



**ITT**

**Lowara**

## GS20-GS21-GS30 Series

Fixed-speed pressure booster sets with  
Vertical Multistage electric pumps e-SV™ series

**50 Hz**



*Engineered for life*



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## BOOSTER SETS GS SERIES

### GENERAL INTRODUCTION - PRODUCT DESCRIPTION

The GS series pressure booster units mainly comprise pumping stations assembled with two or three SV series vertical multistage pumps, or with FH or SH series enbloc horizontal pumps. A smaller pump can also be added to the main ones. Generally known as a jockey pump, it provides for minor usages in order to maintain system pressure without starting the service pump.

The GS series pressure booster units are constant speed sets and are used to distribute water in heating or filling systems.

The pumps are mounted on a single base together with the other hydraulic components, such as on-off valves, check valves and the delivery and return manifolds.

The electrical panel, supplied with a mounting bracket, is attached to the pressure booster unit base.

The pumps start and stop according to the signals sent by the pressure transducer to the electrical control panel.

The latter is fitted with an integrated electronic board. The pumps start and stop automatically depending on the water demand of the system.

These pressure booster systems are combined with suitable expansion tanks in order to guarantee stable operation and reduce the starting frequency of the pumps.

For the correct choice in capacity of the expansion vessel, see the relative chapter on page 102 of the catalogue.

### DESCRIPTION OF OPERATION

The pumps start and stop according to the set pressures detected by the pressure transducer, thus ensuring the required amount of water is delivered. The pressure values can be directly set on the electronic board.

For units with jockey pump, the latter will start first and stop last, depending on the set pressure values.

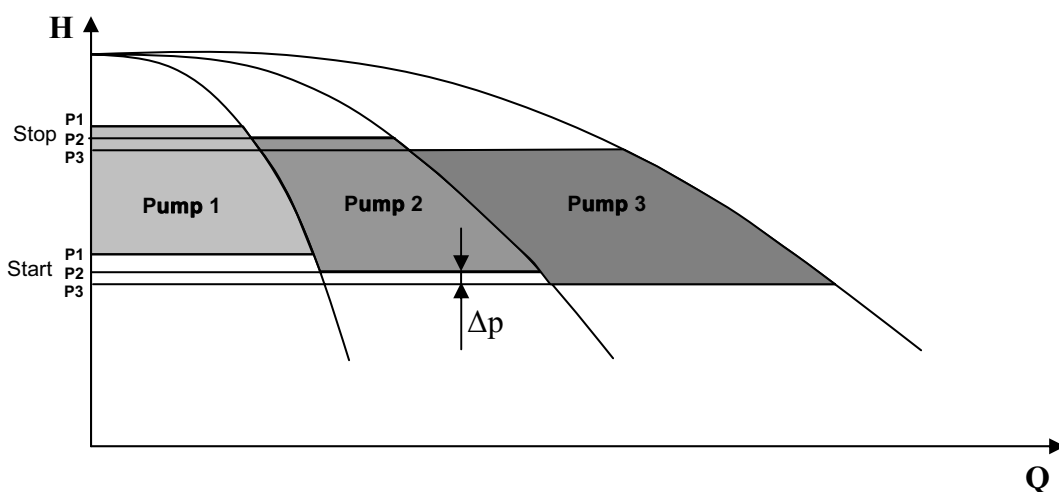
When a tap is opened, water is drawn off from the tank, the pressure starts to fall until it reaches the starting value of the first pump. The delivery of water increases, the pressure falls even further and the other pumps start in sequence according to the demand for water.

When consumption falls, the pressure in the system increases and the pumps stop when the set threshold pressure values are reached.

If consumption falls to zero user demand, the last pump also stops.

If the "timer" function is used, the last pump to work will remain operating for a set time after it is switched off, in order to reach maximum pressure. Make sure the maximum pressure is compatible with the system in which the pump is installed.

Example: GS series pressure booster units, operation.



$\Delta p$  pressure differential between pumps, can be reduced to 0,5 bar.

## BOOSTER SETS GS SERIES CHOICE AND SELECTION

The demand of a water distribution system is generally determined by the designer according to the type of user structure being served.

Users can be schools, hospitals, homes, offices, industries, hotels, shopping centres and for each the water demand changes due to the different requirements of the people living and working in these structures. To find the correct flow rate for the system in question, it is possible to consult pre-calculated tables that give an idea of the flow rate for the typology of user to serve (see pages 94-95 in this catalogue).

Integral system calculation, instead, prevents excessive oversizing and therefore reduces running and installation costs.

The theoretical water demand is calculated by summing the demand of each user. As, however, it is improbable that all users will want to use water at the same time, real demand is lower than theoretical demand.

After defining the flow rate of the system, the head must be calculated. This must consider the following:

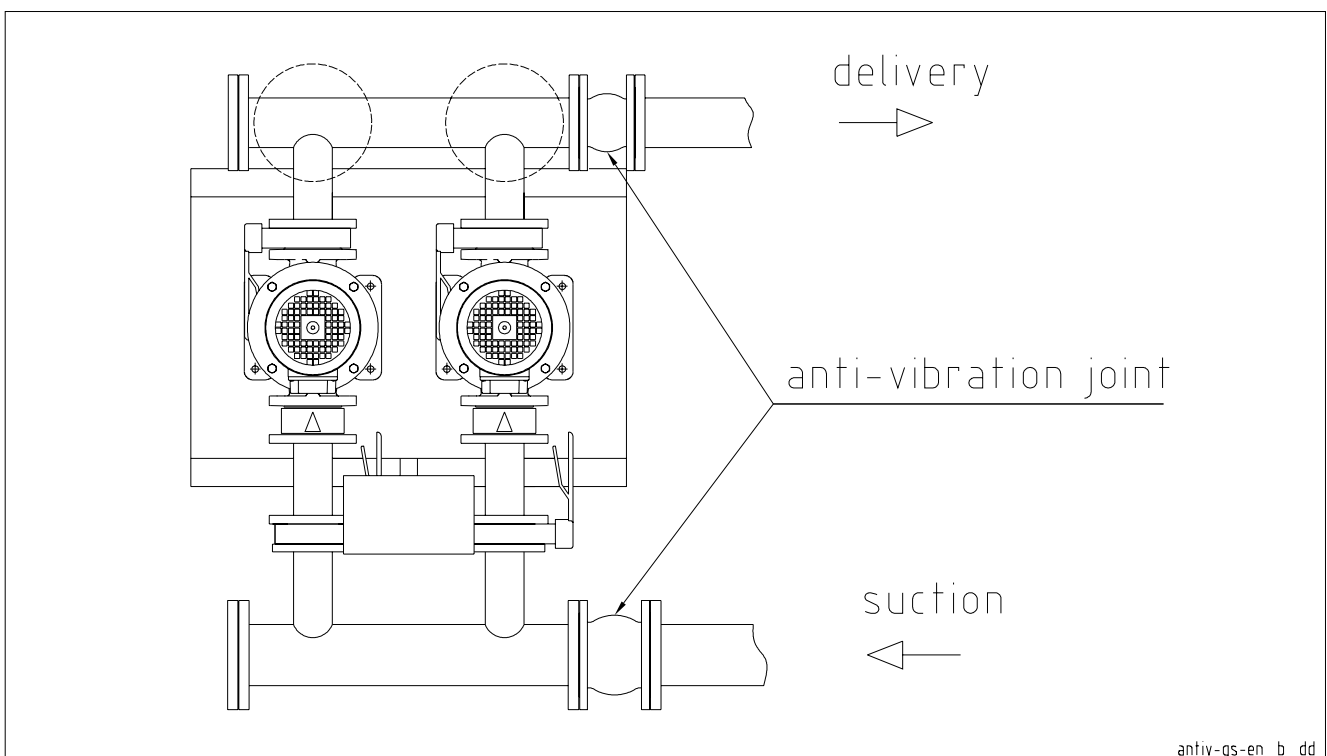
- geodesic head: difference in level between the pumping station and the highest user
- residual head: pressure demand from the most unfavourable user to serve
- pressure drops: value in metres of pressure drops due to friction in the delivery pipes
- inlet height: difference in level between the pump inlet and the surface of the water in the tank (positive or negative depending on the installation type)
- inlet pressure drops: value in metres of pressure drops due to friction in the inlet piping and in any curves and valves.

After analysing the above, the head required for the system is calculated.

Now that the flow rate and head values are known, the most suitable pressure booster unit for the system can be chosen. The designer must decide whether to choose a pressure booster unit with two or three pumps, the third being a reserve pump satisfying demand during pump maintenance periods.

## INSTALLATION

The GS series of pressure booster units must be installed in areas protected from frost and adequately ventilated in order to allow the motors to cool. The delivery and intake pipes should be connected using anti-vibration joints in order to limit vibrations and resonance in the system.



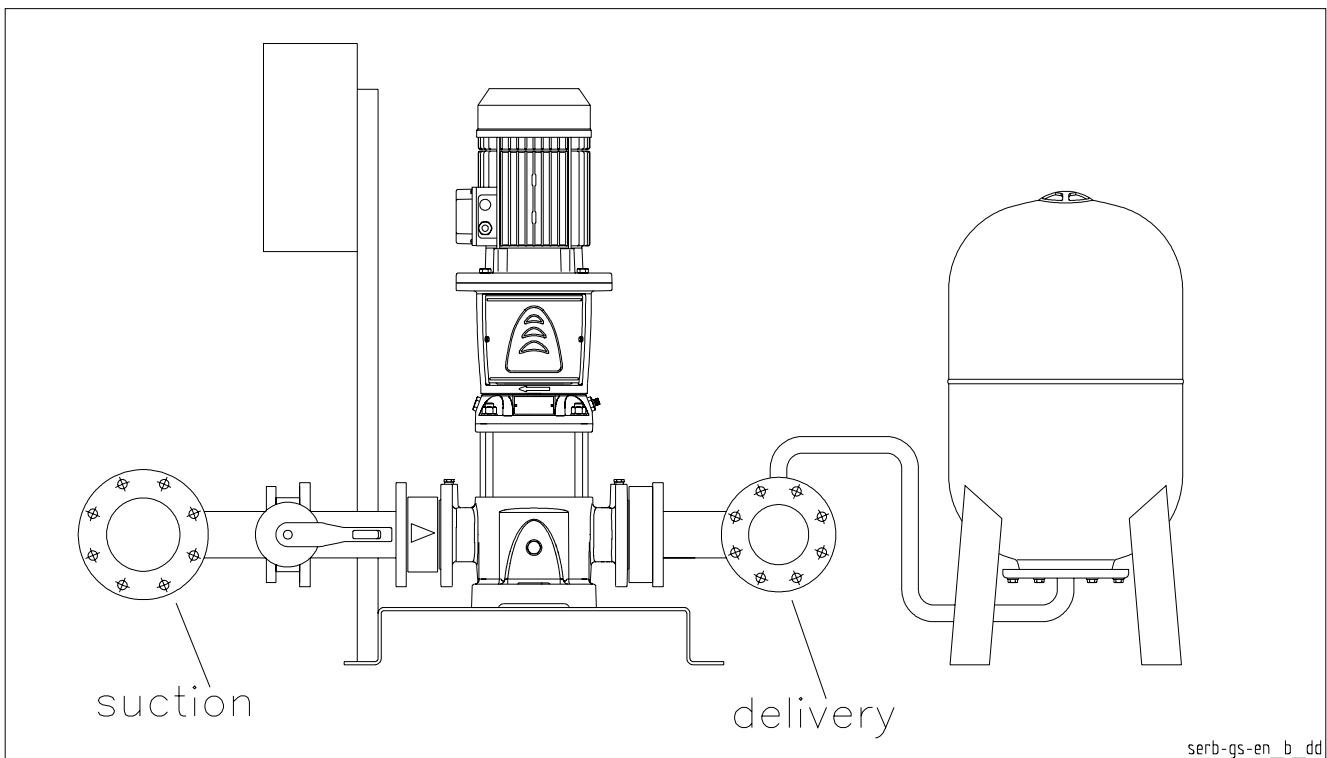
## **BOOSTER SETS GS SERIES INSTALLATION**

The GS series of pressure booster units are generally connected to pressurised tanks with a suitable capacity for the system. These tanks are normally expansion vessels for capacities up to 500 L. Tanks with higher capacities can also be supplied if necessary. In these cases, they are air-cushion tanks and a compressor is required to maintain the pressure inside the tank.

In both cases, the tanks must be connected on the pressure booster unit delivery line. The system, commonly known as an "autoclave", provides the system with a reserve of pressurised water and prevents frequent pump start-ups.

For these systems, sufficient space must always be allowed in the area where the pressure booster set is installed.

Always check maximum pump pressure in order to choose the right tanks for the pressure in question.



## **SUCTION CONDITIONS**

Installation of the pressure booster set must be assessed especially as regards intake conditions. Intake conditions can negatively or positively affect the performance of the pressure booster unit and consequently system performance. A positive suction head is ideal for a pressure booster unit as it keeps the pumps constantly primed and the positive difference in level adds pressure to the system.

A negative suction head is different. In this case, the risks for the pumps are priming which is connected with the intake piping, the NPSH of the pump and the difference in level between the pump and the water in the tank.

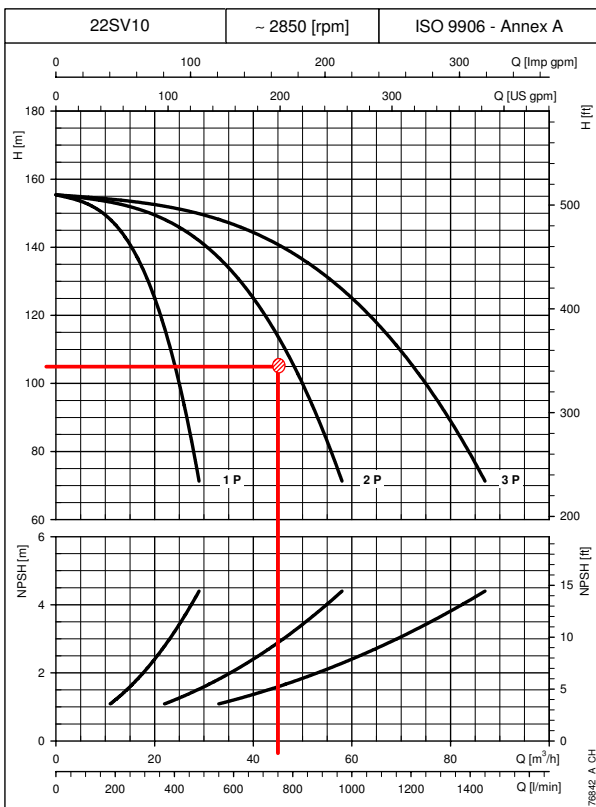
In this type of installation, after checking the intake capacity of the pump, the overall pressure drop in the intake line must be calculated as this will reduce pump performance and consequently that of the pressure booster unit.

In order to select the right pressure booster unit, the performance levels of the pumps installed on them are indicated in this catalogue. To simplify the calculation of net pressure, pressure drop curves, both for the delivery and intake lines of the pumps have been included (see the relative chapter).

## BOOSTER SETS GS SERIES CALCULATING NET PRESSURE

When selecting the GS series of pressure booster units, reference must be made to pump performance. Performance is calculated from the characteristic curves of the pumps and does not consider any pressure drops generated by pipes and valves as in the pressure booster units. To help choose the right pressure booster unit and calculate the correct pressure at the delivery manifold, the following example is shown:

Given the duty point  $Q = 42 \text{ m}^3/\text{h}$   $H = 105 \text{ mca}$  and with two pumps working, the pump with the most suitable characteristic curve is chosen, that is, the one with a curve that guarantees the required flow and head values.



From the example, we have chosen the 22SV10 series pump which guarantees system performance. The pump curve is slightly oversized, but this provides a safety margin to counter the pressure drops in the pressure booster unit pipes. To know the effective pressure at the delivery manifold outlet, the pressure drops in the suction and delivery lines of each pump are calculated.

To simplify calculations, the pressure drop curves for each pump, on page 85 of this catalogue, are used.

Assuming a pressure booster unit with check valves on the suction line (curve B of Hc pressure drops) has been selected, one proceeds as follows:

The Hc pressure drops on the pump suction line are to be evaluated on the "B" curve. At a flow rate of  $21 \text{ m}^3/\text{h}$  the value of  $H_c = 2,8 \text{ m}$ .

Similarly, the Hc pressure drops on the delivery line of the pump, as evaluated on the "B" curve, are analysed. At a flow rate of  $21 \text{ m}^3/\text{h}$ , the value of Hc is  $0,035 \text{ m}$ .

The total pressure drop on the delivery and suction lines is therefore  $2,84 \text{ m}$ .

As regards the pressure drop in the suction and delivery manifolds, 5% with respect to the pressure drops in the pump suction and delivery can be considered.

In this case, therefore, the value is  $0,142 \text{ m}$ .

The total pressure drop is approximately:  $3 \text{ m}$ .

Analysing the performance of the unit at a flow rate of  $42 \text{ m}^3/\text{h}$ , the head H is  $115 \text{ m}$ .

The net pressure at the delivery manifold is  $115 - 3 = 112 \text{ m}$ .

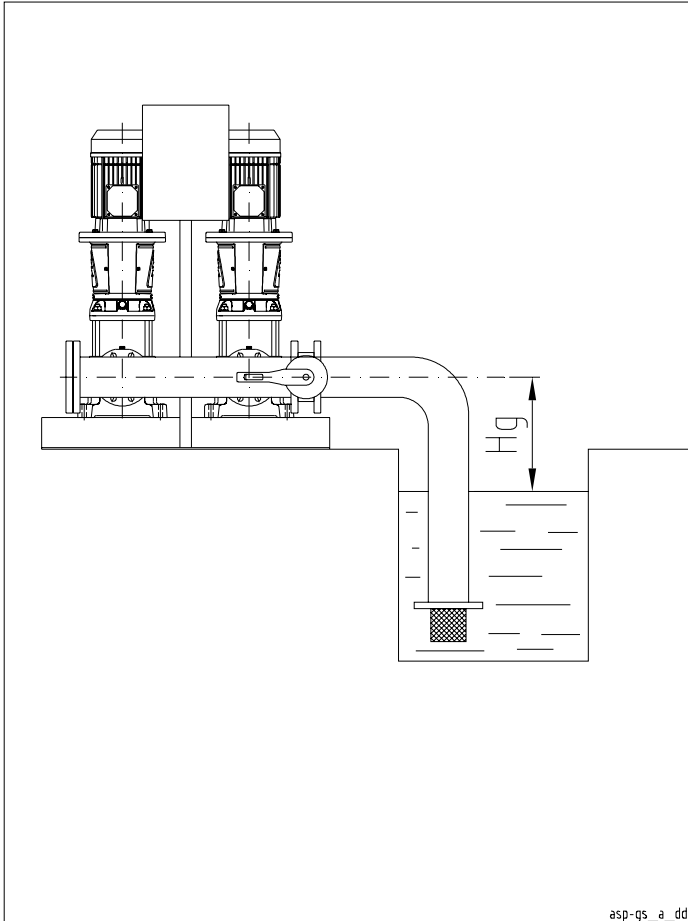
Comparing this value with the rated value,  $112 \text{ m} > 105 \text{ m}$ .

The unit can therefore satisfy the demand of the system.

## BOOSTER SETS GS SERIES SUCTION CONDITIONS

The above example does not consider the suction conditions of the pressure booster unit which, similarly, affect final performance. It is therefore always best to check the suction line for leaks, especially as regards positive head installations.

An example of positive head installation relative to the above case is shown below:



In the positive head installation, the designer must calculate the minimum installation height  $H_g$  of the pump in safety conditions in order to avoid cavitation and, therefore, de-priming of the pump.

The relationship that must be checked and which connects this measurement is the following:

$NPSH_{available} \geq NPSH_{requested}$  where equality is the limit condition.

$NPSH_{available} = P_{atm} + H_g - \sum \text{pressure drops}$ .

Where:

$P_{atm}$  is the atmospheric pressure, equal to 10,33 m

$H_g$  is the geodetic difference in level

The pressure drops are connected with to the suction piping and relative valves (foot and cut-off valves)

$NPSH_{requested}$  is a pump parameter taken from the performance curve of the pump which in our case, at a flow rate of 21 m<sup>3</sup>/h corresponds to 2,5 m. Before calculating the  $NPSH_{available}$ , the suction pressure drops are calculated using the tables on pages 103-104 in this catalogue, considering a material such as steel.

The chosen diameter of the suction piping is DN80.

90° curve DN80 = 2,11 m

Damper DN80 = 0,28 m

Drain valve DN80 = 0,3 m (calculated from supplier data)

Piping DN80 = 0,61 m (assuming a length of 2,5 m)

Piping DN80, intake manifold = 0,04 m (length of manifold 0,61 m)

Pressure drops on pump suction side (curve B) = 2,8 m

$\sum$  pressure drops = 6,1 m

Remembering that:  $NPSH_{available} = 10,33 + H_g - 6,1$

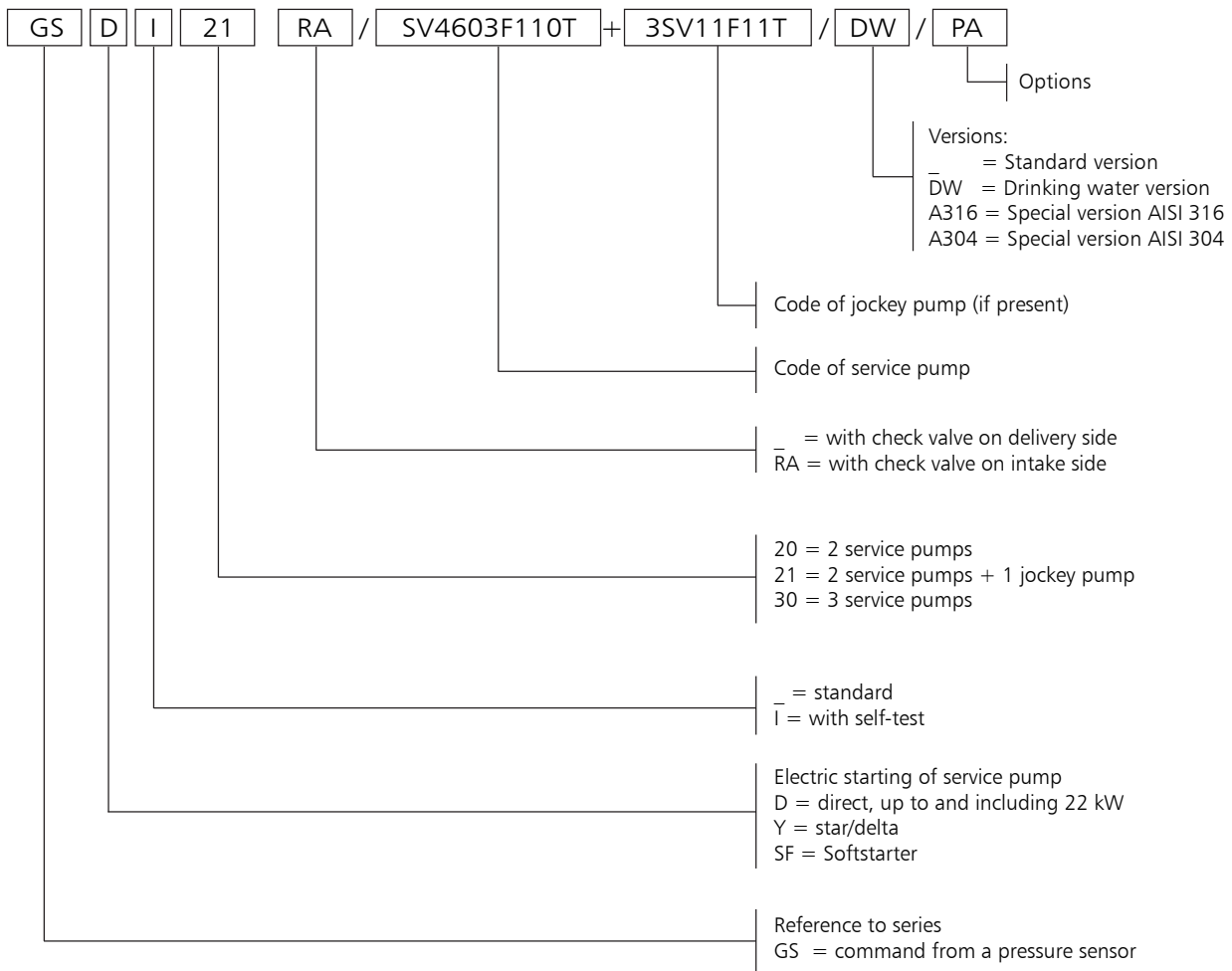
Replacing:  $10,33 + H_g - 6,1 \geq 2,5$

$H_g = 2,5 + 6,1 - 10,33 = -1,73$  m representing the limit, for which reason:  $NPSH_{available} = NPSH_{requested}$

Generally speaking, therefore, in order to assure correct operating conditions as regards the risk of cavitation, the pump must be positioned above the level of the tank so that the suction height is lower than the limit value of 1,73 m.



## SET IDENTIFICATION CODE



## OPTIONS (ON DEMAND)

- 2C Unit with two air-cooled compressors
- 2EV24 N°2 electrovalves 24 Volt
- BAP High pressure switch installed on the delivery manifold
- CM Oversized suction or delivery manifold
- CV Unit with expansion vessels (normally 24 litres supplied separately and not mounted)
- IP65 Control panel versions IP65
- KV Voltmeter Kit with phase switch
- MA Pressure gauge installed on suction manifold
- PA Minimum pressure gauge installed on the suction manifold for dry-running protection
- PR.2C Unit for two air-cooled compressors
- RA Check valves installed on suction side
- RE Panel incorporating a thermostat-controlled anti-condensate heater
- RV Electrical panel with missing-phase, phase-asymmetry, minimum – maximum voltage control
- SA No intake: no suction valves and suction manifold
- SC Group with no control devices, such as pressure switches and transmitters; the pressure gauge is present
- SCA No suction manifold (suction valves present)
- VA Electric control panel fitted with analogue voltmeter and ammeter
- WM Wall-mounted electrical panel with fixing tabs. Cables L= 5m
- PP Pressure-switch control

## SPECIAL VERSIONS

Special versions for materials, operating temperature, control panels with additional functions available on request.



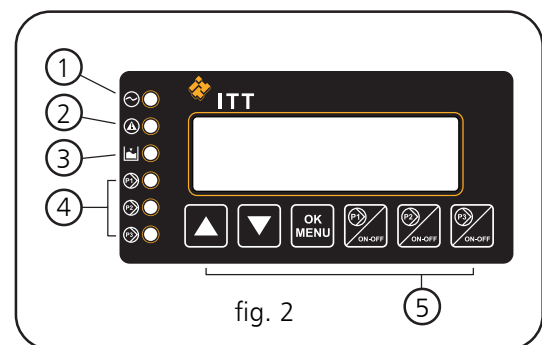
## CONTROL PANEL FOR GS20, GS21, GS30

**Electric panel** for powering, controlling and protecting a maximum of three three-phase pumps, with sheet steel casing (fig. 1) and protected to IP55.

Main characteristics:

- General doorlock switch, fuse holders and fuses, starting contactors and circuit breakers.
- Standard input voltage: 3x400Vca +/-10%, 50/60Hz.  
Non-standard voltages available on request, 1x230Vac +/-10%, 3x230ca +/-10%, 50/60Hz.
- Transformer for auxiliary low voltage circuit; auxiliary voltage 24Vac.
- Lowara SM30 digital microprocessor-controlled control unit with LCD display and programming keyboard (see fig. 2), featuring the following functions:

- Indicator lamps: power on (ref.1), general fault (ref.2), no water alarm (ref.3), pump running (ref.4);
- Programming keyboard (ref.5);
- Manual pump stop/start (one button for each pump) (ref.5);
- Automatic cascade pump control with two electronic pressure transmitters. If a sensor develops a fault, the board automatically switches to the second sensor.  
Pressure switch control available on request.
- Jockey pump management.
- Cycle reversal function (can be disabled). Automatically switches pumps after every start/stop cycle.
- Automatic, manual or disabled mode switches for each pump (inside the board).
- Periodic system self-test with an electrovalve command which opens the hydraulic circuit, simulates a pressure drop and consequently activates the control devices (pressure switches and pressure transmitters). Pump diagnostics.



- No-water protection system alternatives: float, minimum pressure switch, external contact or electrode probes with sensitivity adjustment.
- Adjustable timer delaying tripping the no-water protection system.
- Adjustable timer delaying starting of each pump.
- Adjustable timer extending the operation of each pump.
- System pressure drop offset function, only available with pressure sensor. This function improves system stability.
- Adjustable analogue output, 4-20mA or 0-10Vdc, for visualising the analogue input signal.
- Configurable relay with volt-free contact, delayed activation, signalling the following conditions:
  - Motor overload protection alarm.
  - No-water circuit alarm.
  - Pressure sensor fault.
  - Out-of-curve operation alarms (only if self-test is disabled).
  - Maximum intake pressure alarm.
  - Electrovalve opening permission for self-test circuit.
- Configurable digital inputs.
  - AUX1 input configuration, maximum pressure switch or external self-test.
  - AUX2 input configuration, permission from external device (NO) or external alarm (NC).
  - AUX3 input configuration, change set (NO) or pressure switch operating out-of-curve.
- 12Vdc output for powering the acoustic alarm.

**CONTROL PANEL FOR GS20, GS21, GS30**

- Alarms log and hour counters for each installed pump. Alarms visualised on display:
  - Maximum, minimum pressure;
  - Circuit breaker for each motor;
  - Pressure transmitter fault.
  - Out-of-curve operation;
  - No water;
  - Block for tripped external device (PTC, temperature probe, etc.)
  - Auto-test failed

All the alarms light the Fault lamp (ref.2 – fig.2)

The no-water alarm lights the Level alarm lamp (ref.3 – fig.2)

- Standard, RS485 serial communication, slave, and ModBus RTU protocol.
- The GSM/GPRS module can be connected to send pump alarms and/or operating states via sms or e-mail. Connection via RS485 serial connection. SIM card not included.
- A relay board (optional) can be connected to boost the following signals: pump running, aut-man mode for each pump, overload alarm, no-water alarm, maximum/minimum pressure alarm, power on, self-test failed. The optional signal booster board has six relays, each of which can be configured using the Lowara SM30 control unit.

**REFERENCE STANDARDS**

- The Lowara pressure booster sets are CE-marked for conformity with the following directives:
  - Machinery Directive: 2006/42/EC.
  - Low Voltage Directive 2006/95/EC.
  - Electromagnetic Compatibility Directive 2004/108/EC.
- Electric pump performance complies with the following standard:

ISO 9906-A Rotodynamic pumps – hydraulic performance acceptance tests.



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**GS.../SV**

## GS.../SV Series

Fixed-speed pressure booster sets  
Vertical Multistage electric pumps e-SV™ series  
equipped with high efficiency PLM motors  
flow rate up to 360 m<sup>3</sup>/h

**50 Hz**

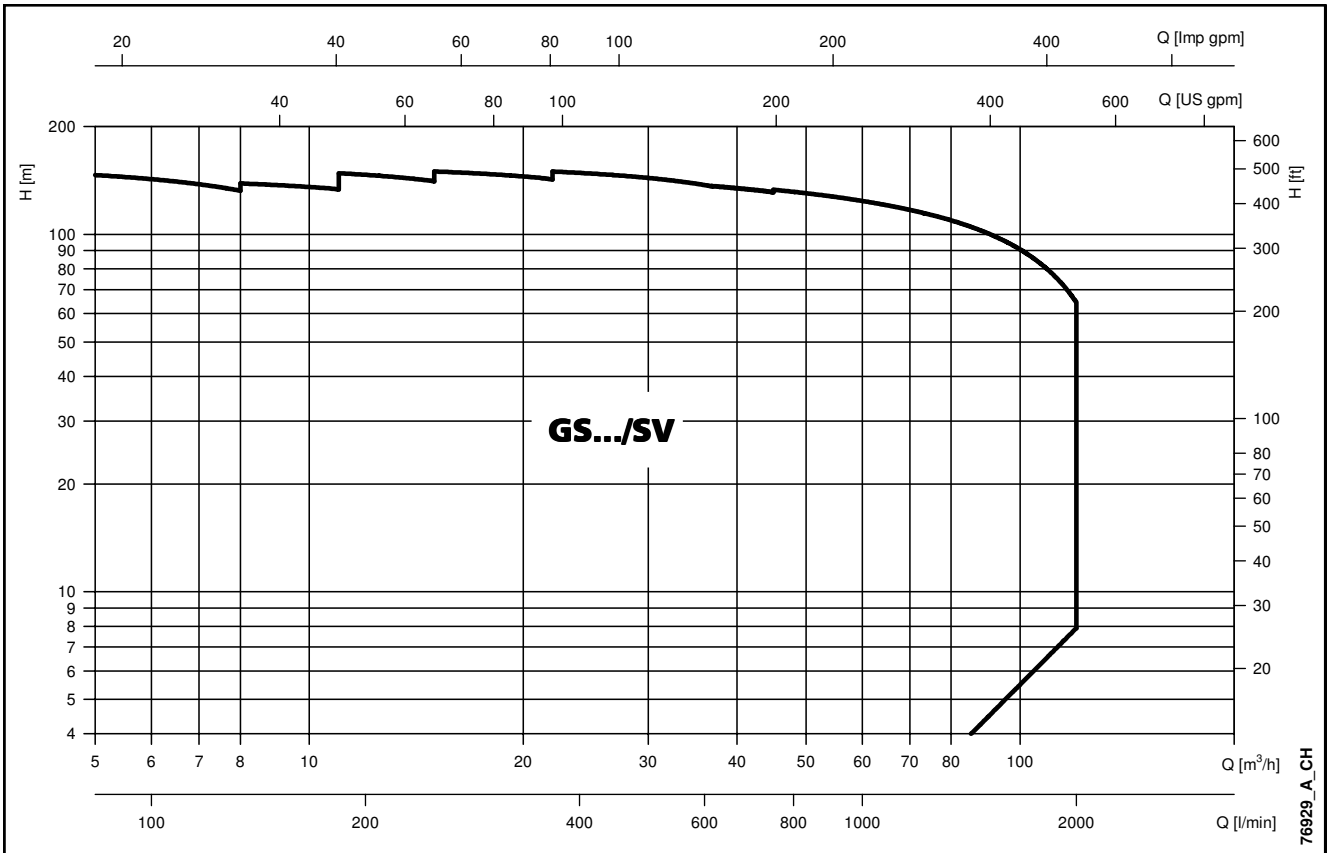


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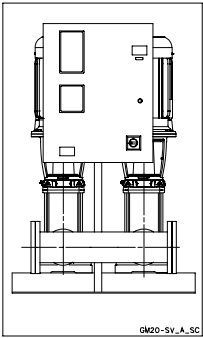
## GS.../SV SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz

GS.../SV



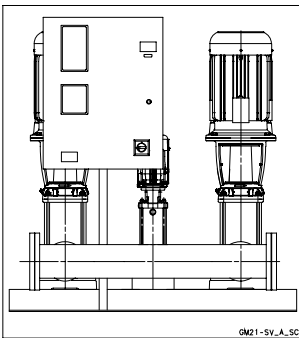
**RANGE**

The GS series of fixed-speed pressure boosters comprises models with 2 or 3 electric service pumps and an optional jockey pump in order to satisfy the specific needs of every application.

**GS.../SV**

**GS20 SETS**

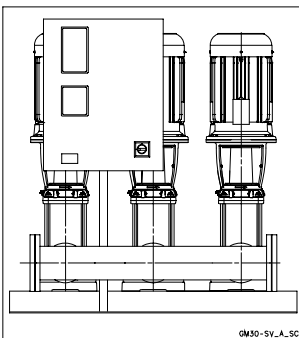
- Fixed-speed sets with two multistage vertical service pumps, SV series, with power ratings up to 37 kW.

**Head** up to 160m.  
**Flow rate** up to 240 m<sup>3</sup>/h.


**GS21 SETS**

- Fixed-speed sets with two service pumps and a jockey pump. Multistage vertical electric pumps, SV series, with power ratings up to 37 kW.

**Head** up to 160m.  
**Flow rate** up to 240 m<sup>3</sup>/h.


**GS30 SETS**

- Fixed-speed sets with three multistage vertical service pumps, SV series, with power ratings up to 37 kW.

**Head** up to 160m.  
**Flow rate** up to 360 m<sup>3</sup>/h.



## CHARACTERISTICS OF THE ELECTRIC PUMPS

GS.../SV

The SV pump is a multistage vertical pump, not self-priming, combined with a normalised standard motor. The hydraulic part is kept in place between the upper cover and the pump body with tie-rods. The pump body is available in different configurations and connection typologies.



### Technical Information:

Flow rates: up to 120 m<sup>3</sup>/h.  
Heads: up to 160 m.

Temperature of pumped liquid:

- from -30°C to +120°C for 3, 5, 10, 15, 22SV standard version.

- from -30°C to +120°C for SV 33, 46, 66, 92, standard version.

Tested to ISO 9906 annex A.

Clockwise direction of rotation looking at the pump from above (indicated with an arrow on the bracket and joint).

### Mechanical seal

SV pumps (only for 10, 15, 22SV  $\geq$  of 5,5 kW and SV33,46,66,92) are fitted standard with a balanced mechanical seal that can be replaced without having to remove the motor from the pump.

### Motor

Short circuit squirrel cage motor, totally enclosed, fan-cooled. Lowara motors up to 7.5 kW (inclusive) for the 4-pole version and up to 22 kW (inclusive) for the 2-pole version supplied standard. Other motor brands for higher powers. The performance levels of Lowara PLM surface motors lie within what is usually referred to as efficiency class 1.

Protection class IP55.

Insulation class F.

Performance levels according to EN 60034-1.

Standard voltage:

Single-phase version: 220-240 Vac, 50 Hz.

Three-phase version: 220-240/380-415 Vac, 50 Hz for power ratings up to 3 kW,

380-415/660-690 Vac, 50 Hz for power ratings higher than 3 kW.

### Materials

Suitable for pumping drinking water (WRAS certified).

## CHARACTERISTICS OF THE ELECTRIC PUMPS USED IN GS SERIES BOOSTER SETS

### CHARACTERISTICS OF 3, 5, 10, 15, 22SV SERIES

- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- The following versions are available:
  - F: round flanges, in-line delivery and suction ports, AISI 304.
  - T: oval flanges, in-line delivery and suction ports, AISI 304.
  - R: round flanges, delivery port above the suction port, with four adjustable positions, AISI 304.
  - N: round flanges, in-line delivery and suction ports, AISI 316.
  - V: Victaulic® couplings, in-line delivery and suction ports, AISI 316.
  - C: Clamp couplings (DIN 32676), in-line delivery and suction ports, AISI 316.
  - K: threaded couplings, (DIN 11851), in-line delivery and suction ports, AISI 316.
- Reduced axial thrusts enable the use of **standard motors** that are easily found in the market. **The Lowara SM ≥ 0,75 kW and PLM surface motors have efficiency values that fall within the range normally referred to as efficiency class IE2.**
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal.
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069 for 3, 5SV and 10, 15, 22SV (≤ di 4 kW) series.
- **Balanced mechanical seal** according to EN 12756 (ex DIN 24960) and ISO 3069, which **can be replaced without removing the motor from the pump** for 10, 15 and 22SV (≥ di 5,5 kW) series.
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal.
- A second plug is available for 10, 15, 22SV series.
- Versions with round flanges that can be coupled to counter-flanges, according to EN 1092.
- Threaded, oval counter-flanges made of stainless steel are standard supply for the T versions.
- Round counter-flanges made of stainless steel are available on request for the F, R and N versions.
- Easy maintenance. No special tools required for assembly or disassembly.
- **Materials are suitable for handling potable water (WRAS and ACS certified).**
- Standard version for temperatures ranging from -30°C to +120°C.

### CHARACTERISTICS OF SV33, 46, 66, 92 SERIES

- Vertical multistage centrifugal pump with impellers, diffusers and outer sleeve made entirely of stainless steel, and with pump casing and motor adaptor made of cast iron in the standard version.
- N version made entirely of AISI 316 stainless steel.
- High heads and capacities **four sizes: SV 33, 46, 66 and 92 (replacing the previous models SV 30 and 60).**
- Re-designed liquid end provides improved efficiency and energy savings.
- Innovative axial load compensation system on pumps with higher head. This ensures reduced axial thrusts and enables the use of **standard motors** that are easily found in the market. **The Lowara PLM surface motors have efficiency values that fall within the range normally referred to as efficiency class 1.**
- **Balanced mechanical seal** according to EN 12756 (ex DIN 24960) and ISO 3069, which **can be replaced without removing the motor from the pump.**
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal.
- **Materials are suitable for handling potable water (WRAS certified).**
- Standard version for temperatures ranging from -30°C to +120°C.
- Pump body fitted with couplings for installing pressure gauges on both suction and delivery flanges.
- In-line ports with round flanges that can be coupled to counter-flanges, in compliance with EN 1092.
- Mechanical sturdiness and easy maintenance. No special tools required for assembly or disassembly.

**OPERATING CHARACTERISTICS AND LIMITS**

Liquids handled	Water containing no gas or corrosive and/or aggressive substances.
Fluid temperature	Above -10°C a + 80 °C
Ambient temperature	Above 0°C a + 40 °C
Maximum operating pressure	16 bar
Minimum inlet pressure	According to NPSH curve and losses, with a minimum margin of 0.5 m
Maximum inlet pressure	The inlet pressure added to the pressure of the pump at zero flow must be lower than the maximum operating pressure of the set.
Installation	Indoors, protected from the weather. Away from heat sources. Max elevation 1000 m ASL. Max humidity 50% without condensation.
Hourly starts (single pump)	0,37 kW ≤ Pn ≤ 3 kW max 60 starts per hour. Direct motor start; 4 kW ≤ Pn ≤ kW max 40 starts per hour. Direct motor start; 11 kW ≤ Pn ≤ kW max 30 starts per hour. Direct motor start; 18,5 kW ≤ Pn ≤ 22 kW max 24 starts per hour. Direct motor start; 30 kW ≤ Pn ≤ 37 kW max 16 starts per hour. Start/delta start; Pn = 45 kW max 8 starts per hour. Start/delta start;
Sound emission	See table

\* On request, PN above in function of the pump

gfix\_2p-en\_b\_ti

**SOUND EMISSION LEVELS**

50 Hz 2900 rpm		LpA (dB ±2)**	
P2 (kW)	IEC*	G..20	G..30
0,37	71R	-	-
0,55	71	-	-
0,75	80R	-	-
1,1	80	<70	<70
1,5	90R	<70	<70
2,2	90R	<70	<70
3	100R	<70	71
4	112R	70	72
5,5	132R	71	73
7,5	132	74	76
11	160R	76	78
15	160	74	76
18,5	160	76	78
22	180R	73	75
30	200	77	79
37	200	77	79

\* R=Reduced motor casing size with respect to shaft extension and related flange.

gsfix\_2p-en\_a\_tr

\*\* Noise value of the electric motor only.





## MAIN COMPONENTS

- **Main On-off valves** on suction and discharge side of each pump, ball type with threaded coupling up to 2" size included. Butterfly type for installation between the flanges are used for larger diameters.
- **Check valve** on discharge side of each pump, spring-loaded type, with threaded coupling up to 1 1/2" size, as well as the double-swing type to fit between the flanges.  
For applications with air-cushion surge tanks, they are mounted on the suction side and the set is equipped with a connector for G 1/2" threaded flexible air feeder pipe (GS..RA series).
- **Suction manifold** made of galvanized or AISI 304 stainless steel depending on the version, with threaded or flanged ends depending on the type of pump (see drawings). Threaded coupling for water charging.
- **Delivery manifold** made of galvanized or AISI 304 stainless steel depending on the version, with threaded or flanged ends depending on the type of pump (see drawings). Fitted with two R1" threaded couplings with caps to allow connection of 24-litre diaphragm pressure vessels.
- **Pressure gauge and 2 control transmitters** located on the delivery side of the unit.
- **Miscellaneous pipe fittings** made of nickel-plated brass, galvanized steel or stainless steel.
- **Mounting base**, for pumpset and panel mounting brackets:
  - in galvanised steel for 3-5-10SV series of pumps with rated powers ≤ 4kW;
  - in painted steel for 10SV of pumps with rated powers > 4kW;
  - in painted steel for all the other units with 15-22SV, SV33-46-66-92 series pumps;
- **Electric control panel**, IP55 protection class.

## STANDARD VERSIONS AVAILABLE

See table of materials.

### STANDARD VERSION

#### For general applications

##### Sets with 3-5-10SV pumps:

Nickel-plated brass valves, brass non-return valves, galvanized steel manifolds, plugs, caps and flanges. Anti-vibration feet included for 2-pump units up to 4 kW.

##### Sets with 15-22SV pumps:

Nickel-plated brass valves, non-return valves with stainless steel flaps.

##### Sets with SV33-46-66-92 pumps:

Valves with polyamide butterfly, non-return valves with stainless steel flaps.

### DW VERSION (GS../DW)

#### For drinking water applications.

The main components in contact with the liquid are certified suitable for drinking water or are made of AISI 304 or higher grade of stainless steel.

##### Sets with 3-5-10SV pumps:

Nickel-plated brass valves, nickel-plated brass non-return valves. Anti-vibration feet included for 2-pump units up to 4 kW.

##### Sets with 15-22SV pumps:

Nickel-plated brass valves, non-return valves with stainless steel flaps.

##### Sets with SV33-46-66-92 pumps:

Valves with epoxy butterfly, non-return valves with stainless steel flaps.

Same dimensions as the standard version.

##### AISI304 Version (GS../A304),

##### AISI 316 (GS../A316)

##### For special applications

Manifolds, valves, non-return valves and main components with parts directly in contact with the pumped liquid are made of AISI 304 or AISI 316 stainless steel.

Same dimensions as the standard version.

Anti-vibration feet included for 2-pump units up to 4 kW.

##### Accessories available on request:

- Devices **against dry running** in one of the following versions:
  - float switch, for positive suction head;
  - probe electrodes kit, for positive suction head;
  - minimum pressure switch, for positive suction head.
- **Surge tank** in the following versions:
  - Air-cushion surge tank with compressor and accessories for surge tank and compressor.
  - Diaphragm vessel as an alternative to the air-cushion tank.
- **Kit featuring a 24-litre diaphragm expansion vessel** with ball valve (one for each pump), in the following versions, depending on the maximum head of the pumps:
  - 24-litre 8 bar cylinder water vessel kit
  - 24-litre 10 bar cylinder water vessel kit
  - 24-litre 16 bar cylinder water vessel kit
- **Alarm kit;**
- **Air feeder** for RA version;
- **Air compressor** for RA version.

## SPECIAL VERSIONS AVAILABLE ON REQUEST

### (Contact the Sales and technical Assistance Service)

- Units with non-standard input voltages, such as three-phase 3x230V, 3x440V.
- Units with single-phase input voltages 1x230V.
- Jockey pump other than the standard ones illustrated in the catalogue.
- Support base in AISI 304, AISI 316 stainless steel.
- Units with stainless steel expansion vessels.
- Units with special valves.
- Units with 4 electric pumps (GS40...).
- Units with 5 electric pumps (GS41... GS50...).



# ITT

# Lowara

## TABLE OF MATERIALS FOR SETS WITH 3-5-10SV PUMPS UP TO 4kW

NAME	MATERIAL			
	(STANDARD)	DW	A304	A316
Manifolds	Galvanized steel	AISI 304	AISI 304	AISI 316
On-off valves	Nickel-plated brass	Nickel-plated brass	AISI 316	AISI 316
Non-return valves	Brass	Brass	AISI 304	AISI 316
Pressure switches	Chrome plated zinc alloy	AISI 304	AISI 304	AISI 304
Pressure transmitters	AISI 316	AISI 316	AISI 316	AISI 316
Caps/plugs/flanges	Galvanized steel	AISI 304	AISI 304	AISI 316
Bracket	Galvanized steel	Galvanized steel	Galvanized steel	Galvanized steel
Base	Galvanized steel	Galvanized steel	Galvanized steel	Galvanized steel
Pump body	AISI 304	AISI 304	AISI 304	AISI 316
Outer sleeve	AISI 304	AISI 304	AISI 304	AISI 316

gfixvsv\_2p-en\_c\_tm

## TABLE OF MATERIALS FOR SETS WITH 10SV PUMPS ABOVE 4kW

NAME	MATERIAL			
	(STANDARD)	DW	A304	A316
Manifolds	Galvanized steel	AISI 304	AISI 304	AISI 316
On-off valves	Nickel-plated brass	Nickel-plated brass	AISI 316	AISI 316
Non-return valves	Brass	Brass	AISI 304	AISI 316
Pressure switches	Chrome plated zinc alloy	AISI 304	AISI 304	AISI 304
Pressure transmitters	AISI 316	AISI 316	AISI 316	AISI 316
Caps/plugs/flanges	Galvanized steel	AISI 304	AISI 304	AISI 316
Bracket	Painted steel	Painted steel	Painted steel	Painted steel
Base	Painted steel	Painted steel	Painted steel	Painted steel
Pump body	AISI 304	AISI 304	AISI 304	AISI 316
Outer sleeve	AISI 304	AISI 304	AISI 304	AISI 316

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## TABLE OF MATERIALS FOR SETS 15-22SV PUMPS

DENOMINAZIONE	MATERIALE			
	(STANDARD)	DW	A304	A316
Manifolds	AISI304	AISI 304	AISI 304	AISI 316
On-off valves	Nickel-plated brass	Nickel-plated brass	AISI 316	AISI 316
Non-return valves	Painted cast iron with stainless steel flaps	Painted cast iron with stainless steel flaps	AISI 304	AISI 316
Pressure switches	Chrome plated zinc alloy	AISI 304	AISI 304	AISI 304
Pressure transmitters	AISI 316	AISI 316	AISI 316	AISI 316
Caps/plugs/flanges	Galvanized steel	AISI 304	AISI 304	AISI 316
Bracket	Painted steel (*)	Painted steel (*)	Painted steel (*)	Painted steel (*)
Base	Painted steel	Painted steel	Painted steel	Painted steel
Pump body	AISI 304	AISI 304	AISI 304	AISI 316
Outer sleeve	AISI 304	AISI 304	AISI 304	AISI 316

(\*) of galvanized steel for two-pump sets up to 4kW

gfixvsv16\_2p-en\_b\_tm

## TABLE OF MATERIALS FOR SETS SV33-46-66-92 PUMPS

DENOMINAZIONE	MATERIALE			
	(STANDARD)	DW	A304	A316
Manifolds	AISI 304	AISI 304	AISI 304	AISI 316
On-off valves	Poliamide	Epoxy	AISI 316	AISI 316
Non-return valves	Painted cast iron with stainless steel flaps	Painted cast iron with stainless steel flaps	AISI 304	AISI 316
Pressure switches	Chrome plated zinc alloy	AISI 304	AISI 304	AISI 304
Pressure transmitters	AISI 316	AISI 316	AISI 316	AISI 316
Caps/plugs/flanges	Galvanized steel	AISI 316	AISI 316	AISI 316
Bracket	Painted steel	Painted steel	Painted steel	Painted steel
Base	Painted steel	Painted steel	Painted steel	Painted steel
Pump body	Cast iron	Cast iron	Cast iron	AISI 316
Outer sleeve	AISI 304	AISI 304	AISI 304	AISI 316

gfixvsv33\_2p-en\_b\_tm

**GS.../SV SERIES BOOSTER SETS  
HYDRAULIC PERFORMANCE TABLE AT 50 HZ (JOCKEY PUMP)**

PUMP TYPE	NOMINAL POWER		Q = DELIVERY										
			l/min 0	12	20	25	30	35	40	45	50	60	73
	HP	m <sup>3</sup> /h 0	0,7	1,2	1,5	1,8	2,1	2,4	2,7	3,0	3,6	4,4	
H = TOTAL HEAD METRES COLUMN OF WATER													
3SV02	0,37	0,5	15		14,5	14,3	14,0	13,5	13,0	12,4	11,7	9,8	6,5
3SV03	0,37	0,5	22		21,2	20,8	20,3	19,6	18,7	17,7	16,6	13,7	8,6
3SV04	0,37	0,5	29		27,7	27,1	26,2	25,2	23,9	22,5	20,8	16,8	10,1
3SV05	0,55	0,75	37		36,4	35,8	35,0	33,9	32,6	31,1	29,2	24,5	16,2
3SV06	0,55	0,75	44		43,4	42,6	41,6	40,2	38,6	36,6	34,3	28,5	18,5
3SV07	0,55	0,75	53		51,8	51,0	50,0	48,7	47,0	45,0	42,5	36,1	24,6
3SV08	0,75	1	60		59,1	58,2	57,0	55,4	53,4	51,0	48,1	40,7	27,5
3SV09	1,1	1,5	68		66,8	65,8	64,5	62,8	60,6	57,9	54,6	46,4	31,6
3SV10	1,1	1,5	75		73,8	72,7	71,3	69,3	66,9	63,8	60,2	51,0	34,5
3SV11	1,1	1,5	82		81,0	79,7	78,0	75,8	73,1	69,7	65,7	55,5	37,4
3SV12	1,1	1,5	90		87,8	86,4	84,5	82,1	79,1	75,5	71,1	59,9	40,1
3SV13	1,5	2	98		96,7	95,4	93,5	91,0	87,8	83,9	79,2	67,2	45,6
3SV14	1,5	2	106		104,1	102,5	100,4	97,7	94,2	89,9	84,8	71,8	48,5
3SV16	1,5	2	120		117,8	116,1	113,6	110,5	106,5	101,6	95,8	80,9	54,2
3SV19	2,2	3	144		142,3	140,3	137,5	133,9	129,2	123,5	116,7	99,1	67,6
3SV21	2,2	3	159		157	155	151	147	142	136	128	108	74

gfix\_fhe\_pp\_3sv-2p50-en\_a\_th

**GS20/10-15SV, GS21/10-15SV SERIES BOOSTER SETS  
HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)**

SET TYPE GS20/..	NOMINAL POWER	Q = DELIVERY														
		l/min 0	167	200	267	340	367	467	540	660	700	800	600	700	800	
	HP	m <sup>3</sup> /h 0	10	12	16	20,4	22	28	32	39,6	42	48	36	42	48	
H = TOTAL HEAD METRES COLUMN OF WATER																
10SV01F007T	2 x 0,75	12	11,2	10,9	9,9	8,3	7,6	4,3								
10SV02F007T	2 x 0,75	24	21,9	21,3	19,6	17,0	15,8	10,0								
10SV03F011T	2 x 1,1	36	33,0	32,1	29,6	25,8	24,1	16,0								
10SV04F015T	2 x 1,5	48	44,2	43,0	39,9	34,8	32,6	21,7								
10SV05F022T	2 x 2,2	60	56,1	54,7	50,9	44,9	42,2	29,0								
10SV06F022T	2 x 2,2	72	66,8	65,0	60,4	53,1	49,8	33,9								
10SV07F030T	2 x 3	84	78,3	76,2	70,8	62,1	58,3	39,8								
10SV08F030T	2 x 3	95	88,9	86,5	80,1	70,2	65,7	44,5								
10SV09F040T	2 x 4	106	100,1	97,5	90,8	80,0	75,1	52,1								
10SV10F040T	2 x 4	118	110,8	107,9	100,3	88,2	82,8	57,2								
10SV11F040T	2 x 4	130	121,3	118,1	109,6	96,3	90,3	62,1								
10SV13F055T	2 x 5,5	156	146,5	142,7	132,6	116,4	109,2	74,3								
15SV01F011T	2 x 11	14			12,9	12,4	12,2	11,3	10,4	8,4	7,6	5,1				
15SV02F022T	2 x 2,2	29			26,7	25,9	25,5	23,9	22,4	18,9	17,4	13,1				
15SV03F030T	2 x 3	43			40,4	39,1	38,6	36,2	33,8	28,7	26,5	20,1				
15SV04F040T	2 x 4	58			54,7	53,1	52,5	49,4	46,3	39,7	36,9	28,7				
15SV05F040T	2 x 4	73			67,8	65,8	65,0	61,0	57,1	48,7	45,2	34,9				
15SV06F055T	2 x 5,5	88			81,5	79,4	78,4	74,1	69,9	60,3	56,3	44,2				
15SV07F055T	2 x 5,5	102			94,5	91,9	90,8	85,7	80,6	69,4	64,7	50,5				
15SV08F075T	2 x 7,5	117			110,9	108,0	106,8	100,8	94,9	82,0	76,7	60,6				
15SV09F075T	2 x 7,5	132			124,4	121,0	119,6	112,8	106,1	91,5	85,5	67,4				
15SV10F110T	2 x 11	148			138,8	135,3	133,8	126,7	119,6	103,9	97,4	77,5				

The tabel referers to performance with 2 pumps running

gms\_2p10-15sv\_2p50-en\_b\_th



# ITT

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## GS20/22SV, GS21/22SV SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)

GS.../SV

SET TYPE GS20/..	NOMINAL POWER kW	Q = DELIVERY													
		l/min 0	167	200	267	340	367	467	540	660	700	800	860	920	967
		m <sup>3</sup> /h 0	10	12	16	20,4	22	28	32	39,6	42	48	52	55	58
H = TOTAL HEAD METRES COLUMN OF WATER															
22SV01F011T	2 x 1,1	15					13,5	12,7	12,0	10,4	9,7	7,7	6,3	4,7	3,4
22SV02F022T	2 x 2,2	30					28,4	27,2	26,0	23,3	22,2	18,9	16,6	13,8	11,5
22SV03F030T	2 x 3	45					42,2	40,4	38,5	34,5	32,8	27,8	24,2	20,2	16,6
22SV04F040T	2 x 4	61					56,8	54,4	51,9	46,6	44,4	37,9	33,1	27,7	23,0
22SV05F055T	2 x 5,5	76					70,9	67,9	64,9	58,3	55,6	47,4	41,4	34,7	28,8
22SV06F075T	2 x 7,5	93					88,8	85,7	82,5	75,4	72,4	63,3	56,7	49,1	42,6
22SV07F075T	2 x 7,5	109					103,1	99,4	95,7	87,2	83,7	73,1	65,3	56,5	48,8
22SV08F110T	2 x 11	125					119,2	115,2	111,0	101,6	97,7	85,7	77,0	66,9	58,2
22SV09F110T	2 x 11	140					133,7	129,2	124,4	113,8	109,3	95,8	86,0	74,6	64,8
22SV10F110T	2 x 11	155					148,2	143,1	137,8	125,9	120,9	105,8	94,8	82,3	71,3

The tabel refers to performance with 2 pumps running

gms\_2p22sv\_2p50-en\_a\_th

## GS20/SV33-46, GS21/SV33-46 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)

SET TYPE GS20/..	NOMINAL POWER kW	Q = DELIVERY										
		l/min 0	500	600	733	833	1000	1167	1333	1500	1800	2000
		m <sup>3</sup> /h 0	30	36	44	50	60	70	80	90	108	120
H = TOTAL HEAD METRES COLUMN OF WATER												
SV3301/1F22T	2 x 2,2	17,4	16,2	15,7	15,0	14,0	12,2	9,8	6,7			
SV3301F30T	2 x 3	23,8	21,7	21,2	20,3	20,0	17,8	15,5	12,7			
SV3302/2F40T	2 x 4	35,1	34,1	33,3	32,0	30,0	27,0	22,4	16,6			
SV3302/1F40T	2 x 4	40,8	38,8	37,9	36,0	35,0	32,0	27,5	22,3			
SV3302F55T	2 x 5,5	47,8	45,0	44,1	43,0	41,0	39,0	35,0	29,9			
SV3303/2F55T	2 x 5,5	57,7	55,2	53,8	51,0	49,0	44,0	38,0	29,6			
SV3303/1F75T	2 x 7,5	64,5	61,3	60,0	58,0	56,0	51,0	45,0	37,0			
SV3303F75T	2 x 7,5	71,5	67,4	66,0	64,0	62,0	58,0	52,0	44,6			
SV3304/2F75T	2 x 7,5	82,0	78,8	77,0	74,0	72,0	66,0	58,0	47,2			
SV3304/1F110T	2 x 11	88,9	85,0	83,0	81,0	78,0	73,0	65,0	55,1			
SV3304F110T	2 x 11	95,9	91,1	90,0	87,0	85,0	80,0	73,0	63,1			
SV3305/2F110T	2 x 11	106,0	101,6	100,0	96,0	93,0	85,0	76,0	63,0			
SV3305/1F110T	2 x 11	112,7	107,2	105,0	102,0	99,0	92,0	82,0	70,0			
SV3305F150T	2 x 15	120,4	114,9	113,0	110,0	107,0	101,0	92,0	80,5			
SV3306/2F150T	2 x 15	131,2	126,9	125,0	120,0	116,0	108,0	96,0	81,2			
SV3306/1F150T	2 x 15	139,1	133,5	131,0	128,0	124,0	116,0	105,0	90,4			
SV3306F150T	2 x 15	145,6	139,0	137,0	133,0	129,0	121,0	110,0	96,1			
SV3307/2F150T	2 x 15	156,0	149,9	147,0	143,0	138,0	128,0	115,0	98,2			
SV4601/1F30T	2 x 3	19,5			19,2	18,8	17,9	16,7	15,1	13,1	8,5	4,6
SV4601F40T	2 x 4	27,2			24,0	23,5	22,5	21,4	19,9	18,2	14,3	10,8
SV4602/2F55T	2 x 5,5	38,8			39,8	39,2	37,8	35,7	32,9	29,4	21,1	13,9
SV4602F75T	2 x 7,5	52,6			48,5	47,7	46,1	44,2	41,7	38,7	31,4	25,1
SV4603/2F110T	2 x 11	64,7			65,1	64,0	62,0	60,0	56,0	52,0	40,4	30,8
SV4603F110T	2 x 11	80,8			74,3	73,0	71,0	68,0	65,0	60,0	50,0	40,7
SV4604/2F150T	2 x 15	92,4			90,7	90,0	87,0	83,0	79,0	73,0	58,0	45,6
SV4604F150T	2 x 15	107,3			99,8	98,0	96,0	92,0	87,0	82,0	68,0	55,9
SV4605/2F185T	2 x 18,5	117,2			114,8	113,0	110,0	106,0	100,0	93,0	75,0	60,2
SV4605F185T	2 x 18,5	134,5			125,1	123,0	120,0	116,0	110,0	103,0	86,0	71,5
SV4606/2F220T	2 x 22	143,7			139,3	138,0	134,0	129,0	122,0	113,0	92,0	73,4
SV4606F220T	2 x 22	161,0			149,9	148,0	144,0	139,0	132,0	124,0	104,0	86,0

The table refers to performance with 2 pumps running.

gms\_2p33-46\_2p50-en\_a\_th



# ITT

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## GS20/SV66-92, GS21/SV66-92 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)

SET TYPE GS20/..	NOMINAL POWER kW	Q = DELIVERY												
		l/min 0 m <sup>3</sup> /h 0	1000 60	1200 72	1400 84	1500 90	1800 108	2000 120	2400 144	2600 156	2833,3 170	3200 192	3600 216	4000 240
H = TOTAL HEAD METRES COLUMN OF WATER														
SV6601/1F40T	2 x 4	23,8	21,4	20,7	19,9	19,4	17,8	16,6	13,3	11,2	8,3			
SV6601F55T	2 x 5,5	29,2	25,8	24,8	23,8	23,3	21,8	20,7	17,9	16,1	13,5			
SV6602/2F75T	2 x 7,5	47,5	42,6	41,2	39,5	38,6	35,5	32,9	26,4	22,2	16,4			
SV6602/1F110T	2 x 11	54,2	49,6	48,2	46,7	45,8	42,9	40,6	34,8	31,2	26,2			
SV6602F110T	2 x 11	60,4	55,7	54,4	52,8	52,0	49,3	47,1	42,0	38,9	34,7			
SV6603/2F150T	2 x 15	78,4	71,6	69,6	67,2	65,9	61,5	57,9	49,0	43,3	35,3			
SV6603/1F150T	2 x 15	84,7	77,8	75,8	73,5	72,2	68,0	64,6	56,3	51,1	44,0			
SV6603F185T	2 x 18,5	91,4	84,7	82,7	80,5	79,3	75,2	72,0	64,4	59,8	53,5			
SV6604/2F185T	2 x 18,5	108,9	99,6	96,9	93,8	92,1	86,3	81,6	70,1	62,8	52,8			
SV6604/1F220T	2 x 22	115,2	105,9	103,1	100,1	98,5	92,9	88,6	77,8	71,1	61,8			
SV6604F220T	2 x 22	121,6	112,5	109,8	106,9	105,3	99,8	95,7	85,5	79,2	70,8			
SV6605/2F300T	2 x 30	139,1	127,5	124,1	120,2	118,2	111,1	105,5	91,5	82,7	70,4			
SV6605/1F300T	2 x 30	145,6	134,0	130,5	126,8	124,7	117,8	112,4	99,2	90,9	79,5			
SV6605F300T	2 x 30	152,0	140,4	137,0	133,3	131,3	124,6	119,4	106,8	99,1	88,5			
SV9201/1F55T	2 x 5,5	24,5				22,2	21,5	20,9	19,4	18,5	17,3	15,0	11,8	7,9
SV9201F75T	2 x 7,5	33,5				28,7	27,2	26,2	24,3	23,3	22,2	20,2	17,6	14,3
SV9202/2F110T	2 x 11	49,4				45,1	43,7	42,5	39,6	37,9	35,5	30,9	24,6	16,8
SV9202F150T	2 x 15	67,8				58,2	55,3	53,4	49,5	47,6	45,2	41,4	36,3	29,6
SV9203/2F185T	2 x 18,5	82,4				74,4	71,6	69,6	64,8	62,1	58,6	52,2	43,6	32,9
SV9203F220T	2 x 22	102,2				88,2	84,0	81,2	75,5	72,6	69,2	63,4	55,9	46,3
SV9204/2F300T	2 x 30	115,7				104,0	99,9	97,0	90,4	86,8	82,1	73,8	62,8	49,0
SV9204F300T	2 x 30	133,1				117,0	111,7	108,0	100,6	96,8	92,3	84,6	74,8	62,5
SV9205/2F370T	2 x 37	149,0				133,2	127,8	124,0	115,6	111,0	105,2	94,9	81,4	64,6

The table refers to performance with 2 pumps running.

gms\_2psv66-92\_2p50-en\_a\_th

**GS.../SV**



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Lowara

**GS30/10-15SV SERIES BOOSTER SETS  
HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)**

GS.../SV

SET TYPE GS30/..	NOMINAL POWER kW	Q = DELIVERY													
		l/min 0	167	200	267	340	367	467	540	660	700	800	600	700	800
		m <sup>3</sup> /h 0	10	12	16	20,4	22	28	32	39,6	42	48	36	42	48
H = TOTAL HEAD METRES COLUMN OF WATER															
10SV01F007T	3 x 0,75	12	11,2	10,9	9,9	8,3	7,6	4,3							
10SV02F007T	3 x 0,75	24	21,9	21,3	19,6	17,0	15,8	10,0							
10SV03F011T	3 x 1,1	36	33,0	32,1	29,6	25,8	24,1	16,0							
10SV04F015T	3 x 1,5	48	44,2	43,0	39,9	34,8	32,6	21,7							
10SV05F022T	3 x 2,2	60	56,1	54,7	50,9	44,9	42,2	29,0							
10SV06F022T	3 x 2,2	72	66,8	65,0	60,4	53,1	49,8	33,9							
10SV07F030T	3 x 3	84	78,3	76,2	70,8	62,1	58,3	39,8							
10SV08F030T	3 x 3	95	88,9	86,5	80,1	70,2	65,7	44,5							
10SV09F040T	3 x 4	106	100,1	97,5	90,8	80,0	75,1	52,1							
10SV10F040T	3 x 4	118	110,8	107,9	100,3	88,2	82,8	57,2							
10SV11F040T	3 x 4	130	121,3	118,1	109,6	96,3	90,3	62,1							
10SV13F055T	3 x 5,5	156	146,5	142,7	132,6	116,4	109,2	74,3							
15SV01F011T	3 x 11	14			12,9	12,4	12,2	11,3	10,4	8,4	7,6	5,1			
15SV02F022T	3 x 2,2	29			26,7	25,9	25,5	23,9	22,4	18,9	17,4	13,1			
15SV03F030T	3 x 3	43			40,4	39,1	38,6	36,2	33,8	28,7	26,5	20,1			
15SV04F040T	3 x 4	58			54,7	53,1	52,5	49,4	46,3	39,7	36,9	28,7			
15SV05F040T	3 x 4	73			67,8	65,8	65,0	61,0	57,1	48,7	45,2	34,9			
15SV06F055T	3 x 5,5	88			81,5	79,4	78,4	74,1	69,9	60,3	56,3	44,2			
15SV07F055T	3 x 5,5	102			94,5	91,9	90,8	85,7	80,6	69,4	64,7	50,5			
15SV08F075T	3 x 7,5	117			110,9	108,0	106,8	100,8	94,9	82,0	76,7	60,6			
15SV09F075T	3 x 7,5	132			124,4	121,0	119,6	112,8	106,1	91,5	85,5	67,4			
15SV10F110T	3 x 11	148			138,8	135,3	133,8	126,7	119,6	103,9	97,4	77,5			

The table refers to performance with 3 pumps running.

gms\_3p10-15sv\_2p50-en\_b\_th

**GS30/22SV SERIES BOOSTER SETS  
HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)**

SET TYPE GS30/..	NOMINAL POWER kW	Q = DELIVERY													
		l/min 0	250	300	400	510	550	700	810	990	1050	1200	1290	1380	1450
		m <sup>3</sup> /h 0	15	18	24	30,6	33	42	49	59,4	63	72	77	83	87
H = TOTAL HEAD METRES COLUMN OF WATER															
22SV01F011T	3 x 1,1	15					13,5	12,7	12,0	10,4	9,7	7,7	6,3	4,7	3,4
22SV02F022T	3 x 2,2	30					28,4	27,2	26,0	23,3	22,2	18,9	16,6	13,8	11,5
22SV03F030T	3 x 3	45					42,2	40,4	38,5	34,5	32,8	27,8	24,2	20,2	16,6
22SV04F040T	3 x 4	61					56,8	54,4	51,9	46,6	44,4	37,9	33,1	27,7	23,0
22SV05F055T	3 x 5,5	76					70,9	67,9	64,9	58,3	55,6	47,4	41,4	34,7	28,8
22SV06F075T	3 x 7,5	93					88,8	85,7	82,5	75,4	72,4	63,3	56,7	49,1	42,6
22SV07F075T	3 x 7,5	109					103,1	99,4	95,7	87,2	83,7	73,1	65,3	56,5	48,8
22SV08F110T	3 x 11	125					119,2	115,2	111,0	101,6	97,7	85,7	77,0	66,9	58,2
22SV09F110T	3 x 11	140					133,7	129,2	124,4	113,8	109,3	95,8	86,0	74,6	64,8
22SV10F110T	3 x 11	155					148,2	143,1	137,8	125,9	120,9	105,8	94,8	82,3	71,3

The table refers to performance with 3 pumps running.

gms\_3p22sv\_2p50-en\_a\_th



# ITT

# Lowara

## GS30/SV33-46 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)

SET TYPE GS30/..	NOMINAL POWER kW	Q = DELIVERY										
		l/min 0 m <sup>3</sup> /h 0	750 45	900 54	1100 66	1250 75	1500 90	1750 105	2000 120	2250 135	2700 162	3000 180
H = TOTAL HEAD METRES COLUMN OF WATER												
SV3301/1F22T	3 x 2,2	17,4	16,2	15,7	15	14	12,2	9,8	6,7			
SV3301F30T	3 x 3	23,8	21,7	21,2	20	20	17,8	15,5	12,7			
SV3302/2F40T	3 x 4	35,1	34,1	33,3	32	30	27	22,4	16,6			
SV3302/1F40T	3 x 4	40,8	38,8	37,9	36	35	32	27,5	22,3			
SV3302F55T	3 x 5,5	47,8	45	44,1	43	41	39	35	29,9			
SV3303/2F55T	3 x 5,5	57,7	55,2	53,8	51	49	44	38	29,6			
SV3303/1F75T	3 x 7,5	64,5	61,3	60	58	56	51	45	37			
SV3303F75T	3 x 7,5	71,5	67,4	66,0	64	62	58	52,0	44,6			
SV3304/2F75T	3 x 7,5	82	78,8	77	74	72	66	58	47,2			
SV3304/1F110T	3 x 11	88,9	85	83	81	78	73	65	55,1			
SV3304F110T	3 x 11	95,9	91,1	90	87	85	80	73	63,1			
SV3305/2F110T	3 x 11	106	101,6	100	96	93	85	76	63			
SV3305/1F110T	3 x 11	112,7	107,2	105	102	99	92	82	70			
SV3305F150T	3 x 15	120,4	114,9	113	110	107	101	92	80,5			
SV3306/2F150T	3 x 15	131,2	126,9	125	120	116	108	96	81,2			
SV3306/1F150T	3 x 15	139,1	133,5	131	128	124	116	105	90,4			
SV3306F150T	3 x 15	145,6	139	137	133	129	121	110	96,1			
SV3307/2F150T	3 x 15	156	149,9	147	143	138	128	115	98,2			
SV4601/1F30T	3 x 3	19,5			19,2	18,8	17,9	16,7	15,1	13,1	8,5	4,6
SV4601F40T	3 x 4	27,2			24	23,5	22,5	21,4	19,9	18,2	14,3	10,8
SV4602/2F55T	3 x 5,5	38,8			39,8	39,2	37,8	35,7	32,9	29,4	21,1	13,9
SV4602F75T	3 x 7,5	52,6			48,5	47,7	46,1	44,2	41,7	38,7	31,4	25,1
SV4603/2F110T	3 x 11	64,7			65,1	64	62	60	56	52	40,4	30,8
SV4603F110T	3 x 11	80,8			74,3	73	71	68	65	60	50	40,7
SV4604/2F150T	3 x 15	92,4			90,7	90	87	83	79	73	58	45,6
SV4604F150T	3 x 15	107,3			99,8	98	96	92	87	82	68	55,9
SV4605/2F185T	3 x 18,5	117,2			114,8	113	110	106	100	93	75	60,2
SV4605F185T	3 x 18,5	134,5			125,1	123	120	116	110	103	86	71,5
SV4606/2F220T	3 x 22	143,7			139,3	138	134	129	122	113	92	73,4
SV4606F220T	3 x 22	161			149,9	148	144	139	132	124	104	86

The table refers to performance with 3 pumps running.

gms\_3psv33-46\_2p50-en\_a\_th

GS.../SV



# ITT

# Lowara

## GS30/SV66-92 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ (SERVICE PUMP)

GS.../SV

SET TYPE GS30/..	NOMINAL POWER  kW	Q = DELIVERY												
		l/min 0	1500	1800	2100	2250	2700	3000	3600	3900	4250	4800	5400	6000
		m <sup>3</sup> /h 0	90	108	126	135	162	180	216	234	255	288	324	360
H = TOTAL HEAD METRES COLUMN OF WATER														
SV6601/1F40T	3 x 4	23,8	21,4	20,7	19,9	19,4	17,8	16,6	13,3	11,2	8,3			
SV6601F55T	3 x 5,5	29,2	25,8	24,8	23,8	23,3	21,8	20,7	17,9	16,1	13,5			
SV6602/2F75T	3 x 7,5	47,5	42,6	41,2	39,5	38,6	36	32,9	26,4	22,2	16,4			
SV6602/1F110T	3 x 11	54,2	49,6	48,2	46,7	45,8	42,9	40,6	34,8	31,2	26,2			
SV6602F110T	3 x 11	60,4	55,7	54,4	52,8	52	49,3	47,1	42	38,9	34,7			
SV6603/2F150T	3 x 15	78,4	71,6	70	67	66	62	58	49	43,3	35,3			
SV6603/1F150T	3 x 15	84,7	77,8	76	74	72	68	65	56	51	44,0			
SV6603F185T	3 x 18,5	91,4	84,7	83	81	79	75	72	64	60	53,5			
SV6604/2F185T	3 x 18,5	108,9	99,6	97	94	92	86	82	70	63	52,8			
SV6604/1F220T	3 x 22	115,2	105,9	103	100	99	93	89	78	71	61,8			
SV6604F220T	3 x 22	121,6	112,5	110	107	105	100	96	86	79	70,8			
SV6605/2F300T	3 x 30	139,1	127,5	124	120	118	111	106	92	83	70,4			
SV6605/1F300T	3 x 30	145,6	134	131	127	125	118	112	99	91	79,5			
SV6605F300T	3 x 30	152	140,4	137	133	131	125	119	107	99	88,5			
SV9201/1F55T	3 x 5,5	24,5				22,2	21,5	20,9	19,4	18,5	17,3	15	11,8	7,9
SV9201F75T	3 x 7,5	33,5				28,7	27,2	26,2	24,3	23,3	22,2	20,2	17,6	14,3
SV9202/2F110T	3 x 11	49,4				45,1	43,7	42,5	39,6	37,9	35,5	30,9	24,6	16,8
SV9202F150T	3 x 15	67,8				58,2	55	53	49,5	47,6	45,2	41,4	36,3	29,6
SV9203/2F185T	3 x 18,5	82,4				74,4	72	70	65	62	59	52	43,6	32,9
SV9203F220T	3 x 22	102,2				88,2	84	81	76	73	69	63	56	46,3
SV9204/2F300T	3 x 30	115,7				104	100	97	90	87	82	74	63	49
SV9204F300T	3 x 30	133,1				117	112	108	101	97	92	85	75	62,5
SV9205/2F370T	3 x 37	149				133,2	128	124	116	111	105	95	81	64,6

The table refers to performance with 3 pumps running.

gms\_3psv66-92\_2p50-en\_a\_th





ITT

Lowara

**GS20, GS21, GS30/10SV-SV33 SERIES BOOSTER SETS  
ELECTRICAL DATA TABLE AT 50 Hz**

SERVICE PUMP 3 X 400 V			JOCKEY PUMP 3 X 400 V			CURRENT ABSORBED BY SET 3 X 400V		
TYPE	Pn kW	In A	TYPE	Pn kW	In A	GS20 A	GS21 A	GS30 A
10SV01	0,75	1,76	3SV02	0,37	1,35	-	4,9	5,3
10SV02	0,75	1,76	3SV04	0,37	1,35	-	4,9	5,3
10SV03	1,1	2,36	3SV05	0,55	1,48	-	6,2	7,1
10SV04	1,5	3,02	3SV07	0,75	1,76	-	7,8	9,1
10SV05	2,2	4,64	3SV09	1,1	2,36	-	11,6	13,9
10SV06	2,2	4,64	3SV10	1,1	2,36	-	11,6	13,9
10SV07	3	6,19	3SV12	1,1	2,36	-	14,7	18,6
10SV08	3	6,19	3SV13	1,5	3,02	-	15,4	18,6
10SV09	4	7,63	3SV14	1,5	3,02	15,3	18,3	22,9
10SV10	4	7,63	3SV19	2,2	4,64	15,3	19,9	22,9
10SV11	4	7,63	3SV19	2,2	4,64	15,3	19,9	22,9
10SV13	5,5	10,40	3SV21	2,2	4,64	20,8	25,4	31,2
15SV01	1,1	2,36	3SV03	0,37	1,35	4,7	6,1	7,1
15SV02	2,2	4,64	3SV05	0,55	1,48	9,3	10,8	13,9
15SV03	3	6,19	3SV06	0,55	1,48	12,4	13,9	18,6
15SV04	4	7,63	3SV08	0,75	1,76	15,3	17,0	22,9
15SV05	4	7,63	3SV10	1,1	2,36	15,3	17,6	22,9
15SV06	5,5	10,40	3SV12	1,1	2,36	20,8	23,2	31,2
15SV07	5,5	10,40	3SV13	1,5	3,02	20,8	23,8	31,2
15SV08	7,5	13,90	3SV16	1,5	3,02	27,8	30,8	41,7
15SV09	7,5	13,90	3SV19	2,2	4,64	27,8	32,4	41,7
15SV10	11	20,50	3SV21	2,2	4,64	41,0	45,6	61,5
22SV01	1,1	2,36	3SV03	0,37	1,35	4,7	6,1	7,1
22SV02	2,2	4,64	3SV05	0,55	1,48	9,3	10,8	13,9
22SV03	3	6,19	3SV07	0,75	1,76	12,4	14,1	18,6
22SV04	4	7,63	3SV09	1,1	2,36	15,3	17,6	22,9
22SV05	5,5	10,40	3SV11	1,1	2,36	20,8	23,2	31,2
22SV06	7,5	13,90	3SV13	1,5	3,02	27,8	30,8	41,7
22SV07	7,5	13,90	3SV14	1,5	3,02	27,8	30,8	41,7
22SV08	11	20,50	3SV19	2,2	4,64	41,0	45,6	61,5
22SV09	11	20,50	3SV19	2,2	4,64	41,0	45,6	61,5
22SV10	11	20,50	3SV21	2,2	4,64	41,0	45,6	61,5
SV33 01/1	2,2	4,64	3SV03	0,37	1,35	9,3	10,6	13,9
SV33 01	3	6,19	3SV04	0,37	1,35	12,4	13,7	18,6
SV33 02/2	4	7,63	3SV05	0,55	1,48	15,3	16,7	22,9
SV33 02/1	4	7,63	3SV06	0,55	1,48	15,3	16,7	22,9
SV33 02	5,5	10,40	3SV07	0,75	1,76	20,8	22,6	31,2
SV33 03/2	5,5	10,40	3SV08	0,75	1,76	20,8	22,6	31,2
SV33 03/1	7,5	13,90	3SV09	1,1	2,36	27,8	30,2	41,7
SV33 03	7,5	13,90	3SV10	1,1	2,36	27,8	30,2	41,7
SV33 04/2	7,5	13,90	3SV11	1,1	2,36	27,8	30,2	41,7
SV33 04/1	11	20,50	3SV12	1,1	2,36	41,0	43,4	61,5
SV33 04	11	20,50	3SV13	1,5	3,02	41,0	44,0	61,5
SV33 05/2	11	20,50	3SV14	1,5	3,02	41,0	44,0	61,5
SV33 05/1	11	20,50	3SV16	1,5	3,02	41,0	44,0	61,5
SV33 05	15	26,00	3SV19	2,2	4,64	52,0	56,6	78,0
SV33 06/2	15	26,00	3SV19	2,2	4,64	52,0	56,6	78,0
SV33 06/1	15	26,00	3SV19	2,2	4,64	52,0	56,6	78,0
SV33 06	15	26,00	3SV21	2,2	4,64	52,0	56,6	78,0
SV33 07/2	15	26,00	3SV21	2,2	4,64	52,0	56,6	78,0

The current shown is the nominal current of the set.

gms\_10-33sv\_2p50-en\_b\_te

GS.../SV



# ITT

# Lowara

## GS20, GS21, GS30/SV46-92 SERIES BOOSTER SETS ELECTRICAL DATA TABLE AT 50 Hz

GS.../SV

SERVICE PUMP 3 X 400 V			JOCKEY PUMP 3 X 400 V			CURRENT ABSORBED BY SET 3 X 400V		
TYPE	Pn kW	In A	TYPE	Pn kW	In A	GS20 A	GS21 A	GS30 A
SV4601/1	3	6,19	3SV03	0,37	1,35	12,4	13,7	18,6
SV4601	4	7,63	3SV04	0,37	1,35	15,3	16,6	22,9
SV4602/2	5,5	10,40	3SV06	0,55	1,48	20,8	22,3	31,2
SV4602	7,5	14,00	3SV08	0,75	1,76	28,0	29,8	42,0
SV4603/2	11	20,50	3SV09	1,1	2,36	41,0	43,4	61,5
SV4603	11	20,50	3SV11	1,1	2,36	41,0	43,4	61,5
SV4604/2	15	26,00	3SV13	1,5	3,02	52,0	55,0	78,0
SV4604	15	26,00	3SV14	1,5	3,02	52,0	55,0	78,0
SV4605/2	18,5	33,20	3SV16	1,5	3,02	66,4	69,4	99,6
SV4605	18,5	33,20	3SV19	2,2	4,64	66,4	71,0	99,6
SV4606/2	22	38,60	3SV21	2,2	4,64	77,2	81,8	115,8
SV4606	22	38,60	3SV23	2,2	4,64	77,2	81,8	115,8
SV6601/1	4	7,63	3SV04	0,37	1,35	15,3	16,6	22,9
SV6601	5,5	10,40	3SV05	0,55	1,48	20,8	22,3	31,2
SV6602/2	7,5	14,00	3SV07	0,75	1,76	28,0	29,8	42,0
SV6602/1	11	20,50	3SV08	0,75	1,76	41,0	42,8	61,5
SV6602	11	20,50	3SV09	1,1	2,36	41,0	43,4	61,5
SV6603/2	15	26,00	3SV11	1,1	2,36	52,0	54,4	78,0
SV6603/1	15	26,00	3SV12	1,1	2,36	52,0	54,4	78,0
SV6603	18,5	33,20	3SV13	1,5	3,02	66,4	69,4	99,6
SV6604/2	18,5	33,20	3SV14	1,5	3,02	66,4	69,4	99,6
SV6604/1	22	38,60	3SV16	1,5	3,02	77,2	80,2	115,8
SV6604	22	38,60	3SV19	2,2	4,64	77,2	81,8	115,8
SV6605/2	30	53,60	3SV19	2,2	4,64	107,2	111,8	160,8
SV6605/1	30	53,60	3SV21	2,2	4,64	107,2	111,8	160,8
SV6605	30	53,60	3SV21	2,2	4,64	107,2	111,8	160,8
SV9201/1	5,5	10,40	3SV04	0,37	1,35	20,8	22,2	31,2
SV9201	7,5	14,00	3SV05	0,55	1,48	28,0	29,5	42,0
SV9202/2	11	20,50	3SV07	0,75	1,76	41,0	42,8	61,5
SV9202	15	26,00	3SV10	1,1	2,36	52,0	54,4	78,0
SV9203/2	18,5	33,20	3SV12	1,1	2,36	66,4	68,8	99,6
SV9203	22	38,60	3SV13	1,5	3,02	77,2	80,2	115,8
SV9204/2	30	53,60	3SV16	1,5	3,02	107,2	110,2	160,8
SV9204	30	53,60	3SV19	2,2	4,64	107,2	111,8	160,8
SV9205/2	37	65,80	3SV21	2,2	4,64	131,6	136,2	197,4

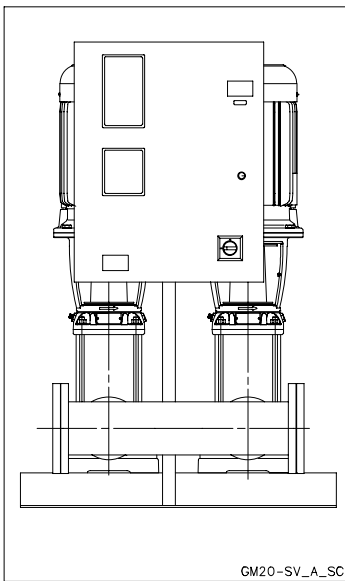
The current shown is the nominal current of the set.

gms\_46-92sv\_2p50-en\_a\_te

**Booster sets**
**MARKET SECTORS**  
 CIVIL, INDUSTRIAL

**APPLICATIONS**

- Water network supply in condominiums, offices, hotels, shopping centres, factories.
- Water supply to agricultural water networks (e.g. irrigation).

**GSD20 - GSY20 Series**

**GSD20  
GSY20**
**SPECIFICATIONS**

- **Flow rate** up to 240 m<sup>3</sup>/h.
- **Head** up to 160 m.
- Electrical panel supply voltage: 3 x 400V ± 10%.
- Frequency 50 Hz.
- Voltage for controls outside panel: 24 Vac.
- Electrical panel protection class IP 55.
- Maximum service pump power: 2 x 37 kW.
- **Motor start-up:**
  - Direct for powers up to 22 kW inclusive for pump (GSD/).
  - Star/Delta for higher powers (GSY/ set).
  - Softstarter, available on request (GSSF/ set).
- **Electric pumps with vertical axis:**
  - SV series (motor protection class IP55).
- Maximum operating pressure: 16 bar.
- Maximum temperature of pumped liquid : +80°C.

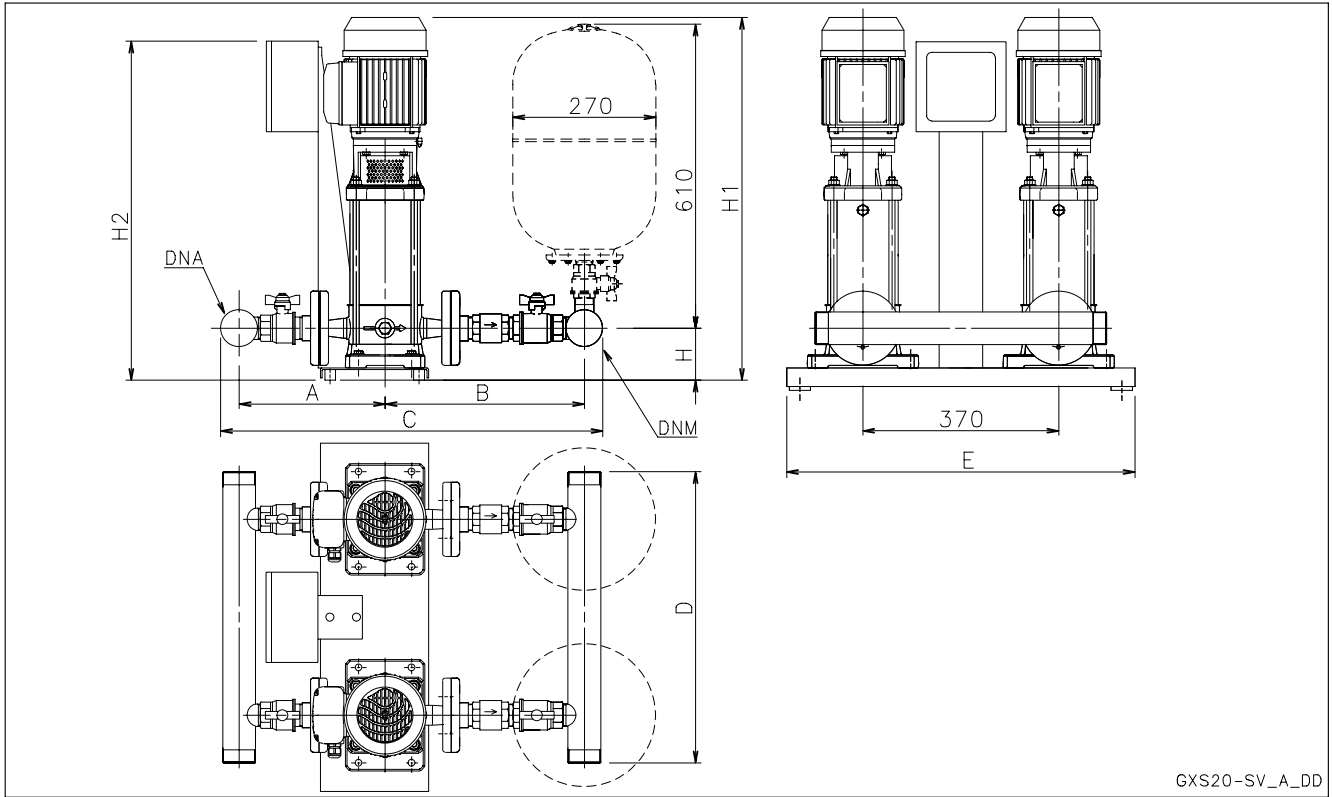


# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD20 SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE

**GSD20  
GSY20**



GXS20-SV\_A\_DD

GSD 20	DNA	DNM	A	B	C	D		E	H	H1	H2
			STD/DW	STD/DW	STD/DW	STD	DW				
10SV09F040T	R 2"1/2	R 2"1/2	287	352	715	550	610	682	114	954	640
10SV10F040T	R 2"1/2	R 2"1/2	287	352	715	550	610	682	114	986	640
10SV11F040T	R 2"1/2	R 2"1/2	287	352	715	550	610	682	114	1018	640

Dimensions in mm. Tolerance  $\pm 10$  mm.

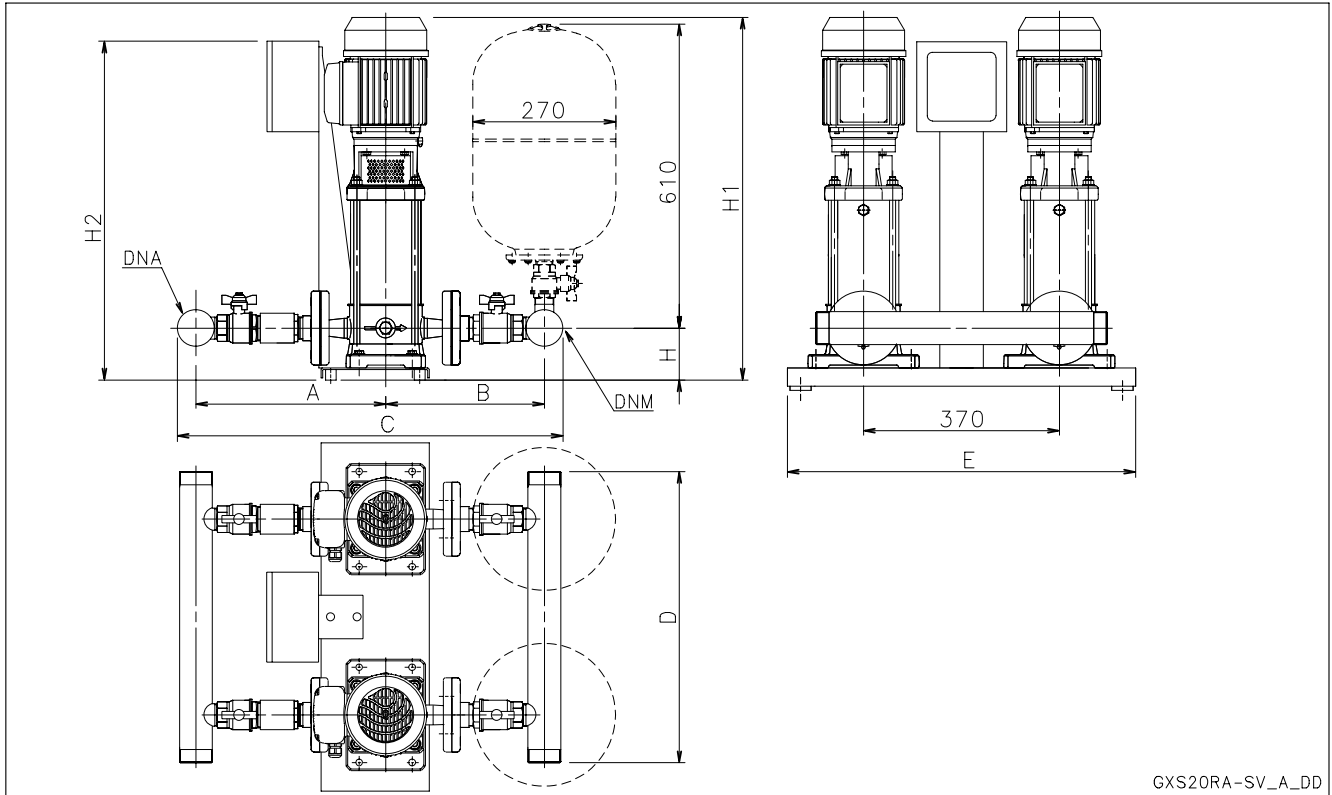
gs20\_10sv-new-small-en\_a\_td



# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD20 RA SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE



GXS20RA-SV\_A\_DD

**GSD20  
GSY20**

GSD 20RA	DNA	DNM	A	B	C	D		E	H	H1	H2
			STD/DW	STD/DW	STD/DW	STD	DW				
10SV09F040T	R 2"1/2	R 2"1/2	345	287	708	550	610	682	114	954	640
10SV10F040T	R 2"1/2	R 2"1/2	345	287	708	550	610	682	114	986	640
10SV11F040T	R 2"1/2	R 2"1/2	345	287	708	550	610	682	114	1018	640

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs20ra\_10sv-new-small-en\_a\_td

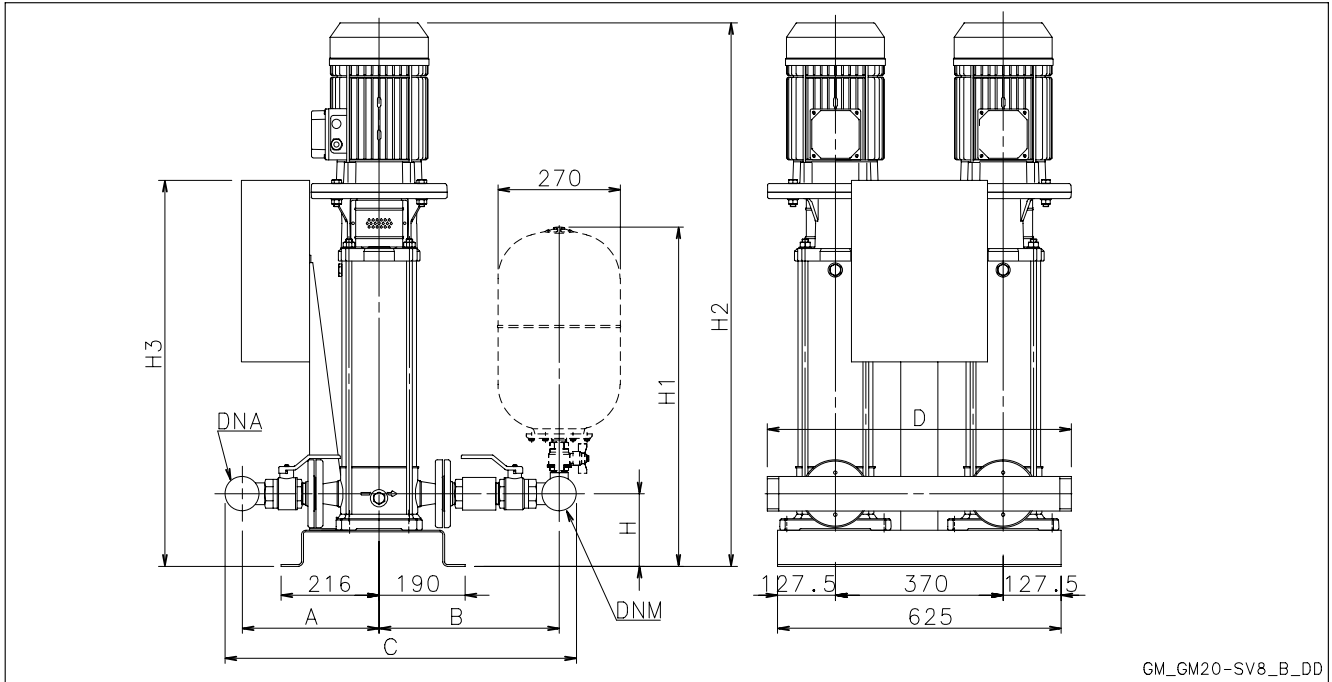


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**TWO-PUMP BOOSTER SETS, GSD20 SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON DISCHARGE SIDE**

**GSD20  
GSY20**



GM\_GM20-SV8\_B\_DD

GSD	DNA	DNM	A		B		C		D		H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI	STD	DW/AISI				
10SV13F055T	R 2"1/2	R 2"1/2	301	356	366	497	743	929	550	610	160	748	1251	771

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs20\_10sv-new-en\_a\_td

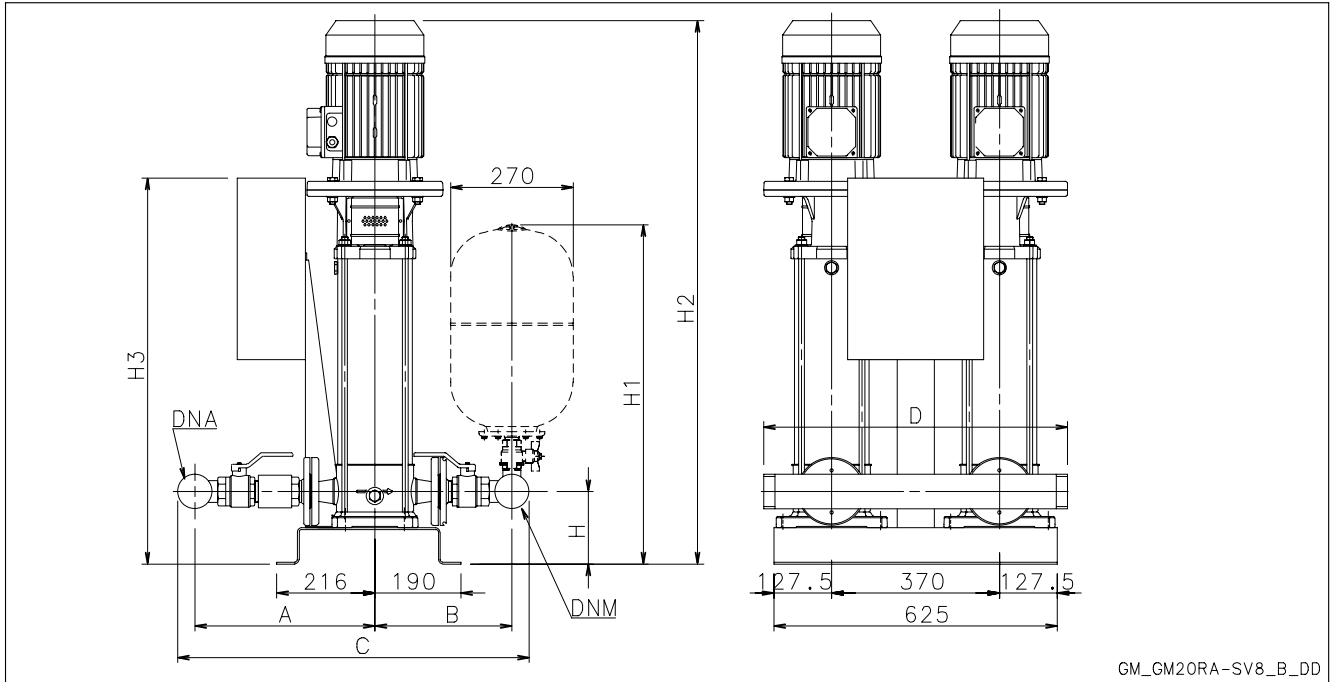
Note: for versions with vibration damping feet increase height by 30 mm.



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Lowara

**TWO-PUMP BOOSTER SETS, GSD20 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON SUCTION SIDE**



GM\_GM20RA-SV8\_B\_DD

**GSD20  
GSY20**

GSD 20 RA	DNA	DNM	A		B		C		D		H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI	STD	DW/AISI				
10SV13F055T	R 2"1/2	R 2"1/2	359	497	301	356	736	929	550	610	160	748	1251	771

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs20ra\_10sv-new-en\_a\_td

Note: for versions with vibration damping feet increase height by 30 mm.

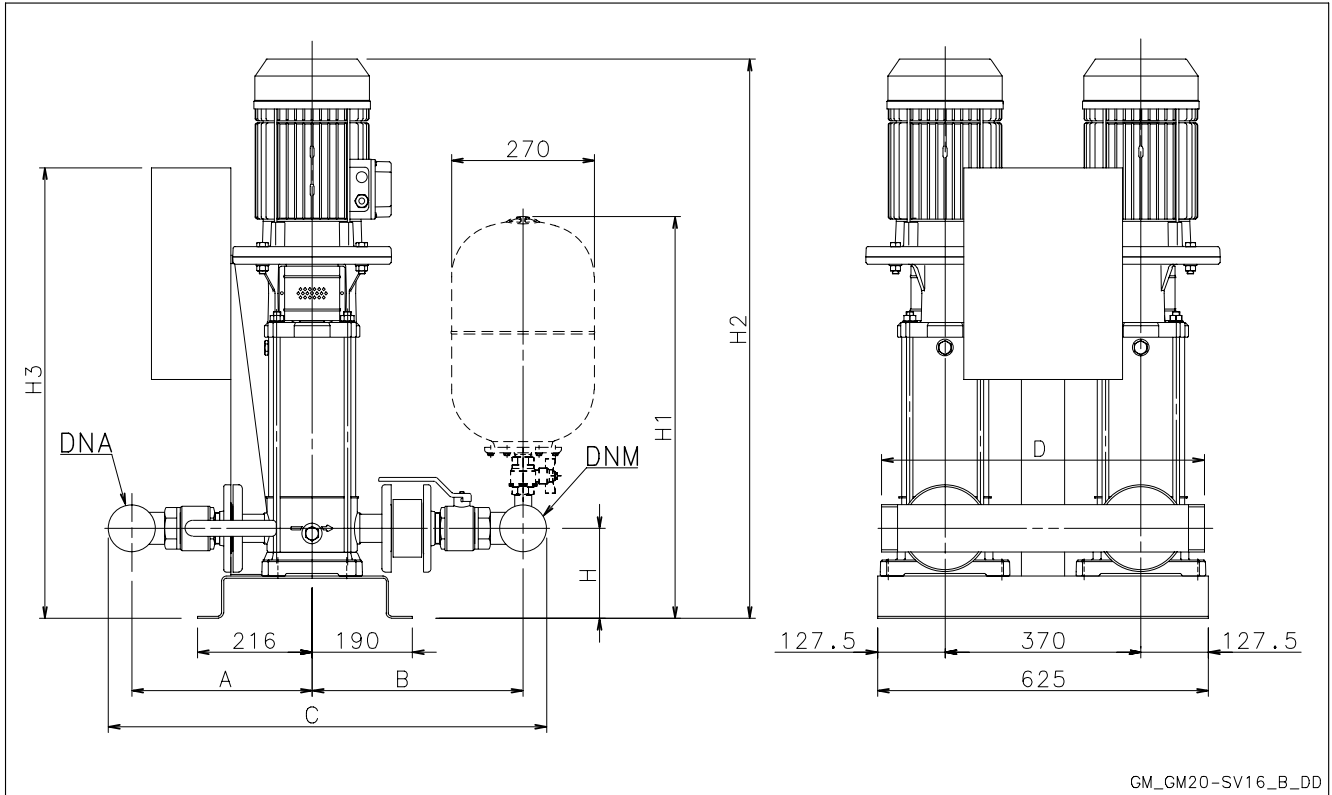


# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD20 SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE

**GSD20  
GSY20**



GM\_GM20-SV16\_B\_DD

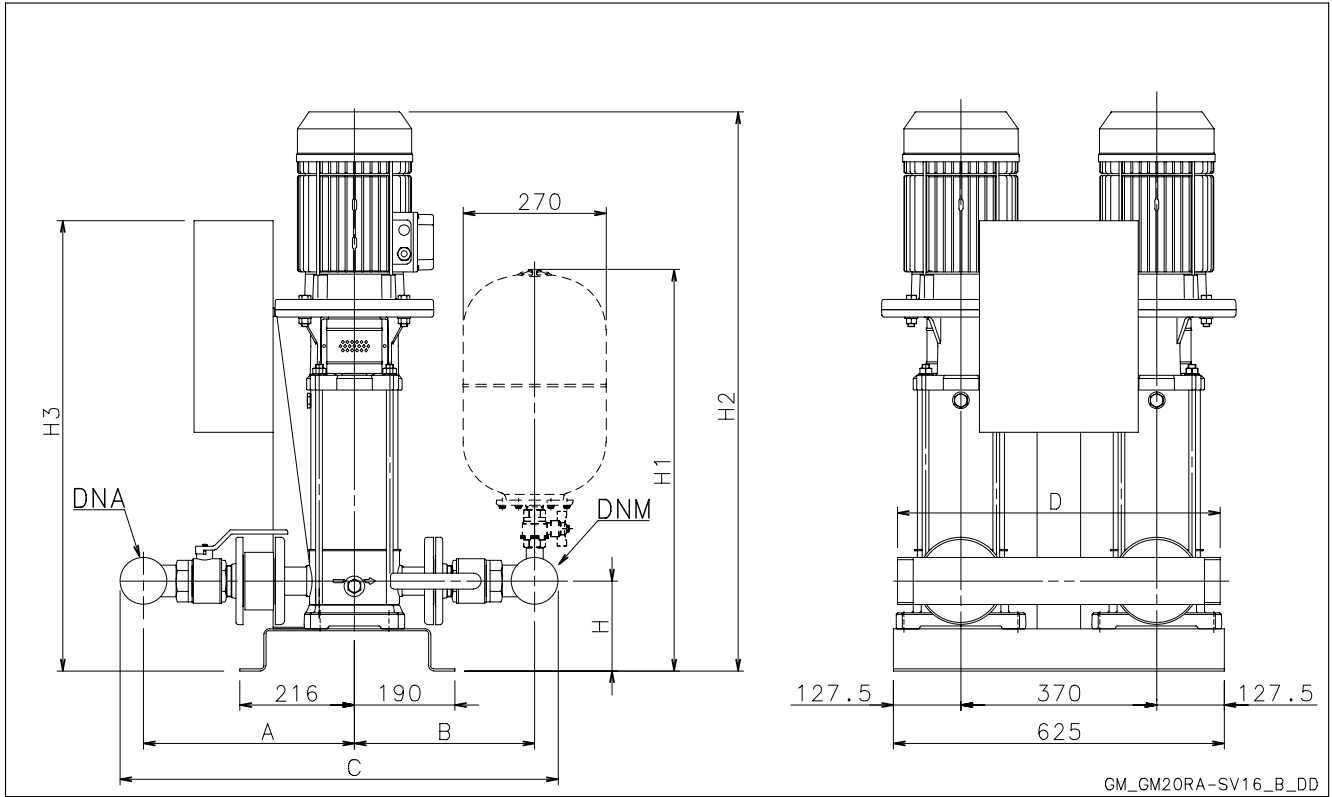
GSD 20	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
15SV01F011T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	742	689
15SV02F022T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	787	689
15SV03F030T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	845	689
15SV04F040T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	914	689
15SV05F040T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	962	689
15SV06F055T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1133	771
15SV07F055T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1181	771
15SV08F075T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1221	771
15SV09F075T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1269	771
15SV10F110T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1408	771
22SV01F011T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	742	614
22SV02F022T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	787	614
22SV03F030T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	845	614
22SV04F040T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	914	614
22SV05F055T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1085	771
22SV06F075T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1125	771
22SV07F075T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1173	771
22SV08F110T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1312	771
22SV09F110T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1360	771
22SV10F110T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1408	771

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs20\_15sv-new-en\_a\_td

Note: for versions with vibration damping feet increase height by 30 mm.



**TWO-PUMP BOOSTER SETS, GSD20 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON SUCTION SIDE**


GM\_GM20RA-SV16\_B\_DD

**GSD20  
GSY20**

GSD 20 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
15SV01F011T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	742	689
15SV02F022T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	787	689
15SV03F030T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	845	689
15SV04F040T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	914	689
15SV05F040T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	962	689
15SV06F055T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1133	771
15SV07F055T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1181	771
15SV08F075T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1221	771
15SV09F075T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1269	771
15SV10F110T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1408	771
22SV01F011T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	742	614
22SV02F022T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	787	614
22SV03F030T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	845	614
22SV04F040T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	914	614
22SV05F055T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1085	771
22SV06F075T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1125	771
22SV07F075T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1173	771
22SV08F110T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1312	771
22SV09F110T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1360	771
22SV10F110T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1408	771

 Dimensions in mm. Tolerance  $\pm 10$  mm.

gs20ra\_15sv-new-en\_a\_td

Note: for versions with vibration damping feet increase height by 30 mm.

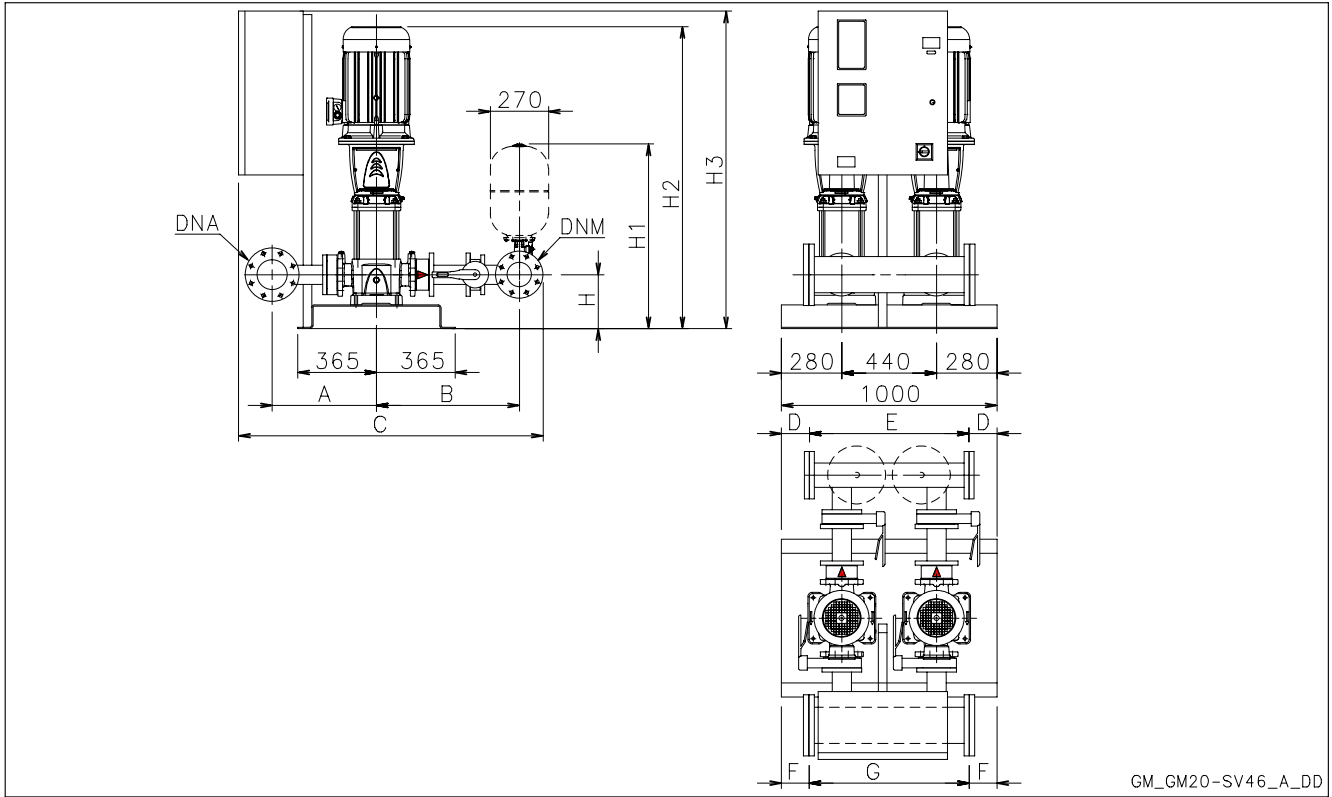


# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD20 SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE

**GSD20  
GSY20**



GM\_GM20-SV46\_A\_DD

**TWO-PUMP BOOSTER SETS, GSD20 SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON DISCHARGE SIDE**

GSD20	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	100	80	448	701	1359	110	780	110	780	215	810	862	1017
SV3301F30T	100	80	448	701	1359	110	780	110	780	215	810	897	1017
SV3302/2F40T	100	80	448	701	1359	110	780	110	780	215	810	993	1017
SV3302/1F40T	100	80	448	701	1359	110	780	110	780	215	810	993	1017
SV3302F55T	100	80	448	701	1359	110	780	110	780	215	810	1069	1097
SV3303/2F55T	100	80	448	701	1359	110	780	110	780	215	810	1144	1097
SV3303/1F75T	100	80	448	701	1359	110	780	110	780	215	810	1136	1097
SV3303F75T	100	80	448	701	1359	110	780	110	780	215	810	1136	1097
SV3304/2F75T	100	80	448	701	1359	110	780	110	780	215	810	1211	1097
SV3304/1F110T	100	80	448	701	1401	110	780	110	780	215	810	1307	1571
SV3304F110T	100	80	448	701	1401	110	780	110	780	215	810	1307	1571
SV3305/2F110T	100	80	448	701	1401	110	780	110	780	215	810	1382	1571
SV3305/1F110T	100	80	448	701	1401	110	780	110	780	215	810	1382	1571
SV3305F150T	100	80	448	701	1401	110	780	110	780	215	810	1448	1571
SV3306/2F150T	100	80	448	701	1401	110	780	110	780	215	810	1523	1571
SV3306/1F150T	100	80	448	701	1401	110	780	110	780	215	810	1523	1571
SV3306F150T	100	80	448	701	1401	110	780	110	780	215	810	1523	1571
SV3307/2F150T	100	80	448	701	1401	110	780	110	780	215	810	1598	1571
SV4601/1F30T	125	100	484	739	1457	110	780	110	780	250	857	937	1017
SV4601F40T	125	100	484	739	1457	110	780	110	780	250	857	958	1017
SV4602/2F55T	125	100	484	739	1457	110	780	110	780	250	857	1109	1097
SV4602F75T	125	100	484	739	1457	110	780	110	780	250	857	1101	1097
SV4603/2F110T	125	100	484	739	1457	110	780	110	780	250	857	1272	1571
SV4603F110T	125	100	484	739	1457	110	780	110	780	250	857	1272	1571
SV4604/2F150T	125	100	484	739	1457	110	780	110	780	250	857	1413	1571
SV4604F150T	125	100	484	739	1457	110	780	110	780	250	857	1413	1571
SV4605/2F185T	125	100	484	739	1457	110	780	110	780	250	857	1488	1571
SV4605F185T	125	100	484	739	1457	110	780	110	780	250	857	1488	1571
SV4606/2F220T	125	100	484	739	1499	110	780	110	780	250	857	1563	1821
SV4606F220T	125	100	484	739	1499	110	780	110	780	250	857	1563	1821
SV6601/1F40T	150	125	504	780	1551	110	780	90	820	250	870	983	1017
SV6601F55T	150	125	504	780	1551	110	780	90	820	250	870	1059	1097
SV6602/2F75T	150	125	504	780	1551	110	780	90	820	250	870	1141	1097
SV6602/1F110T	150	125	504	780	1551	110	780	90	820	250	870	1237	1571
SV6602F110T	150	125	504	780	1551	110	780	90	820	250	870	1237	1571
SV6603/2F150T	150	125	504	780	1551	110	780	90	820	250	870	1393	1571
SV6603/1F150T	150	125	504	780	1551	110	780	90	820	250	870	1393	1571
SV6603F185T	150	125	504	780	1551	110	780	90	820	250	870	1393	1571
SV6604/2F185T	150	125	504	780	1551	110	780	90	820	250	870	1483	1571
SV6604/1F220T	150	125	504	780	1555	110	780	90	820	250	870	1483	1821
SV6604F220T	150	125	504	780	1555	110	780	90	820	250	870	1483	1821
SV9201/1F55T	200	150	529	794	1635	90	820	90	820	250	884	1059	1097
SV9201F75T	200	150	529	794	1635	90	820	90	820	250	884	1051	1097
SV9202/2F110T	200	150	529	794	1635	90	820	90	820	250	884	1237	1571
SV9202F150T	200	150	529	794	1635	90	820	90	820	250	884	1303	1571
SV9203/2F185T	200	150	529	794	1635	90	820	90	820	250	884	1393	1571
SV9203F220T	200	150	529	794	1635	90	820	90	820	250	884	1393	1821

Note: for versions with vibration damping feet increase height by 50 mm.

gs20\_sv46-en\_a\_td16

**GSD20  
GSY20**

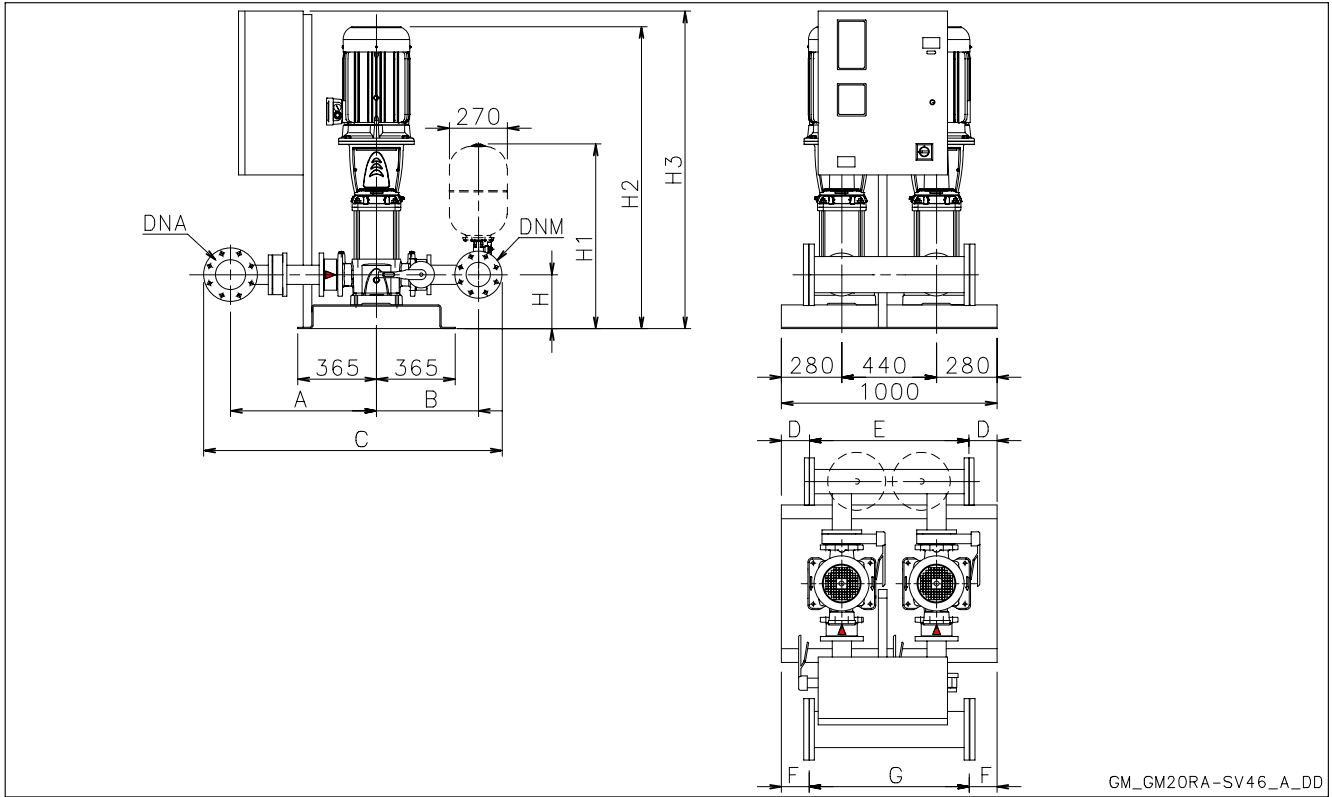


# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD20 RA SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE

**GSD20  
GSY20**



GM\_GM20RA-SV46\_A\_DD

**TWO-PUMP BOOSTER SETS, GSD20 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON SUCTION SIDE**

GSD20RA	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	100	80	713	436	1359	110	780	110	780	215	810	862	1017
SV3301F30T	100	80	713	436	1359	110	780	110	780	215	810	897	1017
SV3302/2F40T	100	80	713	436	1359	110	780	110	780	215	810	993	1017
SV3302/1F40T	100	80	713	436	1359	110	780	110	780	215	810	993	1017
SV3302F55T	100	80	713	436	1359	110	780	110	780	215	810	1069	1097
SV3303/2F55T	100	80	713	436	1359	110	780	110	780	215	810	1144	1097
SV3303/1F75T	100	80	713	436	1359	110	780	110	780	215	810	1136	1097
SV3303F75T	100	80	713	436	1359	110	780	110	780	215	810	1136	1097
SV3304/2F75T	100	80	713	436	1359	110	780	110	780	215	810	1211	1097
SV3304/1F110T	100	80	713	436	1359	110	780	110	780	215	810	1307	1571
SV3304F110T	100	80	713	436	1359	110	780	110	780	215	810	1307	1571
SV3305/2F110T	100	80	713	436	1359	110	780	110	780	215	810	1382	1571
SV3305/1F110T	100	80	713	436	1359	110	780	110	780	215	810	1382	1571
SV3305F150T	100	80	713	436	1359	110	780	110	780	215	810	1448	1571
SV3306/2F150T	100	80	713	436	1359	110	780	110	780	215	810	1523	1571
SV3306/1F150T	100	80	713	436	1359	110	780	110	780	215	810	1523	1571
SV3306F150T	100	80	713	436	1359	110	780	110	780	215	810	1523	1571
SV3307/2F150T	100	80	713	436	1359	110	780	110	780	215	810	1598	1571
SV4601/1F30T	125	100	752	471	1457	110	780	110	780	250	857	937	1017
SV4601F40T	125	100	752	471	1457	110	780	110	780	250	857	958	1017
SV4602/2F55T	125	100	752	471	1457	110	780	110	780	250	857	1109	1097
SV4602F75T	125	100	752	471	1457	110	780	110	780	250	857	1101	1097
SV4603/2F110T	125	100	752	471	1457	110	780	110	780	250	857	1272	1571
SV4603F110T	125	100	752	471	1457	110	780	110	780	250	857	1272	1571
SV4604/2F150T	125	100	752	471	1457	110	780	110	780	250	857	1413	1571
SV4604F150T	125	100	752	471	1457	110	780	110	780	250	857	1413	1571
SV4605/2F185T	125	100	752	471	1457	110	780	110	780	250	857	1488	1571
SV4605F185T	125	100	752	471	1457	110	780	110	780	250	857	1488	1571
SV4606/2F220T	125	100	752	471	1457	110	780	110	780	250	857	1563	1821
SV4606F220T	125	100	752	471	1457	110	780	110	780	250	857	1563	1821
SV6601/1F40T	150	125	794	490	1551	110	780	90	820	250	870	983	1017
SV6601F55T	150	125	794	490	1551	110	780	90	820	250	870	1059	1097
SV6602/2F75T	150	125	794	490	1551	110	780	90	820	250	870	1141	1097
SV6602/1F110T	150	125	794	490	1551	110	780	90	820	250	870	1237	1571
SV6602F110T	150	125	794	490	1551	110	780	90	820	250	870	1237	1571
SV6603/2F150T	150	125	794	490	1551	110	780	90	820	250	870	1393	1571
SV6603/1F150T	150	125	794	490	1551	110	780	90	820	250	870	1393	1571
SV6603F185T	150	125	794	490	1551	110	780	90	820	250	870	1393	1571
SV6604/2F185T	150	125	794	490	1551	110	780	90	820	250	870	1483	1571
SV6604/1F220T	150	125	794	490	1551	110	780	90	820	250	870	1483	1821
SV6604F220T	150	125	794	490	1551	110	780	90	820	250	870	1483	1821
SV9201/1F55T	200	150	819	504	1635	90	820	90	820	250	884	1059	1097
SV9201F75T	200	150	819	504	1635	90	820	90	820	250	884	1051	1097
SV9202/2F110T	200	150	819	504	1635	90	820	90	820	250	884	1237	1571
SV9202F150T	200	150	819	504	1635	90	820	90	820	250	884	1303	1571
SV9203/2F185T	200	150	819	504	1635	90	820	90	820	250	884	1393	1571
SV9203F220T	200	150	819	504	1635	90	820	90	820	250	884	1393	1821

Note: for versions with vibration damping feet increase height by 50 mm.

gs20ra\_sv46-en\_a\_td16

**GSD20  
GSY20**

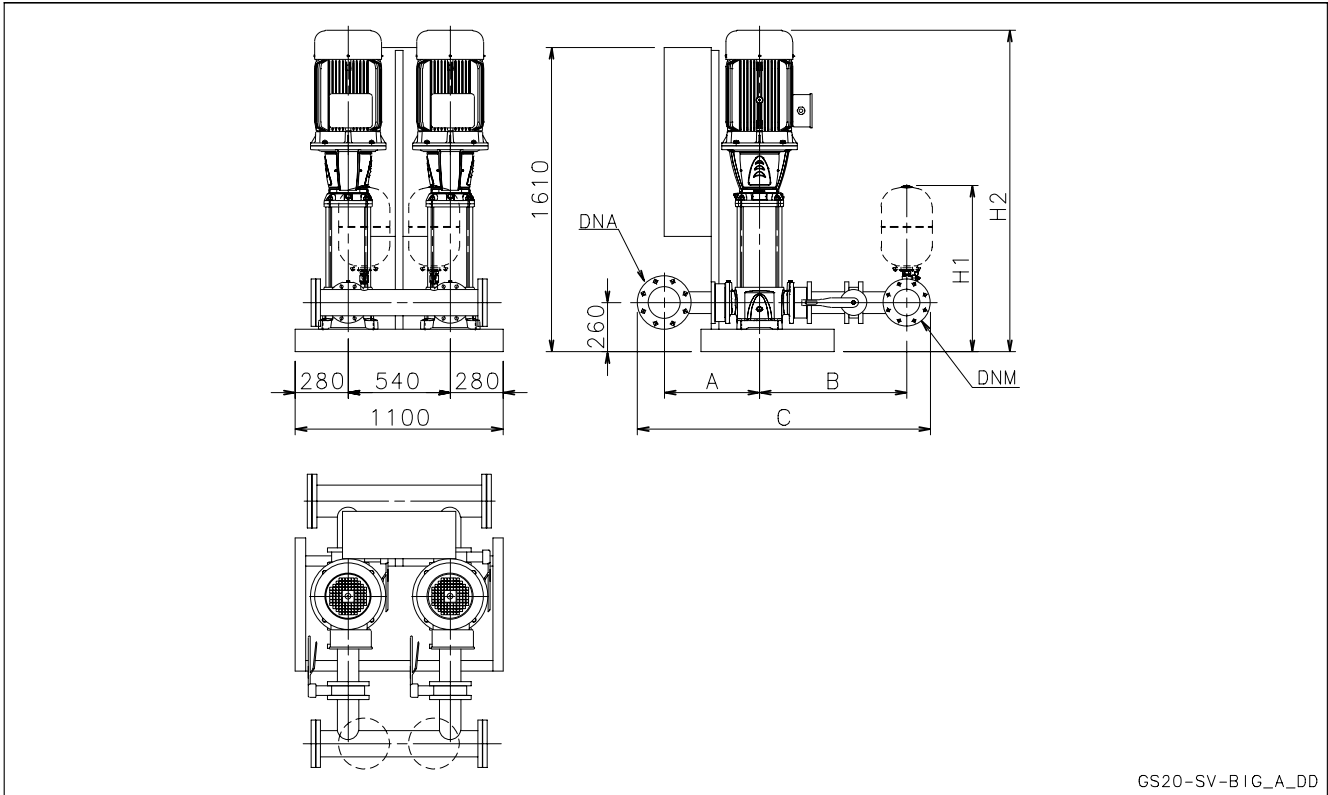


# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSY20 SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE

**GSY20**  
**GSY20**



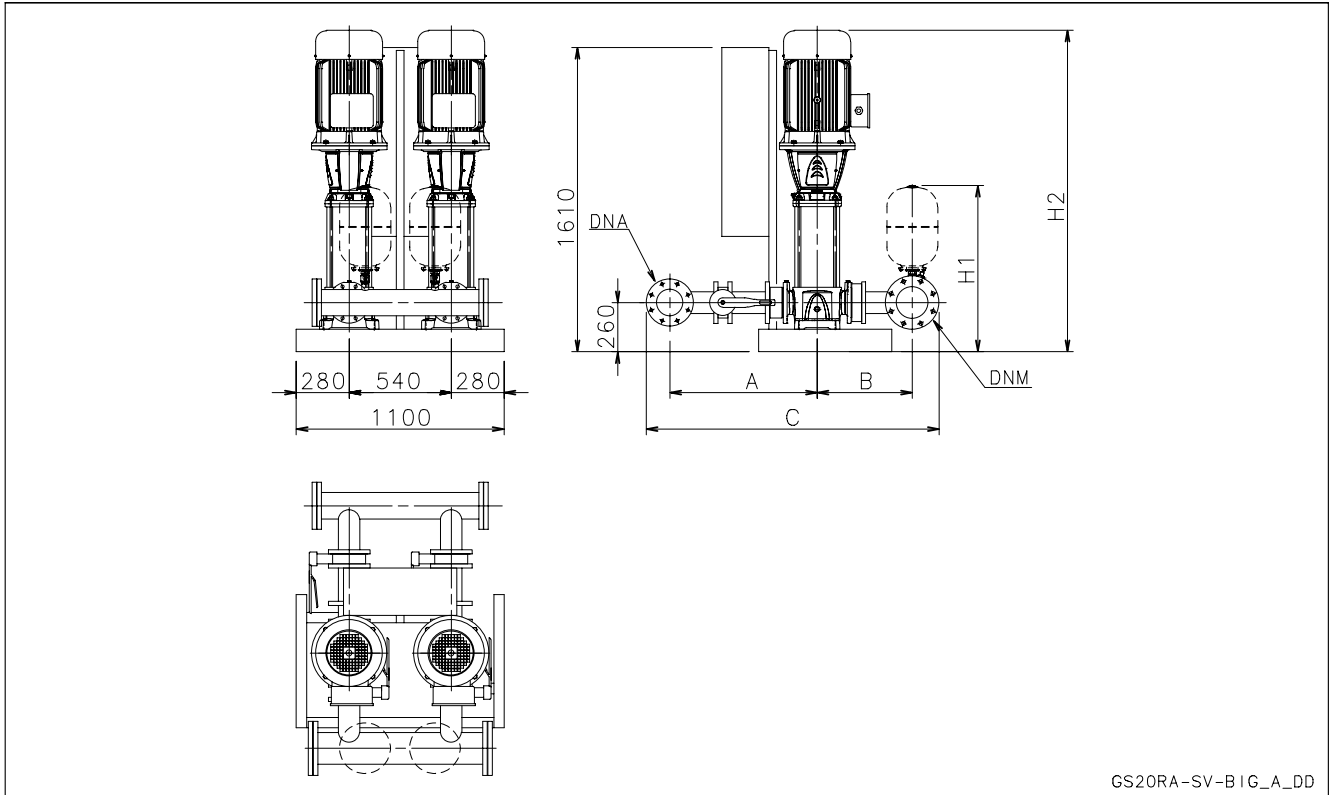
GS20-SV-BIG\_A\_DD

GSY20	DNA	DNM	A	B	C	H1	H2
SV6605/2F300T	150	125	504	780	1552	880	1702
SV6605/1F300T	150	125	504	780	1552	880	1702
SV6605F300T	150	125	504	780	1552	880	1702
SV9204/2F300T	200	150	529	794	1635	894	1612
SV9204F300T	200	150	529	794	1635	894	1612
SV9205/2F370T	200	150	529	794	1635	894	1702

Note: for versions with vibration damping feet increase height by 50 mm.

gs20\_sv-big-en\_a\_td

**TWO-PUMP BOOSTER SETS, GSY20 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON SUCTION SIDE**



**GSD20  
GSY20**

GSY20RA	DNA	DNM	A	B	C	H1	H2
SV6605/2F300T	150	125	794	490	1552	880	1087
SV6605/1F300T	150	125	794	490	1552	880	1087
SV6605F300T	150	125	794	490	1552	880	1087
SV9204/2F300T	200	150	819	504	1635	894	1612
SV9204F300T	200	150	819	504	1635	894	1612
SV9205/2F370T	200	150	819	504	1635	894	1702

Note: for versions with vibration damping feet increase height by 50 mm.

gs20ra\_sv-big-en\_a\_td



**ITT**

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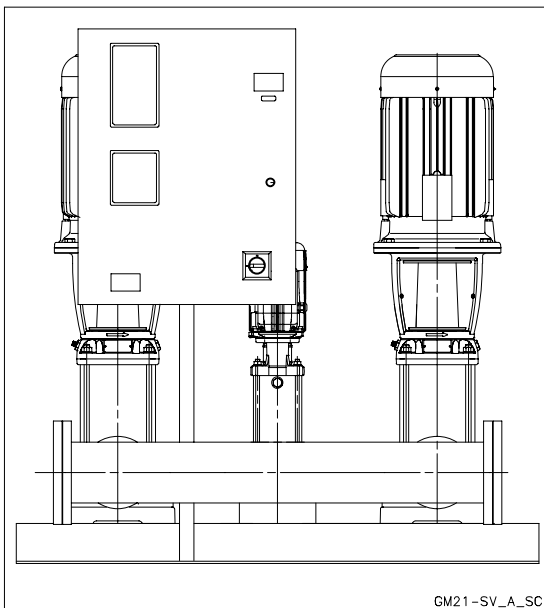
**GSD20  
GSY20**



**Booster sets**
**MARKET SECTORS**  
 CIVIL, INDUSTRIAL

**APPLICATIONS**

- Water network supply in condominiums, offices, hotels, shopping centres, factories.
- Water supply to agricultural water networks (e.g. irrigation).

**GSD21 - GSY21 Series**

**GSD21  
GSY21**
**SPECIFICATIONS**

- **Flow rate** up to 240 m<sup>3</sup>/h.
- **Head** up to 160 m.
- Electrical panel supply voltage:  
3 x 400V ± 10%.
- Frequency 50 Hz.
- Voltage for controls outside panel:  
24 Vac.
- Electrical panel protection class IP 55.
- Maximum service pump power:  
2 x 37 kW.
- **Motor start-up :**
  - Direct for powers up to 22 kW inclusive for pump (GSD/).
  - Star/Delta for higher powers (GSY/ set).
  - Softstarter, available on request (GSSF/ set).
- **Electric pumps with vertical axis:**
  - SV series (motor protection class IP55).
- **Electric jockey pumps with vertical axis:**
  - SV series (motor protection class IP55).
- Maximum operating pressure:  
16 bar.
- Maximum temperature of pumped liquid : +80°C.

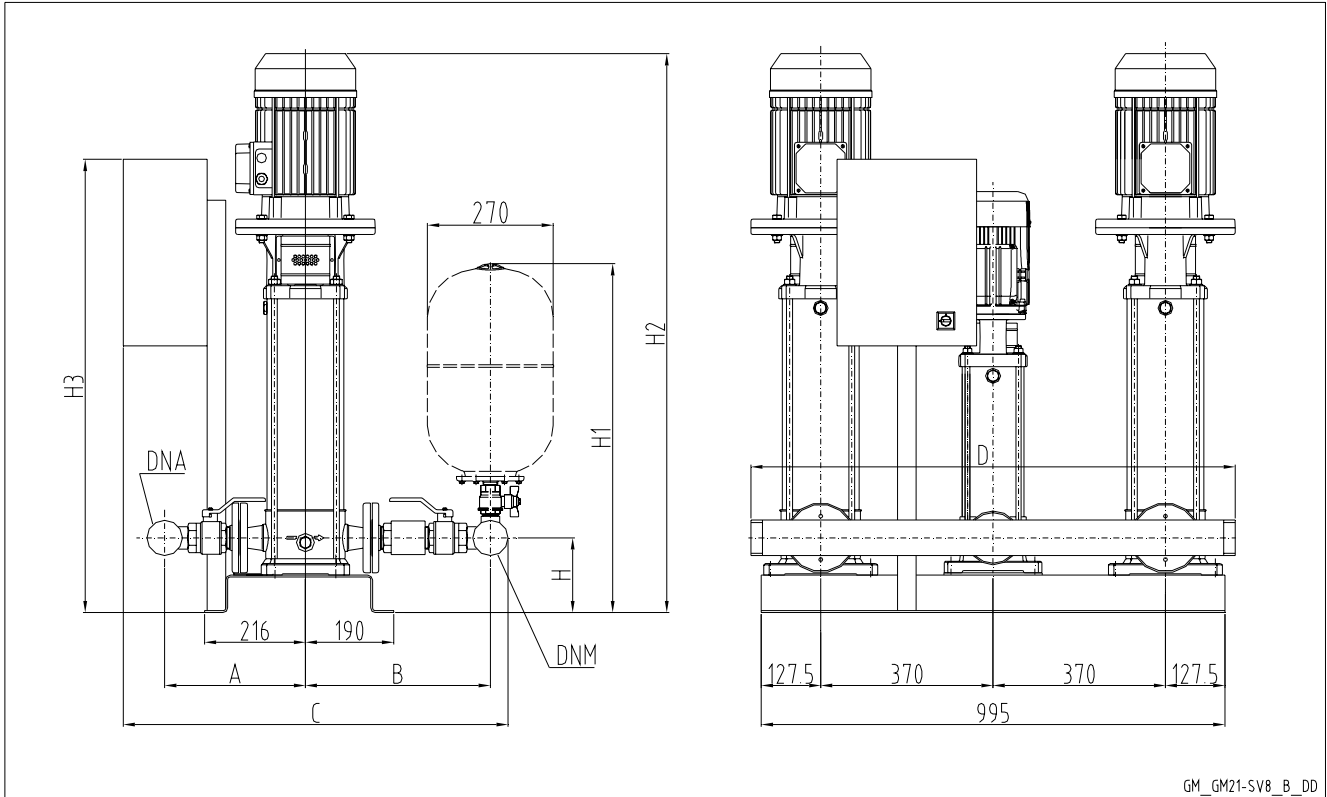


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**TWO-PUMP BOOSTER SETS, GSD21 SERIES  
VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP  
NON-RETURN VALVE ON DISCHARGE SIDE**

**GSD21  
GSY21**



GM\_GM21-SV8\_B\_DD

GSD 21	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
10SV01F007T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	700	973
10SV02F007T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	700	973
10SV03F011T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	732	973
10SV04F015T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	809	973
10SV05F022T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	841	973
10SV06F022T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	873	973
10SV07F030T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	915	973
10SV08F030T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	947	973
10SV09F040T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1000	973
10SV10F040T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1032	973
10SV11F040T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1064	973
10SV13F055T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1251	973

Dimensions in mm. Tolerance  $\pm 10$  mm.

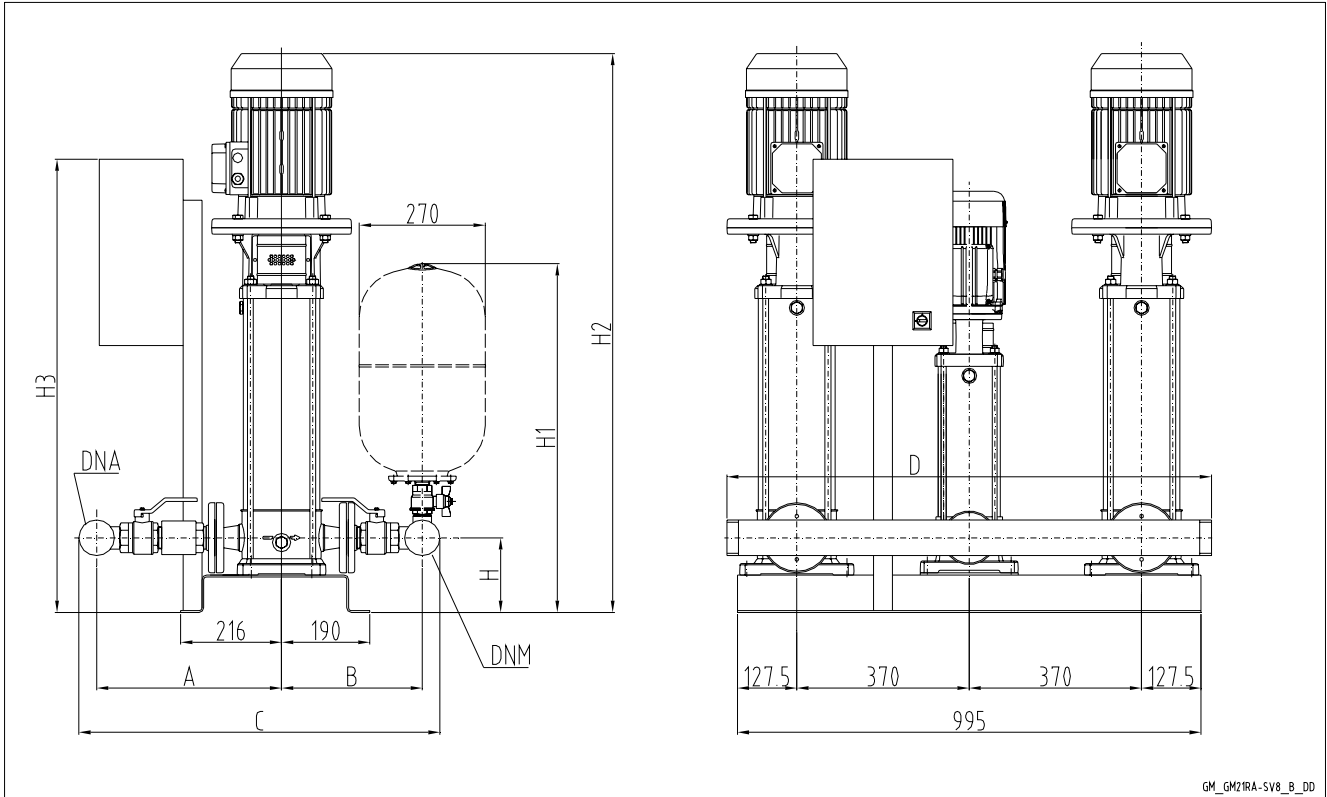
gs21\_10sv-new-en\_a\_td



# ITT

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## TWO-PUMP BOOSTER SETS, GSD21 RA SERIES VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP NON-RETURN VALVE ON SUCTION SIDE



GM\_GM21RA-SV8\_B\_DD

**GSD21  
GSY21**

GSD 21RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
10SV01F007T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	700	973
10SV02F007T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	700	973
10SV03F011T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	732	973
10SV04F015T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	809	973
10SV05F022T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	841	973
10SV06F022T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	873	973
10SV07F030T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	915	973
10SV08F030T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	947	973
10SV09F040T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1000	973
10SV10F040T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1032	973
10SV11F040T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1064	973
10SV13F055T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1251	973

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs21ra\_10sv-new-en\_a\_td

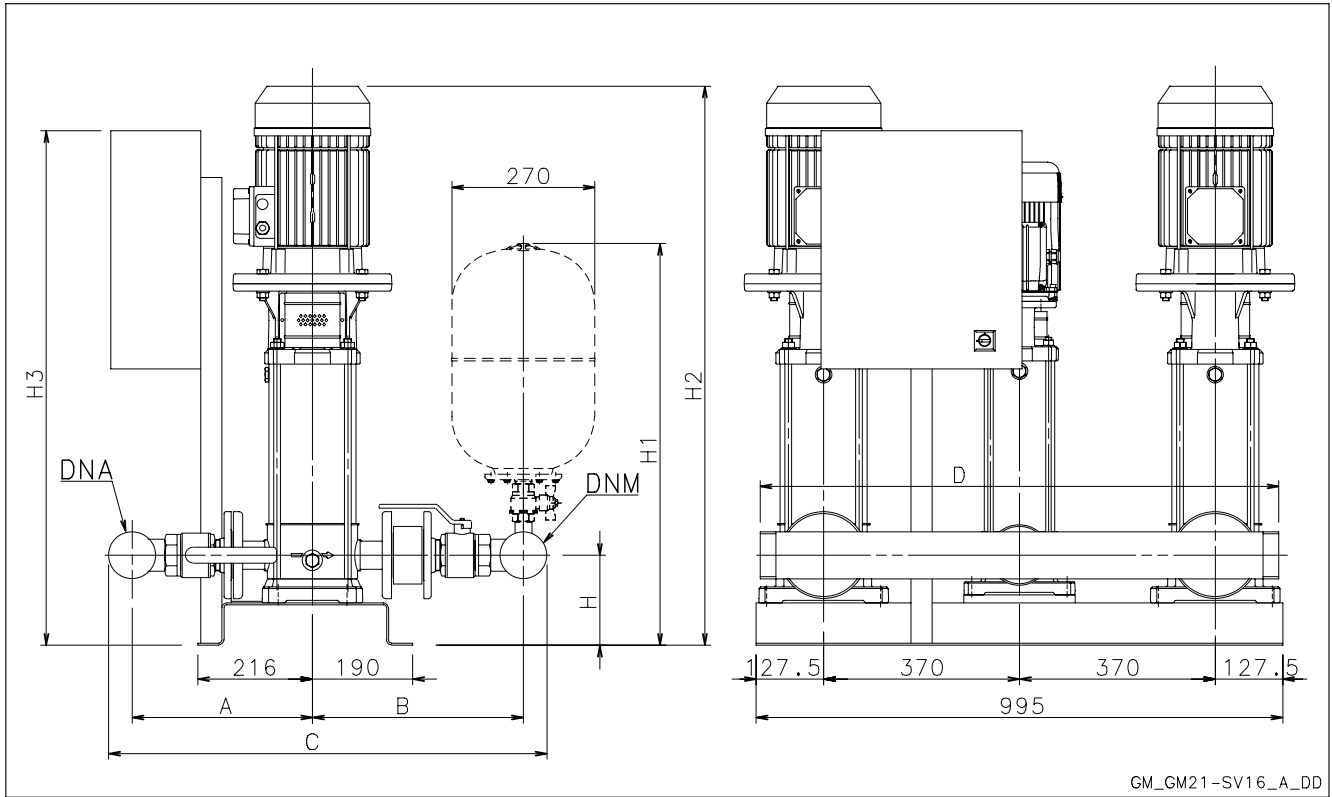
Note: for versions with vibration damping feet increase height by 30 mm.



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**TWO-PUMP BOOSTER SETS, GSD21 SERIES  
VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP  
NON-RETURN VALVE ON DISCHARGE SIDE**



GM\_GM21-SV16\_A\_DD

**GSD21  
GSY21**

GSD 21	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
15SV01F011T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	742	973
15SV02F022T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	787	973
15SV03F030T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	845	973
15SV04F040T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	914	973
15SV05F040T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	962	973
15SV06F055T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1133	973
15SV07F055T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1181	973
15SV08F075T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1221	973
15SV09F075T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1269	973
15SV10F110T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1408	1570
22SV01F011T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	742	973
22SV02F022T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	787	973
22SV03F030T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	845	973
22SV04F040T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	914	973
22SV05F055T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1085	973
22SV06F075T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1125	973
22SV07F075T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1173	973
22SV08F110T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1312	1570
22SV09F110T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1360	1570
22SV10F110T	R 3"	R 3"	341	423	398	466	827	977	1040	170	765	1408	1570

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs21\_15sv-new-en\_a\_td

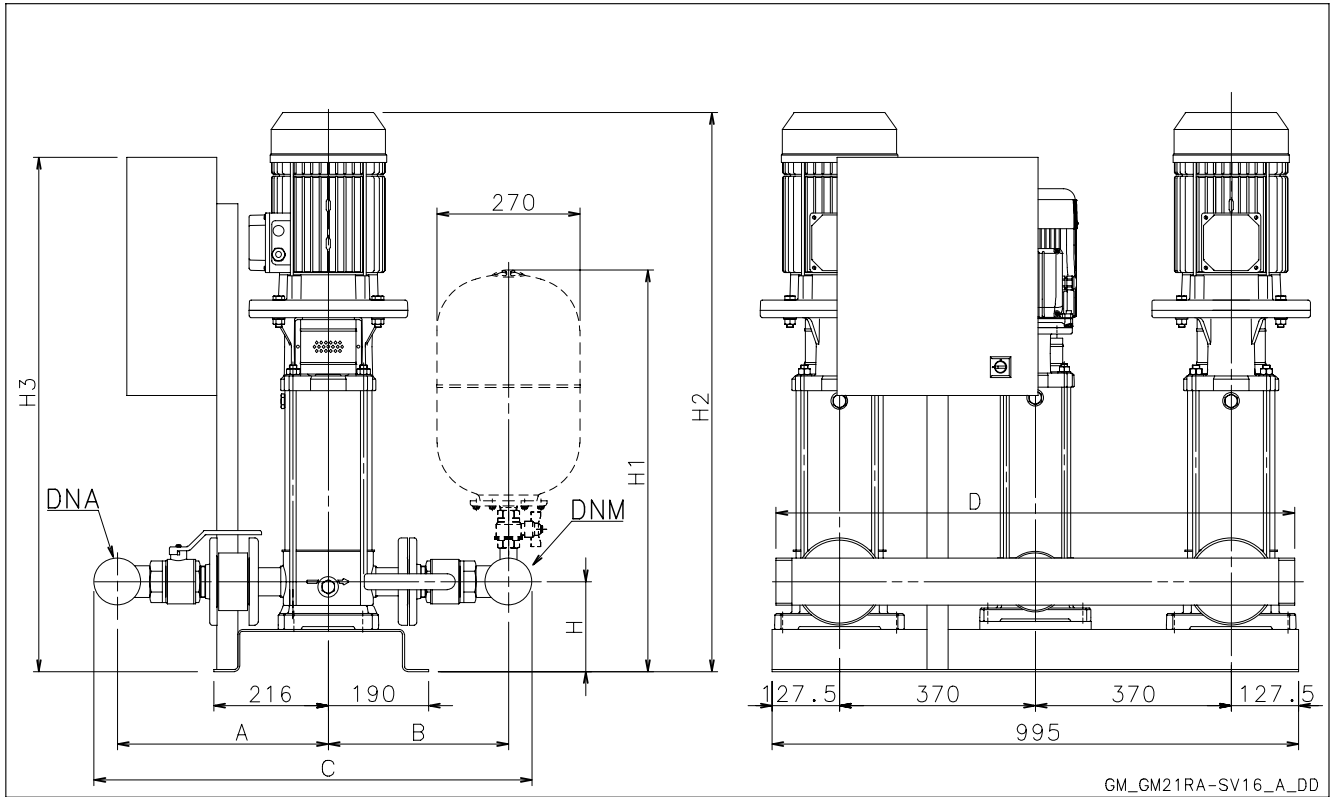
Note: for versions with vibration damping feet increase height by 30 mm.



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## TWO-PUMP BOOSTER SETS, GSD21 RA SERIES VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP NON-RETURN VALVE ON SUCTION SIDE



GM\_GM21RA-SV16\_A\_DD

**GSD21  
GSY21**

GSD 21 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
15SV01F011T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	742	973
15SV02F022T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	787	973
15SV03F030T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	845	973
15SV04F040T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	914	973
15SV05F040T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	962	973
15SV06F055T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1133	973
15SV07F055T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1181	973
15SV08F075T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1221	973
15SV09F075T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1269	973
15SV10F110T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1408	1570
22SV01F011T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	742	973
22SV02F022T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	787	973
22SV03F030T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	845	973
22SV04F040T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	914	973
22SV05F055T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1085	973
22SV06F075T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1125	973
22SV07F075T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1173	973
22SV08F110T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1312	1570
22SV09F110T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1360	1570
22SV10F110T	R 3"	R 3"	398	466	341	423	827	977	1040	170	765	1408	1570

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs21ra\_15sv-new-en\_a\_td

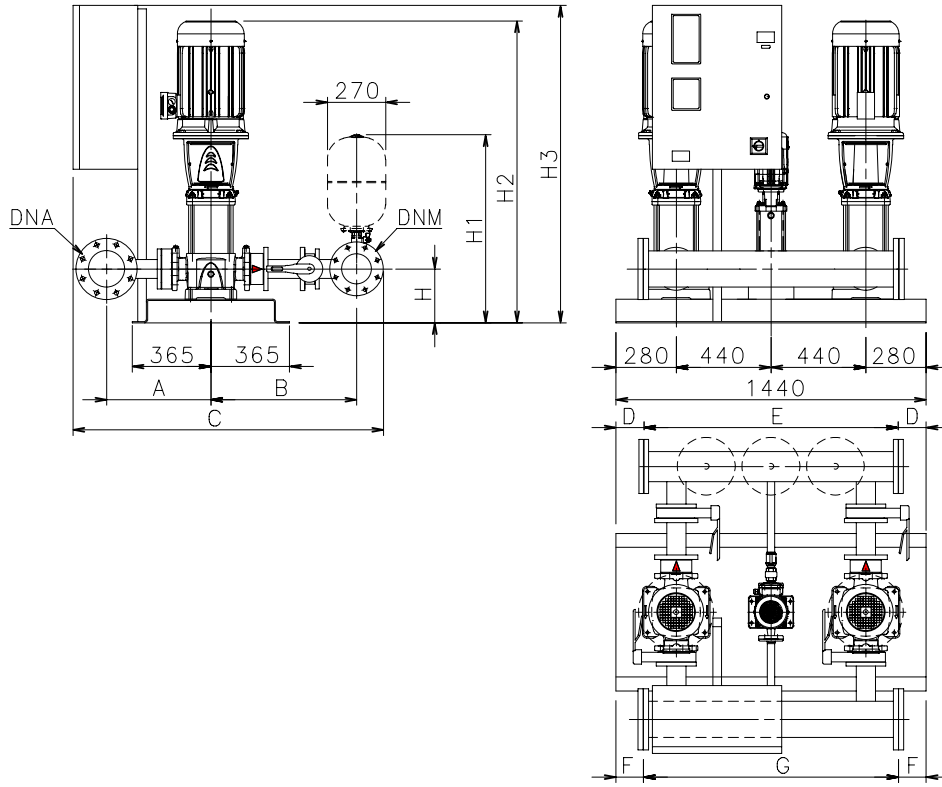
Note: for versions with vibration damping feet increase height by 30 mm.



# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD..Y21 SERIES VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP NON-RETURN VALVE ON DISCHARGE SIDE



GM\_GM21-SV46\_A\_DD

**GSD21**  
**GSY21**

**TWO-PUMP BOOSTER SETS, GSD..Y21 SERIES  
VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP  
NON-RETURN VALVE ON DISCHARGE SIDE**

GSD21 / GSY21	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	100	80	448	701	1359	110	1220	110	1220	215	810	862	974
SV3301F30T	100	80	448	701	1359	110	1220	110	1220	215	810	897	974
SV3302/2F40T	100	80	448	701	1359	110	1220	110	1220	215	810	993	974
SV3302/1F40T	100	80	448	701	1359	110	1220	110	1220	215	810	993	974
SV3302F55T	100	80	448	701	1359	110	1220	110	1220	215	810	1069	974
SV3303/2F55T	100	80	448	701	1359	110	1220	110	1220	215	810	1144	974
SV3303/1F75T	100	80	448	701	1359	110	1220	110	1220	215	810	1136	974
SV3303F75T	100	80	448	701	1359	110	1220	110	1220	215	810	1136	974
SV3304/2F75T	100	80	448	701	1359	110	1220	110	1220	215	810	1211	974
SV3304/1F110T	100	80	448	701	1451	110	1220	110	1220	215	810	1307	1571
SV3304F110T	100	80	448	701	1451	110	1220	110	1220	215	810	1307	1571
SV3305/2F110T	100	80	448	701	1451	110	1220	110	1220	215	810	1382	1571
SV3305/1F110T	100	80	448	701	1451	110	1220	110	1220	215	810	1382	1571
SV3305F150T	100	80	448	701	1451	110	1220	110	1220	215	810	1448	1571
SV3306/2F150T	100	80	448	701	1451	110	1220	110	1220	215	810	1523	1571
SV3306/1F150T	100	80	448	701	1451	110	1220	110	1220	215	810	1523	1571
SV3306F150T	100	80	448	701	1451	110	1220	110	1220	215	810	1523	1571
SV3307/2F150T	100	80	448	701	1451	110	1220	110	1220	215	810	1598	1571
SV4601/1F30T	125	100	484	739	1457	110	1220	110	1220	250	857	937	974
SV4601F40T	125	100	484	739	1457	110	1220	110	1220	250	857	958	974
SV4602/2F55T	125	100	484	739	1457	110	1220	110	1220	250	857	1109	974
SV4602F75T	125	100	484	739	1457	110	1220	110	1220	250	857	1101	974
SV4603/2F110T	125	100	484	739	1499	110	1220	110	1220	250	857	1272	1571
SV4603F110T	125	100	484	739	1499	110	1220	110	1220	250	857	1272	1571
SV4604/2F150T	125	100	484	739	1499	110	1220	110	1220	250	857	1413	1571
SV4604F150T	125	100	484	739	1499	110	1220	110	1220	250	857	1413	1571
SV4605/2F185T	125	100	484	739	1499	110	1220	110	1220	250	857	1488	1571
SV4605F185T	125	100	484	739	1499	110	1220	110	1220	250	857	1488	1571
SV4606/2F220T	125	100	484	739	1499	110	1220	110	1220	250	857	1563	1571
SV4606F220T	125	100	484	739	1499	110	1220	110	1220	250	857	1563	1571
SV6601/1F40T	150	125	504	780	1551	110	1220	90	1260	250	870	983	1194
SV6601F55T	150	125	504	780	1551	110	1220	90	1260	250	870	1059	1194
SV6602/2F75T	150	125	504	780	1551	110	1220	90	1260	250	870	1141	1194
SV6602/1F110T	150	125	504	780	1555	110	1220	90	1260	250	870	1237	1571
SV6602F110T	150	125	504	780	1555	110	1220	90	1260	250	870	1237	1571
SV6603/2F150T	150	125	504	780	1555	110	1220	90	1260	250	870	1393	1571
SV6603/1F150T	150	125	504	780	1555	110	1220	90	1260	250	870	1393	1571
SV6603F185T	150	125	504	780	1555	110	1220	90	1260	250	870	1393	1571
SV6604/2F185T	150	125	504	780	1555	110	1220	90	1260	250	870	1483	1571
SV6604/1F220T	150	125	504	780	1555	110	1220	90	1260	250	870	1483	1571
SV6604F220T	150	125	504	780	1555	110	1220	90	1260	250	870	1483	1571
SV6605/2F300T	150	125	504	780	1555	110	1220	90	1260	250	870	1692	1571
SV6605/1F300T	150	125	504	780	1555	110	1220	90	1260	250	870	1692	1571
SV6605F300T	150	125	504	780	1555	110	1220	90	1260	250	870	1692	1571
SV9201/1F55T	200	150	529	794	1635	90	1260	90	1260	250	884	1059	1194
SV9201F75T	200	150	529	794	1635	90	1260	90	1260	250	884	1051	1194
SV9202/2F110T	200	150	529	794	1635	90	1260	90	1260	250	884	1237	1821
SV9202F150T	200	150	529	794	1635	90	1260	90	1260	250	884	1303	1821
SV9203/2F185T	200	150	529	794	1635	90	1260	90	1260	250	884	1393	1821
SV9203F220T	200	150	529	794	1635	90	1260	90	1260	250	884	1393	1821
SV9204/2F300T	200	150	529	794	1635	90	1260	90	1260	250	884	1599	1821
SV9204F300T	200	150	529	794	1635	90	1260	90	1260	250	884	1599	1821
SV9205/2F370T	DIMENSIONS ON REQUEST												

Note: for versions with vibration damping feet increase height by 50 mm.

gs21\_sv46-en\_a\_td16

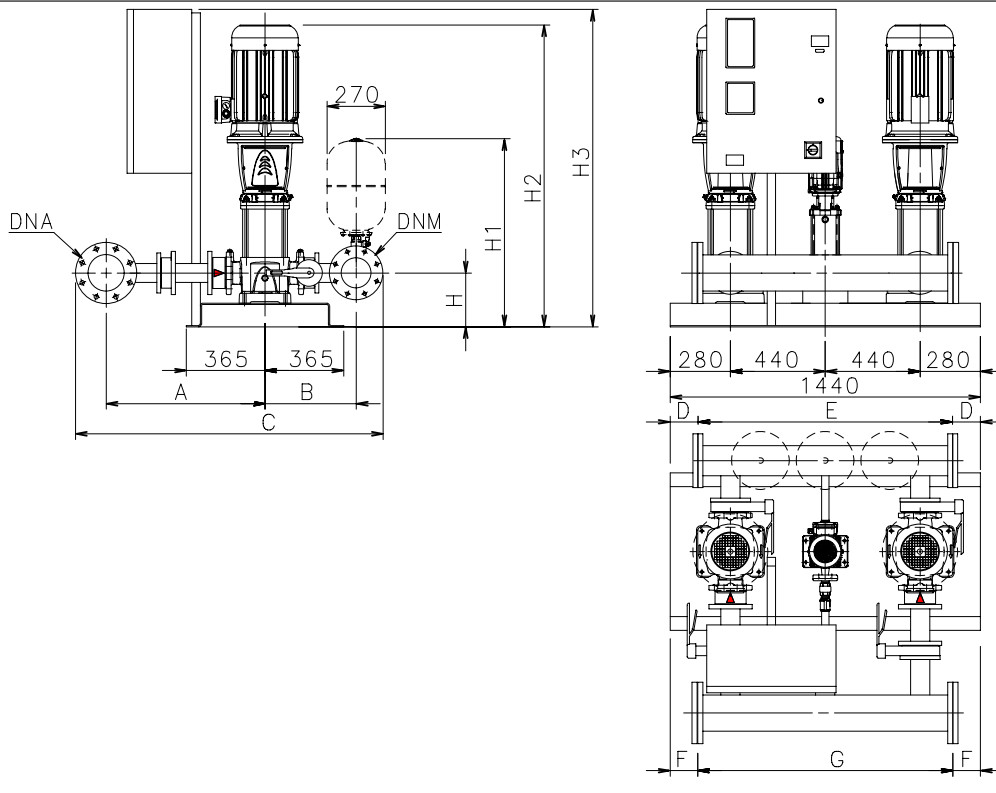
**GSD21  
GSY21**



# ITT

# Lowara

## TWO-PUMP BOOSTER SETS, GSD..Y21 RA SERIES VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP NON-RETURN VALVE ON SUCTION SIDE



GM\_GM21RA-SV46\_A\_DD

**GSD21**  
**GSY21**



**TWO-PUMP BOOSTER SETS, GSD..Y21 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH JOCKEY PUMP  
NON-RETURN VALVE ON SUCTION SIDE**

GSD21RA / GSY21RA	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	100	80	713	436	1359	110	1220	110	1220	215	810	862	974
SV3301F30T	100	80	713	436	1359	110	1220	110	1220	215	810	897	974
SV3302/2F40T	100	80	713	436	1359	110	1220	110	1220	215	810	993	974
SV3302/1F40T	100	80	713	436	1359	110	1220	110	1220	215	810	993	974
SV3302F55T	100	80	713	436	1359	110	1220	110	1220	215	810	1069	974
SV3303/2F55T	100	80	713	436	1359	110	1220	110	1220	215	810	1144	974
SV3303/1F75T	100	80	713	436	1359	110	1220	110	1220	215	810	1136	974
SV3303F75T	100	80	713	436	1359	110	1220	110	1220	215	810	1136	974
SV3304/2F75T	100	80	713	436	1359	110	1220	110	1220	215	810	1211	974
SV3304/1F110T	100	80	713	436	1359	110	1220	110	1220	215	810	1307	1571
SV3304F110T	100	80	713	436	1359	110	1220	110	1220	215	810	1307	1571
SV3305/2F110T	100	80	713	436	1359	110	1220	110	1220	215	810	1382	1571
SV3305/1F110T	100	80	713	436	1359	110	1220	110	1220	215	810	1382	1571
SV3305F150T	100	80	713	436	1359	110	1220	110	1220	215	810	1448	1571
SV3306/2F150T	100	80	713	436	1359	110	1220	110	1220	215	810	1523	1571
SV3306/1F150T	100	80	713	436	1359	110	1220	110	1220	215	810	1523	1571
SV3306F150T	100	80	713	436	1359	110	1220	110	1220	215	810	1523	1571
SV3307/2F150T	100	80	713	436	1359	110	1220	110	1220	215	810	1598	1571
SV4601/1F30T	125	100	752	471	1457	110	1220	110	1220	250	857	937	974
SV4601F40T	125	100	752	471	1457	110	1220	110	1220	250	857	958	974
SV4602/2F55T	125	100	752	471	1457	110	1220	110	1220	250	857	1109	974
SV4602F75T	125	100	752	471	1457	110	1220	110	1220	250	857	1101	974
SV4603/2F110T	125	100	752	471	1457	110	1220	110	1220	250	857	1272	1571
SV4603F110T	125	100	752	471	1457	110	1220	110	1220	250	857	1272	1571
SV4604/2F150T	125	100	752	471	1457	110	1220	110	1220	250	857	1413	1571
SV4604F150T	125	100	752	471	1457	110	1220	110	1220	250	857	1413	1571
SV4605/2F185T	125	100	752	471	1457	110	1220	110	1220	250	857	1488	1571
SV4605F185T	125	100	752	471	1457	110	1220	110	1220	250	857	1488	1571
SV4606/2F220T	125	100	752	471	1457	110	1220	110	1220	250	857	1563	1571
SV4606F220T	125	100	752	471	1457	110	1220	110	1220	250	857	1563	1571
SV6601/1F40T	150	125	794	490	1551	110	1220	90	1260	250	870	983	1194
SV6601F55T	150	125	794	490	1551	110	1220	90	1260	250	870	1059	1194
SV6602/2F75T	150	125	794	490	1551	110	1220	90	1260	250	870	1141	1194
SV6602/1F110T	150	125	794	490	1551	110	1220	90	1260	250	870	1237	1571
SV6602F110T	150	125	794	490	1551	110	1220	90	1260	250	870	1237	1571
SV6603/2F150T	150	125	794	490	1551	110	1220	90	1260	250	870	1393	1571
SV6603/1F150T	150	125	794	490	1551	110	1220	90	1260	250	870	1393	1571
SV6603F185T	150	125	794	490	1551	110	1220	90	1260	250	870	1393	1571
SV6604/2F185T	150	125	794	490	1551	110	1220	90	1260	250	870	1483	1571
SV6604/1F220T	150	125	794	490	1551	110	1220	90	1260	250	870	1483	1571
SV6604F220T	150	125	794	490	1551	110	1220	90	1260	250	870	1483	1571
SV6605/2F300T	150	125	794	490	1551	110	1220	90	1260	250	870	1692	1571
SV6605/1F300T	150	125	794	490	1551	110	1220	90	1260	250	870	1692	1571
SV6605F300T	150	125	794	490	1551	110	1220	90	1260	250	870	1692	1571
SV9201/1F55T	200	150	819	504	1635	90	1260	90	1260	250	884	1059	1194
SV9201F75T	200	150	819	504	1635	90	1260	90	1260	250	884	1051	1194
SV9202/2F110T	200	150	819	504	1635	90	1260	90	1260	250	884	1237	1821
SV9202F150T	200	150	819	504	1635	90	1260	90	1260	250	884	1303	1821
SV9203/2F185T	200	150	819	504	1635	90	1260	90	1260	250	884	1393	1821
SV9203F220T	200	150	819	504	1635	90	1260	90	1260	250	884	1393	1821
SV9204/2F300T	200	150	819	504	1635	90	1260	90	1260	250	884	1599	1821
SV9204F300T	200	150	819	504	1635	90	1260	90	1260	250	884	1599	1821
SV9205/2F370T	DIMENSIONS ON REQUEST												

Note: for versions with vibration damping feet increase height by 50 mm.

gs21ra\_sv46-en\_a\_td16

**GSD21  
GSY21**



**ITT**

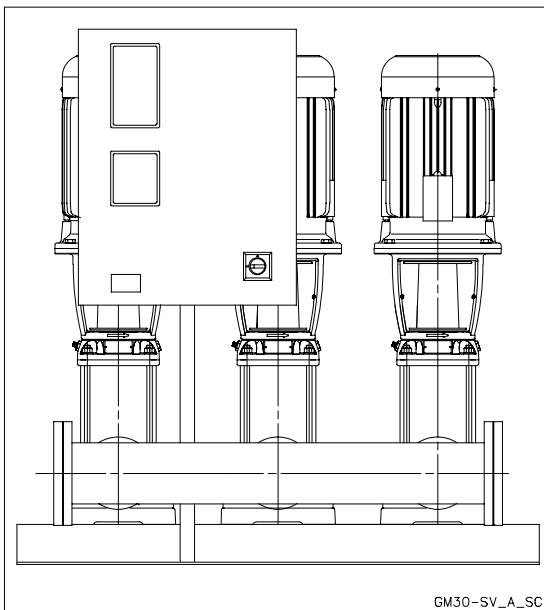
**Lowara**

**GSD21  
GSY21**

**Booster sets**
**MARKET SECTORS**  
 CIVIL, INDUSTRIAL

**APPLICATIONS**

- Water network supply in condominiums, offices, hotels, shopping centres, factories.
- Water supply to agricultural water networks (e.g. irrigation).

**GSD30 - GSY30 Series**

**GSD30  
GSY30**
**SPECIFICATIONS**

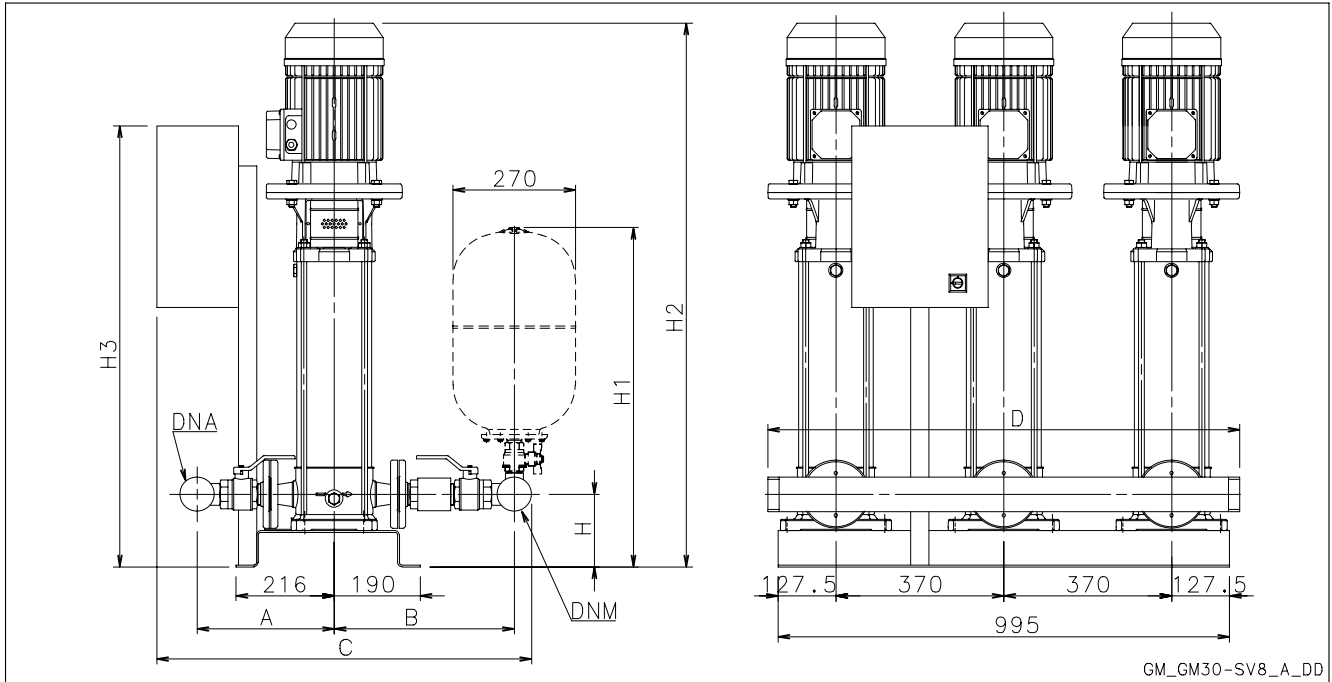
- **Flow rate** up to 360 m<sup>3</sup>/h.
- **Head** up to 160 m.
- Electrical panel supply voltage :  
3 x 400V ± 10%.
- Frequency 50 Hz.
- Voltage for controls outside panel:  
24 Vac.
- Electrical panel protection class IP 55.
- Maximum service pump power:  
3 x 37 kW.
- **Motor start-up :**
  - Direct for powers up to 22 kW inclusive for pump (GSD/).
  - Star/Delta for higher powers (GSY/ set).
  - Softstarter, available on request (GSSF/ set).
- **Electric pump with vertical axis:**
  - SV series (motor protection class IP55).
- Maximum operating pressure 16 bar.
- Maximum temperature of pumped liquid : +80°C.



ITT

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**THREE-PUMP BOOSTER SETS, GSD30 SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON DISCHARGE SIDE**



GM\_GM30-SV8\_A\_DD

**GSD30  
GSY30**

GSD 30	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
10SV01F007T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	700	973
10SV02F007T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	700	973
10SV03F011T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	732	973
10SV04F015T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	809	973
10SV05F022T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	841	973
10SV06F022T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	873	973
10SV07F030T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	915	973
10SV08F030T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	947	973
10SV09F040T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1000	973
10SV10F040T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1032	973
10SV11F040T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1064	973
10SV13F055T	R 2"1/2	R 2"1/2	301	356	366	497	825	956	1040	160	748	1251	973

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs30\_10sv-new-en\_a\_td

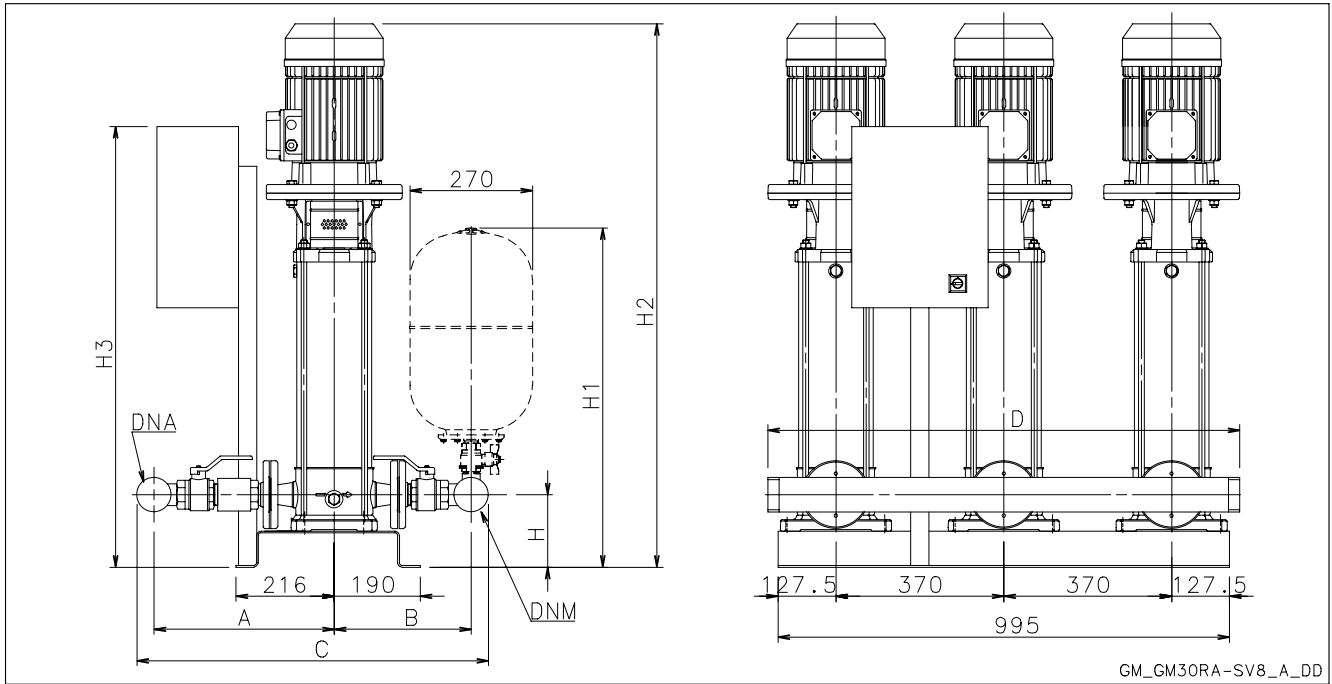
Note: for versions with vibration damping feet increase height by 30 mm.



# ITT

# Lowara

## THREE-PUMP BOOSTER SETS, GSD30 RA SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE



GM\_GM30RA-SV8\_A\_DD

**GSD30  
GSY30**

GSD 30RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
10SV01F007T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	700	973
10SV02F007T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	700	973
10SV03F011T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	732	973
10SV04F015T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	809	973
10SV05F022T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	841	973
10SV06F022T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	873	973
10SV07F030T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	915	973
10SV08F030T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	947	973
10SV09F040T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1000	973
10SV10F040T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1032	973
10SV11F040T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1064	973
10SV13F055T	R 2"1/2	R 2"1/2	359	497	301	356	760	929	1040	160	748	1251	973

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs30ra\_10sv-new-en\_a\_td

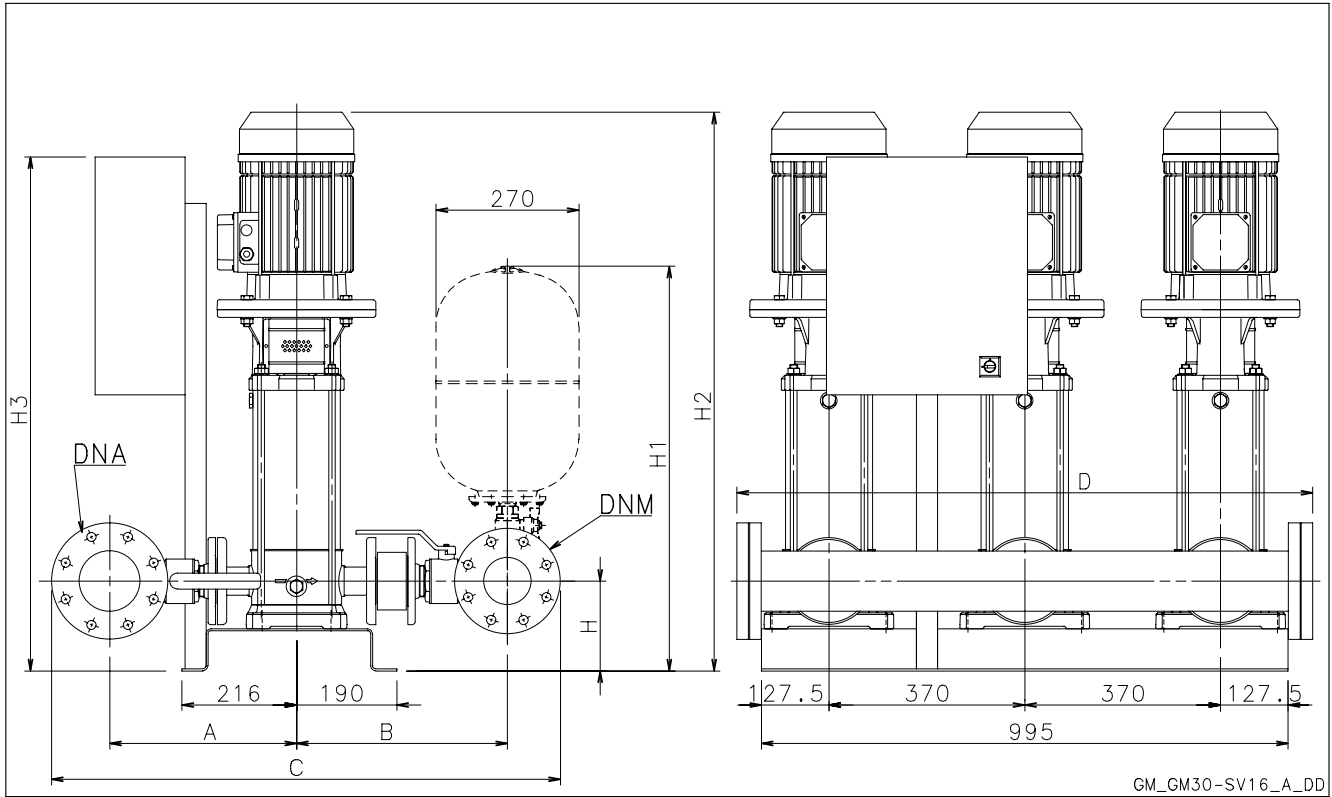
Note: for versions with vibration damping feet increase height by 30 mm.



# ITT

# Lowara

## THREE-PUMP BOOSTER SETS, GSD30 SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE



GM\_GM30-SV16\_A\_DD

**GSD30  
GSY30**

GSD 30	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
15SV01F011T	100	80	353	435	398	466	961	1111	1084	170	765	742	973
15SV02F022T	100	80	353	435	398	466	961	1111	1084	170	765	787	973
15SV03F030T	100	80	353	435	398	466	961	1111	1084	170	765	845	973
15SV04F040T	100	80	353	435	398	466	961	1111	1084	170	765	914	973
15SV05F040T	100	80	353	435	398	466	961	1111	1084	170	765	962	973
15SV06F055T	100	80	353	435	398	466	961	1111	1084	170	765	1133	973
15SV07F055T	100	80	353	435	398	466	961	1111	1084	170	765	1181	973
15SV08F075T	100	80	353	435	398	466	961	1111	1084	170	765	1221	973
15SV09F075T	100	80	353	435	398	466	961	1111	1084	170	765	1269	973
15SV10F110T	100	80	353	435	398	466	961	1111	1084	170	765	1408	1570
22SV01F011T	100	100	353	435	410	478	983	1133	1084	170	777	742	973
22SV02F022T	100	100	353	435	410	478	983	1133	1084	170	777	787	973
22SV03F030T	100	100	353	435	410	478	983	1133	1084	170	777	845	973
22SV04F040T	100	100	353	435	410	478	983	1133	1084	170	777	914	973
22SV05F055T	100	100	353	435	410	478	983	1133	1084	170	777	1085	973
22SV06F075T	100	100	353	435	410	478	983	1133	1084	170	777	1125	973
22SV07F075T	100	100	353	435	410	478	983	1133	1084	170	777	1173	973
22SV08F110T	100	100	353	435	410	478	983	1133	1084	170	777	1312	1570
22SV09F110T	100	100	353	435	410	478	983	1133	1084	170	777	1360	1570
22SV10F110T	100	100	353	435	410	478	983	1133	1084	170	777	1408	1570

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs30\_15sv-new-en\_a\_td

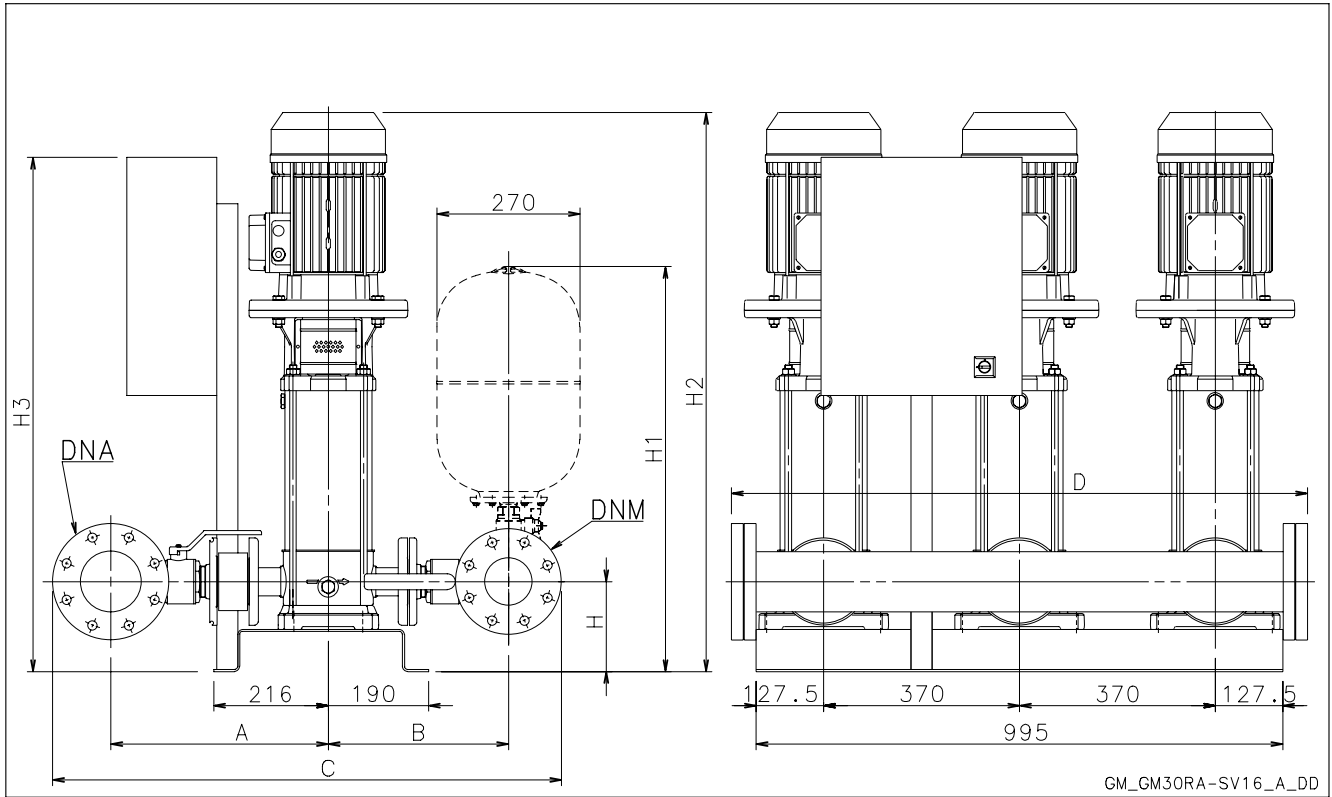
Note: for versions with vibration damping feet increase height by 30 mm.



# ITT

# Lowara

## THREE-PUMP BOOSTER SETS, GSD30 RA SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE



GM\_GM30RA-SV16\_A\_DD

**GSD30  
GSY30**

GSD 30 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
15SV01F011T	100	80	410	478	341	423	961	1111	1084	170	765	742	973
15SV02F022T	100	80	410	478	341	423	961	1111	1084	170	765	787	973
15SV03F030T	100	80	410	478	341	423	961	1111	1084	170	765	845	973
15SV04F040T	100	80	410	478	341	423	961	1111	1084	170	765	914	973
15SV05F040T	100	80	410	478	341	423	961	1111	1084	170	765	962	973
15SV06F055T	100	80	410	478	341	423	961	1111	1084	170	765	1133	973
15SV07F055T	100	80	410	478	341	423	961	1111	1084	170	765	1181	973
15SV08F075T	100	80	410	478	341	423	961	1111	1084	170	765	1221	973
15SV09F075T	100	80	410	478	341	423	961	1111	1084	170	765	1269	973
15SV10F110T	100	80	410	478	341	423	961	1111	1084	170	765	1408	1570
22SV01F011T	100	100	410	478	353	435	983	1133	1084	170	777	742	973
22SV02F022T	100	100	410	478	353	435	983	1133	1084	170	777	787	973
22SV03F030T	100	100	410	478	353	435	983	1133	1084	170	777	845	973
22SV04F040T	100	100	410	478	353	435	983	1133	1084	170	777	914	973
22SV05F055T	100	100	410	478	353	435	983	1133	1084	170	777	1085	973
22SV06F075T	100	100	410	478	353	435	983	1133	1084	170	777	1125	973
22SV07F075T	100	100	410	478	353	435	983	1133	1084	170	777	1173	973
22SV08F110T	100	100	410	478	353	435	983	1133	1084	170	777	1312	1570
22SV09F110T	100	100	410	478	353	435	983	1133	1084	170	777	1360	1570
22SV10F110T	100	100	410	478	353	435	983	1133	1084	170	777	1408	1570

Dimensions in mm. Tolerance  $\pm 10$  mm.

gs30ra\_15sv-new-en\_a\_td

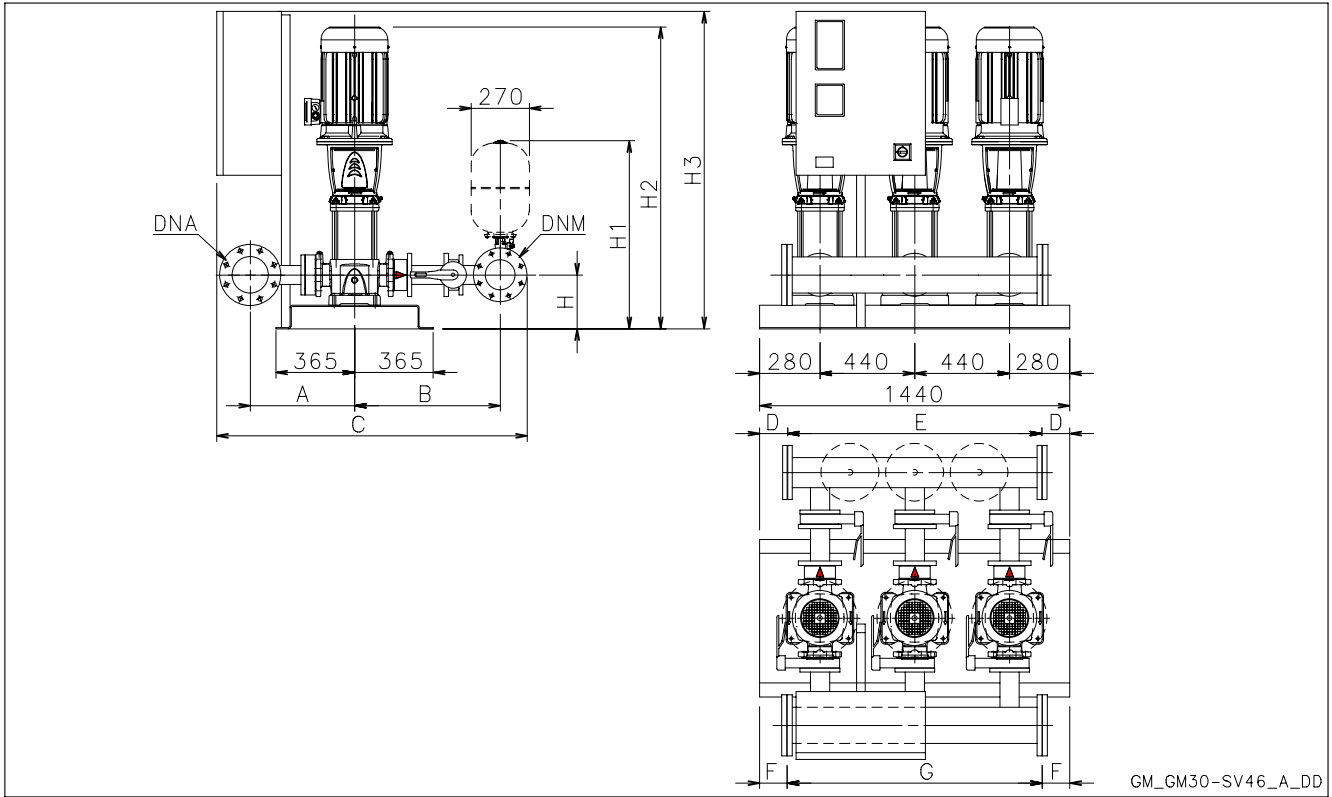
Note: for versions with vibration damping feet increase height by 30 mm.



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**THREE-PUMP BOOSTER SETS, GSD30 SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON DISCHARGE SIDE**



**GSD30  
GSY30**



**THREE-PUMP BOOSTER SETS, GSD30 SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON DISCHARGE SIDE**

GSD30	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	125	100	461	713	1409	110	1220	110	1220	215	822	862	974
SV3301F30T	125	100	461	713	1409	110	1220	110	1220	215	822	897	974
SV3302/2F40T	125	100	461	713	1409	110	1220	110	1220	215	822	993	974
SV3302/1F40T	125	100	461	713	1409	110	1220	110	1220	215	822	993	974
SV3302F55T	125	100	461	713	1409	110	1220	110	1220	215	822	1069	974
SV3303/2F55T	125	100	461	713	1409	110	1220	110	1220	215	822	1144	974
SV3303/1F75T	125	100	461	713	1409	110	1220	110	1220	215	822	1136	974
SV3303F75T	125	100	461	713	1409	110	1220	110	1220	215	822	1136	974
SV3304/2F75T	125	100	461	713	1409	110	1220	110	1220	215	822	1211	974
SV3304/1F110T	125	100	461	713	1473	110	1220	110	1220	215	822	1307	1571
SV3304F110T	125	100	461	713	1473	110	1220	110	1220	215	822	1307	1571
SV3305/2F110T	125	100	461	713	1473	110	1220	110	1220	215	822	1382	1571
SV3305/1F110T	125	100	461	713	1473	110	1220	110	1220	215	822	1382	1571
SV3305F150T	125	100	461	713	1473	110	1220	110	1220	215	822	1448	1571
SV3306/2F150T	125	100	461	713	1473	110	1220	110	1220	215	822	1523	1571
SV3306/1F150T	125	100	461	713	1473	110	1220	110	1220	215	822	1523	1571
SV3306F150T	125	100	461	713	1473	110	1220	110	1220	215	822	1523	1571
SV3307/2F150T	125	100	461	713	1473	110	1220	110	1220	215	822	1598	1571
SV4601/1F30T	150	125	498	752	1517	110	1220	90	1260	250	870	937	974
SV4601F40T	150	125	498	752	1517	110	1220	90	1260	250	870	958	974
SV4602/2F55T	150	125	498	752	1517	110	1220	90	1260	250	870	1109	974
SV4602F75T	150	125	498	752	1517	110	1220	90	1260	250	870	1101	974
SV4603/2F110T	150	125	498	752	1527	110	1220	90	1260	250	870	1272	1571
SV4603F110T	150	125	498	752	1527	110	1220	90	1260	250	870	1272	1571
SV4604/2F150T	150	125	498	752	1527	110	1220	90	1260	250	870	1413	1571
SV4604F150T	150	125	498	752	1527	110	1220	90	1260	250	870	1413	1571
SV4605/2F185T	150	125	498	752	1527	110	1220	90	1260	250	870	1488	1571
SV4605F185T	150	125	498	752	1527	110	1220	90	1260	250	870	1488	1571
SV4606/2F220T	150	125	498	752	1527	110	1220	90	1260	250	870	1563	1571
SV4606F220T	150	125	498	752	1527	110	1220	90	1260	250	870	1563	1571
SV6601/1F40T	200	150	529	794	1635	90	1260	90	1260	250	884	983	1194
SV6601F55T	200	150	529	794	1635	90	1260	90	1260	250	884	1059	1194
SV6602/2F75T	200	150	529	794	1635	90	1260	90	1260	250	884	1141	1194
SV6602/1F110T	200	150	529	794	1635	90	1260	90	1260	250	884	1237	1571
SV6602F110T	200	150	529	794	1635	90	1260	90	1260	250	884	1237	1571
SV6603/2F150T	200	150	529	794	1635	90	1260	90	1260	250	884	1393	1571
SV6603/1F150T	200	150	529	794	1635	90	1260	90	1260	250	884	1393	1571
SV6603F185T	200	150	529	794	1635	90	1260	90	1260	250	884	1393	1821
SV6604/2F185T	200	150	529	794	1635	90	1260	90	1260	250	884	1483	1821
SV6604/1F220T	200	150	529	794	1635	90	1260	90	1260	250	884	1483	1821
SV6604F220T	200	150	529	794	1635	90	1260	90	1260	250	884	1483	1821
SV9201/1F55T	200	200	529	819	1688	90	1260	90	1260	250	910	1059	1194
SV9201F75T	200	200	529	819	1688	90	1260	90	1260	250	910	1051	1194
SV9202/2F110T	200	200	529	819	1688	90	1260	90	1260	250	910	1237	1821
SV9202F150T	200	200	529	819	1688	90	1260	90	1260	250	910	1303	1821
SV9203/2F185T	200	200	529	819	1688	90	1260	90	1260	250	910	1393	1821
SV9203F220T	200	200	529	819	1688	90	1260	90	1260	250	910	1393	1821

**GSD30  
GSY30**

Note: for versions with vibration damping feet increase height by 50 mm.

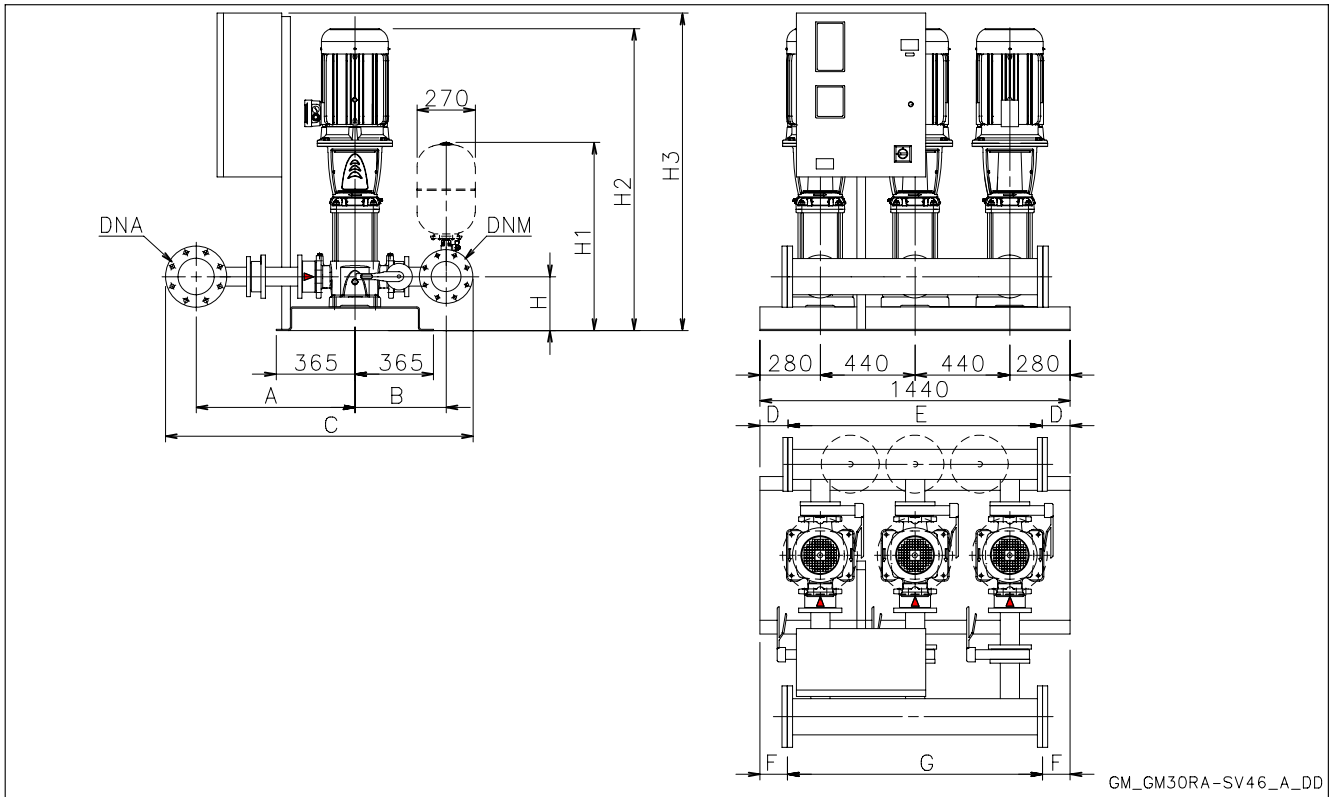
gs30\_sv46-en\_a\_td16



# ITT

# Lowara

## THREE-PUMP BOOSTER SETS, GSD30 RA SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE



**GSD30**  
**GSY30**

**THREE-PUMP BOOSTER SETS, GSD30 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON SUCTION SIDE**

GSD30RA	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	125	100	726	448	1409	110	1220	110	1220	215	822	862	974
SV3301F30T	125	100	726	448	1409	110	1220	110	1220	215	822	897	974
SV3302/2F40T	125	100	726	448	1409	110	1220	110	1220	215	822	993	974
SV3302/1F40T	125	100	726	448	1409	110	1220	110	1220	215	822	993	974
SV3302F55T	125	100	726	448	1409	110	1220	110	1220	215	822	1069	974
SV3303/2F55T	125	100	726	448	1409	110	1220	110	1220	215	822	1144	974
SV3303/1F75T	125	100	726	448	1409	110	1220	110	1220	215	822	1136	974
SV3303F75T	125	100	726	448	1409	110	1220	110	1220	215	822	1136	974
SV3304/2F75T	125	100	726	448	1409	110	1220	110	1220	215	822	1211	974
SV3304/1F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1307	1571
SV3304F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1307	1571
SV3305/2F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1382	1571
SV3305/1F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1382	1571
SV3305F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1448	1571
SV3306/2F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1523	1571
SV3306/1F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1523	1571
SV3306F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1523	1571
SV3307/2F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1598	1571
SV4601/1F30T	150	125	766	484	1517	110	1220	90	1260	250	870	937	974
SV4601F40T	150	125	766	484	1517	110	1220	90	1260	250	870	958	974
SV4602/2F55T	150	125	766	484	1517	110	1220	90	1260	250	870	1109	974
SV4602F75T	150	125	766	484	1517	110	1220	90	1260	250	870	1101	974
SV4603/2F110T	150	125	766	484	1517	110	1220	90	1260	250	870	1272	1571
SV4603F110T	150	125	766	484	1517	110	1220	90	1260	250	870	1272	1571
SV4604/2F150T	150	125	766	484	1517	110	1220	90	1260	250	870	1413	1571
SV4604F150T	150	125	766	484	1517	110	1220	90	1260	250	870	1413	1571
SV4605/2F185T	150	125	766	484	1517	110	1220	90	1260	250	870	1488	1571
SV4605F185T	150	125	766	484	1517	110	1220	90	1260	250	870	1488	1571
SV4606/2F220T	150	125	766	484	1517	110	1220	90	1260	250	870	1563	1571
SV4606F220T	150	125	766	484	1517	110	1220	90	1260	250	870	1563	1571
SV6601/1F40T	200	150	819	504	1635	90	1260	90	1260	250	884	983	1194
SV6601F55T	200	150	819	504	1635	90	1260	90	1260	250	884	1059	1194
SV6602/2F75T	200	150	819	504	1635	90	1260	90	1260	250	884	1141	1194
SV6602/1F110T	200	150	819	504	1635	90	1260	90	1260	250	884	1237	1571
SV6602F110T	200	150	819	504	1635	90	1260	90	1260	250	884	1237	1571
SV6603/2F150T	200	150	819	504	1635	90	1260	90	1260	250	884	1393	1571
SV6603/1F150T	200	150	819	504	1635	90	1260	90	1260	250	884	1393	1571
SV6603F185T	200	150	819	504	1635	90	1260	90	1260	250	884	1393	1821
SV6604/2F185T	200	150	819	504	1635	90	1260	90	1260	250	884	1483	1821
SV6604/1F220T	200	150	819	504	1635	90	1260	90	1260	250	884	1483	1821
SV6604F220T	200	150	819	504	1635	90	1260	90	1260	250	884	1483	1821
SV9201/1F55T	200	200	819	529	1688	90	1260	90	1260	250	910	1059	1194
SV9201F75T	200	200	819	529	1688	90	1260	90	1260	250	910	1051	1194
SV9202/2F110T	200	200	819	529	1688	90	1260	90	1260	250	910	1237	1821
SV9202F150T	200	200	819	529	1688	90	1260	90	1260	250	910	1303	1821
SV9203/2F185T	200	200	819	529	1688	90	1260	90	1260	250	910	1393	1821
SV9203F220T	200	200	819	529	1688	90	1260	90	1260	250	910	1393	1821

**GSD30  
GSY30**

Note: for versions with vibration damping feet increase height by 50 mm.

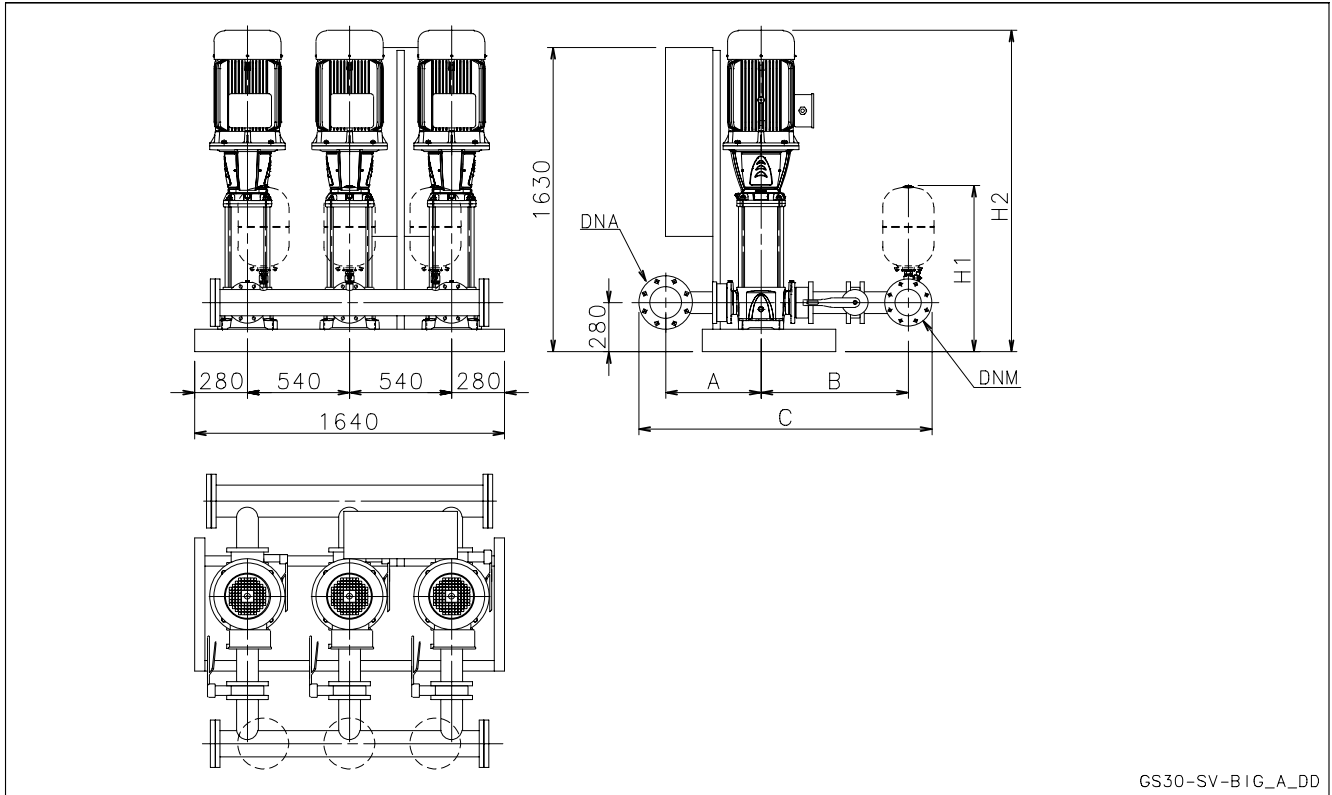
gs30ra\_sv46-en\_a\_td16



ITT

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**THREE-PUMP BOOSTER SETS, GSY30 SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON DISCHARGE SIDE**



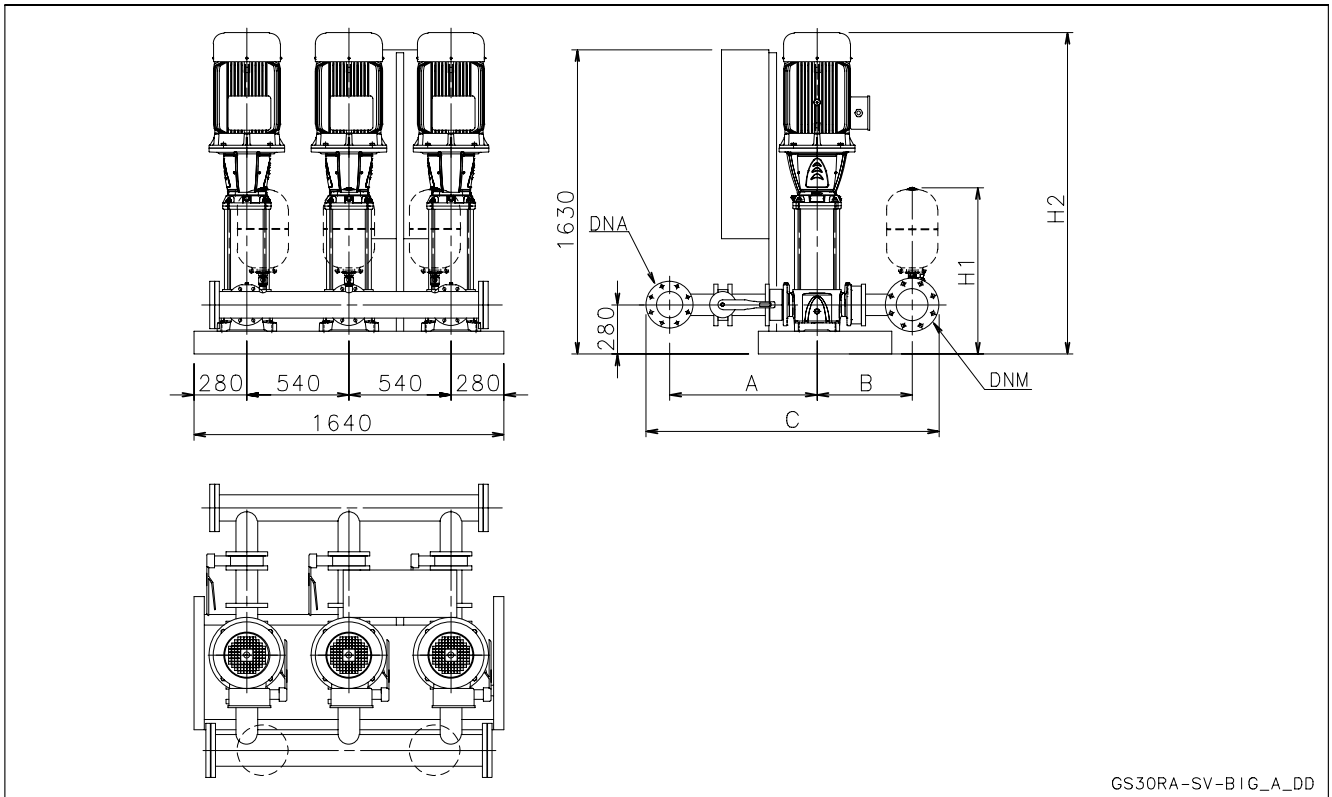
GS30-SV-BIG\_A\_DD

**GSD30  
GSY30**

GSY30	DNA	DNM	A	B	C	H1	H2
SV6605/2F300T	200	150	529	794	1635	914	1722
SV6605/1F300T	200	150	529	794	1635	914	1722
SV6605F300T	200	150	529	794	1635	914	1722
SV9204/2F300T	200	200	529	819	1688	940	1632
SV9204F300T	200	200	529	819	1688	940	1632
SV9205/2F370T	200	200	529	819	1688	940	1722

Note: for versions with vibration damping feet increase height by 50 mm.

gs30\_sv-big-en\_a\_td

**THREE-PUMP BOOSTER SETS, GSY30 RA SERIES  
VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE  
ON SUCTION SIDE**

**GSD30  
GSY30**

GSY30RA	DNA	DNM	A	B	C	H1	H2
SV6605/2F300T	200	150	819	504	1635	914	1722
SV6605/1F300T	200	150	819	504	1635	914	1722
SV6605F300T	200	150	819	504	1635	914	1722
SV9204/2F300T	200	200	819	529	1688	940	1632
SV9204F300T	200	200	819	529	1688	940	1632
SV9205/2F370T	200	200	819	529	1688	940	1722

Note: for versions with vibration damping feet increase height by 50 mm.

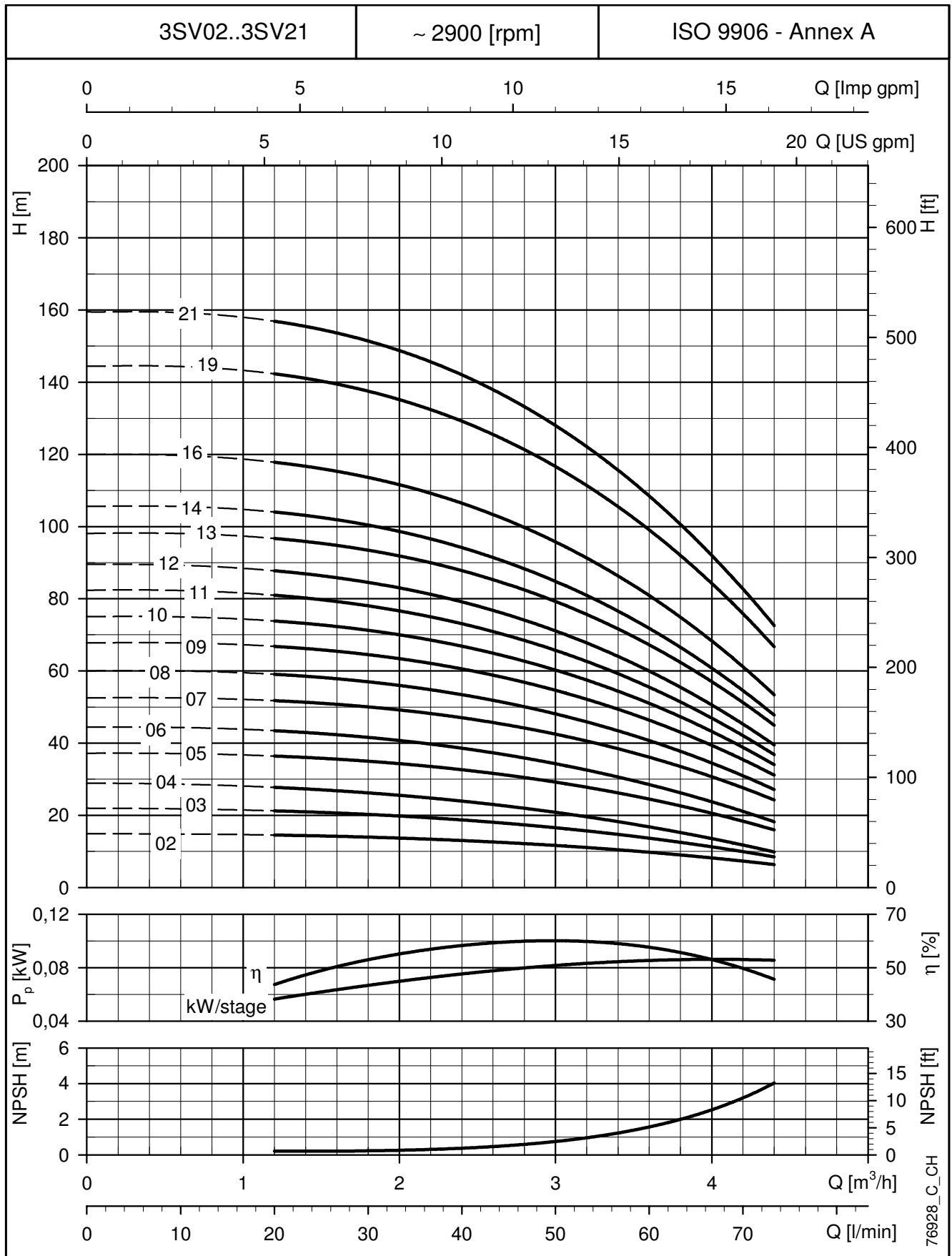
gs30ra\_sv-big-en\_a\_td



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (JOCKEY PUMP)



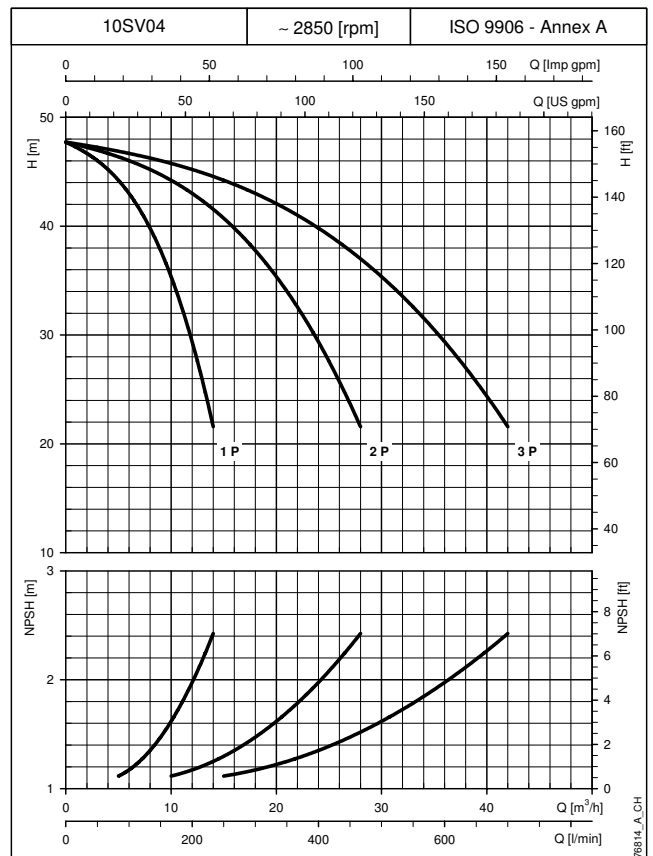
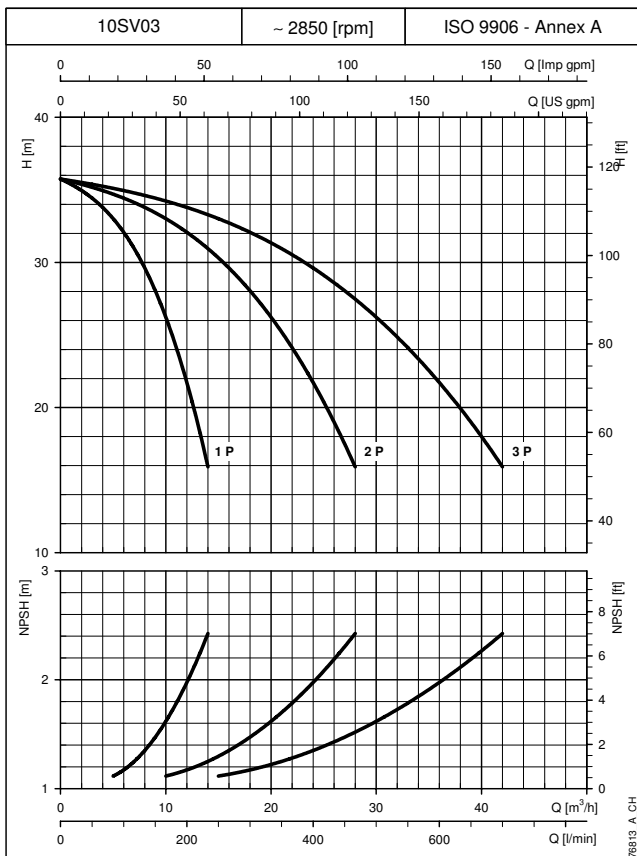
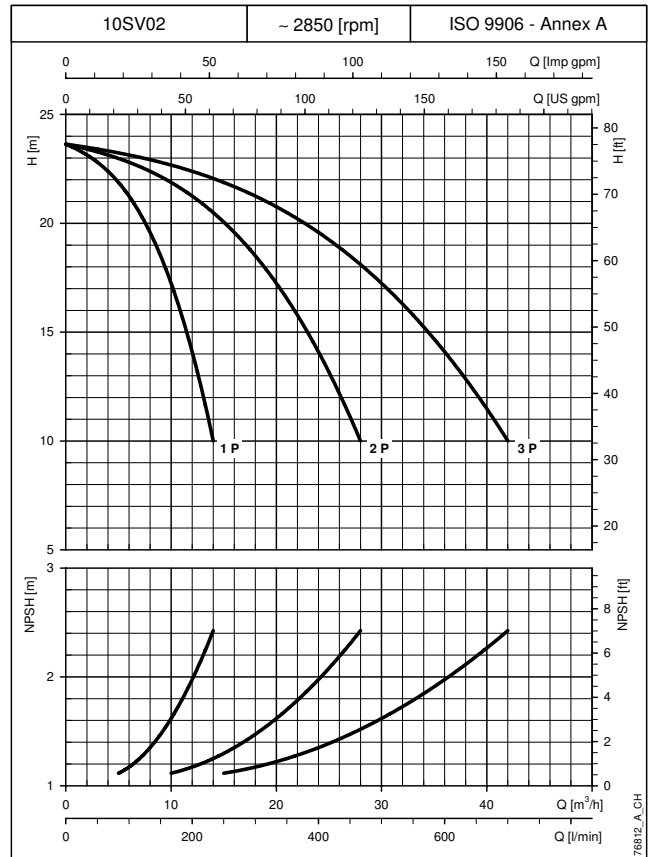
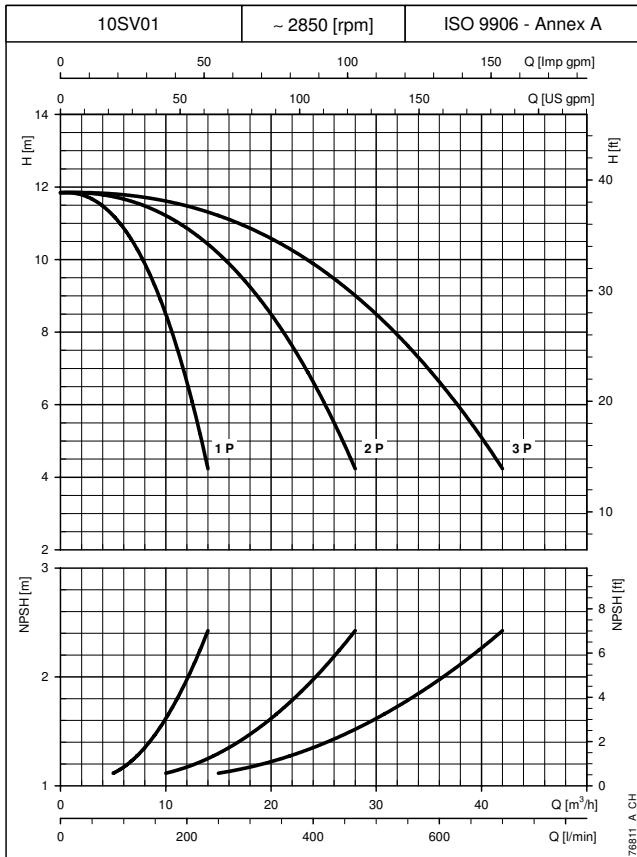
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show performance with one pump running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

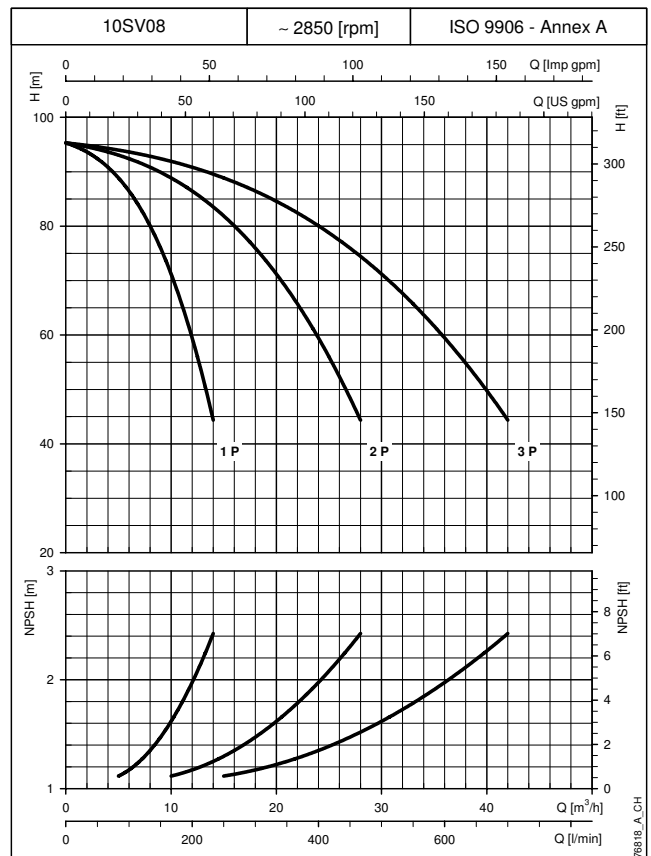
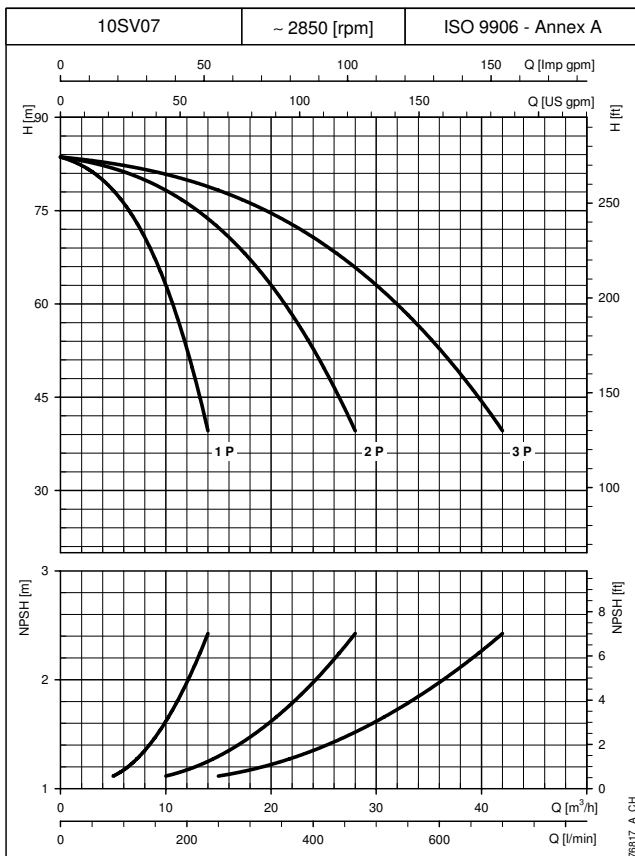
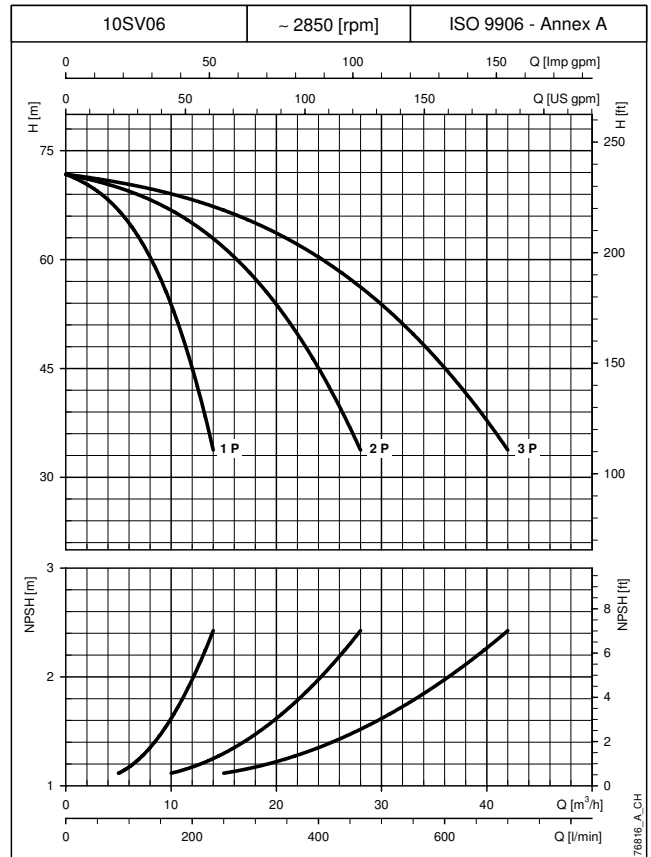
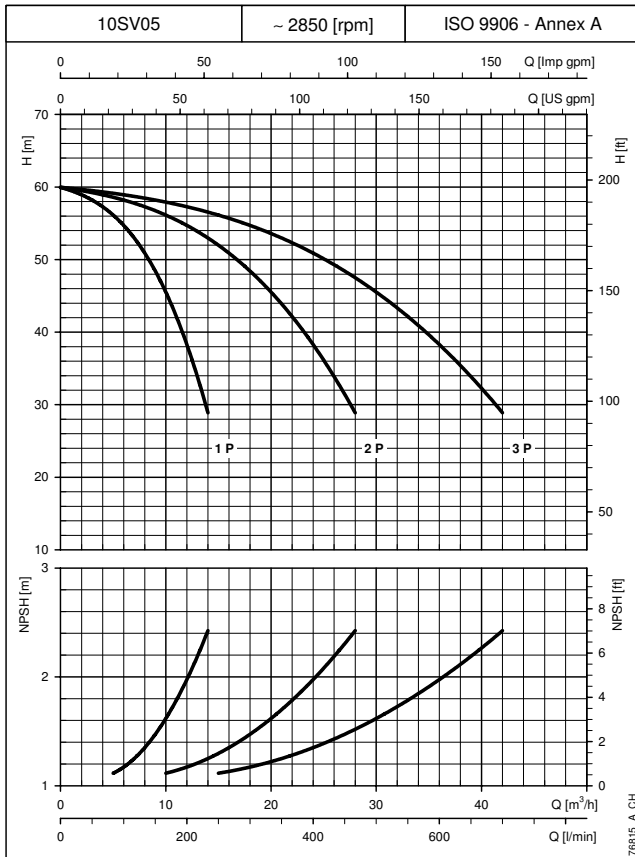
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.

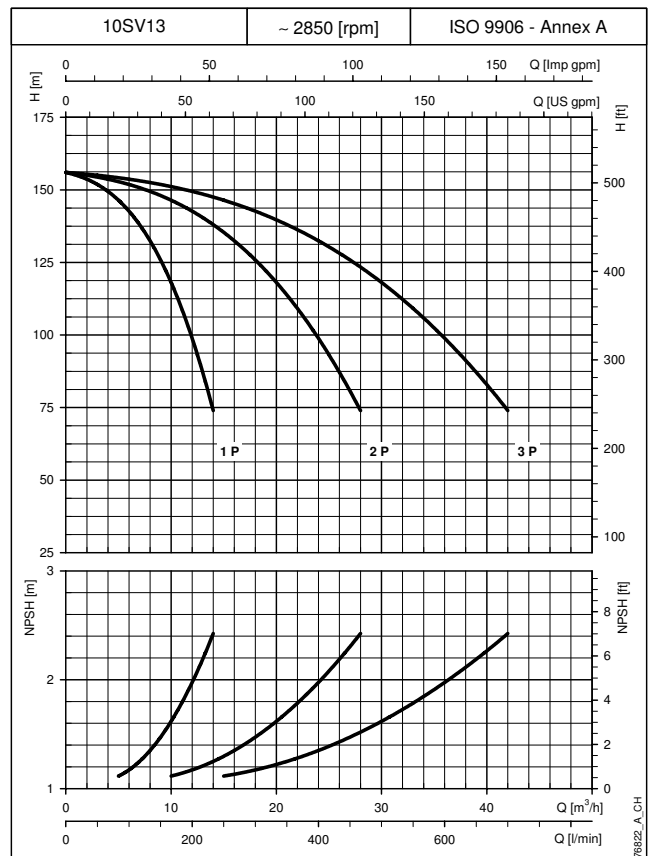
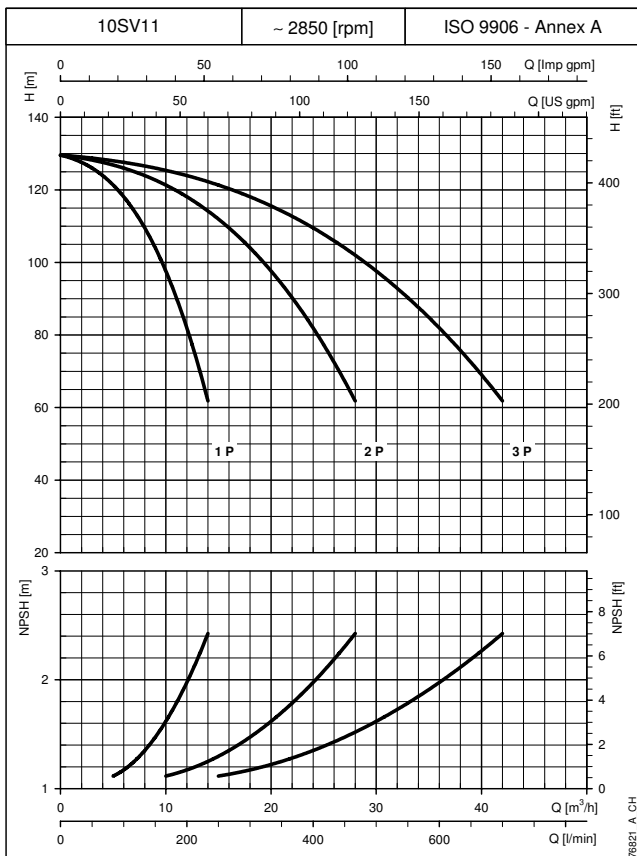
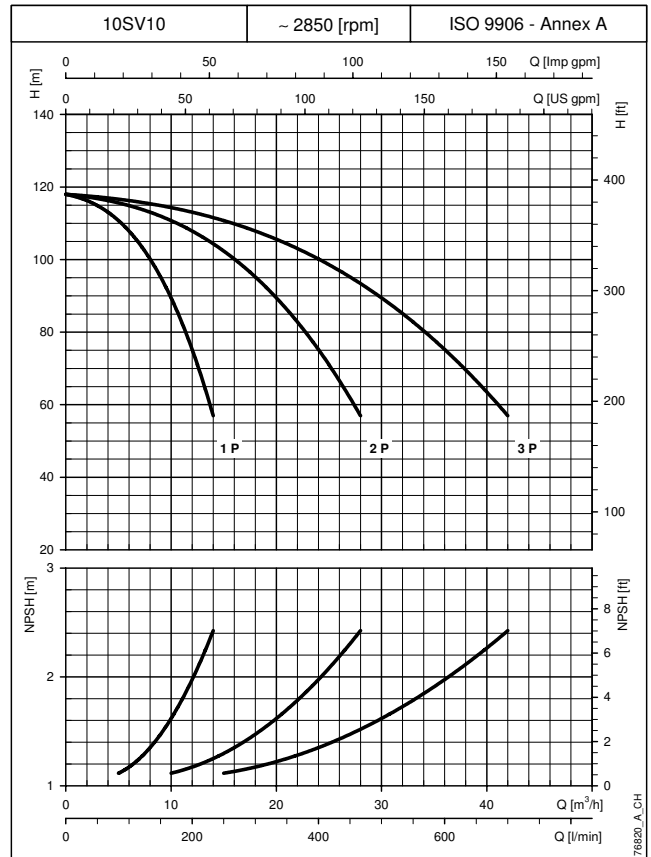
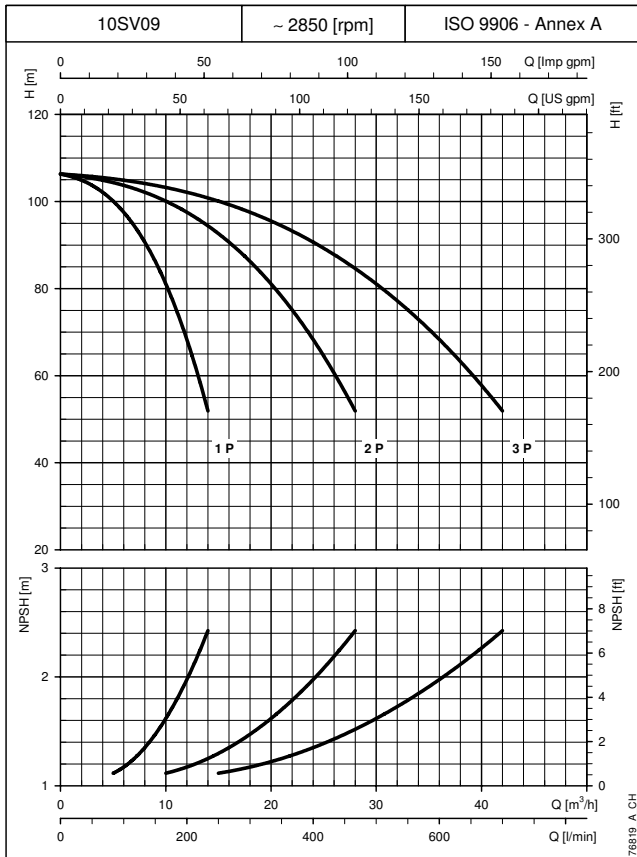




# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.

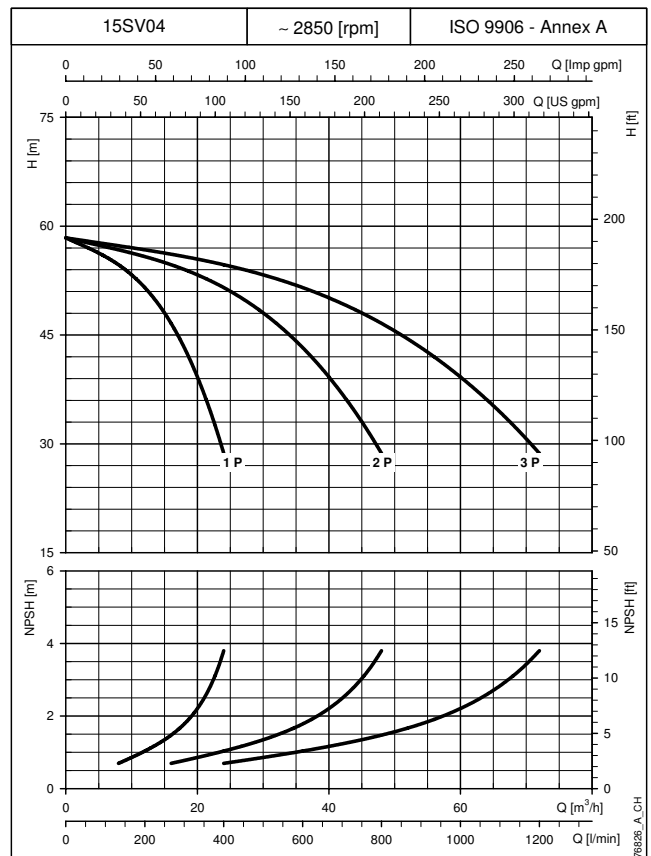
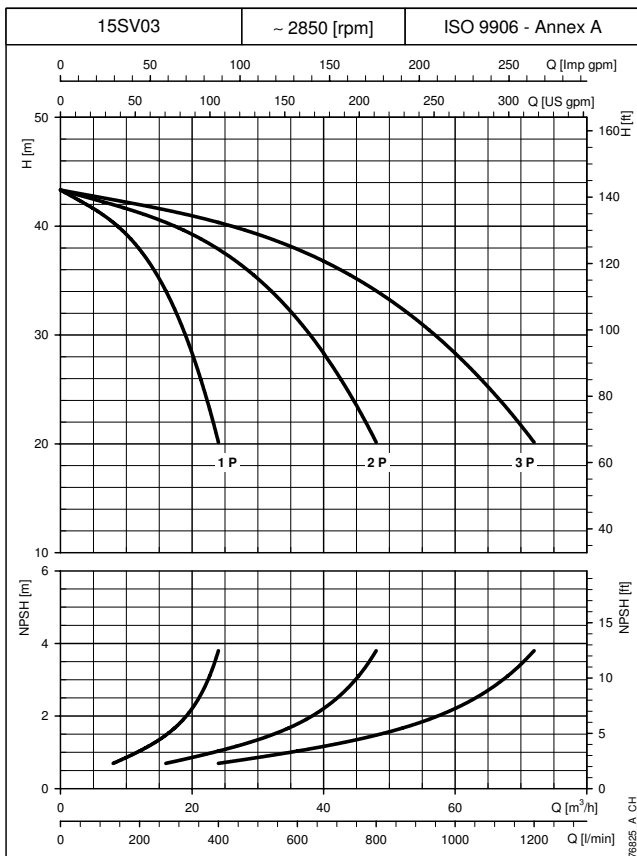
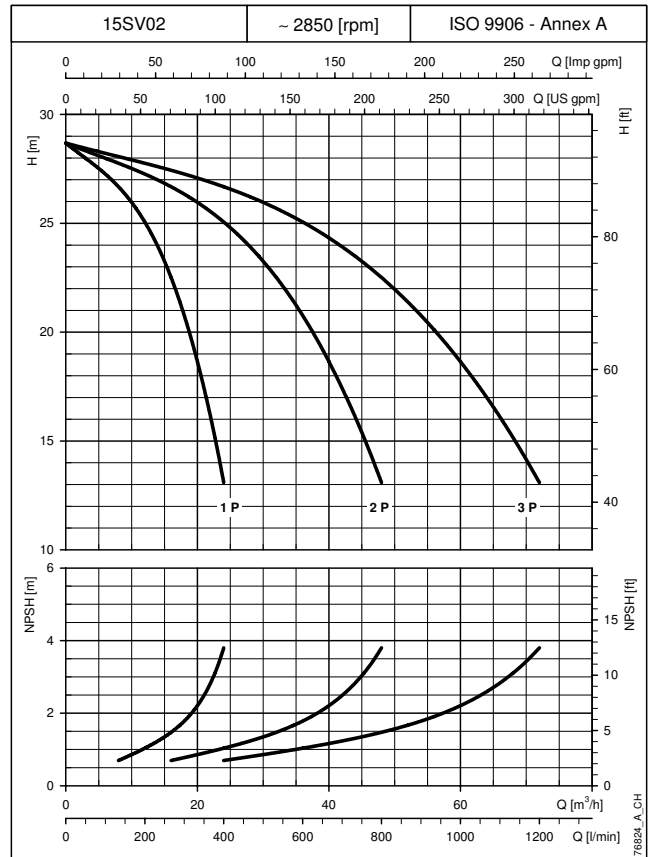
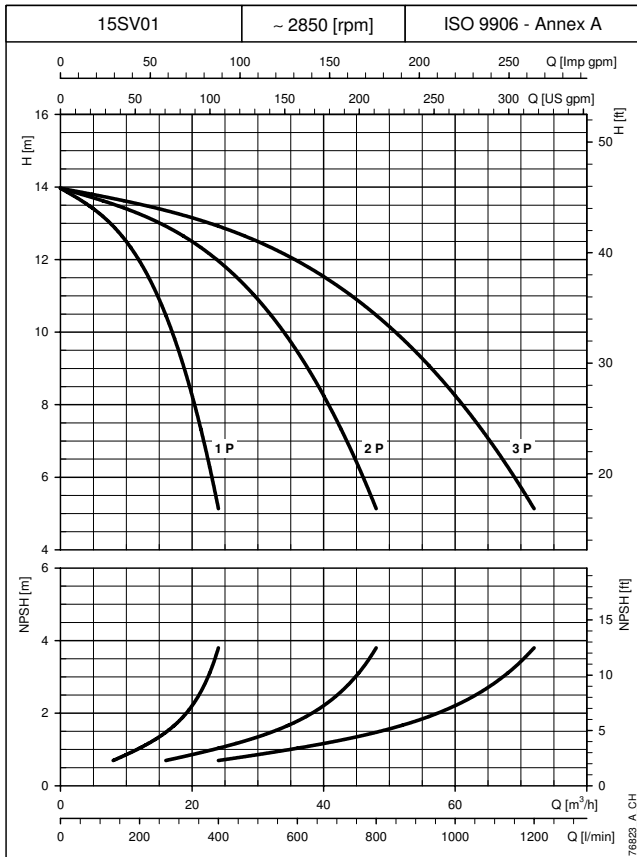
# CURVES



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

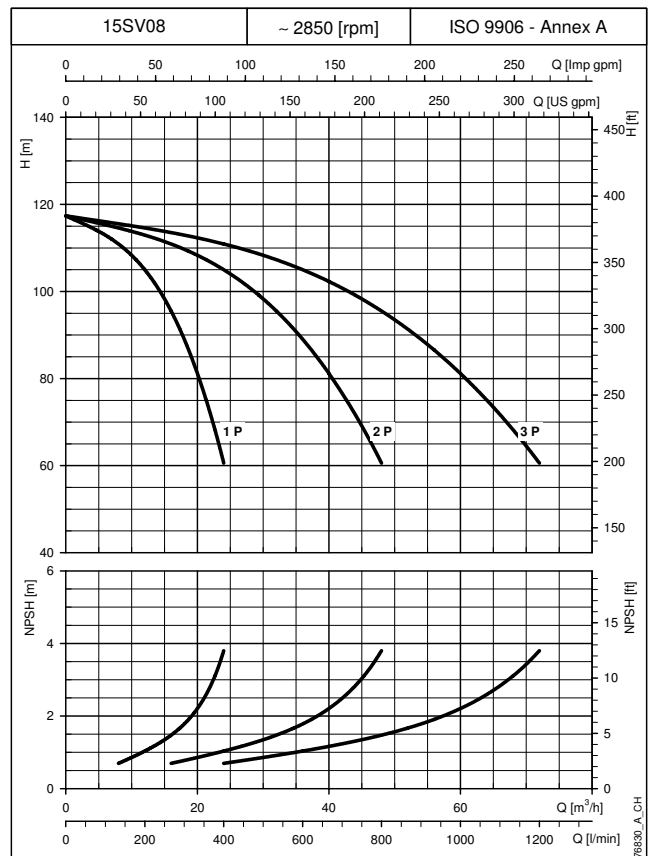
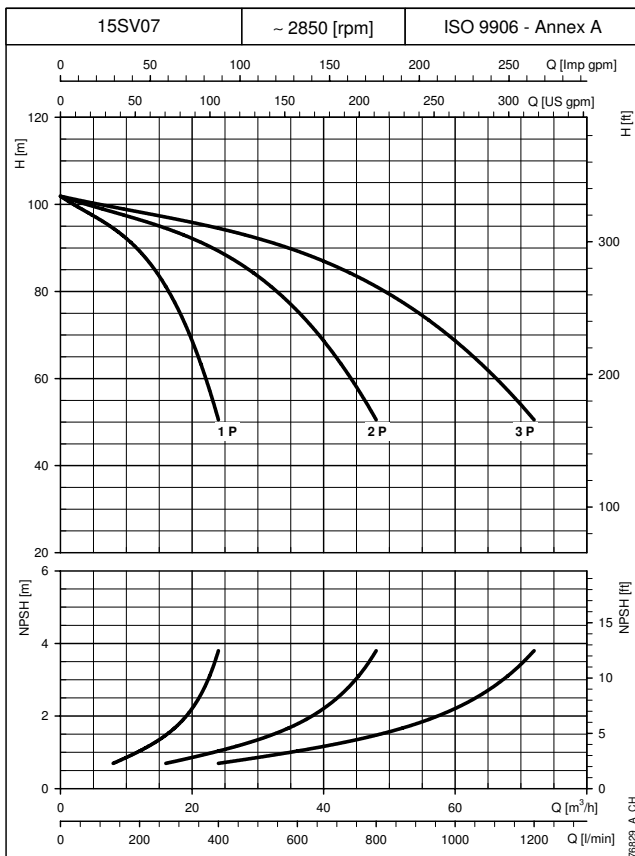
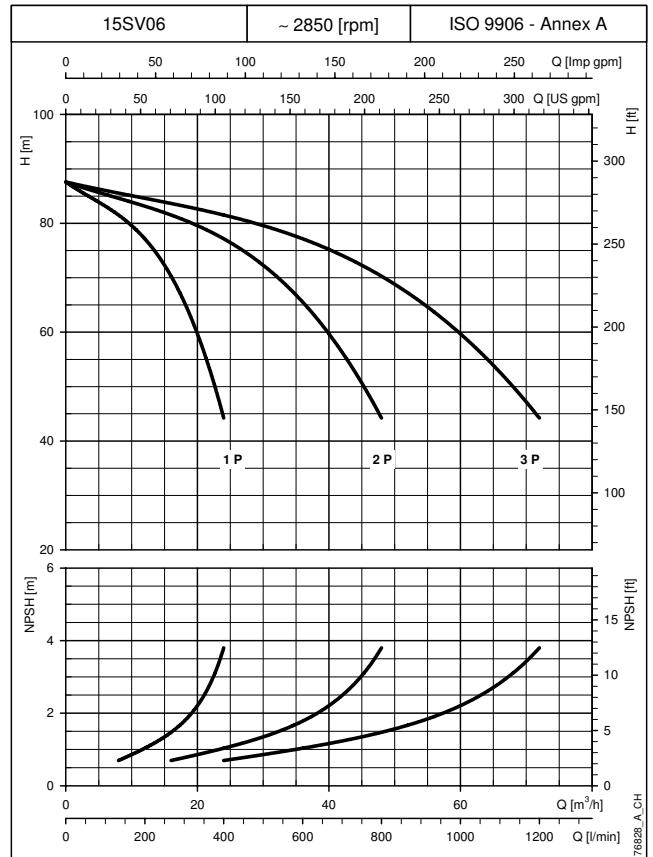
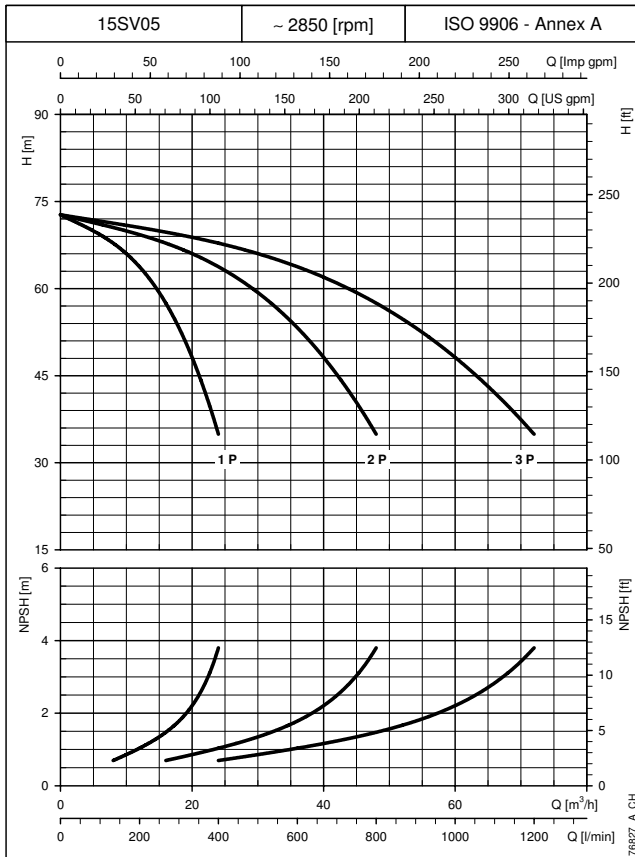
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

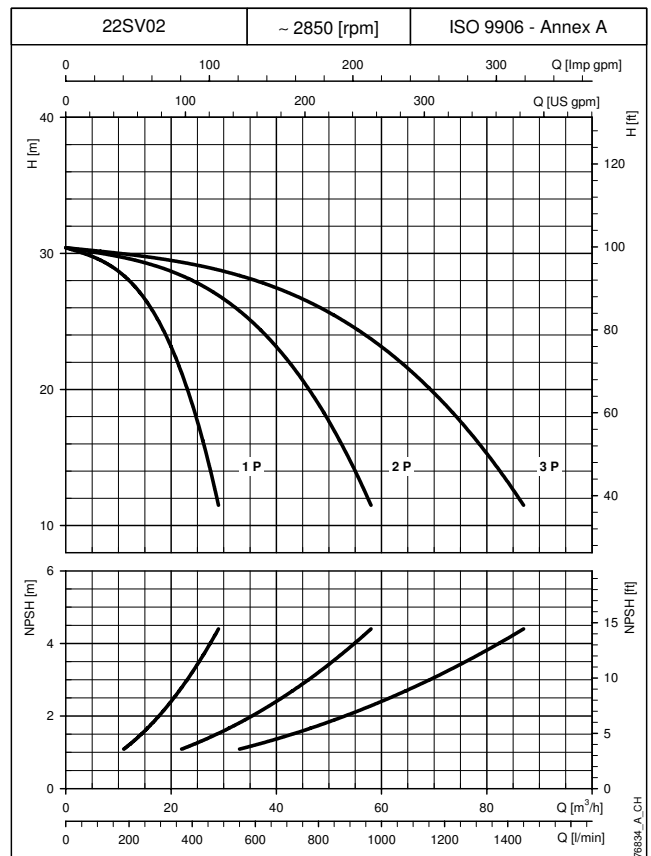
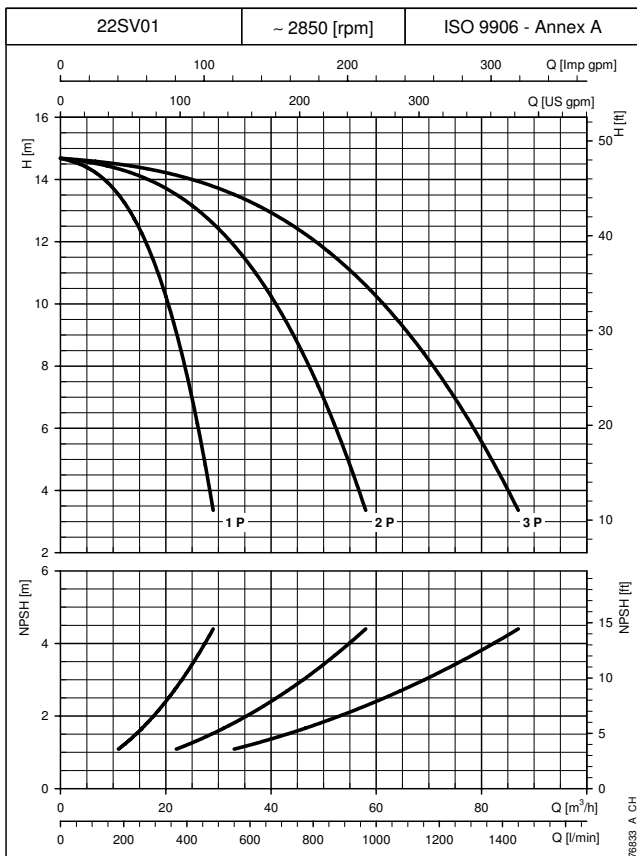
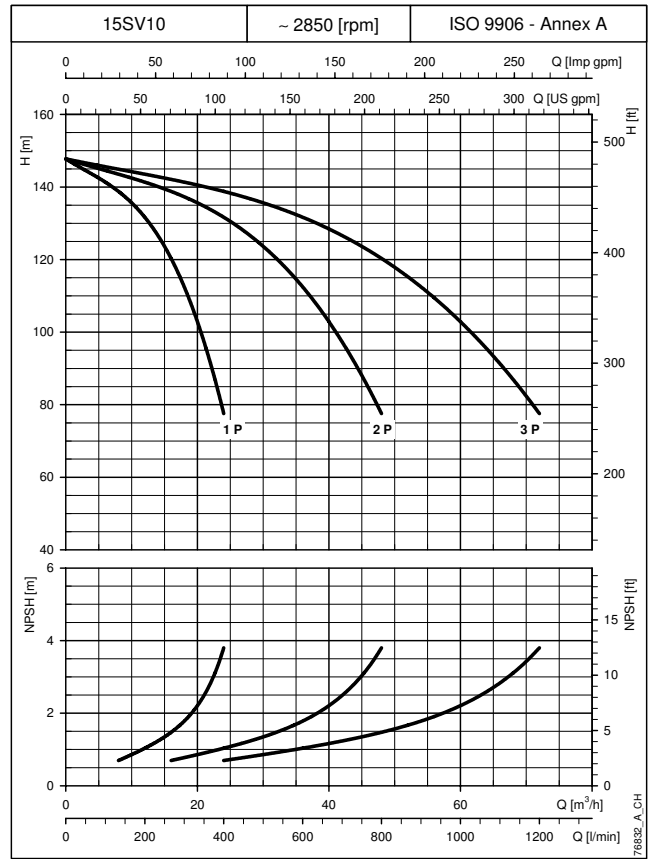
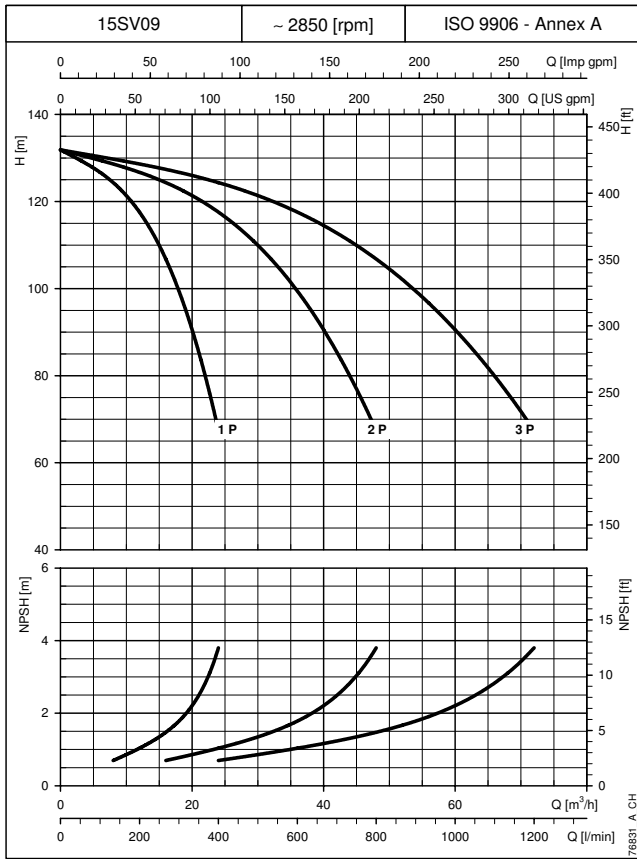
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

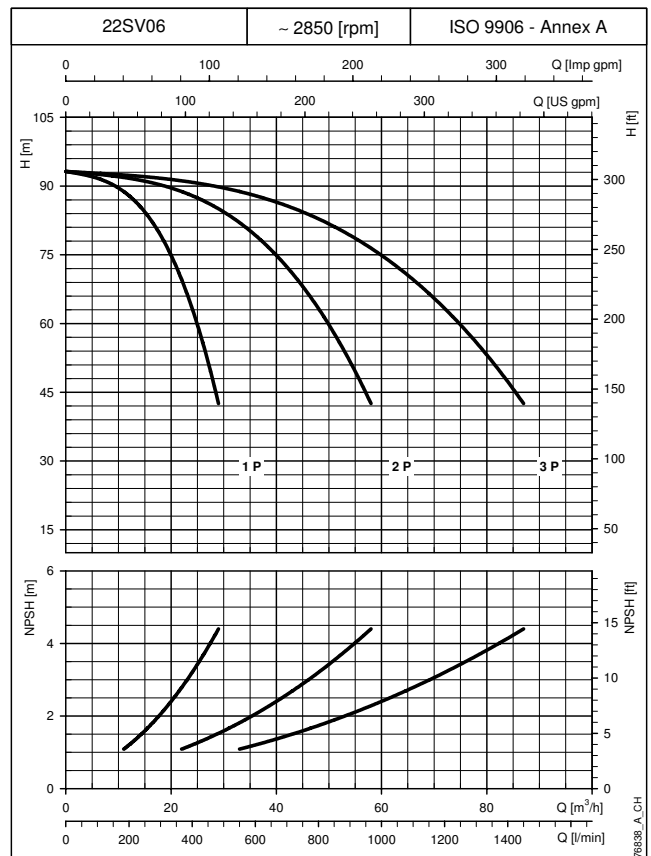
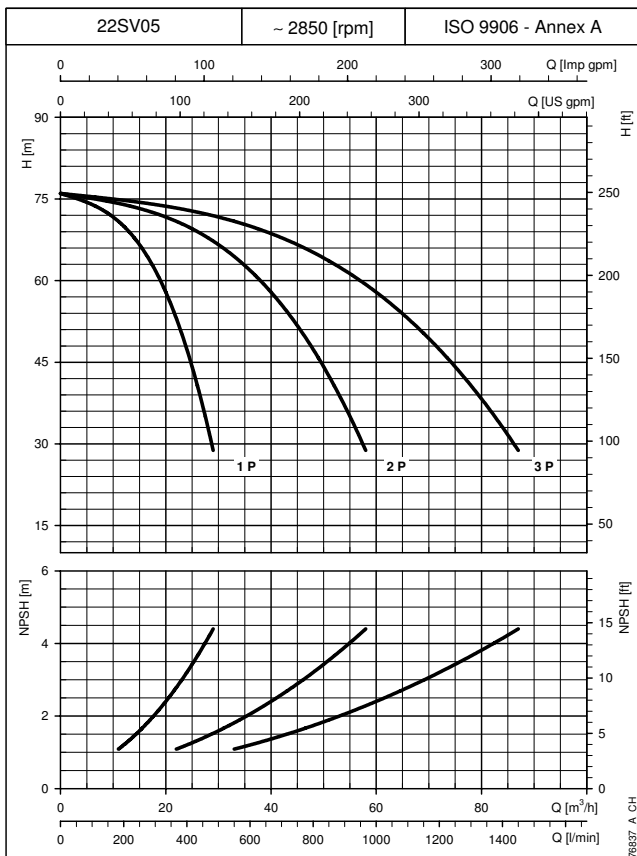
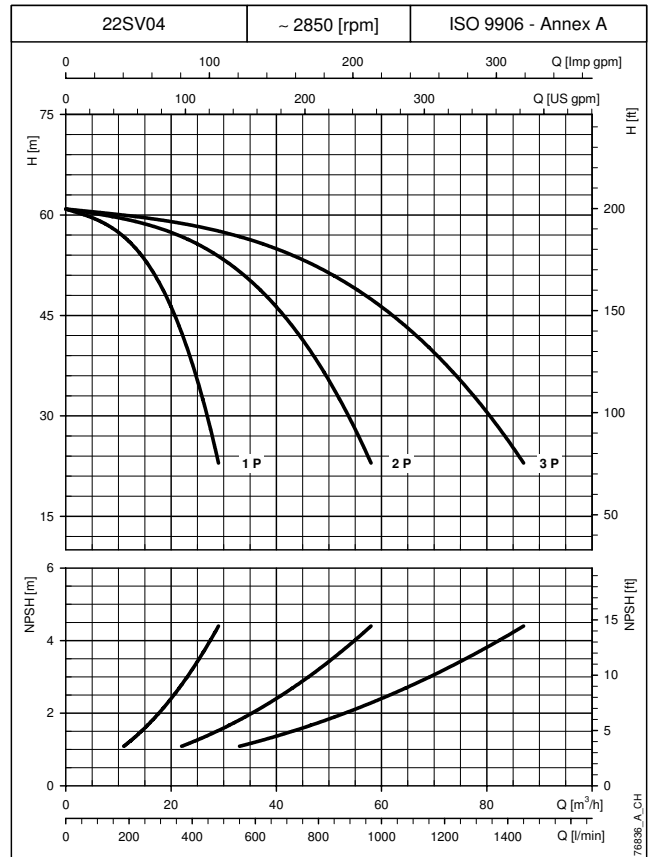
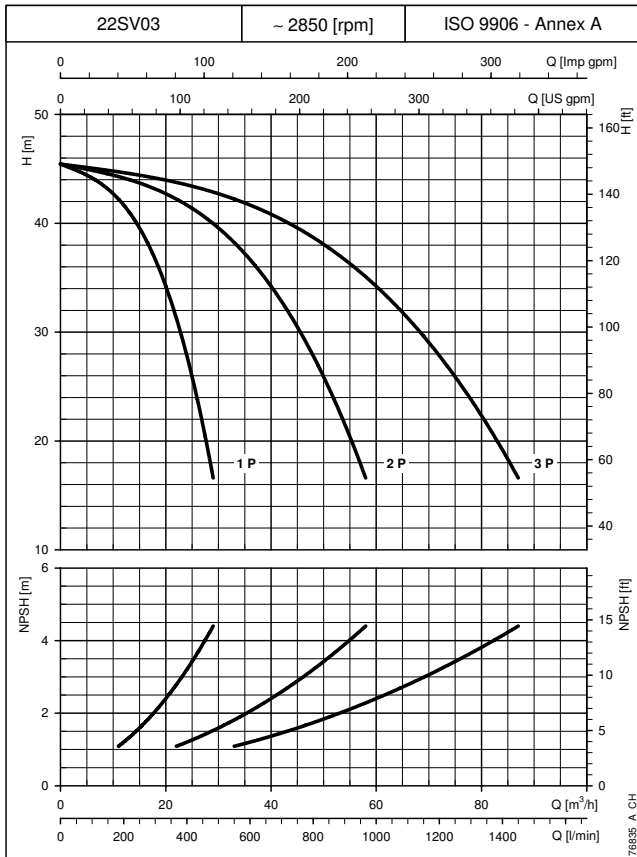
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

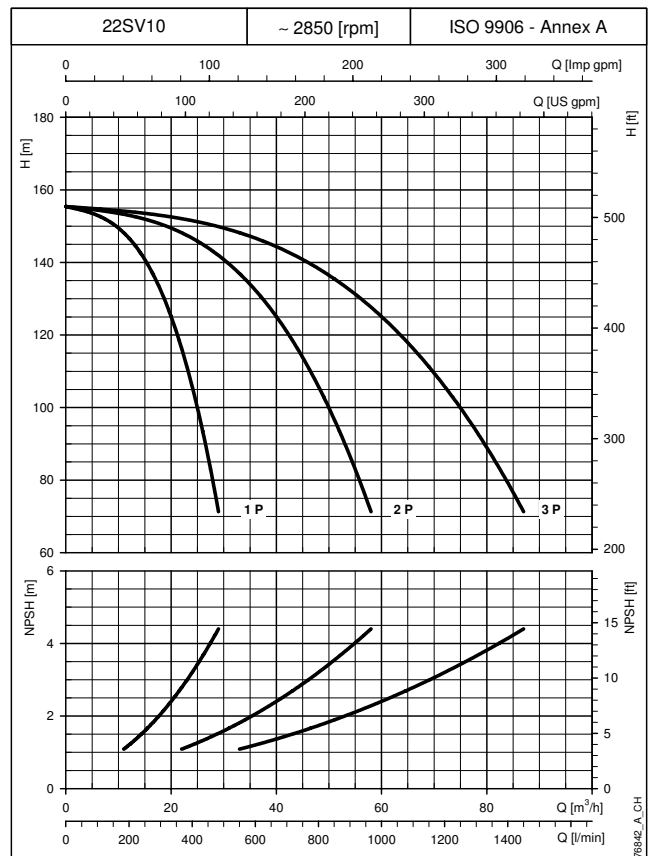
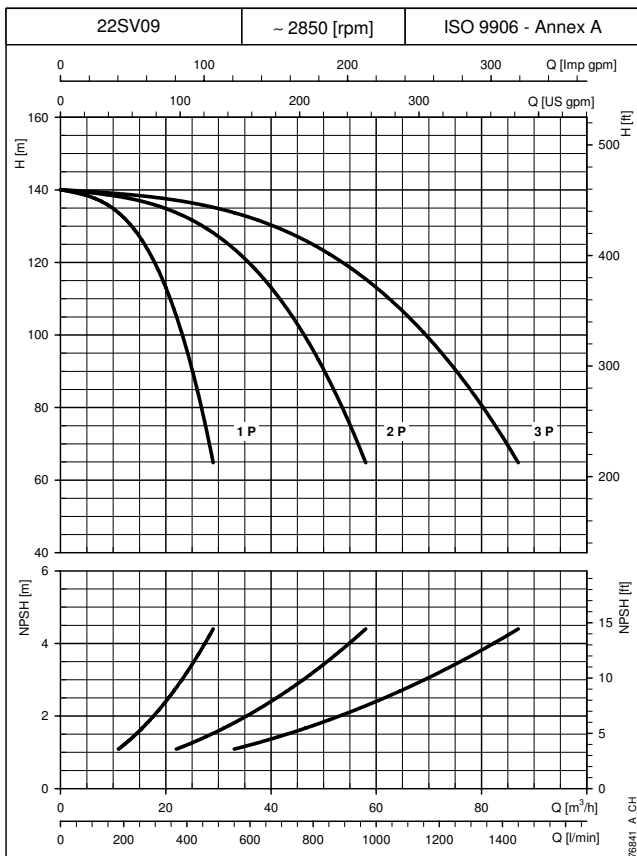
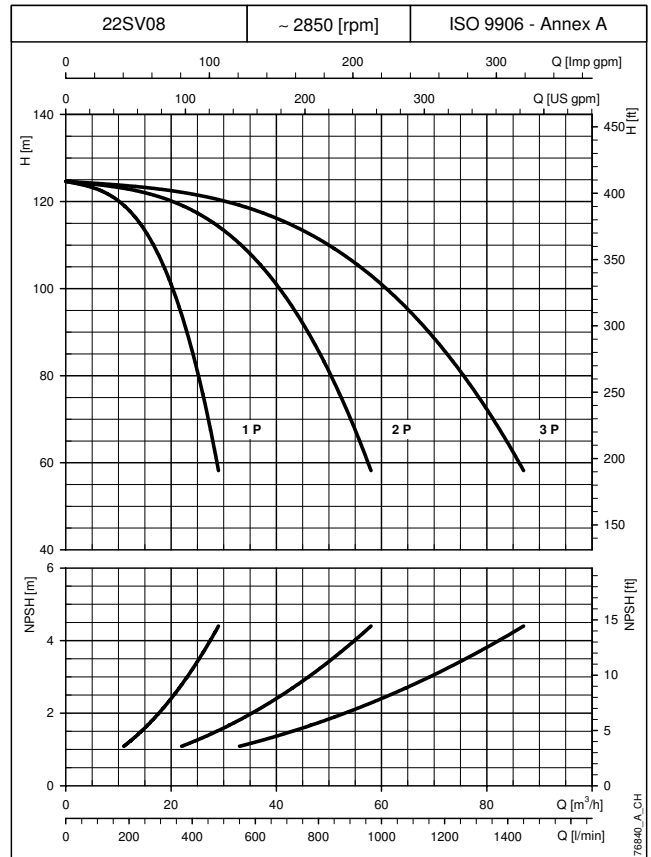
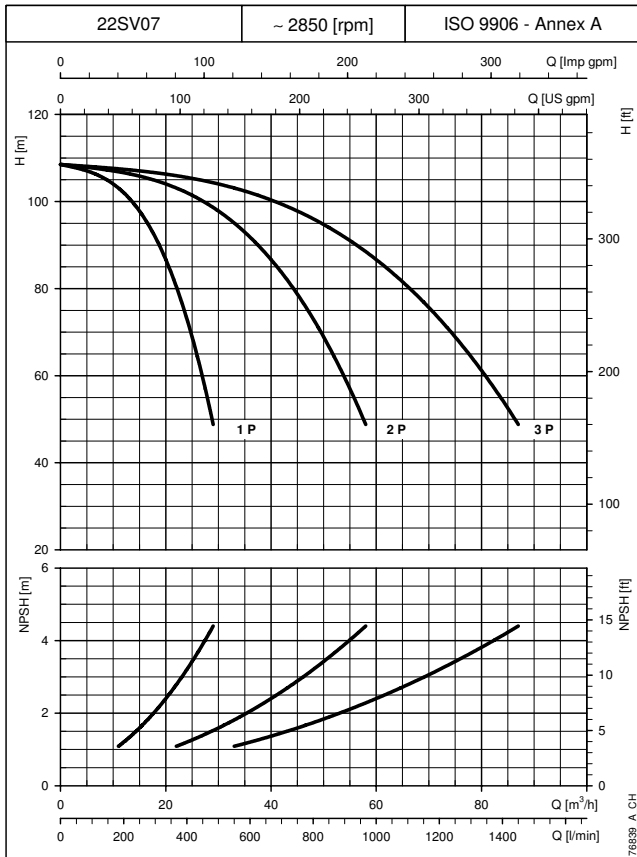
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

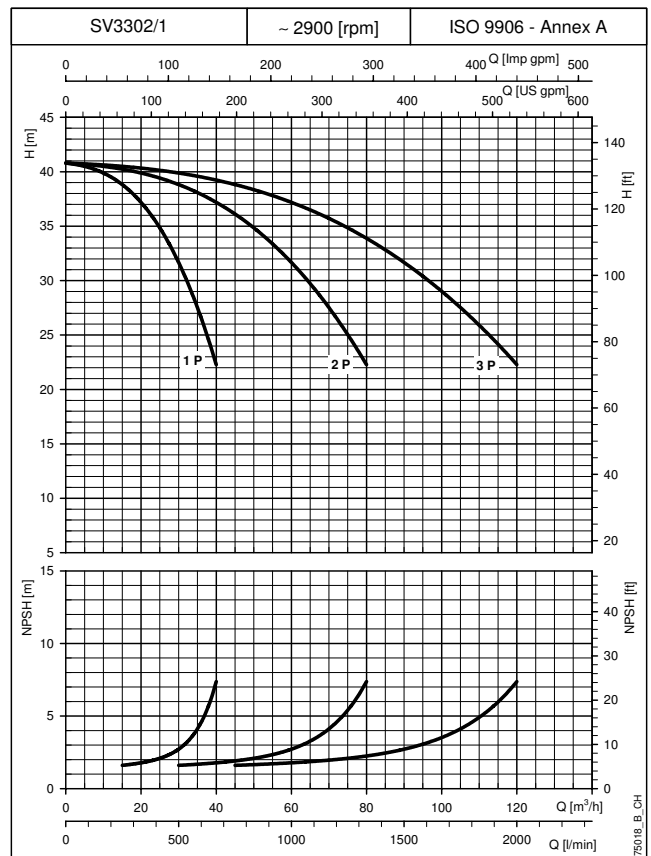
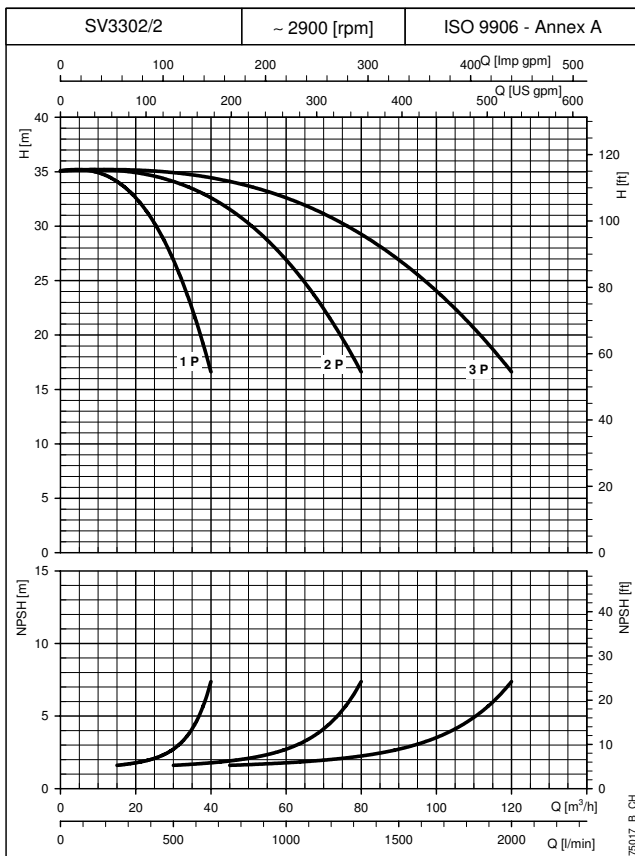
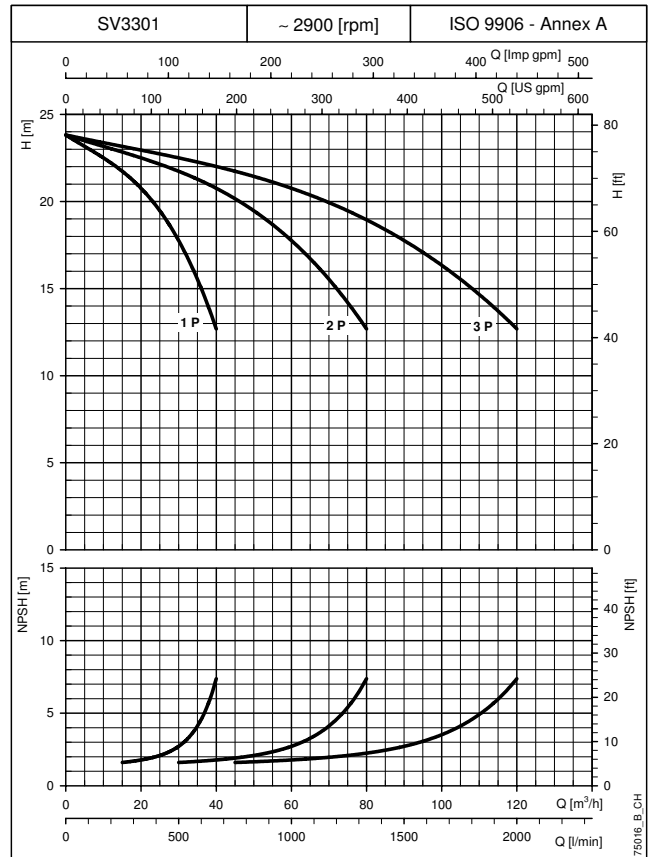
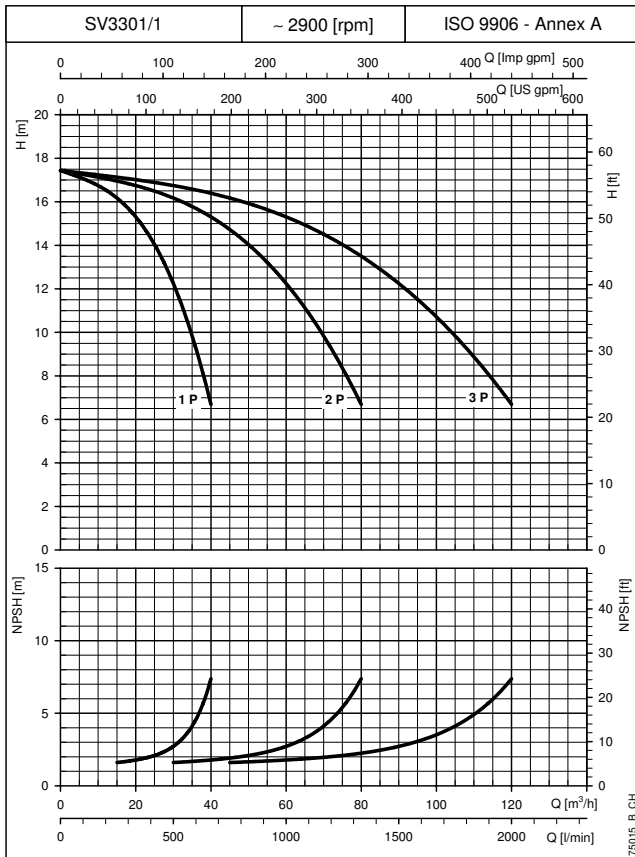
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

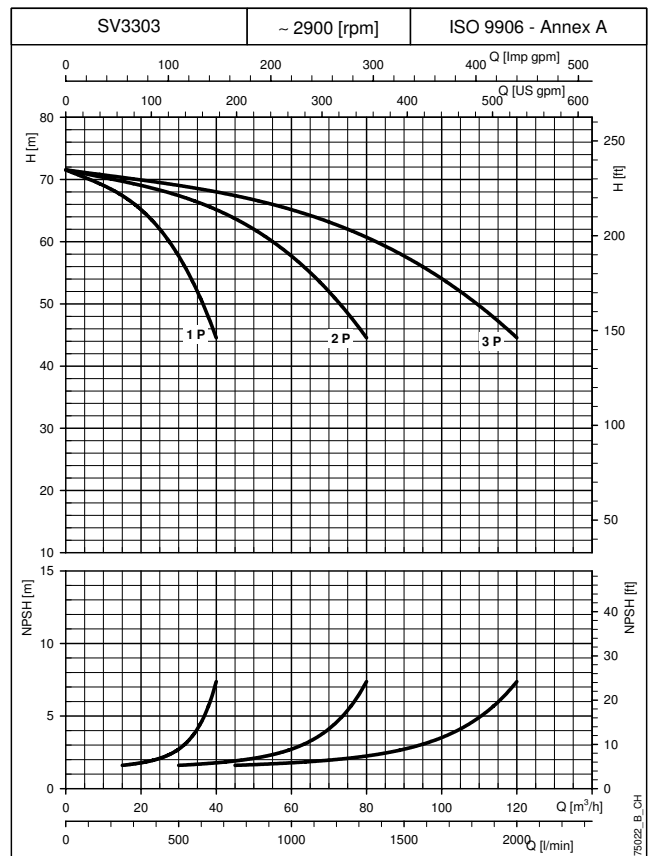
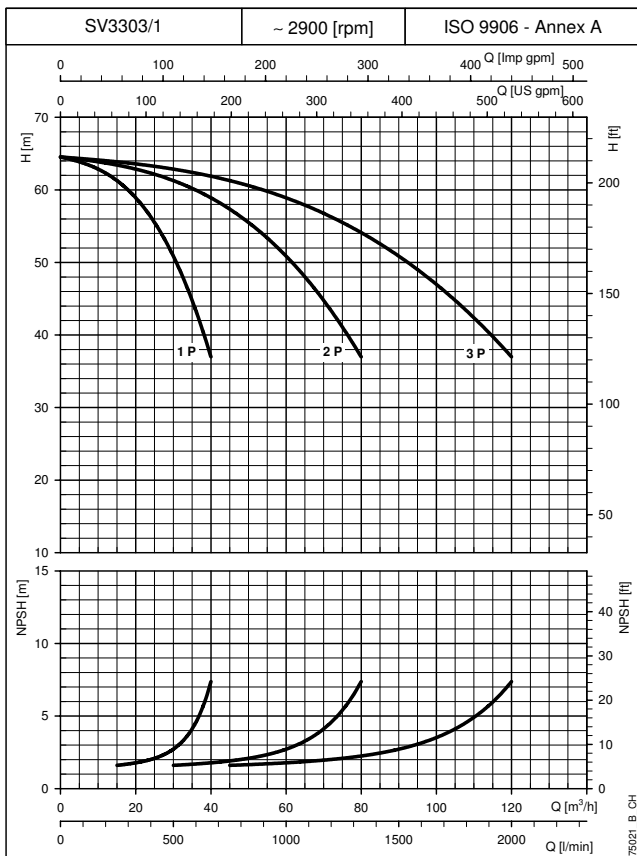
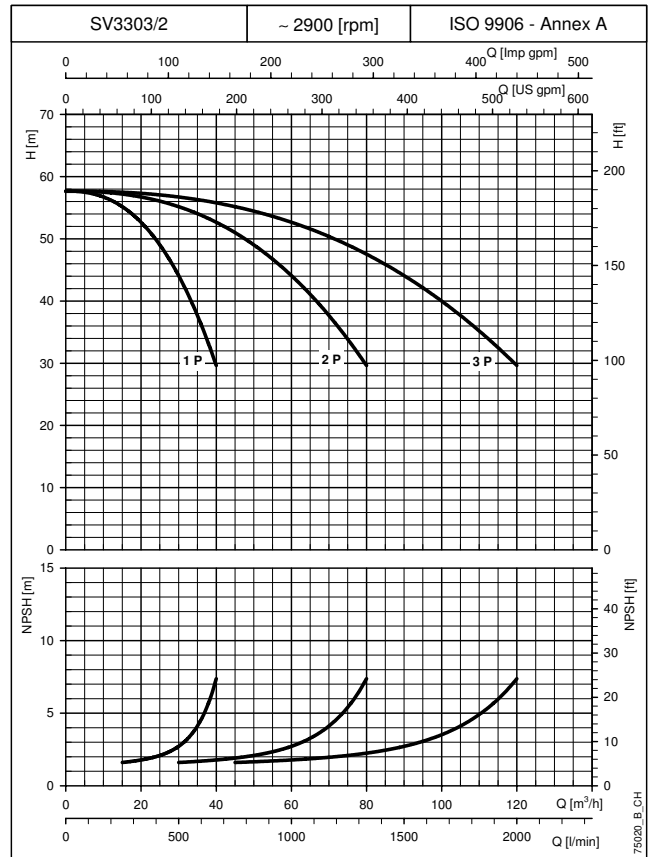
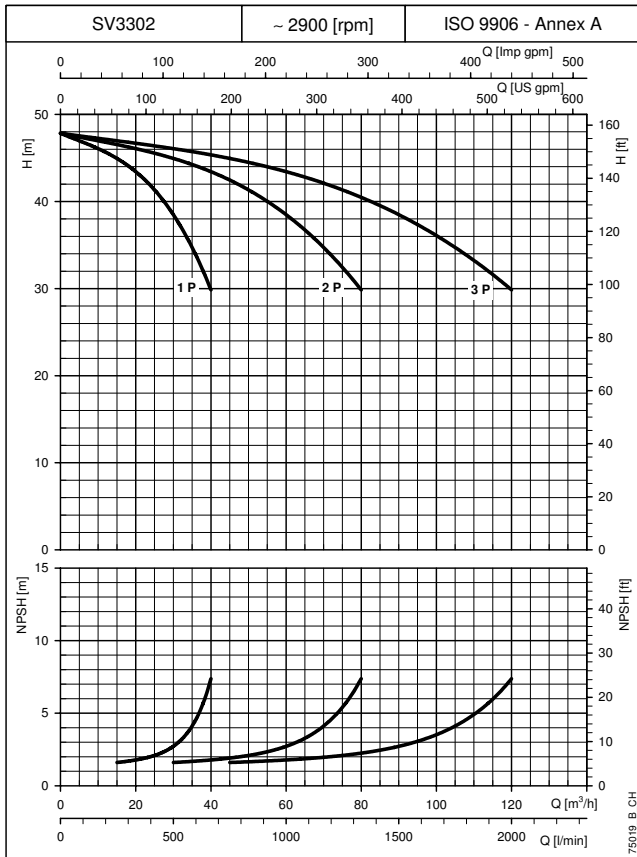
The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

The performance curves do not take into account flow resistance in the valves and piping.  
 The curves show the performance with one, two and three pumps running.  
 These performances are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{s}$ .  
 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.

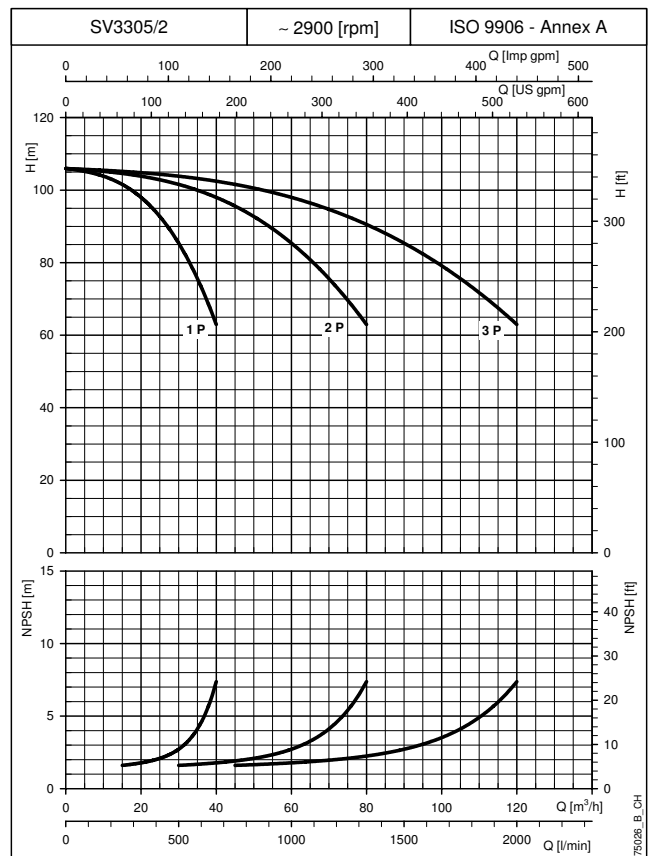
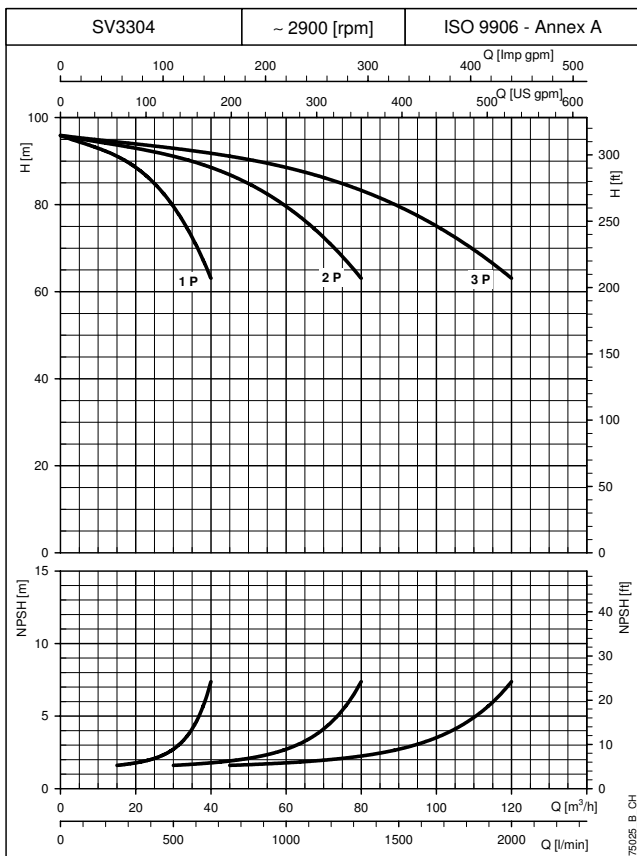
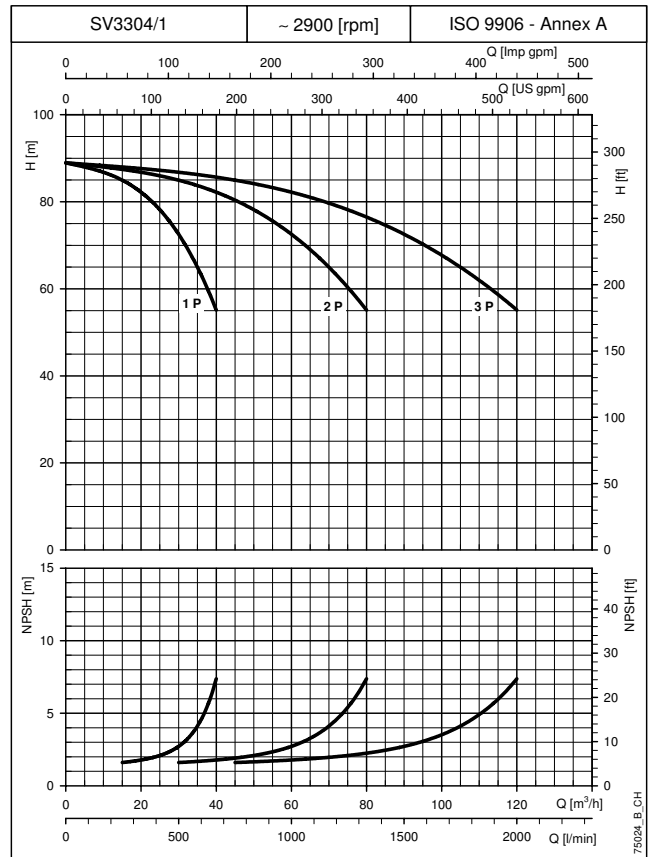
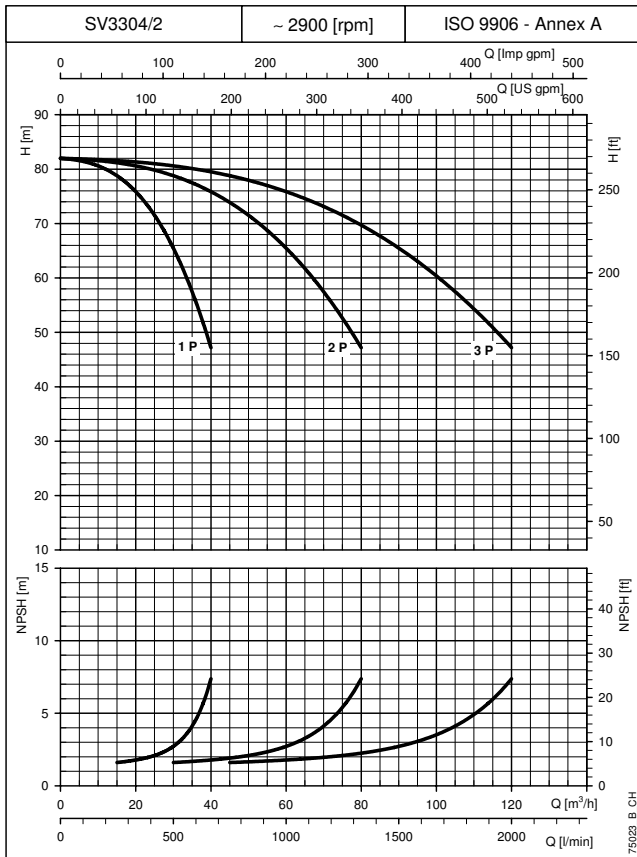




# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

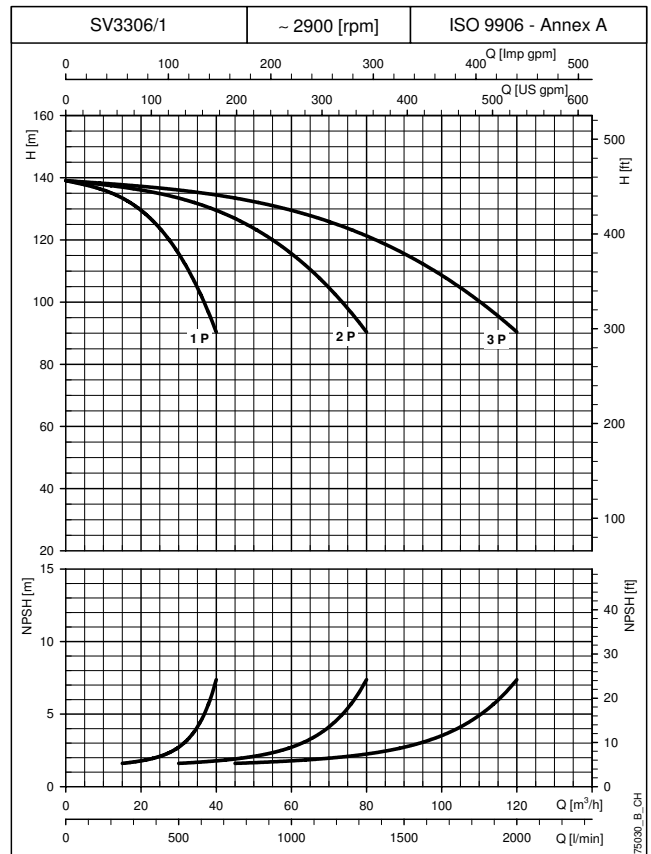
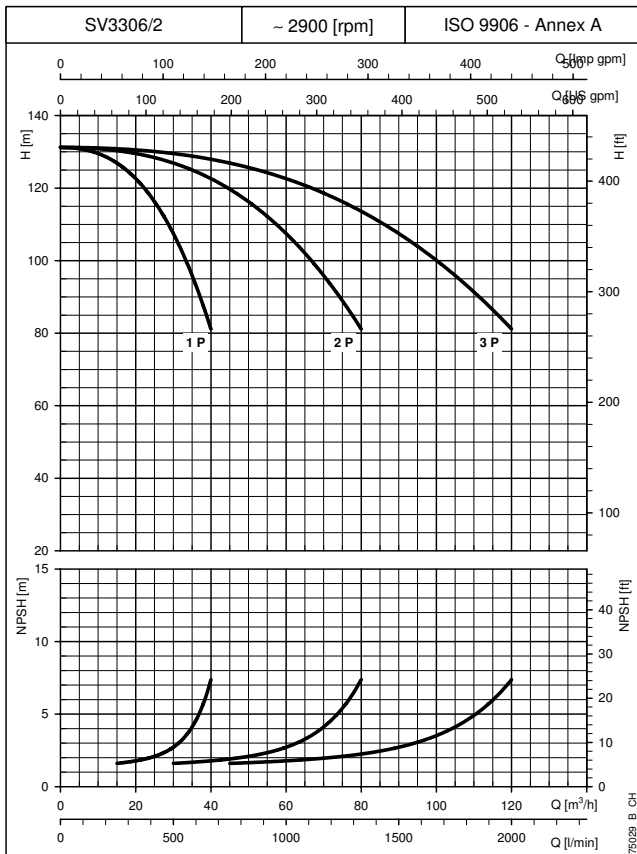
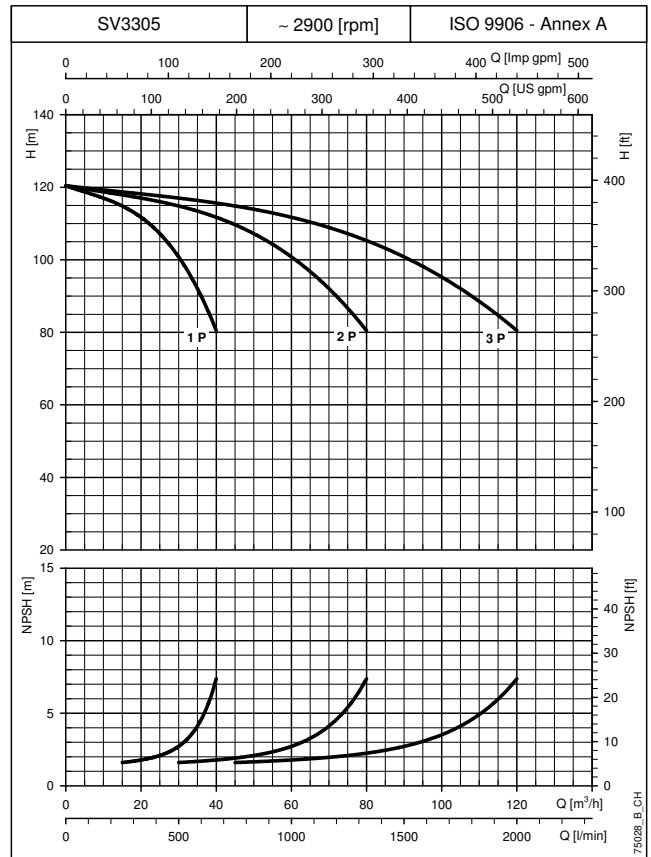
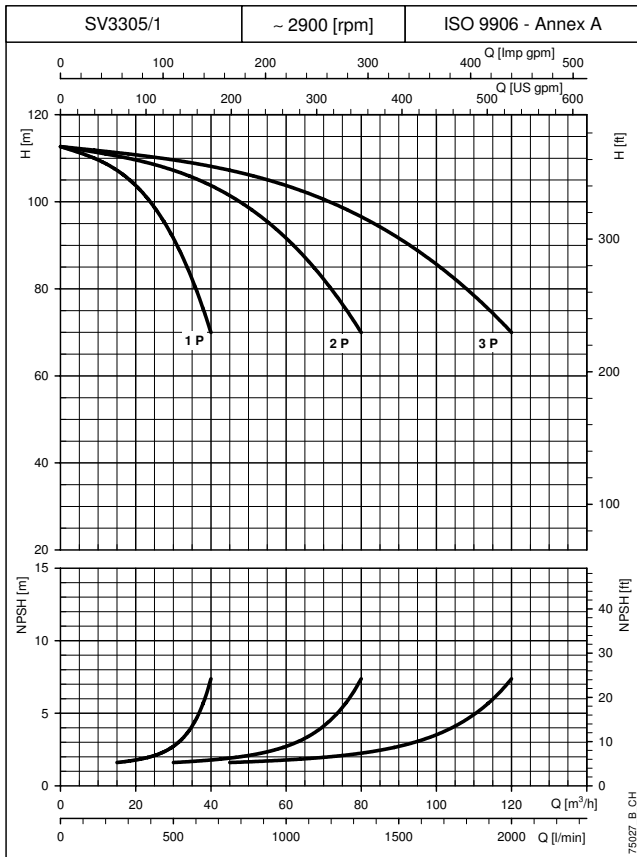
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 The declared NPSH values are laboratory values: for practical use we recommend increasing these values by 0.5 m.



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

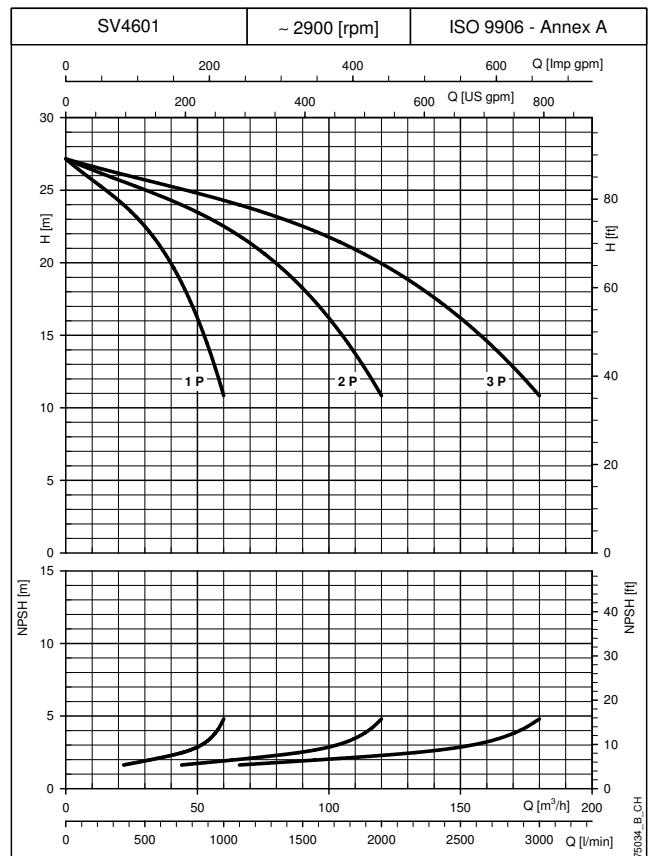
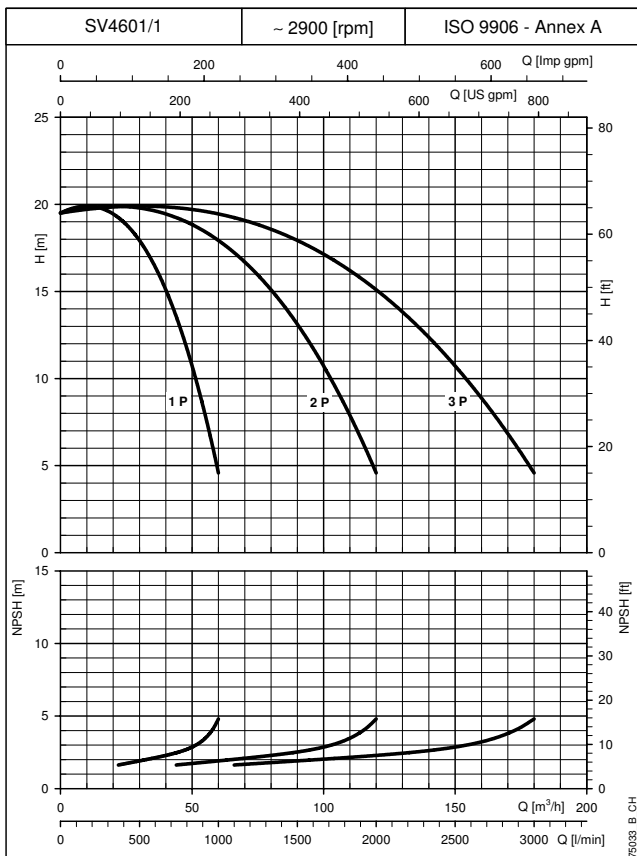
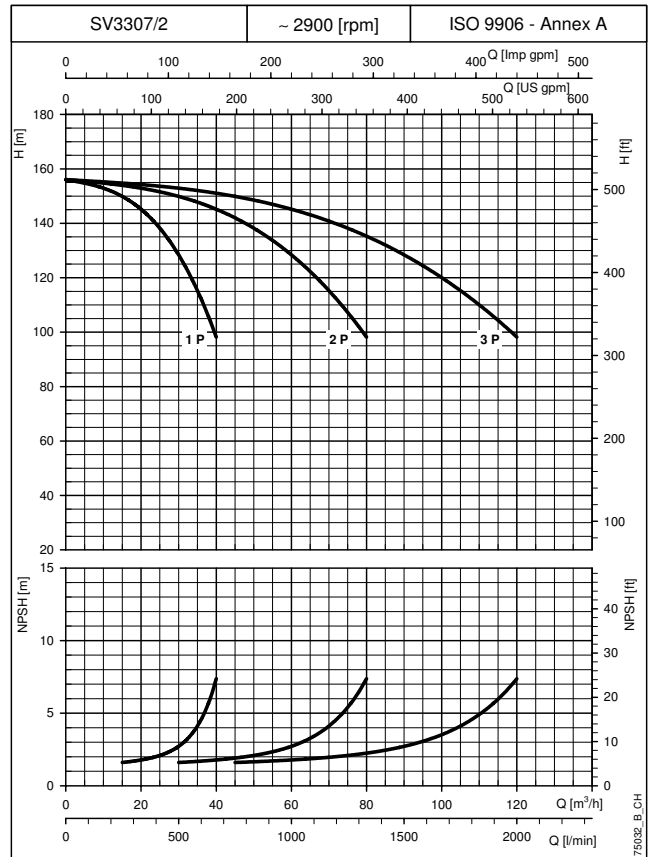
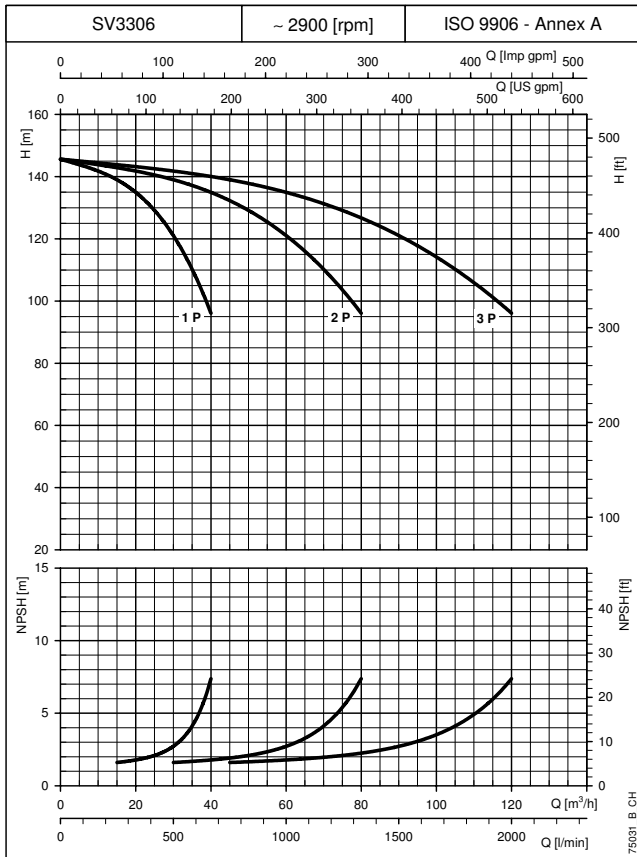
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## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

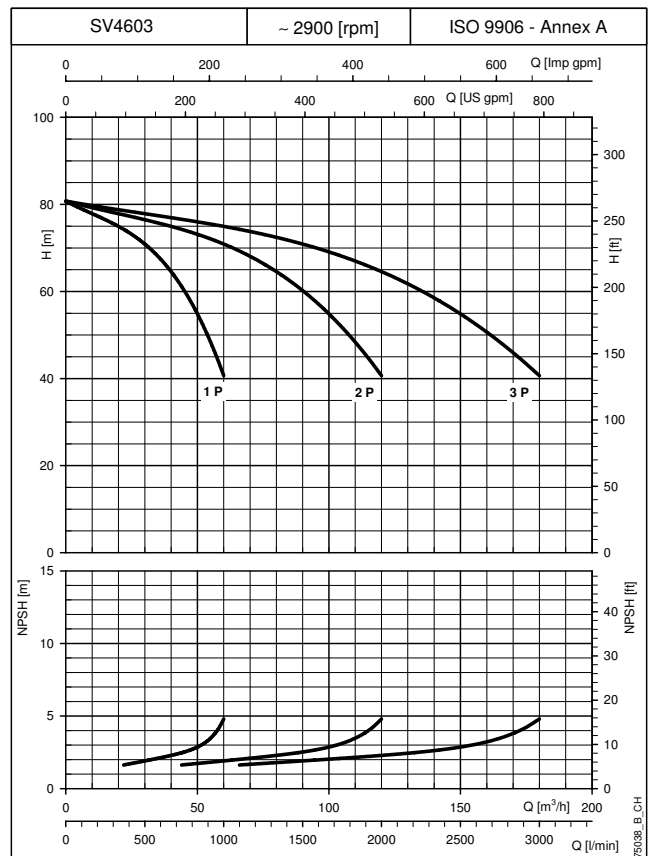
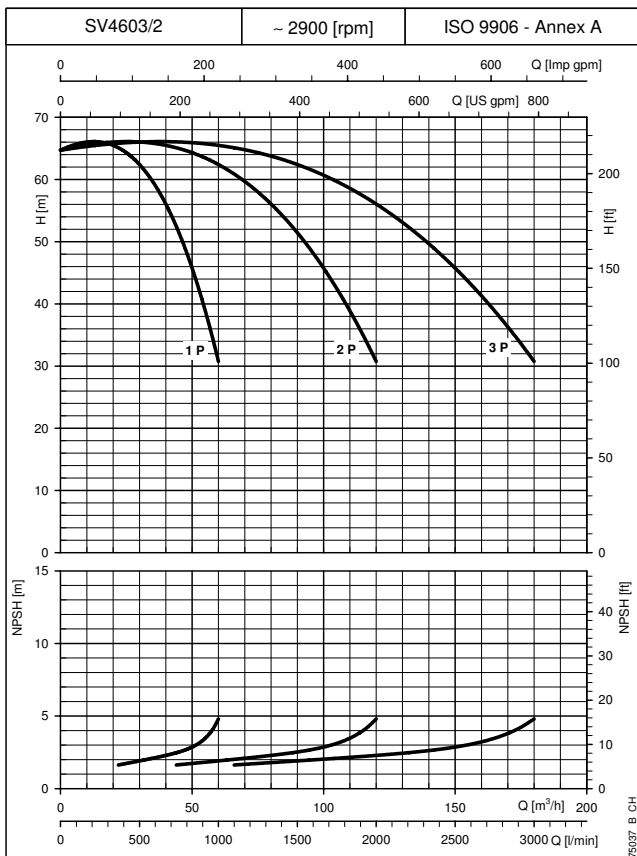
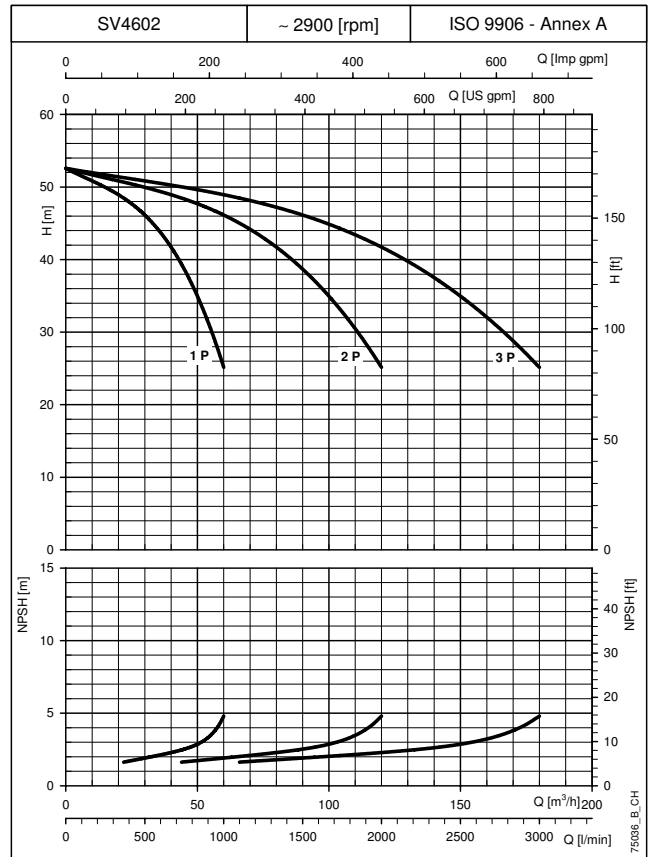
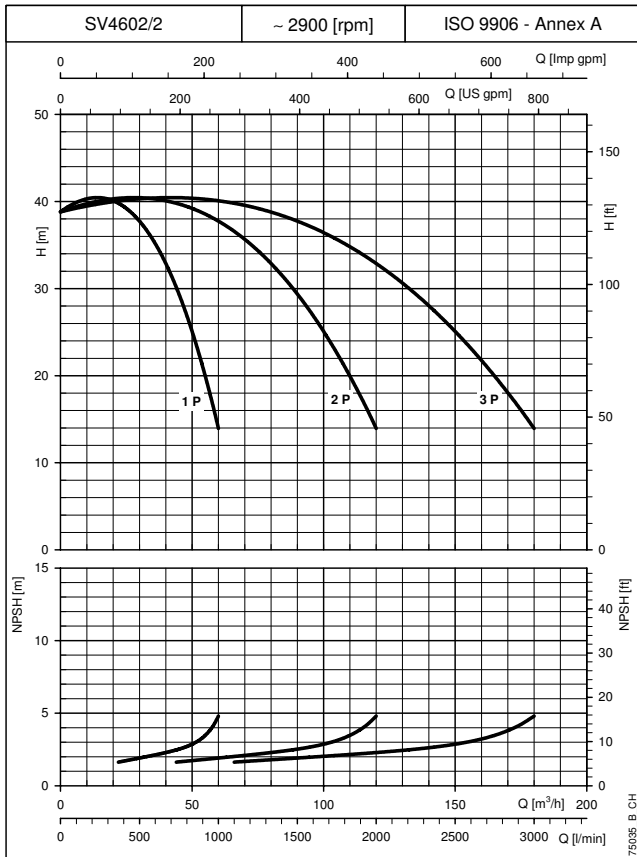
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# ITT

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## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

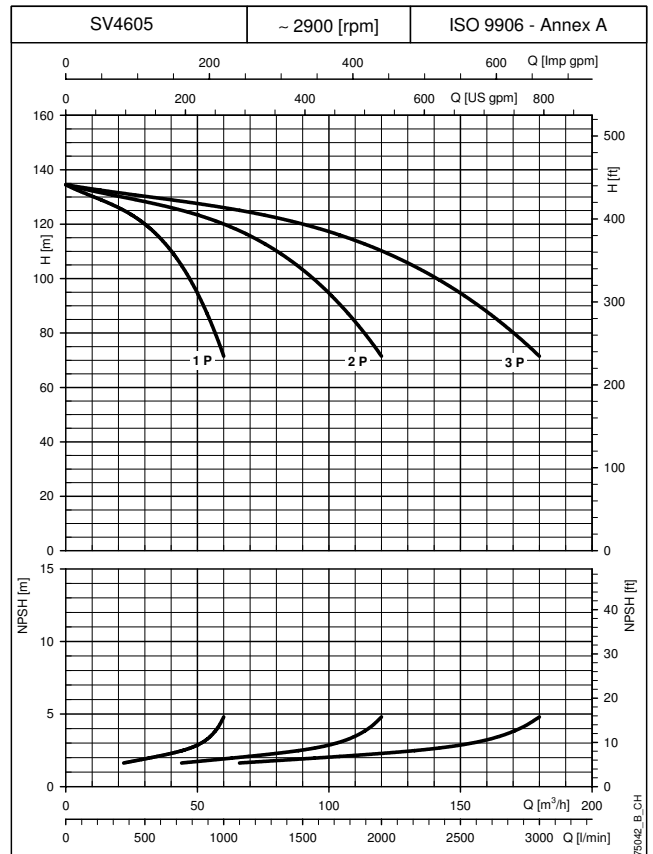
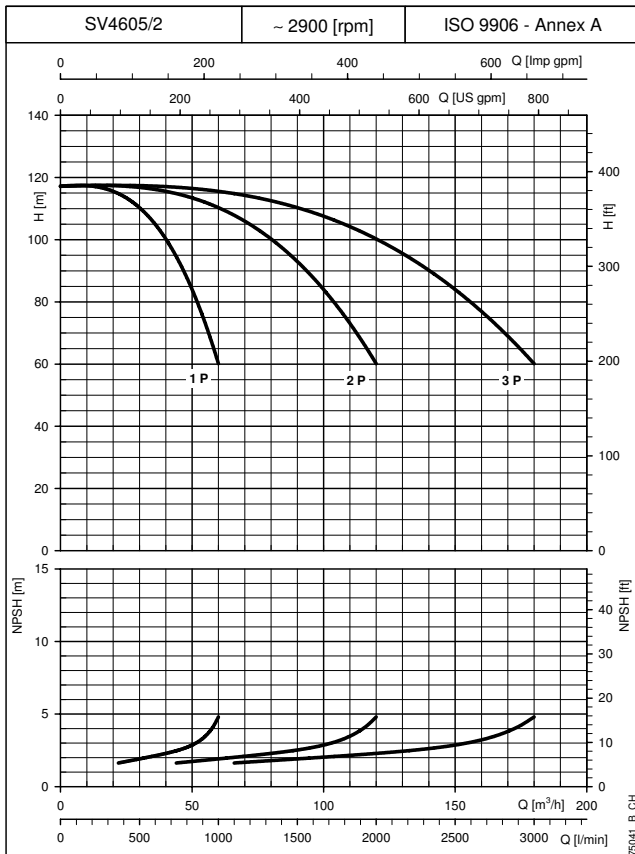
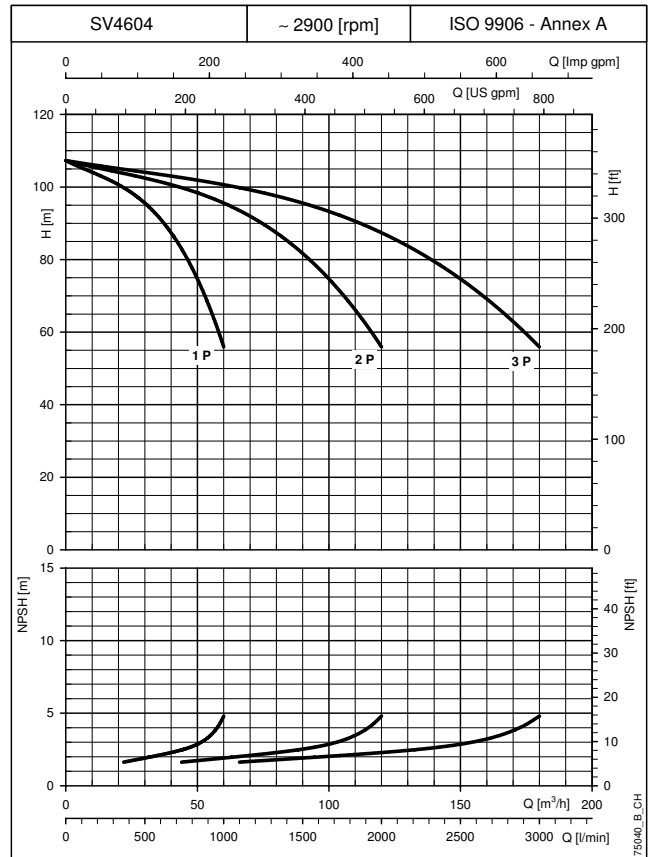
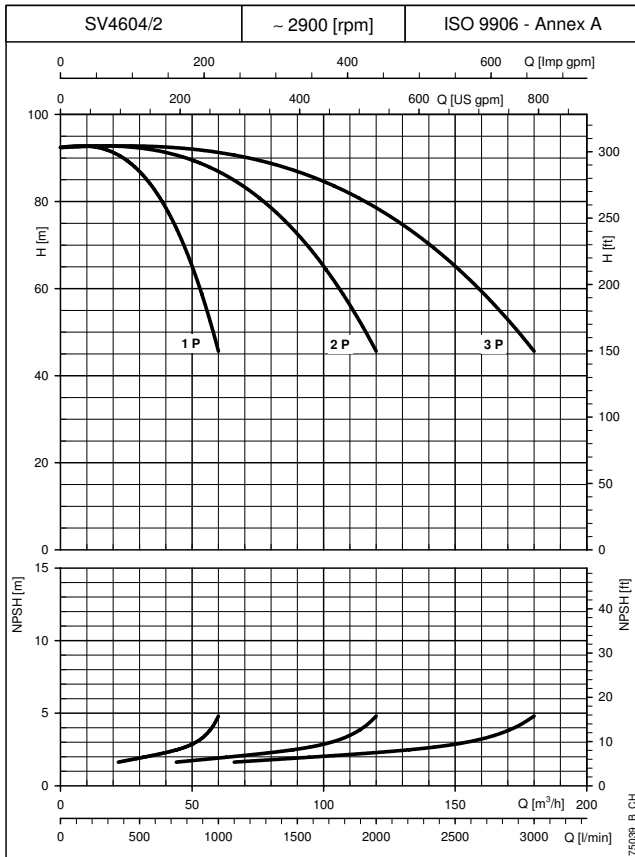
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# ITT

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## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



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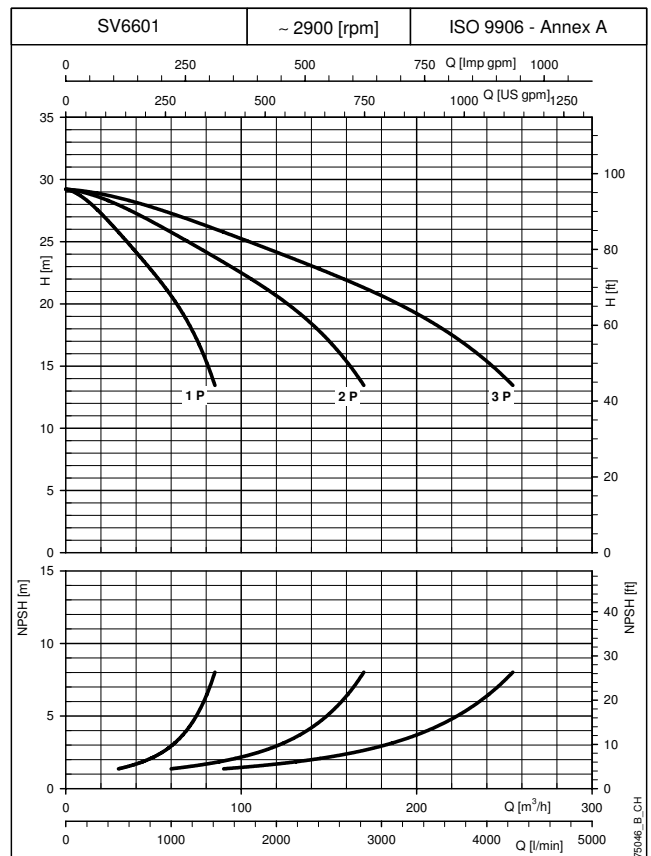
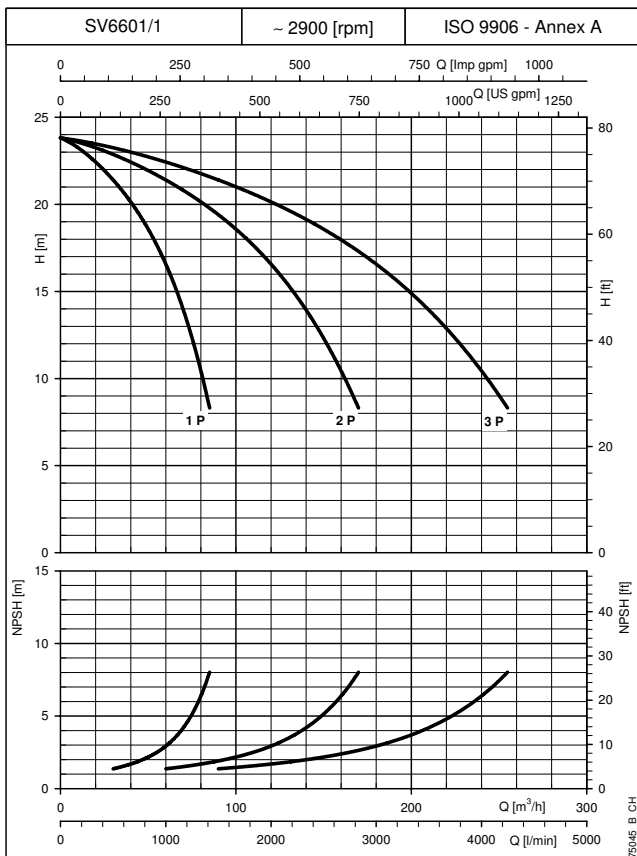
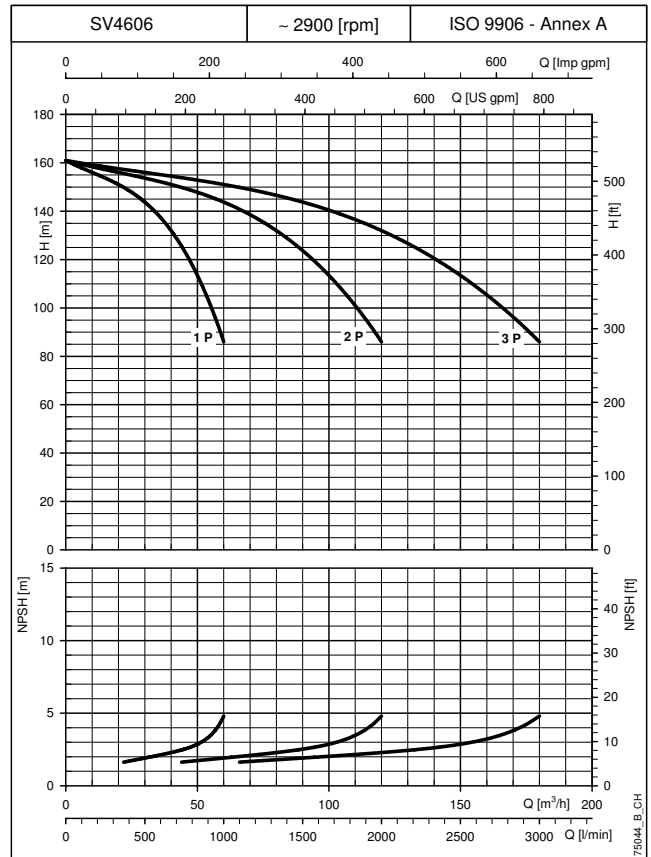
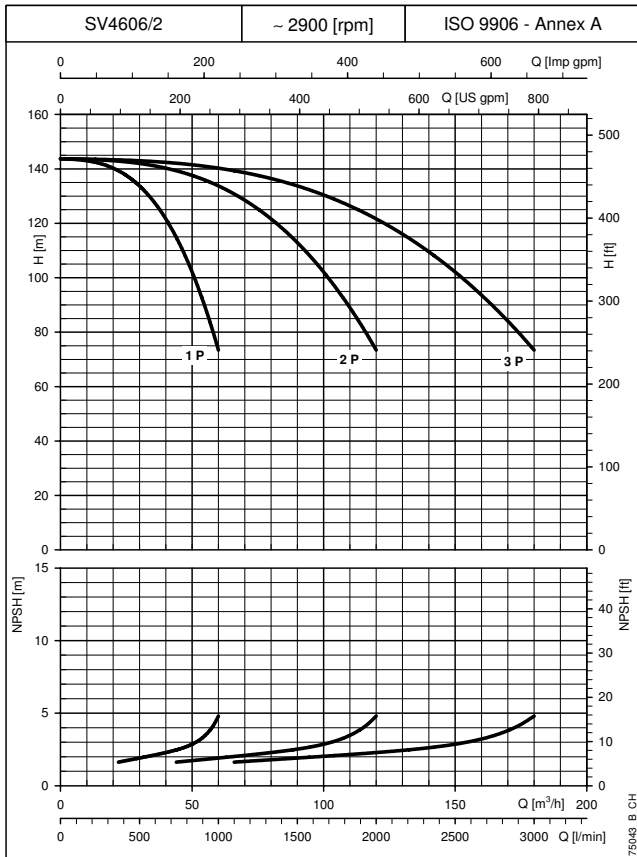
# CURVES



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



CURVES

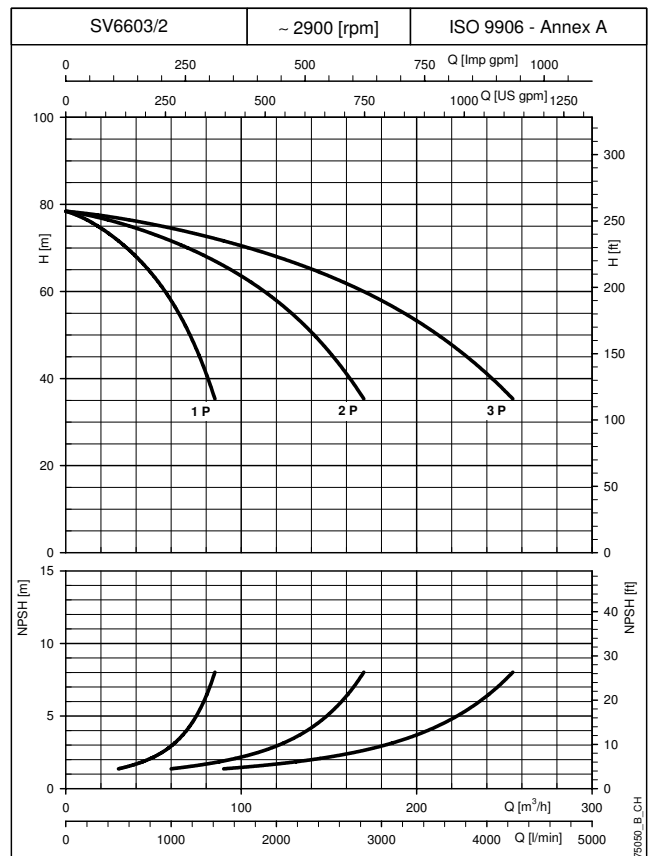
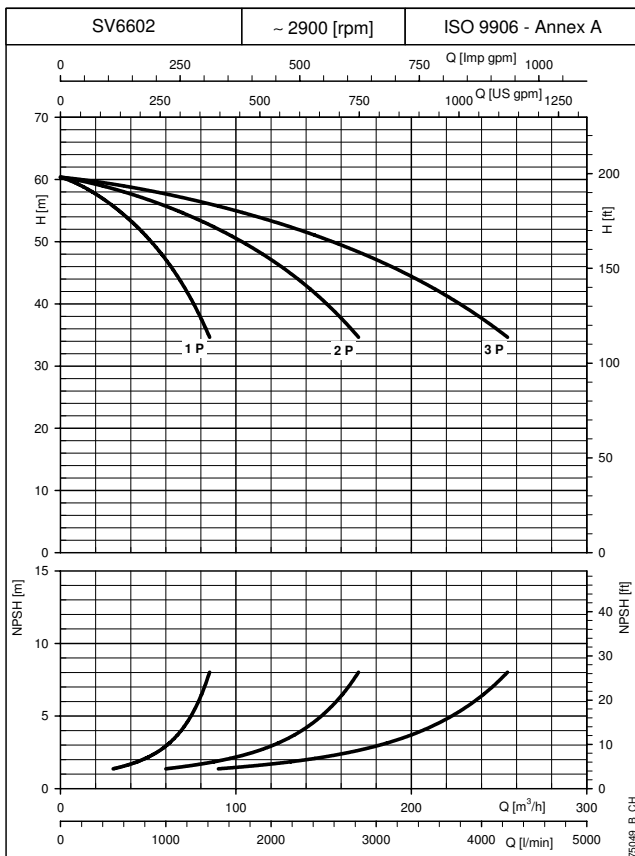
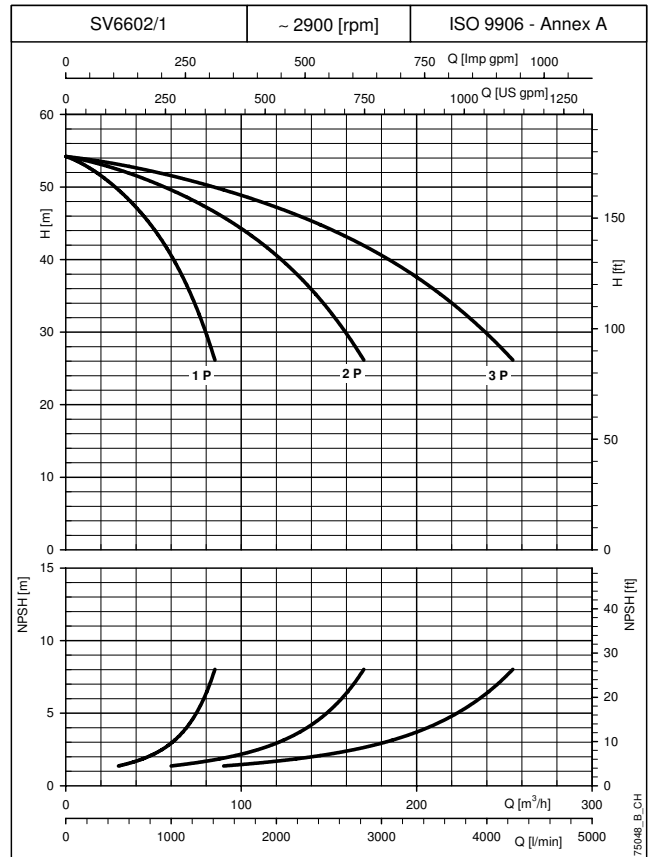
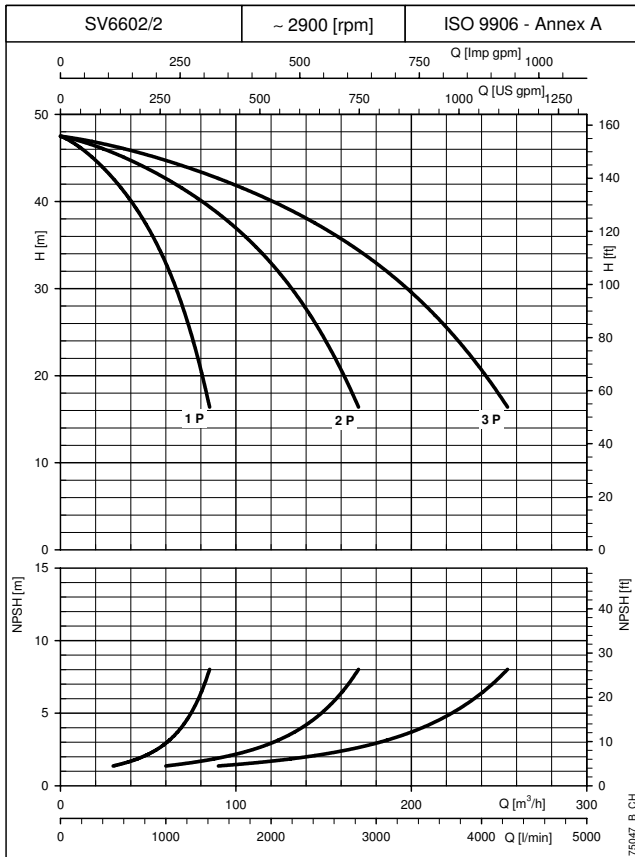
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## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

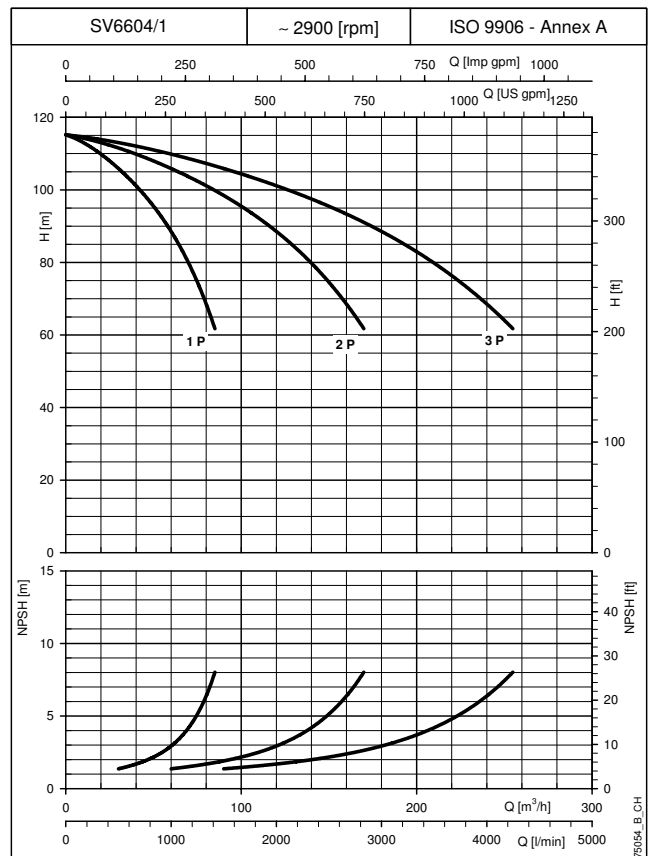
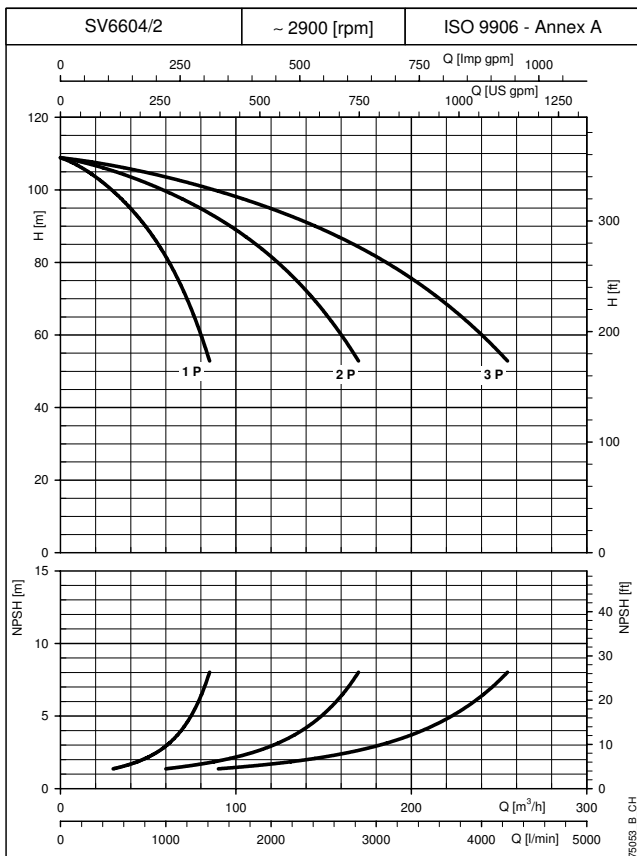
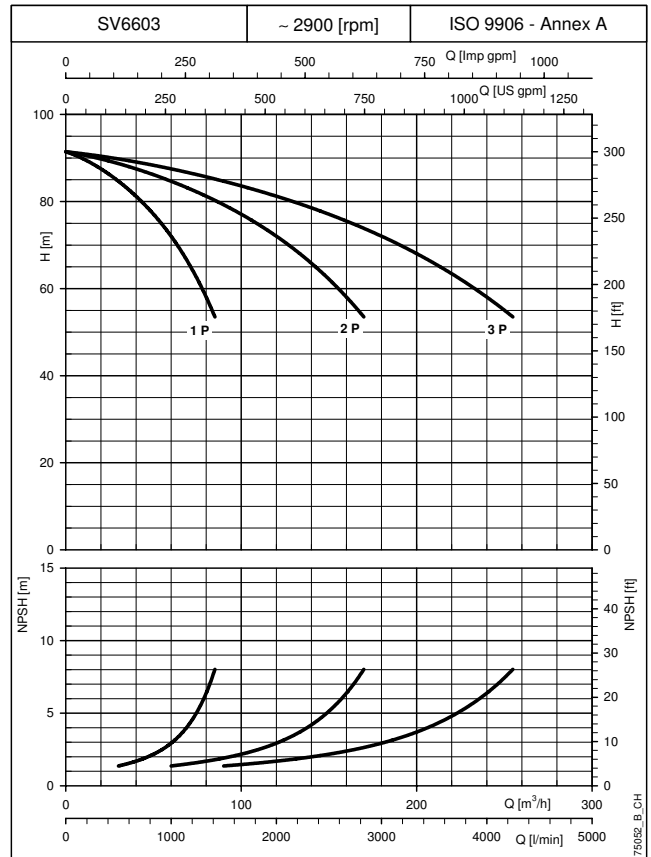
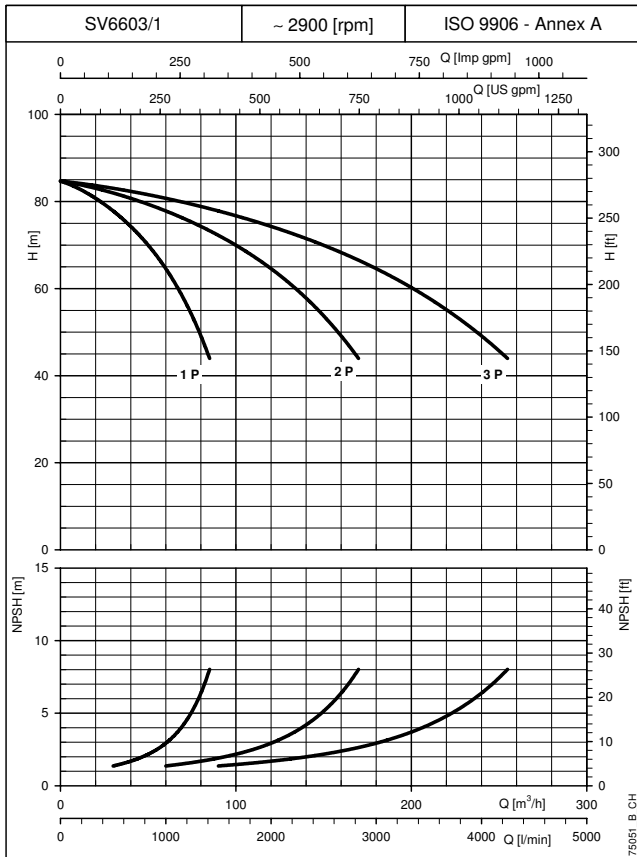
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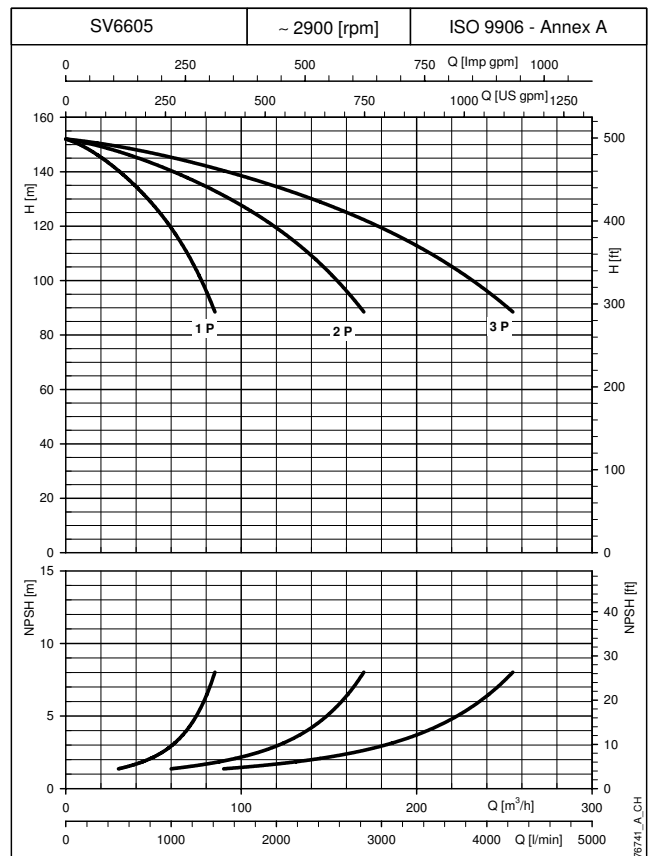
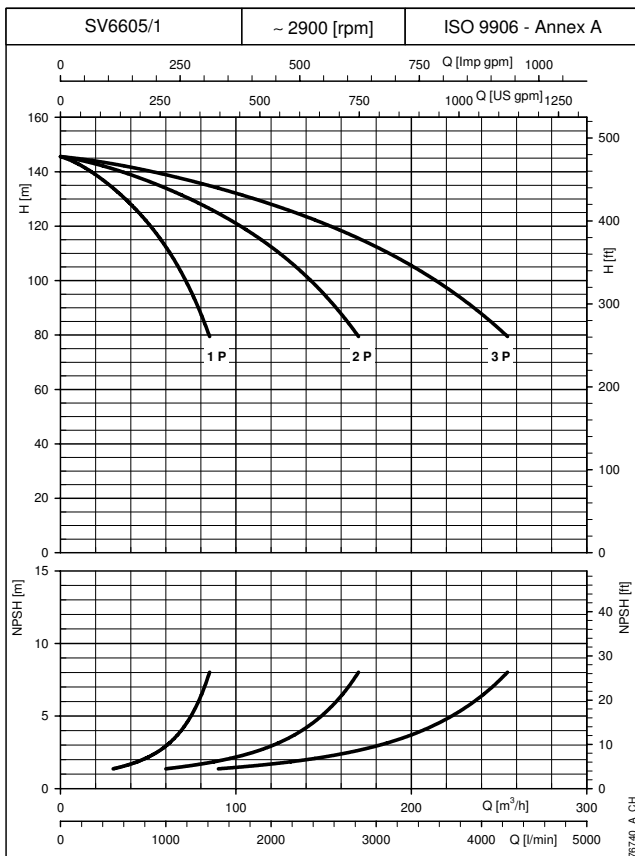
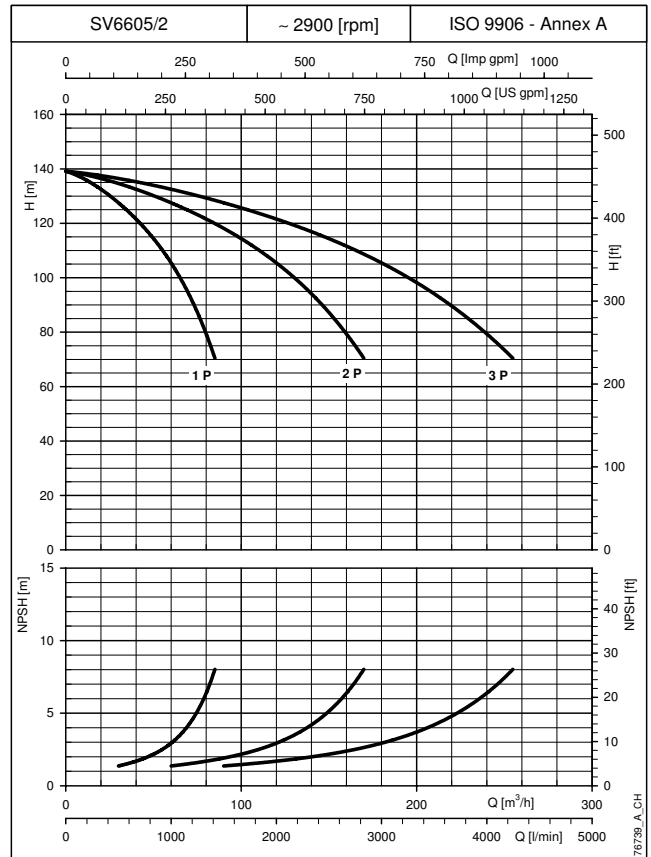
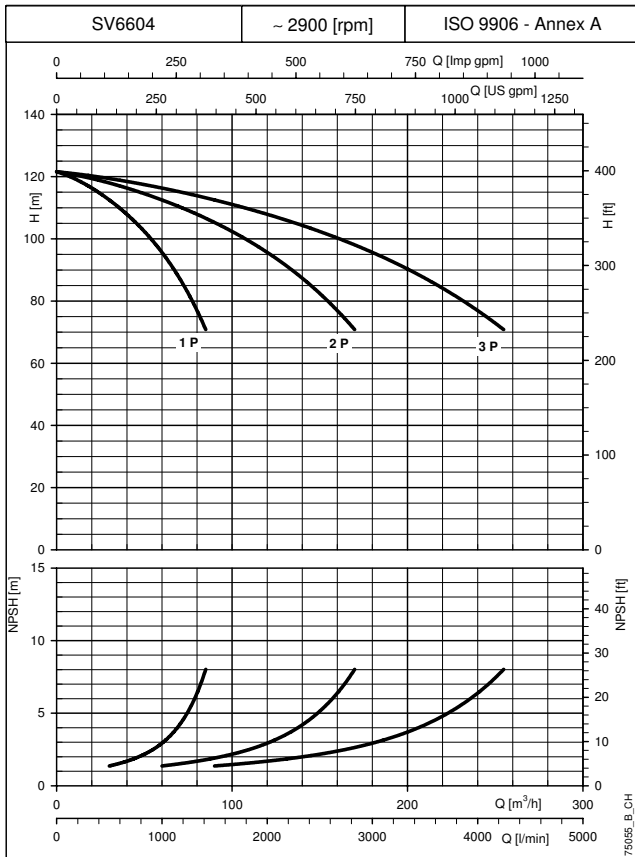




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## BOOSTER SETS, GS.../SV SERIES OPERATING CHARACTERISTICS AT 50 Hz (SERVICE PUMP)



# CURVES

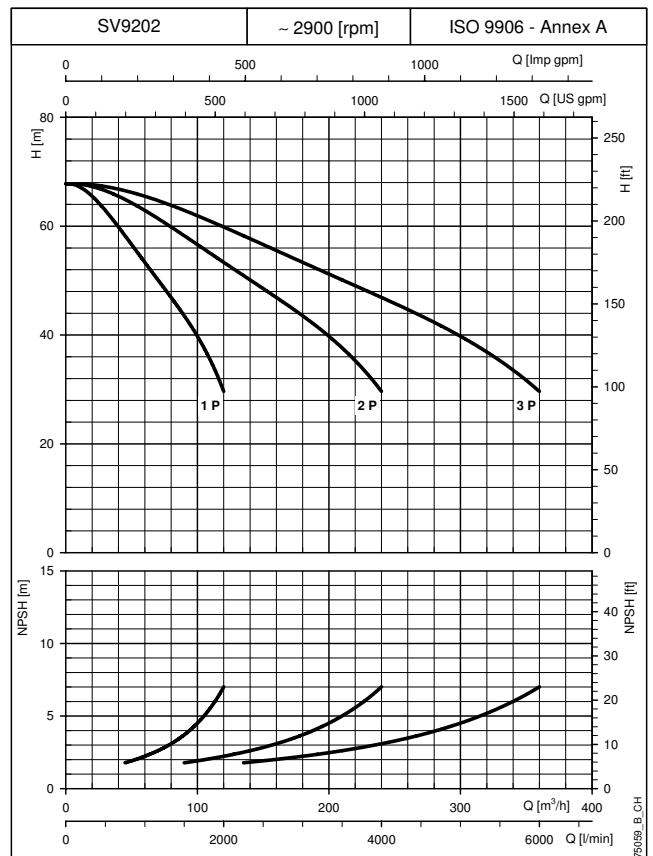
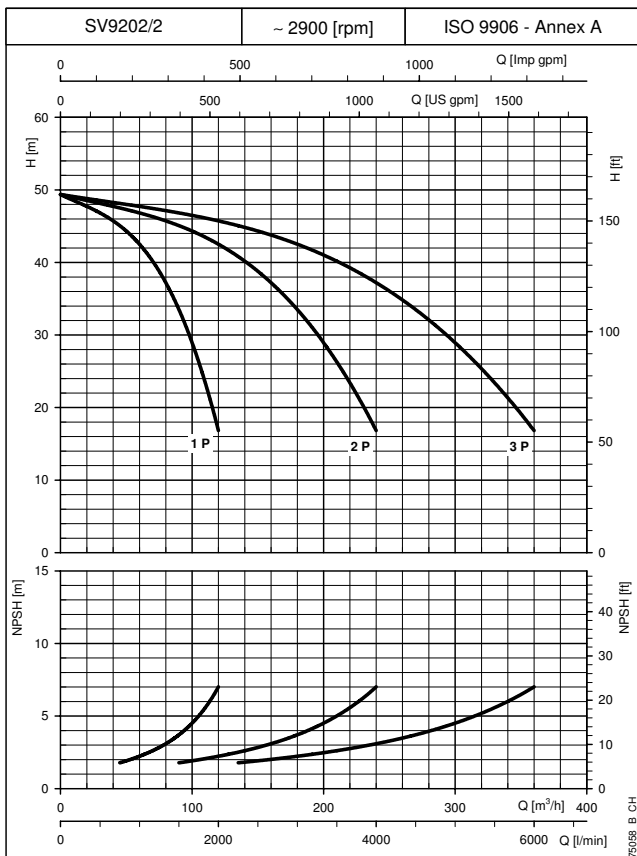
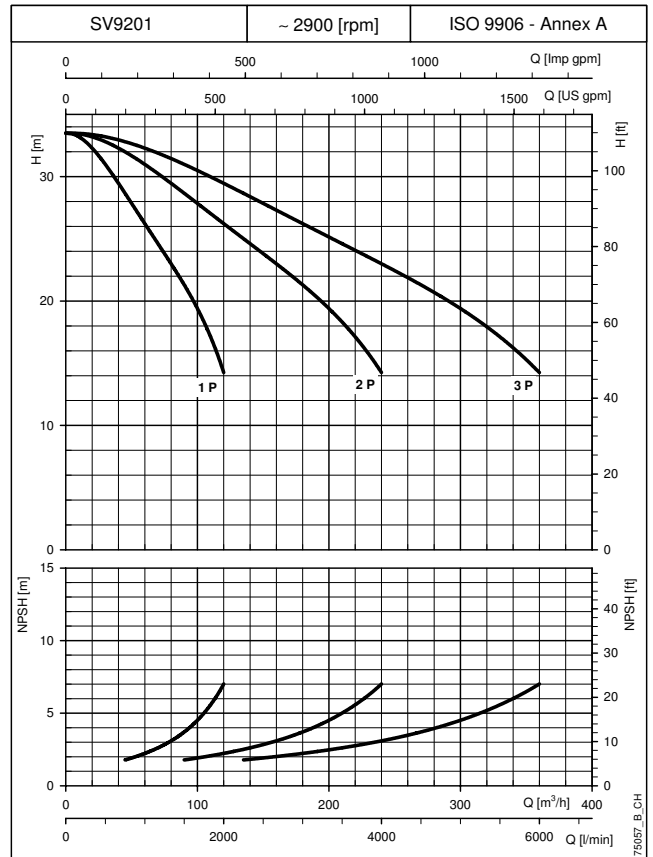
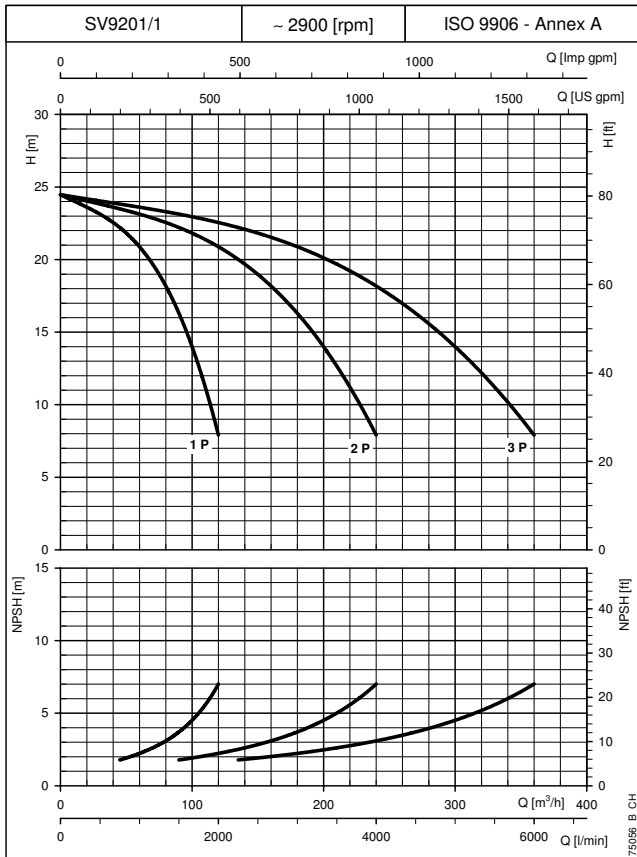
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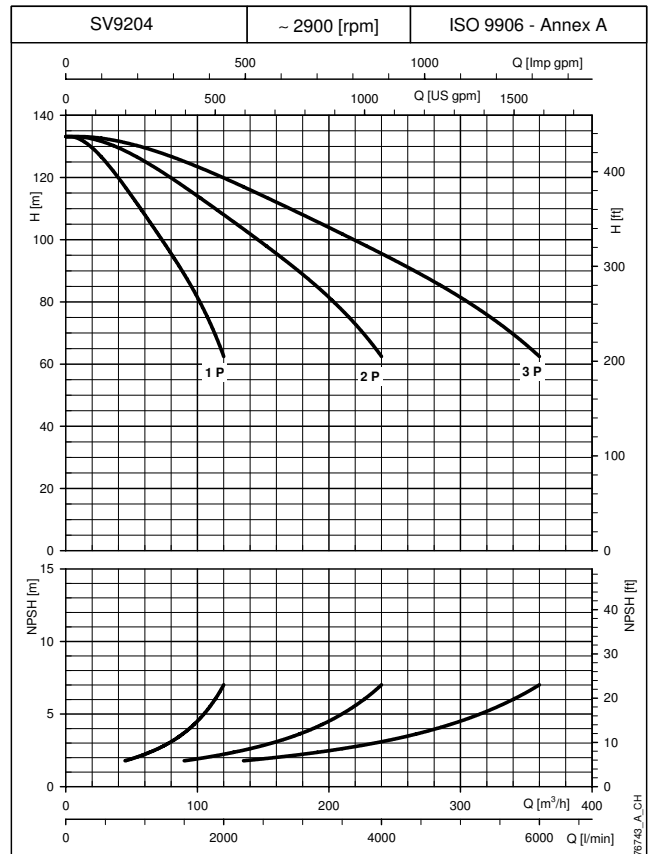
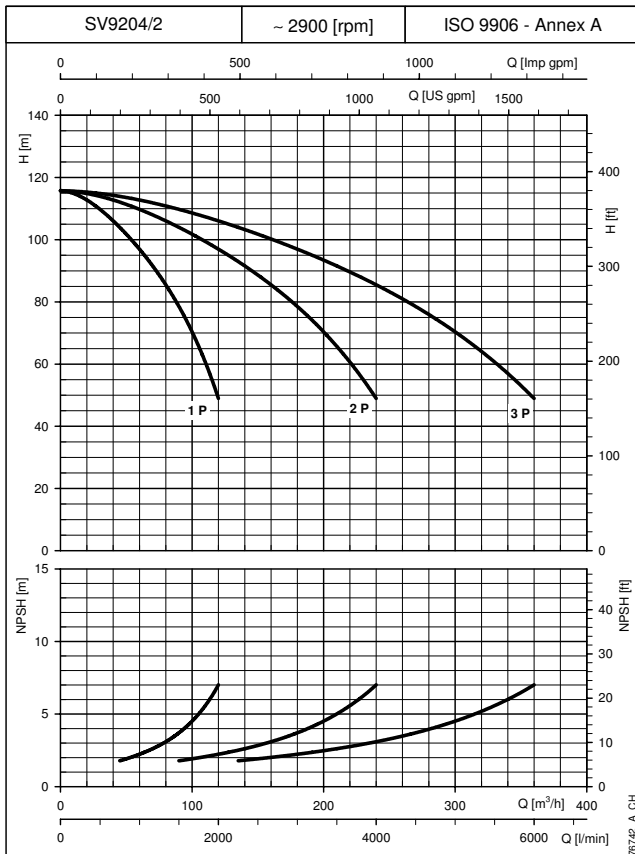
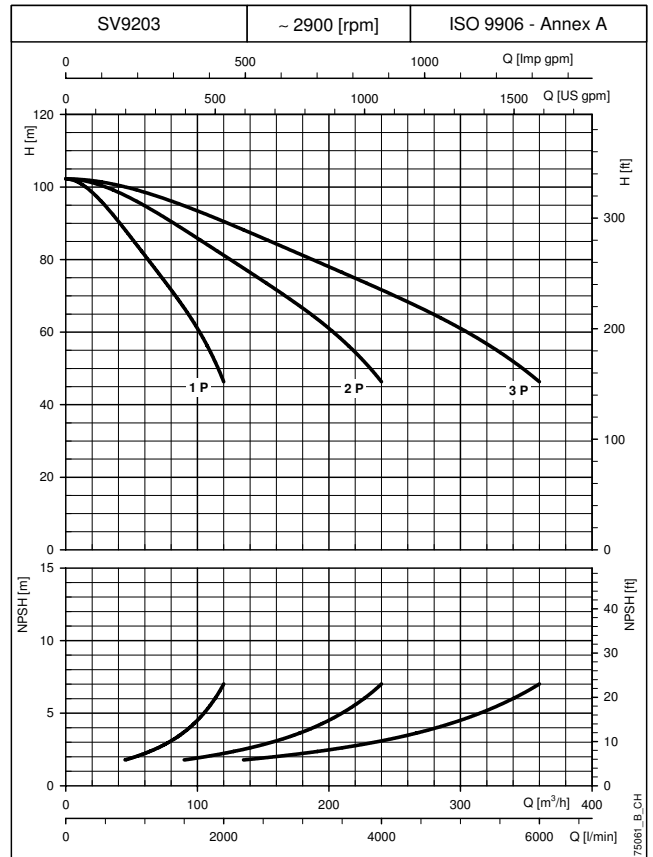
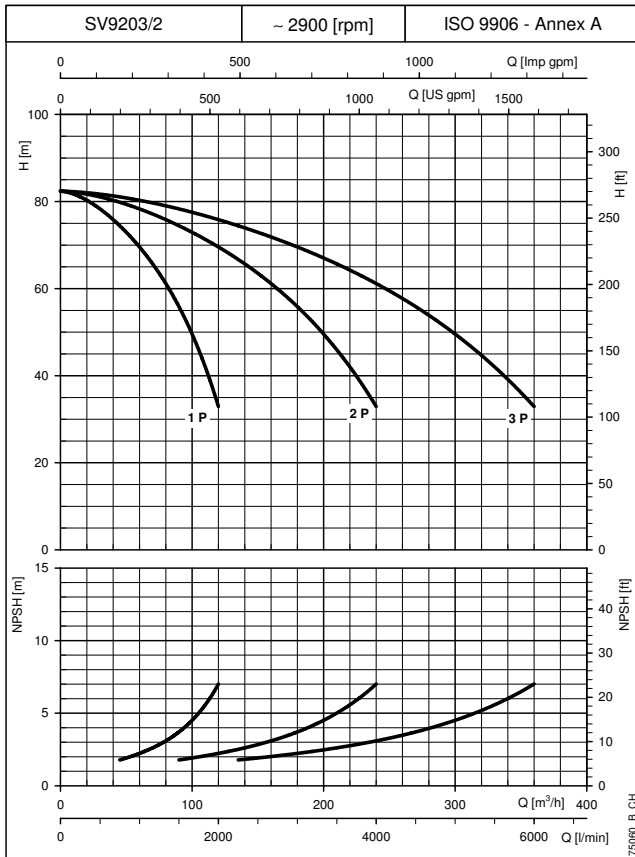
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**CURVES**

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**CURVES**

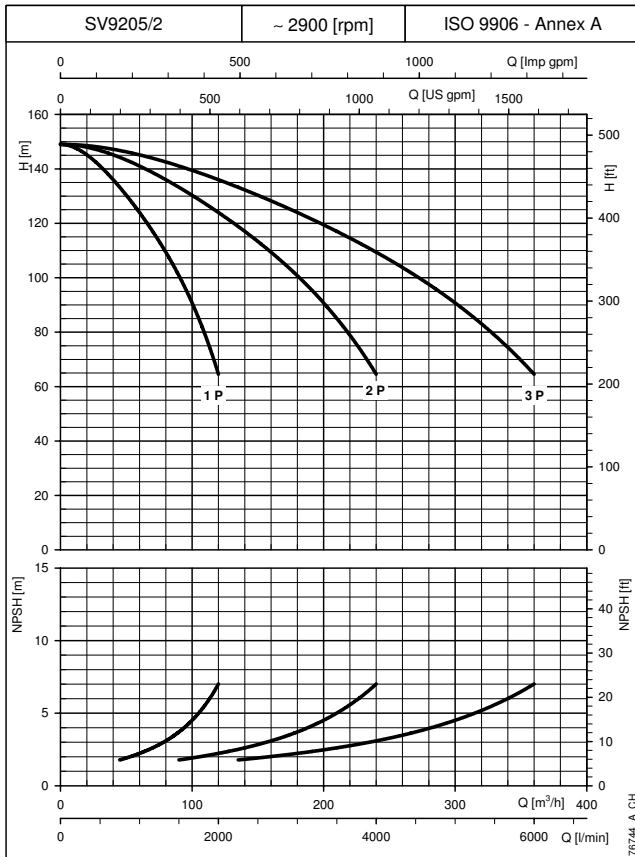
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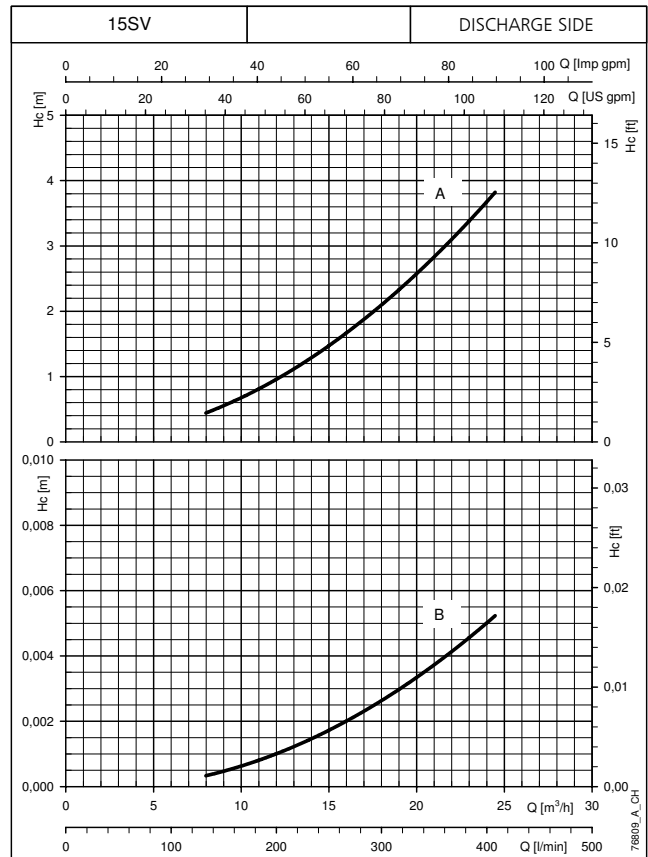
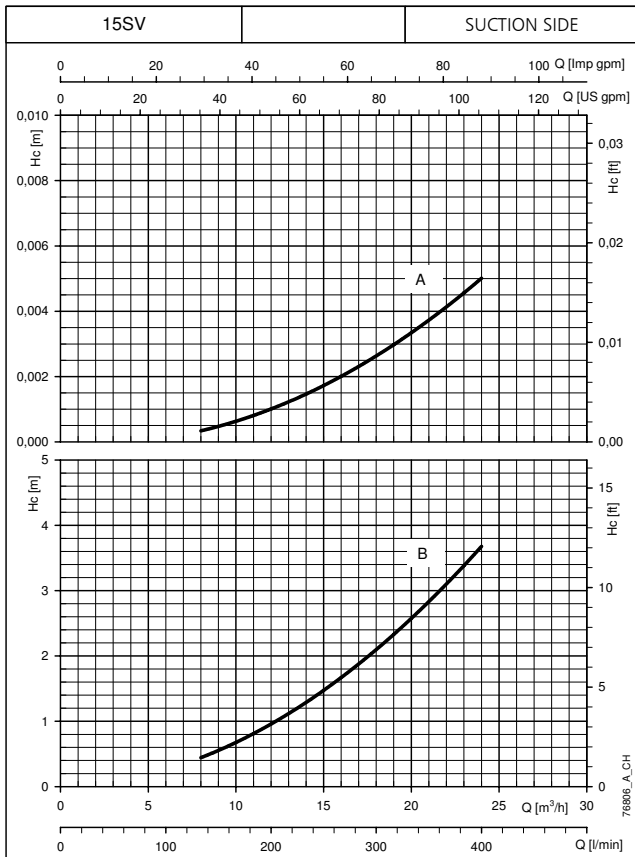
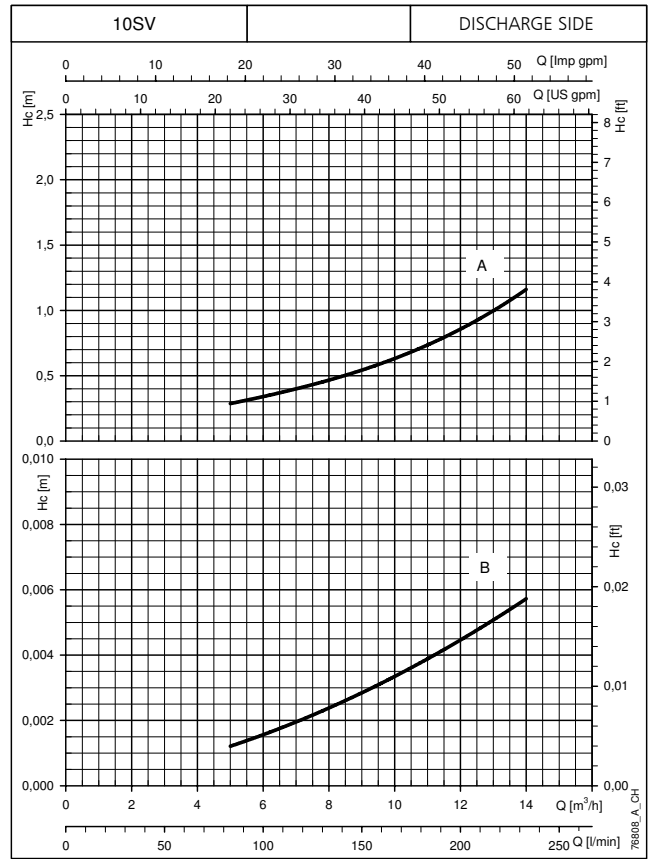
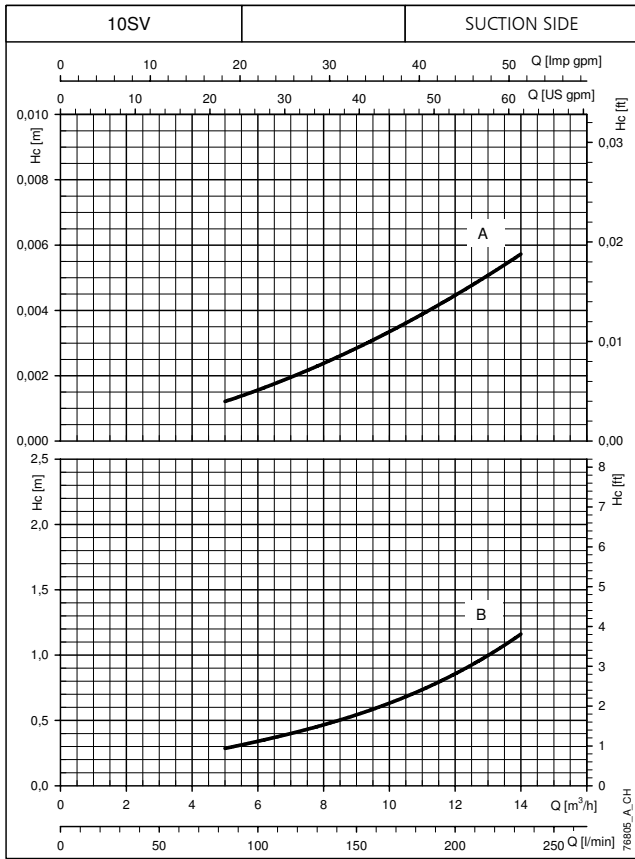
**CURVES**



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES Hc PRESSURE DROP CURVE



The declared curves are valid for liquids with density  $\rho = 1.0 \text{ Kg/dm}^3$  and kinematic viscosity  $\nu = 1 \text{ mm}^2/\text{sec}$ .  
 Hc (A): Pressure drop curve with check valve installed on the delivery side of the pump.  
 Hc (B): Pressure drop curve with check valve installed on the suction side of the pump.  
 The pressure drops do not consider the pressure drops distributed in the manifold.

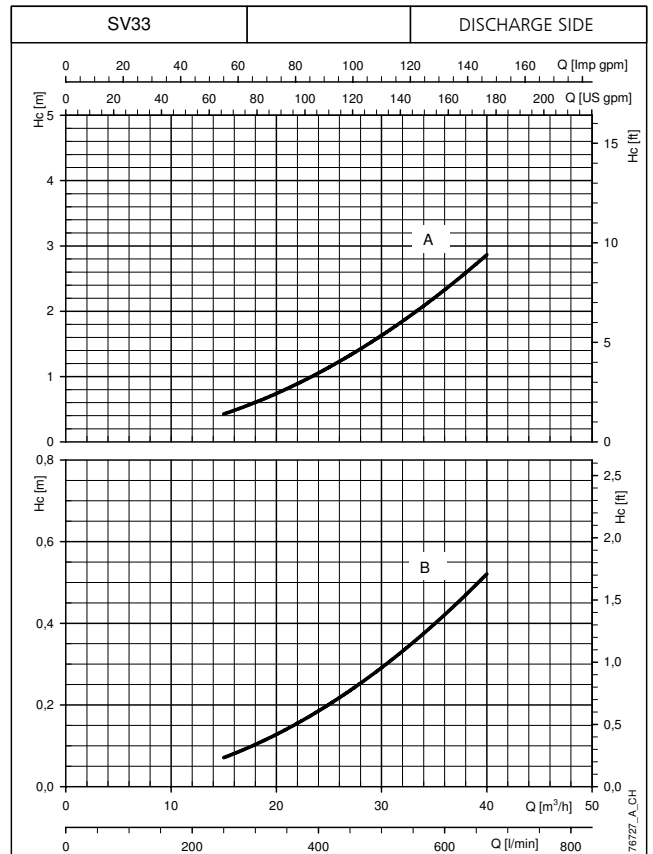
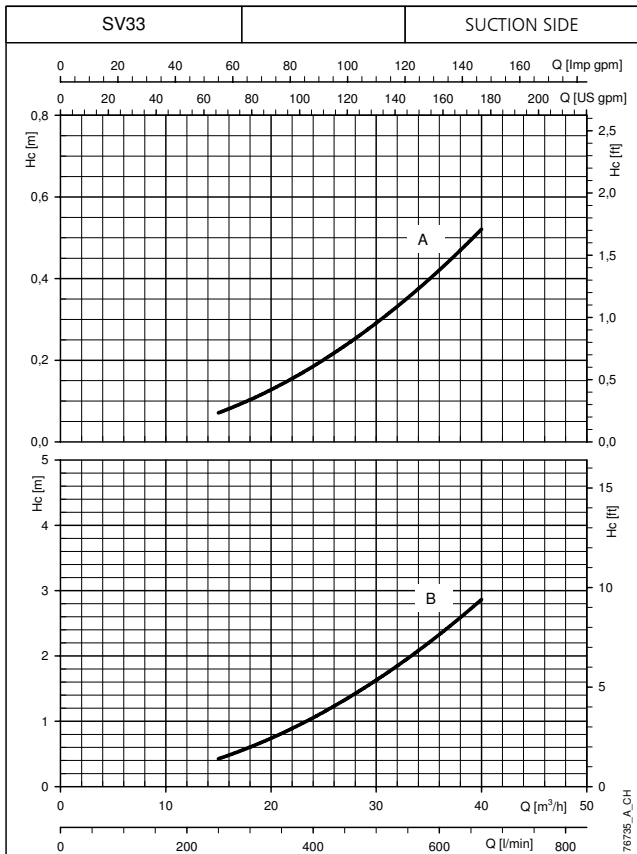
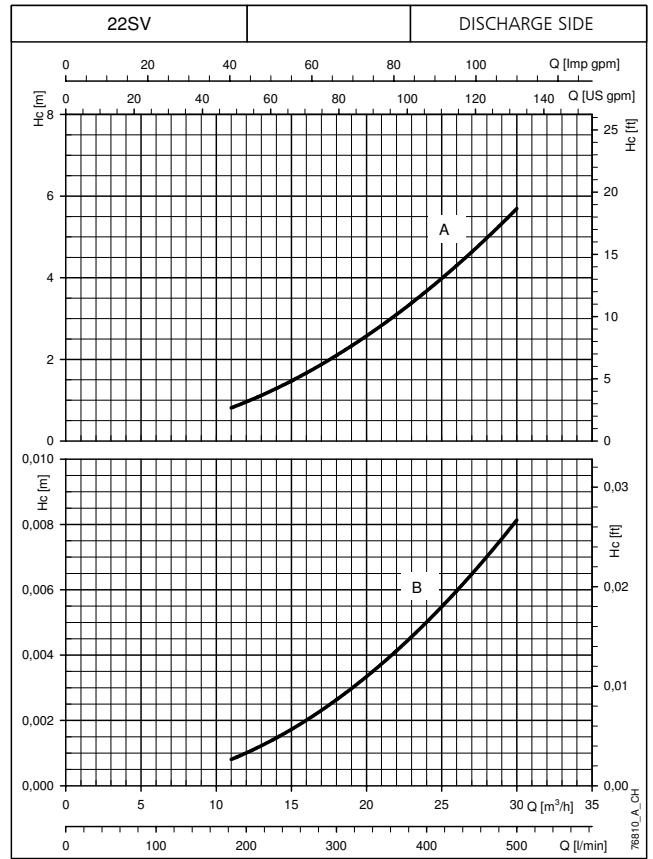
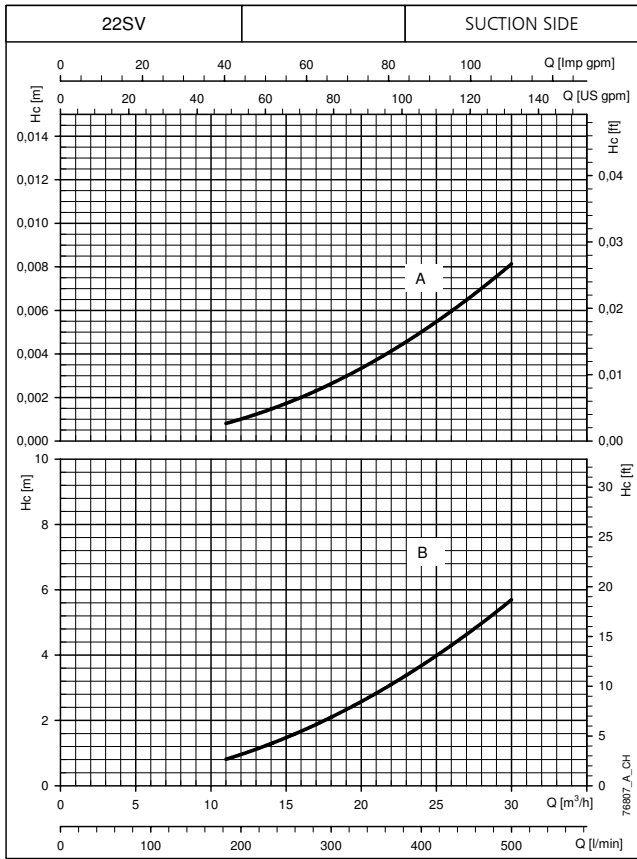
**CURVES**



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES H<sub>c</sub> PRESSURE DROP CURVE



CURVES

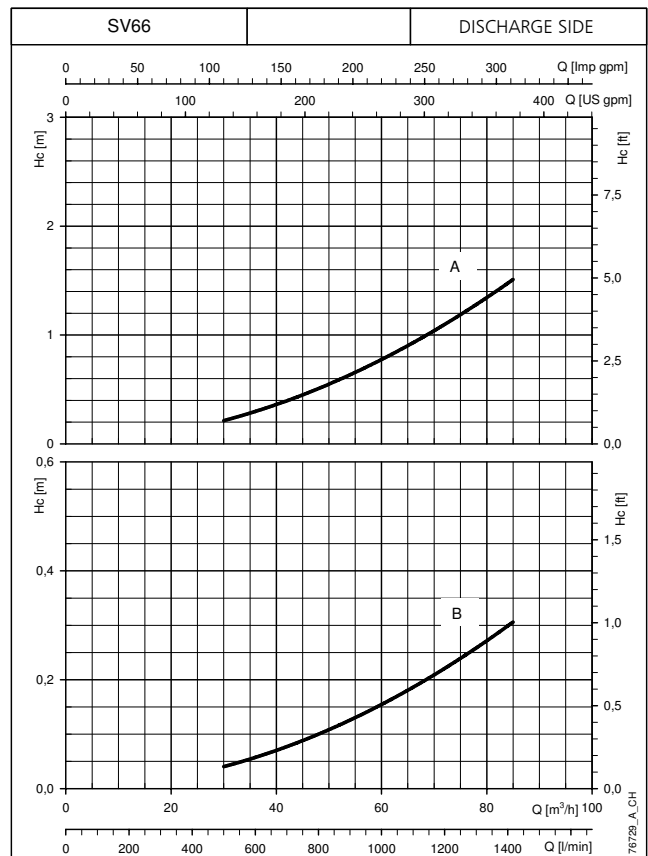
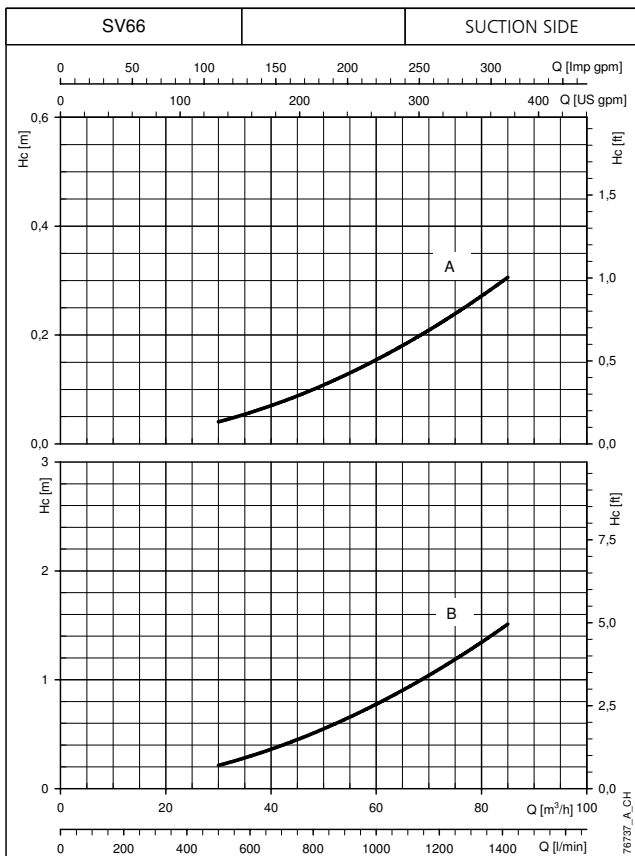
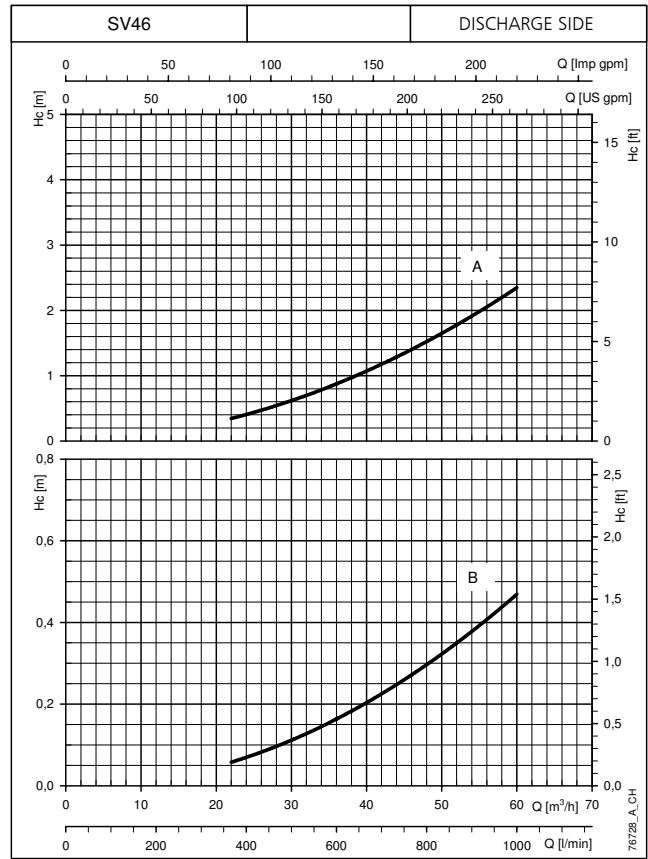
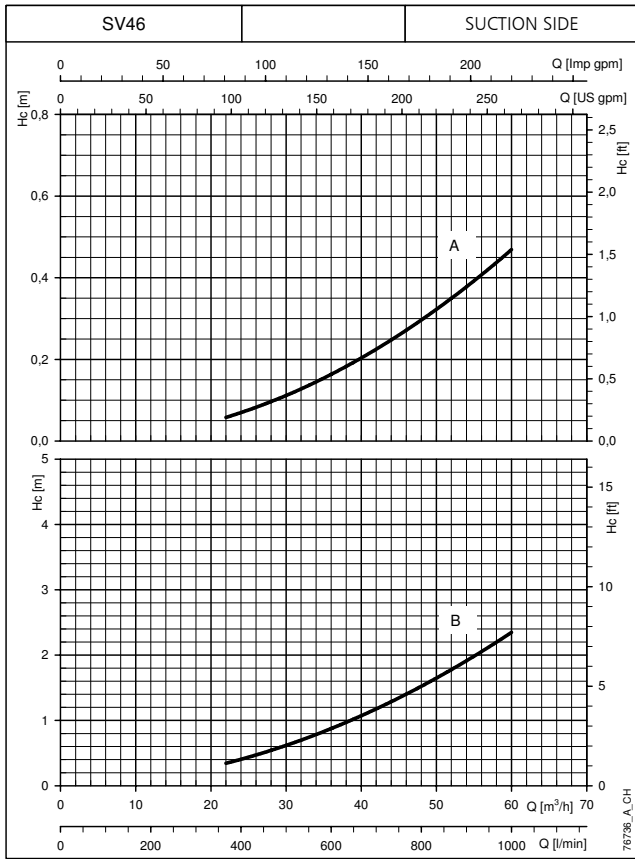
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# ITT

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## BOOSTER SETS, GS.../SV SERIES H<sub>c</sub> PRESSURE DROP CURVE



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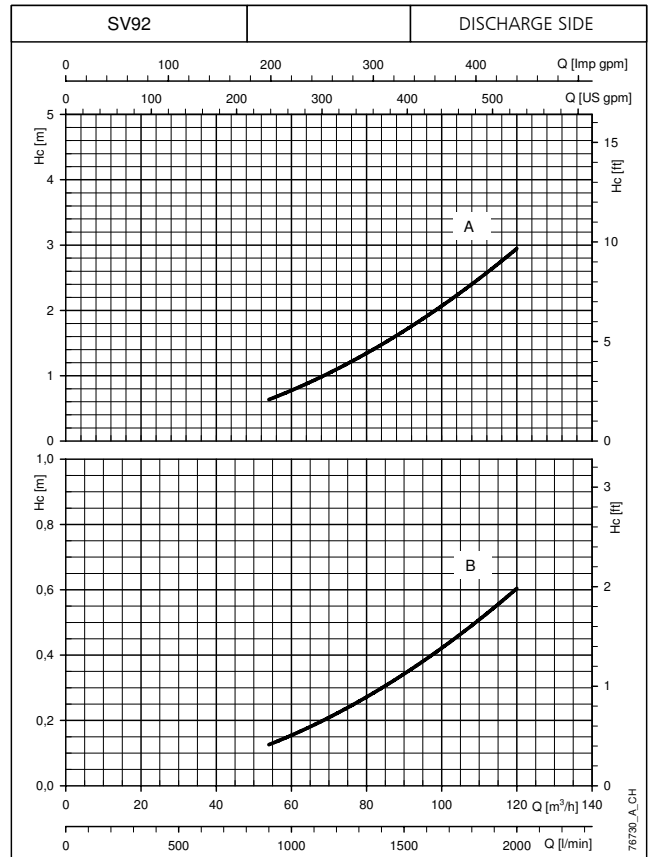
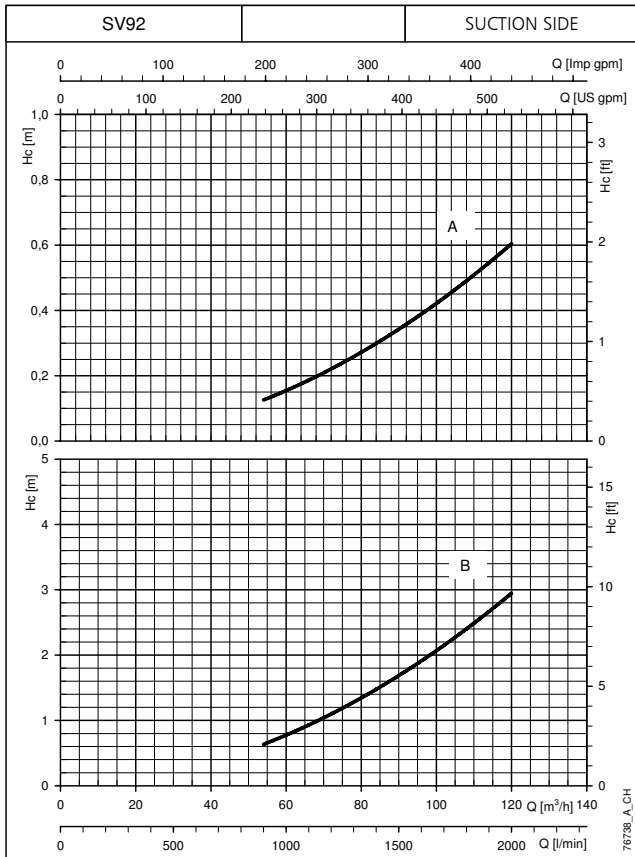
# CURVES



# ITT

# Lowara

## BOOSTER SETS, GS.../SV SERIES H<sub>c</sub> PRESSURE DROP CURVE



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CURVES





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**Lowara**

# **ACCESSORIES**

**ACCESSORIES**

## DIAPHRAGM TANKS

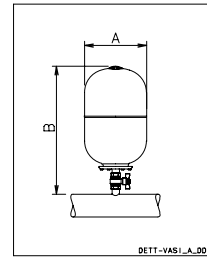
The booster sets are ready for installation, directly on the manifold, of 24-litre diaphragm tanks, one for each pump. The sets are also equipped with caps to close off the unused couplings. Larger tanks can also be connected to the unused end of the discharge manifold. For proper sizing of the tank please refer to the technical appendix.

**Kits** featuring the following accessories are **available on request**:

- diaphragm tank;
- on-off ball valve;
- operating instructions;
- packaging.

## DIAPHRAGM TANK KIT

Volume Litres	PN bar	DIMENSIONS (mm)			Materials		
		ø A	B	Valve	Diaphragm	Vessel	Valve
8	8	205	390	1" FF	EPDM	Painted steel	Nickel-plated brass
24	8	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	10	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	16	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	10	270	575	1" FF	Butyl	Stainless steel	AISI 316 Stainless steel



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## COUNTERFLANGE KIT

Manifolds up to 3" in diameter are usually supplied with threaded couplings and caps on unused end.

**Counterflange coupling kits** made of zinc-plated or stainless steel are available on request.

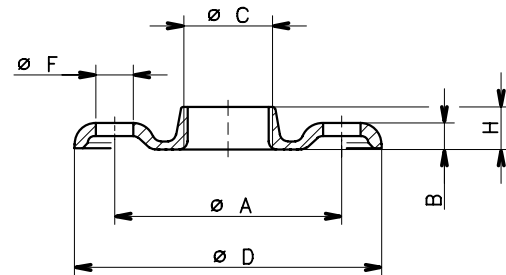
The counterflange kits are equipped with:

- threaded flange.
- gasket and bolts/screws.
- threaded counterflange (weld-on type for 3" diameter).

## THREADED COUNTERFLANGES

KIT TYPE	DN	ø C	DIMENSIONS (mm)				HOLES		PN
			ø A	B	ø D	H	ø F	N°	
2"	50	Rp 2	125	16	165	24	18	4	25
2" 1/2	65	Rp 2 1/2	145	16	185	23	18	4	16
3"	80	Rp 3	160	17	200	27	18	8	16

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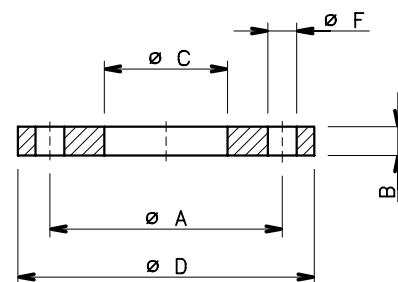


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## WELD-ON COUNTERFLANGES

KIT TYPE	DN	ø C	DIMENSIONS (mm)				HOLES		PN
			ø A	B	ø D	ø F	N°		
2"	50	61	125	19	165	18	4	16	
2"1/2	65	77	145	20	185	18	4	16	
3"	80	90	160	20	200	18	8	16	
4"	100	116	180	22	220	18	8	16	
5"	125	141,5	210	22	250	18	8	16	
6"	150	170,5	240	24	285	22	8	16	
8"	200	221,5	295	26	340	22	12	16	
10"	250	276,5	355	29	405	26	12	16	
12"	300	327,5	410	32	460	26	12	16	

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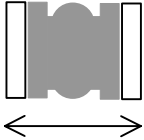
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## RUBBER EXPANSION JOINT KIT

The anti-vibrating joints or compensation joints can be used in order to absorb deformations, expansions, noises in the piping and to reduced ram blows. Moreover they can resist a high degree of empty that allows the absorption of negative expansions for depression.

Being of elastic material it can be become deformed and be dilated facilitating therefore the installation, that it becomes simpler and fast, also in which the piping they are not aligned. It does not need assembly joints.

TABELLA 1 TABLE 1		L 	A-B-C-D non possono essere sommati			A-B-C-D can not be cumulative
GIUNTI ELASTICI RUBBER EXPANSION JOINT			A COMPRESSIONE COMPRESSION	B ESTENSIONE EXTENSION	C SPOSTAMENTO TRANSVERSE	D FLESSIONE ANGOLARE ANGULAR MOVEMENT
DN		mm	mm	mm	mm	(°)
32	1"1/4	95	8	4	8	15
40	1"1/2	95	8	4	8	15
50	2"	105	8	5	8	15
65	2"1/2	115	12	6	10	15
80	3"	130	12	6	10	15
100	4"	135	18	10	12	15
125	5"	170	18	10	12	15
150	6"	180	18	10	12	15
200	8"	205	25	14	22	15
250	10"	240	25	14	22	15
300	12"	260	25	14	22	15
350	14"	265	25	16	22	15
400	16"	265	25	16	22	15
450	18"	265	25	16	22	15
500	20"	265	25	16	22	15

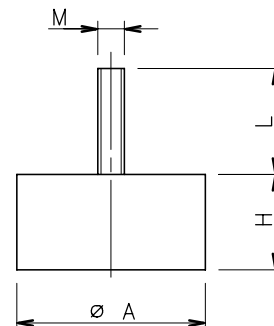
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## VIBRATION DAMPERS

TYPE	SHORE	DIMENSIONS (mm)			
		ø A	H	L	M
VIBRATION DAMPER P20X20	60	20	20	18	6
VIBRATION DAMPER P40X30	60	40	30	23	8
VIBRATION DAMPER P100X50	60	100	50	50	16

Note: Available versions M/F and F/F

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BST-ANT-PIED\_A\_DD

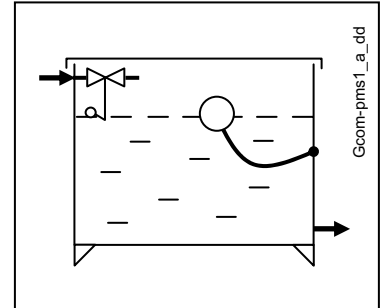
## DRY RUNNING PROTECTION SYSTEMS

Dry run shutdown systems should be installed to protect the pumps in case of insufficient water supply.

### FLOAT SWITCH PROTECTION METHOD

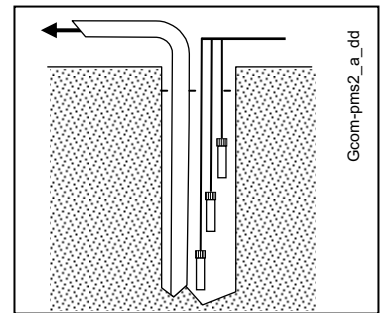
The float switch protection system is used when the water supply comes from open tanks. A float switch immersed in the tank is connected to the electrical panel.

If the water supply is insufficient, the float switch opens the electric contact and the pumps stop running.



### ELECTRODE PROBE PROTECTION METHOD

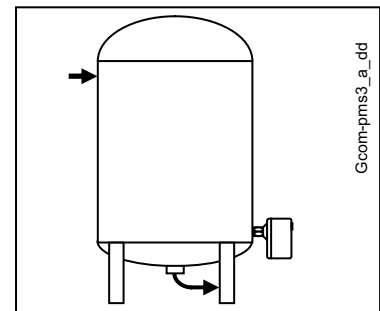
The electrode probe protection system is used when the water supply comes from open tanks or wells. A set of three probes is connected directly to the electronic board in the electrical panel. With the three electrodes immersed in the water, the relay on the electronic board closes the contact, enabling the starting of the pumps. If the water supply is insufficient, the control circuit opens the electric contact and the pumps stop running.



### MINIMUM PRESSURE SWITCH PROTECTION METHOD

The minimum pressure switch protection system is used when the water supply comes from water networks or pressurized tanks. The pressure switch is connected to the electronic board in the electrical panel.

If the water supply is insufficient, the pressure switch opens the electric contact and the pumps stop running.





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# **TECHNICAL APPENDIX**

**TECHNICAL  
APPENDIX**

## WATER REQUIREMENTS IN CIVIL USERS

Determination of the water requirement depends on the type of users and contemporaneity factor. The calculation may be subject to regulations, standards or customs that may vary from country to country. The calculation method shown below is an example based on practical experience, designed to provide a reference value and not a substitute for detailed analytical calculation.

### Water requirements in condominiums

The **consumption table** shows the maximum values for each delivery point, depending on the plumbing amenities.

### MAXIMUM CONSUMPTION FOR EACH DELIVERY POINT

TYPE	CONSUMPTION (l/min)
Sink	9
Dishwasher	10
Washing machine	12
Shower	12
Bathtub	15
Washbasin	6
Bidet	6
Flush tank WC	6
Controlled flushing system WC	90

G-at-cm\_a\_th

The **sum of the water consumption values** of each delivery point determines the maximum theoretical requirement, which must be reduced according to the **contemporaneity coefficient**, because in actual fact the delivery points are never used all together.

$f = \frac{1}{\sqrt{(0,857 \times Nr \times Na)}}$	Coefficient for apartments with one bathroom and flush tank WC
$f = \frac{1}{\sqrt{(0,857 \times Nr \times Na)}}$	Coefficient for apartments with one bathroom and controlled flushing system WC
$f = \frac{1,03}{\sqrt{(0,545 \times Nr \times Na)}}$	Coefficient for apartments with two bathrooms and flush tank WC
$f = \frac{0,8}{\sqrt{(0,727 \times Nr \times Na)}}$	Coefficient for apartments with two bathrooms and controlled flushing system WC
f= coefficient; Nr= number of delivery points; Na= number of apartments	

The **table of water requirements in civil users** shows the maximum contemporaneity flow-rate values based on the **number of apartments** and the type of WC for apartments with one bathroom and two bathrooms. As regards apartments with one bathroom, 7 drawing points have been taken into consideration, while 11 points have been considered for apartments with two bathrooms. If the number of drawing points or apartments is different, use the formulas to **calculate** the requirement.



## TABLE OF WATER REQUIREMENTS IN CIVIL USERS

NUMBER OF APARTMENTS	WITH FLUSH TANK WC		WITH CONTROLLED FLUSHING SYSTEM WC	
	1	2	1	2
	FLOW RATE (l/min)			
1	32	40	60	79
2	45	56	85	111
3	55	68	105	136
4	63	79	121	157
5	71	88	135	176
6	78	97	148	193
7	84	105	160	208
8	90	112	171	223
9	95	119	181	236
10	100	125	191	249
11	105	131	200	261
12	110	137	209	273
13	114	143	218	284
14	119	148	226	295
15	123	153	234	305
16	127	158	242	315
17	131	163	249	325
18	134	168	256	334
19	138	172	263	343
20	142	177	270	352
21	145	181	277	361
22	149	185	283	369
23	152	190	290	378
24	155	194	296	386
25	158	198	302	394
26	162	202	308	401
27	165	205	314	409
28	168	209	320	417
29	171	213	325	424
30	174	217	331	431
35	187	234	357	466
40	200	250	382	498
45	213	265	405	528
50	224	280	427	557
55	235	293	448	584
60	245	306	468	610
65	255	319	487	635
70	265	331	506	659
75	274	342	523	682
80	283	354	540	704
85	292	364	557	726
90	301	375	573	747
95	309	385	589	767
100	317	395	604	787
120	347	433	662	863
140	375	468	715	932
160	401	500	764	996
180	425	530	811	1056
200	448	559	854	1114

For seaside resorts, a flow rate increased by at least 20% must be considered.

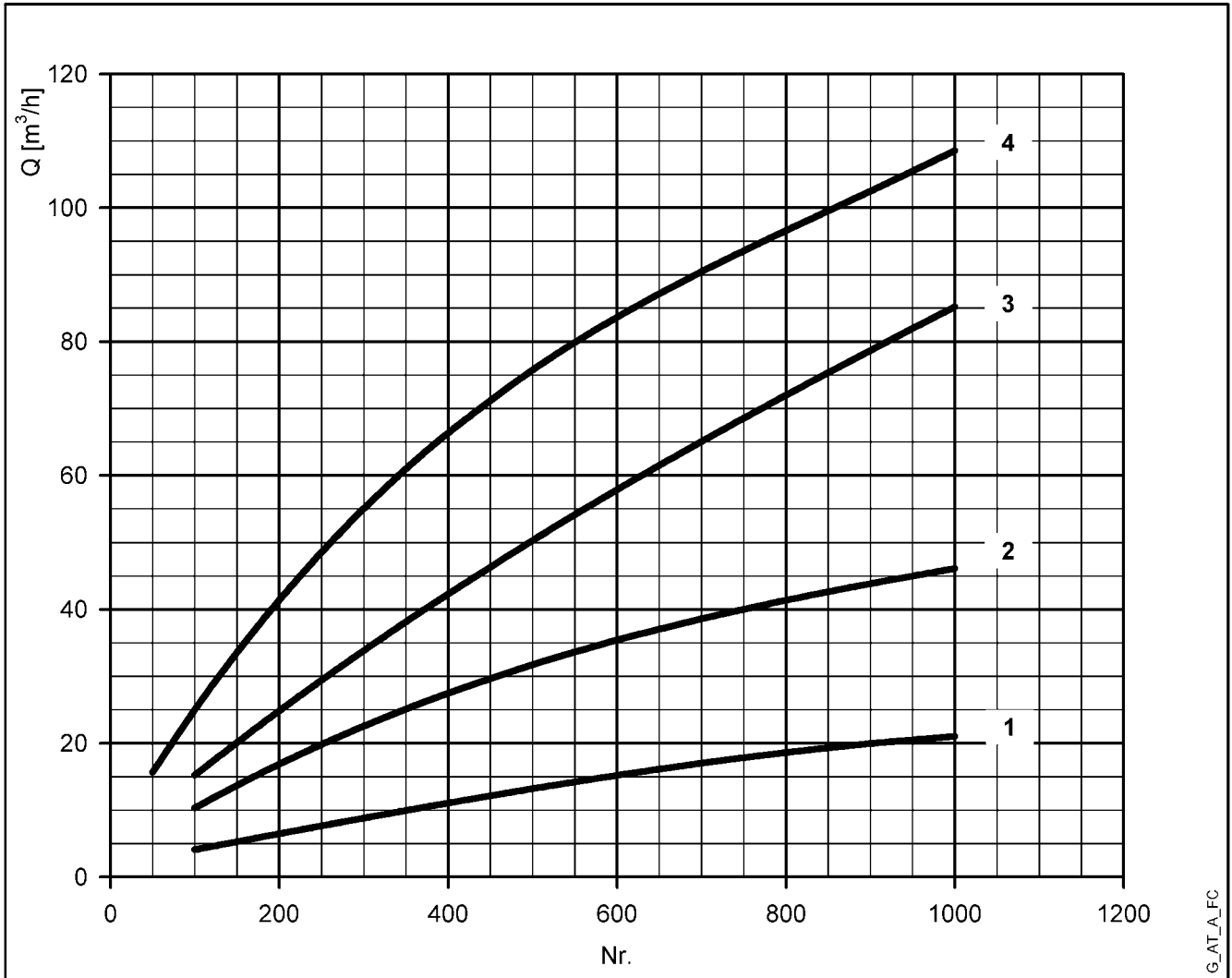
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## WATER REQUIREMENTS FOR COMMUNITY BUILDINGS

The requirements of buildings intended for specific uses, such as **offices, residential units, hotels, department stores, nursing homes** and so on, are different from those of condominiums, and both their global daily water consumption and the maximum contemporaneity flow rate are usually greater. The **diagram of water requirements for community buildings** shows the maximum contemporaneity flow rate of some types of communities, for guidance.

These requirements must be determined case by case with the utmost accuracy, using analytical calculation methods, according to particular needs and local provisions.



For seaside resorts, the flow rate must be increased by at least 20%.

- 1 = Offices (N. of people)
- 2 = Department stores (N. of people)
- 3 = Nursing homes (N. of beds)
- 4 = Hotels, residences (N. of beds)



## USE OF BOOSTER SET

Water is usually delivered by public supply systems and the pressure is generally sufficient for the proper operation of the users' water and sanitary equipment.

When this pressure is not sufficient, booster sets are employed to increase water pressure and ensure an acceptable minimum value at the furthest points. Therefore, the water supply to a building, group of buildings or to a system in general can be considered satisfactory when all the user points can deliver the required quantity of water.

### Set connection methods (intake side)

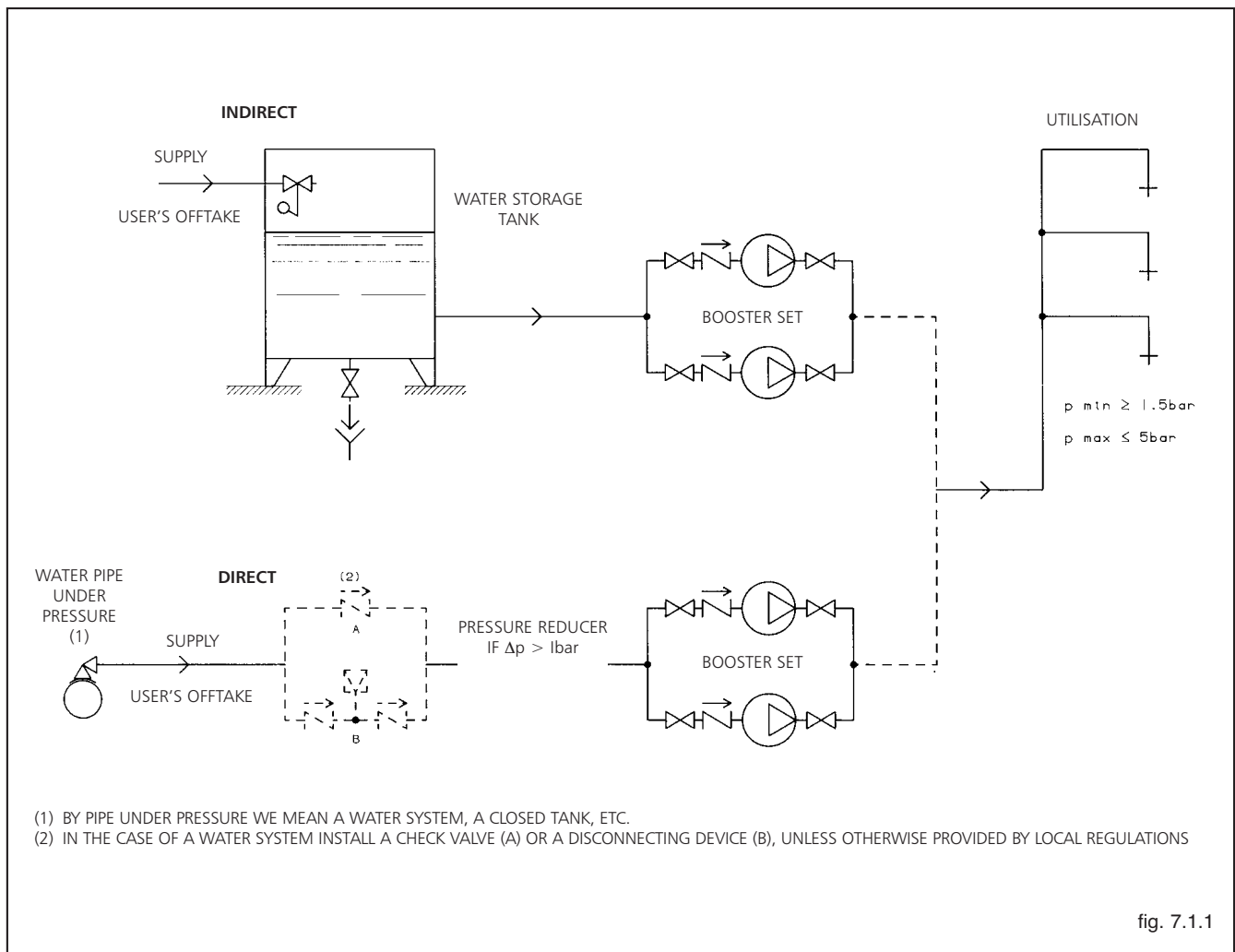
Water can be supplied to a booster set in two ways:

- 1 - By installing a water storage tank between the user's offtake and the booster set (indirect connection, fig. 7.1.1).
- 2 - By connecting the booster set directly between the user's offtake and the system (direct connection, fig. 7.1.1).

The indirect connection does not allow the water system pressure to be utilized. Therefore, it requires pumps with greater head.

The direct connection allows the water system pressure to be utilized, provided the pressure fluctuation ( $\Delta p$ ) does not exceed 1 bar.

If it does, a pressure reducer must be installed for proper operation of the booster set.



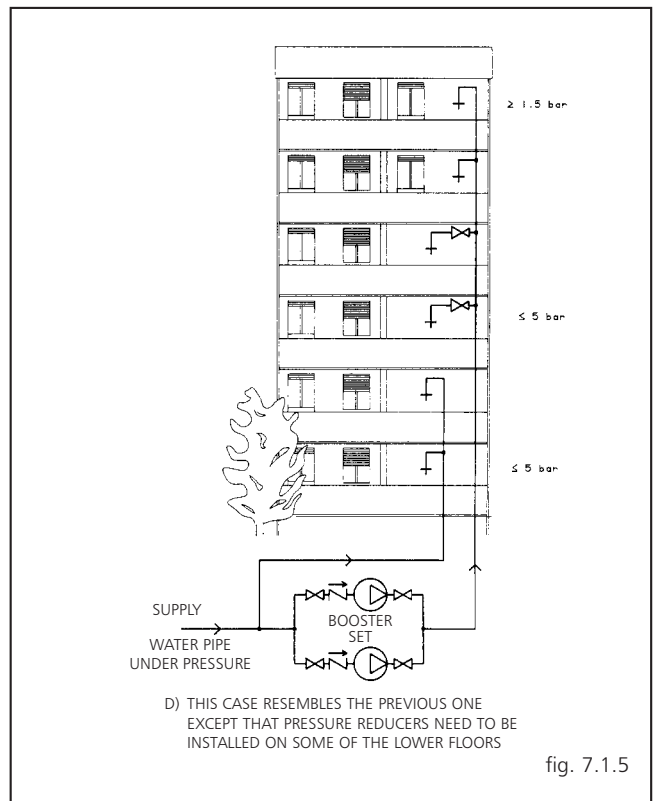
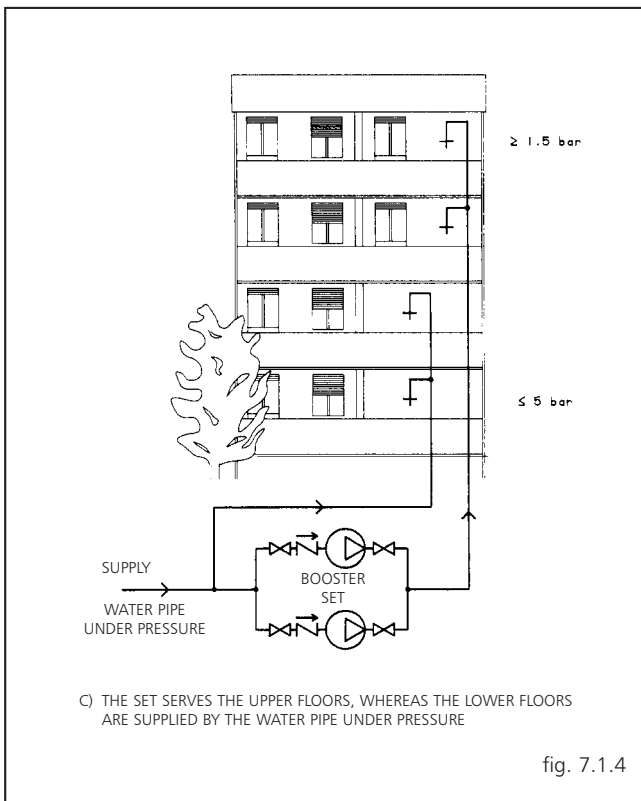
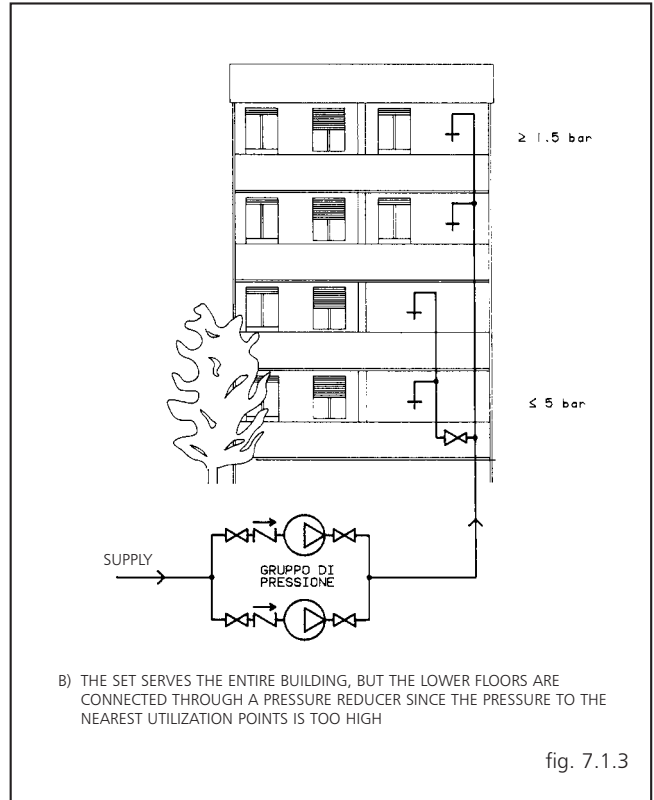
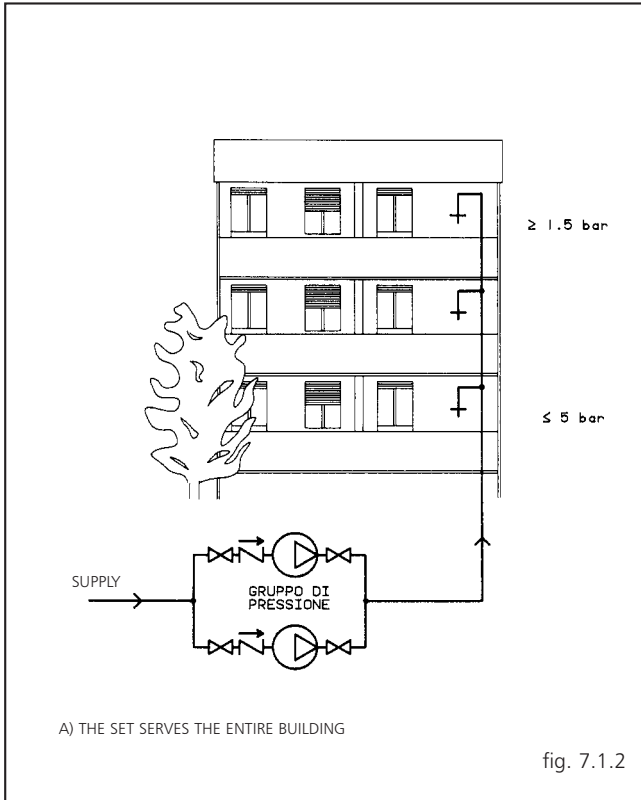


## Water supply systems in civil buildings

The configuration of the supply system must comply with the following conditions:

- The minimum pressure ensuring the proper operation of the equipment must be guaranteed at the most unfavourable drawing point (1.5 bar for valves and flush tank WC, and 2 bar for controlled flushing system WC).
- At the most favourable drawing point, pressure must not exceed 5 bar.

Once these parameters have been satisfied, in relation to the height of the building and to the set intake conditions, the water supply system can have one of the following configurations:



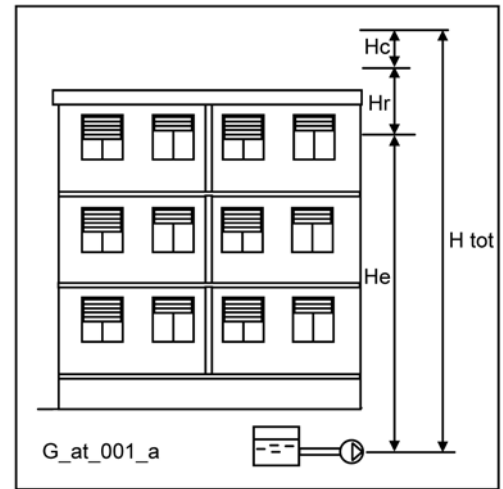
## DETERMINING THE HEAD OF THE SET AND INTAKE CONDITIONS

### Level intake

The delivery head of the set ( $H_{tot}$ ) is the sum of:

- $H_e$  : geodetic difference in level between the set and the furthest delivery point.
- $H_c$  : flow resistance along all the pipes and through other system components, such as valves, filters, etc..
- $H_r$  : pressure required at the most unfavourable point.

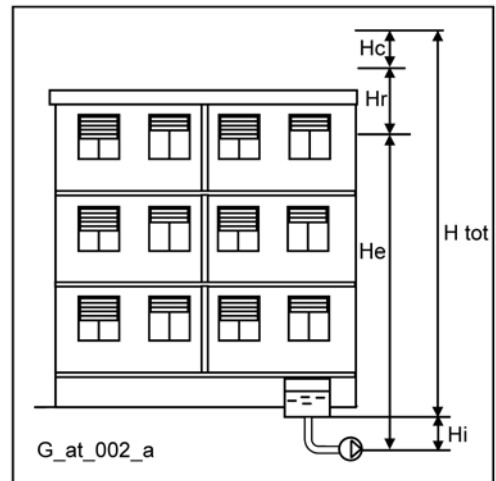
$$H_{tot} = H_e + H_c + H_r$$



### Intake with positive head

In this case, the necessary delivery head ( $H_{tot}$ ) will be reduced by the inlet pressure value ( $H_i$ ).

$$H_{tot} = H_e + H_c + H_r - H_i$$

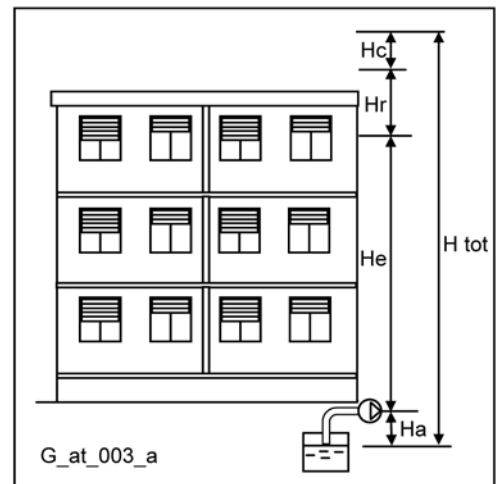


### Intake with negative head

When the pumps suck from an underground tank or well, the necessary head will be increased by the value of the intake height ( $H_a$ ):.

$$H_{tot} = H_e + H_c + H_r + H_a$$

In this case the intake height must be considered very carefully, bearing in mind that an excessive difference in level between the water storage tank and the set, or the wrong sizing of the intake pipe, can have adverse effects on pump operation, such as cavitation and unpriming.



**NPSH**

The minimum operating values that can be reached at the pump suction end are limited by the onset of cavitation.

Cavitation is the formation of vapour-filled cavities within liquids where the pressure is locally reduced to a critical value, or where the local pressure is equal to, or just below the vapour pressure of the liquid.

The vapour-filled cavities flow with the current and when they reach a higher pressure area the vapour contained in the cavities condenses. The cavities collide, generating pressure waves that are transmitted to the walls. These, being subjected to stress cycles, gradually become deformed and yield due to fatigue. This phenomenon, characterized by a metallic noise produced by the hammering on the pipe walls, is called incipient cavitation.

The damage caused by cavitation may be magnified by electrochemical corrosion and a local rise in temperature due to the plastic deformation of the walls. The materials that offer the highest resistance to heat and corrosion are alloy steels, especially austenitic steel. The conditions that trigger cavitation may be assessed by calculating the total net suction head, referred to in technical literature with the acronym NPSH (Net Positive Suction Head).

The NPSH represents the total energy (expressed in m.) of the liquid measured at suction under conditions of incipient cavitation, excluding the vapour pressure (expressed in m.) that the liquid has at the pump inlet.

To find the static height  $h_z$  at which to install the machine under safe conditions, the following formula must be verified:

$$h_p + h_z \geq (NPSH_r + 0.5) + h_f + h_{pv} \quad \text{①}$$

where:

- h<sub>p</sub>** is the absolute pressure applied to the free liquid surface in the suction tank, expressed in m. of liquid;  $h_p$  is the quotient between the barometric pressure and the specific weight of the liquid.
- h<sub>z</sub>** is the suction lift between the pump axis and the free liquid surface in the suction tank, expressed in m.;  $h_z$  is negative when the liquid level is lower than the pump axis.
- h<sub>f</sub>** is the flow resistance in the suction line and its accessories, such as: fittings, foot valve, gate valve, elbows, etc.
- h<sub>pv</sub>** is the vapour pressure of the liquid at the operating temperature, expressed in m. of liquid.  $h_{pv}$  is the quotient between the Pv vapour pressure and the liquid's specific weight.
- 0,5** is the safety factor.

The maximum possible suction head for installation depends on the value of the atmospheric pressure (i.e. the elevation above sea level at which the pump is installed) and the temperature of the liquid.

To help the user, with reference to water temperature (4° C) and to the elevation above sea level, the following tables show the drop in hydraulic pressure head in relation to the elevation above sea level, and the suction loss in relation to temperature.

Water temperature (°C)	20	40	60	80	90	110	120
Suction loss (m)	0,2	0,7	2,0	5,0	7,4	15,4	21,5

Elevation above sea level (m)	500	1000	1500	2000	2500	3000
Suction loss (m)	0,55	1,1	1,65	2,2	2,75	3,3

Friction loss is shown in the tables at pages 103-104 of this catalogue. To reduce it to a minimum, especially in cases of high suction head (over 4-5 m.) or within the operating limits with high flow rates, we recommend using a suction line having a larger diameter than that of the pump's suction port. It is always a good idea to position the pump as close as possible to the liquid to be pumped.

Make the following calculation:

Liquid: water at ~15°C  $\gamma = 1 \text{ kg/dm}^3$   
 Flow rate required: 30 m<sup>3</sup>/h  
 Head for required delivery: 43 m.  
 Suction lift: 3,5 m.  
 The selection is an FHE 40-200/75 pump whose NPSH required value is, at 30 m<sup>3</sup>/h, di 2,5 m.

For water at 15 °C

$$h_p = P_a / \gamma = 10,33\text{m}, h_{pv} = P_v / \gamma = 0,174\text{m} (0,01701 \text{ bar})$$

The H<sub>f</sub> flow resistance in the suction line with foot valves is ~ 1,2 m.

By substituting the parameters in formula ① with the numeric values above, we have:

$$10,33 + (-3,5) \geq (2,5 + 0,5) + 1,2 + 0,17$$

from which we have: 6,8 > 4,4

The relation is therefore verified.



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## TECHNICAL APPENDIX VAPOUR PRESSURE PS VAPOUR PRESSURE AND $\rho$ DENSITY OF WATER TABLE

t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>	t °C	T K	ps bar	$\rho$ kg/dm <sup>3</sup>
0	273,15	0,00611	0,9998	55	328,15	0,15741	0,9857	120	393,15	1,9854	0,9429
1	274,15	0,00657	0,9999	56	329,15	0,16511	0,9852	122	395,15	2,1145	0,9412
2	275,15	0,00706	0,9999	57	330,15	0,17313	0,9846	124	397,15	2,2504	0,9396
3	276,15	0,00758	0,9999	58	331,15	0,18147	0,9842	126	399,15	2,3933	0,9379
4	277,15	0,00813	1,0000	59	332,15	0,19016	0,9837	128	401,15	2,5435	0,9362
5	278,15	0,00872	1,0000	60	333,15	0,1992	0,9832	130	403,15	2,7013	0,9346
6	279,15	0,00935	1,0000	61	334,15	0,2086	0,9826	132	405,15	2,867	0,9328
7	280,15	0,01001	0,9999	62	335,15	0,2184	0,9821	134	407,15	3,041	0,9311
8	281,15	0,01072	0,9999	63	336,15	0,2286	0,9816	136	409,15	3,223	0,9294
9	282,15	0,01147	0,9998	64	337,15	0,2391	0,9811	138	411,15	3,414	0,9276
10	283,15	0,01227	0,9997	65	338,15	0,2501	0,9805	140	413,15	3,614	0,9258
11	284,15	0,01312	0,9997	66	339,15	0,2615	0,9799	145	418,15	4,155	0,9214
12	285,15	0,01401	0,9996	67	340,15	0,2733	0,9793	155	428,15	5,433	0,9121
13	286,15	0,01497	0,9994	68	341,15	0,2856	0,9788	160	433,15	6,181	0,9073
14	287,15	0,01597	0,9993	69	342,15	0,2984	0,9782	165	438,15	7,008	0,9024
15	288,15	0,01704	0,9992	70	343,15	0,3116	0,9777	170	443,15	7,920	0,8973
16	289,15	0,01817	0,9990	71	344,15	0,3253	0,9770	175	448,15	8,924	0,8921
17	290,15	0,01936	0,9988	72	345,15	0,3396	0,9765	180	453,15	10,027	0,8869
18	291,15	0,02062	0,9987	73	346,15	0,3543	0,9760	185	458,15	11,233	0,8815
19	292,15	0,02196	0,9985	74	347,15	0,3696	0,9753	190	463,15	12,551	0,8760
20	293,15	0,02337	0,9983	75	348,15	0,3855	0,9748	195	468,15	13,987	0,8704
21	294,15	0,24850	0,9981	76	349,15	0,4019	0,9741	200	473,15	15,550	0,8647
22	295,15	0,02642	0,9978	77	350,15	0,4189	0,9735	205	478,15	17,243	0,8588
23	296,15	0,02808	0,9976	78	351,15	0,4365	0,9729	210	483,15	19,077	0,8528
24	297,15	0,02982	0,9974	79	352,15	0,4547	0,9723	215	488,15	21,060	0,8467
25	298,15	0,03166	0,9971	80	353,15	0,4736	0,9716	220	493,15	23,198	0,8403
26	299,15	0,03360	0,9968	81	354,15	0,4931	0,9710	225	498,15	25,501	0,8339
27	300,15	0,03564	0,9966	82	355,15	0,5133	0,9704	230	503,15	27,976	0,8273
28	301,15	0,03778	0,9963	83	356,15	0,5342	0,9697	235	508,15	30,632	0,8205
29	302,15	0,04004	0,9960	84	357,15	0,5557	0,9691	240	513,15	33,478	0,8136
30	303,15	0,04241	0,9957	85	358,15	0,5780	0,9684	245	518,15	36,523	0,8065
31	304,15	0,04491	0,9954	86	359,15	0,6011	0,9678	250	523,15	39,776	0,7992
32	305,15	0,04753	0,9951	87	360,15	0,6249	0,9671	255	528,15	43,246	0,7916
33	306,15	0,05029	0,9947	88	361,15	0,6495	0,9665	260	533,15	46,943	0,7839
34	307,15	0,05318	0,9944	89	362,15	0,6749	0,9658	265	538,15	50,877	0,7759
35	308,15	0,05622	0,9940	90	363,15	0,7011	0,9652	270	543,15	55,058	0,7678
36	309,15	0,05940	0,9937	91	364,15	0,7281	0,9644	275	548,15	59,496	0,7593
37	310,15	0,06274	0,9933	92	365,15	0,7561	0,9638	280	553,15	64,202	0,7505
38	311,15	0,06624	0,9930	93	366,15	0,7849	0,9630	285	558,15	69,186	0,7415
39	312,15	0,06991	0,9927	94	367,15	0,8146	0,9624	290	563,15	74,461	0,7321
40	313,15	0,07375	0,9923	95	368,15	0,8453	0,9616	295	568,15	80,037	0,7223
41	314,15	0,07777	0,9919	96	369,15	0,8769	0,9610	300	573,15	85,927	0,7122
42	315,15	0,08198	0,9915	97	370,15	0,9094	0,9602	305	578,15	92,144	0,7017
43	316,15	0,09639	0,9911	98	371,15	0,9430	0,9596	310	583,15	98,70	0,6906
44	317,15	0,09100	0,9907	99	372,15	0,9776	0,9586	315	588,15	105,61	0,6791
45	318,15	0,09582	0,9902	100	373,15	1,0133	0,9581	320	593,15	112,89	0,6669
46	319,15	0,10086	0,9898	102	375,15	1,0878	0,9567	325	598,15	120,56	0,6541
47	320,15	0,10612	0,9894	104	377,15	1,1668	0,9552	330	603,15	128,63	0,6404
48	321,15	0,11162	0,9889	106	379,15	1,2504	0,9537	340	613,15	146,05	0,6102
49	322,15	0,11736	0,9884	108	381,15	1,3390	0,9522	350	623,15	165,35	0,5743
50	323,15	0,12335	0,9880	110	383,15	1,4327	0,9507	360	633,15	186,75	0,5275
51	324,15	0,12961	0,9876	112	385,15	1,5316	0,9491	370	643,15	210,54	0,4518
52	325,15	0,13613	0,9871	114	387,15	1,6362	0,9476	374,15	647,30	221,20	0,3154
53	326,15	0,14293	0,9862	116	389,15	1,7465	0,9460				
54	327,15	0,15002	0,9862	118	391,15	1,8628	0,9445				

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TECHNICAL APPENDIX

## CHOOSING AND SIZING THE SURGE TANK

The purpose of the surge tank is to limit the number of hourly starts of the pumps, placing part of its stock of water, which is maintained under pressure by the air above it, at the disposal of the system.

The surge tank can be of the air cushion or diaphragm type.

In the air cushion version there is no clear separation between air and water. Since part of the air tends to mix with water, it is necessary to restore it by means of air supply units or a compressor.

In the diaphragm version, neither air supply units nor compressor are needed, as contact between air and water is prevented by a flexible diaphragm inside the tank.

The following method, which is used to determine the volume of a surge tank, is valid both for horizontal and vertical surge tanks.

When calculating the volume of the surge tank, it is generally sufficient to consider the first pump only.

## AIR-CUSHION SURGE TANK

It is determined in relation to flow rate, pump pressure, and number of starts per hour allowed by the motor.

$$V_a = \frac{1,25 \times Q_p \times (P_{max} + 10)}{4 \times Z \times (P_{max} - P_{min})}$$

where:

- $V_a$  = Total volume of the air-cushion surge tank in  $m^3$
- $Q_p$  = Average pump flow rate in  $m^3/h$
- $P_{max}$  = Maximum pressure setting (wcm)
- $P_{min}$  = Minimum pressure setting (wcm)
- $Z$  = Maximum number of starts per hour allowed by the motor

Warning! By pump flow rate we mean the average between the flow rate at the maximum pressure switch setting ( $Q_{max}$ ) and the flow rate at the minimum pressure switch setting ( $Q_{min}$ ), i.e.:

$$Q_p = \frac{Q_{max} + Q_{min}}{2} \quad (m^3/h)$$

Example:

- CN 32 - 160/22 pump
- $P_{max}$  = 32 mca
- $P_{min}$  = 22 mca
- $Q_p$  = 18  $m^3/h$
- $Z$  = 30

$$V_a = \frac{1,25 \times 18 \times (32 + 10)}{4 \times 30 \times (32 - 22)} = 0,788 \text{ m}^3$$

A 750-litre surge tank is therefore required.

## DIAPHRAGM TANK

If you decide to use a diaphragm tank, the volume will be lower than that of the air-cushion tank. It can be calculated with the following formula:

$$V_m = \frac{Q_p}{4 \times Z} \times \frac{1}{1 - \frac{(P_{min} - 2)}{P_{max}}}$$

where:

- $V_m$  = Total volume of the air-cushion surge tank in  $m^3$
- $Q_p$  = Average pump flow rate in  $m^3/h$
- $P_{max}$  = Maximum pressure setting (wcm)
- $P_{min}$  = Minimum pressure setting (wcm)
- $Z$  = Maximum number of starts per hour allowed by the motor

Example:

- CN 32 - 160/22 pump
- $P_{max}$  = 32 mca
- $P_{min}$  = 22 mca
- $Q_p$  = 18  $m^3/h$
- $Z$  = 30

$$V_m = \frac{Q_p}{4 \times Z} \times \frac{1}{1 - \frac{(P_{min} - 2)}{P_{max}}} = 0,4 \text{ m}^3$$

A 500-litre surge tank is therefore required.

## Approximate comparison between Lowara air-cushion tanks and diaphragm tanks, as regards some pressure switch setting values

NOMINAL CAPACITY OF AIR CUSHION TANK (litres)	PRESSURE SWITCH SETTING (bar) min/max									
	1,5/2,5	2/3	2,5/3,5	3/4	3,5/4,5	4/5	4,5/5,5	5/6	5,5/6,5	6/7
	NOMINAL CAPACITY OF DIAPHRAGM VESSEL (litres)									
100	N°2 ball type vessels/cylinder type vessels or 60l Export tank or 100-litre vessels (ISPESL tested)									
200	100									
300	200									
500	300									
1000	500									
1500	500 + 200		500 + 300							
2000	500 + 500									
2500	500 + 500	500 + 500 + 300								500 + 500

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**FLOW RESISTANCE**
**TABLE OF FLOW RESISTANCE IN BENDS, VALVES AND GATES**

The flow resistance is calculated using the equivalent pipeline length method according to the table below:

ACCESSORY TYPE	DN											
	25	32	40	50	65	80	100	125	150	200	250	300
	Equivalent pipeline length (m)											
45° bend	0,2	0,2	0,4	0,4	0,6	0,6	0,9	1,1	1,5	1,9	2,4	2,8
90° bend	0,4	0,6	0,9	1,1	1,3	1,5	2,1	2,6	3,0	3,9	4,7	5,8
90° smooth bend	0,4	0,4	0,4	0,6	0,9	1,1	1,3	1,7	1,9	2,8	3,4	3,9
Union tee or cross	1,1	1,3	1,7	2,1	2,6	3,2	4,3	5,3	6,4	7,5	10,7	12,8
Gate	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
Non return valve	1,1	1,5	1,9	2,4	3,0	3,4	4,7	5,9	7,4	9,6	11,8	13,9

G-a-pcv\_a\_th

The table is valid for the Hazen Williams coefficient  $C = 100$  (cast iron pipework). For steel pipework, multiply the values by 1.41. For stainless steel, copper and coated cast iron pipework, multiply the values by 1.85.

When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

The values given are guideline values which are bound to vary slightly according to the model, especially for gate valves and non-return valves, for which it is a good idea to check the values supplied by the manufacturers.



### Air supply unit

The most commonly used air supply unit model is the "depression" type, which uses the depression produced by the pump suction.

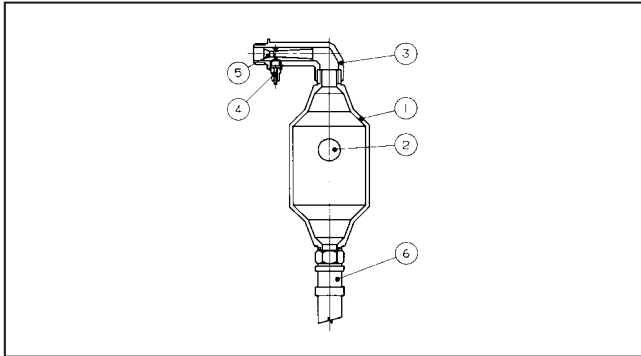


fig. 7.2.2 - The air supply unit consists of a body made of plastic material suitable for foodstuffs (1), a spherical rubber shutter (2), an upper brass union (3) with an air valve (4), a Venturi tube (5), and a flexible pipe (6) to be connected to the pump intake.

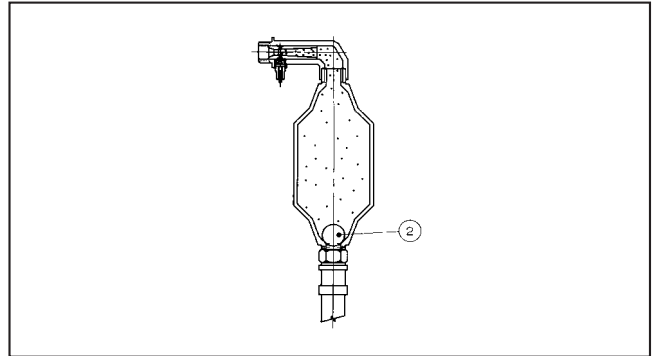


fig. 7.2.5 - The air accumulated inside the body pushes the rubber ball (2) to the bottom, thus blocking the passage. At this point the valve closes and the rubber ball prevents the air accumulated inside the body of the air supply unit from reaching the pump intake.

### Air supply unit operation

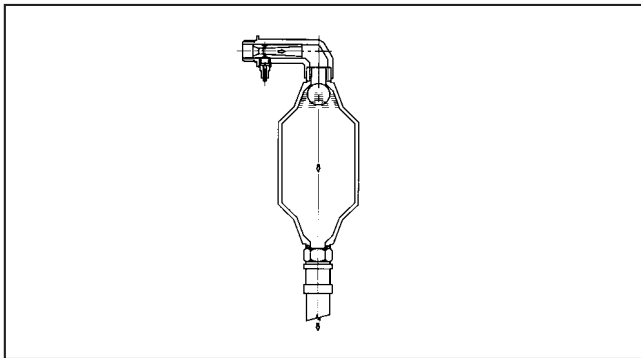


fig. 7.2.3 - When the pump starts up, the intake pressure is lower than the pressure in the surge tank. This difference causes water to flow from the surge tank to the pump intake, through the air supply unit.

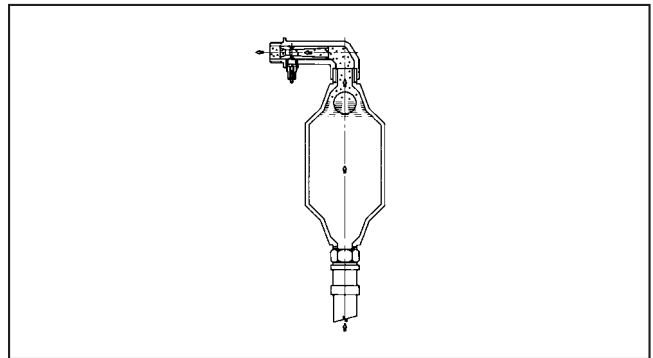


fig. 7.2.6 - When the pump stops the depression ceases and a flow of water is produced, which lifts the ball and pushes the air in the body of the supply unit into the tank.

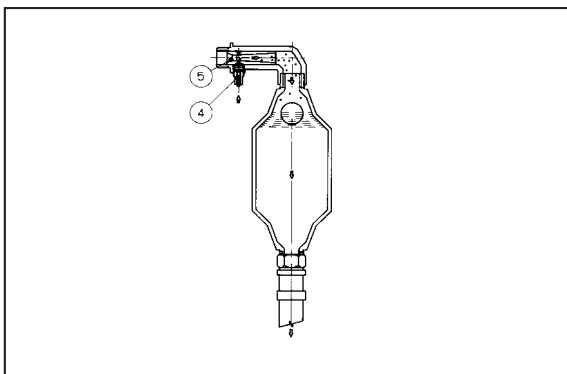


fig. 7.2.4 - The flow of water that passes through the Venturi tube (5) generates a depression and allows the opening of the air valve (4). As a consequence, air enters the body of the supply unit.

### Air supply unit selection tank

TANK CAPACITY L	AVERAGE PRESSURE SETTING bar					
	2.5	3.5	4.5	5.5	6.5	7.5
100	LOW 5					
200						
300						
500	LOW 10					
700						
1000	LOW 25					
1500						
2000						
2500	LOW 40					
3000						
4000						
5000						
6000						

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This cycle is repeated each time the pump starts up until the required quantity of air has accumulated. To ensure proper system operation, no check valve must be mounted between the pump delivery outlet and the surge tank, as it would impede the return flow of water through the pump.

## ASSESSMENT OF PROBABLE DEMAND (VALID IN U.K. ONLY)

The method adopted is based on loading unit values as detailed in the Plumbing Engineering Design Guide published by the Institute of Plumbing.

When designing a hot or cold water supply system an assessment must be made to obtain the maximum probable simultaneous demand.

Depending on the type of services being provided it rarely occurs for all the appliances to be used at the same time therefore the design usually allows for a peak usage which is less than the maximum.

Probable demand will depend on the type of building and its use, type of appliances installed and frequency of use.

The simultaneous demand in most installations can be calculated with an adequate degree of accuracy using the loading unit concept.

The usage patterns and types of appliances in different installations will vary greatly.

Sports and Leisure centres for example are usually calculated directly by the flow rates of each appliance, without diversity factors. Each case will need to be looked at in its own right and assessed accordingly. Judgement of the designer must prevail.

Loading unit values vary for each type of appliance. A loading unit has no precise value in terms of litres per second.

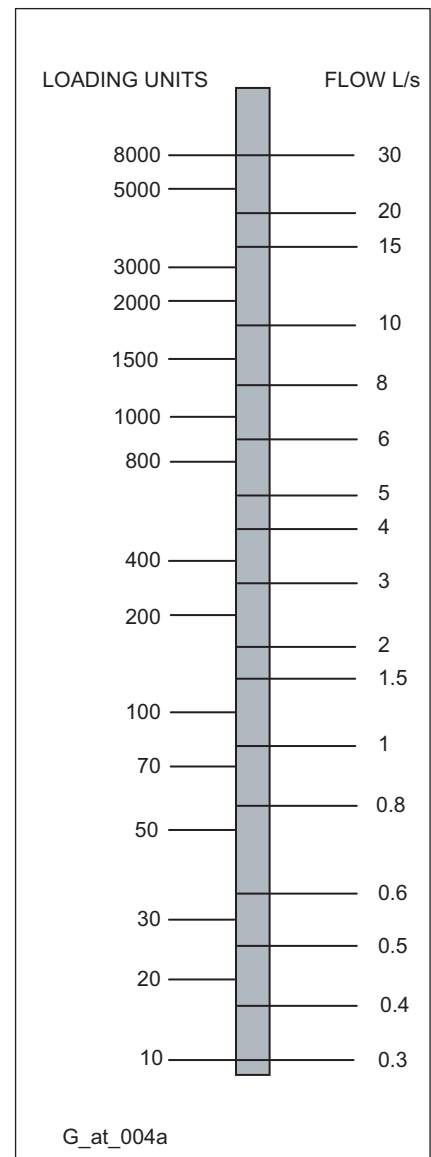
See loading unit table below.

By multiplying the total number of each appliance by the appropriate loading unit number and adding the resultant totals together, the recommended flow can be read from the chart.

### Loading unit table

APPLIANCE	Loading Unit	Recommended Flow L/s
WC	1,5	0,12
Wash basin (hot & cold)	3	0,3
Sink (hot & cold)	6	0,4
Bath (hot & cold)	20	0,6
Shower (hot & cold)	10	0,24
Washing machine	2	0,3

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### Working Example

A block of standard flats containing a total of 70 dwellings

Each standard flat is assumed to have:

1 x Hand basin hot & cold = 3 L/U x 70 = 210

1 x WC cold only = 1.5 L/U x 70 = 105

1 x Shower hot & cold = 10 L/U x 70 = 700

1 x Sink hot & cold = 6 L/U x 70 = 420

Total Loading Unit = 1435

This figure can now be read from the chart opposite: total flow = 8.5 L/s

## ASSESSING HEAD REQUIREMENT (VALID IN U.K. ONLY)

The **head** required in a boosted cold water system consists of three components, static head, residual pressure and system friction losses. The values of these three components are added together to give the total required head at the system flow rate.

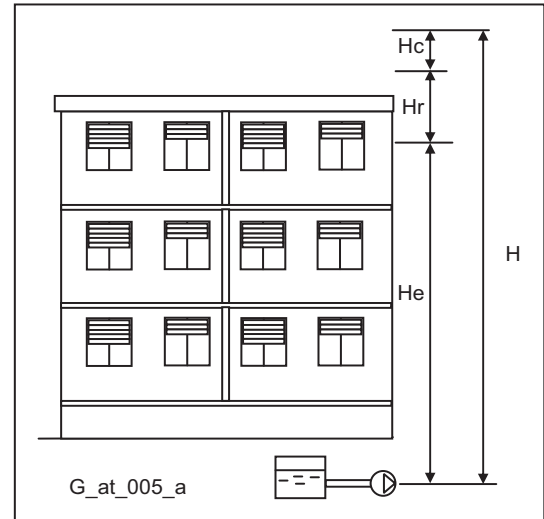
**Static head (He):** This is the difference between the break tank low water line and the highest discharge point in the building. If the height of the build is not known, then 2.8-3.0 metres per floor can be used to assess the building height.

**Residual pressure (Hr):** This is the pressure required at the highest outlet device, normally 20metres.

Note: some modern showers may require higher pressures.

**System friction losses (Hc):** The total losses through pipework, pipework fittings, valves, PRVs and all other equipment fed through the pumpset must be added to find the total system losses.

On conventional systems that do not include excessive runs of pipe or specialised components a rough guide would be to allow 0.05 metres friction loss for each metre of static head.



Example:

Static head (He): Building height four floors @ 2.8m each = 11.2m +  
 Residual pressure (Hr): Pressure at highest outlet = 20m +  
 Friction losses (Hc): 11.2 (static head) x 0.05 = 0.56m  
 Total pump head required (H) = 31.76m (3.11 Bar)

### Pressure limitations

The designer must ensure that adequate precautions are taken to ensure that the system is capable of withstanding the closed valve head produced by the pump set. In cases where closed valve pressures cannot be tolerated, pressure reducing valves should be fitted down stream of the booster set.

### Velocity

Pipework within the system should be sized to limit the velocity to the figures stated in table below.

Higher velocities will lead to excessive noise, wear and higher running costs.

PIPE SIZE	SUCTION PIPE m/s	DELIVERY PIPE m/s
Less than 80mm	0,46	0,91 to 1,07
100-150mm	0,55	1,22 to 1,52
200mm	0,76	1,68
250 and above	0,91	1,82 to 2,13

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### BOOSTER SIZING

What information do we require to size a booster set?

- As a minimum we need to know:
  - The total flow rate, or information to assess this.
  - The total head at flow rate, or the height of building.
  - If the pumps are to operate under positive head, or suction lift conditions.
  - Where the set is to be sited, I.E. basement or roof.
  - Preferred choice fixed or variable speed
- Additional information if available:
  - How to split the duty for particular applications I.E. duty/standby or duty/assist.
  - The size and material of the connecting pipework.
  - Is a Jockey pump required.



# ITT

# Lowara

## ACCESSORIES



AIR SUPPLY UNITS



FLOAT SWITCHES



VALVES



CYLINDER WATER TANK



NON-RETURN VALVES



COUPLINGS



PRESSURE TRANSMITTER

**TECHNICAL  
APPENDIX**



## VOLUMETRIC CAPACITY

Litres per minute l/min	Cubic metres per hour m <sup>3</sup> /h	Cubic feet per hour ft <sup>3</sup> /h	Cubic feet per minute ft <sup>3</sup> /min	Imp. gal. per minute Imp. gal./min	US gal. per minute Us gal./min
<b>1,000</b>	0,0600	2,1189	0,0353	0,2200	0,2642
16,6667	<b>1,000</b>	35,3147	0,5886	3,6662	4,4029
0,4719	0,0283	<b>1,000</b>	0,0167	0,1038	0,1247
28,3168	1,6990	60,0000	<b>1,000</b>	6,2288	7,4805
4,5461	0,2728	9,6326	0,1605	<b>1,000</b>	1,2009
3,7854	0,2271	8,0208	0,1337	0,8327	<b>1,000</b>

## PRESSURE AND HEAD

Newton per square metre N/m <sup>2</sup>	kilo Pascal kPa	bar bar	Pound force per square inch psi	metre of water m H <sub>2</sub> O	millimetre of mercury mm Hg
<b>1,000</b>	0,0010	$1 \times 10^{-5}$	$1.45 \times 10^{-4}$	$1.02 \times 10^{-4}$	0,0075
1000,0000	<b>1,000</b>	0,0100	0,1450	0,1020	7,5006
$1 \times 10^5$	100,0000	<b>1,000</b>	14,5038	10,1972	750,0638
6894,7570	6,8948	0,0689	<b>1,000</b>	0,7031	51,7151
9806,6500	9,8067	0,0981	1,4223	<b>1,000</b>	73,5561
133,3220	0,1333	0,0013	0,0193	0,0136	<b>1,000</b>

## LENGTH

millimetre mm	centimetre cm	metre m	inch in	foot ft	yard yd
<b>1,000</b>	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	<b>1,000</b>	0,0100	0,3937	0,0328	0,0109
1000,0000	100,0000	<b>1,000</b>	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	<b>1,000</b>	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	<b>1,000</b>	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	<b>1,000</b>

## VOLUME

cubic metre m <sup>3</sup>	litre litro	millilitre ml	imp. Gallon imp. gal.	US gallon US gal.	cubic foot ft <sup>3</sup>
<b>1,000</b>	1000,0000	$1 \times 10^6$	219,9694	264,1720	35,3147
0,0010	<b>1,000</b>	1000,0000	0,2200	0,2642	0,0353
$1 \times 10^{-6}$	0,0010	<b>1,000</b>	$2.2 \times 10^{-4}$	$2.642 \times 10^{-4}$	$3.53 \times 10^{-5}$
0,0045	4,5461	4546,0870	<b>1,000</b>	1,2009	0,1605
0,0038	3,7854	3785,4120	0,8327	<b>1,000</b>	0,1337
0,0283	28,3168	28316,8466	6,2288	7,4805	<b>1,000</b>

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ITT-Lowara ([www.lowara.com](http://www.lowara.com)), headquarters of "Residential and Commercial Water - EMEA" part of the ITT Corporation and located in Montecchio Maggiore, Vicenza - Italy, is a leading manufacturer of hydraulic pumps and water handling and control systems. It has 1.819 employees in Europe, 675 operating in Italy. In 2009 its consolidated sales totalled about 286 million €, or over 396 million \$. ITT Corporation is a high-technology engineering and manufacturing company operating on all seven continents in three vital markets: water and fluids management, global defense and security, and motion and flow control. With a heritage of innovation, ITT partners with its customers to deliver extraordinary solutions that create more livable environments, provide protection and safety and connect our world. Headquartered in White Plains, N.Y., the company generated 2009 revenue of \$10.9 billion.

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