

mitsubishi

**TRANSISTORIZED INVERTER
INSTRUCTION MANUAL**

**HIGH-DUTY BRAKE RESISTOR
FR-ABR(H)**

Thank you for choosing the Mitsubishi transistorized inverter option unit.
This instruction manual gives handling information and precautions for use of this equipment.
Incorrect handling might cause an unexpected fault. Before using the equipment, please read this manual carefully to use the equipment to its optimum.
Please forward this manual to the end user.

Safety Instructions

Do not attempt to install, operate, maintain or inspect this product until you have read through this instruction manual and appended documents carefully and can use the equipment correctly.

Do not use this product until you have a full knowledge of the equipment, safety information and instructions.

In this manual, the safety instruction levels are classified into "WARNING" and "CAUTION".



Denotes that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



Denotes that incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause physical damage only.

Note that even the CAUTION level may lead to a serious consequence under some circumstances. Please follow the instructions of both levels as they are important to personnel safety.

SAFETY INSTRUCTIONS

1. Electric Shock Prevention

WARNING

- Before starting wiring or inspection, switch power off, wait for more than 10 minutes, and check for no residual voltage with a meter etc.
- Any person who is involved in the wiring or inspection of this equipment should be fully competent to do the work.
- Always install the unit before wiring. Not doing so can cause an electric shock or injury.
- Do not subject the cables to scratches, excessive stress, heavy loads or pinching. Doing so can cause an electric shock.

2. Fire Prevention

CAUTION

- Mount the brake resistor on an incombustible surface. Installing it directly on or near a combustible surface could cause a fire.
- Use the alarm signal to switch power off. A failure to do so can overheat the brake resistor due to a brake transistor failure etc., causing a fire.
- Do not connect the resistor directly to the DC terminals P (+), N (-). This could cause a fire.

3. Injury Prevention

CAUTION

- Ensure that the cables are connected to the correct terminals. Otherwise, damage, etc. may occur.
- While power is on or for some time after power-off, do not touch the brake resistor as it is hot. Touching it can cause burns.

4. Additional Instructions

Also note the following points to prevent an accidental failure, injury, electric shock, etc.:

(1) Transportation and installation

 CAUTION

- Transport products in a correct manner according to their weights. Not doing so can cause injury.
- Do not stack product boxes higher than the number recommended.
- Install the product in a place secure enough to withstand its weight according to the instruction manual.
- Do not stand or rest heavy objects on the product.

(2) Usage

 WARNING

- Do not modify the equipment.

(3) Emergency stop

 CAUTION

- Provide a safety backup such as an emergency brake which will prevent the machine and equipment from hazardous conditions if the inverter fails.

(4) Maintenance, inspection and parts replacement

 CAUTION

- Do not carry out a megger test (insulation resistance measurement) on the control circuit of the inverter.

(5) Disposal

 CAUTION

- Dispose of this product as general industrial waste.

(6) General instructions

Many of the diagrams and drawings in this instruction manual show the inverter without a cover, or partially open. Never run the inverter like this. Always replace the cover and follow the instruction manual when operating the inverter.

1. CHECKING THE MODEL AND APPLICABLE INVERTERS

Take the option unit out of the package and confirm that the product is as you ordered and intact.

This product may be used with the following inverters:

1.1 Applicable Inverters

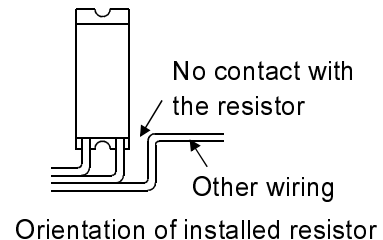
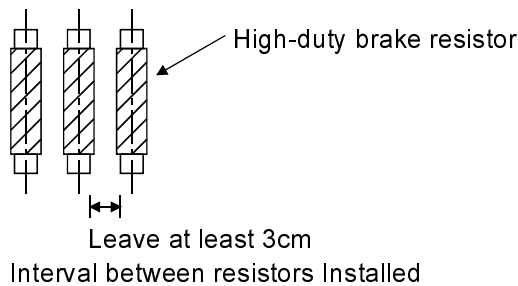
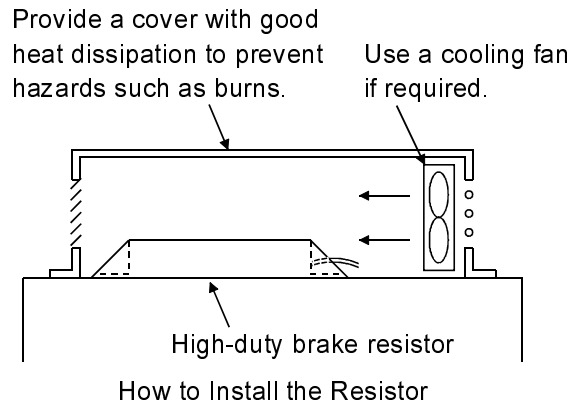
High-Duty Brake Resistor Model		Applicable Inverter Models
200V Class	FR-ABR-0.4K	FR-A520-0.4K(-NA), FR-E520(S)-0.4K(C)(-NA),FR-E510W-0.4K FR-A220(E)-0.4K(-UL)
	FR-ABR-0.75K	FR-A520-0.75K(-NA) FR-E520(S)-0.75K(C)(-NA),FR-E510W-0.75K FR-A220(E)-0.75K(-UL)
	FR-ABR-2.2K	FR-A520-1.5K(-NA), FR-A520-2.2K(-NA) FR-E520-1.5K(C)(-NA), FR-E520-2.2K(C)(-NA) FR-A220(E)-1.5K(-UL), FR-A220(E)-2.2K(-UL) FR-V220E-1.5K, FR-V220E-2.2K
	FR-ABR-3.7K	FR-A520-3.7K(-NA) FR-E520-3.7K(C)(-NA) FR-A220(E)-3.7K(-UL) FR-V220E-3.7K
	FR-ABR-5.5K	FR-A520-5.5K(-NA) FR-E520-5.5K(C)(-NA) FR-A220(E)-5.5K(-UL) FR-V220(E)-5.5K
	FR-ABR-7.5K	FR-A520-7.5K(-NA) FR-E520-7.5K(C)(-NA) FR-A220(E)-7.5K(-UL) FR-V220E-7.5K
400V Class	FR-ABR-H0.4K	FR-A540-0.4K(-NA)(-EC) FR-A240(E)-0.4K(-UL)
	FR-ABR-H0.75K	FR-A540-0.75K(-NA)(-EC) FR-A240(E)-0.75K(-UL)
	FR-ABR-H1.5K	FR-A540-1.5K(-NA)(-EC) FR-A240(E)-1.5K(-UL) FR-V240E-1.5K
	FR-ABR-H2.2K	FR-A540-2.2K(-NA)(-EC) FR-A240(E)-2.2K(-UL) FR-V240E-2.2K
	FR-ABR-H3.7K	FR-A540-3.7K(-NA)(-EC) FR-A240(E)-3.7K(-UL) FR-V240E-3.7K
	FR-ABR-H5.5K	FR-A540-5.5K(-NA)(-EC) FR-A240(E)-5.5K(-UL) FR-V240E-5.5K
	FR-ABR-H7.5K	FR-A540-7.5K(-NA)(-EC) FR-A240(E)-7.5K(-UL) FR-V240E-7.5K

2. INSTRUCTIONS FOR INSTALLATION

- Never mount the resistor on or near wood, paper or any other combustible surface or material. Doing so can cause a fire.
- To prevent burns, do not install the resistor in a place where it is readily accessible. If it is easily accessible, mount a well-ventilated protective cover (e.g. punched metal).
- Mount the resistor carefully so that the leads do not come out of the top of the resistor.
- Avoid contact with the resistor when running the leads of the resistor and any other wiring.

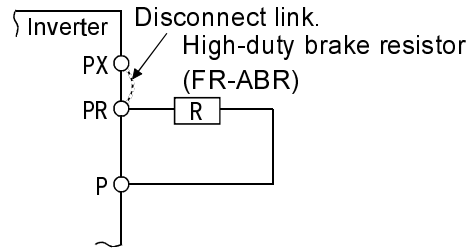
Install the resistor in a place with good heat dissipation. The reason for this is that the surface temperature of the resistor may exceed 300°C in an operation pattern where the resistor is used frequently.

To increase the heat dissipation effect, we recommended you to install the resistor on a metal surface outside the enclosure.



3. INSTRUCTIONS FOR WIRING

- Remove the link from across the PR-PX terminals of the inverter. This disables (switches off) the built-in brake resistor. Note that the built-in brake resistor need not be removed. The leads of the built-in brake resistor need not be disconnected from the terminals.
- Connect the leads of the high-duty brake resistor to the P and PR terminals of the inverter.



Note 1: The high-duty brake resistor cannot be used with a brake unit, high power factor converter, power return converter, built-in brake etc.

Note 2: Twist the leads of the high-duty brake resistor when increasing their length 2m or more. (The wire size used should be 2mm² or more.)

Note that even the twisted leads cannot be made longer than 5m. Doing so can cause an inverter failure.

4. INSTRUCTIONS FOR USE

- Setting of inverter parameters

1) Set "1" in Pr. 30 and "10" in Pr. 70.

(For full information, refer to the instruction manual of the inverter.)

5. SPECIFICATIONS

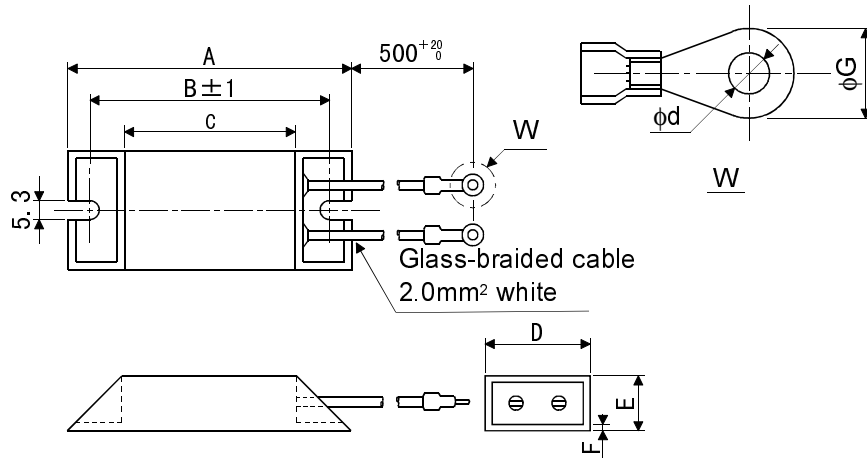
1) Permissible duty and torque

Item	FR-ABR-□ (200V Class)							FR-ABR-H□ (400V Class)						
	0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K	0.4K	0.75K	1.5K	2.2K	3.7K	5.5K	7.5K
Braking torque	150% 5 seconds			100% 5 seconds				100% 5 seconds						
Permissible duty*	10%ED							10%ED						

*The permissible duty represents the braking capability including the motor loss.

The actual duty of the resistor is slightly lower than that.

6. OUTLINE DIMENSIONS



Brake Resistor Model		Dimensions (Unit: mm)						Resistance (Ω)	Crimping Terminal (Unit: mm)		
		A	B	C	D	E	F		G	d	Screw Size
200V Class	FR-ABR-0.4K	140	125	100	40	20	2.5	200	7.0	4.3	M4
	FR-ABR-0.75K	215	200	175	40	20	2.5				
	FR-ABR-2.2K*	240	225	200	50	25	2.0				
	FR-ABR-3.7K	215	200	175	60	30	2.5	40			
	FR-ABR-5.5K	335	320	295	60	30	2.5				
	FR-ABR-7.5K	400	385	360	80	40	2.5				
400V Class	FR-ABR-H0.4K	115	100	75	40	20	2.5	1200	7.0	4.3	M4
	FR-ABR-H0.75K	140	125	100	40	20	2.5				
	FR-ABR-H1.5K	215	200	175	40	20	2.5				
	FR-ABR-H2.2K	240	225	200	50	25	2.0	250			
	FR-ABR-H3.7K	215	200	175	60	30	2.5				
	FR-ABR-H5.5K	335	320	295	60	30	2.5				
	FR-ABR-H7.5K	400	385	360	80	40	2.5	75			

*Used for 1.5K and 2.2K.

7. BRAKING CAPABILITIES

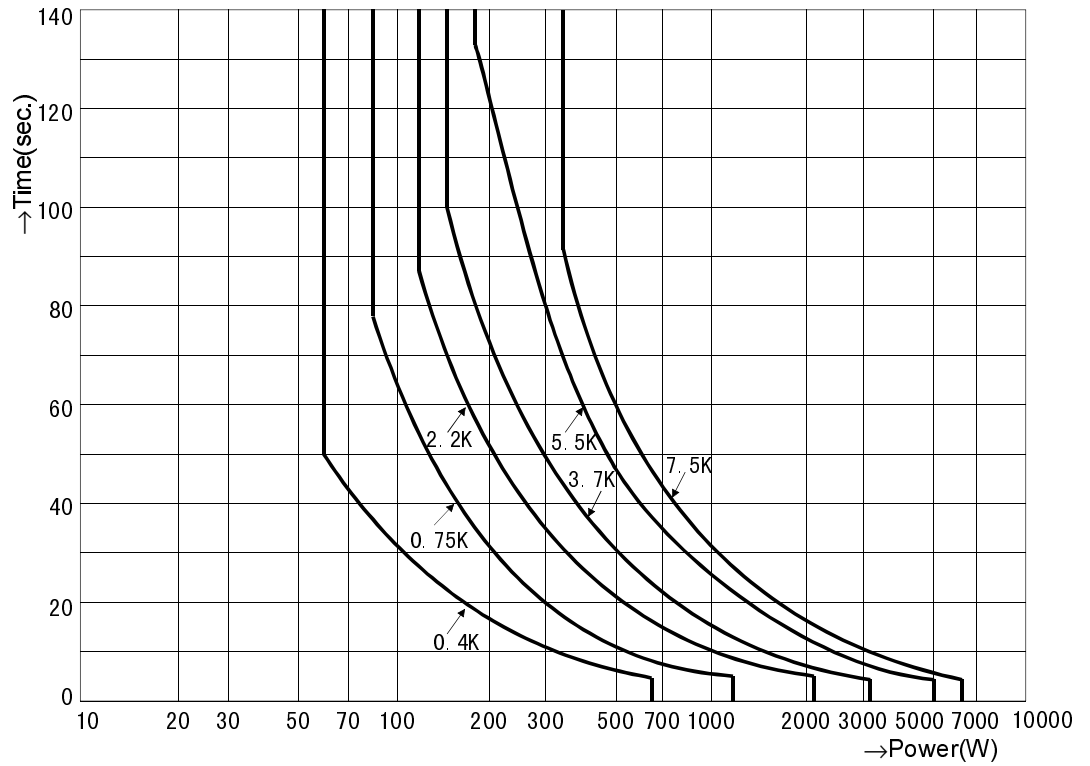
7.1 Continuous Permissible Power

200V Class	Model	Resistance	Continuous Permissible Power
	FR-ABR-0.4K	200Ω	60W
	FR-ABR-0.75K	100Ω	80W
	FR-ABR-2.2K	60Ω	120W
	FR-ABR-3.7K	40Ω	155W
	FR-ABR-5.5K	25Ω	185W
	FR-ABR-7.5K	20Ω	340W

400V Class	Model	Resistance	Continuous Permissible Power
	FR-ABR-H0.4K	1200Ω	45W
	FR-ABR-H0.75K	700Ω	75W
	FR-ABR-H1.5K	350Ω	115W
	FR-ABR-H2.2K	250Ω	120W
	FR-ABR-H3.7K	150Ω	155W
	FR-ABR-H5.5K	110Ω	185W
	FR-ABR-H7.5K	75Ω	340W

7.2 Short-Duration Permissible Power per Braking

● 200V Class



● 400V Class

