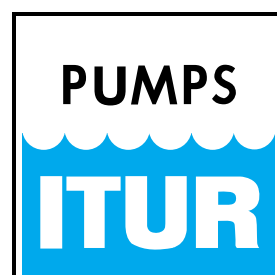


# NP8 series

Heavy Duty Process Pumps  
(According to API-610, 8<sup>th</sup> Edition)



## DESCRIPTION

**Single-stage centrifugal pumps with axial suction and radial drive in centreline arrangement, developed according to the API-610 standard - 8th Edition.**

The continuous Research and Development programmes carried out by Bombas Itur guarantee the application of the latest technologies in the design and production of the pumps.

The safety and reliability of the **NP8** series is recognized and checked in the hardest and most continuous tasks.

The **NP8** series is characterized by the following:

- Heavy duty design strength (API-610 standard 8th Edition)
- High hydraulic efficiency (up to 83%)
- "Centerline" arrangement
- Minimal vibrations for both speed and range
- Wide variety of materials
- Different mechanical closings and circulation plans
- Efficient heating and cooling plans (covers, support,...)
- Very low NPSH required (possibility of including an inducer)
- Modular pumps with standard parts (interchangeability)
- Standard baseplates (with drain tray or peripheral rim)
- High quality piping, carried out by officially authorised welders
- Minimum and easy maintenance

It is normally operated by an electric motor (50 or 60 Hz).

It is also possible to use the pumps at different speeds by operating them using steam turbines (according to API-611) or a reducer (according to API-677). It is assembled on a API base, with spacer coupling and a sparkproof coupling cover.

Two types of base are made:

- a) API base with drain tray.
- b) API base with peripheral drain rim.

## APPLICATIONS

This series' application field extends to the pumping needs for process services in Refineries and the Petrochemical Industry, and by extension for all the industrial services with high pressure and temperature requirements.

The series has two types of drive:

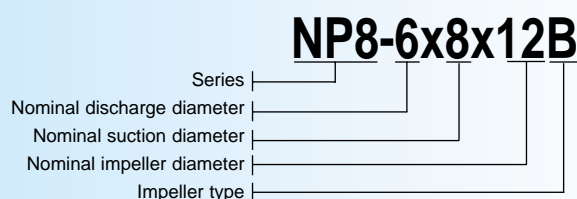
- **Closed:** For clean liquids or liquids with few small-sized non-abrasive solids, as a standard.
- **Optionally partly-open:** For liquids that contain a higher concentration of solids, or solids with worse characteristics.

Arrangements that are only used as required are indicated as **OPTIONAL**. In general the options are not exclusive among themselves.

## RANGE OF SIZES

The series has 34 models ranging from the 1x1<sup>1/2</sup>x8N up to the 8x8x16B.

## PUMP NAME



## OPERATING LIMITS

Operating limits for the series:

- Discharge pressure: 40 bar in CF3M material at 20°C.
- Suction pressure: Maximum values are determined in accordance with the discharge pressure.
- Temperature: from -28°C to +350°C.
- Viscosity. It depends on the size of the pump and the viscosity of the fluid, and therefore it is advisable to consult the correction charts to study its viability.

The corrections for flow, height and efficiency are carried out according to the Hydraulic Institute Standards.

- Speed. From 1500 to 3600 rpm depending on the type of pump.
- Flow. The maximum and minimum flows are indicated on specific data sheets.
- NPSH required. The NPSH limits are those indicated on the actual curves. If a lower NPSH is necessary an inducer can be placed optionally.

## PUMP DESIGN

### PUMP CASING

Made by cast. Its design pressure at CF 3M (and materials of the same or higher resistance) at 20°C is 40 bar including a corrosion allowance of 3 mm.

It is anchored with side legs situated on the centerline plane.

### Flanges

Both have the same rating, in the standard version ANSI 300 lbs. RF, according to ANSI B16.5, although other ratings can be used.

All the models have hubs for:

- Pressure gauge
- Vacuum gauge
- Plan 11
- Cyclonic separator
- Vent
- Drainage

The connections for the vacuum gauge and the cyclonic separator are exclusive.

The suction nozzle is placed axially and horizontally and the discharge nozzle is placed radially and vertically.

- Its nominal size is of type: 1, 1<sup>1/2</sup>, 2, 3, 4, 6, 8 inches.
- Its shape is with projection and the seat of the nuts is mechanised.
- The projection face has saw teeth (SF).
- The SF flange finish is:
  - Concentric grooves or spiral.
  - Surface roughness = 3 to 6.3 max Ra.

### Auxiliary connections

#### • Drainage

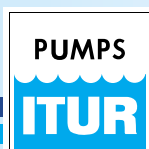
It always has drainage. As a standard it has a socket welding type welded connection with a braced tube (with two flats welded onto the casing) no greater than 150 mm long and made of the same material as the pump or AISI-316L sch 160.

The limit is finished on the edge of the base with a socket welding type flange with the same rating as the pump.

The sizes are indicated on data sheets. If other measurements are needed they are carried out with an extension cone.

It can optionally have the following:

Class 800 valve with globe or gate, with screwed-down cap and spiral-metallic joint, joined by socket welding.



- **Vent**

It is planned but it is not screwed down. It is not necessary as the NP8 pumps are self-venting.

If necessary the same requirements as for the drainage will be applied to its construction.

- **Pressure gauge**

The connections are planned but they will not be screwed on without indication from the customer.

Their size is always 1/2" NPT.

- **Auxiliary closing connections**

When auxiliary lines are used for closing, the connection in the nozzles (suction and discharge) are 1/2" socket welding connections.

The plans 11 are planned and they will only be screwed on when necessary.

### **Heating chambers**

If there is welding material as an option heating chambers can be supplied in the casing.

The size of the connections is at least 1/2" socket welding, with input and output via flanges on the edge of the base.

### **CASING-COVER JOINING**

The casing-cover joint is carried out using studs. These studs do not come into contact with the fluid and are  $\Delta > 13$  mm.

The joint is spiral-metallic inserted with metal-metal contact.

The alignment between them is achieved through the concentricity between the adjustment areas and through the parallelism of the contact sides.

### **PUMP COVER**

Designed for 40 bar pressure in CF3M and at 20°C including an allowance of 3.0 mm.

As a standard it incorporates a heating or refrigeration chamber made using founding with the cover and its plugs in place.

It incorporates the mechanical seal box. This mechanical seal box is self-venting and cylindrical with a bore hole vent and the measurements of the mechanical seal box are according to table 2-3 of API-610 8th.

All the connections on the cover are threaded and minimum 1/2" NPT even the connections for the heating or refrigeration chamber.

If they are plugged, the plugs are made of the same or better material as the cover.

Jackscrews are used on the cover.

### **Pump cover joining with cartridge cover**

It is carried out using studs, nuts and washers.

These studs do not come into contact with the fluid and their measurements are indicated in table 2-3 of API-610 8th.

The centring of the cartridge cover is achieved using concentric adjustment sides and the alignment is achieved using parallelism of the radial contact sides.

The interior and exterior adjustment is planned for the cartridge centring with TIR < 125 micras.

The pump cover-cartridge joint is thoric inserted or spiral with metal-metal seat.

All the joints are confined and the housings are made in the seal gland.

### **IMPELLER**

It is cast in one single piece and has a solid hub. As a standard it is closed, although it can be built half-open.

The compensation of the axial efforts is carried out by compensation rings and openings in the case of the closed impeller and by side flaps in the case of the semi-open impeller.

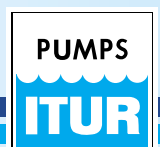
It is fixed to the shaft in axial direction using an oval nut (which is in turn fastened with a screw) and is tightened against the shaft.

In radial direction they are fixed using a key.

The impellers are balanced according to API-610 8th.

### **OPTIONAL**

As an option an inducer can be included.



## WEAR RINGS

### Closed impeller

It has 4 rings which are paired 2 by 2, 1 on the body, 2 on the impeller and lastly 1 on the cover or back ring.

The difference in hardness between paired rings is minimum 50 Brinell, unless the hardness of both of them is over 400 Brinell.

The rings are fixed to their support piece using a threaded or cylindrical pin. The operating clearances meet what is indicated in the standard and the radial clearance is never less than the maximum bend of the shaft.

### Semi-open impeller (Optional)

It has a wear plate on the casing which is joined with screws.

## PUMP SHAFT

It is dimensioned to transmit necessary torque to the impeller and support the torque that can be produced in extreme situations such as sudden start-ups, operation overspeed (105%), etc.

The material is compatible with the fluid.

It is rigid enough to avoid excessive bends being produced on the mechanical seal (less than 50 micras in standard conditions).

## BACK RING

Unless otherwise indicated, back rings are supplied:

- As changeable wear ring.
- To establish the difference in hardness between fixed and rotating parts.

## BEARINGS

Dimensioned for a B10 average life of over 25000 hours.

The front bearing has cylindrical rollers and is "floating" so that it only absorbs radial loads. On the back part, to support the thrust (axial) loads two 40° angular contact bearings are placed back to back.

For high suction pressures a third thrust bearing or a pre-loading spring element can be fitted.

They are always lubricated with oil.

All the bearings are assembled directly on the pump shaft.

## BEARING SUPPORT

In standard running it is made of cast iron and includes the following elements:

- Oil-fill cap, cast, which also serves as a vent element for the support.
- Oil-drain cap. Placed on one side.
- Oil refrigeration chamber made by casting in the inside and prepared with the joint and the caps in place.
- Constant level deposit with a capacity of 0.12 litres or more, made of heat-resistant glass (Pyrex) and protected by a steel mesh cage.
- Oil level mark on the side.
- Characteristics plate riveted onto the support.
- The support sealing is carried out through the small caps with their joints and through two labyrinths in special steam and sparkproof material.
- Two flat surfaces with a diameter of 25 mm to place the horizontal, transversal and vertical vibration probes.
- Placing of two horizontal hubs, one on each bearing, to place the thermocouples on the bearings support.

For the pumps with semi-open impeller the bearings support unit, bearings, shaft and bearing covers are made in such a way that sufficient axial regulation is enabled to adjust the impeller against the wear plate.

## OPTIONAL BY ORDER

Supports with threaded connections for permanent assembly of vibrations transducers according to API 670.

Oil heaters.

## SEALING SYSTEM

Sealing by packing is not supplied.

The sealing system is formed by:

- Cartridge.
- Auxiliary sealing system.

The mechanical seal and sealing systems are in accordance with API 682.

## CARTRIDGE

The cartridge is composed of the following elements:

- Mechanical seal.
- Shaft sleeve.
- Seal gland.
- Throttle bushing.

### Mechanical Seal

All the mechanical seals used are always balanced.

All of their arrangements can be placed and beside this, they can be DIN standardised or not. (single, dual, pressurised and non-pressurised).

Their materials are suitable for the service conditions and can operate at the maximum pressure that can be given.

It is always sent already assembled in the pump. The pressure test is never carried out with it assembled on the pump. All the mechanical seals are of the cartridge design type with smooth sleeve without step. This cartridge is removable without moving the motor.

### Shaft sleeve

It is made of abrasion and rust resistant material.

It is fixed axially and through pump shaft.

It overhangs the mechanical seal box behind the seal gland so that in the event of an escape its origin can be determined. The design is for one single piece.

The shaft sleeve has a minimum thickness of 2.5 mm and adjustments only on both ends. It is sealed on one end.

### Seal gland

Designed in AISI-316 for a pressure of 40 bar at 20°C with a corrosion allowance of 3 mm.

It is capable of supporting the pump hydrostatic test pressure without distortions.

After the stationary seal part its wall is greater than 3 mm. The orifices for the bolts are bored (not torn).

The seal gland is designed for the same pressure as the pump casing, with dimension according to API 610. The mechanical seal box and cartridge have the different inlet and outlet connections marked according to the symbols in Appendix D of API-610.

Different connections:

- Flushing and output fluid barrier: 0° up.
- Draining, quench draining and inlet fluid barrier: 180° down.
- Quench. 90° to the left seen from the coupling side.

The letters I and O are used for inlet and outlet respectively.



### **Drainage ring**

For single mechanical seal, there is a floating type restrictive back bushing (drainage ring), made of premium carbon graphite or PTFE charged with fibreglass.

Diametral tolerance according to API table.

### **AUXILIARY SEALING SYSTEMS**

They are made in accordance with the piping requirements Table.

Auxiliary circulation systems and quench according to Appendix D of API-610.

### **AUXILIARY PROCESS FLUID PIPING**

The minimum connection size is 1/2".

The flanges are in accordance with ANSI B 16.5.

All the piping elements supplied by D-2 and D-3 plans 52-54 are considered to have been submitted at process fluid.

The piping components support the same pressure as the pump case and never less than Class ANSI 300 lb. at room temperature. The piping is made with double tube and welded to minimise the use of accessories.

Flanges welded up to the edge of the base to aid maintenance.

The pipes end at the same input and output point on the base.

### **OPTIONAL**

For plans 52 and 53 the deposits can be designed to be assembled away from the base. In this case the fluid circulation piping is not supplied.

## **PIPING DESIGN**

According to piping requirements Table.

### **COOLING SYSTEMS (WITH WATER)**

Water flow sight glasses are supplied on each output line.

Input and output valves are supplied to each collector. The water pipe arrangement is according to D-4 and D-5 of APL.

### **HEATING SYSTEMS (WITH STEAM)**

According to the tubing requirements Table, ensuring the valves are valid for the steam temperature.

### **COUPLINGS AND COUPLING GUARD**

The couplings are sufficiently dimensioned to transmit the maximum operation power (including service factors).

They have carbon steel hubs with flexible elements made of stainless metallic sheets.

The design retains the spacer even if the sheets are broken.

For rigorous services it meets API-611.

The couplings are manufactured in accordance with ANSI/AGMA 9000 class 9.

The couplings are balanced on each component individually, after they are tooled with the same system as for the Impellers.

The coupling guard is sparkproof and made of brass.

The coupling guards meet the prevailing safety standards.

## **DESIGN OF BASEPLATES**

The baseplate completely covers the pump, motor and piping.

All the elements, such as flanges and pipes, are situated inside the drainage perimeter to collect escapes.

As a standard it is built with laminated welded sections to concrete. It includes:

- Baseplate levelling bolts.
- Central collection tray, 1% slope with 2" NPT connection.
- 4 raising points with eyebolt or lobes.
- Axial and transversal alignment screws.
- As a standard it is not closed.
- The alignment screw positioning lobes are placed so that they do not interfere with the assembly and disassembly of the motors.
- Pump block: they are built with solid rims all over except for requests for refrigerated blocks in which case they are hollow.
- Under pump block and pin: sections exist, so that what is stated in the standard as regards loads in nozzles is met.
- Motor blocks: they are tooled 3 mm below what is necessary and parallel with maximum tolerances of 150 microns/m. of support distance.
- Lower part of base: it is welded with continuous welding between structural members, it remains open and it is on one plane to be able to level it. It is accessible for concrete in all sections.
- The base measurements are in accordance with Appendix M of API-610 and designed for concreting. They are named from 0.5 to 12.
- The exterior edges of the bases are rounded with a radius of 50 mm according to Appendix M, figure M-1.
- In all cases the motor-side coupling is supplied completely tooled and instructions are provided.

### **OPTIONAL**

The baseplate can have a drain rim with upper plate, completely closed and ready for concreting.

In this case holes are planned for concreting  $\Delta$  100 mm on each base opening.

It has a raised edge of a minimum of 13 mm. On the opposite side vent holes of 13 mm minimum  $\varnothing$  are planned

## **OPERATION**

The standard operation is by electric asynchronous motor, although it can be by turbine or internal combustion engine directly joined to the pump, or through a reducer.

The minimum nominal power is as follows:

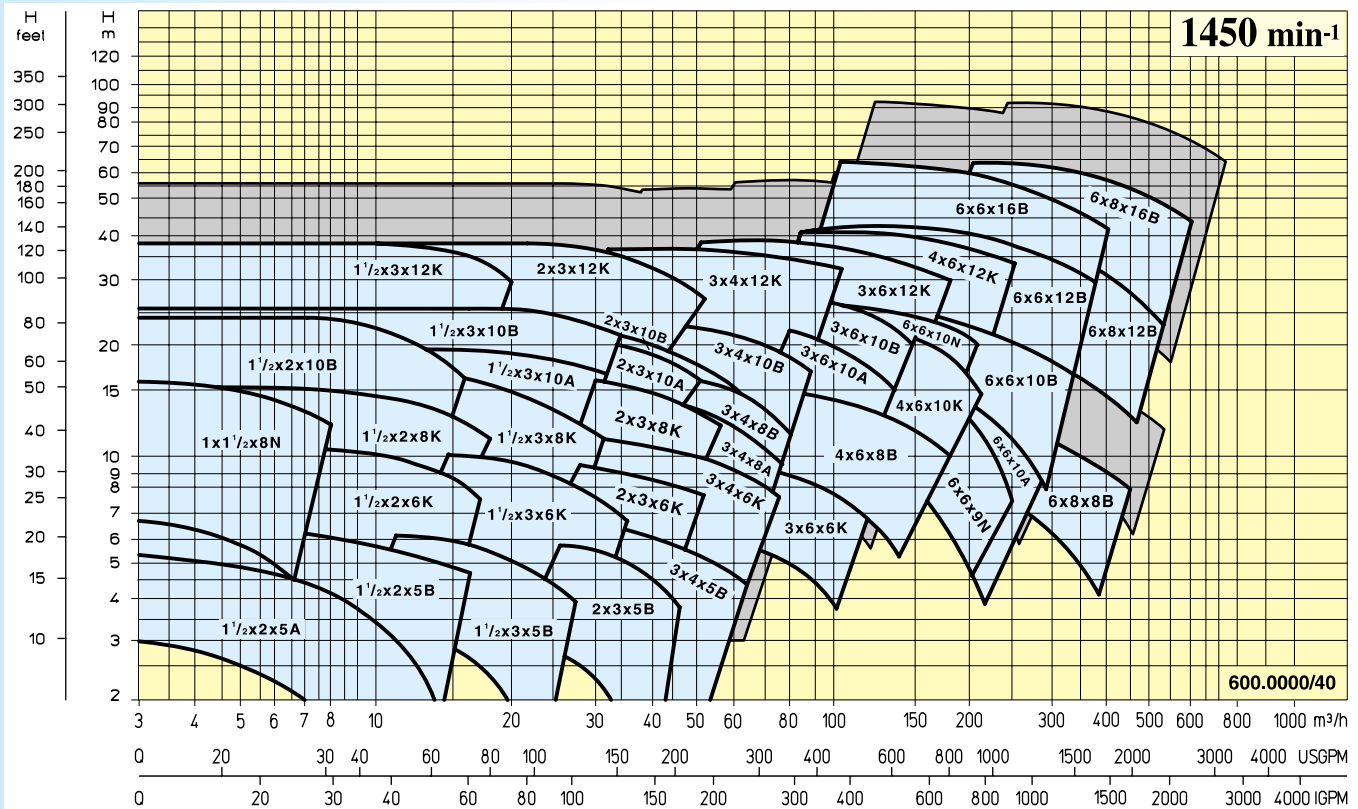
|          |                                   |
|----------|-----------------------------------|
| < 22 kW  | percentage of power absorbed 125% |
| 22-55 kW | percentage of power absorbed 115% |
| > 55 kW  | percentage of power absorbed 110% |

The steam turbines must meet ISO 10436 (API 611) and be designed for 110% of the maximum power required.

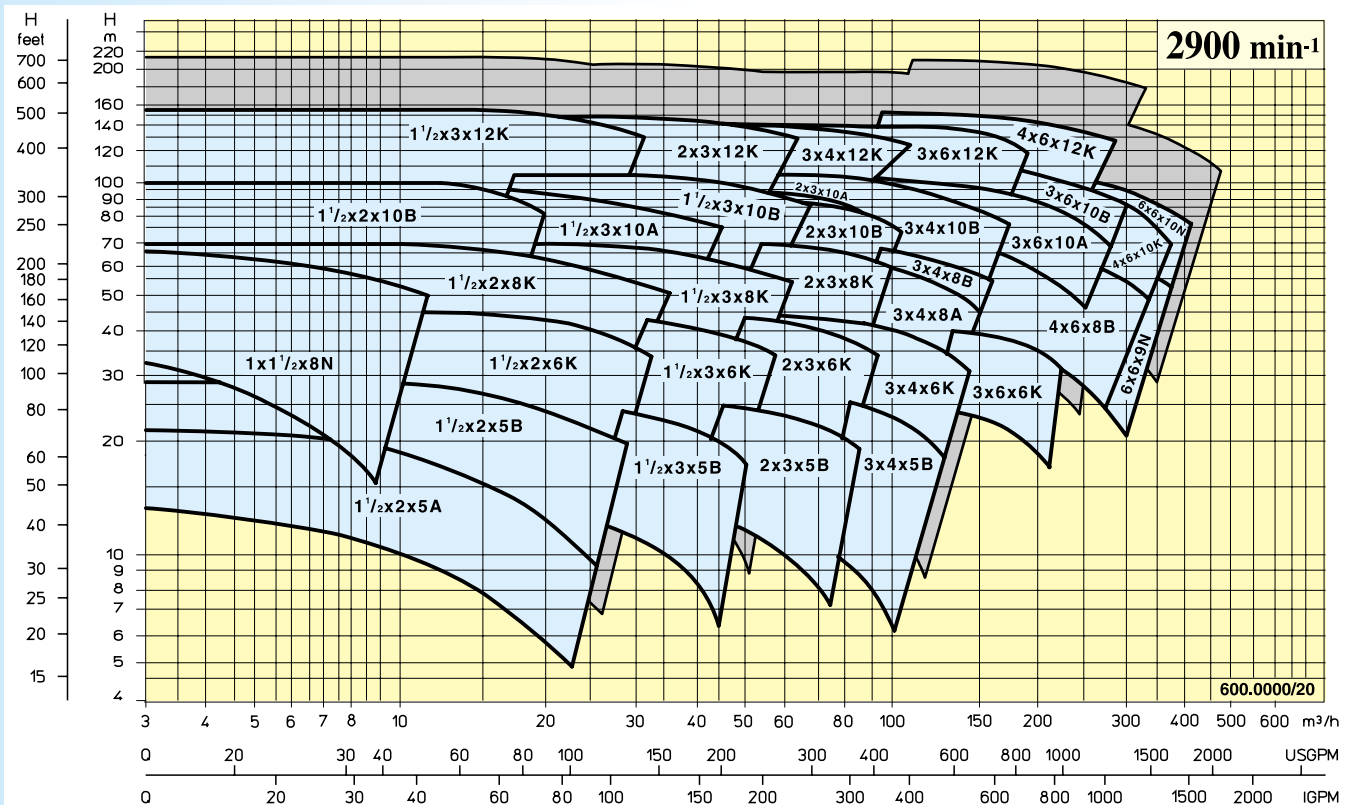
The reducers meet API-677.

## SELECTION DIAGRAMS

The following diagrams at 1450 and 2900 rpm (50Hz) and their respective extensions at 60 Hz pre-situate the operation range of the different pump models. For each particular case and in accordance with the operation, margin available of impeller diameter, required NPSH, improvements by inducer, corrections for viscosity, ..., request the specific curve of the pump with its performances, absorbed power, etc.



Extension of the services at 60 Hz (1750 and 3500 rpm respectively)



## STANDARD MATERIALS

The standard materials in the manufacture of the NP8 Series pumps are selected according to table E-1 of API-610, standardised by ITUR. Other materials are possible as an option. Please consult our Engineering Department.

| Ref. | Component             | Location         | STANDARD RUNNING |               |               |               |               |               |
|------|-----------------------|------------------|------------------|---------------|---------------|---------------|---------------|---------------|
|      |                       |                  | S1               | S5            | S6 (1)        | S8            | C6 (1)        | A8            |
| 102  | Spiral casing         |                  | A216-WCB         | A216-WCB      | A216-WCB      | A216-WCB      | CA6NM         | CF3M          |
| 502  | Casing wear ring      | Pump             | GG-25            | CA6NM (2)     | CA6NM         | AISI-316L     | CA6NM         | AISI-316L     |
| 400  | Gasket                | Pump/Pump cover  | AISI-316+GRAF    | AISI-316+GRAF | AISI-316+GRAF | AISI-316+GRAF | AISI-316+GRAF | AISI-316+GRAF |
| 161  | Pump cover            |                  | A216-WCB         | A216-WCB      | A216-WCB      | A216-WCB      | CA6NM         | CF3M          |
| 502  | Cover wear ring       | Cover            | GG-25            | CA6NM (2)     | CA6NM         | AISI-316L     | CA6NM         | AISI-316L     |
| 203  | Impeller              |                  | GG-25            | CA6NM         | CA6NM         | CF3M          | CA6NM         | CF3M          |
| 503  | Impeller wear ring    | Before and after | GG-25 (4)        | CA6NM         | CA6NM         | AISI-316L     | CA6NM         | AISI-316L     |
| 922  | Impeller blocking nut |                  | AISI-316L        | AISI-316L     | AISI-316L     | AISI-316L     | AISI-316L     | AISI-316L     |
| 210  | Shaft                 |                  | AISI-4140        | AISI-4140     | AISI-431B     | AISI-316L     | AISI-431B     | AISI-316L     |
| 940  | Key                   | Impeller         | AISI-316         | AISI-316      | AISI-316      | AISI-316      | AISI-316      | AISI-316      |
| 350  | Bearings support (3)  |                  | GG-25            | GG-25         | GG-25         | GG-25         | GG-25         | GG-25         |

(1) Running S6 and C 6 are not possible for liquids with presence of SH2 (sulphuric acid).

(2) For liquids with presence of SH2 (sulphuric acid) CF3M material is used.

(3) For toxic or inflammable liquids, the bearing support is made of A216-WCB.

(4) The impeller is made of CA6NM instead of GG-25 in the following types of pumps: 1x1<sup>1/2</sup>x8N; 1<sup>1/2</sup>x2x5A/B; 1<sup>1/2</sup>x2x6K; 1<sup>1/2</sup>x2x8K; 1<sup>1/2</sup>x3x5B; 1<sup>1/2</sup>x3x6K; 1<sup>1/2</sup>x3x8K; 1<sup>1/2</sup>x3x12K; 2x3x5B; 2x3x6K; 2x3x8K; 2x3x12K; 3x4x5B; 3x4x6K; 3x4x12K; 3x6x6K; 3x6x12K; 4x6x10K; 4x6x12K.

## RECOMMENDED SPARES

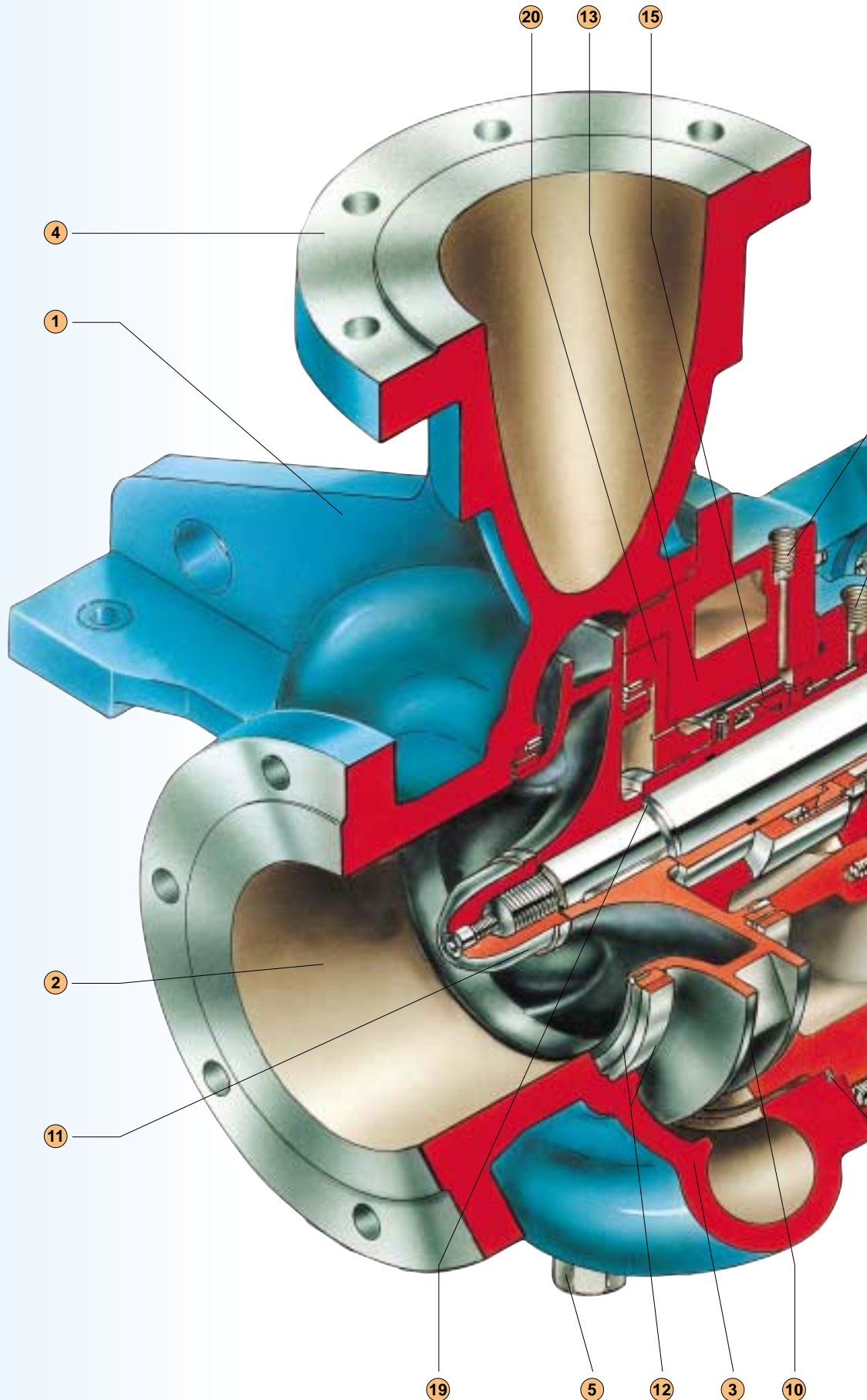
When the pumps are for critical service, the recommended spare is a complete rotating unit, including the bearings support.

For all other cases, the recommended spares are indicated in the following table.

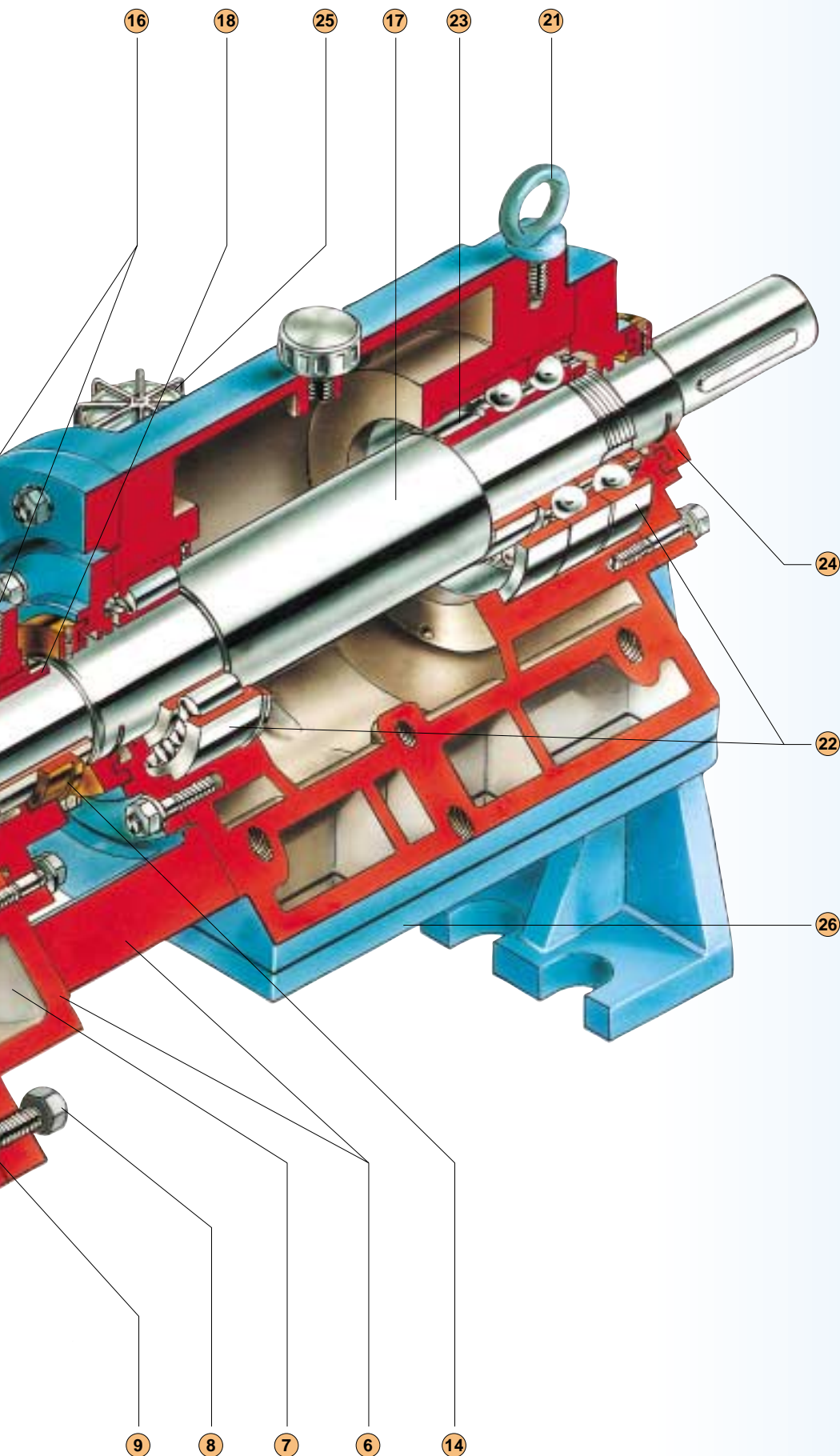
| CONCEPT  | START UP |       |     | MAINTENANCE NORMAL > 1 YEAR |       |       |      | OBSERVATIONS      |
|--|----------|-------|-----|-----------------------------|-------|-------|------|-------------------|
|  | 1 - 3    | 4 - 6 | ≥ 7 | 1 - 3                       | 4 - 6 | 7 - 9 | ≥ 10 |                   |
| Number identical pumps = N                                       |          |       |     |                             |       |       |      |                   |
| Bareshaft pump   |          |       |     | 1                           | 1     | 1     | 1    | Servicio vital    |
| Bareshaft pump without cartridge                                 |          |       |     | 1                           | 1     | 1     | 1    | Servicio vital    |
| Shaft + nuts + bearings + sleeve + rotative mechanical seal port |          |       |     | 1                           | 1     | 1     | 1    | Servicio esencial |
| Pump casing with studs   |          |       |     |                             |       |       | 1    |                   |
| Casing + pump cover  |          |       |     |                             |       |       | 1    |                   |
| Bearings support   |          |       |     |                             |       |       | 1    |                   |
| Shaft + nuts   |          |       |     | 1                           | 1     | 2     | N/3  |                   |
| Impeller   |          |       |     | 1                           | 1     | 2     | N/3  |                   |
| Set of wear rings  | 1        | 1     | 1   | 1                           | 1     | 2     | N/3  |                   |
| Roller bearings  | 1        | 1     | 2   | 1                           | 2     | N/3   | N/3  |                   |
| Set of ball bearings   | 1        | 1     | 2   | 1                           | 2     | N/3   | N/3  |                   |
| Mechanical seal cartridge  | 1        | 2     | N/3 | 1                           | 2     | N/3   | N/3  |                   |
| Shaft sleeve   | 1        | 2     | N/3 | 1                           | 2     | N/3   | N/3  |                   |
| Set of gaskets + motor shims                                     | 1        | 2     | N/3 | 1                           | 2     | N/3   | N/3  |                   |



- 1 34 sizes of axial suction and radial discharge with "centerline" support. Some models take two types of impeller, the series has a total of 40 different models.
- 2 Suction designed to house the inducer if necessary.
- 3 Standard design pressure 40 bar, with a corrosion allowance of 3 mm. Special designs up to 120 bar.
- 4 Standard ANSI 300 lb. RF flanges. Other ratings are possible as an option.
- 5 Standard supply with line at welded base limit with brace welded to the casing, with or without valve.
- 6 The pump cover and the support supplement form one sole cast piece, which gives the unit greater rigidity.
- 7 Cooling/heating chamber casing cover, with its connections for the piping.
- 8 Cover jackscrew.
- 9 Spiral wound gasket joint, in metal-metal contact.
- 10 High performance hydraulic impeller and low NPSH required. It has a minimum internal roughness checked by endoscope.
- 11 Oval nut holding the impeller against the sleeve, fixed with a screw.
- 12 Wear rings on casing, cover and both horns of the impeller, fixed to their respective parts with a threaded pin. Operation clearance according to API-610, and hardness differences greater than 50 Brinell. In the case of semi-open impeller, it is built with wear plates on the body and the cover.
- 13 Mechanical seal box self-venting, dimensioned according to API-610.



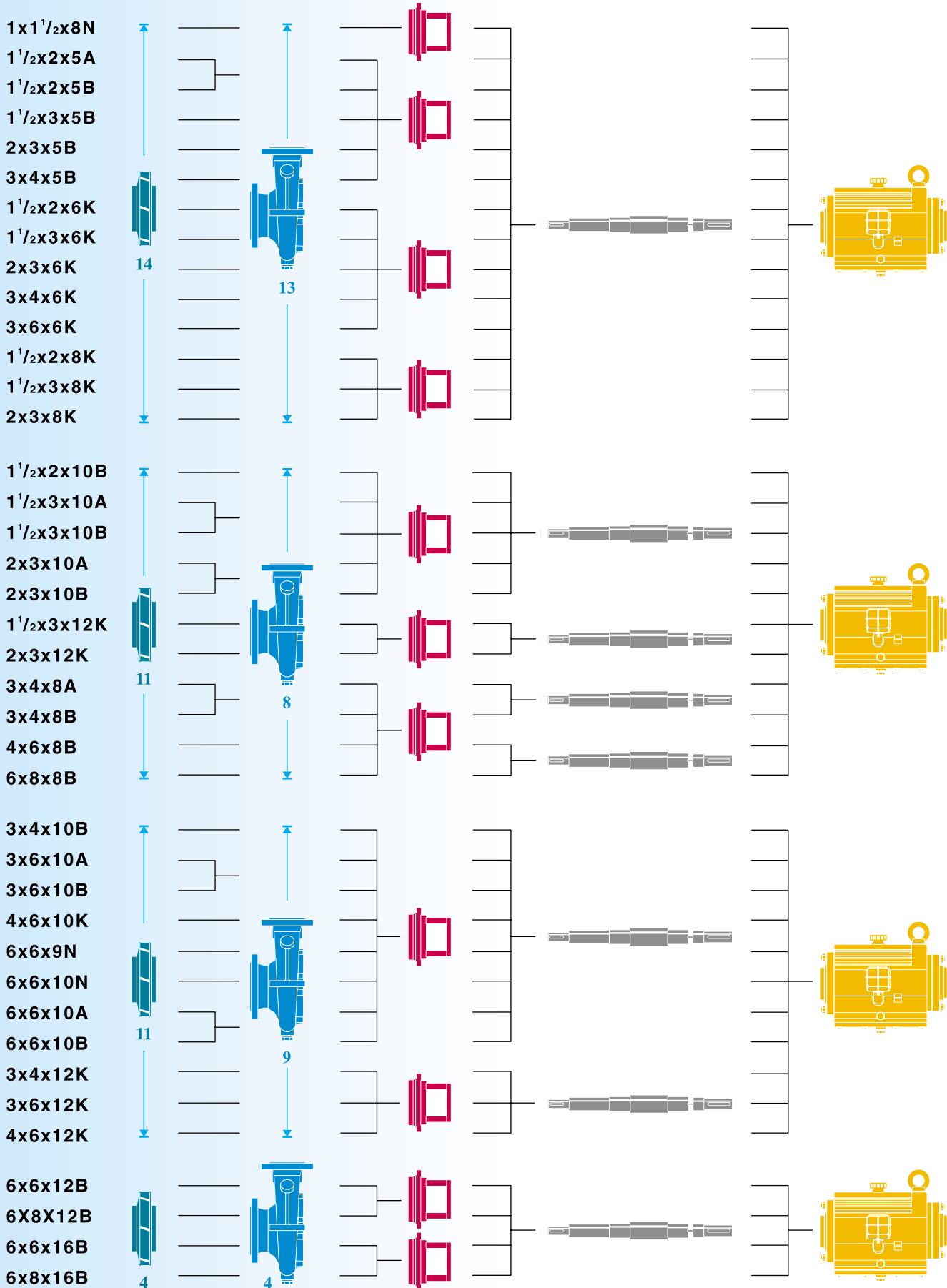




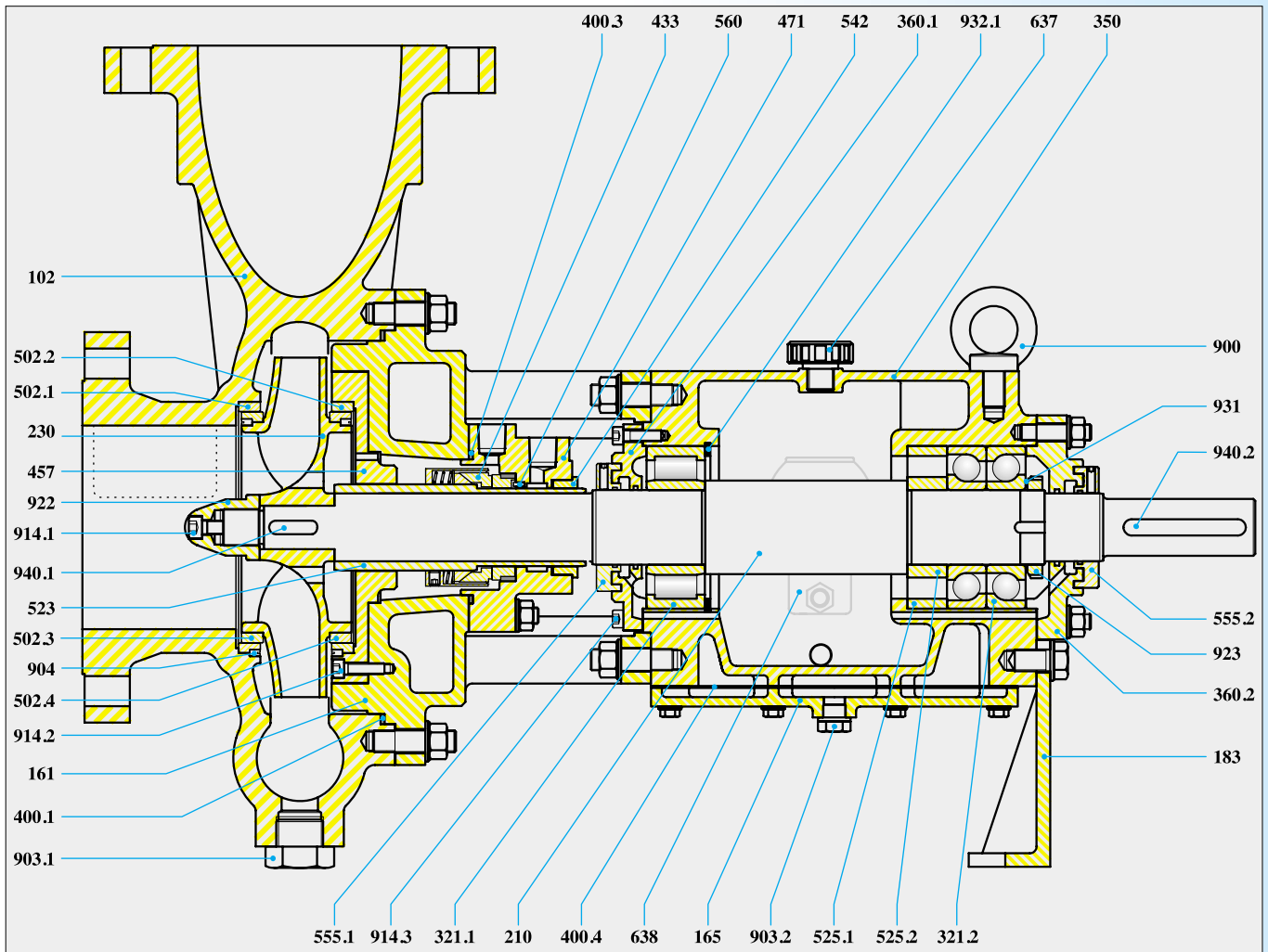
- 14 Sparkproof drainage ring for single mechanical seal.
- 15 Balanced mechanical seal in a cartridge type.
- 16 Connections for the different API mechanical seal circulation and cooling plans.
- 17 Smooth section changes in the shaft to avoid tensions. Overdimensioning to support extreme situations, designed for a bend at mechanical seal less than 0.050 mm.
- 18 The thickness of the shaft sleeve is much greater than 2.5 mm, and its material is abrasion and corrosion resistant. The section change in the sleeve for balanced mechanical seal is smooth, rounded or bevelled.
- 19 Sealing of the shaft sleeve using gasket compatible with the fluid (metallic spiral wound or metallic made of soft material).
- 20 Standard execution with back ring with vent orifice on the upper part, designed for one single assembly position.
- 21 One or two eyebolts (according to the size) to hang the pump.
- 22 Generous spacing between the bearings, dimensioned for an L10 average life, over 25000 hours of continuous operation in standard conditions.
- 23 The support is designed to house a third back bearing, to support large axial loads (e.g. high suction pressure).
- 24 Specially designed labyrinth ring, with sealed chamber, in spark-proof and slip material.
- 25 Constant level deposit with heat-resistant glass, protected by steel mesh.
- 26 Execution with oil refrigeration chamber situated in the lower part of the support, optional connection and easily disassembled.

## MODULARITY AND INTERCHANGEABILITY

The modular design of the **NP8 Series** has been carefully studied, making possible a high level of parts interchangeability.



**CROSS SECTIONAL DRAWING**

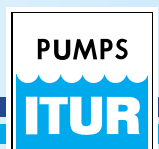


Standard pump with closed impeller and balanced mechanical seal.

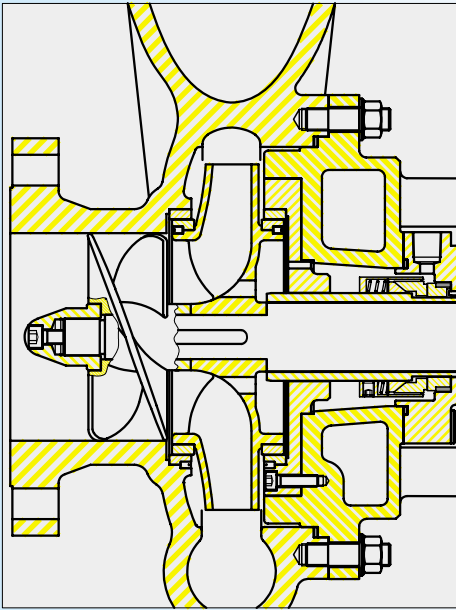
| Ref.  | Name of component        |
|-------|--------------------------|
| 102   | Pump casing              |
| 161   | Pump cover               |
| 165   | Cooling support cover    |
| 183   | Foot                     |
| 210   | Pump shaft               |
| 230   | Impeller                 |
| 321.1 | Front bearing            |
| 321.2 | Back bearings            |
| 350   | Bearing support          |
| 360.1 | Front bearing cover      |
| 360.2 | Back bearing cover       |
| 400.* | Gasket                   |
| 433   | Mechanical seal          |
| 457   | Back ring                |
| 471   | Seal gland               |
| 502.1 | Casing wear ring         |
| 502.2 | Cover wear ring          |
| 502.3 | Front impeller wear ring |
| 502.4 | Back impeller wear ring  |
| 523   | Shaft sleeve             |

| Ref.  | Name of component         |
|-------|---------------------------|
| 525   | Spacer ring               |
| 542   | Seal drainage ring        |
| 555.1 | Front labyrinth ring      |
| 555.2 | Back labyrinth ring       |
| 560   | Pin                       |
| 637   | Oil filler plug           |
| 638   | Oil level constant        |
| 900   | Eyebolt screw             |
| 903.1 | Drainage cap              |
| 903.2 | Cooling chamber cap       |
| 904   | Wear ring fixing screw    |
| 914.1 | Impeller nut fixing screw |
| 914.2 | Allen screw               |
| 914.3 | Allen screw               |
| 922   | Impeller nut              |
| 923   | Bearing fixing nut        |
| 931   | Lockwasher                |
| 932   | Safety ring               |
| 940.1 | Impeller key              |
| 940.2 | Operation key             |

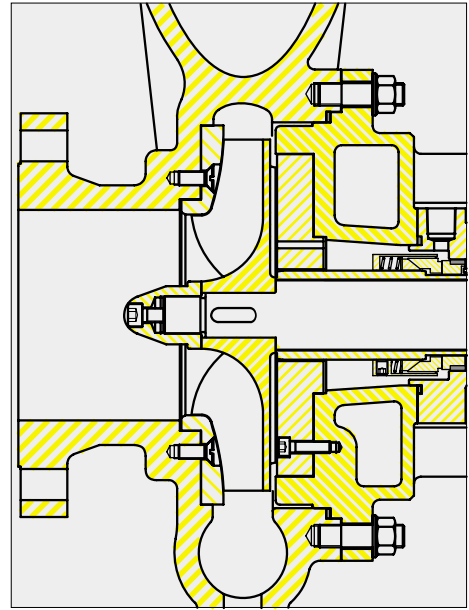
NOTE.- ITUR Pumps practices a policy of continual development of its models. For this reason specifications are subject to change without notice.



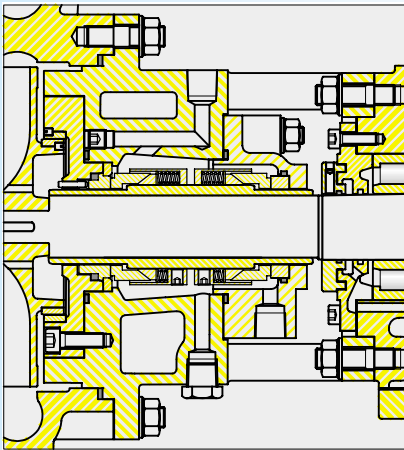
■ CROSS SECTIONAL DRAWING (DETAILS OF THE POSSIBLE VERSIONS)



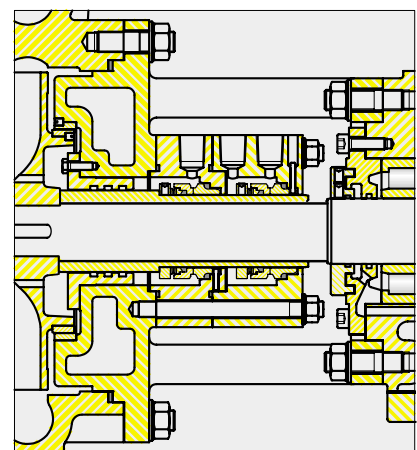
Pump with inducer



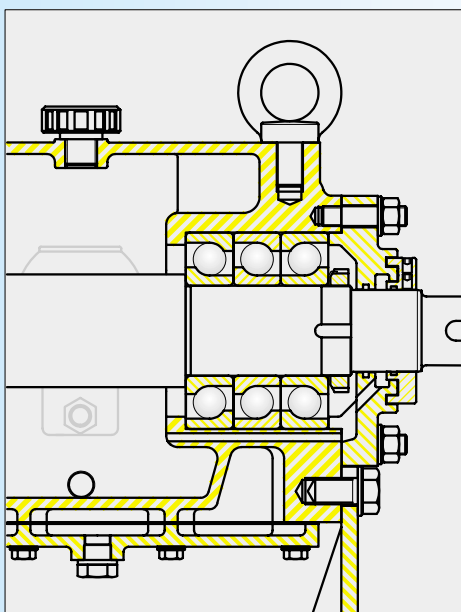
Pump with semiopen impeller



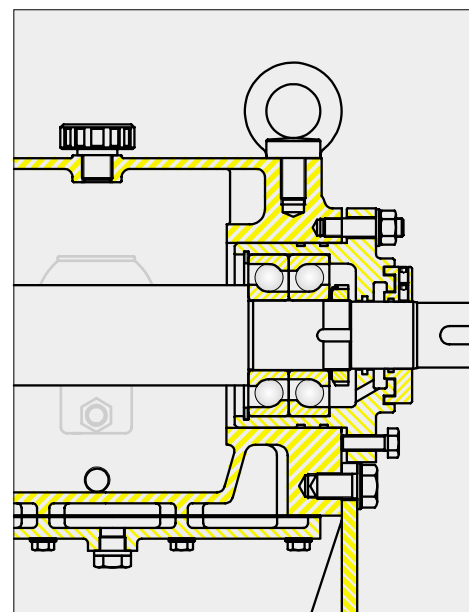
Double mechanical seal back to back



Tandem mechanical seal

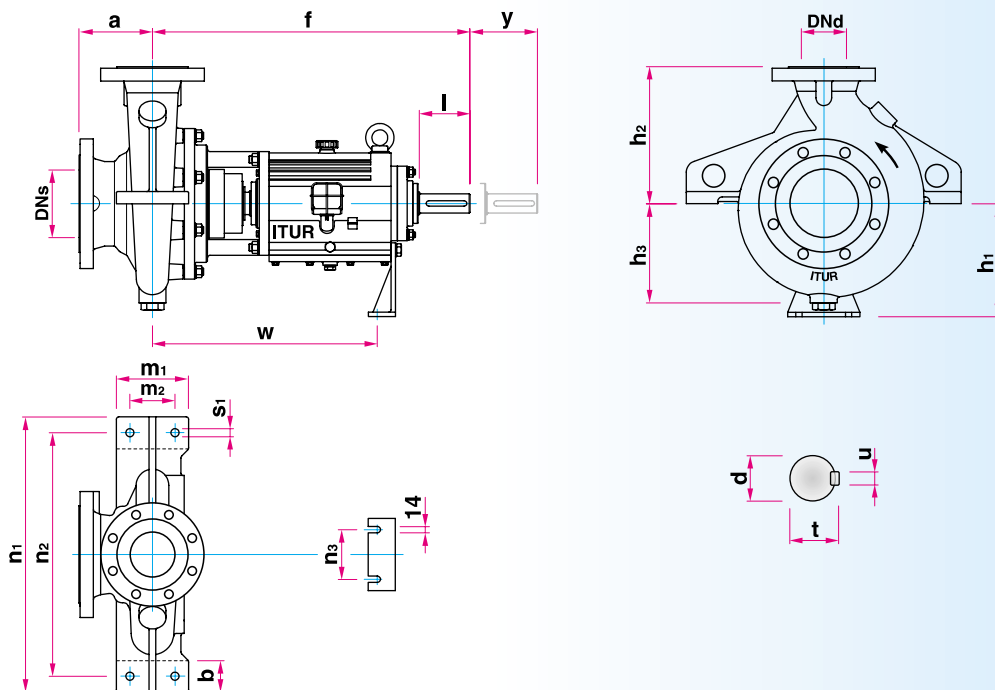


Support with three axial antifriction bearings

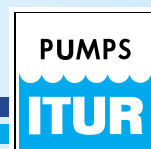


Support with axial adjustable bearing box

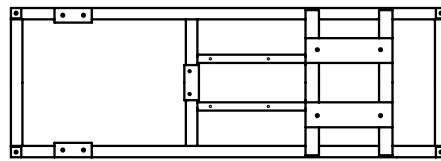
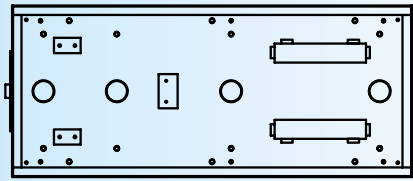
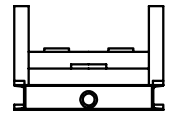
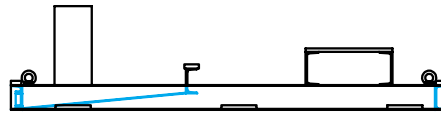
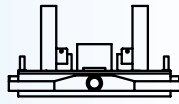
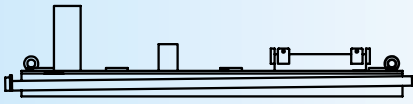
**BARESHAF T PUM P DIMENSIONS**



| Pump Type<br>NP8 | Flanges in inches |       | Dimensions in mm |     |                |                |                |                 |                |                |                |                |                |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
|------------------|-------------------|-------|------------------|-----|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|------|-----------|-----|----|----|-----|-----|-----|-----|-----|----|----|----|----|
|                  | DNd               | DNs   | Pump dimensions  |     |                |                |                | Foot dimensions |                |                |                |                |                |                |     | Sup. | Shaft end |     |    |    |     |     |     |     |     |    |    |    |    |
|                  |                   |       | a                | f   | h <sub>1</sub> | h <sub>2</sub> | h <sub>3</sub> | b               | m <sub>1</sub> | m <sub>2</sub> | n <sub>1</sub> | n <sub>2</sub> | n <sub>3</sub> | s <sub>1</sub> | w   |      | y         | d   | l  | t  | u   |     |     |     |     |    |    |    |    |
| 1x1 1/2x8N       | 1"                | 11/2" | 100              | 577 | 180            | 180            | 137            | 40              | 90             | 55             | 360            | 320            | 110            | 14             | 447 | 100  | 32        | 57  | 35 | 10 |     |     |     |     |     |    |    |    |    |
| 1 1/2x2x5A       | 1 1/2"            | 2"    | 100              | 577 | 180            | 150            | 120            | 50              | 100            | 60             | 340            | 290            | 110            | 18             | 450 | 100  | 32        | 82  | 35 | 10 |     |     |     |     |     |    |    |    |    |
| 1 1/2x2x5B       |                   |       | 100              | 577 | 180            | 150            | 120            | 50              | 100            | 60             | 340            | 290            |                |                | 450 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x2x6K       |                   |       | 105              | 582 | 180            | 180            | 125            | 50              | 100            | 60             | 350            | 300            |                |                | 455 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x2x8K       |                   |       | 105              | 581 | 180            | 180            | 150            | 45              | 105            | 65             | 390            | 345            |                |                | 454 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x2x10B      |                   |       | 125              | 605 | 200            | 225            | 185            | 50              | 125            | 85             | 460            | 410            |                |                | 454 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x3x5B       | 1 1/2"            | 3"    | 125              | 577 | 180            | 160            | 130            | 50              | 100            | 60             | 360            | 310            | 110            | 18             | 450 | 100  | 32        | 82  | 35 | 10 |     |     |     |     |     |    |    |    |    |
| 1 1/2x3x6K       |                   |       | 112              | 583 | 180            | 180            | 135            | 50              | 100            | 60             | 370            | 320            |                |                | 456 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x3x8K       |                   |       | 125              | 581 | 180            | 200            | 155            | 50              | 105            | 65             | 420            | 370            |                |                | 454 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x3x10A      |                   |       | 125              | 605 | 200            | 225            | 190            | 50              | 125            | 85             | 475            | 425            |                |                | 455 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x3x10B      |                   |       | 125              | 605 | 200            | 225            | 190            | 50              | 125            | 85             | 475            | 425            |                |                | 455 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 1 1/2x3x12K      |                   |       | 125              | 613 | 225            | 280            | 210            | 60              | 125            | 80             | 530            | 470            |                |                | 463 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 2x3x5B           |                   |       | 2"               | 3"  | 125            | 577            | 180            | 180             | 145            | 50             | 100            | 60             |                |                | 390 |      |           |     |    |    | 340 | 110 | 18  | 450 | 100 | 32 | 82 | 35 | 10 |
| 2x3x6K           | 125               | 585   |                  |     | 180            | 200            | 150            | 50              | 105            | 65             | 410            | 360            | 458            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 2x3x8K           | 125               | 581   |                  |     | 180            | 225            | 167            | 50              | 105            | 65             | 450            | 400            | 454            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 2x3x10A          | 125               | 605   |                  |     | 200            | 250            | 195            | 50              | 125            | 85             | 490            | 440            | 455            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 2x3x10B          | 125               | 605   |                  |     | 200            | 250            | 195            | 50              | 125            | 85             | 490            | 440            | 455            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 2x3x12K          | 130               | 613   |                  |     | 225            | 280            | 215            | 60              | 130            | 80             | 550            | 490            | 463            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x4x5B           | 3"                | 4"    |                  |     | 125            | 577            | 180            | 200             | 152            | 50             | 105            | 65             | 410            | 360            | 110 | 18   | 450       | 100 | 32 | 82 | 35  |     |     | 10  |     |    |    |    |    |
| 3x4x6K           |                   |       | 130              | 587 | 180            | 225            | 155            | 50              | 125            | 80             | 430            | 380            | 460            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x4x8A           |                   |       | 125              | 605 | 180            | 250            | 175            | 60              | 130            | 85             | 470            | 410            | 455            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x4x8B           |                   |       | 125              | 605 | 180            | 250            | 175            | 60              | 130            | 85             | 470            | 410            | 455            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x4x10B          |                   |       | 160              | 705 | 225            | 250            | 205            | 70              | 130            | 80             | 550            | 480            | 513            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x4x12K          |                   |       | 140              | 707 | 250            | 300            | 235            | 60              | 130            | 80             | 570            | 510            | 515            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x6x6K           |                   |       | 3"               | 6"  | 140            | 589            | 180            | 250             | 175            | 60             | 125            | 80             | 500            | 440            |     |      | 110       |     |    |    |     | 18  | 462 |     | 100 | 32 | 57 | 35 | 10 |
| 3x6x10A          | 160               | 705   |                  |     | 225            | 280            | 212            | 70              | 140            | 90             | 570            | 500            | 514            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x6x10B          | 160               | 705   |                  |     | 225            | 280            | 212            | 70              | 140            | 90             | 570            | 500            | 514            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 3x6x12K          | 160               | 707   |                  |     | 250            | 315            | 240            | 60              | 130            | 80             | 600            | 540            | 515            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 4x6x8B           | 160               | 612   |                  |     | 200            | 280            | 205            | 60              | 130            | 85             | 550            | 490            | 462            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 4x6x10K          | 4"                | 6"    | 180              | 705 | 250            | 300            | 227            | 70              | 160            | 100            | 610            | 540            | 110            | 18             | 512 | 140  | 42        | 112 | 45 | 12 |     |     |     |     |     |    |    |    |    |
| 4x6x12K          |                   |       | 180              | 709 | 280            | 315            | 250            | 70              | 160            | 100            | 650            | 580            |                |                | 518 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 6x6x9N           |                   |       | 160              | 705 | 250            | 355            | 235            | 70              | 160            | 100            | 630            | 560            |                |                | 512 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 6x6x10N          | 6"                | 6"    | 160              | 705 | 250            | 355            | 235            | 70              | 160            | 100            | 630            | 560            | 110            | 18             | 512 | 140  | 42        | 112 | 45 | 12 |     |     |     |     |     |    |    |    |    |
| 6x6x10A          |                   |       | 180              | 708 | 280            | 380            | 255            | 60              | 160            | 100            | 660            | 600            |                |                | 516 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 6x6x10B          |                   |       | 180              | 708 | 280            | 380            | 255            | 60              | 160            | 100            | 660            | 600            |                |                | 516 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 6x6x12B          |                   |       | 180              | 755 | 315            | 380            | 265            | 70              | 160            | 100            | 690            | 620            |                |                | 562 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 6x6x16B          |                   |       | 180              | 755 | 315            | 450            | 295            | 70              | 170            | 110            | 740            | 670            |                |                | 562 |      |           |     |    |    |     |     |     |     |     |    |    |    |    |
| 6x8x8B           |                   |       | 6"               | 8"  | 200            | 627            | 315            | 370             | 280            | 60             | 160            | 100            |                |                | 720 |      |           |     |    |    | 660 | 110 | 23  | 472 | 180 | 32 | 82 | 35 | 10 |
| 6x8x12B          |                   |       |                  |     | 200            | 755            | 315            | 400             | 280            | 70             | 160            | 100            |                |                | 720 |      |           |     |    |    | 650 |     |     | 562 |     |    |    |    |    |
| 6x8x16B          | 200               | 755   |                  |     | 315            | 450            | 298            | 100             | 210            | 150            | 840            | 740            | 562            |                |     |      |           |     |    |    |     |     |     |     |     |    |    |    |    |



## BASEPLATES DESIGN



*Drain rim API baseplate*

*Drain pan API baseplate*



## ■ CONTROL PLAN AND TESTING OF THE NP8 SERIES

Throughout the whole manufacturing process the NP8 Series follows the Control Plan established through the appropriate Procedures and their corresponding Inspection Guidelines:

- Reception of raw materials
- Machined parts (during the process and at the end)
- Balancing of impellers
- Pump assembly
- Hydrostatic pressure test at room temperature of all the elements submitted to pressure.
- Performance and running tests.
- Painting
- Final product

**Bombas ITUR** have several automated test benches, with a wide range of permanently calibrated instruments and their corresponding valid certificates.

Different types of testing and inspections can be established on request, such as strip-tests, NDT, etc.



*The ISO-9001 Quality System, complemented with sophisticated high precision instruments, guarantees the quality of Bombas ITUR's products and services.*





C-INP8/A420-4 (06/02)

**PUMPS**

**ITUR**

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