DRY PIT SOLIDS HANDLING PUMPS

XRW SERIES - 60Hz

GENERAL

Furnish Fairbanks Nijhuis XRW Series solids handling dry-pit sewage pump(s) as specified herein.

The pump unit consists of a centrifugal pump and direct coupled electric motor (B35 flange / foot motor) in vertical and horizontal shaft arrangement on a frame.

Shims and dowel pins are not required and the pump's rotor assembly can be dismantled and inspected without re-alignment. The pump is a dry-pit (not a dry-mounted submersible) pump type. Motor and pump are suitable for 100% duty cycle.

Pump and impeller are suitable for two (2) directions of rotation to allow for bi-directional cleaning options.

Job Name: _____

- Pump: Pentair Fairbanks Nijhuis XRW Series _____
- Number of Pumps: _____
- Impeller: Pentair Xcentric™ Impeller
- Discharge: Shall be _____" ANSI flange.
- Motor: Shall be IEC, 460V, 60 Hz, 3 Phase, B35 type

  NOTE: 230V or dual voltage motors availabe by special order
- Pump Operating Characteristics: Each pump shall be verified for performance according to ANSI/HI14.6-gr2B. Pump shall operate at following conditions:
  - _____GPM at ____TDH
  - _____GPM at _____TDH
  - _____GPM at _____TDH
  - _____GPM at _____TDH

CONSTRUCTION

- The horizontal pumps are supplied without coupling on a galvanized steel foundation frame fitted with no additional levelling rods.
- The foundation frame ensures stable operation and does not act as a resonator or mass-spring mechanism.
- Impeller shall be Pentair Xcentric.
- Execution shall be dry-pit, horizontal or vertical.
- IEC E-motor is direct mounted without coupling (close-coupled).
- Equipped with double mechanical seals.
- Option: Pump and motor combination can be delivered on a sliding support frame (horizontal only).
- Designed / suitable for unfiltered sewage water.
- Optimized clogging & capacity drift operation.

PUMP CASING

The pump casing is constructed such that the pump rotational direction is clockwise as viewed from the free shaft end. On the outer circumference of the pump casing there is an inspection opening with a cover as large and easily accessible as possible, which follows the shape of the inner wall of the pump casing well, fits accurately into the circumference, seals air and water tight by means of a gasket, is secured by bolts, and is large enough to allow removal of potential accumulated dirt.

XCENTRIC IMPELLER

The impeller type is a Pentair Xcentric impeller with externally hydraulic adjustable wear rings. The impeller nut is smooth and streamlined. The impeller is optimized for minimum clogging and capacity drift. The impeller is dynamically balanced.

PUMP SHAFT

The pump shaft is robustly dimensioned and resistant to shock loads. The pump shaft does not vibrate in its resonant frequency. The E-motor shaft is directly inserted in the pump shaft.

SHAFT SEAL

A double mechanical seal is used as shaft seal. The volume between the seals is filled with a barrier fluid. The mechanical seal is easily replaceable, without the use of specialist tools. No external flushing is applied.

WEAR RINGS

Jamming of the impeller by long-fibers between rotating and stationary parts is prevented by a minimum gap width between impeller wear ring and wear ring of the pump. No protruding parts are applied in the pump casing, at the impeller and in the suction channel of the pump, to which long-fibres can adhere. These wear ring gap can be re-adjusted by means of hydraulic pressure.

BEARINGS

The pump shaft is supported using roller bearings, which are resistant to thrust loads.

A roller bearing which absorbs the radial force is arranged as close as possible to the impeller. At a good distance from this, the 2nd bearing is placed. This bearing, in addition to the radial force, also absorbs the axial forces on the shaft, both tensile and thrust. The service life of the bearings is at least 20,000 hours of operation. Bearings are grease packed from the factory, shielded with grease nipples. Bearings are sealed against ingress of dirt and water and are shielded so that no grease escapes.

MATERIALS

Pump casing:	DIN GGG50, ASTM A536-70-50-05
Impeller:	DIN GGG50, ASTM A536-70-50-05
Shaft:	Stainless Steel 1.4122 / X39CrMo17-1 Steel AISI 1144 or AISI 4140 (heat treated) ASTM A564 Type 630 17-4PH Condition H1150
Wear rings:	Volute: Hardened Steel 400 HB or higher Impeller: Hardened Steel 450 HB or higher
O-Rings:	BUNA-N ®

VIBRATION MEASUREMENT

Bearing frame and pump casing surfaces are machined to fit condition monitoring sensors .

FLANGE CONNECTIONS

Flange bore according to ASTM/ANSI 16.1, Class 125

The flanges have a machined surface in the area of the gasket.

The bolt holes are flat at the rear to prevent eccentric loading of the bolts. If necessary, they should be flattened below the nut.

EQUIPMENT MONITORING

Vibration monitoring for XRW pumps follows ANSI/HI 9.6.4. This standard provides guidance on measurement location and acceptance criteria for field measurements.

PAINT

External coating is applied according to standard SSPC-SP6 / SSPC-PA1, color RAL 5010.

OPERATING RANGES

The rated speed refers to the speed at a three-phase frequency of 60 Hz.

There can be over synchronous operation.

The maximum efficiency point is within the operating range. The pumps are designed and must be specified to operate cavitation- and resonance-free with low noise in all situations. The pumps meet the requirements set here in the entire operating range.

Hydraulic efficiency:

10" Discharge and larger sized models: hydraulic efficiency must be at least 80[%] at BEP and all operating points must be within an operating range with a minimum hydraulic efficiency of 70[%].

8" Discharge and smaller sized models: Hydraulic efficiency must be at least 70[%] at BEP ad all operating points must be within an operating range with a minimum hydraulic efficiency of 65[%].

MEDIUM

The pump is suitable for -and resistant to- handling unprocessed sewage water with all contaminants of biological, chemical and solid nature present in it at a temperature of about 39-77° F.

The pump features high dirt handling capacity & superior clog resistance with reduced capacity drift during operation.

TESTING

Pentair's Kansas City test facility is purpose-built to support comprehensive pump testing across a wide range of applications. The facility includes:

- Flow capacities up to 80,000 GPM and horsepower capacity up to 5,000 HP
- Multiple overhead cranes rated up to 10 tons for handling large equipment
- A full suite of calibrated test drivers and instrumentation for measuring hydraulic performance, vibration, temperature, and power
- On-site engineering support and decades of testing experience

Test Reports

Each pump tested at the Pentair facility undergoes detailed performance evaluation. The following documentation is provided:

- Inspection Certificate
- Pump Performance Test Sheet
- Pump Performance Curves

Test Standards

Factory testing is conducted in accordance with Hydraulic Institute® and ANSI standards, including ANSI/HI 14.6 Rotodynamic Pumps for Hydraulic Performance Acceptance Tests. Acceptance grade 2B applies unless otherwise specified. Where applicable, performance data can be adjusted to reflect site-specific conditions using standardized calculation methods.

TRAINING

We offer training for users of our products in the field of installation, operation and maintenance. These training sessions for management and service technicians are held on site or in one of our service centers. Because we have on-going contacts with various users in many applications, our service engineers are equipped to provide existing and new customers with information regarding improvements in the technical and organizational aspects of maintenance. Supported by a user-friendly maintenance manual.

REPAIR AND MAINTENANCE

Pump repair and refurbishment services are available both on-site and at the Pentair service center in Kansas City, Kansas.

- Disassembly, inspection, and rebuild of pump units
- Machining and application of restorative metals and coatings
- Welding and fabrication
- Predictive maintenance and vibration diagnostics
- Engineering support for component upgrades and hydraulic troubleshooting
- Installation, commissioning, and alignment services
- Emergency field service response available 24/7

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