BONITRON

M3775RS
OEM Resistive Load Banks

Overvoltage Solutions for AC Drives

Features

- N.C. thermal switch
- 10 - 100 % duty cycle ratings available
- Durable solutions tolerate high vibration
- 2 connections to braking controller

Advantages

- Suitable for high vibration and harsh applications
- Edgewound solution withstands temperatures up to 800° C
- Full line of voltage and duty cycles allows for use with most all braking solutions
- Easy retrofit, fits all VFD configurations
- Can be used in both AC and DC environments

Benefits

- Minimizes downtime
- Custom design enclosures available
- Easy installation
- Wide range of solutions to meet your needs
- Easy sizing for VFD applications

Resistive Solutions

Resistive solutions are available based on application requirements. Bonitron understands that no one resistor technology can suffice for all resistive needs so we offer a wide range to meet your application needs.

Smoothwound

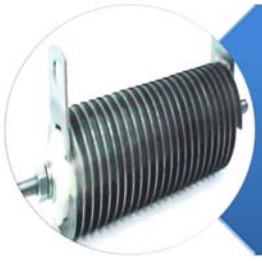
- Smoothwound resistors are most commonly used for light-duty braking of variable frequency drives, small horsepower motor control, space heaters and any low wattage, high resistance load application and can be used in AC or DC power circuits. They are suitable for continuous duty applications where high resistance and low current are required. These units are designed to withstand considerable shock, making them suitable for some high vibration applications.

Ribbonwound

- Ribbonwound resistors are similar to Smoothwound resistors in most respects and are also most commonly used for motor acceleration and braking, but are also suitable for light-duty braking of variable frequency drives, small horsepower motor control, space heaters. The ribbed edges enhance heat dissipation and permit higher wattage ratings for lower ohmic values and can be used for AC or DC power applications. These units are designed to withstand considerable shock, making them suitable for some high vibration applications.

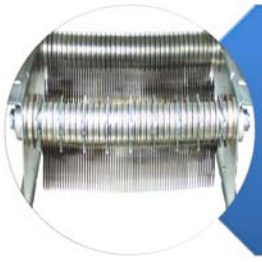
Wirewound

- Wirewound resistors are designed for low current applications and are suitable for continuous duty applications where high resistance and low current are required, including motor control, dynamic braking, neutral grounding and load testing. They can be used for AC or DC power applications. The wirewound resistor will withstand considerable shock and vibration, qualifying it for use in most harsh environments.



Edgewound

- Edgewound resistors are most commonly used for VFD braking, motor control, load banks, neutral grounding applications and can be used for AC or DC power applications. They are suitable for continuous duty applications where low resistance and high current capacity are required. The high element mass allows them to withstand high current, intermittent duty applications. This characteristic, combined with high-temperature ceramic insulation, makes the edgewound ideal for neutral grounding applications, which reach temperatures as high as 800°C.

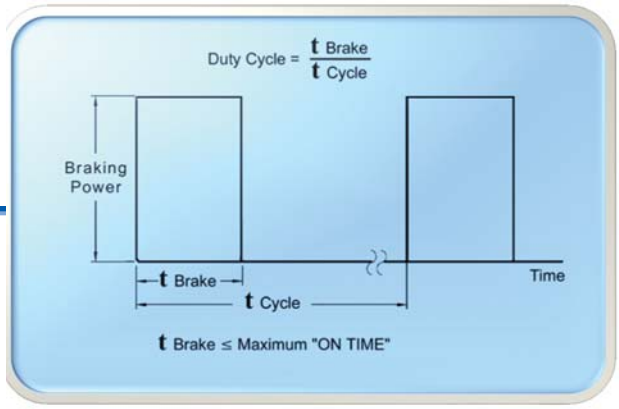


Grid

- Grid resistors are most commonly used for motor acceleration and braking, but are also suitable for load banks, harmonic filtering and some neutral grounding applications and can be used for AC or DC power applications. The rigid construction of the elements make them well suited for use in almost any environment, including high vibration areas such as overhead cranes operated in steel mills and manufacturing plants.

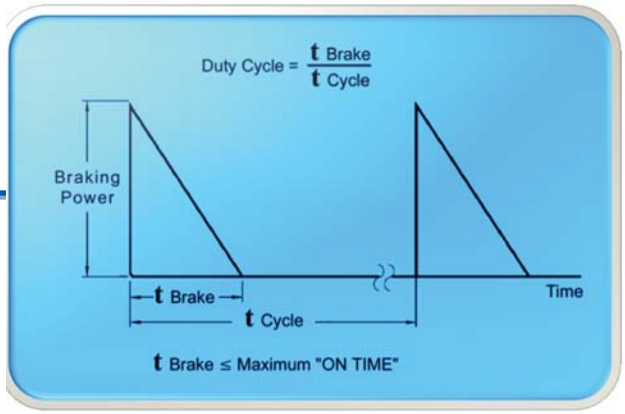
Overhauling

During an overhauling load cycle the braking resistor keeps the motor from increasing speed beyond the synchronous speed set by the drive. The required braking torque remains constant, therefore approximately twice the power of a deceleration braking cycle is required of the braking resistor.



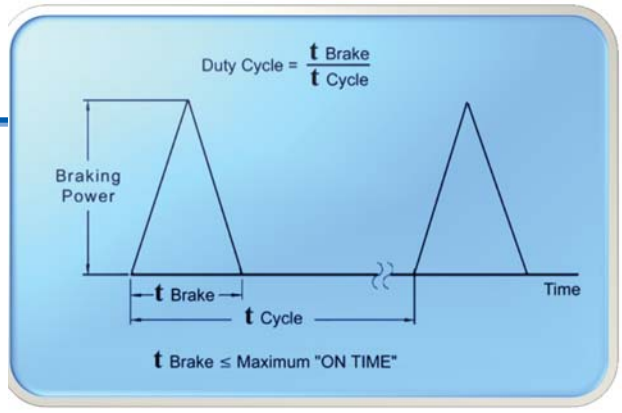
Deceleration

During deceleration, the braking resistor is used to stop or reduce the speed of the motor. The required braking torque reduces with speed, therefore approximately one-half the power of an overhauling load cycle is required of the braking resistor. Most drives require braking resistors only for stopping and estop.



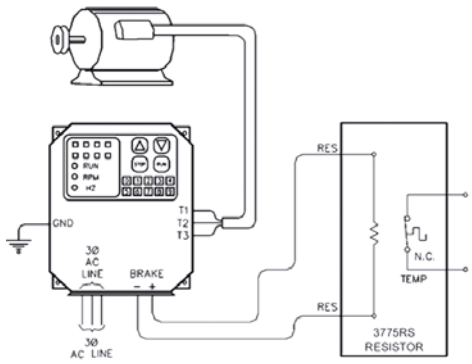
Eccentric

For some applications braking resistors are required because of torque or load fluctuations while the speed remains constant. Some examples of this are tumblers, punch presses and pump jacks.

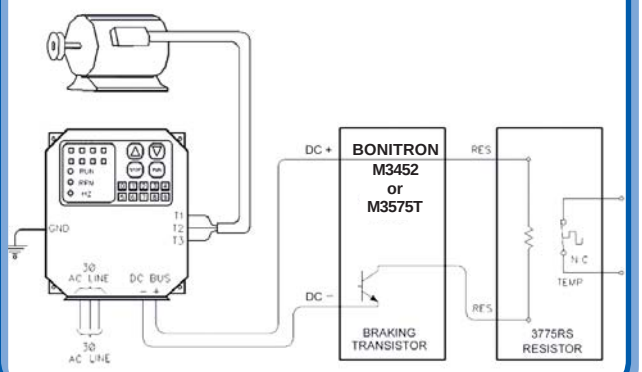


Braking Transistor Field Connections

Internal



External



RATINGS:

Bonitron braking resistors are available in (3) duty cycles based on a cycle time of one minute. Braking resistors are designed for a 375ºC temperature rise when operating at the maximum rated duty cycle. The resistance values are measured at 25ºC.

CAUTION:

It is very important to insure that the resistance listed in the chart below is greater than the minimum specified for your drive or braking module. Installing a braking resistor with too low of a resistance value will cause permanent damage to your drive or external braking transistor. Please call a member of our ENGINEERING TEAM if you need assistance at: (615) 244-2825

ELECTRICAL RATINGS:

These resistor banks are designed to replace or substitute for all of the major manufacturers. These units are electrically equivalent and are designed to have the same resistance rating. In most cases, our banks will have a higher current rating, allowing the unit to operate cooler and last longer.

DIMENSIONS:

Resistor banks feature universal “mill-frames” and are physically interchangeable with the competitive unit.

TERMINAL CONFIGURATION:

In some cases, the location and number of terminals may vary from the unit being replaced. Please specify if your application requires special terminal configurations.

CONSTRUCTION:

PR chassis include resistors installed in a screened enclosure with a galvanized finish. GR chassis include resistors installed in a vented steel enclosure with removable front and rear panels. All enclosures are assembled with stainless steel hardware. Some units are furnished with resistors wired to a terminal block with high temperature silicone or Teflon wire.

M3775RS Model Numbers

230 VAC BRAKING RESISTORS FOR OVERHAULING LOAD

Drive HP	Resistive Value in Ohms	Peak Amps	Duty Cycle: 10% Overhauling 20% for Braking 20% for Eccentric Loads		50% Overhauling		100% Overhauling	
			Part #	Enclosure	Part #	Enclosure	Part #	Enclosure
0.5	375	1	L 0.50 A	PR01	L 0.50 B	PR01	L 0.50 C	PR02
0.75	250	2	L 0.75 A	PR01	L 0.75 B	PR02	L 0.75 C	PR02
1	190	2	L 1.00 A	PR01	L 1.00 B	PR02	L 1.00 C	PR03
1.5	125	3	L 1.50 A	PR01	L 1.50 B	PR03	L 1.50 C	PR04
2	95	4	L 2.00 A	PR01	L 2.00 B	PR03	L 2.00 C	PR04
3	63	6	L 3.00 A	PR01	L 3.00 B	PR04	L 3.00 C	PR06
5	38	10	L 5.00 A	PR01	L 5.00 B	PR08	L 5.00 C	PR10
7.5	26	14	L 7.50 A	PR02	L 7.50 B	PR12	L 7.50 C	PR12
10	19	20	L 010 A	PR02	L 010 B	PR12	L 010 C	PR15
15	12.6	30	L 015 A	PR03	L 015 B	PR15	L 015 C	PR24
20	9.6	39	L 020 A	PR04	L 020 B	PR24	L 020 C	PR30
25	7.5	50	L 025 A	PR05	L 025 B	PR24	L 025 C	PR30
30	6.3	60	L 030 A	PR06	L 030 B	PR30	L 030 C	GR02
40	4.9	77	L 040 A	PR06	L 040 B	PR30	L 040 C	GR03
50	3.9	96	L 050 A	PR06	L 050 B	GR03	L 050 C	GR03
60	3.3	114	L 060 A	PR08	L 060 B	GR03	L 060 C	GR04
75	2.7	139	L 075 A	PR09	L 075 B	GR04	L 075 C	GR06
100	1.9	197	L 100 A	PR10	L 100 B	GR05	L 100 C	GR06
125	1.6	234	L 125 A	PR18	L 125 B	GR05	L 125 C	GR08
150	1.3	288	L 150 A	PR18	L 150 B	GR07	L 150 C	GR08
200	1	375	L 200 A	PR24	L 200 B	GR09	L 200 C	GR06 x 2
250	0.8	469	L 250 A	PR30	L 250 B	GR09	L 250 C	GR08 x 2
300	0.6	600	L 300 A	GR03	L 300 B	TR03	L 300 C	TR01 x 2

M3775RS - Model Numbers

460 VAC BRAKING RESISTORS FOR OVERHAULING LOAD

Drive HP	Resistive Value in Ohms	Peak Amps	Duty Cycle: 10% Overhauling 20% for Braking 20% for Eccentric Loads		Duty Cycle: 50% Overhauling		Duty Cycle: 100% Overhauling	
			Part #	Enclosure	Part #	Enclosure	Part #	Enclosure
0.5	1500	1	H 0.50 A	PR01	H 0.50 B	PR01	H 0.50 C	PR01
0.75	1000	1	H 0.75 A	PR01	H 0.75 B	PR01	H 0.75 C	PR02
1	750	1	H 1.00 A	PR01	H 1.00 B	PR02	H 1.00 C	PR03
1.5	500	2	H 1.50 A	PR01	H 1.50 B	PR03	H 1.50 C	PR04
2	375	2	H 2.00 A	PR01	H 2.00 B	PR04	H 2.00 C	PR06
3	250	3	H 3.00 A	PR01	H 3.00 B	PR05	H 3.00 C	PR08
5	150	5	H 5.00 A	PR02	H 5.00 B	PR08	H 5.00 C	PR10
7.5	100	8	H 7.50 A	PR02	H 7.50 B	PR10	H 7.50 C	PR15
10	75	10	H 010 A	PR02	H 010 B	PR15	H 010 C	PR18
15	50	15	H 015 A	PR03	H 015 B	PR24	H 015 C	PR24
20	38	20	H 020 A	PR04	H 020 B	PR24	H 020 C	PR30
25	30	25	H 025 A	PR05	H 025 B	PR30	H 025 C	GR02
30	25	30	H 030 A	PR06	H 030 B	PR30	H 030 C	GR03
40	19	39	H 040 A	PR08	H 040 B	GR03	H 040 C	GR03
50	15	50	H 050 A	PR08	H 050 B	GR03	H 050 C	GR04
60	12.6	60	H 060 A	PR08	H 060 B	GR03	H 060 C	GR04
75	10	75	H 075 A	PR09	H 075 B	GR04	H 075 C	GR06
100	7.5	100	H 100 A	PR15	H 100 B	GR04	H 100 C	GR06
125	6	125	H 125 A	PR18	H 125 B	GR04	H 125 C	GR08
150	5	150	H 150 A	PR18	H 150 B	GR06	H 150 C	GR08
200	3.8	197	H 200 A	PR24	H 200 B	GR09	H 200 C	GR06 x 2
250	3	250	H 250 A	PR30	H 250 B	GR09	H 250 C	GR08 x 2
300	2.5	300	H 300 A	PR30	H 300 B	GR07 x 2	H 300 C	GR08 x 2
350	2.2	341	H 350 A	PR30	H 350 B	GR07 x 2	H 350 C	GR08 x 3
400	1.9	395	H 400 A	GR03	H 400 B	GR07 x 3	H 400 C	GR08 x 3
500	1.5	500	H 500 A	GR04	H 500 B	GR07 x 3	H 500 C	GR08 x 4
600	1.25	600	H 600 A	GR05	H 600 B	TR03 x 2	H 600 C	TR04 x 2

Maximum Braking Times of Duty Cycles

Duty Cycle	Maximum Braking Time	
	Overhauling Load	Deceleration Braking
10%	6 Seconds	12 Seconds
50%	30 Seconds	NA
100%	Continuous	Continuous

ENCLOSURES

The enclosure and mounting specifications will vary depending on the braking solution chosen to fit your specific application. Some of the most common enclosure types are Open Element Brackets, Louvered enclosures, the Three Sided cover which (depending on cooling requirements) can be mounted vertically or horizontally, and the Four Sided case that is commonly used for grid type resistors which can be free standing or fixed mounted.

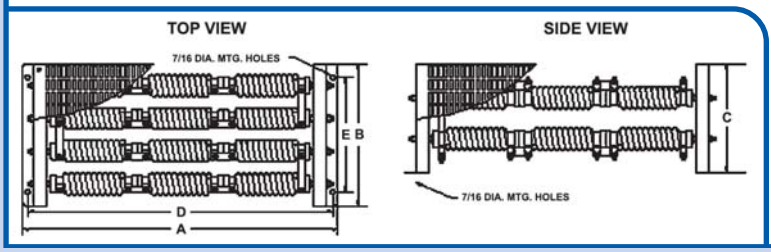
M3775RS - Model Numbers

575 VAC BRAKING RESISTORS FOR OVERHAULING LOAD

Drive HP	Resistive Value in Ohms	Peak Amps	Duty Cycle: 10% Overhauling 20% for Braking 20% for Eccentric Loads — Part #	Enclosure	Duty Cycle: 50% Overhauling — Part #	Enclosure	Duty Cycle: 100% Overhauling — Part #	Enclosure
0.5	2000	0.5	C 0.50 A	PR01	C 0.50 B	PR01	C 0.50 C	PR01
0.75	1500	0.6	C 0.75 A	PR01	C 0.75 B	PR01	C 0.75 C	PR02
1	1200	1	C 1.00 A	PR01	C 1.00 B	PR02	C 1.00 C	PR03
1.5	800	1	C 1.50 A	PR01	C 1.50 B	PR02	C 1.50 C	PR04
2	575	2	C 2.00 A	PR01	C 2.00 B	PR03	C 2.00 C	PR06
3	400	2	C 3.00 A	PR01	C 3.00 B	PR05	C 3.00 C	PR08
5	235	4	C 5.00 A	PR01	C 5.00 B	PR08	C 5.00 C	PR10
7.5	150	6	C 7.50 A	PR02	C 7.50 B	PR10	C 7.50 C	PR15
10	120	8	C 010 A	PR03	C 010 B	PR15	C 010 C	PR24
15	78	12	C 015 A	PR03	C 015 B	PR24	C 015 C	PR30
20	59	16	C 020 A	PR04	C 020 B	PR30	C 020 C	PR30
25	47	20	C 025 A	PR05	C 025 B	PR30	C 025 C	GR02
30	39	24	C 030 A	PR06	C 030 B	PR30	C 030 C	GR03
40	29	32	C 040 A	PR08	C 040 B	GR03	C 040 C	GR03
50	23	41	C 050 A	PR09	C 050 B	GR03	C 050 C	GR04
60	20	47	C 060 A	PR12	C 060 B	GR04	C 060 C	GR05
75	15.6	60	C 075 A	PR12	C 075 B	GR04	C 075 C	GR05
100	11.7	80	C 100 A	PR15	C 100 B	GR04	C 100 C	GR07
125	9.3	101	C 125 A	PR18	C 125 B	GR06	C 125 C	GR08
150	7.8	121	C 150 A	PR18	C 150 B	GR06	C 150 C	GR05 x 2
200	5.9	159	C 200 A	PR24	C 200 B	GR09	C 200 C	GR07 x 2
250	4.7	200	C 250 A	PR24	C 250 B	GR06 x 2	C 250 C	GR08 x 2
375	3.2	300	C 375 A	GR03	C 375 B	TR04	C 375 C	TR02 x 2
760	1.6	600	C 760 A	GR06	C 760 B	TR04 x 2	C 760 C	TR03 x 3

PR Enclosure

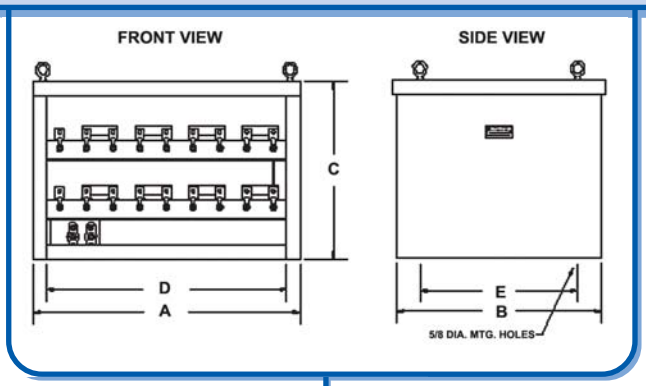
The type **PR** compartment enclosure offers several additional features and options for simplifying an installation. These heavy gage screened enclosures feature a solid bottom and a built-in compartment separated from the resistor assembly. The resistors are factory wired to a terminal block mounted in this compartment using high temperature teflon or silicone wire. During installation, standard 90ºC rated wire is routed into the compartment through the removable 1/2 inch conduit knockouts and connected to the factory wired terminal block. Our standard unit includes a screened cover which is CNC punched to obtain maximum cooling and professional aesthetics. Mounting holes are located inside the enclosure and can be easily accessed by removing the cover. Resistor coils are interconnected using stainless steel bus bars and all stainless steel hardware, producing a corrosion resistant current path to withstand nearly any harsh industrial environment. The standard finish is galvanized, but an optional powder coated, yellow zinc, aluminum or stainless steel finish is available upon request. As shown in the table on the following page, the size of the enclosure will vary depending on the number of resistor coils required for your application. Units are available with a louvered cover. Call Bonitron for pricing on added options.

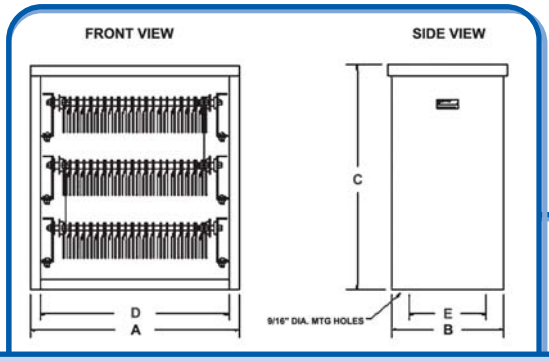


Chassis Type	Chassis Dimensions A x B x C	Mounting Dimensions D x E
PR01	12 x 5 x 5"	10.5" x N/A
PR02	12 x 7 x 5"	10.5 x 4.5"
PR03	12 x 10 x 5"	10.5 x 7.5"
PR04	12 x 13 x 5"	10.5 x 10.5"
PR05	12 x 16 x 5"	10.5 x 13.5"
PR06	19 x 10 x 5"	17.5 x 7.5"
PR08	19 x 13 x 5"	17.5 x 10.5"
PR09	26.5 x 10 x 5"	25 x 7.5"
PR10	19 x 16 x 5"	17.5 x 13.5"
PR12	26.5 x 13 x 5"	25 x 10.5"
PR15	26.5 x 16 x 5"	25 x 13.5"
PR18	28 x 10 x 10"	26.5 x 7.5"
PR24	28 x 13 x 10"	26.5 x 10.5"
PR30	28 x 16 x 10"	26.5 x 13.5"
GR02	30 x 24 x 18"	26.5 x 18"
GR03	30 x 24 x 24"	26.5 x 18"
GR04	30 x 24 x 30"	26.5 x 18"
GR05	30 x 24 x 36"	26.5 x 18"
GR06	30 x 24 x 48"	26.5 x 18"
GR07	30 x 24 x 60"	26.5 x 18"
GR08	30 x 24 x 72"	26.5 x 18"
GR09	30 x 24 x 84"	26.5 x 18"
TR01	30 x 36 x 50	26.5 x 30"
TR02	30 x 36 x 59	26.5 x 30"
TR03	30 x 36 x 77	26.5 x 30"
TR04	30 x 36 x 88	26.5 x 30"

GR Enclosure

The Type **GR** enclosure is designed for applications requiring a large number of resistors. In addition to the large capacity, these units are available with several options to simplify installation. We offer optional terminal connections up to 400 amps continuous located on a terminal plate in the bottom of the enclosure. These factory wired connections allow standard 90ºC rated wire to be used if routed along the enclosure bottom. If installing without the optional terminal connections, always use 150ºC rated silicone or teflon wire when attaching directly to resistors. These rigid enclosures include a screened top and removable front and back screened covers. The enclosure sides and bottom are solid and furnished with two lifting eyes. Mounting holes are located inside the enclosure and can be easily accessed by removing the front or back cover. Resistor coils are interconnected using all stainless steel bus bars and hardware, producing a corrosion resistant current path to withstand nearly any harsh industrial environment. The standard finish is galvanized, but an optional powder coated, hot dipped galvanized, aluminum or stainless steel finish is available upon request. As shown in the table on the following page, the size of the enclosure will vary depending on the number of resistor coils required for your application. Units are available with louvered covers. Call Bonitron for pricing on added options.





TR Enclosure

The Type **TR** enclosure is specifically designed with shelves so individual banks can be easily installed or replaced. Assemblies come complete with all necessary bank-to-bank connections consisting of either high temperature insulated wire or copper bus bars. These rigid, free standing enclosures include a screened top and removable front and back screened covers. The enclosure sides and bottom are solid and the unit is furnished with two lifting eyes. These enclosures are assembled with all stainless steel hardware. The mounting holes are located inside the enclosure and can be easily accessed by removing the front or back cover. The Type TR enclosure also has the capability of housing Type SXR, WR, VR and ER resistor coils. Resistor coils are installed on end frames and interconnected with all stainless steel bus bars and hardware producing a corrosion resistant current path to assure long life in nearly any industrial environment. The standard finish is galvanized, but an optional powder coated, hot dipped galvanized, aluminum, or stainless steel finish is available upon request. As shown in the table on the next page, the size of the enclosure will vary depending on the number of resistors required for your application. Units are available with a louvered cover. Always use 150ºC rated silicone or teflon wire when attaching directly to resistor terminals. Call Bonitron for pricing on added options.

Custom Resistive Load Banks



Bonitron offers resistive load banks to cover most braking applications with variable frequency drives. We offer many different packages ranging from 1 – 3000 hp. We offer resistors that can handle 1% duty cycle up to 100%. If we do not have the braking solution for your application, we have the facilities and the staff to create it.

To accommodate your application needs please contact Bonitron at **(615) 244-2825** with the following information:

Data Requirements:

- Drive Horsepower
- Drive Input Voltage
- Braking Torque
- Maximum Time On
- Repeat Time
- Minimum ohm rating specified for your drive or braking module, or maximum allowable braking current.
- Enclosure Requirements
- Cooling Requirements

More Solutions

Braking Transistor and Braking Resistor modules are used with AC drives to eliminate over voltage faults. The use of these modules permits controlled braking of the AC drive and dramatically shortens the time required for motor shutdown as opposed to coasting to stop.

M3575T

- Bonitron M3575T Standard Duty Braking Transistors can be used to increase throughput by decreasing stopping time and are designed to be used with all drives with DC bus field terminals. The Bonitron M3575T Braking Transistor Modules monitor the drive DC bus levels and control power to a resistive load for dissipating the regenerated energy. Standard modules are available rated up to 600 Amps DC with Braking Duty Cycles up to 20%.

M3452

- Bonitron M3452 Heavy Duty Braking transistors are used in applications that have continuous or high duty cycle requirements. The modules are used with drives that have inadequate or no internal braking transistor. They work with any AC drive system with DC bus field terminals. The Bonitron M3452 Braking Transistor modules monitor the drive DC bus levels and control an IGBT power switch which is connected to a resistive load for dissipating the regenerated energy. Standard modules are available rated up to 1200 Amps DC and braking Duty Cycles to 100%.

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