

AAR/138

Automatic P.F.C. equipment with Detuning Reactors



AAR/138 series equipment are particularly suitable for three-phase networks with **high harmonic distortion** in current with presence of **3° grade harmonics**. These equipment guarantee an accurate P.F.C., thanks to a multi-step design that effectively divides the power. In addition, on the G6E and G9E cabinet, all the capacitors banks are assembled on racks, easily removable from the front of the panel, for simple management and maintenance.

PERFORMANCE DATA

■ Rated voltage	400 Vac (others on request)
■ Rated frequency	50 Hz (60 Hz on request)
■ Insulation voltage	690 Vac
■ auxiliary voltage	230 Vac (110 Vac on request)
■ Overvoltage	1,1 Un (rated voltage)
■ Temperature range	-5 / +40 °C
■ Impulse withstand	8 kV

HARMONIC CONTENT (in the absence of resonance)

THD(I)max. = 100%	on the network
THD(U)max. = 4%	on the network
$\rho = 14\%$	

TECHNICAL DATA

Enclosures	Made of sheet steel, protected against corrosion by phosphating and epoxy powder coating. RAL 7032 colour (others on request). Degree of protection: external panel IP 31 (others on request); internal panel IP 20 at the input of power cables (IP 20 with open doors on request).
Installation	Indoor installation, in a well ventilated position away from heat sources.
Ventilation	Forced.
Switch isolator	Tri-polar under-load type with door lock.
Wiring	The internal connection cables are FS17-450 / 750V type, flame retardant and with very low fumes emission (other types of cables on request). On the non-pre-insulated terminals the connection point is covered with a long-life heat-shrinking sheath. The auxiliary voltage are appropriately identified in compliance with current regulations.
3-pole contactors	Each battery is switched on / off by a three-pole contactor (Class AC6-b) to offer high reliability.
Fuses	Each capacitors bank is protected by fuses. The protection system of both the power circuits (NH-00 curve gG fuses) and the auxiliary ones (isolable fuse holders and 10.3x38 fuses) foresees the use of high breaking power fuses (100kA).
Capacitors	Single-phase capacitors in self-healing metallized polypropylene (MKP), equipped with an anti-burst device and discharge resistance. They are impregnated in vegetable oil, PCB free. Delta connection. Type of continuous service. <ul style="list-style-type: none">• rated voltage: 500 Vac (maximum voltage 550 Vac)• overvoltage: 1.1 x A (8h / 24h)• current overload: 1.3 x In• capacity tolerance: -5% / + 10%• losses due to dissipation: ≤ 0.4 W / kvar• temperature category: -25 / D
Detuning reactors	Tuning frequency: 138 Hz ($\rho = 14\%$) Power losses: 6,5 W / kvar (AVG) Max. Harmonic distortion of the voltage allowed on the networks is: THDU = 4% (138 Hz). On request: higher THDU values.
Controller	<ul style="list-style-type: none">• type of measurement: varmetric.• amperometric signal: by means of an amperometric transformer with secondary 5A, class 1 - 5VA (by the user)• amperometric signal sensitivity: 2.5% for BMR series, 0.3% for HPR series• standard capacitors on / off times: 25 "÷ 30" (others on request)

QUALITY AND TESTING

Regulations	Capacitors: IEC/EN 60831-1 / 2 certified by IMQ (V1927); Equipment: IEC/EN 61439-1 / 2, IEC/EN 61921.
European directives	Low voltage: 2014/35/CE; Electromagnetic compatibility: 2014/30/CE.

Testing 100% of the automatic equipment is subject to visual inspection, insulation test: phase-phase and phase-earth, battery efficiency and ventilation circuit control: the report is included in the documentation. The capacitors are tested in three consecutive stages of the production process: after winding, regeneration and before labeling.


CONFIGURATION

General notes

- For dimensions, please consult the cabinet drawings, referring to the "Type" column.
- The indication for cable entry (power supply) is as follows: ↑ from the bottom, ↙ side up, ↓ from the top
- The rated power is expressed at 400 V - 50 Hz.

The choice of supply cables depends on the installation conditions, the length of the same and the ambient temperature. For a correct sizing, refer to the IEC 60364-5, CEI 64-8 and the UNEL 35024/01 standards.

Cloud Control System (CCS)























The symbol  indicates that CCS, the remote monitoring system, is pre-installed on the P.F.C. equipment. For any specific information, and to find out the advantages of the Cloud Control System service, refer to the appropriate brochure available on www.comarcond.com or directly on request.

Table

THD(I)max. = 100%

THD(U)max. = 4%

p = 14%

Code	Type	Qn (kvar)	Cable entry	In (A)	Banks size (kvar)				Steps (n)	Switch isolator (A)	Controller (type)	CCS	Weight (kg)		
8821402500700	G4RM	50	↓	72	12.5	12.5	25		4	160	BMR4		105		
8821402625750	G4RM	62.5	↓	90	12.5	25	25		5	160	BMR4		115		
8821402750700	G4RM	75	↓	108	12.5	12.5	25	25	6	160	BMR4		125		
8821403100750	G6E	100	↓	144	25	25	25	25	4	200	HPR6		190		
8821403125700	G6E	125	↓	180	25	50	50		5	315	HPR6		200		
8821403150750	G6E	150	↓	216	25	25	50	50	6	400	HPR6		220		
8821403175700	G6E	175	↓	252	25	50	50	50	7	400	HPR6		250		
8821403200750	G9E	200	↑	288	25	50	50	75	8	500	HPR6		290		
8821403225750	G9E	225	↑	324	25	50	75	75	9	500	HPR6		320		
8821403250750	G9E	250	↑	360	25	25	50	75	75	10	630	HPR6		340	
8821403275750	G9E	275	↑	397	25	50	50	75	75	11	630	HPR6		370	
8821403300750	G9E	300	↑	432	25	50	75	75	75	4	800	HPR6		380	
8821403350750	G9E	350	↑	504	50	75	75	75	75	9	800	HPR6		410	
8821403375750	G9E	375	↑	541	25	50	75	75	75	75	5	800	HPR6		430
8821403400750	G9E (II)	400	↑	576	50	50	75	75	75	75	14	1000	HPR6		590
8821403450750	G9E (II)	450	↑	648	25	50	75	75	75	75	18	1000	HPR12		640
8821403500750	G9E (II)	500	↑	720	50	75	75	75	75	75	13	1250	HPR12		690
8821403550750	G9E (II)	550	↑	792	50	50	75	75	75	75	19	1250	HPR12		740
8821403600750	G9E (II)	600	↑	864	75	75	75	75	75	75	8	1250	HPR12		790
8821403650750	G9E (II)	650	↑	936	50	75	75	75	75	75	150	800+630	HPR12		840
8821403750750	G9E (II)	750	↑	1080	75	75	75	75	75	150	150	800+800	HPR12		890
8821403825750	G9E (III)	825	↑	1191	75	75	75	75	75	150	150	800+1000	HPR12		1060
8821403900750	G9E (III)	900	↑	1299	75	75	75	75	150	150	150	800+1250	HPR12		1110
8821403975750	G9E (III)	975	↑	1407	75	75	75	150	150	150	150	800+1250	HPR12		1160
8821404105750	G9E (III)	1050	↑	1516	75	75	150	150	150	150	150	800+1600	HPR12		1210

Other solutions are available on request.