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GHV10-GHV20 GHV30-GHV40 Series

Variable speed water
Booster sets with
Multistage vertical
Electric pumps
flow rates
up to 400 m³/h

50 Hz



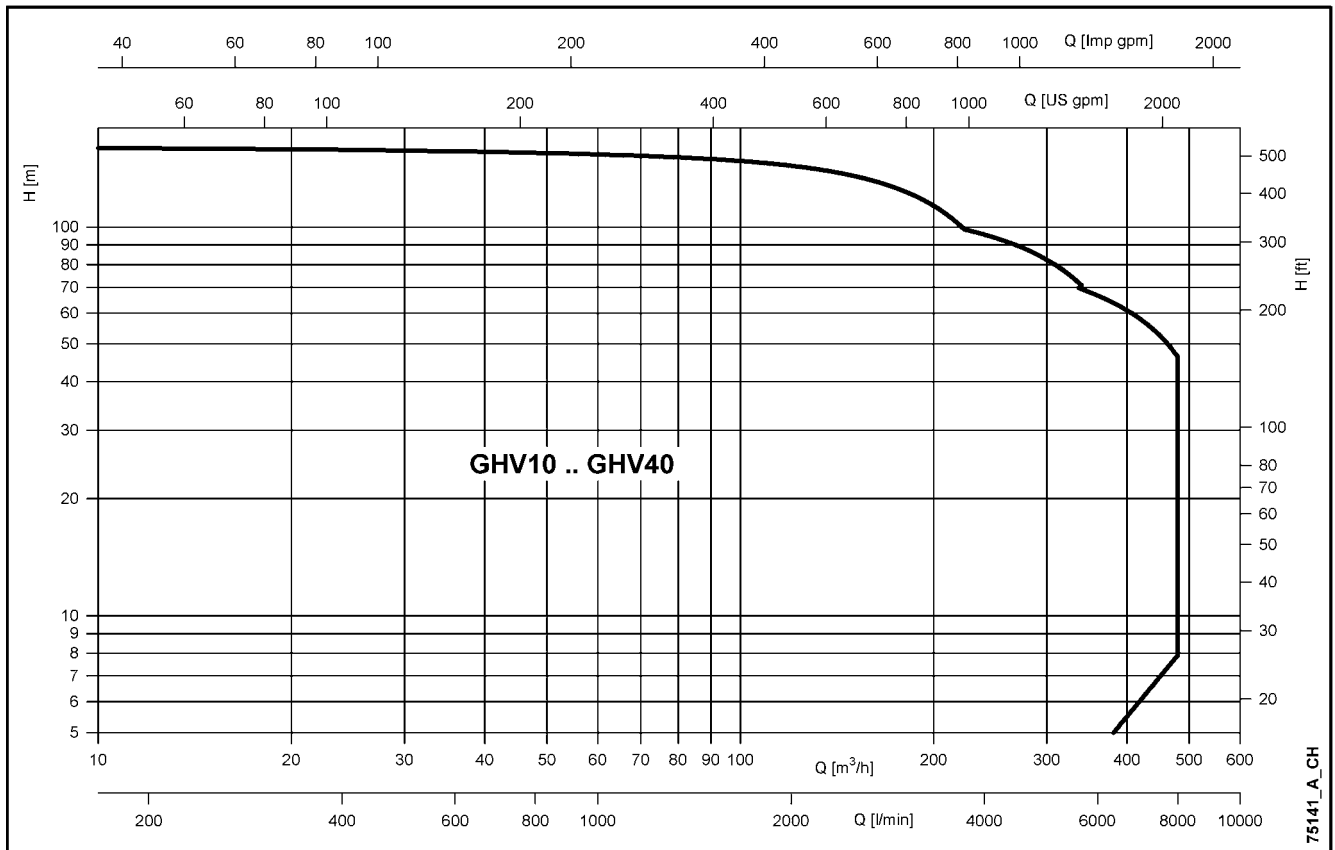
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GHV10 - GHV20 - GHV30 - GHV40 SERIES HYDRAULIC PERFORMANCE RANGE AT 50 Hz





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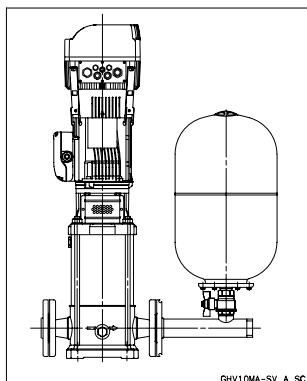
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RANGE



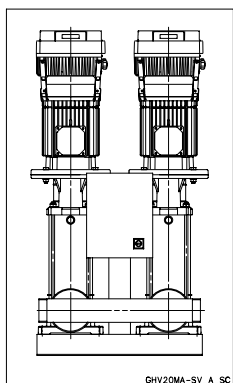
RANGE

- The GHV range of variable speed water boosters sets for industrial and building applications features model with 1 to 4 pumps available in a variety of material configurations to suit the specific requirements of different applications.

GHV10 SERIES SETS

- Variable speed sets equipped with Hydrovar frequency converter and one multistage vertical pump with up to 22 kW power.

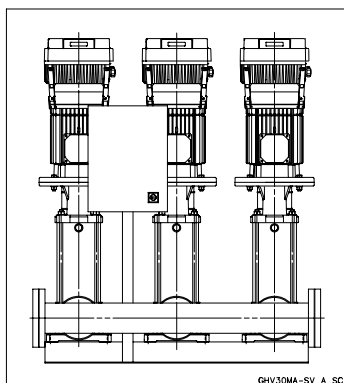
Head up to 150 m.
Flow rate up to 100 m³/h.



GHV20 SERIES SETS

- Variable speed sets equipped with Hydrovar frequency converter and two multistage vertical pumps with up to 22 kW power.

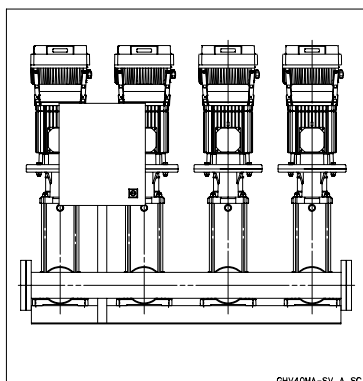
Head up to 150 m.
Flow rate up to 200 m³/h.



GHV30 SERIES SETS

- Variable speed sets equipped with Hydrovar frequency converter and three multistage vertical pumps with up to 22 kW power.

Head up to 150 m.
Flow rate up to 300 m³/h.



GHV40 SERIES SETS

- Variable speed sets equipped with Hydrovar frequency converter and four multistage vertical pumps with up to 22 kW power.

Head up to 150 m.
Flow rate up to 400 m³/h.

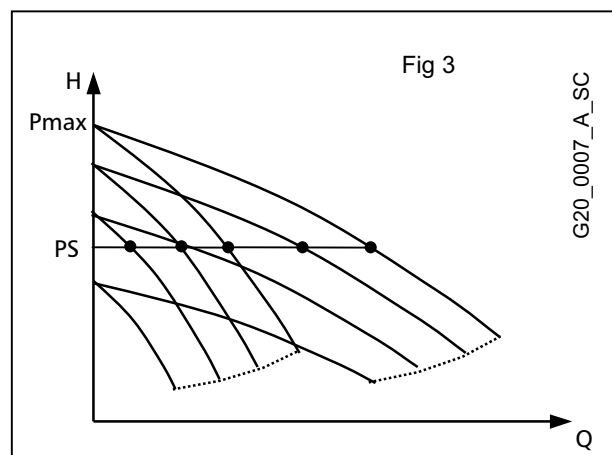
OPERATION DESCRIPTION

SETS WITH VARIABLE-SPEED MOTORS AND PRESSURE TRANSMITTER CONTROL

The starting and stopping of the pumps are determined based on the pressure values set on the controller. Each frequency converter is connected to a pressure transmitter. The converters exchange information with each other and provide for cyclic changeover.

The figure shows the operating mode of a two-pump booster set.

- On demand, water is drawn from the tank.
- When the pressure drops belows the PS setting the first pump starts and the speed is adjusted to maintain a constant pressure as demand increases.
- If the water consumption increases and the pump reaches maximum speed, the second pump starts and the speed is adjusted to maintain constant pressure.
- When consumption diminishes the speed is reduced until minimum speed is reached and one of the pump is switched off.
- If consumption keeps diminishes the pump slows down, fills the tank and stops at the PS setting.



OPERATING CHARACTERISTICS AND LIMITS

Type of pumped liquids	Water containing no gas or corrosive and/or aggressive substances
Fluid temperature	Above 0°C to +40°C
Ambient temperature	Above 0°C to +40°C
Maximum operating pressure	Max 8 bar, 10 bar, 16 bar depending on the type of pump
Minimum inlet pressure	According to NPSH curve and losses, with a minimum margin of 0.5 m
Maximum inlet pressure	The inlet pressure added to the pressure of the pump at zero flow must be lower than the maximum operating pressure of the set.
Installation	Indoors, protected from the weather. Away from heat sources. Max elevation 1000 m ASL. Max humidity 50% without condensation.
Hourly starts	Max 60 up to 7.5 kW. Above 7.5 kW and up to 22 kW, max 40 starts per hour. Frequency converter starts.
Sound emission	See table.

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NOISE EMISSION LEVELS

50 Hz 2900 min ⁻¹		LpA (dB ±2)			
P2 (kW)	IEC	GHV10	GHV20	GHV30	GHV40
0,55	71	-	< 70	-	-
0,75	80R	< 70	< 70	-	-
1,1	80	< 70	< 70	< 70	< 70
1,5	90R	< 70	< 70	< 70	71
2,2	90R	< 70	< 70	< 70	71
3	100R	< 70	< 70	71	72
4	112R	< 70	70	72	73
5,5	132R	< 70	71	73	74
7,5	132R	< 70	72	74	75
11	160R	73	76	78	79
15	160	75	78	80	81
18,5	160	75	78	80	81
22	180R	75	78	80	81

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SELECTING A SET

The first thing to do when selecting a set is to determine the quantity of water required and the pressure it must supply.

CALCULATING THE FLOW RATE

- The quantity of water called **water requirement** depends on the type of users, e.g. homes, offices, schools, as well as their number. The theoretic requirement is the total amount of water required by all the users. In actual fact, since it is very unlikely that there should be a simultaneous demand by all the users, the **real requirement** is lower than the theoretic one.

CALCULATING THE HEAD

- The pressure required depends on the type of user. A number of factors must be taken into account, including the **height of the building**, the suction conditions and the flow resistance in the pipes.

SELECTING A BOOSTER SET

- According to the required flow rate and head values, it is possible to identify the most suitable type of electric pump. On two-pump sets the pumps normally act as **back-up for one another**. A single pump is normally sufficient to provide for average requirements, while in conditions of high demand the back up pump may be called in to assist. With the **cyclic changeover** function duty assignment is rotated to ensure both pumps remain active and with even running hours, so wear is uniform and the use factor is reduced for longer pump life. This system also ensures **continuity of operation** in case one of the pumps needs maintenance.

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 of diaphragm tanks directly on the delivery manifold, and additional tanks can be connected to the unused end of the manifold.

A **simplified calculation method**, developed from experience, is provided in the Appendix. It supplies useful flow rate and head values for most common requirements, as well as a method for calculating diaphragm tank size.

Variable speed booster sets need **smaller tanks** compared to traditional systems. Generally speaking, a tank with a litre capacity of just 10% of the nominal capacity of a single pump, expressed in litres per minute, is needed.

CHARACTERISTICS OF THE ELECTRIC PUMPS USED IN GHV SERIES BOOSTER SETS

SV2, 4, 8, 16 ELECTRIC PUMPS

- Multistage centrifugal vertical electric pumps. All metal parts in contact with pumped liquid are made of stainless steel.
- F version: round flanges, in-line discharge and suction ports, AISI 304
- N version: round flanges, in-line discharge and suction ports, AISI 316
- Reduced axial thrusts enable the use of **standard motors** that are easily found on the market. **The Lowara surface motors have efficiency values that fall within the range normally referred to as efficiency class 2.**
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069
- Easy maintenance. No special tools required for assembly or disassembly.
- **Pump suitable for handling potable water (WRAS certified).**

SV33, 46, 66, 92 ELECTRIC PUMPS

- Vertical multistage centrifugal pump with impellers, diffusers and outer sleeve made entirely of stainless steel, and with pump casing and upper head made of cast iron in the standard version.
- N version made entirely of AISI 316 stainless steel.
- High hydraulic efficiency for significant energy savings.
- Innovative axial load compensation system on pumps with higher head. This ensures reduced axial thrusts and enables the use of standard motors that are easily found on the market. **The Lowara surface motors have efficiency values that fall within the range normally referred to as efficiency class 2.**
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069, which can easily be replaced without disassembling the motor from the pump.
- Mechanical sturdiness and easy maintenance. No special tools required for assembly or disassembly.
- **Pump suitable for handling potable water (WRAS certified).**

REFERENCE STANDARDS

- The Lowara booster sets are marked CE in conformity with the following directives:
 - Machinery Directive 98/37/EC
 - Low Voltage Directive 73/23/EEC and subsequent amendments
 - Electromagnetic Compatibility Directive 89/336/EEC and subsequent amendments.
- Electric pump performances are declared to comply with the following standard:

ISO 9906-A Rotodynamic pumps – Hydraulic performance tests and acceptance criteria.



MAIN CHARACTERISTICS OF FREQUENCY CONVERTERS USED IN THE GHV BOOSTER SETS

The GVH series booster sets use a **Hydrovar®** frequency converter, an automatic device that adjusts the speed of the electric pump in order to maintain **constant pressure** in the system.

Converters with power up to 22 kW can be **mounted directly on to the motor**. Models over 11 kW can be mounted alternatively on the wall if equipped with the optional **fan kit**. Models with over 22 kW power, up to 45 kW, are designed for wall mounting only. The pressure is measured by a **pressure transmitter** which uses a standard **4..20 mA** signal. The system pressure value can be read on the converter's display. A simple user interface allows you to set the desired pressure value for optimal adjustment, as well as to **view the operating data**, such as the hours of operation and any alarms triggered. Included diagnostic menu to view temperature, current and voltage values facilitates diagnostics and failure analysis. Indicator lights signal power status, pump running and malfunctions.

A **password** is required to access sensitive settings that allow you to **configure the converter** in order to adapt it to any control requirements, such as **flow resistance compensation, external control**, periodic testing and so on. When more than one pump is used, the converters exchange information with each other through an **RS485 serial line** which can connect up to 6 Hydrovar devices plus one external unit for remote control. The Pump-link and Pump-watcher dedicated systems, connected to the Hydrovar®, enable remote control through a traditional telephone line or mobile telephony. A serial port available as standard up to 11 kW allows you to control the Hydrovar® converters from a Modbus® field serial bus line.

The converter is equipped with two **potential-free relays** which can be used for **remote signalling** of pump running and malfunction status, plus a programmable voltage **analogue output** for signalling the frequency or pressure.

Standard version with two sensors inputs for implementing of two actual values signals within one system (min/max, difference) or for a second sensor for safety reasons.

Specific digital **inputs** are used for protection against **water failure, motor overtemperature**, as well as for external enable signal and remote control. The converter also incorporates a dry running protection function via an adjustable **minimum pressure** threshold.

Class A filter standard for Hydrovar three-phase power supply. E.g. Industrial areas, technical areas of any building fed from a dedicated transformer are examples of environment locations.

Class B filter standard for Hydrovar single-phase power supply. E.g. Houses, apartments, commercial premises or offices in a residential building are examples of environment locations.

Further information are available into Hydrovar manual



Hydrovar Modular



Hydrovar HV3.15 - HV3.22 with wall-mounting kit



Hydrovar HV3.30 - HV3.45

SPECIFICATIONS

Converter				Motor	
Model *	Power supply (V)	IP Class	Install.	Power supply (V)	Power (kW)
HV 2.015 (HV 2.1)	1x230	IP 55	Motor	3x230	0,75-1,5
HV 2.022 (HV 2.2)	1x230	IP 55	Motor	3x230	2,2
HV 4.022 (HV3.2)	3x400	IP 55	Motor	3x400	1,1-2,2
HV 4.030 (HV3.4)	3x400	IP 55	Motor	3x400	3
HV 4.040 (HV3.4)	3x400	IP 55	Motor	3x400	4
HV 4.055 (HV3.5)	3x400	IP 55	Motor	3x400	5,5
HV 4.075 (HV3.7)	3x400	IP 55	Motor	3x400	7,5
HV 4.110 (HV3.11)	3x400	IP 55	Motor	3x400	11
(HV 3.15)	3x400	IP 54	Motor	3x400	15
(HV 3.18)	3x400	IP 54	Motor	3x400	18,5
(HV 3.22)	3x400	IP 54	Motor	3x400	22
(HV 3.30)	3x400	IP 54	Wall	3x400	30
(HV 3.37)	3x400	IP 54	Wall	3x400	37
(HV 3.45)	3x400	IP 54	Wall	3x400	45

* The new Hydrovar Modular is available single phase up to 2,2kW and above 2,2kW up to 11kW three phase power supply only.

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ELECTRICAL PANELS - GHV SETS

The GHV sets come with an **electrical panel** on which are installed automatic **line protection circuit breakers** for each converter.

Single-pump sets are supplied as standard with an electrical panel encased in plastic material, featuring a thermal-magnetic protection switch and transparent door.

Sets with two or more pumps and three-phase power supply come with an electrical panel with metal casing, featuring a **main switch** and thermal-magnetic protection switches.

The panel is ready for connection of optional accessories for **protection against dry running**: float switch, minimum pressure switch or electrode probes with sensitivity adjustment.

Special electrical panels can be supplied on request, fitted with relay contacts for remote signalling.

For sets with converters up to 11 kW, special electrical panels can be provided featuring **plastic casing** and transparent door allowing direct access to the automatic circuit breakers.

For the GHV10 sets with a single three-phase converter with up to 11 kW power, **special bypass electrical panels** can be provided for direct starting of the motor from the power line via an external pressure switch, bypassing the converter.



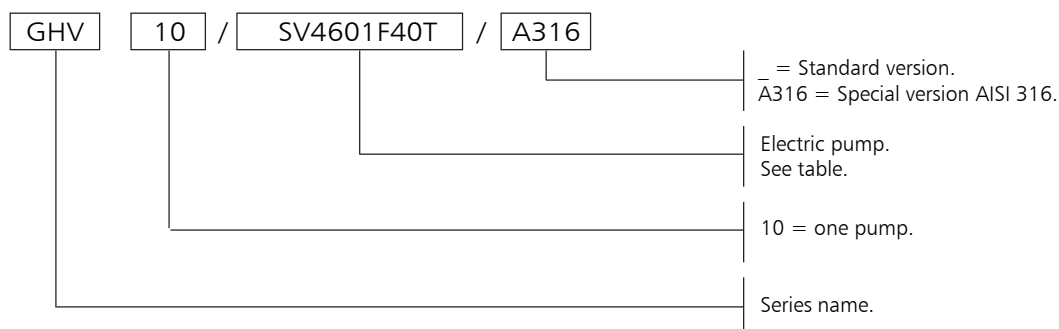


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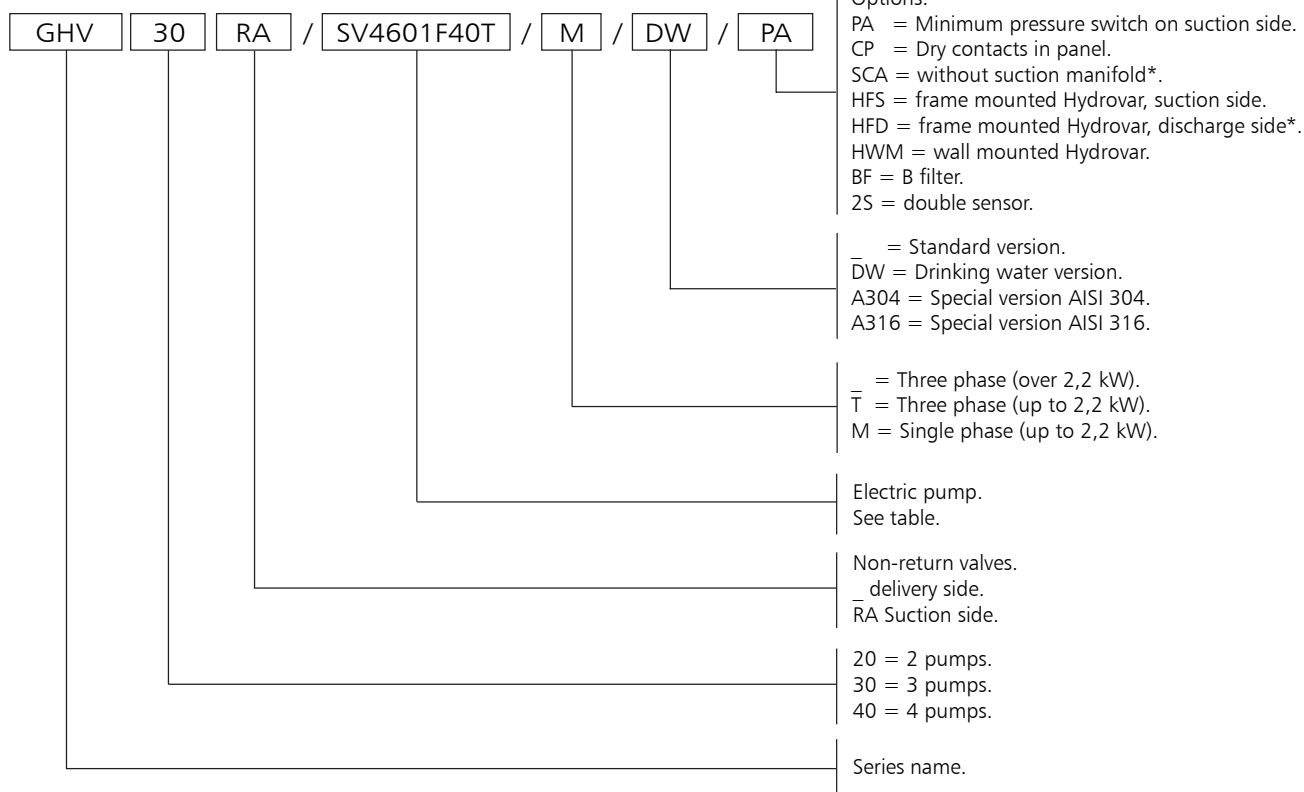
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IDENTIFICATION CODES

GHV10 SETS



GHV20, 30, 40 SETS



* Notes:

- On some models, the HFD option may interfere with the direct installation of the diaphragm tanks on the manifold.
- HFD, HFS, HWM versions are available 15 kW, 18,5 kW and 22 kW power only.
- The PA option is not available with the SCA versions without suction manifold.
- "B" filter is standard for single-phase supply.



FEATURES VERSIONS

INTRODUCTION

The **HYDROVAR Modul Concept** consists mechanically of two main parts, the **Power Unit** and the **Control Card**. In its basic configuration (consists only of the Power Unit) the HYDROVAR can be used as **"Basic Inverter"** without the need of the Control Card. In that form the HYDROVAR can be used as a sequence pump in a multi pump system, with at least one master inverter.

By extending this "Basic Inverter" with the additional Control Card and LCD display, the HYDROVAR **"Master Unit"** is able to work in different modes and can be extended by the implementation of different modules.

STANDARD OPTIONAL FEATURES VERSIONS

CASCADE SERIAL (MASTER + BASIC)

In this mode there are various possibilities to combine the different versions of the HYDROVAR.

In general, each of the pumps is equipped with a HYDROVAR unit. Each pump of the system (extended up to 8 pumps) is equipped with a HYDROVAR unit (at least one **"Master Inverter"** and the others can be **"Basic Inverters"** in order to ensure a proper control of the system) which are connected via the serial interface. Minimum requirement: One "Master Inverter" and the others equipped with "Basic Inverters".

The whole control is performed via the "Master Inverter" every time, but also an automatic change over of the lag pumps to achieve even operating hours is possible.

Following versions are available:

- **Power size above 2.2kW up to 11 kW motor mounted and three phase power supply.**

General description of booster name:

GHV [][]: First digit: total number of pump, Second digit: number of Basic units.

Example:

- **GHV21**: two pumps booster set, one "Master Inverter" and one "Basic Inverter" configuration.
- **GHV31**: three pumps booster set, two "Master Inverter" and one "Basic Inverter" configuration.
- **GHV32**: three pumps booster set, one "Master Inverter" and two "Basic Inverter" configuration.

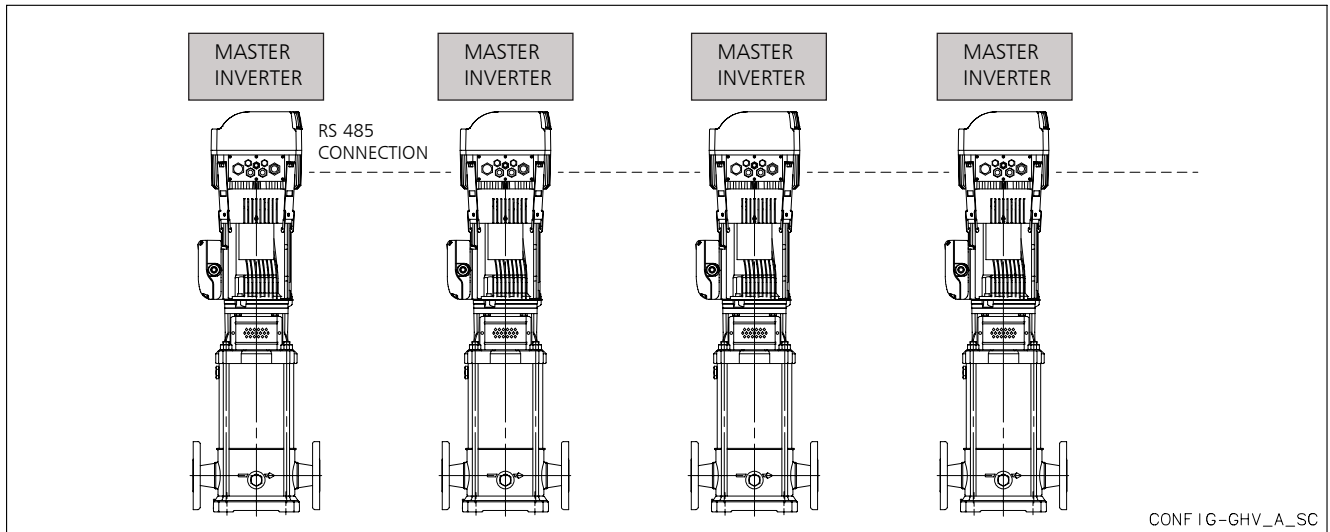
NOTE: Special versions featuring different materials/operating temperatures and panel with additional functions are available on request.



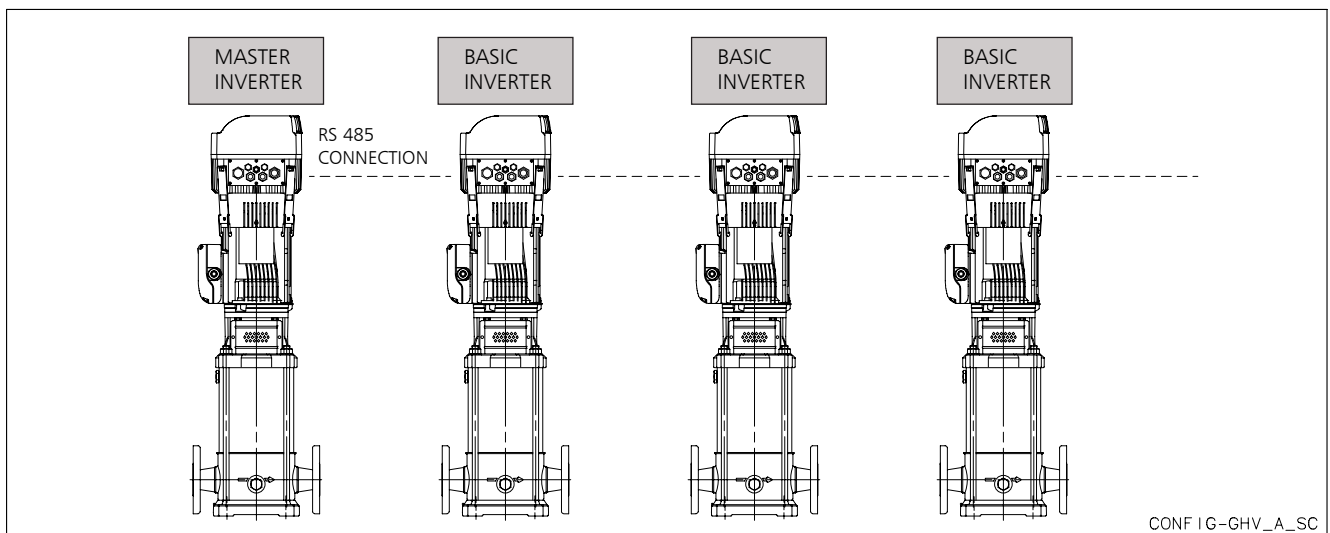
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APPLICATION EXAMPLE "CASCADE SERIAL"



GHV40/..



GHV43/..



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SPECIAL VERSION

CASCADE RELAY, "GV" BOOSTER SETS (Former Digivar product).

One pump is fitted with a HYDROVAR "Master Inverter" and up to 5 full speed slave pumps can be switched ON and OFF on demand.

For this purpose an additional relay card with 5 relays is used in the "Master Inverter". Basically an external panel is needed for all the motor relays, because the relays in the HYDROVAR can't switch the pumps directly as they are just used as switch contacts.

Also an automatic change over of the fixed speed pumps to achieve even operating hours is possible in this mode.

For further technical information see booster sets GV catalogue.



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GHV10/SV2-4-8-16 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV10/..	NOMINAL POWER	Q = DELIVERY																	
		l/min 0	20	30	40	50	60	70	100	120	133	150	167	200	233	267	300	350	400
	m³/h 0	1,2	1,8	2,4	3	3,6	4,2	6	7,2	8	9	10	12	14	16	18	21	24	
kW		H = TOTAL HEAD METERS COLUMN OF WATER																	
SV205F07T	1 x 0.75	53,5	47	42,5	38	32	26	18											
SV206F07T	1 x 0.75	64	56	51	45,5	38,5	31	22											
SV207F11T	1 x 1.1	75	65,5	60	53	45	36,5	26											
SV208F11T	1 x 1.1	85,5	75	68	61	51,5	41,5	30											
SV209F11T	1 x 1.1	96	84	76,5	68,5	58	46,5	32,5											
SV211F15T	1 x 1.5	117	103	94	84	71	57	41											
SV212F15T	1 x 1.5	128	112	102	91	77	62	44											
SV214F22T	1 x 2.2	150	131	119	106	90	73	52											
SV404F07T	1 x 0.75	40			34	32	30,5	29	21	15	10								
SV405F11T	1 x 1.1	50			42,5	40	38	36,5	26	18,5	12,5								
SV406F11T	1 x 1.1	60			51	48	45,5	44	31,5	22	16								
SV407F11T	1 x 1.1	70			59,5	56	53	51	37	26	18								
SV408F15T	1 x 1.5	80			68	65	61	58,5	42	29,5	21								
SV409F15T	1 x 1.5	90			76,5	73	68,5	65,5	47	33,5	23								
SV411F22T	1 x 2.2	111			93,5	89	83,5	80,5	58	41	29								
SV413F22T	1 x 2.2	131			111	105	99	95	68	48	34								
SV414F30T	1 x 3	141			119	113	106	102	73,5	52	36								
SV802F11T	1 x 1.1	27							24,8	24	23	22	20,5	17,2	13,2				
SV803F15T	1 x 1.5	41							37	36	34,5	33	30,5	25,8	20				
SV804F22T	1 x 2.2	55							50	47,5	46	44	41	34,5	26,5				
SV805F22T	1 x 2.2	68							62	60	57,5	55	51	43	33				
SV806F30T	1 x 3	82							74,5	71	69	66	61,5	52	40				
SV808F40T	1 x 4	110							99	95	92	87,5	81,5	69	53				
SV809F40T	1 x 4	123							112	107	104	97,5	92	78	60				
SV811F55T	1 x 5.5	150							137	130	127	119	112	95	73				
SV1602F22T	1 x 2.2	35										32,5	32	31	29,5	27,5	25	20	14,3
SV1603F30T	1 x 3	52										49	48	46	44	41	37,5	30,2	21,5
SV1604F40T	1 x 4	69										65	64	62	59	54,5	50	40,3	28,6
SV1605F55T	1 x 5.5	86										81	80	77	73	68,5	62	50	35,8
SV1606F55T	1 x 5.5	104										98	96	92	88	82	75	60,5	43
SV1607F75T	1 x 7.5	121										114	112	108	103	96	87	70,5	50
SV1608F75T	1 x 7.5	138										130	128	123	117	109	100	81	57

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GHV10/SV33-46 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV10/..	NOMINAL POWER	Q = DELIVERY										
		l/min 0	250	300	367	417	500	583	667	750	900	1000
	m³/h 0	15	18	22	25	30	35	40	45	54	60	
kW		H = TOTAL HEAD METERS COLUMN OF WATER										
SV3301/1F22T	1 x 2.2	17,4	16,2	15,7	15	14	12,2	9,8	6,7			
SV3301F30T	1 x 3	23,8	21,7	21,2	20	20	17,8	15,5	12,7			
SV3302/2F40T	1 x 4	35,1	34,1	33,3	32	30	27	22,4	16,6			
SV3302/1F40T	1 x 4	40,8	38,8	37,9	36	35	32	27,5	22,3			
SV3302F55T	1 x 5.5	47,8	45	44,1	43	41	39	35	29,9			
SV3303/2F55T	1 x 5.5	57,7	55,2	53,8	51	49	44	38	29,6			
SV3303/1F75T	1 x 7.5	64,5	61,3	60	58	56	51	45	37			
SV3303F75T	1 x 7.5	71,5	67,4	66,0	64	62	58	52,0	44,6			
SV3304/2F75T	1 x 7.5	82	78,8	77	74	72	66	58	47,2			
SV3304/1F110T	1 x 11	88,9	85	83	81	78	73	65	55,1			
SV3304F110T	1 x 11	95,9	91,1	90	87	85	80	73	63,1			
SV3305/2F110T	1 x 11	106	101,6	100	96	93	85	76	63			
SV3305/1F110T	1 x 11	112,7	107,2	105	102	99	92	82	70			
SV3305F150T	1 x 15	120,4	114,9	113	110	107	101	92	80,5			
SV3306/2F150T	1 x 15	131,2	126,9	125	120	116	108	96	81,2			
SV3306/1F150T	1 x 15	139,1	133,5	131	128	124	116	105	90,4			
SV3306F150T	1 x 15	145,6	139	137	133	129	121	110	96,1			
SV3307/2F150T	1 x 15	156	149,9	147	143	138	128	115	98,2			
SV4601/1F30T	1 x 3	19,5			19,2	18,8	17,9	16,7	15,1	13,1	8,5	4,6
SV4601F40T	1 x 4	27,2			24	23,5	22,5	21,4	19,9	18,2	14,3	10,8
SV4602/2F55T	1 x 5.5	38,8			39,8	39,2	37,8	35,7	32,9	29,4	21,1	13,9
SV4602F75T	1 x 7.5	52,6			48,5	47,7	46,1	44,2	41,7	38,7	31,4	25,1
SV4603/2F110T	1 x 11	64,7			65,1	64	62	60	56	52	40,4	30,8
SV4603F110T	1 x 11	80,8			74,3	73	71	68	65	60	50	40,7
SV4604/2F150T	1 x 15	92,4			90,7	90	87	83	79	73	58	45,6
SV4604F150T	1 x 15	107,3			99,8	98	96	92	87	82	68	55,9
SV4605/2F185T	1 x 18.5	117,2			114,8	113	110	106	100	93	75	60,2
SV4605F185T	1 x 18.5	134,5			125,1	123	120	116	110	103	86	71,5
SV4606/2F220T	1 x 22	143,7			139,3	138	134	129	122	113	92	73,4
SV4606F220T	1 x 22	161			149,9	148	144	139	132	124	104	86

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GHV10/SV66-92 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV10/..	NOMINAL POWER	Q = DELIVERY													
		l/min 0	500	600	700	750	900	1000	1200	1300	1417	1600	1800	2000	
	m³/h 0	30	36	42	45	54	60	72	78	85	96	108	120		
	kW	H = TOTAL HEAD METERS COLUMN OF WATER													
SV6601/1F40T	1 x 4	23,8	21,4	20,7	19,9	19,4	17,8	16,6	13,3	11,2	8,3				
SV6601F55T	1 x 5.5	29,2	25,8	24,8	23,8	23,3	21,8	20,7	17,9	16,1	13,5				
SV6602/2F75T	1 x 7.5	47,5	42,6	41,2	39,5	38,6	36	32,9	26,4	22,2	16,4				
SV6602/1F110T	1 x 11	54,2	49,6	48,2	46,7	45,8	42,9	40,6	34,8	31,2	26,2				
SV6602F110	1 x 11	60,4	55,7	54,4	52,8	52	49,3	47,1	42	38,9	34,7				
SV6603/2F150T	1 x 15	78,4	71,6	70	67	66	62	58	49	43,3	35,3				
SV6603/1F150T	1 x 15	84,7	77,8	76	74	72	68	65	56	51	44,0				
SV6603F185T	1 x 18.5	91,4	84,7	83	81	79	75	72	64	60	53,5				
SV6604/2F185T	1 x 18.5	108,9	99,6	97	94	92	86	82	70	63	52,8				
SV6604/1F220T	1 x 22	115,2	105,9	103	100	99	93	89	78	71	61,8				
SV6604F220T	1 x 22	121,6	112,5	110	107	105	100	96	86	79	70,8				
SV9201/1F55T	1 x 5.5	24,5				22,2	21,5	20,9	19,4	18,5	17,3	15	11,8	7,9	
SV9201F75T	1 x 7.5	33,5				28,7	27,2	26,2	24,3	23,3	22,2	20,2	17,6	14,3	
SV9202/2F110T	1 x 11	49,4				45,1	43,7	42,5	39,6	37,9	35,5	30,9	24,6	16,8	
SV9202F150T	1 x 15	67,8				58,2	55	53	49,5	47,6	45,2	41,4	36,3	29,6	
SV9203/2F185T	1 x 18.5	82,4				74,4	72	70	65	62	59	52	43,6	32,9	
SV9203F220T	1 x 22	102,2				88,2	84	81	76	73	69	63	56	46,3	

gcomv1psv66-2p50-en_a_th

GHV20/SV2-8 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV20/,,	NOMINAL POWER	Q = DELIVERY													
		l/min 0	40	60	80	100	120	140	200	240	266	300	334	400	466
	m³/h 0	2,4	3,6	4,8	6	7,2	8,4	12	14,4	16	18	20	24	28	
kW		H = TOTAL HEAD METERS COLUMN OF WATER													
SV202F03T	2 x 0.37	21,5	18,5	17	15	13	10,5	7,5							
SV203F03T	2 x 0.37	32	28	25,2	23	19,5	15,5	11							
SV204F05T	2 x 0.55	42,5	37,5	34	30,5	26	20,5	15							
SV205F07T	2 x 0.75	53,5	47	42,5	38	32	26	18							
SV206F07T	2 x 0.75	64	56	51	45,5	38,5	31	22							
SV207F11T	2 x 1.1	75	65,5	60	53	45	36,5	26							
SV208F11T	2 x 1.1	85,5	75	68	61	51,5	41,5	30							
SV209F11T	2 x 1.1	96	84	76,5	68,5	58	46,5	32,5							
SV211F15T	2 x 1.5	117	103	94	84	71	57	41							
SV212F15T	2 x 1.5	128	112	102	91	77	62	44							
SV214F22T	2 x 2.2	150	131	119	106	90	73	52							
SV402F03T	2 x 0.37	20			17	16	15	14,5	10,5	7,5	5				
SV403F05T	2 x 0.55	30			25,5	24	23	22	16	11	7,5				
SV404F07T	2 x 0.75	40			34	32	30,5	29	21	15	10				
SV405F11T	2 x 1.1	50			42,5	40	38	36,5	26	18,5	12,5				
SV406F11T	2 x 1.1	60			51	48	45,5	44	31,5	22	16				
SV407F11T	2 x 1.1	70			59,5	56	53	51	37	26	18				
SV408F15T	2 x 1.5	80			68	65	61	58,5	42	29,5	21				
SV409F15T	2 x 1.5	90			76,5	73	68,5	65,5	47	33,5	23				
SV411F22T	2 x 2.2	111			93,5	89	83,5	80,5	58	41	29				
SV413F22T	2 x 2.2	131			111	105	99	95	68	48	34				
SV414F30T	2 x 3	141			119	113	106	102	73,5	52	36				
SV802F11T	2 x 1.1	27							24,8	24	23	22	20,5	17,2	13,2
SV803F15T	2 x 1.5	41							37	36	34,5	33	30,5	25,8	20
SV804F22T	2 x 2.2	55							50	47,5	46	44	41	34,5	26,5
SV805F22T	2 x 2.2	68							62	60	57,5	55	51	43	33
SV806F30T	2 x 3	82							74,5	71	69	66	61,5	52	40
SV808F40T	2 x 4	110							99	95	92	87,5	81,5	69	53
SV809F40T	2 x 4	123							112	107	104	97,5	92	78	60

The table refers to performance with 2 pumps running

g20v-2p50-en_a_th

GHV20/SV8-16 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV20/..	NOMINAL POWER	Q = DELIVERY											
		l/min 0	200	240	266	300	334	400	466	534	600	700	800
	m³/h 0	12	14,4	16	18	20	24	28	32	36	42	48	
	kW	H = TOTAL HEAD METERS COLUMN OF WATER											
SV811F55T	2 x 5.5	150	137	130	127	119	112	95	73				
SV1602F22T	2 x 2.2	35				32,5	32	31	29,5	27,5	25	20	14,3
SV1603F30T	2 x 3	52				49	48	46	44	41	37,5	30,2	21,5
SV1604F40T	2 x 4	69				65	64	62	59	54,5	50	40,3	28,6
SV1605F55T	2 x 5.5	86				81	80	77	73	68,5	62	50	35,8
SV1606F55T	2 x 5.5	104				98	96	92	88	82	75	60,5	43
SV1607F75T	2 x 7.5	121				114	112	108	103	96	87	70,5	50
SV1608F75T	2 x 7.5	138				130	128	123	117	109	100	81	57

The table refers to performance with 2 pumps running

gcomv2p-2p50-en_a_th

GHV20/SV33-46 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV20/..	NOMINAL POWER	Q = DELIVERY										
		l/min 0	500	600	734	834	1000	1166	1334	1500	1800	2000
	m³/h 0	30	36	44	50	60	70	80	90	108	120	
kW		H = TOTAL HEAD METERS COLUMN OF WATER										
SV3301/1F22T	2 x 2.2	17,4	16,2	15,7	15	14	12,2	9,8	6,7			
SV3301F30T	2 x 3	23,8	21,7	21,2	20	20	17,8	15,5	12,7			
SV3302/2F40T	2 x 4	35,1	34,1	33,3	32	30	27	22,4	16,6			
SV3302/1F40T	2 x 4	40,8	38,8	37,9	36	35	32	27,5	22,3			
SV3302F55T	2 x 5.5	47,8	45	44,1	43	41	39	35	29,9			
SV3303/2F55T	2 x 5.5	57,7	55,2	53,8	51	49	44	38	29,6			
SV3303/1F75T	2 x 7.5	64,5	61,3	60	58	56	51	45	37			
SV3303F75T	2 x 7.5	71,5	67,4	66,0	64	62	58	52,0	44,6			
SV3304/2F75T	2 x 7.5	82	78,8	77	74	72	66	58	47,2			
SV3304/1F110T	2 x 11	88,9	85	83	81	78	73	65	55,1			
SV3304F110T	2 x 11	95,9	91,1	90	87	85	80	73	63,1			
SV3305/2F110T	2 x 11	106	101,6	100	96	93	85	76	63			
SV3305/1F110T	2 x 11	112,7	107,2	105	102	99	92	82	70			
SV3305F150T	2 x 15	120,4	114,9	113	110	107	101	92	80,5			
SV3306/2F150T	2 x 15	131,2	126,9	125	120	116	108	96	81,2			
SV3306/1F150T	2 x 15	139,1	133,5	131	128	124	116	105	90,4			
SV3306F150T	2 x 15	145,6	139	137	133	129	121	110	96,1			
SV3307/2F150T	2 x 15	156	149,9	147	143	138	128	115	98,2			
SV4601/1F30T	2 x 3	19,5			19,2	18,8	17,9	16,7	15,1	13,1	8,5	4,6
SV4601F40T	2 x 4	27,2			24	23,5	22,5	21,4	19,9	18,2	14,3	10,8
SV4602/2F55T	2 x 5.5	38,8			39,8	39,2	37,8	35,7	32,9	29,4	21,1	13,9
SV4602F75T	2 x 7.5	52,6			48,5	47,7	46,1	44,2	41,7	38,7	31,4	25,1
SV4603/2F110T	2 x 11	64,7			65,1	64	62	60	56	52	40,4	30,8
SV4603F110T	2 x 11	80,8			74,3	73	71	68	65	60	50	40,7
SV4604/2F150T	2 x 15	92,4			90,7	90	87	83	79	73	58	45,6
SV4604F150T	2 x 15	107,3			99,8	98	96	92	87	82	68	55,9
SV4605/2F185T	2 x 18.5	117,2			114,8	113	110	106	100	93	75	60,2
SV4605F185T	2 x 18.5	134,5			125,1	123	120	116	110	103	86	71,5
SV4606/2F220T	2 x 22	143,7			139,3	138	134	129	122	113	92	73,4
SV4606F220T	2 x 22	161			149,9	148	144	139	132	124	104	86

The table refers to performance with 2 pumps running

gcomv2psv33-2p50-en_a_th

GHV20/SV66-92 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV20/..	NOMINAL POWER	Q = DELIVERY												
		l/min 0	1000	1200	1400	1500	1800	2000	2400	2600	2834	3200	3600	4000
	kW	m³/h 0	60	72	84	90	108	120	144	156	170	192	216	240
H = TOTAL HEAD METERS COLUMN OF WATER														
SV6601/1F40T	2 x 4	23,8	21,4	20,7	19,9	19,4	17,8	16,6	13,3	11,2	8,3			
SV6601F55T	2 x 5.5	29,2	25,8	24,8	23,8	23,3	21,8	20,7	17,9	16,1	13,5			
SV6602/2F75T	2 x 7.5	47,5	42,6	41,2	39,5	38,6	36	32,9	26,4	22,2	16,4			
SV6602/1F110T	2 x 11	54,2	49,6	48,2	46,7	45,8	42,9	40,6	34,8	31,2	26,2			
SV6602F110	2 x 11	60,4	55,7	54,4	52,8	52	49,3	47,1	42	38,9	34,7			
SV6603/2F150T	2 x 15	78,4	71,6	70	67	66	62	58	49	43,3	35,3			
SV6603/1F150T	2 x 15	84,7	77,8	76	74	72	68	65	56	51	44,0			
SV6603F185T	2 x 18.5	91,4	84,7	83	81	79	75	72	64	60	53,5			
SV6604/2F185T	2 x 18.5	108,9	99,6	97	94	92	86	82	70	63	52,8			
SV6604/1F220T	2 x 22	115,2	105,9	103	100	99	93	89	78	71	61,8			
SV6604F220T	2 x 22	121,6	112,5	110	107	105	100	96	86	79	70,8			
SV9201/1F55T	2 x 5.5	24,5				22,2	21,5	20,9	19,4	18,5	17,3	15	11,8	7,9
SV9201F75T	2 x 7.5	33,5				28,7	27,2	26,2	24,3	23,3	22,2	20,2	17,6	14,3
SV9202/2F110T	2 x 11	49,4				45,1	43,7	42,5	39,6	37,9	35,5	30,9	24,6	16,8
SV9202F150T	2 x 15	67,8				58,2	55	53	49,5	47,6	45,2	41,4	36,3	29,6
SV9203/2F185T	2 x 18.5	82,4				74,4	72	70	65	62	59	52	43,6	32,9
SV9203F220T	2 x 22	102,2				88,2	84	81	76	73	69	63	56	46,3

The table refers to performance with 2 pumps running

gcomv2psv66-2p50-en_a_th

GHV30/SV8-16 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV30/..	NOMINAL POWER kW	Q = DELIVERY											
		l/min 0	300	360	399	450	501	600	699	801	900	1050	1200
		m ³ /h 0	18	21,6	24	27	30	36	42	48	54	63	72
H = TOTAL HEAD METERS COLUMN OF WATER													
SV802F11T	3 x 1.1	27	24,8	24	23	22	20,5	17,2	13,2				
SV803F15T	3 x 1.5	41	37	36	34,5	33	30,5	25,8	20				
SV804F22T	3 x 2.2	55	50	47,5	46	44	41	34,5	26,5				
SV805F22T	3 x 2.2	68	62	60	57,5	55	51	43	33				
SV806F30T	3 x 3	82	74,5	71	69	66	61,5	52	40				
SV808F40T	3 x 4	110	99	95	92	87,5	81,5	69	53				
SV809F40T	3 x 4	123	112	107	104	97,5	92	78	60				
SV811F55T	3 x 5.5	150	137	130	127	119	112	95	73				
SV1602F22T	3 x 2.2	35				32,5	32	31	29,5	27,5	25	20	14,3
SV1603F30T	3 x 3	52				49	48	46	44	41	37,5	30,2	21,5
SV1604F40T	3 x 4	69				65	64	62	59	54,5	50	40,3	28,6
SV1605F55T	3 x 5.5	86				81	80	77	73	68,5	62	50	35,8
SV1606F55T	3 x 5.5	104				98	96	92	88	82	75	60,5	43
SV1607F75T	3 x 7.5	121				114	112	108	103	96	87	70,5	50
SV1608F75T	3 x 7.5	138				130	128	123	117	109	100	81	57

The table refers to performance with 3 pumps running

gcomv3p-2p50-en_a_th

GHV30/SV33-46 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV30/..	NOMINAL POWER	Q = DELIVERY											
		l/min 0	750	900	1101	1251	1500	1749	2001	2250	2700	3000	
	m³/h 0	45	54	66	75	90	105	120	135	162	180		
kW		H = TOTAL HEAD METERS COLUMN OF WATER											
SV3301/1F22T	3 x 2.2	17,4	16,2	15,7	15	14	12,2	9,8	6,7				
SV3301F30T	3 x 3	23,8	21,7	21,2	20	20	17,8	15,5	12,7				
SV3302/2F40T	3 x 4	35,1	34,1	33,3	32	30	27	22,4	16,6				
SV3302/1F40T	3 x 4	40,8	38,8	37,9	36	35	32	27,5	22,3				
SV3302F55T	3 x 5.5	47,8	45	44,1	43	41	39	35	29,9				
SV3303/2F55T	3 x 5.5	57,7	55,2	53,8	51	49	44	38	29,6				
SV3303/1F75T	3 x 7.5	64,5	61,3	60	58	56	51	45	37				
SV3303F75T	3 x 7.5	71,5	67,4	66,0	64	62	58	52,0	44,6				
SV3304/2F75T	3 x 7.5	82	78,8	77	74	72	66	58	47,2				
SV3304/1F110T	3 x 11	88,9	85	83	81	78	73	65	55,1				
SV3304F110T	3 x 11	95,9	91,1	90	87	85	80	73	63,1				
SV3305/2F110T	3 x 11	106	101,6	100	96	93	85	76	63				
SV3305/1F110T	3 x 11	112,7	107,2	105	102	99	92	82	70				
SV3305F150T	3 x 15	120,4	114,9	113	110	107	101	92	80,5				
SV3306/2F150T	3 x 15	131,2	126,9	125	120	116	108	96	81,2				
SV3306/1F150T	3 x 15	139,1	133,5	131	128	124	116	105	90,4				
SV3306F150T	3 x 15	145,6	139	137	133	129	121	110	96,1				
SV3307/2F150T	3 x 15	156	149,9	147	143	138	128	115	98,2				
SV4601/1F30T	3 x 3	19,5			19,2	18,8	17,9	16,7	15,1	13,1	8,5	4,6	
SV4601F40T	3 x 4	27,2			24	23,5	22,5	21,4	19,9	18,2	14,3	10,8	
SV4602/2F55T	3 x 5.5	38,8			39,8	39,2	37,8	35,7	32,9	29,4	21,1	13,9	
SV4602F75T	3 x 7.5	52,6			48,5	47,7	46,1	44,2	41,7	38,7	31,4	25,1	
SV4603/2F110T	3 x 11	64,7			65,1	64	62	60	56	52	40,4	30,8	
SV4603F110T	3 x 11	80,8			74,3	73	71	68	65	60	50	40,7	
SV4604/2F150T	3 x 15	92,4			90,7	90	87	83	79	73	58	45,6	
SV4604F150T	3 x 15	107,3			99,8	98	96	92	87	82	68	55,9	
SV4605/2F185T	3 x 18.5	117,2			114,8	113	110	106	100	93	75	60,2	
SV4605F185T	3 x 18.5	134,5			125,1	123	120	116	110	103	86	71,5	
SV4606/2F220T	3 x 22	143,7			139,3	138	134	129	122	113	92	73,4	
SV4606F220T	3 x 22	161			149,9	148	144	139	132	124	104	86	

The table refers to performance with 3 pumps running

gcomv3psv33-2p50-en_a_th



ITT

Lowara

GHV30/SV66-92 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV30/..	NOMINAL POWER	Q = DELIVERY												
		l/min 0	1500	1800	2100	2250	2700	3000	3600	3900	4251	4800	5400	6000
	m³/h 0	90	108	126	135	162	180	216	234	255	288	324	360	
kW		H = TOTAL HEAD METERS COLUMN OF WATER												
SV6601/1F40T	3 x 4	23,8	21,4	20,7	19,9	19,4	17,8	16,6	13,3	11,2	8,3			
SV6601F55T	3 x 5.5	29,2	25,8	24,8	23,8	23,3	21,8	20,7	17,9	16,1	13,5			
SV6602/2F75T	3 x 7.5	47,5	42,6	41,2	39,5	38,6	36	32,9	26,4	22,2	16,4			
SV6602/1F110T	3 x 11	54,2	49,6	48,2	46,7	45,8	42,9	40,6	34,8	31,2	26,2			
SV6602F110	3 x 11	60,4	55,7	54,4	52,8	52	49,3	47,1	42	38,9	34,7			
SV6603/2F150T	3 x 15	78,4	71,6	70	67	66	62	58	49	43,3	35,3			
SV6603/1F150T	3 x 15	84,7	77,8	76	74	72	68	65	56	51	44,0			
SV6603F185T	3 x 18.5	91,4	84,7	83	81	79	75	72	64	60	53,5			
SV6604/2F185T	3 x 18.5	108,9	99,6	97	94	92	86	82	70	63	52,8			
SV6604/1F220T	3 x 22	115,2	105,9	103	100	99	93	89	78	71	61,8			
SV6604F220T	3 x 22	121,6	112,5	110	107	105	100	96	86	79	70,8			
SV9201/1F55T	3 x 5.5	24,5				22,2	21,5	20,9	19,4	18,5	17,3	15	11,8	7,9
SV9201F75T	3 x 7.5	33,5				28,7	27,2	26,2	24,3	23,3	22,2	20,2	17,6	14,3
SV9202/2F110T	3 x 11	49,4				45,1	43,7	42,5	39,6	37,9	35,5	30,9	24,6	16,8
SV9202F150T	3 x 15	67,8				58,2	55	53	49,5	47,6	45,2	41,4	36,3	29,6
SV9203/2F185T	3 x 18.5	82,4				74,4	72	70	65	62	59	52	43,6	32,9
SV9203F220T	3 x 22	102,2				88,2	84	81	76	73	69	63	56	46,3

The table refers to performance with 3 pumps running

gcomv3psv66-2p50-en_a_th

GHV40/SV8-16 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV40/..	NOMINAL POWER kW	Q = DELIVERY											
		l/min 0	400	480	532	600	668	800	932	1068	1200	1400	1600
		m ³ /h 0	24	28,8	32	36	40	48	56	64	72	84	96
H = TOTAL HEAD METERS COLUMN OF WATER													
SV802F11T	4 x 1.1	27	24,8	24	23	22	20,5	17,2	13,2				
SV803F15T	4 x 1.5	41	37	36	34,5	33	30,5	25,8	20				
SV804F22T	4 x 2.2	55	50	47,5	46	44	41	34,5	26,5				
SV805F22T	4 x 2.2	68	62	60	57,5	55	51	43	33				
SV806F30T	4 x 3	82	74,5	71	69	66	61,5	52	40				
SV808F40T	4 x 4	110	99	95	92	87,5	81,5	69	53				
SV809F40T	4 x 4	123	112	107	104	97,5	92	78	60				
SV811F55T	4 x 5.5	150	137	130	127	119	112	95	73				
SV1602F22T	4 x 2.2	35				32,5	32	31	29,5	27,5	25	20	14,3
SV1603F30T	4 x 3	52				49	48	46	44	41	37,5	30,2	21,5
SV1604F40T	4 x 4	69				65	64	62	59	54,5	50	40,3	28,6
SV1605F55T	4 x 5.5	86				81	80	77	73	68,5	62	50	35,8
SV1606F55T	4 x 5.5	104				98	96	92	88	82	75	60,5	43
SV1607F75T	4 x 7.5	121				114	112	108	103	96	87	70,5	50
SV1608F75T	4 x 7.5	138				130	128	123	117	109	100	81	57

The table refers to performance with 4 pumps running

gcomv4p-2p50-en_a_th

GHV40/SV33-46 SERIES BOOSTER SETS

HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV40/..	NOMINAL POWER kW	Q = DELIVERY											
		l/min 0	1000	1200	1468	1668	2000	2332	2668	3000	3600	4000	
		m ³ /h 0	60	72	88	100	120	140	160	180	216	240	
H = TOTAL HEAD METERS COLUMN OF WATER													
SV3301/1F22T	4 x 2.2	17,4	16,2	15,7	15	14	12,2	9,8	6,7				
SV3301F30T	4 x 3	23,8	21,7	21,2	20	20	17,8	15,5	12,7				
SV3302/2F40T	4 x 4	35,1	34,1	33,3	32	30	27	22,4	16,6				
SV3302/1F40T	4 x 4	40,8	38,8	37,9	36	35	32	27,5	22,3				
SV3302F55T	4 x 5.5	47,8	45	44,1	43	41	39	35	29,9				
SV3303/2F55T	4 x 5.5	57,7	55,2	53,8	51	49	44	38	29,6				
SV3303/1F75T	4 x 7.5	64,5	61,3	60	58	56	51	45	37				
SV3303F75T	4 x 7.5	71,5	67,4	66,0	64	62	58	52,0	44,6				
SV3304/2F75T	4 x 7.5	82	78,8	77	74	72	66	58	47,2				
SV3304/1F110T	4 x 11	88,9	85	83	81	78	73	65	55,1				
SV3304F110T	4 x 11	95,9	91,1	90	87	85	80	73	63,1				
SV3305/2F110T	4 x 11	106	101,6	100	96	93	85	76	63				
SV3305/1F110T	4 x 11	112,7	107,2	105	102	99	92	82	70				
SV3305F150T	4 x 15	120,4	114,9	113	110	107	101	92	80,5				
SV3306/2F150T	4 x 15	131,2	126,9	125	120	116	108	96	81,2				
SV3306/1F150T	4 x 15	139,1	133,5	131	128	124	116	105	90,4				
SV3306F150T	4 x 15	145,6	139	137	133	129	121	110	96,1				
SV3307/2F150T	4 x 15	156	149,9	147	143	138	128	115	98,2				
SV4601/1F30T	4 x 3	19,5			19,2	18,8	17,9	16,7	15,1	13,1	8,5	4,6	
SV4601F40T	4 x 4	27,2			24	23,5	22,5	21,4	19,9	18,2	14,3	10,8	
SV4602/2F55T	4 x 5.5	38,8			39,8	39,2	37,8	35,7	32,9	29,4	21,1	13,9	
SV4602F75T	4 x 7.5	52,6			48,5	47,7	46,1	44,2	41,7	38,7	31,4	25,1	
SV4603/2F110T	4 x 11	64,7			65,1	64	62	60	56	52	40,4	30,8	
SV4603F110T	4 x 11	80,8			74,3	73	71	68	65	60	50	40,7	
SV4604/2F150T	4 x 15	92,4			90,7	90	87	83	79	73	58	45,6	
SV4604F150T	4 x 15	107,3			99,8	98	96	92	87	82	68	55,9	
SV4605/2F185T	4 x 18.5	117,2			114,8	113	110	106	100	93	75	60,2	
SV4605F185T	4 x 18.5	134,5			125,1	123	120	116	110	103	86	71,5	
SV4606/2F220T	4 x 22	143,7			139,3	138	134	129	122	113	92	73,4	
SV4606F220T	4 x 22	161			149,9	148	144	139	132	124	104	86	

The table refers to performance with 4 pumps running

gcomv4psv33-2p50-en_a_th



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GHV40/SV66-92 SERIES BOOSTER SETS HYDRAULIC PERFORMANCE TABLE AT 50 HZ

SET TYPE GHV40/..	NOMINAL POWER	Q = DELIVERY												
		l/min 0	2000	2400	2800	3000	3600	4000	4800	5200	5668	6400	7200	8000
	m³/h 0	120	144	168	180	216	240	288	312	340	384	432	480	
kW		H = TOTAL HEAD METERS COLUMN OF WATER												
SV6601/1F40T	4 x 4	23,8	21,4	20,7	19,9	19,4	17,8	16,6	13,3	11,2	8,3			
SV6601F55T	4 x 5.5	29,2	25,8	24,8	23,8	23,3	21,8	20,7	17,9	16,1	13,5			
SV6602/2F75T	4 x 7.5	47,5	42,6	41,2	39,5	38,6	36	32,9	26,4	22,2	16,4			
SV6602/1F110T	4 x 11	54,2	49,6	48,2	46,7	45,8	42,9	40,6	34,8	31,2	26,2			
SV6602F110	4 x 11	60,4	55,7	54,4	52,8	52	49,3	47,1	42	38,9	34,7			
SV6603/2F150T	4 x 15	78,4	71,6	70	67	66	62	58	49	43,3	35,3			
SV6603/1F150T	4 x 15	84,7	77,8	76	74	72	68	65	56	51	44,0			
SV6603F185T	4 x 18.5	91,4	84,7	83	81	79	75	72	64	60	53,5			
SV6604/2F185T	4 x 18.5	108,9	99,6	97	94	92	86	82	70	63	52,8			
SV6604/1F220T	4 x 22	115,2	105,9	103	100	99	93	89	78	71	61,8			
SV6604F220T	4 x 22	121,6	112,5	110	107	105	100	96	86	79	70,8			
SV9201/1F55T	4 x 5.5	24,5				22,2	21,5	20,9	19,4	18,5	17,3	15	11,8	7,9
SV9201F75T	4 x 7.5	33,5				28,7	27,2	26,2	24,3	23,3	22,2	20,2	17,6	14,3
SV9202/2F110T	4 x 11	49,4				45,1	43,7	42,5	39,6	37,9	35,5	30,9	24,6	16,8
SV9202F150T	4 x 15	67,8				58,2	55	53	49,5	47,6	45,2	41,4	36,3	29,6
SV9203/2F185T	4 x 18.5	82,4				74,4	72	70	65	62	59	52	43,6	32,9
SV9203F220T	4 x 22	102,2				88,2	84	81	76	73	69	63	56	46,3

The table refers to performance with 4 pumps running

gcomv4psv66-2p50-en_a_th



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GHV10..40/SV2-4-8-16 BOOSTER SETS ELECTRICAL DATA TABLE 50 Hz

PUMP TYPE	NOMINAL POWER 1 pump kW	GHV10../M ABSORBED CURRENT 1 x 230 V (*) A	GHV10 ABSORBED CURRENT 3 x 400 V (*) A	GHV20../M ABSORBED CURRENT 1 x 230 V (*) A	GHV20 ABSORBED CURRENT 3 x 400 V (*) A	GHV30 ABSORBED CURRENT 3 x 400 V (*) A	GHV40 ABSORBED CURRENT 3 x 400 V (*) A
SV202	0,37	-	-	-	-	-	-
SV203	0,37	-	-	-	-	-	-
SV204	0,55	-	-	8,92	-	-	-
SV205	0,75	6,3	-	-	-	-	-
SV206	0,75	6,3	-	13,2	-	-	-
SV207	1,1	8,14	2,75	-	-	-	-
SV208	1,1	8,14	2,75	-	-	-	-
SV209	1,1	8,14	2,75	16,28	5,5	-	-
SV211	1,5	10,8	3,63	21,6	-	-	-
SV212	1,5	10,8	3,63	21,6	7,26	-	-
SV214	2,2	15,7	5,28	31,4	10,56	-	-
SV402	0,37	-	-	-	-	-	-
SV403	0,55	-	-	8,92	-	-	-
SV404	0,75	6,3	-	12,6	-	-	-
SV405	1,1	8,14	2,75	-	-	-	-
SV406	1,1	8,14	2,75	-	-	-	-
SV407	1,1	8,14	2,75	16,28	5,5	-	-
SV408	1,5	10,8	3,63	-	-	-	-
SV409	1,5	10,8	3,63	21,6	7,26	-	-
SV411	2,2	15,7	5,28	-	-	-	-
SV413	2,2	15,7	5,28	31,4	10,56	-	-
SV414	3	-	6,31	-	12,62	-	-
SV802	1,1	8,14	2,75	-	-	8,25	11
SV803	1,5	10,8	3,63	21,6	7,26	10,89	14,52
SV804	2,2	15,7	5,28	31,4	10,56	15,84	21,12
SV805	2,2	15,7	5,28	31,4	10,56	15,84	21,12
SV806	3	-	6,31	-	12,62	18,93	25,24
SV808	4	-	8,42	-	-	25,26	33,68
SV809	4	-	8,42	-	16,84	25,26	33,68
SV811	5,5	-	10,5	-	21	31,5	42
SV1602	2,2	15,7	5,28	31,4	10,56	15,84	21,12
SV1603	3	-	6,31	-	12,62	18,93	25,24
SV1604	4	-	8,42	-	16,84	25,26	33,68
SV1605	5,5	-	10,5	-	21	31,5	42
SV1606	5,5	-	10,5	-	21	31,5	42
SV1607	7,5	-	14,1	-	28,2	42,3	56,4
SV1608	7,5	-	14,1	-	28,2	42,3	56,4

Gcom1_2p50-en_a_te

The current shown is the nominal current of the set.

**GHV10..40/SV33-46-66-92 BOOSTER SETS
ELECTRICAL DATA TABLE 50 Hz**

PUMP TYPE	NOMINAL POWER 1 pump kW	GHV10 ABSORBED CURRENT 3 x 400 V A	GHV20 ABSORBED CURRENT 3 x 400 V A	GHV30 ABSORBED CURRENT 3 x 400 V A	GHV40 ABSORBED CURRENT 3 x 400 V A
SV3301/1	2,2	5,28	10,56	15,84	21,12
SV3301	3	6,31	12,62	18,93	25,24
SV3302/2	4	8,42	16,84	25,26	33,68
SV3302/1	4	8,42	16,84	25,26	33,68
SV3302	5,5	10,5	21	31,5	42
SV3303/2	5,5	10,5	21	31,5	42
SV3303/1	7,5	14,1	28,2	42,3	56,4
SV3303	7,5	14,1	28,2	42,3	56,4
SV3304/2	7,5	14,1	28,2	42,3	56,4
SV3304/1	11	24,2	48,4	72,6	96,8
SV3304	11	24,2	48,4	72,6	96,8
SV3305/2	11	24,2	48,4	72,6	96,8
SV3305/1	11	24,2	48,4	72,6	96,8
SV3305	15	31,6	63,2	94,8	126,4
SV3306/2	15	31,6	63,2	94,8	126,4
SV3306/1	15	31,6	63,2	94,8	126,4
SV3306/	15	31,6	63,2	94,8	126,4
SV3307/2	15	31,6	63,2	94,8	126,4
SV4601/1	3	6,31	12,62	18,93	25,24
SV4601	4	8,42	16,84	25,26	33,68
SV4602/2	5,5	10,5	21	31,5	42
SV4602	7,5	14,1	28,2	42,3	56,4
SV4603/2	11	24,2	48,4	72,6	96,8
SV4603	11	24,2	48,4	72,6	96,8
SV4604/2	15	31,6	63,2	94,8	126,4
SV4604	15	31,6	63,2	94,8	126,4
SV4605/2	18,5	39	78	117	156
SV4605	18,5	39	78	117	156
SV4606/2	22	46,3	92,6	138,9	185,2
SV4606	22	46,3	92,6	138,9	185,2
SV6601/1	4	8,42	16,84	25,26	33,68
SV6601	5,5	10,5	21	31,5	42
SV6602/2	7,5	14,1	28,2	42,3	56,4
SV6602/1	11	24,2	48,4	72,6	96,8
SV6602	11	24,2	48,4	72,6	96,8
SV6603/2	15	31,6	63,2	94,8	126,4
SV6603/1	15	31,6	63,2	94,8	126,4
SV6603	18,5	39	78	117	156
SV6604/2	18,5	39	78	117	156
SV6604/1	22	46,3	92,6	138,9	185,2
SV6604	22	46,3	92,6	138,9	185,2
SV9201/1	5,5	10,5	21	31,5	42
SV9201	7,5	14,1	28,2	42,3	56,4
SV9202/2	11	24,2	48,4	72,6	96,8
SV9202	15	31,6	63,2	94,8	126,4
SV9203/2	18,5	39	78	117	156
SV9203	22	46,3	92,6	138,9	185,2

Gcom2_2p50-en_a_te

The current shown is the nominal current of the set.

Booster sets

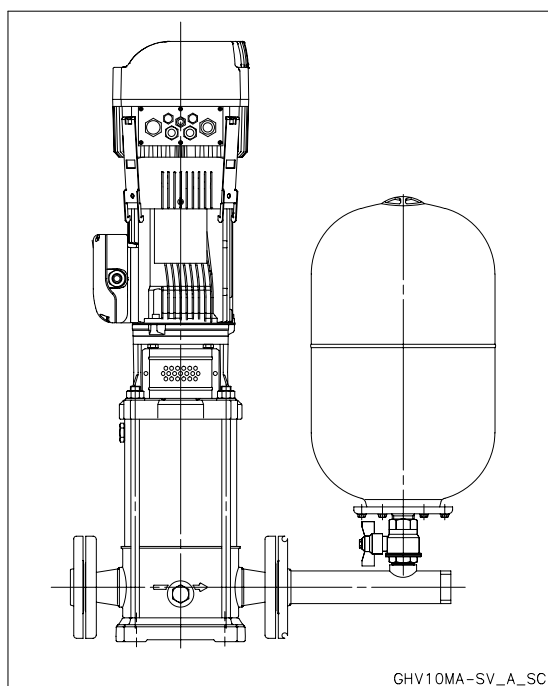
MARKET SECTORS

CIVIL, INDUSTRIAL

APPLICATIONS

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

GHV10 Series



SPECIFICATIONS

- **Flow rate** up to 100 m³/h.
- **Head** up to 150 m.
- Electrical panel supply voltage:
 - 1 x 230V ± 10% up to 2,2 kW.
 - 3 x 400V ± 10% for 1,1 kW and up.
- Frequency: 50 Hz.
- External control voltage:
 - 5 ÷ 10 V.
- Protection class:
 - electrical panel: IP55.
 - converter: IP55 up to 11 kW.
 - IP54 above 11 kW.
- Maximum electric pump power 1 x 22 kW.
- Progressive motor start.
- **Vertical design pump:**
 - SV..T series (motor protection class IP55).
- Maximum operating pressure:
 - 15 bar for sets with SV..T electric pumps.
- Maximum temperature of pumped liquid : +40°C.



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MAIN COMPONENTS of **GHV10** booster sets

- One multistage vertical **electric pump**, SV series.
- **Hydrovar®** frequency **converter** mounted on the electric pump motor.
- **Discharge manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). R1" threaded coupling for connection of a diaphragm tank, with nickel-plated brass valve. Zinc-plated counterflanges.
- 24-litre **diaphragm tank**.
- **Pressure transmitter** for control, connected to the frequency converter.
- **Electrical panel** for control and protection, with casing made of plastic material, IP55 protection class, equipped with:
 - thermal-magnetic converter protector.The panel is mounted on the electric pump using a bracket.

A wall-mounted **bypass panel** is available on request (see control panel section above), with three-phase supply for up to 11 kW power.

The set comes pre-assembled and tested, complete with operating instructions and panel wiring diagram.

VERSIONS AVAILABLE ON REQUEST

A316 version

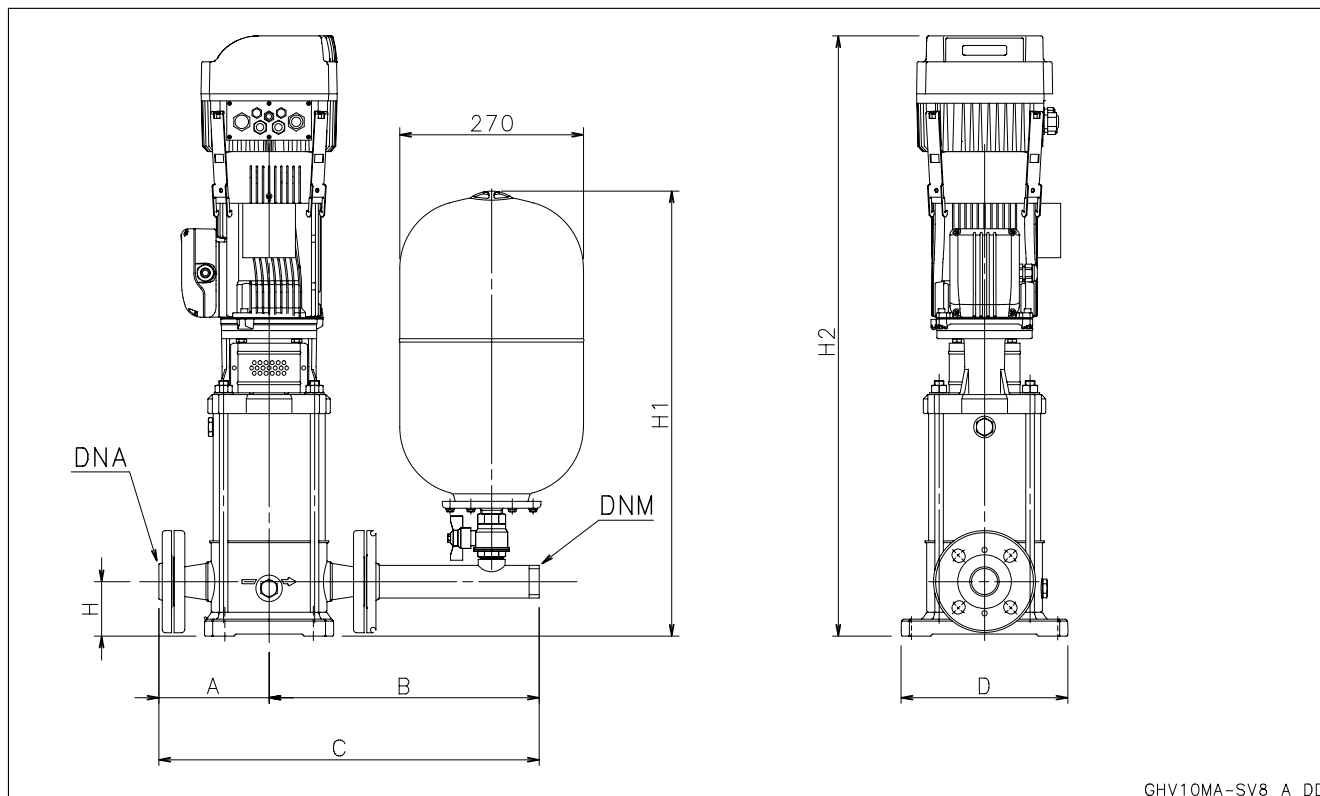
For special applications

Sets with SV 2-4-8-16-33-46-66-92 pumps:

Pump, manifold, valve and diaphragm tank made of AISI 316 stainless steel.

Optional accessories:

- Devices against dry running:
 - float switch, minimum pressure switch to be connected directly to the converter terminal board.
- On-off valve
- Non-return valve

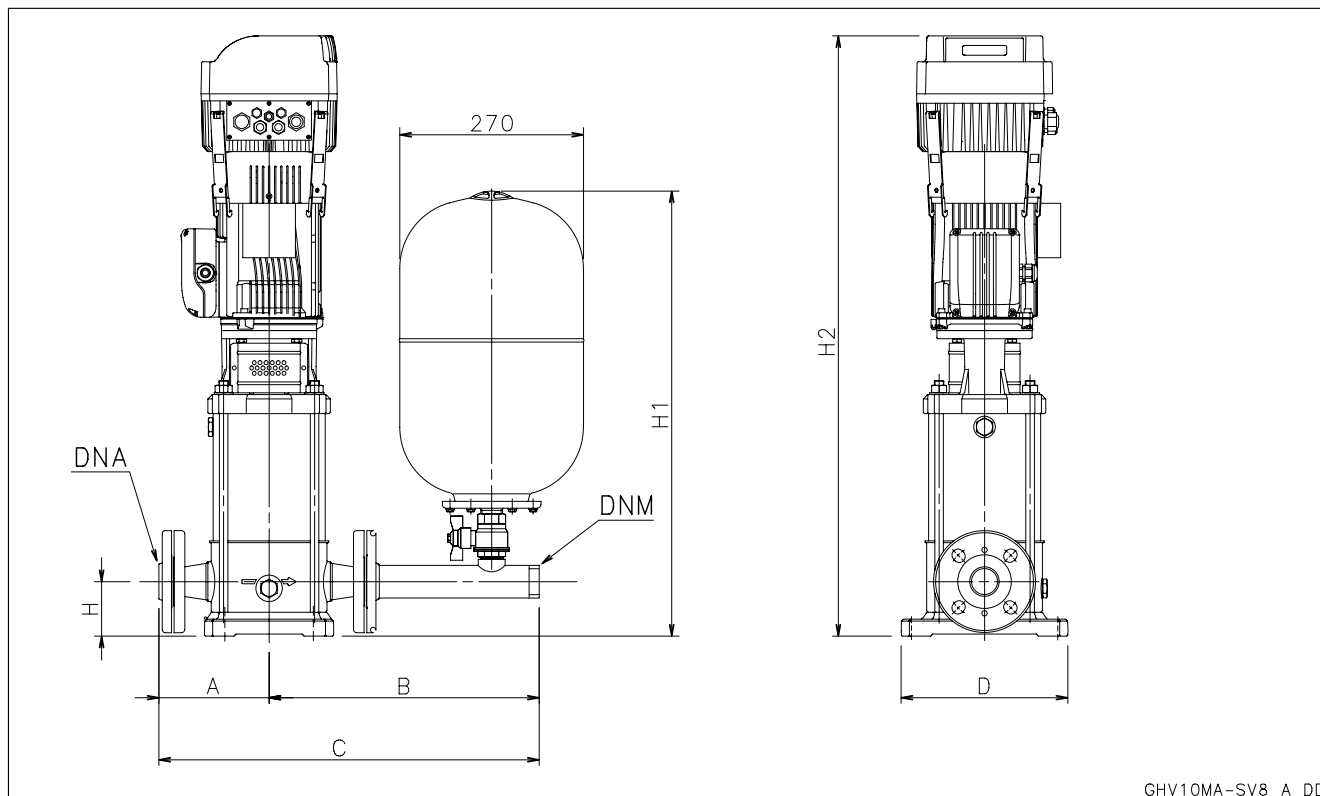
**GHV10 .../M SERIES BOOSTER SETS
SINGLE-PHASE POWER SUPPLY**


GHV10MA-SV8_A_DD

GHV 10	DNA	DNM	A	B	C	D	H	H1	H2
SV205F07T	Rp1"	R1"	146	383	529	210	75	642	781
SV206F07T	Rp1"	R1"	146	383	529	210	75	642	806
SV207F11T	Rp1"	R1"	146	383	529	210	75	642	868
SV208F11T	Rp1"	R1"	146	383	529	210	75	642	893
SV209F11T	Rp1"	R1"	146	383	529	210	75	642	918
SV211F15T	Rp1"	R1"	146	383	529	210	75	642	978
SV212F15T	Rp1"	R1"	146	383	529	210	75	642	1003
SV214F22T	Rp1"	R1"	146	383	529	210	75	642	1053
SV404F07T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	756
SV405F11T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	818
SV406F11T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	843
SV407F11T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	868
SV408F15T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	903
SV409F15T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	928
SV411F22T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	978
SV413F22T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	1028
SV802F11T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	811
SV803F15T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	859
SV804F22T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	897
SV805F22T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	935
SV1602F22T	Rp2"	R2"	175	457	632	245	90	670	831

Dimensions in mm. Tolerance ± 10 mm.

ghvm10_sv8_b_td

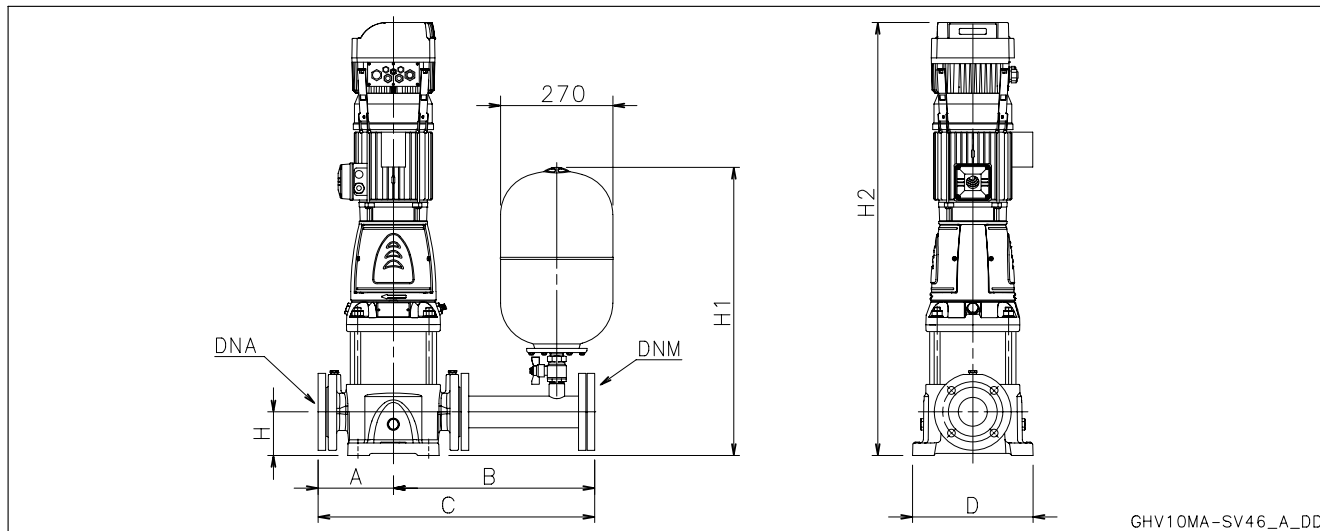
**GHV10 SERIES BOOSTER SETS
THREE-PHASE POWER SUPPLY**


GHV10MA-SV8_A_DD

GHV 10	DNA	DNM	A	B	C	D	H	H1	H2
SV207F11T	Rp1"	R1"	146	383	529	210	75	642	868
SV208F11T	Rp1"	R1"	146	383	529	210	75	642	893
SV209F11T	Rp1"	R1"	146	383	529	210	75	642	918
SV211F15T	Rp1"	R1"	146	383	529	210	75	642	978
SV212F15T	Rp1"	R1"	146	383	529	210	75	642	1003
SV214F22T	Rp1"	R1"	146	383	529	210	75	642	1053
SV405F11T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	818
SV406F11T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	843
SV407F11T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	868
SV408F15T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	903
SV409F15T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	928
SV411F22T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	978
SV413F22T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	1028
SV414F30T	Rp1"1/4	R1"1/4	148	383	531	210	75	646	1103
SV802F11T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	811
SV803F15T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	859
SV804F22T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	897
SV805F22T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	935
SV806F30T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	1023
SV808F40T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	1103
SV809F40T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	1141
SV811F55T	Rp1"1/2	R1"1/2	163	398	561	245	80	654	1304
SV1602F22T	Rp2"	R2"	175	457	632	245	90	670	831
SV1603F30T	Rp2"	R2"	175	457	632	245	90	670	919
SV1604F40T	Rp2"	R2"	175	457	632	245	90	670	961
SV1605F55T	Rp2"	R2"	175	457	632	245	90	670	1086
SV1606F55T	Rp2"	R2"	175	457	632	245	90	670	1124

Dimensions in mm. Tolerance ± 10 mm.

ghvt10_sv8_b_td

**GHV10 SERIES BOOSTER SETS
THREE-PHASE POWER SUPPLY**


GHV 10	DNA	DNM	A	B	C	D	H	H1	H2
SV3301/1F22T	65	65	181	484	665	290	105	693	937
SV3301F30T	65	65	181	484	665	290	105	693	977
SV3302/2F40T	65	65	181	484	665	290	105	693	1056
SV3302/1F40T	65	65	181	484	665	290	105	693	1056
SV3302F55T	65	65	181	484	665	290	105	693	1143
SV3303/2F55T	65	65	181	484	665	290	105	693	1218
SV3303/1F75T	65	65	181	484	665	290	105	693	1218
SV3303F75T	65	65	181	484	665	290	105	693	1218
SV3304/2F75T	65	65	181	484	665	290	105	693	1293
SV3304/1F110T	65	65	181	484	665	290	105	693	1381
SV3304F110T	65	65	181	484	665	290	105	693	1381
SV3305/2F110T	65	65	181	484	665	290	105	693	1456
SV3305/1F110T	65	65	181	484	665	290	105	693	1456
SV3305F150T	65	65	181	484	665	290	105	693	1632
SV3306/2F150T	65	65	181	484	665	290	105	693	1707
SV3306/1F150T	65	65	181	484	665	290	105	693	1707
SV3306F150T	65	65	181	484	665	290	105	693	1707
SV3307/2F150T	65	65	181	484	665	290	105	693	1782
SV4601/1F30T	80	80	206	509	714	315	140	735	1017
SV4601F40T	80	80	206	509	714	315	140	735	1021
SV4602/2F55T	80	80	206	509	714	315	140	735	1183
SV4602F75T	80	80	206	509	714	315	140	735	1183
SV4603/2F110T	80	80	206	509	714	315	140	735	1346
SV4603F110T	80	80	206	509	714	315	140	735	1346
SV4604/2F150T	80	80	206	509	714	315	140	735	1597
SV4604F150T	80	80	206	509	714	315	140	735	1597
SV4605/2F185T	80	80	206	509	714	315	140	735	1716
SV4605F185T	80	80	206	509	714	315	140	735	1716
SV4606/2F220T	80	80	206	509	714	315	140	735	1791
SV4606F220T	80	80	206	509	714	315	140	735	1791
SV6601/1F40T	100	100	208	511	718	315	140	747	1046
SV6601F55T	100	100	208	511	718	315	140	747	1133
SV6602/2F75T	100	100	208	511	718	315	140	747	1223
SV6602/1F110T	100	100	208	511	718	315	140	747	1311
SV6602F110T	100	100	208	511	718	315	140	747	1311
SV6603/2F150T	100	100	208	511	718	315	140	747	1577
SV6603/1F150T	100	100	208	511	718	315	140	747	1577
SV6603F185T	100	100	208	511	718	315	140	747	1621
SV6604/2F185T	100	100	208	511	718	315	140	747	1711
SV6604/1F220T	100	100	208	511	718	315	140	747	1711
SV6604F220T	100	100	208	511	718	315	140	747	1711
SV9201/1F55T	100	100	208	511	718	315	140	747	1133
SV9201F75T	100	100	208	511	718	315	140	747	1133
SV9202/2F110T	100	100	208	511	718	315	140	747	1311
SV9202F150T	100	100	208	511	718	315	140	747	1487
SV9203/2F185T	100	100	208	511	718	315	140	747	1621
SV9203F220T	100	100	208	511	718	315	140	747	1621

Dimensions in mm. Tolerance ± 10 mm.

ghv10_sv46_a_td



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Booster sets

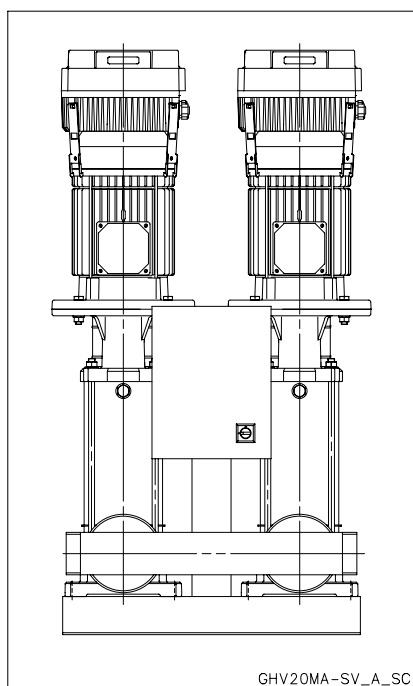
MARKET SECTORS

CIVIL, INDUSTRIAL

APPLICATIONS

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

GHV20 Series



SPECIFICATIONS

- **Flow rate** up to 200 m³/h.
- **Head** up to 150 m.
- Electrical panel supply voltage:
 - 1 x 230V ± 10% up to 2,2 kW.
 - 3 x 400V ± 10% for 1,1 kW and up.
- Frequency: 50 Hz.
- External control voltage:
 - 5 ÷ 10 V.
- Protection class:
 - electrical panel: IP55.
 - converter: IP55 up to 11 kW.
 - IP54 above 11 kW.
- Maximum electric pump power 2 x 22 kW.
- Progressive motor start.
- **Vertical design pump:**
 - SV..T series (motor protection class IP55).
- Maximum operating pressure:
 - 15 bar for sets with SV..T electric pumps.
- Maximum temperature of pumped liquid : +40°C.

MAIN COMPONENTS of GHV20 booster sets

- **Two** multistage vertical **electric pumps**, SV series.
- **Hydrovar®** frequency **converters** mounted on the motor of each electric pump.
- One **suction manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). Threaded coupling for water charging.
- One **discharge manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). Fitted with two R1" threaded couplings with caps to allow connection of 24-litre diaphragm tanks.
- **On-off valves** on suction and discharge sides of each pump, ball type with threaded coupling up to 2" size included (for pumps up to SV16 included). Butterfly type for installation between the flanges are used for larger diameter.
- **Non-return valves** on discharge side of each pump, spring – loaded type, with threaded coupling up to 1" 1/2 size. Spring – loaded type for installation between the flanges are large diameters.
- **Pressure gauge and control transmitter** on the pump's discharge side.
- **Miscellaneous** pipe fittings made of nickel-plated brass, galvanised steel and stainless steel.
- **Pump mounting base** and panel mounting bracket:
 - With SV2, 4, 8 series electric pumps with nominal power up to 4kW, of galvanised steel;
 - With SV8 series electric pumps with nominal power >4 kW, of painted steel;
 - For all others sets with SV16, 33, 46, 92 series electric pumps, of painted steel.
- **Electrical control panel** for control and protection made of plastic or painted steel, IP55 protection class, equipped with:
 - Main doorlock switch, only for three phase panel;
 - Thermal-magnetic protectors for each converter.
 The panel provides protection against dry running and is ready for installation of an external device such as a minimum pressure switch, float switch or electrode probes.
- On request, the sets can be supplied with:
 - non-return valves on suction side (**GHVRA version**);
 - frame-mounted Hydrovar (**HFD or HFS versions**);
 - stainless steel mounting base.

The set comes pre-assembled and tested, complete with operating instructions and panel wiring diagram.

VERSIONS AVAILABLE

STANDARD VERSION (STD)

For general applications

Sets with SV2, 4 ,8 pumps:

Nickel plated brass valves, brass non-return valves, stainless steel manifolds, galvanized plugs, caps and flanges.

Fitted with vibration damping feet, two pumps booster sets up to 4 kW power supply.

Sets with SV16 pumps:

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

Sets with SV33, 46, 92 pumps:

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

DW VERSION

For drinking water applications

The main components in contact with the liquid are certificated suitable for drinking water or are made of AISI304 or higher grade of stainless steel.

Fitted with vibration damping feet.

Sets with SV2, 4, 8 pumps:

Nickel plated brass valves, brass non-return valves, AISI304 stainless steel manifolds.

Sets with SV16 pumps:

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

Sets with SV33, 46, 92 pumps:

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

AISI304, AISI316 VERSIONS

For special applications

Manifolds, valves, non-return valves and main components with parts directly in contact with the pumped liquid are made of AISI304 or AISI316 stainless steel.

Fitted with vibration damping feet.

Accessories available on request:

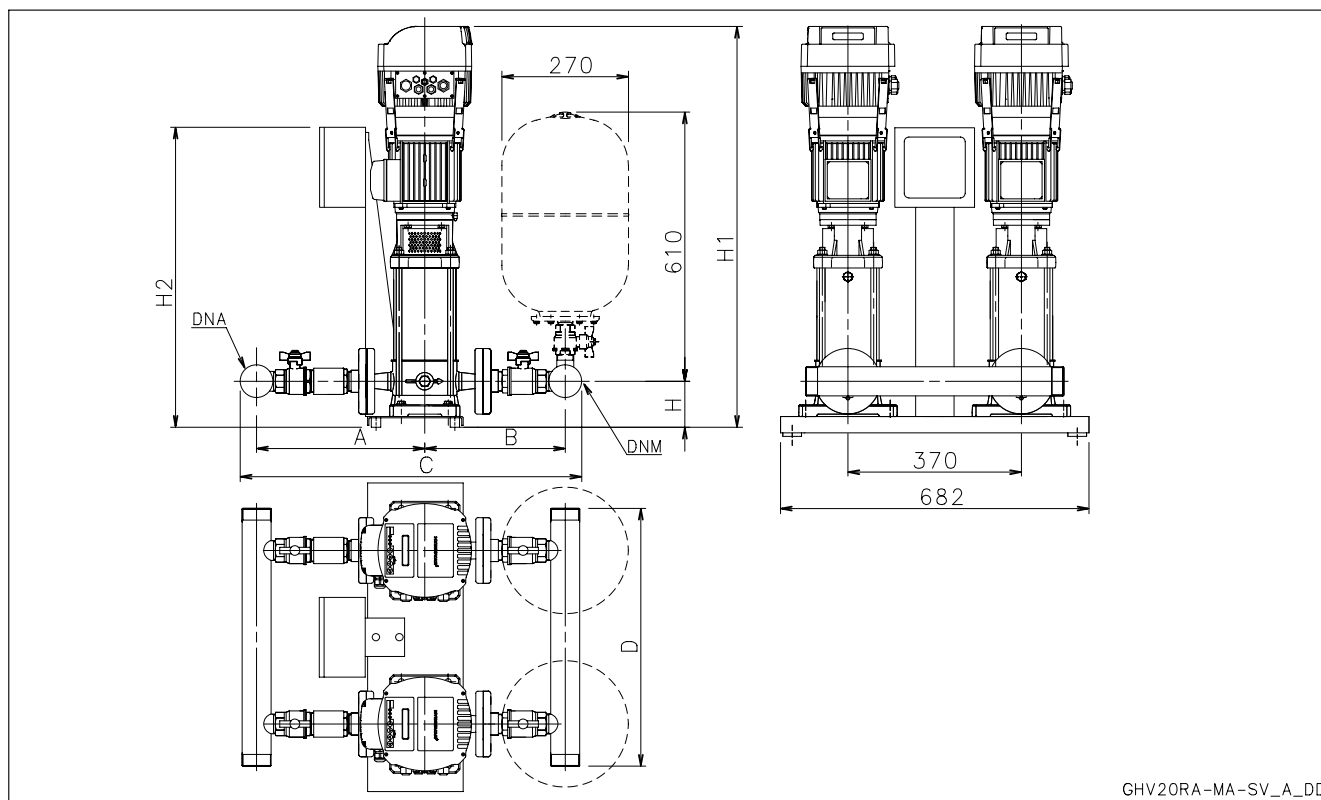
- Vibration dampers kit (1 kit per pump);
- Device against dry running in one of the following versions:
 - float switch, for positive suction head;
 - minimum pressure switch, for positive suction head;
 - probe electrodes kit, for positive suction head.
- Kit featuring a 24-litre diaphragm expansion tank equipped with a ball valve (one for each pump) in the following versions:
 - 24-litre 8 bar cylinder water tank kit
 - 24-litre 10 bar cylinder water tank kit
 - 24-litre 16 bar cylinder water tank kit.



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TWO-PUMP BOOSTER SETS, GHV20 RA../M SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE, SINGLE-PHASE POWER SUPPLY



GHV 20RA	DNA	DNM	A		B		C		D	H	H1	H2
			DW	A304	DW	A304	DW	A304				
SV204F05T	R 2"	R 2"	320	372	252	301	632	733	610	109	785	651
SV206F07T	R 2"	R 2"	320	372	252	301	632	733	610	109	840	651
SV209F11T	R 2"	R 2"	320	372	252	301	632	733	610	109	952	651
SV211F15T	R 2"	R 2"	320	372	252	301	632	733	610	109	1012	651
SV212F15T	R 2"	R 2"	320	372	252	301	632	733	610	109	1037	651
SV214F22T	R 2"	R 2"	320	372	252	301	632	733	610	109	1087	651
SV403F05T	R 2"	R 2"	335	431	265	311	660	802	610	109	760	651
SV404F07T	R 2"	R 2"	335	431	265	311	660	802	610	109	790	651
SV407F11T	R 2"	R 2"	335	431	265	311	660	802	610	109	902	651
SV409F15T	R 2"	R 2"	335	431	265	311	660	802	610	109	962	651
SV413F22T	R 2"	R 2"	335	431	265	311	660	802	610	109	1062	651
SV803F15T	R 2 1/2"	R 2 1/2"	397	497	302	356	775	929	610	114	893	651
SV804F22T	R 2 1/2"	R 2 1/2"	397	497	302	356	775	929	610	114	931	651
SV805F22T	R 2 1/2"	R 2 1/2"	397	497	302	356	775	929	610	114	969	651

Dimensions in mm. Tolerance ± 10 mm.

ghvm20ra_sv_c_td

The /A316 versions have the same dimensions as the /A304 versions.

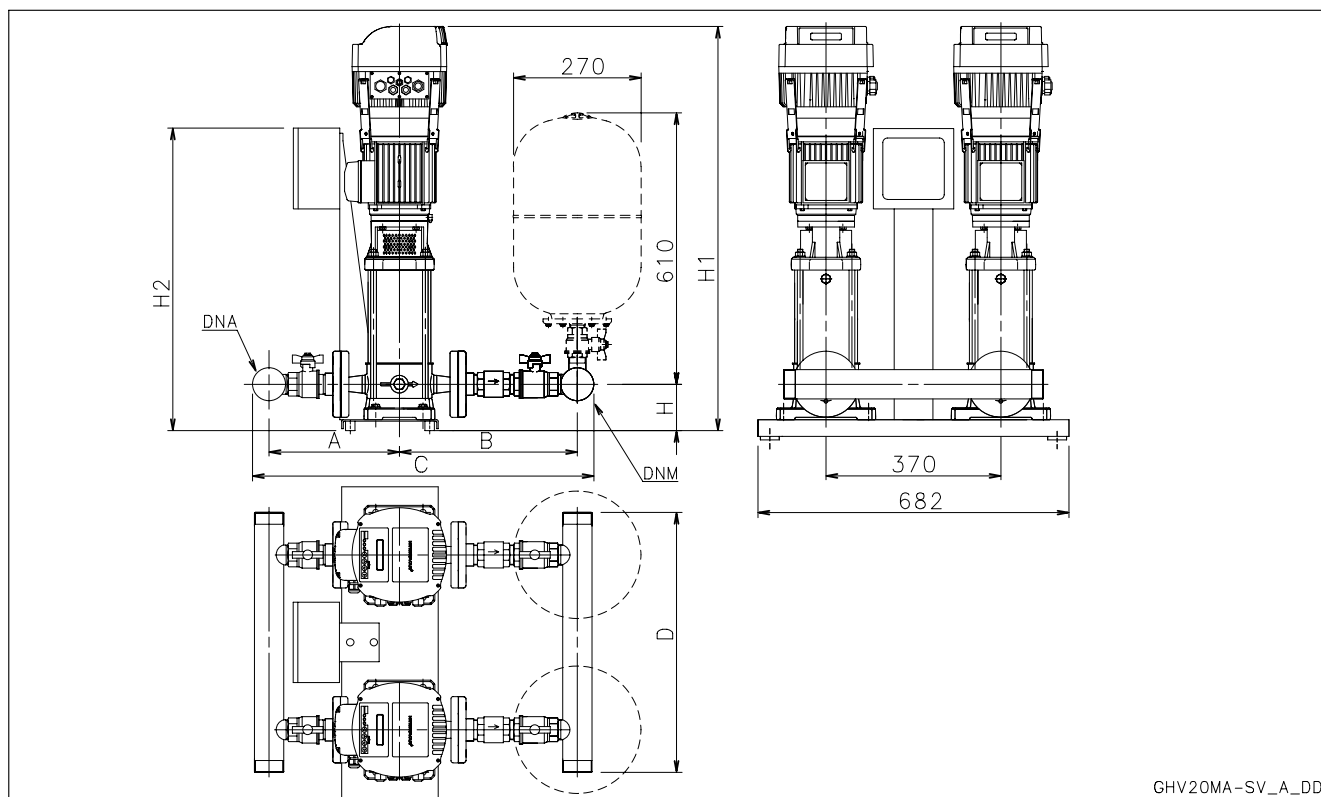
The GHV20 sets with vertical electric pumps in the Standard version use the stainless steel manifold and have the same dimensions as the /DW version.



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TWO-PUMP BOOSTER SETS, GHV20 ../M SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DELIVERY SIDE, SINGLE-PHASE POWER SUPPLY



GHV 20	DNA	DNM	A		B		C		D	H	H1	H2
			DW	A304	DW	A304	DW	A304				
SV204F05T	R 2"	R 2"	252	301	321	346	633	707	610	109	785	651
SV206F07T	R 2"	R 2"	252	301	321	346	633	707	610	109	840	651
SV209F11T	R 2"	R 2"	252	301	321	346	633	707	610	109	952	651
SV211F15T	R 2"	R 2"	252	301	321	346	633	707	610	109	1012	651
SV212F15T	R 2"	R 2"	252	301	321	346	633	707	610	109	1037	651
SV214F22T	R 2"	R 2"	252	301	321	346	633	707	610	109	1087	651
SV403F05T	R 2"	R 2"	265	311	328	431	653	802	610	109	760	651
SV404F07T	R 2"	R 2"	265	311	328	431	653	802	610	109	790	651
SV407F11T	R 2"	R 2"	265	311	328	431	653	802	610	109	902	651
SV409F15T	R 2"	R 2"	265	311	328	431	653	802	610	109	962	651
SV413F22T	R 2"	R 2"	265	311	328	431	653	802	610	109	1062	651
SV803F15T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	893	651
SV804F22T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	931	651
SV805F22T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	969	651

Dimensions in mm. Tolerance ± 10 mm.

ghvm20_sv_b_td

The /A316 versions have the same dimensions as the /A304 versions.

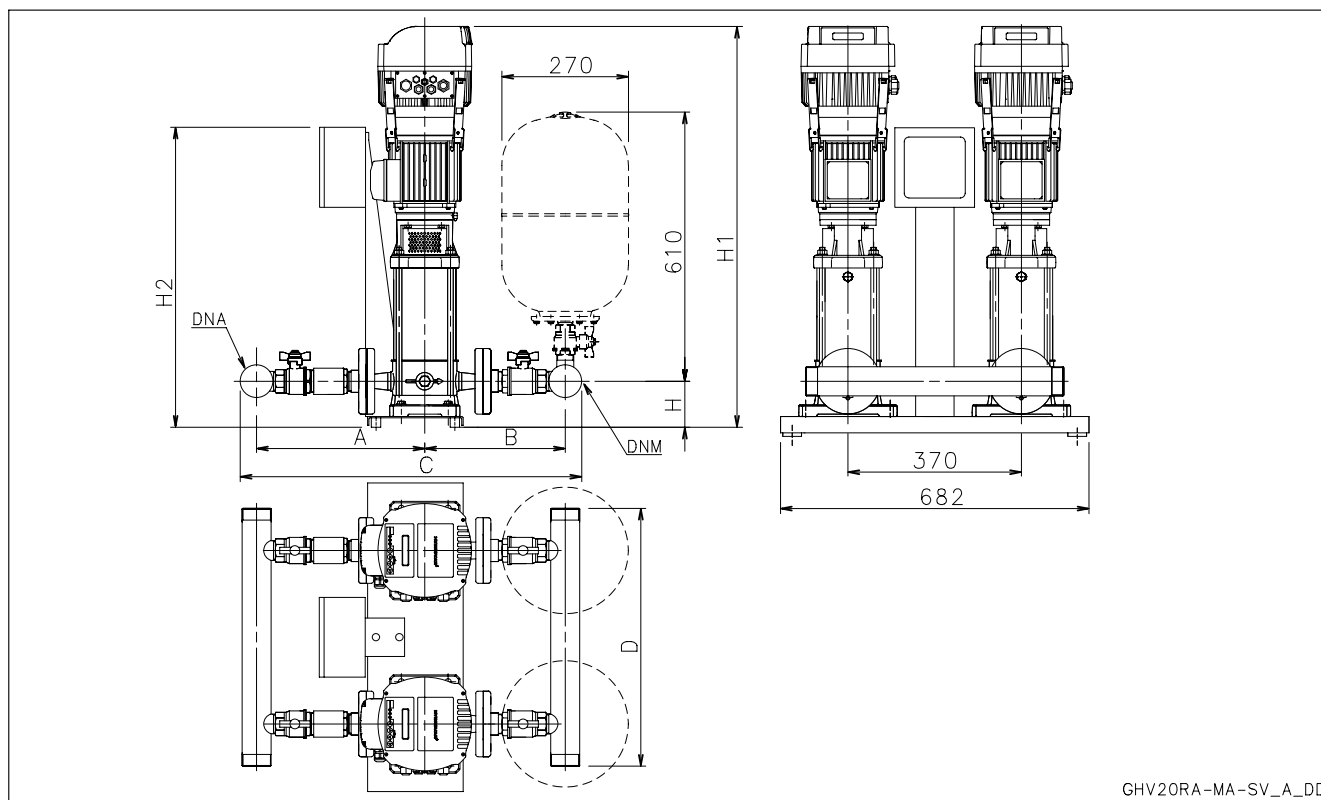
The GHV20 sets with vertical electric pumps in the Standard version use the stainless steel manifold and have the same dimensions as the /DW version.



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TWO-PUMP BOOSTER SETS, GHV20 RA SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE, THREE-PHASE POWER SUPPLY



GHV20RA-MA-SV_A_DD

GHV 20RA	DNA	DNM	A		B		C		D	H	H1	H2
			DW	A304	DW	A304	DW	A304				
SV209F11T	R 2"	R 2"	320	372	252	301	632	733	610	109	952	651
SV212F15T	R 2"	R 2"	320	372	252	301	632	733	610	109	1037	651
SV214F22T	R 2"	R 2"	320	372	252	301	632	733	610	109	1087	651
SV407F11T	R 2"	R 2"	335	431	265	311	660	802	610	109	902	651
SV409F15T	R 2"	R 2"	335	431	265	311	660	802	610	109	962	651
SV413F22T	R 2"	R 2"	335	431	265	311	660	802	610	109	1062	651
SV414F30T	R 2"	R 2"	335	431	265	311	660	802	610	109	1137	651
SV803F15T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	610	114	893	651
SV804F22T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	610	114	931	651
SV805F22T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	610	114	969	651
SV806F30T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	610	114	1057	651
SV809F40T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	610	114	1175	651

Dimensions in mm. Tolerance ± 10 mm.

ghvt20ra_sv_c_td

The /A316 versions have the same dimensions as the /A304 versions.

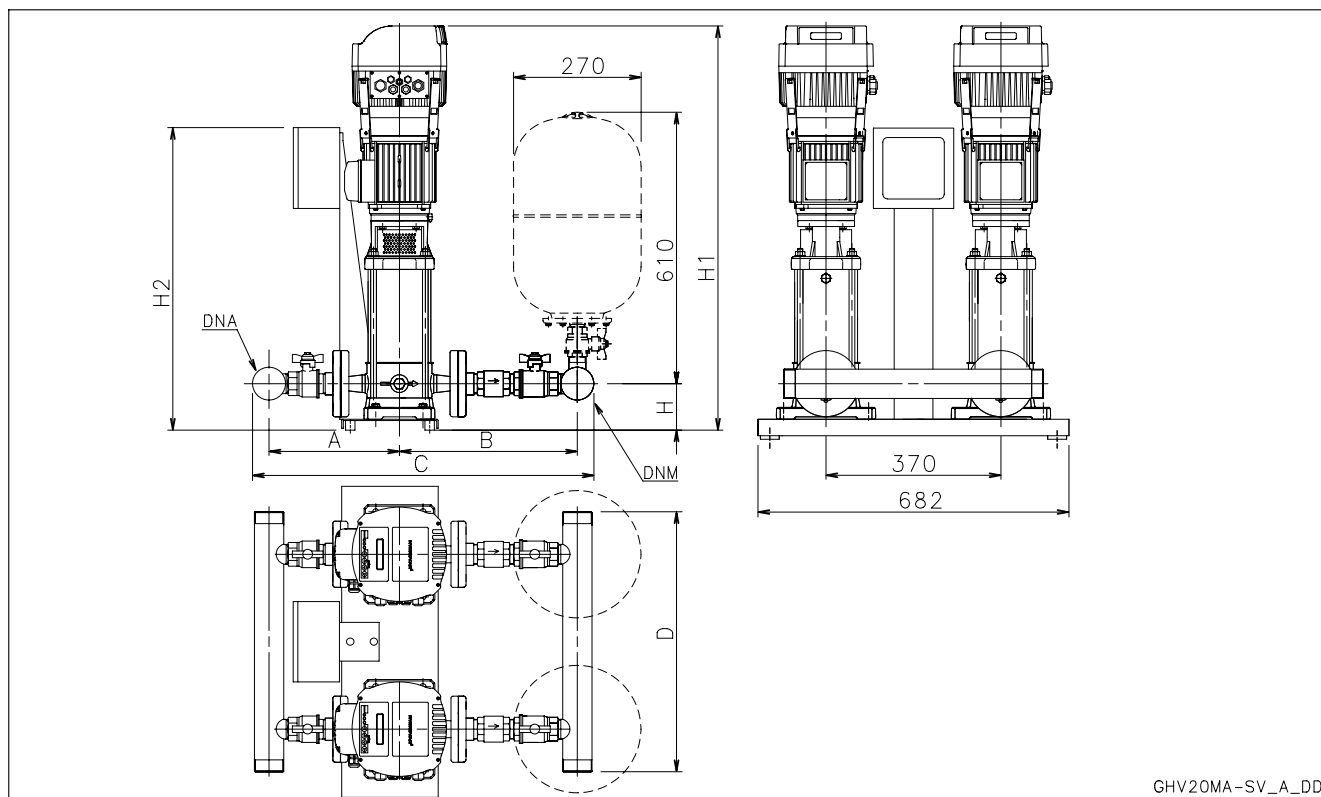
The GHV20 sets with vertical electric pumps in the Standard version use the stainless steel manifold and have the same dimensions as the /DW version.



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TWO-PUMP BOOSTER SETS, GHV20 SERIES VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DELIVERY SIDE, THREE-PHASE POWER SUPPLY



GHV 20	DNA	DNM	A		B		C		D	H	H1	H2
			DW	A304	DW	A304	DW	A304				
SV209F11T	R 2"	R 2"	252	301	321	346	633	707	610	109	952	651
SV212F15T	R 2"	R 2"	252	301	321	346	633	707	610	109	1037	651
SV214F22T	R 2"	R 2"	252	301	321	346	633	707	610	109	1087	651
SV407F11T	R 2"	R 2"	265	311	328	431	653	802	610	109	902	651
SV409F15T	R 2"	R 2"	265	311	328	431	653	802	610	109	962	651
SV413F22T	R 2"	R 2"	265	311	328	431	653	802	610	109	1062	651
SV414F30T	R 2"	R 2"	265	311	328	431	653	802	610	109	1137	651
SV803F15T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	893	651
SV804F22T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	931	651
SV805F22T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	969	651
SV806F30T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	1057	651
SV809F40T	R 2 1/2"	R 2 1/2"	302	356	397	497	775	929	610	114	1175	651

Dimensions in mm. Tolerance ± 10 mm.

ghvt20_sv_b_td

The /A316 versions have the same dimensions as the /A304 versions.

The GHV20 sets with vertical electric pumps in the Standard version use the stainless steel manifold and have the same dimensions as the /DW version.

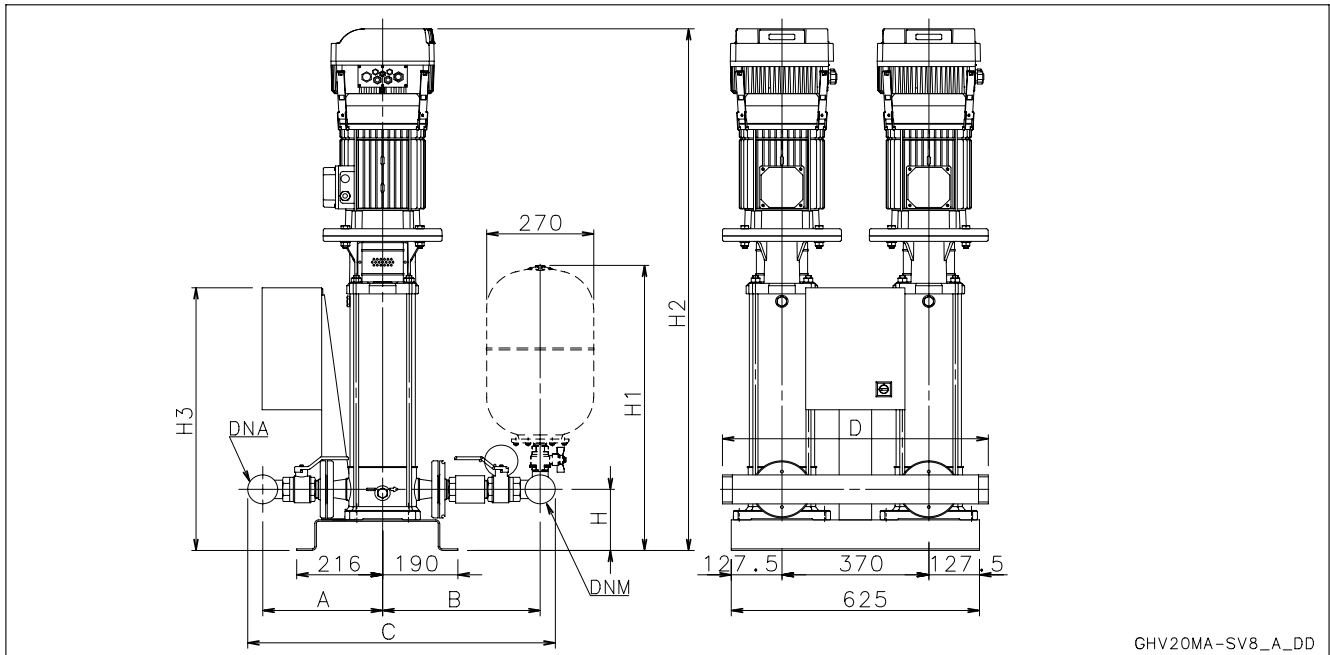


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GHV20 SERIES BOOSTER SETS

TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



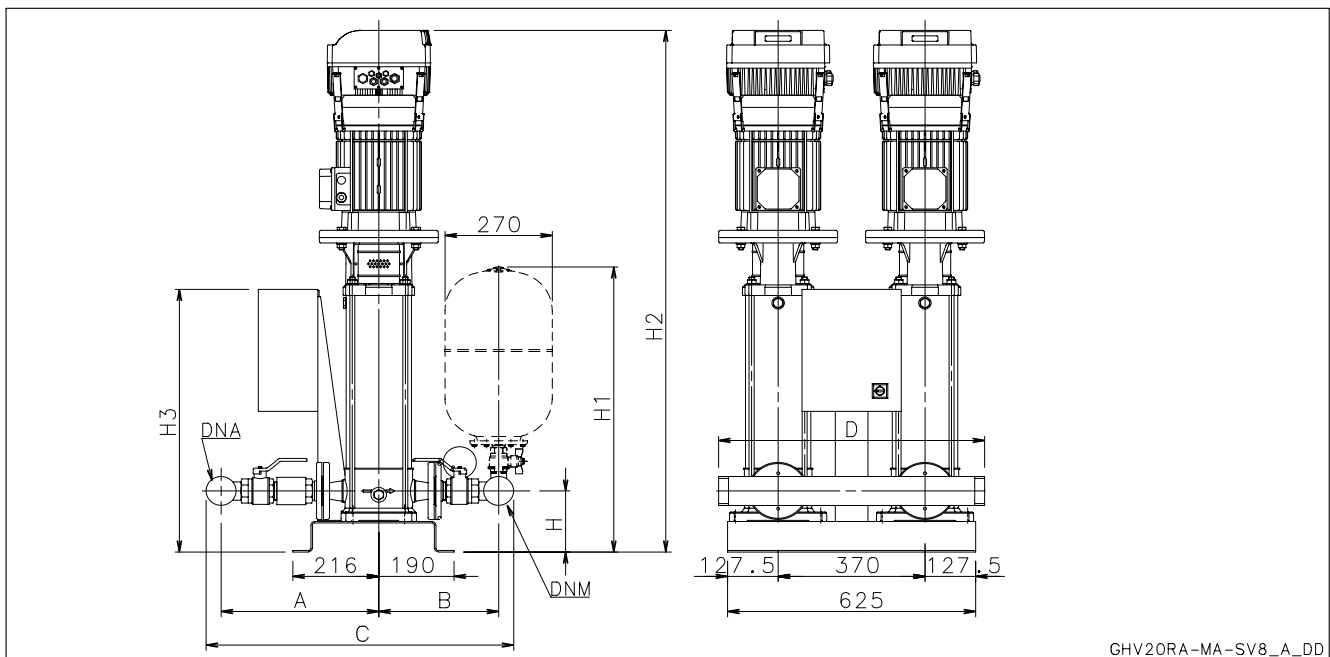
GHV 20 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV811F55T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	610	160	748	1384	689

Dimensions in mm. Tolerance ± 10 mm.

ghv20ra_sv8_a_td

GHV20 RA SERIES BOOSTER SETS

TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV 20	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV811F55T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	610	160	748	1384	689

Dimensions in mm. Tolerance ± 10 mm.

ghv20_sv8_a_td

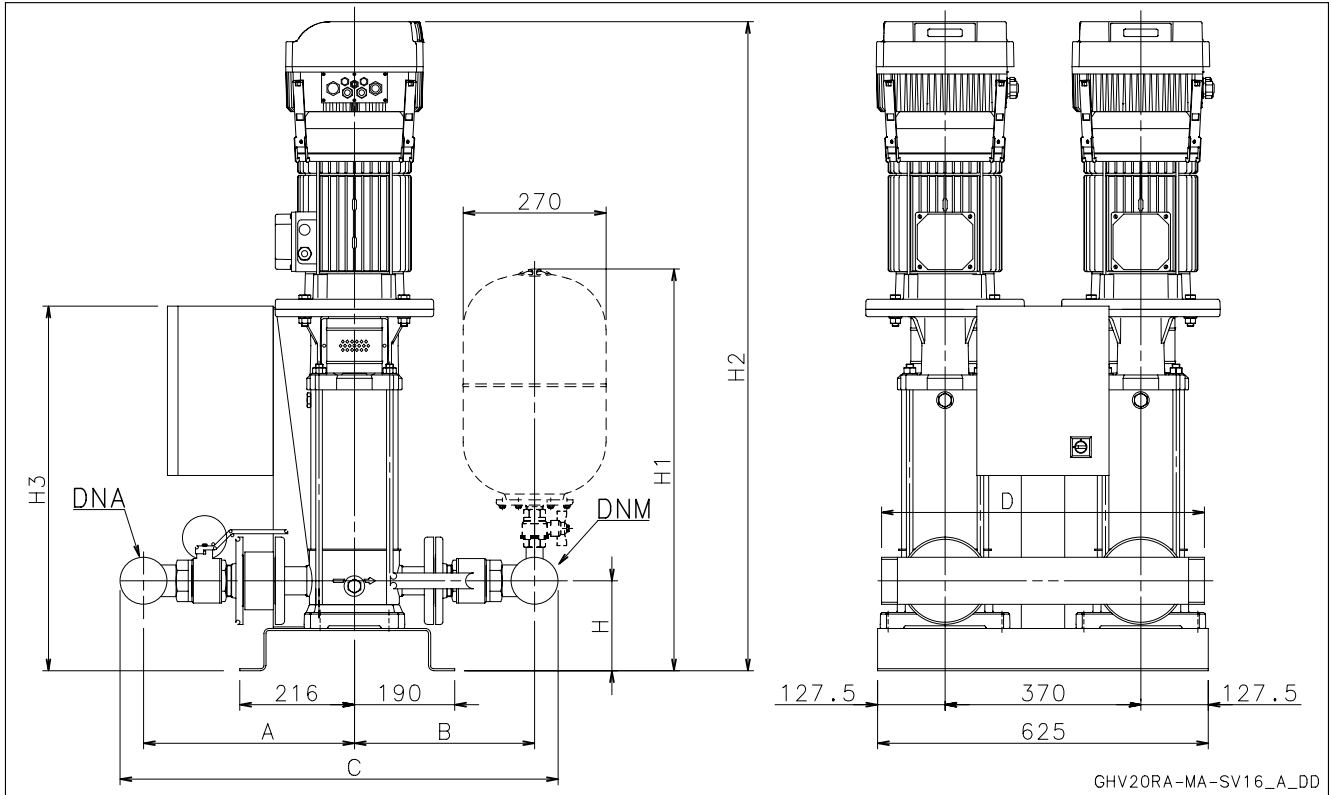


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GHV20 RA SERIES BOOSTER SETS

TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV 20 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV1602F22T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	911	689
SV1603F30T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	999	689
SV1604F40T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1041	689
SV1605F55T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1166	689
SV1606F55T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1204	689
SV1607F75T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1242	689
SV1608F75T	R 3"	R 3"	398	466	341	423	827	977	610	170	765	1280	689

Dimensions in mm. Tolerance ± 10 mm.

ghv20ra_sv16_a_td

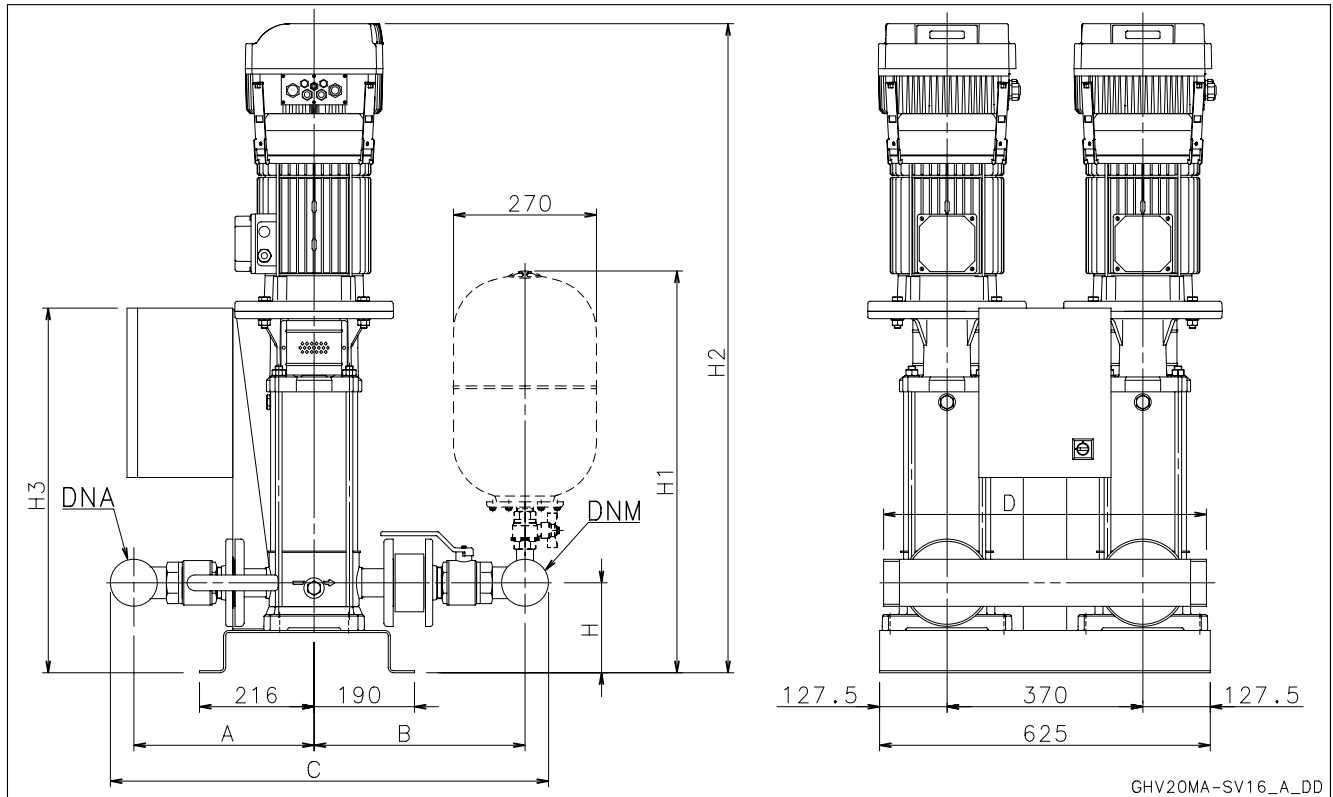


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GHV20 SERIES BOOSTER SETS

TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV 20	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV1602F22T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	911	689
SV1603F30T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	999	689
SV1604F40T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1041	689
SV1605F55T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1166	689
SV1606F55T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1204	689
SV1607F75T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1242	689
SV1608F75T	R 3"	R 3"	341	423	398	466	827	977	610	170	765	1280	689

Dimensions in mm. Tolerance ± 10 mm.

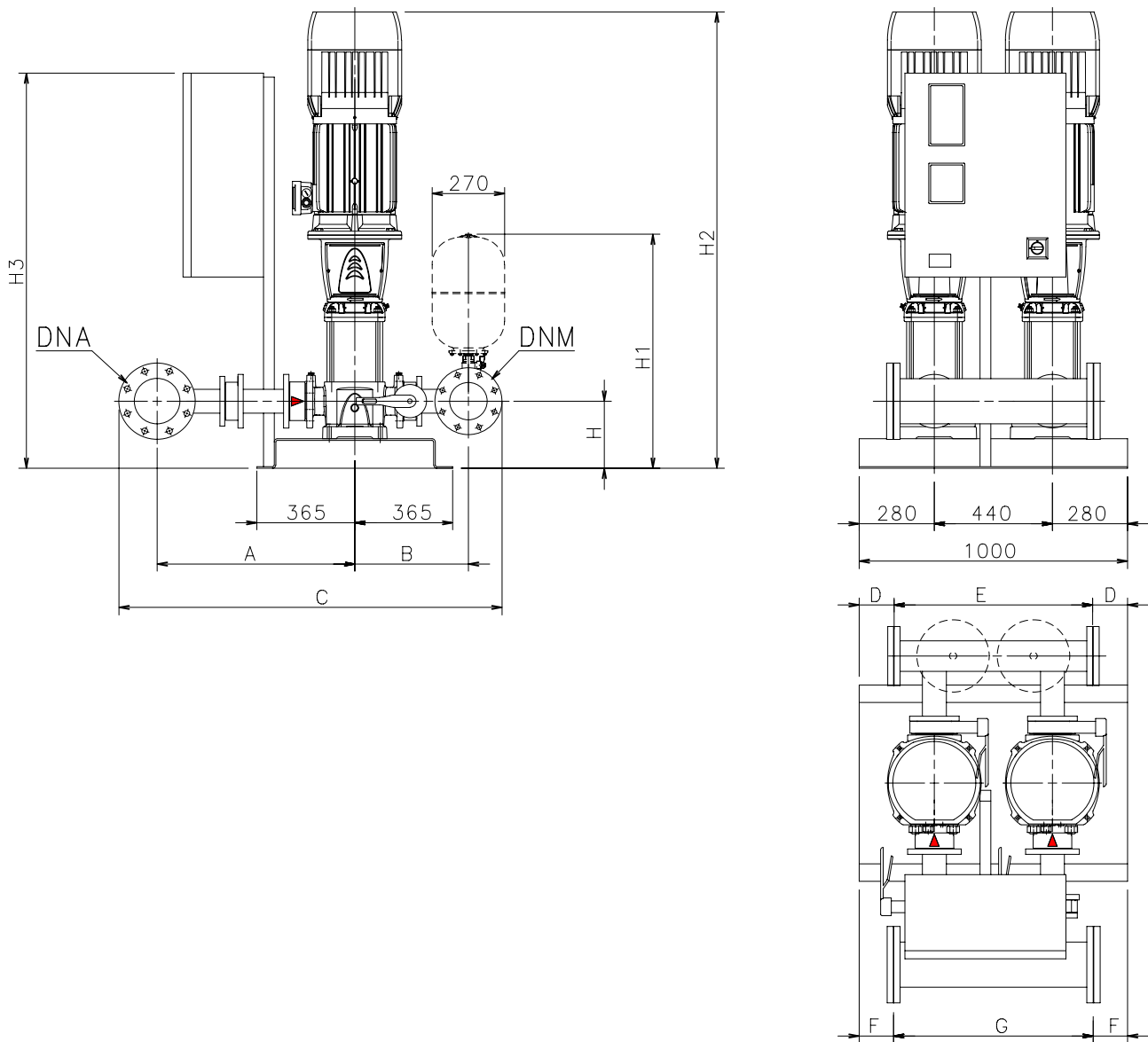
ghv20_sv16_a_td



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GHV20 RA SERIES BOOSTER SETS TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV_GHV20RA-SV46_A_DD

GHV20 RA SERIES BOOSTER SETS
TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY

GHV 20RA	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	100	80	713	436	1359	110	780	110	780	215	810	1047	886
SV3301F30T	100	80	713	436	1359	110	780	110	780	215	810	1087	1017
SV3302/2F40T	100	80	713	436	1359	110	780	110	780	215	810	1166	1017
SV3302/1F40T	100	80	713	436	1359	110	780	110	780	215	810	1166	1017
SV3302F55T	100	80	713	436	1359	110	780	110	780	215	810	1253	1017
SV3303/2F55T	100	80	713	436	1359	110	780	110	780	215	810	1328	1017
SV3303/1F75T	100	80	713	436	1359	110	780	110	780	215	810	1328	1017
SV3303F75T	100	80	713	436	1359	110	780	110	780	215	810	1328	1017
SV3304/2F75T	100	80	713	436	1359	110	780	110	780	215	810	1403	1017
SV3304/1F110T	100	80	713	436	1359	110	780	110	780	215	810	1491	1017
SV3304F110T	100	80	713	436	1359	110	780	110	780	215	810	1491	1017
SV3305/2F110T	100	80	713	436	1359	110	780	110	780	215	810	1566	1017
SV3305/1F110T	100	80	713	436	1359	110	780	110	780	215	810	1566	1017
SV3305F150T	100	80	713	436	1359	110	780	110	780	215	810	1742	1017
SV3306/2F150T	100	80	713	436	1359	110	780	110	780	215	810	1817	1017
SV3306/1F150T	100	80	713	436	1359	110	780	110	780	215	810	1817	1017
SV3306F150T	100	80	713	436	1359	110	780	110	780	215	810	1817	1017
SV3307/2F150T	100	80	713	436	1359	110	780	110	780	215	810	1892	1017
SV4601/1F30T	125	100	752	471	1457	110	780	110	780	250	857	1127	1017
SV4601F40T	125	100	752	471	1457	110	780	110	780	250	857	1131	1017
SV4602/2F55T	125	100	752	471	1457	110	780	110	780	250	857	1293	1017
SV4602F75T	125	100	752	471	1457	110	780	110	780	250	857	1293	1017
SV4603/2F110T	125	100	752	471	1457	110	780	110	780	250	857	1456	1017
SV4603F110T	125	100	752	471	1457	110	780	110	780	250	857	1456	1017
SV4604/2F150T	125	100	752	471	1457	110	780	110	780	250	857	1707	1017
SV4604F150T	125	100	752	471	1457	110	780	110	780	250	857	1707	1017
SV4605/2F185T	125	100	752	471	1457	110	780	110	780	250	857	1826	1194
SV4605F185T	125	100	752	471	1457	110	780	110	780	250	857	1826	1194
SV4606/2F220T	125	100	752	471	1457	110	780	110	780	250	857	1901	1194
SV4606F220T	125	100	752	471	1457	110	780	110	780	250	857	1901	1194
SV6601/1F40T	150	125	794	490	1551	110	780	90	820	250	870	1156	1017
SV6601F55T	150	125	794	490	1551	110	780	90	820	250	870	1243	1017
SV6602/2F75T	150	125	794	490	1551	110	780	90	820	250	870	1333	1017
SV6602/1F110T	150	125	794	490	1551	110	780	90	820	250	870	1421	1017
SV6602F110T	150	125	794	490	1551	110	780	90	820	250	870	1421	1017
SV6603/2F150T	150	125	794	490	1551	110	780	90	820	250	870	1687	1017
SV6603/1F150T	150	125	794	490	1551	110	780	90	820	250	870	1687	1017
SV6603F185T	150	125	794	490	1551	110	780	90	820	250	870	1731	1194
SV6604/2F185T	150	125	794	490	1551	110	780	90	820	250	870	1821	1194
SV6604/1F220T	150	125	794	490	1551	110	780	90	820	250	870	1821	1194
SV6604F220T	150	125	794	490	1551	110	780	90	820	250	870	1821	1194
SV9201/1F55T	200	150	819	504	1635	90	820	90	820	250	884	1243	1237
SV9201F75T	200	150	819	504	1635	90	820	90	820	250	884	1243	1237
SV9202/2F110T	200	150	819	504	1635	90	820	90	820	250	884	1421	1237
SV9202F150T	200	150	819	504	1635	90	820	90	820	250	884	1597	1237
SV9203/2F185T	200	150	819	504	1635	90	820	90	820	250	884	1731	1194
SV9203F220T	200	150	819	504	1635	90	820	90	820	250	884	1731	1194

Dimensions in mm. Tolerance ± 10 mm.

ghv20ra_sv46_a_td

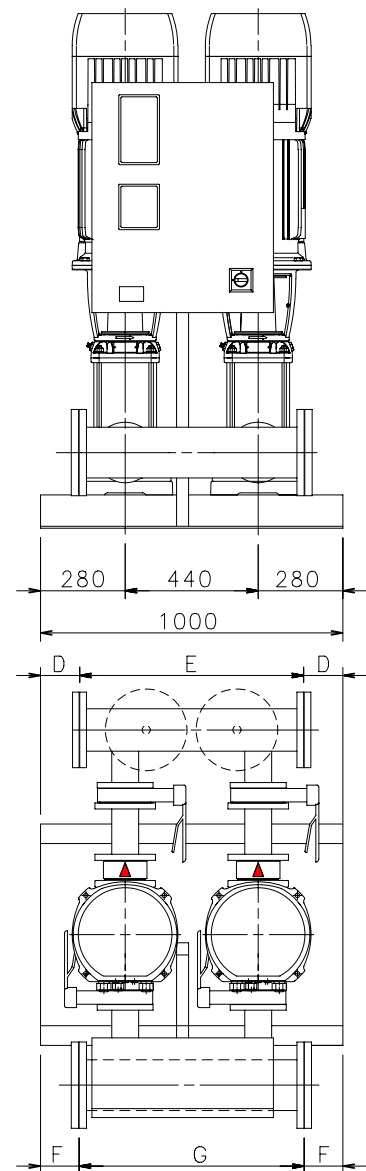
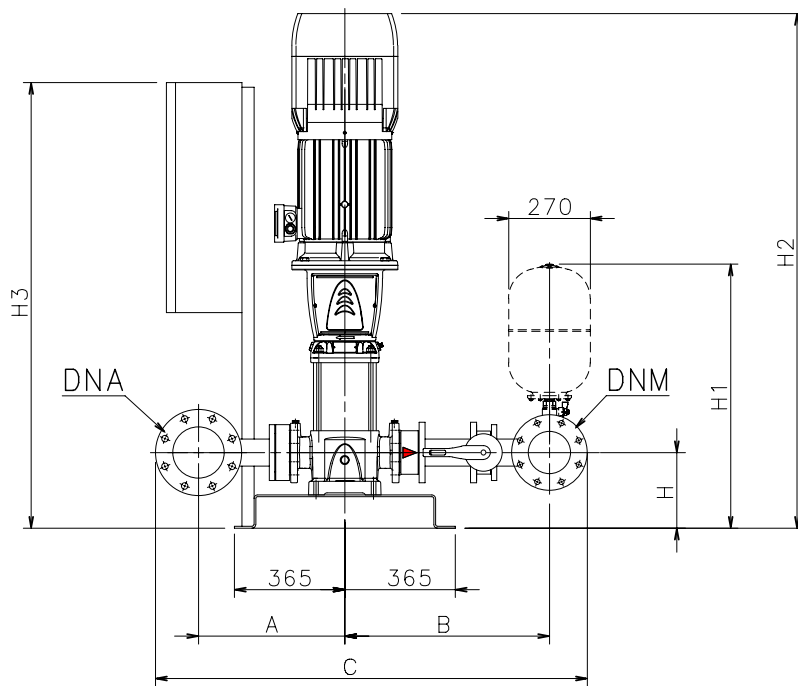


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GHV20 SERIES BOOSTER SETS

TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV_GHV20-SV46_A_DD

GHV20 SERIES BOOSTER SETS **TWO VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON** **DISCHARGE SIDE - THREE-PHASE POWER SUPPLY**

GHV 20	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	100	80	448	701	1359	110	780	110	780	215	810	1047	886
SV3301F30T	100	80	448	701	1359	110	780	110	780	215	810	1087	1017
SV3302/2F40T	100	80	448	701	1359	110	780	110	780	215	810	1166	1017
SV3302/1F40T	100	80	448	701	1359	110	780	110	780	215	810	1166	1017
SV3302F55T	100	80	448	701	1359	110	780	110	780	215	810	1253	1017
SV3303/2F55T	100	80	448	701	1359	110	780	110	780	215	810	1328	1017
SV3303/1F75T	100	80	448	701	1359	110	780	110	780	215	810	1328	1017
SV3303F75T	100	80	448	701	1359	110	780	110	780	215	810	1328	1017
SV3304/2F75T	100	80	448	701	1359	110	780	110	780	215	810	1403	1017
SV3304/1F110T	100	80	448	701	1359	110	780	110	780	215	810	1491	1017
SV3304F110T	100	80	448	701	1359	110	780	110	780	215	810	1491	1017
SV3305/2F110T	100	80	448	701	1359	110	780	110	780	215	810	1566	1017
SV3305/1F110T	100	80	448	701	1359	110	780	110	780	215	810	1566	1017
SV3305F150T	100	80	448	701	1359	110	780	110	780	215	810	1742	1017
SV3306/2F150T	100	80	448	701	1359	110	780	110	780	215	810	1817	1017
SV3306/1F150T	100	80	448	701	1359	110	780	110	780	215	810	1817	1017
SV3306F150T	100	80	448	701	1359	110	780	110	780	215	810	1817	1017
SV3307/2F150T	100	80	448	701	1359	110	780	110	780	215	810	1892	1017
SV4601/1F30T	125	100	484	739	1457	110	780	110	780	250	857	1127	1017
SV4601F40T	125	100	484	739	1457	110	780	110	780	250	857	1131	1017
SV4602/2F55T	125	100	484	739	1457	110	780	110	780	250	857	1293	1017
SV4602F75T	125	100	484	739	1457	110	780	110	780	250	857	1293	1017
SV4603/2F110T	125	100	484	739	1457	110	780	110	780	250	857	1456	1017
SV4603F110T	125	100	484	739	1457	110	780	110	780	250	857	1456	1017
SV4604/2F150T	125	100	484	739	1457	110	780	110	780	250	857	1707	1017
SV4604F150T	125	100	484	739	1457	110	780	110	780	250	857	1707	1017
SV4605/2F185T	125	100	484	739	1457	110	780	110	780	250	857	1826	1194
SV4605F185T	125	100	484	739	1457	110	780	110	780	250	857	1826	1194
SV4606/2F220T	125	100	484	739	1457	110	780	110	780	250	857	1901	1194
SV4606F220T	125	100	484	739	1457	110	780	110	780	250	857	1901	1194
SV6601/1F40T	150	125	504	780	1551	110	780	90	820	250	870	1156	1017
SV6601F55T	150	125	504	780	1551	110	780	90	820	250	870	1243	1017
SV6602/2F75T	150	125	504	780	1551	110	780	90	820	250	870	1333	1017
SV6602/1F110T	150	125	504	780	1551	110	780	90	820	250	870	1421	1017
SV6602F110T	150	125	504	780	1551	110	780	90	820	250	870	1421	1017
SV6603/2F150T	150	125	504	780	1551	110	780	90	820	250	870	1687	1017
SV6603/1F150T	150	125	504	780	1551	110	780	90	820	250	870	1687	1017
SV6603F185T	150	125	504	780	1551	110	780	90	820	250	870	1731	1194
SV6604/2F185T	150	125	504	780	1551	110	780	90	820	250	870	1821	1194
SV6604/1F220T	150	125	504	780	1551	110	780	90	820	250	870	1821	1194
SV6604F220T	150	125	504	780	1551	110	780	90	820	250	870	1821	1194
SV9201/1F55T	200	150	529	794	1635	90	820	90	820	250	884	1243	1237
SV9201F75T	200	150	529	794	1635	90	820	90	820	250	884	1243	1237
SV9202/2F110T	200	150	529	794	1635	90	820	90	820	250	884	1421	1237
SV9202F150T	200	150	529	794	1635	90	820	90	820	250	884	1597	1237
SV9203/2F185T	200	150	529	794	1635	90	820	90	820	250	884	1731	1194
SV9203F220T	200	150	529	794	1635	90	820	90	820	250	884	1731	1194

Dimensions in mm. Tolerance ± 10 mm.

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Booster sets

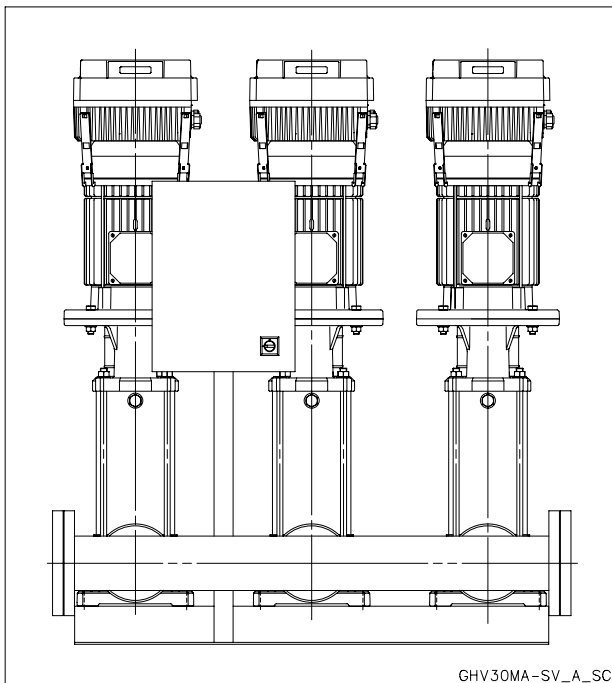
MARKET SECTORS

CIVIL, INDUSTRIAL

APPLICATIONS

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

GHV30 Series



SPECIFICATIONS

- **Flow rate** up to 300 m³/h.
- **Head** up to 150 m.
- Electrical panel supply voltage: 3 x 400V $\pm$ 10%.
- Frequency: 50 Hz.
- External control voltage: 5 ÷ 10 V.
- Protection class:
 - electrical panel: IP55.
 - converter: IP55 up to 11 kW.
 - IP54 above 11 kW.
- Maximum electric pump power 3 x 22 kW.
- Progressive motor start.
- **Vertical design pump:**
 - SV..T series (motor protection class IP55).
- Maximum operating pressure: 15 bar for sets with SV..T electric pumps.
- Maximum temperature of pumped liquid : +40°C.

MAIN COMPONENTS of **GHV30** booster sets

- **Three** multistage vertical **electric pumps**, SV series.
- **Hydrovar®** frequency **converters** mounted on the motor of each electric pump.
- One **suction manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). Threaded coupling for water charging.
- One **discharge manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). Fitted with two R1" threaded couplings with caps to allow connection of 24-litre diaphragm tanks.
- **On-off valves** on suction and discharge sides of each pump, ball type with threaded coupling up to 2" size included (for pumps up to SV16 included). Butterfly type for installation between the flanges are used for larger diameter.
- **Non-return valves** on discharge side of each pump, spring – loaded type, with threaded coupling up to 1" 1/2 size. Spring – loaded type for installation between the flanges are large diameters.
- **Pressure gauge and control transmitter** on the pump's discharge side.
- **Miscellaneous** pipe fittings made of nickel-plated brass, galvanised steel and stainless steel.
- **Pump mounting base** and panel mounting bracket made of painted steel.
- **Electrical panel** for control and protection, with metal casing made of painted steel, IP55 protection class, equipped with:
 - Main doorlock switch.
 - Thermal-magnetic protectors for each converter.
 The panel is designed to protect the pumps against dry running; it must be equipped with an external device such as a minimum pressure switch, float switch or electrode probes.
- On request, the sets can be supplied with:
 - non-return valves on suction side (**GHVRA version**);
 - frame-mounted Hydrovar (**HFD or HFS versions**);
 - stainless steel mounting base.

The set comes pre-assembled and tested, complete with operating instructions and panel wiring diagram.

VERSIONS AVAILABLE

STANDARD VERSION (STD)

For general applications

Sets with **SV8** pumps:

Nickel plated brass valves, brass non-return valves, stainless steel manifolds.

Sets with **SV16** pumps:

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

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

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

DW VERSION

For drinking water applications.

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

Sets with **SV8** pumps:

Nickel-plated brass valves, brass non-return valves.

Sets with **SV16** pumps:

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

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

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

AISI 304, AISI 316 version

For special applications.

Sets with **SV8-16-33-46-66-92** pumps:

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

Fitted with vibration damping feet.

Accessories available on request:

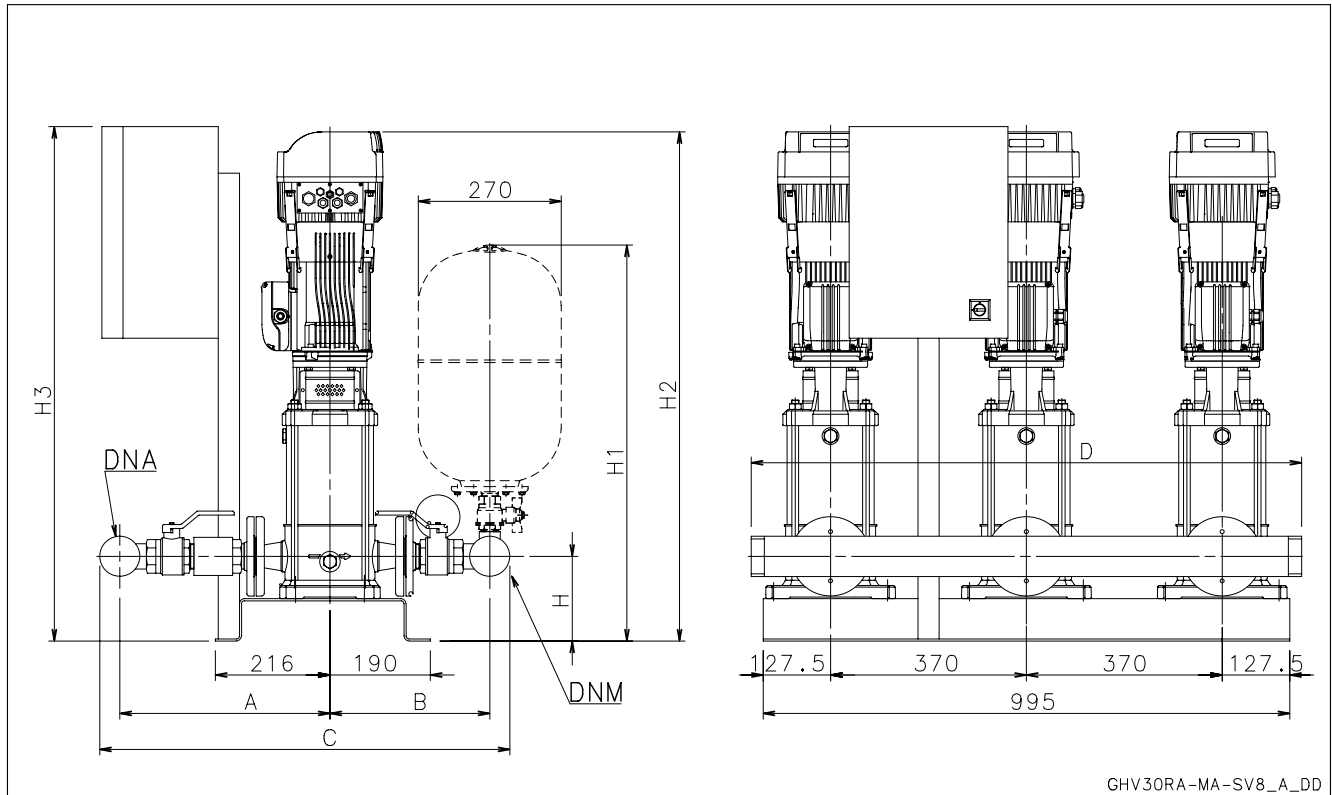
- Vibration dampers kit (1 kit per pump).
- Devices against dry running: float switch, minimum pressure switch, probe electrodes kit.
- Kit featuring a 24-litre diaphragm expansion tank equipped with a ball valve (one for each pump) in the following versions:
 - 24-litre 8 bar cylinder water tank kit
 - 24-litre 10 bar cylinder water tank kit
 - 24-litre 16 bar cylinder water tank kit.



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GHV30 RA SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV 30 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV802F11T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	891	973
SV803F15T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	939	973
SV804F22T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	977	973
SV805F22T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	1015	973
SV806F30T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	1103	973
SV808F40T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	1183	973
SV809F40T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	1221	973
SV811F55T	R 2"1/2	R 2"1/2	397	497	302	356	775	929	1040	160	748	1384	973

Dimensions in mm. Tolerance ± 10 mm.

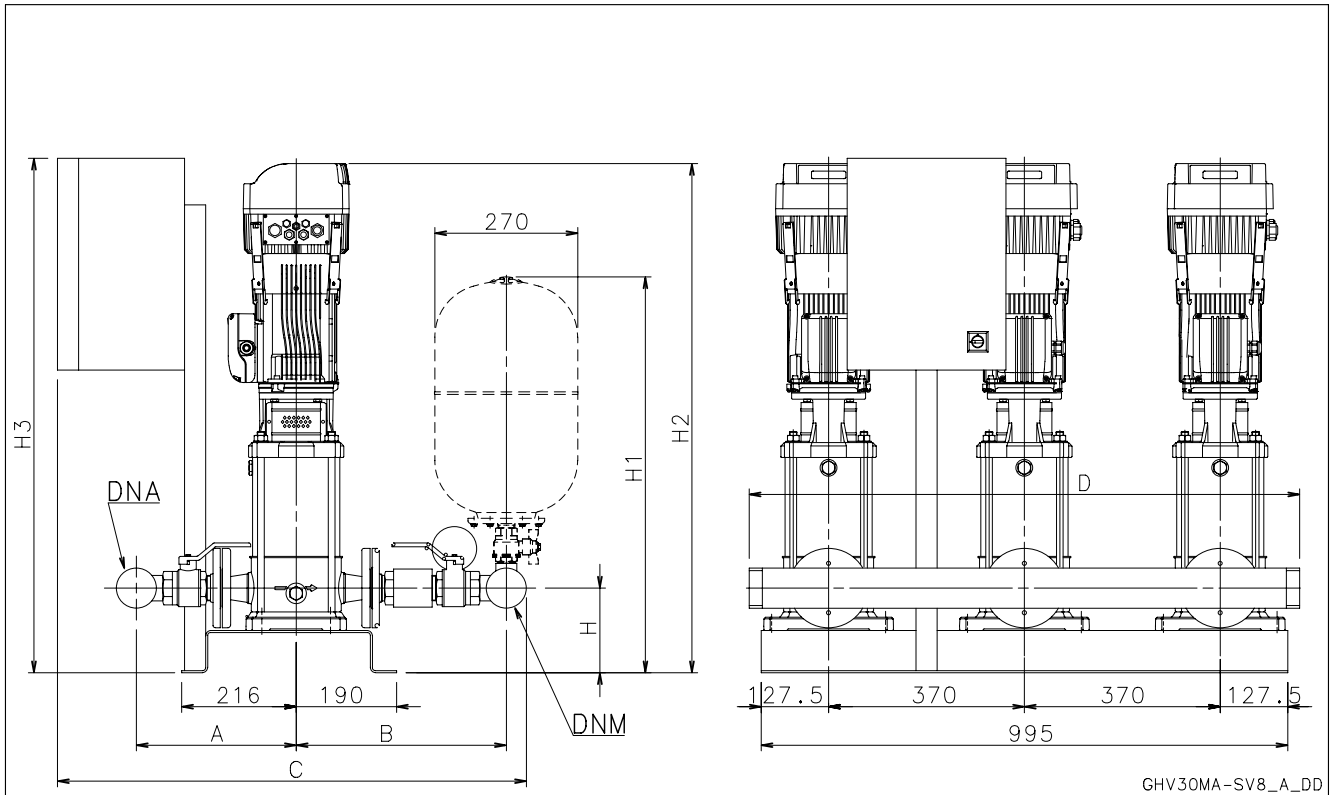
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GHV30 SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV 30	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV802F11T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	891	973
SV803F15T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	939	973
SV804F22T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	977	973
SV805F22T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	1015	973
SV806F30T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	1103	973
SV808F40T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	1183	973
SV809F40T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	1221	973
SV811F55T	R 2"1/2	R 2"1/2	302	356	397	497	886	986	1040	160	748	1384	973

Dimensions in mm. Tolerance ± 10 mm.

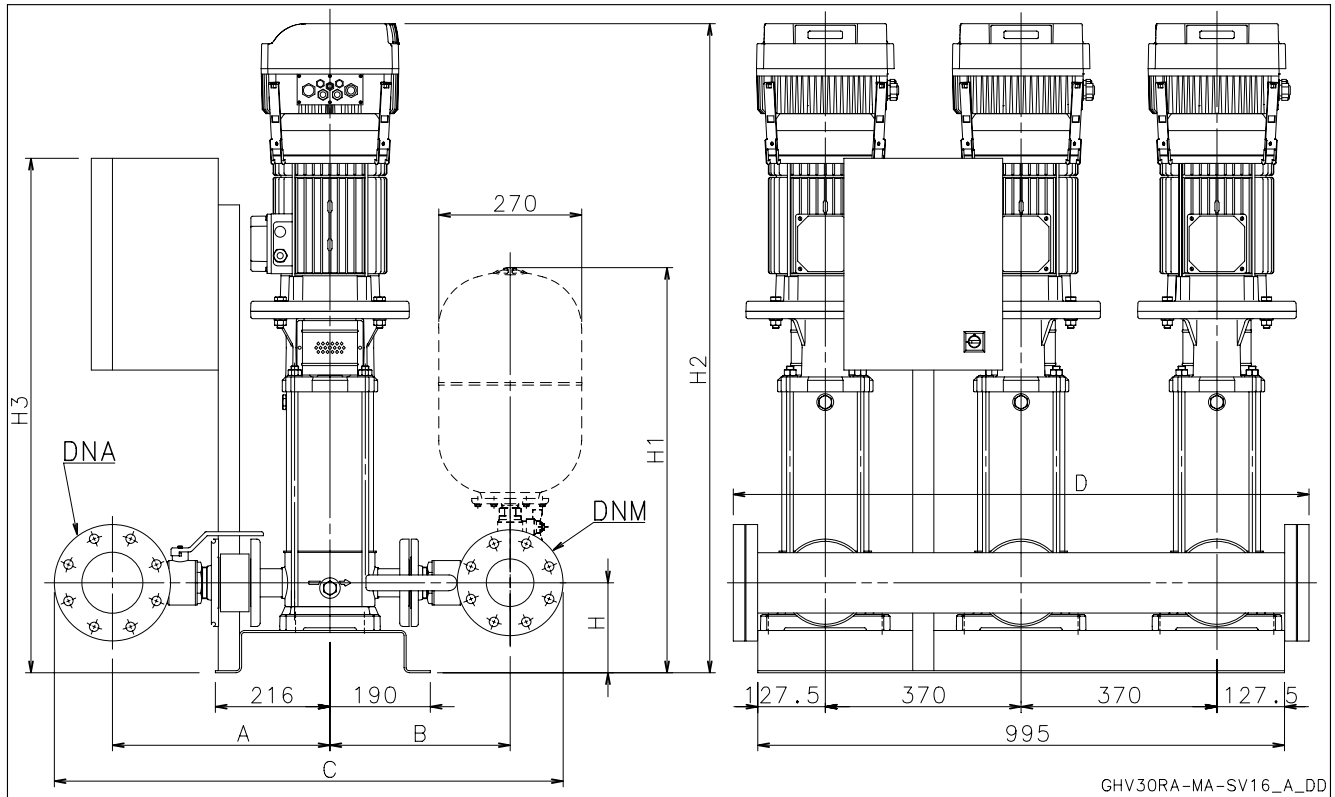
ghv30_sv8_a_td



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GHV30 RA SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV 30 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV1602F22T	100	80	410	478	341	423	961	1111	1084	170	765	911	973
SV1603F30T	100	80	410	478	341	423	961	1111	1084	170	765	999	973
SV1604F40T	100	80	410	478	341	423	961	1111	1084	170	765	1041	973
SV1605F55T	100	80	410	478	341	423	961	1111	1084	170	765	1166	973
SV1606F55T	100	80	410	478	341	423	961	1111	1084	170	765	1204	973
SV1607F75T	100	80	410	478	341	423	961	1111	1084	170	765	1242	973
SV1608F75T	100	80	410	478	341	423	961	1111	1084	170	765	1280	973

Dimensions in mm. Tolerance ± 10 mm.

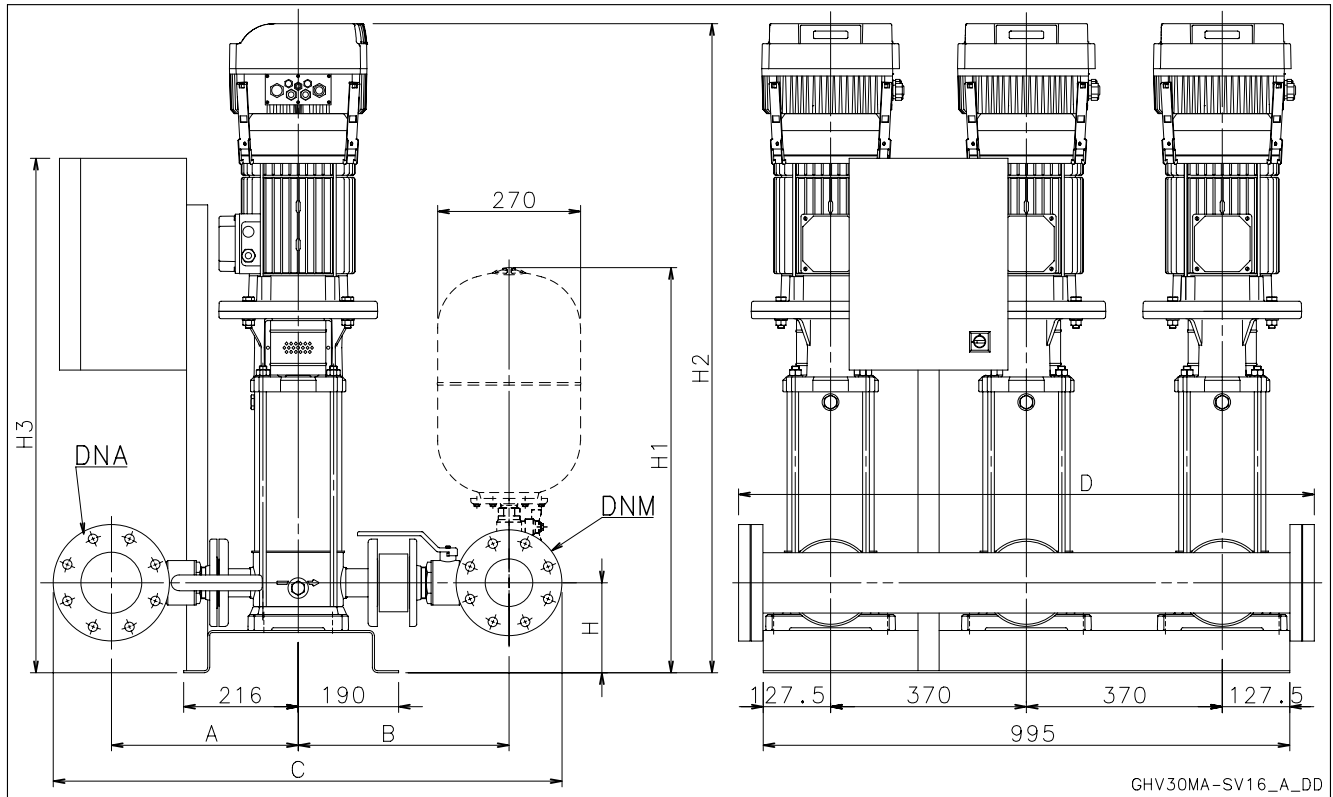
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GHV30 SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV 30	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV1602F22T	100	80	353	435	398	466	961	986	1084	170	765	911	973
SV1603F30T	100	80	353	435	398	466	961	986	1084	170	765	999	973
SV1604F40T	100	80	353	435	398	466	961	986	1084	170	765	1041	973
SV1605F55T	100	80	353	435	398	466	961	986	1084	170	765	1166	973
SV1606F55T	100	80	353	435	398	466	961	986	1084	170	765	1204	973
SV1607F75T	100	80	353	435	398	466	961	986	1084	170	765	1242	973
SV1608F75T	100	80	353	435	398	466	961	986	1084	170	765	1280	973

Dimensions in mm. Tolerance ± 10 mm.

ghv30_sv16_a_td



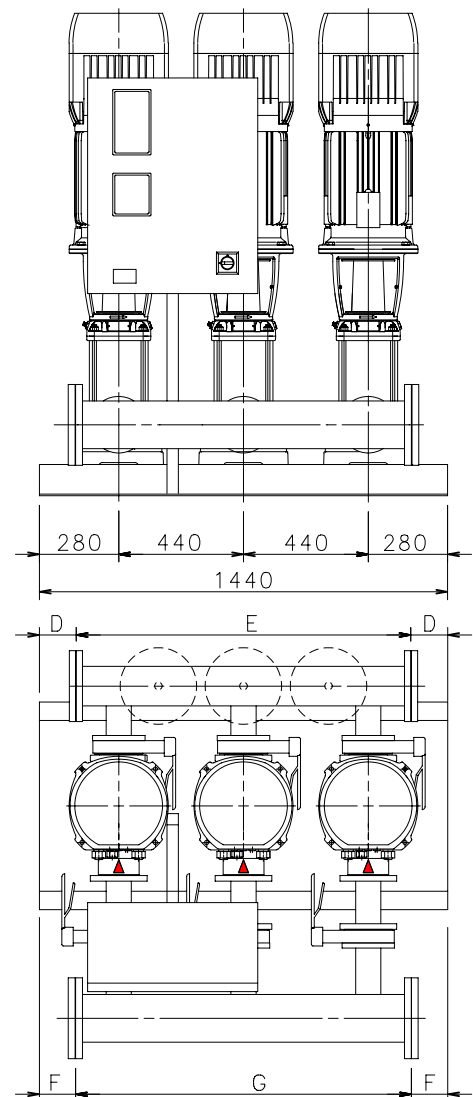
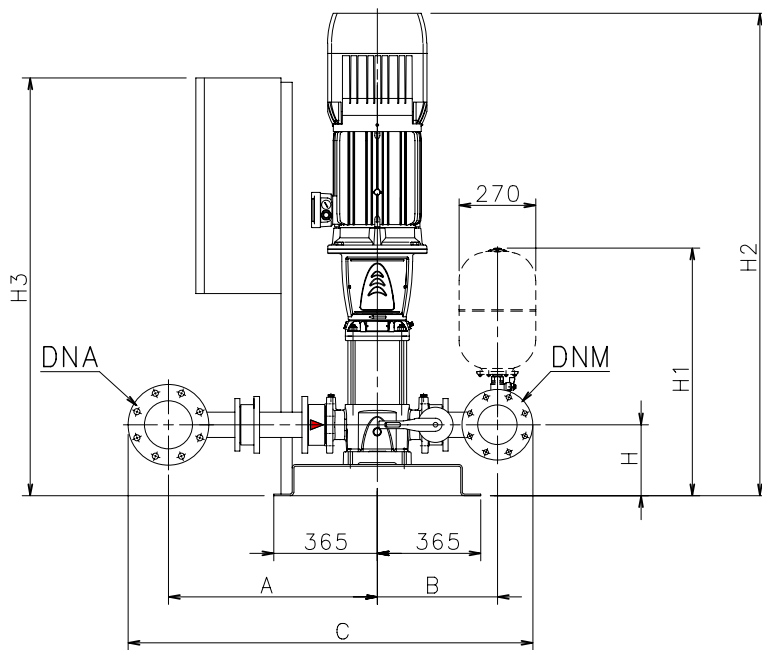
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GHV30 RA SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV_GHV30RA-SV46_A_DD

GHV30 RA SERIES BOOSTER SETS **THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON** **SUCTION SIDE - THREE-PHASE POWER SUPPLY**

GHV 30RA	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	125	100	726	448	1409	110	1220	110	1220	215	822	1047	974
SV3301F30T	125	100	726	448	1409	110	1220	110	1220	215	822	1087	974
SV3302/2F40T	125	100	726	448	1409	110	1220	110	1220	215	822	1166	974
SV3302/1F40T	125	100	726	448	1409	110	1220	110	1220	215	822	1166	974
SV3302F55T	125	100	726	448	1409	110	1220	110	1220	215	822	1253	974
SV3303/2F55T	125	100	726	448	1409	110	1220	110	1220	215	822	1328	974
SV3303/1F75T	125	100	726	448	1409	110	1220	110	1220	215	822	1328	974
SV3303F75T	125	100	726	448	1409	110	1220	110	1220	215	822	1328	974
SV3304/2F75T	125	100	726	448	1409	110	1220	110	1220	215	822	1403	974
SV3304/1F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1491	974
SV3304F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1491	974
SV3305/2F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1566	974
SV3305/1F110T	125	100	726	448	1409	110	1220	110	1220	215	822	1566	974
SV3305F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1742	974
SV3306/2F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1817	974
SV3306/1F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1817	974
SV3306F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1817	974
SV3307/2F150T	125	100	726	448	1409	110	1220	110	1220	215	822	1892	974
SV4601/1F30T	150	125	766	484	1517	110	1220	90	1260	250	870	1127	974
SV4601F40T	150	125	766	484	1517	110	1220	90	1260	250	870	1131	974
SV4602/2F55T	150	125	766	484	1517	110	1220	90	1260	250	870	1293	974
SV4602F75T	150	125	766	484	1517	110	1220	90	1260	250	870	1293	974
SV4603/2F110T	150	125	766	484	1517	110	1220	90	1260	250	870	1456	1194
SV4603F110T	150	125	766	484	1517	110	1220	90	1260	250	870	1456	1194
SV4604/2F150T	150	125	766	484	1517	110	1220	90	1260	250	870	1707	1194
SV4604F150T	150	125	766	484	1517	110	1220	90	1260	250	870	1707	1194
SV4605/2F185T	150	125	766	484	1517	110	1220	90	1260	250	870	1826	1194
SV4605F185T	150	125	766	484	1517	110	1220	90	1260	250	870	1826	1194
SV4606/2F220T	150	125	766	484	1517	110	1220	90	1260	250	870	1901	1194
SV4606F220T	150	125	766	484	1517	110	1220	90	1260	250	870	1901	1194
SV6601/1F40T	200	150	819	504	1635	90	1260	90	1260	250	884	1156	1194
SV6601F55T	200	150	819	504	1635	90	1260	90	1260	250	884	1243	1194
SV6602/2F75T	200	150	819	504	1635	90	1260	90	1260	250	884	1333	1194
SV6602/1F110T	200	150	819	504	1635	90	1260	90	1260	250	884	1421	1194
SV6602F110T	200	150	819	504	1635	90	1260	90	1260	250	884	1421	1194
SV6603/2F150T	200	150	819	504	1635	90	1260	90	1260	250	884	1687	1194
SV6603/1F150T	200	150	819	504	1635	90	1260	90	1260	250	884	1687	1194
SV6603F185T	200	150	819	504	1635	90	1260	90	1260	250	884	1731	1194
SV6604/2F185T	200	150	819	504	1635	90	1260	90	1260	250	884	1821	1194
SV6604/1F220T	200	150	819	504	1635	90	1260	90	1260	250	884	1821	1194
SV6604F220T	200	150	819	504	1635	90	1260	90	1260	250	884	1821	1194
SV9201/1F55T	200	200	819	529	1688	90	1260	90	1260	250	910	1243	1194
SV9201F75T	200	200	819	529	1688	90	1260	90	1260	250	910	1243	1194
SV9202/2F110T	200	200	819	529	1688	90	1260	90	1260	250	910	1421	1194
SV9202F150T	200	200	819	529	1688	90	1260	90	1260	250	910	1597	1194
SV9203/2F185T	200	200	819	529	1688	90	1260	90	1260	250	910	1731	1194
SV9203F220T	200	200	819	529	1688	90	1260	90	1260	250	910	1731	1194

Dimensions in mm. Tolerance ± 10 mm.

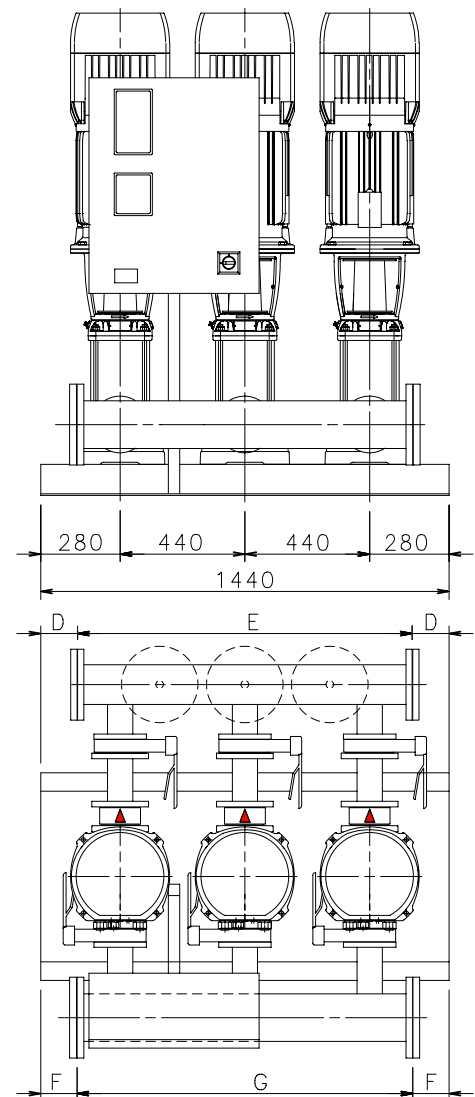
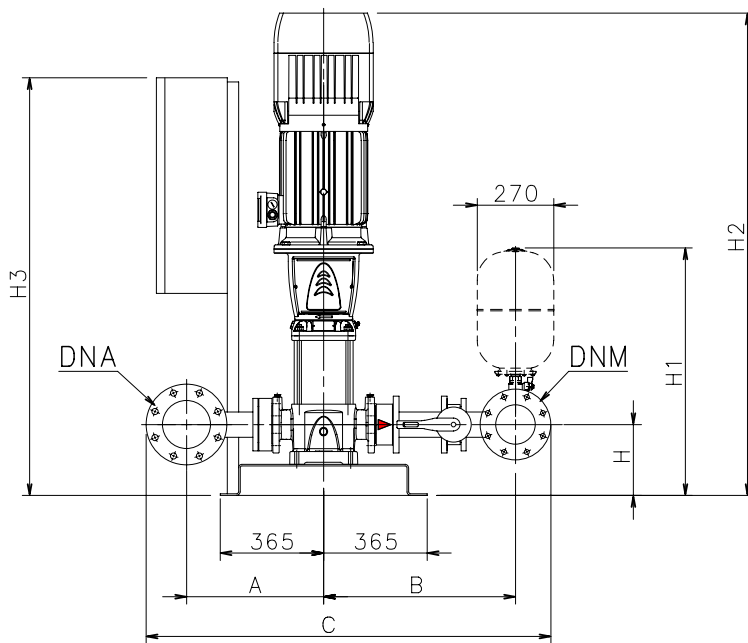
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GHV30 SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV_GHV30-SV46_A_DD

GHV30 SERIES BOOSTER SETS **THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON** **DISCHARGE SIDE - THREE-PHASE POWER SUPPLY**

GHV 30	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	125	100	461	713	1409	110	1220	110	1220	215	822	1047	974
SV3301F30T	125	100	461	713	1409	110	1220	110	1220	215	822	1087	974
SV3302/2F40T	125	100	461	713	1409	110	1220	110	1220	215	822	1166	974
SV3302/1F40T	125	100	461	713	1409	110	1220	110	1220	215	822	1166	974
SV3302F55T	125	100	461	713	1409	110	1220	110	1220	215	822	1253	974
SV3303/2F55T	125	100	461	713	1409	110	1220	110	1220	215	822	1328	974
SV3303/1F75T	125	100	461	713	1409	110	1220	110	1220	215	822	1328	974
SV3303F75T	125	100	461	713	1409	110	1220	110	1220	215	822	1328	974
SV3304/2F75T	125	100	461	713	1409	110	1220	110	1220	215	822	1403	974
SV3304/1F110T	125	100	461	713	1409	110	1220	110	1220	215	822	1491	974
SV3304F110T	125	100	461	713	1409	110	1220	110	1220	215	822	1491	974
SV3305/2F110T	125	100	461	713	1409	110	1220	110	1220	215	822	1566	974
SV3305/1F110T	125	100	461	713	1409	110	1220	110	1220	215	822	1566	974
SV3305F150T	125	100	461	713	1409	110	1220	110	1220	215	822	1742	974
SV3306/2F150T	125	100	461	713	1409	110	1220	110	1220	215	822	1817	974
SV3306/1F150T	125	100	461	713	1409	110	1220	110	1220	215	822	1817	974
SV3306F150T	125	100	461	713	1409	110	1220	110	1220	215	822	1817	974
SV3307/2F150T	125	100	461	713	1409	110	1220	110	1220	215	822	1892	974
SV4601/1F30T	150	125	498	752	1517	110	1220	90	1260	250	870	1127	974
SV4601F40T	150	125	498	752	1517	110	1220	90	1260	250	870	1131	974
SV4602/2F55T	150	125	498	752	1517	110	1220	90	1260	250	870	1293	974
SV4602F75T	150	125	498	752	1517	110	1220	90	1260	250	870	1293	974
SV4603/2F110T	150	125	498	752	1517	110	1220	90	1260	250	870	1456	1194
SV4603F110T	150	125	498	752	1517	110	1220	90	1260	250	870	1456	1194
SV4604/2F150T	150	125	498	752	1517	110	1220	90	1260	250	870	1707	1194
SV4604F150T	150	125	498	752	1517	110	1220	90	1260	250	870	1707	1194
SV4605/2F185T	150	125	498	752	1517	110	1220	90	1260	250	870	1826	1194
SV4605F185T	150	125	498	752	1517	110	1220	90	1260	250	870	1826	1194
SV4606/2F220T	150	125	498	752	1517	110	1220	90	1260	250	870	1901	1194
SV4606F220T	150	125	498	752	1517	110	1220	90	1260	250	870	1901	1194
SV6601/1F40T	200	150	529	794	1635	90	1260	90	1260	250	884	1156	1194
SV6601F55T	200	150	529	794	1635	90	1260	90	1260	250	884	1243	1194
SV6602/2F75T	200	150	529	794	1635	90	1260	90	1260	250	884	1333	1194
SV6602/1F110T	200	150	529	794	1635	90	1260	90	1260	250	884	1421	1194
SV6602F110T	200	150	529	794	1635	90	1260	90	1260	250	884	1421	1194
SV6603/2F150T	200	150	529	794	1635	90	1260	90	1260	250	884	1687	1194
SV6603/1F150T	200	150	529	794	1635	90	1260	90	1260	250	884	1687	1194
SV6603F185T	200	150	529	794	1635	90	1260	90	1260	250	884	1731	1194
SV6604/2F185T	200	150	529	794	1635	90	1260	90	1260	250	884	1821	1194
SV6604/1F220T	200	150	529	794	1635	90	1260	90	1260	250	884	1821	1194
SV6604F220T	200	150	529	794	1635	90	1260	90	1260	250	884	1821	1194
SV9201/1F55T	200	200	529	819	1688	90	1260	90	1260	250	910	1243	1194
SV9201F75T	200	200	529	819	1688	90	1260	90	1260	250	910	1243	1194
SV9202/2F110T	200	200	529	819	1688	90	1260	90	1260	250	910	1421	1194
SV9202F150T	200	200	529	819	1688	90	1260	90	1260	250	910	1597	1194
SV9203/2F185T	200	200	529	819	1688	90	1260	90	1260	250	910	1731	1194
SV9203F220T	200	200	529	819	1688	90	1260	90	1260	250	910	1731	1194

Dimensions in mm. Tolerance ± 10 mm.

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Booster sets

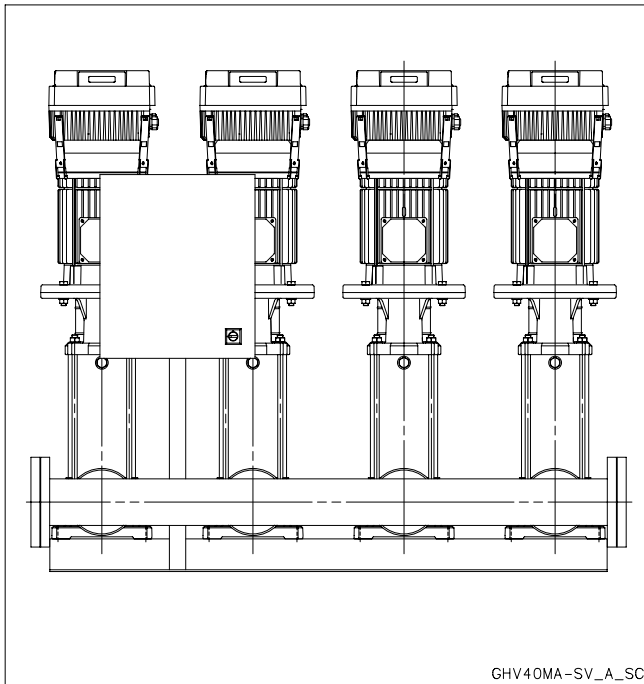
MARKET SECTORS

CIVIL, INDUSTRIAL

APPLICATIONS

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

GHV40 Series



SPECIFICATIONS

- **Flow rate** up to 400 m³/h.
- **Head** up to 150 m.
- Electrical panel supply voltage: 3 x 400V ± 10%.
- Frequency: 50 Hz.
- External control voltage: 5 ÷ 10 V.
- Protection class:
 - electrical panel: IP55.
 - converter: IP55 up to 11 kW.
 - IP54 above 11 kW.
- Maximum electric pump power 4 x 22 kW.
- Progressive motor start.
- **Vertical design pump:**
 - SV..T series (motor protection class IP55).
- Maximum operating pressure: 15 bar for sets with SV..T electric pumps.
- Maximum temperature of pumped liquid : +40°C.

MAIN COMPONENTS of **GHV40** booster sets

- **Four** multistage vertical **electric pumps**, SV series.
- **Hydrovar®** frequency **converters** mounted on the motor of each electric pump.
- One **suction manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). Threaded coupling for water charging.
- One **discharge manifold** made of AISI 304 stainless steel, with threaded or flanged ports depending on the type of pump (see drawings). Fitted with two R1" threaded couplings with caps to allow connection of 24-litre diaphragm tanks.
- **On-off valves** on suction and discharge sides of each pump, ball type with threaded coupling up to 2" size included (for pumps up to SV16 included). Butterfly type for installation between the flanges are used for larger diameter.
- **Non-return valves** on discharge side of each pump, spring – loaded type, with threaded coupling up to 1" 1/2 size. Spring – loaded type for installation between the flanges are large diameters.
- **Pressure gauge and control transmitter** on the pump's discharge side.
- **Miscellaneous** pipe fittings made of nickel-plated brass, galvanised steel and stainless steel.
- **Pump mounting base** and panel mounting bracket made of painted steel.
- **Electrical panel** for control and protection, with metal casing made of painted steel, IP55 protection class, equipped with:
 - Main doorlock switch.
 - Thermal-magnetic protectors for each converter.
 The panel is designed to protect the pumps against dry running; it must be equipped with an external device such as a minimum pressure switch, float switch or electrode probes.
- On request, the sets can be supplied with:
 - non-return valves on suction side (**GHVRA version**);
 - frame-mounted Hydrovar (**HFD or HFS versions**);
 - stainless steel mounting base.

The set comes pre-assembled and tested, complete with operating instructions and panel wiring diagram.

VERSIONS AVAILABLE

STANDARD VERSION (STD)

For general applications

Sets with **SV8** pumps:

Nickel plated brass valves, brass non-return valves, stainless steel manifolds.

Sets with **SV16** pumps:

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

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

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

DW VERSION

For drinking water applications.

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

Sets with **SV8** pumps:

Nickel-plated brass valves, brass non-return valves.

Sets with **SV16** pumps:

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

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

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

AISI 304, AISI 316 version

For special applications.

Sets with **SV8-16-33-46-66-92** pumps:

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

Fitted with vibration damping feet.

Accessories available on request:

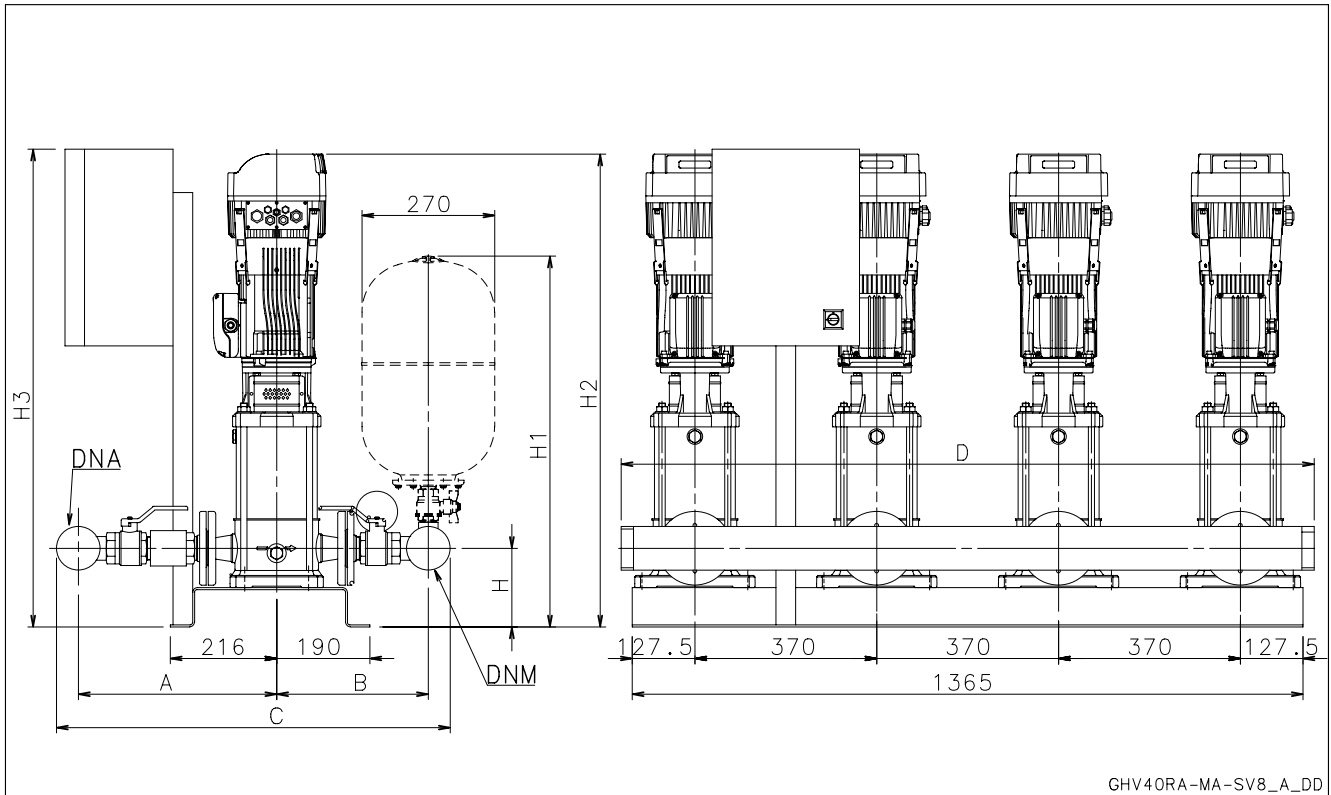
- Vibration dampers kit (1 kit per pump).
- Devices against dry running: float switch, minimum pressure switch, probe electrodes kit.
- Kit featuring a 24-litre diaphragm expansion tank equipped with a ball valve (one for each pump) in the following versions:
 - 24-litre 8 bar cylinder water tank kit
 - 24-litre 10 bar cylinder water tank kit
 - 24-litre 16 bar cylinder water tank kit.



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GHV40 RA SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV 40 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV802F11T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	891	973
SV803F15T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	939	973
SV804F22T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	977	973
SV805F22T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	1015	973
SV806F30T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	1103	973
SV808F40T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	1183	973
SV809F40T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	1221	973
SV811F55T	R 3"	R 3"	404	504	309	363	801	955	1410	160	755	1384	973

Dimensions in mm. Tolerance ± 10 mm.

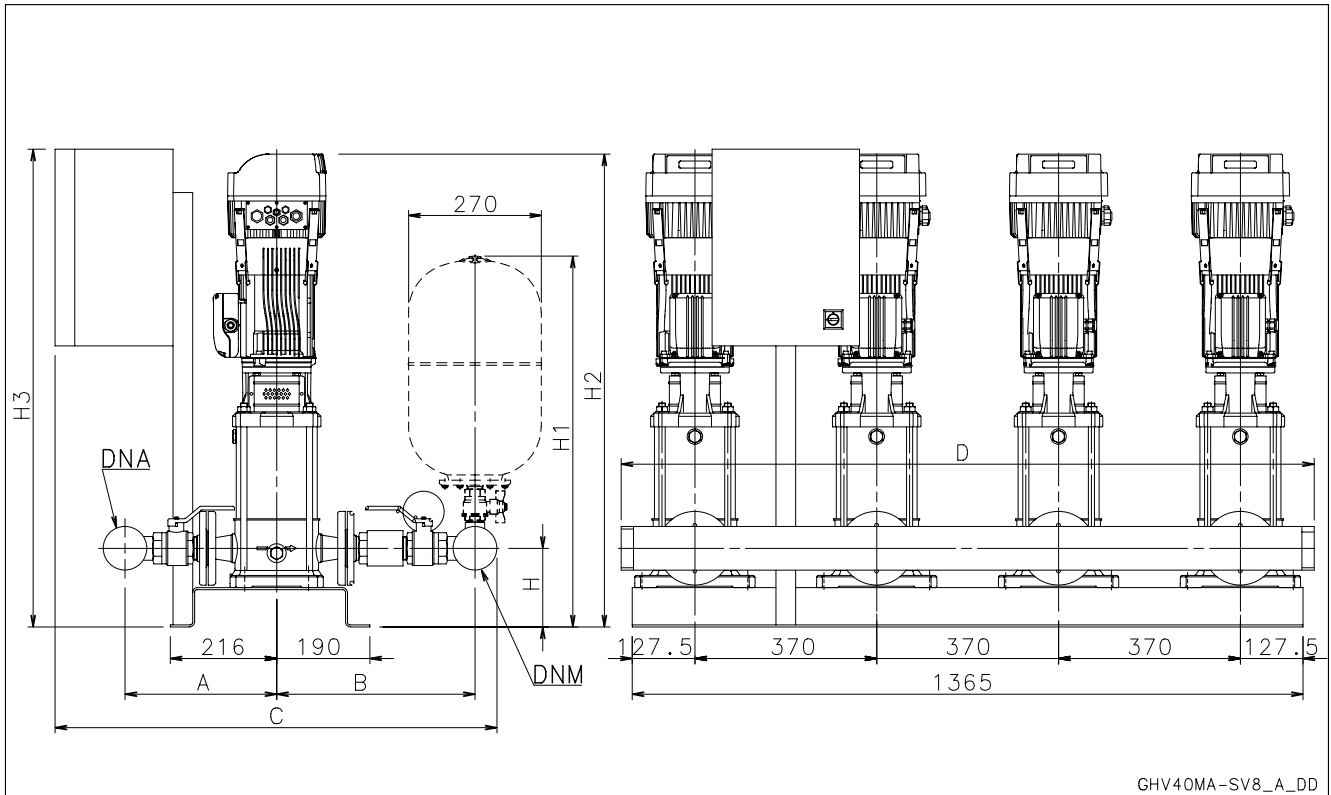
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GHV40 SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV 40	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV802F11T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	891	973
SV803F15T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	939	973
SV804F22T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	977	973
SV805F22T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	1015	973
SV806F30T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	1103	973
SV808F40T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	1183	973
SV809F40T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	1221	973
SV811F55T	R 3"	R 3"	309	363	404	504	899	999	1410	160	755	1384	973

Dimensions in mm. Tolerance ± 10 mm.

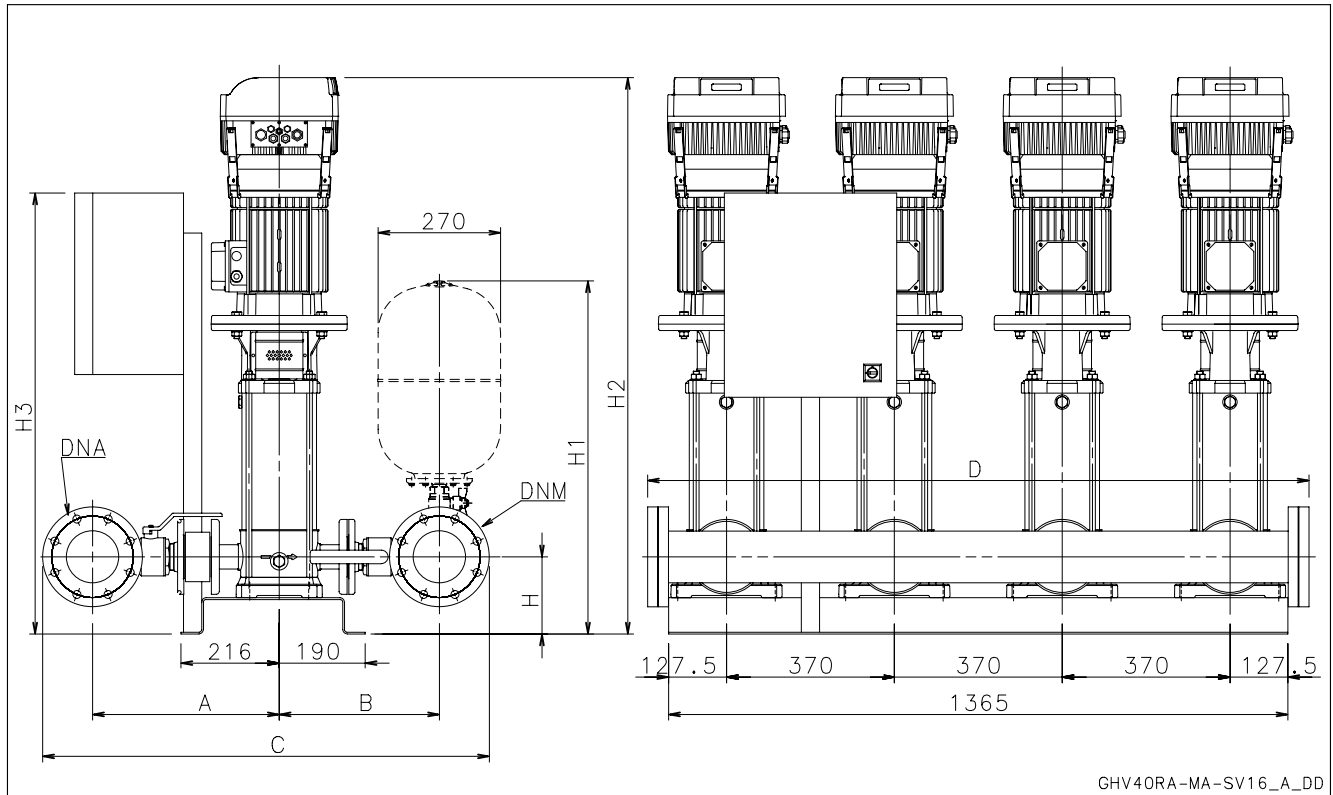
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GHV40 RA SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV40RA-MA-SV16_A_DD

GHV 40 RA	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV1602F22T	100	100	410	478	353	435	801	955	1454	170	777	911	973
SV1603F30T	100	100	410	478	353	435	801	955	1454	170	777	999	973
SV1604F40T	100	100	410	478	353	435	801	955	1454	170	777	1041	973
SV1605F55T	100	100	410	478	353	435	801	955	1454	170	777	1166	973
SV1606F55T	100	100	410	478	353	435	801	955	1454	170	777	1204	973
SV1607F75T	100	100	410	478	353	435	801	955	1454	170	777	1242	1093
SV1608F75T	100	100	410	478	353	435	801	955	1454	170	777	1280	1093

Dimensions in mm. Tolerance ± 10 mm.

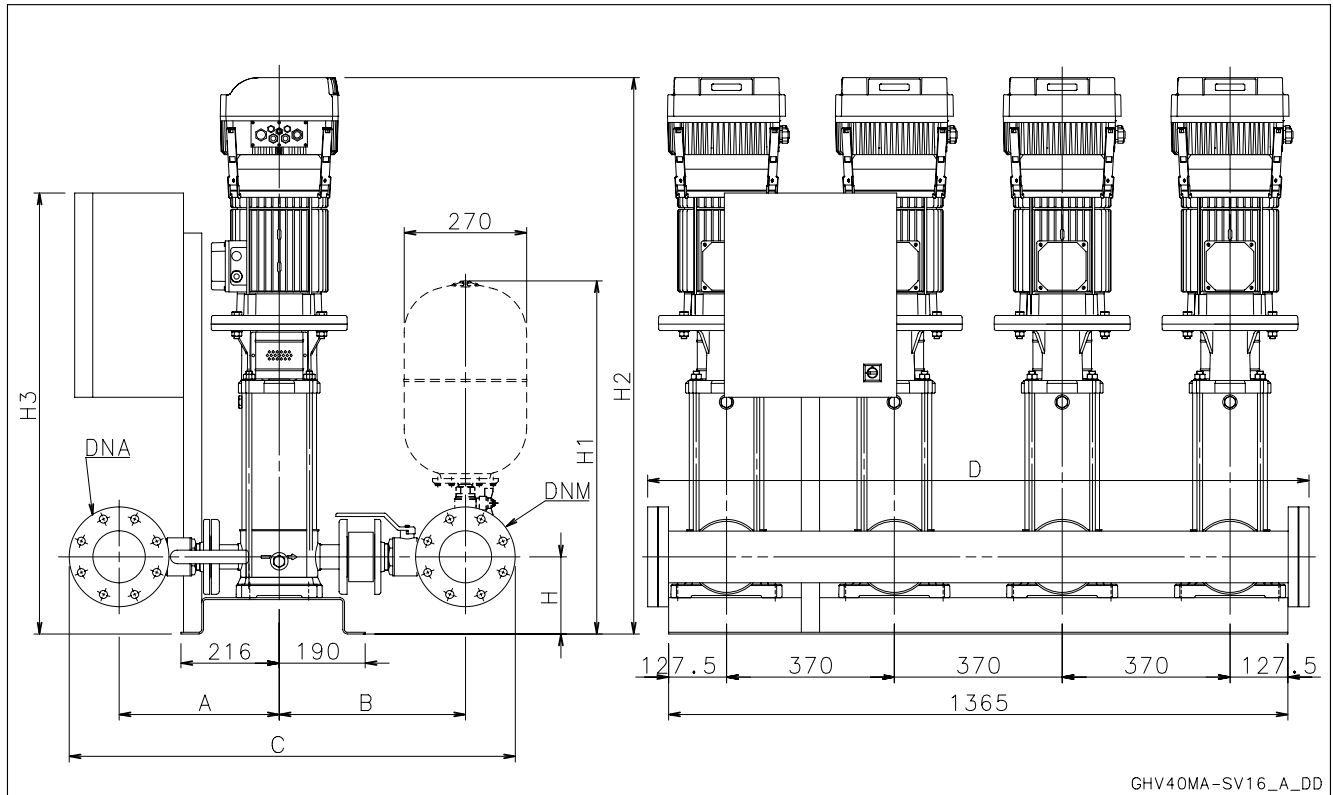
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GHV40 SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV40MA-SV16_A_DD

GHV 40	DNA	DNM	A		B		C		D	H	H1	H2	H3
			STD/DW	AISI	STD/DW	AISI	STD/DW	AISI					
SV1602F22T	100	100	353	435	410	478	983	1133	1454	170	777	911	973
SV1603F30T	100	100	353	435	410	478	983	1133	1454	170	777	999	973
SV1604F40T	100	100	353	435	410	478	983	1133	1454	170	777	1041	973
SV1605F55T	100	100	353	435	410	478	983	1133	1454	170	777	1166	973
SV1606F55T	100	100	353	435	410	478	983	1133	1454	170	777	1204	973
SV1607F75T	100	100	353	435	410	478	983	1133	1454	170	777	1242	1093
SV1608F75T	100	100	353	435	410	478	983	1133	1454	170	777	1280	1093

Dimensions in mm. Tolerance ± 10 mm.

ghv40_sv16_a_td



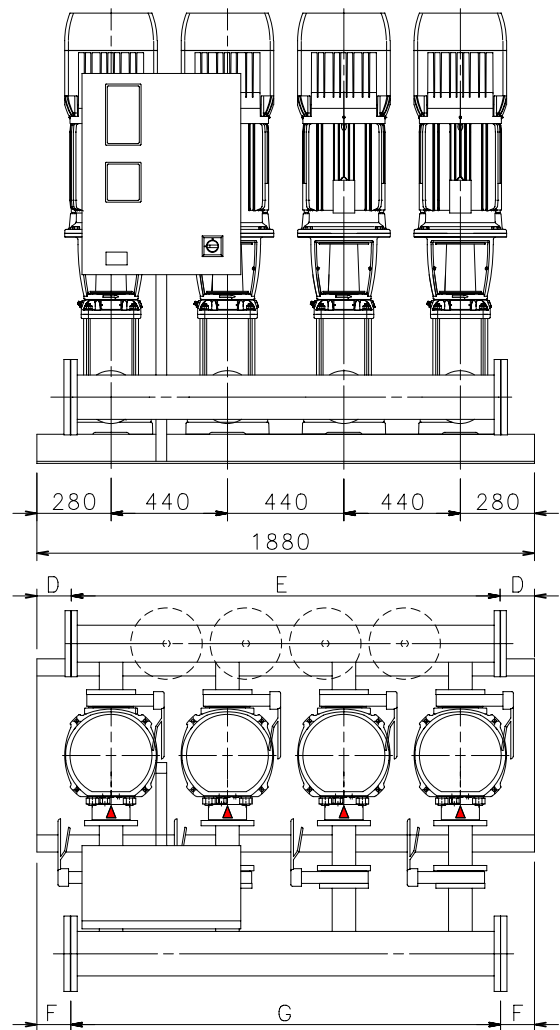
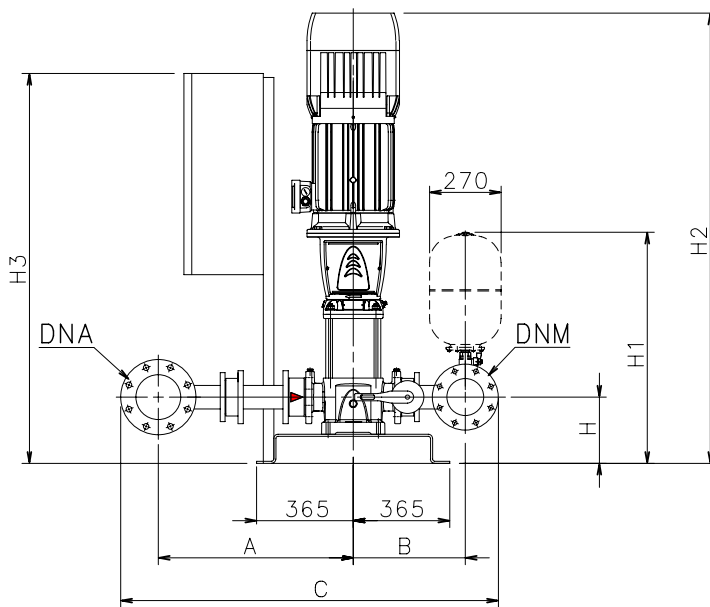
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GHV40 RA SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY



GHV_GHV40RA-SV46_A_DD

GHV40 RA SERIES BOOSTER SETS

THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON SUCTION SIDE - THREE-PHASE POWER SUPPLY

GHV40RA	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	125	125	726	461	1437	110	1660	110	1660	215	835	1047	974
SV3301F30T	125	125	726	461	1437	110	1660	110	1660	215	835	1087	974
SV3302/2F40T	125	125	726	461	1437	110	1660	110	1660	215	835	1166	974
SV3302/1F40T	125	125	726	461	1437	110	1660	110	1660	215	835	1166	974
SV3302F55T	125	125	726	461	1437	110	1660	110	1660	215	835	1253	974
SV3303/2F55T	125	125	726	461	1437	110	1660	110	1660	215	835	1328	974
SV3303/1F75T	125	125	726	461	1437	110	1660	110	1660	215	835	1328	1194
SV3303F75T	125	125	726	461	1437	110	1660	110	1660	215	835	1328	1194
SV3304/2F75T	125	125	726	461	1437	110	1660	110	1660	215	835	1403	1194
SV3304/1F110T	125	125	726	461	1437	110	1660	110	1660	215	835	1491	1194
SV3304F110T	125	125	726	461	1437	110	1660	110	1660	215	835	1491	1194
SV3305/2F110T	125	125	726	461	1437	110	1660	110	1660	215	835	1566	1194
SV3305/1F110T	125	125	726	461	1437	110	1660	110	1660	215	835	1566	1194
SV3305F150T	125	125	726	461	1437	110	1660	110	1660	215	835	1742	1194
SV3306/2F150T	125	125	726	461	1437	110	1660	110	1660	215	835	1817	1194
SV3306/1F150T	125	125	726	461	1437	110	1660	110	1660	215	835	1817	1194
SV3306F150T	125	125	726	461	1437	110	1660	110	1660	215	835	1817	1194
SV3307/2F150T	125	125	726	461	1437	110	1660	110	1660	215	835	1892	1194
SV4601/1F30T	150	150	766	498	1548	90	1700	90	1700	250	884	1127	974
SV4601F40T	150	150	766	498	1548	90	1700	90	1700	250	884	1131	974
SV4602/2F55T	150	150	766	498	1548	90	1700	90	1700	250	884	1293	1194
SV4602F75T	150	150	766	498	1548	90	1700	90	1700	250	884	1293	1194
SV4603/2F110T	150	150	766	498	1548	90	1700	90	1700	250	884	1456	1194
SV4603F110T	150	150	766	498	1548	90	1700	90	1700	250	884	1456	1194
SV4604/2F150T	150	150	766	498	1548	90	1700	90	1700	250	884	1707	1194
SV4604F150T	150	150	766	498	1548	90	1700	90	1700	250	884	1707	1194
SV4605/2F185T	150	150	766	498	1548	90	1700	90	1700	250	884	1826	1321
SV4605F185T	150	150	766	498	1548	90	1700	90	1700	250	884	1826	1321
SV4606/2F220T	150	150	766	498	1548	90	1700	90	1700	250	884	1901	1321
SV4606F220T	150	150	766	498	1548	90	1700	90	1700	250	884	1901	1321
SV6601/1F40T	200	200	819	529	1688	90	1700	90	1700	250	910	1156	1194
SV6601F55T	200	200	819	529	1688	90	1700	90	1700	250	910	1243	1194
SV6602/2F75T	200	200	819	529	1688	90	1700	90	1700	250	910	1333	1194
SV6602/1F110T	200	200	819	529	1688	90	1700	90	1700	250	910	1421	1194
SV6602F110T	200	200	819	529	1688	90	1700	90	1700	250	910	1421	1194
SV6603/2F150T	200	200	819	529	1688	90	1700	90	1700	250	910	1687	1194
SV6603/1F150T	200	200	819	529	1688	90	1700	90	1700	250	910	1687	1194
SV6603F185T	200	200	819	529	1688	90	1700	90	1700	250	910	1731	1321
SV6604/2F185T	200	200	819	529	1688	90	1700	90	1700	250	910	1821	1321
SV6604/1F220T	200	200	819	529	1688	90	1700	90	1700	250	910	1821	1321
SV6604F220T	200	200	819	529	1688	90	1700	90	1700	250	910	1821	1321
SV9201/1F55T	250	200	846	529	1748	90	1700	60	1760	250	910	1243	1194
SV9201F75T	250	200	846	529	1748	90	1700	60	1760	250	910	1243	1194
SV9202/2F110T	250	200	846	529	1748	90	1700	60	1760	250	910	1421	1194
SV9202F150T	250	200	846	529	1748	90	1700	60	1760	250	910	1597	1194
SV9203/2F185T	250	200	846	529	1748	90	1700	60	1760	250	910	1731	1321
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Dimensions in mm. Tolerance ± 10 mm.

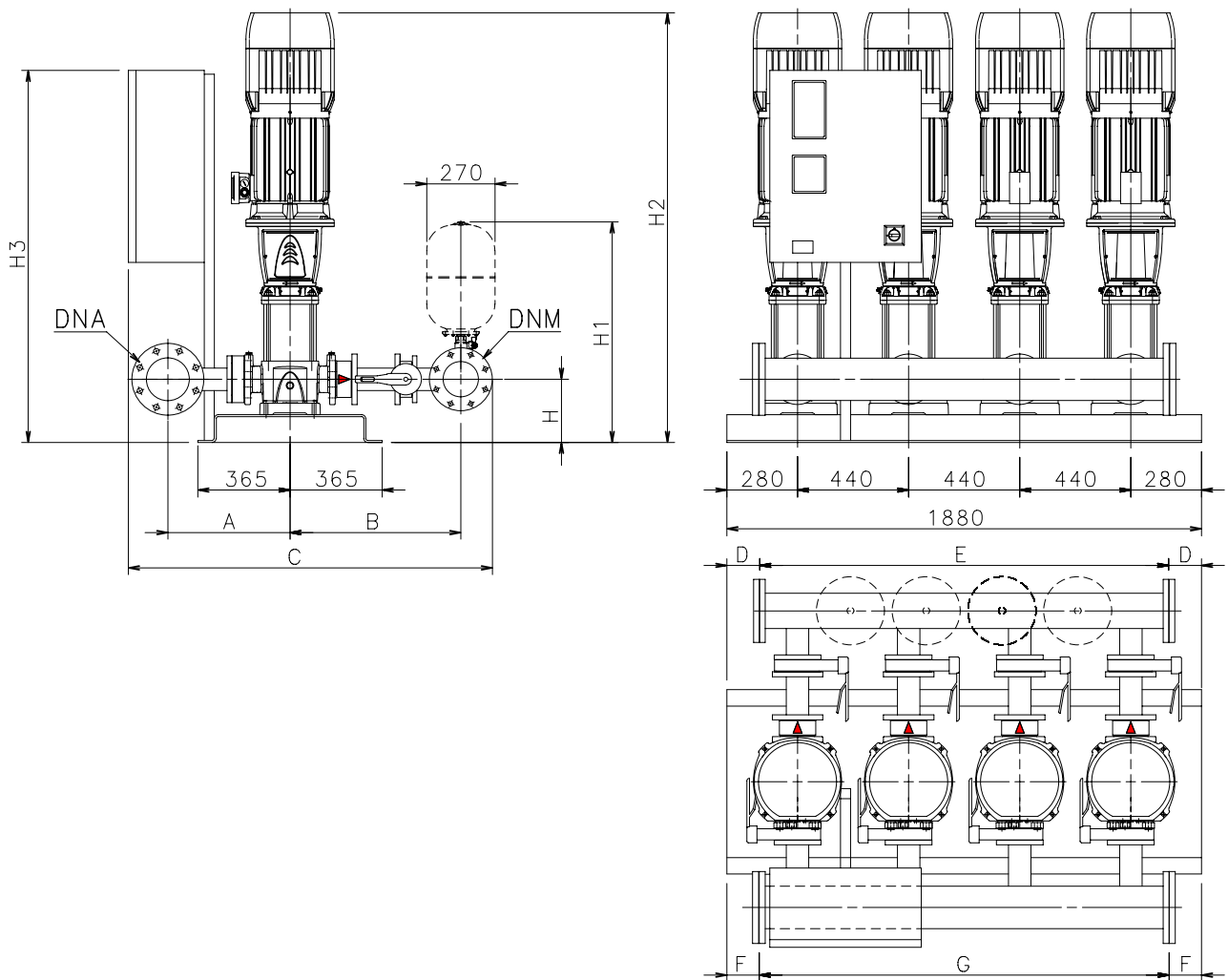
ghv40ra_sv46_a_td



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GHV40 SERIES BOOSTER SETS THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON DISCHARGE SIDE - THREE-PHASE POWER SUPPLY



GHV_GHV40-SV46_A_DD

GHV40 SERIES BOOSTER SETS **THREE VERTICAL ELECTRIC PUMPS WITH NON-RETURN VALVE ON** **DISCHARGE SIDE - THREE-PHASE POWER SUPPLY**

GHV40	DNA	DNM	A	B	C	D	E	F	G	H	H1	H2	H3
SV3301/1F22T	125	125	461	726	1437	110	1660	110	1660	215	835	1047	974
SV3301F30T	125	125	461	726	1437	110	1660	110	1660	215	835	1087	974
SV3302/2F40T	125	125	461	726	1437	110	1660	110	1660	215	835	1166	974
SV3302/1F40T	125	125	461	726	1437	110	1660	110	1660	215	835	1166	974
SV3302F55T	125	125	461	726	1437	110	1660	110	1660	215	835	1253	974
SV3303/2F55T	125	125	461	726	1437	110	1660	110	1660	215	835	1328	974
SV3303/1F75T	125	125	461	726	1437	110	1660	110	1660	215	835	1328	1194
SV3303F75T	125	125	461	726	1437	110	1660	110	1660	215	835	1328	1194
SV3304/2F75T	125	125	461	726	1437	110	1660	110	1660	215	835	1403	1194
SV3304/1F110T	125	125	461	726	1437	110	1660	110	1660	215	835	1491	1194
SV3304F110T	125	125	461	726	1437	110	1660	110	1660	215	835	1491	1194
SV3305/2F110T	125	125	461	726	1437	110	1660	110	1660	215	835	1566	1194
SV3305/1F110T	125	125	461	726	1437	110	1660	110	1660	215	835	1566	1194
SV3305F150T	125	125	461	726	1437	110	1660	110	1660	215	835	1742	1194
SV3306/2F150T	125	125	461	726	1437	110	1660	110	1660	215	835	1817	1194
SV3306/1F150T	125	125	461	726	1437	110	1660	110	1660	215	835	1817	1194
SV3306F150T	125	125	461	726	1437	110	1660	110	1660	215	835	1817	1194
SV3307/2F150T	125	125	461	726	1437	110	1660	110	1660	215	835	1892	1194
SV4601/1F30T	150	150	498	766	1548	90	1700	90	1700	250	884	1127	974
SV4601F40T	150	150	498	766	1548	90	1700	90	1700	250	884	1131	974
SV4602/2F55T	150	150	498	766	1548	90	1700	90	1700	250	884	1293	1194
SV4602F75T	150	150	498	766	1548	90	1700	90	1700	250	884	1293	1194
SV4603/2F110T	150	150	498	766	1548	90	1700	90	1700	250	884	1456	1194
SV4603F110T	150	150	498	766	1548	90	1700	90	1700	250	884	1456	1194
SV4604/2F150T	150	150	498	766	1548	90	1700	90	1700	250	884	1707	1194
SV4604F150T	150	150	498	766	1548	90	1700	90	1700	250	884	1707	1194
SV4605/2F185T	150	150	498	766	1548	90	1700	90	1700	250	884	1826	1321
SV4605F185T	150	150	498	766	1548	90	1700	90	1700	250	884	1826	1321
SV4606/2F220T	150	150	498	766	1548	90	1700	90	1700	250	884	1901	1321
SV4606F220T	150	150	498	766	1548	90	1700	90	1700	250	884	1901	1321
SV6601/1F40T	200	200	529	819	1688	90	1700	90	1700	250	910	1156	1194
SV6601F55T	200	200	529	819	1688	90	1700	90	1700	250	910	1243	1194
SV6602/2F75T	200	200	529	819	1688	90	1700	90	1700	250	910	1333	1194
SV6602/1F110T	200	200	529	819	1688	90	1700	90	1700	250	910	1421	1194
SV6602F110T	200	200	529	819	1688	90	1700	90	1700	250	910	1421	1194
SV6603/2F150T	200	200	529	819	1688	90	1700	90	1700	250	910	1687	1194
SV6603/1F150T	200	200	529	819	1688	90	1700	90	1700	250	910	1687	1194
SV6603F185T	200	200	529	819	1688	90	1700	90	1700	250	910	1731	1321
SV6604/2F185T	200	200	529	819	1688	90	1700	90	1700	250	910	1821	1321
SV6604/1F220T	200	200	529	819	1688	90	1700	90	1700	250	910	1821	1321
SV6604F220T	200	200	529	819	1688	90	1700	90	1700	250	910	1821	1321
SV9201/1F55T	250	200	556	819	1748	90	1700	60	1760	250	910	1243	1194
SV9201F75T	250	200	556	819	1748	90	1700	60	1760	250	910	1243	1194
SV9202/2F110T	250	200	556	819	1748	90	1700	60	1760	250	910	1421	1194
SV9202F150T	250	200	556	819	1748	90	1700	60	1760	250	910	1597	1194
SV9203/2F185T	250	200	556	819	1748	90	1700	60	1760	250	910	1731	1321
SV9203F220T	250	200	556	819	1748	90	1700	60	1760	250	910	1731	1321

Dimensions in mm. Tolerance ± 10 mm.

ghv40_sv46_a_td



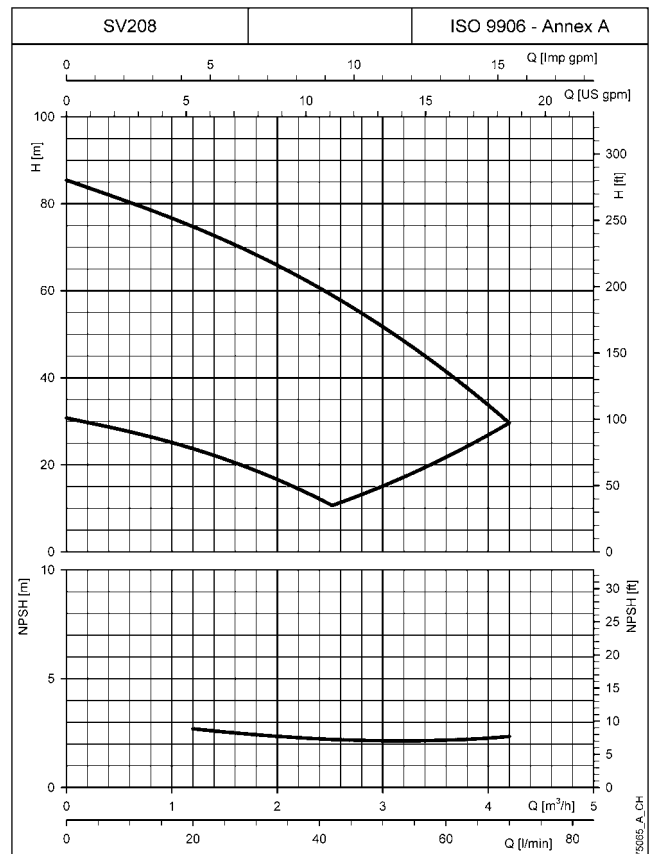
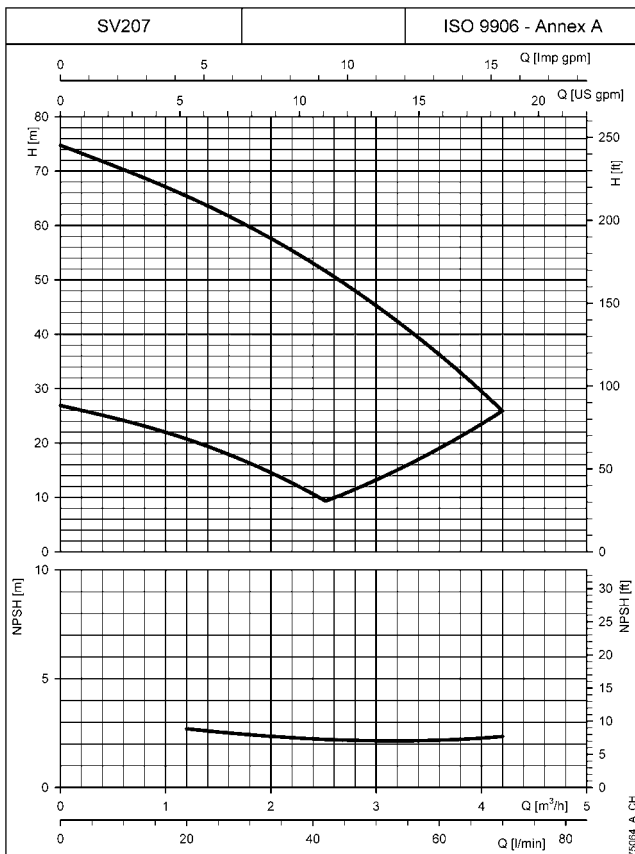
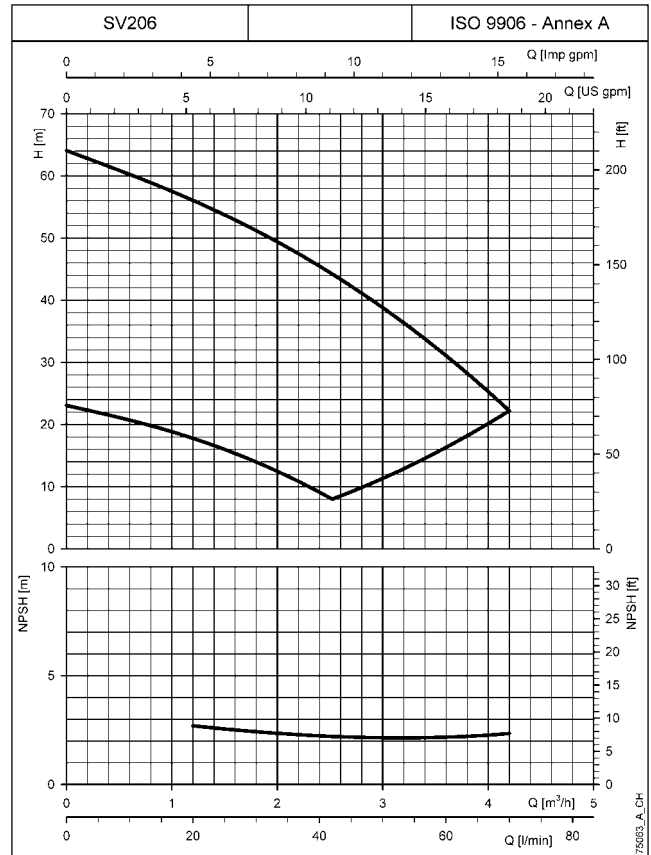
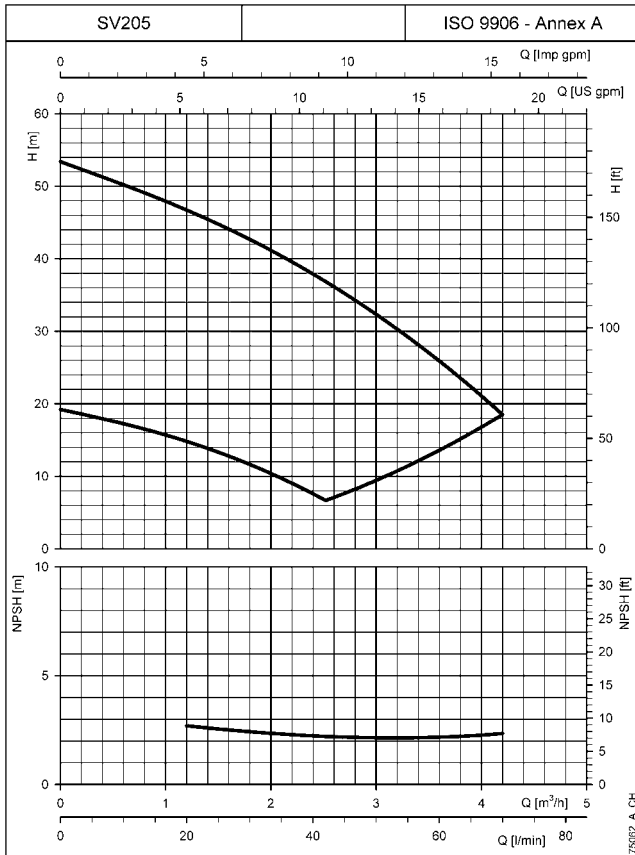
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BOOSTER SETS - GHV10 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



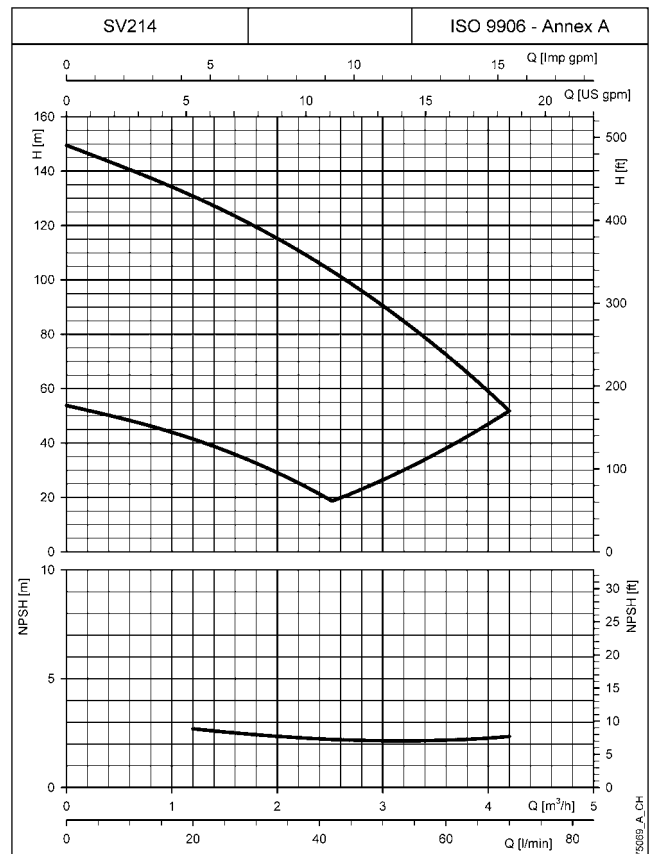
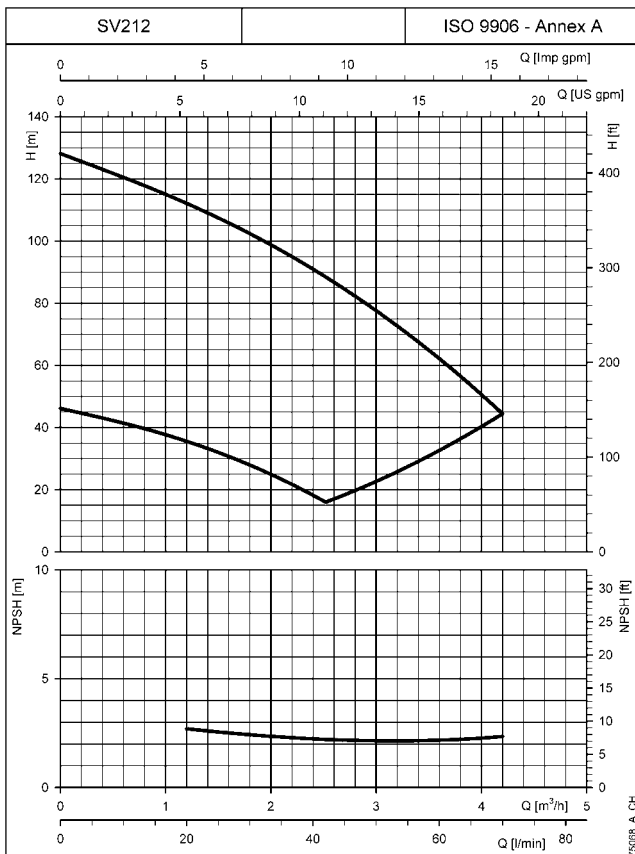
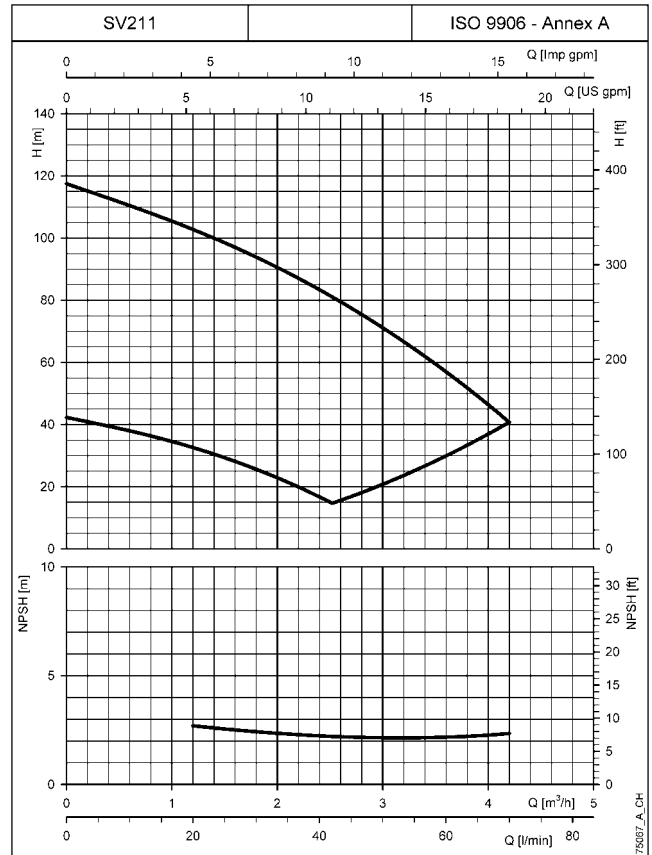
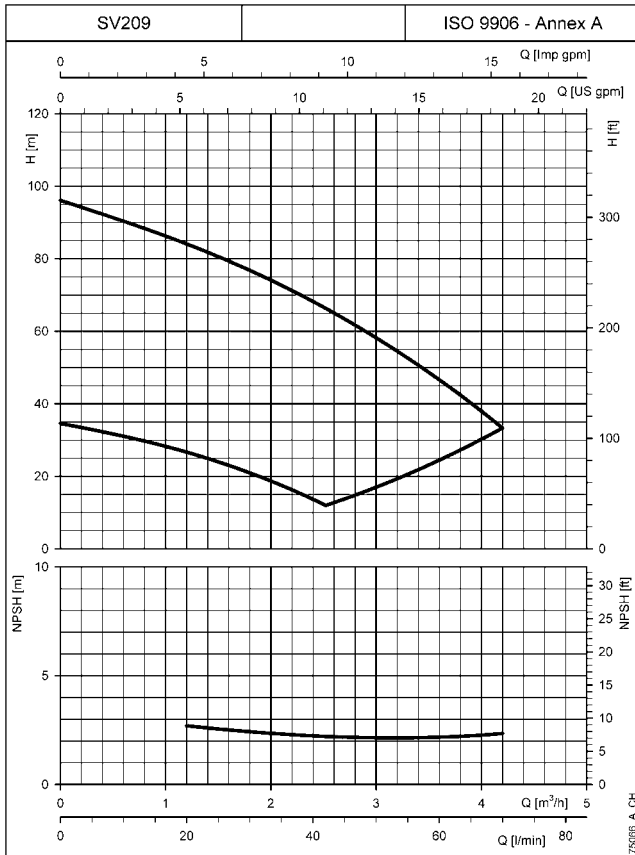
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one pump operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV10 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



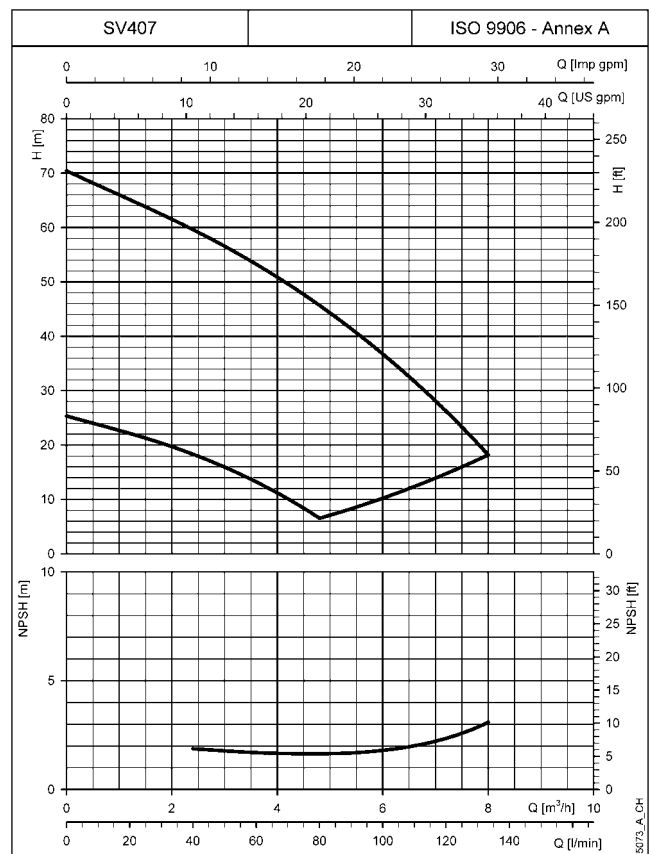
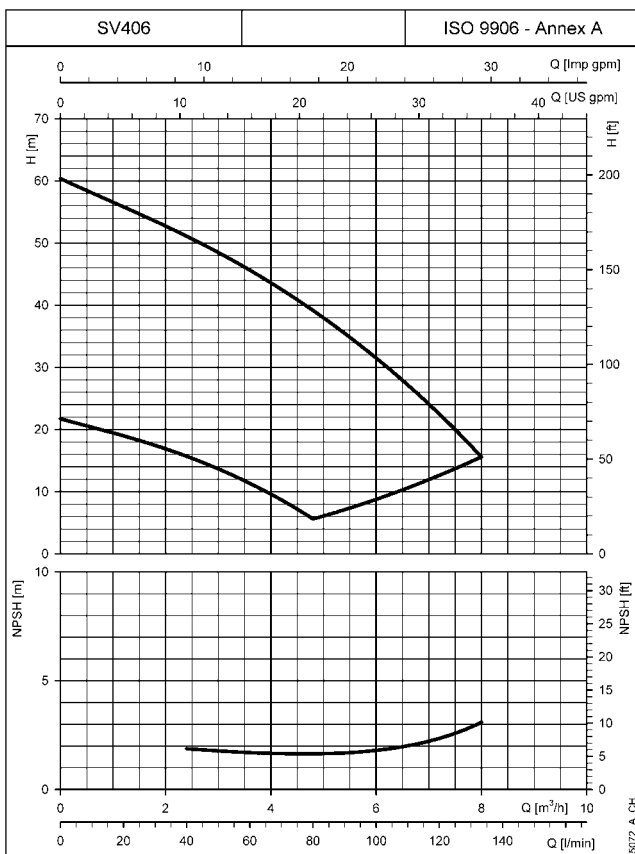
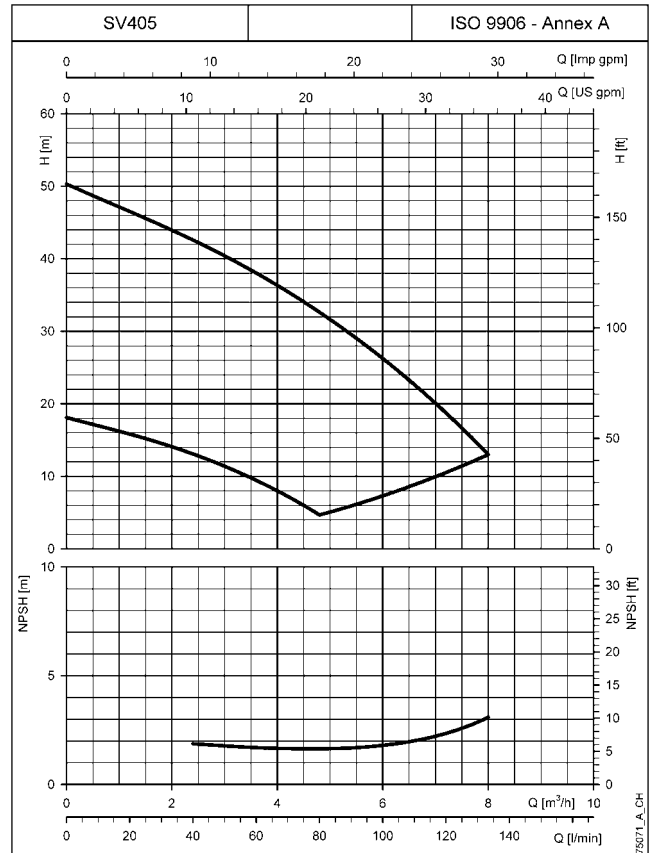
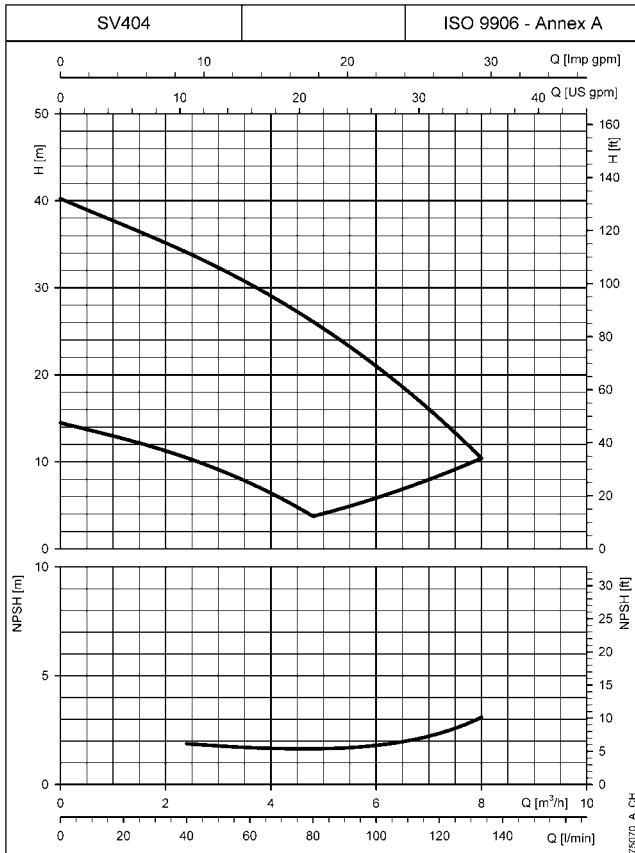
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one pump operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV10 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



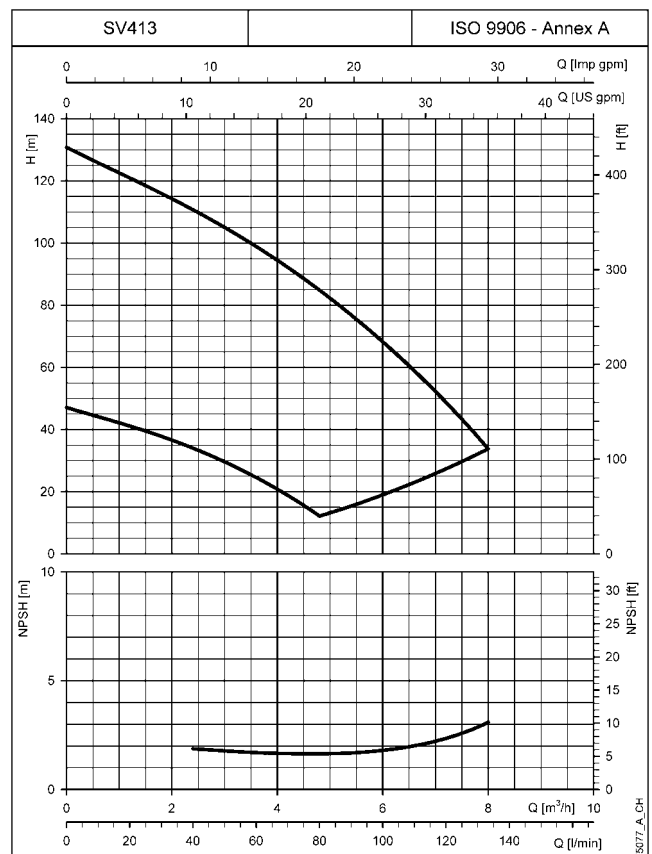
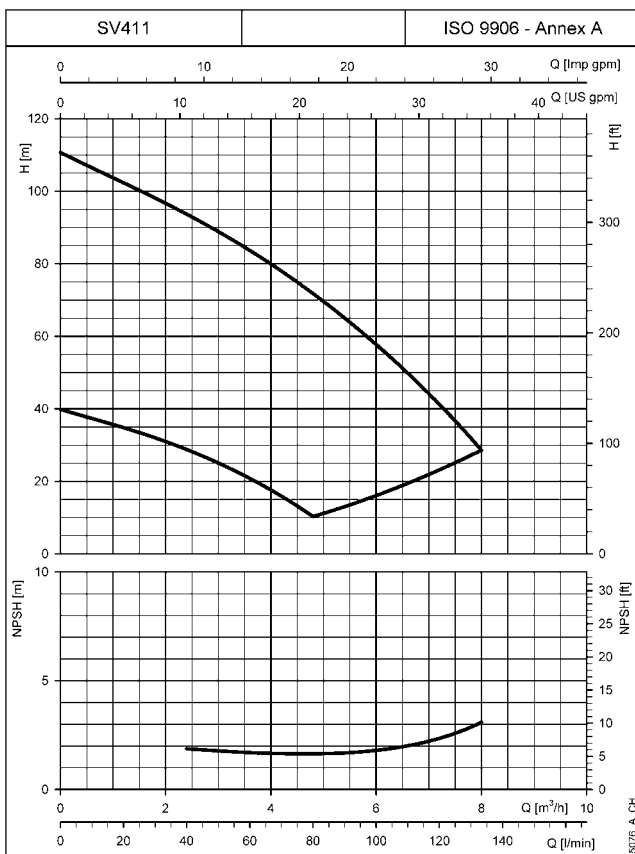
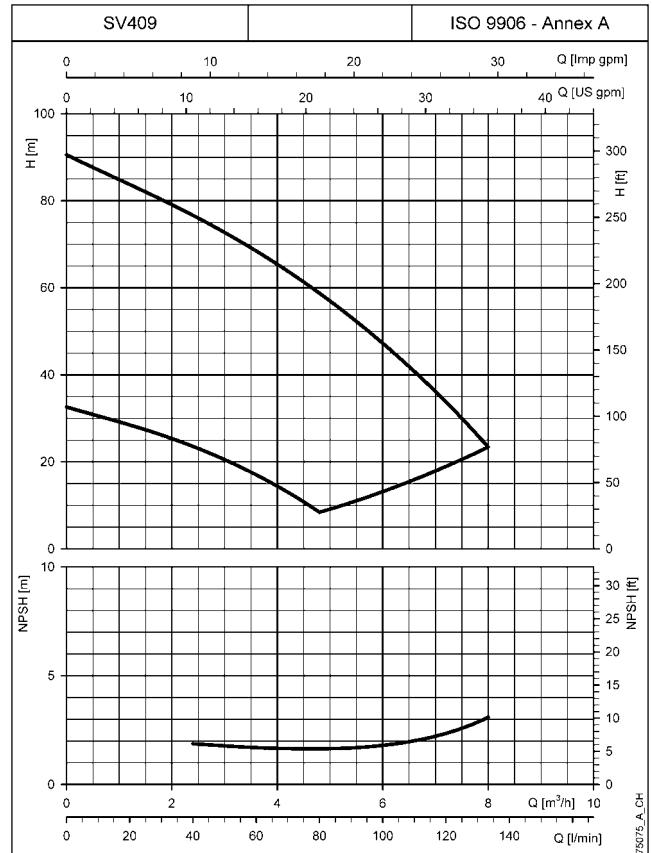
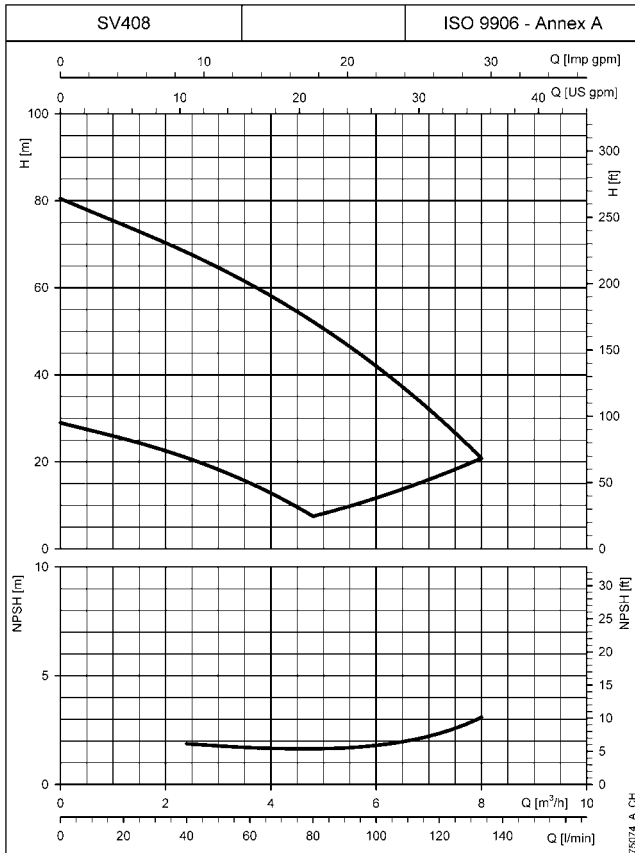
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one pump operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV10 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



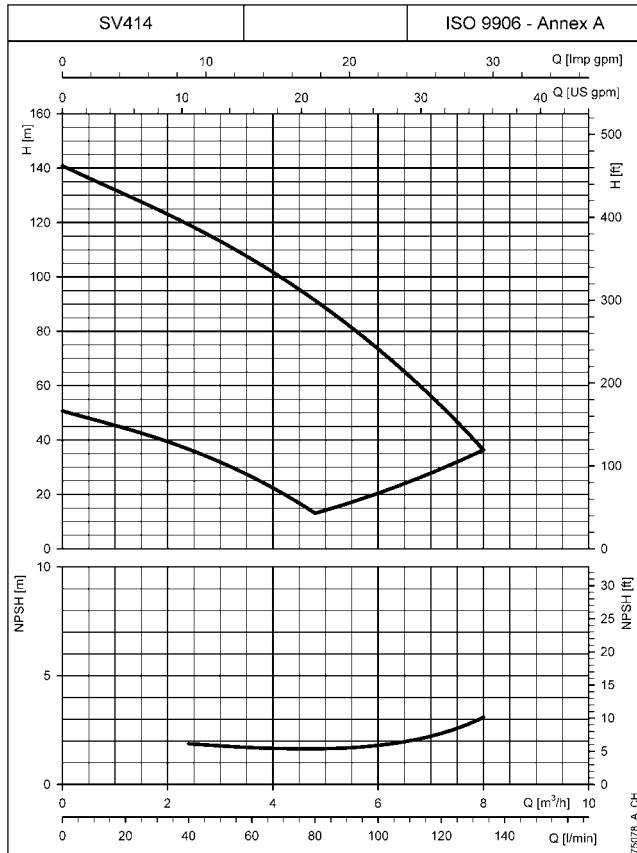
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one pump operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV10 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



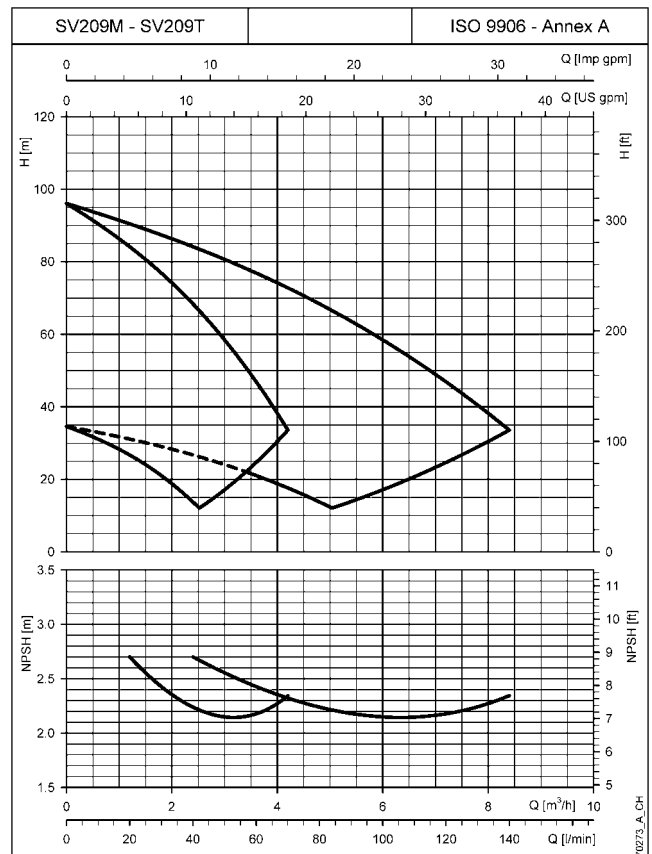
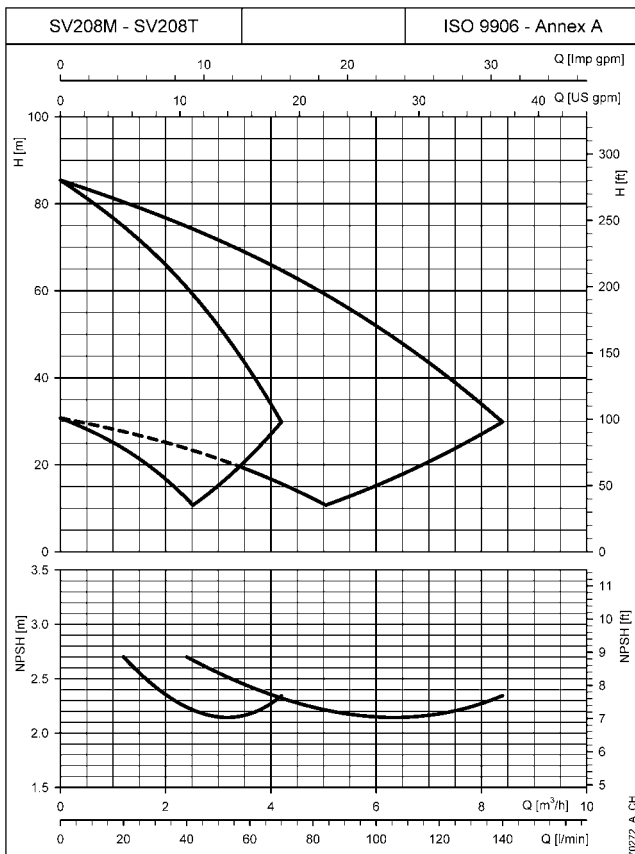
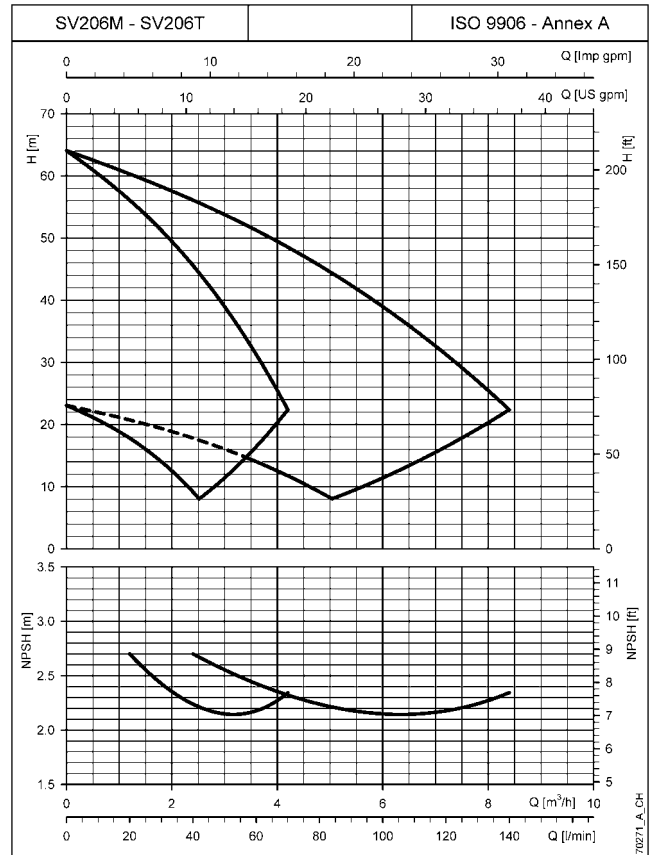
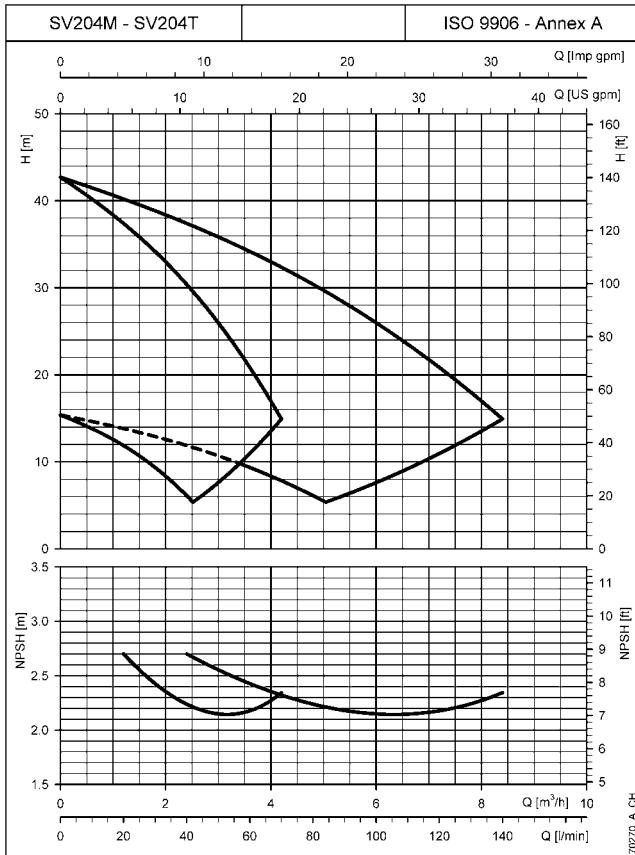
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one pump operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV20 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



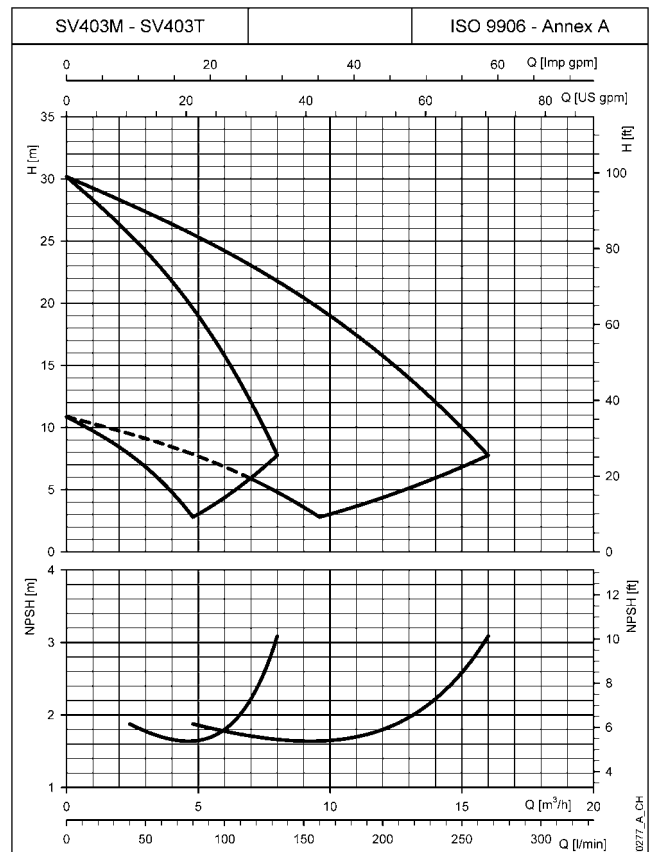
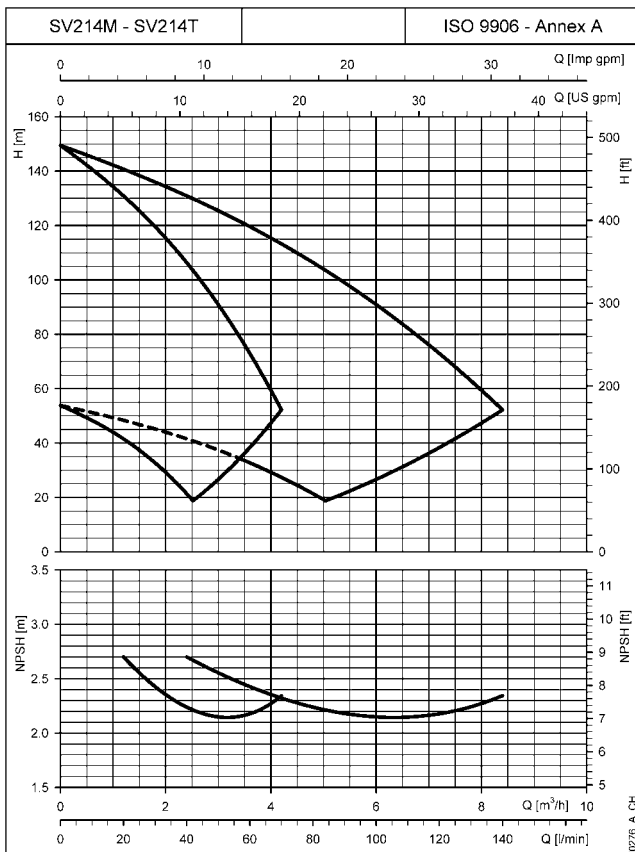
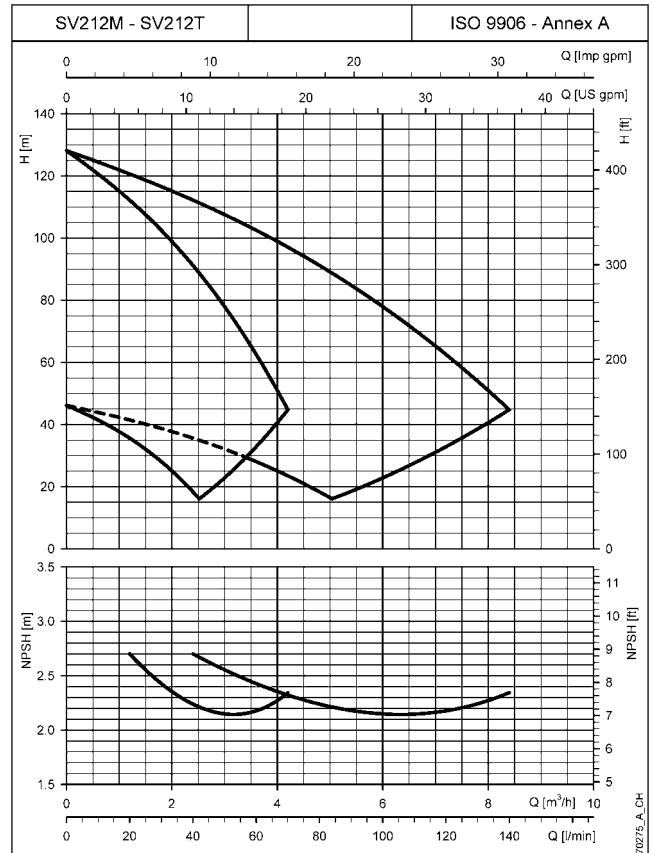
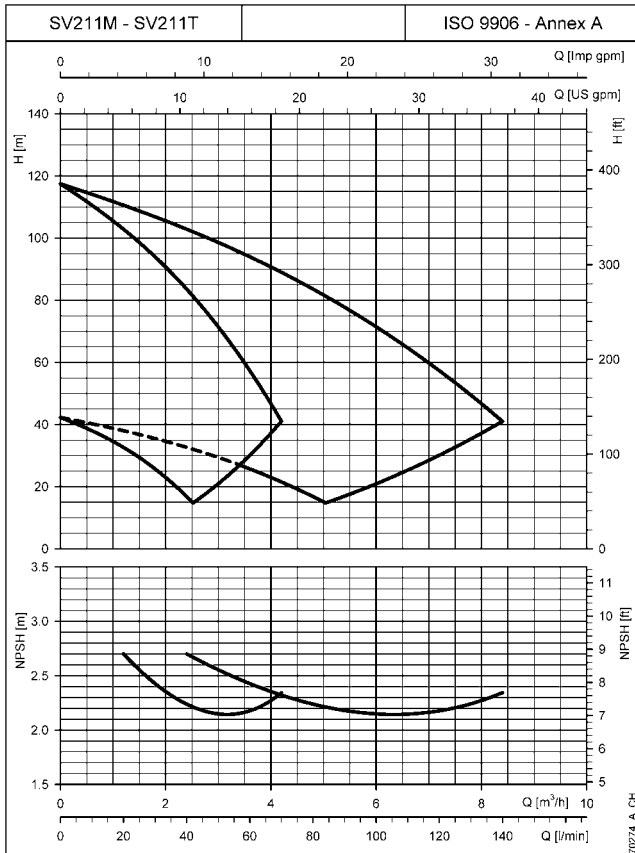
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one and two pumps operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV20 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



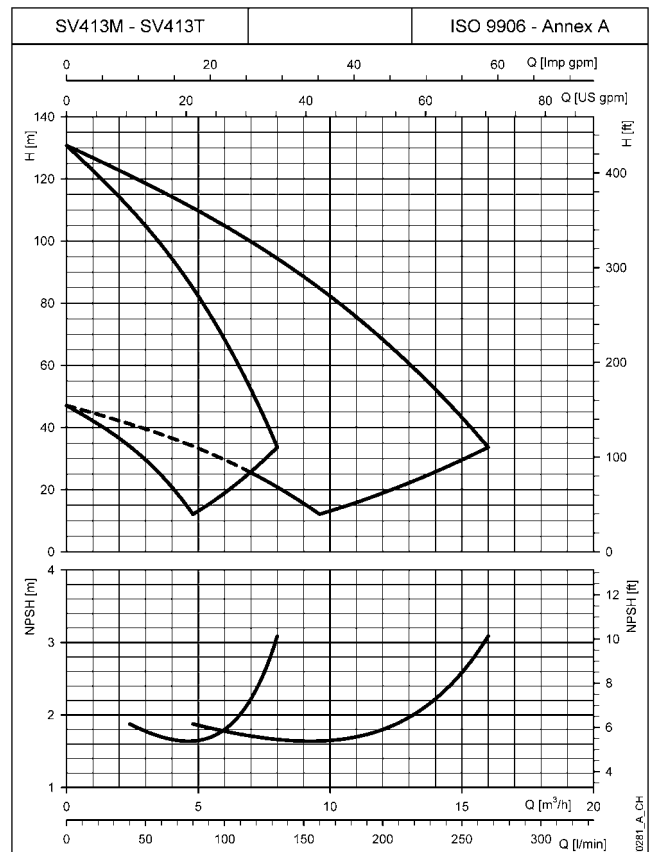
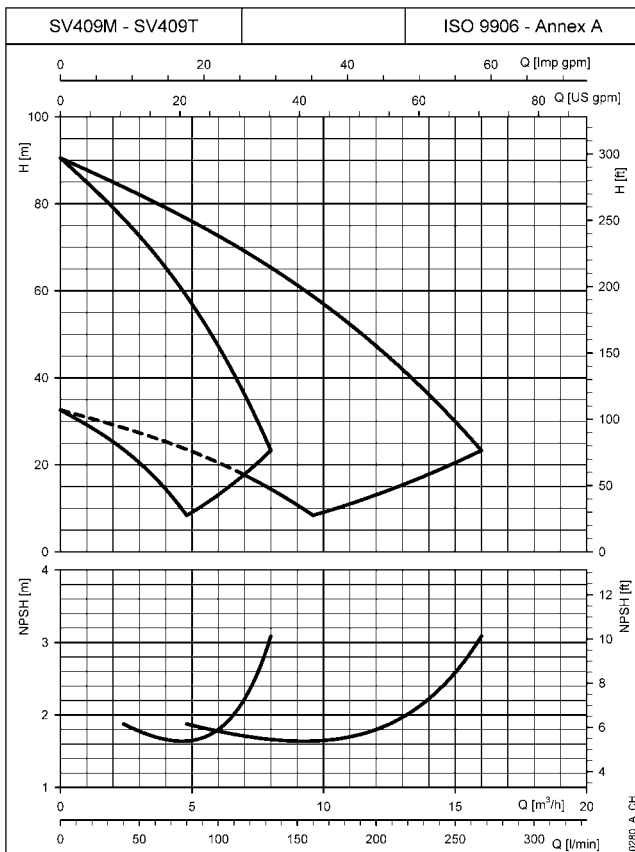
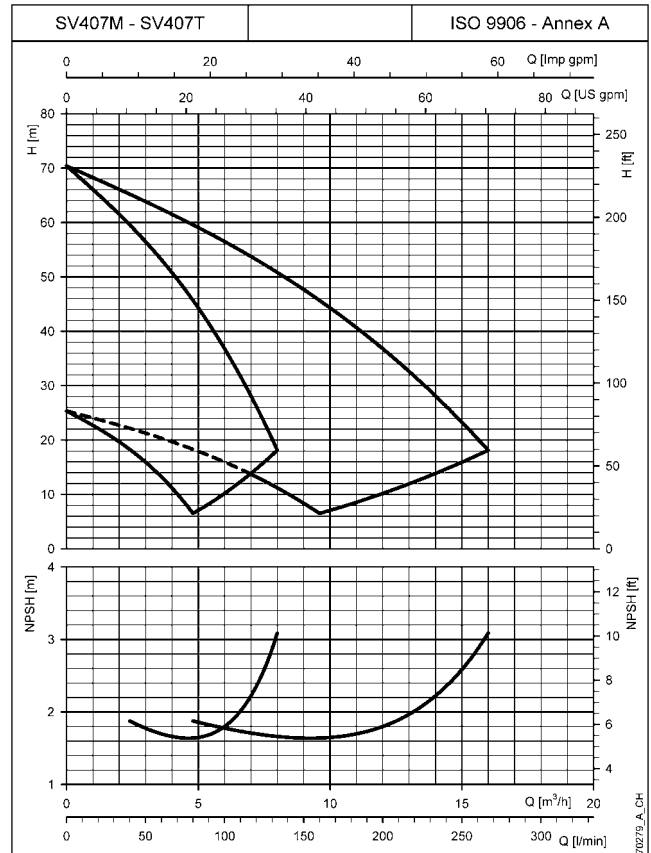
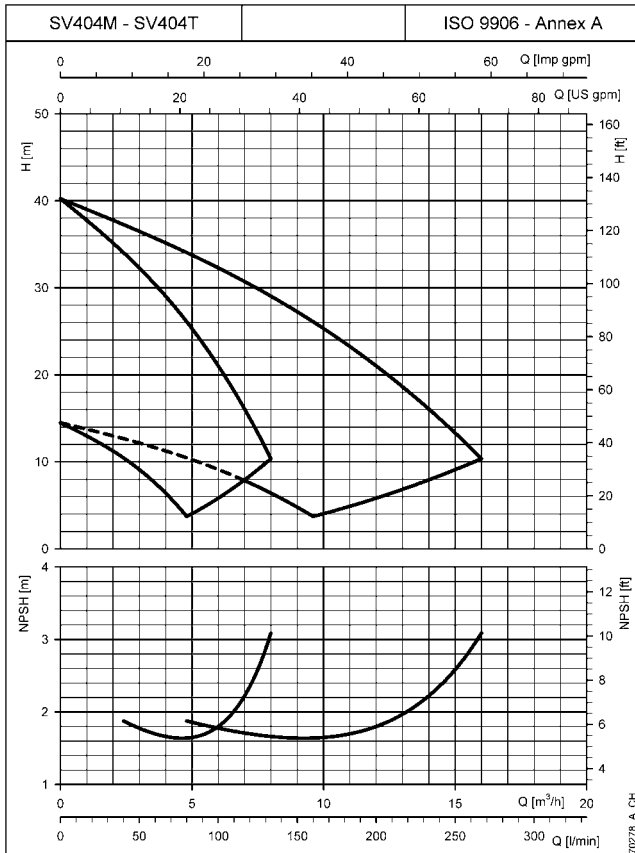
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one and two pumps operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV20 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



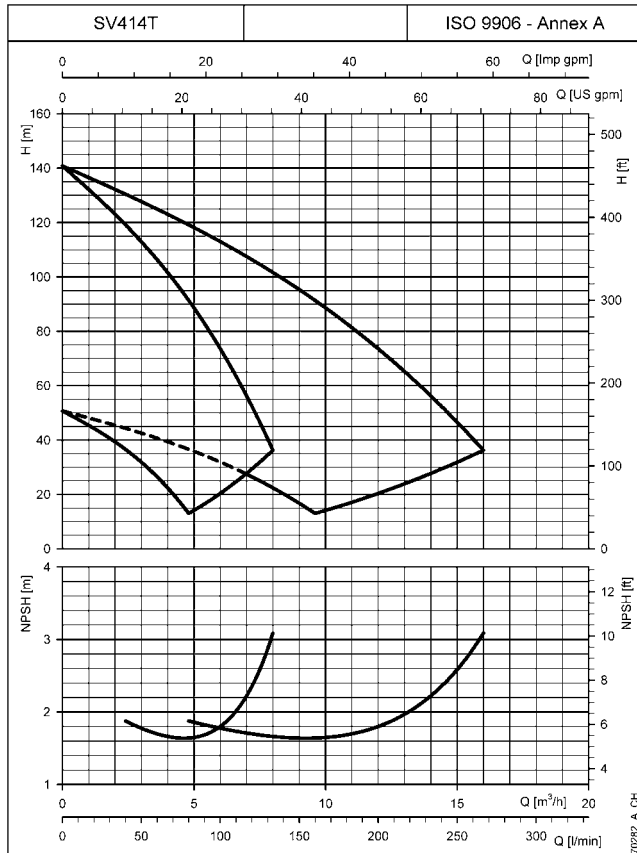
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one and two pumps operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV20 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



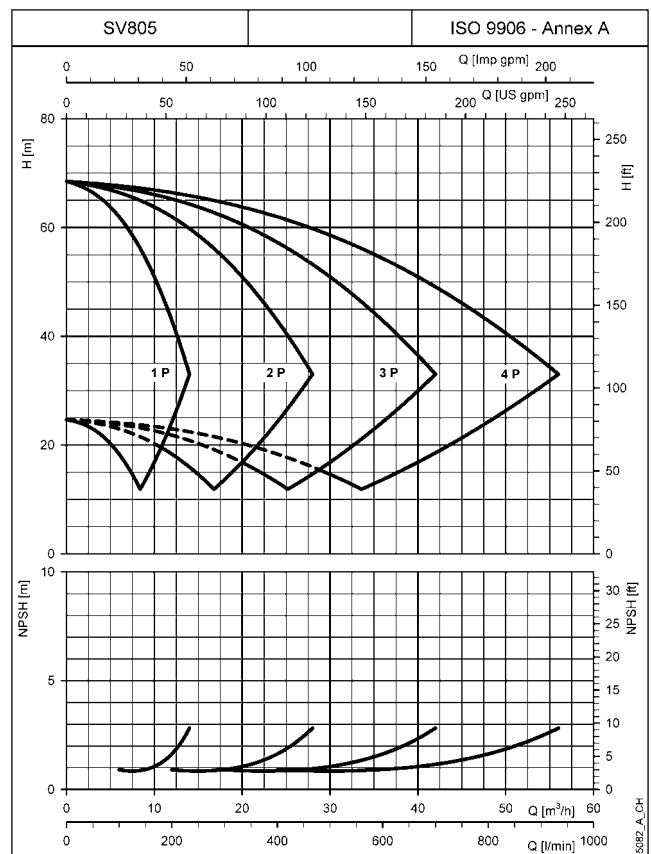
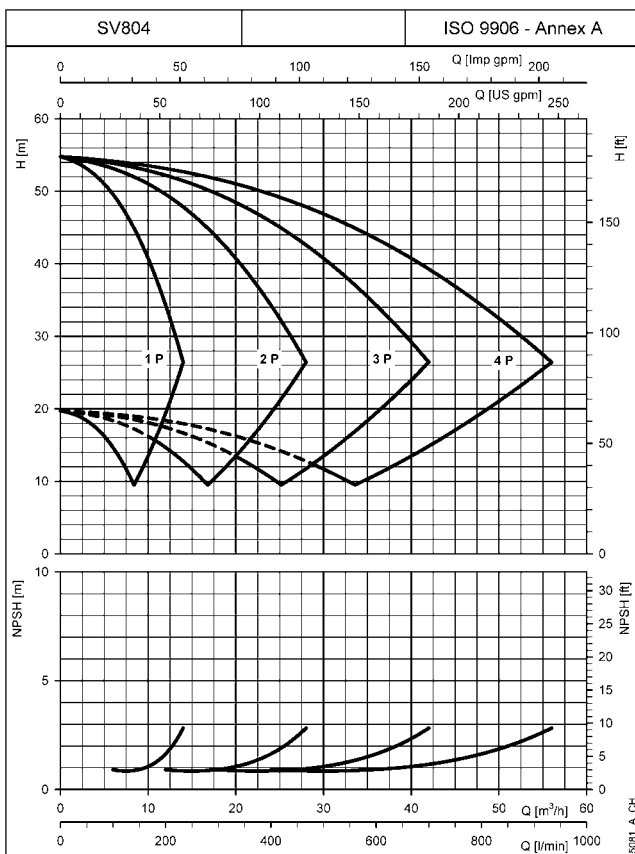
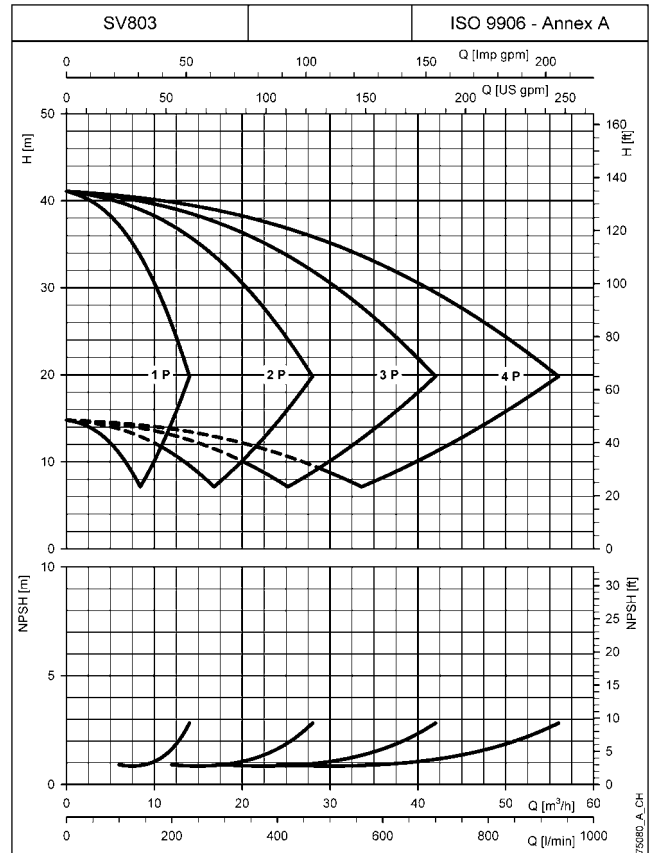
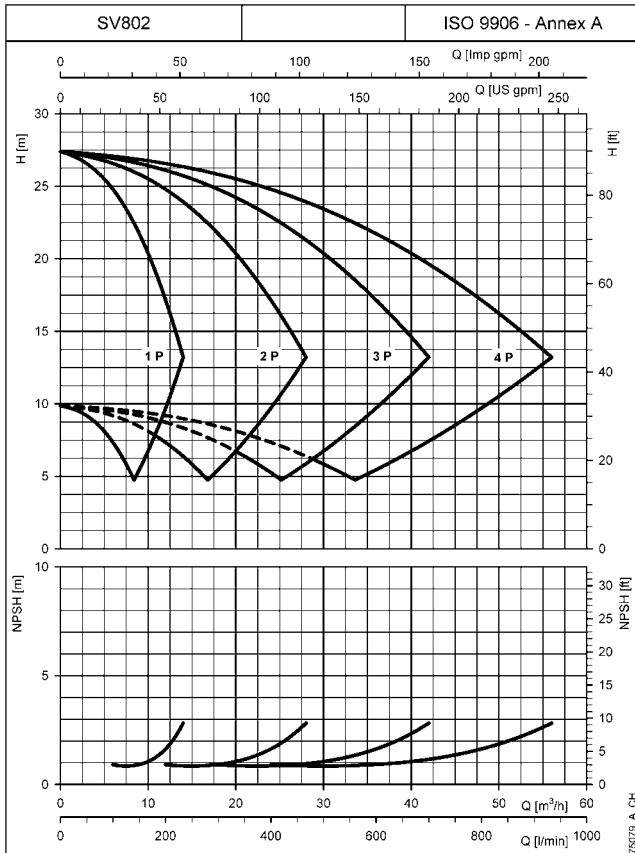
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one and two pumps operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV10..40 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



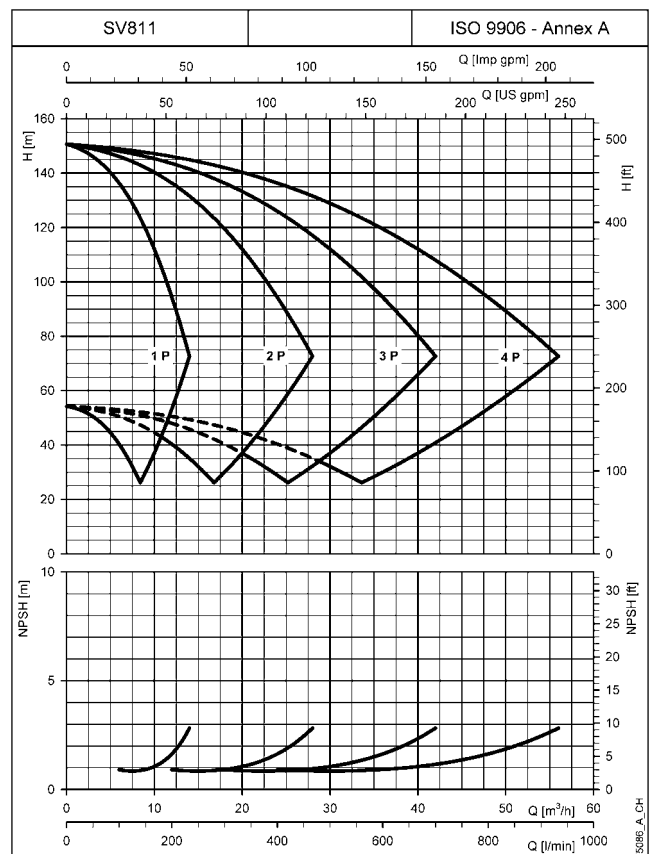
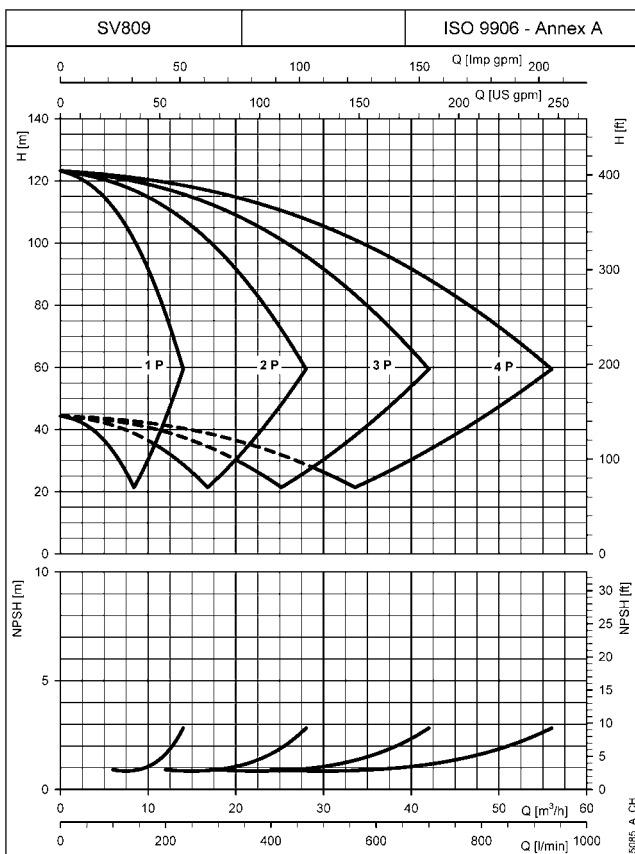
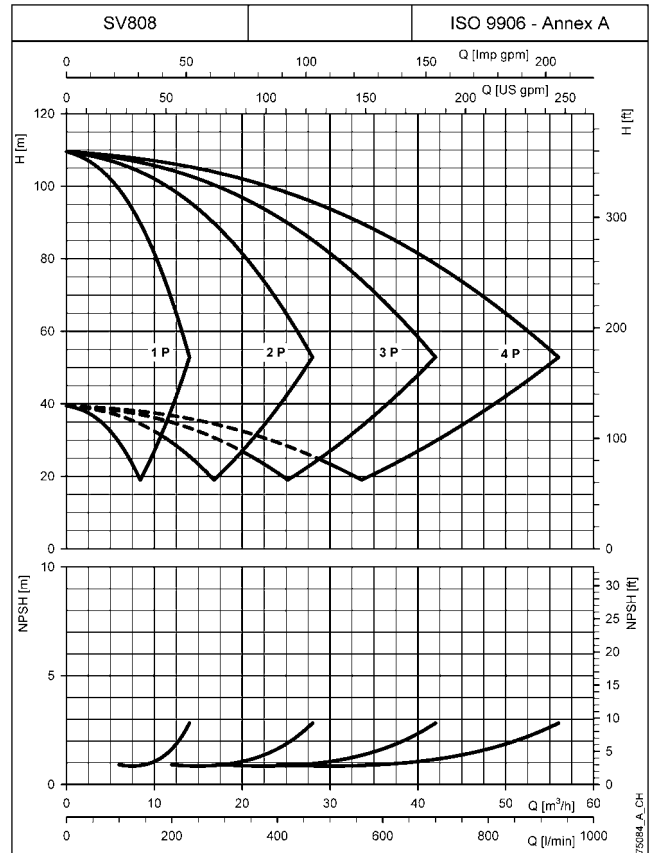
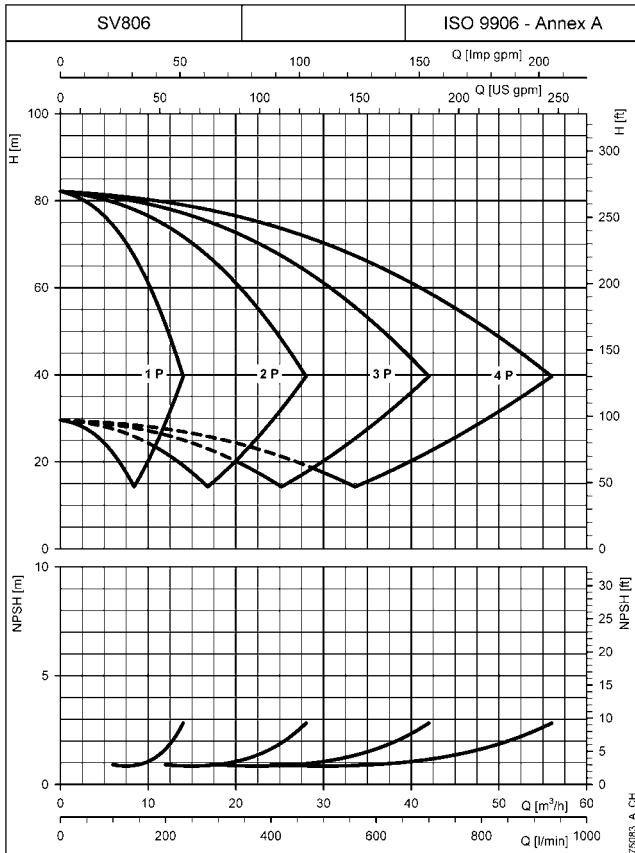
The performance curves do not take into account flow resistance in the valves and piping.
The curves show the performance with one, two, three and four pumps operating at minimum and maximum speed.
These performances are valid for liquids with density $\rho = 1.0 \text{ Kg/dm}^3$ and kinematic viscosity $\nu = 1 \text{ mm}^2/\text{sec}$.
The declared NPSH values are laboratory values; for practical use we recommend increasing these values by 0,5 m.



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BOOSTER SETS - GHV10..40 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



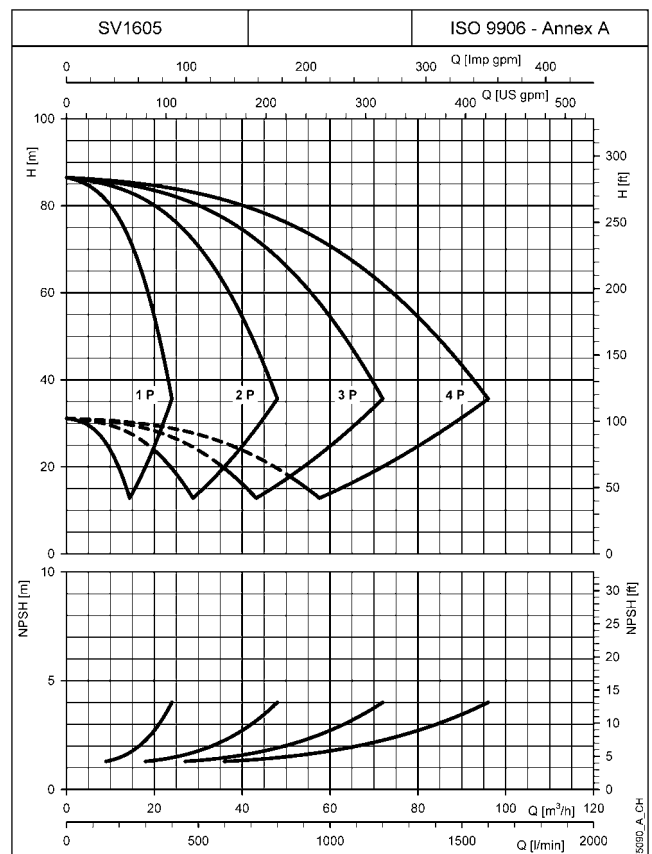
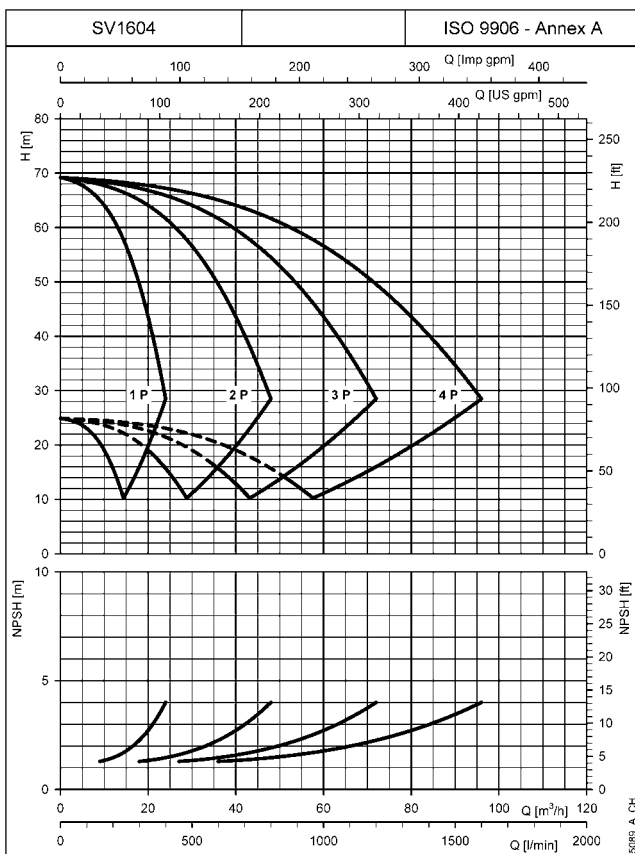
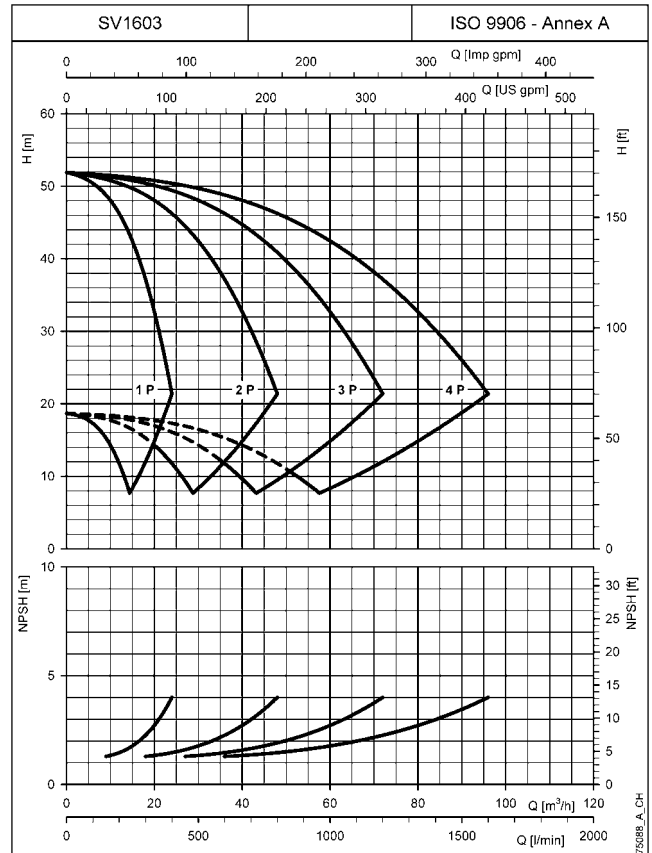
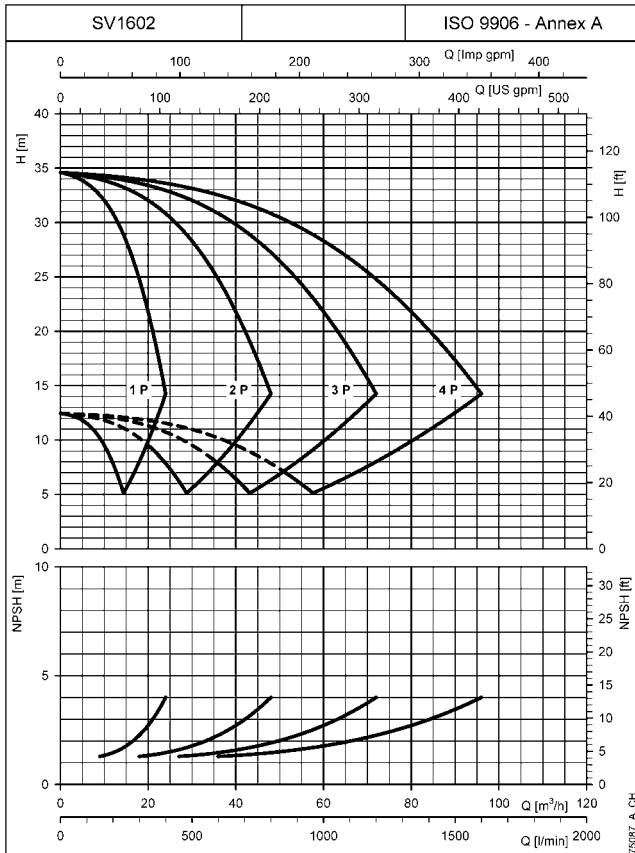
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BOOSTER SETS - GHV10..40 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



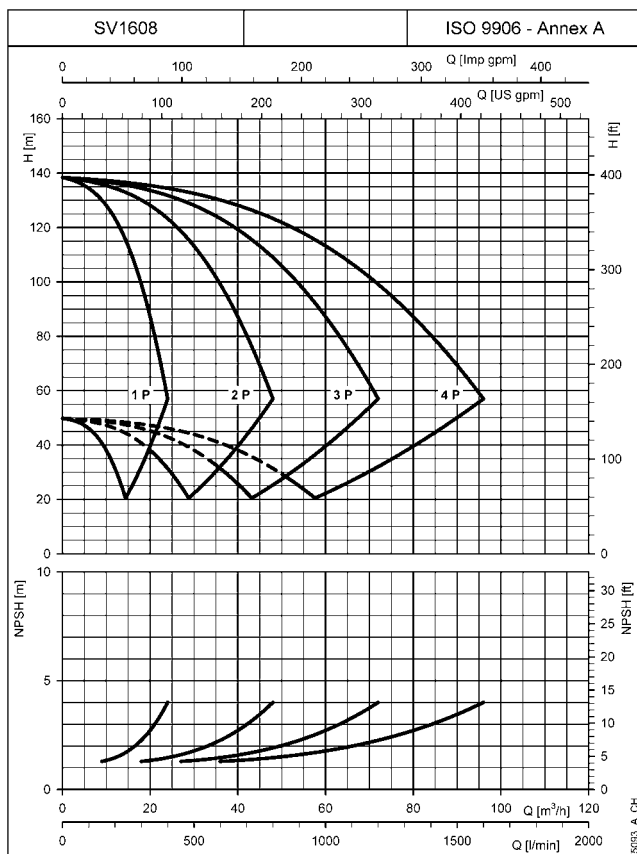
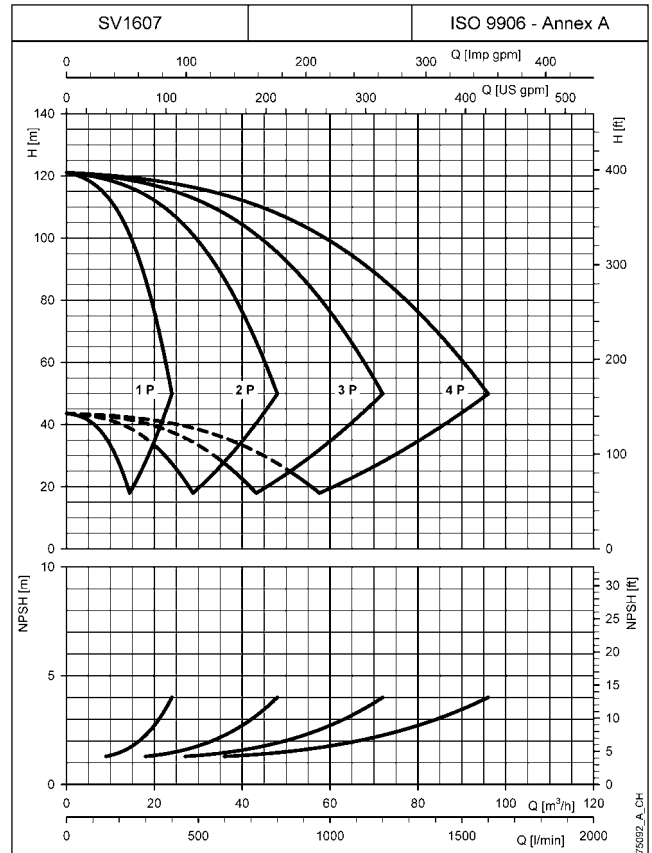
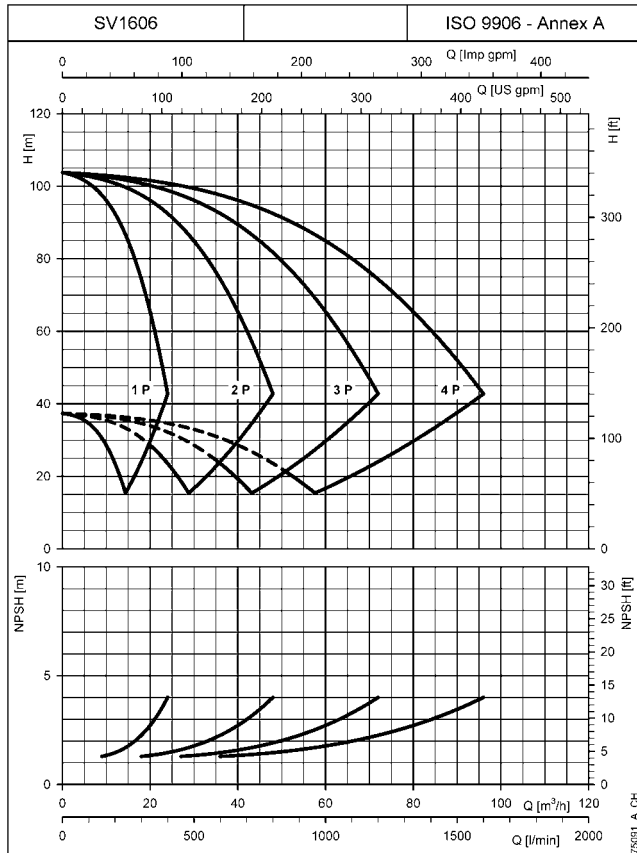
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BOOSTER SETS - GHV10..40 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



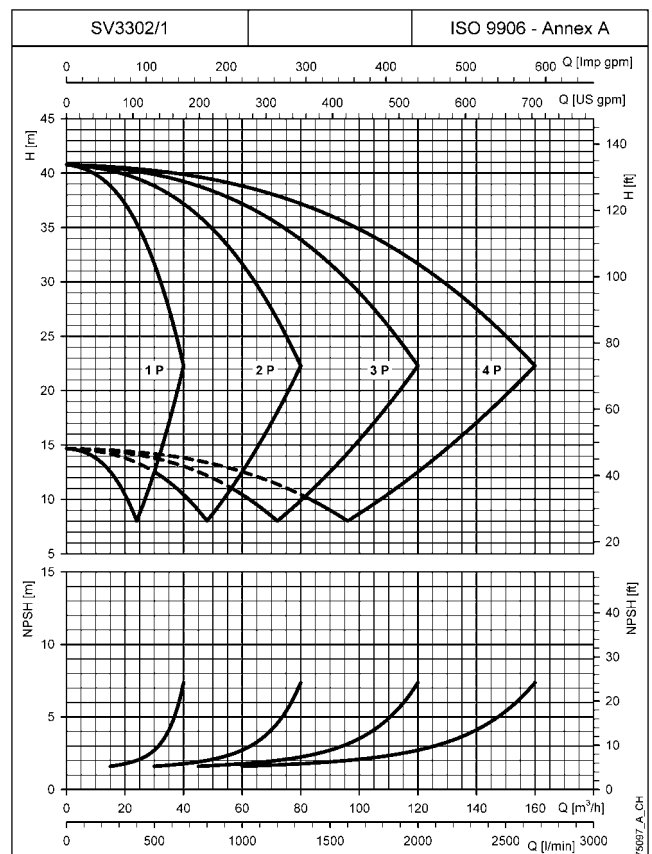
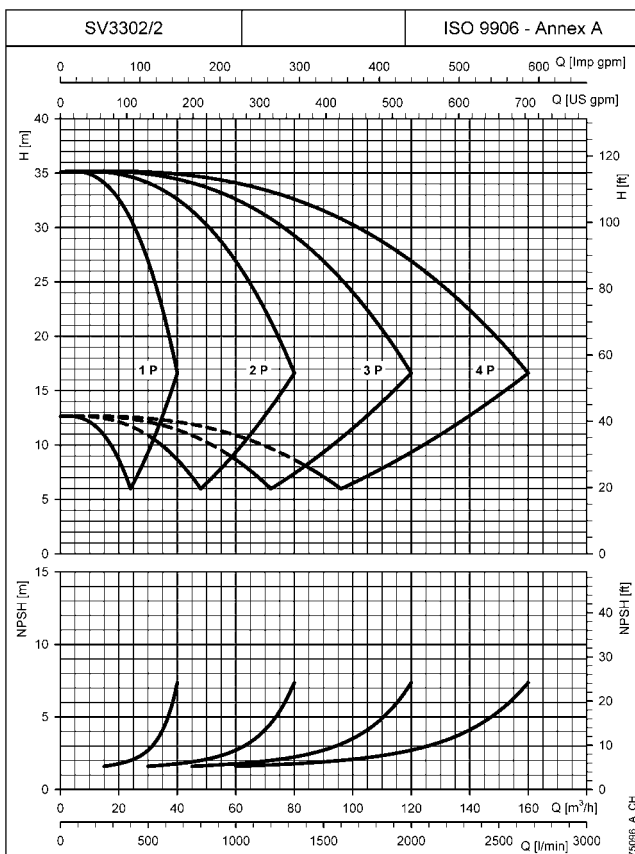
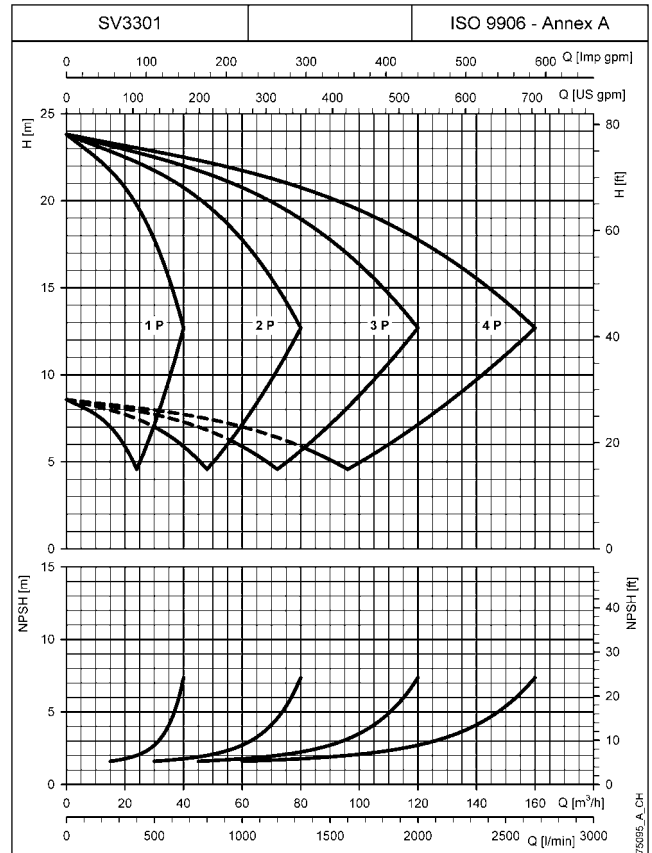
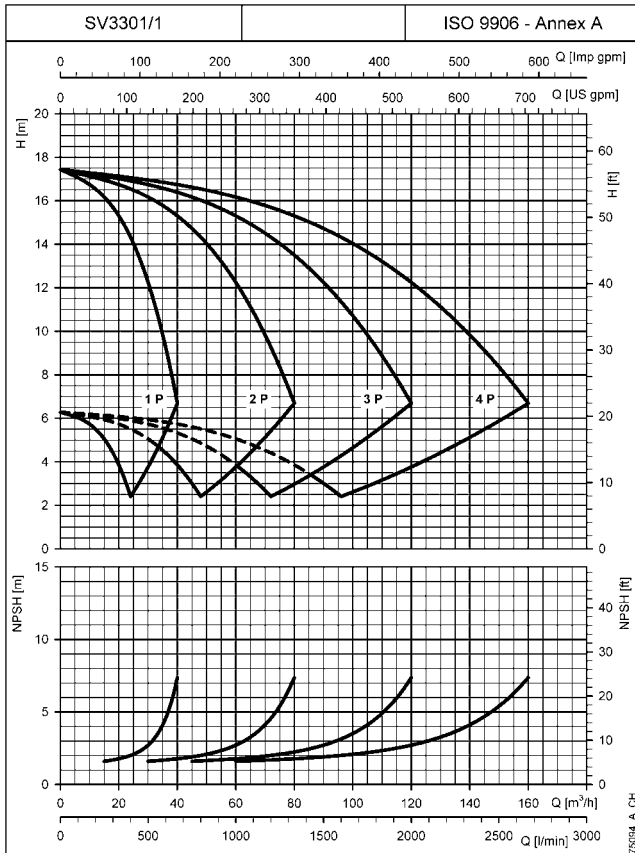
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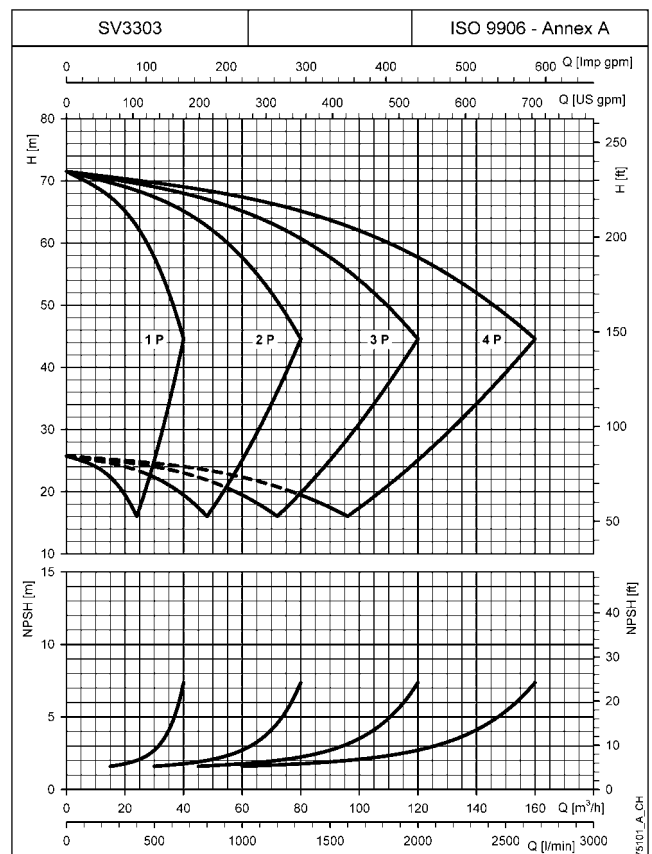
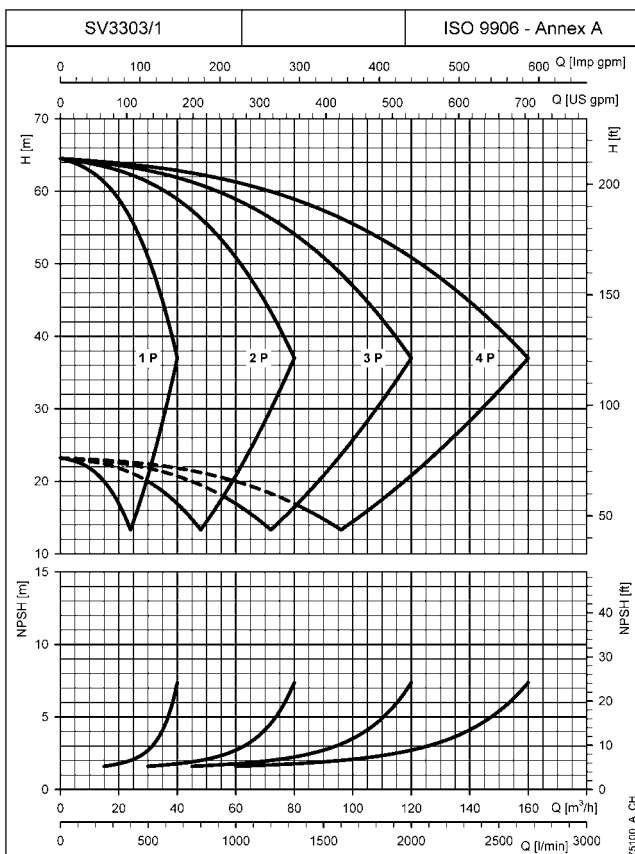
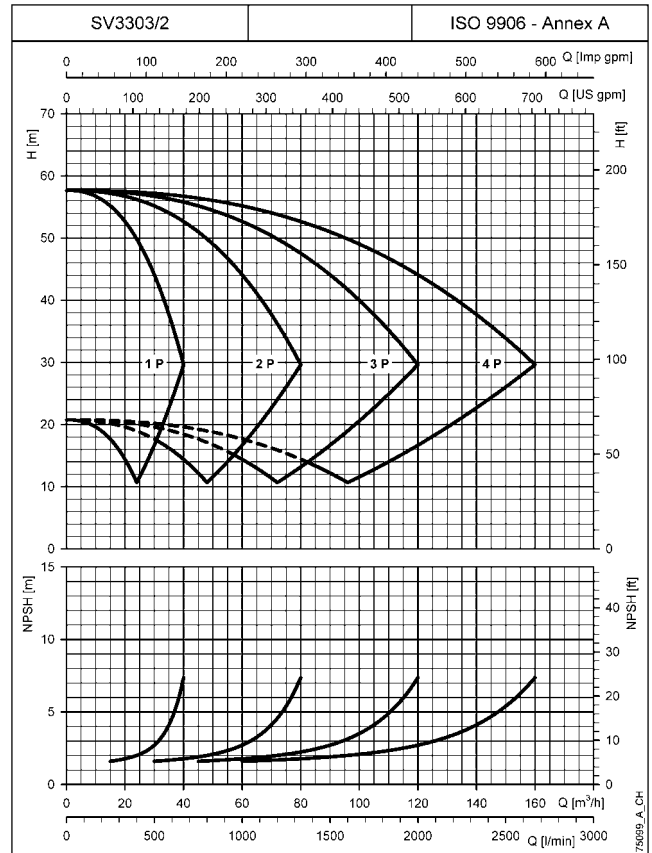
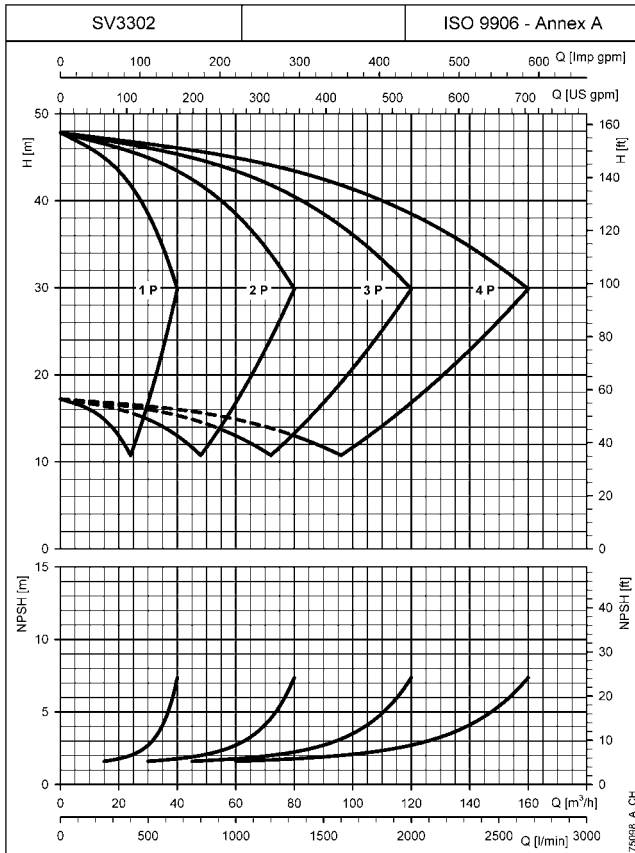
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BOOSTER SETS - GHV10..40 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



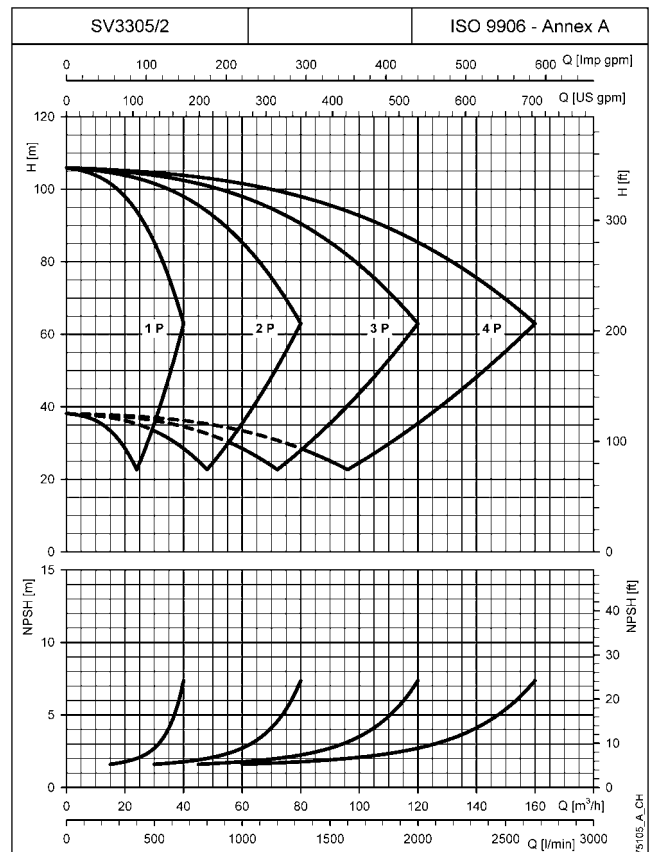
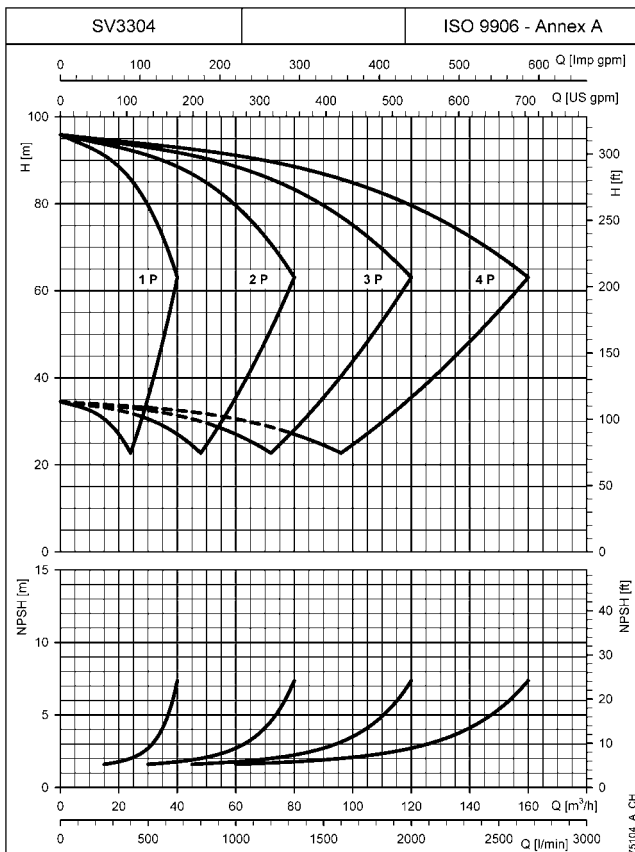
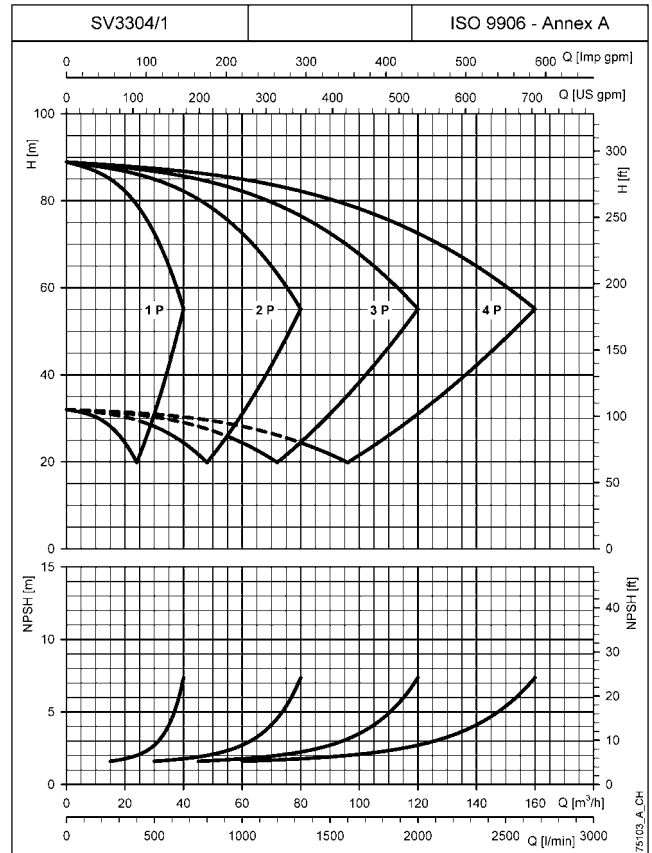
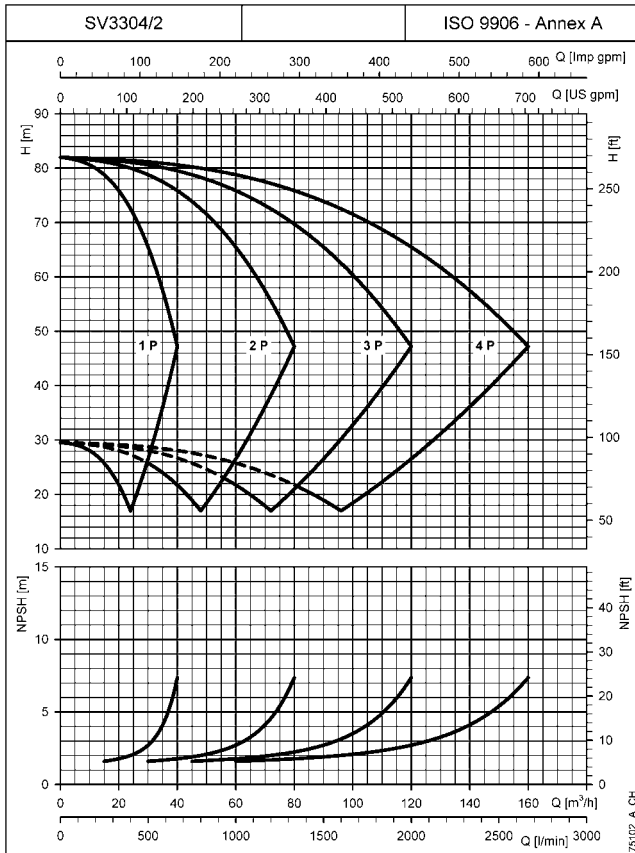
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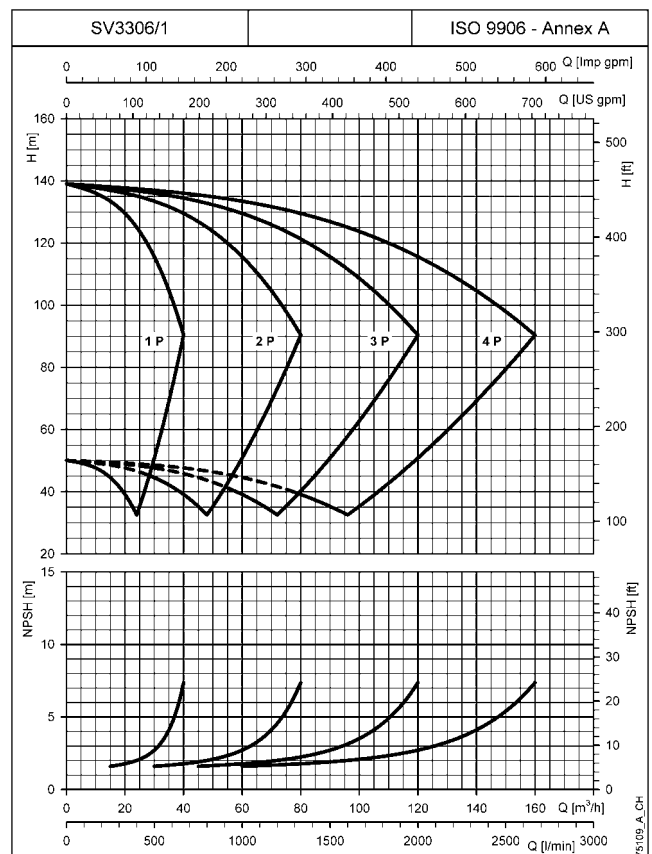
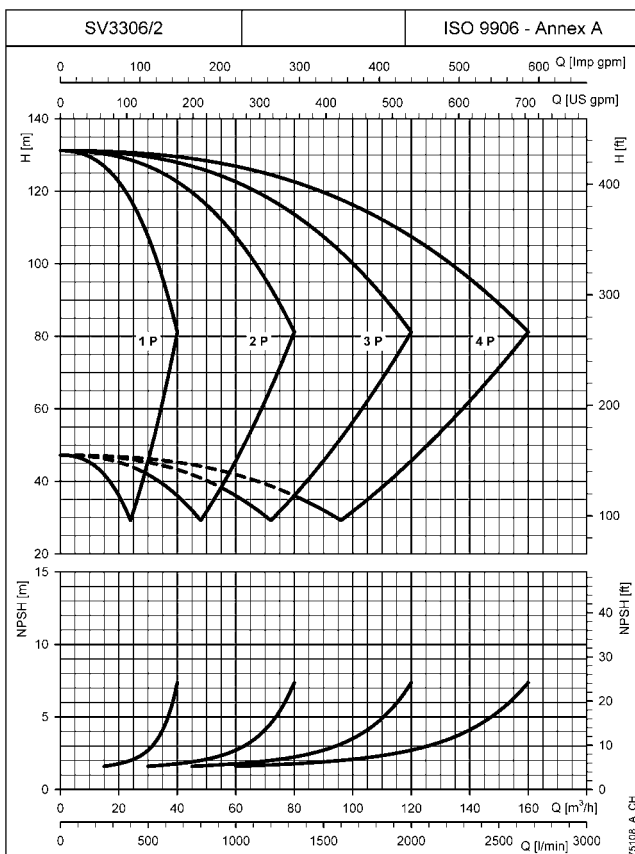
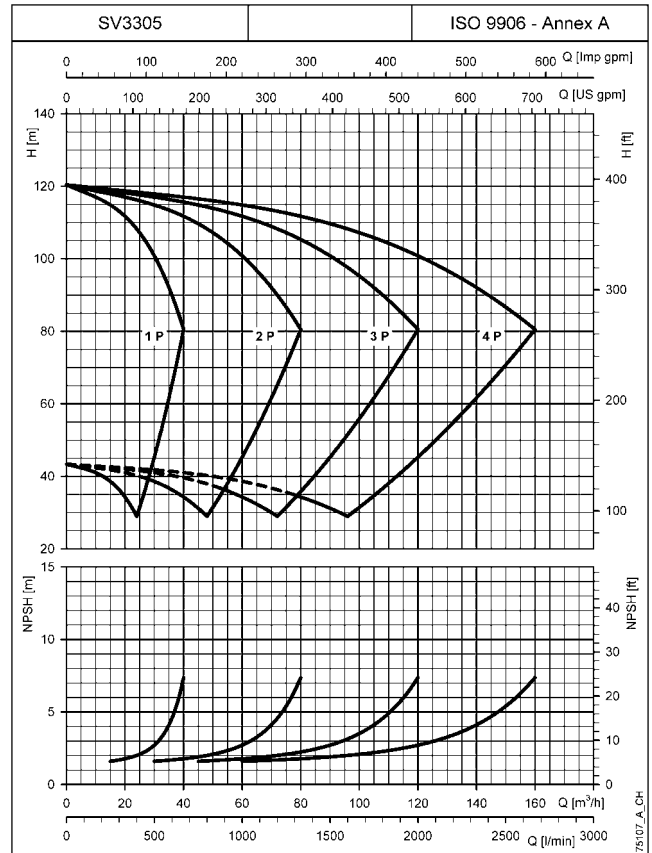
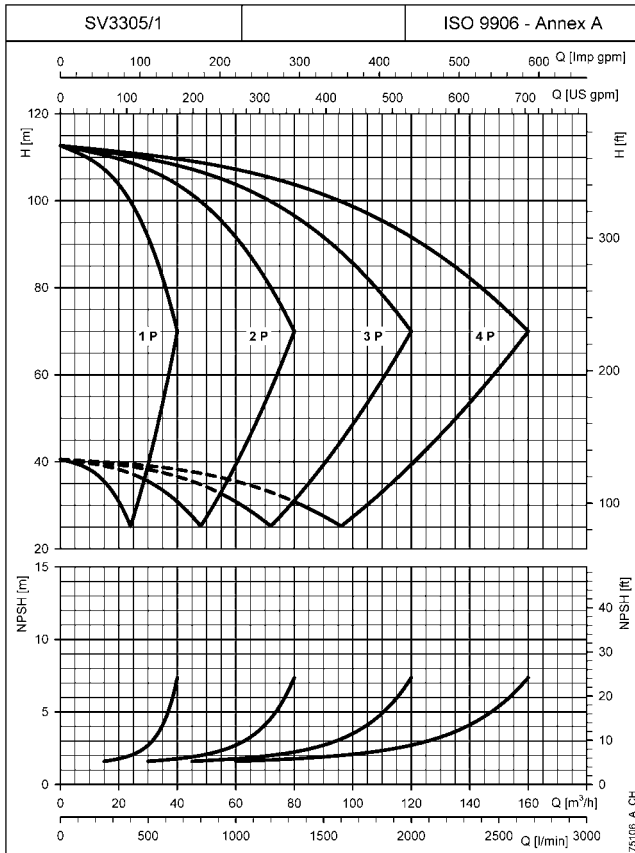
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BOOSTER SETS - GHV10..40 SERIES OPERATING CHARACTERISTICS AT 30..50 Hz



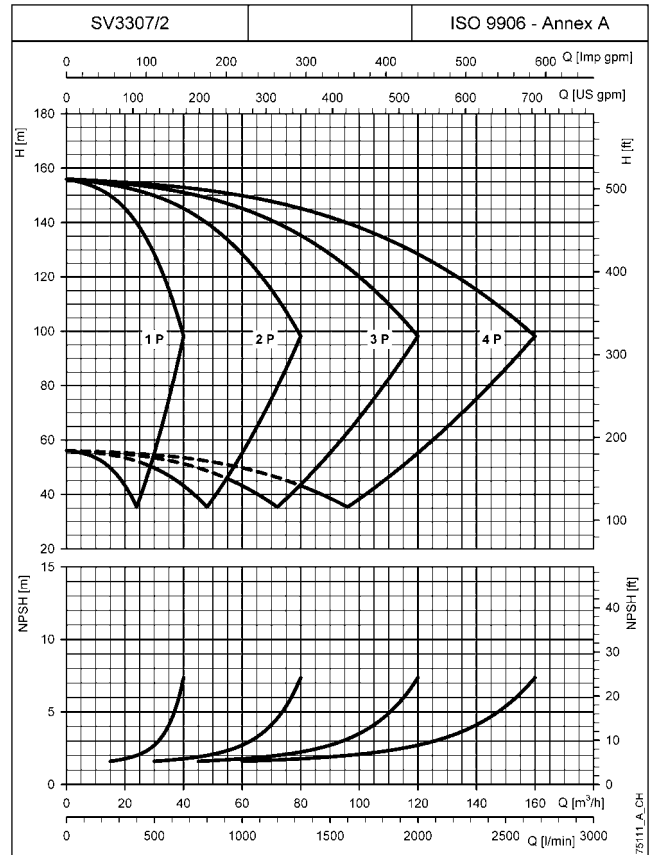
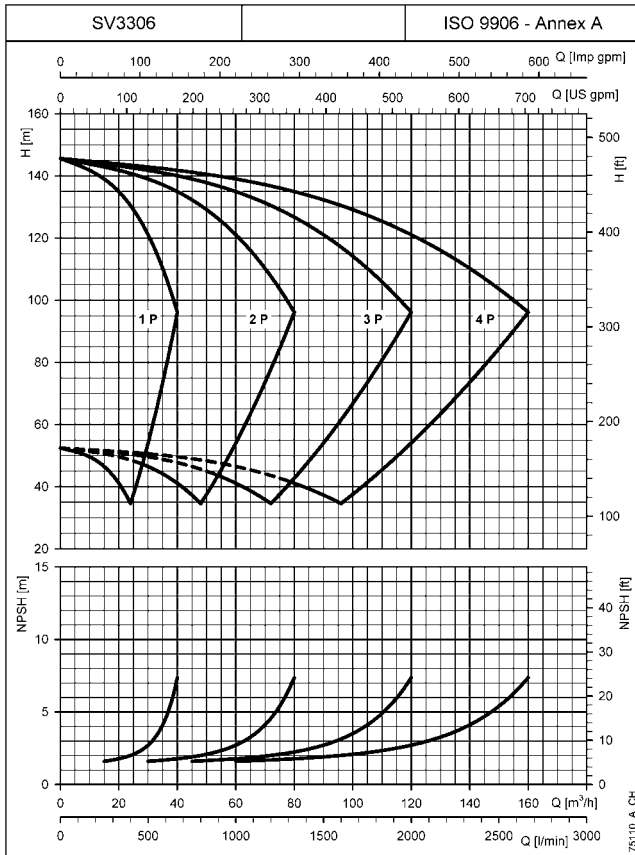
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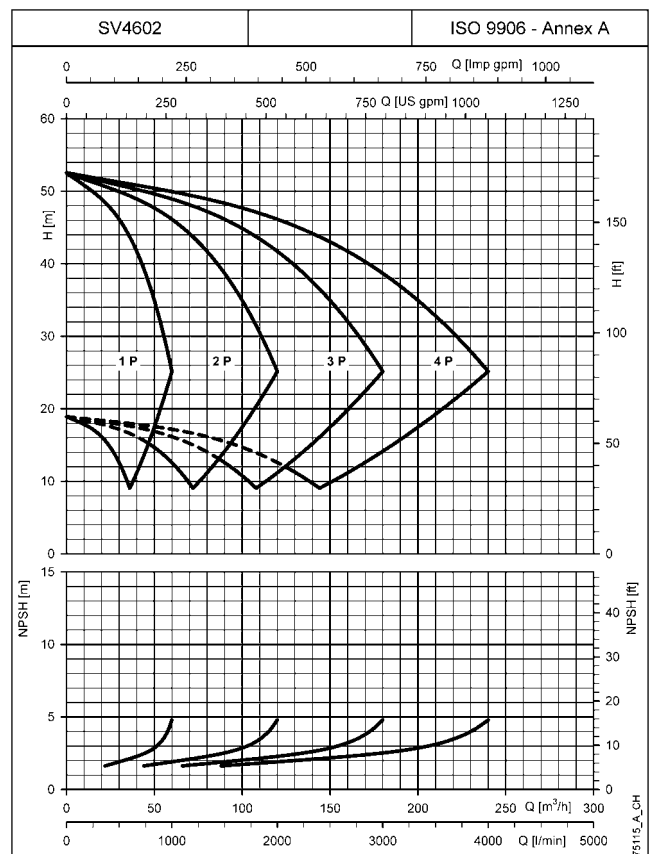
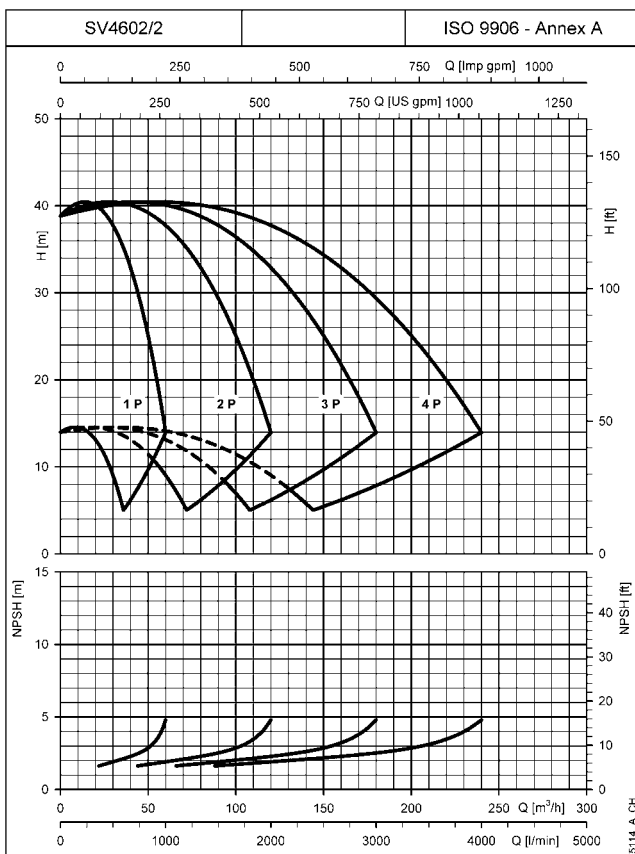
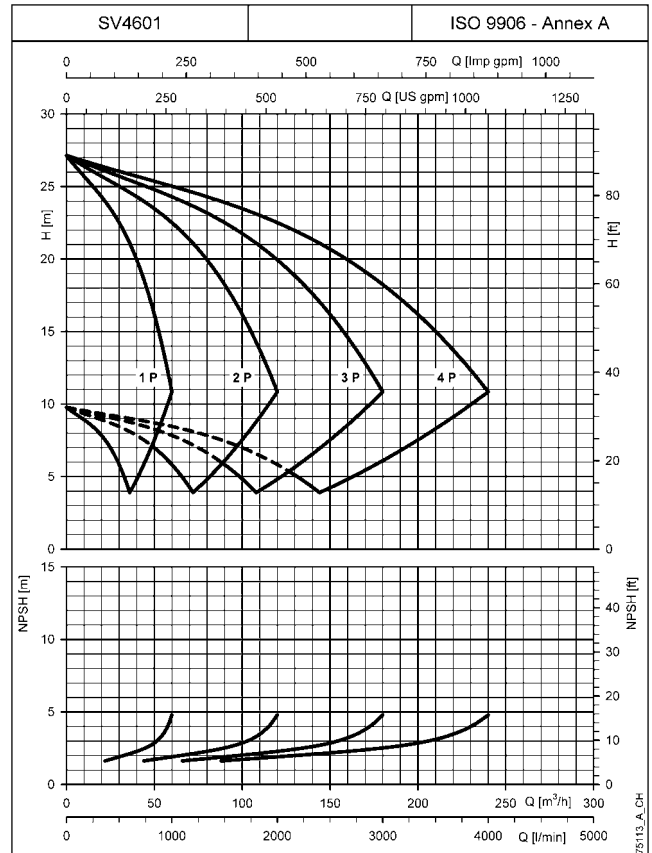
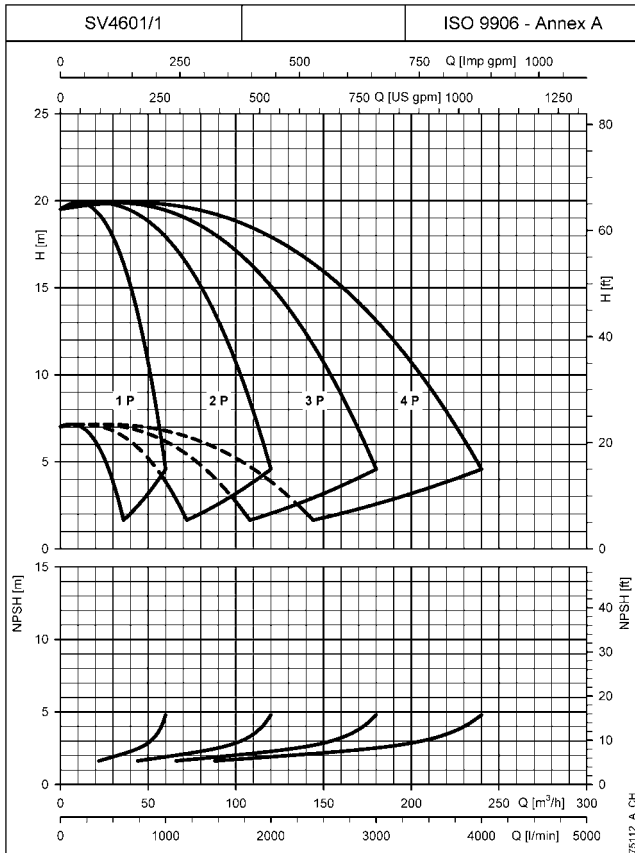
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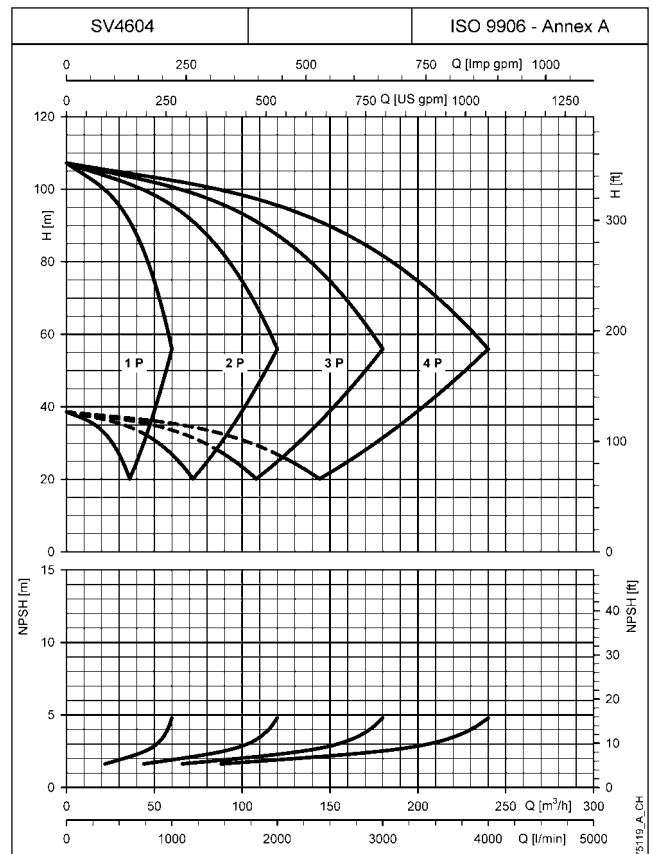
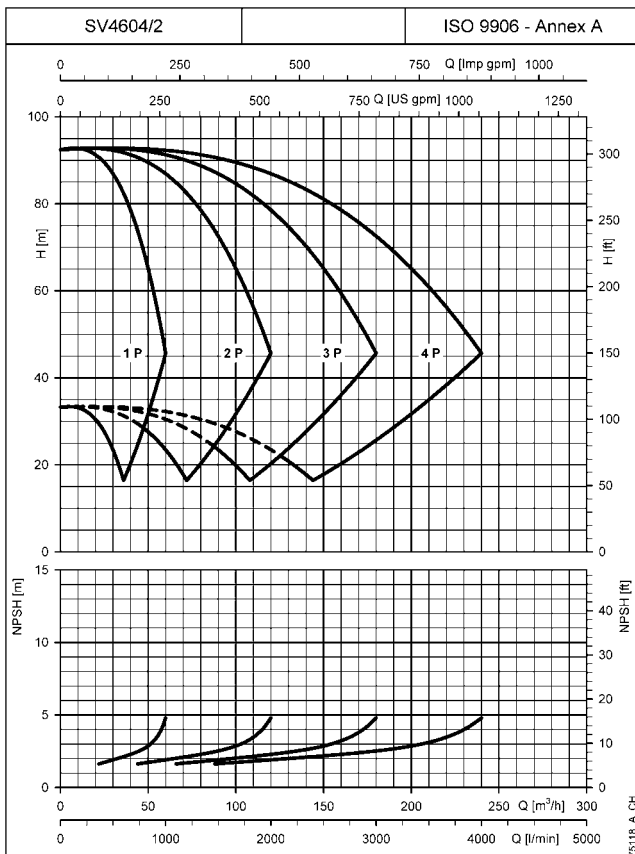
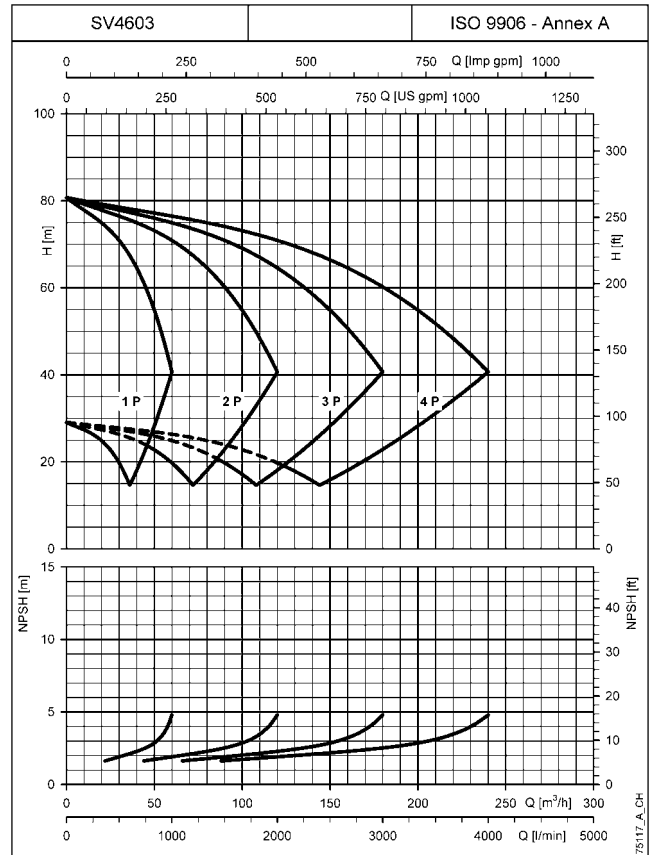
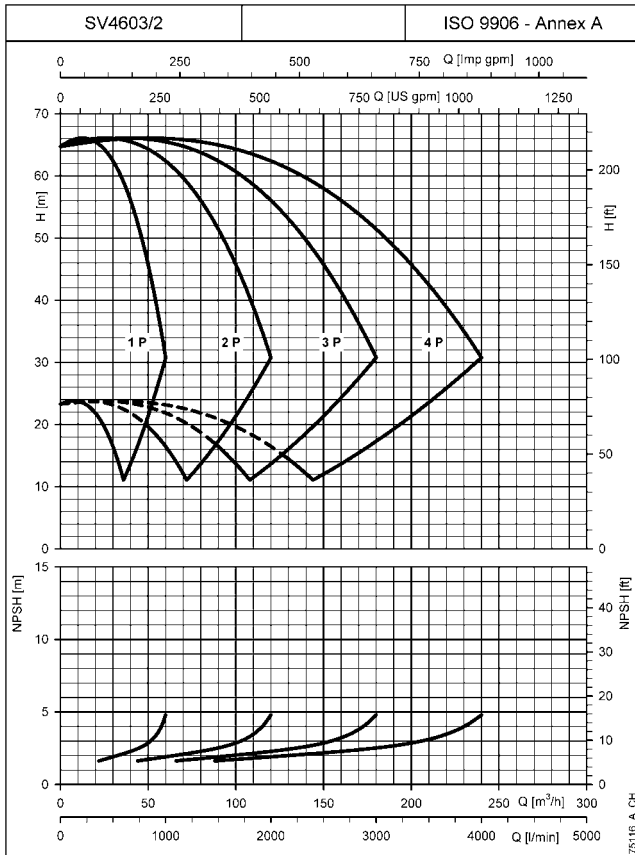
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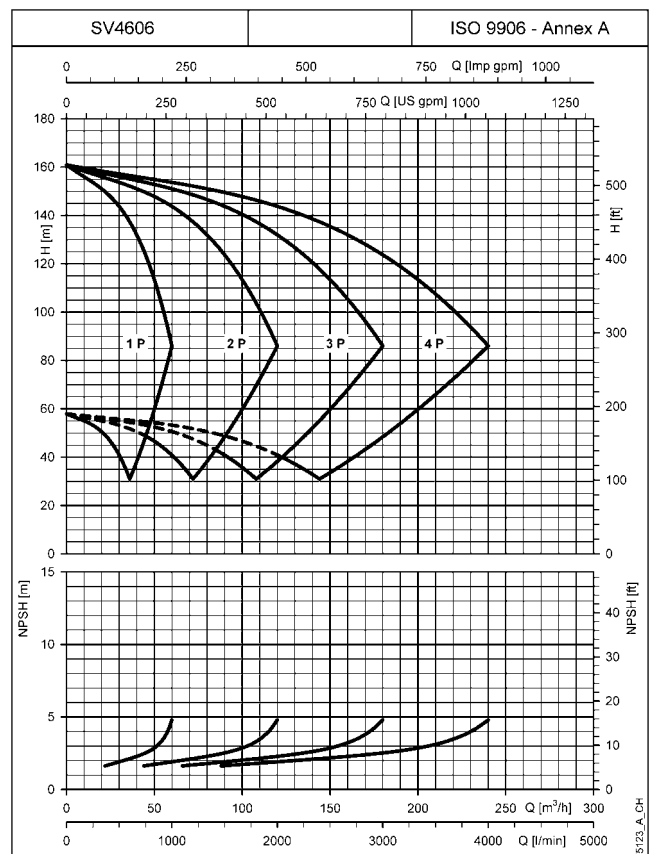
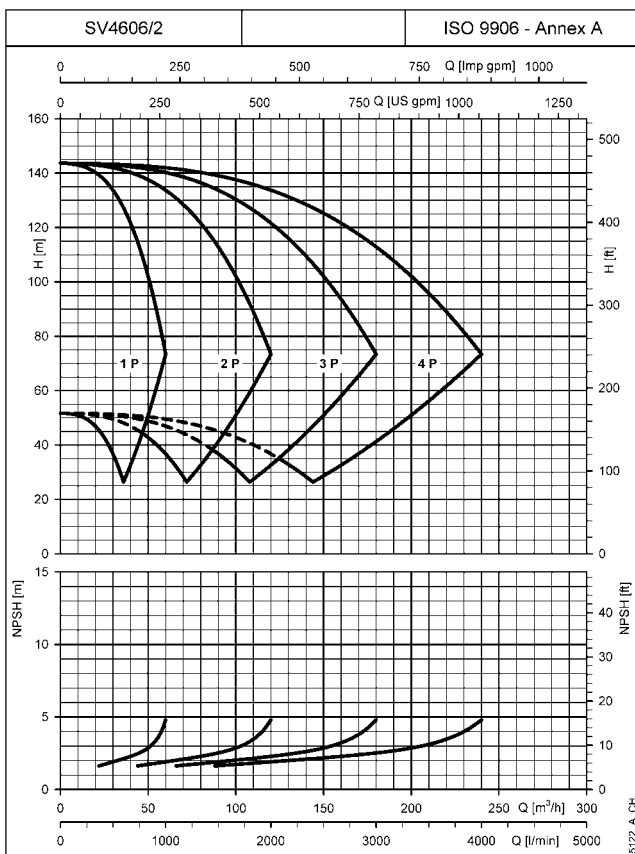
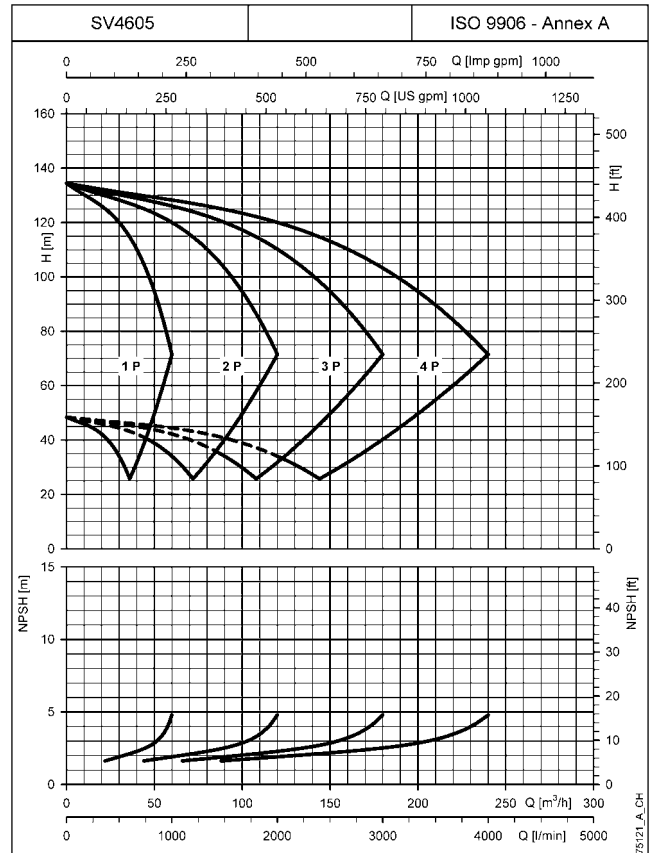
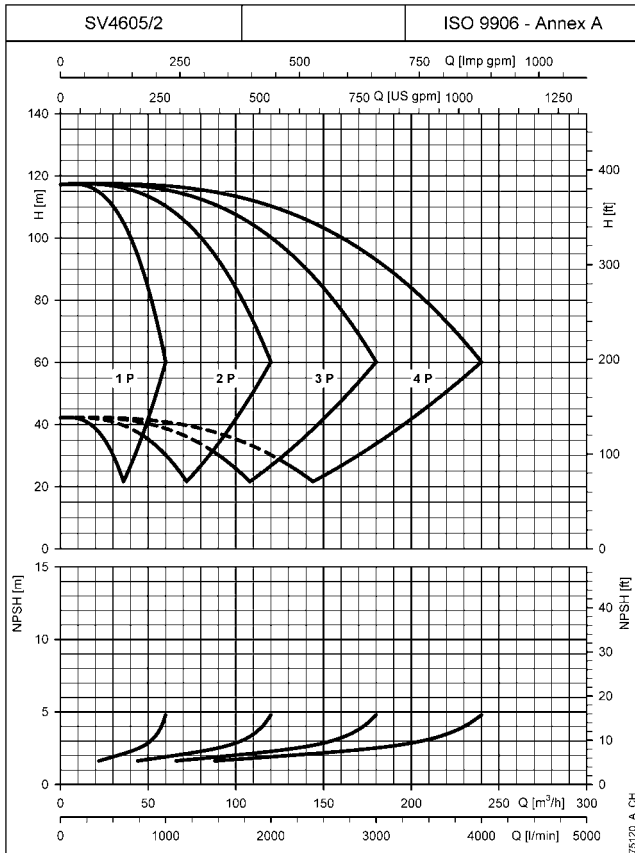
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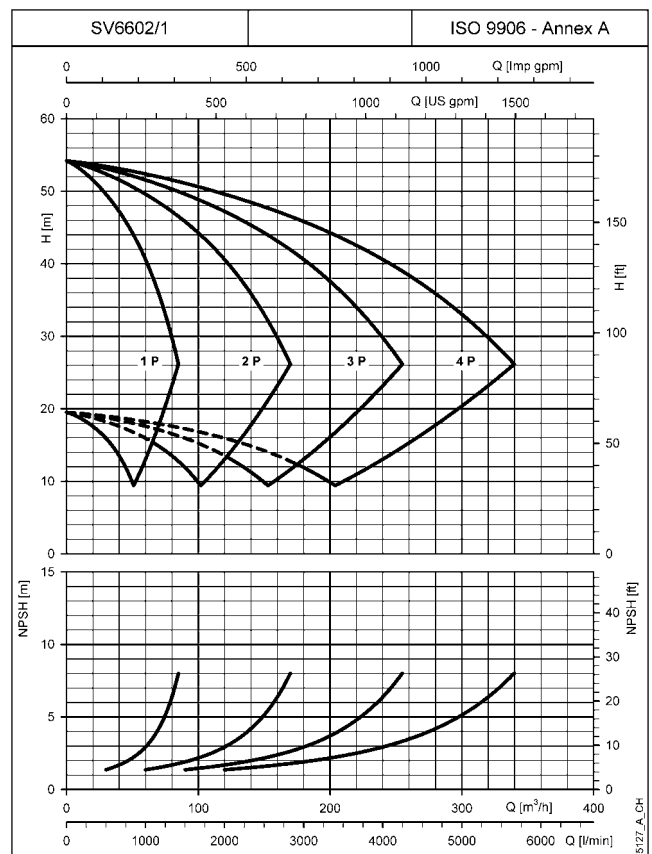
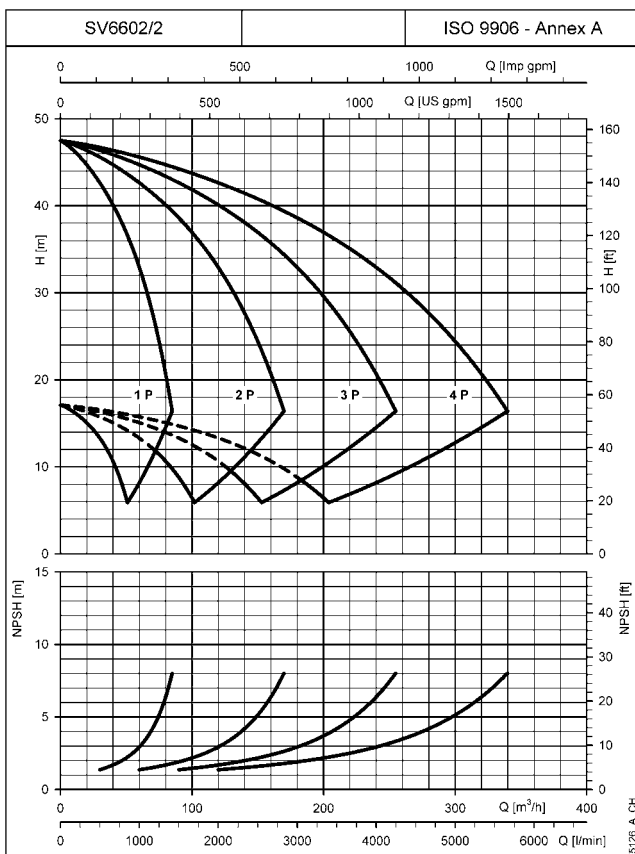
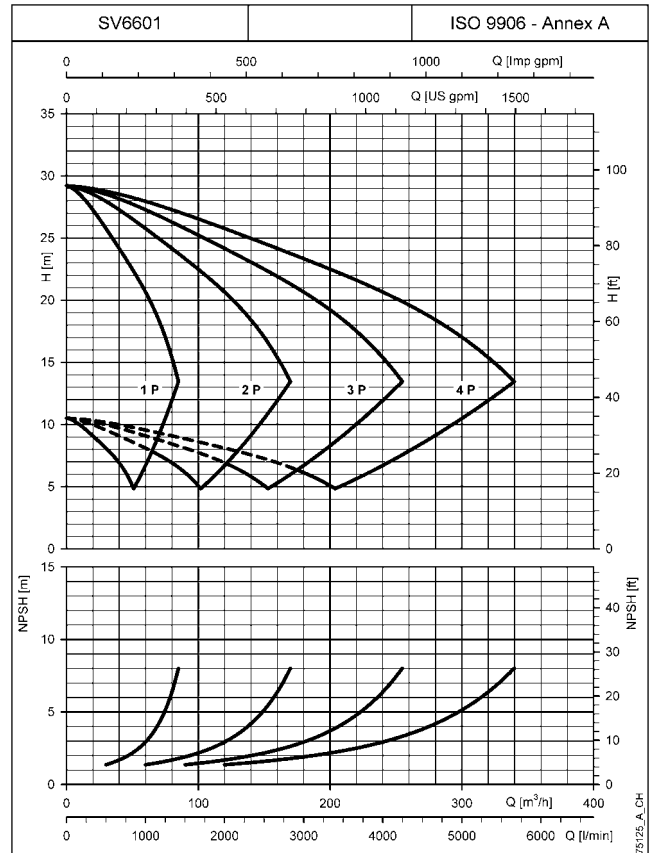
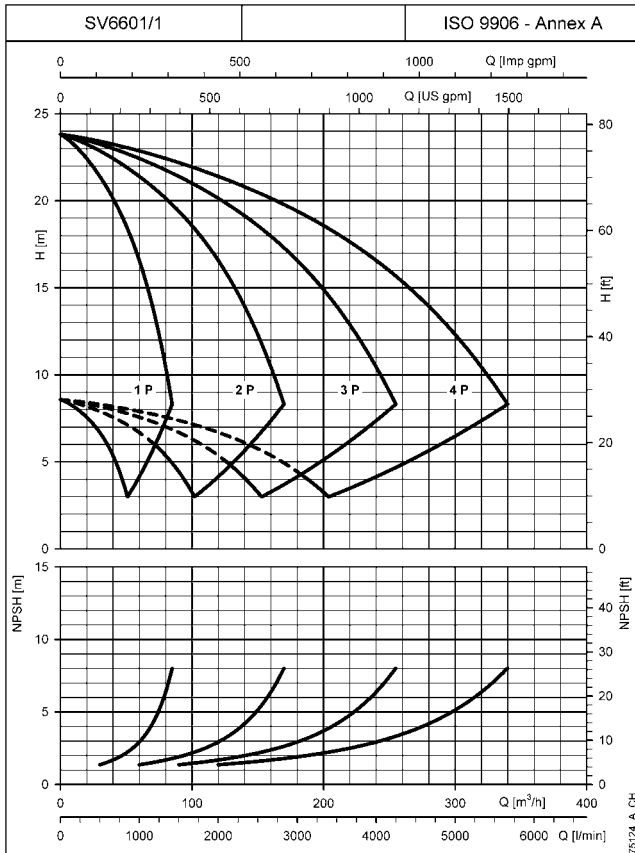
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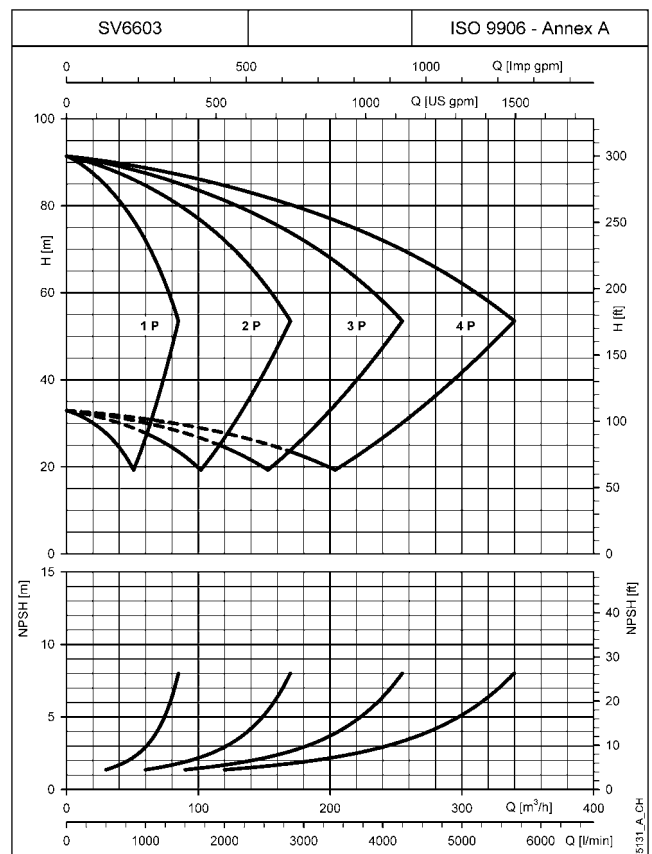
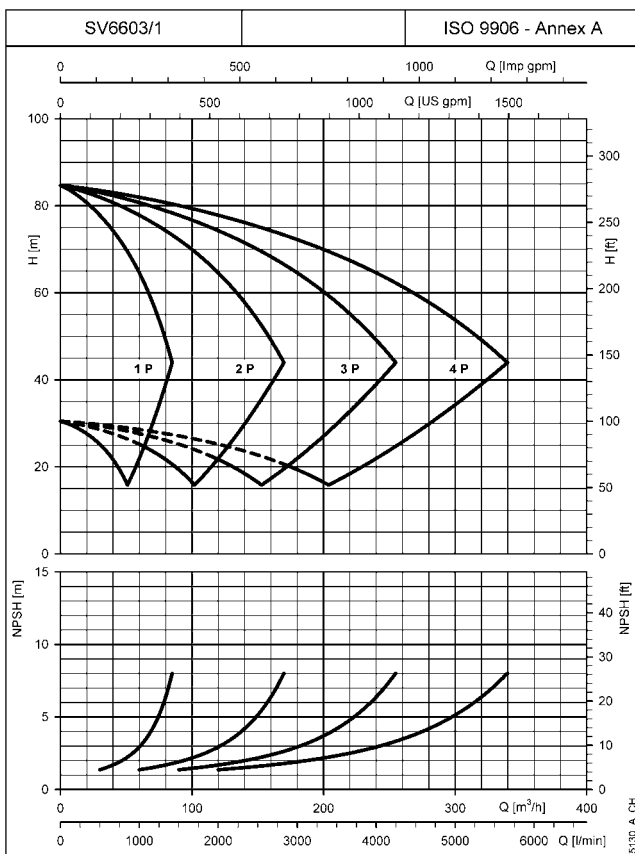
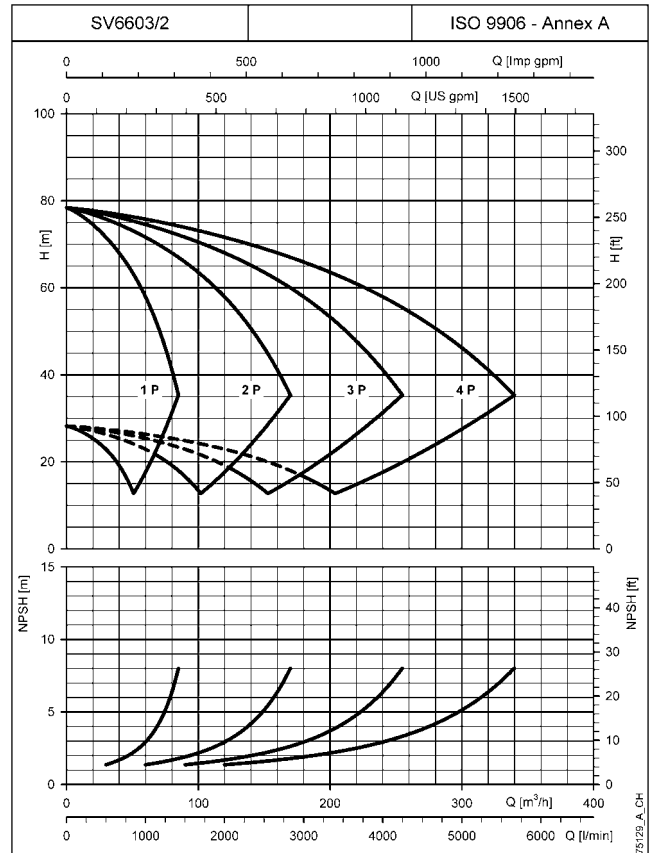
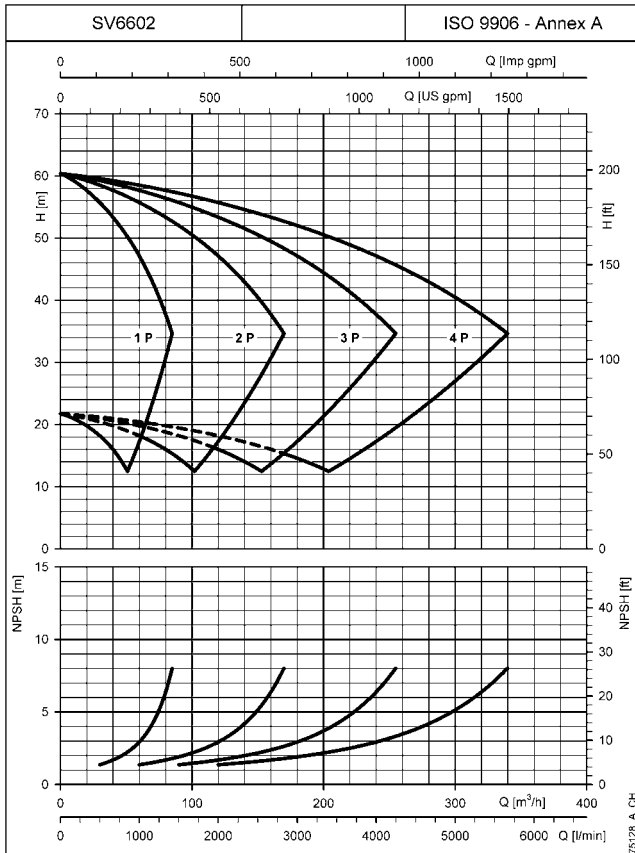
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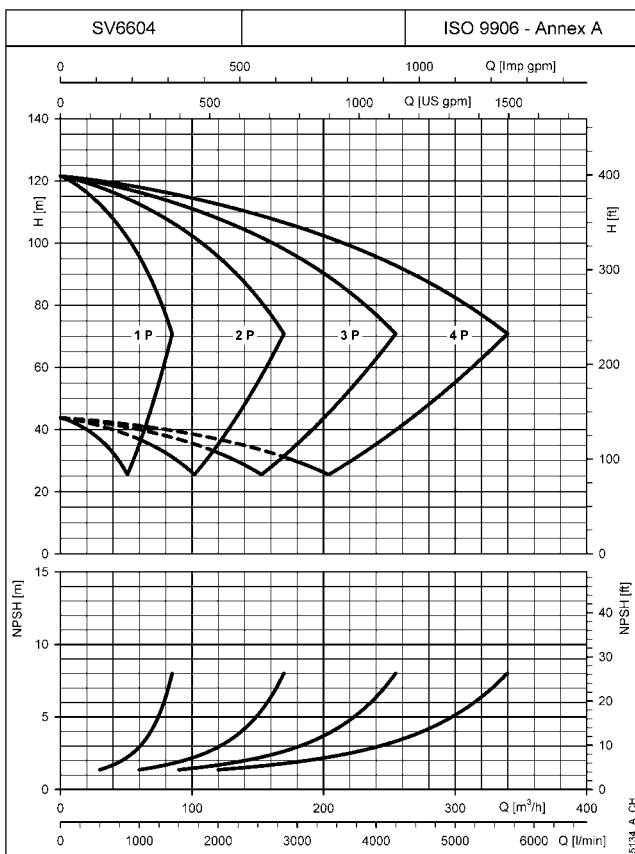
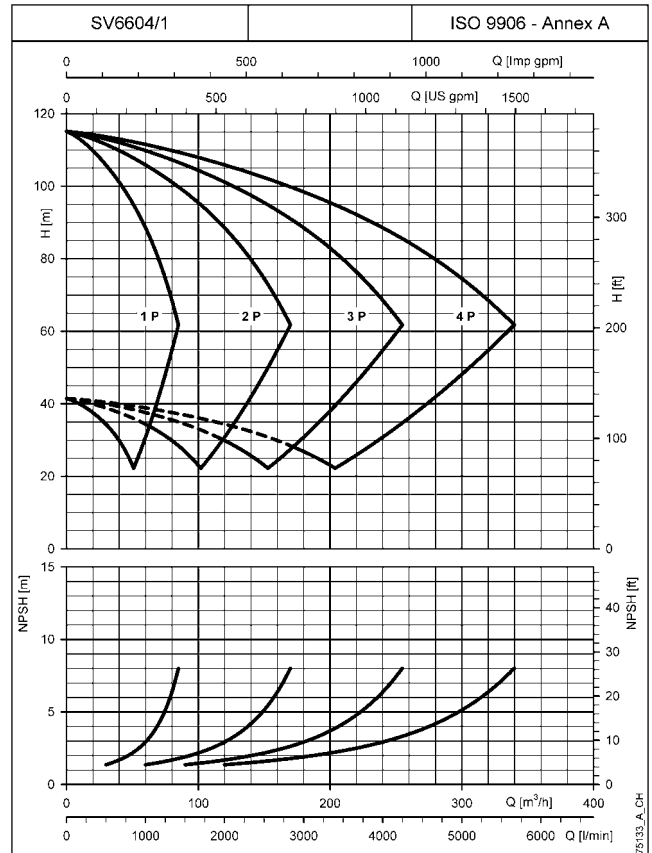
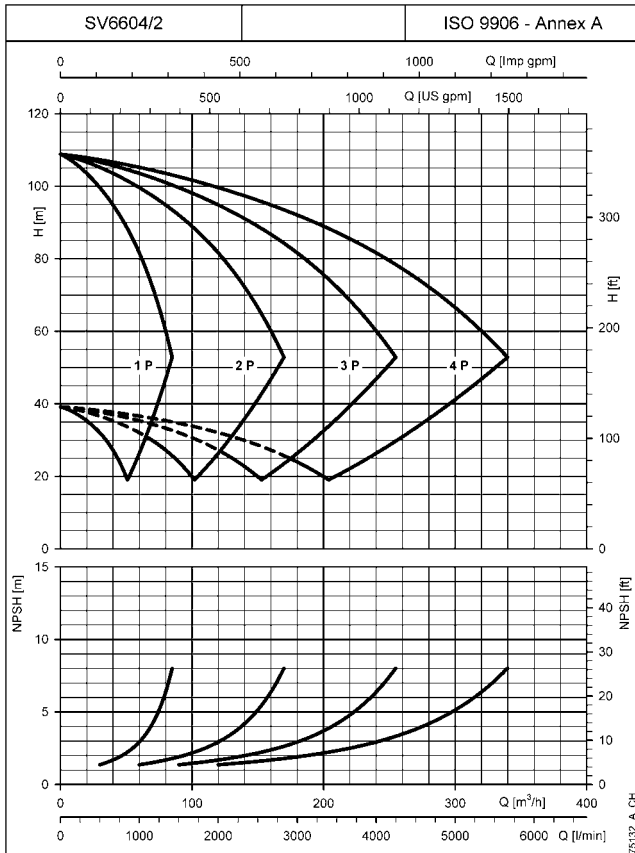
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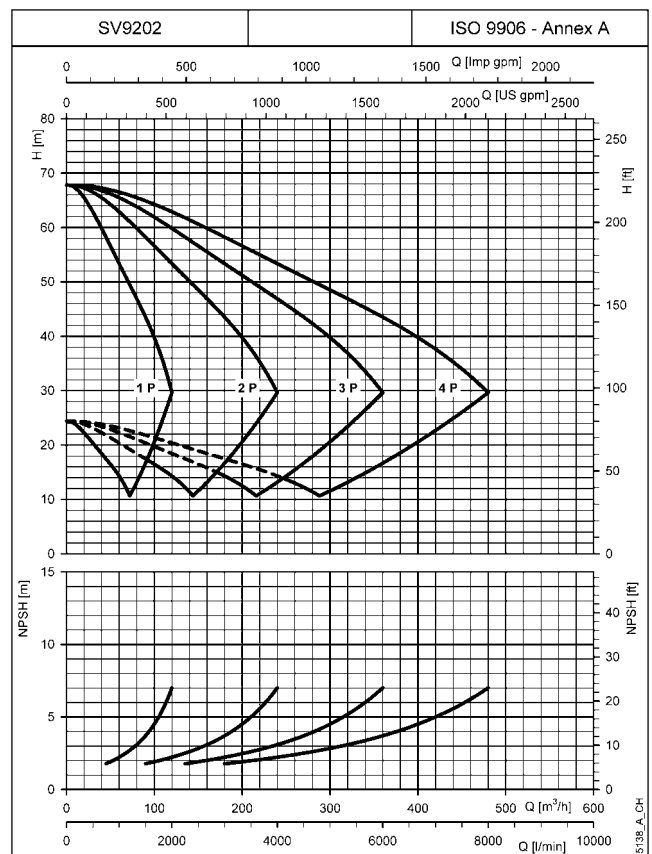
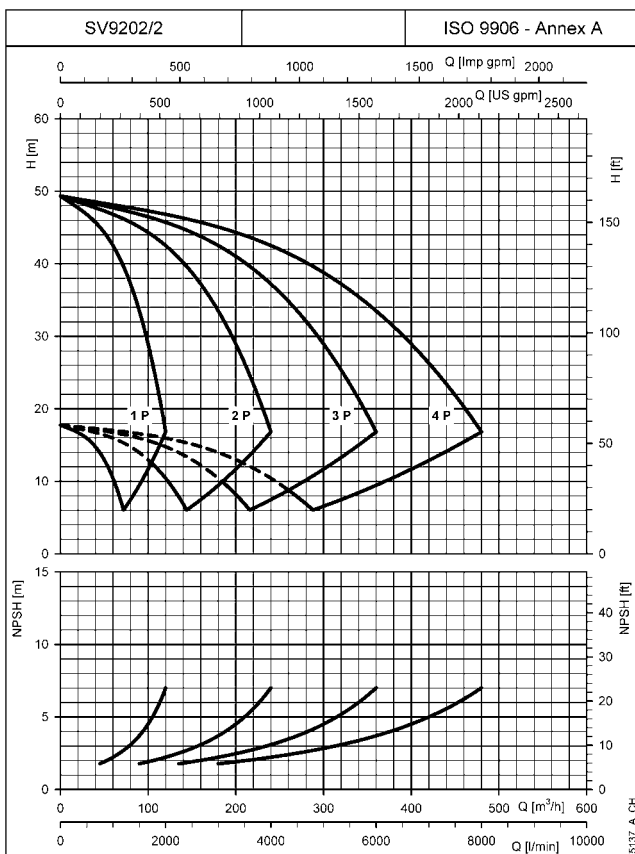
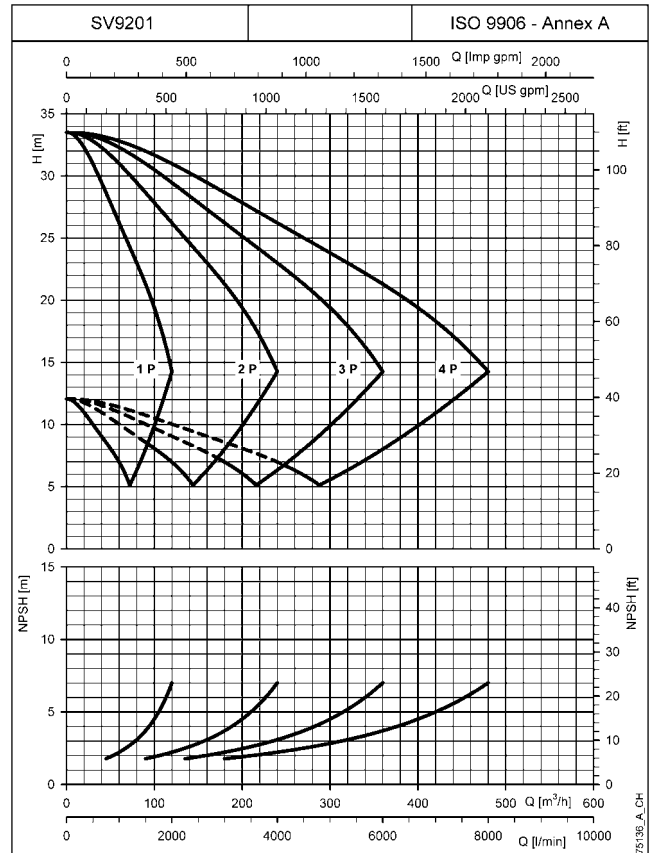
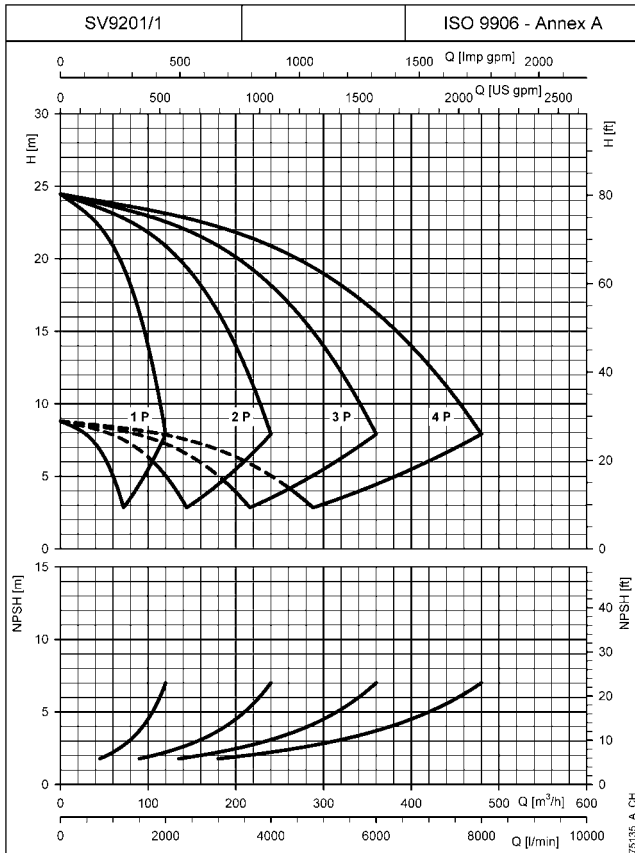
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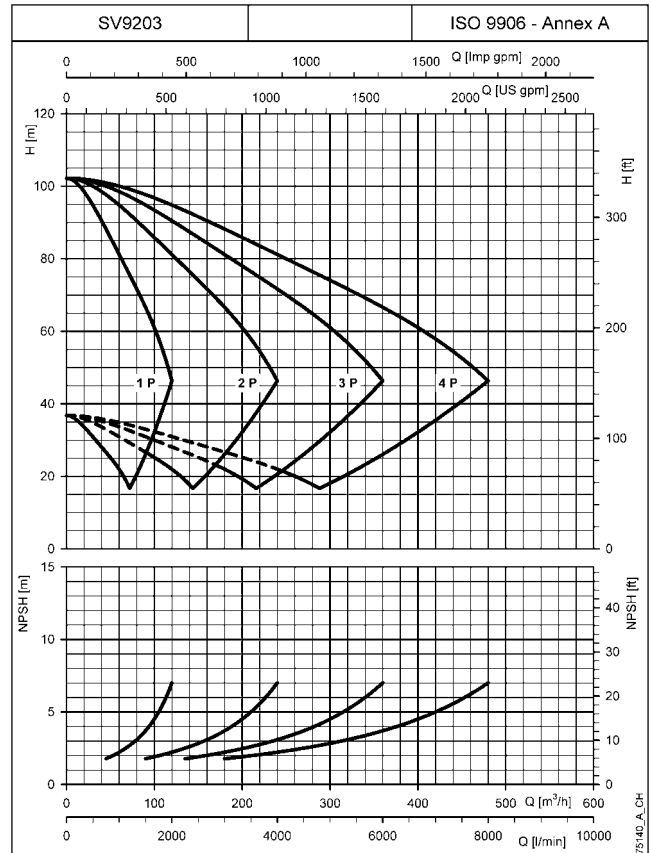
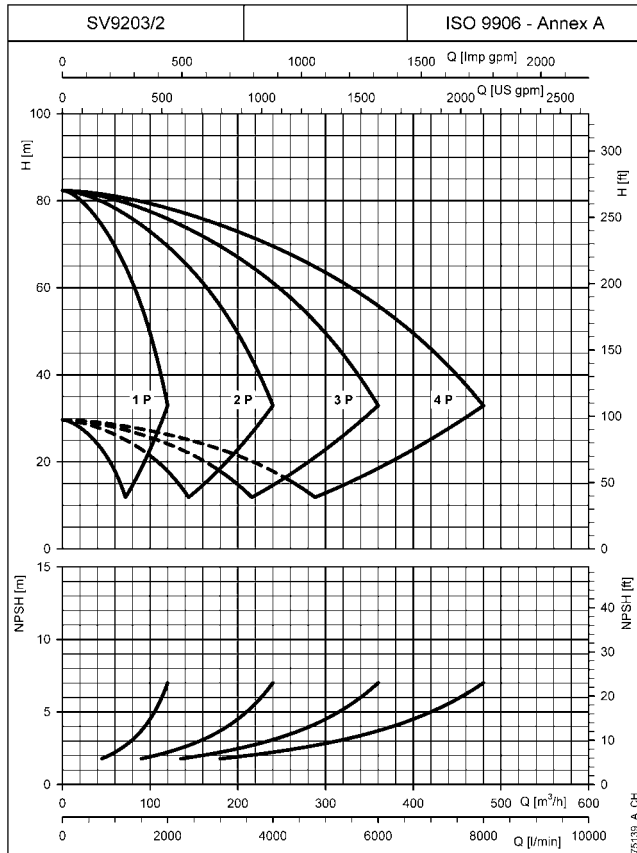
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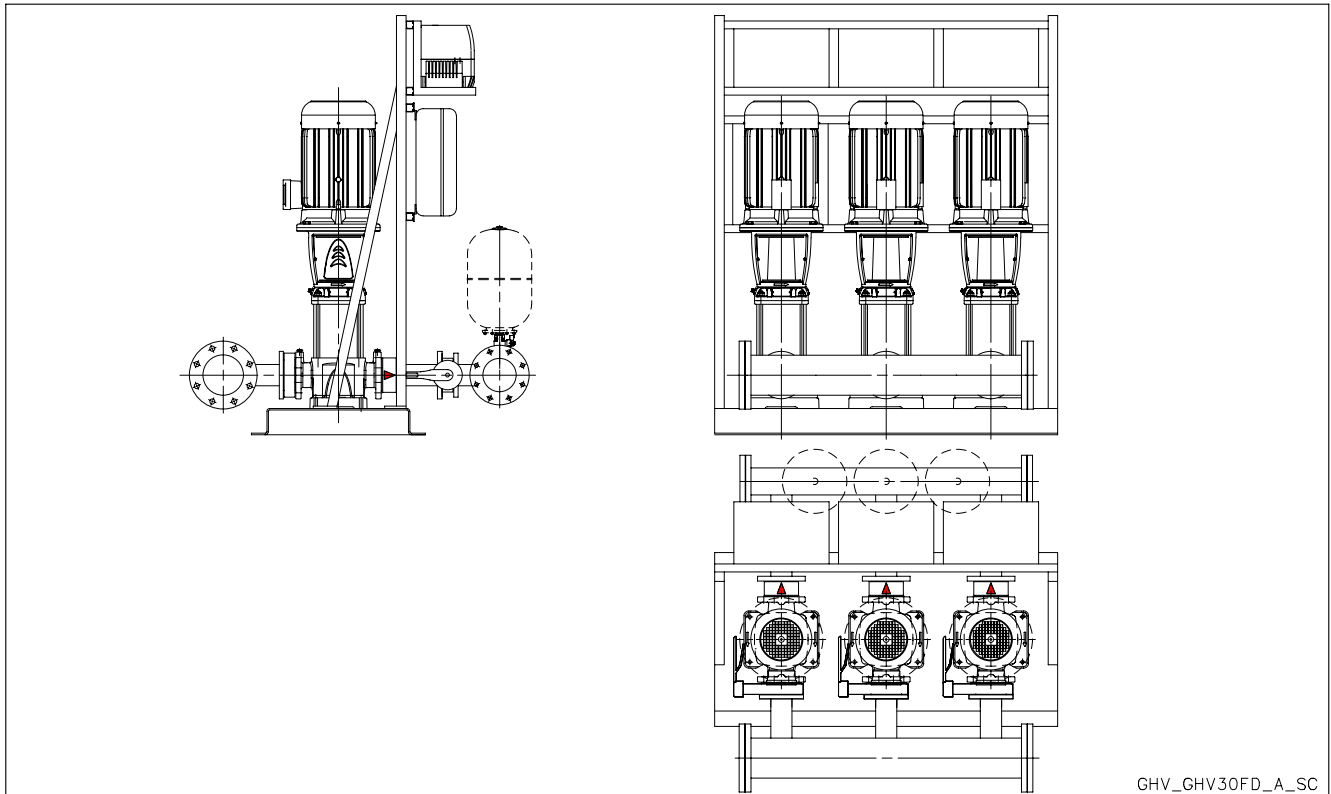
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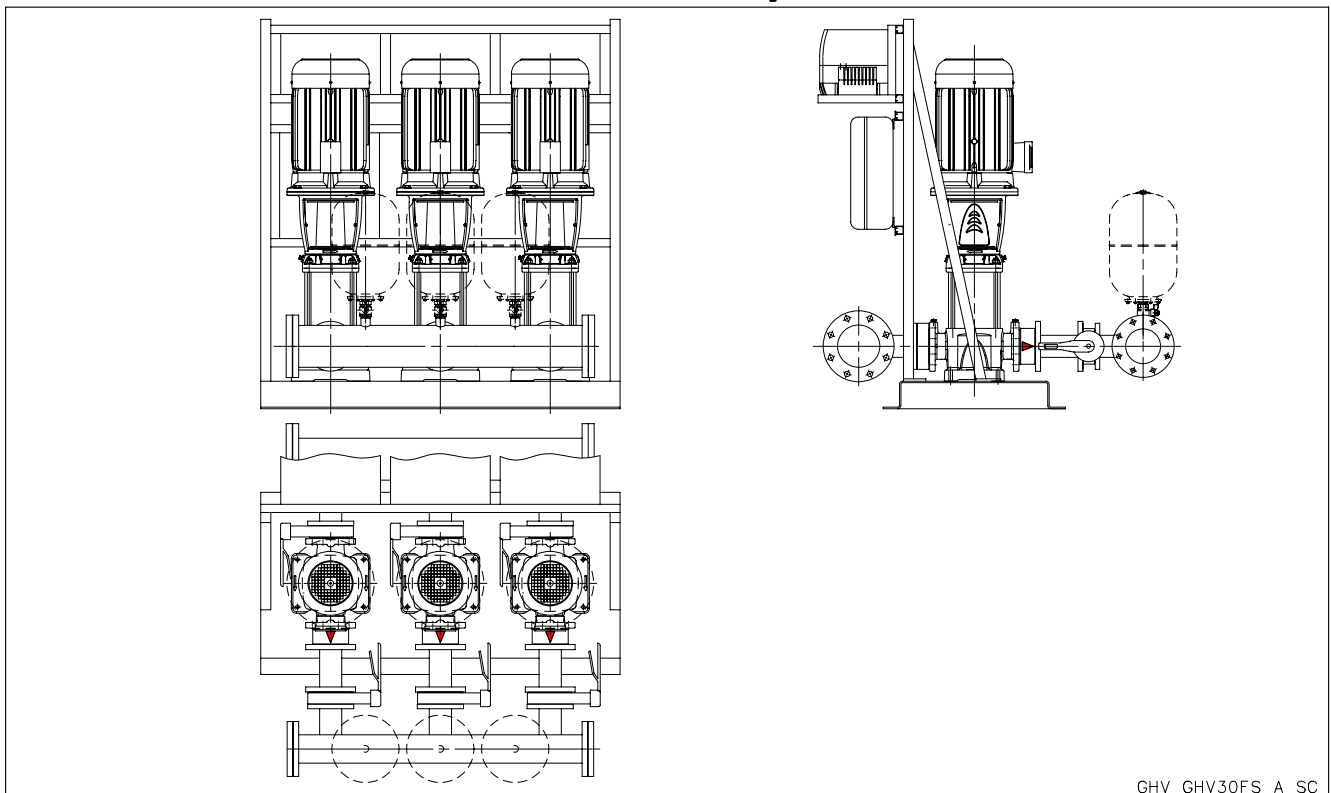
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EXAMPLE OF SPECIAL SETS GHV30 FRAME MOUNTED HYDROVAR, DISCHARGE SIDE



EXAMPLE OF SPECIAL SETS GHV30 FRAME MOUNTED HYDROVAR, SUCTION SIDE

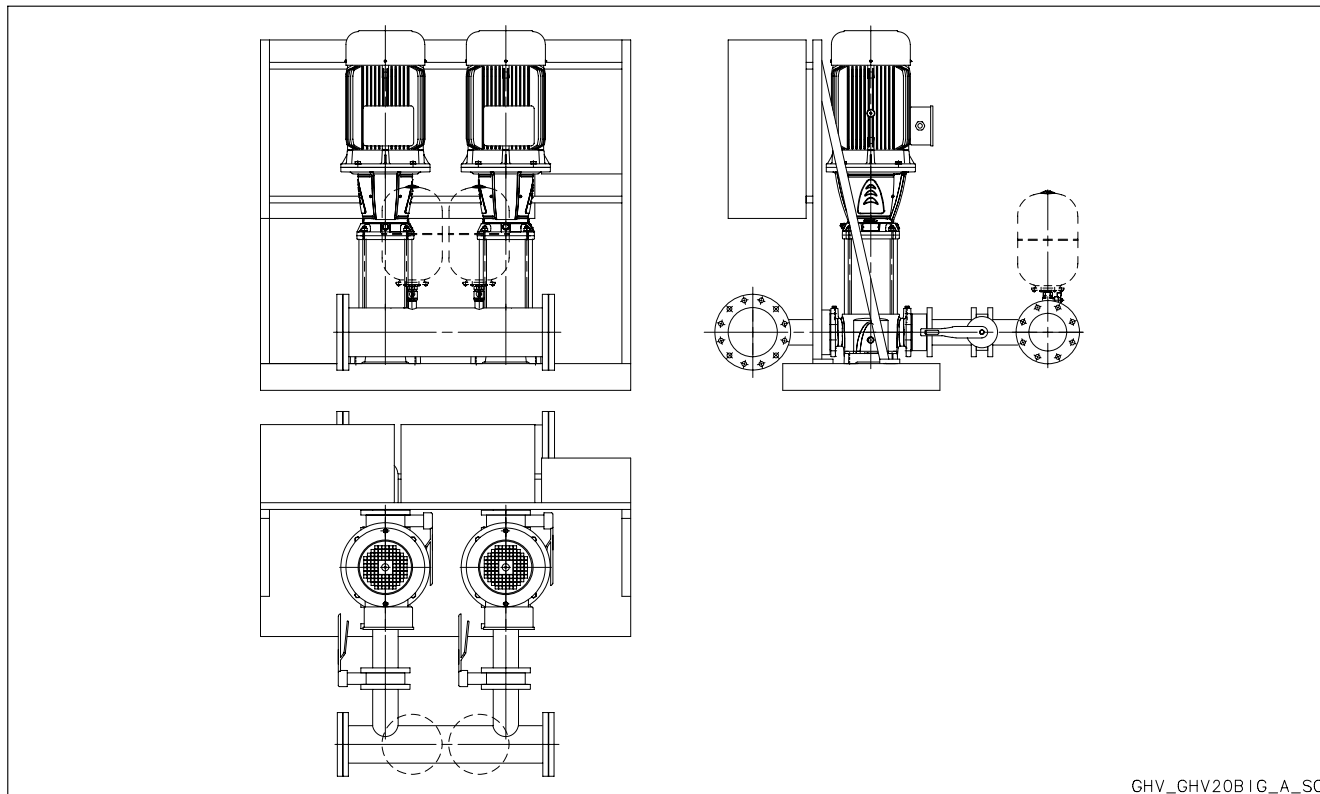




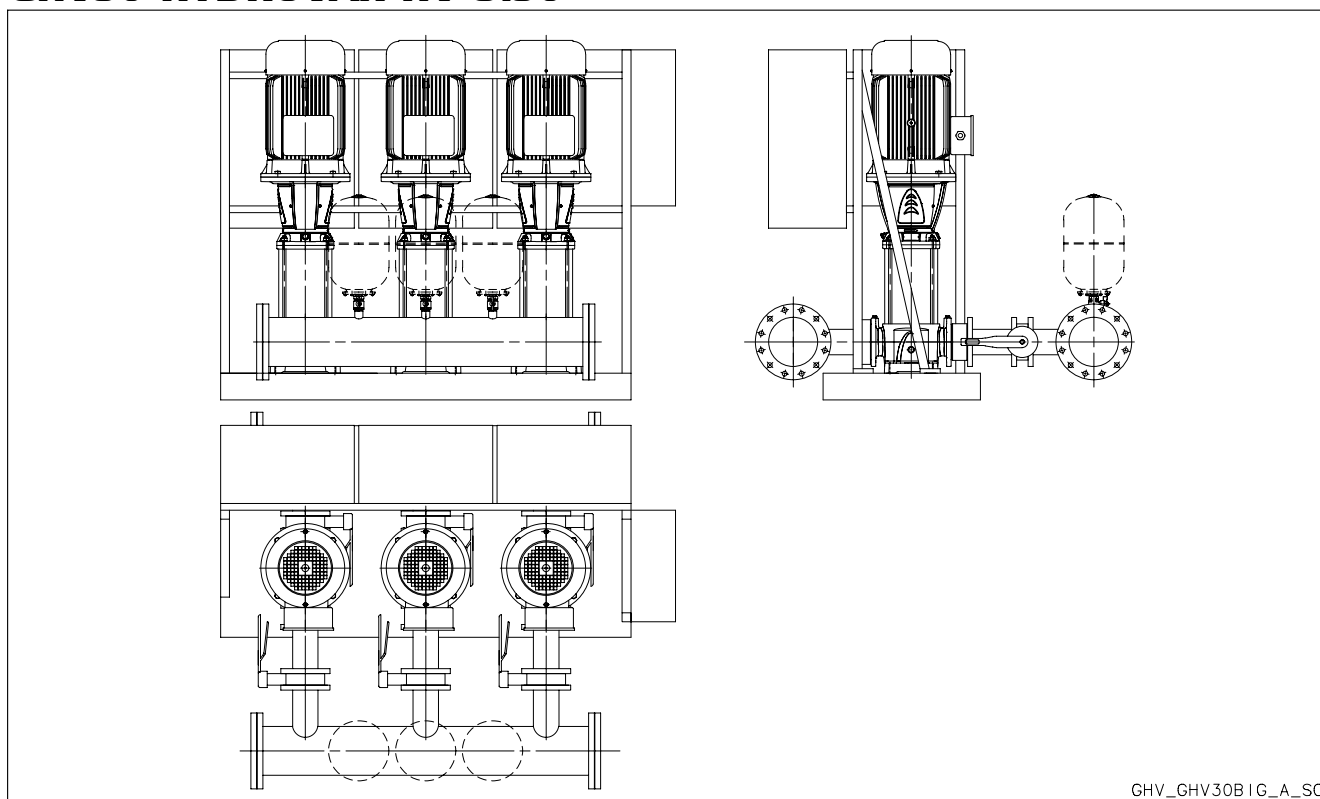
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EXAMPLE OF SPECIAL SETS GHV20 HYDROVAR HV 3.30



EXAMPLE OF SPECIAL SETS GHV30 HYDROVAR HV 3.30



ACCESSORIES

DIAPHRAGM TANKS

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

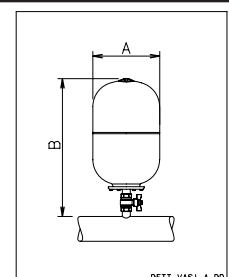
Kit featuring the following accessories are **available on request**:

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

DIAPHRAGM TANK KIT

Volume Litres	PN bar	DIMENSIONS (mm)			Materials		
		ø A	B	Valve	Diaphragm	Vessel	Valve
8	8	205	390	1" FF	EPDM	Painted steel	Nickel-plated brass
24	8	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	10	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	16	270	555	1" FF	EPDM	Painted steel	Nickel-plated brass
24	10	270	485	1" FF	Butyl	Stainless steel	AISI 316 Stainless steel

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COUNTERFLANGE KIT

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

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

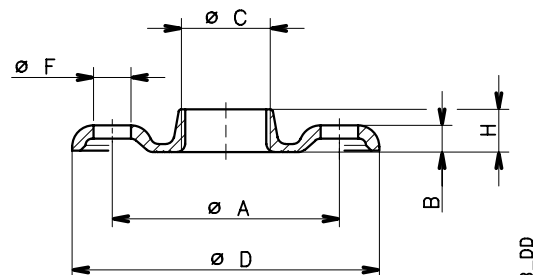
The counterflange kits are equipped with:

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

THREADED COUNTERFLANGES

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

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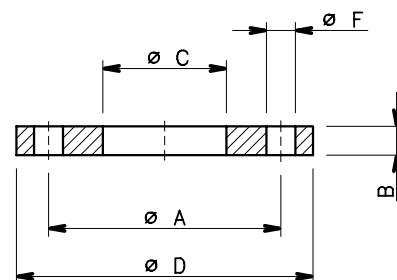


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WELD-ON COUNTERFLANGES

KIT TYPE	DN	ø C	DIMENSIONS (mm)			HOLES		PN
			ø A	B	ø D	ø F	N°	
2"	50	61	125	19	165	18	4	16
2 1/2"	65	77	145	20	185	18	4	16
3"	80	90	160	20	200	18	8	16

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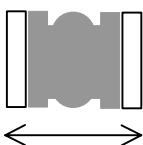
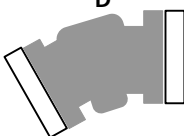


04431_A_DD

KIT RUBBER EXPANTION JOINT

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

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

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

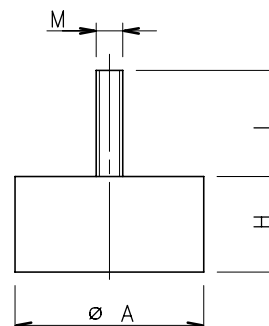
GD_JOINT_A_TD

VIBRATION DAMPERS

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

Note: Available versions M/F and F/F

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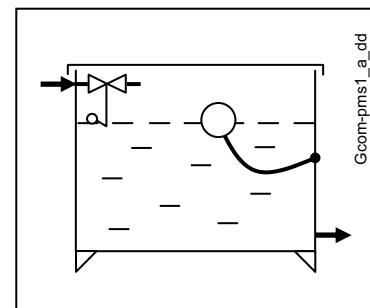
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DRY RUNNING PROTECTION SYSTEMS

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

FLOAT SWITCH PROTECTION METHOD

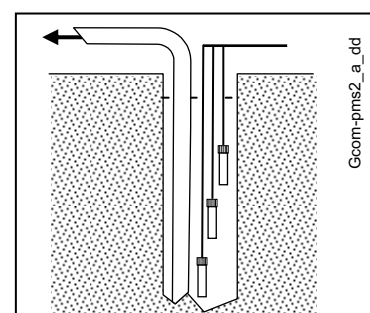
The float switch protection system is used when the water supply comes from open tanks. A float switch immersed in the tank can be connected directly to the frequency converter (GHV10 sets) or to the electrical panel for the GHV20, 30 and 40 sets. If the water supply is insufficient, the float switch opens the electric contact and the pumps stop running.



ELECTRODE PROBE PROTECTION METHOD

The electrode probe protection system is used when the water supply comes from open tanks or wells. A set of three probes is connected directly to the electrical panel with control circuit (for GHV20, 30 and 40 sets). For single-pump sets (GHV10), an additional level control must be installed (probe module) which supplies an electric contact to be connected to the frequency converter.

If the water supply is insufficient, the control circuit opens the electric contact and the pumps stop running.

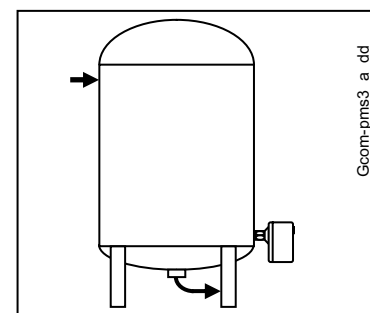


MINIMUM PRESSURE SWITCH PROTECTION METHOD

The minimum pressure switch protection system is used when the water supply comes from water networks or pressurized tanks. The pressure switch is connected to the electrical panel equipped with control circuit (for GHV20, 30 and 40 sets).

For single-pump sets (GHV10) the pressure switch is connected directly to the frequency converter.

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

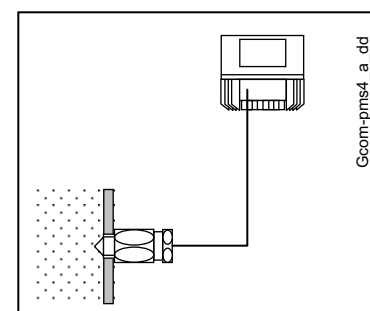


OPTOELECTRONIC SENSOR PROTECTION METHOD (ONLY GHV)

The optoelectronic sensor protection system is used to protect the pump by installing a sensor directly on the body of each pump. The device is mounted onto the fill plug using an adapter, if needed.

The sensor is electrically connected to the frequency converter which powers it.

The sensor cuts in if the water supply is insufficient or if there is air in the area of the pump body where it is positioned. For installations where lack of water is a normal condition when the pump is off, the control system must be equipped with a "pump running" electric contact.





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TECHNICAL APPENDIX

WATER REQUIREMENTS IN CIVIL USERS

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

Water requirements in condominiums

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

MAXIMUM CONSUMPTION FOR EACH DELIVERY POINT

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

G-at-cm_a_th

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

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

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



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TABLE OF WATER REQUIREMENTS IN CIVIL USERS

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

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

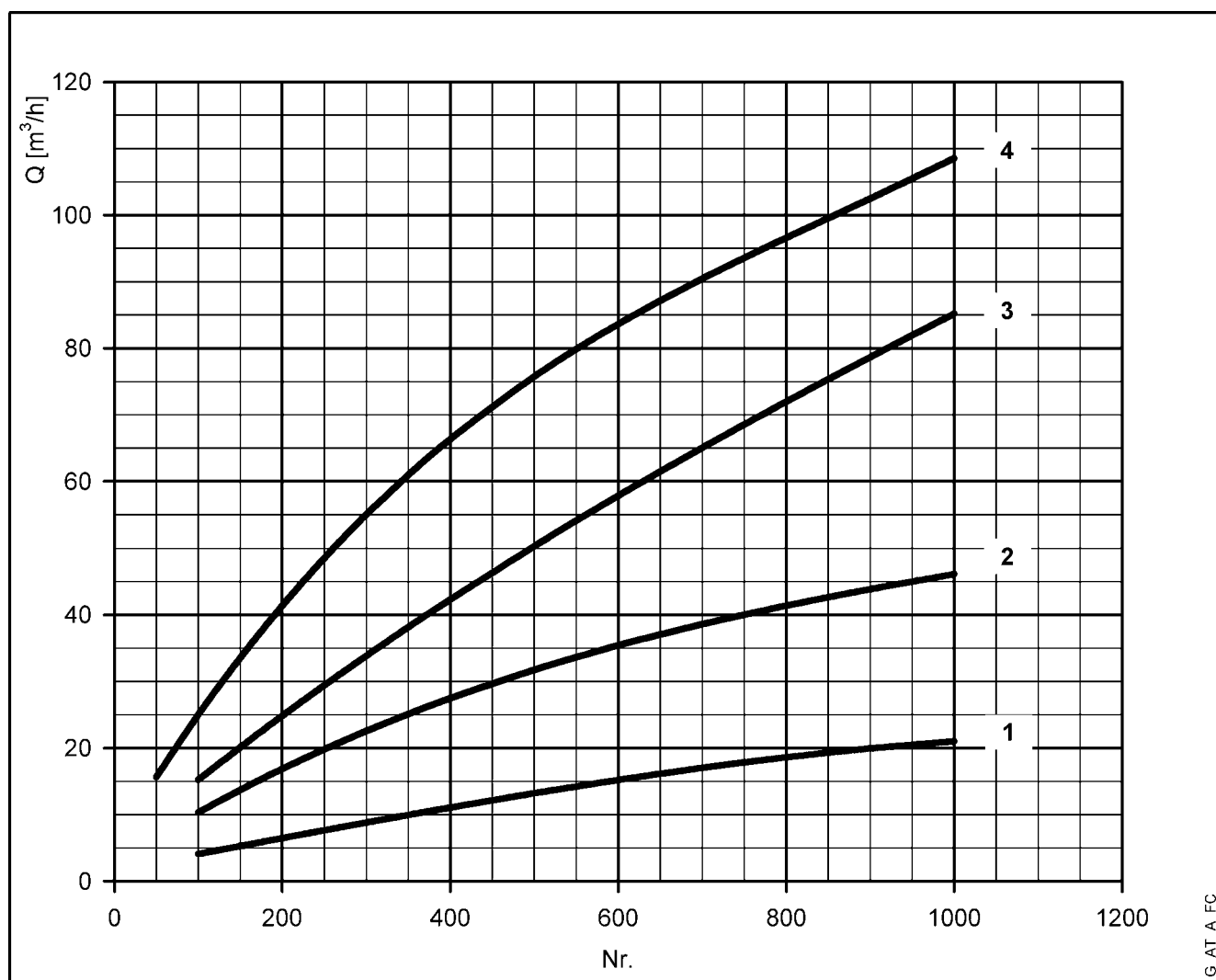
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WATER REQUIREMENTS FOR COMMUNITY BUILDINGS

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

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



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

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

USE OF BOOSTER SET

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

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

Set connection methods (intake side)

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

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

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

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

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

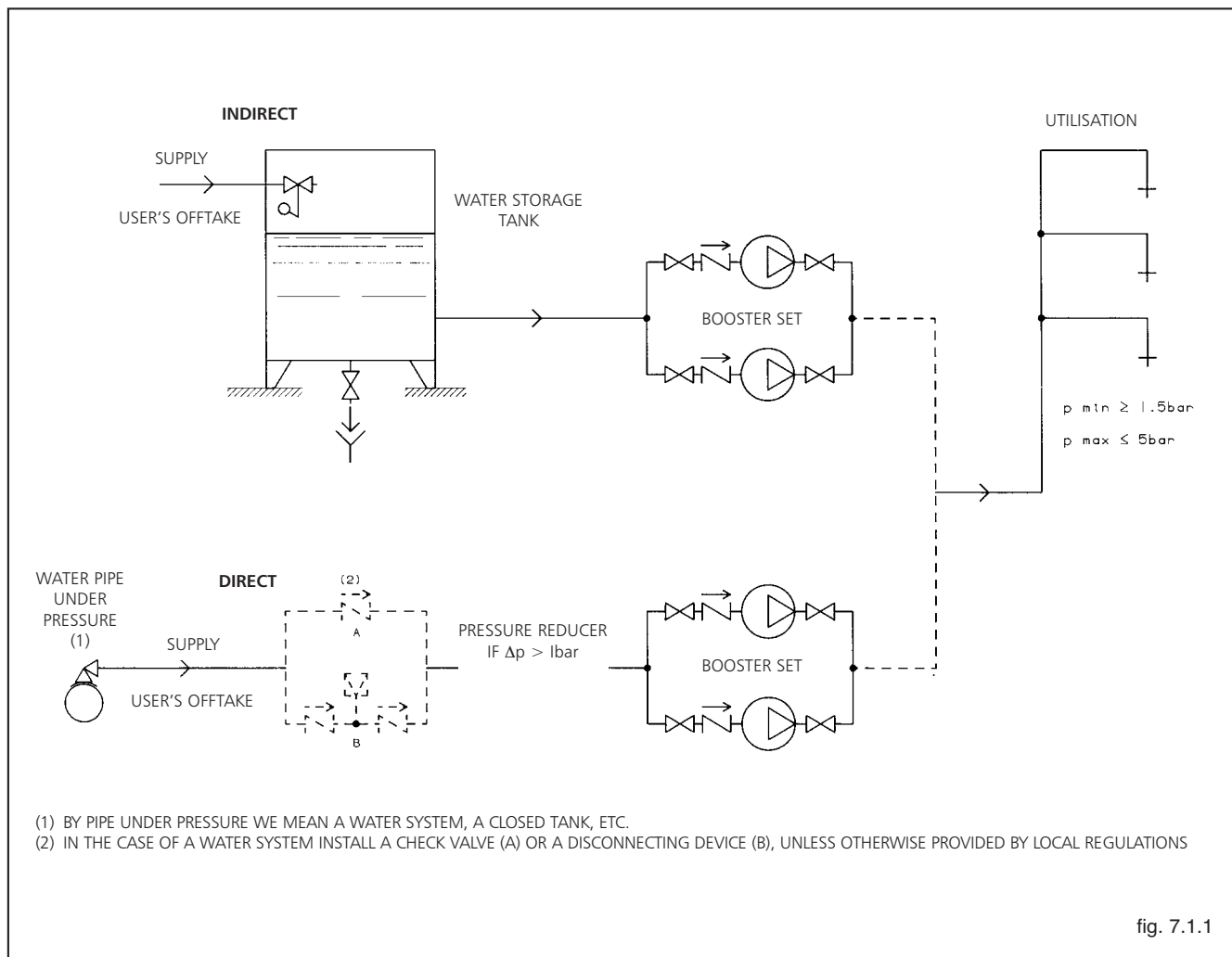


fig. 7.1.1

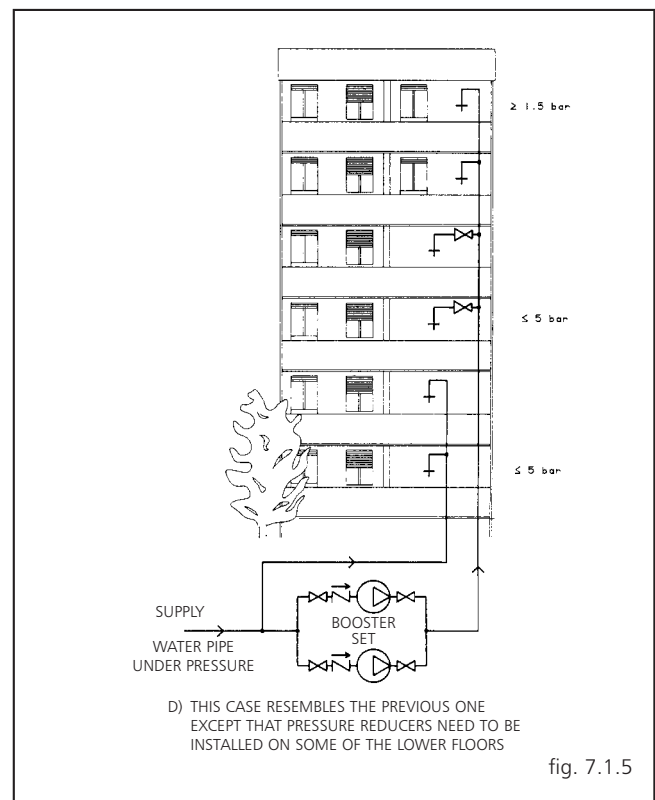
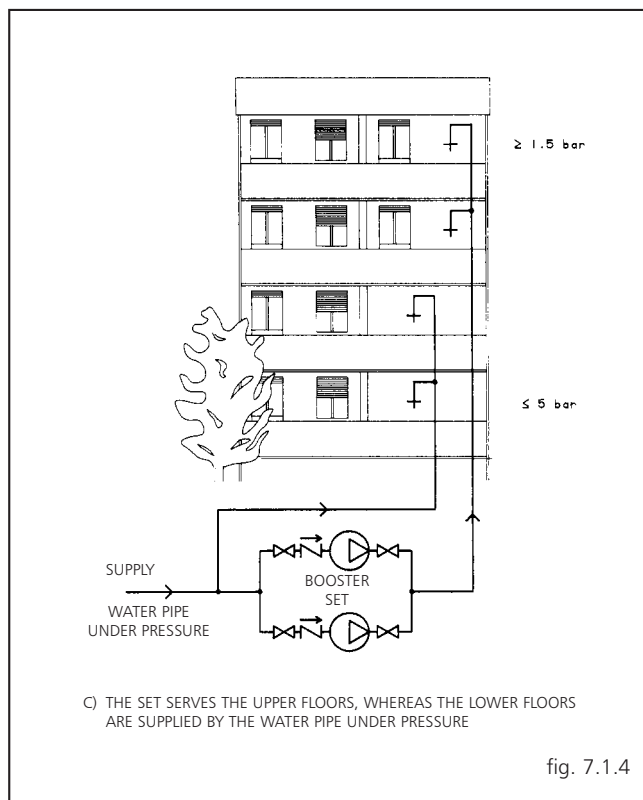
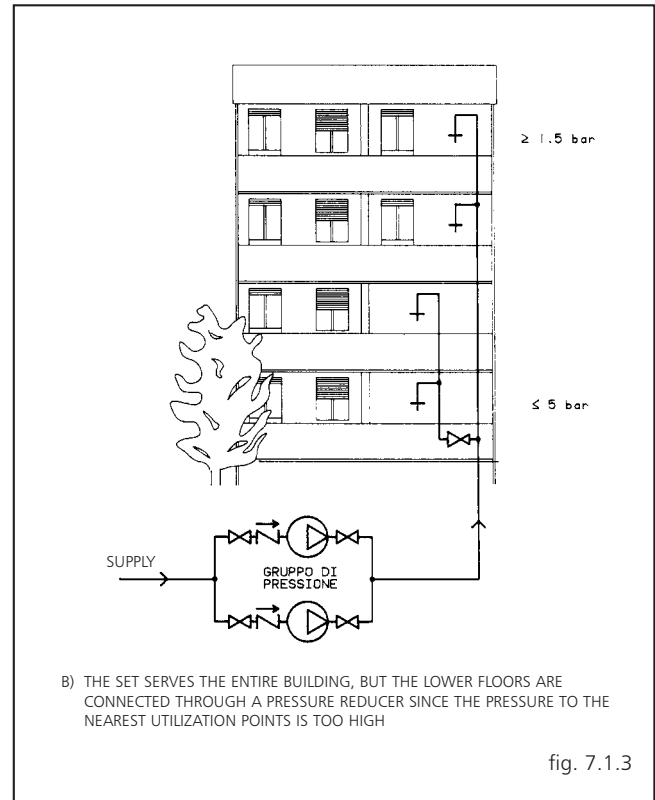
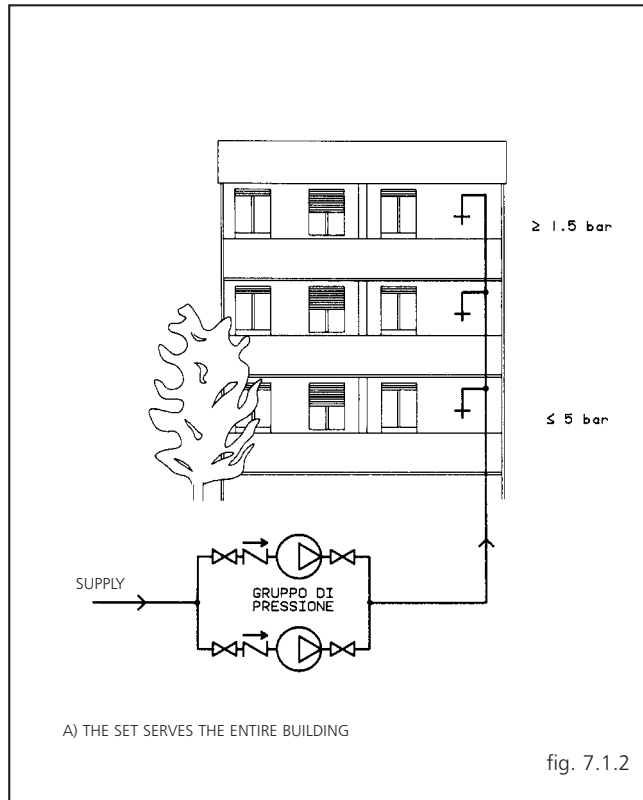


Water supply systems in civil buildings

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

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

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





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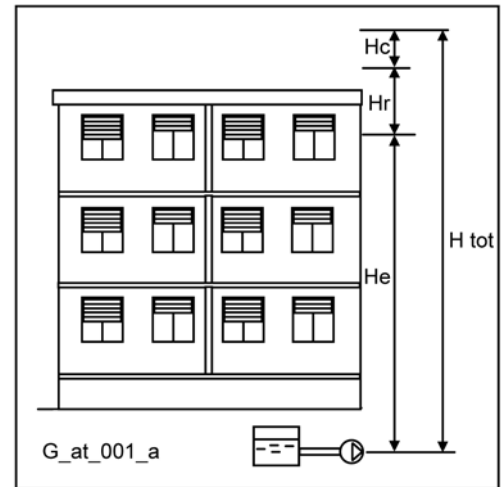
DETERMINING THE HEAD OF THE SET AND INTAKE CONDITIONS

Level intake

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

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

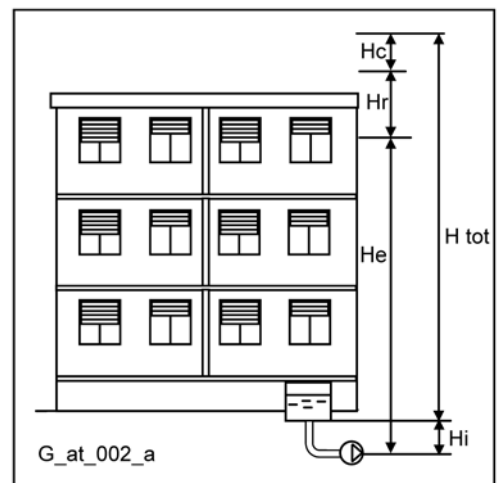
$$H_{tot} = H_e + H_c + H_r$$



Intake with positive head

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

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

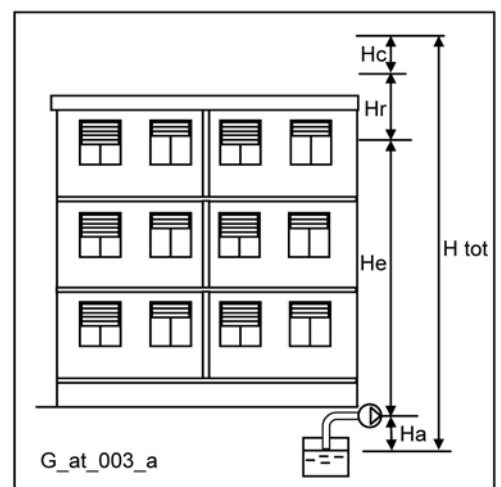


Intake with negative head

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

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

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



NPSH

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

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

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

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

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

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

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

where:

h_p is the absolute pressure applied to the free liquid surface in the suction tank, expressed in m. of liquid; h_p is the quotient between the barometric pressure and the specific weight of the liquid.

h_z is the suction lift between the pump axis and the free liquid surface in the suction tank, expressed in m.; h_z is negative when the liquid level is lower than the pump axis.

h_f is the flow resistance in the suction line and its accessories, such as: fittings, foot valve, gate valve, elbows, etc.

h_{pv} is the vapour pressure of the liquid at the operating temperature, expressed in m. of liquid. h_{pv} is the quotient between the P_v vapour pressure and the liquid's specific weight.

0.5 is the safety factor.

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

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

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

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

Flow resistance is shown in the tables at pages 111-112 of this catalogue. To reduce it to a minimum, especially in cases of high suction head (over 4-5 m.) or within the operating limits with high flow rates, we recommend using a suction line having a larger diameter than that of the pump's suction port. It is always a good idea to position the pump as close as possible to the liquid to be pumped.

Make the following calculation:

Liquid: water at ~ 15°C $\gamma = 1 \text{ kg/dm}^3$

Flow rate required: 10 m³/h

Head for required delivery: 51 m.

Suction lift: 4,5 m.

The selection is an SV805 pump whose NPSH required value is, at 10 m³/h, 1.2 m.

For water at 15°C

$$h_p = \frac{P_a}{\gamma} = 10,33 \text{ m}, h_{pv} = \frac{P_v}{\gamma} = 0,174 \text{ m (0.01701 bar)}$$

The h_f flow resistance in the suction line with foot valves is ~ 2 m.

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

$$10,33 + (-4,5) \geq (1,2 + 0,5) + 2 + 0,17$$

from which we have $5,8 > 3,9$

The relation is therefore verified.



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TECHNICAL APPENDIX VAPOUR PRESSURE PS VAPOUR PRESSURE AND ρ DENSITY OF WATER TABLE

t °C	T K	ps bar	ρ kg/dm ³	t °C	T K	ps bar	ρ kg/dm ³	t °C	T K	ps 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	433,15	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	221,20000	0,3154
53	326,15	0,14293	0,9862	116	389,15	1,7465	0,9460				
54	327,15	0,15002	0,9862	118	391,15	1,8628	0,9445				

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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 calculation 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:

CN 32 - 160/22 pump

P_{max} = 32 mca

P_{min} = 22 mca

Q_p = 18 m^3/h

Z = 30

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

A 500-litre surge tank is therefore required.

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

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

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

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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.

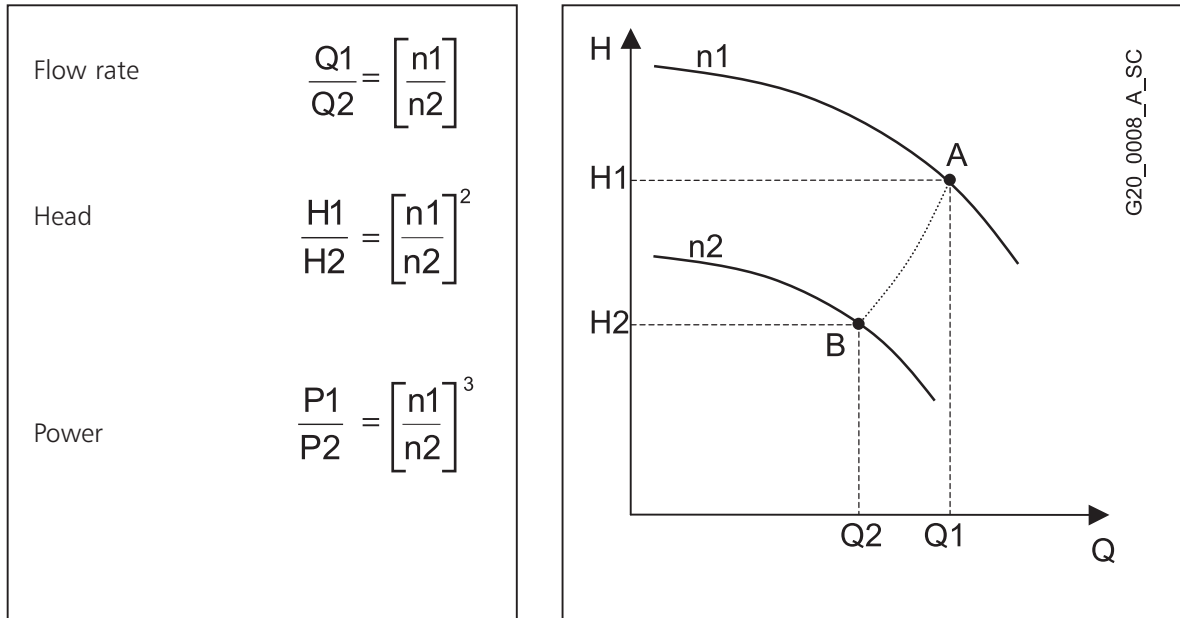
When the **equivalent pipeline length** has been determined, the flow resistance is obtained from the table of flow resistance.

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.



PERFORMANCE WITH VARYING SPEED EQUIVALENCE RELATIONS

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



$n1$ = initial speed;
 $Q1$ = initial flow rate;
 $H1$ = initial head;
 $P1$ = initial power;

$n2$ = speed required.
 $Q2$ = flow rate required.
 $H2$ = head required.
 $P2$ = power required

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

Example : 2-pole 50 Hz electric pump $n1 = 2900$ (point A)

Flow rate (A) = 100 l/min; Head (A) = 50m

By reducing the frequency to 30 Hz the speed is reduced to approx. $n2 = 1740$ rpm (point B)

Flow rate (B) = 60 l/min; Head (B) = 18 m

The power of the new work point B is cut to about 22% of the initial power.

SIZING THE DIAPHRAGM TANK IN SYSTEMS WITH SPEED VARIATION

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

Make the following calculation:

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

The calculation establishes the minimum value needed for proper operation.

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

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

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

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

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

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

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

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

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

See loading unit table below.

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

Loading unit table

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

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Working Example

A block of standard flats containing a total of 70 dwellings

Each standard flat is assumed to have:

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

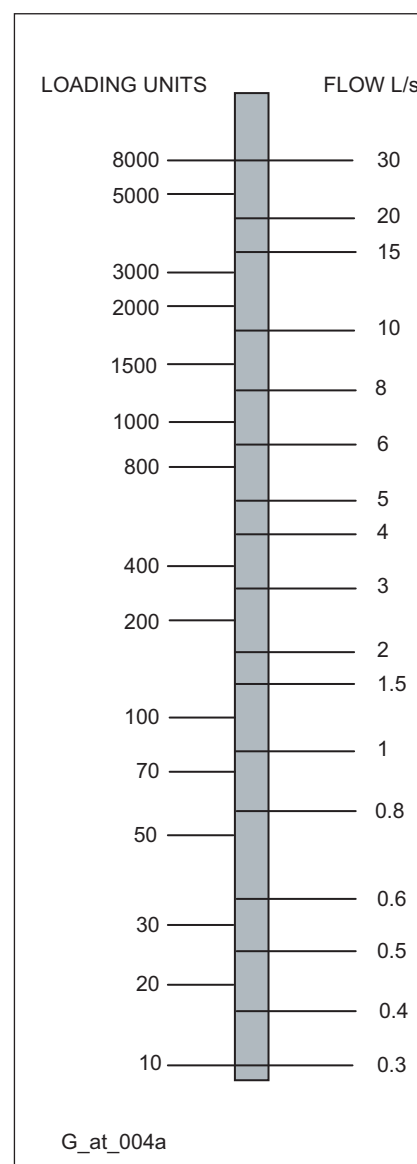
1 x WC cold only = 1.5 L/U x 70 = 105

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

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

Total Loading Unit = 1435

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



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

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

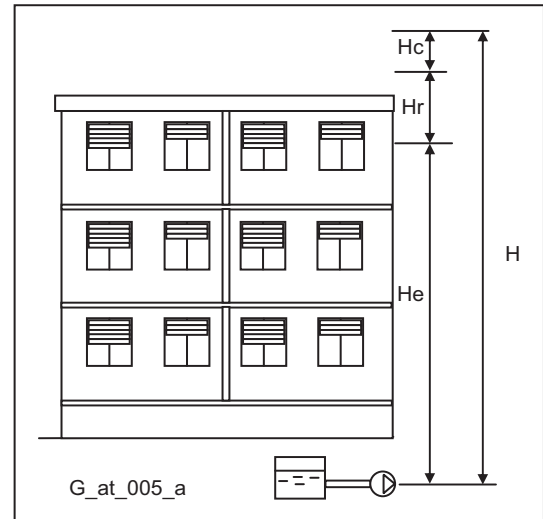
Static head (He): This is the difference between the break tank low water line and the highest discharge point in the building. If the height of the build is not known, then 2.8-3.0 metres per floor can be used to assess the building height.

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

Note: some modern showers may require higher pressures.

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

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



Example:

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

Pressure limitations

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

Velocity

Pipework within the system should be sized to limit the velocity to the figures stated in table below. Higher velocities will lead to excessive noise, wear and higher running costs.

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

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BOOSTER SIZING

What information do we require to size a booster set?

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





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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	Imp. gal. per minute Imp. gal/min	US gal. per minute Us gal./min
1,0000	0,0600	2,1189	0,0353	0,2200	0,2640
16,6670	1,0000	35,3147	0,5886	3,6660	4,4030
0,4720	0,0283	1,0000	0,0167	0,1040	0,1250
28,3170	1,6990	60,0000	1,0000	6,2290	7,4800
4,5460	0,2728	9,6326	0,1605	1,0000	1,2010
3,7850	0,2271	8,0209	0,1337	0,8330	1,0000
0,1100	0,0066	0,2339	0,0039	0,0240	0,0290

PRESSURE AND HEAD

Newtons per square metre N/m ²	kilopascal kPa	bar bar	Pound force per square inch psi	metre of water m H ₂ O	millimetre of mercury mm Hg
1,0000	0,0010	1 x 10 ⁵	1,45 x 10 ⁻⁴	1,02 x 10 ⁻⁴	0,0075
1000,0000	1,0000	0,0100	0,1450	0,1020	7,5000
100000,0000	100,0000	1,0000	14,5000	10,2000	750,1000
98067,0000	98,0700	0,9810	14,2200	10,0000	735,6000
6895,0000	6,8950	0,0690	1,0000	0,7030	51,7200
2984,0000	2,9840	0,0300	0,4330	0,3050	22,4200
9789,0000	9,7890	0,0980	1,4200	1,0000	73,4200
133,3000	0,1330	0,0013	0,0190	0,0140	1,0000
3386,0000	3,3860	0,0338	0,4910	0,3450	25,4000

LENGHT

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

VOLUME

cubic metre m ³	litre litre	millilitre ml	imp. gallon imp. gal.	US gallon US gal.	cubic foot ft ³
1,0000	1000,0000	1 x 10 ⁶	220,0000	264,2000	35,3147
0,0010	1,0000	1000,0000	0,2200	0,2642	0,0353
1 x 10 ⁻⁶	0,0010	1,0000	2,2 x 10 ⁻⁴	2,642 x 10 ⁻⁴	3,53 x 10 ⁻⁵
0,0045	4,5460	4546,0000	1,0000	1,2010	0,1605
0,0038	3,7850	3785,0000	0,8327	1,0000	0,1337
0,0283	28,3170	28317,0000	6,2288	7,4805	1,0000

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