ABB INDUSTRIAL DRIVES

ACS880 frames R1...R11

EMC filter and ground-to-phase varistor disconnecting instructions

ACS880 frames R1…R11

EMC filter and ground-to-phase varistor disconnecting instructions

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Introduction to the manual

Contents of this chapter

This chapter describes the manual. It contains section *Electrical safety precautions*.

Target audience

The manual is intended for people who check whether EMC filter options or ground-to phase varistors of the drive need to be disconnected before the drive is connected to an electrical power system. It is intended for people who disconnect the filter or varistors.

Applicability

The manual contains instructions

- for ACS880-01 and ACS880-07 frames R1 to R9
- for ACS880-04, ACS880-04XT, ACS880-04F, ACS880-04FXT and ACS880-07 frames R10 and R11
- for ACS880-11 and ACS880-31 frames R3, R6 and R8
- for ACS880-14 and ACS880-34 frame R11
- for ACS880-17 and ACS880-37 frames R8 and R11.

Safety

Obey the instructions in the hardware manual.

Electrical safety precautions

These electrical safety precautions 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 electrical professional, do not do installation or maintenance work.

Do these steps before you begin any installation or maintenance work.

1. Clearly identify the work location and equipment.
2. Disconnect all possible voltage sources. Make sure that re-connection is not possible. Lock out and tag out.
   - Open the main disconnecting device of the drive.
   - If you have a permanent magnet motor connected to the drive, disconnect the motor from the drive with a safety switch or by other means.
   - Disconnect all dangerous external voltages from the control circuits.
   - After you disconnect power from the drive, always wait 5 minutes to let the intermediate circuit capacitors discharge before you continue.
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 quality voltage tester.
   - Before and after measuring the installation, verify the operation of the voltage tester on a known voltage source.
   - Make sure that the voltage between the drive input power terminals (L1, L2, L3) and the grounding (PE) busbar is zero.
   - Make sure that the voltage between the drive output terminals (T1/U, T2/V, T3/W) and the grounding (PE) busbar is zero.
   - Make sure that the voltage between the drive DC terminals (UDC+ and UDC-) and the grounding (PE) terminal is zero.
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.

Related manuals

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.

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

ACS880-01 manuals

ACS880-04 manuals

ACS880-07 manuals

ACS880-11 manuals

ACS880-14 manuals

ACS880-17 manuals

ACS880-31 manuals

ACS880-34 manuals

ACS880-37 manuals

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Identifying the grounding system of the electrical power network

WARNING!
Only a qualified electrical professional may do the work instructed in this section. Depending on the installation site, the work may even be categorized as live working. Continue only if you are an electrical professional certified for the work. Obey the local regulations. If you ignore them, injury or death can occur.

To identify the grounding system, examine the supply transformer connection. See the applicable electrical diagrams of the building. If that is not possible, measure these voltages at the distribution board, and use the table to define the grounding system type.

1. input voltage line to line (U_{L-L})
2. input voltage line 1 to ground (U_{L1-G})
3. input voltage line 2 to ground (U_{L2-G})
4. input voltage line 3 to ground (U_{L3-G}).

The table below shows the line-to-ground voltages in relation to the line-to-line voltage for each grounding system.

U_{L-L}	U_{L1-G}	U_{L2-G}	U_{L3-G}	**Electrical power system type**
X	0.58·X	0.58·X	0.58·X	Symmetrically grounded TN system (TN-S system)
X	1.0·X	1.0·X	0	Corner-grounded delta system (nonsymmetrical)
X	0.866·X	0.5·X	0.5·X	Midpoint-grounded delta system (nonsymmetrical)
X	Varying level versus time	Varying level versus time	Varying level versus time	IT systems (ungrounded or high-resistance-grounded [>30 ohms]) nonsymmetrical
X	Varying level versus time	Varying level versus time	Varying level versus time	TT system (the protective earth connection for the consumer is provided by a local earth electrode, and there is another independently installed at the generator)

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ACS880-01 and ACS880-07 frames R1 to R9

Contents of this chapter

This chapter describes how to

- check the compatibility of the drive with IT (ungrounded), corner-grounded delta, midpoint-grounded delta and TT systems
- disconnect EMC filter and ground-to-phase varistor.

Grounding system compatibility check

The standard drive with ground-to-phase varistors connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter and ground-to-phase varistors. See the following sections.

EMC filter options +E200 and +E202

A drive with EMC filter options +E200 or +E202 connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter. See sections

- *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 15)*
- *Guidelines for installing the drive to a TT system (page 15)*
- *Disconnecting instructions (page 17)*

WARNING!
Do not install the drive with EMC filter options +E200 or +E202 connected to a system that the filter is not suitable for. This can cause danger, or damage the drive.

Note: When EMC filter +E200 or +E202 is disconnected, the drive EMC compatibility is considerably reduced.

Ground-to-phase varistor

A drive with the ground-to-phase varistor connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See sections:

- *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 15)*
- *Guidelines for installing the drive to a TT system (page 15)*
- *Disconnecting instructions (page 17)*

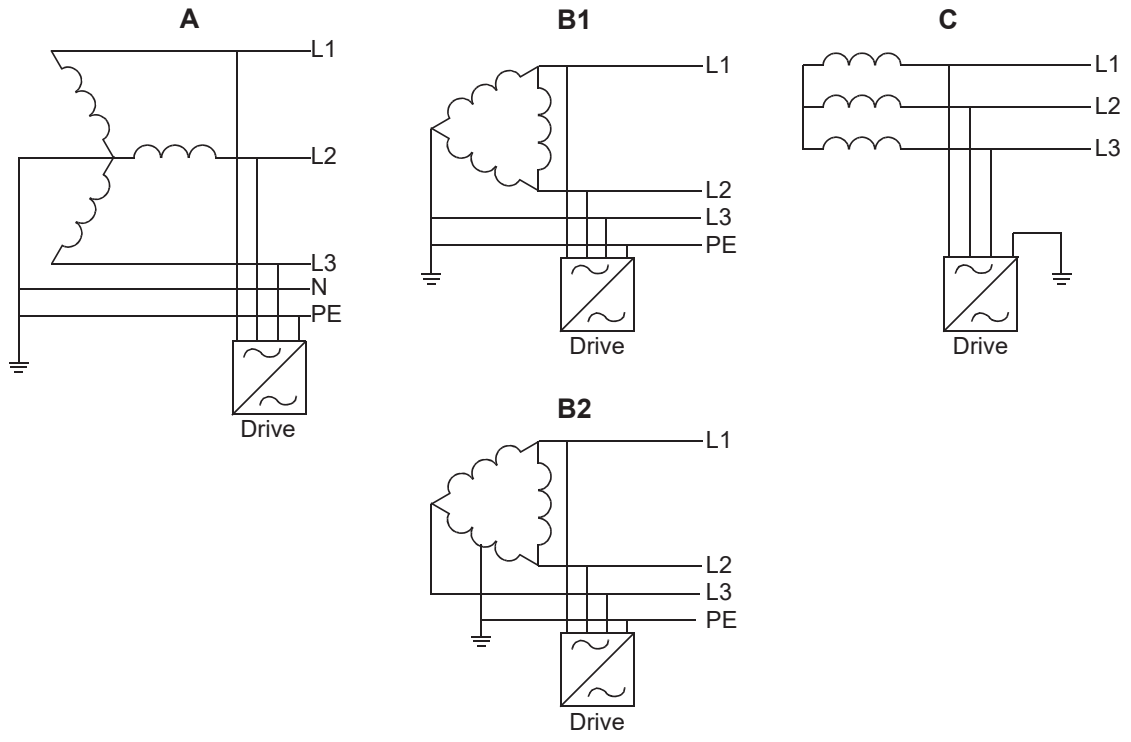
WARNING!
Do not install the drive with the ground-to-phase varistor connected to a system that the varistor is not suitable for. If you do, the varistor circuit can be damaged.

Corner-grounded and midpoint-grounded 525-690 V delta systems

WARNING!
Do not install the drive on a 525…690 V corner-grounded or midpoint-grounded delta system. Disconnecting the EMC filter and ground-to-phase varistor does not prevent damage to the drive.

When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems

Frame size	Symmetrically grounded TN systems (TN-S systems) ie. center-grounded wye (A)	Corner-grounded (B1) and midpoint-grounded delta (B2) systems < 525 V	IT systems (ungrounded or high-resistance- grounded [>30 ohms]) (C)
R1...R4	Do not disconnect EMC AC or VAR screws	Do not disconnect EMC AC or VAR screws	Disconnect EMC AC, EMC DC, VAR [1]
R5		Do not disconnect EMC AC or VAR. Disconnect EMC DC	Disconnect EMC AC, EMC DC, VAR (2×VAR with +E200 and +E202) [1]
R6...R9		Do not disconnect EMC AC or VAR. Disconnect EMC DC	Disconnect EMC AC, EMC DC, VAR [1]



[1] With option +E201, EMC AC, EMC DC and VAR screws are removed at the factory from drives manufactured after 2018-01-01.

Note: These are the EMC filter and varistor screws of different drive frame sizes.

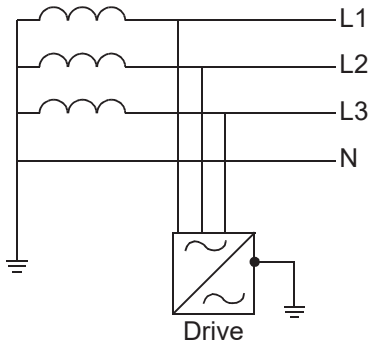
Frame size	EMC filter (+E200) screws	Ground-to-phase varistor screws
R1..R4	EMC AC, EMC DC	VAR
R5	EMC AC, EMC DC	VAR (2×VAR with +E200 and +E202)
R6..R9	EMC AC, EMC DC	VAR

Guidelines for installing the drive to a TT system

The drive can be connected to a TT system under these conditions:

1. Residual current device has been installed in the supply system.
2. These screws have been disconnected. Otherwise EMC filter and ground-to-phase varistor capacitor leakage current will cause the residual current device to trip.

Frame size	EMC filter (+E200, +E202) screws	Ground-to-phase varistor screws
R1...R4	EMC AC, EMC DC	VAR
R5	EMC AC, EMC DC	VAR (2×VAR with +E200 and +E202)
R6...R9	EMC AC, EMC DC	VAR



Note:

- Because the EMC filter screws have been disconnected, ABB does not guarantee the EMC category.
- ABB does not guarantee the functioning of the ground leakage detector built inside the drive.
- In large systems the residual current device can trip without a real reason.

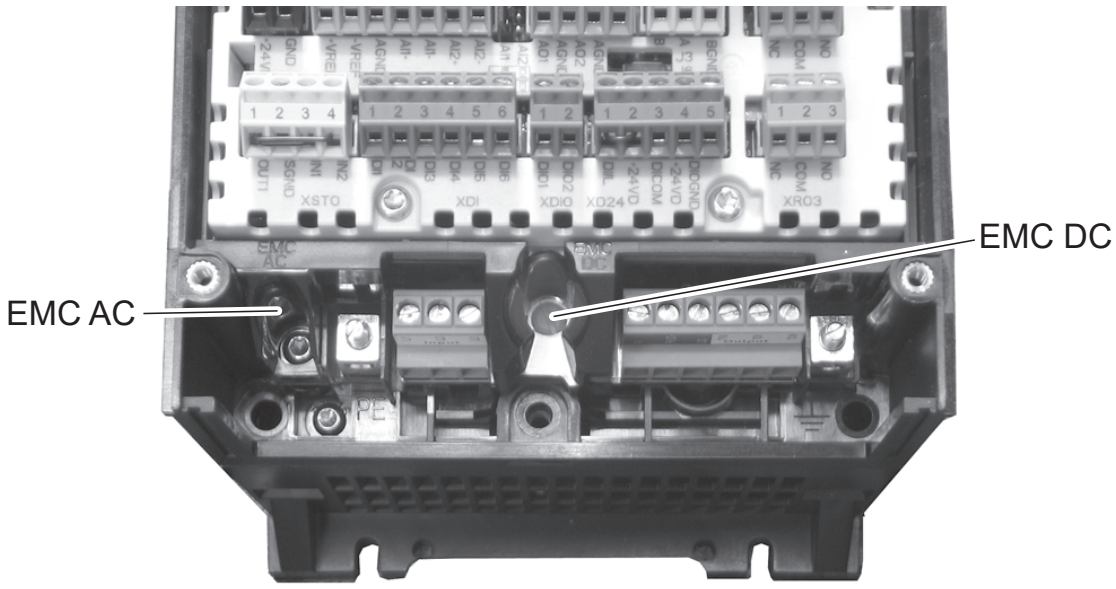
Source document on TT system: 3AXD10000681917

Disconnecting instructions

Frames R1 to R3

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

1. Stop the drive and do the steps in section *Electrical safety precautions* before you start the work.
2. Remove front cover.
3. Disconnect EMC AC and EMC DC screws.
4. Turn on the main input power of the drive.
5. Check the drive status.



For removing the ground-to-phase varistor screw, contact ABB service.

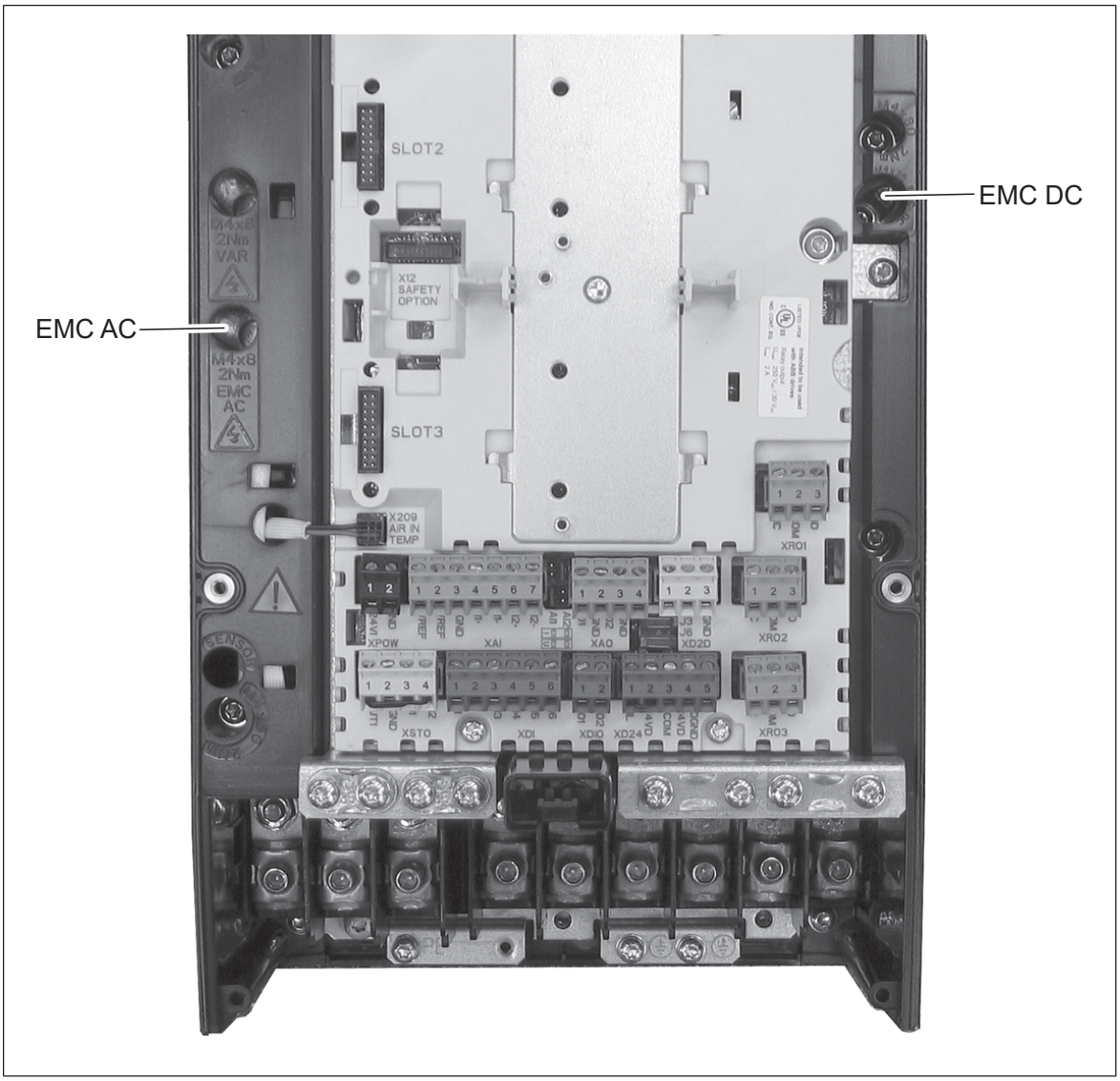
Frame R4

For disconnecting the EMC filter and removing the ground-to-phase varistor screw, contact ABB Service.

Frame R5

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

1. Stop the drive and do the steps in section *Electrical safety precautions* before you start the work.
2. Remove front cover.
3. Disconnect EMC AC and EMC DC screws.
4. Turn on the main input power of the drive.
5. Check the drive status.



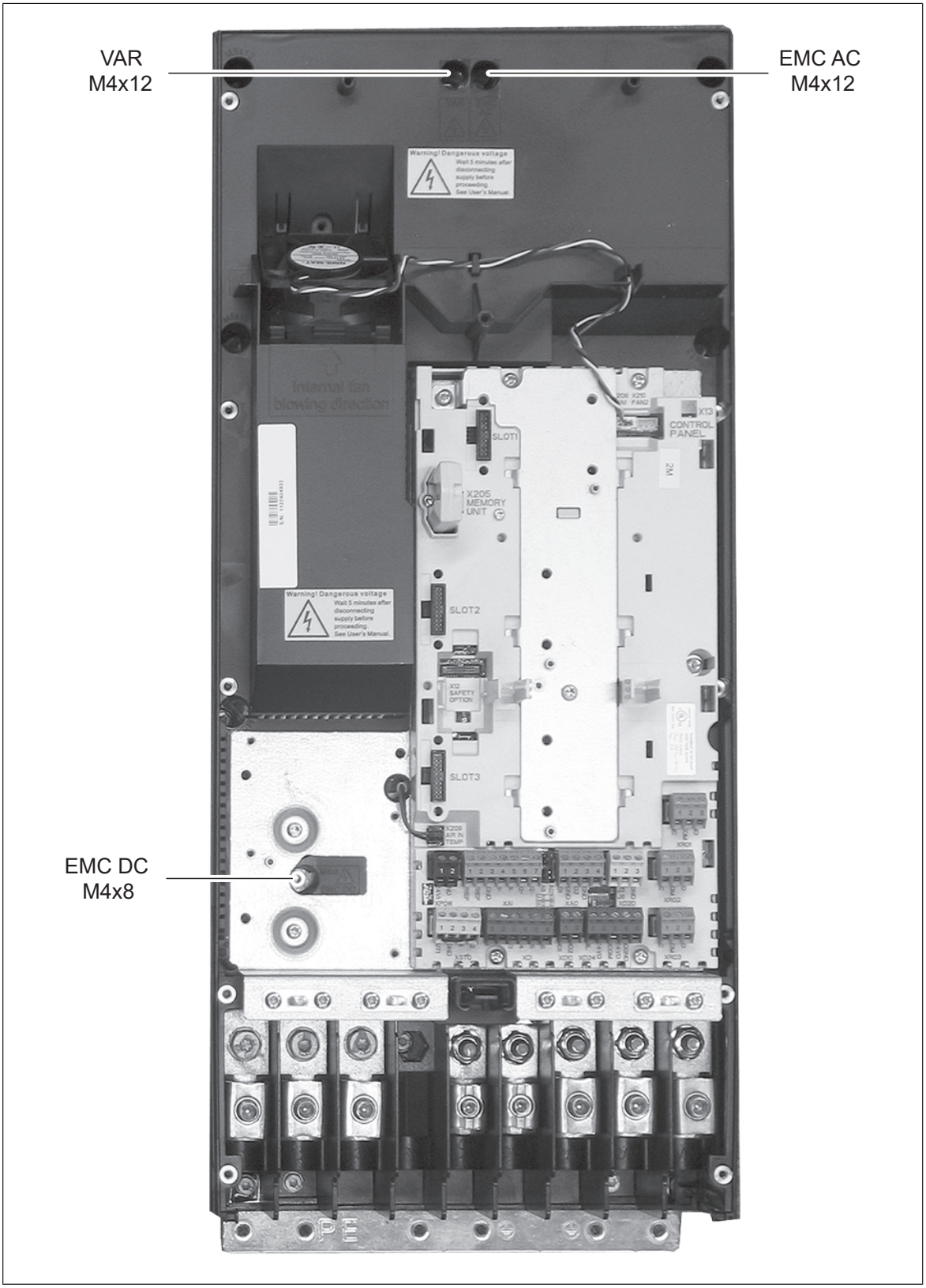
For removing the ground-to-phase varistor screw, contact ABB Service.

Frames R6 to R9

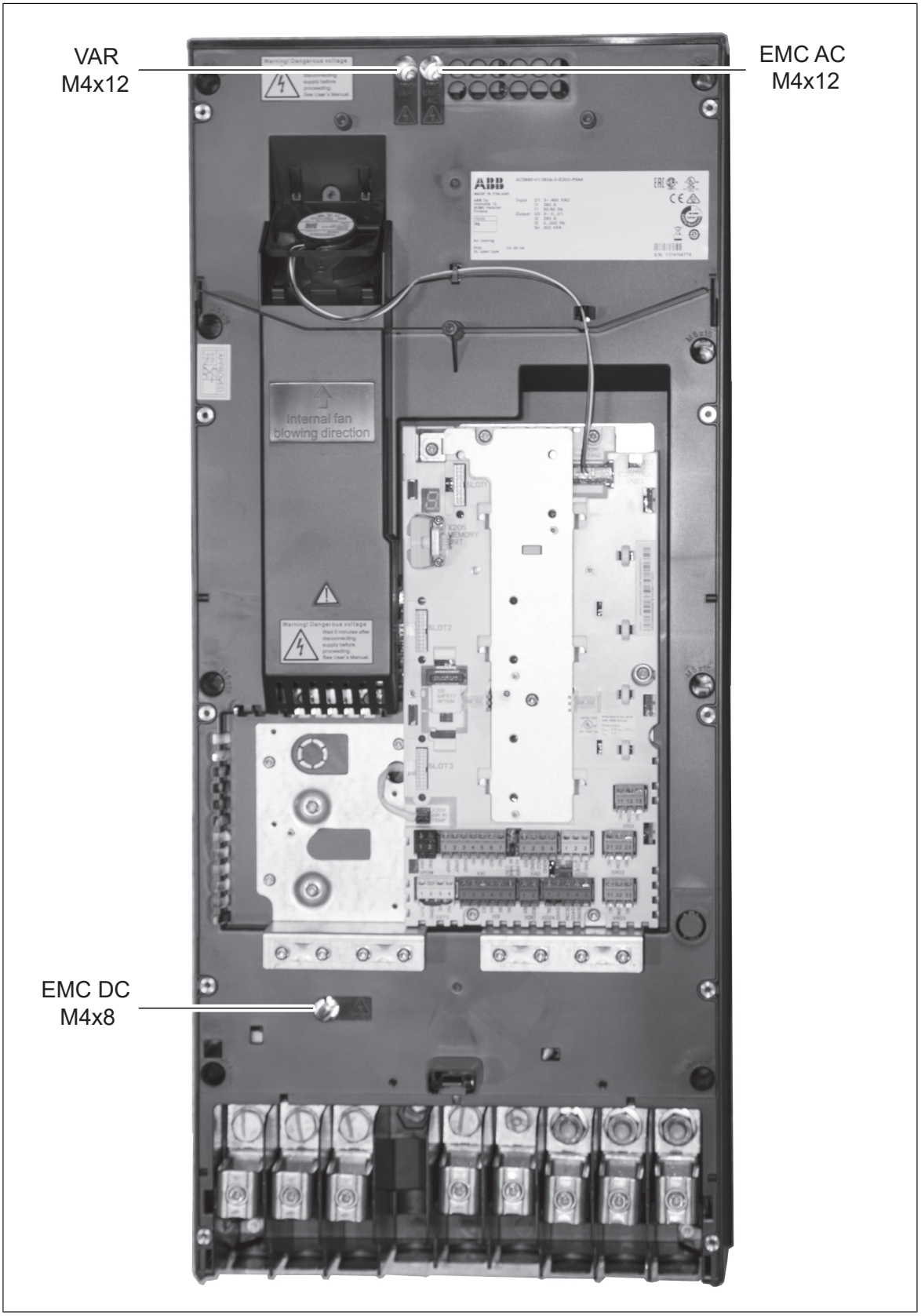
WARNING!
Obey the safety instructions of the drive. If you ignore them, injury or death, or damage to the equipment can occur.

1. Stop the drive and do the steps in section *Electrical safety precautions* before you start the work.
2. Remove front cover.
3. Disconnect EMC AC, EMC DC and VAR screws.
4. Turn on the main input power of the drive.
5. Check the drive status.

Frames R6 and R7:



Frames R8 and R9:



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ACS880-04 and ACS880-07 frames R10 and R11

Contents of this chapter

This chapter describes how to

- check the compatibility of the drive with IT (ungrounded), corner-grounded delta, midpoint-grounded delta and TT systems
- disconnect EMC filter and ground-to-phase varistor.

Applicability

This chapter applies to ACS880-04, ACS880-04XT, ACS880-04F, ACS880-04FXT and ACS880-07 frames R10 and R11.

Grounding system compatibility check

The standard drive with ground-to-phase varistors connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter and ground-to-phase varistors. See the following sections.

EMC filter option +E200

A drive with EMC filter option +E200 can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See sections:

- *When to disconnect EMC filter (option +E200) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 25)*
- *Guidelines for installing the drive to a TT system (page 27)*
- *Disconnecting instructions (page 28)*

WARNING!
Do not install the drive with EMC filter option +E200 connected to a system that the filter is not suitable for. This can cause danger, or damage the drive.

Note: When the EMC filter +E200 is disconnected, the drive EMC compatibility is considerably reduced.

EMC filter option +E202 and ARFI-10 (ordering code 68241561) – 400 V and 500 V drives and drive modules

A drive with EMC filter option +E202 (ARFI-10 also available, ordering code 68241561 for ACS880-04XT) can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See sections:

- *When to disconnect EMC filter (option +E202 or ARFI-10) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 26)*
- *Guidelines for installing the drive to a TT system (page 27)*
- *Disconnecting instructions (page 28)*

WARNING!
Do not install the drive with EMC filter option +E202 or separately ordered ARFI-10 connected to a system that the filter is not suitable for. This can cause danger, or damage the drive.

Note: When the EMC filter +E202 or ARFI-10 is disconnected, the drive EMC compatibility is considerably reduced.

Ground-to-phase varistor

A drive with the ground-to-phase varistor connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See sections:

- *When to disconnect EMC filter (option +E200) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 25)*
- *When to disconnect EMC filter (option +E202 or ARFI-10) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 26)*
- *Guidelines for installing the drive to a TT system (page 27)*
- *Disconnecting instructions (page 28)*

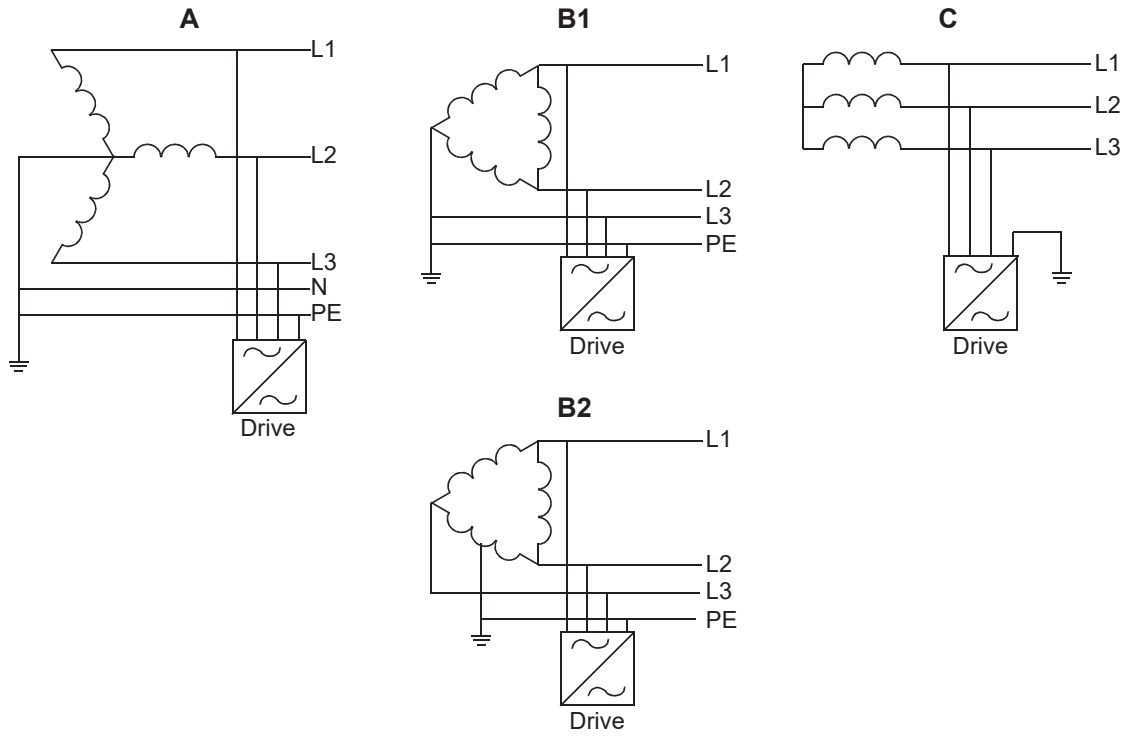
WARNING!
Do not install the drive with the ground-to-phase varistor connected to a system that the varistor is not suitable for. If you do, the varistor circuit can be damaged.

Corner-grounded and midpoint-grounded 525-690 V delta systems

WARNING!
Do not install the drive on a 525…690 V corner-grounded or midpoint-grounded delta system. Disconnecting the EMC filter and ground-to-phase varistor does not prevent damage to the drive.

■ When to disconnect EMC filter (option +E200) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems

Frame size	Symmetrically grounded TN systems (TN-S systems) ie. center-grounded wye (A)	Corner-grounded (B1) and midpoint-grounded delta (B2) systems [2] < 525 V	IT systems (ungrounded or highresistance- grounded [>30 ohms]) (C)
R10, R11	Do not disconnect EMC AC or VAR wires.	Do not disconnect VAR wire.	Disconnect EMC AC and VAR wires.

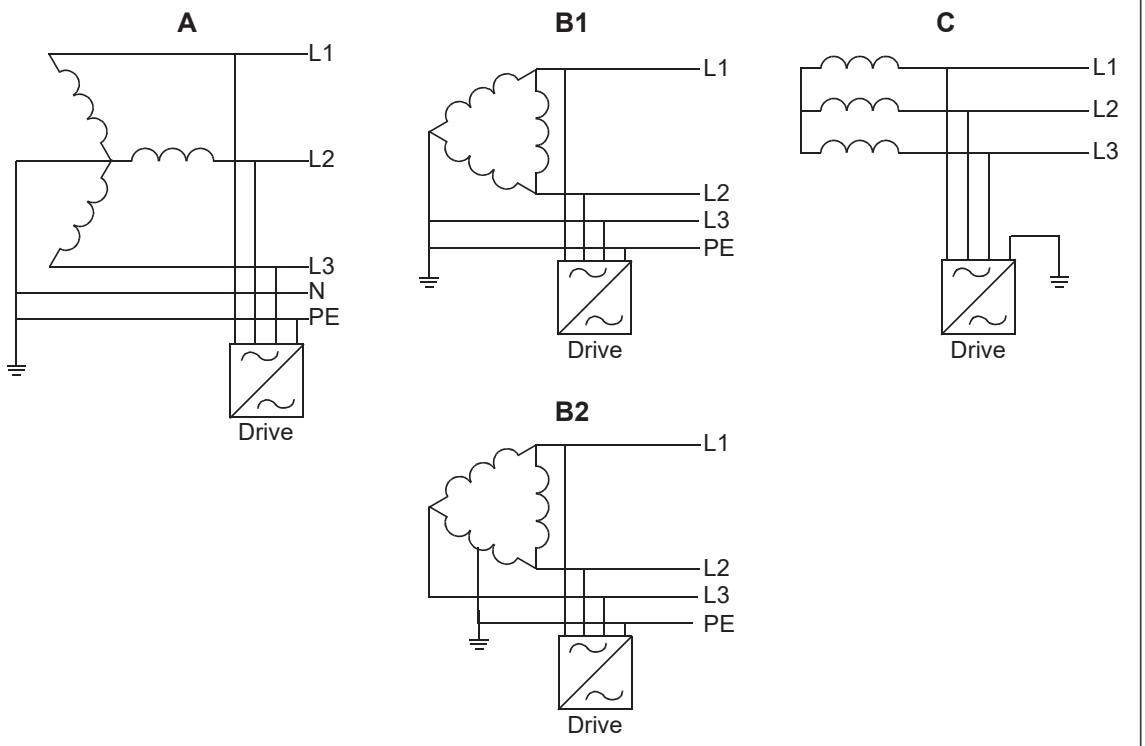


Note: These are the EMC filter and varistor grounding wires of different frame sizes.

Frame size	EMC filter (+E200) wire	Ground-to-phase varistor wire
R10, R11	400 V, 500 V drives: - 690 V drives: EMC AC	VAR

When to disconnect EMC filter (option +E202 or ARFI-10) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems

Frame size	Symmetrically grounded TN systems (TN-S systems) ie. center-grounded wye (A)	Corner-grounded (B1) and midpoint-grounded delta (B2) systems [2] < 525 V	IT systems (ungrounded or highresistance- grounded [>30 ohms]) (C)
R10, R11	Do not disconnect ARFI-10 or VAR wire.	Do not disconnect ARFI-10 or VAR wire.	Disconnect ARFI-10 and VAR wire.



Note: These are the EMC filter and varistor grounding wires of different frame sizes.

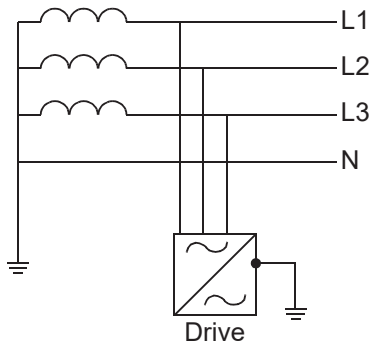
Frame size	EMC filter (+E202) wire	Ground-to-phase varistor wire
R10, R11	400 V, 500 V drives: - 690 V drives: EMC AC	VAR

Guidelines for installing the drive to a TT system

The drive can be connected to a TT system under these conditions:

1. Residual current device has been installed in the supply system.
2. These wires have been disconnected. Otherwise EMC filter and ground-to-phase varistor capacitor leakage current will cause the residual current device to trip.

Frame size	EMC filter (+E200, +E202) wires	Ground-to-phase varistor wire
R10, R11	400 V, 500 V drives: - 690 V drives: EMC AC	VAR



Note:

- Because the EMC filter wires have been disconnected, ABB does not guarantee the EMC category.
- ABB does not guarantee the functioning of the ground leakage detector built inside the drive.
- In large systems the residual current device can trip without a real reason.

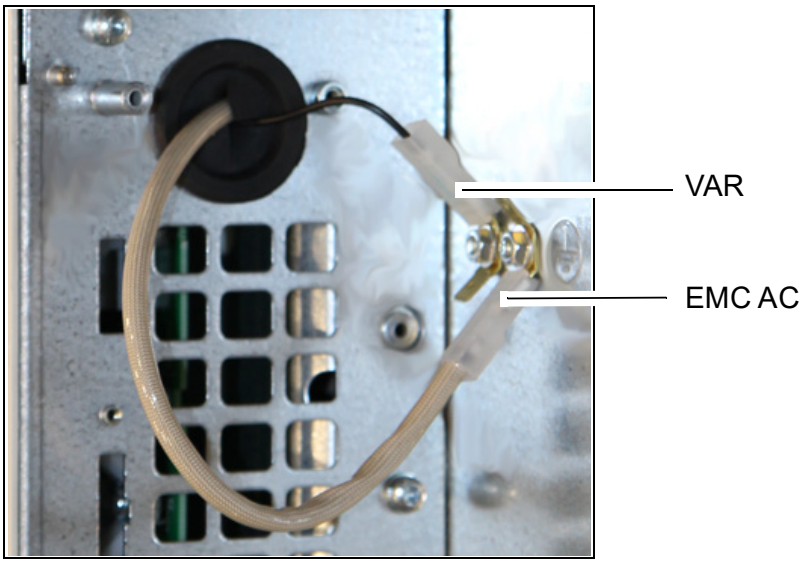
Source document on TT system: 3AXD10000681917

Disconnecting instructions

EMC option +E200 internal (inside the drive module)

EMC AC and varistor (VAR) grounding wires are located at the side of the control circuit compartment. Disconnect them. Insulate the ends and attach them.

Note: EMC AC wire is included only in 690 V drives.



EMC option +E202 / ARFI-10 external (outside the drive module)

Grounding wire EMC AC (see the figure above) is not connected at the factory. Do not connect it. Disconnect the varistor grounding wire (VAR). Contact ABB Service for removing the ARFI-10 filter from the cabinet.

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ACS880-11 and ACS880-31 frames R3, R6 and R8

Contents of this chapter

This chapter describes how to

- check the compatibility of the drive with IT (ungrounded), corner-grounded delta, midpoint-grounded delta and TT systems
- disconnect EMC filter and ground-to-phase varistor.

Grounding system compatibility check

The standard drive can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter and ground-to-phase varistors. See the following sections.

EMC filter option +E200 or +E202

A drive with EMC filter options +E200 and +E202 connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter. See section *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems and TT systems (page 30)*.

WARNING!
Do not install the drive with the EMC filter options +E200 and +E202 connected to a system that the filter is not suitable for. This can cause danger, or damage the drive.

Note: When EMC filter +E200 or +E202 is disconnected, the drive EMC compatibility is considerably reduced.

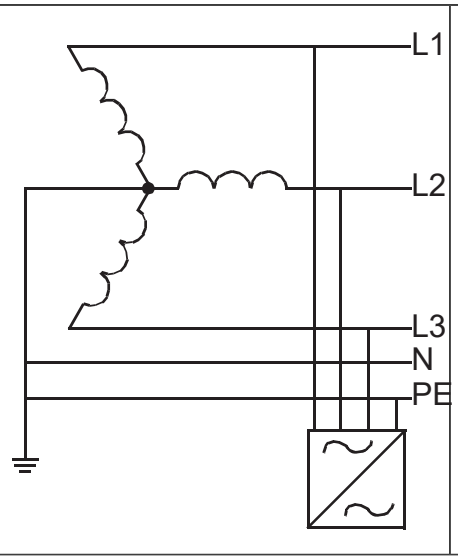
Ground-to-phase varistors

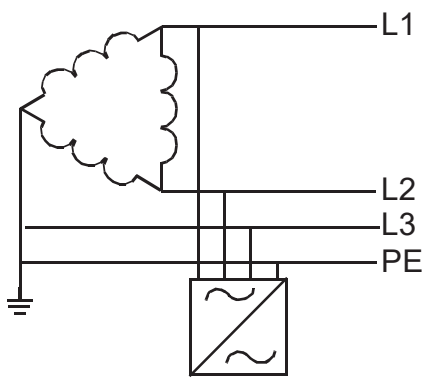
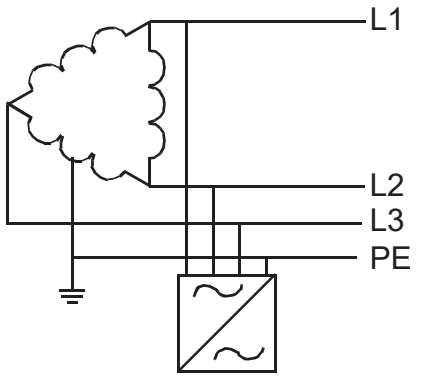
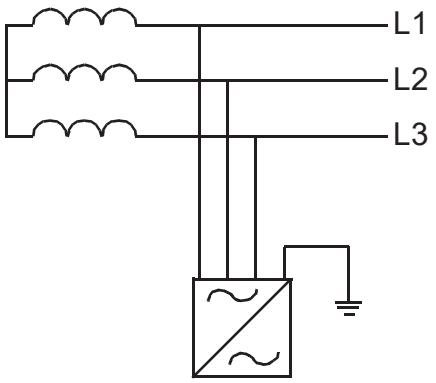
A standard drive with the ground-to-phase varistor connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See sections *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems and TT systems (page 30)*.

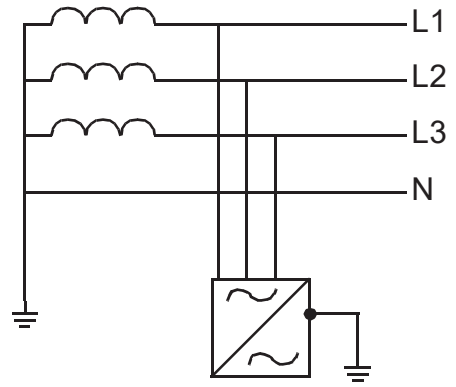
WARNING!
Do not install the drive with the ground-to-phase varistor connected to a system that the varistor is not suitable for. If you do, the varistor circuit can be damaged.

When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems and TT systems

Requirements for disconnecting EMC filter and varistor and additional requirements for different electrical power systems are given below.

Symmetrically grounded TN systems (TN-S systems, ie, center-grounded wye)	
	Do not remove EMC or VAR screws.
Corner-grounded delta systems ≤ 600 V	

	R3: Do not remove EMC or VAR screws. R6: Remove EMC screw. Do not remove VAR screw. See Note 1 below. R8: Remove EMC DC and VAR screws.
Midpoint-grounded delta systems ≤ 600 V	
	R3: Do not remove EMC or VAR screws. R6: Remove EMC screw. Do not remove VAR screw. See Note 1 below. R8: Remove EMC DC and VAR screws.
IT systems (ungrounded or high-resistance grounded [>30 ohms])	
	R3: Remove EMC and VAR screws. R6: Remove EMC and VAR screws. R8: Remove EMC DC and VAR screws.
TT systems	



R3: Remove EMC and VAR screws.
R6: Remove EMC and VAR screws.
R8: Remove EMC DC and VAR screws.
Residual current device has to be installed in the supply system.
Note:
- Because the EMC filter screws have been removed, ABB does not guarantee the EMC category.
- ABB does not guarantee the functioning of the ground leakage detector built inside the drive.
- In large systems the residual current device can trip without a real reason.

Note 1: Frames R3 and R6 are evaluated for use on corner-grounded systems and midpoint-grounded delta systems by UL standards. They are not evaluated by IEC standards for use on corner-grounded or midpoint-grounded systems.

Note 2: These are the EMC filter and varistor screws of different drive frame sizes.

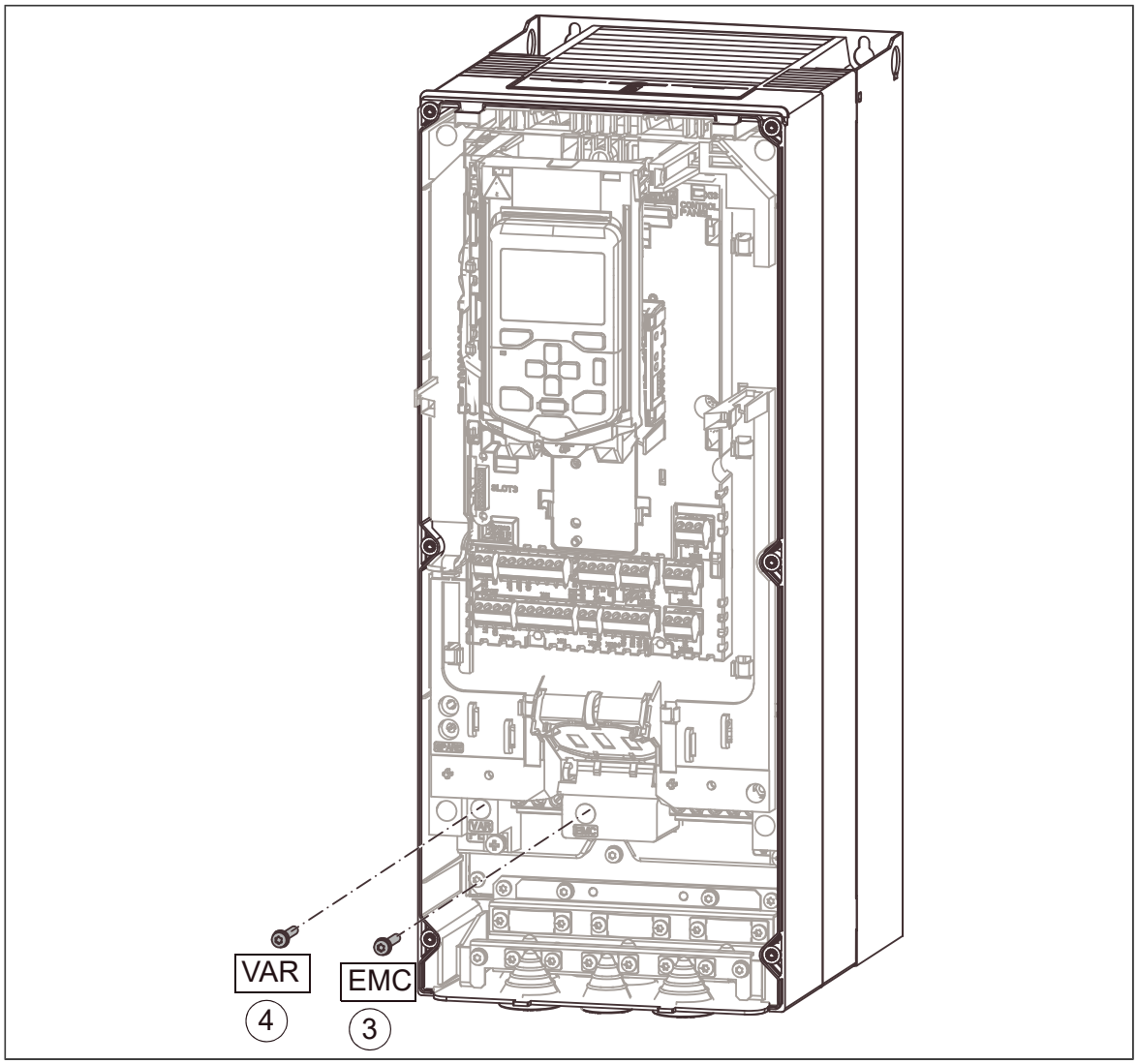
Frame size	EMC filter (options +E200 and +E202) screws	Ground-to-phase varistor screws
R3	EMC	VAR
R6	EMC	VAR
R8	EMC DC	VAR [1)]

1) VAR screw functions also as EMC AC screws in frame R8.

Disconnecting instructions

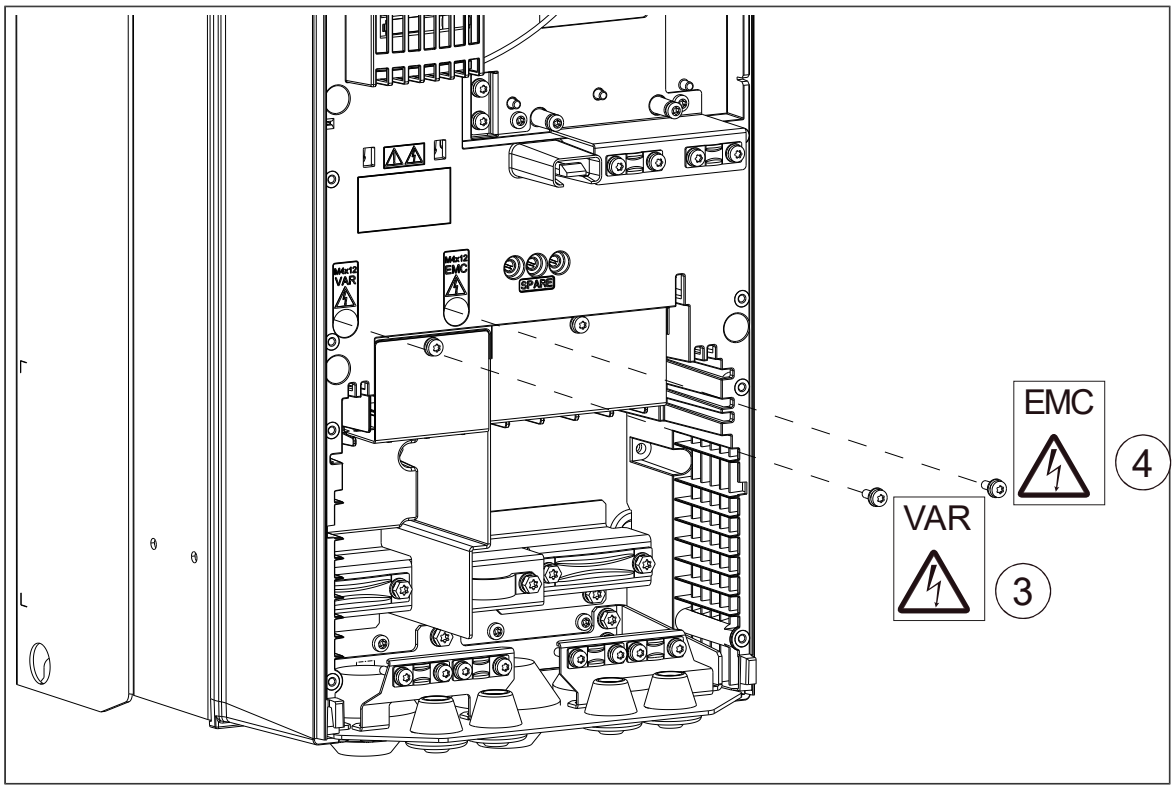
Disconnecting integrated EMC filter (option +E200 or +E202) and ground-to-phase varistor – frame R3

1. Stop the drive and do the steps in section *Electrical safety precautions (page 8)* before you start the work.
2. Remove the front cover.
3. Remove the EMC screw.
4. Remove the VAR screw.



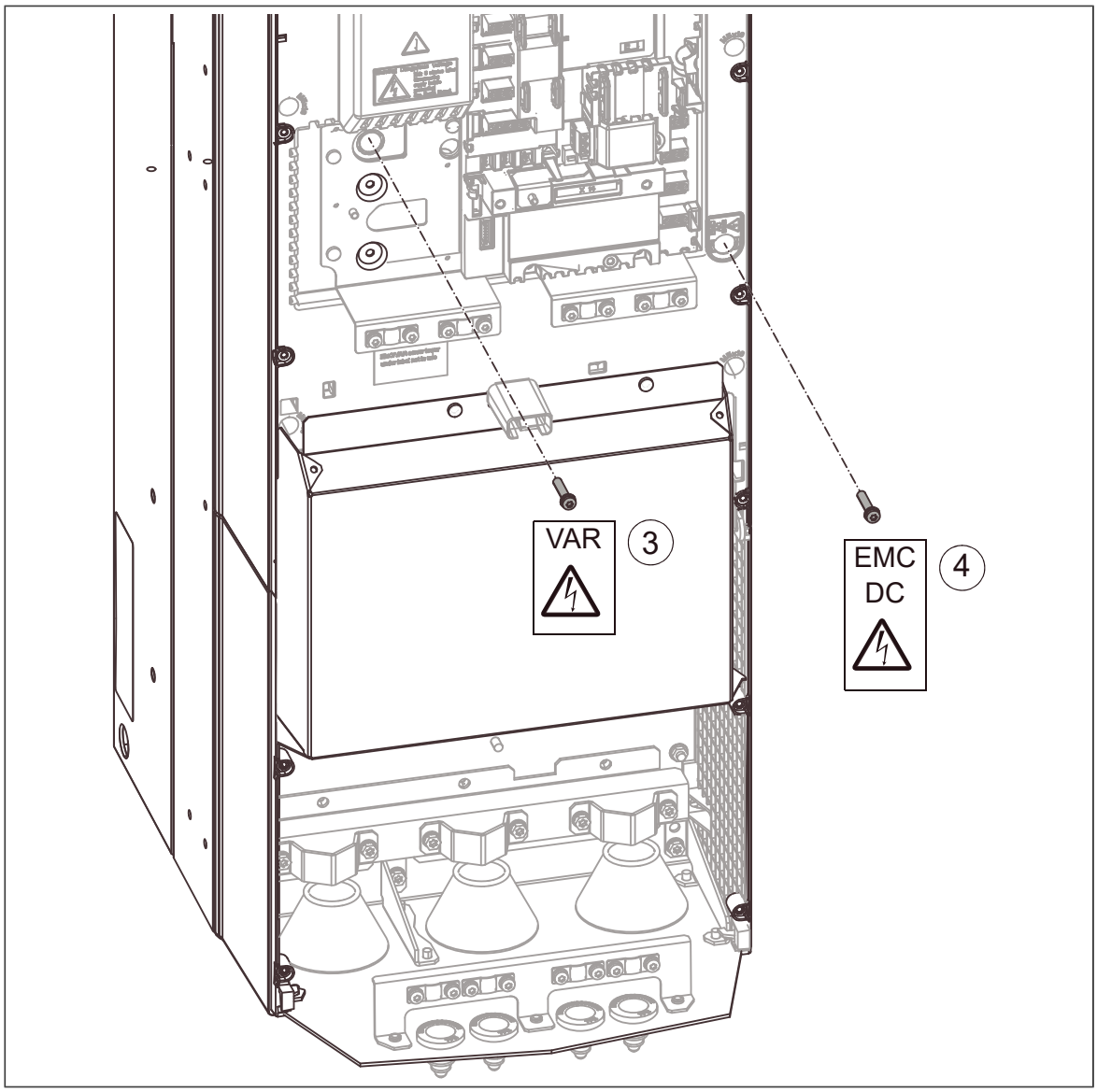
Disconnecting integrated EMC filter (option +E200 or +E202) and ground-to-phase varistor – frame R6

1. Stop the drive and do the steps in section *Electrical safety precautions (page 8)* before you start the work.
2. Remove the front cover and the lower front cover.
3. Remove the VAR screw.
4. Remove the EMC screw.



Disconnecting integrated EMC filter and ground-to-phase varistor – frame R8

1. Stop the drive and do the steps in section *Electrical safety precautions (page 8)* before you start the work.
2. Remove the front cover if it is not already removed.
3. Remove the VAR screw.
4. Remove the EMC DC screw.



6

ACS880-14 and ACS880-34 frame R11

Contents of this chapter

This chapter describes how to

- check the compatibility of the drive with IT (ungrounded), corner-grounded delta, midpoint-grounded delta and TT systems
- disconnect EMC filter and ground-to-phase varistor.

Grounding system compatibility check

The standard drive with ground-to-phase varistors connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter and ground-to-phase varistors. See the following sections.

WARNING! Do not install the drive with the ground-to-phase varistor connected to a system that the varistor is not suitable for. If you do, the varistor circuit can be damaged.

EMC filter options +E200 and +E202

- *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 38)*.

WARNING!
Do not install the drive with EMC filter +E200 or +E202 connected to a system that the filter is not suitable for. This can cause danger, or damage the drive.

Note: When EMC filter +E200 or +E202 is disconnected, the drive EMC compatibility is considerably reduced.

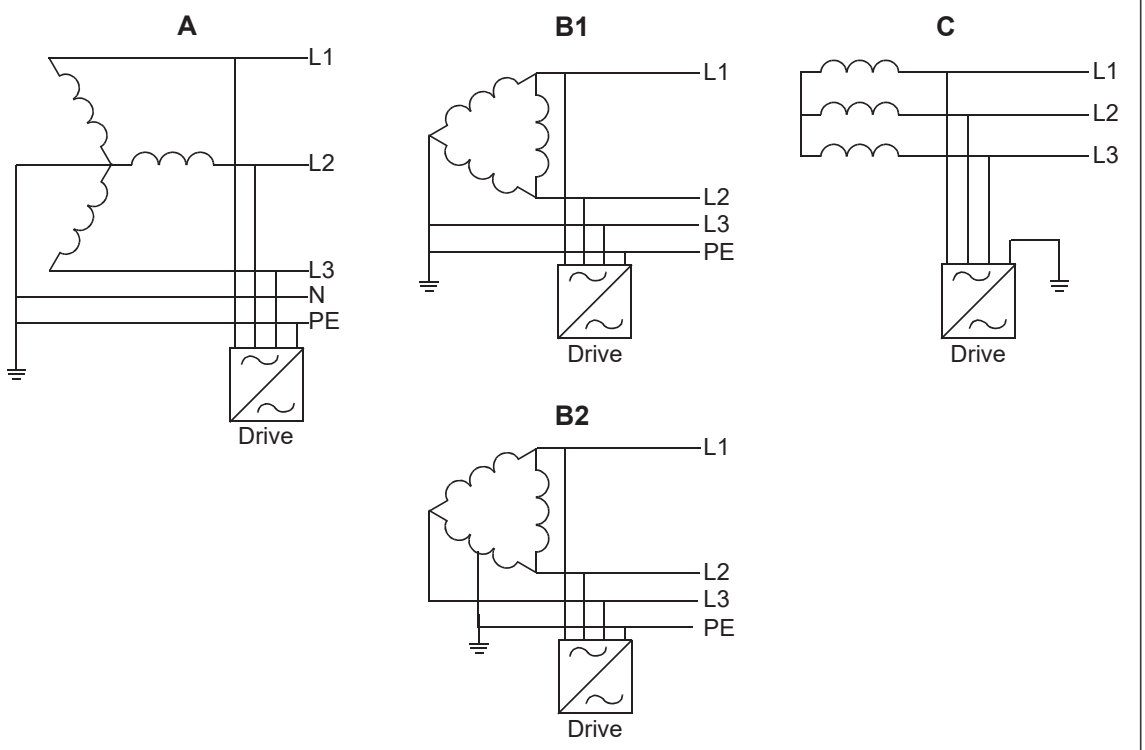
Ground-to-phase varistor

A drive with the ground-to-phase varistor connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See section:

- *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 38)*.

When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems

Frame size	Symmetrically grounded TN systems (TN-S systems) ie. center-grounded wye (A)	Corner-grounded (B1) and midpoint-grounded delta (B2) systems	IT systems (ungrounded or high-resistance- grounded [>30 ohms]) (C)
R11	Do not disconnect EMC AC or VAR wire.	Disconnect the EMC and VAR screws.	Disconnect EMC AC and VAR wires. Remove ARFI-10 (+E202) filter from the cabinet.



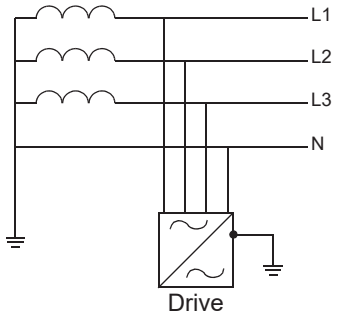
Note: These are the EMC filter and varistor wires.

Frame size	EMC filter (+E200 and +E202) wire	Ground-to-phase varistor wire
R11	EMC AC wire	VAR wire

Guidelines for installing the drive to a TT system

The drive can be connected to a TT system under these conditions:

1. Residual current device has been installed in the supply system.
2. These wires have been disconnected. Otherwise EMC filter and ground-to-phase varistor capacitor leakage current will cause the residual current device to trip.

TT system	EMC filter (+E200 and +E202) wires	Ground-to-phase varistor wire
	EMC AC, ARFI-10 (+E202)	VAR

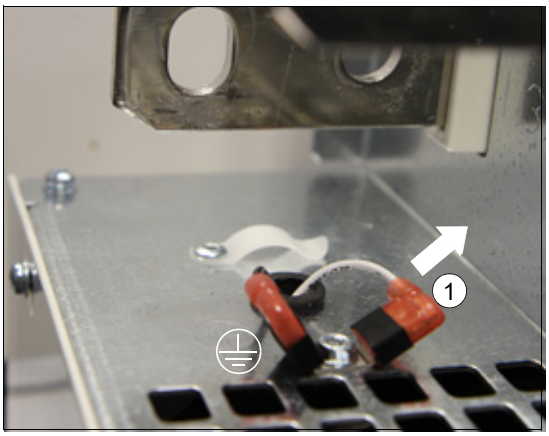
Note:

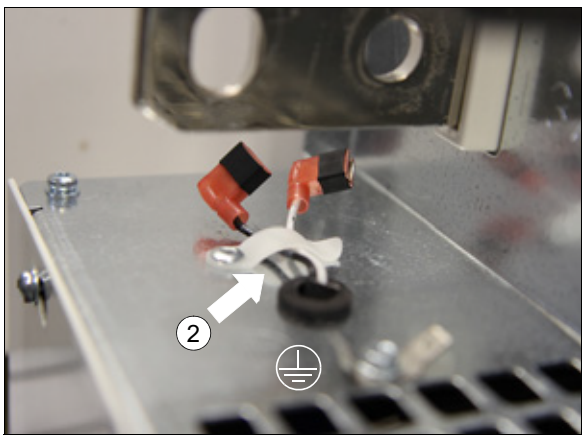
- Because the EMC filter wire have been disconnected, ABB does not guarantee the EMC category.
- ABB does not guarantee the functioning of the ground leakage detector built inside the drive.
- In large systems the residual current device can trip without a real reason.

Source document on TT system: 3AXD10000681917

Disconnecting instructions

EMC AC and varistor (VAR) grounding wires are located at the top of the circuit board compartment. Disconnect them (1) and attach them with the nearby plastic clamp (2). Remove the ARFI-10 (+E202) filter.





7

ACS880-17 and ACS880-37 frames R8 and R11

Contents of this chapter

This chapter describes how to

- check the compatibility of the drive with IT (ungrounded), corner-grounded delta, midpoint-grounded delta and TT systems
- disconnect EMC filter and ground-to-phase varistor.

Grounding system compatibility check

The standard drive with ground-to-phase varistors connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter and ground-to-phase varistors. See the following sections.

EMC filter options +E200 and +E202

A drive with EMC filter options +E200 or +E202 connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the EMC filter. See sections

- *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 43)*
- *Guidelines for installing the drive to a TT system (page 44)*
- *Disconnecting instructions (page 45)*

WARNING!
Do not install the drive with EMC filter options +E200 or +E202 connected to a system that the filter is not suitable for. This can cause danger, or damage the drive.

Note: When EMC filter +E200 or +E202 is disconnected, the drive EMC compatibility is considerably reduced.

Ground-to-phase varistor

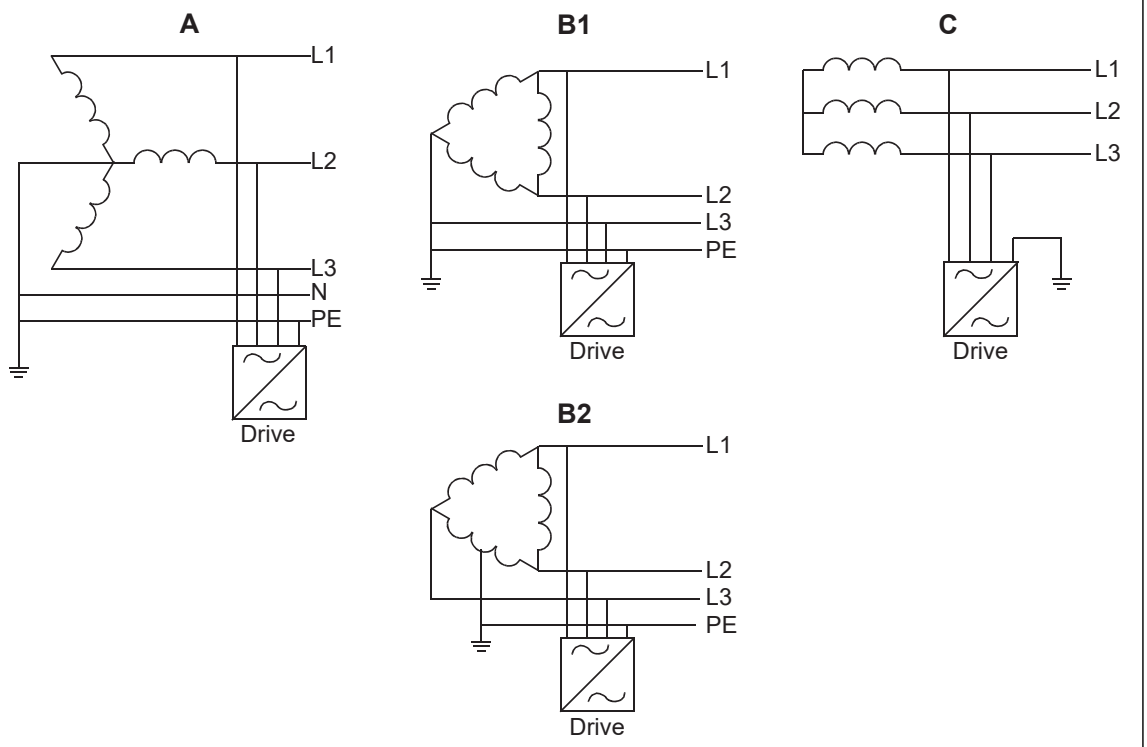
A drive with the ground-to-phase varistor connected can be installed to a symmetrically grounded TN-S system. If you install the drive to another system, you may need to disconnect the varistor. See sections:

- *When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems (page 43)*
- *Guidelines for installing the drive to a TT system (page 44)*
- *Disconnecting instructions (page 45)*

WARNING!
Do not install the drive with the ground-to-phase varistor connected to a system that the varistor is not suitable for. If you do, the varistor circuit can be damaged.

When to disconnect EMC filter (options +E200 and +E202) or ground-to-phase varistor: TN-S, IT, corner-grounded delta and midpoint-grounded delta systems

Frame size	Symmetrically grounded TN systems (TN-S systems) ie. center-grounded wye (A)	Corner-grounded (B1) and midpoint-grounded delta (B2) systems	IT systems (ungrounded or high-resistance- grounded [>30 ohms]) (C)
R8	Do not disconnect EMC or VAR screws.	Disconnect the EMC and VAR screws.	Disconnect EMC DC and VAR screws. [1)]
R11	Do not disconnect EMC AC or VAR wire.	Disconnect the EMC and VAR screws.	Disconnect EMC AC and VAR wires. Remove ARFI-10 filter from the cabinet.



1) With option +E201, disconnect, EMC DC and VAR screws if not removed at the factory. For more information, contact ABB.

Note: These are the EMC filter and varistor screws/wires of different drive frame sizes.

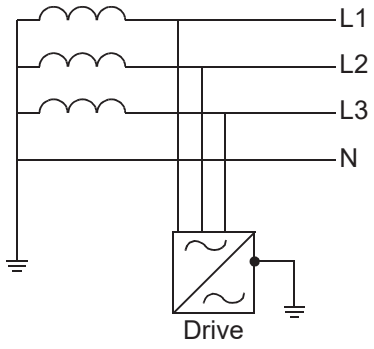
Frame size	EMC filter (+E200, +E202) screws/wires	Ground-to-phase varistor screws/wire
R8	EMC DC screw	VAR screw
R11	EMC AC wire	VAR wire

Guidelines for installing the drive to a TT system

The drive can be connected to a TT system under these conditions:

1. Residual current device has been installed in the supply system.
2. These screws have been disconnected. Otherwise EMC filter and ground-to-phase varistor capacitor leakage current will cause the residual current device to trip.

Frame size	EMC filter (+E200, +E202) screw/wire	Ground-to-phase varistor screw/wire
R8	EMC DC screw	VAR screw
R11	EMC AC wire	VAR wire



Note:

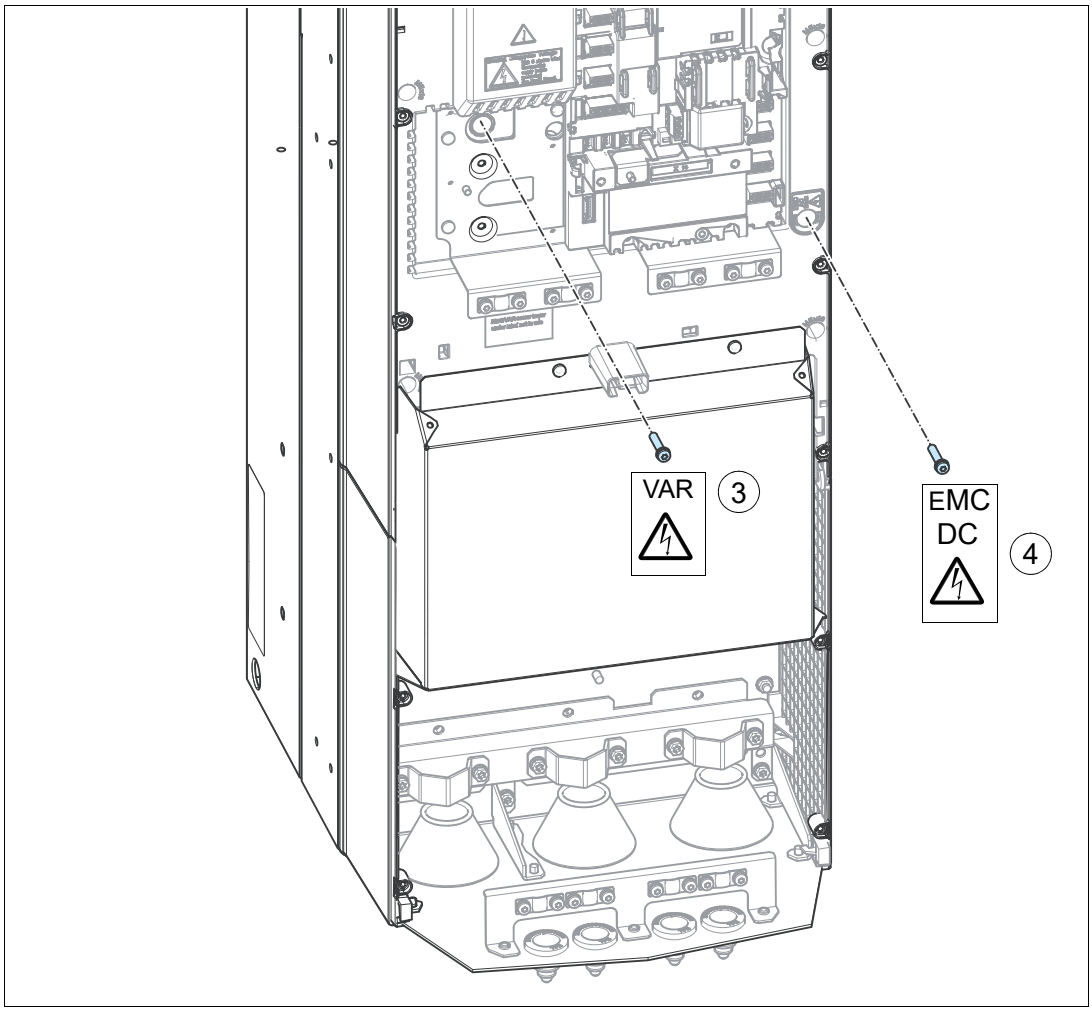
- Because the EMC filter screws have been disconnected, ABB does not guarantee the EMC category.
- ABB does not guarantee the functioning of the ground leakage detector built inside the drive.
- In large systems the residual current device can trip without a real reason.

Source document on TT system: 3AXD10000681917

Disconnecting instructions

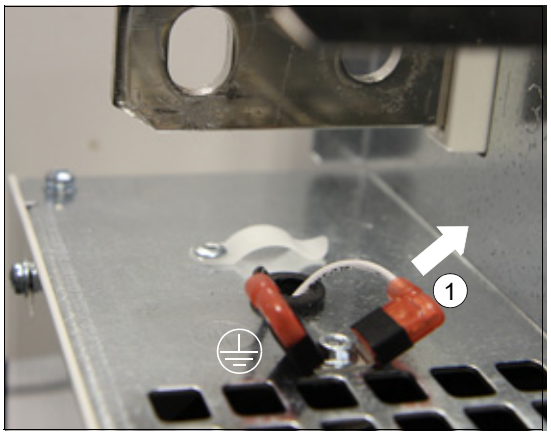
Frame R8:

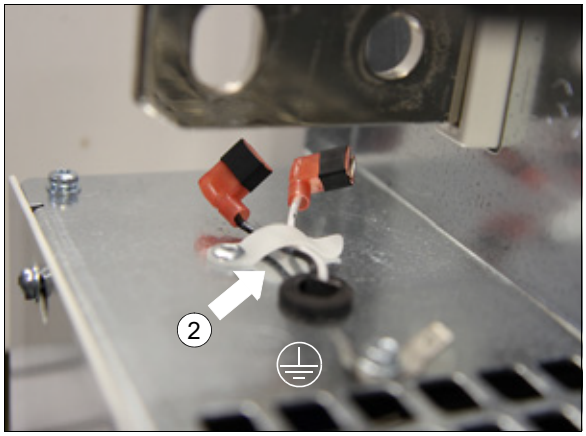
1. Stop the drive and do the steps in section *Electrical safety precautions* before you start the work.
2. Remove the front cover.
3. Disconnect the VAR screw.
4. Disconnect the EMC DC screw.



Frame R11:

EMC AC and varistor (VAR) grounding wires are located at the top of the circuit board compartment. Disconnect them (1) and attach them with the nearby plastic clamp (2). To remove the ARFI-10 filter from the cabinet, contact ABB Service.





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.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

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