cycles/h		40			
Max. mechanical switching frequency		cycles/h		1200			
Mechanical durability in millions of operating cycles				31			

* Version with increased insulation for $1000 \text{ V} \leq U_e \leq 1500 \text{ V}$, please consult us.

Notes: The arc switching on d.c. is more difficult than on a.c.

For selecting a contactor, is essential to determine the current, the voltage, an the **L/R time constant of the controlled load**.

For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces: **L/R ≤ 1 ms**; inductive loads such as shunt motor: **L/R ≤ 2 ms**; series motor: **L/R ≤ 7.5 ms**. The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.

All the **poles** required for breaking must be connected, **in series**, between the load and the source polarity not linked to the earth.

Connection of the poles in series by the user, according to the above diagrams. The connection of the poles in series helps in the elimination of the arcs.

These characteristics are suitable for CC-AMA and CC-AME contactor versions (except for mechanical durability = 0.2 millions of operating cycles).

>> General, Mounting and Connecting Characteristics equivalent to those on pages 2/50, 2/51

>> Electro-magnet Characteristics equivalent to those on pages 2/46 ... 2/47

R.. Series Contactors

CA.. Standard and TP.. Timed Auxiliary Contact Blocks

Technical Data of the Standard Auxiliary Contacts

Types		CA 12-..	CA 15..
Rated operational voltage U_e max.	V	690	
Rated frequency limits	Hz	25 ... 400	
Conventional free-air thermal current I_{th} $\theta \leq 40^\circ\text{C}$	A	12	15
Rated operational current I_e / AC-15 acc. to IEC 60947-5-1			
24-48 V 50/60 Hz	A	8	10
110-127 V 50/60 Hz	A	8	10
220-240 V 50/60 Hz	A	5	6
380-440 V 50/60 Hz	A	3	3.5
500-600 V 50/60 Hz	A	2	2.5
I_e / DC-13 acc. to IEC 60947-5-1			
24 V d.c.	A	6	
48 V d.c.	A	2.8	
72 V d.c.	A	1	
110-125 V d.c.	A	0.55	
220-250 V d.c.	A	0.3	
Rated making capacity acc. to IEC 60947-5-1		10 x I_e / AC-15	
Rated breaking capacity acc. to IEC 60947-5-1		10 x I_e / AC-15	
Short-circuit protection gG type fuses	A	10	16

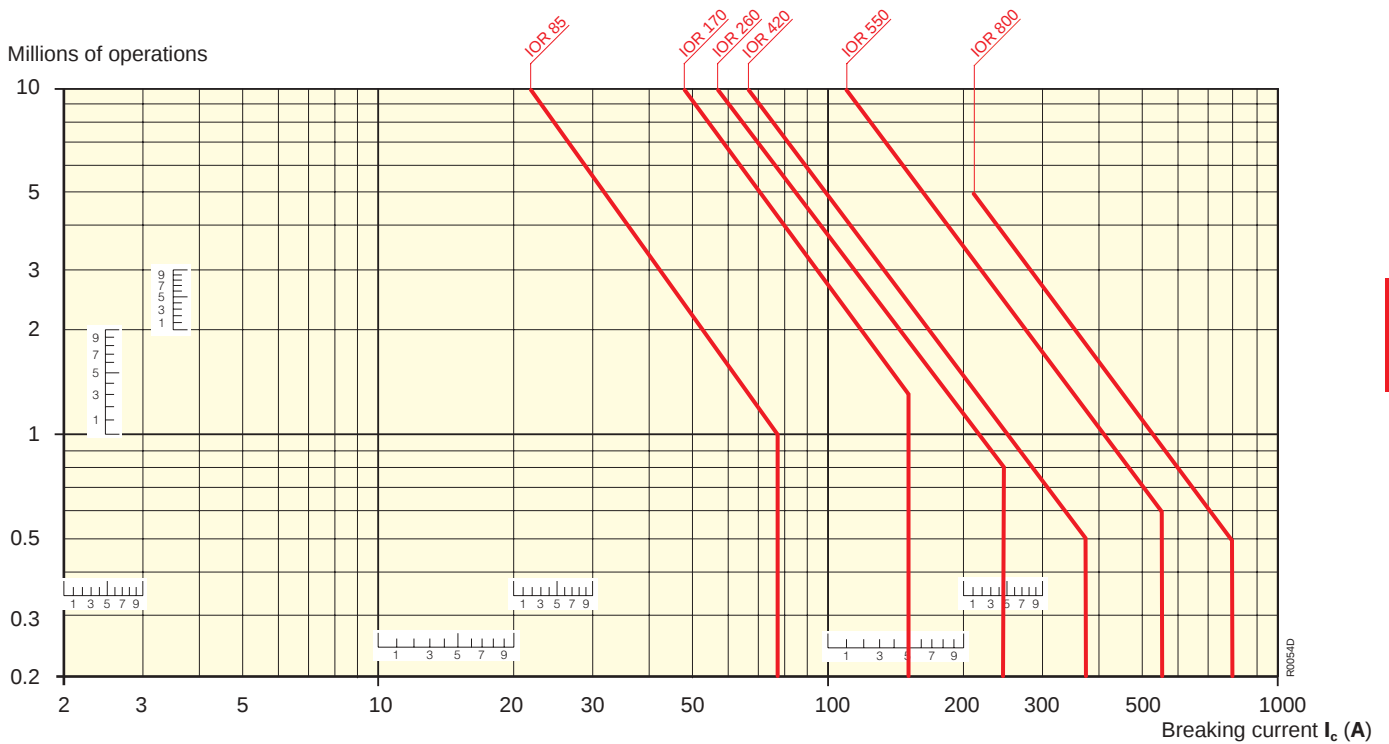
Technical Data of the Timed Auxiliary Contact Blocks

Types		TP 40 D..	TP 180 D..	TP 40 L..	TP 180 L..
Rated operational voltage U_e max.	V	690			
Rated frequency limits	Hz	25 ... 400			
Conventional free-air thermal current I_{th} $\theta \leq 40^\circ\text{C}$	A	10			
Rated operational current I_e / AC-15 acc. to IEC 60947-5-1					
24-127 V 50/60 Hz	A	6			
220-240 V 50/60 Hz	A	4			
380-400 V 50/60 Hz	A	3			
500-690 V 50/60 Hz	A	1/0.5			
I_e / DC-13 acc. to IEC 60947-5-1					
24 V d.c.	A	6			
48 V d.c.	A	2.8			
72 V d.c.	A	1			
125 V d.c.	A	0.55			
250 V d.c.	A	0.3			
Rated making capacity acc. to IEC 60947-5-1		10 x I_e / AC-15			
Rated breaking capacity acc. to IEC 60947-5-1		10 x I_e / AC-15			
Short-circuit protection gG type fuses	A	10			
Timing		Pneumatic			
Time delay		On energization		On de-energization	
Setting range	s	0.1 ... 40	10 ... 180	0.1 ... 40	10 ... 180

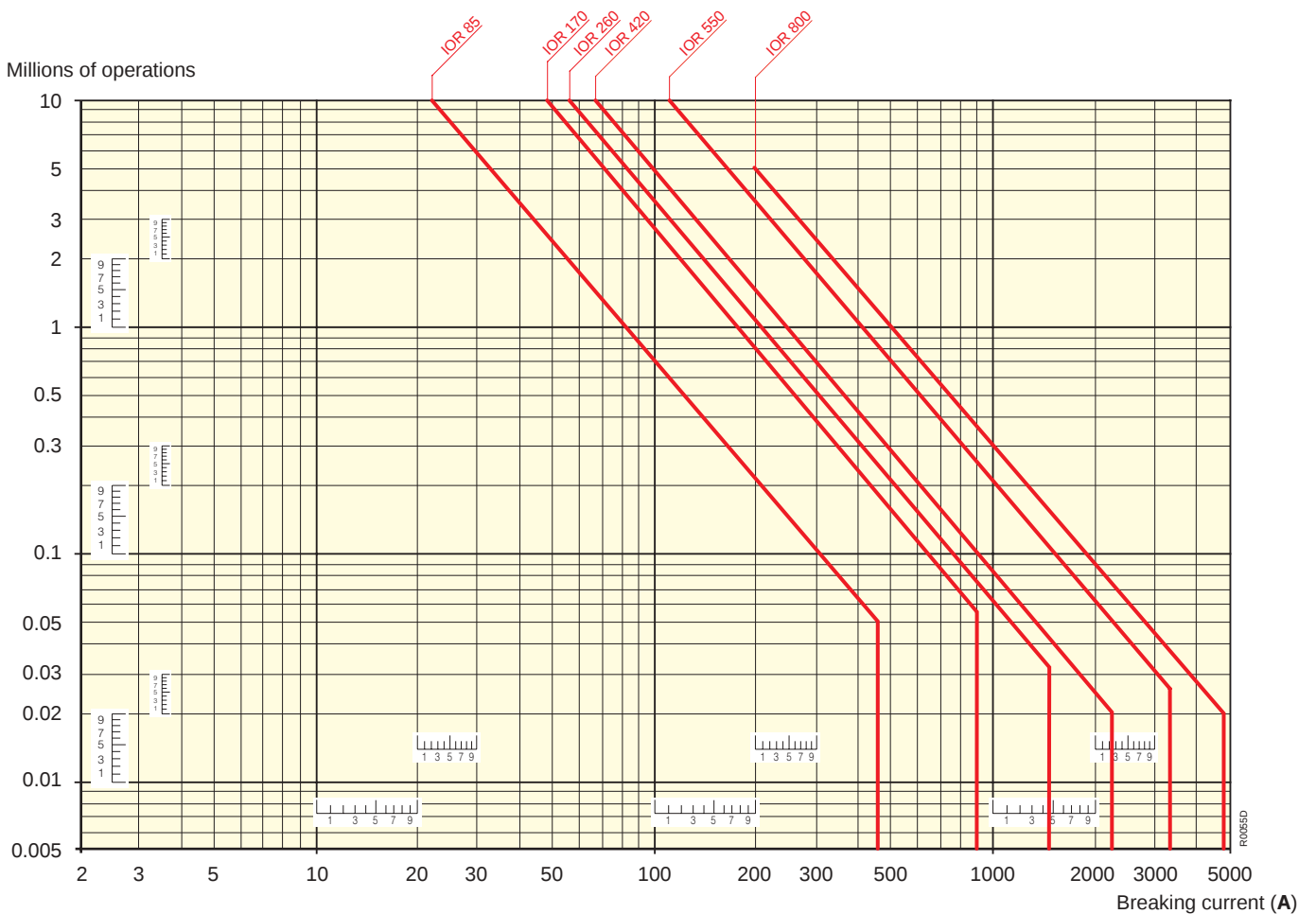
IOR, IORR, IORE, IORC Contactors

Electrical Durability

Electrical Durability for AC-3 Utilization Category - $U_e \leq 400$ V



Electrical Durability for AC-2 and AC-4 Utilization Categories - $U_e \leq 400$ V



The breaking current $I_c = 2.5 \times I_n$ in AC-2 utilization category and $6 \times I_n$ in AC-4 utilization category. (I_n is the motor nominal current.)

Closed Transition Star-Delta Starting of Three-Phase Asynchronous Motors

R.. Series Contactors

Application

R.. series contactors can be used for closed transition star-delta starting of three-phase asynchronous motors up to **900 kW**.

Principle

This starting method, mainly used for large motor powers, prevents the speed drop during the "star-delta" transition time and maintains the resulting current peak at a relatively low value.

For this purpose the extra **KM4** transition contactor closes first before the **KM2** star contactor opens. When the **KM4** contactor closes the motor windings are automatically delta connected, via resistances to compensate the lack of current during the transition time and thus the motor speed remains basically the same. The final delta connection step is then achieved by the **KM3** delta contactor closing which switches-off the coil supply to the **KM4** transition contactor. As in the basic star-delta starting mode, the closed transition star-delta starting mode is restricted to low resistive torque machines.

It is advisable, especially for big masses of inertia, to observe that the connection is made in acc. to the clockwise or anticlockwise rotation direction, as indicated in the block diagram shown below, in order to prevent damages due to torque throbs.

Equipment Sizing

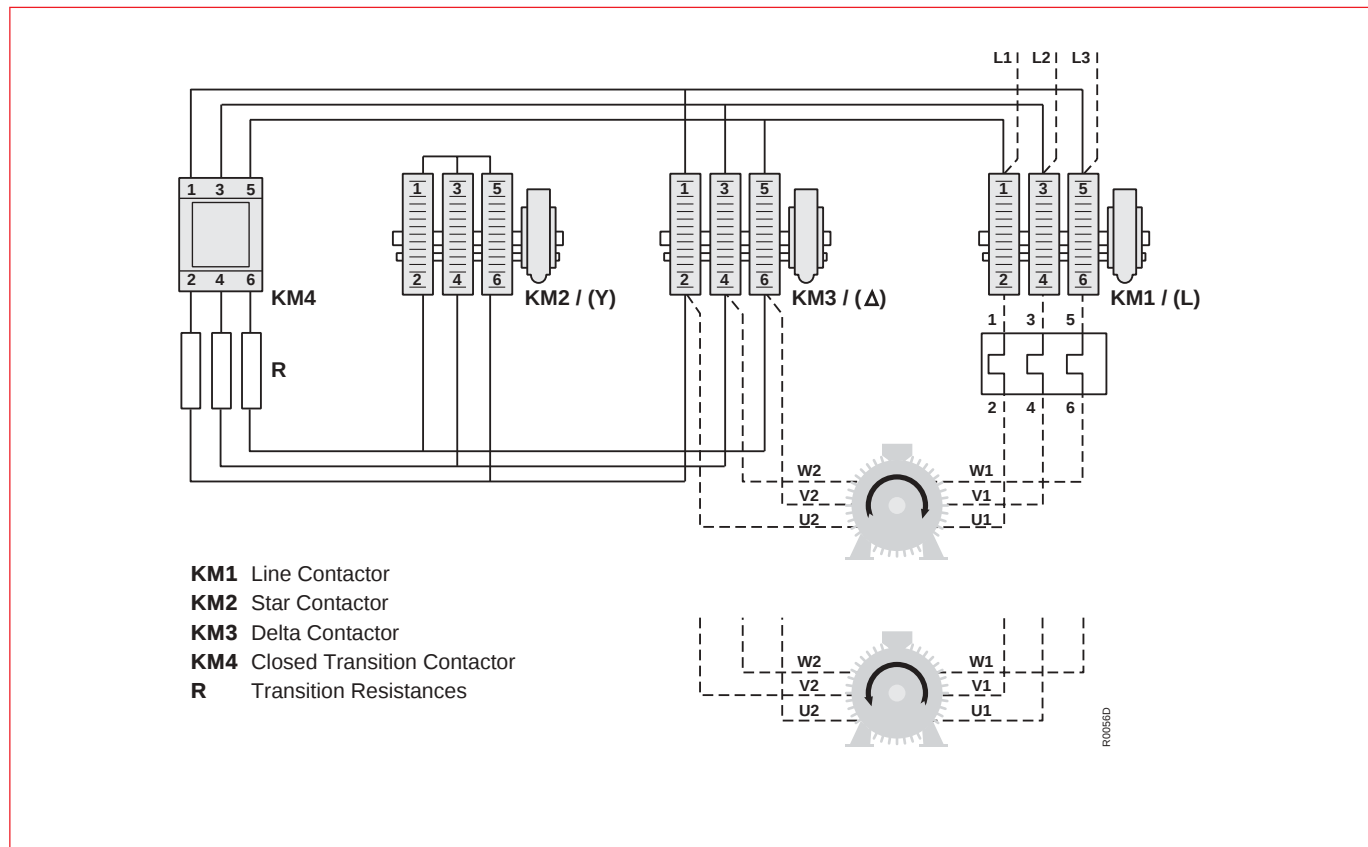
- **KM1** Main Contactor and **KM3** Star Contactor: rating = $0.58 \times I_n$ for both contactors
- **KM2** Star Contactor: compared with a star contactor that would be used for a basic open transition star-delta starter the present **KM2** star contactor has to be over-rated as it is intended to break the star current ($0.34 \times I_n$) and the transition current too.
- **KM4** Transition Contactor: the rating is based on the calculation of the short permissible current duration (I_{cw}).
The value of the current flow is about $1.5 \times I_n$ and the current flow duration $< 100 \text{ ms}$.
A block type contactor in the **A** series can be selected for this step.
- Transition Resistances: empiric value, generally as follows, $R (\Omega) = \frac{0.4 \times U_e}{I_n}$

Watt dissipation values for the transition resistances:

– for 12 cycles/h max. $P (W) = \frac{U_e^2}{1200 \times R}$

– for 30 cycles/h max. $P (W) = \frac{U_e^2}{500 \times R}$

Block Diagram



>> Ordering Details page 2/8 and following ones
>> Technical Data page 2/28 and following ones
>> Accessories pages 2/6, 2/7 and section 3

>> Terminal Marking and Positioning section 7
>> Dimensions section 8
>> "A" Series Block Contactors see Main Catalogue in force

Control of Three-Phase Slip-Ring Motors

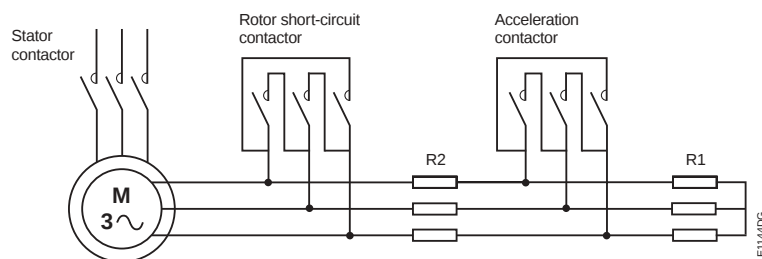
Contactor Selection

2

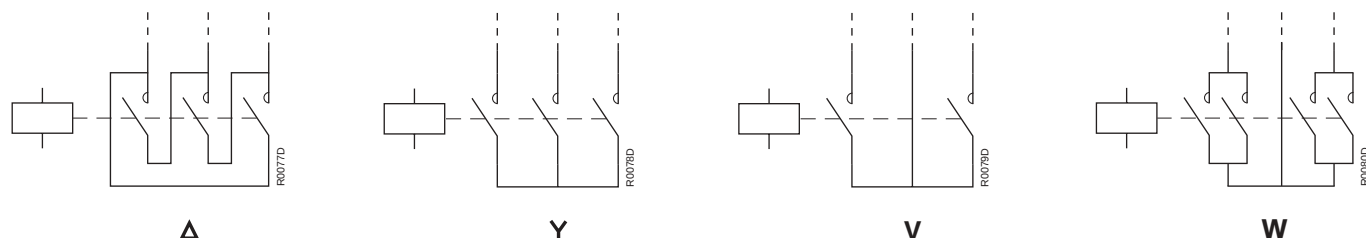
Application

Three kinds of contactors are used to control three-phase slip-ring motors: the **stator contactor**, the **acceleration contactor(s)**, and the **rotor short-circuit** contactor.

Example of a Three-Stroke Starter (Delta (Δ) connection diagram)



The starting resistances should be Delta (Δ), Star (Λ), V or W connected acc. to the following wiring diagrams. Contactors have to be selected accordingly.



The standard **R** series contactors, can be used acc. to the criteria indicated below. The **FOR..**, **FORR..** or **FORE..** contactor types should be mainly used for the rotor short-circuiting.

Stator Contactor

The **R** series contactor selection is based on the motor rated current acc. to the AC-2 utilization category (see curves page 2/55), as well as on the rated operational voltage and the on-load factor.

Acceleration Contactors

The **R** series contactor selection is based on the contactor rated operational current I_e acc. to the AC-1 utilization category, multiplied by the coefficient which includes the resistance duty duration, the number of operating cycles, and depends on the applicable connection diagram.

The **LOR..**, **LORR..** and **LORE..** couplers may be used for applications where equipment is breaking in "Off-load" conditions only.

Rotor Short-Circuit Contactor

The **R** series contactor selection is based on the contactor rated operational current I_e acc. to the AC-1 utilization category but the rated operational current of the selected contactor has to be greater than the motor rotor current and the applicable connection diagram does matter too.

The **LOR..**, **LORR..** and **LORE..** couplers may be used for applications where equipment is breaking in "Off-load" conditions only.

At the time of the short-circuiting the contactor involved has to withstand the short duration rotor voltage peak which is fully acceptable by the contactor in spite of its lower rated insulation voltage. The standard **R** series contactors are therefore suitable to withstand rotor voltages up to 1500 V. (Coefficient 2 accepted acc.to IEC 60947-4-1 Standard)

● **FOR.., FORR.., FORE.. Specific Contactors**

At the time of slip-ring motor starting and as soon as the motor nominal speed is reached, these contactors are used for the short-circuiting of the rotor current limitation starting resistances (e.g. vapour-liquid rheostats).

These contactors are derived from the standard **R** series contactors and are available in 2, 3 or 4-pole version acc. to the applicable connection diagram required (Λ , V, W).

They can control rotor currents from 200 to 3200 A and rotor voltages up to 3500 V (with increased insulation) acc. to the IEC 60947-4-1 Standard requirements. (For voltages above 3500 V, please consult us).

Although the breaking of the rotor circuit is normally carried out in "Off-load" conditions, the contactors are equipped with blow-out devices and can occasionally break "On-load".

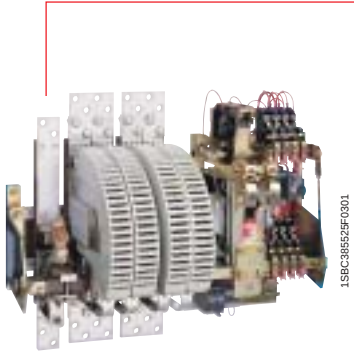
Ordering Details - Technical Data - Dimensions : please consult us

>> Ordering Details page 2/8 and following ones
>> Technical Data page 2/28 and following ones
>> Accessories pages 2/6, 2/7 and section 3

>> LOR.., LORR.., LORE.. Couplers section 5
>> Terminal Marking and Positioning section 7
>> Dimensions section 8

Field Discharge Contactors AM-CC-JOR.. and AMF-CC-JOR..

Poles 1500 V d.c., 80 ... 4000 A

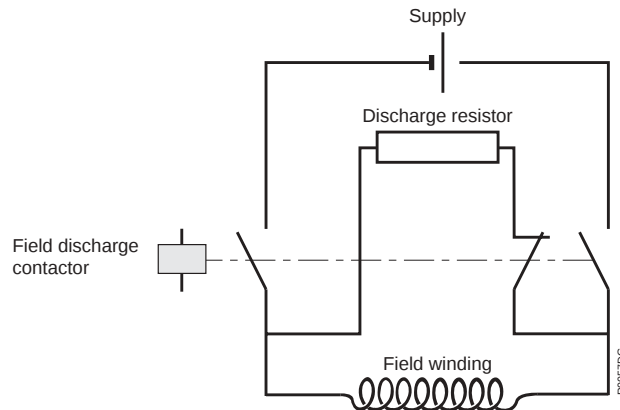


Example: AM-CC-JOR 1500-21

Application

Field discharge contactors (or Field circuit breakers) are used to control the field winding of synchronous machines or exciter machines. In case of disturbances the contactors ensure a definite disconnection from the supply source and the subsequent discharge of the energy stored in the machine magnetic circuit via a discharge resistor.

Block Diagram



Description

Electro-magnet

AM-CC-JOR.. and **AMF-CC-JOR..** field discharge contactors are equipped with a latching device:

- magnetical latch for ratings $80 \text{ A} \leq I_n \leq 200 \text{ A}$
- mechanical latch for ratings $500 \text{ A} \leq I_n \leq 4000 \text{ A}$

Two control circuit versions are offered for a.c. or for d.c. operation.

The **AMF-CC-JOR..** type is equipped with 2 tripping coils (double de-latching control).

Main Poles

Contactors comprise of:

- 2 or 3 N.O. main poles with blow-out devices, suitable for 1500 V d.c. max. operational voltage and circuit time constant $L/R \leq 15 \text{ ms}$.
- 1 N.C. main pole, without blow-out device, named "discharge pole" and set MAKE before BREAK with regard to the N.O. main poles.

Auxiliary Contacts

Up to 5 auxiliary contacts are fitted as standard: 3 N.O. + 2 N.C.

On request, up to 12 extra auxiliary contacts can be added on the **AM-CC-JOR..** types e.g. 6 N.O. + 6 N.C.

Notes:

AM-CC-JOR.. can be offered **without latching device**, as **JORE..** version.

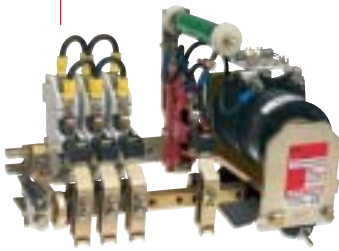
AM-CC-JOR.. and **AMF-CC-JOR..** contactors are superseding the **AM-CC-NOR..** **AMF-CC-NOR..** types.

>> Ordering Details Consult us
>> Technical Data Consult us
>> Auxiliary Contacts Consult us

>> Coil Voltages Consult us
>> Terminal Marking and Positioning Consult us
>> Dimensions Consult us

KOR.., KORR.., KORE.. and KORC Contactor Relays

with Standard Contacts and Timed Auxiliary Contacts



Example: TR-KORC 85-03..
special contactor relay
(3 x N.O. contacts)

1SBC38747/F0301

Application

KOR.., KORR.., KORE.. and KORC.. contactor relays are used for operation of control circuits up to 600 V a.c. or d.c.

A large number of standard auxiliary contacts and timed auxiliary contacts can be combined together. The standard **CA 15..** auxiliary contacts are separately adjustable enabling settings for early/make or late/break operation.

Description

KOR.., KORR.., KORE.. and KORC.. contactor relays are derived from the **R** series contactors.

Electro-Magnet Sizes

Two sizes are available (**85** and **170**) depending on construction requirements.

a.c. Control Circuit Supply

● **KOR..** contactor relays

The magnetic circuit is laminated and the operating coil fed directly from an a.c. supply.

● **KORR..** contactor relays

The magnetic circuit is laminated and the operating coil fed from an a.c. supply via a rectifier and an economy resistor mounted and pre-wired on the contactor.

This type of electro-magnet provides a high closing power and accepts a control supply frequency range from 50 Hz up to 400 Hz.

d.c. Control Circuit Supply

● **KORE..** contactor relays

The magnetic circuit is laminated and the operating coil fed from a d.c. supply via an economy resistor mounted and pre-wired on the contactor.

● **KORC..** contactor relays

The magnetic circuit is of the solid-core design and the operating coil fed directly from a d.c. supply.

This type of electro-magnet is suited to high operation endurance rates. No coil inrush current peak on contactor closing.

Standard Auxiliary Contacts

● **KOR.., KORR.., and KORE..** contactor relays

- 1 N.O. **CARB** auxiliary contact: generally used for "hold-in" (fitted as standard).
- 1 N.C. **CAOVE** auxiliary contact: adjustable, generally used for electrical interlocking (fitted as standard).
- 2 to 15 **CA 15-F** "N.O." or **CA 15-O** "N.C." adjustable early/make or late/break (extra contacts).
- 0 to 3 **CA 12-..** 2-pole auxiliary contact blocks (extra contacts) :

single blocks **CA 12-1** (N.C.+N.O.)

CA 12-2 (N.O.+N.O.)

double blocks **CA 12-11** 2 x (N.C.+N.O.)

CA 12-12 (N.C.+N.O.) + (N.O.+N.O.)

CA 12-22 2 x (N.O.+N.O.)

The **KOR..** and **KORE..** contactor relays can accept 1 single block or 2 single blocks and alternatively 1 single block + 1 double block.

The **KORR..** contactor relay can accept 1 or 2 single blocks only, due to the rectifier unit mounted right above.

● **KORC..** contactor relays

- 2 to 15 **CA 15-F** "N.O." or **CA 15-O** "N.C." adjustable early/make or late/break (extra contacts).

Timed Auxiliary Contacts

● **KOR.., KORR.., KORE.., and KORC..** contactor relays can accept up to 4 **TP..** pneumatic timing blocks:

- **TP 40 DA**: direct timing, adjustable 0.1 ... 40 s
- **TP 40 IA**: inverse timing, adjustable 0.1 ... 40 s
- **TP 180 DA**: direct timing, adjustable 10 ... 180 s
- **TP 180 IA**: inverse timing, adjustable 10 ... 180 s

Each **TP..** pneumatic timing block comprises 1 N.O. + 1 N.C. electrically independent auxiliary contacts.

Variants

- Larger number of **CA 15..** auxiliary contacts or **TP..** timed auxiliary contacts: please consult us.
- Different operational voltages: please consult us.

>> Ordering Details consult us
>> Contact Characteristics page 2/54
>> Other Characteristics consult us

>> Coil Voltages page 1/12
>> Terminal Marking and Positioning consult us
>> Dimensions consult us



Customer	
Contact person	Date
Tel.	e-mail
Project	
Quantity	Delivery date

ABB	
Contact person	Date
Tel.	e-mail
Proposition	

Power Circuit

a.c. switching	d.c. switching
AC-1 ☐	DC-1 ☐
AC-2 ☐	DC-3 ☐
AC-3 ☐	DC-5 ☐
AC-4 %	
Frequency Hz	L/R ms
Rated insulation voltage U_i	kV
Rated operational voltage U_e	V
Rated operational current I_e	A

Number of poles

- **N.O.** main poles
- **N.O. Neutral** pole
- **N.C.** main poles

Mechanical overlap of N.O. / N.C. main poles no ☐ yes ☐

Specific informations for d.c. circuit switching:

For ratings ≤ 550 A, if the actual current rating is below 50 % of the rated operational current of the contactor, the blow-out coil must be rated as the actual service current rating.

Indicate the current for the blow-out coil: A

The poles must be connected in series (see "Technical data").

Must be taken into account to determine the rated number of poles.

If on-load breaking is not necessary

Select a coupler: coupler ☐

Dimension Characteristics

Fixing dimension:	standard ☐	other: mm
Distance between poles:	standard ☐	other: mm

Operating Conditions

Switching frequency:	 cycles/h
Durability required (in millions of operating cycles) :	
Load factor:	On-load operating time x 100 = % Total cycle time
Air temperature close to contactor:	 °C
Climatic withstand	
– industrial or tropical environment	☐
– very corrosive atmosphere / sea fog	☐
Altitude:	≤ 2000 m ☐ > 2000 m ☐

Control Circuit

a.c. operated	d.c. operated
☐	☐
voltage V	voltage V
frequency Hz	
Electro-magnet (a.c.)	Electro-magnet (d.c.)
Without particularity ☐ R *	Without particularity ☐ RE
Rectified current ☐ RR	Solid magnetic circuit ☐ RC
RR version with rectifier unit and economy resistor. This version is used when high closing power is required, according to contactor rating and pole number.	RC version with solid magnetic circuit is available for most of the contactor types and ratings.
* RR version will be proposed if necessary for the functioning of the contactor.	High switching frequency.
	High durability.
	No inrush peak.

Magnetical latching (if necessary)

select AMA version AMA ☐

Mechanical latching (if necessary)

select AME or AMF version

– with 1 tripping coil AME ☐

– with 2 tripping coils AMF ☐

Control voltage for tripping coil

a.c. coil V d.c. coil V
frequency Hz

Auxiliary Circuits

All contactors (except AMA and AME latched versions) are supplied with 1 **N.O.** + 1 **N.C.** auxiliary contacts available.

The AMA magnetically latched versions are supplied with 1 **N.O.** auxiliary contact available.

Indicate below the number of extra auxiliary contacts required.

● **N.O.** standard auxiliary contacts: N.O.

● **N.C.** standard auxiliary contacts: N.C.

● Timed auxiliary contacts (N.O. + N.C.) (pneumatic timers)

– time delay on energization 0.1 ... 40 s TP 40 DA

on de-energization 0.1 ... 40 s TP 40 IA

– time delay on energization 10 ... 180 s TP 180 DA

on de-energization 10 ... 180 s TP 180 IA

Mechanical Interlock

Mechanical interlock unit (for 2 same rating contactors) ☐

For other configurations, please consult us.

Please add any other useful documents for further information e.g. technical specification, drawing, wiring diagram, etc.

This document is used to define the contactor specification according to the complete information on the application

Please photocopy and forward (see catalogue last back cover page).

Questionnaire also available in Word and .PDF formats on the ABB Website:

☞ www.abb.com/lowvoltage ☞ left menu: "Low Voltage On-Line" ☞ select: "Support Tools".



Questionnaire

Specification for R.. Series Contactors



Other Information / Application Type

2

This document is used to define the contactor specification according to the complete information on the application

Please photocopy and forward (see catalogue last back cover page).

Questionnaire also available in Word and .PDF formats on the ABB Website:

 www.abb.com/lowvoltage  left menu: "Low Voltage On-Line"  select: "Support Tools".

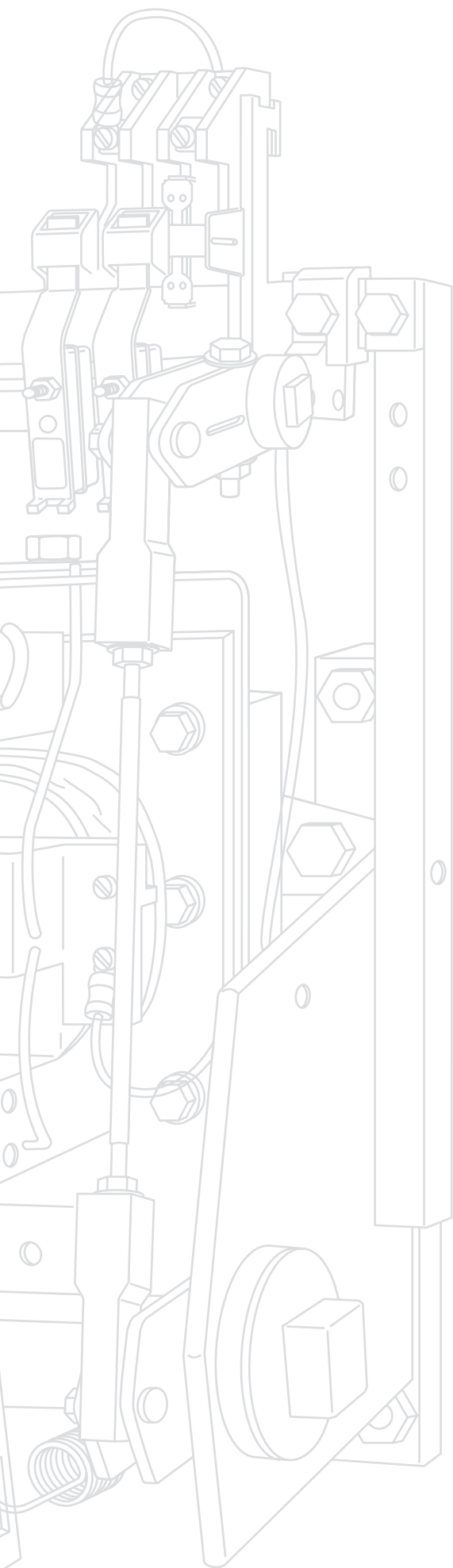
Motor Nominal Powers and Currents

The currents given below concern standard, 1500 r.p.m. 50 Hz, three-phase cage motors.
These values are given for guidance and may vary according to the motor manufacturer and depending on the number of poles.

Motor power		Motor nominal current at:							
kW	PS = hp	220-230 V	240 V	380 V 380-400 V	415 V	440 V	500 V	600 V	660-690 V
		A	A	A	A	A	A	A	A
0.06	1/12	0.38	0.35	0.22	0.20	0.19	0.16	0.12	—
0.09	1/8	0.55	0.50	0.33	0.30	0.28	0.24	0.21	—
0.12	1/6	0.76	0.68	0.42	0.40	0.37	0.33	0.27	—
0.18	1/4	1.1	1	0.64	0.60	0.55	0.46	0.40	—
0.25	1/3	1.4	1.38	0.88	0.85	0.76	0.59	0.56	—
0.37	1/2	2.1	1.93	1.22	1.15	1.06	0.85	0.77	0.7
0.55	3/4	2.7	2.3	1.5	1.40	1.25	1.20	1.02	0.9
0.75	1	3.3	3.1	2	2	1.67	1.48	1.22	1.1
1.1	1.5	4.9	4.1	2.6	2.5	2.26	2.1	1.66	1.5
1.5	2	6.2	5.6	3.5	3.5	3.03	2.6	2.22	2
2.2	3	8.7	7.9	5	5	4.31	3.8	3.16	2.9
2.5	3.4	9.8	8.9	5.7	5.5	4.9	4.3	3.59	3.3
3	4	11.6	10.6	6.6	6.5	5.8	5.1	4.25	3.5
3.7	5	14.2	13	8.2	7.5	7.1	6.2	5.2	4.4
4	5.5	15.3	14	8.5	8.4	7.6	6.5	5.6	4.9
5	6.8	18.9	17.2	10.5	10	9.4	8.1	6.9	6
5.5	7.5	20.6	18.9	11.5	11	10.3	8.9	7.5	6.7
6.5	8.8	23.7	21.8	13.8	12.5	12	10.4	8.7	8.1
7.5	10	27.4	24.8	15.5	14	13.5	11.9	9.9	9
8	11	28.8	26.4	16.7	15.4	14.4	12.7	10.6	9.7
9	12.5	32	29.3	18.3	17	15.8	13.9	11.6	10.6
11	15	39.2	35.3	22	21	19.3	16.7	14.1	13
12.5	17	43.8	40.2	25	23	21.9	19	16.1	15
15	20	52.6	48.2	30	28	26.3	22.5	19.3	17.5
18.5	25	64.9	58.7	37	35	32	28.5	23.5	21
20	27	69.3	63.4	40	37	34.6	30.6	25.4	23
22	30	75.2	68	44	40	37.1	33	27.2	25
25	34	84.4	77.2	50	47	42.1	38	30.9	28
30	40	101	92.7	60	55	50.1	44	37.1	33
37	50	124	114	72	66	61.9	54	45.4	42
40	54	134	123	79	72	67	60	49.1	44
45	60	150	136	85	80	73.9	64.5	54.2	49
51	70	168	154	97	90	83.8	73.7	61.4	56
55	75	181	166	105	96	90.3	79	66.2	60
59	80	194	178	112	105	96.9	85.3	71.1	66
75	100	245	226	140	135	123	106	90.3	82
80	110	260	241	147	138	131	112	96.3	86
90	125	292	268	170	165	146	128	107	98
100	136	325	297	188	182	162	143	119	107
110	150	358	327	205	200	178	156	131	118
129	175	420	384	242	230	209	184	153	135
132	180	425	393	245	242	214	186	157	140
140	190	449	416	260	250	227	200	167	145
147	200	472	432	273	260	236	207	173	152
160	220	502	471	295	280	256	220	188	170
180	245	578	530	333	320	289	254	212	190
184	250	590	541	340	325	295	259	217	200
200	270	626	589	370	340	321	278	235	215
220	300	700	647	408	385	353	310	260	235
250	340	803	736	460	425	401	353	295	268
257	350	826	756	475	450	412	363	302	280
295	400	948	868	546	500	473	416	348	320
315	430	990	927	580	535	505	445	370	337
355	480	1080	1010	636	580	549	483	405	366
400	545	1250	1130	710	650	611	538	450	410
450	610	1410	1270	800	740	688	608	508	460
475	645	1490	1340	850	780	730	645	540	485
500	680	1570	1420	890	830	770	680	565	510
560	760	1750	1580	1000	920	860	760	630	570
600	810	—	—	1080	990	920	810	680	610
670	910	—	—	1200	1100	1030	910	760	680

Notes





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CA 12.. and CA 15.. Standard Auxiliary Contacts

CA 12.. Auxiliary Contact Blocks

These blocks can only be fitted to contactors rated ≤ 550 A and built with a laminated magnetic circuit (**R**, **RR** or **RE** electro-magnet). They cannot be mounted on contactors built with a solid magnetic circuit (**RC** electro-magnet). They are mounted on a support bracket, above the electro-magnet, without increasing the fixing dimensions of the contactor.

The contactors built with **R** or **RE** electro-magnet can be equipped with 1 single block, 2 single blocks, or 1 single block + 1 double block. The contactors built with **RR** electro-magnet can be equipped with 1 or 2 single blocks only. The **CA 12..** auxiliary contact blocks can be either delivered mounted on the contactor (factory mounting) or delivered separate from the contactor for addition by the user or supplied as spare parts for maintenance purposes. Maximum number of auxiliary contacts: ➤ page 2/7 for the contactors, ➤ page 5/7 for the couplers.

Ordering Details

Description	For contactors	Type	Order code	Unit weight Pack ^{ing} 1 piece kg
	Ratings (A)			
Support bracket	63 ... 260	FPTN 410 056 R1	FPTN 410 056 R0001	0.060
Support bracket	315 ... 550	FPTN 410 056 R2	FPTN 410 056 R0002	0.080
Single block N.C. + N.O.	63 ... 550	CA 12-1	FPTN 410 004 R0001	0.045
Single block N.O. + N.O.	63 ... 550	CA 12-2	FPTN 410 005 R0001	0.045
Double block 2 x (N.C. + N.O.)	63 ... 550	CA 12-11	FPTN 410 013 R0001	0.090
Double block 1 x (N.C. + N.O.)	63 ... 550	CA 12-12	FPTN 410 016 R0001	0.090
	+	1 x (N.O. + N.O.)		
Double block 2 x (N.O. + N.O.)	63 ... 550	CA 12-22	FPTN 410 012 R0001	0.090

CA 15.. Auxiliary Contacts

The **CA 15..** auxiliary contacts are mounted (factory mounted) on contactor ratings 63 ... 4000 A, whatever the electro-magnet type may be (**R**, **RR**, **RE** including latched versions and **RC** types).

A variable number of **CA 15..** auxiliary contacts can be fitted within the available space according to the contactor frame size. Consequently the **CA 15..** auxiliary contacts can be mounted by the user providing the required space is available on the frame of the delivered contactor, or supplied as spare parts for maintenance purposes.

Maximum number of auxiliary contacts: ➤ page 2/7 for the contactors, ➤ page 5/7 for the couplers.

Ordering Details

Description	Location on contactors	For contactors	Type	Order code	Unit weight Pack ^{ing} 1 piece kg
		Ratings (A)			
CA 15.. auxiliary contacts c/w mounting support - Mounted on R.. series contactors 63 ... 550 A					
N.O. contact	Frame	63 ... 170	CA 15-F R85-170	FPL 710 1301 R0001	0.140
		200, 260	CA 15-F R200-260	FPL 760 1301 R0001	0.140
		315, 420	CA 15-F R315-420	FPL 800 1301 R0001	0.180
		500, 550	CA 15-F R500-550	FPL 830 1301 R0001	0.180
N.C. contact	Frame	63 ... 170	CA 15-O R85-170	FPL 710 1302 R0001	0.140
		200, 260	CA 15-O R200-260	FPL 760 1302 R0001	0.140
		315, 420	CA 15-O R315-420	FPL 800 1302 R0001	0.180
		500, 550	CA 15-O R500-550	FPL 830 1302 R0001	0.180
CA 15.. auxiliary contacts c/w mounting support - Mounted on R.. series contactors 800 ... 4000 A					
N.O. contact	Aux. frame	≥ 800	CA 15-F R85-170	FPL 710 1301 R0001	0.140
	Main frame	≥ 800	CA 15-F R800	FPL 860 1301 R0001	0.250
N.C. contact	Aux. frame	≥ 800	CA 15 O R85-170	FPL 710 1302 R0001	0.140
	Main frame	≥ 800	CA 15 O R800	FPL 860 1302 R0001	0.250
CA 15.. auxiliary contacts without support					
N.O. contact	—	63 ... 4000	CA 15-F	FPTN 410 008 R0004	0.070
N.C. contact	—	63 ... 4000	CA 15-O	FPTN 410 007 R0006	0.070

>> Auxiliary Contact Allocation pages 2/7, 5/7
>> Technical Data of the Auxiliary Contacts page 2/54

>> Terminal Marking and Positioning section 7
>> Contactor Dimensions with Aux. Contacts section 8

TP.. Timed Auxiliary Contact Blocks



TP.. timed auxiliary contact block (N.O.+N.C.) on the left-hand bearing on 63 A rating contactor



TP 40 DA timed auxiliary contact block

TP.. Timed Auxiliary Contact Blocks

TP.. timed auxiliary contact blocks are equipped with 1 N.O. and 1 N.C. auxiliary contacts. The contacts are electrically separate.

Time delay on energization or de-energization according to the type.

Time delay range 0.1 ... 40 s or 10 ... 180 s with 350° linear scale and setting via marked knurled knob.

The **TP..** timed auxiliary contact block can be mounted on the left-hand bearing support of the contactors rated 63 to 550 A, without increasing the contactor fixing dimensions. For 800 A rating and above, it is mounted on the auxiliary frame and takes space of three **CA 15..** auxiliary contacts.

Mounting possibilities: ➤ page 2/7 for the contactors, ➤ page 5/7 for the couplers.

The **TP..** timed auxiliary contact blocks must not be added on the **IOR...-AMA** and **IORR...-AMA** magnetically latched contactors by the user.

Ordering Details

Time delay	For contactors	Type	Order code	Unit weight Pack ^{ing} 1 piece kg
Ratings (A)				
TP.. timed blocks with mounting kit, fitting on the left-hand bearing of the contactor				
On energization 0.1 ... 40 s	63 ... 170	TP 40 DA	FPTN 410 334 R0001	0.210
	200, 260	TP 40 DA	FPTN 410 335 R0001	0.210
	315, 420	TP 40 DA	FPTN 410 336 R0001	0.210
	500, 550	TP 40 DA	FPTN 410 337 R0001	0.210
On energization 10 ... 180 s	63 ... 170	TP 180 DA	FPTN 410 334 R0003	0.210
	200, 260	TP 180 DA	FPTN 410 335 R0003	0.210
	315, 420	TP 180 DA	FPTN 410 336 R0003	0.210
	500, 550	TP 180 DA	FPTN 410 337 R0003	0.210
On de-energization 0.1 ... 40 s	63 ... 170	TP 40 IA	FPTN 410 334 R0002	0.210
	200, 260	TP 40 IA	FPTN 410 335 R0002	0.210
	315, 420	TP 40 IA	FPTN 410 336 R0002	0.210
	500, 550	TP 40 IA	FPTN 410 337 R0002	0.210
On de-energization 10 ... 180 s	63 ... 170	TP 180 IA	FPTN 410 334 R0004	0.210
	200, 260	TP 180 IA	FPTN 410 335 R0004	0.210
	315, 420	TP 180 IA	FPTN 410 336 R0004	0.210
	500, 550	TP 180 IA	FPTN 410 337 R0004	0.210
TP.. timed blocks with mounting kit, fitting on the auxiliary frame of the contactor				
On energization 0.1 ... 40 s	800 ... 4000	TP 40 DA	FPTN 410 338 R0001	0.210
On energization 10 ... 180 s	800 ... 4000	TP 180 DA	FPTN 410 338 R0003	0.210
On de-energization 0.1 ... 40 s	800 ... 4000	TP 40 IA	FPTN 410 338 R0002	0.210
On de-energization 10 ... 180 s	800 ... 4000	TP 180 IA	FPTN 410 338 R0004	0.210
TP.. timed blocks without mounting kit				
On energization 0.1 ... 40 s	63 ... 4000	TP 40 DA	1 SBN 02 0300 R1000	0.070
On energization 10 ... 180 s	63 ... 4000	TP 180 DA	1 SBN 02 0300 R1001	0.070
On de-energization 0.1 ... 40 s	63 ... 4000	TP 40 IA	1 SBN 02 0301 R1000	0.070
On de-energization 10 ... 180 s	63 ... 4000	TP 180 IA	1 SBN 02 0301 R1001	0.070

>> Auxiliary Contact Allocation pages 2/7, 5/7
>> Technical Data of the Auxiliary Contacts page 2/54

>> Terminal Marking and Positioning section 7
>> Contactor Dimensions with Aux. Contacts section 8

VM... Mechanical Interlock Units

Mounting by the User



VM.. mechanical interlock unit

Mechanical Interlocking of 2 Contactors

The mounting of a mechanical interlock between 2 contactors of a same rating, or 2 couplers, vertically mounted, does not affect their fixing centres or their overall dimensions.

The table below gives the vertical fixing centres "V" between:

- 2 **IOR, IORR, IORE** contactors of a same rating ($U_e \leq 500 \text{ V}$, 50 and 60 **Hz**)
- 2 **LOR, LORR, LORE** couplers of a same rating ($U_e \leq 1000 \text{ V}$, 50 and 60 **Hz** or 1000 **V d.c.**).

For **IORC** contactors and **LORC** couplers or other voltages U_e : please consult us.

The mechanical interlock units are always supplied separately.

Ordering Details

Interlock for reversing contactors (2 contactors of a same rating)

For contactors	Fixing centres "V"	Type	Order code	Unit weight Pack ^{ing} 1 piece kg
Ratings (A)	mm			
85 (1)	180	VM 22 (2)	FPL 710 1403 R0002	0.120
85 (1)	220	VM 21/24	FPL 710 1403 R0001	0.140
170 (1)	220			
260 (1)	260	VM 26	FPL 760 1404 R0001	0.250
420 (1)	320	VM 14	FPL 800 1401 R0001	0.360
550 (1)	400	VM 15	FPL 830 1401 R0001	0.500
800, 1000	520	VM 16	FPL 860 1401 R0001	0.600
1250	640	VM 17/18	FPL 880 1401 R0001	0.700
1500	640			
2000	680	VM 19	FPL 900 1401 R0001	0.800

Notes:

(1) Valid also for $U_e \leq 440 \text{ V d.c.}$

(2) Max. number of **CA-12..** auxiliary contact blocks = 2.

Variants

- Interlocking between 2 contactors of same rating, $\geq 800 \text{ A}$, $U_e \leq 440 \text{ V d.c.}$
- Interlocking between contactors 1000 **V a.c.**, 1000 **V d.c.**, 1500 **V d.c.**
- Interlocking between contactors with N.C. + N.O. poles or latched contactors
- Interlocking between 2 contactors of different ratings
- Interlocking between 3 contactors

For special versions, please consult us.

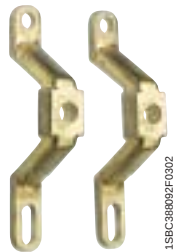
>> Contactor Dimensions with Mechanical Interlock please consult us

Mounting Feet - Shaft Extensions

Mounting by the User



4 NMW 1009/1039
mounting feet



4 NMW 1040/1041
mounting feet

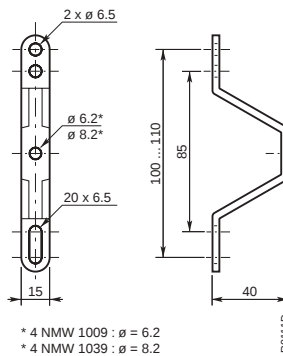
Mounting Feet

When the contactors are to be fitted on a back plate the mounting feet provide an increased clearance behind the contactor for easier cabling.

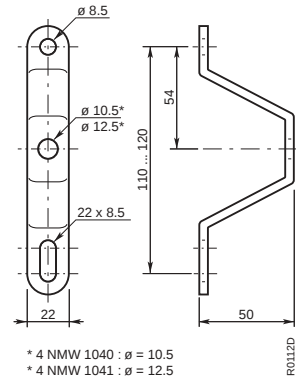
Two pieces are required for one contactor.

Ordering Details

For contactors	Drilling for bar fixing Ø mm	Fixing centres for vertical wall mounting mm	Type	Order code	Weight Pack ^{ing} 2 pieces kg
Ratings (A)					
63 ... 170	6.2	85 / 100 ... 110	4 NMW 1009	FPL 710 8201 P0001	0.060
200, 260	8.2	85 / 100 ... 110	4 NMW 1039	FPL 760 8201 P0001	0.060
315, 420	10.5	110 ... 120	4 NMW 1040	FPL 800 8201 P0001	0.320
500, 550	12.5	110 ... 120	4 NMW 1041	FPL 830 8201 P0001	0.320



* 4 NMW 1009 : Ø = 6.2
* 4 NMW 1039 : Ø = 8.2



* 4 NMW 1040 : Ø = 10.5
* 4 NMW 1041 : Ø = 12.5

Shaft Extensions

For 3 or 4 pole reversing or changeover pairs built with two contactors of different ratings, vertically mounted above one another. Fitting on the shaft of the contactor having the smaller frame size.

Ordering Details

For contactors	Type	Order code	Unit weight Pack ^{ing} 1 piece kg
Ratings (A)			
63 ... 170	—	FPTN 410 111 R0001	—
200 ... 420	—	FPTN 410 111 R0002	—
500, 550	—	FPTN 410 111 R0003	—

Spare Parts

Contacts Sets - Arc Chutes

Ordering Details - Main Contact Sets

For contactors	Main pole operation	Contactor ratings	Order code	Unit weight Pack ^{ing} 1 set kg
Types		(A)		
Set including 1 fixed contact + 1 moving contact, for poles with magnetic blow-out				
IOR, IORR, IORE, IORC	N.O.		FPTN 410 389 R0001	0.050
IOR...CC, IORR...CC	N.O.		FPTN 410 389 R0002	0.150
IORE...CC, IORC...CC	N.O.		FPTN 410 389 R0003	0.250
IOR...MT, IORR...MT	N.O.		FPTN 410 389 R0004	0.400
IORE...MT, IORC...MT	N.O.		FPTN 410 389 R0005	0.480
IOR...AMA, IORR...AMA	N.O.		FPTN 410 391 R0001	0.520
IOR...AME, IORR...AME	N.O.			
IORE...AME	N.O.			
JOR, JORR, JORE, JORC	N.C./N.O.			
NOR, NORR, NORE	N.C./N.O.			
Set including 1 fixed contact + 1 moving contact, for poles without magnetic blow-out ⁽²⁾				
		85	FPTN 410 390 R0001	0.040
		170	FPTN 410 390 R0002	0.090
LOR, LORR	N.O.	260	FPTN 410 390 R0003	0.180
LORE, LORC	N.O.	420	FPTN 410 390 R0004	0.250
		550	FPTN 410 390 R0005	0.470
		800 ... 4000 ⁽¹⁾	FPTN 410 391 R0001	0.520

(1) 1 set per pole for 800 and 1000 A ratings.
2 sets per pole for 1250 and 1500 A ratings.
3 sets per pole for 2000 A rating.
4 sets per pole for 3150 A rating.
5 sets per pole for 4000 A rating.

(2) For couplers or contactors

Ordering Details - Arc Chutes

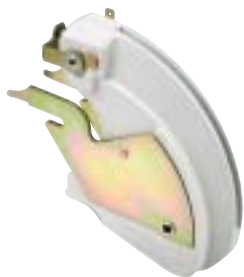
For contactors	Main pole operation	Contactor ratings	Order code	Unit weight Pack ^{ing} 1 piece kg
Types		(A)		
Basic standard arc chutes				
IOR, IORR, IORE	N.O.	63, 85	FPTN 401 928 R0002	0.300
IOR...AMA, IORR...AMA	N.O.	125, 170	FPTN 401 929 R0002	0.500
IOR..., RR... and RE...-AME	N.O.	200, 260	FPTN 401 930 R0002	1.200
JOR, JORR, JORE	N.O.	315, 420	FPTN 401 931 R0002	1.300
NOR, NORR, NORE	N.O.	500, 550	FPTN 401 932 R0002	2.500
		63, 85	FPTN 401 933 R0002	0.300
IORC,	N.O.	125, 170	FPTN 401 934 R0002	0.500
JOR, JORR, JORE	N.C.	200, 260	FPTN 401 935 R0002	1.200
JORC	N.C./N.O.	315, 420	FPTN 401 936 R0002	1.300
NOR, NORR, NORE	N.C.	550	FPTN 401 937 R0002	2.500
De-ion arc chutes				
IOR...CC, IORR...CC	N.O.	63	FPTN 401 938 R0002	0.470
IORE...CC, IORC...CC	N.O.	125	FPTN 401 939 R0002	0.930
IOR...MT, IORR...MT	N.O.	200	FPTN 401 940 R0002	1.360
IORE...MT, IORC...MT	N.O.	500	FPTN 401 941 R0002	3.600
IOR, IORR, IORE, IORC ⁽¹⁾	N.O.	800 ... 4000	FPTN 410 067 R0002	2.570
IOR..., RR... and RE...-AME ⁽¹⁾	N.O.			
IOR...CC, IORR...CC ⁽¹⁾	N.O.			
IORE...CC, IORC...CC ⁽¹⁾	N.O.			
IOR...MT, IORR...MT ⁽²⁾	N.O.			
IORE...MT, IORC...MT ⁽²⁾	N.O.			
JOR, JORR, JORE, JORC ⁽²⁾	N.C./N.O.			
NOR, NORR, NORE ⁽²⁾	N.C./N.O.			

(1) 1 arc chute per pole.

(2) 1 arc chute per pole for 800 A rating.
2 arc chutes per pole for 1500 A rating.
3 arc chutes per pole for 2000 A rating.
4 arc chutes per pole for 3150 A rating.
5 arc chutes per pole for 4000 A rating.



Main contact set



Basic standard arc chute



De-ion arc chute

Spare Parts

Operating Coils



Coil for R, RR, RE electro-magnets
(laminated magnetic circuit)

1SBC386123F0302



Coil for RC electro-magnet
(solid-core magnetic circuit)

1SBC386893F0302

Ordering Details

For standard contactors	Contactors ratings	Voltage / Frequency of the control circuit	Order code	Unit weight Pack ^{ing}
Types	(A)	state coil voltage see page 1/12	state coil voltage code: .. see page 1/12	1 piece kg

a.c. operated coils - 50 Hz

IOR	63, 85		FPL 710 1510 R ☐ 06 ☐	0.180
IOR...CC	125, 170		FPL 740 1510 R ☐ 06 ☐	0.200
IOR...MT	200, 260		FPL 760 1510 R ☐ 06 ☐	0.300
JOR, NOR	315, 420		FPL 800 1510 R ☐ 06 ☐	0.500
LOR	500 ... 550		FPL 830 1510 R ☐ 06 ☐	0.700
	800 ... 2000		FPL 860 1510 R ☐ 06 ☐	1.300

a.c. operated coils - 60 Hz

IOR	63, 85		FPL 710 1570 R ☐ 06 ☐	0.180
IOR...CC	125, 170		FPL 740 1570 R ☐ 06 ☐	0.200
IOR...MT	200, 260		FPL 760 1570 R ☐ 06 ☐	0.300
JOR, NOR	315, 420		FPL 800 1570 R ☐ 06 ☐	0.500
LOR	500, 550		FPL 830 1570 R ☐ 06 ☐	0.700
	800 ... 2000		FPL 860 1570 R ☐ 06 ☐	1.300

a.c. operated coils - 50/60 Hz, for supply via rectifier

IORR	63, 85	⁽²⁾	FPL 710 1550 R ☐ 06 ☐	0.180
IORR...CC	125, 170	⁽²⁾	FPL 740 1550 R ☐ 06 ☐	0.200
IORR...MT	200, 260	⁽²⁾	FPL 760 1550 R ☐ 06 ☐	0.300
JORR ⁽¹⁾ , NORR ⁽¹⁾	315, 420	⁽²⁾	FPL 800 1550 R ☐ 06 ☐	0.500
LORR	500, 550	⁽²⁾	FPL 830 1550 R ☐ 06 ☐	0.700
	800, 1000	⁽²⁾	FPL 860 1550 R ☐ 06 ☐	1.300
	1250 ... 2000	⁽²⁾	FPL 880 1550 R ☐ 06 ☐	1.300

IORR...AMA	85, 170	⁽³⁾	FPL 710 1552 R ☐ 06 ☐	0.150
	260	⁽³⁾	FPL 760 1552 R ☐ 06 ☐	0.190
	420	⁽³⁾	FPL 800 1552 R ☐ 06 ☐	0.240
	550	⁽³⁾	FPL 830 1552 R ☐ 06 ☐	0.430

d.c. operated coils

IORE	63, 85	⁽⁴⁾	FPL 710 1590 R ☐ 06 ☐	0.180
IORE...CC	125, 170	⁽⁴⁾	FPL 740 1590 R ☐ 06 ☐	0.200
IORE...MT	200, 260	⁽⁴⁾	FPL 760 1590 R ☐ 06 ☐	0.300
JORE ⁽¹⁾ , NORE ⁽¹⁾	315, 420	⁽⁴⁾	FPL 800 1590 R ☐ 06 ☐	0.500
LORE	500, 550	⁽⁴⁾	FPL 830 1590 R ☐ 06 ☐	0.700
	800, 1000	⁽⁴⁾	FPL 860 1590 R ☐ 06 ☐	1.300
	1250 ... 2000	⁽⁴⁾	FPL 880 1590 R ☐ 06 ☐	1.300

IORC	63, 85		FPL 710 1530 R ☐ 06 ☐	0.900
IORC...CC	125, 170		FPL 710 1530 R ☐ 06 ☐	0.900
IORC...MT	200, 260		FPL 760 1530 R ☐ 06 ☐	1.300
JORC	315, 420		FPL 800 1530 R ☐ 06 ☐	1.600
LORC	500, 550		FPL 830 1530 R ☐ 06 ☐	2.100
	800 ... 2000		FPL 860 1530 R ☐ 06 ☐	2.100

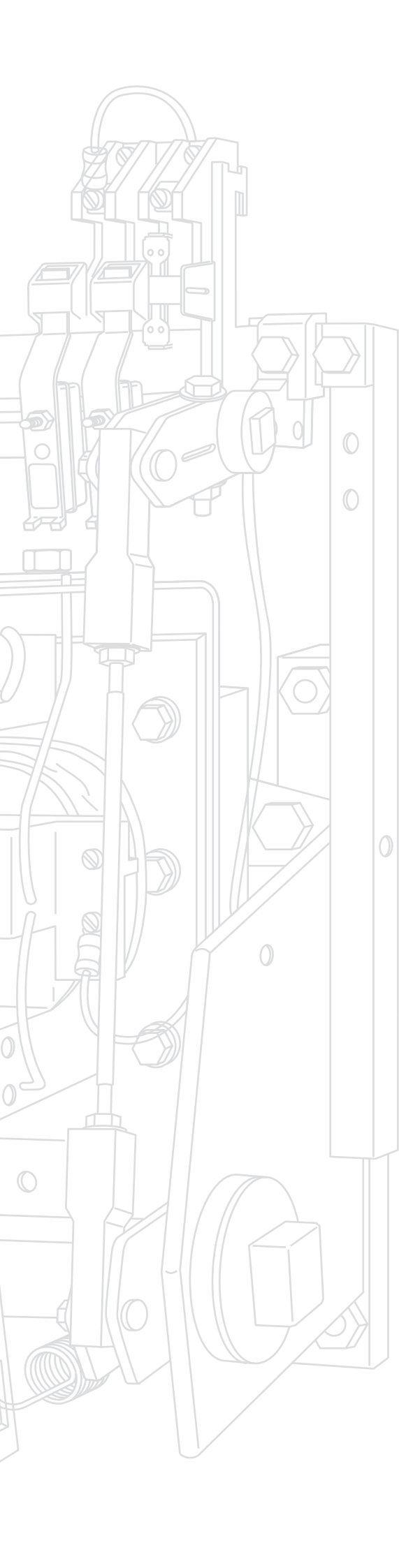
IOR...AMA	85, 170		FPL 710 1592 R ☐ 06 ☐	0.150
	260		FPL 760 1592 R ☐ 06 ☐	0.190
	420		FPL 800 1592 R ☐ 06 ☐	0.240
	550		FPL 830 1592 R ☐ 06 ☐	0.430

Whenever possible for ordering a contactor coil please always quote the corresponding contactor **Order Code** (15 digits) or the specific **CT...** reference number indicated on non-standard contactors.

Notes :

- (1) For ratings ≥ 800 A: please consult us.
- (2) If necessary, order the economy resistor and the rectifier. Indicate the marking of these components.
- (3) If necessary, order the rectifier. Indicate the marking of this component.
- (4) If necessary, order the economy resistor. Indicate the marking of this component.

- For 3150 and 4000 A ratings: please consult us.
- For contactors **IOR...AME** and **IORE...AME** see the instructions supplied with the contactor.



ABB

**Overload Relays
for R.. Series Contactors**

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Magnetic Overload Relays for d.c. Current - RCR 1 Type

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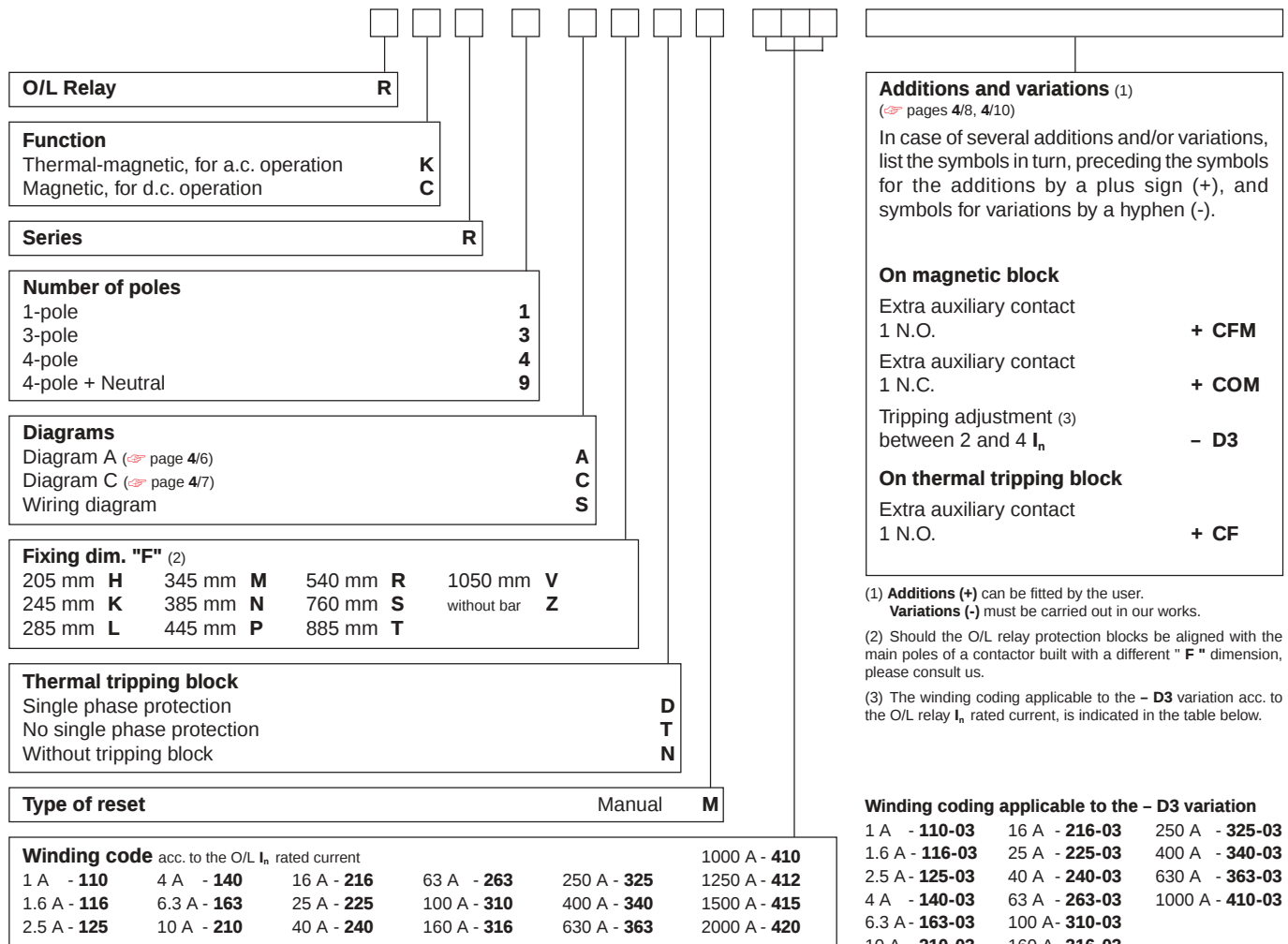
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Overload Relays for R.. Series Contactors

Types



Examples of symbols

RKR 3 ANDM 410 + CF

Thermal-magnetic overload relay – R.. series – 3-pole – Diagram A – "F" dimension = 385 mm – Thermal-magnetic and single phase protection – Manual reset of the thermal tripping block – $I_n = 1000$ A – Magnetic tripping blocks adjustable between 5 and 10 I_n – 1 extra N.O. auxiliary contact on the thermal tripping block.

RKR 3 CHDM 310 – D3 + CFM

Thermal-magnetic overload relay – R.. series – 3-pole – Diagram C – "F" dimension = 205 mm – Thermal and single phase protection – Manual reset of the thermal tripping block – $I_n = 100$ A – Magnetic tripping blocks adjustable between 2 and 4 I_n – 1 extra N.O. auxiliary contact on each magnetic block.

>> RKR Thermal-magnetic O/L Relays for a.c. Operation pages 4/4 ... 4/7
>> RCR 1 Magnetic O/L Relays for d.c. Operation page 4/8

Overload Relays

for R.. Series Contactors

Symbols

Order Code

123
FPU

456

78

910

1112
R2

1314

15
0

Winding code (see tables below)

Function of the relay (1)

Thermal tripping block (1)

Additions and variations (see table below)

Fixing dimension (1)

Number of poles (1)

(1) The corresponding codes are indicated in the Order Codes of the Ordering Details tables (→ pages 4/6, 4/7).

Relay winding code rating $I_n < 100\text{ A}$ - (Pos 4 & 5)

I_n	Winding	Code	Pos. 4 5
A		FPU	☐ ☐
1	110	7 2	
1.6	116	7 3	
2.5	125	7 4	
4	140	7 5	
6.3	163	7 6	
10	210	7 7	
16	216	7 8	
25	225	7 9	
40	240	8 0	
63	263	8 1	
100	310	8 2	

Relay winding code rating $I_n \geq 160\text{ A}$ - (Pos 4 & 5)

→ pages 4/6, 4/7

The corresponding codes are indicated in the Order Codes of the Ordering Details tables.

Additions and variations (Positions 13 & 14)

Code	Pos. 13 14	CFM	COM	CF	D3
R 2	☐ ☐ 0				
0 0		—	—	—	—
0 1		—	—	—	■
0 5		■	—	—	—
0 6		—	■	—	—
0 7		—	—	■	—
1 2		■	—	—	■
1 3		—	■	—	■
1 4		—	—	■	■
3 1		■	■	—	—
3 2		■	—	■	—
3 4		—	■	■	—
4 0		■	■	—	■
4 1		—	■	■	■
5 5		■	■	■	—

RKR.. Thermal-magnetic O/L Relays for a.c. Operation

3-pole, 3-pole + Neutral, or 4-pole



1-pole magnetic tripping block



3-pole thermal tripping block

Application

The **RKR..** O/L relays with variable number of poles are designed for the protection of a.c. circuits up to **1000 V 50 Hz** (for **60 Hz**, please consult us).

A contactor is often combined with an O/L protection relay designed to ensure the automatic tripping of the contactor under pre-determined conditions.

The relays offer a combined **magnetic** and **thermal** protection as described hereafter:

- **Magnetic:** instantaneous tripping on high current peaks or on short-circuit conditions within the limits of the contactors max. breaking capacity.
- **Thermal:** inverse time delayed tripping according to the overload value and its duration.

Description

The **RKR..** O/L relays are offered in 3-pole, 3-pole + neutral, or 4-pole versions.

This comprises of a frame carrying 3 or 4 single pole magnetic blocks and 1 thermal block.

For the 3-pole + neutral version, the neutral pole (1st magnetic block from the L.H.S) is rated one size below compared to the rating of the other 3 poles protecting the 3 main phases.

Magnetic blocks

Each block is made up of a primary winding in series with the phase to be protected and of one secondary winding.

- The primary winding ensures the magnetic function:

– either operating directly on nominal currents as follows:

I_n from 1 - 1.6 - 2.5 - 4 - 6.3 - 10 - 16 - 25 - 40 - 63 - 100 - 160 - 250 - 400 - 630 and 1000 A

– or via a current transformer for current values I_n 1250, 1500 and 2000 A.

The winding can permanently carry 1.2 times its nominal current I_n .

The tripping time of a magnetic block is less than 20 ms when the current value of the relay is greater than 2 times its setting current.

Adjustment of the tripping current is carried out with the aid of a screwdriver on a button on the front of each single pole block.

The blocks rated 1 to 1000 A are adjustable between 5 and 10 times their nominal current value I_n .

Blocks adjustable between 2 and 4 times I_n are also available on request.

Blocks 1250, 1500 and 2000 A are only adjustable between approximately 2 and 6 times I_n .

- The secondary winding is comparable to that of a current transformer and is connected to the thermal tripping block.

Thermal tripping block

This consists of 3 or 4 bimetals each fed by the secondary winding of the magnetic block described above.

The operating current is adjustable between 0.5 and 1 times the nominal current I_n of the relay by means of a slider mounted on the front of the thermal tripping block.

According to the international recommendation (IEC 60947-4-1), setting currents are not tripping currents. This means that the relay will not trip when taking a current equal or less than 1.05 times the setting current and will trip in less than 2 hours when taking a current equal to 1.20 the setting current.

The thermal tripping block is compensated against ambient temperature variations from $-20\text{ }^{\circ}\text{C}$ up to $+65\text{ }^{\circ}\text{C}$.

The 3-pole thermal tripping block provides "single phase protection" (i.e. protection of 3-phase motors against accidental single phase operation, even if the relay has been over-ridden).

On request, the tripping block may also be delivered without single phase protection (variation). 3-pole + neutral or 4-pole relays provide no single phase protection.

>> Ordering Details pages 4/6, 4/7

>> Additions and Variations page 4/8

>> Dimensions

>> Setting Ranges page 4/9

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RKR.. Thermal-magnetic O/L Relays for a.c. Operation

3-pole, 3-pole + Neutral, or 4-pole



RKR.. type - Diagram A



RKR.. type - Diagram C

Versions

Standard versions

The RKR.. O/L protection relays are available in the two following standard versions:

- **Diagram A - available for magnetic blocks from 1 to 1000 A**

Each single pole magnetic block is linked to the thermal tripping block in two ways:

- mechanically linked, for the magnetic protection
- electrically linked, for the thermal protection.

Any magnetic or thermal overload on one or more pole blocks causes the opening of a single N.C. trip contact inside the thermal tripping block.

One manual reset button is located on the thermal block.

- **Diagram C - available for magnetic blocks from 1 to 2000 A**

The magnetic protection of each single pole block is independent from one block to another. Each block is fitted with, on the L.H.S., **1 N.C. contact** (green colour) and on the front, **1 manual reset button** which, in the "tripped" position, gives a visual indication of the magnetic tripping for the faulty phase(s) involved.

The thermal protection is obtained via the thermal tripping block which bimetals are fed from the secondary windings of the single pole magnetic blocks.

The thermal tripping block is fitted with 1 N.C. contact and 1 manual reset button fully independent from those of the single pole magnetic blocks.

Specific versions

O/L relays with magnetic protection only or thermal protection only are available: please consult us.

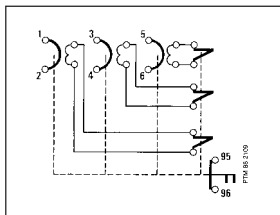
RKR.. Thermal-magnetic O/L Relays for a.c. Operation - Diagram A

3-pole, 3-pole + Neutral, or 4-pole



RKR 3 AKDM 316 - Diagram A

"Diagram A" Blocks from 1 to 1000 A



- 1 only N.C. trip contact on the thermal block.
- 1 only manual reset button on the thermal block.
- Magnetic protection adjustable between 5 and 10 I_n .
- Thermal protection adjustable between 0.5 I_n et I_n .

Winding Codes

Table 1 for completing the Type

Current I_n	Code □□□
1 A	1 1 0
1.6 A	1 1 6
2.5 A	1 2 5
4 A	1 4 0
6.3 A	1 6 3
10 A	2 1 0
16 A	2 1 6
25 A	2 2 5
40 A	2 4 0
63 A	2 6 3
100 A	3 1 0

Table 2 for completing the
Order Code

Current I_n	Code □□
1 A	7 2
1.6 A	7 3
2.5 A	7 4
4 A	7 5
6.3 A	7 6
10 A	7 7
16 A	7 8
25 A	7 9
40 A	8 0
63 A	8 1
100 A	8 2

Codes for additions and variations : page 4/3

Ordering Details

R.. series	Fixing dim.	Rated current I_n	No. of blocks	Type	Order Code	Unit weight without pack ⁽ⁿ⁾
rating / poles	"F" mm	A		Complete with winding code (if $I_n \leq 100$ A) see table 1 opposite	Complete with codes acc. to table 2 opposite and page 4/3 Winding (if $I_n \leq 100$ A) Additions or variations	kg
				RKR _____ □□□	FPU□□ R2□□□	
R85	30 205	1 to 100	3	RKR 3 AHDM □□□	FPU□□ 3 1323 R2□□□	2.700
	40 245	see table opposite	3 ⁽¹⁾	RKR 3 AKTM □□□	FPU□□ 3 2324 R2□□□	3.100
	40 245		3+N ⁽²⁾	RKR 9 AKTM □□□	FPU□□ 3 2624 R2□□□	3.500
	40 245		4	RKR 4 AKTM □□□	FPU□□ 3 2424 R2□□□	3.500
R170	30 245	160	3	RKR 3 AKDM 316	FPU 833 1324 R2□□□	2.700
	40 285	160	3 ⁽¹⁾	RKR 3 ALTM 316	FPU 833 2325 R2□□□	2.800
	40 285	160	3+N ⁽²⁾	RKR 9 ALTM 316	FPU 833 2625 R2□□□	3.500
	40 285	160	4	RKR 4 ALTM 316	FPU 833 2425 R2□□□	3.500
R260	30 285	250	3	RKR 3 ALDM 325	FPU 843 1325 R2□□□	2.800
	40 345	250	3 ⁽¹⁾	RKR 3 AMTM 325	FPU 843 2326 R2□□□	2.900
	40 345	250	3+N ⁽²⁾	RKR 9 AMTM 325	FPU 843 2626 R2□□□	3.600
	40 345	250	4	RKR 4 AMTM 325	FPU 843 2426 R2□□□	3.600
R420	30 345	400	3	RKR 3 AMDM 340	FPU 853 1326 R2□□□	3.600
	40 385	400	3 ⁽¹⁾	RKR 3 ANTM 340	FPU 853 2327 R2□□□	3.700
	40 385	400	3+N ⁽²⁾	RKR 9 ANTM 340	FPU 853 2627 R2□□□	4.400
	40 385	400	4	RKR 4 ANTM 340	FPU 853 2427 R2□□□	4.700
R550	30 385	630	3	RKR 3 ANDM 363	FPU 863 1327 R2□□□	4.200
	40 445	630	3 ⁽¹⁾	RKR 3 APTM 363	FPU 863 2328 R2□□□	4.300
	40 445	630	3+N ⁽²⁾	RKR 9 APTM 363	FPU 863 2628 R2□□□	5.300
	40 445	630	4	RKR 4 APTM 363	FPU 863 2428 R2□□□	5.500
R800	30 385	1000	3	RKR 3 ANDM 410	FPU 873 1327 R2□□□	5.700
R1000	40 540	1000	3 ⁽¹⁾	RKR 3 ARTM 410	FPU 873 2329 R2□□□	5.900
	40 540	1000	3+N ⁽²⁾	RKR 9 ARTM 410	FPU 873 2629 R2□□□	7.000
	40 540	1000	4	RKR 4 ARTM 410	FPU 873 2429 R2□□□	7.000

(1) 3-pole O/L relay used in conjunction with a 4-pole contactor: the 3 magnetic protection blocks are aligned with the 3 main poles to the R.H.S. of the contactor. It is therefore advisable that the L.H.S. main pole is used for the Neutral (fig. 1).

(2) The rating of the Neutral pole of the RKR 9.. O/L relay is one size below the main phase rating. The Neutral pole is mounted on the L.H.S.

Note: 3-pole + Neutral and 4-pole O/L relays are designed without single phase protection (T).

3-pole thermal-magnetic O/L relays offer single phase protection (D) and can be delivered on request, without single phase protection (T).

In this later case, replace letter D by letter T in the type designation (example: RKR 3 AHDM 110) and quote figure 2 instead of figure 1 for the 7th position within the Order Code.

Fixing dimension "F"

The fixing dimension "F" of the O/L relay corresponds with the fixing dimension "F" of the IOR.. contactor type (500 V a.c.) of a same rating, with which it is associated.

- On request, (subject to extra price and longer delivery time) the "F" dimension **may be different**, choosing from the standard "F" dimensions available when the relay is due to be associated with different contactors types:
 - IORE.., IORR.. or IORC.. contactors of a same rating
 - contactors of higher ratings
 - IOR.. (500 V a.c.) contactors of a same rating but built with an increased "F" dimension.

In the above mentioned cases, the **spacing between the blocks is remaining unchanged** (B or B1 dimension) and consequently may differ from the contactor pole spacing.

Example:

O/L relay rating $I_n = 250$ A, i.e. type **RKR 3 ALDM 325** (standard "F" dim. 285 mm) is associated with an **IOR 420-30** contactor (standard "F" dim. 345 mm) instead of an **IOR 260-30** contactor (standard "F" dim. 285 mm):

- should the O/L relay "F" dimension be increased from 285 mm to 345 mm, please consult us for confirmation about Type designation and Order Code.

- In case the spacing between the relay blocks (B or B1 dimension) has to be identical to the contactor pole spacing, as explained in the example above, or in case of association with another contactor type, e.g. **IOR..-MT 1000 V a.c.**, please consult us.

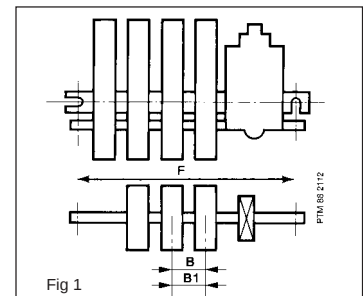


Fig 1

>> Additions and Variations page 4/8
>> Setting Ranges page 4/9

>> Tripping Curves page 4/9
>> Dimensions page 8/26 ... 8/31

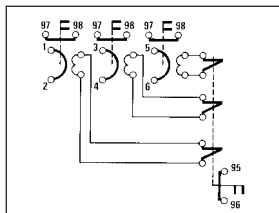
RKR.. Thermal-magnetic O/L Relays for a.c. Operation - Diagram C

3-pole, 3-pole + Neutral, or 4-pole



RKR 3 CKDM 316 - Diagram C

"Diagram C" Blocks from 1 to 2000 A



- 1 N.C. trip contact by phase, on each magnetic block.
- 1 manual reset button by phase, on each magnetic block.
- 1 N.C. trip contact, on the thermal block.
- 1 manual reset button, on the thermal block.
- Magnetic protection adjustable from 5 to 10 I_n for O/L relays 1 to 1000 A (about 2 to 6 I_n , > 1000 A).
- Thermal protection adjustable between 0.5 I_n and I_n .

Winding Codes

Table 1 for completing the Type

Current I_n	Code □□□
1 A	1 1 0
1.6 A	1 1 6
2.5 A	1 2 5
4 A	1 4 0
6.3 A	1 6 3
10 A	2 1 0
16 A	2 1 6
25 A	2 2 5
40 A	2 4 0
63 A	2 6 3
100 A	3 1 0

Table 2 for completing the Order Code

Current I_n	Code □□
1 A	7 2
1.6 A	7 3
2.5 A	7 4
4 A	7 5
6.3 A	7 6
10 A	7 7
16 A	7 8
25 A	7 9
40 A	8 0
63 A	8 1
100 A	8 2

Codes for additions and variations : ➞ page 4/3

Ordering Details

R.. series	Fixing dim.	Rated current I_n	No. of blocks	Type	Numéro d'identification	Unit weight without pack ^{ing}
contactor	"F"	A		Complete with winding code (if $I_n \leq 100$ A) see table 1 opposite	Complete with codes acc. to table 2 opposite and page 4/3	
rating / poles	mm			RKR □□□□	Winding (if $I_n \leq 100$ A) FPU □□□□ Additions or variations R2 □□□□	kg
R85	30 205	1 à 100	3	RKR 3 CHDM □□□□	FPU □□□ 3 1363 R2 □□□□	2.600
	40 245	see table opposite	3 ⁽¹⁾	RKR 3 CKTM □□□□	FPU □□□ 3 2364 R2 □□□□	3.000
	40 245		3+N ⁽²⁾	RKR 9 CKTM □□□□	FPU □□□ 3 2664 R2 □□□□	3.400
	40 245		4	RKR 4 CKTM □□□□	FPU □□□ 3 2464 R2 □□□□	3.400
R170	30 245	160	3	RKR 3 CKDM 316	FPU 833 1364 R2 □□□□	2.600
	40 285	160	3 ⁽¹⁾	RKR 3 CLTM 316	FPU 833 2365 R2 □□□□	2.700
	40 285	160	3+N ⁽²⁾	RKR 9 CLTM 316	FPU 833 2665 R2 □□□□	3.400
	40 285	160	4	RKR 4 CLTM 316	FPU 833 2465 R2 □□□□	3.400
R260	30 285	250	3	RKR 3 CLDM 325	FPU 843 1365 R2 □□□□	2.700
	40 345	250	3 ⁽¹⁾	RKR 3 CMTM 325	FPU 843 2366 R2 □□□□	2.800
	40 345	250	3+N ⁽²⁾	RKR 9 CMTM 325	FPU 843 2666 R2 □□□□	3.500
	40 345	250	4	RKR 4 CMTM 325	FPU 843 2466 R2 □□□□	3.500
R420	30 345	400	3	RKR 3 CMDM 340	FPU 853 1366 R2 □□□□	3.500
	40 385	400	3 ⁽¹⁾	RKR 3 CNTM 340	FPU 853 2367 R2 □□□□	3.600
	40 385	400	3+N ⁽²⁾	RKR 9 CNTM 340	FPU 853 2667 R2 □□□□	4.300
	40 385	400	4	RKR 4 CNTM 340	FPU 853 2467 R2 □□□□	4.600
R550	30 385	630	3	RKR 3 CNDM 363	FPU 863 1367 R2 □□□□	4.100
	40 445	630	3 ⁽¹⁾	RKR 3 CPTM 363	FPU 863 2368 R2 □□□□	4.200
	40 445	630	3+N ⁽²⁾	RKR 9 CPTM 363	FPU 863 2668 R2 □□□□	5.200
	40 445	630	4	RKR 4 CPTM 363	FPU 863 2468 R2 □□□□	5.400
R800	30 385	1000	3	RKR 3 CNDM 410	FPU 873 1367 R2 □□□□	5.600
R1000	40 540	1000	3 ⁽¹⁾	RKR 3 CRTM 410	FPU 873 2369 R2 □□□□	5.800
	40 540	1000	3+N ⁽²⁾	RKR 9 CRTM 410	FPU 873 2669 R2 □□□□	6.900
	40 540	1000	4	RKR 4 CRTM 410	FPU 873 2469 R2 □□□□	6.900
R1250	30 540	1250	3	RKR 3 CRDM 412	FPU 883 1369 R2 □□□□	15.80
	39 760	1250	3 ⁽¹⁾	RKR 3 CSTM 412	FPU 883 2370 R2 □□□□	16.30
	39 760	1250	3+N ⁽²⁾	RKR 9 CSTM 412	FPU 883 2670 R2 □□□□	17.60
	40 760	1250	4	RKR 4 CSTM 412	FPU 883 2470 R2 □□□□	19.60
R1500	30 540	1500	3	RKR 3 CRDM 415	FPU 893 1369 R2 □□□□	16.80
	39 760	1500	3 ⁽¹⁾	RKR 3 CSTM 415	FPU 893 2370 R2 □□□□	16.80
	39 760	1500	3+N ⁽²⁾	RKR 9 CSTM 415	FPU 893 2670 R2 □□□□	18.10
	40 760	1500	4	RKR 4 CSTM 415	FPU 893 2470 R2 □□□□	20.50
R2000	30 885	2000	3	RKR 3 CTDM 420	FPU 903 1371 R2 □□□□	31.60
	39 885	2000	3 ⁽¹⁾	RKR 3 CTTM 420	FPU 903 2371 R2 □□□□	31.60
	39 885	2000	3+N ⁽²⁾	RKR 9 CTTM 420	FPU 903 2671 R2 □□□□	32.10
	40 1050	2000	4	RKR 4 CVTM 420	FPU 903 2472 R2 □□□□	32.80

(1) 3-pole O/L relay used in conjunction with a 4-pole contactor: the 3 magnetic protection blocks are aligned with the 3 main poles to the R.H.S. of the contactor. It is therefore advisable that the L.H.S. main pole is used for the Neutral (fig. 1, page 4/6).

(2) The rating of the Neutral pole of the RKR 9.. O/L relay is one size below the main phase rating for relays rated from 1 to 1000 A.

The Neutral pole is rated 1000 A for the O/L relay ratings 1250, 1500 and 2000 A. The Neutral pole is mounted on the L.H.S.

Note: 3-pole + Neutral and 4-pole O/L relays are designed without single phase protection (T).

3-pole thermal-magnetic O/L relays offer single phase protection (D) and can be delivered on request, without single phase protection (T).

In this later case, replace letter **D** by letter **T** in the type designation (example: RKR 3 CHTM 110) and quote figure 2 instead of figure 1 for the 7th position within the Order Code.

Fixing dimension "F": ➞ page 4/6

Magnetic protection adjustment

As standard, the magnetic protection is adjustable between 5 and 10 I_n on the blocks from 1 to 1000 A.

On the 1250, 1500 and 2000 A blocks the magnetic protection is adjustable between 2 and 6 I_n approx.

On request (subject to extra price and longer delivery) the magnetic blocks from 1 to 1000 A can be delivered with a setting range from 2 to 4 I_n by adding the - D3 symbol after the Type designation. Example: RKR 3 CHDM 110 - D3.

>> Additions and Variations page 4/8
>> Setting Ranges page 4/9

>> Tripping Curves page 4/9
>> Dimensions page 8/26 ... 8/31

RKR.. Thermal-magnetic O/L Relays for a.c. Operation

3-pole, 3-pole + Neutral, or 4-pole



RKR.. type with 1 N.C. aux. contact on each magnetic block

1SBC387584F0301

Additions

The following items can be delivered separately and mounted by the user.

Designation	Function	Type	Order Code	Unit weight kg
Auxiliary contact for magnetic blocks (1)	N.O. (red)	CFM	FPL 710 1201 R0001	0.010
	N.C. (green)	COM	FPL 710 1202 R0001	0.010
Auxiliary contact for thermal blocks (2)	N.O. (green)	CF	FPL 710 1203 R0001	0.010

(1) R.H.S mounting.

(2) Their addition is restricted to blocks with manual reset only and pre-equipped as standard with 1 N.C contact.

Variations

Assembly and factory mounting only.

Designation	Type	Order Code	Unit weight kg
Magnetic tripping adjustable between 2 and 4 I _n instead of 5 to 10 I _n (1)	D3	—	—
Thermal block without single phase protection (2)	T	—	—

(1) Suitable for magnetic blocks from 1 to 1000 A and applicable to diagram C only.

Add symbol — **D3** after the Type designation and use the appropriate winding code (see page 4/2).

Quote the appropriate codes for the position 13 and 14 of the Order Code (see page 4/3).

(2) Quote letter **T** instead of letter **D** for the position 7 of the Type designation.

Quote figure **2** instead of figure **1** for the position 7 of the Order Code.

Possible Additions and Variations

Diagram A - 1 ... 1000 A

CFM	COM	CF	D3
—	—	■	—

Diagram C - 1 ... 2000 A

CFM	COM	CF	D3 ⁽¹⁾
—	—	—	□
■	—	—	—
—	■	—	—
—	—	■	—
■	—	—	□
—	■	—	□
—	—	■	□
■	■	—	—
■	—	■	—
—	■	■	—
■	■	—	□
—	○	■	□
■	■	■	—

Diagram A and diagram C

T
□

■ Additions by the user

□ Variations assembled in the factory

(1) Up to 1000 A only

- Other option: N.O. tripping contact(s) instead of N.C. contact(s), please consult us.

>> Ordering Details for the Thermal-magnetic O/L Relays pages 4/6, 4/7

RKR.. Thermal-magnetic O/L Relays for a.c. Operation

3-pole, 3-pole + Neutral, or 4-pole

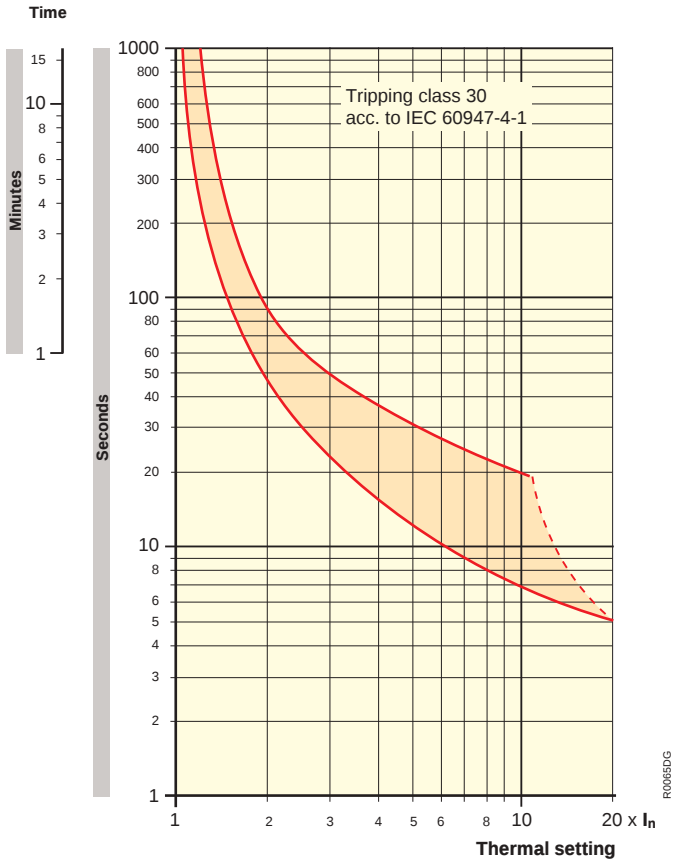
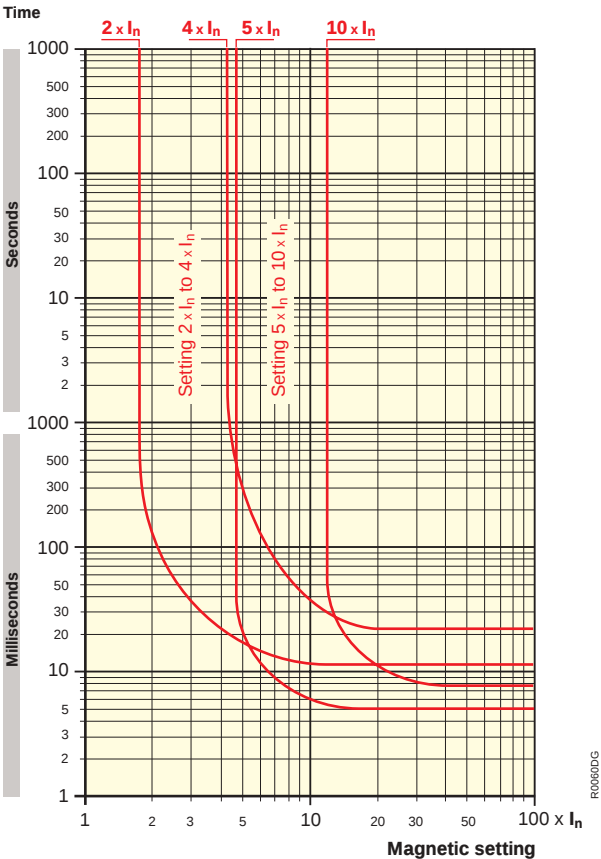
Setting Ranges

Rated Current I_n	Setting range Thermal block $0.5 \dots 1 I_n$	Setting range Magnetic block - Standard $5 \dots 10 I_n$ (blocks 1 ... 1000 A) $2 \dots 6 I_n$ approx. (blocks > 1000 A)	Winding code (1)	Setting range Magnetic block - D3 version $2 \dots 4 I_n$	Winding code (1)
A	A	A		A	
1	0.5 ... 1	5 ... 10	110	2 ... 4	110-03
1.6	0.8 ... 1.6	8 ... 16	116	3.2 ... 6.4	116-03
2.5	1.25 ... 2.5	12.5 ... 25	125	5 ... 10	125-03
4	2 ... 4	20 ... 40	140	8 ... 16	140-03
6.3	3.15 ... 6.3	31.5 ... 63	163	12.6 ... 25.2	163-03
10	5 ... 10	50 ... 100	210	20 ... 40	210-03
16	8 ... 16	80 ... 160	216	32 ... 64	216-03
25	12.5 ... 25	125 ... 250	225	50 ... 100	225-03
40	20 ... 40	200 ... 400	240	80 ... 160	240-03
63	31.5 ... 63	315 ... 630	263	126 ... 252	263-03
100	50 ... 100	500 ... 1000	310	200 ... 400	310-03
160	80 ... 160	800 ... 1600	316	320 ... 640	316-03
250	125 ... 250	1250 ... 2500	325	500 ... 1000	325-03
400	200 ... 400	2000 ... 4000	340	800 ... 1600	340-03
630	315 ... 630	3150 ... 6300	363	1260 ... 2520	363-03
1000	500 ... 1000	5000 ... 10000	410	2000 ... 4000	410-03
1250	750 ... 1250	2800 ... 9600	412	—	—
1500	750 ... 1500	2800 ... 9600	415	—	—
2000	1000 ... 2000	3500 ... 10000	420	—	—

(1) The winding code is part of the Type designation.

Note : When combined with **MT** (1000 V a.c.) contactor types, the above mentioned relays are suitable for motor and synchronous machine protection up to 1000 V a.c.

Tripping Curves (blocks from 1 to 1000 A)



RCR 1.. Magnetic O/L Relays for d.c. Operation

1-pole



RCR 1 SZNM 310

Application

The **RCR 1..** O/L protection relays are designed for the protection of d.c. circuits up to 750 V.

A contactor is often combined with an O/L protection relay designed to ensure the automatic tripping of the contactor under pre-determined conditions.

Description

The **RCR 1..** O/L relay is made up of a winding in series with the electrical circuit to be protected.

Rated currents I_n :

1 - 1.6 - 2.5 - 4 - 6.3 - 10 - 16 - 25 - 40 - 63 - 100 - 160 - 250 - 400 - 630 and 1000 A.

The winding can withstand 1.2 times its rated current I_n continuously.

The tripping time of the RCR 1.. relay is less than 20 ms when the current value in the relay winding is greater than 2 times the setting current value.

Adjustment of the tripping current is carried out with the aid of a screwdriver on a button on the front of the block. Adjustment is possible within the limits indicated in the table below.

Once the tripping value is reached, the N.C. contact (green colour) mounted on the L.H.S of the relay is operated. The relay carries on the front a manual reset button which in the tripped position, gives visual indication of the state of the relay.

The **RCR 1..** relays from 1 to 1000 A are always delivered without bar.

Ordering Details

Rated current I_n A	Setting range A	Type	Order Code to be completed with codes for additions see table opposite	Unit weight without pack ^{ing} kg
1	2 ... 5	RCR 1 SZNM 110	FPU 724 4113 R2□□0	0.600
1.6	3.2 ... 8	RCR 1 SZNM 116	FPU 734 4113 R2□□0	0.600
2.5	5 ... 12.5	RCR 1 SZNM 125	FPU 744 4113 R2□□0	0.600
4	8 ... 20	RCR 1 SZNM 140	FPU 754 4113 R2□□0	0.600
6.3	12.6 ... 31.5	RCR 1 SZNM 163	FPU 764 4113 R2□□0	0.600
10	20 ... 50	RCR 1 SZNM 210	FPU 774 4113 R2□□0	0.600
16	32 ... 80	RCR 1 SZNM 216	FPU 784 4113 R2□□0	0.600
25	50 ... 125	RCR 1 SZNM 225	FPU 794 4113 R2□□0	0.600
40	80 ... 200	RCR 1 SZNM 240	FPU 804 4113 R2□□0	0.600
63	126 ... 315	RCR 1 SZNM 263	FPU 814 4113 R2□□0	0.600
100	200 ... 450	RCR 1 SZNM 310	FPU 824 4113 R2□□0	0.600
160	320 ... 640	RCR 1 SZNM 316	FPU 834 4113 R2□□0	0.600
250	500 ... 1100	RCR 1 SZNM 325	FPU 844 4113 R2□□0	0.600
400	800 ... 1400	RCR 1 SZNM 340	FPU 854 4113 R2□□0	0.850
630	1250 ... 2500	RCR 1 SZNM 363	FPU 864 4113 R2□□0	1.100
1000	2300 ... 3800	RCR 1 SZNM 410	FPU 874 4113 R2□□0	1.600

Codes for additions

Addition	Code
–	0 0
CFM (N.O. contact)	0 5
COM (N.C. contact)	0 6

Additions

The following items can be delivered separately and mounted by the user.

Designation	Type	Order Code	Unit weight kg
N.O. auxiliary contact (red)	CFM	FPL 710 1201 R0001	0.010
N.C. auxiliary contact (green)	COM	FPL 710 1202 R0001	0.010

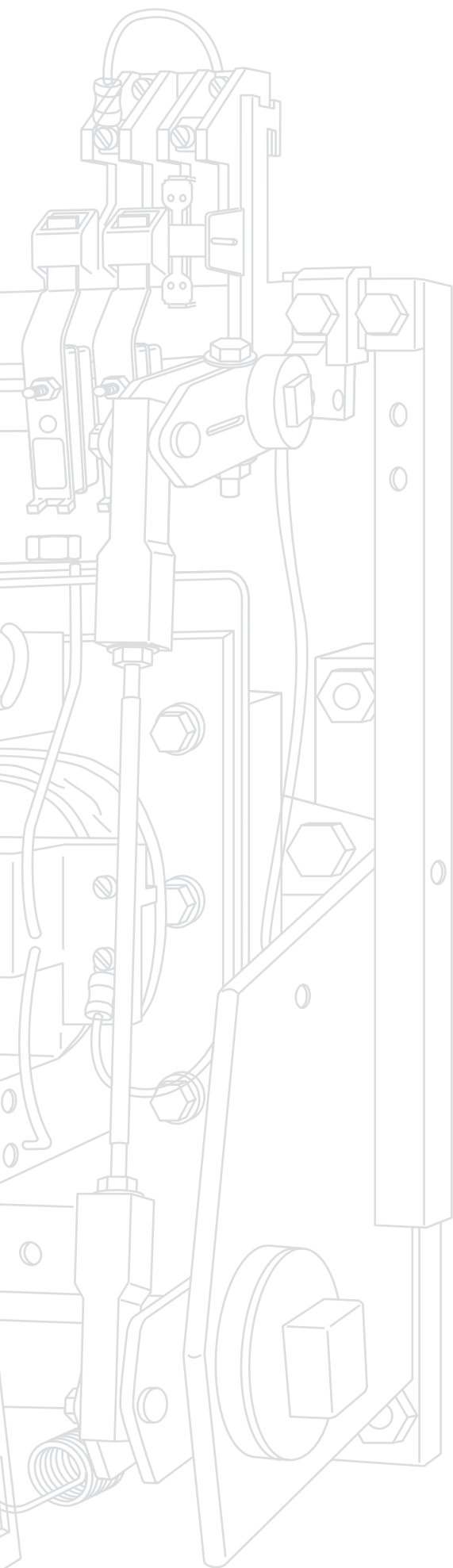
Note : The auxiliary contact has to be mounted on the R.H.S. of the relay.

Variation

N.O. trip contact instead of N.C. contact, please consult us.

Notes





Contents

Couplers

Explanation of Symbols	5/2
Description	5/3
Ordering Details	5/4 to 5/6
Auxiliary Contact Allocation	5/7
Technical Data	5/8 to 5/15
Index for Technical Data	9/5

Symbols

Type

Equipment type Coupler L	Mounting Open bar mounted O	Electro-magnet c/w coil + magnetic circuit a.c. operated coil + laminated magnetic circuit R a.c. operated coil + laminated magnetic circuit + rectifier + economy resistor R R d.c. operated coil + laminated magnetic circuit + economy resistor R E d.c. operated coil + solid-core magnetic circuit without economy resistor R C	Coupler rating 85, 170, 260, 420, 550, 800, 1500, 2000...	Additions Quote in plain text the additions required including qty, type and description e.g.: + 1 x CA.. auxiliary contact block, + 1 x VM.. mechanical interlock	Operating coil voltage Quote in plain text, acc. to a.c. and d.c. coil voltages available (→ page 1/12)	Alternative options – AMA Magnetically latched couplers – AME Mechanically latched couplers	Number of N.C. poles	Number of N.O. poles
---	--	---	---	--	---	---	-----------------------------	-----------------------------

Explanation of symbols

LOR 170-30 230V-50Hz coil + 1 CA 12-1 + 3 CA 15-F

Open type bar mounted coupler with **R** type electro-magnet and laminated magnetic circuit for a.c. operation, 170 A rating, 3 N.O. main poles, without N.C. pole, 230V-50Hz coil, + one extra **CA 12-1** (N.O. + N.C.) auxiliary contact block, + 3 extra **CA 15-F** (N.O.) auxiliary contacts.

LORE 550-40 125 Vd.c. coil + 1 CA 12-11 + 1 TP 40DA

Open type bar mounted coupler with **RE** type electro-magnet and laminated magnetic circuit for d.c. operation via an economy resistor, 550 A rating, 4 N.O. main poles, without N.C. pole, 125 Vd.c. coil, + one extra **CA 12 -11** (2 N.O. + 2 N.C.) double auxiliary contact block, + one extra **TP 40DA** pneumatic timing block adjustable 0.1 to 40 s. direct timing. N.O. + N.C. auxiliary contacts.

Notes:

- Additions which do not increase the fixing centers of the coupler can be ordered separately and mounted by the user.
Variations which do affect the coupler features e.g. the fixing centers, must be carried out in our works (→ page 5/7 and section 8 for "Dimensions").
- Coupler rating must be specified when the TP.. timing block and the CA 15.. auxiliary contact are ordered separately.

Order Codes

FPL

Coupler rating

Equipment type

L **3**

Electro-magnet type

R / U_c 50 Hz **1**

RC **3**

RR / U_c 50...400 Hz **5**

R / U_c 60 Hz **7**

RE **9**

Operating mode

1 Direct

2 Mechanical latching

3 Magnetical latching

Number of poles (☞ "Ordering Details" tables)

Code digit for blow-out coil rating

0 Without blow-out coil

Code digits for extra auxiliary contacts

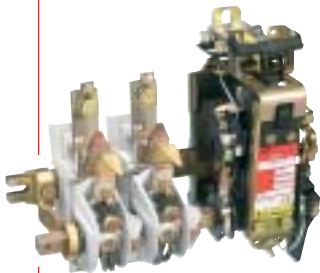
(☞ page 1/12)

Code digits for operating coil voltage

(☞ page 1/12)

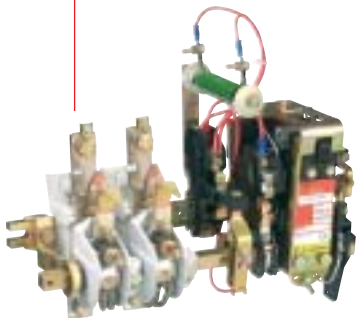
R

LOR.., LORR.., LORE.. and LORC.. Couplers



LOR 170-20

1SBC387965F0302



LORE 170-20

1SBC387955F0302



LORC 170-20

1SBC388805F0302

Application

LOR.., LORR.., LORE.. and LORC.. couplers are used for the connection of a.c. power circuits up to 1000 **V**, 50/60 **Hz** and up to 1000 **V d.c.**
They are not suitable for breaking on-load at voltages above 24 **V** a.c./d.c.

Examples of use

- automatic short-circuiting of the starting resistances of a slip-ring or d.c. motors without the possibility of opening on-load,
- electrolytic installations and electro-plating plants,
- induction furnaces (please consult us).

Description

LOR.., LORR.., LORE.. and LORC.. couplers are derived from **IOR.., IORR.., IORE.. and IORC..** contactors. Couplers are, in fact, contactors without blow-out coils or arc chutes.

Electro-magnet

- a.c. control circuit supply
 - **LOR..** type:
The magnetic circuit is laminated and the coil is fed directly from an a.c. supply.
 - **LORR..** type:
The magnetic circuit is laminated and the operating coil fed from an a.c. supply via a rectifier and an economy resistor mounted and pre-wired on the coupler.
This type of electro-magnet provides a high closing power for the operation of the large size couplers fitted with a large number of poles or when the control supply frequency is > 50 **Hz** and < 400 **Hz**.
- d.c. control circuit supply
 - **LORE..** type:
The magnetic circuit is laminated and the operating coil fed from a d.c. supply via an economy resistor mounted and pre-wired on the coupler.
 - **LORC..** type:
The magnetic circuit is of the solid-core design and the operating coil fed directly from a d.c. supply.
This type of electro-magnet is suited to high operation endurance rates. No coil inrush current peak on coupler closing.

Auxiliary contacts fitted as standard and available (☞ page 5/7)

- 1 N.O. auxiliary contact, generally used for "hold-in"
- 1 N.C. and adjustable auxiliary contact, generally used for electrical interlocking

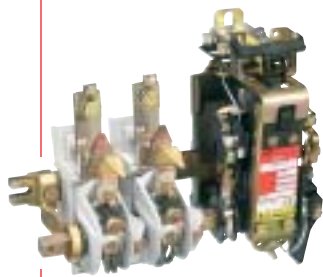
Additions (☞ page 5/7)

Extra **CA..** auxiliary contacts or **TP..** timed auxiliary contacts can be added.

>> Ordering Details	pages 5/4 ... 5/6	>> Terminal Marking and Positioning	section 7
>> Technical Data	pages 5/8 ... 5/15	>> Wiring Diagrams	section 7
>> Auxiliary Contact Allocation	page 5/7	>> Dimensions	section 8

LOR.. and LORR.. Couplers

a.c. Operated



LOR 170-20

1SBC387965F0302

Ordering Details

Conventional thermal current I_{th} ($\theta \leq 40^\circ\text{C}$) A	Rated operational voltage U_o V a.c. - V d.c.	No. of poles	Type to be completed with: – coil voltage and frequency in plain text see page 1/12	Order Code to be completed with codes: – extra aux. contacts ☐ ☐ ☐ – coil voltage ☐ – coil Hz ☐ see p. 1/12	Unit weight without pack ^{ing} kg
90	1000	1	LOR 85-10	FPL 723 ☐ 110 R ☐ ☐ ☐ ☐	2.300
		2	LOR 85-20	FPL 723 ☐ 210 R ☐ ☐ ☐ ☐	2.700
		3	LOR 85-30	FPL 723 ☐ 310 R ☐ ☐ ☐ ☐	3.100
		4	LOR 85-40	FPL 723 ☐ 410 R ☐ ☐ ☐ ☐	3.500
185	1000	2	LOR 170-20	FPL 753 ☐ 210 R ☐ ☐ ☐ ☐	3.800
		3	LOR 170-30	FPL 753 ☐ 310 R ☐ ☐ ☐ ☐	4.700
		4	LOR 170-40	FPL 753 ☐ 410 R ☐ ☐ ☐ ☐	5.600
300	1000	2	LOR 260-20	FPL 783 ☐ 210 R ☐ ☐ ☐ ☐	5.500
		3	LOR 260-30	FPL 783 ☐ 310 R ☐ ☐ ☐ ☐	6.700
		4	LOR 260-40	FPL 783 ☐ 410 R ☐ ☐ ☐ ☐	7.900
420	1000	2	LOR 420-20	FPL 813 ☐ 210 R ☐ ☐ ☐ ☐	7.800
		3	LOR 420-30	FPL 813 ☐ 310 R ☐ ☐ ☐ ☐	9.600
		4	LOR 420-40	FPL 813 ☐ 410 R ☐ ☐ ☐ ☐	11.40
630	1000	2	LOR 550-20	FPL 843 ☐ 210 R ☐ ☐ ☐ ☐	14.20
		3	LOR 550-30	FPL 843 ☐ 310 R ☐ ☐ ☐ ☐	17.50
		4	LOR 550-40	FPL 843 ☐ 410 R ☐ ☐ ☐ ☐	20.80
1100	1000	2	LOR 800-20	FPL 863 ☐ 210 R ☐ ☐ ☐ ☐	34.00
		3	LOR 800-30	FPL 863 ☐ 310 R ☐ ☐ ☐ ☐	42.00
		4	LOR 800-40	FPL 863 ☐ 410 R ☐ ☐ ☐ ☐	54.00
2000	1000	1	LOR 1500-10	FPL 893 ☐ 110 R ☐ ☐ ☐ ☐	35.00
		2	LOR 1500-20	FPL 893 ☐ 210 R ☐ ☐ ☐ ☐	49.00
		3	LORR 1500-30	FPL 893 5310 R ☐ ☐ ☐ ☐	63.00
		4	LORR 1500-40	FPL 893 5410 R ☐ ☐ ☐ ☐	77.00
3000	1000	1	LOR 2000-10	FPL 903 ☐ 110 R ☐ ☐ ☐ ☐	41.00
		2	LORR 2000-20	FPL 903 5210 R ☐ ☐ ☐ ☐	59.00
		3	LORR 2000-30	FPL 903 5310 R ☐ ☐ ☐ ☐	77.00
		4	LORR 2000-40	FPL 903 5410 R ☐ ☐ ☐ ☐	95.00

Poles of couplers ratings 1500 A and above are built-up with sets of 800 A main contacts connected in parallel.

Variants

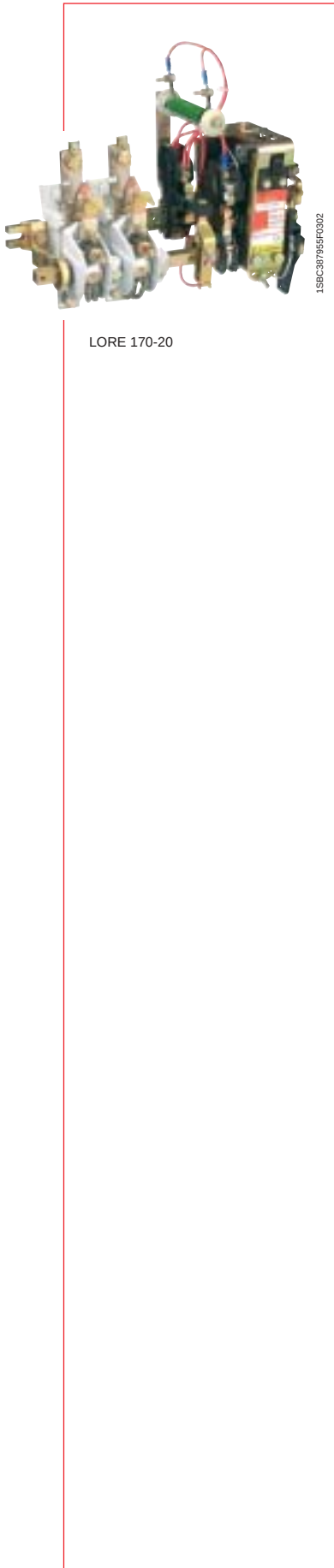
- LOR.. types (a.c. coil, direct supply) can be supplied as LORR.. types (a.c. coil, supply via a rectifier).
- LORR 3150 and LORR 4000 types: please consult us.
- LOR.. and LORR.. couplers with N.C. poles: please consult us.
- LORR..-AMA magnetically latched couplers (with N.O. and/or N.C. poles): please consult us.
- LOR..-AME, LORR..-AME mechanically latched couplers (with N.O. and/or N.C. poles): please consult us.

>> Technical Data pages 5/8 ... 5/13
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

LORE.. Couplers

d.c. Operated (with Economy Resistor)



LORE 170-20

Ordering Details

Conventional thermal current I_{th} ($\theta \leq 40^{\circ}\text{C}$) A	Rated operational voltage U_e V a.c. - V d.c.	No. of poles	Type to be completed with: – coil voltage in plain text see page 1/12	Order Code to be completed with codes: – extra aux. contacts ☐ ☐ – coil voltage ☐ ☐ see page 1/12	Unit weight without packing kg
90	1000	1	LORE 85-10	FPL 723 9110 R ☐ ☐ ☐ ☐	2.600
		2	LORE 85-20	FPL 723 9210 R ☐ ☐ ☐ ☐	3.000
		3	LORE 85-30	FPL 723 9310 R ☐ ☐ ☐ ☐	3.400
		4	LORE 85-40	FPL 723 9410 R ☐ ☐ ☐ ☐	3.800
185	1000	2	LORE 170-20	FPL 753 9210 R ☐ ☐ ☐ ☐	4.100
		3	LORE 170-30	FPL 753 9310 R ☐ ☐ ☐ ☐	5.000
		4	LORE 170-40	FPL 753 9410 R ☐ ☐ ☐ ☐	5.900
300	1000	2	LORE 260-20	FPL 783 9210 R ☐ ☐ ☐ ☐	5.900
		3	LORE 260-30	FPL 783 9310 R ☐ ☐ ☐ ☐	7.100
		4	LORE 260-40	FPL 783 9410 R ☐ ☐ ☐ ☐	8.300
420	1000	2	LORE 420-20	FPL 813 9210 R ☐ ☐ ☐ ☐	8.200
		3	LORE 420-30	FPL 813 9310 R ☐ ☐ ☐ ☐	10.00
		4	LORE 420-40	FPL 813 9410 R ☐ ☐ ☐ ☐	11.80
630	1000	2	LORE 550-20	FPL 843 9210 R ☐ ☐ ☐ ☐	14.70
		3	LORE 550-30	FPL 843 9310 R ☐ ☐ ☐ ☐	18.00
		4	LORE 550-40	FPL 843 9410 R ☐ ☐ ☐ ☐	21.30
1100	1000	2	LORE 800-20	FPL 863 9210 R ☐ ☐ ☐ ☐	34.00
		3	LORE 800-30	FPL 863 9310 R ☐ ☐ ☐ ☐	42.00
		4	LORE 800-40	FPL 863 9410 R ☐ ☐ ☐ ☐	54.00
2000	1000	1	LORE 1500-10	FPL 893 9110 R ☐ ☐ ☐ ☐	35.00
		2	LORE 1500-20	FPL 893 9210 R ☐ ☐ ☐ ☐	49.00
		3	LORE 1500-30	FPL 893 9310 R ☐ ☐ ☐ ☐	63.00
		4	LORE 1500-40	FPL 893 9410 R ☐ ☐ ☐ ☐	77.00
3000	1000	1	LORE 2000-10	FPL 903 9110 R ☐ ☐ ☐ ☐	41.00
		2	LORE 2000-20	FPL 903 9210 R ☐ ☐ ☐ ☐	59.00
		3	LORE 2000-30	FPL 903 9310 R ☐ ☐ ☐ ☐	77.00
		4	LORE 2000-40	FPL 903 9410 R ☐ ☐ ☐ ☐	95.00

Poles of couplers ratings 1500 A and above are built-up with sets of 800 A main contacts connected in parallel.

Variants

- **LORE 3150** and **LORE 4000** types: please consult us.
- **LORE..** couplers with N.C. poles: please consult us.
- **LOR..-AMA** magnetically latched couplers (with N.O. and/or N.C. poles): please consult us.
- **LORE..-AME** mechanically latched couplers (with N.O. and/or N.C. poles): please consult us.

LORC.. Couplers

d.c. Operated (without Economy Resistor)



LORC 170-20

Ordering Details

Conventional thermal current I_{th} ($\theta \leq 40^\circ\text{C}$) A	Rated operational voltage U_e V a.c. - V d.c.	No. of poles	Type to be completed with: – coil voltage in plain text see page 1/12	Order code to be completed with codes: – extra aux. contacts ☐ ☐ ☐ – coil voltage ☐ ☐ ☐ see page 1/12	Unit weight without pack ^{ing} kg
90	1000	1	LORC 85-10	FPL 723 3110 R ☐ ☐ ☐ ☐	3.700
		2	LORC 85-20	FPL 723 3210 R ☐ ☐ ☐ ☐	4.100
		3	LORC 85-30	FPL 723 3310 R ☐ ☐ ☐ ☐	4.500
		4	LORC 85-40	FPL 723 3410 R ☐ ☐ ☐ ☐	4.900
185	1000	2	LORC 170-20	FPL 753 3210 R ☐ ☐ ☐ ☐	5.300
		3	LORC 170-30	FPL 753 3310 R ☐ ☐ ☐ ☐	6.200
		4	LORC 170-40	FPL 753 3410 R ☐ ☐ ☐ ☐	7.100
300	1000	2	LORC 260-20	FPL 783 3210 R ☐ ☐ ☐ ☐	7.700
		3	LORC 260-30	FPL 783 3310 R ☐ ☐ ☐ ☐	9.400
		4	LORC 260-40	FPL 783 3410 R ☐ ☐ ☐ ☐	11.10
420	1000	2	LORC 420-20	FPL 813 3210 R ☐ ☐ ☐ ☐	9.300
		3	LORC 420-30	FPL 813 3310 R ☐ ☐ ☐ ☐	11.10
		4	LORC 420-40	FPL 813 3410 R ☐ ☐ ☐ ☐	12.90
630	1000	2	LORC 550-20	FPL 843 3210 R ☐ ☐ ☐ ☐	15.70
		3	LORC 550-30	FPL 843 3310 R ☐ ☐ ☐ ☐	19.00
		4	LORC 550-40	FPL 843 3410 R ☐ ☐ ☐ ☐	22.30
1100	1000	2	LORC 800-20	FPL 863 3210 R ☐ ☐ ☐ ☐	37.00
		3	LORC 800-30	FPL 863 3310 R ☐ ☐ ☐ ☐	45.00
		4	LORC 800-40	FPL 863 3410 R ☐ ☐ ☐ ☐	53.00

Above 1000 A please consult us.

>> Technical Data pages 5/8 ... 5/15
>> Accessories and Spare Parts section 3

>> Terminal Marking and Positioning - Wiring section 7
>> Dimensions section 8

R.. Series Couplers

CA.. Auxiliary Contacts and TP.. Timing Blocks

Auxiliary Contacts Fitted as Standard

R series couplers are equipped as standard with 1 N.O. auxiliary contact generally used for "hold-in" plus 1 N.C. adjustable auxiliary contact generally used for electrical interlocking or signal contact. Contact types available: ➞ see table below.

Extra Auxiliary Contacts, without Increase of Fixing Dimension "F"

On request R series couplers can be equipped with extra CA.. auxiliary contacts and TP.. timed auxiliary contacts according to the indications given on the table below.

● **CA 12-..** 2-pole auxiliary contact blocks

Single blocks	CA 12-1 (N.C.+N.O.) CA 12-2 (N.O.+N.O.)
Double blocks	CA 12-11 2 x (N.C.+N.O.) CA 12-12 (N.C.+N.O.) + (N.O.+N.O.) CA 12-22 2 x (N.O.+N.O.)

In the event that 3 CA 12-.. 2-pole auxiliary contact blocks are required, use 1 single block + 1 double block.

(Only 1 or 2 single blocks for LORR.. couplers.)

● **CA 15-..** 1-pole adjustable auxiliary contacts:

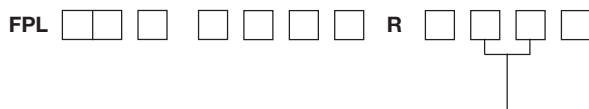
N.O. contact	CA 15-F
N.C. contact	CA 15-O

● **TP..** 2-pole pneumatic timing block with 1 N.O. and 1 N.C. auxiliary contacts.

On ordering please quote:

- timing mode, inverse or direct
- timing range, 0.1 ... 40 s or 10 ... 180 s

Enter into the coupler FPL... Order Code, the appropriate two digit code according to the selected auxiliary contact combination.



Code: ➞ page 1/12

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Extra Auxiliary Contacts, with Increased Fixing Dimension "F"

On request R series couplers can be equipped with a larger number of factory assembled auxiliary contacts but the contactor basic fixing dimension is thus increased.

● **CA 15-..** 1-pole adjustable auxiliary contacts:

N.O. contact	CA 15-F	please quote "qty" required
N.C. contact	CA 15-O	please quote "qty" required

● **TP..** 2-pole pneumatic timing blocks with 1 N.O. and 1 N.C. auxiliary contacts.

On ordering please quote:

- timing mode, inverse or direct
- timing range, 0.1 ... 40 s or 10 ... 180 s

Depending on the coupler rating and the number of poles, the addition of a larger number of auxiliary contacts could lead to the need of a more powerful electro-magnet (RR type) or a second extra electro-magnet. **Consult us.**

Auxiliary Contact Allocation

Coupler	Rating	Aux. contacts available		Extra CA.. standard aux. contacts and TP.. timed aux. contacts	
		N.O.	N.C.	Fitted by the user, without an increase in fixing dimension F	Factory fitted, with an increase in fixing dimension F
LOR	85 ... 550	1 CARB	1 CAOVE	1 ... 3 blocks CA 12.. + 1 TP..	"n" contacts CA 15.. + 1 TP..
	800 ... 1500	1 CA 15F	1 CA 15O	1 ... 3 contacts CA 15.. or 1 TP..	
LORR	85 ... 550	1 CARB	1 CAOVE	1 ... 2 blocks CA 12.. + 1 TP..	
	800 ... 2000	1 CA 15F	1 CA 15O	1 ... 2 contacts CA 15.. or 1 TP..	
LORE	85 ... 550	1 CARB	1 CAOVE	1 ... 3 blocks CA 12.. + 1 TP..	
	800 ... 2000	1 CA 15F	1 CA 15O	1 ... 2 contacts CA 15.. or 1 TP..	
LORC	85 ... 550	1 CA 15F	1 CA 15O	1 TP..	
	800	1 CA 15F	1 CA 15O	1 ... 3 contacts CA 15.. or 1 TP..	

>> Ordering Details pages 3/2, 3/3
>> Technical Data page 2/54

>> Terminal Marking and Positioning section 7
>> Dimensions acc. to the Auxiliary Contact Number section 8

LOR, LORR, LORE and LORC Couplers

Voltages up to 1000 V a.c/d.c. - 85 ... 550 A Ratings

Technical Data

Electro-magnet type / Coupler rating		R 85	R 170	R 260	R 420	R 550
		RR 85	RR 170	RR 260	RR 420	RR 550
		RE 85	RE 170	RE 260	RE 420	RE 550
		RC 85	RC 170	RC 260	RC 420	RC 550
General characteristics						
Number of poles (variable)		1 ... 4				
Standards		Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1				
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1		V	1000			
Rated impulse withstand voltage U_{imp}		kV	8			
Air temperature (close to coupler)		°C	-20 to +70			
– without thermal O/L relay		°C	-20 to +80			
– for storage		°C				
Climatic withstand		Standard version for industrial environment and tropical atmospheres (🔗 page 6/6) Special version for very corrosive atmospheres (on request)				
Operating altitude		m	≤ 2000			
Mounting characteristics						
Mounting position		Position 1 (horizontal bar)  Maximum angle of inclination, in any direction: ± 22° 30'				
Mounting distances		🔗 "Dimensions" section 8				
Fixing by screws (not supplied)		2 x M6	2 x M8	2 x M10	2 x M12	
Connecting characteristics						
Types of terminals		Terminal plates for lugs or bars				
Main poles		M4 screws, with cable clamp				
Coil terminals		M4 screws, with cable clamp				
Built-in auxiliary terminals						
Connecting dimensions						
Main poles						
Width of the terminal plates		mm	16	20	25	30
Terminal screws (supplied)			M6 x 20	M8 x 20	M10 x 25	–
Drilling of the plates (without thread)		mm	–	–	1 x Ø11	1 x Ø13
Auxiliary wires						
(built-in aux. terminals + coil terminals)						
– rigid (solid)		1 or 2 x mm ²	1 ... 2.5			
– flexible (without cable end)		1 or 2 x mm ²	1 ... 2.5			
Tightening torque (min. value)						
Main poles		Nm	7.4	17.5	35	–
Coil terminals		Nm	1.5			
Built-in auxiliary terminals		Nm	1.5			

Note: These characteristics are suitable for AMA and AME coupler versions.

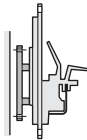
>> Main Pole Utilization Characteristics page 5/10
>> R and RR Electro-magnet Characteristics page 5/12
>> RE and RC Electro-magnet Characteristics page 5/14

>> General Technical Data section 6
>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> Dimensions section 8

LOR, LORR, LORE and LORC Couplers

Voltages up to 1000 V a.c/d.c. - 800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Coupler rating	R 800 RR 800 RE 800 RC 800	R 1500 RR 1500 RE 1500 -	R 2000 RR 2000 RE 2000 -	- RR 3150 RE 3150 -	- RR 4000 RE 4000 -
General characteristics					
Number of poles (variable)	1 ... 4*				
Standards	Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1				
Rated insulation voltage U_i acc. to IEC 60947-4-1 and EN 60947-4-1	V 1000				
Rated impulse withstand voltage U_{imp}	kV 8				
Air temperature (close to coupler)					
- without thermal O/L relay	°C -20 to +70				
- for storage	°C -20 to +80				
Climatic withstand	Standard version for industrial environment and tropical atmospheres (→ page 6/6) Special version for very corrosive atmospheres (on request)				
Operating altitude	m ≤ 2000				
Mounting characteristics					
Mounting position	Position 1 (horizontal bar) 				
	Maximum angle of inclination, in any direction: ± 22° 30'				
Mounting distances	→ "Dimensions" section 8				
Fixing by screws (not supplied)	2 x M12	4 x M12			4 or 6 x M12
Connecting characteristics					
Types of terminals					
Main poles	Terminal plates for lugs or bars				
Coil terminals	M4 screws, with cable clamp				
Built-in auxiliary terminals	M4 screws, with cable clamp				
Connecting dimensions					
Main poles					
Width of the terminal plates	mm 48	100	150	200	250
Terminal screws (supplied)	-	-	-	-	-
Drilling of the plates (without thread)	mm 2 x Ø13	2 x Ø13/4 x Ø13	8 x Ø9	8 x Ø13	12 x Ø13
Auxiliary wires (built-in aux. terminals + coil terminals)					
- rigid (solid) 1 or 2 x mm ²	1 ... 2.5				
- flexible (without cable end) 1 or 2 x mm ²	1 ... 2.5				
Tightening torque (min. value)					
Main poles	Nm -	-	-	-	-
Coil terminals	Nm 1.5				
Built-in auxiliary terminals	Nm 1.5				

* Except for LOR 1500 limited to 2 poles and LOR 2000 limited to 1 pole. (These limitations are not applicable to the LORR 1500, LORR 2000, LORE 1500, LORE 2000 types.)

Note: These characteristics are suitable for AME coupler versions.

>> Main Pole Utilization Characteristics page 5/11
>> R and RR Electro-magnet Characteristics page 5/13
>> RE and RC Electro-magnet Characteristics page 5/15

>> General Technical Data section 6
>> Terminal Marking and Positioning - Wiring Diagrams section 7
>> Dimensions section 8

LOR, LORR, LORE and LORC Couplers

Voltages up to 1000 V a.c/d.c. - 85 ... 550 A Ratings

Technical Data (cont.)

Electro-magnet type / Coupler rating		R 85 RR 85 RE 85 RC 85	R 170 RR 170 RE 170 RC 170	R 260 RR 260 RE 260 RC 260	R 420 RR 420 RE 420 RC 420	R 550 RR 550 RE 550 RC 550	
Main Pole: Utilization Characteristics							
Rated operational voltage U_e max.		V	1000				
Rated frequency limits		Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)				
Conventional free-air thermal current I_{th} according to IEC 60947-4-1 open couplers, θ ≤ 40 °C		A	90	185	300	420	630
with conductor cross sectional area		mm²	35	95	185	300	370
Rated operational current I_e / AC-1 - DC-1 according to air temperature close to coupler							
θ ≤ 40 °C		A	90	185	300	420	630
θ ≤ 55 °C		A	82	170	270	370	570
θ ≤ 70 °C		A	72	150	240	330	500
with conductor cross-sectional area		mm²	35	95	185	300	370
Rated making capacity AC-1, DC-1 acc. to IEC 60947-4-1 1000 V max.		A	1.5 x I _e / AC-1 or DC-1				
Rated breaking capacity AC-1, DC-1 acc. to IEC 60947-4-1 24 V max.		A	1.5 x I _e / AC-1 or DC-1				
Short-circuit protection U _e ≤ 1000 V a.c. - gG type fuses		A	100	200	315	500	700
U _e ≤ 1000 V a.c. - L type fuses		A	–	–	–	–	–
Rated short-time withstand current I_{cw} at 40°C ambient temp.		1 s A	1150	2250	3800	6000	8400
in free air, from a cold state		10 s A	680	1200	1920	2960	4400
		30 s A	310	680	1040	1480	2200
		1 min A	230	450	730	1100	1680
		15 min A	120	250	390	600	840
Impedance per pole		mΩ	1.80	1.20	0.60	0.40	0.35
Max. electrical switching frequency - for AC-1 category		cycles/h	300				
Max. mechanical switching frequency		cycles/h	1200				
Mechanical durability in millions of operating cycles							
– R type			10				
– RR, RE type			5				
– RC type			20				

Above values are applicable to N.O. main poles (for N.C. poles please consult us).

Note: These characteristics are suitable for AMA and AME coupler versions (except for mechanical durability = 0.2 millions of operating cycles).

>> General Characteristics	page 5/8	>> R and RR Electro-magnet Characteristics	page 5/12
>> Mounting Characteristics	page 5/8	>> RE and RC Electro-magnet Characteristics	page 5/14
>> Connecting Characteristics	page 5/8	>> Dimensions	section 8

LOR, LORR, LORE and LORC Couplers

Voltages up to 1000 V a.c/d.c. - 800 ... 4000 A Ratings

Technical Data (cont.)

Electro-magnet type / Coupler rating		R 800 RR 800 RE 800 RC 800	R 1500 RR 1500 RE 1500 –	R 2000 RR 2000 RE 2000 –	– RR 3150 RE 3150 –	– RR 4000 RE 4000 –
Main Pole: Utilization Characteristics						
Rated operational voltage U _e max.	V	1000				
Rated frequency limits	Hz	25 ... 60 (for > 60 Hz ... 400 Hz please consult us)				
Conventional free-air thermal current I _{th} according to IEC 60947-4-1						
open couplers, θ ≤ 40 °C	A	1100	2000	3000	3800	4500
with conductor cross sectional area	mm ²	800	1000	3000	4000	4000
Rated operational current I _e / AC-1 - DC-1 according to air temperature close to coupler						
θ ≤ 40 °C	A	1100	2000	3000	3800	4500
θ ≤ 55 °C	A	1000	1850	2650	3400	4100
θ ≤ 70 °C	A	900	1470	2200	3100	3700
with conductor cross-sectional area	mm ²	800	1000	3000	4000	4000
Rated making capacity AC-1, DC-1 acc. to IEC 60947-4-1 1000 V max.						
	A	1.5 x I _e / AC-1 or DC-1				
Rated breaking capacity AC-1, DC-1 acc. to IEC 60947-4-1 24 V max.						
	A	1.5 x I _e / AC-1 or DC-1				
Short-circuit protection						
U _e ≤ 1000 V a.c. - gG type fuses	A	1250	–	–	–	–
U _e ≤ 1000 V a.c. - L type fuses	A	–	2500	3500	4000	5000
Rated short-time withstand current I _{cw} at 40°C ambient temp. in free air, from a cold state	1 s	A	9000	16000	20000	21000
	10 s	A	8000	12000	16000	17000
	30 s	A	4000	6000	8000	8500
	1 min	A	3000	4500	6000	6500
	15 min	A	1600	2250	3300	4200
Impedance per pole	mΩ	0.18	0.13	0.080	0.060	0.045
Max. electrical switching frequency - for AC-1 category						
	cycles/h	300	120			
Max. mechanical switching frequency						
	cycles/h	1200	600			
Mechanical durability in millions of operating cycles						
– R type		5			–	–
– RR, RE type		5			2	
– RC type		20	–	–	–	–

Above values are applicable to N.O. main poles (for N.C. poles please consult us).

Note: These characteristics are suitable for AME coupler versions (except for mechanical durability = 0.2 millions of operating cycles).

>> General Characteristics page 5/9
 >> Mounting Characteristics page 5/9
 >> Connecting Characteristics page 5/9

>> R and RR Electro-magnet Characteristics page 5/13
 >> RE and RC Electro-magnet Characteristics page 5/15
 >> Dimensions section 8

LOR and LORR Couplers

Laminated Magnetic Circuit

a.c. Operated



Electro-magnet Characteristics - LOR Couplers

Electro-magnet type / Coupler rating			R 85	R 170	R 260	R 420	R 550
Rated control circuit voltage U_c							
50 Hz	V		24 ... 600				
60 Hz	V		24 ... 600				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50 Hz	VA	260	380	620	1100	1700
	60 Hz	VA	305	440	720	1275	1970
Average holding value	50 Hz	VA	50	70	105	190	250
	60 Hz	VA	55	76	115	210	275
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	30		35	40	
Between coil de-energization and N.O. contact opening		ms	20		25		30

Operating time values are applicable to N.O. main poles (for N.C. poles please consult us).

Electro-magnet Characteristics - LORR Couplers

Electro-magnet type / Coupler rating			RR 85	RR 170	RR 260	RR 420	RR 550
Rated control circuit voltage U_c							
50/60 Hz	V		24 ... 550				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50/60 Hz	VA	290	460	410	350	540
Average holding value	50/60 Hz	VA	25	45		50	65
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	30		40	60	
Between coil de-energization and N.O. contact opening (switch-off the d.c. circuit)		ms	20			25	50

Operating time values are applicable to N.O. main poles (for N.C. poles please consult us).

Note: For AMA and AME coupler versions, please consult us.

LOR and LORR Couplers

Laminated Magnetic Circuit

a.c. Operated



Electro-magnet Characteristics - LOR Couplers (cont.)

Electro-magnet type / Coupler rating			R 800	R 1500	R 2000		
Rated control circuit voltage U_c							
	50 Hz	V	42 ... 600				
	60 Hz	V	48 ... 600				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55\text{ }^{\circ}\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50 Hz	VA	3960				
	60 Hz	VA	4675				
Average holding value	50 Hz	VA	475				
	60 Hz	VA	515				
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	45				
Between coil de-energization and N.O. contact opening		ms	30				

Operating time values are applicable to N.O. main poles (for N.C. poles please consult us).

Electro-magnet Characteristics - LORR Couplers (cont.)

Electro-magnet type / Coupler rating			RR 800	RR 1500	RR 2000	RR 3150	RR 4000
Rated control circuit voltage U_c							
	50/60 Hz	V	24 ... 550				
Coil operating limits according to IEC 60947-4-1			0.85 ... 1.1 x U_c (for $\theta \leq 55\text{ }^{\circ}\text{C}$)				
Drop-out voltage in % of U_c			roughly 20 ... 75 %				
Coil consumption (for U_c)							
Average pull-in value	50/60 Hz	VA	610	2 Poles : 610 3 and 4 Poles : 925	925	3 Poles : 925 4 Poles : (1)	(1)
Average holding value	50/60 Hz	VA	55	2 Poles : 55 3 and 4 Poles : 130	130	3 Poles : 130 4 Poles : (1)	(1)
Operating time (average values for U_c)							
Between coil energization and N.O. contact closing		ms	100	90	120	(1)	(1)
Between coil de-energization and N.O. contact opening (switch-off the d.c. circuit)		ms	55	40	30	(1)	(1)

(1) Please consult us

Operating time values are applicable to N.O. main poles (for N.C. poles please consult us).

Note: For AME coupler versions, please consult us.

LORE and LORC Couplers

Laminated Magnetic Circuit (RE) - d.c. Operated
Solid Magnetic Circuit (RC) - d.c. Operated



Electro-magnet Characteristics - LORE Couplers

Electro-magnet type / Coupler rating		RE 85	RE 170	RE 260	RE 420	RE 550
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value W		265	330		360	
Average holding value W		30	45		50	
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing ms		30		40	60	
Between coil de-energization and N.O. contact opening ms		20		20	25	45

Operating time values are applicable to N.O. main poles (for N.C. poles please consult us).

Electro-magnet Characteristics - LORC Couplers

Electro-magnet type / Coupler rating		RC 85	RC 170	RC 260	RC 420	RC 550
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value W		25		30	45	
Average holding value W		25		30	45	
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing ms		145	150	135	140	210
Between coil de-energization and N.O. contact opening ms		45		50	80	150

Note: For AME coupler versions, please consult us.

LORE and LORC Couplers

Laminated Magnetic Circuit (RE) - d.c. Operated
Solid Magnetic Circuit (RC) - d.c. Operated



Electro-magnet Characteristics - LORE Couplers (cont.)

Electro-magnet type / Coupler rating		RE 800	RE 1500	RE 2000	RE 3150	RE 4000
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)			2 Poles : 700		3 Poles : 930	
Average pull-in value W		700	3 and 4 Poles : 930	930	4 Poles : (1)	(1)
Average holding value W		55	2 Poles : 55 3 and 4 Poles : 110	110	3 Poles : 110 4 Poles : (1)	(1)
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing ms		70	80	90	(1)	(1)
Between coil de-energization and N.O. contact opening ms		50	45	35	(1)	(1)

(1) Please consult us

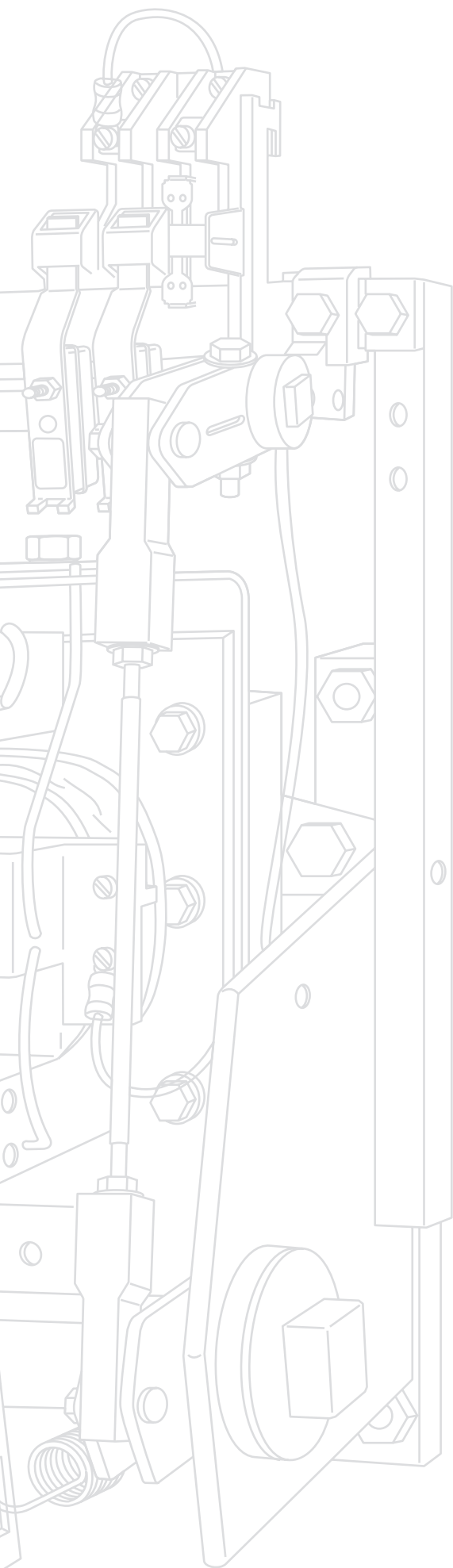
Operating time values are applicable to N.O. main poles (for N.C. poles please consult us).

Electro-magnet Characteristics - LORC Couplers (suite)

Electro-magnet type / Coupler rating		RC 800				
Rated control circuit voltage U_c d.c. V		24 ... 600				
Coil operating limits according to IEC 60947-4-1		0.85 ... 1.1 x U_c (for $\theta \leq 55^\circ\text{C}$)				
Drop-out voltage in % of U_c		roughly 10 ... 75 %				
Coil consumption (for U_c)						
Average pull-in value W		75				
Average holding value W		75				
Operating time (average values for U_c)						
Between coil energization and N.O. contact closing ms		250				
Between coil de-energization and N.O. contact opening ms		150				

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Note: For AME coupler versions, please consult us.



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General Technical Data

Specifications, Standards and Certifying

Definitions

ABB low voltage devices are developed and manufactured according to the rules set out in IEC international publications and in EN European specifications.

In most countries, low voltage apparatus is built according to such rules with checking being the responsibility of the manufacturer. The devices are therefore not subject to any further obligation for approval. A test report from our laboratories can be remitted to our customers, on request, for presentation to different qualified local organizations.

Prescriptions and Standards

● International Specifications

The International Electrotechnical Commission, IEC, which is part of the International Standards Organization, ISO, publishes IEC publications which act as a basis for the world market.

● European Specifications and National Specifications

The European Committee for Electrotechnical Standardization (CENELEC), which groups together 18 European countries, publishes EN standards. These European standards differ very little from IEC international standards and have similar numbering.

The same applies for national standards which use, without exception, the same numbering and reproduce the texts of these unified standards in their entirety. Contradicting national standards are withdrawn.

● European Directives

The guarantee of the free movement of goods within the European Community means that any regulatory differences between member states have been eliminated. The European directives set up common rules that are included in the legislation of each state while contradictory regulations are cancelled.

Three directives are essential:

- Low Voltage Directive 73/23/EEC concerns electrical equipment from 0 to 1000 V a.c. and from 75 to 1500 V d.c.
This specifies that compliance with the requirements that it sets out is acquired if the equipment conforms to the standards harmonized on a European level: EN 60947-1 and EN 60947-4-1 for contactors.
- Machines Directive 89/392/EEC for safety specifications of machines and equipment on complete machines. Machines bearing the CE mark comply with these specifications.
- Electromagnetic Compatibility Directive 89/336/EEC which concerns all devices able to create electromagnetic disturbance.
Standard EN 60947-4-1 does not set out any requirement concerning the level of emission or immunity of contactors which do not have any active electronic components. Owing to this fact, compliance with standard EN 60947-4-1 meets the requirements for CE marking, with respect to this directive.

CE Marking :

CE marking must not be confused with a quality label.

CE marking is proof of conformity with the European Directives concerning the product.

CE marking is part of an administrative procedure and guarantees free movement of the product within the European Community.

● International Standards

IEC 60947-1 Low-voltage switchgear and controlgear – Part 1: General rules.

IEC 60947-4-1 Low-voltage switchgear and controlgear – Part 4: Contactors and motor starters.
Section 1: Electromechanical contactors and motor starters.

IEC 60947-5-1 Low-voltage switchgear and controlgear – Part 5: Control circuit devices and switching elements.
Section 1: Electromechanical control circuit devices.

● European Standards

EN 60947-1 Low-voltage switchgear and controlgear – Part 1: General rules.

EN 60947-4-1 Low-voltage switchgear and controlgear – Part 4: Contactors and motor starters.
Section 1: Electromechanical contactors and motor starters.

EN 60947-5-1 Low-voltage switchgear and controlgear – Part 5: Control circuit devices and switching elements.
Section 1: Electromechanical control circuit devices.

Test Certifying Organizations

ABB Control is a member of the **ASEFA** (Association of French Test Stations for Electrical Apparatus) whose platforms are accredited by **COFRAC** (national test network).

This independent organization is authorized to deliver certificates of testing and conformity with standards, especially IEC.

ASEFA is one of the signatories of the **LOVAG** (Low Voltage Agreement Group) agreement which ensures reciprocal recognition between the main European certifying organizations for low voltage electrical tests by delivering certificates of **LOVAG** conformity.

General Technical Data

Terms and Technical Definitions

Terminology

Altitude

Characterizes the place of use. It is expressed in metres above sea level.

Circuits

- Auxiliary circuit:
All the conductive parts of a contactor designed to be inserted in a different circuit from the main circuit and the contactor control circuits.
- Control circuit:
All the conductive parts of a contactor (other than the main circuit and the auxiliary circuit) used to control the contactor's closing operation or opening operation or both.
- Main circuit:
All the conductive parts of a contactor designed to be inserted in the circuit that it controls.

Rated Operational Current I_e

Current rated by the manufacturer. It is mainly based on the rated operational voltage U_e , the rated frequency, the utilization category, the rated duty and the type of protective enclosure, if necessary.

Conventional Free Air Thermal Current I_{th}

Current that the contactor can withstand in free air for a duty time of 8 hours without the temperature rise of its various parts exceeding the maximum values given by the standard.

Electrical Durability

Number of on-load operations that the contactor is able to carry out. It depends on the utilization category.

Mechanical Durability

Number of no-current operations that a contactor is able to carry out.

Switching Frequency

Number of switching cycles per hour.

Coil Operating Limits

Expressed in multiples of the nominal control circuit voltage U_c for the upper and lower limits.

Mounting Position

Comply with the manufacturer's instructions.

Rated Breaking or Making Capacity

Root mean square value of the current that the contactor is able to break or make at a given voltage according to the conditions specified by standards and for a given utilization category.

Ambient Temperature

Air temperature close to the contactor.

Time

- Time constant :
Ratio of the inductance to the resistance ($L/R = \text{mH}/\Omega = \text{ms}$).
- Short-time withstand current I_{cw} :
Current that the contactor is able to withstand in closed position for a short time interval and in specified conditions.
- Minimum switching time:
This is the minimum closing or opening order time necessary for the contactor to reach complete closing or opening.
- Closing time:
Time interval between the beginning of the closing operation and the instant the contacts touch on all the poles.
- Opening time:
Time interval between the specified starting instant of the opening operation and the instant the arcing contacts separate on all the poles.

Rated Control Voltage U_c

Control voltage value for which the control circuit is sized.

Rated Operational Voltage U_e

Voltage to which the contactor's utilization characteristics refer. In three-phase it is the phase-to-phase voltage.

Rated Insulation Voltage U_i

Reference voltage for dielectric tests and creepage distances.

Rated Impulse Withstand Voltage U_{imp}

Peak value of an impulse voltage, having a specified form and polarity, which does not cause breakdown in specific test conditions.

Shock Withstand

Requirement for vehicles, crane drives, installations on board ships and plug-in equipment. The contactors must not change position and the overload relays must not trip.

Resistance to Vibrations

Requirements for vehicles, boats and other means of transport. For the specified vibration amplitude and frequency values the device must remain able to operate.

General Technical Data

Utilization Categories

Standards

IEC publications 60941-1, 60947-4-1 and 60947-5-1 should be referred to on an international level with respect to contactors. A contactor's duty is characterised by the utilization category together with the rated operational voltage and current indicated.

● Utilization Categories for Contactors According to IEC 60947-4-1

Alternating current:	AC-1	Non-inductive or slightly inductive loads, resistance furnaces.
	AC-2	Slip-ring motors: starting, switching off.
	AC-3	Cage motors: starting, switching off running motors.
	AC-4	Cage motors: starting, plugging, inching.
	AC-5a	Discharge lamp switching.
	AC-5b	Incandescent lamp switching.
	AC-6a	Transformer switching.
	AC-6b	Capacitor bank switching.
	AC-7a	Slightly inductive loads for domestic devices and similar applications.
	AC-7b	Motors for domestic applications.
	AC-8a	Hermetic refrigeration compressor motor control with manual resetting of overload releases.
	AC-8b	Hermetic refrigeration compressor motor control with automatic resetting of overload releases.
Direct current:	DC-1	Non inductive or slightly inductive loads, resistance furnaces.
	DC-3	Shunt motors: starting, plugging, inching, dynamic breaking of d.c. motors.
	DC-5	Series motors: starting, plugging, inching, dynamic breaking of d.c. motors.
	DC-6	Incandescent lamp switching.

● Utilization Categories for the Auxiliary Contacts According to IEC 60947-5-1

Alternating current:	AC-12	Control of resistive loads and static loads with opto-coupler isolation.
	AC-13	Control of static loads with transformer isolation.
	AC-14	Control of weak electromagnetic loads (≤ 72 VA).
	AC-15	Control of electromagnetic loads (> 72 VA).
Direct current:	DC-12	Control of resistive loads and static loads with opto-coupler isolation.
	DC-13	Control of d.c. electromagnets.
	DC-14	Control of d.c. electromagnets having economy resistors.

In fact some applications, and the specific criteria characterizing the various loads controlled by contactors, may modify the utilization characteristics of the contactors.

d.c. Power Circuit Switching

Arc suppression is more difficult in direct current than in alternating current and this is all the more true the higher the circuit time constant which is why it is necessary to connect several poles in series in order to improve breaking conditions. (→ pages 2/48, 2/49, 2/52, 2/53.)

a.c. High Current Circuit Switching

Possibility of increasing performances by connecting poles in parallel. (Please consult us.)

Influence of the Length of the Conductors used in the Contactor Control Circuit

According to the operational voltages and the coil consumption, take line resistances and capacitances into consideration, for the length and the cross-sectional of the conductors.

General Technical Data

Utilization Categories

Making and Breaking Conditions for Utilization Categories

Utilization category	Durability test conditions						Occasional operation						
	Making conditions			Breaking conditions			Making conditions			Breaking conditions			
	I/I_e	U/U_e	$\cos. \varphi$ or L/R (ms)	I/I_e	U/U_e	$\cos. \varphi$ or L/R (ms)	I_c/I_e	U_r/U_e	$\cos. \varphi$ or L/R (ms)	I_c/I_e	U_r/U_e	$\cos. \varphi$ or L/R (ms)	
Contactors for a.c. circuit switching													
AC-1	1	1	0.95	1	1	0.95	1.5	1.05	0.8	1.5	1.05	0.8	
AC-2	2.5	1	0.65	2.5	1	0.65	4	1.05	0.65	4	1.05	0.65	
AC-3	$I_e \leq 100$ A	6	1	0.35	1	0.17	0.35	10	1.05	0.45	8	1.05	0.45
	$I_e > 100$ A	6	1	0.35	1	0.17	0.35	10	1.05	0.35	8	1.05	0.35
AC-4	$I_e \leq 100$ A	6	1	0.35	6	1	0.35	12	1.05	0.45	10	1.05	0.45
	$I_e > 100$ A	6	1	0.35	6	1	0.35	12	1.05	0.35	10	1.05	0.35
Contactors for d.c. circuit switching													
DC-1	1	1	1	1	1	1	1.5	1.05	1	1.5	1.05	1	
DC-3	2.5	1	2	2.5	1	2	4	1.05	2.5	4	1.05	2.5	
DC-5	2.5	1	7.5	2.5	1	7.5	4	1.05	15	4	1.05	15	
Auxiliary contacts for a.c. circuit switching													
AC-14	(≤ 72 VA)	—	—	—	—	—	6	1.1	0.7	6	1.1	0.7	
AC-15	(> 72 VA)	10	1	0.7	1	1	0.4	10	1.1	0.3	10	1.1	0.3
Auxiliary contacts for d.c. circuit switching													
	Standard operation						Occasional operation						
	Making conditions			Breaking conditions			Making conditions			Breaking conditions			
	I/I_e	U/U_e	$T_{0.95}$	I/I_e	U/U_e	$T_{0.95}$	I/I_e	U/U_e	$T_{0.95}$	I/I_e	U/U_e	$T_{0.95}$	
DC-13	1	1	6 P(1)	1	1	6 P(1)	1.1	1.1	6 P(1)	1.1	1.1	6 P(1)	
DC-14	—	—	—	—	—	—	10	1.1	15 ms	10	1.1	15 ms	

(1) The value "6 x P" is the result of an empirical relation which is estimated to represent most d.c. magnetic loads up to the highest limit of P = 50 W (6 x P = 300 ms). It is accepted that loads having drawn energy above 50 W are made up of weaker loads in parallel. As a consequence, the 300 ms value must form the highest limit whatever the value of the power drawn.

Key:

U (I) = applied voltage (current)

U_r = recovery voltage

L/R = test circuit time constant

U_e (I_e) = rated operational voltage (current)

I_c = making and breaking current expressed in d.c. or in a.c. like the r.m.s. value of the symmetrical components

T_{0.95} = time required to reach 95% of the current in steady-state conditions, expressed in milliseconds

General Technical Data

Climatic Withstand of Devices

General

The life time and dependability of devices are mainly influenced by a series of climatic factors which cause their corrosion.

In practice, besides climatic conditions, there are other factors which may damage equipment such as fungi, insects (termites), dust, work site dirt and aggressive environment (salty or sulphurous atmosphere, etc.) which can often only be identified at the place of installation.

The entrance of dust, insects, dirt, etc. in devices may be prevented if the appropriate degree of protection according to IEC 60529 is chosen.

ABB contactors have been used for many years in the most varied countries, with hot and humid climates for example: Brazil, Indonesia, India etc. Experience has shown that **ABB** devices can be used in most countries throughout the world.

The climate of the country in which the device is installed is not the determining choice factor.

Account must be taken of:

- the immediate environment of the devices (sheltered, ventilated, temperature),
- the aggressivity of the immediate atmosphere at the place of installation,
- the length and frequency of non operating periods.

In the case of frequent condensation (i.e. the formation of steam caused by rapid changes in temperature), heating resistors must be installed in cubicles (100 to 250 W per m³ of enclosure).

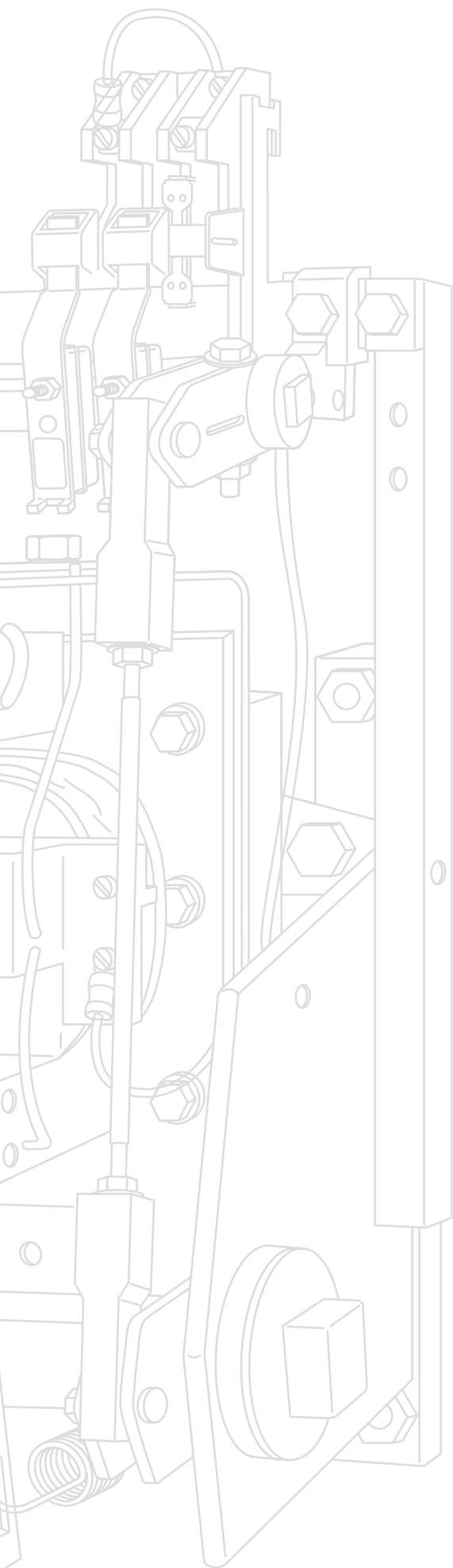
The table below gives the cases where heating is necessary.

Environment		Operating conditions	Climate	Internal heating of enclosure
Inside premises	No running water No condensation	Continuous or not	All climates	Without
	With running water	Continuous	All climates	Without
		Frequent or long stops	Temperate Tropical	Without With
Outside, sheltered	No running water no condensation	Continuous or not	Temperate	Without
			Tropical	With
Outside or by the seaside	With running water	Continuous	All climates	Without
		Frequent or long stops	Temperate	Without
			Tropical	With

- The standard **R** series contactors are suitable for industrial environment and tropical atmospheres. Special versions can be supplied, on request, for very corrosive atmospheres.

Notes





Terminal Marking and Positioning

Wiring Diagrams for Control Circuits

Contents

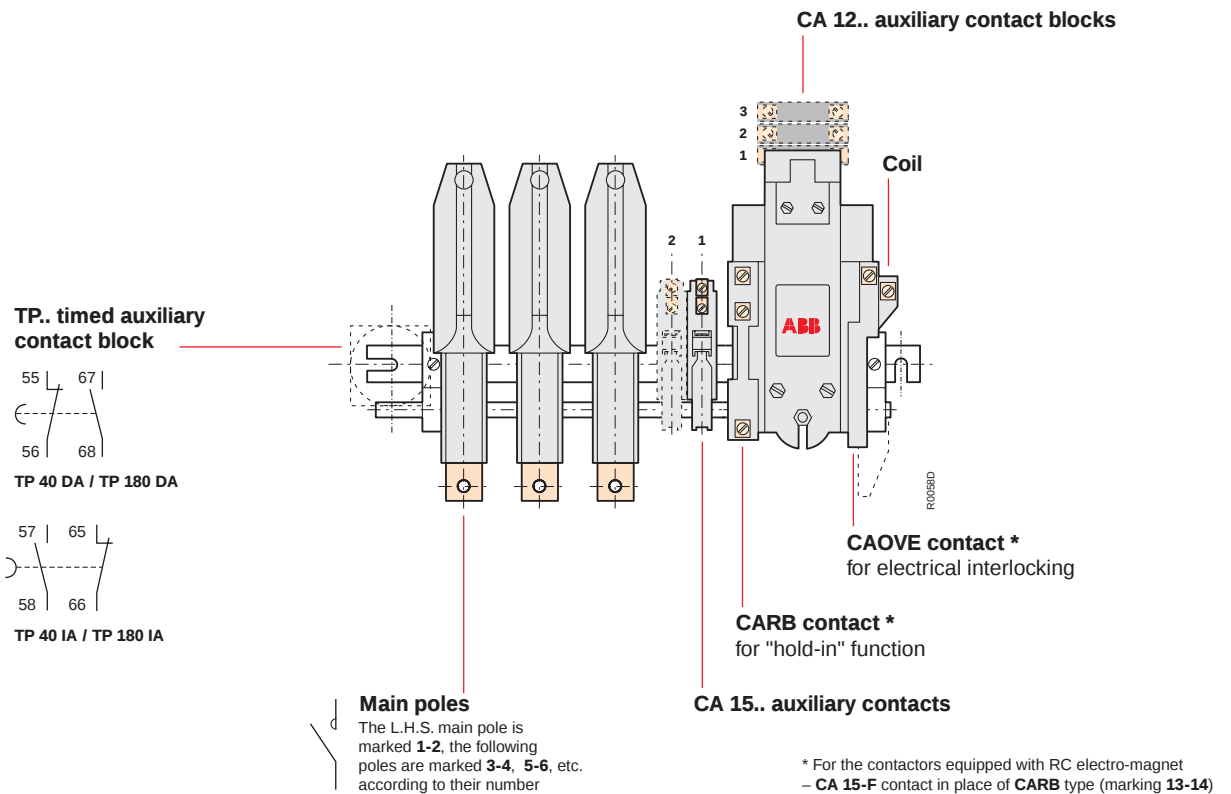
Terminal Marking and Positioning	7/2
Wiring Diagrams for Control Circuits	7/4

R.. Series Contactors and Couplers

Terminal Marking and Positioning

63 ... 550 A Ratings

Main poles in variable number



Main poles

N.O. main poles are respectively marked **1-2**, **3-4**, **5-6**, **7-8**.
For N.C. main poles the letter **R** precedes the figures.

Coil

a.c. coil: the terminals are marked **A1** and **A2**.
d.c. coil: the terminals are marked **A1 (-)** and **A2 (+)**

CAOVE contact

N.C. contact, adjustable, intended for electrical interlocking. Terminal marking: **21-22**

CARB contact

N.O. contact, intended for "hold-in" function. Terminal marking: **13-14**

CA 12.. auxiliary contacts

Block No 3

Block No 2

Block No 1

1 NO + 1 NC	2 NO	2 NO + 2 NC	3 NO + 1 NC	4 NO	3 NO + 3 NC	4 NO + 2 NC	5 NO + 1 NC	6 NO
					83 71 84 72	83 73 84 74	83 73 84 74	83 73 84 74
		63 51 64 52	63 53 64 54	63 53 64 54	63 51 64 52	63 51 64 52	63 53 64 54	63 53 64 54
43 31 44 32	43 33 44 34	43 31 44 32	43 31 44 32	43 33 44 34	43 31 44 32	43 31 44 32	43 31 44 32	43 33 44 34

CA 15.. extra aux. contacts

CA 15-F (N.O.)

or CA 15-O (N.C.)

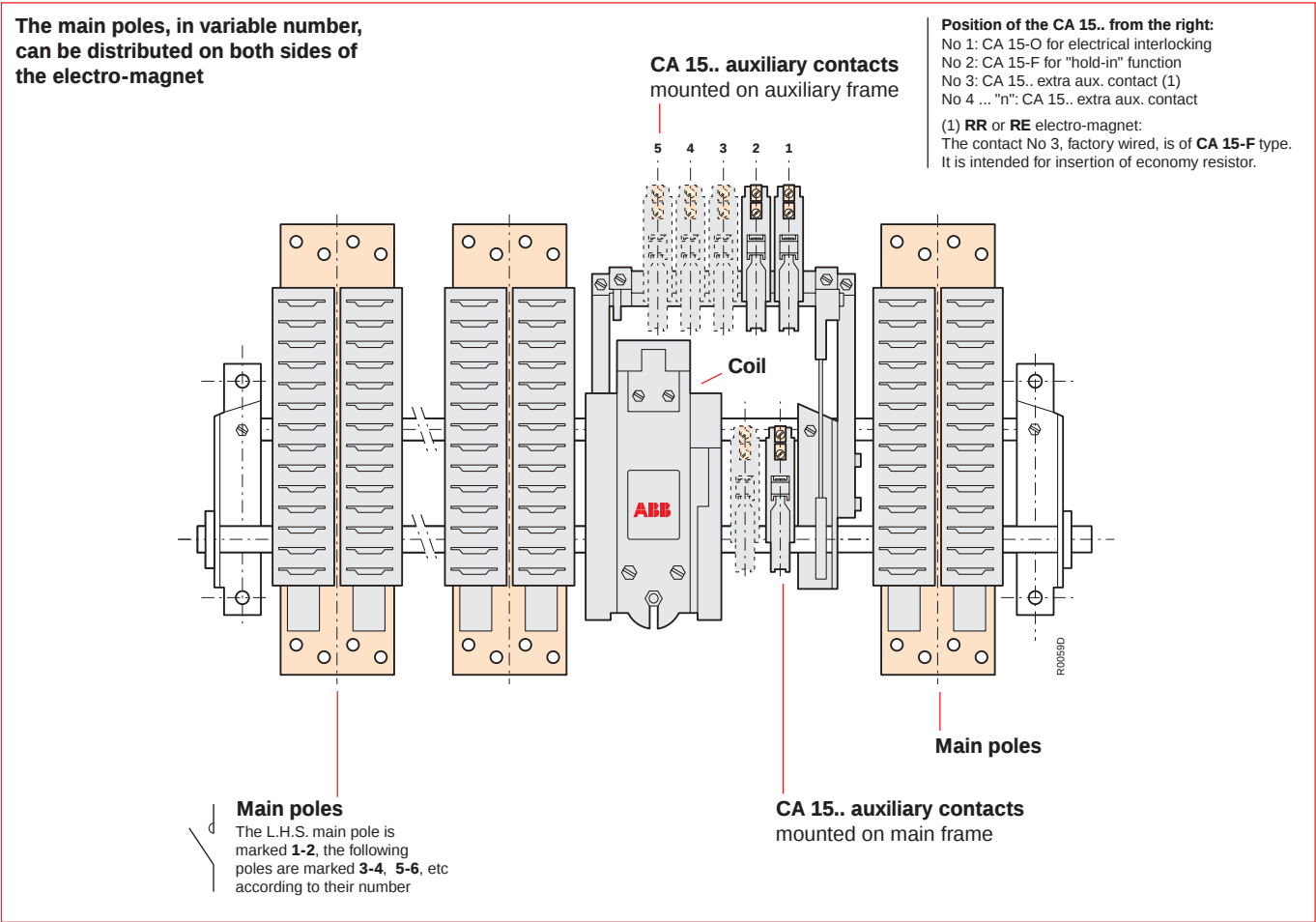
No "n"	No 8	No 7	No 6	No 5	No 4	No 3	No 2	No 1
..3 ..4	173 174	163 164	153 154	143 144	133 134	123 124	113 114	103 104
..1 ..2	171 172	161 162	151 152	141 142	131 132	121 122	111 112	101 102

The **CA 15..** auxiliary contacts are fitted **from the right** on the contactor frame according to this marking.

R.. Series Contactors and Couplers

Terminal Marking and Positioning

800 ... 4000 A Ratings

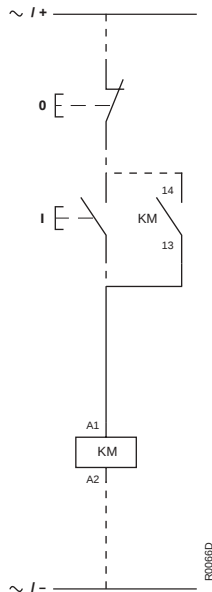


Main poles	N.O. main poles are respectively marked 1-2, 3-4, 5-6, 7-8 . For N.C. main poles the letter R precedes the figures.								
Coil	a.c. coil: the terminals are marked A1 and A2 . d.c. coil: the terminals are marked A1 (-) and A2 (+)								
CA 15.. aux. contact No 1	CA 15-O (N.C.) contact intended for electrical interlocking. Terminal marking: 21-22								
CA 15.. aux. contact No 2	CA 15-F (N.O.) contact intended for "hold-in" function. Terminal marking: 13-14								
CA 15.. extra aux. contacts									
CA 15-F (N.O.)	No "n"	No 10	No 9	No 8	No 7	No 6	No 5	No 4	No 3
									
or CA 15-O (N.C.)									
The CA 15.. auxiliary contacts are fitted from the right , first on the auxiliary frame and next on the main frame of the contactor, acc. to this marking. Contactors equipped with RR or RE electro-magnet: contact No 3 is a CA 15-F (N.O.) type intended for insertion of the economy resistor and wired in factory. Terminal marking: 15-16									
TP timed auxiliary contacts block	TP 40 DA / TP 180 DA				TP 40 IA / TP 180 IA				
									
The TP.. timed auxiliary contact block is mounted on the auxiliary frame and takes space of 3 CA 15.. auxiliary contacts.									

R.. Series Contactors and Couplers

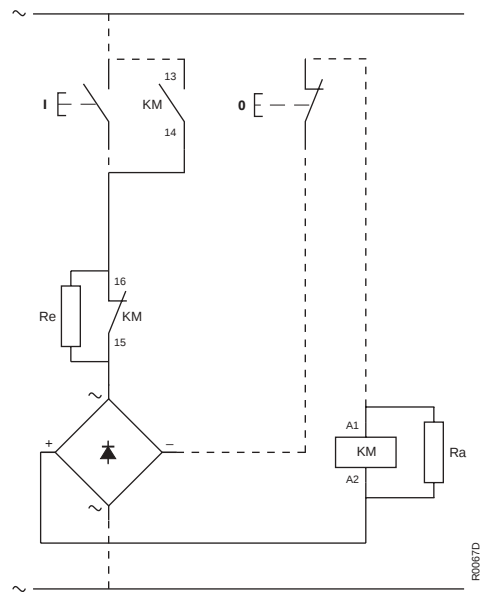
Wiring Diagrams

Control by 2 Impulse Pushbuttons and Hold-in Contact

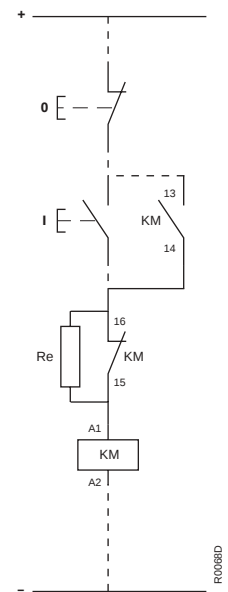


IOR (a.c.)
IOR-MT (a.c.)
IOR-CC (a.c.)
NOR, JOR (a.c.)
LOR (a.c.)

IORC (d.c.)
IORC-MT (d.c.)
IORC-CC (d.c.)
JORC (d.c.)
LORC (d.c.)

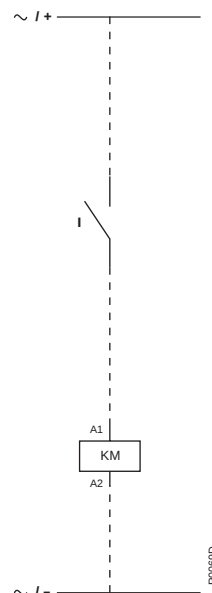


IORR, IORR-MT, IORR-CC, NORR, JORR, LORR



IORE, IORE-MT, IORE-CC, NORE, JORE, LORE

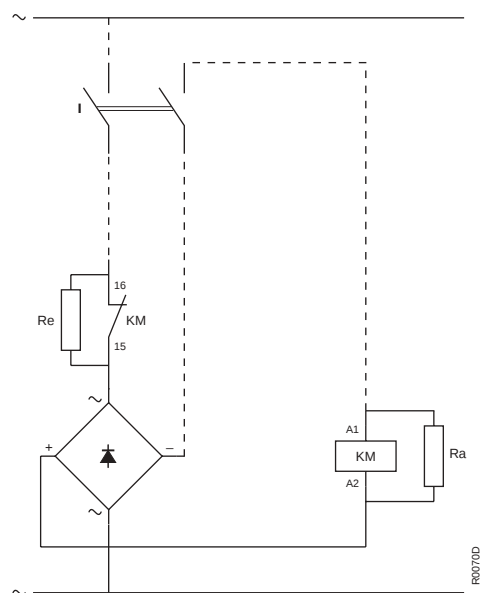
Control by Switch



IOR (a.c.)
IOR-MT (a.c.)
IOR-CC (a.c.)
NOR, JOR (a.c.)
LOR (a.c.)

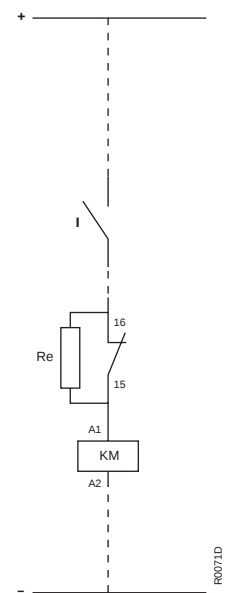
IORC (d.c.)
IORC-MT (d.c.)
IORC-CC (d.c.)
JORC (d.c.)
LORC (d.c.)

Note: to remove the factory wired strap 13 - A1



IORR, IORR-MT, IORR-CC, NORR, JORR, LORR

Note: to remove the factory wired strap 14 - 16



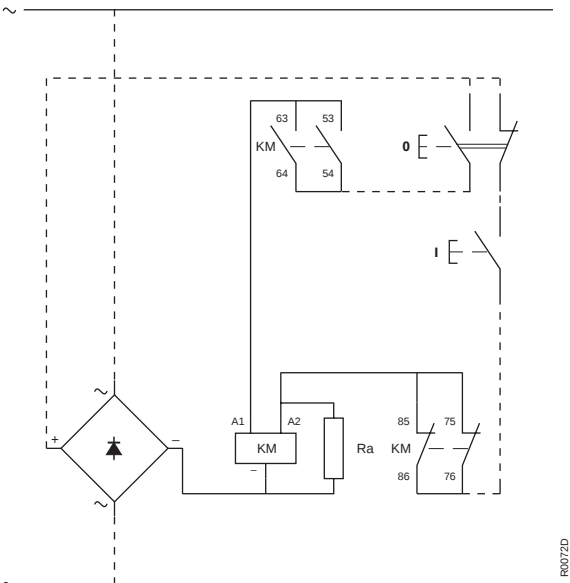
IORE, IORE-MT, IORE-CC, NORE, JORE, LORE

Note: to remove the factory wired strap 14 - 16

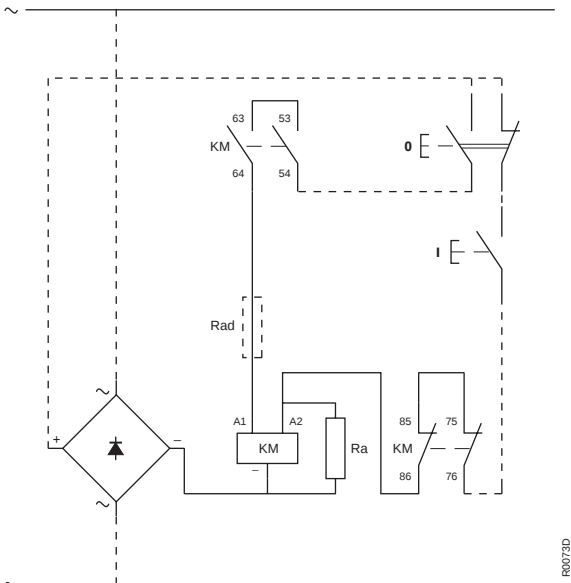
R.. Series Magnetically Latched Contactors and Couplers

Wiring Diagrams

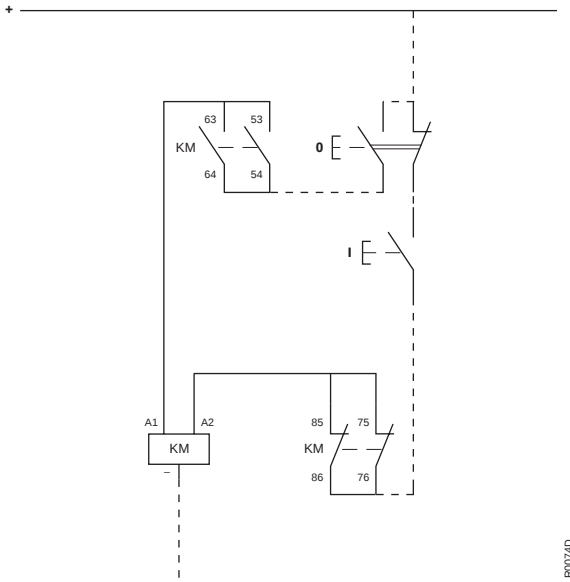
Control by 2 Impulse Pushbuttons



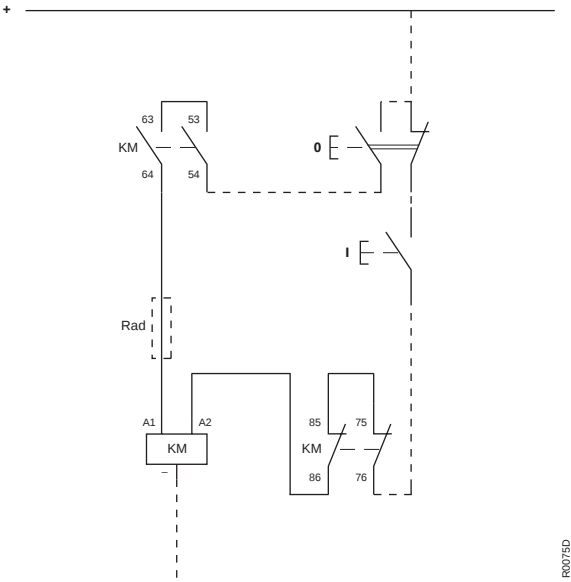
**IORR-AMA, IORR-MT-AMA, IORR-CC-AMA
NORR-AMA, JORR-AMA, LORR-AMA**
Control voltage $U_c \leq 110$ V a.c.



**IORR-AMA, IORR-MT-AMA, IORR-CC-AMA
NORR-AMA, JORR-AMA, LORR-AMA**
Control voltage $U_c \geq 110$ V a.c.



**IOR-AMA, IOR-MT-AMA, IOR-CC-AMA
NOR-AMA, JOR-AMA, LOR-AMA**
Control voltage $U_c \leq 110$ V d.c.

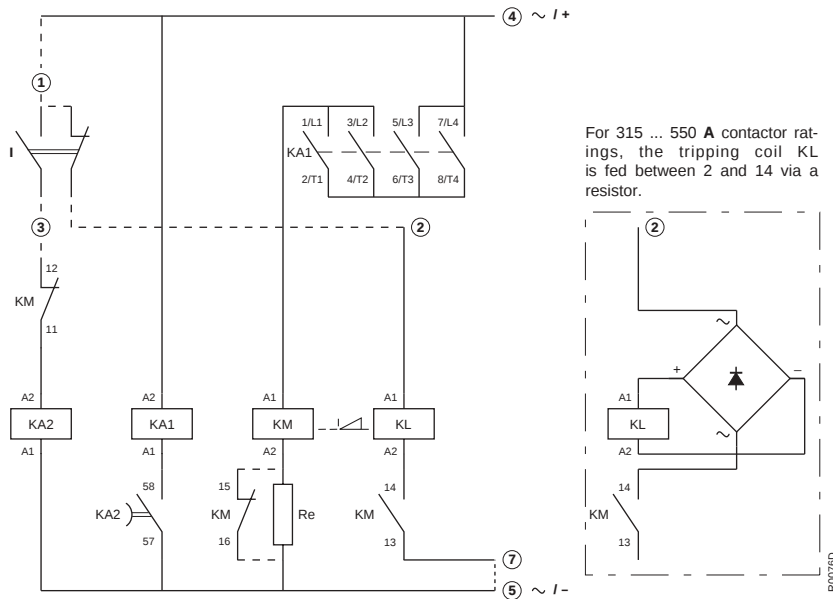


**IOR-AMA, IOR-MT-AMA, IOR-CC-AMA
NOR-AMA, JOR-AMA, LOR-AMA**
Control voltage $U_c \geq 110$ V d.c.

R.. Series Mechanically Latched Contactors and Couplers

Wiring Diagrams

Control by Switch



KM = Closing coil
 KL = Tripping coil
 KA1 = Contactor relay
 KA2 = Timed contactor relay
 Re = Economy resistor

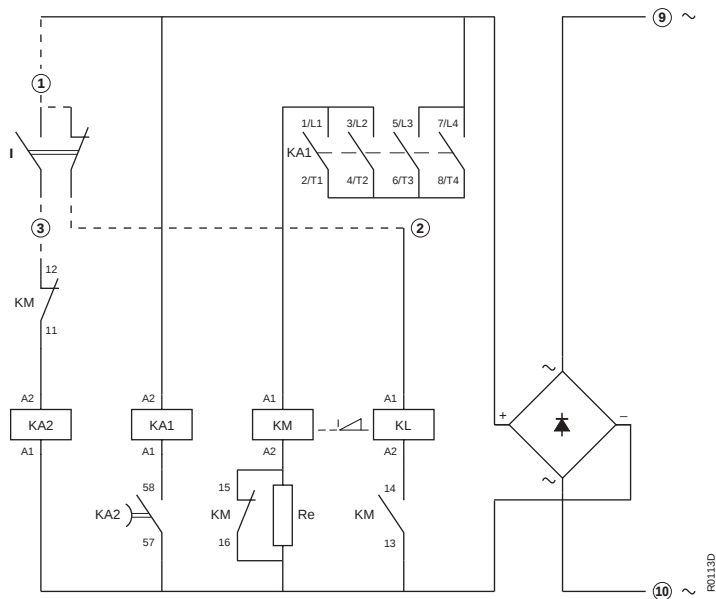
Supply between 4 and 5
Closing between 1 and 3
Tripping between 1 and 2

For the contactors equipped with coils for control voltage > 250 V use a special wiring diagram. Please consult us.

Notes:
 For a.c. control supply the economy resistor RE and the insertion contact 15-16 are not mounted. The terminal A2 of the coil KM is directly connected with the terminal 5.
 If the closing coil voltage and the tripping coil voltage are different remove the strap between terminals 5 and 7.

IOR-AME (a.c.)
IOR-MT-AME (a.c.)
IOR-CC-AME (a.c.)
NOR-AME, JOR-AME (a.c.)
LOR-AME (a.c.)

IORE-AME (d.c.)
IORE-MT-AME (d.c.)
IORE-CC-AME (d.c.)
NORE-AME, JORE-AME (d.c.)
LORE-AME (d.c.)



KM = Closing coil
 KL = Tripping coil
 KA1 = Contactor relay
 KA2 = Timed contactor relay
 Re = Economy resistor

Supply between 9 and 10
Closing between 1 and 3
Tripping between 1 and 2

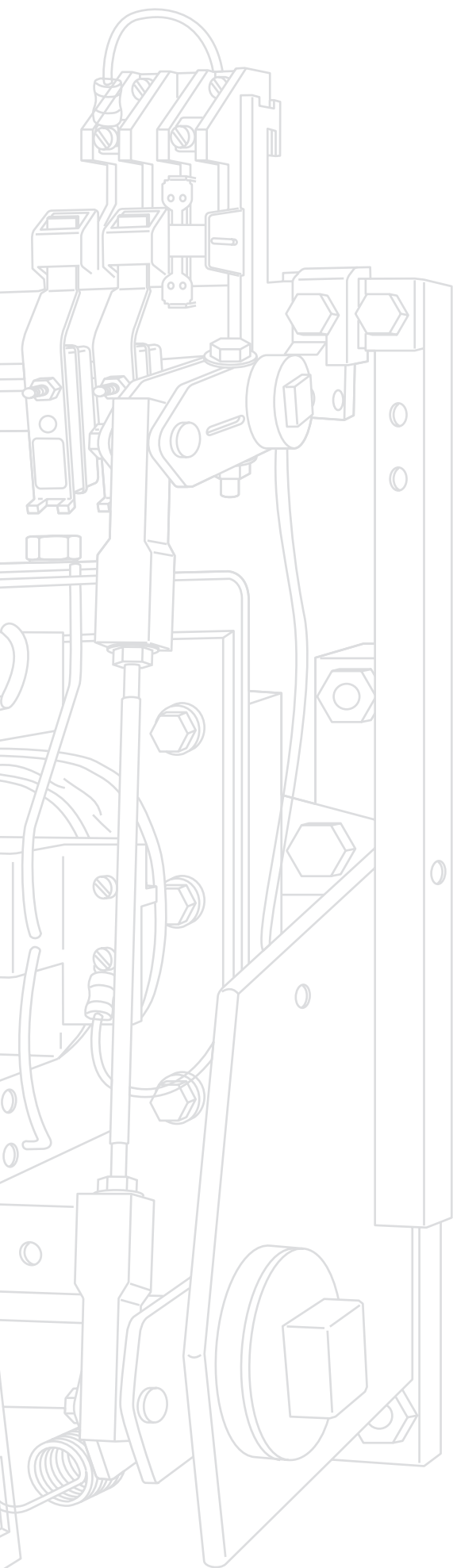
Note:
 If the closing coil voltage and the tripping coil voltage are different, please consult us.

For the contactors equipped with coils for control voltage > 250 V use a special wiring diagram. Please consult us.

IORR-AME
IORR-MT-AME
IORR-CC-AME
NORR-AME, JORR-AME
LORR-AME

Notes





Dimensions

Fixing - Dimensions
Clearing Distances
Connecting

Contents

R.. Series Contactors and Couplers Ratings

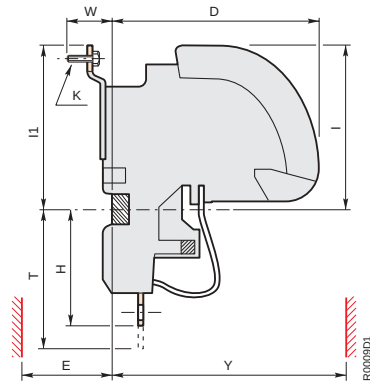
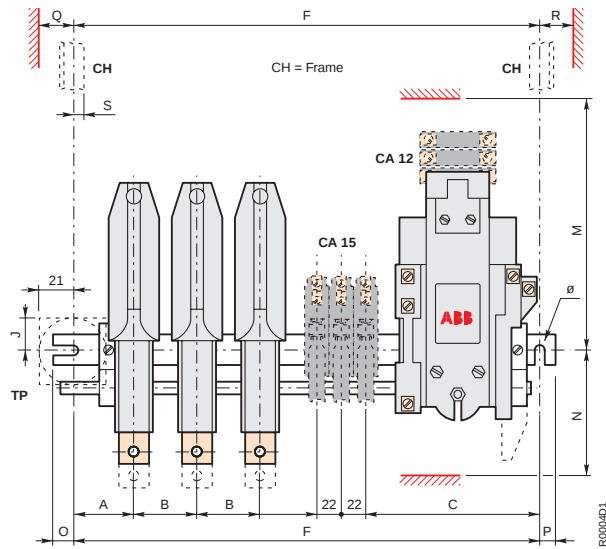
IOR, NOR, JOR, LOR	< 800 A	8/2
IOR, LOR	800 to 2000 A	8/3
IORR, NORR, JORR, LORR	< 800 A	8/4
IORE, NORE, JORE, LORE	800 - 1000 A	8/5
	1250 - 1500 A	1-pole, 2-pole and 3-pole 8/5
		3-pole + N and 4-pole 8/6
	2000 A	1-pole and 2-pole 8/5
		3-pole, 3-pole + N and 4-pole 8/6
	3150 A	3-pole 8/6
		4-pole 8/7
	4000 A	8/7
IOR...MT, IOR...CC	< 800 A	8/8
	800 - 1500 A	8/9
IORR...MT, IORR...CC	< 800 A	8/10
IORE...MT, IORE...CC	800 A	8/11
	1500 A	1-pole, 2-pole and 3-pole 8/11
		3-pole + N and 4-pole 8/12
	2000 A	1-pole and 2-pole 8/11
		3-pole, 3-pole + N and 4-pole 8/12
	3150 A	3-pole 8/12
		4-pole 8/13
	4000 A	8/13
IORC, JORC, LORC	< 800 A	8/14
	800 to 2000 A	8/15
IORC...MT, IORC...CC	< 800 A	8/16
	800 to 2000 A	8/17
IORR...AMA	85 to 550 A	8/18
IOR...AMA	85 to 550 A	8/19
IOR...AME	< 800 A	8/20
	800 - 1000 A	8/21
	1250 - 1500 A	1-pole, 2-pole and 3-pole 8/21
		3-pole + N and 4-pole 8/22
	2000 A	1-pole and 2-pole 8/21
		3-pole, 3-pole + N and 4-pole 8/22
IORR...AME, IORE...AME	< 800 A	8/23
	800 - 1000 A	8/24
	1250 - 1500 A	1-pole, 2-pole and 3-pole 8/24
		3-pole + N and 4-pole 8/25
	2000 A	1-pole and 2-pole 8/24
		3-pole, 3-pole + N and 4-pole 8/25

Overload Relays

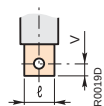
Thermal Magnetic Type RKR	1 to 250 A	8/26
(a.c. current)	400 to 1000 A	8/27
	1250 - 1500 A	3-pole 8/28
		3-pole + N and 4-pole 8/29
	2000 A	3-pole 8/30
		3-pole + N and 4-pole 8/31
Magnetic Type RCR (d.c. current)	1 to 1000 A	8/32

IOR.., NOR.., JOR.. Types LOR.. Types Ratings < 800 A

Dimensions (in mm)



Terminal plate details



Lower terminal plate



Upper terminal plate

Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
63/85	1	140	175	205	245	245	285	285	345	-	-	-	-	2 x 7
	2	175	205	245	245	285	285	345	345	-	-	-	-	
	3	205	245	285	285	345	345	345	-	-	-	-	-	
	4	245	285	345	345	345	-	-	-	-	-	-	-	
125/170	2	205	245	245	285	345	345	345	-	-	-	-	-	2 x 7
	3	245	285	345	345	345	385	385	-	-	-	-	-	
	4	285	345	345	-	-	-	-	-	-	-	-	-	
	4	285	345	345	-	-	-	-	-	-	-	-	-	
200/260	2	245	285	285	345	345	385	385	445	-	-	-	-	2 x 9
	3	285	345	345	385	385	445	445	-	-	-	-	-	
	4	345	385	445	-	-	-	-	-	-	-	-	-	
	4	345	385	445	-	-	-	-	-	-	-	-	-	
315/420	2	285	345	345	345	385	385	445	445	-	-	-	-	2 x 11
	3	345	385	385	445	445	445	540	540	-	-	-	-	
	4	385	445	445	540	540	540	540	635	-	-	-	-	
	4	385	445	445	540	540	540	540	635	-	-	-	-	
550	2	345	385	385	445	445	445	540	540	-	-	-	-	2 x 13
	3	385	445	445	540	540	540	540	635	-	-	-	-	
	4	445	540	540	540	635	635	635	635	-	-	-	-	
	4	445	540	540	540	635	635	635	635	-	-	-	-	

Dimensions - Clearing distances - Connecting

Ratings (A)	A	B	C	D ⁽²⁾	D1	E ⁽¹⁾	H ⁽¹⁾	I ⁽²⁾	I1 ⁽²⁾	I2	J	K	ℓ	M ⁽²⁾	M1 ⁽¹⁾	N ⁽¹⁾	O	P	Q	R	S	T	V	W ⁽²⁾	Y	Y1	Z
63/85	35	37	93	136	110	31	63	91	101	64	35	M6x20	16	156	150	78	12.5	8.5	53	23	15	96	8	16	176	125	8
125/170	41	46	93	139	110	35	76	123	130	84	35	M8x20	20	208	150	91	12.5	8.5	53	23	15	111	10	20	204	125	10
200/260	48	54.5	116	188	130	35	93	125	123	74	16	M10x25	25	230	167	111	9	10	53	20	25	125	13	20	273	145	12
315/420	53	60*	130	212	168	70	99	145	144	78	-	Ø 11	25	270	140	114	12	11	53	21	13	140	15	17	300	183	16
550	62	68*	160	245	178	100	118	183	195	119	-	Ø 13	30	313	142	133	15	14	53	15	20	-	20	46	335	193	20

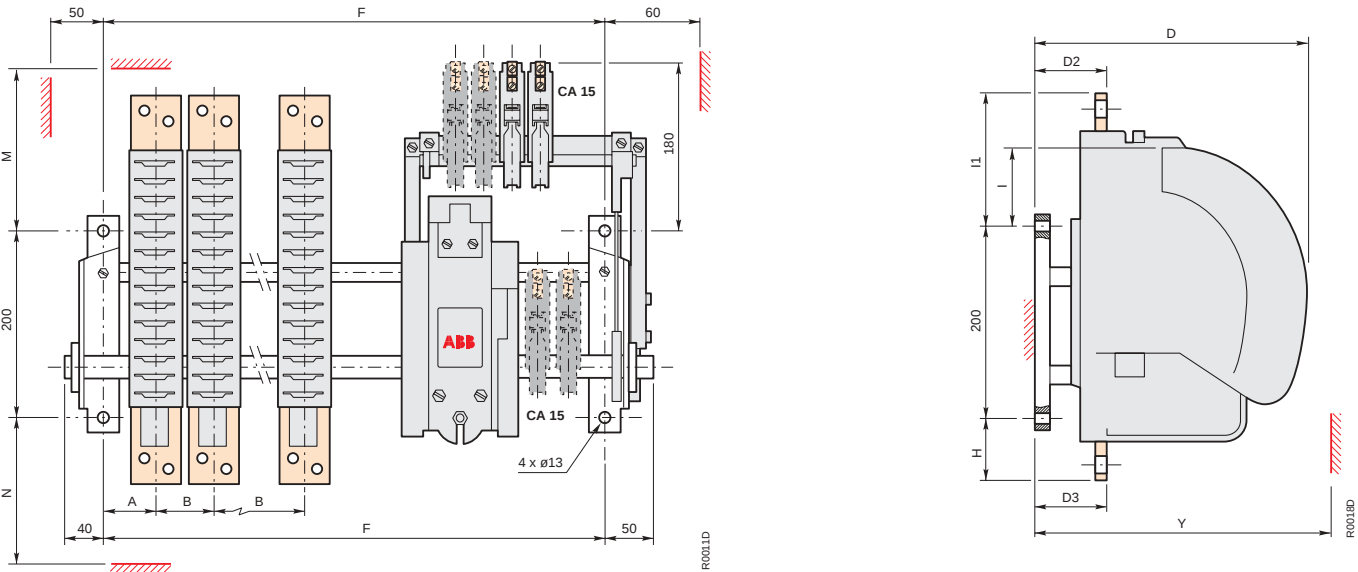
* 2-pole contactor types IOR.., NOR.., JOR.. and 2-pole coupler types LOR, without CA 15.. auxiliary contact: B dim. = 85 for 315/420 A ratings and = 95 for 550 A rating.

(1) NOR.. and JOR.. types: replace H dimension by T dimension. Add to N dimension the difference obtained between T and H.

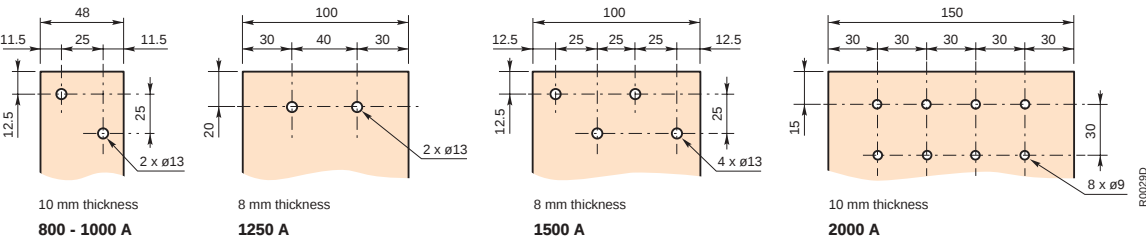
(2) LOR.. types: poles are not equipped with arc chutes. Use D1 dimension instead of D, I2 instead of I1, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

IOR.. Types
 LOR.. Types
 Ratings 800 ... 2000 A

Dimensions (in mm)



Terminal plate details



Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	10	11	
800/1000	2	345	345	345	345	385	385	385	385	445	445	445	445	4 x 13
	3	385	385	385	385	445	445	445	445	540	540	540	540	
	4	540	540	540	540	540	540	540	540	540	540	540	540	
1250/1500	1	345	345	345	345	345	345	345	345	385	385	385	385	4 x 13
	2	445	445	445	445	540	540	540	540	540	540	540	540	
2000	1	345	345	345	345	385	385	385	385	445	445	445	445	4 x 13

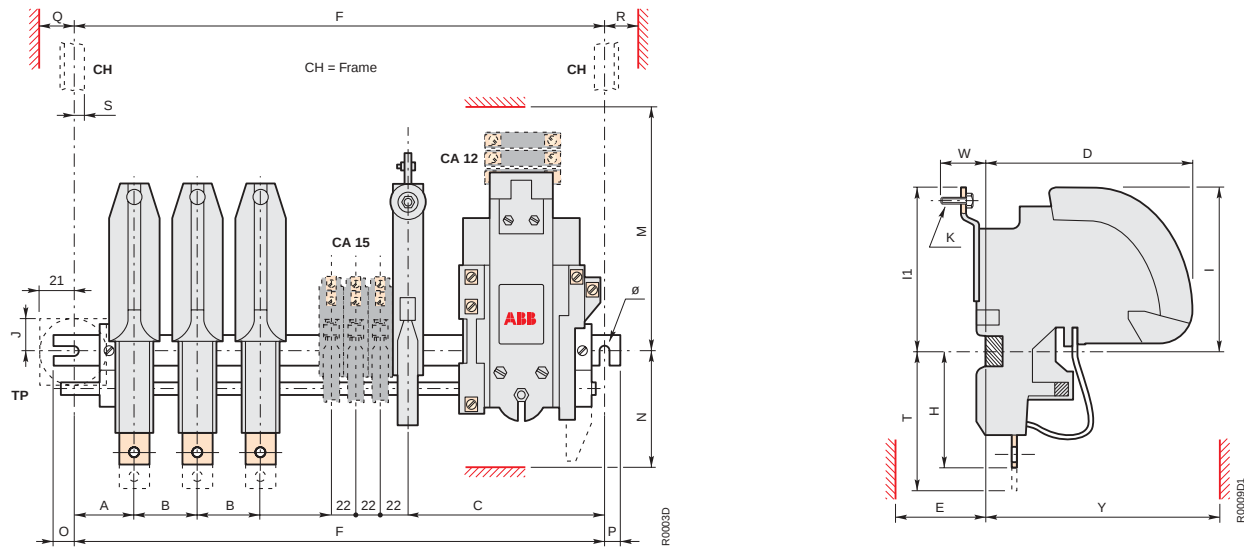
Dimensions - Clearing distances - Connecting															
Ratings (A)	Number of poles	A	B	D (1)	D1	D2	D3	H	I (1)	I1	M (1)	M1	N	Y (1)	Y1
800/1000	2	60	90	325	260	75	77	70	108	98	158	115	85	345	280
	3	60	70	325	260	75	77	70	108	98	158	115	85	345	280
	4	60	70	325	—	75	77	70	108	98	158	—	85	345	—
1250	1	85	—	325	260	83	85	110	108	138	158	165	125	355	280
	2	85	140	325	260	83	85	110	108	138	158	165	125	355	280
1500	1	85	—	325	260	83	85	120	108	148	168	165	135	355	280
	2	85	140	325	260	83	85	120	108	148	168	165	135	355	280
2000	1	110	—	325	260	85	87	133	108	161	188	175	148	375	280

(1) LOR.. types: poles are not equipped with arc chutes. Use D1 dimension instead of D, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

IORR.., IORE.. - NORR.., NORE.. Types JORR.., JORE.. - LORR.., LORE.. Types

Ratings < 800 A

Dimensions (in mm)



Terminal plate details



Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
63/85	1	175	205	245	245	285	285	345	345	-	-	-	-	2 x 7
	2	205	245	245	285	285	345	345	385	-	-	-	-	
	3	245	285	285	345	345	385	385	445	-	-	-	-	
	4	285	345	345	345	385	385	445	445	-	-	-	-	
125/170	2	245	245	285	345	345	345	385	385	-	-	-	-	2 x 7
	3	285	345	345	345	385	385	445	445	-	-	-	-	
	4	345	345	385	385	445	445	540	540	-	-	-	-	
200/260	2	285	285	345	345	385	385	445	445	-	-	-	-	2 x 9
	3	345	345	385	385	445	445	540	540	-	-	-	-	
	4	385	445	445	445	540	540	540	540	-	-	-	-	
315/420	2	345	345	345	385	385	445	445	445	-	-	-	-	2 x 11
	3	385	385	445	445	445	540	540	540	-	-	-	-	
	4	445	445	540	540	540	540	635	635	-	-	-	-	
550	2	385	385	445	445	445	540	540	540	-	-	-	-	2 x 13
	3	445	445	540	540	540	540	635	635	-	-	-	-	
	4	540	540	540	635	635	635	635	635	-	-	-	-	

Dimensions - Clearing distances - Connecting

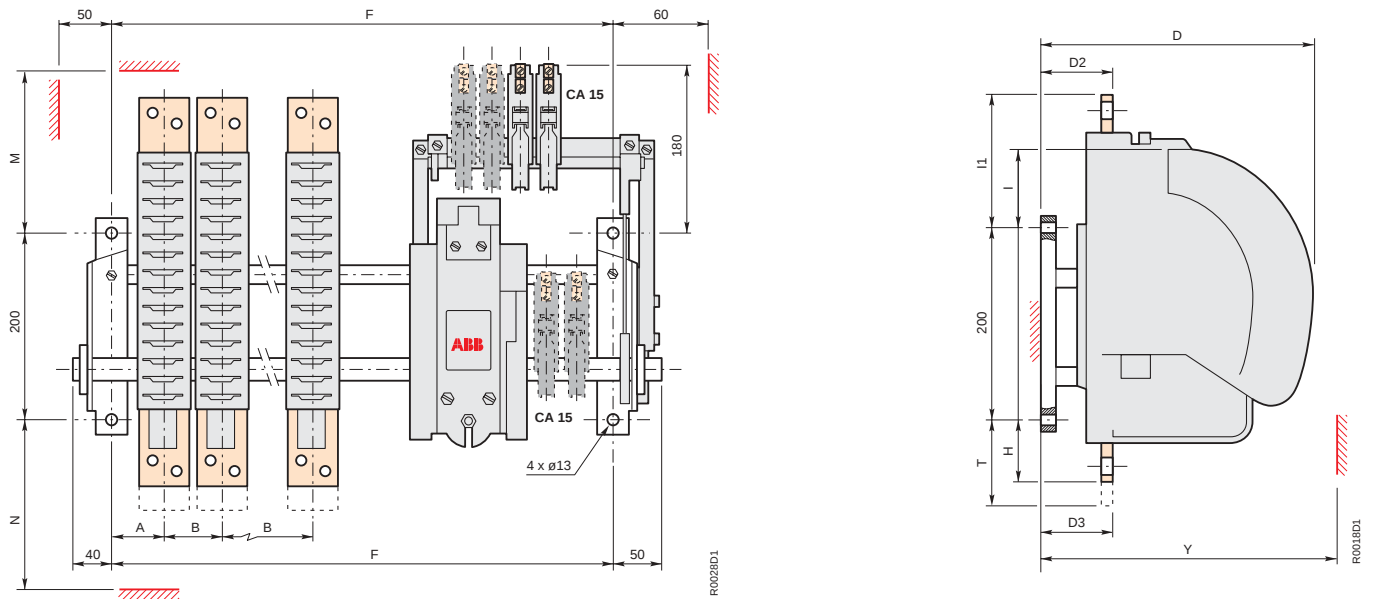
Ratings (A)	A	B	C	D	D1	E	H	I	I1	I2	J	K	ℓ	M	M1	N	O	P	Q	R	S	T	V	W	Y	Y1	Z
63/85	35	37	93	136	110	31	63	91	101	64	35	M6x20	16	156	150	78	12.5	8.5	53	23	15	96	8	16	176	125	8
125/170	41	46	93	139	110	35	76	123	130	84	35	M8x20	20	208	150	91	12.5	8.5	53	23	15	111	10	20	204	125	10
200/260	48	54.5	116	188	130	35	93	125	123	74	16	M10x25	25	230	167	111	9	10	53	20	25	125	13	20	273	145	12
315/420	53	60*	130	212	168	70	99	145	144	78	-	Ø 11	25	270	140	114	12	11	53	21	13	140	15	17	300	183	16
550	62	68*	160	245	178	100	118	183	195	119	-	Ø 13	30	313	142	133	15	14	53	15	20	-	20	46	335	193	20

(1) NORR.., NORE.. types: replace H dimension by T dimension. Add to N dimension the difference obtained between T and H.
(2) LORR.., LORE.. types: poles are not equipped with arc chutes. Use D1 dimension instead of D, I2 instead of I1, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

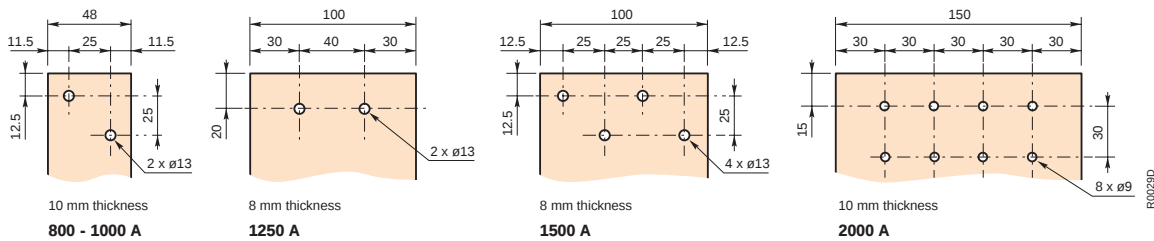
IORR., IORE.. - NORR., NORE.. Types JORR., JORE.. - LORR., LORE.. Types

Ratings 800 ... 2000 A

Dimensions (in mm)



Terminal plate details



Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	10	-	
800/1000	2	345	345	345	385	385	385	385	445	445	445	44	-	4 x 13
	3	385	385	385	445	445	445	445	540	540	540	540	-	
	4	540	540	540	540	540	540	540	540	540	540	540	-	
1250/1500	1	345	345	345	345	345	345	345	385	385	385	385	-	4 x 13
	2	445	445	445	540	540	540	540	540	540	540	540	-	
	3*	540	540	540	635	635	635	635	635	635	635	635	-	
2000	1	345	345	345	385	385	385	385	445	445	445	445	-	4 x 13
	2*	540	540	540	635	635	635	635	635	635	635	635	-	

Dimensions - Clearing distances - Connecting

Ratings (A)	Number of poles	A	B	D ⁽²⁾	D1	D2	D3	H ⁽¹⁾	I ⁽²⁾	I1	M ⁽²⁾	M1	N ⁽¹⁾	T	Y ⁽²⁾	Y1
800/1000	2	60	90	325	260	75	77	70	108	98	158	115	85	132	345	280
	3	60	70	325	260	75	77	70	108	98	158	115	85	132	345	280
	4	60	70	325	-	75	77	70	108	98	158	-	85	132	345	-
1250	1	85	-	325	260	83	85	110	108	138	158	165	125	-	355	280
	2	85	140	325	260	83	85	110	108	138	158	165	125	-	355	280
	3*	85	120	325	260	83	85	110	108	138	158	165	125	-	355	280
1500	1	85	-	325	260	83	85	120	108	148	168	165	135	-	355	280
	2	85	140	325	260	83	85	120	108	148	168	165	135	-	355	280
	3*	85	120	325	260	83	85	120	108	148	168	165	135	-	355	280
2000	1	110	-	325	260	85	87	133	108	161	188	175	148	-	375	280
	2*	110	190	325	260	85	87	133	108	161	188	175	148	-	375	280

* Dimensions of contactors with a larger number of poles: see pages 8/6 and 8/7.

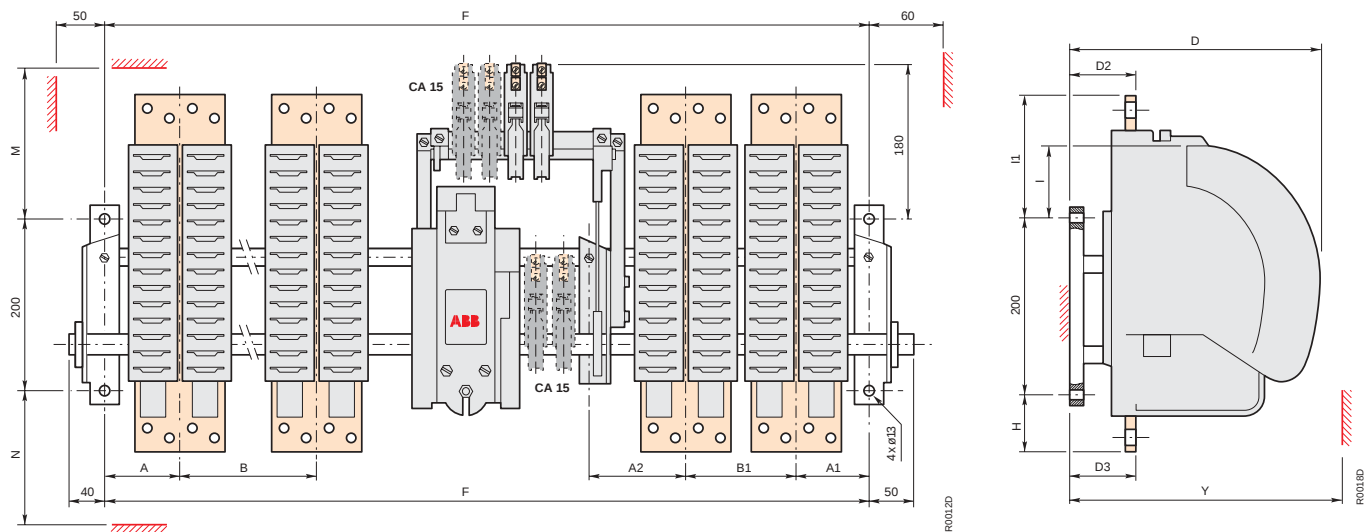
(1) NORR., NORE.. types: replace H dimension by T dimension. Add to N dimension the difference obtained between T and H.

(2) LORR., LORE.. types: poles are not equipped with arc chutes. Use D1 dimension instead of D, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

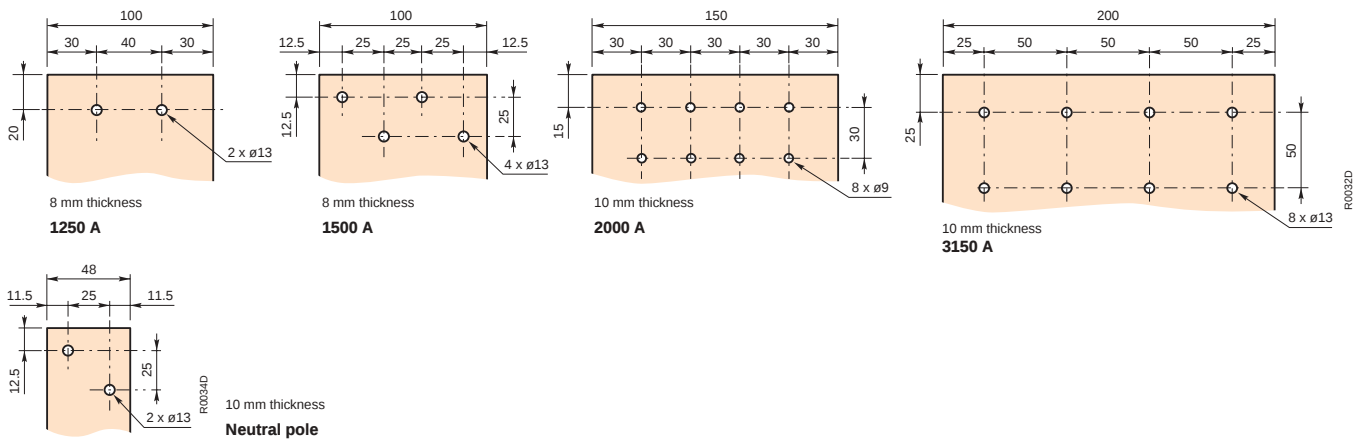
IORR., IORE.. Types LORR., LORE.. Types

Ratings 1250 ... 2000 A (cont.) - Rating 3150 A

Dimensions (in mm)



Terminal plate details



Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:											Fixing holes Ø
1250/1500	3 + N	760	760	760	760	760	760	885	885	885	885	—	4 x 13
	4	760	760	760	885	885	885	885	885	885	885	—	
2000	3	885	885	885	885	885	885	885	885	885	885	—	4 x 13
	3 + N	885	885	885	950	950	950	950	950	950	950	—	
	4	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	—	
3150	3*	950	950	950	1050	1050	1050	1050	1050	1050	1050	—	4 x 13

Dimensions - Clearing distances - Connecting

Ratings (A)	Number of poles	A	A1	A2	B	B1	D (1)	D1	D2	D3 (2)	H (2)	I (1)	I1 (2)	M (1)	M1	N	Y (1)	Y1
1250	3 + N	60	85	140	95	120	325	—	83	85	110	108	138	158	—	125	355	—
	4	85	85	140	120	120	325	—	83	85	110	108	138	158	—	125	355	—
1500	3 + N	60	85	140	95	120	325	—	83	85	120	108	148	168	—	135	355	—
	4	85	85	140	120	120	325	—	83	85	120	108	148	168	—	135	355	—
2000	3	110	110	165	—	170	325	260	85	87	133	108	161	188	175	148	375	280
	3 + N	60	110	165	120	170	325	—	85	87	133	108	161	188	—	148	375	—
	4	110	110	165	170	170	325	—	85	87	133	108	161	188	—	148	375	—
3150	3*	135	135	190	—	220	325	260	85	87	170	108	198	220	220	190	400	280

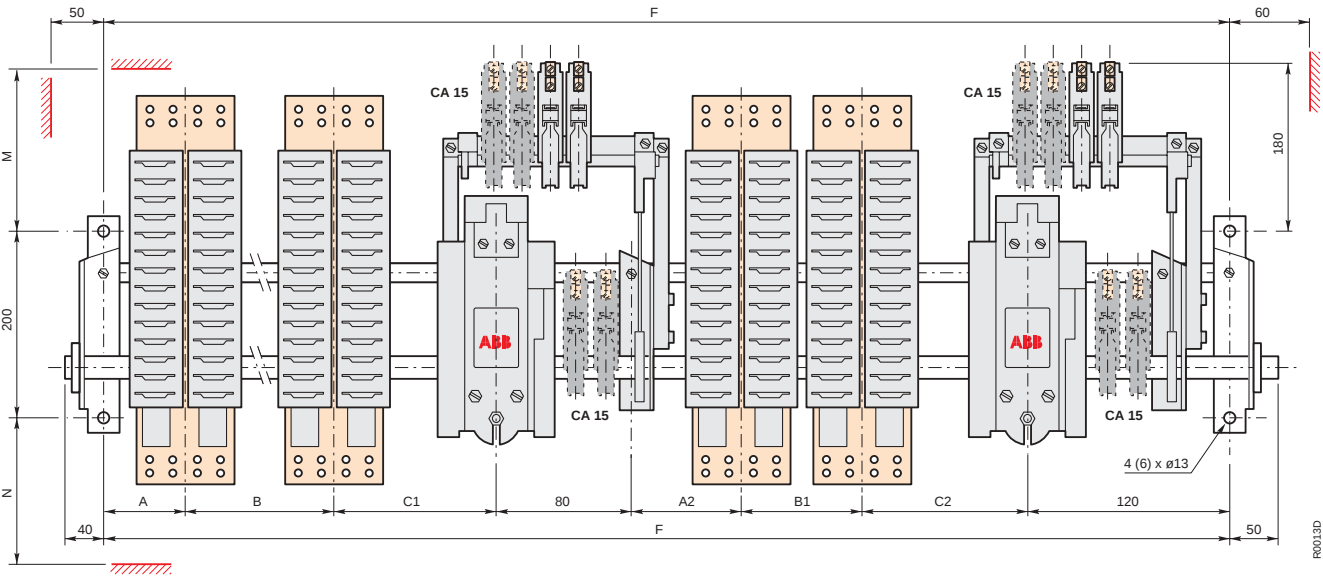
* Dimensions of 4-pole contactors: see page 8/7.

(1) LORR., LORE.. types: poles are not equipped with arc chutes. Use D1 dimension instead of D, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

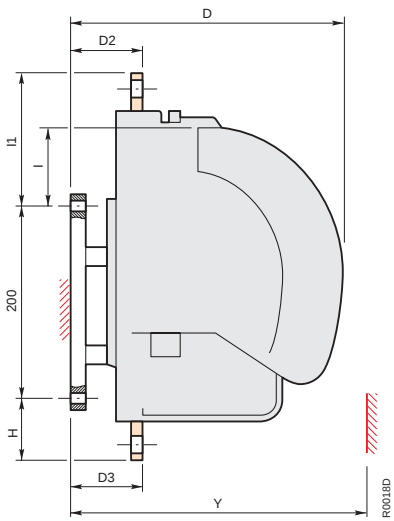
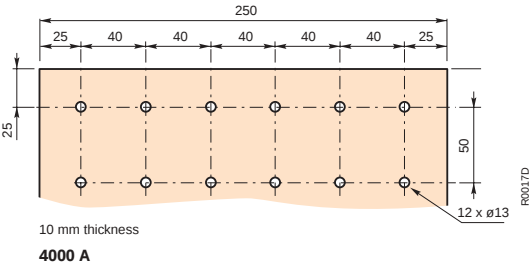
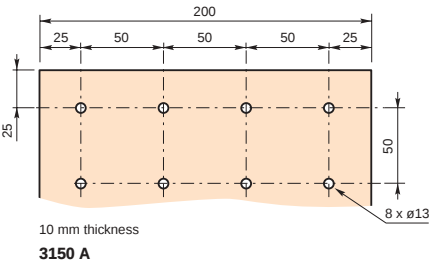
(2) Neutral pole (N): D3 dim. = 77, H dim. = 70, I1 dim. = 98. (The Neutral pole is rated 900 A and always mounted on the L.H.S. of the contactor frame.)

IORR., IORE.. Types
LORR., LORE.. Types
 Rating 3150 A (cont.) - Rating 4000 A

Dimensions (in mm)



Terminal plate details



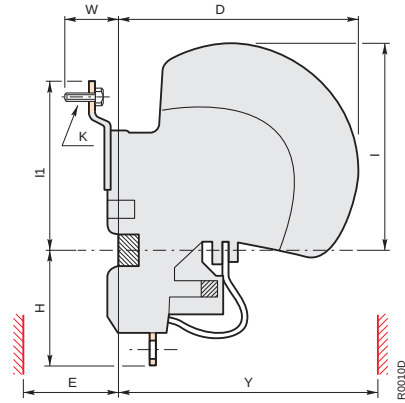
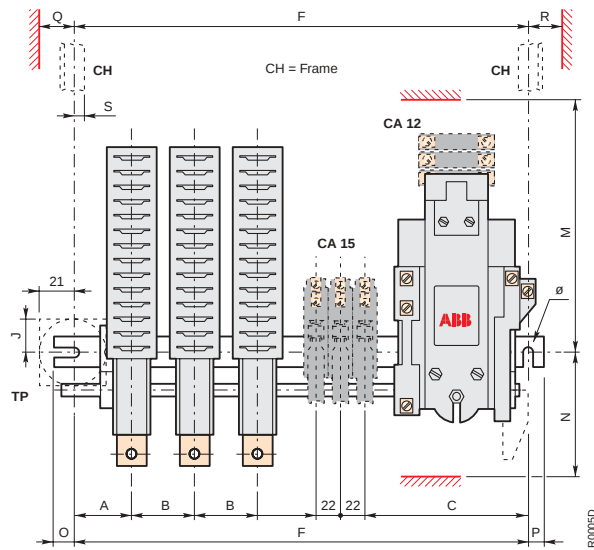
Fixing - Dimensions - Clearing distances - Connecting

Ratings (A)	Number of poles	Dim. F ⁽¹⁾	Holes Ø	A	A2	B	B1	C1	C2	D ⁽²⁾	D2	D3	H	I	I1	M	N	Y ⁽²⁾
3150	4	1350	4 x 13	135	190	220	220	192.5	192.5	335	100	102	170	108	198	220	190	410
4000	3	1350	6 x 13	160	215	—	270	255	250	335	100	102	170	108	198	220	190	410
	4	1550	6 x 13	160	215	270	270	217.5	217.5	335	100	102	170	108	198	220	190	410

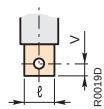
(1) The fixing dimension F is remaining unchanged for a maximum number of 10 pcs. N.O. and/or N.C. CA 15.. auxiliary contacts.
 (2) LORR., LORE.. types: poles are not equipped with arc chutes. D dim. = 270 and Y dim. = 290.
 Contactor or coupler in 3-pole version + N (Neutral pole): please consult us.

IOR..-MT Types IOR..-CC Types Ratings < 800 A

Dimensions (in mm)



Terminal plate details



Lower terminal plate



Upper terminal plate

Fixing

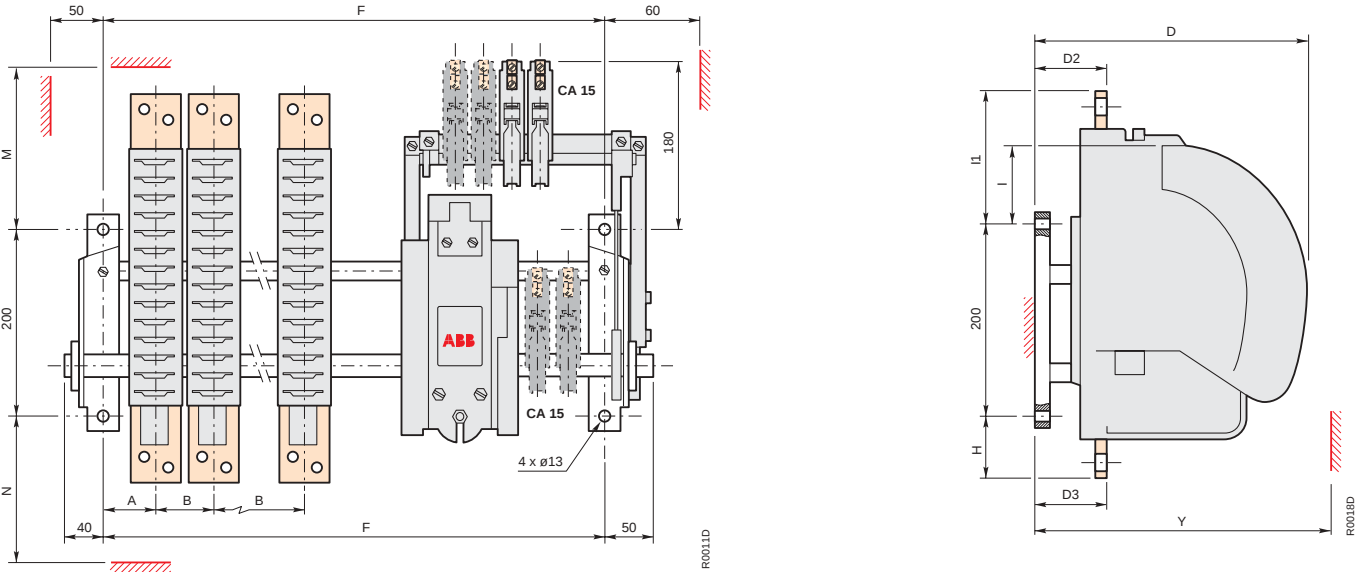
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø	
		0	1	2	3	4	5	6	7	-	-	-	-		
63	2	245	245	285	285	345	345	385	385	-	-	-	-	2 x 7	
	3	285	345	345	345	385	385	445	-	-	-	-	-		
	4	345	345	385	385	445	-	-	-	-	-	-	-		
125	2	245	285	285	345	345	385	385	-	-	-	-	-	2 x 7	
	3	345	345	345	385	385	445	445	-	-	-	-	-		
	4	385	385	445	-	-	-	-	-	-	-	-	-		
200	2	285	345	345	385	385	445	445	445	-	-	-	-	2 x 9	
	3	385	385	445	445	445	540	540	-	-	-	-	-		
	4	445	445	540	-	-	-	-	-	-	-	-	-		
500	2	385	445	445	445	540	540	540	540	-	-	-	-	2 x 13	
	3	445	540	540	540	540	635	635	635	-	-	-	-		
	4	540	635	635	635	635	-	-	-	-	-	-	-		

Dimensions - Clearing distances - Connecting

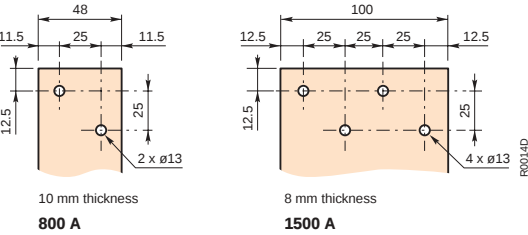
Ratings (A)	A	B	C	D	E	H	I	I1	J	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z
63	45	50	93	148	36	63	114	101	35	M6x20	16	164	83	12.5	10.5	53	23	15	8	16	178	8
125	57	61	93	153	40	76	138	130	35	M8x20	20	188	96	12.5	10.5	53	23	15	10	20	183	10
200	69	68	116	190	40	96	140	123	16	M10x25	25	190	116	9	10	53	20	25	13	20	220	12
500	79	80	160	260	100	118	203	195	-	Ø 13	30	253	150	15	14	53	20	20	20	46	290	20

IOR..-MT Types
 IOR..-CC Types
 Ratings 800 and 1500 A

Dimensions (in mm)



Terminal plate details

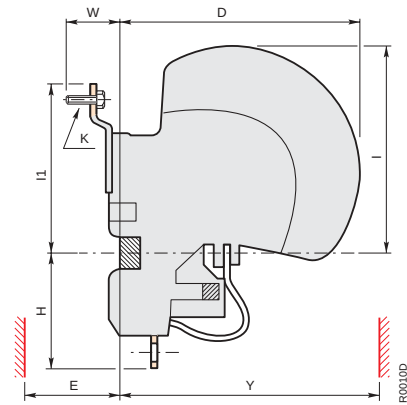
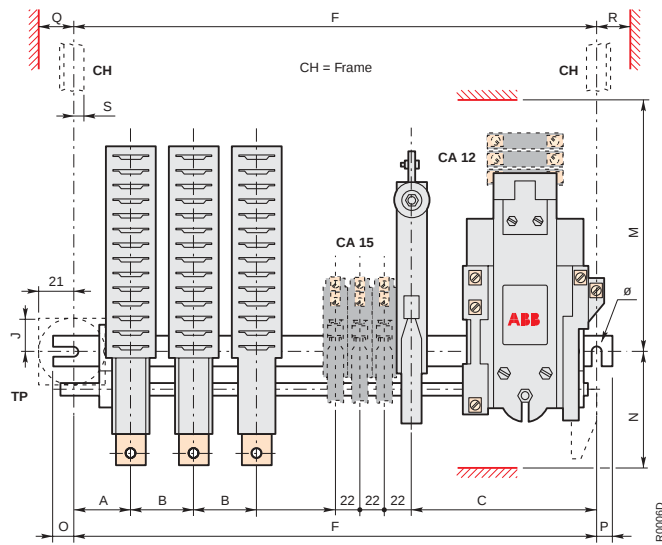


		Fixing												
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø mm
		0	1	2	3	4	5	6	7	8	9	10	11	
800	1	245	245	245	245	285	285	285	285	345	345	345	345	4 x 13
	2	345	345	345	345	385	385	385	385	445	445	445	445	
	3	385	385	385	385	445	445	445	445	540	540	540	540	
	4	540	540	540	540	540	540	540	540	540	540	540	540	
1500	1	345	345	345	345	345	345	345	345	385	385	385	385	4 x 13
	2	445	445	445	445	540	540	540	540	540	540	540	540	

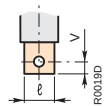
Dimensions - Clearing distances - Connecting													
Ratings (A)	Number of poles	A	B	D	D2	D3	H	I	I1	M	N	Y	
800	1	60	—	325	76	77	70	108	175	195	90	375	
	2	60	90	325	76	77	70	108	175	195	90	375	
	3	60	70	325	76	77	70	108	175	195	90	375	
	4	60	70	325	76	77	70	108	175	195	90	375	
1500	1	85	—	325	84	85	120	108	225	245	140	385	
	2	85	140	325	84	85	120	108	225	245	140	385	

IORR..-MT and IORE..-MT Types IORR..-CC and IORE..-CC Types Ratings < 800 A

Dimensions (in mm)



Terminal plate details



Lower terminal plate



Upper terminal plate

Fixing

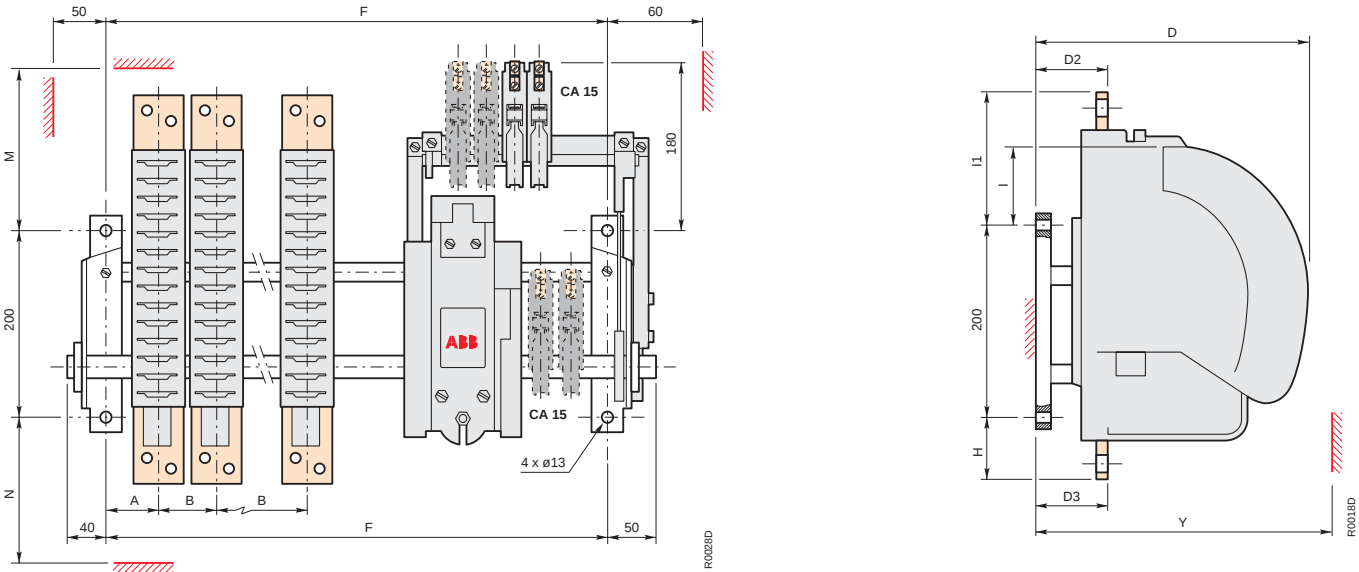
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
63	2	245	285	285	345	345	385	385	445	-	-	-	-	2 x 7
	3	285	345	345	385	385	445	445	445	-	-	-	-	
	4	345	385	385	445	445	540	540	540	-	-	-	-	
125	2	285	285	345	345	385	385	445	445	-	-	-	-	2 x 7
	3	345	345	385	385	445	445	540	540	-	-	-	-	
	4	385	445	445	445	540	540	540	540	-	-	-	-	
200	2	345	345	385	385	445	445	445	540	-	-	-	-	2 x 9
	3	385	445	445	445	540	540	540	540	-	-	-	-	
	4	445	540	540	540	540	-	-	-	-	-	-	-	
500	2	445	445	445	540	540	540	540	635	-	-	-	-	2 x 13
	3	540	540	540	540	635	635	635	635	-	-	-	-	
	4	635	635	635	635	-	-	-	-	-	-	-	-	

Dimensions - Clearing distances - Connecting

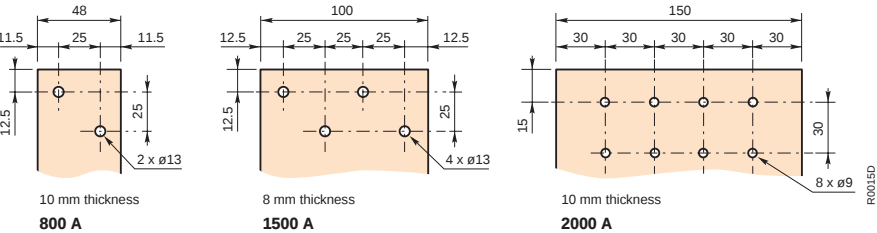
Ratings (A)	A	B	C	D	E	H	I	I1	J	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z
63	45	50	93	148	36	63	114	101	35	M6x20	16	164	83	12.5	10.5	53	23	15	8	16	178	8
125	57	61	93	153	40	76	138	130	35	M8x20	20	188	96	12.5	10.5	53	23	15	10	20	183	10
200	69	68	116	190	40	93	140	123	16	M10x25	25	190	116	9	10	53	20	25	13	20	220	12
500	79	80	160	260	100	118	230	195	-	Ø 13	30	253	150	15	14	53	20	20	20	46	290	20

IORR..-MT and IORE..-MT Types
 IORR..-CC and IORE..-CC Types
 Ratings 800 ... 2000 A

Dimensions (in mm)



Terminal plate details



		Fixing													
Ratings (A)	Number of poles	Fixing dimension - F													Fixing holes
		acc. to number of extra CA 15... auxiliary contacts:													
		0	1	2	3	4	5	6	7	8	9	10	-		
800	1	245	245	245	285	285	285	285	345	345	345	345	-	4 x 13	
	2	345	345	345	385	385	385	385	445	445	445	445	-		
	3	385	385	385	445	445	445	445	540	540	540	540	-		
	4	540	540	540	540	540	540	540	540	540	540	540	-		
1500	1	345	345	345	345	345	345	345	385	385	385	385	-	4 x 13	
	2	445	445	445	540	540	540	540	540	540	540	540	-		
	3*	540	540	540	635	635	635	635	635	635	635	635	-		
2000	1	345	345	345	385	385	385	385	445	445	445	445	-	4 x 13	
	2*	540	540	540	635	635	635	635	635	635	635	635	-		

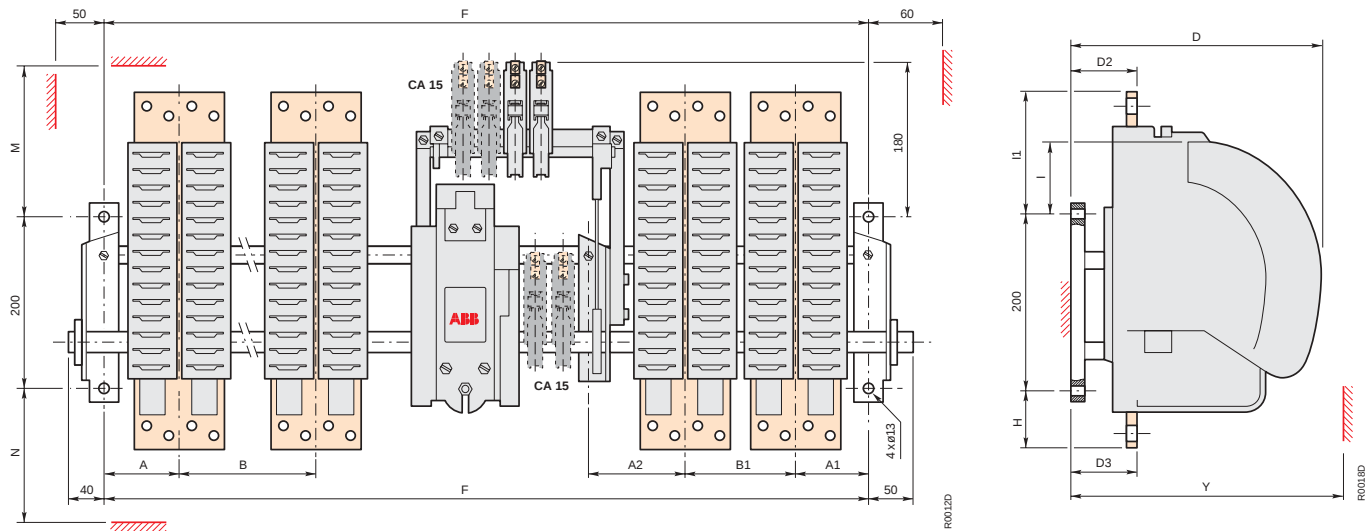
Dimensions - Clearing distances - Connecting

Ratings (A)	Number of poles	A	B	D	D2	D3	H	I	I1	M	N	Y
800	1	60	-	325	76	77	70	108	175	195	90	375
	2	60	90	325	76	77	70	108	175	195	90	375
	3	60	70	325	76	77	70	108	175	195	90	375
	4	60	70	325	76	77	70	108	175	195	90	375
1500	1	85	-	325	84	85	120	108	225	245	140	385
	2	85	140	325	84	85	120	108	225	245	140	385
	3*	85	120	325	84	85	120	108	225	245	140	385
2000	1	110	-	325	86	87	133	108	238	260	153	405
	2*	110	190	325	86	87	133	108	238	260	153	405

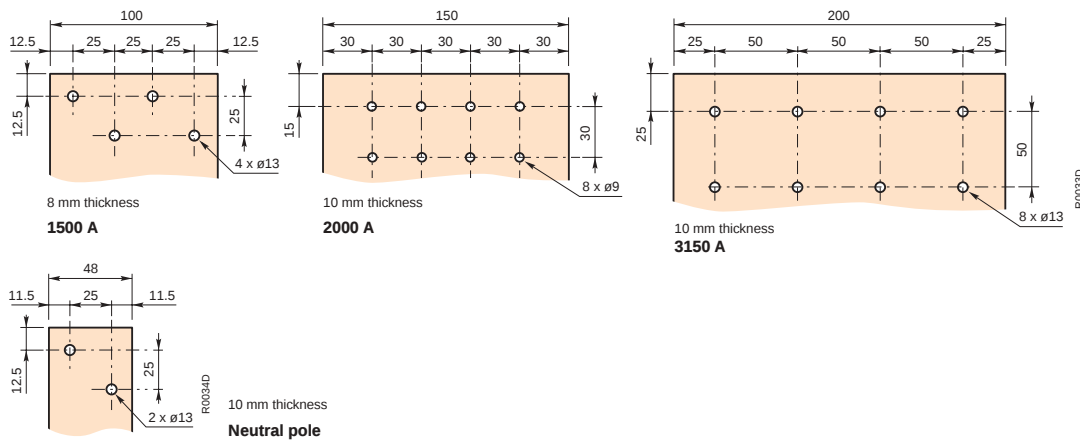
* Dimensions of contactors with a larger number of poles: pages 8/12 and 8/13.

IORR..-MT and IORE..-MT Types IORR..-CC and IORE..-CC Types Ratings 1500 and 2000 A (cont.) - Rating 3150 A

Dimensions (in mm)



Terminal plate details



Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	10	-	
1500	3 + N	760	760	760	760	760	760	760	885	885	885	885	-	4 x 13
	4	760	760	760	885	885	885	885	885	885	885	885	-	
2000	3	885	885	885	885	885	885	885	885	885	885	885	-	4 x 13
	3 + N	885	885	885	950	950	950	950	950	950	950	950	-	
	4	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	-	
3150	3*	950	950	950	1050	1050	1050	1050	1050	1050	1050	1050	-	4 x 13

Dimensions - Clearing distances - Connecting

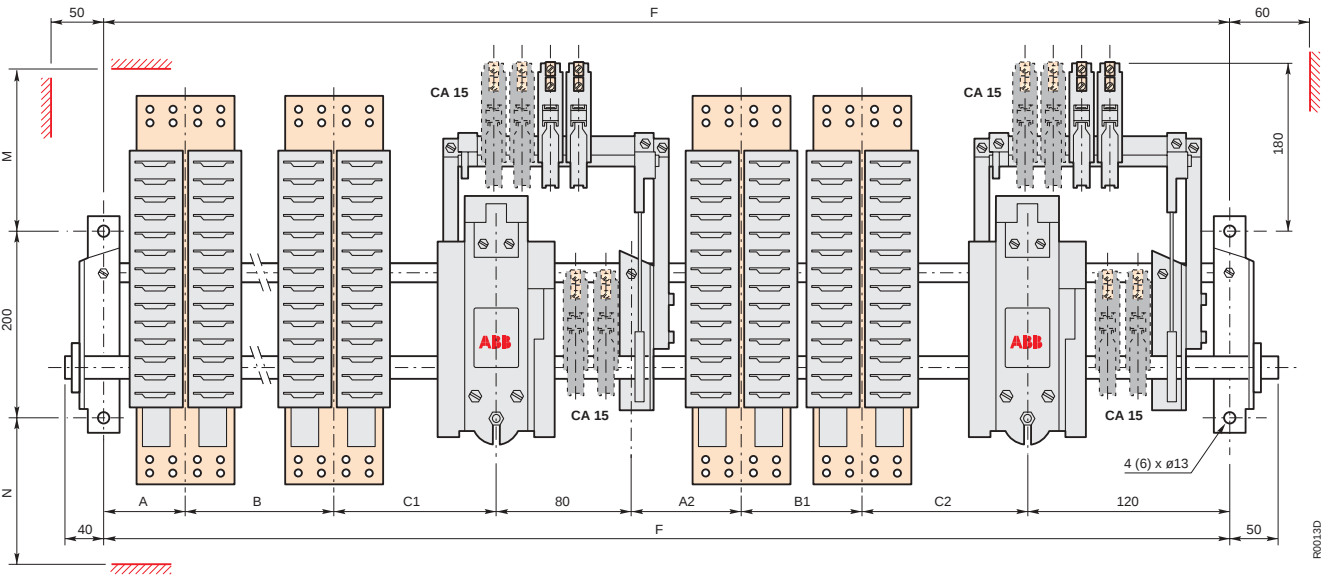
Ratings (A)	Number of poles	A	A1	A2	B	B1	D	D2	D3 (1)	H (1)	I	I1 (1)	M	N	Y
1500	3 + N	60	85	140	95	120	325	84	85	120	108	225	245	140	385
	4	85	85	140	120	120	325	84	85	120	108	225	245	140	385
2000	3	110	110	165	-	170	325	86	87	133	108	238	260	153	405
	3 + N	60	110	165	120	170	325	86	87	133	108	238	260	153	405
	4	110	110	165	170	170	325	86	87	133	108	238	260	153	405
3150	3*	135	135	190	-	220	325	86	87	170	108	275	300	190	405

* Dimensions of 4-pole contactors: see page 8/13.

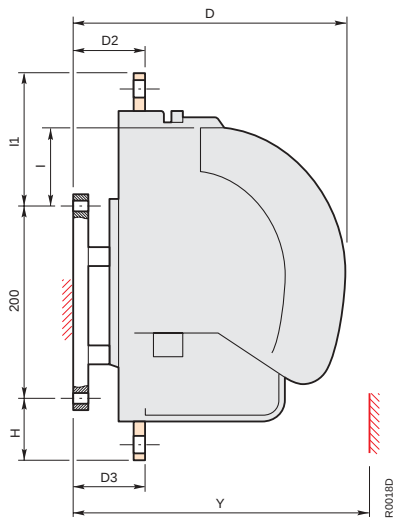
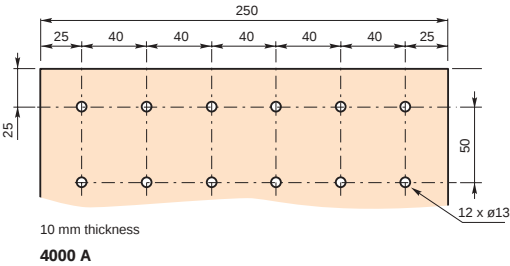
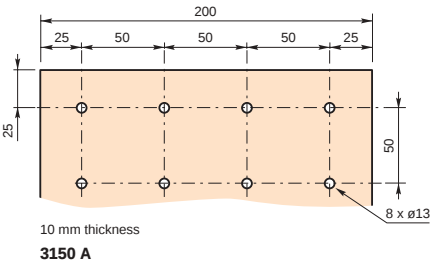
(1) Neutral pole (N): D3 dim. = 77, H dim. = 70, I1 dim. = 175. (The Neutral pole is rated 900 A and always mounted on the L.H.S. of the contactor frame.)

IORR..-MT and IORE..-MT Types
IORR..-CC and IORE..-CC Types
Rating 3150 A (cont.) - Rating 4000 A

Dimensions (in mm)



Terminal plate details



Fixing - Dimensions - Clearing distances - Connecting

Ratings (A)	Number of poles	Dim. F (1)	Holes Ø	A	A2	B	B1	C1	C2	D	D2	D3	H	I	I1	M	N	Y
3150	4	1350	4 x 13	135	190	220	220	192.5	192.5	335	100	102	170	108	275	300	190	410
4000	3	1350	6 x 13	160	215	—	270	255	250	335	100	102	170	108	275	300	190	410
	4	1550	6 x 13	160	215	270	270	217.5	217.5	335	100	102	170	108	275	300	190	410

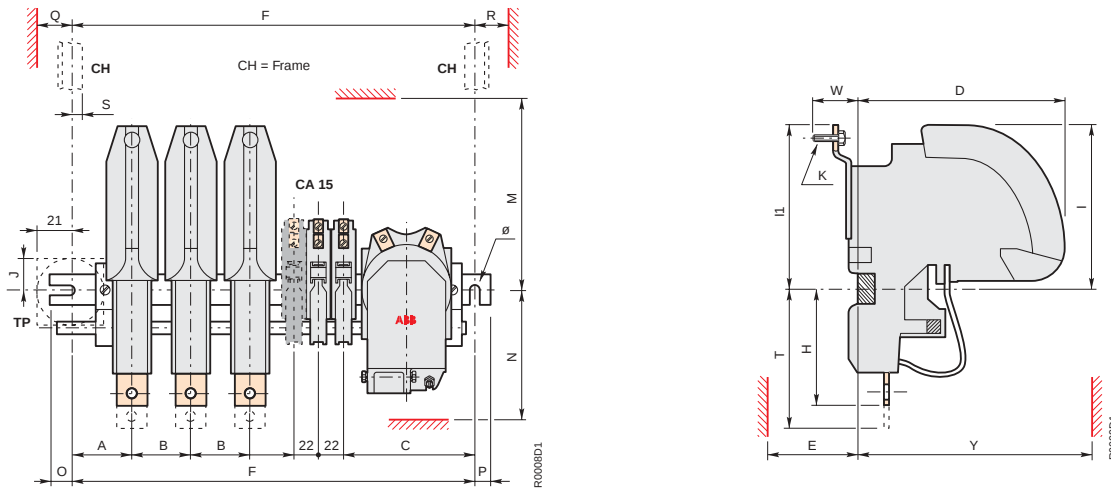
(1) The fixing dimension F is remaining unchanged for a maximum number of 10 pcs. N.O. and/or N.C. CA 15.. auxiliary contacts.
Contactor in 3-pole version + N (Neutral pole): please consult us.

IORC.. and JORC.. Types

LORC.. Types

Ratings < 800 A

Dimensions (in mm)



Terminal plate details



Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
63/85	1	205	245	245	285	285	345	345	345	-	-	-	-	2 x 7
	2	245	245	285	345	345	345	-	-	-	-	-	-	
	3	285	285	345	345	345	-	-	-	-	-	-	-	
	4	345	345	345	-	-	-	-	-	-	-	-	-	
125/170	1	205	245	245	285	285	-	-	-	-	-	-	-	2 x 7
	2	245	285	345	345	345	-	-	-	-	-	-	-	
	3	345	345	345	385	385	-	-	-	-	-	-	-	
	4	345	-	-	-	-	-	-	-	-	-	-	-	
200/260	1	245	285	285	345	345	345	385	385	-	-	-	-	2 x 9
	2	285	345	345	345	385	445	445	445	-	-	-	-	
	3	345	385	385	445	445	-	-	-	-	-	-	-	
	4	445	-	-	-	-	-	-	-	-	-	-	-	
315/420	1	285	285	345	345	345	385	385	445	-	-	-	-	2 x 11
	2	345	345	385	385	445	445	445	540	-	-	-	-	
	3	385	445	445	445	540	540	540	540	-	-	-	-	
	4	445	540	540	540	540	635	635	635	-	-	-	-	
550	2	385	445	445	445	540	540	540	540	-	-	-	-	2 x 13
	3	445	540	540	540	540	635	635	635	-	-	-	-	
	4	540	540	635	635	635	635	-	-	-	-	-	-	

Dimensions - Clearing distances - Connecting

Ratings (A)	Dimensions													Clearing distances													Connecting												
	A	B	C	D (2)	D1	E	H (1)	I (2)	I1 (2)	I2	J	K	ℓ	M (2)	M1	N (1)	O	P	Q	R	S	T	V	W	Y (2)	Y1	Z												
63/85	35	37	93	136	126	31	63	91	101	64	35	M6x20	16	156	150	78	12.5	8.5	53	23	15	96	8	16	176	141	8												
125/170	41	46	93	139	126	35	76	123	130	84	35	M8x20	20	208	150	91	12.5	8.5	53	23	15	111	10	20	204	141	10												
200/260	48	54.5	116	188	142	35	96	125	123	74	16	M10x25	25	230	167	111	9	10	53	20	25	125	13	20	273	157	12												
315/420	53	60	130	212	157	70	99	145	144	78	—	ø 11	25	270	97	114	12	11	53	21	13	140	15	17	300	172	16												
550	62	68	160	245	177	100	118	183	195	119	—	ø 13	30	313	136	133	15	14	53	15	20	—	20	46	335	192	20												

(1) JORC.. types: replace H dimension by T dimension. Add to N dimension the difference obtained between T and H.

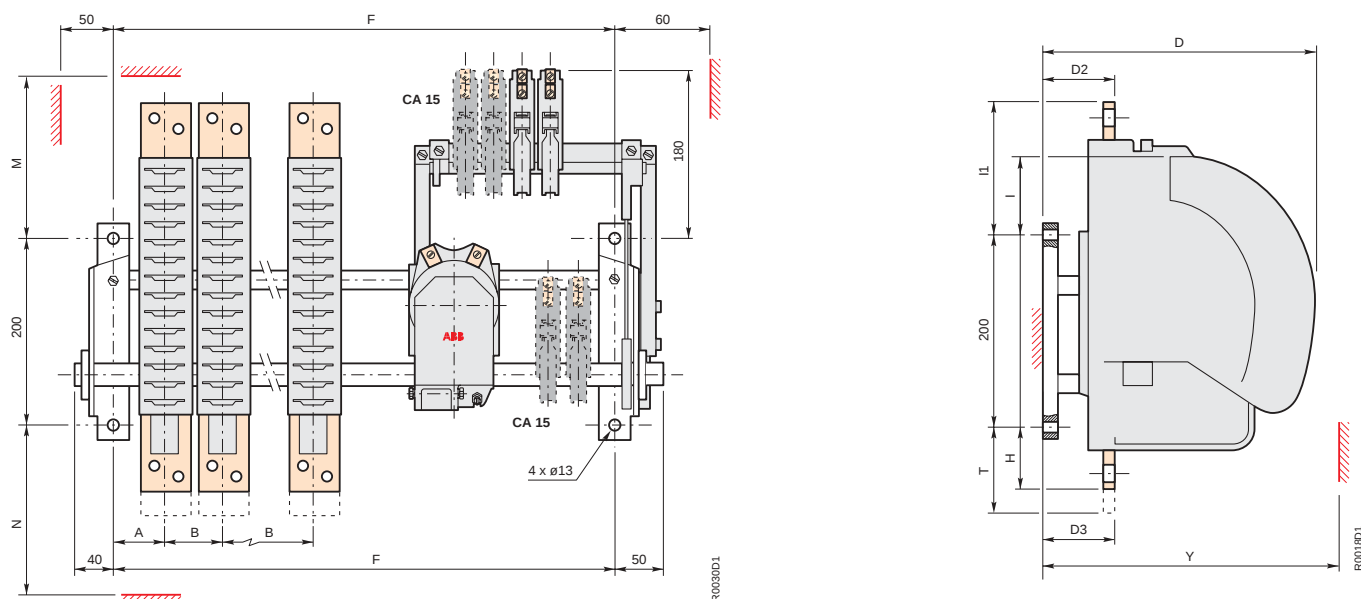
(2) LORC.. types: poles are not equipped with arc chutes. Use D1 dimension instead of D, I2 instead of I1, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

IORC.. and JORC.. Types

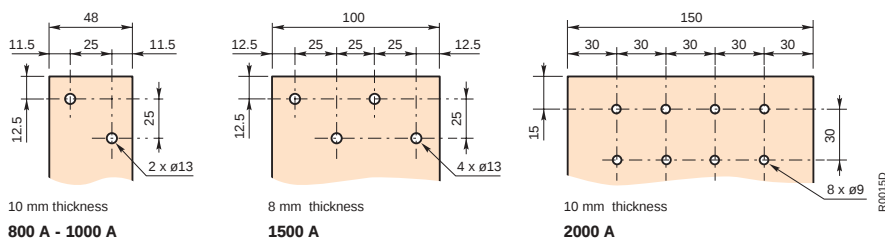
LORC.. Types

Ratings 800 ... 2000 A

Dimensions (in mm)



Terminal plate details



		Fixing												
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15... auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	10	11	
800/1000	2	345	345	345	345	385	385	385	385	445	445	445	445	4 x 13
	3	385	385	385	385	445	445	445	445	540	540	540	540	
	4	540	540	540	540	540	540	540	540	540	540	540	540	
1500	1	345	345	345	345	345	345	345	345	385	385	385	385	4 x 13
	2	445	445	445	445	540	540	540	540	540	540	540	540	
2000	1	345	345	345	345	385	385	385	385	445	445	445	445	4 x 13

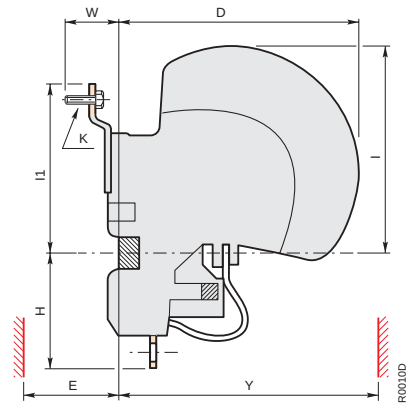
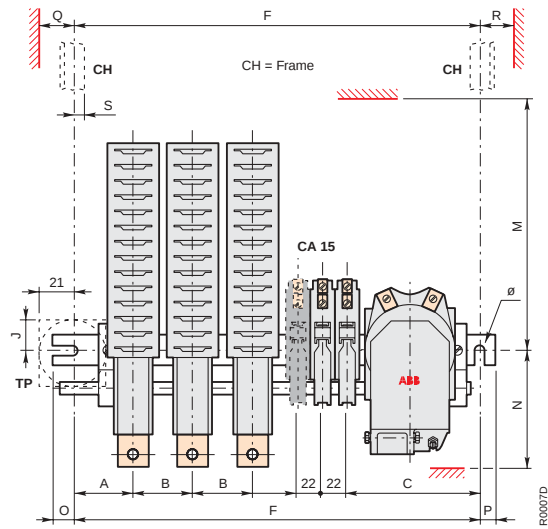
Dimensions - Clearing distances - Connecting																	
Ratings (A)	Number of poles	A	B	D ⁽²⁾	D1	D2	D3	H ⁽¹⁾	I ⁽²⁾	I1	M ⁽²⁾	M1	N ⁽¹⁾	T	Y ⁽²⁾	Y1	
800/1000	2	60	90	325	260	75	77	70	108	98	158	115	85	132	345	280	
	3	60	70	325	260	75	77	70	108	98	158	115	85	132	345	280	
	4	60	70	325	—	75	77	70	108	98	158	—	85	132	345	—	
1500	1	85	—	325	260	83	85	120	108	148	168	165	135	—	355	280	
	2	85	140	325	260	83	85	120	108	148	168	165	135	—	355	280	
2000	1	110	—	325	260	85	87	133	108	161	188	165	148	—	375	280	

(1) **JORC..** types: replace H dimension by T dimension. Add to N dimension the difference obtained between T and H.

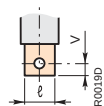
(2) **LORC..** types: poles are not equipped with arc chutes. Use D1 dimension instead of D, M1 instead of M, Y1 instead of Y, I dim. is not applicable.

IORC..-MT Types IORC..-CC Types Ratings < 800 A

Dimensions (in mm)



Terminal plate details



Lower terminal plate



Upper terminal plate

Fixing

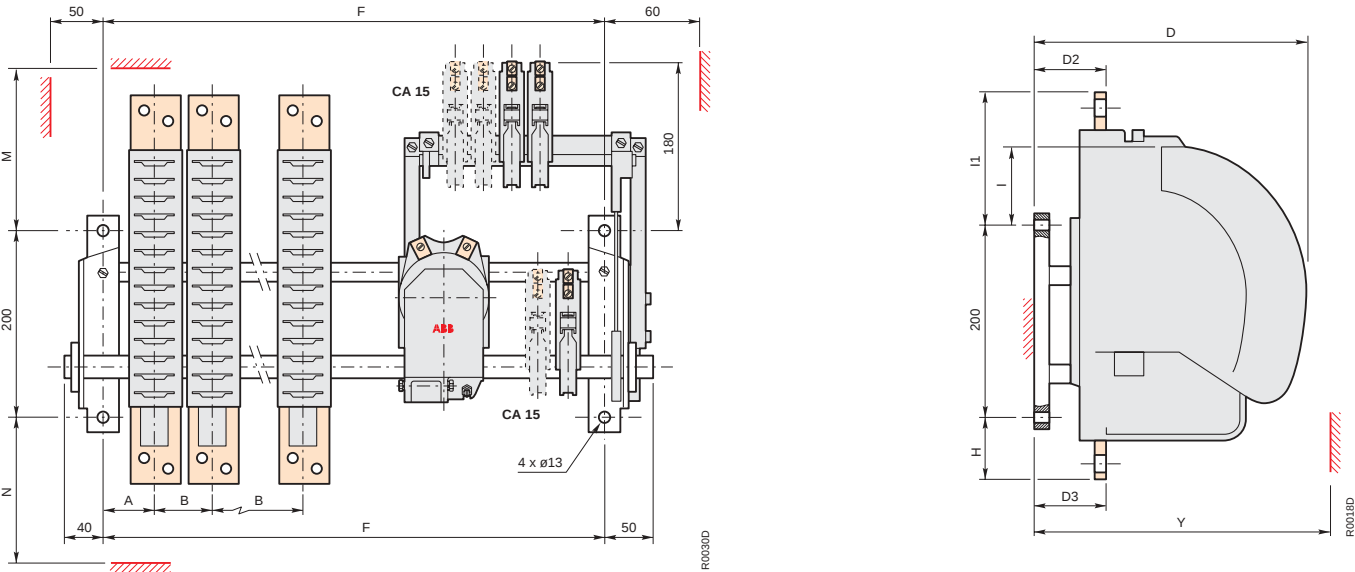
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
63	2	285	285	345	345	385	385	-	-	-	-	-	-	2 x 7
	3	345	345	385	385	445	-	-	-	-	-	-	-	
	4	385	385	445	-	-	-	-	-	-	-	-	-	
125	2	285	345	345	385	385	-	-	-	-	-	-	-	2 x 7
	3	345	385	385	445	445	-	-	-	-	-	-	-	
	4	445	-	-	-	-	-	-	-	-	-	-	-	
200	2	345	385	385	445	445	445	540	540	-	-	-	-	2 x 9
	3	445	445	445	540	540	-	-	-	-	-	-	-	
	4	540	-	-	-	-	-	-	-	-	-	-	-	
500	2	445	445	540	540	540	540	635	635	-	-	-	-	2 x 13
	3	540	540	540	635	635	635	635	-	-	-	-	-	
	4	635	635	635	-	-	-	-	-	-	-	-	-	

Dimensions - Clearing distances - Connecting

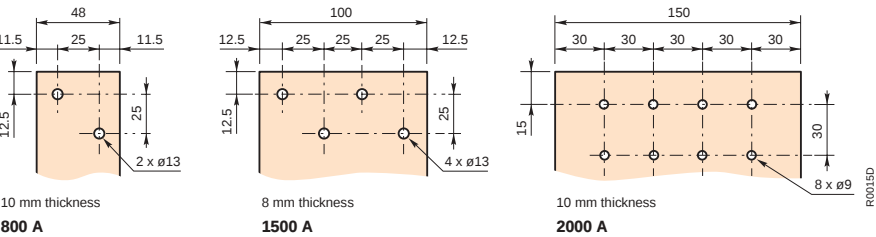
Ratings (A)	A	B	C	D	E	H	I	I1	J	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z
63	45	50	93	148	36	63	114	101	35	M6x20	16	164	83	12.5	10.5	53	23	15	8	16	178	8
125	57	61	93	153	40	76	138	130	35	M8x20	20	188	96	12.5	10.5	53	23	15	10	20	183	10
200	69	68	116	190	40	93	140	123	16	M10x25	25	190	116	9	10	53	20	25	13	20	220	12
500	79	80	160	260	100	118	203	195	-	Ø 13	30	253	150	15	14	53	20	20	20	46	290	20

IORC..-MT Types
IORC..-CC Types
Ratings 800 A ... 2000 A

Dimensions (in mm)



Terminal plate details



		Fixing												
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	10	11	
800	1	245	245	245	245	285	285	285	285	345	345	345	345	4 x 13
	2	345	345	345	345	385	385	385	385	445	445	445	445	
	3	385	385	385	385	445	445	445	445	540	540	540	540	
	4	540	540	540	540	540	540	540	540	540	540	540	540	
1500	1	345	345	345	345	345	345	345	345	385	385	385	385	4 x 13
	2	445	445	445	445	540	540	540	540	540	540	540	540	
2000	1	345	345	345	345	385	385	385	385	445	445	445	445	4 x 13

Dimensions - Clearing distances - Connecting

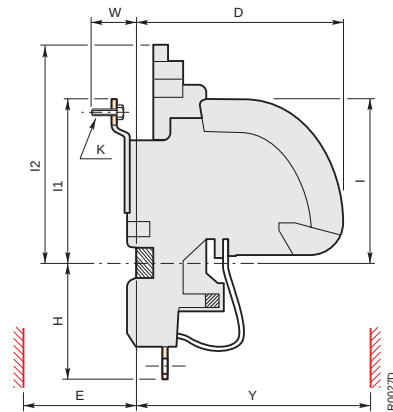
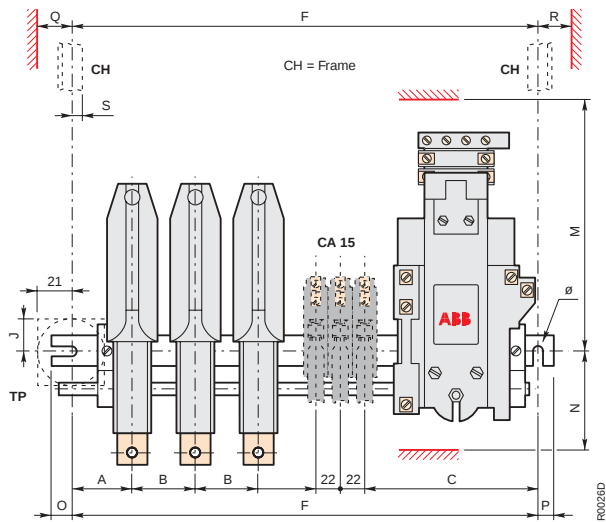
Ratings (A)	Number of poles	A	B	D	D2	D3	H	I	I1	M	N	Y
800	1	60	—	325	76	77	70	108	175	195	90	375
	2	60	90	325	76	77	70	108	175	195	90	375
	3	60	70	325	76	77	70	108	175	195	90	375
	4	60	70	325	76	77	70	108	175	195	90	375
1500	1	85	—	325	84	85	120	108	225	245	140	385
	2	85	140	325	84	85	120	108	225	245	140	385
2000	1	110	—	325	86	87	133	108	238	260	153	405

IORR..-AMA Types

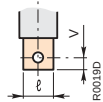
Magnetically Latched

Ratings 85 ... 550 A

Dimensions (in mm)



Terminal plate details



Lower terminal plate



Upper terminal plate

Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
85	1	140	175	205	245	245	285	285	345	-	-	-	-	2 x 7
	2	175	205	245	245	285	285	345	345	-	-	-	-	
	3	205	245	285	285	345	345	345	-	-	-	-	-	
	4	245	285	345	345	345	-	-	-	-	-	-	-	
170	2	205	245	245	285	345	345	345	-	-	-	-	-	2 x 7
	3	245	285	345	345	345	385	385	-	-	-	-	-	
	4	285	345	345	-	-	-	-	-	-	-	-	-	
	4	285	345	345	-	-	-	-	-	-	-	-	-	
260	2	245	285	285	345	345	385	385	445	-	-	-	-	2 x 9
	3	285	345	345	385	385	445	445	-	-	-	-	-	
	4	345	385	445	-	-	-	-	-	-	-	-	-	
	4	345	385	445	-	-	-	-	-	-	-	-	-	
420	2	285	345	345	345	385	385	445	445	-	-	-	-	2 x 11
	3	345	385	385	445	445	445	540	540	-	-	-	-	
	4	385	445	445	540	540	540	540	635	-	-	-	-	
	4	385	445	445	540	540	540	540	635	-	-	-	-	
550	2	345	385	385	445	445	445	540	540	-	-	-	-	2 x 13
	3	385	445	445	540	540	540	540	635	-	-	-	-	
	4	445	540	540	540	635	635	635	635	-	-	-	-	
	4	445	540	540	540	635	635	635	635	-	-	-	-	

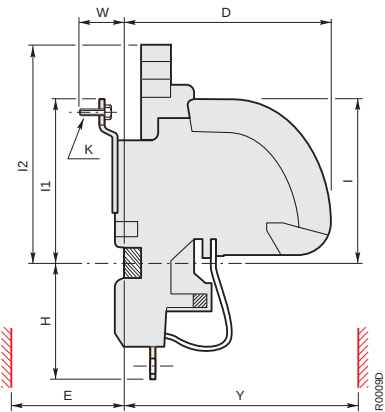
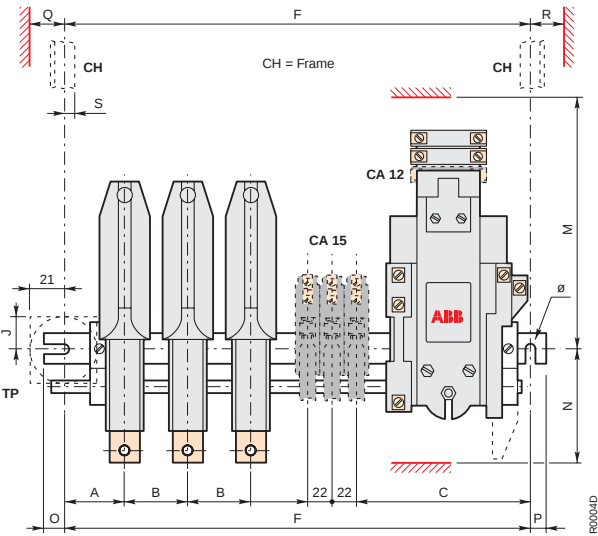
Dimensions - Clearing distances - Connecting

Ratings (A)	A	B	C	D	E	H	I	I1	I2	J	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z
85	35	37	93	136	31	63	91	101	135	35	M6x20	16	156	78	12.5	8.5	53	23	15	8	16	176	8
170	41	46	93	139	35	76	123	130	135	35	M8x20	20	208	91	12.5	8.5	53	23	15	10	20	204	10
260	48	54.5	116	188	35	93	125	123	137	16	M10x25	25	230	111	9	10	53	20	25	13	20	273	12
420	53	60*	130	212	70	99	145	144	135	-	Ø 11	25	270	114	12	11	53	21	13	15	17	300	16
550	62	68*	160	245	100	118	183	195	137	-	Ø 13	30	313	133	15	14	53	15	20	20	46	335	20

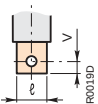
* 2-pole contactor types IORR..-AMA and IOR..-AMA without CA 15.. auxiliary contact: B dim. = 85 for rating 420 A and B dim. = 95 for rating 550 A.

IOR..-AMA Types
Magnetically Latched
Ratings 85 550 A

Dimensions (in mm)



Terminal plate details



Lower terminal plate



Upper terminal plate

Fixing

Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	-	-	-	-	
85	1	140	175	205	245	245	285	285	345	-	-	-	-	2 x 7
	2	175	205	245	245	285	285	345	345	-	-	-	-	
	3	205	245	285	285	345	345	345	-	-	-	-	-	
	4	245	285	345	345	345	-	-	-	-	-	-	-	
170	2	205	245	245	285	345	345	345	-	-	-	-	-	2 x 7
	3	245	285	345	345	345	385	385	-	-	-	-	-	
	4	285	345	345	-	-	-	-	-	-	-	-	-	
	4	285	345	345	-	-	-	-	-	-	-	-	-	
260	2	245	285	285	345	345	385	385	445	-	-	-	-	2 x 9
	3	285	345	345	385	385	445	445	-	-	-	-	-	
	4	345	385	445	-	-	-	-	-	-	-	-	-	
	4	345	385	445	-	-	-	-	-	-	-	-	-	
420	2	285	345	345	345	385	385	445	445	-	-	-	-	2 x 11
	3	345	385	385	445	445	445	540	540	-	-	-	-	
	4	385	445	445	540	540	540	540	635	-	-	-	-	
	4	385	445	445	540	540	540	540	635	-	-	-	-	
550	2	345	385	385	445	445	445	540	540	-	-	-	-	2 x 13
	3	385	445	445	540	540	540	540	635	-	-	-	-	
	4	445	540	540	540	635	635	635	635	-	-	-	-	
	4	445	540	540	540	635	635	635	635	-	-	-	-	

Dimensions - Clearing distances - Connecting

Ratings (A)	A	B	C	D	E	H	I	I1	I2	J	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z
85	35	37	93	136	31	63	91	101	135	35	M6x20	16	156	78	12.5	8.5	53	23	15	8	16	176	8
170	41	46	93	139	35	76	123	130	135	35	M8x20	20	208	91	12.5	8.5	53	23	15	10	20	204	10
260	48	54.5	116	188	35	93	125	123	137	16	M10x25	25	230	111	9	10	53	20	25	13	20	273	12
420	53	60*	130	212	70	99	145	144	137	-	ø 11	25	270	114	12	11	53	21	13	15	17	300	16
550	62	68*	160	245	100	118	183	195	135	-	ø 13	30	313	133	15	14	53	15	20	20	46	335	20

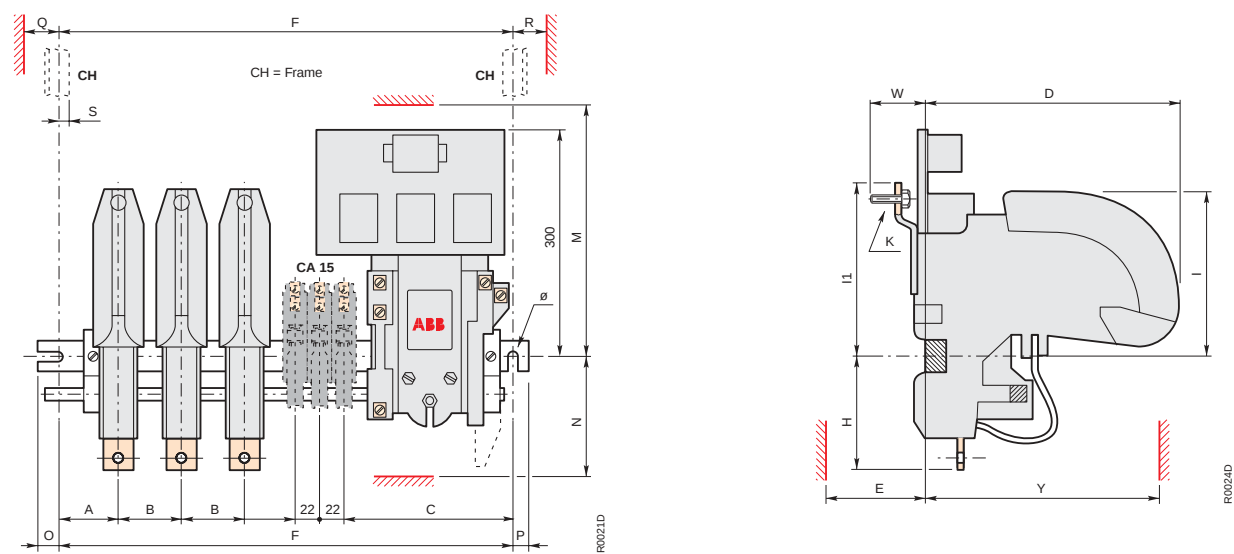
2-pole contactor types IORR..-AMA and IOR..-AMA without CA 15.. auxiliary contact: B dim. = 85 for rating 420 A and B dim. = 95 for rating 550 A.

IOR.-AME Types

Mechanically Latched

Ratings < 800 A

Dimensions (in mm)



Terminal plate details



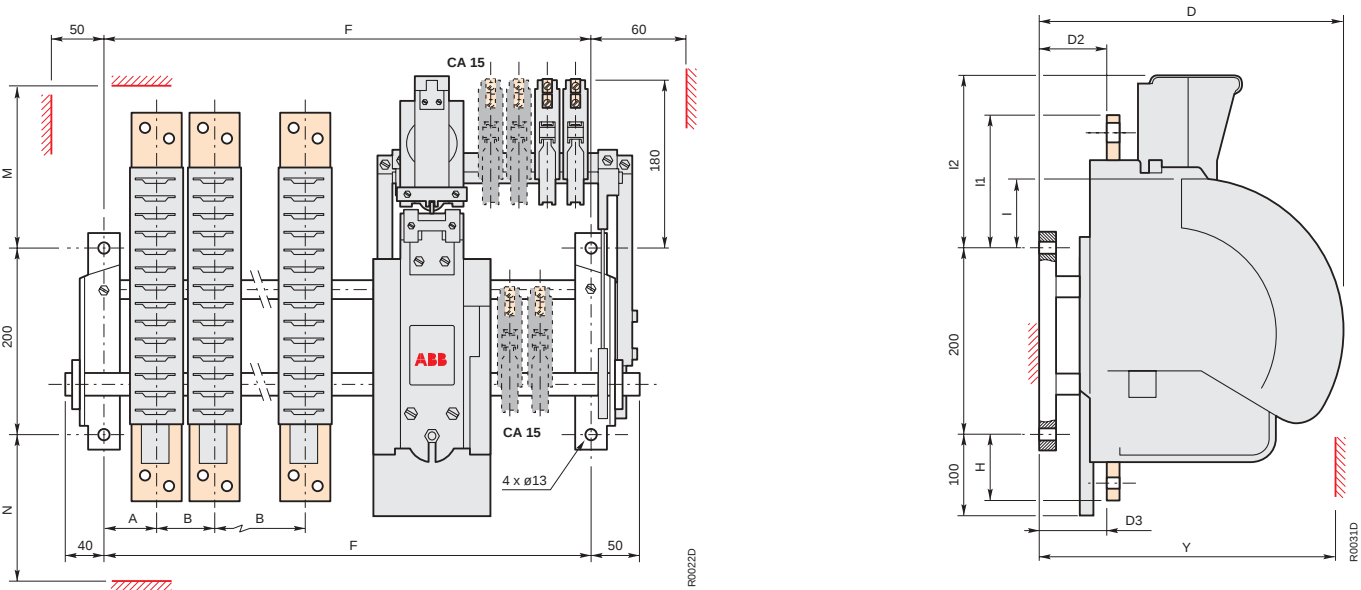
Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	-	-	
420	2	345	345	345	345	385	385	445	445	445	540	-	-	2 x 11
	3	385	385	385	445	445	445	540	540	540	540	-	-	
	4	445	445	445	540	540	540	540	635	635	635	-	-	
550	2	385	385	385	445	445	445	540	540	540	540	-	-	2 x 13
	3	445	445	445	540	540	540	540	635	635	635	-	-	
	4	540	540	540	540	635	635	635	635	-	-	-	-	

Dimensions - Clearing distances - Connecting

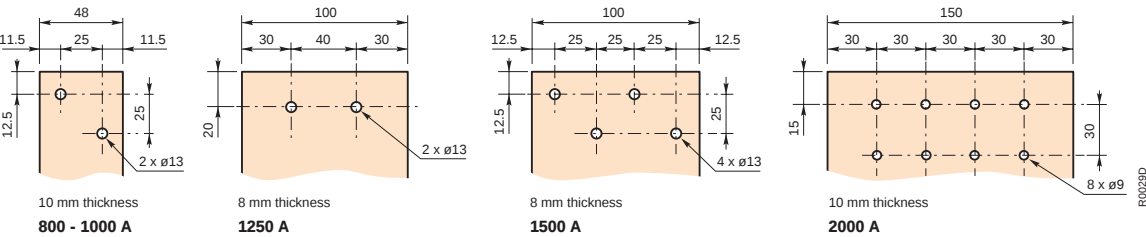
Ratings (A)	A	B	C	D	E	H	I	I1	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z
420	53	60	130	212	70	99	145	144	∅ 11	25	305	114	12	11	53	21	13	15	17	300	16
550	62	68	160	245	100	118	183	195	∅ 13	30	313	133	15	14	53	15	20	20	46	335	20

IOR..-AME Types
 Mechanically Latched
 Ratings 800 ... 2000 A

Dimensions (in mm)



Terminal plate details



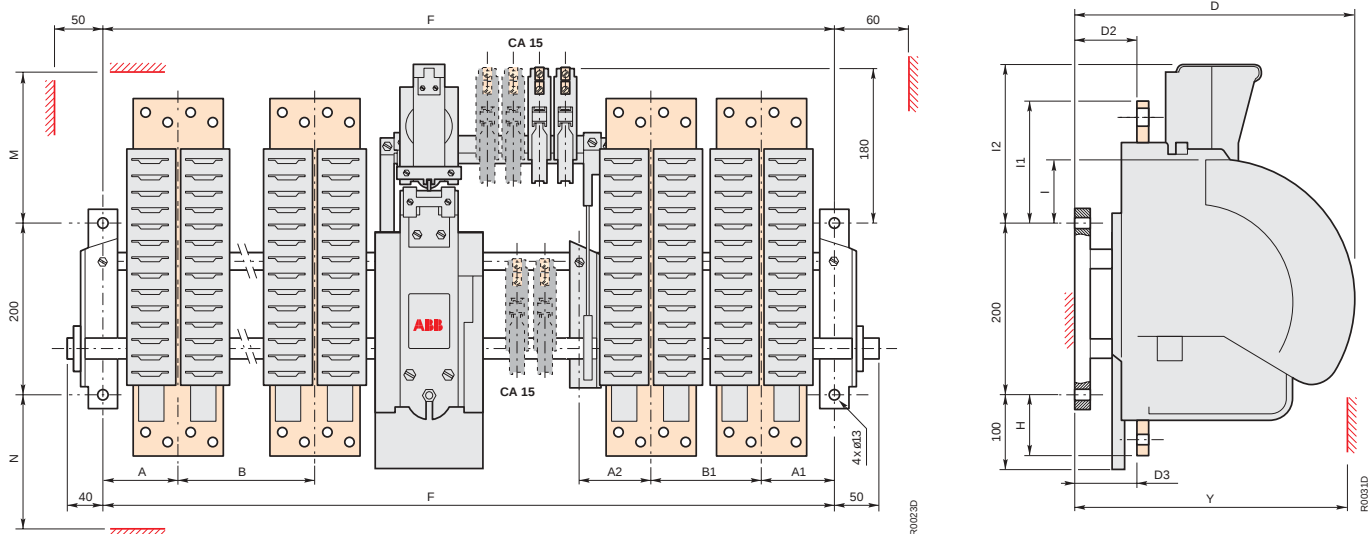
Fixing - Dimensions - Clearing distances - Connecting

Ratings (A)	Number of poles	Dim. F ⁽¹⁾	Holes Ø	A	B	D	D2	D3	H	I	I1	I2	M	N	Y
800/1000	2	445		60	90	325	75	77	70	108	98	210	245	85	345
	3	540	4x13	60	70	325	75	77	70	108	98	210	245	85	345
	4	540		60	70	325	75	77	70	108	98	210	245	85	345
1250	1	385		85	—	325	83	85	110	108	138	210	235	125	355
	2	540	4x13	85	140	325	83	85	110	108	138	210	235	125	355
	3	635		85	120	325	83	85	110	108	138	210	235	125	355
1500	1	385		85	—	325	83	85	120	108	148	210	245	135	355
	2	540	4x13	85	140	325	83	85	120	108	148	210	245	135	355
	3*	635		85	120	325	83	85	120	108	148	210	245	135	355
2000	1	445		110	—	325	85	87	133	108	161	210	245	148	375
	2*	635	4x13	110	190	325	85	87	133	108	161	210	245	148	375

* Dimensions of contactors with a larger number of poles: ➡ page 8/22.

1) The fixing dimension **F** is remaining unchanged independently from the number of extra CA 15.. auxiliary contacts. Max. number of auxiliary contacts: ➡ page 2/7.

Dimensions (in mm)



100
30 40 30
20
2 x $\varnothing 13$
8 mm thickness
1250 A

100
12.5 25 25 25 12.5
12.5 25
4 x $\varnothing 13$
8 mm thickness
1500 A

150
30 30 30 30 30
15
8 x $\varnothing 9$
10 mm thickness
2000 A

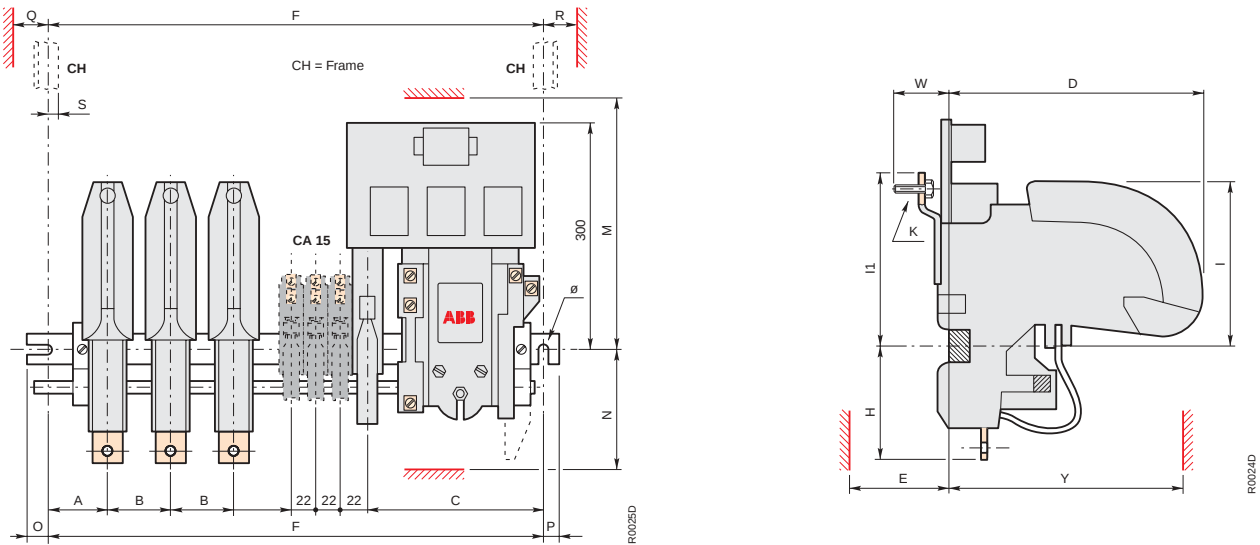
48
11.5 25 11.5
12.5 25
2 x $\varnothing 13$
R0034D
10 mm thickness
Neutral pole

Fixing -  Dimensions -  Clearing distances -  Connecting																		
Ratings (A)	Number of poles	Dim. F (1)	Holes Ø	A	A1	A2	B	B1	D	D2	D3 (2)	H (2)	I	I1 (2)	I2	M	N	Y
1250	3 + N	885	4 x 13	60	85	140	95	120	325	83	85	110	108	138	210	235	125	355
	4	885		85	85	140	120	120	325	83	85	110	108	138	210	235	125	355
1500	3 + N	885	4 x 13	60	85	140	95	120	325	83	85	120	108	148	210	245	135	355
	4	885		85	85	140	120	120	325	83	85	120	108	148	210	245	135	355
2000	3	885	4 x 13	110	110	165	170	170	325	85	87	133	108	161	210	245	148	375
	3 + N	950		60	110	165	120	170	325	85	87	133	108	161	210	245	148	375
	4	1050		110	110	165	170	170	325	85	87	133	108	161	210	245	148	375
				110	110	165	170	170	325	85	87	133	108	161	210	245	148	375

(2) **Neutral pole (N):** D3 dim. = 77, H dim. = 70, I1dim. = 98. (The Neutral pole is rated 900 A and always mounted on the L.H.S. of the contactor frame.)

IORR..-AME and IORE..-AME Types
Mechanically Latched
Ratings < 800 A

Dimensions (in mm)



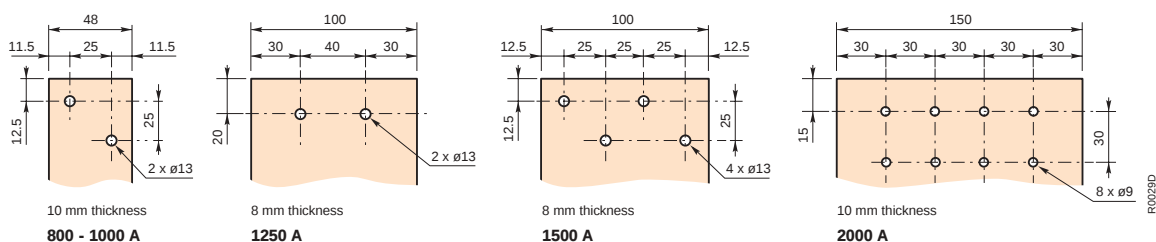
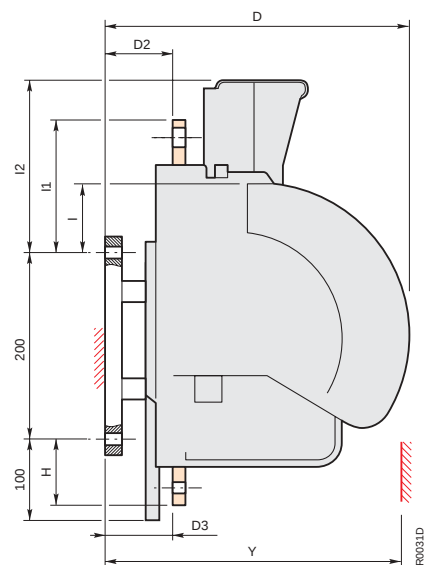
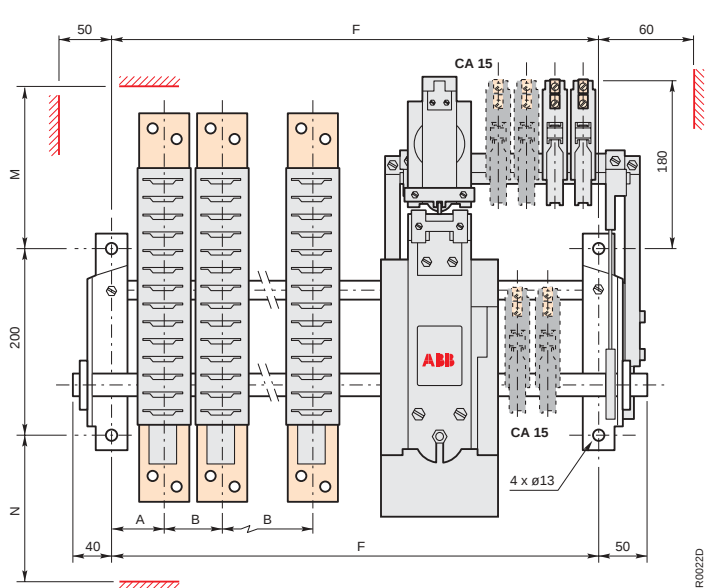
Terminal plate details



Ratings (A)	Number of poles	Fixing dimension - F acc. to number of extra CA 15.. auxiliary contacts:												Fixing holes Ø
		0	1	2	3	4	5	6	7	8	9	-	-	
420	2	345	345	345	385	385	445	445	445	540	540	-	-	2 x 11
	3	385	385	445	445	445	540	540	540	540	635	-	-	
	4	445	445	445	540	540	540	635	635	635	635	-	-	
550	2	385	385	445	445	445	540	540	540	540	635	-	-	2 x 13
	3	445	445	540	540	540	540	635	635	635	635	-	-	
	4	540	540	540	635	635	635	635	-	-	-	-	-	

	Dimensions - Clearing distances - Connecting																					
Ratings (A)	A	B	C	D	E	H	I	I1	K	ℓ	M	N	O	P	Q	R	S	V	W	Y	Z	
420	53	60	130	212	70	99	145	144	ø 11	25	305	114	12	11	53	21	13	15	17	300	16	
550	62	68	160	245	100	118	183	195	ø 13	30	313	133	15	14	53	15	20	20	46	335	20	

Ratings 800 ... 2000 A



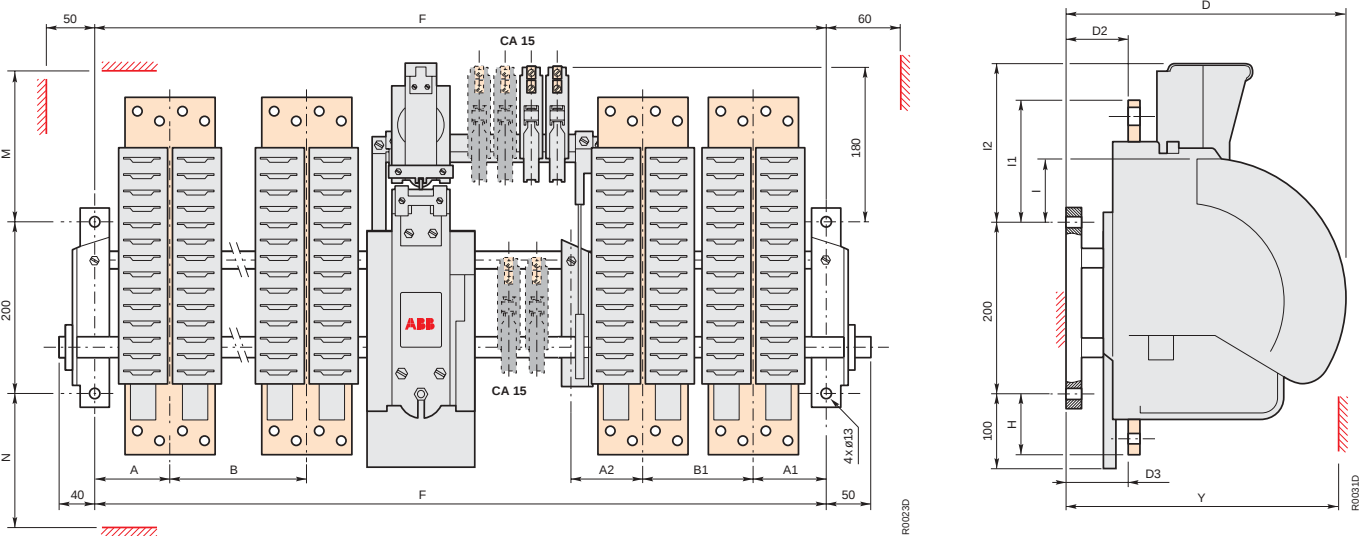
Fixing -  Dimensions -  Clearing distances -  Connecting															
Ratings (A)	Number of poles	Dim. F ⁽¹⁾	Holes Ø	A	B	D	D2	D3	H	I	I1	I2	M	N	Y
800/1000	2	445	4 x 13	60	90	325	75	77	70	108	98	210	245	85	345
	3	540		60	70	325	75	77	70	108	98	210	245	85	345
	4	540		60	70	325	75	77	70	108	98	210	245	85	345
1250	1	385	4 x 13	85	—	325	83	85	110	108	138	210	235	125	355
	2	540		85	140	325	83	85	110	108	138	210	235	125	355
	3*	635		85	120	325	83	85	110	108	138	210	235	125	355
1500	1	385	4 x 13	85	—	325	83	85	120	108	148	210	245	135	355
	2	540		85	140	325	83	85	120	108	148	210	245	135	355
	3*	635		85	120	325	83	85	120	108	148	210	245	135	355
2000	1	445	4 x 13	110	—	325	85	87	133	108	161	210	245	148	375
	2*	635		110	190	325	85	87	133	108	161	210	245	148	375

* Dimensions of contactors with a larger number of poles: ➞ page 8/25.

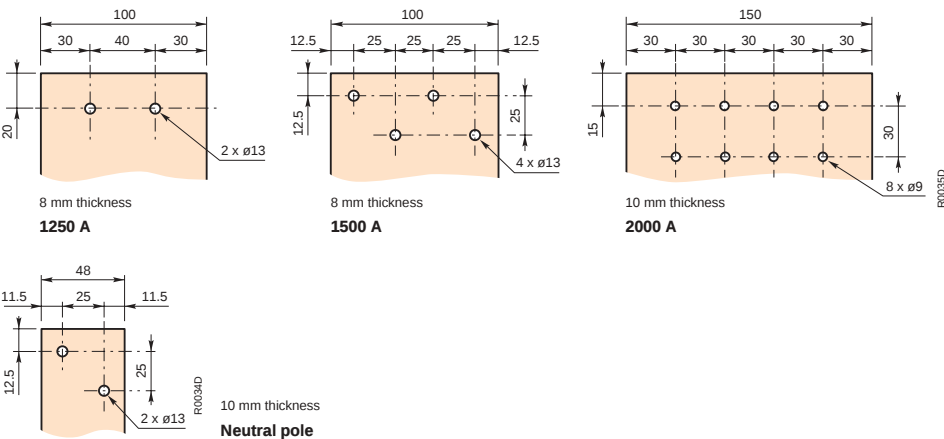
1) The fixing dimension **F** is remaining unchanged independently from the number of extra CA 15.. auxiliary contacts. Max. number of auxiliary contacts:  page **2/7**.

IORR..-AME and IORE..-AME Types
 Mechanically Latched
 Ratings 1250 ... 2000 A (cont.)

Dimensions (in mm)



Terminal plate details



		Fixing	Dimensions	Clearing distances	Connecting													
Ratings (A)	Number of poles	Dim. F (1)	Holes Ø	A	A1	A2	B	B1	D	D2	D3 (2)	H (2)	I	I1 (2)	I2	M	N	Y
1250	3 + N	885	4 x 13	60	85	140	95	120	325	83	85	110	108	138	210	235	125	355
	4	885	4 x 13	85	85	140	120	120	325	83	85	110	108	138	210	235	125	355
1500	3 + N	885	4 x 13	60	85	140	95	120	325	83	85	120	108	148	210	245	135	355
	4	885	4 x 13	85	85	140	120	120	325	83	85	120	108	148	210	245	135	355
2000	3	885	4 x 13	110	110	165	170	170	325	85	87	133	108	161	210	245	148	375
	3 + N	950	4 x 13	60	110	165	120	170	325	85	87	133	108	161	210	245	148	375
	4	1050	4 x 13	110	110	165	170	170	325	85	87	133	108	161	210	245	148	375

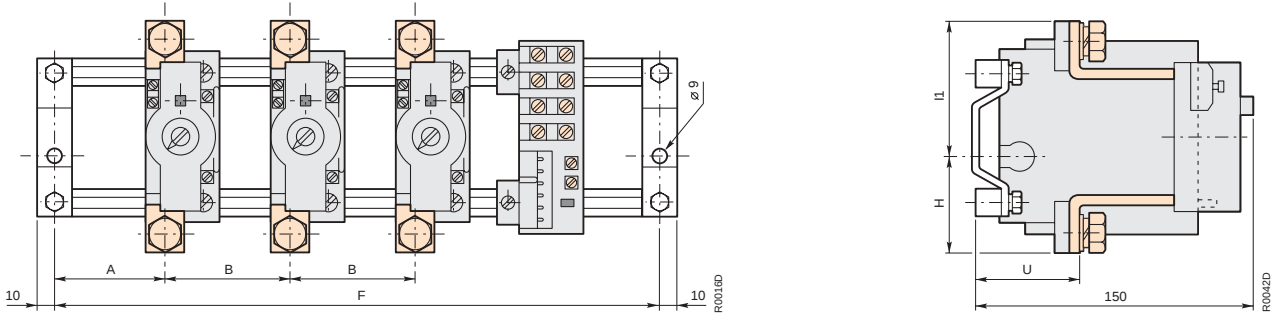
(1) The fixing dimension F is remaining unchanged independently from the number of extra CA 15.. auxiliary contacts. Max. number of auxiliary contacts: -> page 2/7.
 (2) Neutral pole (N): D3 dim. = 77, H dim. = 70, I1dim. = 98. (The Neutral pole is rated 900 A and always mounted on the L.H.S. of the contactor frame.)

RKR.. Thermal Magnetic O/L Relays

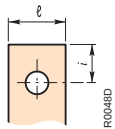
3-Pole, 3-Pole + Neutral or 4-Pole

For a.c. Power Circuits - Ratings 1 ... 250 A

Dimensions (in mm)



Terminal plate details



Fixing - Dimensions - Connecting

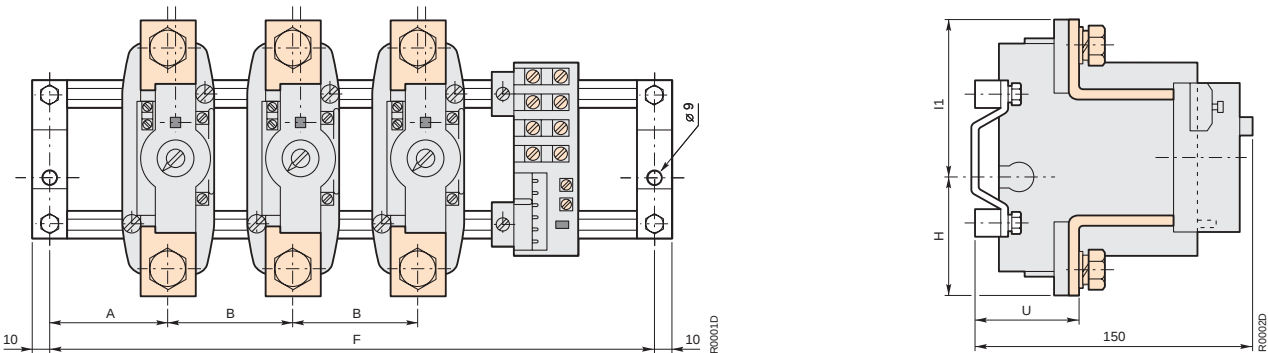
Corresponding contactor rating	Relay I_n rated current (A)	Relay number of poles	Fixing Dim. F	Holes $\varnothing$	A	B	I_1	H	U	i	ℓ	Connections $\varnothing$ Screws
R 85	1 ... 100	3	205		24	46	62	46	63	8	16	M6
		3 ⁽¹⁾	245	2 x 9	64	46	62	46	63	8	16	M6
		4 or 3+N	245		18	46	62	46	63	8	16	M6
R 170	160	3	245		36	51	69	53	63	10	20	M8
		3 ⁽¹⁾	285	2 x 9	87	51	69	53	63	10	20	M8
		4 or 3+N	285		36	51	69	53	63	10	20	M8
R 260	250	3	285		48	54.5	72.5	56.5	63	11	25	M10
		3 ⁽¹⁾	345	2 x 9	102.5	54.5	72.5	56.5	63	11	25	M10
		4 or 3+N	345		48	54.5	72.5	56.5	63	11	25	M10

Notes :

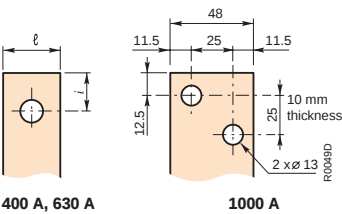
- (1) 3-pole O/L relay used in conjunction with a 4-pole contactor: the 3 protection blocks of the relay are aligned with the 3 main poles to the R.H.S. of the contactor. It is therefore advisable that the L.H.S. main pole of the contactor is used for the Neutral.
- The rating of the Neutral pole of the 3-pole + Neutral O/L relay is one size below to that one of the phases. Consequently the appropriate I_1 and H dimensions as well as flat connection terminal dimensions resulting from its derating should be noted.
- The fixing dimension F of the O/L relay corresponds with the fixing dimension F of the IOR contactor (500 V a.c.) of a same rating (without extra auxiliary contact) with which it is associated. Subject to an extra price and longer delivery, dimension F may differ, choosing from the standard F dimensions. The positioning of the O/L relay protection blocks does not change (B dim.).
Example:
3-pole O/L relay, type **RKR 3 AKDM 316** with fixing dim. **F = 245 mm**, and 3-pole contactor **IOR 170-30** (without extra auxiliary contact) with fixing dim. **F = 245 mm** (see page 8/2).
In the event this contactor would be equipped with two CA 15.. extra auxiliary contacts the fixing dim. **F = 345 mm** and if required the O/L relay fixing dim. F might be increased accordingly, also the O/L relay protection blocks might be aligned with the contactor main poles for easy cabling; **please consult us**.
Fixing dimensions for contactor types **IOR**, **IORR**, **IORE** and **IORC** can differ. Please refer to the corresponding pages in this section of the catalogue.

RKR.. Thermal Magnetic O/L Relays
3-Pole, 3-Pole + Neutral or 4-Pole
For a.c. Power Circuits - Ratings 400 ... 1000 A

Dimensions (in mm)



Terminal plate details



Fixing - Dimensions - Connecting													
Corresponding contactor rating	Relay I _n rated current (A)	Relay number of poles	Fixing Dim. F	Holes Ø	A	B	I ₁	H	U	i	ℓ	Connections Ø Screws	Holes (no thread)
R 420	400	3	345	2 x 9	53	60	74	58	59.5	12.5	32	M10	—
		3 ⁽¹⁾	385		113	60	74	58	59.5	12.5	32	M10	—
		4 ou 3+N	385		53	60	74	58	59.5	12.5	32	M10	—
R 550	630	3	385	2 x 9	62	68	82	66	61.5	15	40	M12	—
		3 ⁽¹⁾	445		130	68	82	66	61.5	15	40	M12	—
		4 ou 3+N	445		62	68	82	66	61.5	15	40	M12	—
R 800/R 1000	1000	3	385	2 x 9	60	70	99	83	63.5	—	—	—	2 x ø13
		3 ⁽¹⁾	540		130	70	99	83	63.5	—	—	—	2 x ø13
		4 ou 3+N	540		60	70	99	83	63.5	—	—	—	2 x ø13

Notes :

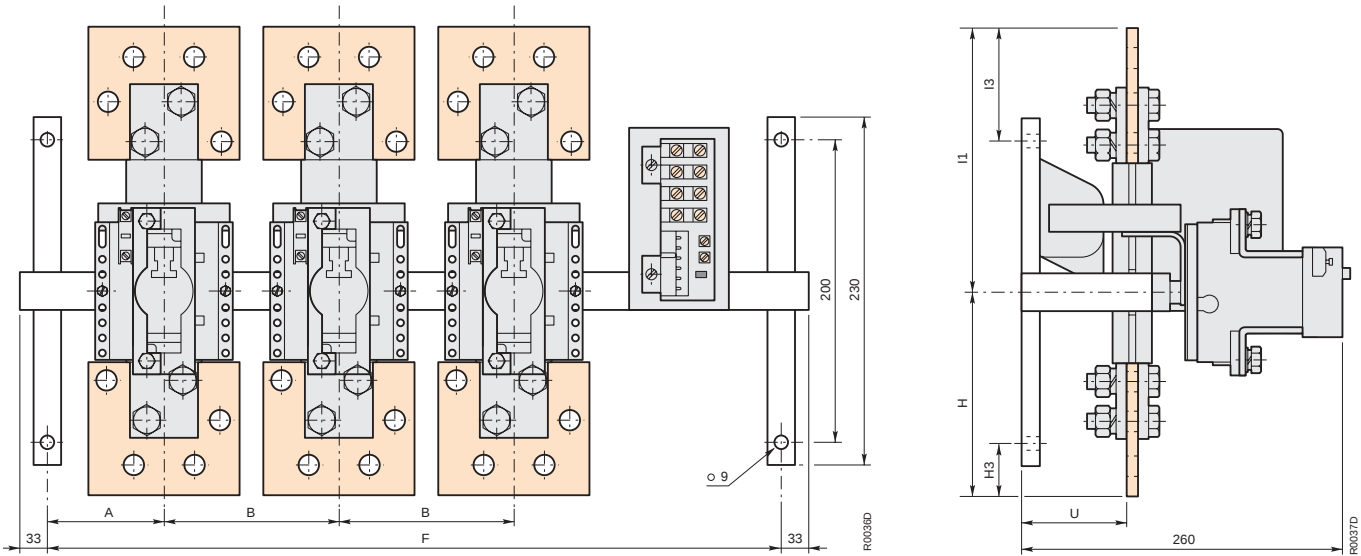
- (1) 3-pole O/L relay used in conjunction with a 4-pole contactor: the 3 protection blocks of the relay are aligned with the 3 main poles to the R.H.S. of the contactor. It is therefore advisable that the L.H.S. main pole of the contactor is used for the Neutral.
- The rating of the Neutral pole of the 3-pole + Neutral O/L relay is one size below to that one of the phases. Consequently the appropriate I₁ and H dimensions as well as terminal plate dimensions resulting from its derating should be noted.
- The fixing dimension F of the O/L relay corresponds with the fixing dimension F of the IOR contactor (500 V a.c.) of a same rating (without extra auxiliary contact) with which it is associated. Subject to an extra price and longer delivery, dimension F may differ, choosing from the standard F dimensions. The positioning of the O/L relay protection blocks does not change (B dim.).
Example:
3-pole O/L relay, type RKR 3 ANDM 363 with fixing dim. F = 385 mm, and 3-pole contactor IOR 550-30 (without extra auxiliary contact) with fixing dim. F = 385 mm (→ page 8/2).
In the event this contactor would be equipped with two CA 15.. extra auxiliary contacts the fixing dim. F = 445 mm and if required the O/L relay fixing dim. F might be increased accordingly, also the O/L relay protection blocks might be aligned with the contactor main poles for easy cabling; please consult us.
Fixing dimensions for contactor types IOR, IORR, IORE and IORC can differ. Please refer to the corresponding pages in this section of the catalogue.

RKR.. Thermal Magnetic O/L Relays

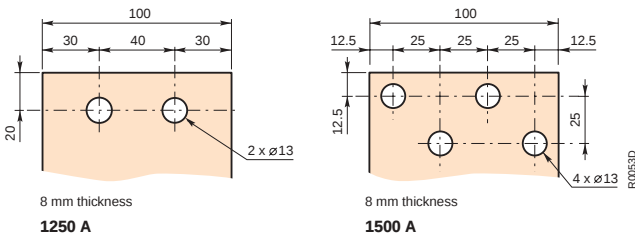
3-Pole

For a.c. Power Circuits - Ratings 1250 A and 1500 A

Dimensions (in mm)



Terminal plate details



Fixing - Dimensions - Connecting

Corresponding contactor rating	Relay I_n rated current (A)	Relay number of poles	Fixing Dim. F	Holes Ø	A	B	H	H ₃	I ₁	I ₃	U
R 1250	1250	3	540	2 x 9	85	120	135	35	175	75	77
R 1500	1500	3	540	2 x 9	85	120	145	45	185	85	77

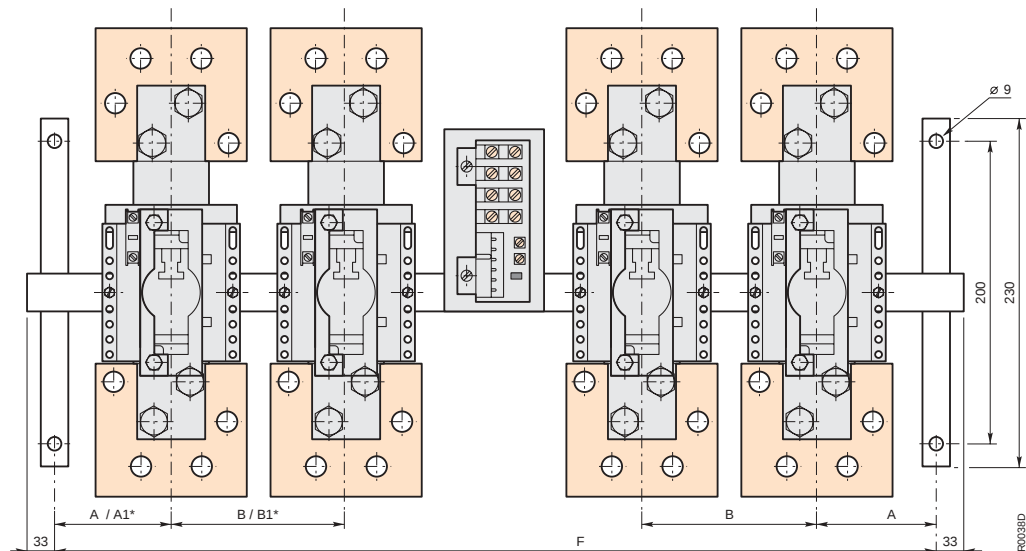
Note:
The fixing dimension **F** of the O/L relay corresponds with the fixing dimension **F** of the **IORR** contactor (500 V a.c. - without extra auxiliary contact) with which it is associated. Subject to an extra price and longer delivery, dimension **F** may differ, choosing from the standard **F** dimensions. The positioning of the O/L relay protection blocks does not change (**B** dim.).
Example:
3-pole O/L relay, type **RKR 3 CDRM 415** with fixing dim. **F = 540 mm**, and 3-pole contactor **IORR 1500-30** (without extra auxiliary contact) with fixing dim. **F = 540 mm** (page 8/5).
In the event this contactor would be equipped with four CA 15.. extra auxiliary contacts the fixing dim. **F = 635 mm** and if required the O/L relay fixing dim. **F** might be increased accordingly, also the O/L relay protection blocks might be aligned with the contactor main poles for easy cabling; **please consult us**.
Fixing dimensions for contactor types **IOR**, **IORR**, **IORE** and **IORC** can differ. Please refer to the corresponding pages in this section of the catalogue.

RKR.. Thermal Magnetic O/L Relays

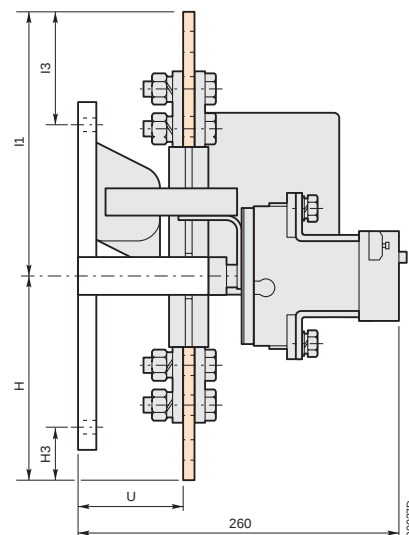
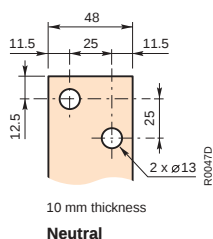
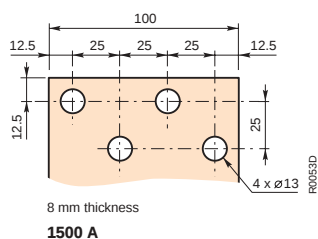
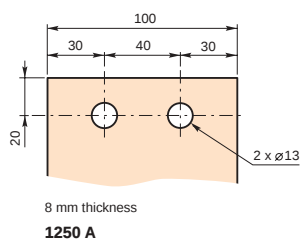
3-Pole + Neutral or 4-Pole

For a.c. Power Circuits - Ratings 1250 A and 1500 A

Dimensions (in mm)



Terminal plate details



Fixing - Dimensions - Connecting

Corresponding contactor rating	Relay I _n rated current (A)	Relay number of poles	Fixing Dim. F	Holes Ø
R 1250	1250	3 + N	760	4 x 9
		4	760	4 x 9
R 1500	1500	3 + N	760	4 x 9
		4	760	4 x 9

A (1)	A ₁	B (1)	B ₁	H (1)	H ₃ (1)	I ₁ (1)	I ₃ (1)	U (1)
85	60	120	95	135	35	175	75	77
85	—	120	—	135	35	175	75	77
85	60	120	95	145	45	185	85	77
85	—	120	—	145	45	185	85	77

(1) **Neutral pole (N):** replace dim. A with A₁ - replace dim. B with B₁ - dim. H = 91 - dim. I₁ = 91 - dim. U = 158.5 - dim. H₃ and I₃ are not applicable.
(The Neutral pole is rated 1000 A and always mounted on the L.H.S. of the O/L relay frame.)

Note:

The fixing dimension **F** of the O/L relay corresponds with the fixing dimension **F** of the **IORR** contactor (500 V a.c. - without extra auxiliary contact) with which it is associated. Subject to an extra price and longer delivery, dimension **F** may differ, choosing from the standard **F** dimensions. The positioning of the O/L relay protection blocks does not change (B dim.). Example:

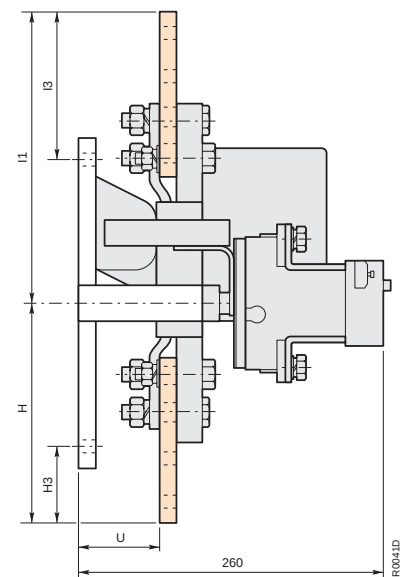
4-pole O/L relay, type **RKR 4 CSTM 415** with fixing dim. **F = 760 mm**, and 4-pole contactor **IORR 1500-40** (without extra auxiliary contact) with fixing dim. **F = 760 mm** (→ page 8/6). In the event this contactor would be equipped with seven CA 15... extra auxiliary contacts the fixing dim. **F = 885 mm** and if required the O/L relay fixing dim. **F** might be increased accordingly, also the O/L relay protection blocks might be aligned with the contactor main poles for easy cabling; **please consult us**.

Fixing dimensions for contactor types **IOR**, **IORR**, **IORE** and **IORC** can differ. Please refer to the corresponding pages in this section of the catalogue.

For a.c. Power Circuits - Ratings 2000 A

Technical drawing of a rectangular plate with the following specifications:

- Overall width: 150
- Overall height: 30
- Thickness: 10 mm
- Material: R0652D
- Hole pattern: 2 rows of 4 holes each (8 holes total).
- Individual hole diameter: $\varnothing 9$
- Row spacing: 8 x $\varnothing 9$
- Column spacing: 30 (between centers of adjacent holes in a row)
- Edge distance: 30 (from the center of a hole to the nearest edge)



Corresponding contactor rating	Relay I _n rated current (A)	Relay number of poles	Fixing Dim. F	Holes Ø	A	B	H	H3	I ₁	I ₃	U
R 2000	2000	3	885	4 x 9	110	170	153	53	203	103	67

Low Voltage Products

For a.c. Power Circuits - Rating 2000 A

Technical drawing of a four-bay mold assembly. The drawing shows four identical mold bays arranged in a row, connected by a central manifold. Each bay contains a central cavity and is surrounded by a cooling jacket. The dimensions and labels are as follows:

- Overall Width:** 33040
- Bay Width:** 33
- Bay Spacing:** 200
- Bay Length:** 230
- Bay Labels:** A / A1*, B / B1*, B, A
- Central Manifold Label:** F

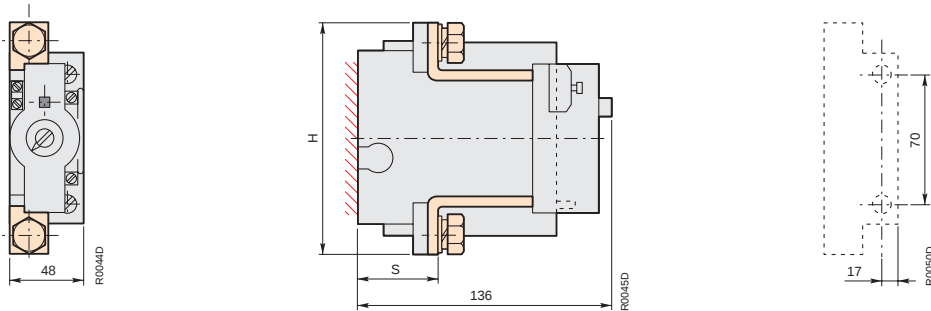
1SBC104112C0201

RCR 1 Magnetic O/L Relay

1-Pole

For d.c. Power Circuits - Ratings 1 ... 1000 A

Dimensions (in mm)

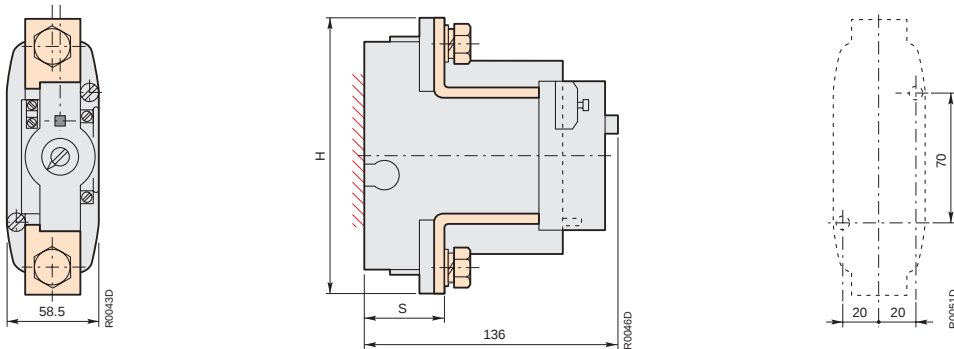
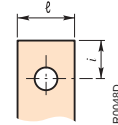


Ratings 1 ... 250 A

Fixing - Dimensions - Connecting

Corresponding contactor rating	Relay I _n rated current (A)	Fixing Ø screws	H	S	i	ℓ	Connections Ø screws
R 85	1 ... 100	2 x M5	103	51.5	8	16	M6
R 170	160	2 x M5	117	51.5	10	20	M8
R 260	250	2 x M5	124	51.5	11	25	M10

Terminal plate details

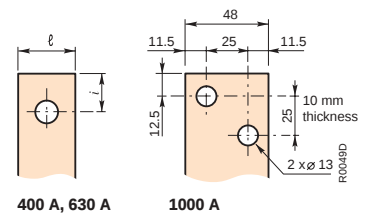


Ratings 400 ... 1000 A

Fixing - Dimensions - Connecting

Corresponding contactor rating	Relay I _n rated current (A)	Fixing Ø screws	H	S	i	ℓ	Connections Ø screws Holes (no thread)
R 420	400	2 x M5	132	48	12.5	32	M10 —
R 550	630	2 x M5	148	50	15	40	M12 —
R 1500-CC	1000	2 x M5	182	52	—	—	— 2 x Ø13

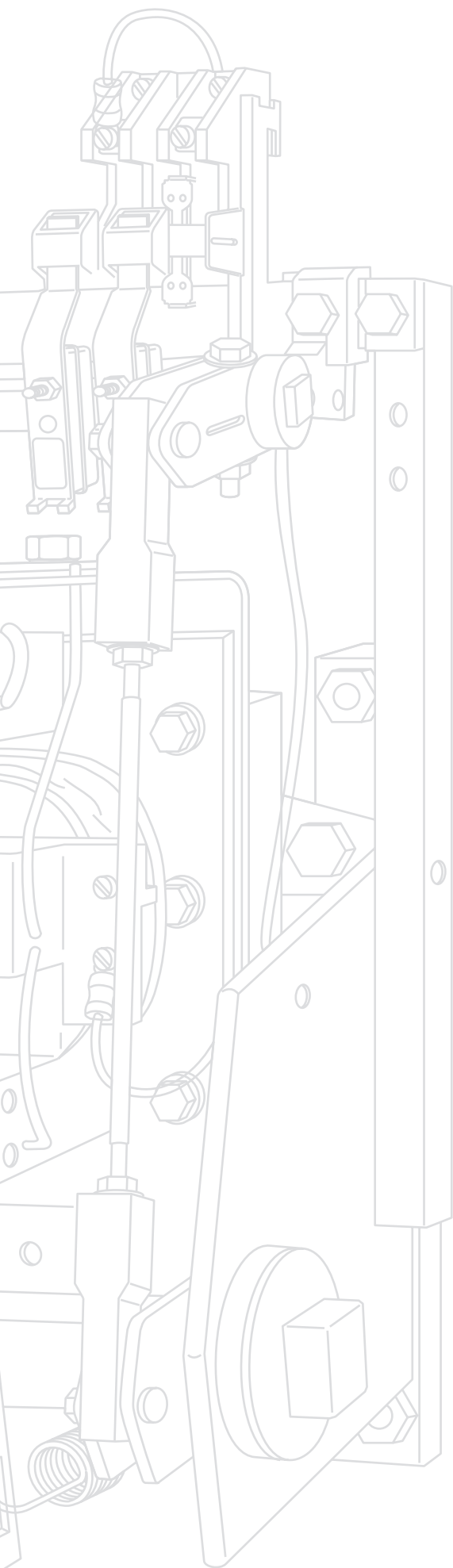
Terminal plate details



Notes



Horizontal lines for writing notes.



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Low Voltage Worldwide

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NOR..-CC	Contactor - N.C. + N.O. poles 1000/1500 V d.c., without mechanical overlap - a.c. operated	consult us
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NORE..-CC-AME	Mechanically Latched Contactor - N.C. + N.O. poles 1000/1500 V d.c., without mechanical overlap - d.c. operated (with economy resistor)	consult us
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NORE..-MT-AME	Mechanically Latched Contactor - N.C. + N.O. poles 1000 V a.c., without mechanical overlap - d.c. operated (with economy resistor)	consult us
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NORE..-MT-AMF	Mechanically Latched Contactor - N.C. + N.O. poles 1000 V a.c., without mechanical overlap - d.c. operated - 2 tripping coils	consult us
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Designation: Technical Data

Section/page : see table below (characteristic classification)

C (suite)

Types	Ratings	Characteristics				
	A	General	Mounting	Connecting	Poles	Electro-magnet
Standard Contactors						
IOR, RR, RE, RC - 500 V a.c.	< 800 A	2/28	2/28	2/28	2/30	2/32, 2/34
	≥ 800 A	2/29	2/29	2/29	2/31	2/33, 2/35
IOR, RR, RE, RC-MT - 1000 V a.c.	< 800 A	2/36	2/36	2/36	2/38	2/40, 2/42
	≥ 800 A	2/37	2/37	2/37	2/39	2/41, 2/43
NOR, RR, RE - 500 V a.c.	≤ 800 A	2/44	2/44	2/44	2/45	2/46, 2/47
NOR, RR, RE-MT - 1000 V a.c.	≤ 800 A	= 2/44	= 2/44	= 2/44	= 2/38	= 2/46, 2/47
JOR, RR, RE, RC - 230/500 V a.c.	≤ 800 A	2/44	2/44	2/44	2/45	2/46, 2/47
IOR, RR, RE, RC - 440 V d.c.	< 800 A	2/28	2/28	2/28	2/48	2/32, 2/34
NOR, RR, RE - 440 V d.c.	< 800 A	2/44	2/44	2/44	2/49	2/46, 2/47
IOR, RR, RE, RC-CC - 1000/1500 V d.c.	< 800 A	2/50	2/50	2/50	2/52	= 2/40, 2/42
	≥ 800 A	2/51	2/51	2/51	Consult us	= 2/41, 2/43
NOR, RR, RE-CC - 1000/1500 V d.c.	≤ 800 A	= 2/50, 2/51	= 2/50, 2/51	= 2/50, 2/51	2/53	= 2/46, 2/47
Magnetically Latched Contactors						
IOR, RR-AMA - 500 V a.c.	< 800 A	= 2/28	= 2/28	= 2/28	= 2/30*	Consult us
IOR, RR-MT-AMA - 1000 V a.c.	< 800 A	= 2/36	= 2/36	= 2/36	= 2/38*	Consult us
NOR, RR-AMA - 500 V a.c.	< 800 A	= 2/44	= 2/44	= 2/44	= 2/45*	Consult us
NOR, RR-MT-AMA - 1000 V a.c.	< 800 A	= 2/44	= 2/44	= 2/44	= 2/38*	Consult us
JOR, RR-AMA - 230/500 V a.c.	< 800 A	= 2/44	= 2/44	= 2/44	= 2/45*	Consult us
IOR, RR-AMA - 440 V d.c.	< 800 A	= 2/28	= 2/28	= 2/28	= 2/48*	Consult us
NOR, RR-AMA - 440 V d.c.	< 800 A	= 2/44	= 2/44	= 2/44	= 2/49*	Consult us
IOR, RR-CC-AMA - 1000/1500 V d.c.	< 800 A	= 2/50	= 2/50	= 2/50	= 2/52*	Consult us
NOR, RR-CC-AMA - 1000/1500 V d.c.	< 800 A	= 2/50	= 2/50	= 2/50	= 2/53*	Consult us
* Except for mechanical durability = 0.2 millions of operating cycles						
Mechanically Latched Contactors						
IOR, RR, RE-AME - 500 V a.c.	< 800 A	= 2/28	= 2/28	= 2/28	= 2/30*	Consult us
	≥ 800 A	= 2/29	= 2/29	= 2/29	= 2/31*	Consult us
IOR, RR, RE-MT-AME - 1000 V a.c.	< 800 A	= 2/36	= 2/36	= 2/36	= 2/38*	Consult us
	≥ 800 A	= 2/37	= 2/37	= 2/37	= 2/39*	Consult us
NOR, RR, RE-AME - 500 V a.c.	≤ 800 A	= 2/44	= 2/44	= 2/44	= 2/45*	Consult us
NOR, RR, RE-MT-AME - 1000 V a.c.	≤ 800 A	= 2/44	= 2/44	= 2/44	= 2/38*	Consult us
JOR, RR, RE-AME - 230/500 V a.c.	≤ 800 A	= 2/44	= 2/44	= 2/44	= 2/45*	Consult us
IOR, RR, RE-AME - 440 V d.c.	< 800 A	= 2/28	= 2/28	= 2/28	= 2/48*	Consult us
NOR, RR, RE-AME - 440 V d.c.	< 800 A	= 2/44	= 2/44	= 2/44	= 2/49*	Consult us
IOR, RR, RE-CC-AME - 1000/1500 V d.c.	< 800 A	= 2/50	= 2/50	= 2/50	= 2/52*	Consult us
	≥ 800 A	= 2/51	= 2/51	= 2/51	Consult us	Consult us
NOR, RR, RE-CC-AME - 1000/1500 V d.c.	≤ 800 A	= 2/50, 2/51	= 2/50, 2/51	= 2/50, 2/51	= 2/53*	Consult us
* Except for mechanical durability = 0.2 millions of operating cycles						
Couplers						
LOR, RR, RE, RC - 1000 V a.c./d.c.	< 800 A	5/8	5/8	5/8	5/10	5/12, 5/14
	≥ 800 A	5/9	5/9	5/9	5/11	5/13, 5/15
LOR, RR-AMA - 1000 V a.c./d.c.	< 800 A	= 5/8	= 5/8	= 5/8	= 5/10*	Consult us
LOR, RR, RE-AME - 1000 V a.c./d.c.	< 800 A	= 5/8	= 5/8	= 5/8	= 5/10*	Consult us
	≥ 800 A	= 5/9	= 5/9	= 5/9	= 5/11*	Consult us
* Except for mechanical durability = 0.2 millions of operating cycles						

When the figure = precede the number
the indicated pages correspond to other types, but their characteristics are the same of those required.

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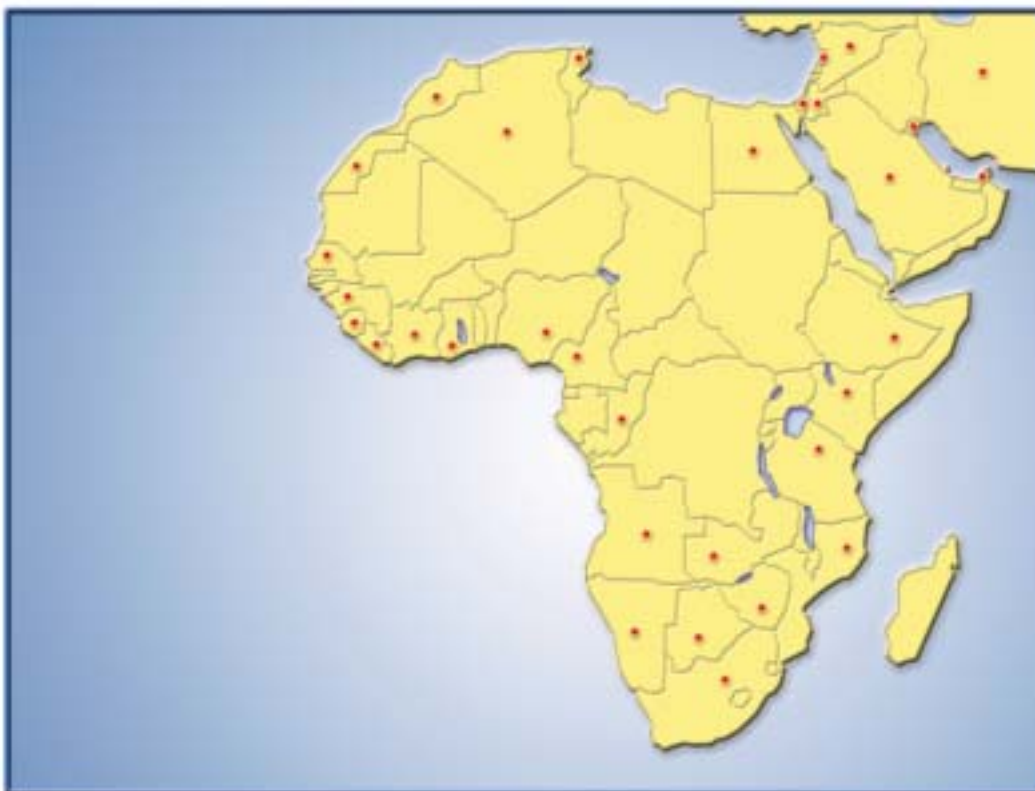
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For non listed countries, please use the nearest Sales Contact.

Notes



Handwriting practice lines consisting of multiple horizontal lines for writing.

Notes





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