

## 2. Submersible pumps

### Features and benefits

#### A wide pump range

Grundfos offers energy-efficient submersible pumps ranging from 1 to 330 m<sup>3</sup>/h. The pump range consists of many pump sizes, and each pump size is available with an optional number of stages to match any duty point.

#### High pump efficiency

Often pump efficiency is a neglected factor compared to the price. However, the observant user will notice that price variations are without importance to water supply economics compared to the importance of pump and motor efficiencies.

#### Example

When pumping 200 m<sup>3</sup>/h at a head of 100 m for a period of 10 years, a normal pump consumes about 688,000 kWh. If the pump/motor efficiency is enhanced by 5 %, you can save about 34,000 EUR in energy cost, if the price is EUR 0.10/kWh.

#### Material and pumped liquids

To ensure the right wear resistance and reduce risk of corrosion, the pump ranges are available with different steel variants.

- **SP:** EN 1.4301
- **SP N:** EN 1.4401
- **SP R:** EN 1.4539

See specified material variants in *Pump range* on page 6. For further protection to corrosive environments, a complete range of zinc anodes for cathodic protection is available. See page 107.

#### Rubber components

For pumping liquid with risk of chemical residue or liquids > 60 °C, all pumps can be supplied with rubber components made of FKM elastomer.

#### Low installation costs

Stainless steel means low weight facilitating the handling of pumps and resulting in low equipment costs and reduced installation and service time.

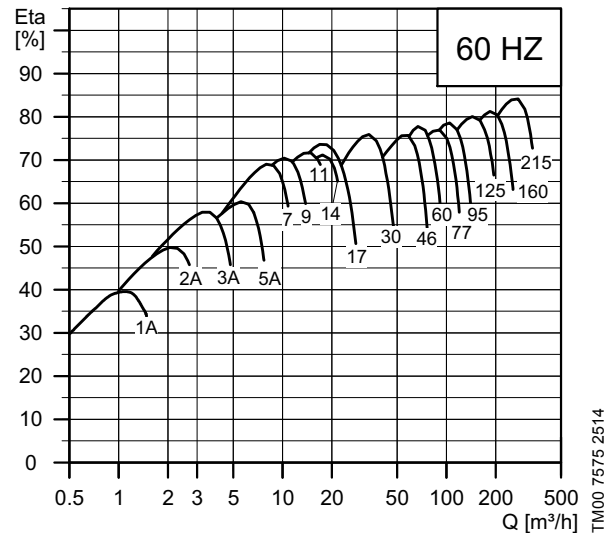


Fig. 1 Pump efficiencies in relation to flow

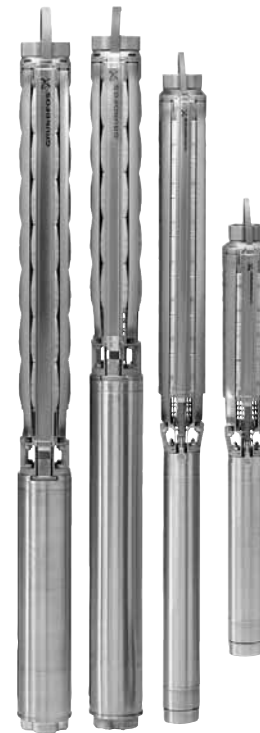


Fig. 2 Various SP pumps

### Bearings with sand channels

All bearings are water-lubricated and have a squared shape enabling sand particles, if any, to leave the pump together with the pumped liquid.

### Inlet strainer

The inlet strainer prevents particles over a certain size from entering the pump.

SP 1A to SP 5A with spline shaft strainer hole size:  $\varnothing 2.5$  mm.

SP 1A to SP 5A with smooth shaft strainer hole size: 2 x 20 mm.

SP 7 to SP 215 all smooth shaft strainer hole size: 4 x 20 mm.

### Non-return valve

All pumps have a reliable non-return valve in the valve casing preventing backflow in connection to pump stoppage.

Furthermore, the short closing time of the non-return valve means that the risk of destructive water hammer is reduced to a minimum.

The valve casing is designed for optimum hydraulic properties to minimise the pressure loss across the valve and thus to contribute to the high efficiency of the pump.

You can get the pump with and without non-return valve and also with a hole in so the raiser pipe can be emptied over time.

### Priming screw

All Grundfos pumps with radial impellers are fitted with a priming screw. Consequently, dry running is prevented because the priming screw ensures that the pump bearings are always lubricated.

SP pumps with semi-axial impellers require no priming screw. The pumps are primed automatically.

It applies to all pump types, however, neither pump nor motor will be protected against dry running if the water table is lowered to a level below the pump inlet.

### Stop ring

The stop ring prevents damage to the pump during transport and in case of upthrust in connection with startup.

The stop ring, which is designed as a thrust bearing, limits axial movements of the pump shaft.

The stationary part of the stop ring (A) is secured in the upper chamber.

The rotating part (B) is fitted above the split cone (C).

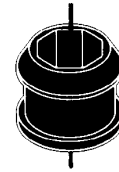


Fig. 3 Bearing

TM00 7301 1096

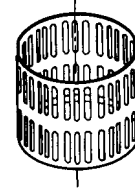


Fig. 4 Inlet strainer

TM00 7302 1096

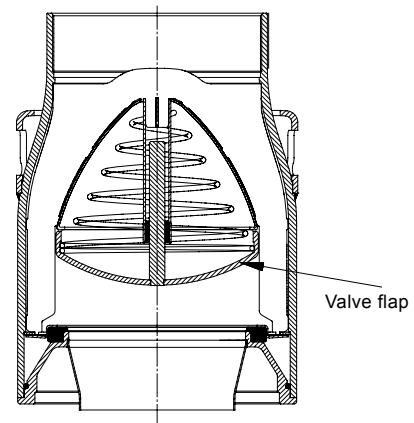


Fig. 5 Non-return valve

TM01 2499 1798

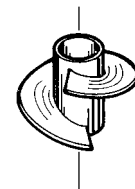


Fig. 6 Priming screw

TM00 7304 1096

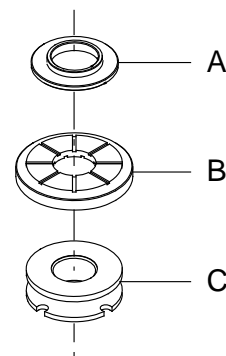


Fig. 7 Stop ring (rotating and stationary parts) and split cone

TM01 3327 3898

## Material specification (SP 1A - SP 5A)

Pos.	Component	Material	Standard	N-version	R-version
				(only SP3A, SP5A)	(only SP 5A)
EN					
1	Valve casing	Stainless steel	1.4301	1.4401	1.4539
2	Valve cup	Stainless steel	1.4301	1.4401	1.4539
3	Valve seat	Rubber type	NBR-FKM	NBR-FKM	NBR-FKM
7	Neck ring	Rubber type	NBR-FKM	NBR-FKM	NBR-FKM
8	Bearing	Rubber type	NBR-FKM	NBR-FKM	NBR-FKM
	Washer for stop ring	Carbon		Carbon/ graphite HY22 in PTFE mass	
9	Chamber	Stainless steel	1.4301	1.4401	1.4539
12	Impeller	Stainless steel	1.4301	1.4401	1.4539
14	Suction interconnector	Cast stainless steel	1.4308	1.4408	1.4517
	Strainer	Stainless steel	1.4301	1.4401	1.4539
16	Shaft complete	Stainless steel	1.4057	1.4460	1.4462
17	Strap	Stainless steel	1.4301	1.4401	1.4539
18	Cable guard	Stainless steel	1.4301	1.4401	1.4539

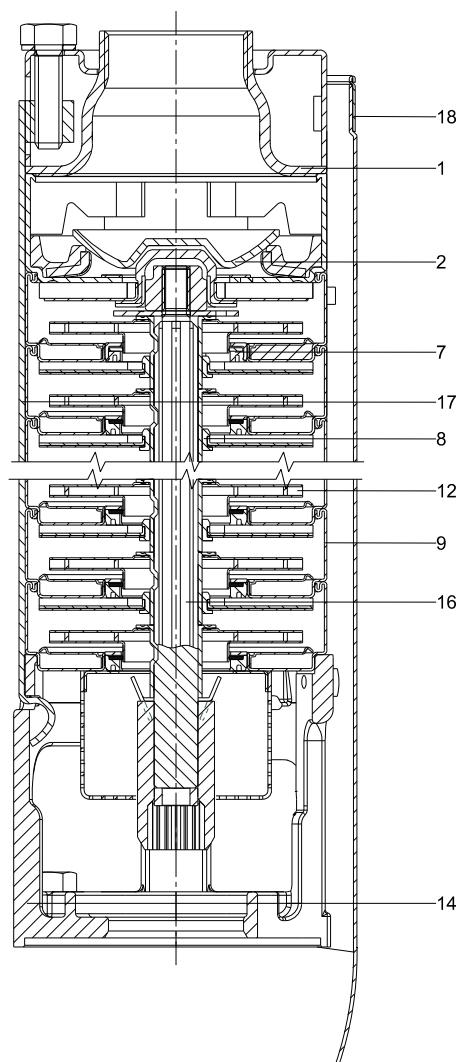
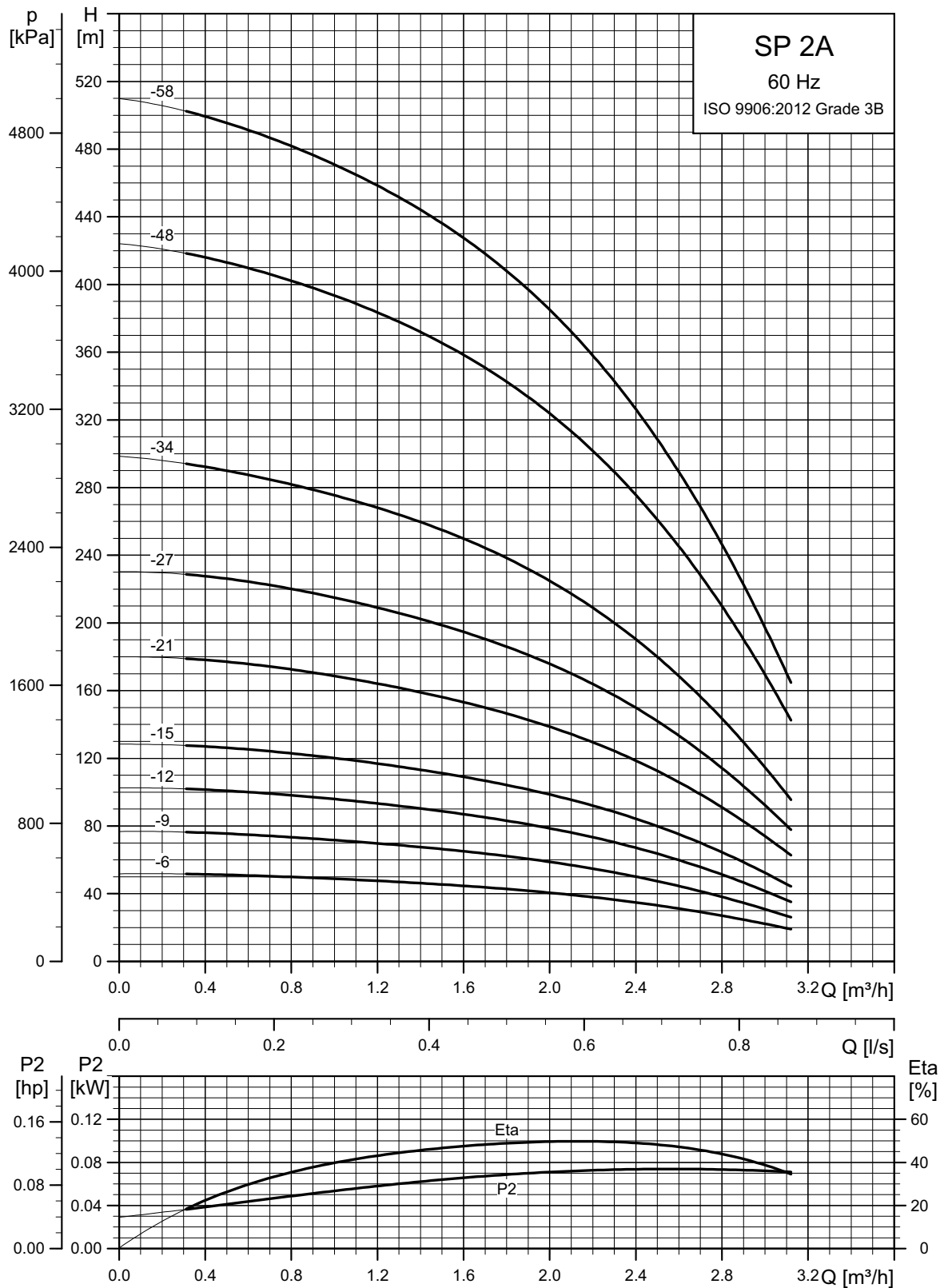


Fig. 8 Example SP 3A, pump with spline shaft.

TM06 1193 1614

# SP 2A

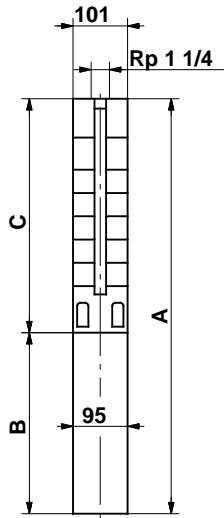
## Performance curves



See also *Curve conditions*, page 19.  
NPSH: Minimum inlet pressure 0.5 m.

TM01 3420 1802

Dimensions and weights



TM00 0955 1196

101 mm = Maximum diameter of pump inclusive of cable guard and motor.

Pump type	Motor			Dimensions [mm]				Net weight [kg]	
	Type	Power [kW]	C	B		A		Net weight [kg]	
				1 x 220 V	3 x 220 V 3 x 380 V 3 x 460 V	1 x 220 V	3 x 220 V 3 x 380 V 3 x 460 V	1 x 220 V	3 x 220 V 3 x 380 V 3 x 460 V
SP 2A-6	MS 402	0.25	281	256		537		10	
SP 2A-6	MS 402	0.37	281		226		507		9
SP 2A-9	MS 402	0.37	344	276	226	620	570	12	9
SP 2A-12	MS 402	0.55	407	291	241	698	648	13	11
SP 2A-15	MS 402	0.75	470	306	276	776	746	14	13
SP 2A-21	MS 402	1.1	596	346	306	942	902	17	15
SP 2A-27	MS 402	1.5	722		346		1068		18
SP 2A-34	MS 4000	2.2	914		453		1367		30
SP 2A-48	MS 4000	4.0	1208		573		1781		39
SP 2A-58 <sup>1)</sup>	MS 4000	4.0	1597	4	573		2170		50

<sup>1)</sup>SP 2A-58 are mounted in sleeve for R 1 1/4 connection and with a maximum diameter of 108 mm.

SP 2A-6 up to SP 2A-21 are pumps with spline shaft.

SP 2A-27 up to SP 2A-58 are pumps with smooth shaft.

All the pumps are only available in stainless steel EN 1.4301/ AISI 304.