

Flexi | X

Installation Manual Infineon ModSTACK™

Supported Concycle® systems:

CW150xRP8.x / CW200xRP8.x

Supported power stack types:

ConverterTec Service stack™ / Infineon ModSTACK™

Version “C”

February 2024

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1. Safety rules

For working at the Concycle system, the 5 safety rules must be followed:

5 Safety Rules

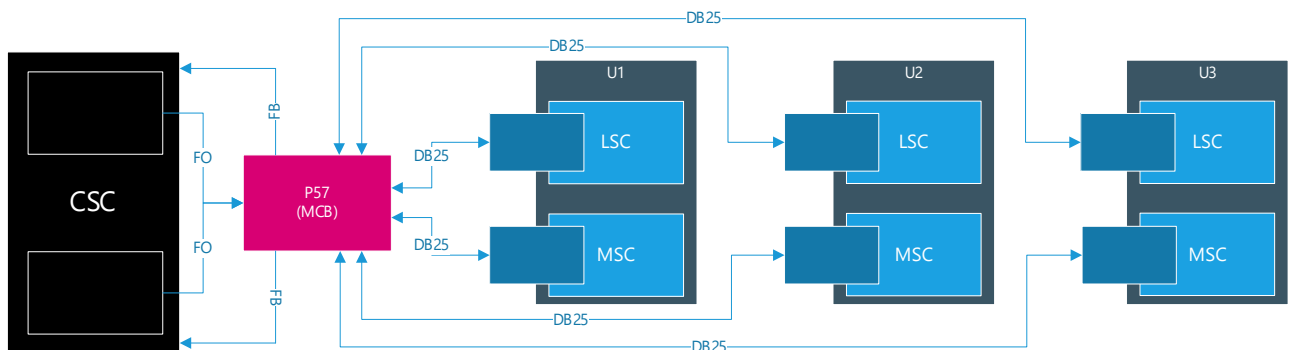
Before starting any work:

- Disconnect completely
- Secure against re-connection
- Verify absence of voltage
- Earthing and short-circuiting
- Protect adjacent live parts

2. Related hardware

Description	Item Number
FlexiX, P57 to ModSTACK mounting kit	I-03025
FlexiX, SDB-SS kit (Service stack distribution board kit)	I-03053
FlexiX, P57 kit (ModSTACK based systems)	I-02816
FlexiX, IB-30x kit (ModSTACK interface kit)	I-02817

3. Functional block diagram



4. Required Tools

- Torque wrench (3,2Nm - 44Nm).
- Ratchet set (socket 7, 8, 13, 17, 19mm; 3, 6, 8mm hex bit).
- Spanner (size 7, 8, 13, 17 and 19mm).
- Screwdriver (Slotted + Philips).
- Screwdriver (Slotted + Philips) 75mm overall length.
- Cutters.
- ESD Protection.
- Personal Protective Equipment (PPE, PSA).

5. Preparation/Disassembly

5.1. Download CSC data

- Last triggers and Event file(s).
- Parameter file.
- Counter and operating hours.

5.2. Stop the turbine and shut down the converter

- Stop the system via wind turbine control (WTC).
- Switch off the 24VDC (-F8+ -F15).
- Switch off 400V/230V auxiliary voltage.
- Ensure the 5 safety rules are fulfilled!
- Wait until DC-link is discharged to a safe level.

5.3. Disconnect external electrical connections of power stack

Mark all external power stack connections before disconnection!

- AC power cables from power stack (LSC & MSC) and fix them to the mounting c-rail above to ensure an easy removal.
- dU/dt filter resistor and DC-link connections.
- If applicable, disconnect the fiber optic cables from the master power stack and fix them to the mounting rail.
- DB25 cables.
- 24V power supply connector.
- Temperature supervision connector.

5.4. Heaters removal

- Remove the heaters, which block the power stack removal.
- Fix them temporarily to the chassis so they do not block the removal and installation process.

**Do not remove any electrical connections.*



5.5. Power stack removal

- Remove all fixation screws of the power stack (3x left and 3x right side).

**The power stack is no longer fixed and can be removed.*

Weight ~ 100kg.



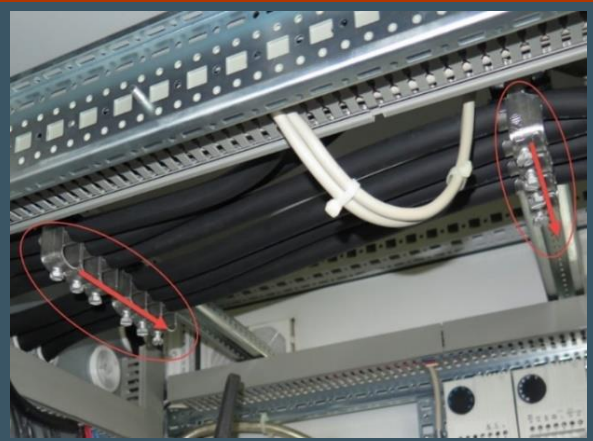
5.6. Cabinet preparation

- Once the power stack is removed, fix the DB25 cables to the chassis. They will be reused later.



Optional

- Since the location of the AC terminals is slightly different, the power cables need to be re-routed if necessary.
- Untighten the cable fixation (at c-rail), push them to the backside of the inverter cabinet, and tighten them again.
- The new routing will absorb the "extra cable length" we got due to the new AC terminals position.



- Release the cables for the current measurement to the CSC from the clamp in the left side of the DC-limiter and leave it loose until the new power stack is installed. Do the same for the other cable on the right side. Reuse the existing DB25 cables for the current measurement to the CSC.

**Unless this is done, the cable length will not be sufficient for the new connection.*



6. Installation of P57(MCB)

6.1. P57 power supply cable

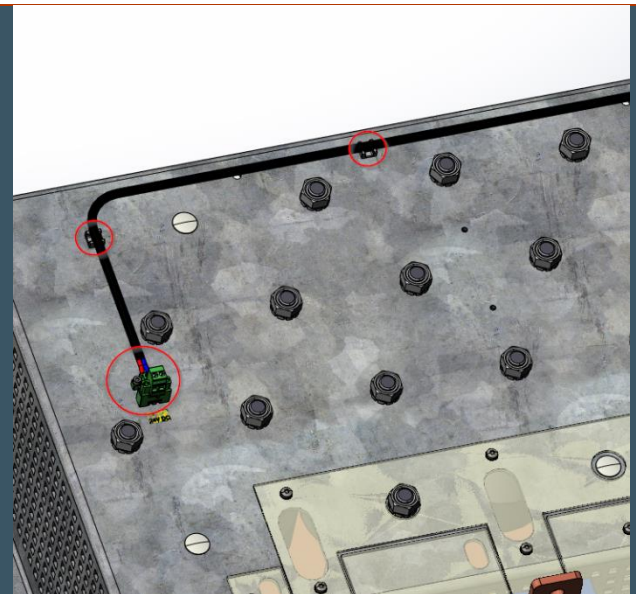
There are two possible cases. Proceed with one of them accordingly.

6.1.1. Case 1 – ModSTACK™ MASTER replacement

Material available in:

- FlexiX, P57 kit (ModSTACK based systems)

- Mount the 2x cable tie holders.
- Mount the 24VDC connector using the M3 fasteners.
- Install the cable and connect it according to the polarity.
- Fix the cable with cable ties to the brackets.
- Apply the 24VDC label



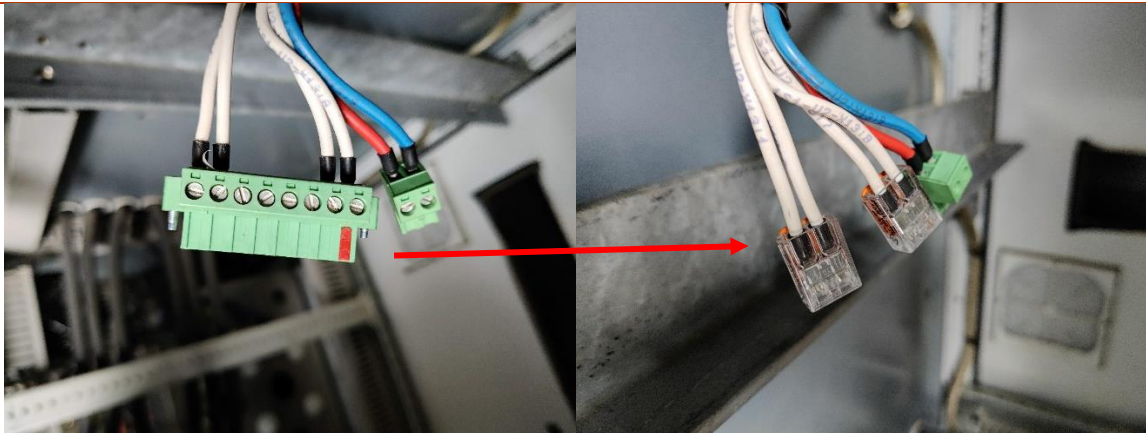
6.1.2. Case 2 – ModSTACK™ SLAVE replacement

- P57 power supply cable will be installed later.

6.2. Temperature supervision.

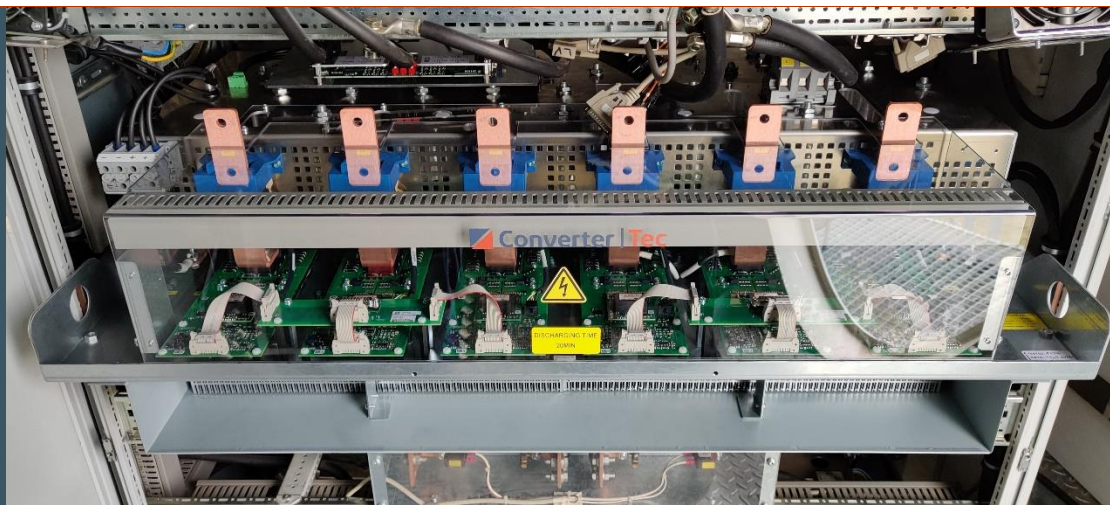
Material available in:

- FlexiX, SDB-SS kit (Service stack distribution board kit)

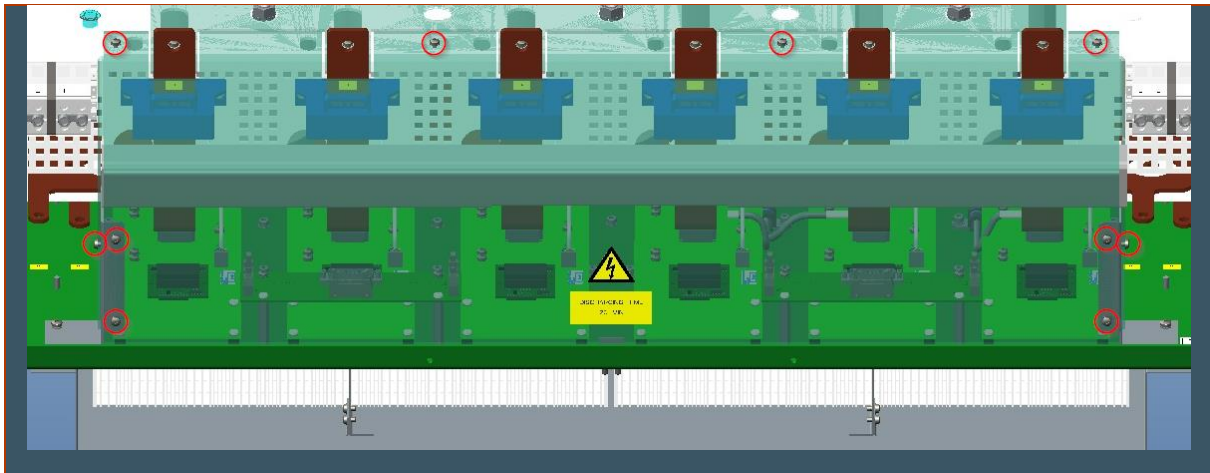


- Use the two-position splicing connectors inside the kit to bridge:
 - X13.1&2
 - X13.7&8

6.3. Service stack™ installation



- Slide Service stack™ into the cabinet.
Weight ~ 100kg.
- Fix it to the mounting rail using the original fixation screws (3x left and 3x right side).



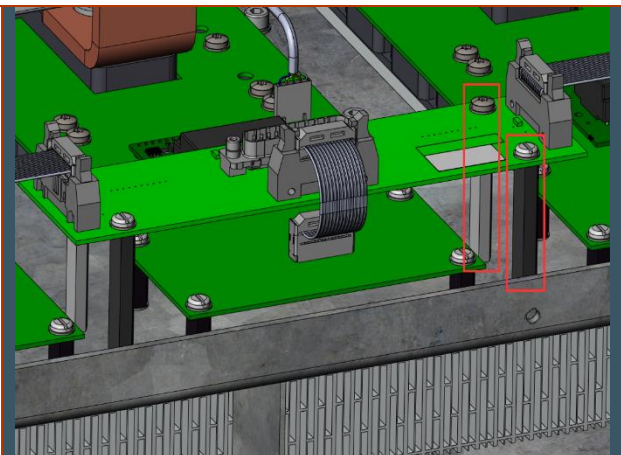
- Remove the 10x screws.
- Remove the plastic cover.

Material available in:

- FlexiX, SDB-SS kit (Service stack distribution board kit)



- Mount 2x metal and 2x plastic standoffs.
- Mount distribution board with 4 screws (2x plastic on plastic standoff, 2x metal on metal standoff)
- Connect 3x IDC cables.



- Perform the same procedure on the other side of the power stack (LSC/MSK).

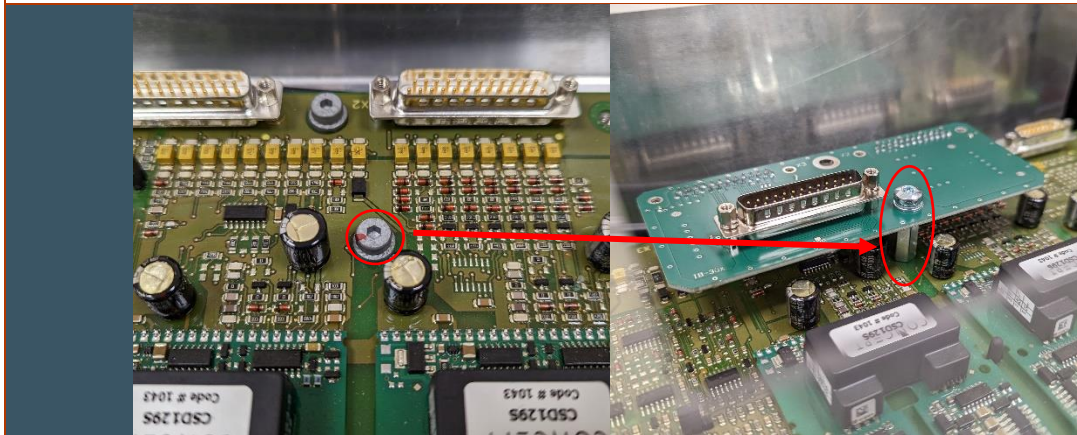
6.4. Install the Flexi|X, IB-30x kit (ModSTACK interface kit)

*Install this kit on all ModSTACK™ power stacks.

6.4.1. Flexi|X, IB-30x kit on SLAVE power stack

Material available in:

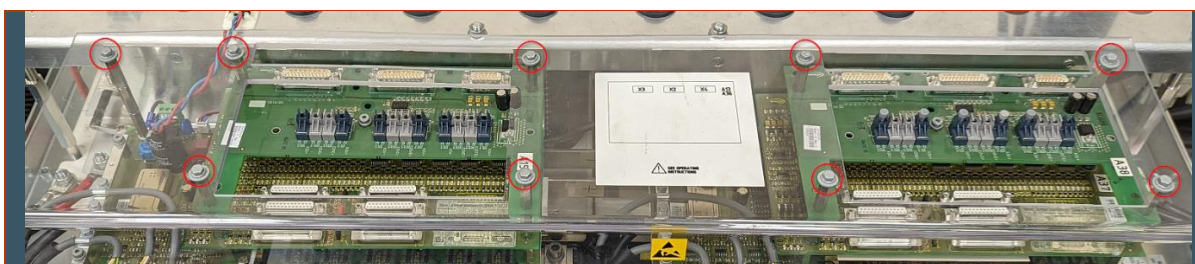
- FlexiX, IB-30x kit (ModSTACK interface kit)



- Remove the ModSTACK PCB fixation screw and washers.
- Install the IB30x boards on LSC and MSC driver board of the ModSTACK power stack using the standoff and fasteners from the kit.

6.4.2. Flexi|X, IB-30x kit on MASTER power stack

- Disconnect the AC power cables.



- Remove the 9x screws.
- Remove the plastic cover.



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

- Remove the 4x standoffs.
- Remove the 1x screw.

**The standoffs will be reused.*



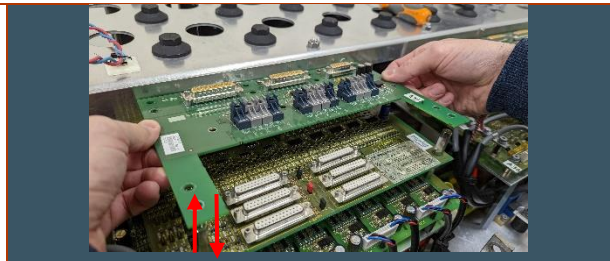
ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

- Fully untighten the 6x screws, but keep them in place.
- Push down with the screwdriver on each screw. This will keep the parts together.



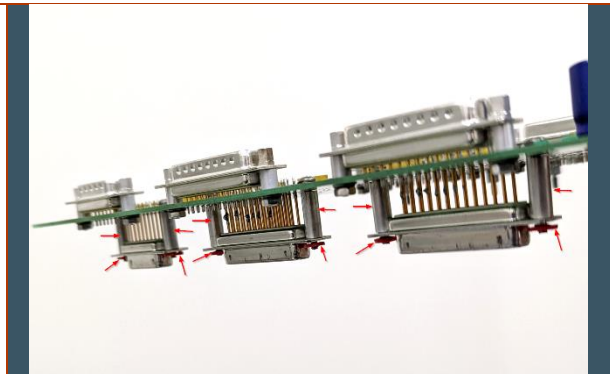
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ELECTROSTATIC
SENSITIVE DEVICES

- Remove the PCB by gently swinging the front side up and down.



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ELECTROSTATIC
SENSITIVE DEVICES

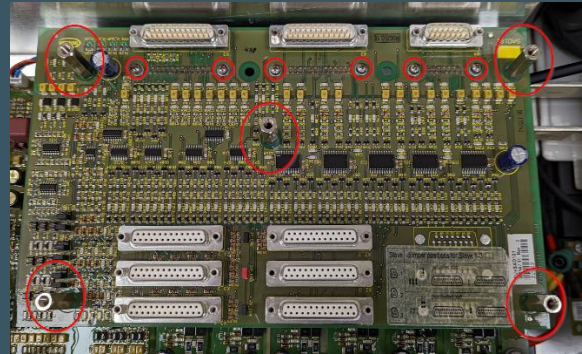
- Make sure that all fasteners on the bottom side of the board are in place.





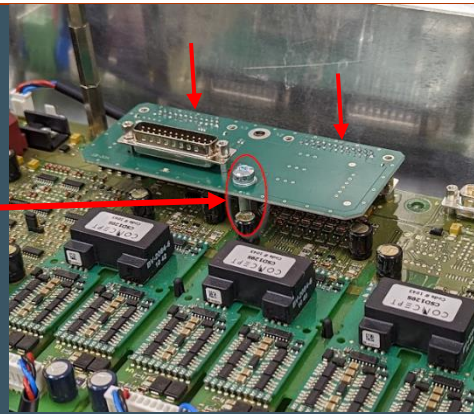
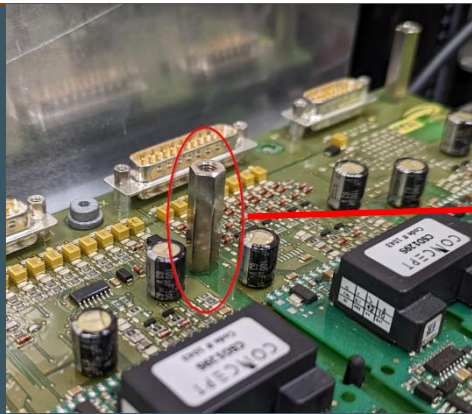
ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

- Remove the 5x standoffs.
- Fully untighten the 6x screws but keep them in place.
- Push down with the screwdriver on each screw. This will keep the parts together.
- Remove the PCB by gently swinging the front side up and down.
- Make sure that all fasteners on the bottom side of the board are in place (as on the previous PCB).



Material available in:

- FlexiX, IB-30x kit (ModSTACK™ interface kit)

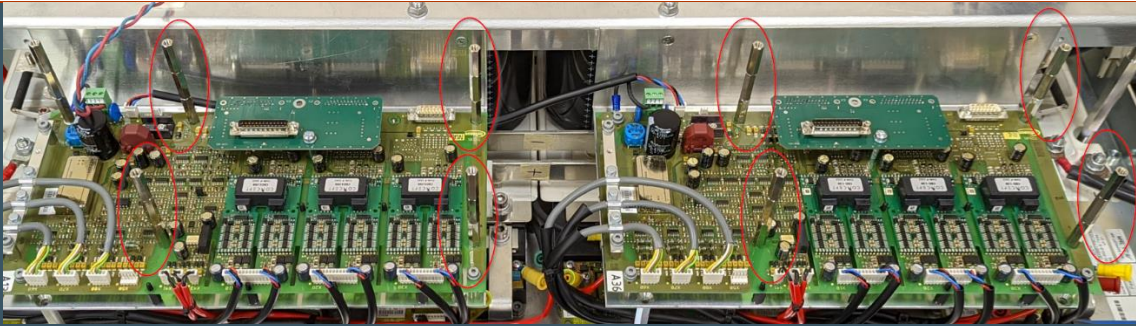


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FOR HANDLING
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SENSITIVE DEVICES

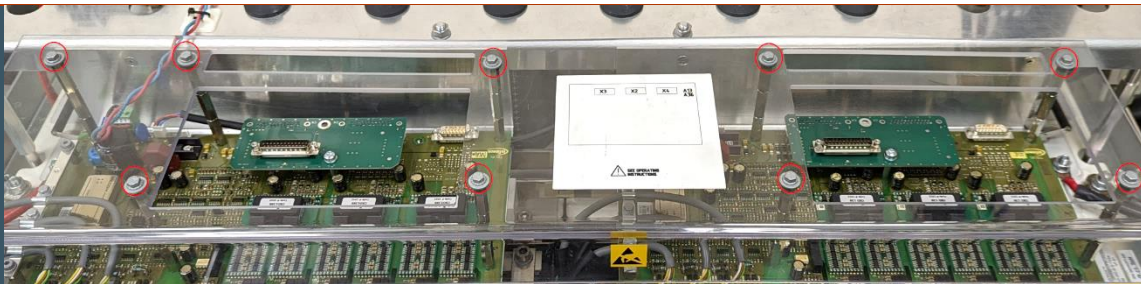
- Remove the original standoff.
- Install the PCB board using the standoff and fasteners inside the kit.

**When installing the PCB push it first towards the 2x connectors in the backside.*

- Perform the same procedure on the other side of the power stack (LSC/MS).



- Add two additional standoffs at each of the marked positions by reusing the original ones, disassembled in previous steps. All positions must be at equal height with three stacked standoffs.



- Mount the plastic cover with 9x screws.

- Connect the AC power cables.

6.5. DB25 cables connection to power stacks

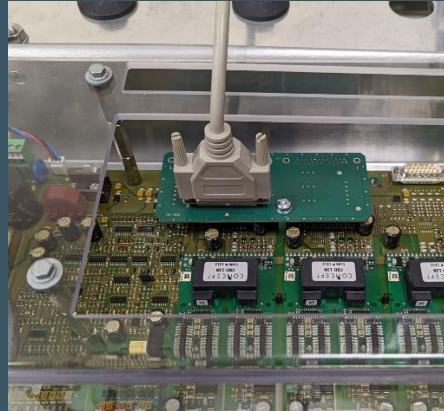
6.5.1. ModSTACK™



- Connect one DB25 cable to each side of the power stacks (LSC & MSC).
- Attach the other one to the chassis with cable tie.

**SLAVE stack: Reuse one of the two DB25 cables.*

***MASTER stack: Use the new DB25 cables.*



6.5.2. Service stack™

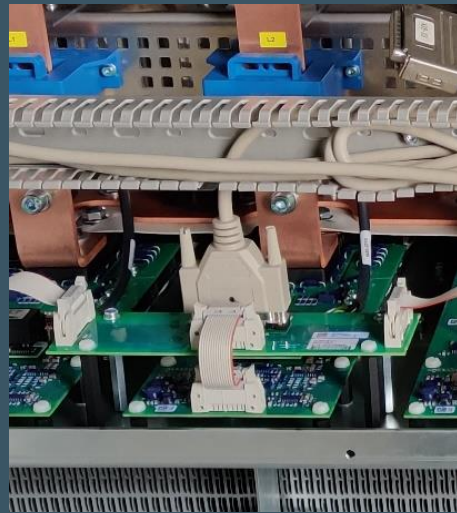


- Connect one DB25 cable to each side of the power stack (LSC & MSC).
- Attach the other one to the chassis with cable tie.

**SLAVE stack: Reuse one of the two DB25 cables.*

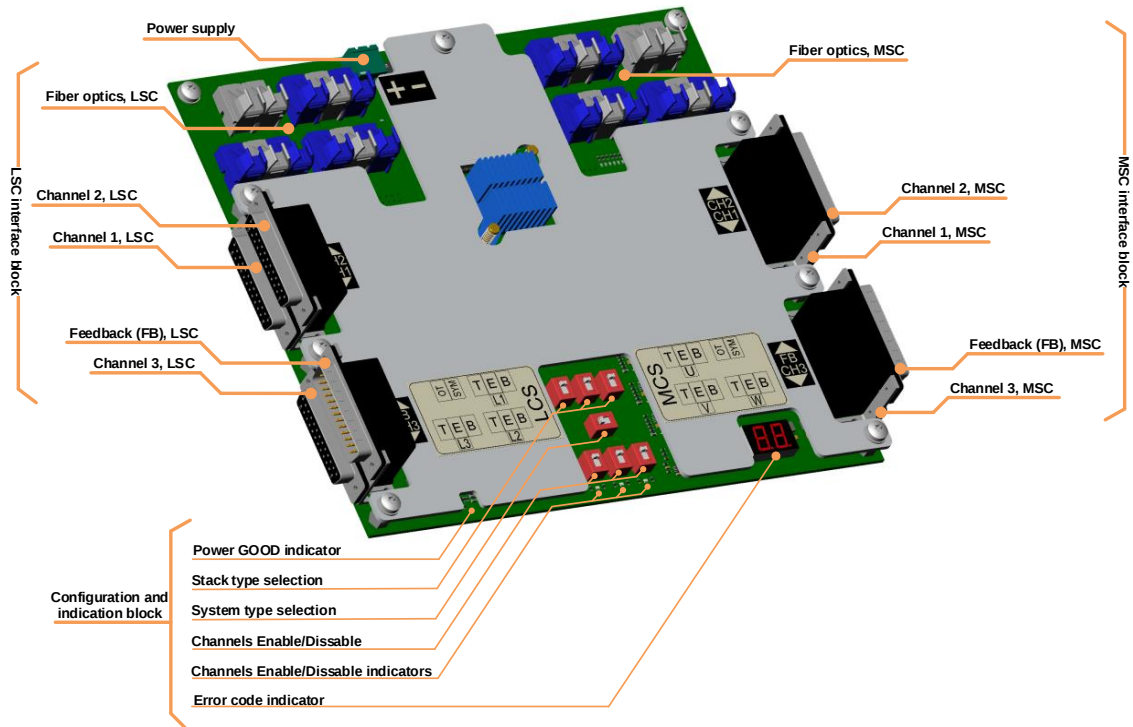
***MASTER stack: Use the new DB25 cables.*

- Mount the front cover to the stack.

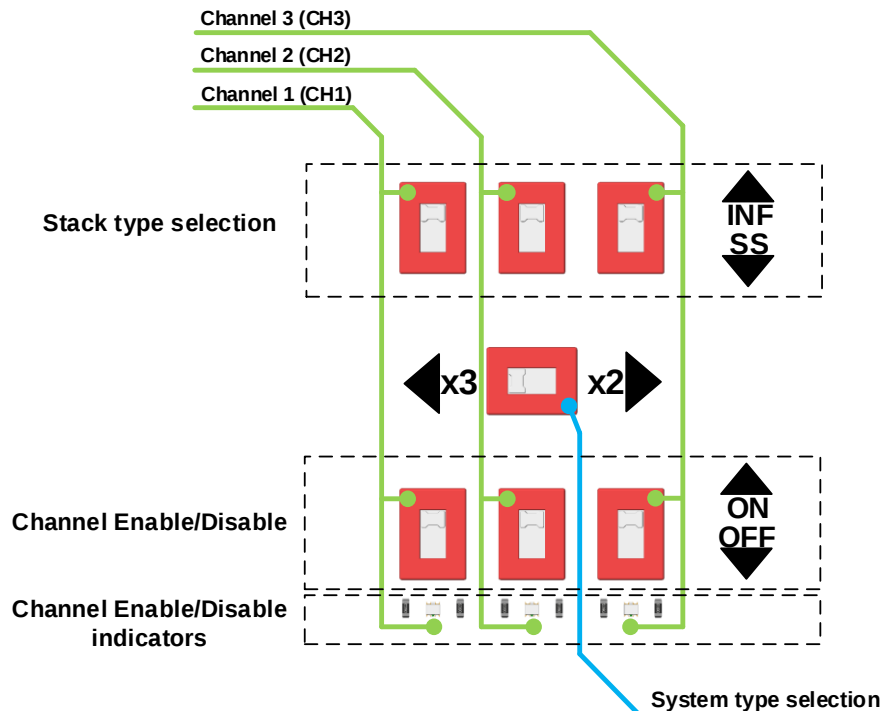


6.6. P57 configuration

6.6.1. Manual stack type selection



(!) Changes in configuration must be made when the board is not powered.



6.6.1.1 Stack type selection

Each channel has two options, controlled by 2-position switch. Depending of the type of the power stack being connected to the channel, the switch must be moved to the proper position:

- ▲ **INF** – Infineon ModSTACK™.
- ▼ **SS** – Service stack™.

6.6.1.2 Channel Enable/Disable

Each channel can be switched ON or OFF, depending from the number of channels used in the system. To each ON/OFF switch there is a corresponding LED indicator, which will show the current state of the channel.

- ▲ **ON** – Channel is ON and the LED indicator will light in green .
- ▼ **OFF** – Channel is OFF and the LED indicator will light in red .

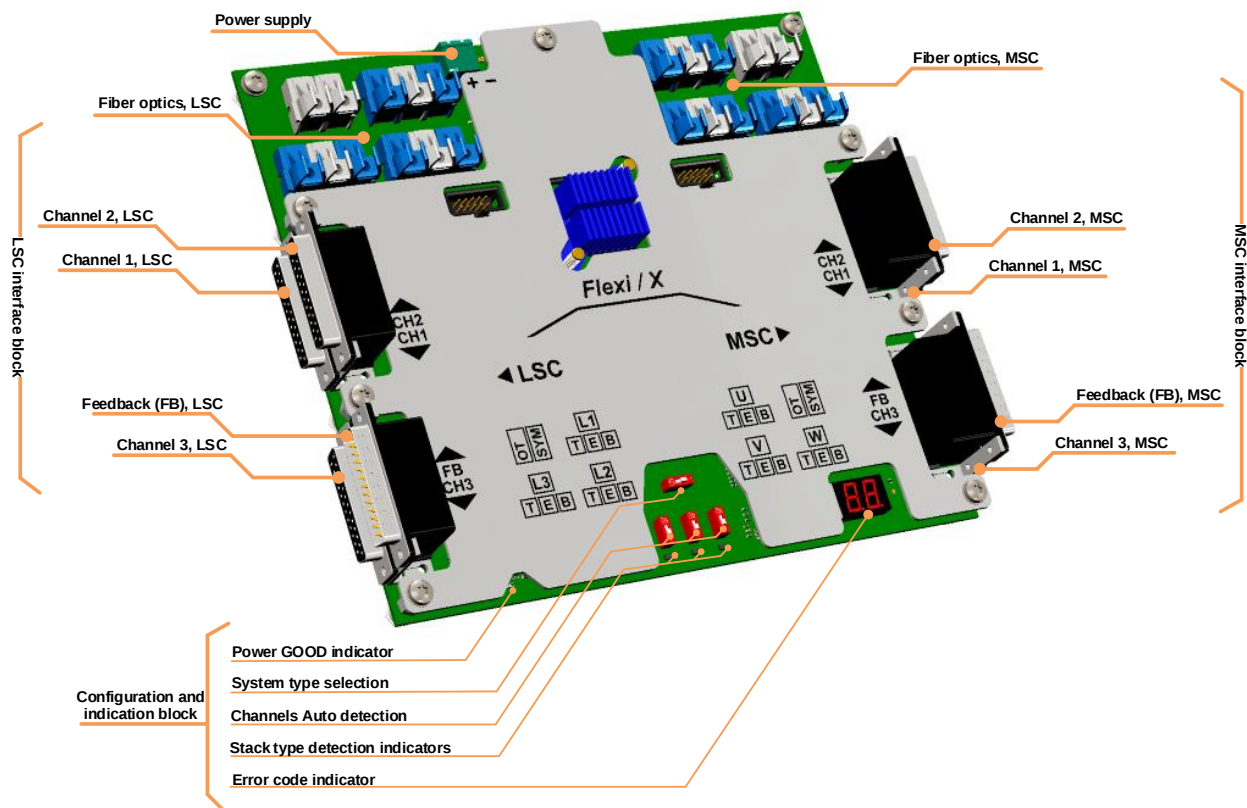
(!) All unused channels must be switched off.

6.6.1.3 System type selection

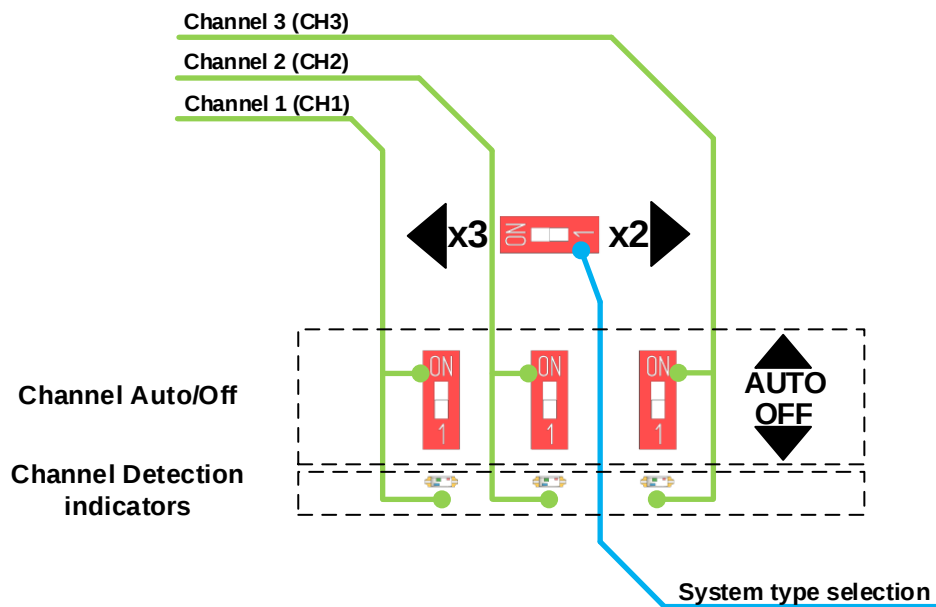
The type of the system must be configured correctly to ensure proper operation. The system type selection switch must be moved to the corresponding position:

- ◀ **x3** – For systems of CW200xRP8.x family.
- **x2** ▶ – For systems of CW150xRP8.x family.

6.6.2. Automatic stack type detection



(!) Changes in configuration must be made when the board is not powered.



6.6.2.1 Automatic Channel detection

Each channel can detect automatically the connected stack type. The 2-position switch can be switched to AUTO or OFF. To each switch there is a corresponding LED indicator, which will show one of the following options shown below.

- **▲AUTO** – Channel is set to automatic detection and the LED indicator will light in the following according to the connected stack type:
 -  Service stack™ as green.
 -  ModSTACK™ as yellow.
 -  Channel left unconnected as red.
- **▼OFF** – Channel is OFF and the LED indicator will light in red . This position is used for derating purposes. It will power on the power stack when connected, but with disabled driving signals.

In standard operation all channels should be left in AUTO. If a channel is not used, it will automatically detect the unused channel when there is no power stack connected to it.

(!) All used channels must be switched to AUTO.

6.6.2.2 System type selection

The type of the system must be configured correctly to ensure proper operation. The system type selection switch must be moved to the corresponding position:

- **◀x3** – For systems of CW200xRP8.x family.
- **x2▶** – For systems of CW150xRP8.x family.

6.7. P57 mounting

There are two possible cases. Proceed with one of them accordingly.

P57 should be mounted on top of the power stack which occupies the MASTER stack position in the cabinet.

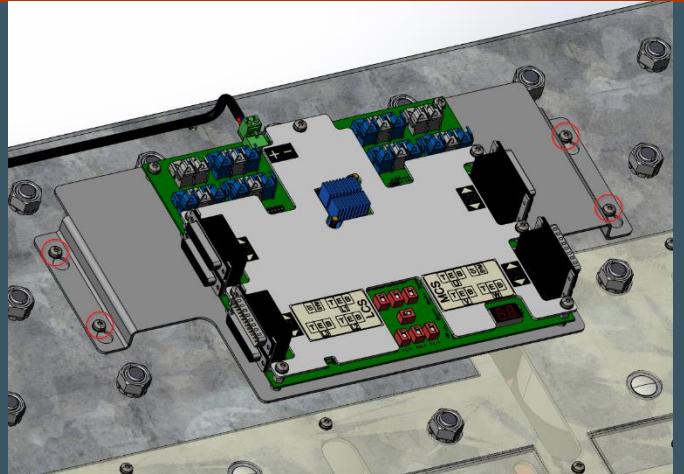
6.7.1. Case 1 – ModSTACK™ MASTER replacement

Material available in:

- FlexiX, P57 kit (ModSTACK based systems)



- Mount P57 on top of the Service stack™ using the 4x M4x10 screws.



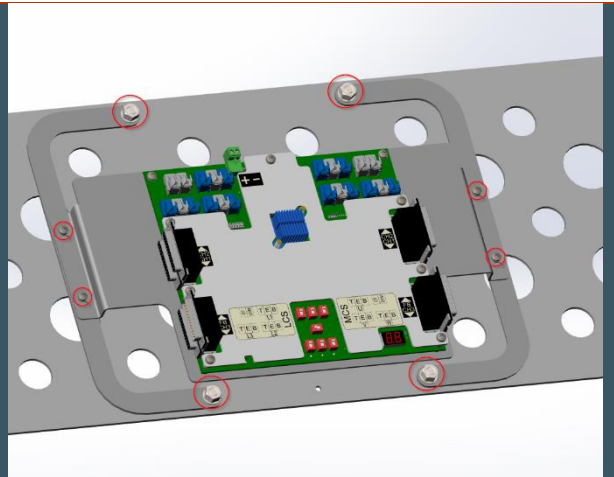
6.7.2. Case 2 – ModSTACK™ SLAVE replacement

Material available in:

- FlexiX, P57 kit (ModSTACK based systems)
- FlexiX, P57 to ModSTACK mounting kit

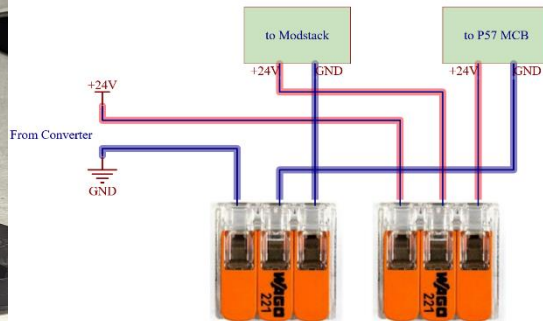
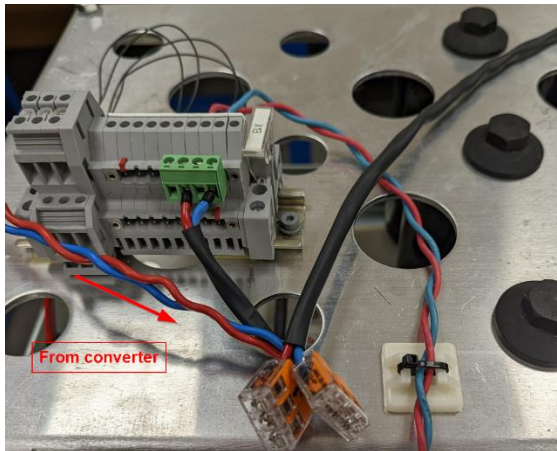


- Unscrew the 4x M8 nuts from the stack.
- Mount the 2x adaptors to the MASTER power stack.
- Mount the 4x M8 nuts, but do not tighten them yet.
- Mount P57 board to the adaptors using the 4x M4x10 screws.
- Tighten the 4x M8 nuts.



Material available in:

- FlexiX, P57 kit (ModSTACK based systems)
- FlexiX, P57 to ModSTACK mounting kit

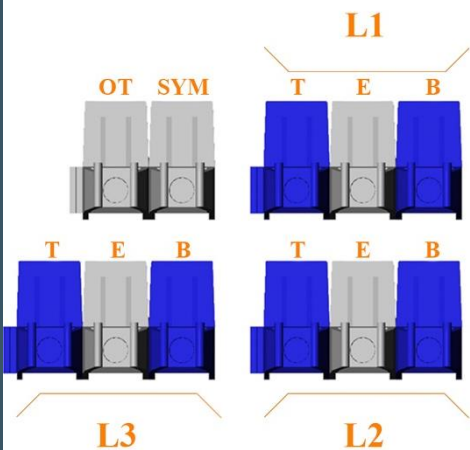


- Disconnect the 24VDC cables coming from the converter to the Modstack X13 terminal(Observe the position of the cables).
- Use the three-position splicing connectors inside the kit to bridge the 24VDC power supply coming from the converter to:
 - Modstack with the 120mm cable.
 - P57 MCB with the 590mm cable.

6.8. P57 connection

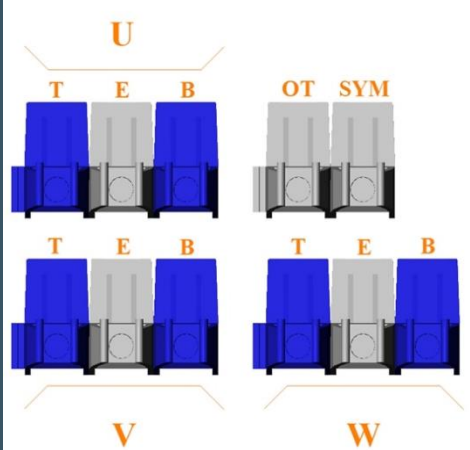


- Connect all LSC fibre optics.



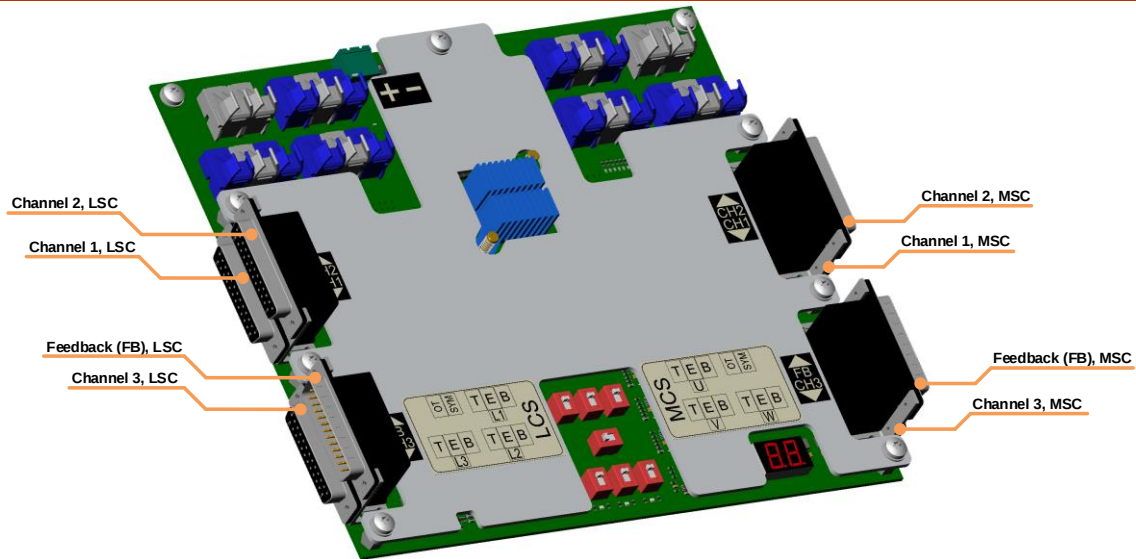


- Connect all MSC fibre optics.



Material available in:

- FlexiX, P57 kit (ModSTACK based systems)



- Connect DB25 (channel) cables:
CH1 (top power stack).
CH2 (middle power stack).
CH3 (bottom power stack).
- Connect DB25 current measurement cables (Feedback).
- Connect 24VDC power supply.

** LSC & MSC cable from one power stack must be connected at the same channel.*

- Keep away all DB25 cables from the chopper resistor.
- Route all DB25 cables into the cable duct as much as possible.
- Fix the unused DB25 cables to the chassis with cable ties.

6.9. Connection of power stacks

Connect the new power stack according to the markings and circuit diagram.

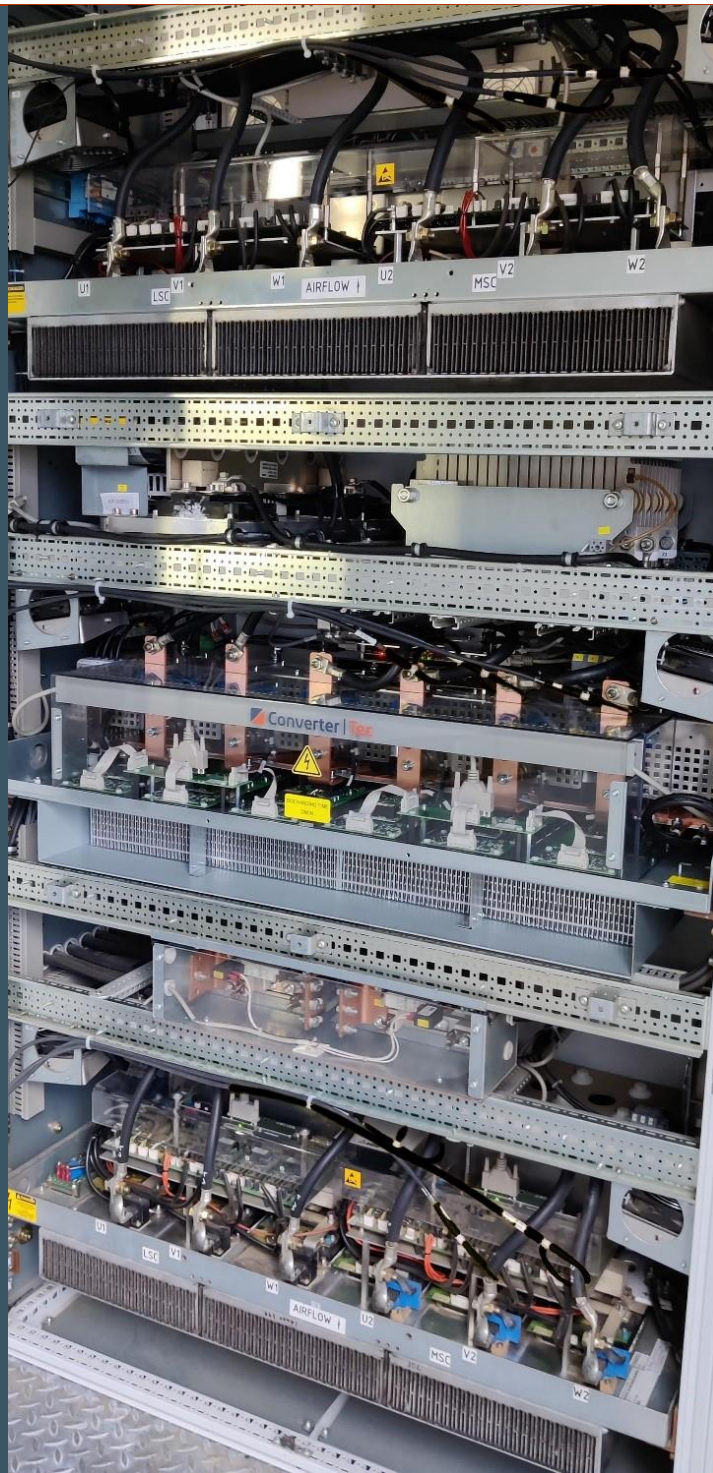
- Connect AC power cables (LSC & MSC).
Tightening torque: **45Nm**.
- Connect dU/dt terminal.
Tightening torque: **3,2 - 3,7Nm**.
- Connect DC-link cables.
Tightening torque: **22Nm**.

Optional: DC-link terminals.

- DC-link terminals are included within the upgrade kit and can be mounted if necessary.
- Connect DC-link cables, left and right side of power stack.
Tightening torque terminal: **3,7Nm**
Tightening torque busbar: **22Nm**



7. Visual inspection



- Check if all steps for the installation are finished and all cables are connected.
- Clean the converter and remove any used tools. Mount all covers, note the serial numbers and close the cabinet before starting the converter.

8. Recommissioning

Ensure that all signals are connected correctly, and all plugs and wires are connected properly. Mount all covers and switch back on the power supply.

Follow your local safety regulation!

The System can be started within automatic mode or (optional) via commissioning mode.

ConverterTec recommends checking the trigger file to prove the proper function of the complete system after successful commissioning!

9. Installation feedback

Feedback Data	
Name of Technician:	
Date of Upgrade:	
Location of Turbine:	
Converter Serial No.:	
Installed IGBT U1 Serial No.:	
Installed IGBT U2 Serial No.:	
Installed IGBT U3 Serial No.:	

Check list	Yes	No
All rework steps done?		
Documentation updated?		
Converter cleaned up and tools removed?		
Concycle system re-commissioned and back in operation?		

Date: _____

Signature: _____

Remarks

Please send this information back to:

kemp.service@convertertec.com

10. Document revision history

Date	Version	Changes
February 2022	01	Initial release.
August 2022	-	Production release.
August 2022	A	Changes in section 6.3.
October 2022	B	Changes in section 6.7.2.
February 2024	C	Changes in section 5.9, 6.3, 6.4.1, 6.6, 6.9.



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