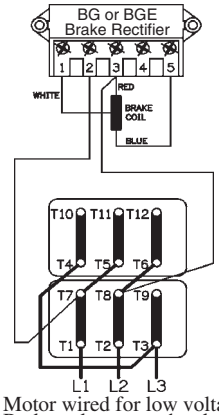
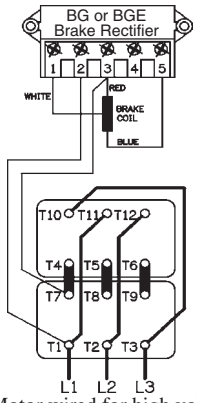
Brake Voltage Supplied from the Motor

There are specific instances when the brake voltage can be tapped from the motor's terminal block. The advantage of brake systems wired in this way is when power is applied to the motor, the brake releases, (requiring no additional brake supply power wiring). The brake can be wired to the motor terminal block under the following conditions: a single speed motor; the motor is started and run across the line (i.e., no inverter or electronic soft start). The connections shown on this page are for normal brake reaction time. For rapid brake reaction time, incorporate the contact as shown on the brake diagram located on the inside of the motor conduit box lid.

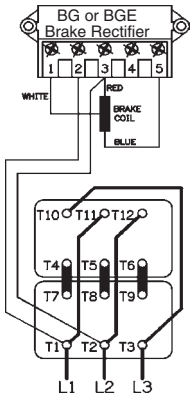
Brake Motor Connection
Single Speed Dual Voltage - ΔΔ/Δ
Connection Diagram DT72
Example Motor Voltages:
230ΔΔ/460Δ Volts - 60 Hz



Motor wired for low voltage.
Brake voltage matches low motor voltage.
Example: 230/460V Motor
Motor wired 230V
Brake voltage 230V

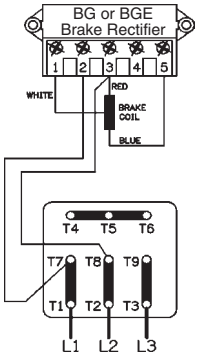


Motor wired for high voltage.
Brake voltage matches low motor voltage.
Example: 230/460V Motor
Motor wired 460V
Brake voltage 230V

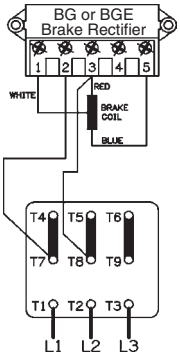


Motor wired for high voltage.
Brake voltage matches high motor voltage.
Example: 230/460V Motor
Motor wired 460V
Brake voltage 460V

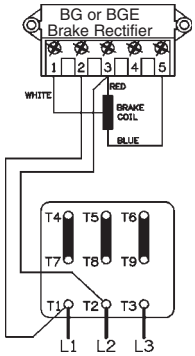
Brake Motor Connection
Single Speed Dual Voltage - YY/Y
Connection Diagram DT79
Example Motor Voltages:
230YY/460Y Volts - 60 Hz
200YY/400Y Volts - 50 Hz



Motor wired for low voltage.
Brake voltage matches low motor voltage.
Example: 230/460V Motor
Motor wired 230V
Brake voltage 230V

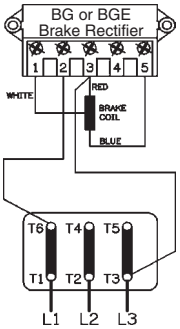


Motor wired for high voltage.
Brake voltage matches low motor voltage.
Example: 230/460V Motor
Motor wired 460V
Brake voltage 230V

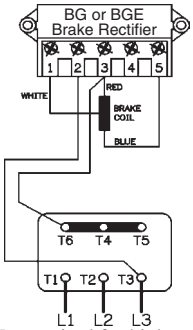


Motor wired for high voltage.
Brake voltage matches high motor voltage.
Example: 230/460V Motor
Motor wired 460V
Brake voltage 460V

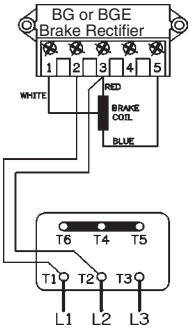
Brake Motor Connection
Single Speed Dual Voltage - Δ/Y
Connection Diagram DT13
Examples Motor Voltages:
200Δ/346Y Volts - 60 Hz
330Δ/575Y Volts - 60 Hz
220Δ/380Y Volts - 50 Hz



Motor wired for low voltage.
Brake voltage matches low motor voltage
Example: 200/346V Motor
Motor wired 200V
Brake voltage 200V



Motor wired for high voltage.
Brake voltage matches low motor voltage.
Example: 220/380V Motor
Motor wired 380V
Brake voltage 220V



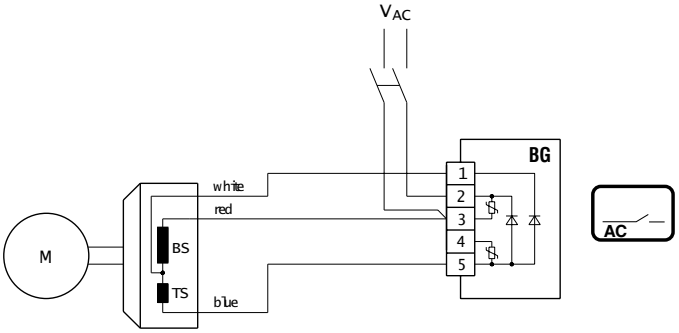
Motor wired for high voltage.
Brake voltage matches high motor voltage.
Example: 220/380V Motor
Motor wired 380V
Brake voltage 380V

The BG Brake Rectifier - Standard for frame sizes up to 100, not available on frame sizes above 100

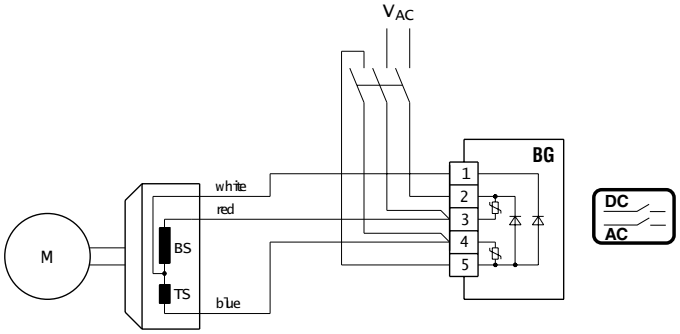
The brake rectifier BG is a half-wave rectifier with overvoltage protection.

This rectifier is used on small motors if no special requirements are needed with respect to the release reaction times of the brake. It cannot be used at elevated ambient temperatures or with unfavorable cooling conditions for the brake.

BG Normal Reaction Time



BG Rapid Reaction Time



The BGE Brake Rectifier - Standard for motor frame sizes 112M and larger, optional on frame sizes 71 to 100

The BGE brake rectifier is a half-wave rectifier with over-voltage protection elements and electronic control for reducing the brake release reaction times.

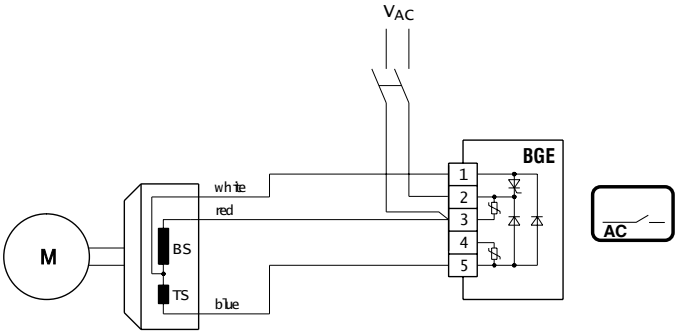
The brake operation is improved by the BGE rectifier in that it releases the brake initially by super-magnetization and then holds the stationary disc securely with reduced magnetization. Due to the exceedingly reduced brake release reaction time t_1 the brake is released before the motor can build up torque and begin to rotate. Minimum wear with maximum service life and excellent switching ability are the outstanding features of the brake system.

In the continuous released state the current losses are reduced to the necessary minimum so the thermal loading of the brake is very low.

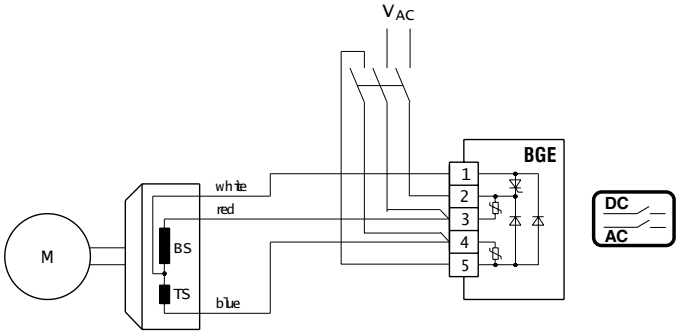
The use of the BGE Brake Rectifier is recommended if:

- Short brake release reaction times are required.
- High starting frequencies are encountered.
- High ambient temperature is present or the brake is required to be in the continuous released state while the motor is at rest or operating at low speeds.

BGE Normal Reaction Time



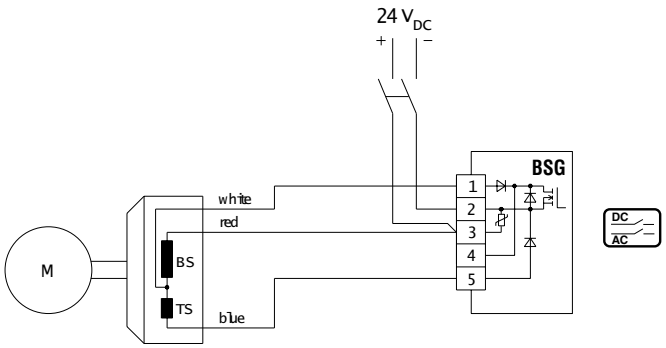
BGE Rapid Reaction Time



The BSG Brake Control Unit - Standard for motor frame sizes 112M and larger, optional on frame sizes 71 to 100

For 24VDC power supply to the brake the control unit BSG is available. With this control unit the same brake release reaction times as with the brake rectifier BGE are attained. If no BSG brake control system is installed a customer provided overvoltage protection must be provided.

BSG Rapid Reaction Time

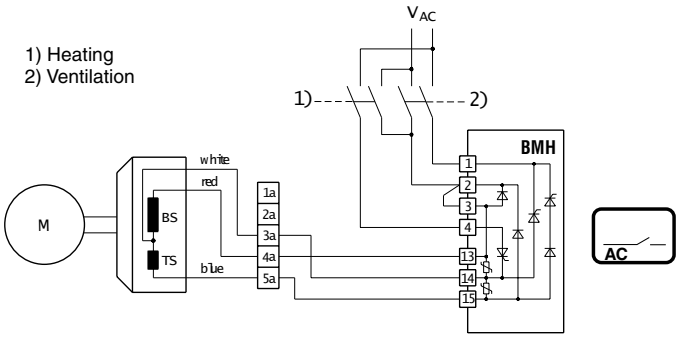


The BMH Brake Rectifier - Optional for frame sizes 71 to 225

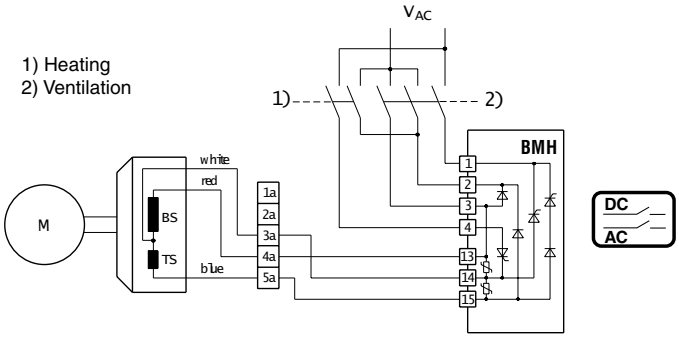
For low ambient temperatures the BMH Brake Rectifier with a heating current is available for heating the brake while the motor is at rest. Electric heating is always recommended where moisture condensation followed by frost may occur or where wet corrosive atmosphere with long periods of rest are to be expected. The BMH unit has the same electronic circuitry as the BGE and thus provides the same short reaction times for the BM(G) brake.

The BMH is designed as a module in a DIN rail housing with plug-in connections for control cabinet installation.

BMH Normal Reaction Time



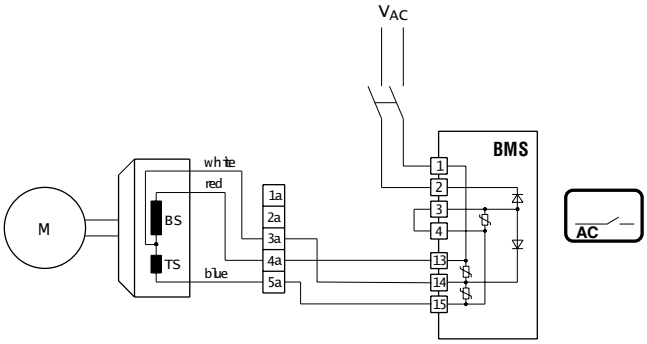
BMH Rapid Reaction Time



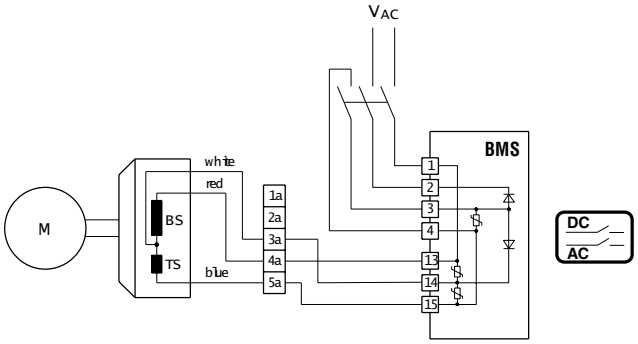
The BMS Brake Rectifier - Optional for frame sizes up to 100, not available on frame sizes above 100

The brake rectifier BMS is a half-wave rectifier with protective elements against overvoltage. It functions like the rectifier type BG, however, it is designed to be mounted in a control panel on DIN rail and not in the motors conduit box. The BMS can be wired to operate for normal or rapid brake reaction times. The BMS rectifier is primarily used when the ambient conditions of the motor preclude the use of the BG rectifier mounted in the motors terminal box.

BMS Normal Reaction Time



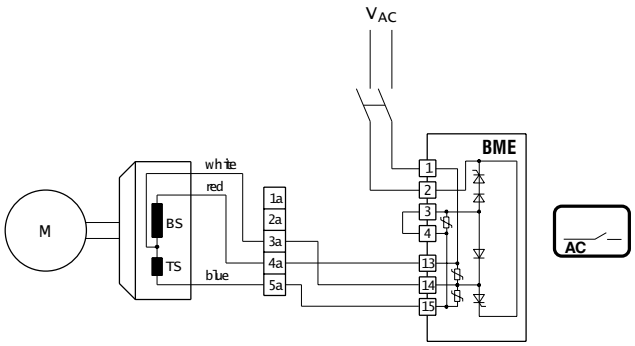
BMS Rapid Reaction Time



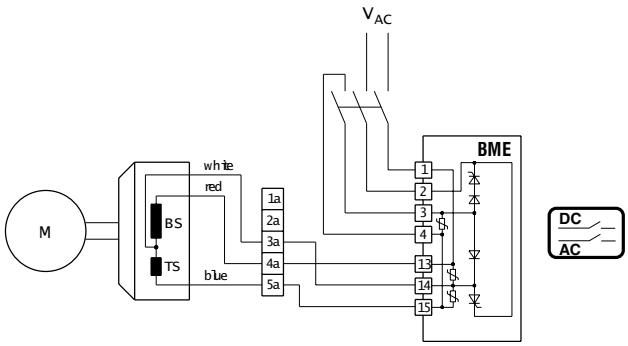
The BME Brake Rectifier - Optional for frame sizes 71 to 225

The BME brake rectifier is a half-wave rectifier with overvoltage protection elements and electronic control for reducing the brake release reaction times. It functions like the rectifier type BGE, however, it is designed to be mounted in a control panel on DIN rail and not in the motors conduit box. The BME has the same high performance functions as the BGE for rapid brake release, which allow the motor brake system to cycle at a very high rate. The BME can we wired to operate for normal or rapid brake reaction times. The BME is primarily used when the ambient conditions of the motor preclude the use of the BGE rectifier mounted in the motors terminal box.

BME Normal Reaction Time



BME Rapid Reaction Time

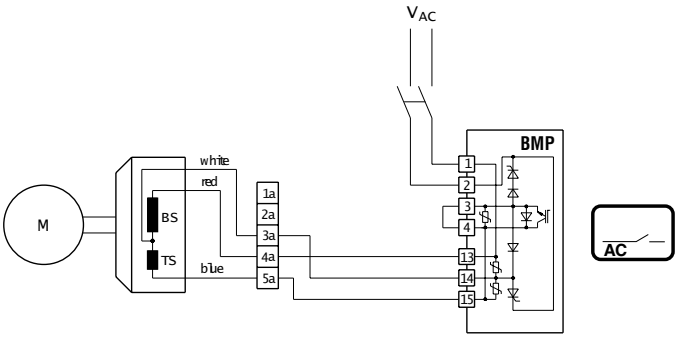


SEW EURODRIVE

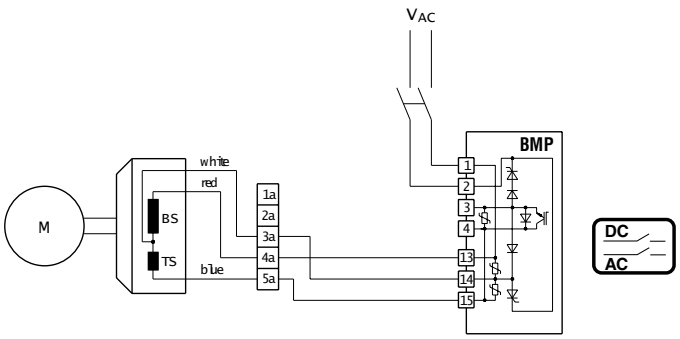
The BMP Brake Control System - Optional for frame sizes 71 to 225

The BMP control system is a BME brake rectifier with an integrated voltage relay. The BMP minimizes response and reaction times and reduces cabling between the switch cabinet and the brake motor. It functions like the rectifier type BGE and the voltage relay UR combined into one device. It is designed to be mounted in a control panel on DIN rail and not in the motors conduit box. The BMP has the same high performance functions as the BGE for fast rake release, which allow the motor brake system to cycle at a very high rate. The BMP rectifier will automatically provide the fast brake reaction function of the UR relay without the requirement of external wiring.

BMP Normal Reaction Time



BMP Rapid Reaction Time



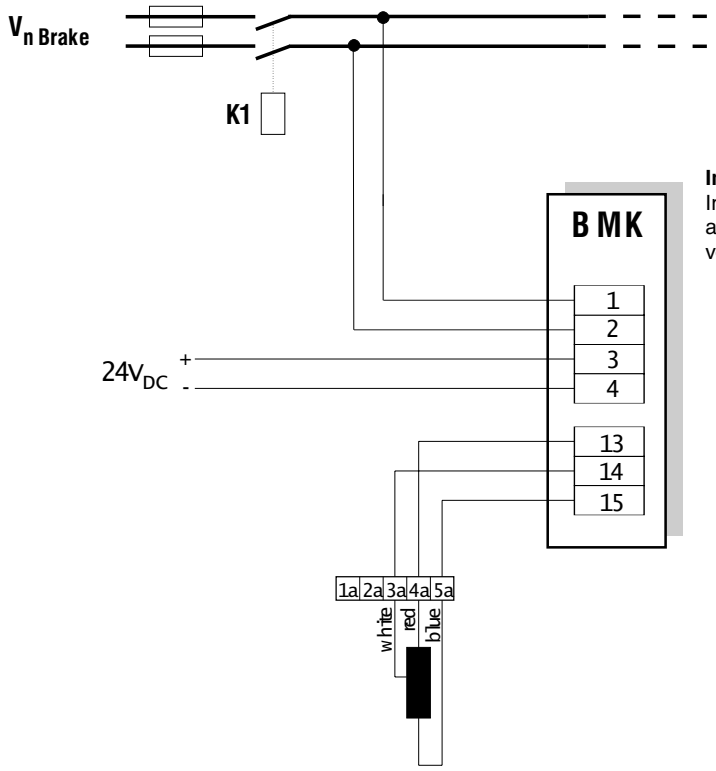
The BMK Brake Control System - Optional for frame sizes 71 to 225

The BMK rectifier functions like the rectifier type BGE, however, it is controlled directly by a $24V_{DC}$ control signal. The BMK is powered with the required AC supply voltage to operate the brake but the brake release is controlled by a $24V_{DC}$ control signal. It is designed to be mounted in a control panel on DIN rail and not in the motors conduit box.

Benefits:

- Direct control using $24V_{DC}$ output signal from a PLC
- Direct control of the brake from an inverter (MOVITRAC®, MOVIDRIVE®, MOVIDYN®) output signal
- Eliminates the need for a brake control brake power contact in most PLC and inverter installations

The BMK has the same high performance functions as the BGE for fast brake release, which allow the motor brake system to cycle at a very high rate.



Important:
In the case of an EMERGENCY stop, an all-pole disconnection of the supply voltage is absolutely necessary!

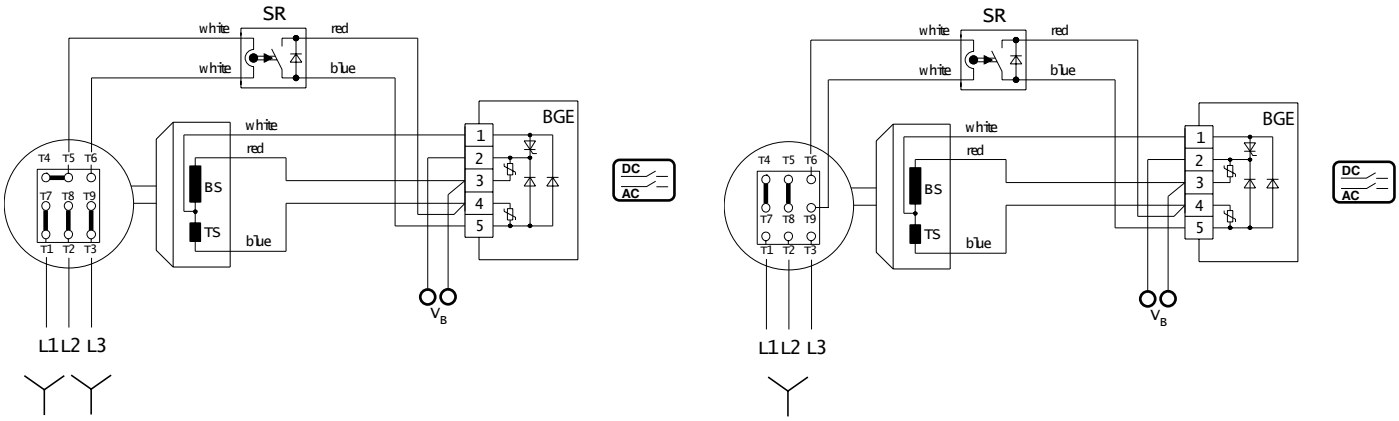
The BSR Brake Control System

The BSR control system achieves the shortest brake reaction and brake release reaction times without any external control equipment or additional wiring leads. The BSR brake control system combines the brake rectifier BGE (for motor frame sizes 71 to 225) with an electronic, current relay SR, which is mounted in the terminal box. The SR takes care of the task of rapidly demagnetizing the brake.

The SR current relay is fed with current from a voltage phase feeding the motor while the motor is running. When the motor is switched off, the current relay, SR, switches instantly to cause the rectifier to demagnetize the brake.

The BSR system is only suitable for single speed motors with current ratings up to 50 Amps.

In general, the white-black leads of the SR relay replace a brass jumper bar on the terminal block of any single speed motor



The BUR Brake Actuator

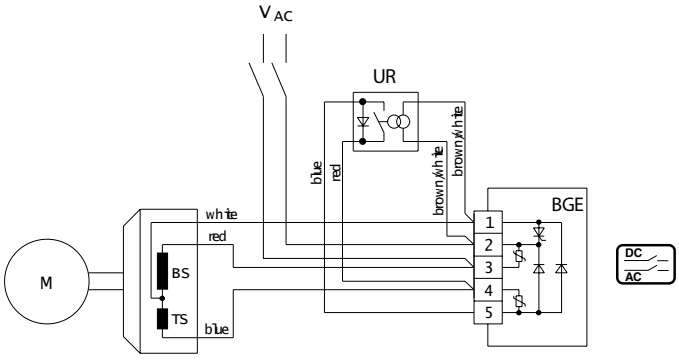
The control system BUR is an integrated combination, in the terminal box, of the brake rectifier BGE (for motor frame sizes 71 through 200), BG (for motor frame size 63) and the voltage relay UR. It is specially suited for two-speed or speed controlled AC squirrel-cage motors or DC motors, which require a very rapid brake reaction time. For these applications it is a characteristic that the AC supply for the brake rectifier is run separately to the terminal box.

The voltage relay UR with power supply interruption separates the DC circuit of the brake and thereby ensures a rapid demagnetizing of the brake.

The control system BUR achieves the shortest brake reaction and brake release reaction times without additional conductor leads requirement between the switch cabinet and brake motor and also without external contactors.

The control system BUR is available for power supplies 42V through 500V and a maximum holding current of 1 A.

The BSR and BUR engage a PG threaded conduit aperature of the terminal box. Should the standard four PG threaded conduit aperatures not be sufficient for the cabling, please consult us.



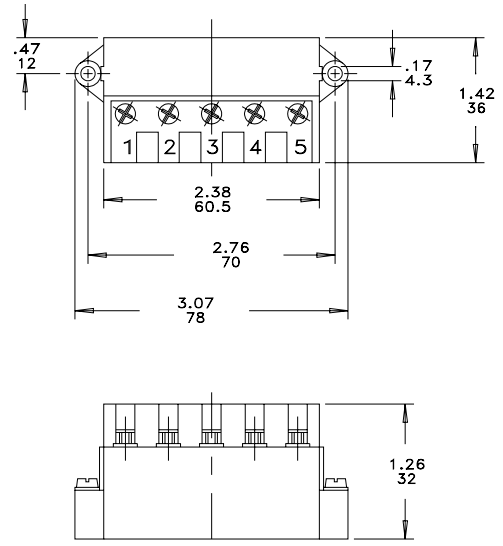
Caution:

The power supply is with separate supply leads. The connection to the terminal board of the motor is not permissible.

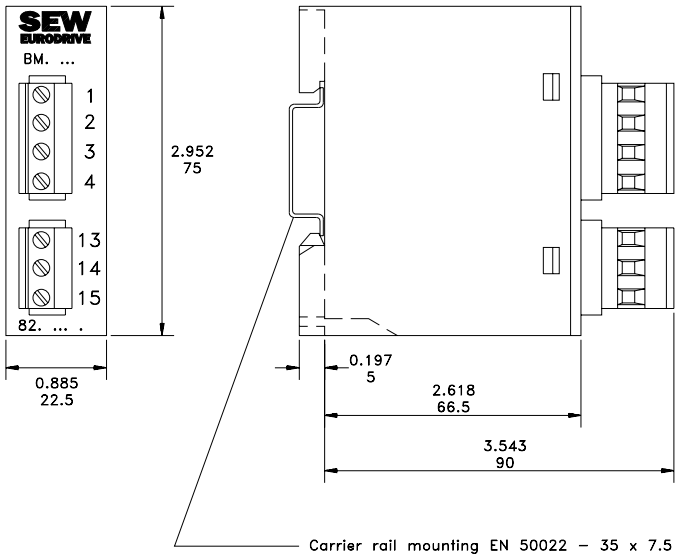
Mechanical Features of the Brake Rectifier and Brake Control Systems

All brake rectifiers for the BM(G) brake have the same external dimensions (except for the DIN rail mounted units). The BG and BGE units are preferably mounted in the motor terminal box, but can also be supplied for switch cabinet installation. The BMS, BME, BMH, BMP and BMK units are for DIN rail mounting.

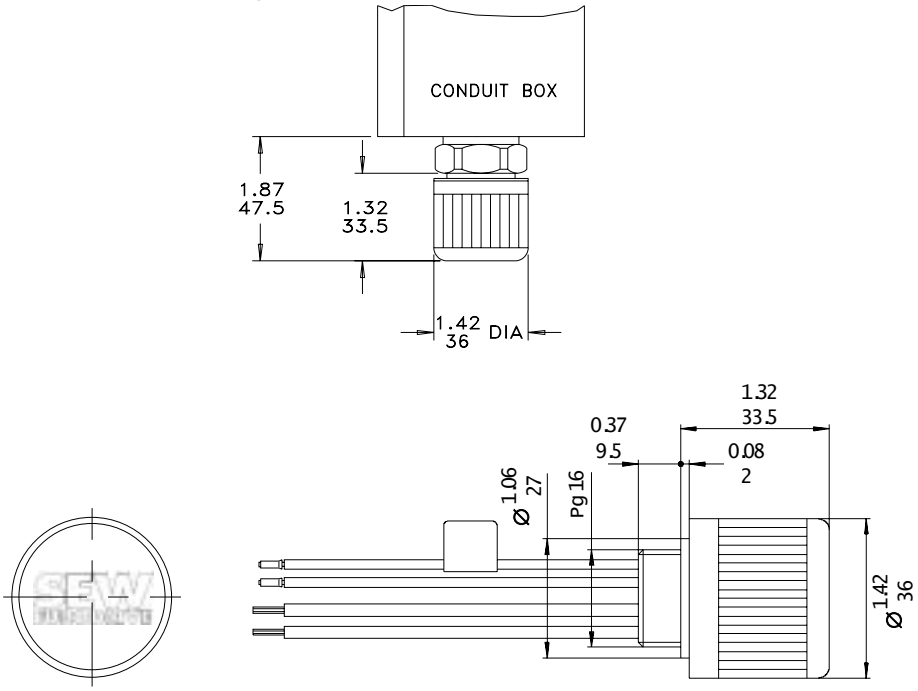
BG, BGE, BSG Brake Rectifiers



BMS, BME, BMH, BMP, BMK Brake Rectifiers



UR/SR Relay



Brake Coil Resistance

Motor Frame Brake Size Brake Torque (lb-ft)		DT71-80 BM(G)05 0.89 - 3.7	DT80 BM(G)1 4.4 - 7.4	DT90-100 BM(G)2 3.7 - 14.8	DT100 BM(G)4 17.7 - 29.5	DV112-132S BM(G)8 7.00 - 55.3	DV132M-160M BM15 18.4 - 110.6	DV160L-225 BM30/31/32/62 36.9 - 442.5	DV250-280 BMG61/122 147.5 - 885
BRAKE VOLTAGE AC (to rectifier V_B)	DC	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$	$R_R(\Omega)$ $R_T(\Omega)$
—	24	4.4 13.4	3.9 12.1	3.4 10.2	2.7 8.2	1.4 7.5	0.8 5.0	0.67 5.0	—
105 - 116	48	17.6 53.4	15.6 48.1	13.6 40.5	10.9 32.7	5.7 29.8	3.1 20.1	2.2 16.8	—
186 - 207	80	55.6 169	49.5 152	42.9 128	34.5 103	17.9 94.2	9.8 63.5	7.1 53.0	—
194 - 217	80	—	—	—	—	—	—	—	4.0 32.6
208 - 233	96	70.0 213	62.3 192	54.0 161	43.4 130	22.5 119	12.4 80.0	8.9 66.7	—
218 - 243	96	—	—	—	—	—	—	—	5.0 41.0
330 - 369	147	176 534	157 481	136 405	109 327	56.5 298	31.1 201	22.3 168	—
344 - 379	147	—	—	—	—	—	—	—	12.6 103
370 - 414	167	221 672	197 606	171 510	137 411	71.2 375	39.2 253	28.1 211	—
380 - 431	167	—	—	—	—	—	—	—	15.8 130
415 - 464	185	279 846	248 762	215 643	173 518	89.6 472	49.3 318	35.4 266	—
432 - 484	185	—	—	—	—	—	—	—	19.9 163
465 - 522	208	351 1066	312 960	271 809	218 652	113 594	62.1 401	44.6 334	—
485 - 542	208	—	—	—	—	—	—	—	25.1 205

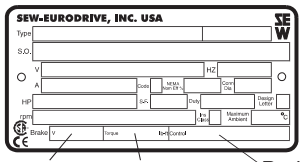
Voltage AC - The voltage shown is the nameplate AC brake voltage supplied to the brake rectifier.
DC - The voltage shown is the effective DC voltage required by the brake coil. The measured voltage from the rectifier will be 10-20% lower than that shown.

Brake Coil Resistance - values must be measured with the brake coil disconnected from the rectifier.
R_B - Accelerator coil resistance in Ω, measured from the red to the white brake coil wire at 20° C.
R_T - Fractional coil resistance in Ω, measured from the white to the blue brake coil wire at 20° C.

Brake Connection (AC Voltage)

SEW-Eurodrive motor brakes can be connected in a number of different ways. In order to connect the brake for each application, it is important to refer to the data on the motor nameplate that describes the brake system. The brake fields are: brake voltage, brake torque and brake control.

This operating instruction covers AC brake voltages with the following brake control components. If the brake voltage is DC, or if the brake control components differ from those listed below, an additional operating instruction must be consulted for connection information.



SEW-Eurodrive fail-safe mechanical brakes are DC controlled. Standardly, a brake rectifier (halfwave) is provided to convert the AC line voltage to the DC voltage required to drive the brake. 24VDC brakes do not include a rectifier. When voltage (V_B) is applied to the brake, it will release. When voltage (V_B) is removed from the brake, it will set.

The brake rectifier can be wired either for normal brake reaction time (setting, stopping) or fast brake reaction time.

Brake Control (Rectifier)	Part Number
BG1.5	825 384 6
BG3.0	825 386 2
BGE1.5	825 385 4
BGE3.0	825 387 0

The fast brake reaction will set the brake more quickly which will provide a shorter and more repeatable stopping distance. There are two basic types of brake rectifiers, BG and BGE. The BG brake rectifier is standard on motor sizes DT71 - DT100. The BGE rectifier is standard on motor sizes DV112 - DV280. The BGE rectifier can be ordered with motor sizes DT71 - DT100 and will provide faster brake release times allowing the motor to cycle more frequently.

The wiring diagrams for brake connections are located on the inside of the motor conduit box lid. The brake will release and allow the motor to rotate when the nameplate AC brake voltage V_B is supplied to the brake rectifier terminals. There are certain cases where the brake rectifier can receive its voltage from the motor's terminal block, meaning that when power is applied to the motor it will simultaneously release the brake and start the motor. See page 3 for this description.