



Optimizing your drive!

RHF-5P XXX-600-60-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] | 11kW - 900kW |
| Degree of Protection [YY] and design [Z] | C = Compact: 11kW - 280kW (IP20) S = Split: 315kW - 900kW panel mount design (IP00). E = Enclosed: 315kW - 900kW panel mount (var. IP ratings) |
| Design | High efficient two-stage filter (no RC damping) |
| Supply voltage | UL=600V (+10% / -15%) CE=690V (+10% / -15%) 60Hz (+/- 2%) |
| Power factor | 1 at nominal power |
| Overload | 1.5 |
| Efficiency | >98.4% - 99.4% (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
- Symmetrical load multiple VFD



General Industry



Marine



Oil & Gas



Water Treatment



Data Center

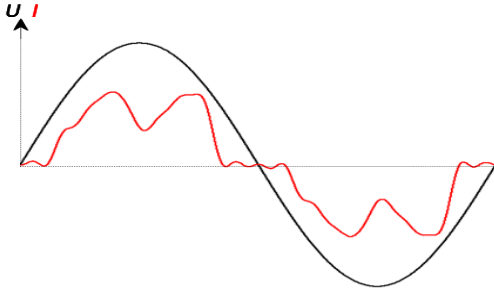


Buildings

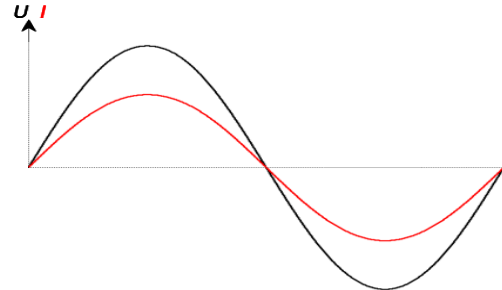
Harmonic current on standard 6-Pulse VFD

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.

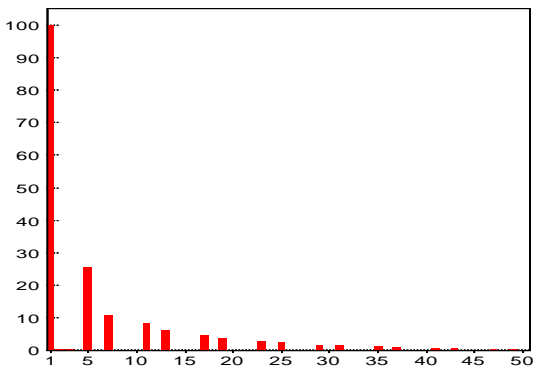
Due to the use of a two-stage filter module, the RHF is able to achieve a significant higher efficiency and a smooth damping across the full harmonic spectrum.



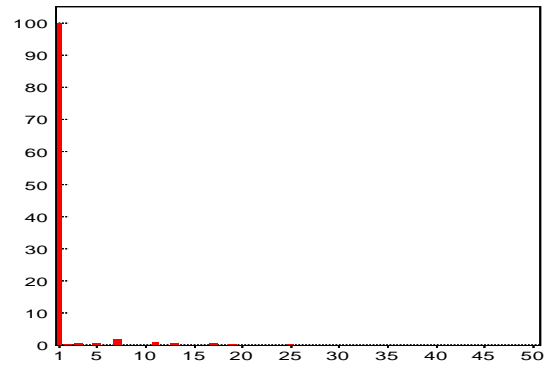
Typical input current shape when using a standard 6-pulse drive



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

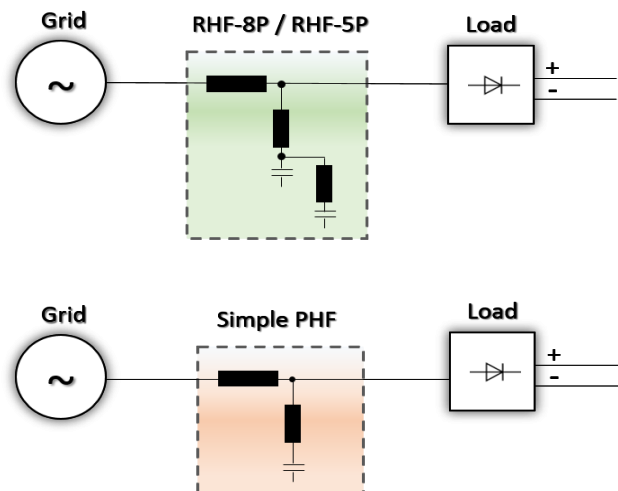
Working Principle RHF-5P - REVCON Passive Harmonic Filter

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.



| Revcon Filter RHF-5P | Order code | UL Input current [A] U = 600V | UL max current [A] U = 600V | CE Input current [A] U = 690V | CE max current [A] U = 690V | Filter encl. | Weight [kg] | Power- loss [W] |
|-------------------------|------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------------|----------------|--------------------|
| RHF-5P 11-600-60-20-C | 25002205 | 15 | 23 | 15 | 23 | X3 | 42 | 268 |
| RHF-5P 15-600-60-20-C | 25002206 | 18 | 27 | 19 | 29 | X3 | 50 | 280 |
| RHF-5P 18.5-600-60-20-C | 25002207 | 20 | 30 | 20 | 30 | X3 | 50 | 305 |
| RHF-5P 22-600-60-20-C | 25002208 | 24 | 36 | 24 | 36 | X3 | 52 | 366 |
| RHF-5P 30-600-60-20-C | 25002209 | 36 | 54 | 35 | 53 | X4 | 82 | 544 |
| RHF-5P 37-600-60-20-C | 25002210 | 40 | 60 | 46 | 69 | X5 | 96 | 600 |
| RHF-5P 45-600-60-20-C | 25002211 | 50 | 75 | 50 | 75 | X5 | 96 | 658 |
| RHF-5P 55-600-60-20-C | 25002212 | 58 | 87 | 58 | 87 | X5 | 104 | 717 |
| RHF-5P 75-600-60-20-C | 25002213 | 77 | 116 | 77 | 116 | X6 | 130 | 812 |
| RHF-5P 90-600-60-20-C | 25002214 | 109 | 164 | 109 | 164 | X6 | 168 | 1050 |
| RHF-5P 110-600-60-20-C | 25002215 | 128 | 192 | 128 | 192 | X6 | 197 | 1164 |
| RHF-5P 132-600-60-20-C | 25002216 | 155 | 233 | 155 | 233 | X7 | 220 | 1228 |
| RHF-5P 160-600-60-20-C | 25002217 | 170 | 255 | 170 | 255 | X7 | 228 | 1280 |
| RHF-5P 185-600-60-20-C | 25002218 | 197 | 296 | 197 | 296 | X7 | 228 | 1346 |
| RHF-5P 200-600-60-20-C | 25002219 | 210 | 315 | 210 | 315 | X8 | 261 | 1400 |
| RHF-5P 220-600-60-20-C | 25002220 | 240 | 360 | 240 | 360 | X8 | 261 | 1450 |
| RHF-5P 250-600-60-20-C | 25002221 | 260 | 390 | 260 | 390 | X8 | 297 | 1650 |
| RHF-5P 280-600-60-20-C | 25002222 | 296 | 444 | 296 | 444 | X8 | 297 | 1792 |
| RHF-5P 315-600-60-00-S | 25002223 | 366 | 549 | 366 | 549 | ** | *** | 1885 |
| RHF-5P 355-600-60-00-S | 25002224 | 394 | 591 | 405 | 608 | ** | *** | 2121 |
| RHF-5P 400-600-60-00-S | 25002225 | 420 | 630 | 450 | 675 | ** | *** | 2520 |
| RHF-5P 450-600-60-00-S | 25002226 | 480 | 720 | 480 | 720 | ** | *** | 2800 |
| RHF-5P 500-600-60-00-S | 25002227 | 520 | 780 | 520 | 780 | ** | *** | 3075 |
| RHF-5P 560-600-60-00-S | 25002228 | 575 | 863 | 575 | 863 | ** | *** | 3380 |
| RHF-5P 630-600-60-00-S | 25002229 | 650 | 975 | 650 | 975 | ** | *** | 3720 |
| RHF-5P 710-600-60-00-S | 25002230 | 720 | 1080 | 720 | 1080 | ** | *** | 4242 |
| RHF-5P 800-600-60-00-S | 25002231 | 830 | 1245 | 830 | 1245 | ** | *** | 4600 |
| RHF-5P 900-600-60-00-S | 25002232 | 960 | 1440 | 960 | 1440 | ** | *** | 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.

** Split range (design for Panel installation) includes separate line choke and filter circuit. Design is to meet 600mm or 800mm wide Panel. Drawings on request.

*** Split range (design for Panel installation) includes separate line choke and filter circuit. Individual weight depend on required options and setup.

Overview enclosure size

| Enclosure Size | Height A [mm] | Width B [mm] | Depth C [mm] | Height MH [mm] | Width MW [mm] | Mount MS [mm] |
|----------------|---------------|--------------|--------------|----------------|---------------|---------------|
| X0 | 285 | 71 | 265 | 273 | 50 | 5.5 |
| 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 |

