

MICROMASTER 4, LC filter Sizes A to C

Description

This LC filter limits the voltage gradient and the capacitive re-charging currents which generally occur in inverter operation. This is the reason that when an LC filter is used, significantly longer screened motor feeder cables are possible and the motor lifetime reaches the same values which are achieved when the motor is connected directly on-line.

CAUTION

Correct installation is essential for safe operation.

NOTES

The LC filter, Sizes A to C, are designed as sub-chassis filters. These filters can be used for all MICROMASTER 4 drive inverters, Sizes A to C.

Sizes A and B:

A maximum of two sub-chassis components plus drive inverter are permissible. In this case, the LC filter must be mounted/installed as the lowest component.

Size C:

Only one sub-chassis component is permissible for Size C. If the line reactor and LC filter are used, then the line reactor must be installed left to the drive inverter. The following clearance is required: 7.5 cm.

The following must be observed when using LC filters:

- Only V/f, FCC control is permissible.
- Use filter only under load !
- Operation is only permissible with a pulse frequency of **4 kHz**. Make sure that the automatic pulse frequency reductions are disabled.

Coercing required parameter adjusting:

P1800 = 4 kHz, P0290 = 0 or 1

CAUTION

Operation with a pulse frequency of 2 kHz leads to overheating the LC Filter.

- If the motor data identification (Mot-ID) run is not properly completed (F0041) during commissioning the drive inverter, the LC filter must be disconnected from the motor circuit and the Mot-ID run repeated.
- The output frequency is limited to a maximum of 150 Hz (restrictions see Table 1).

CAUTION

Size A

When operating with LC filter 6SE6400-3TD00-4AD0 the following output frequencies must not be exceeded:

Table 1 Reduction of output frequency

Rated output	Output frequency	Rated output	Output frequency
0,37 kW, 380 ... 480 V	90 Hz	0,75 kW, 380 ... 480 V	110 Hz
0,55 kW, 380 ... 480 V	100 Hz	1,1 kW, 380 ... 480 V	130 Hz

Technical data

Table 2 Selection data

Order No. LC filter	Size	Voltage [V]	Current [A]	
			40 °C	50 °C
6SE6400-3TD00-4AD0	A	380 – 480	4.5	4.1
6SE6400-3TD01-0BD0	B	380 – 480	11.2	10.2
6SE6400-3TD03-2CD0	C	380 – 480	32.6	26.0
6SE6400-3TD01-0CE0	C ⁽¹⁾	500 – 600	9.0	6.1
6SE6400-3TD02-3CE0	C ⁽²⁾	500 – 600	22.4	17

(1) = Use with inverter 0.75 kW up to 4.0 kW

(2) = Use with inverter 5.0 kW up to 11 kW

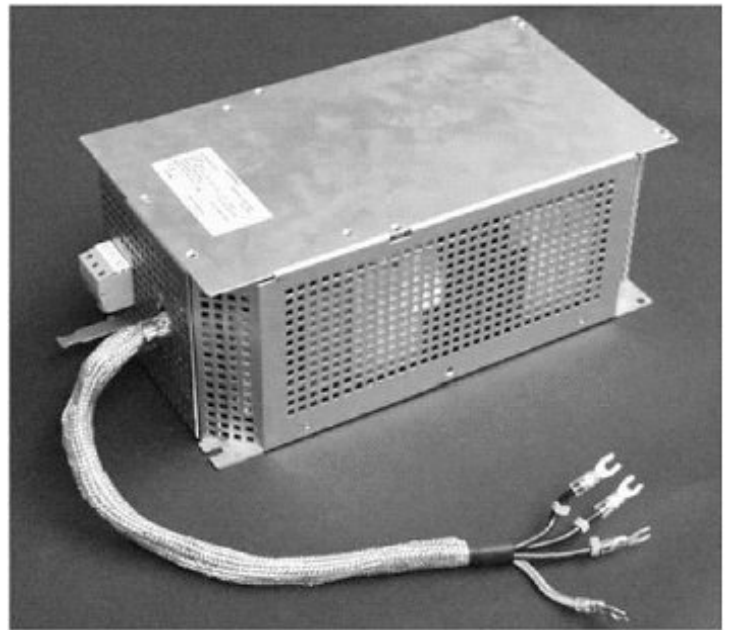


Fig. 1 LC filter, Size C

Table 3 General electrical data

Rated filter current	See Table 2
Motor overvoltage limiting	≤ 1078 V
dv/dt limiting	≤ 500 V/μs
Pulse frequency	4 kHz
Max. motor frequency	150 Hz (restrictions see Table 1)
Max. permissible motor feeder cable lengths	Shielded 200 m Unshielded 300 m
Insulation strength	Overvoltage Category III acc. to VDE 0110
Electromagnetic compatibility	Up to 200 m motor cables length with emission levels (Conducted Emission) acc. to Class A, acc. to EN 55011 in conjunction with filtered drive inverters and non-shielded feeder cables

Table 4 General technical data

Conformance	CE according to the Low-Voltage Directive 73/23/EC
Certification	cUL E 219022
Mechanical strength	EN 60068-2-31
Air humidity	95% air humidity, no moisture condensation
Degree of protection	IP20 (according EN60529)
Insulation Class	H (180 °C)
Permissible temperature	Storage: - 25 °C to + 70 °C Operation: - 10 °C to + 40 °C to + 50 °C
Permissible installation altitude	To 2000 m: 100 % P _{rated} 2000 to 4000 m: 62.5 % P _{rated}
Mounting position	Vertical
Installation clearance	Top: 100 mm Bottom: 100 mm Side: 100 mm
Connection system	Input, finely-stranded: 1U1, 1V1, 1W1 Output, terminals: 1U2, 1V2, 1W2
Torque for power connections	1.5 Nm to 1.8 Nm

Dimension drawings

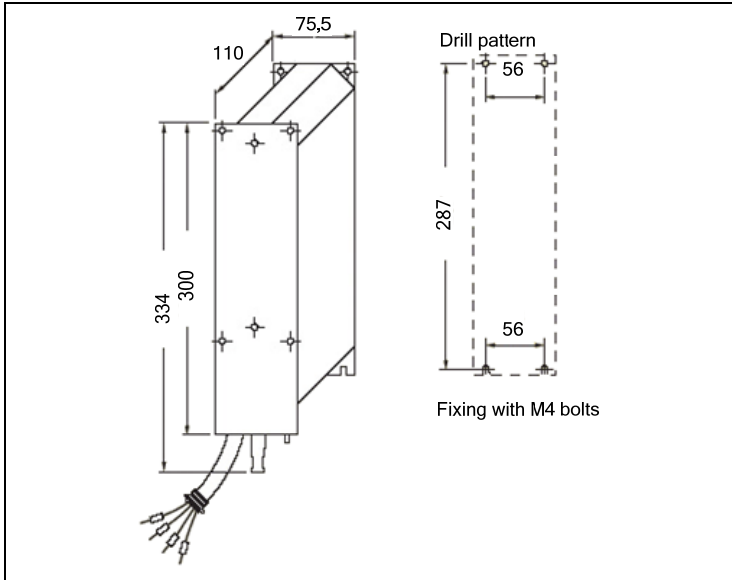


Fig. 2 Size A

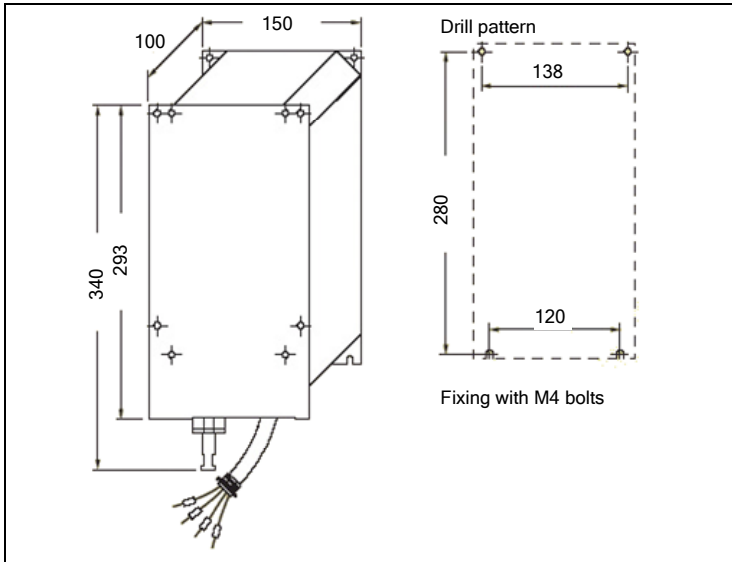


Fig. 3 Size B

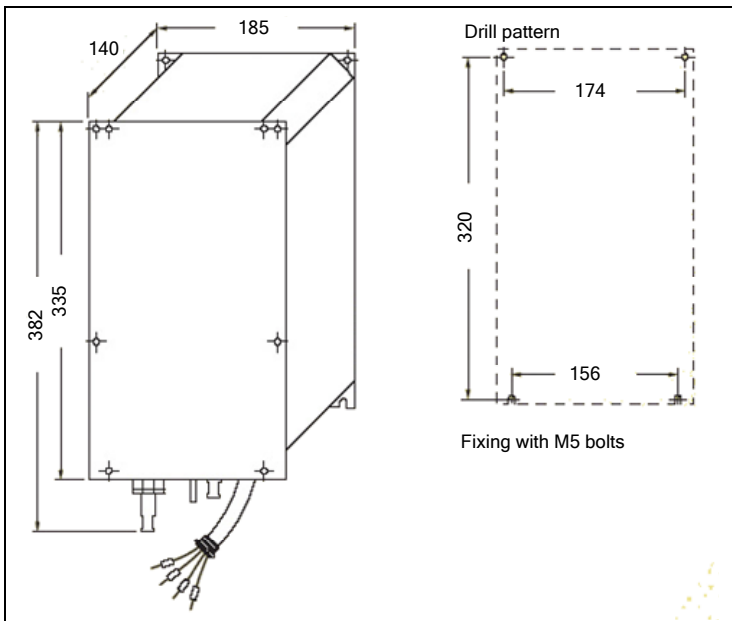


Fig. 4 Size C

Mounting examples



Fig. 5 Sub-chassis: LC filter, Size B



Fig. 6 Shield, LC filter, Size A

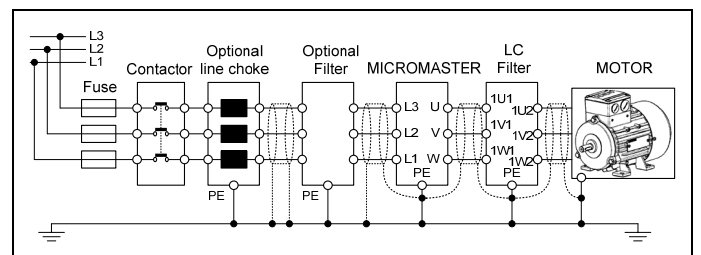


Fig. 7 Mounting sequence

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MICROMASTER 4, LC Filter Sizes D to F

Description

This LC filter limits the voltage gradient (i.e. voltage rate-of-rise) and the capacitive re-charging currents which generally occur in inverter operation. This is the reason that when an LC filter is used, significantly longer screened motor feeder cables are possible and the motor lifetime reaches the same values which are achieved when the motor is connected directly on-line.

CAUTION

Correct installation is essential for safe operation.

NOTES

The LC filters, Sizes D to F, are intended for vertical mounting within the control cabinet.

These filters can be used for all MICROMASTER 4 drive inverters, Sizes D to F.

A minimum distance of 100 mm to adjacent components and metal parts is recommended.

The following should be observed when using LC filters:

- Only V/f, FCC control is permissible.
- Use filter only under load !
- Operation is only permissible with a pulse frequency of **4 kHz**. Make shure that the automatic pulse frequency reductions are disabled.
**Coercing required parameter adjusting:
P1800 = 4 kHz, P0290 = 0 or 1**

CAUTION

Operation with a pulse frequency of 2 kHz leads to overheating the LC Filter.

- If the motor data identification (Mot-ID) run is not properly completed (F0041) when the drive inverter is being commissioned, the LC Filter must be disconnected from the motor circuit and the Mot-ID run repeated.
- The output frequency is limited to a maximum of 150 Hz.

Technical data

Table 1 Selection data

Order No. LC filter	Size	Weight [kg / lbs]	Voltage [V]	Current [A]	
				40 °C	50 °C
6SE6400-3TD03-7DD0	D	21,0 / 46,2	380 – 480	38,8	32,0
6SE6400-3TD04-8DD0	D	26,0 / 57,2	380 – 480	45,9	38,0
6SE6400-3TD06-1DD0	D	34,0 / 74,8	380 – 480	63,2	45,0
6SE6400-3TD02-3DE0	D	26,1 / 57,4	500 - 600	27,5	22,0
6SE6400-3TD03-2DE0	D	39,5 / 87,0	500 – 600	32,6	27,0
6SE6400-3TD03-7DE0	D	42,0 / 92,5	500 – 600	41,8	32,0
6SE6400-3TD07-2ED0	E	49,5 / 108,9	380 – 480	76,5	62,0
6SE6400-3TD04-8EE0	E	48,5 / 107,0	500 – 600	53,0	41,0
6SE6400-3TD06-1EE0	E	57,5 / 126,5	500 – 600	63,2	52,0
6SE6400-3TD11-5FD0	E/F	67,0 / 147,5	380 – 480	112,2	90,0
6SE6400-3TD15-0FD0	F	75,0 / 166,1	380 – 480	147,9	110,0
6SE6400-3TD18-0FD0	F	126 / 277	380 – 480	181,6	145,0
6SE6400-3TD07-1FE0	F	70,5 / 155,0	500 – 600	78,5	62,0
6SE6400-3TD10-0FE0	F	75,1 / 165,2	500 – 600	101,0	77,0
6SE6400-3TD11-5FE0	F	126 / 277	500 – 600	127,5	99,0

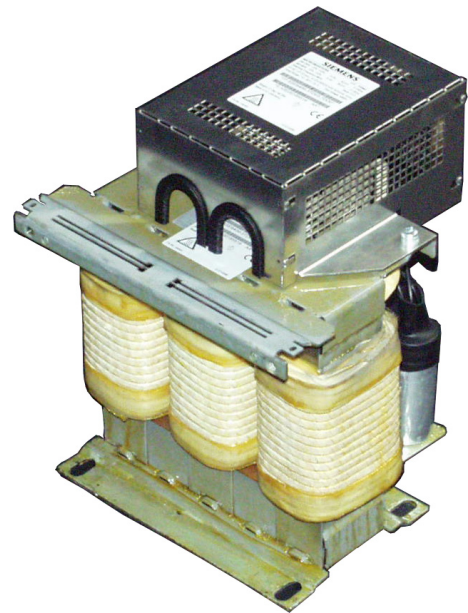


Fig. 1 LC filter, Size F with terminal cover

Table 2 General electrical data

Rated filter current	See Table 1	
Motor overvoltage limiting	≤ 1078 V	
dv/dt limiting	≤ 500 V/μs	
Pulse frequency	4 kHz	
Max. output frequency	150 Hz	
Max. permissible motor feeder cable lengths	Shielded	200 m
	Unshielded	300 m
Insulation strength	Overvoltage Category III acc. to VDE 0110	
Electromagnetic compatibility	Up to 200 m motor cables length with emission (Conducted Emission) levels acc. to Class A, according to EN 55011 in conjunction with filtered drive inverters and non-shielded feeder cables	

Table 3 General technical data

Conformance	CE according to the Low-Voltage Directive 73/23/EC	
Certification	cUL E 219022	
Mechanical strength	EN 60068-2-31	
Air humidity	95 % air humidity, no moisture condensation	
Degree of protection	IP00 according to EN 60529 IP20 with terminal cover	
Insulation Class	H (180 °C)	
Permissible temperature	Storage: - 25 °C to + 70 °C	100 % P _{rated} 80 % P _{rated}
	Operation: - 10 °C to + 40 °C to + 50 °C	
Permissible installation altitude (h in m)	h ≤ 1000 m amsl: without power reduction 1000 m amsl < h ≤ 4000 m amsl with power reduction 12,5 % per 1000 m	
Mounting position	Vertical	
Installation clearance	Top: 100 mm	Side: 100 mm
	Side: 100 mm	
Connection system	Input, terminals: 1U1, 1V1, 1W1	Output, terminals: 1U2, 1V2, 1W2
Torque for power connections	Cross-section	Torque
	16 mm ²	2,0 - 4,0 Nm
	35 mm ²	2,5 - 5,0 Nm
	50 mm ²	3,0 - 6,0 Nm
	95 mm ²	6,0 - 12,0 Nm
	150 mm ²	10,0 - 20,0 Nm

Dimension drawing

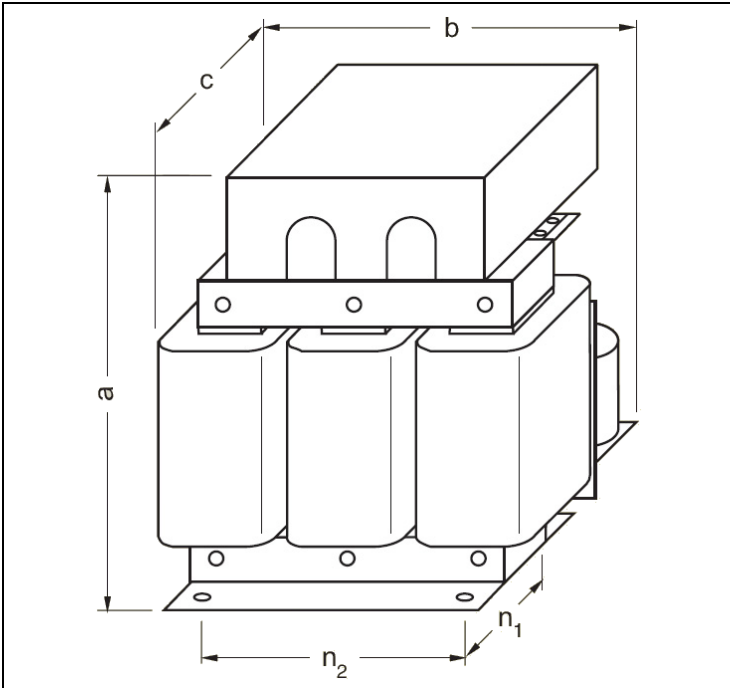


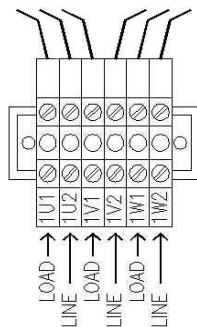
Table 4 Dimensions

Order No. LC filter	a	b	c	n ₁	n ₂	Bolt
6SE6400-3TD03-7DD0	278	240	230	115	190	M10
6SE6400-3TD04-8DD0	290	240	240	125	190	M10
6SE6400-3TD06-1DD0	345	300	220	120	240	M10
6SE6400-3TD02-3DE0	280	240	240	125	190	M10
6SE6400-3TD03-2DE0	310	300	235	133	240	M10
6SE6400-3TD03-7DE0	310	300	250	145	240	M10
6SE6400-3TD07-2ED0	355	300	235	145	240	M10
6SE6400-3TD04-8EE0	345	300	260	160	240	M10
6SE6400-3TD06-1EE0	345	300	275	171	240	M10
6SE6400-3TD11-5FD0	460	360	235	125	264	M10
6SE6400-3TD15-0FD0	460	360	250	140	264	M10
6SE6400-3TD18-0FD0	520	420	290	173	316	M10
6SE6400-3TD07-1FE0	380	300	285	171	240	M10
6SE6400-3TD10-0FE0	460	360	250	140	264	M10
6SE6400-3TD11-5FE0	515	420	290	173	316	M10

Connection Diagram

Input: 1U1 / 1V1 / 1W1
VFD Output / Load

Output: 1U2 / 1V2 / 1W2
Motor / Line



Mounting examples



Fig. 2 Installation example, Size D, with shielded incoming and outgoing line IP20

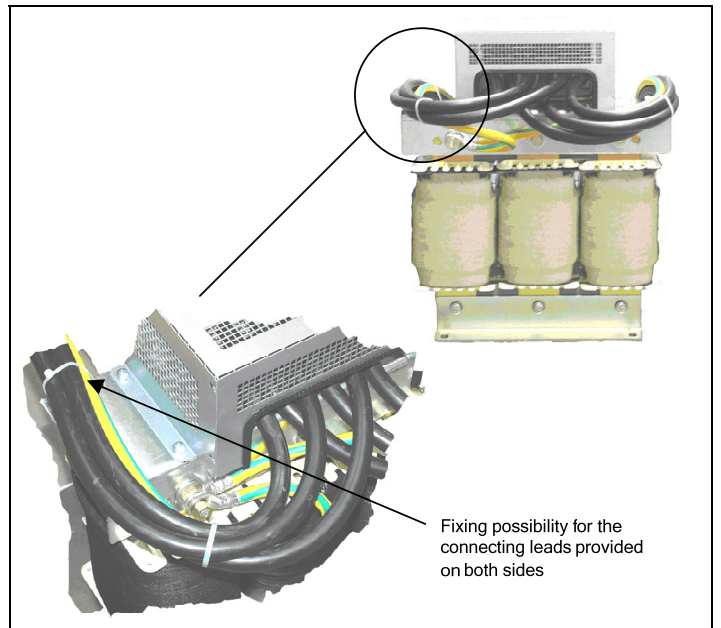


Fig. 3 Installation example, Size F, with unshielded single-core incoming and outgoing line IP20

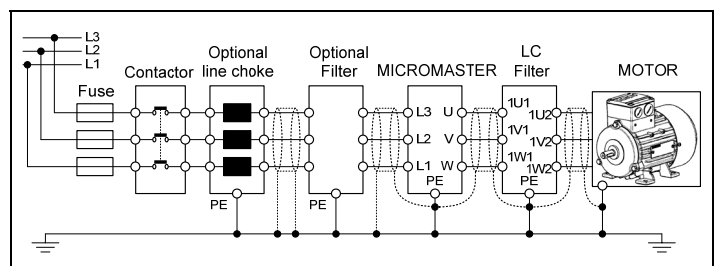


Fig. 4 Mounting sequence

MICROMASTER 4, Sinusoidal Filter Sizes FX and GX

Description

This Sinusoidal Filter limits the voltage gradient (i.e. voltage rate-of-rise) and the capacitive re-charging currents which generally occur in inverter operation. The Motor lifetime reaches the same values which are achieved when the motor is connected directly on-line.

CAUTION

Correct installation is essential for safe operation.

NOTES

The Sinusoidal Filter, Sizes FX to GX, are intended for vertical mounting within the control cabinet.

These Sinusoidal Filter can be used by the following type of inverter:

MICROMASTER 430/440.

A minimum distance of 100 mm to adjacent components and metal parts is recommended.

The following should be observed when using Sinusoidal Filter:

- Only V/f, FCC control is permissible.
- Use filter only under load !
- Operation is only permissible with a pulse frequency of **4 kHz**. Make sure that the automatic pulse frequency reductions are disabled.

Coercing required parameter adjusting:

P1800 = 4 kHz, P0290 = 0 or 1

CAUTION

Operation with a pulse frequency of 2 kHz leads to overheating the Sinusoidal Filter.

- If the motor data identification (Mot-ID) run is not properly completed (F0041) when the drive inverter is being commissioned, the Sinusoidal Filter must be disconnected from the motor circuit and the Mot-ID run repeated.
- The output frequency is limited to a maximum of 150 Hz.
- Due to higher pulse frequencies when using Sinusoidal Filter a derating must be implemented (refer to Operating Instructions).

Technical data

Table 1 Selection data

Order No. Sinusoidal Filter	Size	Weight [kg]	Voltage [V]	Current [A]	
				40 °C	55 °C
6SL3000-2CE32-3AA0	FX	135	380 ... 480	225	191
6SL3000-2CE32-8AA0	GX	138	380 ... 480	276	235
6SL3000-2CE33-3AA0	GX	144	380 ... 480	333	283
6SL3000-2CE34-1AA0	GX	208	380 ... 480	408	347

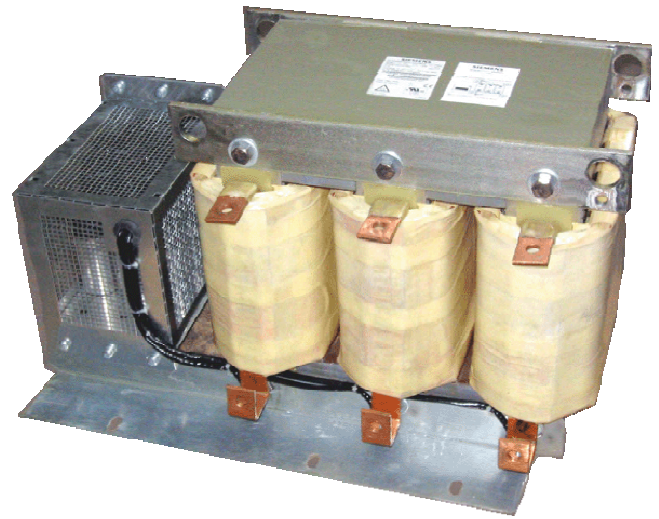


Fig. 1 Sinusoidal Filter, Size FX

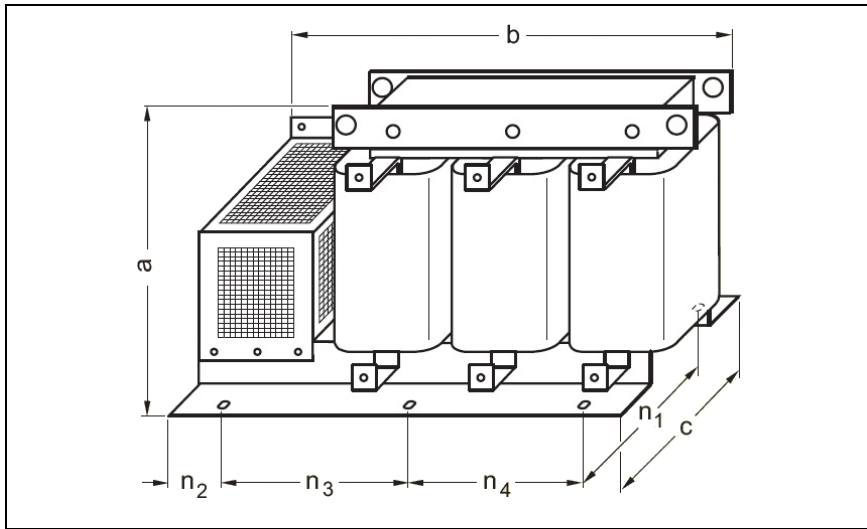
Table 2 General electrical data

Rated filter current	See Table 1	
Motor overvoltage limiting	≤ 1078 V	
dv/dt limiting	≤ 500 V/μs	
Pulse frequency	4 kHz	
Max. output frequency	150 Hz	
Max. permissible motor feeder cable lengths	Shielded	300 m
	Unshielded	450 m
Insulation strength	Overvoltage Category III acc. to VDE 0110	
Electromagnetic compatibility	Up to 150 m motor cables lengthwith emission levels (Conducted Emission) acc. to Class A, according to EN 55011 in conjunction with filtered drive inverters and non-shielded feeder cables	

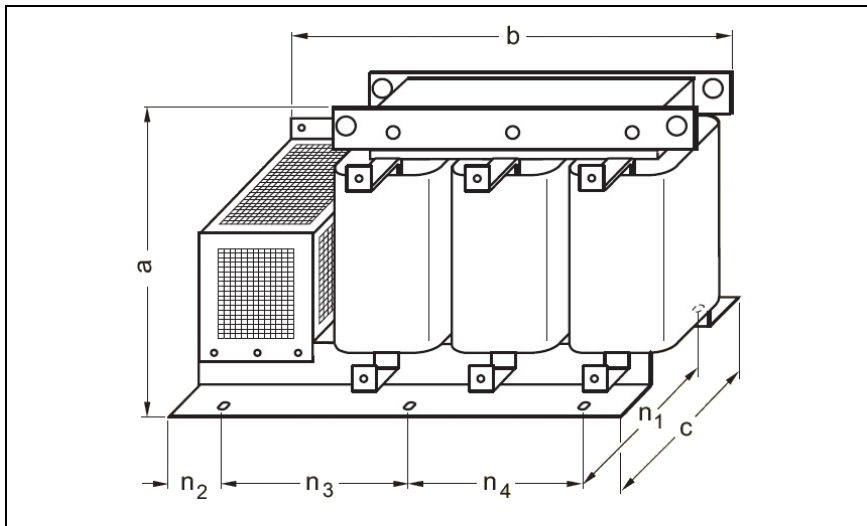
Table 3 General technical data

Conformance	CE according to the Low-Voltage Directive 73/23/EC	
Certification	cUL E 219022	
Mechanical strength	EN 60068-2-31	
Air humidity	95 % air humidity, no moisture condensation	
Degree of protection	IP00	
Insulation Class	H (180 °C)	
Permissible temperature	Storage:	- 40 °C to + 70 °C
	Operation:	- 10 °C to + 40 °C 100 % P _{rated} to + 55 °C 85 % P _{rated}
Permissible installation altitude (h in m)	h ≤ 2000 m amsl:	without power reduction
	2000 m amsl < h ≤ 4000 m amsl	with power reduction 7,5 % per 1000 m
Mounting position	Vertical	
Installation clearance	Top:	100 mm
	Side:	100 mm
Connection system	Input, bus bar:	1U1, 1V1, 1W1
	Output, bus bar:	1U2, 1V2, 1W2
	The bus barr terminals are prepared for screws M12	
Torque for power connections	14,0 up to 31,0 Nm	

Dimension drawing



Order No. Sinusoidal Filter	a	b	c	n ₁	n ₂	n ₃	n ₄
6SL3000-2CE32-3AA0	300	620	320	280	105	225	150
6SL3000-2CE32-8AA0	300	620	320	280	105	225	150



Order No. Sinusoidal Filter	a	b	c	n ₁	n ₂	n ₃	n ₄
6SL3000-2CE33-3AA0	370	620	360	320	105	225	150
6SL3000-2CE34-1AA0	370	620	360	320	105	225	150

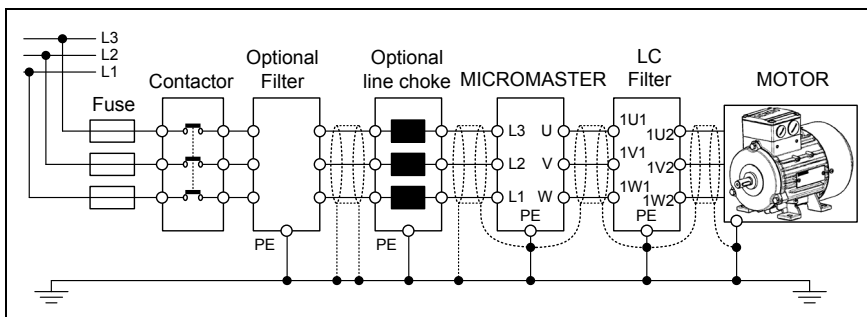


Fig. 2 Mounting sequence