DC motor brake - Open design

- Electronic motor brake
- Intergrated brake contactor control
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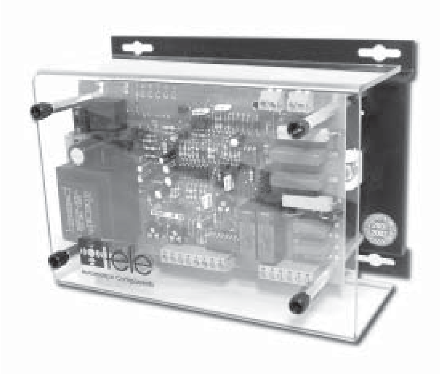
- Brake contactor is switched after de-energization
- Open design



Technical data

1. Functions
Electronic motor brake for braking asynchronous motors without mechanical accessory.
Integrated brake and motor contactor control
Temperature monitoring of DC motor brake

2. Time ranges
	Adjustment range	
Braking time:	0s	45s

3. Indicators
Green LED 1 ON:	indication of supply voltage
Red LED 2 ON/OFF:	braking contactor released
Red LED 3 ON/OFF:	braking current activ
Red LED 4 ON/OFF:	motor contactor enabled

4. Mechanical design
Metal housing with plastic cover, IP rating IP 00
Mounting on mounting plate
Distance to other devices min. 100mm

Mounting position:	cooling fins have to be rightened
Terminals:	depends on power class standard terminals or Cu-Rail
Initial torque:	depends on power class
Terminal capacity:	see table

5. Control circuit
Supply voltage:	
230V AC	terminals L1-N
Tolerance:	±15%
Rated frequency:	48 to 63Hz
Duration of operation:	100%

6. Control input 1 - 2
Function:	activation of brake
Loadable:	No
Line length:	max.10m, twisted pair
Control pulse length:	min. 0.2s

7. Control input 3 - 4
Function:	lock of power circuit
Loadable:	No
Line length:	max.10m, twisted pair
Control pulse length:	min. 0.2s

8. Control input 5 - 6
Function:	feedback braking contactor
Loadable:	No
Line length:	max.10m, twisted pair
Control pulse length:	min. 0.2s

9. Control input 7 - 8
Function:	activation interlock
Loadable:	No
Line length:	max.10m, twisted pair
Control pulse length:	min. 0.2s

10. Signaling contact 10 - 11 - 12
1 potential free change-over contact

Function:	activation of brake contactor
Switching capacity:	1500VA (6A/250V AC)
Fusing:	6A

11. Signaling contact 13 - 14 - 15
1 potential free change-over contact

Function:	activation / enable motor contactor
Switching capacity:	1500VA (6A/250V AC)
Fusing:	6A

12. Power circuit
Supply voltage:	
220V to 500V AC	terminals L1-L2
Tolerance:	±15%
Rated frequency:	48 to 63Hz
Braking current:	see table
Duration of operation:	max. 50% at maximum load

13. Power classes
(see table next page)

14. Ambient conditions
Ambient temperature:	-25 to +55°C (according to IEC 68-1)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	5% to 95% not condensing (according toIEC 721-3-3 class)
Pollution degree:	2 (according toIEC 664-1)

Subject to alterations and errors

Technical data

ref. to 12. Power classes

Type	Recommended motor size	Max. permissible braking current DC	Dimensions	Size	Weight
	(kW)	(A)	H x B x T (mm)		(kg)
BG 20	4.0	18	140 x 200 x 115	A	1.1
BG 35	7.5	32	140 x 200 x 115	A	1.2
BG 60	15.0	60	195 x 260 x 170	B	2.3
BG 100	22.0	100	195 x 260 x 170	B	2.5
BG 150	30.0	150	195 x 260 x 170	B	2.9
BG 220	55.0	220	195 x 260 x 170	B	3.4
BG 300	75.0	300	195 x 260 x 170	B	3.4
BG 400	100.0	400	235 x 360 x 200	C	6.9
BG 500	140.0	500	235 x 360 x 200	C	6.9
BG 750	200.0	750	235 x 360 x 200	C	7.4
BG 1000	250.0	1000	235 x 360 x 200	C	7.6
BG 1500	315.0	1450	360 x 400 x 240	D	9.2
BG 2000	400.0	2000	360 x 400 x 240	D	10.5

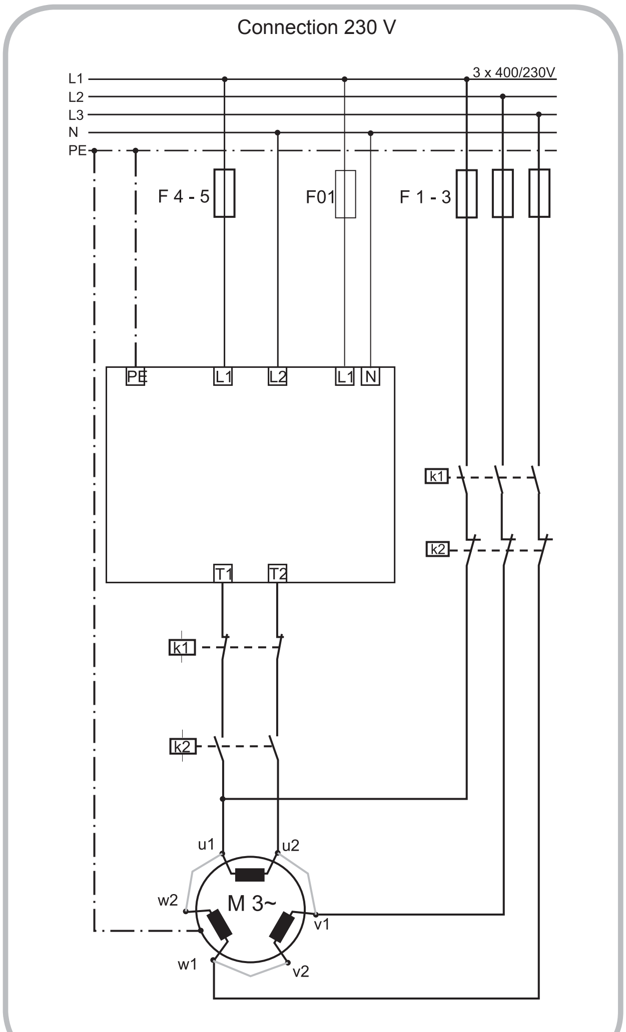
All values refer to standardised motors according to IEC 72 and UNE 20106. The actually needed braking current refers to the application and has to be ascertained by the customer. Therefore it might be necessary to choose a larger motor brake than mentioned in the table above.

Functions

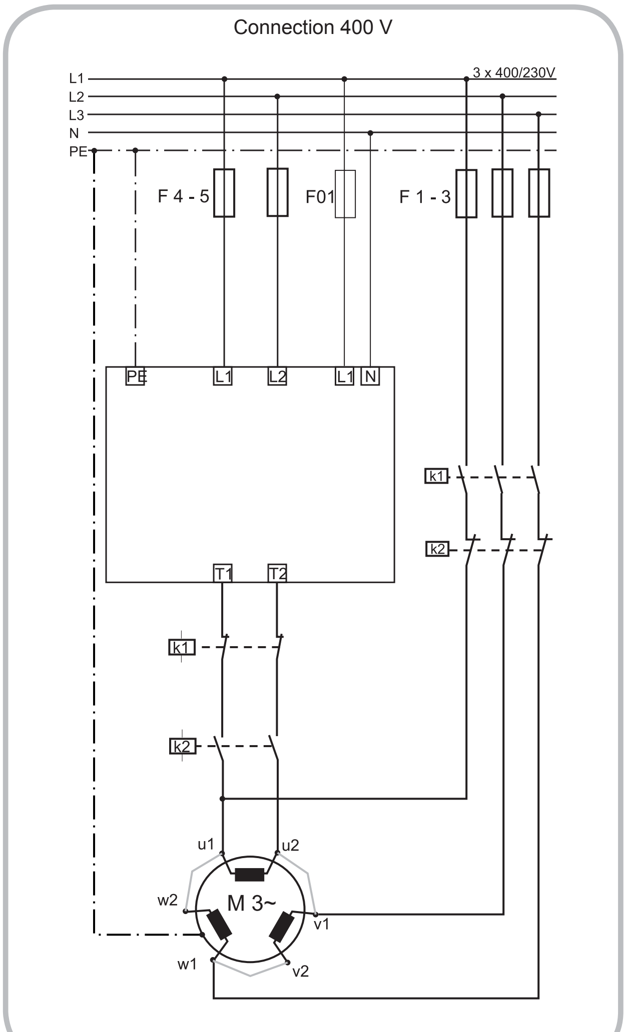
DC-braking of a motor
Closing the start contact activates the motor brake. In doing this the motor contactor is opened and the brake contactor is closed. After a short delay a DC-current (rectified via a transistor using phase angle control) is sent through the motor coil. This current can be adjusted via the t_{brake} regulator.
The maximum value of this current is limited by the serial connection of motor coil, supply voltage and the thyristor. Please note that the resistance of the thyristor can be almost reduced to 0Ω (equivalent to 100% I_{brake}).
The current in the motor coil induces a magnetic field within the stator. The rotor attempts to follow this field and is thus slowed down by the speed-dependent braking torque created within the time adjusted at the t_{brake} regulator. After the interval t_{brake} has expired first the braking current is switched off and then the brake contactor is de-energised. This course of actions avoids the loss of contact material of the contactor caused by an arc-over.
After deactivating the brake contactor the motor contactor is enabled again.
It is a fact that the information necessary to exactly calculate the braking torque or braking current I_{brake} and the braking time t_{brake} is hardly known for the drive system and for all occurring moments of inertia. The necessary braking torque should therefore be recorded on-site during a test run. Please note that the coil resistance continuously changes until the motor has reached theoperating temperature.
As a result of this way of braking no current is induced inside the rotor when the motor has stopped. The motor therefore has no holding torque.
Because the motor brake has no emergency shutoff or safety limitations it can happen that the device is damaged by high braking currents. Therefore it is necessary that during a first test run the braking current is increased slowly and does not exceed the maximum braking current of 10A. The braking current has to be monitored with a True-RMS measuring device during this test run.

Connections

Power circuit

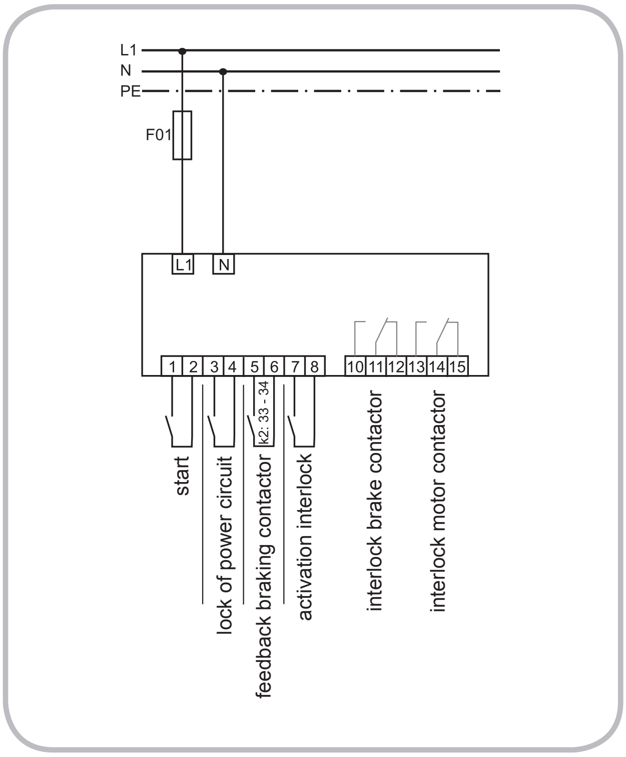


k1 = motor contactor k2 = braking contactor



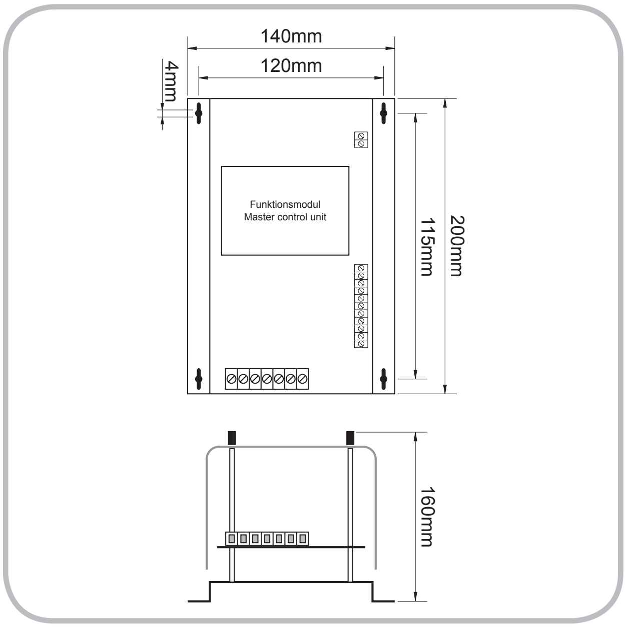
k1 = motor contactor k2 = braking contactor

Control circuit

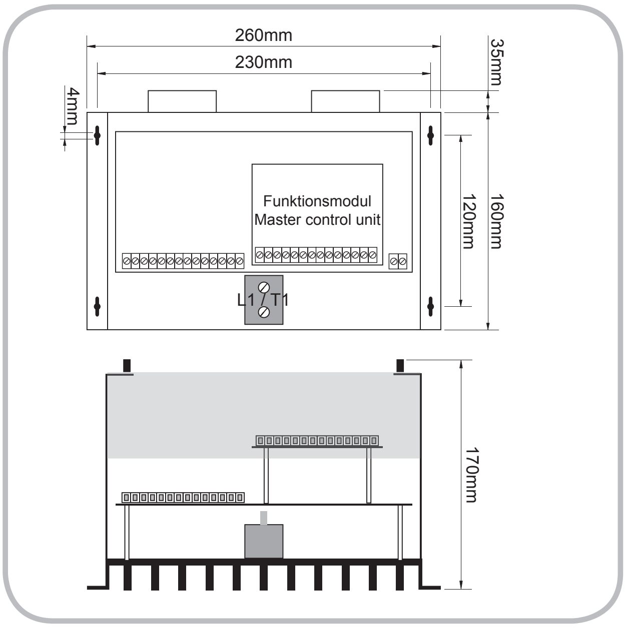


Dimensions

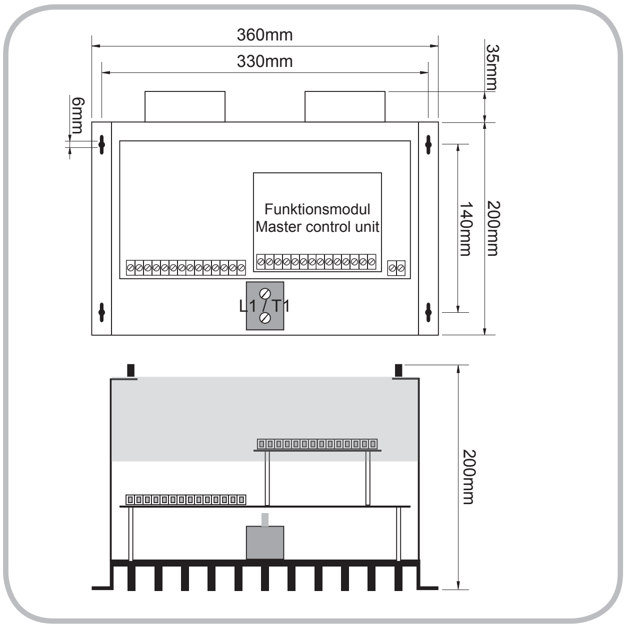
Size A



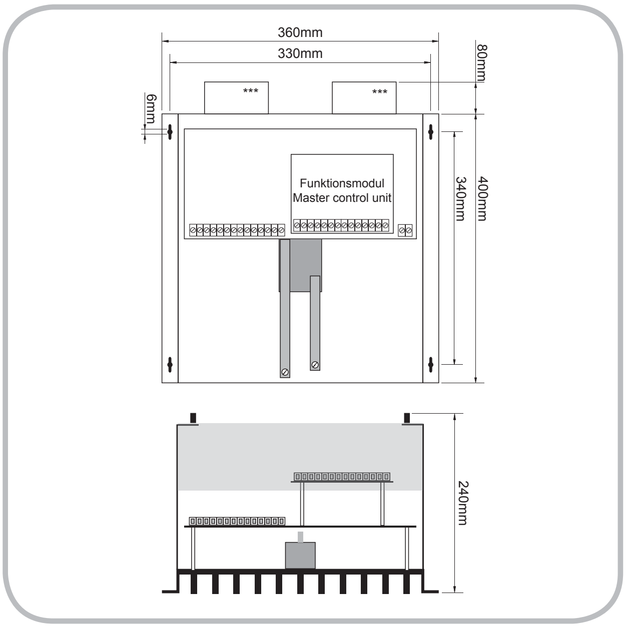
Size B



Size C



Size D



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