

SUBMERSIBLE ELECTRIC PUMPS



 **AXFLOW**

— *Gruppo Aturia* —

SUBMERSIBLE PUMPS

Gruppo Aturia started developing the Submersible Pump for pumping water in agriculture and for distribution of water in the municipalities.

For these applications all the structural parts of the pumps are made of Grey Cast Iron.

Grey Cast Iron is a perfect material for clean and deep water, with good resistance to water corrosion.



Gruppo Aturia, in the 70s developed a series of Mixed-flow and Radial-flow pumps fully in Bronze, to extend the applications of the Submersible Pumps to brackish, volcanic and sea waters.

Bronze material, easy to cast, has excellent resistance to corrosion caused by sodium chloride (present in brackish and sea waters) and to the acids dissolved in the volcanic waters.

Gruppo Aturia, in the last decade, thanks to the development of low wax casting process for steel, developed a complete series (Mixed-flow and Radial-flow types) of stainless steel impellers to be used in the pumps with grey cast iron bodies.

Gruppo Aturia, in the 2007 designs a new series of Mixed-flow pumps from 6" to 12" fully in stainless steel.



PRODUCTION INCLUDES

The present range is manufactured for well diameters from 6" to 25".

- The hydraulic design has been oriented to obtain the maximum efficiencies and a stable Q / H performance curve.
- In order to optimize the pump life the mechanical design limited the number of wear and tear components.
- The impellers are dynamically balanced and splined to the shaft with entrainment key.
- The shafts are driven by coaxial bearing bushes and fully protected by sleeves to ease disassembling.
- All the pumps are provided with a build-in non-return valve, threaded and/or flanged, and low friction losses.
- All the pumps are manufactured in different materials (cast iron / bronze / stainless steel / duplex) to suit various applications.

RADIAL – FLOW PUMPSETS

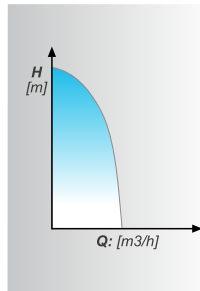
Radial solution allows the use of a high number of stages, to reach very high heads

MIXED - FLOW PUMPSETS

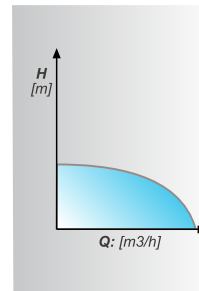
Semiaxial solution is used when higher flows are required for the same well diameter.



TYPES	WELLS
APN 14	6"
APM 14	6"
BG 8	8"
CG 10	10"
DG 12	12"

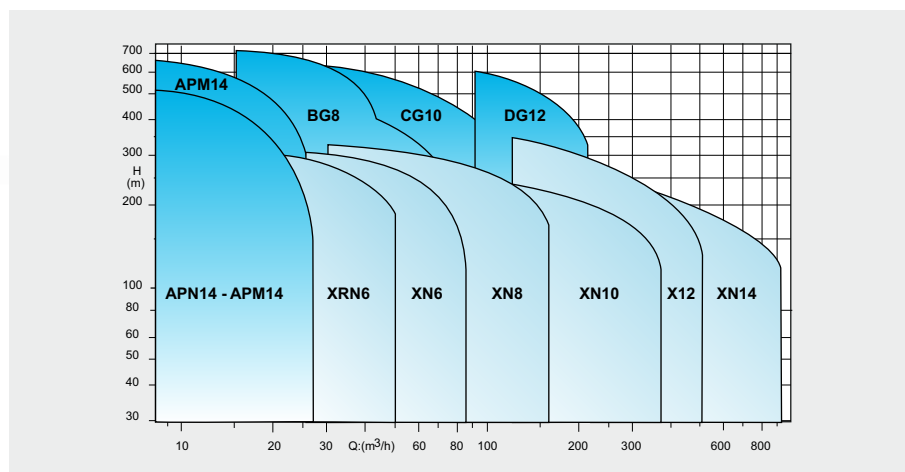


TYPES	WELLS
XRN 6	6"
XN 6	6"
XN 8	8"
XN 10	10"
X 12	12"
XN 14	14"



6" Submersible Pumpsets meet the required Minimum Efficiency Index (MEI) of ≥ 0.1 which has to be fulfilled from the 1st of January 2013

PERFORMANCES RANGE



TECHNICAL SPECIFICATIONS

RADIAL-FLOW PUMPSETS

- Flow rates up to	200 m³/h
- Heads up to	700 m
- Power up to	300 kW
- Max. content of solids (silt)	30 g/m³

MIXED-FLOW PUMPSETS

- Flow rates up to	800 m³/h
- Heads up to	330 m
- Power up to	400 kW
- Max. content of solids (silt)	50 g/m³

REWINDABLE SUBMERSIBLE MOTORS

In the Forties Gruppo Aturia started manufacturing electric submersible motors, worldwide patented. The present production is therefore the result of more than 60 years of research and development.

CONSTRUCTION

Asynchronous, three-phases Motor

- Winding: it is made with copper wire coated by a thermoplastic insulating material with high dielectric properties, suitable for operating in water.
- Rotor: squirrel cage type, dynamically balanced to guarantee regular operations without vibrations.
- Stator: external casing in stainless steel. Stator slots are open type.
- Thrust bearing pad: self-aligning and water lubricated.
- Drive bearings: in graphite or rubber, water lubricated.
- Shaft: in stainless steel. The shaft diameter is properly sized to avoid rotor deflections.
- Seal: rubber rings lip seal. Mechanical seal upon request. Seals are externally protected by a sand-guard.
- Breather diaphragm: in rubber. It allows water volume variations inside the motor according to operating temperature and submergence pressure.
- Motor filling fluid: water added with biodegradable liquid compatible with well water.
- Motor cable: in rubber.

Gruppo Aturia, along the last decade, adopted innovative design solutions for pumping hot water, hot hard water (with high content of calcium and magnesium bicarbonate) and water with suspended solids (e.g. for the well in mines) that deposit on motor surface.

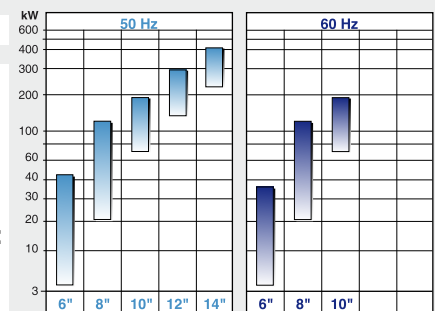
Gruppo Aturia has got several references, both in Italy and abroad.

Gruppo Aturia today is able to offer Submersible Pump-sets for applications:

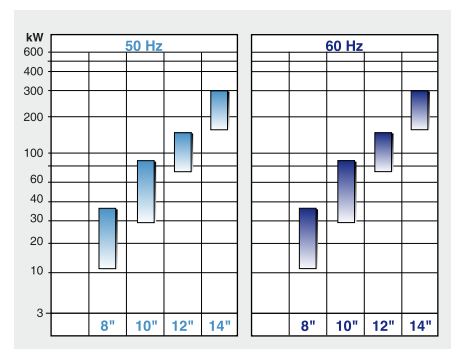
- Up to 60-65 °C with clean and sweet water.
- Up to 50-55 °C for hard water and/or with suspended solids.



kW - 2 Poles



kW - 4 Poles



SELECTION

How to select a submersible pumpset TM.

In order to correctly select the pump and the materials to be used, it is necessary to consider of the following factors:

Water characteristics

- Type of water (potable, salty, industrial, thermal, etc.)
- Sand contents in PPM [g/m^3]
- Temperature in $^{\circ}\text{C}$
- pH (acidity or alkalinity value)

Well type:

- Type of well (bored, artesian, tank)
- Depth in [m or ft].
- Internal diameter at point where pump will be installed.

Use:

- Free discharge at ground level
- Discharge into an elevated tank
- Discharge into a pressure tank
- Sprinkler irrigation
- Other uses.

Capacity:

- Q in m^3/h - l/min - l/sec - USGPM

Total manometric head:

(inclusive of all friction losses)

The total manometric head is calculated on the basis of the following parameters:

- Dynamic water level in the well at the required pumping capacity H_d in m.
- Geodetic head above ground level H_g :
 - Up to the highest water level in the elevated tank in m.
 - Up to the highest level of the discharge pipeline in m.
 - Highest pressure in the pressure tank or at the sprinklers in m.

Characteristics of the pipeline:

- Total length - diameter
- Type and maintenance state
- Number of elbows and valves

Power supply:

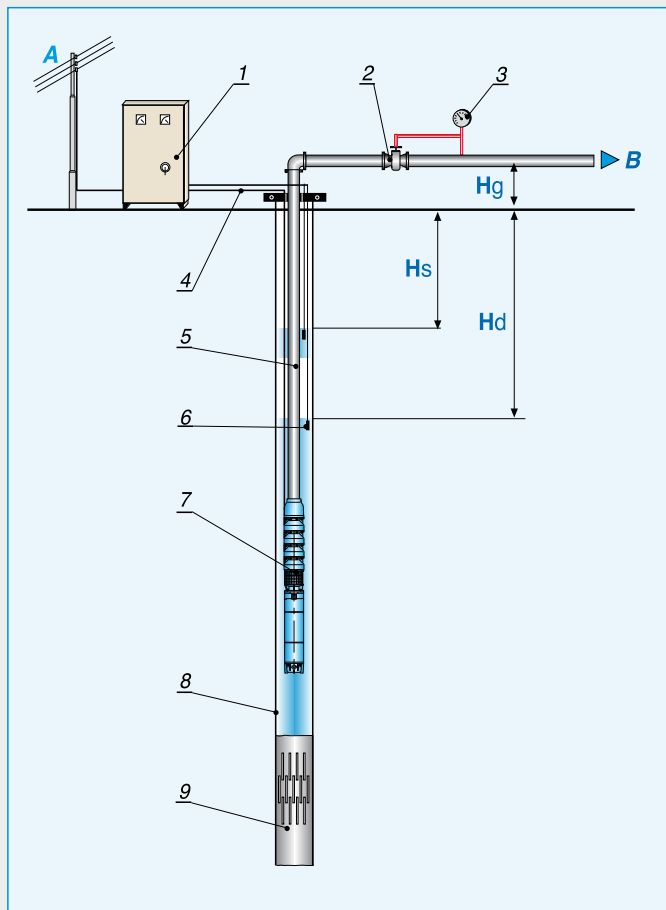
- Single or three phases
- Voltage value- Frequency
- Voltage and frequency changes in percent

Control panel:

- Manual - automatic

Starting system:

- Direct On/Line
- Statoric impedance- Star/Delta,
- Auto-Transformer
- Soft Starting - Frequency converter

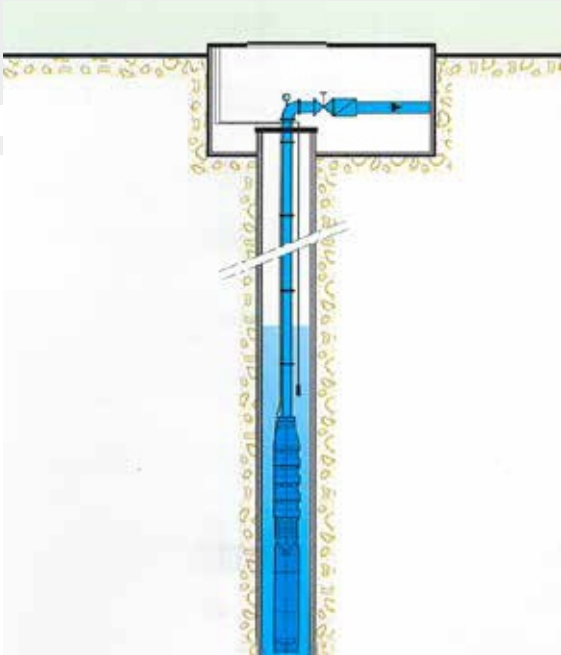


- 1 / Control panel
- 2 / Gate valve
- 3 / Pressure gauge
- 4 / Electric cable
- 5 / Riser pipe
- 6 / Electrode for low water level control
- 7 / Submersible pumpset
- 8 / Well
- 9 / Filter

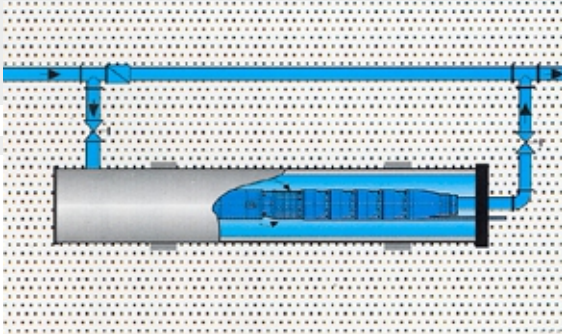
- A / Power supply
- B / User

- H_s : Static water level
- H_d : Dynamic water level
- H_g : Geodetic head

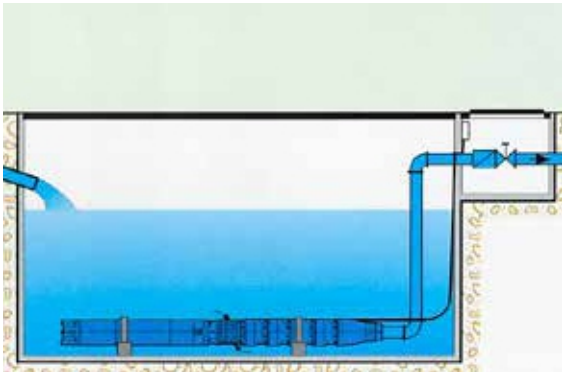
INSTALLATION



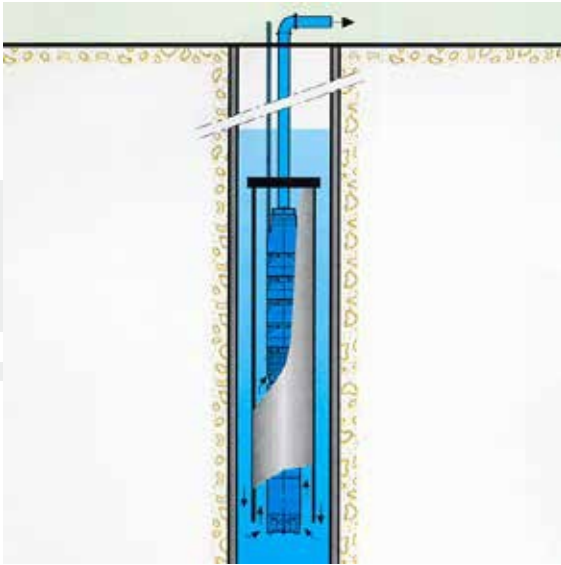
1- Well installation



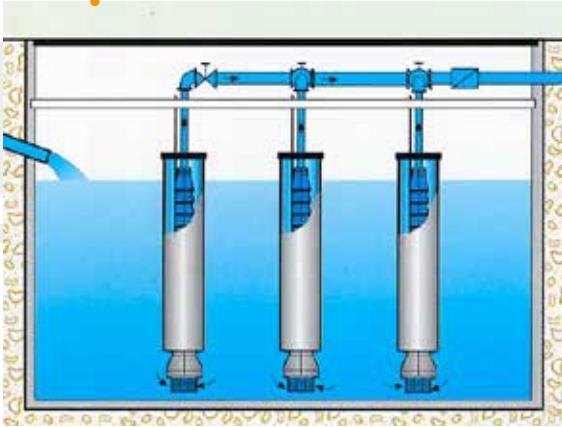
3- Horizontal installation as booster pump



4- Horizontal installation in tank



2- Well or tank installation with motor cooling jacket



5- Jacketed installation with foot valve for water supply