

APPLICATION NOTE	AN-General-0009v101EN
Additional information for installation of RHC converter	

Inverter type	FRENIC Series and RHC (PWM converter)
Software version	All versions
Required options	None
Related documentation	
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Use	Public, Web
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Languages	English

1. Introduction.

This document describes some additional important points regarding the installation of RHC-C series, which are not described in the instruction manual:

- The phase sequence of the AC supply input voltage is relevant (MUST be taken into account) for the operation of the RHC converter.
- The use of DC link fuses to protect the RHC converter and/or the inverters or -at least- to limit the expansion of the damage among the converter/inverters.

2. Description of key points regarding the installation of RHC converter.

2.1 Input phase sequence of AC input supply voltage.

One very important point to consider when installing RHC converter is the phase sequence of the AC input (supply) voltage. Even the wiring (phase correlation) is correct between L1/R-L2/S-L3/T and R1-S1-T1, the RHC converter can generate output voltage (current) ONLY if the phase sequence (rotation direction) corresponds to the Japanese standard, which is opposite to the European standard. Therefore if the phase sequence of the voltage supply is clearly identified (known) please connect the AC supply voltage as described in table 1 below.

Table 1. Connection of AC supply inputs.

AC supply phases (European standard)	RHC converter inputs
R	L1/R
S	L3/T
T	L2/S

If the phase sequence of the input voltage can NOT be identified then make a first trial connection and try to operate the converter. The symptoms of an incorrect connection are:

- The power up sequence of the RHC converter is NOT completed. The keypad of the RHC converter does not show “COMPLETED” after powering up and the LED display shows “2222”, OR
- Even the power up sequence can be completed satisfactorily, when RUN command is given to the RHC converter it trips with “dOV” or “AOC” and can NOT operated normally.

In case that the symptoms described above appear then swap two phases at the AC input (supply) of the RHC converter and try again. If a problem occurs again after swapping the input phases this means that there is another problem in the wiring/installation (i.e.: input fuse broken or missing, bad correlation between L1/R-L2/S-L3/T and R1-S1-T1,.....). If the RHC converter can operate correctly this means that the installation has been completed satisfactorily.

3.2 Use of fuses in the DC link connection.

In order to protect both the RHC converter and inverters supplied by the converter, it is highly recommended to use fuses on the DC link connection. By using these fuses, a failure/damage or bad function of any equipment may prevent other inverters/converter from being damaged at the same time. In other words, the fuses on the DC link connection can make expansion of damage small.

In case of big capacity inverters like FRENIC MEGA equal or above 90 kW, the inverter has already fuses in the DC link or in the IGBT branches. This means that these inverters have already a fuse for the protection of the inverter IGBT's and eventually the other converters/inverters connected to the DC link in the event of a failure.

In case of small capacity inverters like FRENIC MEGA under 90 kW, FRENIC Multi and FRENIC Lift the inverters do not have internal DC fuses. Therefore it is highly recommended to use a DC fuse for the protection of the inverter IGBT's and the other converters/inverters connected to the same DC link in the event of a failure, as shown in figure 1. For the recommended fuse types please consult Fuji Electric staff.

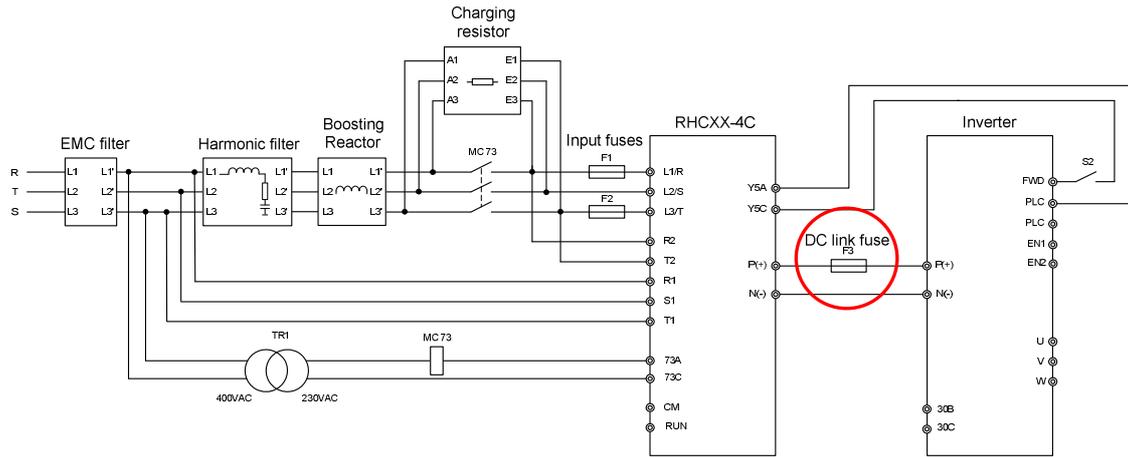


Figure 1. DC link fuse for protection of inverter and converter.

3. Conclusion

The installation of RHC converter requires some important (key) considerations to ensure a correct and safe operation, which are described in this document.

4. Document history.

Version	Changes applied	Date	Written	Checked	Approved
1.0.0	First version	10/02/2012	D. Bedford	J. Alonso	
1.0.1	Modifications after Mochizuki san comments	27/02/2012	D. Bedford	M.Mochizuki	J. Alonso