AMKASYN
Product Description
Main Contactor

Version: 2023/25
Part no.: 203422
Translation of the "Original Dokumentation"

AMKmotion
MEMBER OF THE ARBURG FAMILY

Notes on this document

Name: PDK_203422_AMKASYN_Hauptschuetz_en

Version:

Version	Change	Initials
2023/25	• AMKmotion Design	LeS

Prev. Version: 2017/04

Product version:

Product	Firmware version (Part no.)	Hardware version (Part no.)
Contactor 25A		204297
Contactor 45A		204298
Contactor 80A		29297
Contactor 90A		29298
Contactor 230A		200446
EMI Suppressor		29300
Aux. Contact		204300

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For fast and reliable troubleshooting, you can help us by informing our Customer Service about the following:

- Type plate data for each unit
- Software version
- Device configuration and application
- Type of fault/problem and suspected cause
- Diagnostic messages (error messages)

E-mail service@amk-motion.com

Internet address: www.amk-motion.com

Content

1 For your safety

1.1 Classes of hazard

Safety and warning messages are graduated into classes of hazard (according to ANSI Z535). The class of hazard defines the potential risk of harm and is described by a single word, if the safety information is ignored. The signal word is followed by a safety alert symbol (ISO 3864, DIN EN ISO 7010). In accordance with ANSI Z535, the following signal words are used to define the class of hazard.

Safety alert symbol and signal word	Class of hazard and its meaning
⚠ DANGER	DANGER indicates a hazardous situation which, if not avoided, **will** result in death or serious injury
⚠ WARNING	WARNING indicates a hazardous situation which, if not avoided, **could** result in death or serious injury
⚠ CAUTION	CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, **could** result in minor or moderate injury
NOTICE	NOTICE is used to address preventions to avoid material damage, but not related to personal injury.

1.2 General safety instructions

- The electricity, mechanical movements and high temperatures in electrical drive systems present hazards that can result in fatal injuries and material damage. These hazards are present while starting up and operating the unit, and also during servicing or maintenance work.
- Personnel must have read and understood the safety instructions before installing and operating the unit. In the documentation included with the product, the usage warnings pertain to direct hazards and must therefore be followed directly when operating or handling the unit by the operator.
- Compliance with all of the instructions given in the documentation included with the product will ensure safe and fault-free operation of the unit and is a prerequisite for asserting warranty claims.
- AMK Arnold Müller GmbH & Co. KG shall not be held liable for any damages ensuing from using the unit in a manner contrary to the intended use, from faulty installation or from using the unit beyond the specified operating characteristics and conditions.
- Do not start the system in which the AMK products are installed (begin of intended use) until you can determine that all relevant standards, laws and directives have been complied with.

1.3 Intended use-

The main contactor has been designed for installation in a closed, well-sized switch cabinet, which provides protection against direct contact acc. to EN 50178.

1.4 Requirements for the personnel and their qualification

Only authorised and qualified personnel may work on and with the AMKmotion drive systems.

Specialised personnel must:

- Perform mechanical and electrical work that is described in this documentation, such as mounting and connecting
- Observe all information in the documentation accompanying the product in order to work with the product safely and in an error-free manner
- Understand and know hazards that occur when handling the product
- Know connections and functions of the system
- Be familiar with the control concept in order to operate the drive system
- Be authorised to switch circuits and devices on and off, earth and label them
- Observe local specific safety requirements

1.5 Five safety rules

In particular on drive systems, the instructions pertaining to safety and the following five safety rules have to be kept in the specified sequence:

1. Switch off electrical circuits (also electronic and auxiliary circuits).
2. Secure against being switched on again.
3. Determine that there is no voltage.
4. Ground and short circuit.
5. Cover or close off neighboring parts that are under voltage.

Reverse the measures taken in reverse order after completing the work.

2 Product overview

2.1 Product description

A contactor is used for switching circuits. The externally installed control voltage on the solenoid coil closes and opens the switch contacts.

The solenoid coil causes a disruptive voltage peaks that need to be removed by an EMI suppressor.

The current switch status of the contactor is signalled via an auxiliary contact.

2.2 Product name and ordering data

Product name	AMK part no.
Contactor 25A 3P 600V	204297
Contactor 45A 3P 600V	204298
Contactor 80A 3P 600V	29297
Contactor 90A 3P 600V	29298
Contactor 230A 3P 600V	200446
EMI suppressor	29300
Auxiliary contacts	204300

2.3 Delivery

- Please check whether the delivered parts correspond with the delivery note. If the delivery is incomplete, please contact your nearest AMK representative.
- Check the components for signs of transport damage after their arrival. Do not install and operate any damaged components.
- If there is any transport damage, immediately inform the delivering freight carrier and inform your AMK representative.

2.4 Technical data

Designation	25A 3P 600V	45A 3P 600V	80A 3P 600V
Nominal current	25 A	45 A	80 A
Operating voltage	600 V		
Control voltage coil	20.4 V ... 26.4 V		
Power coil Triggering / Holding	16 W / 1.7 W		200 W / 4 W
Weight / kg	0,32	0,40	1,02
Dimensions / mm W x D x H	45 x 77 x 86	(45 + 12) x 86 x 86	82 x 108 x 110
Protection class	IP 20	IP 20	IP 10
AMK parts no. contactor	204297	204298	29297
AMK parts no. EMI suppressor	not necessary	not necessary	29300
AMK parts no. auxiliary contact	integrated	204300	part of contactor

Designation	90A 3P 600V	230A 3P 600V
Nominal current	90 A	230 A
Operating voltage	600 V	
Control voltage coil	20.4 V ... 26.4 V	
Power coil Triggering / Holding	200 W / 4 W	500 W / 2 W
Weight / kg	1,02	3,22
Dimensions / mm W x D x H	82 x 108 x 110	118 x 160 x 196
Protection class	IP 10	IP 00
AMK parts no. contactor	29298	200446
AMK parts no. EMI suppressor	29300	not necessary
AMK parts no. auxiliary contact	part of contactor	part of contactor

3 Transport, storing, environment, maintenance, disposal

3.1 Transport

- Transport the device in its original packaging and use shock-absorbing padding.
- Protect the device against condensation and prevent sudden changes in temperature and humidity.

3.2 Storing

- Store the device in its original packaging.
- Store the device in a clean and dry location where it is protected against weather conditions.
- Protect the device against condensation and prevent sudden changes in temperature and humidity.
- Protect the device against salt fog, industrial fumes, corroding liquids, vermin and mildew.

3.3 Environmental conditions

NOTICE	
Material Damage!	**Short circuit due to penetrating foreign objects or water** Foreign objects such as metal shavings, screws, etc. cause short circuits. In particular it needs to be prevented that water, e.g. condensation water, seeps in through the cooling units. A temporary forming of dew may only occur as long as the devices are out of operation. **Steps to prevent:** • The modules need to be protected against penetrating foreign objects or water. • When applying mains voltage, no dew may be present any longer.

Storage/Shipping temperature:	- 40 °C to +70 °C
Ambient temperature in operation:	- 40 °C to +55 °C
Installation altitude:	≤ 3000 m above sea level.
Climatic conditions:	according to IEC 60068-2-30

3.4 Maintenance

- The device does not require any maintenance.

3.5 Disposal

Clarify with your local waste disposal company which materials and chemicals need to be separated and how to dispose of them. Observe the local regulations for disposal.

Examples of materials to be disposed of separately:

Components

- Electronic scrap, e. g., encoder electronics
- Iron scrap
- Aluminium
- Non-ferrous metal, e. g., motor windings
- Insulating materials

Chemicals

- Oils (disposal as hazardous waste, in acc. with the pertinent legislation; in Germany, the Waste Oil Ordinance (AltölV) applies)
- Grease
- Solvents
- Paint residue
- Coolant

4 Assembly

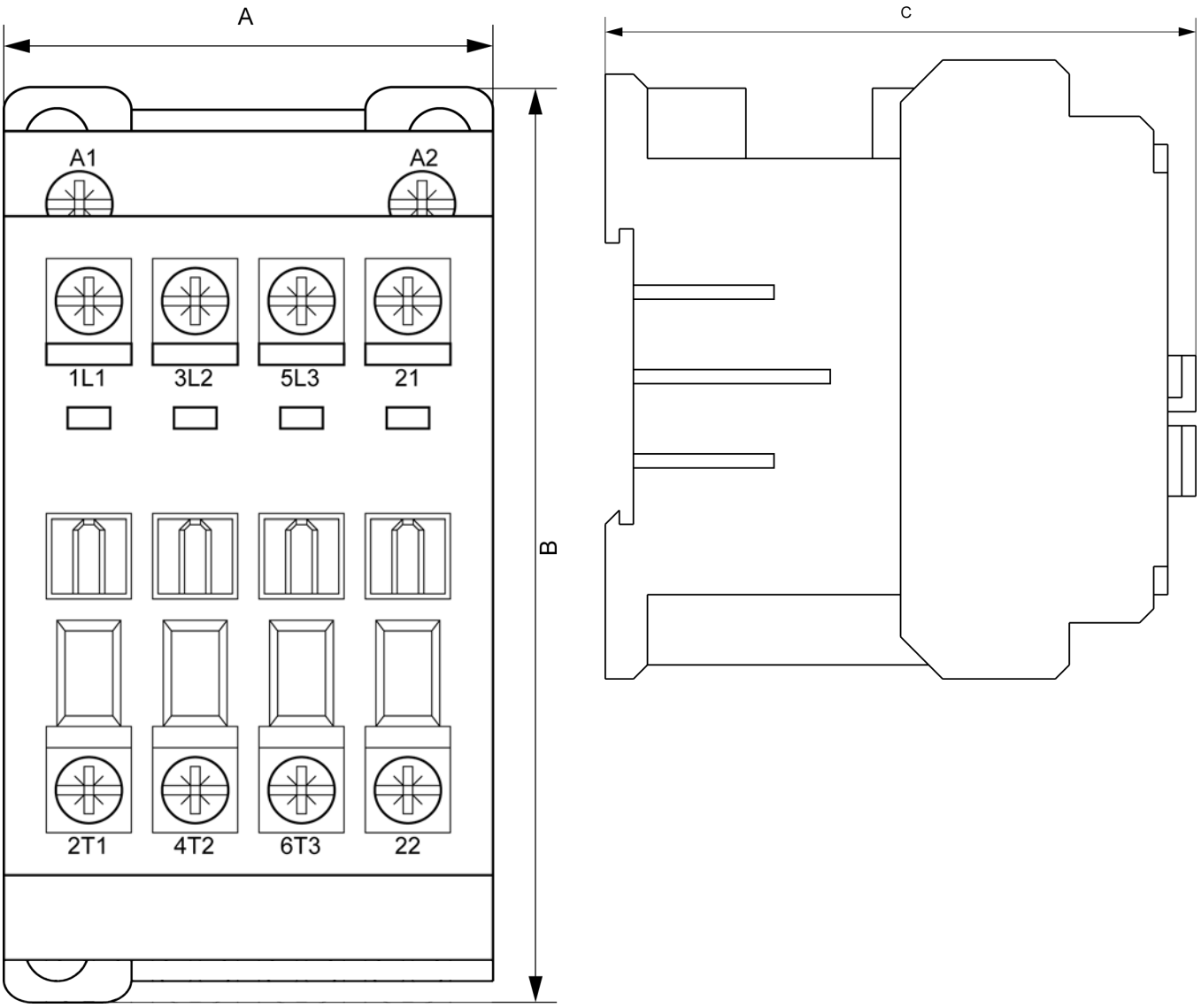
4.1 Avoiding material damage

NOTICE	
Material Damage!	**Electronic components could be destroyed through static discharge!** Therefore touching of the electrical connections (e. g. signal and power supply cable) must be avoided. Otherwise you can be damaged the components when touching by static discharge. **Steps to prevent:** • Avoid touching electrical connections and contacts. • During handling the electronic component discharge yourself by touching PE. • Pay attention to the ESD-notes (electrostatic discharge).

NOTICE	
Material Damage!	**Short circuit due to penetrating foreign objects or water** Foreign objects such as metal shavings, screws, etc. cause short circuits. In particular it needs to be prevented that water, e.g. condensation water, seeps in through the cooling units. A temporary forming of dew may only occur as long as the devices are out of operation. **Steps to prevent:** • The modules need to be protected against penetrating foreign objects or water. • When applying mains voltage, no dew may be present any longer.

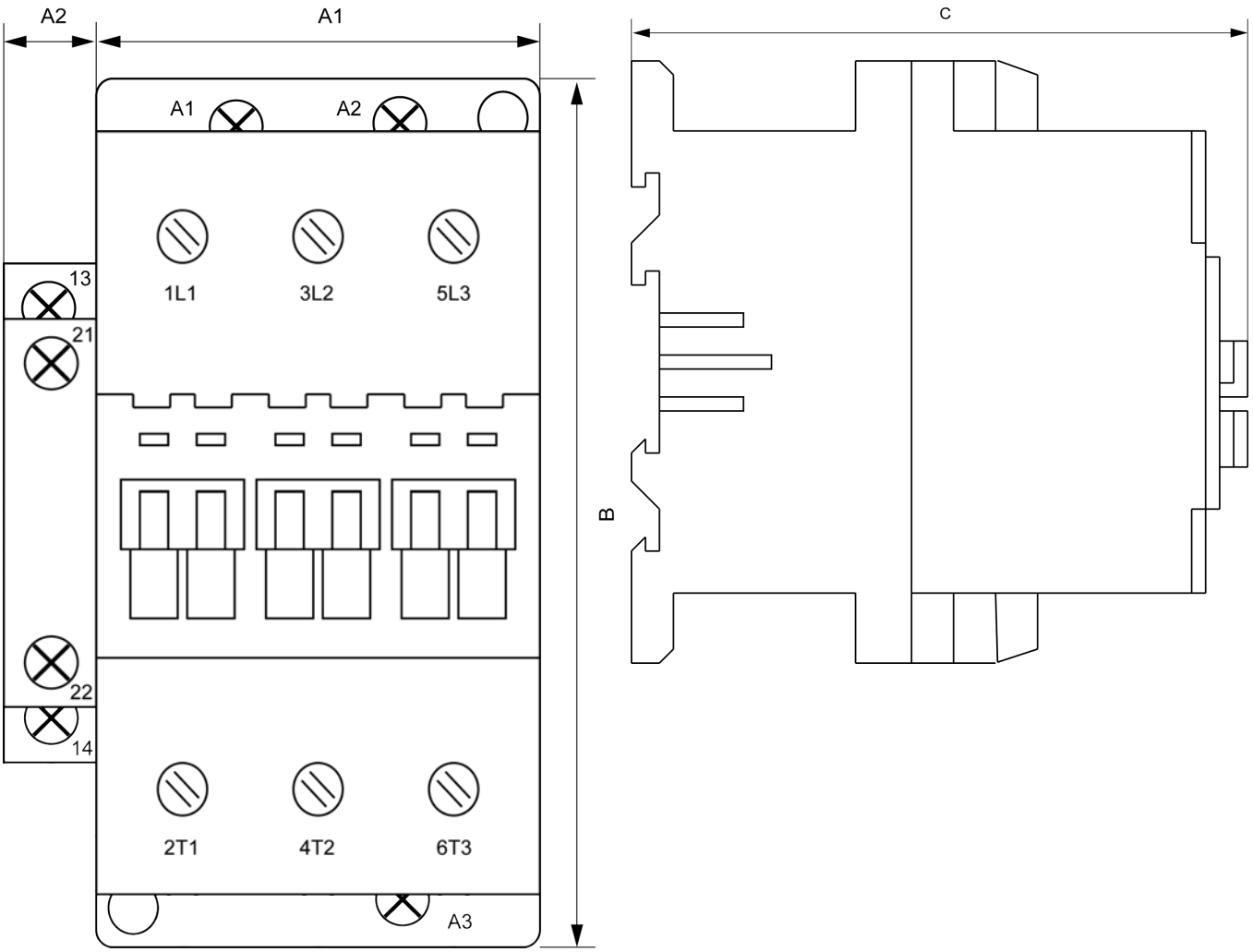
4.2 Dimensions

Contactor 25A (AMK part no. 204297):



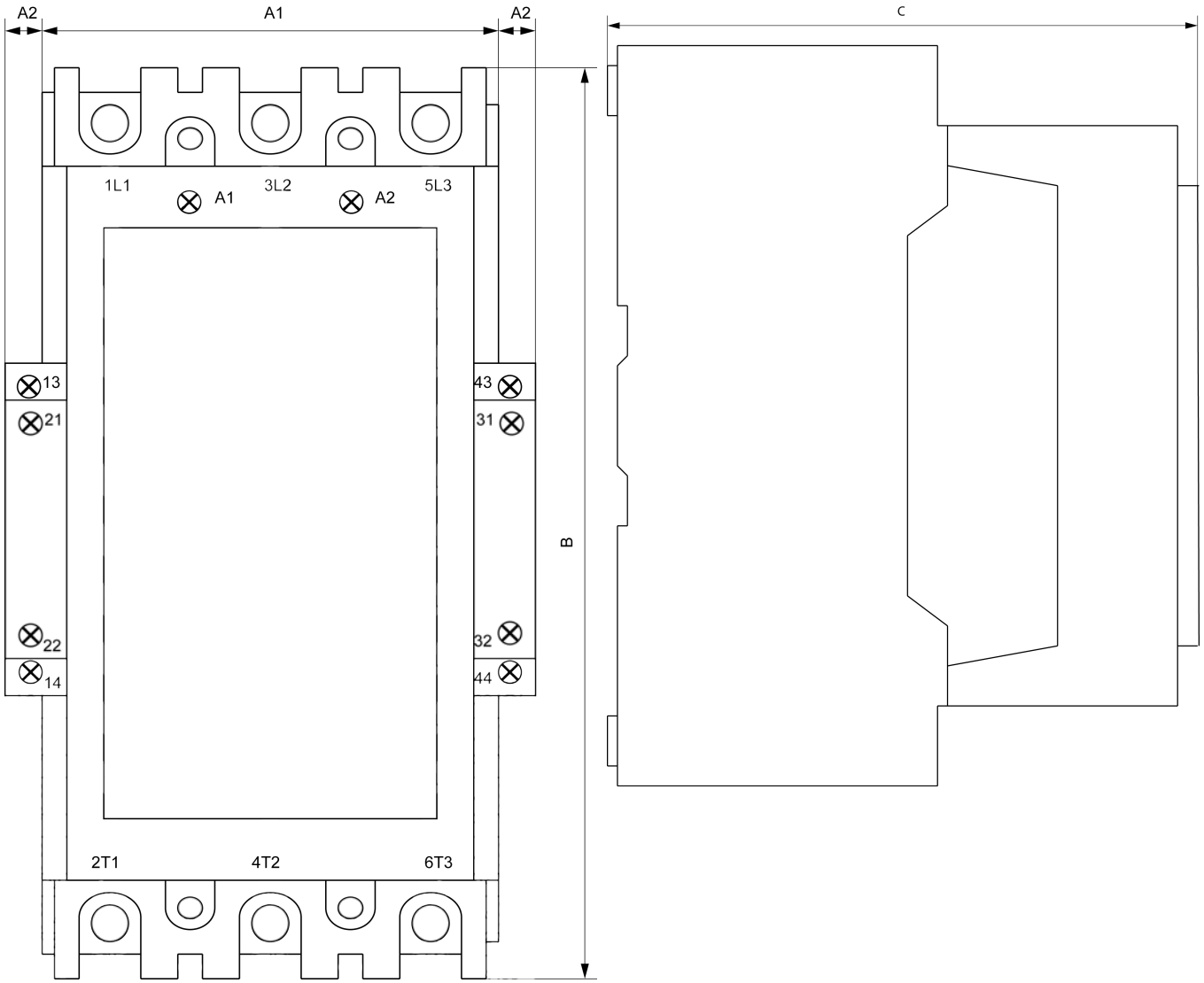
Contactor	25A
AMK part no.	204297
A / mm	45
B / mm	86
C / mm	77

Contactor 45A (AMK part no. 200593)
Contactor 80A (AMK part no. 29297)
Contactor 90A (AMK part no. 29298):



Contactor	45A	80A	90A
AMK part no.	204298	29297	29298
A1 / mm	45	70	70
A2 / mm	12	12	12
B / mm	86	110	110
C / mm	86	108	108

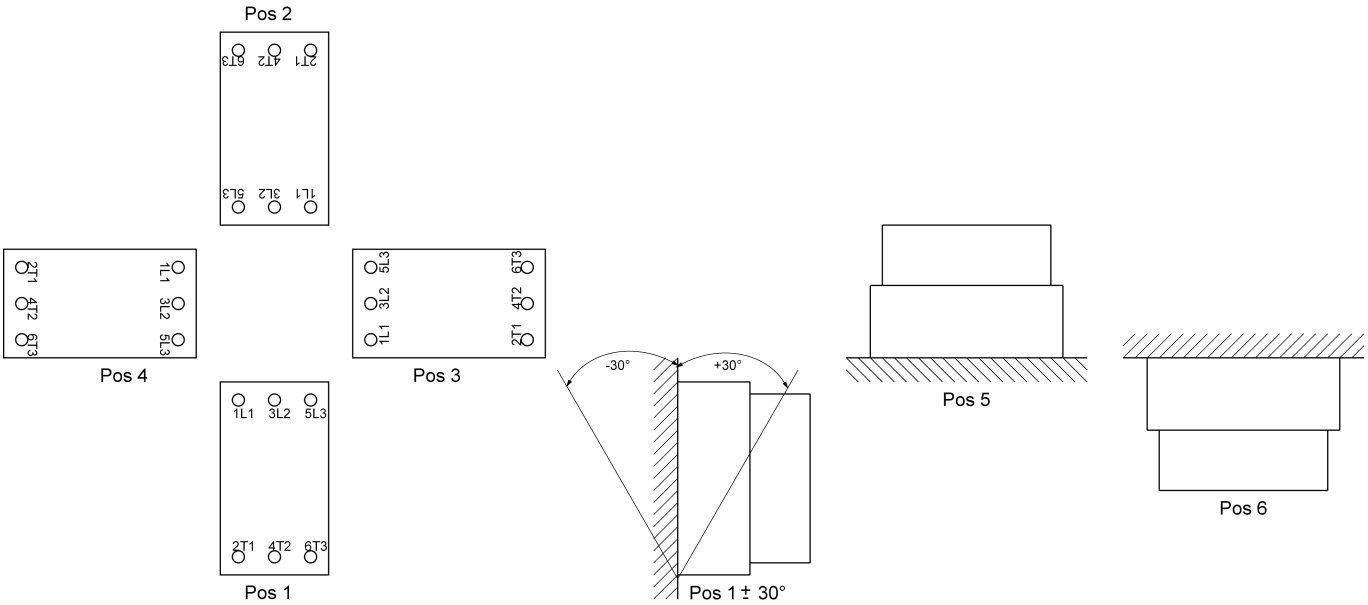
Contactor 230A (AMK part no. 200446):



Contactor	230A
AMK part no.	200446
A1 / mm	105
A2 / mm	6,5
B / mm	196
C / mm	160

4.3 Installation position

The various main contactor types can be built in in the following installation positions:



	25A 3P 600V	45A 3P 600V	80A 3P 600V	90A 3P 600V	230A 3P 600V
AMK part no.	204297	204298	29297	29298	200446
Pos 1	■	■	■	■	■
Pos 1 ±30°	■	■	■	■	■
Pos 2	■	■	■	■	■
Pos 3	■	■	■	■	■
Pos 4	■	■	■	■	■
Pos 5	■	■	■	■	■
Pos 6	not permitted				

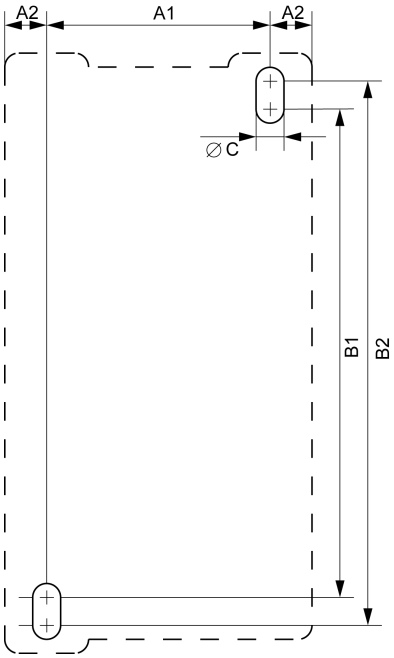
4.4 Mounting

The various main contactor types can be mounted in the following ways:

	25A	45A	80A	90A	230A
AMK part no.	204297	204298	29297	29298	200446
Top hat rail 35 mm (EN 5022)	■	■	■	■	-
Top hat rail 75 mm (EN50023)	-	-	■	■	-
Mounting plate	■	■	■	■	■

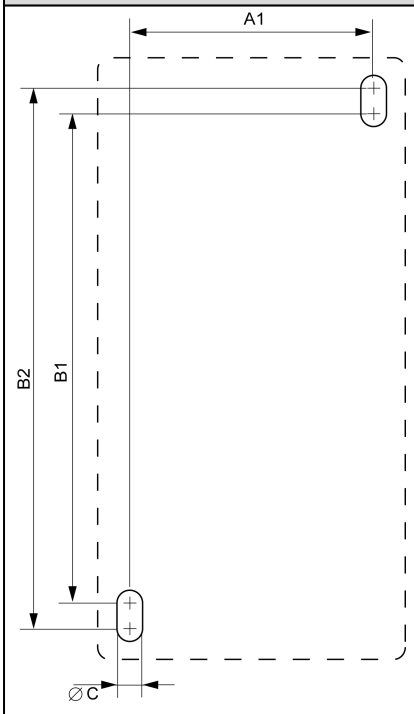
4.4.1 Drilling template for fixing on mounting plate

21 A (AMK part no. 200591)
40 A (AMK part no. 200593)



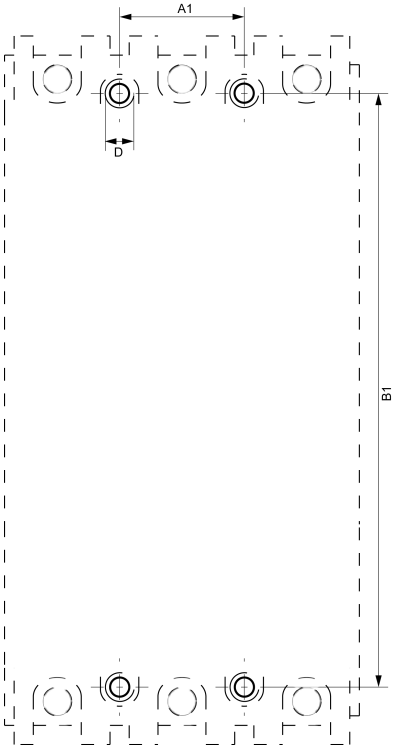
Contactor	25A	45A
A1 / mm	35	35
A2 / mm	4,5	4,5
B1 / mm	60	60
B2 / mm	70	70
C / mm	4,5	4,5

80 A (AMK part no. 29297)
90 A (AMK part no. 29298)



Contactor	80A	90A
A1 / mm	60	60
B1 / mm	90	90
B2 / mm	100	100
C / mm	6,2	6,2

230 A (AMK part no. 200446)



Contactor	230A
A1 / mm	35
B1 / mm	165
D	M5

4.5 Tightening torque

The following table lists the tightening torques for the mechanical fastening of the main contactors on the mounting plate.

	25A	45A	80A	90A	230A
AMK part no.	204297	204298	29297	29298	200446
Diameter	M4	M4	M6	M6	M5
Tightening torque / Nm	1.4	1.4	4.6	4.6	2.9

5 Electrical connections

5.1 For your safety

⚠ DANGER	
	**Danger to life from touching electrical connections!** Electrical terminals and connectors carry voltages that may cause death or serious injury upon contact. **Steps to prevent:** • Prior to any work on the device: Observe the 5 safety rules. • Measure the terminal voltages. There may be no voltage present. • Plug and pull connections only when there is no voltage. • For devices that are connected to a DC bus, or generate it yourself, you need to consider the discharge times of the dc bus capacitors mentioned in the converter documentation • Before commencing work, the connections must be isolated from the voltage supply at both ends! (both ends mean: AC and DC bus supply side)

5.2 Avoiding material damage

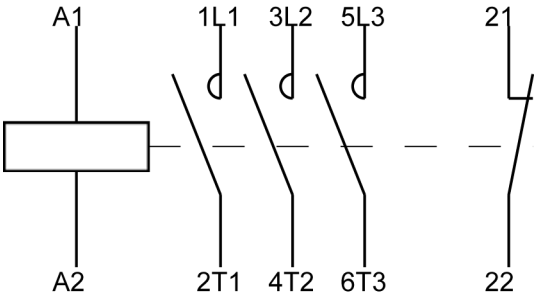
NOTICE	
Material Damage!	**Electronic components could be destroyed through static discharge!** Therefore touching of the electrical connections (e. g. signal and power supply cable) must be avoided. Otherwise you can be damaged the components when touching by static discharge. **Steps to prevent:** • Avoid touching electrical connections and contacts. • During handling the electronic component discharge yourself by touching PE. • Pay attention to the ESD-notes (electrostatic discharge).

NOTICE	
Material Damage!	**Observe the tightening torques.** Note the tightening torques specified in the documentation for screw connections and screw terminals, otherwise the conductivity and the security of the connection are not ensured.

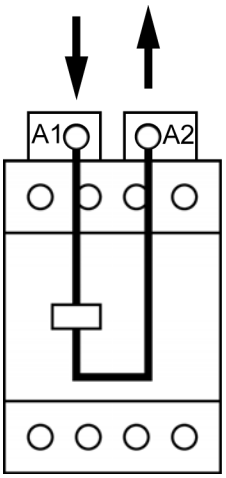
5.3 Circuitry

Contactor 25A (AMK part no. 200591)
Contactor 45A (AMK part no. 200593) with auxiliary contact (204300):

Contacts:

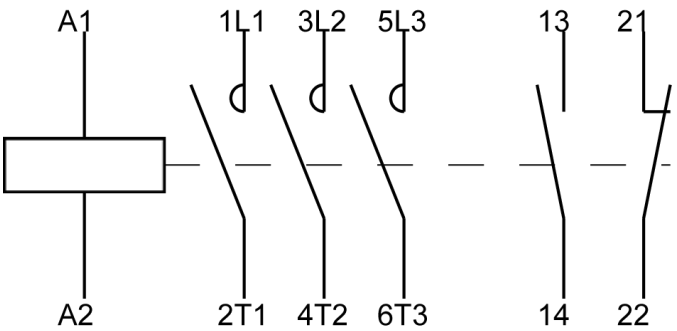


Connection of the control voltage:

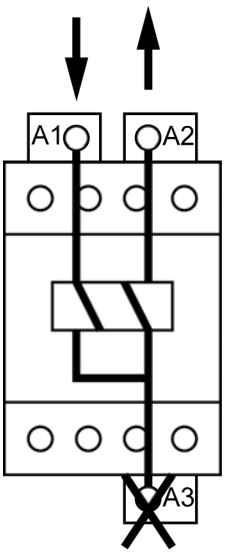


Contactor 80A (AMK part no. 29297)
Contactor 90A (AMK part no. 29298):

Contacts:

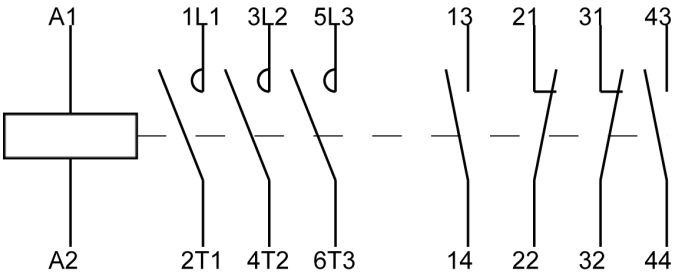


Connection of the control voltage:

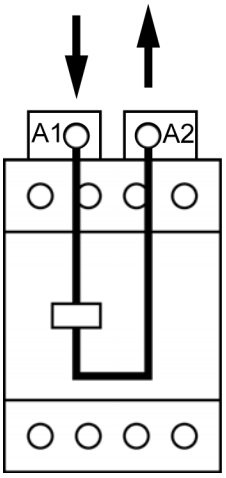


Contactor 230A (AMK part no. 200446):

Contacts:



Connection of the control voltage:



5.4 Main contacts

⚠ DANGER	
	**Danger to life from touching electrical connections!** Electrical terminals and connectors carry voltages that may cause death or serious injury upon contact. **Steps to prevent:** • Prior to any work on the device: Observe the 5 safety rules. • Measure the terminal voltages. There may be no voltage present. • Plug and pull connections only when there is no voltage. • For devices that are connected to a DC bus, or generate it yourself, you need to consider the discharge times of the dc bus capacitors mentioned in the converter documentation • Before commencing work, the connections must be isolated from the voltage supply at both ends! (both ends mean: AC and DC bus supply side)

Description:

Main contacts

Technical data:

- Mains voltage: 3 x 400 V, 50/60 Hz (symmetric three-phase power supply)

Version:

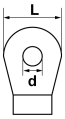
Type	Pins
Screw terminal	3

Assignment:

Designation	Connection
1L1	Mains-side terminal phase L1
3L2	Mains-side terminal phase L2
5L3	Mains-side terminal phase L3
2T1	Load-side terminal phase L1
4T2	Load-side terminal phase L2
6T3	Load-side terminal phase L3

Connection:

Module	25A	45A	80A	90A
AMK part no.	204297	204298	29297	29298
Recommended cable type	4-wire, unshielded			
Cable assembly	Wire end ferrule with plastic sheath			
Shield connection	If available, attach on both sides			
Wire cross-section / mm² / AWG	2.5 mm² AWG 12	6 mm² AWG 8	16 mm² AWG 4	35 mm² AWG 2
Tightening torque	1.5 Nm	2.5 Nm	4.0 - 4.5 Nm	4.0 - 4.5 Nm

Module	230A
AMK part no.	200446
Recommended cable type	4-wire, unshielded
Cable assembly	Ring cable lug  d > 8 mm L < 24 mm
Shield connection	If available, attach on both sides
Wire cross-section / mm² / AWG	95 mm² AWG 4/0
Tightening torque	18 - 20 Nm

5.5 Coil contacts

Description:

Control contacts

Technical data:

- Control voltage 24 VDC
  The control voltage for the contactor coil has to be provided externally by the operator.

Version:

Type	Pins
Screw terminal	1

Assignment:

Designation	Connection
A1	Coil terminal
A2	Coil terminal

Connection:

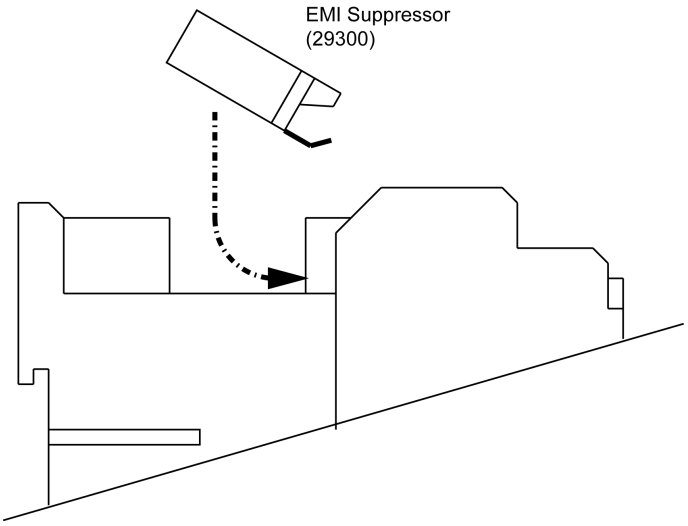
Module	25A	45A	80A	90A
AMK part no.	200591	200593	29297	29298
Recommended cable type	2-wire, unshielded			
Cable assembly	Wire end ferrule with plastic sheath			
Wire cross-section / mm² / AWG	1 mm² AWG 16	1 mm² AWG 16	2.5 mm² AWG 12	2.5 mm² AWG 12
Tightening torque	1.2 Nm	1.2 Nm	1.0 - 1.2 Nm	1.0 - 1.2 Nm

Module	230A
AMK part no.	200446
Recommended cable type	2-wire, unshielded
Cable assembly	Wire end ferrule with plastic sheath
Wire cross-section / mm² / AWG	2.5 mm² AWG 12
Tightening torque	1.0 - 1.2 Nm

5.5.1 Mounting of EMI suppressor

For the main contactors with a nominal current of 80 - 90 A, an EMI suppressor (AMK part no. 29300) needs to be implemented parallel to the contacts of the control voltage.

The EMI suppressor is snapped-in at the top of the contactor in the cutout opening behind the control voltage contacts.



5.6 Auxiliary contacts

Description:

Auxiliary contacts

For the contactor type 25A (204297), the auxiliary contacts are integrated in the contactor.
The contactor types 80 A (29297), 90 A (29298) and 230 A (200446) contain external auxiliary contacts.
The contactor 45A (204298) needs additional external auxiliary contacts (204300).

Technical data:

- Auxiliary voltage: 24 - 690 VAC, 24 - 250 VDC

Version:

Type	Pins
Screw terminal	1

Assignment:

Designation	Connection
11 / 12 21 / 22 31 / 32	Terminals of NC contacts (normally closed contacts)
13 / 14 43 / 44	Terminals of NO contacts (normally opened contacts

Connection:

Module	25A	45A	80A	90A
AMK part no.	204297	204297	29297	29298
Recommended cable type	2-wire, unshielded			
Cable assembly	Wire end ferrule with plastic sheath			
Wire cross-section / mm^2 / AWG	1 mm^2 AWG 16	1 mm^2 AWG 16	2.5 mm^2 AWG 12	2.5 mm^2 AWG 12
Tightening torque	1.2 Nm	1.2 Nm	1.0 - 1.2 Nm	1.0 - 1.2 Nm

Module	230A
AMK part no.	200446
Recommended cable type	2-wire, unshielded
Cable assembly	Wire end ferrule with plastic sheath
Wire cross-section / mm^2 / AWG	2.5 mm^2 AWG 12
Tightening torque	1.0 - 1.2 Nm

6 Operation

6.1 Avoiding material damage

NOTICE	
Material Damage!	**Contacts fuse when activated by hand.** Touching the contactor by hand can cause the contacts to fuse. **Steps to prevent:** • Do not activate the contacts by hand.

Your opinion is important!

With our documentation we want to offer you the highest quality support in handling the AMKmotion products.
That is why we are now working on optimizing our documentation.
Your comments or suggestions are always of interest to us.
We would be grateful if you take a bit of time and answer our questions. Please return a copy of this page to us.

e-mail: Documentation@amk-motion.com
or
fax no.: +49 7021/50 05-199

Thank you for your assistance.
Your AMKmotion documentation team

1. How would you rate the layout of our AMKmotion documentation?

   (1) very good (2) good (3) satisfactory (4) less than satisfactory (5) poor

2. Is the content structured well?

   (1) very good (2) good (3) moderate (4) hardly (5) not at all

3. How easy is it to understand the documentation?

   (1) very easy (2) easy (3) moderately easy (4) difficult (5) extremely difficult

4. Did you miss any topics in the documentation?

   (1) no (2) if yes, which ones:

5. How would you rate the overall service at AMKmotion?

   (1) very good (2) good (3) satisfactory (4) less than satisfactory (5) poor

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