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Fact Sheet

Danfoss packaged drive solutions
VLT® PHD-202 Preferred Harmonic Design

The VLT® PHD-202 Preferred Harmonic Design (PHD) is a full-featured, AQUA dedicated drive solution when conformance to IEEE-519 is required, even at the drive terminals. The PHD-202 has a number of features developed specifically to meet the diverse needs of water and wastewater applications and is the most practical solution to address growing harmonic concerns within the industry.

- Meets the most stringent IEEE-519 levels down to 60% load at panel terminals
  - Delivers enhanced ThiD and Power Factor performance across the typical operating range.
  - Exceeds IEEE-519 THvD requirements
- Includes generator friendly features
- Improves performance versus existing harmonic solutions
  - Delivers greater unit efficiency
  - Produces less heat
  - Provides better harmonic performance in a smaller package

Product range:
3 x 480 V ..... 1.5 – 600 HP
3 x 600 V ..... 1.5 – 650 HP
With 110% overload torque

Larger power sizes and alternate enclosure ratings are available upon request. Please consult factory.

Available enclosure ratings:
- NEMA 1
- NEMA 12
- NEMA 3R

Wall mount units to 75 HP
Floor mount above 75 HP

Preferred
Harmonic Design*
- THiD <5% above 60% load
- THvD <1.6% with <5% voltage line imbalance
- Cos Phi Power Factor = Near Unity
- Distortion Power Factor >.98% at loads > 50%

Features	Benefits
Capacitor Disconnect	- reduces leading Power factor at low speed and insures better generator operation at low speed.
Better overall harmonic performance.	- Meets most stringent IEEE-519 specifications down to 60% load.
Robust single enclosure	- 3 wire in / 3 wire out design; no field wiring of separate components
Modular design utilizing standard VFDs.	- Simplified long-term maintenance (18 pulse solutions require non standard VFD).
Dedicated AQUA functionality	- integrates into existing facilities easily
Utilizes Danfoss VLT AQUA drive	- Full featured AQUA drive. Consult the VLT AQUA data sheet for a list of water/wastewater dedicated features
Units available with the following options: - Fused or CB disconnect - Bypass or non bypass - dV/dt output filter	- Unit configuration matches practically all AQUA panel specifications

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OSHPD Pre-Approval
All units available with Special Seismic Certification and OSHPD Pre-Approval for ease of review by Authorities Having Jurisdiction.

Application Options
A wide range of integrated AQUA options come standard in the AQUA PHD panel, common start/stop, auto bypass, and dv/dt output filter.

Fieldbus Communication
Unit comes standard with built-in fieldbus protocols and with optional communication protocols.

External 24 VDC supply (MCB 107)
24 VDC external supply can be added to facilitate drive communication when main power is disconnected.

Power Options
A wide range of external power options are available for the VLT® PHD-102 Preferred Harmonic Design solution:

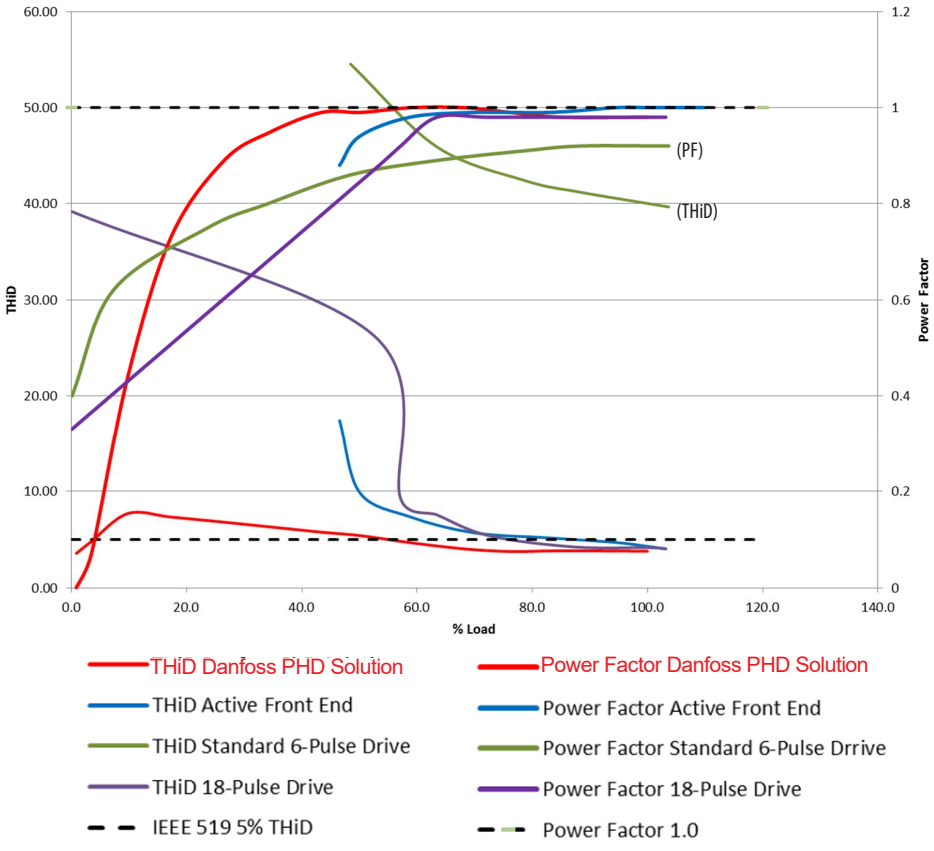
- Fused or Circuit Breaker Disconnect
- Non Bypass
- 3 Contactor Bypass
- dV/dt output filters for motor insulation protection

Harmonic Performance*
- THID <5% above 60% load
- THVD <1.6% with <5% voltage line imbalance
- Cos Phi power factor = unity
- Distortion power factor >.98 at loads >50%

AQUA PC Software Tools
- **MCT 10** Ideal for commissioning and servicing the drive
- **VLT® Energy Box** Comprehensive energy analysis tool, shows the drive payback time
- **MCT 31** Harmonic analysis tool

** Performance can be dependent upon supply transformer and power conductors.*

Harmonic Solution Comparison



Power supply (L1, L2, L3)	
Supply voltage	- 480 V ±10%
Supply voltage	- 600 V ±10%
Supply frequency	- 60 Hz
Displacement Power Factor (cos φ) near unity	- (> 0.98)
Switching on input supply L1, L2, L3	- 1–2 times/min

Output data (U, V, W)	
Output voltage	- 0 – 100% of supply voltage
Switching on output	- Unlimited
Ramp times	- 1-3600 sec.
Open/Closed loop	- 0–1000 Hz

OSHPD Special Seismic Certification	
Pre-Approval	- Certification expedites seismic authorization by - regulatory agencies.

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