



Block Contactors
Overload Relays
Specific Contactors
Mini Contactors
Contactor Relays

3-pole a.c. Circuit Switching

Motor Protection

4-pole a.c. Circuit Switching

d.c. Circuit Switching

Specific Applications



Contents

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ABB Website

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Overview

Block Contactors and Motor Protection

3-pole
a.c. Circuit
Switching



3-pole Contactors

2

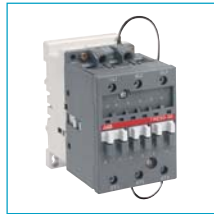
Control circuit	Ratings (AC-3, 400 V)	Types	Pages
a.c. operated	9 ... 110 A	A...	2/6
a.c. operated	145 ... 305 A	A...	2/10
a.c. / d.c. operated	400 ... 1050 A	AF...	2/10



3-pole Contactors

2

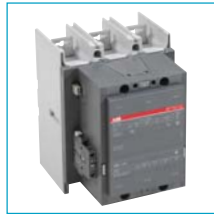
Control circuit	Ratings (AC-3, 400 V)	Types	Pages
d.c. operated, low consumption coil	9 ... 37 A	AL..., AL..Z	2/14
d.c. operated, large voltage range	9 ... 37 A	TAL...	2/16



3-pole Contactors

2

Control circuit	Ratings (AC-3, 400 V)	Types	Pages
d.c. operated, standard voltage range	50 ... 110 A	AE...	2/14
d.c. operated, large voltage range	50 ... 110 A	TAE...	2/16



3-pole Contactors

2

Control circuit	Ratings (AC-3, 400 V)	Types	Pages
a.c. / d.c. operated (electronic coil interface) and wide voltage range	50 ... 110 A	AF...	2/18
	145 ... 1050 A	AF...	2/20

Motor
Protection



3-pole Manual Motor Starters

5

	Setting ranges	Types	Pages
Thermal and electromagnetic protection	0.16 ... 100 A	MS...	5/1



3-pole Overload Relays

5

	Setting ranges	Types	Pages
Thermal O/L Relays	0.1 ... 310 A	TA ... DU	5/1
Electronic O/L Relays	0.1 ... 18.9 A	E 16 DU	5/1
Electronic O/L Relays	60 ... 1250 A	E... DU	5/1

Block Contactors

4-pole
a.c. Circuit
Switching



4-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
a.c. operated	25 ... 125 A	A...	2/22



4-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
a.c. operated	200 ... 1000 A	EK...	2/24



4-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
d.c. operated, low consumption coil	25 ... 45 A	AL...	2/26
d.c. operated, large voltage range	25 ... 45 A	TAL...	2/28



4-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
d.c. operated, standard voltage range	70 ... 125 A	AE...	2/26
d.c. operated, large voltage range	70 ... 125 A	TAE...	2/28



4-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
d.c. operated	200 ... 1000 A	EK...	2/30



4-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
a.c. / d.c. operated (electronic coil interface) and wide voltage range	70 ... 125 A	AF...	2/31

Overview


Contactors for Specific Applications

3-phase Capacitor Switching



3-pole Contactors for Capacitor Switching



2

Control circuit		\hat{I} peak current	Types	Pages
a.c. operated		Unlimited	UA..RA	2/35
a.c. operated		$\leq 100 \times \hat{I}$ rms current	UA...	2/39

Standard 3-pole Contactors

2





Control circuit	 	\hat{I} peak current	Types	Pages
a.c. operated		$\leq 30 \times \hat{I}$ rms current	A...	2/43
a.c. / d.c. operated			AF...	2/43

d.c. Circuit Switching



Contactors for d.c. Switching




2

Control circuit	 	Main pole	Types	Pages
a.c. operated		1-pole	GA...	2/44
d.c. operated		1-pole	GAE...	2/44

Standard Contactors

2





Control circuit	  	Main poles	Types	Pages
a.c. operated		3 and 4-pole	A...	2/60
a.c. / d.c. operated (electronic coil interface)		3 and 4-pole	AF...	2/60
d.c. operated		3 and 4-pole	AL..., AE...	2/60

Standard Contactors

2




Control circuit	 	Main poles	Types	Pages
a.c. operated		4-pole	EK...	2/62
d.c. operated		4-pole	EK...	2/62

Switching with Magnetical Latching



Magnetically Latched Contactors

2

Control circuit		Main poles	Types	Pages
d.c. operated		3xNO	AM...	2/46
		2xNO + 2xNC	AM...	2/46

Contactors for Specific Applications

Non Inductive Loads



3-pole Contactors

Control circuit	Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
a.c. operated	1200 A	EH 1200	2/48
d.c. operated	1200 A	EH 1200	2/48

Star-Delta Starting



Main, Star and Delta Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3-pole	A...	2/50
a.c. / d.c. operated (electronic coil interface)	3-pole	AF...	2/50

3-phase Slip-Ring Motor Control



Stator, Rotor Short-circuit and Acceleration Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3-pole	A...	2/52
a.c. / d.c. operated (electronic coil interface)	3-pole	AF...	2/53
d.c. operated	3-pole	AL..., AE...	2/53

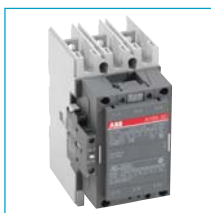
Autotransformer Starting



Line, Autotransformer and Star Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3-pole	A...	2/54
a.c. / d.c. operated (electronic coil interface)	3-pole	AF...	2/54
d.c. operated	3-pole	AL..., AE...	2/54

3-phase Transformer Switching



Line Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3-pole	A...	2/55
a.c. / d.c. operated (electronic coil interface)	3-pole	AF...	2/55
d.c. operated	3-pole	AL..., AE...	2/55

Lighting Circuit Switching



Line Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3 and 4-pole	A...	2/56
a.c. / d.c. operated (electronic coil interface)	3 and 4-pole	AF...	2/56
d.c. operated	3 and 4-pole	AL..., AE...	2/56


Overview

Mini Contactors and Motor Protection

3-pole
a.c. Circuit
Switching




3-pole Mini Contactors

Control circuit		Ratings (AC-3, 400 V)	Types	Pages
a.c. operated		9 A 12 A	B 6 B 7	6/2 6/2
d.c. operated		9 A 12 A	BC 6 BC 7	6/2 6/2

6




3-pole Mini Contactors

Control circuit		Ratings (AC-3, 400 V)	Types	Pages
d.c. operated with large voltage range		12 A	TBC 7	6/7

6




Compact Reversing Contactors with Interlocking

Control circuit		Ratings (AC-3, 400 V)	Types	Pages
a.c. operated		9 A 12 A	VB 6 VB 7	6/3 6/3
d.c. operated		9 A 12 A	VBC 6 VBC 7	6/3 6/3

6



Compact Reversing Contactors with Safety Interlocking

Control circuit		Ratings (AC-3, 400 V)	Types	Pages
a.c. operated		9 A 12 A	VB 6A VB 7A	6/4 6/4
d.c. operated		9 A 12 A	VBC 6A VBC 7A	6/4 6/4

6

Motor
Protection



3-pole Overload Relays


	Setting ranges	Types	Pages
Thermal O/L Relay	0.1 ... 12 A	T7 DU	5/5
Electronic O/L Relay	0.1 ... 18.9 A	E 16 DU	5/11

6

4-pole
a.c. Circuit
Switching



4-pole Mini Contactors

Control circuit		Ratings (AC-1, $\theta \leq 40^\circ\text{C}$)	Types	Pages
a.c. operated		16 A 20 A	B 6 B 7	6/2 6/2

6

Mini Contactors for Specific Applications

6

d.c.
Circuit
Switching



Mini Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3 and 4-pole	B 6	6/11
	3 and 4-pole	B 7	6/11
d.c. operated	3 and 4-pole	BC 6	6/11
	3 and 4-pole	BC 7	6/11

6



Compact Reversing Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3-pole	VB 6	6/11
	3-pole	VB 7	6/11
d.c. operated	3-pole	VBC 6	6/11
	3-pole	VBC 7	6/11

6

Lighting
Circuit
Switching



Mini Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3 and 4-pole	B 6	6/13
	3 and 4-pole	B 7	6/13
d.c. operated	3 and 4-pole	BC 6	6/13
	3 and 4-pole	BC 7	6/13

6



Compact Reversing Contactors

Control circuit	Main poles	Types	Pages
a.c. operated	3-pole	VB 6	6/13
	3-pole	VB 7	6/13
d.c. operated	3-pole	VBC 6	6/13
	3-pole	VBC 7	6/13

6

Interface



Interface Mini Contactors

Control circuit	Main poles	Types	Pages
d.c. operated	3-pole	BC 6	6/5
	3-pole	BC 7	6/5

6

PLC's Output



Mini Contactors for PLC's output

Control circuit	Main poles	Types	Pages
d.c. operated	3-pole	B6 S	6/5
	3-pole	B7 S	6/5

Overview

Contactor Relays and Mini Contactor Relays

Control
Circuit
Switching



Contactor Relays

3

Control circuit		Poles	Types	Pages
a.c. operated		4 and 8-pole	N...	3/4



Contactor Relays

3

Control circuit		Poles	Types	Pages
d.c. operated, low consumption coil		4 and 8-pole	NL..., NL Z	3/6



Contactor Relays

3

Control circuit		Poles	Types	Pages
d.c. operated, large voltage range		4 and 8-pole	TNL...	3/6

Control
Circuit
Switching



Mini Contactor Relays

6

Control circuit		Poles	Types	Pages
a.c. operated		4-pole	K 6...	6/6
d.c. operated		4-pole	KC 6...	6/6



Interface Mini Contactor Relays

6

Control circuit		Poles	Types	Pages
d.c. operated, standard voltage range		4-pole	KC 6...	6/6
d.c. operated, large voltage range		4-pole	TKC 6...	6/7



Mini Contactor Relays for PLC's Output

6

Control circuit		Poles	Types	Pages
d.c. operated		4-pole	K6 S...	6/6

Low Voltage Products

A complete range of products
to fit all your needs in many applications:

@ Industrial Control & Automation

Control Products

Connection Devices

Switches & Fusegear

Switchgear Systems

LOW VOLT/LV Drives

LV Motors

A complete range of products to fit all your needs in many applications.

- Industrial Control & Automation: Connecting, controlling, automating, protecting, and improving machines and equipment
- Installation and Commissioning: Safety and compliance: easy-to-use jobs by licensed electricians to connect appliances, lighting, and heating

@ Installation & Distribution

Modular DIN Rail Devices

Intelligent Installation Systems

Wiring Accessories

Industrial Plugs & Sockets

Enclosure & Cable Systems

Network Quality

Circuit Breakers



abb.com/lowvoltage

Selection of ABB contactor for AC-3 or AC-4 utilization categories

Please select the contactor and read the technical data or find a contactor according to the following data:
 - Voltage and current.
 - Expected electrical durability and current. In AC-4, the durability takes into account the breaking current ($I_c = 6 \times I_e$).
 The rated power is calculated for 4-pole squirrel-cage motor.

Contactor type: **A 9/AL 9**

AC-3 $T_a \leq 55^\circ\text{C}$	240 V	9	I_e [A]	25	TAXXXDU
	400 V	9		2,2	Pd [W]
	440 V	9		16	
	500 V	7		0,1	EXXXDU
	690 V	2,2		7	d [W]
Ue	240 V	4	e [kW]	9	I_n [A]
	400 V	4		9	
	440 V	5,5		30	
				44	$I_{e \leq 440\text{V}}$

AC-3 n=3 x10⁶
 n=2 x10⁶
 n=1 x10⁶
 n=0,5x10⁶

Selection of ABB contactor for AC-1 utilization category

Please select the contactor and read the technical data or you can find a contactor according to the following data:
 - Maximum temperature and current.
 - Expected electrical durability and current.

Contactor type: **A9**

3-4	I_n [A]
25	
690	V
Ue max	4
S	25
	m ²

Selection of ABB contactor for capacitor switching

In Low Voltage industrial installations, capacitors are mainly used for reactive energy correction (raising the power factor). When these capacitors are energized, "inrush current peaks" occur through the installation devices.

This program allows the calculation of these peaks and gives the references of the ABB contactors according to the installation specifications.

This calculation is valid for 1 or several banks.

Consult CAPCAL OnLine (select single or several steps below)	or	DOWNLOAD it. Click HERE to save the application on your computer
<p>Single step</p>	or	<p>Several steps</p>
For several capacitor banks, the control can be:		
Step by Step	The closing of the contactors is always in the same order. Only the last contactor has to withstand the highest current peak.	
Circular	The succession of the contactor closing is done by the control system. Each contactor can withstand the highest peak.	


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Selection of ABB contactor according to lamp technology

Please select the power and the number of lamps per phase that the contactor can control and read the type of available contactors

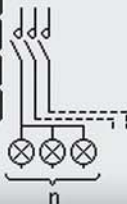
Contactor type: **A 9/AL 9**



AC-5a

Pe	n
20 W	40
40 W	33
65 W	21
80 W	18
100 W	13
110 W	12


V = 220 / 240 V
Ta ≤ 55 °C



Selection of ABB contactor for AC-6a utilization category

The peak of current due to the magnetization phenomena is roughly 20 to 30 times the transformer nominal current. Please select the contactor and read technical data or find a contactor according to rated power of transformer. Then verify if the possible peak of current is in line with the current peak from the transformer. The selection is valid for a maximum switching frequency of 60 operating cycles per hour.


Contactor type: **A 9/AL 9**



AC-6a

Ue	Pe [kVA]
240 V	4
400 V	7
440 V	8
500 V	9,5
690 V	12,5
	330

≤ 60 n/h



Ip [A]

ABB Questionnaire for Product Specifications: Block Contactors

Customer:
 Contact person:
 Tel:
 Project: e-mail:
 ABB correspondent:
 Contact person:
 Tel:
 Date: e-mail:

APPLICATION

Type of load: No of phases:
 Utilization category (AC / DC): % AC4 if any:
 Voltage Un: V Cos φ: frequency:
 L/R: ms
 Nominal current In: A Breaking current:
 Making current: A
 Duty: continuous - temporary - intermittent
 Load factor (% of ON time):
 Number of cycles per hour: or per year:
 Expected durability: cycles
 Number of main poles NO: NC:
 Other information:

CONTROL CIRCUIT

Coil voltage: V DC / AC f = Hz
 Minimum / maximum: V to V
 Surge suppressor: type:
 Interface with PLC:
 Accessories:
 Number of auxiliary contacts: NO: NC:
 Low level contacts:
PROTECTION

Short circuit protection:
 Type: fuse - circuit breaker - MMS
 Max short circuit current: A
 Motor protection: overload relay - MMS

LOGISTIC AND PACKAGING

Quantity by batch:
 Delivery order:

APPROVALS AND OTHER REQUIREMENTS

Reference standards:
 Customer approvals:
 Shock and vibrations:
 Expected quantity:
 Expected first delivery date: and City: per Year
 Quantity on first 6 month: On first year:
 Specific quality assurance clauses:
 Other comments:

This document is used to define the contactor specifications according to the complete information on the application
 ABB Entrellec - Control Division - France
 DQ01036 rev 1

Above tools are available on the ABB Website for selection of the contactors, for the usual utilization categories according to IEC 60947-4-1.

For other utilization categories, or specific applications, a questionnaire for product specifications is also available in this catalogue (see last page of section 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.

However, for some countries and some ship certification and classification organizations, certification is compulsory. In this case, the mark (or logo) of the given organization figures on the devices if so required.

Files pertaining to certifications and approvals obtained are available on request.

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

Environmental information is accessible on ABB Website. www.abb.com/sustainability

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.

Industrial^{IT}

We have committed to the largest program of development and innovation in our corporate history to help our customers focus on productivity and profits.

We cordially invite you to share ABB's vision for a new era of power, automation, and information solutions dedicated to making our customers more productive and profitable in the age of eCommerce!

www.abb.com/lowvoltage - select: **Industrial^{IT}**.

Contact Directory

The ABB Contact Directory helps you find local contacts for ABB products in your country.

www.abb.com/contacts