

Reactive current
compensation modules

multimod-F

Monitoring



Optimizing



multimod-F compensation modules are suitable for building compensation facilities in existing cabinets and are available for all cabinet systems on the market. As KBR quality products, the modules stand out through their long working life.

multimod-F ... GH/GB

Detuned reactive current compensation modules with power from 12.5 to 100 kvar and reactor factors of 5.5, 7, 8, 12.5 or 14 %.



multimod-F ... SH/SB

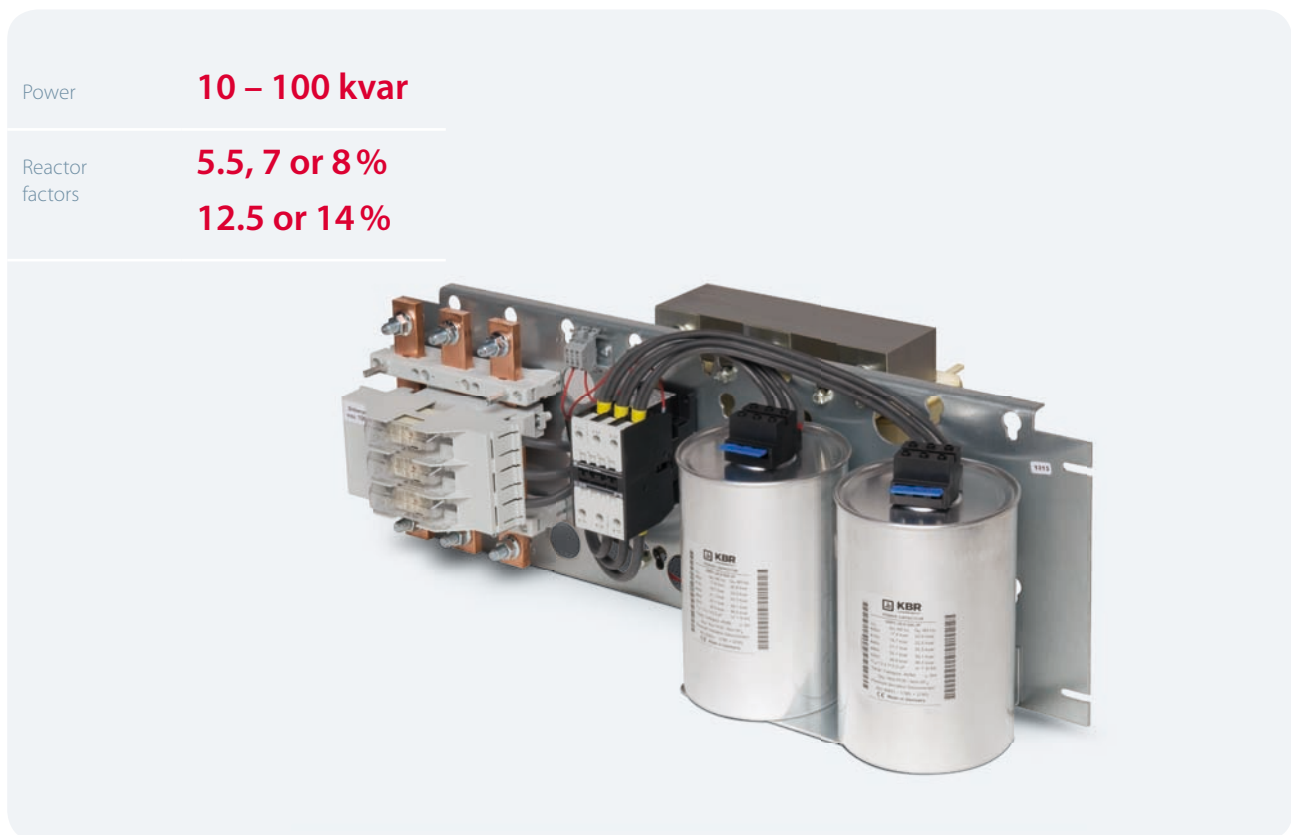
Detuned reactive current compensation module with power from 10 to 100 kvar and reactor factors of 5.5, 7, 8, 12.5 or 14%.



multimod-F ... 08TB

Thyristor switched reactive current compensation module with power from 12.5 to 50 kvar and reactor factors of 5.5, 7, 8, 12.5 or 14 %.

multimod-F Plug-in design



Detuned reactive current compensation modules in plug-in design

- Highlights**
- Power from 10 to 100 kvar
 - Reactor factors 5.5, 7 or 8 % and 12.5 or 14 %
 - Capacitor rated voltage with 440 V or 525 V
 - For cabinet widths of 600 or 800 mm
 - For cabinet depths of 400, 500 or 600 mm

Accessories: If there are several modules, the bus bar connector and covers are also delivered.
Selection of back-up fuses and supply lines for complete facilities can be found on pages 224/225.

An overall view of **technical details** can be found on page 156.
 The **housing dimensions** are listed on page 158.

Specifications multimod-F ... SH

Modules with plug-in design Reactor factors: **5.5, 7 or 8 %** Capacitor rated voltage: **440 V**

POWER ¹ in kvar	STAGES in kvar	WEIGHT approx. in kg	TYPE multimod-F ... 64SH for cabinet width 600 mm	CON- STRUC- TION TYPE ²	TYPE multimod-F ... 8.SH for cabinet width 800 mm	CON- STRUC- TION TYPE ²
10	10	20	multimod-F 010/01-1000-XX-64SH	M12	multimod-F 010/01-1000-XX-84SH	M22
12,5	12,5	25	multimod-F 012/01-1000-XX-64SH	M12	multimod-F 012/01-1000-XX-84SH	M22
15	5 – 10	27	multimod-F 015/03-1200-XX-64SH	M12	multimod-F 015/03-1200-XX-84SH	M22
20	20	26	multimod-F 020/01-1000-XX-64SH	M12	multimod-F 020/01-1000-XX-84SH	M22
20	10 – 10	29	multimod-F 020/02-1100-XX-64SH	M12	multimod-F 020/02-1100-XX-84SH	M22
25	25	31	multimod-F 025/01-1000-XX-64SH	M12	multimod-F 025/01-1000-XX-84SH	M22
25	12,5 – 12,5	33	–	–	multimod-F 025/02-1100-XX-84SH	M22
30	30	34	multimod-F 030/01-1000-XX-64SH	M12	multimod-F 030/01-1000-XX-84SH	M22
30	15 – 15	39	–	–	multimod-F 030/02-1100-XX-84SH	M22
30	5 – 10 – 15	41	–	–	multimod-F 030/06-1230-XX-84SH	M24
40	40	38	multimod-F 040/01-1000-XX-64SH	M13	multimod-F 040/01-1000-XX-84SH	M23
40	20 – 20	41	–	–	multimod-F 040/02-1100-XX-84SH	M22
50	50	40	multimod-F 050/01-1000-XX-64SH	M13	multimod-F 050/01-1000-XX-84SH	M23
50	25 – 25	51	–	–	multimod-F 050/02-1100-XX-84SH	M22
75	25 – 50	60	–	–	multimod-F 075/03-1200-XX-84SH	M23
100	50 – 50	98	–	–	multimod-F 100/02-1100-XX-85SH	M29

Specifications multimod-F ... SB

Modules with plug-in design Reactor factors: **12.5 or 14 %** Capacitor rated voltage: **525 V**

POWER ¹ in kvar	STAGES in kvar	WEIGHT approx. in kg	TYPE multimod-F ... 64SB for cabinet width 600 mm	CON- STRUC- TION TYPE ²	TYPE multimod-F ... 64SB for cabinet width 800 mm	CON- STRUC- TION TYPE ²
10	10	26	multimod-F 010/01-1000-XX-64SB	M12	multimod-F 010/01-1000-XX-84SB	M22
12,5	12,5	30	multimod-F 012/01-1000-XX-64SB	M12	multimod-F 012/01-1000-XX-84SB	M22
20	20	38	multimod-F 020/01-1000-XX-64SB	M12	multimod-F 020/01-1000-XX-84SB	M22
20	10 – 10	42	–	M12	multimod-F 020/01-1100-XX-84SB	M22
25	25	39	multimod-F 025/01-1000-XX-64SB	M12	multimod-F 025/01-1000-XX-84SB	M22
25	12,5 – 12,5	51	–	M12	multimod-F 025/02-1000-XX-84SB	M22
30	30	46	multimod-F 030/01-1000-XX-64SB	–	multimod-F 030/01-1000-XX-84SB	M22
30	15 – 15	54	–	M12	multimod-F 030/02-1100-XX-84SB	M22
40	40	50	multimod-F 040/01-1000-XX-64SB	–	multimod-F 040/01-1000-XX-84SB	M22
40	20 – 20	66	–	–	multimod-F 040/02-1100-XX-84SB	M24
50	50	61	multimod-F 050/01-1000-XX-65SB	M13	multimod-F 050/01-1000-XX-84SB	M23
50	25 – 25	71	–	–	multimod-F 050/02-1100-XX-84SB	M22

¹ Power at 400 V, 50 Hz ² Measurement details and other details on the construction type can be found on page 158
– construction type not possible

XX = It is important that you state the reactor factor when ordering (see also following order example).

Performances and sizes deviating from the standard are available on request. All changes reserved.

Example for order: Detuned module in plug-in design for cabinet width 800 mm, for cabinet depth 400 mm, 50 kvar in 2 stages, 440 V capacitors, 7 % detuned. The appropriate ordering detail is as follows: **Type multimod-F 050/02-1100-07-84SH**.

multimod-F Rack-mounted design



Detuned reactive current compensation modules in rack-mounted design

- Highlights**
- Power from 12.5 to 100 kvar
 - Reactor factors 5.5, 7 or 8 % and 12.5 or 14 %
 - Capacitor rated voltage with 440 V or 525 V
 - For cabinet widths of 600 or 800 mm
 - For cabinet depths of 400, 500 or 600 mm

Accessories: If there are several modules, the bus bar connector and covers are also delivered.
Selection of back-up fuses and supply lines for complete facilities can be found on pages 224/225.

An overall view of **technical details** can be found on pages 156/157.
 The **housing dimensions** are listed on page 159.

Specifications multimod-F ... GH

Modules with rack-mounted design Reactor factors: **5.5, 7 or 8 %** Capacitor rated voltage: **440 V**

POWER ¹ in kvar	STAGES in kvar	WEIGHT approx. in kg	TYPE multimod-F ... 6yGH for cabinet width 600 mm	CONSTRUCTION TYPE ²			TYPE multimod-F ... 8yGH for cabinet width 800 mm	CONSTRUCTION TYPE ²		
				yy	64	65		66	yy	84
12,5	12,5	27	multimod-F 012/01-1000-XX-yyGH	x	x	x	multimod-F 012/01-1000-XX-yyGH	x	x	x
25	25	32	multimod-F 025/01-1000-XX-yyGH	x	x	x	multimod-F 025/01-1000-XX-yyGH	x	x	x
25	12,5 – 12,5	42	multimod-F 025/02-1100-XX-yyGH	–	–	x	multimod-F 025/02-1100-XX-yyGH	x	x	x
50	50	44	multimod-F 050/01-1000-XX-yyGH	x	x	x	multimod-F 050/01-1000-XX-yyGH	x	x	x
50	25 – 25	54	multimod-F 050/02-1100-XX-yyGH	–	–	x	multimod-F 050/02-1100-XX-yyGH	x	x	x
75	25 – 50	65	–	–	–	–	multimod-F 075/03-1200-XX-yyGH	–	x	x
100	50 – 50	76	–	–	–	–	multimod-F 100/02-1100-XX-yyGH	–	x	x
100	25 – 25 – 50	86	–	–	–	–	multimod-F 100/04-1120-XX-yyGH	–	–	x

Specifications multimod-F ... GB

Modules with rack-mounted design Reactor factors: **12.5 or 14 %** Capacitor rated voltage: **525 V**

POWER ¹ in kvar	STAGES in kvar	WEIGHT approx. in kg	TYPE multimod-F ... 6yGH for cabinet width 600 mm	CONSTRUCTION TYPE ²			TYPE multimod-F ... 8yGH for cabinet width 800 mm	CONSTRUCTION TYPE ²		
				yy	64	65		66	yy	84
12,5	12,5	32	multimod-F 012/01-1000-XX-yyGB	x	x	x	multimod-F 012/01-1000-XX-yyGB	x	x	x
25	25	42	multimod-F 025/01-1000-XX-yyGB	x	x	x	multimod-F 025/01-1000-XX-yyGB	x	x	x
25	12,5 – 12,5	52	multimod-F 025/02-1100-XX-yyGB	–	–	x	multimod-F 025/02-1100-XX-yyGB	x	x	x
50	50	65	multimod-F 050/01-1000-XX-yyGB	x	x	x	multimod-F 050/01-1000-XX-yyGB	x	x	x
50	25 – 25	72	multimod-F 050/02-1100-XX-yyGB	–	–	x	multimod-F 050/02-1100-XX-yyGB	x	x	x
75	25 – 50	95	–	–	–	–	multimod-F 075/03-1200-XX-yyGB	–	x	x
100	50 – 50	118	–	–	–	–	multimod-F 100/02-1100-XX-yyGB	–	x	x
100	25 – 25 – 50	125	–	–	–	–	multimod-F 100/04-1120-XX-yyGB	–	–	x

¹ Power at 400 V, 50 Hz ² Measurement details and other details on the construction type can be found on page 159
– construction type not possible

XX = reactor factor yy = construction type

It is important that you state the reactor factor when ordering (see also following order example).

Performances and sizes deviating from the standard are available on request. All changes reserved.

Example for order: Detuned module in rack-mounted design for cabinet width 800 mm, for cabinet depth 500 mm, 50 kvar in 2 stages, 440 V capacitors, 7 % detuned. The appropriate ordering detail is as follows: **Type multimod-F 050/02-1100-07-85GH**.

multimod-F Thyristor-switched / plug-in design

Power **12,5 – 50 kvar**

Reactor factors
5.5, 7 or 8 %
12.5 or 14 %



Detuned reactive current compensation modules in plug-in design

- Highlights**
- Power from 12.5 to 50 kvar
 - Reactor factors 5.5, 7 or 8 % and 12.5 or 14 %
 - Capacitor rated voltage 525 V
 - For cabinet widths 800 mm
 - Long working life through unlimited frequency of operations
 - No noise formation
 - Short switching times

Accessories: If there are several modules, the bus bar connector and covers are also delivered.
Selection of back-up fuses and supply lines for complete facilities can be found on pages 224/225.

An overall view of **technical details** can be found on page 157.
The **housing dimensions** are listed on page 158.

Specifications multimod-F ... 08TB

Modules with plug-in design Reactor factors: **5.5, 7 or 8 %** Capacitor rated voltage: **525 V**

POWER ¹ in kvar	STAGES in kvar	WEIGHT approx. in kg	TYPE multimod-F ... 08TB for cabinet width 800 mm	CONSTRUCTION TYPE ²
12,5	12,5	27	multimod-F 012/01-1000-XX-08TB	M27
25	25	33	multimod-F 025/01-1000-XX-08TB	M27
50	50	44	multimod-F 050/01-1000-XX-08TB	M27

Specifications multimod-F ... 08TB

Modules with plug-in design Reactor factors: **12.5 or 14 %** Capacitor rated voltage: **525 V**

POWER ¹ in kvar	STAGES in kvar	WEIGHT approx. in kg	TYPE multimod-F ... 08TB for cabinet width 800 mm	CONSTRUCTION TYPE ²
12,5	12,5	32	multimod-F 012/01-1000-XX-08TB	M27
25	25	42	multimod-F 025/01-1000-XX-08TB	M27
50	50	65	multimod-F 050/01-1000-XX-08TB	M27

¹ Power at 400 V, 50 Hz ² Measurement details and other details on the construction can be found on page 158

XX = It is important that you state the reactor factor when ordering (see also following order example).
Performances and sizes deviating from the standard are available on request. All changes reserved.

Example for order: Thyristor-switched modules for cabinet width 800 mm, 50 kvar, 525 V capacitors, 14 % detuned.
The appropriate ordering detail is as follows: **Type multimod-F 050/01-14 08TB**.

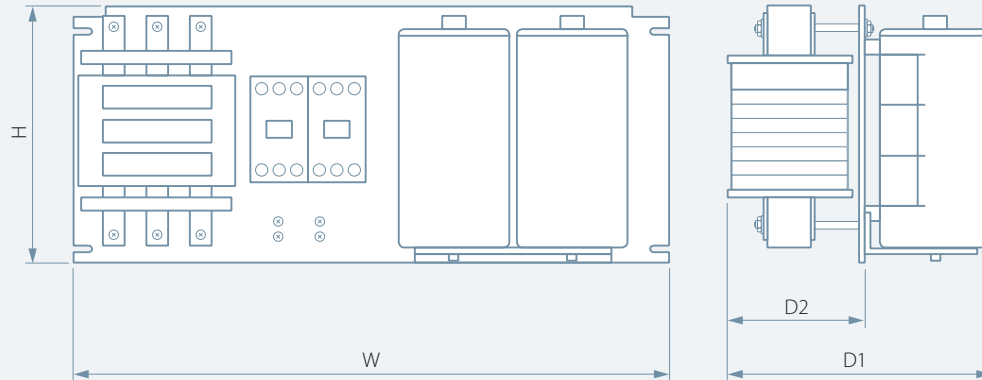
multimod-F Technical details

DEVICE TYPE	multimod-F Plug-in design		multimod-F Rack-mounted design
	SH p = 5.5, 7 or 8%	SB p = 12.5 or 14 %	GH p = 5.5, 7 or 8%
Rated voltage Frequency	U _n = 400 V 50 Hz		
Maximum permissible operating voltage	U _n = 400 V ± 10%		
Maximum permissible operating current	1.3 × I _n , permanently		
SWITCH ELEMENT	Capacitor contactors		Capacitor contactors
Control voltage	U _{Control} = 230 V, 50 Hz		U _{Control} = 230 V, 50 Hz
	Control voltage transformer required for deviating operating voltage		
Switch delay	60 s		60 s
CAPACITORS	Low-loss multicond-UHPC power capacitors, MTK technology		
Capacitor rated voltage	U _{Meas.} = 440 V	U _{Meas.} = 525 V	U _{Meas.} = 440 V
Discharge of capacitors	Discharge resistors t < 60 s Optional discharge inductors t < 3 s		Discharge resistors t < 60 s Optional discharge inductors t < 3 s
Discharge of capacitors	Linear filter circuit reactors to avoid resonances in networks with harmonics, built-in temperature monitoring		
Reactor factors	p = 5.5, 7 or 8%	p = 12.5 or 14 %	p = 5.5, 7 or 8%
MODULE VERSION	Module plates galvanized		
MODE OF PROTECTION	IP 00, the components used correspond to BGV-A2		
AMBIENT TEMPERATURES	+40 °C highest value, briefly +35 °C in 24-hour average +20 °C in annual average −10 °C lowest value		
FUSE PROTECTION	Group back-up fuse with NH fuses and fuse socket (NH-disconnector on request)		

GB p = 12.5 or 14 %	multimod-F Combination filter K1 Note: Selection tables can be found on pages 172/173	multimod-F Thyros witch p = 5.5, 7 or 8% p = 12.5 or 14 %
	U _n = 400 V 50 Hz	
	U _n = 400 V ± 10 %	
	1,3 x I _n dauernd	
	Capacitor contactors	Thyristor switches
	U _{Control} = 230 V, 50 Hz	DC gating: U _{Control} = 10 – 30 V AC gating: U _{Control} = 230 V, 50/60 Hz Gating via reactive power controller or directly via SPS or process sliders
	Control voltage transformer required for deviating operating voltage	
	60 s	DC gating: 1 – 15 ms, dynamic controller required AC gating: 10 – 25 ms with direct gating 500 ms for gating via standard reactive power controller
	Low-loss multicond-UHPC power capacitors, MTK technology	
U _{Meas.} = 525 V	U _{Meas.} = 525 V	U _{Meas.} = 525 V U _{Meas.} = 525 V
	Discharge resistors t < 60 s Optional discharge inductors t < 3 s	Through the EPL technology, no discharge time can be maintained during operation. Discharge resistors t < 60 s No discharge reactor possible
	linear filter circuit reactors to avoid resonances in networks with harmonics, built-in temperature monitoring	
p = 12.5 or 14 %	p = 5.5 and 12.5 %	p = 5.5, 7 or 8 % p = 12.5 or 14 %
	Module plates galvanized	
	IP 00, the components used correspond to BGV-A2	
	+40 °C highest value, briefly +35 °C in 24-hour average +20 °C in annual average –10 °C lowest value	
	Group back-up fuse with NH fuses and fuse socket (NH-disconnector on request)	

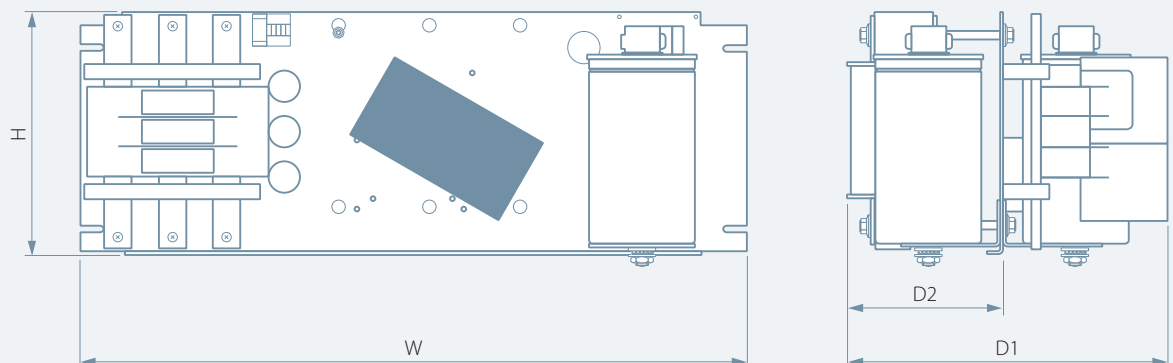
multimod-F Sizes

multimod-F ... SH/SB Modules in rack-mounted design



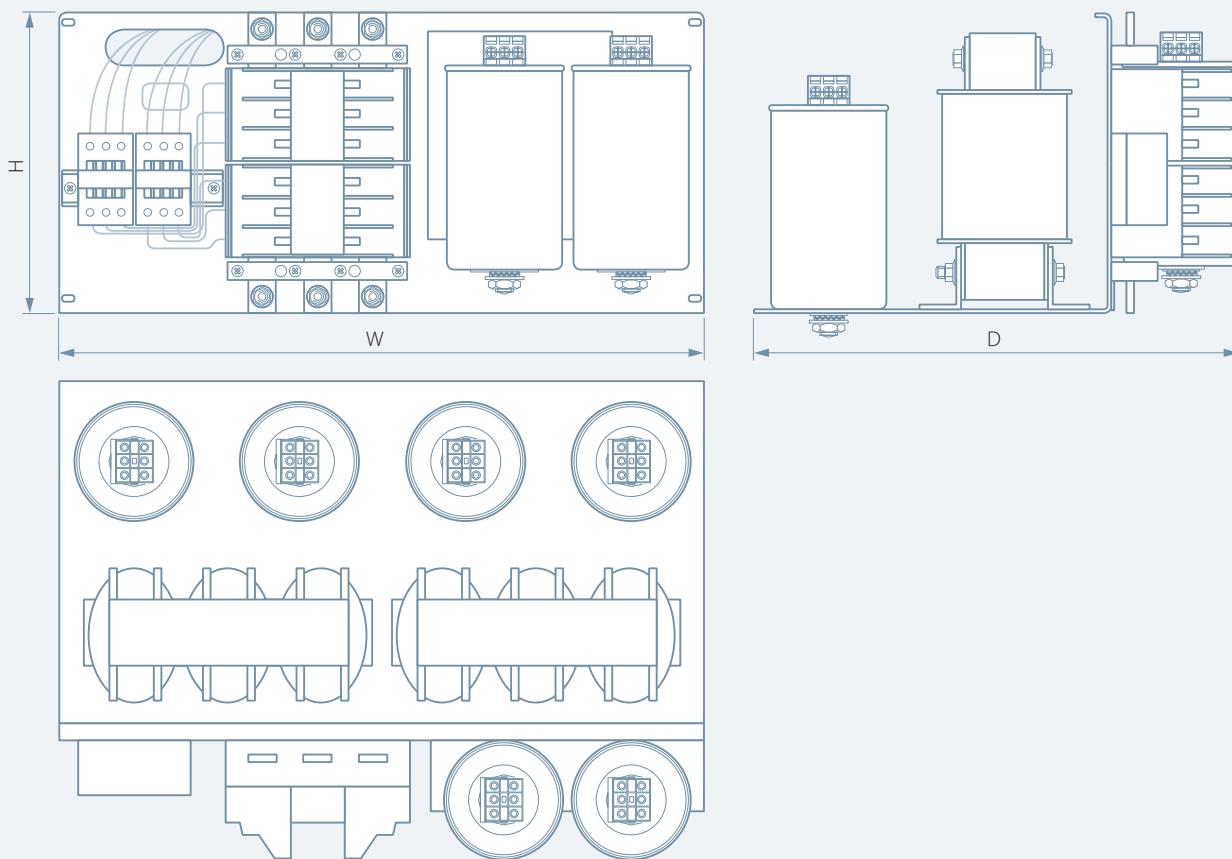
CONSTRUCTION TYPE	HEIGHT (H) in mm	WIDTH (W) in mm	DEPTH (D) in mm
M12	265	535	130
M13	265	535	170
M14	265	535	190
M15	265	535	195
M22	265	535	130
M23	265	735	170
M24	265	735	190
M29	350	735	195

multimod-F ... 08TB Modules in rack-mounted design



CONSTRUCTION TYPE	HEIGHT (H) in mm	WIDTH (W) in mm	DEPTH 1 (D1) in mm	DEPTH 2 (D2) in mm	MIN. CABINET DEPTH in mm
M27	265	735	400	190	600

multimod-F ... GH/GB Modules with rack-mounted design
 multimod-F ... K combination filter



CONSTRUCTION TYPE	HEIGHT (H) in mm	WIDTH (W) in mm	DEPTH (D) in mm	MIN. CABINET DEPTH in mm
M64	325	495	350	400
M65	325	495	450	500
M66	325	495	550	600
M84	325	695	350	400
M85	325	695	450	500
M86	325	695	550	600