REVCON *Optimizing your drive!*

RHF-5P XXX-690-50-YY-Z

Main

Product type	The REVCON Harmonic Filter - RHF-5P - reduces the THDi of nonlinear loads from typically 35% to significantly below 5% even under realistic ambient conditions. Due to the use of a two-stage filter module, the RHF is able to achieve a significant higher efficiency and a smooth damping across the full harmonic spectrum.
Performance	5P = <5% THDi, (3% THDi typical performance)
Motor Power [XXX]	15kW - 1000kW
Degree of Protection [YY] and design [Z]	C = Compact: 15kW - 315kW (IP20) S = Split: 355kW - 1 000kW panel mount design (IP00). E = Enclosed: 355kW - 1 000kW panel mount (var. IP ratings)
Design	High efficient two-stage filter (no RC damping)
Supply voltage	600 - 690V (+10% / -15%) 50Hz (+/- 2%)
Power factor	1 at nominal power
Overload	1.5
Efficiency	>98.4% - 99.5% (efficiency depend on rating and load)
Standards and requirements	IEC/EN 61000-2-2 / -4 IEC/EN 61000-3-2 / -4 / -12 IEEE 519-2014 Engineering Recommendation G5-5
Humidity	Humidity class F without condensation 5…..85% - Class 3K3 (non-condensing) during operation
Ambient temp.	min. 5°C (41°F) max. 45 °C (113°F) derating above 45°C (113°F) = -1.5%/K (up to 60°C (140°F))
Altitude	<1000m derating above 1000m: -5%/1000m (up to 4000m)

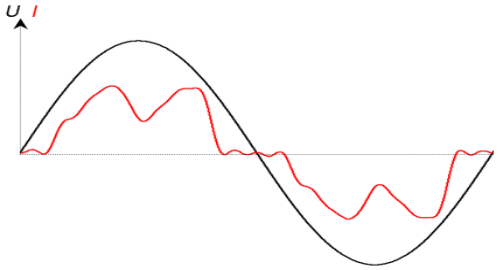
Applications

Water and wastewater treatment
HVAC / Pumps and Fans (VFD)
Industrial/ Factory Process (VFD)
DC charger
Buildings / IEEE 519-2014 requirement
Marine
Symetrical load multiple VFD

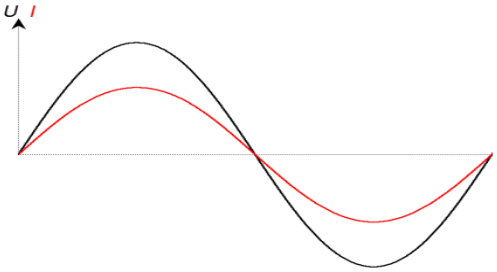
General Industry · Marine · Oil & Gas · Water Treatment · Data Center · Buildings

Harmonic current on standard 6-Pulse VFD

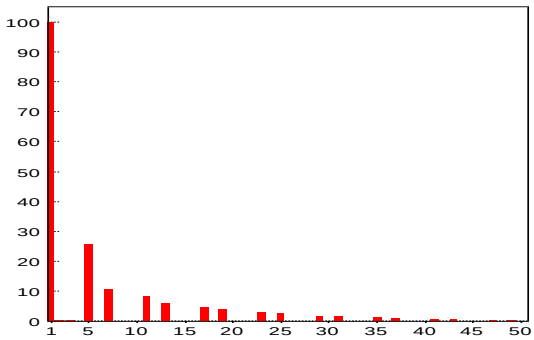
Systems with significant part of non linear loads will cause harmonic distortion on the voltage supply, which may damage equipment and supply transformer. REVCON Harmonic Filter – RHF - reduces the THDi of nonlinear loads from typically 35% to significantly below 5% (RHF-5P) or below 8% (RHF-8P) even under realistic ambient conditions.
Due to the use of a two-stage filter module, the RHF is able to achieve a significant higher efficiency and a smooth damping across the full harmonic spectrum.



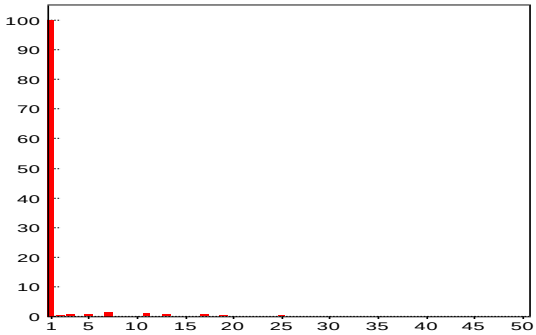
Typical input current shape when using a standard 6-pulse drive



Typical input current shape when using a standard 6-pulse drive with RHF harmonic filter



Typical harmonic current spectrum when using a standard 6-pulse drive with DC-Choke



Typical harmonic current shape when using a standard 6-pulse drive with RHF-5P

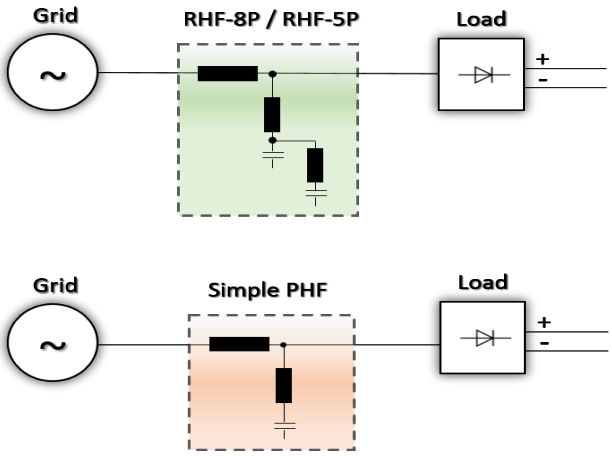
Working Principle RHF-5P - REVCON Passive Harmonic Filter

The following pictures describe the RHF-5P hardware configuration. Instead of using a simple drain circuit (Simple PHF) for the 5th Harmonic, the RHF-5P use a two-stage filter which enables the following advantages:

1. Performance: The RHF is designed to reach its stated performance in the field and not defined for unique simulated conditions. The double stage filter offers a smooth damping of all Harmonics, instead of focusing on the 5th Harmonic.

2. Full Drive Power: The RHF allows for 100% DC Bus voltage at 100% drive load. This avoid further calculations and de-rating of the drive. (Drives connected to Simple Harmonic Filter may have up to 7% lower power ratings)!

3. Efficiency: Simple Harmonic Filter may add RC circuits in order to reach specified performance which leads to a significant lower efficiency. The RHF-5P double stage harmonic filter cause up to 70% less power loss than comparable <5% THDi solutions.



Available size for 3 Phase supply / 690V / 50Hz / 5% THDi

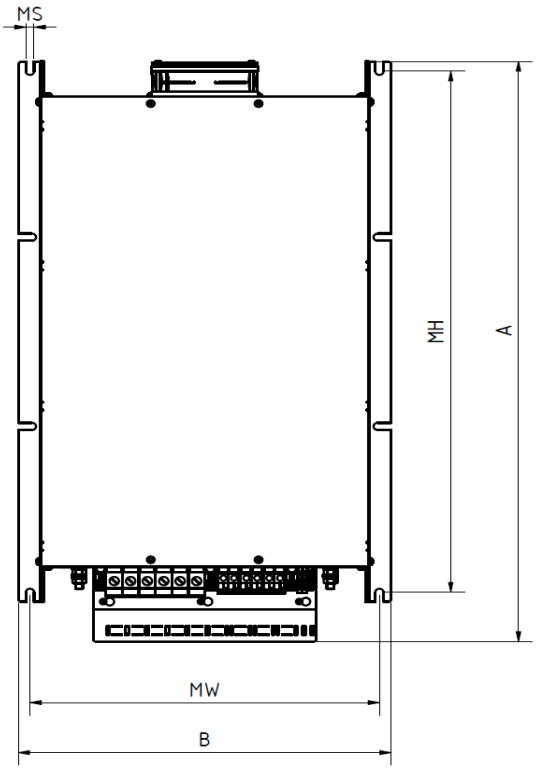
Compact range - All filter components combined in one enclosure							
Revcon Filter RHF-5P	Order code	Input current [A]	max current [A]	Motor size*	Filter encl.	Weight [kg]	Power-loss [W]
RHF-5P 15-690-50-20-C	25002156	15	23	15kW	X3	42	268
RHF-5P 18.5-690-50-20-C	25002157	19	29	18.5kW	X3	50	305
RHF-5P 22-690-50-20-C	25002158	24	36	22kW	X3	50	366
RHF-5P 30-690-50-20-C	25002159	29	44	30kW	X4	75	452
RHF-5P 37-690-50-20-C	25002160	35	53	37kW	X4	82	544
RHF-5P 45-690-50-20-C	25002161	46	69	45kW	X5	96	658
RHF-5P 55-690-50-20-C	25002162	58	87	55kW	X5	104	717
RHF-5P 75-690-50-20-C	25002163	70	105	75kW	X6	130	812
RHF-5P 90-690-50-20-C	25002164	84	126	90kW	X6	135	932
RHF-5P 110-690-50-20-C	25002165	101	152	110kW	X6	168	1050
RHF-5P 132-690-50-20-C	25002166	128	192	132kW	X6	197	1164
RHF-5P 160-690-50-20-C	25002167	146	219	160kW	X7	220	1228
RHF-5P 185-690-50-20-C	25002168	168	252	185kW	X7	228	1300
RHF-5P 200-690-50-20-C	25002169	180	270	200kW	X7	228	1322
RHF-5P 220-690-50-20-C	25002170	198	297	220kW	X7	228	1346
RHF-5P 250-690-50-20-C	25002171	240	360	250kW	X8	261	1450
RHF-5P 280-690-50-20-C	25002172	260	390	280kW	X8	297	1620
RHF-5P 315-690-50-20-C	25002173	290	435	315kW	X8	297	1792

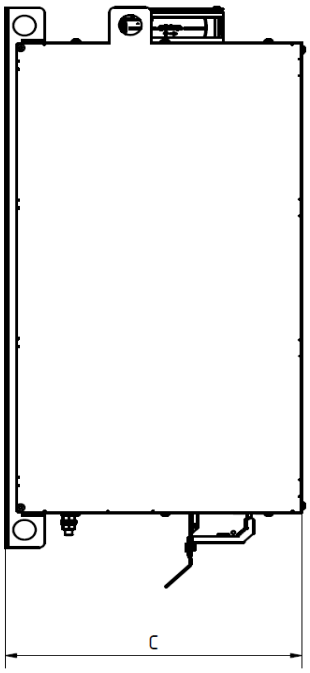
Split range - Filter consisting of line choke and filter enclosure X9-X11								
Revcon Filter RHF-5P	Order code	Input current [A]	max current [A]	Motor size*	Filter encl.	Weight		Power-loss [W]
						Filter Modul [Kg]	line inductor [Kg]	
RHF-5P 355-690-50-00-S	25002174	320	480	355kW	X10	223	215	1885
RHF-5P 400-690-50-00-S	25002175	362	543	400kW	X10	223	215	2121
RHF-5P 450-690-50-00-S	25002176	405	607,5	450kW	X10	230	240	2520
RHF-5P 500-690-50-00-S	25002177	450	675	500kW	X10	230	260	2800
RHF-5P 560-690-50-00-S	25002178	510	765	560kW	X10	234	280	3075
RHF-5P 630-690-50-00-S	25002179	575	862,5	630kW	X10	289	310	3380
RHF-5P 710-690-50-00-S	25002180	650	975	710kW	X11	337	360	3720
RHF-5P 800-690-50-00-S	25002181	740	1110	800kW	X11	372	380	4242
RHF-5P 900-690-50-00-S	25002182	830	1245	900kW	X11	372	390	4600
RHF-5P 1000-690-50-00-S	25002183	960	1440	1000kW	X11	397	390	5700

*The corresponding motor size listed in this file is based on the following technical specification:
Motor is IE3 6-Pol or lower. VFD efficiency is 97% or higher and have internal DC-Choke of 3% or higher.

Overview enclosure size compact execution

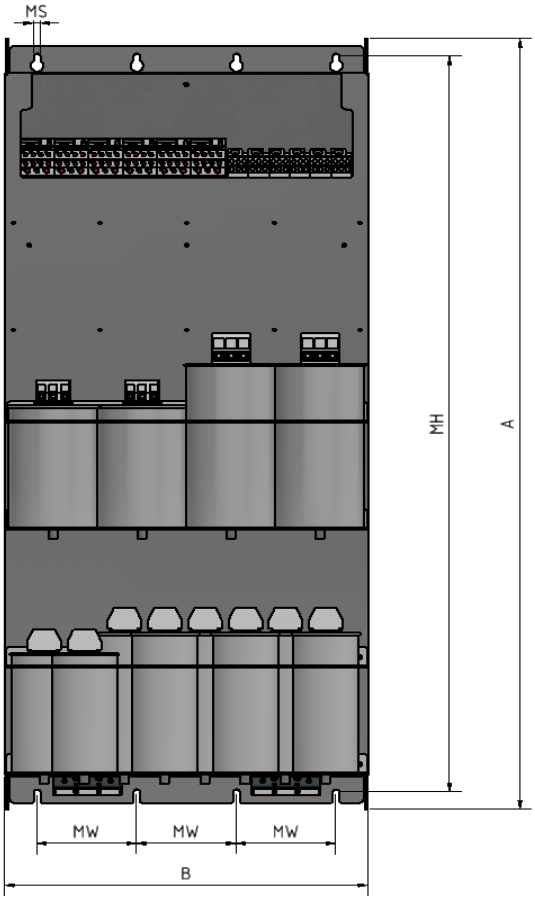
Enclosure Size	Height A [mm]	Width B [mm]	Depth C [mm]	Height MH [mm]	Width MW [mm]	Mount MS [mm]
X1	322	196	205	278	163	6.8
X2	454	232	248	382	205	6,8
X3	592	378	245	523	353	9
X4	621	378	338	554	353	9
X5	736	418	333	661	392	9
X6	764	418	405	661	392	9
X7	957	468	451	780	443	9
X8	957	468	515	780	443	9

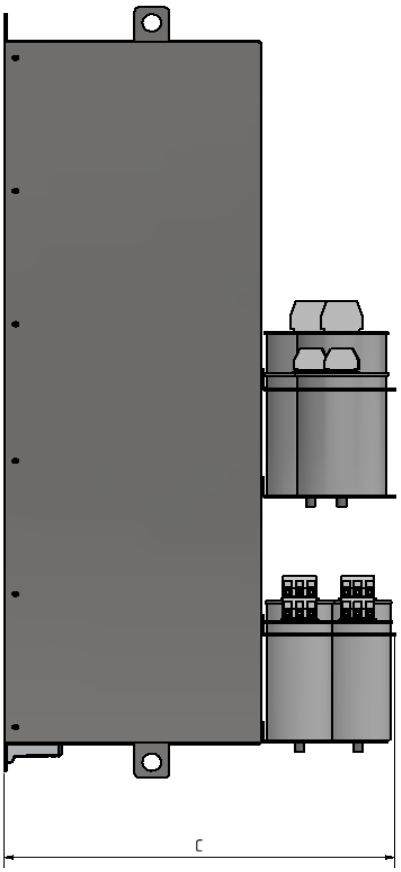




Overview enclosure size separate execution

Enclosure Size	Height A [mm]	Width B [mm]	Depth C [mm]	Height MH [mm]	Width MW [mm]	Mount MS [mm]
X9	1100	274	510	1052	211	9
X10	1100	474	510	1050	130	9
X11	1100	674	510	1050	200	9





Overview line inductor size separate execution

line inductor type	Width A [mm]	Height B [mm]	Depth 1 C [mm]	Depth 2 D [mm]	bus bars MH E [mm]	Width MW F [mm]	depth MW G [mm]	bus bars MW H [mm]	Mount MS I/J [mm]
RHF-5P 355-690-50-00-S	480	520	300	440	340	430	260	160	14
RHF-5P 400-690-50-00-S	480	520	300	440	340	430	260	160	14
RHF-5P 450-690-50-00-S	600	640	240	370	420	520	175	200	14
RHF-5P 500-690-50-00-S	600	640	255	385	420	520	190	200	14
RHF-5P 560-690-50-00-S	600	640	270	400	420	520	205	200	14
RHF-5P 630-690-50-00-S	600	640	290	420	420	520	225	200	14
RHF-5P 710-690-50-00-S	600	640	310	450	420	520	245	200	14
RHF-5P 800-690-50-00-S	600	640	320	460	420	520	255	200	14
RHF-5P 900-690-50-00-S	600	640	320	460	420	520	255	200	14
RHF-5P 1000-690-50-00-S	600	640	320	460	420	520	255	200	14