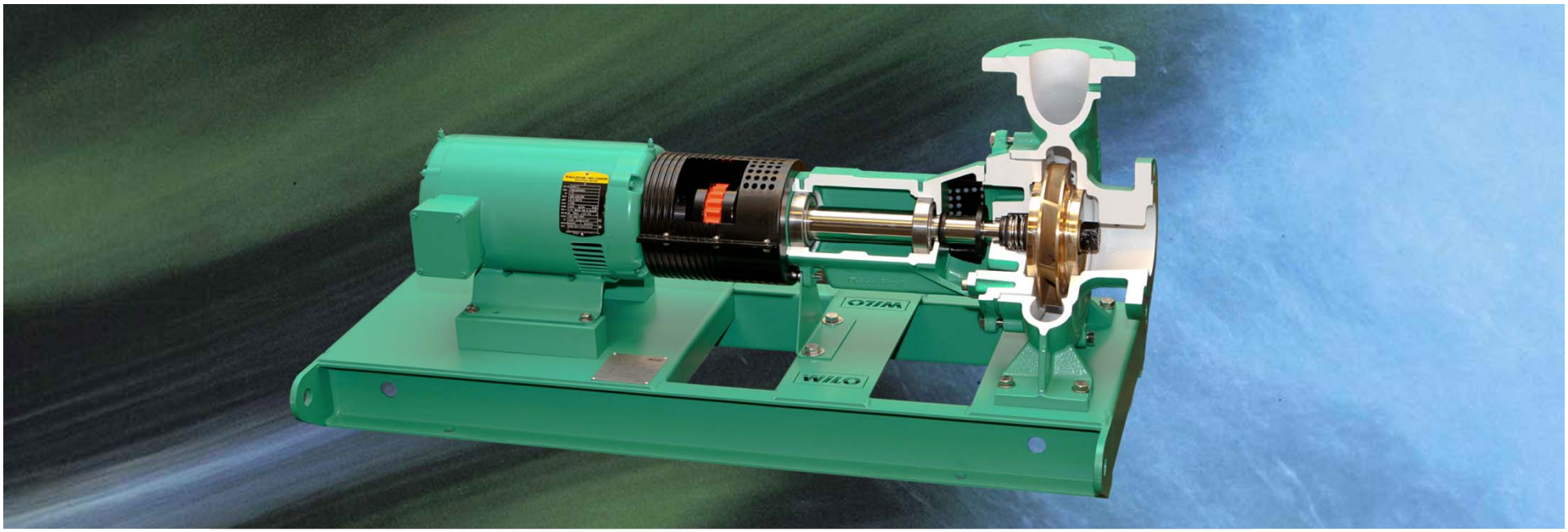


# Wilo NL End Suction Base Mounted Pumps

**End Suction, Centerline Discharge Base Mounted Pumps – February 18, 2013**

Marcos D. Roimicher, Product Manager BS Market Segment, Product Management Department

120-05-002-0213

# Agenda

1. Features and Benefits
2. General Technical Specifications
3. Model Number Designation
4. Family Curves
5. Detailed Technical Features / Construction Details
6. Options
7. Noise Levels
8. Wear Ring Discussion

# Features and Benefits

## Radially Split, Back Pullout Design

- Repair "wet end" without disturbing piping

## WILO Brain "Easy Read" Model Numbering System

- References flange size and max impeller size in standard North American units

## Uses Baldor NEMA Frame Foot Mount Motors (other Manufacturers are OK)

- All voltages and enclosures available
- Various efficiency types and VFD-ready
- Do not need to be Inverter Duty
- Optional Aegis Ring motors available

# Features and Benefits

## Excellent Delivery Times – 2 weeks

- Common pump ends and motors stocked in Thomasville, Georgia

## ¼" Pressure Gauge Tappings Standard

- Suction and discharge

## Excellent Commercial Pump Warranty

- 24 months from date of purchase

# General Technical Specifications

## Size Range – Flange Size

- 1-¼" to 8"
- 18 Models @ 2 Pole (3600 RPM)
- 39 Models @ 4 Pole (1800 RPM)

## Horsepower Range

- 2 Pole (3600 RPM) - 1.0 to 75 Hp
- 4 Pole (1800 RPM) - 0.5 to 200 Hp

## Performance

- Max flow 2800 USGPM,  Max head 300 ft

# General Technical Specifications

## Pressure Ranges

- 150 PSI maximum inlet pressure with standard mechanical seal limitations
- 250 PSI maximum discharge pressure (with 250 # Flange Drilling) optional

### Temperature Range for HVAC applications

- - 4°F to + 250°F (-20°C to + 120°C) at maximum ambient temperature: 104°F (40°C)

### Approved Liquids

- Water-glycol mixtures - for 20-40% glycol and fluid temperature ≤ 104°F (40°C)

### Standard Construction Material Specification

- Cast iron, bronze fitted, mechanical seal type

## Model Number Designation

NL 4 x 3 x 8 - 44

**NL**

- End Suction, Base Mounted, Single Stage Pump
- Centerline Discharge, Back Pull-out Design

**4 Suction (Inlet) Size in Inches**

- 125# ANSI raised face standard (150# same as 125#)
- 250# ANSI raised face optional (300# same as 250#)

**3 Discharge (Outlet) Size in Inches**

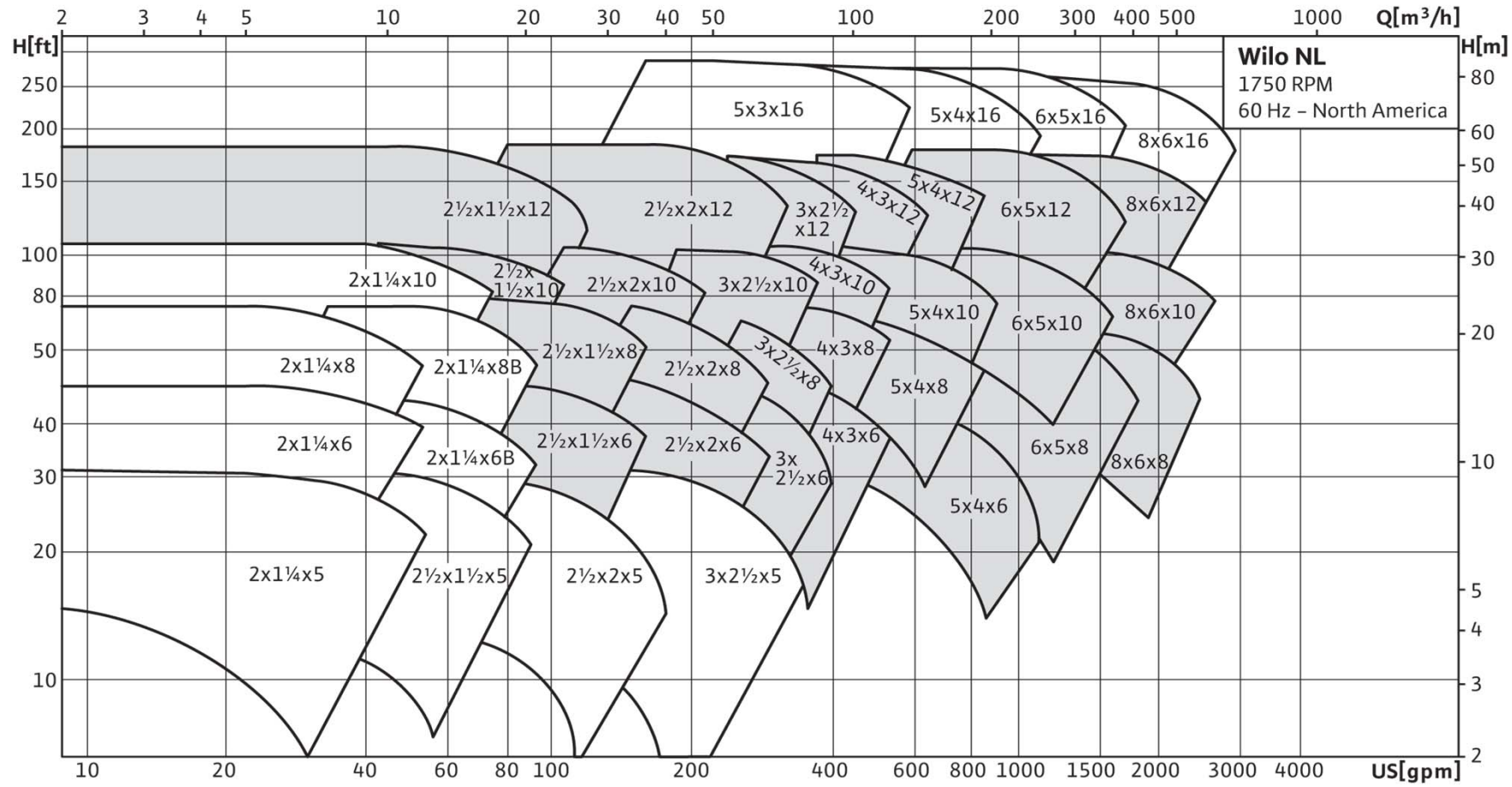
**8 Maximum Impeller Diameter in Inches**

**44 Standard CI / Bronze Fitted, Mechanical Seal**

Note: Complete units include motor HP, motor enclosure, # poles (RPM), frame size, phase and voltage

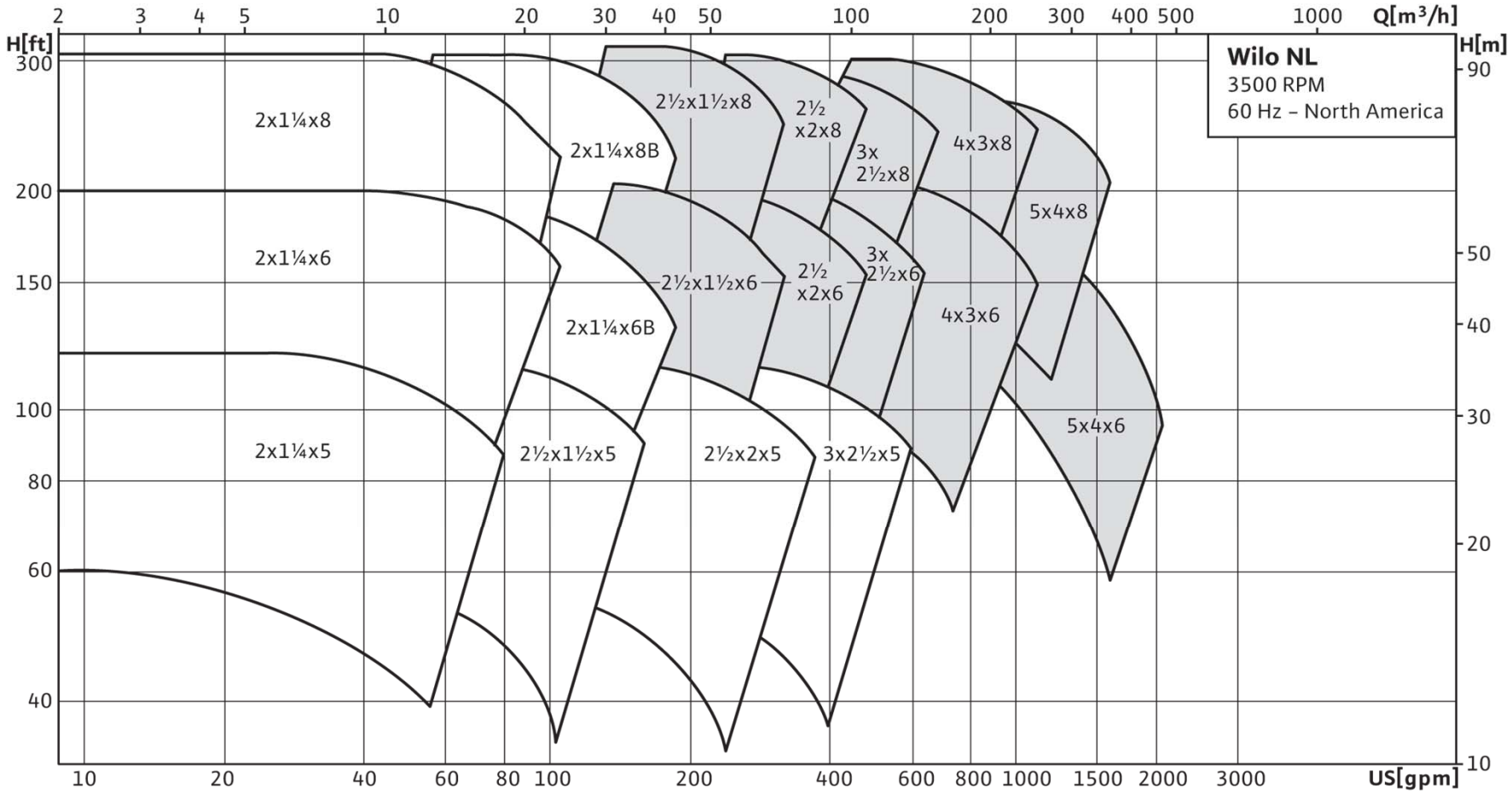
# Family Curves – 1750 RPM (4 Pole), 60 Hz

## Gray designates stock pump

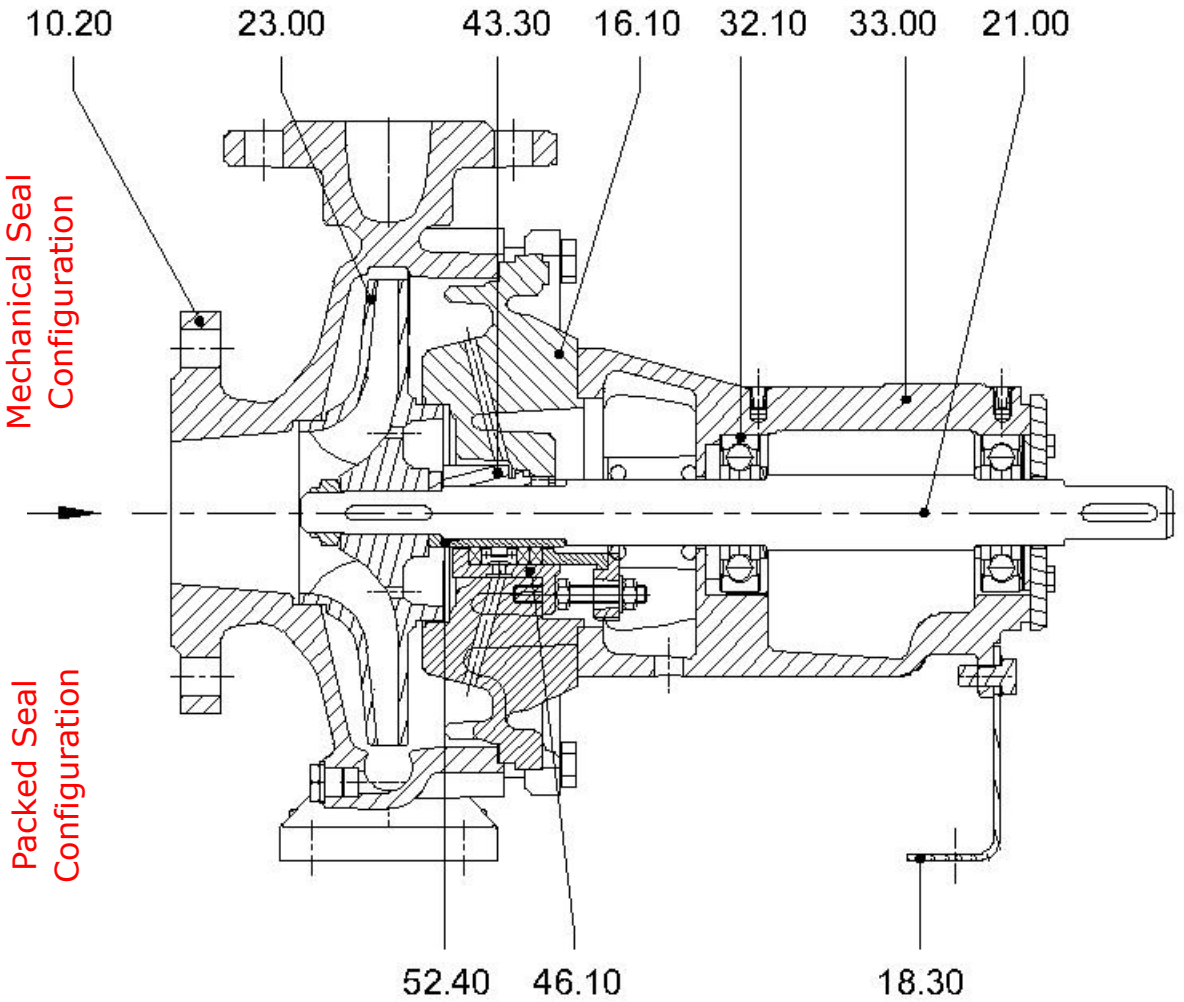


# Family Curves – 3500 RPM (2 Pole), 60 Hz

## Gray designates stock pump



# Detailed Technical Features




## List Of Components

- 10.20 Volute Casing
- 16.10 Casing Cover
- 18.30 Support Foot
- 21.00 Shaft
- 23.00 Impeller
- 32.10 Ball Bearing
- 33.00 Bearing Bracket
- 43.30 Mechanical Seal
- 46.10 Stuffing Box
- 52.40 Shaft Sleeve

# Detailed Technical Features

- **Materials of Construction**

| Item No. | Part Name | MATERIAL EXECUTION | | | |
|---|---|---|---|---|---|
| | | 06 | 08 | 26 | **44** (Std) |
| 10.2 | Volute Casing | Cast Iron ASTM A48 class 35 (DIN: C.I. FG 260) | | | |
| 16.1 | Casing Cover | | | | |
| 21 | Shaft | STAINLESS STEEL AISI 420 | | | |
| 23 | Impeller | Cast Iron ASTM A48 class 35 (DIN: C.I. FG 260) | Cast Iron ASTM A48 class 35 (DIN: C.I. FG 260) | Bronze ASTM 83600/SAE40 (DIN: BR LG 2) | Bronze ASTM 83600/SAE40 (DIN: BR LG 2) |
| | Bearing Bracket | Cast Iron ASTM A48 class 35 (DIN: C.I. FG 260) | | | |
| 43.3 | Mechanical Seal | Gland Packed | EPDM | Gland Packed | EPDM |
| 47.1 | Shaft Sleeve for Gland packing | STAINLESS STEEL AISI 420 | | | |
| | Gland Packing | PTFE | Mech Seal | PTFE | Mech Seal |

# Detailed Technical Features

## Bearings

- Deep groove ball bearings lubricated for the life of the bearings
- Only three shaft groups covering all sizes – $L_{10} \geq 20{,}000$ hrs @ shutoff (0 flow)

| Shaft Group | Bearing Size. |
|---|---|
| 25 | 6306 2Z C3 |
| 35 | 6308 2Z C3 |
| 45 | 6311 2Z C3 |

## Flanges

- Flanges are 125# (150#) ANSI Type (250 # optional – different Bolt Circle Diameter and # of holes)
- Per ANSI 16.5 at 250°F, 125# (150#) flange is rated to 230 psi

## Pump Performance

- Pump performance conforms to Hydraulic Institute standards

## Pressure Rating

- 250 PSI maximum operating pressure

# Detailed Technical Features

## Painting

- 2-part epoxy paint as per internal standards
- Primer: Red Oxide Zinc Coated ~ 40 microns thick
- Final top coat: Enamel paint ~ 40 microns thick - "Wilo green" (Pantone 334) as standard
- Customized paint available upon request, will require longer lead time and extra cost

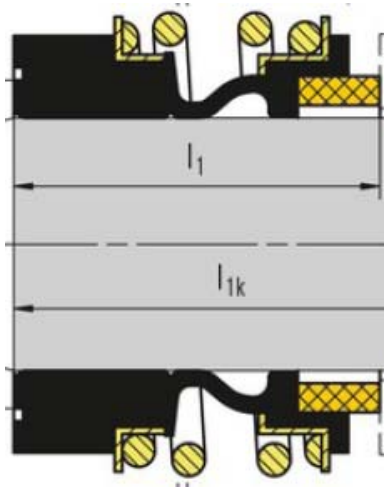
## Construction Features

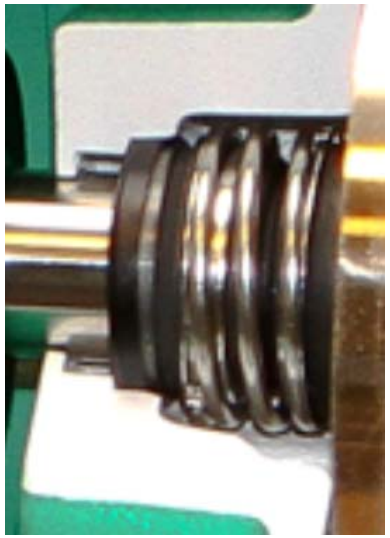
- Reduced shaft deflection (compliance with ISO 5199)
- Oversized radial ball bearings
- Improved lubrication and cooling of mechanical seal through conical seal chamber and anti-vortex ribs
- No seal piping for flushing of the seal is needed!
- Improved hydraulic efficiency

# Detailed Technical Features

## Shaft Sealing

- Mechanical Seal standard for temperatures (-4°F to 250°F)
  - Seal, Unbalanced, bidirectional, bellows seal – internally flushed, no external tubing
  - Eagle-Burgmann Type: MG12AQ1EGG



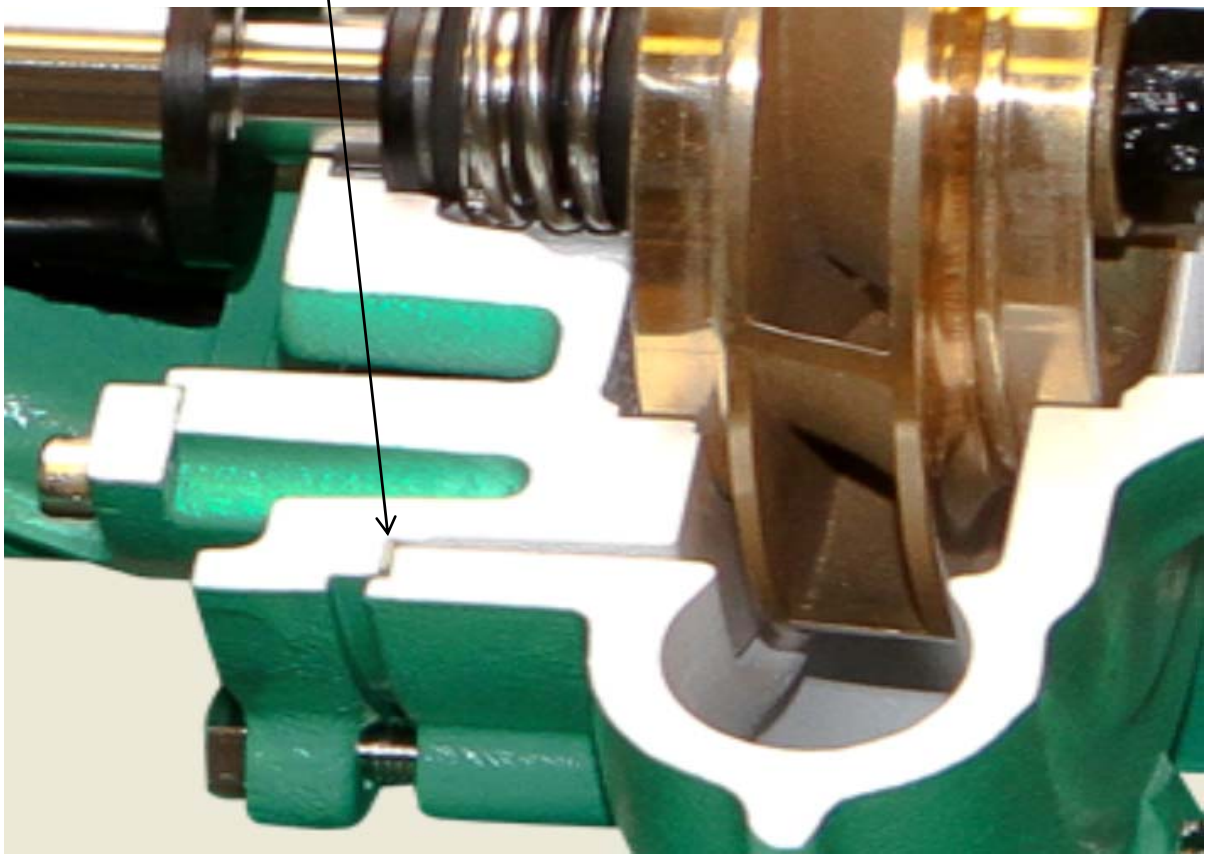



**MG12 AQ1EGG**

| | |
|---|---|
| A | : Carbon Graphite Antimony Impregnated |
| Q1 | : Silicon carbide |
| E | : EPDM |
| G | : Components in SS |

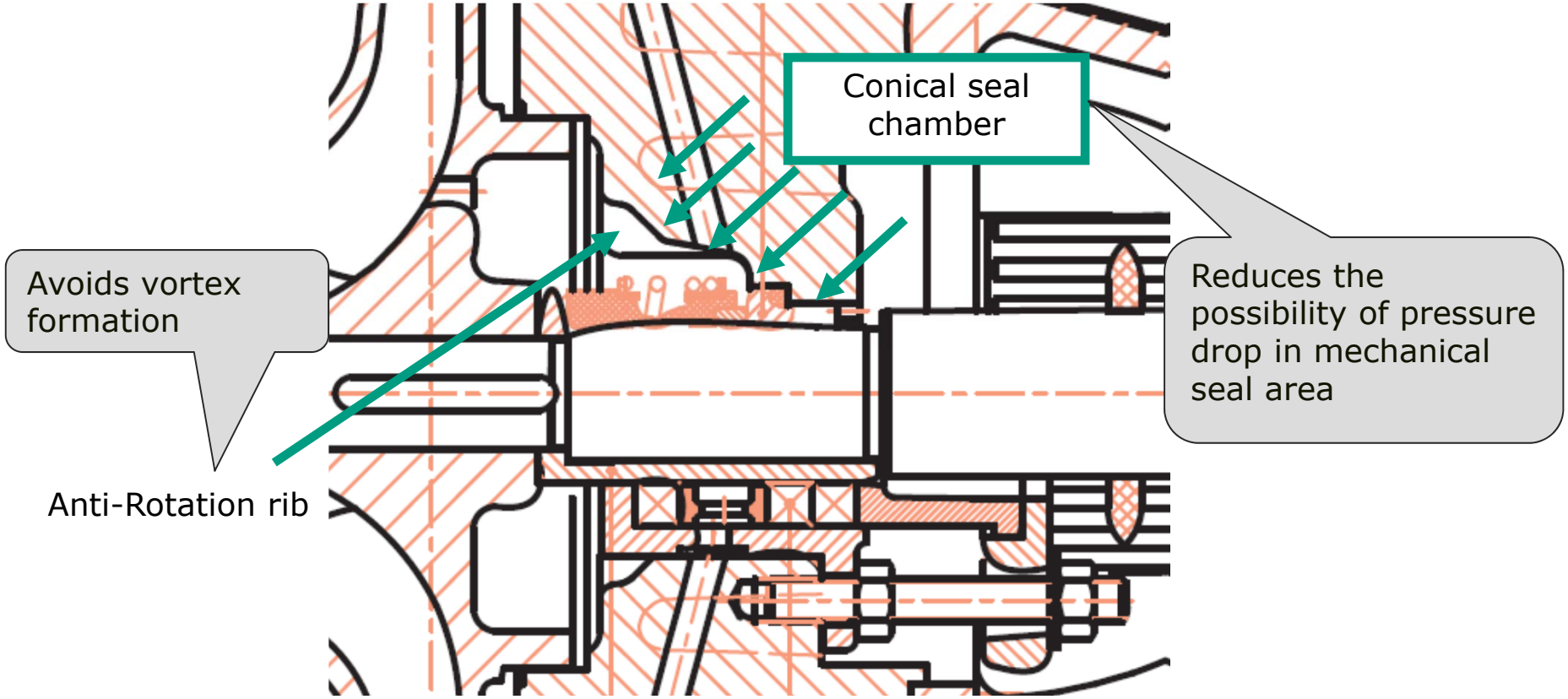
## Casing Sealing

- Flat cellulose gasket



# Detailed Technical Features

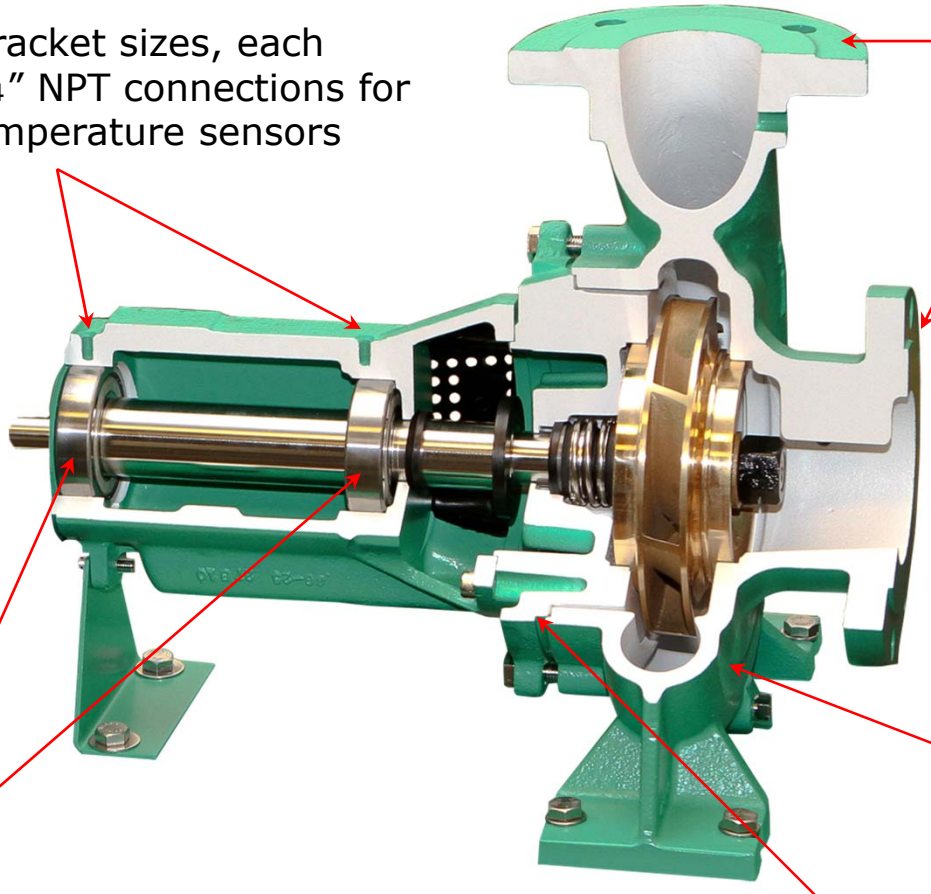
## Conical Seal Chamber



# Detailed Technical Features

Three bearing bracket sizes, each equipped with ¼" NPT connections for vibration and temperature sensors

Flanges machined to ANSI standard



High quality construction

Less complex design requires fewer parts, resulting in easier maintenance

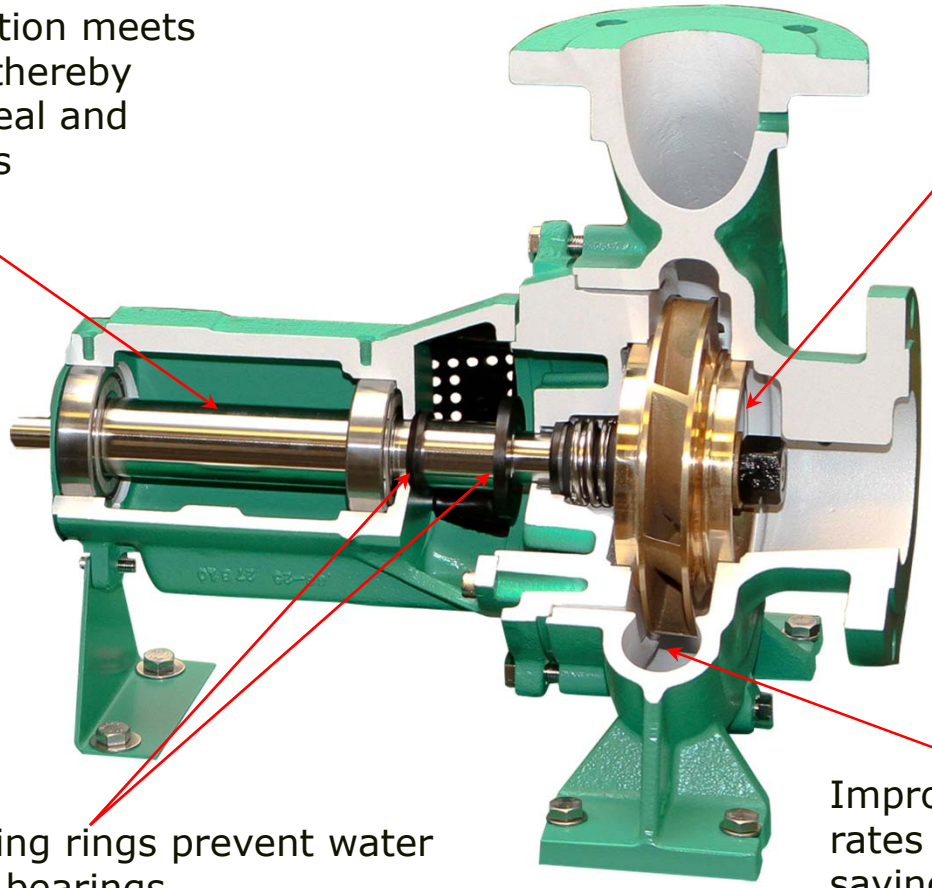
Ball bearings type 2Z, permanently greased, oversized, maintenance free with V seal

Confined gasket enclosed between cover and casing, preventing leakage

# Detailed Technical Features

Shaft deflection meets ISO 5199* thereby extending seal and bearing lives

Axial thrust lower than other makes



**Less vibration for an extended life time with ISO 5199 norm**

Special sealing rings prevent water ingress into bearings

Improved hydraulics for higher flow rates and better efficiencies, giving savings in operating costs

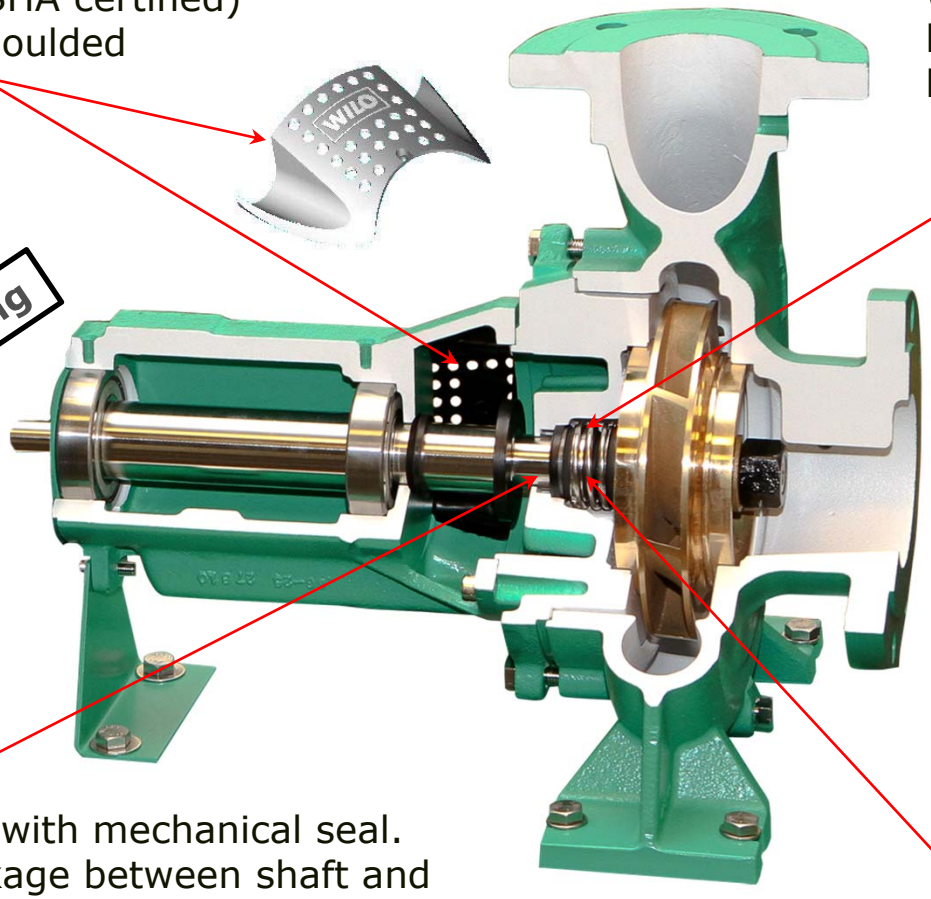
** Covers class II for pumps of back pull-out design as used primarily in the chemical and petrochemical industries.*

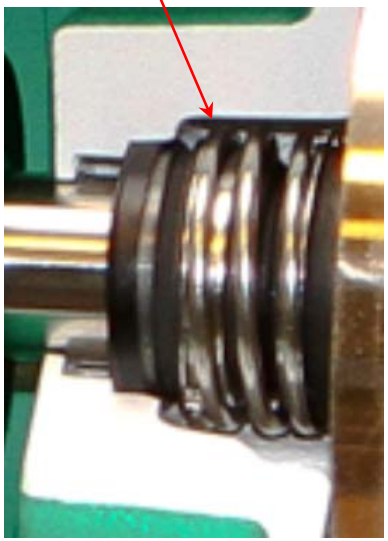
# Detailed Technical Features, cont'd

Enhanced safety (OSHA certified) by using precision moulded protective covers.

Seal chamber provided with anti-rotation ribs for best seal performance and longer operating life

High grade of finishing



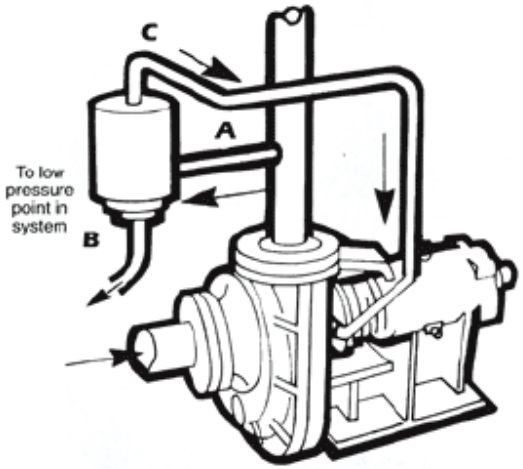
No shaft sleeve used with mechanical seal. Avoids danger of leakage between shaft and sleeve. Pump with gland packing equipped with shaft sleeve for low cost maintenance

Mechanical seal: Burgmann MG12

# Options

## Cyclone Sediment Separator

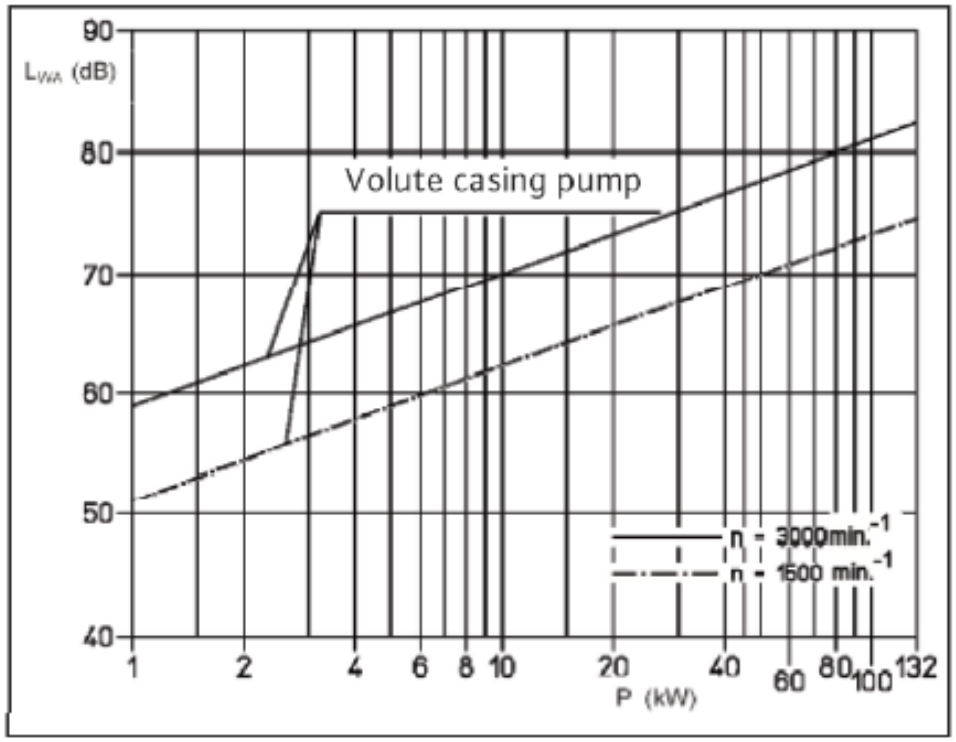
- Provides clean, abrasive-free injection flow for flushing the surfaces of the mechanical shaft seal (longer lead time and extra cost)
- John Crane – model 100 (nylon), 1/2” NPT
  - “A” – feed inlet to the separator
  - “B” – particle-bearing underflow return (dirty discharge)
  - “C” – clean overflow routed to the seal (clean discharge)




## Noise Levels

**The noise levels of the pump comply with the Directive 001/30 - 1992 of the EUROPUMP Commission.**

- The following table provides approximate values:




Notes :

Additional noise can be generated by:

1. Motor
2. A possible misalignment of the coupling
3. Pipework - The larger the pipe diameter, the lower the pipe noise

# Wear Ring Discussion

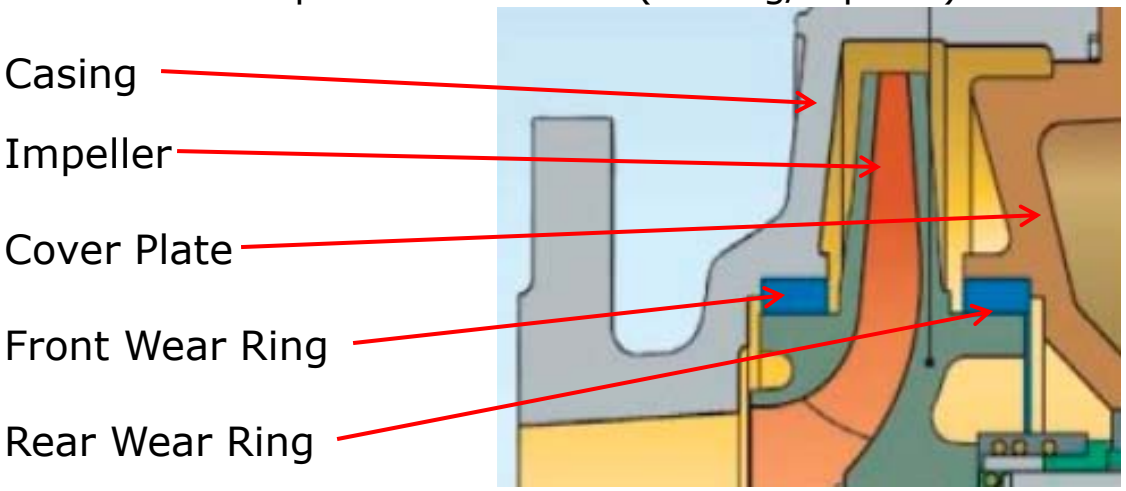
## Reasons why front and/or rear wear rings are not needed:

- Wilo has very high quality/manufacturing components and assemblies which reduces the axial (along shaft) and radial (perpendicular to shaft) forces to minimum levels
  - This results in high concentricity between components like the impeller wear surface and casing bore
- If an impeller deflects enough to rub on the wear ring(s) serious problems will arise
  - A wear ring will due nothing at this point therefore, an impeller and a wear rings will have to be replaced versus just an impeller = more $$
- A wear ring is only necessary when the fluid which is being pumped is abrasive and creates wear
  - Wear rings are sacrificial parts and are usually of the same or like material of the impeller, i.e. bronze impeller and wear ring
  - Cast iron (pump) performs much better than bronze (wear ring) with abrasives

# Wear Ring Discussion

## Reasons why front and/or rear wear rings are not needed:

- In general, for HVAC applications, abrasive liquids are not normally used
  - Otherwise, the pumps would be over-engineered for the application and cost more
- To allow for wear rings to fit within the pump, the pump casing and cover plates need to be "machined out"
  - This reduces the wall thicknesses of the casing and/or cover plate
  - This can lead to premature failure (leaking/rupture) when the pump is pressurized



# Wear Ring Discussion

## Reasons why front and/or rear wear rings are not needed:

- Use of wear rings can actually reduce overall pump efficiency due to poor machining/QA
  - Without wear rings only (3) parts have to be machined – casing, impeller and cover plate
  - When wear rings are used, as many as (4) or (5) parts need to be machined – casing, impeller, cover plate, and front and/or rear wear rings
  - When a standard tolerance stack-up is done (worst-case) the maximum diametrical clearance is larger on (5) parts than it is on (3) parts
- Wear rings are needed for fire protection due to regulations by UL, cUL and FM, and they are NOT required for standard HVAC applications
- When end users and maintenance people in the HVAC business from the US and Europe were asked "how often are wear rings changed", the answer was "never", 98% of the time

# Questions/Comments?