FA05

Three-Phase Passive Filters

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

FA05 series is specially designed for the knock down of current harmonics generated by U.P.S, in industrial applications. The passive filter is realized by tuning in frequency a capacitor bank and a three-phase reactance. In this way there is a resonant circuit which is chosen as the preferential way from the harmonic current which is to be reduced: in fact, the filter has a sufficiently low impedance value only at the frequency value to which it is tuned.

TUNED FILTER

5° grade Harmonic

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).
Ventilation	Forced.
Thermal protection	Made by means of two thermoprobes. The first, with an operating threshold of 35 ° C, controls the insertion of the cooling fans on the roof. The second (50 ° C) separates the filter branch if the temperature exceeds the maximum allowed limit. When the phenomenon ceases, there is automatic recovery.
Insertion	Manual, or automatic piloted remotely (commands by the installer).
Supply	To be carried out directly on the line choke or on the power supply of the fuses. Three-phase input + grounding cable from below for G6E and G8E cabinets. The termination of an NC contact of max 5 Amps 250 Vac for the remote indication of the operation of the equipment is provided by a terminal board. If not used, the remote control must be short-circuited.
Signals	On the front of each panel there is a luminous signal with green light for a live panel, the selector for the insertion of the filter with white light, the intervention of the amperometric protection with yellow light and the relative reset button, the intervention maximum temperature with yellow light signal..
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. • rated voltage: 500 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
Line reactor (on request)	It is manufactured using magnetic low losses core plates. When used, it allows the decoupling of the load and the filter from the network for a correct current sharing between the network and the filter. It also ensures the correct operation of the filter in case of varying distortion in the network.

Filtering reactor

It is manufactured using magnetic low losses core plates and it is tuned with the capacitors. Class H and linearity up to 2In.
- agreement frequency of 245Hz (FA05)
- losses due to dissipation: depending on the power of the filter
- maximum possible harmonic harmonic distortion in the THD network (v) = 5% (others on request).

Amperometric protection

Protects condenser banks by disabling them in case of overcurrents.

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

- 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.

The application of the filters involves an in-depth analysis of the operating conditions of the system.
Below is a list of the information essential for a correct sizing:
- Nominal data and operating cycle of the load to be filtered.
- Campaign of harmonic distortion measurements, to determine the frequency and the value of the harmonic current to be reduced.
- Electrical scheme of the system, with indication of the installation point of the filter.
- Presence of power factor correction equipment (automatic or fixed), type and location.
- Nominal data of other distorting loads present in the system.

Table

Code	Load Data			Filter Data					
	Max. power load U.P.S.	Pn[1]	Rated current	5th harmonic current to be filtered	Reactive power	Reactive current	Impact resistance degree	Type	Weight
	(kVA)	(kW)	(A)	(A)	(kvar)	(A)		(mm)	(kg)
FA05 15-400	15	12	22	8	6	9	IK05	G6E	60
FA05 20-400	20	16	30	12	8	11	IK05	G6E	71
FA05 30-400	30	24	42	16	10	14	IK05	G6E	79
FA05 40-400	40	32	60	24	13	19	IK05	G6E	95
FA05 55-400	55	44	80	32	18	25	IK05	G6E	105
FA05 70-400	70	56	100	40	22	32	IK05	G6E	115
FA05 90-400	90	72	130	52	26	38	IK10	G6E	240
FA05 110-400	110	88	160	64	32	46	IK10	G8E	265
FA05 140-400	140	112	200	80	41	59	IK10	G8E	280
FA05 180-400	180	144	260	105	52	75	IK10	G8E	305
FA05 230-400	230	184	330	132	67	97	IK10	G8E	340
FA05 270-400	270	216	390	155	79	114	IK10	G8E	385
FA05 320-400	320	256	460	185	97	140	IK10	G8E	415
FA05 360-400	360	288	520	210	110	159	IK10	G8E	430
FA05 410-400	410	328	590	236	123	178	IK10	G8E	450
FA05 450-400	450	360	650	260	138	199	IK10	G8E	475
FA05 500-400	500	400	720	288	152	219	IK10	G8E (II)	490
FA05 550-400	550	440	790	310	167	241	IK10	G8E (II)	530
FA05 600-400	600	480	865	340	182	263	IK10	G8E (II)	720

(1) Sizing realized considering the working load at full power and an average cos φ of the line = 0.80