



Type series FGF.. 31..

1,0 – 22 kW with 2 terminals



Steel-grid fixed resistor unit, degree of protection IP 20 if mounted on an appropriate surface, with zinc plated steel enclosure. It is equipped with max. 2 terminals of different kinds mounted in or at the enclosure or in the attached terminal box. Some types can be provided with a temperature switch or with an integrated thermal overload relay or DC/POWERSWITCH. For your selection of a specific type you will find tables on the next page.

① if mounted on an appropriate surface

③ optional (not for FGFG and FGFX), type designation would be FGF..U 31..

## Technologies

- low priced type, very compact design
- continuous power rating up to 22 kW
- for mounting on top of a switch cabinet (all types besides FGFD..)
- for integration into a switch cabinet with terminals that are protected against contact (type FGFD..)
- units may be wall or plate mounted, perforated steel sheet at the front, top and bottom, terminals at the bottom.
- terminal type and size selectable according to mounting place and connection technics
- optional with temperature switch (type FGF.Q)
- optional with thermal overload relay (type FGFT)
- optional in intrinsically safe version with FRIZLEN DC-POWERSWITCH<sup>③</sup> (type FGFX)

## Application

These units are fitting especially for mounting on, beside or in a switch cabinet by their relatively flat and compact construction in 6 widths with various connections and monitoring possibilities (Please mind the description of the types).

An important application is the use as braking resistor for motor/generator drive of motors with frequency converters, where high power rating is combined with low budget solution.

You will find suggestions for the dimensioning of the resistor for short time load at chapter Technical Details, pages T613E to T620E.

## Warning

When resistor is integrated into a cabinet we recommend to provide a corresponding forced ventilation by the user for better removal of larger dissipations.

## Details of the different types

### Type FGFG:

Version with 2 flat type terminals up to max. 35 A rated current in the attached terminal box with cable gland. An additional temperature switch is not possible.

### Type FGFK(Q):

Version like FGFG, with a bigger attached terminal box with cable glands, the space is sufficient for 2 terminals up to M8 (max. 115 A rated current), and for 2 additional porcelain terminals for an optional temperature switch (FGFKQ).

### Type FGFL(Q):

Version, where all terminals are mounted on the terminal strip inside the housing. Terminals up to M8 (max. 115 A rated current) are accessible after disassembling a part of the cover. If equipped with temperature switch, there are 2 additional porcelain terminals on the terminal strip (Type FGFLQ). No cable glands.

### Type FGFD(Q):

Construction with feed-through terminals up to max. 65 A that are protected against contact and directly fixed on the side plate. It is a space-saving solution for integrating into a switch cabinet. If equipped with temperature switch there are 2 additional protected feed-through terminals (FGFDQ).

### Type FGFT:

Version with integrated thermal overload relay in the attached terminal box with cable glands up to max. 80 A rated current. With integrated short-circuit and overload signalling. Connection directly at the overload relay.

### Type FGFX:

Intrinsically safe version with integrated FRIZLEN DC-POWERSWITCH in the attached terminal box with cable glands, up to max. 40 A rated current. With integrated short-circuit and overload protection inclusive switching off the resistor and signalling. Connection directly at the FRIZLEN DC-POWERSWITCH<sup>②</sup>.

② DGBM Nr. 20 2009 015 851.9

**Attention: Only for DC voltage up to 850 VDC.**

## Rated current and cross section of terminals and devices

See technical details on page T618E.



Monitoring options of the type series FGF.. 31..

1,0 – 22 kW with 2 terminals

## 1. Signalling – no disconnection!

This warning has to be considered by the customer, e.g. by a warning or disconnection of the mains through the customer. Details, on page T615E.

### 1a) with temperature switch (FGF.Q)

Different types can be equipped for temperature monitoring with a temperature switch which monitors an overloading of the resistor by a normally closed contact free of potential (NCC).

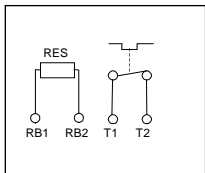
Connections pls. look at picture 1a)

### 1b) with thermal overload relay (FGFT)

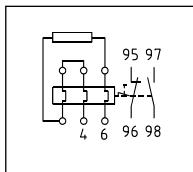
An eventual overload of the resistor is monitored by the thermal overload relay which is mounted in the attached terminal box. This is accomplished by NCC and NOC contacts. Also for signalling high short time peak power.

Connections pls. look at picture 1b)

Pic. 1a)



P 1b)



## 2. Disconnecting and signalling!

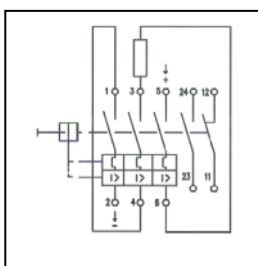
### with FRIZLEN DC-POWERSWITCH (FGFX) up to 850 VDC and up to 40 A

This type series with integrated overload switch in the attached terminal box is able to protect the integrated resistor from constant overload and from too high short time peak power, e.g. caused by a false operational mode or a fault by an short circuited chopper transistor.

This option for protection not only signals the hardware default, it switches off the object / the resistor absolutely reliable! Possible damage in the environment by overheating and burning are effectively avoided.

After a successful fault clearance the DC-POWERSWITCH can be switched on like a normal automatic cutout.

Connections pls. look at picture



## Decision matrix

type	FGFG	FGFK	FGF KQ	FGFL	FGF LQ	FGFD	FGF DQ	FGFT	FGFX
properties									
with temperature switch (TS)			X		X		X		
thermal overload relay (up to max. 80 A rated current)								X	
DC-POWERSWITCH (up to max. 40 A)									X
terminals in attached terminal box with PG-strain relief	X	X	X					X	X
terminals inside unit (without PG- strain relief)				X	X				
flat terminals up to max. 35 A	X	X	X	X	X				
device terminal up to max. 60 A		X	X						
bolt terminals M6 up to max. 60 A		X	X	X	X				
bolt terminals M8 up to max. 115 A		X	X	X	X				
feed-thru terminals up to max. 65 A						X	X		
PA cage clamp terminals up to max. 30 A		X	X						

## Electrical and mechanical data

types	typical power in kW at 40°C and 100% DCF	production range Ω-value		number of steel-grids corresp. to given device size	dimensions in mm					max. weight in kg
		from	to		A	B	C1 ①	C2 ②	C3 ③	
FGF.. 31503..	1,5	0,07	16	3	170	195	207	230	255	6,0
FGF.. 31504..	2,0	0,09	22	4	170	195	207	230	255	6,5
FGF.. 31005..	2,5	0,11	28	5	270	295	307	330	355	7,5
FGF.. 31007..	3,5	0,15	39	7	270	295	307	330	355	8,5
FGF.. 31009..	4,5	0,20	50	9	270	295	307	330	355	9,5
FGF.. 31112..	6,0	0,26	67	12	370	395	407	430	455	12
FGF.. 31114..	7,0	0,31	78	14	370	395	407	430	455	13
FGF.. 31216..	8,0	0,35	89	16	570	595	607	630	655	18
FGF.. 31220..	10,0	0,44	112	20	570	595	607	630	655	20
FGF.. 31224..	12,0	0,53	134	24	570	595	607	630	655	22
FGF.. 31326..	13,0	0,57	145	26	770	795	807	830	855	29
FGF.. 31330..	15,0	0,66	168	30	770	795	807	830	855	31
FGF.. 31334..	17,0	0,75	190	34	770	795	807	830	855	33
FGF.. 31436..	18,0	0,79	201	36	970	995	1007	1030	1055	40
FGF.. 31440..	20,0	0,88	224	40	970	995	1007	1030	1055	42
FGF.. 31444..	22,0	0,97	246	44	970	995	1007	1030	1055	44

This table represents only a selection of our program. All numbers of steel-grids between 2 pc. (1,0 kW) and 44 pc. (22 kW) corresponding to our types are available. Type code and selection of units see Technical Details pages T613E to T620E.

Example: 2 device terminals + temperature switch (2 terminals) => FGFKQ 31...04

① dim. C1 is only valid for Type FGFD (dimension sheet 16M0442)

② dim. C2 is only valid for Type FGFG (dimension sheet 16M0041)

③ dim. C3 valid for types FGFK (dim. sheet 16M0410), FGFT (dim. sheet 16M0086) and FGFX (dim. sheet 16M0841)

for type FGFL dim. „B“ is valid, as design without term.box (dim. sheet 16M0424)

