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Let's Solve Water

50 Hz

SMB20 - SMB30 Series

VARIABLE SPEED BOOSTER SETS WITH e-SM DRIVE
VERTICAL MULTISTAGE ELECTRIC PUMPS SERIES e-SV™ SMART
VERTICAL MULTISTAGE CLOSE-CLOUPED ELECTRIC PUMPS SERIES VM™ SMART
HORIZONTAL MULTISTAGE ELECTRIC PUMPS SERIES e-HM™ SMART

LOWARA
a xylem brand

Cod. 191020451 Rev. B Ed.09/2018

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CONTENTS

SMB BOOSTER SETS SERIES
GENERAL INTRODUCTION – PRODUCT DESCRIPTION

The variable speed SMB booster sets are designed for water transfer and pressurization in the following applications:

- Apartments, single and multi-family houses, condominiums and residential buildings
- Hotels, restaurants, spas
- Various industrial applications

SMB series booster set are variable speed pumping stations with two or three **e-SV Smart** series multistage vertical pumps, **VM Smart** series multistage vertical monolithic threaded pumps or **e-HM Smart** series multistage horizontal pumps. Each pump is equipped with an e-SM frequency drive that ensures the variable speed operation on all electric pumps.

These types of systems improve the comfort of the end user, reducing noise emissions and also "water hammer", thanks to the gradual switching off of the pumps.
The pumps are installed on a single base and connected to each other by means of suction and delivery manifolds.
The pumps are connected to the manifolds by means of on-off valves and non-return valves.
The control panel is secured to the same base by means of a bracket.

SMB series booster sets with e-SV Smart, VM Smart, e-HM Smart series pumps are certified for use with drinking water according to WRAS and ACS standards, and with Italian Ministry Decree no. 174.

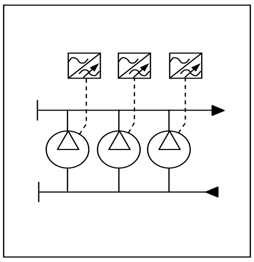
SMB series booster sets are available with a wide range of electric pumps to satisfy the different needs of every system. SMB booster sets are also available in special version to fit specific duty points and applications.
Systems for regulating the speed of the electric motors, as in SMB series booster sets, are used in the following cases:

- In case of systems with a lot of users where the daily consumption varies frequently and in different periods.
- When it is necessary to obtain constant pressure.
- In the case of systems with supervision it is possible to monitor and check the performances of the booster sets.

SMB BOOSTER SETS SERIES
DESCRIPTION OF OPERATION

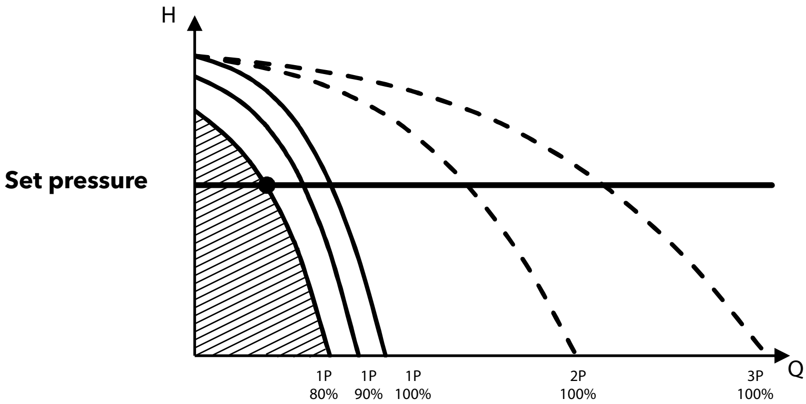
All the electric pumps are controlled by e-SM drive frequency converter and operate at variable speeds. Start-up is automatic, depending on system requirements. Each electric pump has a pressure transmitter that provides a pressure reading, which is recorded and sent to the frequency converter.
The electric pump speed is modulated based on system requirements.
Electric pump start alternation is automatic, following a preset time (parameter available in the frequency converter).
Electric pump starts and stops are determined based on the pressures entered as set values in the menu of the frequency converter.

Example operation of a set of three electric pumps.

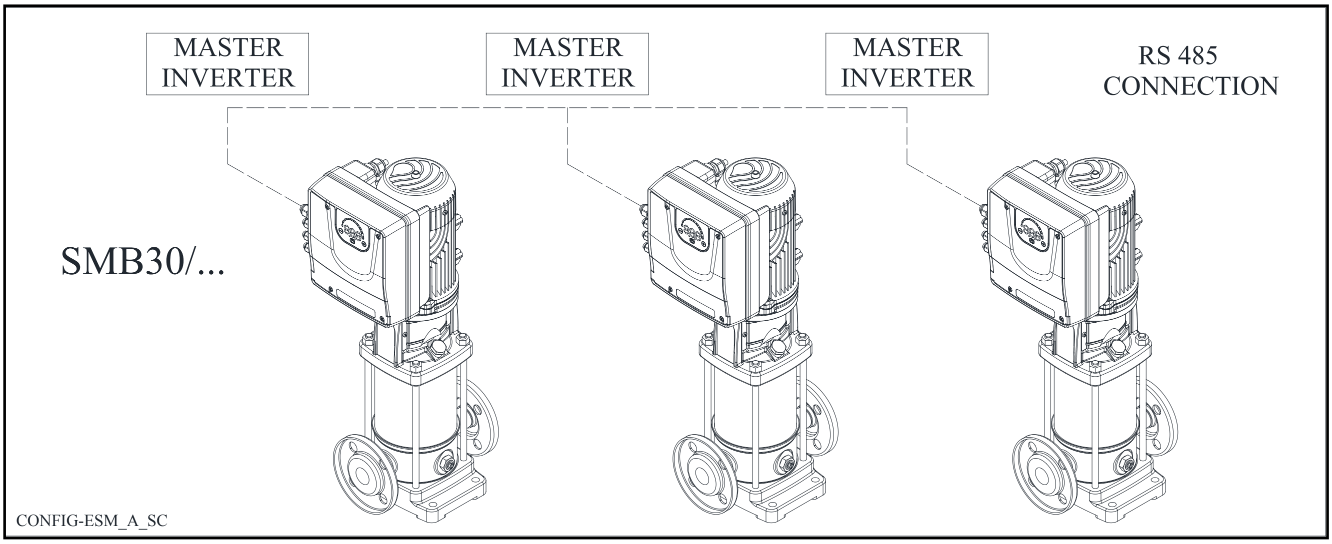


Each electric pump is controlled by a frequency converter. The starting priority is changed in accordance with the time set in the relevant parameter field on frequency converter. The speed adjustment will apply to all the electric pumps installed. When the water request decreases, the electric pumps stop in succession.
The electric pumps connected to the frequency converter keep the pressure constant by modulating the number of motor revs.
The acceleration and deceleration of the electric pump, both at start-up and switch off, is of the soft type.
This helps to reduce water hammer and ensures a quiet operation of the booster set.

Lowara SMB series booster sets guarantee constant pressure of the system as in the following example:

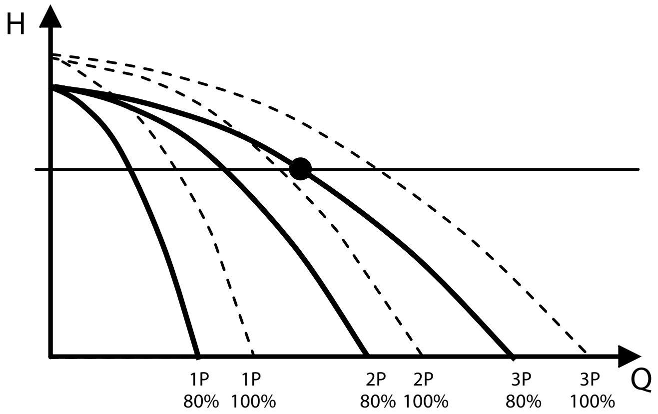


Example: multistage vertical electric pumps e-SV Smart series



SMB BOOSTER SETS SERIES
DESCRIPTION OF OPERATION

When the pressure decreases, an electric pump starts, adjusting the motor speed so that the set pressure value can be guaranteed. When the demand for water increases, the other electric pumps also start in sequence, at variable speed, to keep the pressure at a constant level.



When the demand for water decreases, the electric pumps switch off in succession. The number of revolutions of the first electric pump switched on decreases to a set minimum before switching off.

Regulating the constant pressure value

SMB series booster sets guarantee constant pressure of the system even during frequent variations in water consumption.
The system pressure value is measured by the pressure transducers connected to the delivery manifold.
The value found is compared with the set value. The comparison between the measured pressure and the set pressure is performed through the internal "controller" of frequency converter, which manages the motor speed acceleration and deceleration ramps (frequency), changing the performance of the electric pump during the time.
In case of fault of one of the frequency converters, the others will remain active and will continue to guarantee the control of the other electric pumps and the constant pressure.

Type of control

SMB series booster sets use one or more sensors as a standard device to control pressure.
For each booster set, there are as many sensors as the number of electric pumps installed. In case of fault of one of the transducer, the converter connected to the electric pump stops working. It is also possible to change the unit of measure into bar, psi, m3/h, °C, °F, l/sec, l/min, %. In this case, different transducers may be used, depending on the selected measure, such as flow or temperature transducers.

Cyclical exchange of pumps

In the SMB series, electric pump start is alternated according to a time set for each pump, through a clock in the frequency converter menu.

Additional protection against dry running

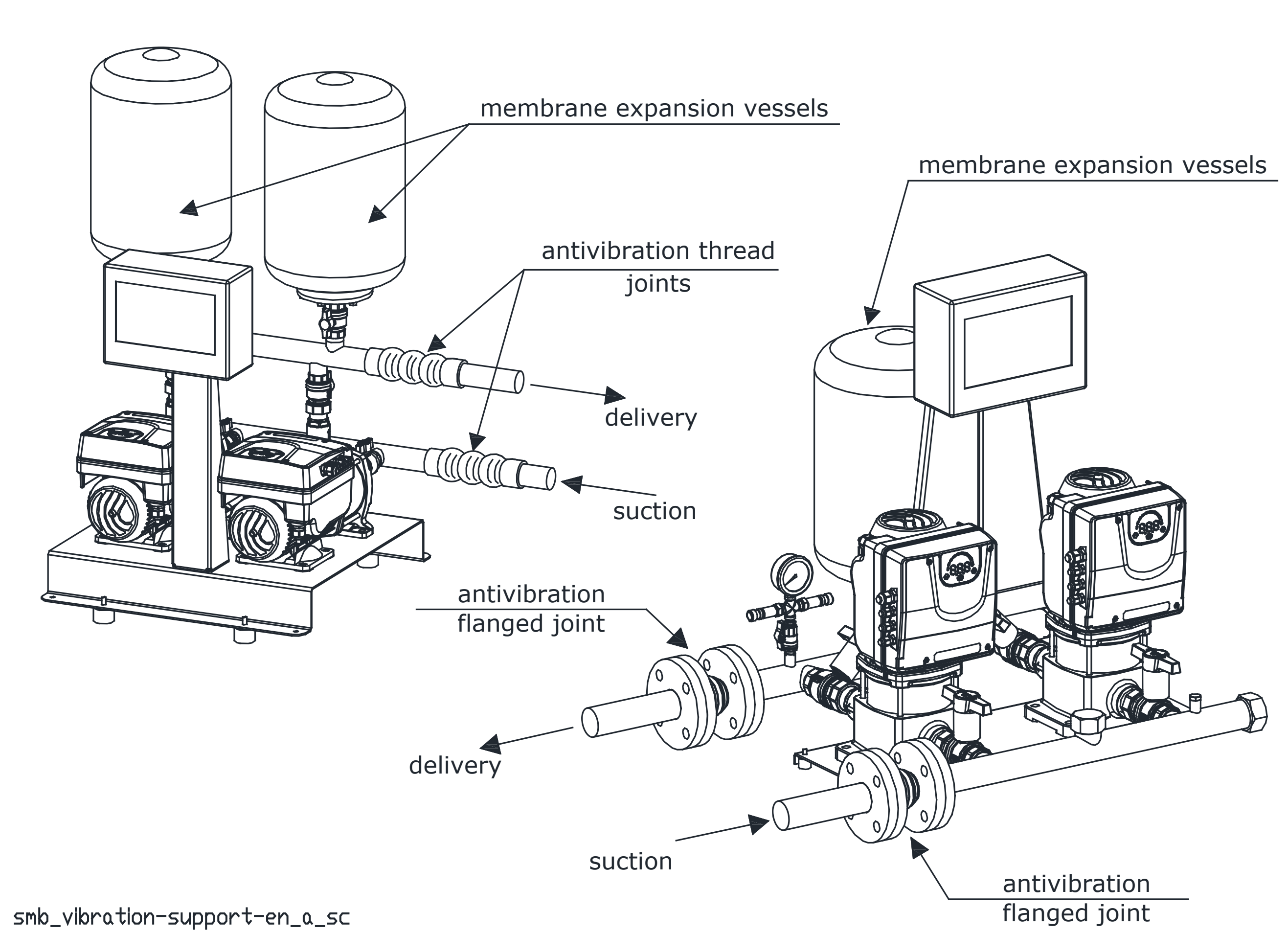
Protection against dry running activates when the water reserve falls below the minimum level guaranteed for suction.
The level can be checked using a float switch, a minimum pressure switch, an external contact, or level probes. For the latter, the probes must be connected to the adjustable sensitivity electronic module.
The control panel is already preset for the installation of this module.

Minimum delivery pressure protection

The minimum delivery pressure function can be managed by entering the pressure value in the menu of the frequency converter, which will receive the signal through the pressure transducer at the delivery.

SMB BOOSTER SETS SERIES
INSTALLATION

The booster sets must be installed in areas protected against frost and with adequate ventilation to cool the motors. It is a good practice to connect the booster set to the suction and delivery pipes of the system inserting vibration-damping joints to limit the transmission of vibrations and resonance to the system.



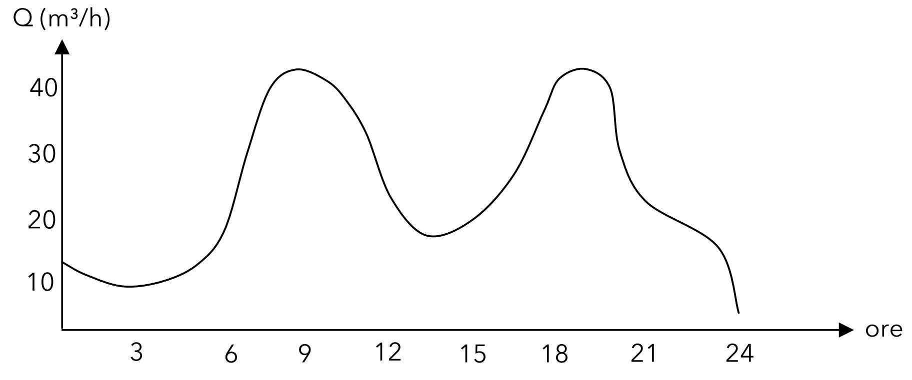
The booster sets must be connected to pressurised tanks with an adequate capacity for the system to be made. These tanks can avoid any problems due to water hammer that is created due to the sudden stopping of the electric pumps running at a fixed speed. For this type of system, it is possible to install in the delivery piping diaphragm expansion vessels (hydro tube) that perform a pressure dampening function.
Due to their design, variable-speed booster sets can satisfy users' demands by moderating the electric pump speed. It is always recommended to check the type of system to be made and choose the correct capacity of the vessels accordingly.
For the sizing of the expansion vessels, see the specific chapter in this catalogue.
Considering also that variable-pressure sets are very sensitive to swings of pressure in the system, the use of vessels allows the pressure to stabilise when requests are low or inexistent, and avoids the electric pumps remaining in operation at minimum speed without stopping.
It is good practice to check the value of the maximum electric pump pressure to match the set with a vessel suitable for the pressure value.

SMB BOOSTER SETS SERIES
CHOICE AND SELECTION

The following conditions should be considered when choosing a booster set:

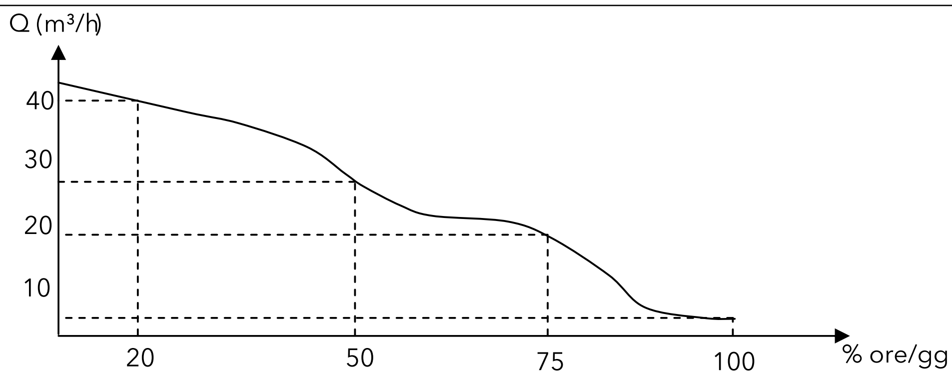
- The system's flow rate and pressure requirements should be met.
- The unit must not be oversized, avoiding unnecessary installation and running costs.

Generally water distribution systems such as those for domestic water supply or for large agglomerates such as hospitals, hotels or similar, have "variable" water consumption i.e. in a 24-hour period there may be sudden variations in consumption that are difficult to foresee. A pattern of consumption may occur in 24 hours, but the daily percentage of unit operation may also occur at various flow rates.
Generally the definition of flow rate for these types of systems is based on either the "probability calculation" which is a very complex system of calculation, or based on tables or diagrams in the national standards which provide guidelines for the sizing of the systems and therefore for calculating the maximum simultaneous flow rate.



Consumption over 24h

The operating time of the unit still calculated over 24h, gives us a view of the daily percentage of operation at the various flow rates.
This means that there may be daily peaks where the maximum flow rate requested is concentrated in a short space of time. In the example given below, it can be seen that in 100% of the time there is a consumption of 4 m³/h, while in 20% of the operating time there is a consumption of 40 m³/h.



Operating time

When selecting the booster set the consumption figure of the system must be considered, which is generally supplied by the person who designed the system. For systems where consumption varies continuously and suddenly over time it is advisable to install SMB series booster sets with variable regulation of the electric pump speed.
The calculation of the size of the booster set (its performance and the number of electric pumps) is based on the take-off point and therefore on the consumption value which takes the following factors into account:

- The value of the peak in consumption
- Efficiency
- NPSH
- Standby pumps
- Diaphragm tanks

SMB BOOSTER SETS SERIES
CHOICE AND SELECTION

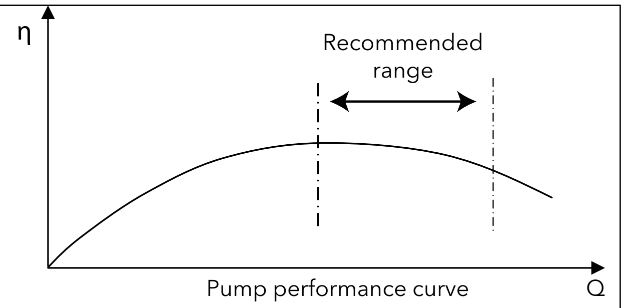
By adjusting their operation over time, variable-speed booster sets give the end user energy savings which can be calculated directly on the control board with a metering module fitted in the electric control panel.
This allows checking of the system yield, especially in complex systems with many users and many ranges of consumption.
It is possible to install a standby electric pump if it is necessary to have some kind of additional safety in the pump station.
This is typical in systems of a certain importance, such as hospitals or factories, or in the field of crop irrigation.

SMB series booster sets must also be equipped with expansion vessels (for the size of the vessels, see the specific chapter in this catalogue).
A single vessel or several smaller vessels can be installed on the delivery of the booster set, always taking the total capacity into account.
Expansion vessels avoid the risk of water hammer, which is harmful for both the system and the electric pumps.

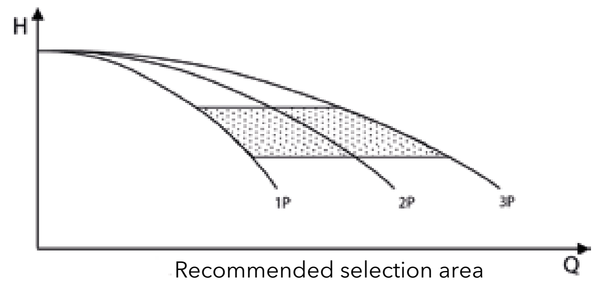
Generally for systems with highly variable or sudden variations in consumption, it is recommended to install a booster set with variable electric pump speed, such as the SMB series, to guarantee constant pressure.

What type of electric pump to choose?
Generally, the selection of electric pump is based on the maximum duty point of the system, which is usually the highest possible. The maximum request value is normally for short periods, so the electric pump must also be able to satisfy variable requests throughout its time in service.Generally the choice of the electric pump, based on the performance curve, should fall around the maximum efficiency point. The pump must ensure operation within its rated performance.

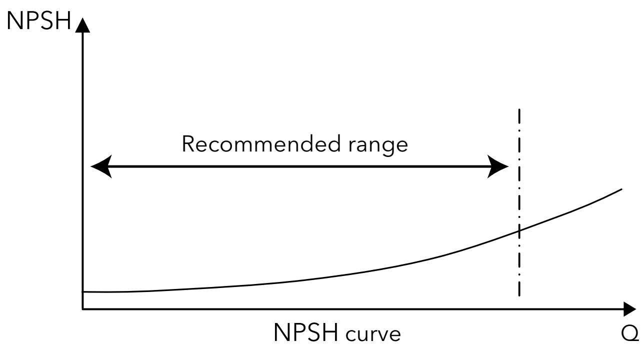
Since the unit is sized according to the maximum possible consumption, the maximum duty point of the electric pumps must be in the area on the right of the performance curve so that, if there is a fall in consumption, the efficiency remains high.



If we make a choice on the characteristic curve of the electric pump, we can see that the optimum working area where the booster works is represented by the following graph:



Another factor to be considered when choosing the electric pumps is its NPSH value. Never choose a electric pump where the maximum duty point is too far to the right of the NPSH curve.
This risks not having good electric pump suction, which may be aggravated by the type of installation (where negative suction is possible).
In these cases there is the risk of cavitation.
The NPSH of the electric pump must always be checked at the maximum flow rate requested.



SMB BOOSTER SETS SERIES
HOW TO READ BOOSTER SETS WITH e-SM DRIVE CURVES

To exploit to the maximum potential of SMB BOOSTER SETS it's important to properly read working curves shown in the relevant charts.

① **Booster set model**

② **Maximum speed curve**

③ **Minimum speed curve**: it refers to the minimum rpm level the motor can work at, it's calculated depending on the model of pump maximizing for each one the working area and allowing the highest system flexibility.

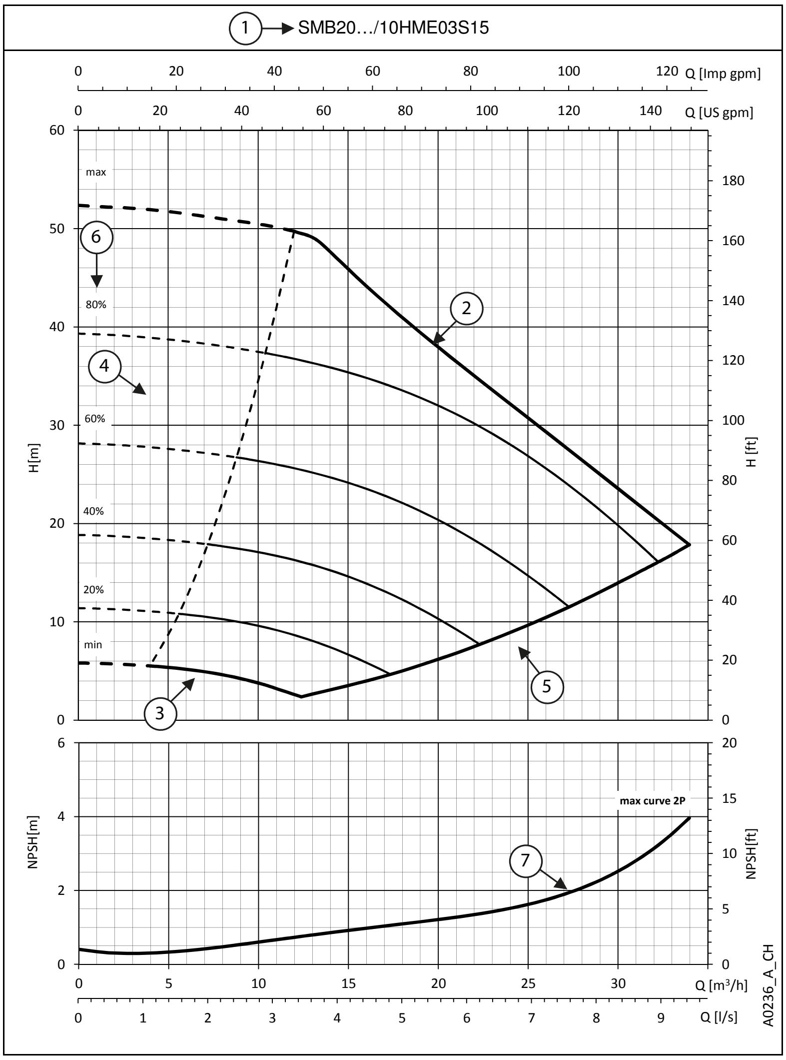
④ The **area with dotted lines** is where he pump could only operate intermittently for short periods of time.

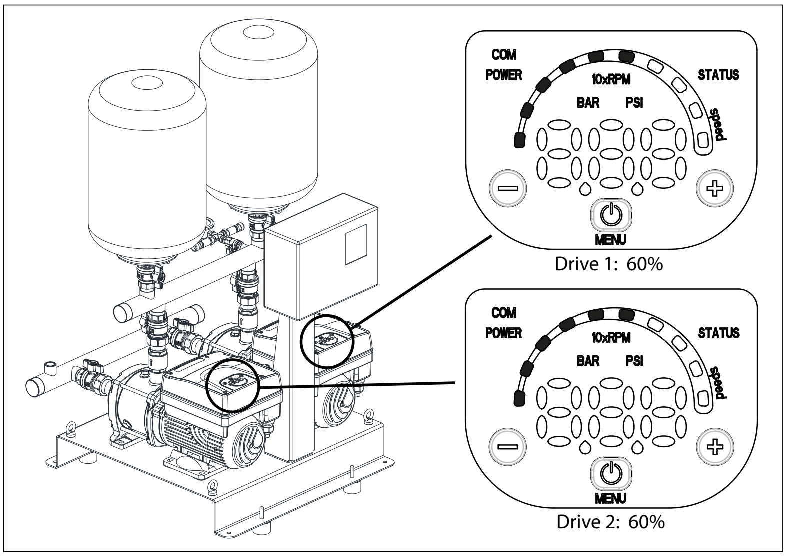
⑤ Each **intermediate curve** between max and min speed shows the percentage of load the system is working at **synchronous** mode (all pumps work at the same speed); it's easy to read also from the LED speed bar on the HMI keypad: at 90% there will be 9 led, at 80% there will be 8 and so on.
Example: at 60% there will be 6 lit led's as in figure.

⑥ The **part load percentage** is calculated depending on maximum speed (max, 100%) and minimum speed (min, equal to 0%, which is the minimum part load step, below it the drive stays powered up but cannot work).

⑦ **NPSH**: is the net positive suction head of booster set with all pumps working at synchronous mode and at the maximum speed.

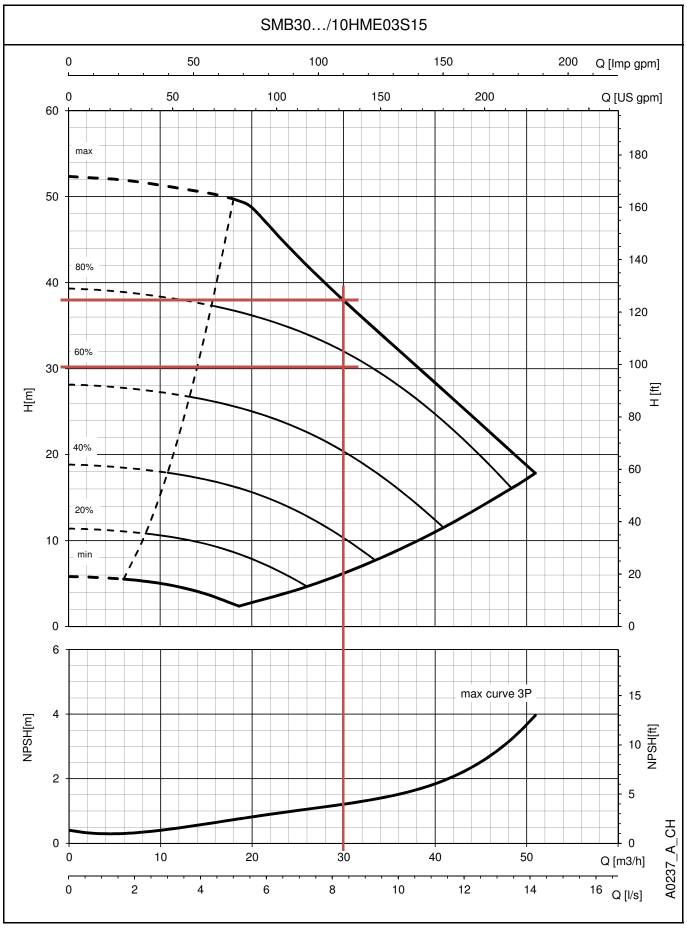
Load control: the booster set SMB series controls and limits power consumption at high flow/low head, in this way the motor stays protected from overload and ensure a longer life of pump+motor+drive system.





SMB BOOSTER SETS SERIES
SELECTING THE PUMPS

The choice of electric pump is therefore based on the characteristic curve of the electric pump depending on the flow rate and the pressure required for the system. Starting from the required flow rate, a vertical line is drawn until it meets the horizontal line of the required pressure. The point of intersection of the lines gives both the type and the number of electric pumps necessary for the system.



The example alongside refers to a required flow rate of 30 m³/h and a pressure of 30 m water column

As shown in the operating curves on page 97, the selection requires three 10HME03S electric pumps.

Moreover the take-off point falls in the npsh area farthest to the left and therefore in an area with a low cavitation risk.

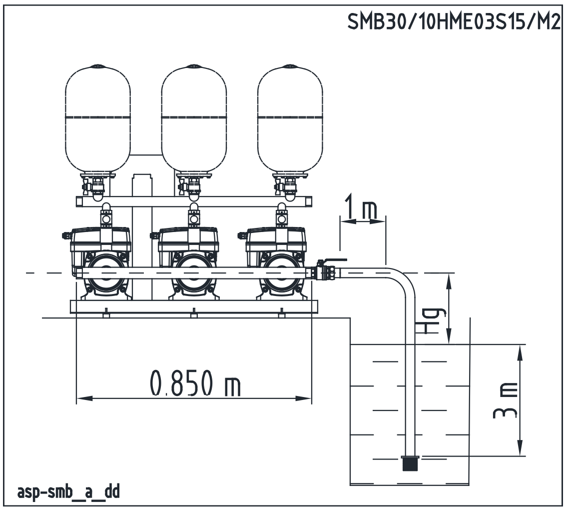
The values obtained are those for the performance of the pumps. A correct check of the net pressure value must be made due to the intrinsic load loss of the booster set and the conditions of installation. For this reason it is recommended to see the specific chapter in this catalogue.

NPSH

The minimum operating values that can be reached by the pump suction are limited by the appearance of cavitation. Cavitation consists in the formation of steam pockets in the liquid when the local pressure reaches a critical value. A critical value is when the local pressure is equal or just below the pressure of the liquid steam. Steam cavitation flows with the current. When it reaches a higher pressure area, condensation of the contained steam occurs. The pockets collide, causing pressure waves that are transmitted to the walls, which are therefore subjected to stress cycles that can cause deformation and then breaks due to fatigue. This phenomena, characterised by a metallic noise due to the hammering of the walls, is called incipient cavitation. Cavitation damage can be made worse by electrochemical corrosion, and by local temperature increases due to the plastic deformation of the walls.
The materials with the highest resistance to heat and corrosion are alloyed steels, and particularly austenitic steels. The conditions that cause cavitation can be predicted by calculating the total suction height, indicated in the technical literature with the acronym NPSH (Net Positive Suction Head).
The NPSH represents the total energy (in m) of the flow measured at the suction in incipient cavitation conditions, net of the steam pressure (in m) of the fluid at the input of the pump.

SMB BOOSTER SETS SERIES
SUCTION CONDITIONS

Once the type and the number of electric pumps of the set have been identified, the suction conditions must also be assessment. Below is an example of the assessment of the suction lift installation conditions, in relation to the previously described case: in suction lift installation, it is necessary to calculate the maximum Hg height which must not be exceeded due to safety reasons, to avoid cavitation, and therefore the unpriming of the pump itself.



The relation that must assessed, and which connects this value, is the following:

NPSH $_{available}$ ≥ NPSH $_{required}$, when the equality condition represents the limit condition.

NPSH $_{available}$ = Patm + Hg – ∑t – ∑a

Where:
Patm is the atmospheric pressure, equal to 10,33 m
Hg is the geodetic level difference
∑t are the pressure drops for suction components such as foot check valve, suction piping, curve, gate valve.
∑a are the pressure drops for suction set branch.

NPSH $_{requested}$ is a parameter obtained from the performance curve; in our case, at the flow of each pump equal to 10 m^3/h, it corresponds to 1,2 m (page 97). Before calculating the l'NPSH $_{available}$, it is necessary to calculate the pressure drops at the suction, using the tables on page 110-111, and taking into account the material, such as the type of stainless steel for the piping and cast iron for the valves.
The total sum of the pressure drops ∑t for suction components is made in the following way, considering that the diameter of the suction piping is DN65, equal to the diameter of the suction manifold of the set (page 44).

Calculation of suction drops ∑c for cast iron components
Equivalent piping length for DN65 foot check valve = 3 m
Equivalent piping length for DN65 gate valve = 0,2 m
Total equivalent length = 3 + 0,2 = 3,2 m
Pressure drops in the suction piping (cast iron) ∑c = 3,2 x 17,6 /100 = 0,56 m

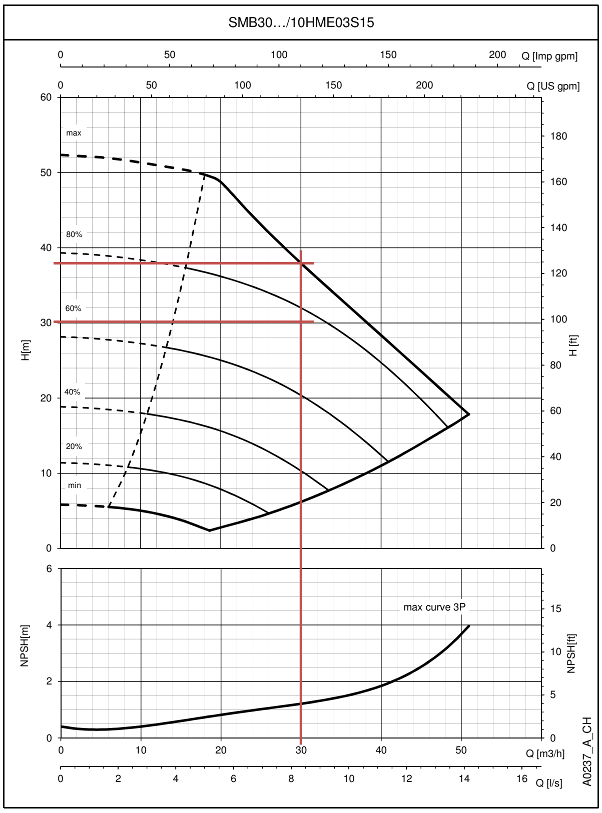
Calculation of suction drops ∑s for stainless steel components
Equivalent piping length for DN65 90° curve = 1,3 m
Total equivalent length = 1,3 m
Horizontal suction pipe length = 1 m
Vertical suction pipe length = 3 m
Pressure drops in the suction piping (stainless steel) ∑s = (1,3 + 1 + 3) x 17,6 x 0,54 / 100 = 0,50 m

Pressure drops for suction components ∑t = ∑c + ∑s = 0,56 + 0,50 = 1,06 m
The total sum of the pressure drops ∑a for suction components is made in the following way, considering that the diameter of the suction piping is DN65, equal to the diameter of the suction manifold of the set (page 44).
Hc pressure drops for suction set branch must be assessed on the B curve (page 99, scheme A0536_A_CH); at the flow value of each pump equal to 10 m^3/h, a value of Hc = 0,0035 m is obtained
Calculation of suction drops ∑s for stainless steel components
Equivalent piping length for DN65 manifold T fitting = 2,6 m
Suction manifold length = 0,85 m
Pressure drops in the suction manifold (steel) ∑s = (2,6 + 0,85) x 17,6 x 0,54 / 100 = 0,327 m
Pressure drops ∑a = Hc + ∑s = 0,0035 + 0,327 = 0,331 m

Remembering that NPSH $_{available}$ = Patm + Hg - ∑t – ∑a and that NPSH $_{available}$ ≥ NPSH $_{requested}$ we have that Patm + Hg - ∑t - ∑a must be ≥ NPSH $_{requested}$.
Substituting the values we get that 10,33 + Hg - 1,06 - 0,331 ≥ 1,2 m (NPSH $_{requested}$),
Hg = 1,2 + 1,06 + 0,331 - 10,33 = - 7,74 m, it represents the limit condition for which
NPSH $_{available}$ = NPSH $_{requested}$

Therefore, in order to guarantee the conditions for the correct operation of the system as far as cavitation risks, it will be necessary to position the pump above the water level, **so that the Hg height is below the limit value of 7,74 m**.

SMB BOOSTER SETS SERIES
NET PRESSURE CALCULATION



When selecting SMB booster sets, the performance levels of the pump must be taken into account.
Performance levels are obtained from the characteristic curves of the pumps, and do not take into account any pressure drops due to system piping and valves.
The following example helps the customer to obtain the **correct delivery manifold pressure value**:
by knowing the system operating point Q = 30 m³/h and H = 30 mH_2O (P requested),and the installation height Hg (estimated to 3 m), in order to make the calculations easier we use the pressure drop curves for each single pump on page 97 of this catalogue.
Assuming that a booster set SMB30/10HME03S with non-return valves on the delivery has been selected, we proceed as follows:

P net available ≥ P requested, when the equality condition represents the limit condition.

P net available = H – (Hg + ∑t + ∑a + ∑m)

Where:
H head value of booster set
Hg is the geodetic level difference (estimated to 3 m)
∑t are the pressure drops for suction components such as foot check valve, suction piping, curve and gate valve.
∑a are the pressure drops for suction set branch
∑m are the pressure drops for delivery set branch

The total sum of the pressure drops for suction components ∑t = ∑c + ∑s = 0,56 + 0,50 = 1,06 m
The total sum of the pressure drops ∑t for suction components is made in the following way, considering that the diameter of the suction piping is DN65, equal to the diameter of the suction manifold of the set (page 44). Hc pressure drops for suction set branch must be assessed on the B curve (page 99, scheme A0536_A_CH); at the flow value of each pump equal to 10 m³/h, a value of Hc = 0,0035 m is obtained.

Calculation of suction drops ∑s for stainless steel components
Equivalent piping length for DN65 manifold TEE fitting = 2,6 m
Suction manifold length = 0,85
Pressure drops in the suction piping (stainless steel) ∑s = (2,6 + 0,85) x 17,6 x 0,54 / 100 = 0,327 m
The total pressure drops ∑a for suction components are:
∑a = Hc + ∑s= 0,0035 + 0,327 = 0,33 m

The total sum of the pressure drops ∑m for delivery branch is made in the following way, considering that the diameter of the delivery manifold is DN65, equal to the diameter of the delivery manifold of the set (page 44). Hc pressure drops for delivery set branch must be assessed on the A curve (page 99, scheme A0536_A_CH); at the flow value of each pump equal to 10 m³/h, a value of Hc = 1,8 m is obtained

Calculation of delivery drops ∑s for stainless steel components
Equivalent piping length for DN65 manifold TEE fitting = 2,6 m
Delivery manifold length = 0,85 m
Pressure drops in the delivery manifold (steel) ∑s = (2,6 + 0,85) x 17,6 x 0,54 / 100 = 0,327 m

Pressure drops in delivery manifold ∑m = Hc + ∑s = 1,8 + 0,327 = 2,12 m
If we analyse the performance of the set at the flow value of 30 m³/h, the head value H is 38 m.
The net pressure at the delivery manifold will be P net available= H – (Hg + ∑t + ∑a + ∑m)
Substituting the values we get that P net available = 38 – (3 + 1,06 + 0,33 + 2,12) = 31,5
When comparing this value with the design value (not taking into account the dynamic energy)
we see that 31,5 m > 30 m [P net available > P Required]

The set is therefore capable of meeting system requirements.

SMB20 - SMB30 SERIES

Variable speed booster sets

e-SV™ SMART series multistage vertical electric pumps
VM™ SMART series multistage vertical lose-coupled threaded electric pumps
e-HM™ SMART series multistage horizontal electric pumps

High efficiency motors with integrated e-SM drive
Flow rate up to 51 m^3/h
Pressure up to 16 bar

SMB BOOSTER SETS SERIES IDENTIFICATION CODE

S	M	B	2	0	R	A	/	A	/	5	S	V	E	0	8	R	0	1	5	/	M	2	/	A	3	0	4	/	P	E	/	R	E

Name [3 digits]
[SMB] booster with e-SM drive

Number of pumps [2 digits]
[20] = 2 pumps
[30] = 3 pumps

Non-return valve
[_] = Delivery side
[RA] = Suction side

Set drinking water certificate [1 digit]
[A] = Booster set certificated (WRAS, ACS, D.M.174)
[B] = Booster set certificated (ACS, D.M.174)
[Z] = Booster set not certified by a third party.

Electric pumpa
[e-SV Smart series model]
[VM Smart series model]
[e-HM Smart series model]

Control panel power supply [2 digit]
[M2] = Single-phase, 1 x 230 V
[T3] = Three-phase, 3 x 230 V
[T4] = Three-phase, 3 x 400 V

Versions
[_] = Standard version
[A304] = Special AISI 304 version
[B304] = Special AISI 304 version
[C304] = Special AISI 304 version
[K304] = Special AISI 304 version
[A316] = Special AISI 316 version
[B316] = Special AISI 316 version
[C316] = Special AISI 316 version

Options

[3A]	[DR2]	[RE]	[SR]
[3B]	[DR3]	[SA]	[TS]
[BAP]	[IP65]	[SC]	[VA]
[C9]	[PA]	[SCA]	[WM]
[CM]	[PE]	[SCM]	
[CP]	[PMA]	[SM]	
[DR1]	[PQ]	[SQ]	

VERSIONS AVAILABLE

A304 Main components in contact with the liquid in AISI 304 stainless steel or higher. Galvanised screws and bolts. Flanges not in contact with the liquid galvanised (Available in the Z version).
B304 Main components in contact with the liquid in AISI 304 stainless steel or higher. Screws and bolts in AISI 304 stainless steel or higher. Flanges not in contact with the liquid in AISI 304 stainless steel (Available in the Z version).
C304 Main components in contact with the liquid in AISI 304 stainless steel or higher. Base, brackets, supports,screws and bolts in AISI 304 stainless steel or higher. Flanges not in contact with the liquid in AISI 304 stainless steel or higher. Valves fully made of AISI 304 stainless steel or higher (body, heads, disc) (Available in the Z version).
K304 Baseplate in AISI 304 stainless steel.
A316 Main components in contact with the liquid in AISI 316 stainless steel or higher. Galvanised screws and bolts.Flanges not in contact with the liquid galvanised (Available in the Z version).
B316 Main components in contact with the liquid in AISI 316 stainless steel. Screws and bolts in AISI 316 stainless steel.Flanges not in contact with the liquid in AISI 316 stainless steel (Available in the Z version).
C316 Main components in contact with the liquid in AISI 316 stainless steel. Base, brackets, supports, screws and bolts in AISI 316 stainless steel. Flanges not in contact with the liquid in AISI 316 stainless steel. Valves fully made of AISI 316 stainless steel (body, heads, disc) (Available in the Z version).

OPTIONS

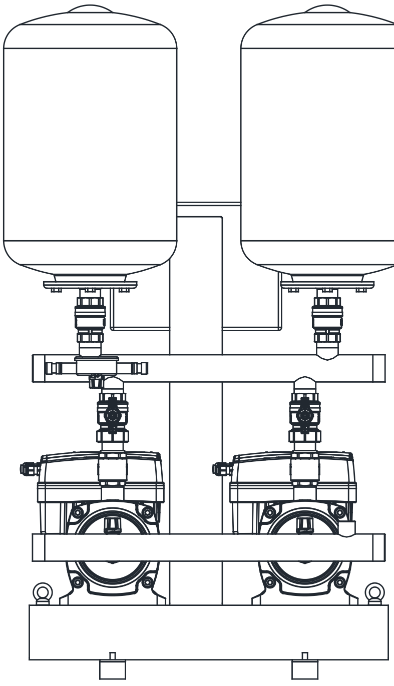
3A Set with 1A certified pumps (Factory test report issued from end of line, QH curve included).
3B Set with 1B certified pumps (Test bulletin issued by Sala Audit (Audit Room); it includes QH curve, output and power).
BAP High pressure pressure switch on the delivery manifold.
C9 Delivery manifold turned by 90°, curves. It is not possible to install expansion vessels directly on the manifold.
CM Suction or delivery manifold larger than standard size.
CP Control panel with clean contacts: converter faulty, operation/stop for each pump. Electric contact normally open.
DR1 Set with 1 optical sensor for lack/presence of water, installed on the suction manifold.
DR2 Set with 2 optical sensors for lack/presence of water (fixed to each pump).
DR3 Set with 3 optical sensors for lack/presence of water (fixed to each pump).
IP65 IP65 protection degree control panel.
PA Minimum pressure pressure switch on the suction manifold, for protection against dry running.
PE Control panel with emergency button.
PMA Minimum pressure pressure switch and vacuum pressure gauge for protection against dry running, installed on the suction manifold.
PQ Set for aqueduct installation (with pressure gauge/ pressure switches/transmitters oversized by one size).
RE Control panel with condensation resistance, controlled by a thermostat.
SA Without suction: without suction valves and without suction manifold.
SC Set without control devices such as pressure switches and transmitters; with pressure gauge.
SCA Without suction manifold (but with suction valves).
SCM Without delivery manifold (without pressure switches, transmitters and pressure gauge; with delivery valves).
SM Without delivery: without delivery valves and without delivery manifold.
SQ Booster set without control panel and bracket; with pressure transmitters and e-SM drive.
SR Without non-return valve.
TS Set with electric pumps with special seals.
VA Control panel with digital voltmeter and ammeter.
WM Wall mounted control panel; cables L=5m.

SMB BOOSTER SETS SERIES
RANGE

The standard range of SMB series variable-speed booster sets includes models with 2 and 3 electric pumps in different configurations, to adapt to the specific needs of each application.

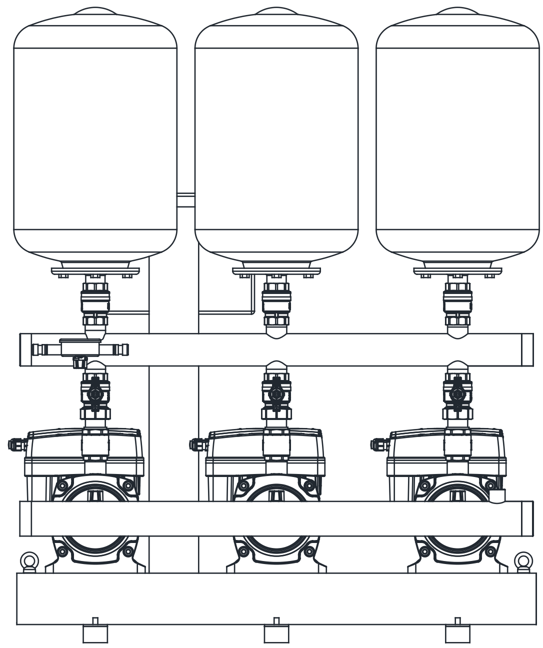
SMB20 SERIES

- Single-phase power supply, variable speed and control by pressure transducers and e-SM frequency converter
- drives, integrated with permanent magnets motors.
- Two electric pumps e-SVE, VME, e-HME series.
- Head up to 152 m.
- Flow rate up to 34 m^3/h.



SMB30 SERIES

- Single-phase power supply, variable speed and control by pressure transducers and e-SM frequency converter drives, integrated with permanent magnets motors.
- Three electric pumps e-SVE, VME, e-HME series.
- Head up to 152 m.
- Flow rate up to 51 m^3/h.



e-SM DRIVE
GENERAL DESCRIPTION

Background and context

In every sector, from construction and industry to agriculture and building services the need for intelligent, compact and high-efficiency pumping systems is constantly growing.
That's why Lowara has developed the **e-SM drive**: an integrated intelligent pumping system with electronically driven, permanent magnet motor (IE5 efficiency level).
The integrated control system, combined with the high performance, power and efficiency from the motor and hydraulics, guarantees impressively low operating costs. You also benefit from flexibility, precision and its ultra-compact size.

Savings
The electronics and permanent magnet motor are highly efficient and minimize power losses while transferring maximum energy to the hydraulic parts of the pump.
The refined control system with integrated microprocessor adjusts the motor speed, matching the required operating point of the pump or system requirements.
This reduces demand on electricity according to the required working conditions.
This creates economies, especially in systems where pump demand varies over time.

Flexibility
The compact size, low loss and increased control make the e-SM drive a good choice in applications and systems where fixed speed pumps are commonly used. It is easy to integrate in control and regulation loops thanks to the wide availability of compatible communication protocols, including analog and digital inputs.
The pump is supplied with a pressure sensor.

Ease of use and commissioning
e-SM drive has an intuitive interface that guides the user through the installation, and an easily accessible area for connections.
The control system is integrated and no additional external electrical panel is required.

Application sectors

- Water supply systems in residential buildings
- Air conditioning
- Water treatment plants
- Industrial installations

e-SM System

- 230V +/- 10% single phase power supply, 50/60 Hz
- Power up to 1.5 kW
- Protection class IP55
- Can be linked up to 3 pumps

Motor

- IE5 efficiency level (IEC TS 60034-30-3:2016)
- Synchronous electric motor with permanent magnets, (TEFC), closed structure, air-cooled
- Insulation class 155 (F)
- Overload protection and locked rotor with automatic reset incorporated

Optional components:
Sensors

The following sensors are available for electric pump equipped with e-SM drive:
- Pressure-transducer
- Level-sensor.

PUMPS WITH e-SM DRIVE
GENERAL DESCRIPTION

e-SV Smart (e-SVE)

Pump

- **Flow rate**: up to 30 m³/h
- **Head**: up to 180 m
- Ambient temperature: from -20°C to +50°C without performance penalty
- Temperature of pumped liquid up to +120°C for single-phase motor versions
- Maximum operating **pressure**:
  - 1, 3, 5, 10, 15, 22SV with oval flanges: 16 bar (PN16) at 50°C.
  - 1, 3, 5, 10, 15, 22SV with round flanges or Victaulic®, Clamp,o DIN 11851 connections: 25 bar (PN 25) a 50°C.
- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- **F**: round flanges, in-line delivery and suction ports, AISI 304.
- **R**: round flanges, delivery port above the suction port, with four adjustable positions, AISI 304.
- Further choice possibilities among the following versions:
  - **T**: oval flanges, in-line delivery and suction ports, AISI 304.
  - **N**: round flanges, in-line delivery and suction ports, AISI 316.
- Reduced axial thrusts enable the use of **standard motors** that are easily found in the market.
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069 for 1, 3, 5SV and 10, 15, 22SV (≤ of 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 (≥ of 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.
- Easy maintenance. No special tools required for assembly or disassembly.
- The hydraulic performances meet the tolerances specified in ISO 9906:2012.

VM Smart (VME)

Pump

- **Flow rate**: up to 17 m³/h
- **Head**: up to 100 m
- Ambient temperature: from -20°C to +50°C without performance penalty
- Temperature of pumped liquid up to +90°C for single-phase motor versions
- Maximum operating **pressure**: 10 bar (PN 10)
- Connections: Rp threaded for both suction and discharge manifold
- The hydraulic performances meet the tolerances specified in ISO 9906:2012.

e-HM Smart (e-HME)

Pump

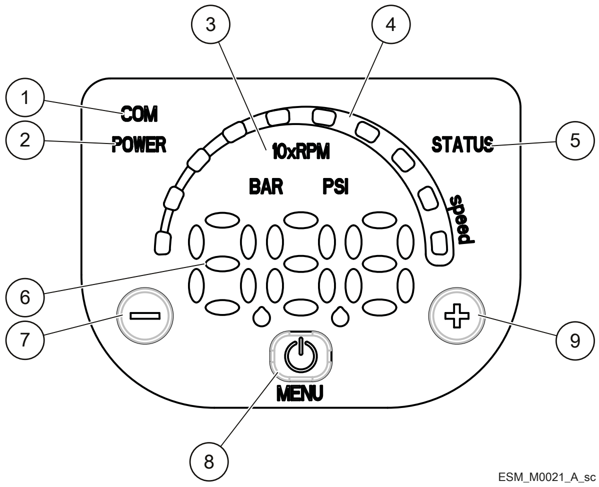
- **Flow rate**: up to 29 m³/h
- **Head**: up to 152 m
- Ambient temperature: from -20°C to +50°C without performance penalty
- Temperature of pumped liquid up to +120°C for single-phase motor versions
- Maximum operating **pressure**: 16 bar (PN 16)
- Connections: Rp threaded for both suction and discharge manifold
- The hydraulic performances meet the tolerances specified in ISO 9906:2012.

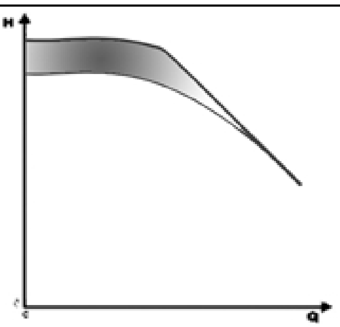
e-SM DRIVE SERIES

e-SM drive series is equipped with an intelligent control that optimizes hydraulic performance while minimizing waste.

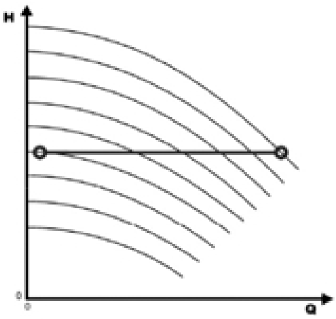
Integrated intelligence: The electronic control of the motor enables a 20% increase in performance compared to an equivalent fixed speed pump (area highlighted in figure "Integrated intelligence").

Adjustment: This is possible both at constant pressure and according to the characteristic curve of the system, based on the customer's preferences. Another option is according to an external signal or at a preset speed.

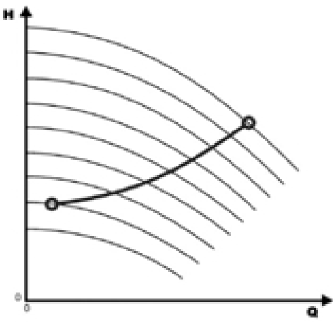




Integrated intelligence



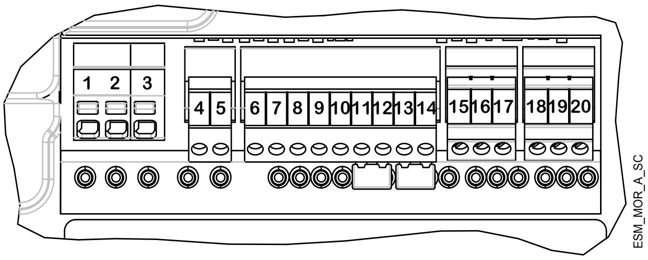
Control for constant pressure



Control to match a system curve

Intuitive and simple interface: You can control the unit from just three buttons, with an easy to read display for parameters and alarms, designed for complete control of system operation.

(1) Communication LED
(2) Power on LED
(3) Unit of measure LED
(4) Speed LED bar
(5) Status LED
(6) Numeric display
(7) ⊖ decrease key
(8) ⏻ on/off and menu key
(9) ⊕ increase key



Terminal block
e-SM drive has the following terminals::
1, 2, 3 = Power supply (⏚, L, N)
4, 5 = Fault signal (NO) - (Ext V_{max}<250 VAC - I_{max}<2A)
6 = Auxiliary voltage supply +15 VDC
7, 8 = Analog 0-10V
9 = Power supply external sensor +15 VDC
10 = External sensor 4-20 mA input
11, 12 = External start/stop
13, 14 = External lack of water
15, 16, 17 = Communication bus RS485, protocol Modbus and BACnet
18, 19, 20 = Communication bus RS485, enabled via dedicated module

SMB BOOSTER SETS SERIES
CONTROL PANEL

Control and protection panel for electric pumps with integrated frequency converters:

- power supply **single-phase 1x230 V** +/-10%, 50/60Hz (SMB.../M2)

- **IP55** protection (the IP65 degree is optional (SMB.../IP65))

- Polycarbonate material with clear door.

Main characteristics:
- Automatic switch with thermal magnetic protection for each e-SM drive frequency converter.
- Protection against dry running.
  Protection against dry running activates when the water reserve falls below the minimum level guaranteed for suction. The level can be checked using a float switch, a minimum pressure switch, an external contact, or level probes. For the latter, the probes must be connected to the adjustable sensitivity electronic module. The control panel is already preset for the installation of this module.

On request, CP version free contact for fault diagnostic status, for each frequency converter. Electrical contact normally open.

For booster sets requiring a wall mounted control panel (SMB.../WM), the panel is supplied with 5 metre cables.
Other options available:

- SMB.../CP
- SMB.../PA
- SMB.../PE
- SMB.../RE
- SMB.../VA

See the option description on page 16.

Control panel for two electric pumps QESM20 series

Control panel for three electric pumps QESM30 series

SMB BOOSTER SETS SERIES
MAIN COMPONENTS

- **Main on-off valves** at the suction and delivery of each electric pump, ball type.

- **Non return valve** on the delivery of each electric pump, spring type.

- **Suction manifold** with threaded ends. Threaded fitting for filling the booster set.

- **Delivery manifold** with threaded ends. It has R1” threaded fittings with corresponding caps, for connection with diaphragm expansion vessels (hydro tube).

- **Pressure gauge and transmitters** for control, installed on the delivery manifold of the set.

- **Control** panel.

- **Various fittings** for the connections.

- **Support base** for the pump set and control panel bracket.

- **Vibration dampers** sized depending on the set. In some sets, vibration dampers are provided not assembled; installation is care of the customer.

Versions available

Manifolds, valves, flanges, base and main components made of AISI 304 or AISI 316 stainless steel;
versions:
SMB.../A304, SMB.../B304, SMB.../C304,
SMB.../A316, SMB.../B316, SMB.../C316
Available in the Z version.

Accessories on request:

- Devices **for protection against dry running** in one of the following versions:
  - float switch
  - package including module and level probes with electrodes.
  - minimum pressure switch
- **Diaphragm expansion vessel kit**
  Hydrotube with on-off valve, depending on the maximum head of the pump:
  - 24 lt, 8 bar hydro tube kit
  - 24 lt, 10 bar hydro tube kit
  - 24 lt, 16 bar hydro tube kit
  - 20 lt, 25 bar hydro tube kit

SPECIAL EQUIPMENT ON REQUEST
(Contact the Sales and Technical Assistance Service)

- Sets with special valves.
- Sets with stainless steel expansion vessels.

SMB series booster sets with e-SV Smart, VM Smart, e-HM Smart series pumps are certified for use with drinking water according to WRAS and ACS standards, and with Italian Ministry Decree no. 174.

SMB BOOSTER SETS SERIES MATERIAL TABLE

DENOMINATION	SMB... (STANDARD)	SMB.../A304	SMB.../A316
Manifolds	AISI 304	AISI 304	AISI 316
On-off valves	Nickel-plated brass	AISI 316	AISI 316
Non-return valves	Brass	AISI 304	AISI 316
Pressure switches	Galvanized steel/AISI 301	AISI 301	AISI 301
Pressure transmitters	AISI 304	AISI 304	AISI 304
Caps/plugs/flanges	AISI 304 / 316	AISI 304 / 316	AISI 316
Fittings	AISI 304 / 316	AISI 316	AISI 316
Bracket	Galvanized/painted steel	Galvanized/painted steel	Galvanized/painted steel
Base	Painted steel	Painted steel	Painted steel

g_smb_wad-en_a_tm

SMB BOOSTER SETS SERIES WORKING LIMITS

The input pressure of the pump, added to the pressure with the port shut off, must not exceed the maximum permitted operating pressure (PN) of the set.

Permitted liquids	Water without gases and corrosive and/or aggressive substances.
Fluid temperature	-10°C to + 80 °C
Ambient temperature	0°C to + 40 °C
Maximum operating pressure*	Max 16 bar
Minimum input pressure	In line with the NPSH curve and the losses, with a margin of at least 0,5 m
Maximum input pressure	The input pressure added to the pump pressure without flow must be lower than the maximum operating pressure of the set.
Installation	Internal environment protected from atmospheric agents. Away from heat sources. Max altitude 1000 a.s.l. Max humidity 50%, without condensation.
Sound emission	See table

* Higher PN available on request depending on pump type

smb_2p-en_a_ti

SOUND EMISSION LEVELS

3600 min^{-1}			LpA (dB ±2)**	
P2 (kW)	IEC*(HME, VME)	IEC* (SVE)	SMB20	SMB30
0,37	80	90R	< 70	< 70
0,55	80	90R	< 70	< 70
0,75	80	90R	< 70	< 70
1,1	80	90R	< 70	< 70
1,5	80	90R	< 70	< 70

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

SMB_2p-en_a_tr

** Noise value of the electric motor only.

ELECTRIC PUMP e-SVE SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	6,7	13,3	20,0	26,7	33,3	40,0	46,7
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	0,4	0,8	1,2	1,6	2,0	2,4	2,8
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1SVE05..003	0,37	ESM90R/103 SVE	1 x 0.49	2,24	44,7	45,0	45,2	44,6	41,5	35,0	28,1	20,8
1SVE08..005	0,55	ESM90R/105 SVE	1 x 0,68	3,07	71,5	72,0	72,3	71,2	62,3	52,0	41,2	29,6
1SVE11..007	0,75	ESM90R/107 SVE	1 x 0,91	4,04	98,3	99,1	99,3	97,7	85,1	70,9	56,0	40,0
1SVE15..011	1,1	ESM90R/111 SVE	1 x 1,33	5,85	134,1	135,1	135,5	133,8	123,6	103,9	83,3	61,4

** PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	13,3	26,7	40,0	53,3	66,7	80,0	86,7
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	0,8	1,6	2,4	3,2	4,0	4,8	5,2
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3SVE03..003	0,37	ESM90R/103 SVE	1 x 0,49	2,24	33,4	33,7	33,6	30,7	24,9	19,5	14,0	10,9
3SVE05..005	0,55	ESM90R/105 SVE	1 x 0,69	3,08	55,7	56,2	55,8	46,3	37,1	28,4	19,5	14,4
3SVE07..007	0,75	ESM90R/107 SVE	1 x 0,92	4,06	77,9	78,7	77,2	63,4	50,7	38,6	26,0	18,7
3SVE09..011	1,1	ESM90R/111 SVE	1 x 1,33	5,85	100,2	101,0	100,5	88,8	72,5	56,4	39,9	31,2
3SVE11..015	1,5	ESM90R/115 SVE	1 x 1,78	7,80	122,5	123,3	122,5	117,9	98,4	78,0	57,2	46,3

** PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	23,3	46,7	70,0	93,3	116,7	140,0	166,7
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	1,4	2,8	4,2	5,6	7,0	8,4	10,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5SVE02..003	0,37	ESM90R/103 SVE	1 x 0,49	2,24	22,4	22,2	21,8	20,0	16,5	13,3	10,2	6,5
5SVE03..005	0,55	ESM90R/105 SVE	1 x 0,68	3,07	33,5	33,3	32,7	29,8	24,5	19,8	15,2	9,5
5SVE04..007	0,75	ESM90R/107 SVE	1 x 0,91	4,05	44,7	44,4	43,5	40,5	33,4	27,1	20,8	13,3
5SVE06..011	1,1	ESM90R/111 SVE	1 x 1,33	5,86	67,1	66,6	65,3	59,5	49,0	39,6	30,4	19,1
5SVE08..015	1,5	ESM90R/115 SVE	1 x 1,78	7,81	88,8	89,3	87,6	82,6	68,3	55,3	42,6	27,9

** PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	283,3
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	2,4	4,8	7,2	9,6	12,0	14,4	17,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10SVE01..005	0,55	ESM90R/105 SVE	1 x 0,68	3,07	17,3	17,3	16,9	16,2	13,6	10,4	7,1	3,3
10SVE02..007	0,75	ESM90R/107 SVE	1 x 0,92	4,09	24,2	23,9	23,1	21,7	19,3	14,6	9,7	3,6
10SVE02..011	1,1	ESM90R/111 SVE	1 x 1,33	5,85	34,8	34,5	33,7	32,3	27,7	22,4	17,1	11,0
10SVE03..015	1,5	ESM90R/115 SVE	1 x 1,78	7,81	52,7	52,2	51,0	46,1	38,1	30,8	23,5	15,1

Table refers to hydraulic performances with one pump running, max rpm, friction loss not included

g10_1-10sve-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

TABLE OF ELECTRIC MOTOR DATA

In the range 3000-3600 rpm the nominal motor power is guaranteed. Above 3600 rpm it isn't possible work and the motor is automatically limited; below 3000 rpm it works partially load.

P_N	MOTOR TYPE	IEC SIZE*	Construction Design	SPEED	INPUT CURRENT	DATA RELATED TO THE VOLTAGE OF 230V						
				(RPM)**	I (A)	In	cosφ	Tn	η %			IES
kW				min^{-1}	208-240 V	A		Nm	4/4	3/4	2/4	
0,37	ESM90R/103 SVE	90R	V18/B14	3000	2,28-1,99	2,08	0,95	1,18	81,3	79,1	74,3	2
				3600	2,30-2,02	2,10		0,98	80,6	77,5	72,0	
0,55	ESM90R/105 SVE	90R		3000	3,27-2,85	2,96	0,97	1,75	83,3	82,2	78,8	2
				3600	3,27-2,85	2,96		1,46	83,3	81,5	77,5	
0,75	ESM90R/107 SVE	90R		3000	4,43-3,84	4,00	0,98	2,39	83,3	83,3	81,5	2
				3600	4,38-3,79	3,94		1,99	84,5	83,5	80,6	
1,10	ESM90R/111 SVE	90R		3000	6,26-5,35	5,64	0,99	3,50	85,7	85,1	82,7	2
				3600	6,20-5,32	5,63		2,92	85,9	84,6	81,4	
1,50	ESM90R/115 SVE	90R		3000	8,57-7,32	7,69	0,99	4,77	85,6	85,7	84,7	2
				3600	8,42-7,25	7,62		3,98	86,3	85,9	84,0	

* R = Reduced size of motor casing as compared to shaft extension and flange.

eSV_Smart-motm_en_a_te

** The indicated rotational speed are representing the upper and lower limits of the rated power operational speed range.

ELECTRIC PUMP VME SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP TYPE VME Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	e-SM SET * P_1 kW	e-SM SET * I 208-240 V A	Q = DELIVERY l/min 0 / m³/h 0	6,7 / 0,4	13,3 / 0,8	20,0 / 1,2	26,7 / 1,6	33,3 / 2,0	40,0 / 2,4	50,0 / 3,0
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1VME02P03	0,37	ESM80/103 HM..	1 x 0,49	2,24	34,4	33,3	32,1	30,6	28,3	24,4	20,4	14,6
1VME04P05	0,55	ESM80/105 HM..	1 x 0,69	3,07	57,5	55,3	53,1	50,4	46,7	39,3	32,0	21,9
1VME05P07	0,75	ESM80/107 HM..	1 x 0,91	4,04	80,8	78,0	75,0	71,7	63,0	53,5	44,1	30,8
1VME06P11	1,1	ESM80/111 HM..	1 x 1,33	5,85	99,8	96,3	92,8	88,5	83,2	76,1	65,5	47,9

** PUMP TYPE VME Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	e-SM SET * P_1 kW	e-SM SET * I 208-240 V A	Q = DELIVERY l/min 0 / m³/h 0	13,3 / 0,8	26,7 / 1,6	40,0 / 2,4	53,3 / 3,2	66,7 / 4,0	80,0 / 4,8	86,7 / 5,2
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3VME02P03	0,37	ESM80/103 HM..	1 x 0,49	2,24	35,5	34,3	31,2	25,0	19,5	14,5	9,8	7,5
3VME03P05	0,55	ESM80/105 HM..	1 x 0,69	3,07	53,2	51,3	47,1	37,9	29,8	22,7	16,1	12,4
3VME04P07	0,75	ESM80/107 HM..	1 x 0,91	4,06	70,9	68,3	63,9	51,6	40,6	31,1	22,3	17,3
3VME05P11	1,1	ESM80/111 HM..	1 x 1,33	5,85	88,6	85,5	82,4	74,3	59,5	46,6	34,8	28,8
3VME06P15	1,5	ESM80/115 HM..	1 x 1,78	7,78	100,5	96,8	93,2	86,6	77,0	64,1	49,3	42,0

** PUMP TYPE VME Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	e-SM SET * P_1 kW	e-SM SET * I 208-240 V A	Q = DELIVERY l/min 0 / m³/h 0	20,0 / 1,2	40,0 / 2,4	60,0 / 3,6	80,0 / 4,8	100,0 / 6,0	120,0 / 7,2	140,0 / 8,4
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5VME02P05	0,55	ESM80/105 HM..	1 x 0,69	3,07	36,3	34,8	33,4	29,1	23,4	18,7	14,1	8,9
5VME03P07	0,75	ESM80/107 HM..	1 x 0,92	4,06	54,2	52,4	49,8	39,9	32,5	25,8	18,8	11,5
5VME04P11	1,1	ESM80/111 HM..	1 x 1,33	5,85	72,3	69,9	66,3	57,8	47,4	38,2	28,6	18,6
5VME05P15	1,5	ESM80/115 HM..	1 x 1,78	7,80	90,4	87,4	82,9	77,9	64,2	52,3	40,1	27,3

** PUMP TYPE VME Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	e-SM SET * P_1 kW	e-SM SET * I 208-240 V A	Q = DELIVERY l/min 0 / m³/h 0	40,0 / 2,4	80,0 / 4,8	120,0 / 7,2	160,0 / 9,6	200,0 / 12,0	240,0 / 14,4	283,3 / 17,0
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10VME01P07	0,75	ESM80/107 HM..	1 x 0,91	4,04	22,6	22,2	21,2	20,0	16,6	13,5	10,4	6,8
10VME02P11	1,1	ESM80/111 HM..	1 x 1,34	5,86	38,0	37,2	35,4	30,7	24,7	19,2	13,4	6,7

Table refers to hydraulic performances with one pump running, max rpm, friction loss not included

g10_1-10vme-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see technical catalogue of single electric pump

TABLE OF ELECTRIC MOTOR DATA

In the range 3000-3600 rpm the nominal motor power is guaranteed. Above 3600 rpm it isn't possible work and the motor is automatically limited; below 3000 rpm it works partially load.

P_N kW	MOTOR TYPE	IEC SIZE	Construction Design	SPEED (RPM) min^{-1}	INPUT CURRENT I (A) 208-240 V	DATA RELATED TO THE VOLTAGE OF 230V In A	cosφ	Tn Nm	η % 4/4	η % 3/4	η % 2/4	IES
0,37	ESM80/103 HM..	80	SPECIAL	3000	2,28-1,99	2,08	0,95	1,18	81,3	79,1	74,3	2
				3600	2,30-2,02	2,10		0,98	80,6	77,5	72,0	
0,55	ESM80/105 HM..	80		3000	3,27-2,85	2,96	0,97	1,75	83,3	82,2	78,8	2
				3600	3,27-2,85	2,96		1,46	83,3	81,5	77,5	
0,75	ESM80/107 HM..	80		3000	4,43-3,84	4,00	0,98	2,39	83,3	83,3	81,5	2
				3600	4,38-3,79	3,94		1,99	84,5	83,5	80,6	
1,10	ESM80/111 HM..	80		3000	6,26-5,35	5,64	0,99	3,50	85,7	85,1	82,7	2
				3600	6,20-5,32	5,63		2,92	85,9	84,6	81,4	
1,50	ESM80/115 HM..	80		3000	8,57-7,32	7,69	0,99	4,77	85,6	85,7	84,7	2
				3600	8,42-7,25	7,62		3,98	86,3	85,9	84,0	

* The indicated rotational speed are representing the upper and lower limits of the rated power operational speed range.

eHM-eVM_Smart-motm_en_a_te

ELECTRIC PUMP e-HME SERIES
TABLE OF HYDRAULIC PERFORMANCE

PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	6,7	13,3	20,0	26,7	33,3	40,0	46,7
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	0,4	0,8	1,2	1,6	2,0	2,4	2,8
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1HME05S03	0,37	ESM80/103 HM..	1 x 0,49	2,24	44,7	44,8	44,9	44,1	39,2	32,5	25,7	18,9
1HME08S05	0,55	ESM80/105 HM..	1 x 0,69	3,07	71,6	71,5	71,7	70,4	60,3	50,0	39,6	29,0
1HME11S07	0,75	ESM80/107 HM..	1 x 0,91	4,04	98,5	98,5	98,8	94,3	80,7	66,8	52,9	38,6
1HME15S11	1,1	ESM80/111 HM..	1 x 1,33	5,85	134,0	134,4	134,6	132,3	119,5	99,5	79,6	59,6
1HME17S15	1,5	ESM80/115 HM..	1 x 1,77	7,77	151,8	152,2	152,7	149,6	141,6	128,6	110,7	87,2

PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	13,3	26,7	40,0	53,3	66,7	80,0	86,7
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	0,8	1,6	2,4	3,2	4,0	4,8	5,2
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3HME03S03	0,37	ESM80/103 HM..	1 x 0,49	2,24	33,3	33,9	33,4	31,5	25,6	20,1	14,6	11,8
3HME05S05	0,55	ESM80/105 HM..	1 x 0,69	3,07	55,5	56,5	55,7	47,5	38,2	29,4	20,5	16,0
3HME07S07	0,75	ESM80/107 HM..	1 x 0,91	4,06	77,6	79,1	78,1	64,9	52,0	39,8	27,5	21,3
3HME09S11	1,1	ESM80/111 HM..	1 x 1,33	5,85	99,8	101,8	100,3	93,6	76,1	59,6	43,0	34,7
3HME12S15	1,5	ESM80/115 HM..	1 x 1,78	7,80	133,1	135,9	133,6	127,3	103,6	81,5	59,2	48,1

PUMP	MOTOR		e-SM SET		Q = DELIVERY							
TYPE				* I	l/min 0	23,3	46,7	70,0	93,3	116,7	140,0	170,0
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	1,4	2,8	4,2	5,6	7,0	8,4	10,2
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5HME02S03	0,37	ESM80/103 HM..	1 x 0,49	2,24	22,2	22,4	21,9	19,8	16,2	13,0	9,9	6,0
5HME03S05	0,55	ESM80/105 HM..	1 x 0,69	3,07	33,3	33,6	32,9	29,5	24,1	19,3	14,7	8,8
5HME04S07	0,75	ESM80/107 HM..	1 x 0,91	4,05	44,4	44,7	43,8	40,1	32,8	26,4	20,2	12,2
5HME06S11	1,1	ESM80/111 HM..	1 x 1,33	5,85	66,7	67,2	65,8	59,0	48,1	38,7	29,5	17,5
5HME08S15	1,5	ESM80/115 HM..	1 x 1,78	7,82	88,9	89,5	87,7	80,2	65,5	52,8	40,4	24,4

PUMP	MOTOR		SMB10 SET		Q = DELIVERY							
TYPE				* I	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	283,3
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	2,4	4,8	7,2	9,6	12,0	14,4	17,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10HME01S07	0,75	ESM80/107 HM..	1 x 0,86	3,80	17,5	17,5	17,0	16,1	14,7	12,7	10,2	6,6
10HME02S11	1,1	ESM80/111 HM..	1 x 1,33	5,85	34,8	34,9	33,8	32,3	27,2	21,9	16,6	11,1
10HME03S15	1,5	ESM80/115 HM..	1 x 1,78	7,81	52,4	51,8	50,6	46,9	39,2	32,2	25,3	17,8

Table refers to hydraulic performances with one pump running, max rpm, friction loss not included g10_1-10hmes-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see technical catalogue of single electric pump

TABLE OF ELECTRIC MOTOR DATA

In the range 3000-3600 rpm the nominal motor power is guaranteed. Above 3600 rpm it isn't possible work and the motor is automatically limited; below 3000 rpm it works partially load.

P_N	MOTOR TYPE	IEC SIZE	Construction Design	SPEED	INPUT CURRENT	DATA RELATED TO THE VOLTAGE OF 230V						
				(RPM)	I (A)	In	cosφ	Tn	η %			IES
kW				min^{-1}	208-240 V	A		Nm	4/4	3/4	2/4	
0,37	ESM80/103 HM..	80	SPECIAL	3000	2,28-1,99	2,08	0,95	1,18	81,3	79,1	74,3	2
				3600	2,30-2,02	2,10		0,98	80,6	77,5	72,0	
0,55	ESM80/105 HM..	80		3000	3,27-2,85	2,96	0,97	1,75	83,3	82,2	78,8	2
				3600	3,27-2,85	2,96		1,46	83,3	81,5	77,5	
0,75	ESM80/107 HM..	80		3000	4,43-3,84	4,00	0,98	2,39	83,3	83,3	81,5	2
				3600	4,38-3,79	3,94		1,99	84,5	83,5	80,6	
1,10	ESM80/111 HM..	80		3000	6,26-5,35	5,64	0,99	3,50	85,7	85,1	82,7	2
				3600	6,20-5,32	5,63		2,92	85,9	84,6	81,4	
1,50	ESM80/115 HM..	80		3000	8,57-7,32	7,69	0,99	4,77	85,6	85,7	84,7	2
				3600	8,42-7,25	7,62		3,98	86,3	85,9	84,0	

* The indicated rotational speed are representing the upper and lower limits of the rated power operational speed range. eHM-eVM_Smart-motm_en_a_te

SMB20/..SVE BOOSTER SETS SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP TYPE SVE Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	SMB20 SET * P_1 kW	SMB20 SET * I 208-240 V A	l/min 0 / m³/h 0	13,3 / 0,8	26,7 / 1,6	40,0 / 2,4	53,3 / 3,2	66,7 / 4,0	80,0 / 4,8	93,3 / 5,6
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1SVE05..003	0,37	ESM90R/103 SVE	2 x 0.49	4,48	44,7	45,0	45,2	44,6	41,5	35,0	28,1	20,8
1SVE08..005	0,55	ESM90R/105 SVE	2 x 0,68	6,14	71,5	72,0	72,3	71,2	62,3	52,0	41,2	29,6
1SVE11..007	0,75	ESM90R/107 SVE	2 x 0,91	8,08	98,3	99,1	99,3	97,7	85,1	70,9	56,0	40,0
1SVE15..011	1,1	ESM90R/111 SVE	2 x 1,33	11,70	134,1	135,1	135,5	133,8	123,6	103,9	83,3	61,4

** PUMP TYPE SVE Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	SMB20 SET * P_1 kW	SMB20 SET * I 208-240 V A	l/min 0 / m³/h 0	26,7 / 1,6	53,3 / 3,2	80,0 / 4,8	106,7 / 6,4	133,3 / 8,0	160,0 / 9,6	173,3 / 10,4
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3SVE03..003	0,37	ESM90R/103 SVE	2 x 0,49	4,48	33,4	33,7	33,6	30,7	24,9	19,5	14,0	10,9
3SVE05..005	0,55	ESM90R/105 SVE	2 x 0,69	6,16	55,7	56,2	55,8	46,3	37,1	28,4	19,5	14,4
3SVE07..007	0,75	ESM90R/107 SVE	2 x 0,92	8,12	77,9	78,7	77,2	63,4	50,7	38,6	26,0	18,7
3SVE09..011	1,1	ESM90R/111 SVE	2 x 1,33	11,70	100,2	101,0	100,5	88,8	72,5	56,4	39,9	31,2
3SVE11..015	1,5	ESM90R/115 SVE	2 x 1,78	15,60	122,5	123,3	122,5	117,9	98,4	78,0	57,2	46,3

** PUMP TYPE SVE Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	SMB20 SET * P_1 kW	SMB20 SET * I 208-240 V A	l/min 0 / m³/h 0	46,7 / 2,8	93,3 / 5,6	140,0 / 8,4	186,7 / 11,2	233,3 / 14,0	280,0 / 16,8	333,3 / 20,0
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5SVE02..003	0,37	ESM90R/103 SVE	2 x 0,49	4,48	22,4	22,2	21,8	20,0	16,5	13,3	10,2	6,5
5SVE03..005	0,55	ESM90R/105 SVE	2 x 0,68	6,14	33,5	33,3	32,7	29,8	24,5	19,8	15,2	9,5
5SVE04..007	0,75	ESM90R/107 SVE	2 x 0,91	8,10	44,7	44,4	43,5	40,5	33,4	27,1	20,8	13,3
5SVE06..011	1,1	ESM90R/111 SVE	2 x 1,33	11,72	67,1	66,6	65,3	59,5	49,0	39,6	30,4	19,1
5SVE08..015	1,5	ESM90R/115 SVE	2 x 1,78	15,62	88,8	89,3	87,6	82,6	68,3	55,3	42,6	27,9

** PUMP TYPE SVE Single-phase	MOTOR P_N kW	MOTOR TYPE 1x230 V	SMB20 SET * P_1 kW	SMB20 SET * I 208-240 V A	l/min 0 / m³/h 0	80,0 / 4,8	160,0 / 9,6	240,0 / 14,4	320,0 / 19,2	400,0 / 24,0	480,0 / 28,8	566,7 / 34,0
					H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10SVE01..005	0,55	ESM90R/105 SVE	2 x 0,68	6,14	17,3	17,3	16,9	16,2	13,6	10,4	7,1	3,3
10SVE02..007	0,75	ESM90R/107 SVE	2 x 0,92	8,18	24,2	23,9	23,1	21,7	19,3	14,6	9,7	3,6
10SVE02..011	1,1	ESM90R/111 SVE	2 x 1,33	11,70	34,8	34,5	33,7	32,3	27,7	22,4	17,1	11,0
10SVE03..015	1,5	ESM90R/115 SVE	2 x 1,78	15,62	52,7	52,2	51,0	46,1	38,1	30,8	23,5	15,1

Table refers to hydraulic performances with two pumps running, max rpm, friction loss not included

g20_1-10sve-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

SMB20/..VME BOOSTER SETS SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY								
TYPE				* I	l/min 0	13,3	26,7	40,0	53,3	66,7	80,0	100,0	
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	0,8	1,6	2,4	3,2	4,0	4,8	6,0	
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER								
1VME02P03	0,37	ESM80/103 HM..	2 x 0,49	4,48	34,4	33,3	32,1	30,6	28,3	24,4	20,4	14,6	
1VME04P05	0,55	ESM80/105 HM..	2 x 0,69	6,14	57,5	55,3	53,1	50,4	46,7	39,3	32,0	21,9	
1VME05P07	0,75	ESM80/107 HM..	2 x 0,91	8,08	80,8	78,0	75,0	71,7	63,0	53,5	44,1	30,8	
1VME06P11	1,1	ESM80/111 HM..	2 x 1,33	11,70	99,8	96,3	92,8	88,5	83,2	76,1	65,5	47,9	

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	26,7	53,3	80,0	106,7	133,3	160,0	173,3
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	1,6	3,2	4,8	6,4	8,0	9,6	10,4
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3VME02P03	0,37	ESM80/103 HM..	2 x 0,49	4,48	35,5	34,3	31,2	25,0	19,5	14,5	9,8	7,5
3VME03P05	0,55	ESM80/105 HM..	2 x 0,69	6,14	53,2	51,3	47,1	37,9	29,8	22,7	16,1	12,4
3VME04P07	0,75	ESM80/107 HM..	2 x 0,91	8,12	70,9	68,3	63,9	51,6	40,6	31,1	22,3	17,3
3VME05P11	1,1	ESM80/111 HM..	2 x 1,33	11,70	88,6	85,5	82,4	74,3	59,5	46,6	34,8	28,8
3VME06P15	1,5	ESM80/115 HM..	2 x 1,78	15,56	100,5	96,8	93,2	86,6	77,0	64,1	49,3	42,0

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	280,0
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	2,4	4,8	7,2	9,6	12,0	14,4	16,8
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5VME02P05	0,55	ESM80/105 HM..	2 x 0,69	6,14	36,3	34,8	33,4	29,1	23,4	18,7	14,1	8,9
5VME03P07	0,75	ESM80/107 HM..	2 x 0,92	8,12	54,2	52,4	49,8	39,9	32,5	25,8	18,8	11,5
5VME04P11	1,1	ESM80/111 HM..	2 x 1,33	11,70	72,3	69,9	66,3	57,8	47,4	38,2	28,6	18,6
5VME05P15	1,5	ESM80/115 HM..	2 x 1,78	15,60	90,4	87,4	82,9	77,9	64,2	52,3	40,1	27,3

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	80,0	160,0	240,0	320,0	400,0	480,0	566,7
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	4,8	9,6	14,4	19,2	24,0	28,8	34,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10VME01P07	0,75	ESM80/107 HM..	2 x 0,91	8,08	22,6	22,2	21,2	20,0	16,6	13,5	10,4	6,8
10VME02P11	1,1	ESM80/111 HM..	2 x 1,34	11,72	38,0	37,2	35,4	30,7	24,7	19,2	13,4	6,7

Table refers to hydraulic performances with two pumps running, max rpm, friction loss not included

g20_1-10vme-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

SMB20/..HME BOOSTER SETS SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	13,3	26,7	40,0	53,3	66,7	80,0	93,3
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	0,8	1,6	2,4	3,2	4,0	4,8	5,6
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1HME05S03	0,37	ESM80/103 HM..	2 x 0,49	4,48	44,7	44,8	44,9	44,1	39,2	32,5	25,7	18,9
1HME08S05	0,55	ESM80/105 HM..	2 x 0,69	6,14	71,6	71,5	71,7	70,4	60,3	50,0	39,6	29,0
1HME11S07	0,75	ESM80/107 HM..	2 x 0,91	8,08	98,5	98,5	98,8	94,3	80,7	66,8	52,9	38,6
1HME15S11	1,1	ESM80/111 HM..	2 x 1,33	11,70	134,0	134,4	134,6	132,3	119,5	99,5	79,6	59,6
1HME17S15	1,5	ESM80/115 HM..	2 x 1,77	15,54	151,8	152,2	152,7	149,6	141,6	128,6	110,7	87,2

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	26,7	53,3	80,0	106,7	133,3	160,0	173,3
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	1,6	3,2	4,8	6,4	8,0	9,6	10,4
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3HME03S03	0,37	ESM80/103 HM..	2 x 0,49	4,48	33,3	33,9	33,4	31,5	25,6	20,1	14,6	11,8
3HME05S05	0,55	ESM80/105 HM..	2 x 0,69	6,14	55,5	56,5	55,7	47,5	38,2	29,4	20,5	16,0
3HME07S07	0,75	ESM80/107 HM..	2 x 0,91	8,12	77,6	79,1	78,1	64,9	52,0	39,8	27,5	21,3
3HME09S11	1,1	ESM80/111 HM..	2 x 1,33	11,70	99,8	101,8	100,3	93,6	76,1	59,6	43,0	34,7
3HME12S15	1,5	ESM80/115 HM..	2 x 1,78	15,60	133,1	135,9	133,6	127,3	103,6	81,5	59,2	48,1

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	46,7	93,3	140,0	186,7	233,3	280,0	340,0
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	2,8	5,6	8,4	11,2	14,0	16,8	20,4
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5HME02S03	0,37	ESM80/103 HM..	2 x 0,49	4,48	22,2	22,4	21,9	19,8	16,2	13,0	9,9	6,0
5HME03S05	0,55	ESM80/105 HM..	2 x 0,69	6,14	33,3	33,6	32,9	29,5	24,1	19,3	14,7	8,8
5HME04S07	0,75	ESM80/107 HM..	2 x 0,91	8,10	44,4	44,7	43,8	40,1	32,8	26,4	20,2	12,2
5HME06S11	1,1	ESM80/111 HM..	2 x 1,33	11,70	66,7	67,2	65,8	59,0	48,1	38,7	29,5	17,5
5HME08S15	1,5	ESM80/115 HM..	2 x 1,78	15,64	88,9	89,5	87,7	80,2	65,5	52,8	40,4	24,4

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	80,0	160,0	240,0	320,0	400,0	480,0	566,7
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m^3/h 0	4,8	9,6	14,4	19,2	24,0	28,8	34,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10HME01S07	0,75	ESM80/107 HM..	2 x 0,86	7,60	17,5	17,5	17,0	16,1	14,7	12,7	10,2	6,6
10HME02S11	1,1	ESM80/111 HM..	2 x 1,33	11,70	34,8	34,9	33,8	32,3	27,2	21,9	16,6	11,1
10HME03S15	1,5	ESM80/115 HM..	2 x 1,78	15,62	52,4	51,8	50,6	46,9	39,2	32,2	25,3	17,8

Table refers to hydraulic performances with two pumps running, max rpm, friction loss not included

g20_1-10hmes-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

SMB30/..SVE BOOSTER SETS SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	20,0	40,0	60,0	80,0	100,0	120,0	140,0
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	1,2	2,4	3,6	4,8	6,0	7,2	8,4
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1SVE05..003	0,37	ESM90R/103 SVE	3 x 0.49	6,72	44,7	45,0	45,2	44,6	41,5	35,0	28,1	20,8
1SVE08..005	0,55	ESM90R/105 SVE	3 x 0.68	9,21	71,5	72,0	72,3	71,2	62,3	52,0	41,2	29,6
1SVE11..007	0,75	ESM90R/107 SVE	3 x 0.91	12,12	98,3	99,1	99,3	97,7	85,1	70,9	56,0	40,0
1SVE15..011	1,1	ESM90R/111 SVE	3 x 1.33	17,55	134,1	135,1	135,5	133,8	123,6	103,9	83,3	61,4

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	260,0
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	2,4	4,8	7,2	9,6	12,0	14,4	15,6
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3SVE03..003	0,37	ESM90R/103 SVE	3 x 0.49	6,72	33,4	33,7	33,6	30,7	24,9	19,5	14,0	10,9
3SVE05..005	0,55	ESM90R/105 SVE	3 x 0.69	9,24	55,7	56,2	55,8	46,3	37,1	28,4	19,5	14,4
3SVE07..007	0,75	ESM90R/107 SVE	3 x 0.92	12,18	77,9	78,7	77,2	63,4	50,7	38,6	26,0	18,7
3SVE09..011	1,1	ESM90R/111 SVE	3 x 1.33	17,55	100,2	101,0	100,5	88,8	72,5	56,4	39,9	31,2
3SVE11..015	1,5	ESM90R/115 SVE	3 x 1.78	23,40	122,5	123,3	122,5	117,9	98,4	78,0	57,2	46,3

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	70,0	140,0	210,0	280,0	350,0	420,0	500,0
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	4,2	8,4	12,6	16,8	21,0	25,2	30,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5SVE02..003	0,37	ESM90R/103 SVE	3 x 0.49	6,72	22,4	22,2	21,8	20,0	16,5	13,3	10,2	6,5
5SVE03..005	0,55	ESM90R/105 SVE	3 x 0.68	9,21	33,5	33,3	32,7	29,8	24,5	19,8	15,2	9,5
5SVE04..007	0,75	ESM90R/107 SVE	3 x 0.91	12,15	44,7	44,4	43,5	40,5	33,4	27,1	20,8	13,3
5SVE06..011	1,1	ESM90R/111 SVE	3 x 1.33	17,58	67,1	66,6	65,3	59,5	49,0	39,6	30,4	19,1
5SVE08..015	1,5	ESM90R/115 SVE	3 x 1.78	23,43	88,8	89,3	87,6	82,6	68,3	55,3	42,6	27,9

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	120,0	240,0	360,0	480,0	600,0	720,0	850,0
SVE	P_N	TYPE	* P_1	208-240 V	m^3/h 0	7,2	14,4	21,6	28,8	36,0	43,2	51,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10SVE01..005	0,55	ESM90R/105 SVE	3 x 0,68	9,21	17,3	17,3	16,9	16,2	13,6	10,4	7,1	3,3
10SVE02..007	0,75	ESM90R/107 SVE	3 x 0.92	12,27	24,2	23,9	23,1	21,7	19,3	14,6	9,7	3,6
10SVE02..011	1,10	ESM90R/111 SVE	3 x 1.33	17,55	34,8	34,5	33,7	32,3	27,7	22,4	17,1	11,0
10SVE03..015	1,5	ESM90R/115 SVE	3 x 1.78	23,43	52,7	52,2	51,0	46,1	38,1	30,8	23,5	15,1

Table refers to hydraulic performances with three pumps running, max rpm, friction loss not included

g30_1-10sve-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

SMB30/..VME BOOSTER SETS SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	20,0	40,0	60,0	80,0	100,0	120,0	150,0
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	1,2	2,4	3,6	4,8	6,0	7,2	9,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1VME02P03	0,37	ESM80/103 HM..	3 x 0,49	6,72	34,4	33,3	32,1	30,6	28,3	24,4	20,4	14,6
1VME04P05	0,55	ESM80/105 HM..	3 x 0,69	9,21	57,5	55,3	53,1	50,4	46,7	39,3	32,0	21,9
1VME05P07	0,75	ESM80/107 HM..	3 x 0,91	12,12	80,8	78,0	75,0	71,7	63,0	53,5	44,1	30,8
1VME06P11	1,1	ESM80/111 HM..	3 x 1,33	17,55	99,8	96,3	92,8	88,5	83,2	76,1	65,5	47,9

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	260,0
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	2,4	4,8	7,2	9,6	12,0	14,4	15,6
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3VME02P03	0,37	ESM80/103 HM..	3 x 0,49	6,72	35,5	34,3	31,2	25,0	19,5	14,5	9,8	7,5
3VME03P05	0,55	ESM80/105 HM..	3 x 0,69	9,21	53,2	51,3	47,1	37,9	29,8	22,7	16,1	12,4
3VME04P07	0,75	ESM80/107 HM..	3 x 0,91	12,18	70,9	68,3	63,9	51,6	40,6	31,1	22,3	17,3
3VME05P11	1,1	ESM80/111 HM..	3 x 1,33	17,55	88,6	85,5	82,4	74,3	59,5	46,6	34,8	28,8
3VME06P15	1,5	ESM80/115 HM..	3 x 1,78	23,34	100,5	96,8	93,2	86,6	77,0	64,1	49,3	42,0

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	60,0	120,0	180,0	240,0	300,0	360,0	420,0
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	3,6	7,2	10,8	14,4	18,0	21,6	25,2
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5VME02P05	0,55	ESM80/105 HM..	3 x 0,69	9,21	36,3	34,8	33,4	29,1	23,4	18,7	14,1	8,9
5VME03P07	0,75	ESM80/107 HM..	3 x 0,92	12,18	54,2	52,4	49,8	39,9	32,5	25,8	18,8	11,5
5VME04P11	1,1	ESM80/111 HM..	3 x 1,33	17,55	72,3	69,9	66,3	57,8	47,4	38,2	28,6	18,6
5VME05P15	1,5	ESM80/115 HM..	3 x 1,78	23,40	90,4	87,4	82,9	77,9	64,2	52,3	40,1	27,3

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	120,0	240,0	360,0	480,0	600,0	720,0	850,0
VME	P_N	TYPE	* P_1	208-240 V	m^3/h 0	7,2	14,4	21,6	28,8	36,0	43,2	51,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10VME01P07	0,75	ESM80/107 HM..	3 x 0,91	12,12	22,6	22,2	21,2	20,0	16,6	13,5	10,4	6,8
10VME02P11	1,1	ESM80/111 HM..	3 x 1,34	17,58	38,0	37,2	35,4	30,7	24,7	19,2	13,4	6,7

Table refers to hydraulic performances with three pumps running, max rpm, friction loss not included

g30_1-10vme-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

SMB30/..HME BOOSTER SETS SERIES
TABLE OF HYDRAULIC PERFORMANCE

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	20,0	40,0	60,0	80,0	100,0	120,0	140,0
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m³/h 0	1,2	2,4	3,6	4,8	6,0	7,2	8,4
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
1HME05S03	0,37	ESM80/103 HM..	3 x 0,49	6,72	44,7	44,8	44,9	44,1	39,2	32,5	25,7	18,9
1HME08S05	0,55	ESM80/105 HM..	3 x 0,69	9,21	71,6	71,5	71,7	70,4	60,3	50,0	39,6	29,0
1HME11S07	0,75	ESM80/107 HM..	3 x 0,91	12,12	98,5	98,5	98,8	94,3	80,7	66,8	52,9	38,6
1HME15S11	1,1	ESM80/111 HM..	3 x 1,33	17,55	134,0	134,4	134,6	132,3	119,5	99,5	79,6	59,6
1HME17S15	1,5	ESM80/115 HM..	3 x 1,77	23,31	151,8	152,2	152,7	149,6	141,6	128,6	110,7	87,2

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	40,0	80,0	120,0	160,0	200,0	240,0	260,0
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m³/h 0	2,4	4,8	7,2	9,6	12,0	14,4	15,6
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
3HME03S03	0,37	ESM80/103 HM..	3 x 0,49	6,72	33,3	33,9	33,4	31,5	25,6	20,1	14,6	11,8
3HME05S05	0,55	ESM80/105 HM..	3 x 0,69	9,21	55,5	56,5	55,7	47,5	38,2	29,4	20,5	16,0
3HME07S07	0,75	ESM80/107 HM..	3 x 0,91	12,18	77,6	79,1	78,1	64,9	52,0	39,8	27,5	21,3
3HME09S11	1,1	ESM80/111 HM..	3 x 1,33	17,55	99,8	101,8	100,3	93,6	76,1	59,6	43,0	34,7
3HME12S15	1,5	ESM80/115 HM..	3 x 1,78	23,40	133,1	135,9	133,6	127,3	103,6	81,5	59,2	48,1

** PUMP	MOTOR		SMB30 SET		Q = DELIVERY							
TYPE				* I	l/min 0	70,0	140,0	210,0	280,0	350,0	420,0	510,0
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m³/h 0	4,2	8,4	12,6	16,8	21,0	25,2	30,6
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
5HME02S03	0,37	ESM80/103 HM..	3 x 0,49	6,72	22,2	22,4	21,9	19,8	16,2	13,0	9,9	6,0
5HME03S05	0,55	ESM80/105 HM..	3 x 0,69	9,21	33,3	33,6	32,9	29,5	24,1	19,3	14,7	8,8
5HME04S07	0,75	ESM80/107 HM..	3 x 0,91	12,15	44,4	44,7	43,8	40,1	32,8	26,4	20,2	12,2
5HME06S11	1,1	ESM80/111 HM..	3 x 1,33	17,55	66,7	67,2	65,8	59,0	48,1	38,7	29,5	17,5
5HME08S15	1,5	ESM80/115 HM..	3 x 1,78	23,46	88,9	89,5	87,7	80,2	65,5	52,8	40,4	24,4

** PUMP	MOTOR		SMB20 SET		Q = DELIVERY							
TYPE				* I	l/min 0	120,0	240,0	360,0	480,0	600,0	720,0	850,0
HME..S, HME..N	P_N	TYPE	* P_1	208-240 V	m³/h 0	7,2	14,4	21,6	28,8	36,0	43,2	51,0
Single-phase	kW	1x230 V	kW	A	H = TOTAL HEAD IN METRES OF COLUMN OF WATER							
10HME01S07	0,75	ESM80/107 HM..	3 x 0,86	11,40	17,5	17,5	17,0	16,1	14,7	12,7	10,2	6,6
10HME02S11	1,1	ESM80/111 HM..	3 x 1,33	17,55	34,8	34,9	33,8	32,3	27,2	21,9	16,6	11,1
10HME03S15	1,5	ESM80/115 HM..	3 x 1,78	23,43	52,4	51,8	50,6	46,9	39,2	32,2	25,3	17,8

Table refers to hydraulic performances with three pumps running, max rpm, friction loss not included

g30_1-10hmes-esm-2p50-en_a_th

* Maximum value in specified range: P1 = input power; I = input nominal current absorbed by set

** For technical details see see technical catalogue of single electric pump

Booster sets

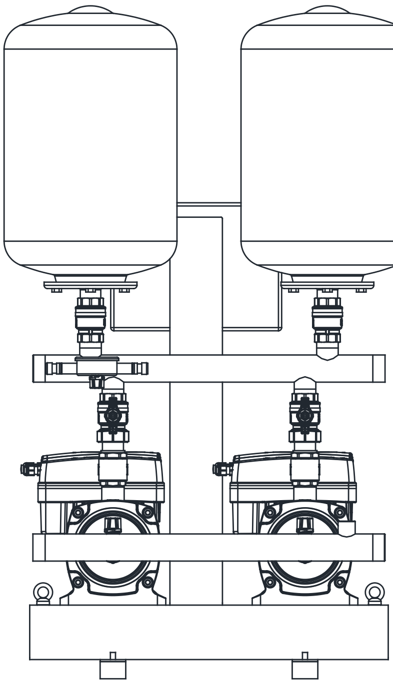
MARKET SECTORS
RESIDENTIAL, COMMERCIAL, INDUSTRIAL

SMB20 Series

APPLICATIONS

Water supply and pressure boosting in:

- apartments, villas, condominiums and residential buildings
- hotels, restaurants, spas
- various industrial applications

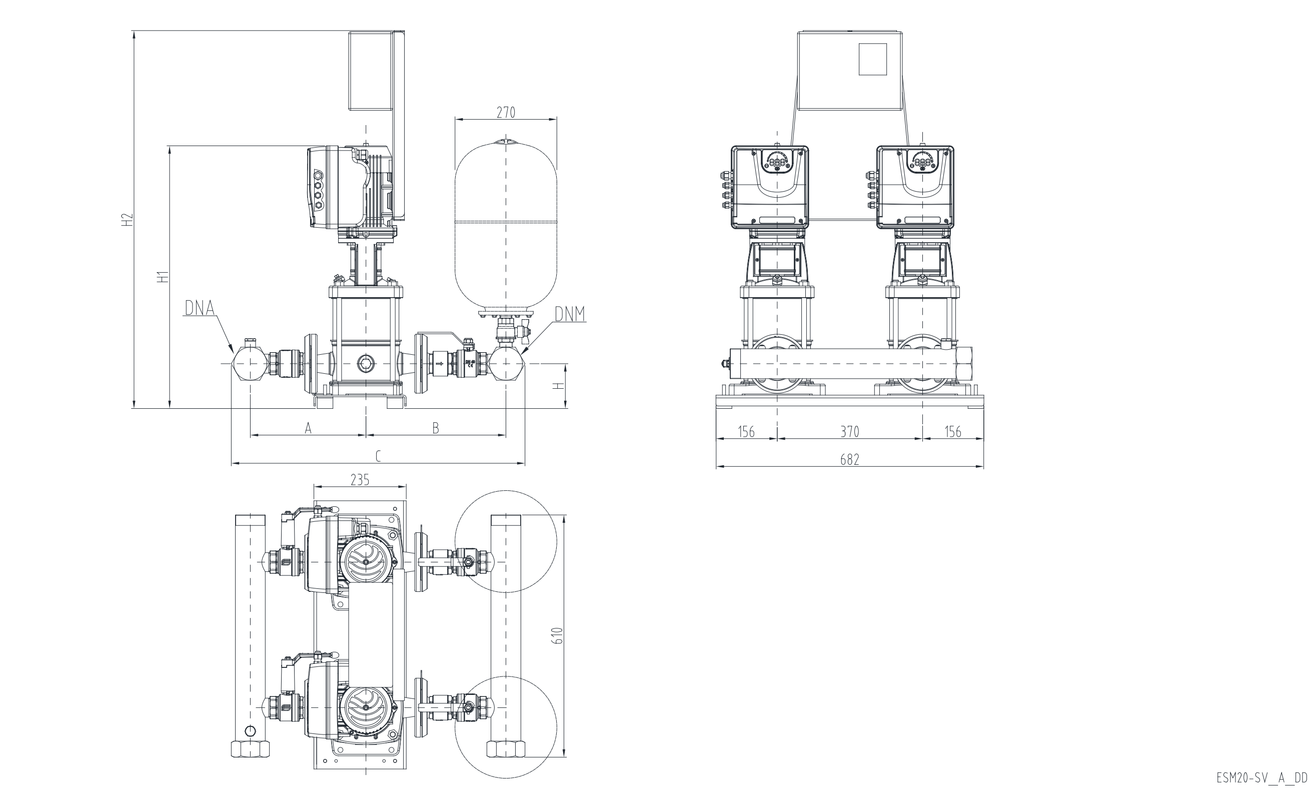


SPECIFICATIONS

- **e-SVE** vertical axis electric pump.
- **VME** vertical axis close-coupled threaded electric pump.
- **e-HME..S** horizontal axis electric pump.
- **Flow rate:** up to 34 m^3/h.
- **Maximum operating pressure:** max 16 bar.
- **Electric panel supply voltage:**
  - single-phase 1 x 230V ± 10% (SMB../M2).
- **Frequency**: 50Hz.
- **Protection class IP55 for:**
  - electrical control panel
  - electrical pump motor
  - e-SM drive frequency converter
- **Maximum electric pump power:** 2 x 1,5 kW.
- **Progressive motor start.**
- **Maximum pumped liquid temperature:**
  - up to 80 °C for SMB.../SVE
  - up to 80 °C for SMB.../VME
  - up to 80 °C for SMB.../HME..S

SMB series booster sets with e-SV Smart, VM Smart, e-HM Smart series pumps are certified for use with drinking water according to WRAS and ACS standards, and with Italian Ministry Decree no. 174.

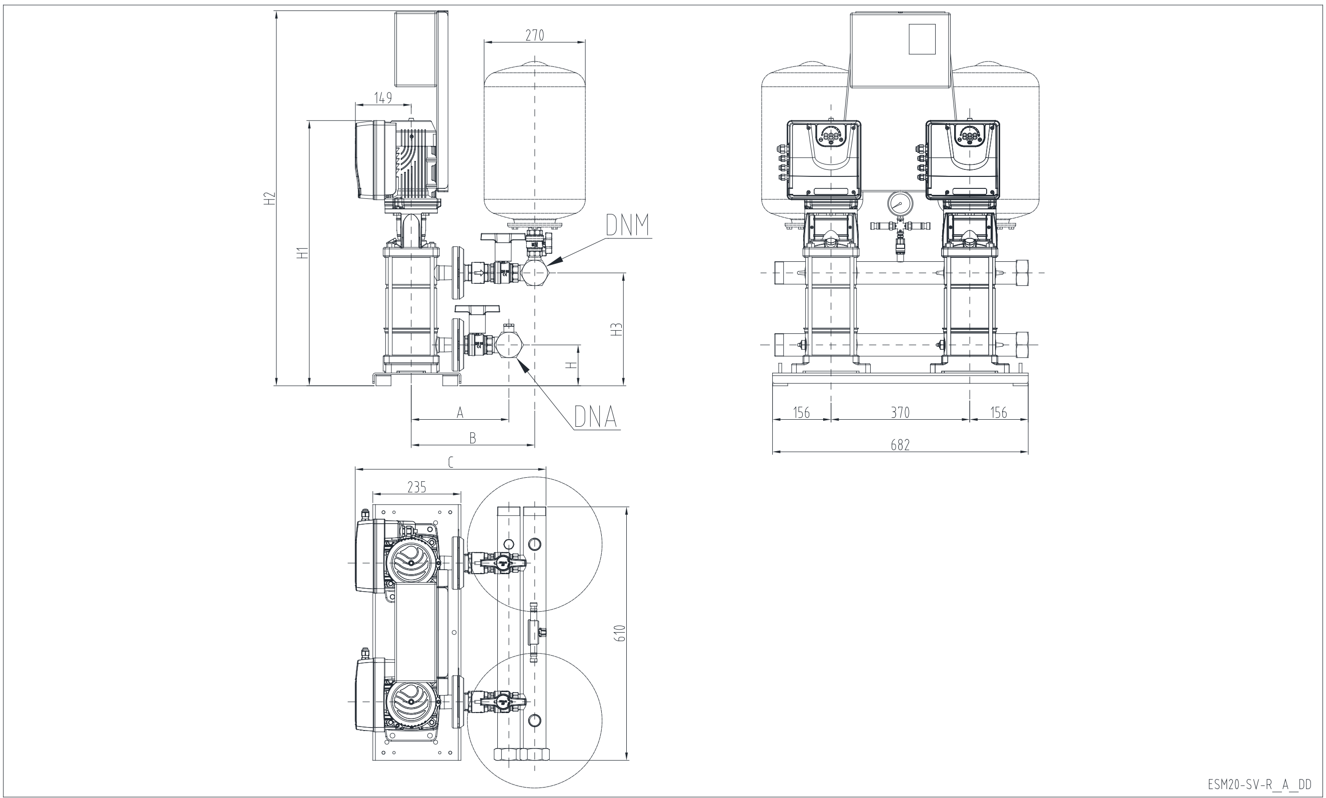
SET OF 2 PUMPS SVE..F SERIES
SINGLE-PHASE POWER SUPPLY (SMB20.../M2)



SMB 20	DNA	DNM	A		B		C		H	H1	H2
			STD	AISI	STD	AISI	STD	AISI			
1SVE05F003	R2"	R2"	265	257	311	363	636	680	109	614	901
1SVE08F005	R2"	R2"	265	257	311	363	636	680	109	674	961
1SVE11F007	R2"	R2"	265	257	311	363	636	680	109	734	1021
1SVE15F011	R2"	R2"	265	257	311	363	636	680	109	814	1101
3SVE03F003	R2"	R2"	265	257	311	363	636	680	109	574	861
3SVE05F005	R2"	R2"	265	257	311	363	636	680	109	614	901
3SVE07F007	R2"	R2"	265	257	311	363	636	680	109	654	941
3SVE09F011	R2"	R2"	265	257	311	363	636	680	109	694	981
3SVE11F015	R2"	R2"	265	257	311	363	636	680	109	734	1021
5SVE02F003	R2"	R2"	269	267	329	387	658	714	109	564	851
5SVE03F005	R2"	R2"	269	267	329	387	658	714	109	589	876
5SVE04F007	R2"	R2"	269	267	329	387	658	714	109	614	901
5SVE06F011	R2"	R2"	269	267	329	387	658	714	109	664	951
5SVE08F015	R2"	R2"	269	267	329	387	658	714	109	714	1001
10SVE01F005	R2"1/2	R2"1/2	294	301	356	453	726	830	114	643	930
10SVE02F007	R2"1/2	R2"1/2	294	301	356	453	726	830	114	643	930
10SVE02F011	R2"1/2	R2"1/2	294	301	356	453	726	830	114	643	930
10SVE03F015	R2"1/2	R2"1/2	294	301	356	453	726	830	114	675	962

Dimensions in mm. ± 10 mm tolerance range. smb20-sv-f_a_td

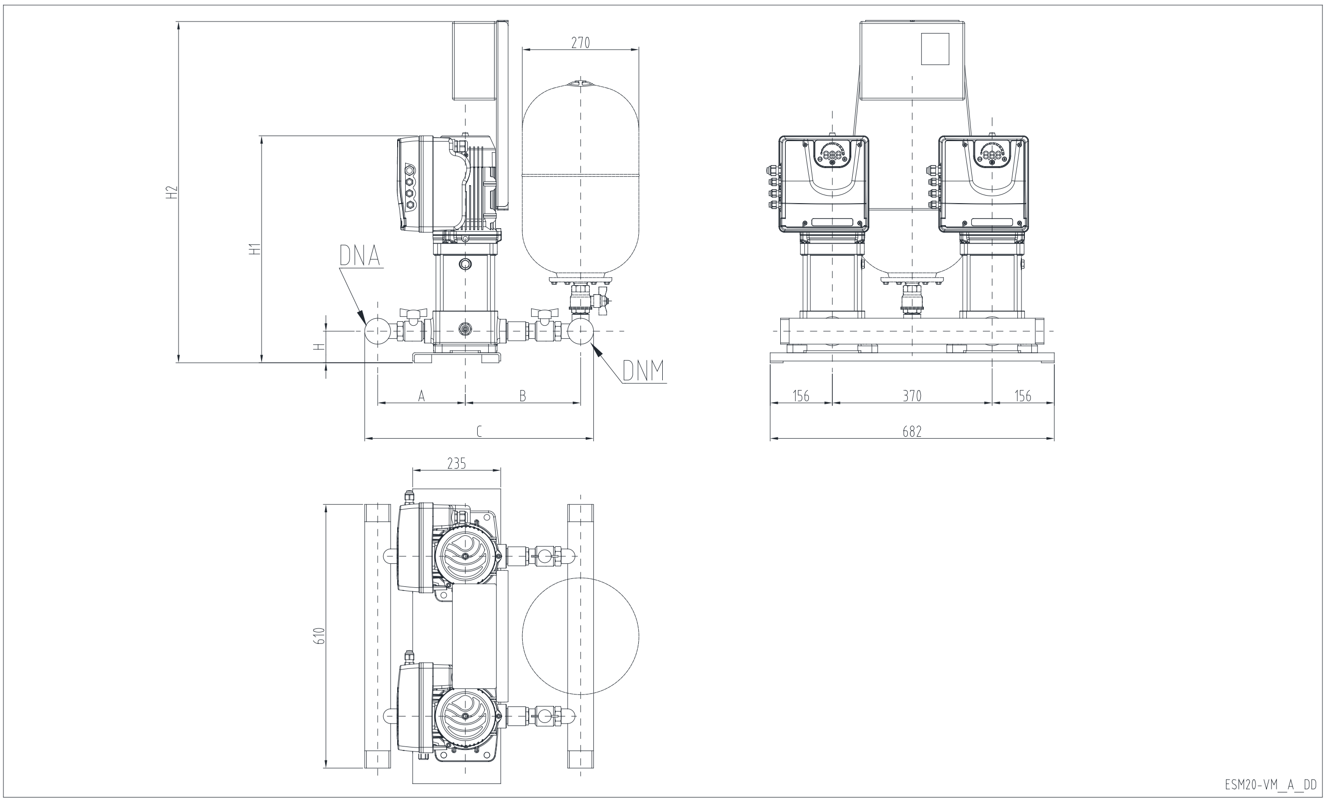
SET OF 2 PUMPS SVE..R SERIES
SINGLE-PHASE POWER SUPPLY (SMB20.../M2)



SMB 20	DNA	DNM	A		B		C		H	H1	H2	H3
			STD	AISI	STD	AISI	STD	AISI				
1SVE08R005	R2"	R2"	265	257	311	363	490	542	109	674	961	261
1SVE11R007	R2"	R2"	265	257	311	363	490	542	109	734	1021	321
1SVE15R011	R2"	R2"	265	257	311	363	490	542	109	814	1101	401
3SVE07R007	R2"	R2"	265	257	311	363	490	542	109	654	941	241
3SVE09R011	R2"	R2"	265	257	311	363	490	542	109	694	981	281
3SVE11R015	R2"	R2"	265	257	311	363	490	542	109	734	1021	301
5SVE08R015	R2"	R2"	269	267	329	387	508	566	109	714	1001	301

Dimensions in mm. ± 10 mm tolerance range. smb20-sv-r_a_td

SET OF 2 PUMPS VME SERIES
SINGLE-PHASE POWER SUPPLY (SMB20.../M2)

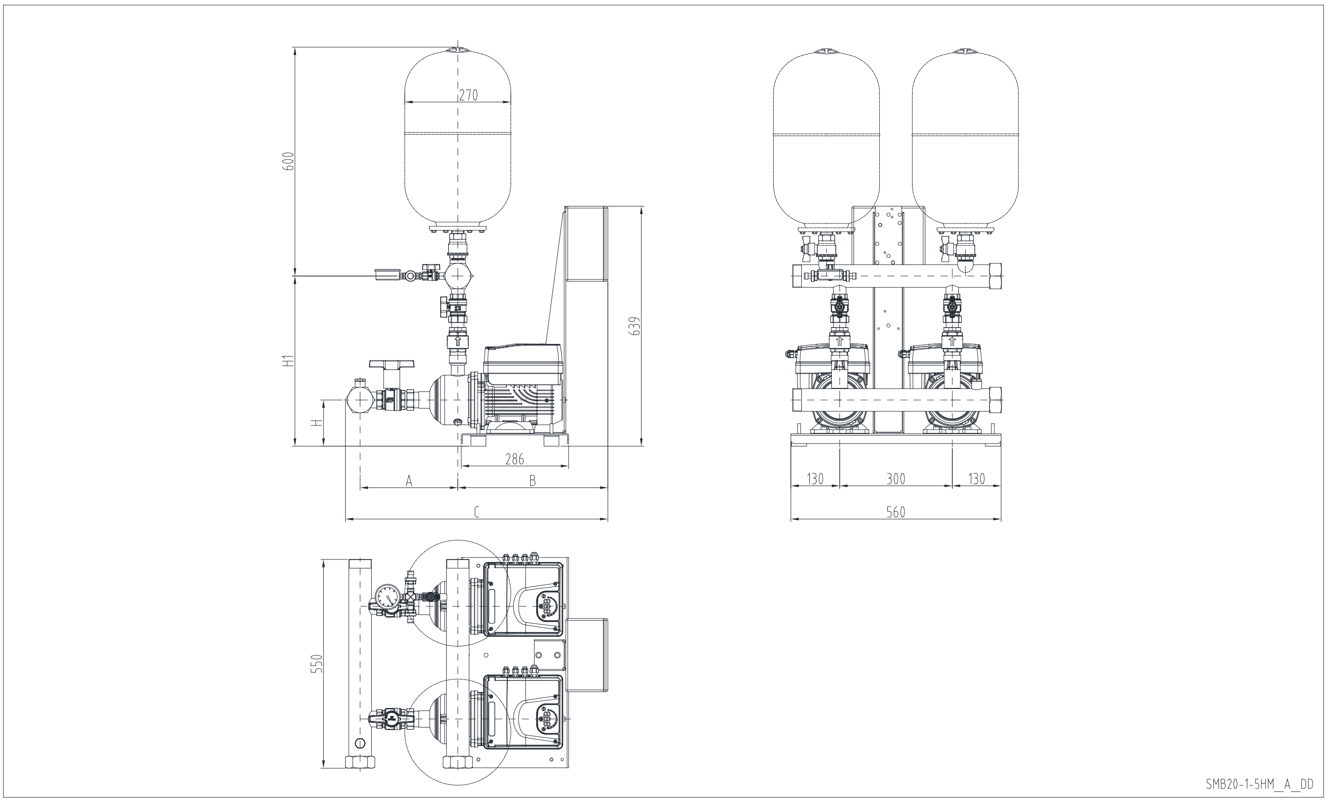


SMB 20	DNA	DNM	A		B		C		H	H1	H2
			STD	AISI	STD	AISI	STD	AISI			
1VME02P03	R2"	R2"	232	314	287	419	579	793	84	449	736
1VME04P05	R2"	R2"	232	314	287	419	579	793	84	469	756
1VME05P07	R2"	R2"	232	314	287	419	579	793	84	489	776
1VME06P11	R2"	R2"	232	314	287	419	579	793	84	509	796
3VME02P03	R2"	R2"	232	314	287	419	579	793	84	449	736
3VME03P05	R2"	R2"	232	314	287	419	579	793	84	449	736
3VME04P07	R2"	R2"	232	314	287	419	579	793	84	469	756
3VME05P11	R2"	R2"	232	314	287	419	579	793	84	469	756
3VME06P15	R2"	R2"	232	314	287	419	579	793	84	509	796
5VME02P05	R2"	R2"	251	329	316	449	627	838	84	449	736
5VME03P07	R2"	R2"	251	329	316	449	627	838	84	449	736
5VME04P11	R2"	R2"	251	329	316	449	627	838	84	469	756
5VME05P15	R2"	R2"	251	329	316	449	627	838	84	469	756
10VME01P07	R2"1/2	R2"1/2	286	374	348	517	710	967	114	513	800
10VME02P11	R2"1/2	R2"1/2	286	374	348	517	710	967	114	513	800

Dimensions in mm. ± 10 mm tolerance range.

smb20-vm_b_td

SET OF 2 PUMPS HME..S SERIES
SINGLE-PHASE POWER SUPPLY (SMB20.../M2)

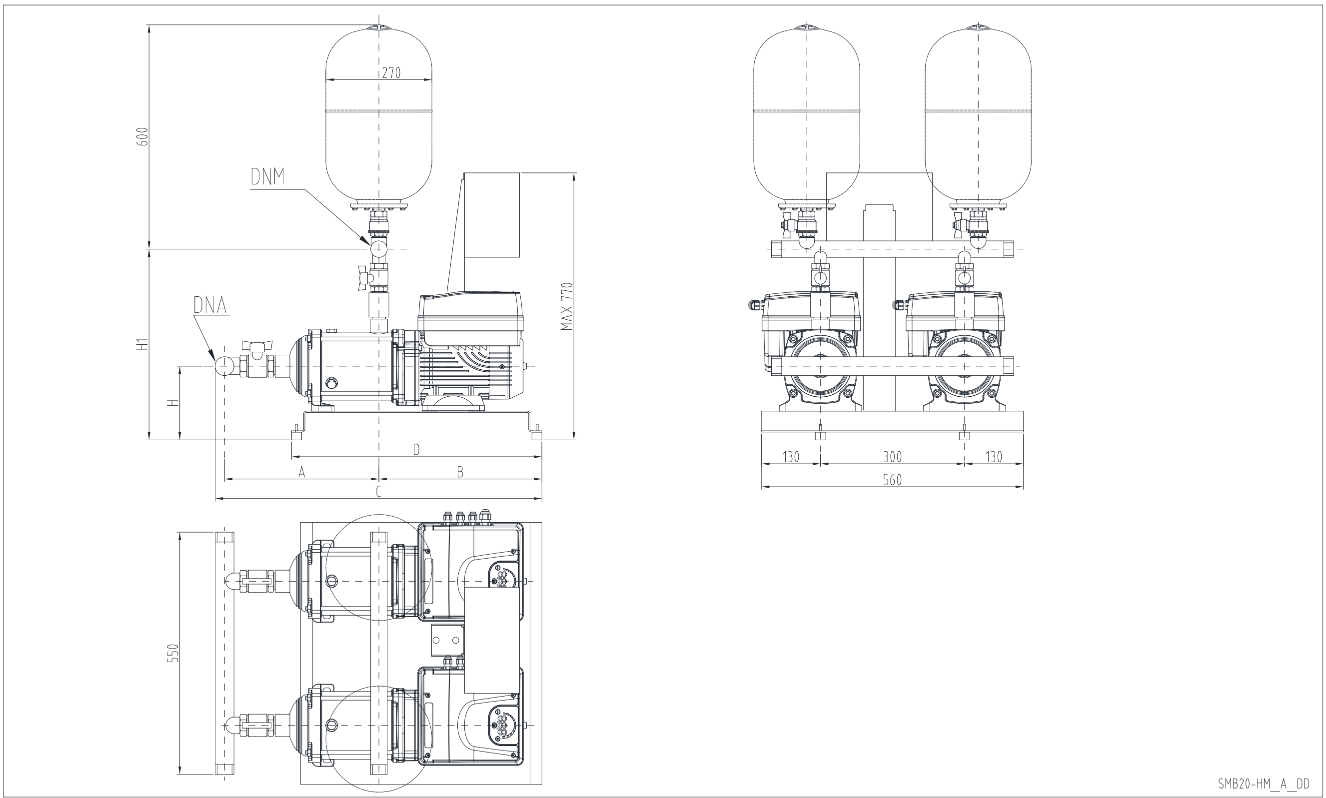


SMB 20	DNA	DNM	A		B	C		H	H1	
			STD	AISI		STD	AISI		STD	AISI
1HME05	R 2"	R 2"	264	308	400	703	747	123	408	446
3HME03	R 2"	R 2"	224	268	400	663	707	123	408	446
3HME05	R 2"	R 2"	264	308	400	703	747	123	408	446
5HME02	R 2"	R 2"	260	320	400	699	759	123	453	527
5HME03	R 2"	R 2"	260	320	400	699	759	123	453	527
5HME04	R 2"	R 2"	285	345	400	724	784	123	453	527

Dimensions in mm. ± 10 mm tolerance range.

smb20_1-5hms_a_td

SET OF 2 PUMPS HME..S SERIES
SINGLE-PHASE POWER SUPPLY (SMB20.../M2)



SMB 20	DNA	DNM	A		B	C		D	H	H1	
			STD	AISI		STD	AISI			STD	AISI
1HME08	R 2"	R 2"	308	352	349	687	731	590	205	490	528
1HME11	R 2"	R 2"	368	412	349	747	791	590	205	490	528
1HME15	R 2"	R 2"	448	492	349	827	871	762	205	490	528
1HME17	R 2"	R 2"	488	532	349	867	911	762	205	490	528
3HME07	R 2"	R 2"	288	332	349	667	711	590	205	490	528
3HME09	R 2"	R 2"	328	372	349	707	751	590	205	490	528
3HME12	R 2"	R 2"	388	432	349	767	811	590	205	490	528
5HME06	R 2"	R 2"	314	374	349	693	753	590	205	551	625
5HME08	R 2"	R 2"	364	424	349	743	803	590	205	551	625
10HME01	R 2"1/2	R 2"1/2	308	361	350	696	749	590	205	617	709
10HME02	R 2"1/2	R 2"1/2	308	361	350	696	749	590	205	617	709
10HME03	R 2"1/2	R 2"1/2	308	361	350	696	749	590	205	617	709

Dimensions in mm. ± 10 mm tolerance range.

smb20_1-10hms_b_td

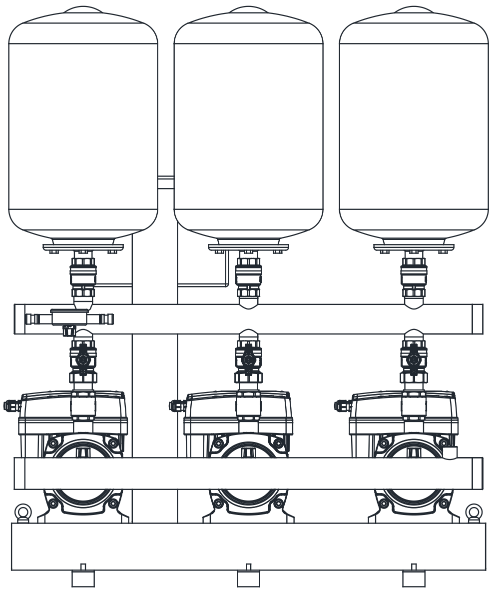
a xylem brand

Booster sets

MARKET SECTORS
RESIDENTIAL, COMMERCIAL, INDUSTRIAL

SMB30 Series

APPLICATIONS
Water supply and pressure boosting in:
- apartments, villas, condominiums and residential buildings
- hotels, restaurants, spas
- various industrial applications

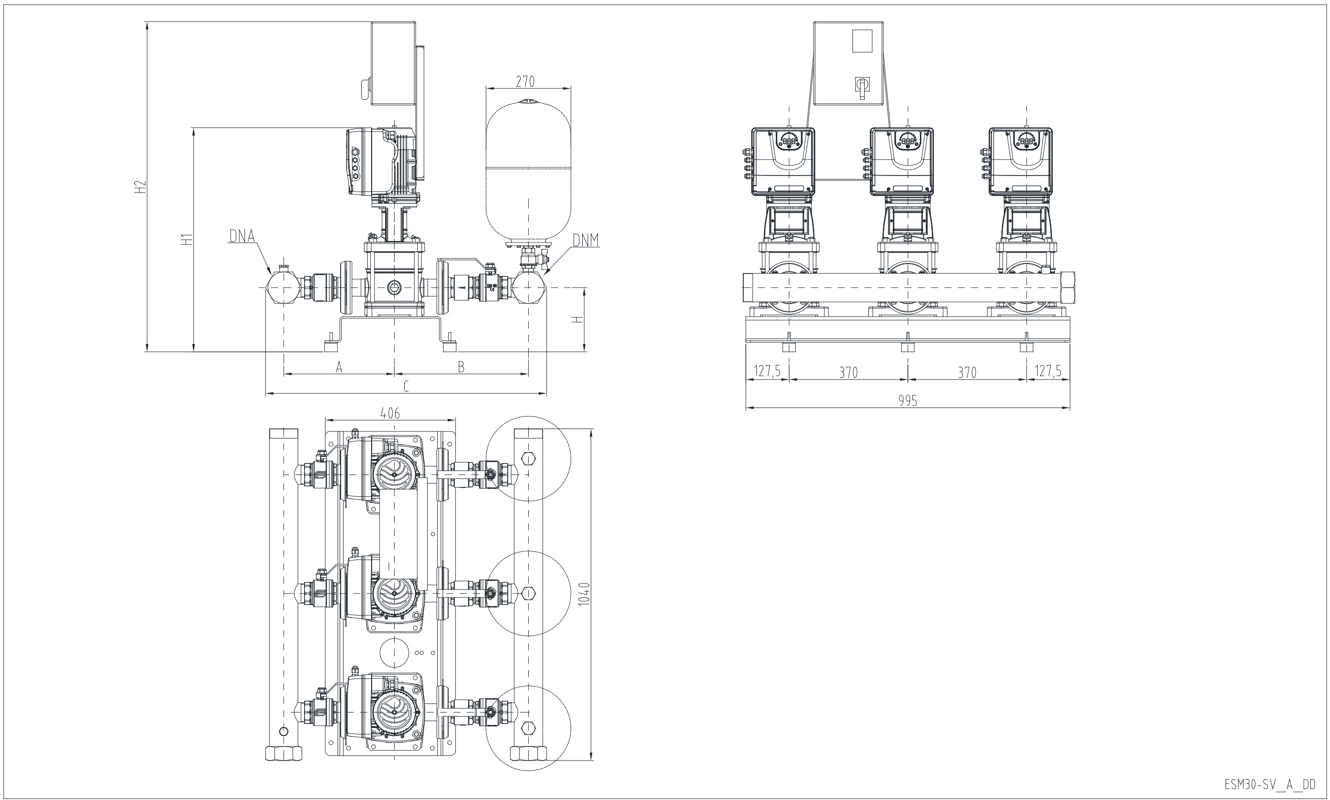


SPECIFICATIONS

- **e-SVE** vertical axis electric pump.
- **VME** vertical axis close-coupled threaded electric pump.
- **e-HME..S** horizontal axis electric pump.
- **Flow rate:** up to 51 m^3/h.
- **Maximum operating pressure:** max 16 bar.
- **Electric panel supply voltage:**
  - single-phase 1 x 230V ± 10% (SMB../M2).
- **Frequency:** 50Hz.
- **Protection class IP55 for:**
  - electrical control panel
  - electrical pump motor
  - e-SM drive frequency converter
- **Maximum electric pump power:** 3 x 1,5 kW.
- **Progressive motor start.**
- **Maximum pumped liquid temperature:**
  - up to 80 °C for SMB.../SVE
  - up to 80 °C for SMB.../VME
  - up to 80 °C for SMB.../HME..S

SMB series booster sets with e-SV Smart, VM Smart, e-HM Smart series pumps are certified for use with drinking water according to WRAS and ACS standards, and with Italian Ministry Decree no. 174.

SET OF 3 PUMPS SVE..F SERIES
SINGLE-PHASE POWER SUPPLY (SMB30.../M2)

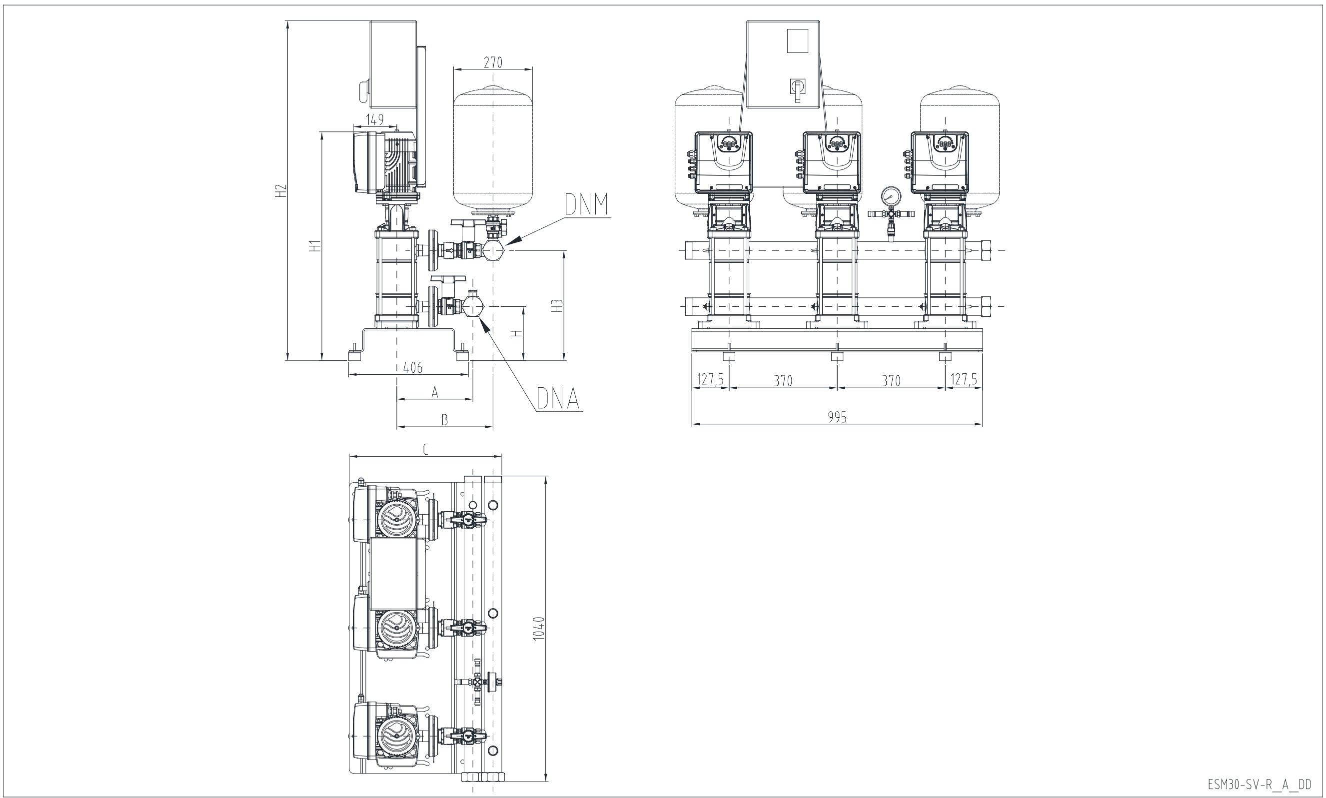


SMB 30	DNA	DNM	A		B		C		H	H1	H2
			STD	AISI	STD	AISI	STD	AISI			
1SVE05F003	R2"	R2"	265	257	311	363	636	680	185	690	1064
1SVE08F005	R2"	R2"	265	257	311	363	636	680	185	750	1124
1SVE11F007	R2"	R2"	265	257	311	363	636	680	185	810	1184
1SVE15F011	R2"	R2"	265	257	311	363	636	680	185	890	1264
3SVE03F003	R2"	R2"	265	257	311	363	636	680	185	650	1024
3SVE05F005	R2"	R2"	265	257	311	363	636	680	185	690	1064
3SVE07F007	R2"	R2"	265	257	311	363	636	680	185	730	1104
3SVE09F011	R2"	R2"	265	257	311	363	636	680	185	770	1144
3SVE11F015	R2"	R2"	265	257	311	363	636	680	185	810	1184
5SVE02F003	R2"	R2"	269	267	329	387	658	714	185	640	1014
5SVE03F005	R2"	R2"	269	267	329	387	658	714	185	665	1039
5SVE04F007	R2"	R2"	269	267	329	387	658	714	185	690	1064
5SVE06F011	R2"	R2"	269	267	329	387	658	714	185	740	1114
5SVE08F015	R2"	R2"	269	267	329	387	658	714	185	790	1164
10SVE01F005	R2"1/2	R2"1/2	294	301	356	453	726	830	190	719	1093
10SVE02F007	R2"1/2	R2"1/2	294	301	356	453	726	830	190	719	1093
10SVE02F011	R2"1/2	R2"1/2	294	301	356	453	726	830	190	719	1093
10SVE03F015	R2"1/2	R2"1/2	294	301	356	453	726	830	190	751	1125

Dimensions in mm. ± 10 mm tolerance range.

smb30-sv-f_a_td

SET OF 3 PUMPS SVE..R SERIES
SINGLE-PHASE POWER SUPPLY (SMB30.../M2)

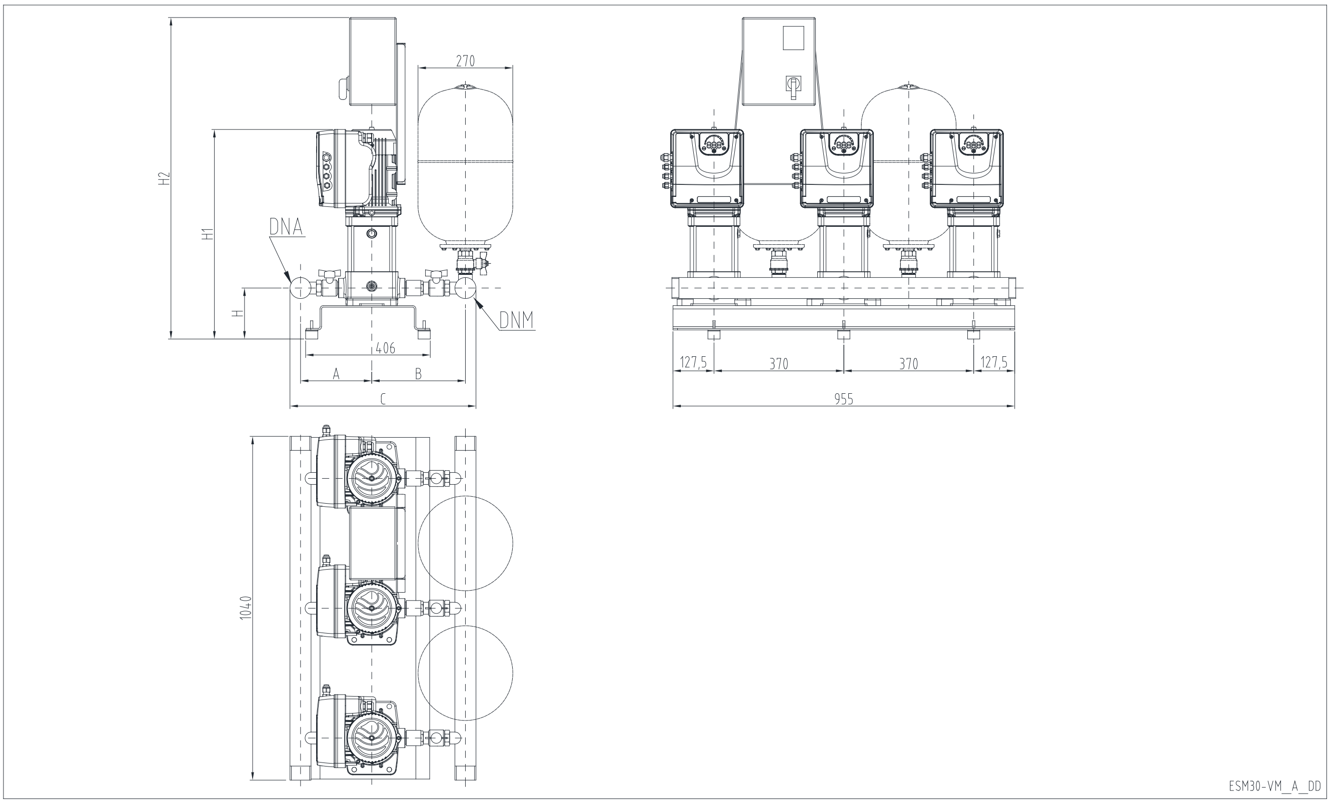


SMB 30	DNA	DNM	A		B		C		H	H1	H2	H3
			STD	AISI	STD	AISI	STD	AISI				
1SVE08R005	R2"	R2"	265	257	311	363	490	542	185	750	1124	337
1SVE11R007	R2"	R2"	265	257	311	363	490	542	185	810	1184	397
1SVE15R011	R2"	R2"	265	257	311	363	490	542	185	890	1264	477
3SVE07R007	R2"	R2"	265	257	311	363	490	542	185	730	1104	317
3SVE09R011	R2"	R2"	265	257	311	363	490	542	185	770	1144	357
3SVE11R015	R2"	R2"	265	257	311	363	490	542	185	810	1184	377
5SVE08R015	R2"	R2"	269	267	329	387	508	566	185	790	1164	377

Dimensions in mm. ± 10 mm tolerance range.

smb30-sv-r_a_td

SET OF 3 PUMPS VME SERIES
SINGLE-PHASE POWER SUPPLY (SMB30.../M2)

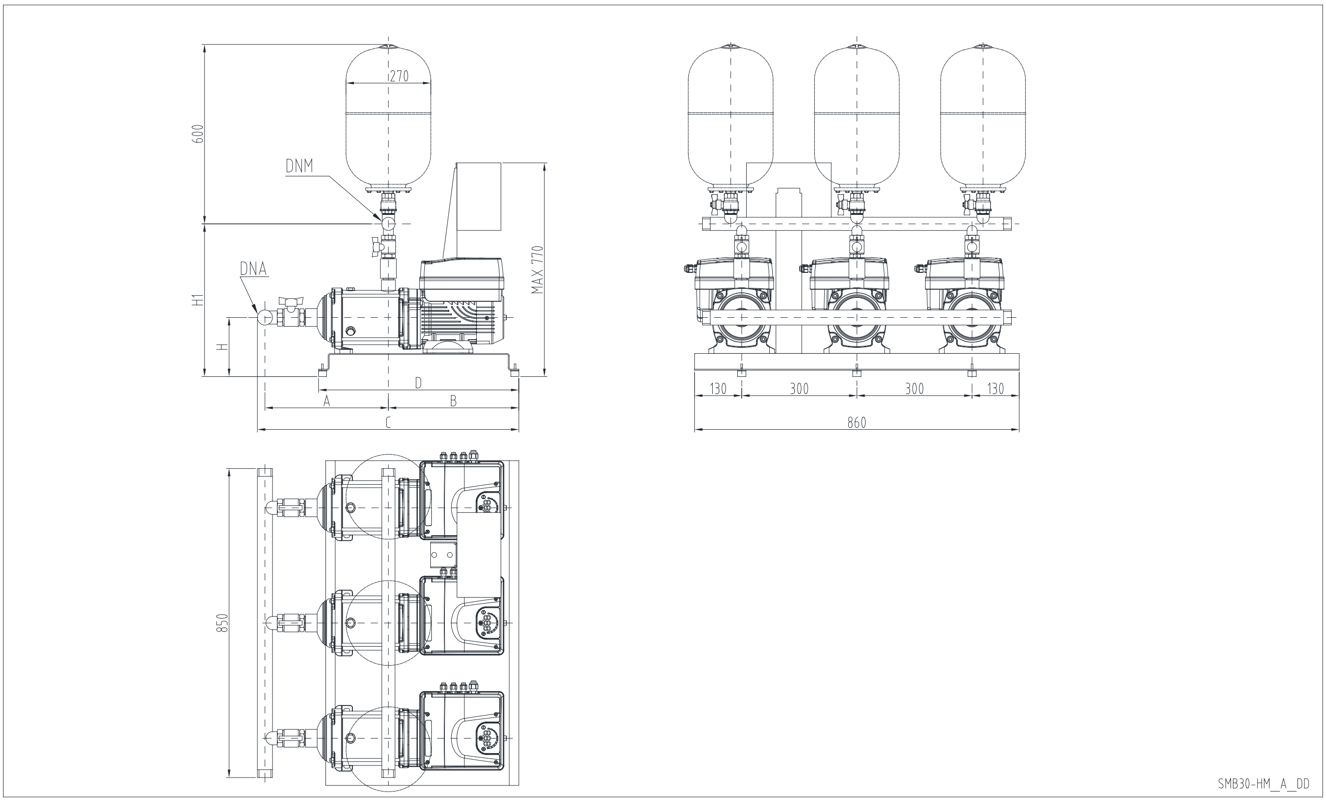


SMB 30	DNA	DNM	A		B		C		H	H1	H2
			STD	AISI	STD	AISI	STD	AISI			
1VME02P03	R2"	R2"	232	314	287	419	579	793	160	525	899
1VME04P05	R2"	R2"	232	314	287	419	579	793	160	545	919
1VME05P07	R2"	R2"	232	314	287	419	579	793	160	565	939
1VME06P11	R2"	R2"	232	314	287	419	579	793	160	585	959
3VME02P03	R2"	R2"	232	314	287	419	579	793	160	525	899
3VME03P05	R2"	R2"	232	314	287	419	579	793	160	525	899
3VME04P07	R2"	R2"	232	314	287	419	579	793	160	545	919
3VME05P11	R2"	R2"	232	314	287	419	579	793	160	545	919
3VME06P15	R2"	R2"	232	314	287	419	579	793	160	585	959
5VME02P05	R2"	R2"	251	329	316	449	627	838	160	525	899
5VME03P07	R2"	R2"	251	329	316	449	627	838	160	525	899
5VME04P11	R2"	R2"	251	329	316	449	627	838	160	545	919
5VME05P15	R2"	R2"	251	329	316	449	627	838	160	545	919
10VME01P07	R2"1/2	R2"1/2	286	374	348	517	710	967	190	589	963
10VME02P11	R2"1/2	R2"1/2	286	374	348	517	710	967	190	589	963

Dimensions in mm. ± 10 mm tolerance range.

smb30-vm_b_td

SET OF 3 PUMPS HME..S SERIES
SINGLE-PHASE POWER SUPPLY (SMB30.../M2)



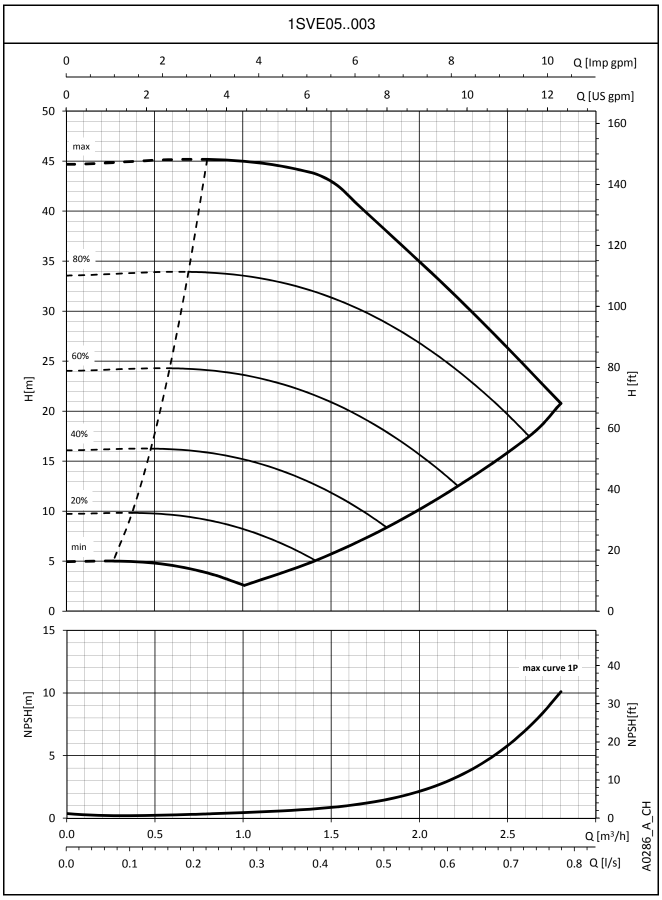
SMB 30	DNA	DNM	A		B	C		D	H	H1	
			STD	AISI		STD	AISI			STD	AISI
1HME05	R 2"	R 2"	264	308	340	634	678	590	205	490	528
1HME08	R 2"	R 2"	308	352	349	687	731	590	205	490	528
1HME11	R 2"	R 2"	368	412	349	747	791	590	205	490	528
1HME15	R 2"	R 2"	448	492	349	827	871	762	205	490	528
1HME17	R 2"	R 2"	488	532	349	867	911	762	205	490	528
3HME03	R 2"	R 2"	224	268	340	594	638	590	205	490	528
3HME05	R 2"	R 2"	264	308	340	634	678	590	205	490	528
3HME07	R 2"	R 2"	288	332	349	667	711	590	205	490	528
3HME09	R 2"	R 2"	328	372	349	707	751	590	205	490	528
3HME12	R 2"	R 2"	388	432	349	767	811	590	205	490	528
5HME02	R 2"	R 2"	260	320	340	630	690	590	205	551	625
5HME03	R 2"	R 2"	260	320	340	630	690	590	205	551	625
5HME04	R 2"	R 2"	285	345	340	655	715	590	205	551	625
5HME06	R 2"	R 2"	314	374	349	693	753	590	205	551	625
5HME08	R 2"	R 2"	364	424	349	743	803	590	205	551	625
10HME01	R 2"1/2	R 2"1/2	308	361	350	696	749	590	205	617	709
10HME02	R 2"1/2	R 2"1/2	308	361	350	696	749	590	205	617	709
10HME03	R 2"1/2	R 2"1/2	308	361	350	696	749	590	205	617	709

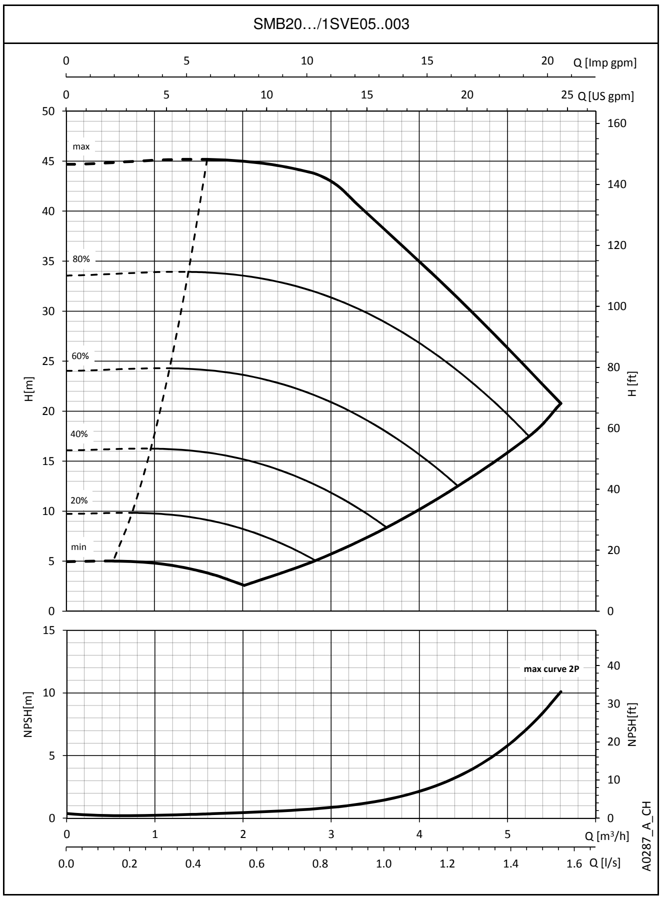
Dimensions in mm. ± 10 mm tolerance range.

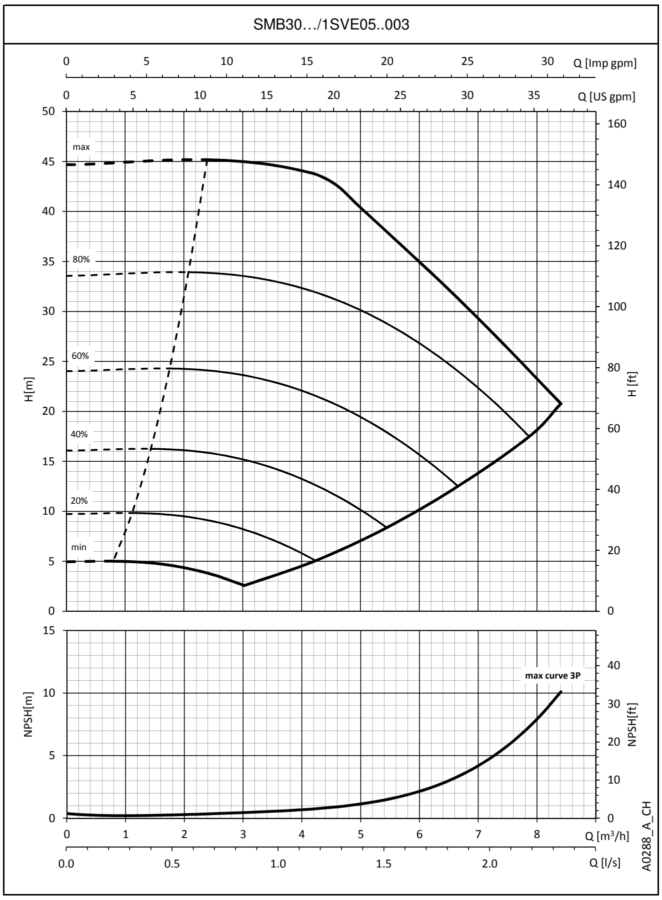
smb30_1-10hms_a_td

PERFORMANCE CURVES

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS



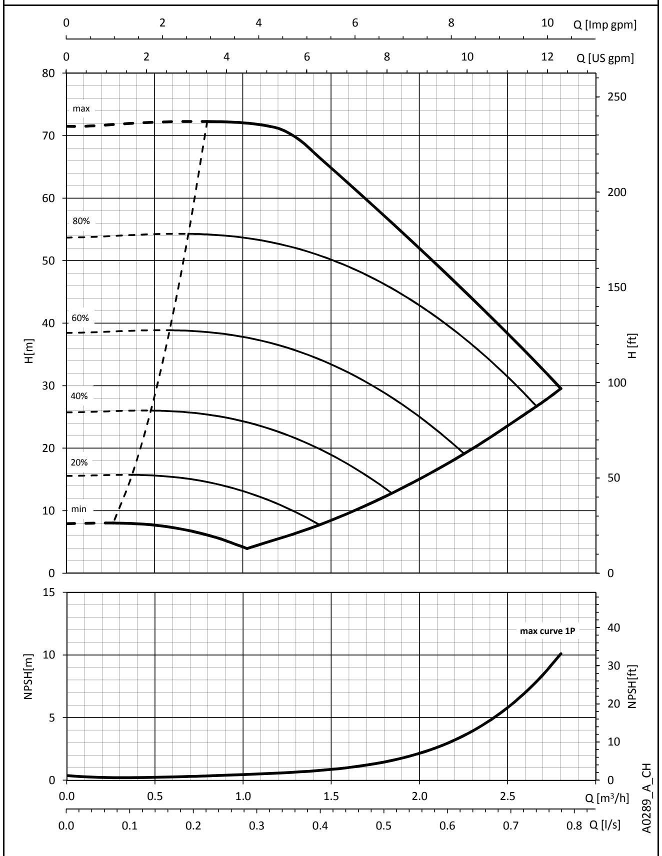




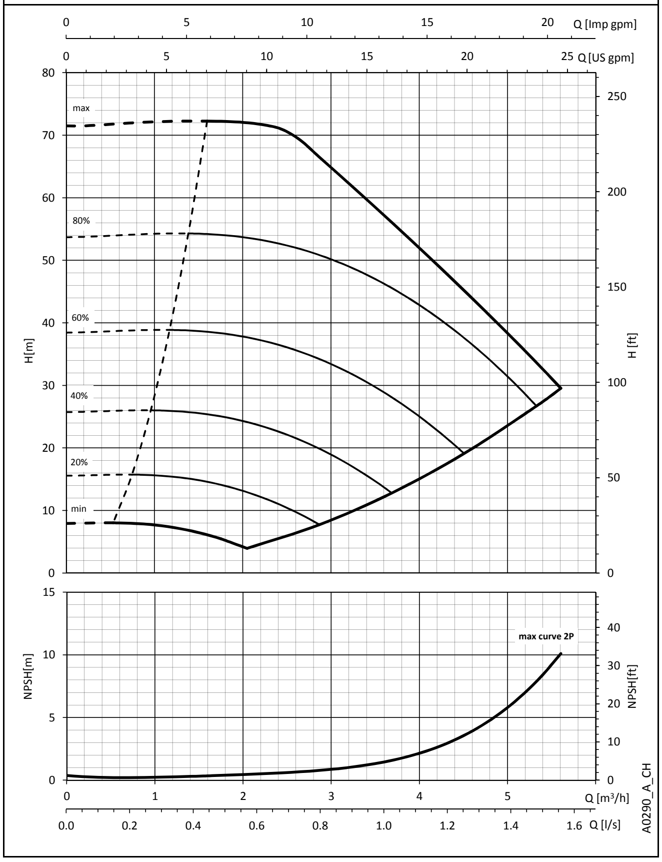
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

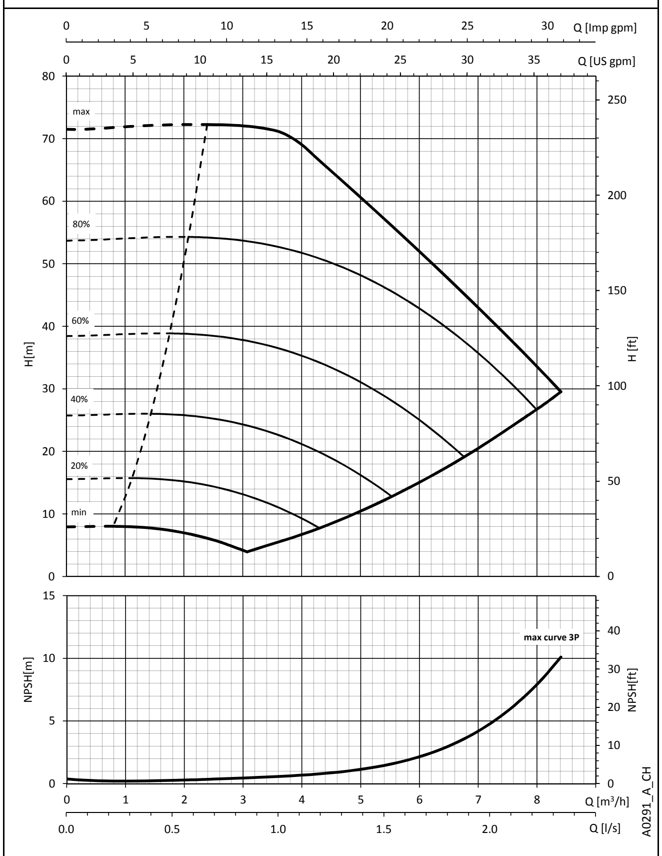
1SVE08..005



SMB20.../1SVE08..005



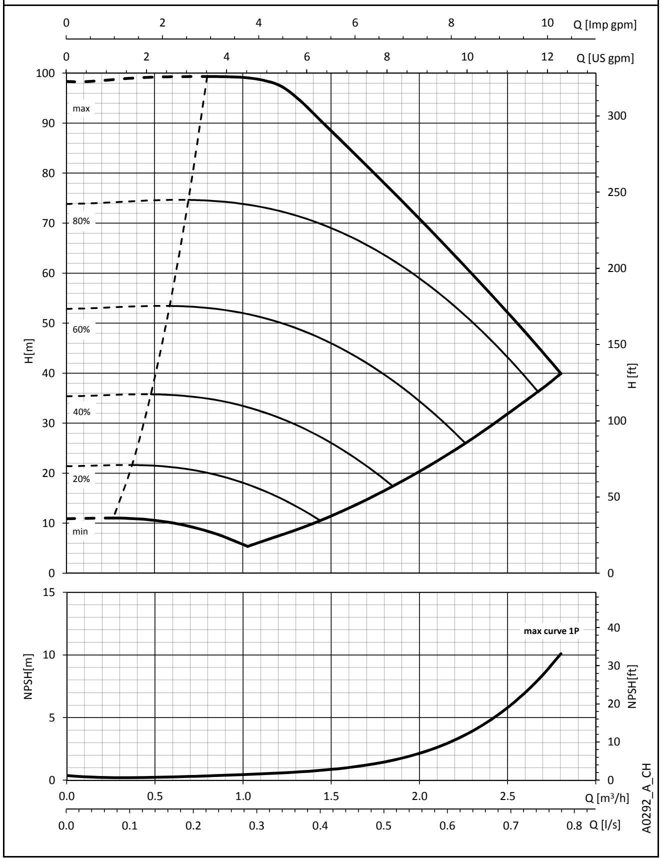
SMB30.../1SVE08..005



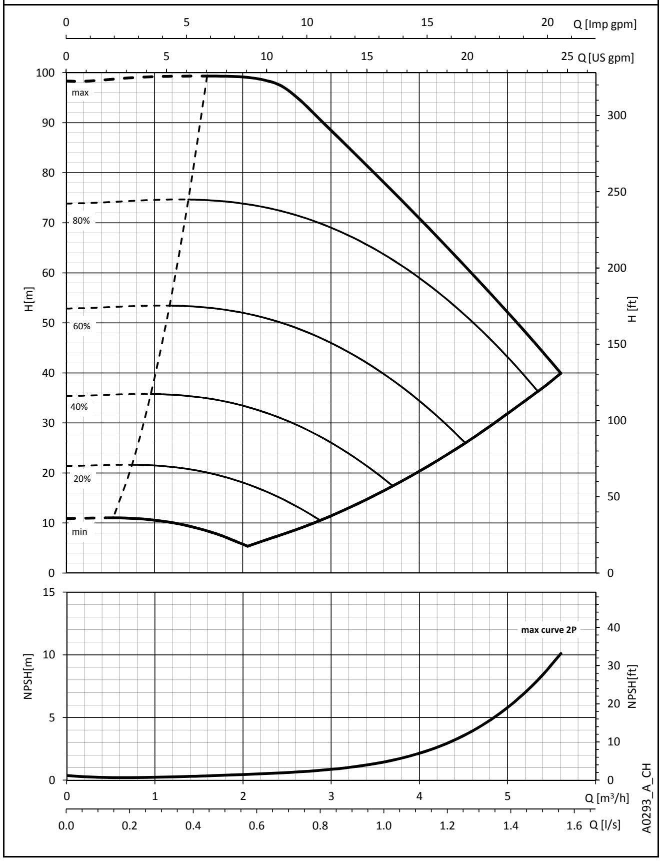
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

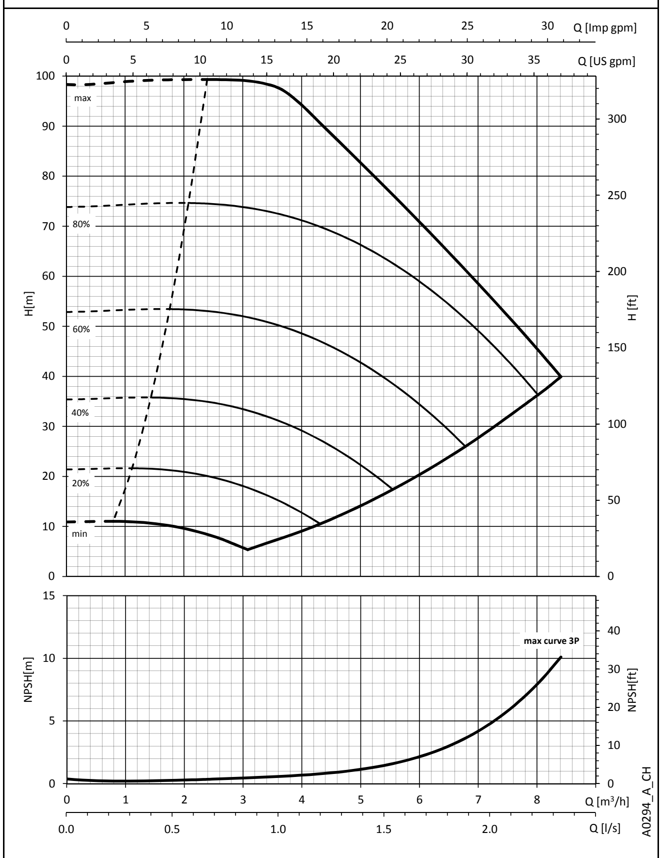
1SVE11..007



SMB20…/1SVE11..007



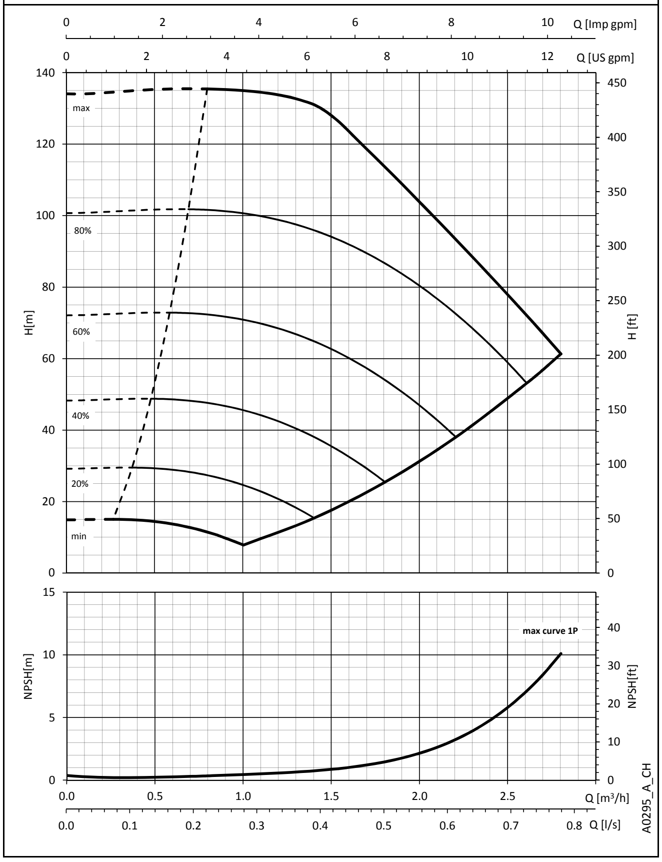
SMB30…/1SVE11..007



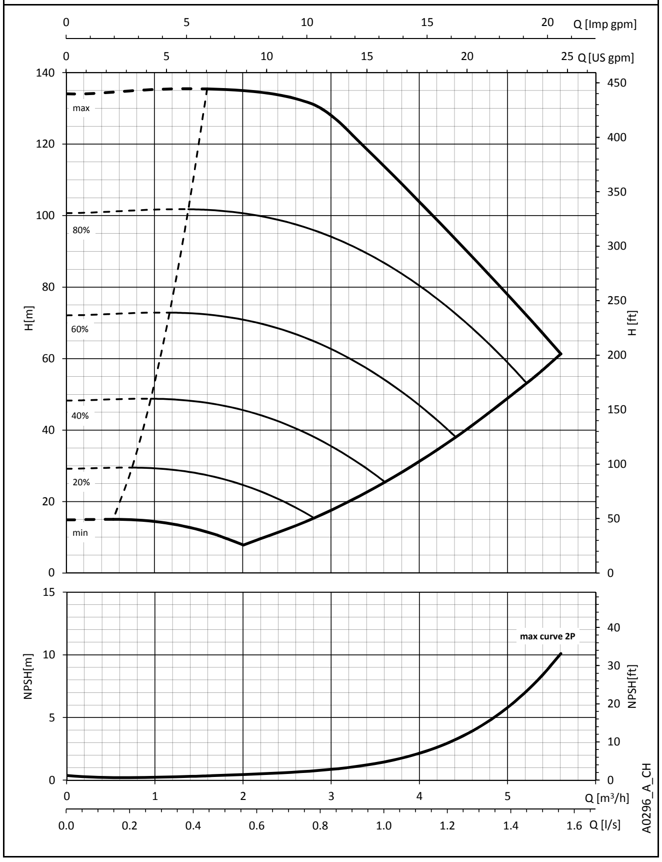
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

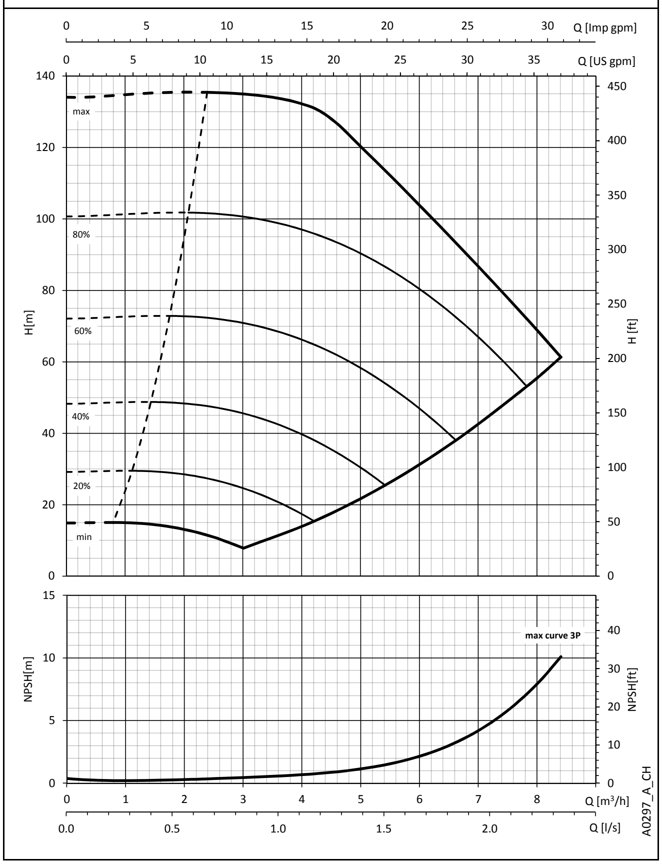
1SVE15..011



SMB20…/1SVE15..011



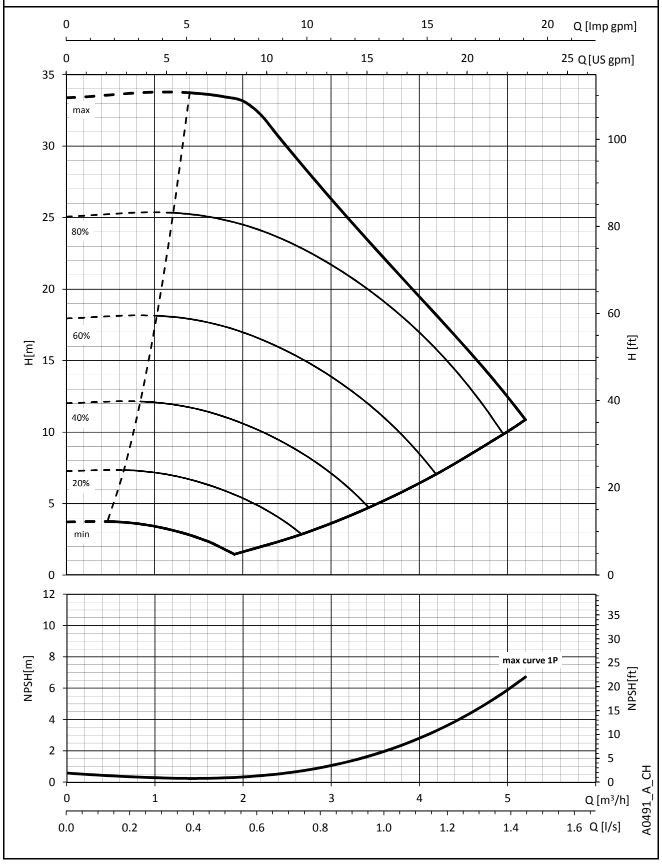
SMB30…/1SVE15..011



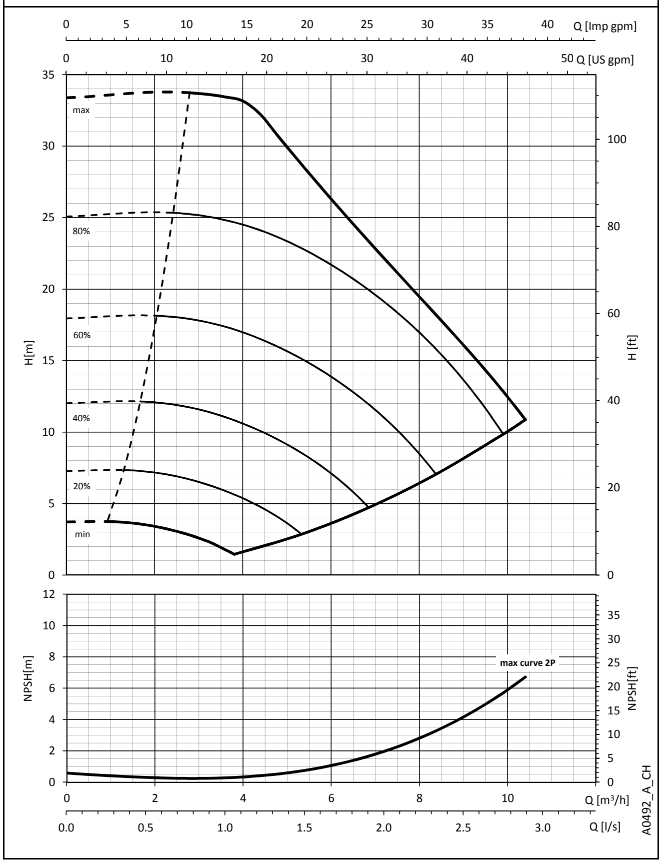
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

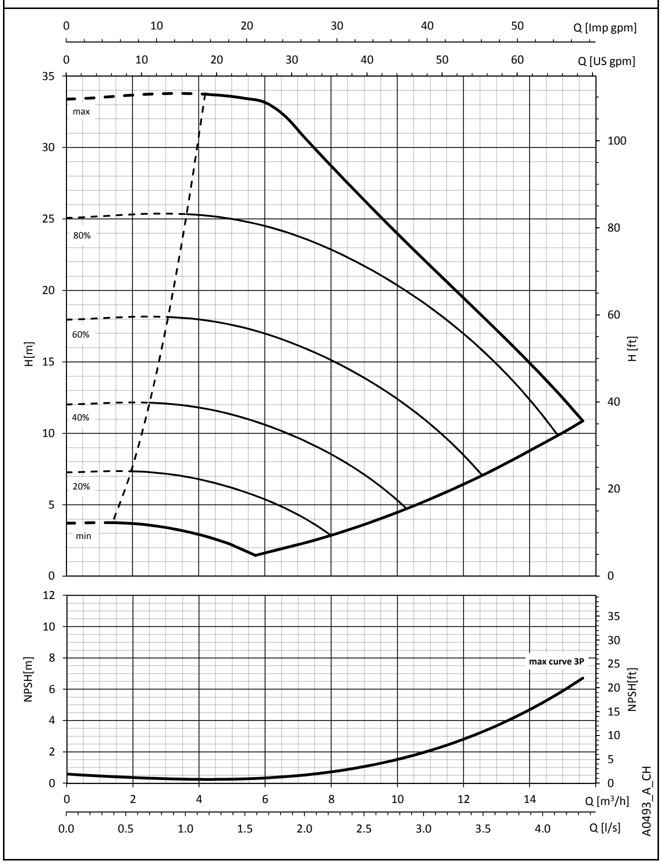
3SVE03..003



SMB20…/3SVE03..003



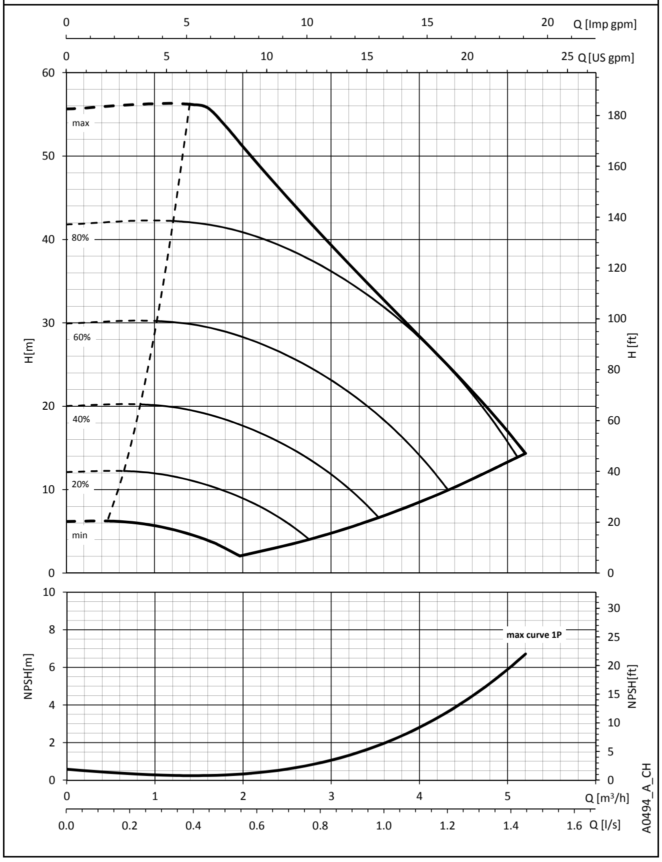
SMB30…/3SVE03..003



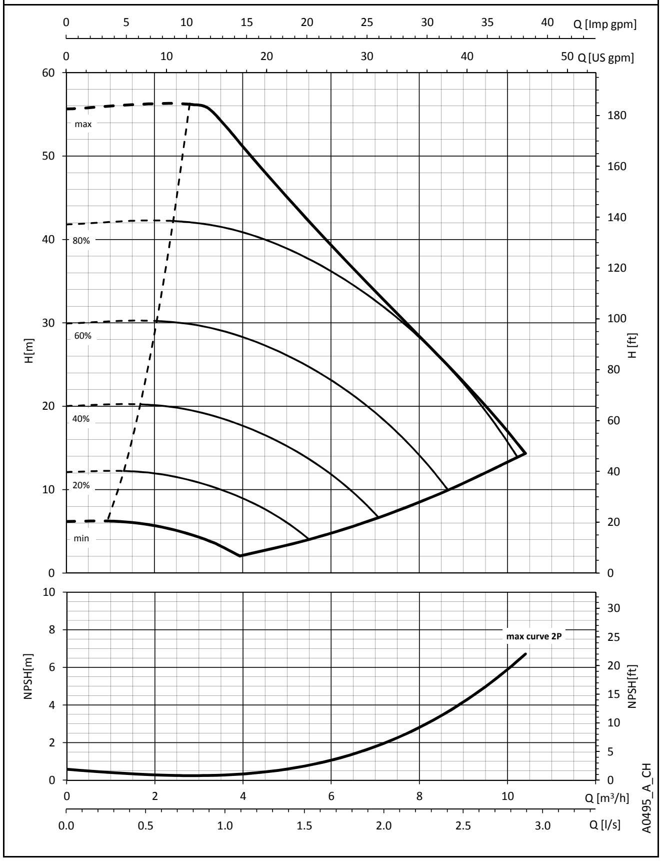
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

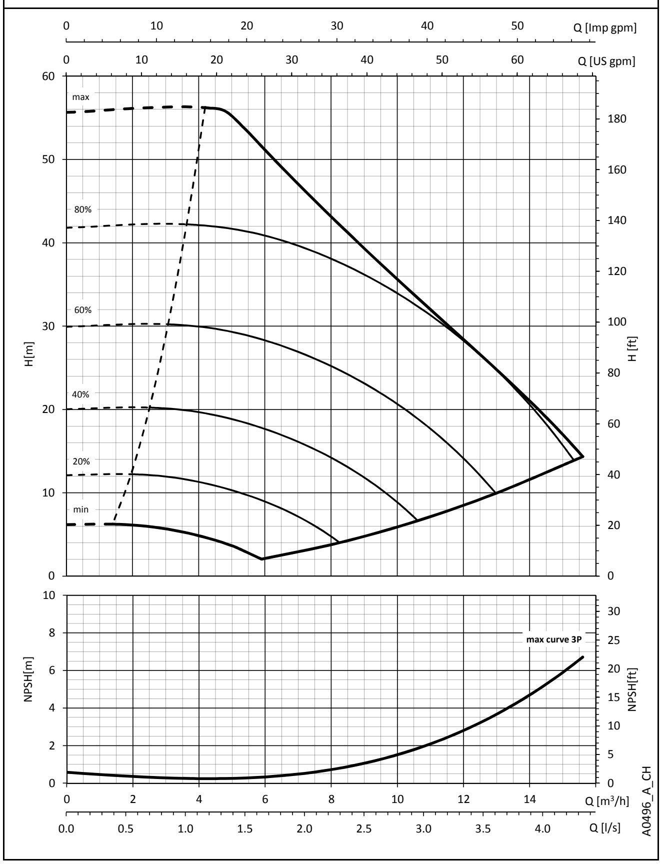
3SVE05..005



SMB20…/3SVE05..005



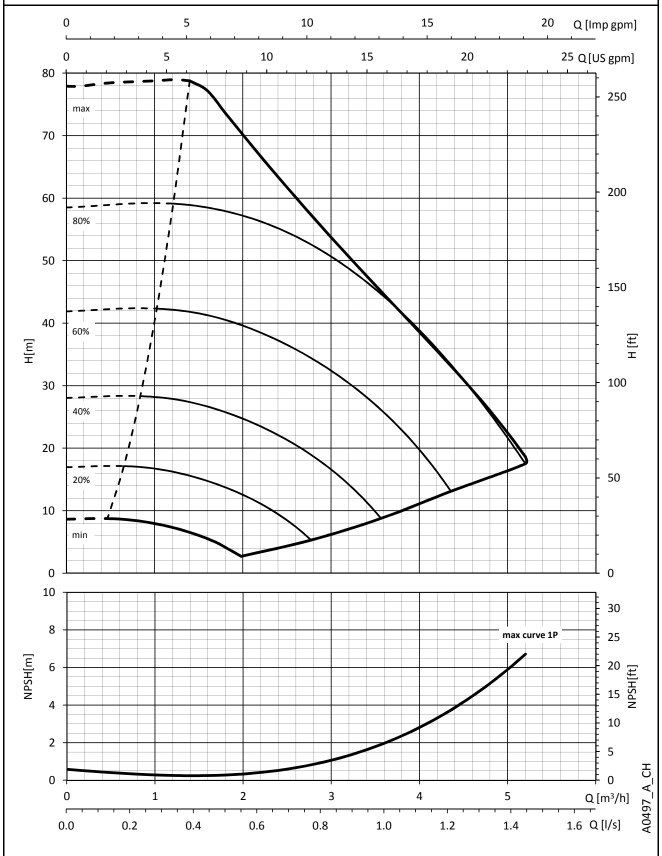
SMB30…/3SVE05..005



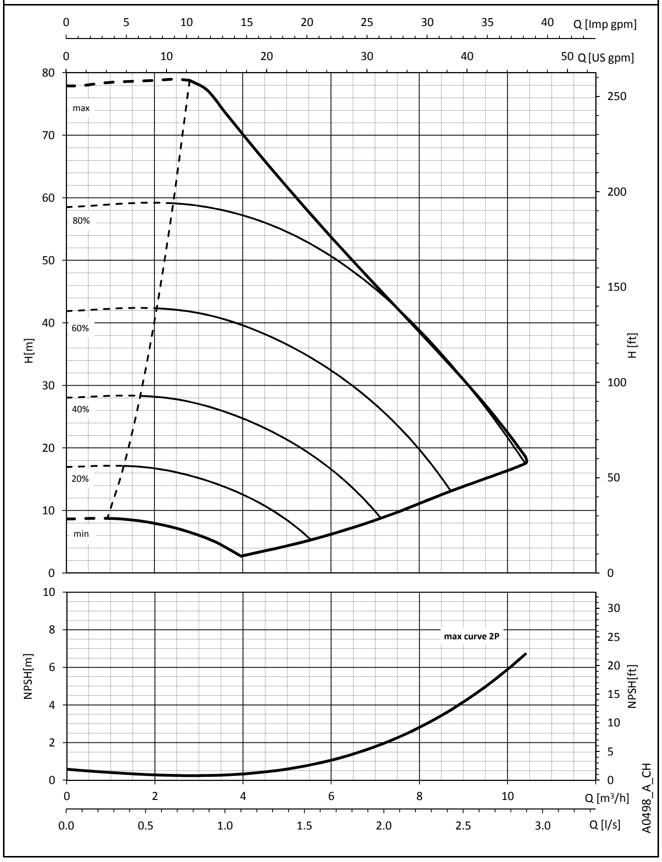
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES OPERATING CHARACTERISTICS

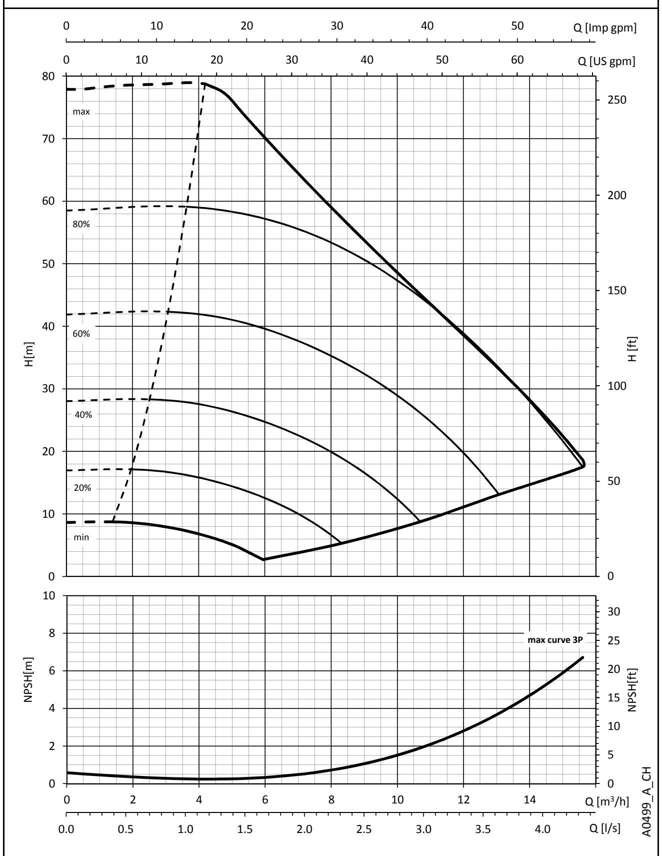
3SVE07..007



SMB20.../3SVE07..007



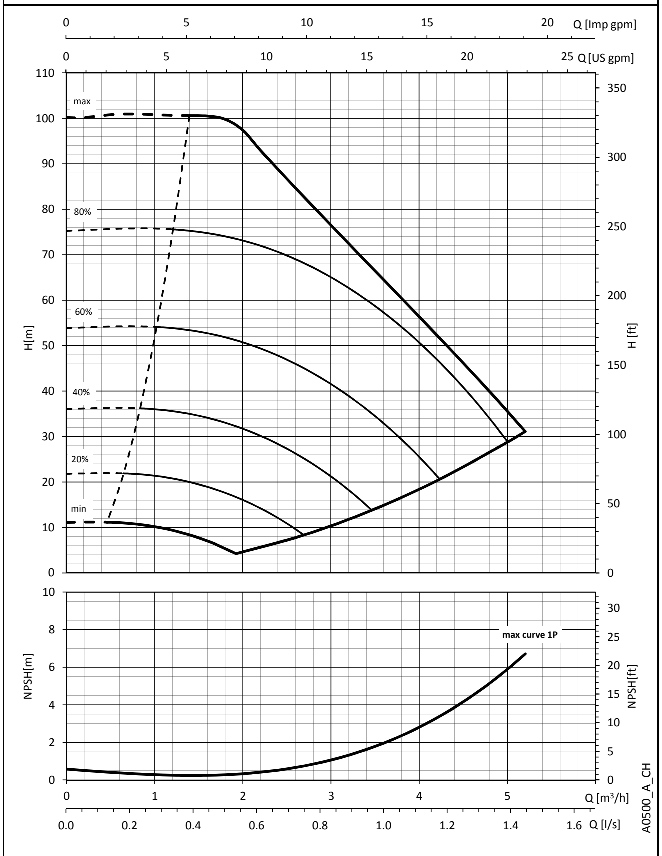
SMB30.../3SVE07..007



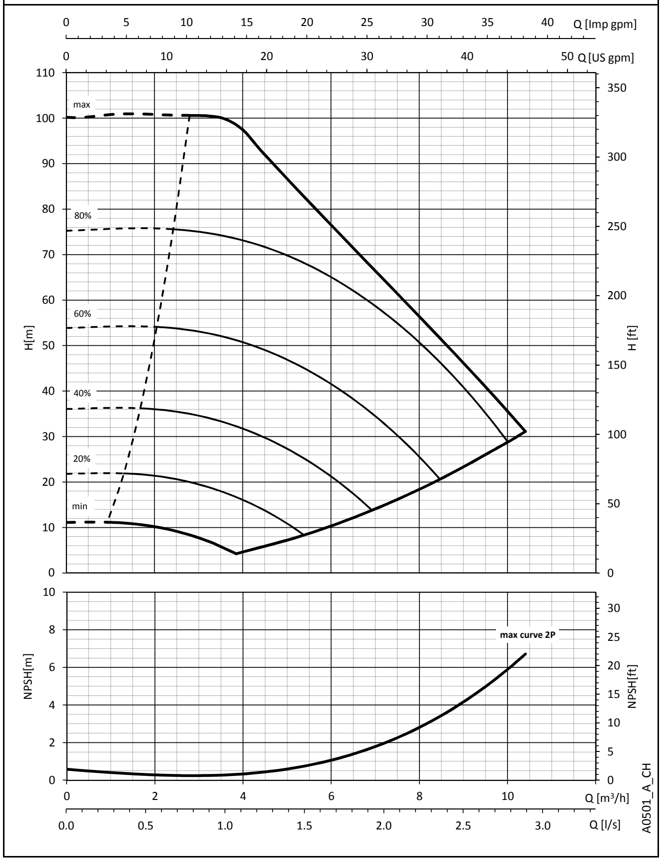
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES OPERATING CHARACTERISTICS

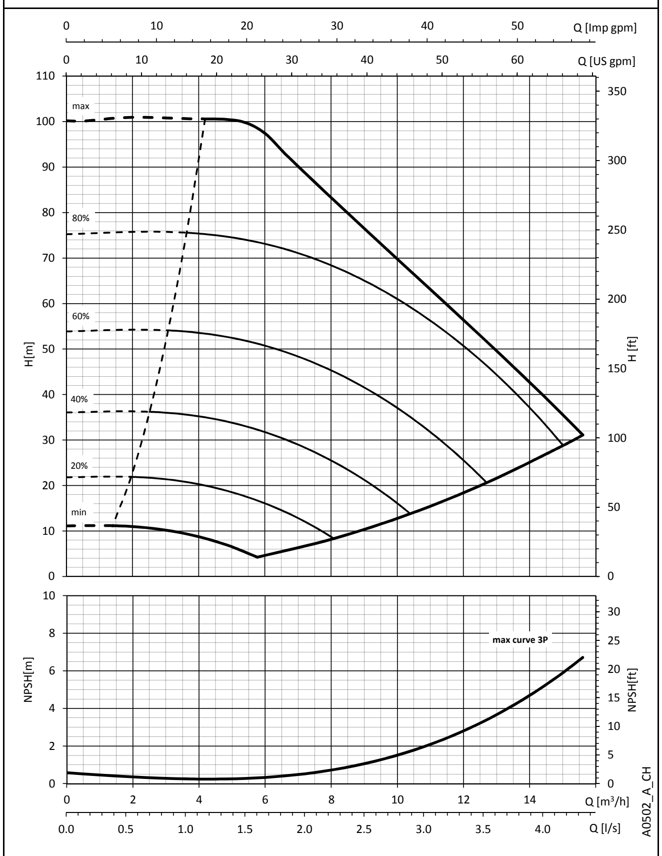
3SVE09..011



SMB20.../3SVE09..011



SMB30.../3SVE09..011



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
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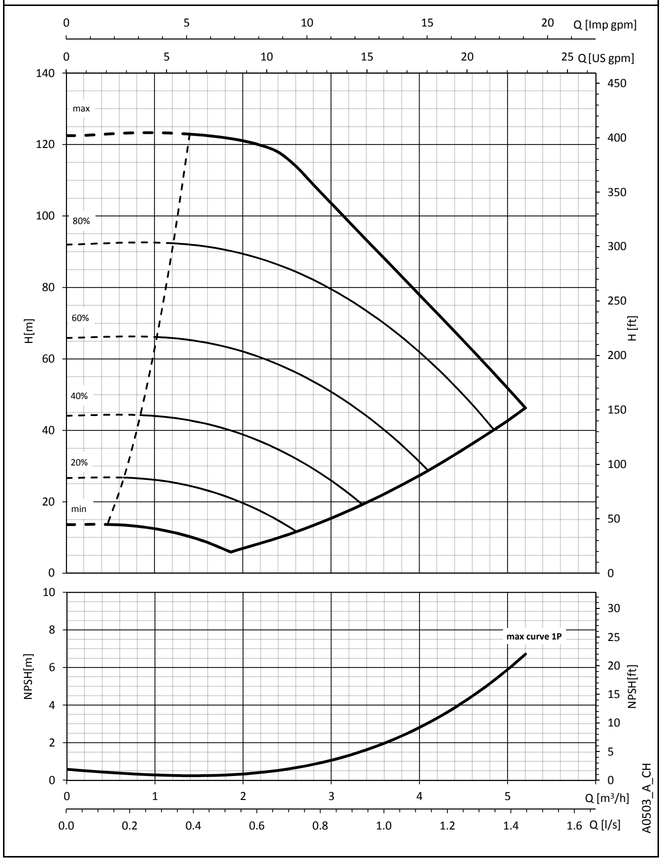
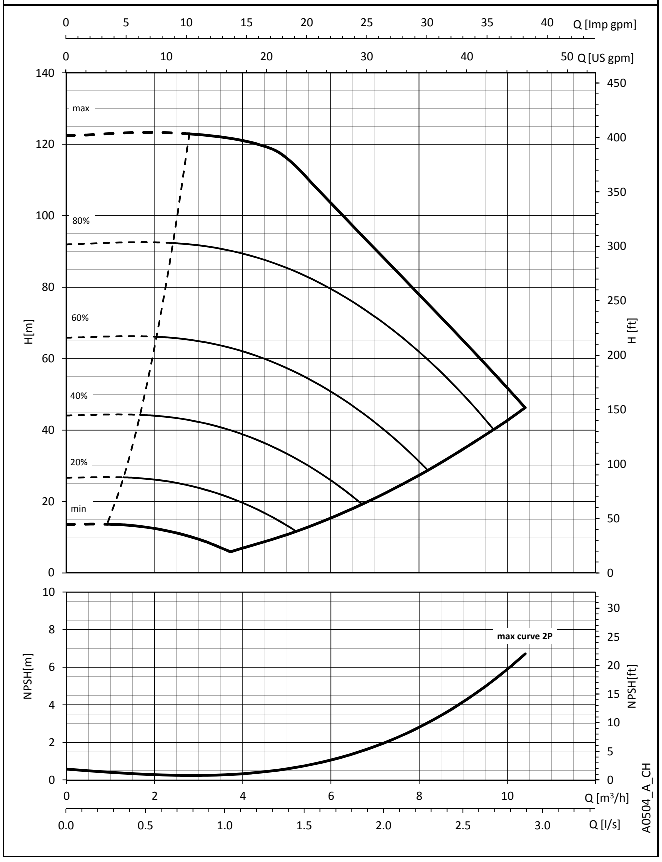
SMB.../SVE BOOSTER SETS SERIES OPERATING CHARACTERISTICS

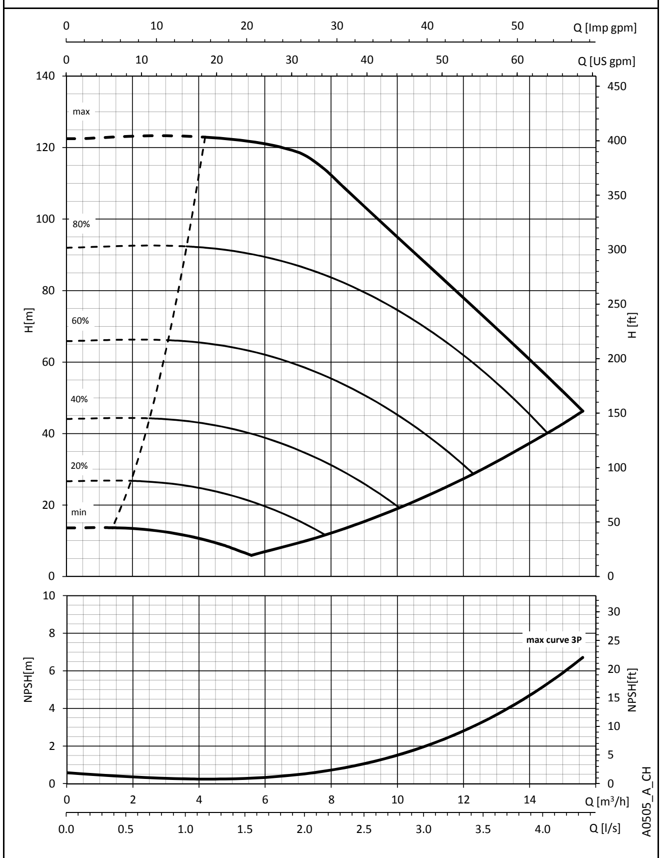
3SVE11..015



SMB20.../3SVE11..015



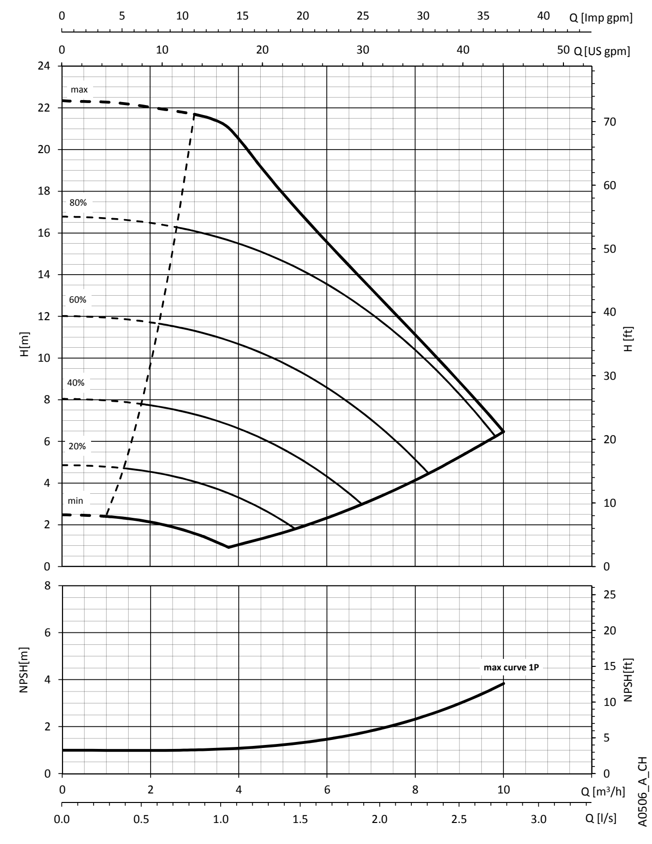
SMB30.../3SVE11..015



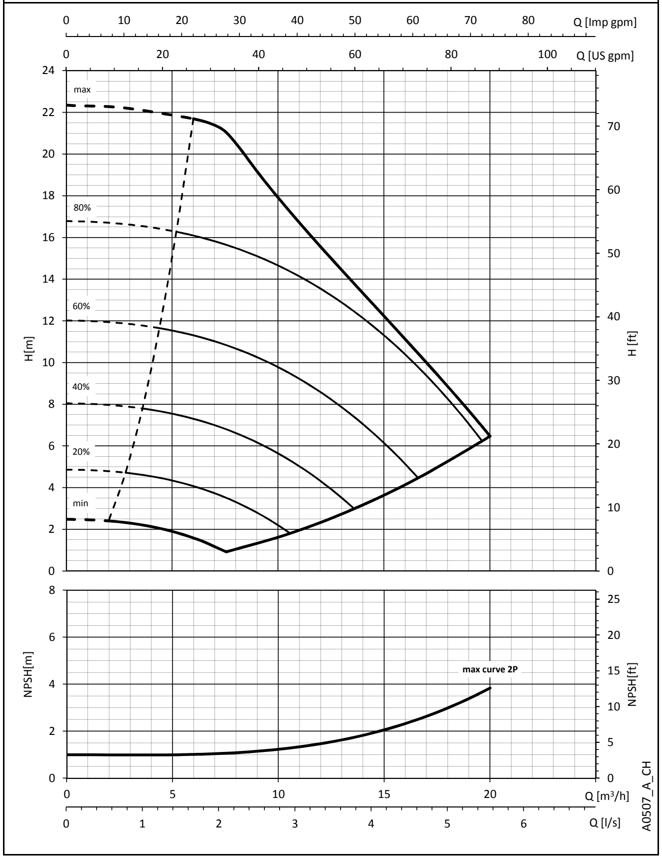
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

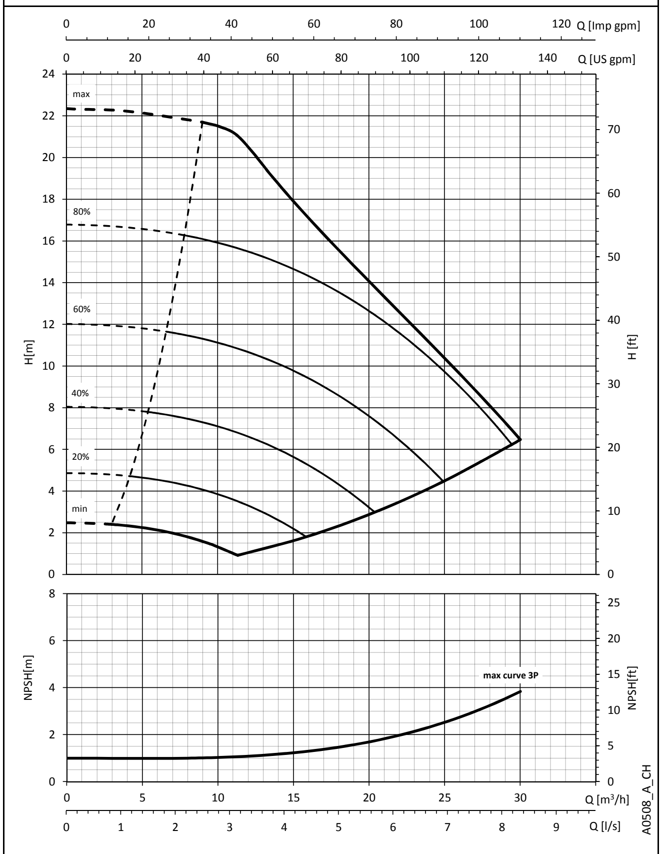
5SVE02..003



SMB20…/5SVE02..003



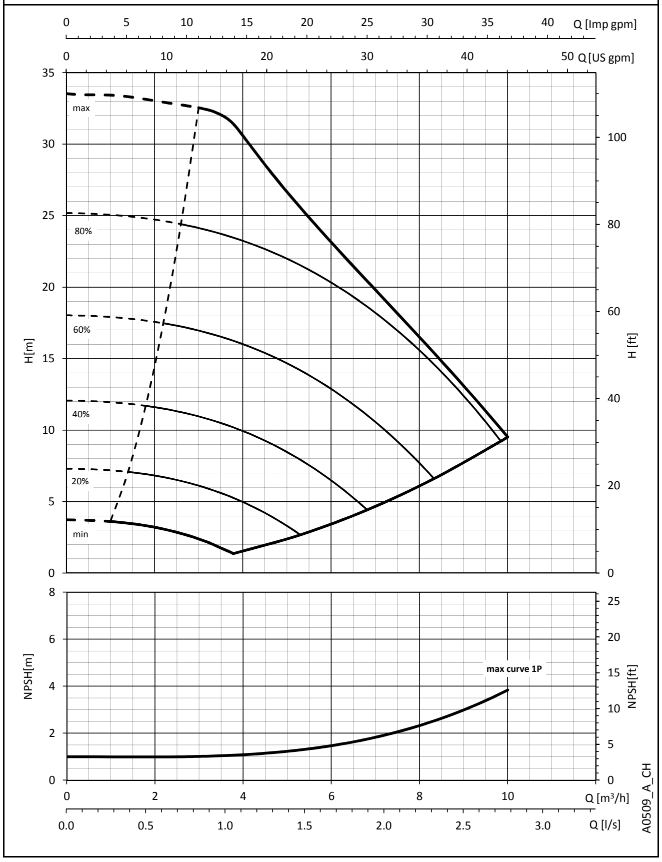
SMB30…/5SVE02..003



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5SVE03..005



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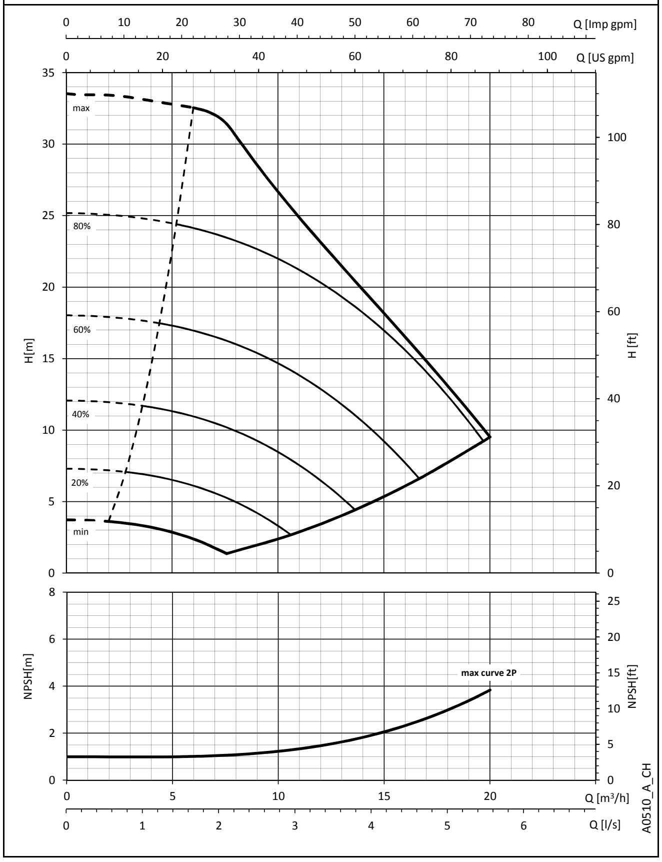

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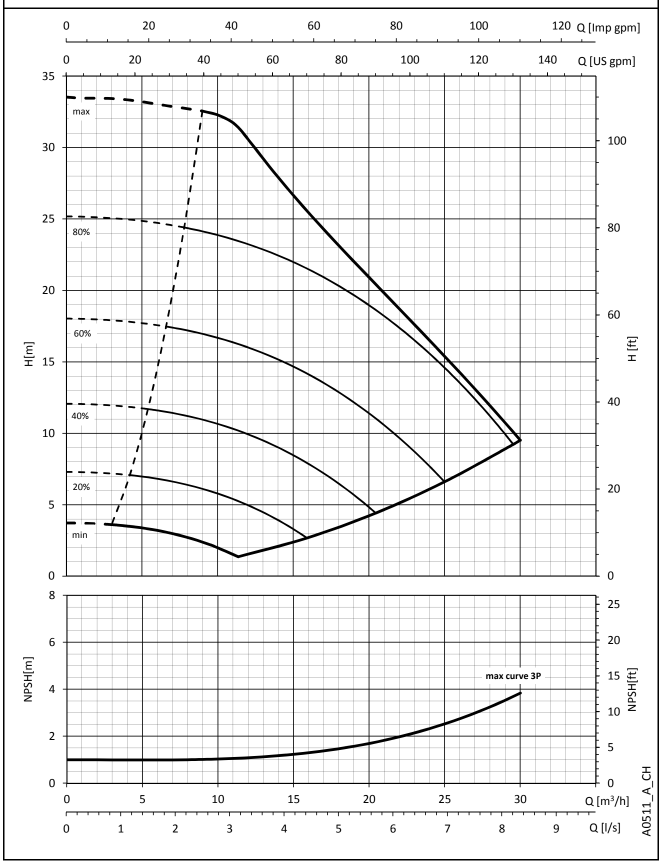
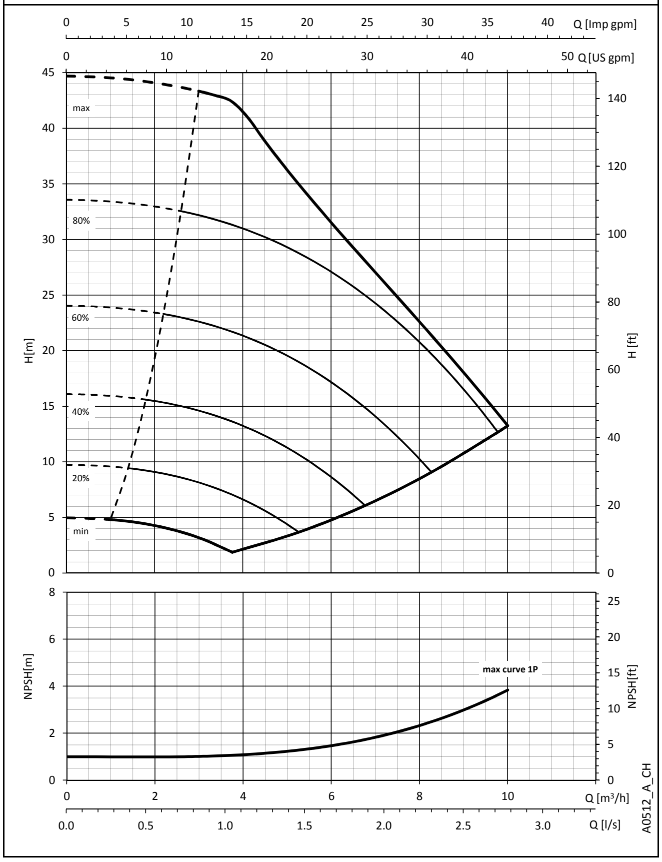


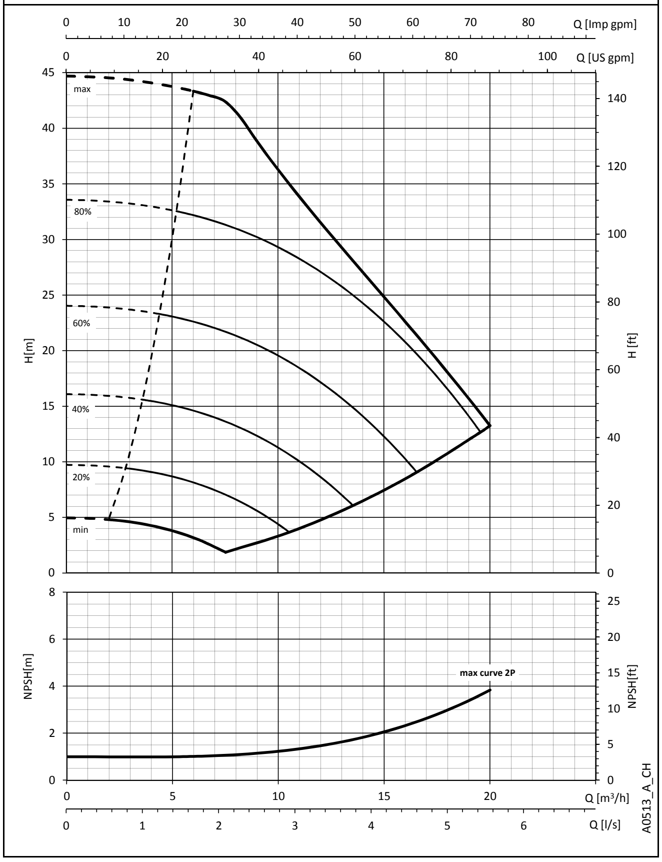
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5SVE04..007



SMB20…/5SVE04..007



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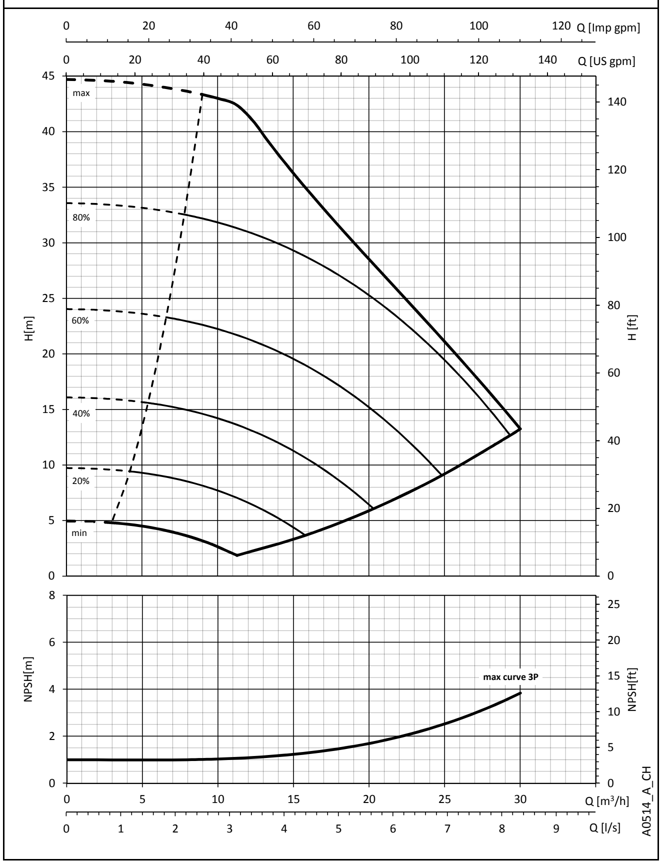

The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
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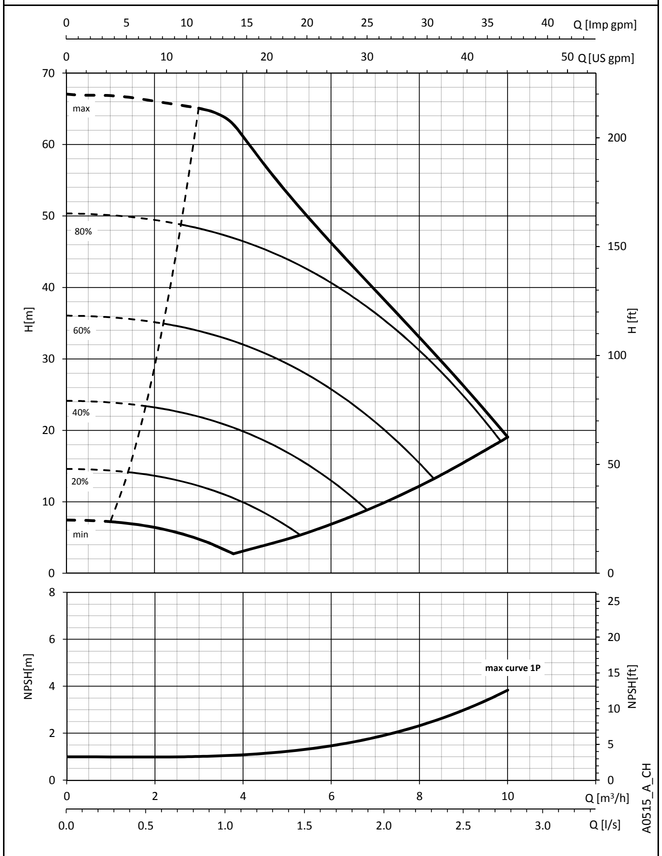
SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5SVE06..011



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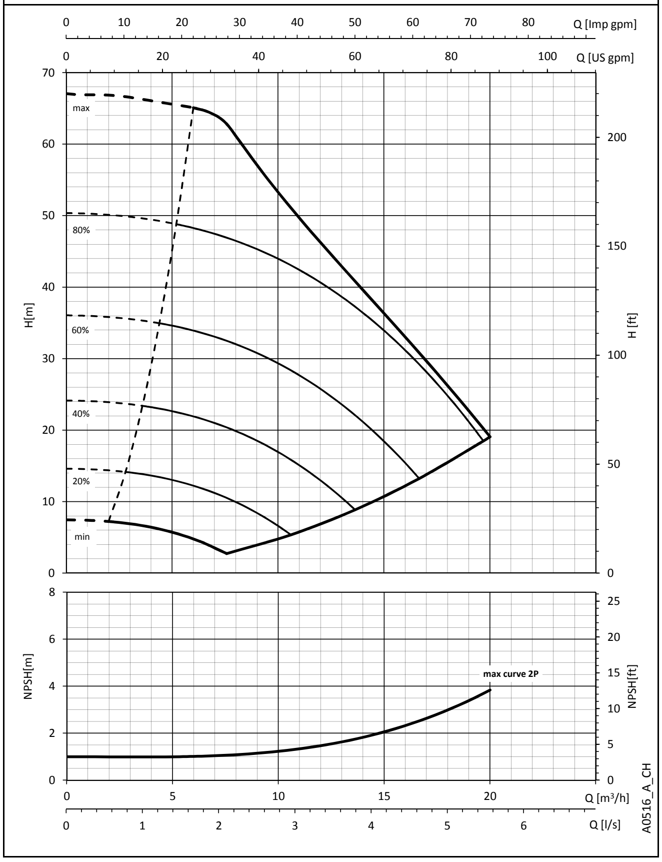

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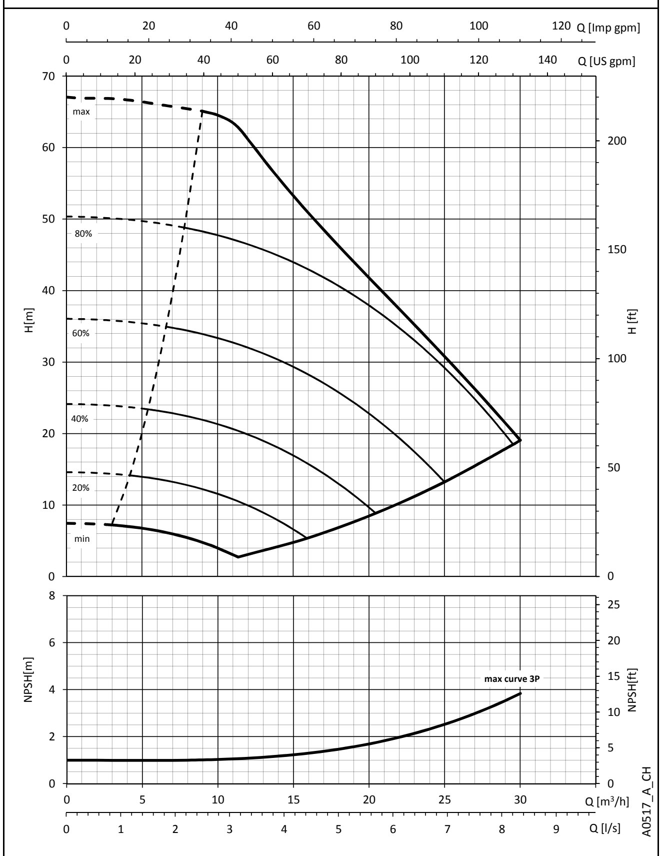
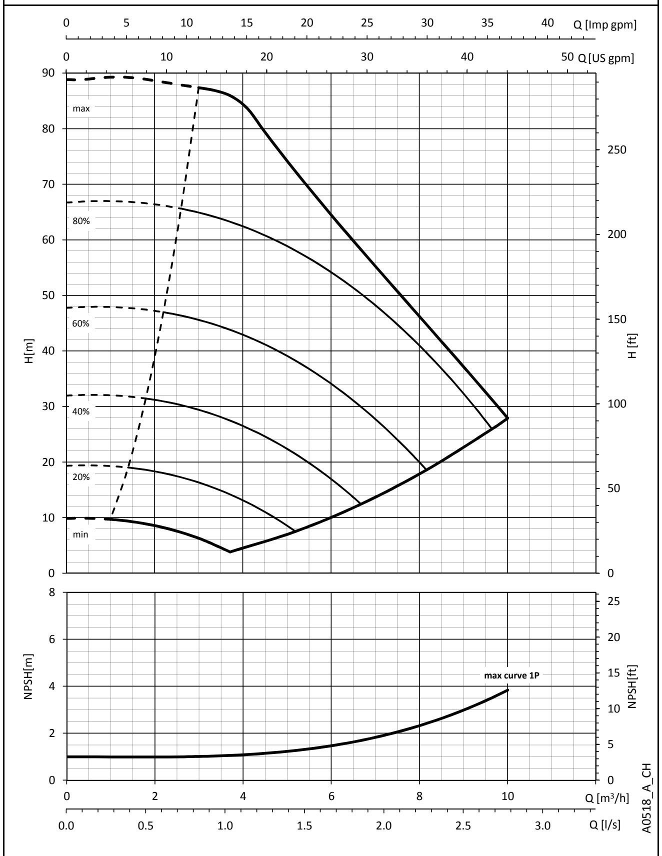


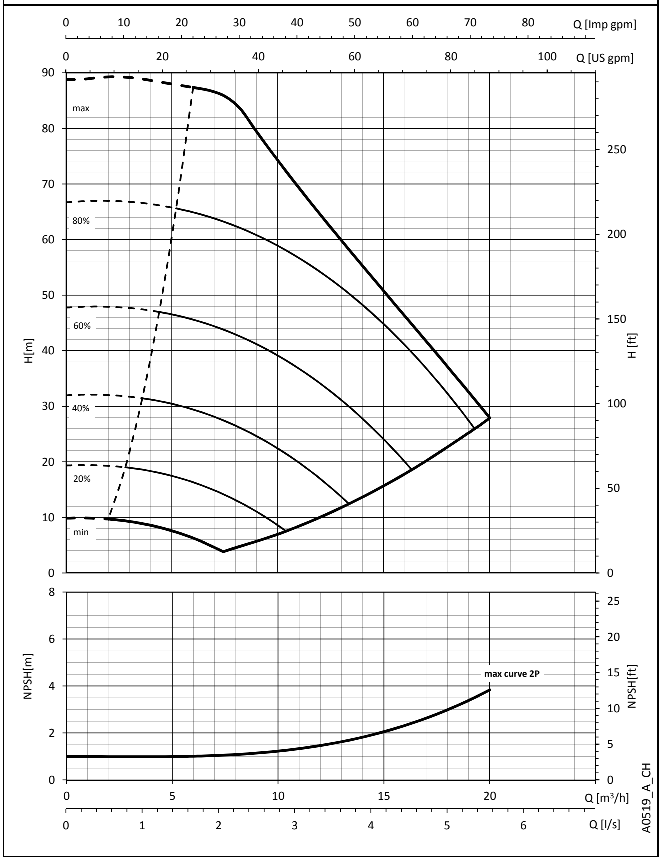
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5SVE08..015



SMB20…/5SVE08..015



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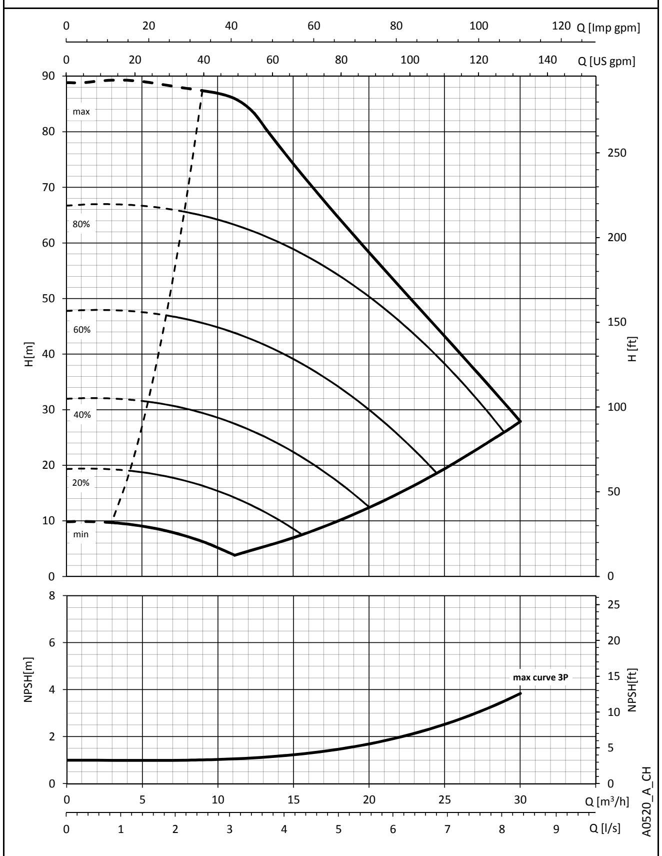
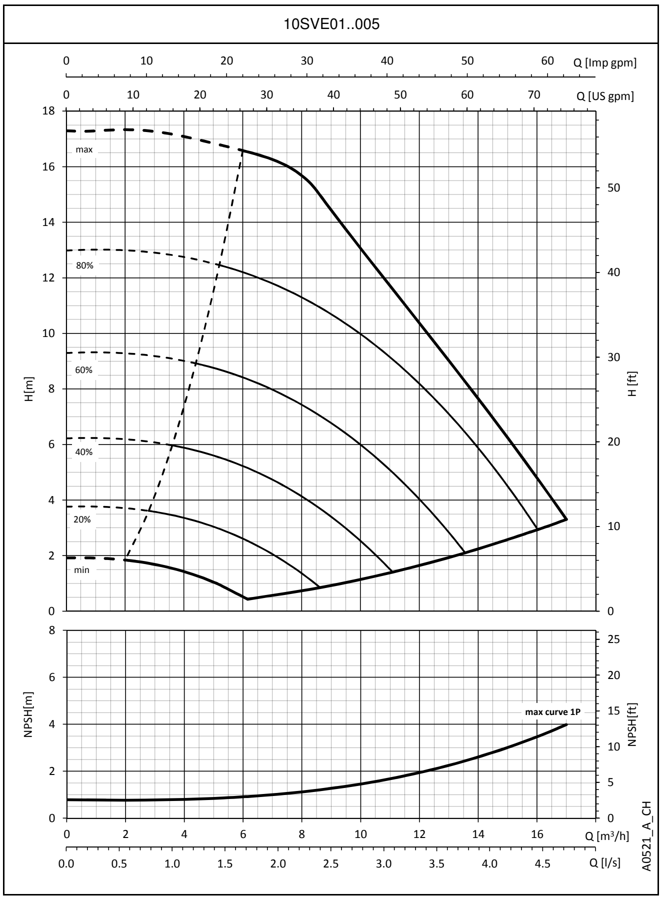
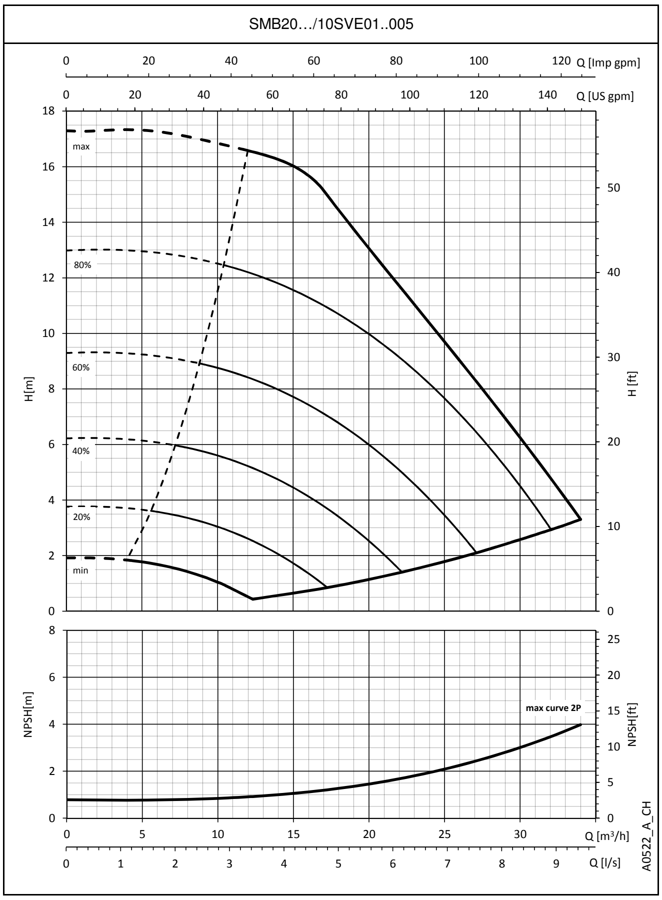
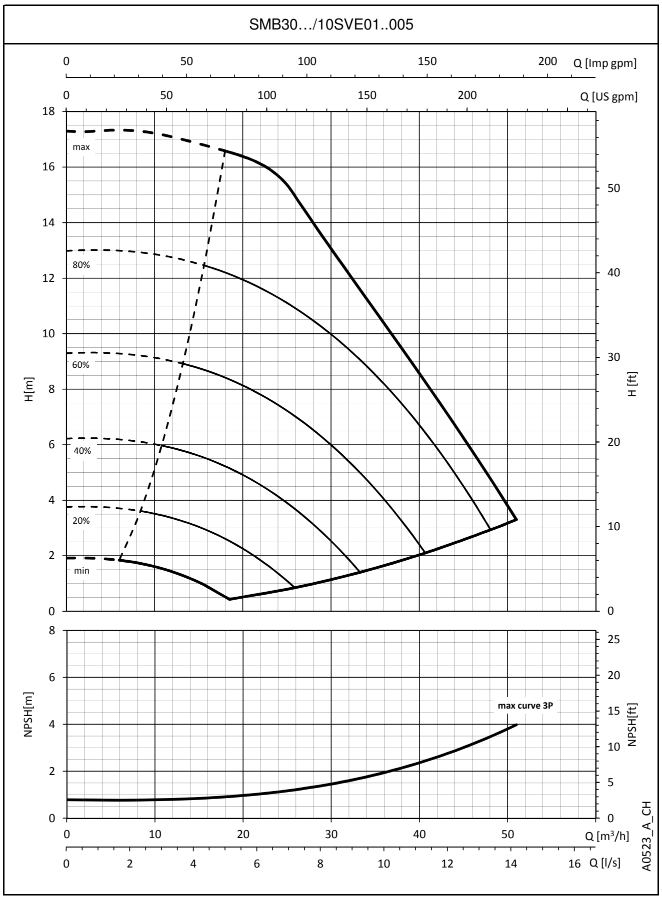


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS



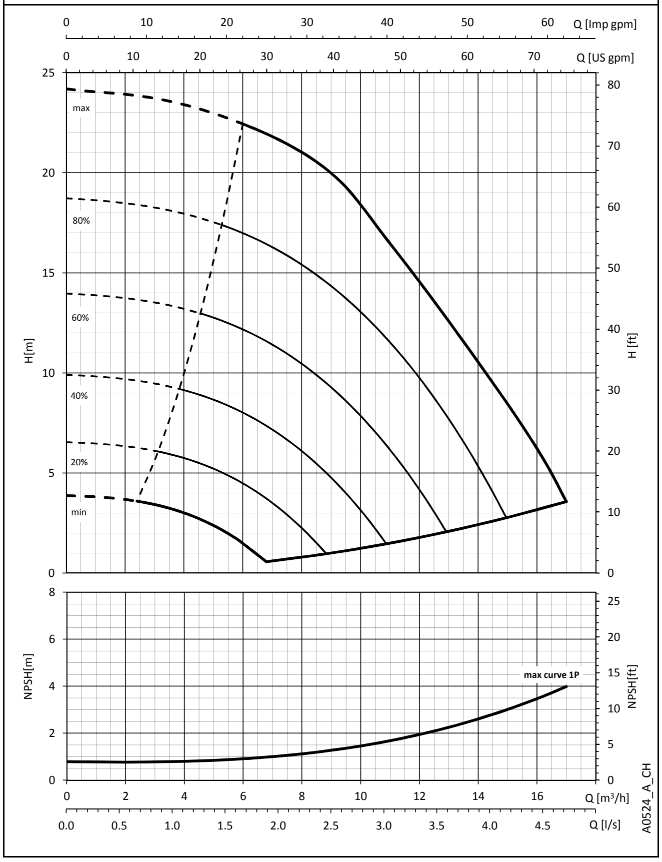




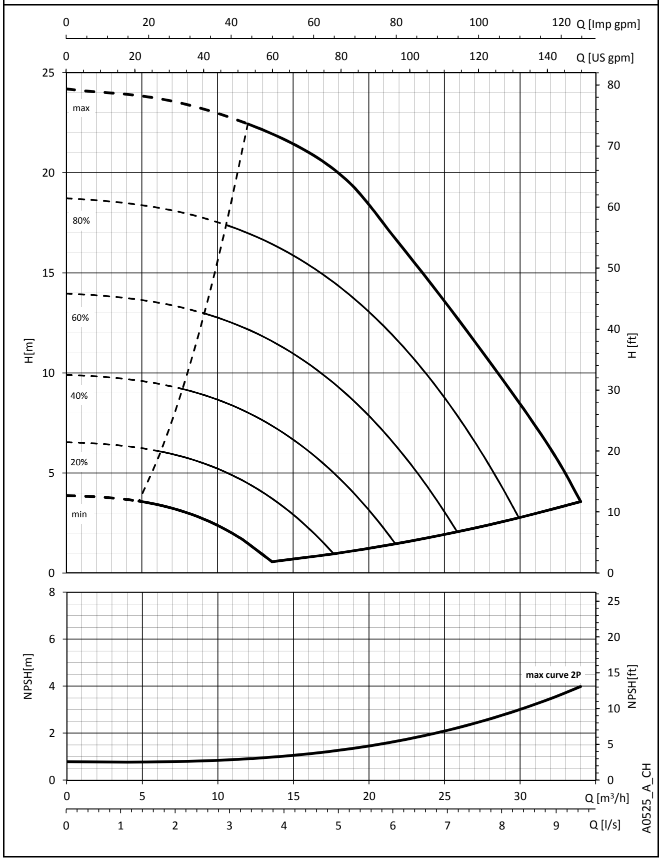
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

10SVE02..007



SMB20.../10SVE02..007



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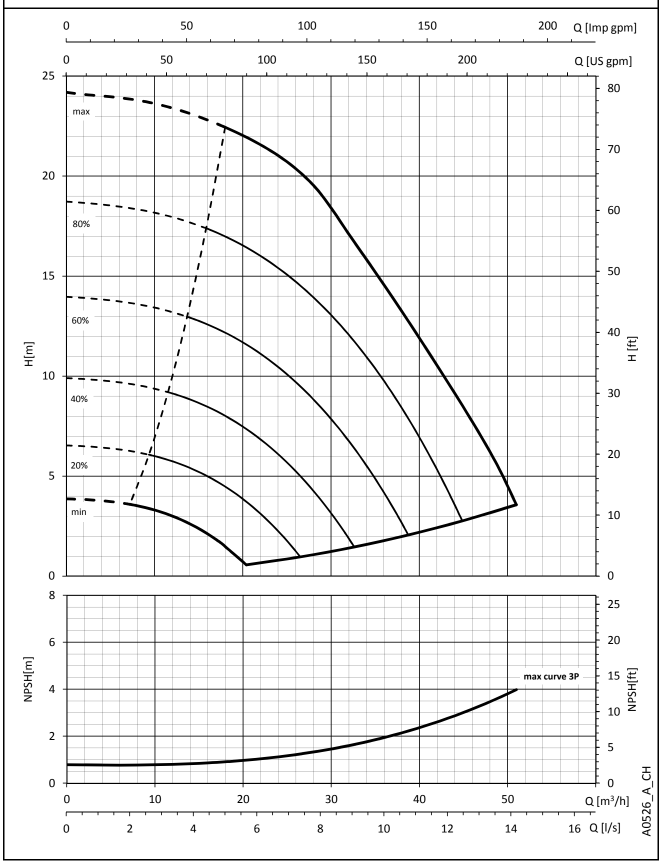

The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
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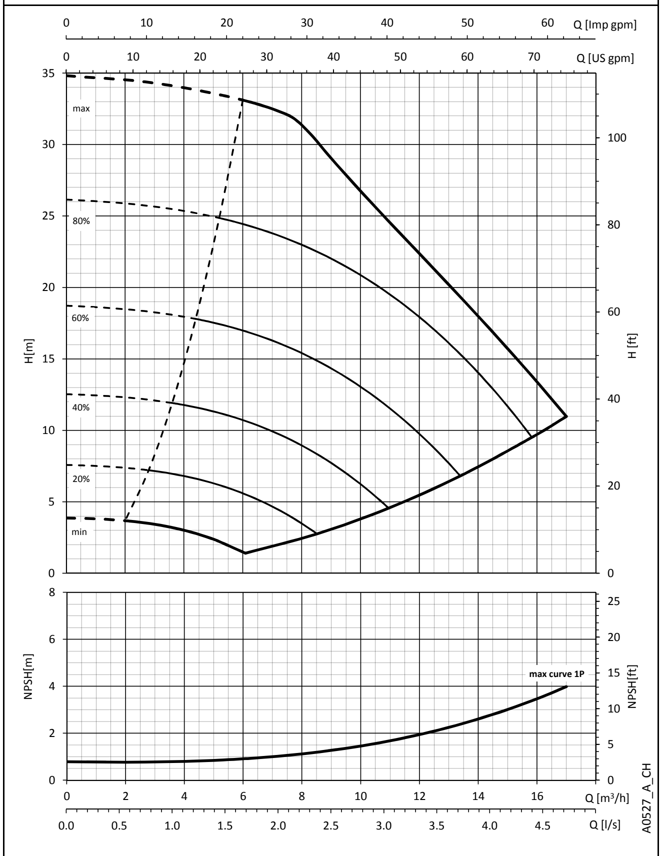
SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

10SVE02..011



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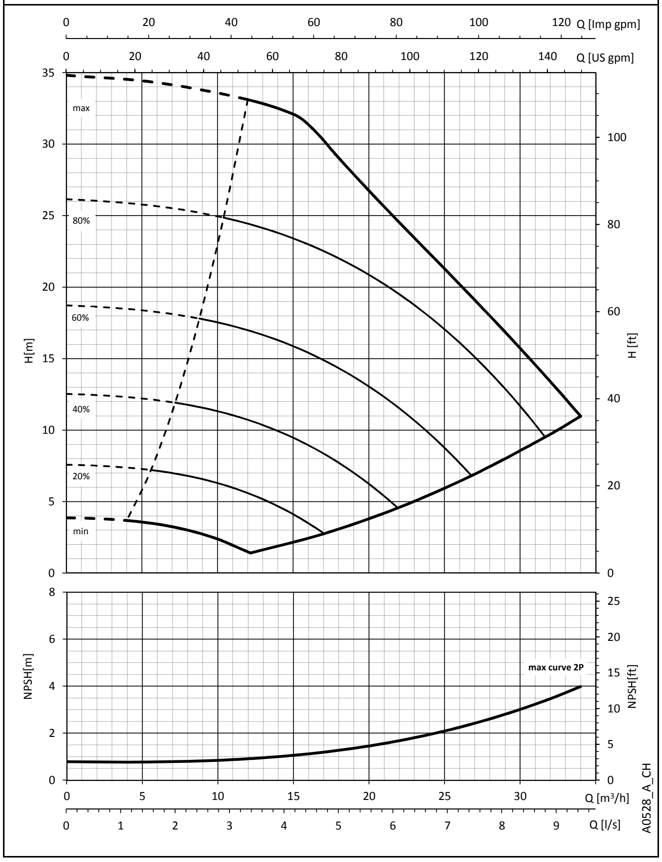

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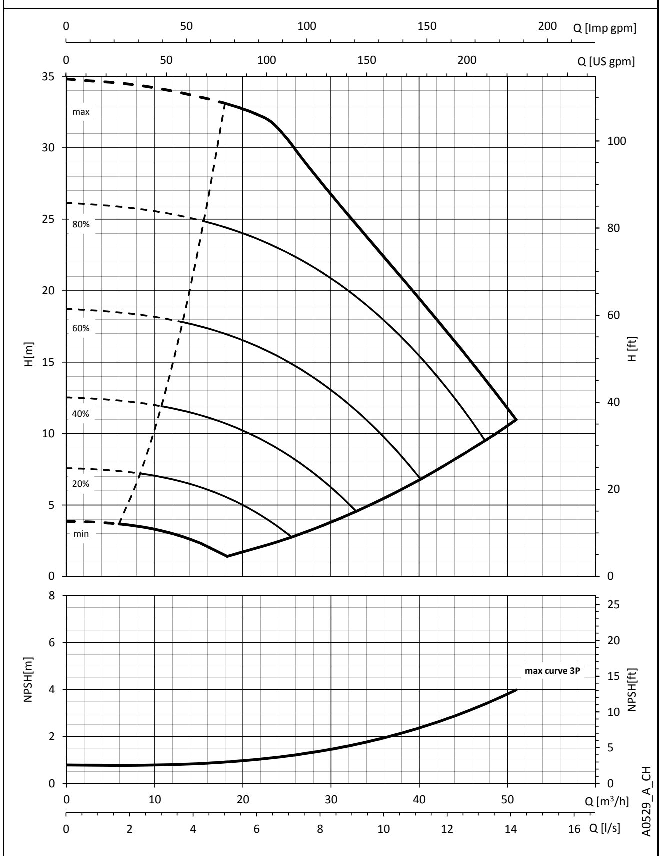

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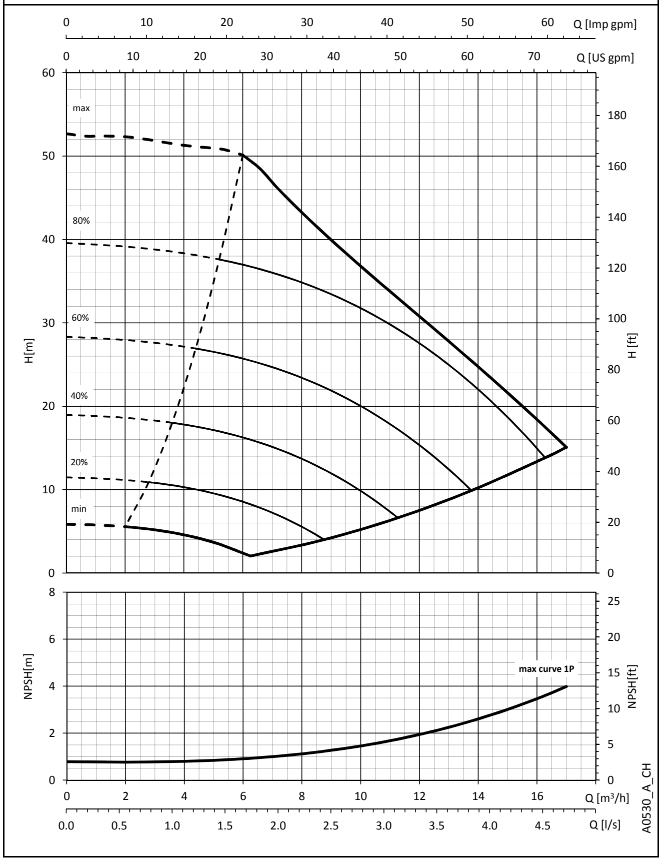
SMB.../SVE BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

10SVE03..015



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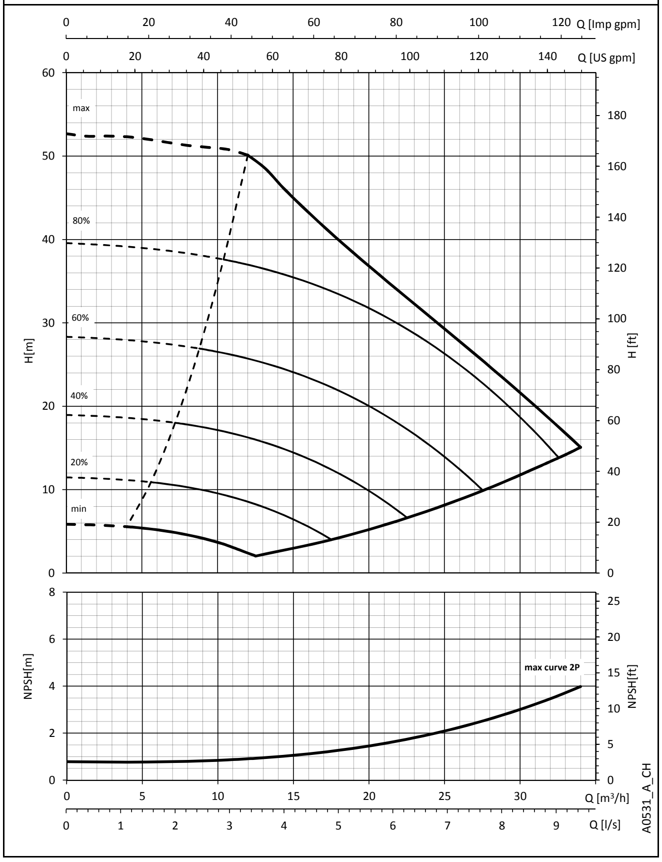

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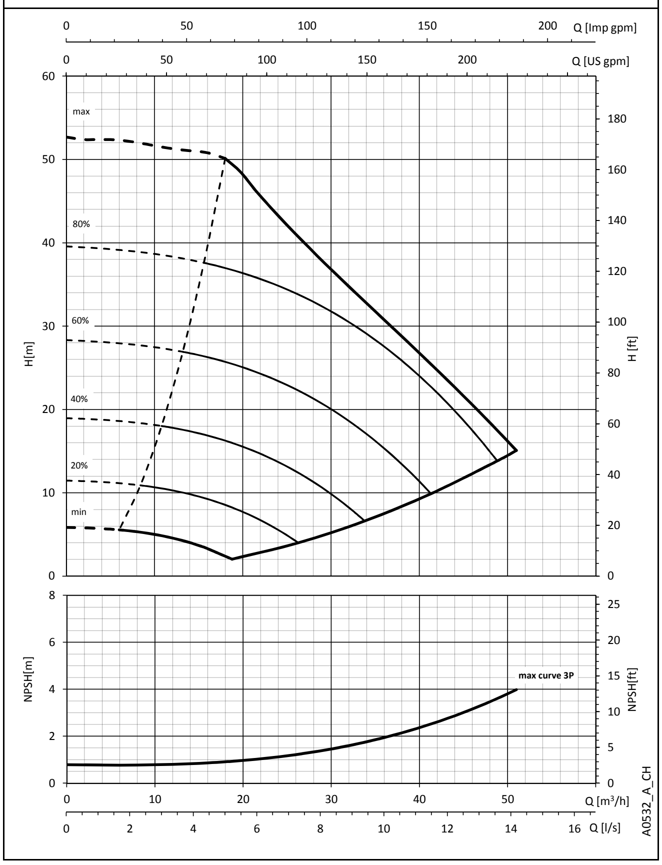

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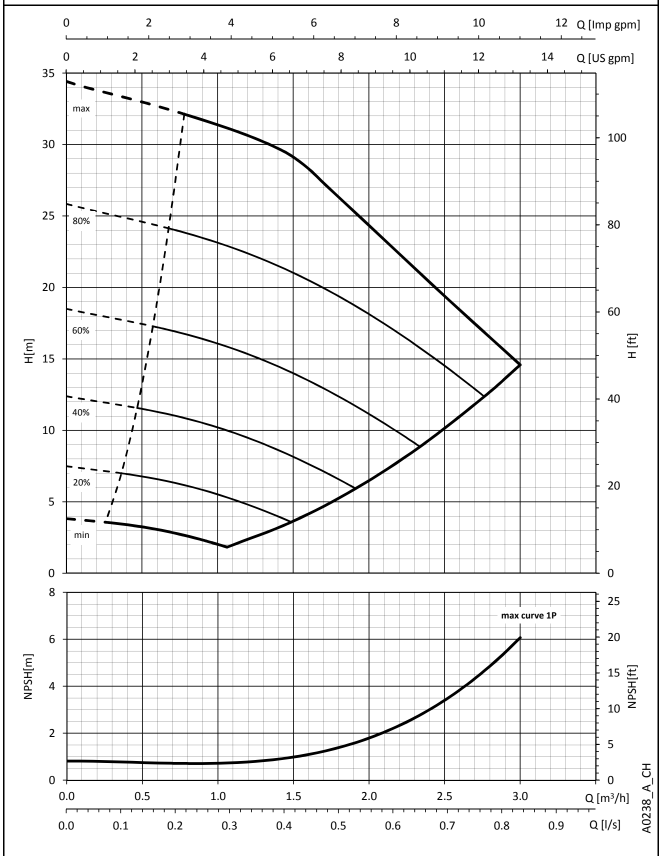
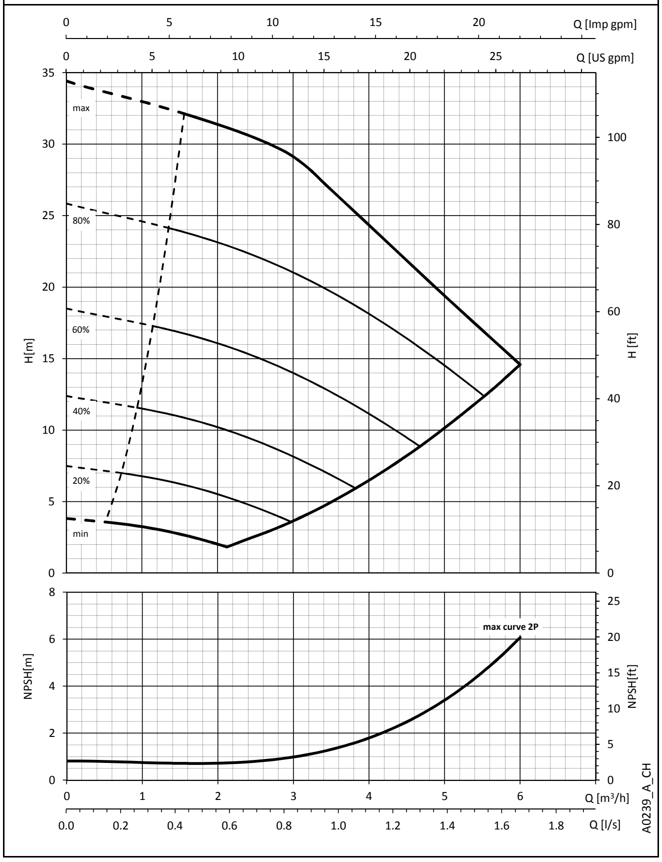
SMB…/VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

1VME02P03



SMB20…/1VME02P03



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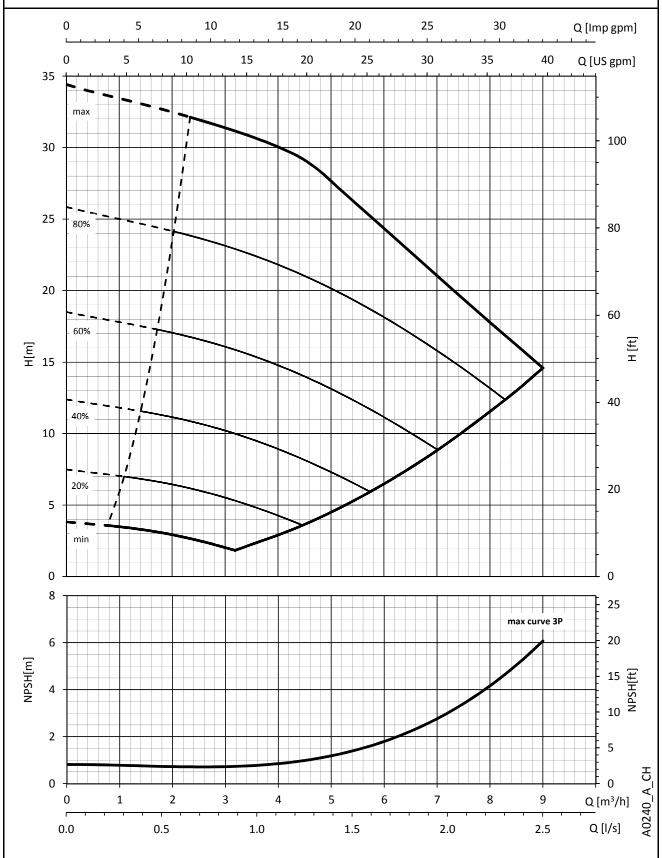

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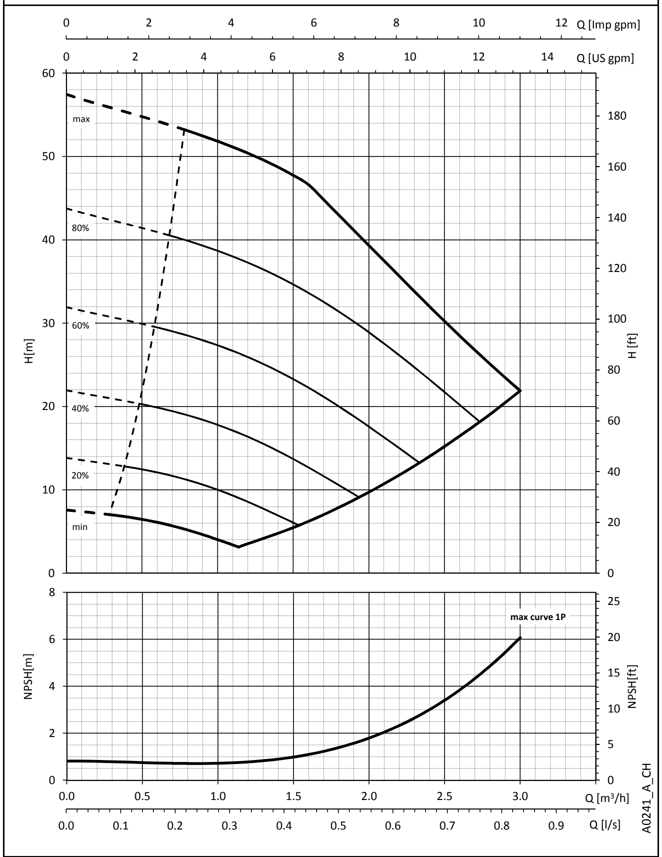
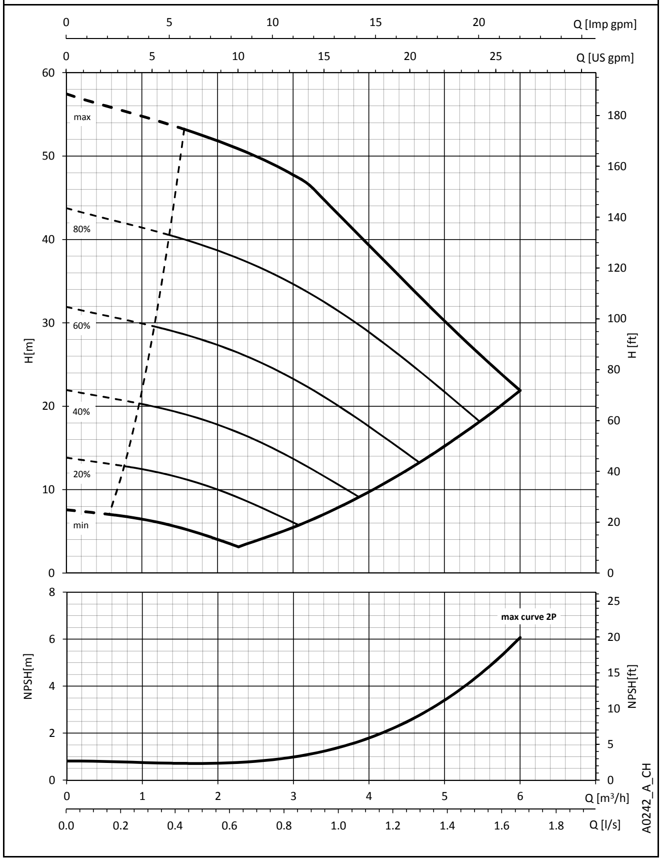
SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

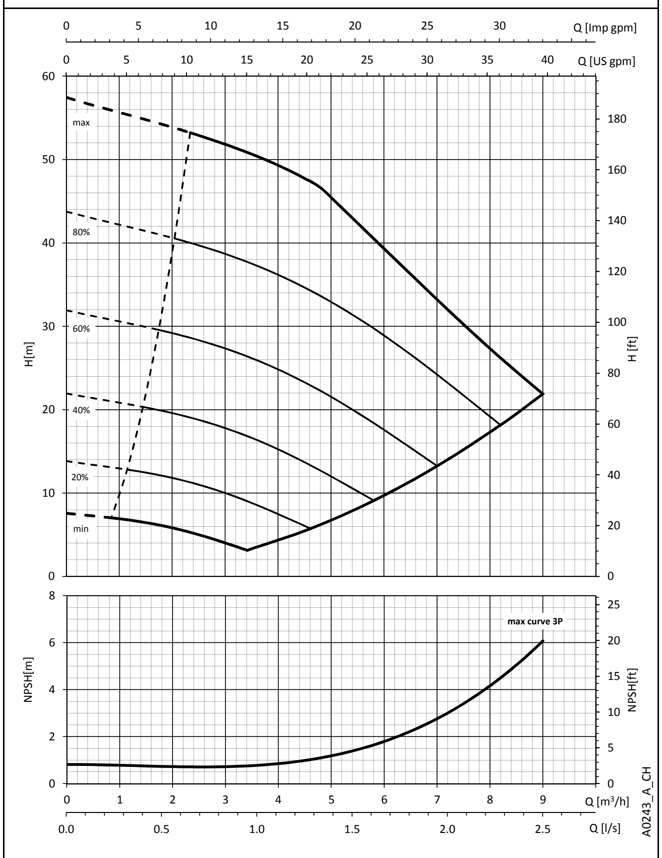
1VME04P05



SMB20…/1VME04P05



SMB30…/1VME04P05



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
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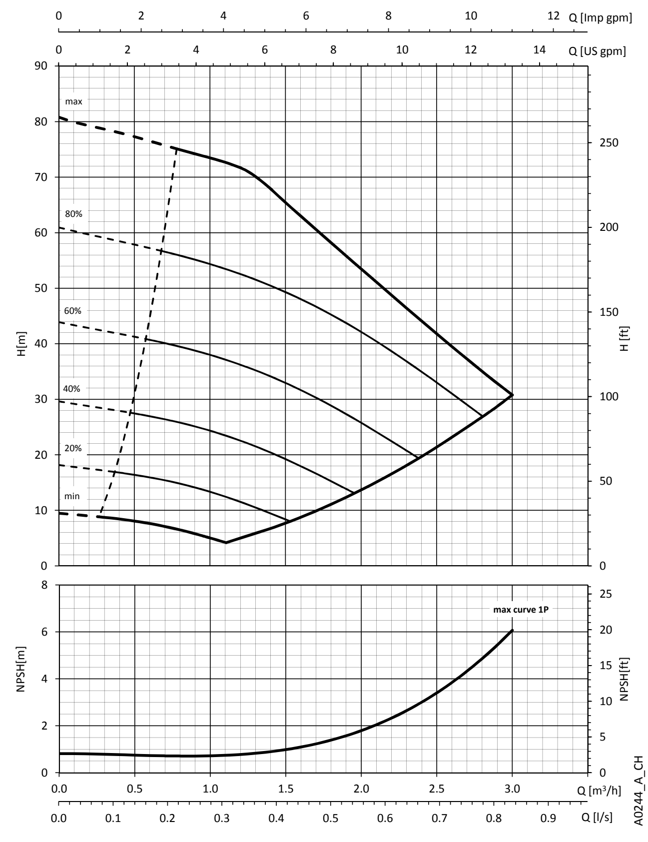
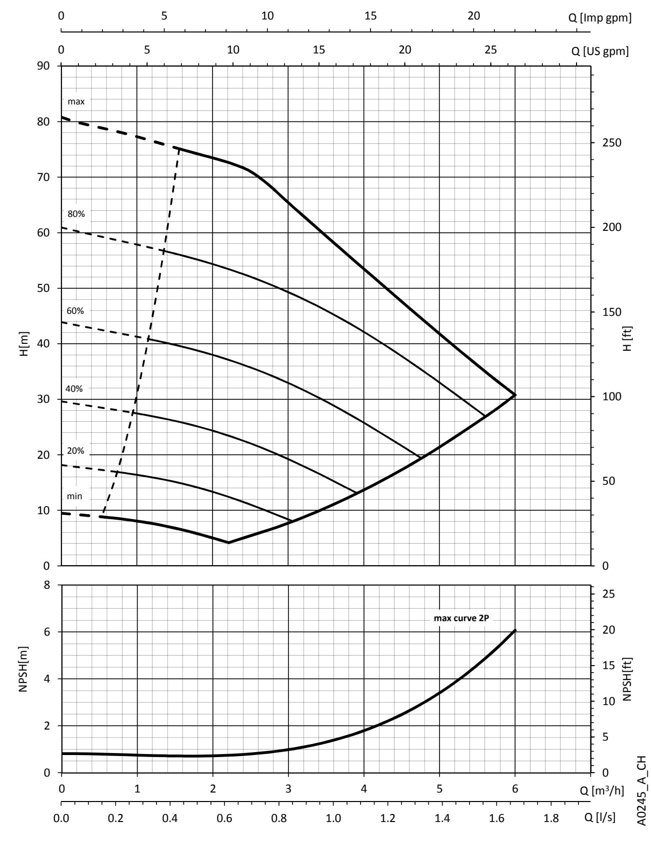
SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

1VME05P07



SMB20…/1VME05P07



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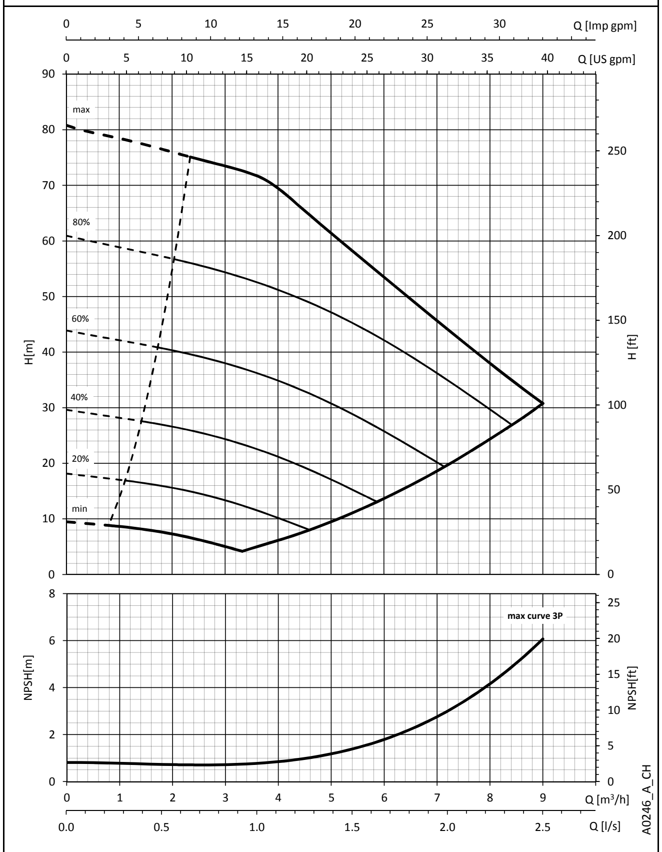

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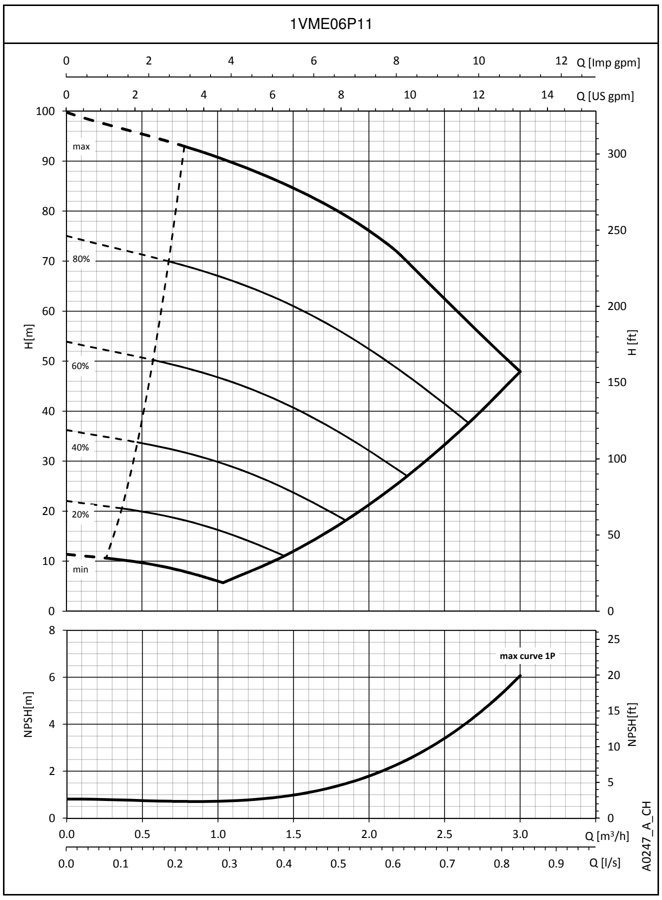
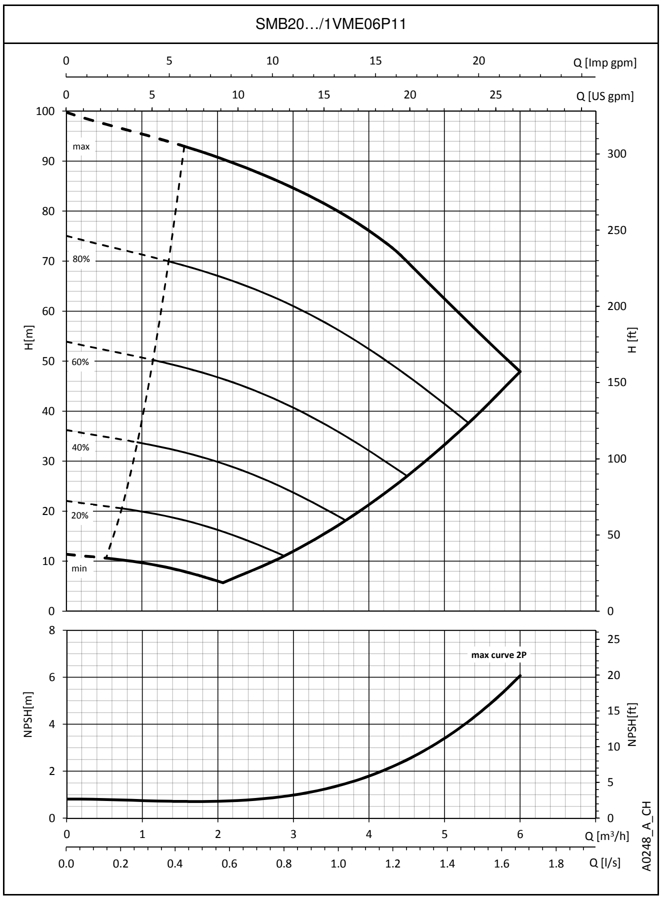
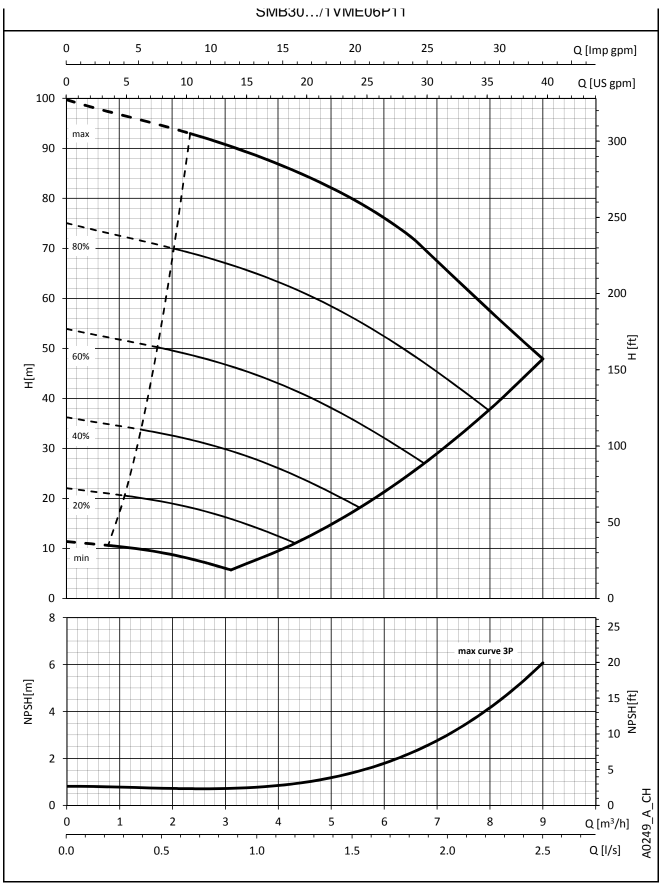
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES OPERATING CHARACTERISTICS







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.
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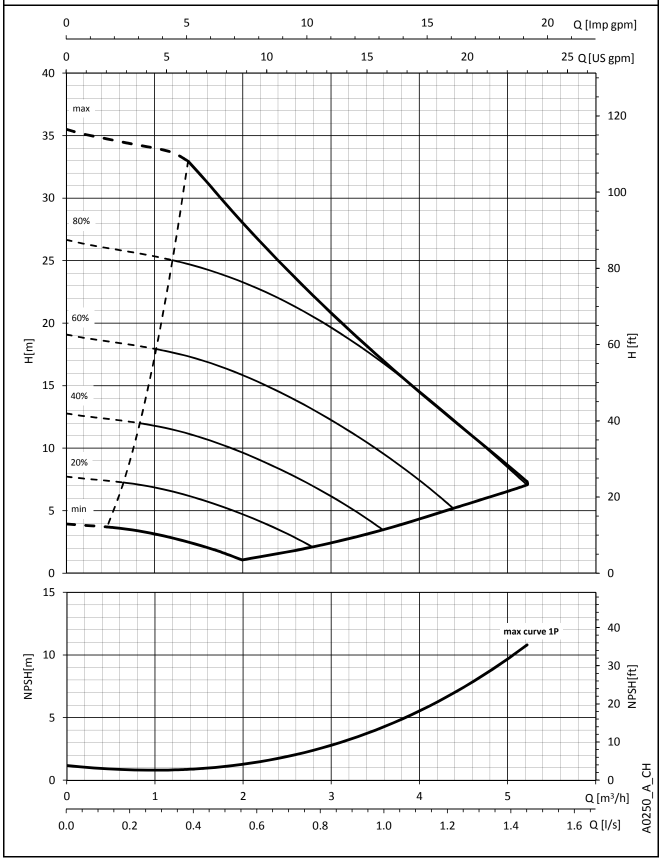
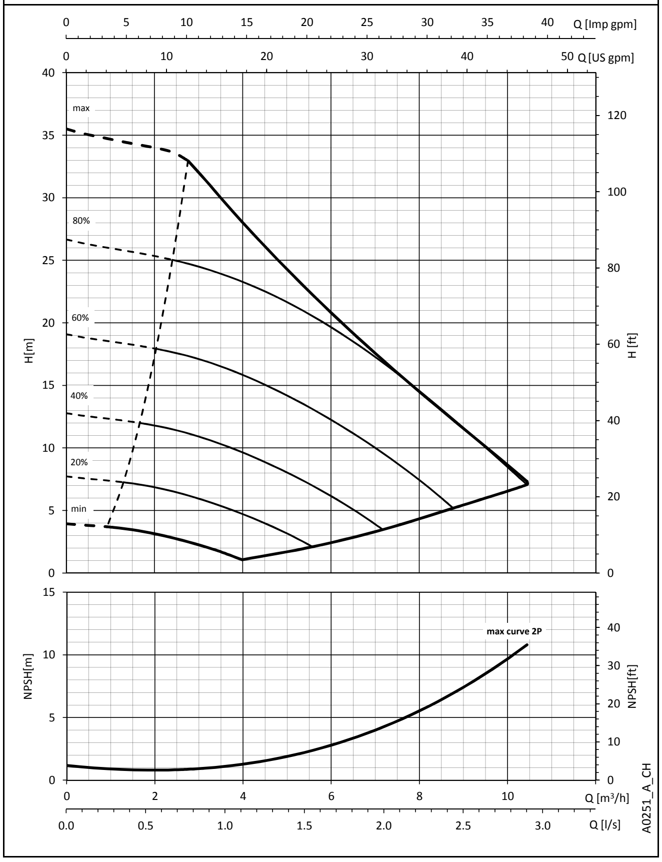
SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

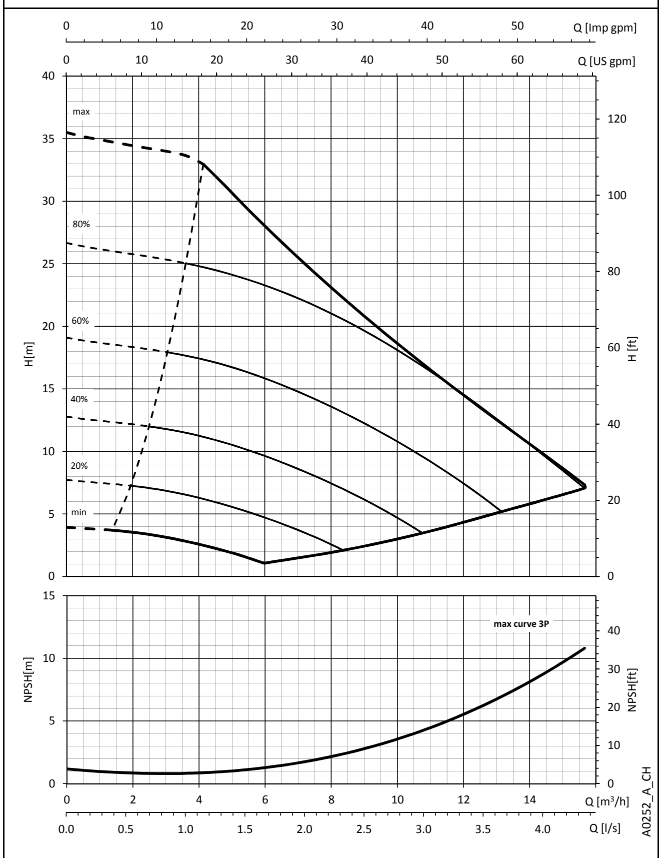
3VME02P03



SMB20…/3VME02P03



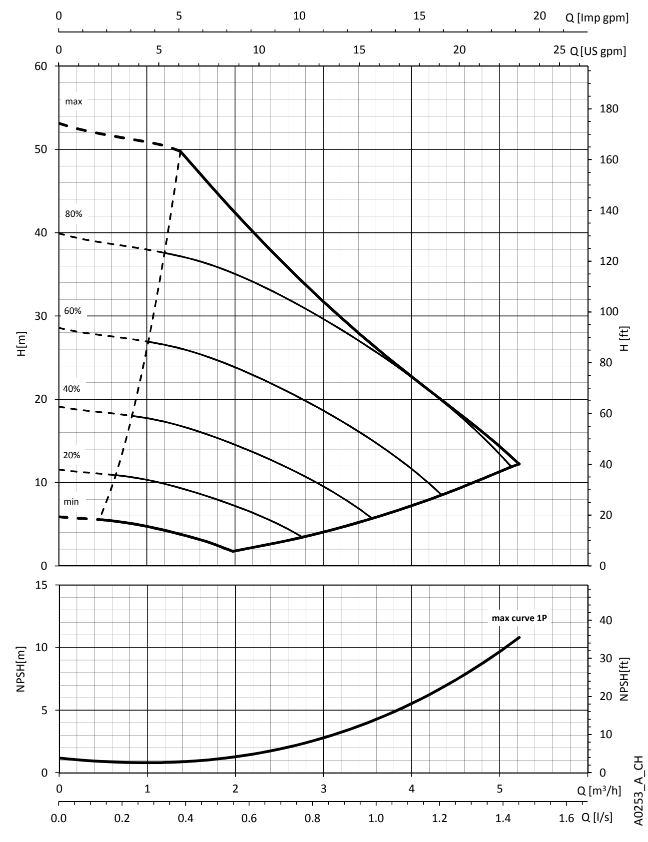
SMB30…/3VME02P03



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

3VME03P05



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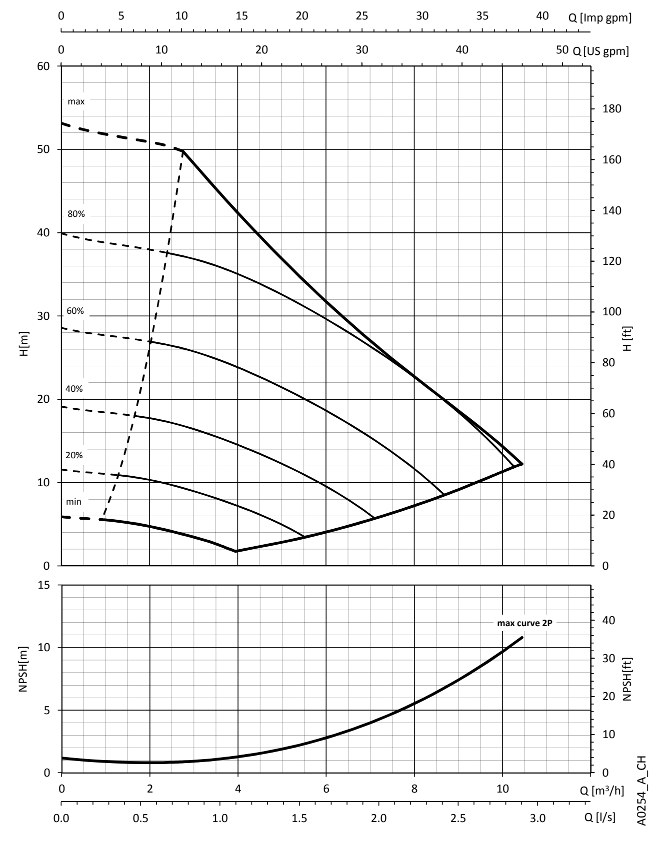

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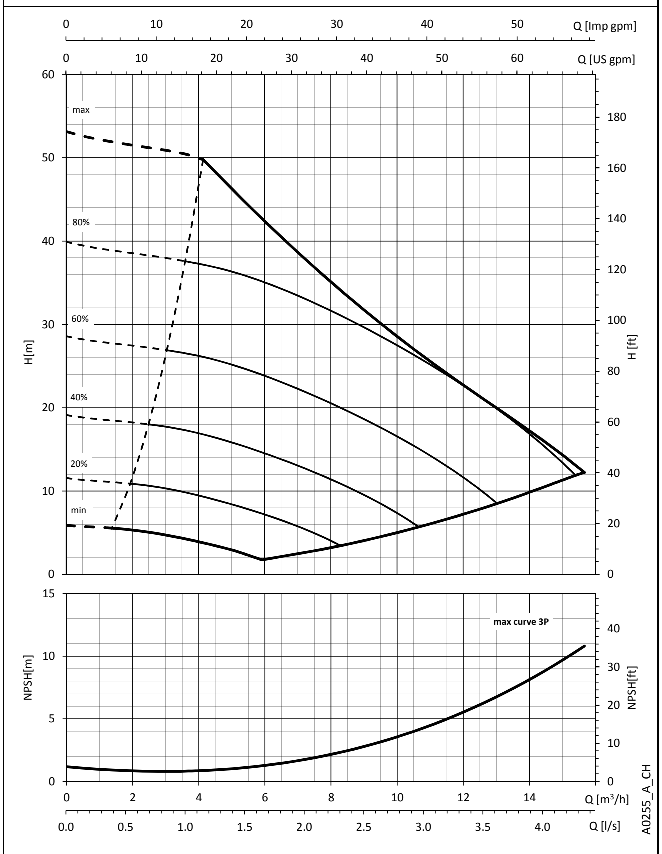

The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
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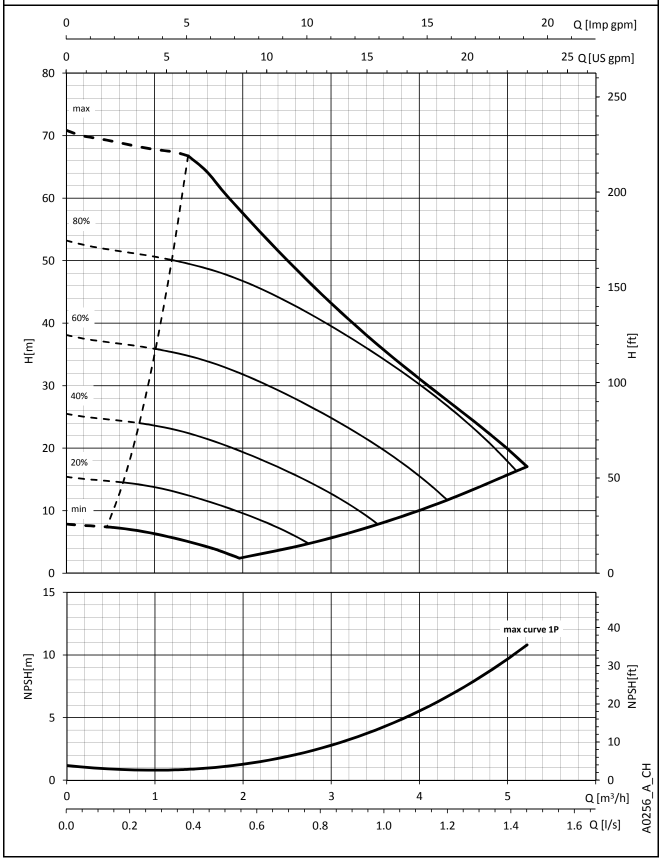
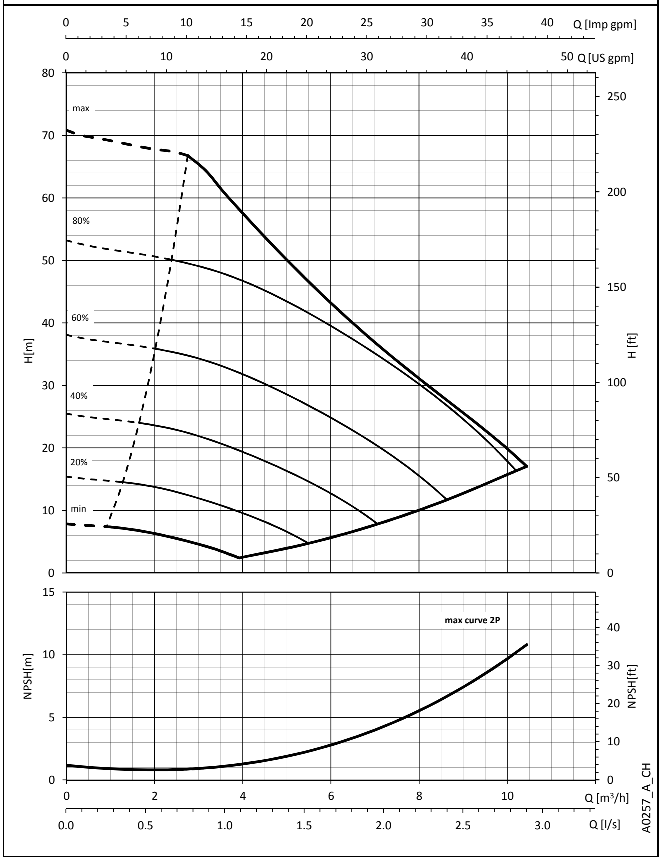
SMB.../VME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

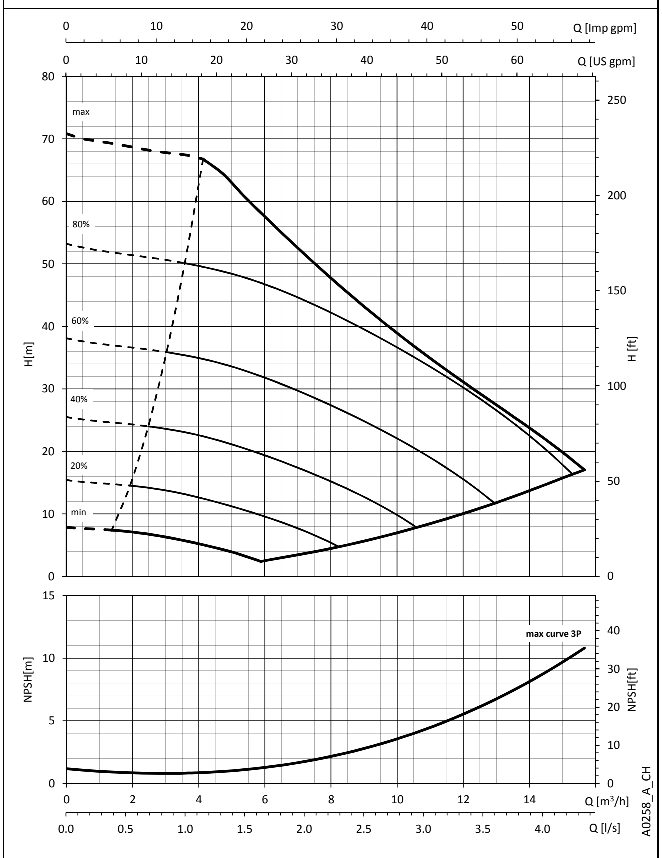
3VME04P07



SMB20…/3VME04P07

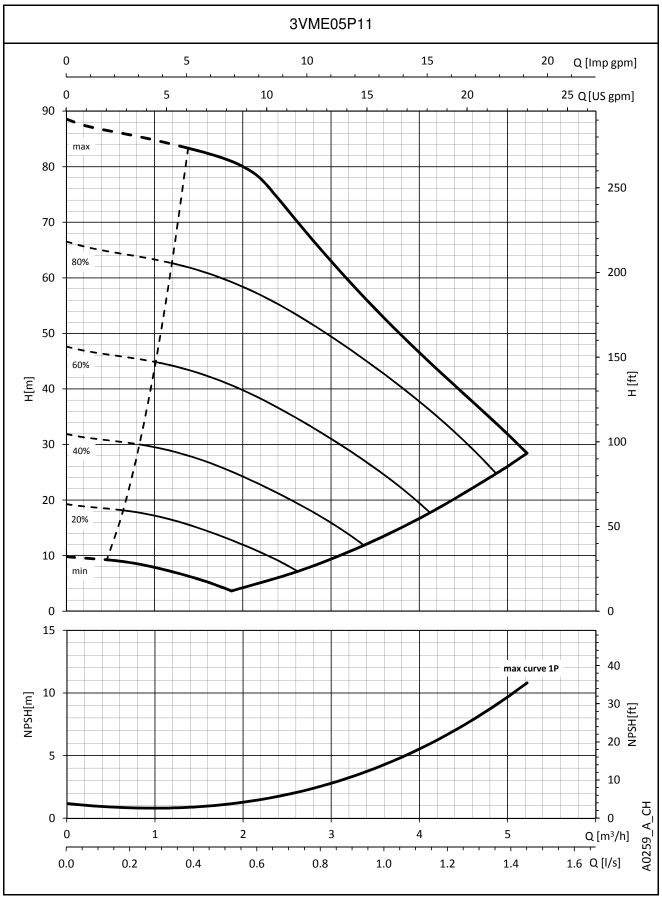


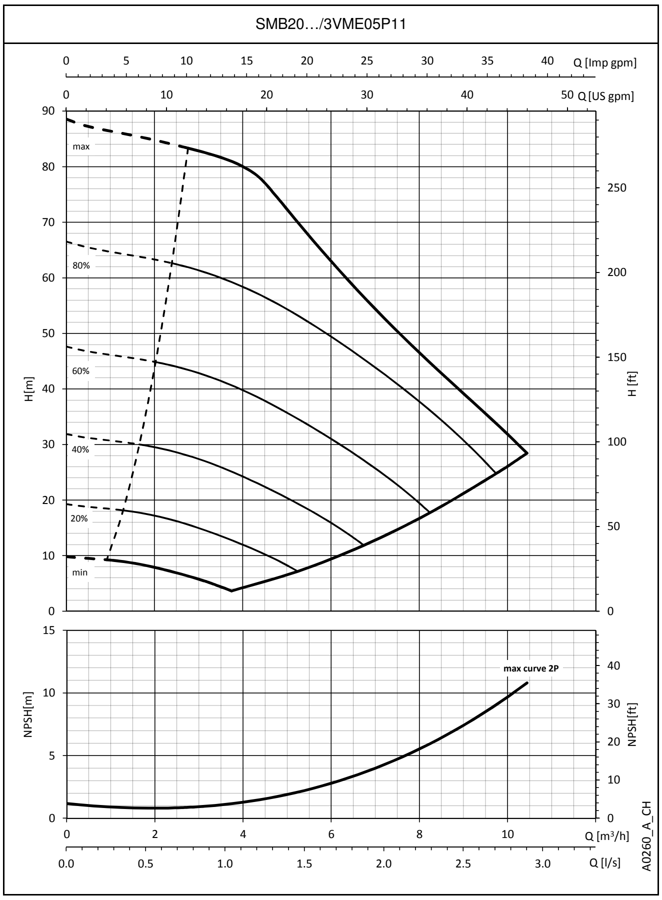
SMB30…/3VME04P07

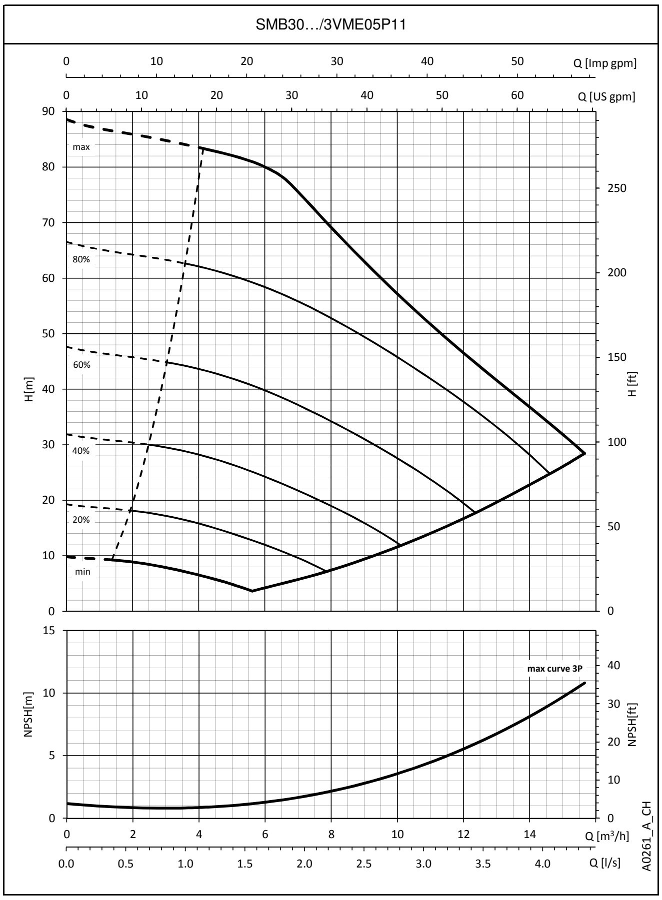


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm^3 and kinematic viscosity ν = 1 mm^2/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

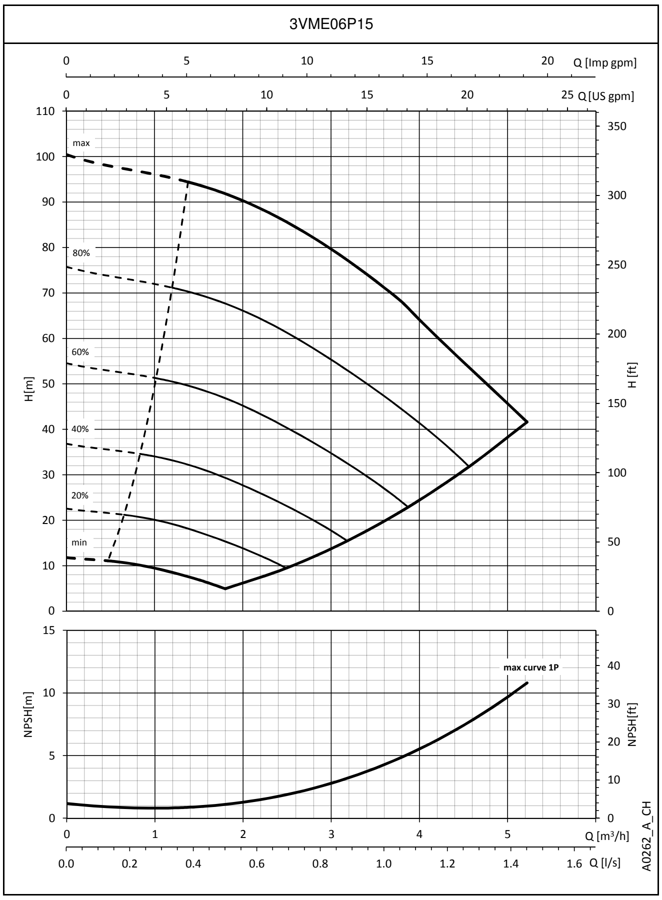


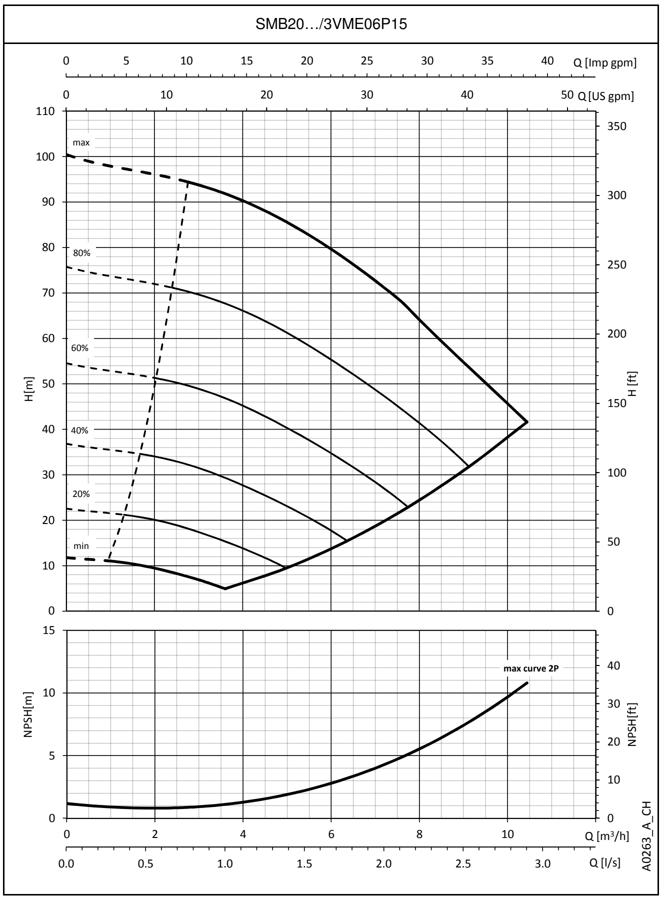


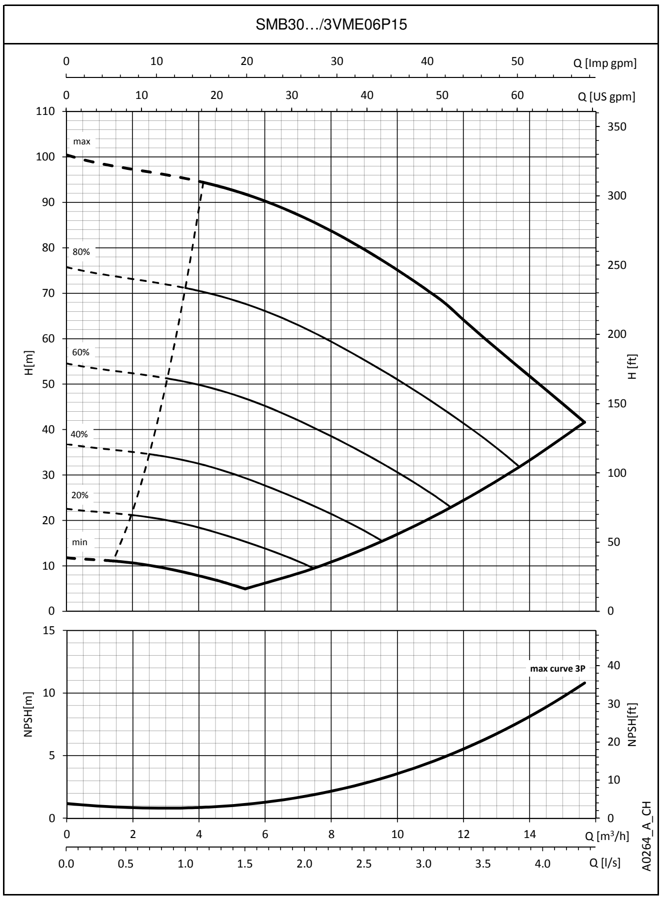


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS



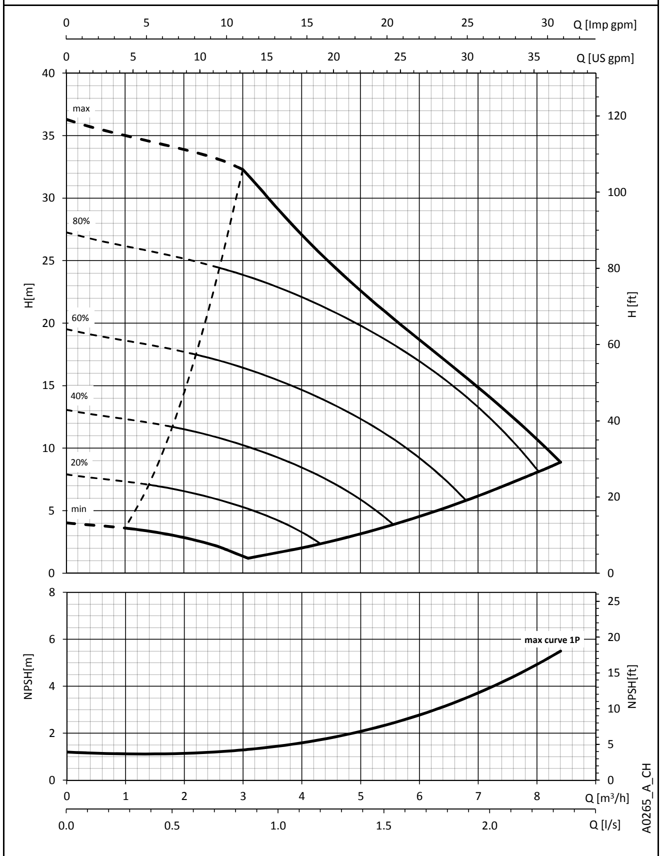




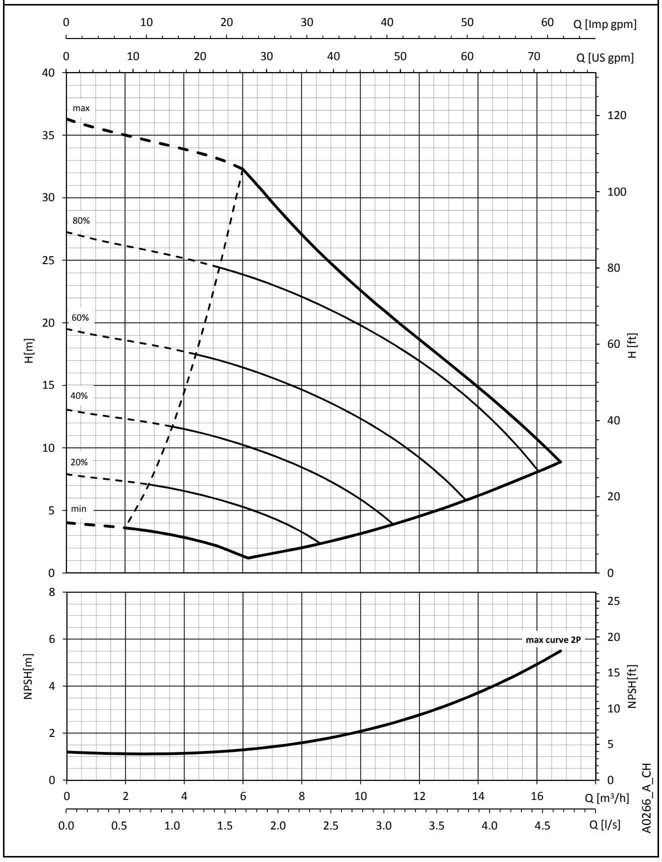
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

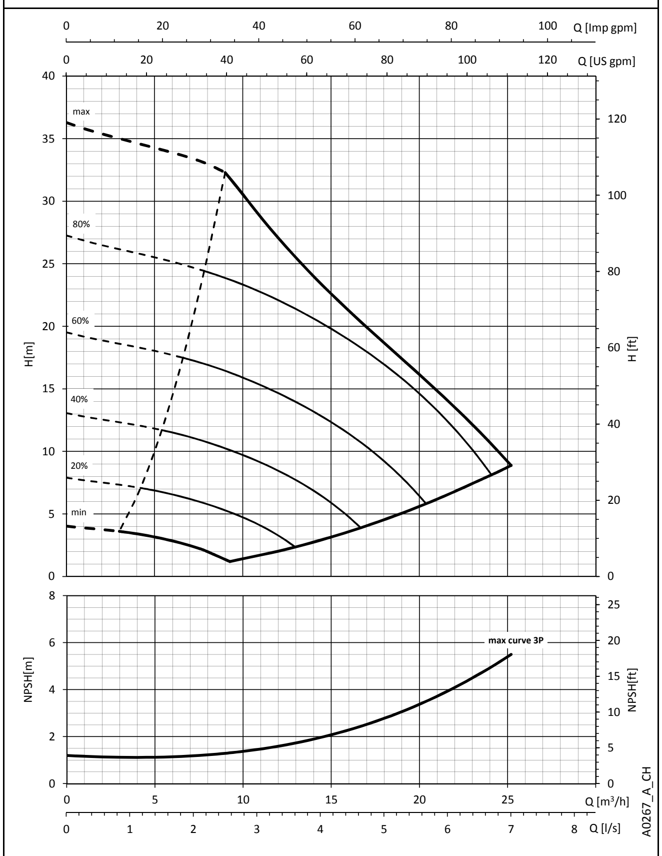
5VME02P05



SMB20.../5VME02P05



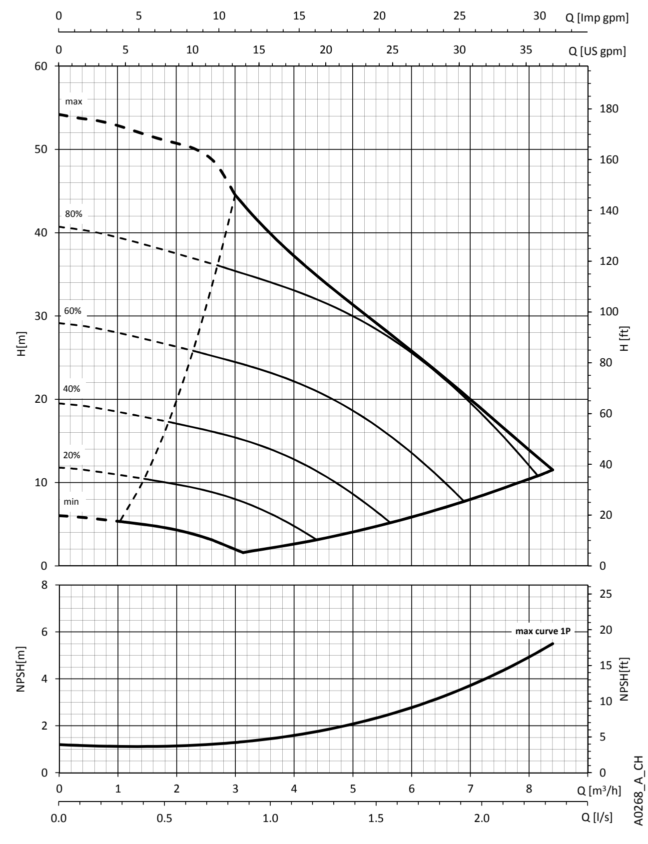
SMB30.../5VME02P05



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5VME03P07



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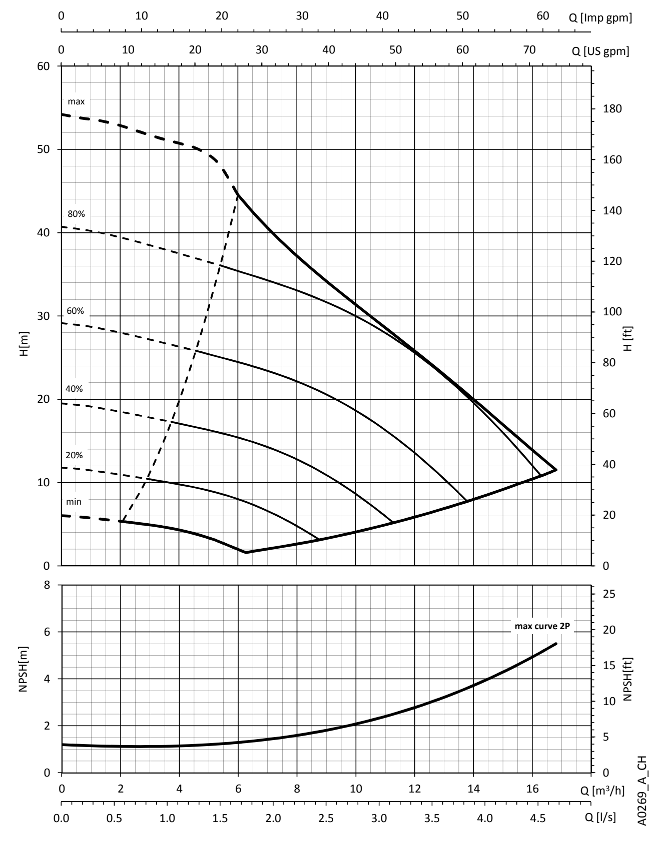

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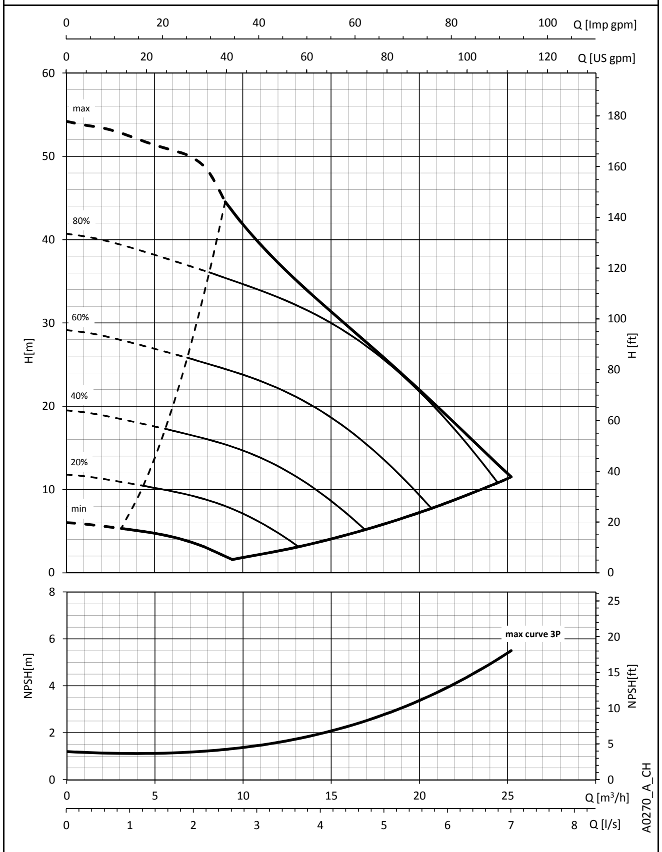
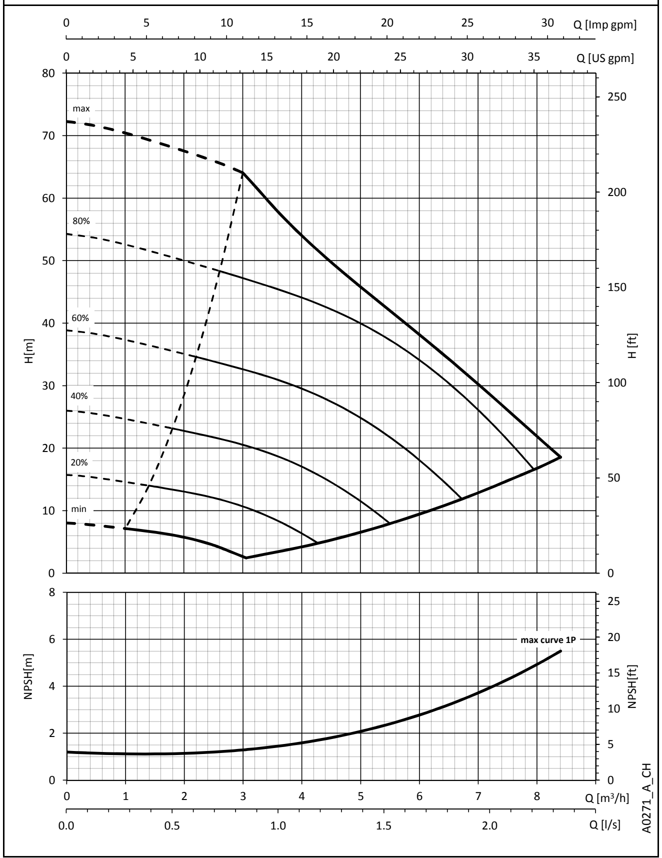


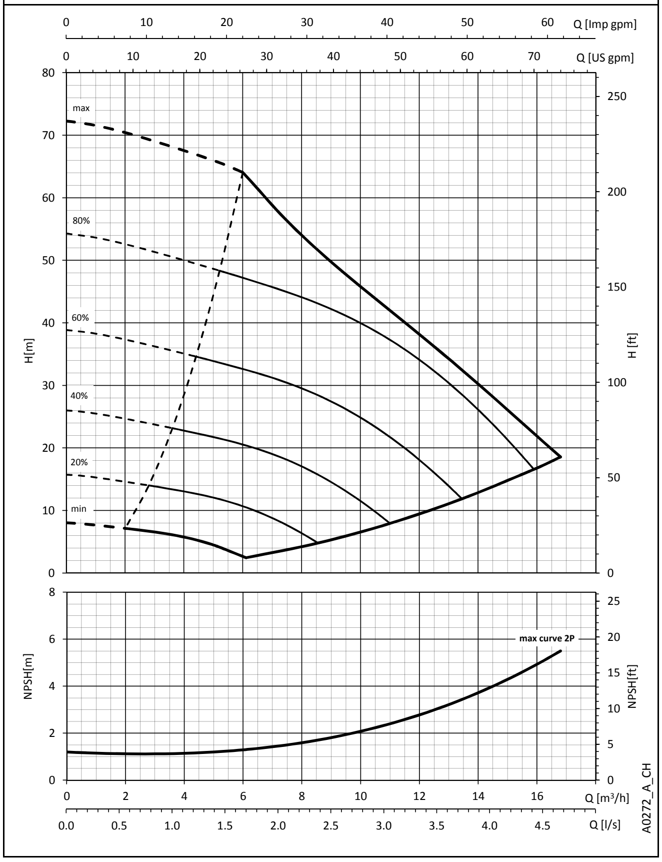
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5VME04P11



SMB20…/5VME04P11



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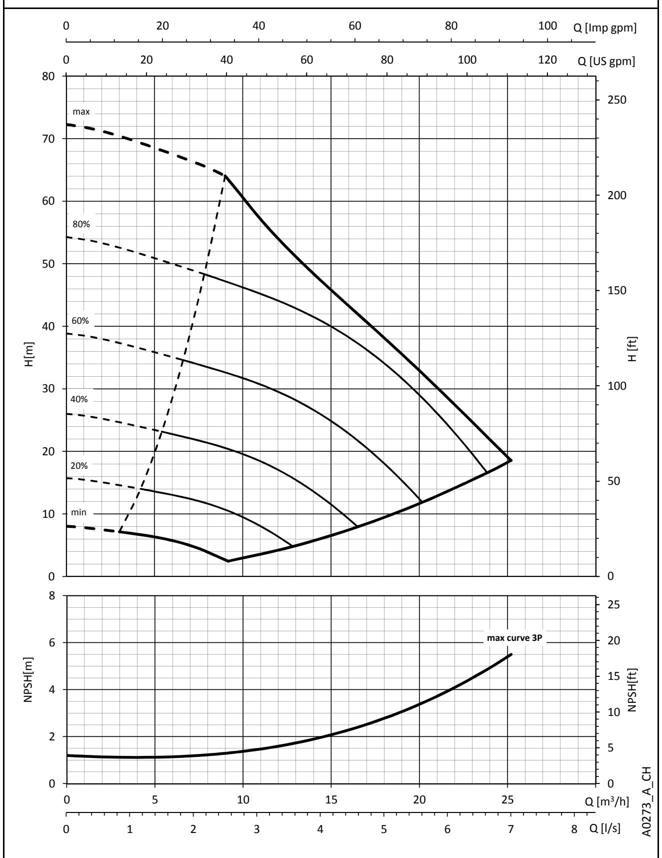
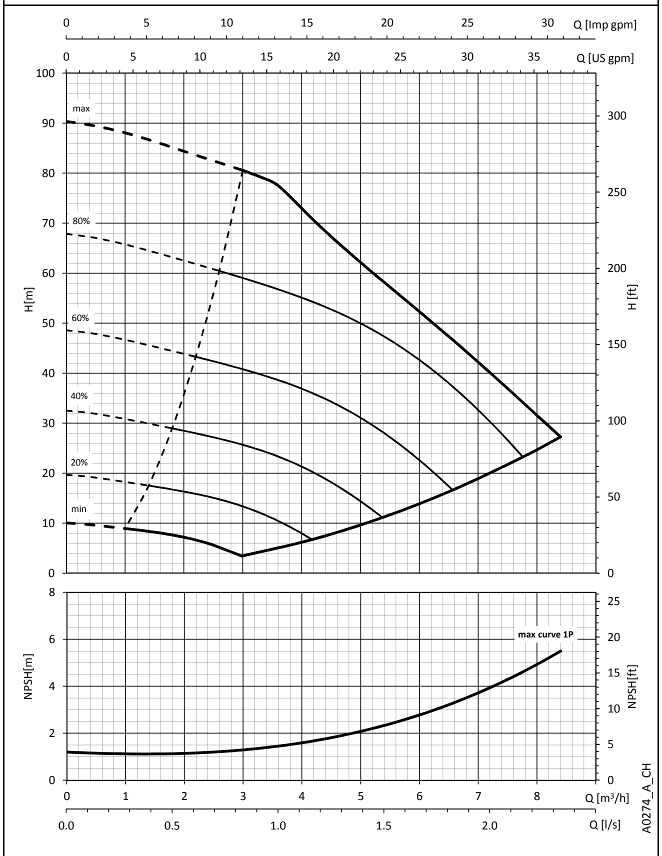


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

5VME05P15



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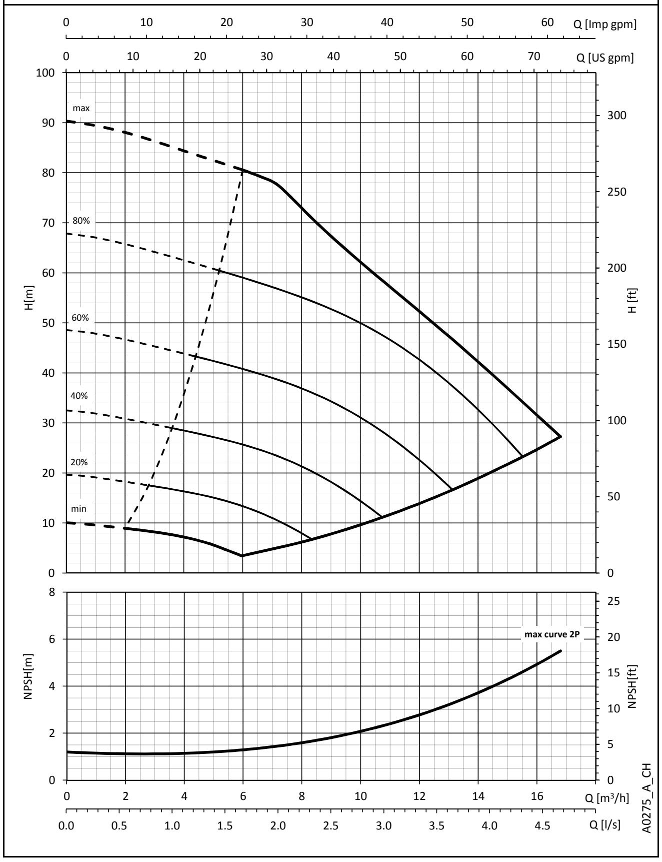
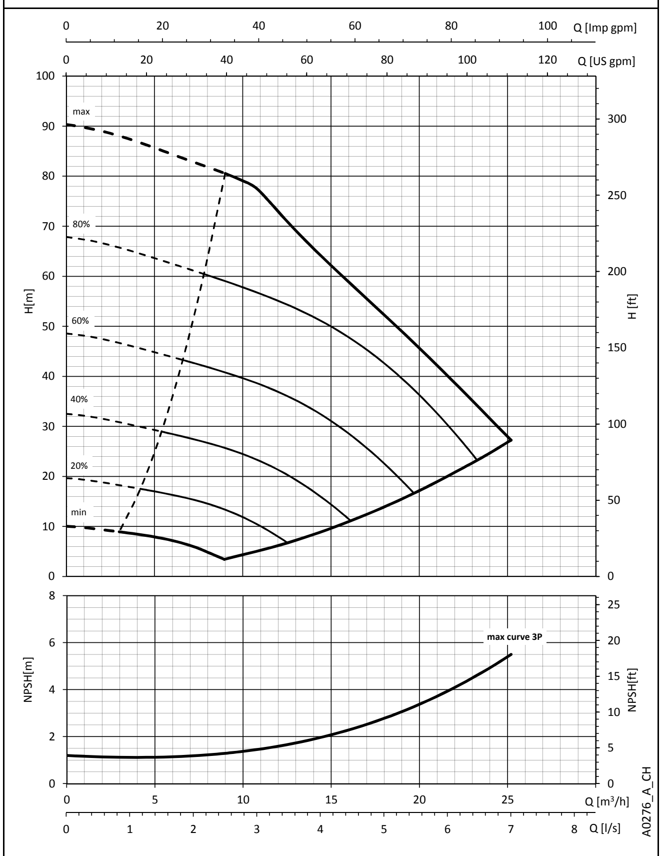
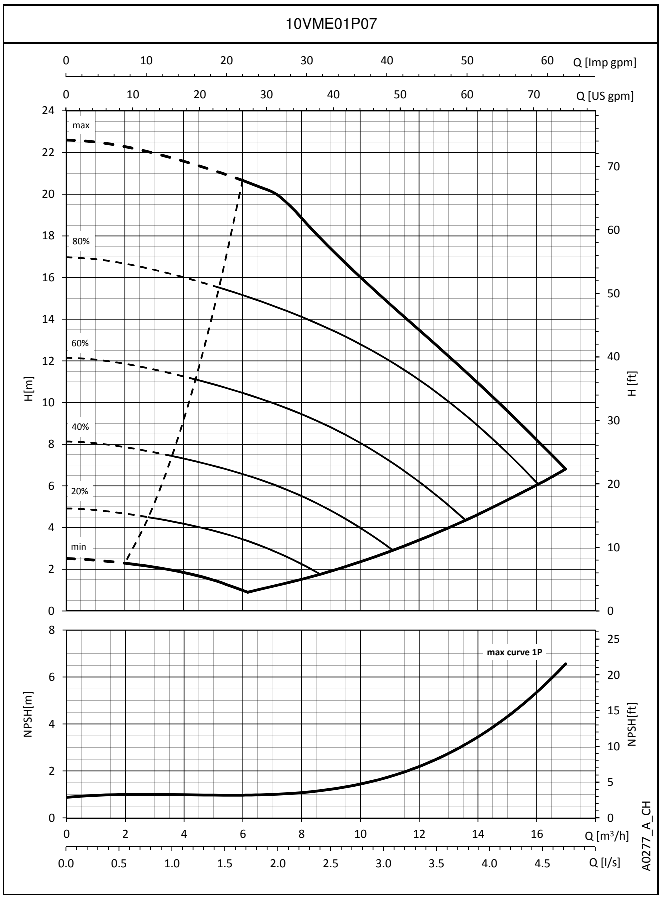


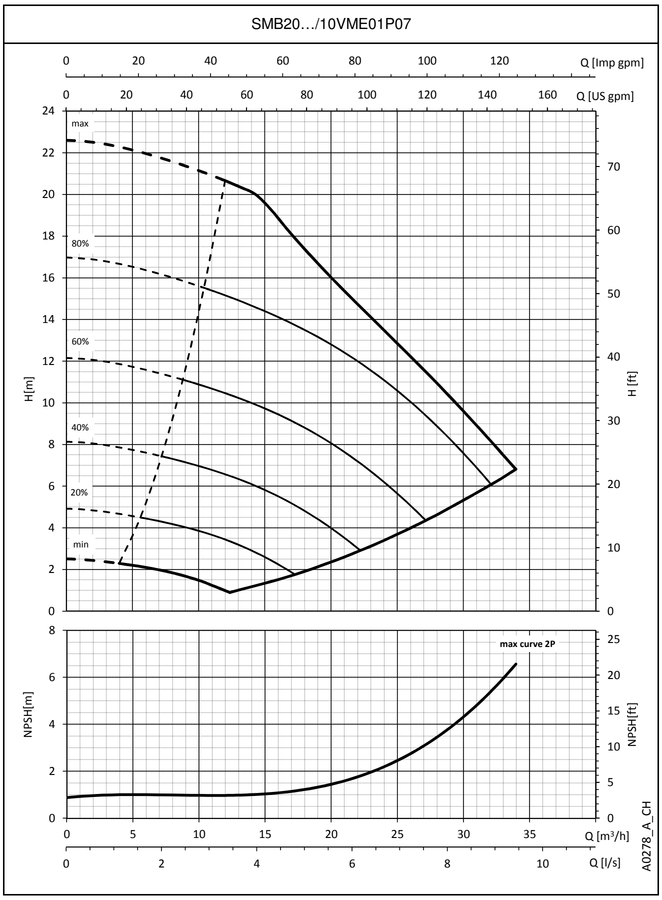
SMB30…/5VME05P15

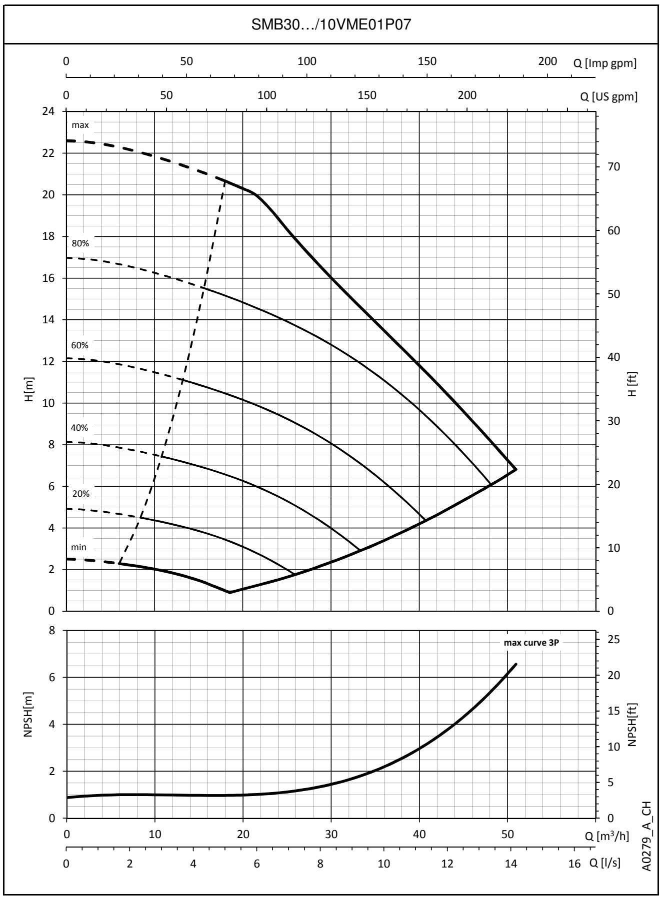


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES OPERATING CHARACTERISTICS



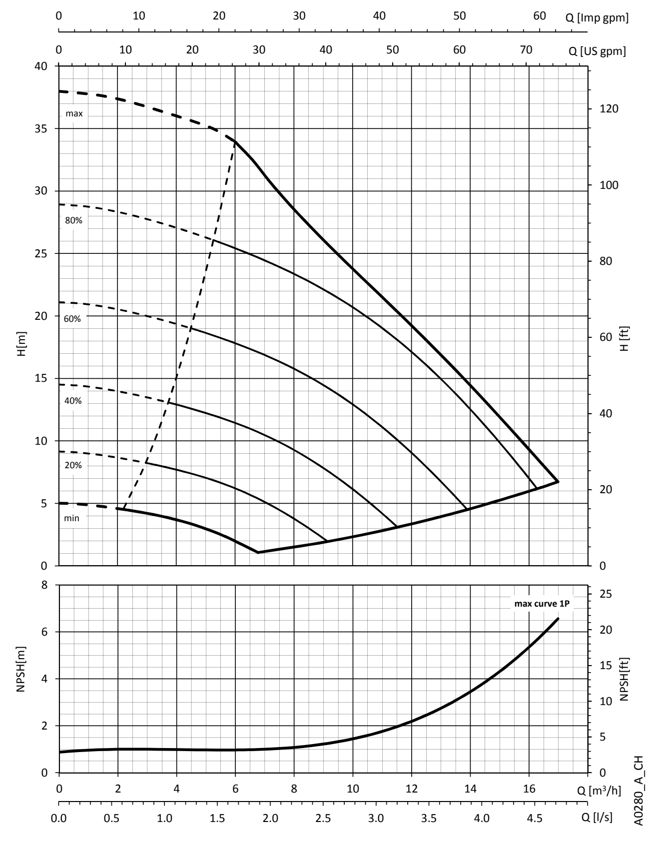




The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../VME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

10VME02P11



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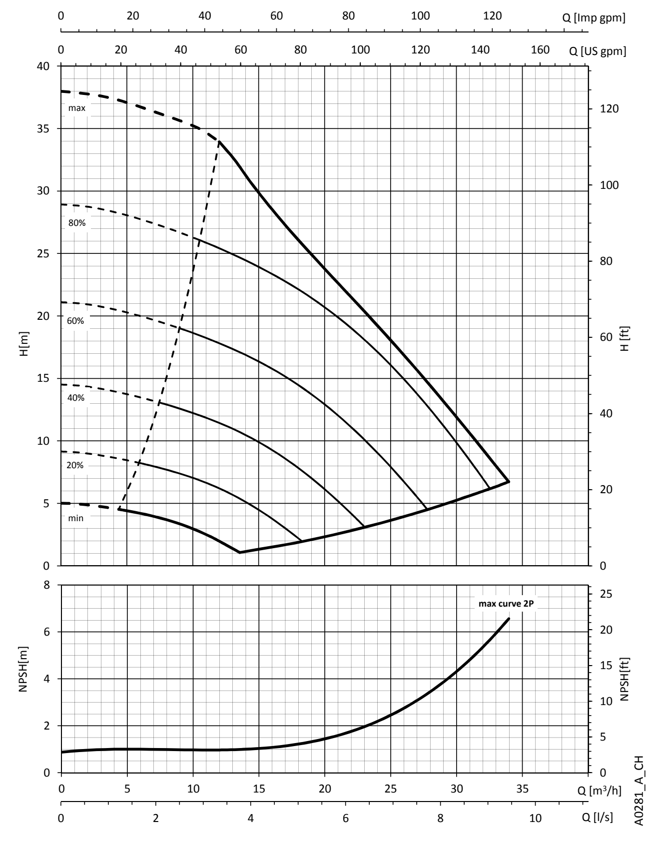

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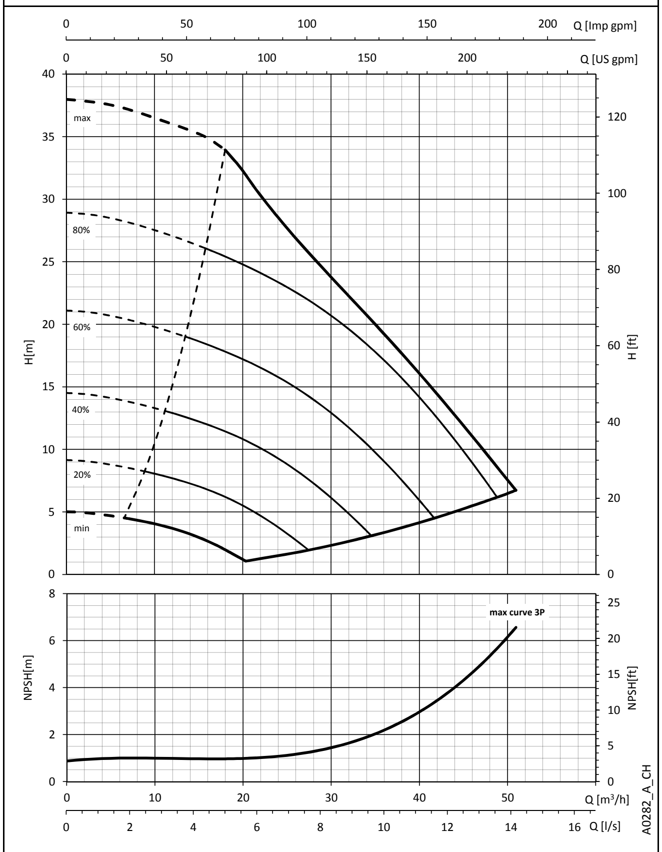
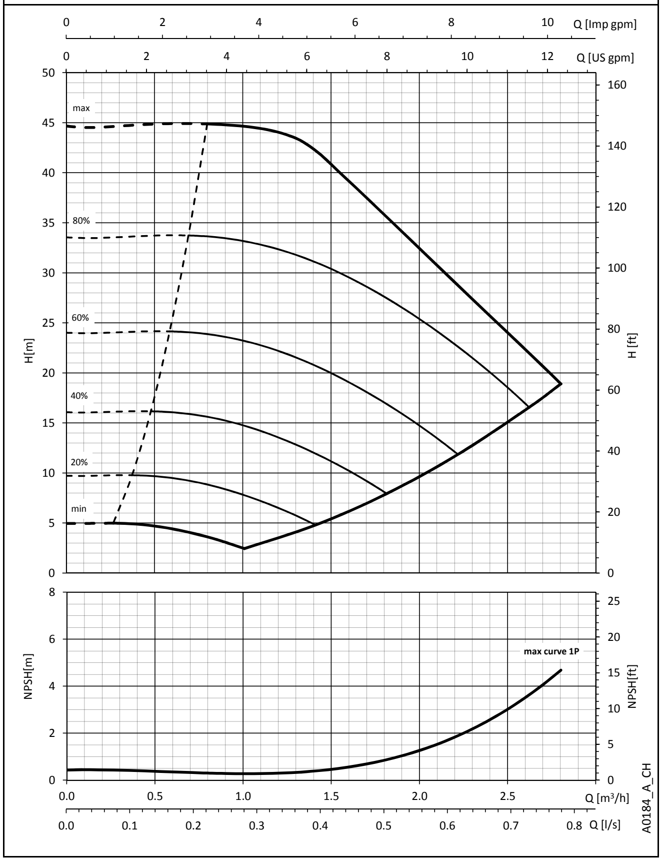


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

1HME05S03



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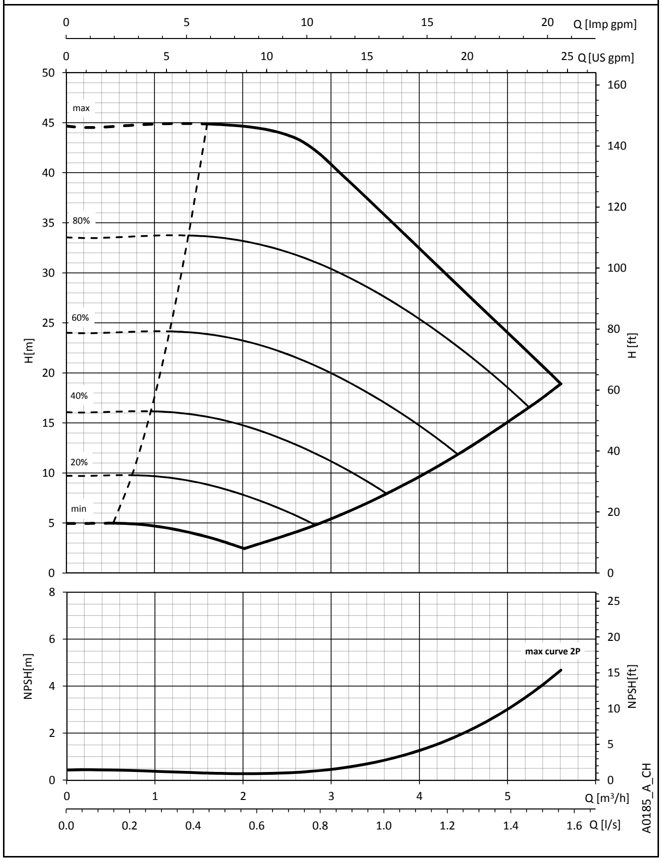

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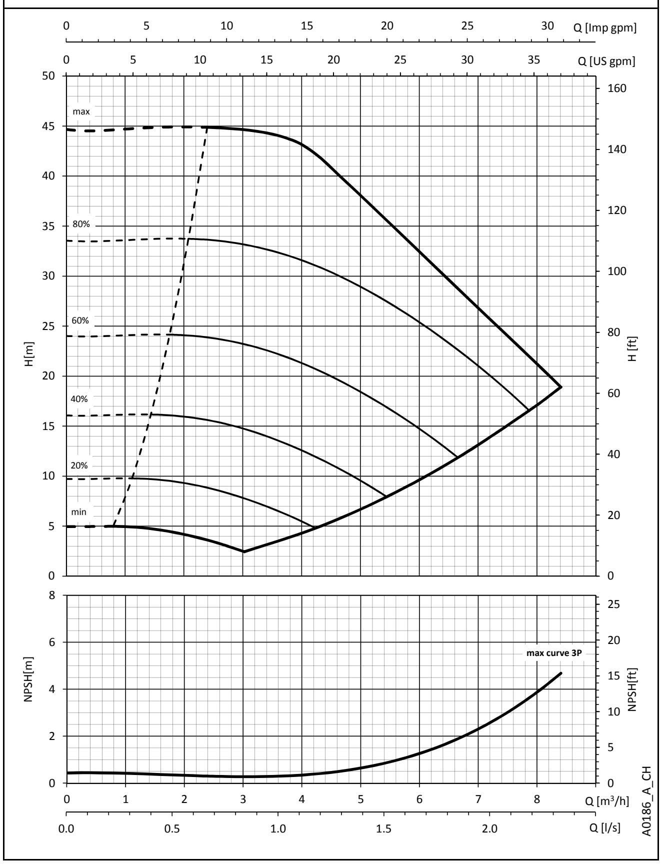
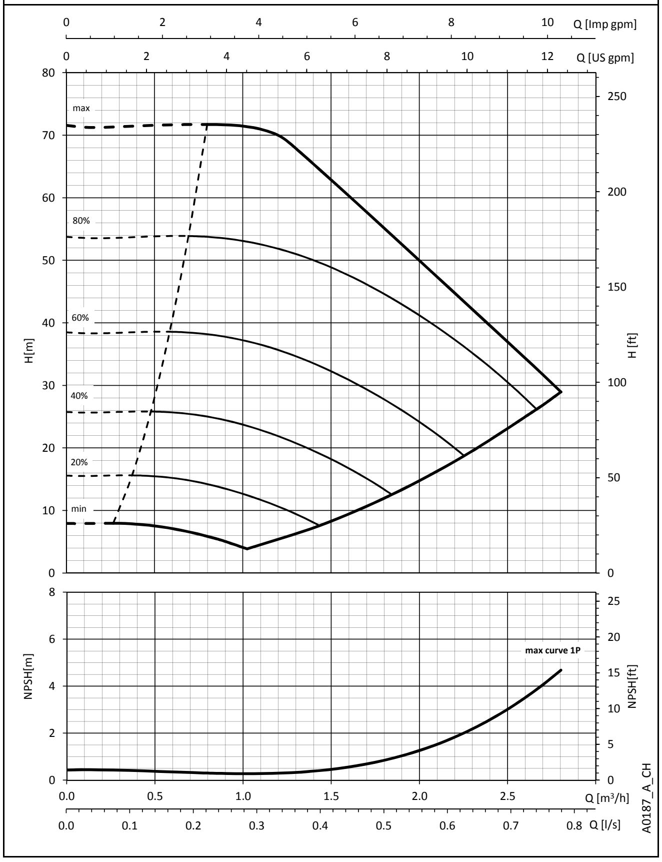


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

1HME08S05



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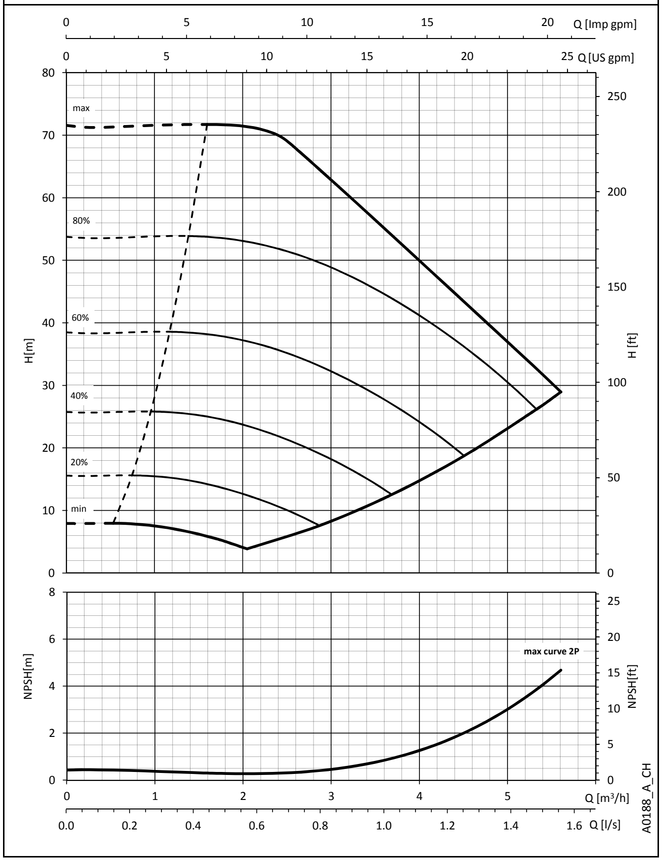

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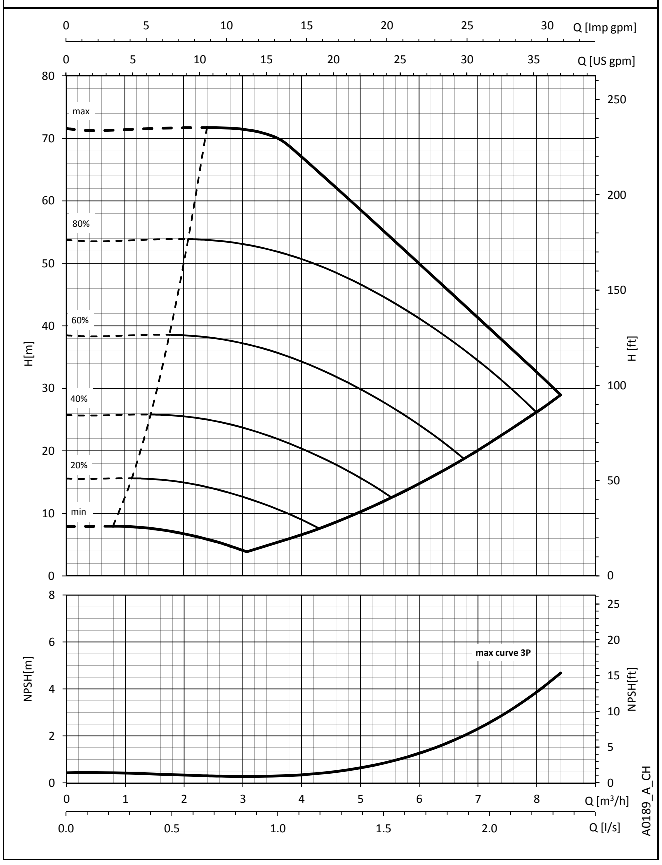

The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
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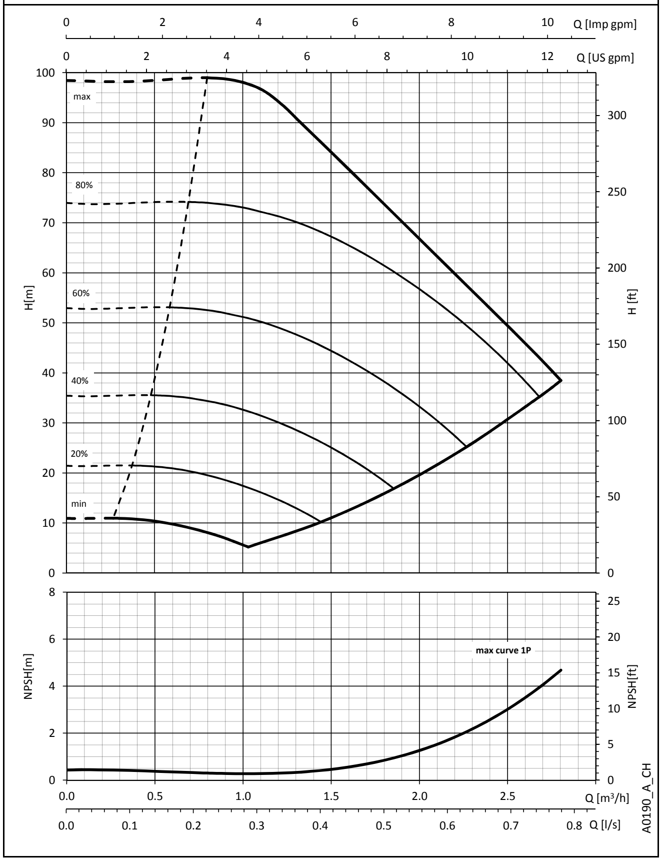
SMB.../HME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

1HME11S07



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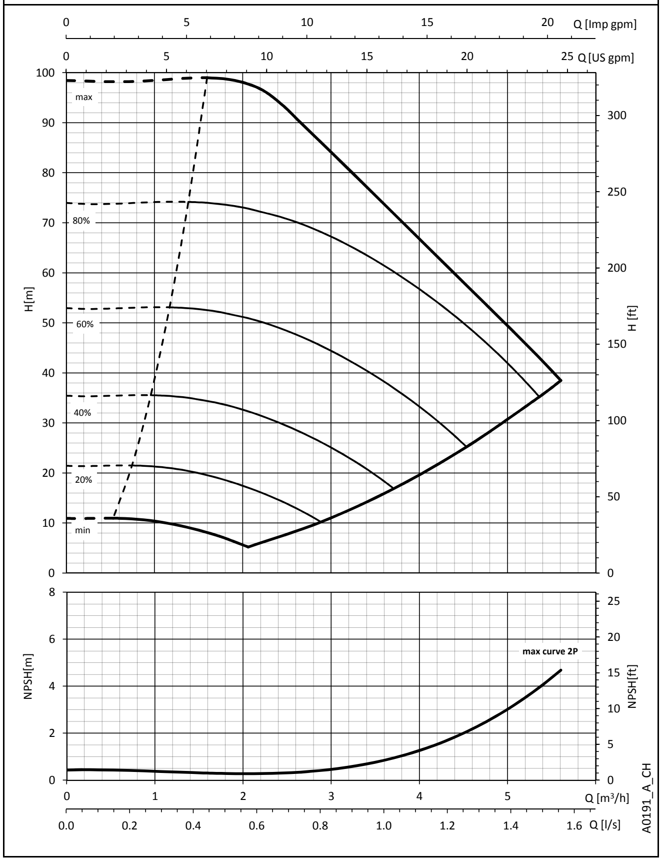

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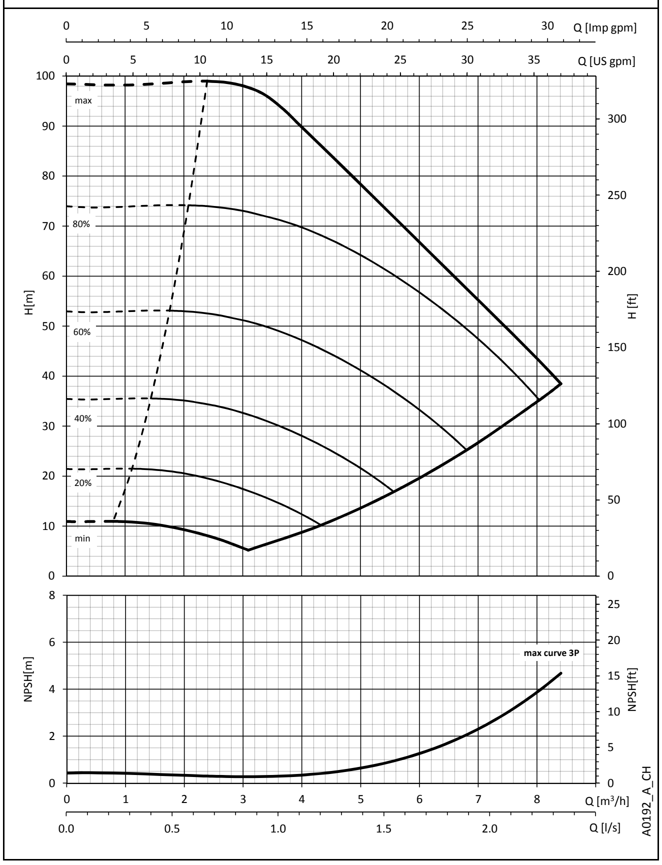
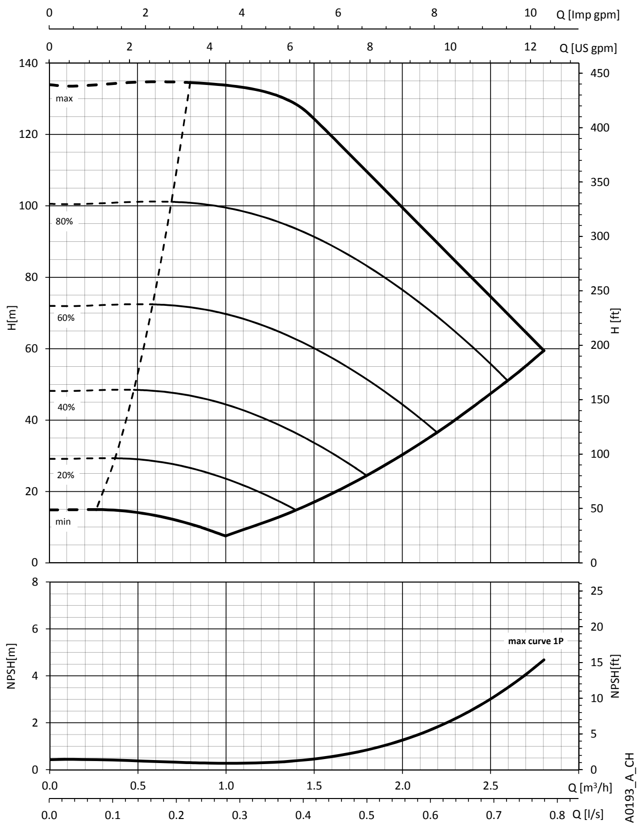


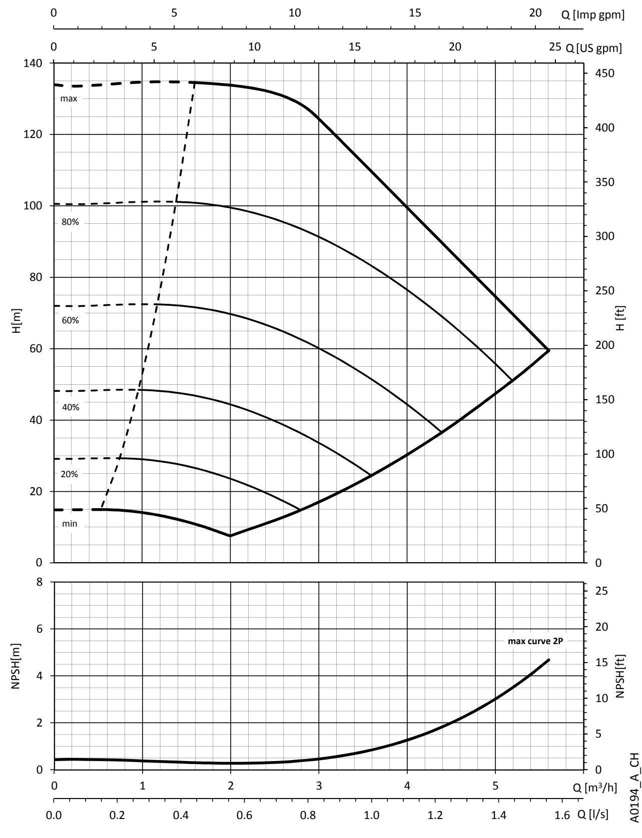
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

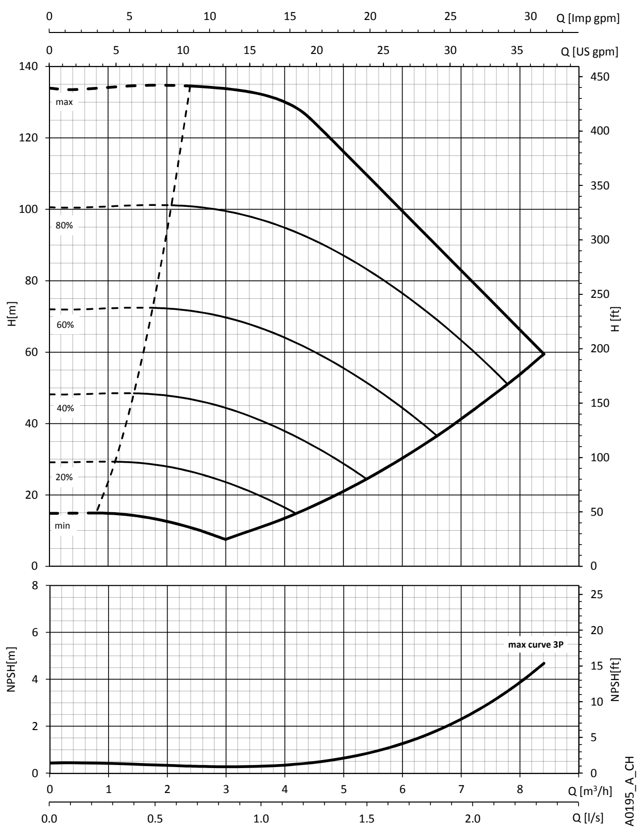
1HME15S11



SMB20…/1HME15S11

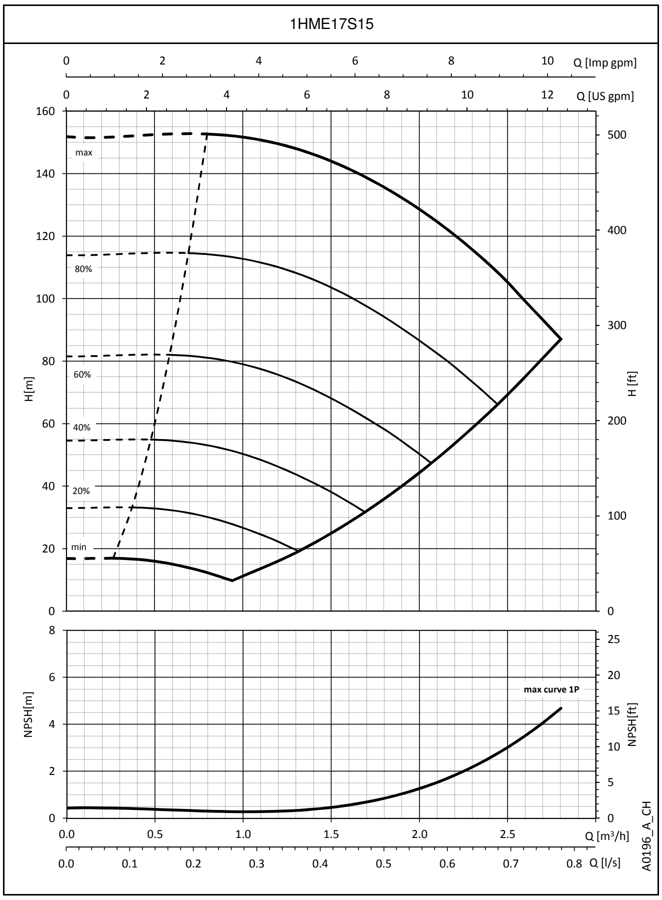


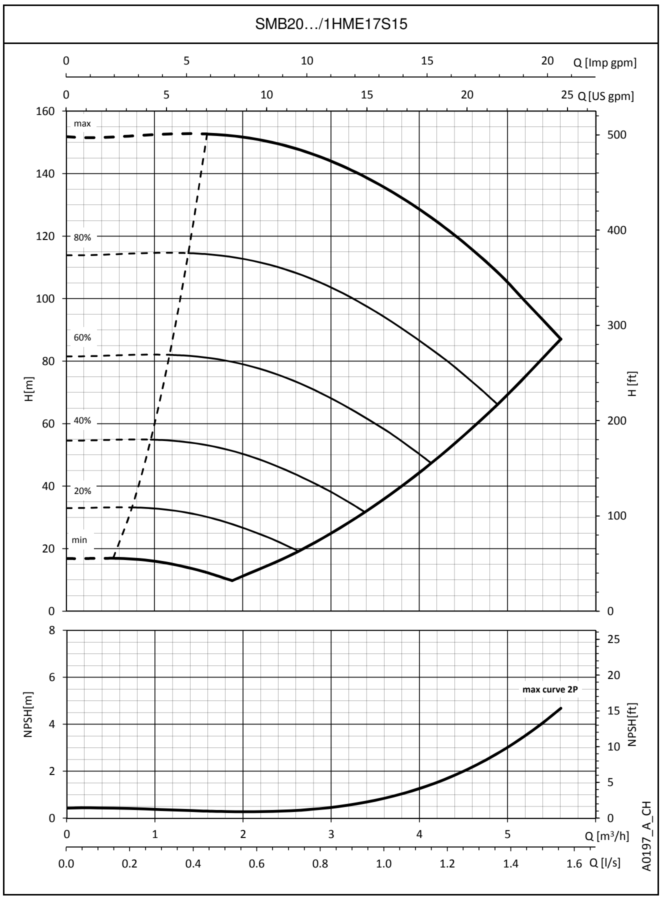
SMB30…/1HME15S11

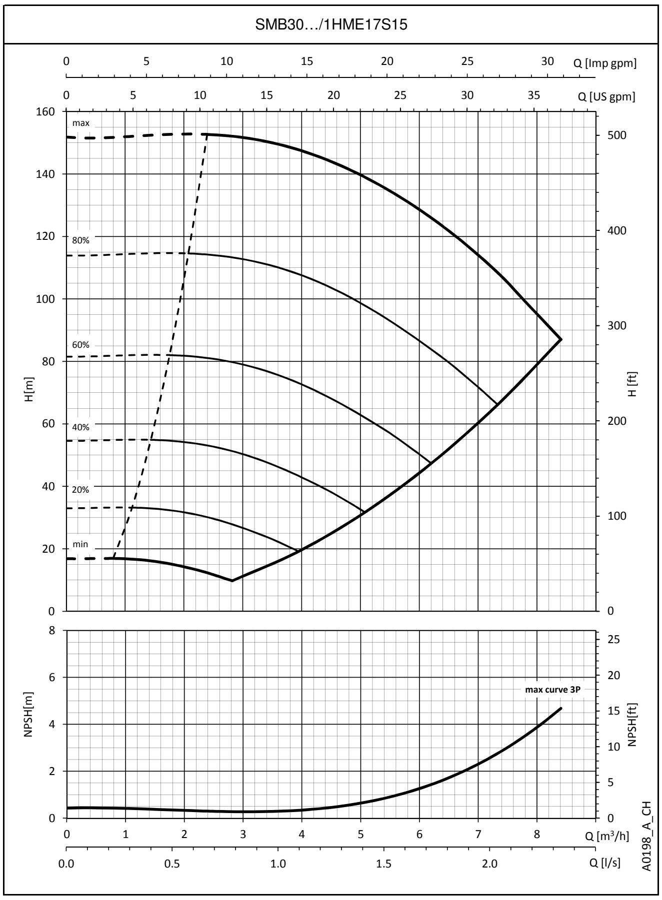


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS



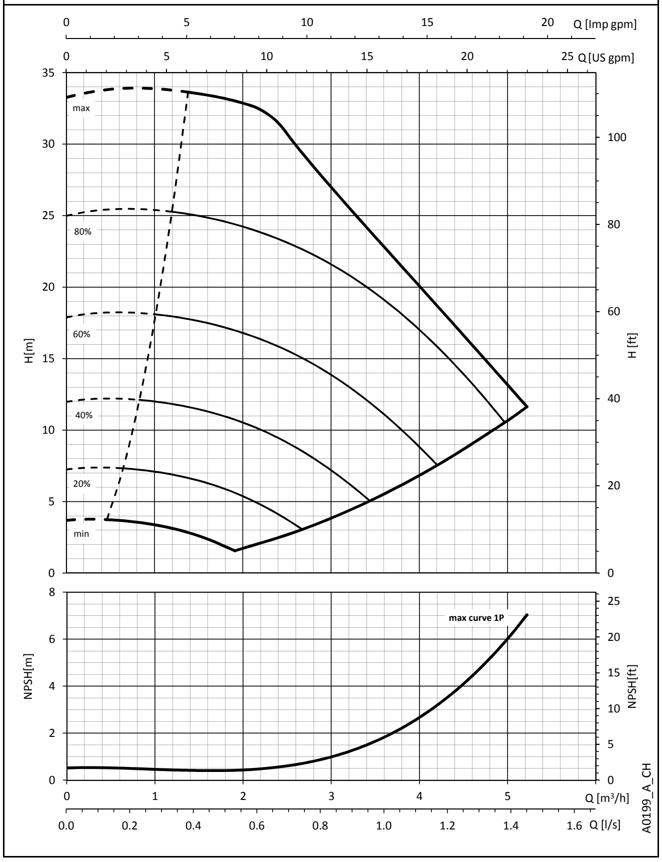




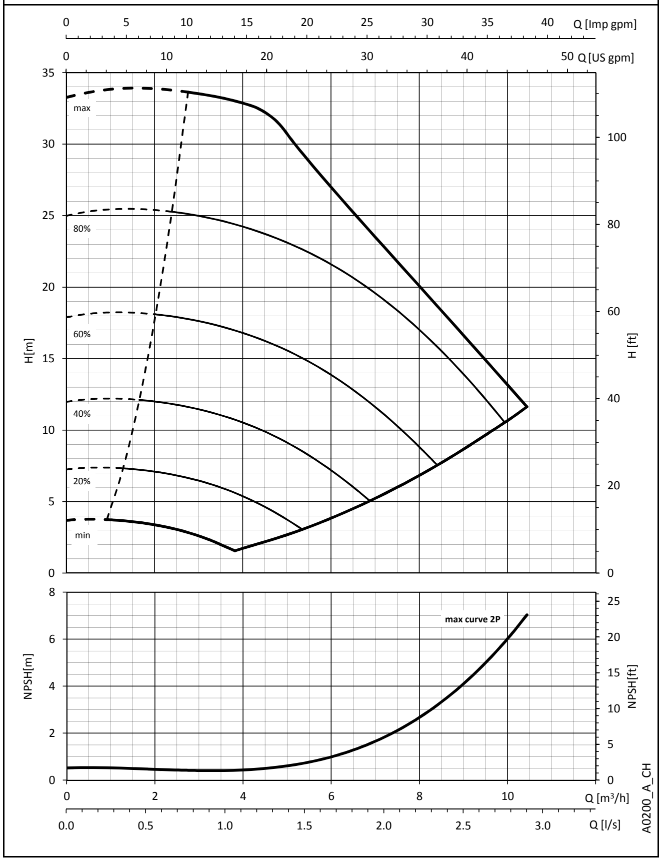
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

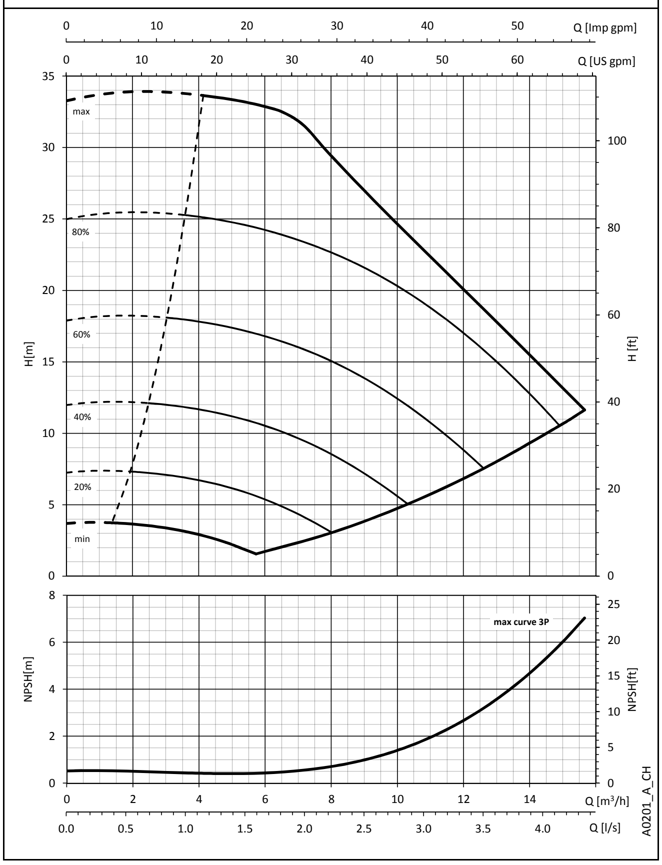
3HME03S03



SMB20…/3HME03S03



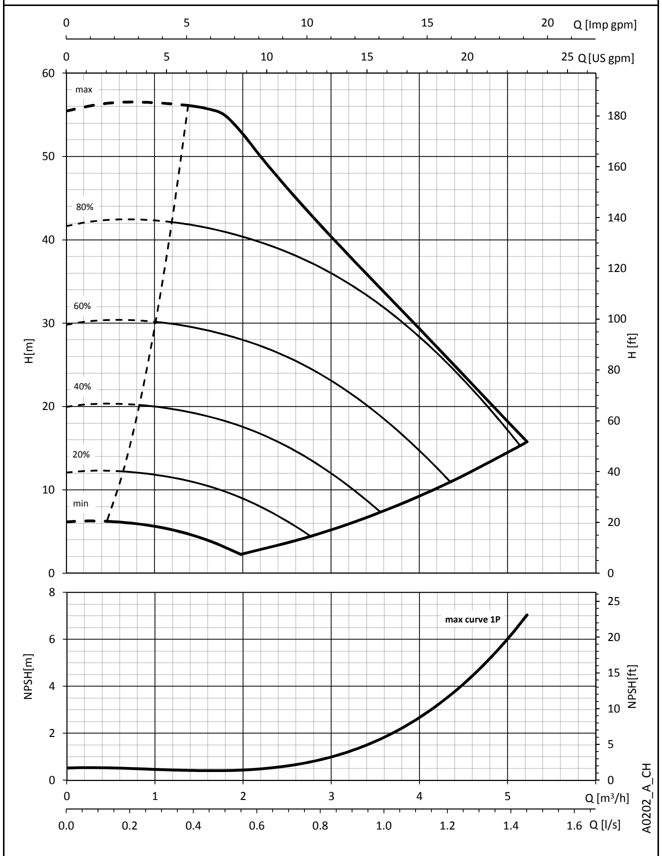
SMB30…/3HME03S03



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

3HME05S05



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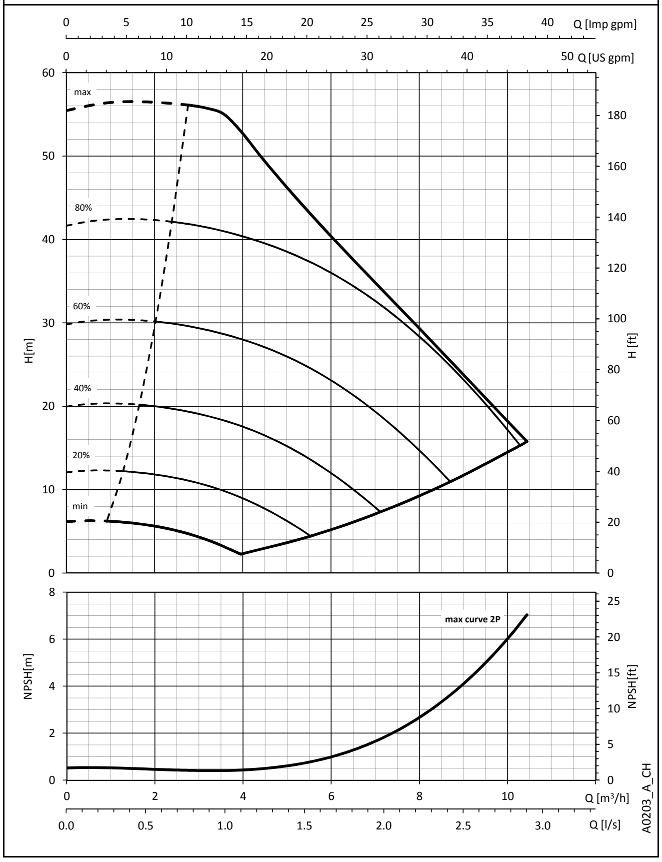
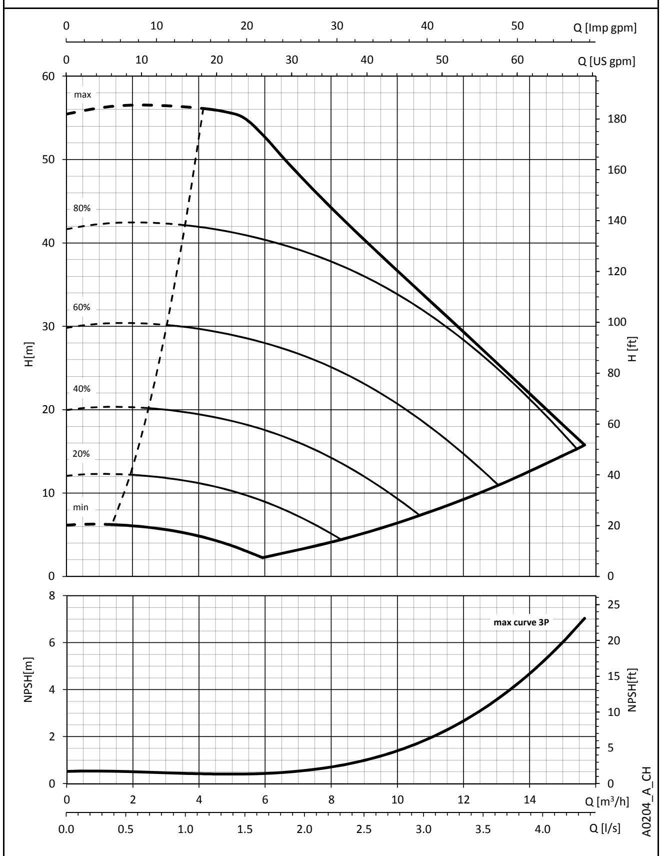
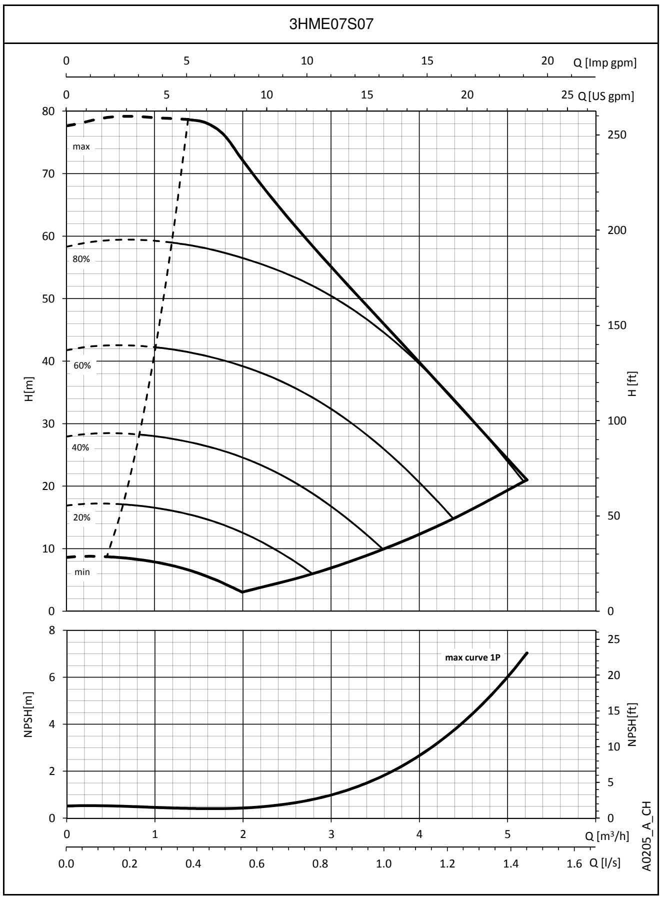


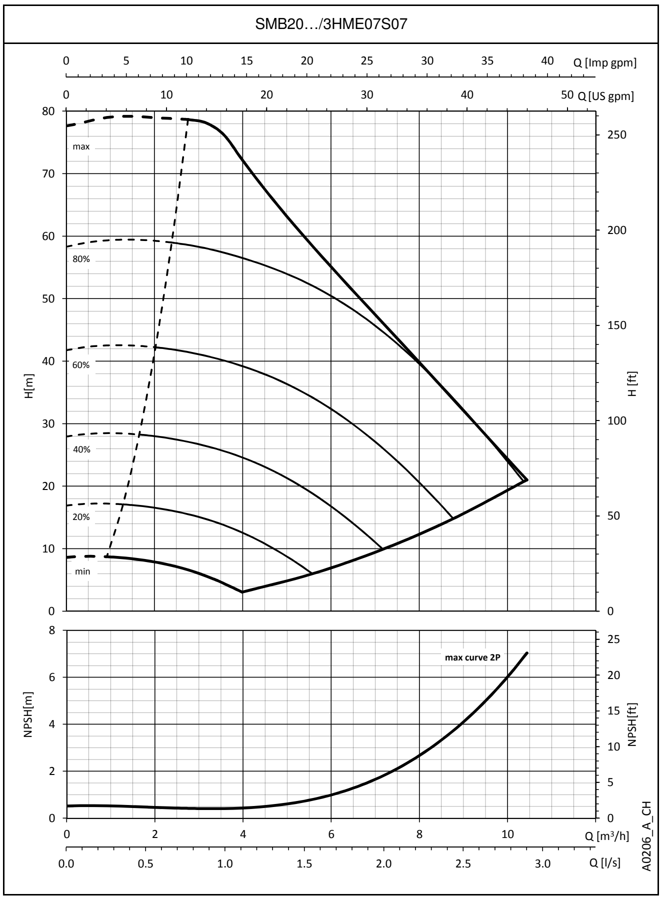
SMB30…/3HME05S05

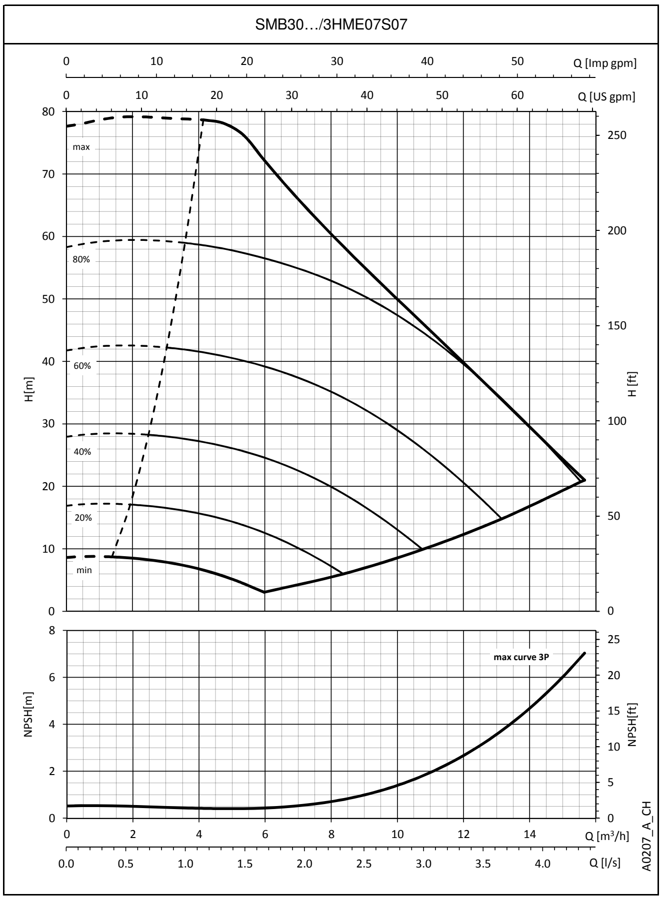


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS



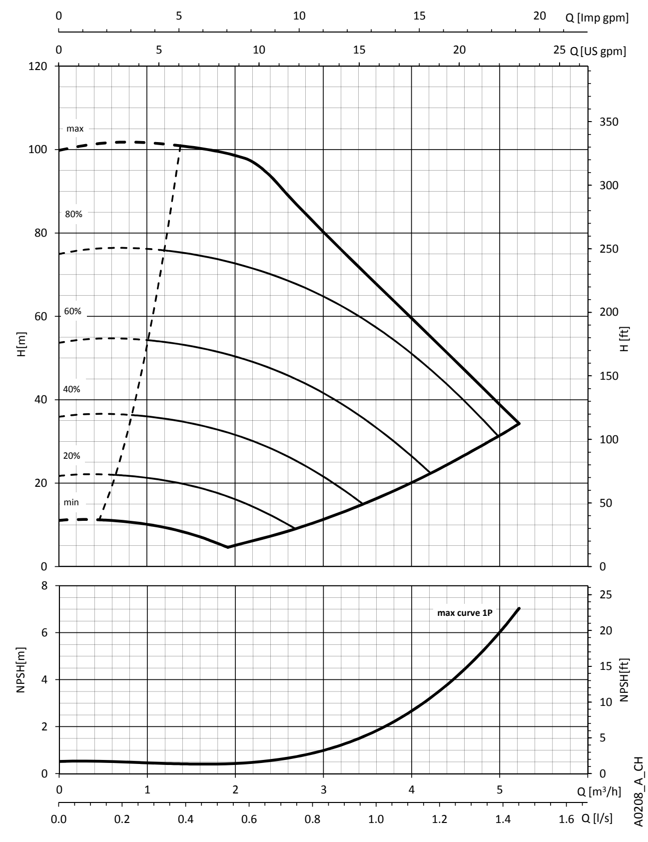




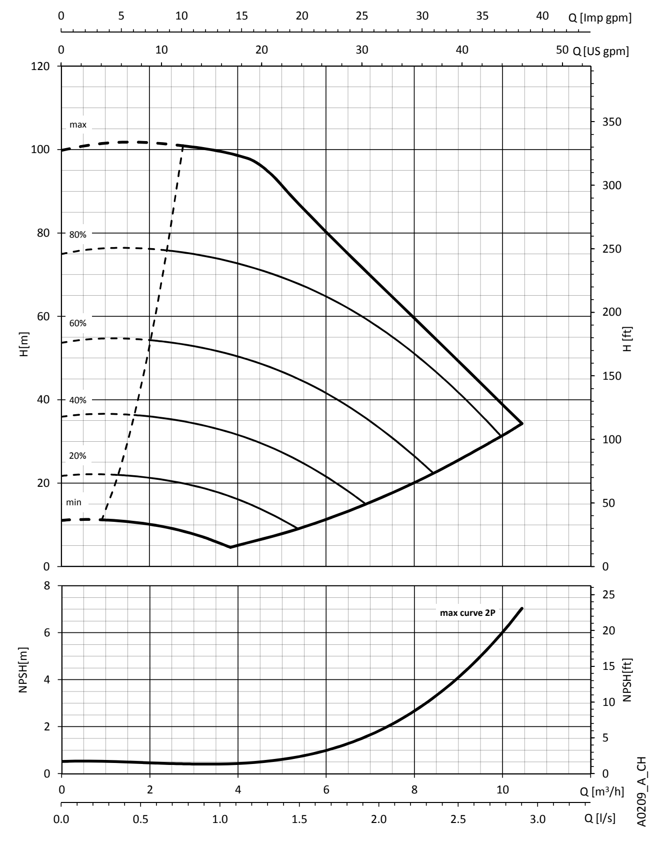
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

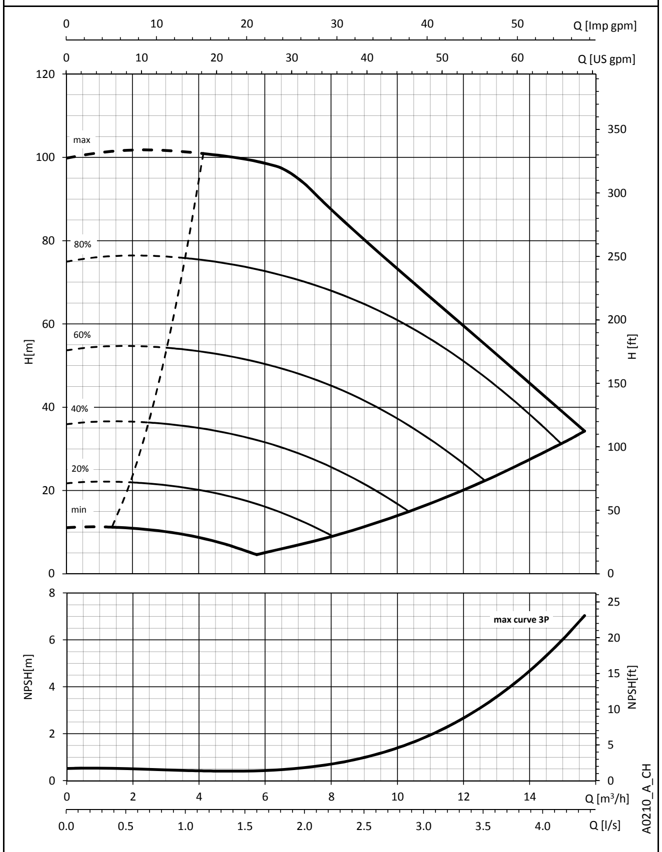
3HME09S11



SMB20…/3HME09S11



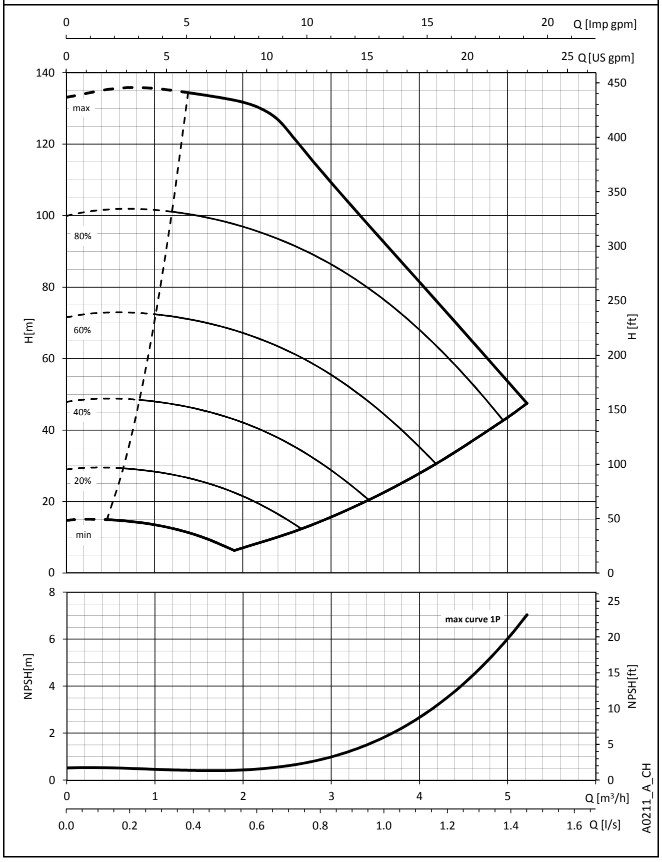
SMB30…/3HME09S11



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 ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

3HME12S15



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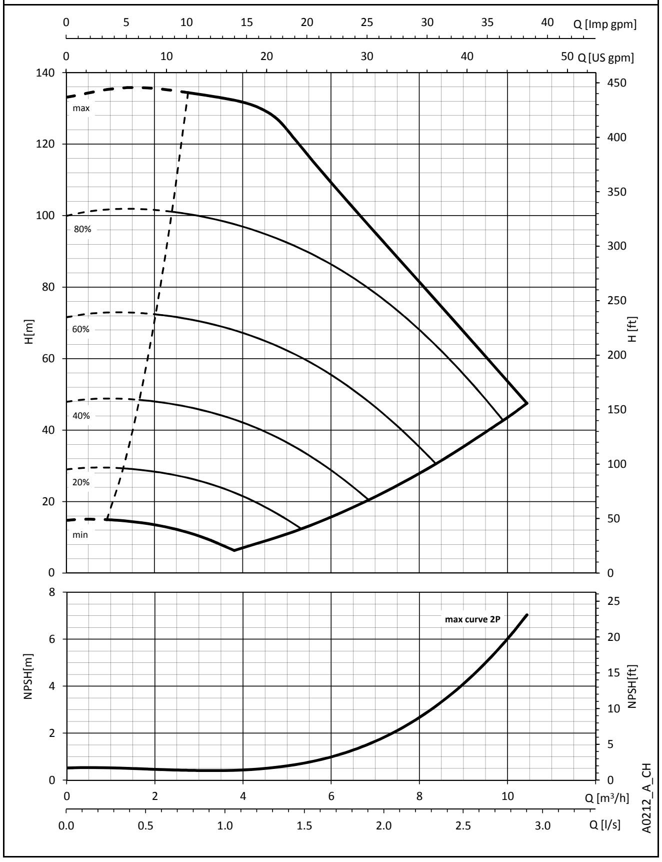

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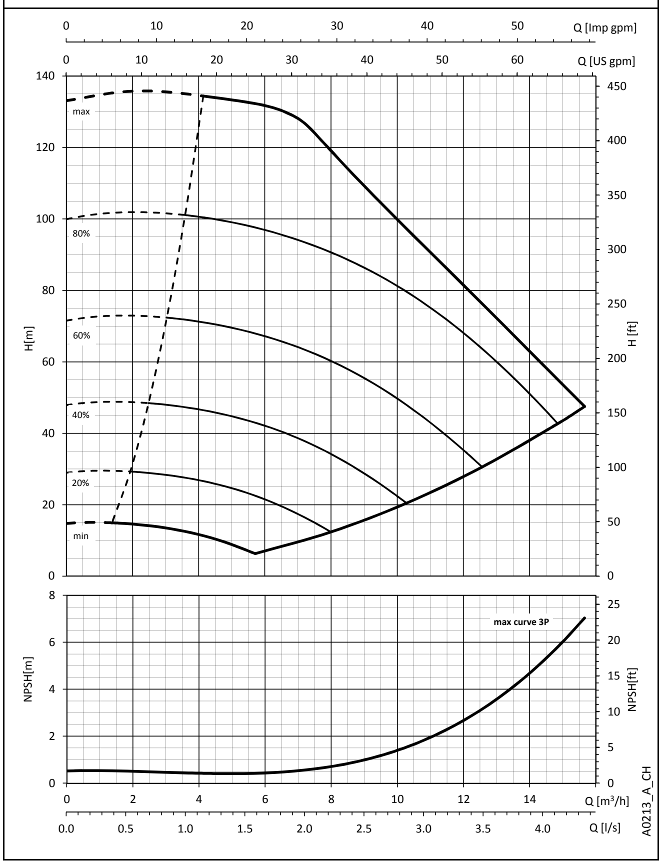
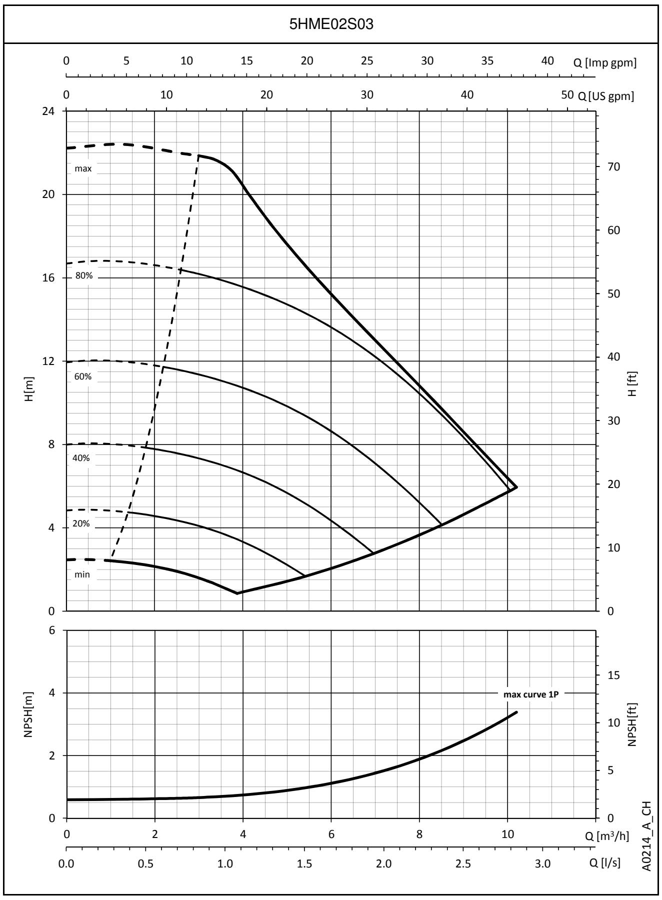
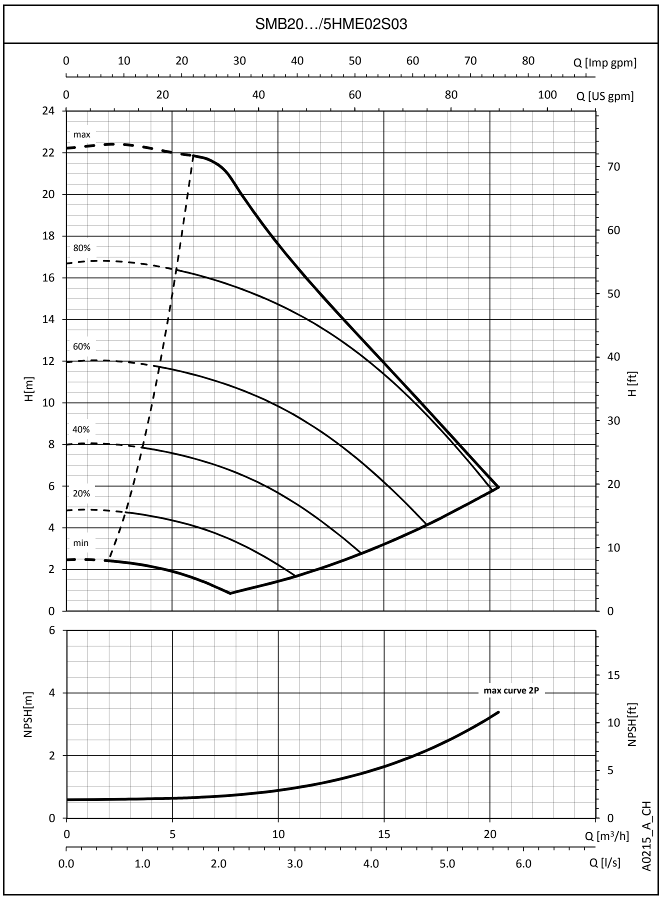
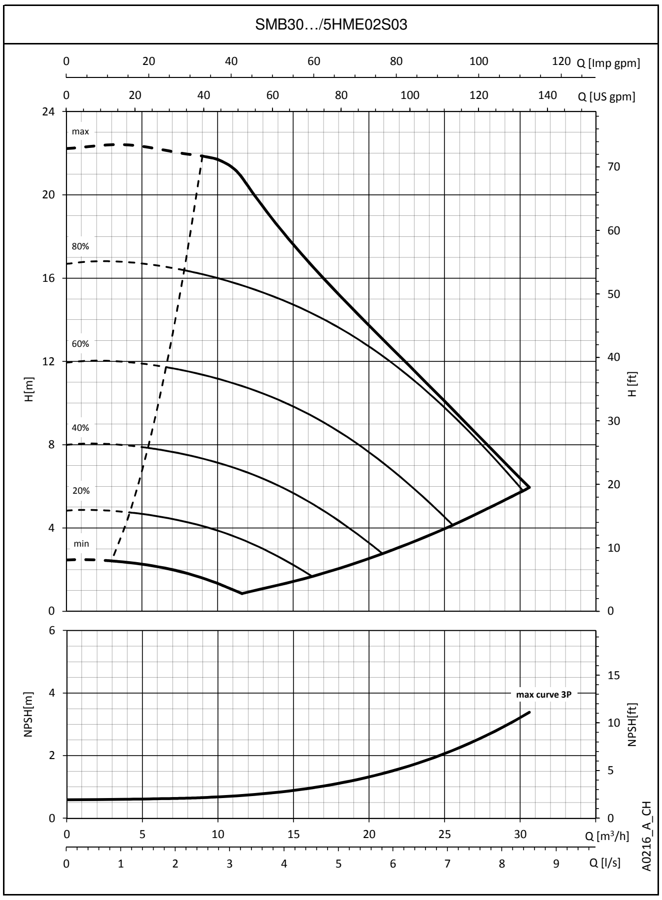


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS



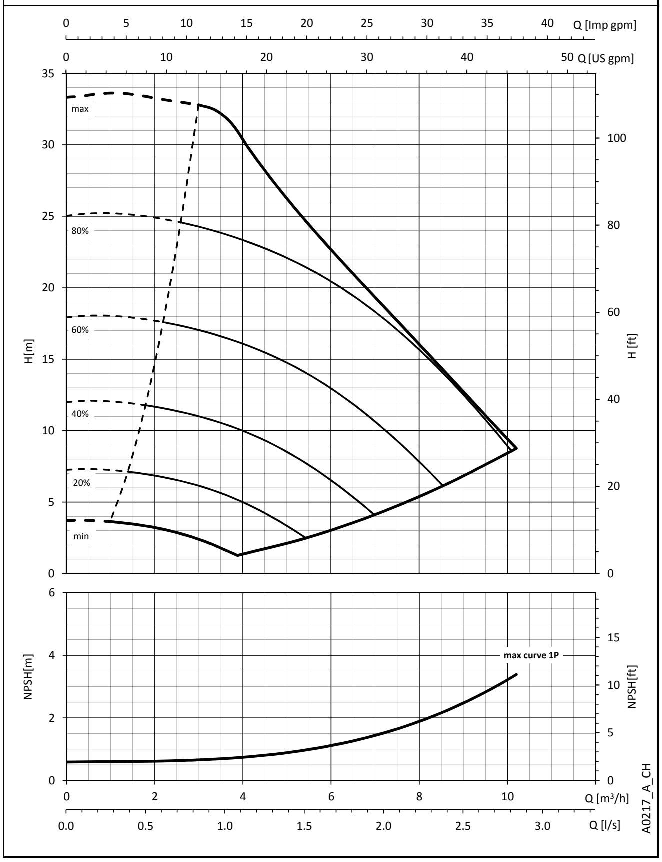




The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB…/HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5HME03S05



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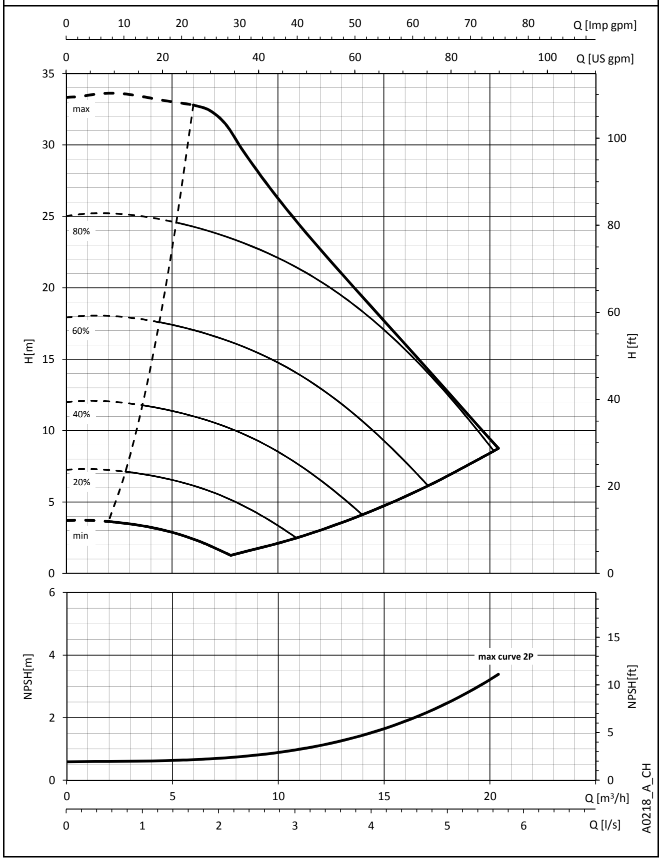

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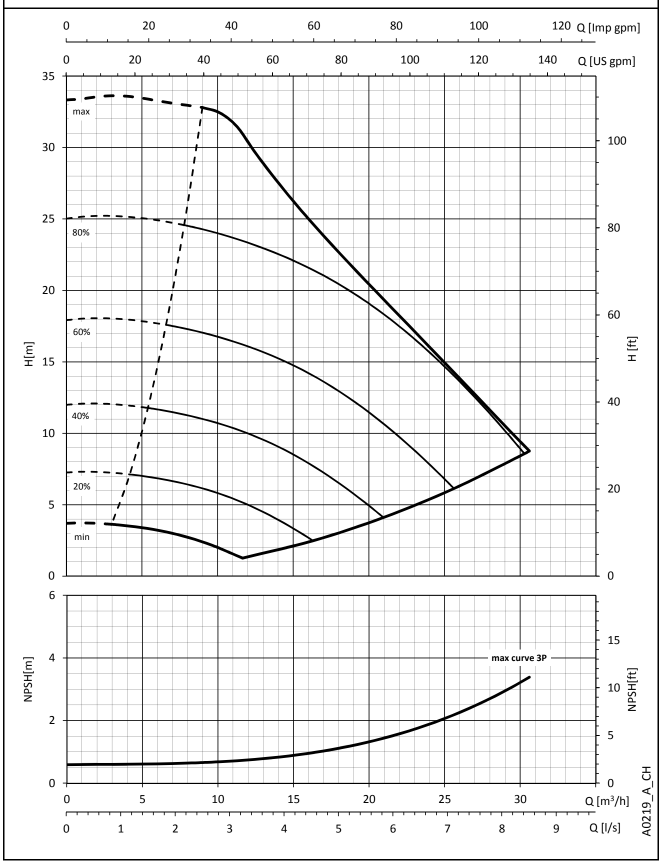
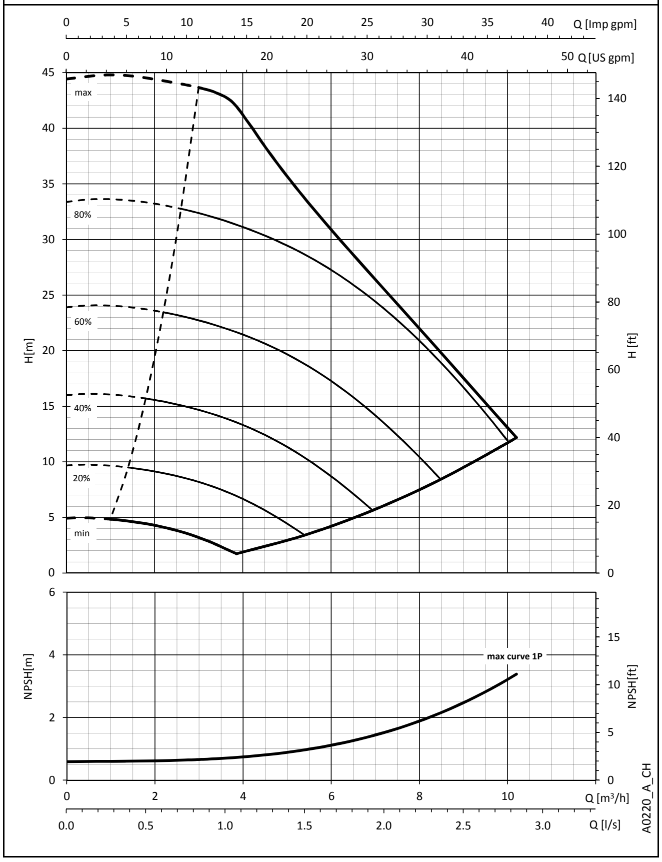


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density $\rho = 1$ Kg/dm^3 and kinematic viscosity $\nu = 1$ mm^2/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5HME04S07



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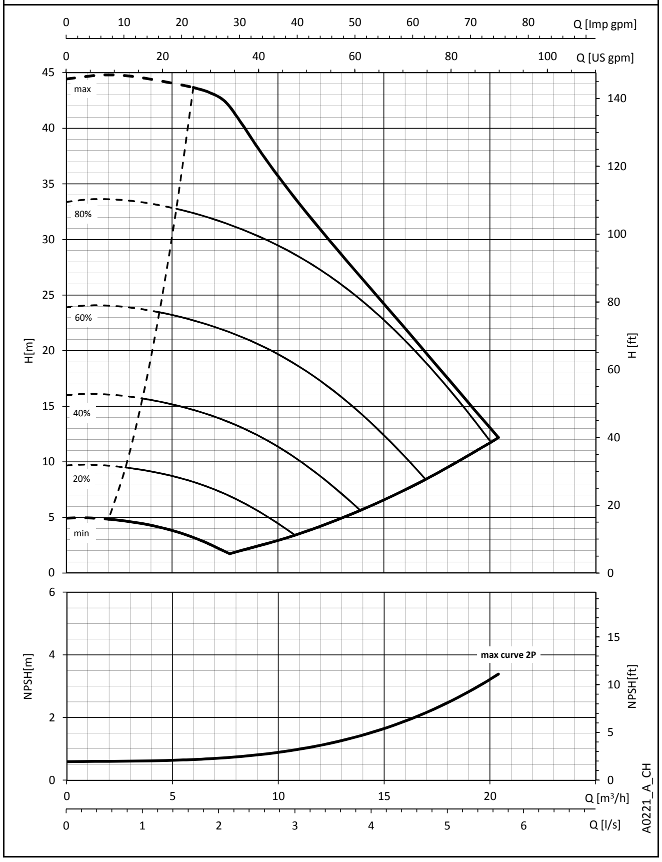

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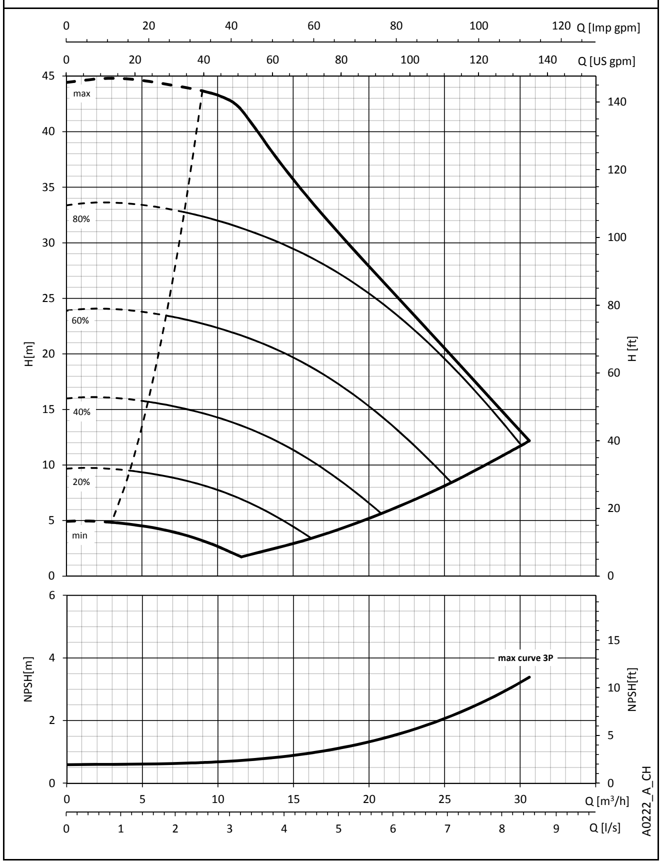
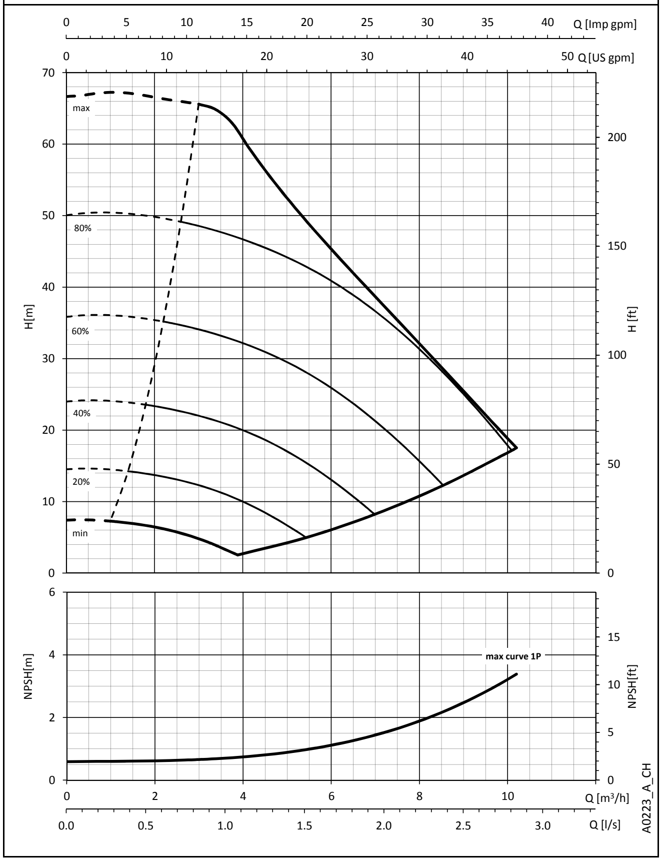


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

5HME06S11



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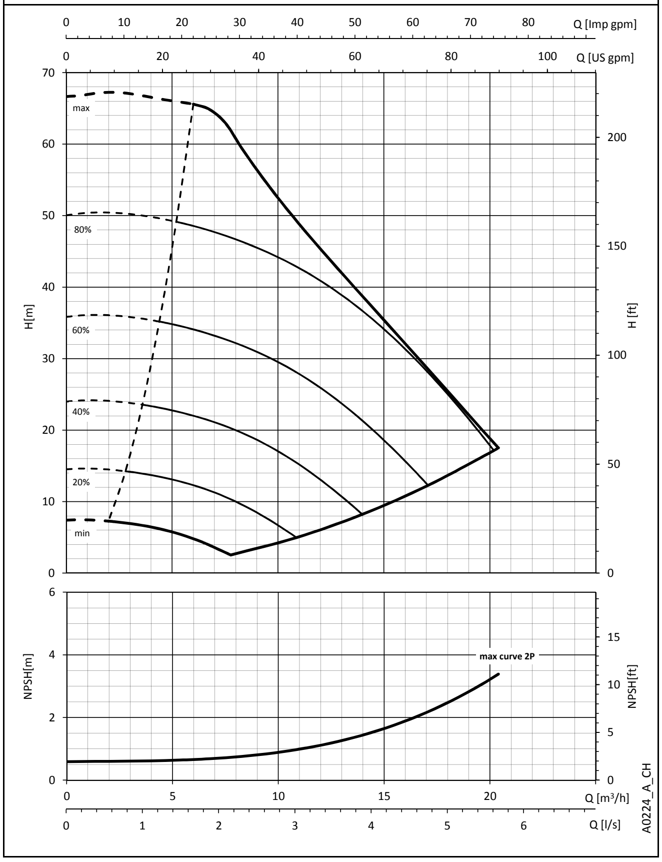

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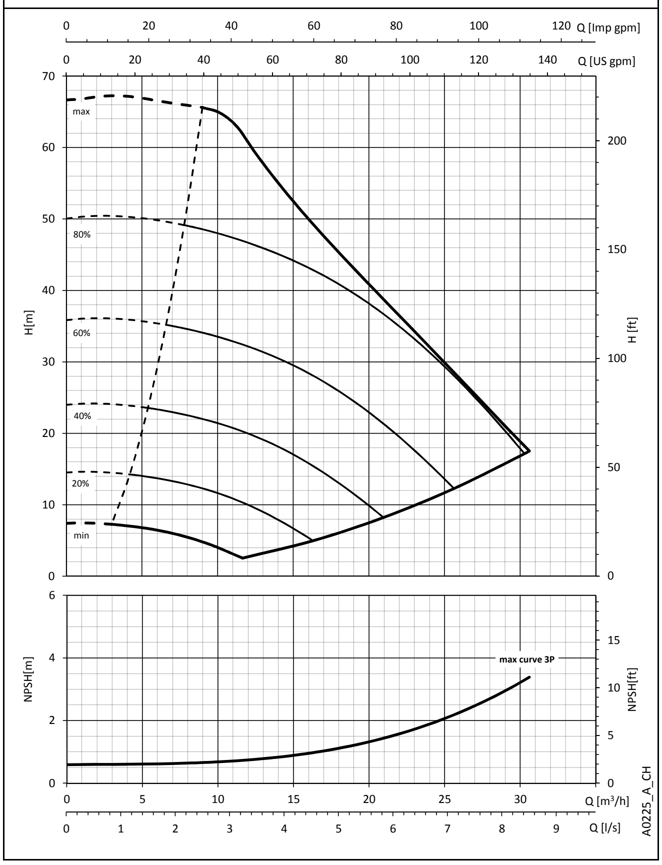
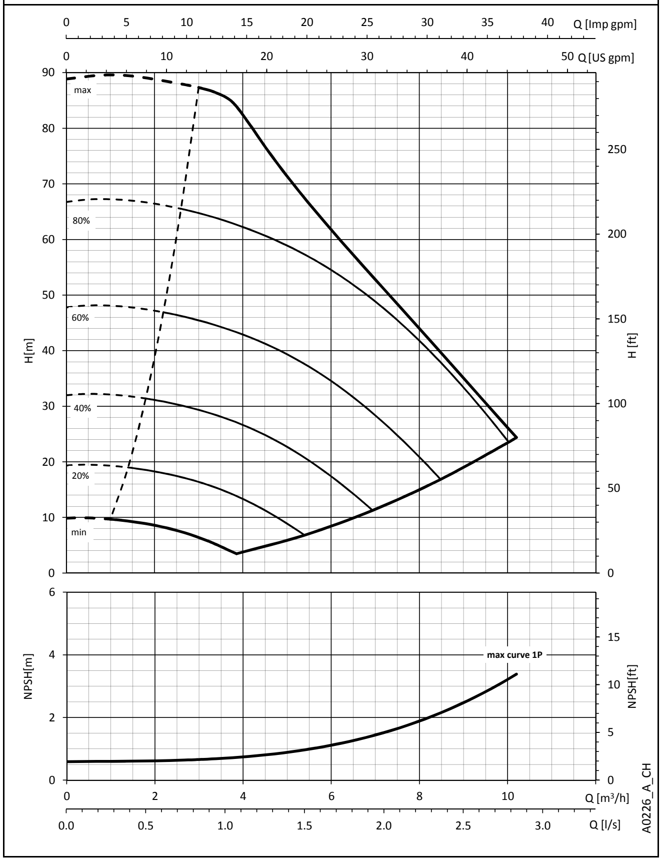


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

5HME08S15



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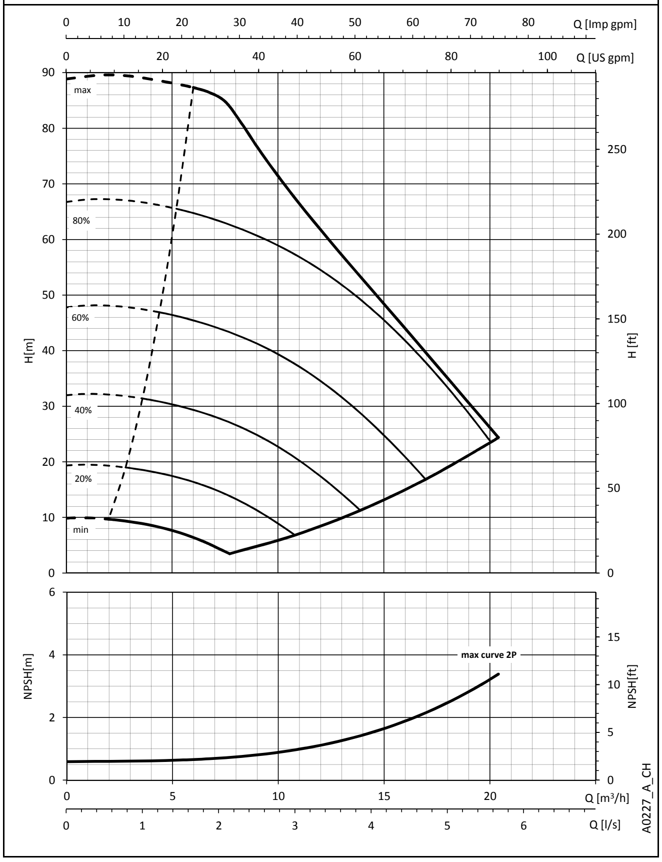

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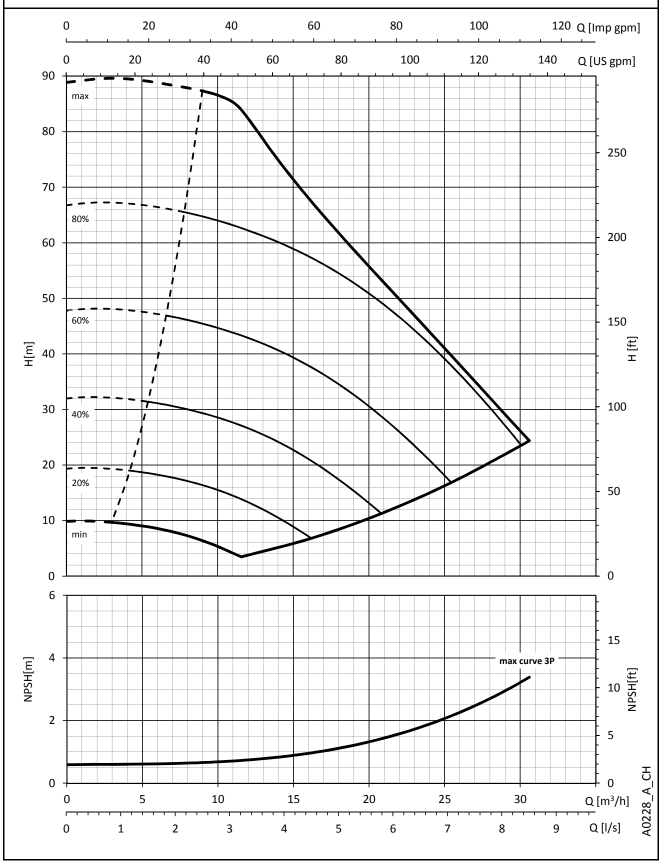
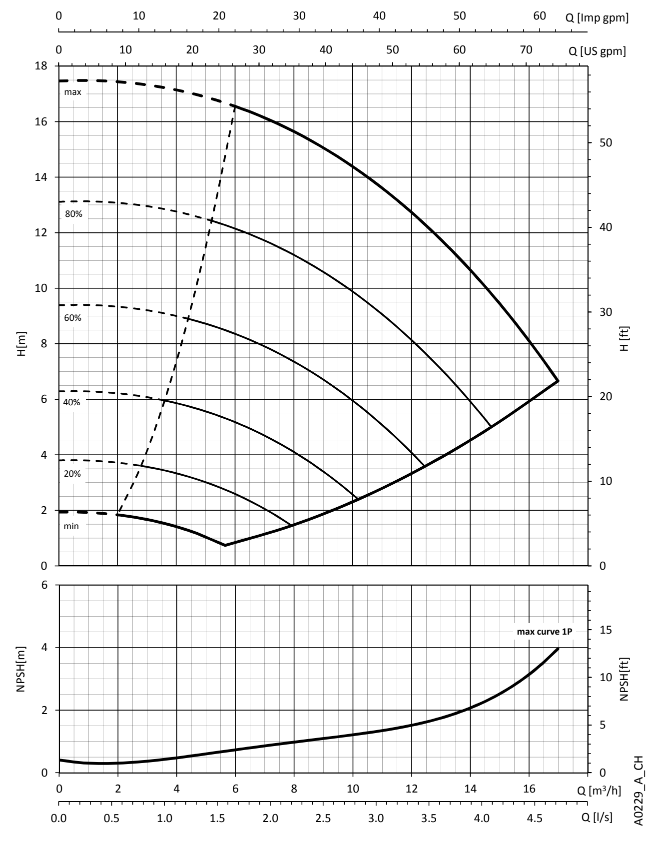


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES OPERATING CHARACTERISTICS

10HME01S07



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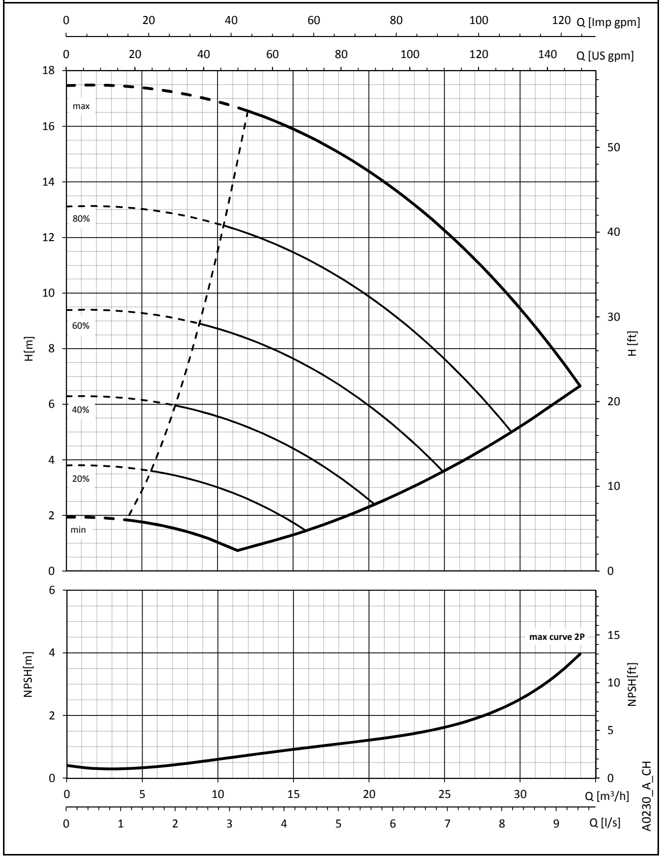

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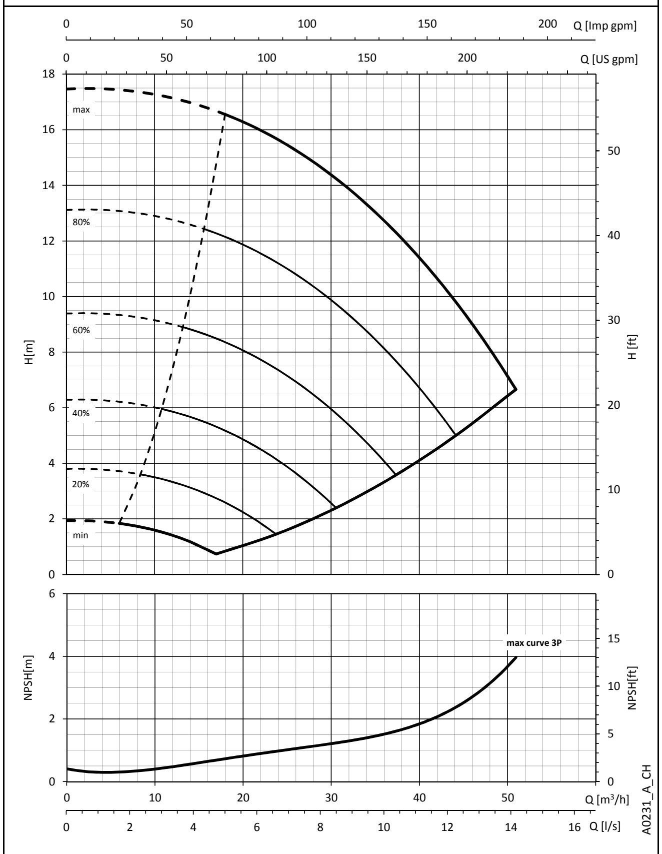
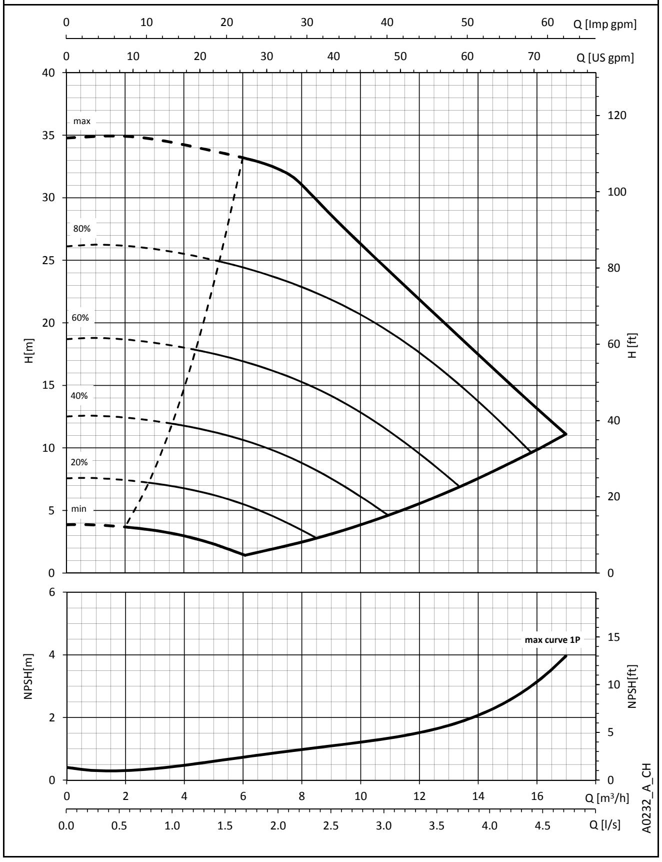


The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

10HME02S11



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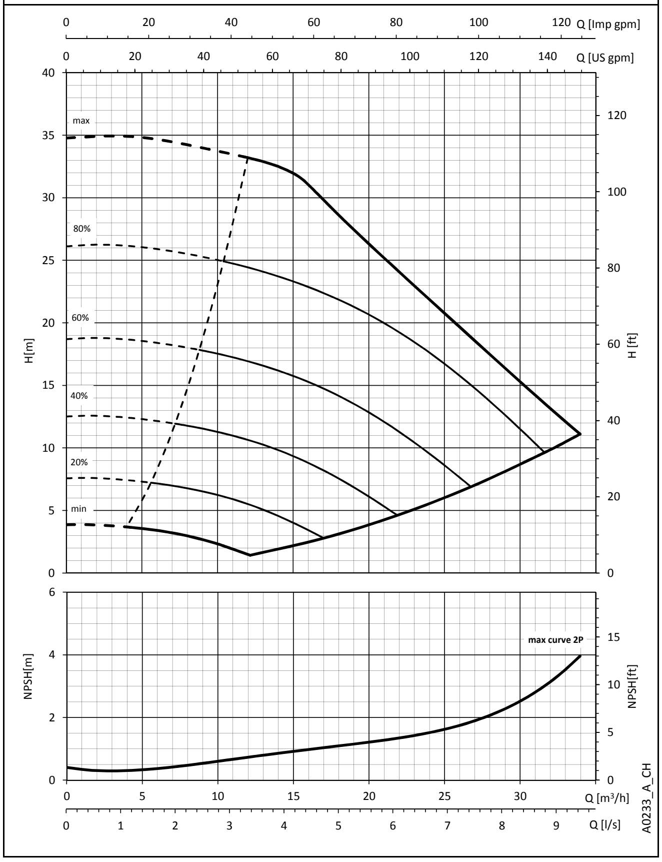

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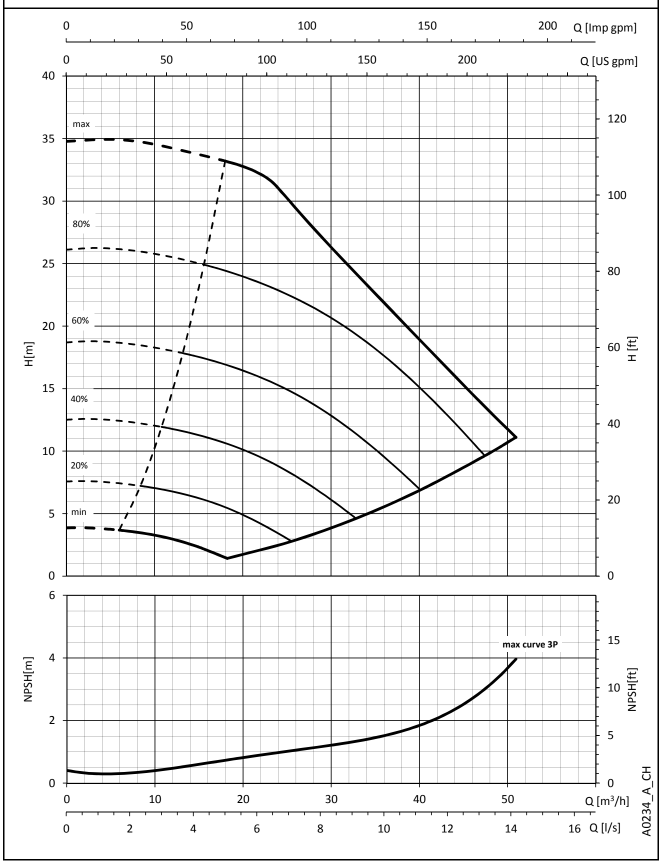

The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
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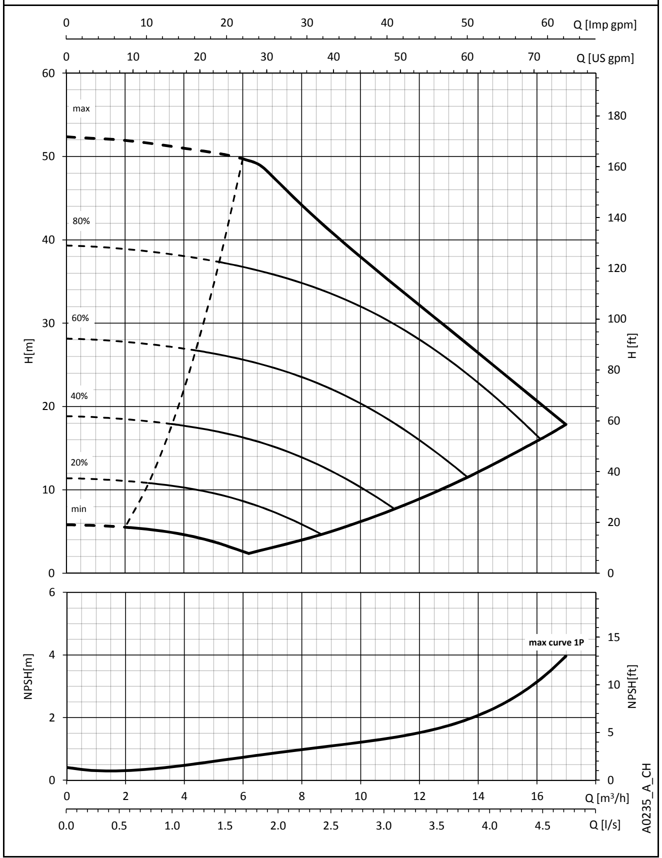
SMB.../HME BOOSTER SETS SERIES
OPERATING CHARACTERISTICS

10HME03S15



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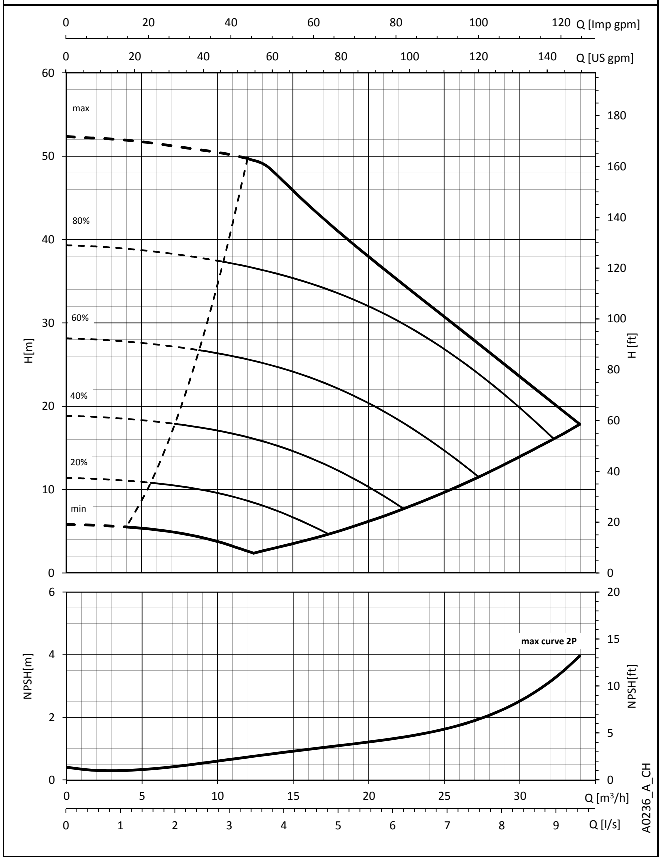

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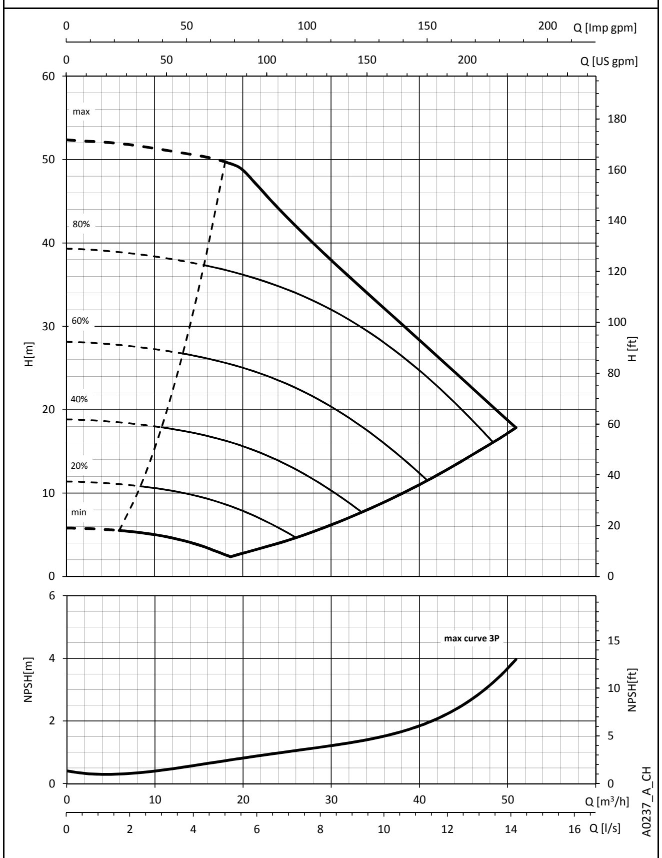
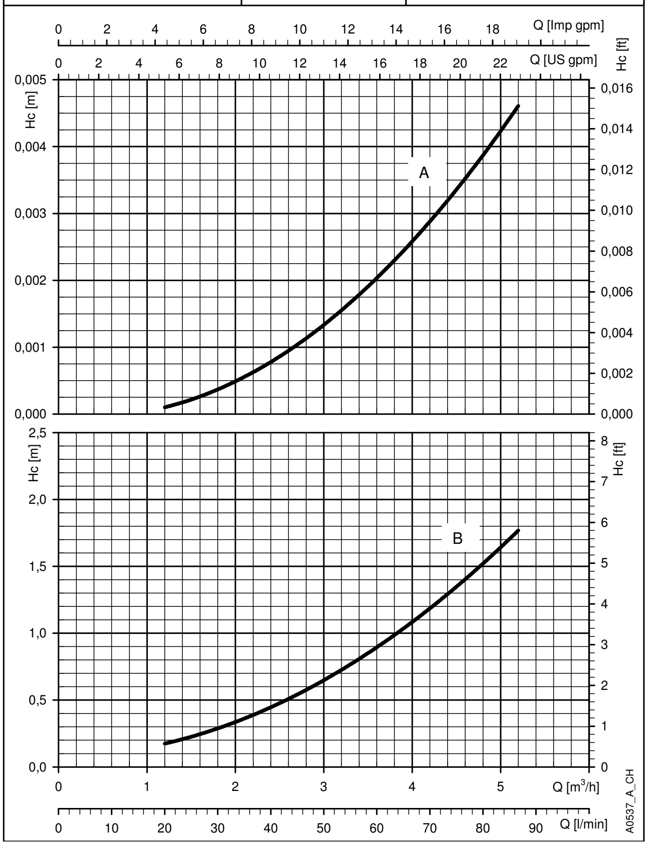


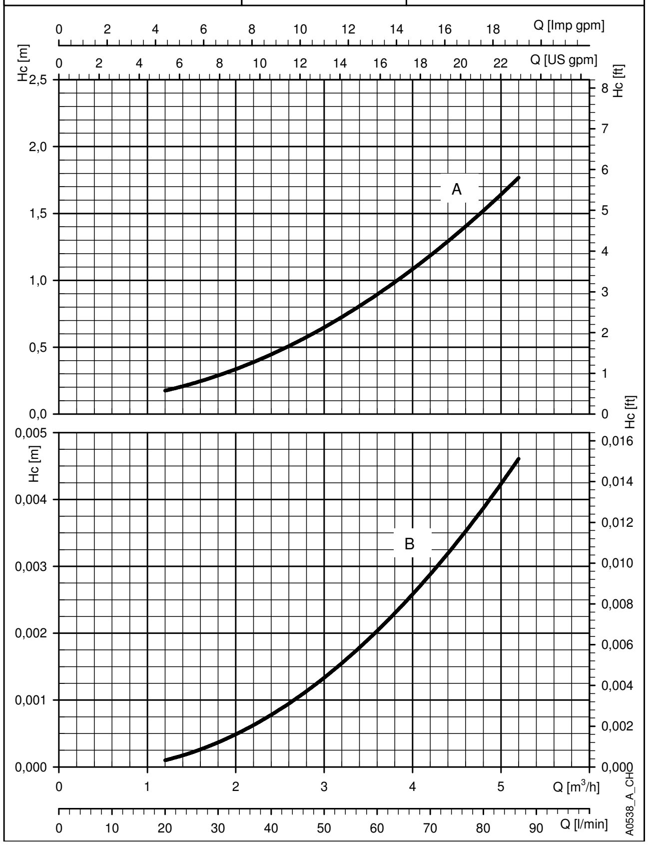
The performance curves do not take into account flow resistance in the valves and piping. The curves show the performance with one, two and three pumps running.
These performances are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.

SMB20, SMB30 BOOSTER SETS SERIES
Hc PRESSURE DROP CURVE

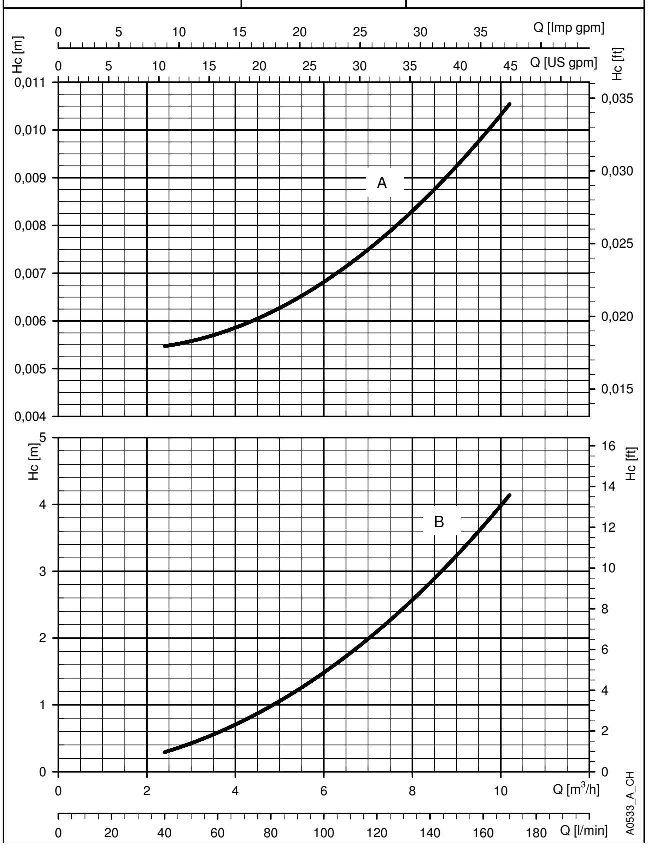
1-3 SVE / VME / HME		RA



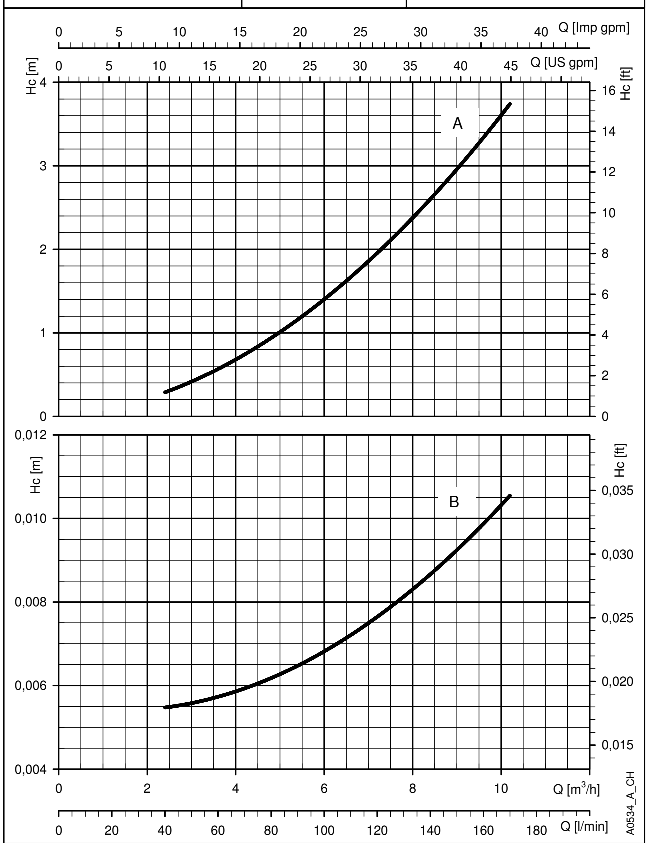
1-3 SVE / VME / HME		RM



5 SVE / VME / HME		RA



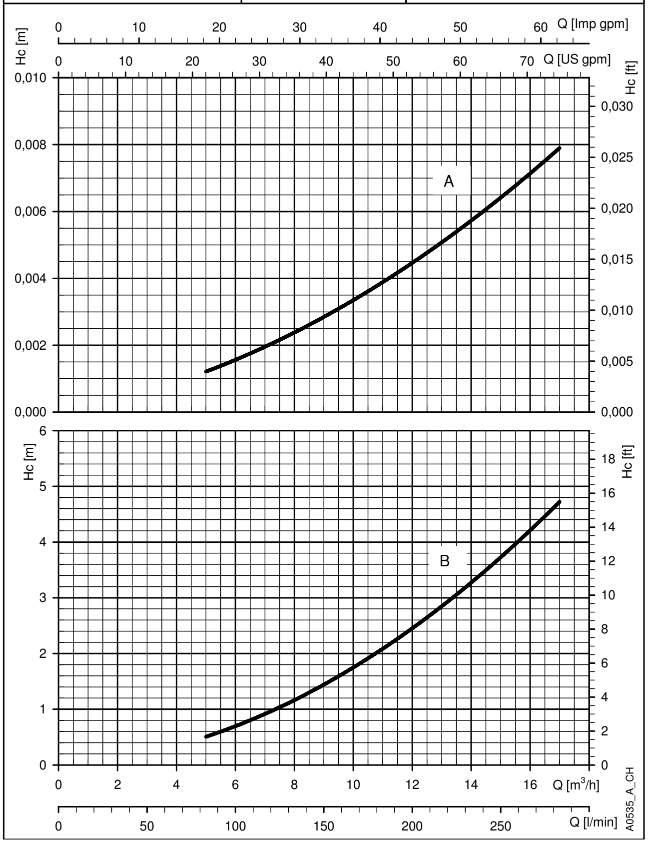
5 SVE / VME / HME		RM



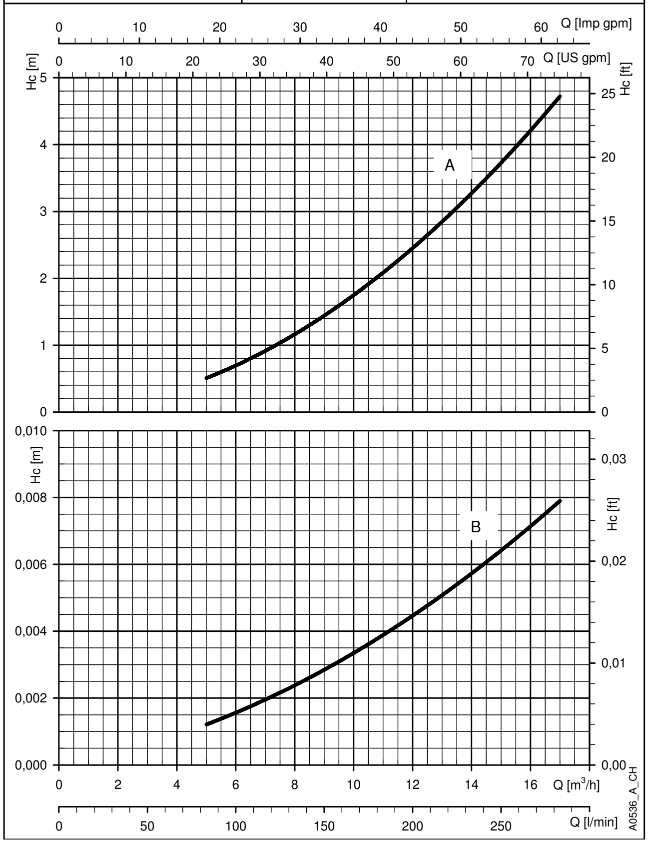
The declared curves are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
Hc (A): Pressure drop curve on delivery side of the pump. Hc (B): Pressure drop curve on suction side of the pump.
RA: check valve on suction side. RM: check valve on delivery side.
The pressure drops do not consider the distributed pressure drops on the manifold.

SMB20, SMB30 BOOSTER SETS SERIES
Hc PRESSURE DROP CURVE

10 SVE / VME / HME		RA



10 SVE / VME / HME		RM



The declared curves are valid for liquids with density ρ = 1 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.
Hc (A): Pressure drop curve on delivery side of the pump. Hc (B): Pressure drop curve on suction side of the pump.
RA: check valve on suction side. RM: check valve on delivery side.
The pressure drops do not consider the distributed pressure drops on the manifold.

ACCESSORIES

DIAPHRAGM EXPANSION VESSELS KITS

Booster sets have delivery manifolds with attachments for the installation of 8 or 24 litre diaphragm expansion vessels (hydrotube).
The caps for sealing any unused attachments are supplied with the set.
Any large size vessels can be connected to the unused end of the delivery manifold. For proper sizing of the vessel, please refer to the technical appendix.
Kits featuring the following accessories are **available on request**:

- expansion vessel.
- on-off valve.
- instructions sheet.
- packing.

Volume	PN	DIMENSIONS (mm)			Materials		
Litres	bar	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
20	25	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass

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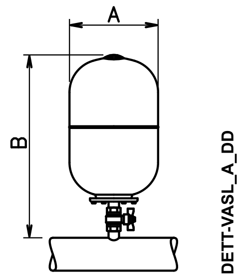

FLANGE KIT

Manifolds are supplied with threaded attachments and caps for sealing the unused ends.
For these manifolds, stainless steel AISI 304 or 316 flanges for connection to the system are available on request.

THREADED COUNTERFLANGES

KIT			DIMENSIONS (mm)				HOLES		
TYPE	DN	ø C	ø A	B	ø D	H	ø F	N°	PN
2"	50	Rp 2	125	16	165	24	18	4	25
2" ½	65	Rp 2 ½	145	16	185	23	18	4	16
3"	80	Rp 3	160	17	200	27	18	8	16

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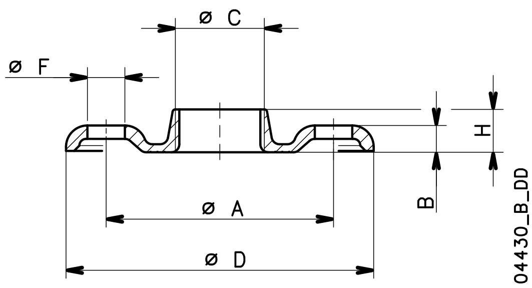

WELD-ON COUNTERFLANGES

KIT			DIMENSIONS (mm)			HOLES		
TYPE	DN	ø C	ø A	B	ø D	ø F	N°	PN
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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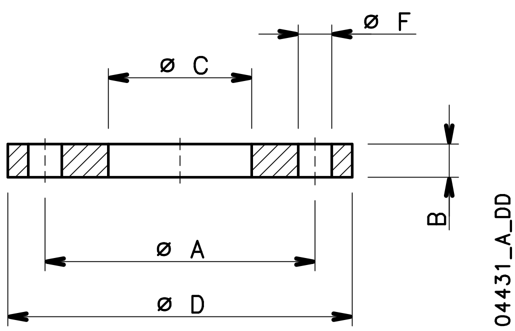


ANTI-VIBRATION JOINT KIT

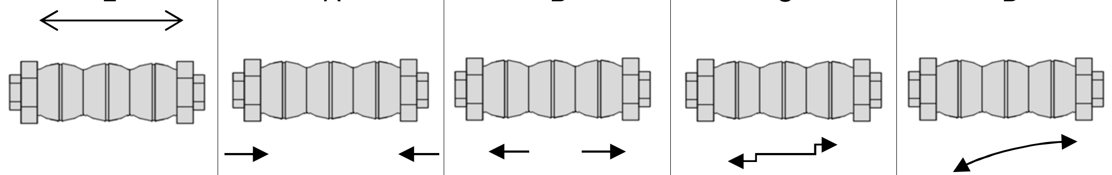
Anti-vibration joints, or compensation joints, can be used to absorb deformations, expansions, pipe noise and reduce water hammering. They can also withstand a high level of vacuum, which enables the absorption of negative expansions due to depression.

Due to its elasticity, the material can deform or expand as necessary, making installation easier, simpler and quicker, even when the piping is not aligned.

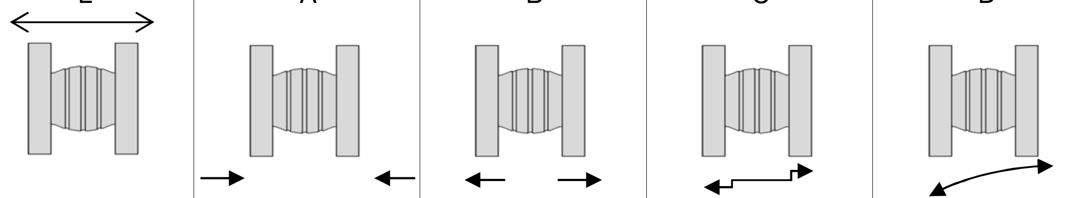
The certificate for drinking water (WRAS, ACS, D.M. 174) is valid for the standard configuration, without joint. The certification could be voided if the booster was sent, on request, complete with fitted joints.

For more information, please contact the sales network.

RUBBER EXPANSION JOINT



DN	L (mm)	A (mm)	B (mm)	C (mm)	D (°)
1"	200	25	6	23	30
1"1/4	200	25	6	23	30
1"1/2	200	25	6	23	30
2"	200	25	6	23	20
2"1/2	225	25	6	23	15



DN	L (mm)	A (mm)	B (mm)	C (mm)	D (°)
32	95	8	4	8	15
40	95	8	4	8	15
50	105	8	5	8	15
65	115	12	6	10	15
80	130	12	6	10	15
100	135	18	10	12	15
125	170	18	10	12	15
150	180	18	10	12	15
200	205	25	14	22	15
250	240	25	14	22	15
300	260	25	14	22	15
350	265	25	16	22	15
400	265	25	16	22	15
450	265	25	16	22	15
500	265	25	16	22	15

GD_JOINT_B_TD

LEGEND

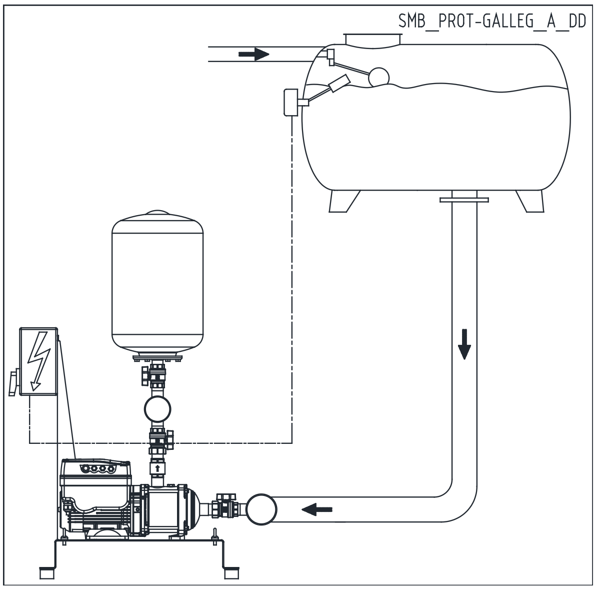
A = compression
B = extension
C = transverse
D = angular movement
NOTE. A - B - C - D can not be cumulative

PROTECTION SYSTEMS AGAINST DRY RUNNING

To avoid damaging the pumps, protection systems must be used to prevent it from dry running.

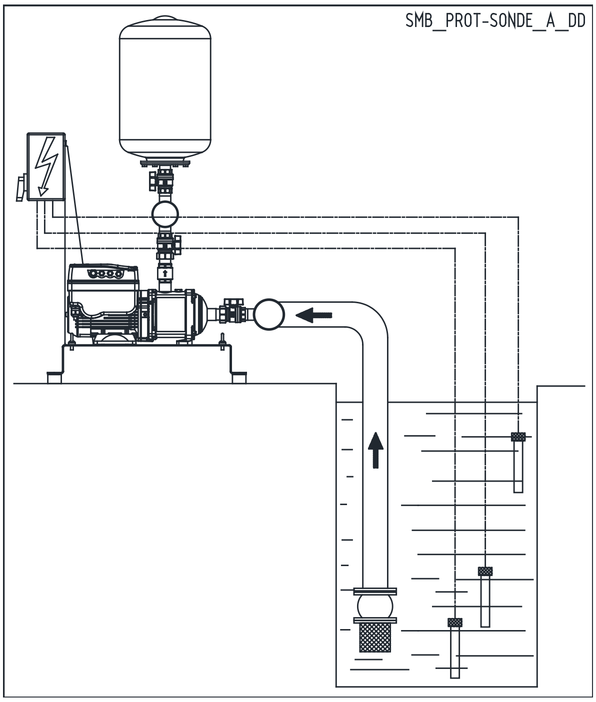
FLOAT SWITCH PROTECTION

The float switch system is used for supplies from open tanks. The float switch immersed in the tank must be connected to the control panel.
If there is no water, the float switch opens the electrical contact and the electric pumps stop.



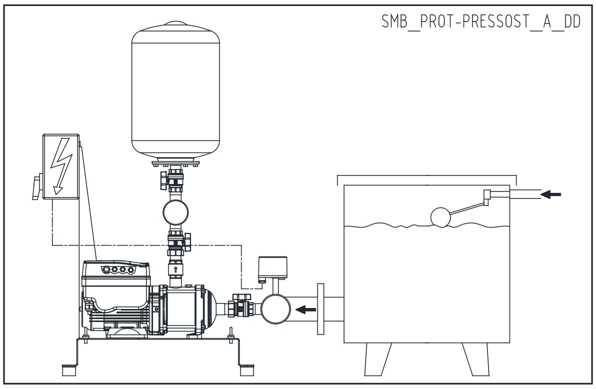
ELECTRODE PROBE PROTECTION

The system with electrode probes is used for supplies from open tanks or wells.
Three probes are directly connected to the electric module with adjustable sensitivity that can be installed in the control panel.
If there is no water, the control circuit opens the electrical contact and the electric pumps stop.



MINIMUM PRESSURE SWITCH PROTECTION

The system with minimum pressure switch is used for water supplies from pressurised networks or tanks. The pressure switch is connected to the control panel. In case of water shortage, it opens the electric contact, causing the stop of the electric pumps.



PROTECTION SENSOR AGAINST DRY RUNNING

Sensor for detecting the presence of water based on the optoelectronic principle, therefore non-invasive and with no moving parts. The sensor features an electronic contact (on/off) which stops the pump if there is no water in the seal area.
The sensor opens the electric contact if there is no water after they factory-set delay (10 seconds) elapses. The sensor is supplied as a kit complete with 2 metres of cable, an EPDM O-ring gasket and a stainless steel adapter.

General operating features

- In the boosters sets the sensor is assembled on the suction manifold with a specific hydraulic fitting. (/DR1 set version).
- The sensor can also be fitted directly on the filling cap of the e-SV™ pumps series. (/DR2, /DR3 set versions).
- Operation is independent of the hardness and conductivity of the water. The sensor cannot detect frozen liquids.

Available in two power versions depending on foreseen use:

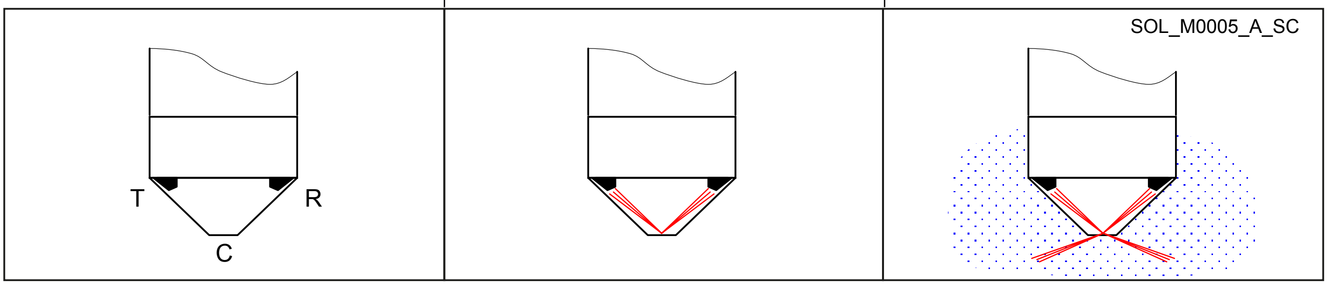
- 21÷27 Vac, universal solid state output for external relay at 24 Vac (21÷27 Vac, 50 mA).
- 15÷25 Vdc, NPN output at 25 V (10 mA) for HYDROVAR inverter and e-SM drive.

Operating principle

Operation is based on the change in the refractive index on the surfaces.
The optic sensor comprises a glass cap (C) containing a transmitter (T) and an infrared receiver (R).

If there is no liquid, all the infrared light emitted by the transmitter is internally reflected by the surface of the glass cap of the receiver. The electronic contact will be open.

If liquid is present, the refractive index of the surface changes. Most of the infrared light emitted by the transmitter is dispersed in the liquid.
The receiver receives less light and the electronic contact is closed.



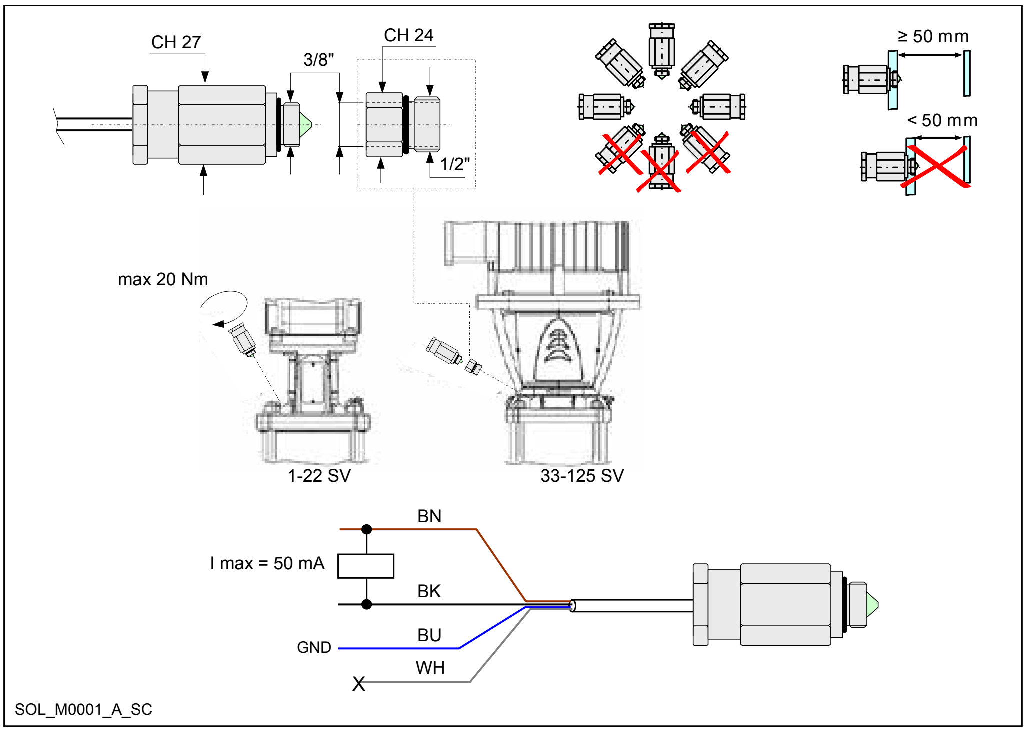
SPECIFICATIONS

- Materials:
  - Body in AISI 316L stainless steel
  - Glass optic cap
  - EPDM gasket
- Liquids: clean water, demi water. Operation is not affected by the hardness and conductivity of the liquid. To check the suitably of other liquids, contact the Lowara technical assistance service providing the characteristics of the liquid.
- Temperature of liquid: -20°C÷+120°C (cannot be used to detect frozen liquids).
- Ambient temperature: -5°C ÷+50°C
- Maximum pressure (PN): 25 bar
- Connector: 3/8 " (3/8" x 1/2" adaptor plug included in the Kit)
- Dimensions: 27x 60 mm
- IP55 protection
- Electrical characteristics:
  - Input voltage SENSOR KIT DRP-GP: 21÷27 Vac
    SENSOR KIT DRP-HV: 15÷25 Vdc
  - Output SENSOR KIT DRP-GP: universal solid state 21÷27 Vac (50 mA) for 24 Vac external relay
    SENSOR KIT DRP-HV: NPN 25 V (10 mA) for HYDROVAR™ inverter and e-SM drive
  - Alarm delay: 10 seconds (factory setting)
  - FROR cable 4 x 0,34 mm² (PVC-CEI 20-22) 2 metres long.

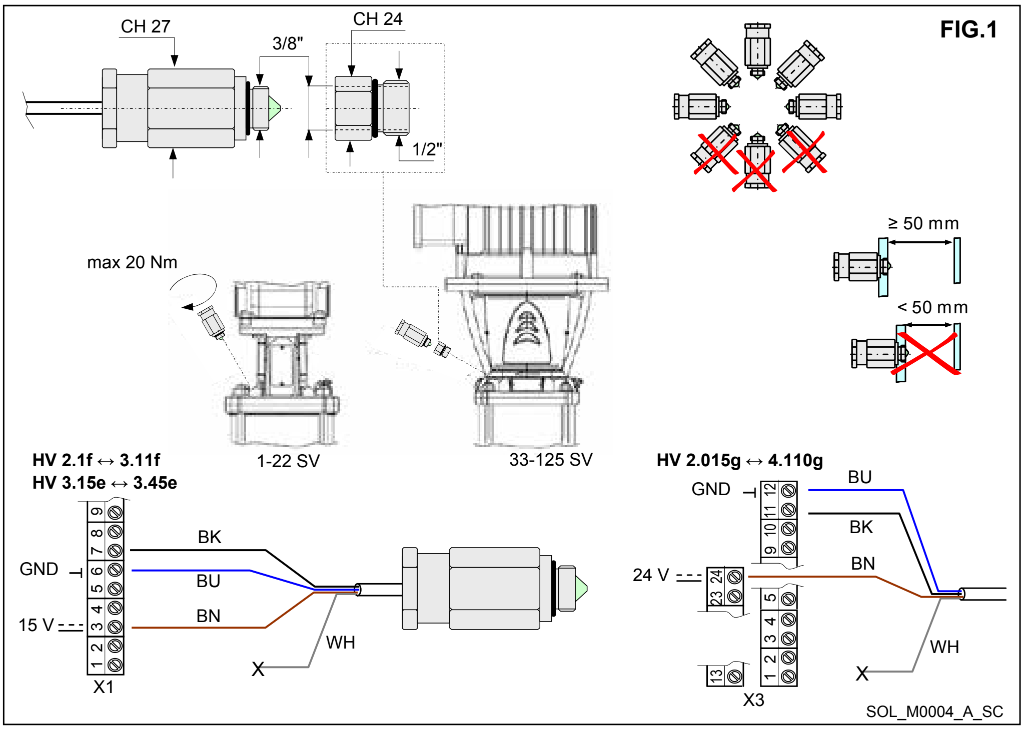
WIRING DIAGRAM

The sensor can be directly mounted on the filling plug of the e-SV™ pumps.
For the 33, 46, 66, 92, 125SV series, the 3/8" x 1/2" adaptor ring included in the kit must also be installed.

KIT SENSOR DRP-GP (code 109394610)



KIT SENSOR DRP-HV (code 109394600)



BK Black	BN Brown	BU Blue	WH Bianco	X1, X3 Terminal board

TECHNICAL APPENDIX

VAPOUR PRESSURE
VAPOUR PRESSURE ps AND ρ DENSITY OF WATER TABLE

t °C	T K	ps bar	ρ kg/dm³
0	273,15	0,00611	0,9998
1	274,15	0,00657	0,9999
2	275,15	0,00706	0,9999
3	276,15	0,00758	0,9999
4	277,15	0,00813	1,0000
5	278,15	0,00872	1,0000
6	279,15	0,00935	1,0000
7	280,15	0,01001	0,9999
8	281,15	0,01072	0,9999
9	282,15	0,01147	0,9998
10	283,15	0,01227	0,9997
11	284,15	0,01312	0,9997
12	285,15	0,01401	0,9996
13	286,15	0,01497	0,9994
14	287,15	0,01597	0,9993
15	288,15	0,01704	0,9992
16	289,15	0,01817	0,9990
17	290,15	0,01936	0,9988
18	291,15	0,02062	0,9987
19	292,15	0,02196	0,9985
20	293,15	0,02337	0,9983
21	294,15	0,24850	0,9981
22	295,15	0,02642	0,9978
23	296,15	0,02808	0,9976
24	297,15	0,02982	0,9974
25	298,15	0,03166	0,9971
26	299,15	0,03360	0,9968
27	300,15	0,03564	0,9966
28	301,15	0,03778	0,9963
29	302,15	0,04004	0,9960
30	303,15	0,04241	0,9957
31	304,15	0,04491	0,9954
32	305,15	0,04753	0,9951
33	306,15	0,05029	0,9947
34	307,15	0,05318	0,9944
35	308,15	0,05622	0,9940
36	309,15	0,05940	0,9937
37	310,15	0,06274	0,9933
38	311,15	0,06624	0,9930
39	312,15	0,06991	0,9927
40	313,15	0,07375	0,9923
41	314,15	0,07777	0,9919
42	315,15	0,08198	0,9915
43	316,15	0,09639	0,9911
44	317,15	0,09100	0,9907
45	318,15	0,09582	0,9902
46	319,15	0,10086	0,9898
47	320,15	0,10612	0,9894
48	321,15	0,11162	0,9889
49	322,15	0,11736	0,9884
50	323,15	0,12335	0,9880
51	324,15	0,12961	0,9876
52	325,15	0,13613	0,9871
53	326,15	0,14293	0,9862
54	327,15	0,15002	0,9862

t °C	T K	ps bar	ρ kg/dm³
55	328,15	0,15741	0,9857
56	329,15	0,16511	0,9852
57	330,15	0,17313	0,9846
58	331,15	0,18147	0,9842
59	332,15	0,19016	0,9837
60	333,15	0,1992	0,9832
61	334,15	0,2086	0,9826
62	335,15	0,2184	0,9821
63	336,15	0,2286	0,9816
64	337,15	0,2391	0,9811
65	338,15	0,2501	0,9805
66	339,15	0,2615	0,9799
67	340,15	0,2733	0,9793
68	341,15	0,2856	0,9788
69	342,15	0,2984	0,9782
70	343,15	0,3116	0,9777
71	344,15	0,3253	0,9770
72	345,15	0,3396	0,9765
73	346,15	0,3543	0,9760
74	347,15	0,3696	0,9753
75	348,15	0,3855	0,9748
76	349,15	0,4019	0,9741
77	350,15	0,4189	0,9735
78	351,15	0,4365	0,9729
79	352,15	0,4547	0,9723
80	353,15	0,4736	0,9716
81	354,15	0,4931	0,9710
82	355,15	0,5133	0,9704
83	356,15	0,5342	0,9697
84	357,15	0,5557	0,9691
85	358,15	0,5780	0,9684
86	359,15	0,6011	0,9678
87	360,15	0,6249	0,9671
88	361,15	0,6495	0,9665
89	362,15	0,6749	0,9658
90	363,15	0,7011	0,9652
91	364,15	0,7281	0,9644
92	365,15	0,7561	0,9638
93	366,15	0,7849	0,9630
94	367,15	0,8146	0,9624
95	368,15	0,8453	0,9616
96	369,15	0,8769	0,9610
97	370,15	0,9094	0,9602
98	371,15	0,9430	0,9596
99	372,15	0,9776	0,9586
100	373,15	1,0133	0,9581
102	375,15	1,0878	0,9567
104	377,15	1,1668	0,9552
106	379,15	1,2504	0,9537
108	381,15	1,3390	0,9522
110	383,15	1,4327	0,9507
112	385,15	1,5316	0,9491
114	387,15	1,6362	0,9476
116	389,15	1,7465	0,9460
118	391,15	1,8628	0,9445

t °C	T K	ps bar	ρ kg/dm³
120	393,15	1,9854	0,9429
122	395,15	2,1145	0,9412
124	397,15	2,2504	0,9396
126	399,15	2,3933	0,9379
128	401,15	2,5435	0,9362
130	403,15	2,7013	0,9346
132	405,15	2,867	0,9328
134	407,15	3,041	0,9311
136	409,15	3,223	0,9294
138	411,15	3,414	0,9276
140	413,15	3,614	0,9258
145	418,15	4,155	0,9214
155	428,15	5,433	0,9121
160	433,15	6,181	0,9073
165	438,15	7,008	0,9024
170	433,15	7,920	0,8973
175	448,15	8,924	0,8921
180	453,15	10,027	0,8869
185	458,15	11,233	0,8815
190	463,15	12,551	0,8760
195	468,15	13,987	0,8704
200	473,15	15,550	0,8647
205	478,15	17,243	0,8588
210	483,15	19,077	0,8528
215	488,15	21,060	0,8467
220	493,15	23,198	0,8403
225	498,15	25,501	0,8339
230	503,15	27,976	0,8273
235	508,15	30,632	0,8205
240	513,15	33,478	0,8136
245	518,15	36,523	0,8065
250	523,15	39,776	0,7992
255	528,15	43,246	0,7916
260	533,15	46,943	0,7839
265	538,15	50,877	0,7759
270	543,15	55,058	0,7678
275	548,15	59,496	0,7593
280	553,15	64,202	0,7505
285	558,15	69,186	0,7415
290	563,15	74,461	0,7321
295	568,15	80,037	0,7223
300	573,15	85,927	0,7122
305	578,15	92,144	0,7017
310	583,15	98,70	0,6906
315	588,15	105,61	0,6791
320	593,15	112,89	0,6669
325	598,15	120,56	0,6541
330	603,15	128,63	0,6404
340	613,15	146,05	0,6102
350	623,15	165,35	0,5743
360	633,15	186,75	0,5275
370	643,15	210,54	0,4518
374,15	647,30	221,20	0,3154

G-at_npsh_b_sc

TANK
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.

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:

$$V_m = \frac{Qp}{4 \text{ x } Z} \text{ x } \frac{1}{1 - \frac{(Pmin - 2)}{Pmax}}$$

where:
Vm = Total volume of the air-cushion surge tank in m^3
Qp = Average pump flow rate in m^3/h
Pmax = Maximum pressure setting (wcm)
Pmin = Minimum pressure setting (wcm)
Z = Maximum number of starts per hour allowed by the motor
Example:
22SV10F110T electric pump
Pmax = 23 wcm
Pmin = 15 wcm
Qp = 20 m^3/h
Z =25

$$V_m = \frac{Qp}{4 \text{ x } Z} \text{ x } \frac{1}{1 - \frac{(Pmin - 2)}{Pmax}} = 0{,}46 \text{ m}^3$$

A 500-litre surge tank is therefore required.

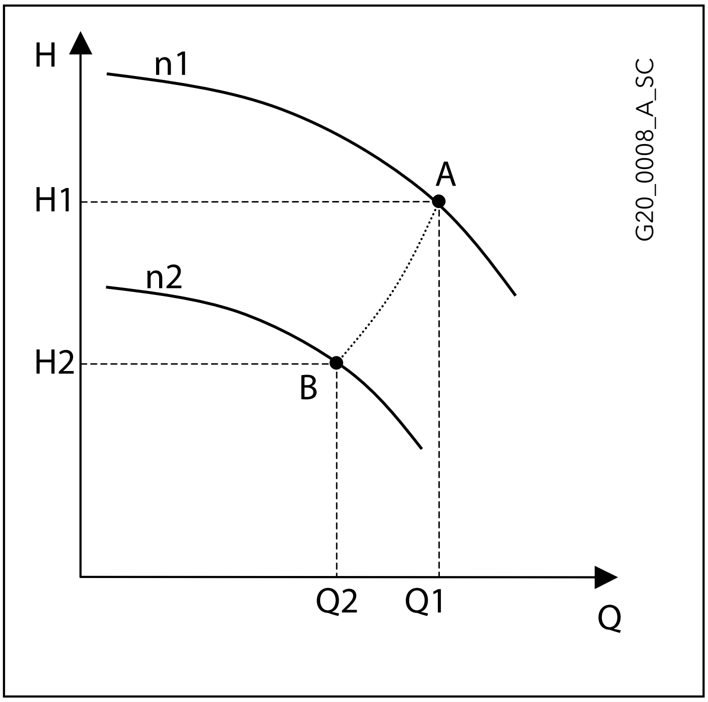
TANK
PERFORMANCE WITH VARYING SPEED EQUIVALENCE RELATIONS

Fitting the electric pump with a frequency converter makes it possible to vary the pump rotation speed, normally according to the system pressure parameter. **Variations in electric pump speed** result in **modified performances** according to the equivalence relations.

Flow rate $$\frac{Q1}{Q2} = \left[\frac{n1}{n2}\right]$$

Head $$\frac{H1}{H2} = \left[\frac{n1}{n2}\right]^2$$

Power $$\frac{P1}{P2} = \left[\frac{n1}{n2}\right]^3$$



n1 = initial speed; n2= speed required.
Q1 = initial flow rate; Q2= flow rate required.
H1 = initial head; H2= head required.
P1 = initial power; P2= power required

Frequency ratios can be used instead of speed in practical applications, keeping 30 Hz as the bottom limit.

Example : 2-pole 50 Hz electric pump n1 =2900 rpm (point A)
Flow rate (A) = 100 l/min; Head (A) = 50 m
By reducing the frequency to 30 Hz the speed is reduced to approx. n2 = 1740 rpm (point B)
Flow rate (B) = 60 l/min; Head (B) = 18 m
The power of the new work point B is cut to about 22% of the initial power.

SIZING THE DIAPHRAGM TANK IN SYSTEMS WITH SPEED VARIATION

Variable speed booster sets need **smaller tanks** compared to traditional systems. Generally speaking, a tank with a litre capacity of just 10% of the nominal capacity of a single pump, expressed in litres per minute, is needed.
The **gradual starting** of the pumps controlled by the frequency converters reduces the need to limit the number of hourly starts; the main purpose of the tank is to compensate for small system losses, stabilize the pressure and make up for pressure variations caused by sudden demand.

Make the following calculation:
Set made up of three electric pumps, each with a maximum flow rate of 400 l/min, for a total capacity of 1200 l/min.
The **volume** required for the tank is 40 litres. This size can be obtained by using two 24-litre tanks mounted directly onto the set's manifold.
The calculation establishes the minimum value needed for proper operation.

TABLE OF FLOW RESISTANCE IN 100 m OF STRAIGHT CAST IRON PIPELINE (HAZEN-WILLIAMS FORMULA C=100)

FLOW RATE			NOMINAL DIAMETER in mm and inches																
m^3/h	l/min		15 1/2"	20 3/4"	25 1"	32 1 1/4"	40 1 1/2"	50 2	65 2 1/2"	80 3"	100 4"	125 5"	150 6"	175 7"	200 8"	250 10"	300 12"	350 14"	400 16"
0,6	10	v	0,94	0,53	0,34	0,21	0,13												
		hr	16	3,94	1,33	0,40	0,13												
0,9	15	v	1,42	0,80	0,51	0,31	0,20												
		hr	33,9	8,35	2,82	0,85	0,29												
1,2	20	v	1,89	1,06	0,68	0,41	0,27	0,17											
		hr	57,7	14,21	4,79	1,44	0,49	0,16											
1,5	25	v	2,36	1,33	0,85	0,52	0,33	0,21											
		hr	87,2	21,5	7,24	2,18	0,73	0,25											
1,8	30	v	2,83	1,59	1,02	0,62	0,40	0,25											
		hr	122	30,1	10,1	3,05	1,03	0,35											
2,1	35	v	3,30	1,86	1,19	0,73	0,46	0,30											
		hr	162	40,0	13,5	4,06	1,37	0,46											
2,4	40	v		2,12	1,36	0,83	0,53	0,34	0,20										
		hr		51,2	17,3	5,19	1,75	0,59	0,16										
3	50	v		2,65	1,70	1,04	0,66	0,42	0,25										
		hr		77,4	26,1	7,85	2,65	0,89	0,25										
3,6	60	v		3,18	2,04	1,24	0,80	0,51	0,30										
		hr		108	36,6	11,0	3,71	1,25	0,35										
4,2	70	v		3,72	2,38	1,45	0,93	0,59	0,35										
		hr		144	48,7	14,6	4,93	1,66	0,46										
4,8	80	v		4,25	2,72	1,66	1,06	0,68	0,40										
		hr		185	62,3	18,7	6,32	2,13	0,59										
5,4	90	v			3,06	1,87	1,19	0,76	0,45	0,30									
		hr			77,5	23,3	7,85	2,65	0,74	0,27									
6	100	v			3,40	2,07	1,33	0,85	0,50	0,33									
		hr			94,1	28,3	9,54	3,22	0,90	0,33									
7,5	125	v			4,25	2,59	1,66	1,06	0,63	0,41									
		hr			142	42,8	14,4	4,86	1,36	0,49									
9	150	v				3,11	1,99	1,27	0,75	0,50	0,32								
		hr				59,9	20,2	6,82	1,90	0,69	0,23								
10,5	175	v				3,63	2,32	1,49	0,88	0,58	0,37								
		hr				79,7	26,9	9,07	2,53	0,92	0,31								
12	200	v				4,15	2,65	1,70	1,01	0,66	0,42								
		hr				102	34,4	11,6	3,23	1,18	0,40								
15	250	v				5,18	3,32	2,12	1,26	0,83	0,53	0,34							
		hr				154	52,0	17,5	4,89	1,78	0,60	0,20							
18	300	v					3,98	2,55	1,51	1,00	0,64	0,41							
		hr					72,8	24,6	6,85	2,49	0,84	0,28							
24	400	v					5,31	3,40	2,01	1,33	0,85	0,54	0,38						
		hr					124	41,8	11,66	4,24	1,43	0,48	0,20						
30	500	v					6,63	4,25	2,51	1,66	1,06	0,68	0,47						
		hr					187	63,2	17,6	6,41	2,16	0,73	0,30						
36	600	v						5,10	3,02	1,99	1,27	0,82	0,57	0,42					
		hr						88,6	24,7	8,98	3,03	1,02	0,42	0,20					
42	700	v						5,94	3,52	2,32	1,49	0,95	0,66	0,49					
		hr						118	32,8	11,9	4,03	1,36	0,56	0,26					
48	800	v						6,79	4,02	2,65	1,70	1,09	0,75	0,55					
		hr						151	42,0	15,3	5,16	1,74	0,72	0,34					
54	900	v						7,64	4,52	2,99	1,91	1,22	0,85	0,62					
		hr						188	52,3	19,0	6,41	2,16	0,89	0,42					
60	1000	v							5,03	3,32	2,12	1,36	0,94	0,69	0,53				
		hr							63,5	23,1	7,79	2,63	1,08	0,51	0,27				
75	1250	v							6,28	4,15	2,65	1,70	1,18	0,87	0,66				
		hr							96,0	34,9	11,8	3,97	1,63	0,77	0,40				
90	1500	v							7,54	4,98	3,18	2,04	1,42	1,04	0,80				
		hr							134	48,9	16,5	5,57	2,29	1,08	0,56				
105	1750	v							8,79	5,81	3,72	2,38	1,65	1,21	0,93				
		hr							179	65,1	21,9	7,40	3,05	1,44	0,75				
120	2000	v								6,63	4,25	2,72	1,89	1,39	1,06	0,68			
		hr								83,3	28,1	9,48	3,90	1,84	0,96	0,32			
150	2500	v								8,29	5,31	3,40	2,36	1,73	1,33	0,85			
		hr								126	42,5	14,3	5,89	2,78	1,45	0,49			
180	3000	v									6,37	4,08	2,83	2,08	1,59	1,02	0,71		
		hr									59,5	20,1	8,26	3,90	2,03	0,69	0,28		
210	3500	v									7,43	4,76	3,30	2,43	1,86	1,19	0,83		
		hr									79,1	26,7	11,0	5,18	2,71	0,91	0,38		
240	4000	v									8,49	5,44	3,77	2,77	2,12	1,36	0,94		
		hr									101	34,2	14,1	6,64	3,46	1,17	0,48		
300	5000	v										6,79	4,72	3,47	2,65	1,70	1,18		
		hr										51,6	21,2	10,0	5,23	1,77	0,73		
360	6000	v										8,15	5,66	4,16	3,18	2,04	1,42		
		hr										72,3	29,8	14,1	7,33	2,47	1,02		
420	7000	v											6,61	4,85	3,72	2,38	1,65	1,21	
		hr											39,6	18,7	9,75	3,29	1,35	0,64	
480	8000	v											7,55	5,55	4,25	2,72	1,89	1,39	
		hr											50,7	23,9	12,49	4,21	1,73	0,82	
540	9000	v											8,49	6,24	4,78	3,06	2,12	1,56	1,19
		hr											63,0	29,8	15,5	5,24	2,16	1,02	0,53
600	10000	v												6,93	5,31	3,40	2,36	1,73	1,33
		hr												36,2	18,9	6,36	2,62	1,24	0,65

The hr values must be multiplied by:

0,71 for galvanized or painted steel pipes

0,54 for stainless steel or copper pipes

0,47 for PVC or PE pipes

hr = flow resistance for 100 m of straight pipeline (m)

V = water speed (m/s)

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LOWARA
a xylem brand

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 valve	-	-	-	0,2	0,2	0,2	0,4	0,4	0,6	0,9	1,1	1,3
Foot check 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
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-en_b_th

The table is valid for the Hazen Williams coefficient C=100 (cast iron pipework)
for galvanized steel or painted steel multiply the values by 0,71;
for stainless steel and copper multiply the values by 0,54;
for Pvc and PE multiply the values by 0,47.

When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table in the previous page.
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 manufacturers.

VOLUMETRIC CAPACITY

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

PRESSURE AND HEAD

Newton per square metre N/m^2	kilo Pascal kPa	bar bar	Pound force per square inch psi	Metre of water m H_2O	Millimetre of mercury mm Hg
1,0000	0,0010	1×10^{-5}	$1{,}45 \times 10^{-4}$	$1{,}02 \times 10^{-4}$	0,0075
1 000,0000	**1,0000**	0,0100	0,1450	0,1020	7,5006
1×10^{5}	100,0000	**1,0000**	14,5038	10,1972	750,0638
6 894,7570	6,8948	0,0689	**1,0000**	0,7031	51,7151
9 806,6500	9,8067	0,0981	1,4223	**1,0000**	73,5561
133,3220	0,1333	0,0013	0,0193	0,0136	**1,0000**

LENGTH

Millimetre mm	Centimetre cm	Metre m	Inch in	Foot ft	Yard yd
1,0000	0,1000	0,0010	0,0394	0,0033	0,0011
10,0000	**1,0000**	0,0100	0,3937	0,0328	0,0109
1 000,0000	100,0000	**1,0000**	39,3701	3,2808	1,0936
25,4000	2,5400	0,0254	**1,0000**	0,0833	0,0278
304,8000	30,4800	0,3048	12,0000	**1,0000**	0,3333
914,4000	91,4400	0,9144	36,0000	3,0000	**1,0000**

VOLUME

Cubic metre m^3	Litre L	Millilitre ml	Imperial gallon imp. gal.	U.S. gallon US gal.	Cubic foot ft^3
1,0000	1 000,0000	1×10^{6}	219,9694	264,1720	35,3147
0,0010	**1,0000**	1 000,0000	0,2200	0,2642	0,0353
1×10^{-6}	0,0010	**1,0000**	$2{,}2 \times 10^{-4}$	$2{,}642 \times 10^{-4}$	$3{,}53 \times 10^{-5}$
0,0045	4,5461	4 546,0870	**1,0000**	1,2009	0,1605
0,0038	3,7854	3 785,4120	0,8327	**1,0000**	0,1337
0,0283	28,3168	28 316,8466	6,2288	7,4805	**1,0000**

TEMPERATURE

Water	Kelvin K	Celsius °C	Fahrenheit °F	
icing	273,1500	0,0000	32,0000	$°F = °C \times 9/5 + 32$
boiling	373,1500	100,0000	212,0000	$°C = (°F - 32) \times 5/9$

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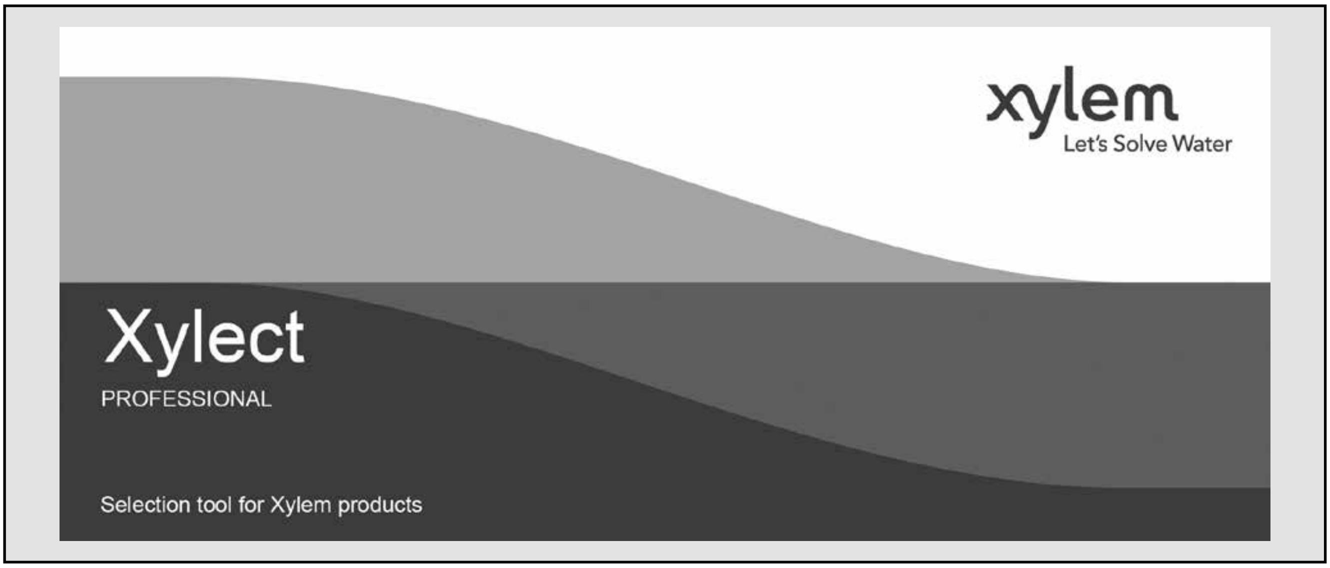
FURTHER PRODUCT SELECTION AND DOCUMENTATION
Xylect™



Xylect™ is pump solution selection software with an extensive online database of product information across the entire Lowara range of pumps and related products, with multiple search options and helpful project management facilities. The system holds up-to-date product information on thousands of products and accessories.

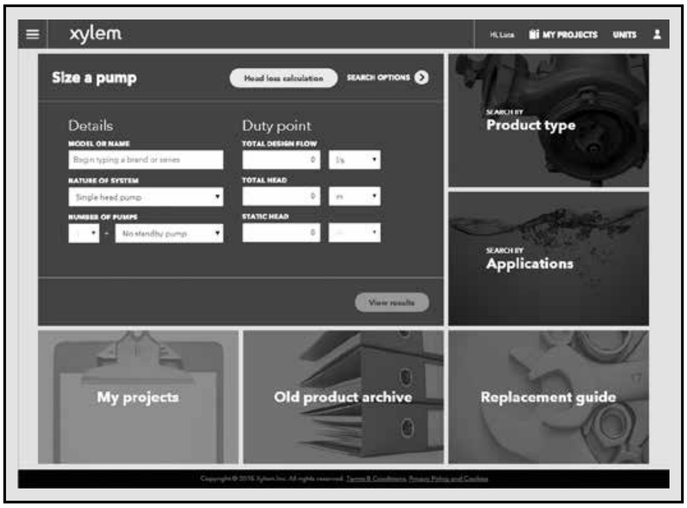
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Lowara products.

The search can be made by:

- Application
- Product type
- Duty point

Xylect™ gives a detailed output:

- List with search results
- Performance curves (flow, head, power, efficiency, NPSH)
- Motor data
- Dimensional drawings
- Options
- Data sheet printouts
- Document downloads incl dxf files



The search by application guides users not familiar with the product range to the right choice.

LOWARA
a xylem brand

FURTHER PRODUCT SELECTION AND DOCUMENTATION
Xylect™

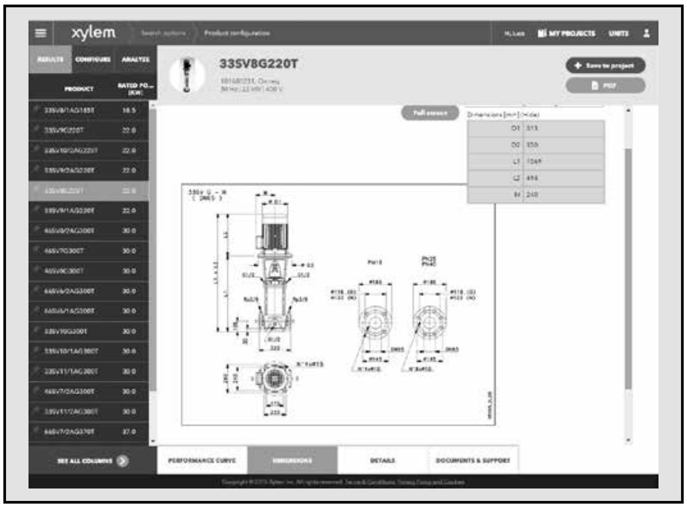
The detailed output makes it easy to select the optimal pump from the given alternatives.

The best way to work with Xylect™ is to create a personal account. This makes it possible to:

- Set own standard units
- Create and save projects
- Share projects with other Xylect™ users

Every registered user has a proper space, where all projects are saved.

For more information about Xylect™ please contact our sales network or visit www.xylect.com.



Dimensional drawings appear on the screen and can be downloaded in dxf format.

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com.

LOWARA®

xylem
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