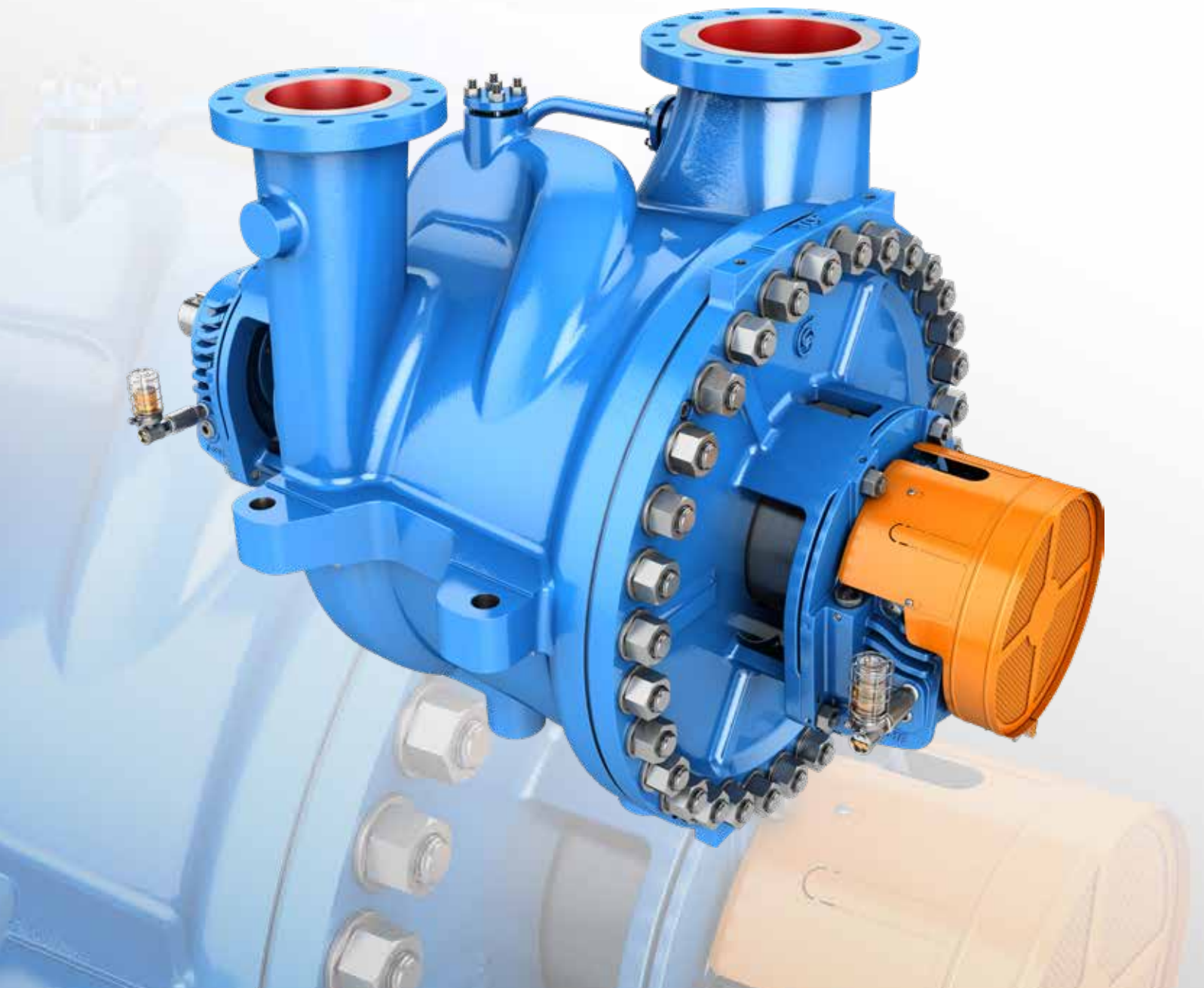


Goulds 3620i / 3640i

API 610 BB2 1 and 2 Stage, Between-Bearing,
Radially Split Pumps



3620i / 3640i

A Leader in API Engineered Pump Package Solutions

Proven API Leadership

ITT Goulds Pumps is a proven leader in API Pumps

- Over 20,000 units installed
 - Over 17,000 OH2 / OH3s
 - Over 3,000 BB1 / BB2 / BB3 pumps
- 50+ years of API expertise
- Participating member on API 610 and API 682 committees

Family of API Pumps

ITT Goulds Pumps has a family of proven API pumps:

- Overhung pumps
- 1 and 2 stage between-bearing
- Multistage between-bearing pumps – axially split
- Multistage between-bearings pumps - radially split
- Vertical, double casing pumps
- Specialty pumps

Global Coverage

ITT Goulds Pumps has the global coverage needed to serve multi-national companies in any region.

Industry Leading Hydraulic Coverage

- We offer extensive coverage to meet your process needs.
- Better hydraulic fits can mean improved efficiency and long-term reliability and parts life.

8000 HP / 6000 kW Testing Capability

- Our test facility can test your pump in the most demanding conditions.
- Testing at rated speeds is critical to assess the impact of dynamic conditions including vibration.

API Engineering Expertise

- We are experts in packaging engineered pumps that meet your demanding applications – with true conformance to the latest API specifications.
- We have extensive experience in nearly every type of driver, bearing, seal, piping configuration, nozzle configuration, flange, and baseplate design to meet your application needs.
- ITT is a world leader in technology and engineering including hydraulics, materials science, mechanical design and fluid dynamics.

Broad Applications

- Petroleum refining, production and distribution
- Petrochemical and demanding chemical processing
- High temperature applications including boiler circulation
- General industrial requiring high temperature or high pressures



High Temperature and Pressure Process Pumps that Meet or Exceed API 610 11th Edition

Safety reliability, and versatility are the key words for our 1 and 2 stage, centerline mounted, between-bearing (BB2) API 610 process pumps.

Safety and Reliability

We provide engineered solutions with true conformance to the latest API specifications including the stringent emissions containment per API 682.

The result is a safe and rugged between-bearing API process pump designed for a minimum 20-year life.

Versatility

3620i:

- Capacity to 20,000 GPM (4,540 m³/h)
- Total Dynamic Head to 1,500 feet (455 m)
- Temperature to 800° F (425° C)
- Pressure to 850 psi (59 bar)

3640i:

- Capacity to 7,500 GPM (1700 m³/h)
- Total Dynamic Head to 2,500 feet (760 m)
- Temperature to 800° F (425° C)
- Pressure to 1480 psi (102 bar)

Materials: Available in a wide range of materials including all API 610 constructions and custom application needs.

Engineered Hydraulics: Dense hydraulic coverage to better match your process for efficiency and reliability. Custom hydraulics are available.

Engineered Packaging with a wide range of drivers, seals, piping, nozzle configurations, flanges, base plates, and QC testing.

Applications

3620i:

- **Refinery:** Tower bottoms, process feed, column reflux, circulation and pump around, process booster
- **Power Plant:** Boiler feed booster, boiler circulation, ash sluice

3640i:

- **Refinery:** Process feed, reflux, splitter bottoms, high pressure process transfer
- **Boiler Feed Booster**

i-FRAME[®] Bearing Housing Features

- This modern i-FRAME[®] Ball/Ball design bearing housing comes standard on all Goulds between-bearing pumps. A revolutionary oil capture and delivery system provides consistent lubrication to lower bearing temperatures and optimize bearing life.
- See the difference
 - Patent Pending Oil Filter Assembly removes debris and moisture
 - Optimized Housing Design Lowers bearing temperatures
 - i-ALERT2 Machine Health Monitor identifies potential problems before they become costly failures
 - Instrumentation provisions as standard



Goulds Model 3620i/3640i process pumps are designed for smooth, reliable operation, and fully meet the specification requirements of API 610 to assure extended service life.

3620i / 3640i

Design Features for Optimum Reliability

Low Vibration / Smooth Performance

- Individual impellers and complete rotor assembly dynamically balanced.
- Precision cast impellers have equal volumes between vanes for reduced pressure pulsations.

Serviceability

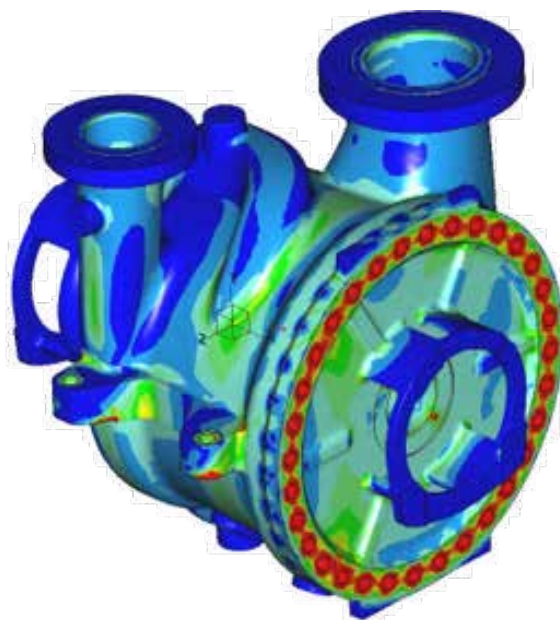
- Cartridge type mechanical seals for ease of assembly, proper installation.

Entire rotating assembly can be removed for maintenance without disturbing suction/discharge piping.



Design / Analysis Capabilities

Goulds utilizes FEA and CFD analysis to check the pressure capability, structural integrity of the casings and flow pattern in the pump. Goulds Engineering staff is fully equipped to perform the rotor lateral response analysis, torsional analysis and rotor residual unbalance checks to ensure stable operation, low vibration level and trouble free operation of the pumps.



Designed for API 610

- Casing, nozzles and baseplate meet API 610 nozzle load requirements.
- Impellers are secured against axial movement by Goulds Pumps' patent pending impeller locking collar.
- Seal chambers meet dimensional requirements of API 610 and can be fitted with single, double, or tandem cartridge mechanical seals.
- Non metallic rings available for applications with low specific gravity, increased efficiency, or ability to withstand short periods of dry running

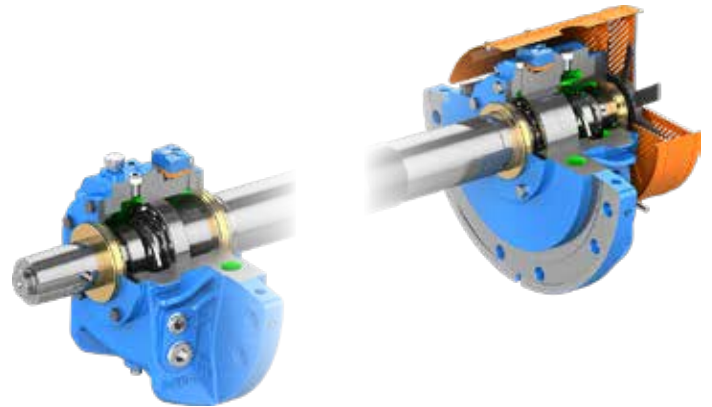
Optional Features for Application Flexibility

Bearing Arrangements

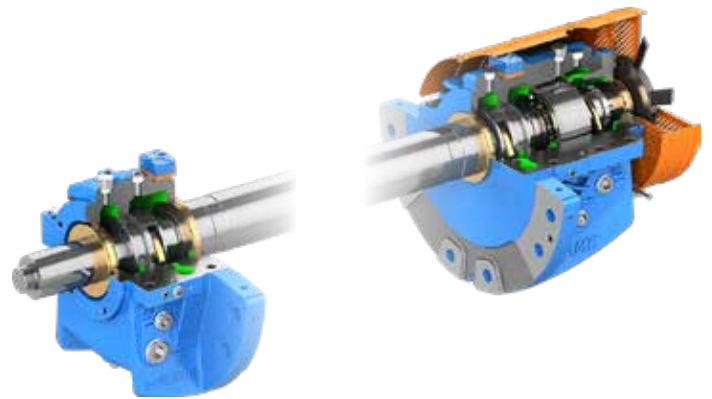
Oil lubricated Ball/Ball bearings are standard on the model 3620i / 3640i. Ring oil lubricated Sleeve/Ball or pressure lubricated Sleeve/Tilt bearings can be furnished to meet customer or operating requirements. sleeve/tilt bearings are offered with pressurized oil lube system.

Instrumentation

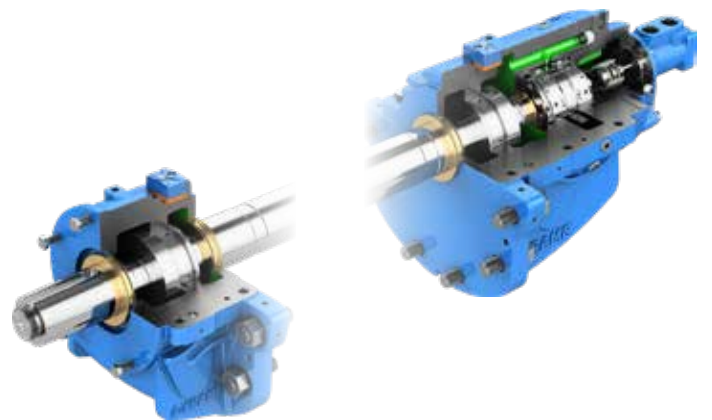
The 3620i / 3640i can be furnished with instrumentation options to measure vibration and temperature. RTDs can be furnished to measure bearing temperatures and to monitor temperature rise in the casing. Bearing housing vibration can be monitored on pumps. Pumps supplied with Hydrodynamic bearings can be furnished with non contacting vibration probes to measure rotor vibration.



Ball / Ball



Sleeve / Ball



Sleeve / Tilt

Bearings & Bearing Housings

To get superior MTBF you need two things: Optimum pump hydraulics and a robust pump structure. The new 360° i-FRAME housings deliver on the second point by providing a premium robust housing with unique features that raises the bar on what you can expect from your pump's long term performance. These 360° i-FRAME bearing housings include the new patented one piece design bearing housing for the Ball/Ball bearing arrangement, as well as the patent pending split bearing housing for the Sleeve/Ball and Sleeve/Tilt pad bearing arrangement.

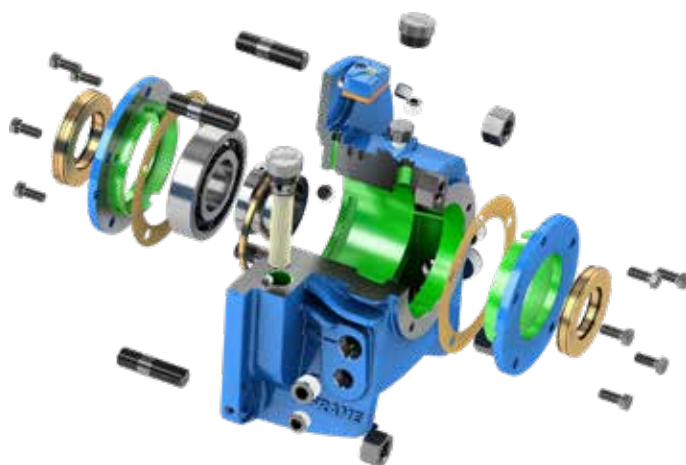
Bearing housings constructed in ASTM A216 Grade WCB carbon steel. Three bearing arrangements available:

- Ball/Ball bearings
 - Duplex 40° Angular Contact Bearing Set on the Non-Drive End (NDE) to handle radial and axial loads. Bearing set is supplied with a light clearance
 - Deep Groove Ball Bearing on the Drive End (DE) to handle radial loads
- Sleeve/Ball bearings
 - Duplex 40° Angular contact Bearing Set on the Non-Drive End (NDE) handle axial loads. Bearing set is supplied with a light clearance.
 - Babbitt lined Sleeve Bearings handle radial loads on NDE and DE (Non Drive End and Drive End)
- Sleeve/Tilt pad bearings
 - Tilting pad Bearings are installed on NDE to handle axial load.
 - Babbitt lined Sleeve Bearings handle radial loads and are installed on NDE and DE (Non Drive End and Drive End).
 - This bearing configuration utilizes an external pressurized Lubrication Oil System (LOS) to lubricate and cool the bearings. Both API, standard and custom designed systems can be offered.

All bearing housings feature a 360° bearing saddle bolted to the casing positioned with precision dowels for accurate, repeatable alignment. The 360° bearing saddle is optimized for stiffness and rigidity of connection between the pump casing and housing along with increased bolt diameters. This provides significantly increased stiffness, resulting in reduced vibration.

The bearing housing exterior includes distinctive cooling fins optimized by CFD/FEA analysis to aid in heat dissipation.

The Ball/Ball and Sleeve/Ball 360° i-FRAME bearing housings have enhanced air cooling with axial fans and without the need for cooling water. The NDE side comes standard with a guarded extension to accept a fan for ease of field retrofit, so if your process needs to change, the fan can be fitted without the need for expensive pump disassembly and installation.



Bearing housing put through rigorous testing.

Patented Filters and Monitoring

Bearing oil contamination by wind-blown sand and dust together with atmospheric moisture are major contributors to bearings failing well before their design life. In an industry first, all Ball/Ball and Sleeve/Ball include a cartridge filter assembly that will help safeguard the bearing oil from debris contamination. The patent pending filter cartridge will also continuously work to scrub dissolved water from the bearing oil utilizing specifically engineered moisture absorbing materials built into the filter. The design allows for easy changeover of filter cartridges even while the pump is operating – no need to stop your process. All this additional reliability is achieved *without* the need for additional oil pumps or piping – no additional system complexity, monitoring, or control overhead.



Oil with Particulate**



Oil with Water



Run time = 72 hrs*	Run time = 314 hrs*
Black Oil	Result: Clean Oil

Run time = 0 hrs*	Run time = 72 hrs*
Cloudy Oil	Result: Clean Oil

*Continuous operation at 3100RPM

**Test dust used is ISO 12103-1, A3 Medium test dust

Another smart feature included as standard is the award winning, i-ALERT. This provides class leading continuous machine monitoring with comprehensive wireless reporting including diagnostic quality vibration FFTs and operating history to the mobile phone or tablet of your choice. The bearing housings come equipped *as standard* with constant level oilers¹, sight window¹ and provisions for instrumentation including: RTD's, proximity probes¹, and accelerometers. If your monitoring needs change in the future, this comprehensive approach allows field retrofitting of almost any monitoring scheme without replacing your bearing housings or relying on ad-hoc instrument mounting.



¹where appropriate, based on the bearing arrangement purchased.

3620i / 3640i

API 610 BB2 1 and 2 Stage, Between-Bearing, Radially Split Pumps

ROBUST CASING DESIGN

- Suitable for hot services / rapid temperature changes
- Double volute design for maximum reliability

BEARING HOUSING & LUBRICATION

- 360° mount minimizes vibration levels
- Anti-friction bearings' as standard with options for anti-friction / hydrodynamic or complete hydrodynamic depending on requirements
- Oil-ring lubrication as standard with options for pure / purge oil mist or pressure fed

INTEGRAL OIL FILTRATION – I-FRAME BEARING HOUSING

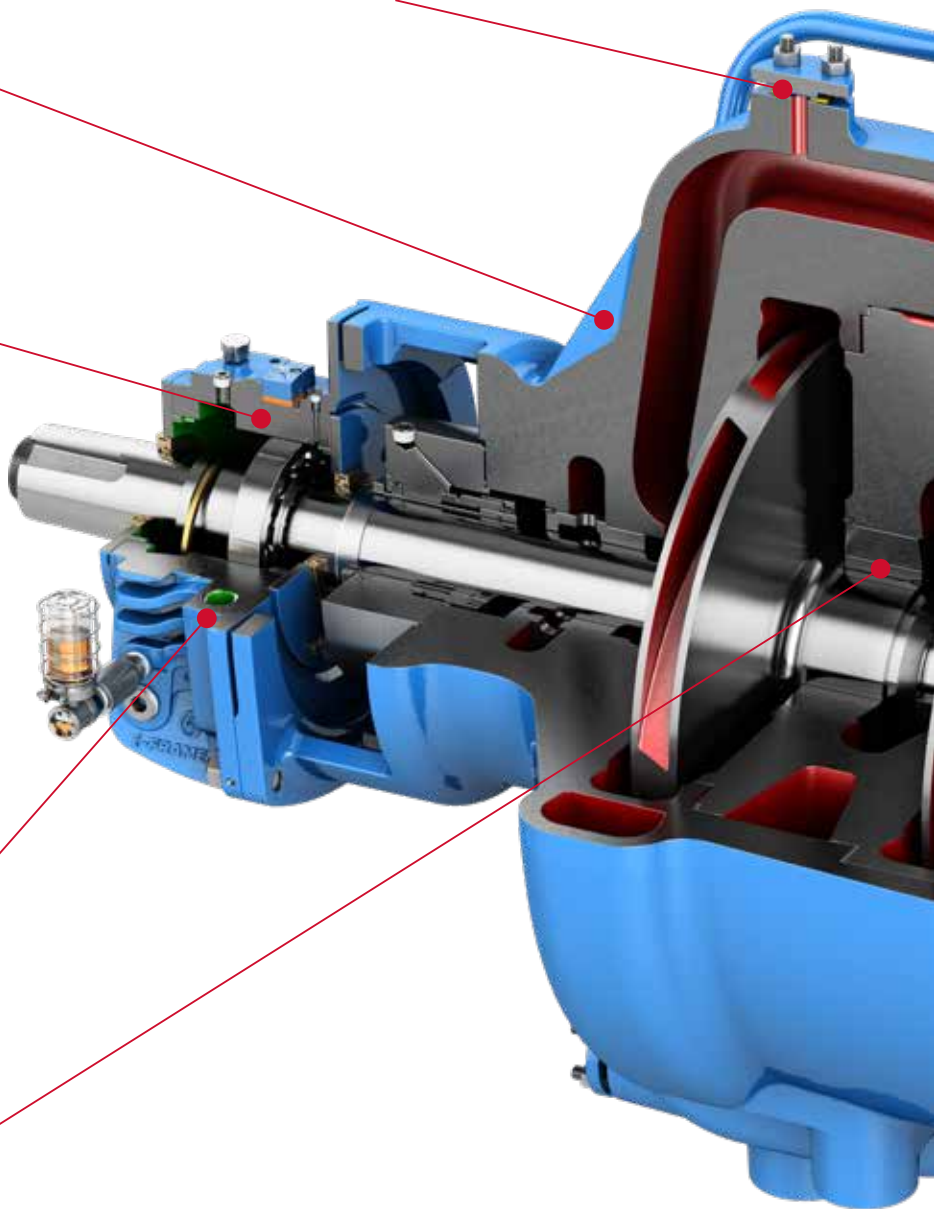
- Innovative i-FRAME bearing housings fitted as standard
- Filter removes sand / dust & moisture during operation
- i-ALERT fitted as standard monitoring vibration & temperature

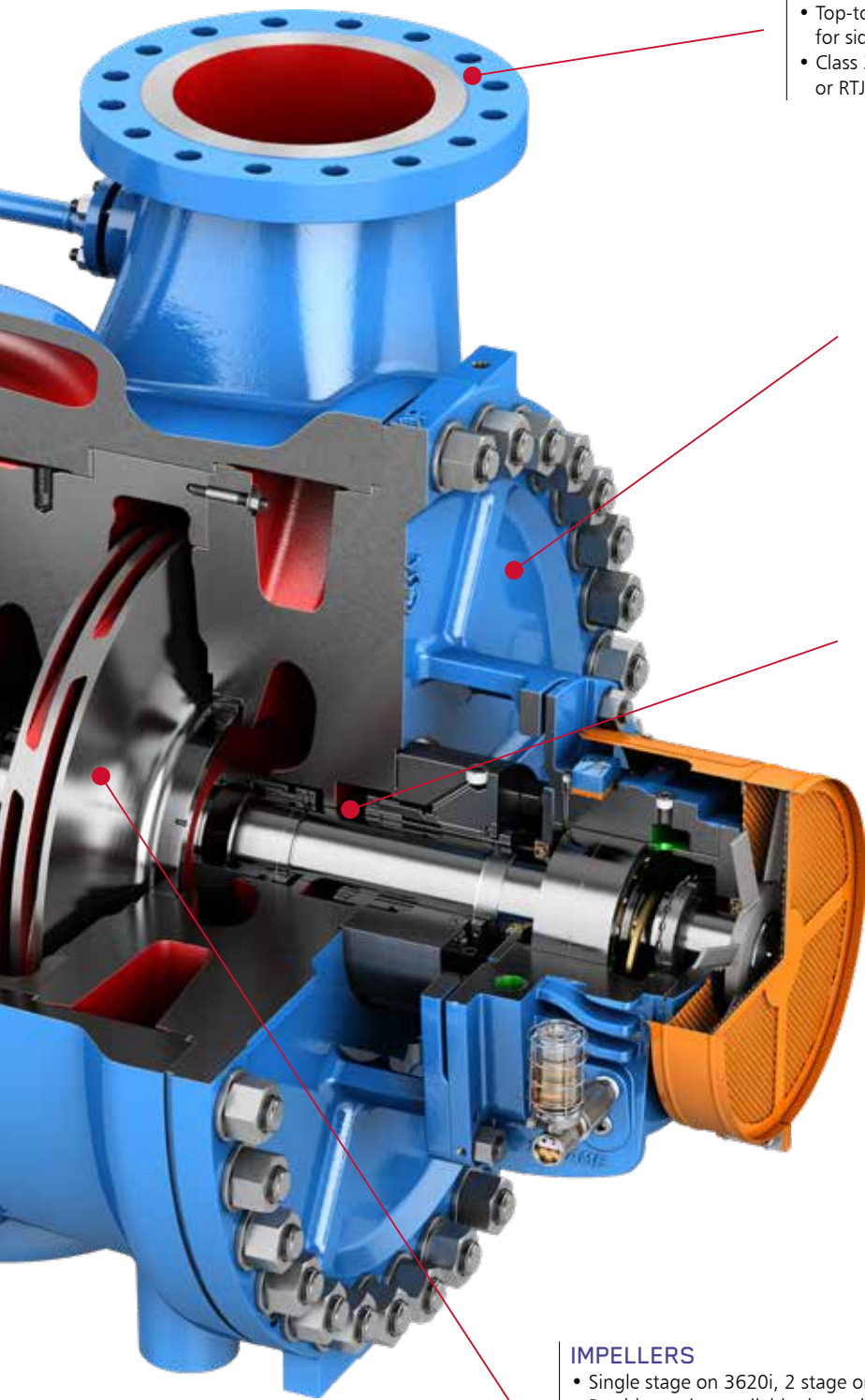
WEAR RINGS

- Integral impeller wear rings as standard (depending on material)
- Clearances in accordance with API 610
- Non-metallic material options available to suit applications requirements

VENT & DRAIN CONNECTIONS

- Integrally flanged as standard
- Removes requirement for welding/bracing and NDE
- Improved integrity of main casing connections





FLANGE CONFIGURATIONS

- Top-top flange locations as standard with options for side / side and side / top
- Class 300 & 600 available as standard with either RF or RTJ facings

CASING COVER

- Designed for high temperature / high pressure applications
- Fully confined controlled compression gasket assures leak-proof sealing
- Single end cover design on outboard side for maximum integrity and ease of maintenance

SEAL CHAMBER

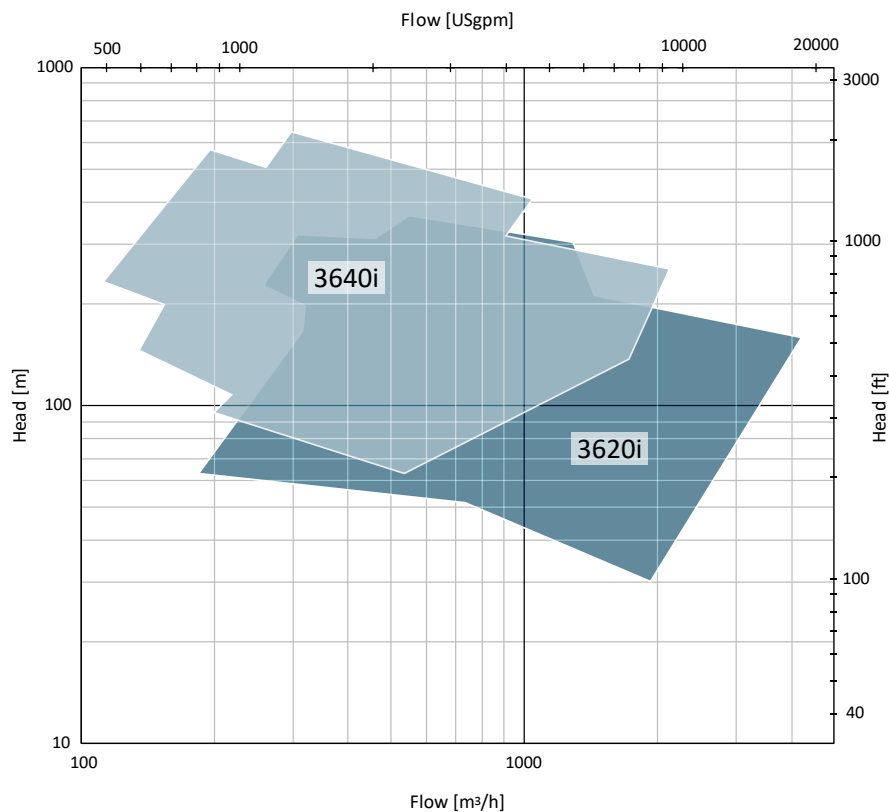
- Conforms to API 610 dimensional requirements
- Allows use of wide range of API 682 cartridge mechanical seals to meet specific service conditions

IMPELLERS

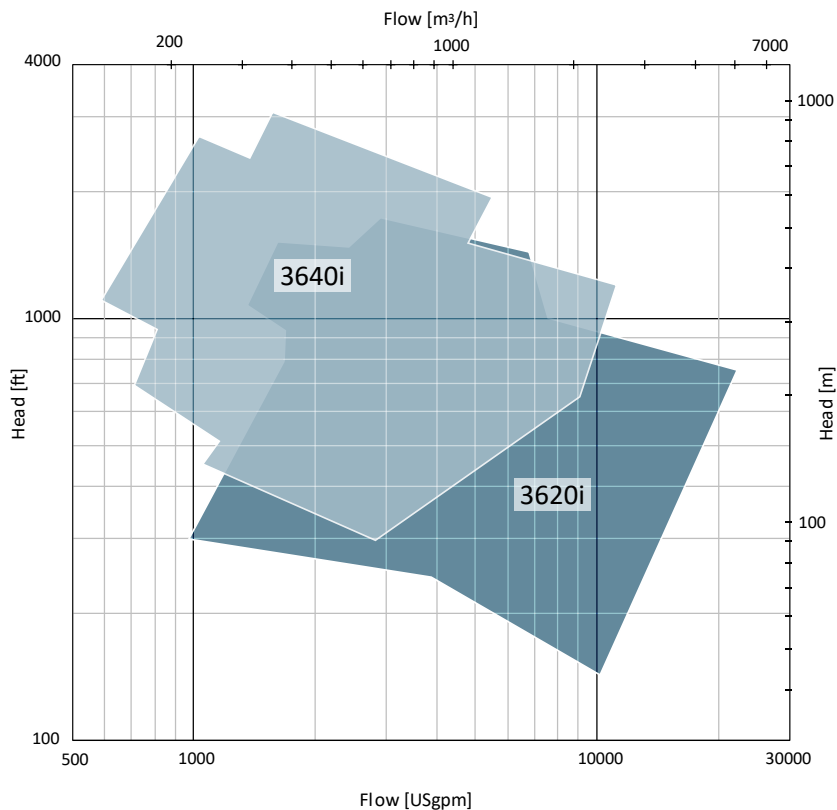
- Single stage on 3620i, 2 stage on 3640i
- Double suction available depending on size for low NPSHA applications
- Designed to balance axial loads, maximizing bearing life

Hydraulic Coverage

50Hz Range Coverage



60Hz Range Coverage



Note: additional sizes are available beyond standard coverage by consultation.

i-ALERT[®] Monitoring Solution

Sensor | App | Ai Platform

www.i-alert.com



What it Does:

Monitor

Tracks vibration, temperature & run-time hours 24/7/365.

Alarm

Takes high resolution data when an alarm condition occurs and stores it for later analysis.

Trend

Captures data every 1-60 minutes and has up to 170 days of hourly on-board storage.

Analyze

Diagnose machine faults with vibration tools
Fast Fourier Transform (FFT) & Time Wave Form Analysis.

Environment

Rated for any industrial environment. water & dust resistant.
Intrinsically Safe with a 3-year battery life (use dependent).

- ATEX Zone 0 AEx ia IIB Ga (Groups C & D)

Wireless

Sync data via Bluetooth Smart enabled smartphones and tablets.

Online Monitoring

Monitor and manage all of your i-ALERT enabled machines in one place - i-ALERT Ai Online Platform. This subscription service requires no software to download or dedicated hardware to run.

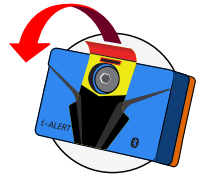


Spend less time collecting data and more time fixing problems. The i-ALERT mobile app has the ability to scan multiple i-ALERT[®]2 sensors within range to quickly and safely inspect multiple machines.

How it Works:

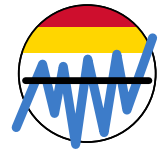
1. ACTIVATE

The i-ALERT[®]2 devices are light activated by removing the sticker. The sensor begins wirelessly broadcasting once activated.



2. AUTO CONFIGURATION

The i-ALERT device averages the vibration over 25 hours of run-time and sets the alarm levels to 2 x average (0.1-1.5ips minimum). Temperature alarm default to 80°C (176°F)



OR

2. MANUAL CONFIGURATION

User manually sets the alarm thresholds via the i-ALERT mobile application.



3. Monitor

The i-ALERT sensor is configurable to check every 1-5 minutes. If two consecutive readings are above alarm threshold the i-ALERT device will go into alarm.



Dashboard

Simple, intuitive dashboard to track vibration, temperature, run-time & battery life.



Trending

Trend vibration, temperature, & kurtosis to monitor any changes in the equipment operation.



BOM

Load the as built of materials based on the pump serial number.

Locations



For more information Please Visit:
www.gouldspumps.com | www.ittproservices.com



— An ITT Brand

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