



Elektroniksysteme GmbH
Entwicklung und Produktion elektronischer Systeme

Eichelreuth 13
83224 Grassau

Telefon: 08641/598360
Telefax: 08641/598364

E-Mail: info@rs-steiner.com
Internet: <http://www.rs-steiner.com>

Start-up instructions

Electronic braking unit Type: BG-S...

- **braking motors without mechanical components**
- **integrated braking contactor**
- **braking contactor switches if no current is available**
- **integrated controlling of the mains contactor**
- **frame sizes conform with industrial standards**

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1. General information

All asynchronous motors (squirrel cage or slip ring motors) can be slowed down during coasting with the electronic braking unit type BG-S.

How it works:

A brake rotary current flowing through the motor coil is used to brake the motor. This brake rotary current creates a static magnetic field in the stator. The rotor attempts to follow this field. The rotary current brake, together with the characteristics of the used motor, effect brake moment dependent of the rpm, that results in the motor coming to a standstill.

Due to this rotary current braking, no current is produced in the rotor at standstill. As a result, the motor has no holding moment.

Current limitation: Brake unit type BG-S 10 doesn't possess any current limitation. Therefore the device might be destroyed by too high currents. When the device is put into operation you have to ensure that the current doesn't exceed the value of 10A. As a matter of fact, the current has to be monitored permanently.

In contrast to the BG-S 10 the types BG-S 20 und BG-S 35 are equipped with a current limitation which preserves them from being destroyed by over-current. This state is indicated by the LED "over-current".

Braking torque, braking current, braking time:

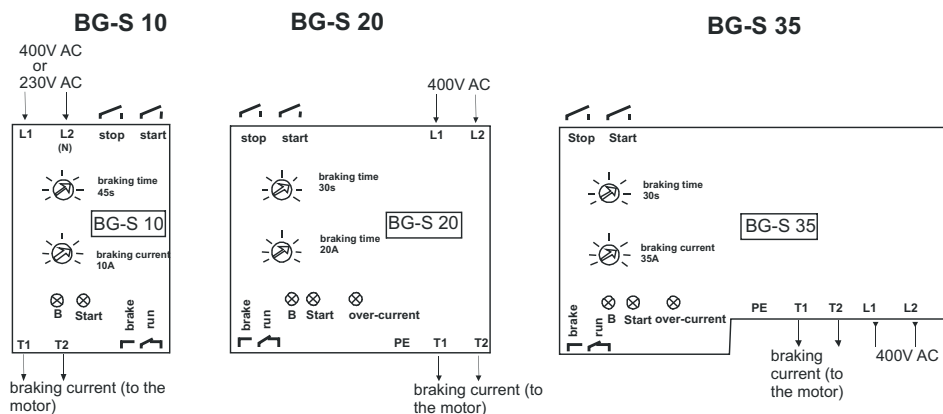
In order to compute braking torque, current and time precisely a lot of pieces of information concerning the given motor is absolutely required. However, these values can't be obtained that easily in general.

The following rule of thumb has proved to be rather correct:

$$I_B = 2 \times I_{rated}$$

- I_B = brake current (A)
- I_{rated} = rated current (A)

2. Possible device constructions



Time ranges:	
	valid ranges
BG-S 10	0-45s
BG-S 20 and 35	0-30s

LED:	
B (green):	control voltage is connected
B (yellow):	failure (temperature exceedance)
Start (green):	braking process was activated
over-current (yellow):	max. current reached, current limitation was enabled (only BG-S 20 and BG-S 35)

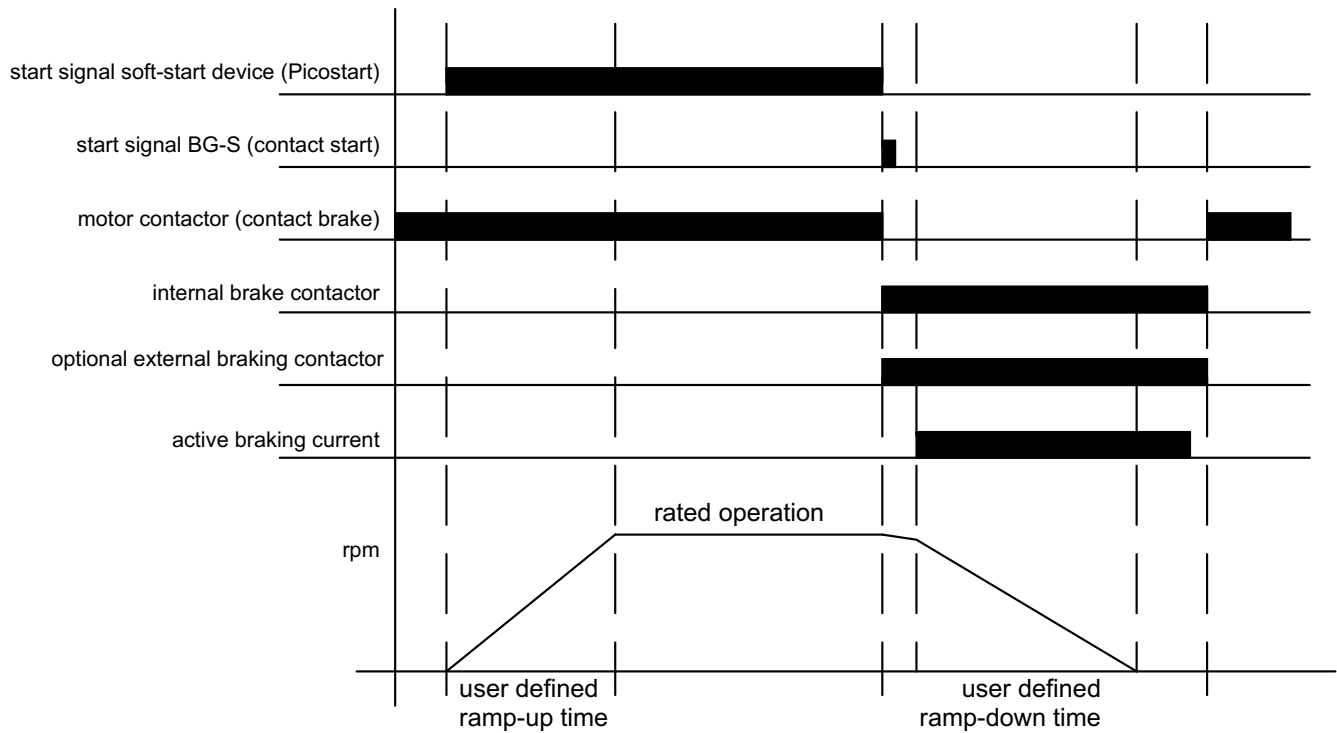
Built-in Device:
 The BG-S brake units agree with the IP40 standard. The mounting has to be done on a profile rail (type TS 35) according to EN 50022. In addition to that the heat sink must be on top.

Control inputs:	
Start	activation of the braking process
Stop	interruption of the braking process

Control contacts:	
Brake	potential-free connection of a further braking contactor
Run	potential-free connection of mains or motor contactor

Power unit:	
BG-S 10:	
Voltage:	1~230V or 400V, terminals L1-L2 (N)
Tolerance:	±10%
Mains frequency:	48-63Hz
Current limitation:	no
Number of brakings:	<ul style="list-style-type: none"> • 30/h (5s and braking current 10A) • 10/h (t_{max} and braking current 10A)
Rated surge voltage	2,5kV
Isolation voltage:	345/600V (according to IEC60947-1, 4.3.1.2)
BG-S 20 and BG-S 35:	
Voltage:	~400V, terminals L1-L2
Tolerance:	±10%
Mains frequency:	48-63Hz
Current limitation I_{max}:	BG-S 20 20A
	BG-S 35 35A
Number of brakings:	<ul style="list-style-type: none"> • 30/h (5s and I_{max}) • 10/h (t_{max} and I_{max})
Rated surge voltage:	2,5kV
Isolation voltage:	345/600V (according to IEC60947-1, 4.3.1.2)

3. Chronological description of a braking process



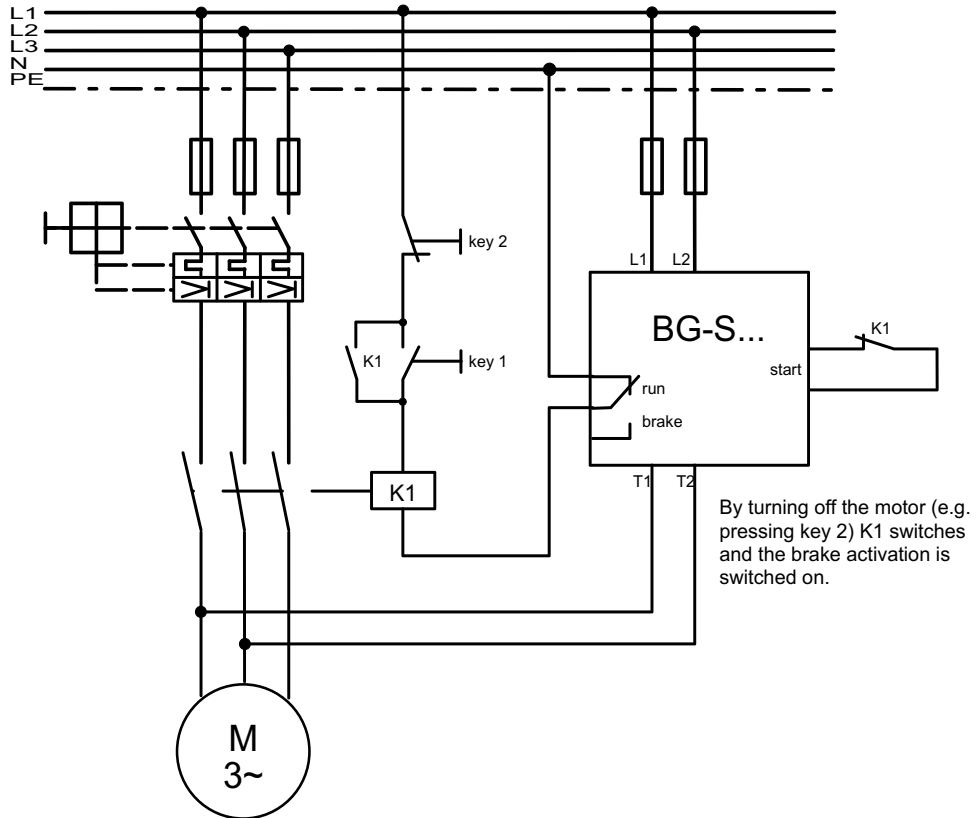
Chronological progress of a normal cycle:

- soft-start performed by Picostart, ESG, EUROSTART
- braking process started by BG-S

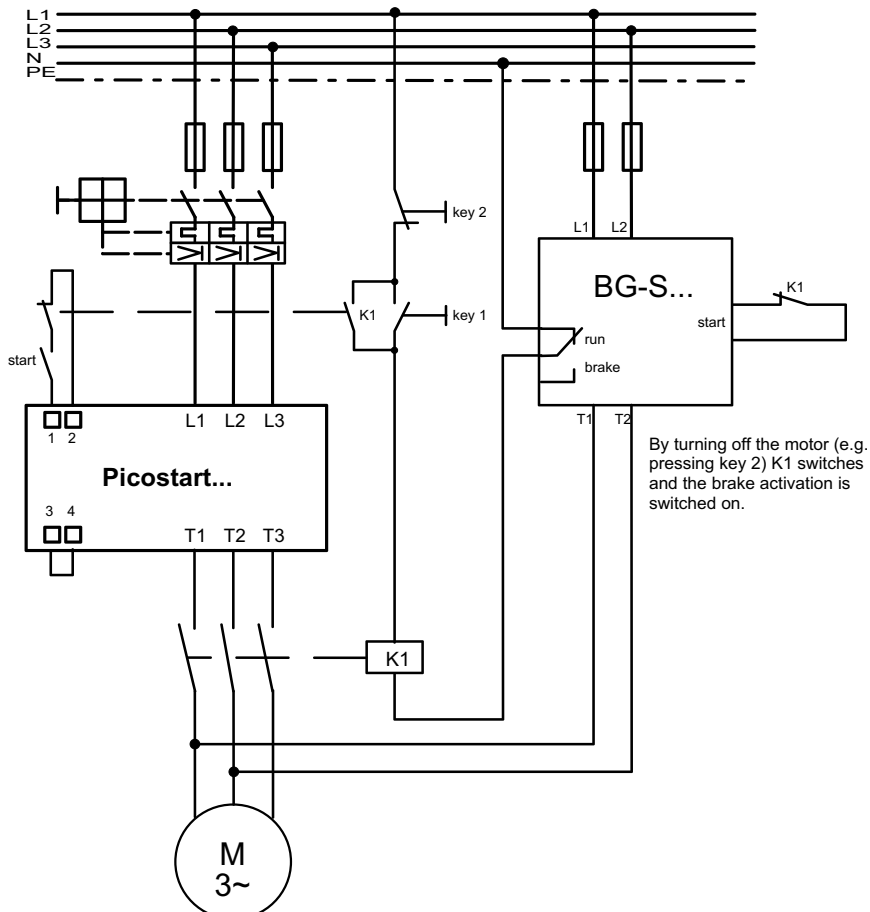
The different switching states are interrupted by safety intervals when the brake current is switched on and off. With the help of those intervals a current-free switching of contactors is ensured. As a matter of fact erroneous switchings (e.g. by defective contactors) can therefore be avoided.

4. Wiring

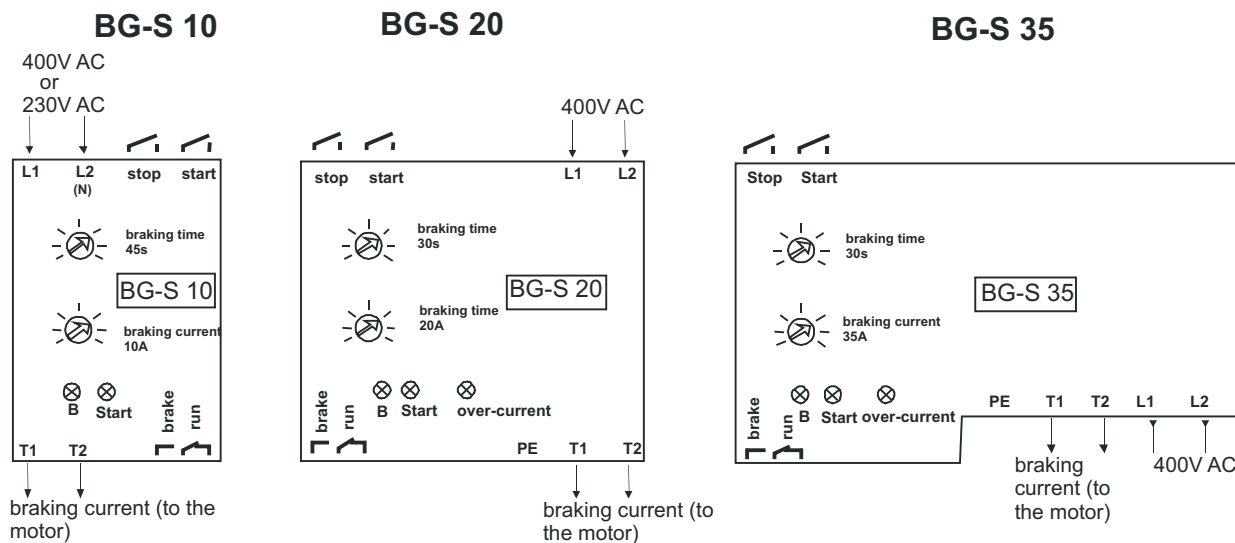
Standard



Extended wiring with BG-S and Picostart:



5. Connection of the power supply



To begin with, all electrical connections are to be made according to the accompanying wiring diagrams: L1, L2, T1 (U), T2 (V). The electronic braking units must be connected to the power supply according to the VDE specifications so that they can be disconnected from the mains using a suitable switching means (i. e. master switch, contactor, protective power switch).

Wiring:

The mains power supply and motor power supply, as well as the control wiring, are to be in separate ducts or conduits. In order to avoid malfunctions it is advisable to install the electronic signal wiring separate from the power supply and/or protective control wiring and either to twist the feed and return signal lines or to use shielded control lines.

Fuses:

The mains fuse protection is dependent on the recommended or employed power-transmission cross-section, and must be carried out in accordance with DIN 57100, Part 430/VDE 0100 and part 430/6.81.

6. Survey of the individual types

Type	Rec. motor power [kW]	Max. braking current [A]	Rec. semi-conductor fuses [A]	Mains fuse [A]	Rec. cross-section [mm ²]	Weight [g]	Dimensions WxHxD [mm]
BG-S 10	2,2	10	16	16	2,5	290	45x75x117
BG-S 20	5,5	20	25	25	6	510	70x75x117
BG-S 35	11,0	35	35	35	10	680	100x75x117

Errors and technical modifications excepted (Date: 2008/08)

Nominal values of the devices according to DIN VDE0660, part 500 und part 102).

Special features of the brake units type BG-S...:

- optimal braking behaviour
- reduces motor vibration and volume
- braking current and time can be adjusted independently from each other
- can be mounted easily
- simple use of standard contactors
- easy to upgrade

7. Technical data

Operating voltage:	230V / 400V 50Hz
Supply voltage:	generated internally, upon request external 230V / 400V 50Hz
Connection:	L1, L2 or L1, N
Ambient temperature:	-25-55°C (corresponds to IEC 68-1)
Storage temperature:	-25-70°C
Relative Luftfeuchtigkeit:	5-95%, not condensing
Max. altitude:	1500m
Potential-free contacts:	250V AC / 3A
Malfunction report:	temperature exceedance
Mounting:	vertical, heat sink on top
Control inputs:	potential free activation
Number of brakings:	30/h with max. current
Pollution degree:	2 (corresponds to IEC 664-1)

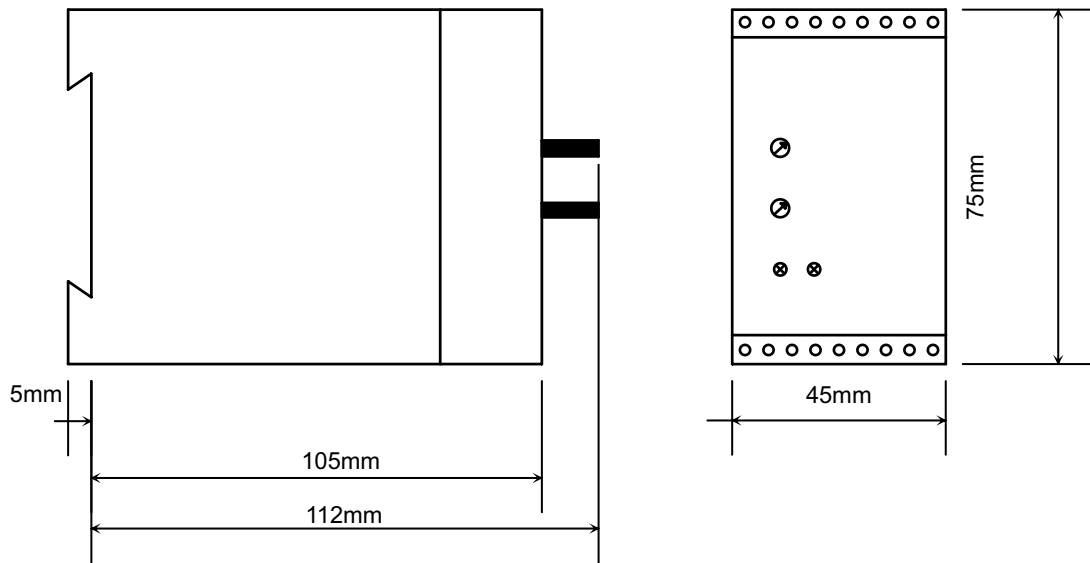
Errors and technical modifications excepted (Date: 2008/08)

Extra equipment:

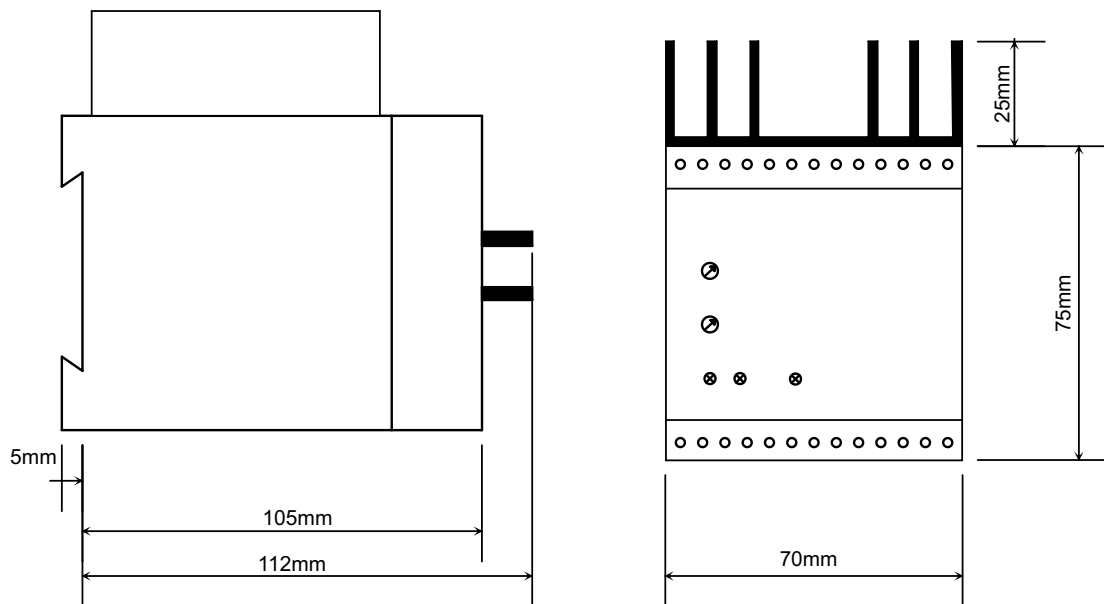
The removable protection cover can be sealed so that no adjustments (i.e. avoiding unauthorized modifications) can be made.

8. Frame sizes

Frame size: BG-S 10



Frame size: BG-S 20



Frame size: BG-S 35

