

Operating manual

Brakes for Asynchronous Motors / Asynchronous Motors IE2



This operating instructions is a supplement to the operating instructions "System Motors / Asynchronous Motors".

The electromagnetically operated, twin-surface spring pressure brake is applied by spring force when not energised and is released by an electromagnetic DC coil (Fig. 1, pos. 2) or, when stationary, by an optionally installed manual valve (Fig 1, pos. 3). The DC coil can be supplied either directly with direct current or with an alternating current via a brake rectifier (bridge, single-phase or Powerbox, see information on the specification plate). When a direct DC supply is provided (without a rectifier), a varistor must be installed as protection against switching surges. Observe the information in the STÖBER catalogue, on the braked motor specification plate, in the operating instructions, wiring diagrams and safety instructions.

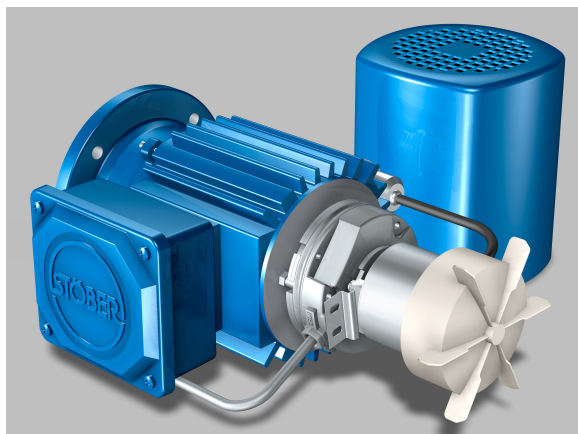
If in doubt or when documents are lacking, obtain the necessary information from the pertaining STÖBER sales office or service workshops.

1 Technical data

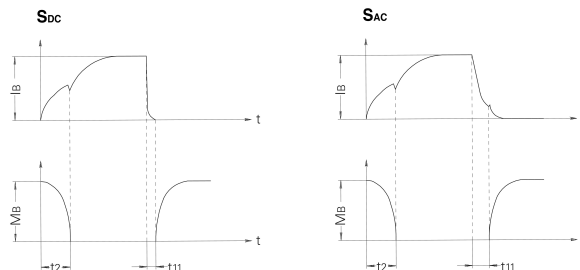
Technical data for brake see appendix.

1.1 Electrical features Powerbox

Powerbox electrical properties		
Powerbox for use with	Frame size 63 - 132: Terminal box or switch cabinet; Size 160 - 225: only in switch cabinet	
Input voltage	180 - 300 V _{AC} +/- 0% can be used for a wide range 220 - 275 V +/- 5% 50 or 60 Hz	
Excitation time	350 ms +/- 10%	
Cable length	max. 100 m of brake coil	
Current	I _N 45°C	1,2 A stable; 2,4 A for 350 ms
Current	I _N 75°C	0,7 A stable; 1,4 A for 350 ms



1.2 Current and torque-time diagram in dependency on the circuit arrangement



It is appropriate to switch on the brakes by the respective switch-on time t_2 before the motor.

See also Item 3, Electrical connection.

1.3 Formula brake

M_B [Nm] - Braking torque
 P_{20} [W] - Power input in continuous operation at 20° C
 W_{NR} [$10^6 \cdot J$] - Friction work until next adjustment, amplification factor for Powerbox see below!
 $(W_{NR} = 10 \cdot W_{01} \cdot (L_{max} - L_N))$
 W_{01} [$10^6 \cdot J$] - Friction work per 0.1 mm of wear
 L_N [mm] - Rated air gap
 L_{max} [mm] - Maximum air gap
 g_{min} [mm] - Min. permissible lining thickness
 t_2 [ms] - Switch-on time (brake release time) up to $M = 0$ Nm
 $t_{11 DC}$ [ms] - Switch-off time (delay) at S DC
 $t_{11 AC}$ [ms] - Switch-off time (delay) at S AC
 J_B [$10^{-4} kgm^2$] - Mass moment of inertia
 U_{DC} [V_{DC}] - Brake voltage
 U_{AC} [V] - Brake rectifier voltage
 t_{2P} [ms] - Powerbox switch-on time (brake release time) up to $M = 0$ Nm
 $t_{11 DCP}$ [ms] - (delay) at S DC with Powerbox
 $t_{11 ACP}$ [ms] - (delay) at S AC with Powerbox
 W_{NRP}/W_{NR} - Friction work until next adjustment, Powerbox (amplification factor)
 I_B - Brake current
 Z_S [1/min] - Permitted switching cycles per minute (a switching cycle consists of switching on and off once)

2 Installation, adjustment / readjustment of the air gap (Fig. 1)



WARNING!

For work on the brake:

- Secure machine against unintentional movement (vertical load, etc.).

The brakes are installed on the drive upon delivery and the braking torque and air gap are adjusted to their rated values.

Air gap setting:

Adjust the air gap "L" to the rated value (L_N) when the maximum air gap (L_{max}) is reached due to wear:

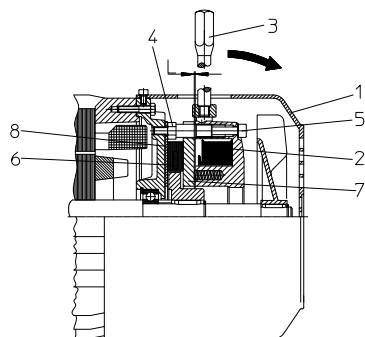
- Remove fan guard (1).

- Loosen cheese-head screws (5).
- Adjust the air gap to the rated value by applying an open-jawed spanner to the adjusting nuts (4). Two calliper gauges are necessary to measure the air gap; the deviations at the three measuring points should not exceed ± 0.05 mm.
- Tighten cheese-head screws (5).
- Replace fan guard (1).

Replace brake:

When the minimum lining thickness g_{min} is reached, replace brake disc (6). During the replacement, inspect the anchor disc (7), lining (motor B bearing bracket), friction disc (8) and brass foil (if installed). Replace if excessively worn. Anchor disc (7) available only complete with brake coil (2).

Fig. 1



While making the motor connection, observe and comply with the attached safety instructions and the respective operating instructions. Observe connection designation and connection plan!

To be observed while using rectifiers:

If the full nominal power is used, or if the motor is driven only with its own ventilation in the lower speed range (at drive controller), then it is possible for the temperature of the motor housing surface to exceed the **maximum permissible ambient temperature** for Powerbox fast rectifier (**75° C**) or for one-way or bridge rectifier (**80° C**). In this case, installation in the terminal box is not advisable, as the higher temperatures can lead to the premature failure of the rectifier. Instead, the rectifier should be installed in the control cabinet. Of course, here too, a position should be selected at which the temperature is always lower than the permissible ambient temperature! For use under increased temperature conditions, or operation through drive controllers, we request you to please discuss the matter with our sales engineers.

3 Electrical connection

- **Without rectifier**, connected voltage U_{DC} see specification plate (Fig. 3)

- **With rectifier and external supply** U_{AC} (Fig. 2, Fig. 4) fast rectifier (Powerbox) also included.

See specification plate for connected voltage U_{AC} .

AC switching (with bridge B).

DC switching (fast application of the brake).

Remove bridge B in Fig. 2, replace with switch contacts and employ additional AC switching.

- **With rectifier and direct U_{AC} supply** from the motor terminals.

Install the enclosed connecting bridges as shown in Fig. 5 and Fig. 6.

The following applies for connected voltage of the brake (U_{AC}) according to specification plate and supply voltage (U_{3AC}): $U_{AC} = U_{3AC} \times 0.58$ (Fig. 5), $U_{AC} = U_{3AC}$ (Fig. 6).

Connection of the brake to motor terminals possible only when the voltages are equal.

Permissible only for direct starting with supply.

Connected voltage with Powerbox rectifier 220 - 277 V_{AC} , coil voltage 115 (or 127) V_{DC} .

Observe terminal designations on the component.

For other designs or other installed equipment, see separate circuit diagram.

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Fig. 2

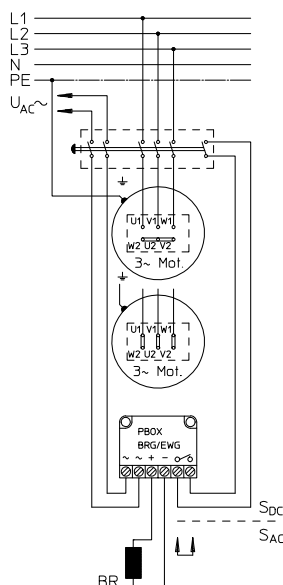


Fig. 3

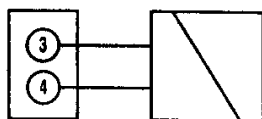


Fig. 4

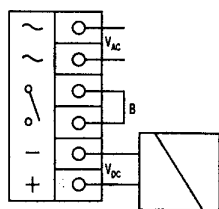


Fig. 5

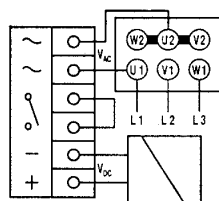
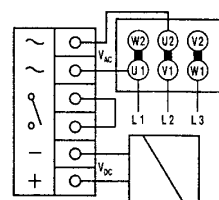


Fig. 6:



4 Troubleshooting

In the event of a malfunction of the drive unit, call the STÖBER service department at 07231 582-1190 (-1191, -1224, -1225) in order to locate the nearest STÖBER service partner for further action.

In urgent cases outside of normal business hours, you can call the STÖBER 24-hour service hotline at 01805 786323 / 01805 STOEBER

5 Spare parts

Include the following when ordering replacement parts:

- item no. of the part according to the replacement parts list
- model designation according to the rating plate
- serial number according to rating plate

You can reach the STÖBER replacement parts service by phone: 07231 582-1190 (-1191, -1224, -1225), or fax: 07231 582-1010.

Important notice: The replacement parts lists are not assembly instructions! They are not binding for assembly of the gear unit. Use only original replacement parts from Stöber. Otherwise we will provide no guarantee and will assume no liability for resulting damages!

6 Disposal

This product contains recyclable materials. Observe local applicable regulations for disposal.

7 Appendix

Technical data:

Typ	Mot.	MB [Nm]	P20 [W]	WNR [10 ⁶ J]	W01 [10 ⁶ J]	LN [mm]	Lmax [mm]	gmin [mm]	t2 [ms]	t11DC [ms]	t11AC [ms]	JB [10 ⁻⁴ kgm ²]	mB [kg]
K38-03	80K,80L	10	30	37,5	12,5	0,2	0,5	6,5	55	15	100	0,79	1,7
K38-04	90L,90S	20	30	76,0	19,0	0,2	0,6	8,0	90	25	180	1,50	3,3
K38-05	100K,100L	36	48	112,0	28,0	0,2	0,6	10,0	110	25	220	3,85	5,0
L48-14	112M	60	50	215,0	43,0	0,3	0,8	6,0	150	65	390	6,93	5,7
L48-16	132M,132S	80	55	434,0	62,0	0,3	1,0	7,5	180	90	540	16,5	8,7
L48-18	160K,160L,160M	150	85	540,0	90,0	0,4	1,0	8,0	300	110	660	31,9	13,2
L48-20	180L,180M	260	100	612,0	76,5	0,4	1,2	9,6	400	200	1200	80,3	21,2
L48-25	200L,200M,225M,225S	400	110	792,0	88,0	0,5	1,4	12,5	500	270	1620	220	32,0

Technical data for standard wide-range brakes with high-speed rectifier:

Typ	Mot.	MB [Nm]	Udc [V]	Uac [V] 50-60 [Hz]	LN [mm]	Lmax [mm]	t2P [ms]	t11DCP [ms]	t11ACP [ms]	WNRP/ WNR	Zs [1/min]
K38-03	80K,80L	10	115	220-275	0,2	1.36 - 1.75	31 - 26	13 - 16	78 - 85	3.9 - 5.2	40
K38-04	90L,90S	20	115	220-275	0,2	1.6 - 2.1	50 - 44	17 - 21	126 - 139	3.5 - 5.3	40
K38-05	100K,100L	36	115	220-275	0,2	2.1 - 2.8	55 - 48	35 - 42	186 - 198	4.8 - 6.5	25
L48-14	112M	60	127	220-275	0,3	2.5 - 3.4	89 - 76	54 - 65	359 - 390	4.6 - 6.2	5
L48-16	132M,132S	80	127	220-275	0,3	2.5 - 3.4	107 - 91	75 - 90	497 - 540	4.1 - 5.6	5
L48-18	160K,160L,160M	150	127	220-275	0,4	2.5 - 3.4	179 - 152	91 - 110	608 - 660	4.7 - 6.3	5
L48-20	180L,180M	260	127	220-275	0,4	2.5 - 3.4	238 - 203	166 - 200	1105 - 1200	3.5 - 5.9	2
L48-25	200L,200M,225M,225S	400	127	220-275	0,5	2.5 - 3.4	286 - 244	224 - 270	1492 - 1620	4.3 - 6.0	1