High Current Line Filters for 3-phase + neutral systems

FMAD Series, all-purpose filters to Protection Class I, conform to EN 133200, UL 1283 and IEC 60950

Nominal current: 6 - 250 A @ ϑa 40°C
Rated voltage U_R ($U_{max.}$): 275/480 VAC 50/60 Hz
Attenuation: High
Leakage current: for Industrial applications
Test voltages: L → L 2.25kVDC, 2 sec *
L → N 1.7 kVDC, 2 sec *
L → E 3 kVDC, 2 sec *
N → E 2.7 kVDC, 2 sec *
Climatic category: 25/100/21 acc. to IEC 60068-1
50% saturation typ.: 2 to 3 x I_N @ 20°C
Inrush current: 1.5 x I_N 1 min. per hour
MTBF @ 40°C / U_R (U_{max}): > 200'000 h acc. to MIL-HB-217 F

*without resistors

Conception conforms to EN 133200, UL 1283 and CSA 22.2 Nr. 8 1986

The TIMONTA high current filter family FMAD was developed for the following industrial applications:

- **Frequency converters**
- **Stepper Motor Drives**
- **UPS-Systems**
- **Inverters**

International approvals centers (i.e. UL) today demand high filter performance with regard to attenuation and loading characteristics. During the design, special considerations were made for applications that require high attenuation at the specified maximum load or where asymmetrical loading of the filter occur independently from line impedance at the installation site. The implemented filter range wholly conforms to the requirements of the international standards EN 133200, UL 1283, IEC 60950 and VDE 0565.

They are ideally suited for applications with EN 55011, EN 55014 and EN 55022 requirements.

- Standard version include insulated safety screw terminals.
- Optionally, wire lead connections instead of the screw terminals are available (m.o.q. 50 pcs).
- Key features of the high current filter range include:
  – easy, space saving installation
  – high symmetrical and asymmetrical mode attenuation (from 10 kHz to 300 MHz)
- To maximize the filter performance in the application, the following EMC-rules should be considered:
  – physical separation of filter input and output lines
  – physical separation of the interference source itself
  – dedicated earth connection for the filter

Technical Data

Insertion losses and case designs see pages 78-79-80-81.

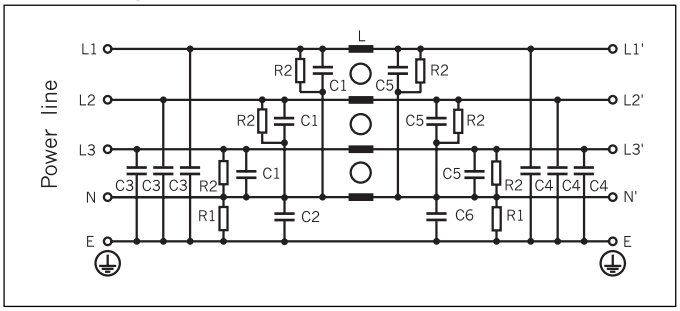
Type blocks	I_N (1) @ ϑa 40°C [A]	U_R (U_{max}) 50/60 Hz [V]	L_N (2) -30%/+50% [mH]	Resistance L-L' ±15% [mΩ]	Power dissipation total ±15% [W]	Max. leakage current @ 440 V/50 Hz In 3-phase systems (3) [mA]	Max. leakage current @ 440 V/50 Hz Worst case (4) [mA]	C1 ±20% [µF]	C2 ±20% [µF]	C3 ±20% [nF]	C4 ±20% [nF]	C5 ±20% [µF]	C6 ±20% [µF]	R1 [MΩ]	R2 [MΩ]	Case	Terminal [mm²]
FMAD-0924-0610	4 x 6		4 x 9	27	3.9		41	1.0	–	100	10	2.2	–	–	1	24-4	4
FMAD-0931-0810	4 x 8		4 x 8	35	9		41	1.0	–	100	10	2.2	–	–	1	31-4	4
FMAD-0931-1610	4 x 16		4 x 5	15	15.4		41	1.0	–	100	10	2.2	–	–	1	31-4	4
FMAD-0932-1610	4 x 16		4 x 5	15	15.4		41	1.0	–	100	10	2.2	–	–	1	32-4	4
FMAD-0932-2510	4 x 25		4 x 2.6	4.6	11.5		156	4.4	1	10	47	4.4	1	1	1	32-8	6
FMAD-0934-3610	4 x 36	275/	4 x 1.8	4	21		156	4.4	1	10	47	4.4	1	1	1	34-4	10
FMAD-0934-5010	4 x 50	480 V	4 x 0.8	2	20	≤ 5	160	4.4	1	10	100	4.4	1	1	1	34-4	10
FMAD-0953-6410	4 x 64		4 x 0.6	1.6	27		160	4.4	1	10	100	4.4	1	1	1	53-4	25
FMAD-0937-8010	4 x 80		4 x 0.9	1.5	39		167	6.6	1	47	100	6.6	1	1	1	37-4	25
FMAD-0954-H110	4 x 110		4 x 0.5	1.2	58		167	6.6	1	47	100	6.6	1	1	1	54-4	50
FMAD-0955-H210	4 x 180		4 x 0.25	0.39	51		167	6.6	1	47	100	6.6	1	1	1	55-4	95
FMAD-0956-H310	4 x 250		4 x 0.2	0.25	62.5		174	11	1	100	100	11	1	1	0.5	56-4	240

(1) Current derating over 40°C : $I = I_N \times \sqrt{(100-\vartheta a)/60}$
(2) Nominal inductance measured according to EN 138100, see introduction of this catalog, paragraph 3.4
(3) Measured according to IEC 60950 - 5.2.4 - 5.2.5, valid for TT and TN mains and with regular Sinus. See introduction of this catalog, paragraph 3.5
(4) Measured according to IEC 60950 - Annex G.4, valid for IT mains. See introduction of this catalog, paragraph 3.5

Drive Rating Converter / Recommended Filter type

Motor Rating [PS / HP]	[kW]	Converter Rating [kVA]	Recommended filter I_N [A]
1	0.75	to 1.5	6
2	1.5	to 2.9	8
5	3.7	to 6.8	16
10	7.5	to 12.2	25
15	11	to 20	36
20	15	to 26	50
25	18.5	to 30	64
30	22.5	to 40	80
38	28	to 50	110
60	45	to 85	180
87	65	to 120	250

Circuit diagram



Insertion losses and case designs see pages 78-79-80-81.