PSF Sine Wave Filters

Three-Phase, Iron-Core, PolyGap®-Design

MANGOLDT's PSF Sine Wave Filters provide proven performance and reliable high quality for your application

MANGOLDT'S Type PSF Sine Wave Filters set a new standard for Sine Wave Filter performance and reliability. The combination of precise three-phase reactors and high performance capacitors guarantees best-in-class motor protection and extended motor life-time.

Based on knowledge gained from several decades of applications experience as well as ongoing R&D they provide stable feature properties for your application. PolyGap® core technology is utilized for low power losses as well as balanced inductance. This leads to a superior lifetime of MANGOLDT PSF Sine Wave Filters.

Sine Wave Filters from MANGOLDT are designed to suit both - line input or load output of drive systems. The modular design and its overall small dimensions make it easy to integrate and install them. They are designed for higher DC link voltages to assure proper function even within stressful applications like active front end drives (AFE) and motors for frequent regenerative braking.

Technical Data

Rated Voltage	U_N / [V_{AC}]	400...500	525...690
Rated Frequency*	f_N / [Hz]	0...80	0...70
Pulse Frequency	fsw / [kHz]	2...10	1,5...10
Rated Currents	I_N / [A_{RMS}]	5...1460	5...1160
High Voltage Test	U / [V_{AC}] 3000 (1 min)		
Impulse Voltage Test	U / [Vpeak] 4200		
Overload	1.5 x I_N for 60s/every 10min (ta ≤ 45°C)		
Impregnation	Vacuum Overpressure (VPI)		
Insulation Class	T45/H		
Type of Cooling	Natural Convection (AN)		
Protection Class	IP00 (IP20/IP23/IP54 optional)		
Thermal Protection	Prepared - easy retrofit		
Altitude Maximum*	1000 Meters		
Relative Humidity	Maximum 95% non-condensing		

* without applied derating – for derating values consult Mangoldt

Features

- Line and load side application
- PolyGap® Core Construction
- Vacuum and overpressure impregnation
- Balanced inductance in all three phases
- Low losses, especially due to harmonics

Benefits

- Provides a sinusoidal output voltage
- Guarantees trouble-free operation with longer motor cables (≤ 1500 m, shielded)
- Possible installation of filters in parallel
- Reduces discharge currents driven by pulse frequency in the case of long cable lengths
- Eliminates acoustic switching noise from the motor caused by magnetostriction
- Reduces high-frequency transient emissions
- Reduces bearing currents caused by circulating currents

Approvals / Standards

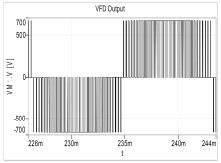
CUL Listed (E173113),

IEC/EN60076-6, VDE0532-76-6

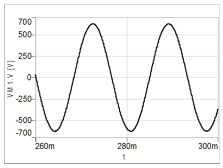
RoHS 2011/65/EU

c UL us LISTED

Voltage Waveform

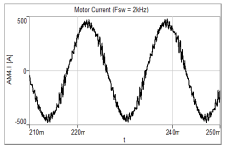


Without MANGOLDT PSF

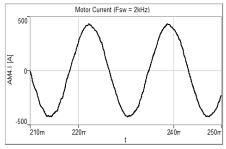


With MANGOLDT PSF

Current Waveform



Without MANGOLDT PSF



With MANGOLDT PSF

PSF53 Sine Wave Filters

Three-Phase, Iron-Core, PolyGap®-Design

Sine-Wave Filters utilize low-pass filter technology to suppress the pulse-frequency component from voltage-source frequency converters. The filter network suppresses the high-frequency content (pulses) from the Pulse-Width Modulated (PWM) voltage waveform, resulting in a nearly sinusoidal phase-to-phase output voltage. Due to the sinusoidal voltage supply, insulation stress and hysteresis thermal losses in the motor are reduced prolonging the lifetime of the motor. Sine-wave filters are considered to be the ideal solution for a large number of applications.

MANGOLDT PSF53 Sine Wave Filter Selection Table

Filter Type	Rated Current	Typical Motor Power Rating		Rated Inductance	Rated Capacitance	Terminal Input/Output	Typical Power Loss	Total Weight
	[A]	[kW] @500V	[hp] @480V	[mH]	[µF]		[W] @ 100% Load	[kg]
PSF53-0005	**5**	1,1/1,5	3	**14,5**	1,5	Terminal Blocks	45	6,4
PSF53-0008	**8**	2,2/3	5	**9**	2,2	Terminal Blocks	70	7,6
PSF53-0011	**11**	4	7,5	**6,5**	3	Terminal Blocks	90	10,8
PSF53-0015	**15**	5,5/7,5	10	**4,8**	4,7	Terminal Blocks	110	12,7
PSF53-0021	**21**	11	15	**3,4**	6,8	Terminal Blocks	140	15,8
PSF53-0027	**27**	12,5	20	**2,7**	6,8	Copper Bus Bar	170	23,8
PSF53-0035	**35**	15	25	**2**	10	Copper Bus Bar	195	24,4
PSF53-0040	**40**	18,5	30	**1,8**	10	Copper Bus Bar	220	28,9
PSF53-0052	**52**	22	40	**1,38**	15	Copper Bus Bar	260	30,9
PSF53-0065	**65**	30	50	**1,1**	20	Copper Bus Bar	310	41,5
PSF53-0077	**77**	37	60	**0,93**	20	Copper Bus Bar	350	40,4
PSF53-0100	**100**	45	75	**0,72**	33	Copper Bus Bar	410	58,7
PSF53-0125	**125**	55	100	**0,57**	33	Copper Bus Bar	450	68,9
PSF53-0156	**156**	75	125	**0,46**	47	Copper Bus Bar	550	78,4
PSF53-0187	**187**	90	150	**0,39**	47	Copper Bus Bar	620	91,9
PSF53-0240	**240**	110	200	**0,3**	66	Copper Bus Bar	850	121
PSF53-0302	**302**	132	250	**0,24**	94	Copper Bus Bar	935	158
PSF53-0360	**360**	160	300	**0,2**	94	Copper Bus Bar	1050	175
PSF53-0420	**420**	200	350	**0,17**	94	Copper Bus Bar	1200	195
PSF53-0480	**480**	250	400	**0,15**	141	Copper Bus Bar	1350	216
PSF53-0520	**520**	250	450	**0,138**	141	Copper Bus Bar	1400	244
PSF53-0590	**590**	315	500	**0,12**	141	Copper Bus Bar	1500	259
PSF53-0720	**720**	355	600	**0,1**	188	Copper Bus Bar	1750	302
PSF53-0840	**840**	400/450	700	**0,085**	188	Copper Bus Bar	1850	338
PSF53-1000	**1000**	500	850	**0,07**	282	Copper Bus Bar	2650	415
PSF53-1220	**1220**	560/630	1000	**0,06**	282	Copper Bus Bar	3100	469
PSF53-1460	**1460**	710/800	1200	**0,05**	376	Copper Bus Bar	3500	565

The range of applications of present VFD's is broadly diversified thereby making it difficult to find the proper solution for each specific drive system. In addition the drive system is not only affected by the application, but also by the VFD settings. We – MANGOLDT – have the aspiration to ease the product selection for our customers as much as possible. Please follow our Filter selection guide for further information, or consult our engineering team.

PSF53 Sine Wave Filters

Three-Phase, Iron-Core, PolyGap®-Design

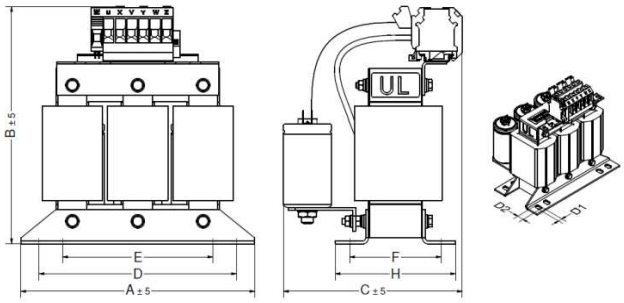
The PSF product line is available as standard solution for several voltage ratings from 400V to 690V matching your application. For your specific demands MANGOLDT offers tailor-made solutions, our engineering team develops precise solutions to meet your specific application requirements.

PSF Sine Wave Filters can be used with most of the common motors and drives available on the global market. Even for short cable installations, at voltages higher than 500V Sine-Wave Filters are recommended for drive applications, to protect the motor winding insulation against high voltage peaks and to assure your best application performance.

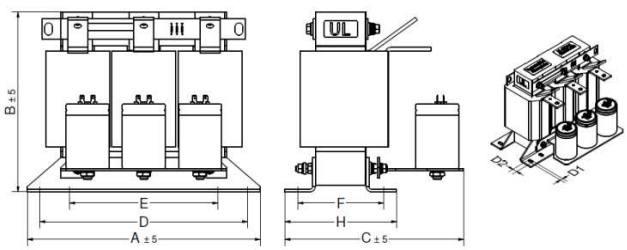
Mechanical Data

Filter Type	A	B	C	D	E	F	H	D1	D2	Terminal		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]^2	PE	[Nm]
PSF53-0005	178	188	136	146	106	69	89	7	12	0,2-4	0,2-4	0,5-0,8
PSF53-0008	219	214	149	181	136	70	100	10	16	0,2-4	0,2-4	0,5-0,8
PSF53-0011	219	215	169	181	136	90	120	10	16	0,2-4	0,2-4	0,5-0,8
PSF53-0015	243	233	164	205	156	85	115	10	16	0,5-10	0,2-4	1,5-1,8
PSF53-0021	243	242	179	205	156	95	125	10	16	1,5-16	0,5-10	2,5-3
PSF53-0027	316	195	250	278	200	125	164	10	16	30 x 5	M8	45
PSF53-0035	291	214	246	253	185	125	152	10	16	30 x 5	M8	45
PSF53-0040	316	235	250	278	200	125	164	10	16	30 x 5	M8	45
PSF53-0052	316	250	250	278	200	125	164	10	16	30 x 5	M8	45
PSF53-0065	352	241	285	314	224	140	184	10	16	30 x 5	M8	45
PSF53-0077	352	266	270	314	224	125	169	10	16	30 x 5	M8	45
PSF53-0100	360	314	297	300	-	141	177	10	13	30 x 5	M10	45
PSF53-0125	360	314	314	300	-	156	192	10	13	30 x 5	M10	45
PSF53-0156	420	369	330	350	-	152	192	12	18	30 x 5	M10	45
PSF53-0187	420	367	349	350	-	169	209	12	18	30 x 5	M10	45

5...21 A Types (Terminal Block)



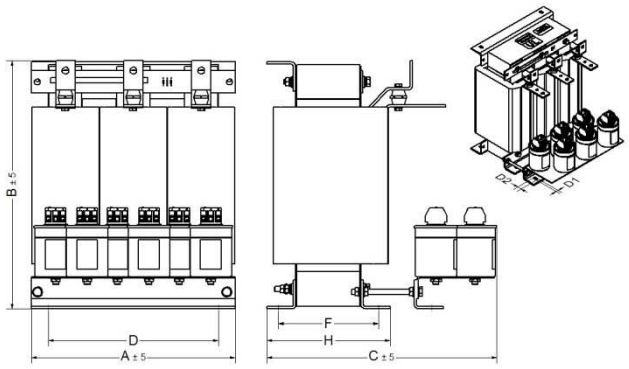
35...187 A Types (Copper Bus Bars)



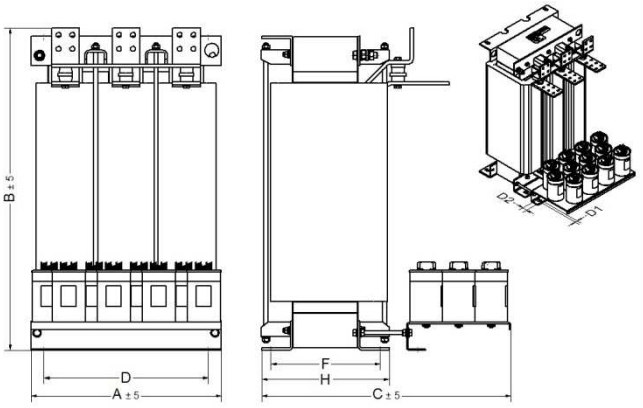
Mechanical Data

Filter Type	A	B	C	D	E	F	H	D1	D2	Terminal		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	$[mm]^2$	PE	[Nm]
PSF53-0240	420	472	419	350	-	161	203	11	20	30 x 5	M10	45
PSF53-0302	420	506	444	350	-	176	218	11	20	40 x 5	M10	75
PSF53-0360	420	508	474	350	-	206	248	11	20	40 x 5	M12	75
PSF53-0420	420	568	474	350	-	206	248	11	20	40 x 5	M12	75
PSF53-0480	480	641	539	425	-	223	269	13	22	40 x 8	M12	75
PSF53-0520	480	607	563	425	-	253	299	13	22	40 x 8	M12	75
PSF53-0590	480	643	569	425	-	253	299	13	22	40 x 8	M12	75
PSF53-0720	480	748	524	425	-	253	299	13	22	40 x 8	M12	75
PSF53-0840	480	758	549	425	-	268	314	13	22	50 x 10	M12	75
PSF53-1000	550	912	575	475	-	265	319	17,5	30	80 x 6	M16	75
PSF53-1220	550	922	600	475	-	280	334	17,5	30	80 x 8	M16	75
PSF53-1460	550	931	720	475	-	315	369	17,5	30	80 x 10	M16	75

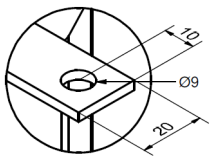
240...420 A Types (Copper Bus Bars)



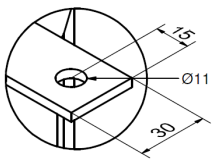
480...1460 A Types (Copper Bus Bars)



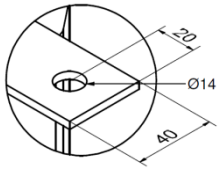
Bus Bar 20 mm



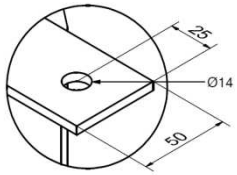
Bus Bar 30 mm



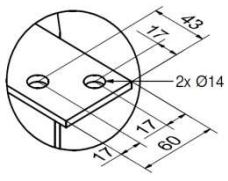
Bus Bar 40 mm



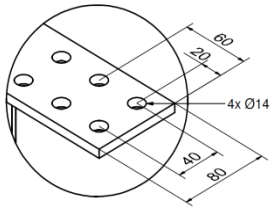
Bus Bar 50 mm



Bus Bar 60 mm



Bus Bar 80 mm



Connection Diagramm