

Installation of ACN/ACW644 +V991 Spare part Phase module kit and operation instructions AND dc-capacitor reforming guide

Installation of ACN/ACW644 +V991 Spare part Phase module kit and operation instructions AND dc-capacitor reforming guide 1

1. Rules for parallel connected ACN/ACW644 +V991 Spare part Phase modules 1
2. Before installing operation 3
3. Repairing of V-phase module with spare part +V991 phase module kit 4
4. Repairing of U- or W-phase modules with spare part +V991 phase module kit 5
5. Connecting +V991 phase modules in cabinet 9
6. Converter intermediate circuit capacitor reforming (re-ageing) after storage 12

1. Rules for parallel connected ACN/ACW644 +V991 Spare part Phase modules

ATTENTION!! Parallel connection of the new +V991 type of phase module (or upgraded phase module) and old type of phase module is not allowed. It is extremely forbidden to run the drive with the +V991 phase module(s) and old type of phase module(s) in parallel. Serious IGBT failure is obvious if this rule is ignored!

- In 1xR11i or 1xR12i drive, one phase module is minimum upgrade
- In 2xR11i or 2xR12i drive, two phase modules is minimum upgrade
- In 4xR11i or 4xR12i drive, four phase modules is minimum upgrade
- An example of minimum upgrade marked with [X] in figures 1 and 2 in the case phase W is damaged

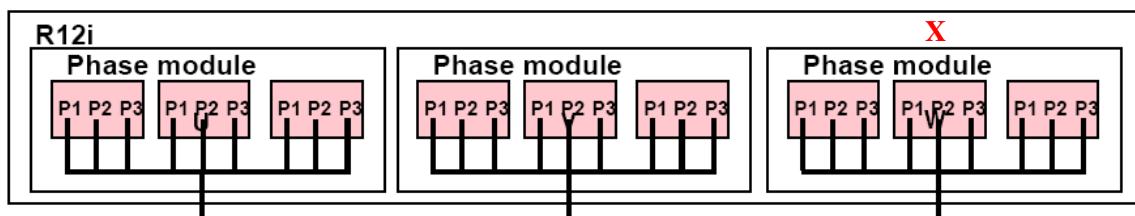


Figure 1. A principle drawing of parallel connected IGBTs in 1x R12i drive, minimum upgrade is one phase module.

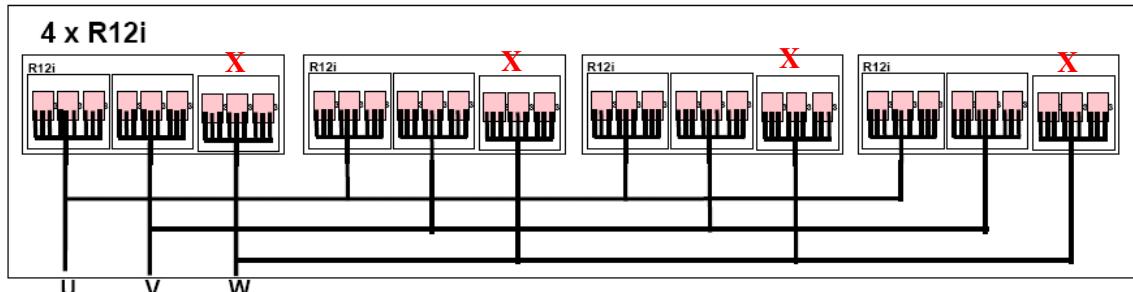


Figure 2. A principle drawing of parallel connected IGBTs in 4x R12i drive, minimum upgrade is four phase modules.

Dept.	Project	Status Date	Author	Status	Revision	Page
		14.May 2009	ASIKAINEN MIKA	APPROVED/NISKANEN ARI /FISER	B	2 / 15

Minimum upgrade is marked with X in the case one phase module is damaged. In figures phase W is damaged.

R12i	three phase modules (ACW 644 xxxx) = one inverter
2 x R12i	two times three phase modules (ACW 644 xxxx) = two phase module blocks ⇒ one inverter

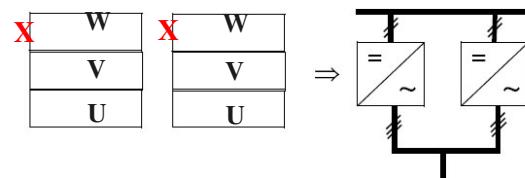
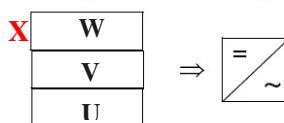


Figure 3. A principle drawing of parallel connected IGBTs in 1x R12i and 2xR12i ACW600 Multidrive. Minimum upgrade is marked with [X] in the case one phase module is damaged. In figures phase W is damaged.

3 x R12i	three times three phase modules (ACW 644 xxxx) = three phase module blocks ⇒ one inverter
4 x R12i	four times three phase modules (ACW 644 xxxx) = four phase module blocks ⇒ one inverter

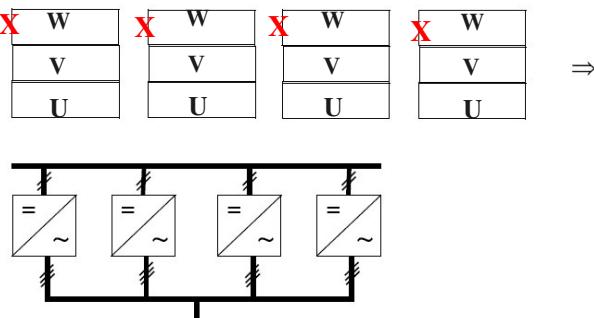
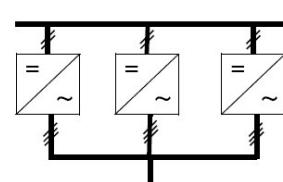
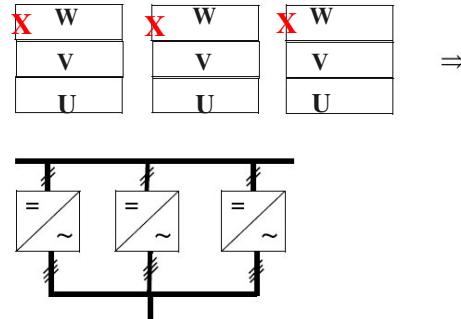


ABB Drives			ACN/ACW644+V991 MODULES Installation Instruction			3AFE 6896 2463 IIM_ ACN_ACW644_V991_revB.D OC	
Dept.	Project	Status Date	Author	Status	Revision	Page	
		14.May 2009	ASIKAINEN MIKA	APPROVED/NISKANEN ARI /FISER	B	3 / 15	

Figure 4. A principle drawing of parallel connected IGBTs in 3x R12i and 4xR12i ACW600 Multidrive. Minimum upgrade is marked with [X] in the case one phase module is damaged. In figures phase W is damaged.

2. Before installing operation

An ACN/ACW +V991 module is equipped with an *IGBT upgrade kit*, meaning that the *Powerplate* IGBT has been replaced by a *PrimePack* IGBT.

This document shows how to modify an ACX644 +V991 R10i, R11i or R12i V-phase module into a U/W -phase module, and how to connect +V991 modules during cabinet installation. This instruction substitutes the original instruction 63987751. When installing other than ACX644 +V991 modules, refer to the original document.

The spare part phase module kits always consist of:

- *V-phase module*
- *NXPP-01/02 control distribution board*
- *An extra base plate for NINT-XX*
- *Control board shield busbar and 4 M4x8 screws*
- *An insulating spacer screw*
- *Short-circuit adapter connected to X414 on NINT-XX board (This only applies to sizes R10i and R11i, where NGPS-XX board is not used. In R12i NGPS-XX is always used.)*
- *Configuration manual of main circuit interface board NINT-XX*
- *This document*

In case of installing an upgrade kit to an existing ACN644 phase module on site, refer to chapter 4 for instructions about cabinet installation.

ABB Drives			ACN/ACW644+V991 MODULES Installation Instruction			3AFE 6896 2463 IIM_ ACN_ACW644_V991_revB.D OC	
Dept.	Project	Status Date	Author	Status		Revision	Page
		14.May 2009	ASIKAINEN MIKA	APPROVED/NISKANEN ARI /FISER		B	4 / 15

3. Repairing of V-phase module with spare part +V991 phase module kit

a) Jumpers

The spare part module is ready to be installed as a V-phase module. In this case the included NXPP-XX board is not needed. First check the *current adjustment jumpers (S2...S4)* of NINT-XX that they are applicable for power plate ratings. The current adjustment procedure is explained in the NINT-XX board configuration manual (3AFE 6149 8842).

Check from the documentation or from the phase module if NGPS-XX board is used or if there's a short-circuit adapter connected to X414 on NINT-XX. If NGPS-XX is not used, the short-circuit adapter can be taken from the old phase module or the one, that comes with the new spare part module, can be used as well.

b) Installation

Attach the module *electrically to (+) and (-) bus bars with screws at the top and mechanically to the frame of the cubicle with two clamps (or screws) at the top*. Connect the phase output bus bars of R12i modules with *three screws in the middle*. Connect the R10i and R11i modules with *one screw*. Attach all module types *to the frame with two screws at the frontside bottom and the Marine models also with two screws at the backside bottom*.

c) Note

Do not damage *black insulation parts or bus bars*, when installing the module. It is very important to check the *installation of flat cables, the output voltage measurement wires and insulation of the cables*. Remember to lock the *flat cables*. Check the *condition of fibre cable connectors* especially after power plate explosion. Check also the *installation and the bending radius of the fibre cables*. The radius must be more than 35 mm.

If adjacent U/W phase modules are of type +V991, see chapter 5 to ensure their correct connection.

ABB Drives			ACN/ACW644+V991 MODULES Installation Instruction			3AFE 6896 2463	
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Dept.	Project	Status Date	Author	Status	Approved/NISKANEN ARI /FISER	Revision	Page
		14.May 2009	ASIKAINEN MIKA			B	5 / 15

4. Repairing of U- or W-phase modules with spare part +V991 phase module kit

a) Uninstalling of redundant boards

NOTICE! Remove every unnecessary board. They can be used as spare parts in other modules. Boards that can be removed are *NPOW-XX*, *NGPS-XX* and in 690V modules *NRED-61*.

Remove boards *with bottom plate*. Then it is easy to remove also *the supply cables (+) and (-)* of *NPOW-XX* and in 690V modules *NRED-61*. The supply cables are connected to the capacitor bank. In certain models the *cable of discharging resistor* is also connected to the capacitor bank. Check that the cable is fastened properly.

Undamaged *bottom plate* of *NPOW-XX* board can be reused from faulty phase module. The bottom plate is mounted to the both sides of the module with four or six screws.

b) In urgent cases

In urgent cases remove only the following cables of *NGPS-XX* and *NPOW-XX* boards:

NGPS-XX : X3 -----> *NINT-XX* : X414

NPOW-XX : X32 -----> *NINT-XX* : X42

Do not remove any boards. Let also *NPOW-XX* and for 690V modules *NRED-61* remain connected. These boards do not influence on the operation of the drive. This case is described as *an option*, because removing of the supply cables of *NPOW-XX* and *NRED-61* can last long.

IMPORTANT! **Spacer modifications for U/W phase modules must be done in all cases, see following chapter c.**

c) Configuring control pcb section from V-phase to U / W phase module

All new phase modules are delivered as a V-phase.

NOTICE! This method is different from one described in original *ACX644* instruction 63987751.

Follow steps 1-6 in order to ensure correct operation of the modules.

1. Disconnect control wires and remove the *NINT-XX* assembly (figure 1).

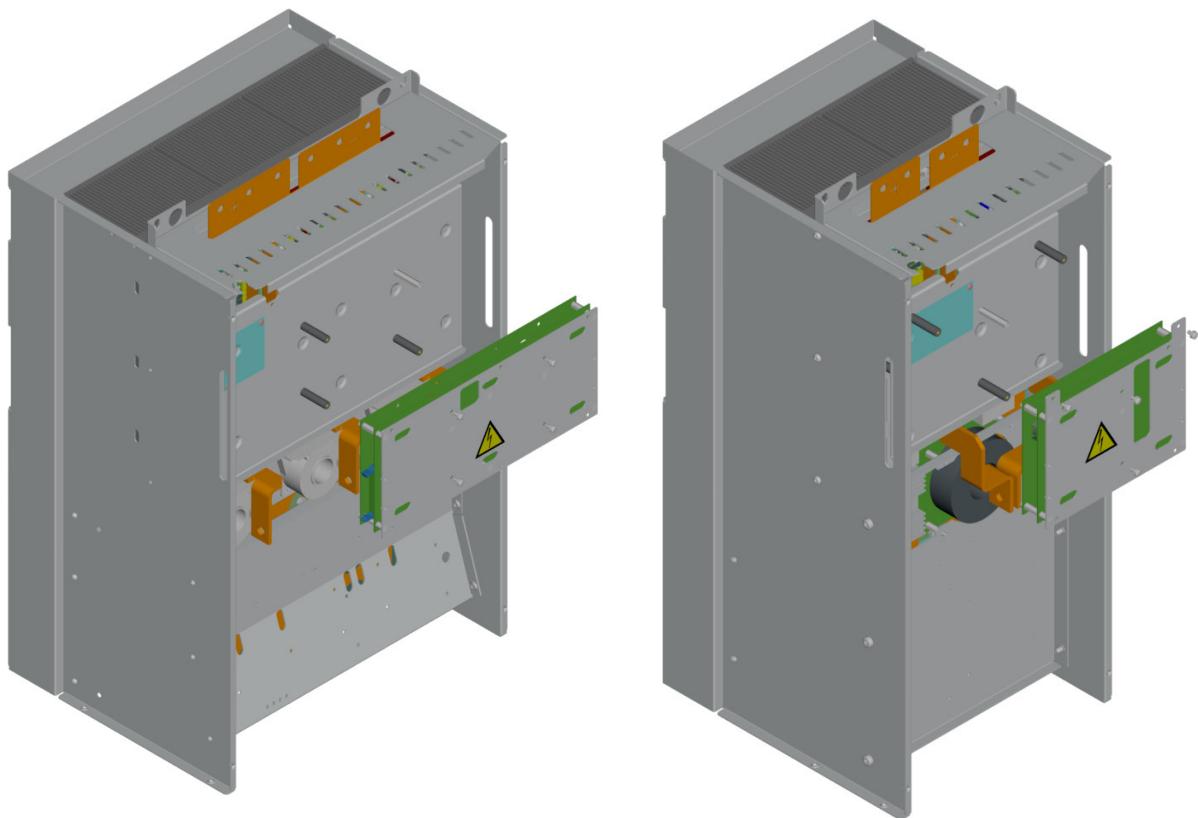


Figure 1. Remove 4 pcs M4x8 and the control pcb assembly
Left: R12i, right: R10i/R11i

2. Remove the NINT-XX subassembly. Replace the NINT-72C/73C with NXPP-02C/03C (figure 2).

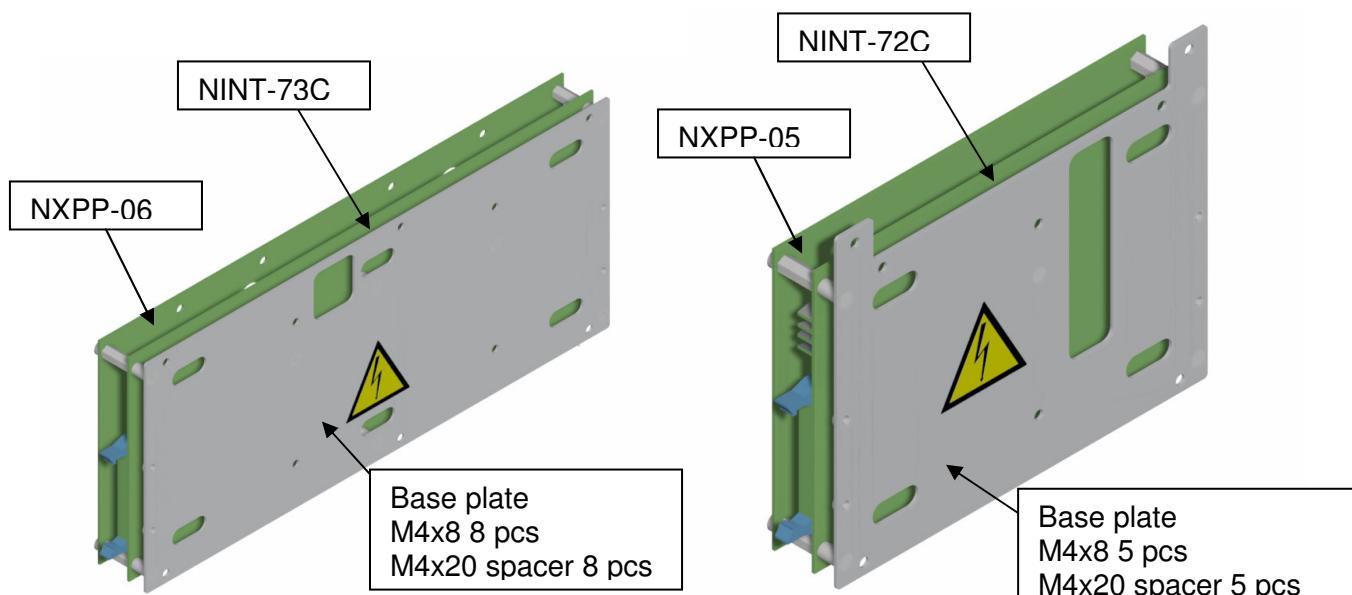


Figure 2. Replace NINT-73C with NXPP-03C (R12i, left)
Replace NINT-72C with NXPP-02C (R10i/R11i, right)