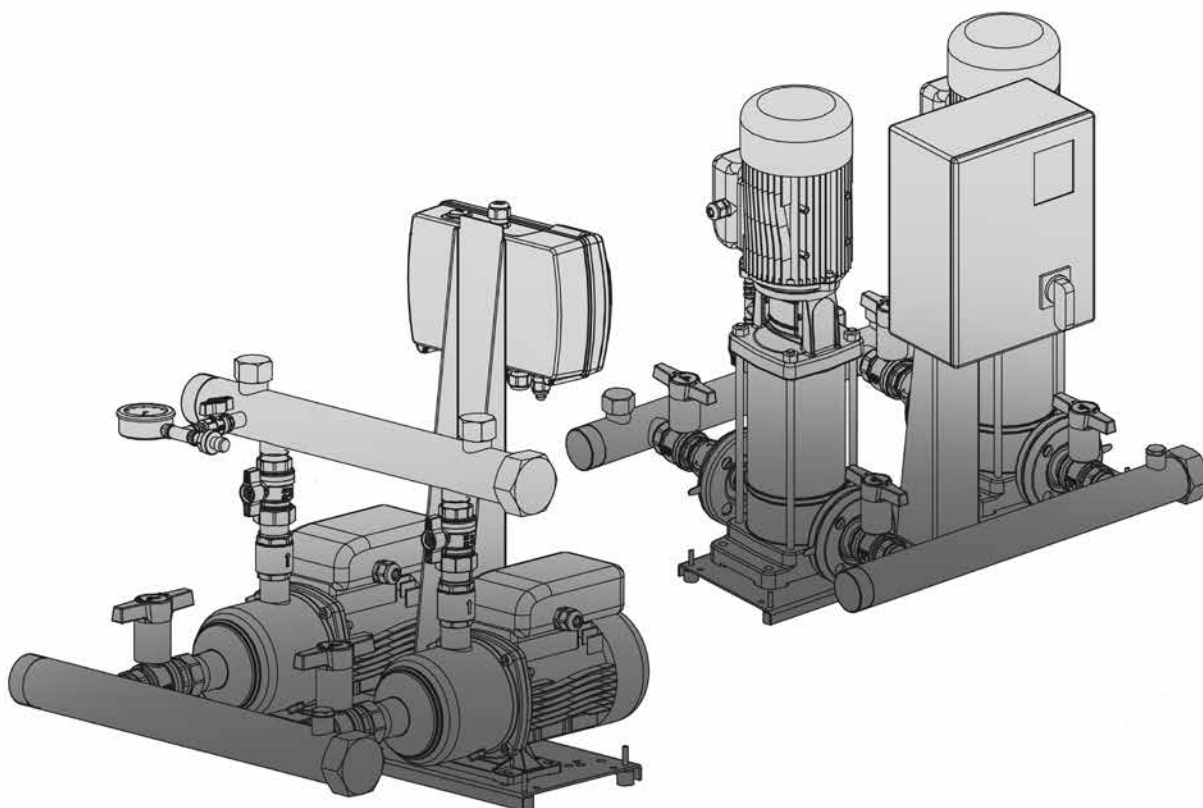


60 Hz



GXS and GMD Booster sets series

BOOSTER SETS FOR RESIDENTIAL MARKET,
HORIZONTAL MULTI-STAGE ELECTRIC PUMP e-HM™ SERIES
HORIZONTAL ELECTRIC PUMP CEA SERIES
HORIZONTAL ELECTRIC PUMP BG SERIES
VERTICAL MULTI-STAGE ELECTRIC PUMP e-SV™ SERIES

MENA market only

Cod. G91010401 Rev. A Ed.11/2017

GOULDS
WATER TECHNOLOGY
a xylem brand

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BOOSTER SETS GX S AND GMD SERIES GENERAL INTRODUCTION - PRODUCT DESCRIPTION

Goulds **GXS** and **GMD** series booster sets are designed to transfer and increase the pressure of water, in the following applications:

- Public buildings
- Apartment
- Single house
- Condominiums
- Garden irrigation

The booster sets series are pumping stations assembled with two horizontal centrifugal multi-stages **e-HM** series, horizontal centrifugal **CEA/CEAM** or **BG/BGM** series, vertical multi-stage **e-SV** series.

The booster sets **GXS** and **GMD** series are pumping station with single-phase or three-phase. The boosters sets have two pumps with automatic operating and fixed speed; The pumps are connected to one another by suction and delivery pipes, and fixed onto a single base. The pumps are connected to the manifolds by means of stop valves and check valves.

An electric protection and control panel is installed using a bracket on the base of the set. There are available a different type of costumized applications.

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

BOOSTER SETS GX S AND GMD SERIES CHOICE AND SELECTION

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

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

Generally speaking, the water consumption in water distribution systems, such as circuits for villas, detached houses and the like, is defined as "variable" though it is fairly concentrated during the day in what are known as peak consumption periods. Given the type of residential use, these concentrations of water demand mainly occur in the morning and in the evening.

The definition of the flow for these system types is generally based on practical tables giving the value of daily consumption depending on the type of user (number of occupants, number of services, etc..).

The size of the pressure booster set and, in practice, the performance levels of the pumps and the number of pumps is based on the take-off point and, therefore, on the consumption value which takes the following factors into account:

- The consumption peak
- Yield
- NPSH
- Diaphragm tanks

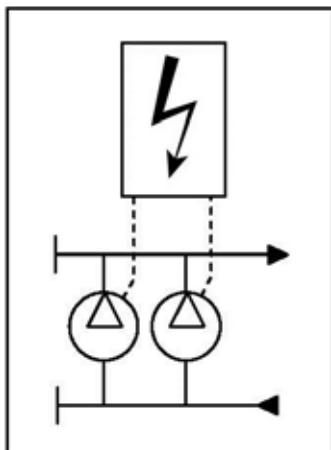
BOOSTER SETS GX5 AND GMD SERIES DESCRIPTION OF OPERATION

GXS BOOSTER SERIES

The starting and stopping of the pumps are determined by the pressure values set and measured by the transducer control. The pressure values are set by the controller.

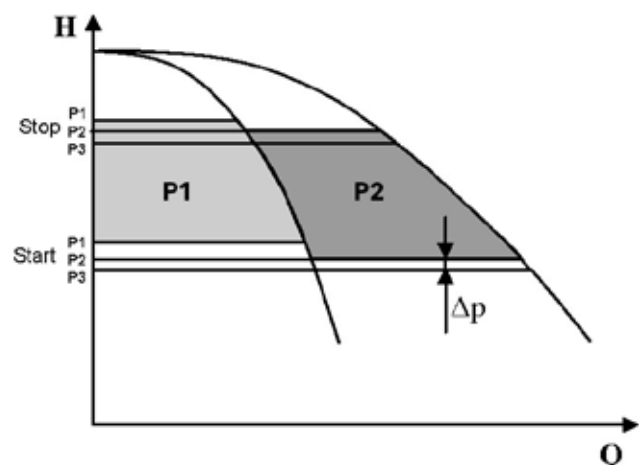
GMD BOOSTER SERIES

The starting and stopping of the pumps are determined by the pressure values set on the pressure switches. Each pressure switch is connected to a single pump with a cyclic pump changeover. The differential pressure is the difference between starting pressure and switch-off pressure. It is set at the same value for both pumps.



- On demand, the pressure decreases in the system until it reaches the pressure to start the first pump ($P1_{start}$).
- If the water consumption increases, the pressure decreased and the second pump starts ($P2_{start}$).
- When the water consumption decreases, the pressure in the system increases and the first pump stops at the $P2$ setting ($P2_{stop}$).
- If the water consumption decrease yet, the second pump stops ($P1_{stop}$).
- With the function "timer", the last pump functioning, will remain turned on ,until will reach the maximum pressure.
- Before starting, check that the maximum pressure of the pumps must be compatible with the maximum pressure of the system.

The below picture shows the operating mode with the pumps' curves:



BOOSTER SETS GXS AND GMD SERIES

DESCRIPTION OF OPERATION

BOOSTER SERIES GXS

On fixed speed booster sets **GXS** series, the control and protection panel with electronic board, manages the operations of the pumps, the cyclic changeover, and, in case of lack of water on suction side, stops the set. The pumps run in cascade through the transmitter signal.

Cyclical exchange of pumps

In the **GXS** e **GMD** series, the cyclical exchange of pumps is controlled by electrical panel.

Protection against dry running

The protection function against dry running intervenes if the water reserve to which the booster set is connected falls below the minimum level guaranteed for suction. The level may be controlled by a float, level probes or minimum pressure switch.

Maximum delivery pressure protection

The maximum 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.

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.

Tank

Frequent demand or small system losses determine pressure variations that may be compensated for by using a tank. Correct selection of a diaphragm tank reduces the number of pump starts and, if it is installed near the booster set, helps reduce the effect of water hammer.

The booster sets are ready for installation with diaphragm tanks mounted directly on the delivery manifold, and additional tanks can be connected to the unused end of the manifold.

BOOSTER SERIES GMD

On fixed speed booster sets **GMD** series, the control and protection panel with electronic board, manages the operations of the pumps, the cyclic changeover, and, in case of lack of water on suction side, stops the set. The pumps run in cascade through the two pressure switches signals.

Cyclical exchange of pumps

In the **GXS** e **GMD** series, the cyclical exchange of pumps is controlled by electrical panel.

Protection against dry running

The protection function against dry running intervenes if the water reserve to which the booster set is connected falls below the minimum level guaranteed for suction. The level may be controlled by a float, level probes or minimum pressure switch.

Maximum delivery pressure protection

The maximum delivery pressure function can be managed by pressure switch.

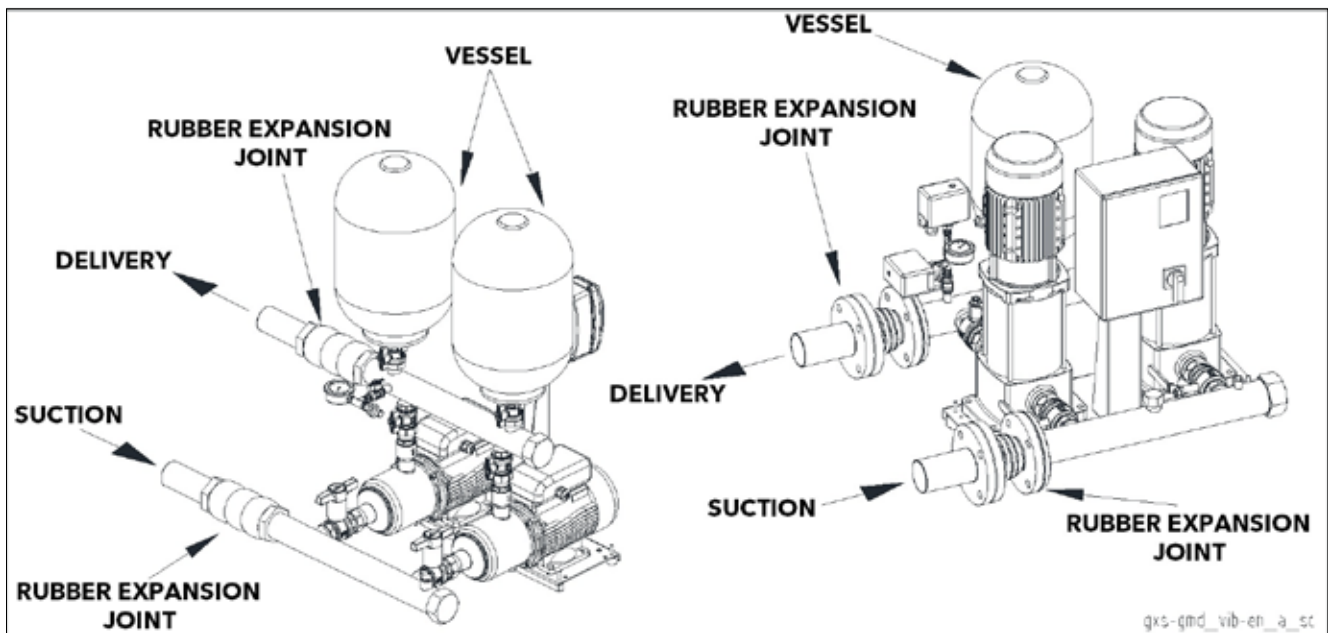
Tank

Frequent demand or small system losses determine pressure variations that may be compensated for by using a tank. Correct selection of a diaphragm tank reduces the number of pump starts and, if it is installed near the booster set, helps reduce the effect of water hammer.

The booster sets are ready for installation with diaphragm tanks mounted directly on the delivery manifold, and additional tanks can be connected to the unused end of the manifold.

BOOSTER SETS GX5 AND GMD 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. 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.. 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 that the electric pumps start too many times.

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

BOOSTER SETS GX5 AND GMD SERIES SELECTING THE PUMPS

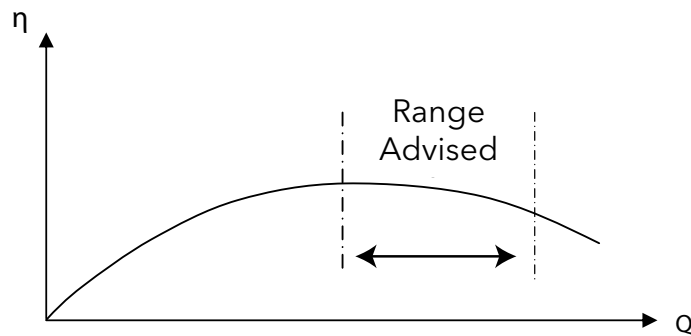
What type of pump to choose?

Generally, the choice of pump is based on the take-off point of the system, which is usually the highest possible. As maximum demand normally lasts a short time, the pump must also be able to satisfy variable requests throughout its time in service.

In this case, if variability is elevated, variable speed booster sets are preferred.

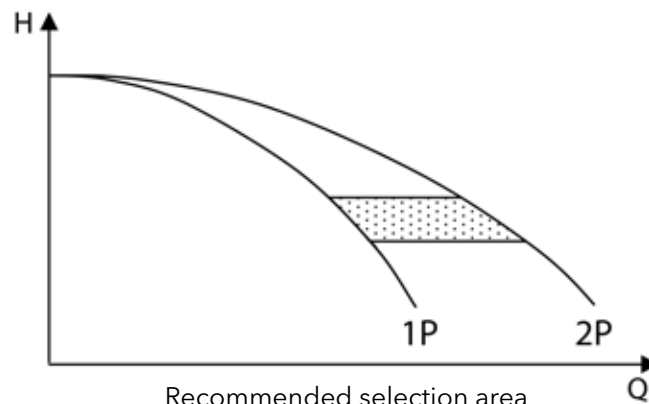
Generally the choice of the pump, based on the performance curve, should fall around the maximum efficiency point. The pump must ensure operation within its rated performance.

Since the booster set is sized according to the maximum possible consumption, the take-off point of the 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.



Pump performance curve

If we make a choice on the characteristic curve of the pump, we can see that the area where it is best to select the pump is represented by the following graph:



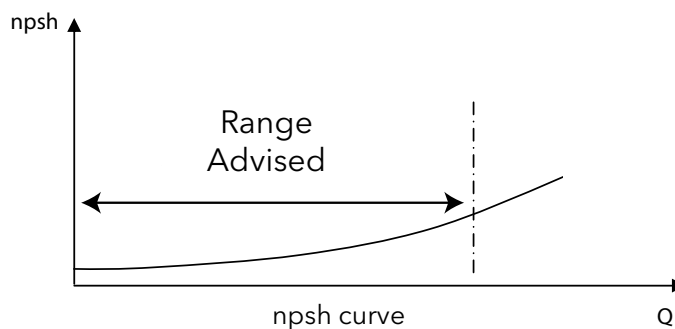
Recommended selection area

Another factor to be considered when choosing the pumps is its npsH value. Never choose a pump where the take-off point is too far to the right of the npsH curve.

This risks not having good pump suction, which may be aggravated by the type of installation (where negative suction is possible).

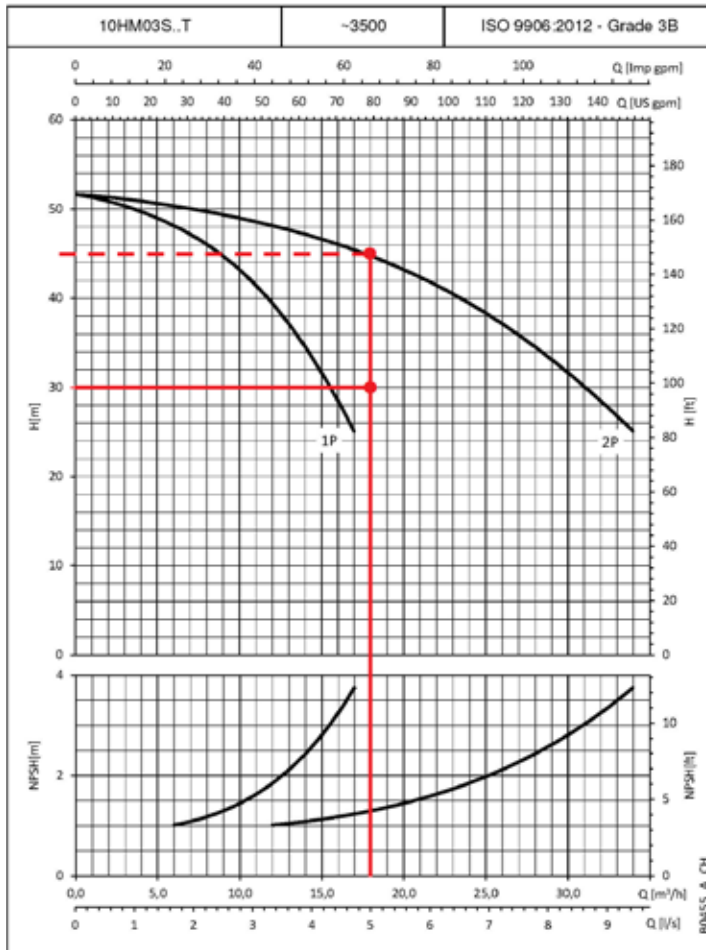
In these cases there is the risk of cavitation.

The npsH of the pump must always be checked at the maximum flow rate requested.



BOOSTER SETS GX5 AND GMD SERIES SELECTING THE PUMPS

The choice of pump is therefore based on the characteristic curve of the 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 pumps necessary for the system.



The example alongside refers to a required flow rate of 18 m³/h and a pressure of 30 water column.

As may be seen from the specific selection page 66, the system requires two pumps of the type 10HM03S..T as indicated top left in the table.

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.

NPSH

The minimum operating values that can be reached at the pump suction end are limited by the onset of cavitation. Cavitation is the formation of vapour-filled cavities within liquids where the pressure is locally reduced to a critical value, or where the local pressure is equal to, or just below the vapour pressure of the liquid.

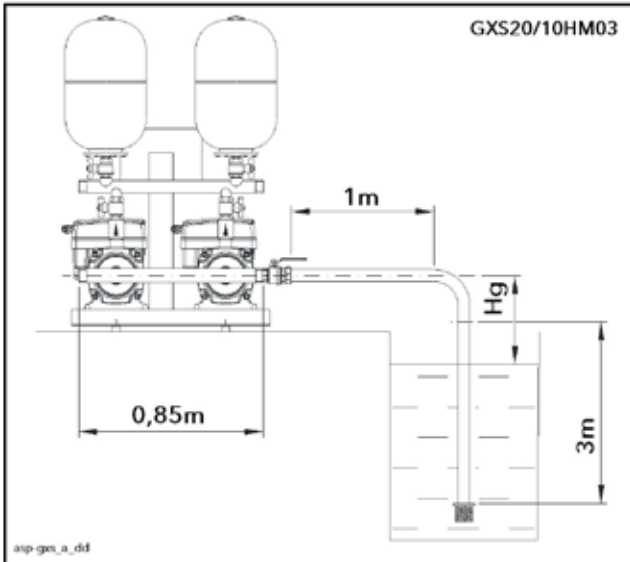
The vapour-filled cavities flow with the current and when they reach a higher pressure area the vapour contained in the cavities condenses. The cavities collide, generating pressure waves that are transmitted to the walls. These, being subjected to stress cycles, gradually become deformed and yield due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

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

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

BOOSTER SETS GX5 AND GMD 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:

$NPSH_{available} \geq NPSH_{required}$, when the equality condition represents the limit condition.

$$NPSH_{available} = Patm + Hg - \sum t - \sum a$$

Where:

$Patm$ is the atmospheric pressure, equal to 10,33 m

Hg is the geodetic level difference

$\sum t$ are the pressure drops for suction components such as foot check valve, suction piping, curve, gate valve.

$\sum a$ 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 9 m³/h, it corresponds to 1,25 m (page 66). Before calculating the $NPSH_{available}$, it is necessary to calculate the pressure drops at the suction, using the tables on page 97-98, 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 $\sum t$ 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 52).

Calculation of suction drops $\sum c$ 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) $\sum c = 3,2 \times 6,85 / 100 = 0,219$ m

Calculation of suction drops $\sum s$ for stainless steel components

Equivalent piping length for DN65 90° curve = 1,3 m

Total equivalent length = 1,3 m

Horizontal suction pipe length = 4 m

Vertical suction pipe length = 1 m

Pressure drops in the suction piping (stainless steel) $\sum s = (1,3 + 4 + 1) \times 6,85 \times 0,54 / 100 = 0,23$ m

Pressure drops for suction components $\sum t = \sum c + \sum s = 0,219 + 0,23 = 0,45$ m

The total sum of the pressure drops $\sum a$ 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 52).

H_c pressure drops for suction set branch must be assessed on the B curve (page 83, scheme B0542_A_CH); at the flow value of each pump equal to 9 m³/h, a value of $H_c = 0,0028$ m is obtained

Calculation of suction drops $\sum s$ 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) $\sum s = (2,6 + 0,85) \times 6,85 \times 0,54 / 100 = 0,0127$ m

Pressure drops $\sum a = H_c + \sum s = 0,0028 + 0,0127 = 0,01298$ m

Remembering that $NPSH_{available} = Patm + Hg - \sum t - \sum a$ and that $NPSH_{available} \geq NPSH_{requested}$ we have that $Patm + Hg - \sum t - \sum a$ must be $\geq NPSH_{requested}$.

Substituting the values we get that $10,33 + Hg - 0,45 - 0,01298 \geq 1,45$ m ($NPSH_{requested}$),

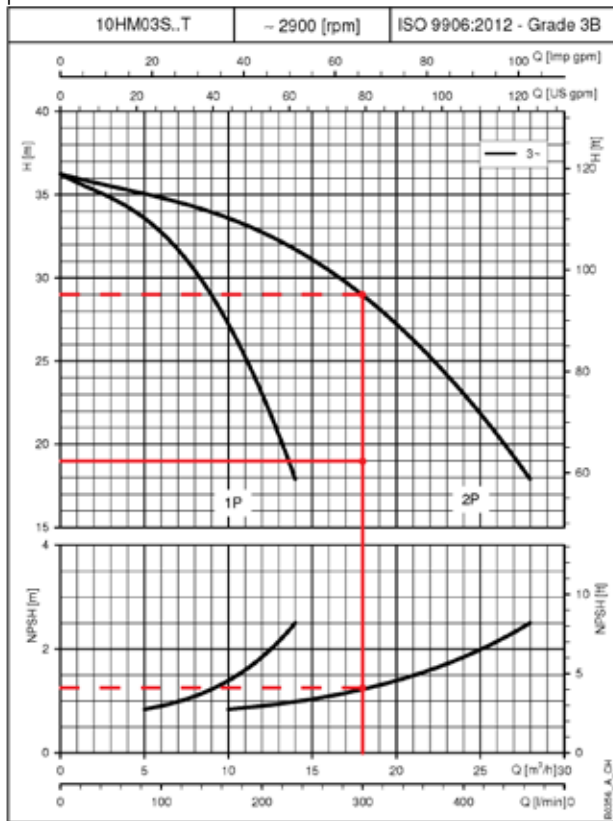
$Hg = 1,45 + 0,45 + 0,01298 - 10,33 = - 8,3$ m, it represents the limit condition for which

$NPSH_{available} = NPSH_{requested}$

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 8,3 m.**

BOOSTER SETS GXS AND GMD SERIES NET PRESSURE CALCULATION

When selecting 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:



Knowing the system operating point $Q = 18 \text{ m}^3/\text{h}$ and $H = 22 \text{ mH}_2\text{O}$ (P requested), and the installation height H_g (estimated to 5 m), in order to make the calculations easier we use the pressure drop curves for each single pump on page 82 of this catalogue. Assuming that a booster set GMD20/10HM03 with non-return valves on the delivery has been selected, we proceed as follows:

$P_{\text{net available}} \geq P_{\text{requested}}$, when the equality condition represents the limit condition.

$P_{\text{net available}} = H - (H_g + \sum t + \sum a + \sum m)$

Where:

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

The total sum of the pressure drops $\sum t$ 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 51).

Calculation of suction drops $\sum c$ 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) $\sum c = 3,2 \times 6,85 / 100 = 0,219 \text{ m}$

Calculation of suction drops $\sum s$ for stainless steel components:

Equivalent piping length for DN65 90° curve = 1,3 m
 Total equivalent length = 1,3 m Horizontal suction pipe length = 4 m Vertical suction pipe length = 1 m
 Pressure drops in the suction piping (stainless steel) $\sum s = (1,3 + 4 + 1) \times 6,85 \times 0,54 / 100 = 0,23 \text{ m}$

The total sum of the pressure drops for suction components $\sum t = \sum c + \sum s = 0,219 + 0,23 = 0,45 \text{ m}$
 The total sum of the pressure drops $\sum t$ 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 52).
 H_c pressure drops for suction set branch must be assessed on the B curve (page 83, scheme B0542_A_CH); at the flow value of each pump equal to 9 m³/h, a value of $H_c = 0,0028 \text{ m}$ is obtained.

Calculation of suction drops $\sum s$ for stainless steel components

Equivalent piping length for DN65 manifold TEE fitting = 2,6 m Suction manifold length = 0,85 m
 Pressure drops in the suction piping (stainless steel) $\sum s = (2,6 + 0,85) \times 6,85 \times 0,54 / 100 = 0,127 \text{ m}$
 The total pressure drops $\sum a$ for suction components are:
 $\sum a = H_c + \sum s = 0,0028 + 0,127 = 0,1298 \text{ m}$

The total sum of the pressure drops $\sum m$ 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 52).
 H_c pressure drops for delivery set branch must be assessed on the A curve (page 83, scheme B0542_A_CH); at the flow value of each pump equal to 9 m³/h, a value of $H_c = 2,2 \text{ m}$ is obtained

Calculation of delivery drops $\sum s$ 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) $\sum s = (2,6 + 0,85) \times 6,85 \times 0,54 / 100 = 0,127 \text{ m}$

Pressure drops in delivery manifold $\sum m = H_c + \sum s = 2,2 + 0,127 = 2,327 \text{ m}$

If we analyse the performance of the set at the flow value of 18 m³/h, the head value H is 29 m. The net pressure at the delivery manifold will be $P_{\text{net available}} = H - (H_g + \sum t + \sum a + \sum m)$
 Substituting the values we get that $P_{\text{net available}} = 45 - (5 + 0,45 + 0,1298 + 2,327) = 37,0932 \text{ m}$
 When comparing this value with the design value (not taking into account the dynamic energy), we see that $37,0932 \text{ m} > 30 \text{ m}$ [$P_{\text{net available}} > P_{\text{Required}}$]

The set is therefore capable of meeting system requirements.

BOOSTER SETS GXS AND GMD SERIES CHARACTERISTICS OF THE e-HM ELECTRIC PUMPS

The **e-HM™** series comprises horizontal multi-stage centrifuge pumps in pressed AISI 304 stainless steel. Compact construction, with pump coupled directly to motor; special motor shaft extension in common with the pump.

**GXS-GMD
e-HM**



Technical Information:

Flow rate: up to 34 m³/h.

Head: up to 157 m.

Temperature of the pumped liquid:

minimum from -10°C to -30°C according to gasket material. maximum

+90°C for three-phase version and uses according to EN 60335-2-41

+120°C for three-phase version with stainless steel impellers (HM..S HM..N) and uses other than EN 60335-2-41.

+60°C for single-phase version.

Maximum operating pressure:

16 bar (PN 16) for pumps with stainless steel impeller.

Power: from 0,75 to 5,5 kW.

Mechanical seal:

Ceramic/Carbon/EPDM (standard).

Silicon carbide/Carbon/EPDM (PN 16).

Elastomers: EPDM.

Motor

Standard supplied IE3 three-phase surface motors surface motors ≥ 0,75 kW

Performance to EN 60034-1.

Insulation class: 155 (F).

Protection class: IP55.

Condensate drain plugs on standard version.

Cooling by fan according to EN 60034-6.

Cable gland metric size according to EN 50262.

Standard voltage:

- **Single-phase version:**

220-240 V 60 Hz (incorporated automatic-reset overload protection up to 2.2 kW)

- **Three-phase version:**

220-240/380-415 V 60 Hz until 3 kW.

380-415/660-690 V 60 Hz up to 3 kW.

(overload protection to be provided by the user)

For electrical data of the motors used see Technical Appendix.

Material

All pumps are certified for drinking water use (WRAS, ACS and D.M.174.).

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-HM HYDRAULIC PERFORMANCE RANGE AT 60 Hz

PUMP TYPE HM..S	VERSION	ELECTRIC PUMP			Q = DELIVERY								
		* P ₁ kW	P _N kW	MOTOR TYPE	l/min 0	46	68	90	112	134	156	174,0	
					m ³ /h 0	2,8	4,1	5,4	6,7	8,0	9,4	10,4	
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
3HM03	1 ~	2 x 0,63	2 x 0,4	SM63HM../1046	31,7	31,1	29,8	27,8	25,2	21,9	17,7	13,7	
3HM04		2 x 0,82	2 x 0,5	SM63HM../1056	42,0	41,1	39,1	36,4	32,8	28,3	22,7	17,4	
3HM05		2 x 1,03	2 x 0,75	SM71HM../1076	53,3	52,5	50,3	47,1	42,8	37,3	30,4	23,7	
3HM06		2 x 1,21	2 x 0,95	SM71HM../1096	64,0	62,9	60,3	56,5	51,4	44,8	36,5	28,5	
3HM07		2 x 1,35	2 x 0,95	SM71HM../1096	74,3	72,6	69,3	64,7	58,6	50,7	41,0	31,6	
3HM08		2 x 1,57	2 x 1,1	SM80HM../1116	85,8	84,6	81,3	76,3	69,7	60,9	49,9	39,2	
3HM09		2 x 1,83	2 x 1,5	SM80HM../1156	97,2	96,7	93,2	88,0	80,8	71,2	59,0	47,0	
3HM10		2 x 1,98	2 x 1,5	SM80HM../1156	107,7	106,9	103,0	97,1	88,9	78,1	64,5	51,2	
3HM03		3 ~	2 x 0,52	2 x 0,5	SM63HM../305	31,6	30,5	29,0	26,9	24,3	20,8	16,7	12,7
3HM04			2 x 0,66	2 x 0,5	SM63HM../305	41,4	39,4	37,1	34,1	30,3	25,6	20,0	14,7
3HM05	2 x 0,91		2 x 0,75	SM80HM../307 E3	54,5	54,3	52,5	49,6	45,7	40,4	33,7	27,1	
3HM06	2 x 1,11		2 x 1,1	SM80HM../311 E3	65,5	65,5	63,4	60,1	55,4	49,2	41,1	33,2	
3HM07	2 x 1,27		2 x 1,1	SM80HM../311 E3	76,3	76,1	73,5	69,6	64,2	56,8	47,4	38,1	
3HM08	2 x 1,43		2 x 1,5	SM80HM../315 E3	87,4	87,4	84,6	80,3	74,1	65,8	55,0	44,5	
3HM09	2 x 1,6		2 x 1,5	SM80HM../315 E3	98,2	98,1	94,8	89,8	82,8	73,4	61,3	49,4	
3HM10	2 x 1,76		2 x 1,5	SM80HM../315 E3	108,9	108,6	105,0	99,3	91,5	80,9	67,4	54,2	
3HM11	2 x 1,96		2 x 2,2	PLM90HM../322 E3	120,4	120,5	116,7	110,8	102,4	91,0	76,2	61,7	
3HM12	2 x 2,12		2 x 2,2	PLM90HM../322 E3	131,2	131,2	127,0	120,5	111,2	98,7	82,7	66,8	
3HM13	2 x 2,28		2 x 2,2	PLM90HM../322 E3	142,0	141,9	137,3	130,1	120,0	106,4	89,0	71,8	
3HM14	2 x 2,44		2 x 2,2	PLM90HM../322 E3	152,8	152,5	147,4	139,6	128,7	114,1	95,2	76,7	

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_mena_3hm-s-2p60-en_a_th

* Maximum value in specified range: P1 = input power.

The table refers to performance with 2 pumps running.

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-HM HYDRAULIC PERFORMANCE RANGE AT 60 Hz

GXS-GMD
e-HM

PUMP TYPE HM..S	VERSION	ELECTRIC PUMP			Q = DELIVERY							
		* P ₁ kW	P _N kW	MOTOR TYPE	l/min 0	100	140	180	220	260	300	340
					m ³ /h 0	6,0	8,4	10,8	13,2	15,6	18,0	20,4
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
5HM02	1 ~	2 x 0,73	2 x 0,5	SM63HM../1056	21,3	20,1	19,1	17,8	16,2	14,1	11,6	8,8
5HM03		2 x 1,04	2 x 0,75	SM71HM../1076	32,2	30,5	29,0	27,0	24,5	21,5	17,8	13,5
5HM04		2 x 1,31	2 x 0,95	SM71HM../1096	42,8	40,3	38,2	35,5	32,2	28,1	23,1	17,4
5HM05		2 x 1,63	2 x 1,1	SM80HM../1116	54,0	51,1	48,6	45,4	41,3	36,3	30,1	22,9
5HM06		2 x 2	2 x 1,5	SM80HM../1156	65,0	62,3	59,4	55,7	51,0	45,0	37,7	29,1
5HM02	3 ~	2 x 0,57	2 x 0,5	SM63HM../305	21,2	19,5	18,3	16,8	15,1	13,0	10,5	7,6
5HM03		2 x 0,92	2 x 0,75	SM80HM../307 E3	32,8	31,6	30,3	28,5	26,2	23,3	19,7	15,4
5HM04		2 x 1,22	2 x 1,1	SM80HM../311 E3	43,8	42,3	40,5	38,1	35,1	31,3	26,5	20,8
5HM05		2 x 1,49	2 x 1,5	SM80HM../315 E3	54,9	53,0	50,8	47,9	44,2	39,4	33,4	26,2
5HM06		2 x 1,77	2 x 1,5	SM80HM../315 E3	65,7	63,2	60,5	57,0	52,4	46,6	39,4	30,8
5HM07		2 x 2,07	2 x 2,2	PLM90HM../322 E3	76,9	74,4	71,3	67,3	62,1	55,4	47,0	37,0
5HM08		2 x 2,34	2 x 2,2	PLM90HM../322 E3	87,7	84,7	81,1	76,5	70,5	62,8	53,2	41,8
5HM09		2 x 2,62	2 x 2,2	PLM90HM../322 E3	98,6	94,9	90,9	85,5	78,7	70,0	59,2	46,3
5HM10		2 x 2,91	2 x 3	PLM90HM../330 E3	109,7	106,0	101,6	95,7	88,2	78,6	66,7	52,4
5HM11		2 x 3,19	2 x 3	PLM90HM../330 E3	120,6	116,2	111,3	104,9	96,5	85,9	72,7	57,0
5HM12		2 x 3,45	2 x 3	PLM90HM../330 E3	131,4	126,4	121,0	113,9	104,7	93,1	78,7	61,5

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_mena_5hm-s-2p60-en_a_th

* Maximum value in specified range: P1 = input power.

The table refers to performance with 2 pumps running.

PUMP TYPE HM..S	VERSION	ELECTRIC PUMP			Q = DELIVERY							
		* P ₁ kW	P _N kW	MOTOR TYPE	l/min 0	200,0	262	324	386	448	510	566
					m ³ /h 0	12,0	15,7	19	23,2	27	30,6	34
H = TOTAL HEAD IN METRES OF COLUMN OF WATER												
10HM02	1 ~	2 x 1,75	2 x 1,5	SM80HM../1156	33,9	31,5	29,9	27,9	25,2	21,9	17,9	13,8
10HM02	3 ~	2 x 1,51	2 x 1,5	SM80HM../315 E3	34,1	31,6	30,0	28,0	25,3	22,0	18,0	13,9
10HM03		2 x 2,17	2 x 2,2	PLM90HM../322 E3	51,6	48,1	46,2	43,7	40,3	36,0	30,7	25,1
10HM04		2 x 2,86	2 x 3	PLM90HM../330 E3	68,8	64,1	61,5	58,1	53,7	47,9	40,9	33,4
10HM05		2 x 3,56	2 x 4	PLM100HM../340 E3	86,4	80,8	77,6	73,4	67,9	60,8	52,0	42,6
10HM06		2 x 4,22	2 x 4	PLM100HM../340 E3	103,4	96,4	92,5	87,4	80,7	72,1	61,5	50,3

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_mena_10hm-s-2p60-en_a_th

* Maximum value in specified range: P1 = input power.

The table refers to performance with 2 pumps running.

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-HM HYDRAULIC PERFORMANCE RANGE

PUMP TYPE HM..S	VERSION	ELECTRIC PUMP			CURRENT ABSORBED	
		* P1 kW	PN kW	MOTOR TYPE	GXS 1 x 220Vac A	
3HM03	1 ~	2 X 0,63	2 X 0,4	SM63HM../1046	6,0	
3HM04		2 X 0,82	2 X 0,5	SM63HM../1056	7,7	
3HM05		2 X 1,03	2 X 0,75	SM71HM../1076	9,3	
3HM06		2 X 1,21	2 X 0,95	SM71HM../1096	11,0	
3HM07		2 X 1,35	2 X 0,95	SM71HM../1096	12,1	
3HM08		2 X 1,57	2 X 1,1	SM80HM../1116	14,3	
3HM09		2 X 1,83	2 X 1,5	SM80HM../1156	17,3	
3HM10		2 X 1,98	2 X 1,5	SM80HM../1156	18,5	
						GMD 3 x 380Vac A
3HM03		3 ~	2 X 0,52	2 X 0,5	SM63HM../305	2,1
3HM04	2 X 0,66		2 X 0,5	SM63HM../305	2,4	
3HM05	2 X 0,91		2 X 0,75	SM80HM../307 E3	3,5	
3HM06	2 X 1,11		2 X 1,1	SM80HM../311 E3	4,4	
3HM07	2 X 1,27		2 X 1,1	SM80HM../311 E3	4,8	
3HM08	2 X 1,43		2 X 1,5	SM80HM../315 E3	5,6	
3HM09	2 X 1,6		2 X 1,5	SM80HM../315 E3	6,0	
3HM10	2 X 1,76		2 X 1,5	SM80HM../315 E3	6,5	
3HM11	2 X 1,96		2 X 2,2	PLM90HM../322 E3	7,8	
3HM12	2 X 2,12		2 X 2,2	PLM90HM../322 E3	8,2	
3HM13	2 X 2,28		2 X 2,2	PLM90HM../322 E3	8,6	
3HM14	2 X 2,44		2 X 2,2	PLM90HM../322 E3	9,0	

The current shown is the nominal current of set

2p_mena_3hm-s-2p60-en_a_te

* Maximum value in specific range: P1 = input power

GXS-GMD
e-HM

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-HM ELECTRICAL DATA TABLE

**GXS-GMD
e-HM**

PUMP TYPE HM..S	VERSION	ELECTRIC PUMP			CURRENT ABSORBED
		* P1 kW	PN kW	MOTOR TYPE	GXS 1 x 220Vac A
5HM02	1 ~	2 X 0,73	2 X 0,5	SM63HM../1056	7,0
5HM03		2 X 1,04	2 X 0,75	SM71HM../1076	9,4
5HM04		2 X 1,31	2 X 0,95	SM71HM../1096	11,8
5HM05		2 X 1,63	2 X 1,1	SM80HM../1116	14,8
5HM06		2 X 2,00	2 X 1,5	SM80HM../1156	18,6
					GMD 3 x 380Vac A
5HM02	3 ~	2 X 0,57	2 X 0,5	SM63HM../305	2,2
5HM03		2 X 0,92	2 X 0,75	SM80HM../307 E3	3,5
5HM04		2 X 1,22	2 X 1,1	SM80HM../311 E3	4,7
5HM05		2 X 1,49	2 X 1,5	SM80HM../315 E3	5,8
5HM06		2 X 1,77	2 X 1,5	SM80HM../315 E3	6,5
5HM07		2 X 2,07	2 X 2,2	PLM90HM../322 E3	8,1
5HM08		2 X 2,34	2 X 2,2	PLM90HM../322 E3	8,7
5HM09		2 X 2,62	2 X 2,2	PLM90HM../322 E3	9,4
5HM10		2 X 2,91	2 X 3	PLM90HM../330 E3	11,2
5HM11		2 X 3,19	2 X 3	PLM90HM../330 E3	11,9
5HM12		2 X 3,45	2 X 3	PLM90HM../330 E3	12,6

The current shown is the nominal current of set

2p_mena_5hm-s-2p60-en_a_te

* Maximum value in specific range:P1 = input power

PUMP TYPE HM..S	VERSION	ELECTRIC PUMP			CURRENT ABSORBED
		* P1 kW	PN kW	MOTOR TYPE	GXS 1 x 220Vac A
10HM02	1 ~	2 X 1,75	2 X 1,5	SM80HM../1156	16,7
					GMD 3 x 380Vac A
10HM02	3 ~	2 X 1,51	2 X 1,5	SM80HM../315 E3	5,4
10HM03		2 X 2,17	2 X 2,2	PLM90HM../322 E3	8,3
10HM04		2 X 2,86	2 X 3	PLM90HM../330 E3	11,1
10HM05		2 X 3,56	2 X 4	PLM100HM../340 E3	13,0
10HM06		2 X 4,22	2 X 4	PLM100HM../340 E3	14,9

The current shown is the nominal current of set

2p_mena_10hm-s-2p60-en_a_te

* Maximum value in specific range:P1 = input power

BOOSTER SETS GXs AND GMD SERIES WITH ELECTRIC PUMPS e-HM SINGLE-PHASE MOTORS, 2 POLES AT 60 Hz

GXS-GMD e-HM

P _N kW	MOTOR TYPE	IEC SIZE	Construction Design	INPUT CURRENT I _N (A)	CAPACITOR		DATA FOR 220 V 60 Hz VOLTAGE						
					μF	V	min ⁻¹	I _s / I _N	η %	cosφ	T _N Nm	T _s /T _N	T _m /T _N
0,30	SM63HM../1036	63	SPECIAL	2,31-2,36	10	450	3350	3,41	62,0	0,95	0,85	0,68	1,88
0,40	SM63HM../1046	63		2,86-2,94	14	450	3385	3,80	67,5	0,94	1,13	0,73	2,04
0,50	SM63HM../1056	63		3,57-3,65	16	450	3365	3,73	66,8	0,95	1,42	0,69	2,07
0,55	SM71HM../1056	71		3,68-3,62	16	450	3400	4,28	70,2	0,97	1,54	0,66	2,11
0,75	SM71HM../1076	71		4,98-4,88	20	450	3380	3,90	69,8	0,98	2,12	0,64	1,91
0,95	SM71HM../1096	71		6,04-5,96	25	450	3370	3,80	72,9	0,98	2,69	0,58	1,86
1,1	SM80HM../1116	80		6,94-6,89	30	450	3435	4,54	74,2	0,97	3,06	0,62	2,03
1,5	SM80HM../1156	80		9,28-9,35	40	450	3455	4,91	76,3	0,96	4,14	0,49	2,19
2,2	PLM90HM../1226	90		12,3-11,7	60	450	3455	4,99	83,4	0,98	6,08	0,54	2,06

1-22hm-motm-2p60-en_a_te

BOOSTER SETS GXs AND GMD SERIES WITH ELECTRIC PUMPS e-HM THREE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	Efficiency η _N %												IE
	Δ 220 V Y 380 V			Δ 230 V Y 400 V			Δ 380 V Y 660 V			Δ 400 V Y 690 V			
	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	
0,30	69,5	69,4	65,5	71,0	69,6	64,5	-	-	-	-	-	-	-
0,40	74,1	74,4	71,2	74,7	74,1	70,2	-	-	-	-	-	-	-
0,50	74,3	75,9	74,3	75,7	76,1	73,5	-	-	-	-	-	-	-
0,55	78,6	78,7	76,0	78,9	78,5	75,1	-	-	-	-	-	-	-
0,75	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	-
1,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	-
1,5	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	3
2,2	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	-
3	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	-
4	91,0	91,0	89,6	91,0	91,0	89,6	91,0	91,0	89,6	91,0	91,0	89,6	-
5,5	91,0	90,5	88,6	91,0	90,5	88,6	91,0	90,5	88,6	91,0	90,5	88,6	-

P _N kW	Model	IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 380 V / 60 Hz Voltage				
						cosφ	I _s / I _N	T _N Nm	T _s /T _N	T _m /T _N
0,30	SM63HM../303	63	SPECIAL	2	60	0,79	4,81	0,87	3,44	3,50
0,40	SM63HM../304	63				0,79	5,03	1,16	3,42	3,44
0,50	SM63HM../305	63				0,83	4,94	1,48	3,31	3,33
0,55	SM71HM../305	71				0,81	6,15	1,54	3,23	3,30
0,75	SM80HM../307 E3	80				0,79	8,25	2,05	3,80	4,02
1,1	SM80HM../311 E3	80				0,80	9,11	3,01	4,15	4,29
1,5	SM80HM../315 E3	80				0,82	9,79	4,10	4,36	4,37
2,2	PLM90HM../322 E3	90				0,82	9,80	6,01	3,80	4,01
3	PLM90HM../330 E3	90				0,82	9,35	8,21	4,26	4,10
4	PLM100HM../340 E3	100				0,87	10,0	10,9	2,43	4,53
5,5	PLM112HM../355 E3	112				0,88	12,0	15,0	4,70	5,55

P _N kW	Voltage U _N V								n _N min ⁻¹	Operating conditions **	
	Δ		Y		Δ		Y			Altitude Above Sea Level (m)	T. amb min/max °C
	220 V	230 V	380 V	400 V	380 V	400 V	660 V	690 V			
0,30	1,42	1,42	0,82	0,82					3275 ÷ 3325	1000 VI	-15 / 40
0,40	1,75	1,75	1,01	1,01					3290 ÷ 3335		
0,50	2,15	2,10	1,24	1,21					3220 ÷ 3285		
0,55	2,27	2,22	1,31	1,28					3405 ÷ 3425		
0,75	3,03	3,01	1,75	1,74	1,75	1,74	1,01	1,00	3490 ÷ 3500		
1,1	4,24	4,24	2,45	2,45	2,44	2,43	1,41	1,40	3495 ÷ 3505		
1,5	5,58	5,53	3,22	3,19	3,23	3,22	1,86	1,86	3485 ÷ 3500		
2,2	7,97	7,93	4,60	4,58	4,59	4,57	2,65	2,64	3490 ÷ 3505		
3	10,9	10,8	6,30	6,23	6,32	6,29	3,65	3,63	3485 ÷ 3500		
4	13,4	13,2	7,76	7,62	7,78	7,63	4,49	4,41	3510 ÷ 3520		
5,5	18,2	18,0	10,5	10,4	10,5	10,5	6,08	6,06	3505 ÷ 3515		

** Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

1-22hm-ie3-mott-2p60-en_a_te

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-HM ELECTRIC PUMP NOISE

POWER kW	NOISE LpA dB
0,30	55
0,40	55
0,50	55
0,55	59
0,75	59
0,95	59
1,1	65
1,5	65
2,2	65
3	65
4	65
5,5	65

1-22hm_mot_2p60_a_tr

The table show the mean sound pressure (Lp) measured as per Curve A (Standard ISO 1680).
Noise values were measured with the 60 Hz running with a tolerance of 3 dB (A).

BOOSTER SETS GX5 AND GMD SERIES CHARACTERISTICS OF THE ELECTRIC PUMPS CEA / CEAM

The **CEA** and **CEAM**, series comprises centrifuge pumps with single impeller in pressed AISI 304 stainless steel. The enbloc centrifuge pump features axial suction and radial discharge. Compact construction, with pump coupled directly to motor; special motor shaft extension in common with the pump and supported by ball bearings. The rotating part can be removed from the control side without removing the pump body from the system piping. Threaded suction and discharge ports (Rp ISO 7).

**GXS-GMD
CEA/CEAM**



Technical Information (standard version):

Flow rate: up to 32 m³/h.

Head: up to 46 m.

Temperature of the pumped liquid:
from -10°C to +85°C (standard version)

Maximum operating pressure: 8 bar

Power: from 0,37 to 3 kW.

Mechanical seal:
Ceramic/Carbon/EPDM (standard).

Elastomers: NBR.

Motor

Standard supplied IE2/IE3 three-phase surface motors $\geq 0,75$ kW are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.

Performance to EN 60034-1.

Insulation class: 155 (F).

Protection class: IP55.

Condensate drain plugs on standard version.

Cooling by fan according to EN 60034-6.

Cable gland metric size according to EN 50262.

Standard voltage:

- **Single-phase version:**

220-240 V 60 Hz (incorporated automatic-reset overload protection up to 1,5 kW).

- **Three-phase version:**

220-240/380-415 V 60 Hz (overload protection to be provided by the user).

For electrical data of the motors used see Technical Appendix.

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS CEA / CEAM HYDRAULIC PERFORMANCE TABLE AT 60 Hz

PUMP TYPE	VERSION	ELECTRIC PUMP			Q = DELIVERY										
		* P ₁ kW	MOTOR		l/min 0	40	60	80	120	160	240	280	360		
			P _N kW	TYPE	m ³ /h 0	2,4	3,6	4,8	7,2	9,6	14,4	16,8	21,6		
H = TOTAL HEAD IN METRES OF COLUMN OF WATER															
CEAM 706/3	1 ~	2 X 0,96	2 X 0,75	SM71BG/1076	32,3	30,7	30,0	29,2	27,0	23,5					
CEAM 706/4		2 X 1,3	2 X 0,9	SM71BG/1096	39,2	37,5	36,6	35,7	33,4	29,9					
CEAM 706/5		2 X 1,54	2 X 1,1	SM80BG/1116	45,2	43,3	42,4	41,4	38,6	34,4					
CEAM 1206/1		2 X 0,84	2 X 0,55	SM71BG/1056	22,1				19,1	17,7	14,4	12,2	9,8		
CEAM 1206/2		2 X 1,05	2 X 0,75	SM71BG/1076	27,8				24,1	22,6	19,1	16,9	14,3		
CEAM 1206/3		2 X 1,39	2 X 0,9	SM71BG/1096	32,8				29,1	27,7	24,1	22,0	19,6		
CEAM 1206/4		2 X 1,85	2 X 1,5	SM80BG/1156	40,5				36,3	34,6	30,6	28,2	25,4		
CEA 706/3	3 ~	2 X 0,84	2 X 0,75	SM80BG/307PE	32,3	30,7	30,0	29,2	27,0	23,5					
CEA 706/4		2 X 1,17	2 X 0,9	SM80BG/311PE	39,2	37,5	36,6	35,7	33,4	29,9					
CEA 706/5		2 X 1,46	2 X 1,1	SM80BG/311PE	45,2	43,3	42,4	41,4	38,6	34,4					
CEA 1206/1		2 X 0,74	2 X 0,55	SM71BG/305	22,1				19,1	17,7	14,4	12,2	9,8		
CEA 1206/2		2 X 0,94	2 X 0,75	SM80BG/307PE	27,8				24,1	22,6	19,1	16,9	14,3		
CEA 1206/3		2 X 1,27	2 X 0,9	SM80BG/311PE	32,8				29,1	27,7	24,1	22,0	19,6		
CEA 1206/4		2 X 1,71	2 X 1,5	SM80BG/315PE	40,5				36,3	34,6	30,6	28,2	25,4		
CEA 1206/5		2 X 2,23	2 X 1,85	PLM90BG/322	46,6				42,2	40,4	36,0	33,4	30,6	27,4	

GXS-GMD
CEA/CEAM

PUMP TYPE	VERSION	ELECTRIC PUMP			Q = DELIVERY									
		* P ₁ kW	MOTOR		l/min 0	240	280	320	360	480	600	640		
			P _N kW	TYPE	m ³ /h 0	14,4	16,8	19,2	21,6	28,8	36,0	38,4		
H = TOTAL HEAD IN METRES OF COLUMN OF WATER														
CEAM 2106/0	1 ~	2 X 0,84	2 X 0,75	SM80BG/307PE	17,0	15,9	15,5	14,9	14,3	11,9	8,8			
CEAM 2106/1		2 X 1,17	2 X 0,9	SM80BG/311PE	21,1	20,4	20,0	19,5	19,0	16,9	14,0			
CEAM 2106/2		2 X 1,46	2 X 1,1	SM80BG/311PE	25,3	24,5	24,1	23,7	23,2	21,3	18,7			
CEA 2106/0	3 ~	2 X 0,74	2 X 0,55	SM71BG/305	17,0	15,9	15,5	14,9	14,3	11,9	8,8			
CEA 2106/1		2 X 0,94	2 X 0,75	SM80BG/307PE	21,1	20,4	20,0	19,5	19,0	16,9	14,0			
CEA 2106/2		2 X 1,27	2 X 0,9	SM80BG/311PE	25,3	24,5	24,1	23,7	23,2	21,3	18,7			
CEA 2106/3		2 X 1,71	2 X 1,5	SM80BG/315PE	30,0	29,4	29,1	28,8	28,3	26,7	24,3	23,3		
CEA 2106/4		2 X 2,23	2 X 1,85	PLM90BG/322	34,8	34,3	34,0	33,6	33,2	31,5	28,9	27,9		

PUMP TYPE	VERSION	ELECTRIC PUMP			Q = DELIVERY										
		* P ₁ kW	MOTOR		l/min 0	320	360	480	600	640	760	840	920	1000	1080
			P _N kW	TYPE	m ³ /h 0	19,2	21,6	28,8	36,0	38,4	45,6	50,4	55,2	60,0	64,8
H = TOTAL HEAD IN METRES OF COLUMN OF WATER															
CEAM 3706/0	1 ~	2 X 1,54	2 X 1,1	SM80BG/1116	16,9	15,9	15,6	14,4	12,8	12,2	10,0				
CEAM 3706/0A		2 X 1,97	2 X 1,5	SM80BG/1156	19,8	19,4	19,2	18,4	17,2	16,7	14,6	12,9			
CEA 3706/0	3 ~	2 X 1,45	2 X 1,1	SM80BG/311PE	16,9	15,9	15,6	14,4	12,8	12,2	10,0				
CEA 3706/0A		2 X 1,84	2 X 1,5	SM80BG/315PE	19,8	19,4	19,2	18,4	17,2	16,7	14,6	12,9			
CEA 3706/1		2 X 2,42	2 X 1,85	PLM90BG/322	23,5	22,9	22,6	21,7	20,3	19,8	17,8	16,3	14,5		
CEA 3706/2		2 X 3,21	2 X 3	PLM90BG/330	29,6	29,0	28,8	27,9	26,6	26,1	24,2	22,7	21,0	19,0	
CEA 3706/3		2 X 3,92	2 X 3	PLM90BG/330	35,0	33,0	32,7	31,6	30,2	29,7	27,9	26,5	24,9	23,0	20,9

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_cea-2p60-en_a_th

* Maximum value in specified range: P₁ = input power.

The table refers to performance with 2 pumps running.

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS CEA / CEAM ELECTRICAL DATA TABLE AT 60 Hz

**GXS-GMD
CEA/CEAM**

PUMP TYPE	VERSION	ELECTRIC PUMP			CURRENT ABSORBED
		* P1 kW	PN kW	MOTOR TYPE	
CEAM 706/3	1 ~	2 X 0,96	2 X 0,75	SM71BG/1076	GXS 1 x 220Vac A 8,8
CEAM 706/4		2 X 1,3	2 X 0,9	SM71BG/1096	11,8
CEAM 706/5		2 X 1,54	2 X 1,1	SM80BG/1116	14,3
CEAM 1206/1		2 X 0,84	2 X 0,55	SM71BG/1056	7,7
CEAM 1206/2		2 X 1,05	2 X 0,75	SM71BG/1076	9,6
CEAM 1206/3		2 X 1,39	2 X 0,9	SM71BG/1096	12,6
CEAM 1206/4		2 X 1,85	2 X 1,5	SM80BG/1156	17,4
					GMD 3 x 380 Vac A
CEA 706/3	3 ~	2 X 0,84	2 X 0,75	SM80BG/307PE	3,3
CEA 706/4		2 X 1,17	2 X 0,9	SM80BG/311PE	4,6
CEA 706/5		2 X 1,46	2 X 1,1	SM80BG/311PE	5,3
CEA 1206/1		2 X 0,74	2 X 0,55	SM71BG/305	2,7
CEA 1206/2		2 X 0,94	2 X 0,75	SM80BG/307PE	3,6
CEA 1206/3		2 X 1,27	2 X 0,9	SM80BG/311PE	4,8
CEA 1206/4		2 X 1,71	2 X 1,5	SM80BG/315PE	6,4
CEA 1206/5	2 X 2,23	2 X 1,85	PLM90BG/322	8,5	

PUMP TYPE	VERSION	ELECTRIC PUMP			CURRENT ABSORBED
		* P1 kW	PN kW	MOTOR TYPE	
CEAM 2106/0	1 ~	2 X 1,06	2 X 0,75	SM71BG/1076	GXS 1 x 220Vac A 9,7
CEAM 2106/1		2 X 1,5	2 X 1,1	SM80BG/1116	14,0
CEAM 2106/2		2 X 1,9	2 X 1,5	SM80BG/1156	17,7
					GMD 3 x 380 Vac A
CEA 2106/0	3 ~	2 X 0,95	2 X 0,75	SM80BG/307PE	3,6
CEA 2106/1		2 X 1,4	2 X 1,1	SM80BG/311PE	5,2
CEA 2106/2		2 X 1,74	2 X 1,5	SM80BG/315PE	6,4
CEA 2106/3		2 X 2,27	2 X 1,85	PLM90BG/322	8,6
CEA 2106/4		2 X 2,95	2 X 2,2	PLM90BG/322	10,5

PUMP TYPE	VERSION	ELECTRIC PUMP			CURRENT ABSORBED
		* P1 kW	PN kW	MOTOR TYPE	
CEAM 3706/0	1 ~	2 X 1,54	2 X 1,1	SM80BG/1116	GXS 1 x 220Vac A 14,3
CEAM 3706/0A		2 X 1,97	2 X 1,5	SM80BG/1156	18,4
					GMD 3 x 380 Vac A
CEA 3706/0	3 ~	2 X 1,45	2 X 1,1	SM80BG/311PE	5,3
CEA 3706/0A		2 X 1,84	2 X 1,5	SM80BG/315PE	6,7
CEA 3706/1		2 X 2,42	2 X 1,85	PLM90BG/322	9,0
CEA 3706/2		2 X 3,21	2 X 3	PLM90BG/330	11,7
CEA 3706/3		2 X 3,92	2 X 3	PLM90BG/330	13,8

The current shown is the nominal current of set

2p_cea-2p60-en_a_te

* Maximum value in specific range:P1 = input power

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS CEA SINGLE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	MOTOR TYPE	IEC SIZE	Construction Design	INPUT CURRENT I _n (A) 220-230 V	CAPACITOR		DATA FOR 220 V 50 Hz VOLTAGE						
					μF	V	min ⁻¹	I _s / I _n	η %	cosφ	T _n Nm	T _s /T _n	T _m /T _n
0,55	SM71BG/1056	71	SPECIAL	3,68-3,62	16	450	3400	4,28	70,2	0,97	1,54	0,66	2,11
0,75	SM71BG/1076	71		4,98-4,88	20	450	3380	3,90	69,8	0,98	2,12	0,64	1,91
0,9	SM71BG/1096	71		6,04-5,96	25	450	3370	3,80	72,9	0,98	2,69	0,58	1,86
1,1	SM80BG/1116	80		6,94-6,89	30	450	3435	4,54	74,2	0,97	3,06	0,62	2,03
1,5	SM80BG/1156	80		9,28-9,35	40	450	3455	4,91	76,3	0,96	4,14	0,49	2,19
1,85	PLM90BG/1226	90		12,3-11,7	60	450	3455	4,99	83,4	0,98	6,08	0,54	2,06
2,2	PLM90BG/1226	90		12,3-11,7	60	450	3455	4,99	83,4	0,98	6,08	0,54	2,06

cea-motm-2p60-en_a_te

GXS-GMD
CEA/CEAM

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS CEAM THREE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	Efficiency h _N %												Year of construction		
	D 220 V Y 380 V			D 230 V Y 400 V			D 380 V Y 660 V			D 400 V Y 690 V				IE	
	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4			
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	By Oct 2013
0,75	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	-		
0,9	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	3		
1,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	3		
1,5	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	3		
1,85	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	3		
2,2	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	3		
3	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	3		

P _N kW	Manufacturer		IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 380 V / 60 Hz				
	Xylem Service Italia Srl Reg. No. 07520560967 Montecchio Maggiore Vicenza - Italia						cosj	I _s / I _N	T _N Nm	T _s /T _N	T _m /T _n
	Model										
0,55	SM71BG /305		71	SPECIAL	2	60	0,84	5,83	1,55	3,09	2,77
0,75	SM80BG /307 PE		80				0,79	8,25	2,05	3,80	4,02
0,9	SM80BG /311 PE		80				0,80	9,11	3,01	4,15	4,29
1,1	SM80BG /311 PE		80				0,80	9,11	3,01	4,15	4,29
1,5	SM80BG /315 PE		80				0,82	9,79	4,10	4,36	4,37
1,85	PLM90BG /322 E3		90				0,79	9,8	6,01	3,80	4,01
2,2	PLM90BG /322 E3		90				0,79	9,8	6,01	3,80	4,01
3	PLM90BG /330 E3		90				0,78	9,35	8,21	4,26	4,1

P _N kW	Voltage U _N V								n _N min ⁻¹	Operating conditions **			
	D		Y		D		Y			Altitudine s.l.m. m	T. amb min/max °C	ATEX	
	220 V	230 V	380 V	400 V	380 V	400 V	660 V	690 V					
	I _N (A)												
0,55	2,37	2,30	1,37	1,33	-	-	-	-	3380 ÷ 3415	See note.	≤ 1000	- 15 / 40	No
0,75	3,03	3,01	1,75	1,74	1,75	1,74	1,01	1,00	3490 ÷ 3500				
0,9	4,24	4,24	2,45	2,45	2,44	2,43	1,41	1,40	3490 ÷ 3505				
1,1	4,24	4,24	2,45	2,45	2,44	2,43	1,41	1,40	3490 ÷ 3505				
1,5	5,58	5,53	3,22	3,19	3,23	3,22	1,86	1,86	3485 ÷ 3505				
1,85	7,97	7,93	4,60	4,58	4,59	4,57	2,65	2,64	3490 ÷ 3505				
2,2	7,97	7,93	4,60	4,58	4,59	4,57	2,65	2,64	3490 ÷ 3505				
3	10,9	10,8	6,30	6,23	6,32	6,29	3,65	3,63	3485 ÷ 3500				

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

cea-ie3-mott-2p60-en_a_te

** Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

BOOSTER SETS GX5 AND GMD SERIES CHARACTERISTICS OF THE ELECTRIC PUMPS BG / BGM

The **BG** and **BGM** series comprises self-priming, single-impeller, horizontal centrifuge pumps featuring stainless steel bodies and rotors.

Motor: enbloc motor-pump coupling with rotor directly splined onto the motor shaft protrusion.

**GXS-GMD
BG/BGM**



Technical Information (standard version):

Flow rates: up to 4,2 m³/h.

Head: up to 53 m.

Temperature of pumped liquid:
from -10°C to +40°C.

Maximum ambient temperature: +40°C.

Maximum suction head: 8 m.

Mechanical seal: Ceramic/Carbon/EPDM.

Elastomers: EPDM.

Motor

Standard supplied IE2/IE3 three-phase surface motors $\geq 0,75$ kW are compliant with Regulation (EC) no. 640/2009 and IEC 60034-30.

Electrical performances according to EN 60034-1.

Insulation class 155 (F).

IP55 protection.

Condensate drain plugs on standard version.

Cooling by fan according to EN 60034-6.

Cable gland metric size according to EN 50262.

Standard voltage:

- **Single-phase version:** 220-240 V 60 Hz (incorporated automatic-reset overload protection).
- **Three-phase version:** 220-240/380-415 V 60 Hz (overload protection to be provided by the user).

For electrical data of the motors used see Technical Appendix.

BOOSTER SETS GX S AND GMD SERIES WITH ELECTRIC PUMPS BG AND BGM HYDRAULIC PERFORMANCE TABLE AT 60 Hz

PUMP TYPE	VERSION	ELECTRIC PUMP			Q = DELIVERY								
		* P1 kW	MOTOR		l/min 0	20	40	60	80	100	120	140	160
			PN kW	TYPE									
H = TOTAL HEAD IN METRES OF COLUMN OF WATER													
BGM 56	1 ~	2 X 0,91	2 X 0,55	SM71BG/1056	41,0	38,0	34,0	31,0	28,0	26,0	24,0		
BGM 76		2 X 1,11	2 X 0,75	SM71BG/1076	47,0	43,0	40,0	37,0	34,0	31,0	29,0		
BGM 116		2 X 1,57	2 X 1,1	SM80BG/1156	53,0	51,0	48,0	46,0	44,0	42,0	40,0	38,0	36,0
BG 56	3 ~	2 X 0,81	2 X 0,55	SM71BG/305	41,0	38,0	34,0	31,0	28,0	26,0	24,0		
BG 76		2 X 1,05	2 X 0,75	SM71BG/307	47,0	43,0	40,0	37,0	34,0	31,0	29,0		
BG 116		2 X 1,45	2 X 1,1	SM80BG/311	53,0	51,0	48,0	46,0	44,0	42,0	40,0	38,0	36,0

Maximum delivery depends on geodetic suction lift with clean 8 m pipe and 1¼" foot valve.

2p_bg-2p60-en_a_th

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

* Maximum value in specified range: P1 = input power.

The table refers to performance with 2 pumps running.

GX S-GMD
BG/BGM

BOOSTER SETS GX S AND GMD SERIES WITH ELECTRIC PUMPS BG AND BGM ELECTRICAL DATA TABLE AT 60 Hz

PUMP TYPE	VERSION	ELECTRIC PUMP			CURRENT ABSORBED
		* P1 kW	MOTOR		
			PN kW	TYPE	GXS 1 x 220Vac A
BGM 56	1 ~	2 X 0,91	2 X 0,55	SM71BG/1056	8,4
BGM 76		2 X 1,11	2 X 0,75	SM71BG/1076	10,1
BGM 116		2 X 1,57	2 X 1,1	SM80BG/1156	14,6
					GMD 3 x 380Vac A
BG 56	3 ~	2 X 0,81	2 X 0,55	SM71BG/305	2,9
BG 76		2 X 1,05	2 X 0,75	SM71BG/307	3,8
BG 116		2 X 1,45	2 X 1,1	SM80BG/311	4,9

The current shown is the nominal current of set

2p_bg-2p60-en_a_te

* Maximum value in specific range: P1 = input power

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS BG / BGM SINGLE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	MOTOR TYPE	IEC SIZE	Construction Design	INPUT CURRENT I _n (A) 220-230 V	CAPACITOR		DATA FOR 220 V 50 Hz VOLTAGE						
					μF	V	min ⁻¹	I _s / I _n	η %	cosφ	T _n Nm	T _s /T _n	T _m /T _n
0,55	SM71BG/1056	71	SPECIAL	3,68-3,62	16	450	3400	4,28	70,2	0,97	1,54	0,66	2,11
0,75	SM71BG/1076	71		4,98-4,88	20	450	3380	3,90	69,8	0,98	2,12	0,64	1,91
0,9	SM71BG/1096	71		6,04-5,96	25	450	3370	3,80	72,9	0,98	2,69	0,58	1,86
1,1	SM80BG/1116	80		6,94-6,89	30	450	3435	4,54	74,2	0,97	3,06	0,62	2,03
1,5	SM80BG/1156	80		9,28-9,35	40	450	3455	4,91	76,3	0,96	4,14	0,49	2,19
1,85	PLM90BG/1226	90		12,3-11,7	60	450	3455	4,99	83,4	0,98	6,08	0,54	2,06
2,2	PLM90BG/1226	90		12,3-11,7	60	450	3455	4,99	83,4	0,98	6,08	0,54	2,06

cea-motm-2p60-en_a_te

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS BG / BGM THREE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	Efficiency h _N %												Year of construction		
	D 220 V Y 380 V			D 230 V Y 400 V			D 380 V Y 660 V			D 400 V Y 690 V				IE	
	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4			
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	By Oct 2013
0,75	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	-		
0,9	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	3		
1,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	3		
1,5	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	3		
1,85	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	3		
2,2	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	3		
3	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	3		

P _N kW	Manufacturer		IEC SIZE	Construction Design	N. of Poles	f _N Hz	Data for 380 V / 60 Hz				
	Xylem Service Italia Srl Reg. No. 07520560967 Montecchio Maggiore Vicenza - Italia						cosj	I _s / I _N	T _N Nm	T _s /T _N	T _m /T _n
	Model										
0,55	SM71BG /305		71	SPECIAL	2	60	0,84	5,83	1,55	3,09	2,77
0,75	SM80BG /307 PE		80				0,79	8,25	2,05	3,80	4,02
0,9	SM80BG /311 PE		80				0,80	9,11	3,01	4,15	4,29
1,1	SM80BG /311 PE		80				0,80	9,11	3,01	4,15	4,29
1,5	SM80BG /315 PE		80				0,82	9,79	4,10	4,36	4,37
1,85	PLM90BG /322 E3		90				0,79	9,8	6,01	3,80	4,01
2,2	PLM90BG /322 E3		90				0,79	9,8	6,01	3,80	4,01
3	PLM90BG /330 E3		90				0,78	9,35	8,21	4,26	4,1

P _N kW	Voltage U _N V								n _N min ⁻¹	Operating conditions **			
	D		Y		D		Y			Altitudine s.l.m. m	T. amb min/max °C	ATEX	
	220 V	230 V	380 V	400 V	380 V	400 V	660 V	690 V					
	I _N (A)												
0,55	2,37	2,30	1,37	1,33	-	-	-	-	3380 ÷ 3415	See note.	≤ 1000	-15 / 40	No
0,75	3,03	3,01	1,75	1,74	1,75	1,74	1,01	1,00	3490 ÷ 3500				
0,9	4,24	4,24	2,45	2,45	2,44	2,43	1,41	1,40	3490 ÷ 3505				
1,1	4,24	4,24	2,45	2,45	2,44	2,43	1,41	1,40	3490 ÷ 3505				
1,5	5,58	5,53	3,22	3,19	3,23	3,22	1,86	1,86	3485 ÷ 3505				
1,85	7,97	7,93	4,60	4,58	4,59	4,57	2,65	2,64	3490 ÷ 3505				
2,2	7,97	7,93	4,60	4,58	4,59	4,57	2,65	2,64	3490 ÷ 3505				
3	10,9	10,8	6,30	6,23	6,32	6,29	3,65	3,63	3485 ÷ 3500				

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

cea-ie3-mott-2p60-en_a_te

** Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

GXS-GMD
BG/BGM

BOOSTER SETS GX5 AND GMD SERIES CHARACTERISTICS OF THE ELECTRIC PUMPS e-SV

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



Technical Information (standard version):

Flow rate: up to 160 m³/h.

Head: up to 280 m.

Temperature of the pumped liquid:
+120°C

Maximum operating pressure: 16 bar (PN16)

Power: from 0,37 to 4 kW.

Mechanical seal:
Ceramic/Carbon/EPDM (standard).

Elastomers: EPDM.

**GXS-GMD
e-SV**

Motor

Standard supplied IE3 three-phase surface motors surface motors $\geq 0,75$ kW

Performance to EN 60034-1.
Insulation class: 155 (F).
Protection class: IP55.
Condensate drain plugs on standard version.
Cooling by fan according to EN 60034-6.
Cable gland metric size according to EN 50262.

Standard voltage:

- **Single-phase version:**
220-240 V 60 Hz (incorporated automatic-reset overload protection until 2.2 kW)
- **Three-phases version:**
220-240/380-415 V 60 Hz until 3 kW.
(overload protection to be provided by the user)

For electrical data of the motors used see Technical Appendix.

Material

All pumps are certified for drinking water use (WRAS, ACS and D.M.174.).

BOOSTER SETS GXS AND GMD SERIES CHARACTERISTICS OF THE ELECTRIC PUMPS e-SV

- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- Versions **F**: round flanges, in-line delivery and suction ports, AISI 304.
- The following versions are available:
 - **T**: oval flanges, in-line delivery and suction ports, AISI 304.
 - **R**: round flanges, delivery port above the suction port, with four adjustable positions, AISI 304.
 - **N**: round flanges, in-line delivery and suction ports, AISI 316.
- 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, (\leq 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 (\geq 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 10SV series.
- Easy maintenance. No special tools required for assembly or disassembly.

The pumps for F, T, R, N versions are certified for drinking water use (WRAS, ACS and D.M.174. certified).

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-SV HYDRAULIC PERFORMANCE TABLE

PUMP TYPE	RATED POWER kW	Q = DELIVERY													
		l/min 0	26,68	40	46,8	60	70	93,2	100	120	140	173,2	200	240	333,33
		m ³ /h 0	1,6	2,4	2,8	3,6	4,2	5,6	6,0	7,2	8,4	10,4	12,0	14,4	20,0
H = TOTAL HEAD IN METRES OF COLUMN OF WATER															
3SV04	2 x 0,75	43,4			43,1	42,5	41,8	39,3	38,3	34,8	30,5	20,8			
3SV05	2 x 1,1	54,7			54,6	53,9	53,1	50,0	48,8	44,6	39,2	27,1			
3SV06	2 x 1,1	65,4			65,2	64,3	63,2	59,4	58,0	52,8	46,3	31,8			
3SV07	2 x 1,1	76,1			75,6	74,5	73,2	68,6	66,9	60,8	53,1	36,1			
3SV08	2 x 1,5	87,2			86,6	85,5	84,2	79,5	77,7	70,9	62,2	43,1			
3SV09	2 x 1,5	97,8			97,0	95,7	94,2	88,8	86,7	79,1	69,3	47,8			
3SV10	2 x 2,2	109,5			108,9	107,6	106,0	100,3	98,0	89,7	78,9	55,0			
3SV11	2 x 2,2	120,3			119,5	118,1	116,3	109,9	107,4	98,2	86,3	60,0			
3SV12	2 x 2,2	131,0			130,1	128,4	126,4	119,4	116,6	106,6	93,5	64,8			
3SV13	2 x 2,2	141,8			140,6	138,7	136,6	128,8	125,8	114,8	100,7	69,6			
3SV14	2 x 2,2	152,5			151,0	148,9	146,5	138,1	134,8	123,0	107,7	74,2			

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_mena_3sv-075-2p60-en_a_th

The table refers to performance with 2 pumps running.

PUMP TYPE	RATED POWER kW	Q = DELIVERY													
		l/min 0	26,68	40	46,8	60	70	93,2	100	120	140	173,2	200	240	333,33
		m ³ /h 0	1,6	2,4	2,8	3,6	4,2	5,6	6,0	7,2	8,4	10,4	12,0	14,4	20,0
H = TOTAL HEAD IN METRES OF COLUMN OF WATER															
5SV03	2 x 0,75	32,7							30,9	30,3	29,5	28,1	26,6	24,0	15,2
5SV04	2 x 1,1	43,9							41,7	40,9	40,0	38,1	36,2	32,7	21,0
5SV05	2 x 1,5	55,0							52,3	51,4	50,2	47,9	45,5	41,2	26,8
5SV06	2 x 1,5	65,9							62,4	61,2	59,7	56,8	54,0	48,8	31,3
5SV07	2 x 2,2	76,5							74,0	72,7	71,0	67,6	64,2	57,8	37,0
5SV08	2 x 2,2	87,2							84,2	82,6	80,7	76,7	72,8	65,5	41,6
5SV09	2 x 2,2	97,8							94,3	92,5	90,3	85,7	81,2	72,9	46,0
5SV10	2 x 3	109,2							105,8	103,9	101,5	96,7	91,8	82,7	53,0
5SV11	2 x 3	119,9							116,0	113,9	111,3	105,9	100,4	90,4	57,7
5SV12	2 x 3	130,6							126,1	123,8	120,9	114,9	108,9	98,0	62,2
5SV13	2 x 4	142,5							138,2	135,6	132,4	125,7	119,1	107,0	68,1
5SV14	2 x 4	153,4							148,5	145,7	142,2	135,0	127,9	114,8	72,9

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_mena_5sv-075-2p60-en_a_th

PUMP TYPE	RATED POWER kW	Q = DELIVERY													
		l/min 0	200	240	280	333,4	380	433,34	566,6	640	700	966,6	1000	1060	1132
		m ³ /h 0	12,0	14,4	16,8	20,0	22,8	26,0	34,0	38,4	42,0	58,0	60,0	63,6	67,9
H = TOTAL HEAD IN METRES OF COLUMN OF WATER															
10SV01	2 x 0,75	17,0	16,0	15,5	14,8	13,7	12,6	10,9	5,5						
10SV02	2 x 1,5	34,2	31,9	31,0	30,0	28,2	26,3	23,7	14,5						
10SV03	2 x 2,2	51,8	48,3	47,0	45,4	42,9	40,1	36,3	23,3						
10SV04	2 x 3	69,2	64,7	63,0	61,0	57,7	54,1	49,1	31,6						
10SV05	2 x 4	87,3	82,2	80,2	77,9	73,9	69,5	63,3	41,2						
10SV06	2 x 4	104,5	98,1	95,7	92,8	87,9	82,6	75,1	48,6						

Hydraulic performances in compliance with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A)

2p_mena_10sv-2p60-en_a_th

The table refers to performance with 2 pumps running.

BOOSTER SETS GX S AND GMD SERIES WITH ELECTRIC PUMPS e-SV ELECTRICAL DATA TABLE AT 60 Hz

TYPE	PUMP		GXS20 CURRENT ABSORBED 1 x 220 V A	GMD20 CURRENT ABSORBED 3 x 380 V A
	NOMINAL POWER P _N kW			
3SV04	2 x 0,75		10,0	3,5
3SV05	2 x 1,1		13,9	4,9
3SV06	2 x 1,1		13,9	4,9
3SV07	2 x 1,1		13,9	4,9
3SV08	2 x 1,5		18,7	6,4
3SV09	2 x 1,5		18,7	6,4
3SV10	2 x 2,2		-	9,2
3SV11	2 x 2,2		-	9,2
3SV12	2 x 2,2		-	9,2
3SV13	2 x 2,2		-	9,2
3SV14	2 x 2,2		-	9,2
5SV03	2 x 0,75		10,0	3,5
5SV04	2 x 1,1		13,9	4,9
5SV05	2 x 1,5		18,7	6,4
5SV06	2 x 1,5		18,7	6,4
5SV07	2 x 2,2		-	9,2
5SV08	2 x 2,2		-	9,2
5SV09	2 x 2,2		-	9,2
5SV10	2 x 3		-	12,6
5SV11	2 x 3		-	12,6
5SV12	2 x 3		-	12,6
5SV13	2 x 4		-	15,6
5SV14	2 x 4		-	15,6
10SV01	2 x 0,75		10,0	3,5
10SV02	2 x 1,5		18,7	6,4
10SV03	2 x 2,2		-	9,2
10SV04	2 x 3		-	12,6
10SV05	2 x 4		-	15,6
10SV06	2 x 4		-	15,6

The current shown is the nominal current of the set.

g20v_mena_2p60-en_a_te

GX S-GMD
e-SV

BOOSTER SETS GX S AND GMD SERIES WITH ELECTRIC PUMPS e-SV SINGLE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	MOTOR TYPE	IEC SIZE*	Construction Design	INPUT CURRENT I _n (A) 220-230 V	CAPACITOR		DATA FOR 220 V 60 Hz VOLTAGE						
					μF	V	min ⁻¹	I _s / I _n	η %	cosφ	T _n Nm	T _s /T _n	T _m /T _n
0,4	SM71RB14/1046	71R	V18/B14	2,86-2,94	14	450	3385	3,80	67,5	0,94	1,13	0,73	2,04
0,55	SM71B14/1056	71		3,68-3,62	16	450	3400	4,28	70,2	0,97	1,54	0,66	2,11
0,75	SM80RB14/1076	80R		4,98-4,88	20	450	3380	3,90	69,8	0,98	2,12	0,64	1,91
1,1	SM80B14/1116	80		6,94-6,89	30	450	3435	4,54	74,2	0,97	3,06	0,62	2,03
1,5	SM90RB14/1156	90R		9,28-9,35	40	450	3455	4,91	76,3	0,96	4,14	0,49	2,19
2,2	PLM90B14/1226	90		12,3-11,7	60	450	3455	4,99	83,4	0,98	6,08	0,54	2,06

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

1-225v-motm-2p60-en_d_te

BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-SV THREE-PHASE MOTORS, 2 POLES AT 60 Hz

P _N kW	Efficiency η_N %												Year of manufacture	
	Δ 220 V Y 380 V			Δ 230 V Y 400 V			Δ 380 V Y 660 V			Δ 400 V Y 690 V				IE
	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4	4/4	3/4	2/4		
0,37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0,75	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	83,4	82,4	79,0	-	-
1,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	85,6	85,0	82,1	-	-
1,5	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	87,2	87,0	84,6	-	-
2,2	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	87,7	87,2	84,7	-	-
3	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	89,1	88,8	86,9	-	-
4	91,0	91,0	89,6	91,0	91,0	89,6	91,0	91,0	89,6	91,0	91,0	89,6	-	-
5,5	91,0	90,5	88,6	91,0	90,5	88,6	91,0	90,5	88,6	91,0	90,5	88,6	-	-
7,5	90,8	90,2	88,1	90,8	90,2	88,1	90,8	90,2	88,1	90,8	90,2	88,1	-	-
11	92,5	92,2	90,6	92,5	92,2	90,6	92,5	92,2	90,6	92,5	92,2	90,6	-	-
15	93,4	93,1	91,7	93,4	93,1	91,7	93,4	93,1	91,7	93,4	93,1	91,7	-	-
18,5	93,5	93,2	91,9	93,5	93,2	91,9	93,5	93,2	91,9	93,5	93,2	91,9	-	-
22	93,4	92,7	90,8	93,4	92,7	90,8	93,4	92,7	90,8	93,4	92,7	90,8	-	-

from 11/2014

3

P _N kW	Manufacturer		IEC SIZE*	Construction Design	N. of Poles	f _N Hz	Data for 380 V / 60 Hz Voltage				
	Xylem Service Italia Srl Reg. No. 07520560967 Montecchio Maggiore Vicenza - Italia						cos ϕ	I _s / I _N	T _N Nm	T _s /T _N	T _m /T _N
	Model										
0,37	SM71RB14/304		71R	V18/B14	2	60	0,81	4,76	1,16	3,48	2,15
0,55	SM71B14/305		71				0,84	5,83	1,55	3,09	2,77
0,75	SM80B14/307 PE		80				0,79	8,25	2,05	3,80	4,02
1,1	SM80B14/311 PE		80				0,80	9,11	3,01	4,15	4,29
1,5	SM90RB14/315 PE		90R				0,82	9,79	4,10	4,36	4,37
2,2	PLM90B14/322 E3		90				0,82	9,80	6,01	3,80	4,01
3	PLM100RB14/330 E3		100R				0,82	9,35	8,21	4,26	4,10
4	PLM112RB14S6/340 E3		112R				0,87	10,0	10,9	2,43	4,53
5,5	PLM132RB5/355 E3		132R				0,88	12,0	15,0	4,70	5,55
7,5	PLM132B5/375 E3		132				0,87	11,0	20,2	3,31	4,98
11	PLM160RB5/3110 E3		160R				0,89	9,00	29,6	2,43	4,26
15	PLM160B5/3150 E3		160				0,89	9,81	40,3	2,79	4,41
18,5	PLM160B5/3185 E3		160				0,89	10,1	49,7	2,78	4,59
22	PLM180RB5/3220 E3		180R				0,87	11,3	59,1	3,27	5,18

P _N kW	Voltage U _N V								η_N min ⁻¹	Observe the regulations and codes locally in force regarding sorted waste disposal.	Operating conditions **		
	Δ		Y		Δ		Y				Altitude above sea Level (m)	T. amb min/max °C	ATEX
	220 V	230 V	380 V	400 V	380 V	400 V	660 V	690 V					
0,37	1,96	1,89	1,13	1,09	-	-	-	-	3280 ÷ 3335	≤ 1000	-15 / 40	No	
0,55	2,37	2,30	1,37	1,33	-	-	-	-	3380 ÷ 3415				
0,75	3,03	3,01	1,75	1,74	1,75	1,74	1,01	1,00	3490 ÷ 3500				
1,1	4,24	4,24	2,45	2,45	2,44	2,43	1,41	1,40	3490 ÷ 3505				
1,5	5,58	5,53	3,22	3,19	3,23	3,22	1,86	1,86	3485 ÷ 3505				
2,2	7,97	7,93	4,60	4,58	4,59	2,65	4,57	2,64	3490 ÷ 3505				
3	10,9	10,8	6,30	6,23	6,32	6,29	3,65	3,63	3485 ÷ 3500				
4	13,4	13,2	7,76	7,62	7,78	7,63	4,49	4,41	3510 ÷ 3520				
5,5	18,2	18,0	10,5	10,4	10,5	10,5	6,08	6,06	3505 ÷ 3515				
7,5	25,0	24,7	14,5	14,2	14,4	14,1	8,34	8,15	3535 ÷ 3540				
11	35,3	34,3	20,4	19,8	20,4	19,6	11,8	11,3	3545 ÷ 3555				
15	47,6	46,4	27,5	26,8	27,8	27,1	16,1	15,6	3550 ÷ 3560				
18,5	58,7	57,5	33,9	33,2	34,0	33,2	19,6	19,2	3550 ÷ 3555				
22	71,1	70,2	41,1	40,5	40,8	39,8	23,5	23,0	3555 ÷ 3560				

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

sv-IE3-mott22-2p60-en_a_te

** Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

**BOOSTER SETS GXS AND GMD SERIES WITH ELECTRIC PUMPS e-SV
MOTOR NOISE 2-POLE MOTORS AT 60 Hz**

POWER	MOTOR TYPE	NOISE
kw	IEC SIZE*	LpA dB
0,37	71R	<70
0,55	71	<70
0,75	80-80R	<70
1,1	80	<70
1,5	90-90R	<70
2,2	90	<70
3	100R	<70
4	112R	<70
5,5	132R	<70
7,5	132	71
11	160R	71
15	160	71
18,5	160	73
22	180R	70
30	200	76
37	200	76
45	225	79
55	250	79

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

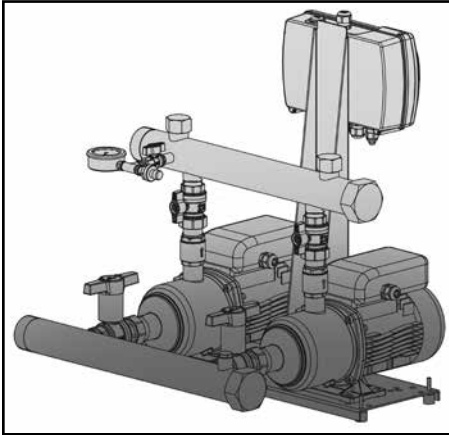
1-125sv_mott_2p60-en_d_tr

**GXS-GMD
e-SV**

The table show the mean sound pressure (Lp) measured as per Curve A (Standard ISO 1680). Noise values were measured with the 60 Hz motor running idle with a tolerance of 3 dB (A).

BOOSTER SETS GX5 AND GMD SERIES RANGE

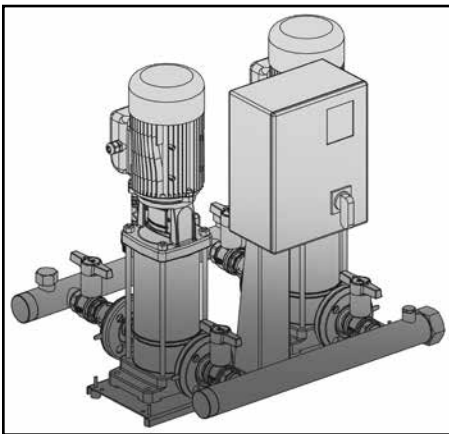
The range of two-pump booster sets includes fixed speed systems available in a variety of material configurations to suit the specific requirements of different applications.



GXS SERIES SETS

- Single-phase power supply, fixed speed and pressure transducer.
For BGM, CEAM, e-HM, e-SV series electric pumps.

Head up to 107,7 m.
Flow rate up to 50,4 m³/h.
Power up to 2 x 1,5 kW.



GMD SERIES SETS

- Three-phase power supply, fixed speed and pressure switches control.
For BG, CEA, e-HM and e-SV series electric pumps.

Head up to 152,8 m.
Flow rate up to 64,8 m³/h.
Power up to 2 x 4 kW.

Booster sets

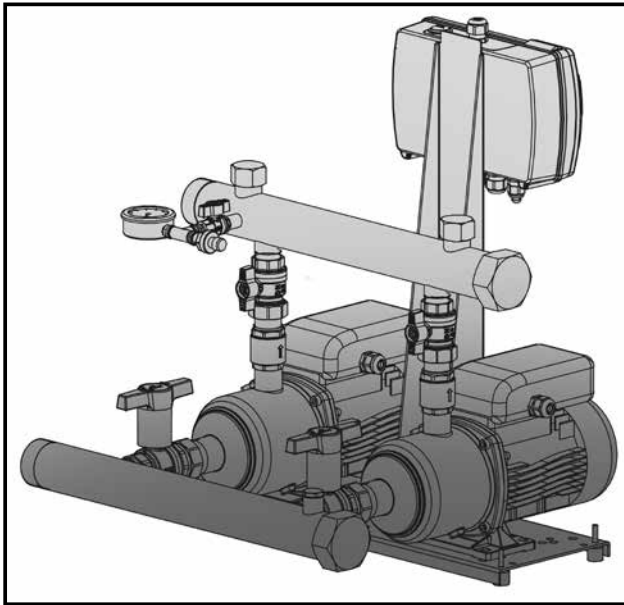
MARKET SECTORS

RESIDENTIAL AND LIGHT COMMERCIAL BUILDINGS

APPLICATIONS

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

GXS Series

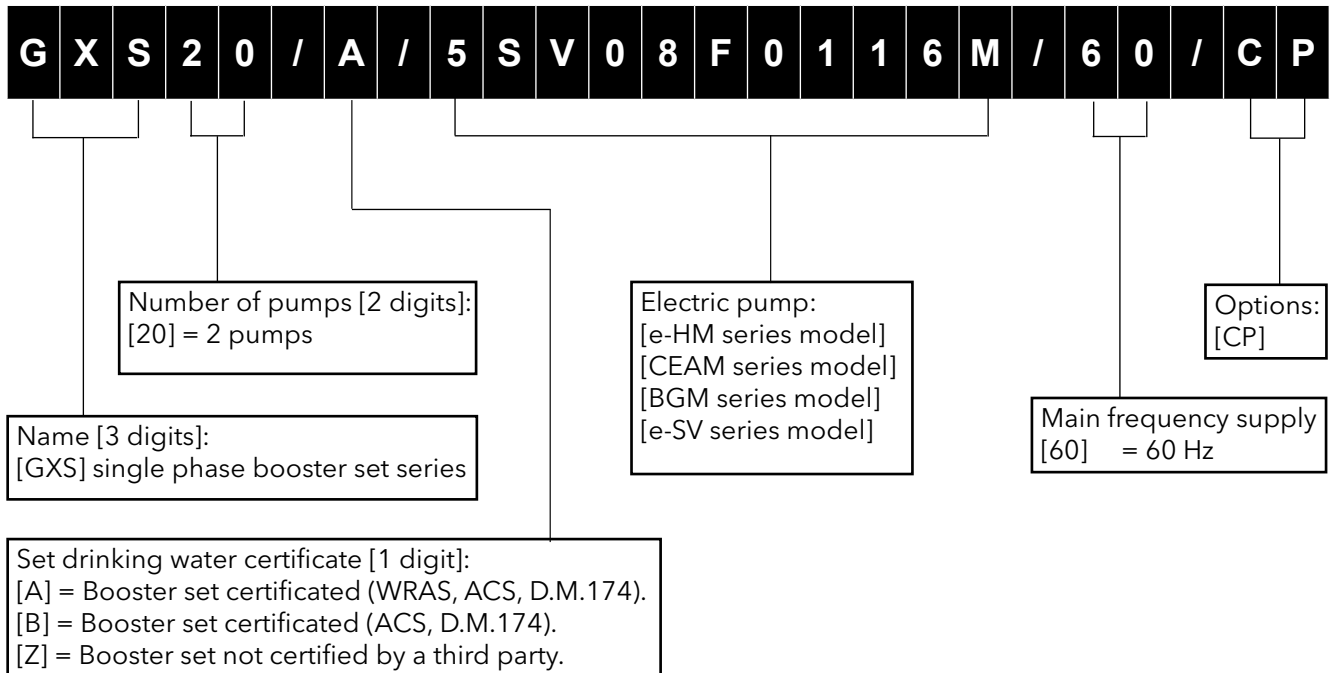


SPECIFICATIONS

- **Flow rate:**
up to 50,4 m³/h.
- **Head:**
up to 107,7 m.
- **Electrical panel supply voltage:**
1 x 230V ± 10%.
- **Frequency:**
60 Hz.
- **Protection class electrical panel:**
IP 55.
- **Maximum electric pump power:**
2 x 1,5 kW.
- **Direct motor start.**
- **Maximum temperature of pumped liquid:**
from -10 to +60° C (per e-HM).
from -10 to +80° C (per CEA).
from -10 to +40° C (per BG).
from -10 to +80° C (per e-SV).
- **Horizontal design pump**
Maximum operating pressure:
16bar for e-HM...S
8bar for BG and CEA
- **Vertical design pump**
Maximum operating pressure:
16bar for e-SV

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

**BOOSTER SETS GXS SERIES
IDENTIFICATION CODE**



OPTIONS:

CP Dry contact version: power line, Automatic/Manual mode, Run/Stop for each pump, thermal block.

OTHER VERSION ARE AVAILABLE ON REQUEST.

GXS

BOOSTER SETS GX5 SERIES CONTROL PANEL

Q-Smart single-phase electronic control panel (fig. 1), single-phase power input, for controlling and protecting up to two single-phase electric pumps, made of self-extinguishing thermoplastic polymer and protected to IP55.

Main characteristics:

- Automatic switch with general overload protection and short circuit protection fuses for each motor.
- Standard supply voltage: 1x230Vac +/-10%, 50/60Hz.
- In standard setting, pressure controlled by sensor.
- Inside digital control unit, with microprocessor, offers the following functions:
 - Alphanumeric LED's display (rif. C)
 - Indicator LED's: power on (ref. 9), general fault (rif. 4) and no water level alarm (ref. 6), electric pump running (ref. 1, 3), automatic mode (rif. 2) and manual mode (rif. 5), unit (rif. 7, 8, 10).
 - Push buttons (rif. A, B, D, E) to set the unit, control the electric pumps in manual mode, show the alarm log and unit's status. Alarms visualised on display:
 - Maximum, minimum pressure;
 - Short circuit breaker protection for each motor;
 - Pressure transmitter fault.
 - Out-of-curve operation;
 - No water;
 - Maximum/minimum pressure
 - Block for tripped external device (digital input configurable)
 - In standard configuration with sensor, pressure is measured and shown.
 - Cycle reversal function (can be disabled). Automatically switches pumps after every start/stop cycle.
 - Jockey pump management by disabled of cycle reversal function.
- Adjustable electronic thresholds to manage start and stop of each electric pumps. Ready for connection of pressure switches. Automatic switch-on of the pressure switches if the sensor is defective.
- Adjustable timer extending the operation of each electric pumps.
- Dedicated circuit for connection of electrode probes with sensitivity adjustment.
- Adjustable timer delaying tripping the no-water protection system
- Set electronic thresholds for maximum and minimum discharge pressure.
- Recording of operating hours and alarms.
- No-water protection system alternatives: float, minimum pressure switch.
- Connection for maximum pressure switch.
- Connection for external ON/OFF or external alarm.
- Inside card, automatic, manual or exclusion switches for each electric pump. To be used in the event of failure of the electronic board to guarantee the operation of the pumps.
- Connection for 6 relais card (optional) to boost the following signals: Electric pump 1 running, Electric pump 2 running, Fuse electricpump 1 burned, Fuse electricpump 2 burned, No water alarm, Maximum pressure threshold alarm, Minimum pressure threshold alarm, External alarm, Auto-test faulty, Power ON, Aut/Man mode
- Connection ready for ModBus kit RTU 485 (optional).



Fig.1 - Electric control panel

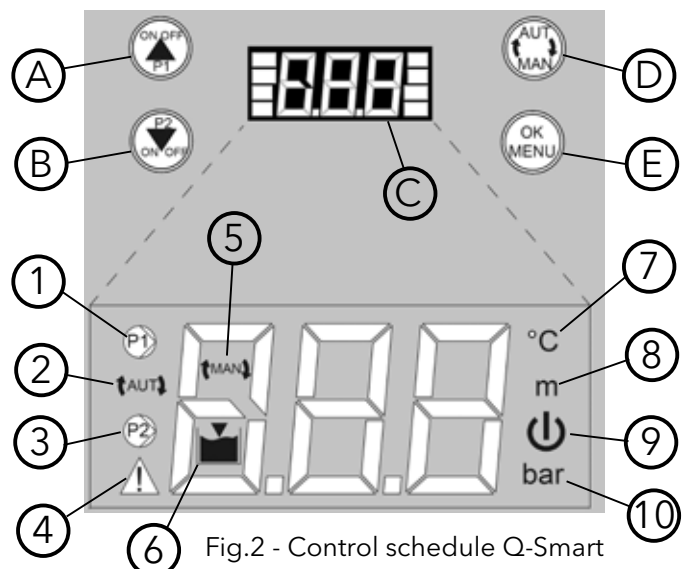


Fig.2 - Control schedule Q-Smart

MODEL	NOMINAL VOLTAGE	FREQUENCY Hz	ENCLOSURE RATE	ENCLOSURE MATERIAL	NOMINAL POWER		NOMINAL CURRENT INPUT (A)	MOTOR THERMAL PROTECTION (A)
	(V)				kW	HP		
Q-SMART20/15	1~230 ±10%	50/60	IP55	TERMOPLASTIC	2 x (0,37÷1,5)	2 x (0,5÷2)	24	12 A (gG) CH10

qsmart_50-60-en_a_te

BOOSTER SETS GX5 SERIES MAIN COMPONENTS

- **Main On-off valves** on suction and discharge side of each pump, ball type with threaded coupling.
- **Check valve** on discharge side of each pump, spring-loaded type
- **Suction manifold** with threaded ends. Threaded coupling for water charging
- **Delivery manifold** with threaded ends. Fitted with two R1" threaded couplings with caps to allow connection of diaphragm pressure vessels.
- **Pressure gauge and control transmitters** located on the delivery side of the unit.
- **Electric control panel**
- **Various couplings** for the connections.
- **Mounting base**, for pumpset and panel mounting brackets
- **Anti-vibration dampers** sized depending on the set. In some sets they are provided but not assembled. The installation is the responsibility of the customer.

Accessories on request:

Devices for protection against dry running in one of the following versions:

- float switch
- pack of electronic module and probe electrodes
- minimum pressure switch

SPECIAL VERSIONS AVAILABLE ON REQUEST

AISI: Main components in contact with water are made by stainless steel.

(Contact the Sales and technical Assistance Service).

BOOSTER SETS GX S SERIES TABLE OF MATERIALS

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

2p_mena-en_a_tm

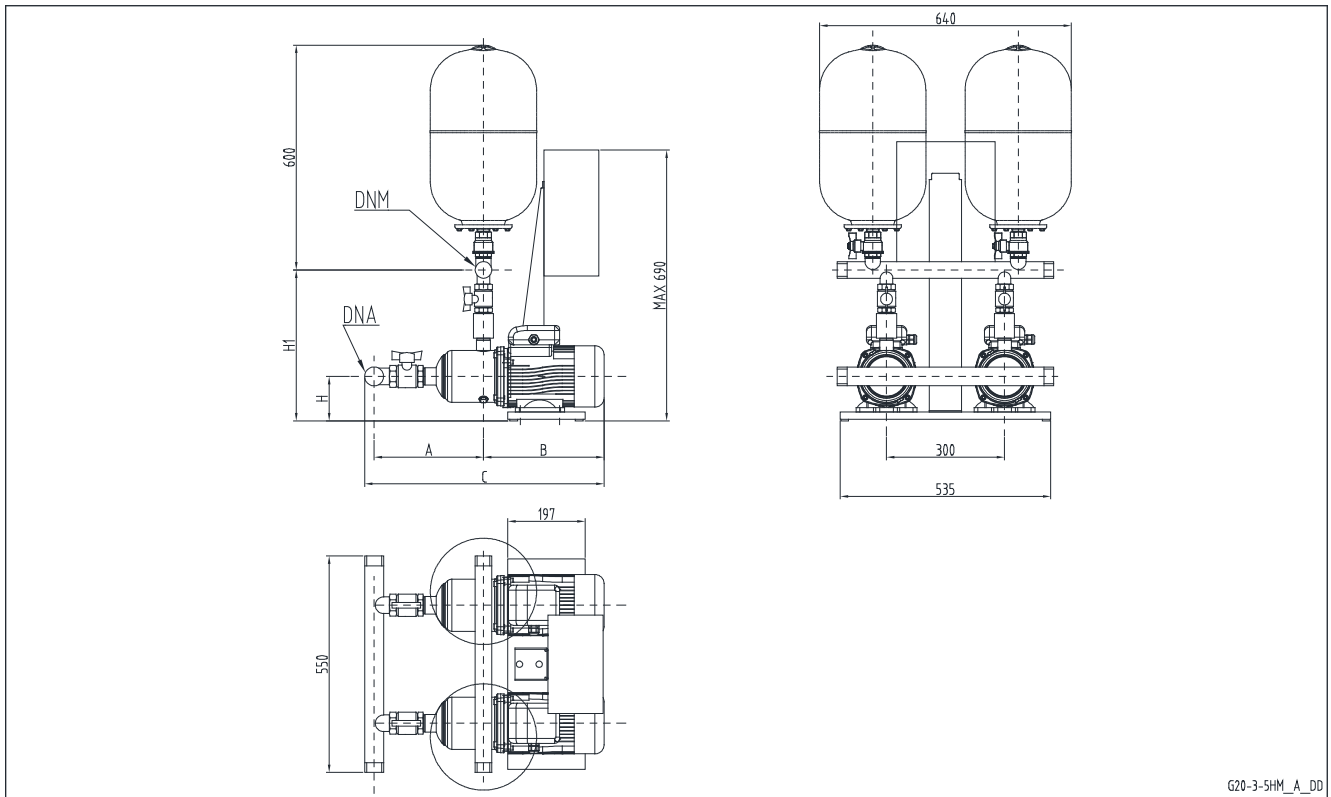
BOOSTER SETS GX S SERIES OPERATING CHARACTERISTICS AND LIMITS

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

**BOOSTER SETS GXS SERIES
HM..S HORIZONTAL ELECTRIC PUMPS**



GXS 20	DNA	DNM	A		B	C		H	H1	
			STD	AISI		STD	AISI		STD	AISI
3HM03	R 2"	R 2"	224	236	249	503	515	113	398	530
3HM04	R 2"	R 2"	244	256	249	523	535	113	398	530
3HM05	R 2"	R 2"	264	276	263	557	569	113	398	530
3HM06	R 2"	R 2"	284	296	263	577	589	113	398	530
5HM02	R 2"	R 2"	245	248	249	524	527	113	459	530
5HM03	R 2"	R 2"	245	248	249	524	527	113	459	530
5HM04	R 2"	R 2"	265	268	263	558	561	113	459	530
5HM05	R 2"	R 2"	285	288	263	578	581	113	459	530

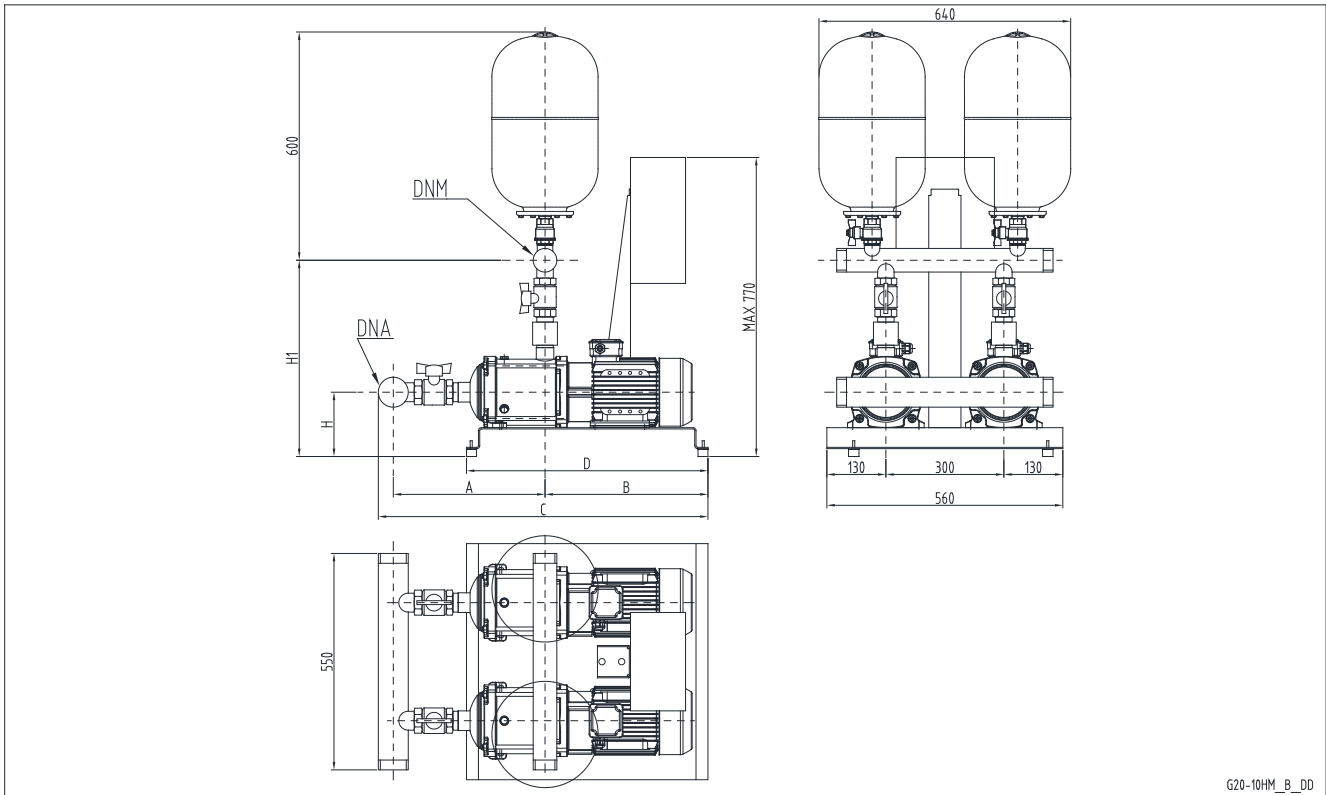
Dimensions in mm. Tolerance ± 10mm

gxs20_3-5hm-60hz_b_td

GXS

AISI: Special version available on request (see page 38)

**BOOSTER SETS GXS SERIES
HM..S HORIZONTAL ELECTRIC PUMPS**



G20-10HM_B_DD

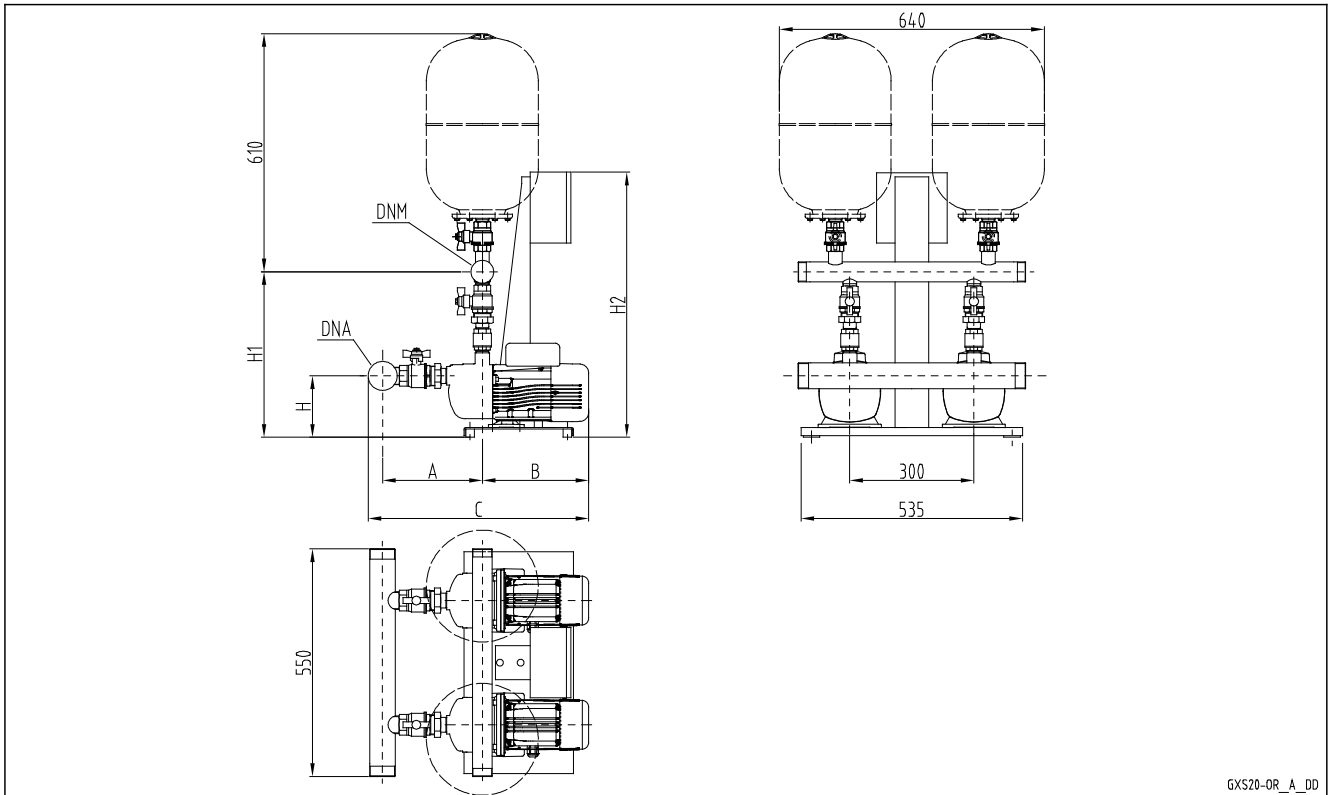
GXS 20	DNA	DNM	A		B	C		D	H	H1	
			STD	AISI		STD	AISI			STD	AISI
3HM07	R 2"	R 2"	288	300	354	672	684	590	205	490	622
3HM08	R 2"	R 2"	308	320	354	692	704	590	205	490	622
3HM09	R 2"	R 2"	328	340	354	712	724	590	205	490	622
3HM10	R 2"	R 2"	348	360	354	732	744	590	205	490	622
5HM06	R 2"	R 2"	314	317	354	698	692	590	205	551	622
10HM02	R 2"1/2	R 2"1/2	302	309	354	694	701	590	205	617	680

Dimensions in mm. Tolerance ± 10mm

gxs20_3-10hm-60hz_a_td

AISI: Special version available on request (see page 38)

**BOOSTER SETS GXS SERIES
BGM / CEAM HORIZONTAL ELECTRIC PUMPS**



GXS 20	DNA	DNM	A		B	C		H	H1		H2
			STD	AISI		STD	AISI		STD	AISI	
BGM56	R 2"	R 1 1/2"	225	299	311	566	640	189	431	501	640
BGM76	R 2"	R 1 1/2"	225	299	356	611	685	189	431	501	640
BGM116	R 2"	R 1 1/2"	225	299	356	611	685	189	431	501	640
CEAM 706/3	R 2"	R 1 1/2"	207	281	274	511	585	134	429	499	640
CEAM 706/4	R 2"	R 1 1/2"	207	281	274	511	585	134	429	499	640
CEAM 706/5	R 2"	R 1 1/2"	207	281	320	557	631	134	429	499	640
CEAM 1206/1	R 2"	R 2"	207	281	274	511	585	134	453	505	640
CEAM 1206/2	R 2"	R 2"	207	281	274	511	585	134	453	505	640
CEAM 1206/3	R 2"	R 2"	207	281	274	511	585	134	453	505	640
CEAM 1206/4	R 2"	R 2"	207	281	320	557	631	134	453	505	640
CEAM 2106/0	R 2" 1/2"	R 2 1/2"	231	318	285	554	641	134	493	602	640
CEAM 2106/1	R 2" 1/2"	R 2 1/2"	231	318	331	600	687	134	493	602	640
CEAM 2106/2	R 2" 1/2"	R 2 1/2"	231	318	331	600	687	134	493	602	640
CEAM 3706/0	R 3"	R 3"	272	325	331	647	700	134	585	609	640
CEAM 3706/0A	R 3"	R 3"	272	325	331	647	700	134	585	609	640

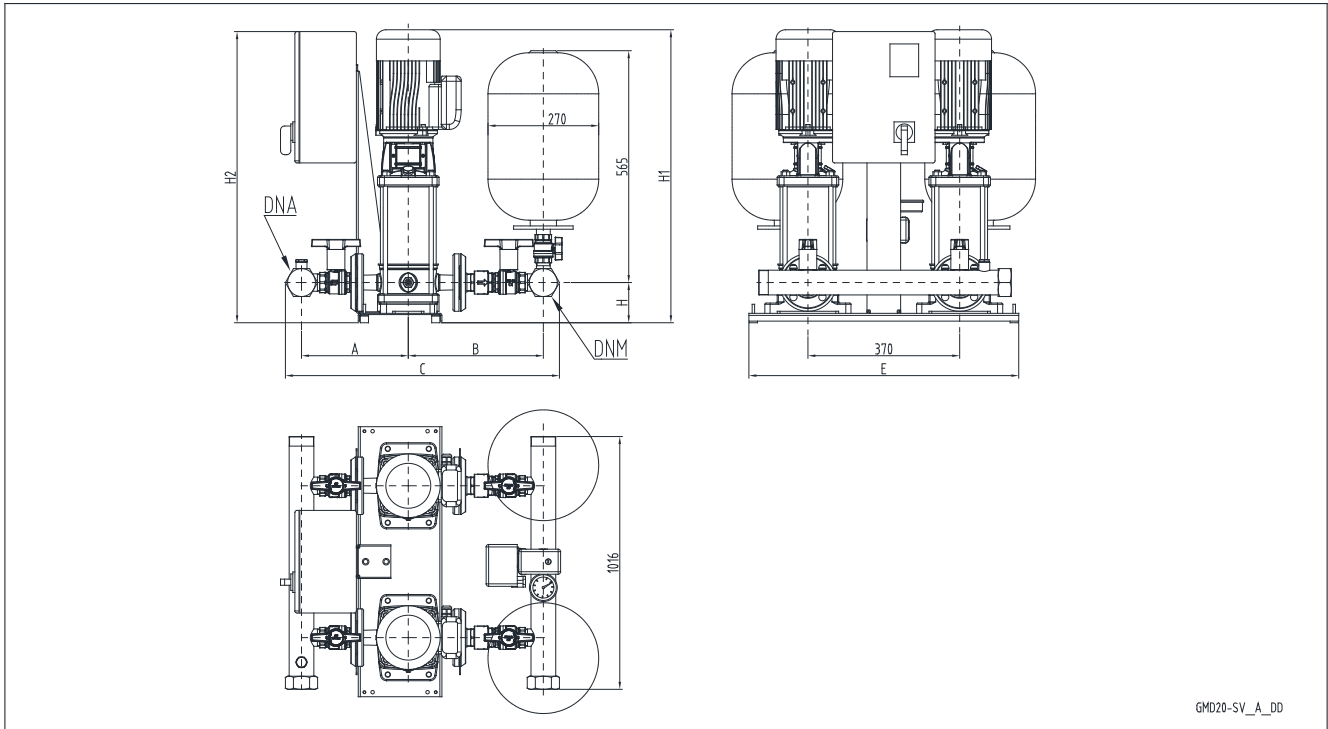
Dimensions in mm. Tolerance ± 10mm

gxs20-60hz_or_b_td

GXS

AISI: Special version available on request (see page 38)

BOOSTER SETS GXS SERIES
e-SV VERTICAL ELECTRIC PUMPS



GXS

GXS 20	DNA	DNM	A		B		C		E	H	H1	H2
			STD	AISI	STD	AISI	STD	AISI				
3SV04F0076M	R 2"	R 2"	256	257	311	363	627	680	658	98	557	629
3SV05F0116M	R 2"	R 2"	256	257	311	363	627	680	658	98	614	629
3SV06F0116M	R 2"	R 2"	256	257	311	363	627	680	658	98	634	629
3SV07F0116M	R 2"	R 2"	256	257	311	363	627	680	658	98	654	629
3SV08F0156M	R 2"	R 2"	256	257	311	363	627	680	658	98	684	629
3SV09F0156M	R 2"	R 2"	256	257	311	363	627	680	658	98	704	629
5SV03F0076M	R 2"	R 2"	260	267	329	387	649	714	658	98	552	629
5SV04F0116M	R 2"	R 2"	260	267	329	387	649	714	658	98	614	629
5SV05F0156M	R 2"	R 2"	260	267	329	387	649	714	658	98	649	629
5SV06F0156M	R 2"	R 2"	260	267	329	387	649	714	658	98	674	629
10SV01F0076M	R 2"1/2	R 2"1/2	294	301	356	453	726	830	682	114	617	640
10SV02F0156M	R 2"1/2	R 2"1/2	294	301	356	453	726	830	682	114	664	640

Dimensions in mm. Tolerance ± 10mm

gxs20_essv-60hz_a_td

AISI: Special version available on request (see page 38)

Booster sets

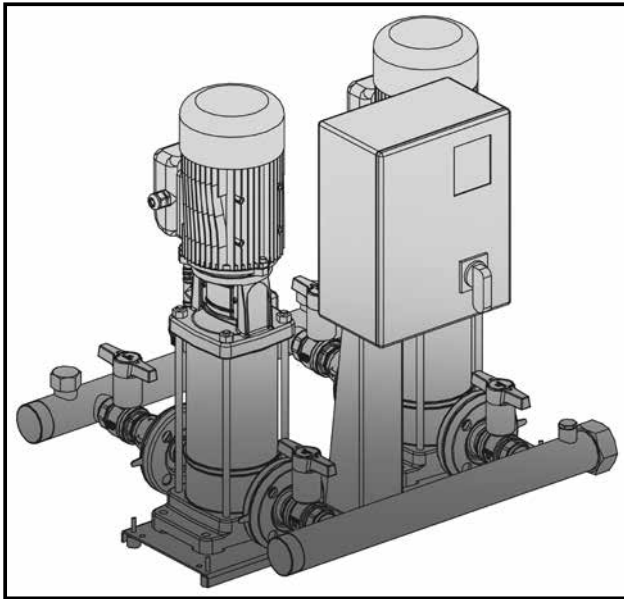
MARKET SECTORS

RESIDENTIAL AND LIGHT COMMERCIAL BUILDINGS

APPLICATIONS

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

Serie GMD

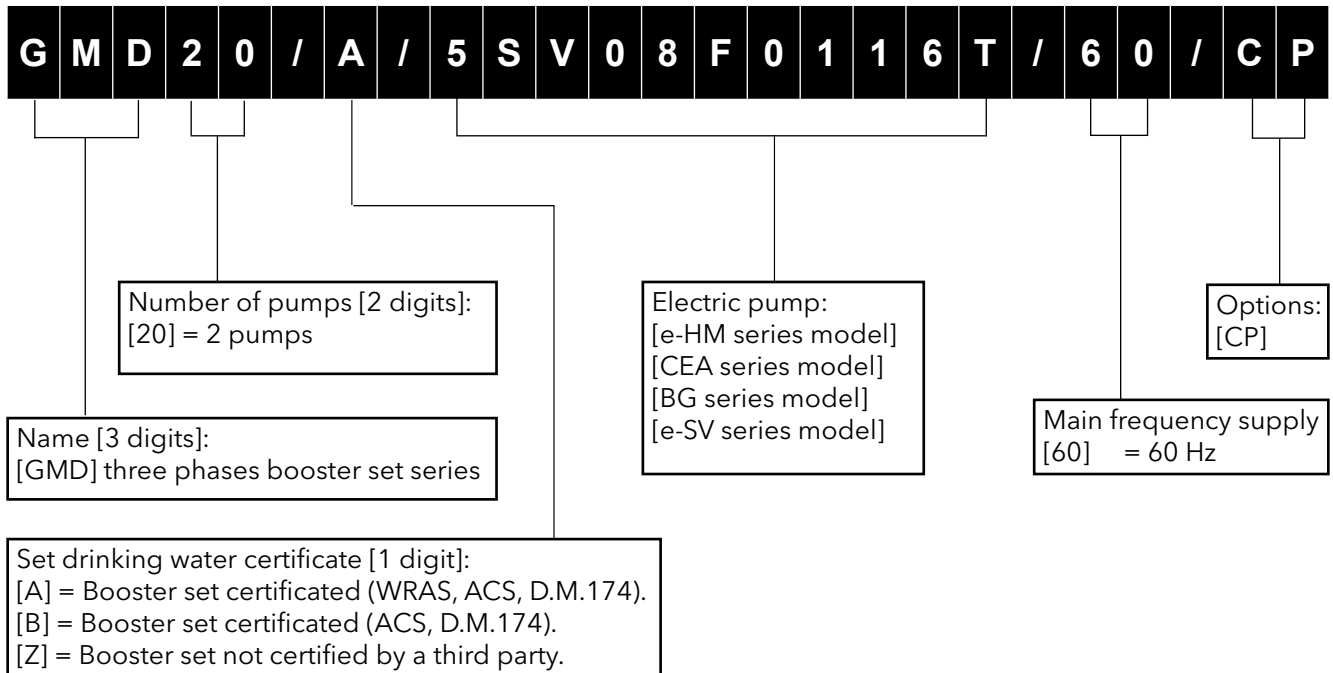


SPECIFICATIONS

- **Flow rate:**
up to 64,8 m³/h.
- **Head:**
up to 152,8 m.
- **Electrical panel supply voltage:**
3 x 400V ± 10%.
- **Frequency:**
60 Hz.
- **Protection class electrical panel:**
IP 54.
- **Maximum electric pump power:**
2 x 4 kW.
- **Direct motor start.**
- **Maximum temperature of pumped liquid(set):**
from -10 to +80° C (per e-HM...S).
from -10 to +80° C (per CEA).
from -10 to +40° C (per BG).
from -10 to +80° C (per e-SV).
- **Horizontal design pump**
Maximum operating pressure:
16bar for e-HM...S
8bar for BG and CEA
- **Vertical design pump**
Maximum operating pressure:
16bar for e-SV

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

**BOOSTER SETS GXS SERIES
IDENTIFICATION CODE**



OPTIONS:

CP Dry contact version: power line, Automatic/Manual mode, Run/Stop for each pump, thermal block.

OTHER VERSION ARE AVAILABLE ON REQUEST.

BOOSTER SETS GMD SERIES CONTROL PANEL

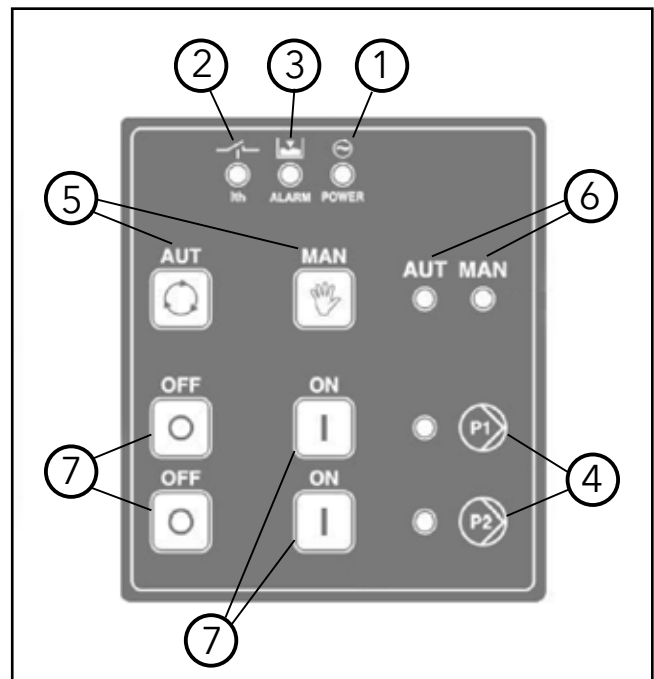
Electric panel, three-phase power supply, for controlling and protecting up to two three-phase electric pumps, with case made from sheet steel (fig. 1) and protected to IP54.

Caratteristiche principali:

- Main door-lock switch, fuse holders and fuses, starting contactors and thermal protection such as overload protectors for each motor.
- Standard supply voltage: 3x400Vac +/-10%, 50/60 Hz. Non standard voltages on request, 3x230Vac +/-10%, 3x440Vac +/-10%, 3x460Vac +/-10%, 3x480Vac +/-10%, 50/60 Hz.
- Transformer for low voltage auxiliary circuit; auxiliary voltage 24 Vac.
- Goulds SM20 digital control unit (see fig. 2), offers the following functions:
 - Indicator LED's: power on (ref. 1), thermal protection cut-in (ref. 2), no-water level alarm (ref. 3), pump running (ref. 4).
 - Automatic / manual operation buttons (ref. 5) and indicator LED's (ref. 6).
 - Manual pump stop/start (one button for each pump) (ref. 7).
 - Automatic cascade pump control with two pressure switches (one for each pump).
 - Jockey pump management by disabling cycle reversal.
 - Cycle reversal function (can be disabled). Automatically switches pumps after every start/stop cycle.
 - Automatic, manual or disabled mode switches for each pump (inside board). Only to be used if a board fault develops in order to assure pump operation.
 - No-water protection system alternatives: float, minimum pressure switch, external contact or electrode probes with sensitivity adjustment.
 - Adjustable timer delaying tripping of the no-water protection system (inside board); can be adjusted from 0 to 30 seconds.
 - Adjustable timer extending the operation of each pump (inside board); can be adjusted from 0 to 100 sec.
 - A relay board standard is installed on the board to boost the following signals: pump 1,2 running, manual mode, overload alarm, no-water alarm, power on.
- External enable connection or pressure switch for maximum pressure protection.



Fig.1 - QMD electrical panel



GMD

BOOSTER SETS GMD SERIES CONTROL PANEL TECHNICAL DATA

MODEL	NOMINAL VOLTAGE (V)	FREQUENCY Hz	ENCLOSURE RATE	ENCLOSURE MATERIAL	NOMINAL POWER		NOMINAL CURRENT INPUT (A)	MOTOR THERMAL PROTECTION (A)
					kW	HP		
QMD20/03-05	3~400 ±10%	50/60	IP54	METALLIC	2 x (0,37÷0,55)	2 x (0,5÷0,75)	3,2	(1÷1,6)
QMD20/07		50/60			2 x 0,75	2 x 1	5	(1,6÷2,5)
QMD20/11-15		50/60			2 x (1,1÷1,5)	2 x (1,5÷2)	8	(2,5÷4)
QMD20/22		50/60			2 x 2,2	2 x 3	12,6	(4÷6,3)
QMD20/30-40		50/60			2 x (3÷4)	2 x (4÷5,5)	20	(6,3÷10)

qmd_50-60-en_a_te

BOOSTER SETS GMD SERIES MAIN COMPONENTS

- **Main On-off valves** on suction and discharge side of each pump, ball type.
- **Check valve** on discharge side of each pump, spring-loaded type.
- **Suction manifold** with threaded ends. Threaded coupling for water charging.
- **Delivery manifold** made of galvanized or AISI 304 stainless steel with threaded ends. Fitted with R1" threaded couplings with caps to allow connection of 24 or 20-litre diaphragm pressure vessels.
- **Pressure gauge and pressure switch** located on the delivery side of the unit.
- **Electric control panel.**
- **Various couplings** depending on the version.
- **Mounting base**, for pumpset and panel mounting brackets.
- **Anti-vibration dampers** sized depending on the set. In some sets they are provided but not assembled. The installation is the responsibility of the customer.

Accessories on request:

Devices for protection against dry running in one of the following versions:

- float switch
- pack of electronic module and probe 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 VERSIONS AVAILABLE ON REQUEST

AISI: Main components in contact with water are made by stainless steel.

(Contact the Sales and technical Assistance Service).

BOOSTER SETS GMD SERIES TABLE OF MATERIALS

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

2p_mena-en_a_tm

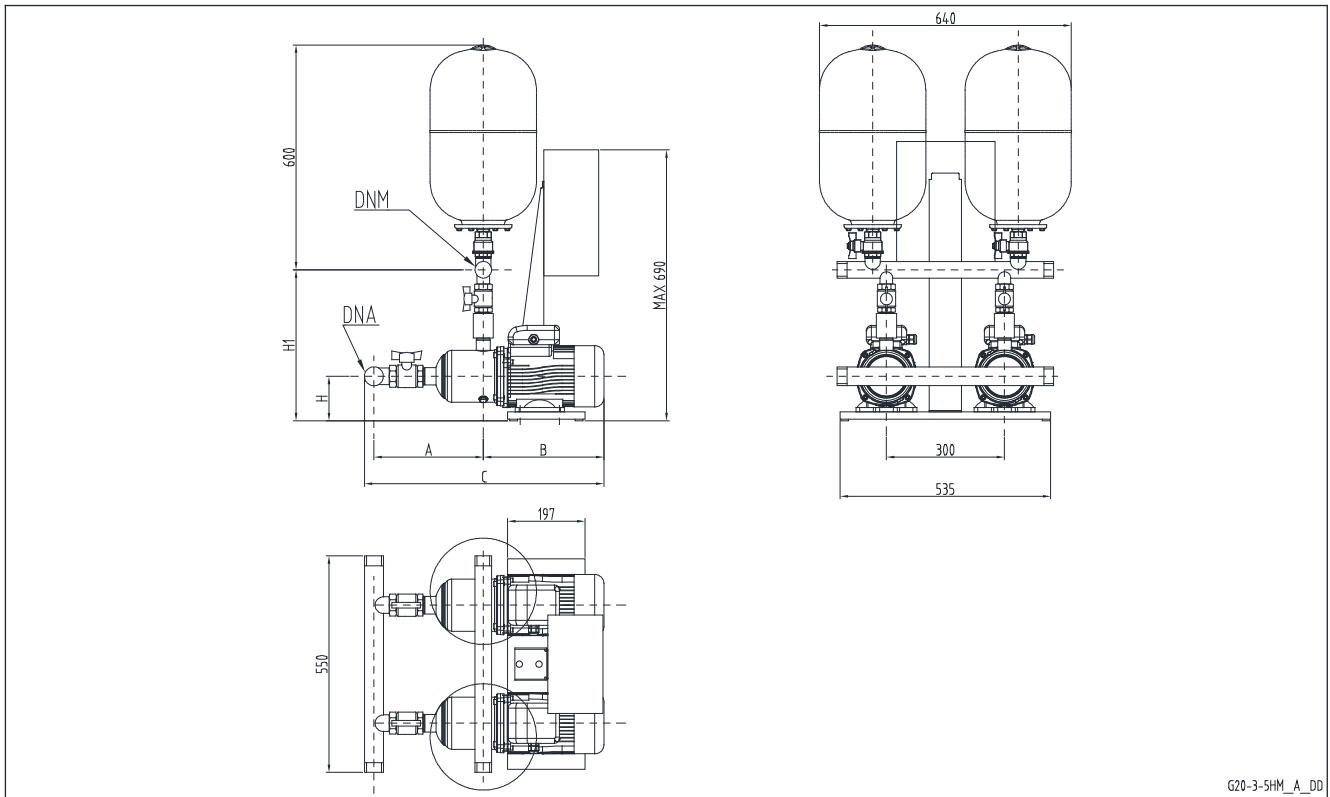
BOOSTER SETS GMD SERIES OPERATING CHARACTERISTICS AND LIMITS

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

**BOOSTER SETS GMD SERIES
HM..S HORIZONTAL ELECTRIC PUMPS**



GMD 20	DNA	DNM	A		B	C		H	H1	
			STD	AIISI		STD	AIISI		STD	AIISI
3HM03	R 2"	R 2"	224	236	249	503	515	113	398	530
3HM04	R 2"	R 2"	244	256	249	523	535	113	398	530
3HM05	R 2"	R 2"	264	276	308	602	614	113	398	530
3HM06	R 2"	R 2"	284	296	308	622	634	113	398	530
5HM02	R 2"	R 2"	245	248	234	524	527	113	459	530
5HM03	R 2"	R 2"	245	248	234	524	527	113	459	530
5HM04	R 2"	R 2"	265	268	288	603	606	113	459	530
5HM05	R 2"	R 2"	285	288	283	623	626	113	459	530

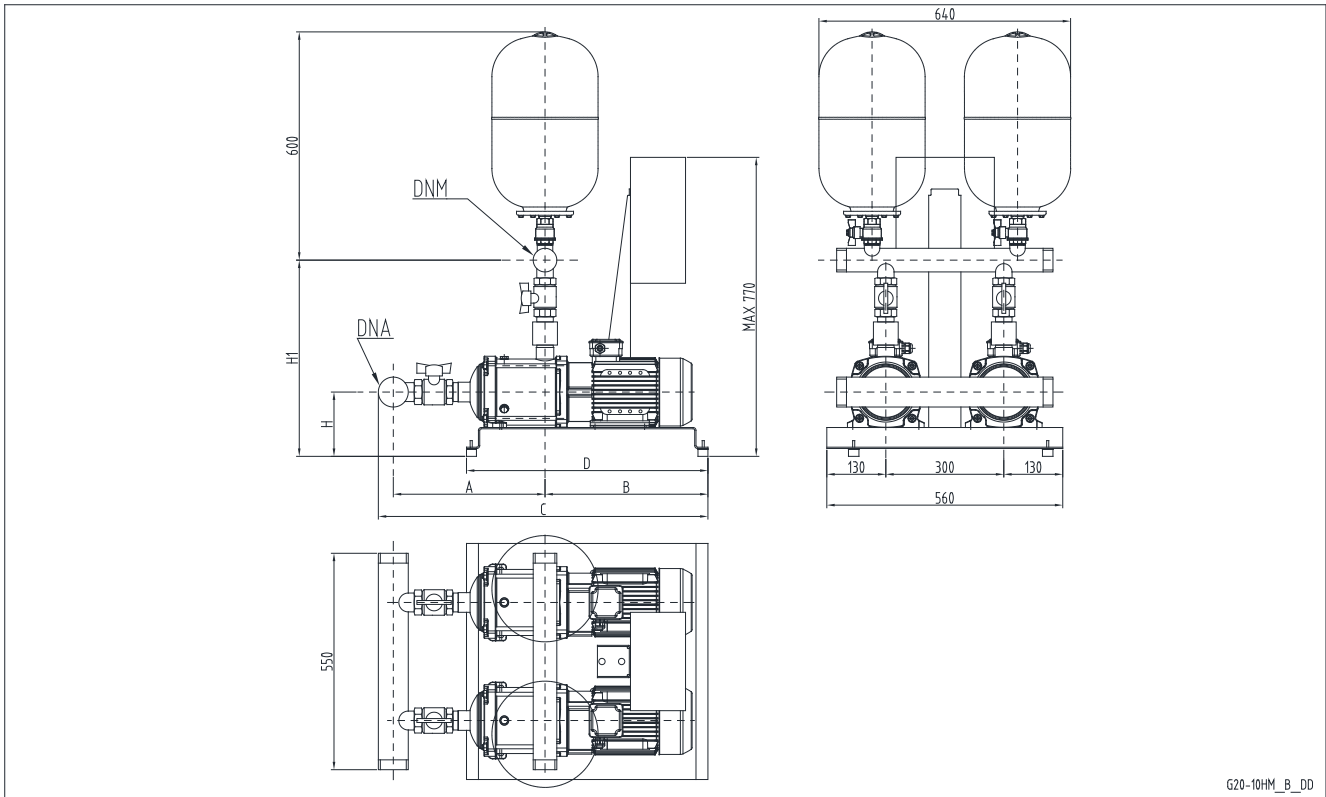
Dimensions in mm. Tolerance ± 10mm

gmd20_3-5hm-60hz_a_td

GMD

AIISI: Special version available on request (see page 49)

**BOOSTER SETS GMD SERIES
HM..S HORIZONTAL ELECTRIC PUMPS**



G20-10HM_B_DD

GMD 20	DNA	DNM	A		B	C		D	H	H1	
			STD	AISI		STD	AISI			STD	AISI
3HM07	R 2"	R 2"	288	300	354	672	684	590	205	490	622
3HM08	R 2"	R 2"	308	320	354	692	704	590	205	490	622
3HM09	R 2"	R 2"	328	340	354	712	724	590	205	490	622
3HM10	R 2"	R 2"	348	360	354	732	744	590	205	490	622
3HM11	R 2"	R 2"	368	380	354	752	764	590	205	490	622
3HM12	R 2"	R 2"	388	400	354	772	784	590	205	490	622
3HM13	R 2"	R 2"	408	420	354	792	804	762	205	490	622
3HM14	R 2"	R 2"	428	440	354	812	824	762	205	490	622
5HM06	R 2"	R 2"	314	317	354	698	701	590	205	551	622
5HM07	R 2"	R 2"	339	342	354	723	726	590	205	551	622
5HM08	R 2"	R 2"	364	367	354	748	751	590	205	551	622
5HM09	R 2"	R 2"	389	392	354	773	776	590	205	551	622
5HM10	R 2"	R 2"	414	417	354	798	801	762	205	551	622
5HM11	R 2"	R 2"	439	442	354	823	826	762	205	551	622
5HM12	R 2"	R 2"	464	467	390	884	887	762	205	551	622
10HM02	R 2"1/2	R 2"1/2	302	309	354	694	701	590	205	617	680
10HM03	R 2"1/2	R 2"1/2	302	309	354	694	701	590	205	617	680
10HM04	R 2"1/2	R 2"1/2	334	341	390	762	769	590	205	617	680
10HM05	R 2"1/2	R 2"1/2	366	373	390	794	801	590	215	627	690
10HM06	R 2"1/2	R 2"1/2	398	405	390	826	833	590	215	627	690

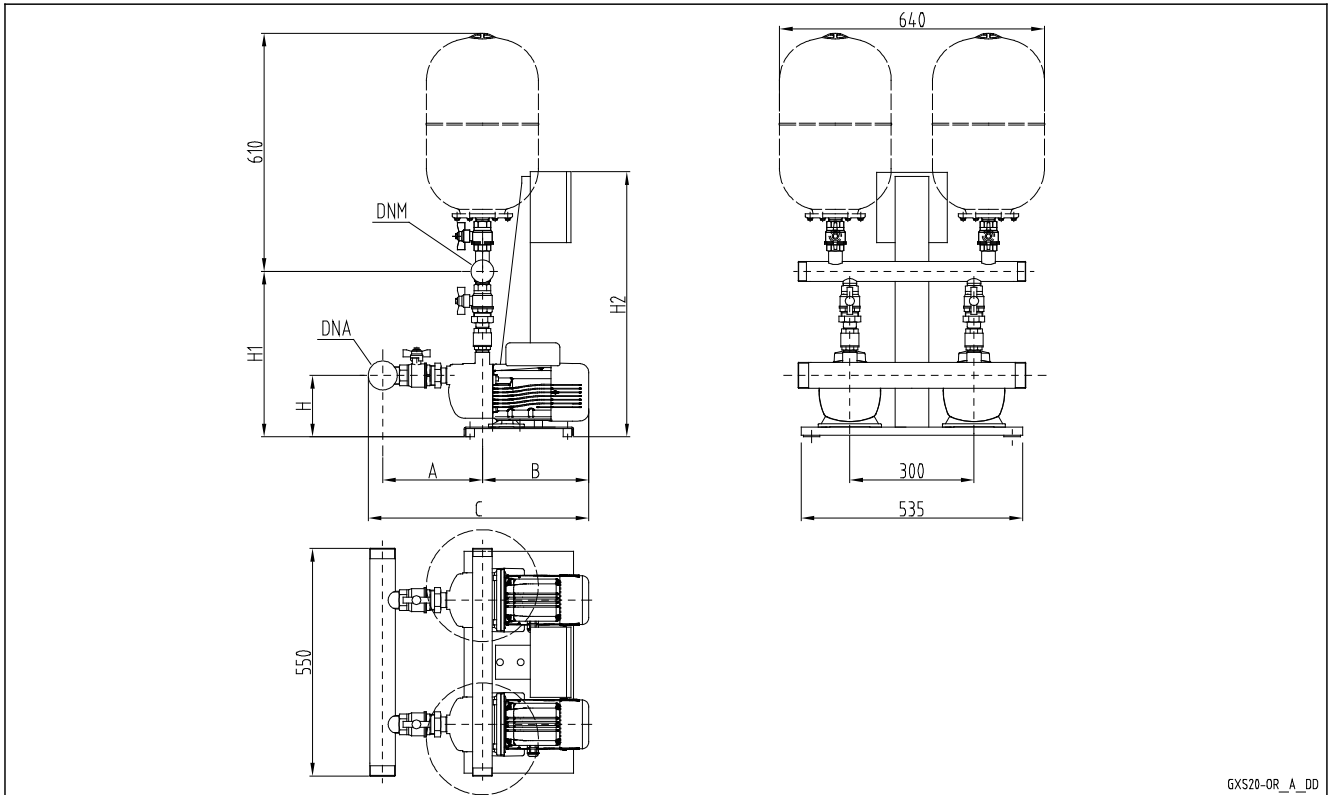
Dimensions in mm. Tolerance ± 10mm

gmd20_3-10hm-60hz_b_td

AISI: Special version available on request (see page 49)

GMD

**BOOSTER SETS GMD SERIES
BG AND CEA HORIZONTAL ELECTRIC PUMPS**



GMD 20	DNA	DNM	A		B	C		H	H1		H2
			STD	AISI		STD	AISI		STD	AISI	
BG56	R 2"	R 1 1/2"	225	299	311	566	640	189	431	501	640
BG76	R 2"	R 1 1/2"	225	299	356	611	685	189	431	501	640
BG116	R 2"	R 1 1/2"	225	299	356	611	685	189	431	501	640
CEA 706/3	R 2"	R 1 1/2"	207	281	274	511	585	134	429	499	640
CEA 706/4	R 2"	R 1 1/2"	207	281	274	511	585	134	429	499	640
CEA 706/5	R 2"	R 1 1/2"	207	281	320	557	631	134	429	499	640
CEA 1206/1	R 2"	R 2"	207	281	274	511	585	134	453	505	640
CEA 1206/2	R 2"	R 2"	207	281	274	511	585	134	453	505	640
CEA 1206/3	R 2"	R 2"	207	281	274	511	585	134	453	505	640
CEA 1206/4	R 2"	R 2"	207	281	320	557	631	134	453	505	640
CEA 1206/5	R 2"	R 2"	207	281	365	602	676	134	453	505	640
CEA 2106/0	R 2" 1/2	R 2" 1/2	231	318	285	554	641	134	493	602	640
CEA 2106/1	R 2" 1/2	R 2" 1/2	231	318	331	600	687	134	493	602	640
CEA 2106/2	R 2" 1/2	R 2" 1/2	231	318	331	600	687	134	493	602	640
CEA 2106/3	R 2" 1/2	R 2" 1/2	231	318	375	644	731	134	493	602	640
CEA 2106/4	R 2" 1/2	R 2" 1/2	231	318	375	644	731	134	493	602	640
CEA 3706/0	R 2" 1/2	R 2" 1/2	265	318	331	634	687	134	578	602	640
CEA 3706/0A	R 2" 1/2	R 2" 1/2	265	318	331	634	687	134	578	602	640
CEA 3706/1	R 2" 1/2	R 2" 1/2	265	318	331	634	687	134	578	602	640
CEA 3706/2	R 2" 1/2	R 2" 1/2	265	318	375	678	731	134	578	602	640
CEA 3706/3	R 2" 1/2	R 2" 1/2	265	318	375	678	731	134	578	602	640

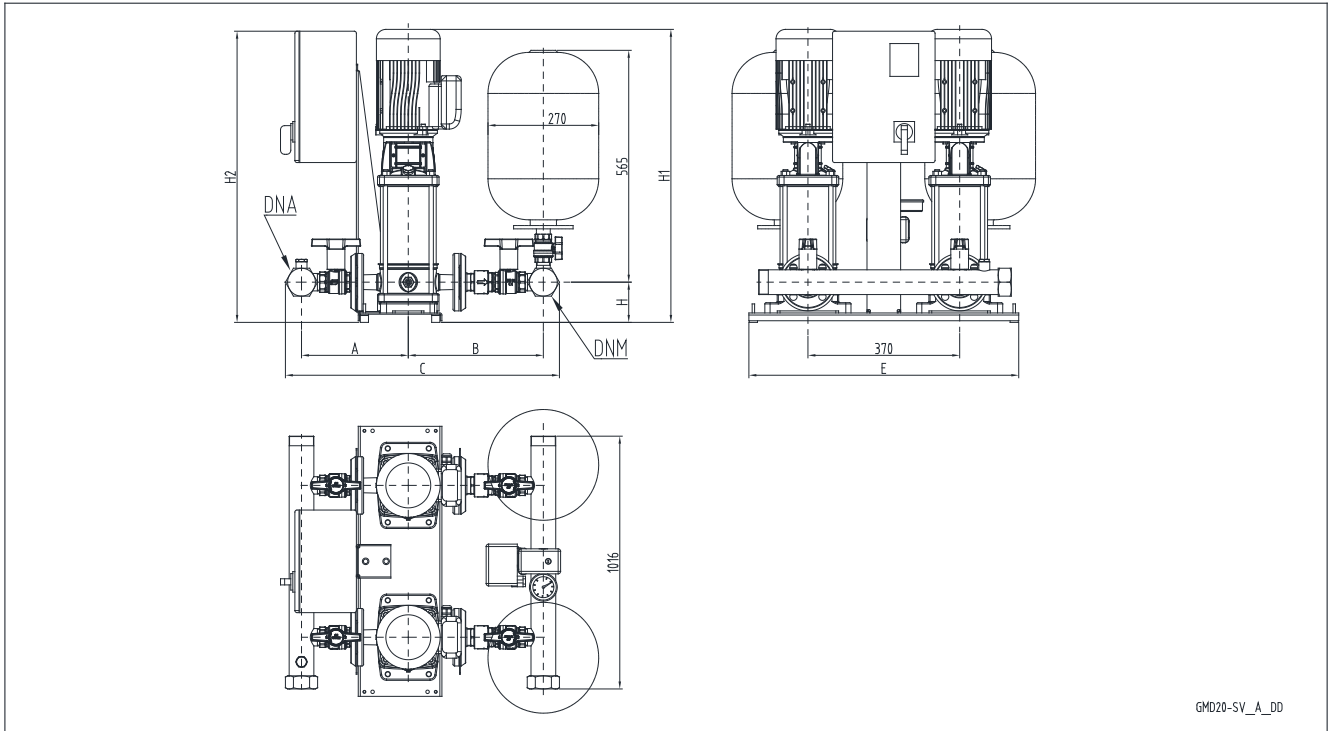
Dimensions in mm. Tolerance ± 10mm

gmd20-60hz_or_b_td

AISI: Special version available on request (see page 49)

GMD

BOOSTER SETS GMD SERIES
e-SV VERTICAL ELECTRIC PUMPS



GMD20-SV_A_DD

GMD 20	DNA	DNM	A		B		C		E	H	H1	H2
			STD	AISI	STD	AISI	STD	AISI				
3SV04F0076T	R 2"	R 2"	256	257	311	363	627	680	658	98	594	700
3SV05F0116T	R 2"	R 2"	256	257	311	363	627	680	658	98	614	700
3SV06F0116T	R 2"	R 2"	256	257	311	363	627	680	658	98	634	700
3SV07F0116T	R 2"	R 2"	256	257	311	363	627	680	658	98	654	700
3SV08F0156T	R 2"	R 2"	256	257	311	363	627	680	658	98	684	700
3SV09F0156T	R 2"	R 2"	256	257	311	363	627	680	658	98	704	700
3SV10F0226T	R 2"	R 2"	256	257	311	363	627	680	658	98	759	700
3SV11F0226T	R 2"	R 2"	256	257	311	363	627	680	658	98	779	700
3SV12F0226T	R 2"	R 2"	256	257	311	363	627	680	658	98	799	700
3SV13F0226T	R 2"	R 2"	256	257	311	363	627	680	658	98	819	700
3SV14F0226T	R 2"	R 2"	256	257	311	363	627	680	658	98	839	700
5SV03F0076T	R 2"	R 2"	260	267	329	387	649	714	658	98	589	700
5SV04F0116T	R 2"	R 2"	260	267	329	387	649	714	658	98	614	700
5SV05F0156T	R 2"	R 2"	260	267	329	387	649	714	658	98	649	700
5SV06F0156T	R 2"	R 2"	260	267	329	387	649	714	658	98	674	700
5SV07F0226T	R 2"	R 2"	260	267	329	387	649	714	658	98	734	700
5SV08F0226T	R 2"	R 2"	260	267	329	387	649	714	658	98	759	700
5SV09F0226T	R 2"	R 2"	260	267	329	387	649	714	658	98	784	700
5SV10F0306T	R 2"	R 2"	260	267	329	387	649	714	658	98	819	700
5SV11F0306T	R 2"	R 2"	260	267	329	387	649	714	658	98	844	700
5SV12F0306T	R 2"	R 2"	260	267	329	387	649	714	658	98	869	700
5SV13F0406T	R 2"	R 2"	260	267	329	387	649	714	658	98	915	700
5SV14F0406T	R 2"	R 2"	260	267	329	387	649	714	658	98	940	700
10SV01F0076T	R 2 1/2	R 2 1/2	294	301	356	453	726	830	682	114	654	720
10SV02F0156T	R 2 1/2	R 2 1/2	294	301	356	453	726	830	682	114	664	720
10SV03F0226T	R 2 1/2	R 2 1/2	294	301	356	453	726	830	682	114	731	720
10SV04F0306T	R 2 1/2	R 2 1/2	294	301	356	453	726	830	682	114	773	720
10SV05F0406T	R 2 1/2	R 2 1/2	294	301	356	453	726	830	682	114	826	720
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Dimensions in mm. Tolerance ± 10mm

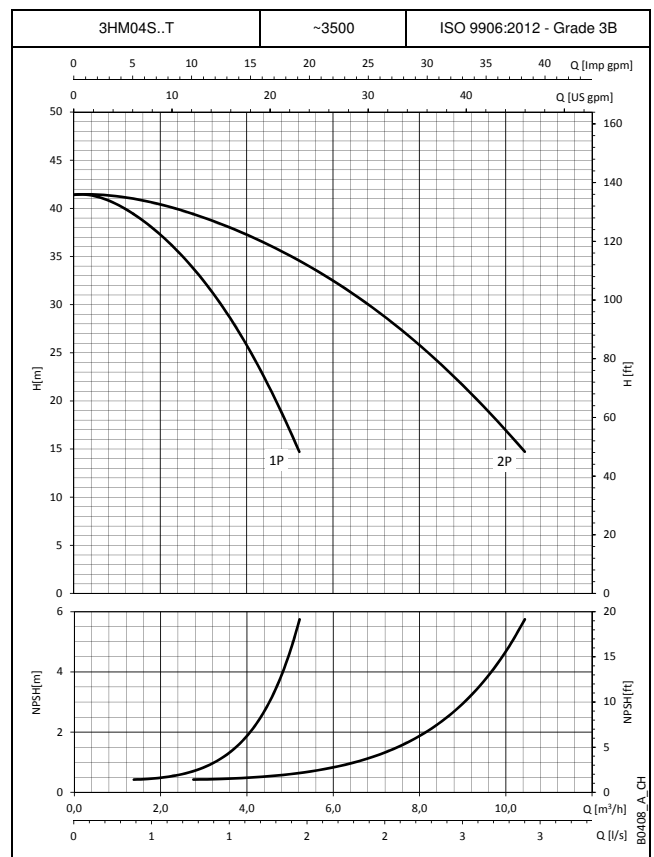
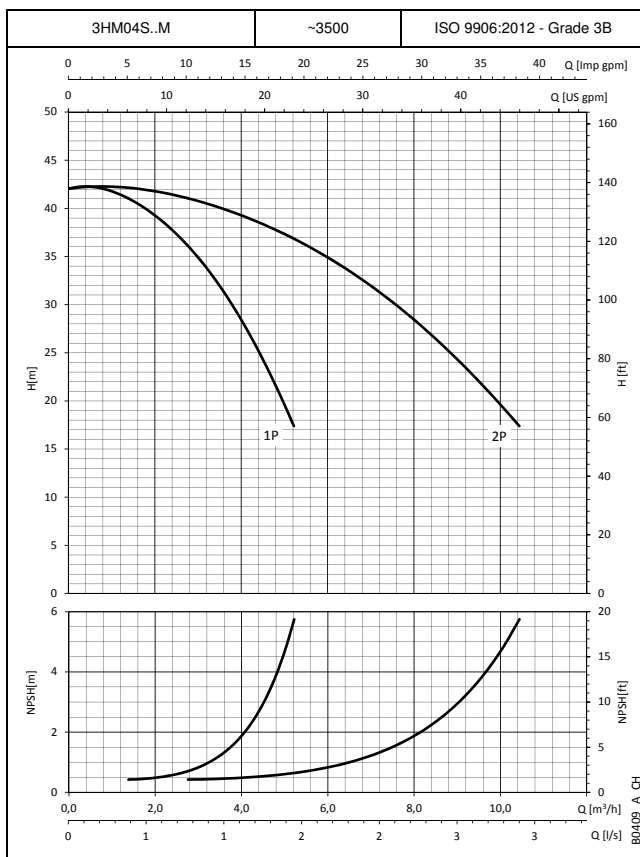
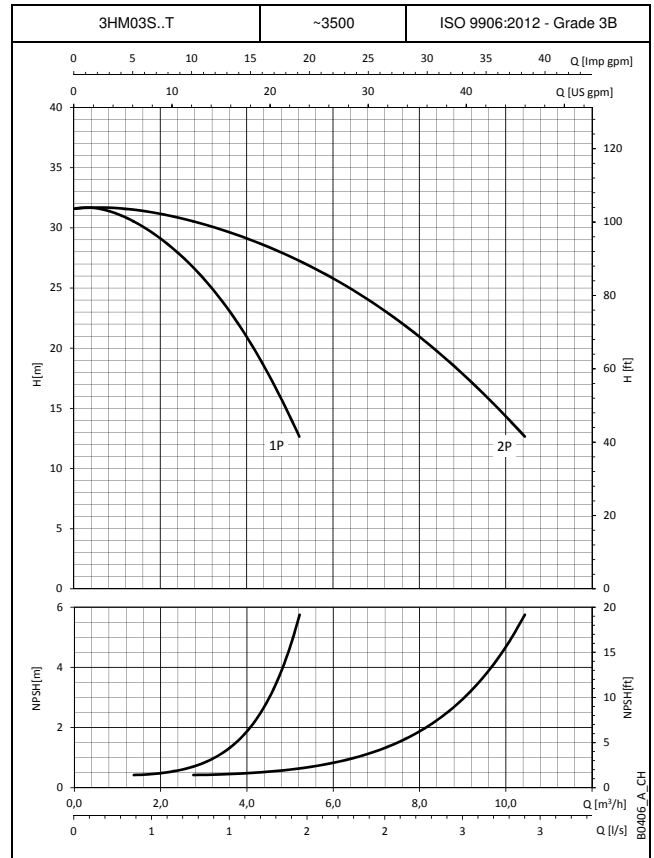
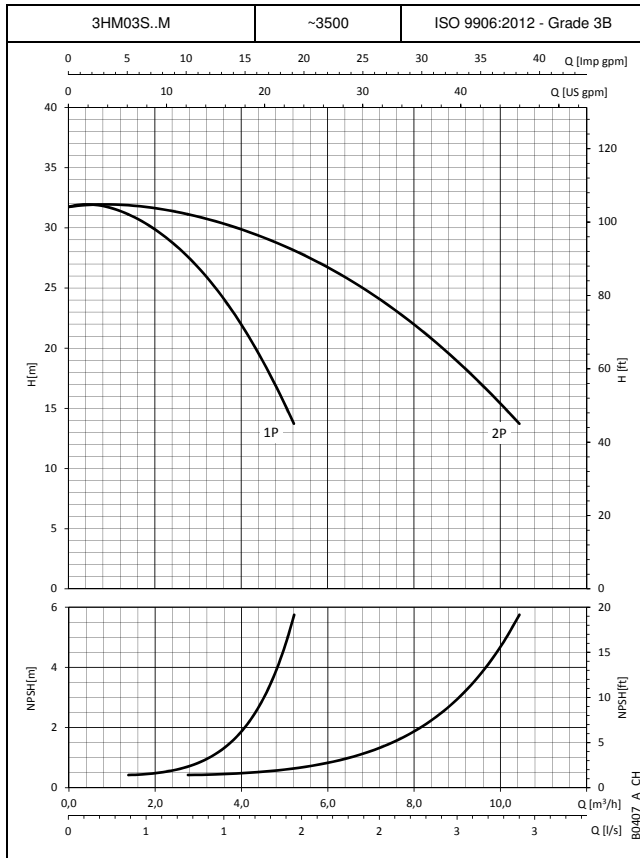
gmd20_eshv-60hz_a_td

AISI: Special version available on request (see page 49)

PERFORMANCES CURVES

CURVES

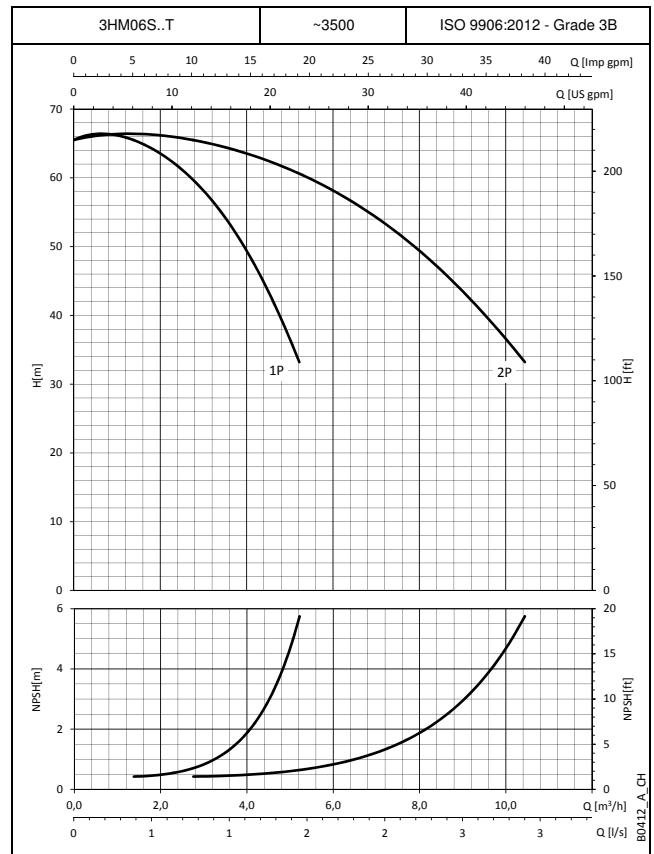
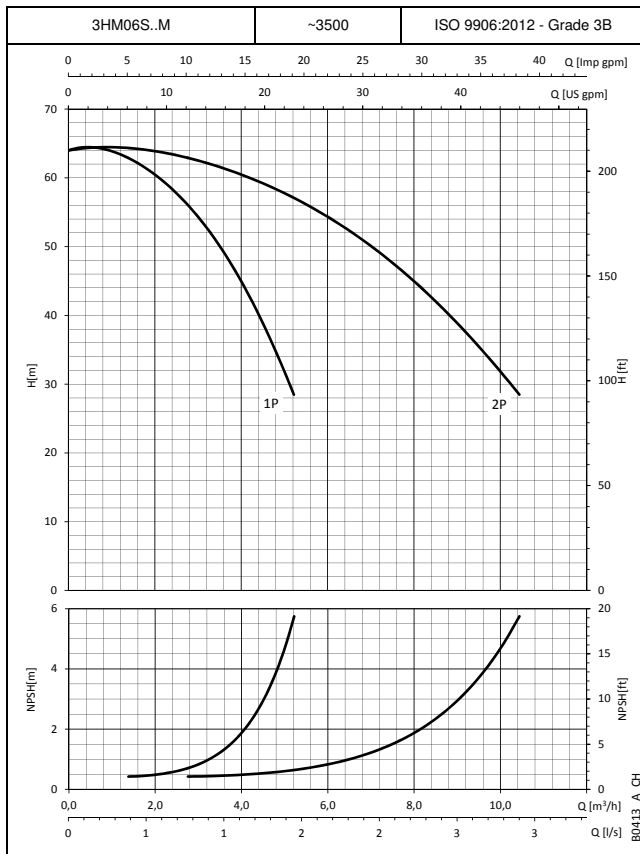
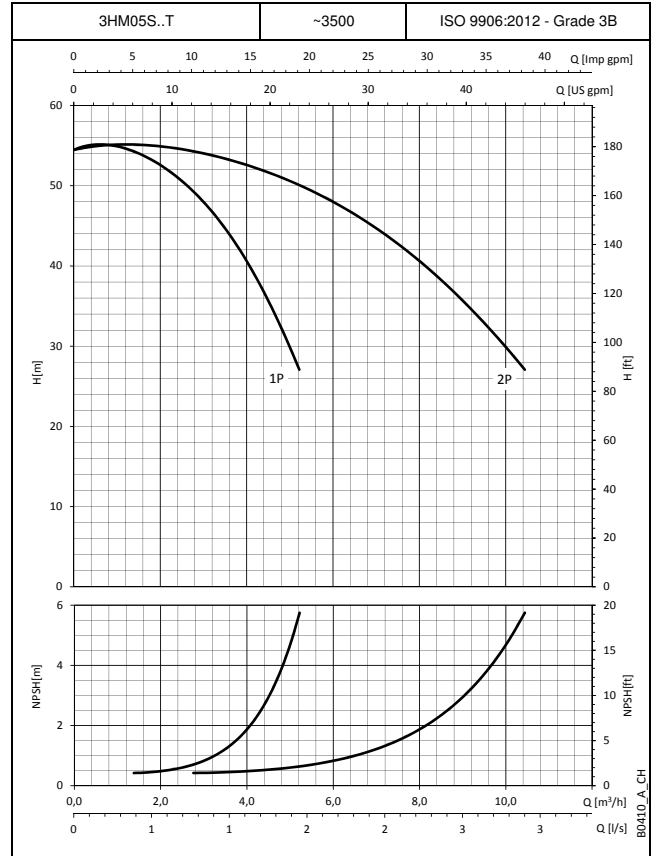
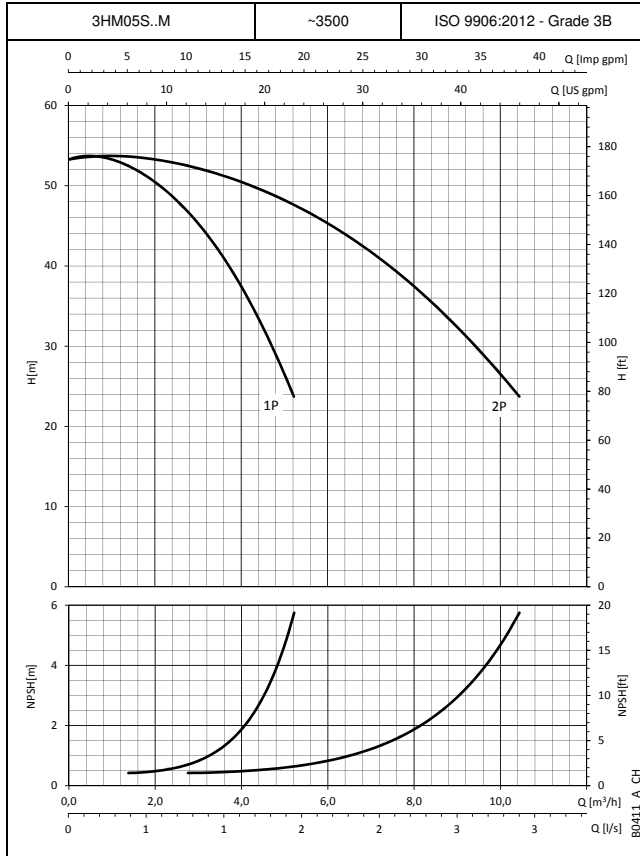
**BOOSTER SETS GX S AND GMD SERIES
 OPERATING CHARACTERISTICS AT 60 Hz**



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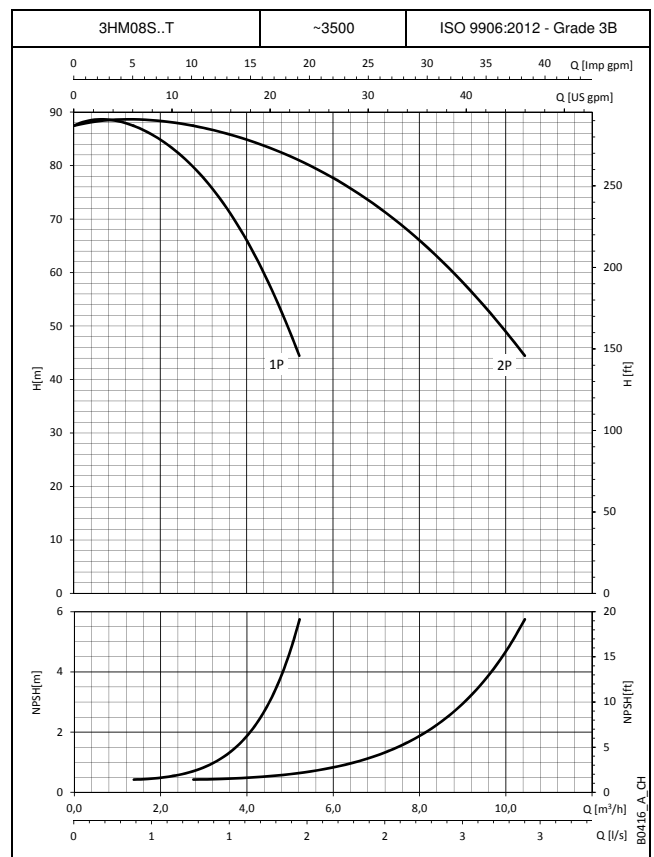
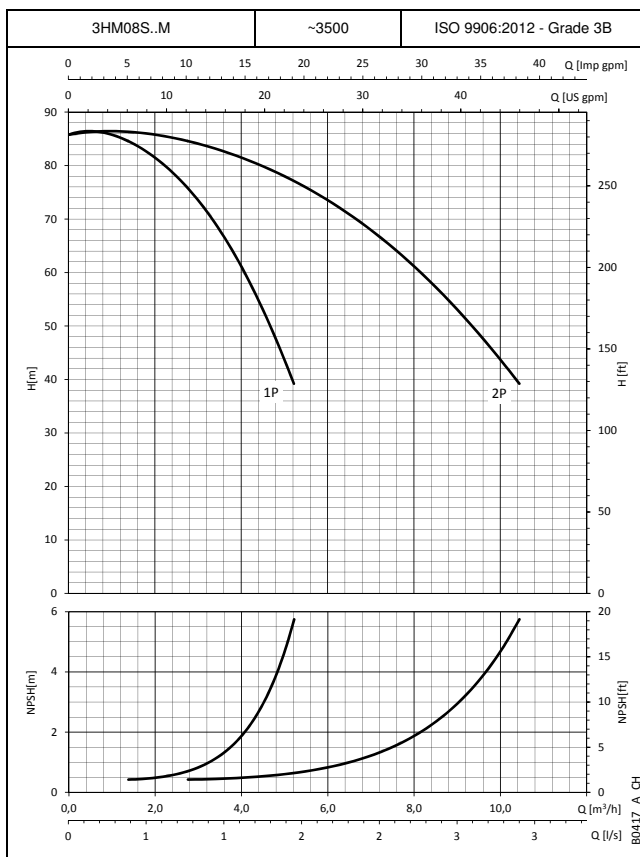
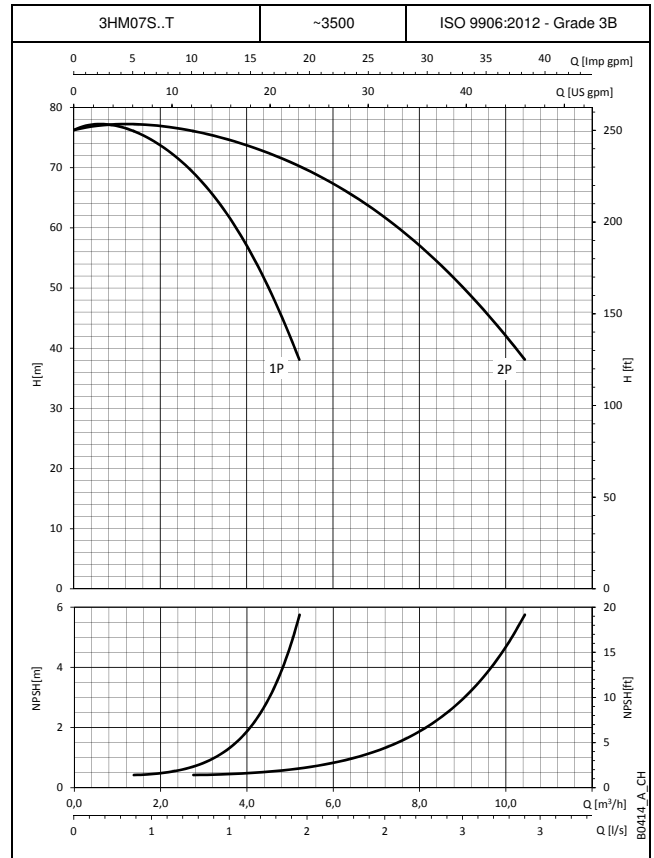
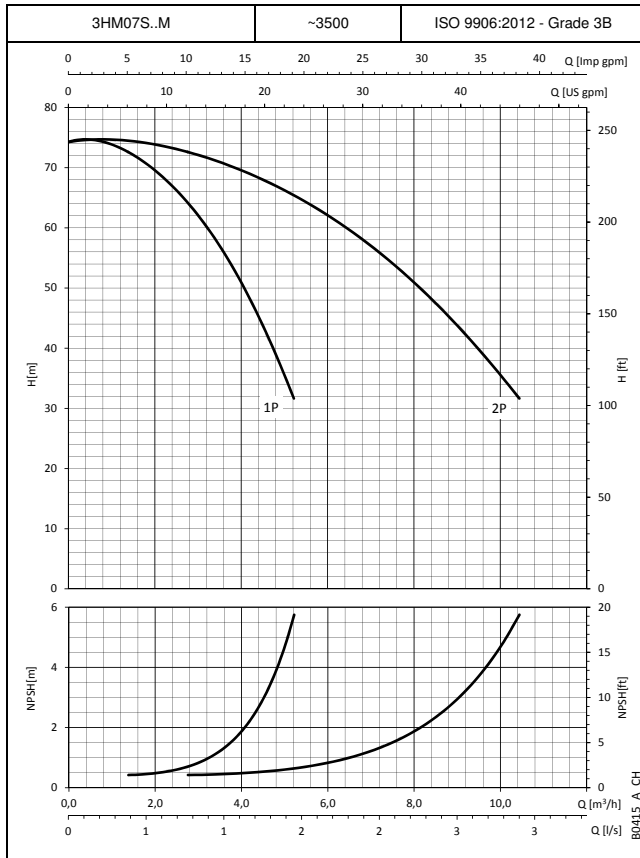
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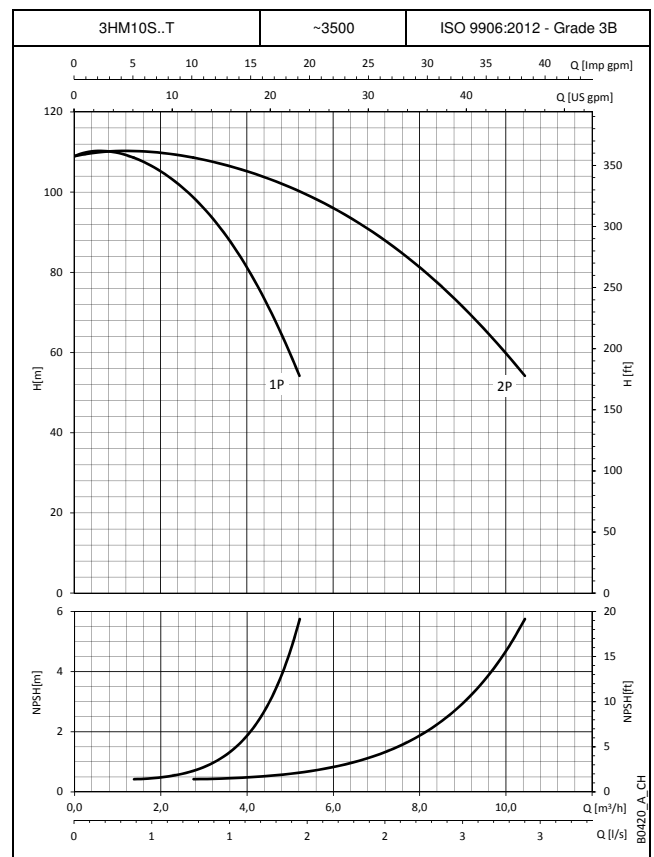
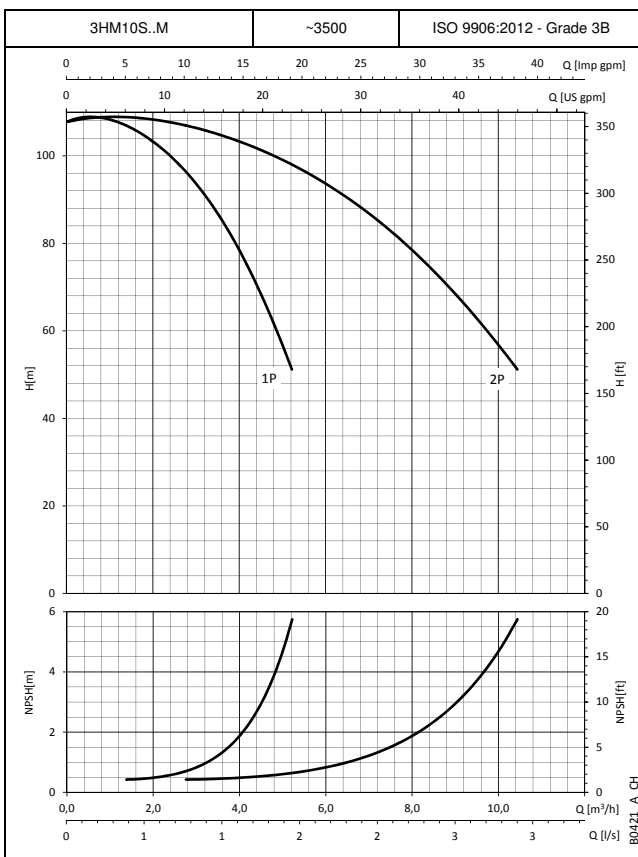
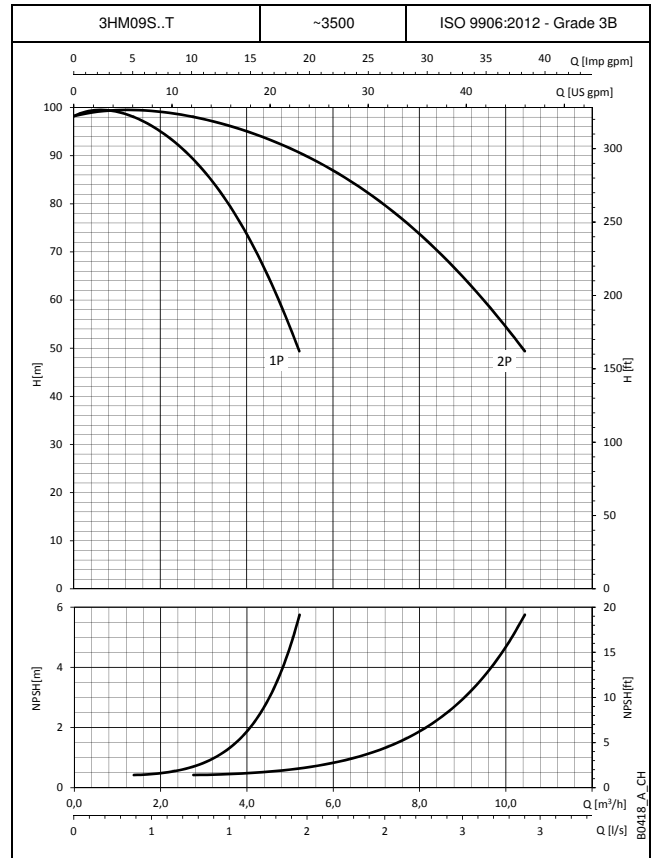
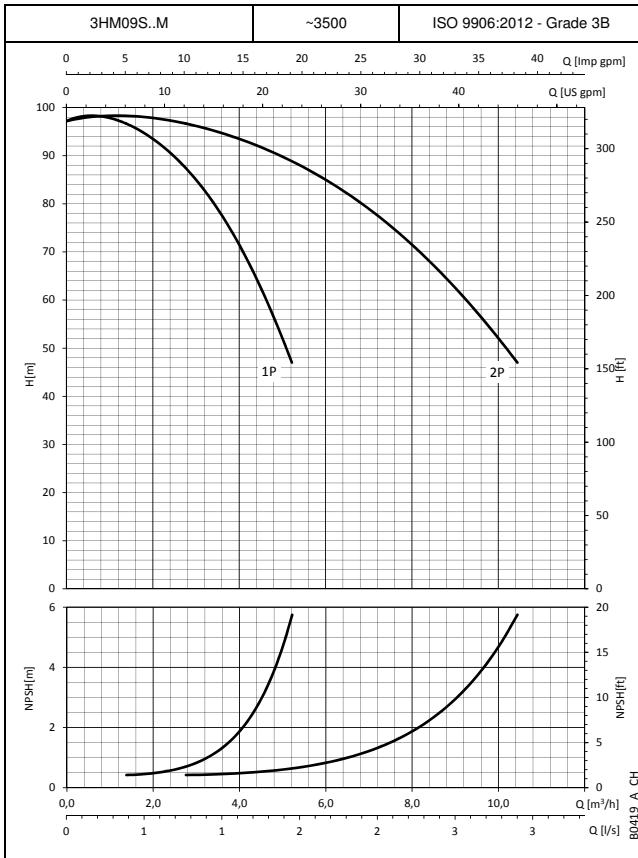
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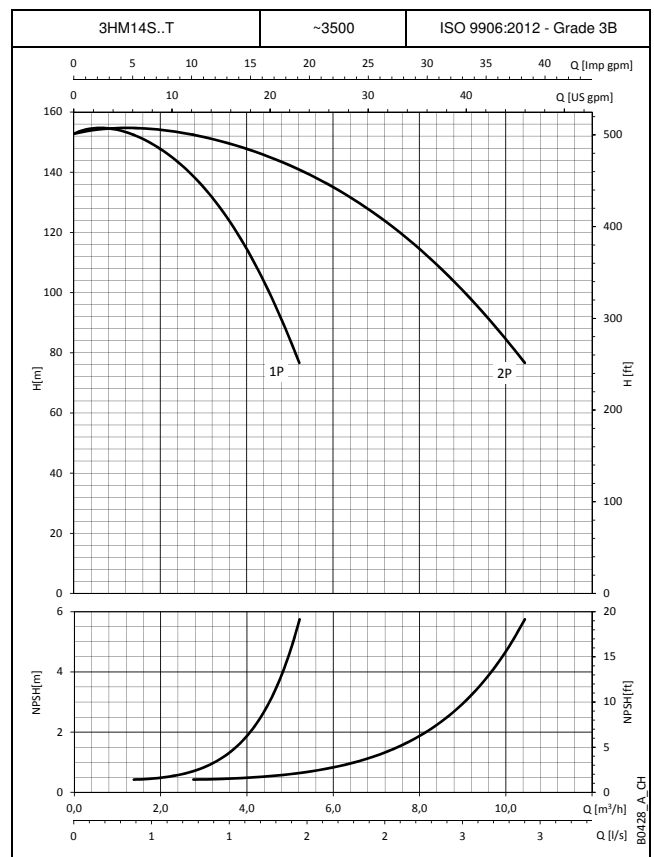
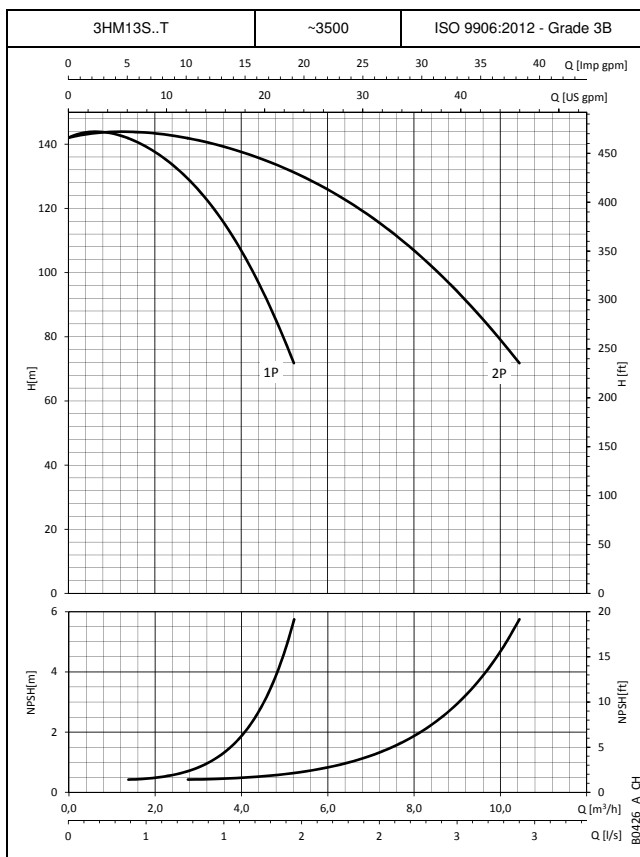
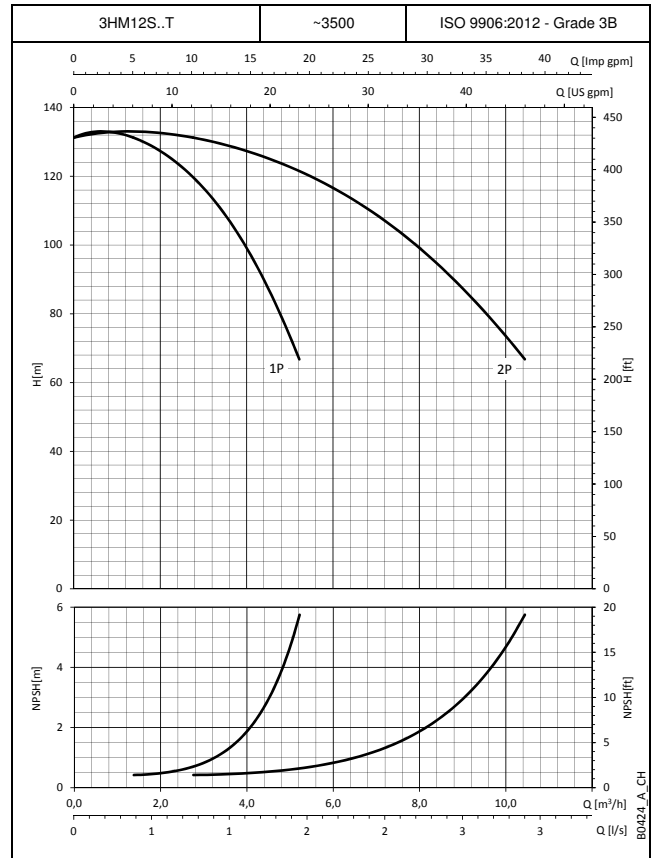
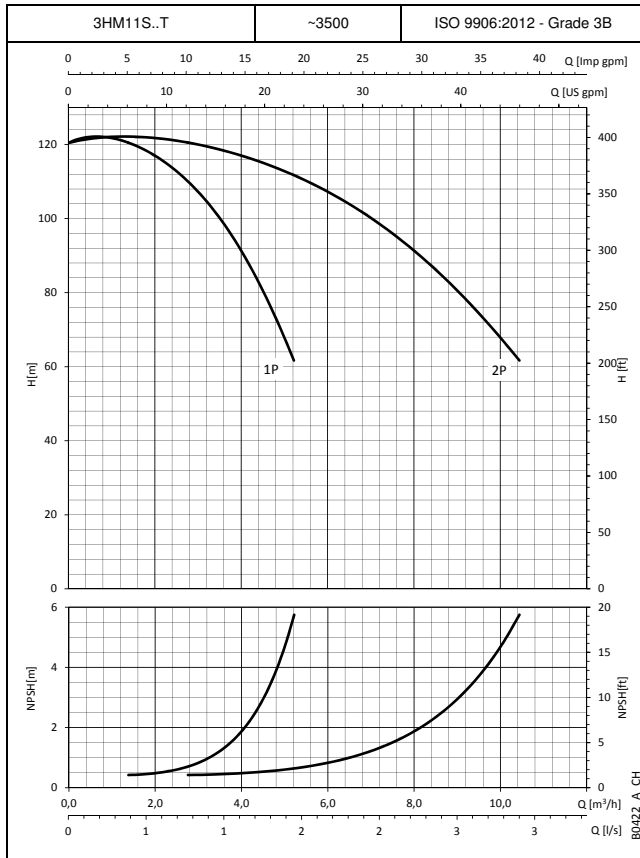
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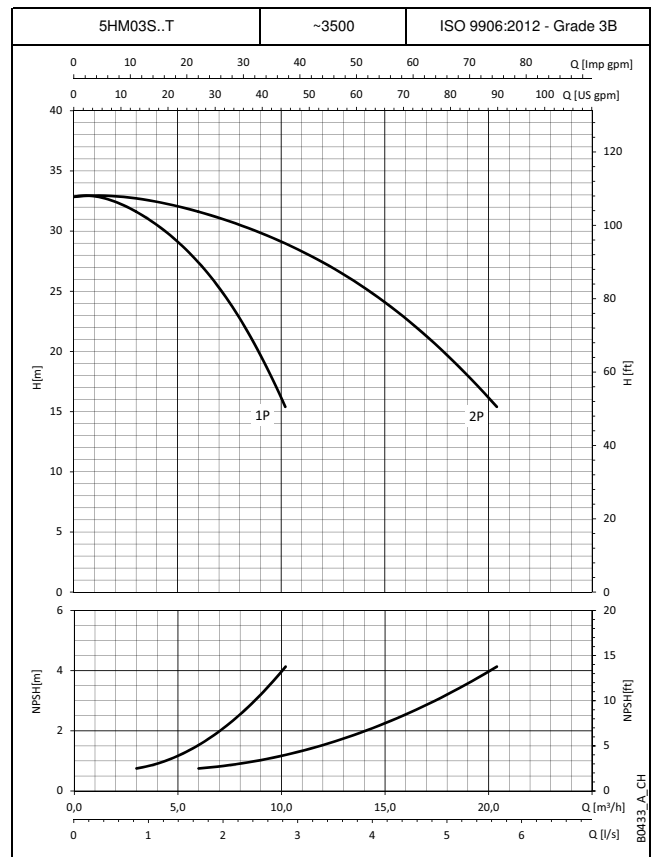
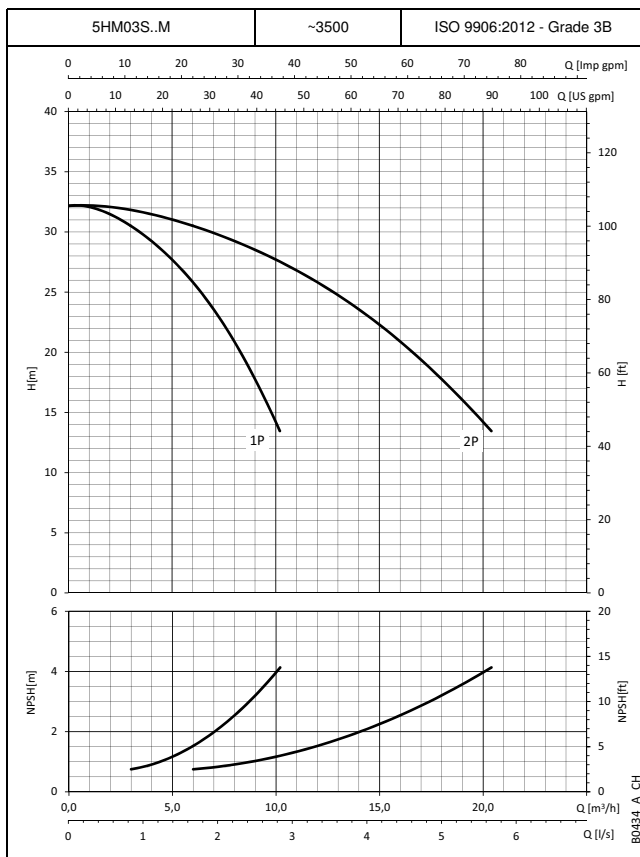
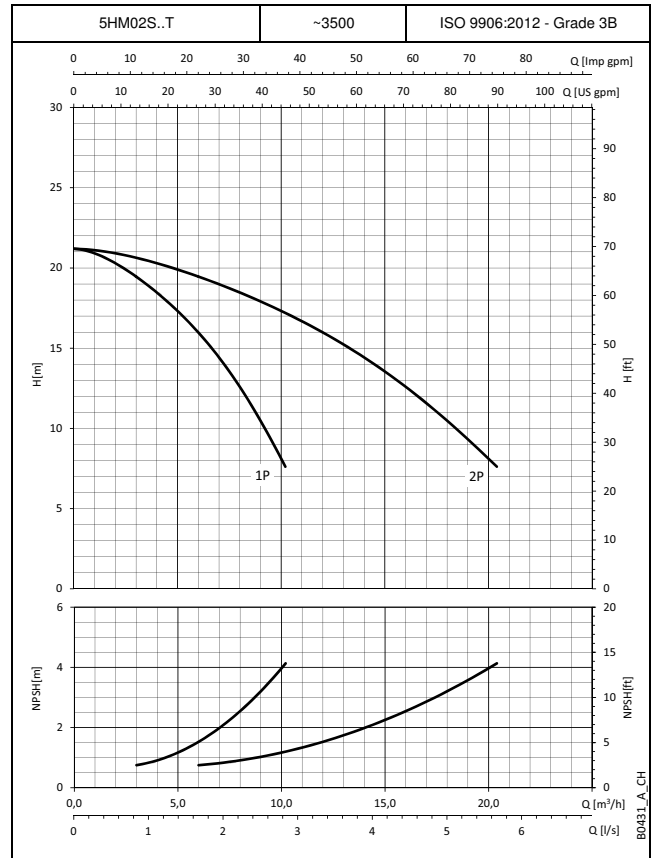
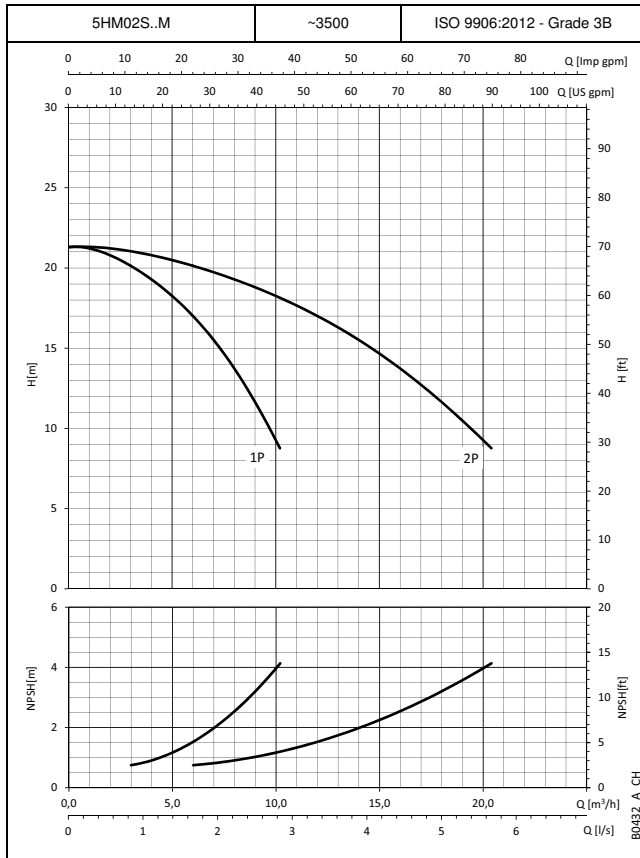
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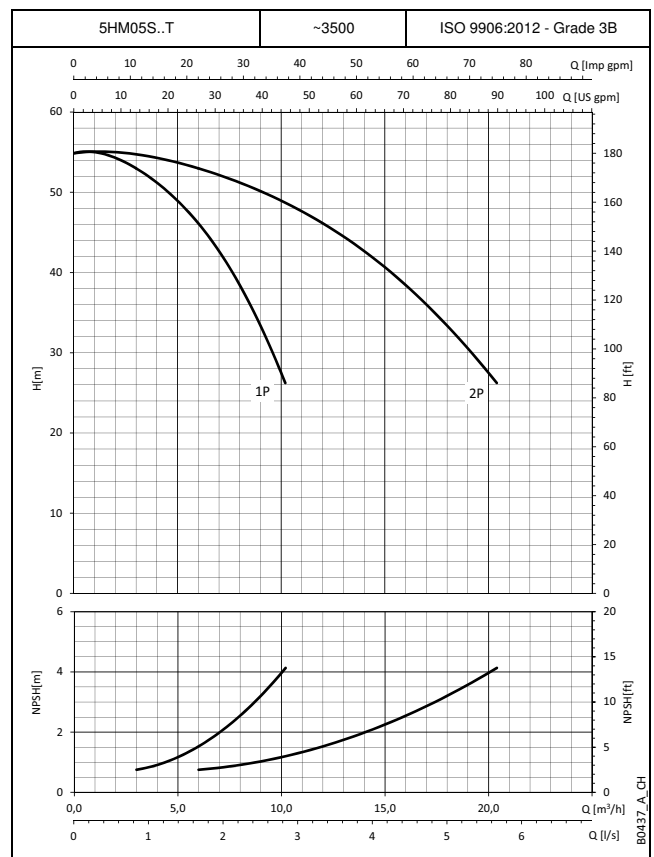
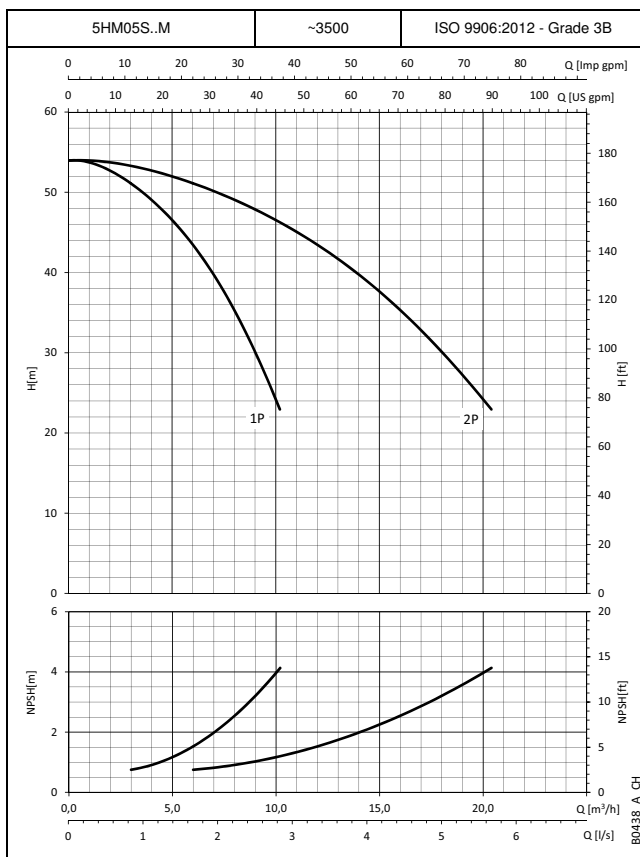
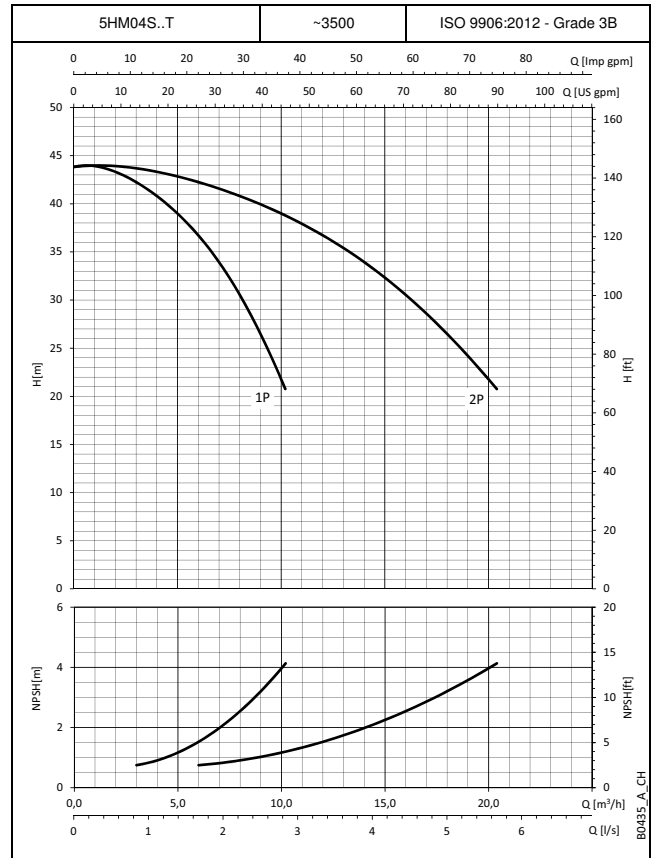
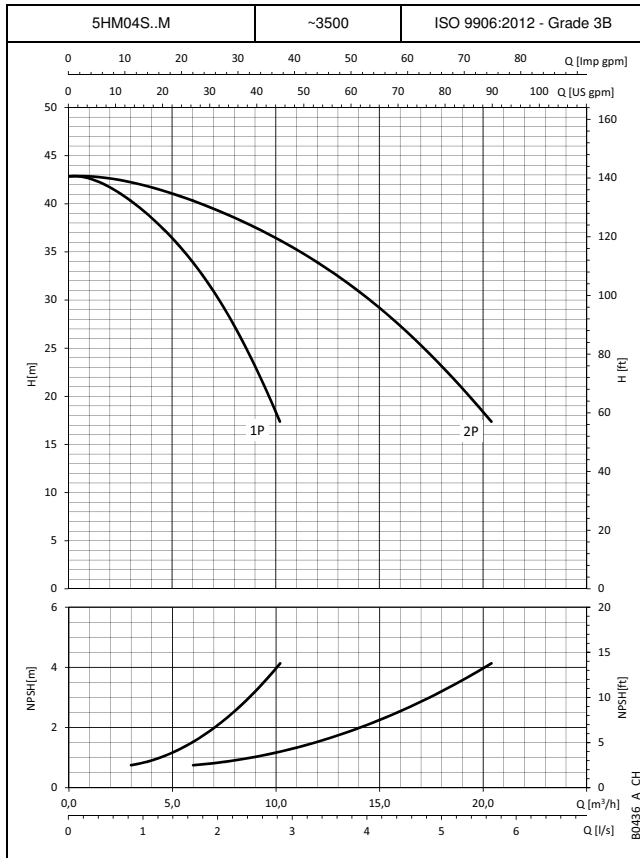
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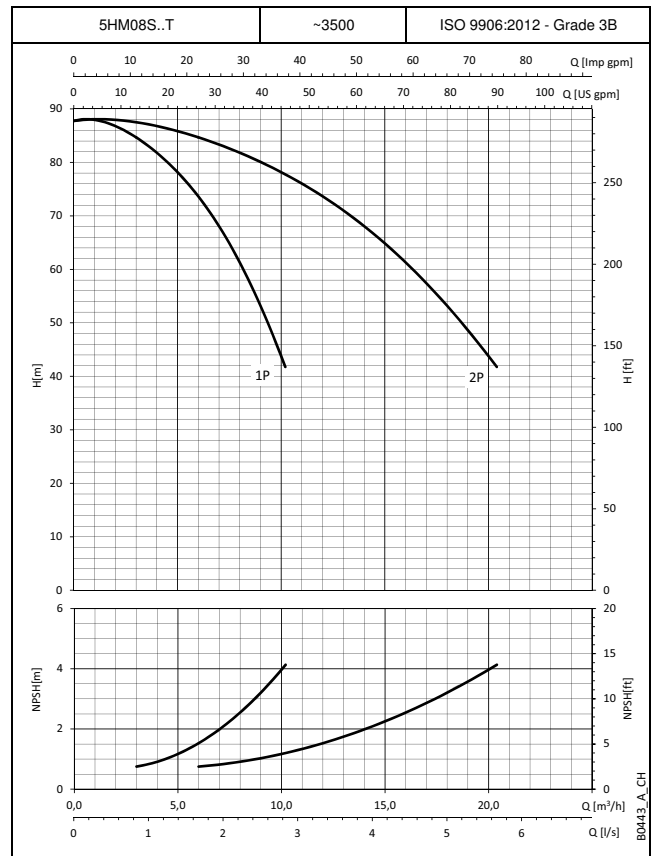
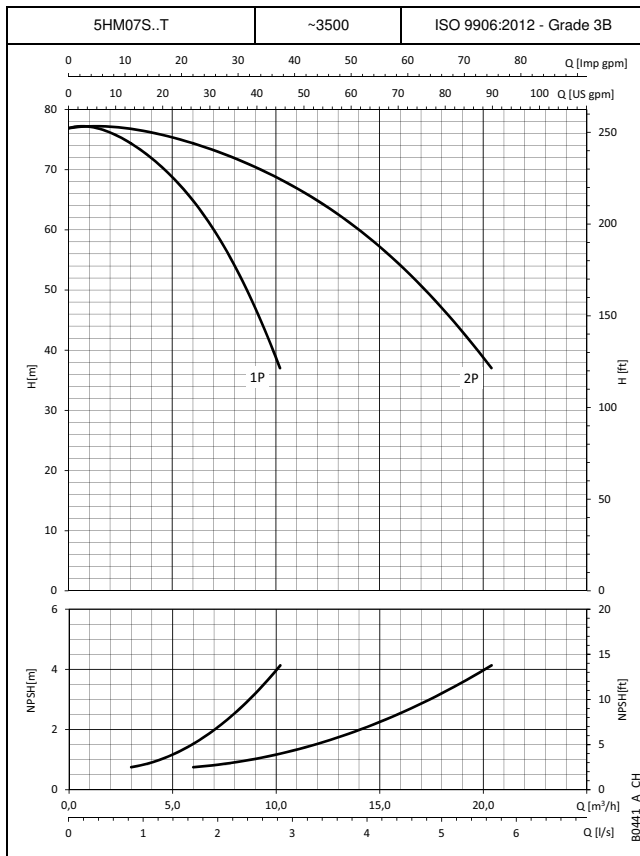
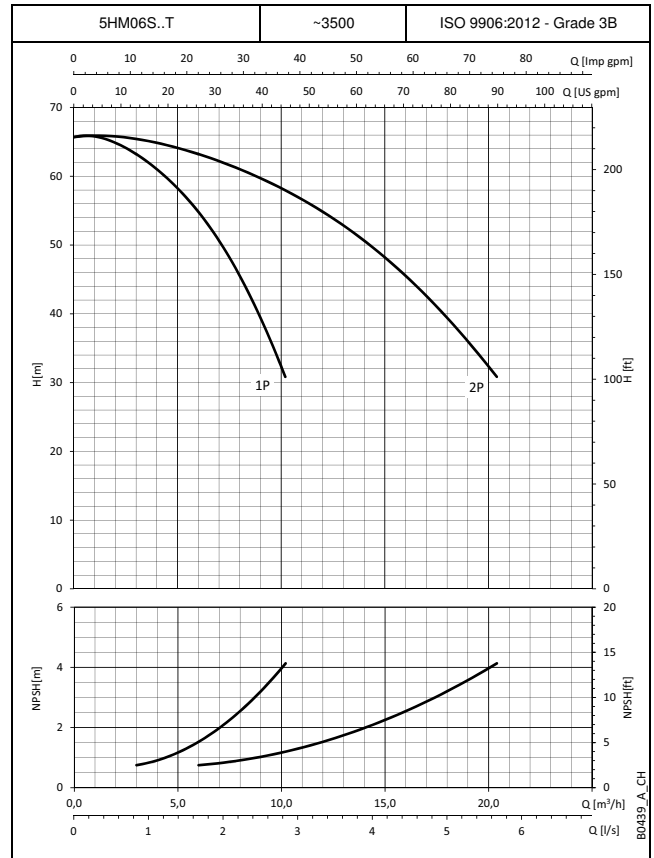
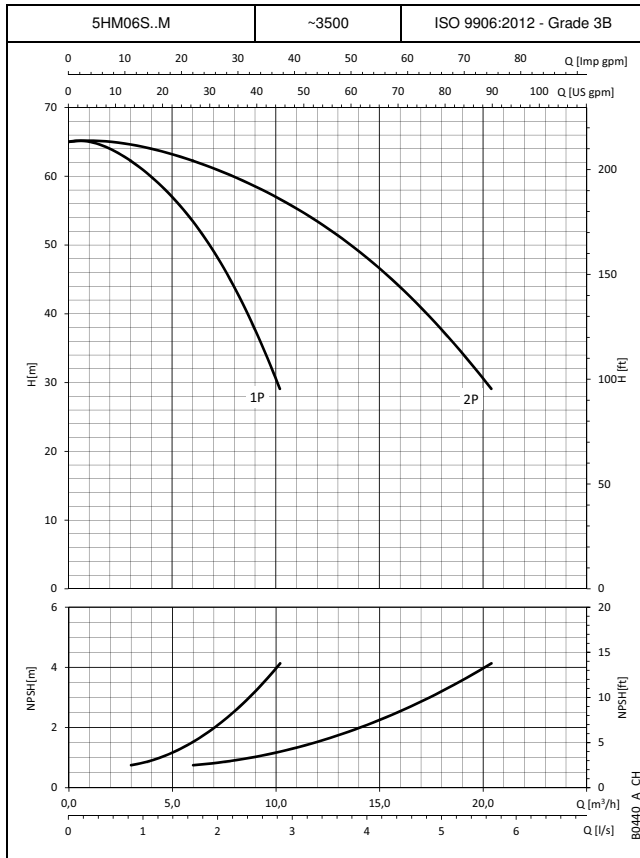
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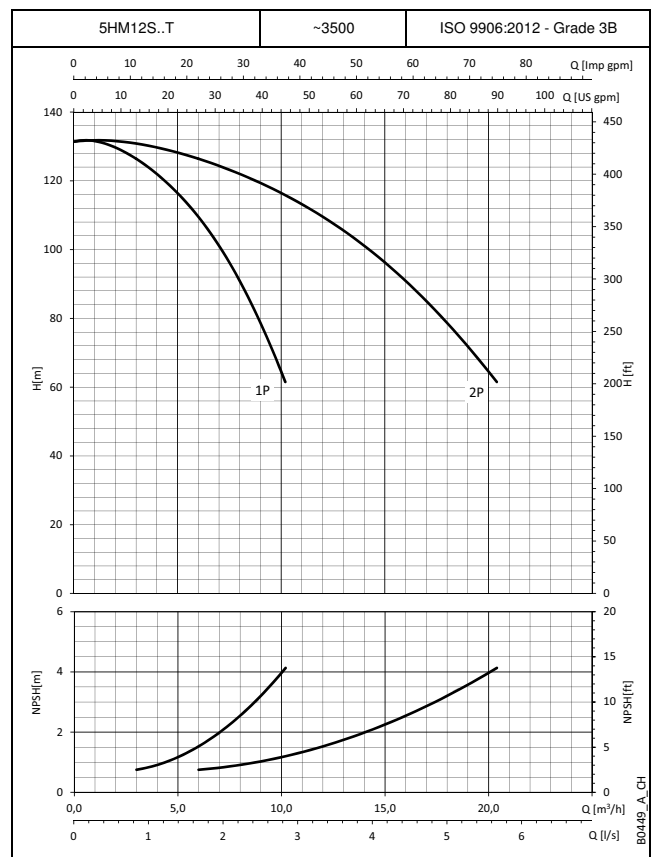
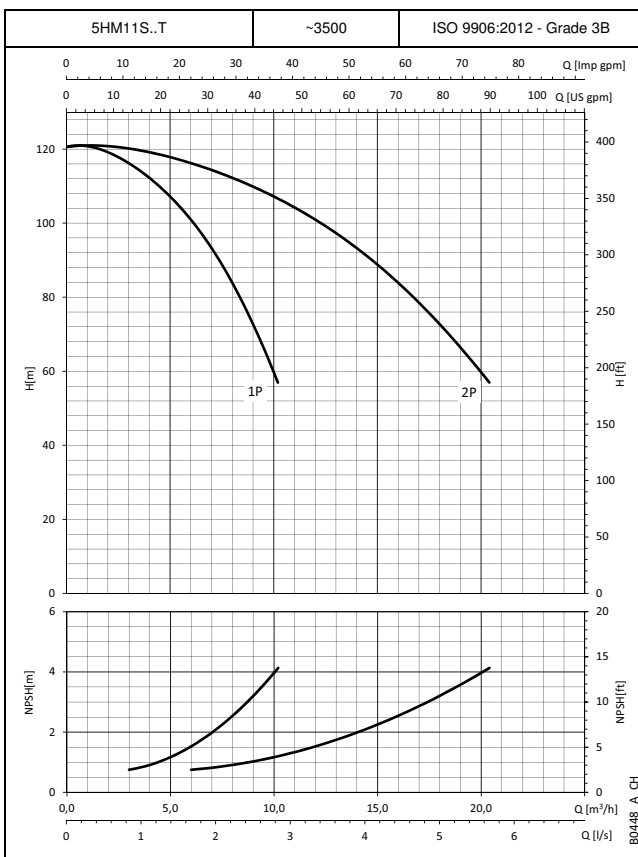
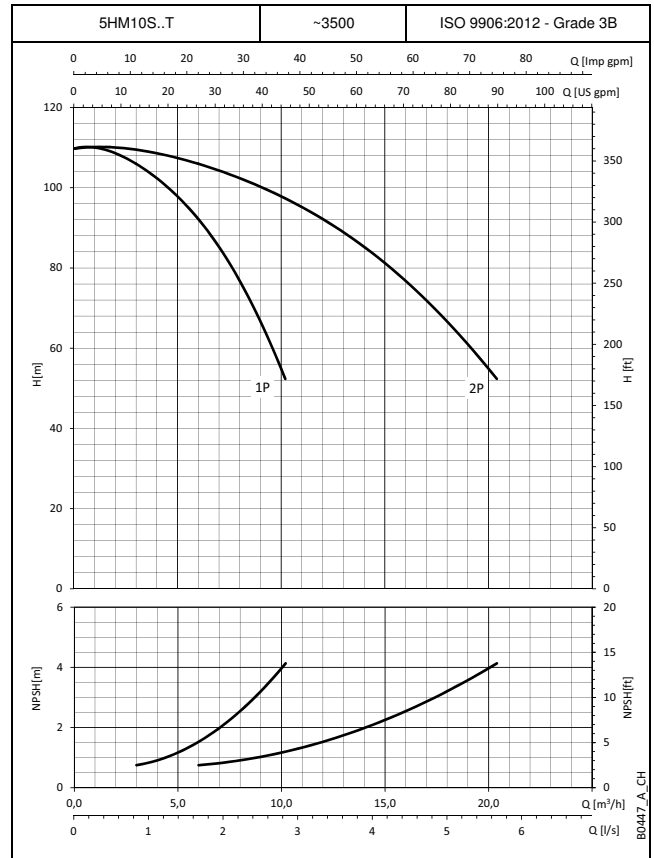
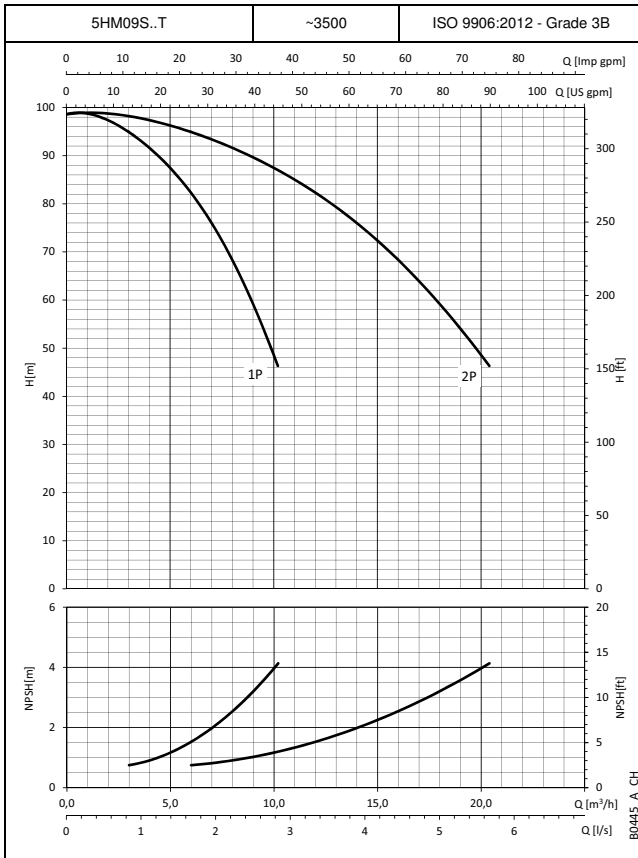
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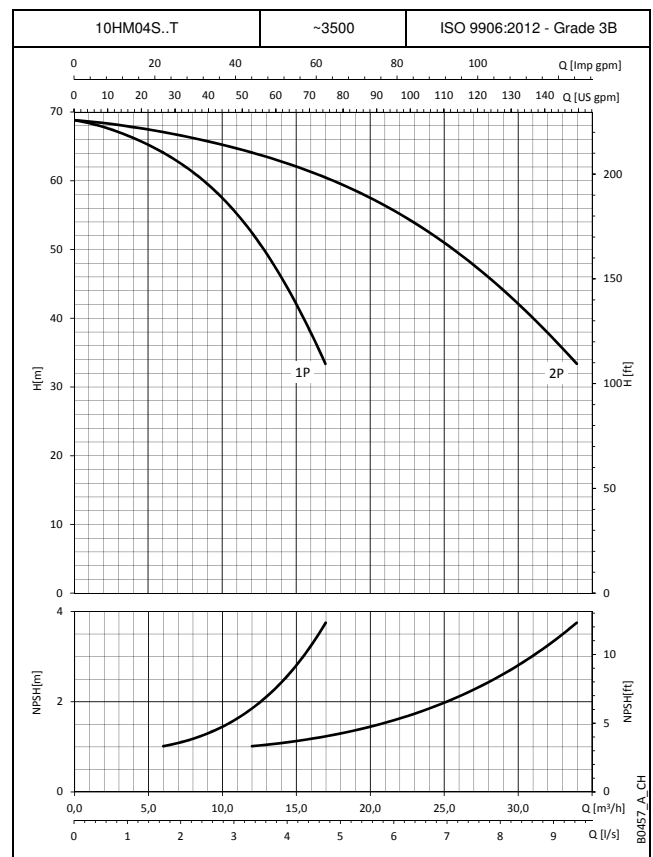
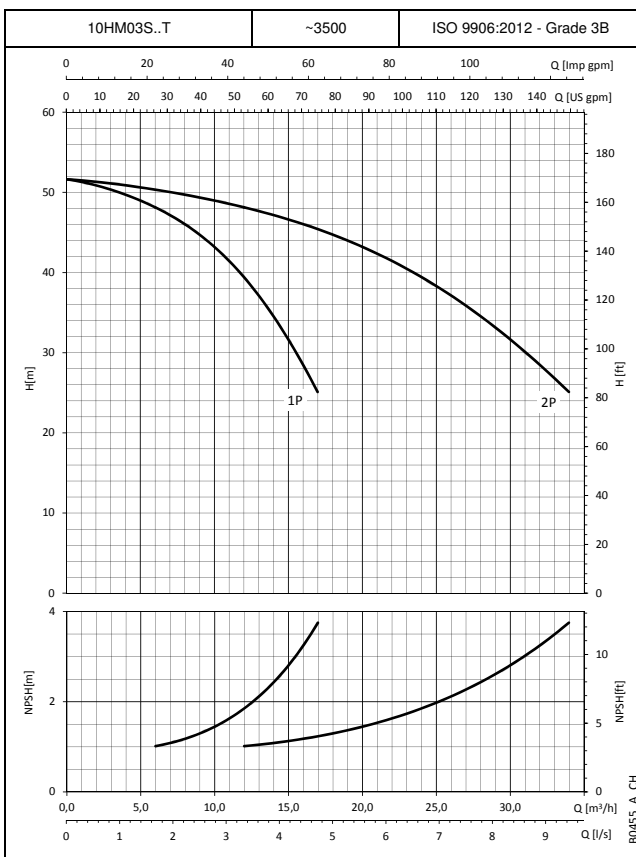
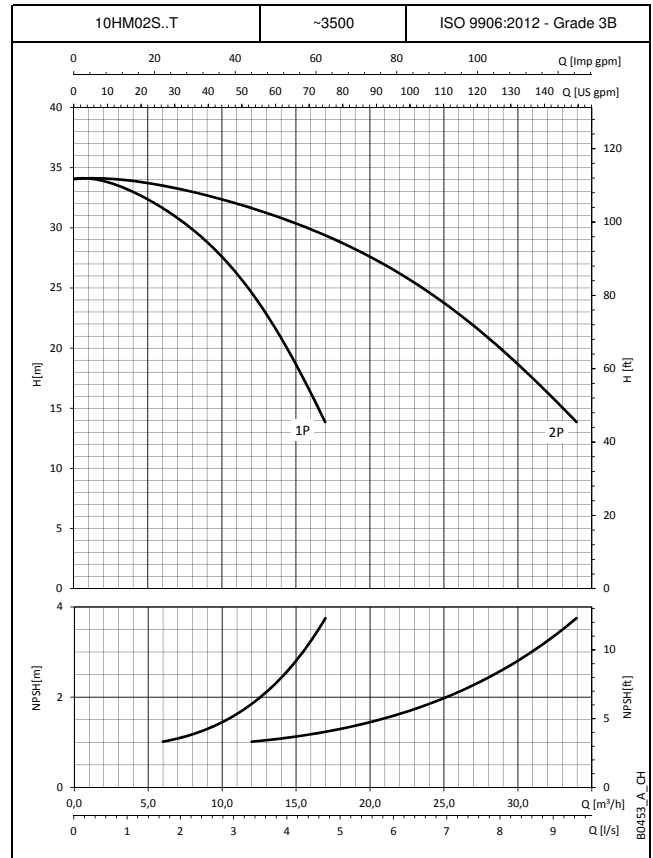
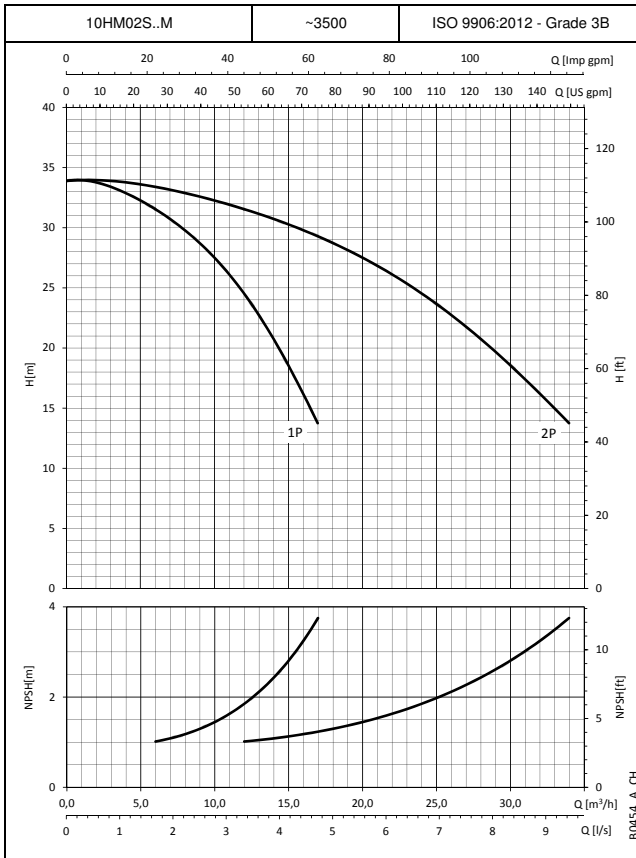
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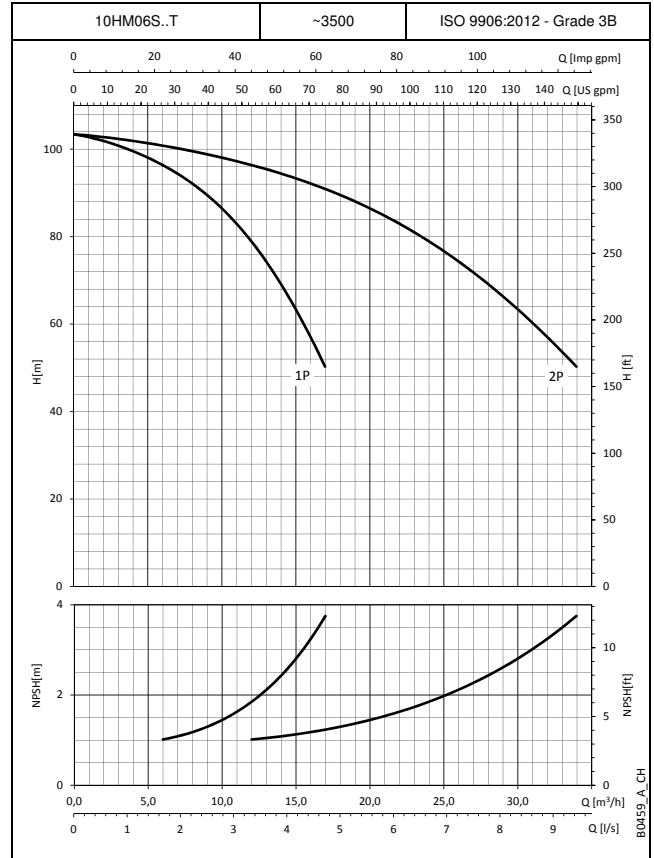
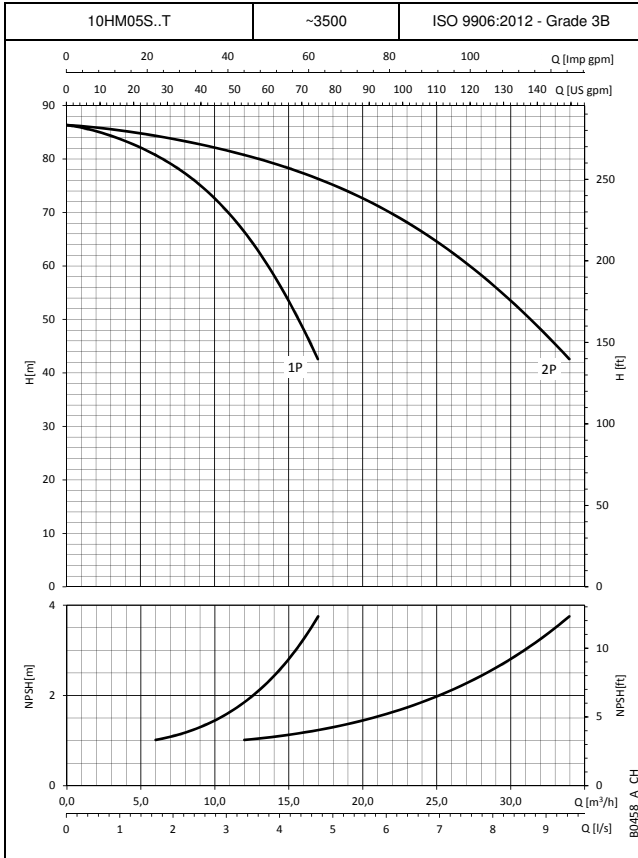
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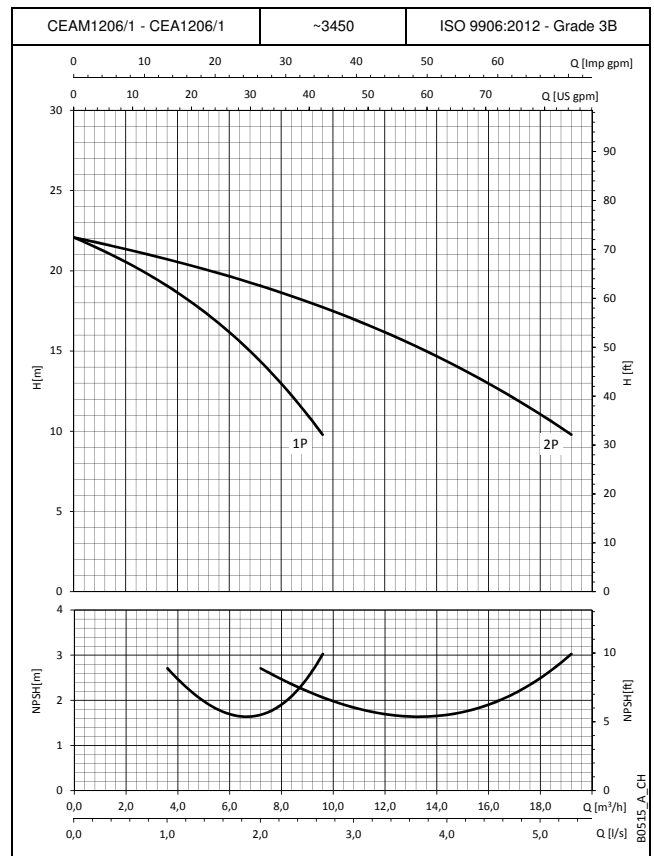
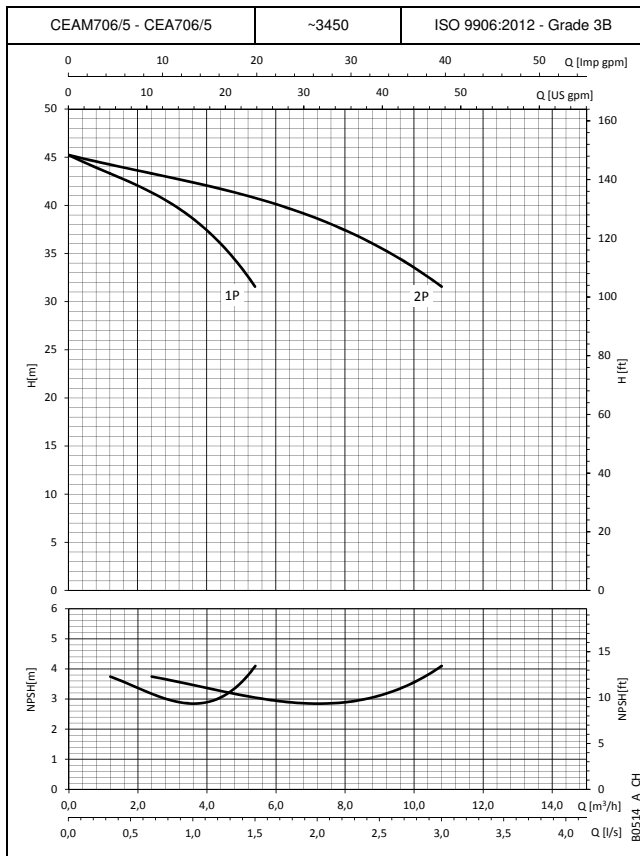
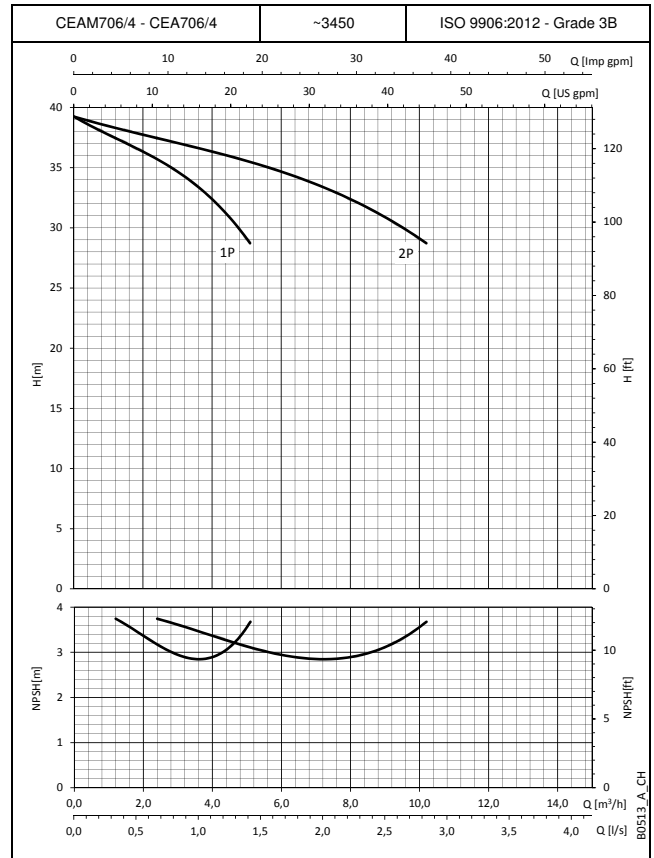
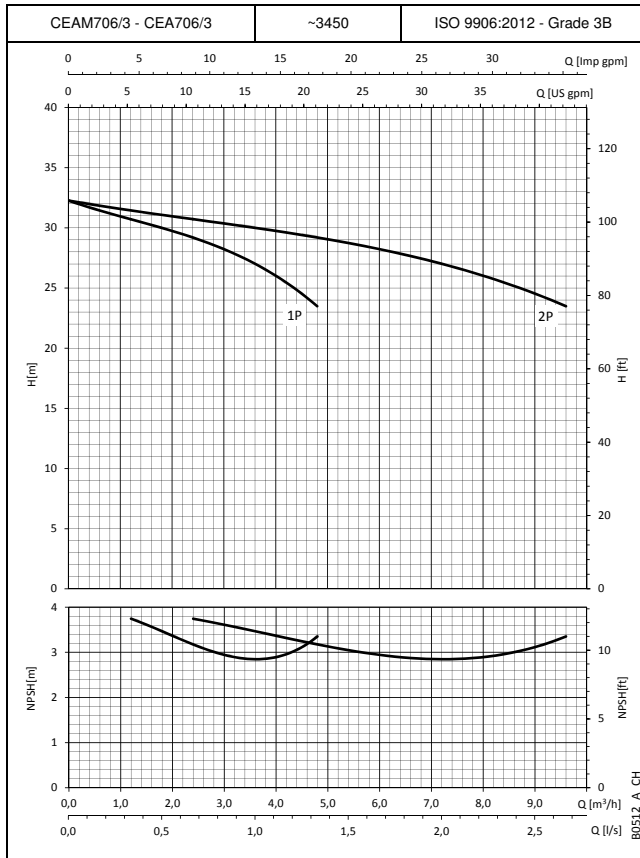
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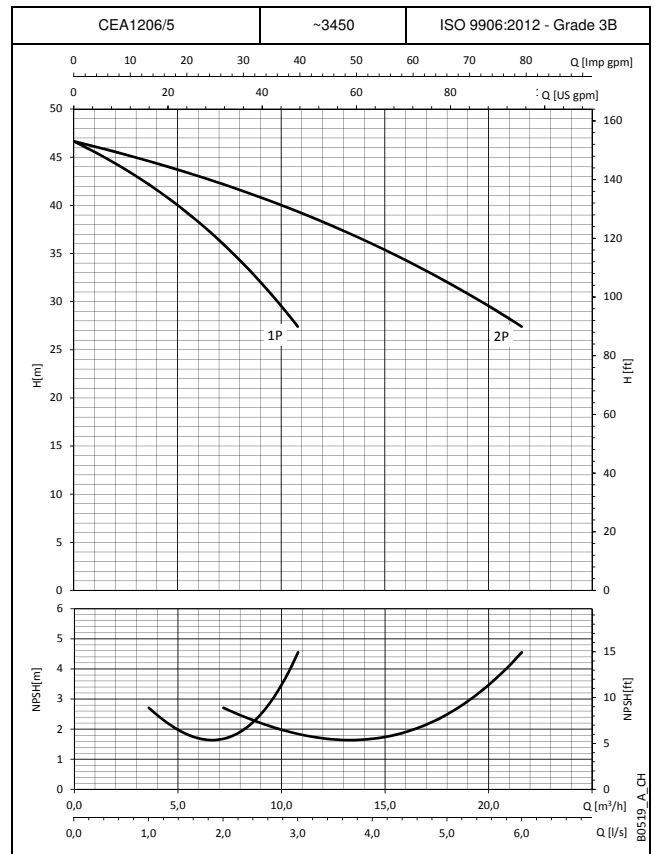
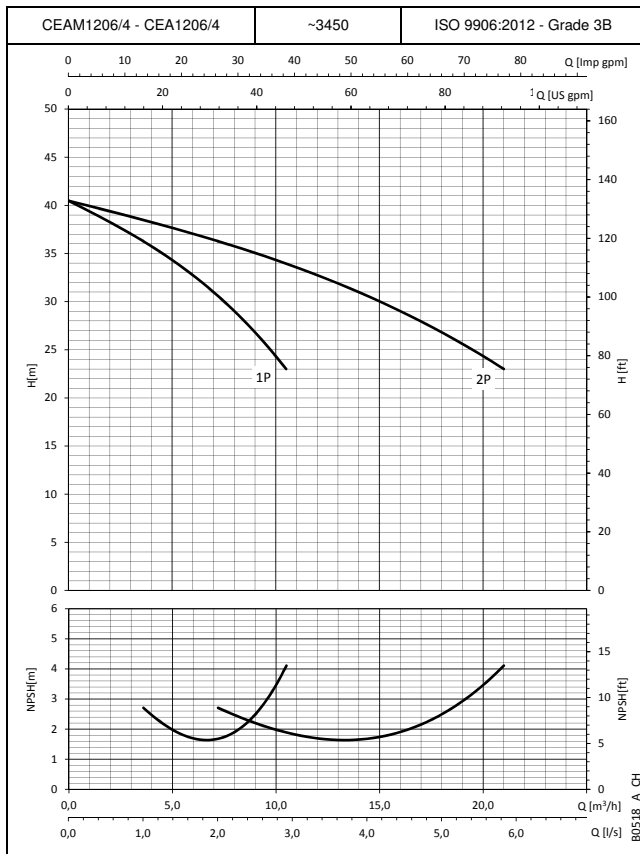
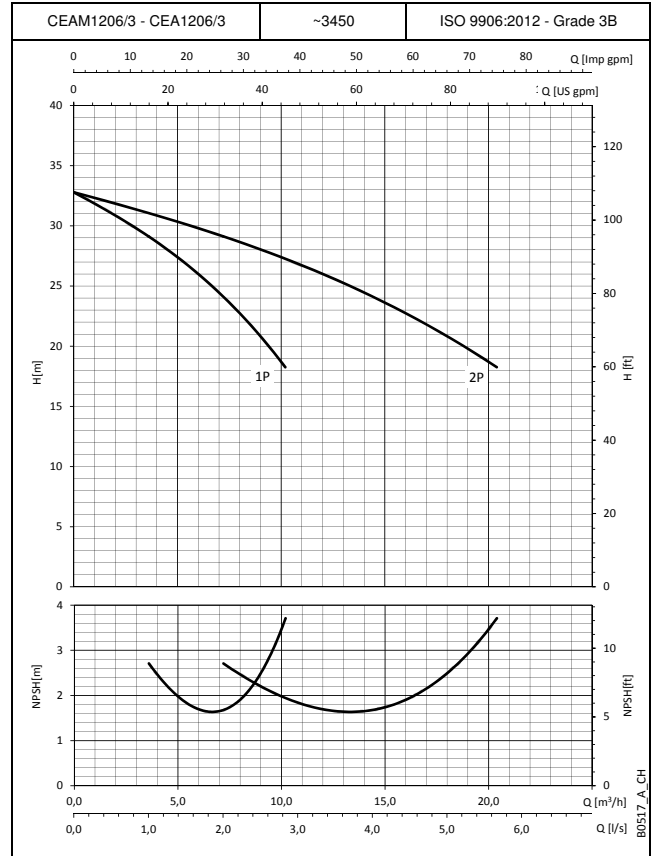
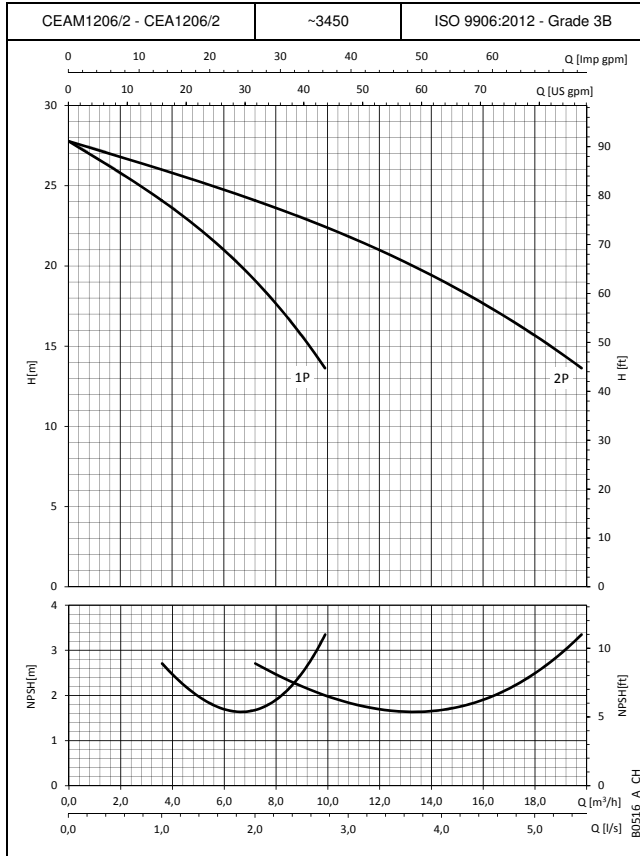
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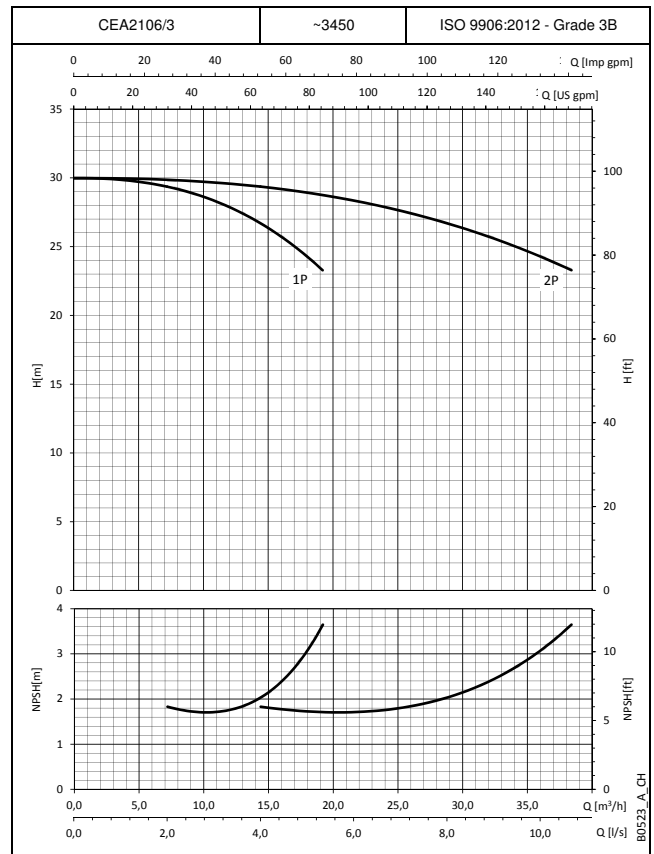
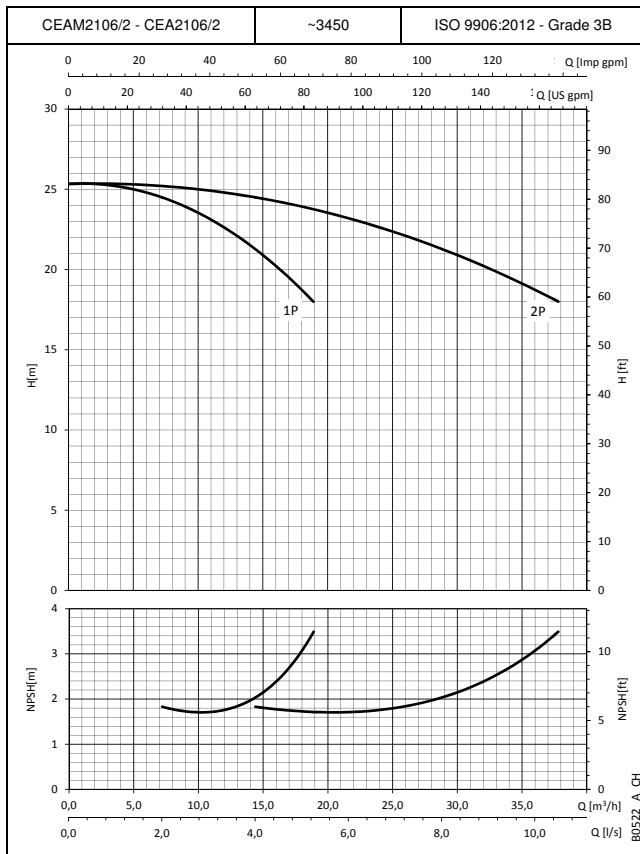
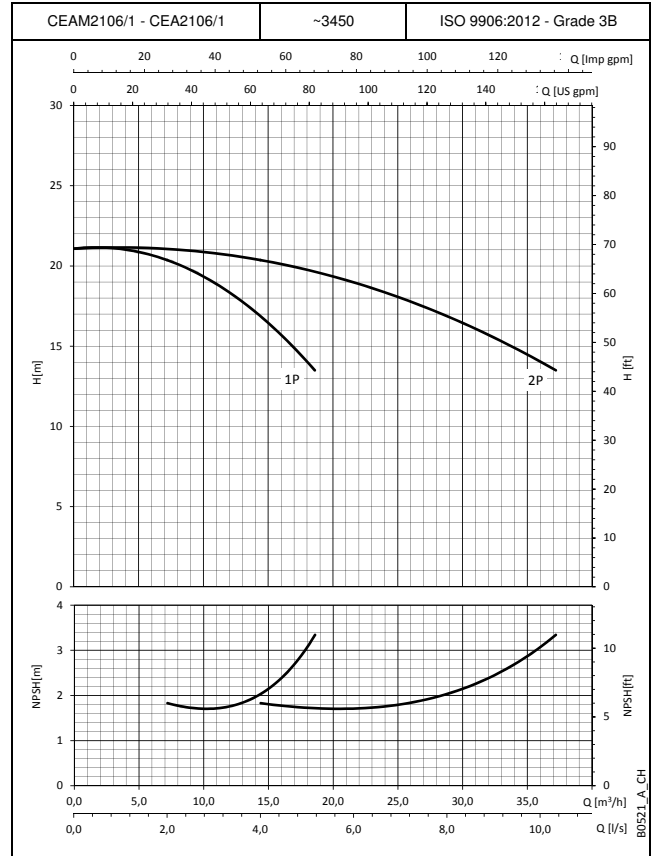
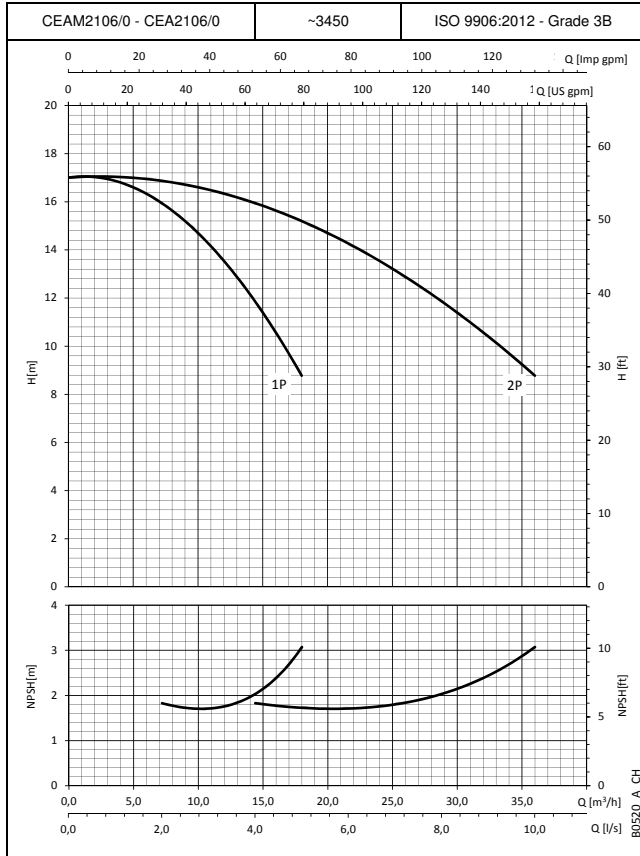
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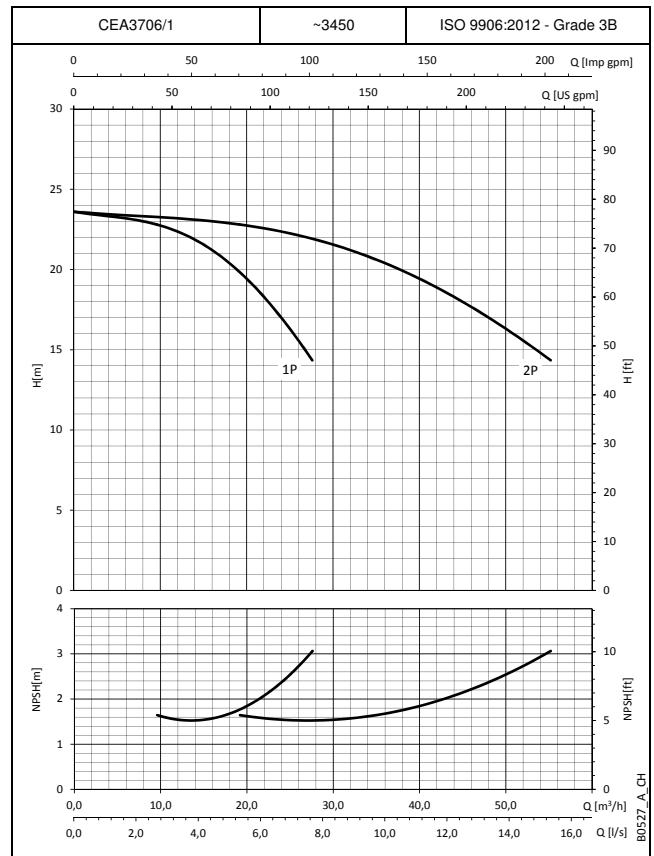
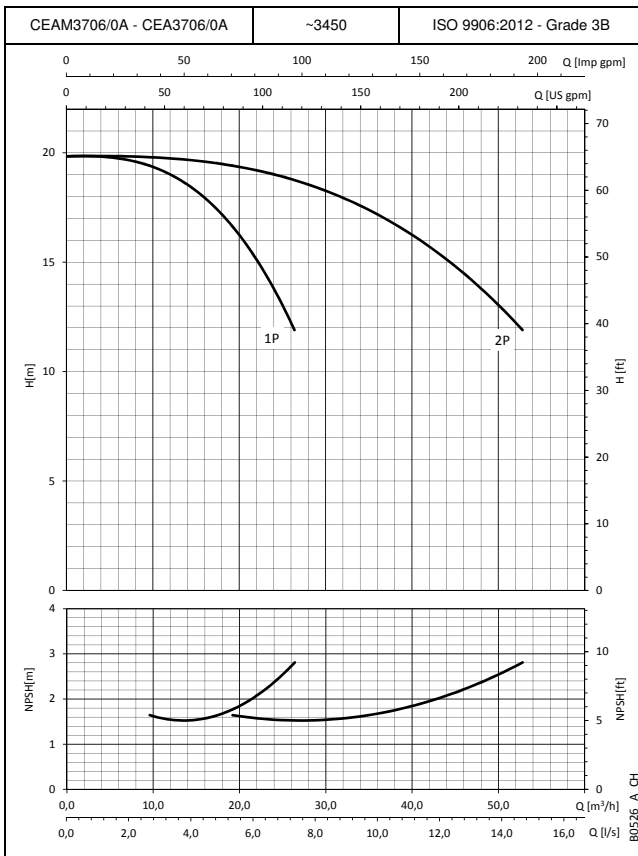
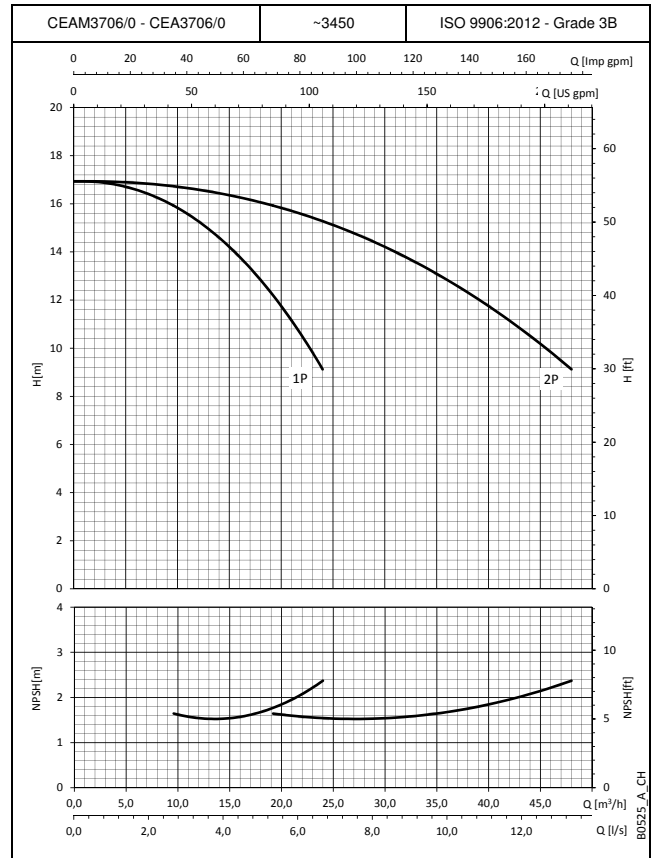
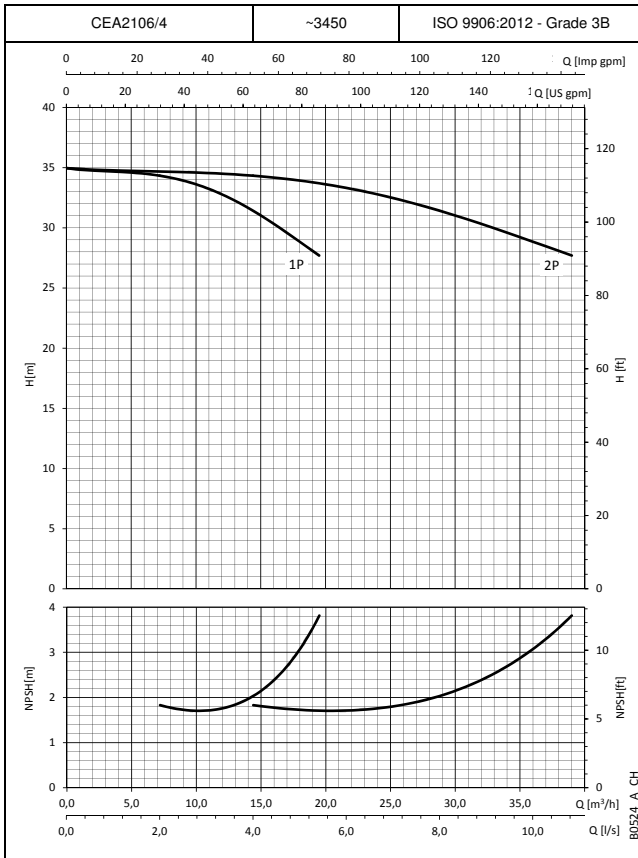
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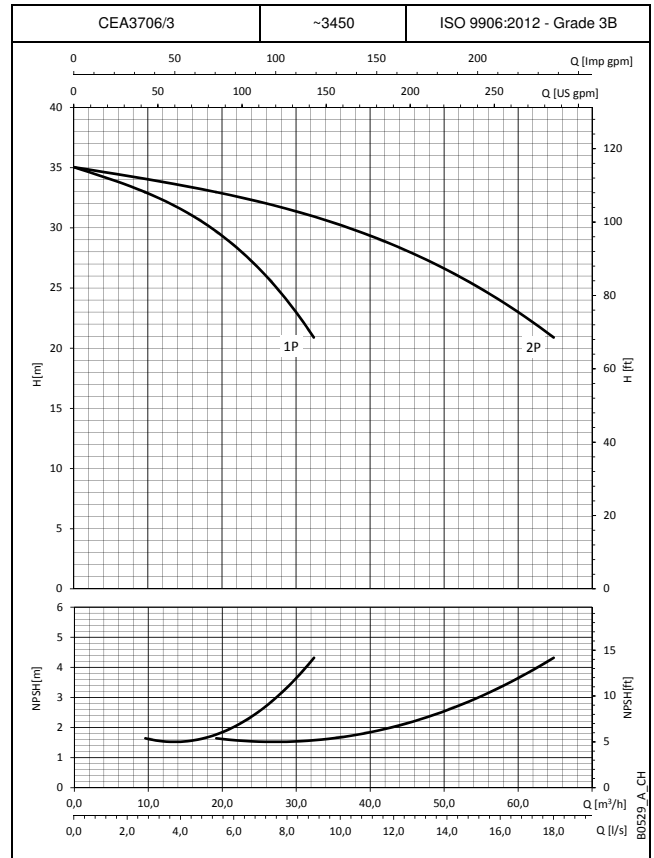
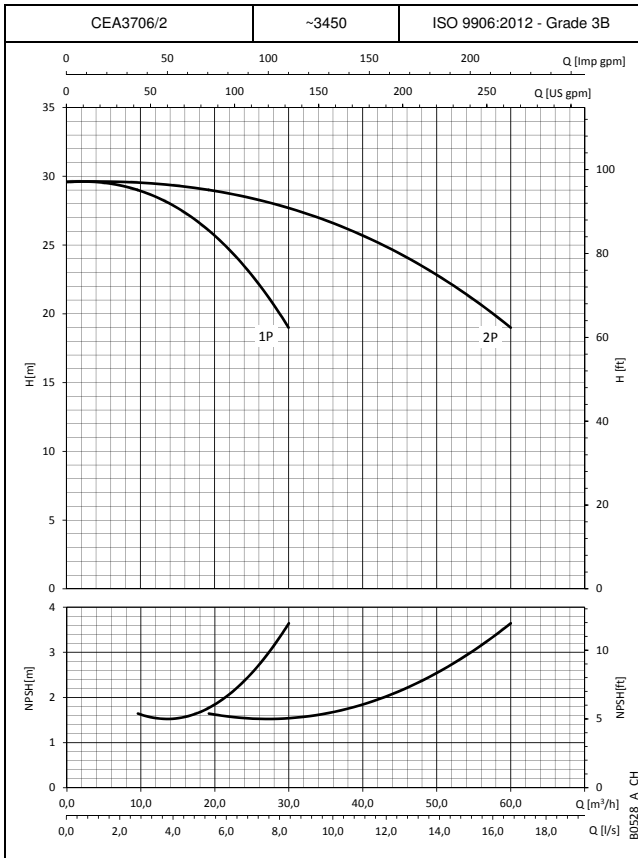
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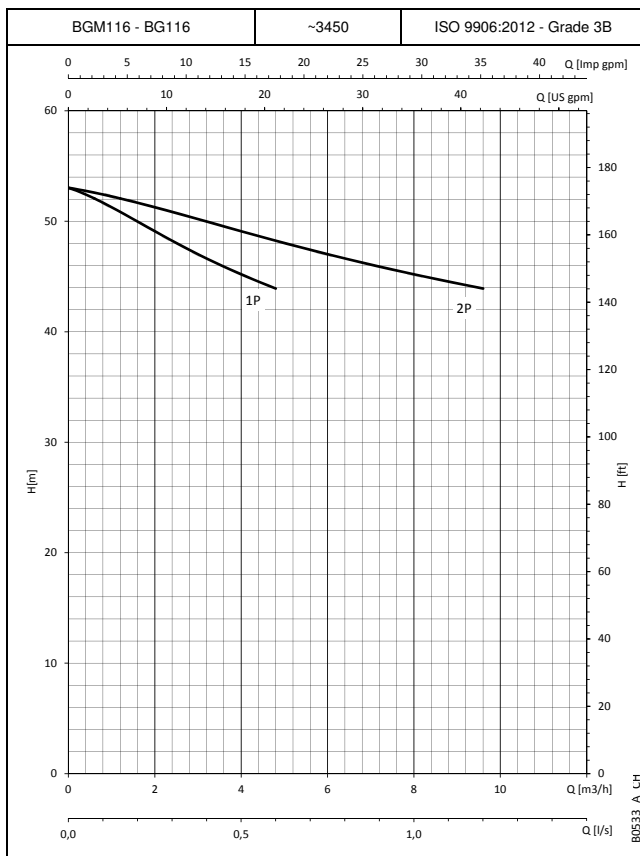
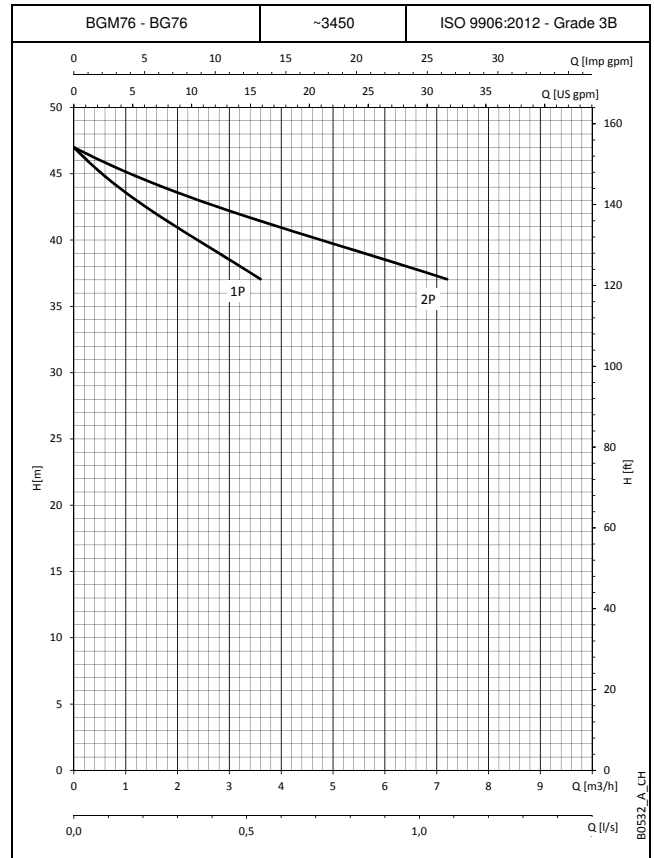
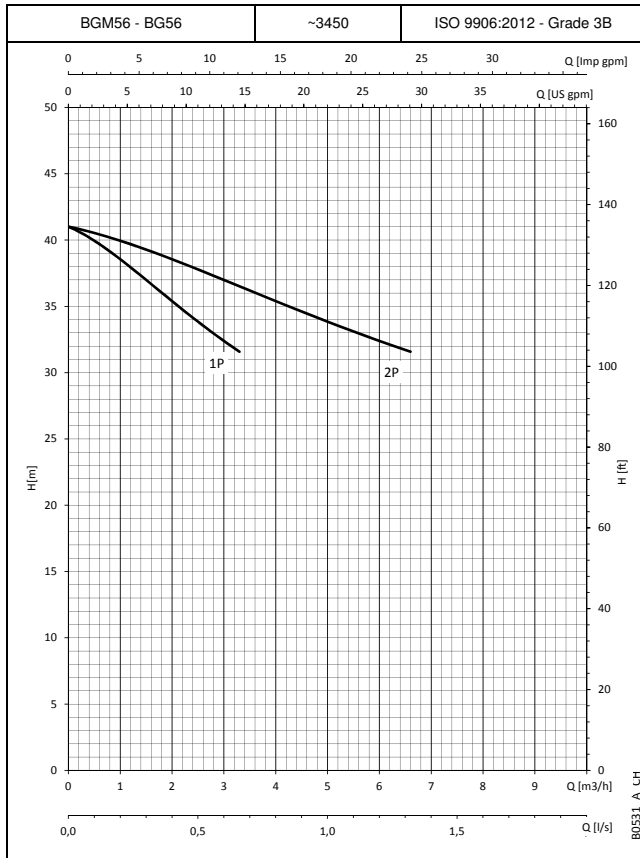
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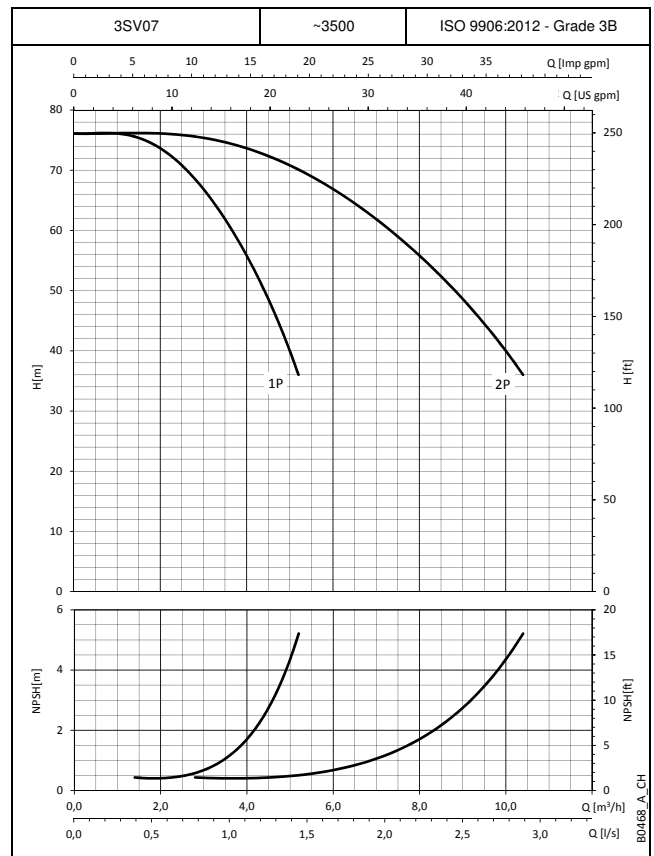
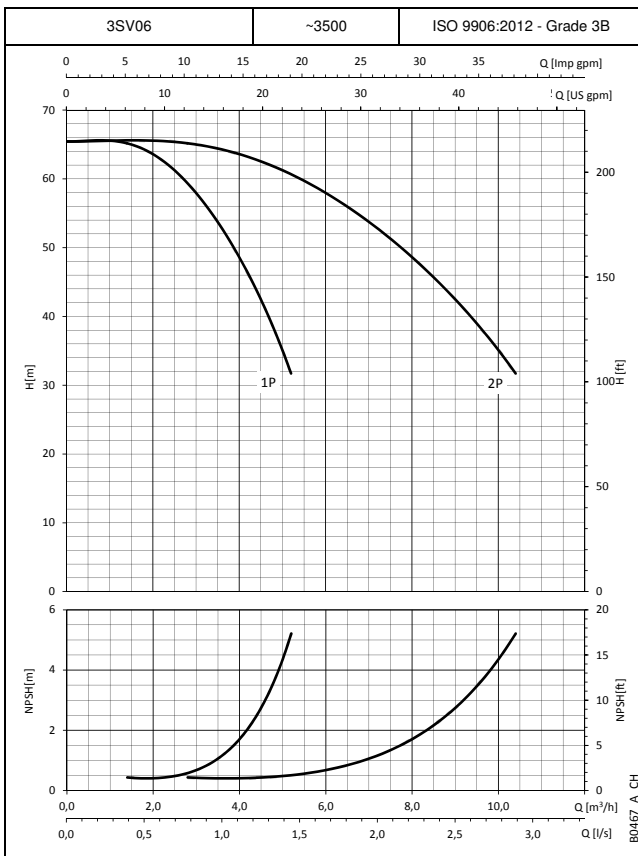
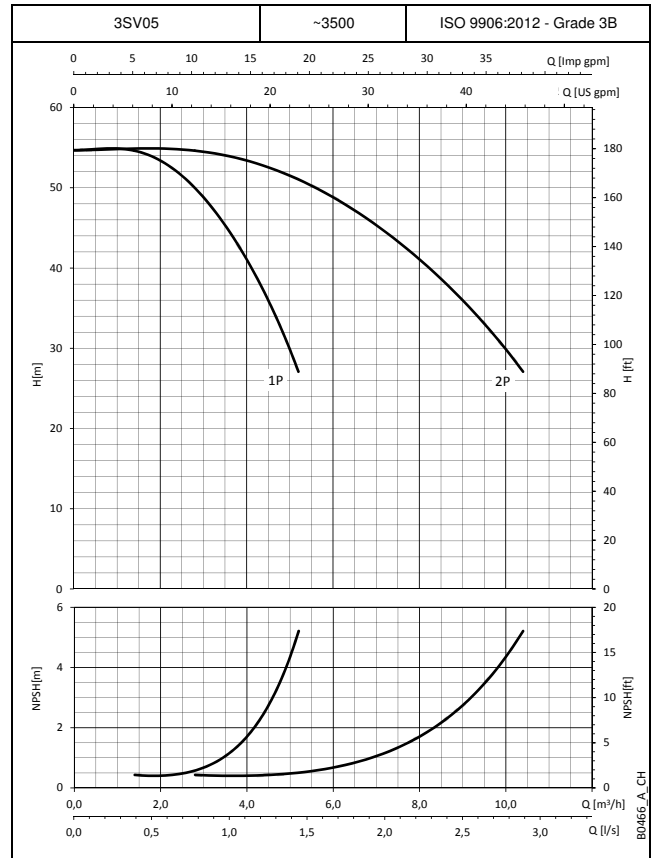
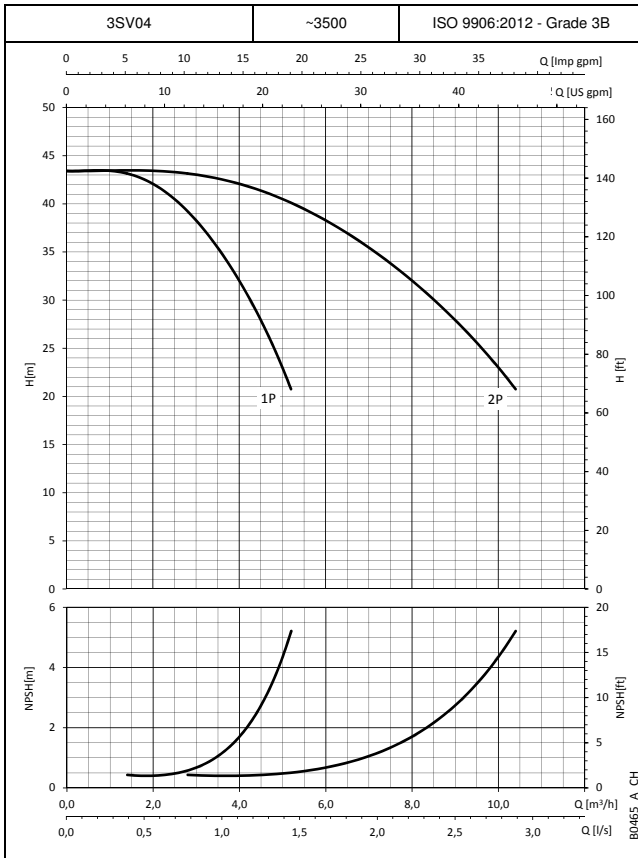
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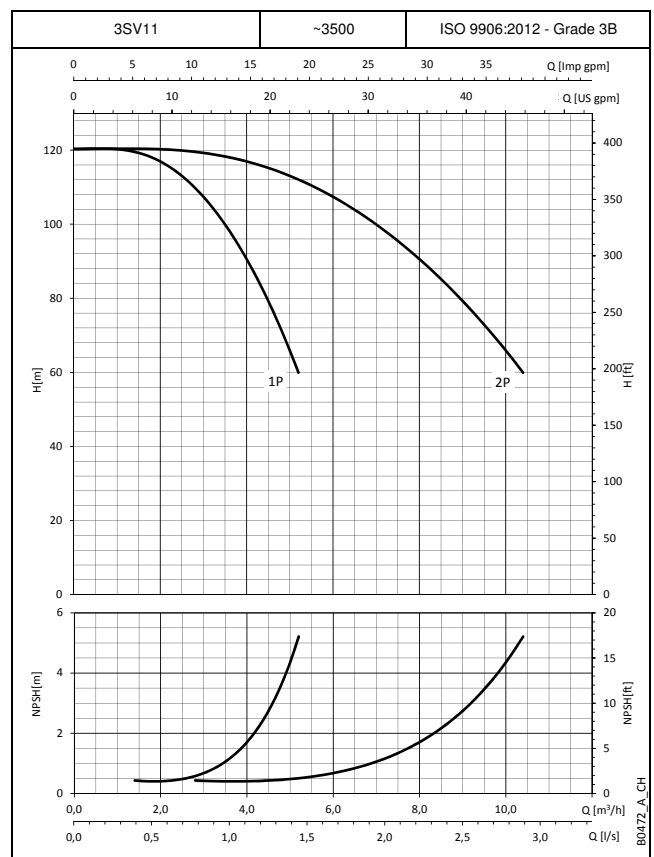
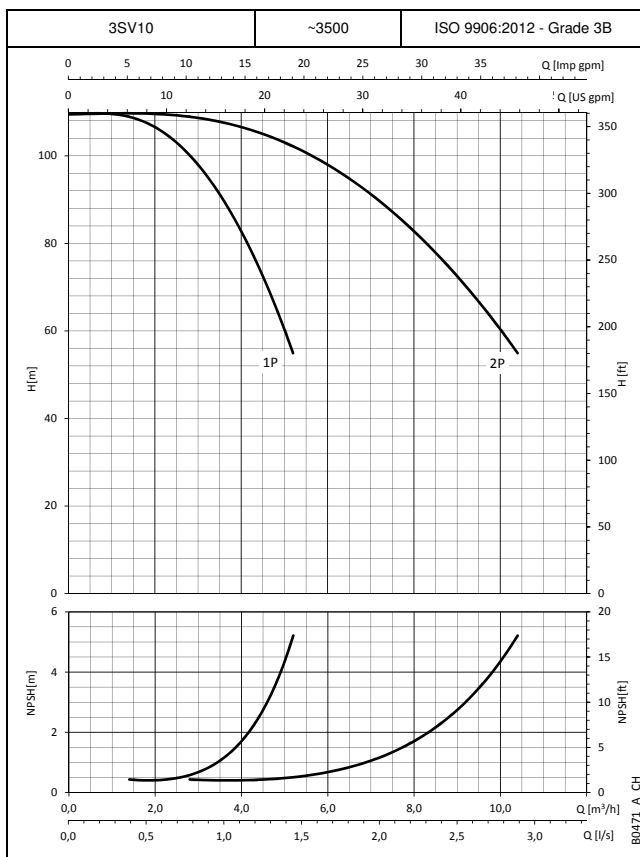
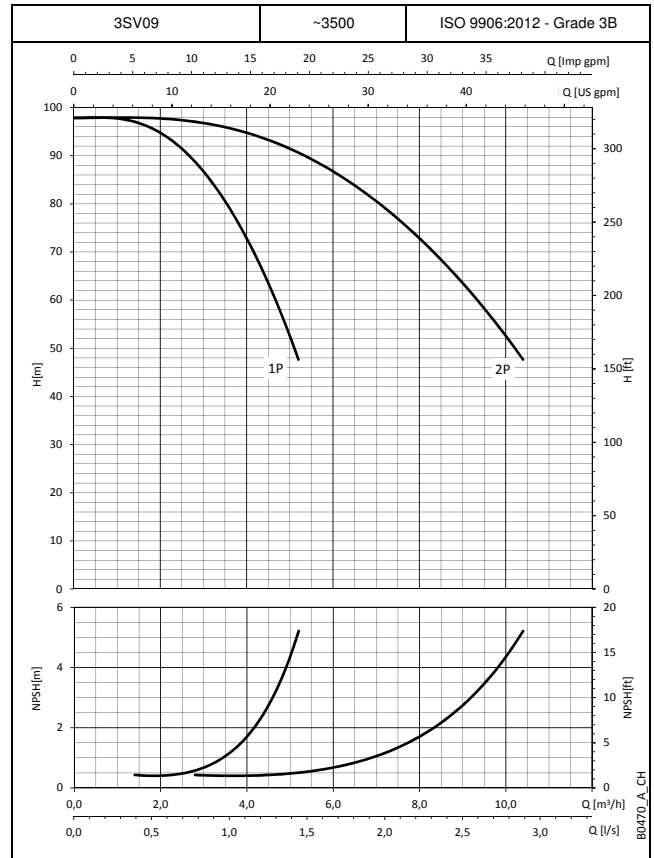
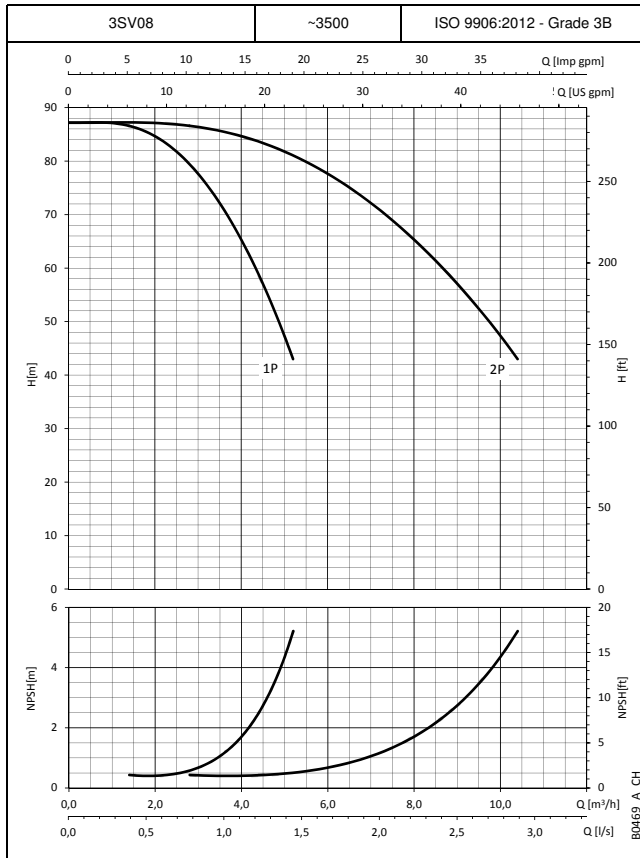
**BOOSTER SETS GX5 AND GMD SERIES
 OPERATING CHARACTERISTICS AT 60 Hz**



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CURVES

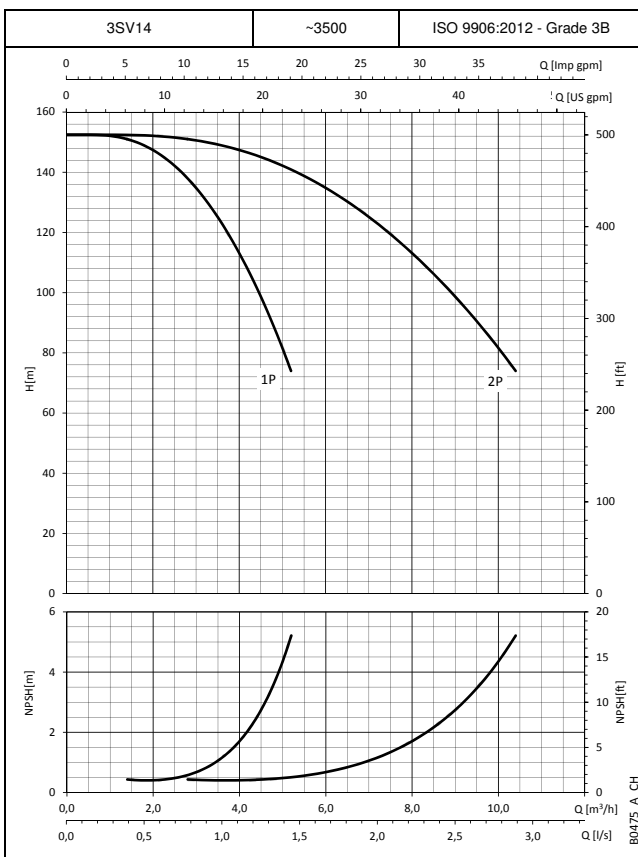
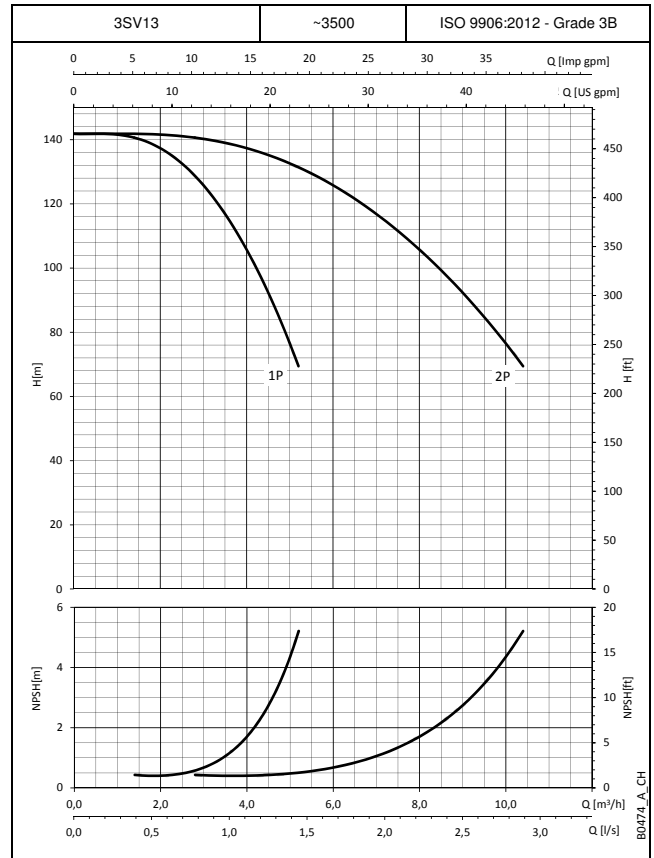
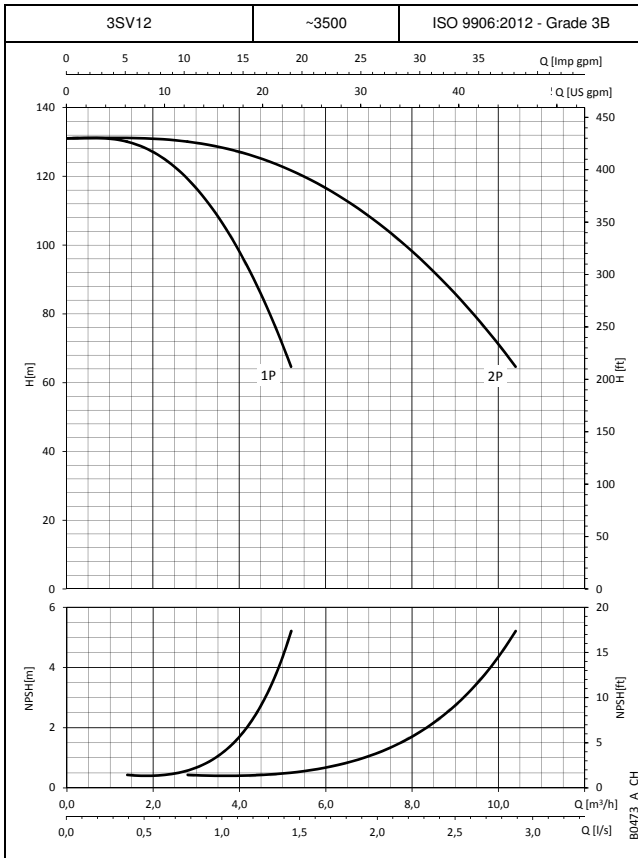
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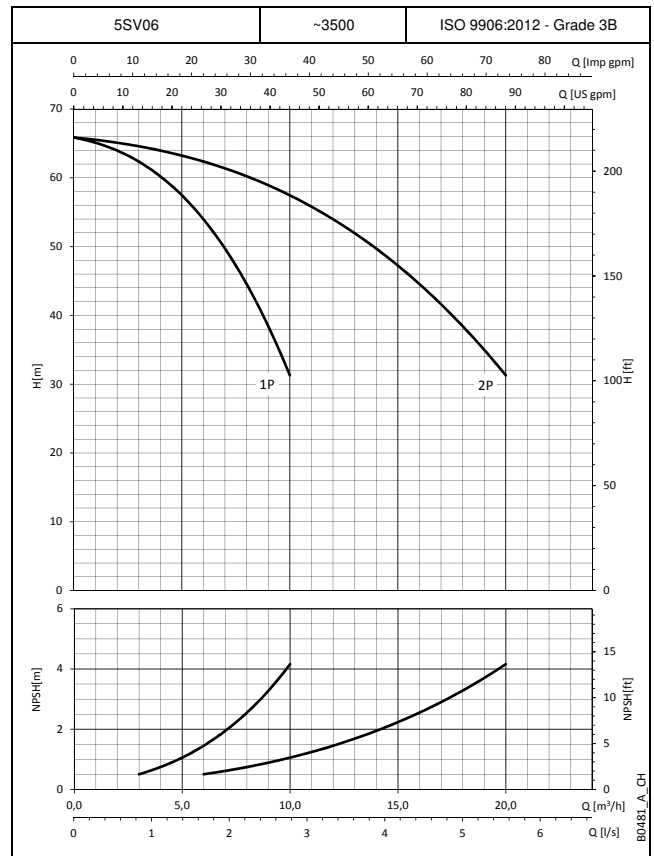
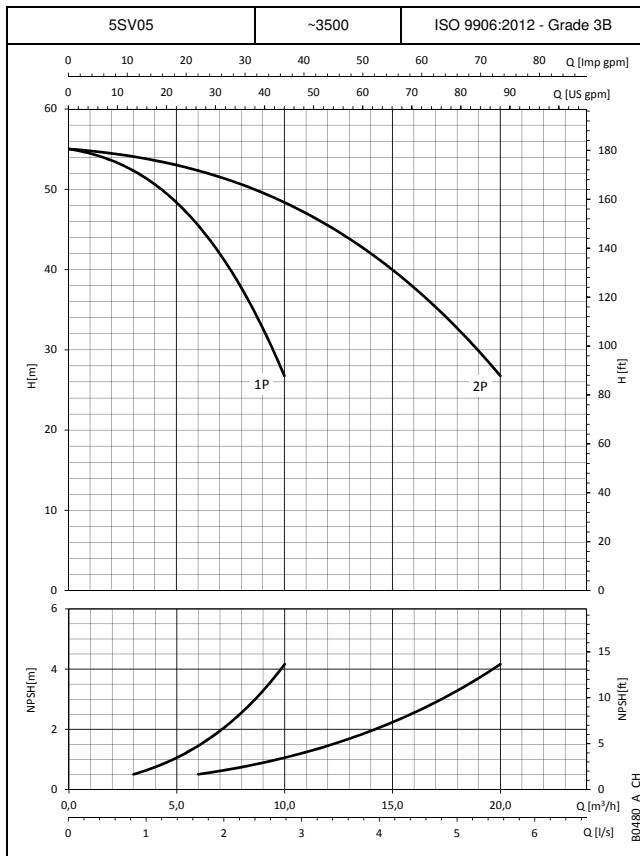
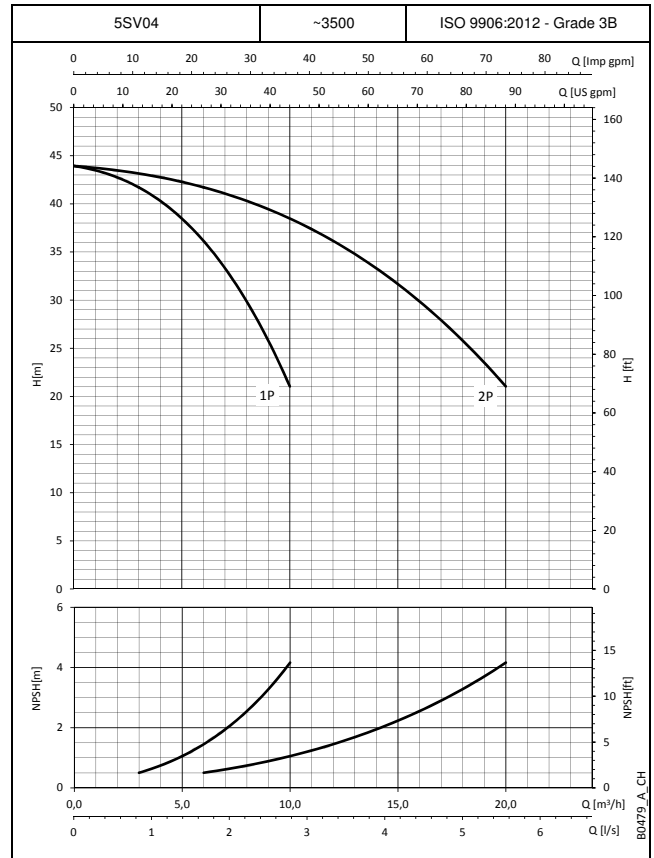
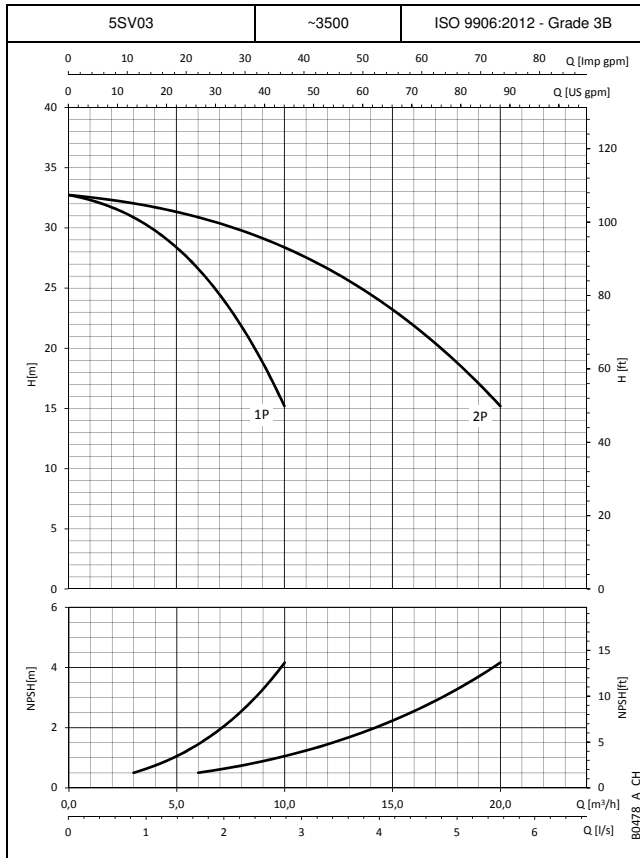
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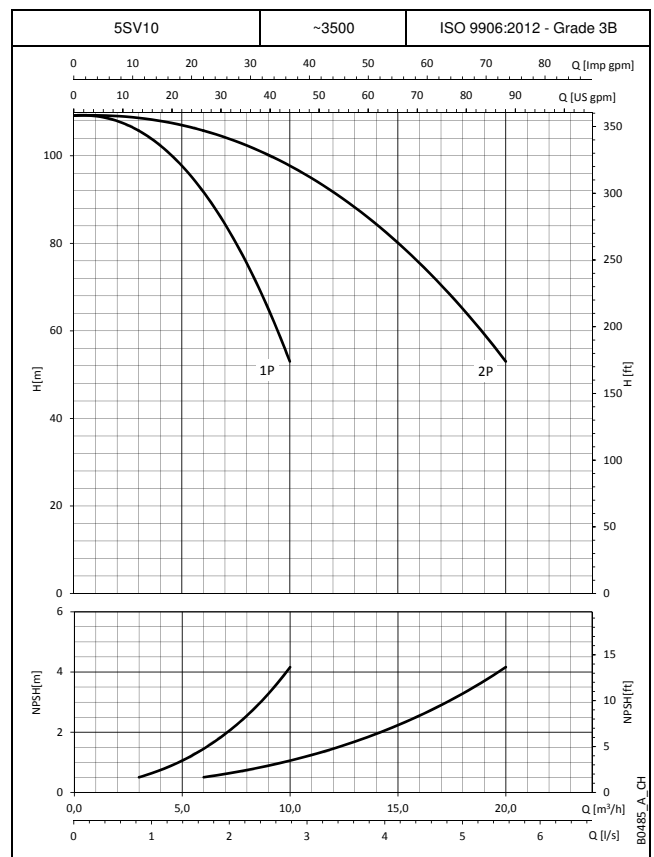
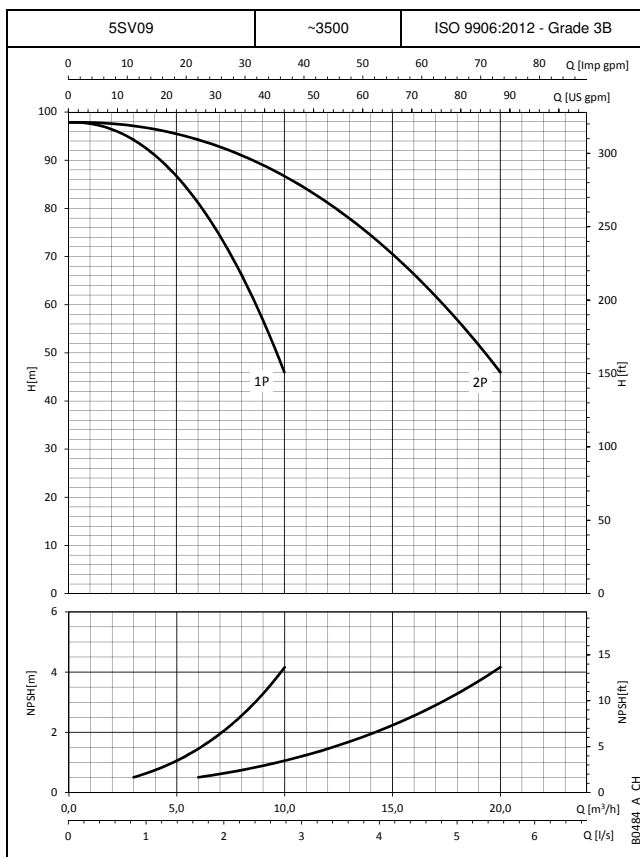
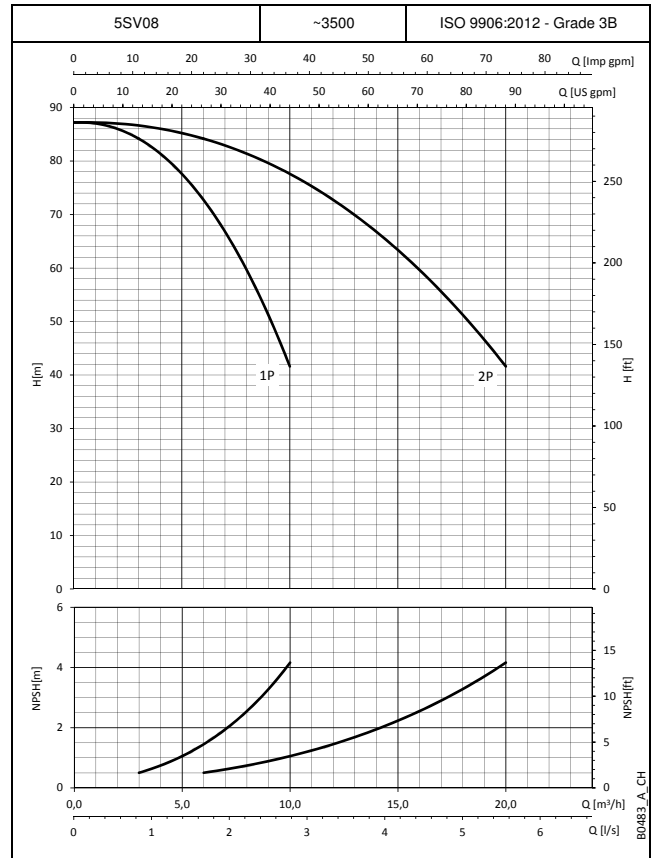
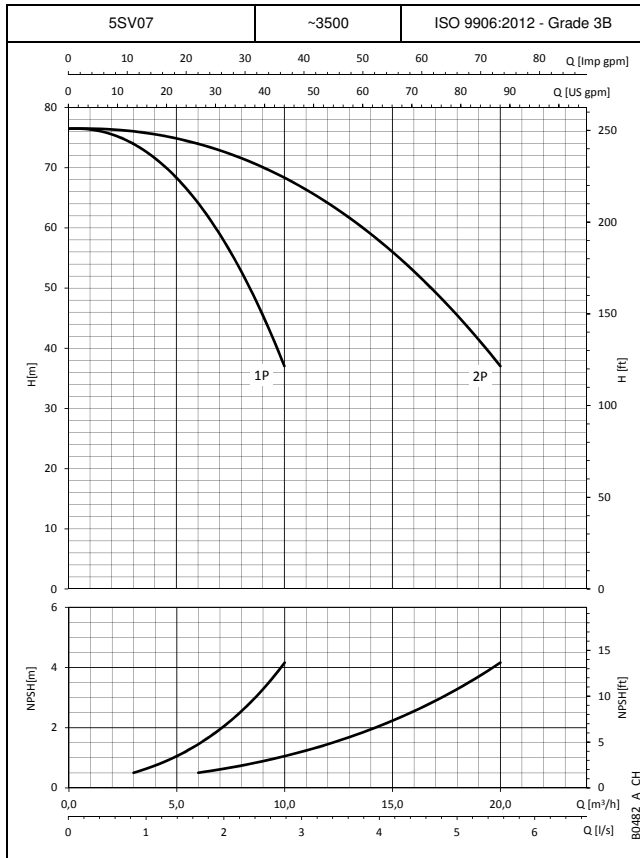
**BOOSTER SETS GX5 AND GMD SERIES
 OPERATING CHARACTERISTICS AT 60 Hz**



CURVES

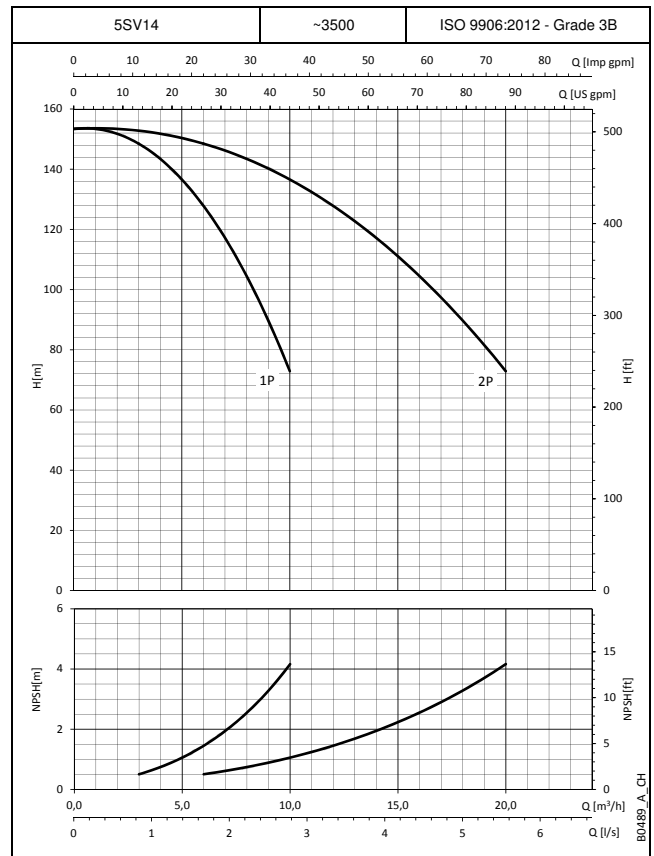
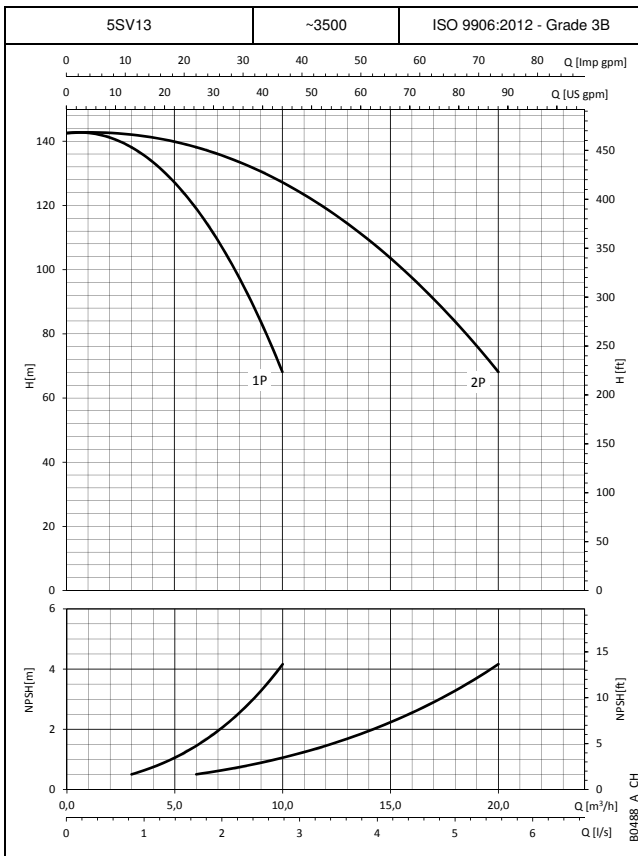
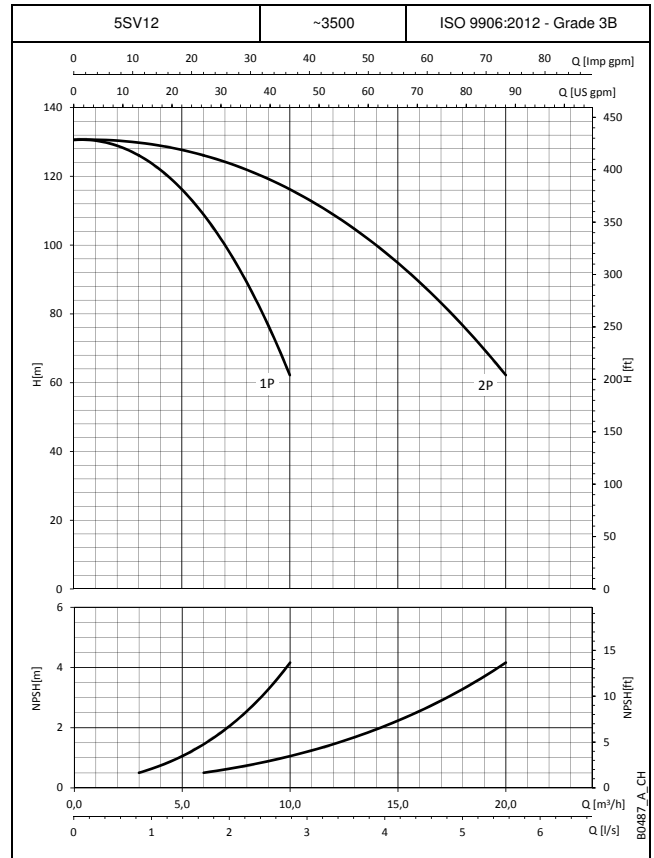
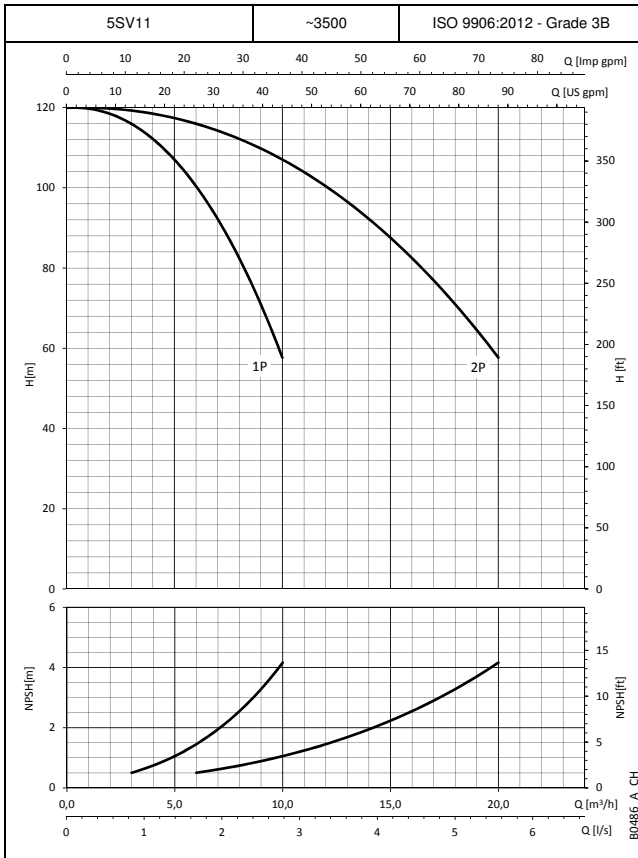
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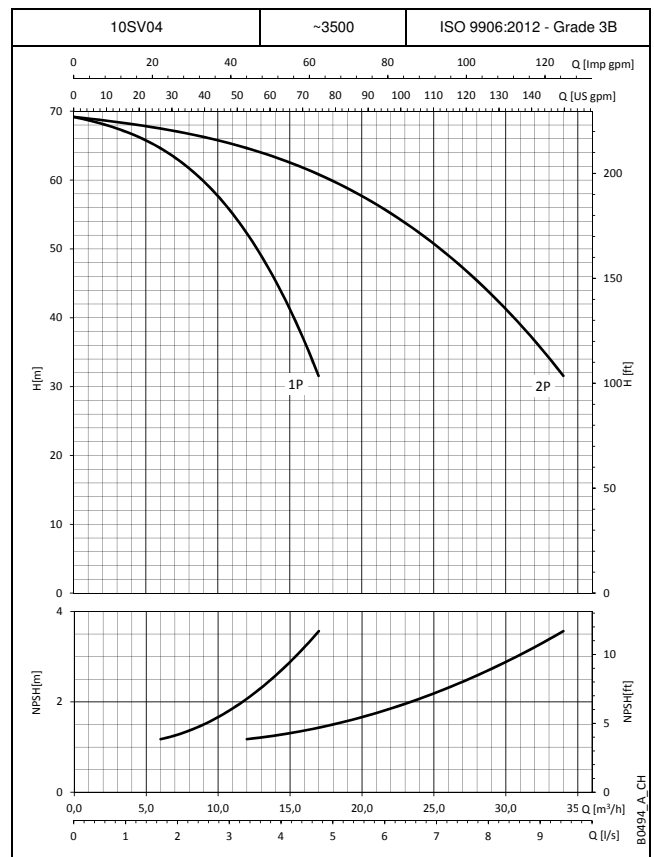
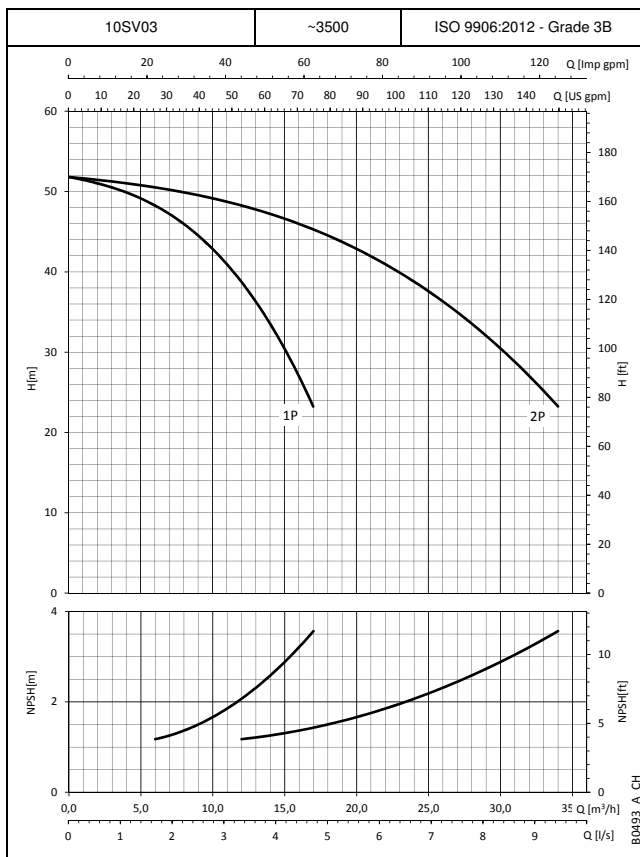
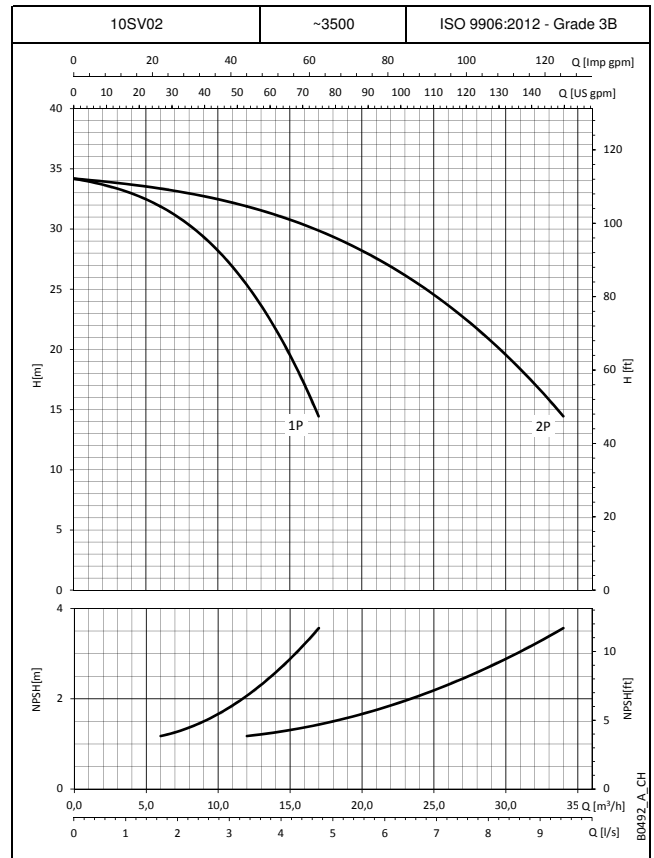
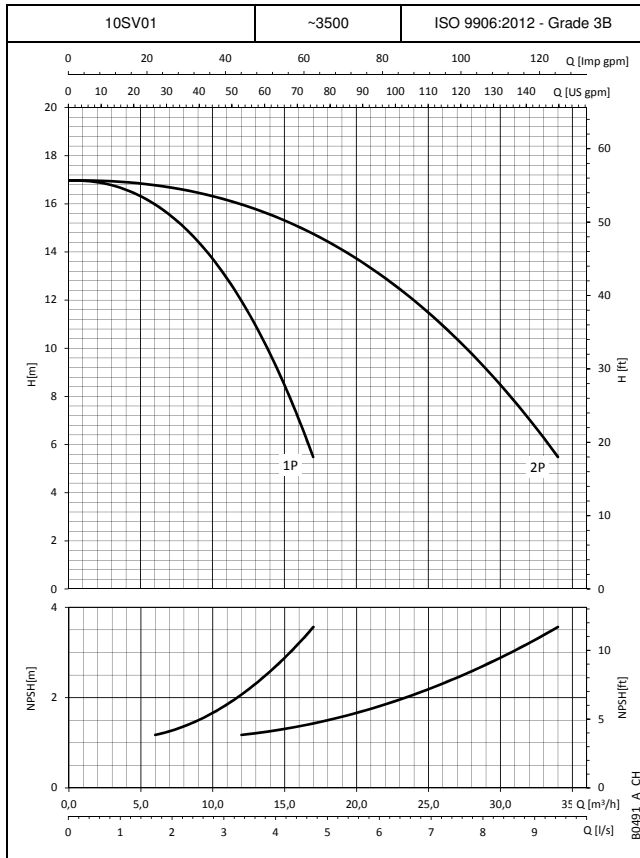
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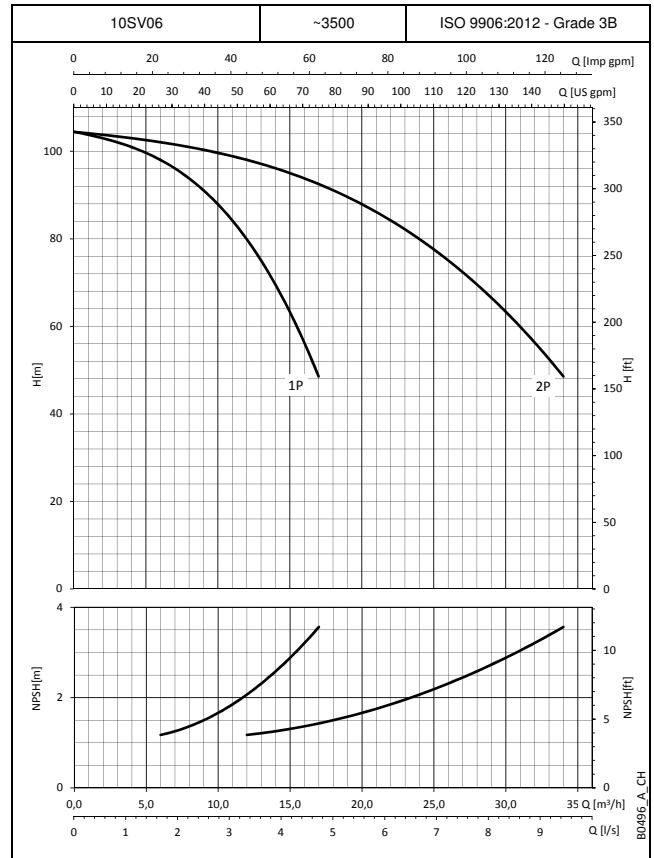
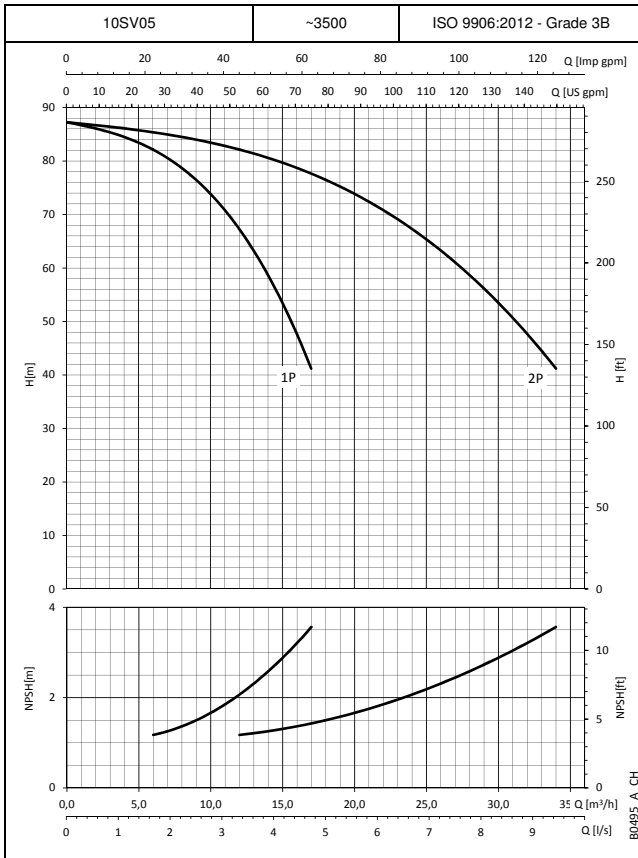
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OPERATING CHARACTERISTICS AT 60 Hz



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CURVES

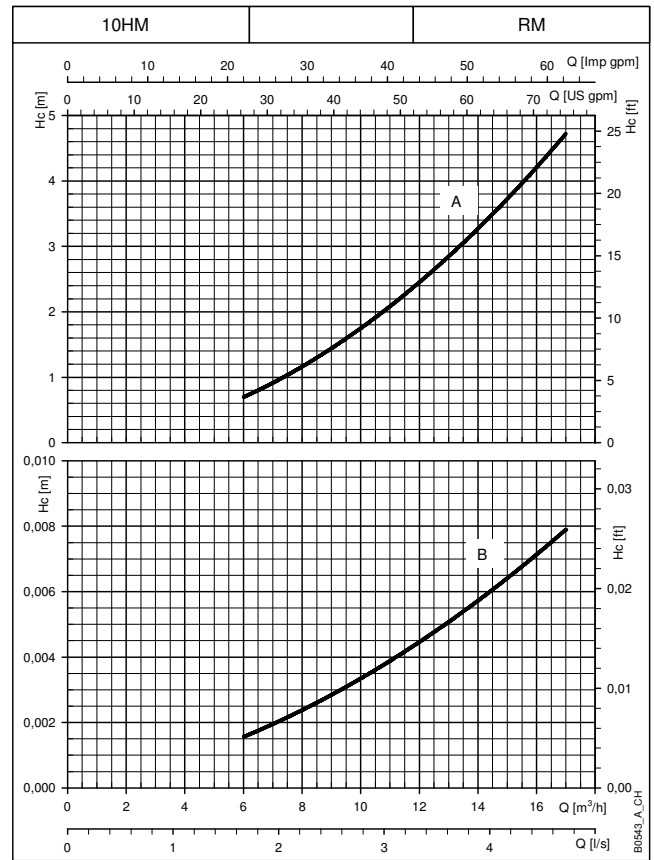
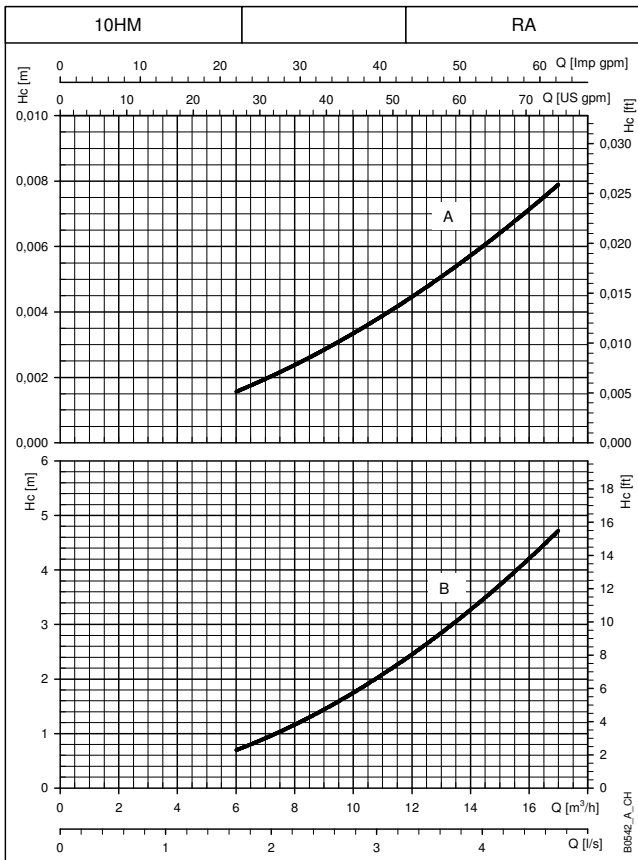
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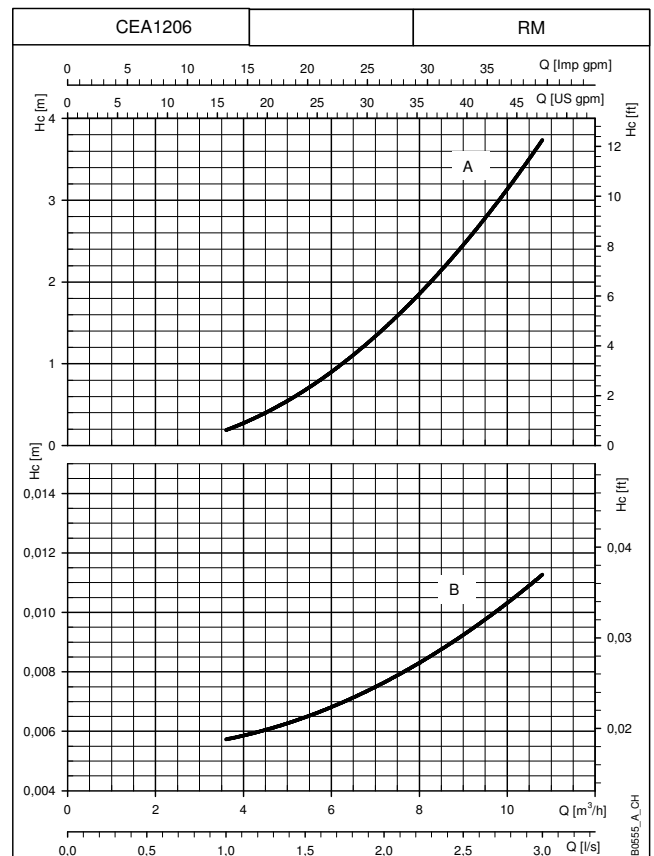
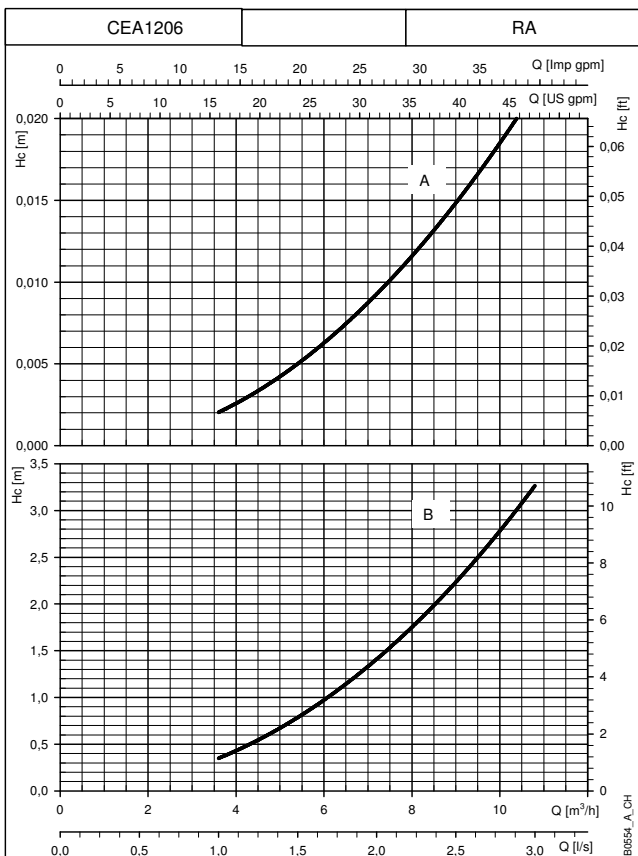
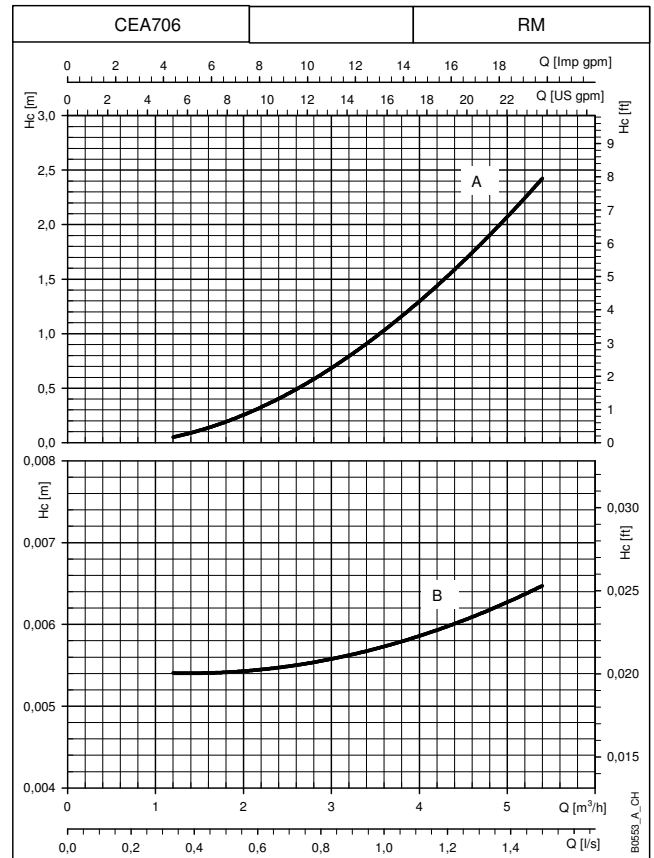
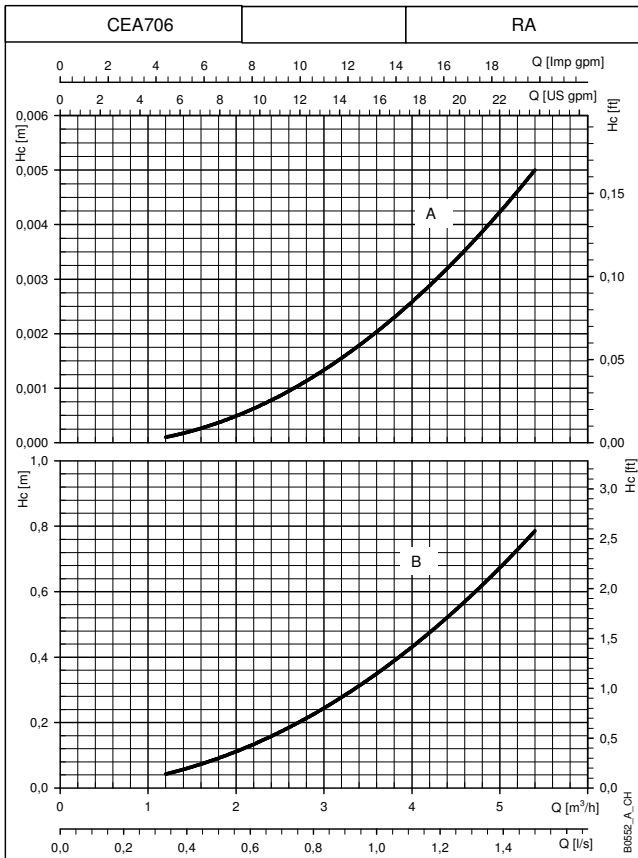
BOOSTER SETS GX5 AND GMD SERIES
H_c PRESSURE DROP CURVE



CURVES

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 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.

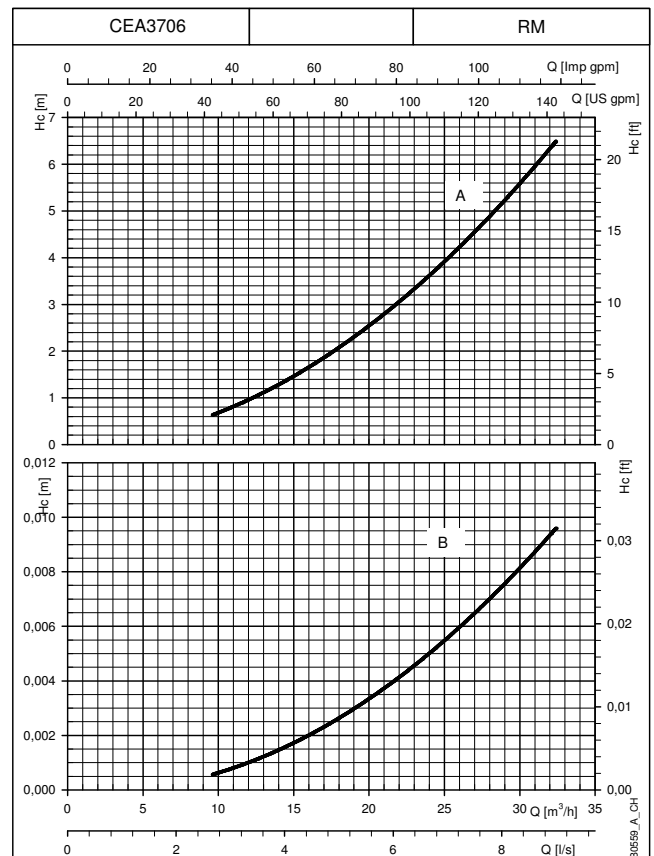
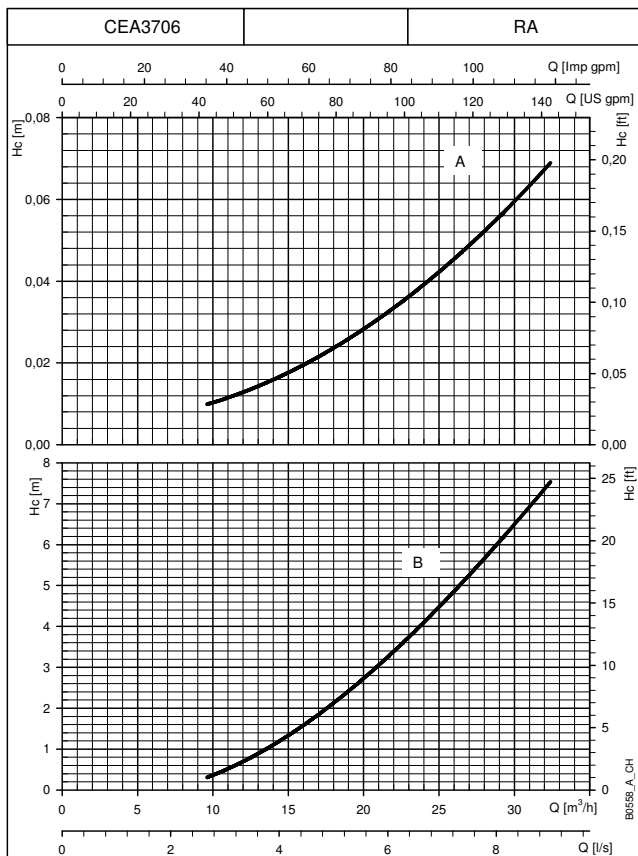
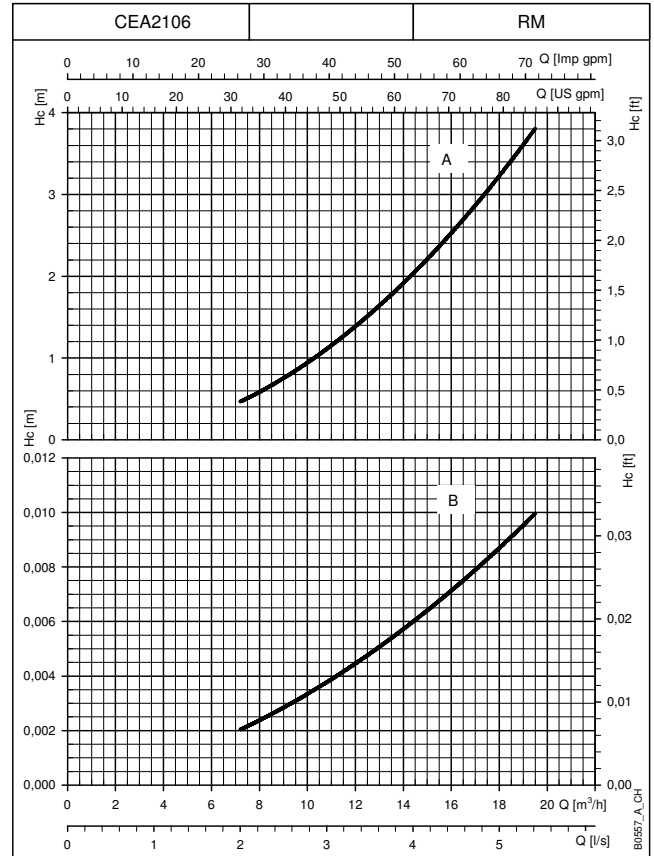
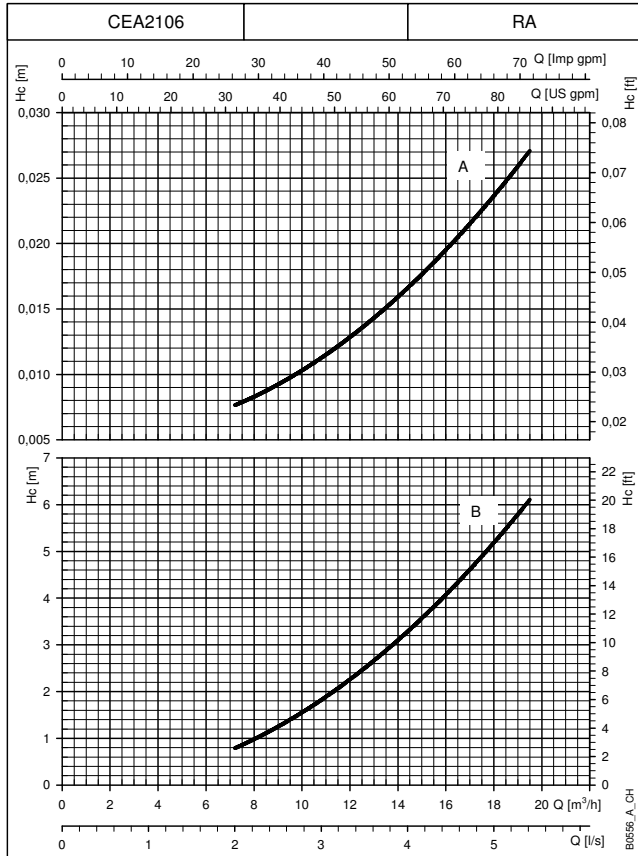
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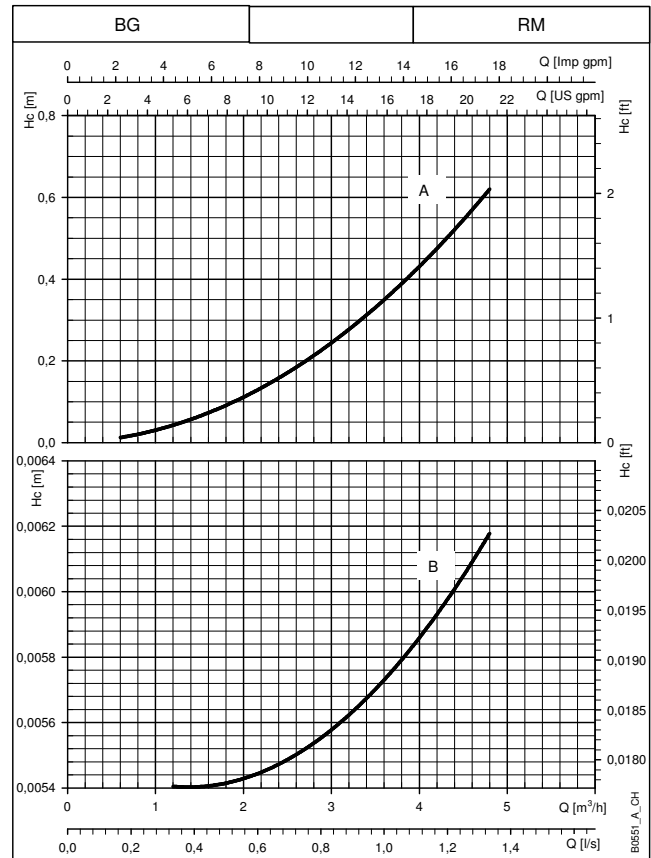
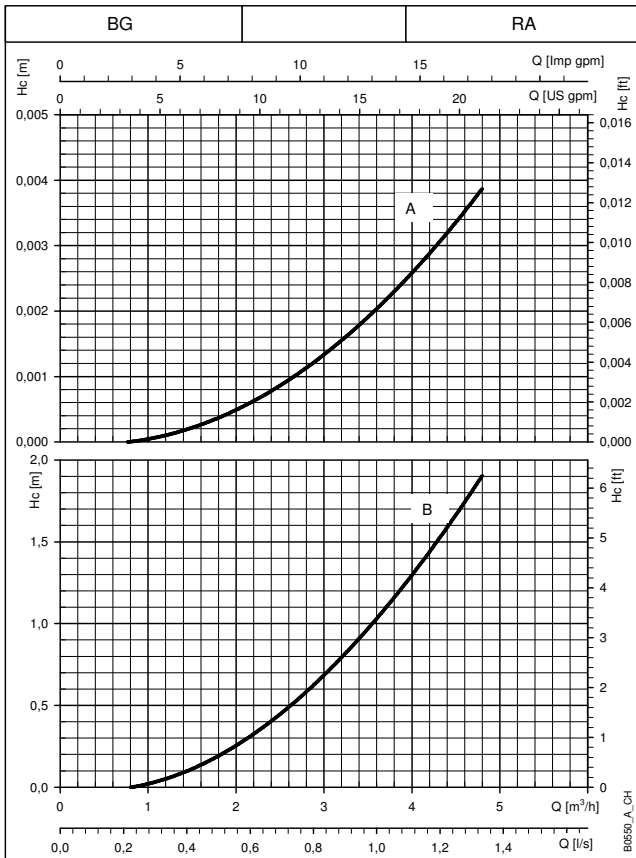
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H_c PRESSURE DROP CURVE



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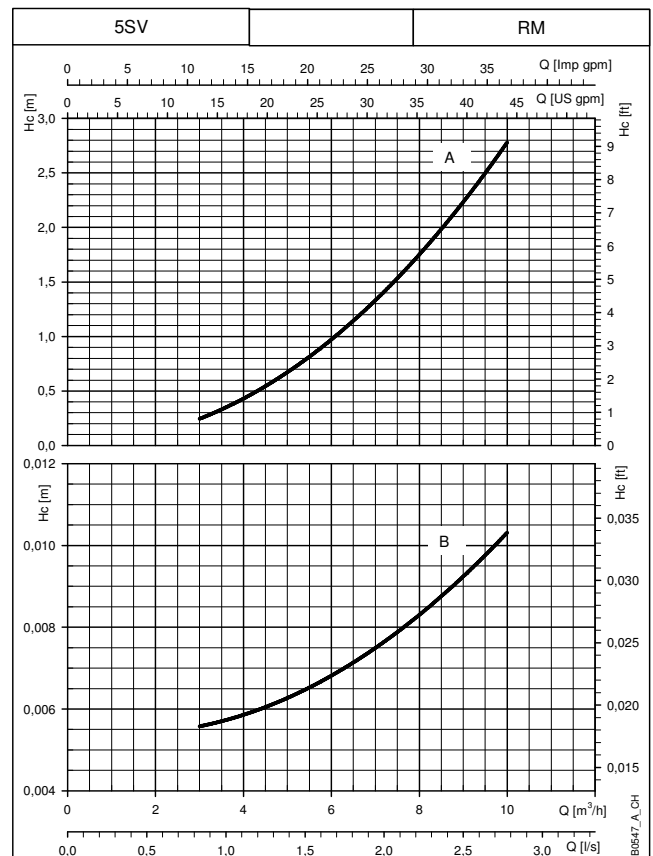
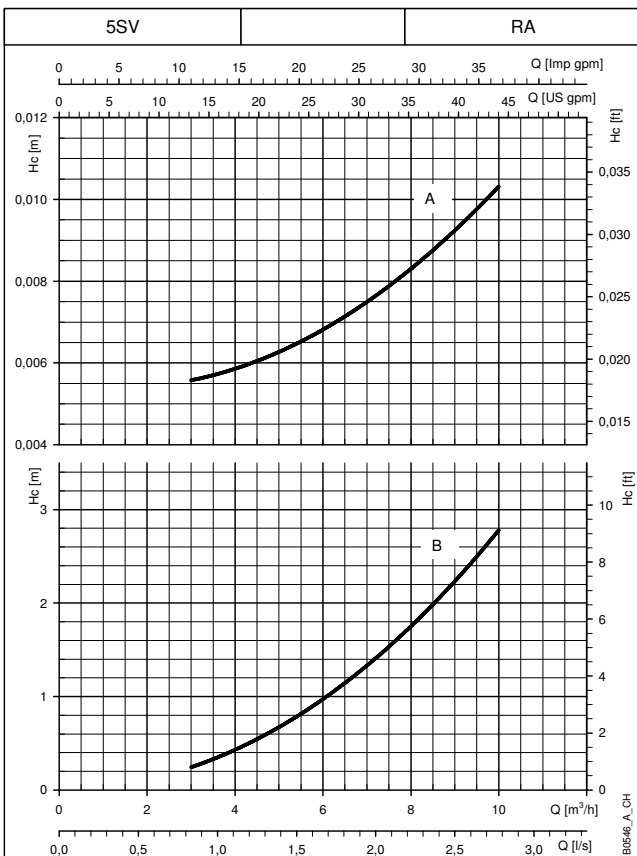
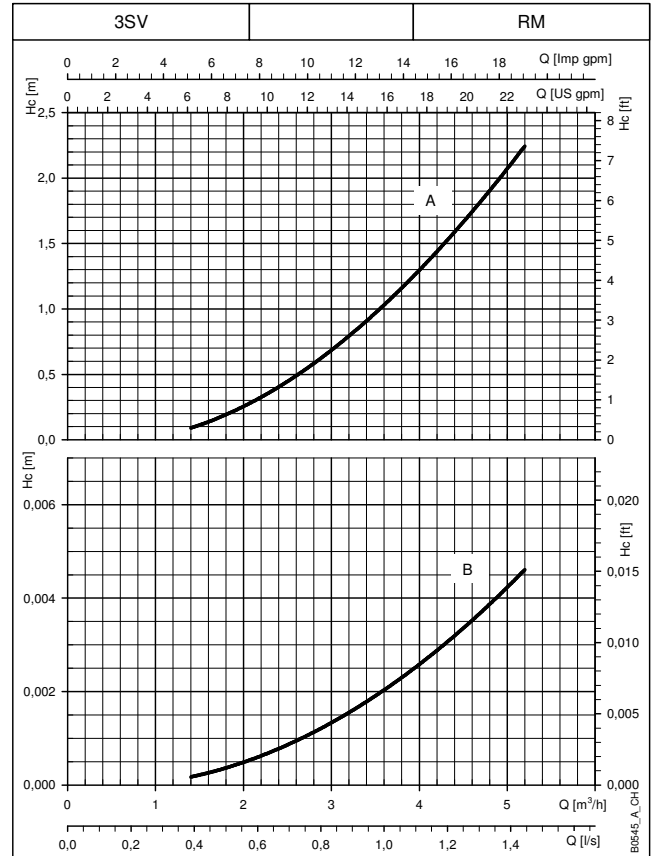
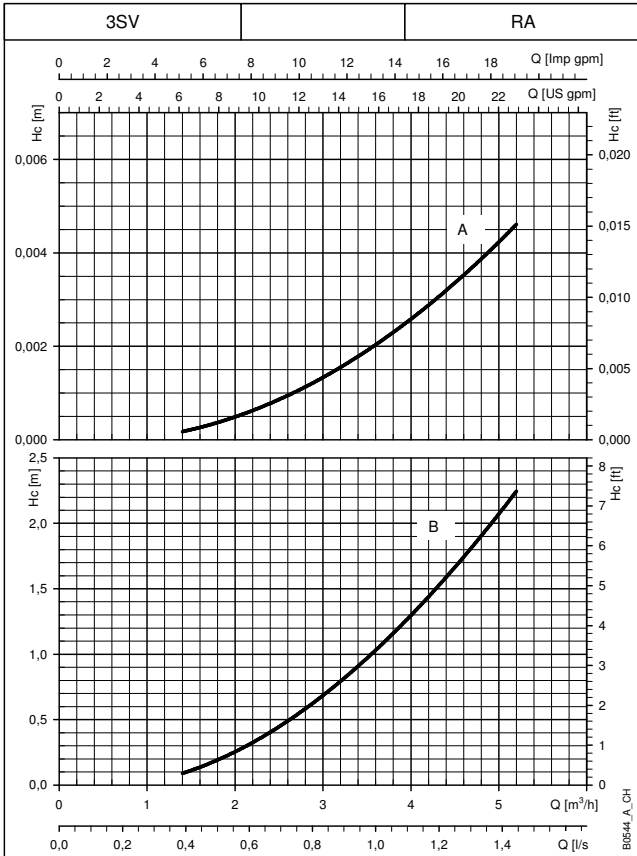
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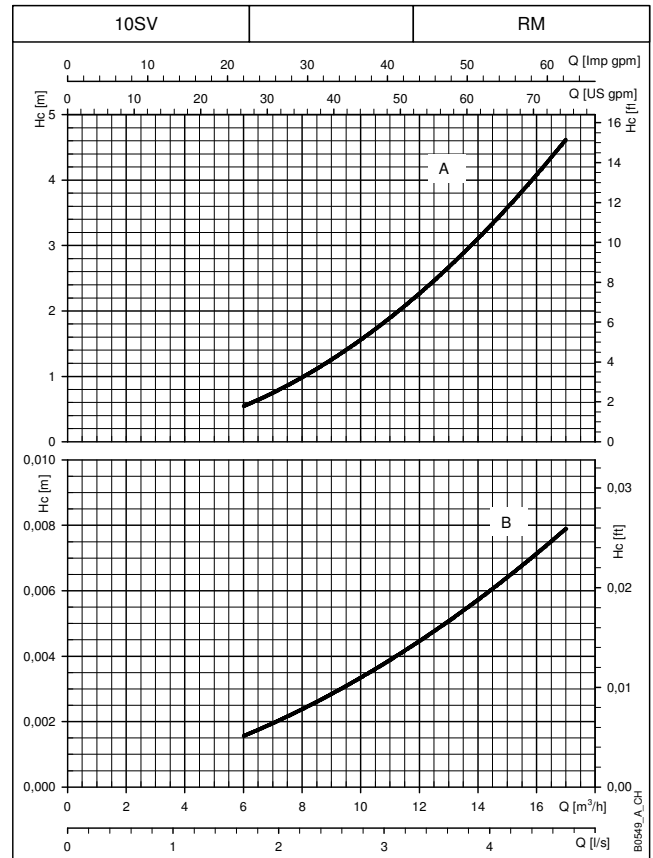
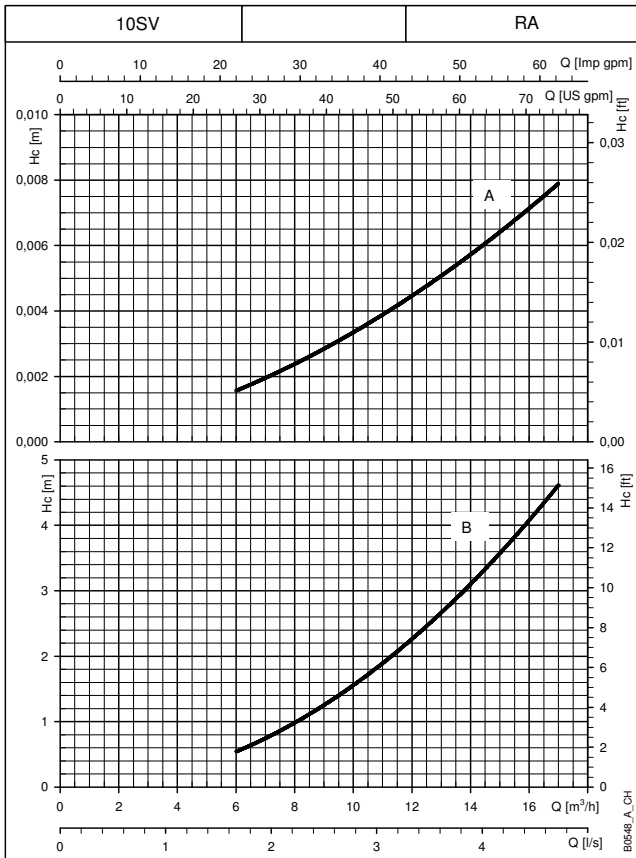
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CURVES

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H_c PRESSURE DROP CURVE



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ACCESSORIES

EXPANSION VESSELS

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.

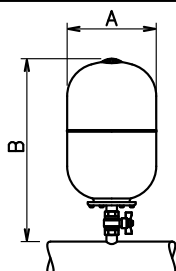
Any large size vessels can be connected to the unused end of the delivery manifold. For proper sizing of the vessel, please refer to the technical appendix.

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

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

DIAPHRAGM EXPANSION VESSELS KITS

Volume Litres	PN bar	DIMENSIONS (mm)			Materials		
		ø A	B	Valve	Diaphragm	Vessel	Valve
8	8	205	390	1" FF	EPDM	Painted steel	Nickel-plated brass
24	8	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	10	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	16	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	10	270	575	1" FF	Butyl	Stainless steel	AISI 316 stainless steel
20	25	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass



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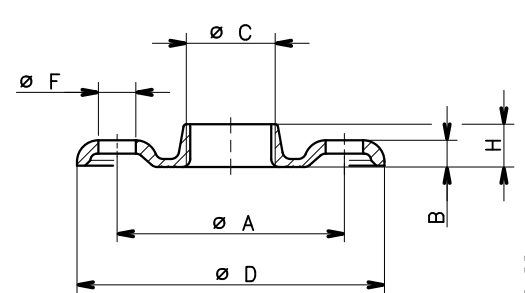
FLANGE KITS

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

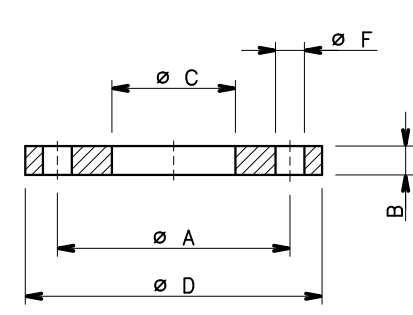


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WELD-ON COUNTERFLANGES

KIT TYPE	DN	ø C	DIMENSIONS (mm)			HOLES		
			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

	L	A	B	C	D
DN	 (mm)	 (mm)	 (mm)	 (mm)	 (°)
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	 (mm)	 (mm)	 (mm)	 (mm)	 (°)
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

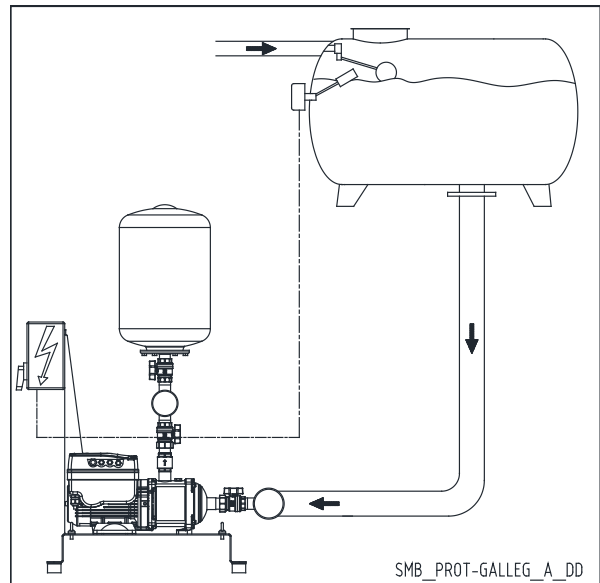
PROTECTION SYSTEMS AGAINST DRY RUNNING

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.

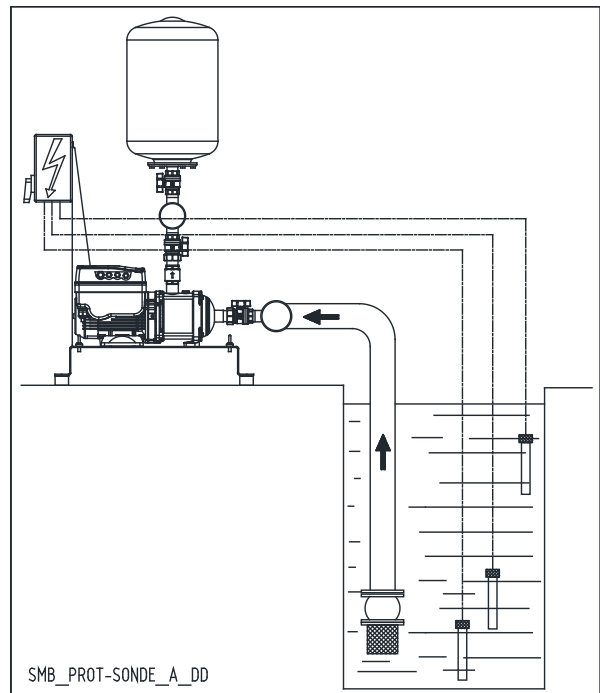


ELECTRODE PROBE PROTECTION

The system with electrode probes is used for supplies from open tanks or wells.

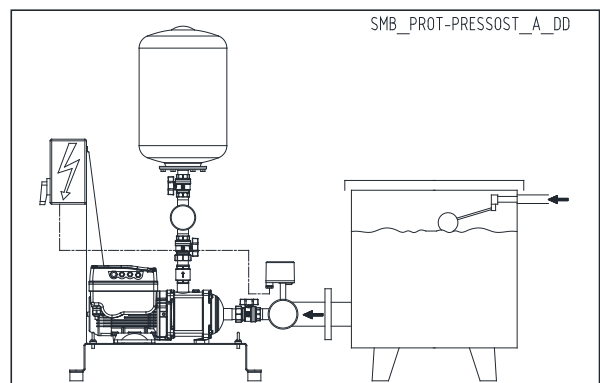
Three probes are directly connected to the electric module with adjustable sensitivity that can be installed in the control panel.

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.



TECHNICAL APPENDIX

VAPOUR PRESSURE VAPOUR PRESSURE p_s AND ρ DENSITY OF WATER TABLE

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

G-at_npsb_sc

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 steel pipework, multiply the values by 1.41. For stainless steel, copper and coated cast iron pipework, multiply the values by 1.85. When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

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

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:

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

where:

V_m = Total volume of the air-cushion surge tank in m^3

Q_p = Average pump flow rate in m^3/h

P_{max} = Maximum pressure setting (wcm)

P_{min} = Minimum pressure setting (wcm)

Z = Maximum number of starts per hour allowed by the motor

Example:

22SV10F110T electric pump

P_{max} = 23 wcm

P_{min} = 15 wcm

Q_p = 20 m^3/h

Z = 25

$$V_m = \frac{Q_p}{4 \times Z} \times \frac{1}{1 - \frac{(P_{min} - 2)}{P_{max}}} = 0,46 \text{ m}^3$$

A 500-litre surge tank is therefore required.

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
1,000	0,0600	2,1189	0,0353	0,2200	0,2642
16,6667	1,000	35,3147	0,5886	3,6662	4,4029
0,4719	0,0283	1,000	0,0167	0,1038	0,1247
28,3168	1,6990	60,0000	1,000	6,2288	7,4805
4,5461	0,2728	9,6326	0,1605	1,000	1,2009
3,7854	0,2271	8,0208	0,1337	0,8327	1,000

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 ₂ O	Millimetre of mercury mm Hg
1,000	0,0010	1×10^{-5}	$1,45 \times 10^{-4}$	$1,02 \times 10^{-4}$	0,0075
1 000,0000	1,000	0,0100	0,1450	0,1020	7,5006
1×10^5	100,0000	1,000	14,5038	10,1972	750,0638
6 894,7570	6,8948	0,0689	1,000	0,7031	51,7151
9 806,6500	9,8067	0,0981	1,4223	1,000	73,5561
133,3220	0,1333	0,0013	0,0193	0,0136	1,000

LENGTH

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

VOLUME

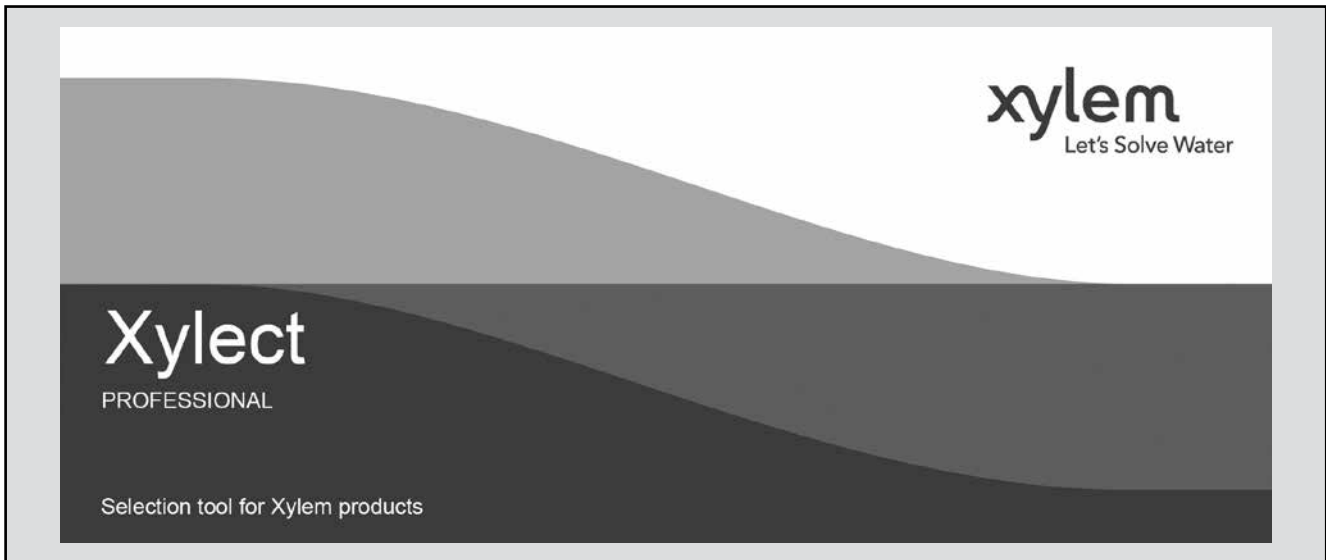
Cubic metre m ³	Litre L	Millilitre ml	Imperial gallon imp. gal.	U.S. gallon US gal.	Cubic foot ft ³
1,000	1 000,0000	1×10^6	219,9694	264,1720	35,3147
0,0010	1,000	1 000,0000	0,2200	0,2642	0,0353
1×10^{-6}	0,0010	1,000	$2,2 \times 10^{-4}$	$2,642 \times 10^{-4}$	$3,53 \times 10^{-5}$
0,0045	4,5461	4 546,0870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

TEMPERATURE

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

G-at_pp-en_b_sc

FURTHER PRODUCT SELECTION AND DOCUMENTATION Xylect™



Xylect™ is pump solution selection software with an extensive online database of product information across the entire Goulds 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.

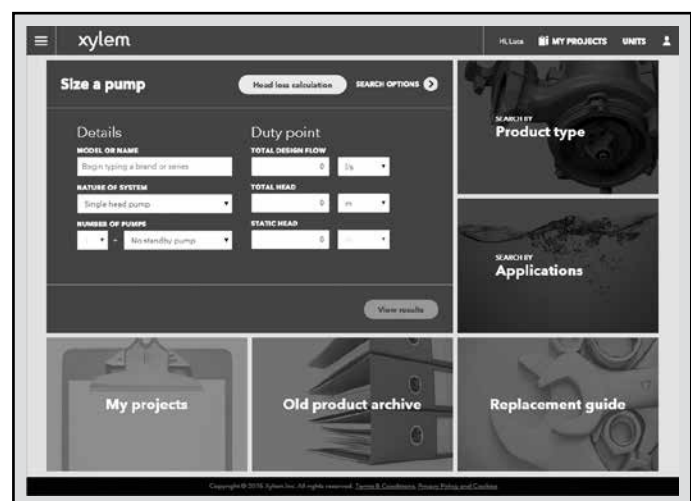
The possibility to search by applications and the detailed information output given makes it easy to make the optimal selection without having detailed knowledge about the Goulds products.

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.

FURTHER PRODUCT SELECTION AND DOCUMENTATION Xylect™



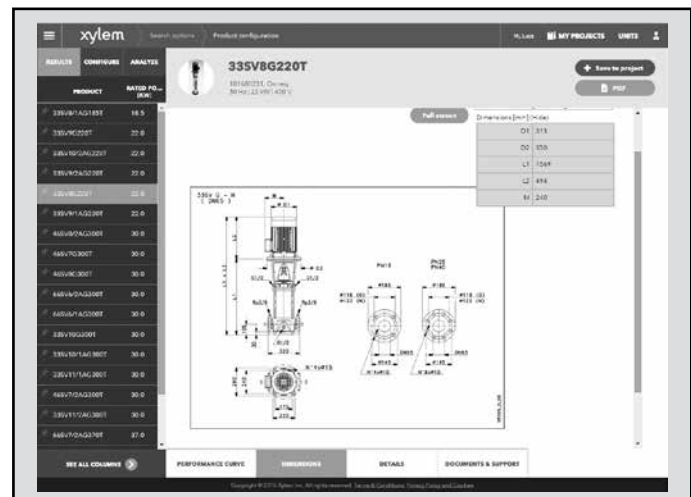
The detailed output makes it easy to select the optimal pump from the given alternatives.

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 reused 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, and agricultural settings. With its October 2016 acquisition of Sensus, Xylem added smart metering, network technologies and advanced data analytics for water, gas and electric utilities to its portfolio of solutions. 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 xylem.com.



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