MITSUBISHI

FOR MITSUBISHI FREQROL-A500L SERIES INVERTER

This compact and high-performance brake unit ensures operator safety

Brake Unit
MT-BU5
Brake Resistor
MT-BR5

INSTRUCTION MANUAL

IB-T7238

MT-BU5 Brake Unit and MT-BR5 Brake Resistor

Use MT-BU5 Brake Unit and MT-BR5 brake resistor in combination with Mitsubishi FREQROL-A500L series general-purpose inverter. The combination of these units will consume the regenerative energy of the motor thermally, and as a result, the motor braking capability will be enhanced. If your machine needs a large braking torque to prevent the motor from being unnecessarily rotated by the load or to reduce speed immediately, Please use our brake unit and resistor.

■Features

1. Greatly upgraded braking capability

The brake unit and resistor ensure excellent braking capability even during frequent use of the brake. This is because the allowable operation rate (% ED) for a rated short-time operation is very large (10% ED at 100% torque) when the motor has the same capacity as the brake unit.

2. Various capacities

There are various types of the brake units and re-resistors, such as 75k to 375k brake units and resistors for a rated power supply of 400V.

3. Easy wiring

Wiring is very easy because the cables necessary to connect the brake unit to the inverter unit are already connected to the brake unit before shipment.

4. Easy operation

The monitor function of the inverter unit enables you to check the brake operation rate during operation.

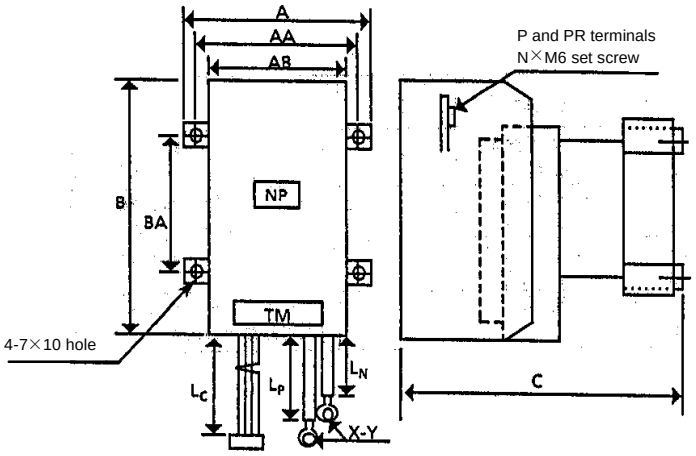
■Specifications

Brake Unit		—(Note.1)	—(Note.1)	MT-BU5-H75K	MT-BU5-H150K	MT-BU5-H220K	MT-BU5-H280K	MT-BU5-H375K
Brake Resistor		—(Note.1)	—(Note.1)	1×MT-BR5-H75K	2×MT-BR5-H75K	3×MT-BR5-H75K	4×MT-BR5-H75K	5×MT-BR5-H75K
Resistor		—	—	6.5 Ω	6.5 Ω/2P	6.5 Ω/3P	6.5 Ω/4P	6.5 Ω/5P
DC input voltage		200V Type Less than 400V DC		400V Type Less than 800V DC				
Capacity of applicable motor		The braking torque and operation rate (% ED)depends on the capacity of the motor which is combined with the brake unit.						
Braking torque		The braking torque depends on the capacity of the motor which is combined with the brake unit and the rated time (short or continuous time).						
Operation rate(% ED)		The rated time depends on the capacity of the motor which is combined with the brake unit and on the braking torque.						
Applicable control unit		Mitsubishi general-purpose FR-A500L series inverters.						
Output signal		Resistor overheat (1a) The brake resistor mounts the output signal.						
Protective function		Fin and resistor overheat preventive functions						
Display		Braking torque operation rate (%ED) and fault (displayed on the inverter unit main body)						
Ambient conditions	Ambient temperature	-10ºC～+50ºC						
	Ambient humldlty	90% RH or less						
	Storage temperature	-20ºC～+65ºC						
	Ambient atmosphere	Indoors: No corrosive gas, oil mist, flammable gas, dust, or dirt						
	Altitude and vibration	1,000m above sea level or less, 5.9m/s^2 (.06G) or less (in accordance with JIS C0911)						
Protective structure (JEM1030)		Open type (IP00)						
Cooling method		Forced air cooling						

(Note.1) Development stages.
(Note.2) Select the optimum brake unit and brake unit and brake resistor by referring to the combination table.

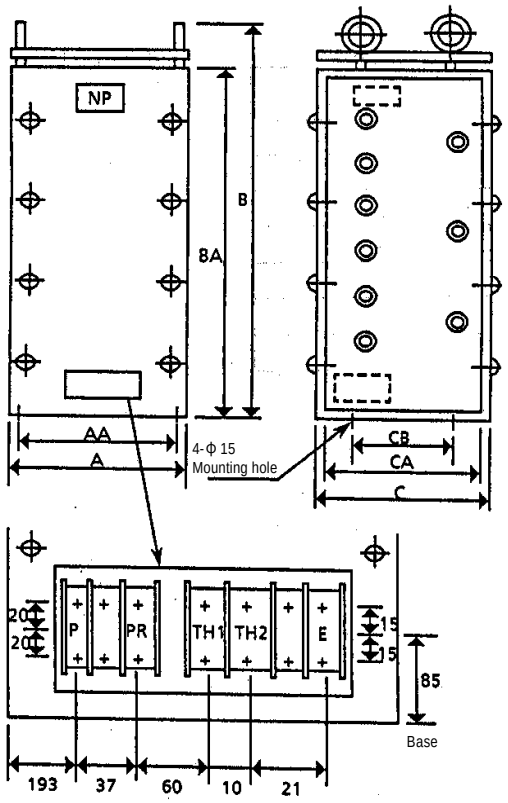
■Outline Dimensions

Brake unit



Brake unit model		A	AA	AB	B	BA	C	L_C	L_P	L_N	N	Approx. weight	X	Y
200V	-	118	102	85	200	100	256.5	-	-	-	1	1.5	-	-
	-	188	172	155	200	100	256.5	-	-	-	2	3.0	-	-
400V	MT-BU5-H75K	118	102	90	200	100	256.5	550	1740	1740	1	1.5	14	12
	MT-BU5-H150K	188	172	160	200	100	256.5	550	2000	2000	2	3.0	22	12
	MT-BU5-H220K	258	242	230	200	100	256.5	550	2000	2000	3	4.5	38	12
	MT-BU5-H280K	328	312	300	200	100	256.5	550	2330	2330	4	6.0	60	12
	MT-BU5-H375K	398	382	370	200	100	256.5	550	2330	2330	5	7.5	60	12

Brake resistor



(Note1) Install the brake resistor in a well-ventilated area, If the resistor brake is installed in uneasily-heated area, such as inside the panel, be sure to ventilate the inside of the panel.

(Note2) The brake resistor temperature rises to 300deg. Therefore connect the cables carefully so that no cables come into contact with the resistor. Keep parts not resistant to heat 40 to 50 cm away from the resistor.

(Note3) If the operation rate of the brake unit exceeds the specified value, the resistor temperature will rise excessively. If this occurs turn off the input power of the inverter to protect the brake resistor from overheating.

※The resistor is equipped with an overheating prevention thermostat (a-contact).

If the thermostat is activated during normal operation, the inverter slow-down time will be too short. Prolong the set slow-down time.

Brake unit model		A	AA	B	BA	C	CA	CB	Resistor	Weight
200V	-	-	-	-	-	-	-	-	-	-
400V	MT-BR5-H75K	510	480	885	800	465	450	300	6.5 Ω	70 kg

■Terminals

Brake unit

Terminal		Terminal name	Rating	Description
Main circuit	P	Brake resistor terminal set	-	This is the terminal to connect to the brake resistor. Some brake unit have two or more brake resistor terminal sets to that two or more resistors can be connected to the brake unit.
	PR			
	P/+	Brake unit input terminal	-	This is the cable to connect the P and N terminals of inverter. The connection cables are supplied with the brake unit.
	N/-			
Control circuit	GBR	Brake unit drive terminal	-	This is the brake unit control signal.
	EBR			
	THBP	Abnormal output detection terminal	-	This is an output signal that indicates that the brake unit is overheated. ※The cable for transmission of these control signals is supplied with the brake unit.
	THBN			

Brake resistor

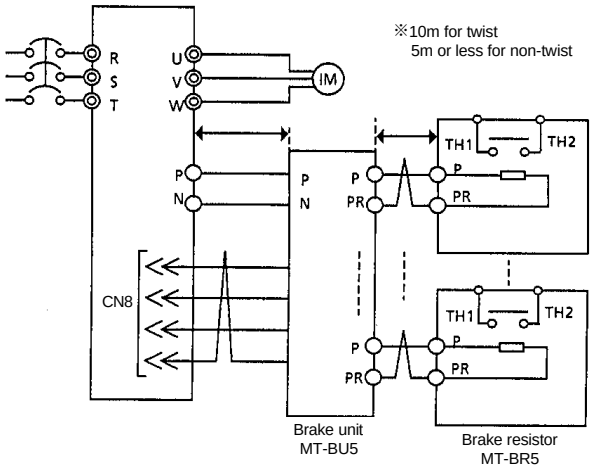
Terminal		Terminal name	Rating	Description
Main circuit	P	Brake resistor input terminal set	-	This is the cable to connect the P and PR terminals of brake unit.
	PR			
Control circuit	TH1	Abnormal output detection terminal	1a contact AC110V 5A AC220V 3A	This is an output signal that indicates that the resistor is overheated.
	TH2			

Cable size

Brake unit model		Brake resistor model	Cable (P-P, PR-PR)
200V	-	-	
	-	-	
400V	MT-BU5-H75K	MT-BR5-H75K	14mm^2
	MT-BU5-H150K	2×MT-BR5-H75K	2×14mm^2
	MT-BUR-H220K	3×MT-BR5-H75K	3×14mm^2
	MT-BU5-H280K	4×MT-BR5-H75K	4×14mm^2
	MT-BU5-H375K	5×MT-BR5-H75K	5×14mm^2

Be sure to use the cables of the above recommended sizes or above.

■Example of External Writing



(Note1) When connecting the brake unit to the inverter unit, be sure to use the electric cables supplied with the brake unit.

(Note2) The main circuit wire is connected to the P and N terminals, and the control circuit wire is connected to the internal LL connector (CN8) after placing slits on the rubber bushing on the top of the inverter.

(Note3) The brake unit that uses multiple brake resistors has the same number of terminals as the brake resistor unit. Connect the one brake resistor to one set of terminals (P, PR).

■Selection

[Application to inverter]

(1) Select the brake unit appropriate for the motor capacity.

(2) Even if an inverter 1-rank larger in capacity is used, the braking torque and operation rate(% ED) should be as follows:

・% ED at 100% braking torque during rated short-time operation

Motor capacity				37kW	55kW	75kW	90kW	110kW	150kW	160kW	220kW	280kW	375kW
Inverter			200V	75k	75k	75k	90k	110k	-	-	-	-	-
			400V	75k	75k	75k	110k	110k	150k	160k	220k	280k	375k
Brake Unit	200V	MT-BU5-55K	%ED	20	10	-	-	-	-	-	-	-	-
		MT-BU5-110K		85	40	20	15	10	-	-	-	-	-
	400V	MT-BU5-H75K	%ED	40	15	10	-	-	-	-	-	-	-
		MT-BU5-H150K		-	70	40	25	15	10	-	-	-	-
		MT-BU5-H220K		-	-	85	55	40	20	15	10	-	-
		MT-BU5-H280K		-	-	-	95	60	30	30	15	10	-
		MT-BU5-H375K		-	-	-	-	-	60	50	25	15	10

・Braking torque (%) at 10% 15sec ED during rated short-time operation

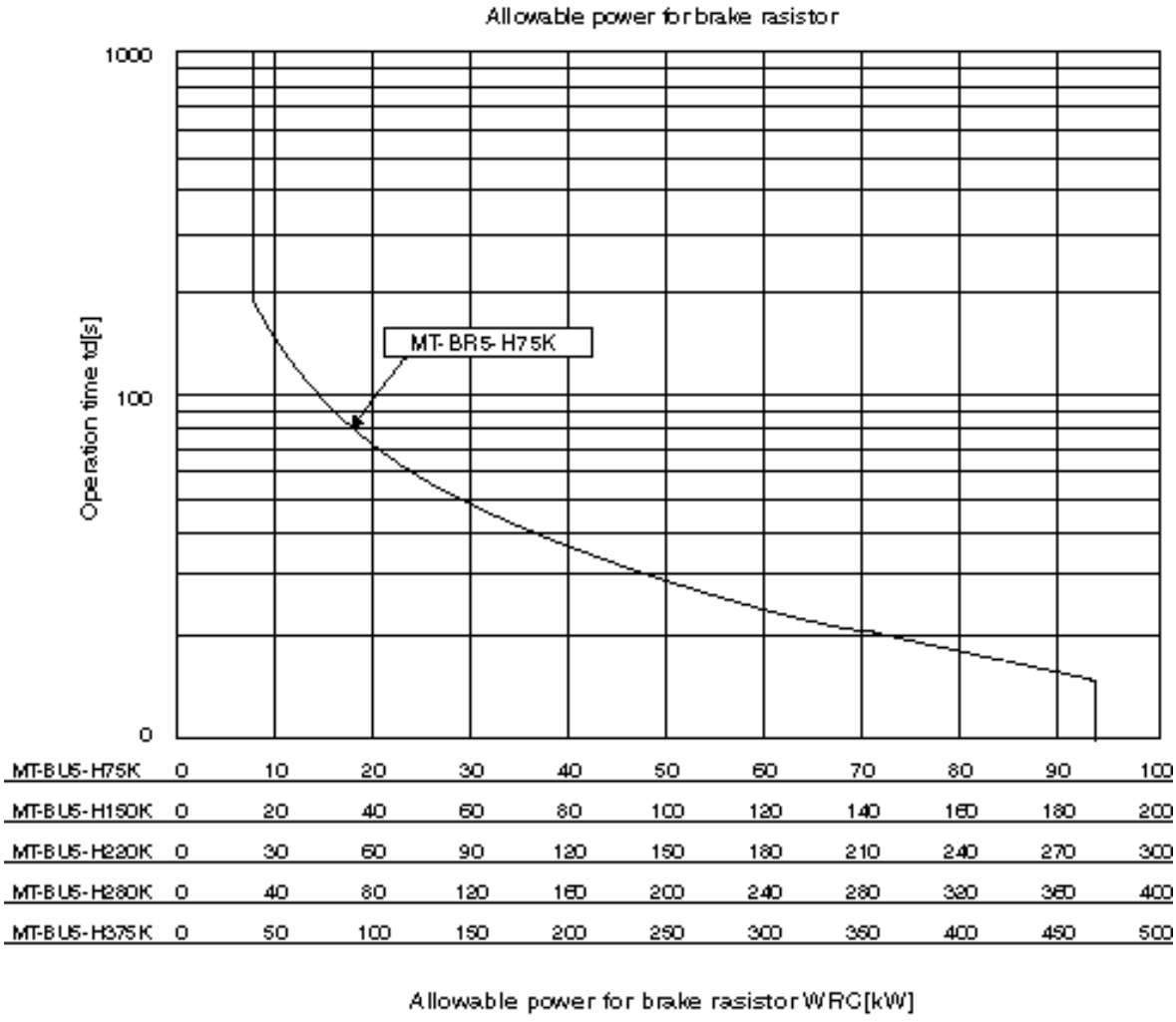
Motor capacity				37kW	55kW	75kW	90kW	110kW	150kW	160kW	220kW	280kW	375kW
Inverter			200V	75k	75k	75k	90k	110k	-	-	-	-	-
			400V	75k	75k	75k	110k	110k	150k	160k	220k	280k	280k
Brake Unit	200V	MT-BU5-55K	Braking torque (%)	145	100	70	60	50	-	-	-	-	-
		MT-BU5-110K		290	200	145	120	100	-	-	-	-	-
	400V	MT-BU5-H75K	Braking torque (%)	200	135	100	80	65	50	45	30	25	20
		MT-BU5-H150K		-	270	200	165	135	100	90	65	50	40
		MT-BU5-H220K		-	-	290	240	200	145	135	100	75	55
		MT-BU5-H280K		-	-	-	300	250	185	175	125	100	70
		MT-BU5-H375K		-	-	-	-	300	250	230	170	130	100

※To obtain large braking torque, the motor should have optimum torque characteristics. Check the torque characteristics of the motor.

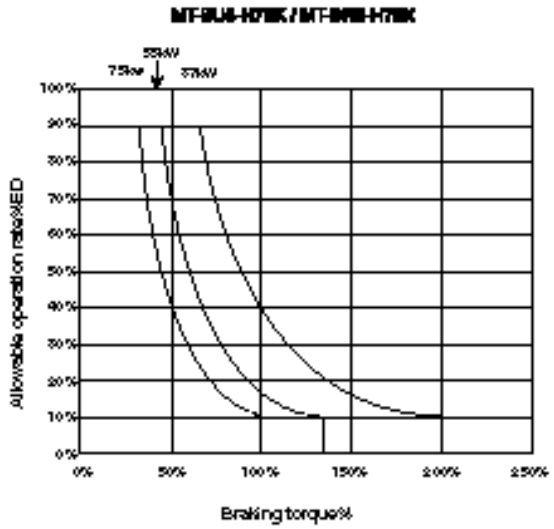
■Allowable Continuous Power

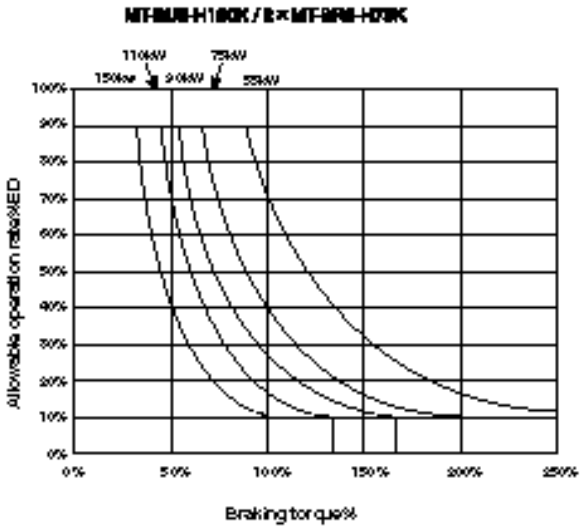
Allowable continuous power for brake unit MT-BR5

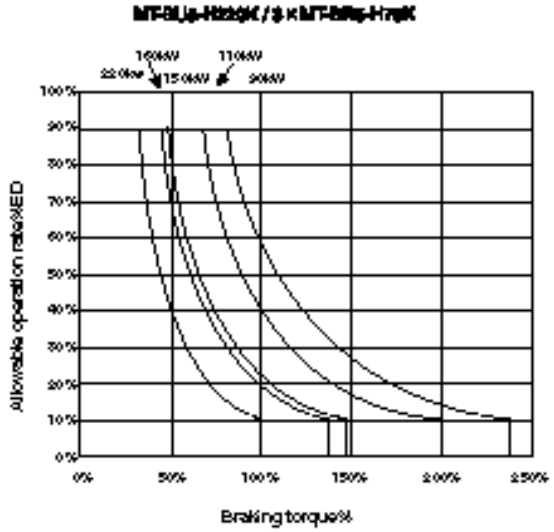
Model		Allowable continuous power : WRC[kW]
200V	Development stages	-
400V	MT-BR5-H75K	7.5

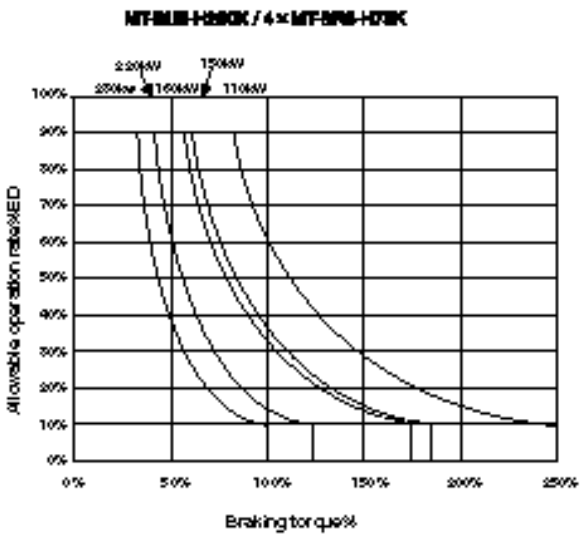


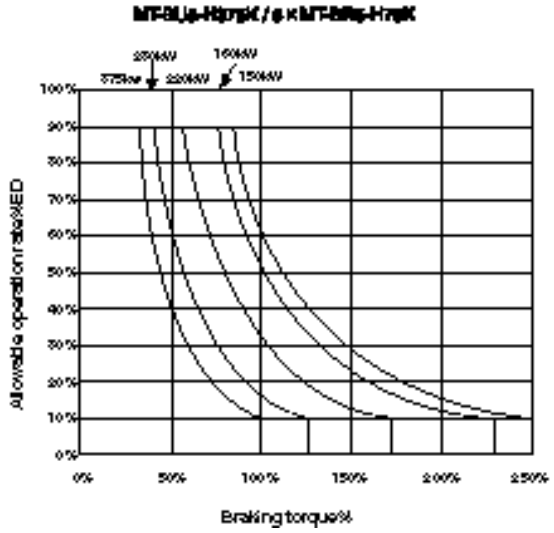
■Braking Torque







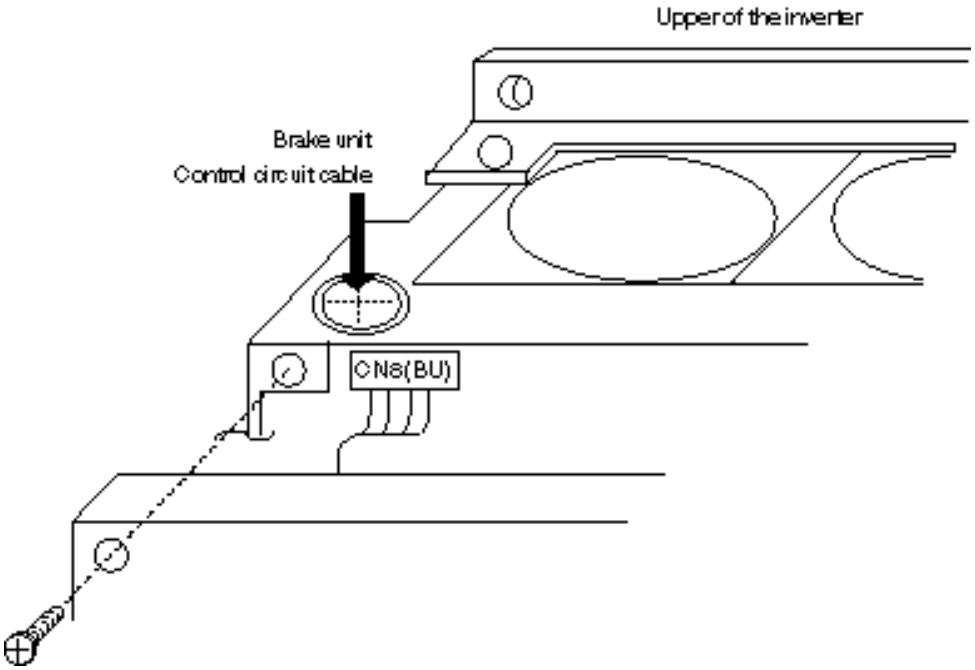




■Operation

Connecting the brake unit

Remove the inverter unit's cover, and connect the cable with the brake resistor to the brake unit terminals P and PR. Connect the main circuit cable enclosed with the brake unit to the inverter unit's P and N terminals, and connect the control circuit cable to the LL connector CN8 on the upper left of the inverter.
※The rubber bushing must be cut, so take special care to safety.



Setting parameters for inverter unit

Set the parameters for the inverter unit before starting the brake unit.

Pr.31 (Factory-set value : "0")
0 :

Pr.7※Set the parameters for inverter unit by referring to the setting table.
0 : (Factory-set value : 0%)

Setting parameters for brake unit

(1) Setting parameters for display of brake unit operation rate (Pr.52 to Pr.54 and Pr.158)
These parameters select the monitor and output signal function of the inverter unit so that DU, PU, and meter can display the brake unit operation rate.

(2) Setting parameters for output of brake unit pre-alarm signal (Pr.190 to Pr.195)
The output terminal of the inverter unit will out-put a pre-alarm signal when the regenerative brake operation rate is 85% (detected setting Pr.70).

(3) Brake circuit fault
If the brake unit overheats, the inverter will be stopped due to a "brake circuit fault", and DU and PU will display the main circuit fault "E.15".