

INVERTER

New Product RELEASE

No.17-12E

Release of Options for the FR-A842-500K Serving as a High Power Factor Converter

The plug-in option FR-A8AVP and the stand-alone options FR-A8VPB-H, FR-A8BL1-H500K, FR-A8BL2-H500K, FR-A8BC-H500K, and FR-A8MC-H500K are now available as new additions to the FR-A800 series inverter option lineup.

Features

FR-A842 inverter serving as a high power factor converter with the following options

Harmonic suppression (K5 = 0) achieved

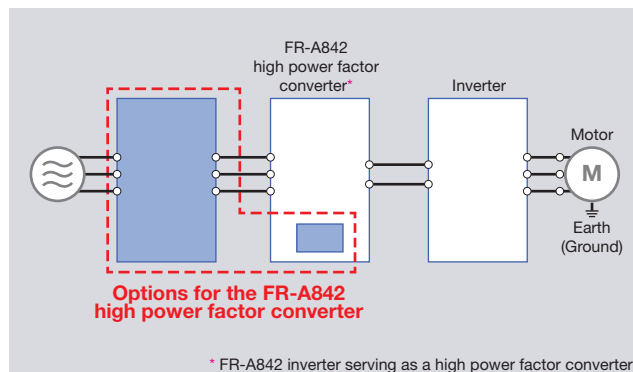
The FR-A842 converter (converted from the FR-A842 inverter by using the plug-in option FR-A8AVP) is classified as a self-excitation three-phase bridge circuit under the "Harmonic Suppression Guidelines for Specific Consumers" and achieves K5 = 0 (conversion factor for equivalent capacity).

Only 5% or less of the total harmonic distortion of the input current (THDi)*

Such a low rate of THDi facilitates compliance with the overseas standards related to harmonic suppression.

* When the input voltage is distorted, harmonic contents increase because power harmonics flow into the converter.

System configuration example



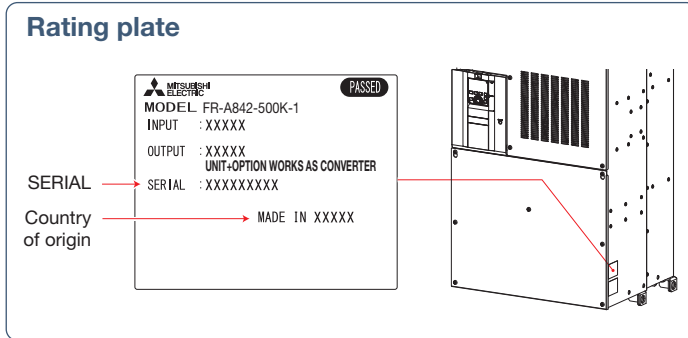
For wiring details, refer to page 3.



Inverters supporting conversion to a converter

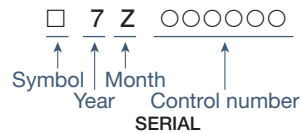
The FR-A8AVP is available for inverters with the following SERIAL number or later. Check the SERIAL number indicated on the inverter rating plate or package.

For information on this inverter serving as a high power factor converter, see the rating plate for converter shown in the following figure.



Country of origin indication	SERIAL number	Manufactured year and month
MADE in Japan	□ 7Z ○○○○○○ or later	December 2017 or later
MADE in China	Please contact your sales representative.	

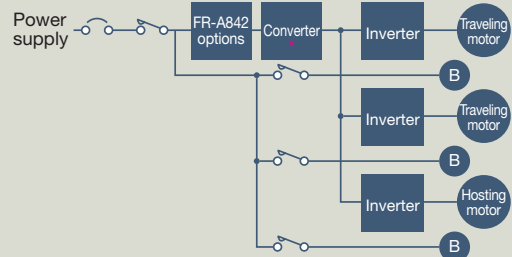
[Example]



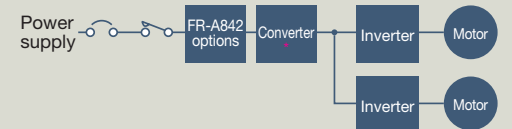
The SERIAL consists of one symbol, two characters indicating the production year and month, and six characters indicating the control number.

The last digit of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).

Converter applications



- The converter has a power regeneration function, so no brake unit is required.
- Take power for the mechanical brake from the cable on the input side of the first stand-alone option connected to the power supply.



- Inverter power supply harmonics can be suppressed.
- The converter has a power regeneration function, so no brake unit is required.

* FR-A842 inverter serving as a high power factor converter

FR-A842 converter connects to multiple inverters

Up to 10 inverters are connectable to a single FR-A842 converter.

Be sure to use the FR-A842 converter with a capacity equal to or higher than the total capacity of inverters/motors. Additionally, the total capacity of the inverters or motors needs to be equal to or higher than half the capacity of the FR-A842 converter.

$(\text{FR-A842 converter capacity} \times 1/2 \leq \text{total capacity of connected inverters or motors} \leq \text{FR-A842 converter capacity})$

If the total inverter capacity is less than half the FR-A842 converter capacity the harmonic suppression effect is reduced.

For details on connecting multiple inverters, refer to the Instruction Manual of the FR-A8AVP.

Converter ratings and specifications

Model FR-A842-[]	500K 12120
Applicable inverter capacity (kW)	500
Rated output capacity (kW)*1	595
Rated voltage (V)*2	Three-phase 380 to 500 V, 50/60 Hz*5*6
Rated current (A)	895
Overload current rating*3	150% 60 s
Permissible power supply voltage fluctuation	323 to 506 V, 50/60 Hz
Permissible power supply frequency fluctuation	±5%
Input power factor	0.99 or more (when load ratio is 100%)
Power supply capacity (kVA)	724
Protective structure of the converter*4	Open type (IP00)
Cooling system	Forced air cooling
Approx. mass (kg)	243

*1: DC output capacity when the input voltage is 400 VAC.

*2: Change the stepdown transformer tap according to the input voltage.

*3: The percentage of the overload current rating is the ratio of the overload current to the converter's rated input current. For repeated duty, allow time for the temperatures of the converter and the inverter to return to or below the temperatures under 100% load.

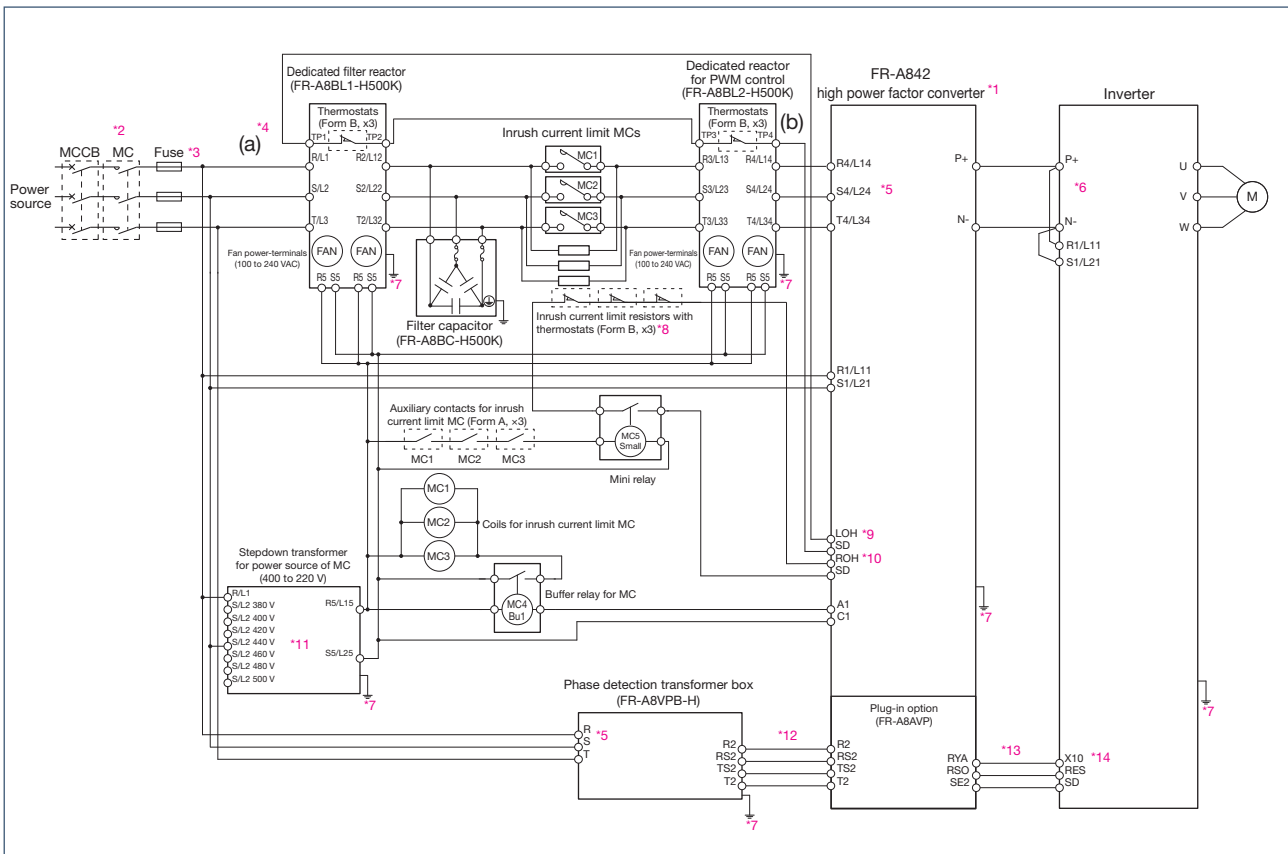
*4: FR-DU08: IP40 (except for the PU connector)

*5: The permissible voltage imbalance ratio is 3% or less.

(Imbalance ratio = (highest voltage between lines - average voltage between three lines) / average voltage between three lines × 100)

*6: Voltage rating is between 380 and 480 V for inverters with a normal duty (ND) current rating of 110 A or less, or for the FR-F840-01800(75K) inverter.

Connection example



*1: Use the FR-A842 inverter converted into a high power factor converter.

*2: Install a magnetic contactor for each phase.

*3: Install the UL listed fuse (specified in the Instruction Manual of the FR-A8AVP) on the input side of the FR-A842 converter to meet the UL/cUL standards.

*4: Do not install an MCCB or MC between the dedicated filter reactor input terminals (R/L1, S/L2, and T/L3) (a) and the converter input terminals (R4/L14, S4/L24, and T4/L34) (b).
Doing so disrupts proper operation (except for the inrush current limit MC).

*5: Confirm the correct voltage phase sequence between terminals R4/L14, S4/L24, and T4/L34 of the converter and terminals R, S, and T of the phase detection transformer box.

*6: Do not install any MCCB between the inverter and the converter (P to P and N to N).
Connecting opposite polarity of terminals P and N will damage the converter and the inverter.

*7: Securely perform grounding (earthing) by using the grounding (earthing) terminal.

*8: Connect the following set of resistors (components of the FR-A8MC-H500K) per phase of the inrush current limit MC: Two 0.960HM BKO-CA2573H01 (resistor without thermostat) and one 0.960HM BKO-CA2573H11 (resistor with thermostat).

*9: The LOH signal is assigned to terminal RT in the initial status. Set "33" in any of Pr.178 to Pr.189 (Input terminal function selection) to assign the LOH signal to another terminal.

*10: The ROH signal is assigned to terminal AU in the initial status. Set "34" in any of Pr.178 to Pr.189 (input terminal functionselection) to assign the ROH signal to another terminal.

*11: Select a terminal S/L2 according to the input voltage.

*12: Always connect between terminals R2, RS2, T2, and TS2 of the FR-A8AVP installed on the converter and those terminals of the phase detection transformer box, respectively. Failure to do so can damage the converter when the inverter is operated.

*13: Always connect between terminal RYA of the FR-A8AVP installed on the converter and an inverter terminal to which the X10 signal is assigned, and between terminal SE2 of the FR-A8AVP and terminal SD (terminal PC in the source logic) of the inverter. Failure to do so may damage the converter.

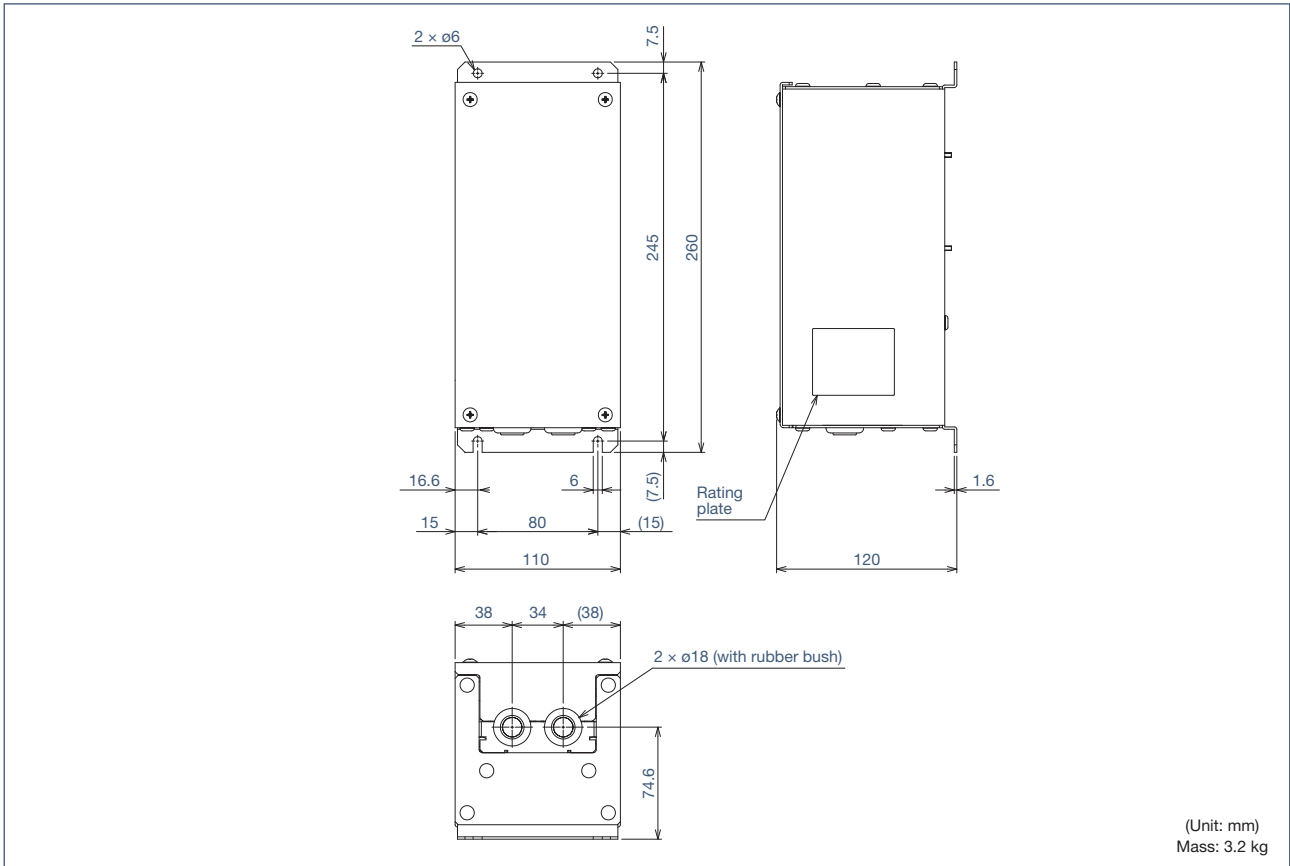
*14: Use the Input terminal function selection to assign the X10 signal to an inverter terminal. The X10 signal is assigned to terminal MRS in the initial status. (Refer to the Instruction Manual of the inverter.)

The name of the option FR-A8MC-H500K is not shown in the connection diagram above because the FR-A8MC-H500K is only a package name. The components of the package such as the inrush current limit magnetic contactor, stepdown transformer for power source of magnetic contactor, buffer relay, mini relay, and inrush current limit resistor are shown in the diagram instead.

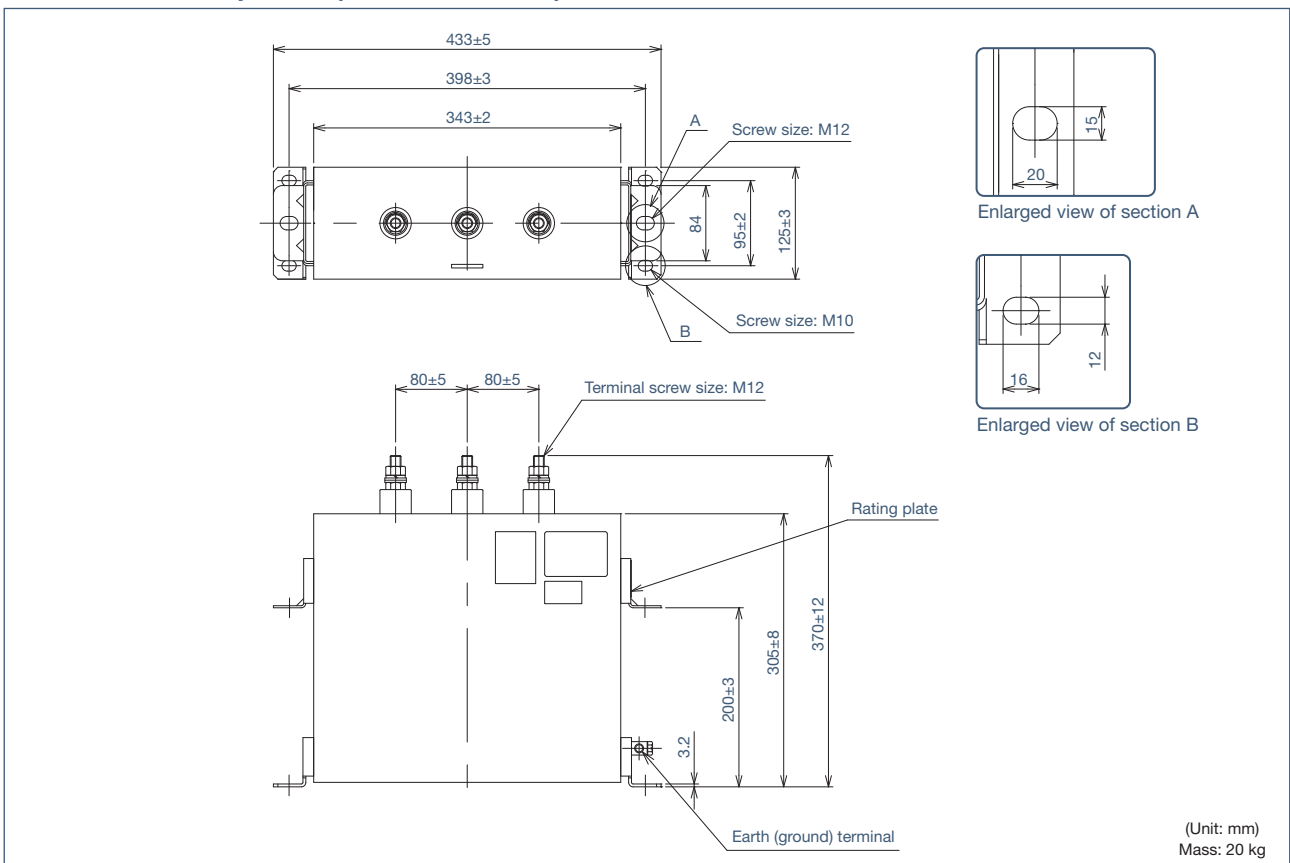
For wiring details, refer to the Instruction Manual of the FR-A8AVP.

Outline dimensions

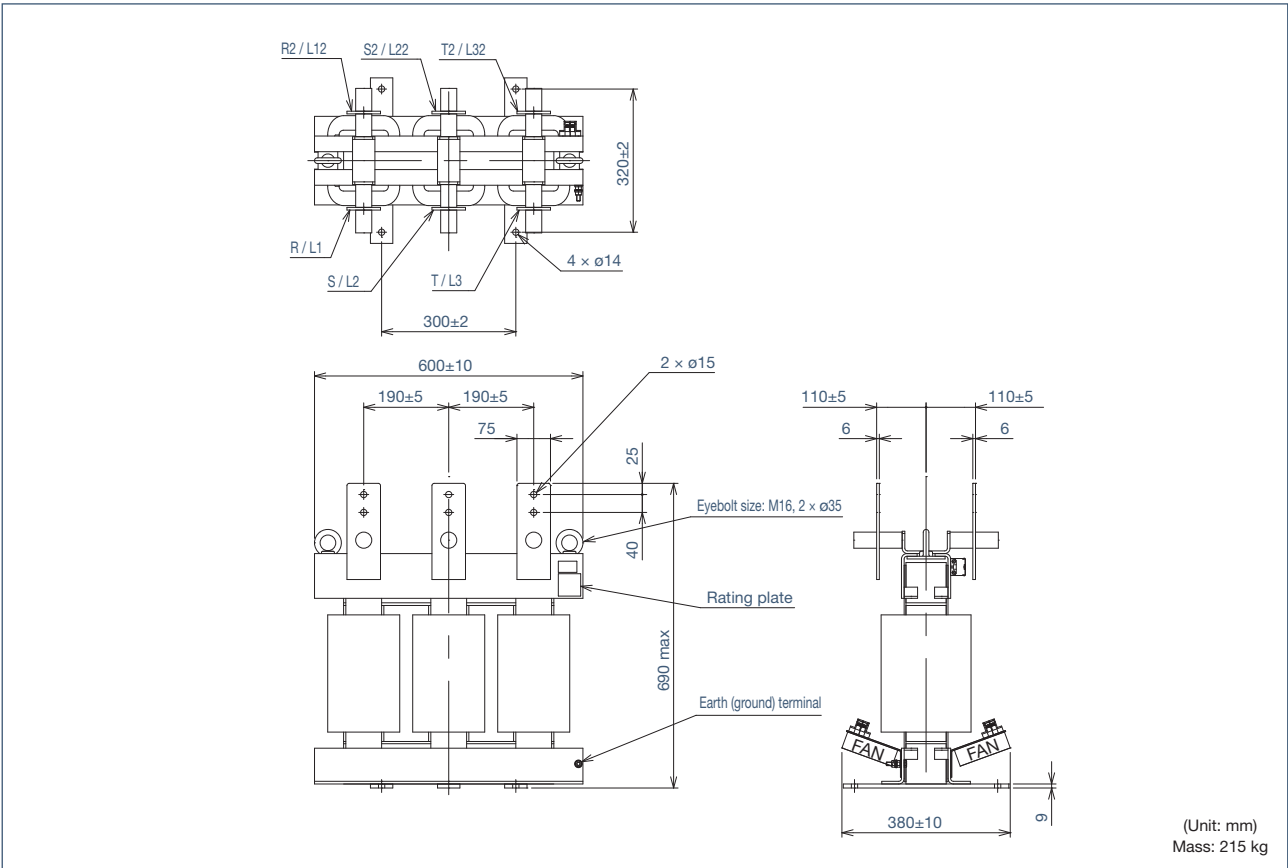
Phase detection transformer box (FR-A8VPB-H)



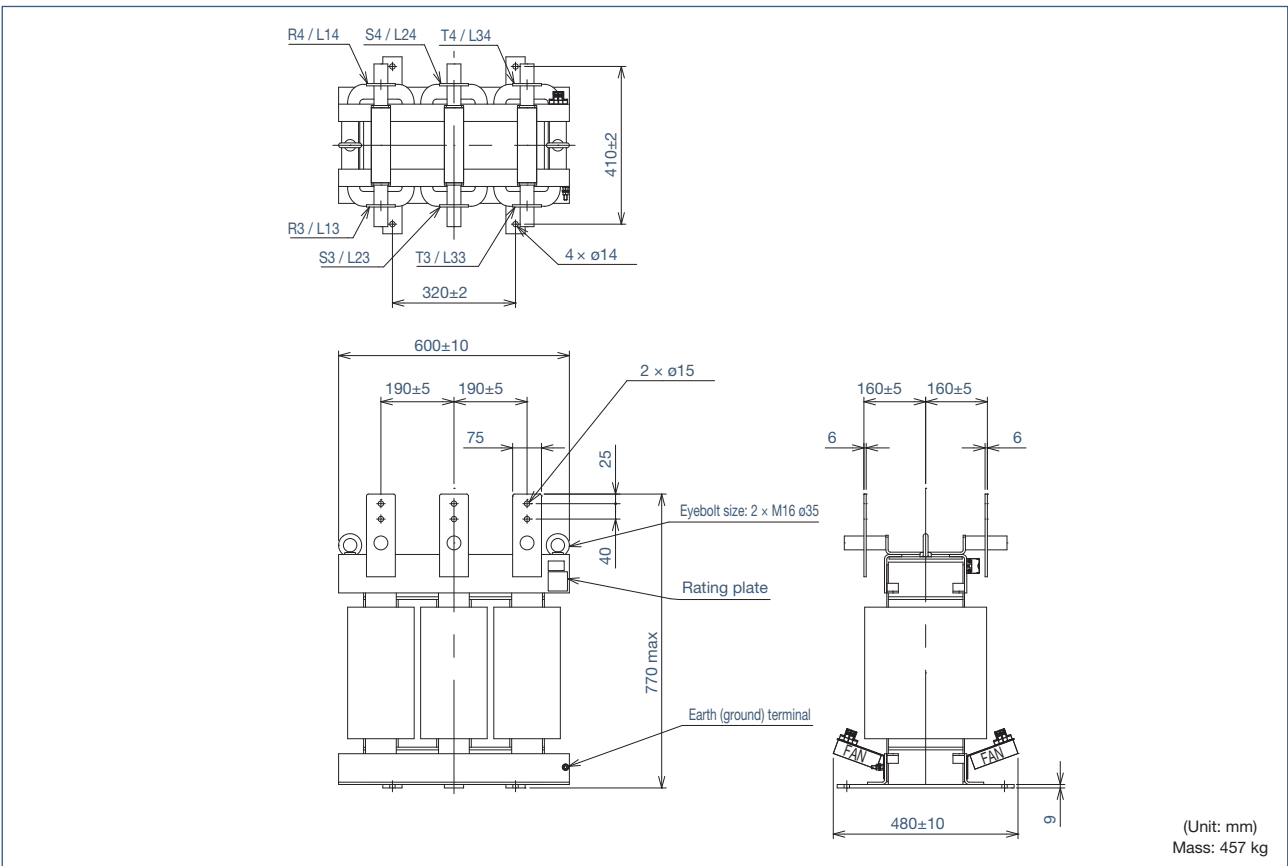
Dedicated filter capacitor (FR-A8BC-H500K)



Dedicated filter reactor (FR-A8BL1-H500K)



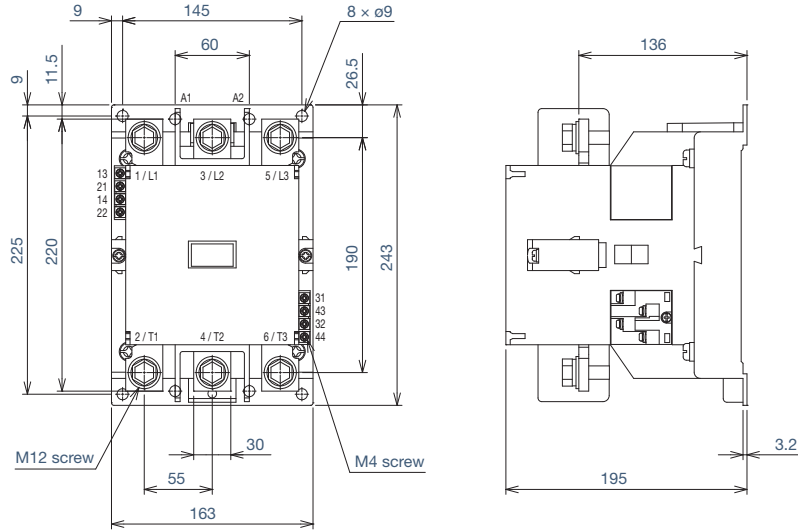
Dedicated reactor for PWM control (FR-A8BL2-H500K)



Outline dimensions

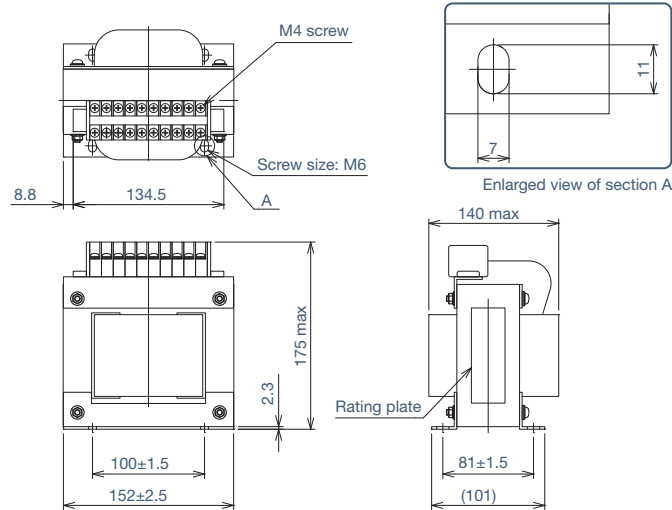
Components of the dedicated circuit parts for inrush current protection (FR-A8MC-H500K)

Inrush current limit magnetic contactor (S-N400 AC200V 2A2B)



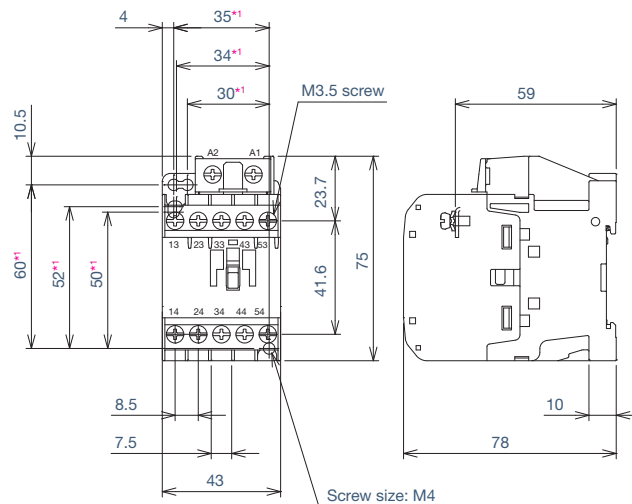
(Unit: mm)
Mass: 9.5 kg

Stepdown transformer for power source of magnetic contactor (BKO-CA2571H01)



(Unit: mm)
Mass: 9 kg

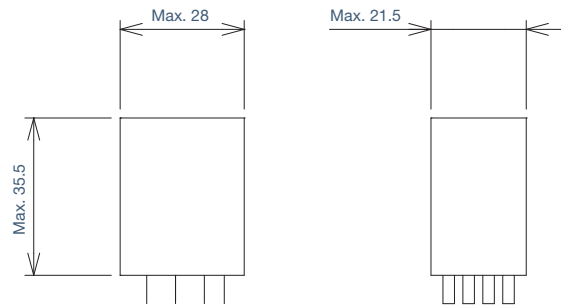
Buffer relay (SR-T5 AC200V 5A)



*1: The upper-left mounting hole is selectable from four locations: 1) 30 mm left and 60 mm up from the lower-right hole, 2) 34 mm left and 52 mm up from the lower-right hole, 3) 35 mm left and 50-52 mm up from the lower-right hole, 4) 35 mm left and 60 mm up from the lower-right hole.

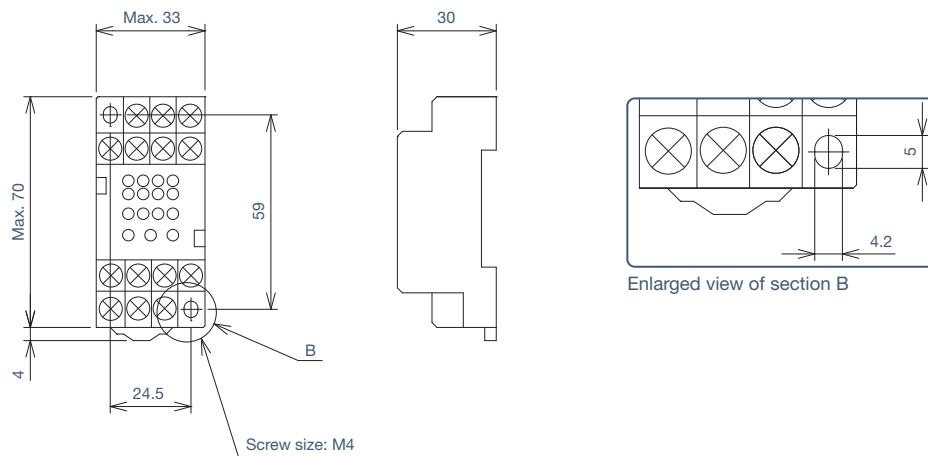
(Unit: mm)
Mass: 0.27 kg

Mini relay (MYQ4Z AC200/220)



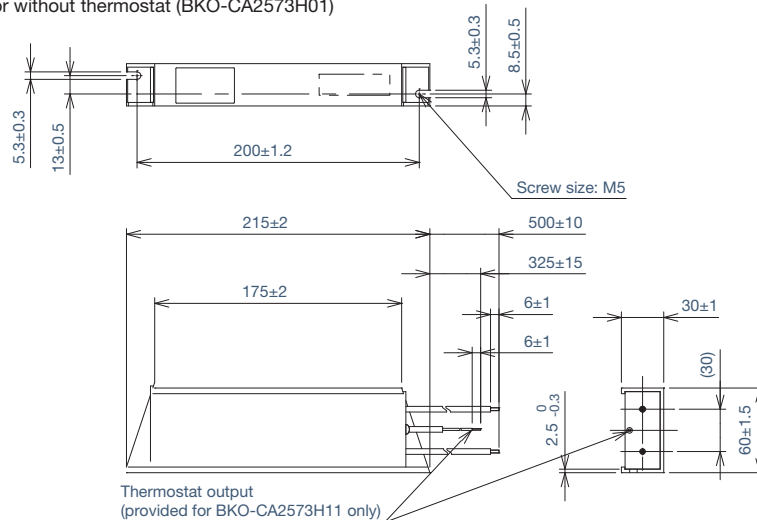
(Unit: mm)
Mass: 35 g

Mini relay terminal block (PYF14T)



(Unit: mm)
Mass: 53 g

Inrush current limit resistor with thermostat (BKO-CA2573H11)
Inrush current limit resistor without thermostat (BKO-CA2573H01)



(Unit: mm)
Mass: 0.8 kg

Option lineup

For information on the installation location of each option, refer to page 3.

Phase detection option

The FR-A8AVP converts the FR-A842 inverter into a high power factor converter. In combination with the FR-A8VPB-H, the FR-A8AVP can send phase and voltage information about the commercial power supply to an inverter connected to the FR-A842 converter. It is not possible to use any other plug-in option when the FR-A8AVP is installed on the FR-A842 converter. All terminal options become unusable too.

FR-A8AVP

Phase detection transformer box

This is a stepdown transformer acquiring phase and voltage information about the power system to send to the FR-A842 converter.

FR-A8VPB-H

Dedicated filter capacitor

This is a filter capacitor specifically made for the FR-A842 converter to improve its input power factor and reduce harmonics in the power supply.

FR-A8BC-H500K

Dedicated filter reactor

This is a filter reactor specifically made for the FR-A842 converter to improve its input power factor and reduce harmonics in the power supply.

FR-A8BL1-H500K

Dedicated reactor for PWM control

This is a PWM control reactor specifically made for the FR-A842 converter.

FR-A8BL2-H500K

Dedicated circuit parts for inrush current protection

This is an inrush current limit circuit kit specifically made for the FR-A842 converter.

FR-A8MC-H500K

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN