



Supplementary Document to Instruction Manual **PWM CONVERTER**

High power factor PWM converter with power regenerative function

TYPE: RHC7.5-4C to RHC55-4C

**A part of compliance with European standard is added.
Read this manual in addition to main instruction manual**

CAUTION


- Read all operating instructions manual before installing, connecting (wiring), operating, servicing, or inspecting the converter.
- Ensure that this instruction manual is made available to the final user of the converter.
- Store this manual in a safe, convenient location.
- The product is subject to change without prior notice.


Instructions

Thank you for purchasing our RHC-C series Converter. This manual shows how to make RHC-C conform to the EN Standards. If you want to use the RHC-C series converter as a part of EN standards certified product, refer to this manual. As incorrect use of this product may result in personal injury and/or property damage, read all operating instructions before using it. As this manual does not cover the use of function codes and option cards, etc., refer to RHC-C Installation Manual.

Safety Instructions

Read this manual carefully before installing, connecting (wiring), operating, servicing, or inspecting the Converter. Familiarize yourself with all safety features before using the Converter. In this manual, safety messages are classified as follows:

 WARNING	Improper operation may result in serious personal injury or death.
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 CAUTION	Improper operation may result in slight to medium personal injury or property damage.
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Situations more serious than those covered by CAUTION will depend on prevailing circumstances. Follow always the instructions.

1. Compliance with European standards

The CE marking on Fuji products indicates that they comply with the essential requirements of the Electromagnetic Compatibility (EMC) Directive 2004/108/EC and Low Voltage Directive 2006/95/EC which are issued by the Council of the European Communities.

The products comply with the following standards

	Type: RHC-C series (*1)
EMC Directive standards (*2)	EN61800-3 : 2004 Immunity : Second environment (Industrial) Emission : Category C2 (*3)
Low Voltage Directive standards	EN 50178: 1997

*1) Only RHC-C models shown in table 2.1, 2.2 and 3.1 comply with the EN standards.

*2) If connected to an external EMC filter dedicated to Fuji converters, RHC-C converters that bear a CE marking become compliant with these EMC directive.

*3) 45kW and 55kW converters without ACL: Category C3 conducted emission, C2 radiated emission

2. Compliance with Low Voltage Directive


2-1. Overview

Converters are subject to the Low Voltage Directive in Europe. Fuji voluntarily declares the compliance with the Low Voltage Directive.

2-2 Notes

See the notes below when you use converters as products compliant with the Low Voltage Directive in Europe.

CAUTION

- The contact capacity for the alarm relay output (30A, B, C) and the relay signal output (Y5A, Y5C) is DC 48V, 0.5A.
- Connect your converter to the ground securely.
- Attach ring terminals to the wires when you connect them to the converter main circuit terminals and converter ground terminals.
- Use an independent wiring for the converter ground terminal G. Do not connect two or more wires.
- When you use an earth leakage breaker (RCD), you can use only the Type B for protection for the power supply.
- Use a molded case circuit breaker (MCCB) and a magnetic contactor (MC) compliant with the EN or IEC standard.
- For a power supply system where the neutral point is not grounded (IT-Net), the control terminals are provided as basic insulation in respect to the main circuit. When a person may touch them directly, an external insulation circuit for double insulation should be added.
- Use your converter under a condition corresponding to the overvoltage category III and pollution degree 2 or better, as prescribed in IEC664 standard. If the converter will be used in an environment with pollution degree 3 or worse, install it inside an enclosure (electrical panel) of IP54 or higher, preventing water, oil, carbon and dust from entering, and thus meeting the pollution degree 2 or better.
- Use wires with the diameter and the type prescribed in the Appendix C of EN 60204 for the input/output wiring for your converter. Refer to the table 2.1.
- When you install the converter with the heatsink external to the control panel, a protection cover should be installed, thus preventing the capacitor located on the heatsink from being touched.
- When you install the boosting reactor, the filter reactor, filter capacitor and the filter resistor, follow the description below to prevent an electric shock due to touching the terminals and electrically active parts.
 - 1) Install them in an enclosure or wall of IP4X or higher when a person may have an easy access to them.
 - 2) Install them in an enclosure or wall of IP2X or higher when a person does not have an easy access to them.
- To prevent the risk of hazardous accidents that could be caused by damage of the converter, install the specified fuses in the supply side (primary side) according to the table 2.2.

CAUTION

Table 2.1 Applicable main circuit and motor wire sizes for compliance to Low Voltage Directive

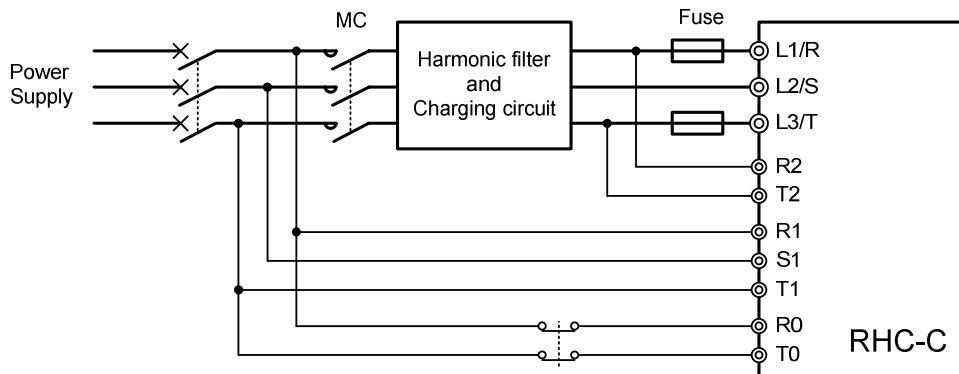
Voltage	Output capacity KW	Converter type: RHC□	Mode	MCCB Rated current [A]	Tightening torque [N.m]				Recommended wire size [mm ²]					
					L1/R,L2/S,L3/T P(+),N(-)	⊕G	R0,T0	R1,S1,T1 R2,T2,73a,73c	Controller	L1/R,L2/S,L3/T (⊕G)	P(+),N(-)	R0,T0	R1,S1,T1 R2,T2,73a,73c	Controller
400V series	8.8	7.5-4C	CT	20	5.8	5.8	1.2	1.2	0.7	2.5	2.5	2.5	2.5	0.75
	13		VT	30										
	18	11-4C	CT	40						4	6			
			VT											
	22	15-4C	CT	50						6	6			
	26		VT											
	36	22-4C	CT	75						10	10			
	44		VT											
	53	30-4C	CT	100						16	16			
			VT											
65	45-4C	CT	125	13.5	13.5									
		VT												
	55-4C	CT												

Note: The wires shown are 600V PVC insulated electric wire with permissible temperature of 70°C. These wires are selected assuming that the ambient temperature is 40°C or less.

Table 2.2 The size of main circuit fuses for compliance to Low Voltage Directive

Voltage	Converter type: RHC□	Mode	Fuse Rating (*1)		
			Rated current [A]	Class	The recommend fuses (Manufacturer)
400V series	7.5-4C	CT / VT	30	IEC60269-4	CR6L-30/UL (Fuji Electric)
	11-4C		50		CR6L-50/UL (Fuji Electric)
	15-4C		75		CR6L-75/UL (Fuji Electric)
	22-4C		100		CR6L-100/UL (Fuji Electric)
	30-4C		150		CR6L-150/UL (Fuji Electric)
	45-4C		200		CR6L-200/UL (Fuji Electric)
	55-4C	CT			

*1) Breaking capacity: 10kA min, Rated voltage: 500V min



3. Compliance with EMC Directive

3-1 Overview

The CE marking of the product does not certify that the entire machine to which you apply Fuji product complies with the EMC Directive. Thus presenting the CE marking for the entire machine will be the responsibility of the machine manufacturer. The reason is that the CE marking of Fuji product assumes the product is used under certain conditions. Using the product under these conditions is up to the machine manufacturer.

In general, various products in addition to Fuji product are used in a machine. Thus the machine manufacturer should take care of the entire machine.

One of the conditions as described above, is that the recommended EMC filters should be used together with Fuji "RHC-C" series, installing them in a metal control panel following this appendix.

3-2 EMC Filter

The Table 3.1 shows EMC filter types recommended by Fuji and applicable converters. These filters have been conceived to be installed on the side of the converter.

Table 3.1 EMC Filter Dimension List

Applicable Converter	CT / VT Mode	Filter type	EMC filter								ACL	
			External dimensions					Terminals		Moun-ting		Fig
			W	W1	H	H1	D	Main	G			
RHC7.5-4C	CT	FN3258-30-47	270	255	50	30	85	10mm ² (Max)	M5	M5	3.1	-
RHC11-4C	VT											
RHC15-4C	CT	FN3258T-75-34	318	255	80	60	135	25mm ² (Max)	M6	M6		
RHC22-4C	VT											
RHC30-4C	CT	FN3258T-100-35 ACL-74B (*1)	330	255	90	65	150	50mm ² (Max)	M10	M6		
RHC45-4C	VT											
RHC55-4C	CT										RST side, 1piece - 2turns	

*1) When ACL is not used with the converter, 45kW and 55kW converters conform to Category C3 conducted emission and C2 radiated emission.

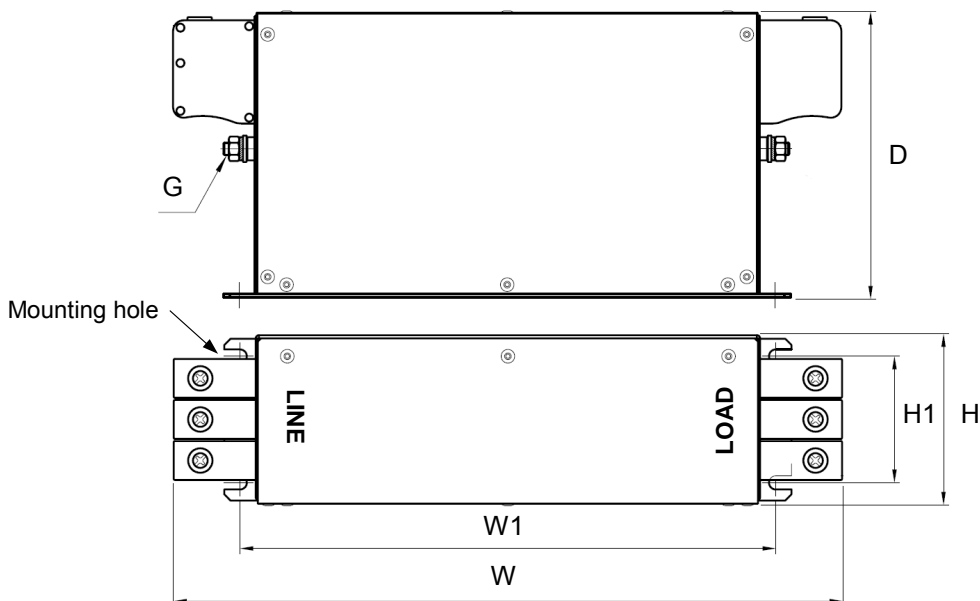


Figure 3.1

3-3 Recommended Installation

Let an electrical engineer follow the steps below to wire your converter and filter. To comply with the EMC directive, follow as close as possible the steps below.

- 1) First, check if the filter's rated current, voltage, and type are correct.
- 2) Make holes according to the installation position of the filter on the control panel. To reduce the contact resistance between the filter and the control panel, remove paint around the filter installation holes.
- 3) Connect the input power supply to the input terminals (LINE) and the earth line to the earth stud of the filter. Then, use a wire as short as possible to connect the output terminal (LOAD) of the filter to the MC or harmonic filter of your converter. If a ferrite core (ACL) is attached, pass the L1, L2 and L3 wiring through the ferrite core on the input terminal (LINE) side.
- 4) Connect the converter's output lines to the load. Use wires as short as possible. Connect both the converter and the load to the earth using the earth terminals. If you use shielded wires, connect the shield so that the shield of the shielded wires completely fills the periphery of the holes at the entrance to the control panel.
- 5) Use a shielded wire to wire to the control terminals on the converter. Make sure that the shield wire is connected to earth. Use wires as short as possible in all connections. Separate the wiring from the power supply to the filter and that from the converter to the load as far as possible.
- 6) If radiated noise from the inverter exceeds the permissible level, enclose the converter and its peripherals within a metal panel as shown in Figure 3.2.
- 7) When using single-phase input power for control circuit, do not connect neutral line directly to control circuit. Insert an insulation transformer at the power supply side.

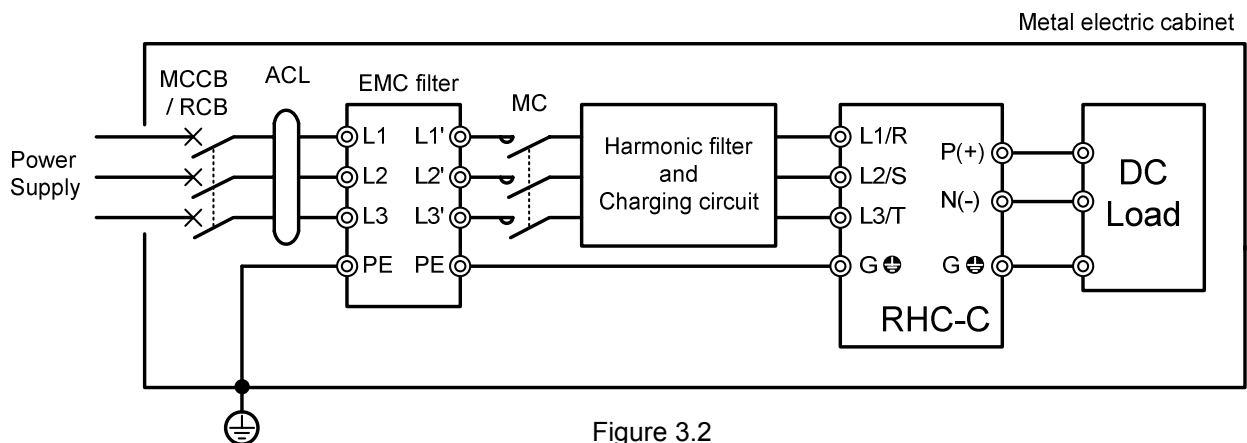


Figure 3.2