ABB Drives

Technical reference

ACS50 Frequency converters



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Technical reference

ACS50

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Introduction

This technical reference supplements the ACS50 User's Guide (3AFE68247756).

This document contains information which is relatively rarely needed by the customers using the ACS50, and is therefore not included in the ACS50 User's Guide.

1 – Additional EMC information

Overview

The ACS50 fulfils the following EMC standards provided that the installation is done properly and according to the instructions of this manual:

Conductive high frequency emissions	EN61800-3 first environment, unrestricted/restricted distribution. (1
Radiated high frequency emissions	EN61800-3 first environment, restricted distribution. (2
Immunity	EN61800-3 second environment
Line current harmonics	IEC6100-3-2 (3 (4 (5

Notes:

1) Observe the maximum allowed motor cable lengths and switching frequency which are listed in page 18 of the ACS50 User's Guide. See also cabling instructions on page 15.

2) Following warning is required by the EN61800-3: "Warning: This is a product of restricted sales distribution class according to IEC 61800-3. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures". For example, distances to any sensitive apparatus such as TV and radio sets should be maximised to avoid possible interference.

3) The ACS50 is a professional equipment to be used in trades, professions and industries and which is not intended for sale to general public. Such equipment, with input power >1kW (ACS50 types 04A3-2, 07A6-2, 09A8-2), can be connected to 230V industrial or domestic networks without need for external input chokes.

4) When the low power 230V ACS50 types 01A4-2 and 02A2-2 are used in non-industrial applications, an input choke must be connected. Alternatively, if the input choke is not used, the user should request connection approval from the supply authorities.

5) The high power ACS50 types 07A6-2 and 09A8-2 exceed harmonic current limits of IEC 61000-3-4.

Line current harmonics

The product standard EN61800-3 refers to EN61000-3-2 which specifies limits for harmonic current emissions for equipment connected to low voltage public supply network.

The EN 61000-3-2 applies to low-voltage networks interfacing with the public supply at the low-voltage level. It does not apply to private low voltage networks interfacing with the public supply only at the medium- or high-voltage level.

Public low voltage network

The limits and requirements of the EN 61000-3-2 apply for equipment with rated current ≤ 16A. The ACS50 models with total rated power greater than 1kW conform with EN 61000-3-2. Below 1kW – that is, with ACS50 types 01A4-2 and 02A2-2 – external input chokes must be used, or alternatively, permission to connect must be obtained from the supply authority.

To select correct input chokes for ACS50, refer to the ACS50 Technical Catalogue (3AFE68216061).

Private low-voltage network

If an ACS50 is used in an industrial installation for which the EN61000-3-2 is not relevant, a reasonable economical approach which considers the total installation shall be used.

Typically a single low power equipment like ACS50 does not cause significant voltage distortion to network. However, the user shall be aware of the values of the harmonic currents and voltages occurring within the power supply system before connecting the ACS50, as well as the internal impedance of the power supply system. The current harmonic levels of the ACS50 under rated load conditions are available on request and the assessment procedure given in Appendix B of the EN61800-3 may be used as a guide.

2 – Floating networks

Overview

Special caution should be observed if the ACS50 is installed in a floating network (also known as IT, ungrounded, or high-impedance networks).

Important!

- **The grounding screw (see figures 2a and 2b) must be removed before the ACS50 is installed on an IT system. Failure to do so may cause danger or damage the unit. This applies to all ACS50 types (EMC and non-EMC).**
- **After the screw is detached, the ACS50 must be installed in vibration free environment.**

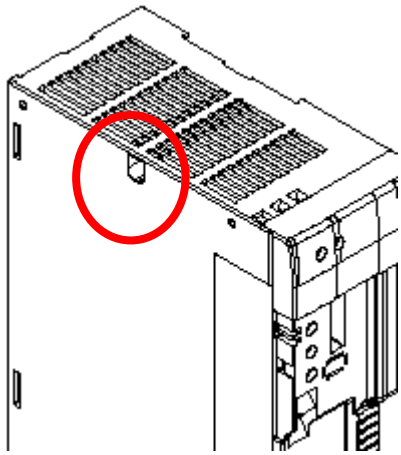


Figure 2a: Grounding screw location in Frames C and D.

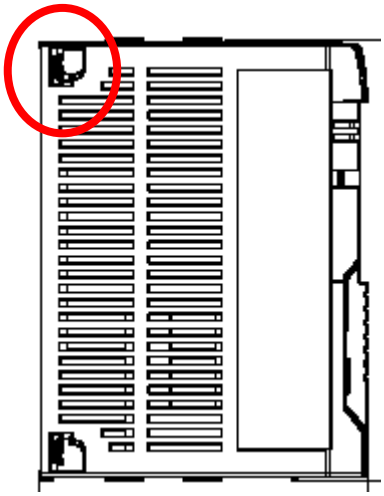


Figure 2b. Grounding screw location in Frames A and B.

Make sure that no excessive emissions are propagated to neighbouring low voltage networks. In some cases , the natural suppression in transformers and cables is sufficient. If in doubt, a

supply transformer with static screening between the primary and secondary windings can be used.

External EMC filter

Note! External EMC filter ACS50-IFAB-01, or any EMC filter, must NOT be used in floating network. The mains will be connected to earth potential through the filter capacitors. This could be dangerous and could damage the unit.

3 – Mounting clip

Overview

The ACS50 units come equipped with versatile clips that allow mounting of the unit in several ways. The ACS 50 can either be mounted on a 35 mm DIN rail or alternatively on wall using M4 screws. As default, the mounting clip is attached on the narrow side of the drive. It is also possible to move the mounting clip to the wide side of the drive.

Frames A and B

Figures 3a-3c show detaching and attaching of the clip in Frames A and B. The clip consists of two plastic parts which have to be separated by pushing two plastic knobs in the clip (Figure 3a).

The parts are slided between the aluminium rails when the clip is attached on the narrow side of the drive or on wide side of frame B (Figure 3c). The parts have “fingers” which should go to plastic receptacles in the drive, when the clip is attached on the wider side of the frame A (Figure 3b).

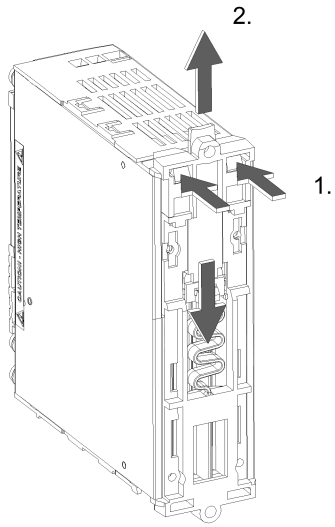


Figure 3a: Frames A and B

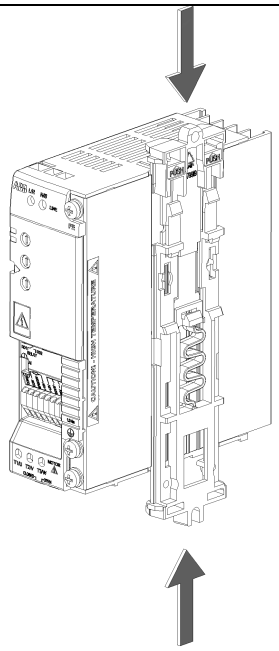


Figure 3b: Frame A

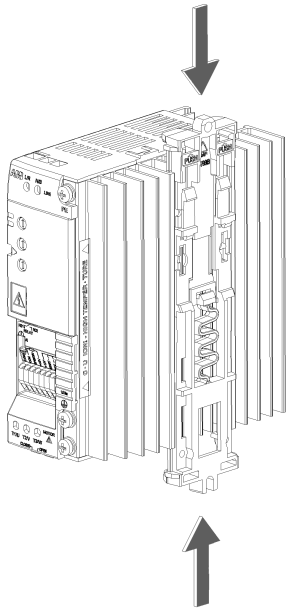


Figure 3c: Frame B

Frames C and D

Figures 3d-3e show detaching and attaching of the clip in Frames C and D. The clip consists of single plastic part which slides between the aluminium rails. There is a small button which also has to be pressed when detaching the clip (Figure 3d).

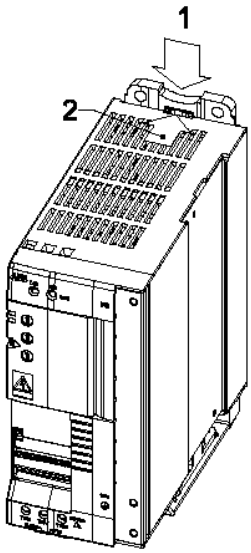


Figure 3d: Frames C and D

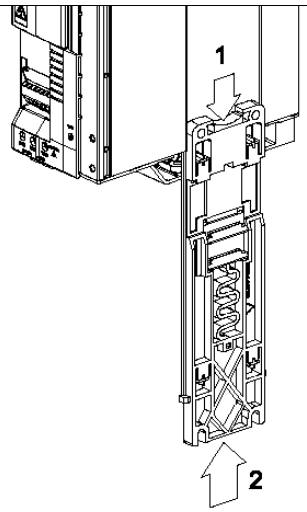


Figure 3e: Frames C and D

4 – Protective devices

Overview Table 4a contains examples of suitable protective devices for use with ACS50.

Type		Circuit Breaker		Residual-current-operated circuit breaker (RCCB)		Combined RCCB and overload protector	
ACS50-	Frame size	Type	Manufacturer	Type	Manufacturer	Type	Manufacturer
Un= 100V-120V							
-01N-01A4-1	A	S201-K 10	ABB				
-01N-02A2-1	A	S201-K 16	ABB				
Un= 100V-120V							
-01E-01A4-1	A	S201-K 10	ABB				
-01E-02A2-1	A	S201-K 16	ABB				
Un = 200V-240V							
-01N-01A4-2	A	S201-K 10	ABB	F 202 A-25/0.03	ABB	FS 201-K 10/0.03	ABB
-01N-02A2-2	A	S201-K 16	ABB	F 202 A-25/0.03	ABB	FS 201-K 16/0.03	ABB
-01N-04A3-2	B	S201-K 16	ABB	F 202 A-25/0.03	ABB	FS 201-K 16/0.03	ABB
-01N-07A6-2	C	S201-C 25 or S201-K 25	ABB	F 202 A-25/0.03	ABB	FS 201-K 25/0.03	ABB
-01N-09A8-2	C	S201-C 32 or S201-K 32	ABB	F 202 A-40/0.03	ABB	FS 201-K 32/0.03	ABB
Un = 200V-240V							
-01E-01A4-2	A	S201-K 10	ABB	F 202 A-25/0.03	ABB	FS 201-K 10/0.03	ABB
-01E-02A2-2	A	S201-K 16	ABB	F 202 A-25/0.03	ABB	FS 201-K 16/0.03	ABB
-01E-04A3-2	B	S201-K 16	ABB	F 202 A-25/0.03	ABB	FS 201-K 16/0.03	ABB
-01E-07A6-2	D	S201-C 25 or S201-K 25	ABB	F 202 A-25/0.03	ABB	FS 201-K 25/0.03	ABB
-01E-09A8-2	D	S201-C 32 or S201-K 32	ABB	F 202 A-40/0.03	ABB	FS 201-K 32/0.03	ABB

Table 4a. (00236162.XLS Rev C)