
 ABB Oy, Drives Service	<b>On-Site Service Instructions</b>	Document nbr 3AXD10000303478	
	<b>ACx580-01 R0-R5</b>	Related to material	
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## On-site Service Instructions for ACx580-01 Frames R0-R5

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## 1. General

### 1.1 Warnings

#### WARNING!

Any qualified electrician, who according to the local laws has the required legitimacy, is allowed to perform installation and maintenance work on the ACX580 frame sizes R0-R5.

Do not attempt any work on a powered ACX580. After switching off the mains, always allow the intermediate circuit capacitors 5 minutes to discharge before working on the frequency converter, the motor or the motor cable. The voltage between each input terminal (U1, V1, W1) and earth must be measured with a multimeter (impedance at least 1M $\Omega$ ) to ensure that the frequency converter is discharged before beginning work.

Always ensure by measuring with a multimeter (impedance at least 1 M $\Omega$ ) that:

1. There is no voltage between the drive input phases U1, V1 and W1 and the ground.
2. There is no voltage between terminals UDC+ and UDC- and the ground.
3. There is no voltage between terminals R+ and R- and the ground.

Also make sure that no one can accidentally power the system up while you're working on the drive.

All insulation tests must be carried out with the ACX580 disconnected from the cabling.

Do not make any insulation or voltage withstand tests on any part of the drive.


The ACX580 motor cable terminals are at a dangerously high voltage when input power is applied, regardless of motor operation. No work on the motor cable should be attempted with mains power applied.

There can be dangerous voltage inside the ACX580 from external control circuits when the ACX580 input power is shut off. No work on the control cables should be attempted when power is applied to the frequency converter or to the external control circuits. Exercise appropriate care when working with the unit.

ESD (Electro Static Discharge): The printed circuit boards contain integrated circuits that are extremely sensitive to electrostatic discharge. Use ESD –protection and exercise appropriate care when working on the unit to avoid permanent damage to the circuits. Avoid unnecessary touching of the boards.

#### WARNING!

Before working with the ACX580 read carefully the Safety Instruction on the ACX580 Hardware Manual. Ignoring the safety instructions can cause injury or death.

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## 1.2 Content

The purpose of this document is to specify on-site maintenance and repair actions of ACx580-01 frame sizes R0 – R5. Following actions are included in this document:


- Control unit replacement
- Cooling fan replacement

## 1.3 Required tools

- ESD field service kit
- Cross head screwdriver
- Flathead screwdriver
- Torxhead screwdriver

## 1.4 Maintenance schedule

Maintenance schedule is available at ABB library. Contact your local ABB representative for more information.

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## 2. Preventive maintenance actions


### 2.1 Heat sink temperature check and cleaning

Need for heat sink temperature check and cleaning depends on the dustiness of the environment. The heat sink fins pick up dust from the cooling air. The drive runs into over temperature warnings and faults if the heat sink is not clean. Too high operating temperature causes faster aging of the drive components. In a normal environment the heat sink should be checked annually and cleaned if needed, in a dusty environment more often. Heat sink must also be cleaned when replacing a cooling fan.

NOTE! Compressed air or normal vacuum cleaner must **NOT** be used to clean any other parts of the drive than heat sink only. Airflow causes a high risk of ESD damage to components. Fan must also be removed before cleaning with compressed air. Otherwise strong air flow will affect fan bearings.

#### 2.1.1 Heat sink cleaning

- a. Turn off the main input power of the drive
- b. Remove the cooling fan
- c. Blow clean dry compressed air from the bottom
- d. Use a vacuum cleaner on top to trap the dust
- e. Install the cooling fan

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## 2.2 Cooling fan replacement

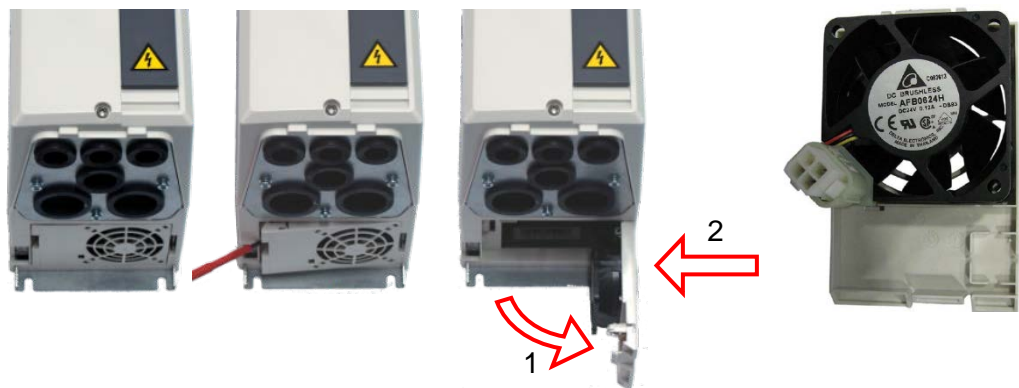
### 2.2.1 Frame R0, Main cooling fan

#### Types:

- ACx580-01-02A6-4
- ACx580-01-03A3-4
- ACx580-01-04A0-4
- ACx580-01-05A6-4

The main cooling fan is located at the bottom of the drive. Replace the fan as follows:


- a. Release the locking clamp, use a flathead screwdriver to assist
- b. Remove the fan by opening the unit (1.) and pushing leftwards at the base (2.)
- c. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1



- d. Check that the fans blowing direction is inside the unit and install the new fan unit simply by pushing it to its place.

Ensure the fan operation when the drive is powered up



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## 2.2.2 Frame R0 IP55, Internal cooling fan

### Types:

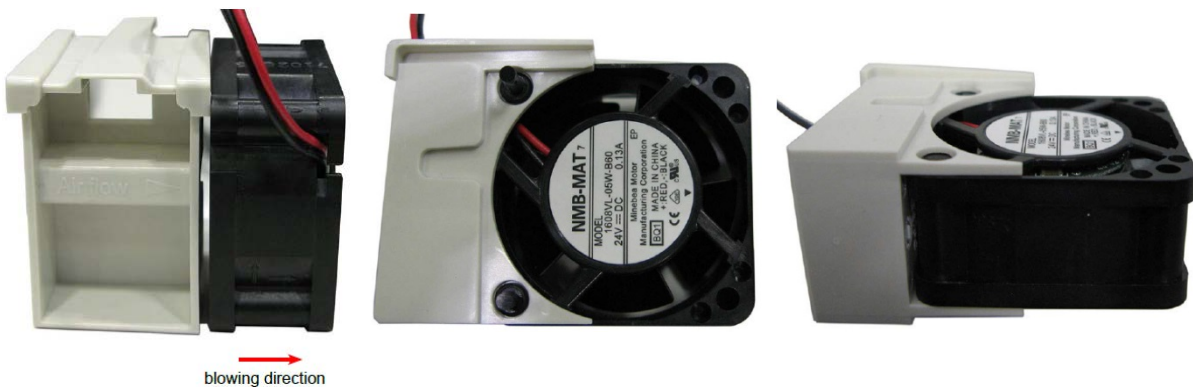
- ACx580-01-02A6-4
- ACx580-01-03A3-4
- ACx580-01-04A0-4
- ACx580-01-05A6-4

### 1. Remove front cover

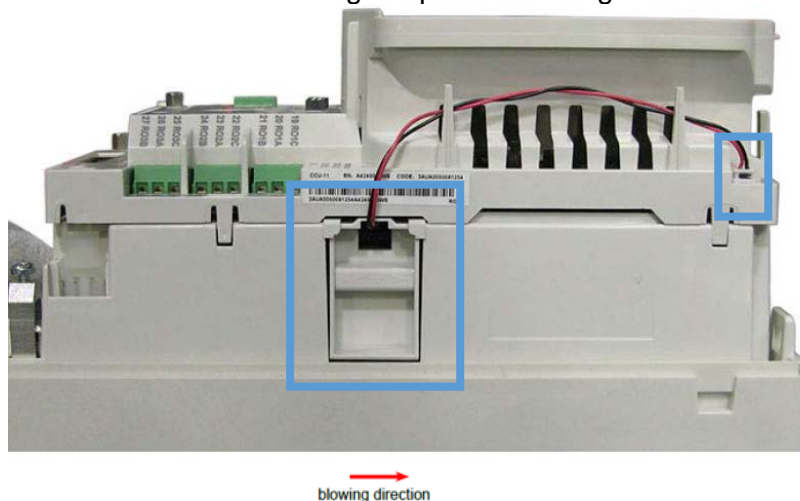
- a. Remove control panel
- b. Open mounting **screw** with a screwdriver
- c. Push the front cover slightly upwards and lift it off

### 2. Replace internal fan


- a. Remove internal fan sledge from plastic housing
- b. Assembly new internal fan+sledge combination
  - i. Place internal fan to sledge, ensure correct blowing direction
  - ii. Place FR-1 rivets through the holes and push them to bottom



- c. Place internal fan sledge to plastic housing



### 3. Install components in reverse order

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## 2.2.3 New Frame R1, Main cooling fan


### Types:

- ACX580-01-04A6-2
- ACX580-01-04A7-2
- ACX580-01-06A6-2
- ACX580-01-06A7-2
- ACX580-01-07A5-2
- ACX580-01-07A6-2
- ACX580-01-10A6-2
- ACX580-01-012A-2
- ACX580-01-017A-2
- ACX580-01-018A-2
- ACX580-01-02A1-4
- ACX580-01-02A7-4
- ACX580-01-03A0-4
- ACX580-01-03A4-4
- ACX580-01-03A5-4
- ACX580-01-04A1-4
- ACX580-01-04A8-4
- ACX580-01-05A7-4
- ACX580-01-06A0-4
- ACX580-01-07A3-4
- ACX580-01-07A6-4
- ACX580-01-09A9-4
- ACX580-01-012A-4
- ACX580-01-12A7-4

The main cooling fan is located on the top of the drive.





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Replace the fan as follows:

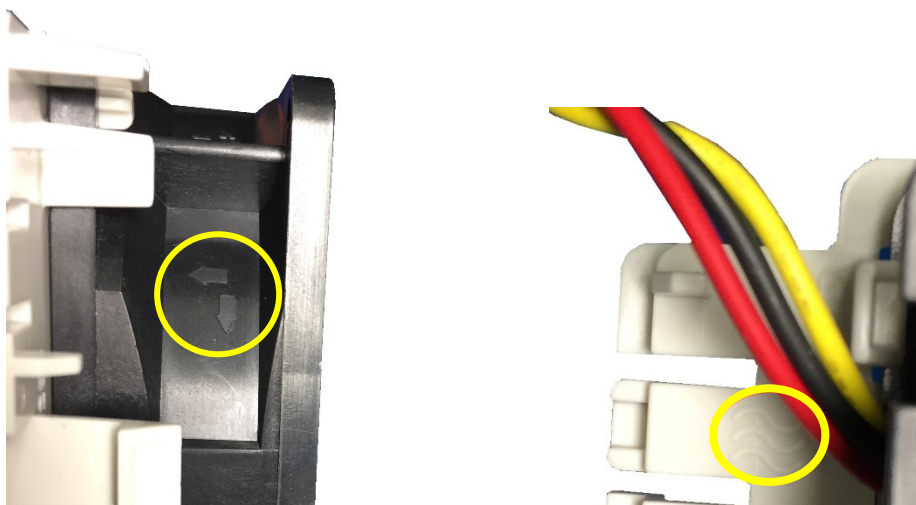
1. Release two locking clamps, use a flathead screwdriver to assist.




2. Remove the fan.



3. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1.
4. Check that the fan blowing direction is outside the unit and install the new fan in reverse order to above. Ensure the fan operation when the drive is powered up.



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## 2.2.4 New Frame R1 IP55, Internal cooling fan

### Types:

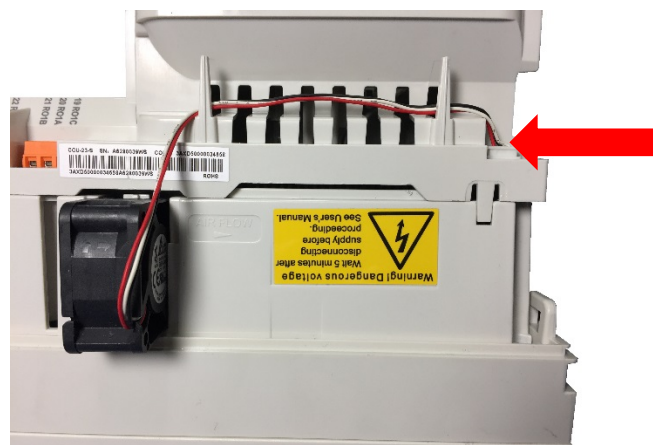
- ACX580-01-04A6-2
- ACX580-01-04A7-2
- ACX580-01-06A6-2
- ACX580-01-06A7-2
- ACX580-01-07A5-2
- ACX580-01-07A6-2
- ACX580-01-10A6-2
- ACX580-01-012A-2
- ACX580-01-017A-2
- ACX580-01-018A-2
- ACX580-01-02A1-4
- ACX580-01-02A7-4
- ACX580-01-03A0-4
- ACX580-01-03A4-4
- ACX580-01-03A5-4
- ACX580-01-04A1-4
- ACX580-01-04A8-4
- ACX580-01-05A7-4
- ACX580-01-06A0-4
- ACX580-01-07A3-4
- ACX580-01-07A6-4
- ACX580-01-09A9-4
- ACX580-01-012A-4
- ACX580-01-12A7-4


Remove the front cover. You will find the internal cooling fan on the right side of the drive.

1. Remove the transparent plastic cover in front of the fan with a screwdriver.

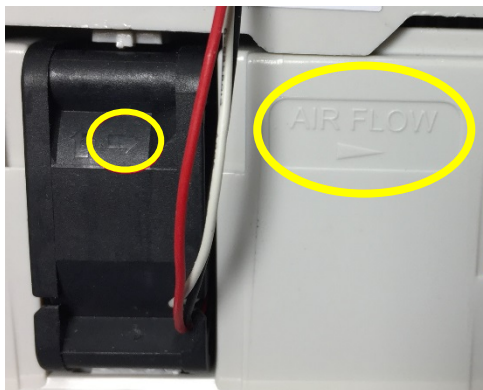


2. Unlock the wires from the right and take slowly the fan out by pulling the wires.



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3. Assembly the new internal fan and check that the blowing direction is to upwards. Remember to reinstall the transparent plastic cover and the wires.



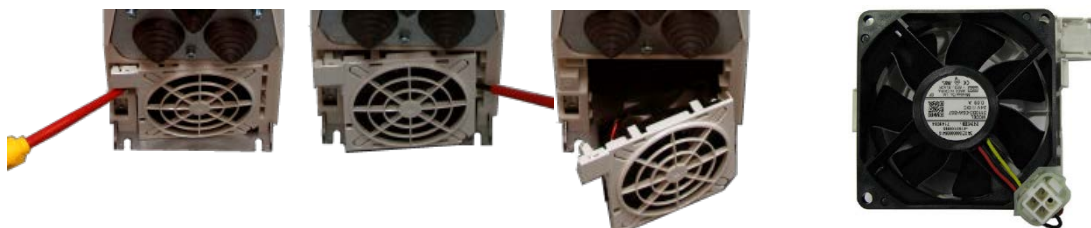
## 2.2.5 Old Frame R1, Main cooling fan

### Types:


- ACX580-01-07A2-4
- ACX580-01-09A4-4
- ACX580-01-12A6-4

The main cooling fan is located at the bottom of the drive. Replace the fan as follows:

- a. Release two locking clamps, use a flathead screwdriver to assist
- b. Remove the fan



- c. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1
- d. Check that the fans blowing direction is inside the unit and install the new fan in reverse order to above. Ensure the fan operation when the drive is powered up

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## 2.2.6 Old Frame R1 IP55, Internal cooling fan

### Types:

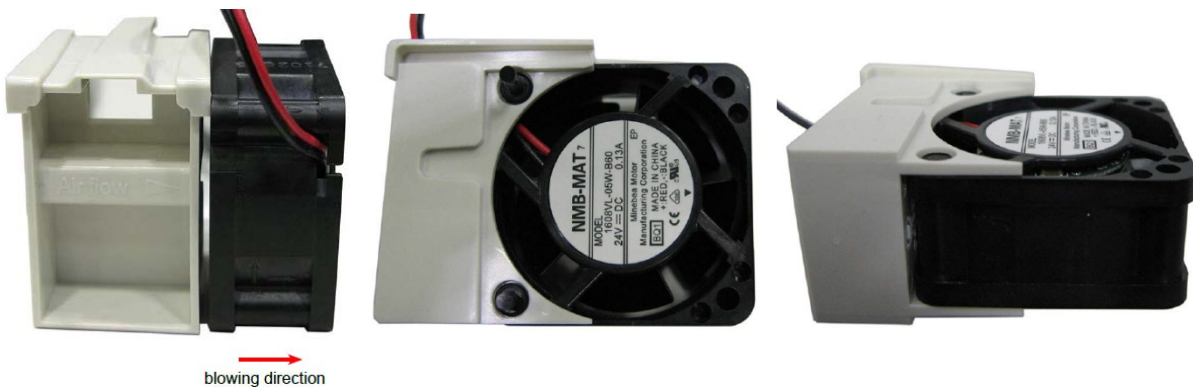
- ACX580-01-07A2-4
- ACX580-01-09A4-4
- ACX580-01-12A6-4

### 1. Remove front cover

- a. Remove control panel
- b. Open mounting **screw** with a screwdriver
- c. Push the front cover slightly upwards and lift it off

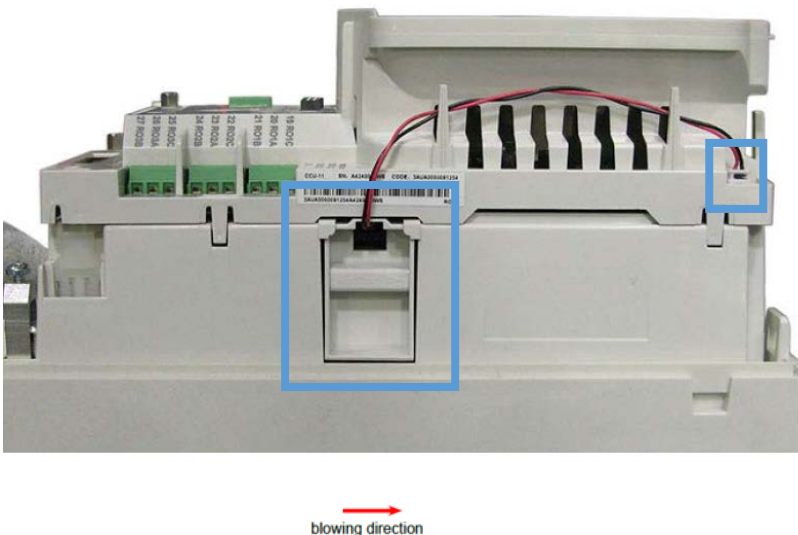
### 1. Replace internal fan


- a. Remove internal fan sledge from plastic housing
- b. Assembly new internal fan+sledge combination
  - i. Place internal fan to sledge, ensure correct blowing direction
  - ii. Place FR-1 rivets through the holes and push them to bottom



- c. Place internal fan sledge to plastic housing

### 2. Install components in reverse order



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## 2.2.7 New Frame R2, Main cooling fan

### Types:


- ACX580-01-024A-2
- ACX580-01-025A-2
- ACX580-01-031A-2
- ACX580-01-032A-2
- ACX580-01-014A-4
- ACX580-01-018A-4
- ACX580-01-023A-4
- ACX580-01-03A9-6
- ACX580-01-06A1-6
- ACX580-01-09A0-6
- ACX580-01-011A-6
- ACX580-01-017A-6

The main cooling fan is located on the top of the drive.



Replace the fan as follows:

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1. Release the two locking clamps, use a flathead screwdriver to assist.




2. Remove the fan.



3. Clean the cooling air duct and the heat sink with compressed air. See separated instructions in section 2.1.1.
4. Check that the fans blowing direction is outside the unit and install the new fan in reverse order to above. Ensure the fan operation when the drive is powered up.



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## 2.2.8 New Frame R2 IP55, Internal cooling fan

### Types:

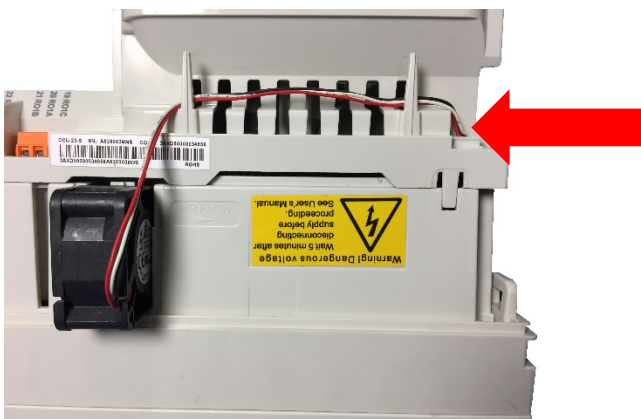
- ACX580-01-024A-2
- ACX580-01-025A-2
- ACX580-01-031A-2
- ACX580-01-032A-2
- ACX580-01-014A-4
- ACX580-01-018A-4
- ACX580-01-023A-4
- ACX580-01-026A-4
- ACX580-01-02A7-6
- ACX580-01-03A9-6
- ACX580-01-06A1-6
- ACX580-01-09A0-6
- ACX580-01-011A-6
- ACX580-01-017A-6

Remove the front cover. You will find the internal cooling fan on the right side of the drive.

1. Remove the transparent plastic cover in front of the fan with a screwdriver.

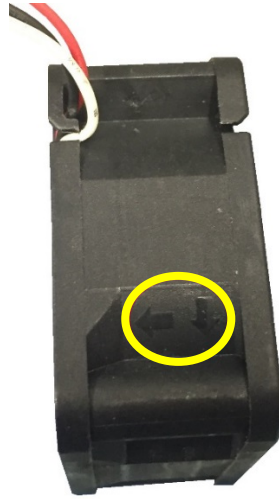
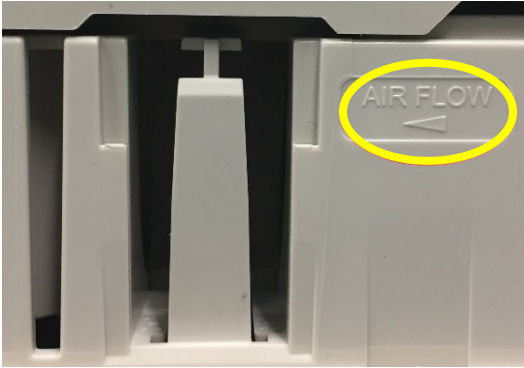


2. Unlock the wires from the right and take slowly the fan out by pulling the wires.




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3. Assembly the new internal fan and check that the blowing direction is to downwards.  
Remember to reinstall the transparent plastic cover and the wires.





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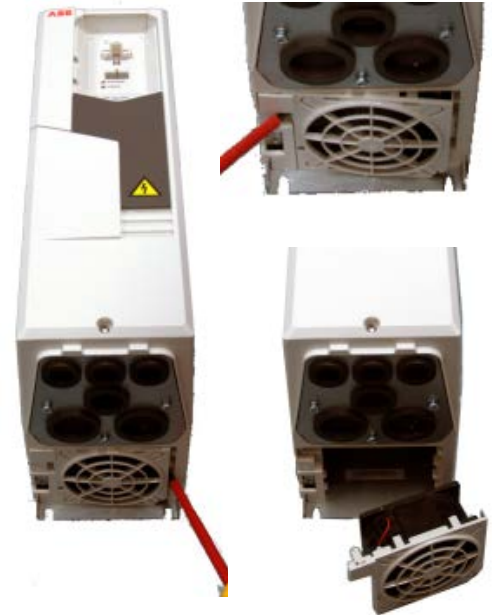
## 2.2.9 Old Frame R2, Main cooling fan

### Types:

- ACX580-01-017A-4
- ACX580-01-025A-4


The main cooling fan is located at the bottom of the drive.  
Replace the fan as follows:

- a. Release two locking clamps, use a flathead screwdriver to assist
- b. Remove the fan
- c. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1



- d. Check that the fans blowing direction is inside the unit and install the new fan in reverse order to above. Ensure the fan operation when the drive is powered up



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## 2.2.10 Old Frame R2 IP55, Internal cooling fan

### Types:

- ACX580-01-017A-4
- ACX580-01-025A-4

### 1. Remove front cover

- a. Remove control panel
- b. Open mounting **screw** with a screwdriver
- c. Push the front cover slightly upwards and lift it off

### 2. Remove control unit

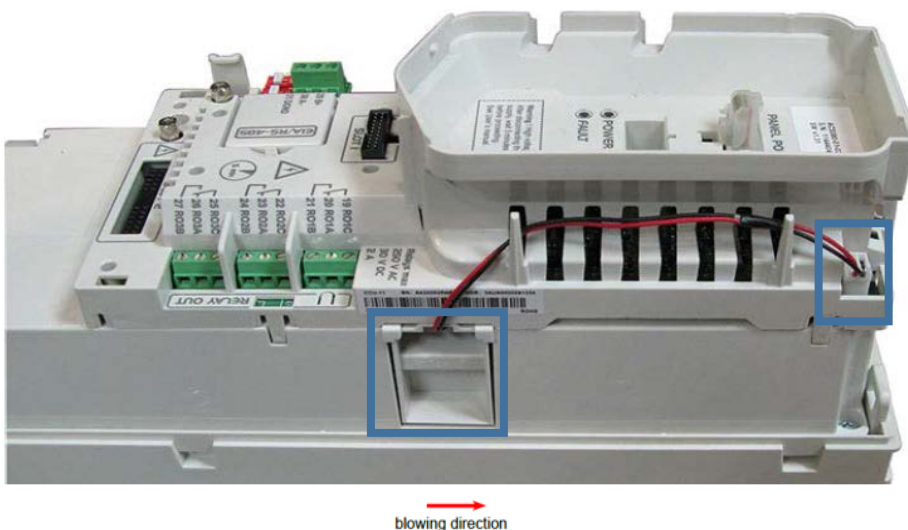
- a. Remove mounting screws with a screwdriver
- b. Release mounting clamps and lift CCU-11/CCU-23 and the rigid connector off

### 3. Replace internal fan

- a. Remove internal fan sledge and cable from plastic housing
- b. Assembly new internal fan+sledge combination
  - i. Place internal fan to sledge, ensure correct blowing direction
  - ii. Place FR-1 rivets through the holes and push them to bottom




- c. Place internal fan sledge to plastic housing



### 4. Install components in reverse order

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## 2.2.11 New Frame R3, Main cooling fan

### Types:

- ACX580-01-046A-2
- ACX580-01-047A-2
- ACX580-01-059A-2
- ACX580-01-060A-2
- ACX580-01-027A-4
- ACX580-01-033A-4
- ACX580-01-034A-4
- ACX580-01-039A-4
- ACX580-01-044A-4
- ACX580-01-046A-4
- ACX580-01-022A-6
- ACX580-01-027A-6
- ACX580-01-032A-6


The main cooling fan is located on the top of the drive.



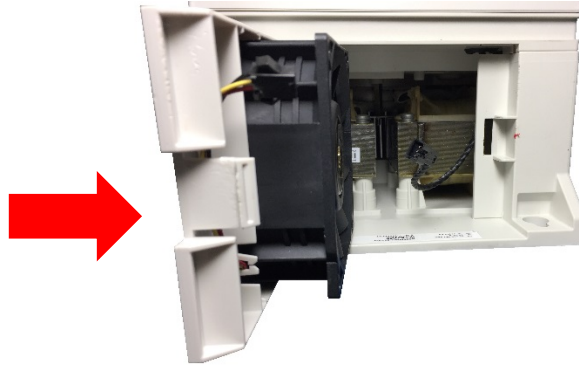
Replace the fan as follows:

1. Release the locking clamp, use a flathead screwdriver to assist.



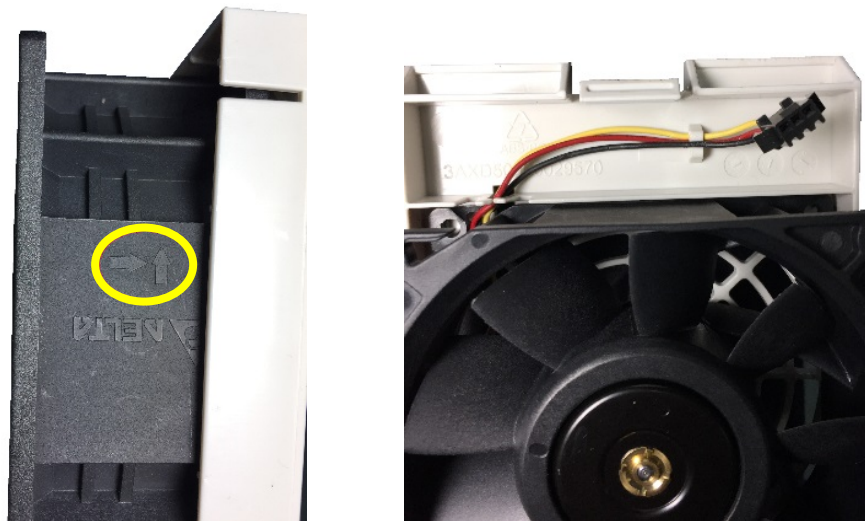
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- Remove the fan by opening the unit and pushing rightwards at the base.



- Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1
- Check that the fans blowing direction is outside the unit and install the new fan unit simply by pushing it to its place.

Ensure the fan operation when the drive is powered up



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## 2.2.12 New Frame R3 IP55, Internal cooling fan

### Types:

- ACX580-01-046A-2
- ACX580-01-047A-2
- ACX580-01-059A-2
- ACX580-01-060A-2
- ACX580-01-027A-4
- ACX580-01-033A-4
- ACX580-01-034A-4
- ACX580-01-039A-4
- ACX580-01-044A-4
- ACX580-01-046A-4
- ACX580-01-022A-6
- ACX580-01-027A-6
- ACX580-01-032A-6

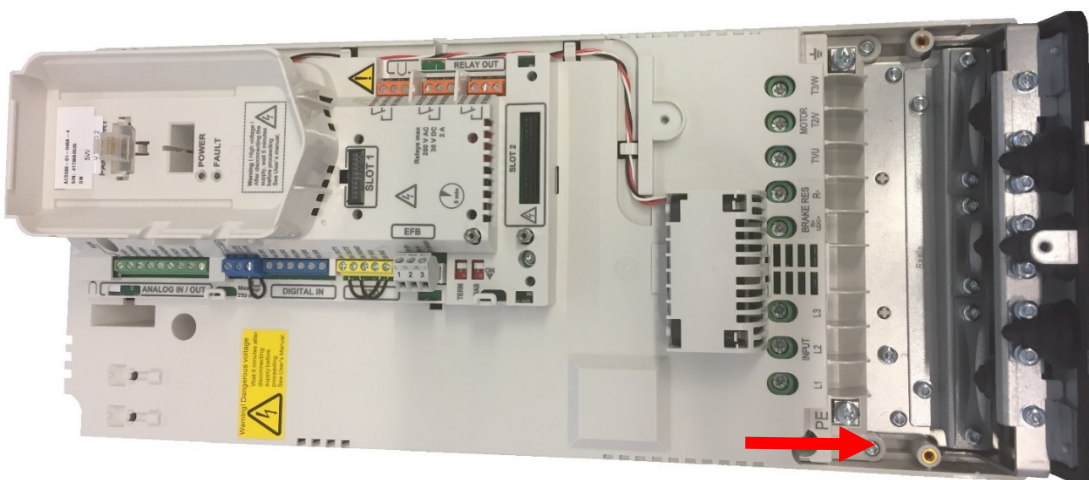
### 1. Remove front cover

- a. Remove control panel
- b. Open mounting screws with a screwdriver
- c. Push the front cover slightly upwards and lift it off




### 2. Replace the internal fan

- a. Remove internal fan plastic housing
- b. Remove fan connector from CCU-23
- c. Replace internal fan, see that the blowing direction is downwards the unit



### 3. Install components in reverse order



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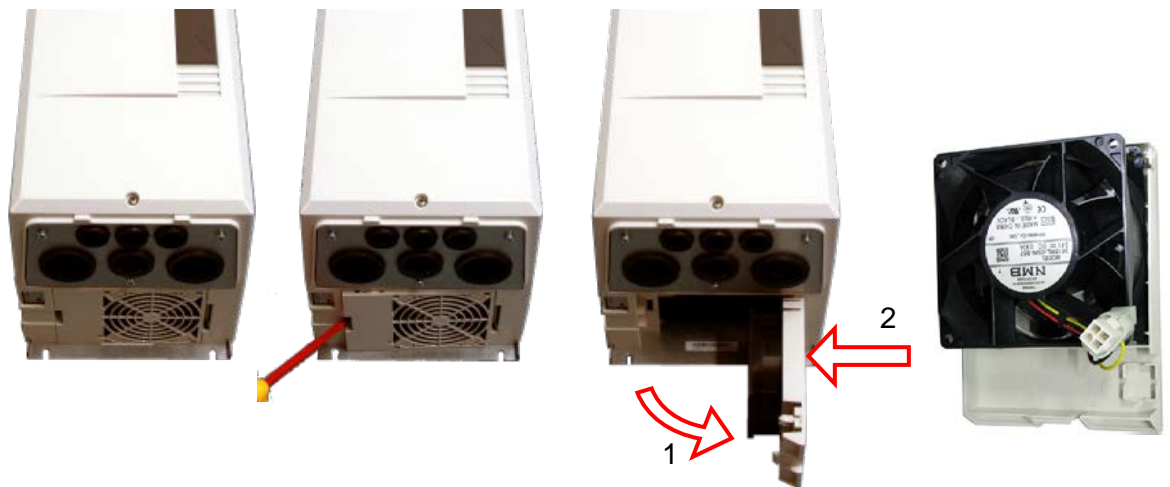
### 2.2.13 Old Frame R3, Main cooling fan

#### Types:

- ACX580-01-032A-4
- ACX580-01-038A-4
- ACX580-01-045A-4

The main cooling fan is located at the bottom of the drive. Replace the fan as follows:


- a. Release the locking clamp, use a flathead screwdriver to assist
- b. Remove the fan by opening the unit (1.) and pushing leftwards at the base (2.)



- c. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1
- d. Check that the fans blowing direction is inside the unit and install the new fan unit simply by pushing it to its place.

Ensure the fan operation when the drive is powered up



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## 2.2.14 Old Frame R3 IP55, Internal cooling fan

### Types:

- ACX580-01-032A-4
- ACX580-01-038A-4
- ACX580-01-045A-4

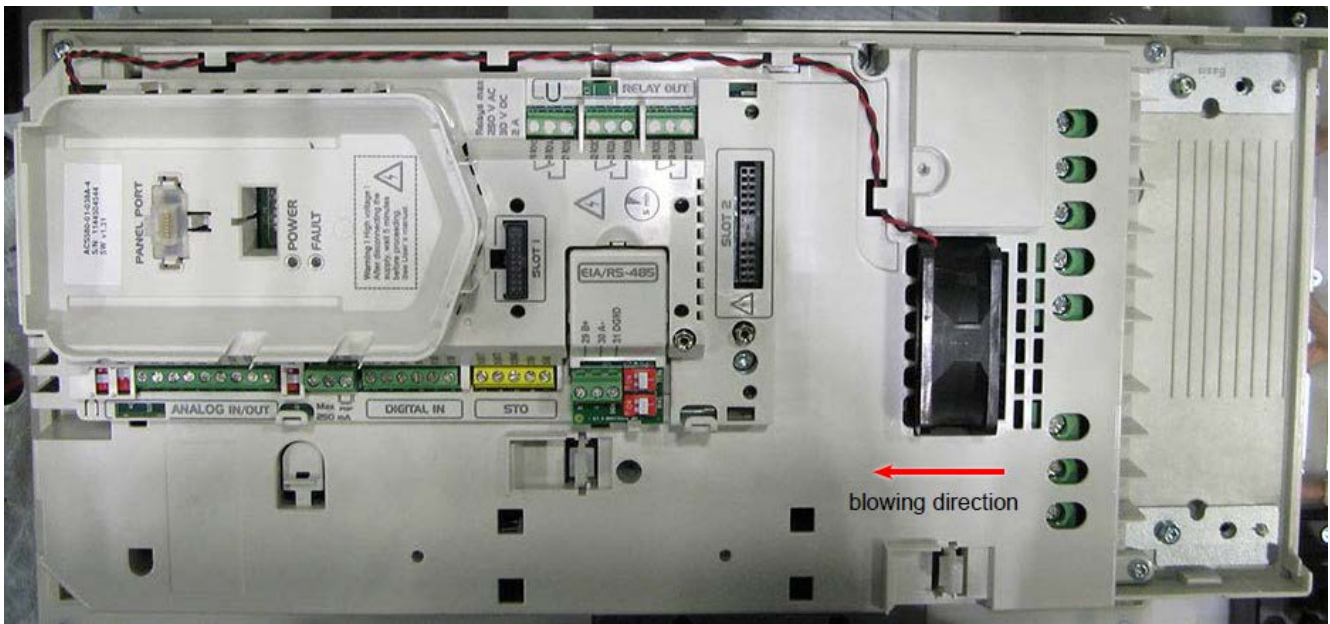
### 1. Remove front cover

- a. Remove control panel
- b. Open mounting screws with a screwdriver
- c. Push the front cover slightly upwards and lift it off




### 2. Replace internal fan

- a. Remove internal fan plastic housing
- b. Remove fan connector from CCU-11/CCU-23
- c. Replace internal fan, see that the blowing direction is upwards the unit



### 3. Install components in reverse order

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## 2.2.15 Frame R4, Main cooling fan

### Types:

- ACX580-01-062A-4
- ACX580-01-073A-4
- ACX580-01-075A-2
- ACX580-01-076A-2
- ACX580-01-052A-4
- ACX580-01-065A-4
- ACX580-01-077A-4

The main cooling fan is located at the bottom of the drive. Replace the fan as follows:

- a. Release the locking clamp, use a flathead screwdriver to assist
- b. Remove the fan by opening the unit (1.) and pushing leftwards at the base (2.)




- c. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1
- d. Check that the fans blowing direction is inside the unit and install the new fan unit simply by pushing it to its place.

Ensure the fan operation when the drive is powered up





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## 2.2.16 Frame R4 IP55, Internal cooling fan

### Types:

- ACX580-01-062A-4
- ACX580-01-073A-4
- 
- ACX580-01-075A-2
- ACX580-01-076A-2
- ACX580-01-052A-4
- ACX580-01-065A-4
- ACX580-01-077A-4

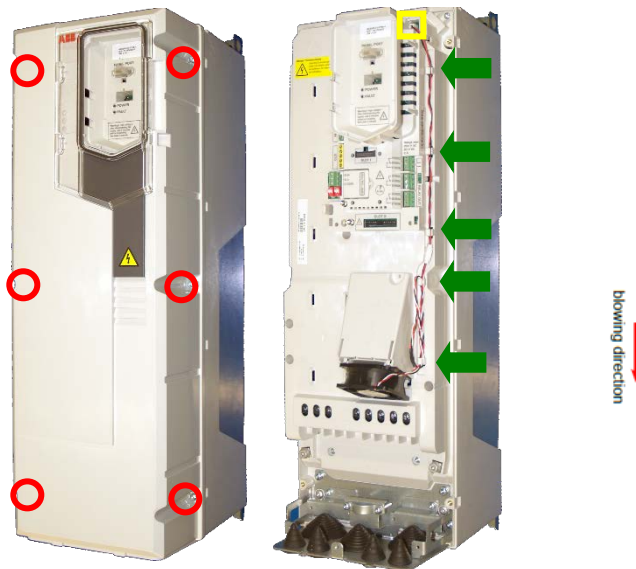
### 1. Remove front cover


- a. Remove control panel
- b. Open six mounting **screw** with a screwdriver
- c. Push the front cover slightly upwards and lift it off

### 2. Remove internal fan

- a. Remove **fan connector** and detach fan cable from **clamps**
- b. Pull fan out of fan holder and replace

### 3. Install components in reverse order



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## 2.2.17 Frame R5, Main cooling fan,

### Types:

- ACX580-01-106A-4
- ACX580-01-088A-2
- ACX580-01-089A-2
- ACX580-01-114A-2
- ACX580-01-115A-2
- ACX580-01-078A-4
- ACX580-01-096A-4
- ACX580-01-041A-6
- ACX580-01-052A-6
- ACX580-01-062A-6
- ACX580-01-077A-6

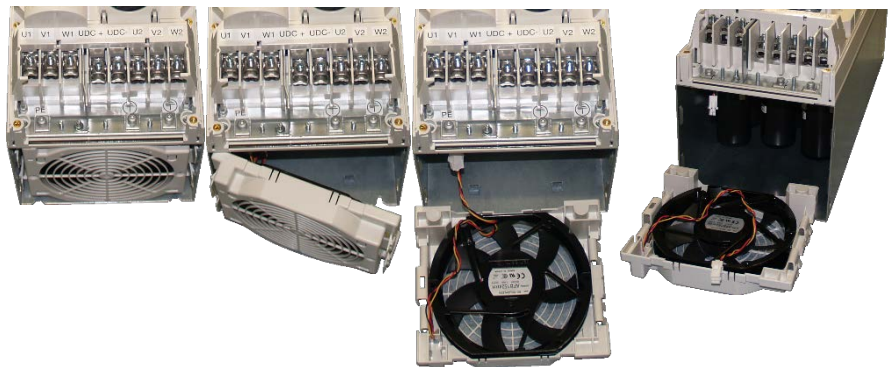



The main cooling fan is located at the bottom of the drive. Replace the fan as follows:

- a. Remove the drive cover and gland box cover. Remove gland box to reveal main fan.
- b. Pull the main fan out the drive by pressing the holding clamps. Release the fan wire from the drive and remove the fan
- c. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1
- d. Check that the fans blowing direction is outwards from the unit. Attach the fan wire to the drive and install the new fan.

Ensure the fan operation when the drive is powered up

**Note:** In these pictures the gland box has been removed in order to better visibility to the pictures. Normally this is not done.



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## 2.2.18 Frame R5, Internal cooling fan

### Types:

- ACX580-01-106A-4
- ACX580-01-088A-2
- ACX580-01-089A-2
- ACX580-01-114A-2
- ACX580-01-115A-2
- ACX580-01-078A-4
- ACX580-01-096A-4
- ACX580-01-041A-6
- ACX580-01-052A-6
- ACX580-01-062A-6
- ACX580-01-077A-6

### 1. Remove front cover


- a. Remove control panel
- b. Open mounting **screws** with a screwdriver
- c. Push the front cover slightly upwards and lift it off

### 2. Remove internal fan

- a. Remove **fan connector** and detach fan cable from **clamps**
- b. Pull fan out of fan holder and replace

### 3. Install components in reverse order



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## 2.2.19 Old Frame R5, Main cooling fan

### Types:

- ACX580-01-061A-4
- ACX580-01-072A-4
- ACX580-01-087A-4

The main cooling fan is located at the top of the drive. Replace the fan as follows:

- e. Release the locking clamp, use a flathead screwdriver to assist
- f. Lift the fan off the drive (when the drive is in upward position). Release the fan wire from the drive and remove the fan
- g. Clean the cooling air duct and the heat sink with compressed air. See separate instructions in section 2.1.1
- h. Check that the fans blowing direction is outwards from the unit. Attach the fan wire to the drive and install the new fan.

Ensure the fan operation when the drive is powered up



## 2.2.20 Old Frame R5, Internal cooling fan

### Types:

- ACX580-01-061A-4
- ACX580-01-072A-4
- ACX580-01-087A-4

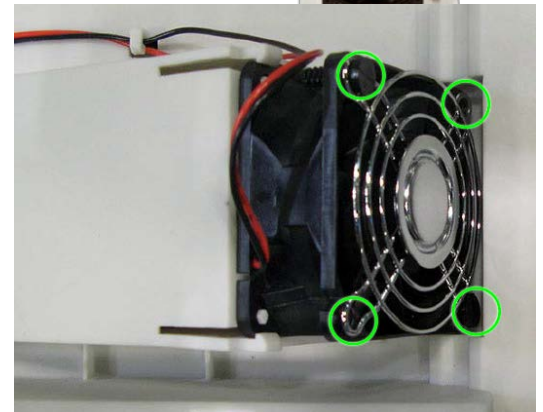
### 1. Remove front cover


- a. Remove control panel
- b. Open six mounting **screw** with a screwdriver
- c. Push the front cover slightly upwards and lift it off

### 2. Replace internal fan

- a. Remove internal fan and cable from skeleton kit clamps
- b. Assemble internal fan + grill with plastic rivets
- c. Place internal fan to skeleton kit and attach fan cable

### 3. Install components in reverse order



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## 2.3 Control unit replacement (CCU)

### 2.3.1 Safe torque off function STO

Safe operation of the **STO must be verified** after any changes and maintenance work related to the safety function (circuit boards, wiring, components, settings, etc.). The acceptance test procedure is described in section 2.3.2. **More on STO and the *Acceptance test procedure* can be found in the ACX580 User's Manual.**

The drive supports the Safe torque off function according to standards EN 61800-5- 2:2007; EN ISO 13849-1:2008, IEC 61508, IEC 61511:2004 and EN 62061:2005. The function also corresponds to prevention of unexpected start-up of EN 1037.


The Safe torque off function disables the control voltage of the power semiconductors of the drive output stage, thus preventing the inverter from generating the voltage required to rotate the motor. By using this function, short-time operations (like cleaning) and/or maintenance work on non-electrical parts of the machinery can be performed without switching off the power supply of the drive.

**WARNING!** The Safe torque off function does not disconnect the voltage of the main and auxiliary circuits from the drive. Therefore maintenance work on electrical parts of the drive or the motor can only be carried out after isolating the drive from the main supply.

**WARNING!** (With permanent magnet motors only) In case of a multiple IGBT power semiconductor failure, the drive system can produce an alignment torque which maximally rotates the motor shaft by  $180/p$  degrees regardless of the activation of the Safe torque off function.  $p$  denotes the number of pole pairs.

#### Notes:

- If a running drive is stopped by using the Safe torque off function, the drive will cut off the motor supply voltage and the motor will coast to a stop. If this causes danger or is not otherwise acceptable, stop the drive and machinery using the appropriate stop mode before activating the Safe torque off function.
- The Safe torque off function overrides all other functions of the drive unit.
- The Safe torque off function is ineffective against deliberate sabotage or misuse.
- The Safe torque off function has been designed to reduce the recognized hazardous conditions. In spite of this, it is not always possible to eliminate all potential hazards. The assembler of the machine must inform the final user about the residual risks.

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### 2.3.2 Acceptance test procedure

The acceptance test of the safety function must be carried out by an authorized person with expertise and knowledge of the safety function. The test must be documented and signed by the authorized person. An authorized person is an individual with authorization from the machine builder or end user to carry out, report and sign off the safety function validation / acceptance testing on behalf of the machine builder or end user.

Signed acceptance test reports must be stored in the logbook of the machine. The report shall include documentation of start-up activities and test results, references to failure reports and resolution of failures. Any new acceptance tests performed due to changes or maintenance shall be logged into the logbook.

<b>Action</b>	<input checked="" type="checkbox"/>
Ensure that the drive can be run and stopped freely during start-up.	<input type="checkbox"/>
Stop the drive (if running), switch the input power off and isolate the drive from the power line by a disconnecter.	<input type="checkbox"/>
Check the Safe torque off circuit connections against the wiring diagram.	<input type="checkbox"/>
Close the disconnecter and switch the power on.	<input type="checkbox"/>
Test the operation of the STO function when the motor is stopped. <ul style="list-style-type: none"> <li>• Give a stop command for the drive (if running) and wait until the motor shaft is at a standstill.</li> </ul> Ensure that the drive operates as follows: <ul style="list-style-type: none"> <li>• Open the STO circuit. The drive generates an indication if one is defined for the 'stopped' state in parameter <i>31.22 STO indication run/stop</i>. For description of the warning, see ACX580 User's Manual.</li> <li>• Give a start command to verify that the STO function blocks the drive's operation. The drive displays a warning. The motor should not start.</li> <li>• Close the STO circuit.</li> <li>• Reset any active faults. Restart the drive and check that the motor runs normally.</li> </ul>	<input type="checkbox"/>
Test the operation of the STO function when the motor is running. <ul style="list-style-type: none"> <li>• Start the drive and ensure the motor is running.</li> <li>• Open the STO circuit. The motor should stop. The drive generates an indication if one is defined for the 'running' state in parameter <i>31.22 STO indication run/stop</i>. For description of the warning, see ACX580 User's Manual.</li> <li>• Reset any active faults and try to start the drive.</li> <li>• Ensure that the motor stays at a standstill and the drive operates as described above in testing the operation when the motor is stopped.</li> <li>• Close the STO circuit.</li> <li>• Reset any active faults. Restart the drive and check that the motor runs normally.</li> </ul>	<input type="checkbox"/>
Document and sign the acceptance test report which verifies that the safety function is safe and accepted for operation.	<input type="checkbox"/>



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### 2.3.3 Removing CCON-11 / CCON-23 from its assembly mechanics

In case there is a need to remove the control board from its assembly mechanics, operate as follows:

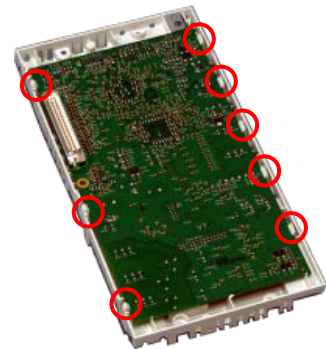
- a. Lift the EIA/RS-485 module off, assist with a flathead screwdriver. Remove jumpers
- b. Release the **locking clamps** and lift the board from its assembly plate. Pay attention to terminals and jumpers
- c. Disconnect control panel cable
- d. Replace CCON, connect control panel cable. Pay attention to the connectors and jumpers when installing CCON to its assembly mechanics



### 2.3.4 Removing CCON-12 from its assembly mechanics

In case there is a need to remove the control board from its assembly mechanics, operate as follows:

- a. Release the **locking clamps** and lift the board from its assembly plate. Pay attention to terminals and jumpers
- b. Replace CCON. Pay attention to the connectors and jumpers when installing CCON to its assembly mechanics

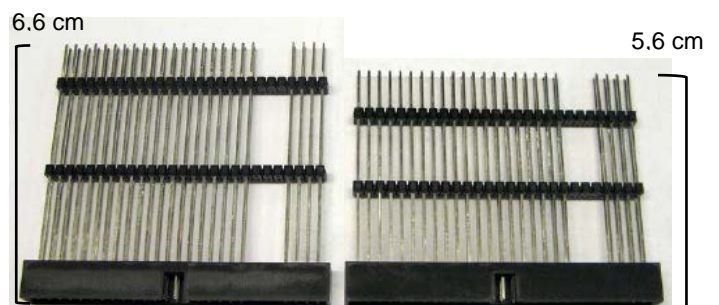


### 2.3.5 Rigid connectors for different frame sizes

A rigid connector is attached to the CCU-11 or CCU-23 unit but the length of the connector varies for different frame sizes:


Ordering code	Length	Frames
3AXD50000010956	6,6 cm / 2.36"	Old R0-R2
3AXD50000010957	5,6 cm / 1.97"	R3-R5

Table 1: Rigid connector sizes



New Models of the ACX580-01 use

Ordering code	Frames
3AXD50000150540	New R1, R2

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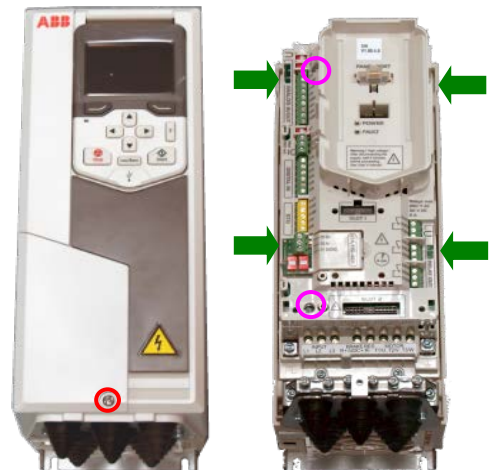
### 2.3.6 Frames R0-R1, CCU-11 or CCU-23 replacement

#### Types:

- ACX580-01-02A6-4
- ACX580-01-03A3-4
- ACX580-01-04A0-4
- ACX580-01-04A6-2
- ACX580-01-04A7-2
- ACX580-01-06A6-2
- ACX580-01-06A7-2
- ACX580-01-02A1-4
- ACX580-01-02A7-4
- ACX580-01-03A0-4
- ACX580-01-03A4-4
- ACX580-01-03A5-4
- ACX580-01-05A6-4
- ACX580-01-07A2-4
- ACX580-01-09A4-4
- ACX580-01-07A5-2
- ACX580-01-07A6-2
- ACX580-01-10A6-2
- ACX580-01-012A-2
- ACX580-01-04A1-4
- ACX580-01-04A8-4
- ACX580-01-05A7-4
- ACX580-01-06A0-4
- ACX580-01-07A3-4
- ACX580-01-12A6-4
- ACX580-01-017A-2
- ACX580-01-018A-2
- ACX580-01-07A6-4
- ACX580-01-09A9-4
- ACX580-01-012A-4
- ACX580-01-12A7-4

#### 1. Remove front cover

- a. Remove control panel
- b. Open one mounting **screw** with a crosshead screwdriver
- c. Lift the front cover from the bottom and simultaneously push it upwards



#### 2. Replace CCU-11 or CCU-23 unit

- a. Remove two fixing **screws** (M3x10)
- b. Loosen the locking **clamps** and pull the CCU unit off. Use a flathead screwdriver to assist. Pay attention to the rigid connector in the upper right corner (under the CCU unit)
- c. Attach the **rigid connector** to the new CCU. Ensure that it is properly connected before re-installing the CCU. Rigid connector sizes for different frames are listed in page 29.




#### 3. Install components in reverse order

Use tightening torque 0,5 Nm (0.37 lbf-ft) for CCU screws.

When re-installing the front cover, ensure that the cover border sits properly.

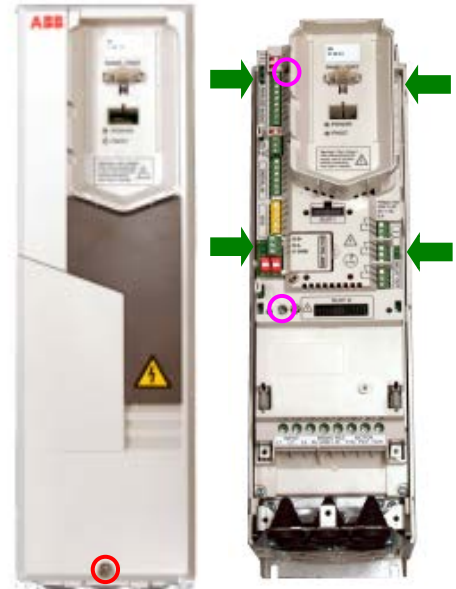


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### 2.3.7 Frame R2, CCU-11 or CCU-23 replacement

#### Types:

- ACX580-01-017A-4
- ACX580-01-025A-4
  
- ACX580-01-024A-2
- ACX580-01-025A-2
- ACX580-01-031A-2
- ACX580-01-032A-2
- ACX580-01-014A-4
- ACX580-01-018A-4
- ACX580-01-023A-4
- ACX580-01-026A-4
- ACX580-01-02A7-6
- ACX580-01-03A9-6
- ACX580-01-06A1-6
- ACX580-01-09A0-6
- ACX580-01-011A-6
- ACX580-01-017A-6



#### 4. Remove front cover

- a. Remove control panel
- b. Open one mounting **screw** with a crosshead screwdriver
- c. Push the front cover slightly upwards and lift it off


#### 5. Replace CCU-11 or CCU-23 unit

- a. Remove two fixing **screws** (M3x10)
- b. Loosen the locking **clamps** and pull the CCU unit off. Use a flathead screwdriver to assist. Pay attention to the rigid connector in the upper right corner (under the CCU unit)
- c. Attach the **rigid connector** to the new CCU. Ensure that it is properly connected before re-installing the CCU. Rigid connector sizes for different frames are listed in page 29.



#### 6. Install components in reverse order

Use tightening torque 0,5 Nm (0.37 lbf-ft) for CCU screws

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### 2.3.8 Frame R3, CCU-11 or CCU-23 replacement

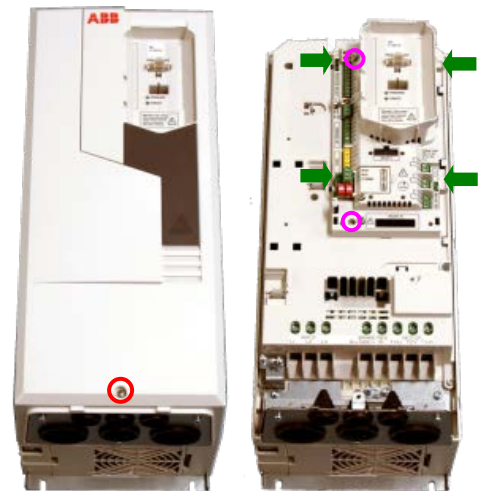
- **Types:**
- ACX580-01-032A-4
- ACX580-01-038A-4
- ACX580-01-045A-4
  
- ACX580-01-046A-2
- ACX580-01-047A-2
- ACX580-01-059A-2
- ACX580-01-060A-2
- ACX580-01-027A-4
- ACX580-01-033A-4
- ACX580-01-034A-4
- ACX580-01-039A-4
- ACX580-01-044A-4
- ACX580-01-046A-4
- ACX580-01-022A-6
- ACX580-01-027A-6
- ACX580-01-032A-6

#### 1. Remove front cover

- a. Remove control panel
- b. Open one mounting **screw** with a crosshead screwdriver
- c. Push the front cover slightly upwards and lift it off


#### 2. Replace CCU-11 or CCU-23 unit

- a. Remove two fixing **screws** (M3x10)
- b. Loosen the locking **clamps** and pull the CCU unit off. Use a flathead screwdriver to assist. Pay attention to the rigid connector in the upper right corner (under the CCU unit)
- c. Attach the **rigid connector** to the new CCU. Ensure that it is properly connected before re-installing the CCU. Rigid connector sizes for different frames are listed in page 29.



#### 3. Install components in reverse order

Use tightening torque 0,5 Nm (0.37 lbf-ft) for CCU screws

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### 2.3.9 Frame R4 IP21, CCU-11 or CCU-23 replacement

#### Types:

- ACX580-01-062A-4
- ACX580-01-073A-4
  
- ACX580-01-088A-2
- ACX580-01-089A-2
- ACX580-01-114A-2
- ACX580-01-115A-2
- ACX580-01-078A-4
- ACX580-01-096A-4
- ACX580-01-041A-6
- ACX580-01-052A-6
- ACX580-01-062A-6
- ACX580-01-077A-6



#### 1. Remove front cover

- a. Remove control panel
- b. Open one mounting **screw** with a crosshead screwdriver
- c. Push the front cover slightly upwards and lift it off


#### 2. Replace CCU-11 or CCU-23 unit

- a. Remove two fixing **screws** (M3x10)
- b. Loosen the locking **clamps** and pull the CCU unit off. Use a flathead screwdriver to assist. Pay attention to the rigid connector in the upper right corner (under the CCU unit)
- c. Attach the **rigid connector** to the new CCU. Ensure that it is properly connected before re-installing the CCU. Rigid connector sizes for different frames are listed in page 29.



#### 3. Install components in reverse order

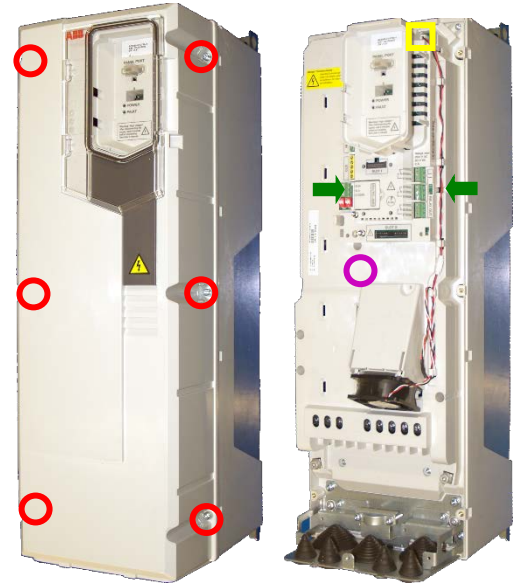
Use tightening torque 0,5 Nm (0.37 lbf-ft) for CCU screws

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### 2.3.10 Frame R4 IP55, CCU-11 or CCU-23 replacement

#### Types:

- ACX580-01-062A-4+B056
- ACX580-01-073A-4+B056
  
- ACX580-01-088A-2+B056
- ACX580-01-089A-2+B056
- ACX580-01-114A-2+B056
- ACX580-01-115A-2+B056
- ACX580-01-078A-4+B056
- ACX580-01-096A-4+B056
- ACX580-01-041A-6+B056
- ACX580-01-052A-6+B056
- ACX580-01-062A-6+B056
- ACX580-01-077A-6+B056



#### 1. Remove front cover

- a. Remove control panel
- b. Open six mounting **screws** with a screwdriver
- c. Push the front cover slightly upwards and lift it off


#### 2. Replace CCU-11 or CCU-23 unit

- a. Remove fan **connector**
- b. Remove two fixing **screws** (M3x10)
- c. Loosen the locking **clamps** and pull the CCU unit off. Use a flathead screwdriver to assist. Pay attention to the rigid connector in the upper right corner (under the CCU unit)
- d. Attach the **rigid connector** to the new CCU. Ensure that it is properly connected before re-installing the CCU. Rigid connector sizes for different frames are listed in page 29.



#### 3. Install components in reverse order

Use tightening torque 0,5 Nm (0.37 lbf-ft) for CCU screws

 ABB Oy, Drives Service		<b>On-Site Service Instructions</b>		Document nbr 3AXD10000303478
		<b>ACx580-01 R0-R5</b>		Related to material
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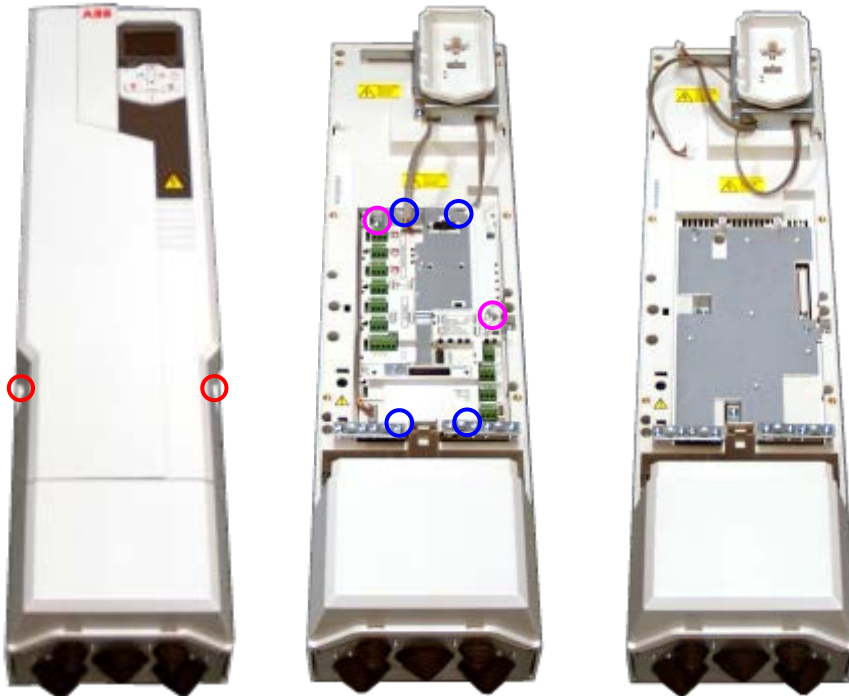
### 2.3.11 Frame R5v1, CCU-12 replacement

#### Types:

- ACX580-01-061A-4
- ACX580-01-072A-4
- ACX580-01-087A-4

#### 1. Remove front cover

- a. Remove control panel
- b. Open two mounting **screws** with a torxhead screwdriver
- c. Remove the front cover




#### 2. Replace CCU-12 unit

- a. Disconnect wires from CCU
- b. Remove fixing screws (2pcs of **M4x8** and 4pcs of **4x12 PT**)

#### 3. Install components in reverse order

Use tightening torque 1,2 Nm (0.89 lbf-ft) for CCU screws

 ABB Oy, Drives Service		<b>On-Site Service Instructions</b>		Document nbr 3AXD10000303478
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## 2.3.12 Frame R5v2, CCU-11 or CCU-23 replacement

### Types:

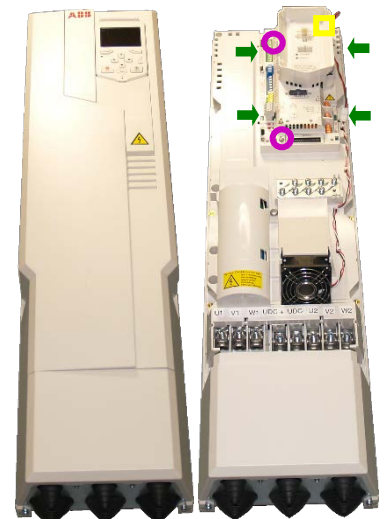
- ACX580-01-106A-4
- ACX580-01-088A-2
- ACX580-01-089A-2
- ACX580-01-114A-2
- ACX580-01-115A-2
- ACX580-01-078A-4
- ACX580-01-096A-4
- ACX580-01-041A-6
- ACX580-01-052A-6
- ACX580-01-062A-6
- ACX580-01-077A-6

### 1. Remove front cover

- a. Remove control panel
- b. Open one mounting **screw** with a crosshead screwdriver
- c. Push the front cover slightly upwards and lift it off

### 2. Replace CCU-11 or CCU-23 unit


- a. Remove two fixing **screws** (M3x10)
- b. Loosen the locking **clamps** and pull the CCU unit off. Use a flathead screwdriver to assist. Pay attention to the rigid connector in the upper right corner (under the CCU unit)
- c. Attach the **rigid connector** to the new CCU. Ensure that it is properly connected before re-installing the CCU. Rigid connector sizes for different frames are listed in page 29.



### 3. Install components in reverse order

Use tightening torque 0,5 Nm (0.37 lbf-ft) for CCU screws



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### 3. Fault tracing


A possible fault in an output or an input bridge can be traced without opening the module. In this section there are given pass criteria for following measurements conducted with a multimeter for frame sizes R0-R5:

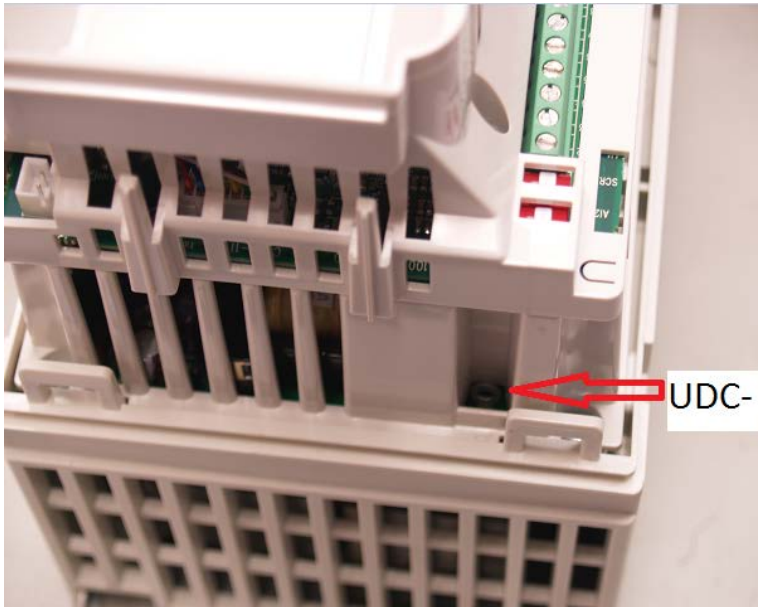
- Input bridge diode measurement from input connectors
- IGBT freewheeling diode measurement from output connectors

If a broken semiconductor module is detected, the whole drive must be replaced.

**Note: Always make sure that there is no voltage connected to input terminals. In case a permanent magnet motor is used, the motor axel must not rotate as it would feed voltage to drive side.**

<b>STEP 1</b>	<b>Input bridge diode measurement</b>				
Performance	Use a multimeter to make sure that the measurements for the input bridge diodes are OK.				
Pass criteria	By using the diode measurement setting for the multimeter, you should get following values:  <b>Note: In case of a controlled charging circuit, the input bridge measurement is not possible for all phases.</b>				
	+ probe	- probe	R1-R3 display	R4 display	R5 display
	L1	+DC	~0,5 Vdc	~0,45 Vdc	~1,1 Vdc
	L2	+DC	~0,5 Vdc	~0,45 Vdc	OL
	L3	+DC	~0,5 Vdc	~0,45 Vdc	OL
	+DC	L1	OL	OL	OL
	+DC	L2	OL	OL	OL
	+DC	L3	OL	OL	OL
	+ probe	- probe	R1-R3 display	R4-R5 display	
	L1	-DC	OL	OL	
	L2	-DC	OL	OL	
	L3	-DC	OL	OL	
	-DC	L1	~0,5 Vdc	~0,45 Vdc	
	-DC	L2	~0,5 Vdc	~0,45 Vdc	
	-DC	L3	~0,5 Vdc	~0,45 Vdc	
Meaning of the test	To ensure that the input bridge diodes are OK.				

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Picture UDC- test point

<b>STEP 2</b>	<b>Freewheeling diode measurement</b>																																										
Performance	Use a multimeter to make sure that the measurements for the output freewheeling diodes are OK.																																										
Pass criteria	<p>By using the diode measurement setting for the multimeter, you should get following values:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0e0e0;">+ probe</th> <th style="background-color: #e0e0e0;">- probe</th> <th style="background-color: #e0e0e0;">R1-R5 display</th> </tr> </thead> <tbody> <tr> <td>U</td> <td>+DC</td> <td>~0,4 Vdc</td> </tr> <tr> <td>V</td> <td>+DC</td> <td>~0,4 Vdc</td> </tr> <tr> <td>W</td> <td>+DC</td> <td>~0,4 Vdc</td> </tr> <tr> <td>+DC</td> <td>U</td> <td>OL</td> </tr> <tr> <td>+DC</td> <td>V</td> <td>OL</td> </tr> <tr> <td>+DC</td> <td>W</td> <td>OL</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0e0e0;">+ probe</th> <th style="background-color: #e0e0e0;">- probe</th> <th style="background-color: #e0e0e0;">R1-R5 display</th> </tr> </thead> <tbody> <tr> <td>U</td> <td>-DC</td> <td>OL</td> </tr> <tr> <td>V</td> <td>-DC</td> <td>OL</td> </tr> <tr> <td>W</td> <td>-DC</td> <td>OL</td> </tr> <tr> <td>-DC</td> <td>U</td> <td>~0,4 Vdc</td> </tr> <tr> <td>-DC</td> <td>V</td> <td>~0,4 Vdc</td> </tr> <tr> <td>-DC</td> <td>W</td> <td>~0,4 Vdc</td> </tr> </tbody> </table>	+ probe	- probe	R1-R5 display	U	+DC	~0,4 Vdc	V	+DC	~0,4 Vdc	W	+DC	~0,4 Vdc	+DC	U	OL	+DC	V	OL	+DC	W	OL	+ probe	- probe	R1-R5 display	U	-DC	OL	V	-DC	OL	W	-DC	OL	-DC	U	~0,4 Vdc	-DC	V	~0,4 Vdc	-DC	W	~0,4 Vdc
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-DC	W	~0,4 Vdc																																									
Meaning of this test	To ensure that the output freewheeling diodes are OK.																																										

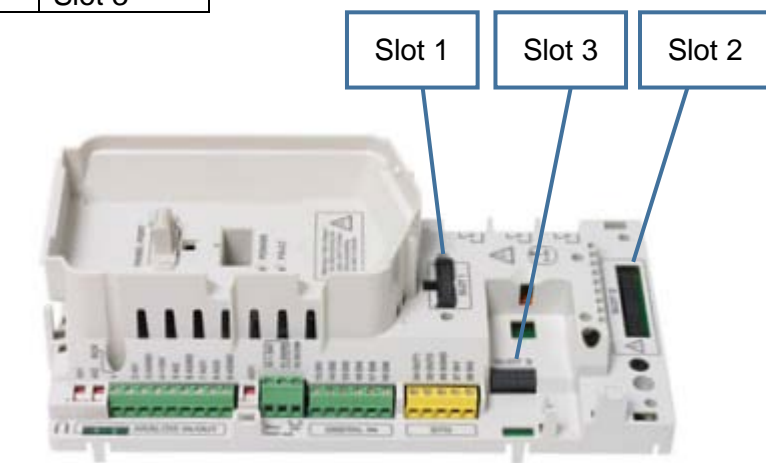
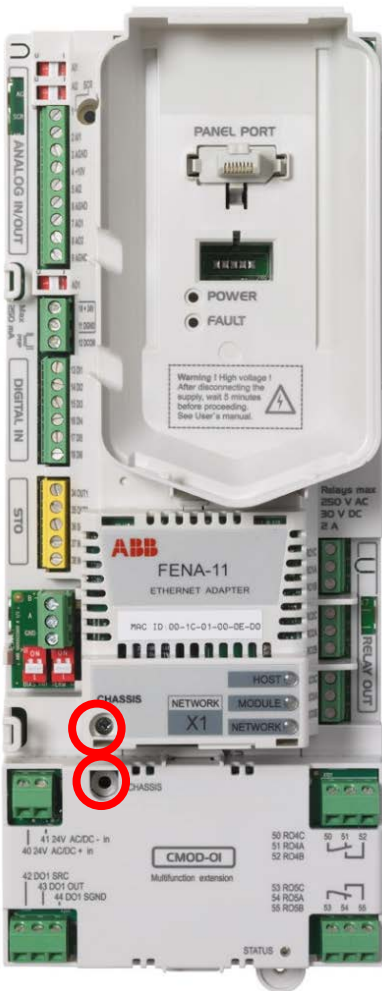


## 4. Replacement of interface options

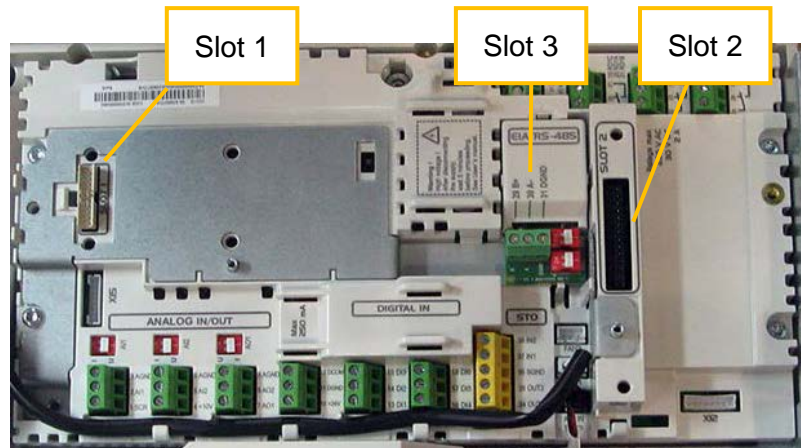
Optional modules such as fieldbus adapters and I/O extensions are inserted in the optional module slot on the control unit.

ACX580 CCU control unit contains three option slots. In the table below there is described which interface options can be used in which slot

Option modules	Install to
Fieldbus adapters (FENA, FPBA)	Slot 1
I/O extensions (CMOD)	Slot 2
Embedded fieldbus (CEIA)	Slot 3



CCU-11 option slots



CCU-12 option slots

**Install the optional modules as follows:**

1. Insert the module carefully into its position on the control board.
2. Fasten the **fastening screws**. **Note:** Proper tightening of the screws is essential for fulfilling the EMC requirements and for proper operation of the module.