

Water-jet pump - Injector - Type SP 820

The optimal solution:

- For mixing, dosing and delivering fluids
- For evacuating air in lines and tanks
- Self-priming

Maintenance free:

- No mechanical parts in motion

Execution:

- DN 10 up to DN 80
- uPVC, PP or PVDF



Range of application:

ASV water-jet pumps are used for admixing, mixing, dosing, pumping out and evacuating of tanks.

Working principle:

Driving liquid, which comes in main flow direction out of the nozzle installed in the water-jet pump, is accelerated by the diameter reduction of the nozzle. This acceleration causes low pressure at the suction spigot end sucking liquids or gaseous media.

The suction volume is a function of the driving liquid pressure and the nozzle bore. As to standard values of the suction volume see diagrams.

Type of fluids:

Neutral, aggressive or gaseous liquids provided that the selected materials are resistant at operating temperature. Refer to the ASV resistance guide.

Materials:

Housing/nozzle: uPVC, PP or PVDF
Sealings: EPDM or FPM

Nominal pressure¹⁾:

uPVC PN 10
PP PN 10
PVDF PN 10

Media temperature:

Depends on the operating conditions (system pressure, load etc.). Taking creep strength into account, the following approximate temperatures apply:

uPVC: - 10 up to + 60 °C
PP: +10 up to + 80 °C
PVDF: - 30 up to +120 °C
EPDM: - 30 up to +120 °C
FPM: - 30 up to +120 °C

Operating pressure:

See material dependent pressure/temperature diagram.

Connection:

DN 10 up to DN 50

- Union socket with:
 - Inserts (PVC) for solvent welding acc. DIN/ISO.
 - Inserts made of PP or PVDF for fusion welding acc. DIN/ISO.
 - Inserts for spigot ends for fusion welding on request.
 - Inserts made of PE on request.
 - Inserts acc. BS, ANSI, JIS on request.
- Flange connection acc. DIN 2501 (PN 10/16) on request.

Connection:

DN 65 and DN 80

- Spigot ends for solvent welding acc. DIN/ISO.
- Spigot ends for fusion welding acc. DIN/ISO.
- Flange connection on request.

Suction volume:

Standard values see diagram.

We recommend an empiric determination by adjusting the nozzle bore to the desired operating point.

Installation instructions:

See page 15.

Colour:

Housing:

- uPVC: grey, RAL 7011
- PP: grey, RAL 7032
- PVDF: opaque, yellowish-white
- PP-nature on request

¹⁾ for H₂O, 20 °C

Operating pressure:

See material dependent pressure/temperature diagram.

The pressure/temperature limits are applicable for a computed operating life factor of 25 years at PN 10.

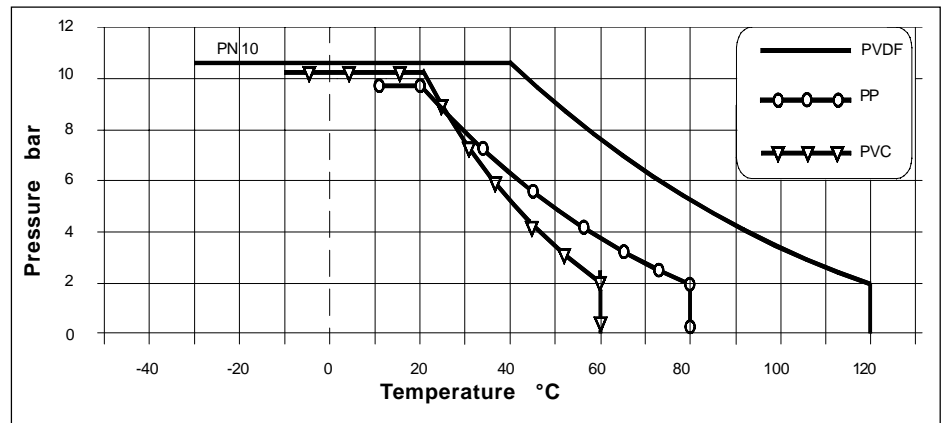
The values are a guide for harmless fluids (DIN 2403) against which the material of the valve is resistant.

Other media see the ASV resistance guide.

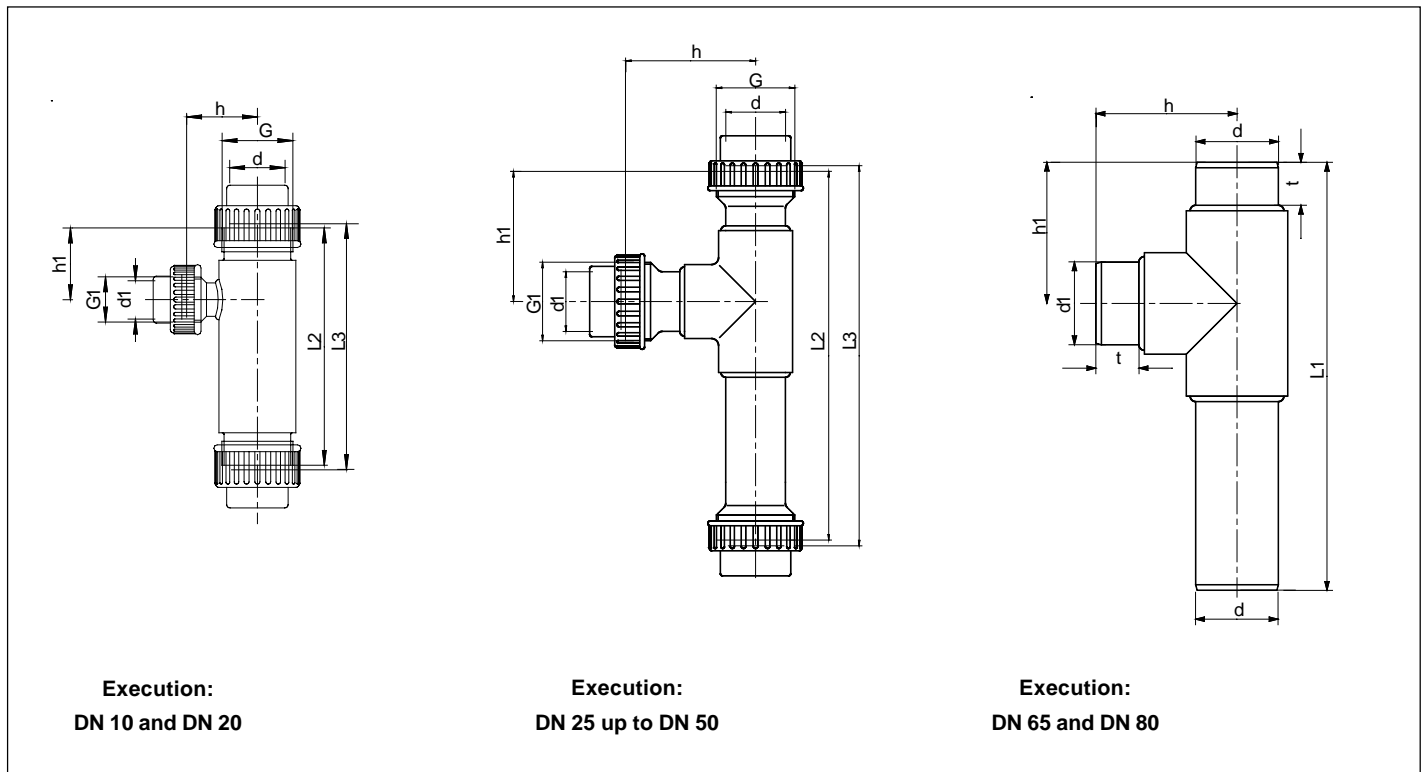
Durability of wear and tear parts is depending on the working conditions of the application.

Values < 0 °C (PP < +10 °C) on request with exact data of operation.

Pressure/temperature diagram

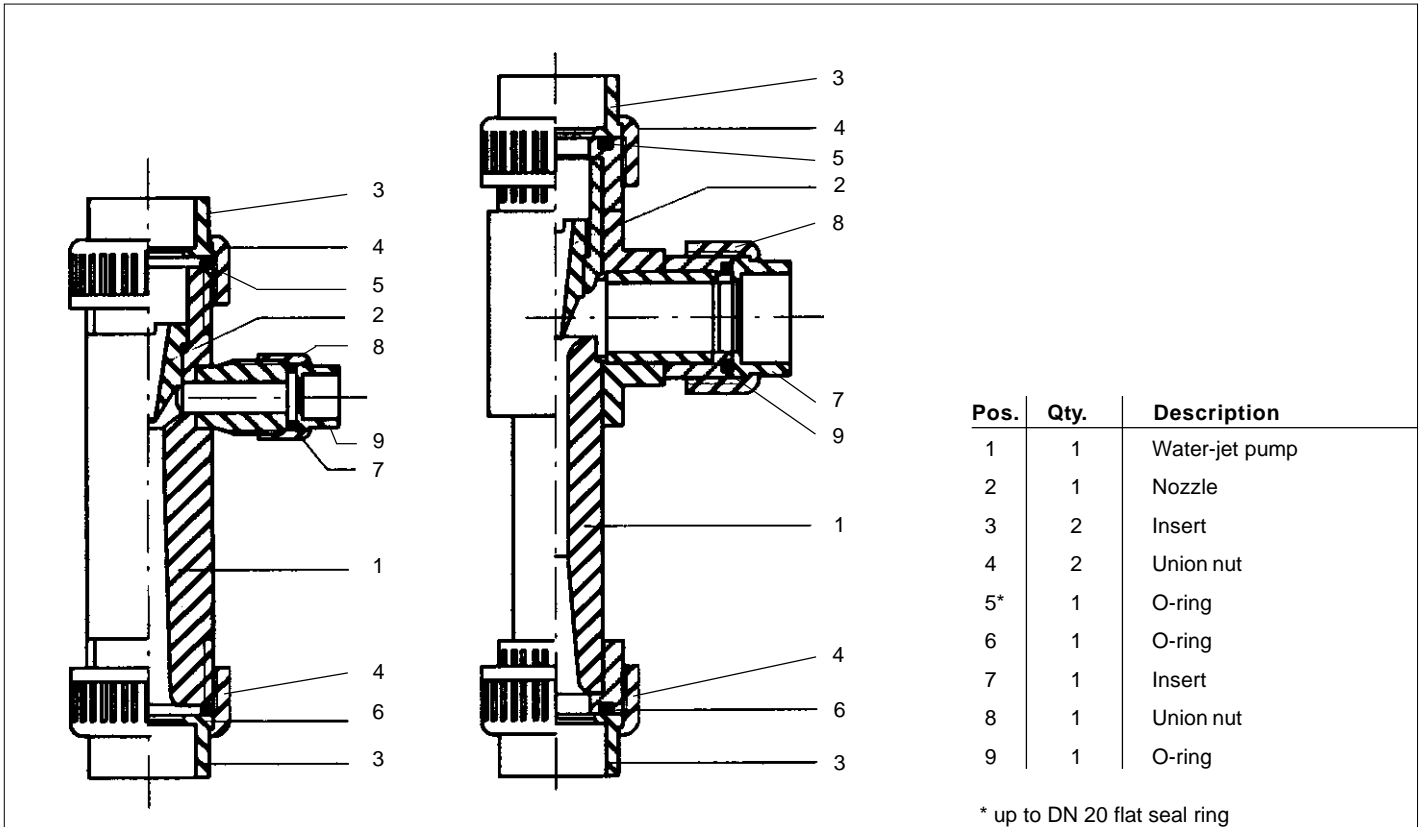


Dimensions



Size			Dimensions mm								
d	DN	DN	d1	G	G1	h	h1	L1	L2	L3	t
mm	mm	Zoll		Inch	Inch						
16	10	3/8	16	R 3/4	R 3/4	35	40	-	110	116	-
20	15	1/2	16	R 1	R 3/4	35	40	-	110	116	-
25	20	3/4	16	R 1 1/4	R 3/4	45	45	-	145	151	-
32	25	1	32	R 1 1/2	R 1 1/2	71	71	-	195	201	-
40	32	1 1/4	40	R 2	R 2	87	87	-	239	245	-
50	40	1 1/2	50	R 2 1/4	R 2 1/4	105	105	-	301	307	-
63	50	2	63	R 2 3/4	R 2 3/4	128	128	-	351	357	-
75	65	2 1/2	75	R -	R -	115	115	388	-	-	44
90	80	3	90	R -	R -	149	149	465	-	-	51

Spare part list SP 820



Ident-No. SP 820

Housing:			uPVC		PP		PVDF		Weights (kg)		
Connection:			Union socket ends ¹⁾		Union socket ends ²⁾		Union socket ends ²⁾		(standard value)		
Sealing element			EPDM	FPM	EPDM	FPM	EPDM	FPM	PVC	PP	PVDF
d	DN	Inch	ID-No.	ID-No.	ID-No.	ID-No.	ID-No.	ID-No.			
16	10	3/8	54385	-	61385	-	-	60997	0,15	0,11	0,20
20	15	1/2	54386	-	59679	-	-	59800	0,20	0,15	0,26
25	20	3/4	54389	-	57140	-	-	67425	0,35	0,25	0,50
32	25	1	54387	-	60123	-	-	59464	0,45	0,32	0,59
40	32	1 1/4	54388	-	59794	-	-	54380	0,80	0,56	1,05
50	40	1 1/2	54390	-	59698	-	-	65591	1,30	0,91	1,70
63	50	2	54391	-	61335	-	-	67883	2,35	1,65	3,06
75*	65	2 1/2	64866	-	65948	-	-	67884	2,40	1,70	3,15
90*	80	3	61352	-	65949	-	-	65592	4,10	2,90	5,35

*spigot ends

On placing order please state nozzle bore.

¹⁾ for solvent welding

²⁾ for fusion welding

Dimensioning of a water-jet pump

Example 1:

What is the driving water pressure or the driving water volume for:

- suction volume of 900 l/h H₂O
- back pressure of 1 bar

According to diagram:

- driving water pressure about 2,5 bar
- driving water volume about 1100 l/h

Example 2:

What is the suction volume for:

- driving water pressure of 5 bar
- back pressure of 1,5 bar

According to diagram:

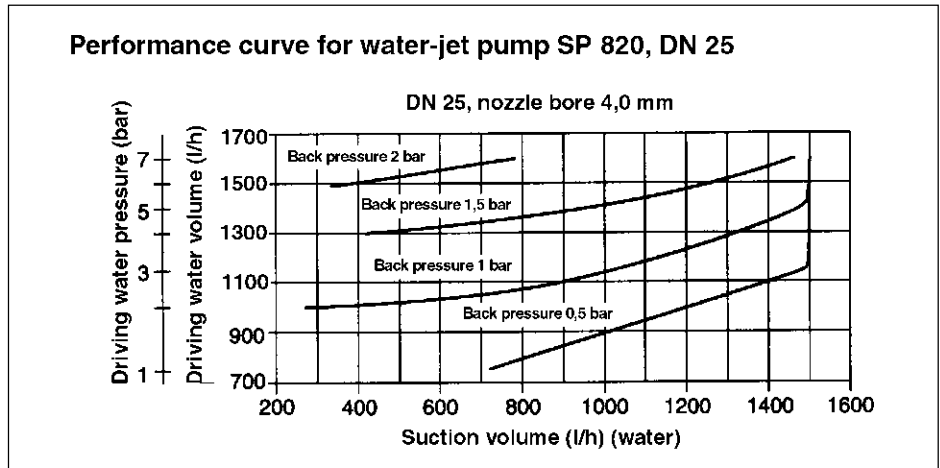
- Suction volume about 1080 l/h.

Description of a water-jet pump

Type SP 820

Size DN 25

Nozzle bore 4,0 mm

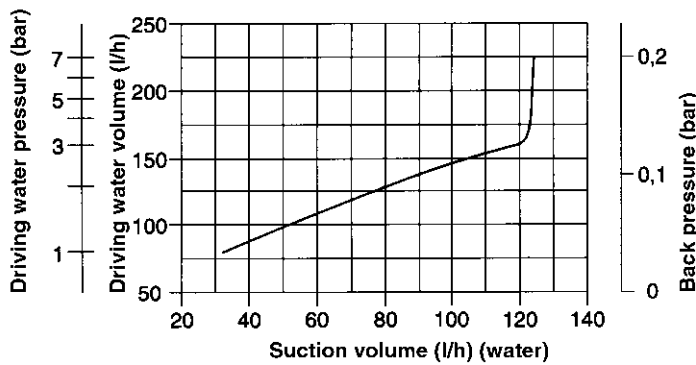


Note The diagrams are for H₂O, 20 °C.

Performance curve for water-jet pump Type SP 820, DN 10

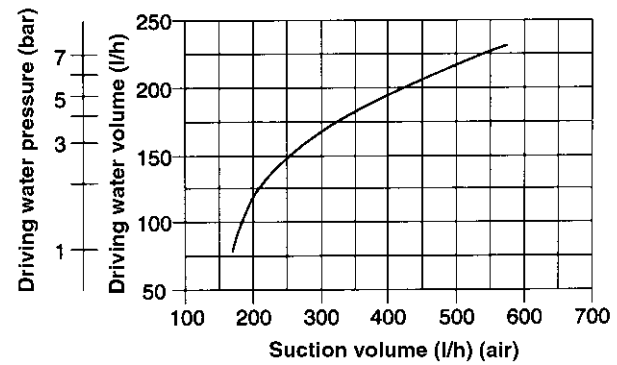
Suction media: water

Nozzle bore 1,5 mm

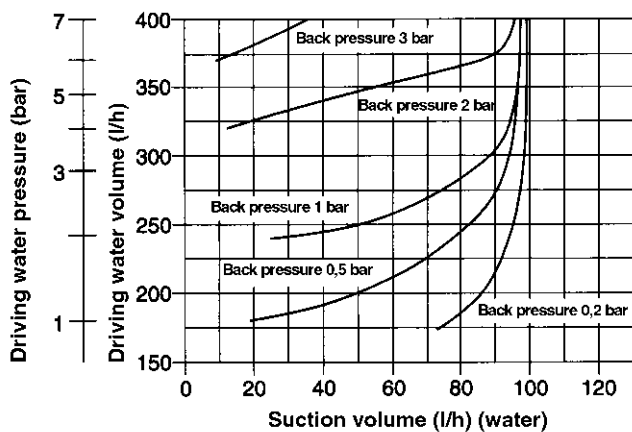


Suction media: air

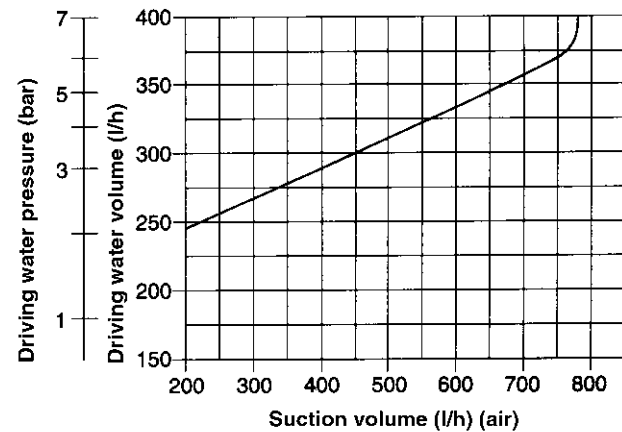
Nozzle bore 1,5 mm



Nozzle bore 2,0 mm



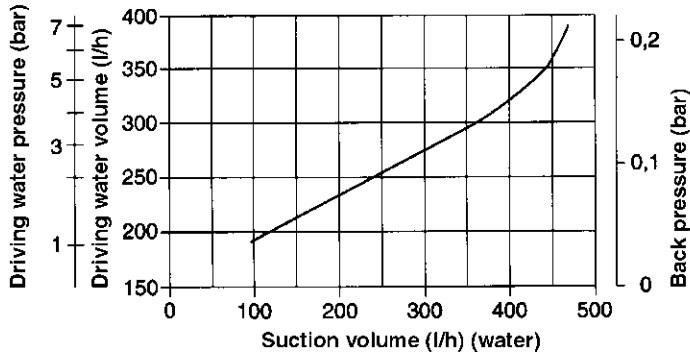
Nozzle bore 2,0 mm



Performance curve for water-jet pump Type SP 820, DN 15

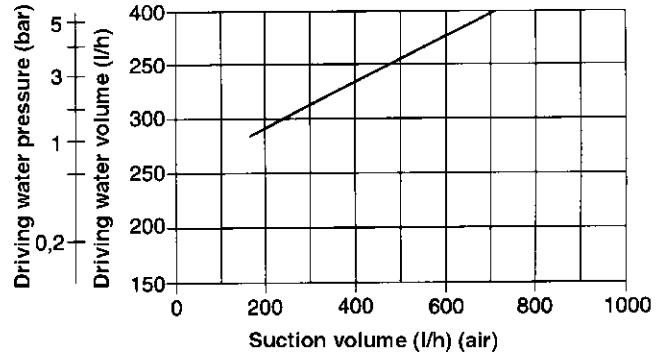
Suction media: water

Nozzle bore 2,0 mm

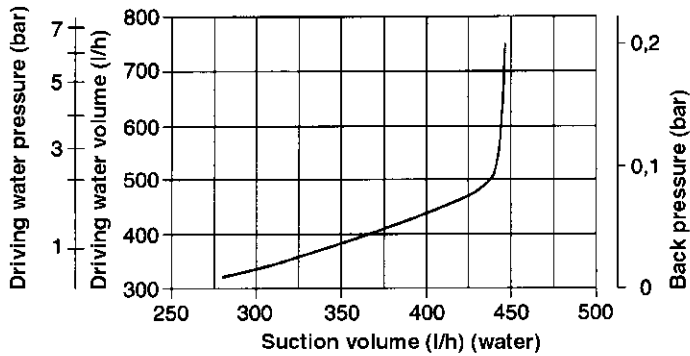


Suction media: air

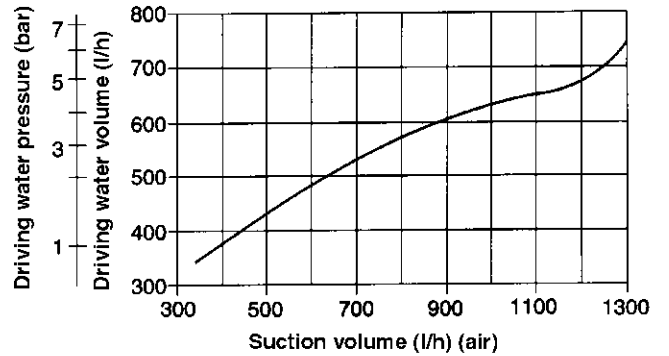
Nozzle bore 2,0 mm



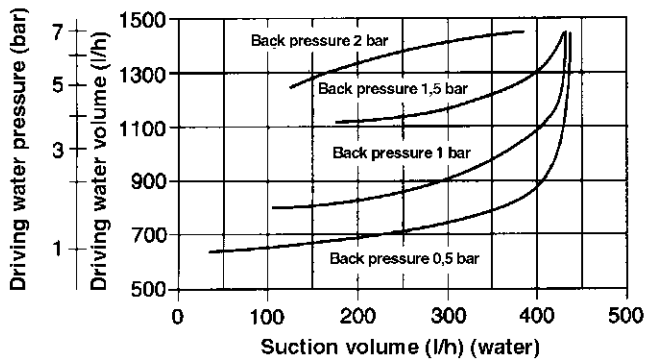
Nozzle bore 3,0 mm



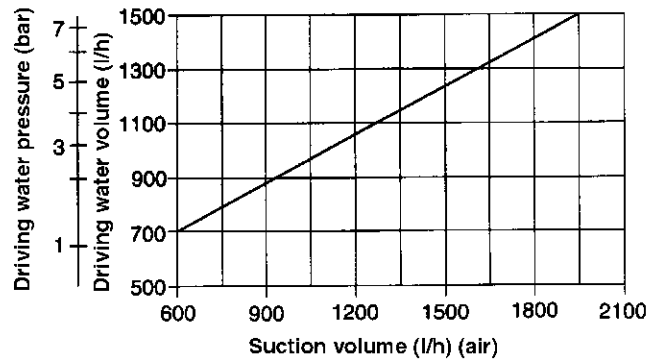
Nozzle bore 3,0 mm



Nozzle bore 4,0 mm

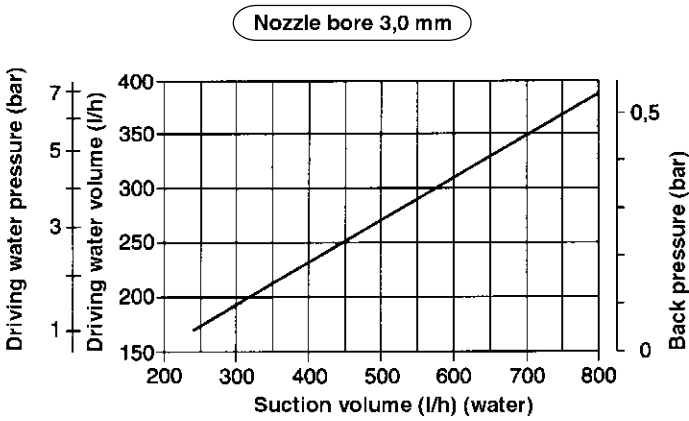


Nozzle bore 4,0 mm

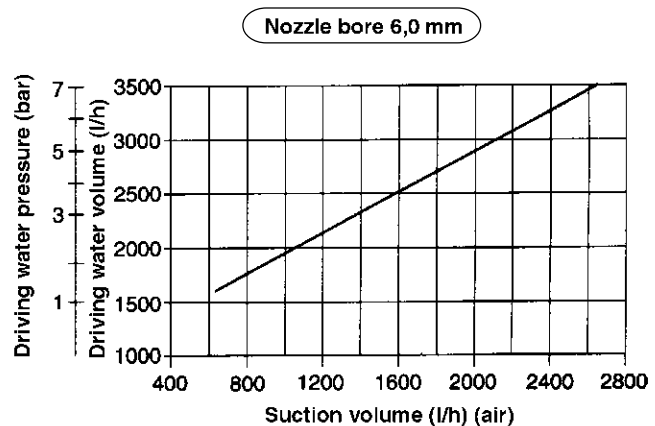
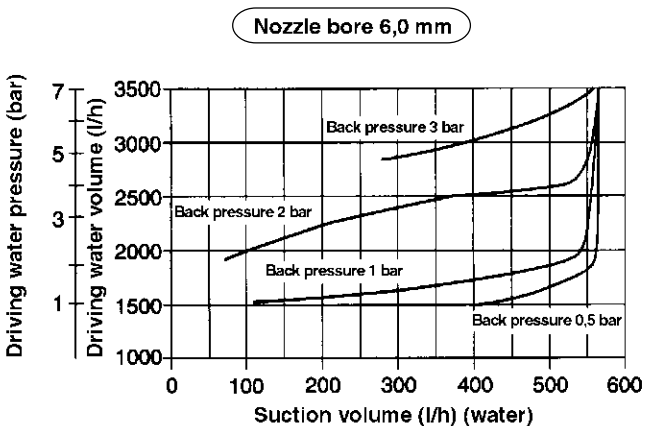
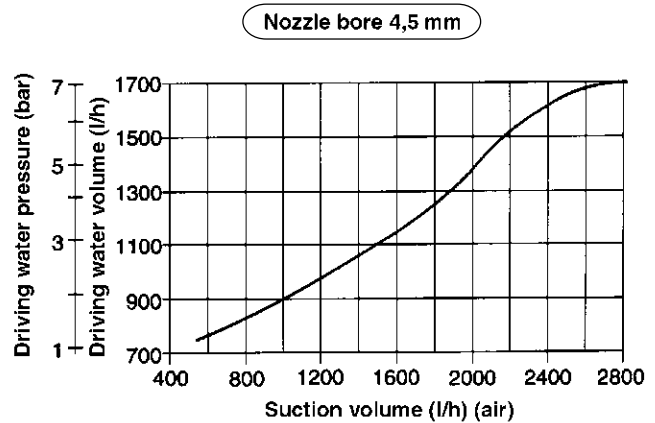
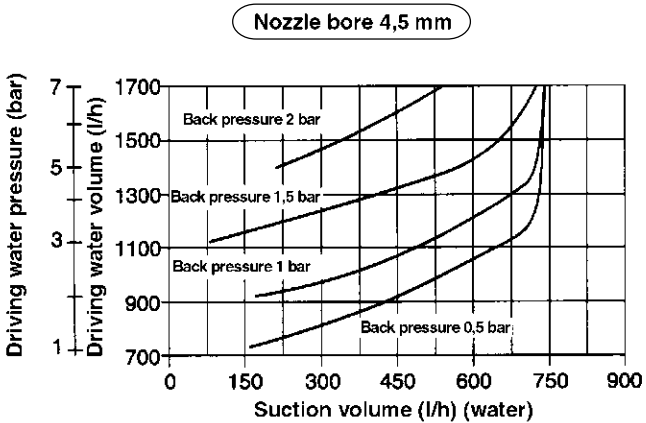
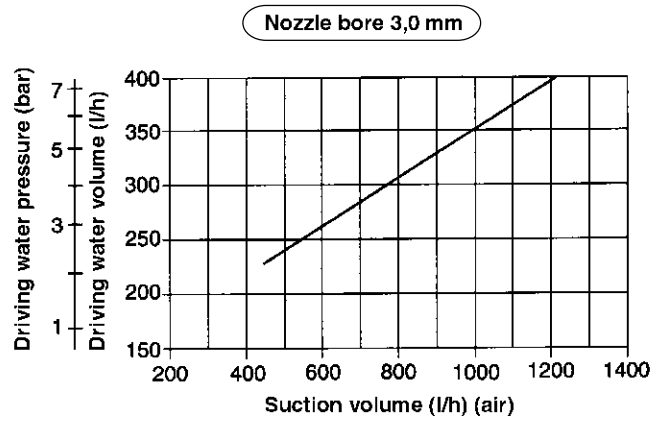


Performance curve for water-jet pump
Type SP 820, DN 20

Suction media: water



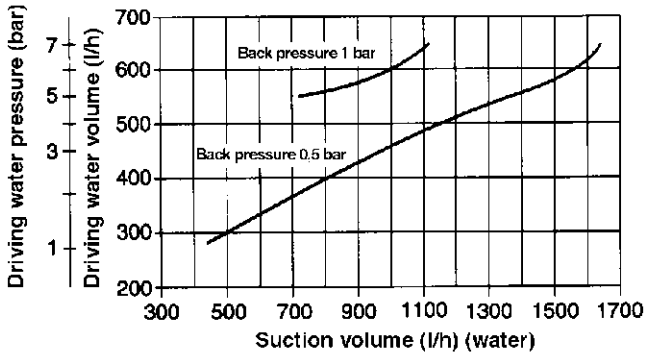
Suction media: air



Performance curve for water-jet pump Type SP 820, DN 25

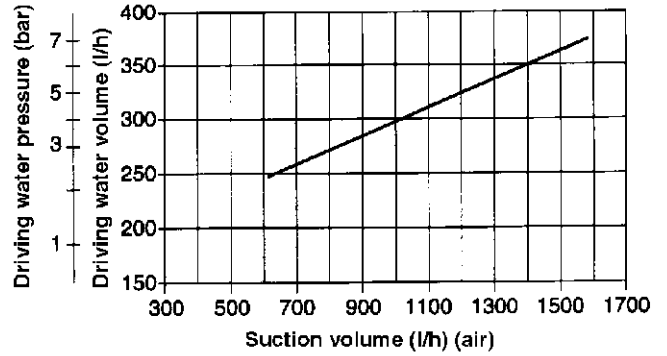
Suction media: water

Nozzle bore 2,5 mm

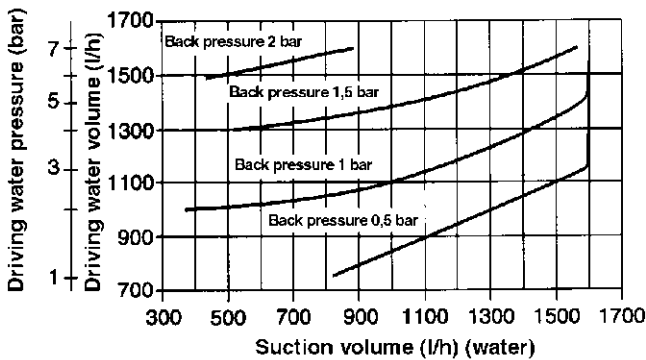


Suction media: air

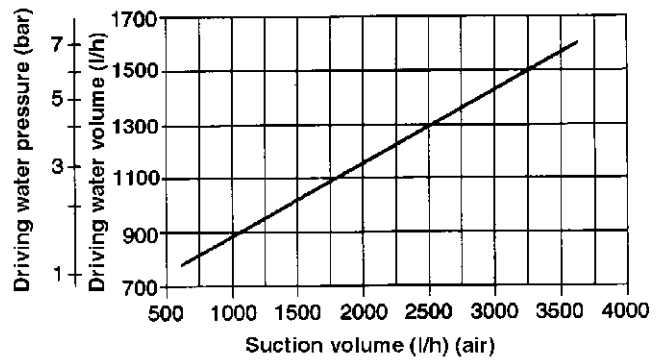
Nozzle bore 2,5 mm



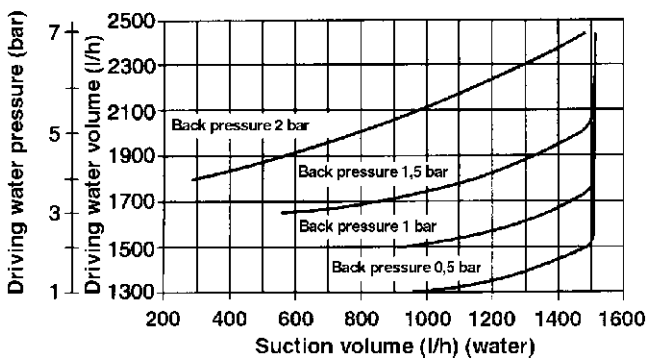
Nozzle bore 4,0 mm



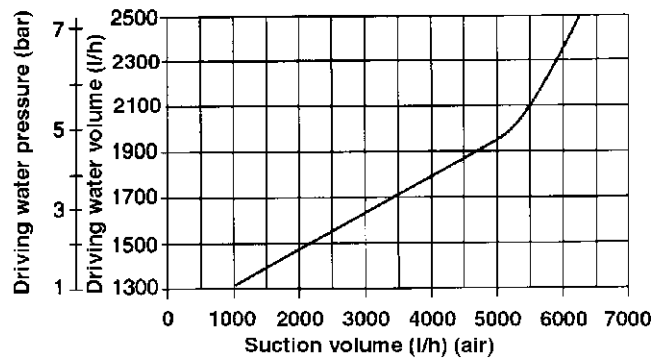
Nozzle bore 4,0 mm



Nozzle bore 5,0 mm

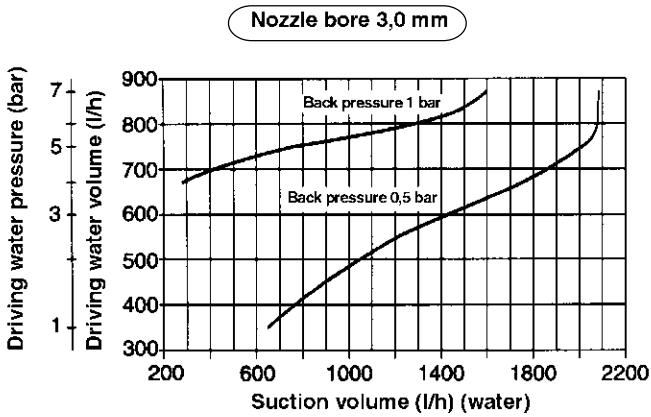


Nozzle bore 5,0 mm

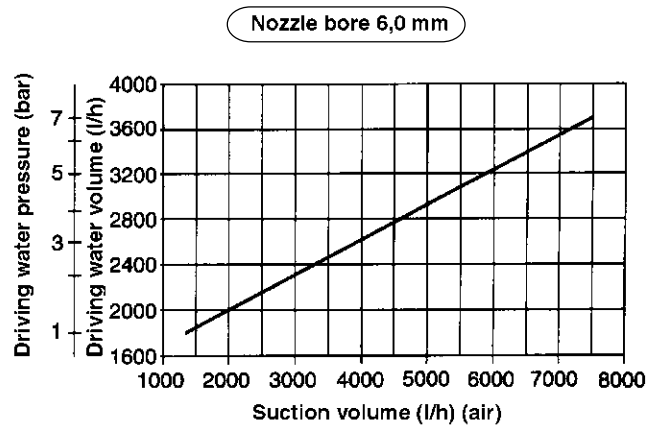
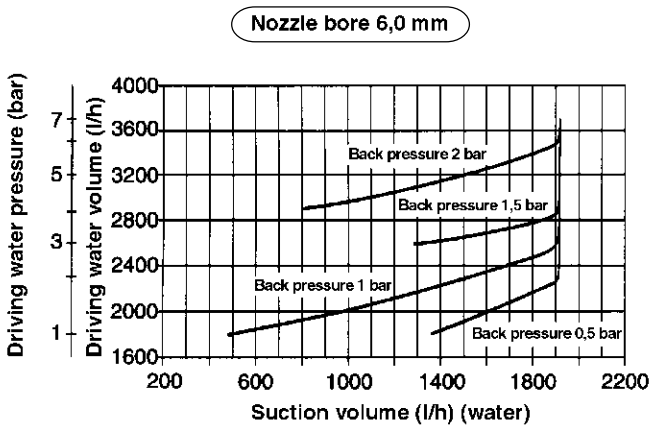
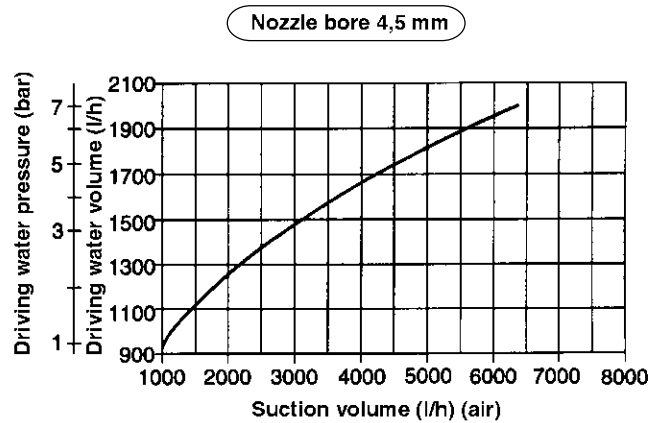
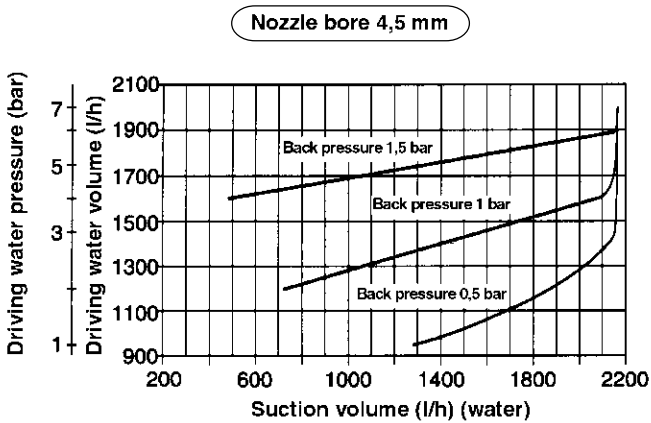
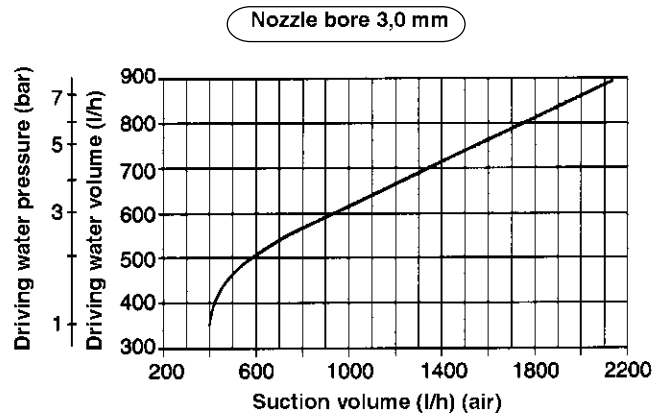


Performance curve for water-jet pump
Type SP 820, DN 32

Suction media: water



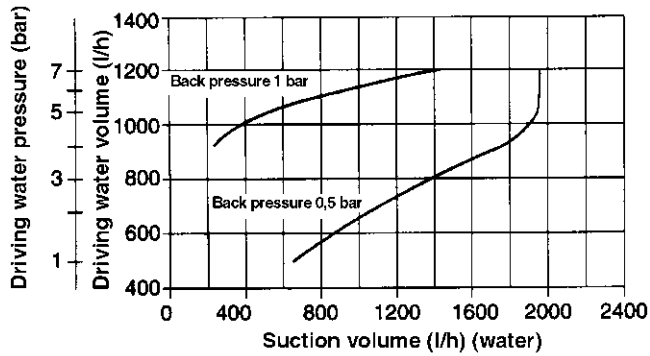
Suction media: air



Performance curve for water-jet pump Type SP 820, DN 40

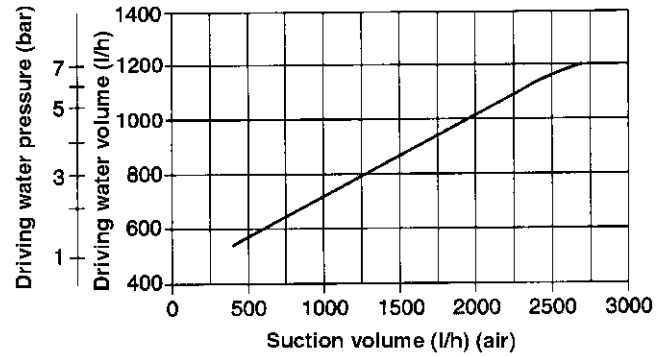
Suction media: water

Nozzle bore 3,5 mm

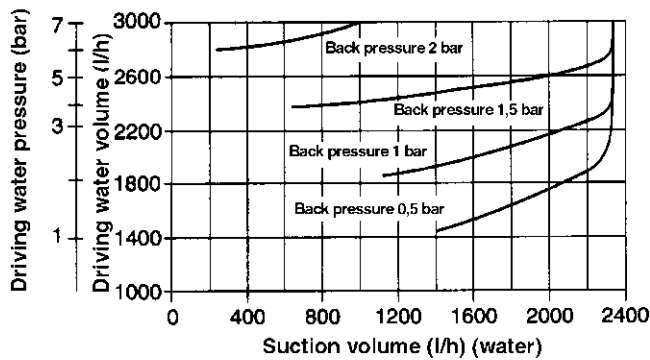


Suction media: air

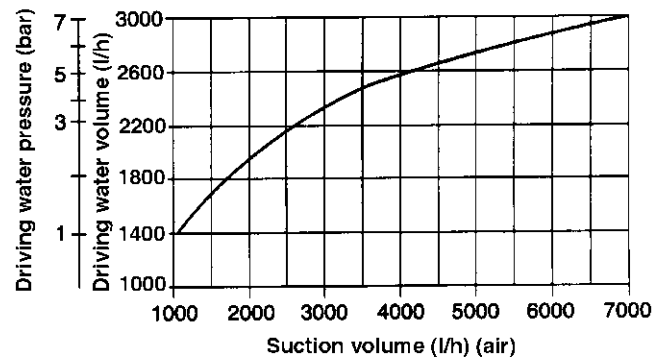
Nozzle bore 3,5 mm



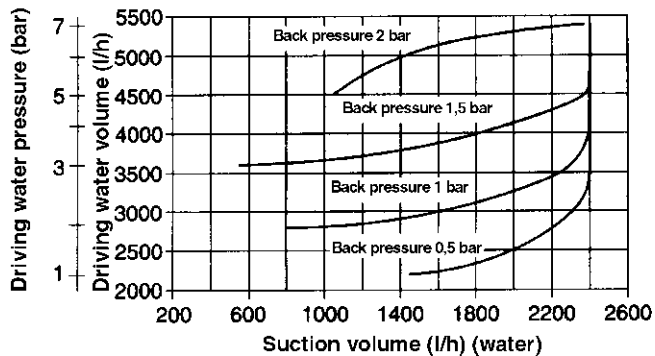
Nozzle bore 5,5 mm



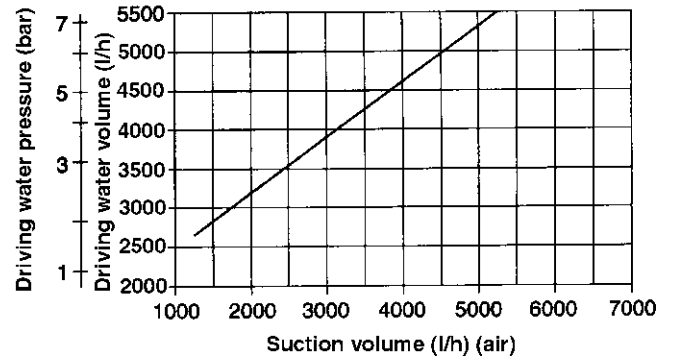
Nozzle bore 5,5 mm



Nozzle bore 7,5 mm



Nozzle bore 7,5 mm

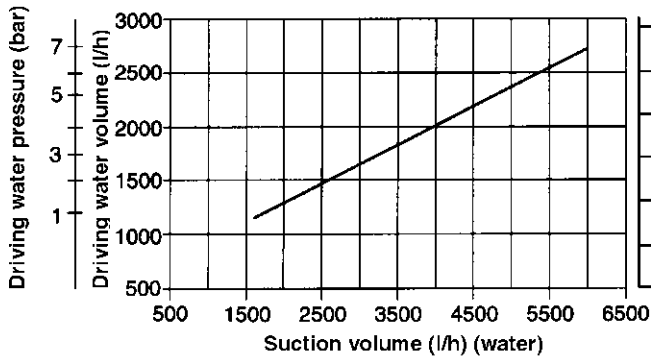


Performance curve for water-jet pump Type SP 820, DN 50

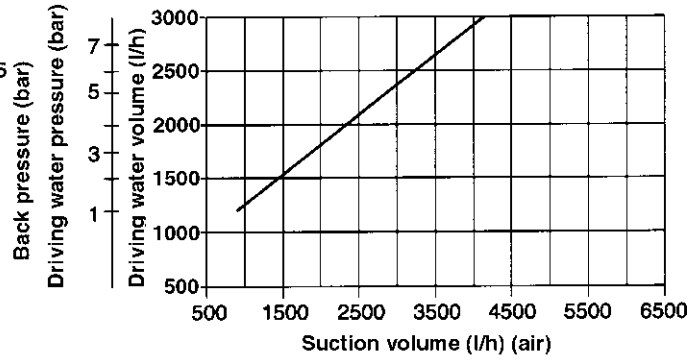
Suction media: water

Suction media: air

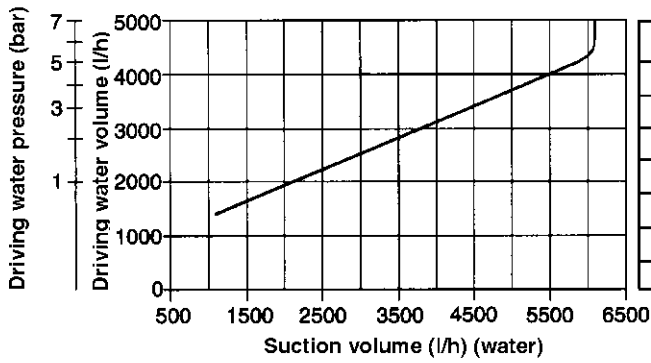
Nozzle bore 5,0 mm



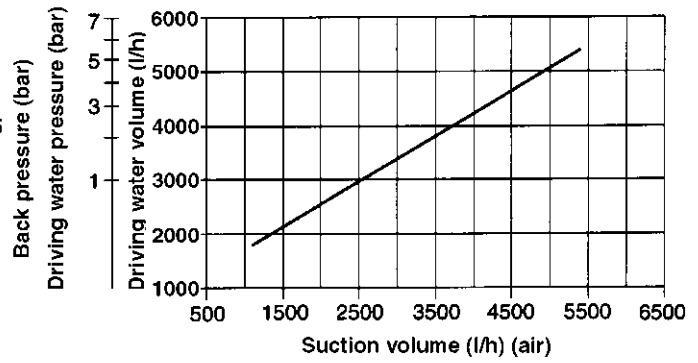
Nozzle bore 5,0 mm



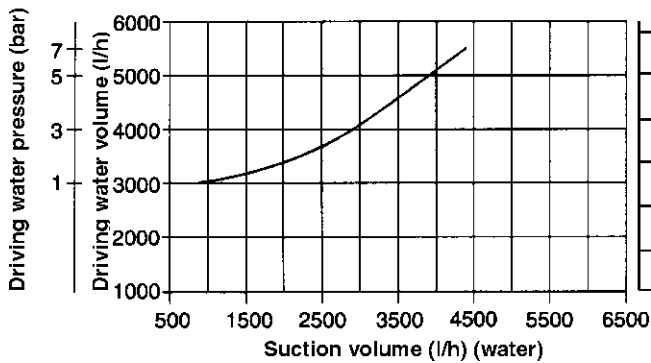
Nozzle bore 7,0 mm



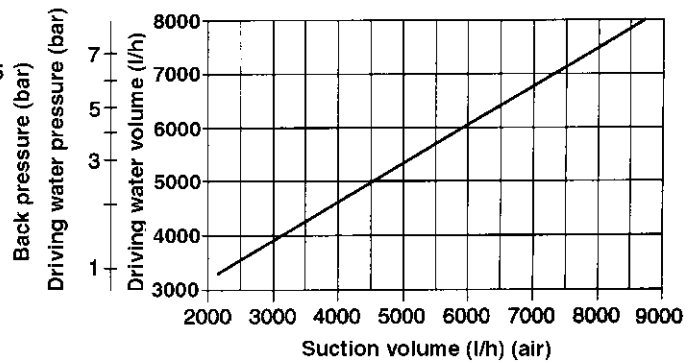
Nozzle bore 7,0 mm



Nozzle bore 9,0 mm



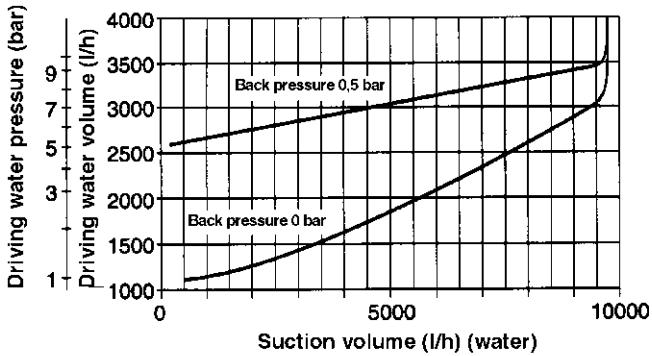
Nozzle bore 9,0 mm



Performance curve for water-jet pump Type SP 820, DN 65

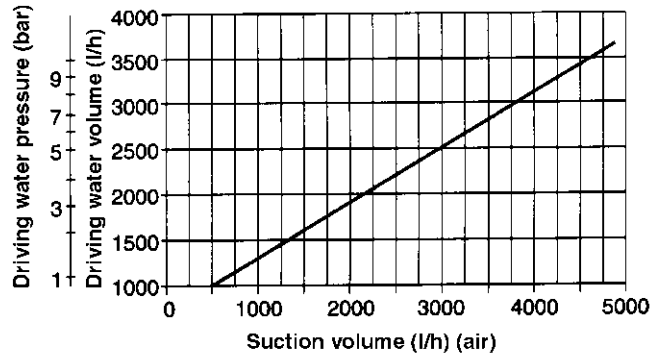
Suction media: water

Nozzle bore 6,5 mm

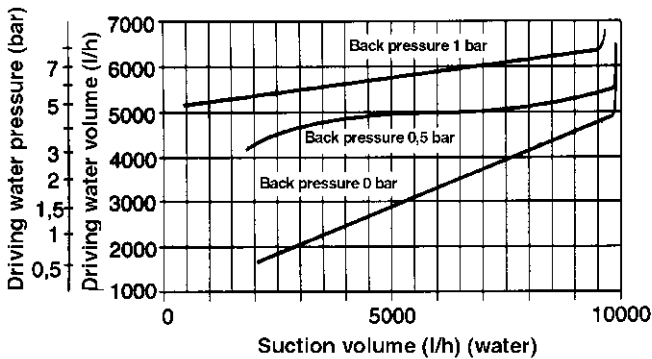


Suction media: air

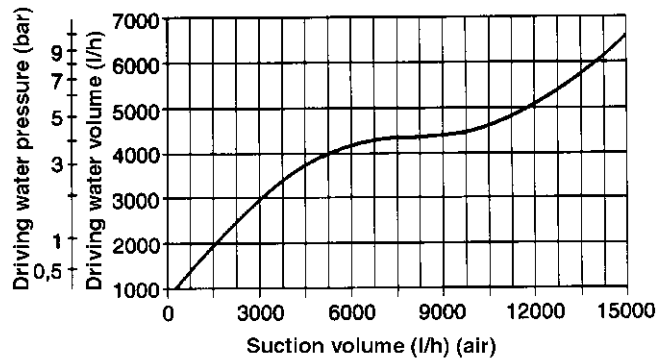
Nozzle bore 6,5 mm



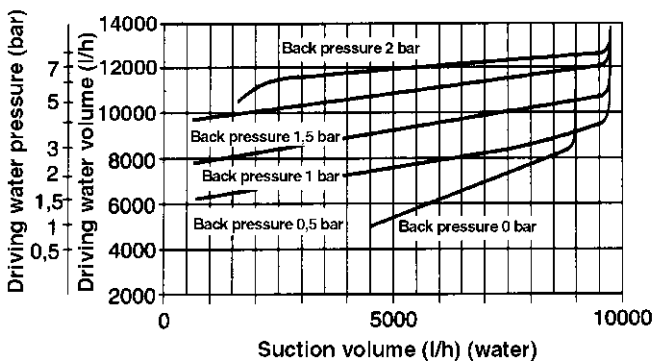
Nozzle bore 9,0 mm



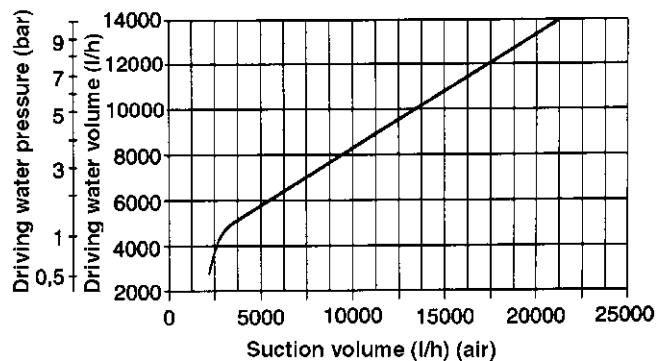
Nozzle bore 9,0 mm



Nozzle bore 11,5 mm



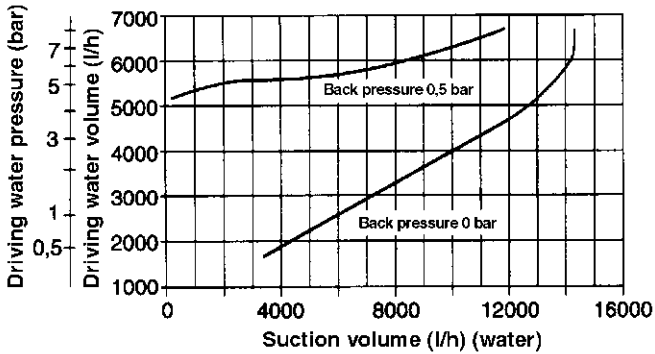
Nozzle bore 11,5 mm



Performance curve for water-jet pump
Type SP 820, DN 80

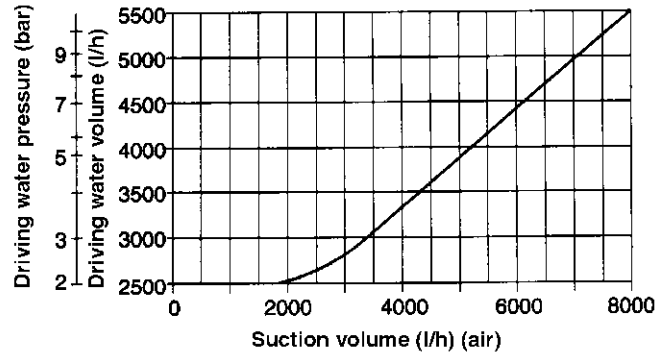
Suction media: water

Nozzle bore 8,0 mm

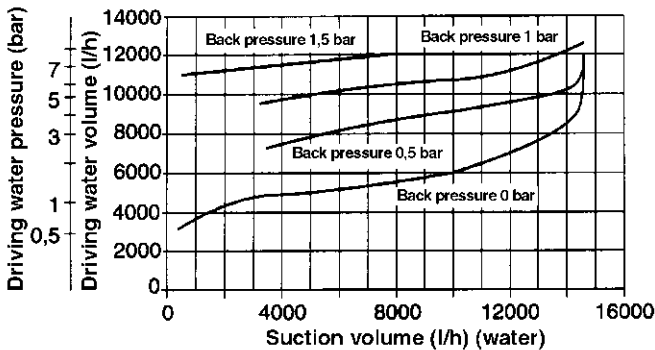


Suction media: air

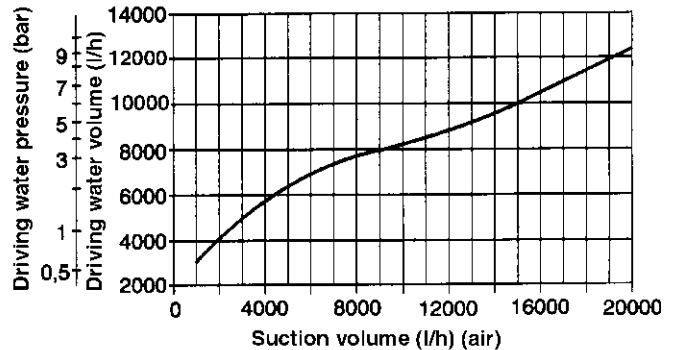
Nozzle bore 8,0 mm



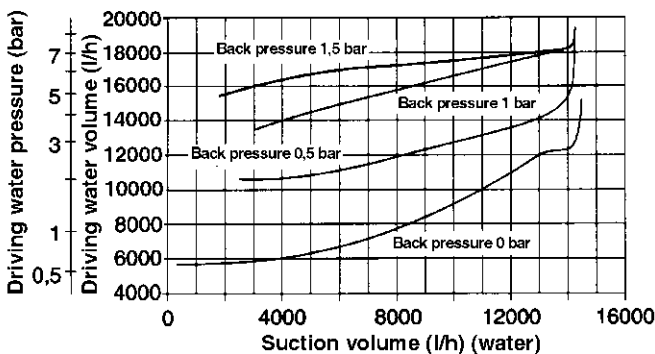
Nozzle bore 11,0 mm



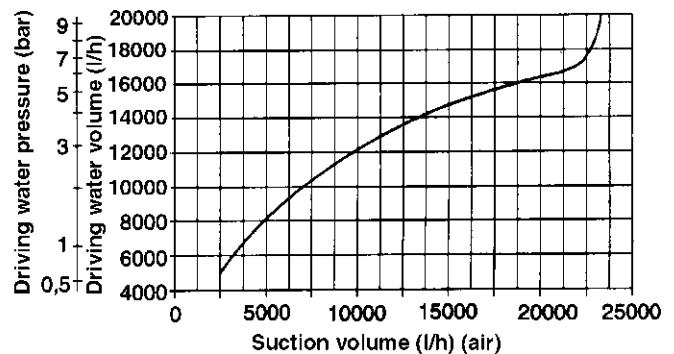
Nozzle bore 11,0 mm



Nozzle bore 14,0 mm

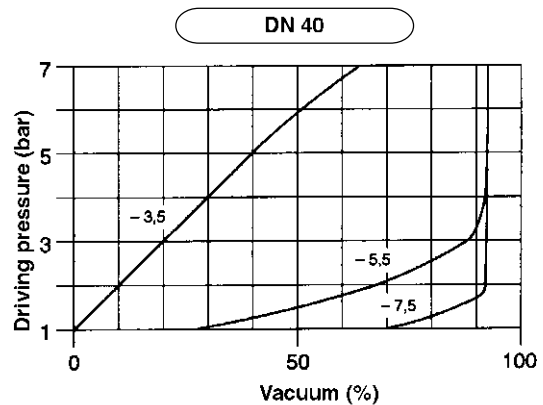
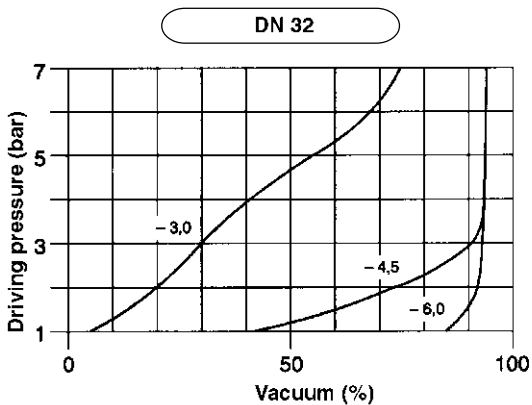
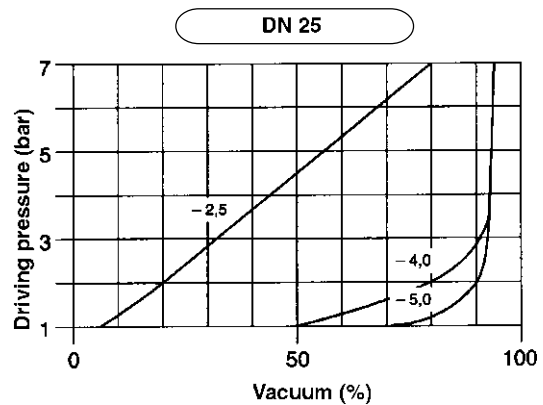
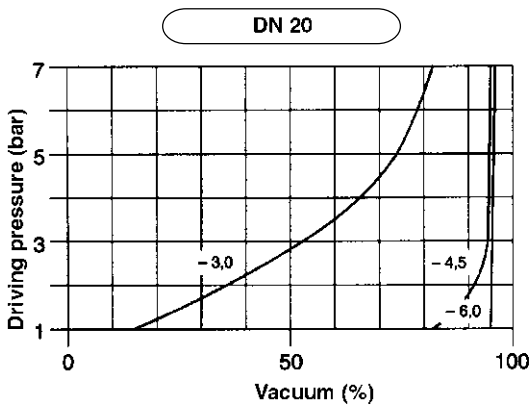
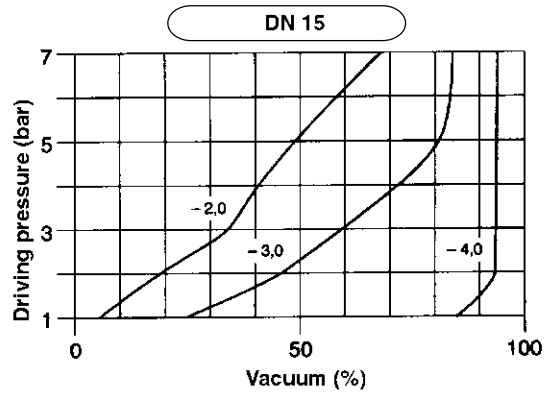
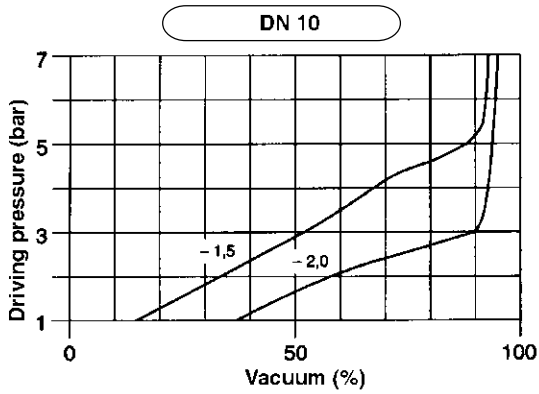


Nozzle bore 14,0 mm



Max. possible vacuum for water-jet pumps

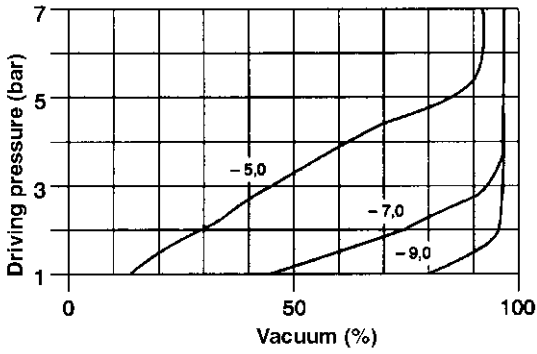
Type SP 820, DN 10 up to DN 40



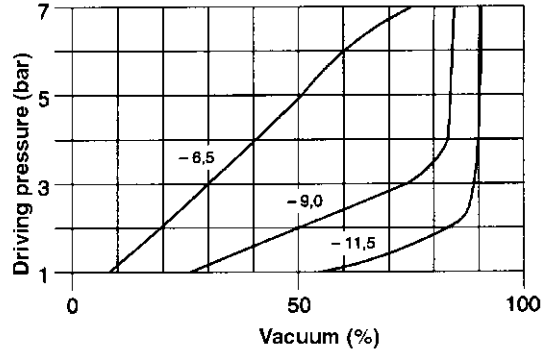
Max. possible vacuum for water-jet pumps

Type SP 820, DN 50 up to DN 80

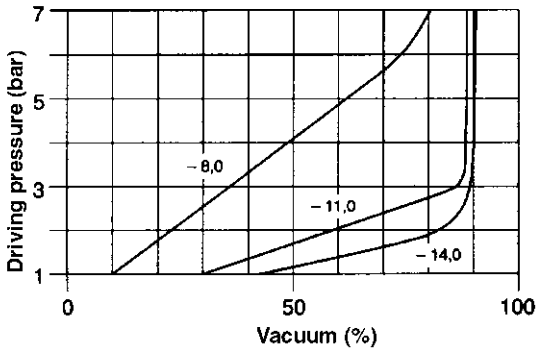
DN 50



DN 65



DN 80



Note:
The figure of the respective characteristic curve states the size of the nozzle bore.

Operating instructions:


Safe operation of the valve can only be ensured if it is properly installed, operated, serviced or repaired by qualified personnel according to its intended use while observing the accident prevention regulations, safety regulations, standards and technical regulations.

The intended use includes adhering to the specified limit values for pressure and temperature as well as the chemical resistance referring to the operating conditions.

For this purpose, ensure that all components getting in contact with the media are »**resistant**« in accordance to the ASV resistance guide.

The owner/user must inform the authorized qualified personnel instructed to perform the assembly, inspection and/or maintenance work of any potential danger emanating from the machine line/medium, and ensure that suitable safety measures are observed including local regulations and laws of the territories of use.

Non-observance of the specified information and safety instructions may lead to injuries and/or property damages.

Installation:

- Normally the nozzles are supplied **without** boring. Arrange the boring.
- Ensure that the flow direction coincides with the arrow direction.
- Allow a straight distance of min. 5 x DN before and behind the water-jet pump.
- In order to meet the requirements of precise mixing or dosing, we recommend to use suitable ASV flow control valves, ASV flowmeters and ASV diaphragm pressure gauge guard with pressure gauge.
- The valve has to be installed in the pipeline. In case of PVC it has to be cemented and in case of PP/PVDF to be welded into the pipeline. The valve body is to be mounted between the two nuts which have to be fastened hand tight.

In case of flange connections the torque of the nuts should be in respect to thermoplastic flanges.

- After proper installation the pipe system with all components has to be tested for leakages.

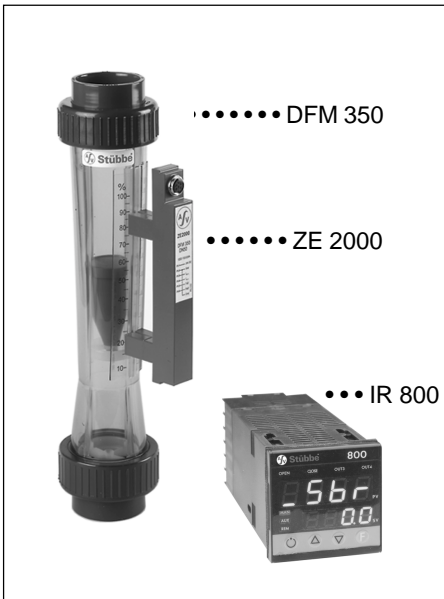
Disassembly/assembly of the nozzle:

- Adhere to the safety instructions.
- Empty the pipelines, collect remaining media and dispose according to regulations.
- Release union nut and remove the jet pump out of the pipeline.
- Unscrew the nozzle counter-clockwise with appropriate tool.
- Reassemble in the reverse order.
- After proper installation of jet pump the pipe system with all components has to be tested for leakages.

Failures:

Failures could occur e.g. in case of varying operating pressure or driving water volumes or due to varying back pressures.

Furthermore there could be failures because of contaminated or worn out nozzles.



Flowmeter with float DFM 165 up to DFM 350 (PN 10)

Tube PVC transparent, PA, PSU or PVDF. Measuring range from 3 l/h to 50.000 l/h.

BUS compatible und programmable Sensor ZE 2000

Measuring accuracy $\pm 1\%$ of measured value. Reproducibility below 0,2 %. Analog output 4 ... 20 mA. Digital output RS232.

Controller 800, the optimal complement to ZE 2000 for exact controlling of flow volume.



BUS compatible flow transmitter and dosing sensor DFT 8035.

Compact-housing, DN 15 to DN 50, made of PVC, PP, PVDF or VA with integrated impeller.

Transmitter electronic with integrated flow indicator and integrated measuring device.



MV 315 pneumatically actuated

... MV 315

Manual actuated or externally controlled 2/2-way-diaphragm valve MV 315.

Body (PN 10), DN 15 to DN 50, made of PVC, PP or PVDF. Connection with screw fitting acc. to DIN 8063 or with spigot ends acc. to DIN/ISO.

Options: Lift limit, manual emergency control, position remote indicator, Namur adaptor for pilot valve.

For controlling adaptable with electronic pneumatic position controller.



... DHV 712-R (Pat.)

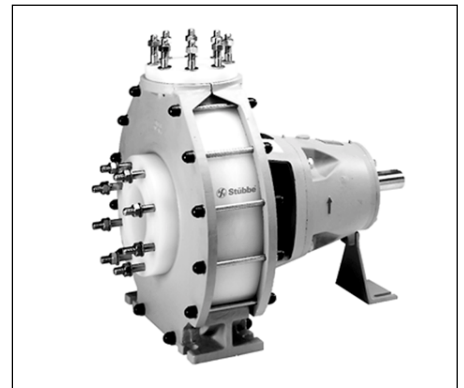
DHV 725

Pressure relief and pressure reducing valves (PN 10)

The optimal monitoring or controlling valves for protection of the equipment.

Body, DN 10 bis DN 50, made of PVC, PP, PVDF and VA. Setting range from 0,2 - 10 bar with high reproducibility and low differential pressure up to full opening of the valve.

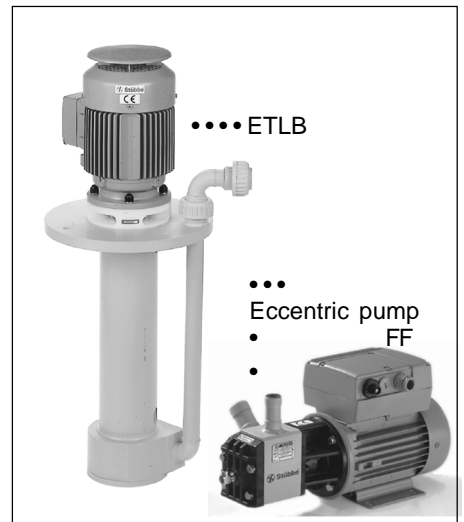
DHV 712-R (Pat.) - back pressure safe - for constant dosing quantities for oscillating pumps.



Chemical standard pump NM

according to EN 22858.

Sizes: 32 - 125 to 150 - 400.



... ETLB

... Eccentric pump FF

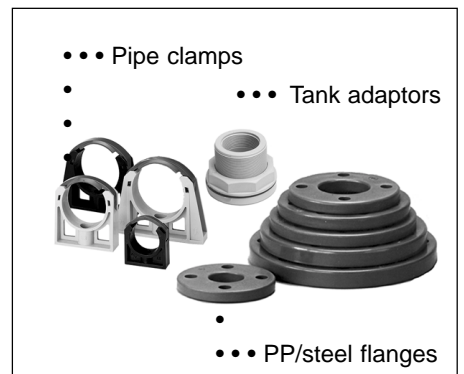
Vertical sump pump ETLB,

dry-run safe, without bearing and maintenance free.

Flow rate: up to 85 m³/h

Head: up to 36 m

Frequency controlled eccentric pump FF, dry-run safe, self-priming and reliable and safe in operation.



... Pipe clamps

... Tank adaptors

... PP/steel flanges

Technical alterations excepted