



TRANSISTORIZED INVERTER

MT-RC

POWER REGENERATIVE CONVERTER
INSTRUCTION MANUAL

Thank you for employing the power regenerative converter MT-RC.

The equipment has been developed to improve the brake capacities of Mitsubishi Transistor Inverters (*FR-A700, FR-F700, FR-A540L, FR-F540L, MT-A200, MT-A100, MT-A200E, MT-A100E, MT-V200* Series).

Before use, be sure to read through this instruction manual for proper operation.

* Don't use the converter on any other inverter except described above since they can not be fit to each other.

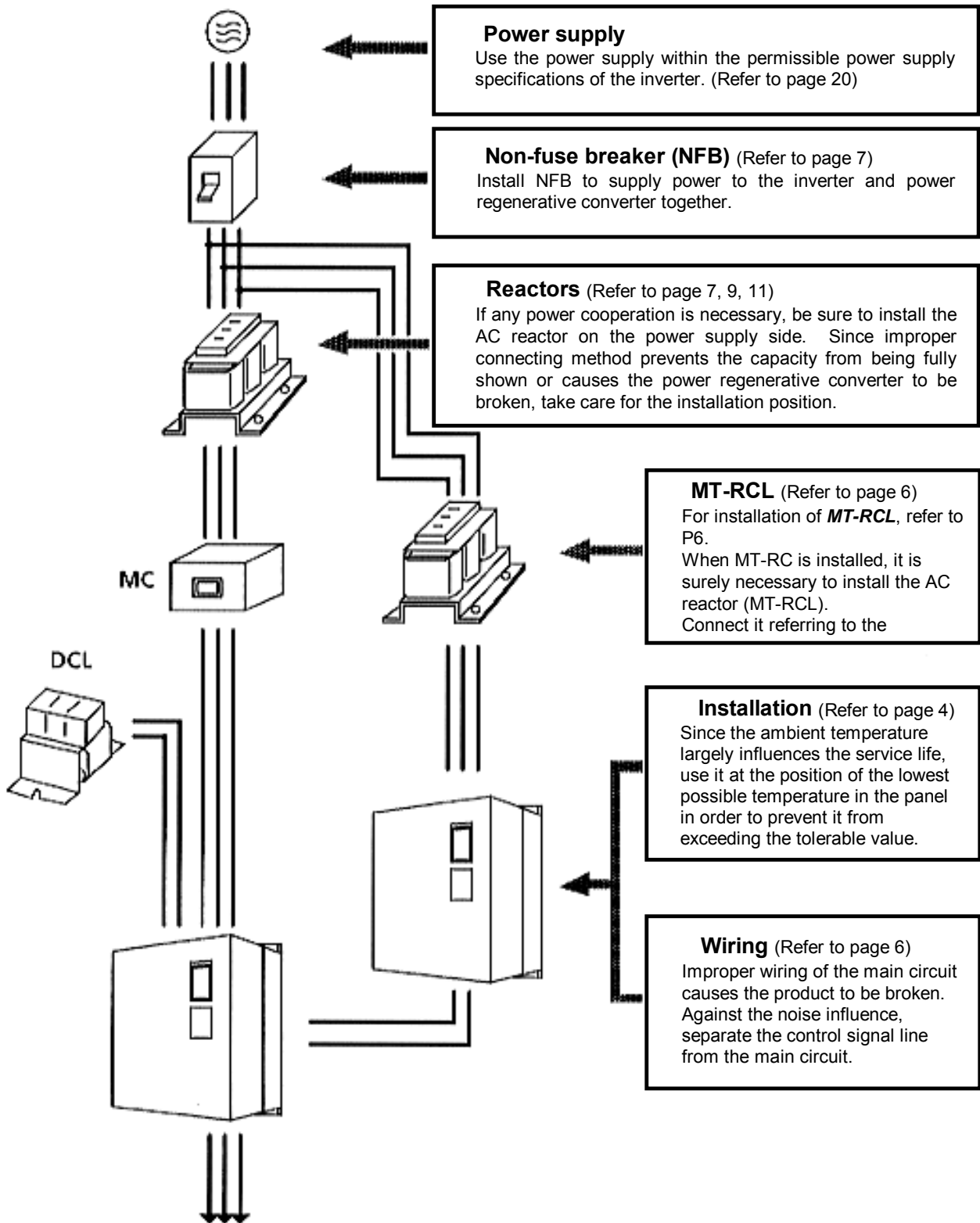
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Operation guide

Incorrect operation can cause the inverter to operate improperly, its life to be reduced considerably and in the worst case, the inverter to be damaged.

Please handle the inverter properly in accordance with the information in each section as well as the precautions and instructions of this manual.



1 Structure

1-1 Appearance and structure

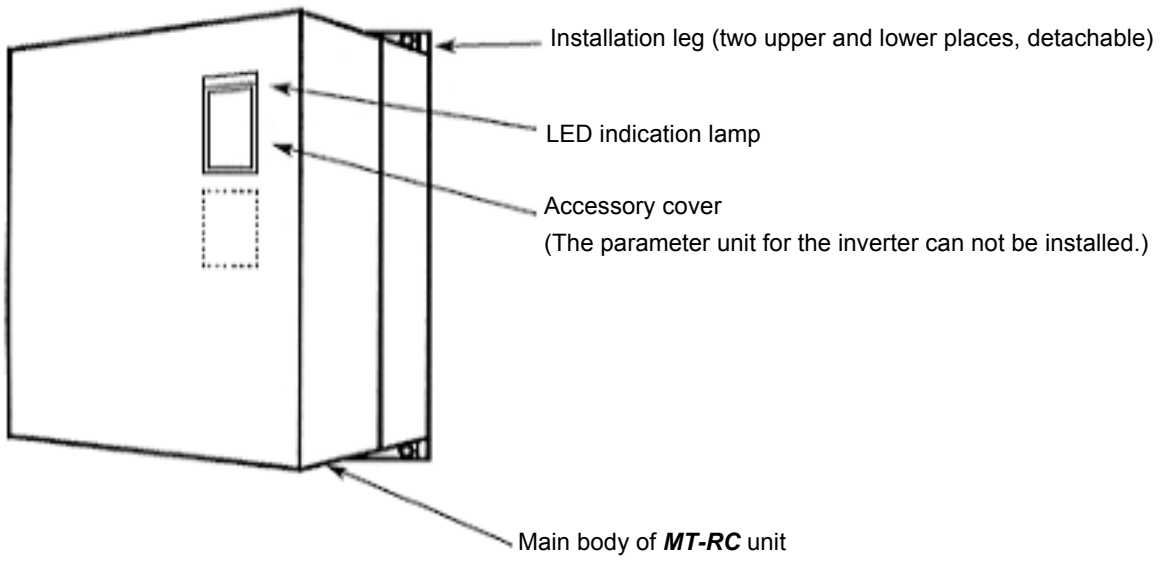


Fig. 1 Product appearance

2 Unpacking inspection

During unpacking inspection, check the following points.

- (1) Checking the rating nameplate on the power regenerative converter, verify that the model is as ordered.
- (2) Check for damage during transportation.
- (3) Verify that the reactor model is as shown below.

Regenerative converter model	<i>MT-RC-H75K</i>	<i>MT-RC-H160K</i>	<i>MT-RC-H220K</i>	<i>MT-RC-H280K</i>
Reactor <i>MT-RCL</i> model	<i>MT-RCL-H75K</i>	<i>MT-RCL-H160K</i>	<i>MT-RCL-H220K</i>	<i>MT-RCL-H280K</i>

If any obscure point or damage is found among the above, contact your dealer or our nearest sales office.

3 Installation

3-1 Transportation

Carefully handle the power regenerative converter against a damage. Here, don't lift it to apply any force to the surface cover alone.

3-2 Installation site

(1) For installation, avoid the following places.

Place exposed to direct sunlight, high temperature or high humidity. Place with oil mist, cotton or dust suspended. Place splashed with water, oil or grinding liquid. Place with falling iron powder. Place with corrosive gas. Place with inflammable gas. Place with vibration applied.

(2) When installing the power regenerative converter in the fully enclosed panel, check whether the cooling system and panel dimensions are sufficiently considered against heating of the converter itself or not.

In addition to the power regenerative converter, it is the important check point the ambient temperature of the inverter installed in the same panel is within the tolerance.

(3) For continuous regenerative operation with the converter installed in the panel, apply the method of Item 3-4.

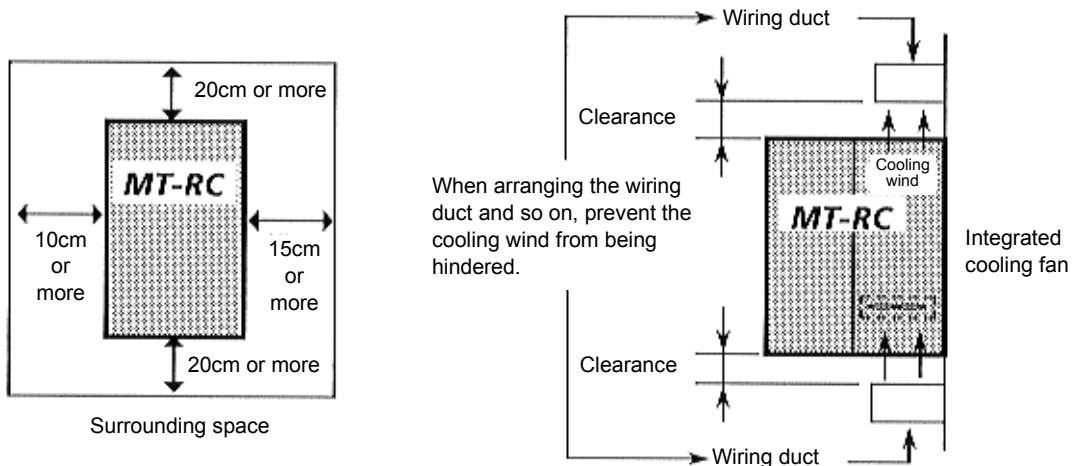
3-3 Installation direction and space

(1) Securely install the converter on the play-free installation surface with the bolts to be vertical (the letters of the model MT-RC on the nameplate is visible from the front).

(2) Since the power regenerative converter generates heat, assure the sufficient surrounding space to prevent the heat from being accumulated.

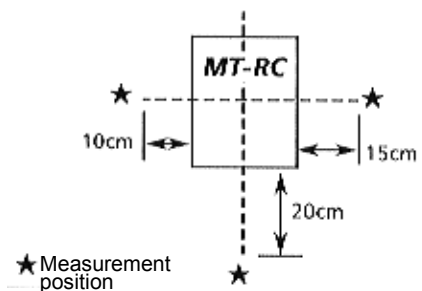
(3) Don't arrange the power regenerative converter and inverter to vertical in line.

(Otherwise, the warmed air will be sucked to cause overheating.)



Cautions for ambient temperature

Since the service life of the product is largely influenced by the ambient temperature, verify that the ambient temperature does not exceed the tolerable value (50°C) after installation in the position shown in the right.



3-4 Removal/installation of heat radiation fin section

If any regenerative state continues long in the winding operation, elevation operation and others in which a minus torque is applied for a long time, the power regenerative converter will generate much heat.

If it is stored in the panel during such operation, the temperature in the panel will excessively rise. Therefore, it is recommended to install the power regenerative converter, exposing the heat radiation section outside as shown in Fig.2.

For this countermeasure, the installation leg can be replaced on the power regenerative converter **MT-RC**.

Preparation

- Produce the holes on the storage panel. For the machining hole dimensions, refer to P23 and P24.
- Reposition the installation leg (at two upper and lower places). Refer to Fig. 3.

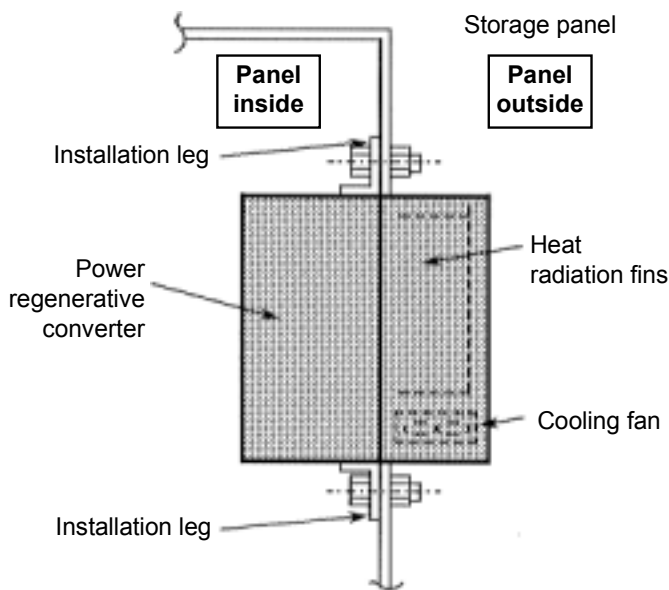


Fig. 2 Method to install the heat radiation section outside the panel

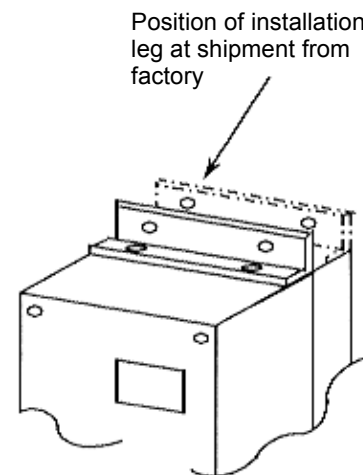
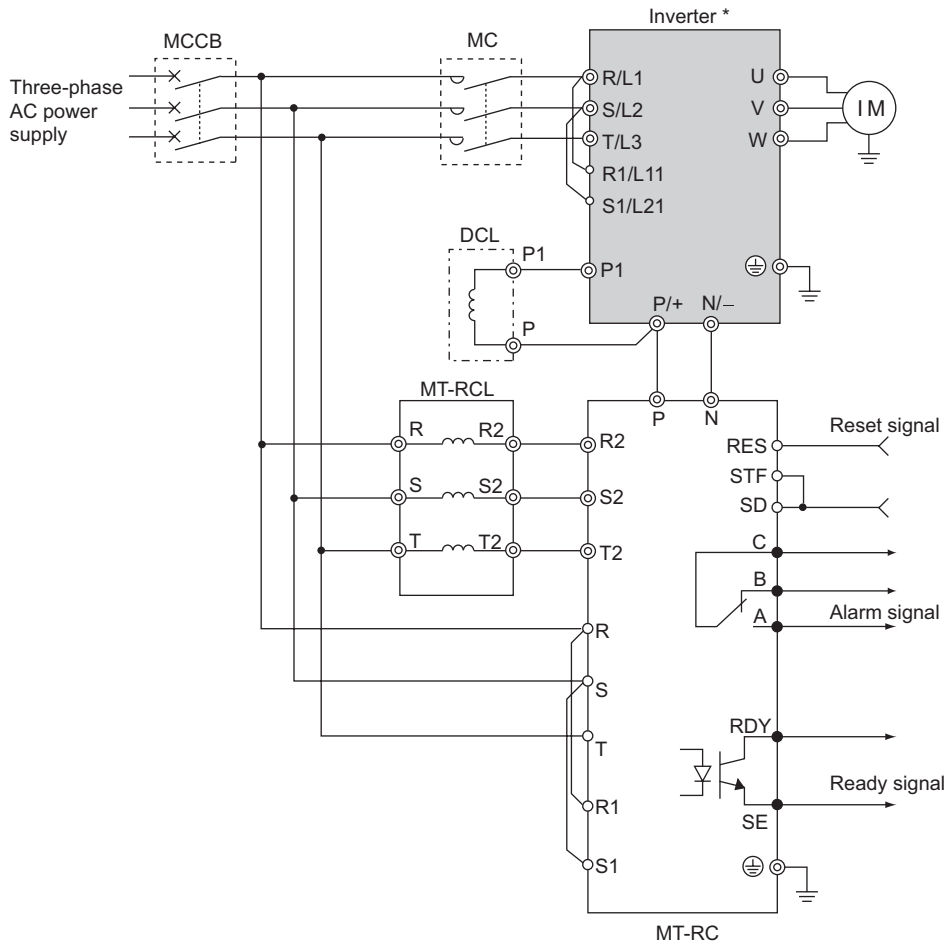


Fig. 3 Reposition of installation leg

Note: The cooling fan is provided in the cooling section which is positioned outside the panel. Moreover, the section installed in the panel and the cooling section are not completely enclosed. Accordingly, don't use it in the poor environments of water drip, oil mist, dust, corrosive gas or similar.

4 Wiring

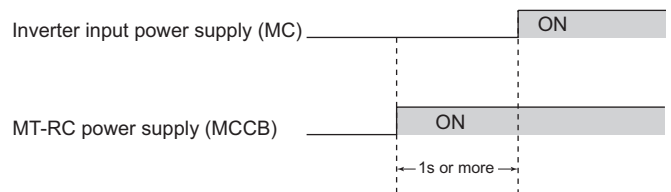
4-1 Terminal connection diagram(The basic connection is shown.)



*Don't use any other converter except MT-A, MT-V, FR-A500L, FR-F500L, and FR-A700, FR-F700 Series.

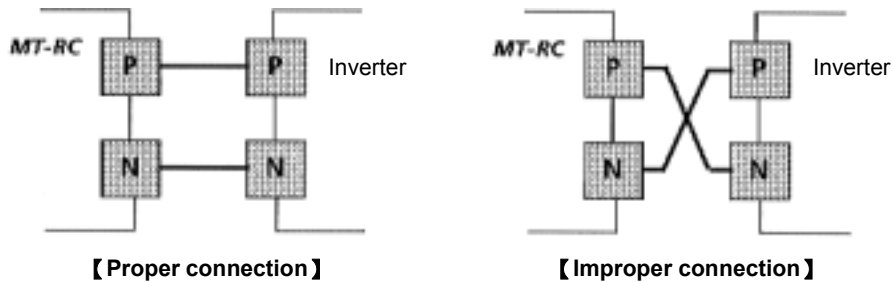
CAUTION

- When using either the FR-A700 series or FR-F700 series with the MT-RC, install a magnetic contactor(MC) at the input side of the inverter and power on the inverter 1s or more after powering on MT-RC. When power is supplied to the inverter before the MT-RC, the inverter and the MT-RC may be damaged or the MCCB may trip or be damaged.



Cautionary items for wiring

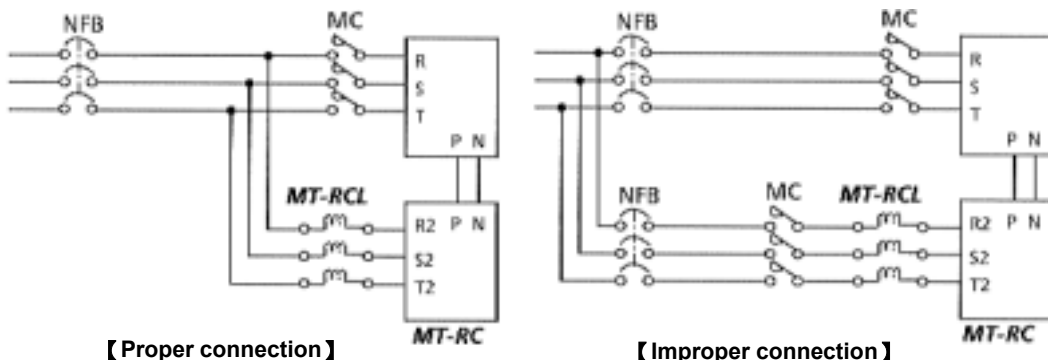
- (1) Properly connect the terminals P and N to the terminals P and N of the inverter.
If they are improperly connected, the power regenerative converter will be broken.



- (2) If the AC reactor MT-BAL for power cooperation is installed, be sure to connect it to the power supply side of the inverter. (Referring to P9, don't improperly connect them.)
- (3) Keep the wiring distance of 5m or less across the terminals P and N of the inverter.
Use the cables of the recommended size or more (Refer to P25).
- (4) Though the common terminals SD and SE of the control circuit are insulated from each other, don't ground them.
- (5) Use the shield cable or twist cable as the connection cables to the terminals of the control circuit, and separate them from the main circuit (power circuit, 200V sequence circuit and so on).
- (6) To surely prevent the wire chips from entering the inside during wiring work, place the cover or similar on the upper vent hole.
- (7) For secure grounding, use the ground terminal.
- (8) Properly connect the terminals R, S and T in the phase order. If they are improperly connected, the power regenerative converter will be broken or the circuit breaker will trip against overcurrent. If it trips against overcurrent, be sure to check whether they are connected in the proper phase order or not before turning ON the power supply again.

Design information

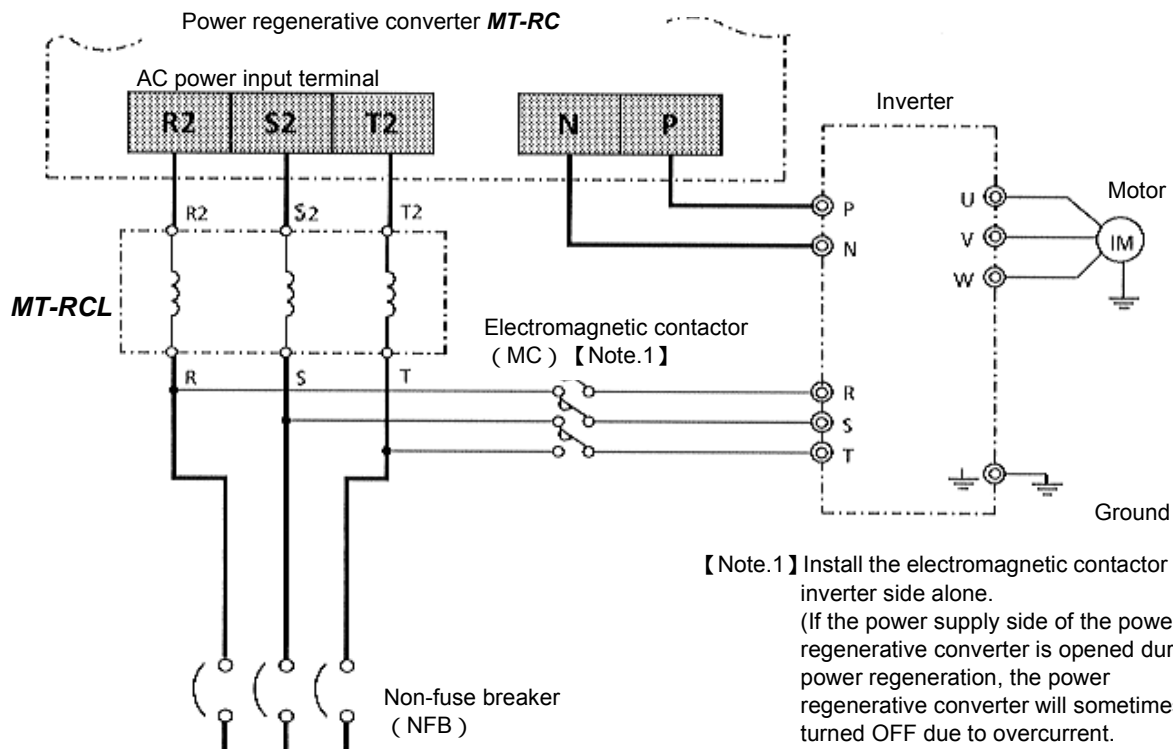
- (1) Arrange NFB and MC to surely make the power regenerative converter previously turned ON when the power supply is turned ON.



- (2) Do not apply a large voltage to the contact input terminals (RES) of the control circuit.
- (3) Do not apply a voltage directly to the alarm output signal terminals (A, B, C).
Always apply a voltage to these terminals via a relay coil, lamp, etc.
- (4) Since the input signals to the control circuit are on a low level, use two parallel micro signal contacts or a twin contact for contact inputs to prevent a contact fault.

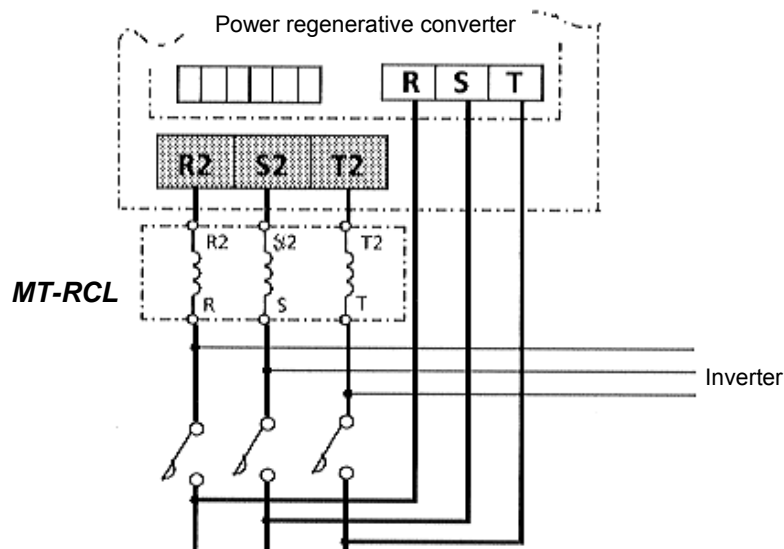
4-2 Main circuit

(1) Connection of power supply and inverter



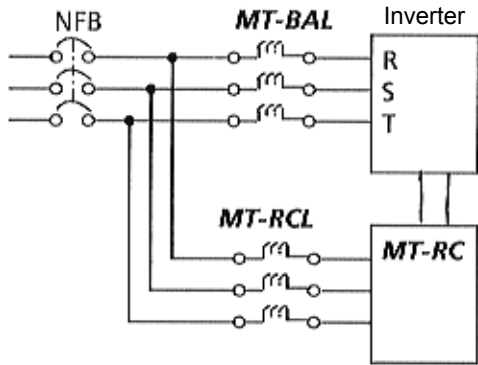
(2) Connection of power supply of control circuit to another power supply

If MC of the power supply is turned OFF when the protective circuit is activated, the power supply of the control circuit will be turned OFF to make it impossible to hold the error signal (relay) and error indication. If it is necessary to hold them, proceed with the following procedure to connect the power supply of the control circuit to another power supply or the primary side of MC.

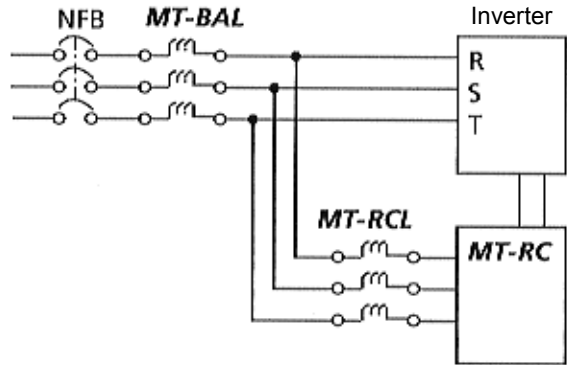


(3) Connection of AC reactor to the power side

Don't install the power cooperation type AC reactor (MT-BAL) on the power supply side of MT-RCL.
 When MT-BAL is installed, apply the following connection.



【 Proper connection 】

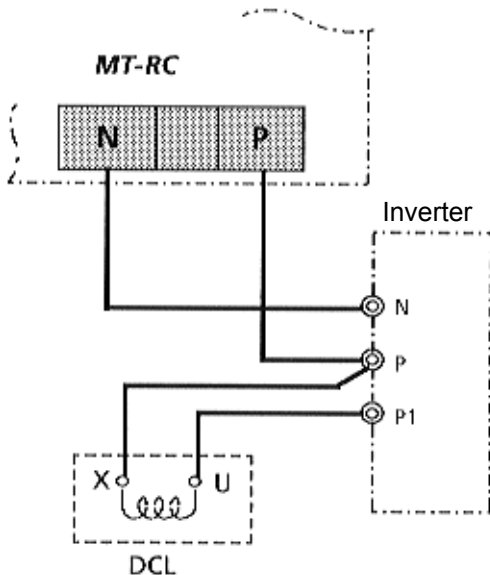


【 Improper connection 】

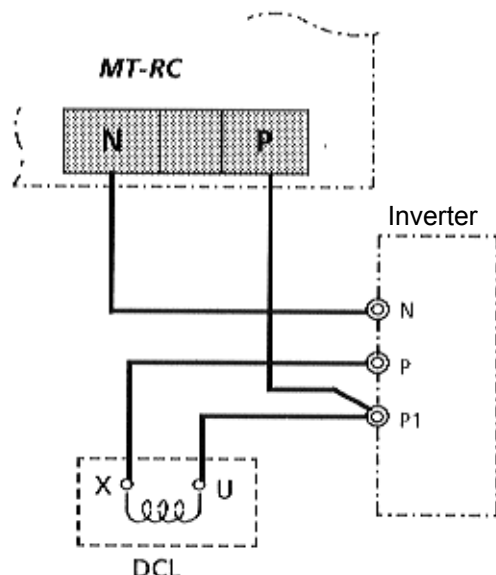
(4) Connection of power-factor improving DC reactor provided on the inverter (Connection to the terminals P thru P1 of the inverter)

For connection, be sure to use the DC reactor which is provided on the inverter.

Connect the terminals P and N of the power regenerative converter to the terminals P and N of the inverter, and the terminals U and X of DCL to the terminals P1 and P without mistake. (Refer to the following figure.)



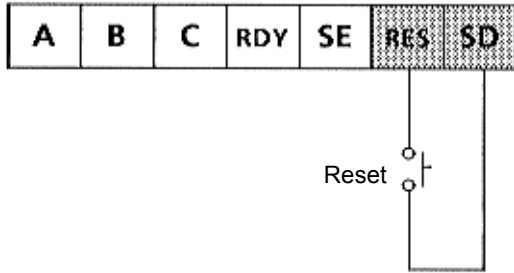
【 Proper connection 】



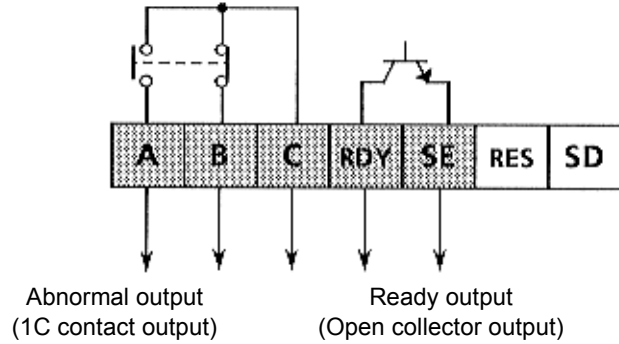
【 Improper connection 】

4-3 Control circuit

(1) Input signal



(2) Output signal

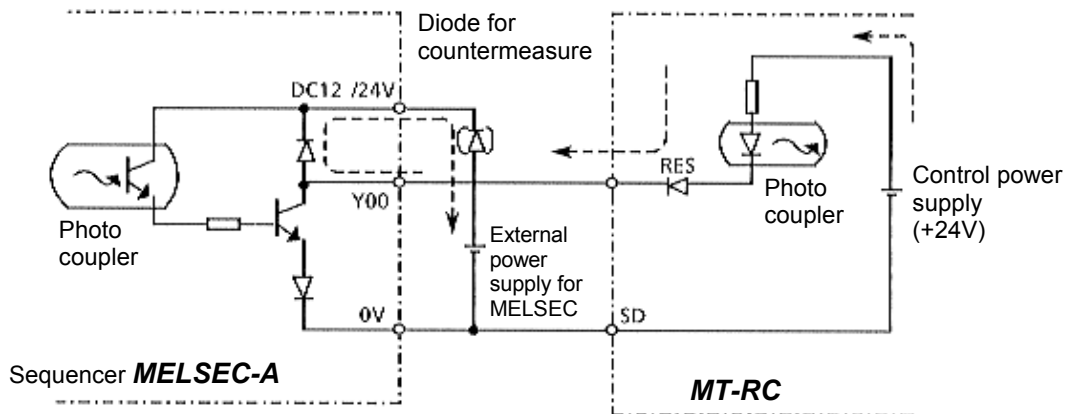


Cautionary items for connection to sequencer

If the control power voltage in the inverter becomes higher than the external power voltage of the sequencer when the sequencer output unit (open collector output) and MT-RC are connected, the dot-lined current will flow to give the command signal to the inverter even though the transistor of the sequencer is not turned ON.

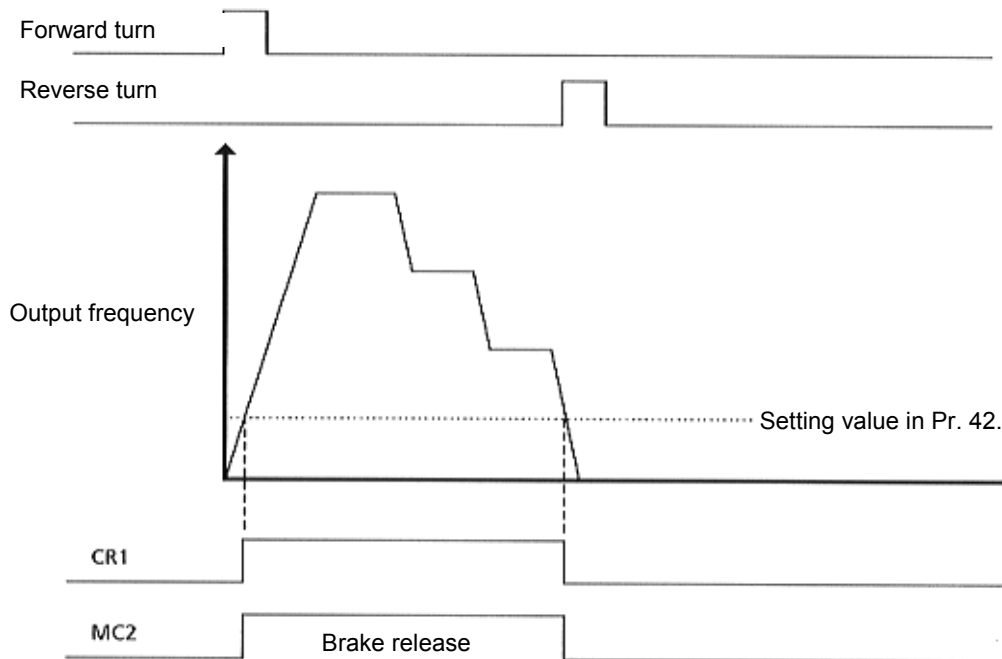
Countermeasure

- (1) Insert the diode which prevents the sneak current.
- (2) Use the output unit of all-point independent type. (Example: AY40A, etc.)
- (3) The external power supply becomes higher than the control power supply of the power regenerative converter.



4-4 Connection example

- (1) Combination of brake motor and power regenerative converter (**MT-RC**) (Application for elevation equipment and so on)
- In combination with the brake motor, it is also applicable for the elevator equipment. It is used in combination with MT-RC type power regenerative converter.
 - Since it sometimes slips down on the elevation equipment at the start time, it is necessary to delay the release timing of the brake. Against such a case, the brake is released with the frequency arrival signal (FU).



Note 1: The AC reactor (**MT-BAL**) for power cooperation is necessary in the following cases.

- The ratio between power capacity and inverter capacity is 10 times or more
- The rectifier load is present in the same power supply.
- The phase-advance capacitor is present in the same power supply.

Note 2: The terminals STF and SD of the power generative converter (**MT-RC**) is normally short-circuited.

Note 3: LS indicates the upper/lower limit switch of the machine.

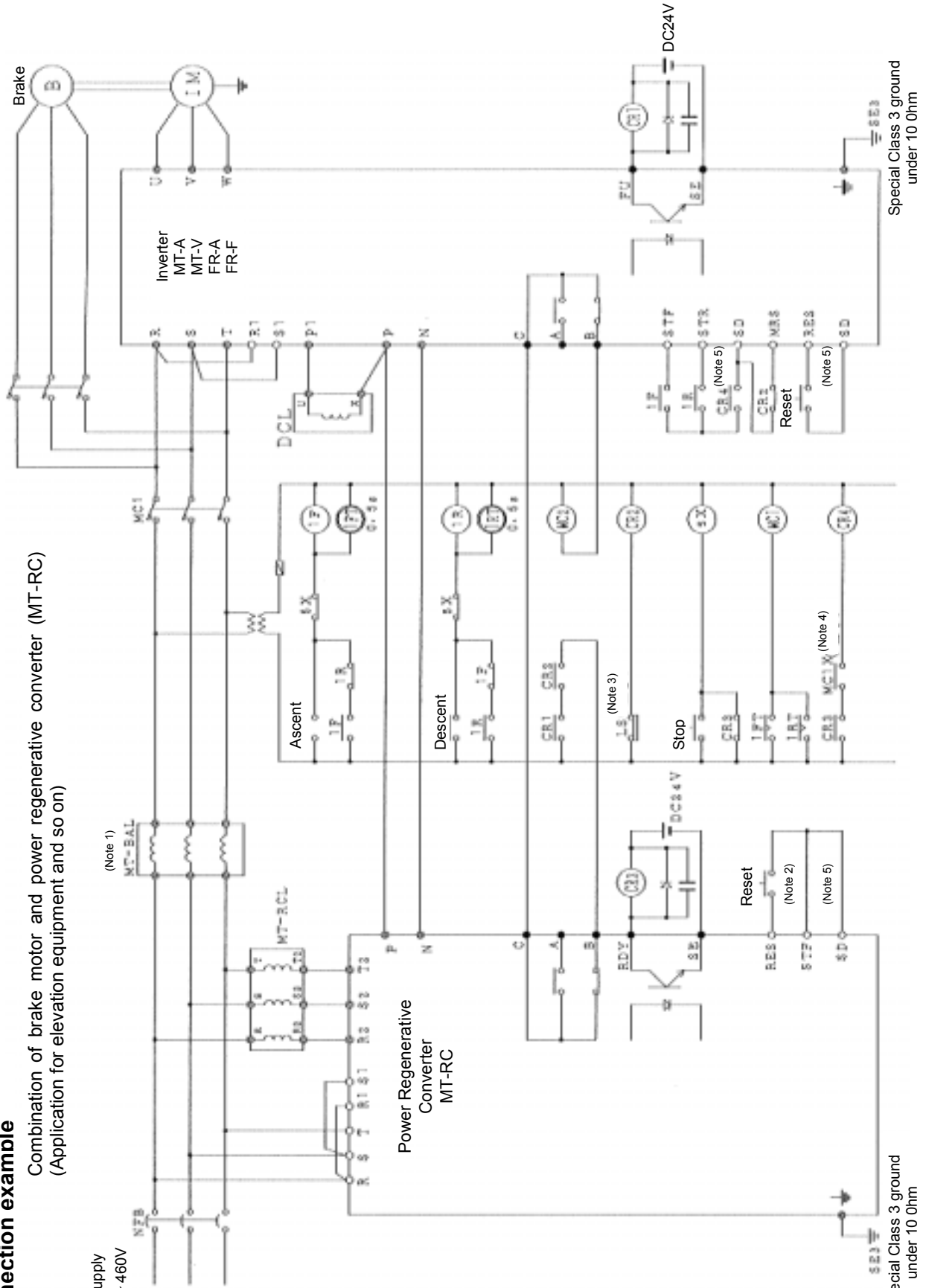
Note 4: MC1X is the auxiliary contact of the contactor MC1.

Note 5: Be sure to separate the SD terminals of the inverter unit and power regenerative converter from each other.

Connection example

Combination of brake motor and power regenerative converter (MT-RC)
(Application for elevation equipment and so on)

Power supply
AC380 ~ 460V



5 Operation

5-1 Inspection before operation

After installation and wiring, check the following before turning ON the power supply.

- (1) Is any error present in the wiring. Is it properly wired particularly on the terminals P and N of the main circuit?
- (2) Is any wire chip left inside after the cable connecting work? Is it also short-circuited with wire chip or similar?
- (3) Is it skipped to fasten any terminal screw, or it is loose?
- (4) Check the phase order of the power supply, and verify that any wrong connection is not present on the power terminals R2, S2 and T2, and the phase power terminal R, S and T.

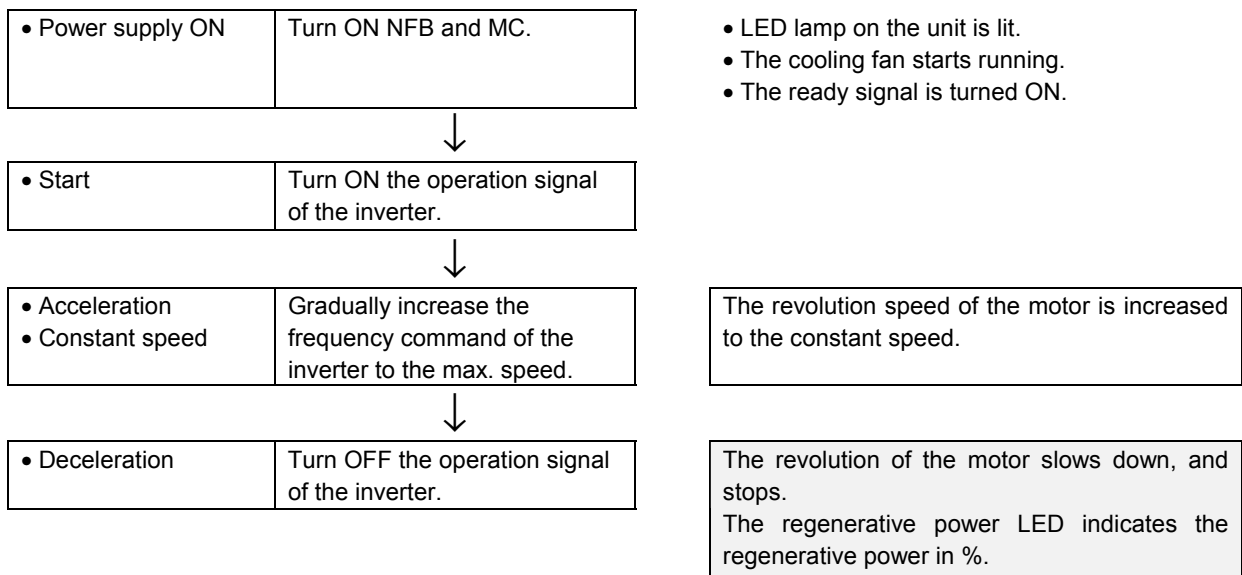
Set the parameters of the inverter to make the power regeneration possible.

- Set "1" at Pr. 30. (Regenerative operation is selected.)
- Set "100" at Pr. 70. (Set the operation rate% ED. Be sure to set "100" when MT-RC is used.)
- Set the motor rating at Pr. 3 and 19. (Excessive excitation is prevented during regeneration.)

5-2 Operation example (Case of load with power running during acceleration and constant speed and regeneration during deceleration)

Preparation

- Turn OFF the start signal of the inverter.
- Zero the signal of the frequency command of the inverter.



→ Check point

• Does the regenerative power LED indicate any proper value?	Since the regenerative operation may not be proper, check the wiring and the constant setting value for the inverter.
• Does the regenerative power indication exceed 100%? The regenerative power indicator (% indication) includes an error of approx. 5%.	If this state continues long, it may trip since the capacity is exceeded.
• Is the trouble indicator lit?	Referring to Item "Protective function", inspect the cause.

6 Precautions for maintenance

The transistorized inverter is a static unit mainly consisting of semiconductor devices. Daily inspection must be performed to prevent any fault from occurring due to adverse influence by the operating environment, such as temperature, humidity, dust, dirt and vibration, changes in the parts with time, service life, and other factors.

6-1 Precautions for maintenance and inspection

Even after the power is shut down, high voltage is charged on the inner electrolytic capacitor for a while. For the inspection, turn OFF the power supply, and wait until the charge lamp on the control board goes out. Using the tester or similar, verify that DC voltage across the terminals P and N is 0V.

6-2 Check items

(1) Daily inspections

Check the following:

- Motor operation fault
- Unusual vibration and noise
- Unusual overheating and discoloration
- Cleaning of filter in the vent section of storage panel
- Improper installation environment

(2) Periodic inspection

Check the areas inaccessible during operation and requiring periodic inspection. For periodic inspection, consult us.

- Screws and bolts
- Conductors and insulating materials: Check for corrosion and damage.
- Cooling fan, smoothing capacitor, relay: Check and change if necessary.
- Cooling system fault

(3) Megger test procedure

- Before the megger test of the power system, disconnect the cable which is connected to the power regenerative converter, in order to prevent the test voltage from being applied.
- Take the megger test of the power regenerative converter itself, keeping the terminal block of the main circuit short-circuited with the procedure in Fig. 4. Here, don't take the megger test of the control circuit.

Note 1: When taking the continuity test of the control circuit, use the tester (in the high-resistance range) but not the megger buzzer.

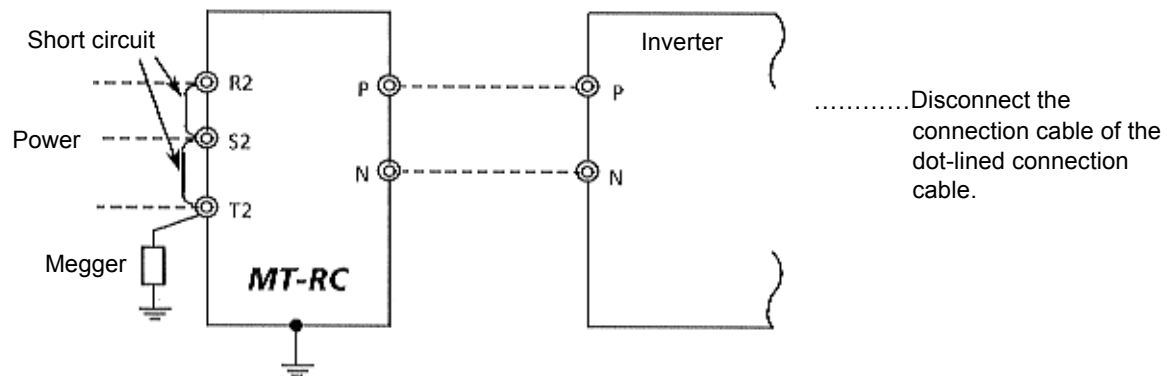


Fig. 4 Megger test procedure

Daily and Periodic Inspection

Area of Inspection	Inspection Item	Description	Interval			Method	Criterion	Instrument
			Daily	Periodic				
				1 year	2 years			
General	Surrounding environment	Check ambient temperature, humidity, dust, dirt, etc.	○			(Refer to page 4)	Ambient temperature: 10°C to + 40°C, non-freezing. Ambient humidity: 90% or less, non-condensing.	Thermometer, hygrometer, recorder
	Overall unit	Check for unusual vibration and noise.	○			Visual and auditory checks.	No fault.	
	Power supply voltage	Check that main circuit voltage is normal.	○			Measure voltage across inverter terminals R2, S2, T2.	323V to 506V 50Hz / 60Hz	Tester, digital multimeter
Main circuit	General	(1) Check with megger (across main circuit terminals and ground terminal). (2) Check for loose screws and bolts. (3) Check for overheating of each part. (4) Clean.		○	○	(1) Disconnect all cables from inverter and measure across terminals R2, S2, T2 and ground terminal with megger. (2) Re-tighten. (3) Visual check.	(1) 5M Ω or more. (2), (3) No fault.	500VDC class megger
	Conductors, cables	(1) Check conductors for distortion. (2) Check cable sheaths for breakage.		○		(1), (2) Visual check.	(1), (2) No fault.	
	Terminal block	Check for damage.		○		Visual check.	No fault	
	IGBT module	Check resistance across terminals.			○	Disconnect cables from inverter and measure across terminals R2, S2, T2, ↔ and P, N with tester range of 1Ω.	(See the following pages)	Analog tester
	Smoothing capacitor	(1) Check for liquid leakage. (2) Check for safety valve projection and bulge. (3) Measure electrostatic capacity.	○			(1), (2) Visual check. (3) Measure with capacity meter.	(1), (2) No fault. (3) 85% or more of rated capacity.	Capacity meter
	Relay	(1) Check for chatter during operation. (2) Check for rough surface on contacts.		○		(1) Auditory check. (2) Visual check.	(1) No fault. (2) No fault.	
	Resistor	(1) Check for crack in resistor insulation. (2) Check for open cable.		○		(1) Visual check. Cement resistor, Wire wound resistor and so on. (2) Disconnect one end and measure with tester.	(1) No fault. (2) Error should be within ±10% of indicated resistance value.	Tester, digital multimeter
Control circuit	Operation check	(1) Perform sequence protective operation test to make sure of no fault in protective and display circuits.		○		(1) Simulatively connect or disconnect inverter protective circuit output terminals.	(1) Fault must occur because of sequence.	Digital multimeter, rectifier type voltmeter
Cooling system	Cooling fan	(1) Check for unusual vibration and noise. (2) Check for loose connection.	○			(1) Turn by hand with power off. (2) Re-tighten	(1) Smooth rotation. (2) No fault.	
Display	Display	(1) Check if LED lamp is blown. (2) Clean.	○			(1) Check that lamps are lit. (2) Clean with rag.		
	Meter	Check that reading is normal.	○			Check reading of meters on panel.	Must satisfy specified and management values.	Voltmeter, ammeter, etc.

6-3 Checking the inverter and converter modules

(1) Preparation

- Disconnect the external power supply cables (R2, S2 and T2) and inverter cables (P, N).
- Prepare a tester. (Use 1Ω range.)

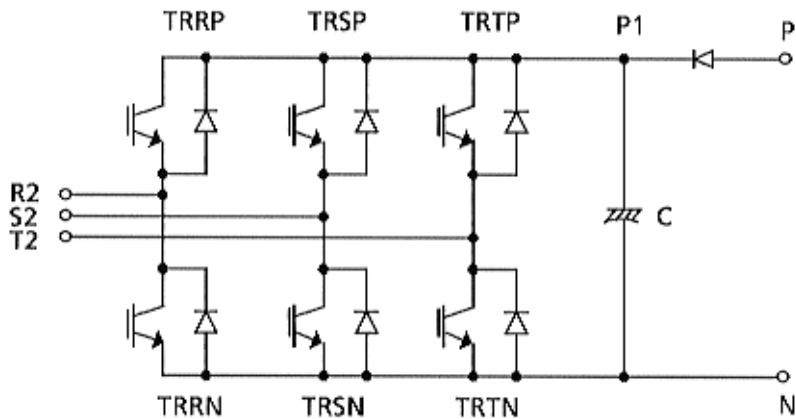
(2) Checking method

Change the polarity of the tester alternately at the inverter terminals R2, S2, T2, P and N, check for continuity.

- Note:1.** Before measurement, check that the smoothing capacitor is discharged.
- 2.** At the time of continuity, the measured value is several to several ten's-of ohms depending on the module type, quantity in parallel, circuit tester type, etc. If all measured values are almost the same, the modules are without fault.

On the model in which plural modules are connected in parallel, it is necessary to disconnect the connection bus cable in order to isolate the defective module.

		Tester Polarity		Measured Value	Tester Polarity		Measured Value	
		+	-		+	-		
IGBT module	TRRP	R2	P1	Discontinuity	TRRN	R2	N	Continuity
		P1	R2	Continuity		N	R2	Discontinuity
	TRSP	S2	P1	Discontinuity	TRSN	S2	N	Continuity
		P1	S2	Continuity		N	S2	Discontinuity
	TRTP	T2	P1	Discontinuity	TRTN	T2	N	Continuity
		P1	T2	Continuity		N	T2	Discontinuity



Module device numbers and terminals to be checked

6-4 Replacement of parts

The inverter consists of many electronic parts such as semiconductor devices.

The following parts may deteriorate with age because of their structures or physical characteristics, leading to reduced performance or failure of the inverter. For preventive maintenance, the parts must be changed periodically.

(1) Cooling fan

The cooling fan cools heat-generating parts such as the main circuit semiconductor devices. The life of the cooling fan bearing is usually 10,000 to 35,000 hours. Hence, the cooling fan must be changed every 2 to 3 years if the inverter is run continuously. When unusual noise and/or vibration is noticed during inspection, the cooling fan must be changed immediately.

(2) Smoothing capacitors

A large-capacity aluminum electrolytic capacitor is used for smoothing the DC in the main circuit, and an aluminum electrolytic capacitor is also used for stabilizing the control power in the control circuit. Their characteristics are adversely affected by ripple current, etc. When the inverter is operated in an ordinary, air-conditioned environment, change the capacitors about every 5 years. When 5 years have elapsed, the capacitors will deteriorate more rapidly.

Check the capacitors at least every year (less than six months if their life will be expired soon).

Check the following:

- 1) Case (side faces and bottom face for expansion)
- 2) Sealing plate (for remarkable warping and extreme cracks)
- 3) Explosion-proof valve (for excessive valve expansion and operation)
- 4) Appearance, external cracks, discoloration, leakage. When the measured capacitance of the capacitor has reduced below 85% of the rating, change the capacitor.
(On the new part, measure and record the capacity across P and N.)

(3) Relays

To prevent a contact fault, etc., relays must be changed according to the number of accumulative switching times (switching life).

See the following table for the inverter parts replacement guide. Lamps and other short-life parts must also be changed during periodic inspection.

Replacement Parts of the Inverter

Part Name	Standard Replacement Interval	Description
Cooling fan	2 to 3 years	Change (as required)
Smoothing capacitor in main circuit	5 years	Change (as required)
Smoothing capacitor on control board	5 years	Change the board (as required)
Relays	——	Change as required

7 Troubleshooting

If any trouble should occur to impair the function of the equipment, isolate the cause and take the remedy referring to the following inspection content.

7-1 Indication and inspection for abnormal stop

The display unit has the following indications in order to inform the causes of abnormal operations.

LED display	Protective function	Operation cause	Check point	Remedy
E. OC2	Overcurrent shut-off	Excessive regenerative current Power failure	Does any load rapidly vary? Is any rapid slowdown operation applied? Does any power failure occur during regenerative operation? Is any phase of power supply in proper order?	Lengthen the slowdown time. Check the phase order, and correct it if improper.
E. OV2	Regenerative overvoltage shut-off	Excessive DC voltage Excessive regenerative power Power failure	Does any load rapidly vary? Is any rapid slowdown operation applied? Does any power failure occur during regenerative operation?	Lengthen the slowdown time.
E. THT	Overload shut-off (Transistor thermal)	Excessive regenerative current (Current flows beyond the specified value for a long time.)	Does any regenerative overload state continue long during operation?	Reduce the load. Change the operation content to shorten the overload time.
E. UVT	Undervoltage protection	Power supply voltage drop	Is there any cause to drop the power supply voltage? (Large-capacity motor start, etc.)	Inspect the power supply capacity and system.
E. GF	Ground fault overcurrent protection on the power supply side	Ground fault on the power supply side	Is any ground fault present on the equipment or cable of power supply side?	Isolate the ground fault place.
E. FIN	Cooling fin overheat protection	Overheat of cooling fin Temperature rise in the unit	Is cooling fin troubled? Is fin or filter clogged?	Inspect and recover cooling fin. Clean fin, filter and other cooling air path.
E. FAN	Cooling fan stop	Overcurrent of cooling fan	Inspect cooling fan.	Inspect and recover cooling fin. Replace cooling fan.

Note: If any above trouble is indicated, the power regenerative converter will stop running. Accordingly, the protective function "overcurrent" or "overvoltage" will be activated also on the inverter side.
To restart the operation, isolate and remove the cause, and reset the system.

7-2 Protective functions

Though the following protective functions are provided for the power regenerative converter to protect itself, it may be activated if any trouble occurs in the power regenerative converter.

Function name	LED display	Content
Overcurrent shut-off	E. OC2	If any regenerative current of the converter unit exceeds approx. 300% of the rated current, the protective circuit will be activated to stop output of the power regenerative converter.
Arm short-circuit	E. ATT E. OC2 Alternate display	The arm short-circuit occurs across P and N of the transistor. Output of the power regenerative converter is stopped.
Regenerative overvoltage shut-off	E. OV2	If any DC voltage of the main circuit in the power regenerative converter exceeds 138% of the rated voltage, the protective circuit will be activated to stop output of the power regenerative converter. It is sometimes activated by the surge voltage which occurs in the power supply system.
Overload shut-off	E. THT	If any current exceeds 100% of the rated output current but the overcurrent shut-off (OC) is not activated, the electronic thermal relay will be activated due to the reverse time properly in order to protect the main circuit transistor, thus stopping output of the power regenerative converter. (Overload suppression 150% 60 seconds)
Undervoltage protection	E. UVT	If any power supply voltage becomes approx. 300VAC or less, output of the power regenerative converter will be stopped.
Ground fault overcurrent protection on the power supply side	E. GF	If any ground fault overcurrent flows because of the ground fault on the power supply side of the power regenerative converter, output of the power regenerative converter will be stopped.
CPU error	E. CPU	If the integrated CPU does not complete its operation within the specified time, it will be self-diagnosed as an error, thus stopping output of the power regenerative converter.
Cooling fin overheat protection	E. FIN	If the cooling fin is overheated since the cooling fin is troubled to stop or the fin is clogged, the thermosensor will be activated to stop output of the power regenerative converter. It will be also activated if the air temperature in the unit rises.
Cooling fan stop	E. FAN	The cooling fan stops due to an abnormality. Output of the power regenerative converter is stopped.

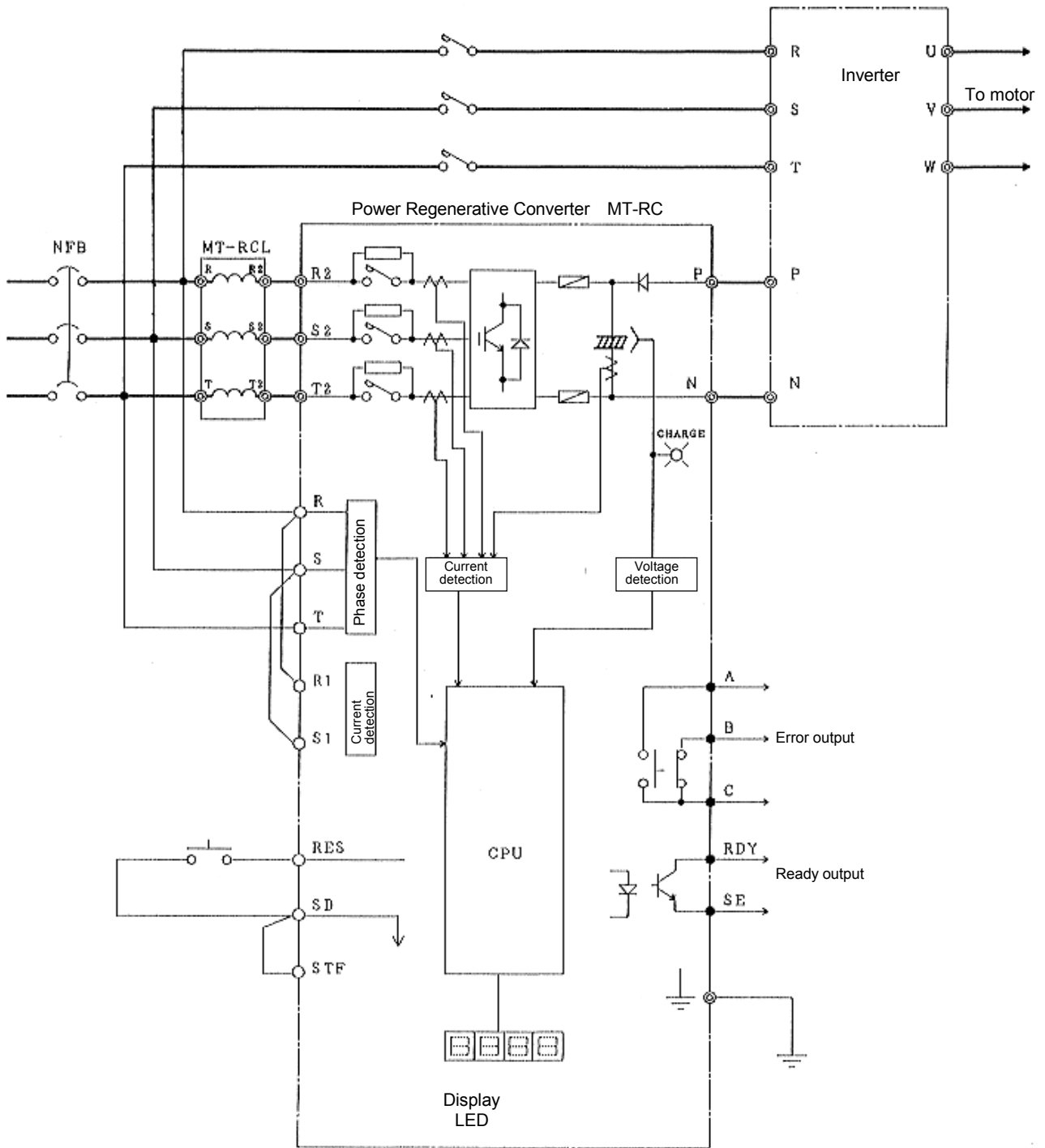
8 Specifications

8-1 Standard specifications


Model MT-RC-		H75K	H160K	H220K	H280K
Rated input power supply voltage/frequency		3-phase 380V to 460V 50/60Hz			
Tolerable voltage fluctuation		323V to 506V 50/60Hz			
Applicable motor capacity		75	90 to 160	185 to 220	250 to 280
Rated current (A) 1		102	218	300	382
Brake torque		Continuous rating : 100% Short-time rating : 150% 60 seconds			
Applicable control unit		MT-A140, A240, A140E, A240E Series, FR-A540L, FR-F540L Series MT-V240 Series			
Input/output signal	Input signal	Reset signal			
	output signal	Ready signal (Open collector), Alarm signal, (1C contact)			
Protective function		Overcurrent shut-off, Arm short-circuit, Regenerative overvoltage shut-off, Overload shut-off, Undervoltage protection, Ground fault overcurrent protection on the power supply side, CPU error, Cooling fin overheat protection, Cooling fan stop			
Display (LED 4-digit display)		% display of regenerative power (including an error of $\pm 5\%$), display of error content			
Ambient temperature		-10°C to + 50°C (non-freezing)			
Ambient humidity		90 % RH or less (non-condensing)			
Storage temperature (JEM1030)		-20°C to + 65°C			
Ambience		Indoors (free from corrosive gas, flammable gas, oil mist, dust and dirt)			
Altitude, vibration		Altitude of 1000m or less, 5.9m/s ² {0.6G} or less (Compliance with JIS C0911)			
Protective structure		Open type (IP00)			
Cooling system (JEM 1030)		Forced air cooling			
AC reactor model (standard accessory) MT-RCL-		H75K	H160K	H220K	H280K

1: The current flows in the AC bus cables (terminals P and N) of the main circuit.

8-2 Block diagram

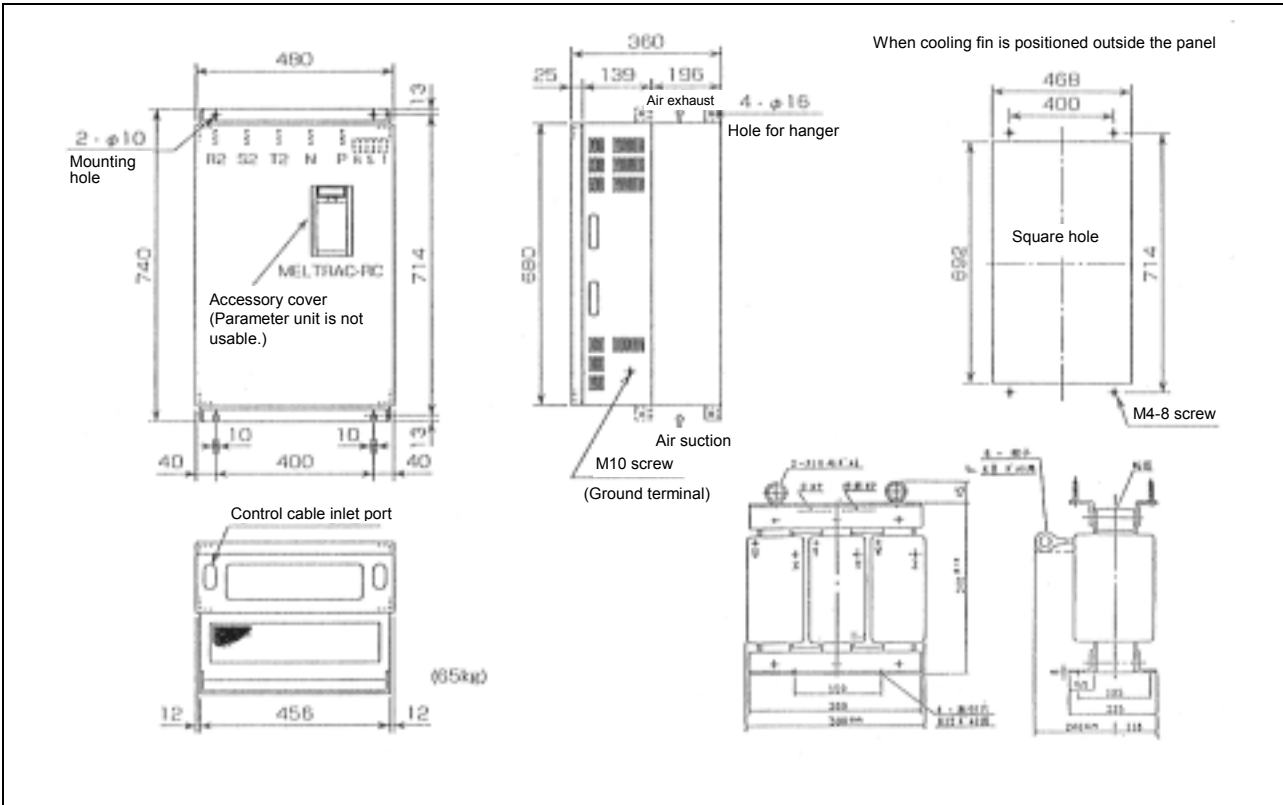


8-3 Terminal specifications

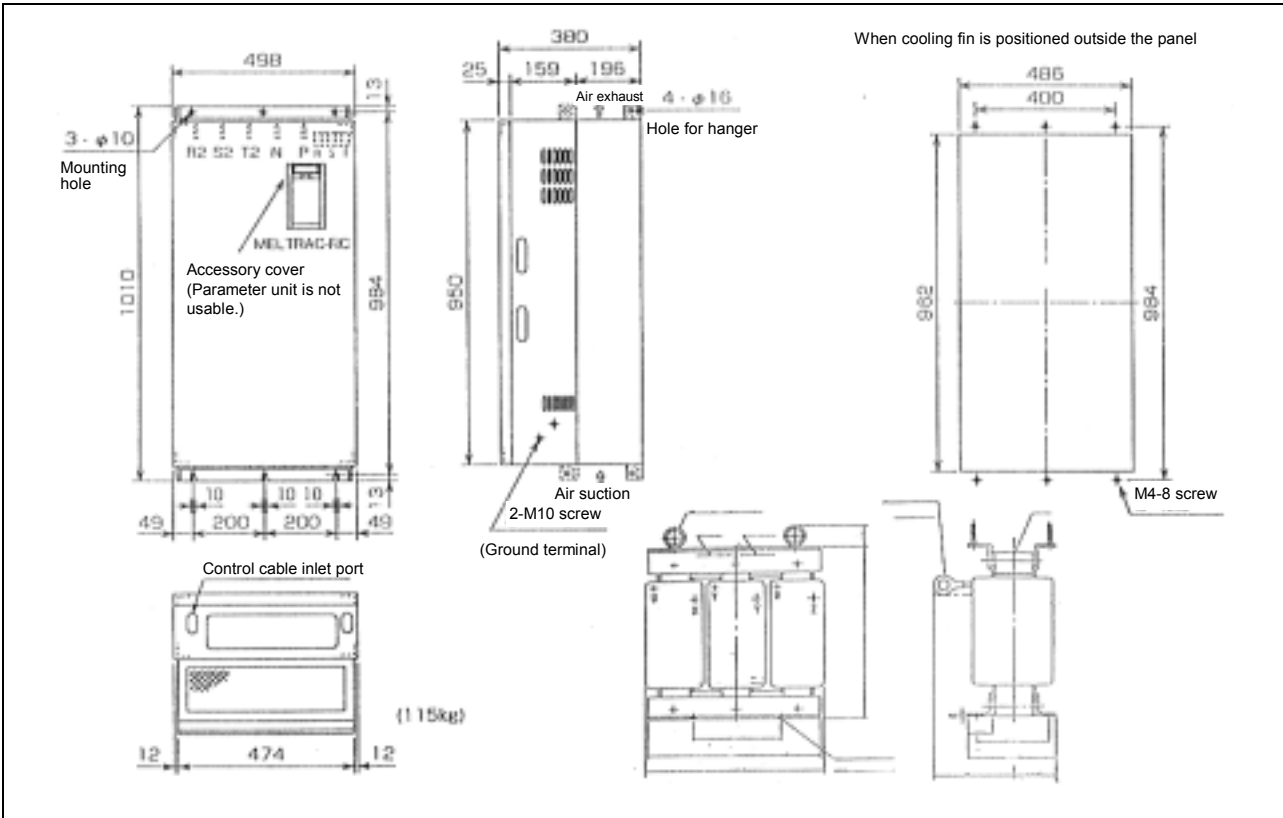
Type	Terminal code	Terminal name	Rating	Content	
Main circuit type	AC reactor	R S T	AC power supply input terminals	3-phase 380V to 460V	Terminals are connected to the same input power of the inverter.
		R2 S2 T2	Power regenerative converter connection terminal	50/60Hz	Terminals are connected to the terminals R2, S2 and T2 of the power regenerative converter.
	Regenerative converter unit	P N	Converter input terminals		Terminals are connected to the terminals P and N of the inverter.
		R2 S2 T2	AC reactor connection terminals		Terminals are connected to the terminals R2, S2 and T2 of the AC reactor.
		R S T	Power phase detection terminals	3-phase 380V to 460V 50/60Hz	Terminals are connected to the same input power of the inverter.
		R1 S1	Power supply terminals for control circuit		Connected to the power phase detection terminals R and S with short bar. To hold the error display, disconnect the short bars and input the power supply from outside.
			Ground terminal		For ground earth
Control circuit type	Regenerative converter unit	STF	Test mode terminal	Input resistor 4.7kΩ	Circuit between terminals STF and SD is normally shorted.
		RES	Reset input terminal	when STF to SD circuit is shorted	The input terminal is used to reset the protected state when the protective circuit is activated. After shorting RES to SD circuit 0.1 second or more, open it, and it will be ready for resetting.
		SD	Contact input common terminal	when RES to SD circuit is shorted DC 4 to 6 mA	
	Regenerative converter unit	A B C	Error output terminal	1C contact 200VAC 0.3A 30VDC 0.3A	Output signal to indicate that the protective circuit is activated. • Normal time B to C : Closed A to C : Open • Abnormal time B to C : Open A to C : Closed
		RDY	Ready output terminal	Tolerable load of open collector output	Output signal indicates that the power regenerative converter is ready for operation.
		SE	RDY common terminal	24VDC 0.1A	L operation when readiness is completed.

9 Dimensional outline drawing

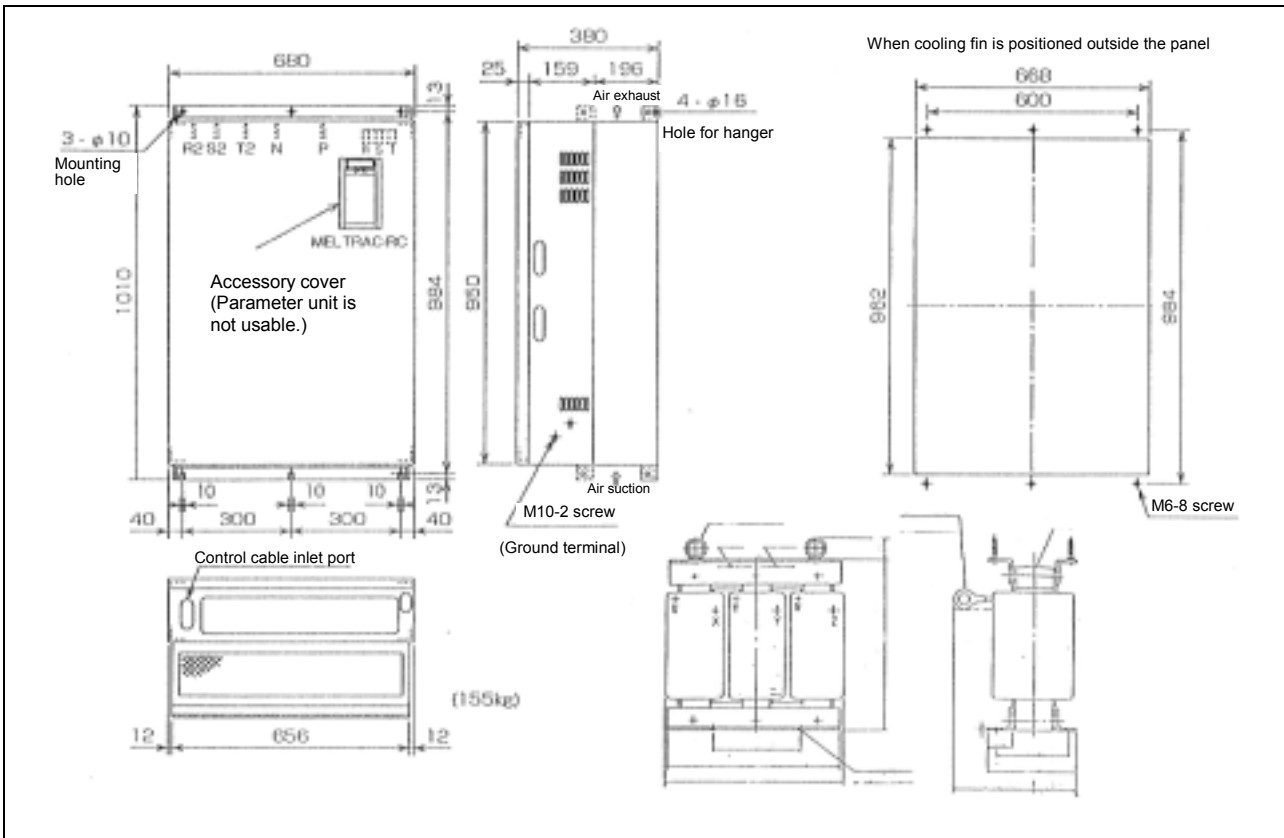
MT-RC-H75K



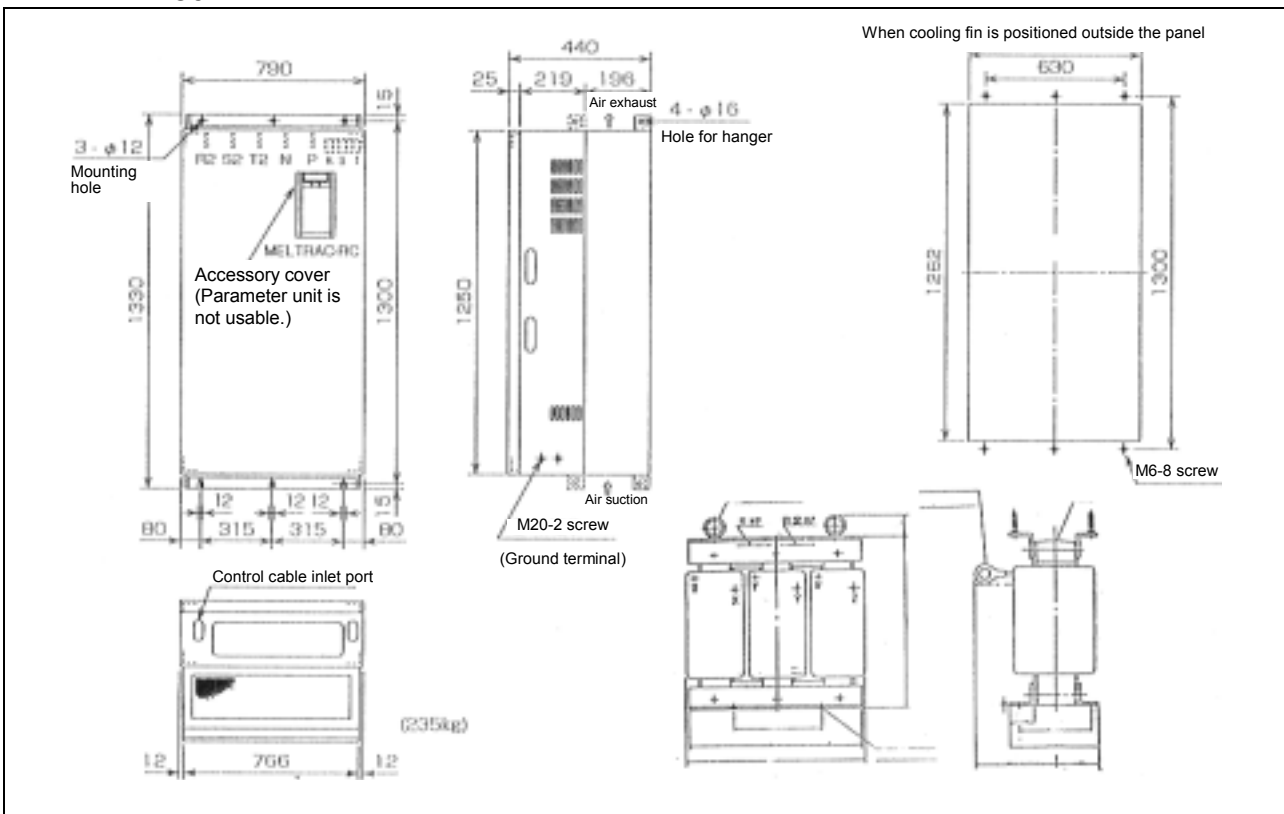
MT-RC-H160K



MT-RC-H220K



MT-RC-H280K



9-1 Selection of peripheral equipment

- (1) Referring to "Instruction Manual for Inverter", select the non-fuse breaker (NFB) and electromagnetic contactor (MC) depending on the capacities of the motor and inverter.
- (2) On the connection cables to the power regenerative converter, select the cable size(mm²) which is larger than specified in the following table.

Model MT-RC	Applicable motor capacity (kW)	Cable size		
		R2/S2/T2	R/S/T	P/N
MT-RC-H75K	75	60	2	60
MT-RC-H160K	90	60	2	80
MT-RC-H160K	110	80	2	100
MT-RC-H160K	132	100	2	100
MT-RC-H160K	150	125	2	150
MT-RC-H160K	160	125	2	2x100
MT-RC-H220K	185	150	2	2x100
MT-RC-H220K	200	2x100	2	2x100
MT-RC-H220K	220	2x100	2	2x100
MT-RC-H280K	250	2x125	2	2x150
MT-RC-H280K	280	2x125	2	2x150

The table is based on the characteristics of the standard motors of Mitsubishi Electric Corp..

- (3) Select MT-BSL and MT-BAL according to the capacity of the inverter.
- (4) Since MT-RCL is attached to MT-RC, be sure to use the attached one.

9-2 Model selection

According to the motor capacity and brake torque strength, select the model as shown in the following table.

- Don't use MT-RC whose capacity is larger than combined in the following table.
(Even if the capacity of MT-RC is increased, the continuous brake torque will not exceed 100% of the motor rating.)

Brake torque (%) for continuous rating (% with the rated torque of the motor regarded as 100%)

Motor capacity (kW)	75	90	110	132	150	160	185	200	220	250	280
Inverter model	75K	110K	110K	160K	160K	160K	220K	220K	220K	280K	280K
MT-RC-H75K	100	80	65	55	50	45	40	35	30	30	25
MT-RC-H160K		100	100	100	100	100	85	80	70	60	55
MT-RC-H220K							100	100	100	85	75
MT-RC-H280K										100	100

