FR

Capacitor banks with detuned filters

Description

The **FR** Series capacitor banks with detuned filters have been designed for power compensation purposes in networks with fluctuating load levels, a high content of harmonics and where there is a risk of resonance. Power variations are relatively slow (in seconds) so that the switching operations are carried out with contactors.

Application

Its application is mainly focused on the compensation of installations with different loads, which require a regulated compensation, as a result of the power factor variations and where there is a high content of harmonics in the network.

- **Fixed detuned filters**. For the compensation of transformers and motors (**FRF/ FRM**)
- **Automatic detuned filters**. For the monitoring of variable loads (**FR**).

Features

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Operating voltage		230, 400 V (for other voltages, please ask)
Support voltage (400 V)		440 V
Capacity tolerance		± 10%
Unit composed of		• **CF**B capacitor • Contactors with pre-insertion block and quick discharge resistor • Individual protection of each step with fuses with high rupture power (HRP). NH-00 Series. • Two-pole protection circuit-breaker for capacitor bank and regulator operations. • Power factor regulator of the **computer Max** series. • Detuned filters tuned at 189 Hz for the protection against harmonics present in the network and to avoid the problems of resonance with fifth or higher order harmonics. Built-in thermostat for the disconnection of the step in case of excessive temperatures (90 ºC).
Add-ons		• Manual capacitor bank header switch • Automatic capacitor bank header switch • Automatic switch + Earth leakage protection at the capacitor bank's header • Forced ventilation unit + thermostat • Polycarbonate plate to protect against direct contacts • Auto-transformer 400/230 V
Insulation level		3 / 15 kV
Discharge resistance		75 V / 3 minutes
Overload		1.3 times the rated current permanently
Overvoltage		• 10 % 8 over 24 hours • 15 % up to 15 minutes over 24 hours • 20 % up to 5 minutes over 24 hours • 30 % up to 1 minutes over 24 hours
Contactor operating voltage		230 V
Ambient conditions		
Class D temperature	Daily mean Annual mean Maximum Minimum	45 ºC 35 ºC 50 ºC -25 ºC
Humidity		80% RH
Altitude		2,000 m
Construction features		
Degree of protection		IP 21
Colour		RAL 7035 Grey RAL 3005 Maroon
Assembly conditions		
Type of assembly		Vertical
Ventilation		Natural or forced, depending on the option
Distance between capacitors		Minimum, 2 cm
Standards		
CEI 60831-1, CEI 70/7, UNE 20827, UNE 20010, BS 1650, VDE 560		

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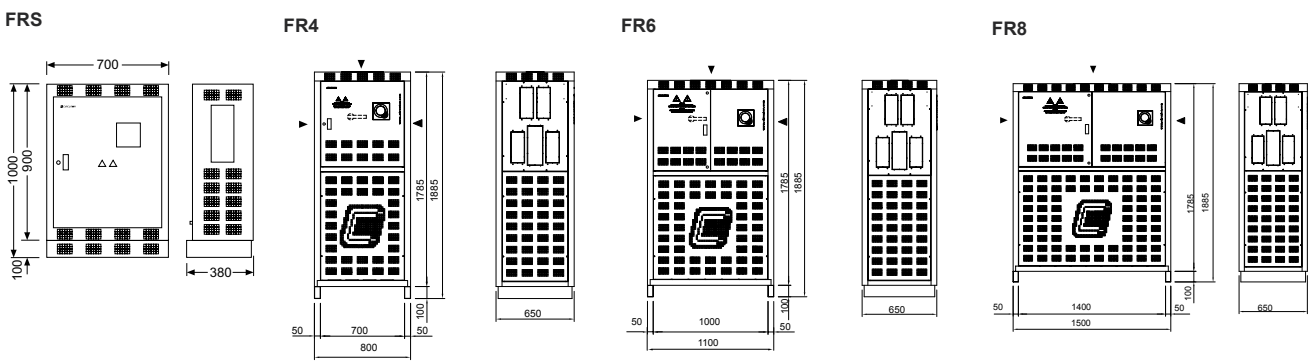
Dimensions



FR12 = 2 x FR6 = 2200 mm wide

References

kvar		Composition	Switch (A)	Cable section (mm^2)	Weight (kg)	Dimensions (mm) width x height x depth	Type	Code
440	400							
17,5	14	(2,5 + 5 + 10)	63 - Included	6	105	700 x 1000 x 380	FRS-17,5-440	R5H450
25	21	(5 + (2 X 10))	63 - Included	10	120	700 x 1000 x 380	FRS-25-440	R5H455
27,5	23	(2,5 + 5 + (2 x 10))	125 - Included	16	130	700 x 1000 x 380	FRS-27,5-440	R5H460
35	29	(5 + (3 X 10))	125 - Included	16	140	700 x 1000 x 380	FRS-35-440	R5H465
37,5	31	(7,5 + (2 X 15))	125 - Included	25	150	700 x 1000 x 380	FRS-37,5-440	R5H470
45	37	(3 x 15)	125 - Included	25	175	700 x 1000 x 380	FRS-45-440	R5H475
60	50	(4 x 15)	200 - Included	35	200	700 x 1000 x 380	FRS-60-440	R5H480
75	62	(4 x 18,75)	200 - Included	50	215	700 x 1000 x 380	FRS-75-440	R5H485
87,5	72	(12,5 + 25 + 50)	200	50	300	800 x 1900 x 650	FR4-87,5-440	R5E416
100	83	(25 + 25 + 50)	250	95	325	800 x 1900 x 650	FR4-100-440	R5E420
125	103	(25 + 50 + 50)	400	95	345	800 x 1900 x 650	FR4-125-440	R5E422
150	125	(25 + 25 + 50 + 50)	400	95	355	800 x 1900 x 650	FR4-150-440	R5E423
175	145	(25 + 50 + 100)	400	120	365	800 x 1900 x 650	FR4-175-440	R5E425
200	165	(50 + 50 + 100)	400	150	380	800 x 1900 x 650	FR4-200-440	R5E428
250	207	(50 + (2 x 100))	630	185	390	800 x 1900 x 650	FR4-250-440	R5E429
300	248	(50 + 50 + (2 x 100))	630	240	410	800 x 1900 x 650	FR4-300-440	R5E430
350	289	(50 + (3 x 100))	800	2x150	430	800 x 1900 x 650	FR4-350-440	R5E432
400	331	(4 x 100)	800	2x150	460	800 x 1900 x 650	FR4-400-440	R5E434
400	331	(50 + 50 + (3 x 100))	800	2x185	550	1100 x 1900 x 650	FR6-400-440	R5J425
450	372	(50 + (4 x 100))	1000	2x185	587	1100 x 1900 x 650	FR6-450-440	R5J430
500	413	(5 x 100)	1000	2x240	621	1100 x 1900 x 650	FR6-500-440	R5J435
550	455	(50 + (5 x 100))	1250	2x240	658	1100 x 1900 x 650	FR6-550-440	R5J440
600	496	(6 x 100)	1250	2x240	685	1100 x 1900 x 650	FR6-600-440	R5J445
600	496	(50 + 50 + (5 x 100))	1250	2x240	820	1500 x 1900 x 650	FR8-600-440	R5K436
650	537	(50 + (6 x 100))	1250	3x150	865	1500 x 1900 x 650	FR8-650-440	R5K438
700	579	(7 x 100)	1250	3x150	910	1500 x 1900 x 650	FR8-700-440	R5K440
750	620	(50 + (7 x 100))	1600	3x185	955	1500 x 1900 x 650	FR8-750-440	R5K442
800	661	(8 x 100)	1600	3x185	1000	1500 x 1900 x 650	FR8-800-440	R5K442
800	661	(50 + 50 + (7 x 100))	1250 /400	2x240/ 240	1100	2200 x 1900 x 650	FR12-800-440	R5L425
850	702	(50 + (8 x 100))	1000 / 630	2x240/ 240	1137	2200 x 1900 x 650	FR12-850-440	R5L430
900	744	(9 x 100)	1250 / 630	2x240/ 240	1174	2200 x 1900 x 650	FR12-900-440	R5L435
950	785	(50 + (9 x 100))	1000 / 800	2x240/ 2x185	1211	2200 x 1900 x 650	FR12-950-440	R5L440
1000	826	(10 x 100)	1250 / 800	2x240/ 2x185	1248	2200 x 1900 x 650	FR12-1000-440	R5L445
1050	868	(50 + (10 x 100))	1250 / 800	2x240/ 2x240	1285	2200 x 1900 x 650	FR12-1050-440	R5L450
1100	909	(11 x 100)	1250 / 1000	2x240/ 2x240	1322	2200 x 1900 x 650	FR12-1100-440	R5L455
1150	950	(50 + (11 x 100))	2 X 1250	2x240/ 2x240	1359	2200 x 1900 x 650	FR12-1150-440	R5L460
1200	992	(12 x 100)	2 X 1250	2x240/ 2x240	1389	2200 x 1900 x 650	FR12-1200-440	R5L465