

TECHNOFORCE e-HV™

VARIABLE SPEED BOOSTERS WITH
VERTICAL MULTISTAGE e-SV PUMPS 60 HZ
TECHNICAL BROCHURE



Table of Content

General Introduction	2
Major System Components	3
Operating Conditions	3
Typical Arrangements	3
Hydraulic Performance Range	4
Typical Construction	5-6
Operation Description	7-10
Booster Selection	11
Pump Selection	12-14
3SV Curves/Dimensions	15-19
5SV Curves/Dimensions	20-24
10SV Curves/Dimensions	25-29
15SV Curves/Dimensions	30-34
33SV Curves/Dimensions	35-39
Product Key	40

General Introduction - Product Description

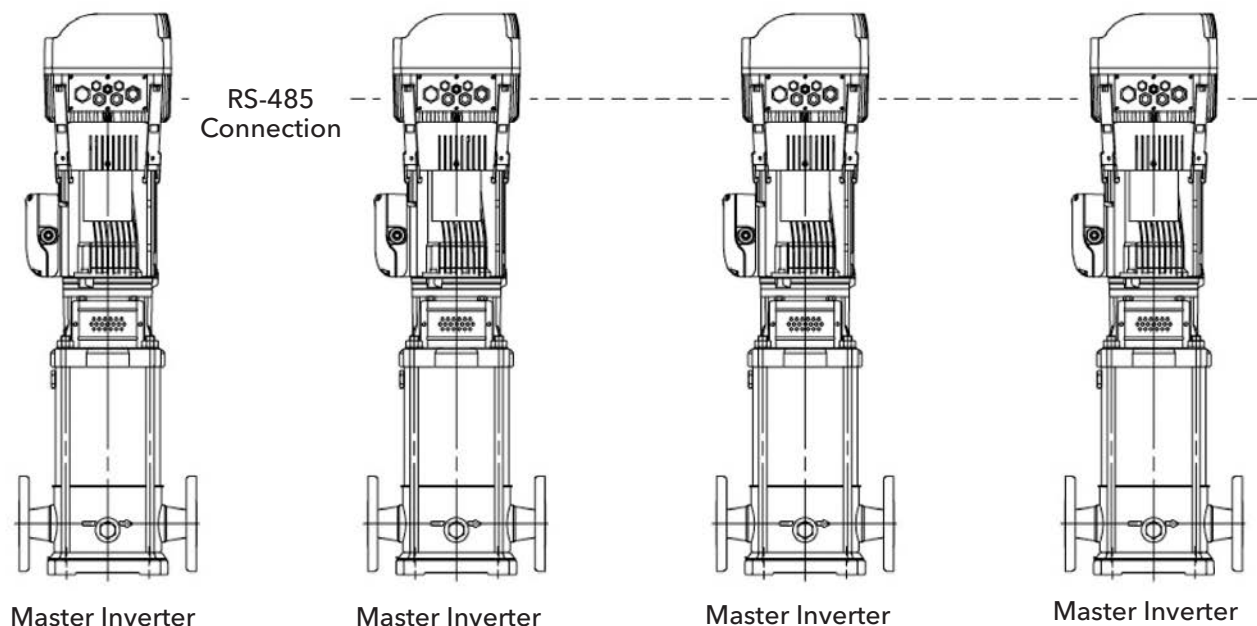
The e-HV pump systems are pre-engineered and fabricated packaged booster systems designed to transfer and increase the pressure of clean water. The e-HV provides pressure boosting for a variety of applications:

- Hospitals
- Schools
- Public Buildings
- Industrial and Plant
- Hotels, Inns and Resorts
- Condominiums and Apartments
- Sports Facilities
- Main water systems
- Rural Water

The e-HV booster sets are assembled with two to four vertical multistage e-SV pumps fixed onto a single base and connected in parallel via suction and discharge manifolds and fittings. The station is provided with a main system disconnect as well as individual electrical pump isolation to ensure that each pump can be serviced without the need to shut down the entire station.

Hydrovar Multi-Master Drive/Controllers

As a standard every e-HV booster is offered in the Multi-Master configuration. This means that each pump is paired with our Hydrovar® master type VFD mounted directly to a standard TEFC Premium Efficient NEMA Frame motor. Variable speed operation is handled via the designated “lead” master VFD in the given e-HV configuration. In the event of a failure in the lead master VFD, any of the sub sequential masters will become the lead and take control of the station. This gives the end user complete redundancy and increases the reliability of the system.



Major System Components

Number of Pumps: 2 to 4
Motor Power (HP): 1.5 - 15
Base: 304SS reinforced, formed
Frame: 304SS
Manifolds: 304SS Sch. 10 with Grooved connections
Isolation: Less than 2 inch - Ball Greater than 2 inch - Butterfly
Check: Less than 2 inch - Silent Greater than 2 inch - Wafer
Pump: e-SV vertical multistage
Motor: TEFC Premium Efficient NEMA C-Face
VFD: HydroVar® Master Pump Control/Drive UL Type 1/ IP55
Panel: NEMA 12 with integrated system and pump disconnects
Communication: RS-485

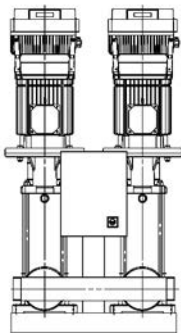


Operating Conditions

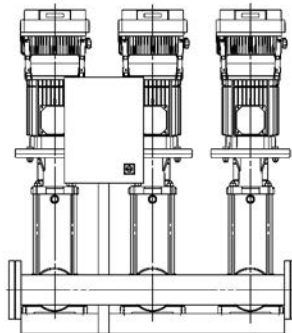
Fluids: Water containing now gas or corrosive and/or aggressive substances, no undissolved solids
Flow Rate: Up to 780GPM
Operating Pressure: Up to 270 PSIG
Liquid Temperature: 32°F to 180°F
Ambient Temperature: 32°F to 104°F, avoid direct sunlight
Relative Humidity: 90% non-condensing
Elevation: 3300 ft above sea level without derate

*On special request B&G can offer higher flow, pressure and Typic temperature rated packages.

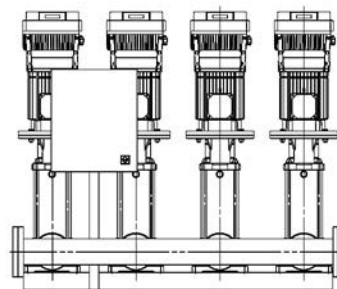
Typical Arrangements



Duplex

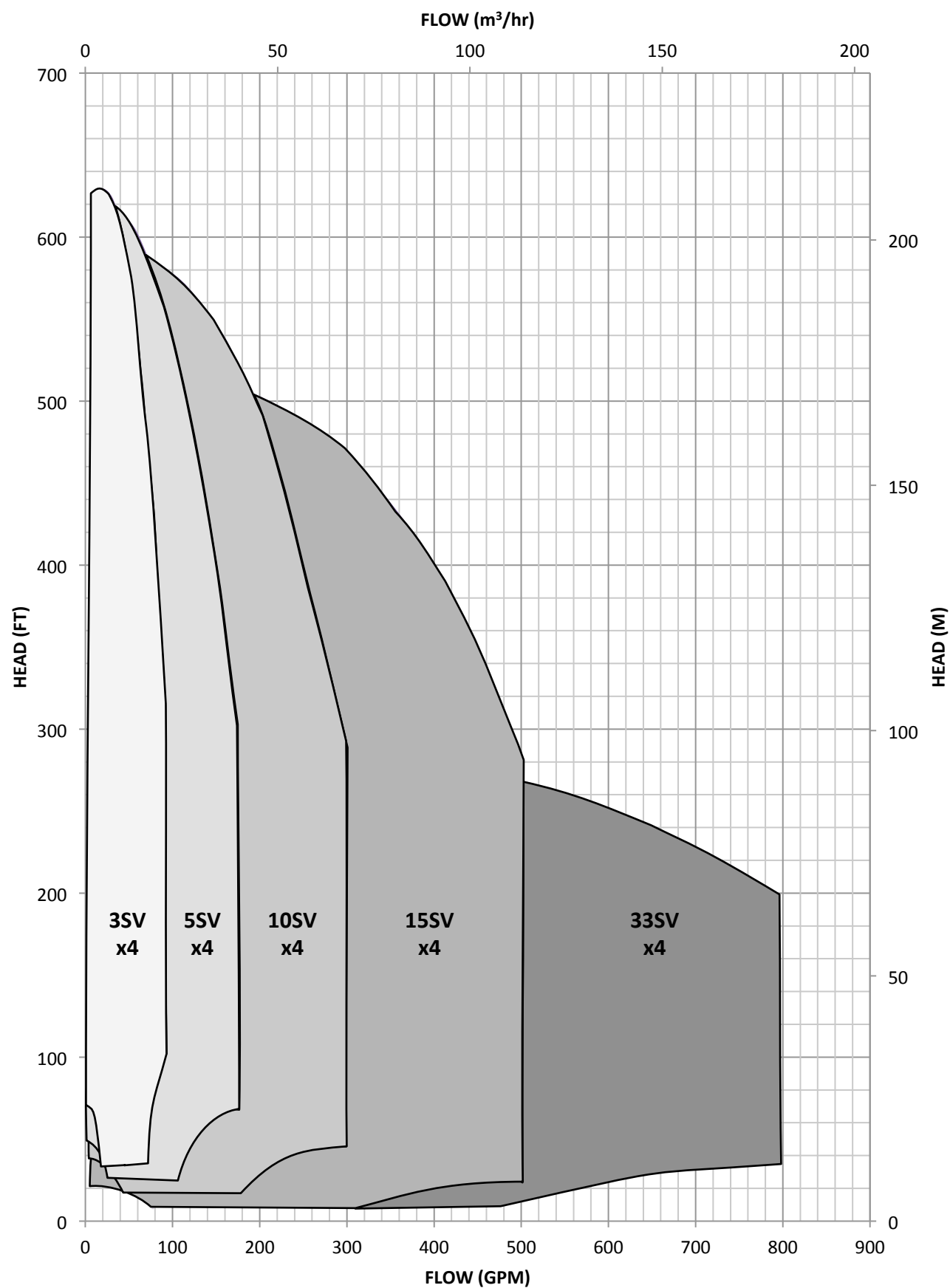


Tripex



Quadplex

Hydraulic Performance Range



Typical Constuction

PUMP

The e-SV pump is a non-self-priming vertical multistage pump coupled to a standard motor. The liquid end, located between the upper cover and the pump casing, is held in place by tie rods. This design allows for the removal of the mechanical seal without the need to remove the motor from the pump. The pump casing is available with different configurations and connection types.



TECHNICAL INFORMATION

Available Models: 3SV, 5SV, 10SV, 15SV, 33SV

Flow Rates: up to 200 GPM.

Heads: (TDH): up to 620 feet

Power: 1.5 to 15HP

Max Operating Pressure:

SV1-22 with round flanges: 360 or 575 PSI (25 or 40 bar)

SV33, 360 or 580 PSI (25 or 40 bar)

Temperature of Pumped Liquid:

22°F to 250°F standard design

22°F to 300°F Hot water design

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

For more information please refer to e-SV Technical Manual BeSV60

MOTOR

The e-SV pump utilizes standard NEMA C-face motors. The e-HV comes standard with Baldor TEFC Premium Efficient 2-pole motors. For more information please refer to station submittal documentation.

STATION DISCONNECT ENCLOSURE

A NEMA 12 rated enclosure is fitted with all the necessary components required to provide power to the station via a single field provided electrical connection. Each station will be provided with a main station disconnect and individual pump circuit breakers accessible without the need to disengage the main station disconnect.

Pump Control

The e-HV utilizes master Hydrovar variable frequency drives (VFD) that adjusts the speed of the pump in order to maintain constant pressure in the system. The HydroVar comes standard with a UL Type 1 / IP55 rating and is mounted directly on to the TEPE motor via mechanical brackets.

Pressure is measured via a 4-20mA pressure transmitter which can be read on the HydroVar's display. A simple user interface allows you to set the desired pressure value for optimal adjustment, as well as view the operating data, such as the hours of operation and any alarms triggered.

Included diagnostic menu to view temperature, current and voltage values of Hydrovar facilitates diagnostics and failure analysis. Indicator lights signal power status, pump running and malfunctions. A password is required to access sensitive settings such as flow resistance compensation, external control and so on that allow you to configure the pump logic control in order to adapt it to any control requirements.

When more than one pump is used, the vfd's exchange information with each other through an RS485 serial line which can connect up to 8 Hydrovar devices plus one external unit for remote control. RS485 serial interface available as standard which allows to control the Hydrovar converters from a Modbus® field serial bus line.

Each VFD is equipped with two potential-free relays which can be used for remote signaling of pump running and malfunction status, plus a programmable voltage analog output for signaling 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 over temperature, as well as for external enable signal and remote control. The vfd also incorporates a dry running protection function via an adjustable minimum pressure threshold.

As added protection designed to protect the pump, motor and pumping system, the Hydrovar operating system shall also detect the following fault conditions: under voltage, motor overload, short circuit, ground fault, motor over-heat (with thermistor), low suction pressure, and pump run-out.

A Class A filter is standard for Hydrovar three-phase power supply.

The following programmable flow 'Run/Standby' splits are available for multi-pump control:

- 100 + Stdbby
- 50/50
- 50/50 + Stdbby
- 33/33/33
- 33/33/33 + Stdbby
- 25/25/25/25

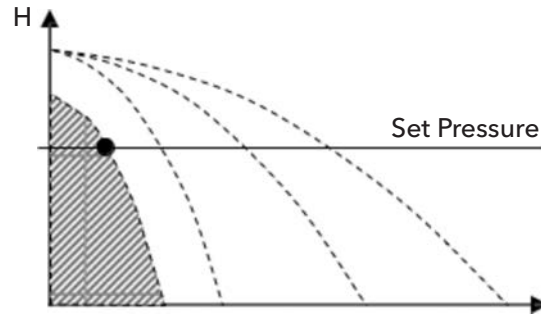
Further information is available into Hydrovar manual IM223 and IM224.



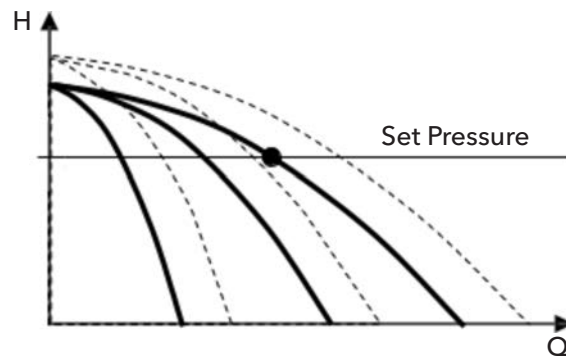
Sequence of Operation

The e-HV multi-pump booster control system operates up to 4 equal pumps. Each pump is outfitted with a Hydrovar combination variable speed Master drive (VFD) & controller (PLC) which operate together via a RS-485 interface. Each drive/controller is fitted with a dedicated 4-20 mA pressure transducer located on the discharge manifold. As flow demand increases, the pump speed shall be increased to maintain the system set-point pressure.

The e-HV booster maintains a constant system setpoint pressure as shown in the following example:



When the lead pump drive/controller reaches 48 Hz, and a pressure drop of 2 PSI below the set-point is detected for minimum of 5 seconds, additional pump(s) will start as needed and will increase speed until the system set point is achieved. {note: control value parameters are adjustable}.



When demand decreases, pump speed is reduced until minimum speed is reached, and pumps switch off in Cascade Serial mode. For condition of 'no-flow', the booster control system will shut down until a programmed minimum pressure set point is detected, signaling the control system to restart the lead pump. Cascade Serial control mode shall alternate the pumps automatically every 24 hrs for balanced usage, wear and tear.

Operation Description

SETPOINT

It is possible to select up to two set points of different values, thus use the booster set to serve systems that require different user pressure values. For example, different set points can be used for different times of the day when the load conditions may vary greatly in an office build or school. The set point changes can set when the Booster is installed and are adjustable via the RS-485 communication through the BMS. It is also possible to change the measuring units to bar, psi, m3/h, °C, °F, l/sec, l/min, %. In this case it is possible to use different transducers depending of the selected measuring unit, such as flow and temperature transducers.

PUMP ALTERNATION

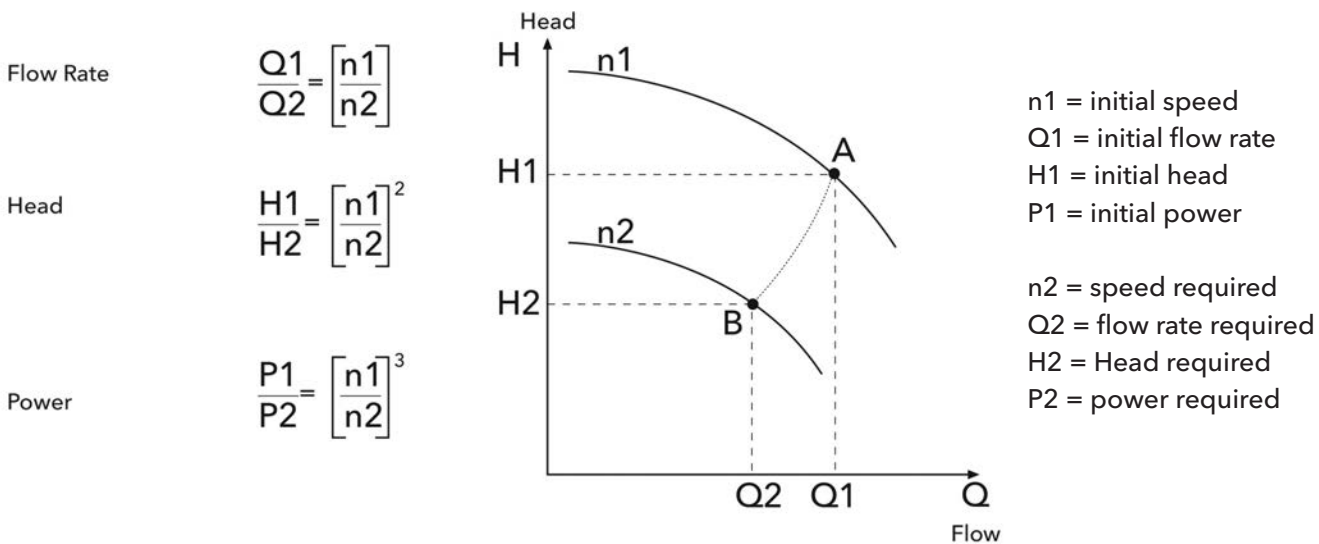
Alteration of the pumps can be set at the start at every system restart or at a given time set for each pump by means of an internal clock in the drive menu. This will help ensure equal amounts of run time for the available pumps on the station.

PROTECTION AGAINST DRY RUN

The protection function against dry running intervenes if the water reserve to which the booster set is connected falls below the minimum level guaranteed for suction. For the e-HV the level may be controlled by a float, level probes or minimum pressure switch. It is also possible to manage the function directly by imputing a minimum pressure value in the Hydrovar control board menu, which will receive a signal from the pressure transducer

VARIABLE SPEED PERFORMANCE

By outfitting the pump with a variable frequency drive it becomes possible to vary the pump rotation speed according to a system pressure. These variations in speed with result in modified performance characteristics according to the relationships established by the Affinity Laws.



Example:

2-pole, 60Hz, electric pump; n1 = 3500 RPM (point A); P1= 20HP

Flow Rate (A) = 150 GPM; Head (A) = 300 ft

By reducing the frequency to 50Hz the is reduced to approx. n2 = 2500 RPM (point B)

Flow Rate (B) = 107 GPM; Head (B) = 153 ft

The required power of the new work point B is now 7.29 HP

Booster Selection

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

- Design Point
- Part Load Conditions
- Efficiency
- NPSH (Suction Conditions)
- Standby pumps
- Diaphragm tanks

CALCULATING THE FLOW RATE

The quantity of water called the **water requirement** depends on the type of application, e.g. office, school, hospital. The **value of peak consumption or design point** is the total amount of water required by all of the users at a given time period. In actual fact it is very unlikely that there will ever be a simultaneous demand by all the users so the **part load conditions** will be lower than the value of peak consumption and should be taken into account when selecting your package. Understanding these part load conditions could impact the size and number of pumps you select to optimize the efficiency of the system

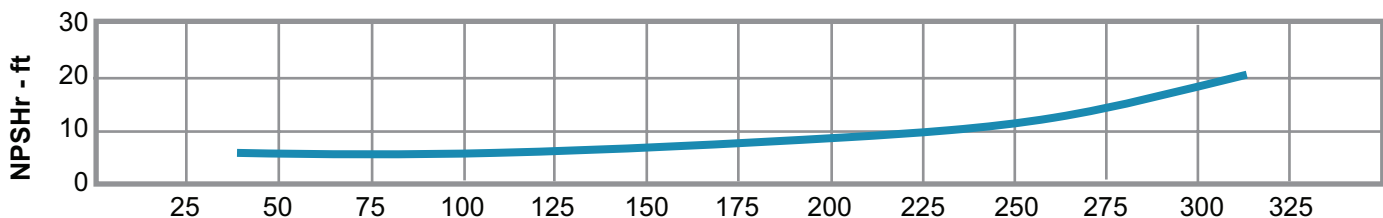
CALCULATING THE HEAD

The pressure required for a given system will depend greatly on the application. A number of factors must be taken into account, including the **height of the building, resistance in the pipes and suction conditions**.

For help calculating pipe resistance download the B&G System Syzer: <http://bellgossett.com/selection-sizing-cad-tools/system-syzer>

NPSHr

The **Net Positive Suction Head Required** is the net suction head as required by the pump in order to prevent cavitation for safe and reliable operation of the pump. These values are displayed on the pump curves.



NPSHa

The **Net Positive Suction Head Available** is the absolute total suction head available at the pump suction. The application will dictate this value and a few other conditions must be taken into consideration:

ha = Absolute Pressure on the surface of the liquid supply level in feet. (Barometric for open tank)

h_{vpa} = The head in feet corresponding to the vapor pressure of the liquid at pumping temperature

h_{st} = static height in feet of the liquid supply level above or below the pump centerline

h_{fs} = All suction line losses in feet.

Booster Selection

SUCTION CONDITIONS

Understanding the suction conditions for a given application is very important when selecting a Booster. Without the proper **NPSHa (Net Positive Suction Head Available)** the Booster may not be able to deliver proper conditions to the system and the pumps will likely cavitate if not higher than the **NPSHr (Net Positive Suction Head Required)**. If more suction pressure is available than the system was designed for the system may be prone to short-cycling or simply not operate at all.

NPSHa > NPSHr

In general there are **three types** of suction conditions to consider when selecting your booster station:

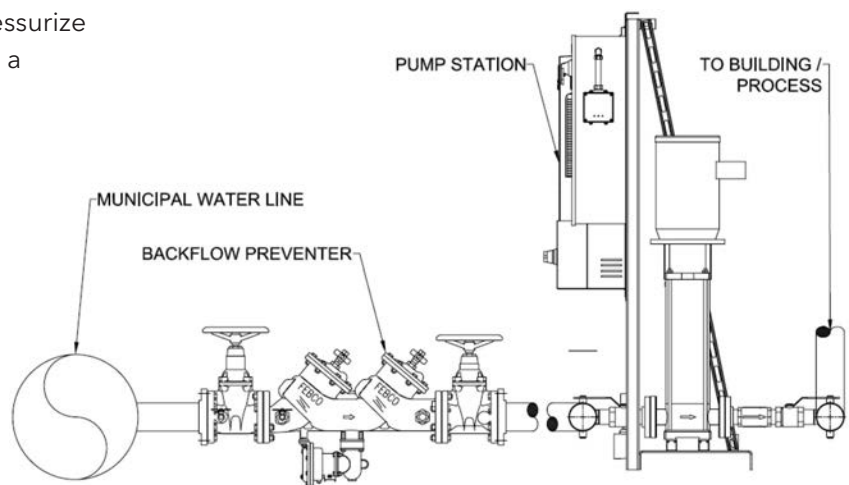
1. Pressurized

Installation where the supply is coming from a pressurized source. Typically this is a municipal water line with a backflow preventer

NPSHa = Suction Pressure

Available Boost =
Station discharge pressure
- Station suction pressure
+ Station friction losses

* Note: Suction pressure should be calculated at full flow to get accurate DP across the backflow preventer.



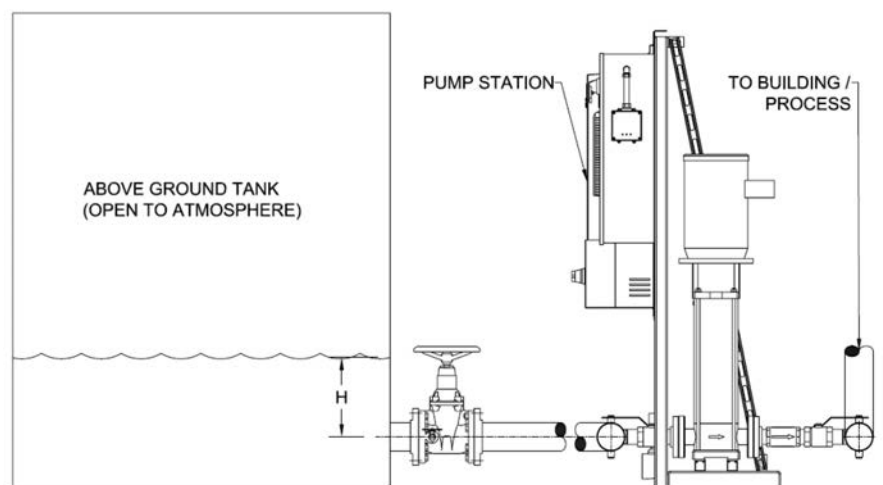
2. Flooded

Installation where the supply is from an above ground tank or water source where the water level is higher than the pump centerline.

NPSHa = $h_a - h_{vpa} - h_{st} - h_{fs}$

Available Boost =
Station discharge pressure
- Station suction pressure
+ Station friction losses

* Note: Elevation can affect atmospheric pressure and temperature, vapor pressure. Please refer to the tables in Appendix.



Booster Selection

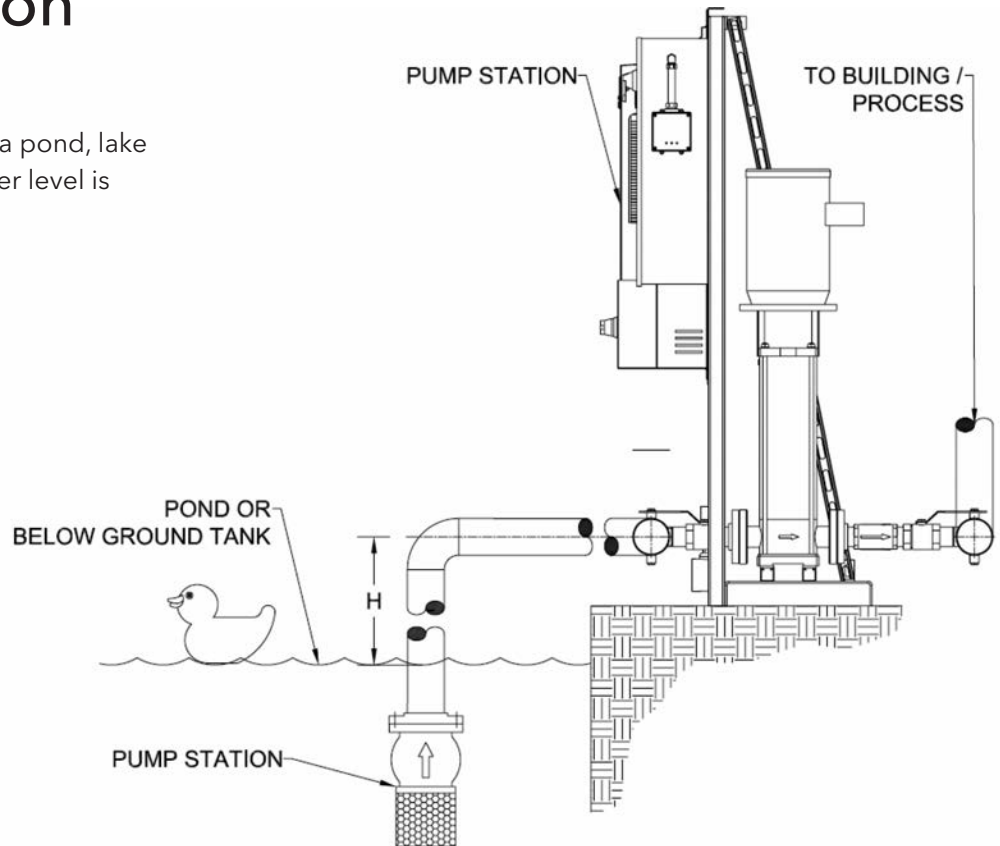
3. Lift

Installation where the supply is from a pond, lake or below ground tank where the water level is below the pump centerline.

$$NPSHa = h_a - h_{vpa} - h_{st} + h_{fs}$$

Available Boost =
Station discharge pressure
- Station suction pressure
+ Station friction losses

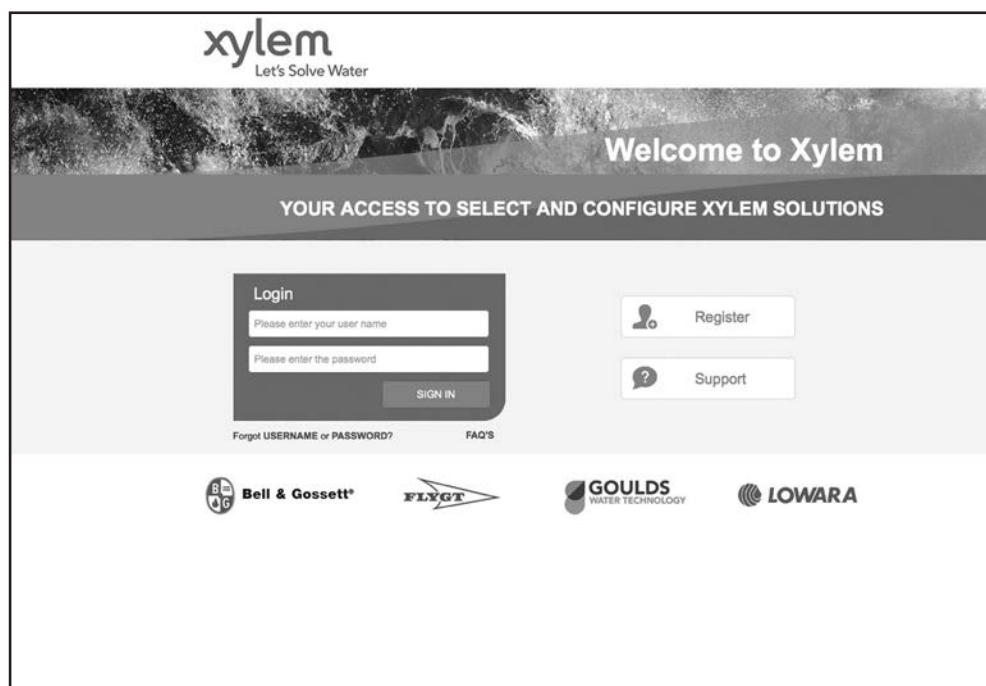
* Note: Lift applications typically require special design considerations. Foot valves and/or dedicated suction valves may be required. Please Consult Factory for Lift applications.



Pump Selection

Now that we understand the factors that typically impact our Booster selection, sizing the proper pump is key. Ensuring the station can meet the design point but is also efficient at the part load conditions will provide the end user with the best possible solution. Utilizing the Xylem Online selection software you can automatically understand the available e-SV pumps that can meet your system needs as well as complete Booster stations.

Visit: <https://myaccess.xyleminc.com> to login or register.



Pump Selection

Using the online tool we are able to sort pump selections based on all of the above factors discussed in previous sections:

The screenshot shows the Xylem Selector interface. On the left, under 'Product Series', the 'e-SV Series Stainless Steel Vertical Multi-Stage' pump is selected. On the right, under 'Search Criteria', the following values are entered: Search Type (Duty Point), Pumps in Parallel (1), Total Flow Rate (250 USgpm), Total Head (250 USgpm), Frequency (60 Hz), Speed/RPM (3600 and 1800), Fluid Type (Water), Temperature (70 °F), NPSHa (0 ft), Suction Pressure (30 Psi), and Suction Head (0 ft). A 'Search' button is at the bottom right.

Search Criteria	Value
Search Type	Duty Point
Pumps in Parallel	1
Total Flow Rate	250 USgpm
Total Head	250 USgpm
Frequency	60 Hz
Speed/RPM	3600, 1800
Fluid Type	Water
Temperature	70 °F
NPSHa	0 ft
Suction Pressure	30 Psi
Suction Head	0 ft

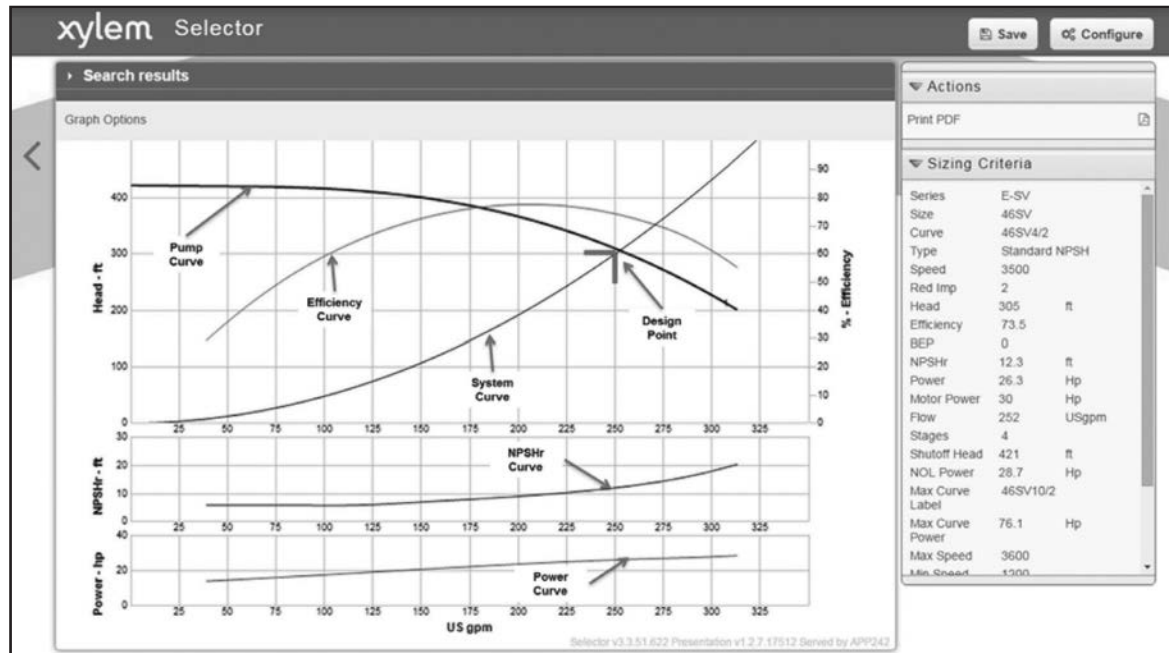
After entering our conditions we are given the available pumps sorted by efficiency.

The screenshot shows the Xylem Selector interface displaying search results. The table lists various pump models sorted by efficiency. The columns include Series, Size, Curve, Type, Speed, Red Imp, Head, EFF, BEP, NPSHr, Power, STG, and Shut-off Head. The results are sorted by EFF (Efficiency) in descending order.

Series	Size	Curve	Type	Speed	Red Imp	Head	EFF	BEP	NPSHr	Power	STG	Shut-off Head
E-SV	46SV	46SV4/2	Standard NPSH	3500	2	305	73.5	77.5	12.3	26.3	4	421
E-SV	66SV	66SV3/1	Standard NPSH	3500	1	316	71.6	77.3	9.95	28.6	3	367
E-SV	92SV	92SV3/2	Standard NPSH	3500	2	327	66	78.5	9.13	32.4	3	365
E-SV	125SV	125SV3/3A	Standard NPSH	3500	3A	315	50.3	77.4	12.7	40.5	3	358
E-SV	46SV	46SV4/2	Low NPSH	3550	2	326	---	---	9.03	28.5	4	426
E-SV	66SV	66SV3/2	Low NPSH	3550	2	302	---	---	7.31	30.5	3	350

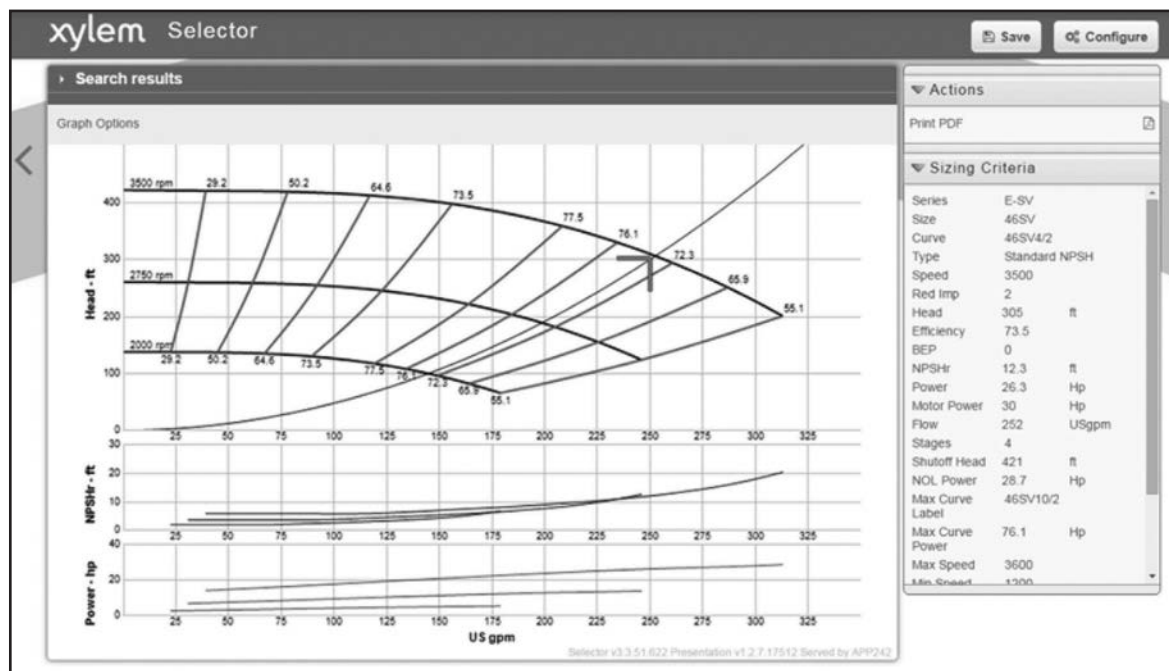
Pump Selection

Pulling up the pump curve we can now evaluate pump selection for our application:



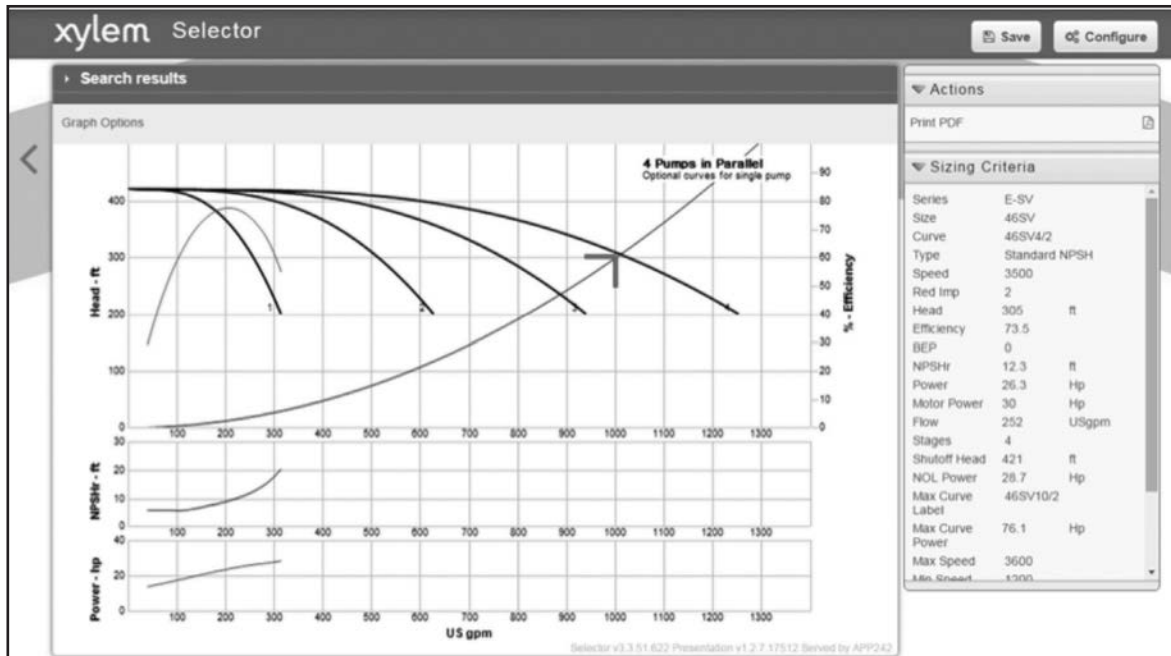
In the above example the red "knee" signifies the desired condition point that we entered on the previous screen. Note how on that particular pump curve the point is to the right on curve close to the area of most efficient operation. This allows for a drop in consumption while maintaining efficiency.

In the tool we also have the ability to show the variable speed curves for the selected pump:



Pump Selection

We can even see what multiple pumps in parallel will look like:



For the e-HV we have optimized the pump selection based on flow and head available for 1 to 4 pumps running in parallel. For standard offering and availability please see the Pump Curves section of this brochure or selection software available in the online tool.

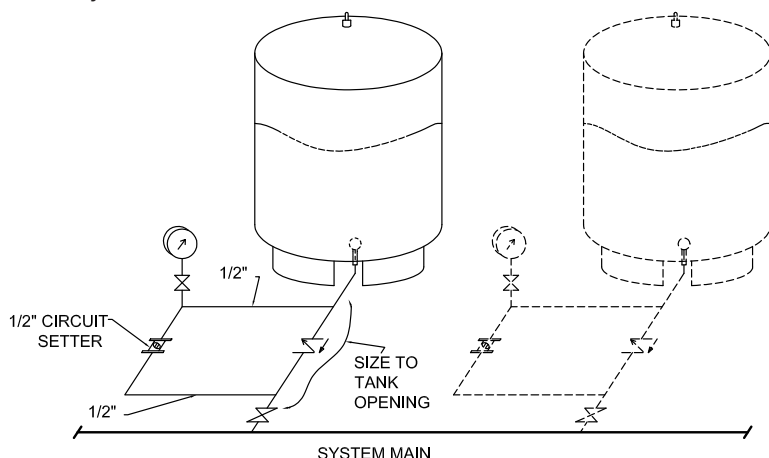
DIAPHRAGM TANKS

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 or fast acting flush valves.

The e-HV booster sets are ready for installation of the diaphragm tanks directly on the delivery manifold or on the unused end of the manifold.

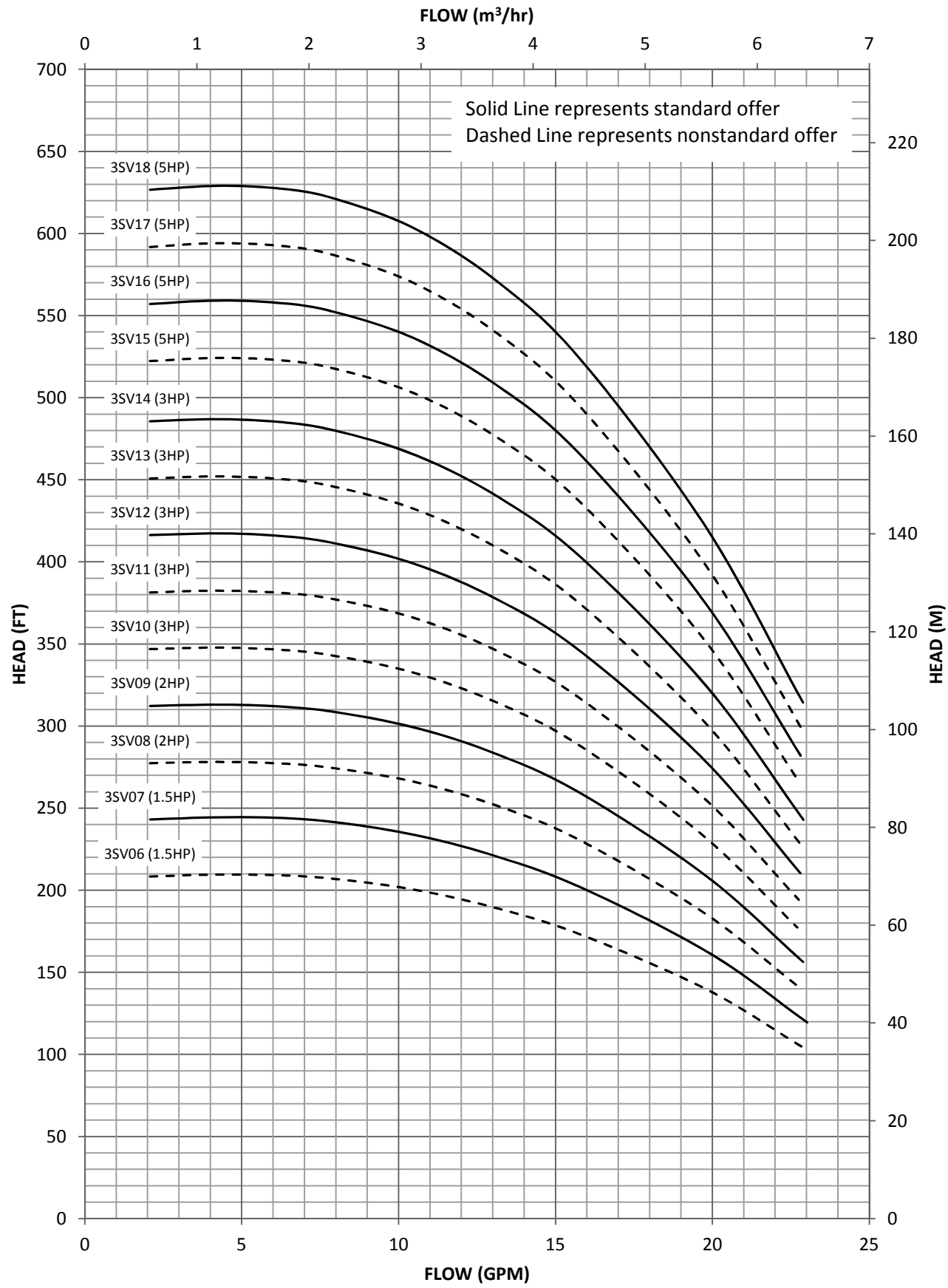
For peak performance, variable speed booster sets need smaller tanks compared to traditional systems. Generally speaking a tank with a capacity of just 20% the nominal capacity of a single pump, expressed in gallon per minute, is required. Example: If a pump is sized for 100GPM, then a tank sized at 20 Gallons would be typical.

Pre-charge the tank with air, 10-15 psi below your system pressure. Charge a dry tank without water pressure or before installing in the system.

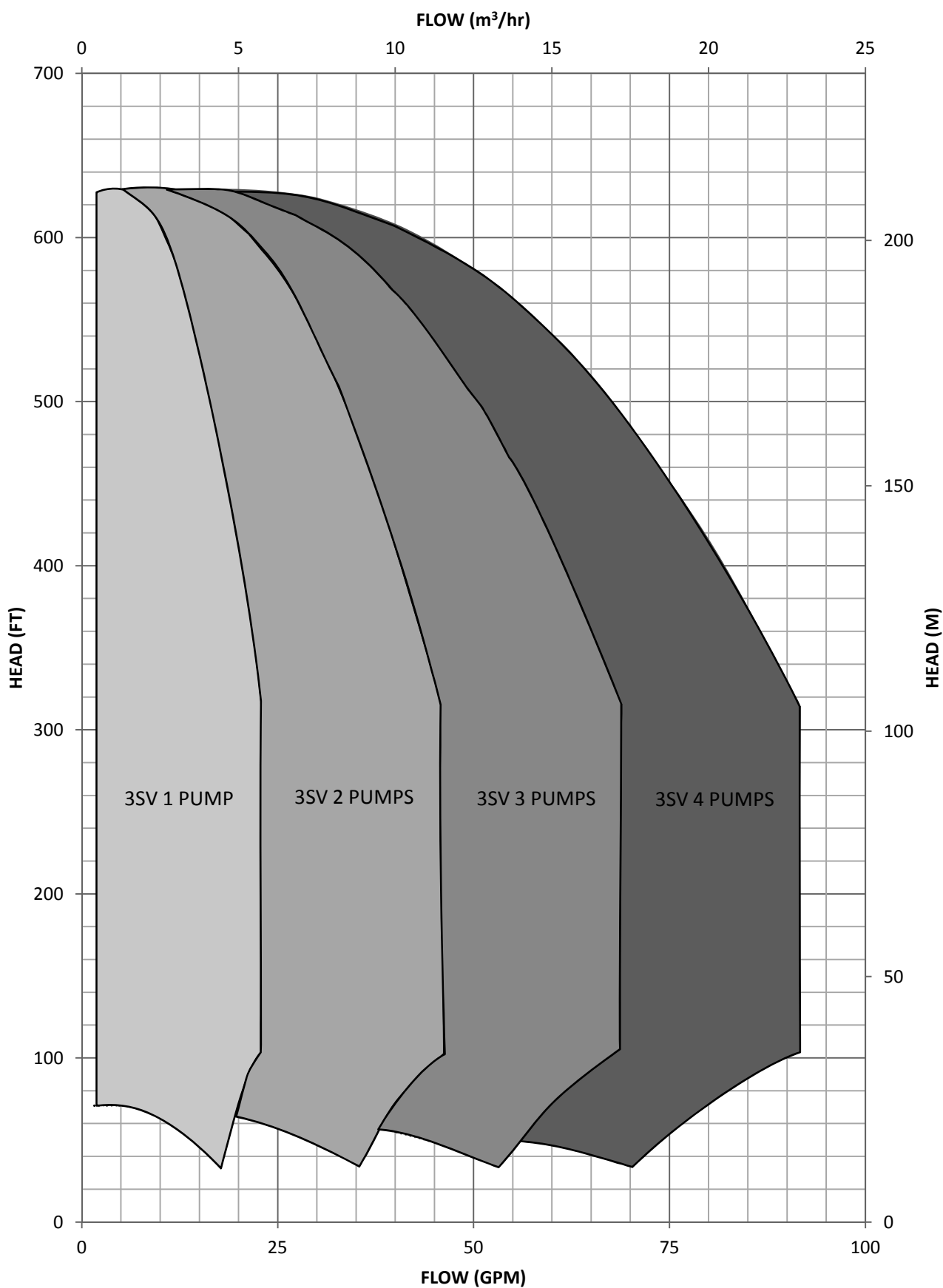


- 1) IF MULTIPLE TANKS ARE INSTALLED, ALL MUST BE PIPED AND PRE-CHARGED THE SAME.
- 2) PIPING ARRANGEMENT SHOWN RECOMMENDED WITH "NO-FLOW SHUT DOWN" SYSTEMS.
- 3) ADJUST CIRCUIT SETTER TO LIMIT TANK CHARGING RATE TO LESS THAN LEAD PUMP'S DESIGN FLOW RATE.
- 4) FAILURE TO RESTRICT FLOW MAY CAUSE SECOND PUMP TO STAGE UNNECESSARILY DURING CHARGING CYCLE.

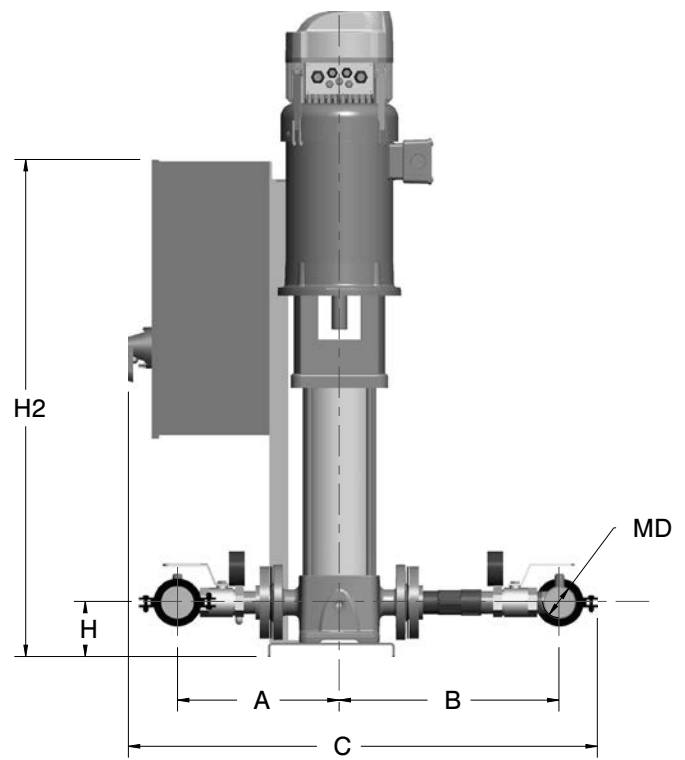
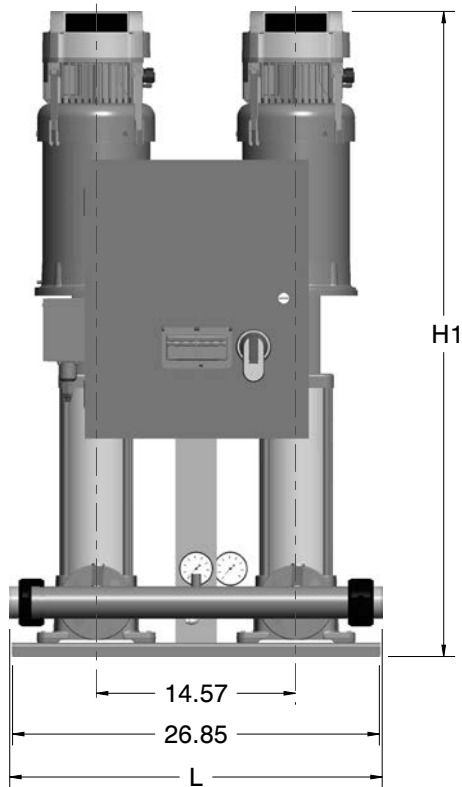
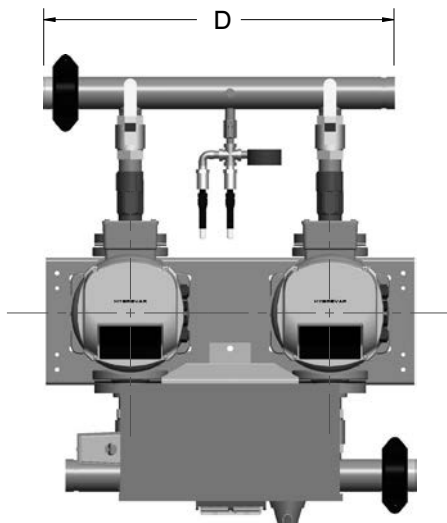
TechnoForce e-HV Curves 3SV



TechnoForce e-HV Curves 3SV

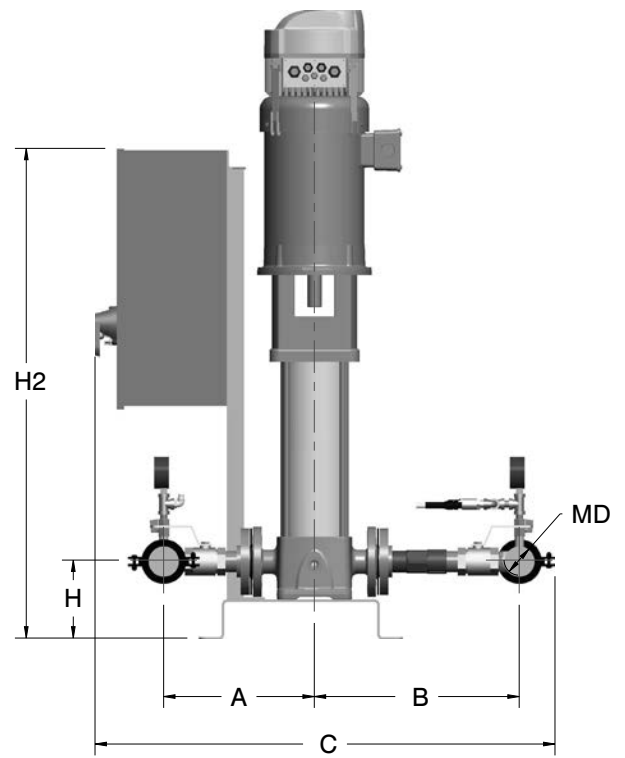
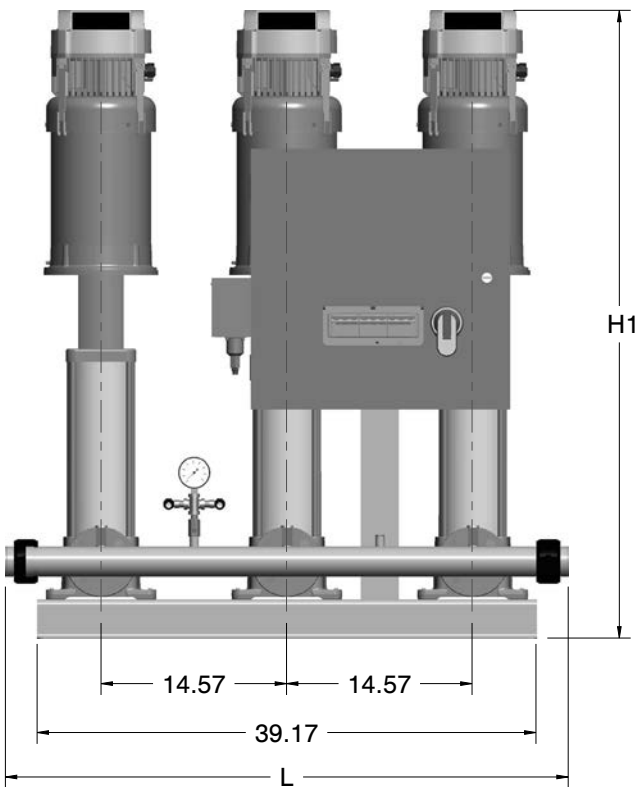
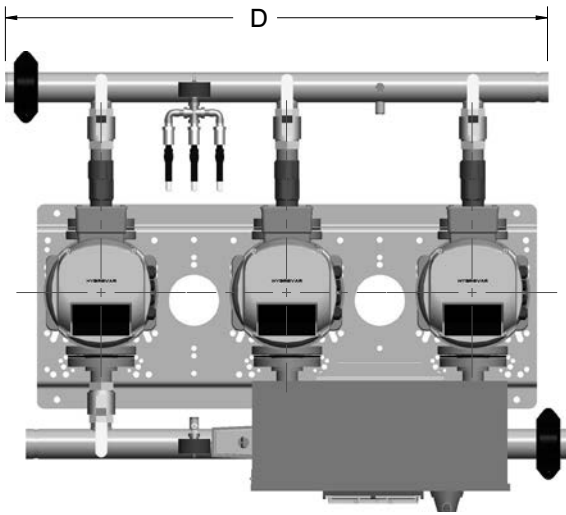


TechnoForce e-HV Dimentions 3SV



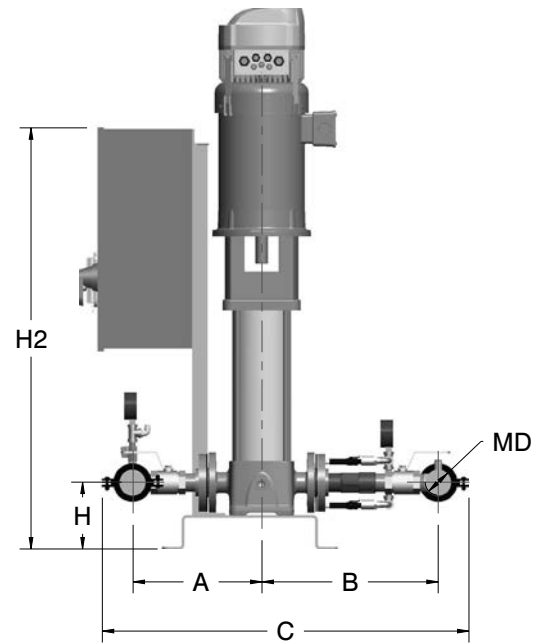
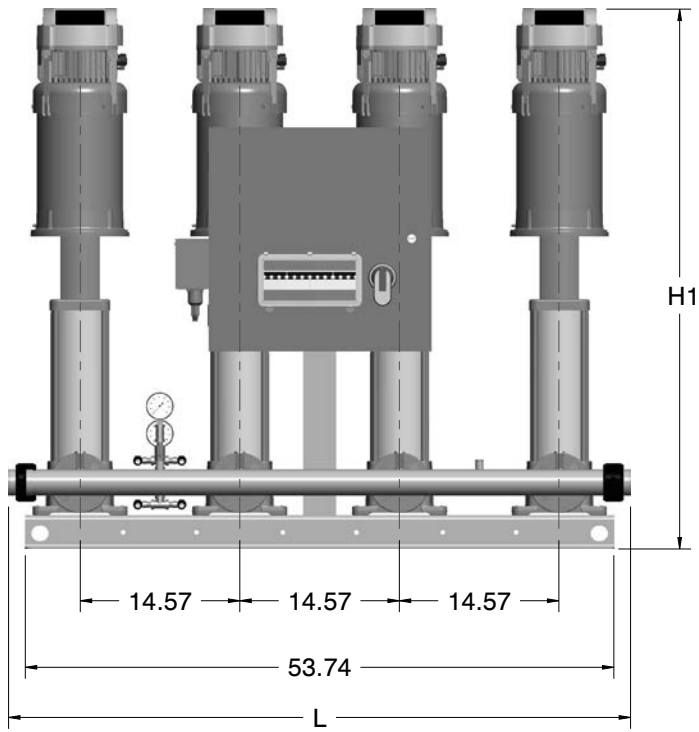
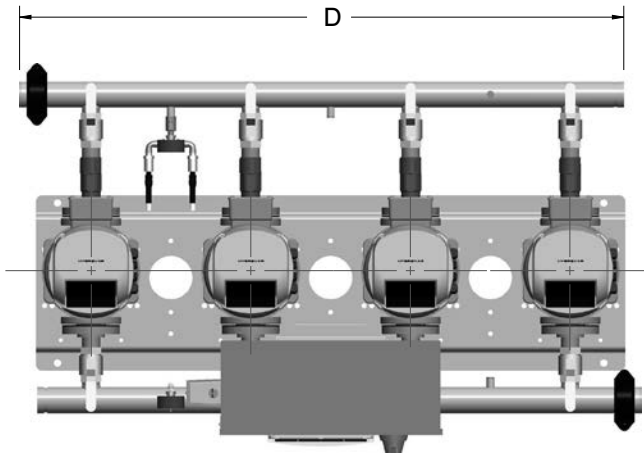
HV2D2	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
3SV7GD4F60	2	11.83	16.09	34.33	25.64	4.04	34.55	31.39	27.27	393.3
3SV9GE4F60	2	11.83	16.09	34.33	25.64	4.04	37.13	31.39	27.27	409.4
3SV12GF4F60	2	11.83	16.09	34.33	25.64	4.04	40.61	31.39	27.27	441.6
3SV14GF4F60	2	11.83	16.09	34.33	25.64	4.04	42.18	31.39	27.27	446.2
3SV16GG4C60	2	11.83	16.09	34.33	25.64	4.04	44.95	36.39	27.27	508.3
3SV18GG4C60	2	11.83	16.09	34.33	25.64	4.04	47.22	36.39	27.27	517.5

TechnoForce e-HV Dimensions 3SV



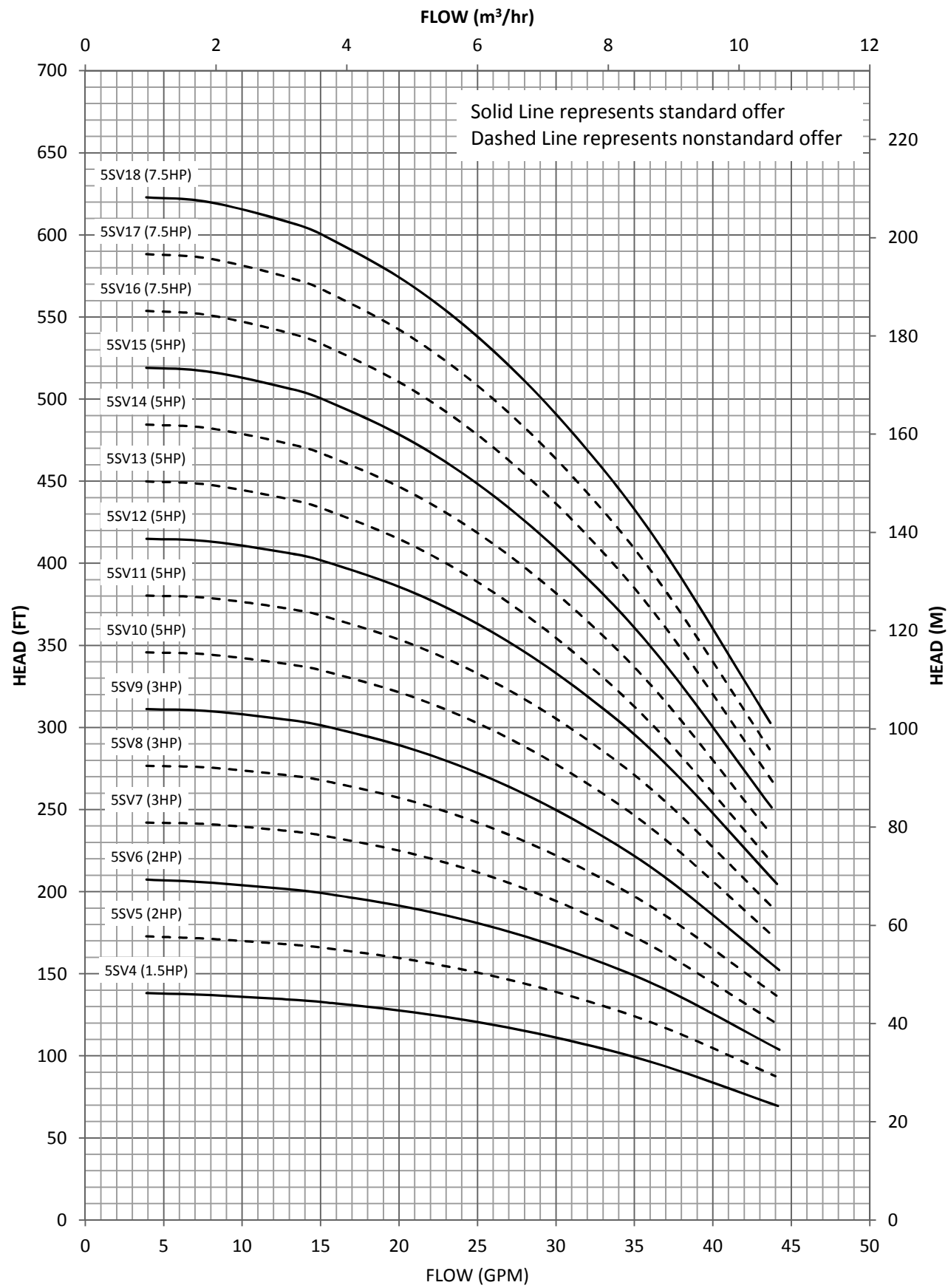
HV3D2	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
3SV7GD4F60	2	11.83	16.09	36.12	42.57	6.12	36.62	33.45	44.20	535.5
3SV9GE4F60	2	11.83	16.09	36.12	42.57	6.12	39.2	33.45	44.20	559.7
3SV12GF4F60	2	11.83	16.09	36.12	42.57	6.12	42.68	33.45	44.20	608.0
3SV14GF4F60	2	11.83	16.09	36.12	42.57	6.12	44.25	33.45	44.20	614.9
3SV16GG4C60	2	11.83	16.09	36.12	42.57	6.12	47.02	38.45	44.20	708.0
3SV18GG4C60	2	11.83	16.09	36.12	42.57	6.12	49.29	38.45	44.20	721.8

TechnoForce e-HV Dimensions 3SV

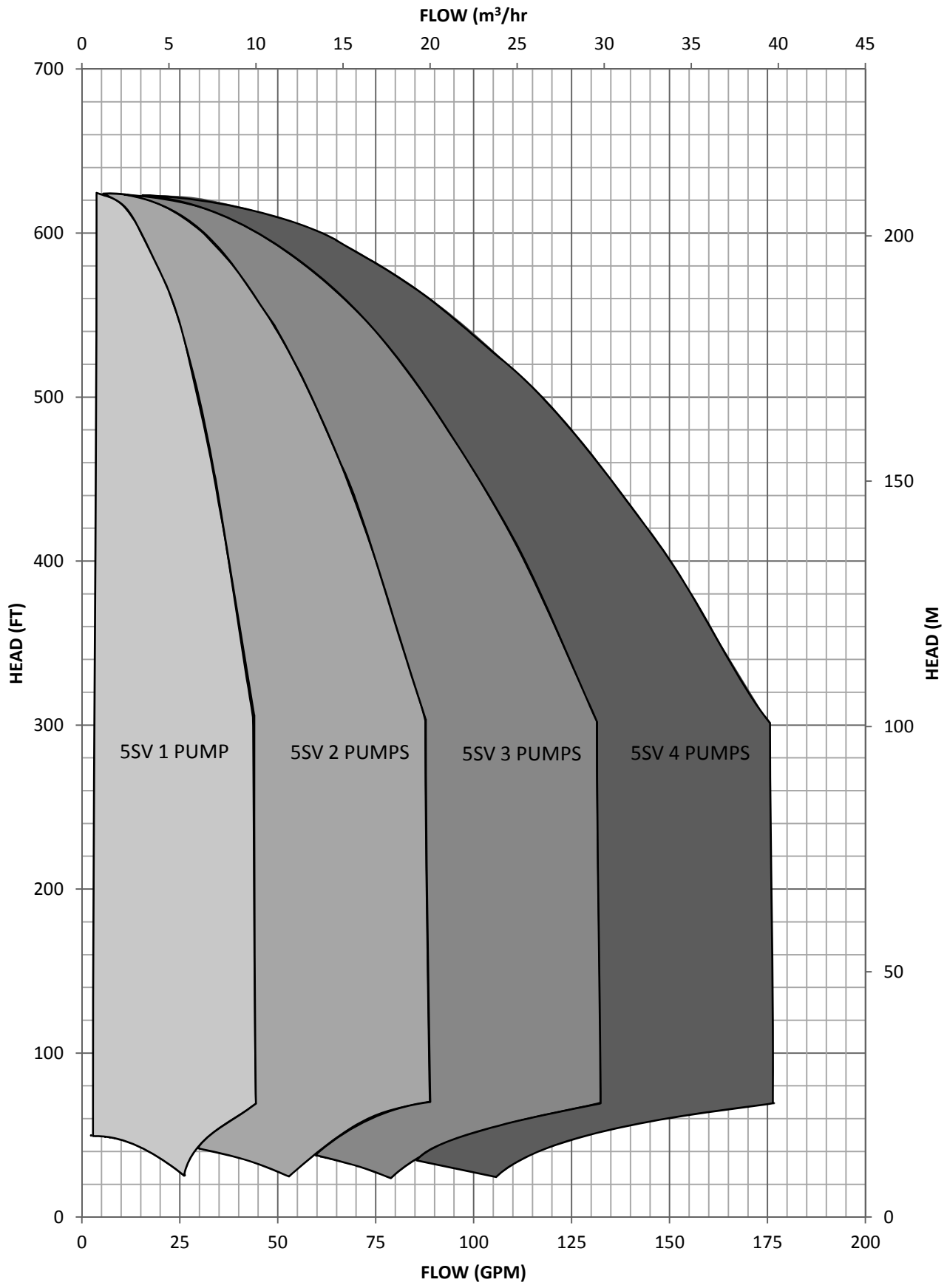


HV4D2	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
3SV7GD4F60	2	11.77	16.09	33.48	55.17	6.10	36.62	33.34	56.79	700.7
3SV9GE4F60	2	11.77	16.09	33.48	55.17	6.10	39.2	33.34	56.79	732.9
3SV12GF4F60	2	11.77	16.09	33.48	55.17	6.10	42.68	33.34	56.79	797.3
3SV14GF4F60	2	11.77	16.09	33.48	55.17	6.10	44.25	33.34	56.79	806.5
3SV16GG4C60	2	11.77	16.09	33.48	55.17	6.10	47.02	38.34	56.79	930.7
3SV18GG4C60	2	11.77	16.09	33.48	55.17	6.10	49.29	38.34	56.79	949.1

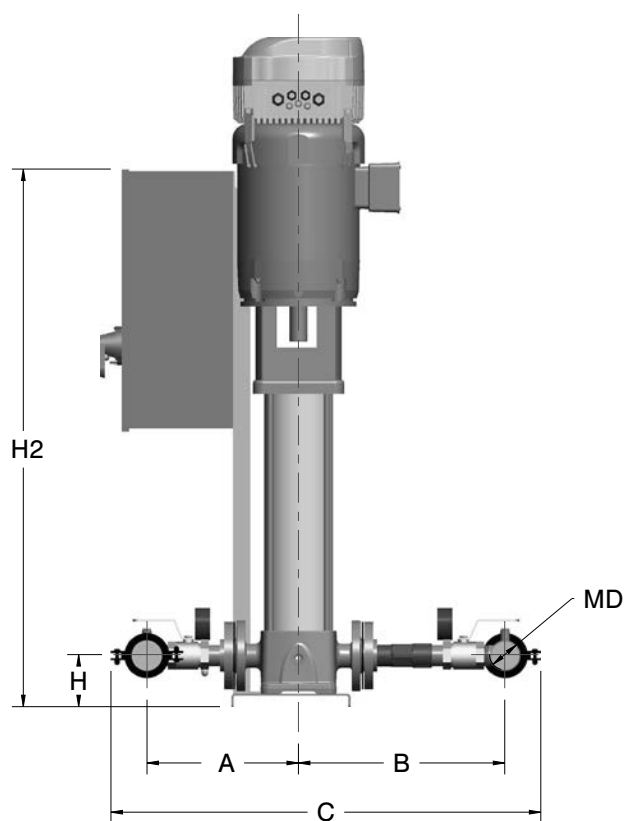
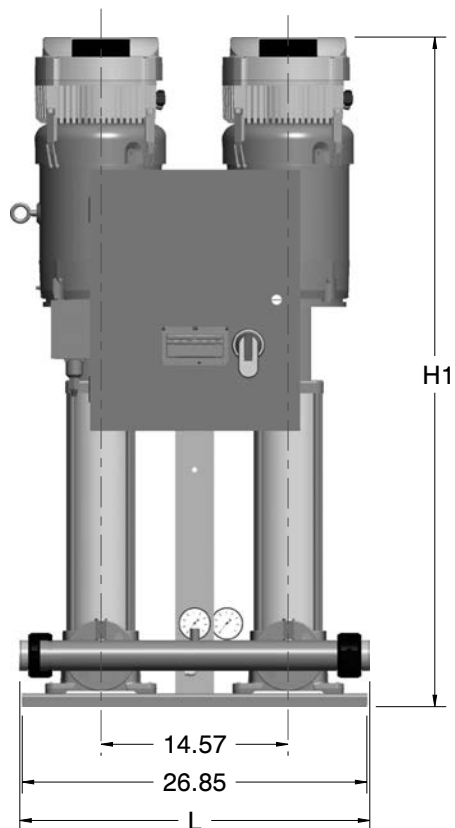
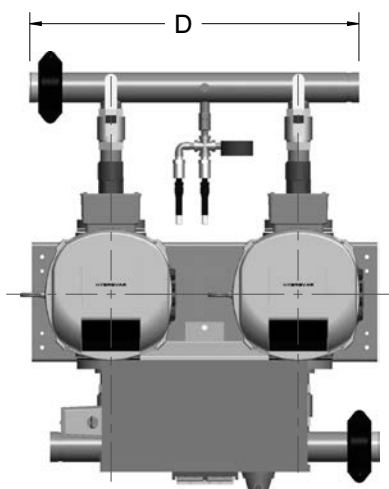
TechnoForce e-HV Curves 5SV



TechnoForce e-HV Curves 5SV

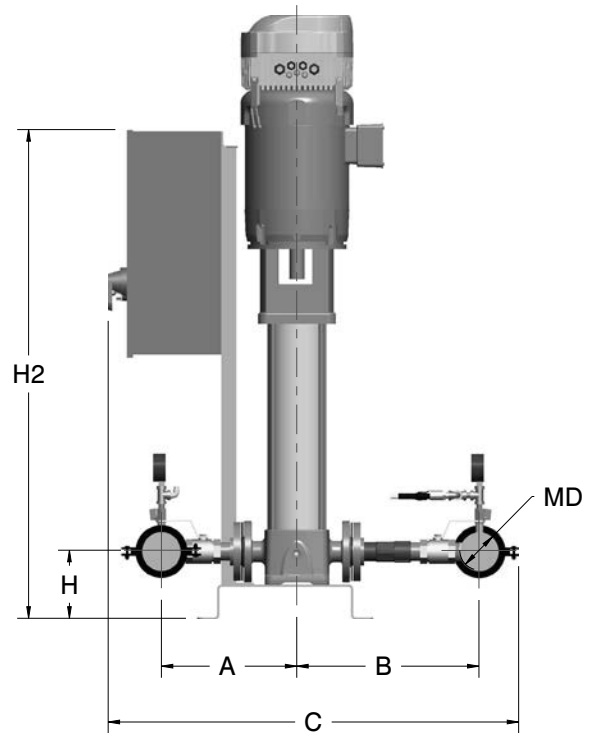
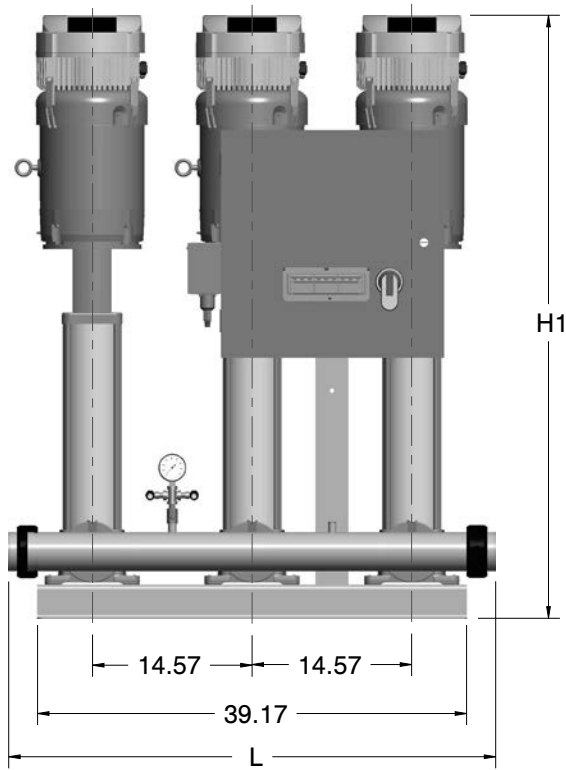
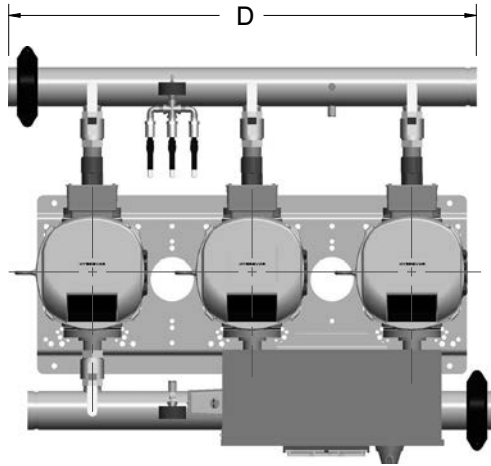


TechnoForce e-HV Dimentions 5SV



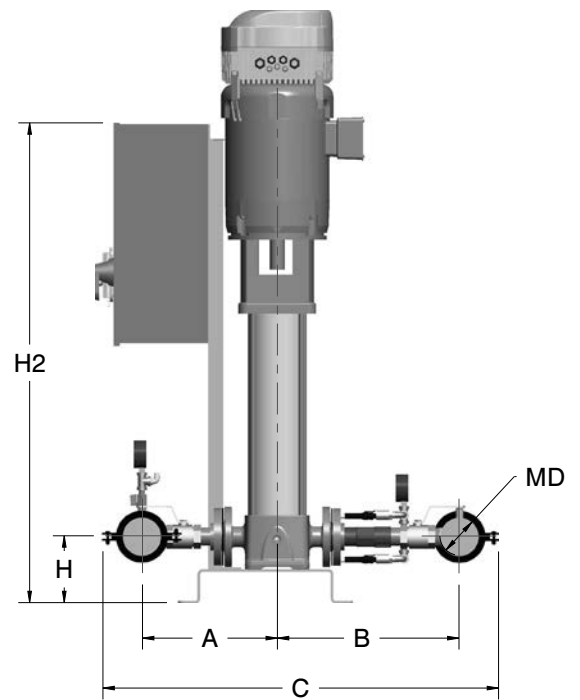
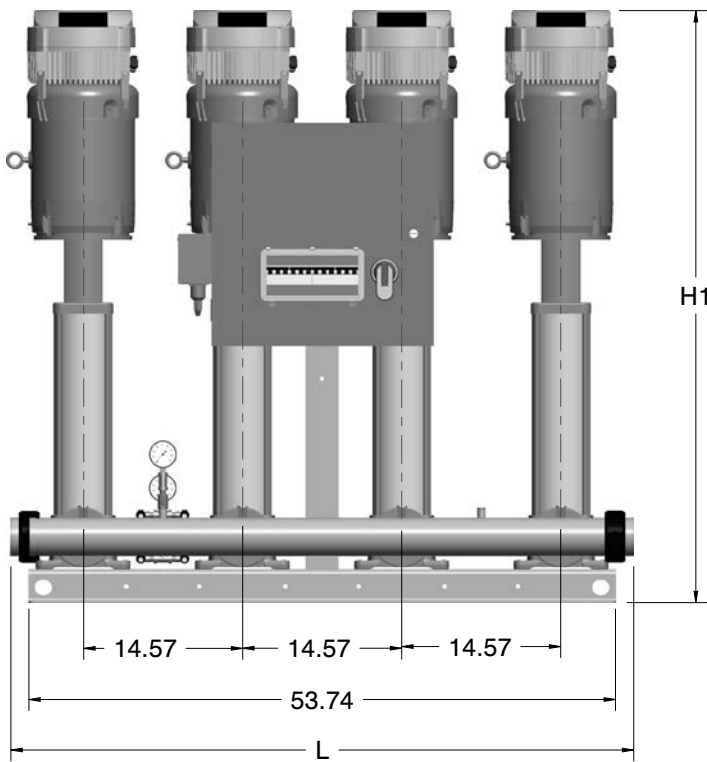
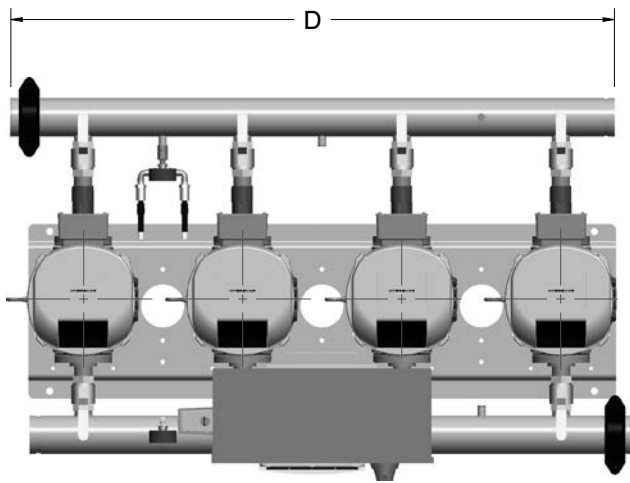
HV2D2	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
5SV4GD4F60	2	11.80	16.07	34.49	25.64	4.06	32.98	31.27	27.27	383.9
5SV6GE4F60	2	11.80	16.07	34.49	25.64	4.06	35.94	31.27	27.27	400.0
5SV9GF4F60	2	11.80	16.07	34.49	25.64	4.06	40.02	31.27	27.27	432.2
5SV12GG4C60	2	11.80	16.07	34.49	25.64	4.06	44.86	36.27	27.27	501.2
5SV15GG4C60	2	11.80	16.07	34.49	25.64	4.06	47.81	36.27	27.27	508.1
5SV18GH4F60	2	11.80	16.07	34.49	25.64	4.06	52.16	41.77	27.27	556.4

TechnoForce e-HV Dimentions 5SV



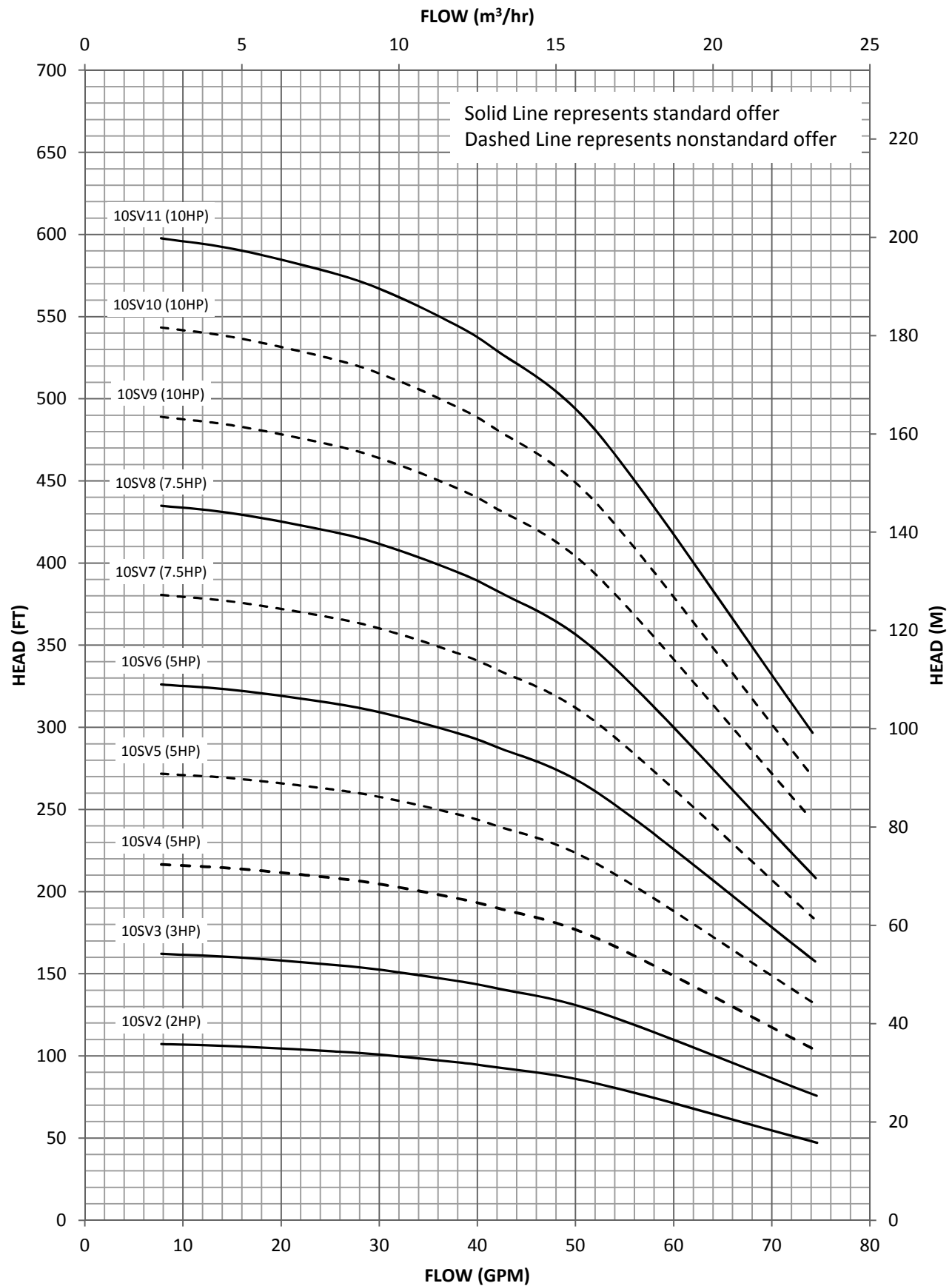
HV3D2	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
5SV4GD4F60	2	11.80	16.07	36.10	42.57	6.12	35.05	33.34	44.20	520.4
5SV6GE4F60	2	11.80	16.07	36.10	42.57	6.12	38.01	33.34	44.20	544.6
5SV9GF4F60	2	11.80	16.07	36.10	42.57	6.12	42.09	33.34	44.20	592.9
5SV12GG4C60	2	11.80	16.07	36.10	42.57	6.12	46.93	38.34	44.20	696.4
5SV15GG4C60	2	11.80	16.07	36.10	42.57	6.12	49.88	38.34	44.20	706.7
5SV18GH4F60	2	11.80	16.07	36.10	42.57	6.12	54.23	43.84	44.20	779.2
HV3D3	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
5SV4GD4F60	3	12.36	16.64	36.25	42.70	6.12	35.05	33.34	44.47	537.0
5SV6GE4F60	3	12.36	16.64	36.25	42.70	6.12	38.01	33.34	44.47	561.2
5SV9GF4F60	3	12.36	16.64	36.25	42.70	6.12	42.09	33.34	44.47	609.5
5SV12GG4C60	3	12.36	16.64	36.25	42.70	6.12	46.93	38.34	44.47	713.0
5SV15GG4C60	3	12.36	16.64	36.25	42.70	6.12	49.88	38.34	44.47	723.3
5SV18GH4F60	3	12.36	16.64	36.25	42.70	6.12	54.23	43.84	44.47	795.8

TechnoForce e-HV Dimentions 5SV

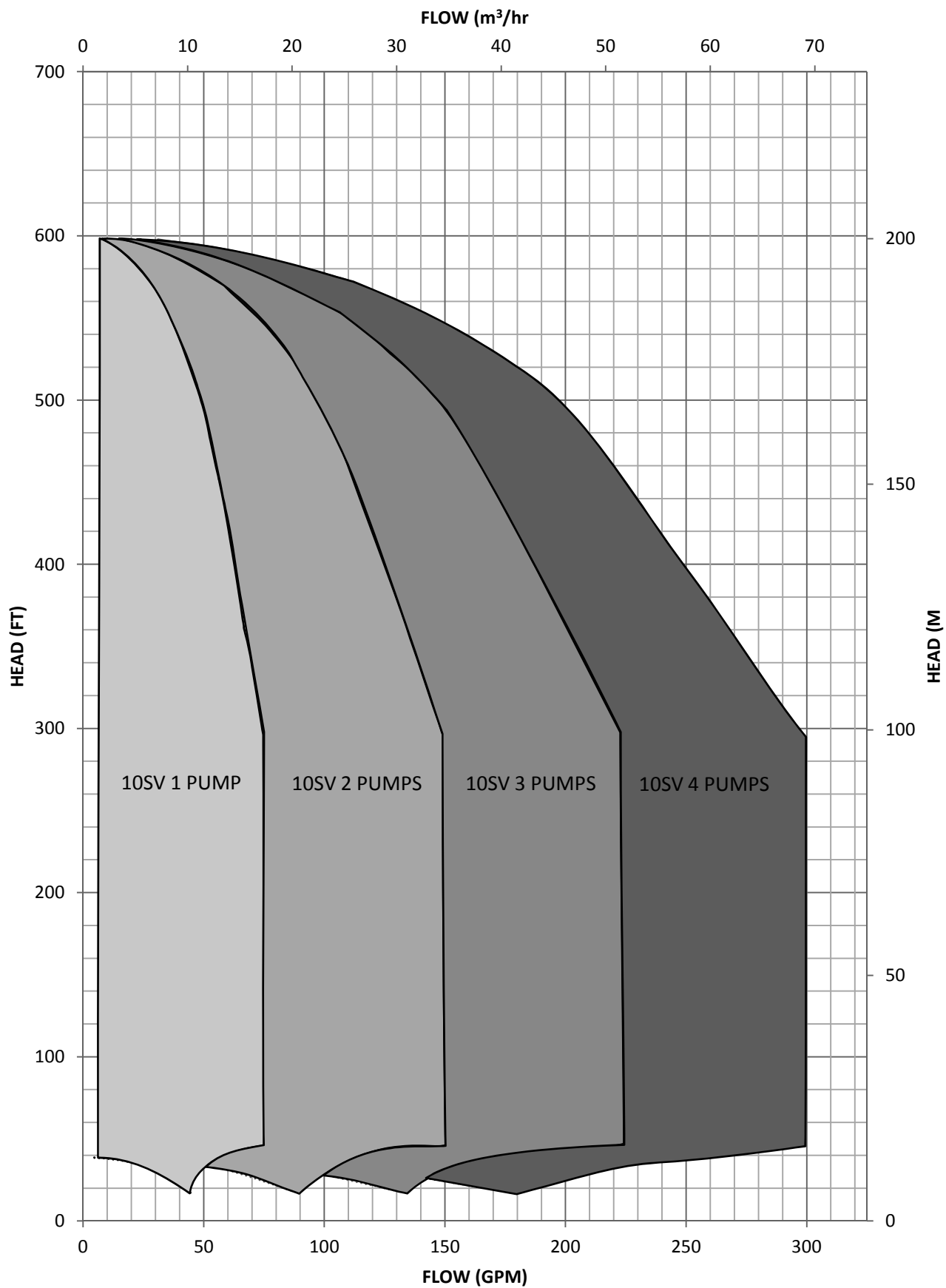


HV4D3	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
5SV4GD4F60	3	12.36	16.64	36.25	55.29	6.12	35.05	33.34	57.06	700.4
5SV6GE4F60	3	12.36	16.64	36.25	55.29	6.12	38.01	33.34	57.06	732.6
5SV9GF4F60	3	12.36	16.64	36.25	55.29	6.12	42.09	33.34	57.06	797.0
5SV12GG4C60	3	12.36	16.64	36.25	55.29	6.12	46.93	38.34	57.06	935.0
5SV15GG4C60	3	12.36	16.64	36.25	55.29	6.12	49.88	38.34	57.06	948.8
5SV18GH4F60	3	12.36	16.64	36.25	55.29	6.12	54.23	43.84	57.06	1045.4

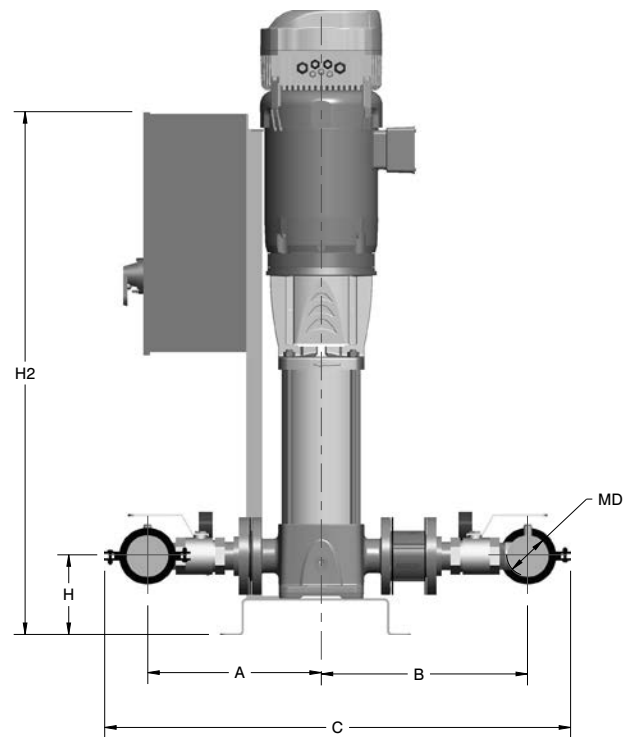
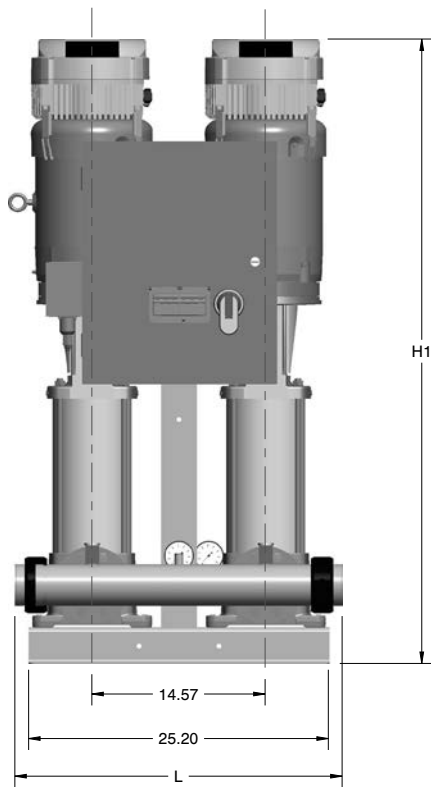
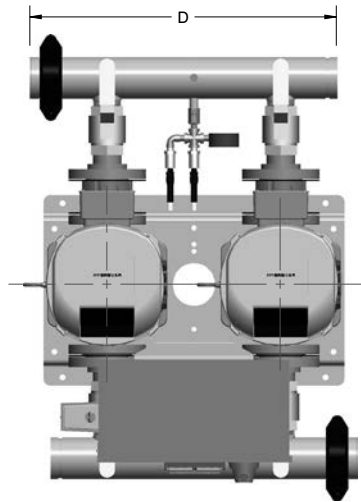
TechnoForce e-HV Curves 10SV



TechnoForce e-HV Curves 10SV



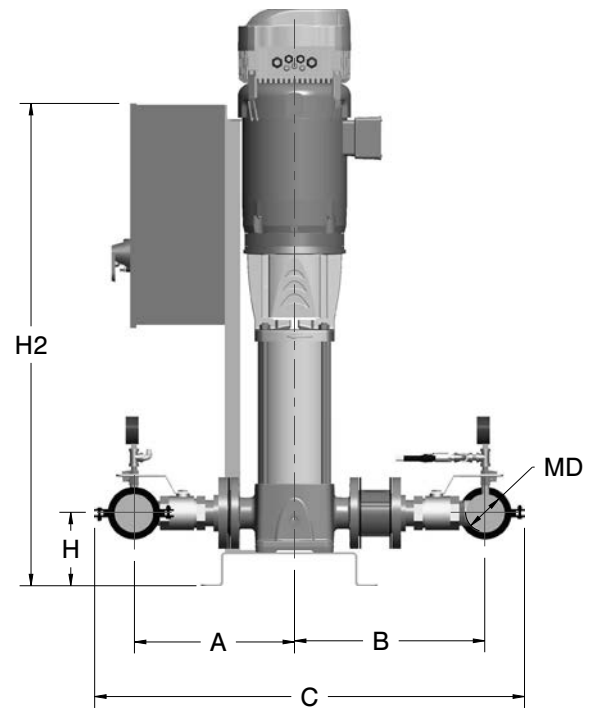
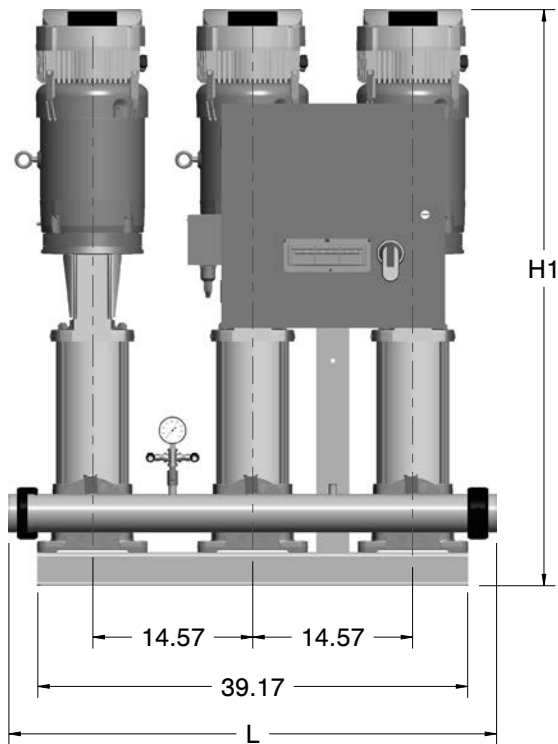
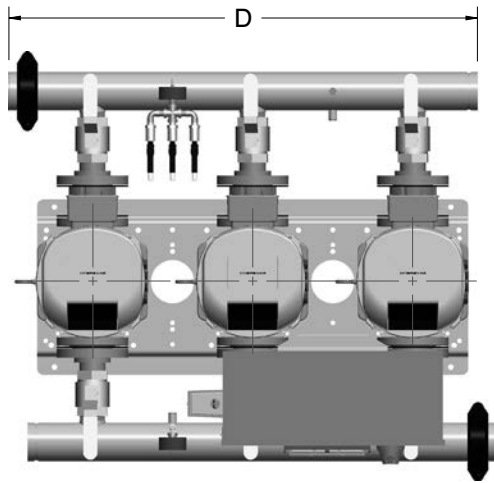
TechnoForce e-HV Dimensions 10SV



HV2D2	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
10SV2GE4F60	2	14.03	16.78	36.42	25.64	6.69	37.76	33.34	27.27	467.4
10SV3GF4F60	2	14.03	16.78	36.42	25.64	6.69	40.14	33.34	27.27	497.3
10SV6GG4C60	2	14.03	16.78	36.42	25.64	6.69	45.98	38.34	27.27	577.8
10SV8GH4F60	2	14.03	16.78	36.42	25.64	6.69	48.34	38.34	27.27	623.8
10SV11GJ4F60	2	14.03	16.78	36.42	25.64	6.69	52.50	43.84	27.27	741.1

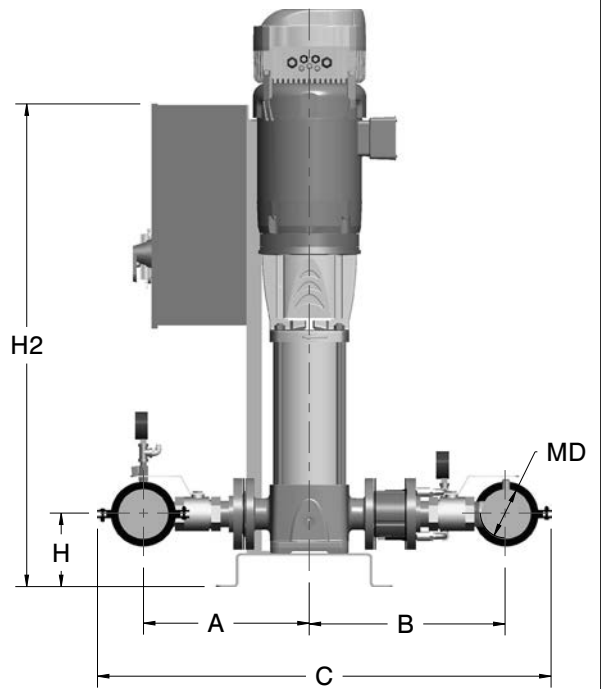
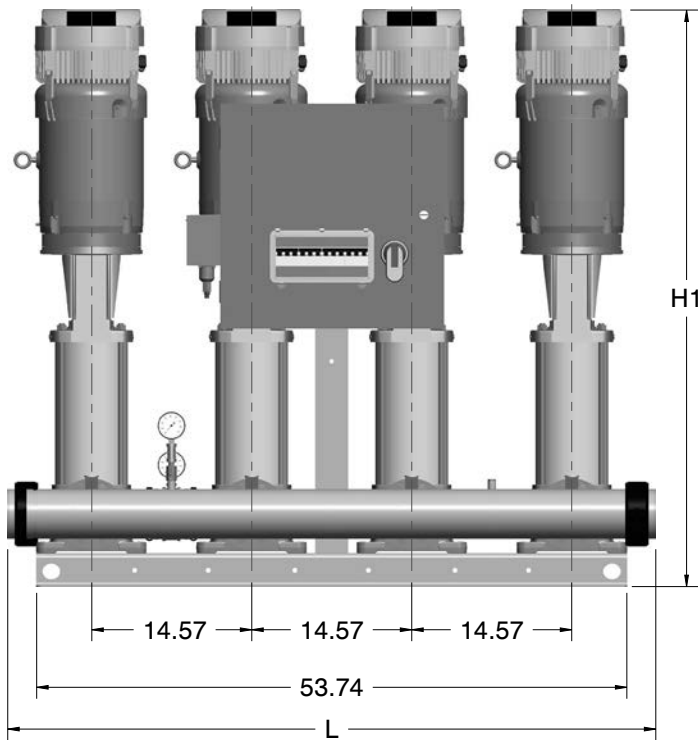
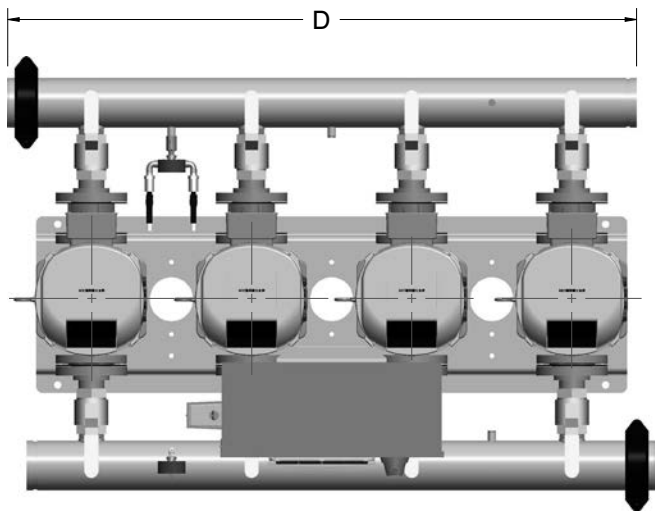
HV2D3	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
10SV2GE4F60	3	14.59	17.34	39.17	25.77	6.69	37.76	33.34	27.52	483.6
10SV3GF4F60	3	14.59	17.34	39.17	25.77	6.69	40.14	33.34	27.52	513.5
10SV6GG4C60	3	14.59	17.34	39.17	25.77	6.69	45.98	38.34	27.52	594.0
10SV8GH4F60	3	14.59	17.34	39.17	25.77	6.69	48.34	38.34	27.52	640.0
10SV11GJ4F60	3	14.59	17.34	39.17	25.77	6.69	52.50	43.84	27.52	757.3

TechnoForce e-HV Dimensions 10SV



HV3D3	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
10SV2GE4F60	3	14.59	17.34	39.17	42.70	6.69	37.76	33.34	44.45	634.3
10SV3GF4F60	3	14.59	17.34	39.17	42.70	6.69	40.14	33.34	44.45	679.1
10SV6GG4C60	3	14.59	17.34	39.17	42.70	6.69	45.98	38.34	44.45	799.9
10SV8GH4F60	3	14.59	17.34	39.17	42.70	6.69	48.34	38.34	44.45	868.9
10SV11GJ4F60	3	14.59	17.34	39.17	42.70	6.69	52.50	43.84	44.45	1044.8

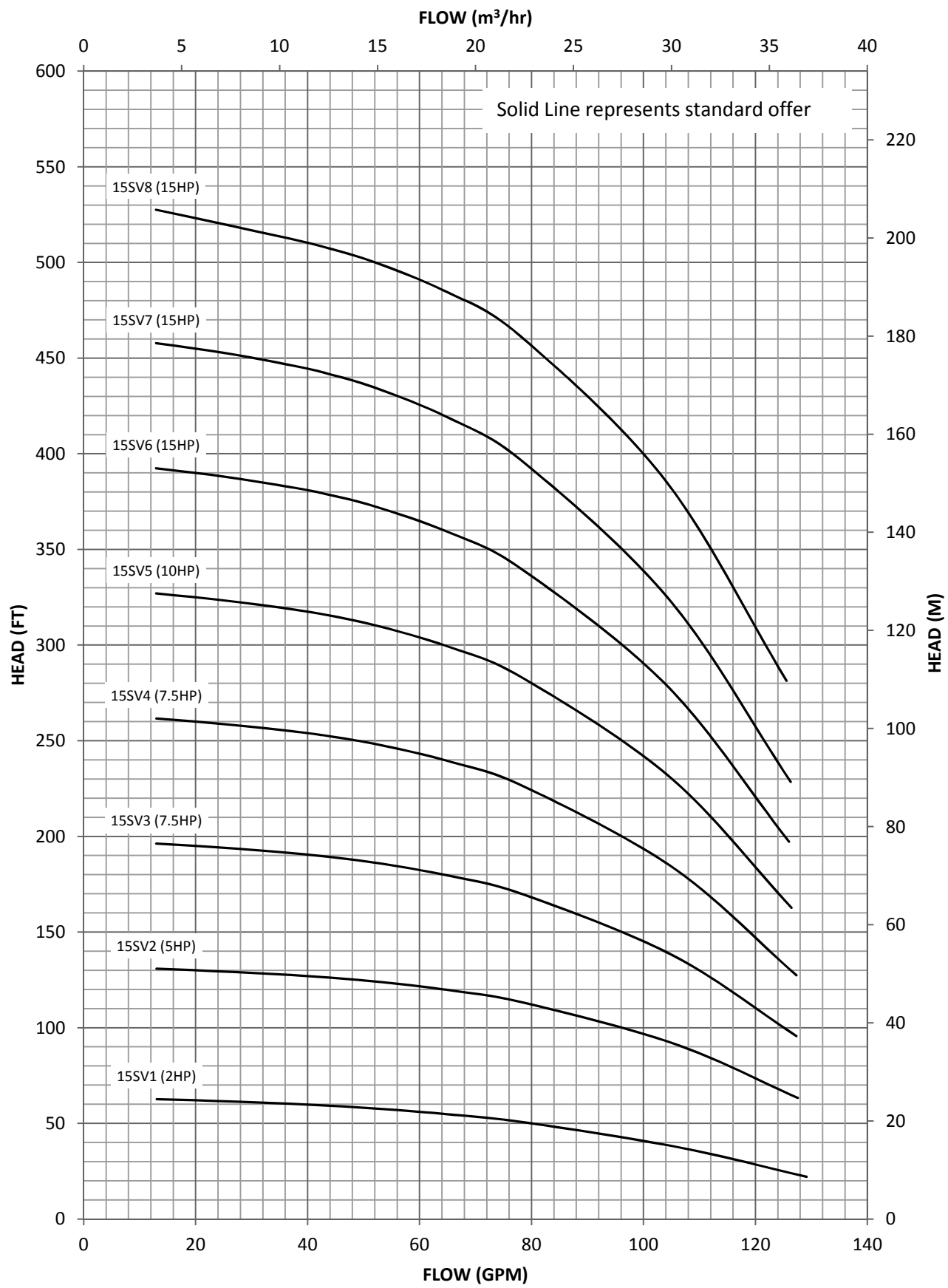
TechnoForce e-HV Dimensions 10SV



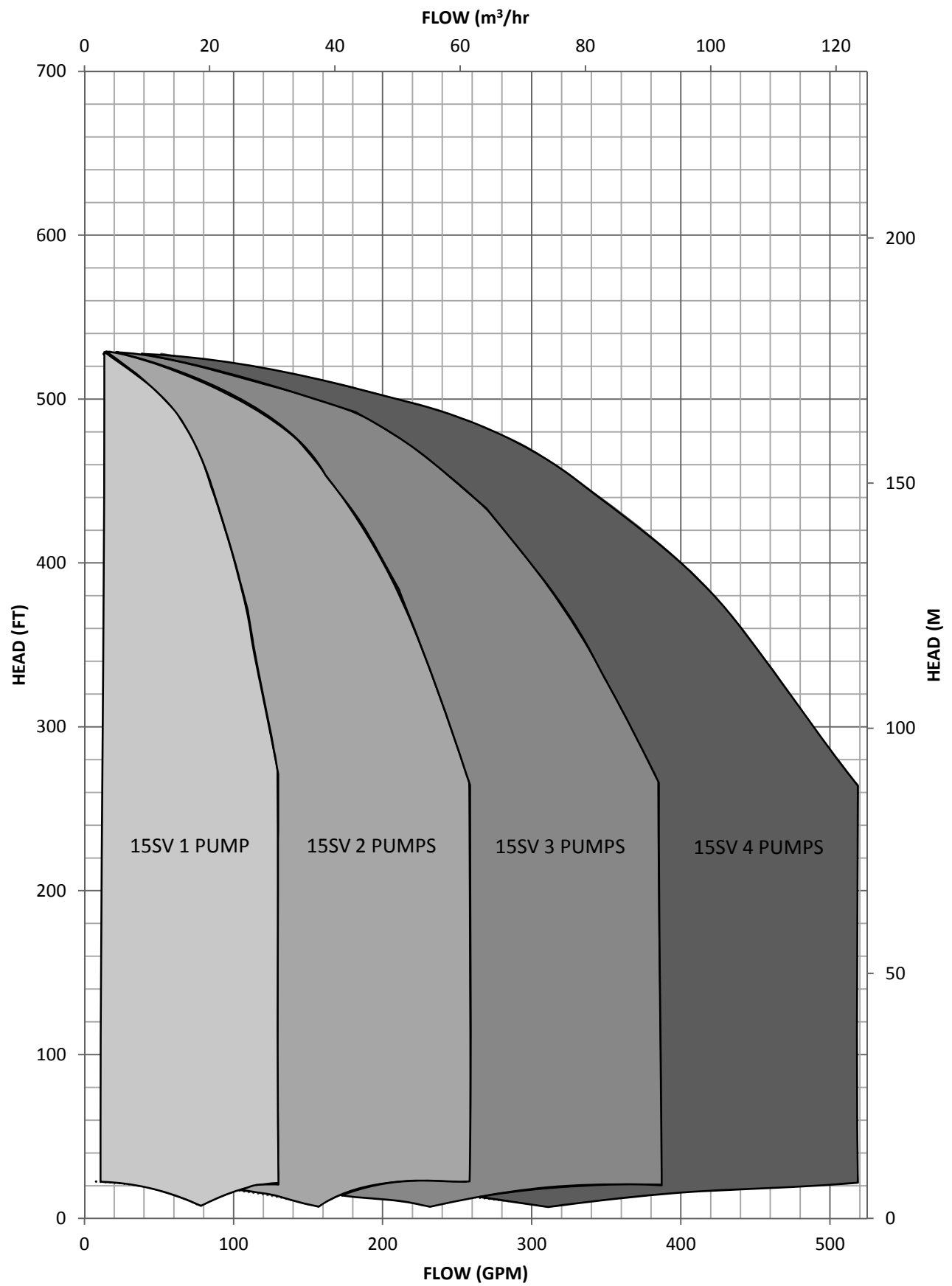
HV4D3	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
10SV2GE4F60	3	14.59	17.34	39.18	55.29	6.69	37.76	33.34	57.04	840.1
10SV3GF4F60	3	14.59	17.34	39.18	55.29	6.69	40.14	33.34	57.04	899.9
10SV6GG4C60	3	14.59	17.34	39.18	55.29	6.69	45.98	38.34	57.04	1060.9
10SV8GH4F60	3	14.59	17.34	39.18	55.29	6.69	48.34	38.34	57.04	1152.9
10SV11GJ4F60	3	14.59	17.34	39.18	55.29	6.69	52.50	43.84	57.04	1387.5

HV4D4	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
10SV2GE4F60	4	15.09	17.84	41.30	57.26	6.69	37.76	33.34	59.01	1008.0
10SV3GF4F60	4	15.09	17.84	41.30	57.26	6.69	40.14	33.34	59.01	1067.8
10SV6GG4C60	4	15.09	17.84	41.30	57.26	6.69	45.98	38.34	59.01	1228.8
10SV8GH4F60	4	15.09	17.84	41.30	57.26	6.69	48.34	38.34	59.01	1320.8
10SV11GJ4F60	4	15.09	17.84	41.30	57.26	6.69	52.50	43.84	59.01	1555.4

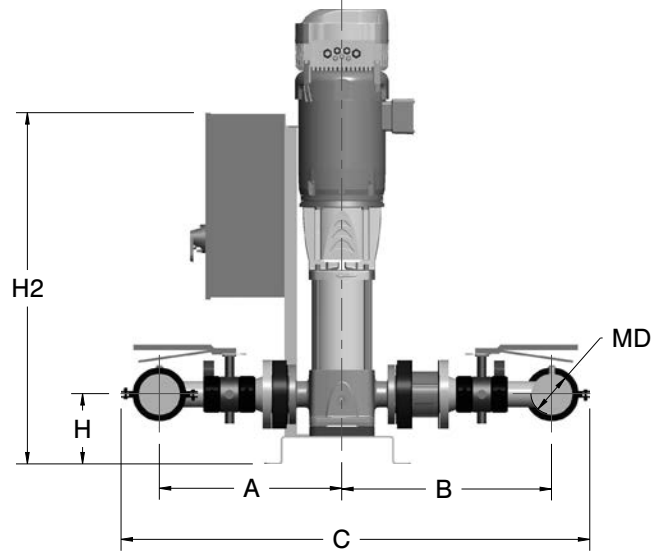
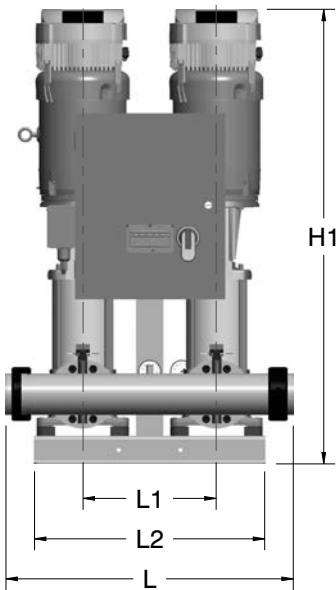
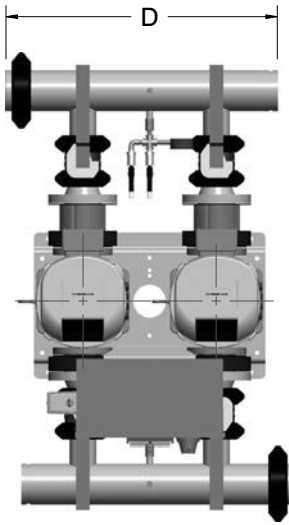
TechnoForce e-HV Curves 15SV



TechnoForce e-HV Curves 15SV



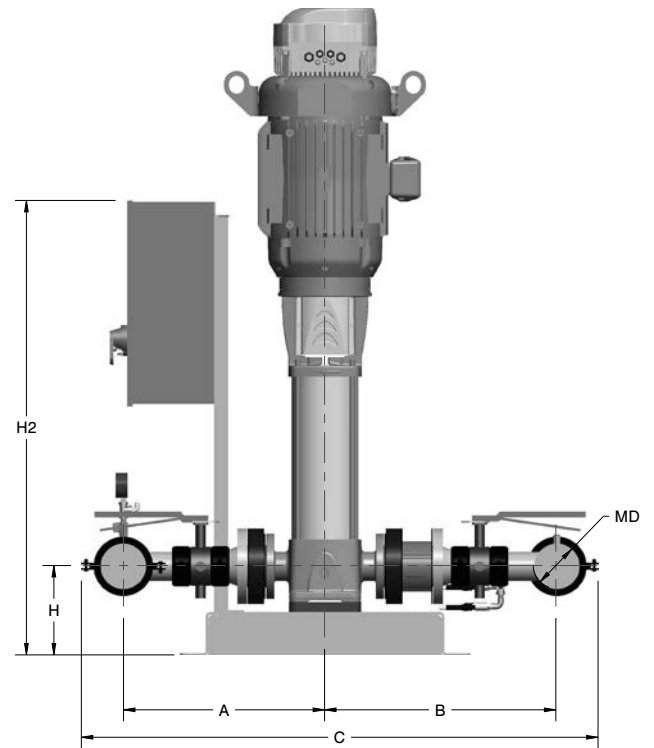
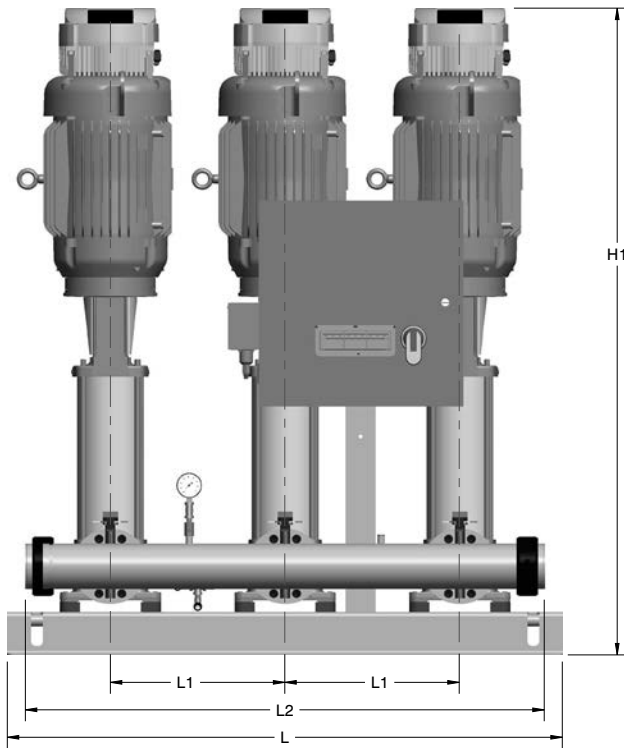
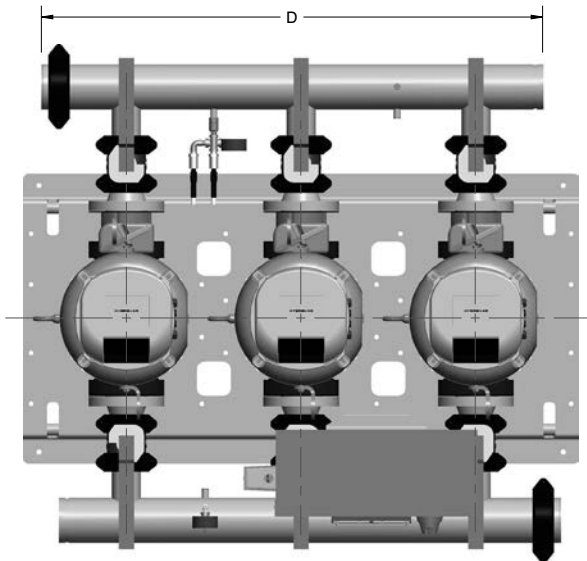
TechnoForce e-HV Dimensions 15SV



HV2D3	MD	A	B	C	D	H	H1	H2	L	L1	L2	Wt.(lb)
15SV1GE4F60	3	19.47	22.47	49.19	29.70	7.69	40.81	38.34	31.45	14.57	25.20	642.7
15SV2GG4C60	3	19.47	22.47	49.19	29.70	7.69	43.59	38.34	31.45	14.57	25.20	739.3
15SV3GH4F60	3	19.47	22.47	49.19	29.70	7.69	45.99	38.34	31.45	14.57	25.20	746.2
15SV4GH4F60	3	19.47	22.47	49.19	29.70	7.69	47.93	38.34	31.45	14.57	25.20	789.9
15SV5GJ4F60	3	19.47	22.47	49.19	29.70	7.69	49.77	38.34	31.45	14.57	25.20	895.7
15SV6GK4F60	3	19.47	22.47	49.19	32.46	8.87	59.82	45.02	37.80	17.32	37.80	1167.6
15SV7GK4F60	3	19.47	22.47	49.19	32.46	8.87	62.34	45.02	37.80	17.32	37.80	1186.0
15SV8GK4F60	3	19.47	22.47	49.19	32.46	8.87	64.23	45.02	37.80	17.32	37.80	1190.6

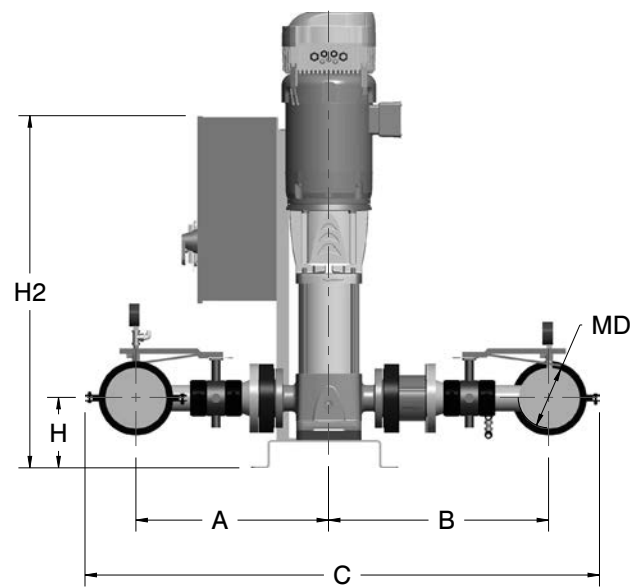
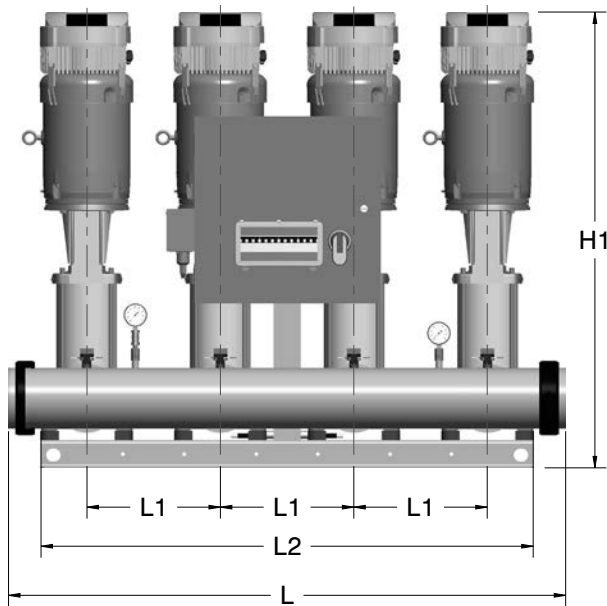
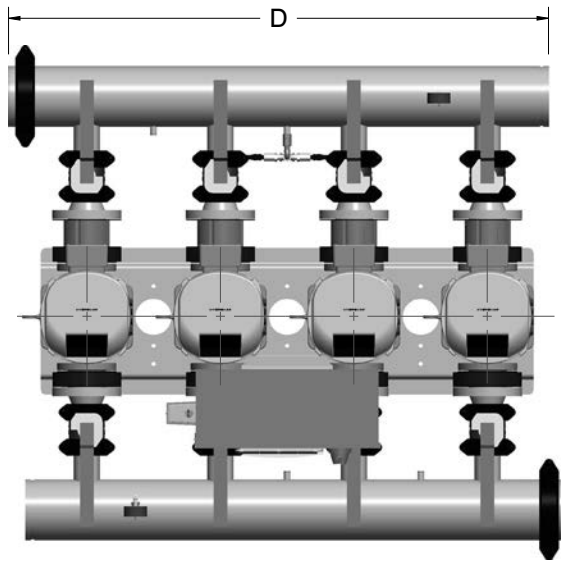
HV2D4	MD	A	B	C	D	H	H1	H2	L	L1	L2	Wt.(lb)
15SV1GE4F60	4	19.97	22.97	51.32	29.70	7.69	40.81	38.34	31.45	14.57	25.20	728.5
15SV2GG4C60	4	19.97	22.97	51.32	29.70	7.69	43.59	38.34	31.45	14.57	25.20	825.1
15SV3GH4F60	4	19.97	22.97	51.32	29.70	7.69	45.99	38.34	31.45	14.57	25.20	832.0
15SV4GH4F60	4	19.97	22.97	51.32	29.70	7.69	47.93	38.34	31.45	14.57	25.20	875.7
15SV5GJ4F60	4	19.97	22.97	51.32	29.70	7.69	49.77	38.34	31.45	14.57	25.20	981.5
15SV6GK4F60	4	19.97	22.97	51.32	32.46	8.87	59.82	45.02	37.80	17.32	37.80	1182.1
15SV7GK4F60	4	19.97	22.97	51.32	32.46	8.87	62.34	45.02	37.80	17.32	37.80	1200.5
15SV8GK4F60	4	19.97	22.97	51.32	32.46	8.87	64.23	45.02	37.80	17.32	37.80	1205.1

TechnoForce e-HV Dimensions 15SV



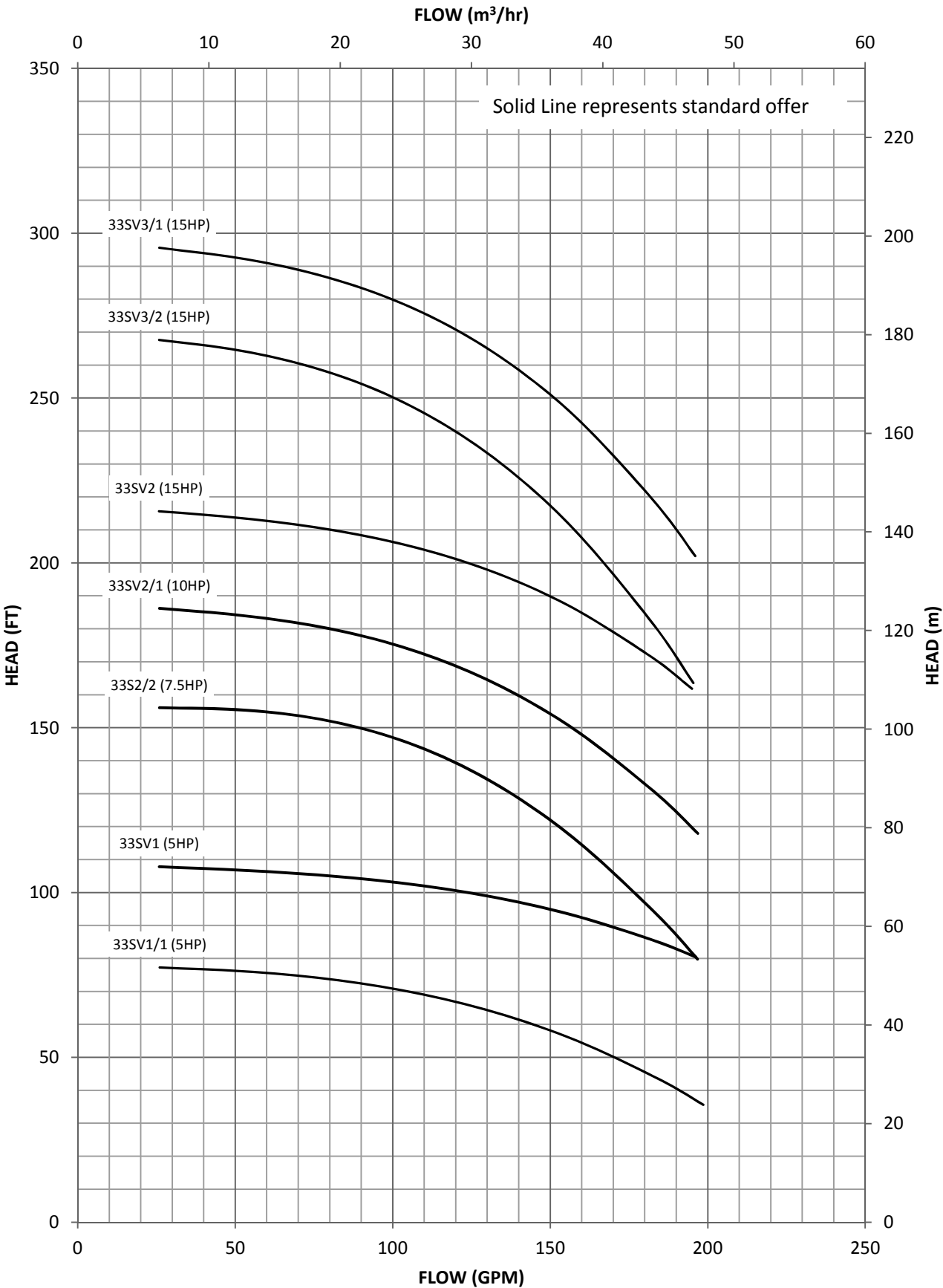
HV3D4	MD	A	B	C	D	H	H1	H2	L	L1	L2	Wt.(lb)
15SV1GE4F60	4	19.97	22.97	51.32	44.27	7.69	40.81	38.34	39.17	14.57	46.02	998.1
15SV2GG4C60	4	19.97	22.97	51.32	44.27	7.69	43.59	38.34	39.17	14.57	46.02	1101.5
15SV3GH4F60	4	19.97	22.97	51.32	44.27	7.69	45.99	38.34	39.17	14.57	46.02	1148.7
15SV4GH4F60	4	19.97	22.97	51.32	44.27	7.69	47.93	38.34	39.17	14.57	46.02	1159.1
15SV5GJ4F60	4	19.97	22.97	51.32	44.27	7.69	49.77	38.34	39.17	14.57	46.02	1275.2
15SV6GK4F60	4	19.97	22.97	51.32	49.78	8.87	59.82	45.02	55.12	17.32	51.53	1688.5
15SV7GK4F60	4	19.97	22.97	51.32	49.78	8.87	62.34	45.02	55.12	17.32	51.53	1716.1
15SV8GK4F60	4	19.97	22.97	51.32	49.78	8.87	64.23	45.02	55.12	17.32	51.53	1723.0

TechnoForce e-HV Dimensions 15SV

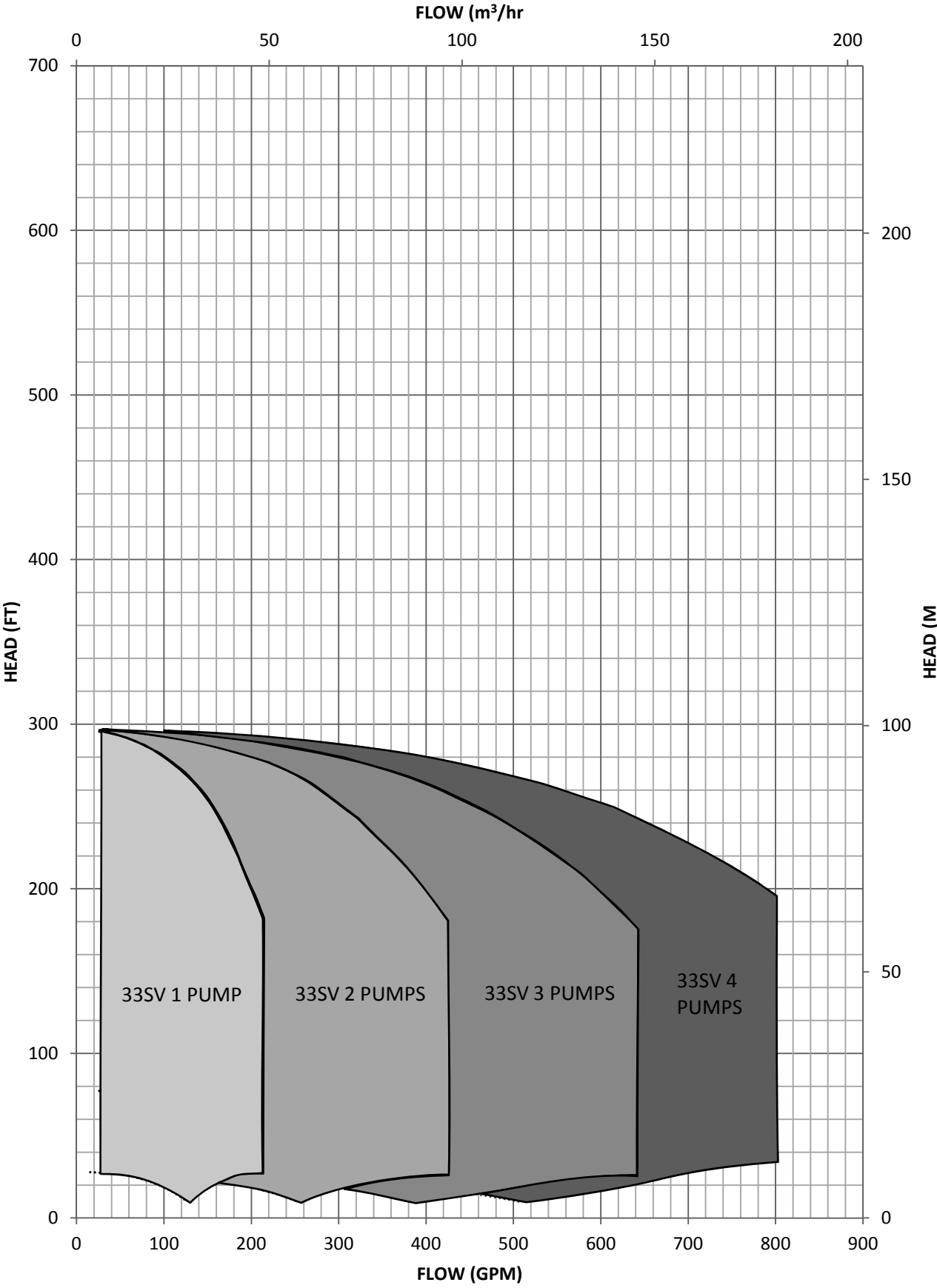


HV4D4	MD	A	B	C	D	H	H1	H2	L	L1	L2	Wt.(lb)
15SV1GE4F60	4	19.97	22.97	51.32	57.26	7.69	40.81	38.34	59.01	14.57	53.74	1175.6
15SV2GG4C60	4	19.97	22.97	51.32	57.26	7.69	43.59	38.34	59.01	14.57	53.74	1368.8
15SV3GH4F60	4	19.97	22.97	51.32	57.26	7.69	45.99	38.34	59.01	14.57	53.74	1456.2
15SV4GH4F60	4	19.97	22.97	51.32	57.26	7.69	47.93	38.34	59.01	14.57	53.74	1470.0
15SV5GJ4F60	4	19.97	22.97	51.32	57.26	7.69	49.77	38.34	59.01	14.57	53.74	1681.6
15SV6GK4F60	4	19.97	22.97	51.32	65.53	8.87	59.82	45.02	74.01	17.32	74.01	2249.9
15SV7GK4F60	4	19.97	22.97	51.32	65.53	8.87	62.34	45.02	74.01	17.32	74.01	2286.7
15SV8GK4F60	4	19.97	22.97	51.32	65.53	8.87	64.23	45.02	74.01	17.32	74.01	2295.9
HV4D6	MD	A	B	C	D	H	H1	H2	L	L1	L2	Wt.(lb)
15SV1GE4F60	6	21.03	24.03	56.18	58.96	7.69	40.81	38.34	60.84	14.57	53.74	1230.0
15SV2GG4C60	6	21.03	24.03	56.18	58.96	7.69	43.59	38.34	60.84	14.57	53.74	1423.2
15SV3GH4F60	6	21.03	24.03	56.18	58.96	7.69	45.99	38.34	60.84	14.57	53.74	1510.6
15SV4GH4F60	6	21.03	24.03	56.18	58.96	7.69	47.93	38.34	60.84	14.57	53.74	1524.4
15SV5GJ4F60	6	21.03	24.03	56.18	58.96	7.69	49.77	38.34	60.84	14.57	53.74	1736.0
15SV6GK4F60	6	21.03	24.03	56.18	67.23	8.87	59.82	45.02	74.01	17.32	74.01	2310.1
15SV7GK4F60	6	21.03	24.03	56.18	67.23	8.87	62.34	45.02	74.01	17.32	74.01	2346.9
15SV8GK4F60	6	21.03	24.03	56.18	67.23	8.87	64.23	45.02	74.01	17.32	74.01	2356.1

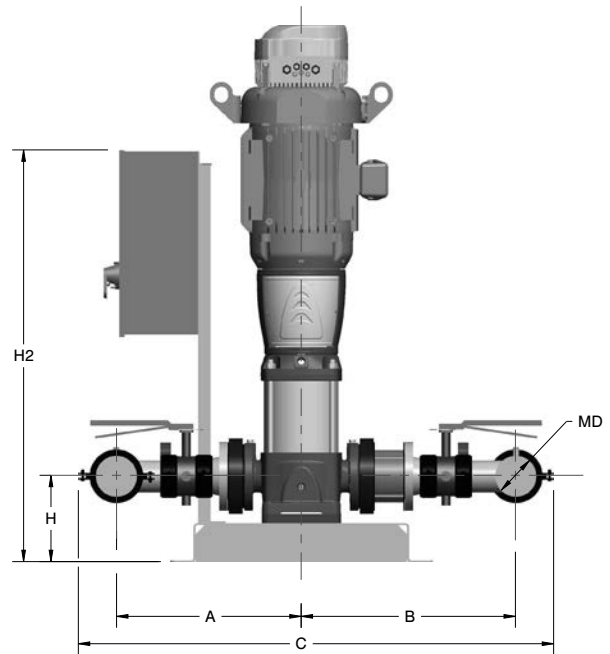
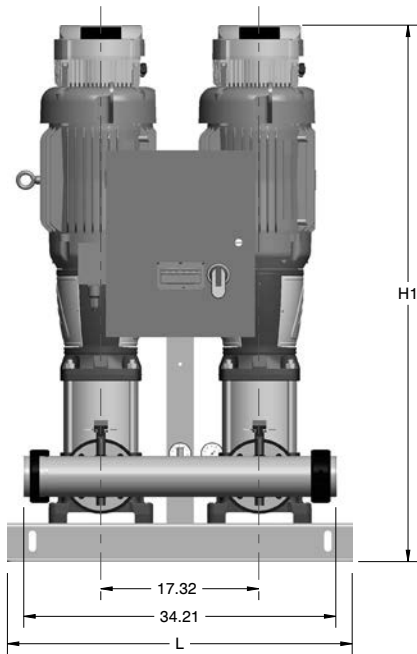
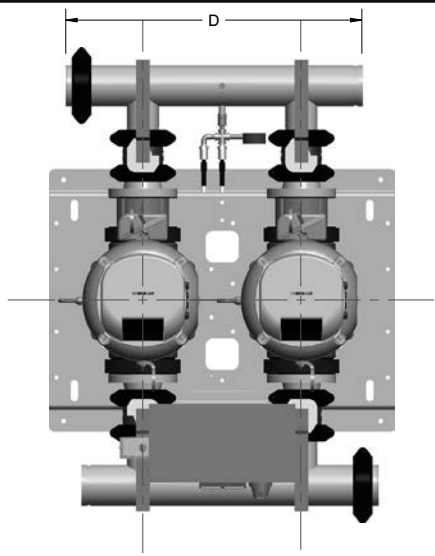
TechnoForce e-HV Curves 33SV



TechnoForce e-HV Curves 33SV



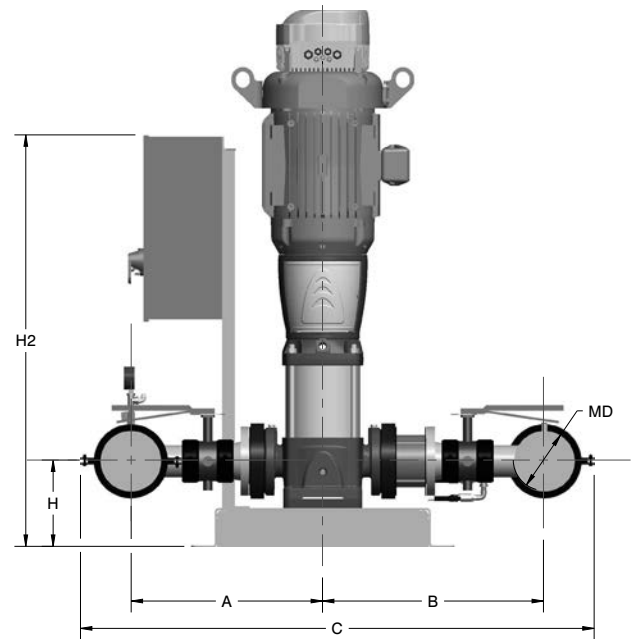
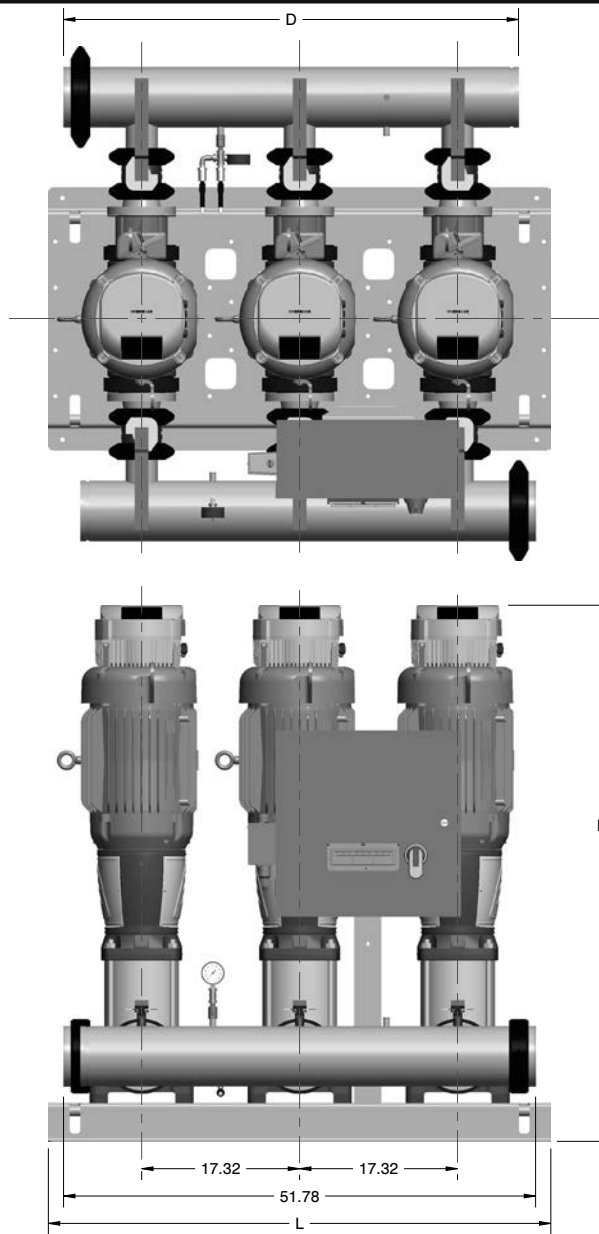
TechnoForce e-HV Dimensions 33SV



HV2D3	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
33SV11GG4C60	3	23.36	26.61	49.97	32.46	9.46	46.57	45.13	37.80	1053.8
33SV10GH4F60	3	23.36	26.61	49.97	32.46	9.46	46.57	45.13	37.80	1090.6
33SV22GH4F60	3	23.36	26.61	49.97	32.46	9.46	49.49	45.13	37.80	1113.6
33SV21GJ4F60	3	23.36	26.61	49.97	32.46	9.46	49.49	45.13	37.80	1198.7
33SV20GK4F60	3	23.36	26.61	49.97	32.46	9.46	49.49	45.13	37.80	1366.6
33SV32GK4F60	3	23.36	26.61	49.97	32.46	9.46	58.80	50.63	37.80	1389.6
33SV31GK4F60	3	23.36	26.61	49.97	32.46	9.46	58.80	50.63	37.80	1389.6

HV2D4	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
33SV11GG4C60	4	20.24	23.49	52.10	32.46	9.46	46.57	45.13	37.80	1068.5
33SV10GH4F60	4	20.24	23.49	52.10	32.46	9.46	46.57	45.13	37.80	1105.3
33SV22GH4F60	4	20.24	23.49	52.10	32.46	9.46	49.49	45.13	37.80	1128.3
33SV21GJ4F60	4	20.24	23.49	52.10	32.46	9.46	49.49	45.13	37.80	1213.4
33SV20GK4F60	4	20.24	23.49	52.10	32.46	9.46	49.49	45.13	37.80	1381.3
33SV32GK4F60	4	20.24	23.49	52.10	32.46	9.46	58.80	50.63	37.80	1404.3
33SV31GK4F60	4	20.24	23.49	52.10	32.46	9.46	58.80	50.63	37.80	1404.3

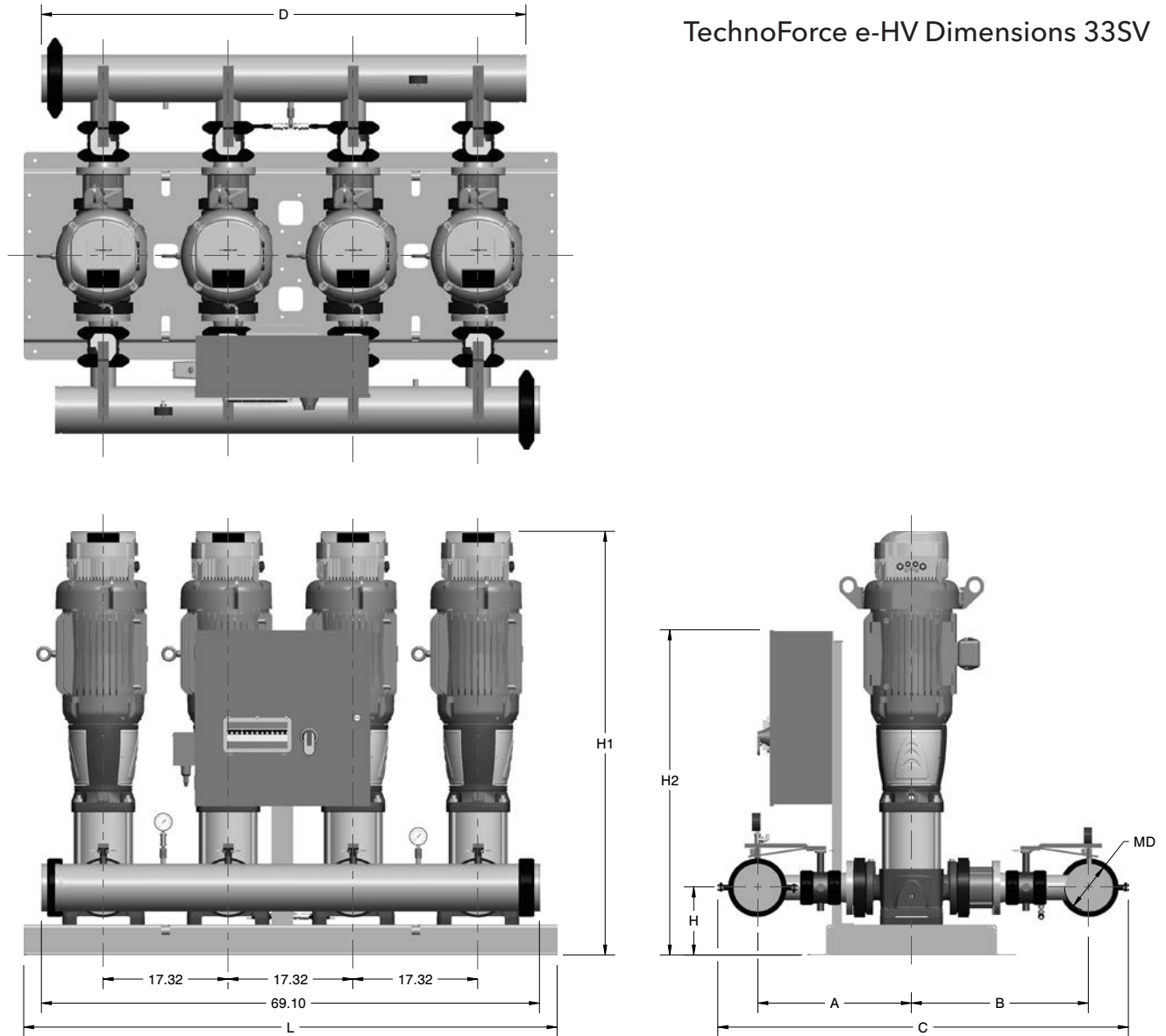
TechnoForce e-HV Dimensions 33SV



HV3D4	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
33SV11GG4C60	4	20.24	23.17	51.79	49.78	9.46	46.57	45.13	55.12	1519.3
33SV10GH4F60	4	20.24	23.17	51.79	49.78	9.46	46.57	45.13	55.12	1574.5
33SV22GH4F60	4	20.24	23.17	51.79	49.78	9.46	49.49	45.13	55.12	1609.0
33SV21GJ4F60	4	20.24	23.17	51.79	49.78	9.46	49.49	45.13	55.12	1736.6
33SV20GK4F60	4	20.24	23.17	51.79	49.78	9.46	49.49	45.13	55.12	1988.5
33SV32GK4F60	4	20.24	23.17	51.79	49.78	9.46	58.80	50.63	55.12	2023.0
33SV31GK4F60	4	20.24	23.17	51.79	49.78	9.46	58.80	50.63	55.12	2023.0

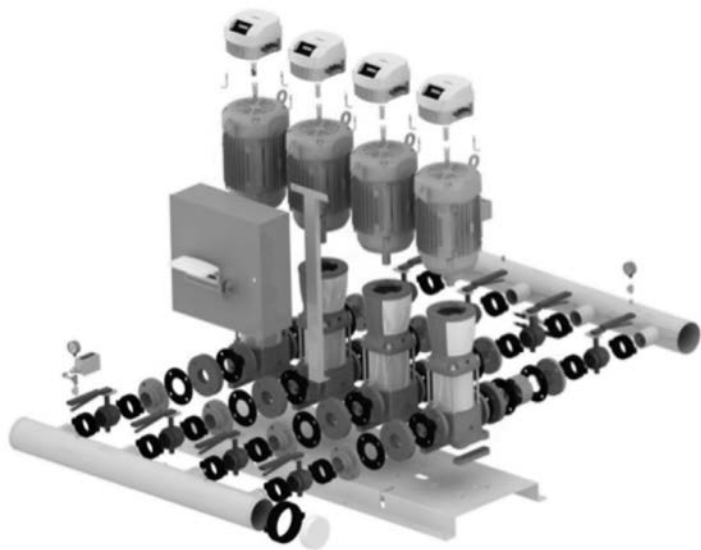
HV3D6	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
33SV11GG4C60	6	20.99	24.24	56.34	49.91	9.46	46.57	45.13	55.12	1565.4
33SV10GH4F60	6	20.99	24.24	56.34	49.91	9.46	46.57	45.13	55.12	1620.6
33SV22GH4F60	6	20.99	24.24	56.34	49.91	9.46	49.49	45.13	55.12	1655.1
33SV21GJ4F60	6	20.99	24.24	56.34	49.91	9.46	49.49	45.13	55.12	1782.7
33SV20GK4F60	6	20.99	24.24	56.34	49.91	9.46	49.49	45.13	55.12	2034.6
33SV32GK4F60	6	20.99	24.24	56.34	49.91	9.46	58.80	50.63	55.12	2069.1
33SV31GK4F60	6	20.99	24.24	56.34	49.91	9.46	58.80	50.63	55.12	2069.1

TechnoForce e-HV Dimensions 33SV



HV4D6	MD	A	B	C	D	H	H1	H2	L	Wt.(lb)
33SV11GG4C60	6	21.30	24.55	56.97	67.23	9.46	46.57	45.13	74.02	2082.3
33SV10GH4F60	6	21.30	24.55	51.79	49.78	9.46	46.57	45.13	74.02	2155.9
33SV22GH4F60	6	21.30	24.55	51.79	49.78	9.46	49.49	45.13	74.02	2201.9
33SV21GJ4F60	6	21.30	24.55	51.79	49.78	9.46	49.49	45.13	74.02	2372.1
33SV20GK4F60	6	21.30	24.55	51.79	49.78	9.46	49.49	45.13	74.02	2707.9
33SV32GK4F60	6	21.30	24.55	51.79	49.78	9.46	58.80	50.63	74.02	2753.9
33SV31GK4F60	6	21.30	24.55	51.79	49.78	9.46	58.80	50.63	74.02	2753.9

Product Key



HV		3		D		3		-	10SV6GG4C60		-	3		B		M	
Series		# of Pumps		Voltage		Header		-	Pump		-	Pump Split		Brand		Com	
HV	eHV	2 Duplex		D	460/3/60	2 2 inch - 105GPM		-	XXXXXXXXXX	-	1 100 + Stdbby		B	B&G	M	Modbus	
		3 Triplex				3 3 inch - 230GPM					2 50/50						
		4 Quadplex				4 4 inch - 400GPM					3 50/50 + Stdbby						
						6 6 inch - 900GPM					4 33/33/33						
											5 33/33/33 + Stdbby						
											6 25/25/25/25						

Notes

[illegible]

Notes

[illegible]

Xylem |'zīləm|

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

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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