

ABB GENERAL PURPOSE DRIVES

Quick installation and start-up guide

ACS580-01 drives (frames R1 to R9)

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List of related manuals in English

Drive manuals and guides	Code (English)
<i>ACS580 standard control program firmware manual</i>	3AXD50000016097
<i>ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual</i>	3AXD50000018826
<i>ACS-AP-X assistance control panels user's manual</i>	3AUA0000085685
Option manuals and guides	
<i>CDPI-01 communication adapter module user's manual</i>	3AXD50000009929
<i>DPMP-01 mounting platform for control panels</i>	3AUA0000100140
<i>DPMP-02/03 mounting platform for control panels</i>	3AUA0000136205
<i>FCAN-01 CANopen adapter module user's manual</i>	3AFE68615500
<i>FCNA-01 ControlNet adapter module user's manual</i>	3AUA0000141650
<i>FDNA-01 DeviceNet™ adapter module user's manual</i>	3AFE68573360
<i>FECA-01 EtherCAT adapter module user's manual</i>	3AUA0000068940
<i>FENA-01/-11/-21 Ethernet adapter module user's manual</i>	3AUA0000095368
<i>FEPL-02 Ethernet POWERLINK adapter module user's manual</i>	3AUA0000123527
<i>FPBA-01 PROFIBUS DP adapter module user's manual</i>	3AFE68573271
<i>FSCA-01 RS485 adapter module user's manual</i>	3AUA0000109533
<i>Flange mounting kit quick installation guide for ACS580-01 frames R0 to R5</i>	3AXD50000036610
<i>Flange mounting kit quick installation guide for ACS580-01 frames R6 to R9</i>	3AXD50000019099
<i>Flange mounting kit installation supplement</i>	3AXD50000019100
Tool and maintenance manuals and guides	
<i>Drive composer PC tool user's manual</i>	3AUA0000094606
<i>Converter module capacitor reforming instructions</i>	3BFE64059629
<i>NETA-21 remote monitoring tool user's manual</i>	3AUA00000969391
<i>NETA-21 remote monitoring tool installation and start-up guide</i>	3AUA0000096881

You can find manuals and other product documents in PDF format on the Internet. See section [Document library on the Internet](#) on the inside of the back cover. For manuals not available in the Document Library, contact your local ABB representative.

The QR code below opens an online listing of the manuals applicable to the product.



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Safety instructions

These are the safety instructions which you must obey when you install and operate the drive and do maintenance on the drive. If you ignore the safety instructions, injury, death or damage can occur.

Use of warnings and notes in this manual

Warnings tell you about conditions which can cause injury or death, or damage to the equipment. They also tell you how to prevent the danger. Notes draw attention to a particular condition or fact, or give information on a subject.

The manual uses these warning symbols:



Electricity warning tells about hazards from electricity which can cause injury or death, or damage to the equipment.



General warning tells about conditions, other than those caused by electricity, which can cause injury or death, or damage to the equipment.



Electrostatic sensitive devices warning tells you about the risk of electrostatic discharge which can cause damage to the equipment.

General safety in installation, start-up and maintenance

These instructions are for all personnel that install the drive and do maintenance work on it.



WARNING! Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur.

- Use safety shoes with a metal toe cap to avoid foot injury. Wear protective gloves and long sleeves. Some parts have sharp edges.
- Handle the drive carefully.
- Frames R5...R9: Lift the drive with a lifting device. Use the lifting eyes of the drive.
- Frames R5...R9: Do not tip the drive over. The drive is heavy and its center of gravity is high. An overturning drive can cause physical injury.

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- Beware of hot surfaces. Some parts, such as heatsinks of power semiconductors, remain hot for a while after disconnection of the electrical supply.
 - Keep the drive in its package prior to installation. Protect the installed drive against dust and burrs. Electrically conductive debris inside the drive may cause damage or malfunction.
 - Clean the area below the drive before start-up to prevent the drive cooling fan from drawing dust inside the drive.
 - Do not cover the air inlet and outlet.
 - Make sure that there is sufficient cooling. See section [Ensure the cooling](#) on page 22, 38 or 50 for more information.
- Before you connect voltage to the drive, make sure that the drive covers are on. Keep the covers on during the operation.
 - Before you adjust the drive operation limits, make sure that the motor and all driven equipment can operate throughout the set operation limits.
 - Before you activate the automatic fault reset or automatic restart functions of the drive control program, make sure that no dangerous situations can occur. These functions reset the drive automatically and continue operation after a fault or supply break.
 - The maximum number of drive power-ups is five in ten minutes. Too frequent power-ups can damage the charging circuit of the DC capacitors.
 - If you have connected safety circuits to the drive (for example, emergency stop and Safe torque off), validate them at start-up. For the validation of the Safe torque off, see *ACS580 standard control program firmware manual (3AXD50000016097 [English])*. For the validation of other safety circuits, see the instructions provided with them.

Note:


- If you select an external source for start command and it is on, and the start command is level-triggered, the drive will start immediately after fault reset. See parameters 20.02 Ext1 start trigger type and 20.07 Ext2 start trigger type in *ACS580 standard control program firmware manual (3AXD50000016097 [English])*.

- When the control location is not set to Local (text Hand is not shown on the top row of the panel and parameter 19.17 Off mode disable has value Off button disabled), the stop key on the control panel will not stop the drive.
- Only authorized persons are allowed to repair a malfunctioning drive.

Electrical safety in installation, start-up and maintenance

■ Precautions before electrical work


These warnings are for all personnel who do work on the drive, motor cable or motor.

 **WARNING!** Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur. If you are not a qualified electrician, do not do electrical installation or maintenance work. Go through these steps before you begin any installation or maintenance work.

1. Clearly identify the work location.
2. Disconnect all possible voltage sources.
 - Open the main disconnecter at the power supply of the drive.
 - Make sure that reconnection is not possible. Lock the disconnecter to open position and attach a warning notice to the disconnecter.
 - Disconnect any external power sources from the control circuits before you do work on the control cables.

3. Protect any other energized parts in the work location against contact.
4. Take special precautions when close to bare conductors.
5. Measure that the installation is de-energized.
 - Use a multimeter with an impedance of at least 1 Mohm.
 - Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the grounding terminal (PE) is close to 0 V.
 - Make sure that the voltage between the drive DC terminals (UDC+ and UDC-) and the grounding terminal (PE) is close to 0 V.
6. Install temporary grounding as required by the local regulations.
7. Ask for a permit to work from the person in control of the electrical installation work.

■ Additional instructions and notes

 **WARNING!** Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur.

- If the drive will be connected on an IT system (ungrounded or high-resistance-grounded [over 30 ohms]), make sure neither the EMC filter nor the ground-to-phase varistor are connected (metal screws

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should not be installed). Connections with metal screws in these systems can cause danger or damage. See section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on pages 23, 39 or 51.

Note: For other systems, connecting the internal EMC filter will reduce the conducted emission.

- If the drive will be connected on a corner-grounded TN system, make sure the EMC filter is not connected (metal screws should not be installed). Connections with metal screws in these systems can cause danger or damage. See section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on pages 23, 39 or 51. **Note:** For other systems, connecting the internal EMC filter (using metal screws) will reduce the conducted emission.
- Use all ELV (extra low voltage) circuits connected to the drive only within a zone of equipotential bonding, that is, within a zone where all simultaneously accessible conductive parts are electrically connected to prevent hazardous voltages appearing between them. You can accomplish this by a proper factory grounding, that is, make sure that all simultaneously accessible conductive parts are grounded to the protective earth (PE) bus of the building.
- Do not do insulation or voltage withstand tests on the drive or drive modules.

Note:

- The motor cable terminals of the drive are at a dangerous voltage

when the input power is on, regardless of whether the motor is running or not.

- The DC and brake resistor terminals (UDC+, UDC-, R+ and R-) are at a dangerous voltage.
- External wiring can supply dangerous voltages to the terminals of relay outputs (RO1, RO2 and RO3).
- The Safe torque off function does not remove the voltage from the main and auxiliary circuits. The function is not effective against deliberate sabotage or misuse.



WARNING! Use a grounding wrist band when you handle the printed circuit boards. Do not touch the boards unnecessarily. The boards contain components sensitive to electrostatic discharge.

Grounding

These instructions are for all personnel who are responsible for the electrical installation, including the grounding of the drive.



WARNING! Obey these instructions. If you ignore them, injury or death, or equipment malfunction can occur, and electromagnetic interference can increase.

- If you are not a qualified electrician, do not do grounding work.
- Always ground the drive, the motor and adjoining equipment to the protective earth (PE) bus of the power supply. This is necessary for the personnel safety. Proper grounding also reduces

electromagnetic emission and interference.

- In a multiple-drive installation, connect each drive separately to the protective earth (PE) bus of the power supply.
- Make sure that the conductivity of the protective earth (PE) conductors is sufficient. See chapter Technical data in *ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual (3AXD50000018826 [English])*. Obey the local regulations.
- Connect the power cable shields to the protective earth (PE) terminals of the drive.
- Standard IEC/EN 61800-5-1 (section 4.3.5.5.2.) requires that as the normal touch current of the drive is higher than 3.5 mA AC or 10 mA DC, you must use a fixed protective earth (PE) connection. In addition,
 - install a second protective earth conductor of the same cross-sectional area as the original protective earthing conductor,
 or
 - install a protective earth conductor with a cross-section of at least 7 AWG (10 mm²) Cu,
 or
 - install a device which automatically disconnects the supply if the protective earth conductor breaks.

Additional instructions for permanent magnet motor drives

■ Safety in installation, start-up and maintenance

These are additional warnings concerning permanent magnet motor drives. The other safety instructions in this chapter are also valid.



WARNING! Obey these instructions. If you ignore them, injury or death and damage to the equipment can occur.

- Do not work on a drive when a rotating permanent magnet motor is connected to it. A rotating permanent magnet motor energizes the drive including its power terminals.

Before installation, start-up and maintenance work on the drive:

- Stop the motor.
- Disconnect the motor from the drive with a safety switch or by other means.
- If you cannot disconnect the motor, make sure that the motor cannot rotate during work. Make sure that no other system, like hydraulic crawling drives, can rotate the motor directly or through any mechanical connection like felt, nip, rope, etc.
- Measure that the installation is de-energized.
 - Use a multimeter with an impedance of at least 1 Mohm.

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- Make sure that the voltage between the drive output terminals (T1/U, T2/V, T3/W) and the grounding (PE) busbar is close to 0 V.

- Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the grounding (PE) busbar is close to 0 V.

- Make sure that the voltage between the drive DC terminals (UDC+, UDC-) and the grounding (PE) terminal is close to 0 V.


- Install temporary grounding to the drive output terminals (T1/U, T2/V, T3/W). Connect the output terminals together as well as to the PE.

Start-up and operation:

- Make sure the motor is not run over the rated speed with dynamic/positive displacement loads.

General safety in operation

These instructions are for all personnel that operate the drive.

 **WARNING!** Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur.

- Do not control the motor with the line side disconnect at the drive power supply; instead, use the control panel start and stop keys or commands through the I/O terminals of the drive.
- Give a stop command to the drive before you reset a fault. If you have an external source for the start command and the start is on, the drive will start immediately after the

fault reset, unless you configure the drive for pulse start. See the firmware manual.

- Before you activate automatic fault reset functions of the drive control program, make sure that no dangerous situations can occur. These functions reset the drive automatically and continue operation after a fault.

Note: When the drive is not in the Hand mode, the Off key on the control panel will not stop the drive.

Cybersecurity disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Ratings and fuses

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Type ACS580- 01	Input rating	Output ratings				Maximum heat dissipation	Frame size
		Nominal use		Heavy duty use			
	I_{IN}	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	W	
	A	A	hp	A	hp		
3-phase $U_N = 240$ V (208...240 V)							
04A6-2	4.6	1	4.6	0.75	3.5	45	R1
06A6-2	6.6	1.5	6.6	1	4.6	55	R1
07A5-2	7.5	2	7.5	1.5	6.6	66	R1
10A6-2	10.6	3	10.6	2	7.5	84	R1
017A-2	16.7	5	16.7	3	10.6	106	R1
024A-2	24.2	7.5	24.2	5	16.7	133	R2
031A-2	30.8	10	30.8	7.5	24.2	174	R2
046A-2	46.2	15	46.2	10	30.8	228	R3
059A-2	59.4	20	59.4	15	46.2	322	R3
075A-2	74.8	25	74.8	20	59.4	430	R4
088A-2	88	30	88	25	74.8	525	R5
114A-2	114	40	114	30	88	619	R5
143A-2	143	50	143	40	114	835	R6
169A-2	169	60	169	50	143	1035	R7
211A-2	211	75	211	60	169	1251	R7
273A-2	273	100	273	75	211	1240	R8
343A-2	343	343	125	273	100	2547	R9
396A-2	396	396	150	343***	125	3060	R9

* 130% overload only

** 125% overload only

*** Maximum current with 40% overload, allowed for one minute every ten minutes

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R1- R4	Type ACS580- 01	Input rating	Output ratings				Maximum heat dissipation	Frame size	
			Nominal use		Heavy duty use				
			I_{LN}	I_{Ld}	P_{Ld}	I_{Hd}			P_{Hd}
			A	A	hp	A			hp
	3-phase $U_N = 480\text{ V}$ (440...480 V)								
R5	02A1-4	2.1	2.1	1	1.6	0.75	45	R1	
	03A0-4	3	3	1.5	2.1	1	55	R1	
R6- R9	03A5-4	3.5	3.5	2	3	1.5	66	R1	
	04A8-4	4.8	4.8	3	3.4	2	84	R1	
	06A0-4	6	6	3	4	3	106	R1	
	07A6-4	7.6	7.6	5	4.8	3	133	R1	
	012A-4	12	12	7.5	7.6	5	174	R1	
	014A-4	14	14	10	11	7.5	228	R2	
	023A-4	23	23	15	14	10	322	R2	
	027A-4	27	27	20	21	15	430	R3	
	034A-4	34	34	25	27	20	525	R3	
	044A-4	44	44	30	34	25	619	R3	
	052A-4	52	52	40	40	30	835	R4	
	065A-4	65	65	50	52	40	1024	R4	
	077A-4	77	77	60	65	50	1240	R5	
	078A-4	77	77	60	65	50	1240	R5	
	096A-4	96	96	75	77	60	1510	R5	
	124A-4	124	124	100	96	75	1476	R6	
	156A-4	156	156	125	124	100	1976	R7	
	180A-4	180	180	150	156	125	2346	R7	
	240A-4	240	240	200	180	150	3336	R8	
	260A-4	260	260	200	240*	150	3936	R8	
	302A-4	302	302	250	260	200	4836	R9	

* 130% overload only

** 125% overload only

*** Maximum current with 40% overload, allowed for one minute every ten minutes

Type ACS580- 01	Input rating	Output ratings				Maximum heat dissipation	Frame size
		Nominal use		Heavy duty use			
	I_{IN}	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	W	
	A	A	hp	A	hp		
361A-4	361	361	300	302	250	4836	R9
414A-4	414	414	350	361**	300	6036	R9
3-phase $U_N = 600$ V (500...575 V)							
02A7-6	2.7	2.7	2	2.4	1.5	66	R2
03A9-6	3.9	3.9	3	2.7	2	84	R2
06A1-6	6.1	6.1	5	3.9	3	133	R2
09A0-6	9	9	7.5	6.1	5	174	R2
011A-6	11	11	10	9	7.5	228	R2
017A-6	17	17	15	11	10	322	R2
022A-6	22	22	20	17	15	430	R3
027A-6	27	27	25	22	20	525	R3
032A-6	32	32	30	27	25	619	R3
041A-6	41	41	40	32	30	835	R5
052A-6	52	52	50	41	40	1024	R5
062A-6	62	62	60	52	50	1240	R5
077A-6	77	77	75	62	60	1510	R5
099A-6	99	99	100	77	75	2061	R7
125A-6	125	125	125	99	100	2466	R7
144A-6	144	144	150	125	125	3006	R8
192A-6	180	192	200	144	150	4086	R9
242A-6	242	242	250	192	200	4896	R9
271A-6	271	271	250	210	200	4896	R9

* 130% overload only

** 125% overload only

*** Maximum current with 40% overload, allowed for one minute every ten minutes

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II

	NEC type ACS580	UL				
		I_N A	Voltage rating V	Bussmann type ¹⁾	UL class	Frame size
R1- R4	3-phase $U_N = 240$ V (208...240 V)					
	04A6-2	4.6	600	KTK-R-15 or JJS-15	CC or T	R1
R5	06A6-2	6.6	600	KTK-R-15 or JJS-15	CC or T	R1
	07A5-2	7.6	600	KTK-R-15 or JJS-15	CC or T	R1
R6- R9	10A6-2	10.6	600	KTK-R-15 or JJS-15	CC or T	R1
	017A-2	16.7	600	KTK-R-30 or JJS-30	CC or T	R1
	024A-2	24.2	600	JJS-40	T	R2
	031A-2	30.8	600	JJS-40	T	R2
	046A-2	46.2	600	JJS-80	T	R3
	059A-2	59.4	600	JJS-80	T	R3
	075A-2	74.8	600	JJS-100	T	R4
	088A-2	88	600	JJS-150	T	R5
	114A-2	114	600	JJS-150	T	R5
	143A-2	143	600	JJS-200	T	R6
	169A-2	169	600	JJS-250	T	R7
	211A-2	211	600	JJS-300	T	R7
	273A-2	273	600	JJS-400	T	R8
	343A-2	343	600	JJS-500	T	R9
	396A-2	396	600	JJS-600	T	R9

1) ABB does not require Bussmann brand fuses. Fuses which meet the appropriate UL class type, current rating, and are rated at 600V, 200 kA may be used.

NEC type ACS580	UL				
	I_N	Voltage rating	Bussmann type ¹⁾	UL class	Frame size
	A	V			
3-phase $U_N = 480$ V (440...480 V)					
02A1-4	15	600	JJS-15	T	R1
03A0-4	15	600	JJS-15	T	R1
03A5-4	15	600	JJS-15	T	R1
04A8-4	15	600	JJS-15	T	R1
06A0-4	15	600	JJS-15	T	R1
07A6-4	15	600	JJS-15	T	R1
012A-4	15	600	JJS-15	T	R1
014A-4	30	600	JJS-30	T	R2
023A-4	30	600	JJS-30	T	R2
027A-4	40	600	JJS-40	T	R3
034A-4	50	600	JJS-50	T	R3
044A-4	60	600	JJS-60	T	R3
052A-4	80	600	JJS-80	T	R4
065A-4	90	600	JJS-90	T	R4
077A-4	100	600	JJS-100	T	R4
078A-4	110	600	JJS-110	T	R5
096A-4	150	600	JJS-150	T	R5
124A-4	200	600	JJS-200	T	R6
156A-4	225	600	JJS-225	T	R7
180A-4	300	600	JJS-300	T	R7
240A-4	350	600	JJS-350	T	R8
260A-4	400	600	JJS-400	T	R8
302A-4	500	600	JJS-500	T	R9
361A-4	500	600	JJS-500	T	R9
414A-4	600	600	JJS-600	T	R9

1) ABB does not require Bussmann brand fuses. Fuses which meet the appropriate UL class type, current rating, and are rated at 600V, 200 kA may be used.

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	NEC type ACS580	UL				
		I_N	Voltage rating	Bussmann type ¹⁾	UL class	Frame size
		A	V			
3-phase $U_N = 600$ V (500...575 V)						
R1- R4	02A7-6	2.7	600	KTK-R-15 or JJS-15	CC or T	R2
	03A9-6	3.9	600	KTK-R-15 or JJS-15	CC or T	R2
R5	06A1-6	6.1	600	KTK-R-15 or JJS-15	CC or T	R2
	09A0-6	9	600	KTK-R-15 or JJS-15	CC or T	R2
R6- R9	011A-6	11	600	KTK-R-15 or JJS-15	CC or T	R2
	017A-6	17	600	KTK-R-30 or JJS-30	CC or T	R2
	022A-6	22	600	JJS-40	T	R3
	027A-6	27	600	JJS-40	T	R3
	032A-6	32	600	JJS-40	T	R3
	041A-6	41	600	JJS-100	T	R5
	052A-6	52	600	JJS-100	T	R5
	062A-6	62	600	JJS-100	T	R5
	077A-6	77	600	JJS-100	T	R5
	099A-6	99	600	JJS-150	T	R7
	125A-6	125	600	JJS-200	T	R7
	144A-6	144	600	JJS-250	T	R8
	192A-6	180	600	JJS-300	T	R9
	242A-6	242	600	JJS-400	T	R9
	271A-6	271	600	JJS-400	T	R9

1) ABB does not require Bussmann brand fuses. Fuses which meet the appropriate UL class type, current rating, and are rated at 600V, 200 kA may be used.

ABB GENERAL PURPOSE DRIVES

Quick installation guide

ACS580-01 drives (frames R1 to R4)

R1-
R4



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R1...R4 Quick installation guide

This guide briefly describes how to install the drive. For complete information on installation, see *ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual (3AXD50000018826 [English])*. For start-up instructions, see chapter *Quick start-up guide* on page 61.

R1-
R4

To read a manual, go to www.abb.com/drives/documents and search for the document number.

Obey the safety instructions



WARNING! Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur:

- If you are not a qualified electrician, do not do electrical installation work.
 - Do not work on the drive, motor cable or motor when main power is applied. If the drive is already connected to the input power, wait for 5 minutes after disconnecting the input power.
 - Do not work on the control cables when power is applied to the drive or to the external control circuits.
 - Make sure that debris from borings and grindings does not enter the drive when installing.
 - Make sure that the floor below the drive and the wall where the drive is installed are non-flammable.
-

Check if capacitors need to be reformed

If the drive has not been powered (either in storage or unused) for over one year, you must reform the capacitors.

You can determine the manufacturing time from the serial number, which you find on the type designation label attached to the drive. The serial number is of format MYYWWRXXXX. YY and WW tell the manufacturing year and week as follows:

YY: 16, 17, 18, ... for 2016, 2017, 2018, ...

WW: 01, 02, 03, ... for week 1, week 2, week 3, ...

For information on reforming the capacitors, see *Converter module capacitor reforming instructions (3BFE64059629 [English])*, available on the Internet at www.abb.com/drives/documents.

Select the power cables

Size the power cables according to local regulations to carry the nominal current given on the type designation label of your drive.

R1-
R4

Ensure the cooling

See table *I* on page [13](#) for the losses. The allowed operating temperature range of the drive is -15 to +50 °C (+5 to +122 °F). No condensation or frost is allowed. For more information on the ambient temperature and derating, see chapter *Technical data* in *ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual (3AXD50000018826 [English])*.

Protect the drive and input power cable

See table *II* on page [16](#) for the fuses.

If you use gG fuses, make sure that the operating time of the fuse is below 0.5 seconds. Follow the local regulations.

Install the drive on the wall

See figure [R1...R4 Figures A](#) on page [73](#).

Check the insulation of the power cables and the motor

Check the insulation of the input cable according to local regulations before connecting it to the drive.

See figure [B1](#) on page [73](#).

1. Check the insulation of the motor cable and motor when the cable is disconnected from the drive. Measure the insulation resistance between each phase conductor and then between each phase conductor and the Protective Earth conductor using a measuring voltage of 1000 V DC. The insulation resistance of an ABB motor must exceed 100 Mohm (reference value at 25 °C or 77 °F). For the insulation resistance of other motors, see the manufacturer's instructions.

Note: Moisture inside the motor casing will reduce the insulation resistance. If moisture is suspected, dry the motor and repeat the measurement.

Switch off the power and open the cover

See figure [B1](#) on page [73](#).

2. Switch off the power from the drive.
3. Remove the front cover: Loosen the retaining screw, if any, with a screwdriver (3a) and lift the cover from the bottom outwards (3b) and then up (3c).

**R1-
R4**

Install the cable box

Only for frames IP21, R1....R2 and IP55, R1....R2.

See figures [B1](#) and [B2](#) on page [73](#).

4. IP21, R1....R2: Remove the screw (4a) and lift the cover off (4b) from the separate cable box.
5. IP21, R1....R2: Attach the cable box cover to the front cover.
6. IP21, R1....R2: Install the cable box to the frame. Position the cable box (6a) and tighten the screws (6b).

Attach the warning sticker

See figure [B2](#) on page [73](#).

7. Attach the residual voltage warning sticker in the local language.

Check the compatibility with IT (ungrounded) and corner-grounded TN systems

■ EMC filter

The internal EMC filter is not suitable for use on an IT (ungrounded) system or on a corner-grounded TN system. Disconnect the EMC filter before connecting the drive to the supply network. Check the table on page [24](#).



WARNING! Do not install the drive with the internal EMC filter connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the system will be connected to ground potential through the EMC filter capacitors of the drive. This can cause danger, or damage the drive.

Do not install the drive with the internal EMC filter connected on a corner-grounded TN system, otherwise the drive will be damaged.

Note: When the internal EMC filter is disconnected, the drive EMC compatibility is considerably reduced.

Ground-to-phase varistor

The ground-to-phase varistor is not suitable for use on an IT (ungrounded) system. Disconnect the ground-to-phase varistor before connecting the drive to the supply network. Check the table on page 24.

R1-
R4

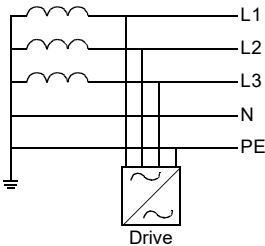


WARNING! Do not install the drive with the ground-to-phase varistor connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the varistor circuit can be damaged.

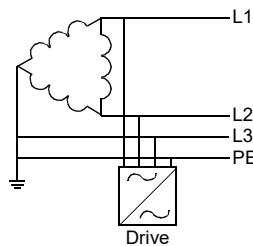
Check the table below to determine which screws may be metal for your system. For instructions on how to do this, see page 25.

Frame sizes	EMC filter (EMC) ⁵⁾	Ground-to-phase varistor (VAR) ⁵⁾	Symmetrically grounded TN systems (TN-S systems) ¹⁾	Corner grounded TN systems ²⁾	IT systems (ungrounded or high-resistance grounded [>30 ohms]) ³⁾
R1...R3	VAR 1 metal screw (connects VAR and AC EMC circuit)		<u>Do not disconnect:</u> Metal screws can be used.	<u>Disconnect:</u> Remove metal screw.	<u>Disconnect:</u> Remove metal screw.
	EMC 1 plastic screw	-		<u>Disconnect:</u> Maintain plastic screw.	<u>Disconnect:</u> Maintain plastic screw.
R4	EMC 1 metal, 1 plastic screw	-		<u>Disconnect:</u> Maintain plastic screw. Remove metal screw. ⁴⁾	<u>Disconnect:</u> Maintain plastic screw. Remove metal screw.
	-	VAR 1 metal screw		<u>Do not disconnect:</u> Maintain metal screw. ⁴⁾	<u>Disconnect:</u> Remove metal screw.

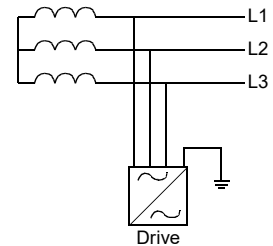
1)



2)



3)



⁴⁾R4 frames were evaluated for use on corner grounded networks by UL standards.

R4 frames are not to be used on IEC installations of corner grounded networks.

⁵⁾EMC and VAR columns show the screw material when the drive is shipped.

Note: For statements containing "Maintain plastic screw.": Metal screw must not be used, plastic screw may be maintained or removed from the AC EMC circuit.

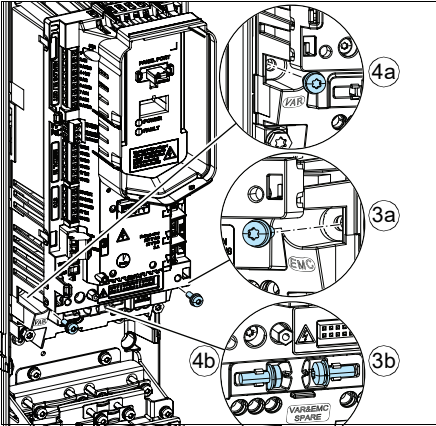
■ Disconnect EMC filter or ground-to-phase varistor, if needed

To disconnect the internal EMC filter or ground-to-phase varistor, if needed, do as follows:

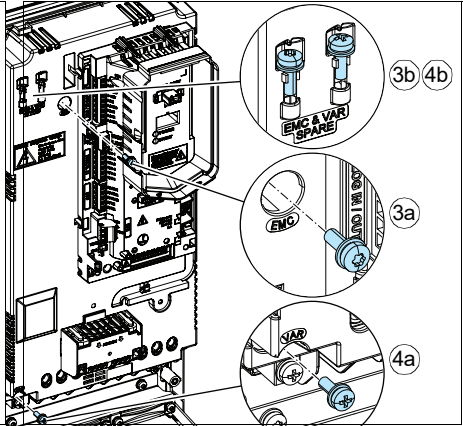
1. Switch off the power from the drive.
2. Open the front cover, if not already opened, see figure **B1** on page **73**.
3. **R1...R3:** To disconnect the internal EMC filter, remove the EMC screw (3a) and place it in the storage place (3b).
R4: To disconnect the internal EMC filter, remove the two EMC screws.
4. **R1...R3:** To disconnect the ground-to-phase varistor, remove the varistor screw (4a) and place it in the storage place (4b).
R4: To disconnect the ground-to-phase varistor, remove the varistor screw.

**R1-
R4**

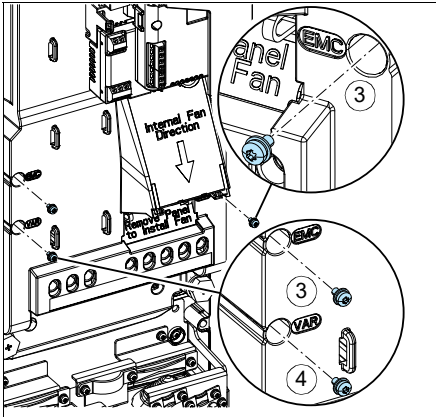
R1...R2



R3



R4



Wiring R1...R2

Note: These are instructions for conduit wiring. For cable wiring, see the *ACS580 Hardware manual*, publication number 3AXD50000018826.

Note: In US deliveries, options are already installed at the factory. If installing on site, option slot 1 modules (fieldbus adapter) may be installed by mounting the module on the control board and tightening the mounting screw, which is also the grounding screw. Option slot 2 modules (I/O extension) should not be installed until after the power cables. Refer to Warning and step 8 below.



WARNING! If installing modules, obey the instructions in [Safety instructions](#) on page 7. If you ignore them, injury or death, or damage to the equipment can occur. Option slot 2 in frames R1...R5 is at U_{DC} potential. You must disconnect power supplies before installing or removing an I/O extension module.

See figure on page 28.

1. Install thin-wall conduit clamps for IP21/UL Type 1 or liquid-tight conduit connectors for IP55/UL Type 12 (not supplied). Type 12 has a Pressfit gasket.
2. Connect conduit runs for input power, motor and control cables to the conduit box. Ensure grommets (pointing down) are inserted into all unused holes.
3. Route the input power and motor wiring through separate conduits.
4. Strip wires.
5. Connect the motor and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
6. Connect the input power and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
7. *If brake resistor is used* — Connect the resistor and ground wires. Tighten the screws to torques shown in the Power wiring torque table.
8. Install option slot 2 modules (I/O extension), if necessary, at this point.
 - A *Frame R1 only:* Install the option mounting.
 - B Put the module carefully into its position on the control board and tighten the mounting screw.
 - C Tighten the grounding screw, which is necessary for proper operation and for fulfilling EMC requirements.

Note: Frame R1 — The module in option slot 2 covers the power terminals. Do not install a module in option slot 2 before you have installed the power cables.

9. Route the control cables through the conduit (not the same conduit as either input power or motor wiring).

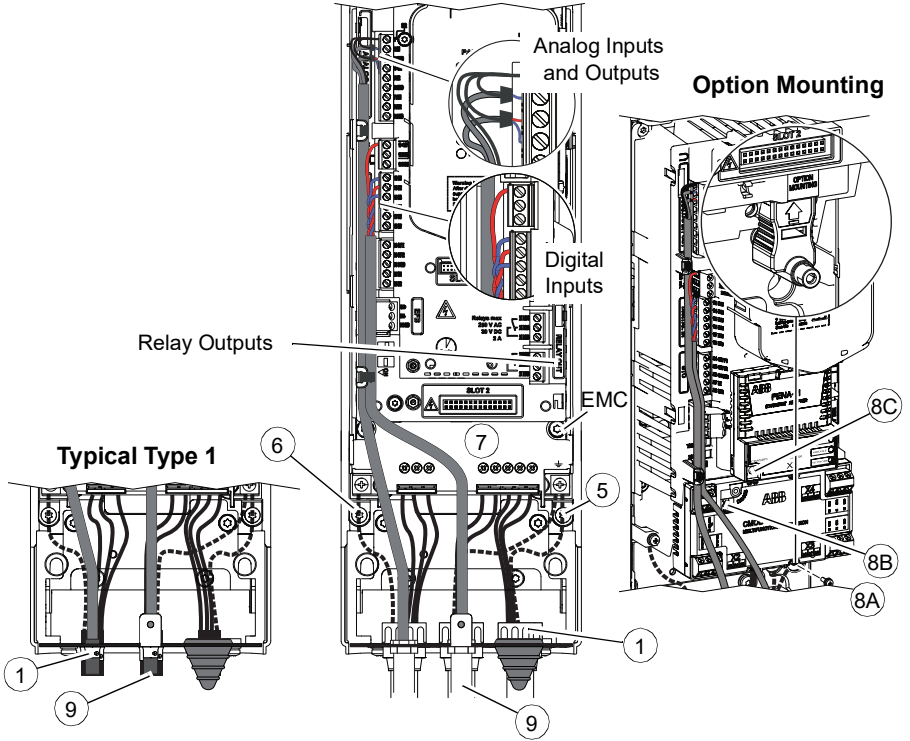
10. Strip the control cable sheathing and twist the copper screen into a pig-tail.
11. Refer to page 33. Connect the ground screen pig-tail for digital and analog I/O cables. (Ground only at drive end.)
12. Connect the ground screen pig-tail for Embedded fieldbus, EFB (EIA-485) cables at X5. (Ground only at drive end.)
13. Strip and connect the individual control wires to the drive terminals. Tighten the screws to 0.4 lb-ft (0.5...0.6 N-m).

R1-
R4

WARNING! To avoid danger or damage to the drive on IT systems and corner grounded TN systems, see section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on page 23.

R1-
R4

R1...R2 Type 12



Power wiring torque table

Frame size	R1		R2	
	lb-ft	N-m	lb-ft	N-m
T1/U, T2/V, T3/W	0.4	1.2...1.5	1.1	1.2...1.5
L1, L2, L3	0.4	1.2...1.5	1.1	1.2...1.5
R+, R-	0.4	1.2...1.5	1.1	1.2...1.5
PE Ground	1.1	1.5	1.1	1.5

Wiring R3

Note: These are instructions for conduit wiring. For cable wiring, see the *ACS580 Hardware manual*, publication number 3AXD50000018826.

Note: In US deliveries, options are already installed at the factory. If installing on site, option slot 1 modules (fieldbus adapter) may be installed by mounting the module on the control board and tightening the mounting screw, which is also the grounding screw. Option slot 2 modules (I/O extension) may be installed by mounting the module on the control board and tightening both the mounting screw and the grounding screw. Refer to Warning.

R1-
R4



WARNING! If installing modules, obey the instructions in [Safety instructions](#) on page 7. If you ignore them, injury or death, or damage to the equipment can occur. Option slot 2 in frames R1...R5 is at U_{DC} potential. You must disconnect power supplies before installing or removing an I/O extension module.

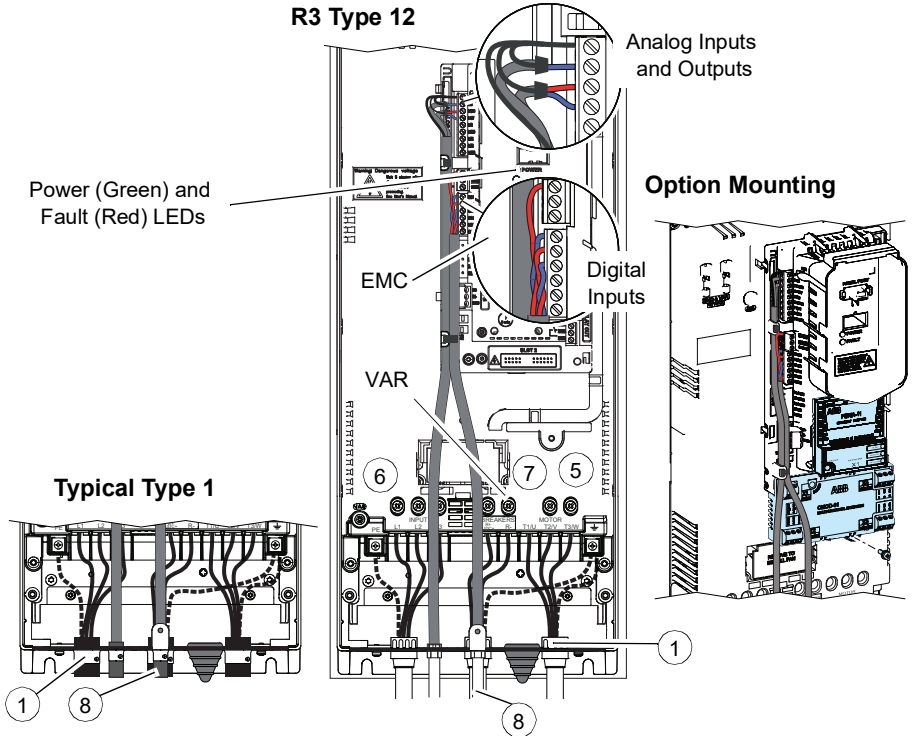
See figure on page 30.

1. Install thin-wall conduit clamps for IP21/UL Type 1 or liquid-tight conduit connectors for IP55/UL Type 12 (not supplied). Type 12 has a Pressfit gasket.
2. Connect conduit runs for input power, motor and control cables to the conduit box. Ensure grommets (pointing down) are inserted into all unused holes.
3. Route the input power and motor wiring through separate conduits.
4. Strip wires.
5. Connect the motor and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
6. Connect the input power and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
7. *If brake resistor is used* — Connect the resistor and ground wires. Tighten the screws to torques shown in the Power wiring torque table.
8. Route the control cables through the conduit (not the same conduit as either input power or motor wiring).
9. Strip the control cable sheathing and twist the copper screen into a pig-tail.
10. Refer to page 33. Connect the ground screen pig-tail for digital and analog I/O cables. (Ground only at drive end.)
11. Connect the ground screen pig-tail for Embedded fieldbus, EFB (EIA-485) cables at X5. (Ground only at drive end.)

12. Strip and connect the individual control wires to the drive terminals. Tighten the screws to 0.4 lb-ft (0.5...0.6 N-m).

WARNING! To avoid danger or damage to the drive on IT systems and corner grounded TN systems, see section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on page 23.

R1-
R4



Power wiring torque table

Frame size	R3	
	lb-ft	N-m
T1/U, T2/V, T3/W	3.3	2.5...4.5
L1, L2, L3	3.3	2.5...4.5
R+, R-	3.3	2.5...4.5
PE Ground	1.1	1.5

Wiring R4

Note: These are instructions for conduit wiring. For cable wiring, see the *ACS580 Hardware manual*, publication number 3AXD50000018826.

Note: In US deliveries, options are already installed at the factory. If installing on site, option slot 1 modules (fieldbus adapter) may be installed by mounting the module on the control board and tightening the mounting screw, which is also the grounding screw. Option slot 2 modules (I/O extension) may be installed by mounting the module on the control board and tightening both the mounting screw and the grounding screw. Refer to Warning.

R1-
R4



WARNING! If installing modules, obey the instructions in [Safety instructions](#) on page 7. If you ignore them, injury or death, or damage to the equipment can occur. Option slot 2 in frames R1...R5 is at U_{DC} potential. You must disconnect power supplies before installing or removing an I/O extension module.

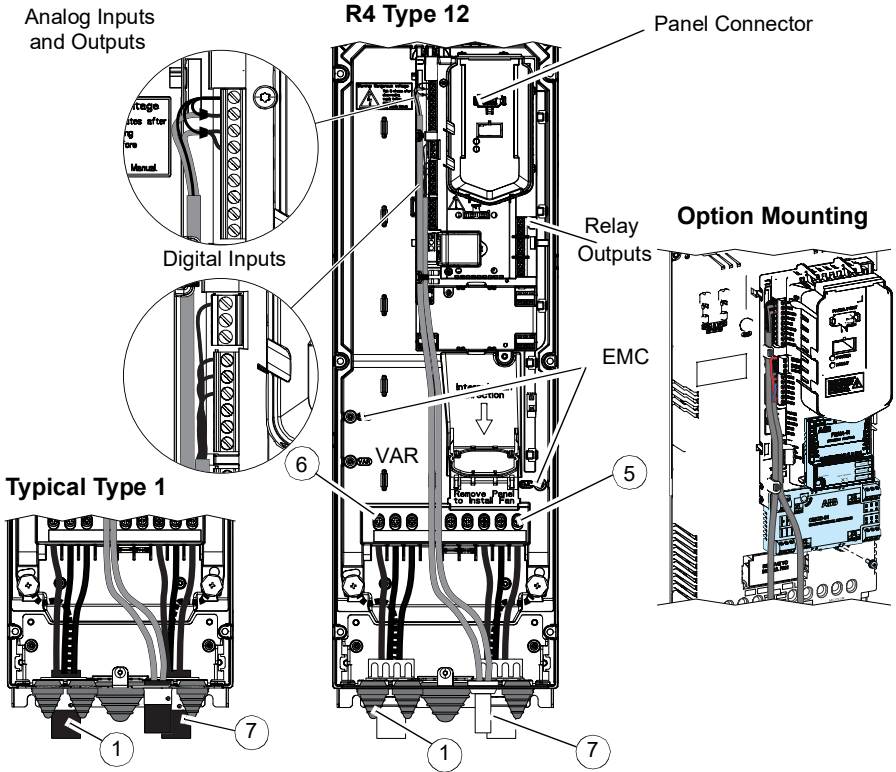
See figure on page 32.

1. Install thin-wall conduit clamps for IP21/UL Type 1 or liquid-tight conduit connectors for IP55/UL Type 12 (not supplied). Type 12 has a Pressfit gasket.
2. Connect conduit runs for input power, motor and control cables to the conduit box. Ensure grommets (pointed down) are inserted into all unused holes.
3. Route the input power and motor wiring through separate conduits.
4. Strip wires.
5. Connect the motor and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
6. Connect the input power and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
7. Route the control cables through the conduit (not the same conduit as either input power or motor wiring).
8. Strip the control cable sheathing and twist the copper screen into a pig-tail.
9. Refer to page 33. Connect the ground screen pig-tail for digital and analog I/O cables. (Ground only at drive end.)
10. Connect the ground screen pig-tail for Embedded fieldbus, EFB (EIA-485) cables at X5. (Ground only at drive end.)
11. Strip and connect the individual control wires to the drive terminals. Tighten the screws to 0.4 lb-ft (0.5...0.6 N-m).



WARNING! To avoid danger or damage to the drive on IT systems and corner grounded TN systems, see section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on page 23.

R1-
R4



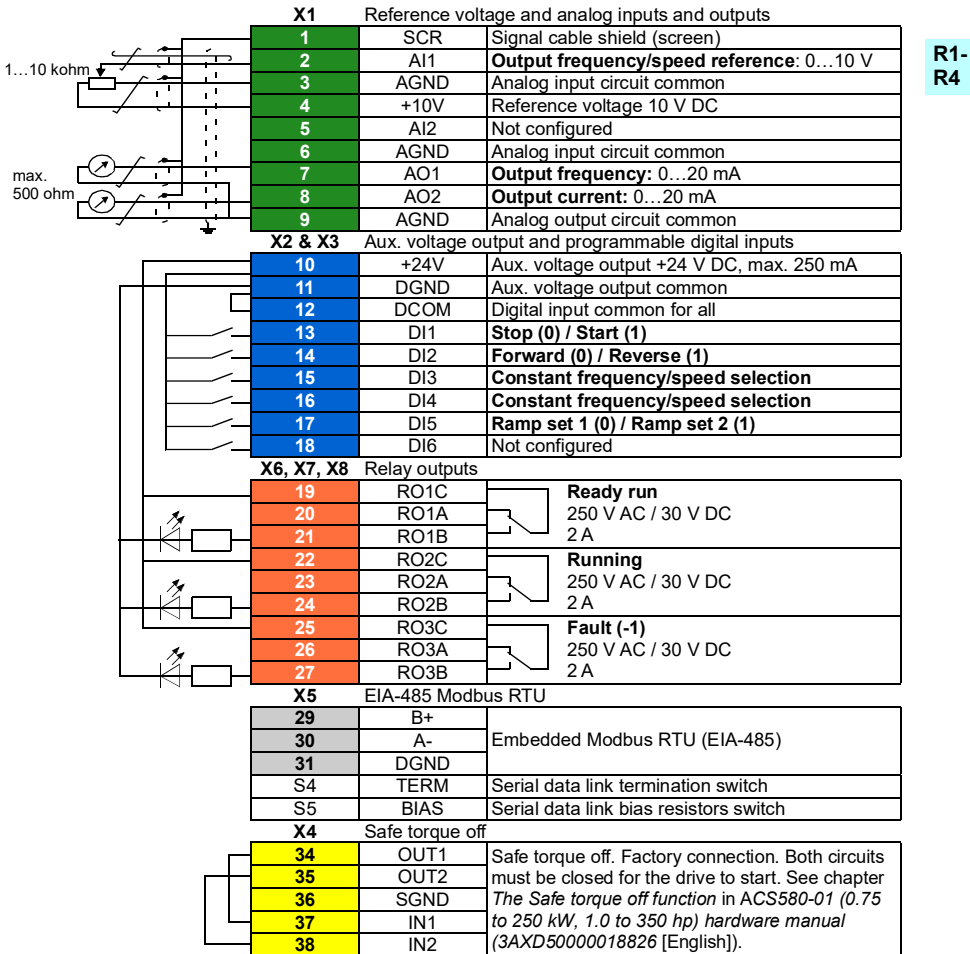
Note: UDC+ and UDC- terminals are used for external brake chopper units.

Power wiring torque table

Frame size	R4	
	lb-ft	N-m
T1/U, T2/V, T3/W	3.0	4.0
L1, L2, L3	3.0	4.0
UDC+ and UDC-	3.0	4.0
PE Ground	1.1	1.5

Default I/O connections

Default I/O connections of the ABB Standard macro are shown below.



Total load capacity of the Auxiliary voltage output +24V (X2:10) is 6.0 W (250 mA / 24 V DC).

Wire sizes:

0.2...2.5 mm² (24...14 AWG): Terminals +24V, DGND, DCOM, B+, A-, DGND, Ext. 24V

0.14...1.5 mm² (26...16 AWG): Terminals DI, AI, AO, AGND, RO, STO

Tightening torques: 0.5...0.6 N·m (0.4 lbf·ft)

Install optional modules, if any

See chapter *Electrical installation* in *ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual (3AXD50000018826 [English])*.

R1-
R4

Reinstall cover

See figure [J](#) on page [76](#).

1. Put the tabs on the inside of the cover top in their counterparts on the housing (1a) and then press the cover at the bottom (1b).
2. Tighten the retaining screw with a screwdriver.

For start-up instructions, see chapter [Quick start-up guide](#) on page [61](#).

ABB GENERAL PURPOSE DRIVES

Quick installation guide

ACS580-01 drives (frames R5)

R5



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R5 Quick installation guide

This guide briefly describes how to install the drive. For complete information on installation, see *ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual* (3AXD50000018826 [English]). For start-up instructions, see chapter *Quick start-up guide* on page 61.

R5

To read a manual, go to www.abb.com/drives/documents and search for the document number.

Obey the safety instructions



WARNING! Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur:

- If you are not a qualified electrician, do not do electrical installation work.
 - Do not work on the drive, motor cable or motor when main power is applied. If the drive is already connected to the input power, wait for 5 minutes after disconnecting the input power.
 - Do not work on the control cables when power is applied to the drive or to the external control circuits.
 - Make sure that debris from borings and grindings does not enter the drive when installing.
 - Make sure that the floor below the drive and the wall where the drive is installed are non-flammable.
-

Check if capacitors need to be reformed

If the drive has not been powered (either in storage or unused) for over one year, you must reform the capacitors.

You can determine the manufacturing time from the serial number, which you find on the type designation label attached to the drive. The serial number is of format MYYWWRXXXX. YY and WW tell the manufacturing year and week as follows:

YY: 16, 17, 18, ... for 2016, 2017, 2018, ...

WW: 01, 02, 03, ... for week 1, week 2, week 3, ...

For information on reforming the capacitors, see *Converter module capacitor reforming instructions* (3BFE64059629 [English]), available on the Internet at www.abb.com/drives/documents.

Select the power cables

Size the power cables according to local regulations to carry the nominal current given on the type designation label of your drive.

Ensure the cooling

R5 See table *I* on page [13](#) for the losses. The allowed operating temperature range of the drive is -15 to +50 °C (+5 to +122 °F). No condensation or frost is allowed. For more information on the ambient temperature and derating, see chapter *Technical data* in *ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual (3AXD50000018826 [English])*.

Protect the drive and input power cable

See table *II* on page [16](#) for the fuses.

If you use gG fuses, make sure that the operating time of the fuse is below 0.5 seconds. Follow the local regulations.

Install the drive on the wall

See figure *R5 Figures A* on page [77](#).

Check the insulation of the power cables and the motor

Check the insulation of the input cable according to local regulations before connecting it to the drive.

See figure *B* on page [77](#).

1. Check the insulation of the motor cable and motor when the cable is disconnected from the drive. Measure the insulation resistance between each phase conductor and then between each phase conductor and the Protective Earth conductor using a measuring voltage of 1000 V DC. The insulation resistance of an ABB motor must exceed 100 Mohm (reference value at 25 °C or 77 °F). For the insulation resistance of other motors, see the manufacturer's instructions.

Note: Moisture inside the motor casing will reduce the insulation resistance. If moisture is suspected, dry the motor and repeat the measurement.

Switch off the power and open the cover

See figure [B](#) on page [77](#).

2. Switch off the power from the drive.
3. [IP21, Remove the module cover](#): Loosen the retaining screws with a screwdriver (3a) and lift the cover from the bottom outwards (3b) and then up (3c).
4. [IP21, Remove the box cover](#): Loosen the retaining screws with a screwdriver (4a) and slide the cover downwards (4b).
5. [IP55, Remove the front cover](#): Loosen the retaining screws with a screwdriver (4a) and lift the cover from the bottom outwards (4b) and then up (4c).

R5

Check the compatibility with IT (ungrounded) and corner-grounded TN systems

■ EMC filter

The internal EMC filter is not suitable for use on an IT (ungrounded) system or on a corner-grounded TN system. Disconnect the EMC filter before connecting the drive to the supply network. Check the table on page [40](#).



WARNING! Do not install the drive with the internal EMC filter connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the system will be connected to ground potential through the EMC filter capacitors of the drive. This can cause danger, or damage the drive.

Do not install the drive with the internal EMC filter connected on a corner-grounded TN system, otherwise the drive will be damaged.

Note: When the internal EMC filter is disconnected, the drive EMC compatibility is considerably reduced.

■ Ground-to-phase varistor

The ground-to-phase varistor is not suitable for use on an IT (ungrounded) system. Disconnect the ground-to-phase varistor before connecting the drive to the supply network. Check the table on page [40](#).

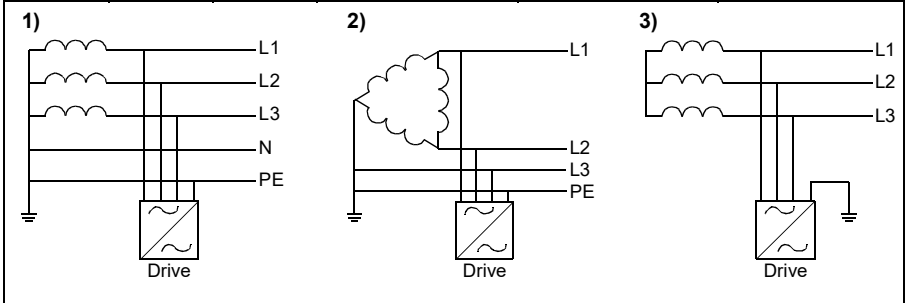


WARNING! Do not install the drive with the ground-to-phase varistor connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the varistor circuit can be damaged.

Check the table below to determine which screws may be metal for your system. For instructions on how to do this, see page 41.

R5

Frame sizes	EMC filter (EMC) ⁵⁾	Ground-to-phase varistor (VAR) ⁵⁾	Symmetrically grounded TN systems (TN-S systems) ¹⁾	Corner grounded TN systems ²⁾	IT systems (ungrounded or high-resistance grounded [$>30 \text{ ohms}$]) ³⁾
R5	EMC 1 metal, 1 plastic screw	-	<u>Do not disconnect:</u> Metal screws can be used.	<u>Disconnect:</u> Maintain plastic screw. Remove metal screw. ⁴⁾	<u>Disconnect:</u> Maintain plastic screw. Remove metal screw.
	-	VAR 1 metal screw		<u>Do not disconnect:</u> Maintain metal screw. ⁴⁾	<u>Disconnect:</u> Remove metal screw.



⁴⁾ R5 frames were evaluated for use on corner grounded networks by UL standards. R5 frames are not to be used on IEC installations of corner grounded networks.

⁵⁾ EMC and VAR columns show the screw material when the drive is shipped.

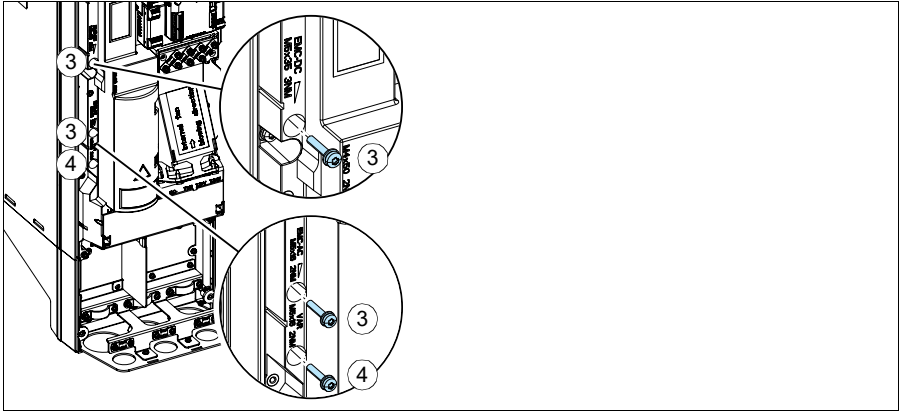
Note: For statements containing "Maintain plastic screw.": Metal screw must not be used, plastic screw may be maintained or removed from the AC EMC circuit.

■ Disconnect EMC filter or ground-to-phase varistor, if needed

To disconnect the internal EMC filter or ground-to-phase varistor, if needed, do as follows:

1. Switch off the power from the drive.
2. Open the front cover, if not already opened, see figure *B* on page 77.
3. To disconnect the internal EMC filter, remove the two EMC screws.
4. To disconnect the ground-to-phase varistor, remove the varistor screw.

R5



Wiring R5

Note: These are instructions for conduit wiring. For cable wiring, see the *ACS580 Hardware manual*, publication number 3AXD50000018826.

Note: In US deliveries, options are already installed at the factory. If installing on site, option slot 1 modules (fieldbus adapter) may be installed by mounting the module on the control board and tightening the mounting screw, which is also the grounding screw. Option slot 2 modules (I/O extension) may be installed by mounting the module on the control board and tightening both the mounting screw and the grounding screw. Refer to Warning.



WARNING! If installing modules, obey the instructions in *Safety instructions* on page 7. If you ignore them, injury or death, or damage to the equipment can occur. Option slot 2 in frames R1...R5 is at U_{DC} potential. You must disconnect power supplies before installing or removing an I/O extension module.

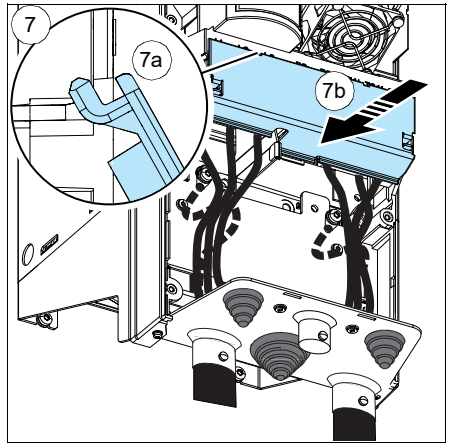
See figure on page 43.

1. Install thin-wall conduit clamps for IP21/UL Type 1 or liquid-tight conduit connectors for IP55/UL Type 12 (not supplied). Type 12 has a Pressfit gasket.
2. Connect conduit runs for input power, motor and control cables to the conduit box. Ensure grommets (pointing down) are inserted into all unused holes.

R5

3. Route the input power and motor wiring through separate conduits.
4. Strip wires.
5. Connect the motor and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
6. Connect the input power and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.

7. Reinstall the shroud on the power terminals by putting the tabs at the top of the shroud in their counterparts on the drive frame and then pressing the shroud in place.



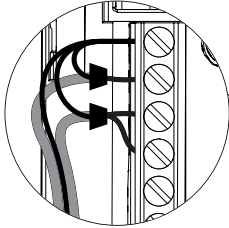
8. Route the control cables through the conduit (not the same conduit as either input power or motor wiring).
9. Strip the control cable sheathing and twist the copper screen into a pig-tail.
10. Refer to page 44. Connect the ground screen pig-tail for digital and analog I/O cables. (Ground only at drive end.)

11. Connect the ground screen pig-tail for Embedded fieldbus, EFB (EIA-485) cables at X5. (Ground only at drive end.)

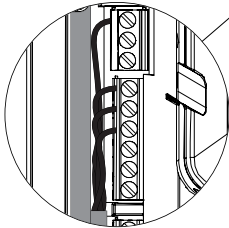
12. Strip and connect the individual control wires to the drive terminals. Tighten the screws to 0.4 lb-ft (0.5...0.6 N-m).

⚠ WARNING! To avoid danger or damage to the drive on IT systems and corner grounded TN systems, see section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on page 39.

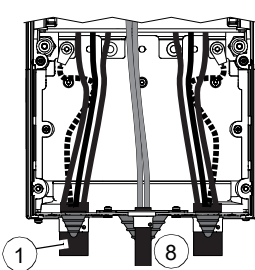
Analog Inputs and Outputs



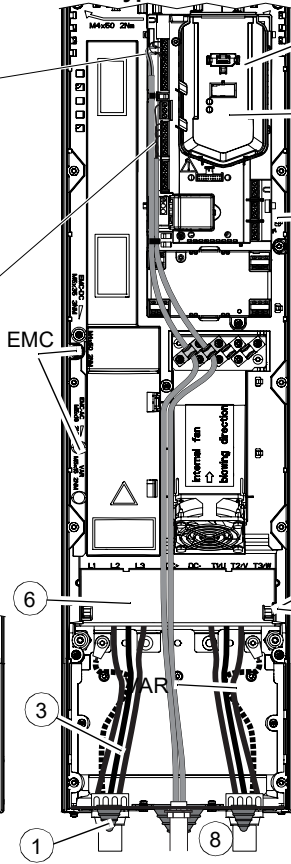
Digital Inputs



Typical Type 1



R5 Type 12



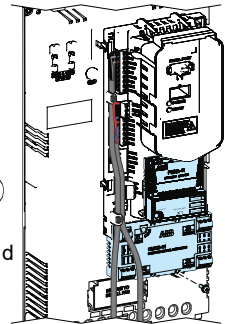
Panel Connector

Power (Green) and Fault (Red) LEDs

Relay Outputs

EMC

Option Mounting



5

Shroud

6

3

1

8

Note: UDC+ and UDC- terminals are used for external brake chopper units.

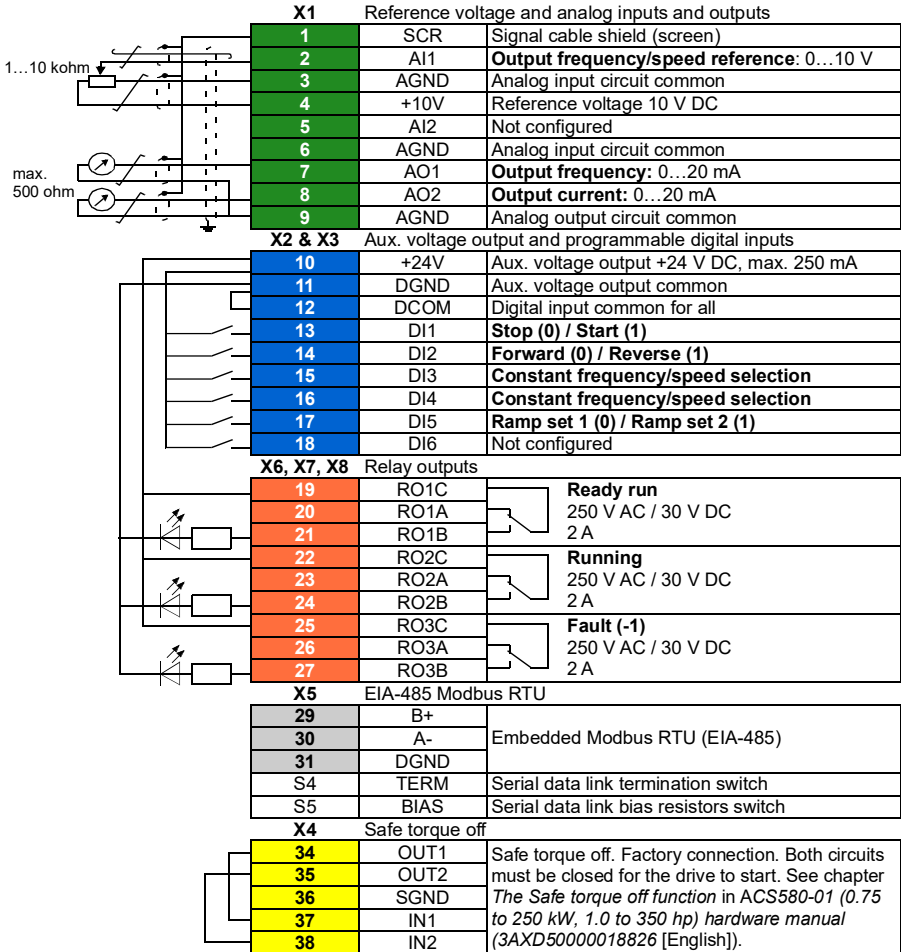
Power wiring torque table

Frame size	R5	
	lb-ft	N-m
T1/U, T2/V, T3/W	4.1	5.6
L1, L2, L3	4.1	5.6
UDC+ and UDC-	4.1	5.6
PE Ground	1.1	1.5

Default I/O connections

Default I/O connections of the ABB Standard macro are shown below.

R5



Total load capacity of the Auxiliary voltage output +24V (X2:10) is 6.0 W (250 mA / 24 V DC).

Wire sizes:

0.2...2.5 mm² (24...14 AWG): Terminals +24V, DGND, DCOM, B+, A-, DGND, Ext. 24V

0.14...1.5 mm² (26...16 AWG): Terminals DI, AI, AO, AGND, RO, STO

Tightening torques: 0.5...0.6 N·m (0.4 lbf·ft)

Install optional modules, if any

See chapter *Electrical installation* in ACS580-01 (0.75 to 250 kW, 1.0 to 350 hp) hardware manual (3AXD50000018826 [English]).

Reinstall cover

See figure [H](#) on page [80](#).

R5

1. IP21, Reinstall the box cover: Slide the cover upwards (1a) and tighten the retaining screws (1b).
2. IP21, Reinstall the module cover: Put the tabs on the inside of the cover top in their counterparts on the housing (2a), press the cover at the bottom (2b) and tighten the retaining screws (2c).
3. IP55, Reinstall the front cover: Put the tabs on the inside of the cover top in their counterparts on the housing (3a), press the cover at the bottom (3a) and tighten the retaining screws (3b).

For start-up instructions, see chapter [Quick start-up guide](#) on page [61](#).

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ABB GENERAL PURPOSE DRIVES

Quick installation guide

ACS580-01 drives (frames R6 to R9)



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R6...R9 Quick installation guide

This guide briefly describes how to install the drive. For complete information on installation, see *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]). For start-up instructions, see chapter *Quick start-up guide* on page 61.

To read a manual, go to www.abb.com/drives/documents and search for the document number.

R6-
R9

Obey the safety instructions



WARNING! Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur:

- If you are not a qualified electrician, do not do electrical installation work.
 - Do not work on the drive, motor cable or motor when main power is applied. If the drive is already connected to the input power, wait for 5 minutes after disconnecting the input power.
 - Do not work on the control cables when power is applied to the drive or to the external control circuits.
 - Use the lifting eyes of the drive when you lift the drive. Do not tilt the drive. The drive is heavy and its center of gravity is high. An overturning drive can cause physical injury.
 - Make sure that debris from borings and grindings does not enter the drive when installing.
 - Make sure that the floor below the drive and the wall where the drive is installed are non-flammable.
-

Check if capacitors need to be reformed

If the drive has not been powered (either in storage or unused) for over one year, you must reform the capacitors.

You can determine the manufacturing time from the serial number, which you find on the type designation label attached to the drive. The serial number is of format MYYWWRXXXX. YY and WW tell the manufacturing year and week as follows:

YY: 13, 14, 15, ... for 2013, 2014, 2015, ...

WW: 01, 02, 03, ... for week 1, week 2, week 3, ...

For information on reforming the capacitors, see *Converter module capacitor reforming instructions* (3BFE64059629 [English]), available on the Internet at www.abb.com/drives/documents.

Select the power cables

Size the power cables according to local regulations to carry the nominal current given on the type designation label of your drive.

R6- R9 Ensure the cooling


See table *I* on page *13* for the losses. The allowed operating temperature range of the drive is -15 to +50 °C (+5 to +122 °F). No condensation or frost is allowed. For more information on the ambient temperature and derating, see chapter *Technical data* in *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]).

Protect the drive and input power cable

See table *II* on page *16* for the fuses.

If you use gG fuses, make sure that the operating time of the fuse is below 0.5 seconds. Follow the local regulations.

Install the drive on the wall

 **Warning!** The drive module is heavy (42 to 103 kg / 93 to 227 lb). Use a suitable lifting device. Do not lift the module manually. Make sure that the wall and the fixing devices can carry the weight.

See figure *A* on page *81*.

Check the insulation of the power cables and the motor

Check the insulation of the input cable according to local regulations before connecting it to the drive.

See figure [B](#) on page [81](#).

1. Check the insulation of the motor cable and motor before connecting it to the drive. Measure the insulation resistance between each phase conductor and then between each phase conductor and the Protective Earth conductor using a measuring voltage of 1000 V DC. The insulation resistance of an ABB motor must exceed 100 Mohm (reference value at 25 °C or 77 °F). For the insulation resistance of other motors, see the manufacturer's instructions.

**R6-
R9**

Note: Moisture inside the motor casing will reduce the insulation resistance. If moisture is suspected, dry the motor and repeat the measurement.

Check the compatibility with IT (ungrounded) and corner-grounded TN systems

■ EMC filter

The internal EMC filter is not suitable for use on an IT (ungrounded) system or on a corner-grounded TN system. Disconnect the EMC filter before connecting the drive to the supply network. Check the table on page [52](#).



WARNING! Do not install the drive with the internal EMC filter connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the system will be connected to ground potential through the EMC filter capacitors of the drive. This can cause danger, or damage the drive.

Do not install the drive with the internal EMC filter connected on a corner-grounded TN system, otherwise the drive will be damaged.

Note: When the internal EMC filter is disconnected, the drive EMC compatibility is considerably reduced.

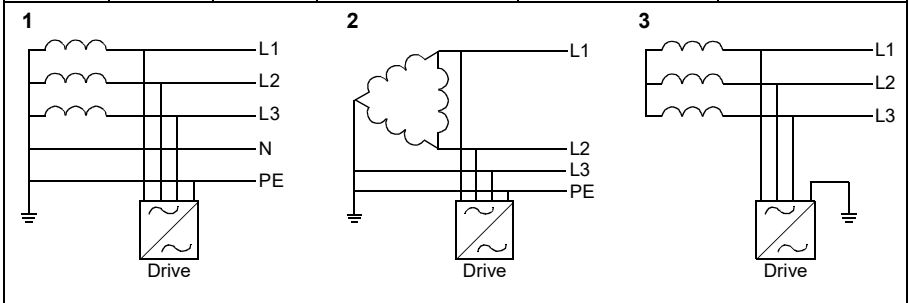
■ Ground-to-phase varistor

The ground-to-phase varistor is not suitable for use on an IT (ungrounded) system. Disconnect the ground-to-phase varistor before connecting the drive to the supply network. Check the table on page [52](#).

⚠ WARNING! Do not install the drive with the ground-to-phase varistor connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the varistor circuit can be damaged.

Check the table below to determine which screws may be metal for your system. For instructions on how to do this, see page 53.

Frame sizes	EMC filter (EMC) ⁵⁾	Ground-to-phase varistor (VAR) ⁵⁾	Symmetrically grounded TN systems (TN-S systems) ¹⁾	Corner grounded TN systems ²⁾	IT systems (ungrounded or high-resistance grounded [>30 ohms]) ³⁾
R6...R9	EMC 1 metal, 1 plastic screw	-	Do not disconnect: Metal screws can be used.	Disconnect: Maintain plastic screw. Remove metal screw.	Disconnect: Maintain plastic screw. Remove metal screw.
	-	VAR 1 metal screw		Do not disconnect: Maintain metal screw.	Disconnect: Remove metal screw.



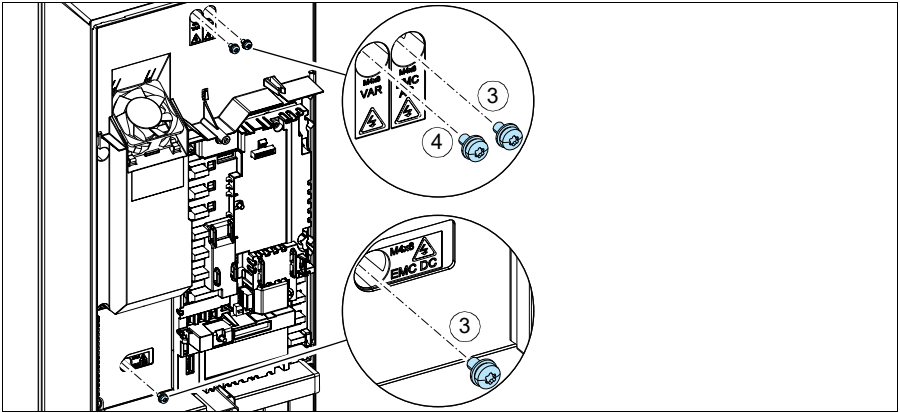
⁵⁾ EMC and VAR columns show the screw material when the drive is shipped.

Note: For statements containing "Maintain plastic screw.": Metal screw must not be used, plastic screw may be maintained or removed from the AC EMC circuit.

■ Disconnect EMC filter or ground-to-phase varistor, if needed

To disconnect the internal EMC filter or ground-to-phase varistor, if needed, do as follows:

1. Switch off the power from the drive.
2. Open the front cover, if not already opened, see steps 5, IP21 and 5, IP55 in figure [A](#) on page [81](#).
3. To disconnect the internal EMC filter, remove the two EMC screws.
4. To disconnect the ground-to-phase varistor, remove the varistor screw.

**R6-
R9**

Wiring R6...R9

Note: These are instructions for conduit wiring. For cable wiring, see the *ACS580 Hardware manual*, publication number 3AXD50000018826.

Note: In US deliveries, options are already installed at the factory. If installing on site, see the appropriate option module manual for specific installation and wiring.

See figure on page 55.

R6-
R9

1. Install thin-wall conduit clamps for IP21/UL Type 1 or liquid-tight conduit connectors for IP55/UL Type 12 (not supplied). Type 12 has a Pressfit gasket.
2. Connect conduit runs for input power, motor and control cables to the conduit box. Ensure grommets (pointing down) are inserted into all unused holes.
3. Route the input power and motor wiring through separate conduits.
4. Strip wires.
5. Connect the motor and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.

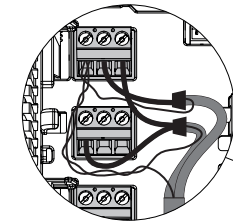
Note: *Frames R8...R9* — If you connect only one conductor to the connector, we recommend that you put it under the upper pressure plate.

6. Connect the input power and ground wires to the drive terminal. Tighten the screws to torques shown in the Power wiring torque table.
7. *Frames R8...R9* — If parallel cables are used, install the parallel power cables.
8. Reinstall the shroud on the power terminals and the conduit box side plates.
9. Route the control cables through the conduit (not the same conduit as either input power or motor wiring).
10. Strip the control cable sheathing and twist the copper screen into a pig-tail.
11. Refer to page 56. Connect the ground screen pig-tail for digital and analog I/O cables. (Ground only at drive end.)
12. Connect the ground screen pig-tail for Embedded fieldbus, EFB (EIA-485) cables at X5. (Ground only at drive end.)
13. Strip and connect the individual control wires to the drive terminals. Tighten the screws to 0.4 lb-ft (0.5...0.6 N-m).

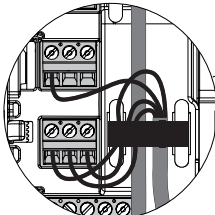


WARNING! To avoid danger or damage to the drive on IT systems and corner grounded TN systems, see section [Check the compatibility with IT \(ungrounded\) and corner-grounded TN systems](#) on page 51.

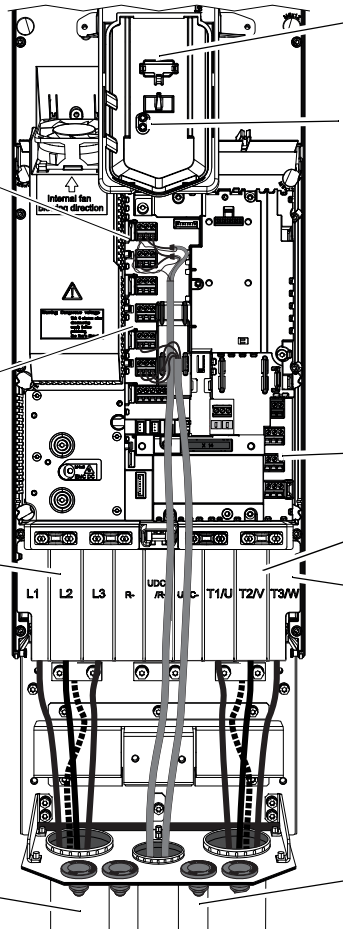
R7 Type 12



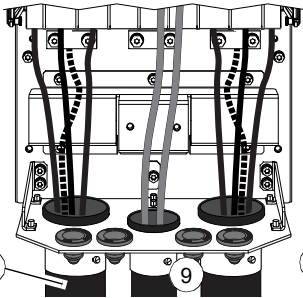
Analog Inputs and Outputs



Digital Inputs



Typical Type 1



1

9

5

Note: UDC+ and UDC- terminals are used for external brake chopper units.

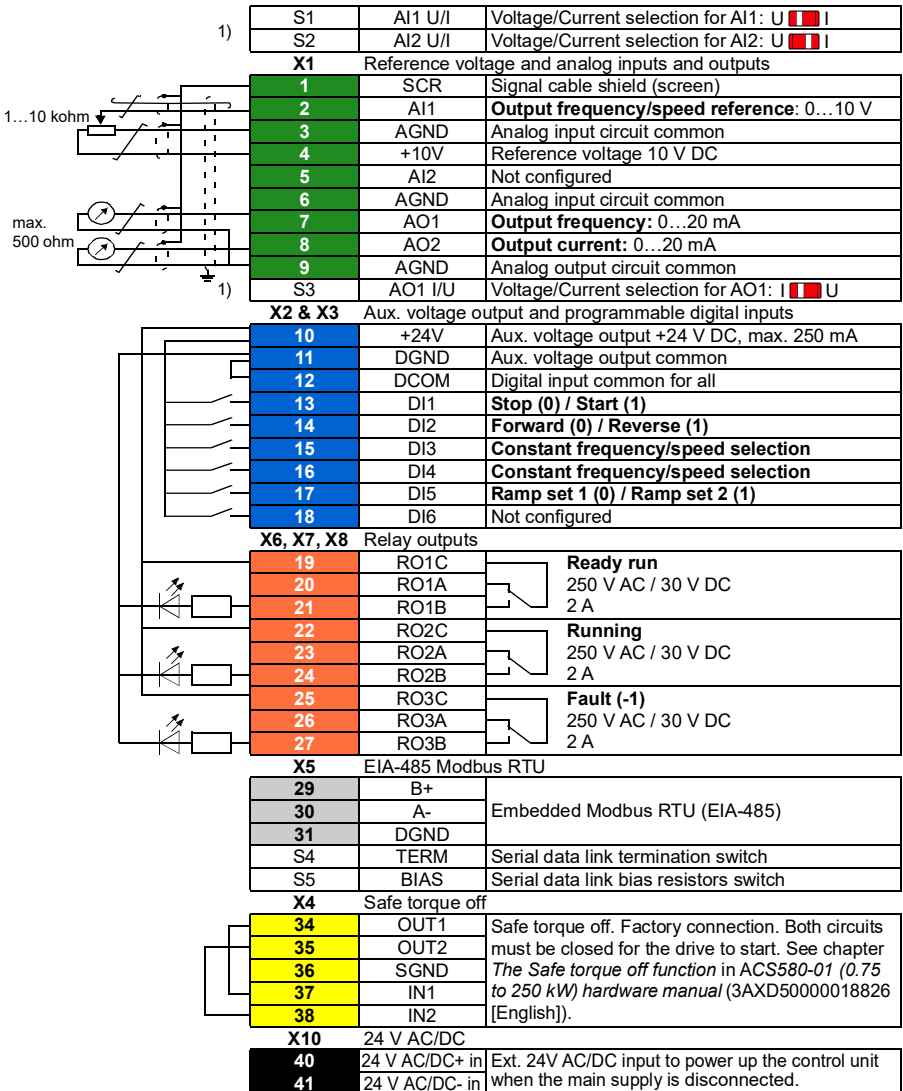
Power wiring torque table

Frame size	R6		R7		R8		R9	
	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m
T1/U, T2/V, T3/W	22.1	30	29.5	40	29.6	40	51.6	70
L1, L2, L3	22.1	30	29.5	40	29.6	40	51.6	70
UDC+ and UDC-	22.1	30	29.5	30	29.5	40	51.6	70
PE Ground	1.1	1.5	1.1	1.5	1.1	1.5	1.1	1.5

Default I/O connections

Default I/O connections of the ABB Standard macro are shown below.

R6-
R9



1) All control boards do not have switches S1, S2 and S3. In that case, select voltage or current for inputs AI1 and AI2 and output AO1 with parameters. See the firmware manual.

Total load capacity of the Auxiliary voltage output +24V (X2:10) is 6.0 W (250 mA / 24 V DC).

Wire sizes: 0.14...2.5 mm² (26...16 AWG): All terminals

Tightening torques: 0.5...0.6 N·m (0.4 lbf·ft)

Install optional modules, if any

See chapter *Electrical installation* in *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]).

Install side plates and covers

See figure on page [83](#).

IP21

1. Reinstall the side plates of the cable entry box. Tighten the retaining screws with a screwdriver.
2. Slide the cover of the cable entry box on the module from below until the cover snaps into place.
3. Reinstall the module cover. Tighten the two retaining screws with a screwdriver.

IP55

1. Reinstall the module cover. Tighten the two retaining screws with a screwdriver.

For start-up instructions, see chapter [Quick start-up guide](#) on page [61](#).

R6-
R9

[Page intentionally left blank]

ABB GENERAL PURPOSE DRIVES

Quick start-up guide

ACS580-01 drives (frames R1 to R9)

R1-
R4

R5

R6-
R9



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Quick start-up guide


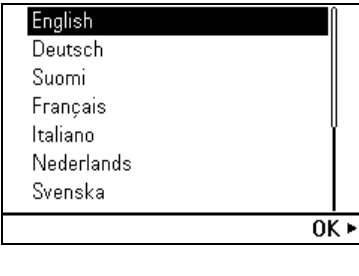

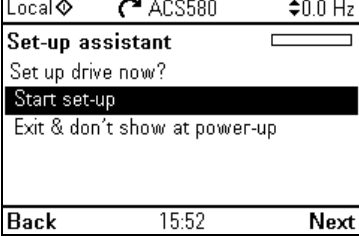

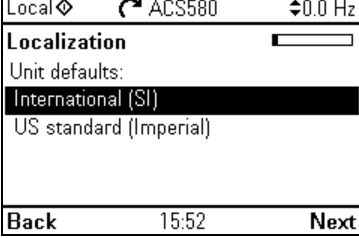




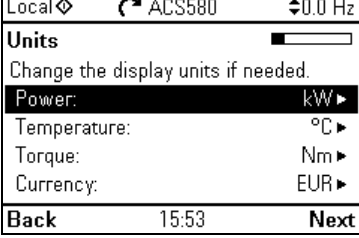




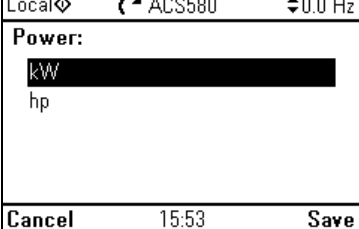
This guide describes how to start-up the drive using the First start assistant on the assistant control panel.





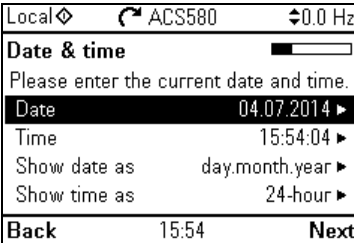









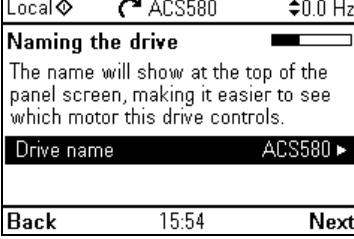

Before you start


























Ensure that the drive has been installed as described in chapter [R1...R4 Quick installation guide](#) on page 21, in chapter [R5 Quick installation guide](#) page 37 chapter [R6...R9 Quick installation guide](#) on page 49 (frames R6...R9) or in chapter [R6...R9 Quick installation guide](#) on page 49.




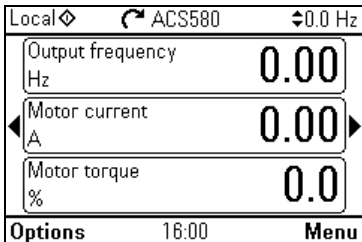





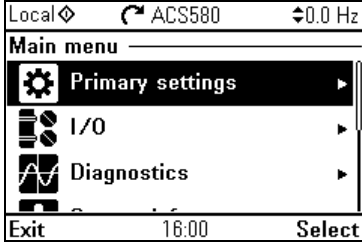




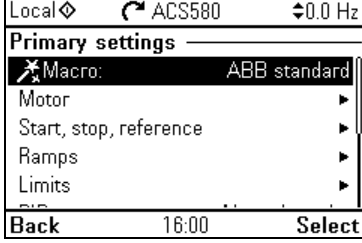


Start-up with the First start assistant on an assistant control panel

Safety	
<input type="checkbox"/>	Make sure that the installation work is complete. Make sure that cover of the drive and the cable box, if included, are on place.
<input type="checkbox"/>	 Check that the starting of the motor does not cause any danger. De-couple the driven machine if there is a risk of damage in case of an incorrect direction of rotation.
Hints on using the assistant control panel	
<p>The two commands at the bottom of the display (Options and Menu in the figure on the right), show the functions of the two softkeys  and  located below the display. The commands assigned to the softkeys vary depending on the context.</p> <p>Use keys , ,  and  to move the cursor and/or change values depending on the active view.</p> <p>Key  shows a context-sensitive help page.</p>	
1 – First start assistant guided settings: Language, date and time, and motor nominal values	
<input type="checkbox"/>	Have the motor name plate data at hand. Power up the drive.

<p><input type="checkbox"/> The First start assistant guides you through the first start-up.</p> <p>The assistant begins automatically. Wait until the control panel enters the view shown on the right.</p> <p>Select the language you want to use by highlighting it (if not already highlighted) and pressing  (OK).</p> <p>Note: After you have selected the language, it takes a few minutes for the control panel to wake up.</p>	 <p>English Deutsch Suomi Français Italiano Nederlands Svenska</p> <p>OK ▶</p>
<p><input type="checkbox"/> Select Start set-up and press  (Next).</p>	 <p>Local ◊ ACS580 0.0 Hz</p> <p>Set-up assistant</p> <p>Set up drive now?</p> <p>Start set-up</p> <p>Exit & don't show at power-up</p> <p>Back 15:52 Next</p>
<p><input type="checkbox"/> Select the localization you want to use and press  (Next).</p>	 <p>Local ◊ ACS580 0.0 Hz</p> <p>Localization</p> <p>Unit defaults:</p> <p>International (SI)</p> <p>US standard (Imperial)</p> <p>Back 15:52 Next</p>
<p><input type="checkbox"/> Change the units shown on the panel if needed.</p> <ul style="list-style-type: none"> Go to the edit view of a selected row by pressing . Scroll the view with  and . <p>Go to the next view by pressing  (Next).</p>	 <p>Local ◊ ACS580 0.0 Hz</p> <p>Units</p> <p>Change the display units if needed.</p> <p>Power: kW ▶</p> <p>Temperature: °C ▶</p> <p>Torque: Nm ▶</p> <p>Currency: EUR ▶</p> <p>Back 15:53 Next</p>
<p><input type="checkbox"/> To select a value in an edit view:</p> <ul style="list-style-type: none"> Use  and  to select the value. <p>Press  (Save) to accept the new setting, or press  (Cancel) to go back to the previous view without making changes.</p>	 <p>Local ◊ ACS580 0.0 Hz</p> <p>Power:</p> <p>kW</p> <p>hp</p> <p>Cancel 15:53 Save</p>

<p><input type="checkbox"/> Set the date and time as well as date and time display formats.</p> <ul style="list-style-type: none"> Go to the edit view of a selected row by pressing . Scroll the view with  and . <p>Go to the next view by pressing  (Next).</p>	
<p><input type="checkbox"/> To change a value in an edit view:</p> <ul style="list-style-type: none"> Use  and  to move the cursor left and right. Use  and  to change the value. Press  (Save) to accept the new setting, or press  (Cancel) to go back to the previous view without making changes. 	
<p><input type="checkbox"/> To give the drive a name that will be shown at the top, press .</p> <p>If you do not want to change the default name (ACS580), continue straight to the set-up of the motor nominal values by pressing  (Next).</p> <p>For information on editing text, see <i>ACS580 standard control program firmware manual</i> (3AXD50000016097 [English]).</p>	
<p>Refer to the motor nameplate for the following nominal value settings of the motor. Enter the values <u>exactly</u> as shown on the motor nameplate.</p> <p>Example of a nameplate of an induction (asynchronous) motor:</p> 	

<input type="checkbox"/>	<p>Check that the motor data is correct. Values are predefined on the basis of the drive size but you should verify that they correspond to the motor. Start with the motor type.</p> <p>Motor nominal $\cos\Phi$ and nominal torque are optional.</p> <p>Press  (Next) to continue.</p>	<p>Local  ACS580  0.0 Hz</p> <p>Motor nominal values </p> <p>Find the values on the motor's nameplate, and enter them here:</p> <p>Type: Asynchronous motor </p> <p>Current: 1.8 A </p> <p>Voltage: 400.0 V </p> <p>Back 15:56 Next</p>
<input type="checkbox"/>	<p>This step is optional, and requires rotating the motor. Do not do this if it could cause any risk, or if the mechanical set-up does not allow it.</p> <p>To do the direction test, select Spin the motor and press  (Next).</p>	<p>Local  ACS580  0.0 Hz</p> <p>Direction test? </p> <p>Spin the motor to check direction?</p> <p>Not now</p> <p>Spin the motor</p> <p>Back 15:58 Next</p>
<input type="checkbox"/>	<p>Press the Start key  on the panel to start the drive.</p>	<p>Local  ACS580  0.0 Hz</p> <p>Press Start </p> <p>Warning: Until set-up is done, safeties are not active and motor speed is 5 Hz.</p> <p>Press Start now to spin the motor, then check the direction of rotation.</p> <p>Back 15:59</p>
<input type="checkbox"/>	<p>Check the direction of the motor.</p> <p>If it is forward, select Yes, motor is spinning forward and press  (Next) to continue.</p> <p>If the direction is not forward, select No, fix direction and press  (Next) to continue.</p>	<p>Local  ACS580  5.0 Hz</p> <p>Is this forward? </p> <p>Selecting "No, fix direction" tells the drive to change direction, and labels the new direction "forward".</p> <p>Yes, motor is spinning forward</p> <p>No, fix direction</p> <p>Back 15:59 Next</p>
<input type="checkbox"/>	<p>If you want to make a backup of the settings made so far, select Backup and press  (Next).</p> <p>If you do not want to make a backup, select Not now and press  (Next).</p>	<p>Local  ACS580  0.0 Hz</p> <p>Make backup? </p> <p>Copies all settings into a backup file stored in the control panel. To restore a backup, go to Menu > Backups.</p> <p>Not now</p> <p>Backup</p> <p>Back 16:00 Next</p>

<input type="checkbox"/> The first start is now complete and the drive is ready for use. Press  (Done) to enter the Home view.	 <p>Local  ACS580 0.0 Hz</p> <p>First start complete</p> <p>Drive is ready for use.</p> <p>Start/Stop: DI1</p> <p>Direction: DI2</p> <p>Reference (freq): AI1 scaled</p> <p>Back 16:00 Done</p>
<input type="checkbox"/> The Home view monitoring the values of the selected signals is shown on the panel.	 <p>Local  ACS580 0.0 Hz</p> <p>Output frequency 0.00 Hz</p> <p>Motor current 0.00 A</p> <p>Motor torque 0.0 %</p> <p>Options 16:00 Menu</p>
2 – Additional settings in the Primary settings menu	
<input type="checkbox"/> Make any additional adjustments, for example macro, ramps and limits, starting from the Main menu – press  (Menu) to enter the Main menu. Select Primary settings and press  (Select) (or ). We recommend that you make at least these additional settings: <ul style="list-style-type: none"> • Choose a macro or set start, stop and reference values individually • Ramps • Limits With the Primary settings menu, you can also adjust settings related to the motor, PID, fieldbus, advanced functions and clock, region and display. In addition, the menu contains an item to reset the panel Home view. To get more information on the Primary settings menu items, press  to open the help page.	 <p>Local  ACS580 0.0 Hz</p> <p>Main menu</p> <p> Primary settings ▶</p> <p> I/O ▶</p> <p> Diagnostics ▶</p> <p>Exit 16:00 Select</p>  <p>Local  ACS580 0.0 Hz</p> <p>Primary settings</p> <p> Macro: ABB standard</p> <p>Motor ▶</p> <p>Start, stop, reference ▶</p> <p>Ramps ▶</p> <p>Limits ▶</p> <p>Back 16:00 Select</p>
















2 – Additional settings: Start, stop and reference values

<p><input type="checkbox"/> If you do not wish to use a macro, define the settings for start, stop and reference: Select Start, stop, reference and press (Select) (or).</p>	<p>Local ACS580 0.0 Hz</p> <p>Primary settings</p> <ul style="list-style-type: none"> Macro: ABB standard Motor Start, stop, reference Ramps Limits <p>Back 16:02 Select</p>
<p><input type="checkbox"/> Adjust the parameters according to your needs. Select a parameter and, depending on the parameter type, press (Edit) or press (Select) (or).</p> <p>When you change the settings, you also change the use of the I/O signals in the drive. Make sure the actual I/O wiring and the use of I/O in the control program match each other. You can check the current I/O use in the I/O menu under the Main menu.</p> <p>After making the adjustments, go back to the Primary settings menu by pressing (Back).</p>	<p>Local ACS580 0.0 Hz</p> <p>Start, stop, reference</p> <ul style="list-style-type: none"> Reference from: A11 directly A11 scaling Start/stop/dir from: D11 start/stop,... Secondary control location Off Constant frequencies On <p>Back 16:02 Edit</p>

2 – Additional settings: Ramps (acceleration and deceleration times for the motor)

<p><input type="checkbox"/> Select Ramps and press (Select) (or).</p>	<p>Local ACS580 0.0 Hz</p> <p>Primary settings</p> <ul style="list-style-type: none"> Macro: ABB standard Motor Start, stop, reference Ramps Limits <p>Back 16:02 Select</p>
<p><input type="checkbox"/> Adjust the parameters according to your needs. Select a parameter and press (Edit). After making the adjustments, go back to the Primary settings menu by pressing (Back).</p>	<p>Local ACS580 0.0 Hz</p> <p>Ramps</p> <ul style="list-style-type: none"> Acceleration time: 20.000 s Deceleration time: 20.000 s Shape time: 0.100 s Stop mode: Coast <input checked="" type="checkbox"/> Use two ramp sets <p>Back 16:02 Edit</p>

2 – Additional settings: Limits

<input type="checkbox"/>	Select Limits and press  (Select) (or ).	<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid black;"> Local   ACS580  0.0 Hz </div> <div style="border-bottom: 1px solid black;"> <p>Primary settings</p> <ul style="list-style-type: none">  Macro: ABB standard Motor  Start, stop, reference  Ramps  Limits  </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid black;"> Back 16:02 Select </div> </div>
<input type="checkbox"/>	Adjust the parameters according to your needs. Select a parameter and press  (Edit). After making the adjustments, go back to the Primary settings menu by pressing  (Back).	<div style="border: 1px solid black; padding: 5px;"> <div style="display: flex; justify-content: space-between; border-bottom: 1px solid black;"> Local   ACS580  0.0 Hz </div> <div style="border-bottom: 1px solid black;"> <p>Limits</p> <ul style="list-style-type: none"> Minimum frequency: -50.00 Hz Maximum frequency: 50.00 Hz Maximum current: 3.24 A </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid black;"> Back 16:03 Edit </div> </div>

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Compliance with the European Machinery Directive 2006/42/EC



EU Declaration of Conformity

(According to Machinery Directive 2006/42/EC)

We

Manufacturer: ABB Oy, Drives
Address: Hiomotie 13, P.O Box 184, 00381 Helsinki, Finland.

hereby declare that the product

ACS580-01 (frame sizes R0, R1, R2, R3, R4, R5, R6, R7, R8 and R9)

with regard to the following safety function

Safe torque off

fulfils all the relevant safety component requirements of EC Machinery Directive 2006/42/EC, when the listed safety function is used for safety component functionality.

The following harmonized standards below were used:

EN 61800-5-2: 2007	<i>Adjustable speed electrical power drive systems – Part 5-2: Safety requirements - Functional</i>
EN 62061: 2015	<i>Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems</i>
EN ISO 13849-1: 2008 + AC: 2009	<i>Safety of machinery – Safety-related parts of control systems. Part 1: General requirements</i>
EN ISO 13849-2: 2012	<i>Safety of machinery – Safety-related parts of the control systems. Part 2: Validation</i>
EN 60204-1:2006 + A1:2009 + AC:2010	<i>Safety of machinery – Electrical equipment of machines – Part 1: General requirements</i>

Other used standards:

IEC 61508 ed. 2: 2010	Functional safety of electrical / electronic / programmable electronic safety-related systems
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The products referred in this Declaration of Conformity fulfil the relevant provisions of the Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC. Declaration of conformity according to these directives is available from the manufacturer.

Person authorized to compile the technical file:

Name: Risto Myntinen
Address: P.O. Box 184, FIN-00381 Helsinki, Finland

Helsinki, 2016-02-15


Tuomo Höysniemi
Vice President
ABB Oy

3AXD10000302783

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Compliance with the European Machinery Directive 2006/42/EC

NOTICE

The ratings listed below are NOT included in the compliance directive and do not carry the CE mark.

ACS580-01-343A-2 125 HP at 230 V

ACS580-01-396A-2 150 HP at 230 V

These ratings do carry UL listing (cULus).

UL PENDING



ABB GENERAL PURPOSE DRIVES

Quick installation guide

ACS580-01 drives

Installation figures

R1-
R4

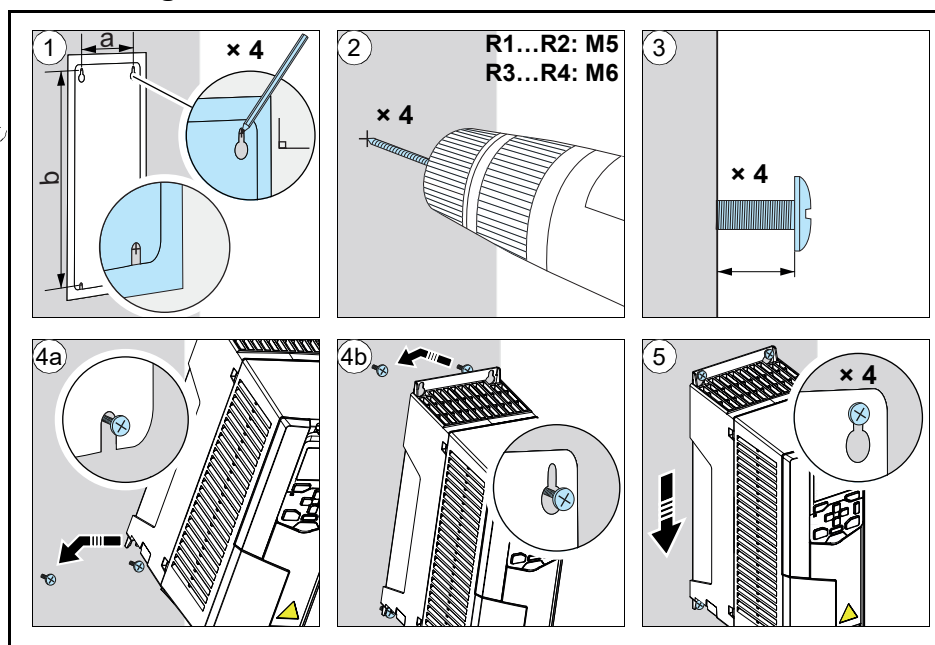
R5

R6-
R9

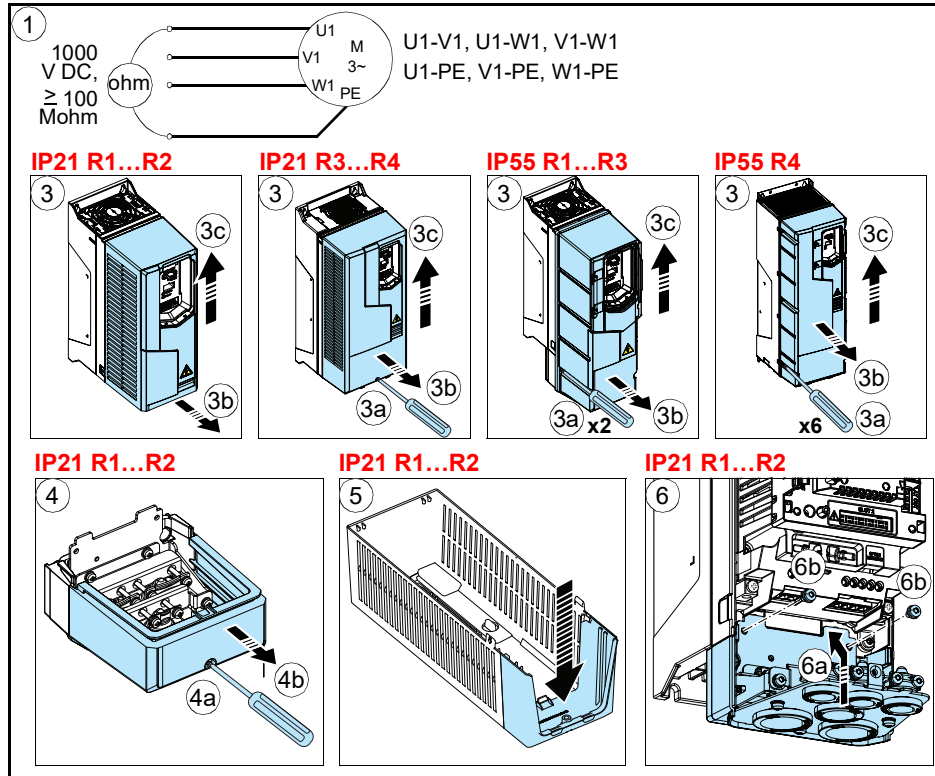


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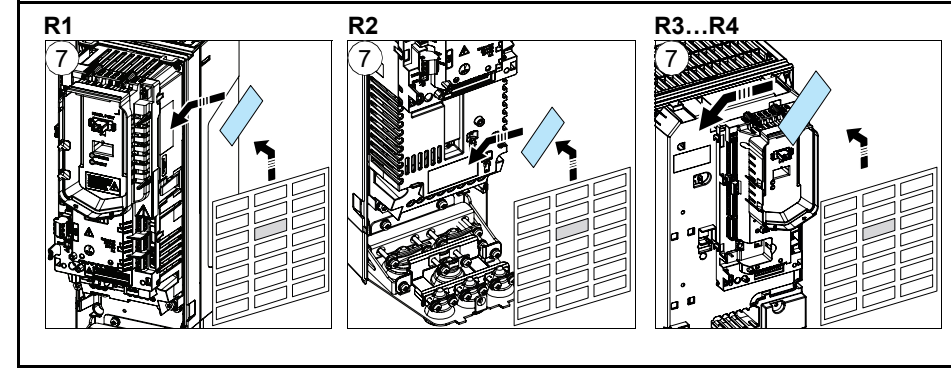
R1...R4 Figures A



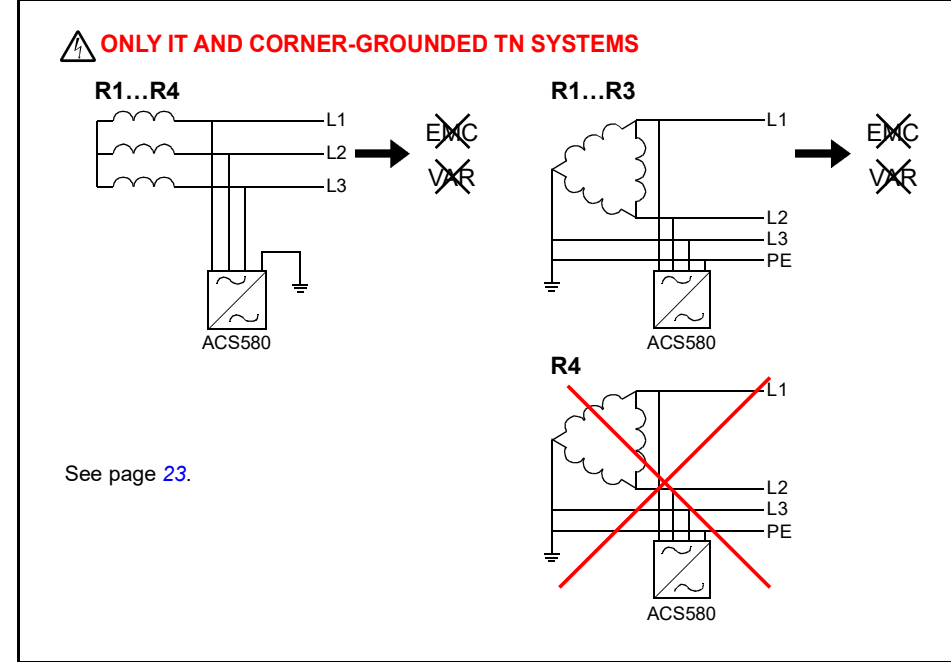
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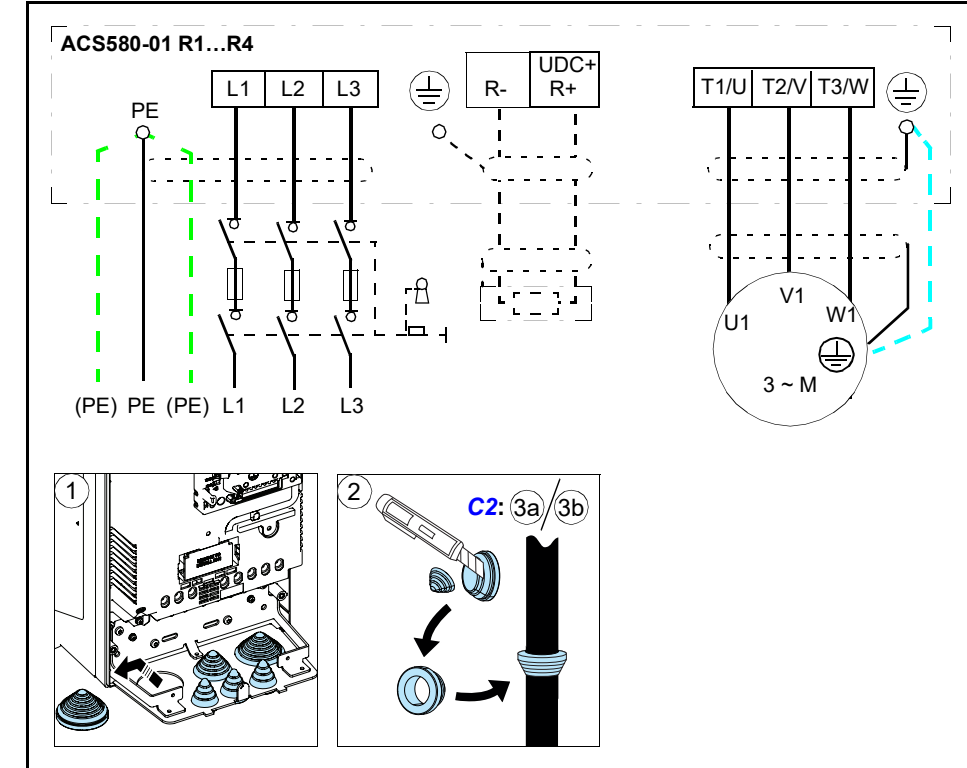
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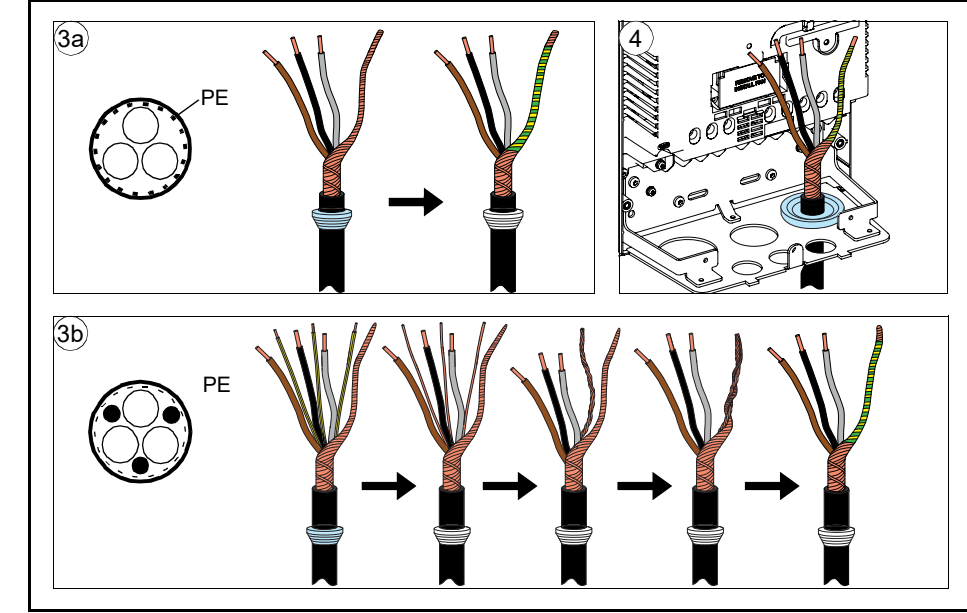
B3



C1



C2



D

R1...R2

R3

R4

Frame size	R1		R2	
	N·m	lbf-ft	N·m	lbf-ft
T1/U, T2/V, T3/W	0.5...0.6	0.4	1.2...1.5	1.1
PE, ⊕	1.5	1.1	1.5	1.1
	1.2	0.9	1.2	0.9

Frame size	R3		R4	
	N·m	lbf-ft	N·m	lbf-ft
T1/U, T2/V, T3/W	2.5...4.5	3.3	4.0	3.0
PE, ⊕	1.5	1.1	2.9	2.1
	1.2	0.9	1.2	0.9

E1

6a

6b

6c

E2

R1...R2

R3

R4

Frame size	R1		R2	
	N·m	lbf-ft	N·m	lbf-ft
L1, L2, L3	0.5...0.6	0.4	1.2...1.5	1.1
PE, ⊕	1.5	1.1	1.5	1.1
	1.2	0.9	1.2	0.9

Frame size	R3		R4	
	N·m	lbf-ft	N·m	lbf-ft
L1, L2, L3	2.5...4.5	3.3	4.0	3.0
PE, ⊕	1.5	1.1	2.9	2.1
	1.2	0.9	1.2	0.9

F

R1...R2

R4

G1

9

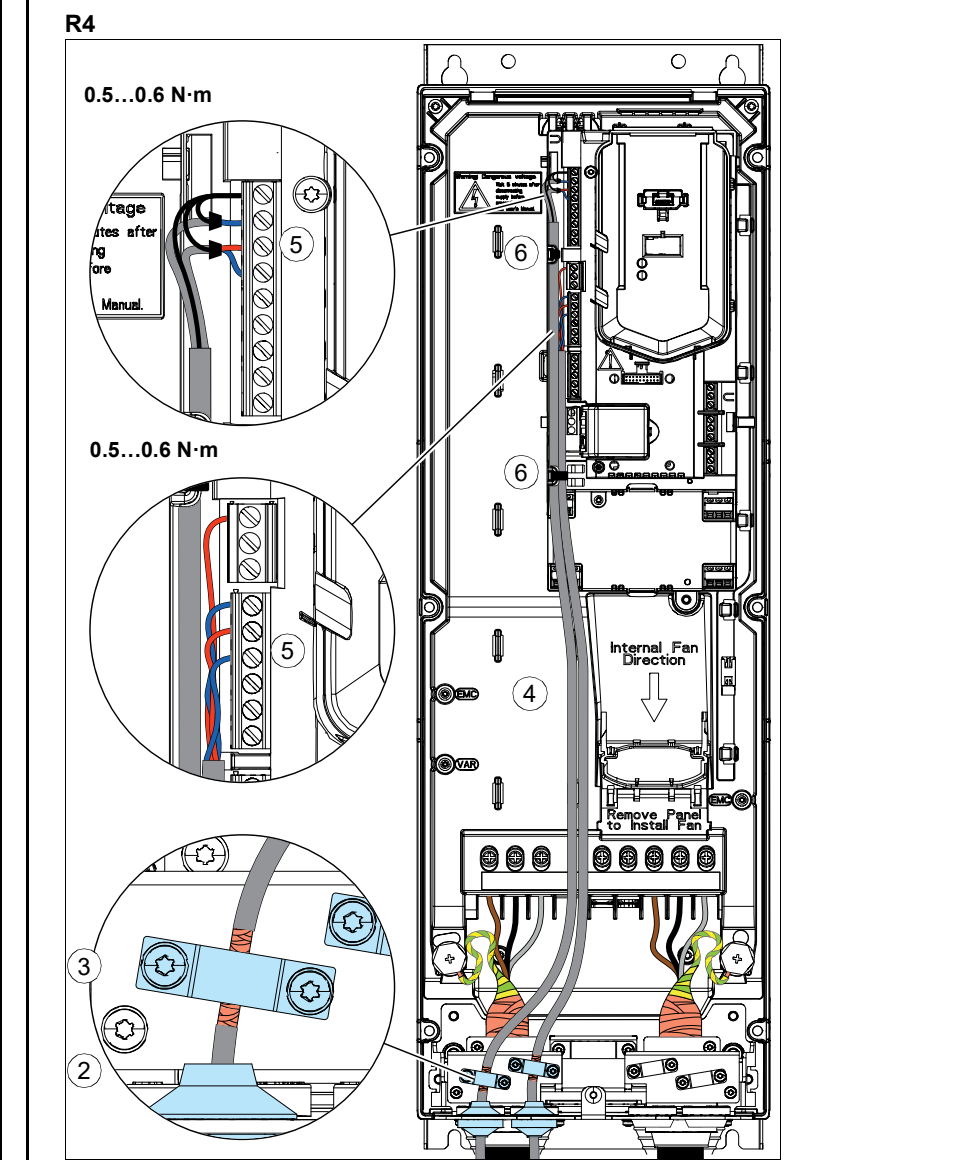
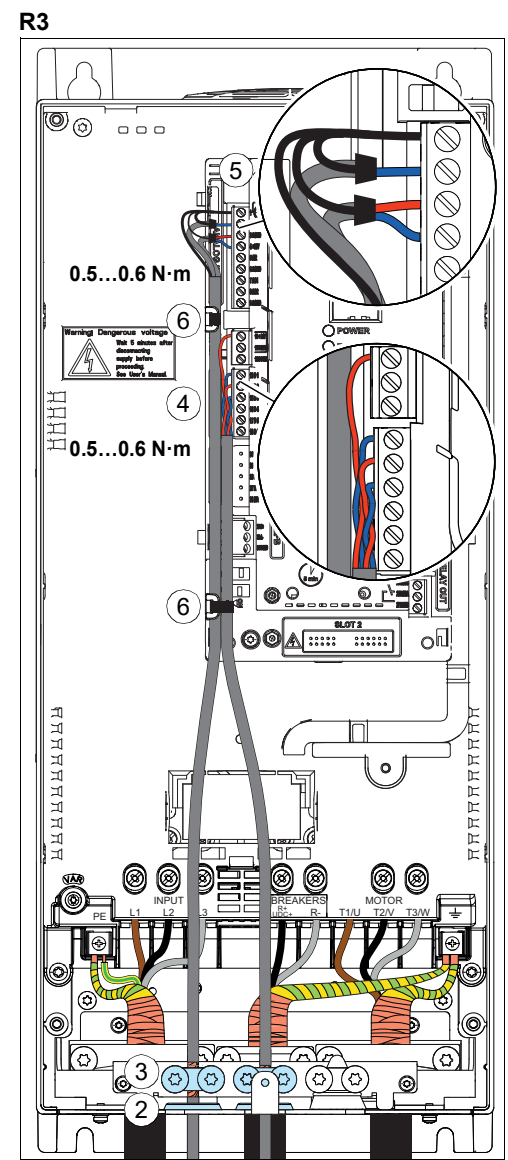
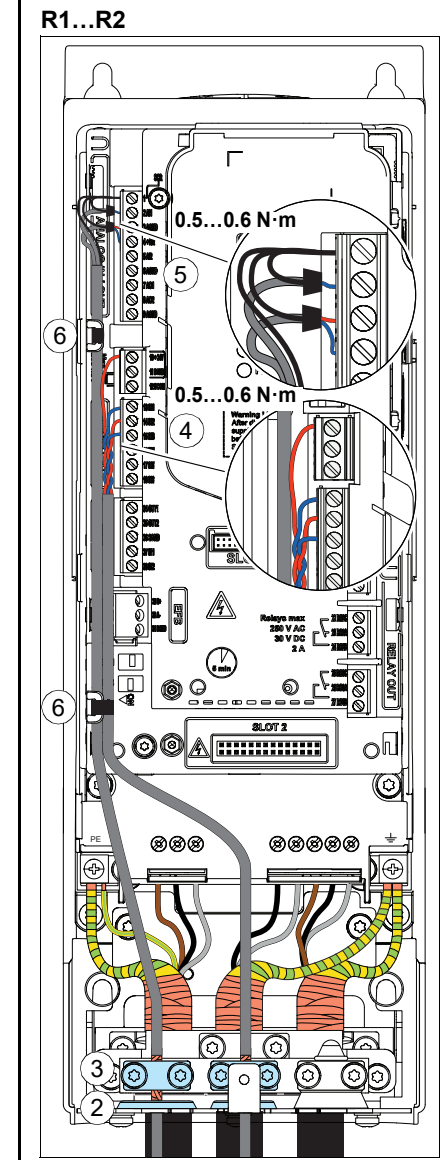
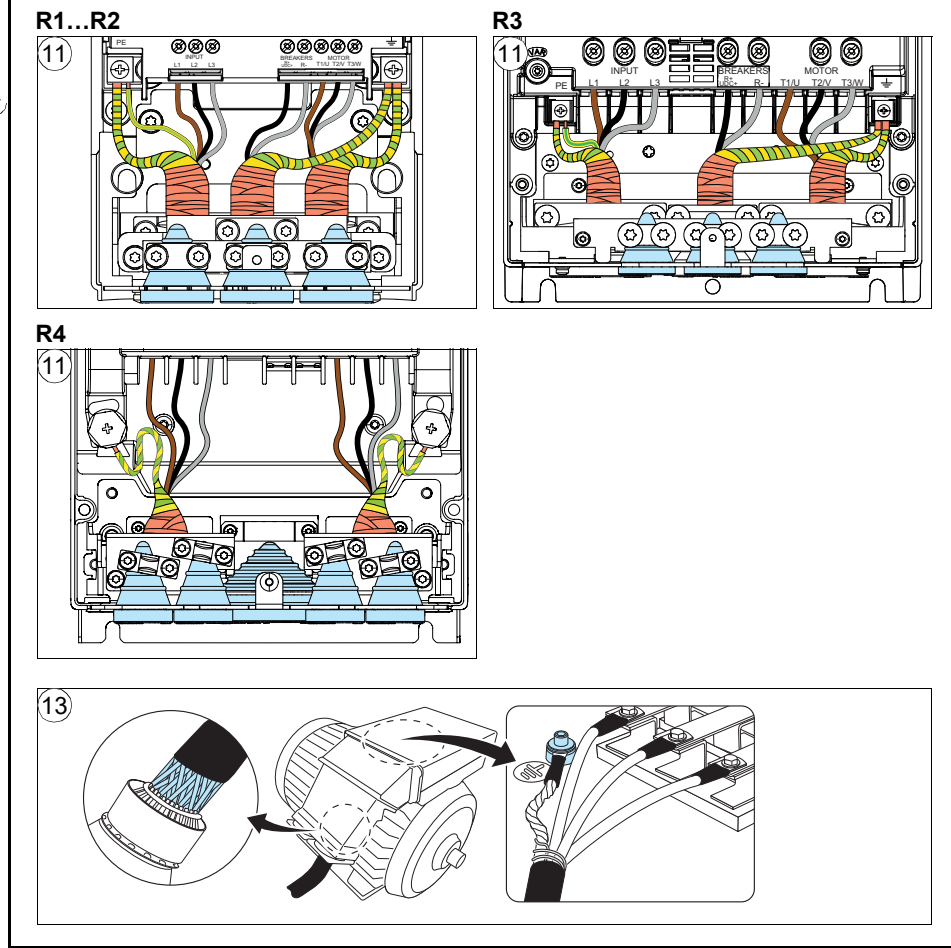
G2

R1...R2

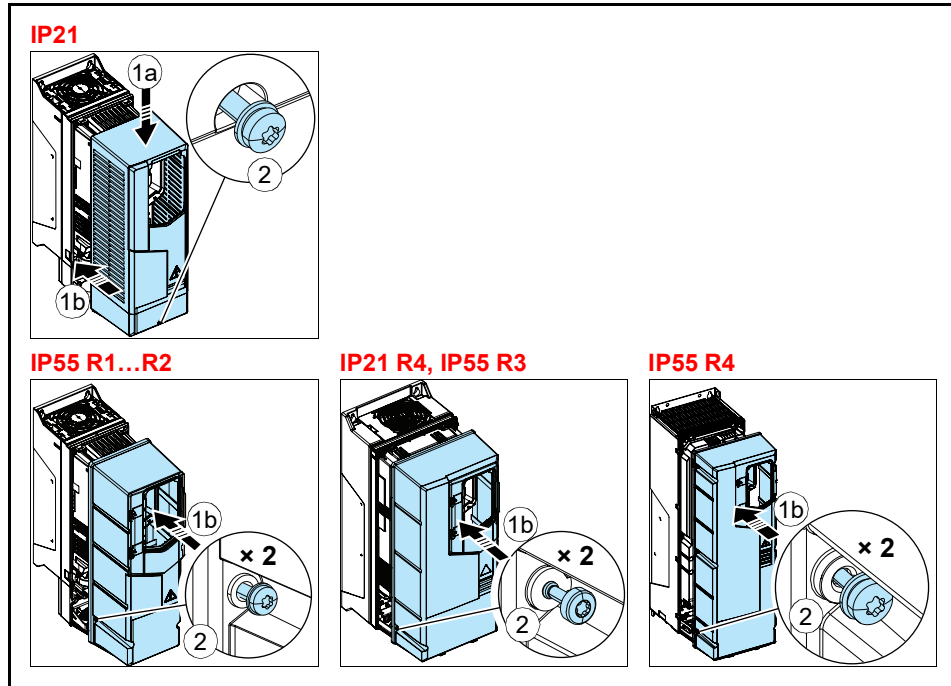
R3

Frame size	R1		R2		R3	
	N·m	lbf-ft	N·m	lbf-ft	N·m	lbf-ft
R-, R+	0.5...0.6	0.4	1.2...1.5	1.1	2.5...4.5	3.3
PE, ⊕	1.5	1.1	1.5	1.1	1.5	1.1
	1.2	0.9	1.2	0.9	1.2	0.9

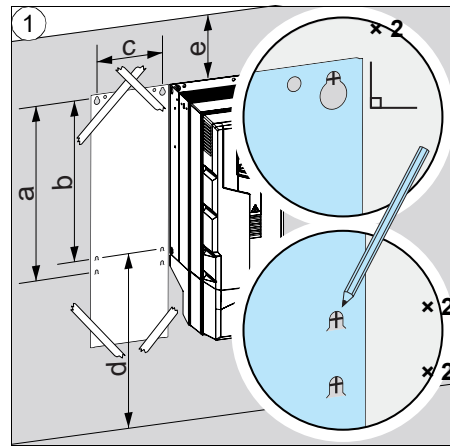
R1...R4 Figures H



J

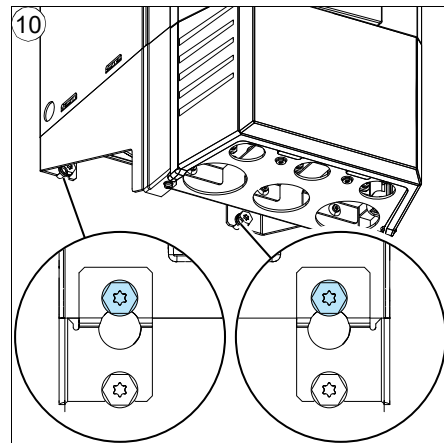
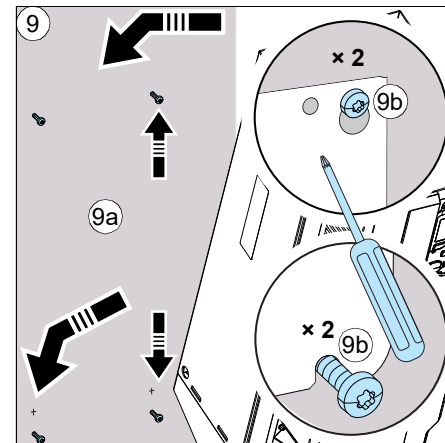
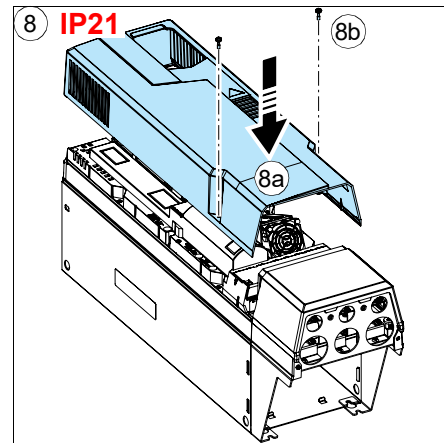
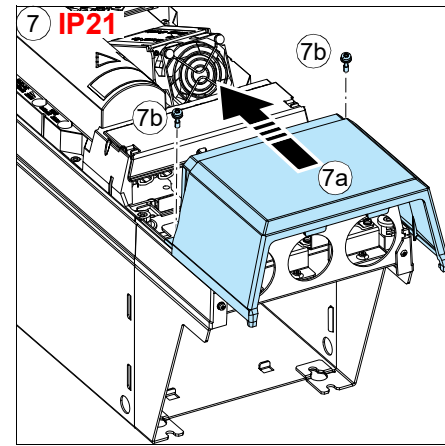
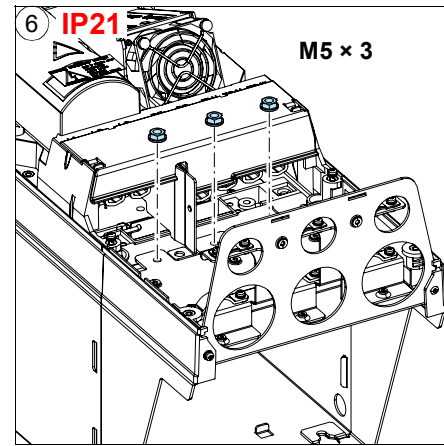
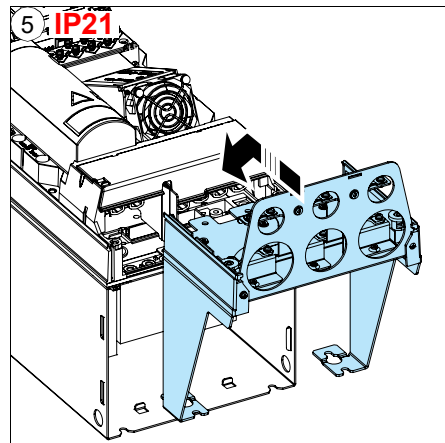
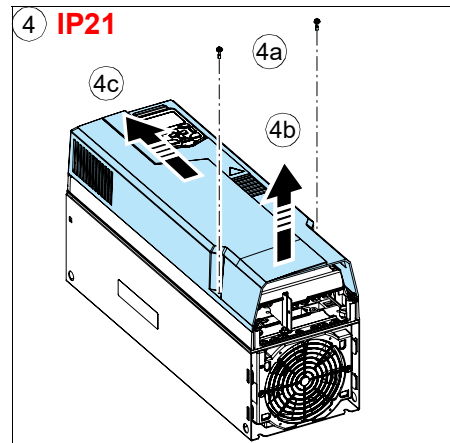
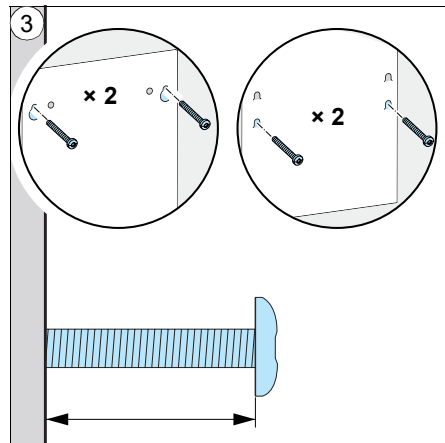
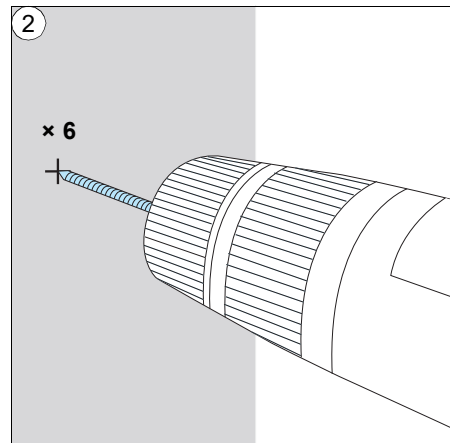


R5 Figures A

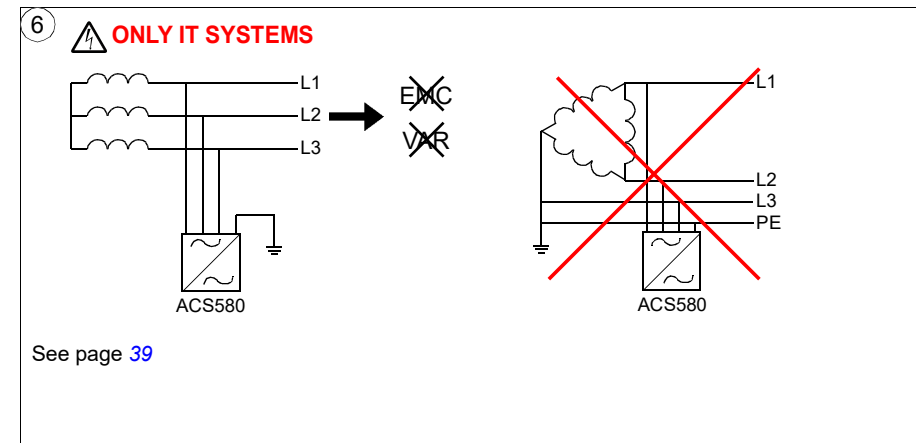
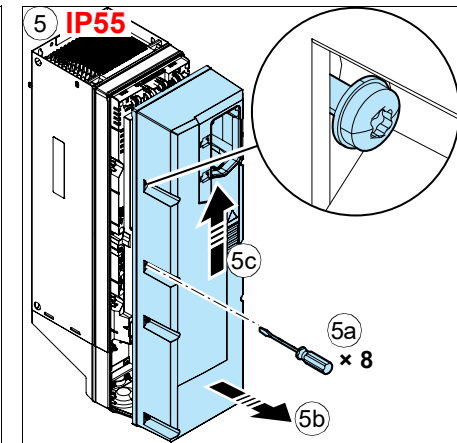
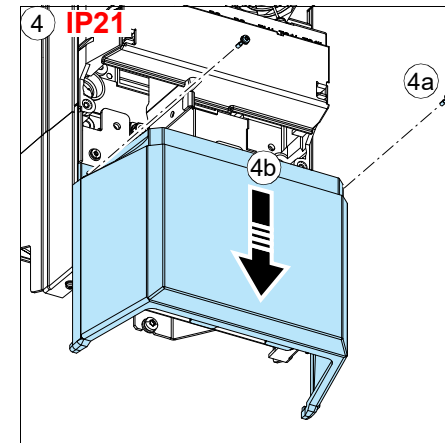
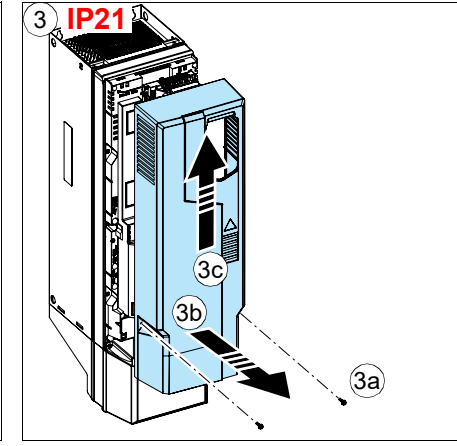
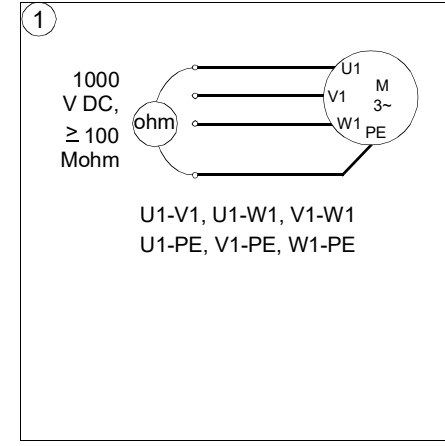


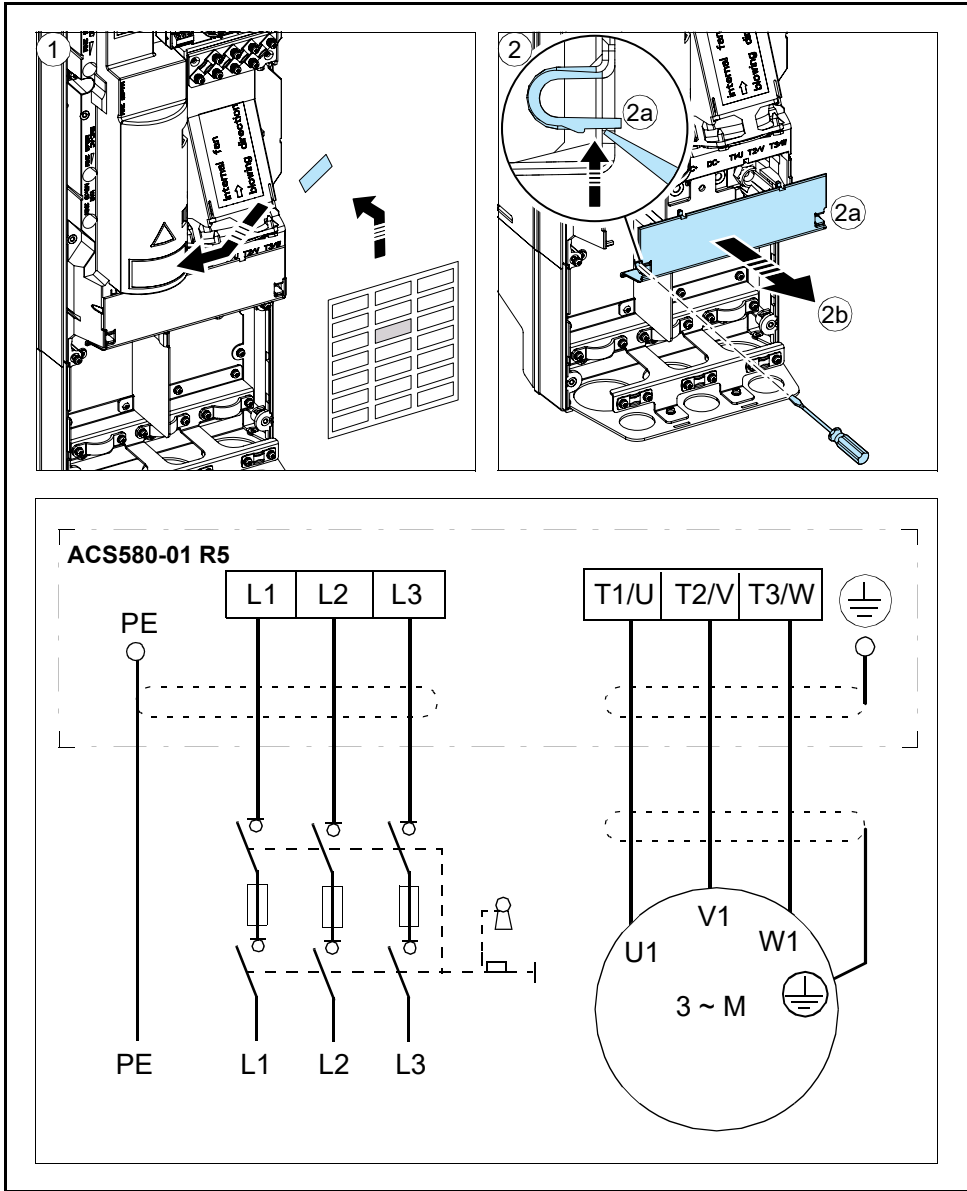
	R5 IP21		R5 IP55	
	mm	in	mm	in
a	612	24.09	612	24.09
b	581	22.87	581	22.87
c	160	6.30	160	6.30
d >	200	7.9	200	7.9
e >	200	7.9	200	7.9

⚠	R5 IP21		R5 IP55	
	kg	lb	kg	lb
	28.3	62.4	28.6	63.1

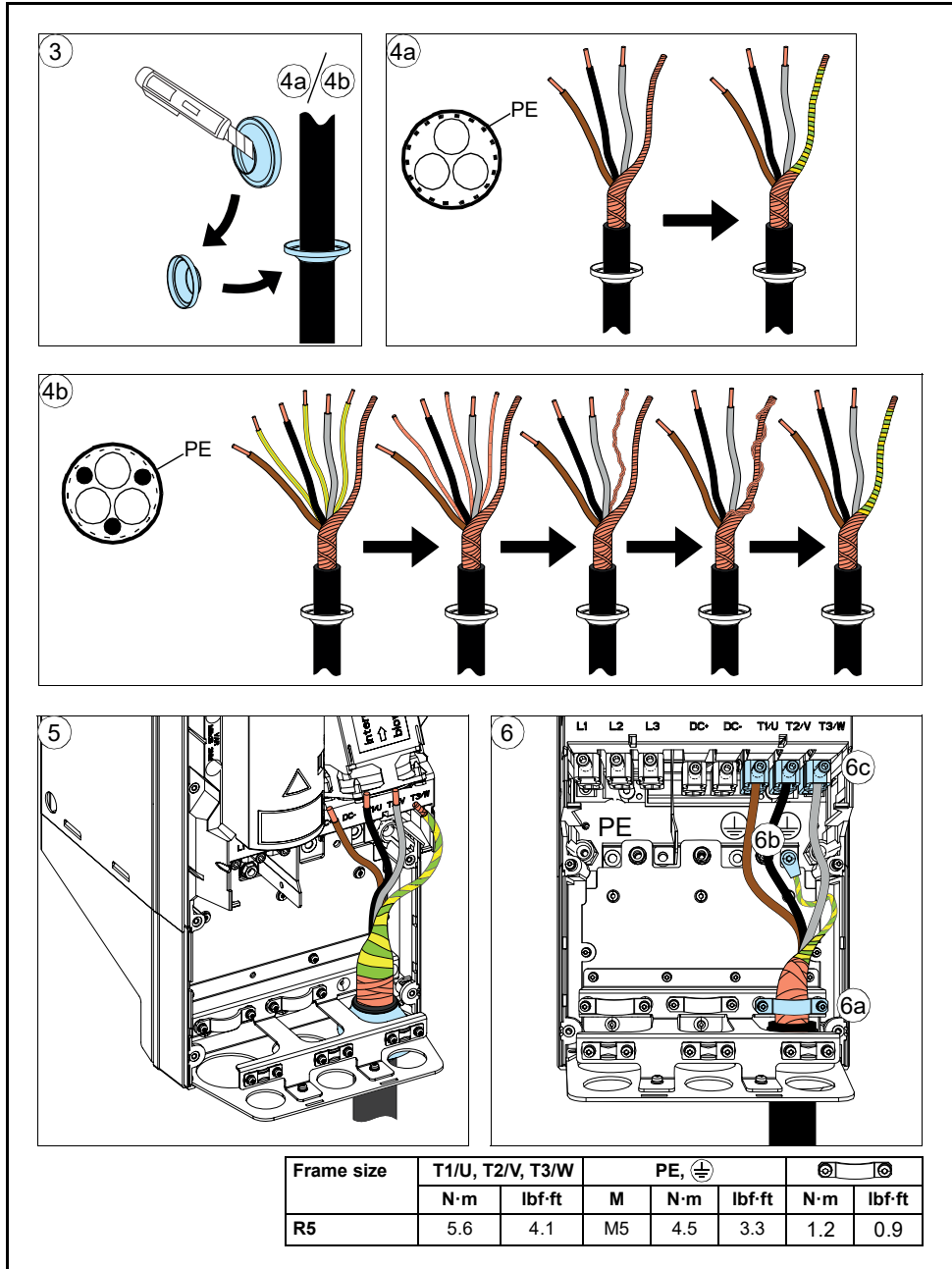


B

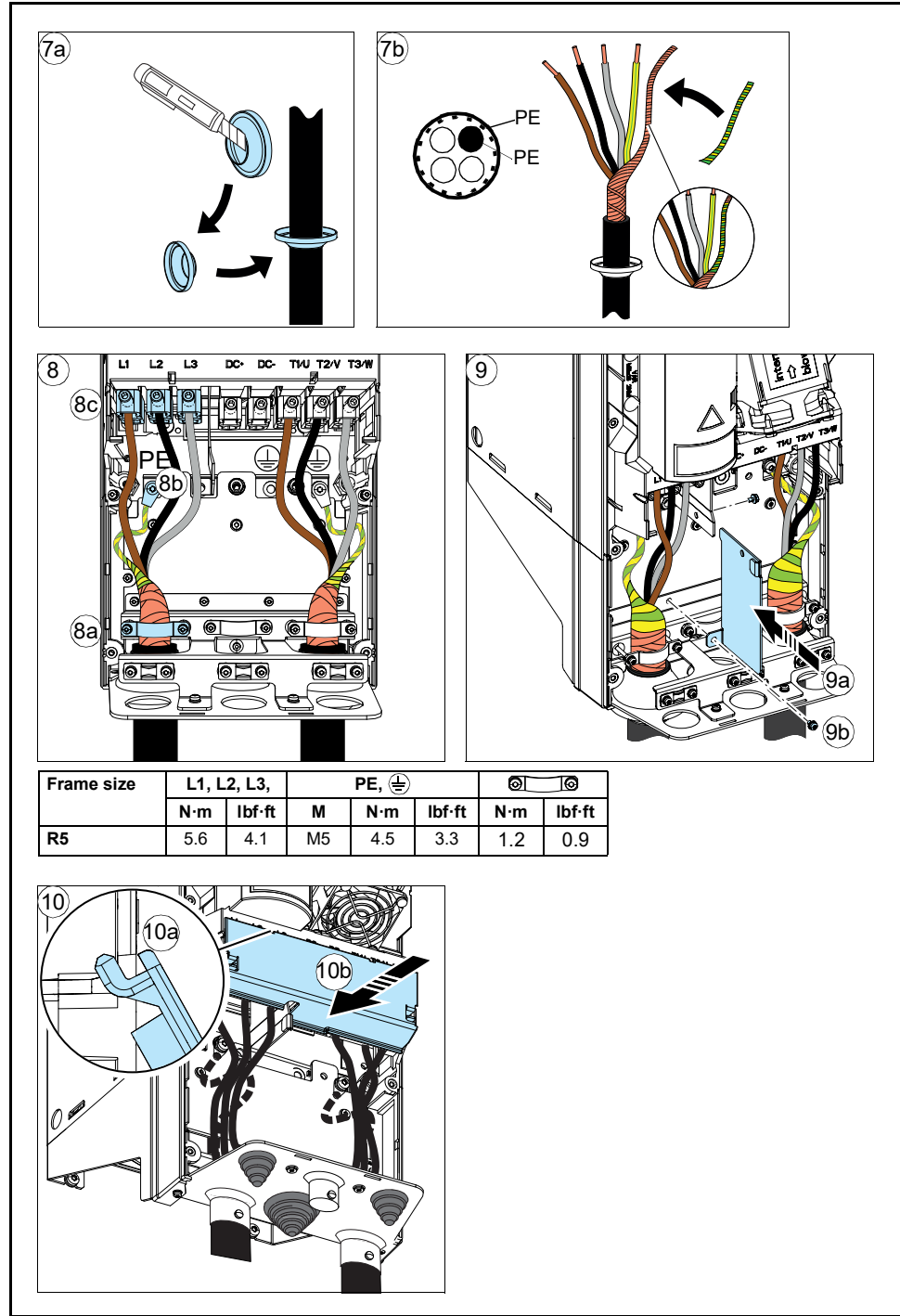




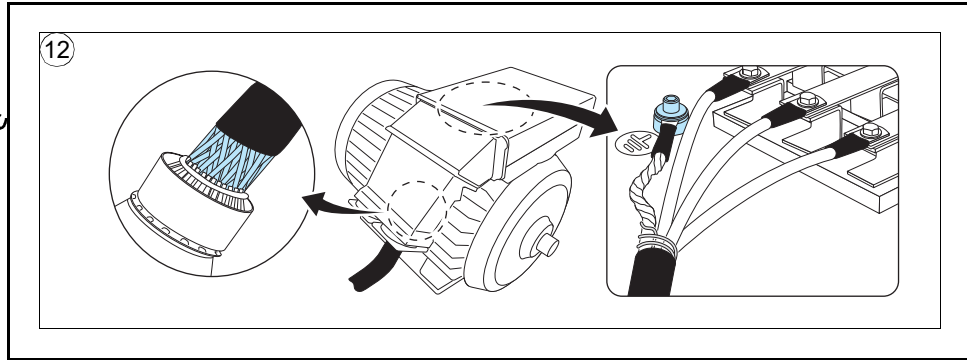
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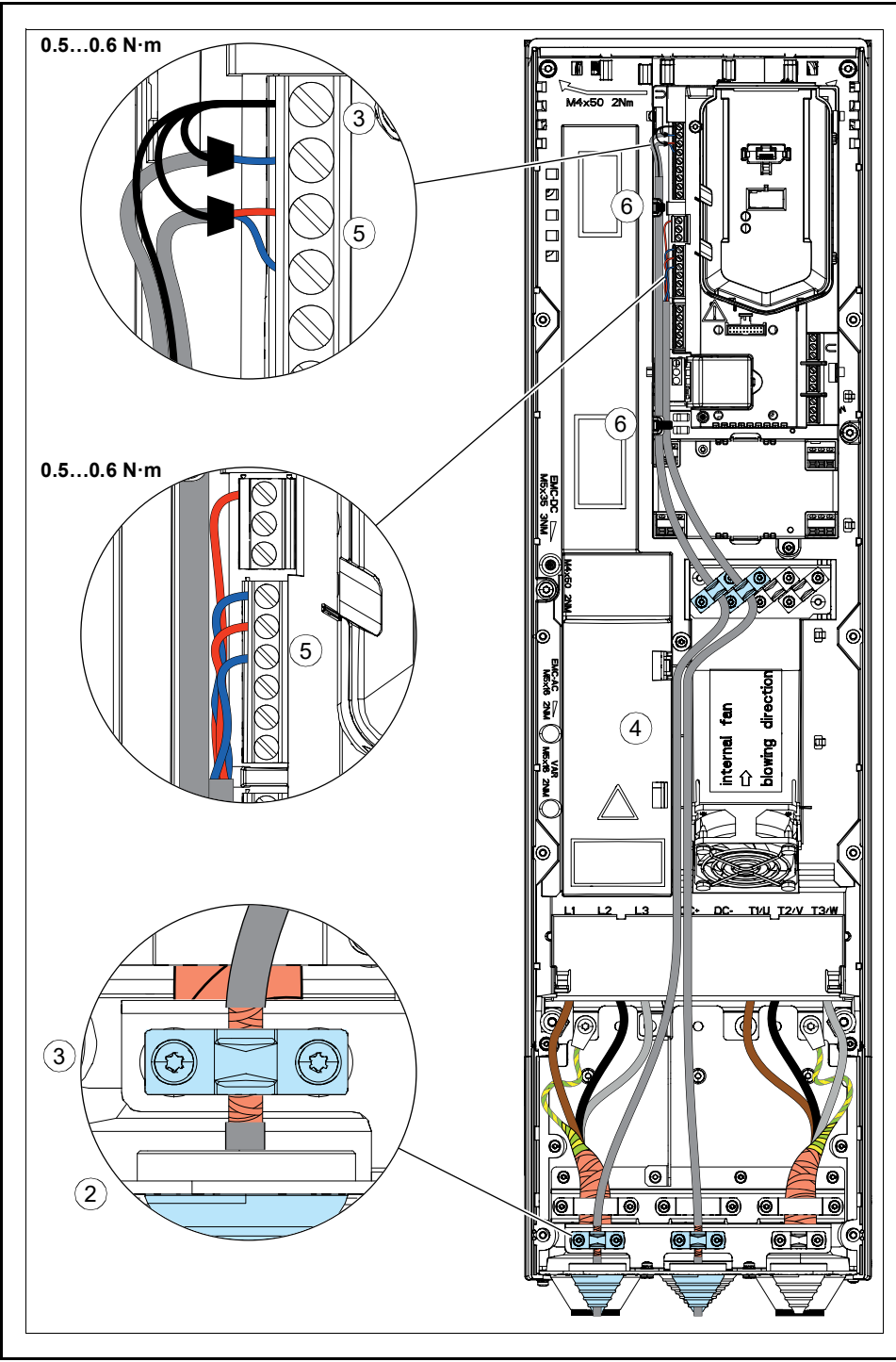
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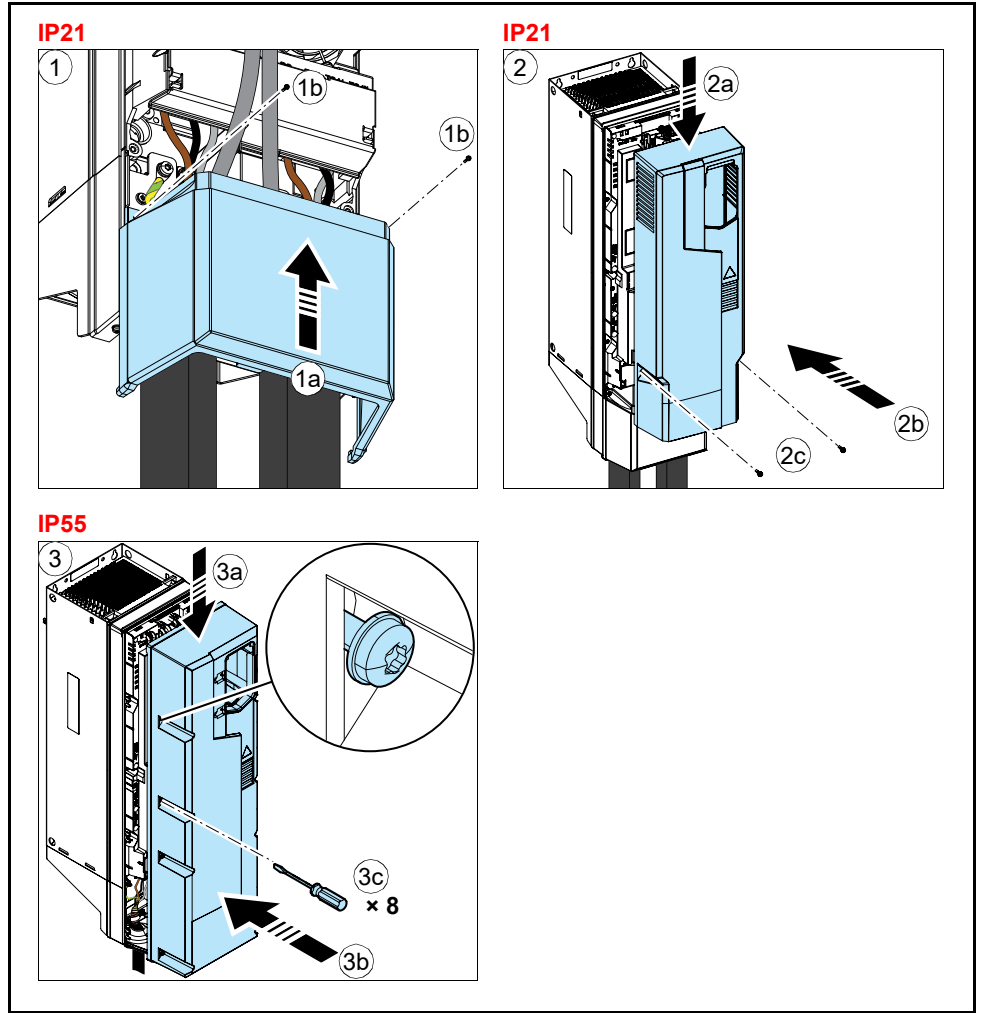
R5 Figures F

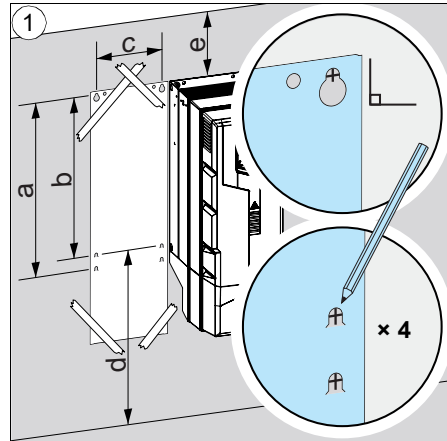


G

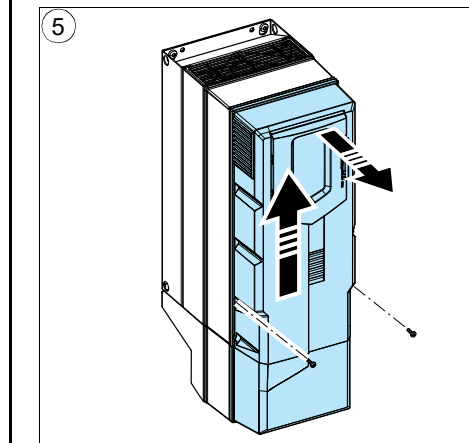
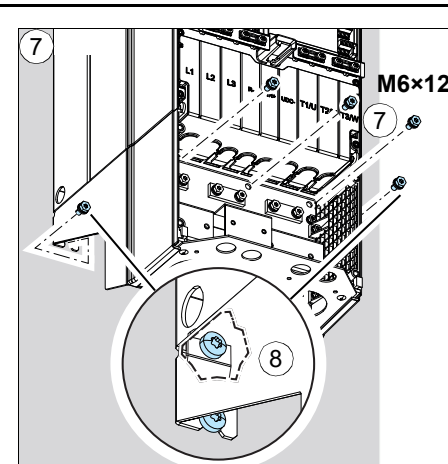
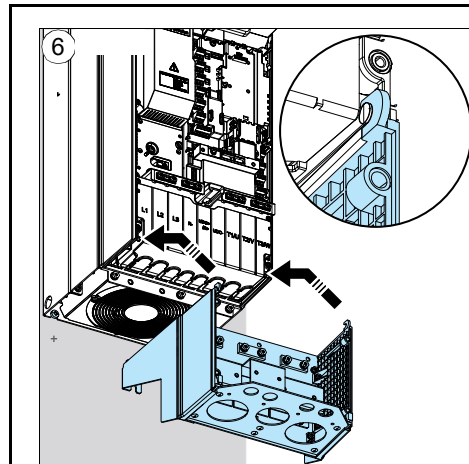
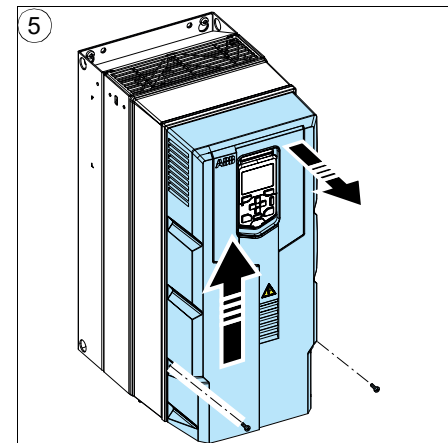
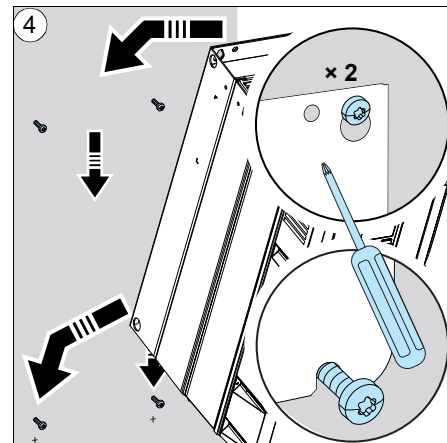
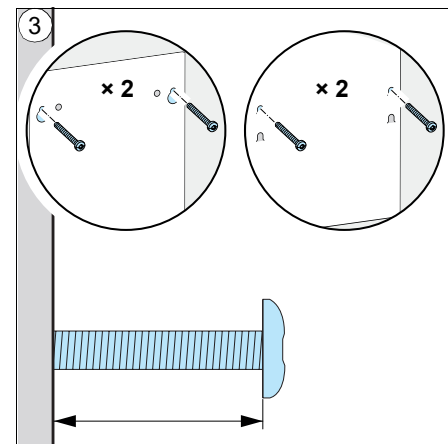
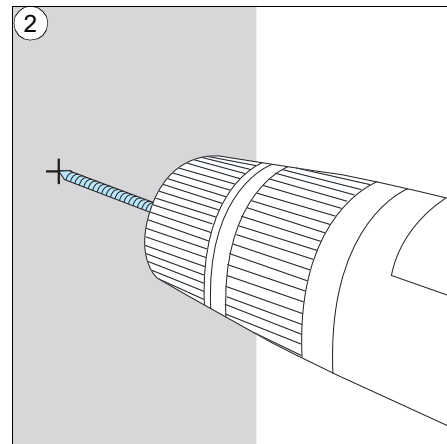


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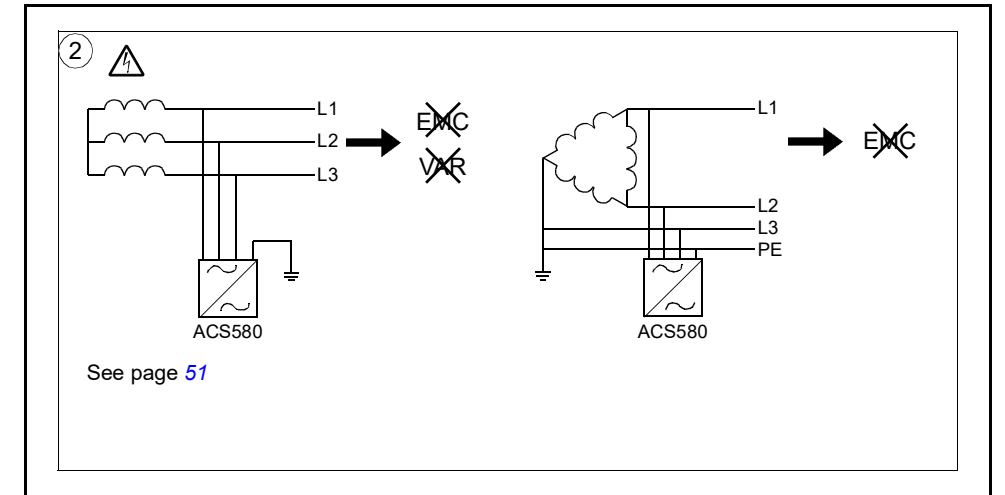
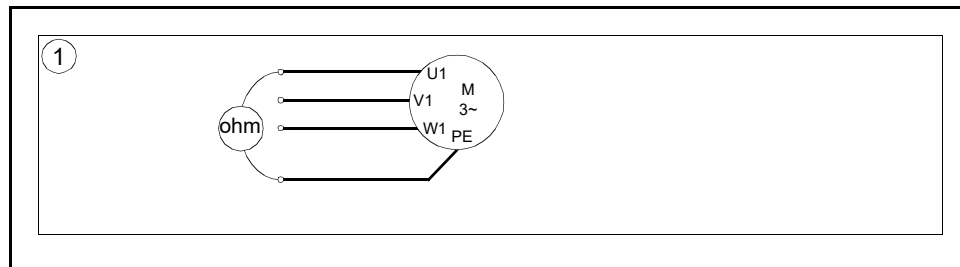




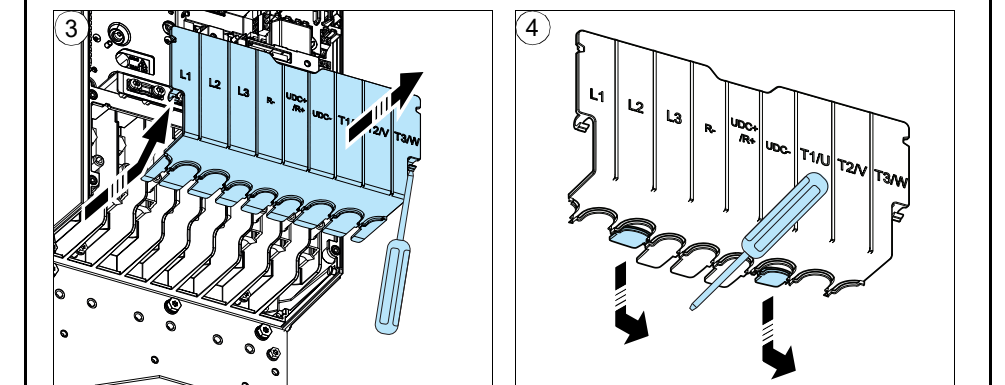
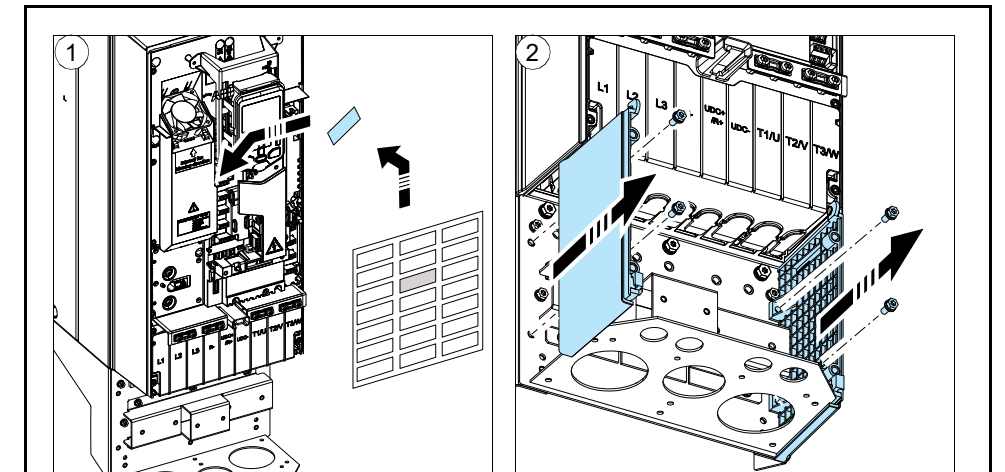
	R6	R7	R8	R9
a (mm/in)	571/ 22.5	623/ 24.5	701/ 27.6	718/ 28.3
b (mm/in)	531/ 20.9	583/ 22.9	658/ 25.9	658/ 25.9
c (mm/in)	213/ 8.4	245/ 9.7	263/ 10.4	345/ 13.6
d > (mm/in)	300/ 11.8	300/ 11.8	300/ 11.8	300/ 11.8
e > (mm/in)	200/ 7.9	200/ 7.9	200/ 7.9	200/ 7.9

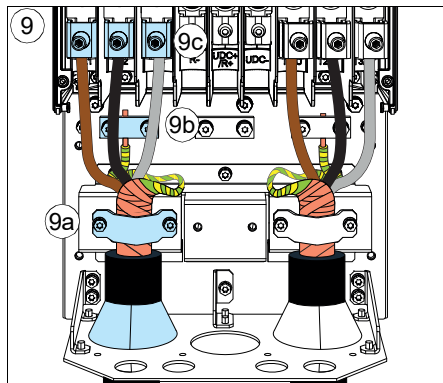
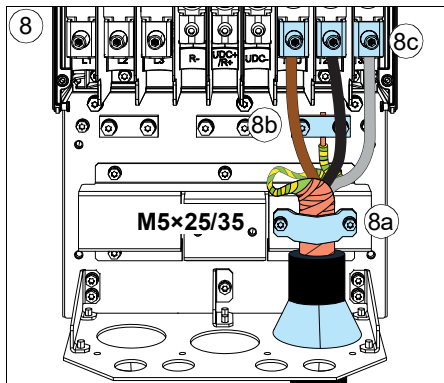
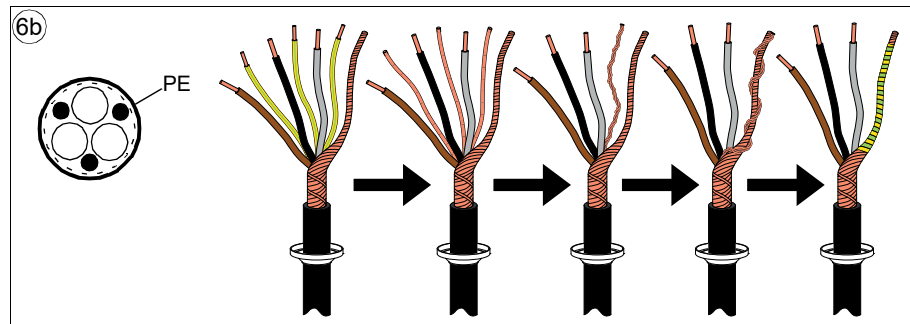
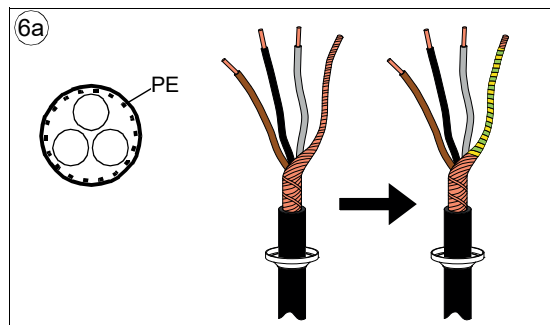
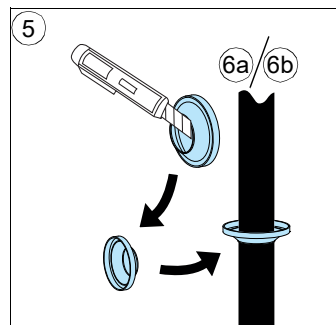
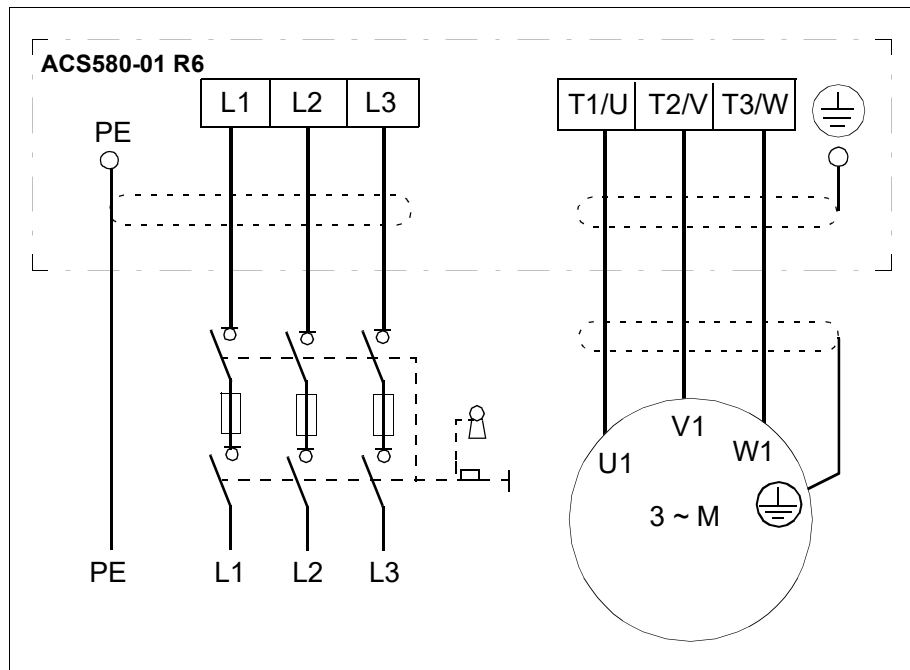


B



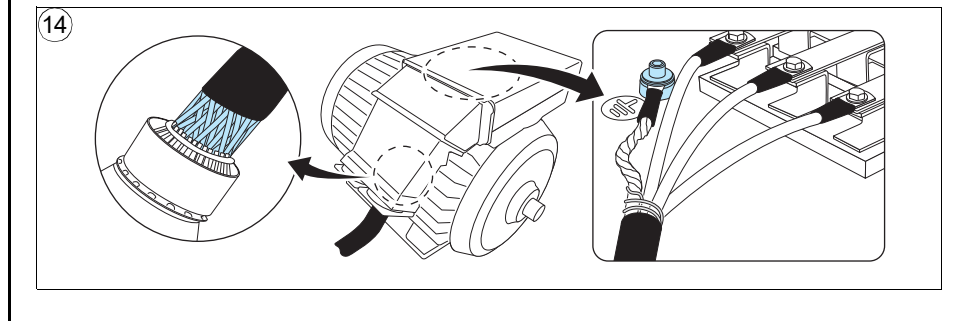
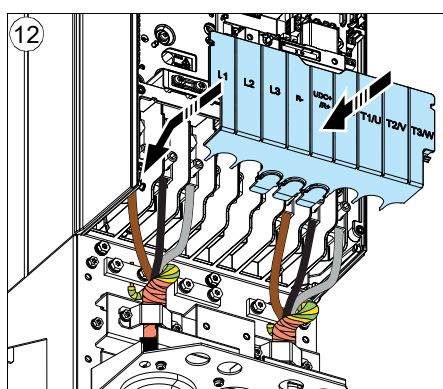
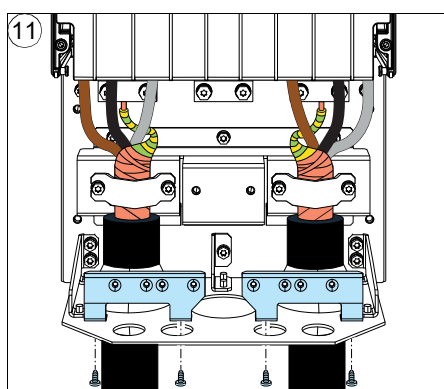
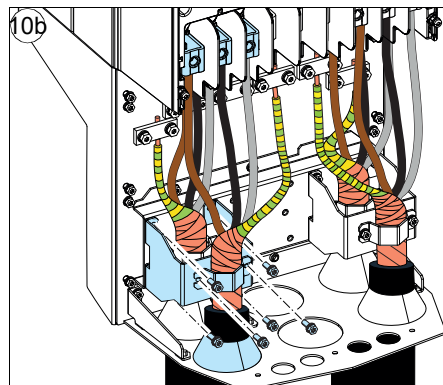
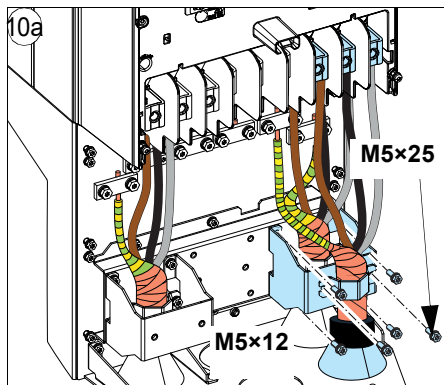
C





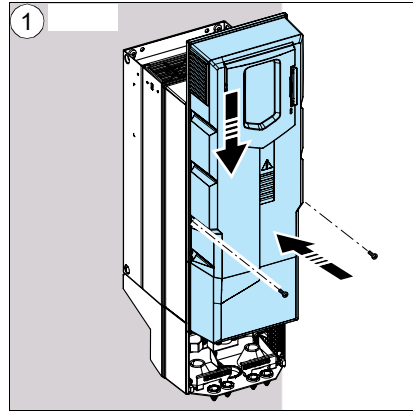
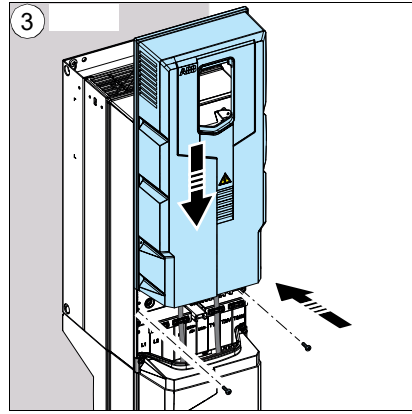
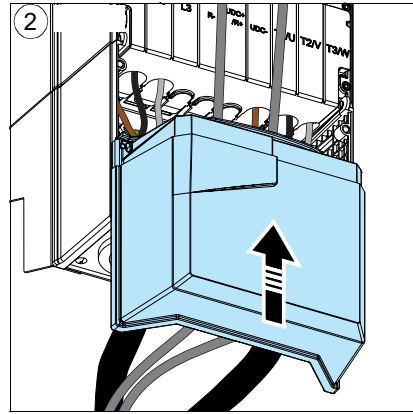
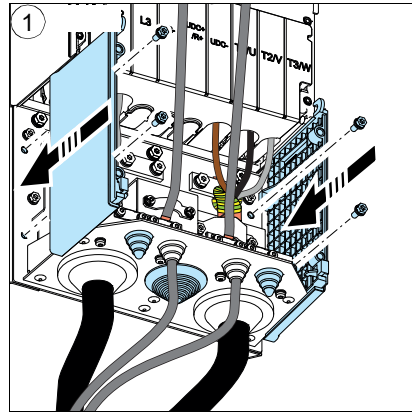
	R6		R7		R8		R9	
	N·m	lbf·ft	N·m	lbf·ft	N·m	lbf·ft	N·m	lbf·ft
L1, L2, L3, T1/U, T2/V, T3/W			40	30	40	30	70	52
PE	10	7	10	7	10	7	10	7

R8...R9 only



D

SC



Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

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