

13.13 Brakes

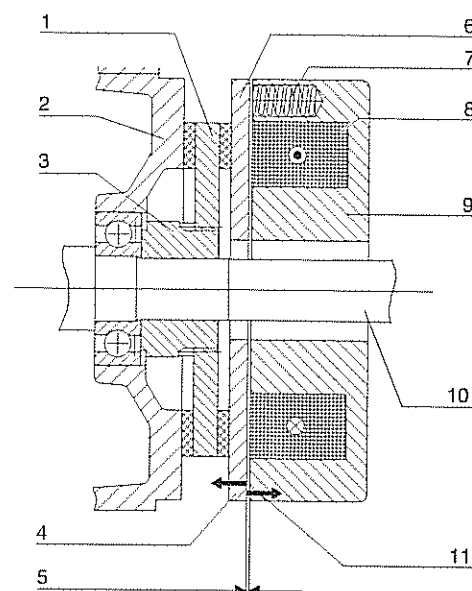
General information

On request, SEW-EURODRIVE motors and gearmotors can be supplied with an integrated mechanical brake. The brake is an electromagnetic disc brake with a DC coil that opens electrically and brakes using spring force. The brake is applied in case of a power failure. This means it complies with fundamental safety requirements. The brake can also be released mechanically if equipped with manual brake release. For this purpose, either a hand lever or a setscrew is supplied with the brake. The hand lever springs back automatically and the setscrew is lockable. The brake is activated by a brake control system housed either in the wiring space of the motor or in the switch cabinet. Refer to the "Brakes and Accessories" manual for detailed information about SEW-EURODRIVE brakes.

A significant advantage of SEW-EURODRIVE brakes is their very short length. The brake end shield is a part of both the motor and the brake. The integrated design of the brake motor permits particularly compact and sturdy solutions.

Configuration principles

The illustration below shows the basic structure of the brake.



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Figure 37: Basic structure of the brake

- | | | |
|--------------------|-------------------|--------------------------|
| 1 Brake disk | 5 Working air gap | 9 Brake coil body |
| 2 Brake end shield | 6 Pressure plate | 10 Motor shaft |
| 3 Carrier | 7 Brake spring | 11 Electromagnetic force |
| 4 Spring force | 8 Brake coil | |

Rapid response times

A particular feature of the brake is its patented two coil system. It comprises the accelerator coil BS and the coil section TS. The special SEW-EURODRIVE brake control system ensures that, when the brake is released, the accelerator coil is switched on first with a high current inrush, after which the coil section is switched on. The result is a particularly short response time when releasing the brake. The brake disk moves clear very swiftly and the motor starts up with hardly any brake friction.

This principle of the two coil system also reduces self-induction so that the brake is applied more rapidly. The result is a reduced braking distance. The brake can be switched off in the DC and AC circuit to achieve particularly short response times when applying the brake, for example in hoists.

Overview

SEW-EURODRIVE AC brake motors are equipped with the following SEW brake types:

Brake type	For motor	Description
BR	DR63	Double-disc, spring-loaded brake
BMG	DT56, DT71...DV132S, DV250...DV280	Double-disc, spring-loaded brake
BMG.2	DV250...DV280	Double-disc, spring-loaded brake
BM	DV132M...DV225	Double-disc, spring-loaded brake
BM..2	DV180...DV225	Double-disc, spring-loaded brake

Technical data

The following table lists the technical data of the brakes. The type and number of brake springs determines the level of the braking torque. Maximum braking torque M_{Bmax} is installed as standard, unless specified otherwise in the order. Other brake spring combinations can result in reduced braking torque values M_{Bred} .

Brake Type	For motor size	M_{Bmax} [Nm]	Reduced braking torques M_{Bred} [Nm]					W [10^6 J]	t_1 [10^{-3} s]	t_{2I} [10^{-3} s]	t_{2II} [10^{-3} s]	P_B [W]
BMG02	DT56	1.2	0.8					15	28	10	100	7
BR03	DR63	3.2	2.4	1.6	0.8			200	25	3	30	24
BMG05	DT71 DT80	5.0	4	2.5	1.6	1.2		120	30 20 ¹	5	35	32
BMG1	DT80	10	7.5	6				120	50 20 ¹	8	40	36
BMG2	DT90 DV100	20	16	10	6.6	5		260	70 30 ¹	12	80	40
BMG4	DV100	40	30	24				260	130 35 ¹	15	80	50
BMG8	DV112M	55	45	37	30	19	12.6	600	30	12	60	65
	DV132S	75	55	45	37	30	19	12.6	35	10	50	65
BM15	DV132M	100	75	50	35	25		1000	40	14	70	95
	DV132ML DV160M	150	125	100	75	50	35	1000	50	12	50	95
BM30	DV160L	200	150	125	100	75	50	1500	55	18	90	130
	DV180M/L	300	250	200	150	125	100	1500	60	16	80	130
BM31	DV200/225	300	250	200	150	125	100	1500	60	16	80	130
BM32 ²	DV180M/L	300	250	200	150	100		1500	55	18	90	130
BM62 ²	DV200/225	600	500	400	300	250	200	1500	60	16	80	130
BMG61	DV250/280	600	500	400	300	200		2500	70	25	120	200
BMG122 ²	DV250/280	1200	1000	800	600	400		2500	70	25	120	200

1 for operation with the BGE/BME brake control system

2 Double disc brake

M_{Bmax} = Maximum braking torque

M_{Bred} = Reduced braking torque

W = Braking work until service

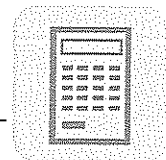
t_1 = Response time

t_{2I} = Brake application time for cut-off in the AC circuit

t_{2II} = Brake application time for cut-off in the DC and AC circuit

P_B = Braking power

The response and application times are recommended values in relation to the maximum braking torque.



13.14 Block diagrams of brake control systems

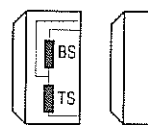
Legend



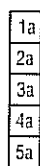
Cut-off in the AC circuit
(standard application of the brake)



Cut-off in the DC and AC circuits
(rapid application of the brake)



Brake
BS = Accelerator coil
TS = Coil section



Auxiliary terminal strip in the terminal box



Motor with delta connection



Motor with star connection

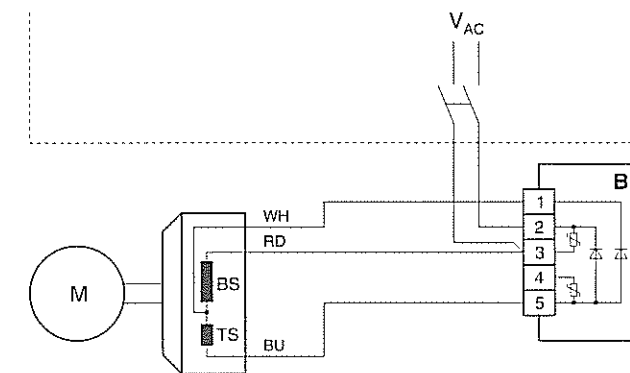
Color code according to IEC 757:

WH	White
RD	Red
BU	Blue
BN	Brown
BK	Black

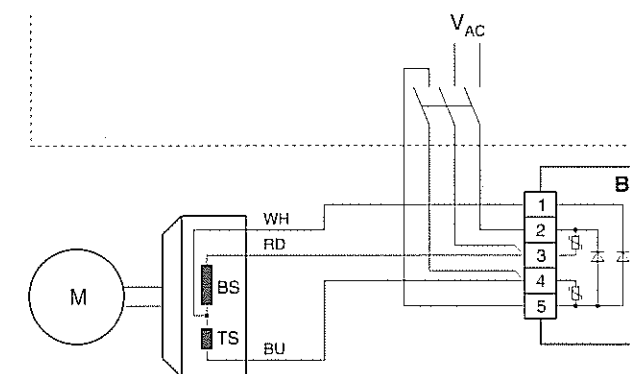


Switch cabinet limit

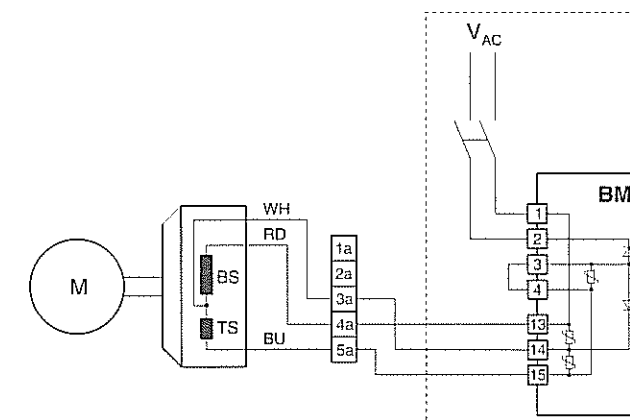
BG, BMS



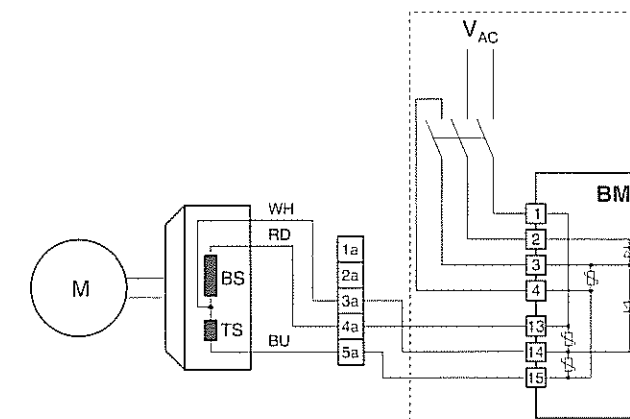
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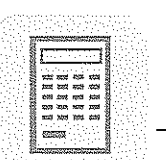
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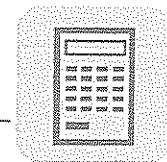
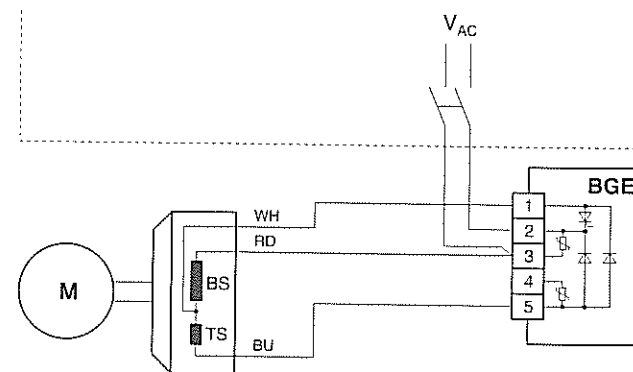


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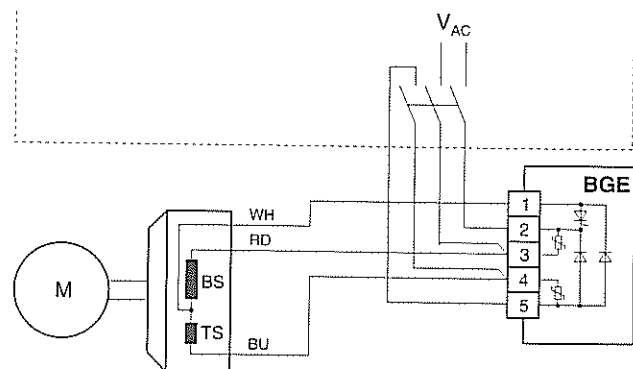


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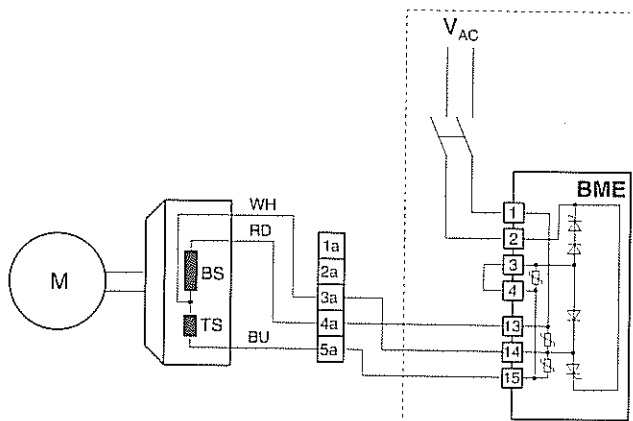


**BGE, BME**

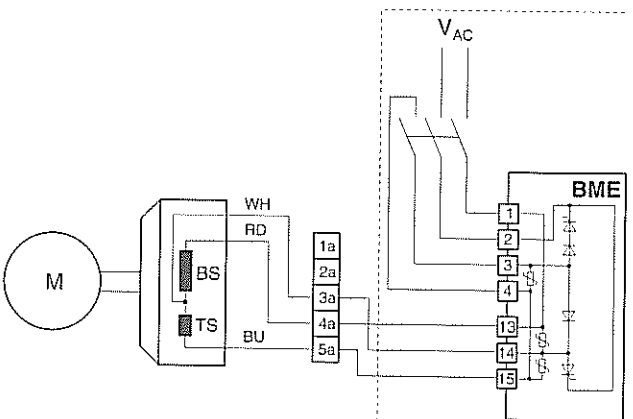
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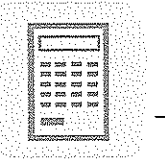
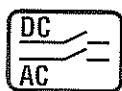
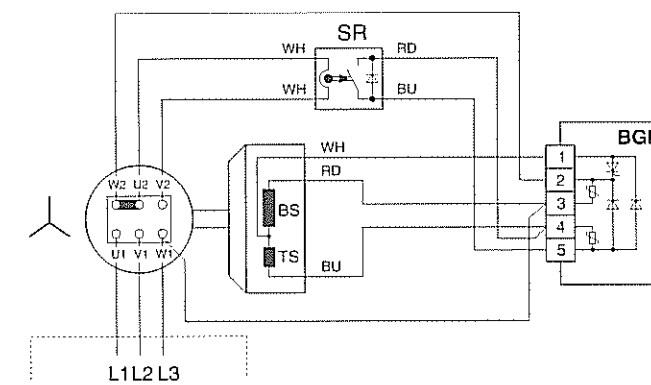
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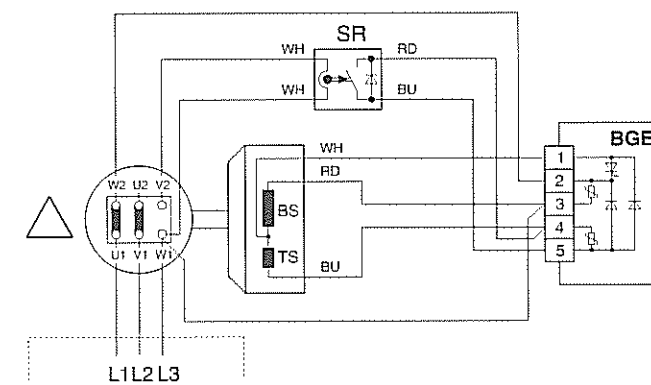
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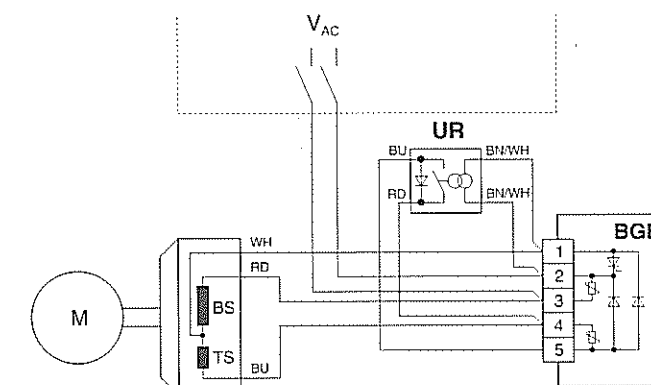
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**BSR**

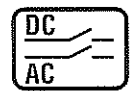
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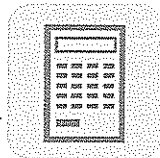


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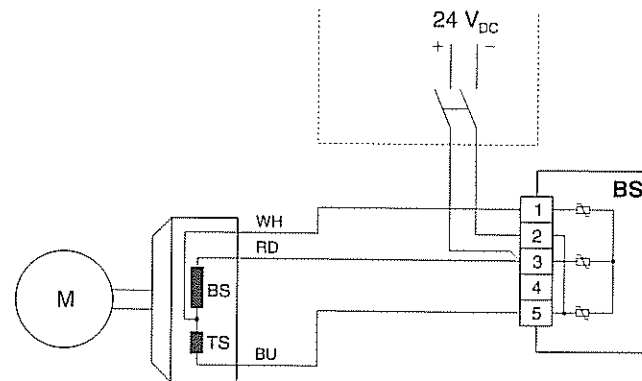
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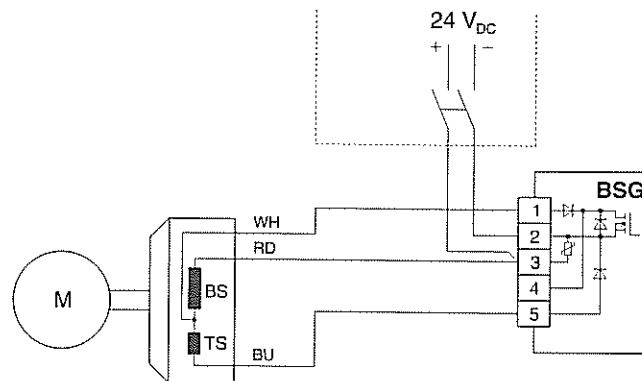


BS



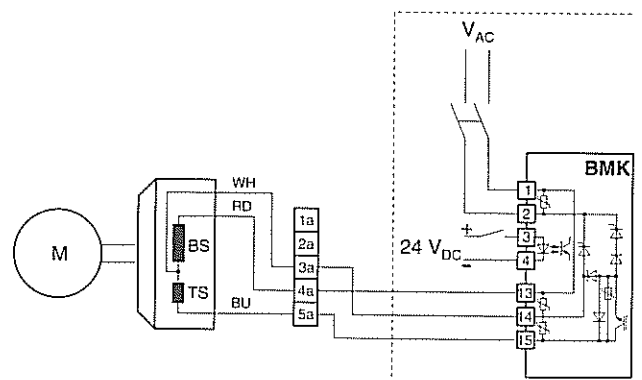
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BSG

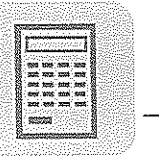
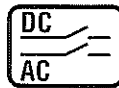
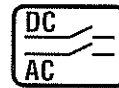


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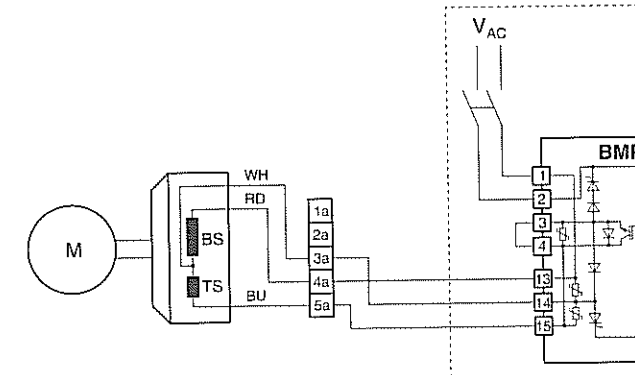
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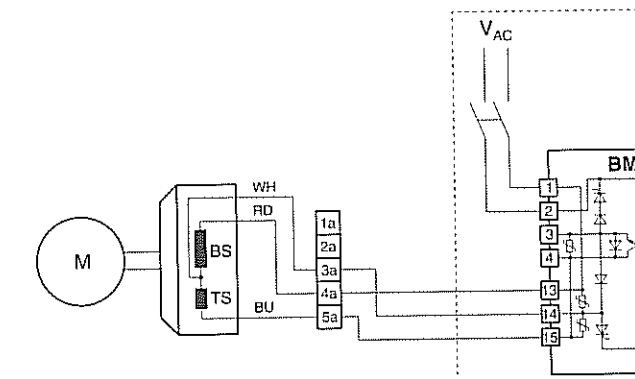
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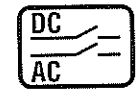
BMP, BMH



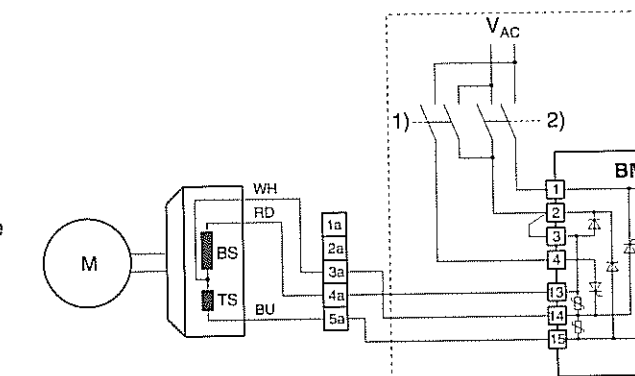
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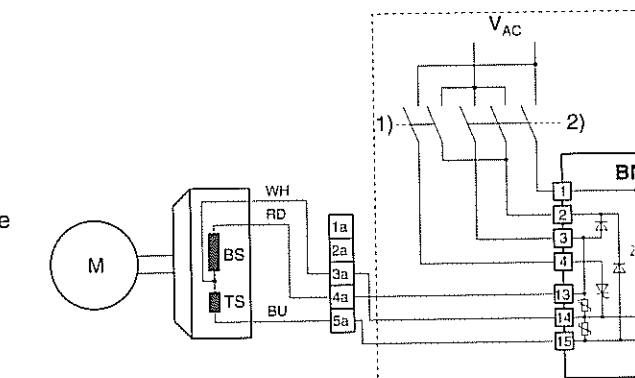
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2) Ventilate



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1) Heat
2) Ventilate



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