Sundyne

VS1 (FG)
VS2 (FQ / FQX)
VS4 (VSMK / VSMKD)
VS6 (FGB / TKVB)

Vertical Suspended Centrifugal Pumps

API-610 / ISO 13709
latest edition

50/60 Hz

MARELLI

INDEX

Sundyne Vertical Sump Pump range

More than 50 years of experience in centrifugal pump design, development, manufacturing and service, to fulfill the latest standards for petroleum, petrochemical process and heavy duty processing industries, as full compliance machinery.

Vertical suspended centrifugal pumps are core family developed under API610/ISO 13709, latest edition standards.

Wide range of solutions are designed for matching vertical suspended centrifugal pumps needs in markets as:

Markets

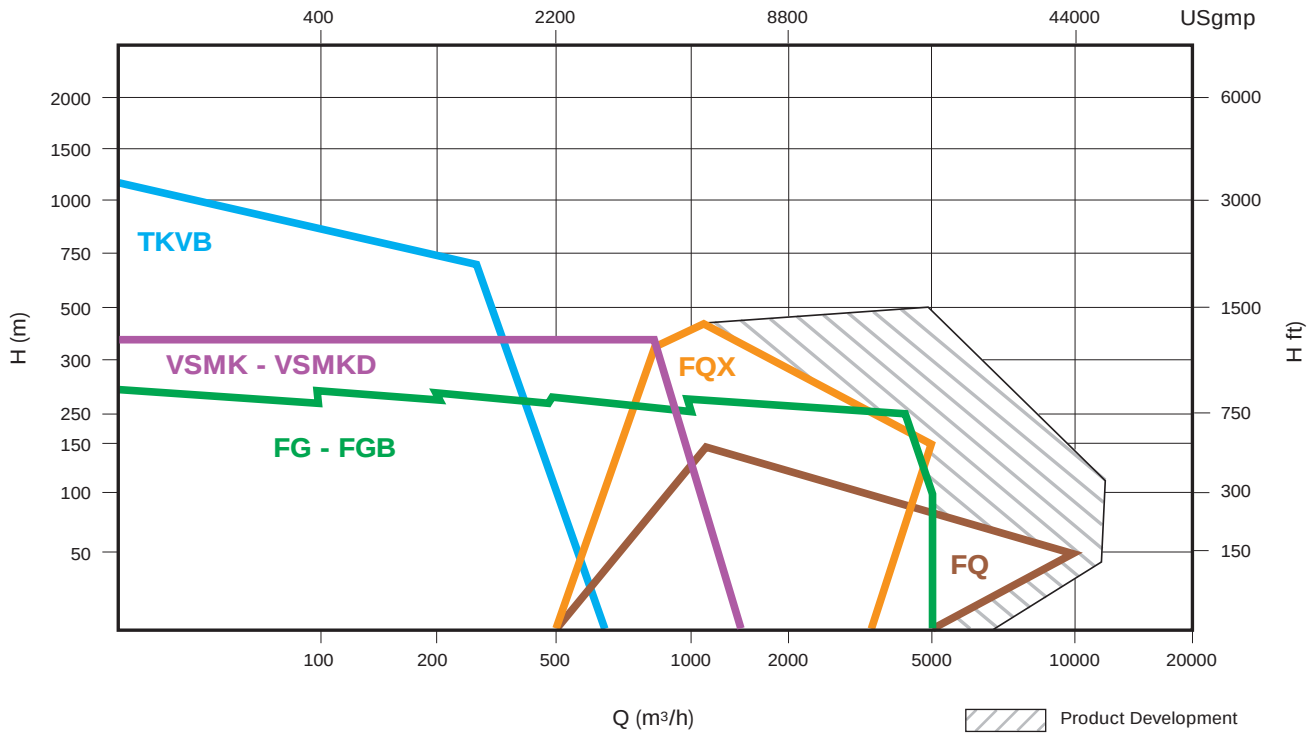
- Downstream O&G
- Desalination plants
- Up Stream O&G
- FPSO & FLNG
- Petrochemical plants
- Oil fields and terminals
- Off-shore and on-shore installations for petroleum and gas

Overall Data (*)

- Capacities: to 20000 m³/h (over 80000 USgpm)
- Heads up to: 750 m (2200 feet)
- Temperature range to: 450 ºF (232 ºC)
- Pit depth: to 22 m (60 feet)

(*) Special types could be designed on demand.

Performance curves



VS1 Type

FG

Description

FG vertical pumps have been designed for pumping fluids on heavy duty process.

Pump assembly has to be partially submerged, so that pump does not need priming before operation.

Drive unit is located on the surface, completely accessible.

The pump is mainly composed of four different components: bowl assembly, column, discharge head and drive unit. Sundyne Marelli have different solutions for every one, regarding design and size, that allows us to meet any conditions of service and installations.

Operating data

- Capacities: to 5.000 m^3/h. (30000 USgpm)
- Total discharge head up to 300 m. (1100 feet)
- Maximum working pressure up to 30 kg/cm^2
- Working temperature from -125 °F (-30 °C) up to 420 °F (250 °C)
- Pit depths: to 40 feet (12 m)

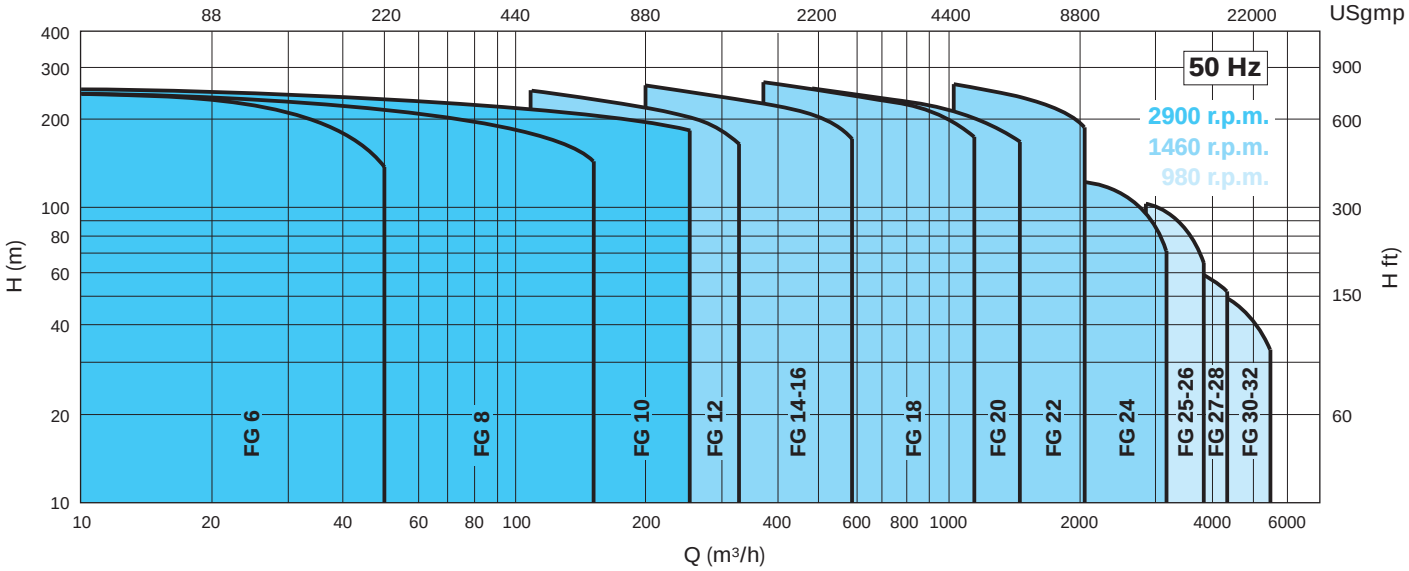
All performance data are strictly verified in our test bay.

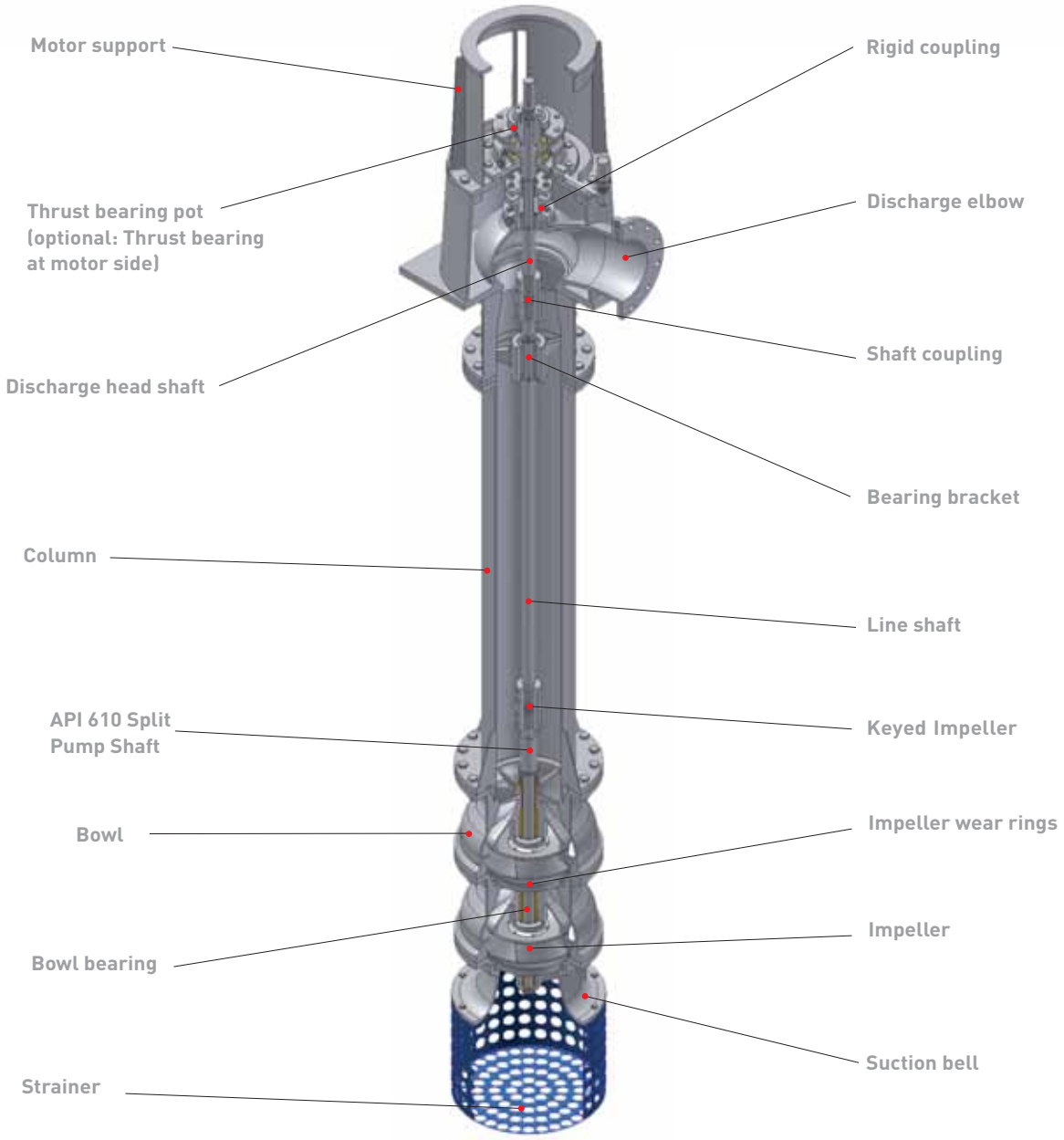
Applications

FG vertical pumps are suitable for any pumping station that requires a vertical pump, preferably in:

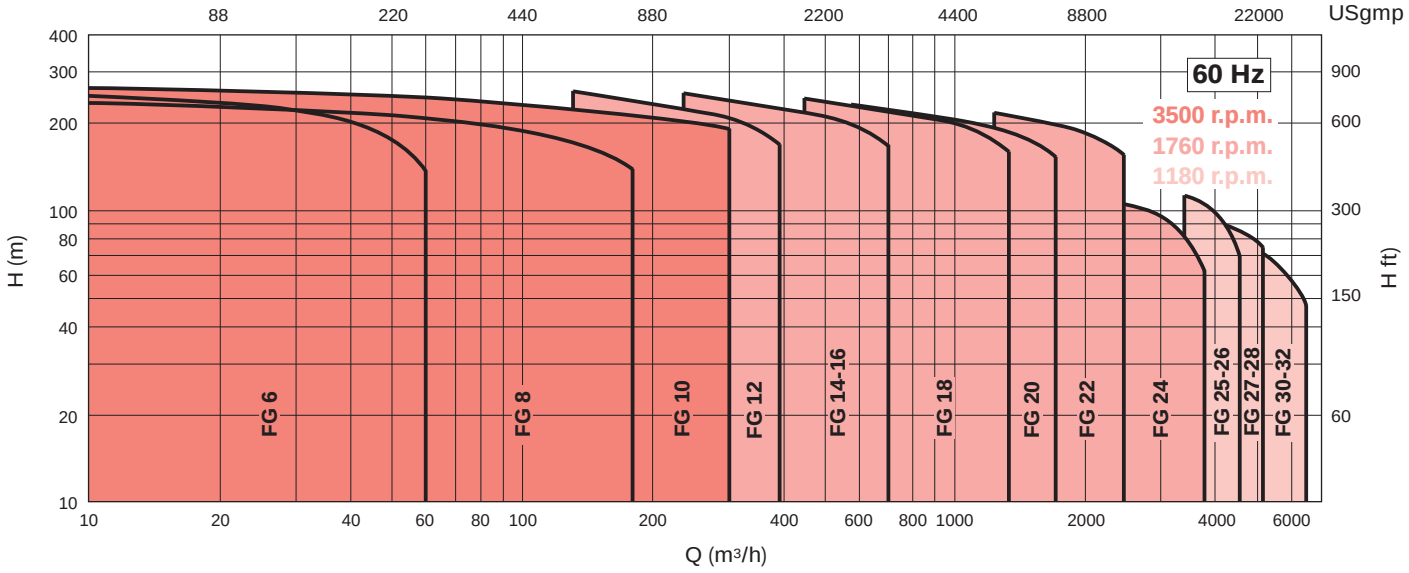
- Refineries
- Desalination plants
- Process charge
- API basins
- Condensate extraction
- Tank Farms
- Tanks fluid transfer
- Petrochemical plants
- Fertilizers
- Oil fields and terminals
- Off-shore and on-shore installations for petroleum and gas
- Reverse osmosis
- Synfuels
- Paper mills
- Other intensive heavy duty services and systems, that demand high reliability and efficient equipment

Performance curves





Performance curves



VS2 Type

FQ/FQX

Description

The pumps comprised within **FQ/FQX** family, are centrifugal pumps, vertical mounted and double suction impeller. That design prevents some of the bad functioning of semi axial vertical pumps, eliminating the source of such potential faults, as unbalanced axial thrust.

The **FQ** sub-family comprises all one stage pumps. And the **FQX** sub-family comprises pumps with several stages, one of them as **FQ** sub-family inside the bulb volute, and all other stages incorporated alongside the suspension column itself.

Double suction vertical suspended centrifugal pumps, **FQ/FQX**, **improve the hydro-mechanical performances compare to the traditional vertical pumps,** saving costs in their preventive maintenance and overhaul, to help the hydraulic management in medium and big flow applications.

Operating data

- Capacities: to 11.000 m^3/h. (48000 USgpm)
- Total discharge head up to 300 m. (1100 feet)
- Maximum working pressure up to 30 kg/cm^2
- Working temperature from -125 ºF (-30 °C) up to 420 ºF (250 °C)
- Pit depths: to 80 feet (25 m)

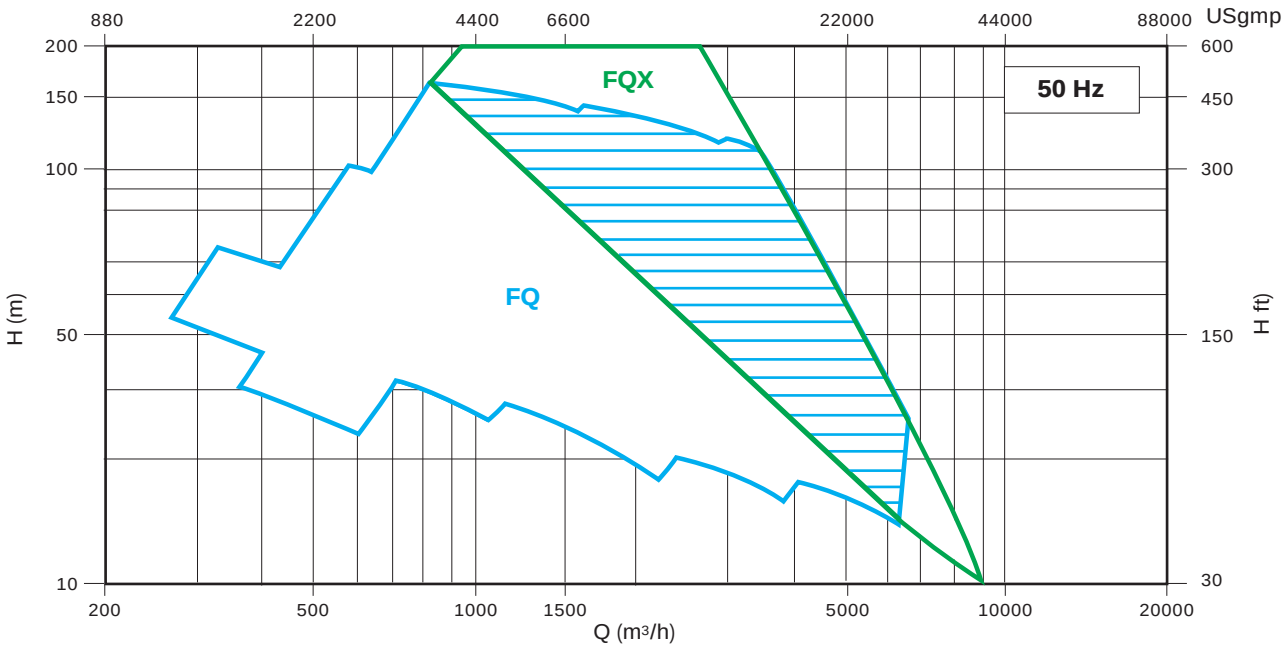
All performance data are strictly verified in our test bay.

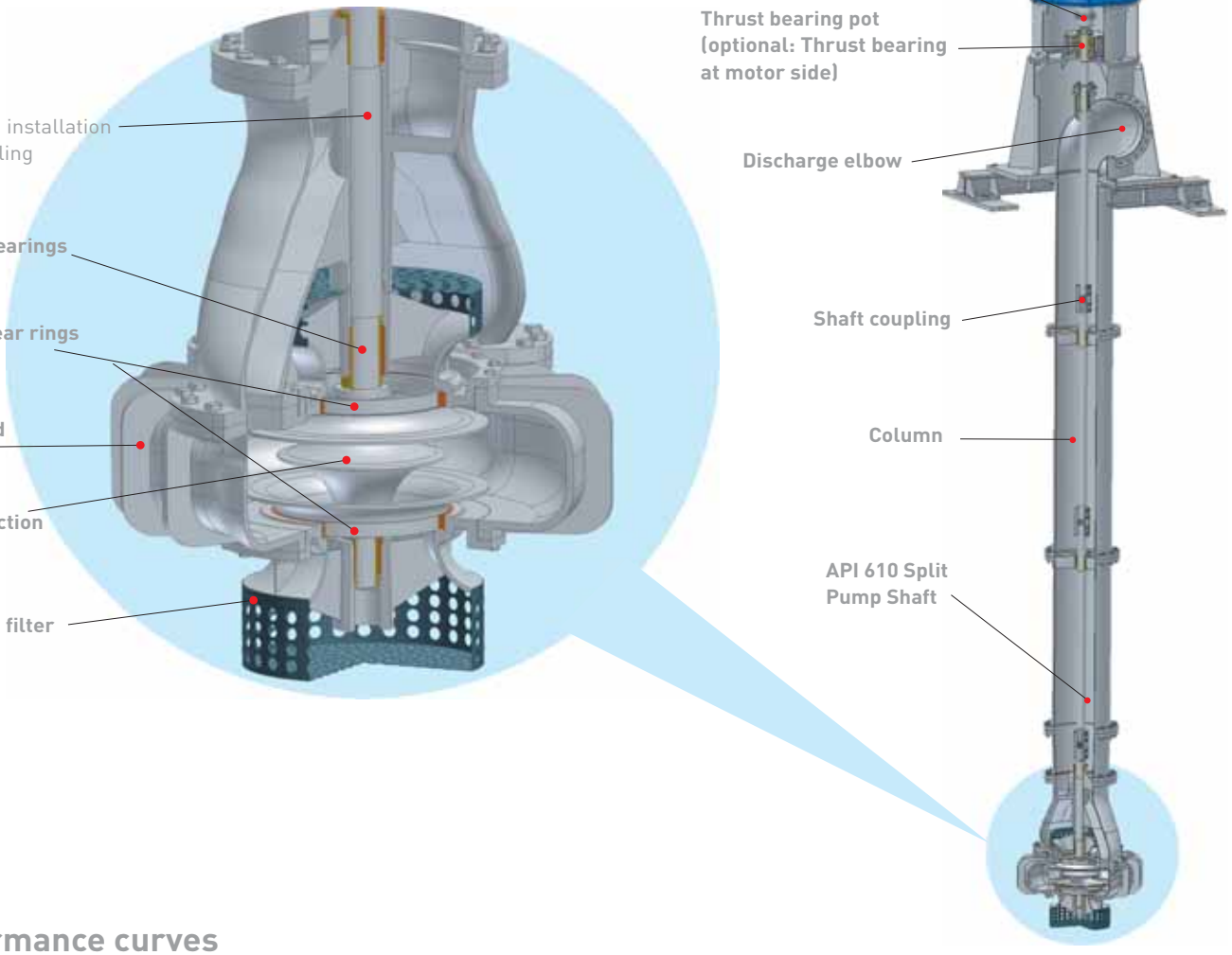
Applications

The range of applications is then very wide, with projects and industries as follows:

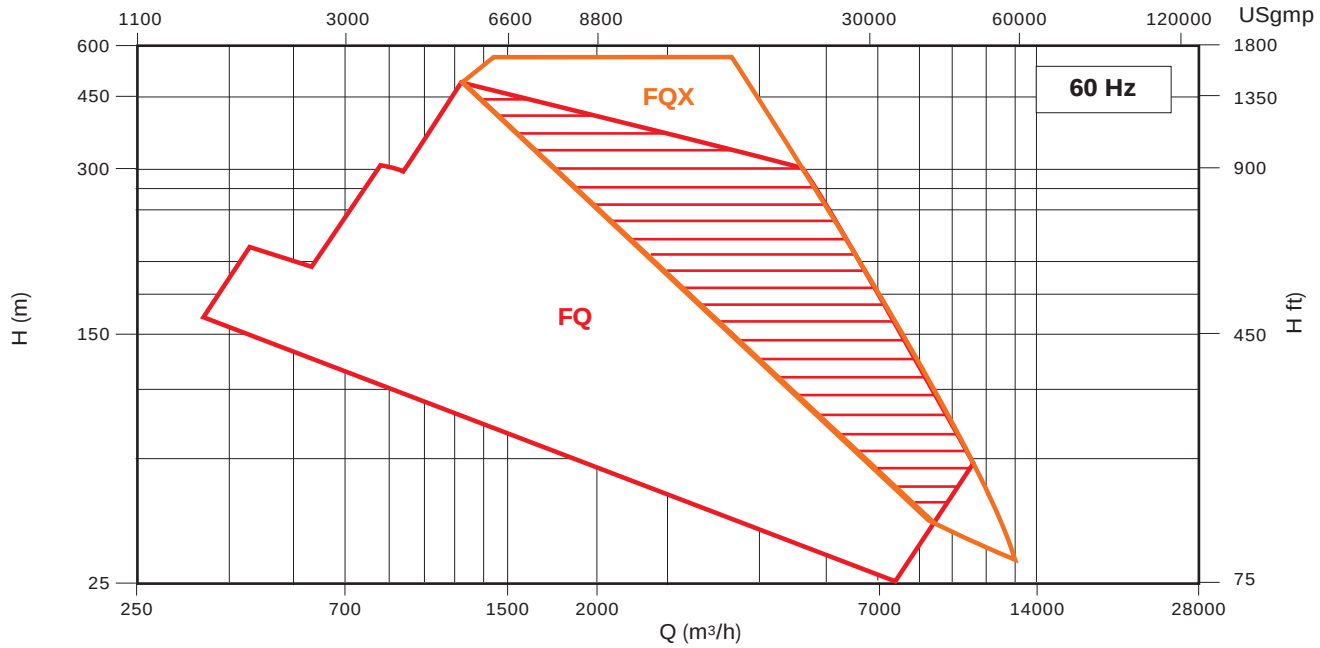
- Sea water in take pumps for desalination plants.
- Water reservoir pumps and dumps.
- Cooling towers in refineries.
- Industrial applications for **continuous running 24/24hrs**, muning applications.
- Petrochemical process and refineries under **API 610/ISO 13709 latest edition.**
- Tank farms for Oil & Gas.
- API tanks.
- Waste water treatments plants.

Performance curves





Performance curves



VS4 Type

VSMK
VSMKD

Applications

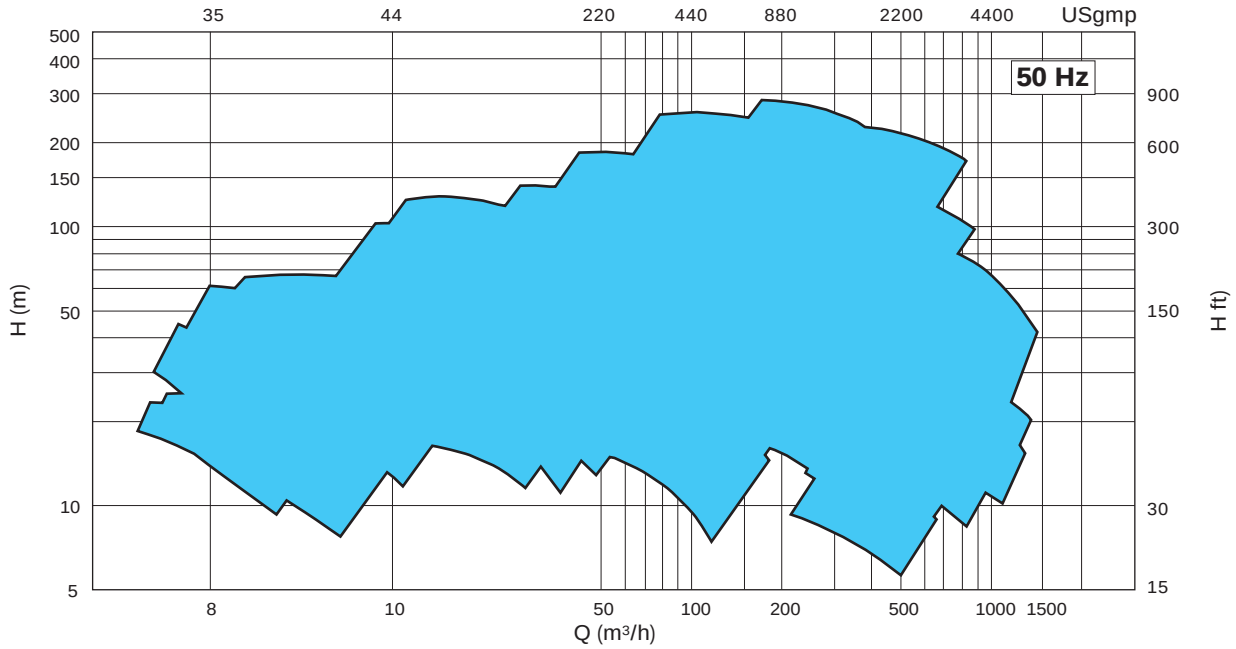
Sundyne Marelli, develops tailor made solutions for the medimum-pressure movement of water, hydrocarbon, and other process liquids. Our solutions meet the most stringent customer specifications for the following heavy industries:

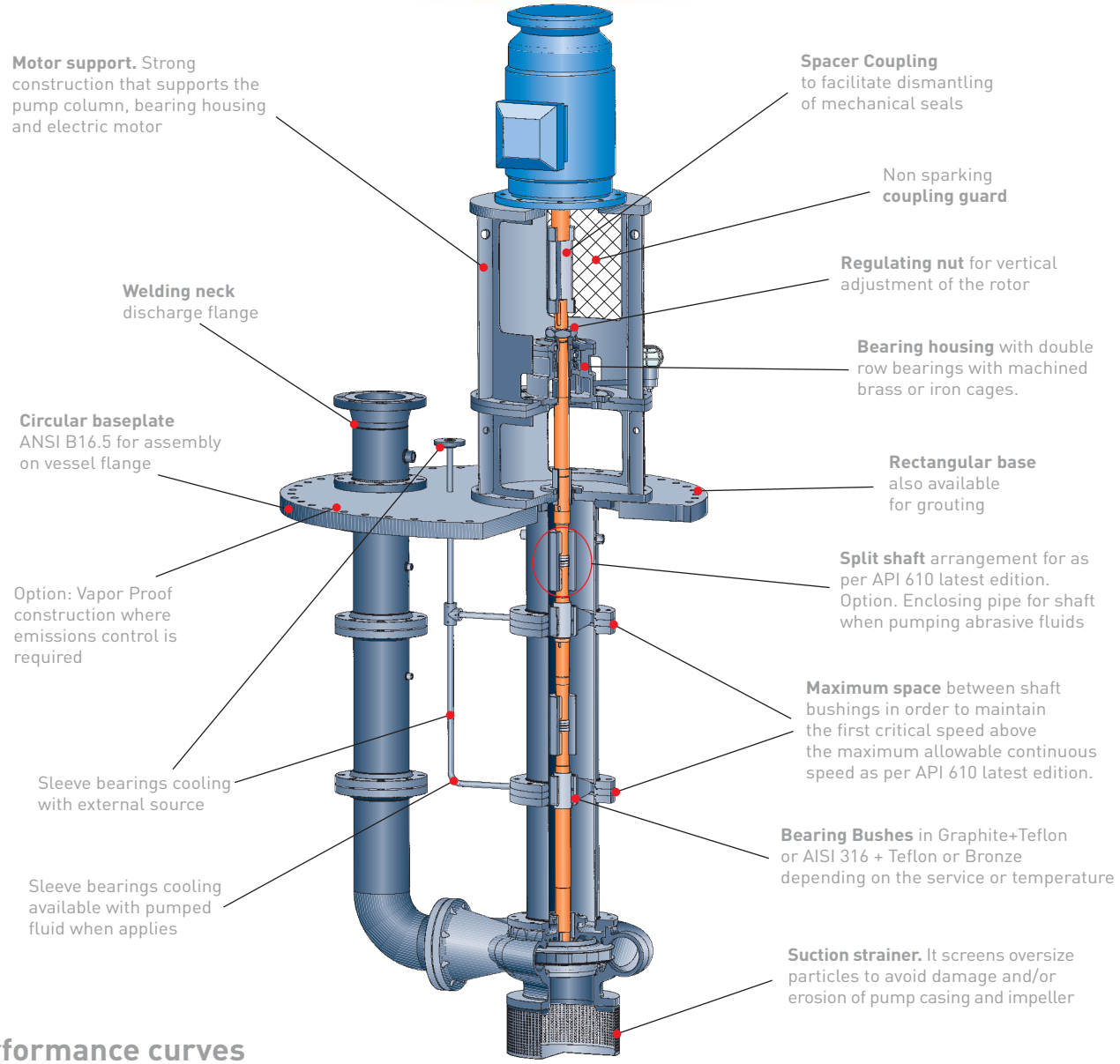
- Refineries
- Desalination plants
- Process charge
- API basins
- Condensate extraction
- Tank Farms
- Tanks fluid transfer
- Petrochemical plants
- Fertilizers
- Oil fields and terminals
- Off-shore and on-shore installations for petroleum and gas
- Reverse osmosis
- Synfuels
- Paper mills
- Other intensive high-pressure services and systems, that demand high reliability and efficient equipment

Operating Data

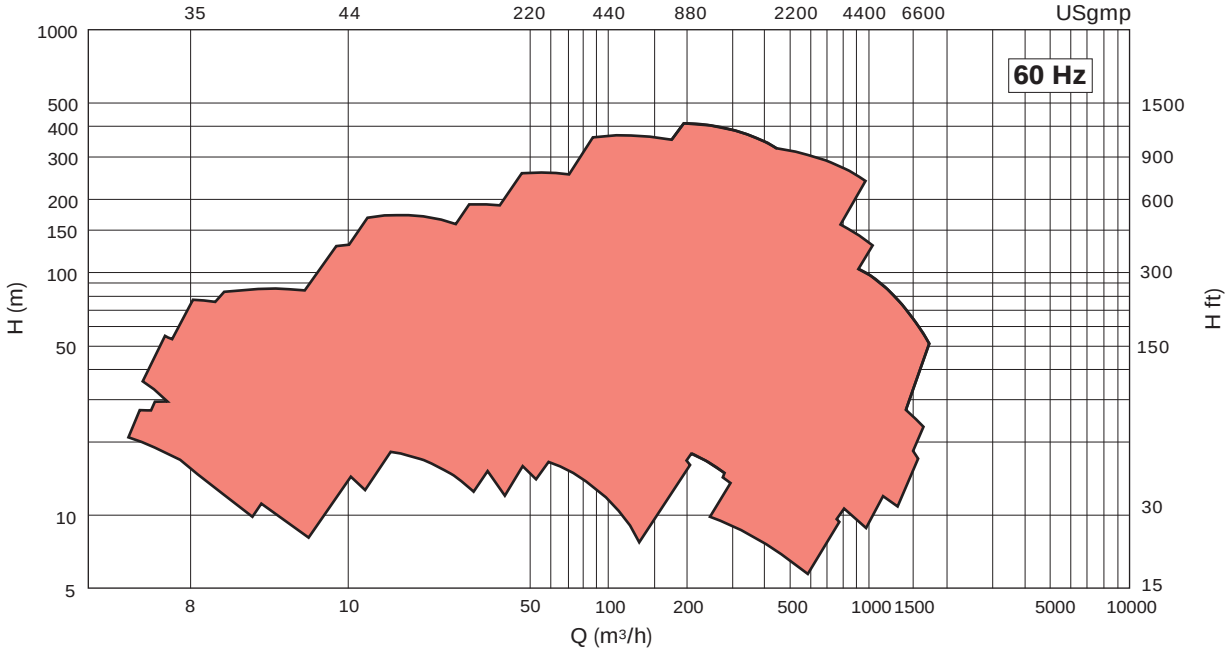
- Capacities: to 3500 USgpm (800m³/hr)
- Heads: to 850 feet (270 m)
- Temperature Range: to 450 ºF (232 ºC)
- Pit Depths: to 30 feet (10 m)

Performance curves





Performance curves



VS6 Type (semiaxial bowl type)

FGB

Description

Operating at very low, null or negative NPSHa values, these pumps are fitted with a can, containing

hydraulic parts and column, hermetically closed and baseplate. Column length is calculated according to NPSHa-NPSHr ratio. Suction and delivery flanges in line construction or suction flange under ground level are available.

Main applications in oil industries, refineries, petrochemistry, pipe lines, power plants, siderurgical industries, chemical plants, nuclear plants, reverse osmosis, desalination, airport supplies, etc.

Idoneous to pump hydrocarbons LPG's, ammonia, criogenic liquids, condensates, propilene and very cold or hot clean liquids in general.

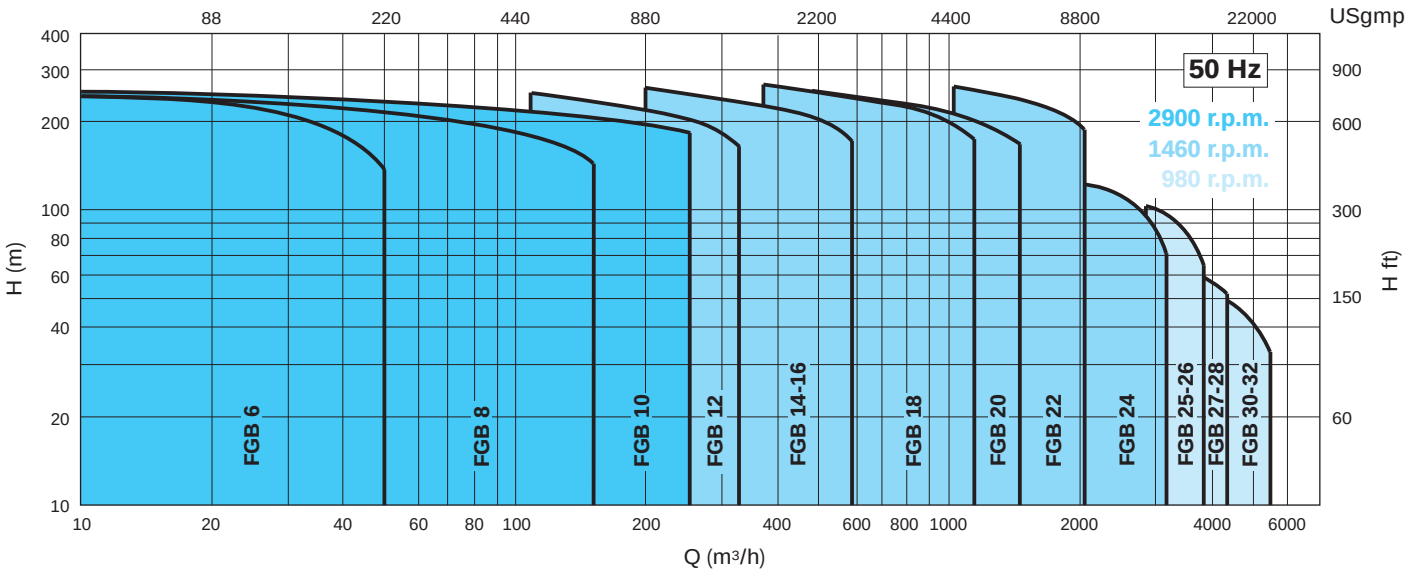
Applications

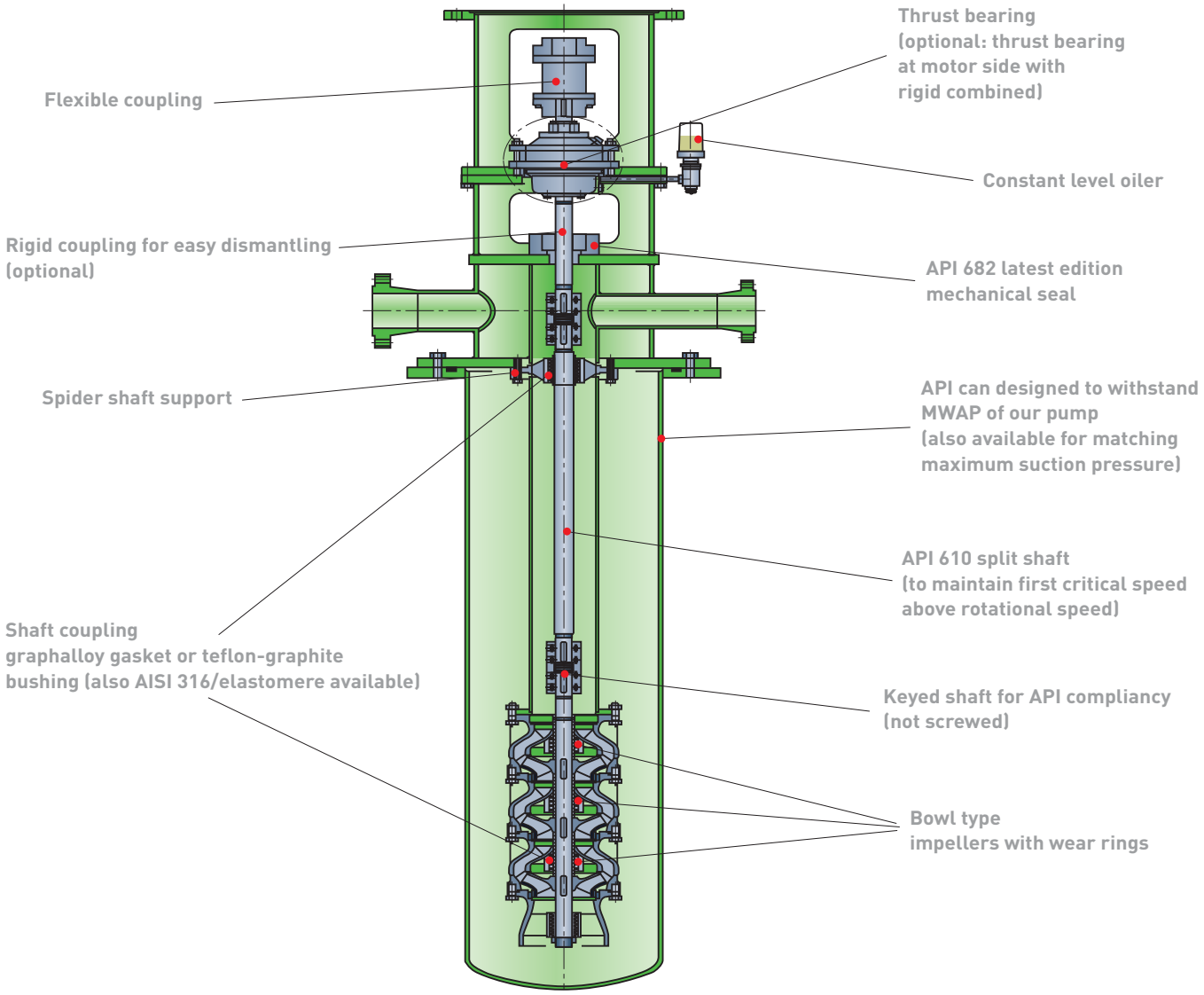
- Refineries
- Desalination plants
- Process charge
- API basins
- Condensate extraction
- Tank Farms
- Tanks fluid transfer
- Petrochemical plants
- Fertilizers
- Oil fields and terminals
- Off-shore and on-shore installations for petroleum and gas
- Reverse osmosis
- Synfuels
- Paper mills
- Other intensive heavy duty services and systems, that demand high reliability and efficient equipment

Operating data

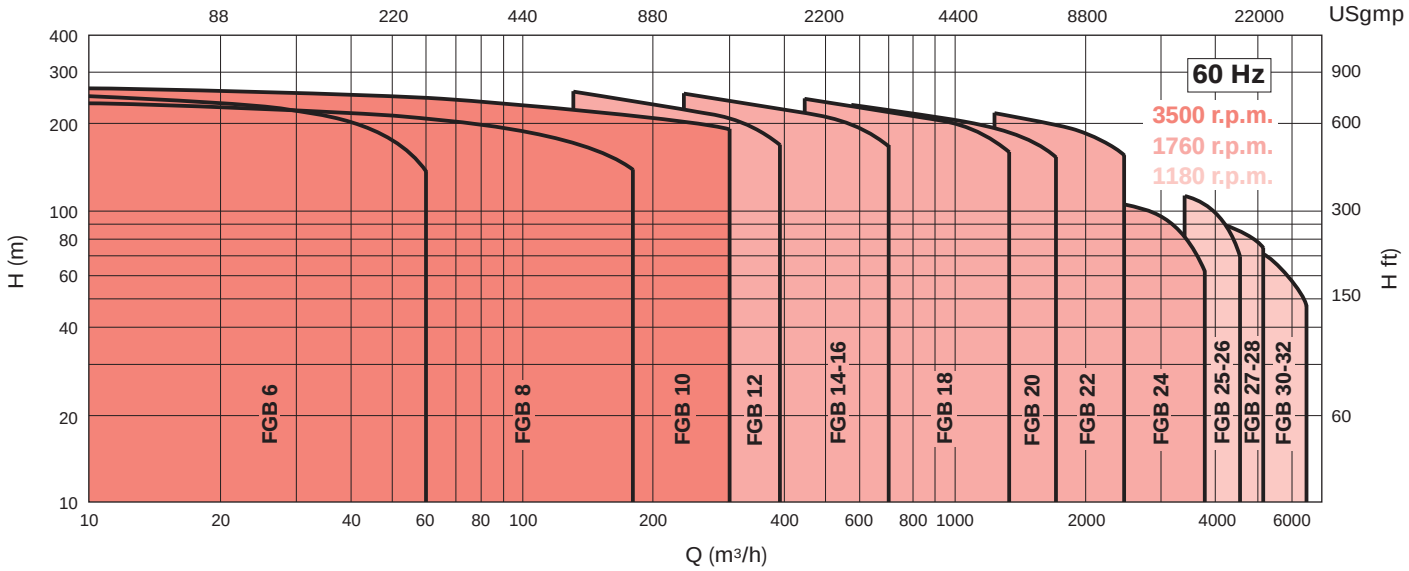
- Capacity Q up to 5,000 m³/h.
- Total dynamic head 600 m (1800 feet)
- Discharge pressure 50 bar
- Temperature from –80 °C (125 °F) up to 250 °C (482 °F).

Performance curves





Performance curves



VS6 Type (ring section impeller)

TKVB

Description

TKVB pumps are multicelular, specially adequates for pumping fluids at medium and high pressures.

They are manufactured in materials selected for each particular application, all included within **table H1 of API 610 standard**.

Manufacturing processes guarantees the best quality level and includes rotor dynamic balance, hydrostatic and performances tests, measuring flow, head efficiency, NPSH, vibrations and the most rigorous quality control.

Multistage centrifugal pumps up to 14 stages (standard construction), mounted in series separated and placed into perpendicular elements to the shaft rotation.

Leakproof between stages is guaranteed by O-rings (Perbunan is standard manufacturing) with a perfect tight by exterior tie bolts.

Axial thrusts are compensated by dynamically balanced impellers. The remaining axial thrusts are taken up by adequately sized antifriction bearings.

For pressures higher than 35 kgs/cm^2, axial thrust is compensated by balancing discs.

In the discharge side, feet are under the discharge casing.

In all pumps until 65-100, the discharge side feet are located under the first elements to allow diferent suction locations.

In higher models the feet are located under the suction side (location can be varied under request).

Applications

- Refineries
- Desalination plants
- Process charge
- API basins
- Condensate extraction
- Tank Farms
- Tanks fluid transfer
- Petrochemical plants
- Fertilizers
- Oil fields and terminals
- Off-shore and on-shore installations for petroleum and gas
- Reverse osmosis
- Synfuels
- Paper mills
- Other intensive high-pressure services and systems, that demand high reliability and efficient equipment

Operating data

Flow: up to 700 m^3/h (3100 USgpm)

Manometric head: up to 400 m (1200 feet)

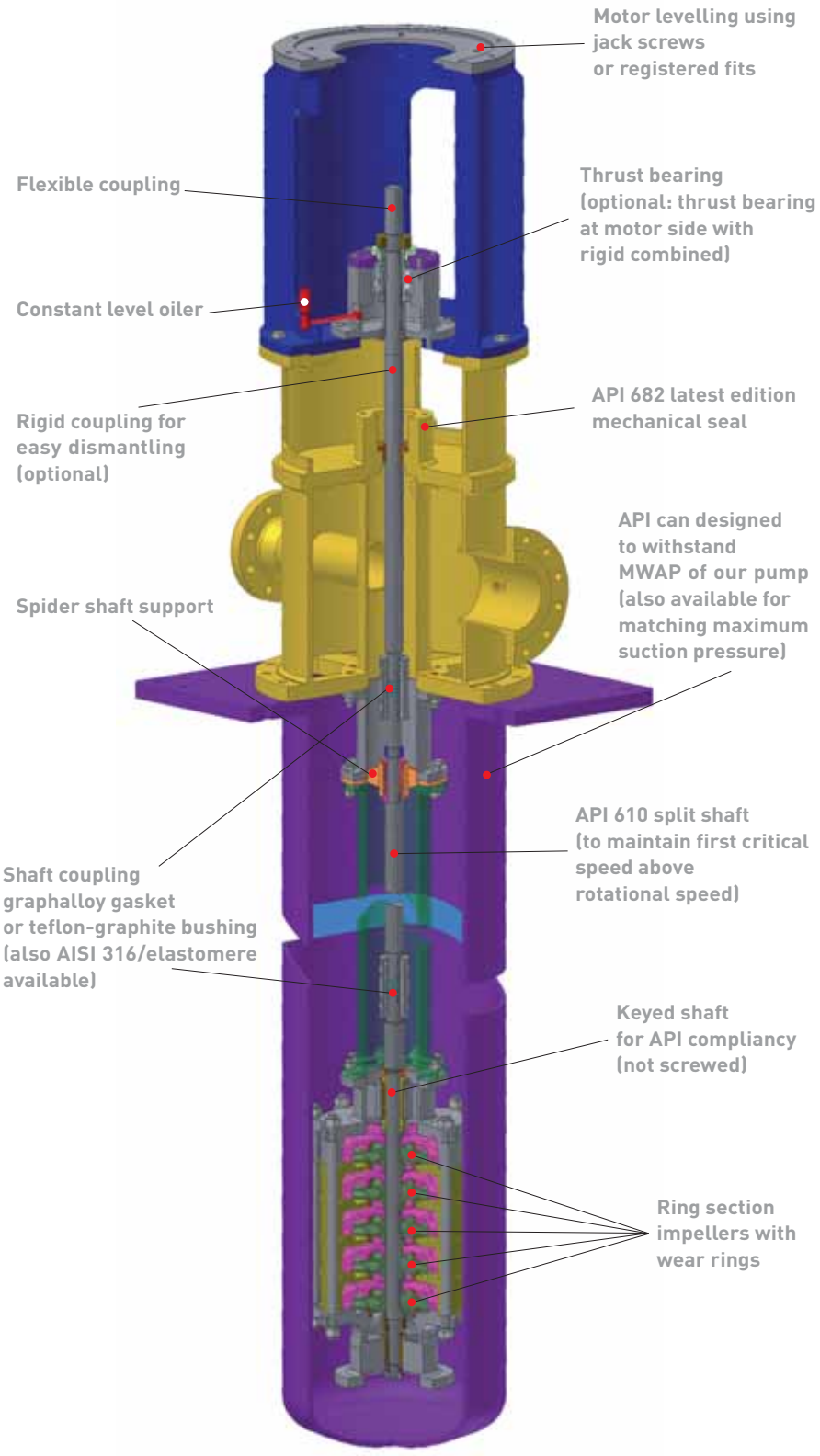
Maximum working pressure: up to 40 kg/cm^2.

Temperature: -80 ºC (-125 ºF) to 250 ºC (482 ºF).

From 110 ºC with cooled stuffing box (R).

- **Sealing** on the shaft can be done either by a stuffing box or mechanical seal, as required.
- **Suction flange** arranged horizontally towards the left hand side and discharge flange radially upwards viewed from coupling side. Flanges execution according to DIN standards from 2432 PN 10 up to 2535 PN 40 depending on sizes and pressures ANSI flanges under request.
- **Column** of variable length depending on the installation needs. Transmission shafts and guide bearings are lubricated by the pumped fluid itself.
- **Discharge head** with discharge elbow situed above or below the support plate, and stuffing box cooled or not, that can fit either a gland packing or a mechanical seal.
- **Bearing support,** with radial and thrust bearings in order to absorb radial and axial residual thrust, the same as the rotor weight avoiding the transmission to the motor. The rotor is supported by strong bearing housings, with roller or ball bearings lubricated by grease. Depending on the service, intermediate bearing are fitted.
- **Motor lantern,** for direct start-up with electric motor in standard version, joined to the head shaft by a flexible coupling. Optionally, with spacer, which allows to access to the stuffing-box for replacements or maintenance purposes without removing the motor.

  These pumps allows other types of start-ups and/or transmissions, like V-belts right angle gear (for engines, steam turbines, tractors, etc.).
- **Applications** in every type of services where a vertical pump is needed.

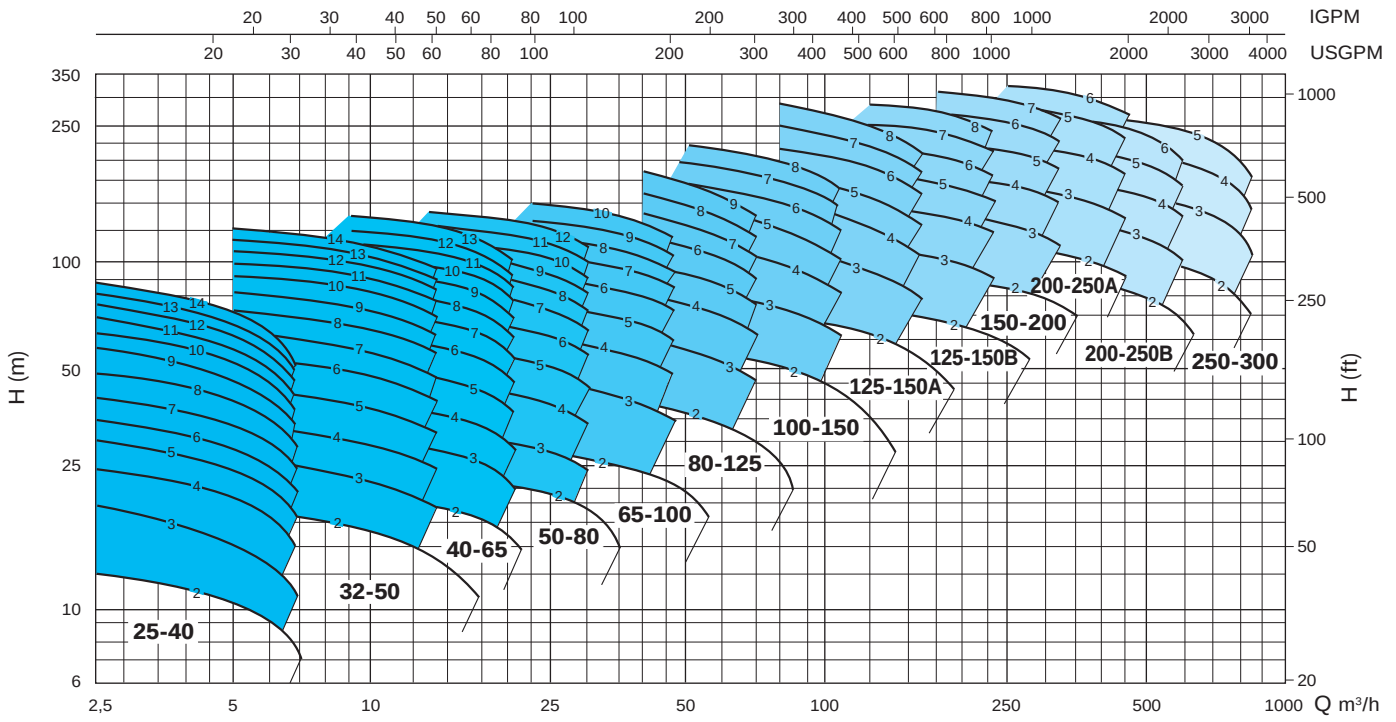


VS6 Type (ring section impeller)

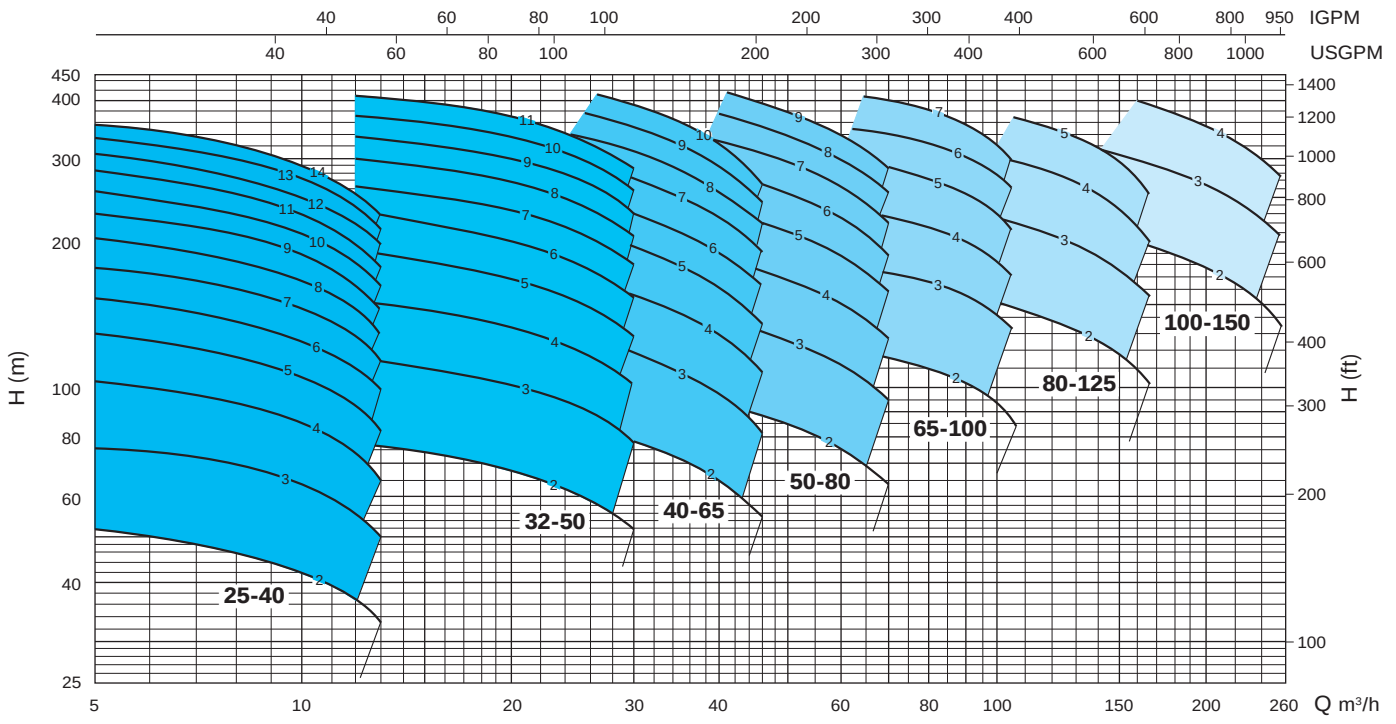
TKVB

Performance curves

1450 rpm /min — 50 Hz



2950 rpm /min — 50 Hz



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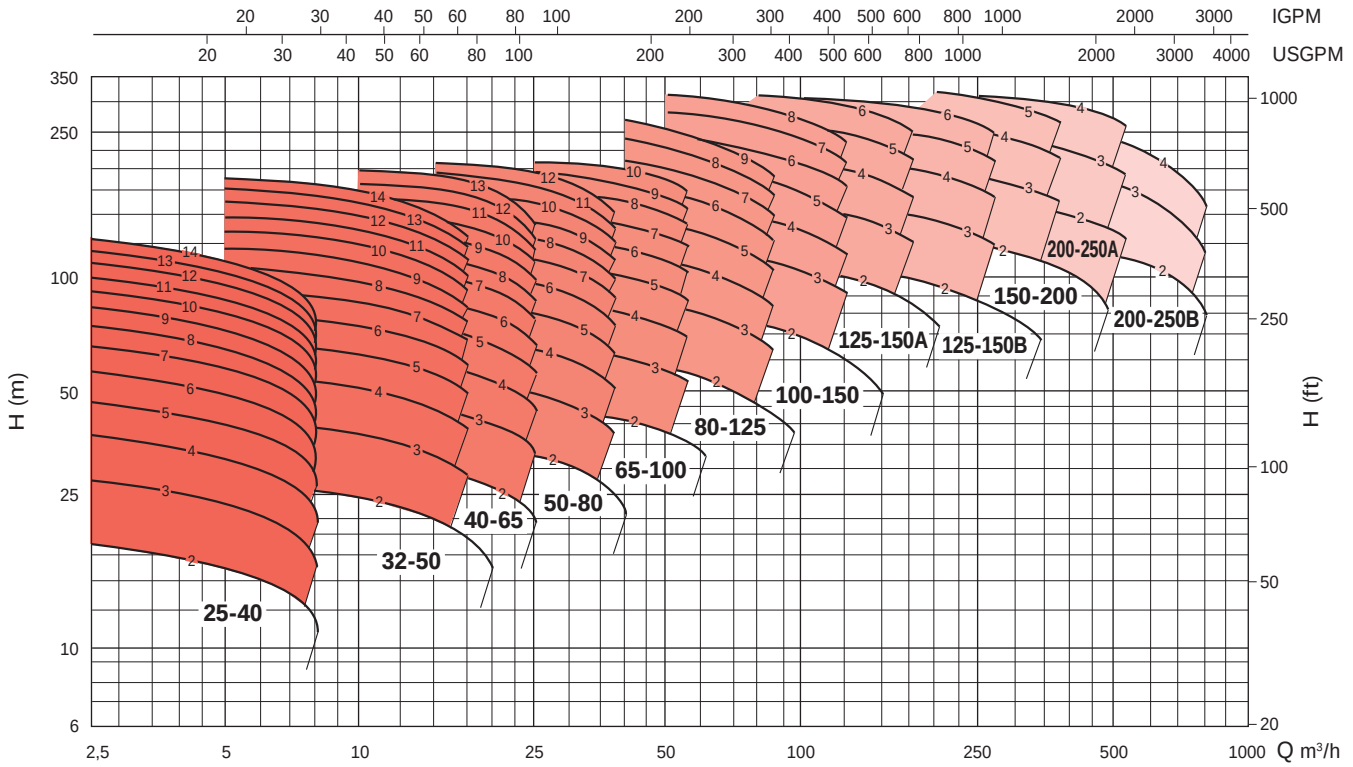
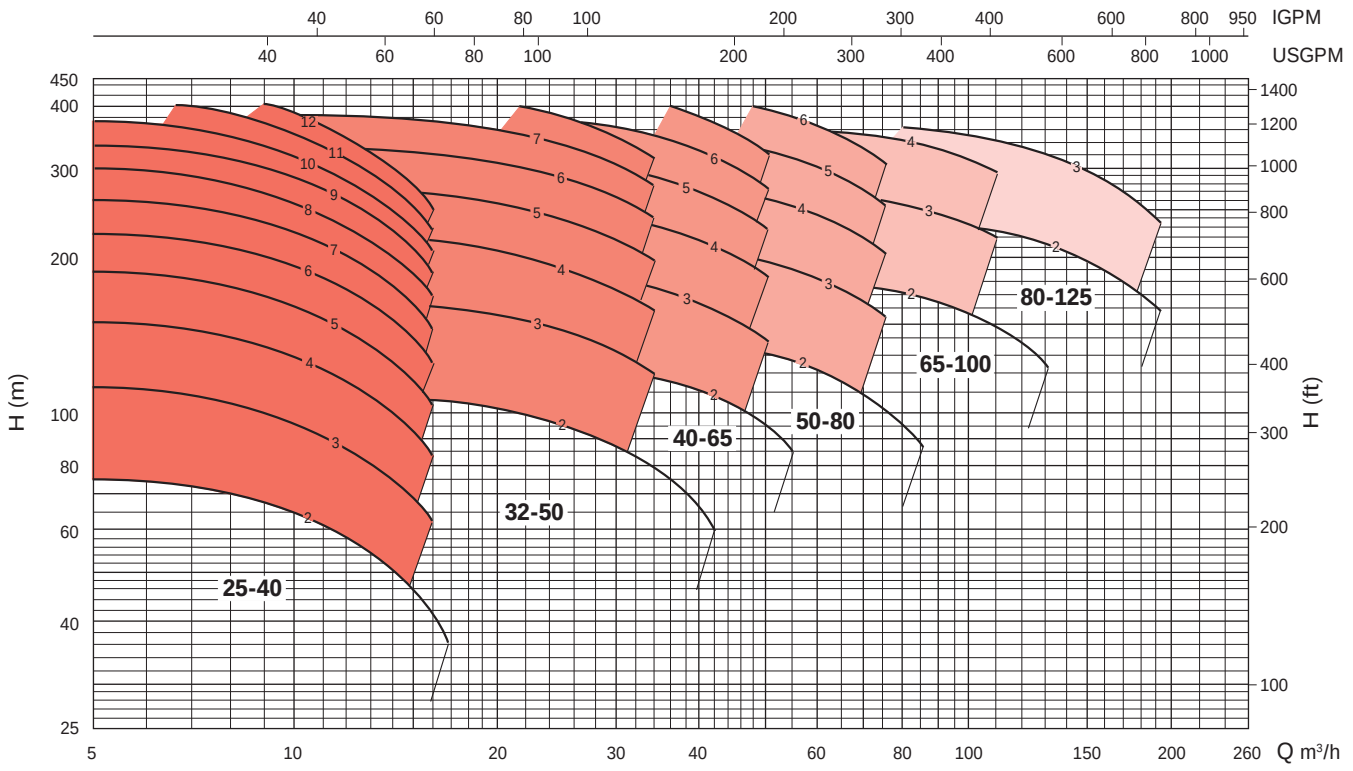
1750 rpm /min — 60 Hz



3500 rpm /min — 60 Hz



HIGHER PERFORMANCES ON DEMAND

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