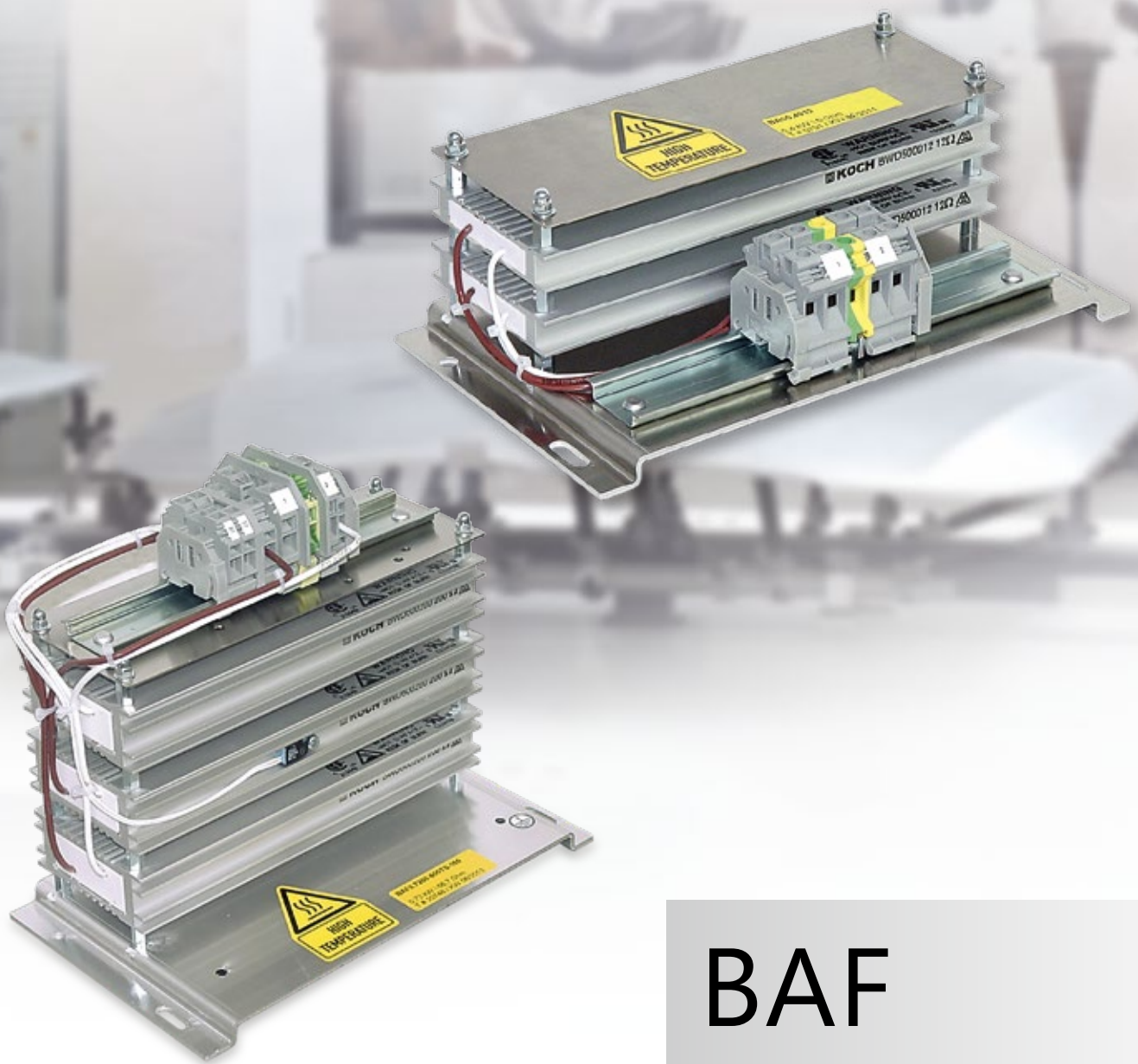


# Our modular system for safe brake resistors



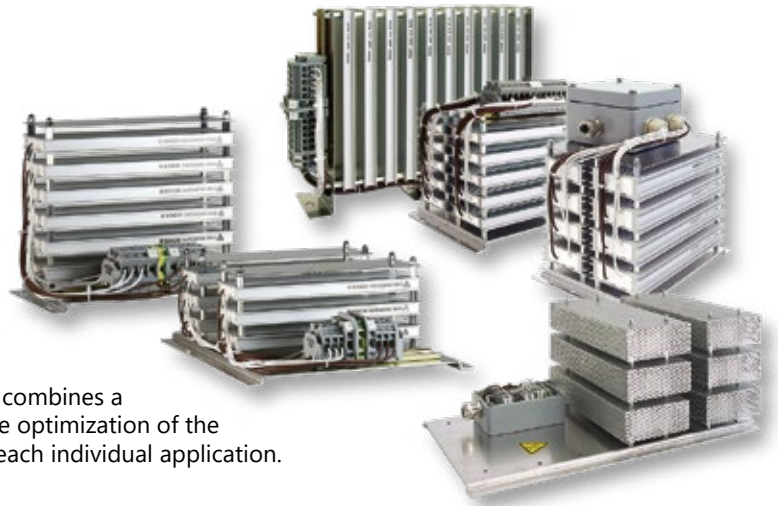
BAF  
BAS

## Our modular system for safe brake resistors

We manufacture resistor combinations by an extensive set of accessories for high performance applications.

The modular system is based on individual modules of the BWD series 250 to 1000 with nominal output of 100 to 400 watts.

In addition to its high performance, this modular system combines a compact design with extreme flexibility. This results in the optimization of the braking resistor in accordance with the specifications of each individual application.



### Optimized to the requirements of your application:

Required power - no „unnecessary over-dimensioning“

Many resistance values – based on the inverters requirements

Mechanical design – according to the existing installation space

Assembly - horizontal or vertical

Protection class IP 20 or IP 65<sup>1</sup> - according to installation location and environmental conditions

Individual modules with UL and CSA standard approval

Several braking resistors in a resistor combination, e.g. for moving and hoisting gear

Optional: Temperature switch, strain relief, protective cover, etc.



### Technical specifications of individual modules

( $\vartheta_A = 20^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Value	Unit	Conditions
Tolerance (resistance)		$\pm 5$	%	Room temperature
Insulation resistance	$R_{ISO}$	$\geq 100$	$M\Omega$	$U_{mess} = 1,000 \text{ VDC}$
Inductance	$L$	$\leq 30$	$\mu\text{H}$	$f = 300 \text{ kHz}, U_{mess} = 50 \text{ mV}$
Capacity against enclosure	$C$	$\leq 300$	$\text{pF}$	$f = 300 \text{ kHz}, U_{mess} = 50 \text{ mV}$
Thermal time constant	$\tau$	approx. 550	s	BWD250/500
		approx. 600	s	BWD600
		approx. 850	s	BWD1000
Energy absorption BWD250	$Q$	4	$\text{kJ}$	with 1.2 s (1% duty cycle)
		8	$\text{kJ}$	with 7.2 s (6% duty cycle)
Energy absorption BWD500	$Q$	7,5	$\text{kJ}$	with 1.2 s (1% duty cycle)
		15	$\text{kJ}$	with 7.2 s (6% duty cycle)
Energy abs. BWD600/1000	$Q$	13	$\text{kJ}$	with 1.2 s (1% duty cycle)
		26	$\text{kJ}$	with 7.2 s (6% duty cycle)
Maximum permissible operating voltage	$U_B$	$\leq 700 \text{ AC}$	V	Taking into consideration
		$\leq 1,000 \text{ DC}$	V	the „intrinsic safety“ <sup>2</sup>
		$\leq 600 \text{ AC}$	V	according to CSA and UL
		$\leq 848 \text{ DC}$	V	
Isolation voltage	$U_{iso}$	$\geq 4,000 \text{ AC}$	V	$f = 50 \text{ Hz}; t = 1 \text{ s}$
Max. permissible case temp.	$\vartheta_C$	$\leq 250$	$^\circ\text{C}$	unobstructed convection
		$\leq 300$	$^\circ\text{C}$	unobstructed conv. (BWD1000)
Storage temperature	$\vartheta_S$	-25 ... +85	$^\circ\text{C}$	



<sup>1</sup> Test conditions: Water jet from nozzle 6.3 mm inside diameter, flow rate 12.5 l / min +/- 5%, water pressure according to volume flow, distance 2.5-3m, test duration 3min.

<sup>2</sup> With fourfold type power and free convection. 1. no short-circuit, 2. no fault to frame, 3. self-extinguishing, 4. no melting of casing. Type power always corresponds to 35% duty cycle of the respective resistor type.

## Brake resistor combination BAF...

Short-circuit-proof, „intrinsically safe“<sup>2</sup> resistor for operation with drive controllers (brake transistors), consisting of a combination of individual resistor modules of the 500/600/1000 series, mechanically connected with spring-loaded terminals.

These resistor combinations are outstanding in their compact design by virtue of their versatile base plates. Version with IP20 + IP65<sup>1</sup> protection classes available.



**Rated power (kW)**  
0.2 - 7.2 or upon request

**Technical specifications**  
The technical data can be found on page 2 of this document.

**Resistance (Ohm)**  
1 - 17,360 or upon request

**Dimensions (mm)**  
Upon request

**Dimensions and mounting holes (mm)**  
Mounting plates for brake resistor combinations BAF. Detailed dimensions for specific versions available upon request.



### Individual solutions



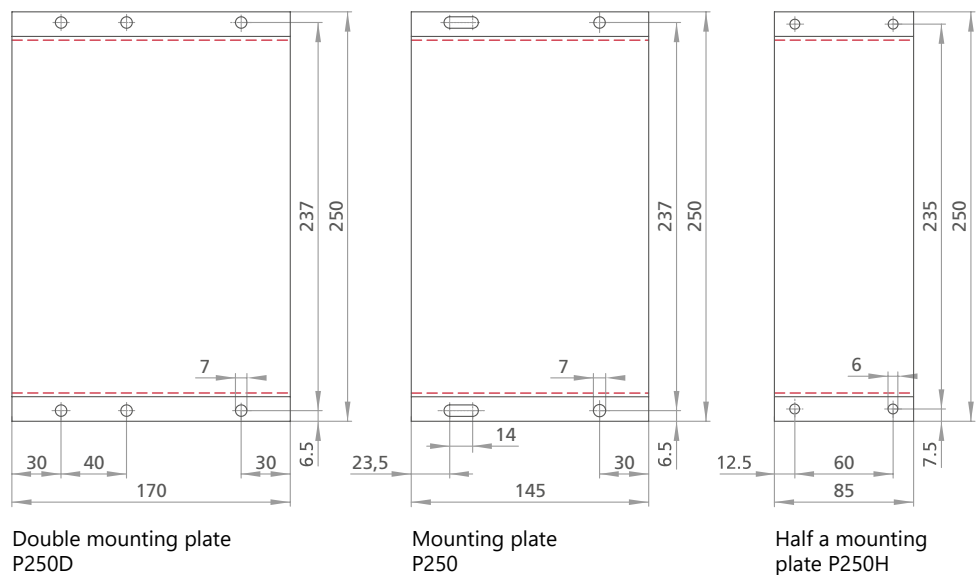
BAF combination in IP65<sup>1</sup> on small mounting plate P250H



BAF combination in IP65<sup>1</sup> on doubled mounting plate P250D



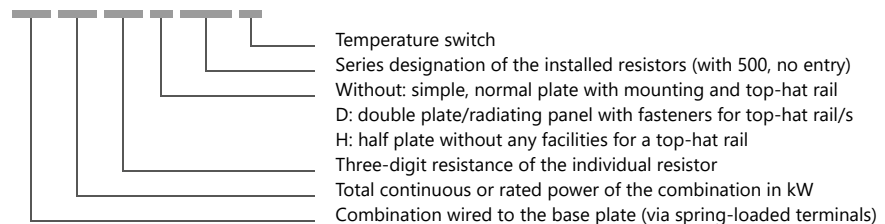
BAF combination in IP20 on mounting plate P250



### Nomenclature

Brake resistor combination BAF...

**BAF2.4100D-1000TS**



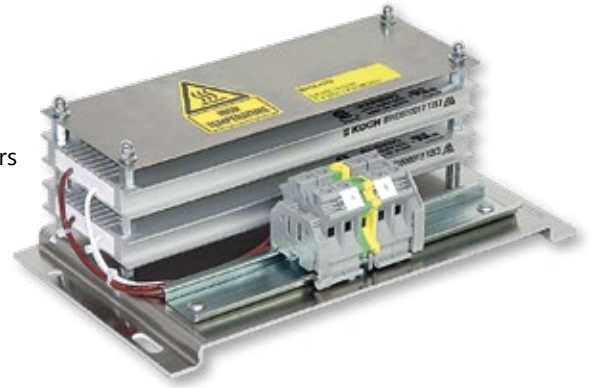
<sup>1</sup> Test conditions: Water jet from nozzle 6.3 mm inside diameter, flow rate 12.5 l / min +/- 5%, water pressure according to volume flow, distance 2.5-3m, test duration 3min.

<sup>2</sup> With fourfold type power and free convection. 1. no short-circuit, 2. no fault to frame, 3. self-extinguishing, 4. no melting of casing. Type power always corresponds to 35% duty cycle of the respective resistor type.

## Brake resistor combination BAS<sup>3</sup>...

Short-circuit-proof, „intrinsically safe“<sup>2</sup> resistor for operation with drive controllers (brake transistors), consisting of a combination of individual resistor modules of the 500/600/1000 series, mechanically connected with screw terminals.

These resistor combinations are outstanding in their compact design by virtue of their versatile base plates. Version with IP20 protection class available.



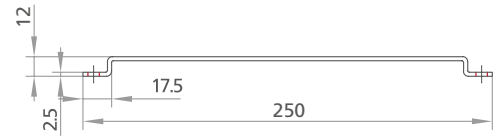
**Rated power (kW)**  
0.2 - 7.2 or upon request

**Technical specifications**  
The technical data can be found on page 2 of this document.

**Resistance (Ohm)**  
1 - 17,360 or upon request

**Dimensions and mounting holes (mm)**  
Mounting plates for brake resistor combinations BAS. Detailed dimensions for specific versions available upon request.

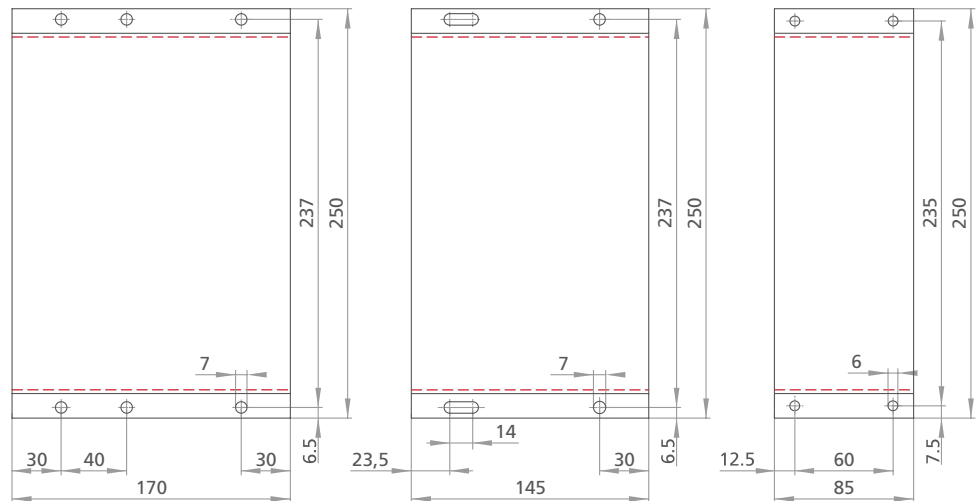
**Dimensions (mm)**  
Upon request



### Individual solutions



BAS combination on small mounting plate P250H



Double mounting plate P250D

Mounting plate P250

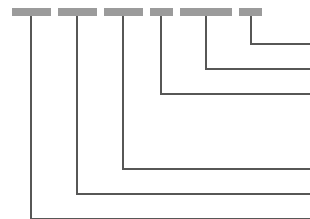
Half a mounting plate P250H



BAS combination on doubled mounting plate P250D

### Nomenclature Brake resistor combination BAS...

**BAS2.4100D-1000TS**



- Temperature switch
- Series designation of the installed resistors (with 500, no entry)
- Without: simple, normal plate with mounting and top-hat rail
- D: double plate/radiating panel with fasteners for top-hat rail/s
- H: half plate without any facilities for a top-hat rail
- Three-digit resistance of the individual resistor
- Total continuous or rated power of the combination in kW
- Combination wired to the base plate (via screw-type terminals)



BAS combination in IP20 consisting of 18 single resistor modules

<sup>2</sup> With fourfold type power and free convection. 1. no short-circuit, 2. no fault to frame, 3. self-extinguishing, 4. no melting of casing. Type power always corresponds to 35% duty cycle of the respective resistor type.  
<sup>3</sup> Only IP20.

## Special solutions

Customized designs demonstrate our flexibility:

Due to the large variety mechanical and electrical options, almost no limits apply to match the requirements of each individual application.

### Brake resistor combination BAF0.1xxxD-250IP65D

0.1 kW, Resistance values upon request

Includes:

Dual retaining plate, resistor, terminal boxes

Rated<sup>4</sup>: up to 0.1 kW with 100% D  
power up to 3.0 kW with 1% D

Prot. class: IP 65<sup>1</sup>

Temperature monitoring



### Brake resistor combination BAF0.2xxxIP65

0.2 kW, Resistance values upon request

Includes:

Dual retaining plate, resistor, terminal boxes

Rated<sup>4</sup>: up to 0.2 kW with 100% D  
power up to 6.0 kW with 1% D

Prot. class: IP 65<sup>1</sup>



### Brake resistor combination BAF0.4xxxIP65ES

0.4 kW, Resistance values upon request

Includes:

Dual retaining plate, 2 resistors, terminal boxes, shielded cable incl. plug

Rated<sup>4</sup>: up to 0.4 kW with 100% D  
power up to 12 kW with 1% D

Prot. class: IP 65<sup>1</sup>



### Brake resistor combination BAF0.8xxx-1000IP65S

0.8 kW, Resistance values upon request

Includes:

Customized retaining plate, 2 resistors, terminal boxes, protective covers

Rated<sup>4</sup>: up to 0.8 kW with 100% D  
power up to 24.0 kW with 1% D

Prot. class: IP 65<sup>1</sup>



### Brake resistor combination BAF1.2xxxH-600V5B

5x 0.24 kW, Resistance values upon request

Includes:

Half retaining plate, 5 resistors, each with its own separate, customized pickup

Rated<sup>4</sup>: each up to 0.24 kW with 100% D  
power each up to 12.0 kW with 1% D

Prot. class: IP 20

Temperature monitoring



### Brake resistor combination BAF1.6DV5M

3x 0.4 kW + 2x 0.2 kW, Resistance values upon req.

Includes:

Dual retaining plate, 8 resistors, each with its own separate, customized pickup

Rated<sup>4</sup>: up to 3x 0.4 kW with 100% D  
power or 2x 0.2 kW with 100% D  
up to 3x 12.0 kW with 1% D  
or 2x 6.0 kW with 1% D

Prot. class: IP 20

Temperature monitoring



<sup>1</sup> Test conditions: Water jet from nozzle 6.3 mm inside diameter, flow rate 12.5 l / min +/- 5%, water pressure according to volume flow, distance 2.5-3m, test duration 3min.

<sup>4</sup> Power at 70° C ambient temperatures

D = Duty cycle

## Special solutions

Customized designs demonstrate our flexibility:

Due to the large variety mechanical and electrical options, almost no limits apply to match the requirements of each individual application.

### Brake resistor combination BAF2.4D-250V24

24x 0.1 kW, Resistance values upon request

Includes:

Specific retaining plate, 24 resistors, each with its own separate, customized pickup

Rated<sup>4</sup>: up to 24x 0.1 kW with 100% D power up to 24x 3.0 kW with 1% D

Prot. class: IP 20



### Brake resistor combination BAS0.3xxx-250U

3x 0.1 kW, Resistance values upon request

Includes:

Retaining plate, 3 resistors, not inter-connected incl. accessories

Rated<sup>4</sup>: up to 3x 3.0 kW with 100% D power up to 3x 0.1 kW with 1% D

Prot. class: IP 20



### Brake resistor combination BAS1.2xxxH-1000G

3x 0.4 kW, Resistance values upon request

Includes:

Half retaining plate, 3 BWG-resistors

Rated<sup>4</sup>: up to 3x 0.4 kW with 100% D power up to 3x 12.0 kW with 1% D

Prot. class: IP 65<sup>1</sup>



### Brake resistor combination BAS1.2xxxDLADE

1.2 kW, Resistance values upon request

Includes:

Dual retaining plate, 6 resistors, protection cover

Rated<sup>4</sup>: up to 1.2 kW with 100% D power up to 36.0 kW with 1% D

Prot. class: IP 20

Temperature monitoring



### Brake resistor combination BAS2.8DV2A

2x 1.4 kW, Resistance values upon request

Includes:

Specific retaining plate, 14 resistors

Rated<sup>4</sup>: up to 2x 1.4 kW with 100% D power up to 2x 42.0 kW with 1% D

Prot. class: IP 20

Temperature monitoring



### Brake resistor combination BAS4.0xxxDTS-160

4.0 kW, Resistance values upon request

Includes:

Specific retaining plate, 20 resistors

Rated<sup>4</sup>: up to 4.0 kW with 100% D power up to 120.0 kW with 1% D

Prot. class: IP 20

Temperature monitoring



<sup>1</sup> Test conditions: Water jet from nozzle 6.3 mm inside diameter, flow rate 12.5 l / min +/- 5%, water pressure according to volume flow, distance 2.5-3m, test duration 3min.

<sup>4</sup> Power at 70° C ambient temperatures

D = Duty cycle

## What we offer:

- Tested product quality
- Certified processes
- Individual application support
- Machine specific design and sizing
- Rapid reaction
- Quick delivery times
- On-time delivery
- Reliable partner
- Long-term business relationship
- Direct customer relations

Use our communication channels:



## Your specialist for:

- Active energy management devices and systems
- Safe brake resistors

We look forward to hearing from you!



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