EBARA VARIABLE SPEED and CONSTANT PRESSURE BOOSTER SYSTEM

The EBARA Hydro Booster system consists of two or more EVM pumps coupled in parallel and mounted on a common baseplate, integrally provided with a EBARA Hydro Controller electrical cabinet and all the necessary common pipe work and fittings. All EBARA Hydro Booster system is factory assembled and tested, pre-set according to customer requirement. It is ready-to-connect at site. Scope of supply includes instruction manual.

Fully assembled and certified Hydro Booster set type UN generally consist of multiple pumps arranged in parallel, mounted on a common baseframe, pipework complete with EBARA microcomputer controller unit, frequency inverters, pressure sensor and complete with all internal electrical wiring.

EBARA Hydro Booster system type UN is a variable speed control booster system utilising advance and proven microcomputer namely EBARA Hydro Controller unit to provide constant pressure to suit your system requirement.

Applications

- General water supply i.e schools, hotels, hospitals, high-rise buildings, etc.
- Industrial water supply
- Irrigation system for garden, parks, golf courses, etc.
- All booster pump station

Pumps

2 or more EBARA pumps are arranged for parallel operation. All parts contact with liquid are of stainless steel.

Baseframe & Common Pipe work

Galvanized pipe work enable easy connection to all commonly used pipe fittings. The pipework is sized suitable for maximum hydraulic unit capacity. Check valve and suitable gate valves are fitted for optimal system operation.

Diaphragm Pressure Tank

A pre-charged diaphragm tank is fitted to the discharge pipe with a compatible Butyl-rubber diaphragm. Generally this tank serves basic functions of supplying water at a very low flow and minimising effect of water hammering.

Pressure Sensor

1-5V to transmit control type signals to the EBARA Hydro Booster Controller, located at the discharge side or/suction side (depend on systems offered).

Frequency Converter

Constant water pressure is achieved due to variable speed drive made possible by the use of frequency converters. To ensure highly reliable EBARA system, each pump is equipped with frequency converter unit, thus ensure optimal operation of pumping system.

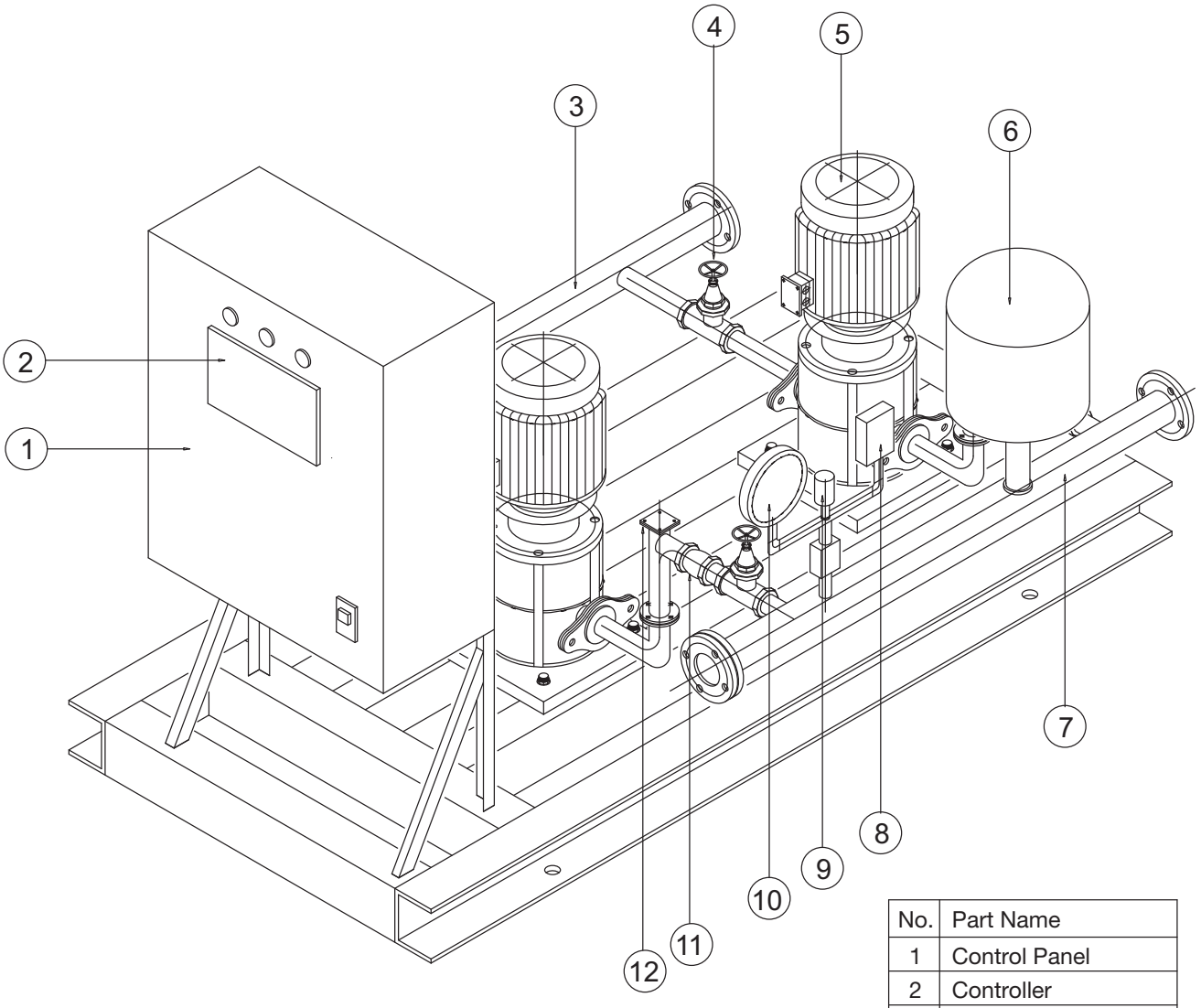
Flow Switch

Flow switch is used to enhance system operation by receiving signal to cut-out pump operation during low-flow or no-flow condition. Thus can be used as dry-running protection device.

Ebara Controller

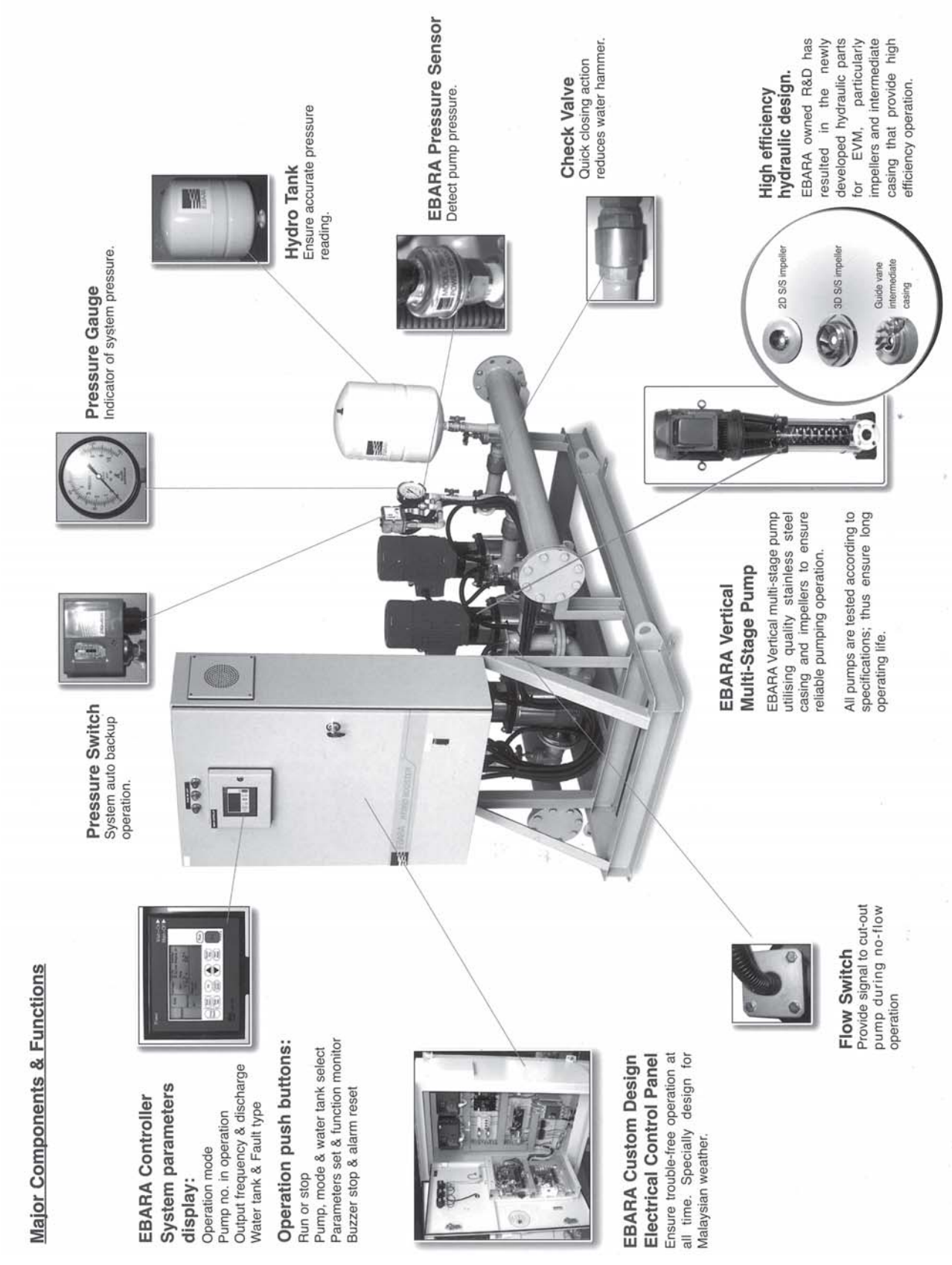
This micro-processor controller unit is fitted to the Hydro Booster Control Panel to control variable speed pumping operation. It provides 'One-touch' operating possibility to interpret various signals from pressure transmitter and flow switch, thereby enhance constant pressure system operation. In addition, it provides various advance operative functions that maintain constant pressure and trouble-free water supply system.

ISOMETRIC DRAWING



No.	Part Name
1	Control Panel
2	Controller
3	Suction Manifold
4	Gate Valve
5	Pump
6	Expansion Tank
7	Discharge Manifold
8	Pressure Switch
9	Pressure Transmitter
10	Pressure Gauge
11	Check Valve
12	Flow Switch

EBARA VARIABLE SPEED BOOSTER SYSTEM



EBARA VARIABLE SPEED BOOSTER SYSTEM

1. Advance energy saving system

This unit is operating on variable speed drive control incorporated with logic control system. Thus saving energy for most demanding conditions.

2. Constant pressure water supply

The variable speed pumping system would ensure constant water pressure for the furthest point with pipe friction loss compensation capability.

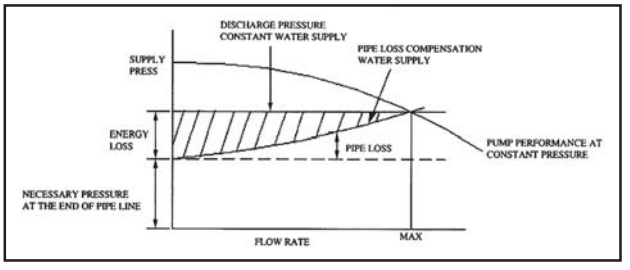


Fig. Pipe Friction Loss Compensation Operation

3. Highly reliable inverters being used

Individual frequency inverters are provided for each pump, thus reduces emergency risk with automatic change over and back-up system. During pump or inverter failure, second pump will start automatically and back-up operation to ensure water supply continues.

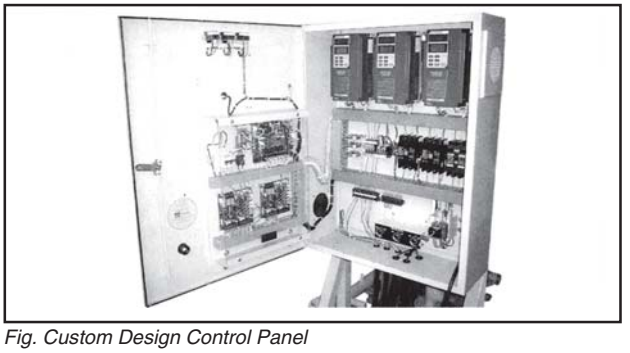


Fig. Custom Design Control Panel

4. User-friendly operation

Ebara unique controller permits easy access and displays most data in the front panel. The controller is a microcomputer board with LCD operation adjustment and instant information display.

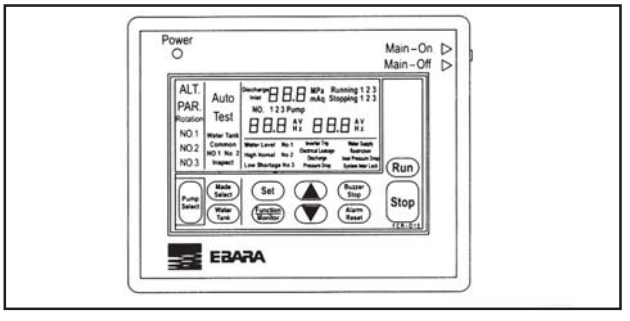


Fig. Ebara Proven - Designed Controller

5. Cyclic & forced cyclic operation

During continuous operation, if the pump continuously run over 6 hours, second pump will start to run parallel and then change over to new one. This would ensure even operating hours for multiple pumping system; thus prolong life span of pumps.

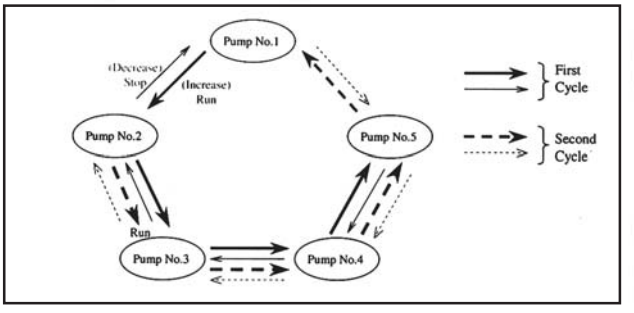


Fig. Cyclic Operating System

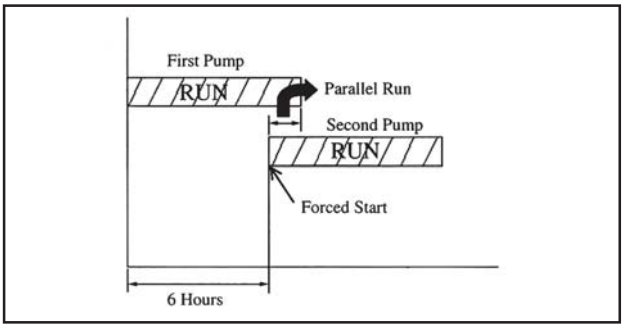


Fig. Forced Cyclic Operation

6. APNC & APR System

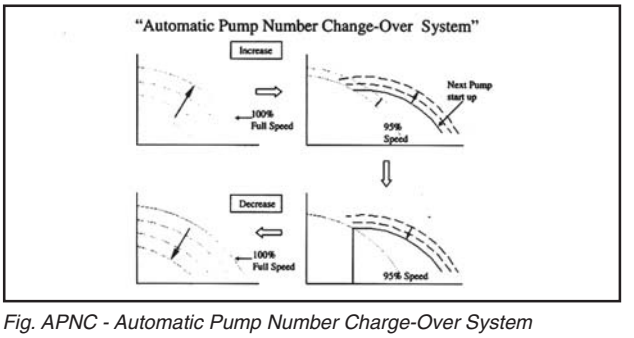


Fig. APNC - Automatic Pump Number Charge-Over System

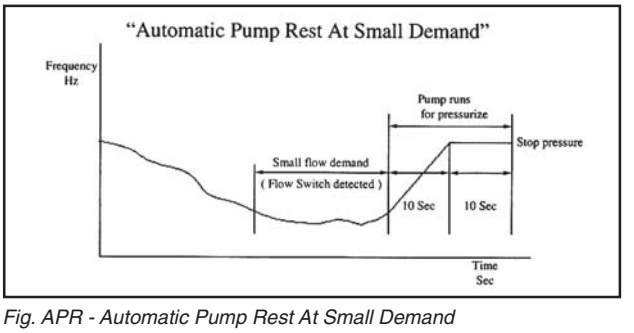
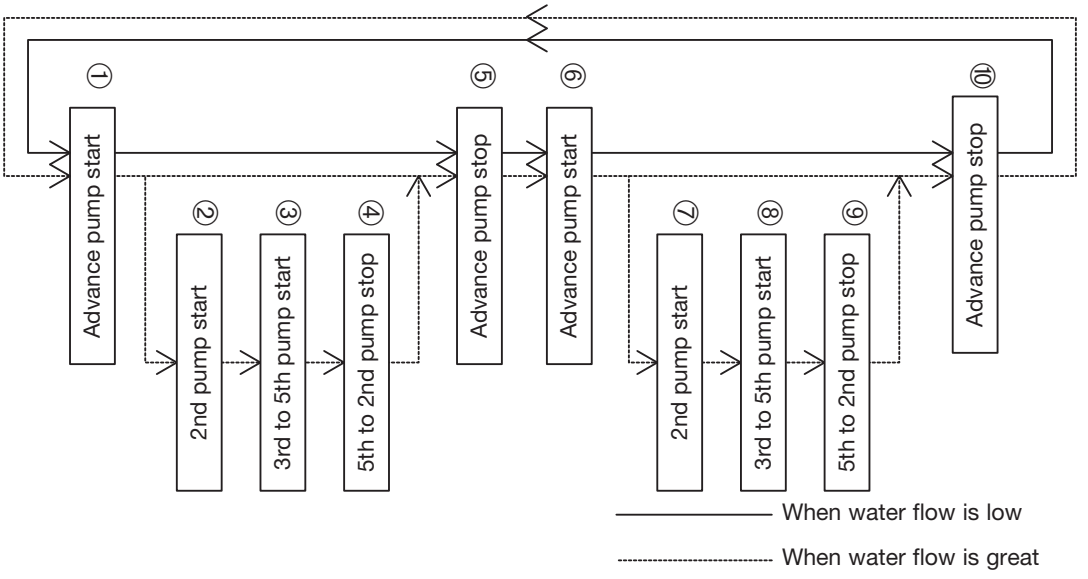


Fig. APR - Automatic Pump Rest At Small Demand

EBARA VARIABLE SPEED BOOSTER SYSTEM - OPERATION METHOD



A. When water flow is low

① If water is used, the inner pressure of the pipes drop, triggering the pressure sensor, and advance pump (Ex: No.1) starts up.

⑤ If water stops being used, the flow switch is triggered, and advance pump (Ex: No. 1) stops after the required time has elapsed. At this time, the advance pump rotates. (Ex: The advance pump changes from No. 1 to No. 2)

⑥ If water is used again, the inner pressure of the pipes drops, triggering the pressure sensor, and advance pump (Ex: No. 2) starts up.

⑩ If water stops being used, the flow switch is triggered, and advance pump (Ex: No. 2) stops after the required time has elapsed. At this time, the advance pump rotates. (Ex: The advance pump changes from No. 2 to No. 3.) In the same way, the advance pump rotates in order from No. 3 to No. 4, No. 4 to No. 5 and No. 5 to No. 1, while steps ① , ⑤ , ⑥ , and ⑩ are repeated in order.

B. When water flow is great

① If water is used, the inner pressure of the pipes drop, triggering the pressure sensor, and advance pump (Ex: No.1) starts up.

② If the flow continues to increase, the rotational speed of advance pump reaches maximum and 2nd pump (Ex: No. 2) starts up.

③ As the volume of water used increases in order, the delayed pumps starts in order from the 3rd (Ex: No. 3) to the 4th (Ex: No. 4), to the 5th (Ex: No. 5), to a maximum of 5 pumps.

④ If the volume of water used decreases, the flow switch is triggered and the delayed pumps shut down in order, eventually leaving only the advance pump operational.

⑤ If water stops being used, the flow switch is triggered, and advance pump stops after the required time has elapsed. At this time, the advance pump rotates. (Ex: The advance pump changes from No. 1 to No. 2.)

⑥ If water is used again, the inner pressure of the pipes drops, triggering the pressure sensor, and 2nd pump (Ex: No. 2) starts up.

⑦ If the flow continues to increase, the rotational speed of advance pump (Ex: No. 2) reaches maximum and 2nd pump (Ex: No. 3) starts up.

⑧ As the volume of water used increases in order, the delayed pumps start in order from the 3rd (Ex: No. 4) to the 4th (Ex: No. 5), to the 5th (Ex: No. 1), to a maximum of 5 pumps.

⑨ If the volume of water used decreases, the flow switch is triggered and the delayed pumps shut down in order, eventually leaving only the advance pump operational.

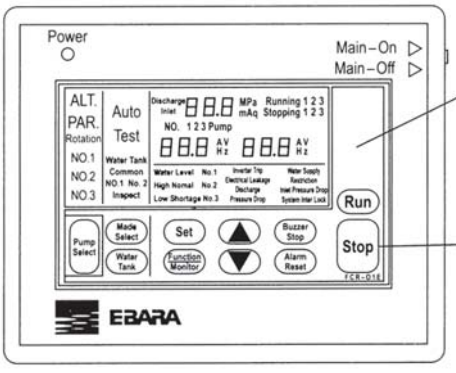
⑩ If water stops being used, the flow switch is triggered, and advance pump (Ex: No. 2) stops after the required time has elapsed. At this time, the advance pump rotates. (Ex: The advance pump changes from No. 2 to No. 3.)
In the same way, the advance pump rotates in order from No. 3 to No. 4, No. 4 to No. 5, and No. 5 to No. 1, while steps ① - ⑩ are repeated in order.

EBARA VARIABLE SPEED BOOSTER SYSTEM - CONTROLLER

The heart of the system is the EBARA controller unit, which is user-friendly and permits 'One-touch' operation. It controls the sequence of pump operation with signals input from the pressure sensor and/or flow switch in Auto & Alternate mode. This user-friendly controller unit operates compatible with other electrical components to ensure smooth function of booster system.

EBARA controller unit generally provides the below 'One-touch' functioning features:

1 x Power on indicating light
1 x Power selector switch (ALT/PAR/Rotation/P1 to P5)
1 x Mode selector switch (Auto/Test)
1 x Power main on off switch
1 x Set switch
1 x Function / Monitor switch
1 x Buzzer stop switch
1 x Alarm reset switch
1 x Run switch
1 x Stop switch
1 x LCD System parameter displays



System parameters display:
Operation mode
Pump no. in operation
Output frequency & discharge
Water tank & Fault type

Operation pushbuttons:
Run or stop
Pump, mode & water tank select
Parameters set & function monitor
Buzzer stop & alarm reset

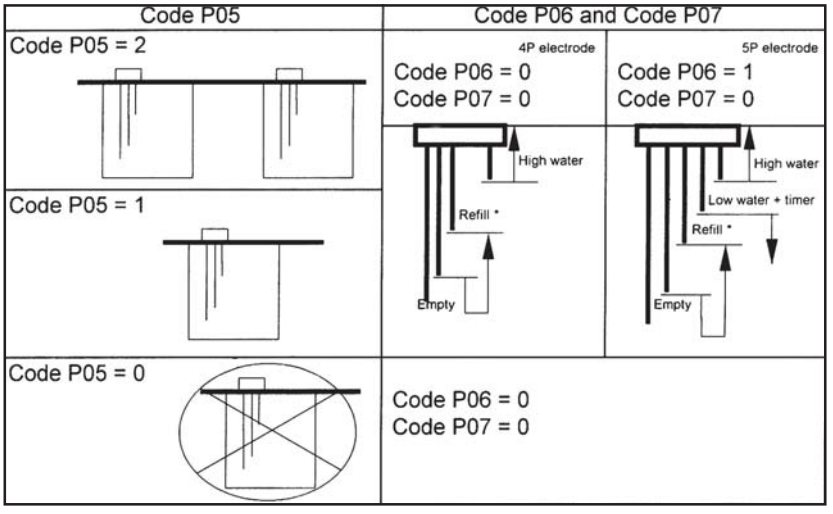
Rotation – No.1 – No.2 – No.3 – No.5 – No.4 indicates that the item displayed changes, in rotation, each time the button is pushed.

Operation	Function	
Pump Select	Rotation – No.1 – No.2 – No.3 – No.5 – No.4	Changes the operation method. Method cannot be changed during operation.
Mode Select	Auto — Test	Changes between auto and test operation. Method cannot be changed during operation.
Water Tank	Common – No.1 – No.2	Used when a dual tank type receiving tank is used.
Function Monitor	(No. 1, Hz, A) - (No. 2, Hz, A) - (No. 3, Hz, A) - V — (No. 5, Hz, A) — (No. 4, Hz, A) *	Switches displayed item, in rotation, among pump No.1, pump No.2, pump No.3, pump No.4, pump No.5, and power supply voltage. *
Set	Switches to the setting mode	Used for setting codes.
▲ ▼	In test mode:	Set the frequency for manual operation.
	In setting mode:	Increase/decrease code No. or set values.
Buzzer Stop	Stops sounding of buzzer	For turning the buzzer OFF when an alarm has occurred. Buzzer turns off automatically after 2 minutes if this button is not pushed.
Alarm Reset	Clears alarm, and stops buzzer	For resetting inverter relay trip and discharge pressure drop alarms.
Run	Starts the pumps	Runs the pumps in auto or test operation.
Stop	Stops the pumps	Stops the pumps in auto or test operation.

* Displayed for 5-pump units.
For 3- and 4-pump units, pumps No. 4 - No. 5 or pump No. 5 are not displayed.

EBARA VARIABLE SPEED BOOSTER SYSTEM - UNIQUE FEATURE

Unique Feature- Receiving (Water) tank



Note 1. * Short circuit E12-E15, E22-E25 (when using the dual tank system) with the jumper cable (included).
2. Water reduction is detected by timer control. Therefore, the empty display may be triggered during the period when the suction amount is greater than the volume of water flowing into the water tank.

PROTECTION FEATURES

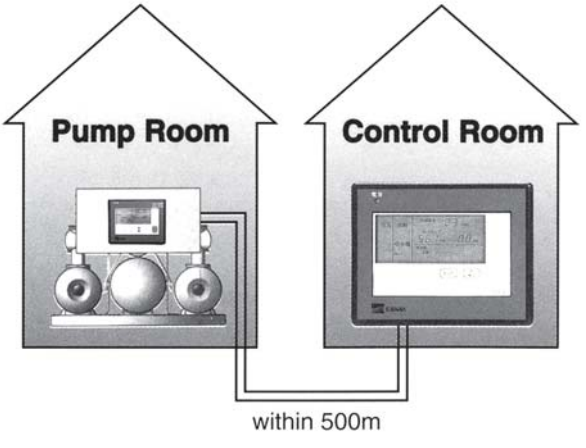
Automatic back up system ensure smooth and continuous pumping operation during the below malfunction:
- electrical leakage,
- discharge pressure drop,
- inverter tripped

Freezes pump Operation when Low Water level at suction tank. Fault Display for below:
- suction tank water level
- system interlock
- electrical leakage
- low discharge pressure. *Option (IN-LINE BOOSTING mode)

REMOTE MONITORING FEATURES

The same operation conditions of the pumping system can be observed and monitored at remote station with only 2 wire connection. No additional electrical supply is required. Buzzer is provided, and distance within 500 m is permissible.

Display Items:
1) Normal display
   Digital : Discharge pressure, Pump Operation Hz (each pump). Operation current (each pump), Voltage.
   Others : Electrical source (LED Display). Operation mode (Auto, Test, No. of Pump) System interlock.
2) Fault Display
   Discharge pressure drop (each pump),
   Inverter fault (each pump),
   Water level (over-flow, insufficient, shortage conditions).



Item		Standard	Optional
Operation system	Pump speed	Inverter variable speed control drive	
	Pressure control	Constant pressure with system loss compensation	
	Number of pump control	Single alternate, Parallel alternate, Up to 5 pumps cyclic Pumps rest at small flow rate	
Installation area		Indoor Ambient temperature Up to 40°C	Outdoor Weather-proof available
Pump		Vertical multistage Pump: Model EVM	3M, CDX and other EBARA model
Power source		Three phase, 380/400/415 V, 50 Hz	
Pressure tank	Type	Pre-charged Diaphragm	
	Capacity	18L	Over 18L
	Max. working pressure	10 bar	Up to 20 bar
Pressure sensor		3 Wire for DC 12V Output Voltage 1 - 5V	
Control panel & Controller	Main components	Inverter (each pump), Control panel (Remote type) Main circuit breaker, Main control CPU board Interface board, Pilot light, Isolator, Voltage detection board Control circuit noise filter, Electric leakage breaker	Water level board, Main supply noise filter Surge protector
	Protection	Electric thermal device, controlled by microcomputer	
	Display Items	Discharge pressure {digital display} Pump operation current {digital display} Voltage {digital display} Pump operation frequency {digital display} Power {red LED} Operation condition {running pump} Operation mode {Automatic or manual} Storage tank selection {Tank 1 or 2} Storage tank water level condition {normal} System interlock Failure : Shortage or full of storage tank Low discharge pressure. *Option: IN-LINE BOOSTING mode Inverter trip	
	External output signal (No voltage, normal open contact)	Pump running Pump failure Storage tank condition {Full, low, shortage}	
	External input signal (No voltage, normal open contact)	System interlock {on/off}	

CUSTOM BUILT HYDRO BOOSTER SYSTEM (available upon request)

Applications	Product Options	Features / Benefits
Inline boosting system specially design for: • automatic water supply system. • water supply distribution.	 *UN-IB*	• consistent pressure. • no suction tank required i.e: direct boosting from suction pipe. • flexible usage i.e. capable of integrating with existing. pumping system with minimal modification works.
• automatic booster system for housing estate, hospitals, condominium and high-rise building.	 *UN-GB*	• consistent pressure. • reduce storage tank size. • empties water effectively to process and utilities etc.
• golf course irrigation.	 *UN-GC*	• automatic irrigation of required capacity and pressure setting. • economical design. • economy set.
• general boosting for factories, plant and booster station.	 *UN-SP*	• automatic boosting system for large-scale water supply. • ensure constant pressure. • maintenance free operation.

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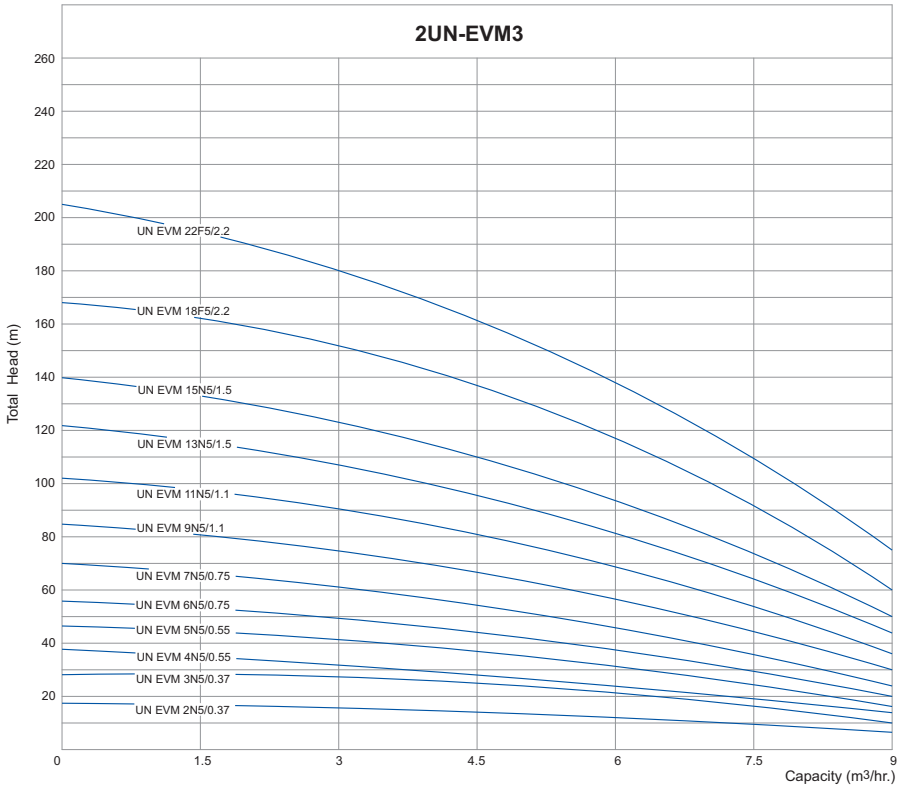

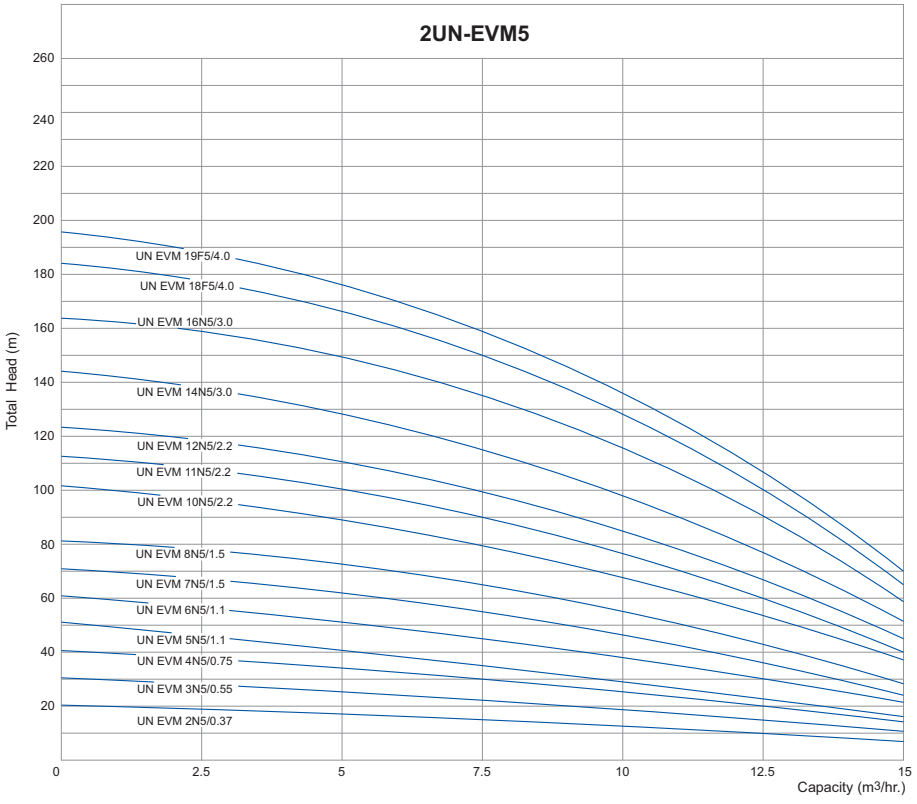

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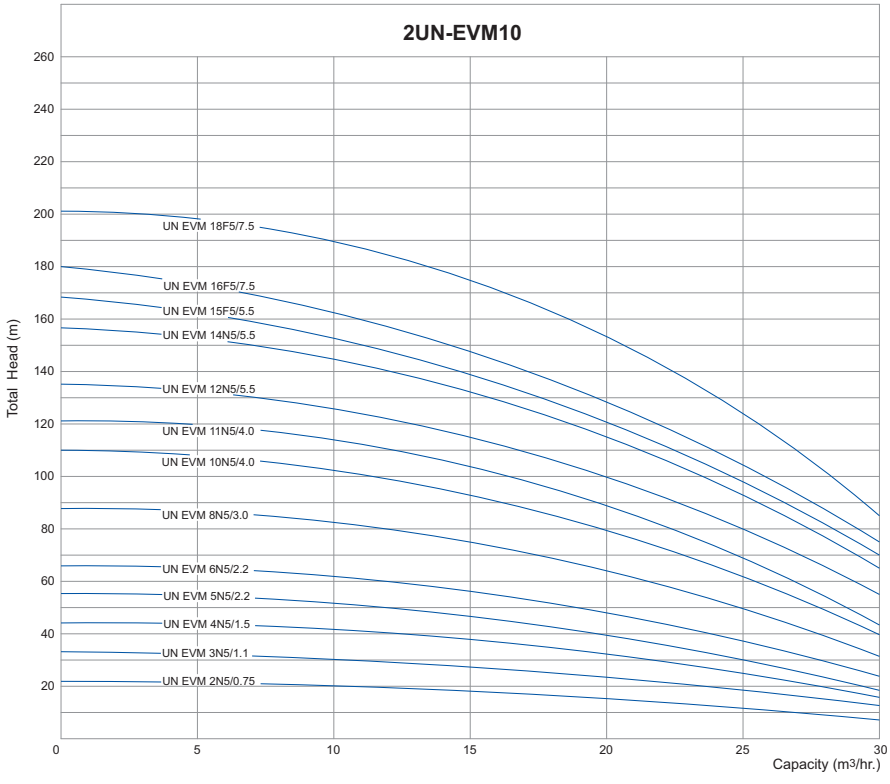

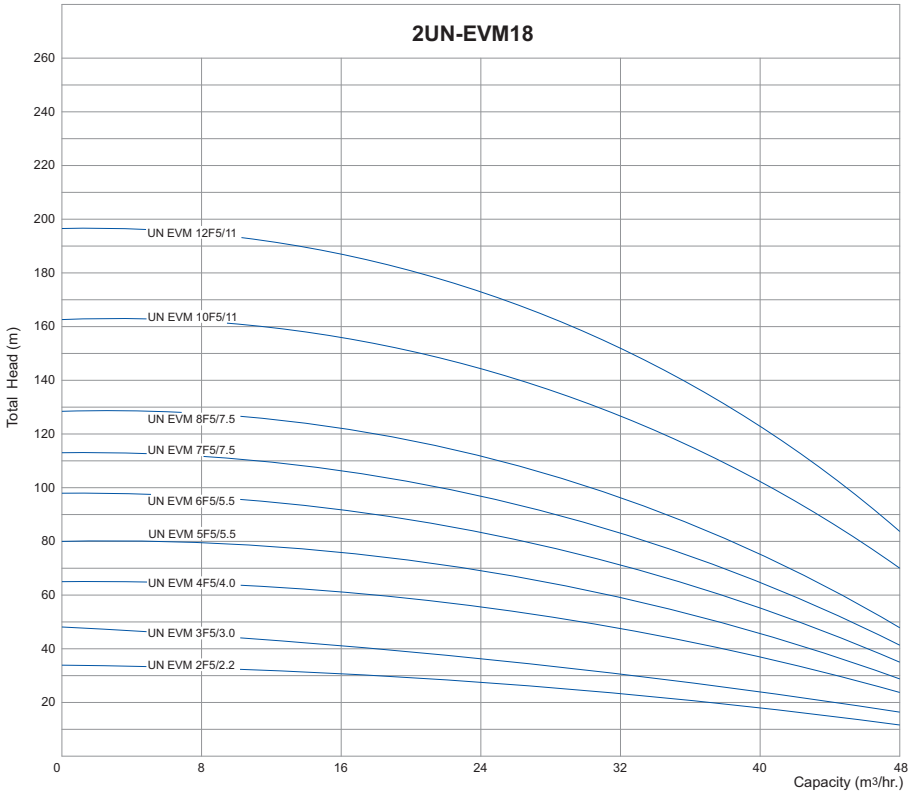

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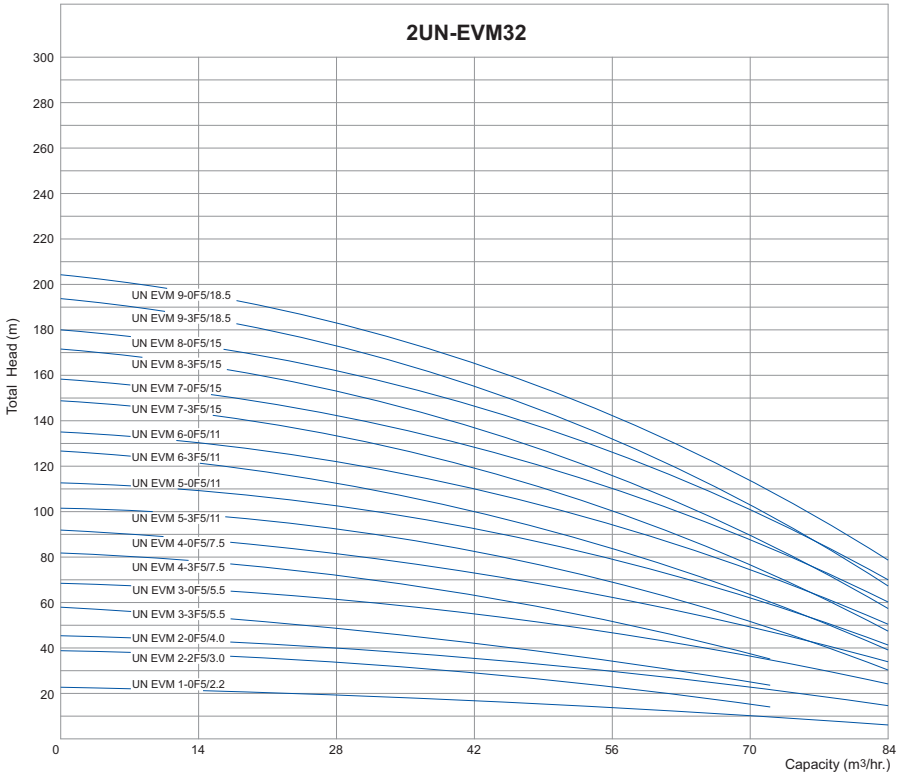

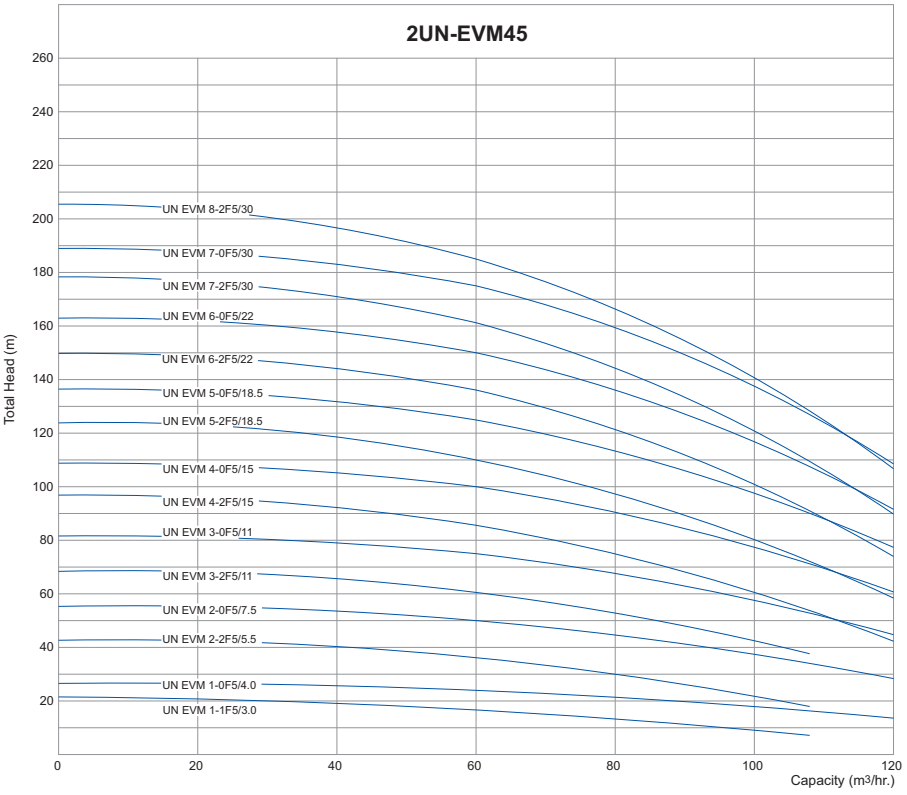

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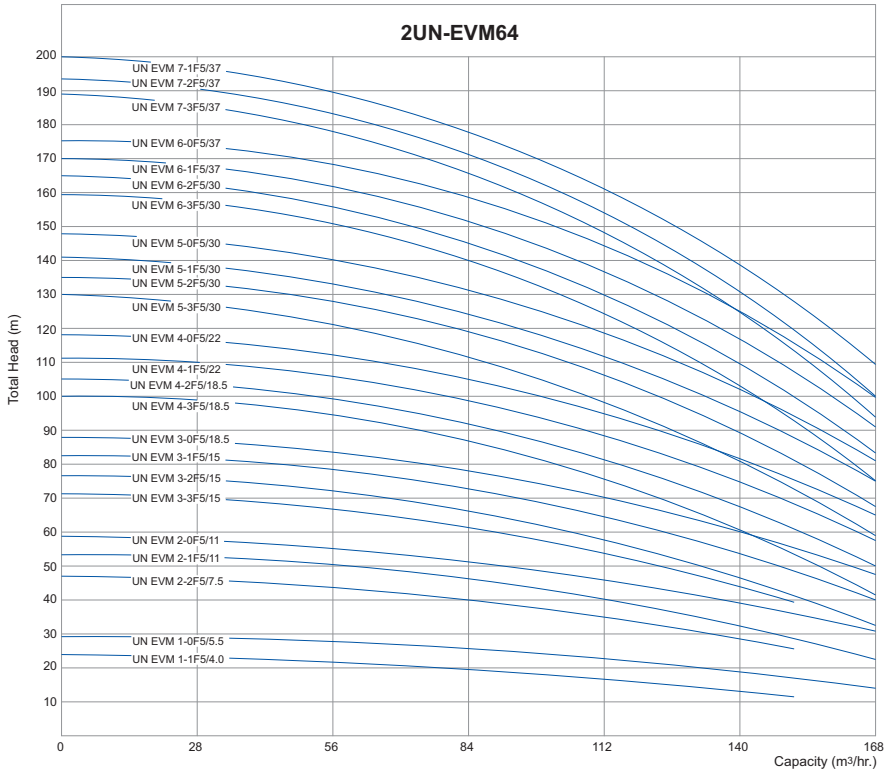

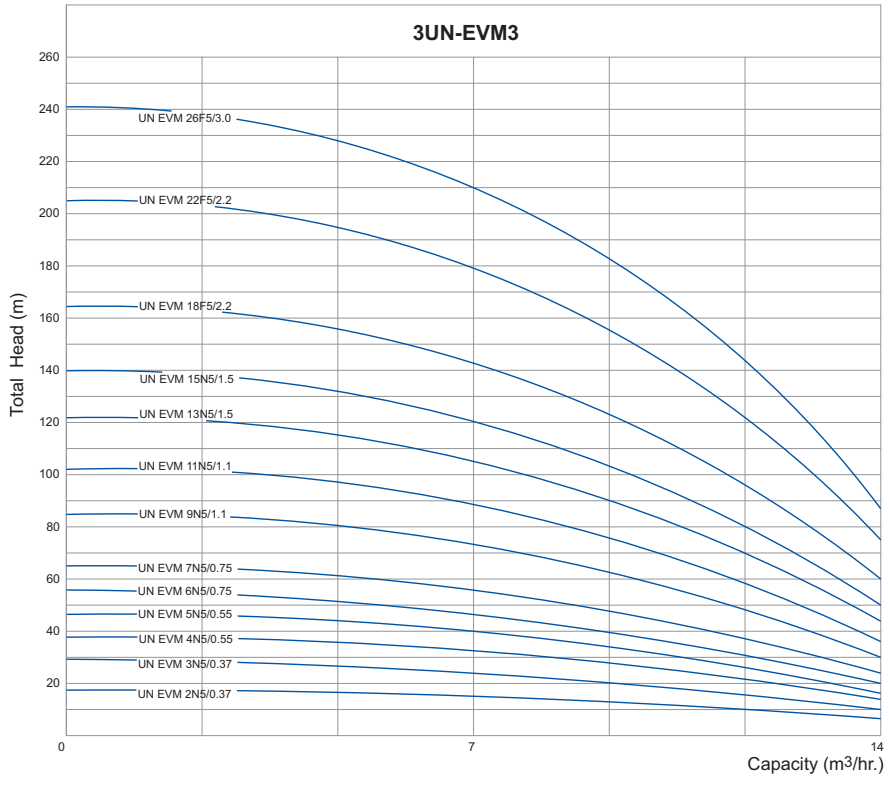

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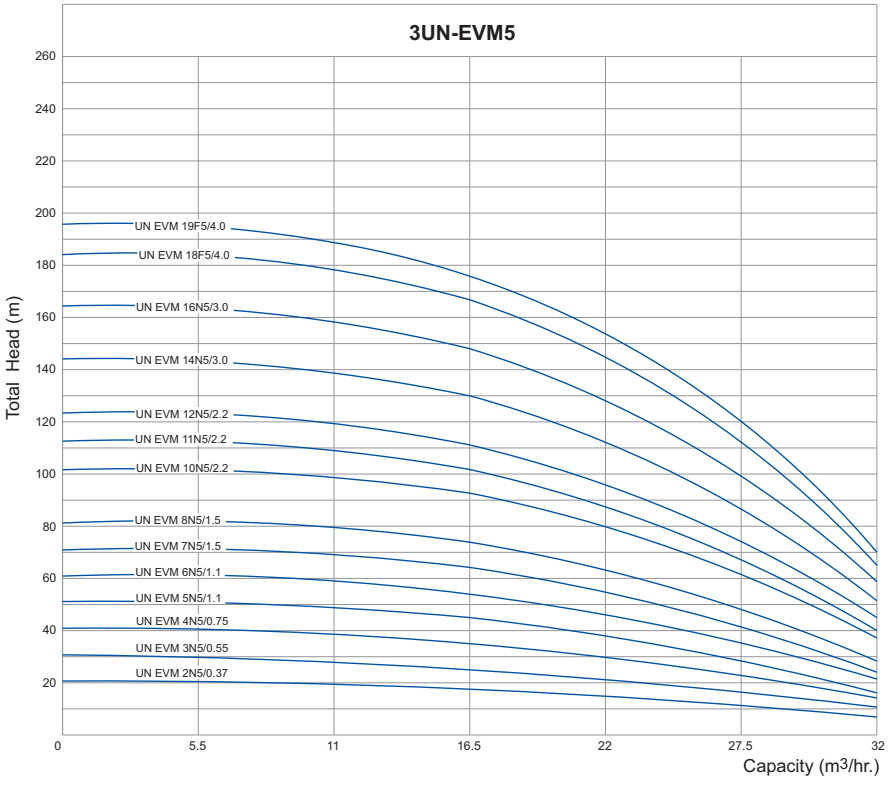

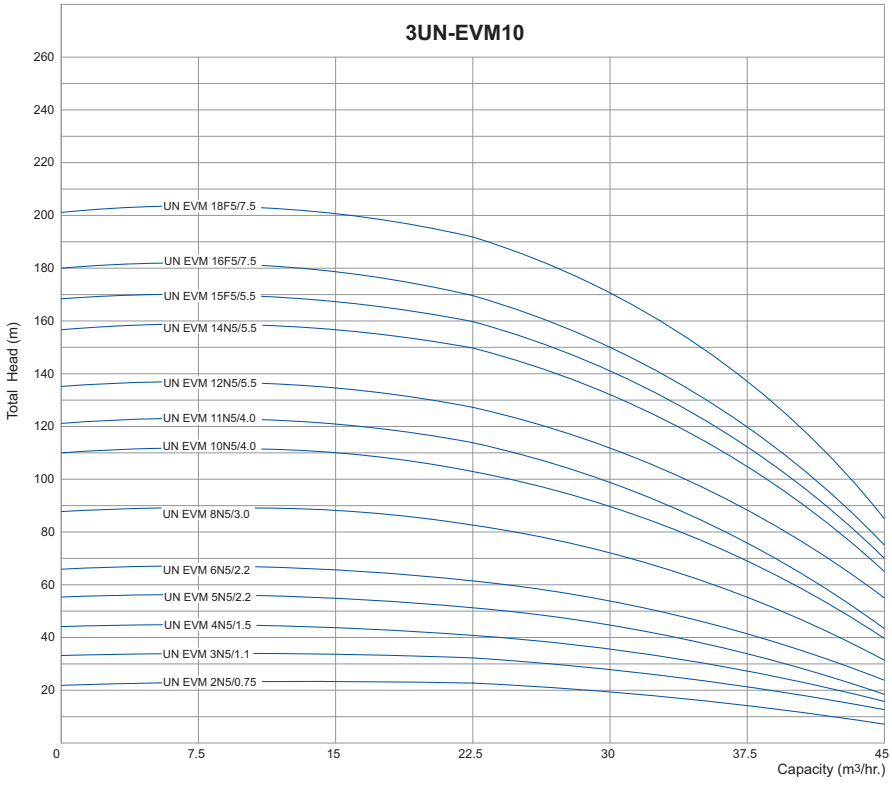

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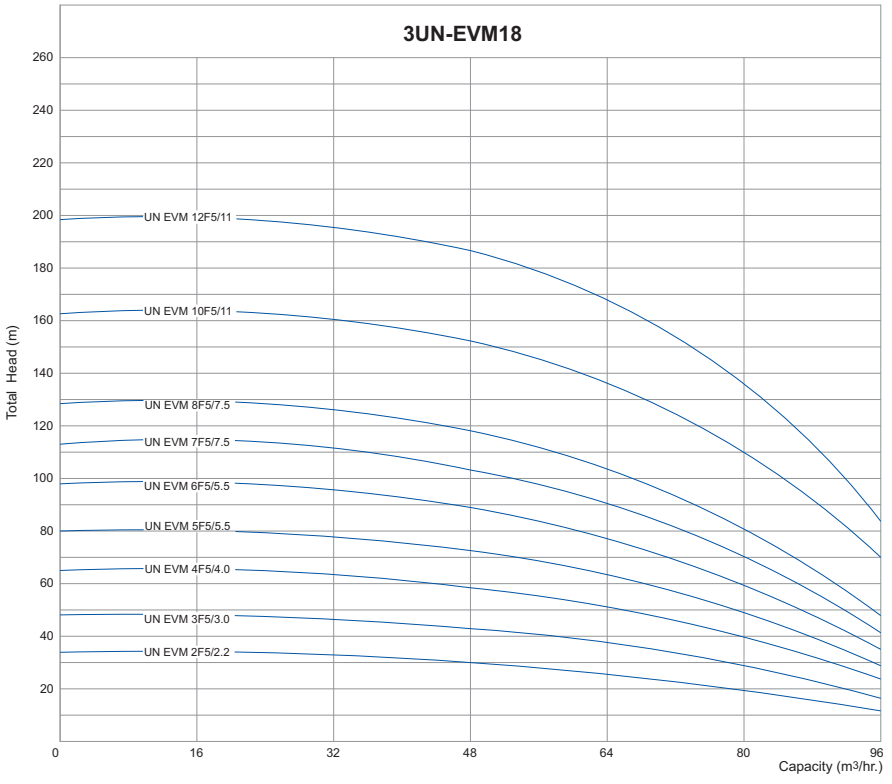

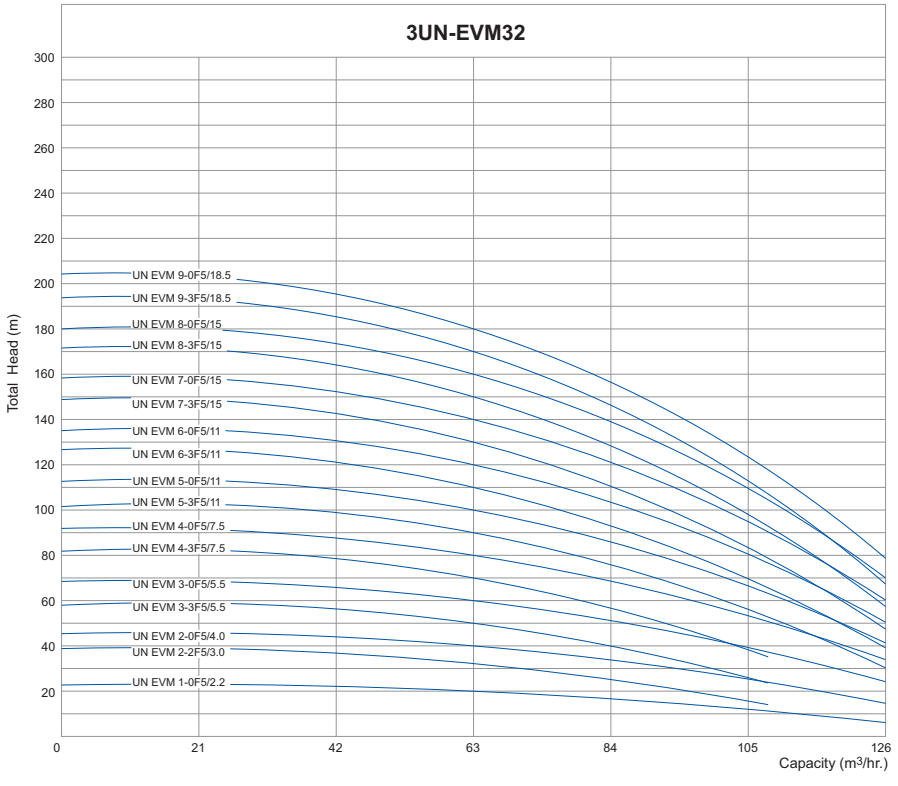

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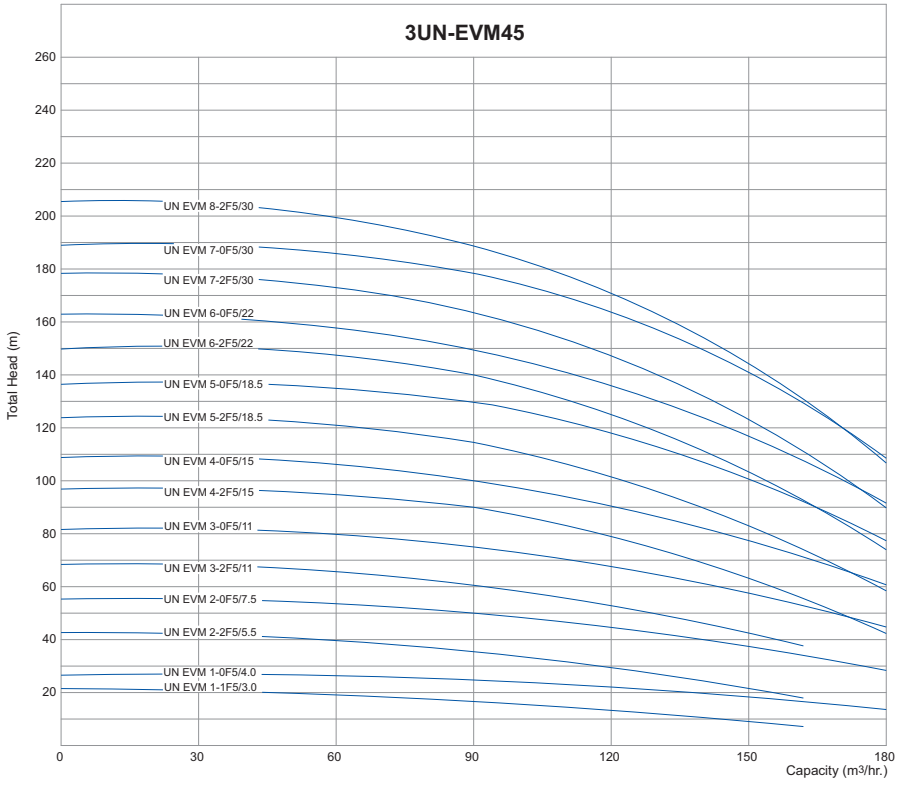

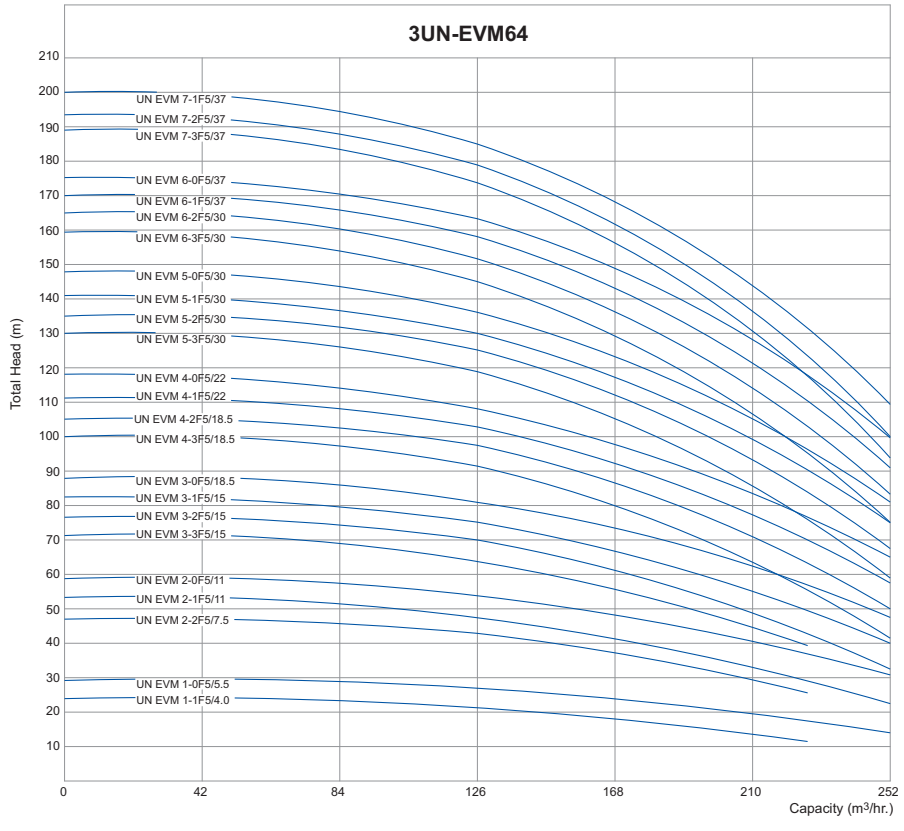

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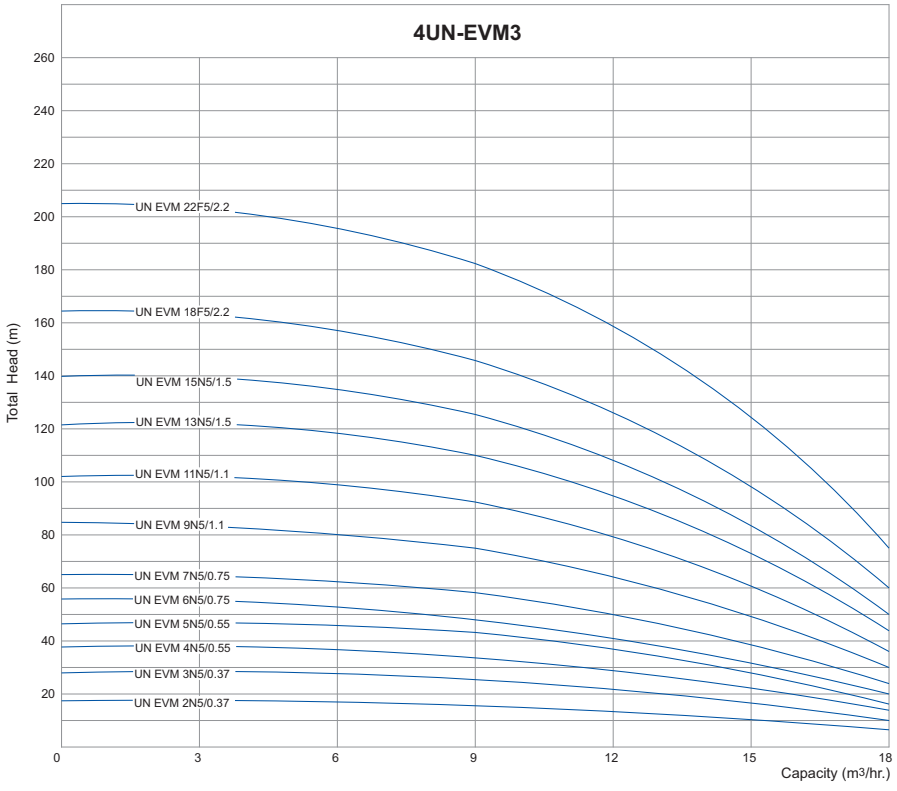

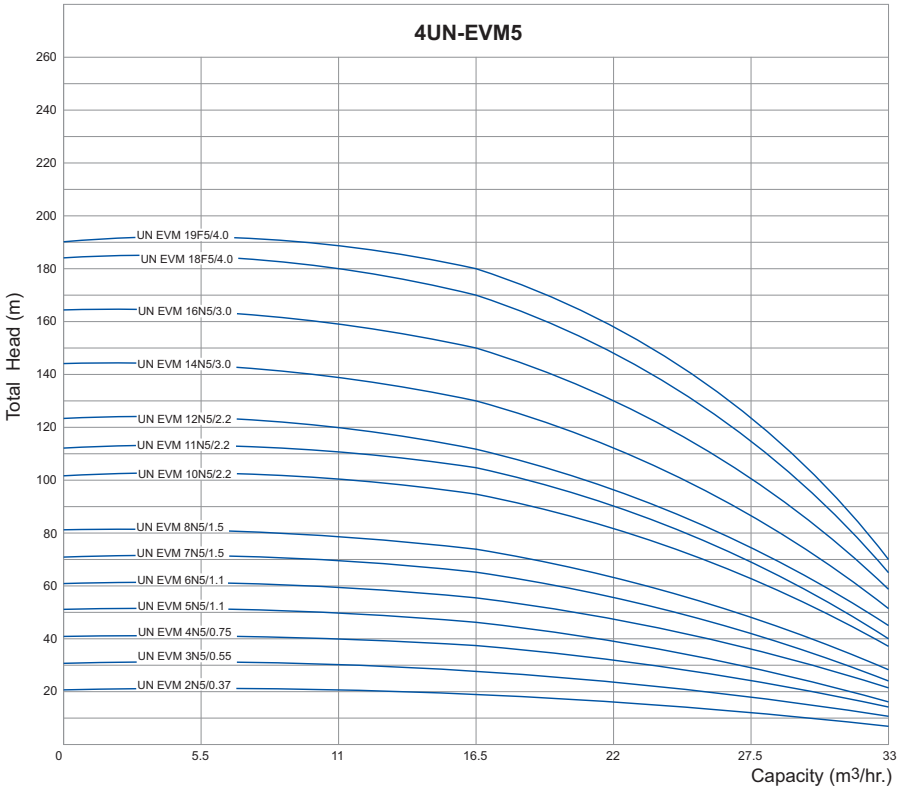

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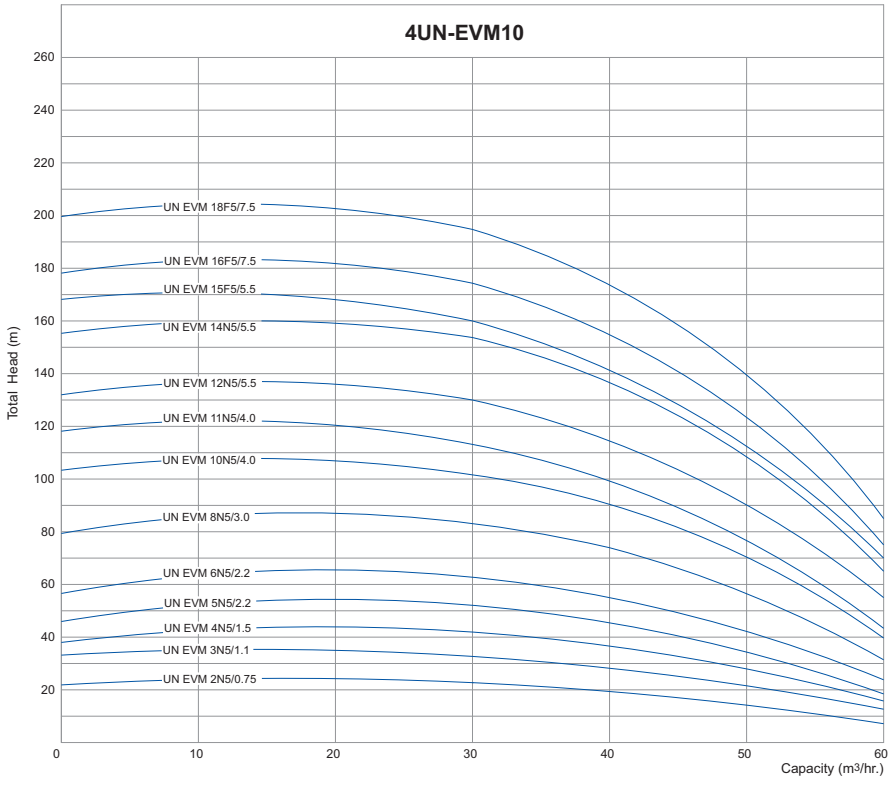

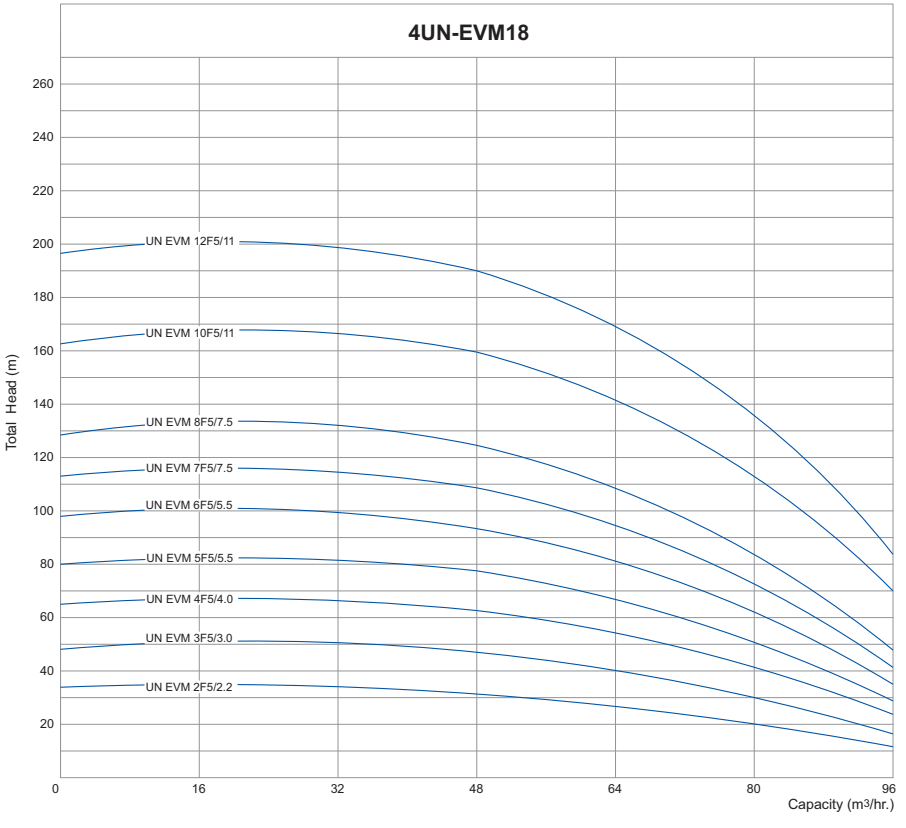

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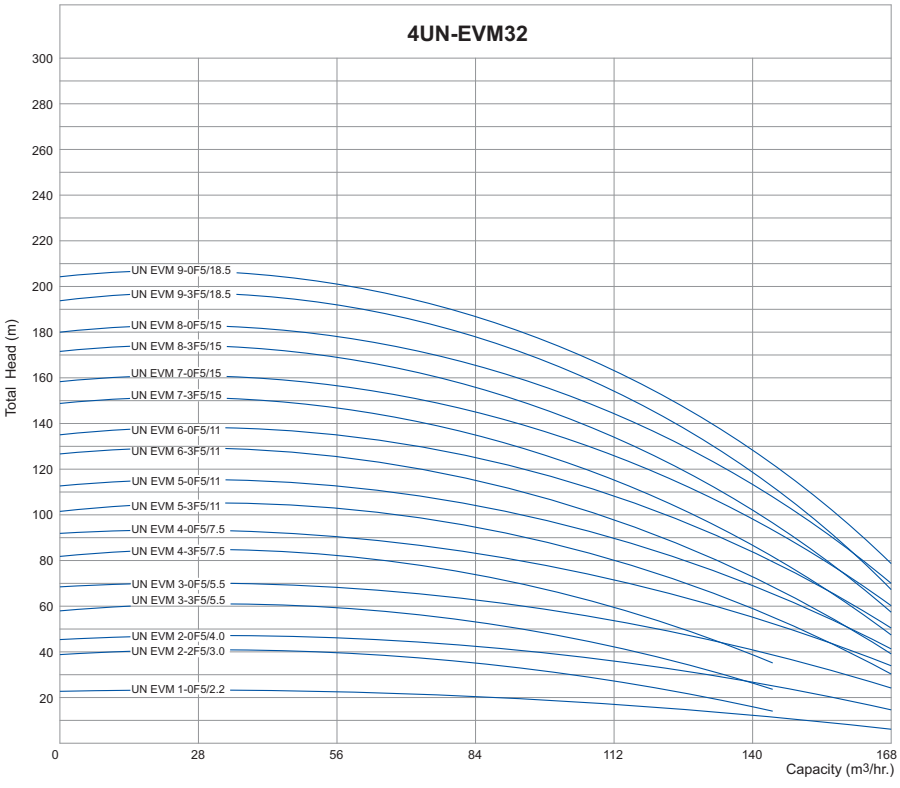

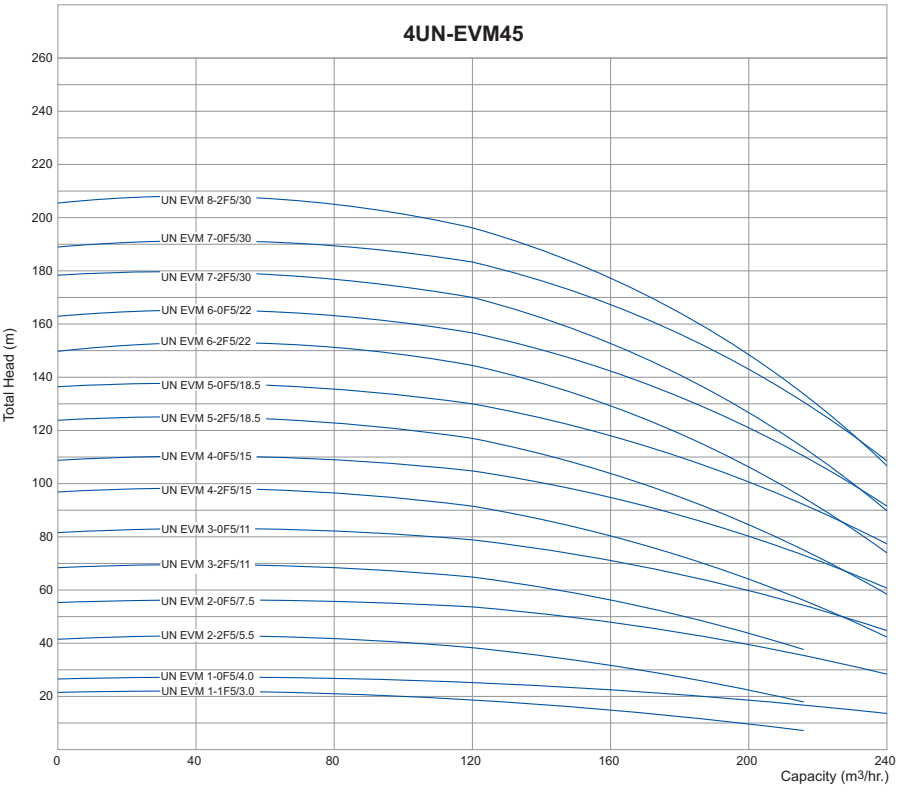

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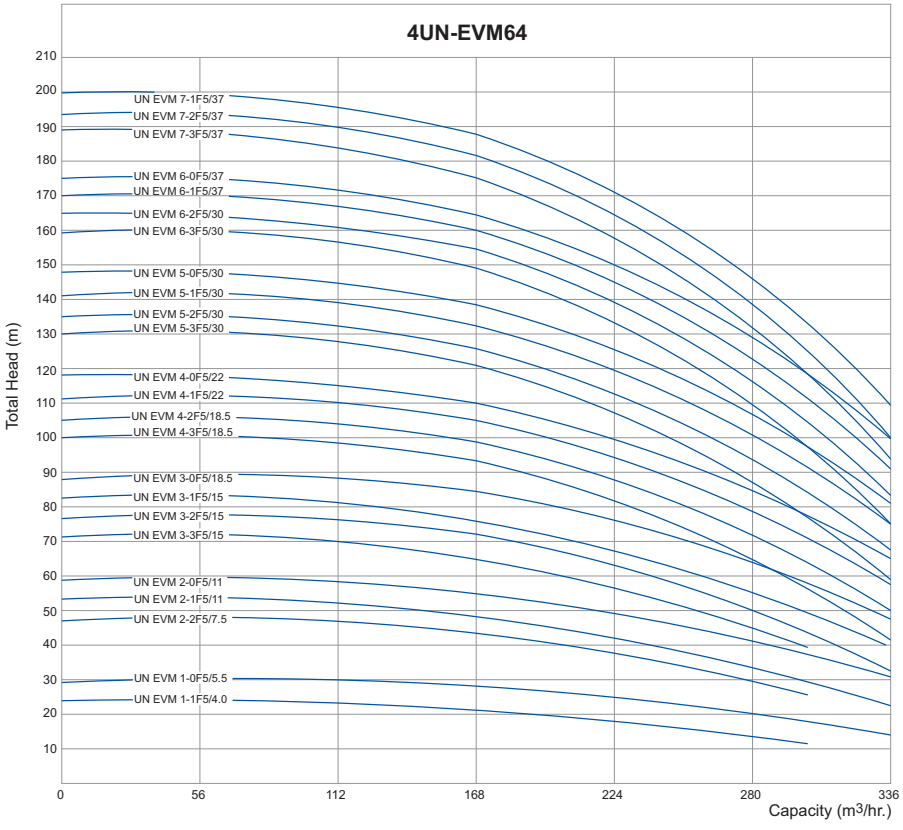
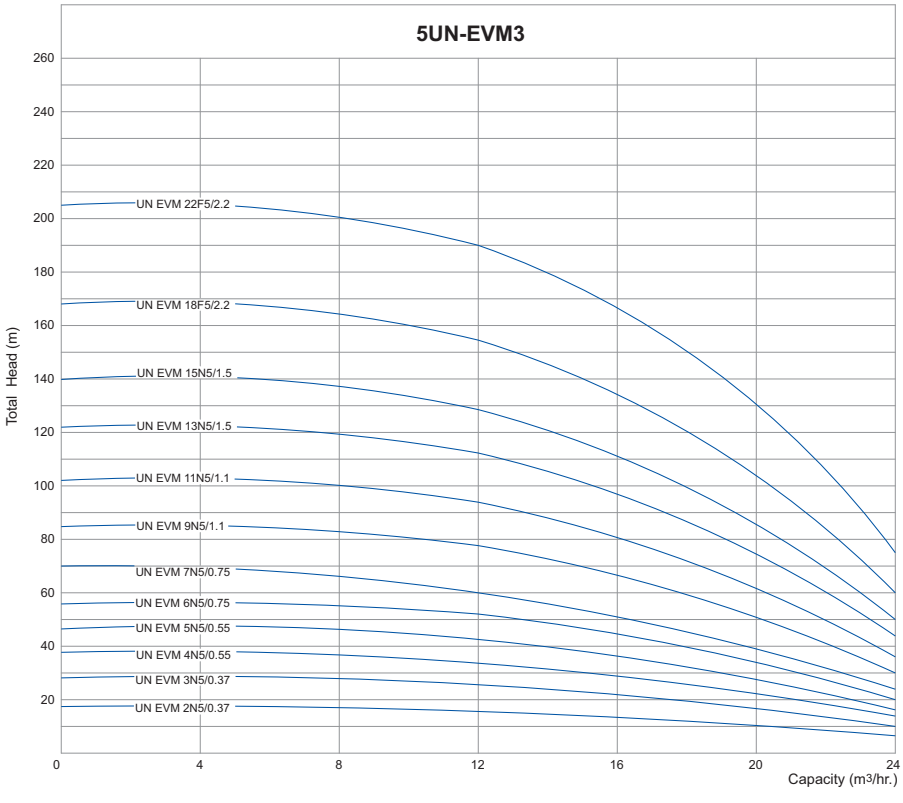
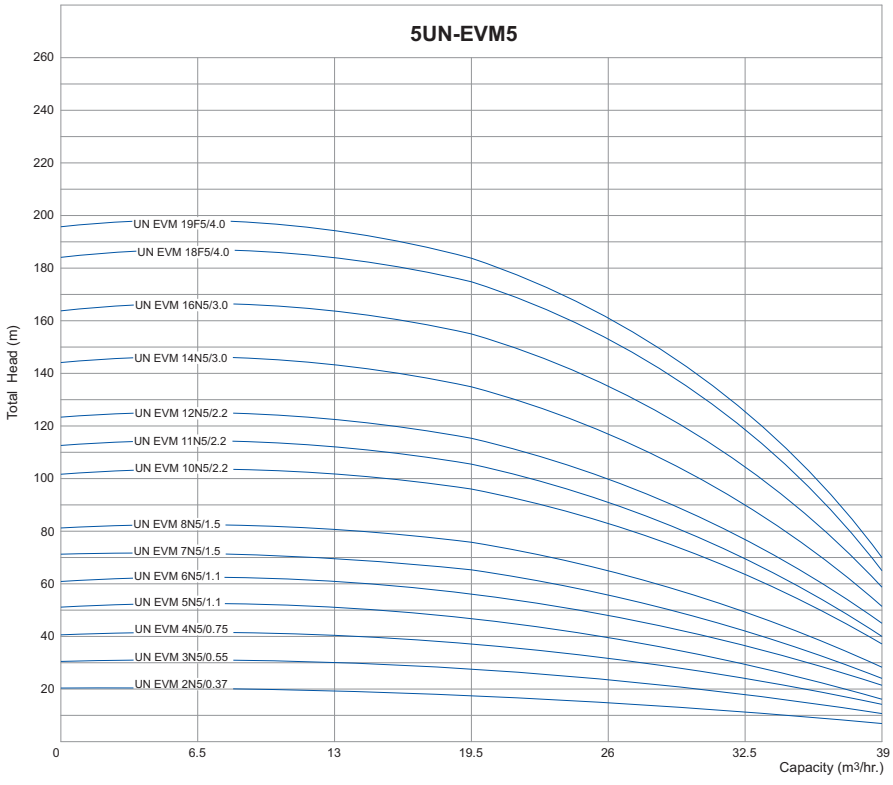
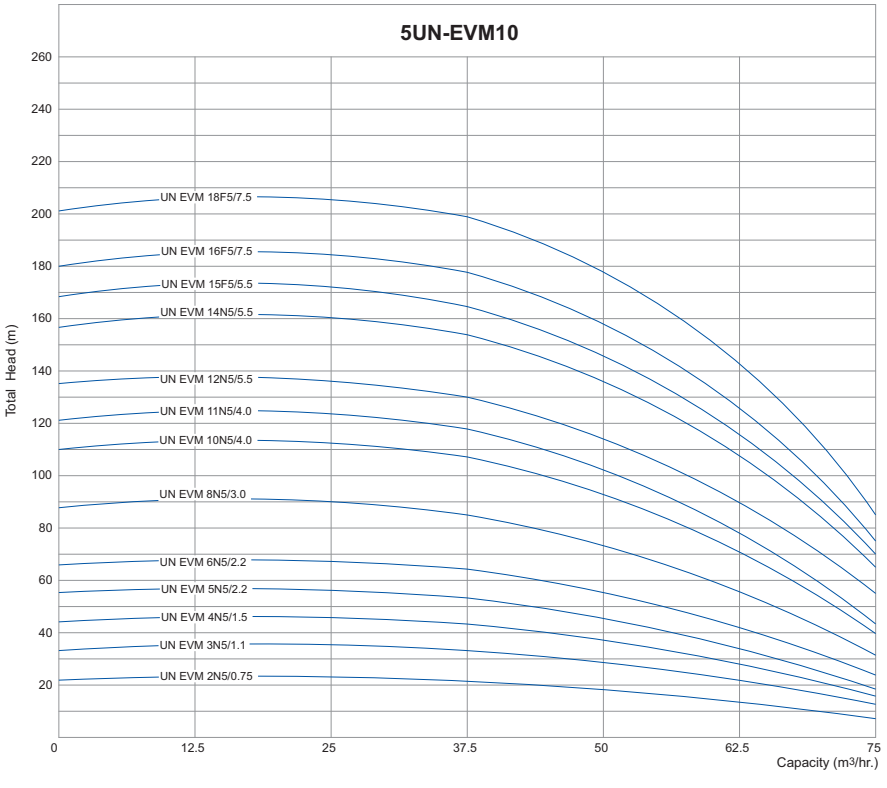


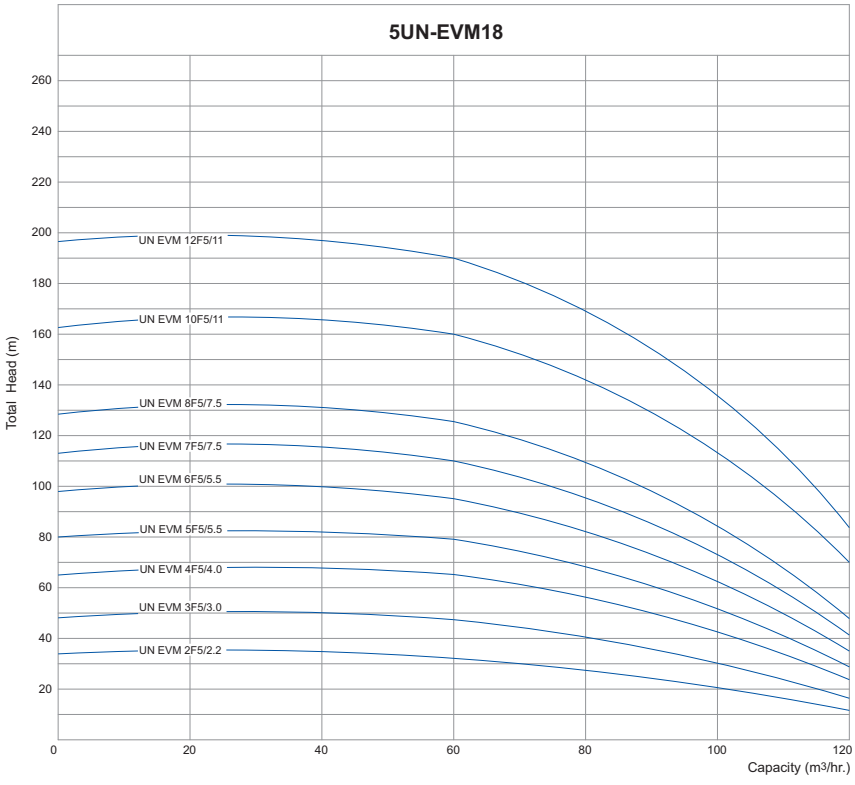


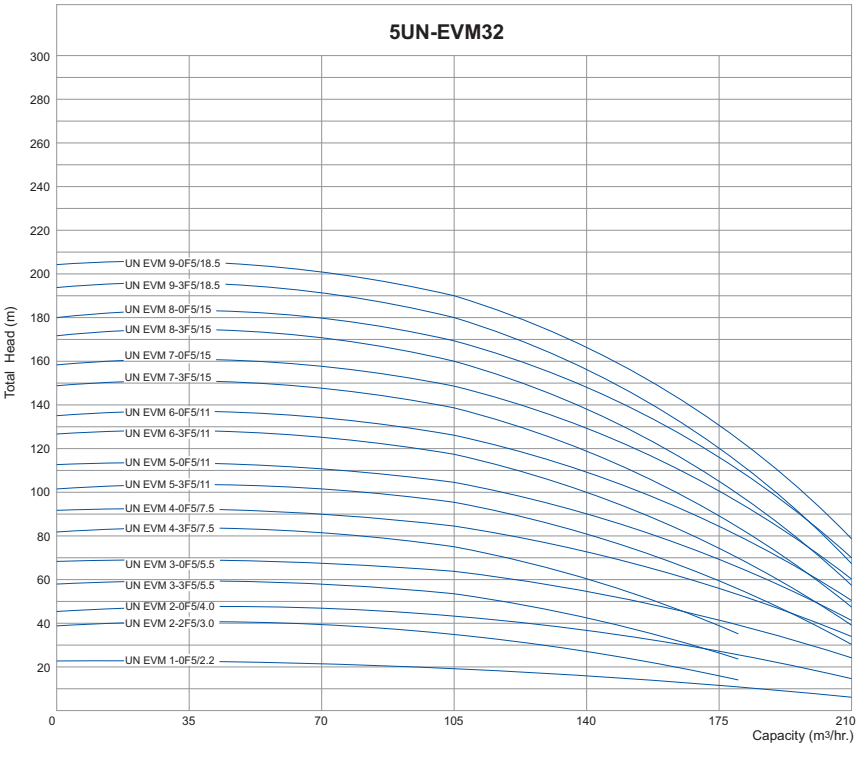
SELECTION GUIDE



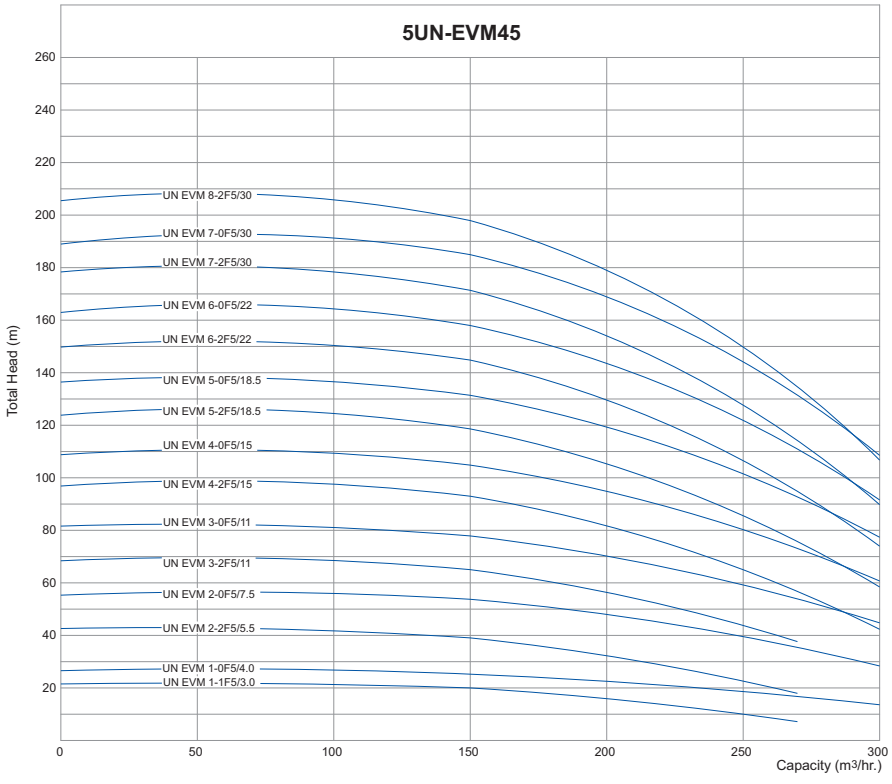


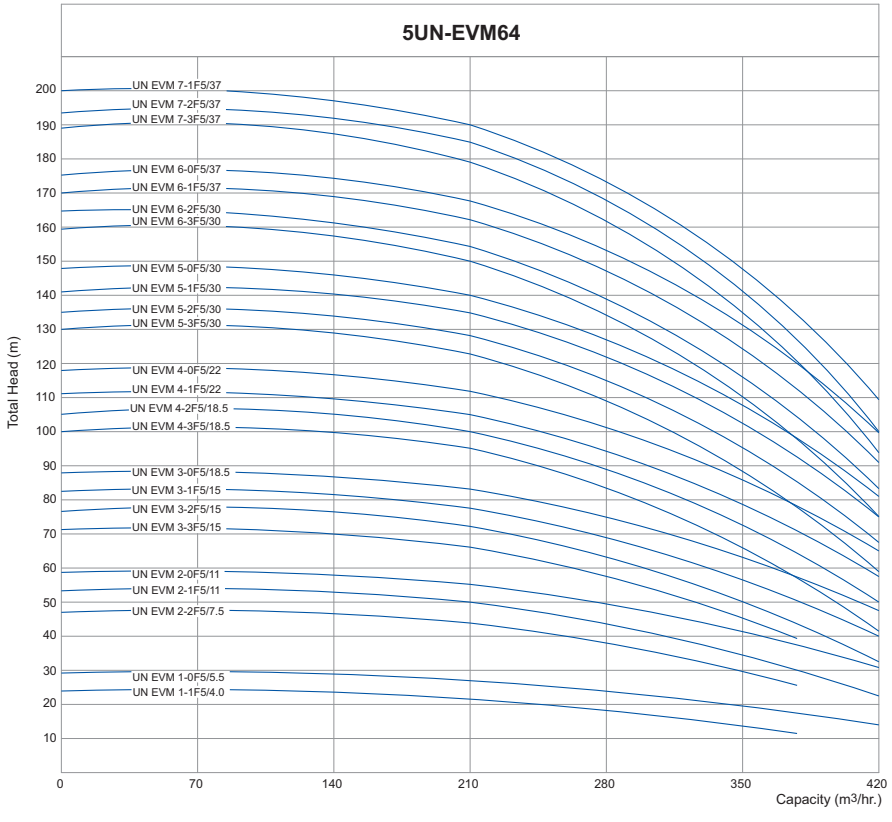
SELECTION GUIDE



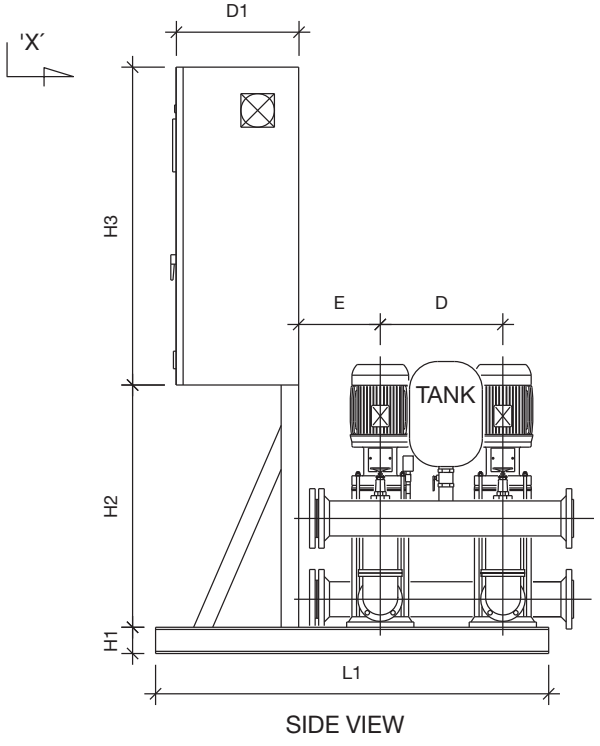


SELECTION GUIDE

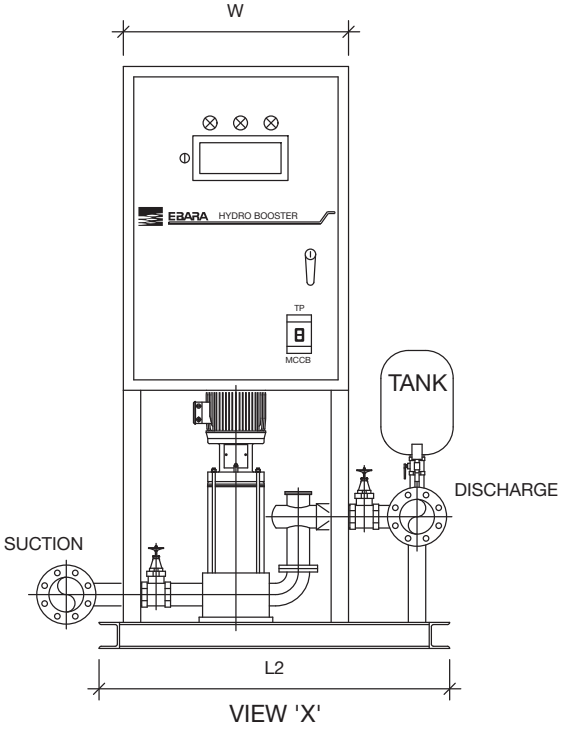




DIMENSIONAL DRAWING (2UN)



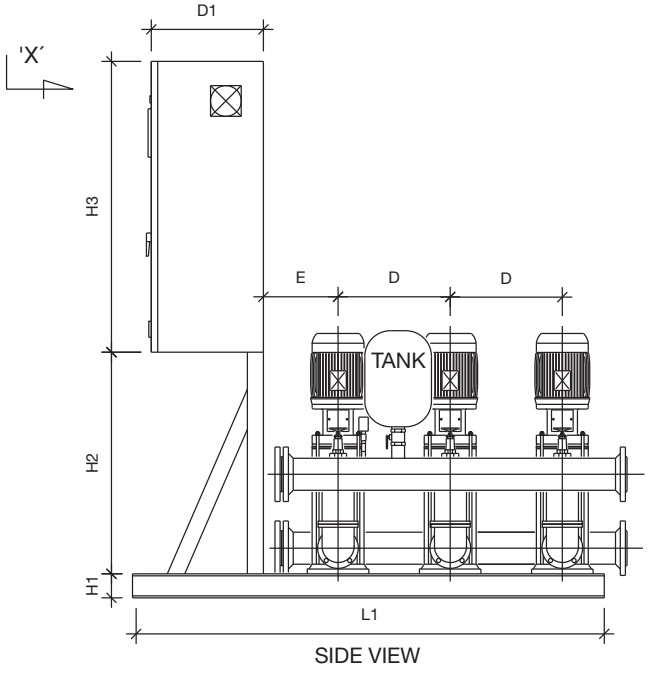
SIDE VIEW



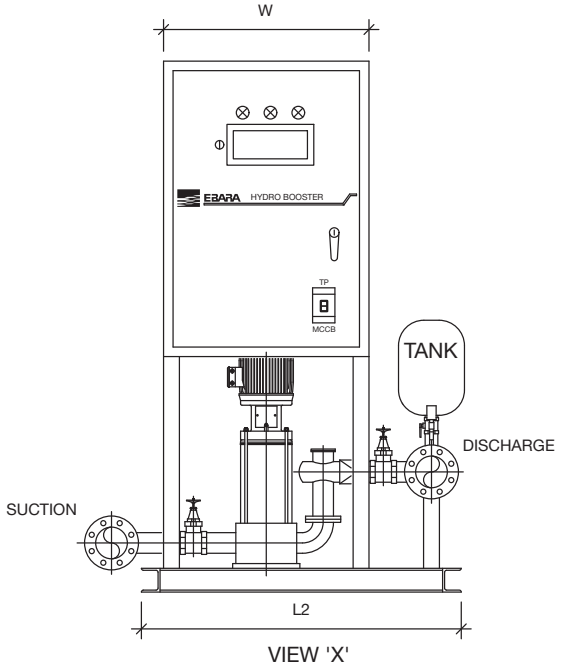
VIEW 'X'

DIMENSION / MODEL	HI mm	H2 mm	H3 mm	D1 mm	W mm	L1 mm	L2 mm	D mm	E mm	TANK LITER	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm	PIPE CONNECTION
2UN-EVM 3	75	725	800	250	600	1030	780	350	180	18	50	50	NPT
2UN-EVM 5	75	725	800	250	600	1030	780	350	180	18	50	50	NPT
2UN-EVM 10	100	725	800	250	600	1100	910	390	210	24	65	65	NPT
2UN-EVM 18	100	725	800	250	600	1245	910	440	305	24	80	80	FLANGE
2UN-EVM 32	100	725	800	250	600	1755	910	440	305	100	100	100	FLANGE
2UN-EVM 45	100	725	800	250	600	1865	1200	550	305	100	150	150	FLANGE
2UN-EVM 64	100	725	800	250	600	1865	1200	550	305	100	150	150	FLANGE

DIMENSIONAL DRAWING (3UN)



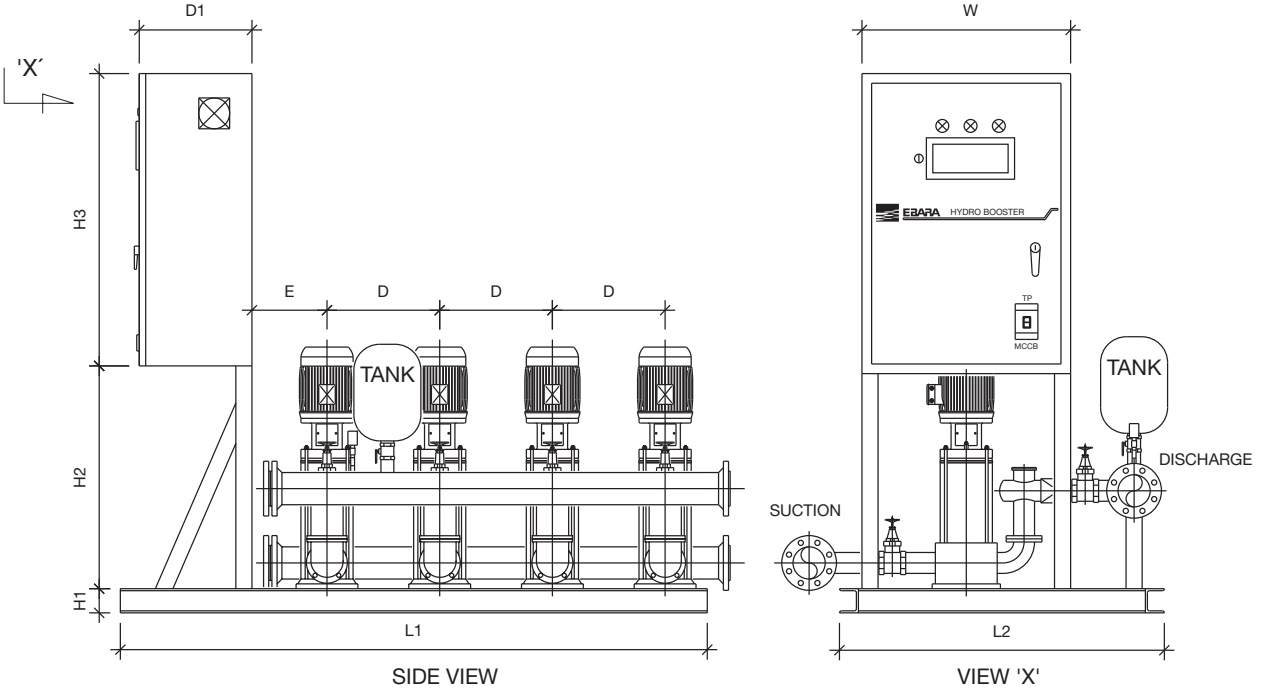
SIDE VIEW



VIEW 'X'

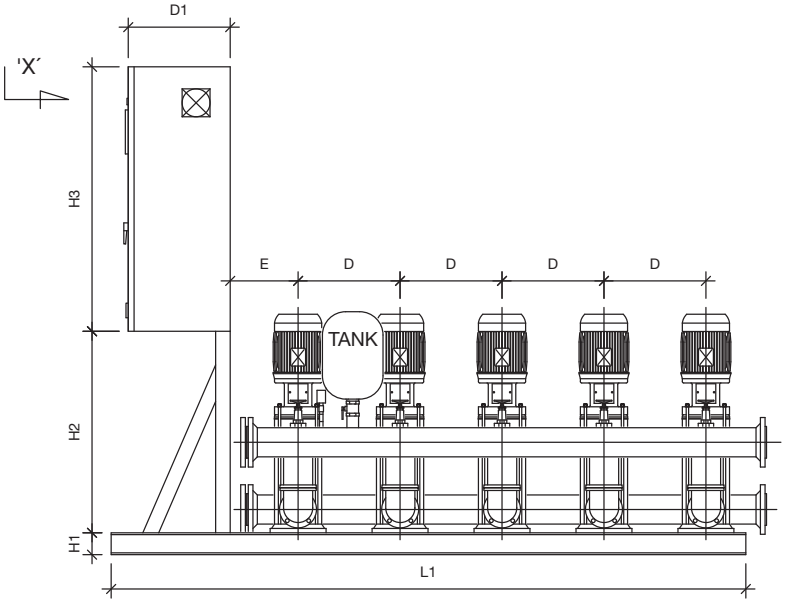
DIMENSION / MODEL	HI mm	H2 mm	H3 mm	D1 mm	W mm	L1 mm	L2 mm	D mm	E mm	TANK LITER	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm	PIPE CONNECTION
3UN-EVM 3	100	625	900	250	700	1380	780	350	180	18	50	50	NPT
3UN-EVM 5	100	625	900	250	700	1380	780	350	180	18	50	50	NPT
3UN-EVM 10	100	625	900	250	700	1490	910	390	210	24	65	65	NPT
3UN-EVM 18	150	625	900	250	700	1685	910	440	305	24	100	100	FLANGE
3UN-EVM 32	150	625	900	250	700	2195	910	440	305	100	150	150	FLANGE
3UN-EVM 45	150	625	900	250	700	2415	1200	550	305	100	150	150	FLANGE
3UN-EVM 64	150	625	900	250	700	2415	1200	550	305	100	150	150	FLANGE

DIMENSIONAL DRAWING (4UN)

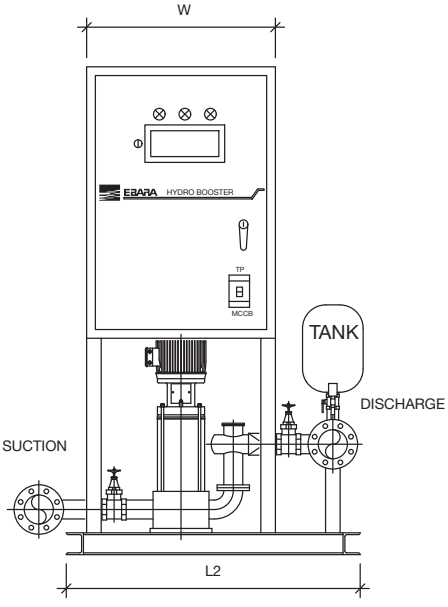


DIMENSION / MODEL	HI mm	H2 mm	H3 mm	D1 mm	W mm	L1 mm	L2 mm	D mm	E mm	TANK LITER	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm	PIPE CONNECTION
4UN-EVM 3	100	625	900	250	700	1730	780	350	180	18	65	65	NPT
4UN-EVM 5	100	625	900	250	700	1730	780	350	180	18	65	65	NPT
4UN-EVM 10	150	625	900	250	700	1880	910	390	210	24	80	80	FLANGE
4UN-EVM 18	150	625	900	250	700	2125	910	440	305	24	100	100	FLANGE
4UN-EVM 32	150	625	900	250	700	2635	910	440	305	100	150	150	FLANGE
4UN-EVM 45	150	625	900	250	700	2965	1200	550	305	100	200	200	FLANGE
4UN-EVM 64	150	625	900	250	700	2965	1200	550	305	100	200	200	FLANGE

DIMENSIONAL DRAWING (5UN)



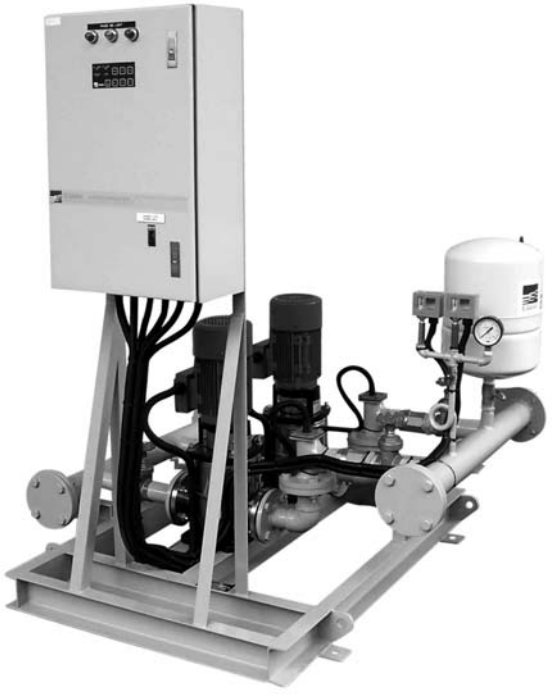
SIDE VIEW



VIEW 'X'

DIMENSION / MODEL	HI mm	H2 mm	H3 mm	D1 mm	W mm	L1 mm	L2 mm	D mm	E mm	TANK LITER	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm	PIPE CONNECTION
5UN-EVM 3	150	500	1100	250	800	2080	780	350	180	18	80	80	FLANGE
5UN-EVM 5	150	500	1100	250	800	2080	780	350	180	18	80	80	FLANGE
5UN-EVM 10	150	500	1100	250	800	2270	910	390	210	24	100	100	FLANGE
5UN-EVM 18	150	500	1100	250	800	2565	910	440	305	24	150	150	FLANGE
5UN-EVM 32	150	500	1100	250	800	3075	910	440	305	100	200	200	FLANGE
5UN-EVM 45	150	500	1100	250	800	3515	1200	550	305	100	200	200	FLANGE
5UN-EVM 64	150	500	1100	250	800	3515	1200	550	305	100	200	200	FLANGE

EBARA FLOW SWITCH CONTROLLED BOOSTER SYSTEM



Ebara Hydro Booster pressure set type UD is a flow switch control system which prevents frequent start/ stop of pumps, thus ensure constant water supply.

Application

Domestic : High-rise buildings, Condominiums, Apartments etc.
Commercial : Office buildings, Hotels, Shopping centres etc.
Industrial : High-rise factories, Manufacturing & Processing industries applications etc.
Social Service : Schools, Hospitals etc.

Construction Features

Fully assembled and certified Hydro Booster unit consisting of one or two (2) pump arranged in parallel, mounted on a common baseframe, pipework complete with all hydraulically required parts, EBARA Controller unit, pressure switches and flow switches together with complete internal electrical wiring.

Baseframe & Common Pipework

Galvanized pipework to enable easy connection to all commonly used pipe fittings. The pipework is sized suitable for maximum hydraulic unit capacity. Check valves and suitable gate valves are fitted for optimal system operation.

Pumps

Single or two (2) EBARA pumps arranged for parallel operation. All parts contact with liquid are of stainless steel.

Diaphragm Pressure Tank

A pre-charged diaphragm tank is fitted to the discharge pipe with a compatible Butyl-rubber diaphragm. Generally this tank serves basic functions of supplying water at a very low flow and minimising effect of water hammering.

Pressure Switches

The pressure switch controls start/stop of pump operation. Stop-value of pressure switch should be 0.6kgf/cm2 higher than pump supply pressure. Start value of pressure should be set so that the water supply appliance at the highest point of building or the most remote place has sufficient water supply pressure.

Flow Switch

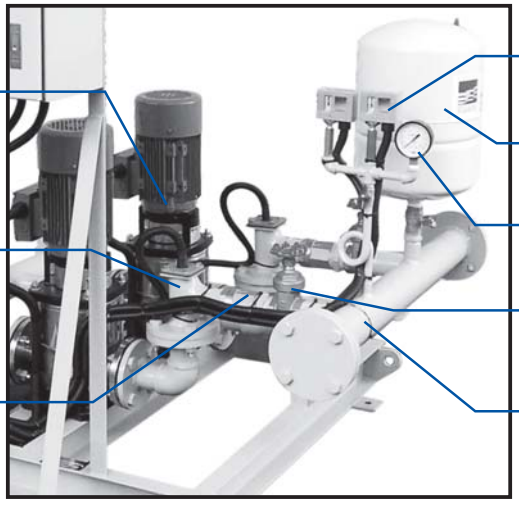
The primary function of flow switch is to detect low flow condition, and cut off pump operation during very low flow condition. This reduces the frequency of on/off pump to prolong operating life of pumping system.

EBARA FLOW SWITCH CONTROLLED BOOSTER SYSTEM

Pump
Stainless steel casing and impeller provide rusty-free water supply

Flow switch
Detects very low flow to cut off No. 1 pump thus reducing frequency of on / off pump at low flow

Check valve
Quick closing action reduces water hammer



Pressure switches
Adjustment type-signal cut-in and cut-out pumps

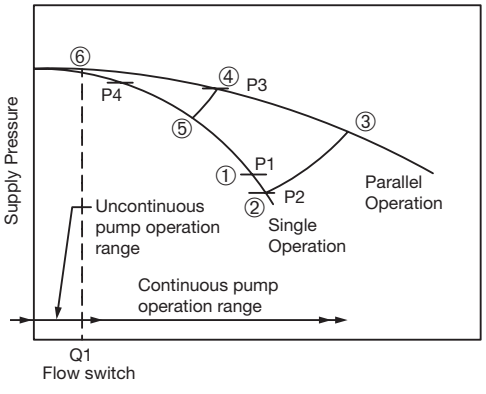
Pre-charge diaphragm tank

Pressure gauge
Indicator of water pressure

Isolating Valve

Discharge pipe
Galvanize pipework provides to enable easy connection

UD - CONTROL SYSTEM



Step 1) Both pumps are stopped when water tank is fully charged. In this condition water is supplied from the pressure tank, and water pressure in tank gradually decreases.

Step 2) No. 1 pump starts at pressure P1 (Point ①) and water is supplied from pump (and pressure tank).

Step 3) When more water is required and water pressure decreases to P2 (Point ②), No. 2 pump also starts, operation point shifts to Point ③ and system shifts to parallel operation.

Step 4) When water consumption decreases, water pressure in tank increases and when pressure reaches P3 (Point ④), No. 2 pump is stopped and operation point shifts to Point ⑤.

Step 5) When water consumption further decreases, water pressure in tank increases and pressure switch is turned off, and the flow switch used to detect small flow, is turned off. When both pressure and flow switches are off, No. 1 pump stops (Point ⑥). Flow switch setting point is at small capacity point, therefore pump continuous operation range is much wider. Accordingly pump start frequency is greatly decreased.

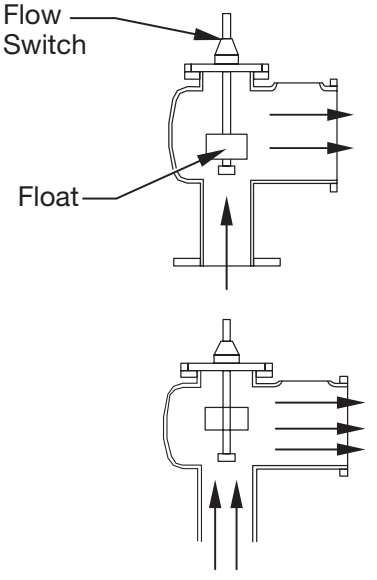
EBARA FLOW SWITCH CONTROLLED BOOSTER SYSTEM

Flow Switch

The primary function of flow switch is to detect a very low flow in order to cut off No.1 pump. This reduces the frequency of on/off pump at low flow. The life of pump is thus prolonged. The fundamental working principle is shown graphically as below.

At a very low flow, the float of the flow switch positions itself at/almost to its lowest resting position. That is, water pressure force from pump discharge is equivalent/lesser than the weight of the float. The location of the float sends signal out to trigger No.1 pump to stop.

At higher flow, the float is lifted up by the water pressure force from pump discharge. Its location is determined by the balancing act between its own weight and water pressure force. Signal generates no impact in operation on pump.



UD - CONTROLLED UNIT

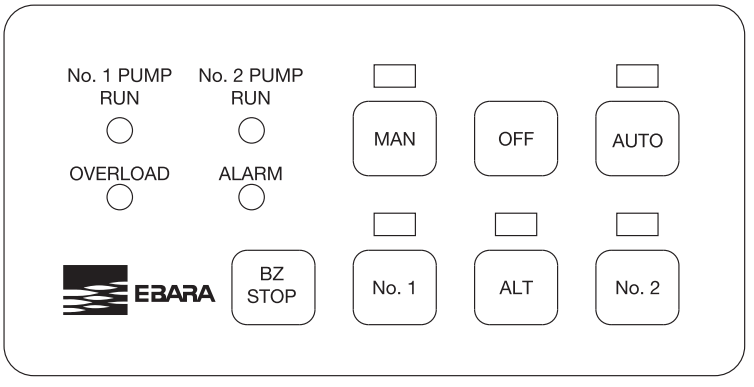
The heart of the system is the EBARA controller unit, which is user-friendly and permit 'One-touch' operation. It controls the sequence of pump operation with signals input from the pressure switch and/or flow switch in Auto & Alternate mode.

EBARA controller unit generally provides the below 'one-touch' functioning features:
- 1x Selector switch (P1/P2/ALT)
- 1x Selector switch (Manual/Auto/Off)
- 1x Power incoming indicating light
- 2x Pump RUN indicating light
- 1x Pump overload indicating light
- 1x Alarm (fault) indicating light
- 1x Buzzer stop

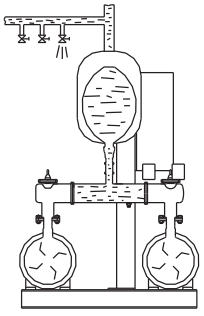
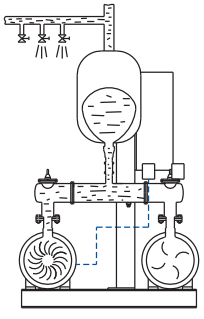
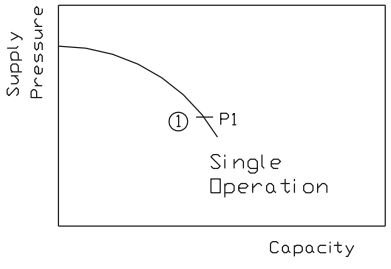
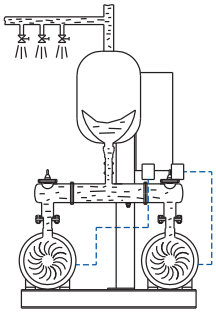
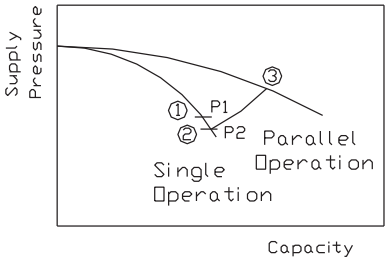
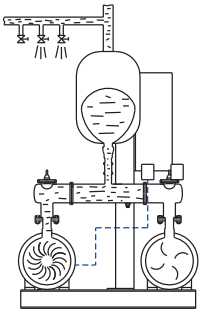
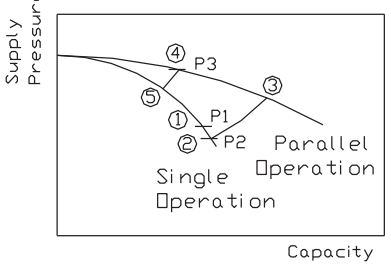
This user-friendly controller unit operates compatible with other electrical components to ensure smooth functioning of booster system.

Fig. below shows the display of panel board. Two modes of operation are possible, namely manual and auto & alternate.

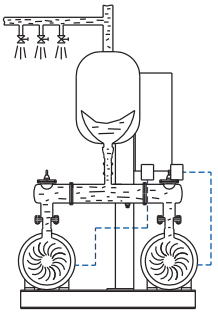
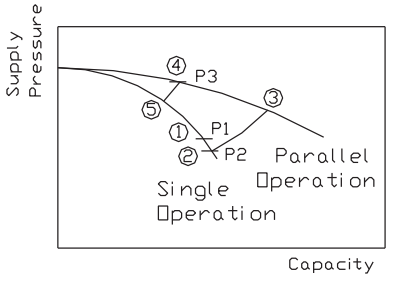
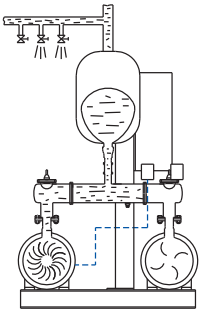
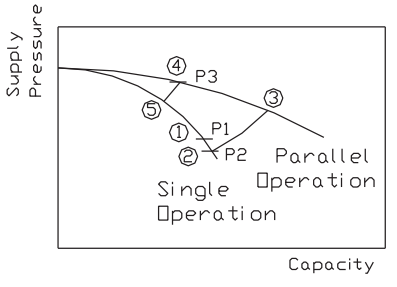
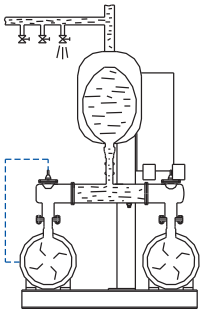
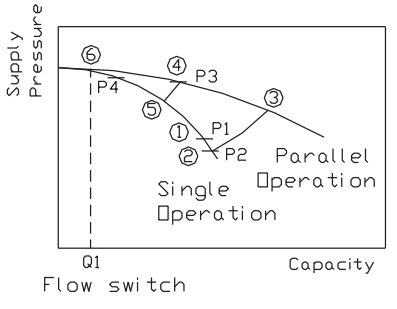
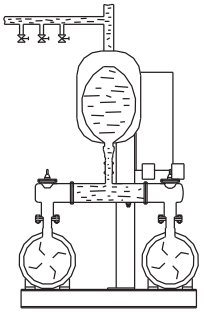
Various configurations of standard control panel are available. It varies from indoor to outdoor, DOL to star-delta starter and auto transformer type panel.



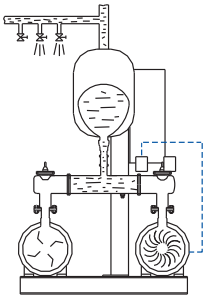
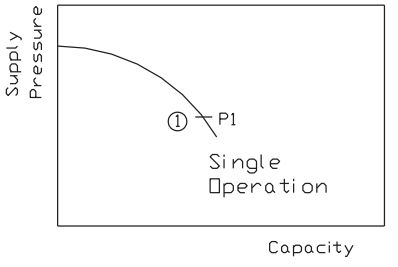
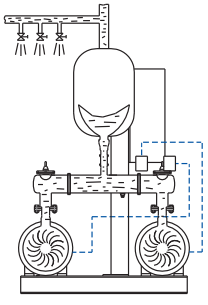
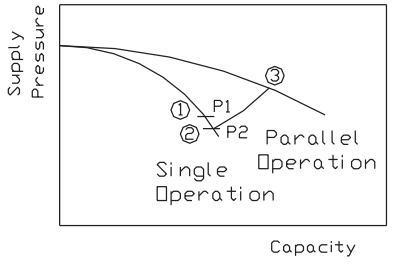
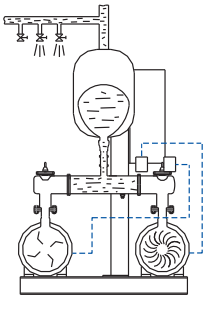
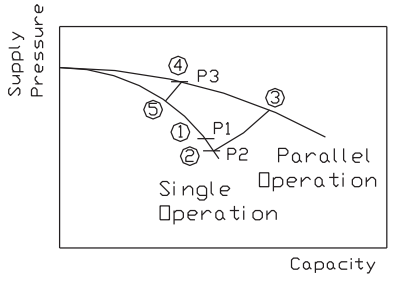
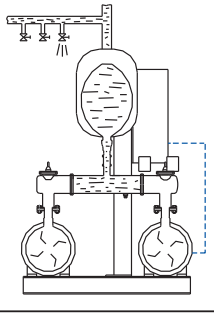
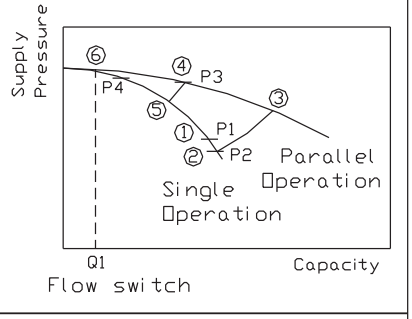
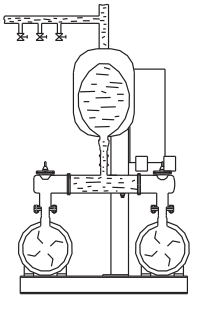
EBARA FLOW SWITCH CONTROLLED BOOSTER SYSTEM - OPERATION METHOD

Schematic Diagram	Operation	System Performance Curve
	Both pumps not operating at very low flow & small demand. Water supplies directly from hydro-pneumatic pressure vessel.	N/A
	At higher flow & higher demand water pressure in hydro-pneumatic pressure vessel decreases to P1 (point ①). No. 1 pressure switch initiates start of No. 1 pump.	
	At higher flow & water pressure decreases to P2 (point ②). No. 2 pressure switch triggers No. 2 pump to start & system shifts to parallel operation (operation point is at point ③).	
	As water consumption decreases & water pressure increases to P3 (point ④). No. 2 pressure switch activates No. 2 pump to stop & operation shifts to point ⑤.	

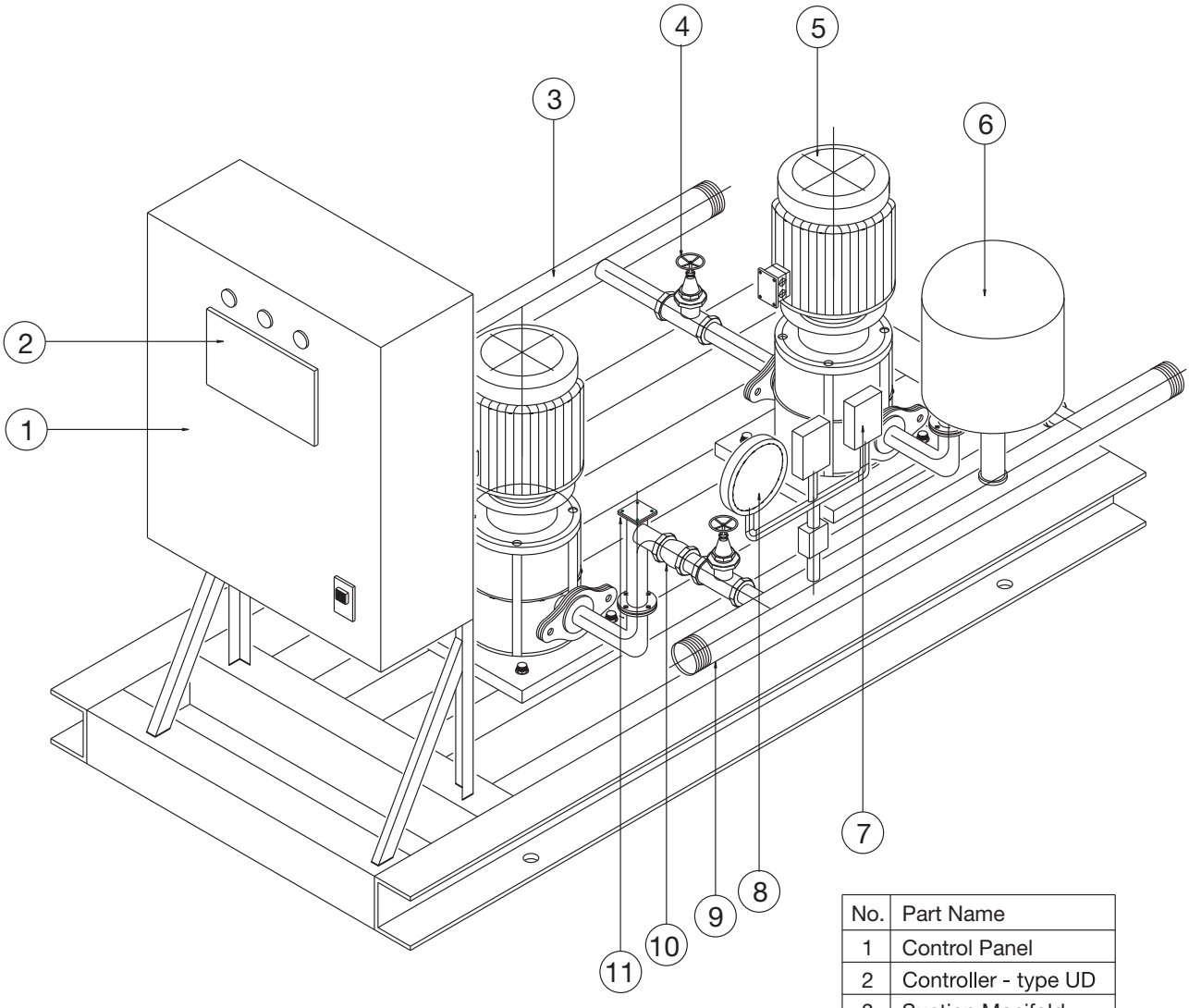
EBARA FLOW SWITCH CONTROLLED BOOSTER SYSTEM - OPERATION METHOD

Schematic Diagram	Operation	System Performance Curve
	At higher flow & water pressure decreases to P2 (point ②). No. 2 pressure switch triggers No. 2 pump to start & system shifts to parallel operation (operation point is at point ③)	
	As water consumption decreases & water pressure increases to P3 (point ④). No. 2 pressure switch activates No. 2 pump to stop & operation shifts to point ⑤.	
	As water consumption further decreases & water pressure increases to P4. No. 1 pressure switch cut off. Flow switch triggers No. 1 pump to stop at very low flow of Q1 (point ⑥).	
	Both pumps not operating at no demand.	N/A

EBARA FLOW SWITCH CONTROLLED BOOSTER SYSTEM - OPERATION METHOD

Schematic Diagram	Operation	System Performance Curve
	As demand increases again & water pressure in hydropneumatic pressure vessel decreases to P1 (point ①) No. 1 pressure switch initiates start of No.2 pump.	
	At higher flow & water pressure decreases to P2 (point ②). No. 2 pressure switch triggers No. 1 pump to start & system shifts to parallel operation (operation point is at point ③).	
	As water consumption decreases & water pressure increases to P3 (point ④). No. 2 pressure switch activates No. 1 pump to stop & operation shifts to point ⑤.	
	As water consumption further decreases & water pressure increases to P4. No. 1 pressure switch cut off. Flow switch triggers No. 2 pump to stop at very low flow of Q1 (point ⑥).	
	Both pumps not operating at no demand.	N/A

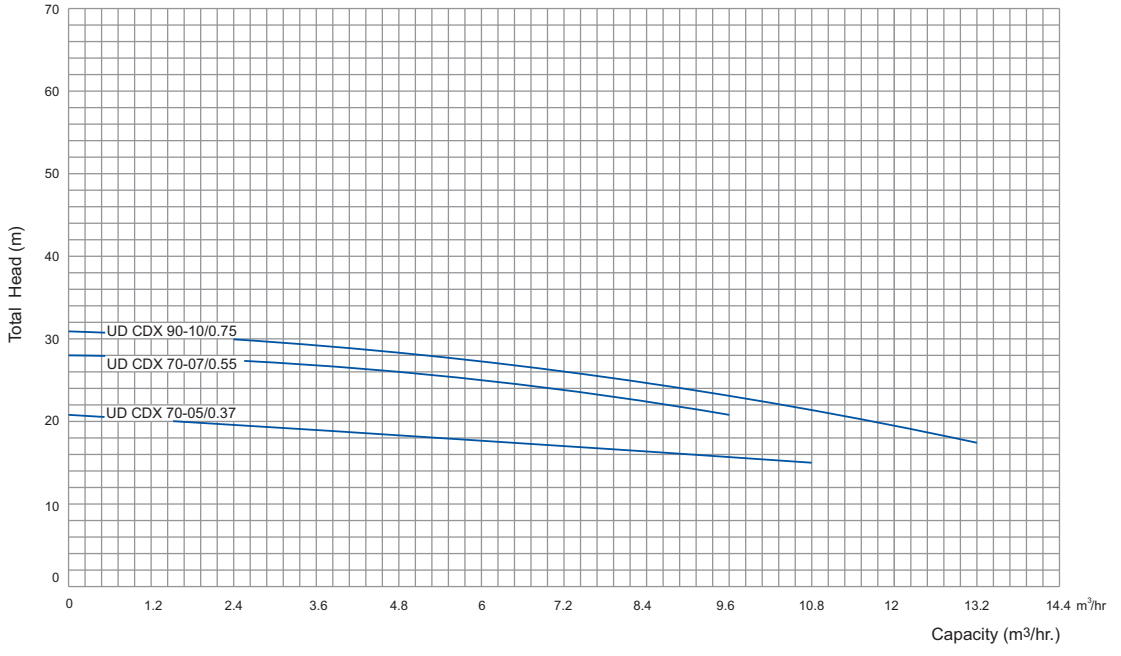
ISOMETRIC DRAWING



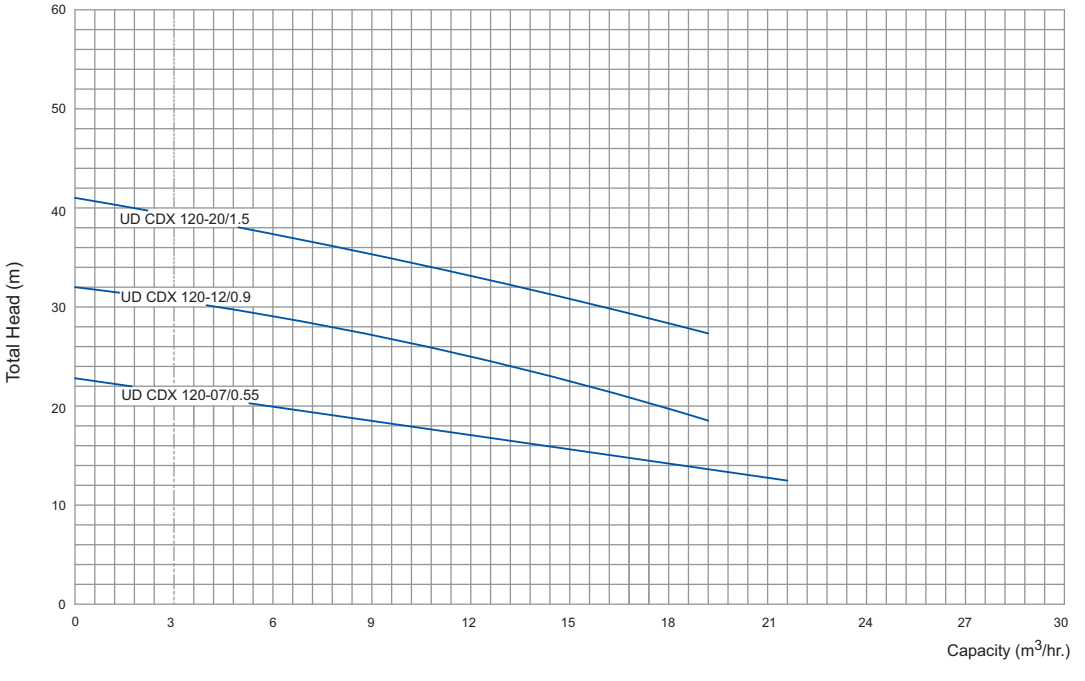
No.	Part Name
1	Control Panel
2	Controller - type UD
3	Suction Manifold
4	Gate Valve
5	Pump
6	Diaphragm Tank
7	Pressure Switch
8	Pressure Gauge
9	Discharge Manifold
10	Check Valve
11	Flow Switch

SELECTION GUIDE

UD CDX 70 / 90
CURVES 2 POLES 50 Hz

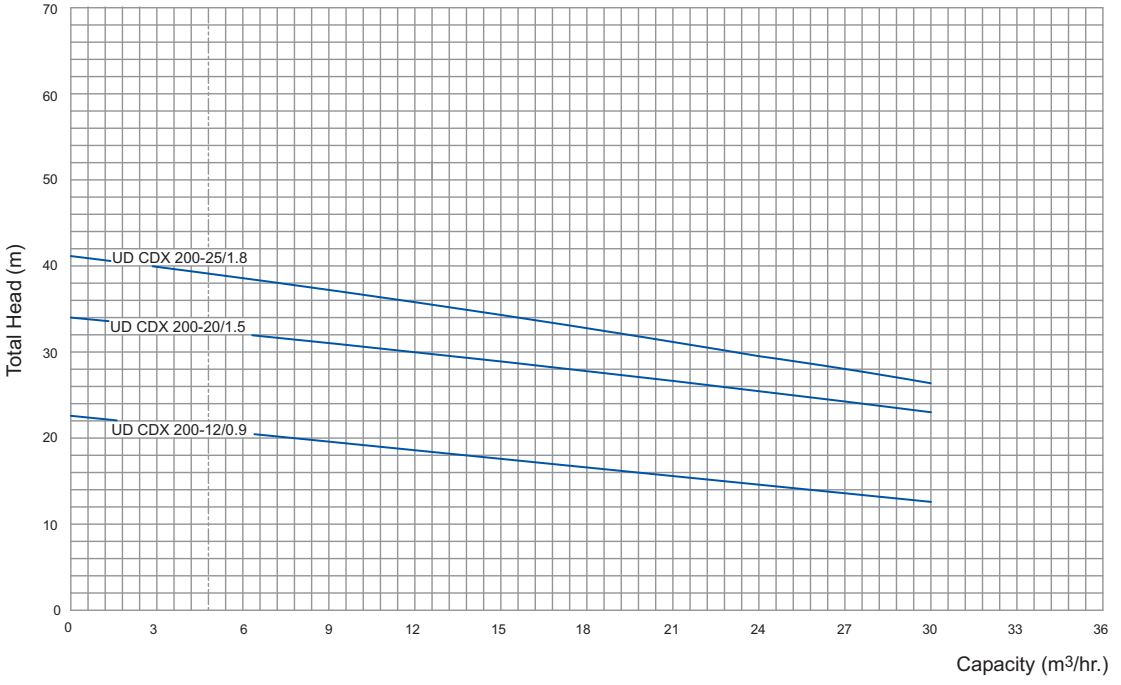


UD CDX 120
CURVES 2 POLES 50 Hz

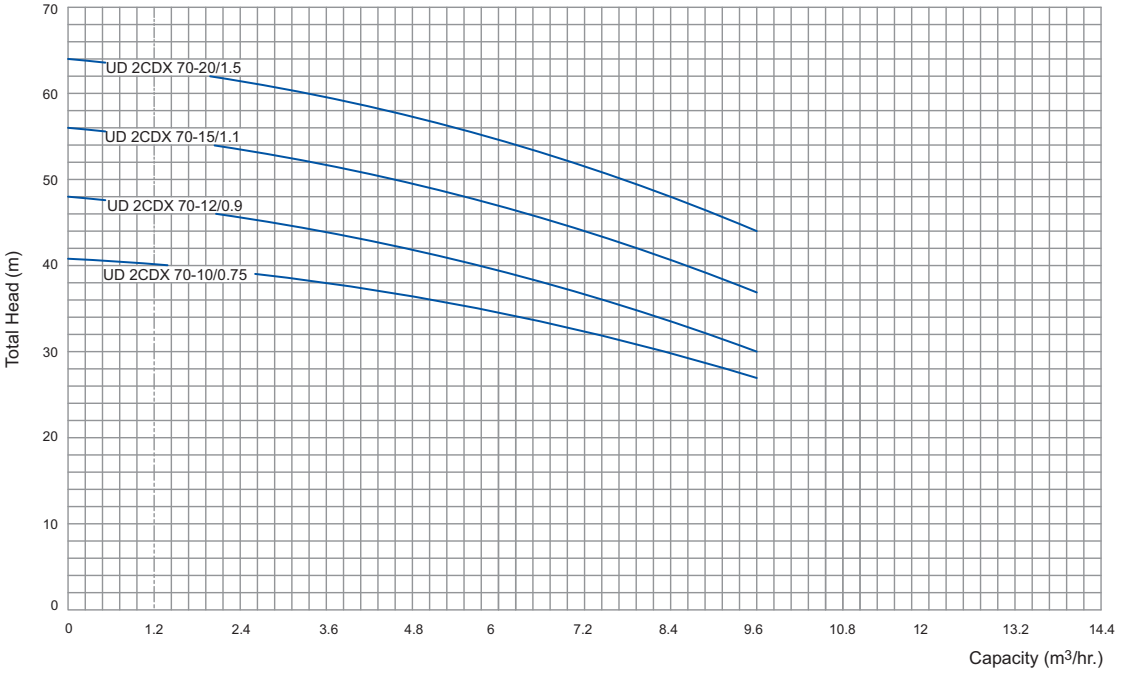


SELECTION GUIDE

UD CDX 200
CURVES 2 POLES 50 Hz

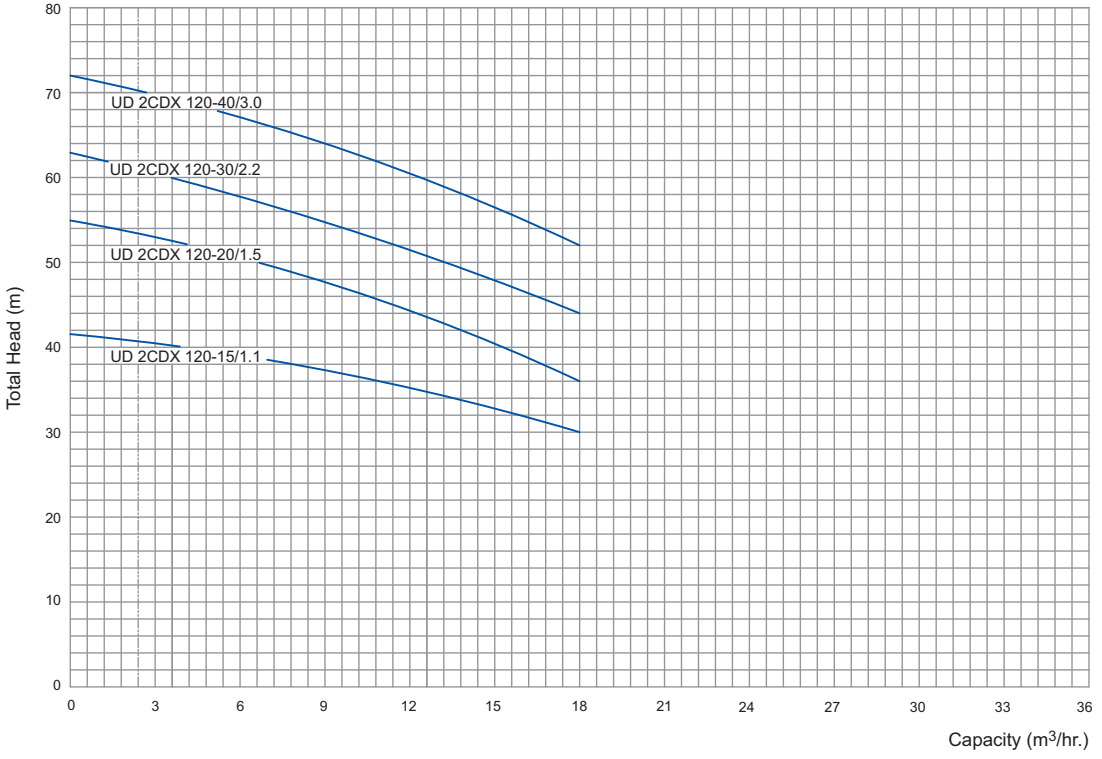


UD 2CDX 70
CURVES 2 POLES 50 Hz

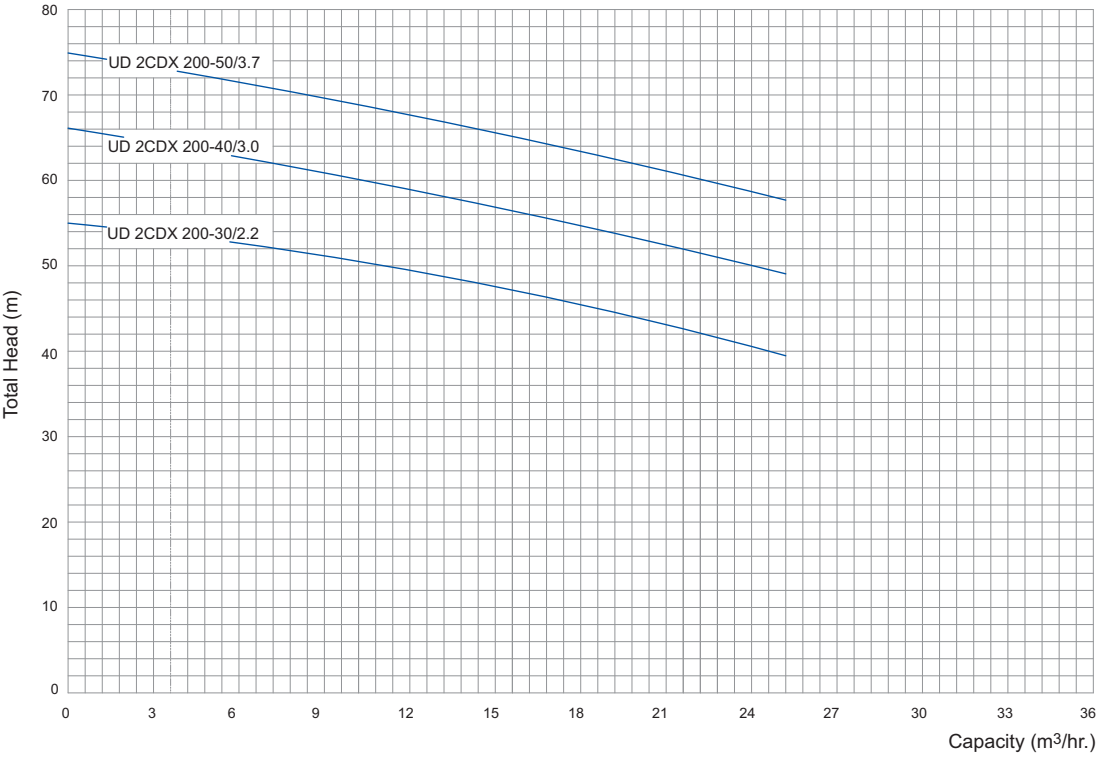


SELECTION GUIDE

UD 2CDX 120
CURVES 2 POLES 50 Hz

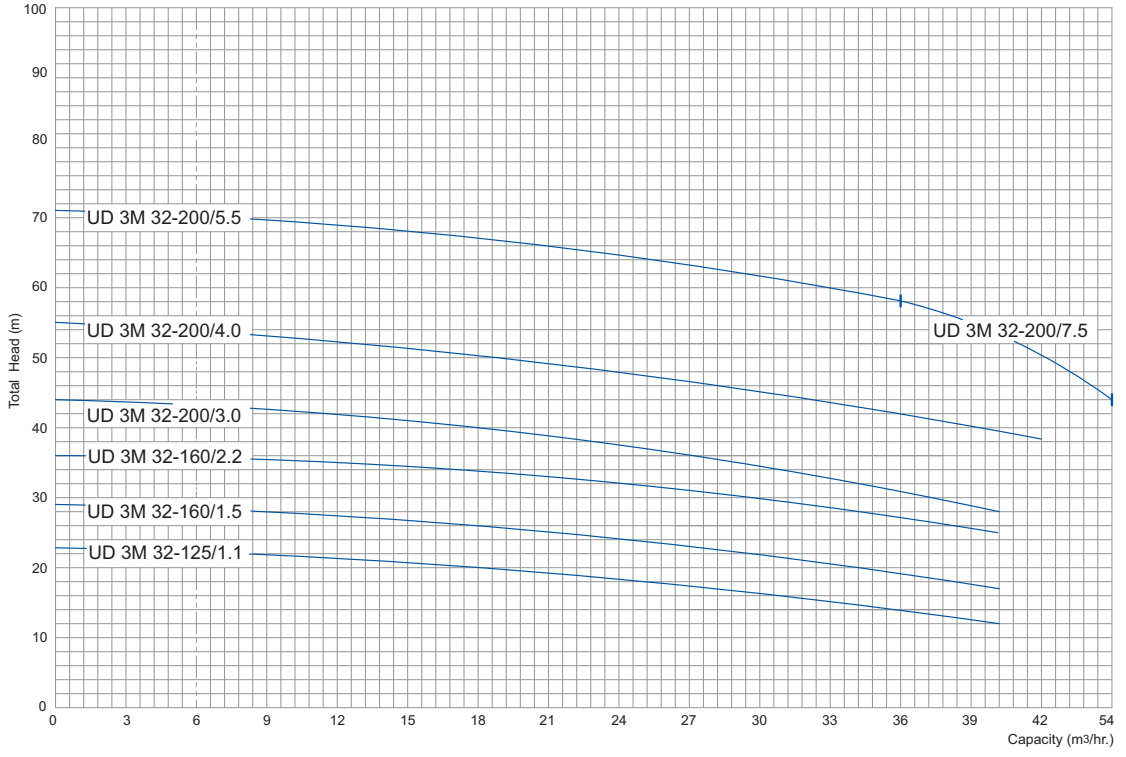


UD 2CDX 200
CURVES 2 POLES 50 Hz

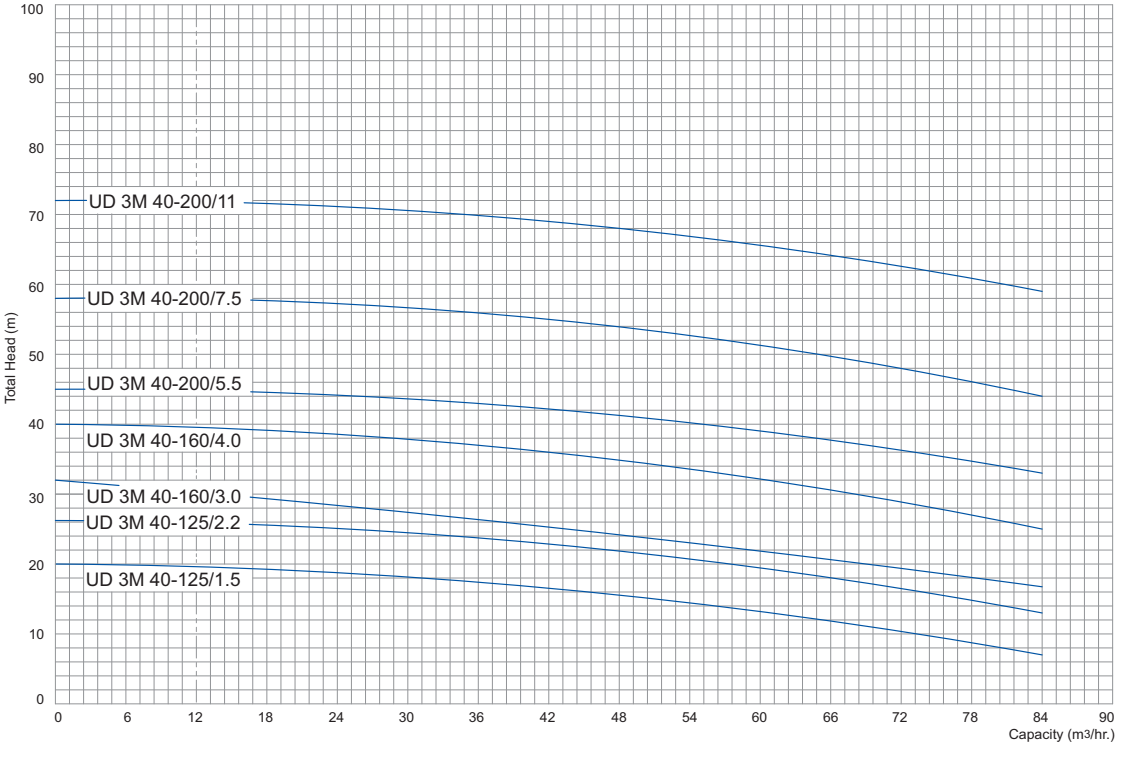


SELECTION GUIDE

UD 3M 32
CURVES 2 POLES 50 Hz

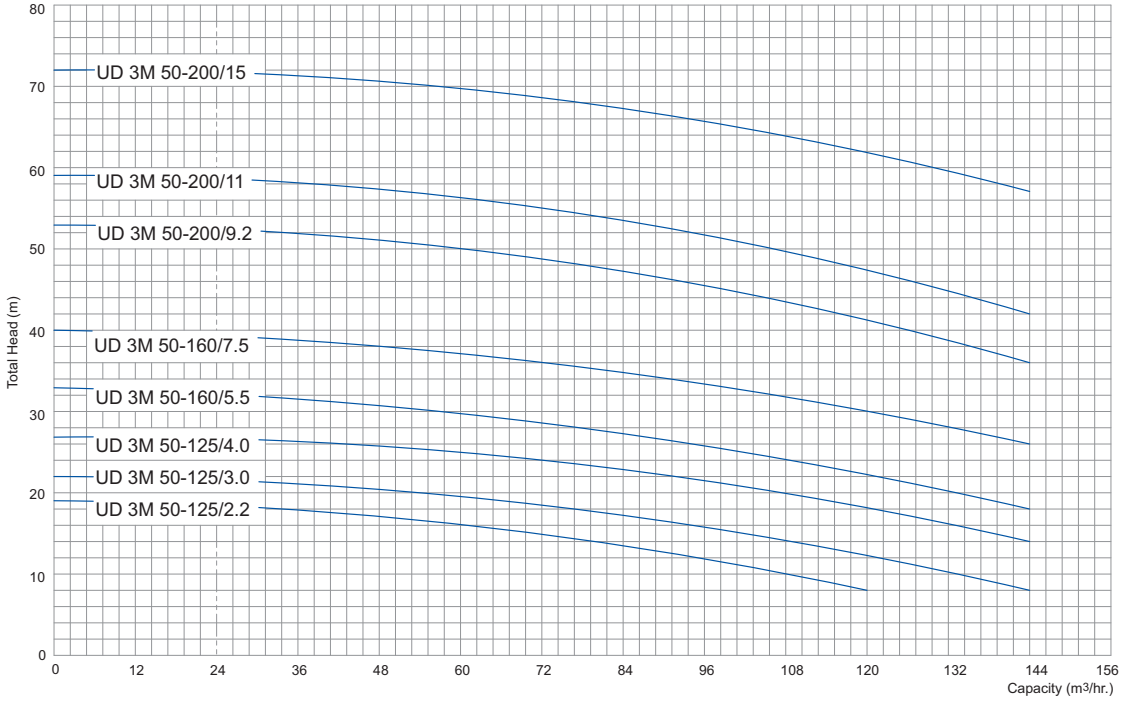


UD 3M 40
CURVES 2 POLES 50 Hz

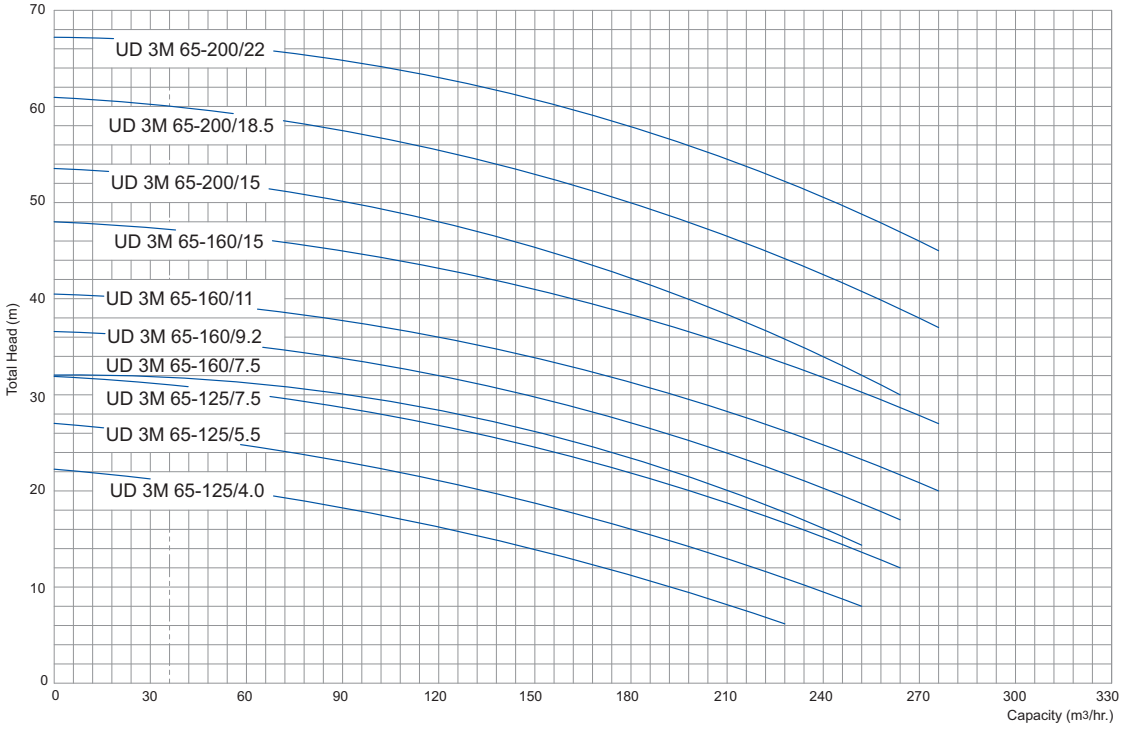


SELECTION GUIDE

UD 3M 50
CURVES 2 POLES 50 Hz

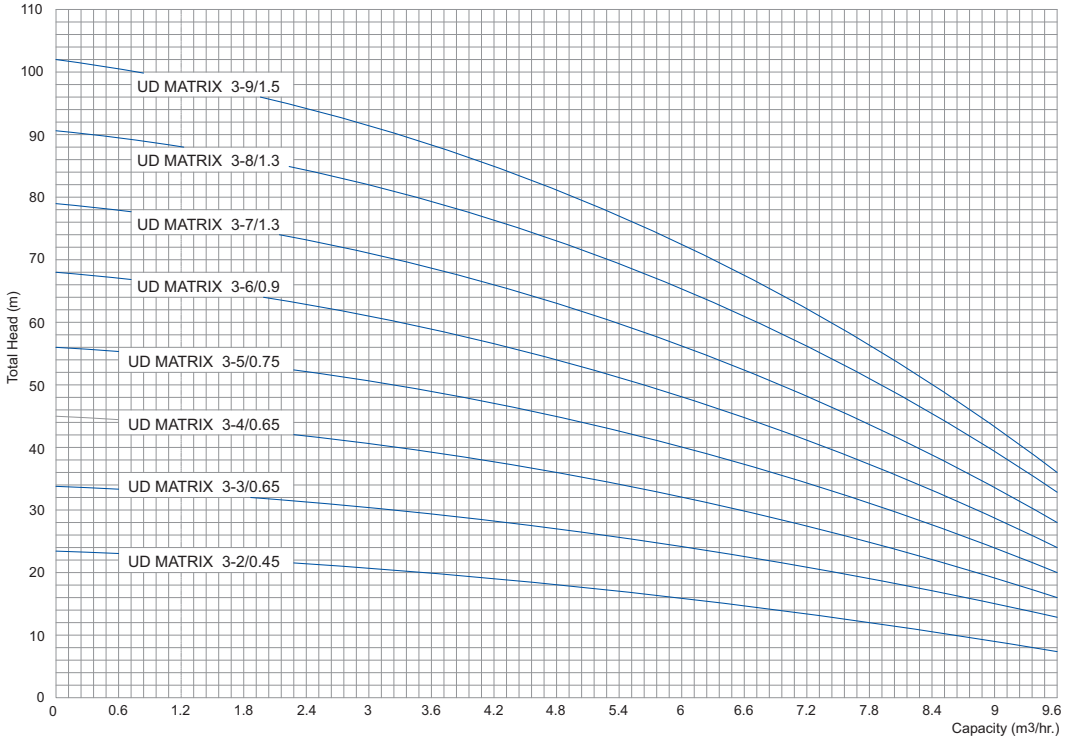


UD 3M 65
CURVES 2 POLES 50 Hz

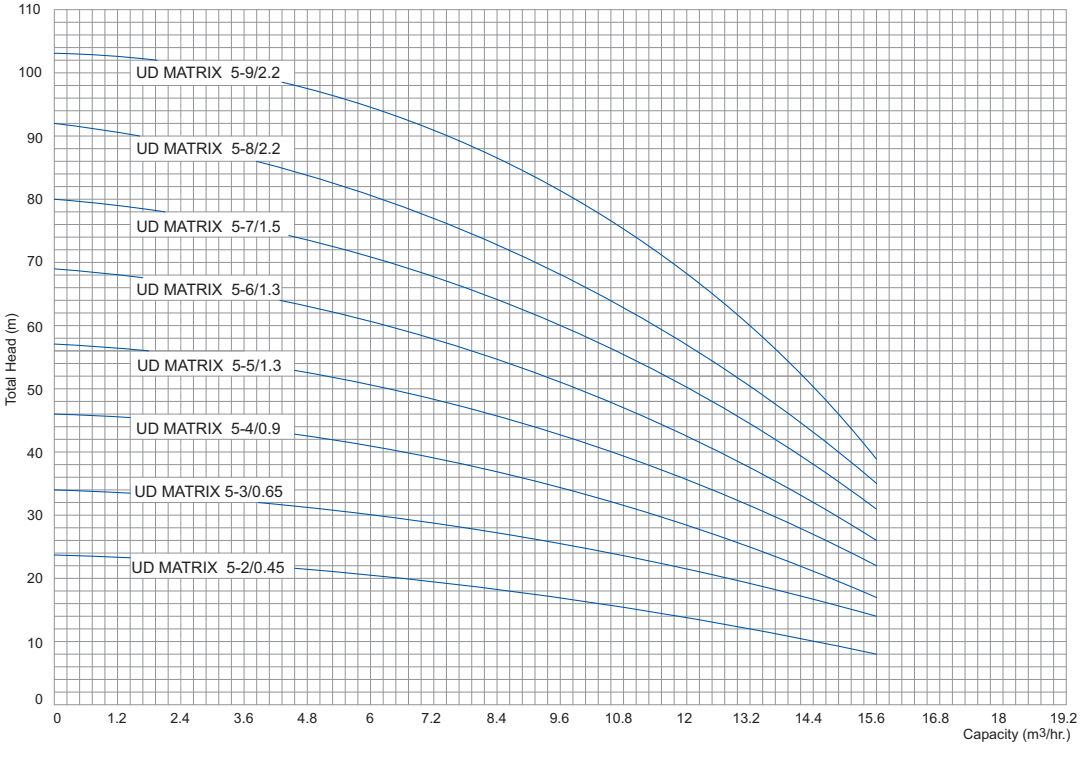


SELECTION GUIDE

UD MATRIX 3
CURVES 2 POLES 50 Hz

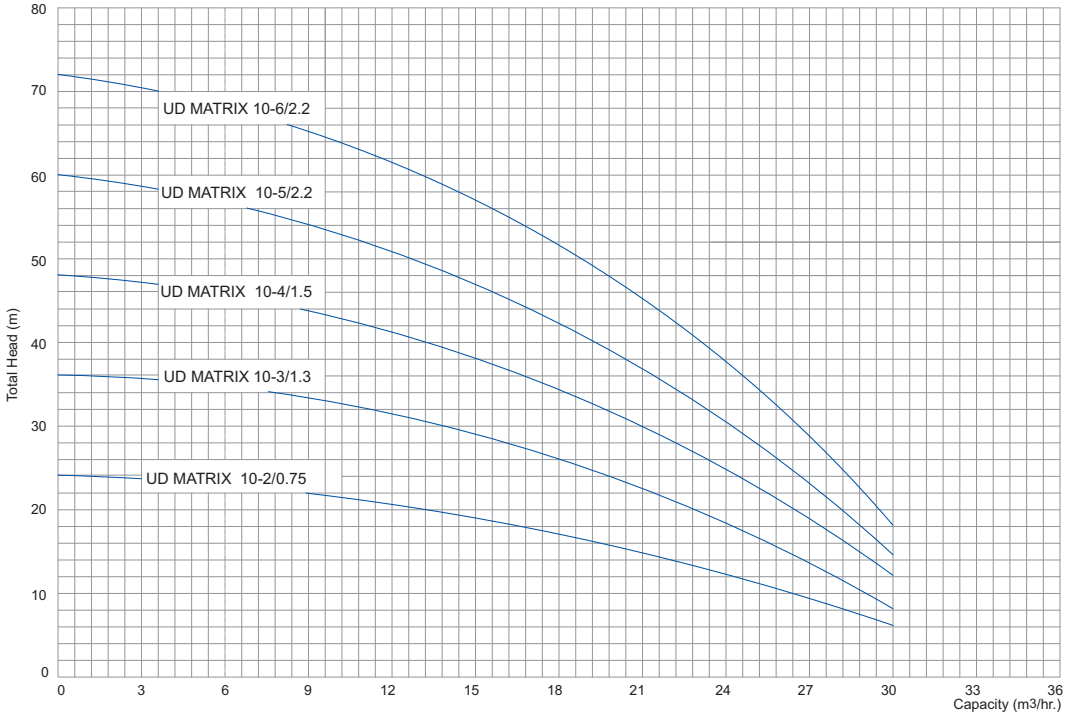


UD MATRIX 5
CURVES 2 POLES 50 Hz

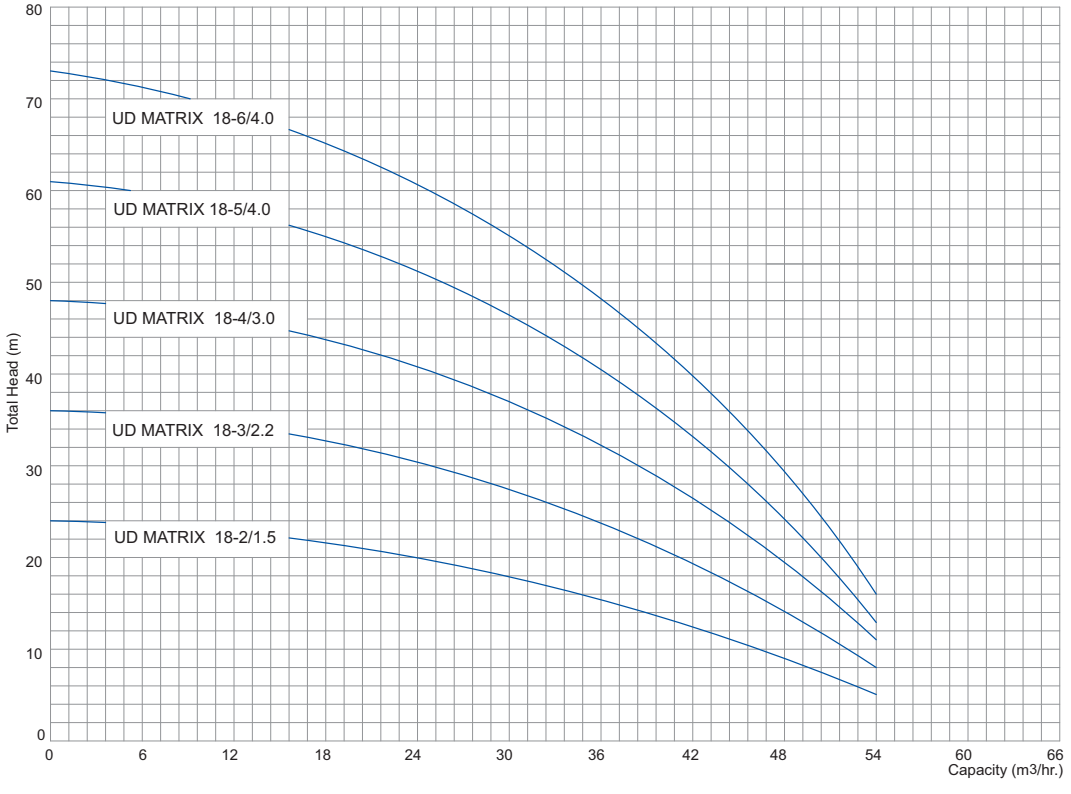


SELECTION GUIDE

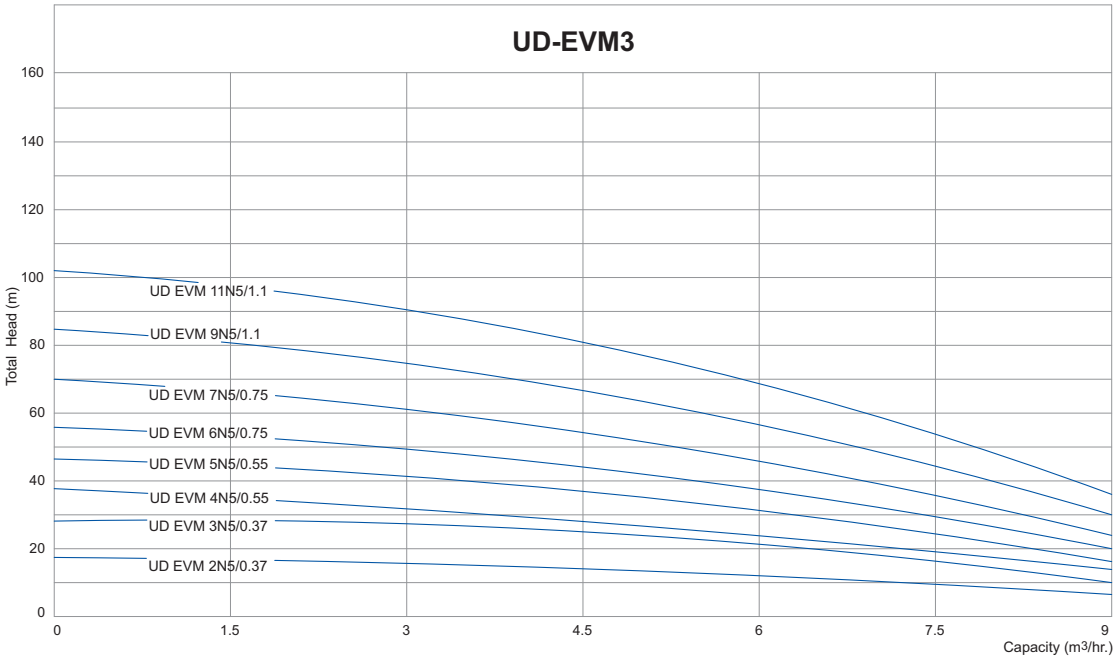
UD MATRIX 10
CURVES 2 POLES 50 Hz

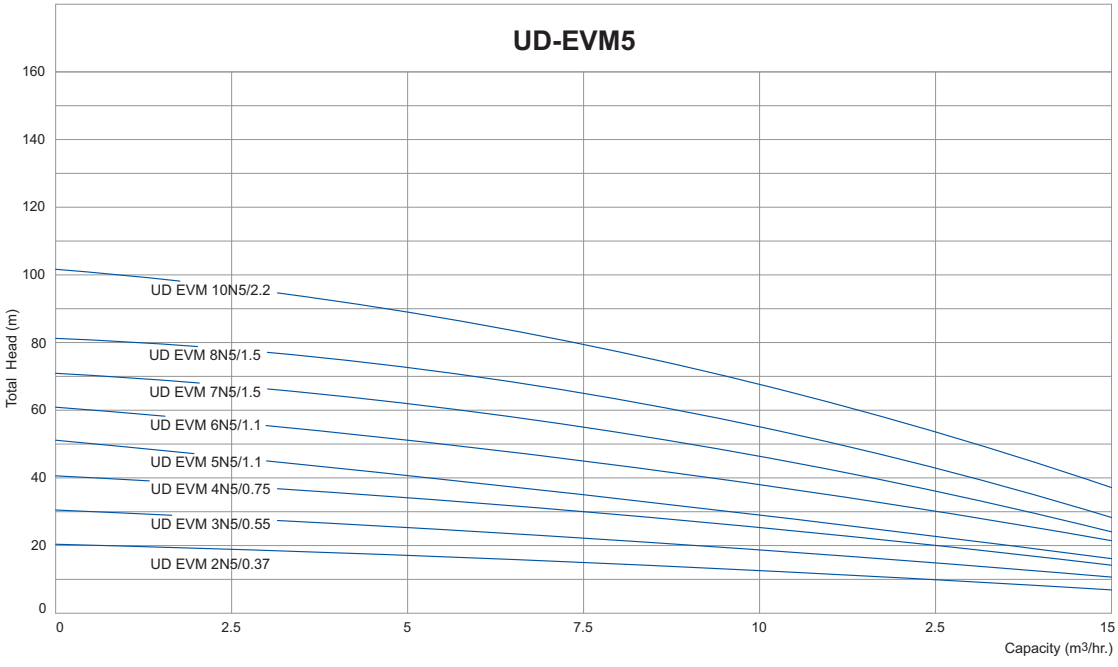


UD MATRIX 18
CURVES 2 POLES 50 Hz

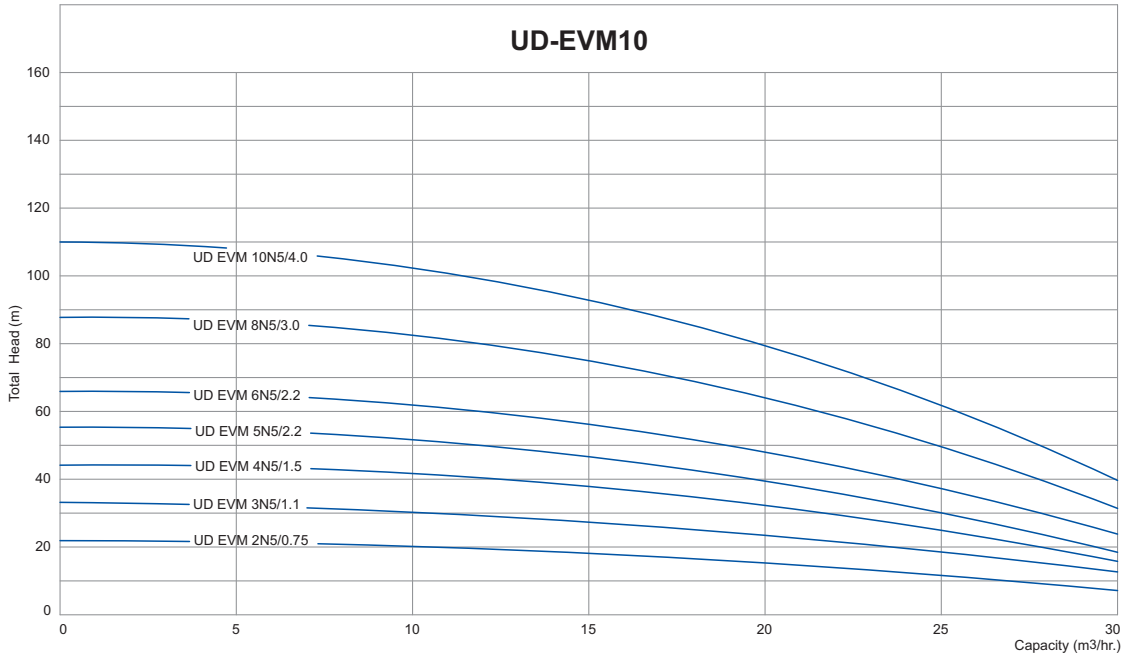


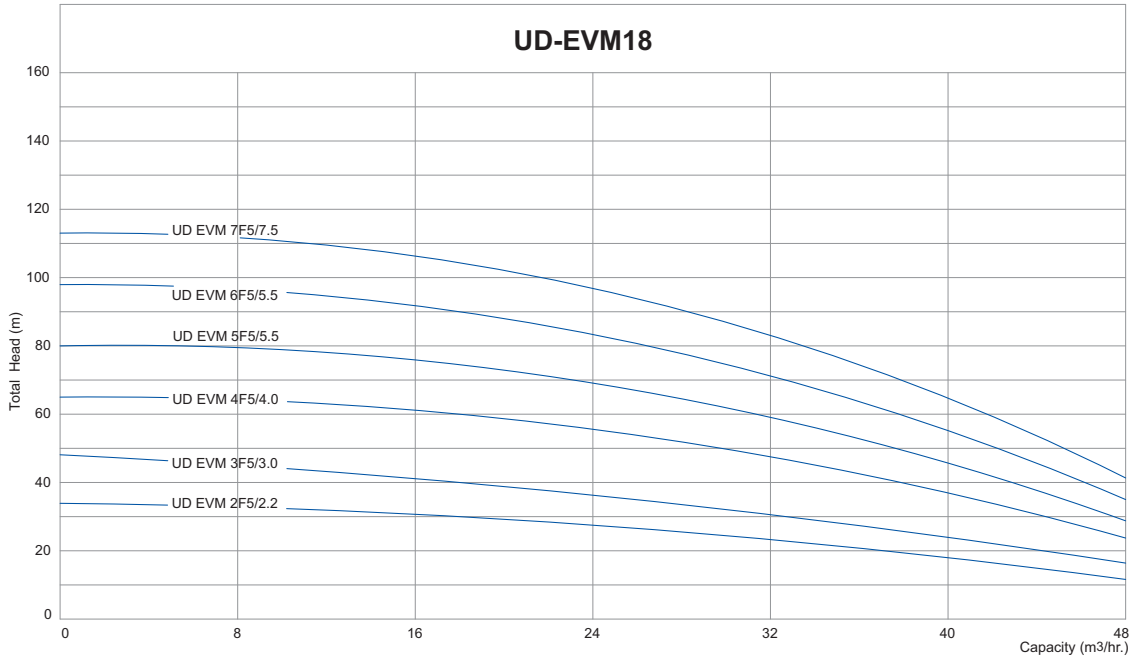
SELECTION GUIDE



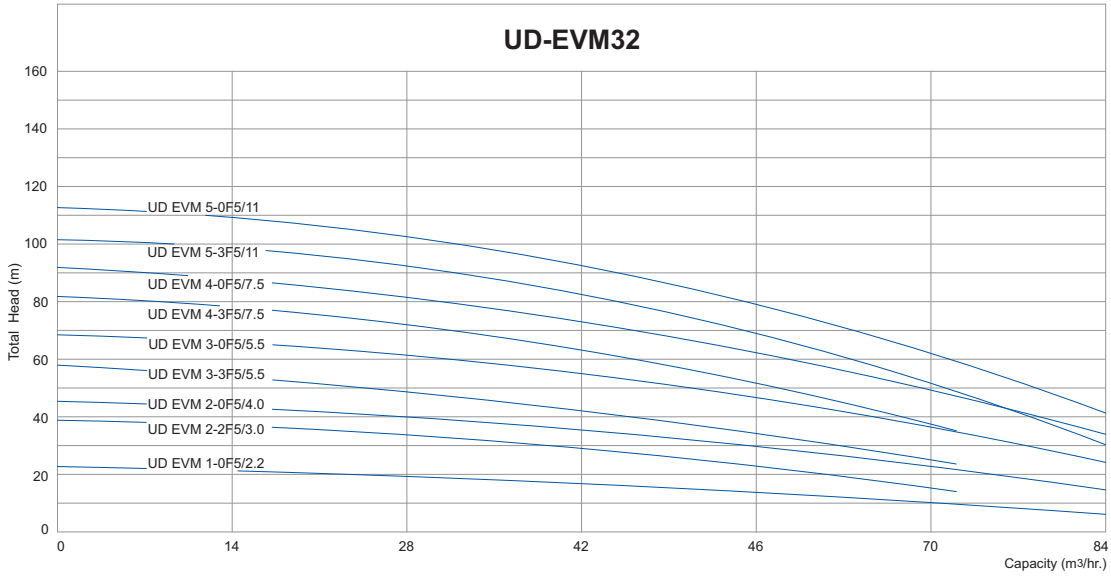


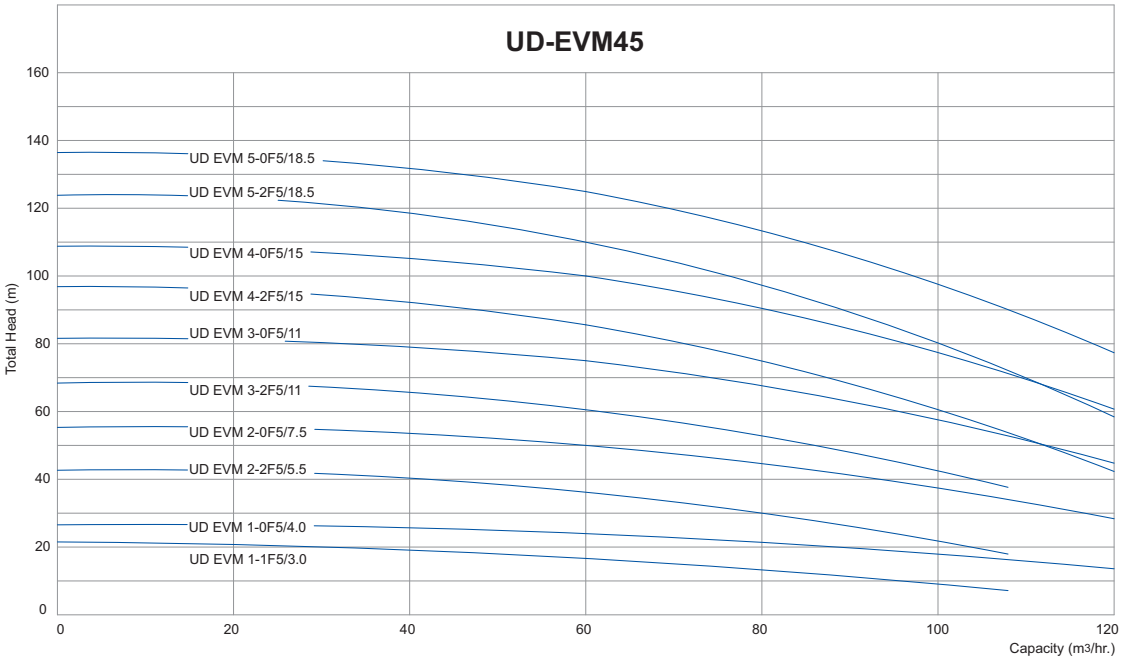
SELECTION GUIDE



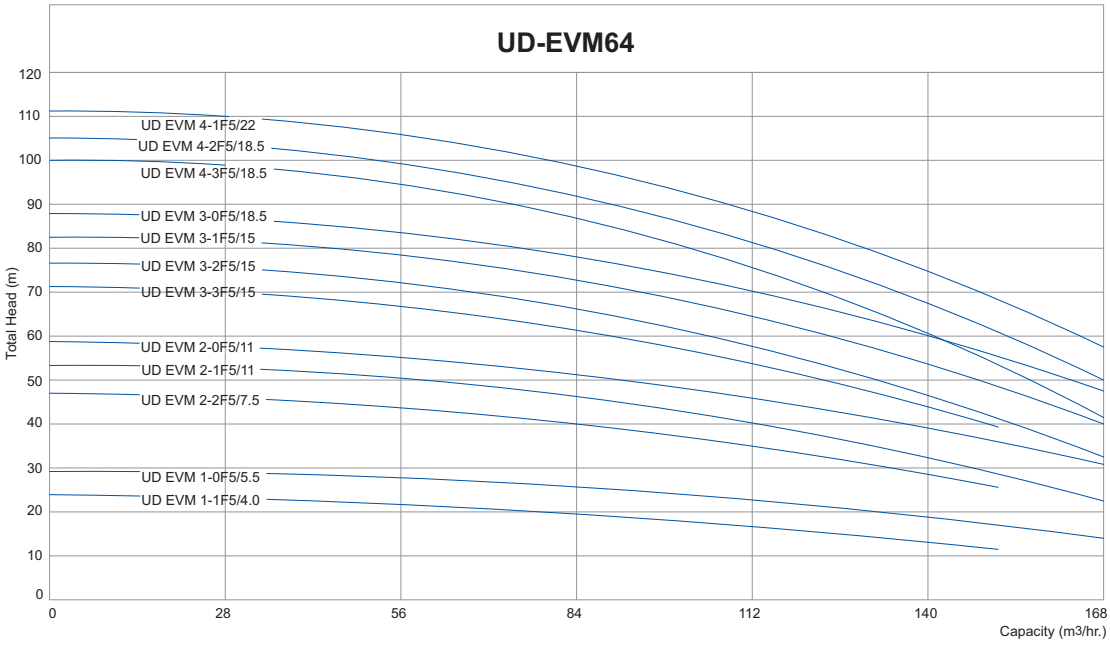


SELECTION GUIDE

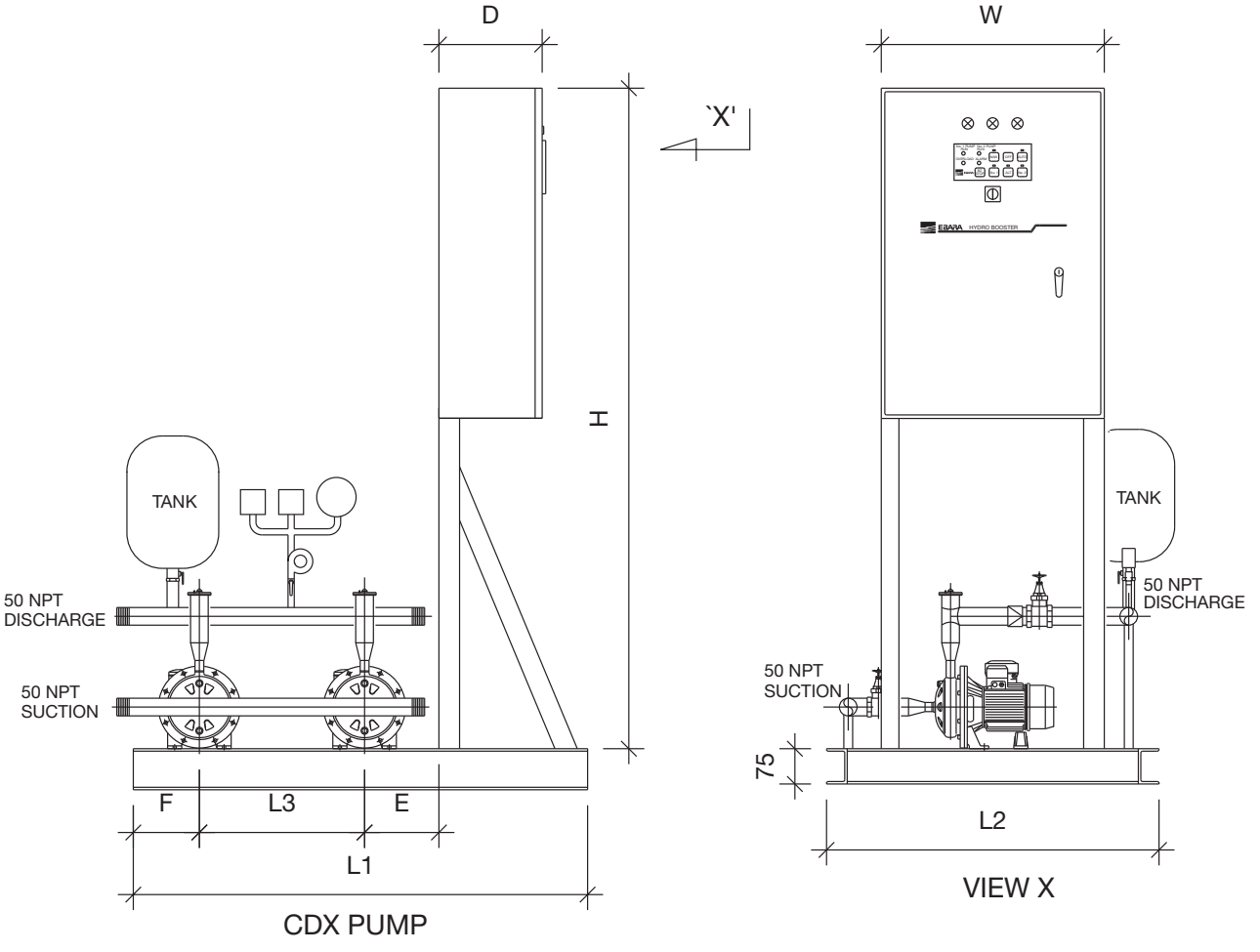




SELECTION GUIDE

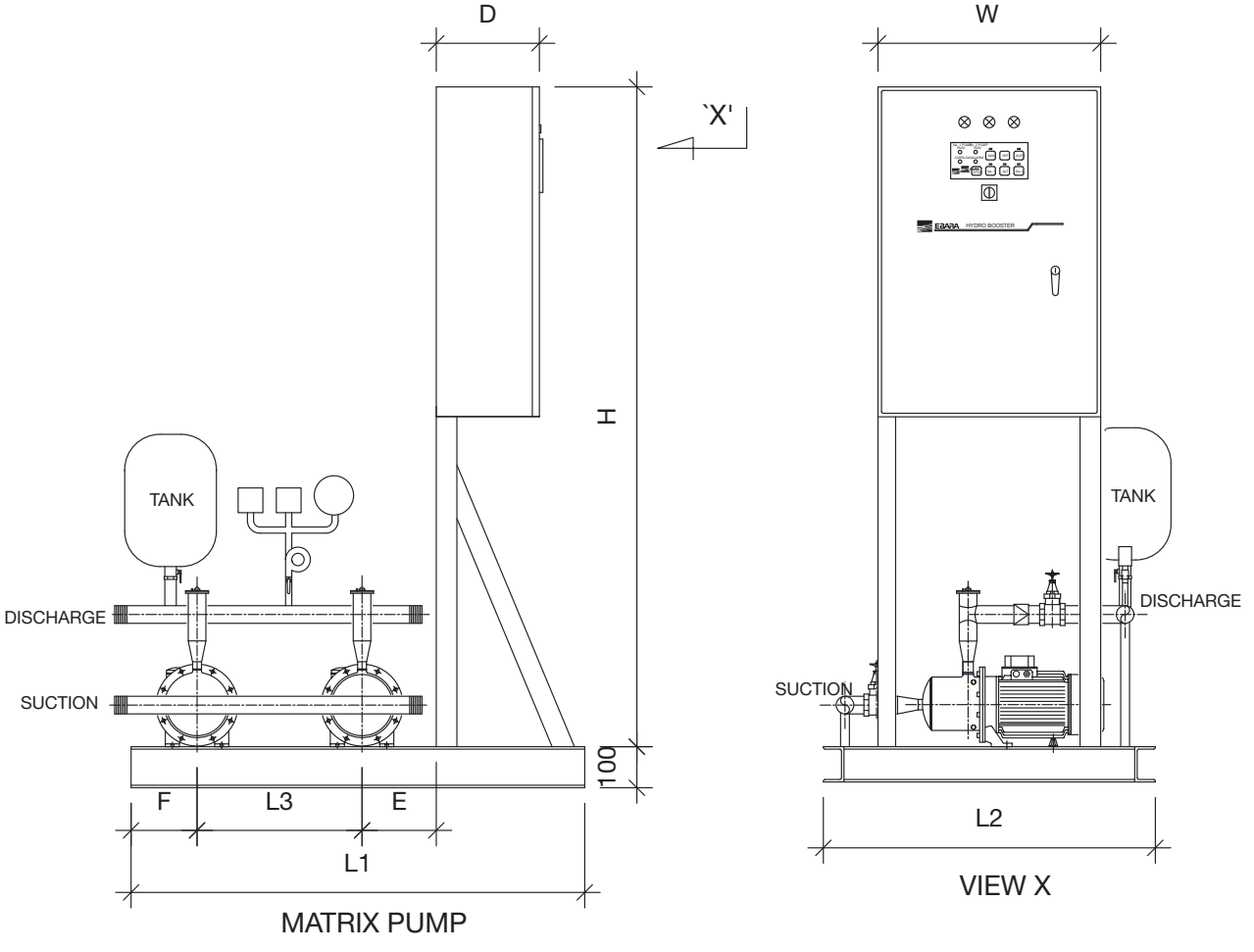


DIMENSIONAL DRAWING UD SYSTEM (CDX)



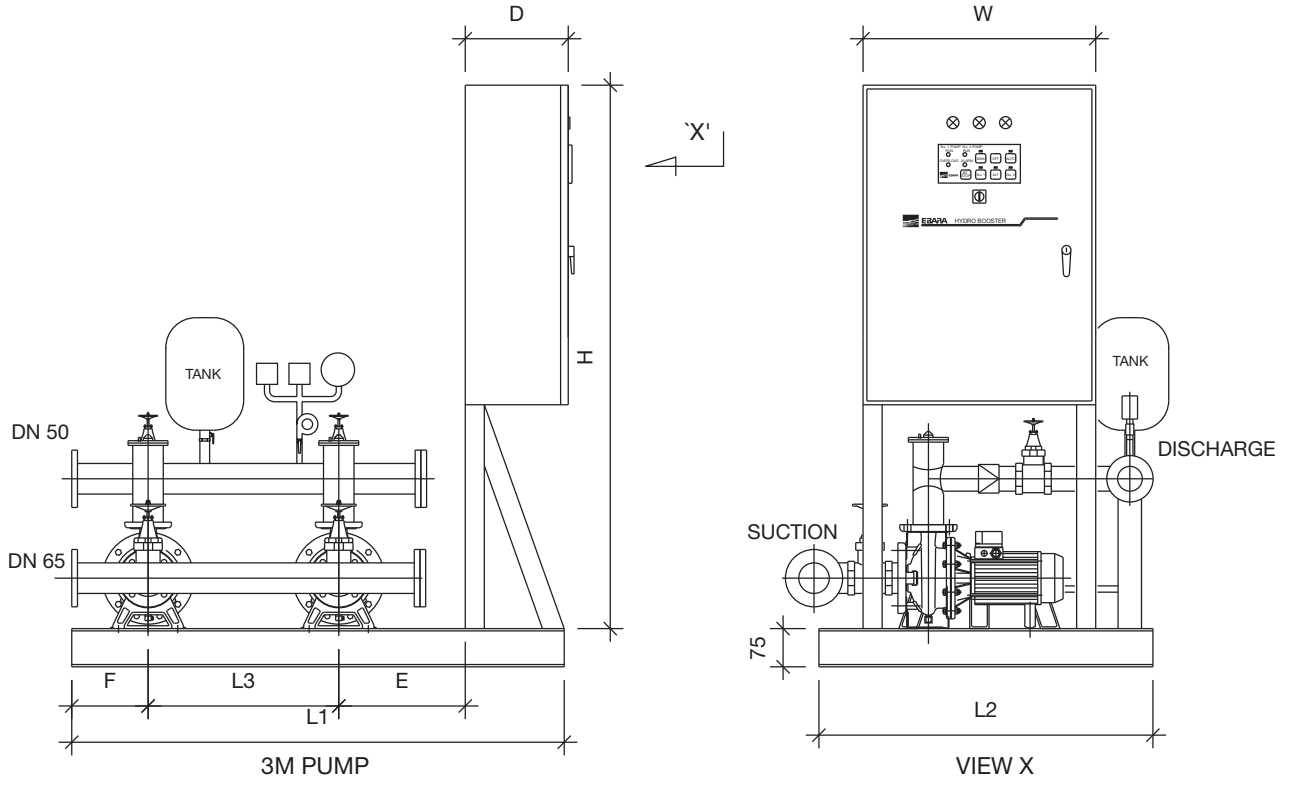
DIMENSION / MODEL	D mm	W mm	H mm	L1 mm	L2 mm	L3 mm	E mm	F mm	TANK LITER	PIPE CONNECTION
UD-2 x CDX	200	450	1525	1030	860	350	250	180	18	NPT

DIMENSIONAL DRAWING UD SYSTEM (MATRIX)



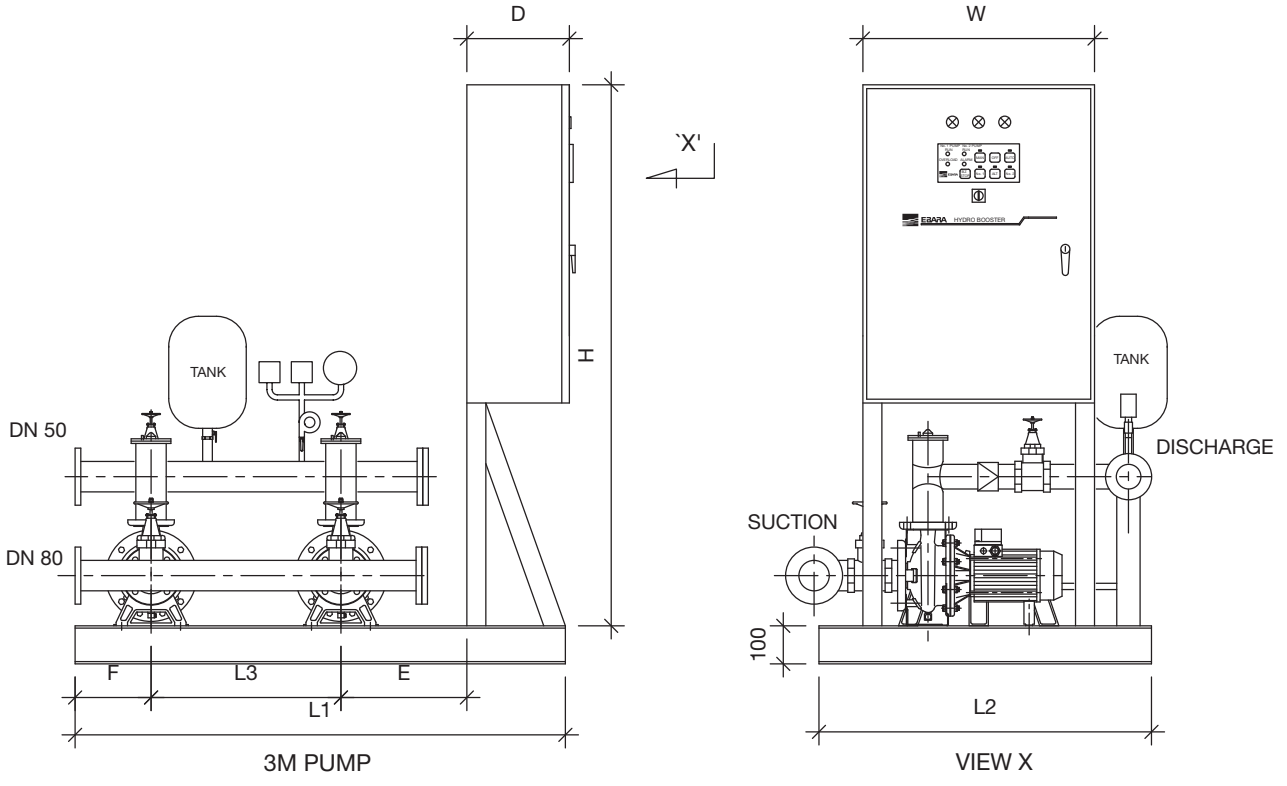
DIMENSION / MODEL	D mm	W mm	H mm	L1 mm	L2 mm	L3 mm	E mm	F mm	TANK LITER	PIPE CONNECTION
UD-2 x MATRIX 3/5/10	200	450	1525	1030	860	350	250	180	18	50 NPT
UD-2 x MATRIX 18	200	450	1525	1080	910	350	250	180	24	75 NPT

DIMENSIONAL DRAWING UD SYSTEM (3M 32)



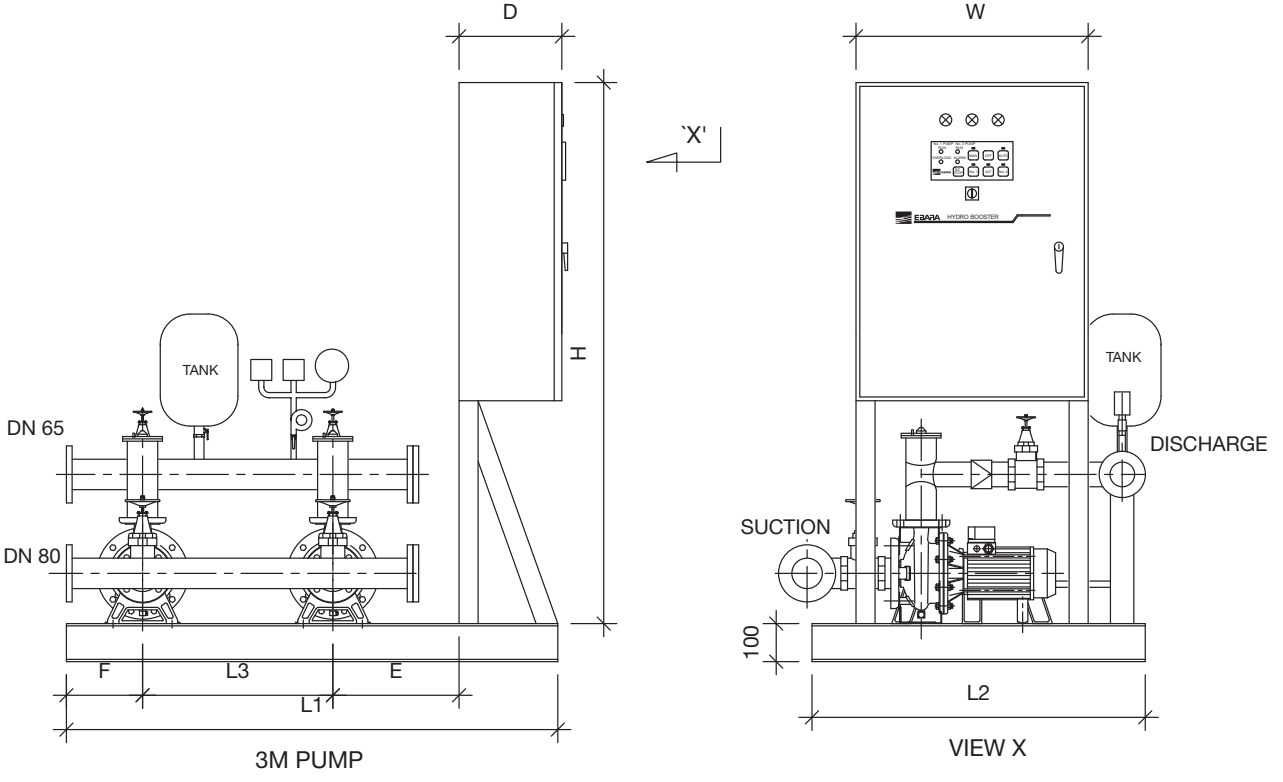
DIMENSION / MODEL	D mm	W mm	H mm	L1 mm	L2 mm	L3 mm	E mm	F mm	TANK LITER	PIPE CONNECTION
UD-2 x 3M32	200	550	1525	1200	920	440	250	210	24	FLANGE

DIMENSIONAL DRAWING UD SYSTEM (3M 40)



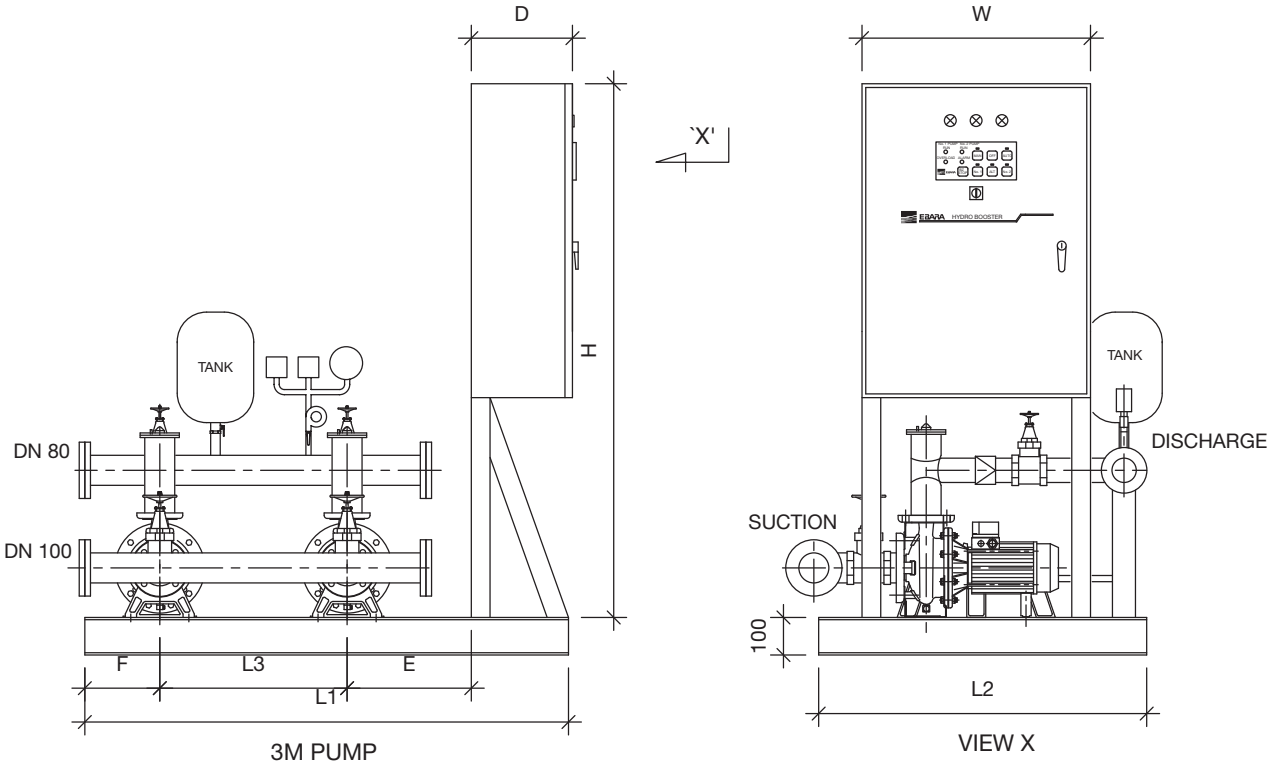
DIMENSION / MODEL	D mm	W mm	H mm	L1 mm	L2 mm	L3 mm	E mm	F mm	TANK LITER	PIPE CONNECTION
UD-2 x 3M40	200	550	1525	1460	1050	500	310	250	24	FLANGE

DIMENSIONAL DRAWING UD SYSTEM (3M 50)



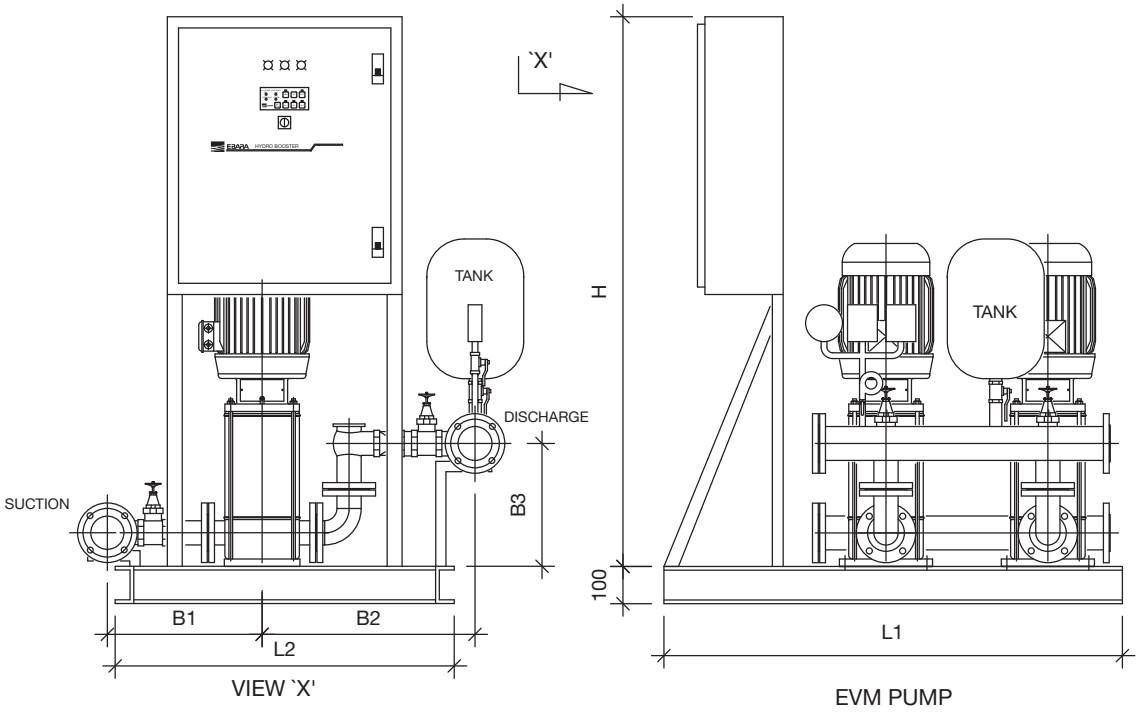
DIMENSION / MODEL	D mm	W mm	H mm	L1 mm	L2 mm	L3 mm	E mm	F mm	TANK LITER	PIPE CONNECTION
UD-2 x 3M50	200	550	1525	1460	1050	500	310	250	24	FLANGE

DIMENSIONAL DRAWING UD SYSTEM (3M 65)



DIMENSION / MODEL	D mm	W mm	H mm	L1 mm	L2 mm	L3 mm	E mm	F mm	TANK LITER	PIPE CONNECTION
UD-2 x 3M65	200	550	1525	1460	1050	500	310	250	24	FLANGE

DIMENSIONAL DRAWING UD SYSTEM (EVM)



DIMENSION / MODEL	B1 mm	B2 mm	B3 mm	H mm	L1 mm	L2 mm	TANK LITER	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm	PIPE CONNECTION
2UD-EVM 3	400	700	350	1525	1030	880	18	50	50	NPT
2UD-EVM 5	400	700	350	1525	1030	880	18	50	50	NPT
2UD-EVM 10	420	720	350	1525	1100	1040	24	65	65	NPT
2UD-EVM 18	420	720	350	1525	1245	1040	24	80	80	FLANGE
2UD-EVM 32	440	740	400	1525	1755	1360	100	100	100	FLANGE
2UD-EVM 45	440	740	400	1525	1860	1530	100	150	150	FLANGE
2UD-EVM 64	440	740	400	1525	1860	1530	100	150	150	FLANGE

HYDRO BOOSTER-PNEUMATIC TYPE

EBARA Hydro-pneumatic booster system uses EBARA stainless steel pumps with one or more pressure tanks mounted on a common baseplate skid consisting of valves and manifolds.
Custom designed electrical control panel is utilised and built to highest standard, interconnected with pump motor and control devices to ensure automatic trouble-free booster operation.

PUMPS
Vertical multi-stage stainless steel pump, all wetted parts in contact with liquid are stainless steel for robust operation.

Option: Other EBARA centrifugal pumps also avalaible upon request.

TANK
Local JKKP approved tanks with imported supreme quality diaphragm to ensure long operating life.

CONTROL PANEL
Corrosion-resistance epoxy coated control panel incorporated with quality electrical / electronic components built to EBARA's quality standard.

ACCESSORIES
Approved pressure switches, valves and fittings are selected and used to enhance operating efficiency and assure durability.

Options:

EBARA HP booster set with EVM pump

Weather-proof type HP booster set

SELECTION GUIDE

PERFORMANCE TABLE

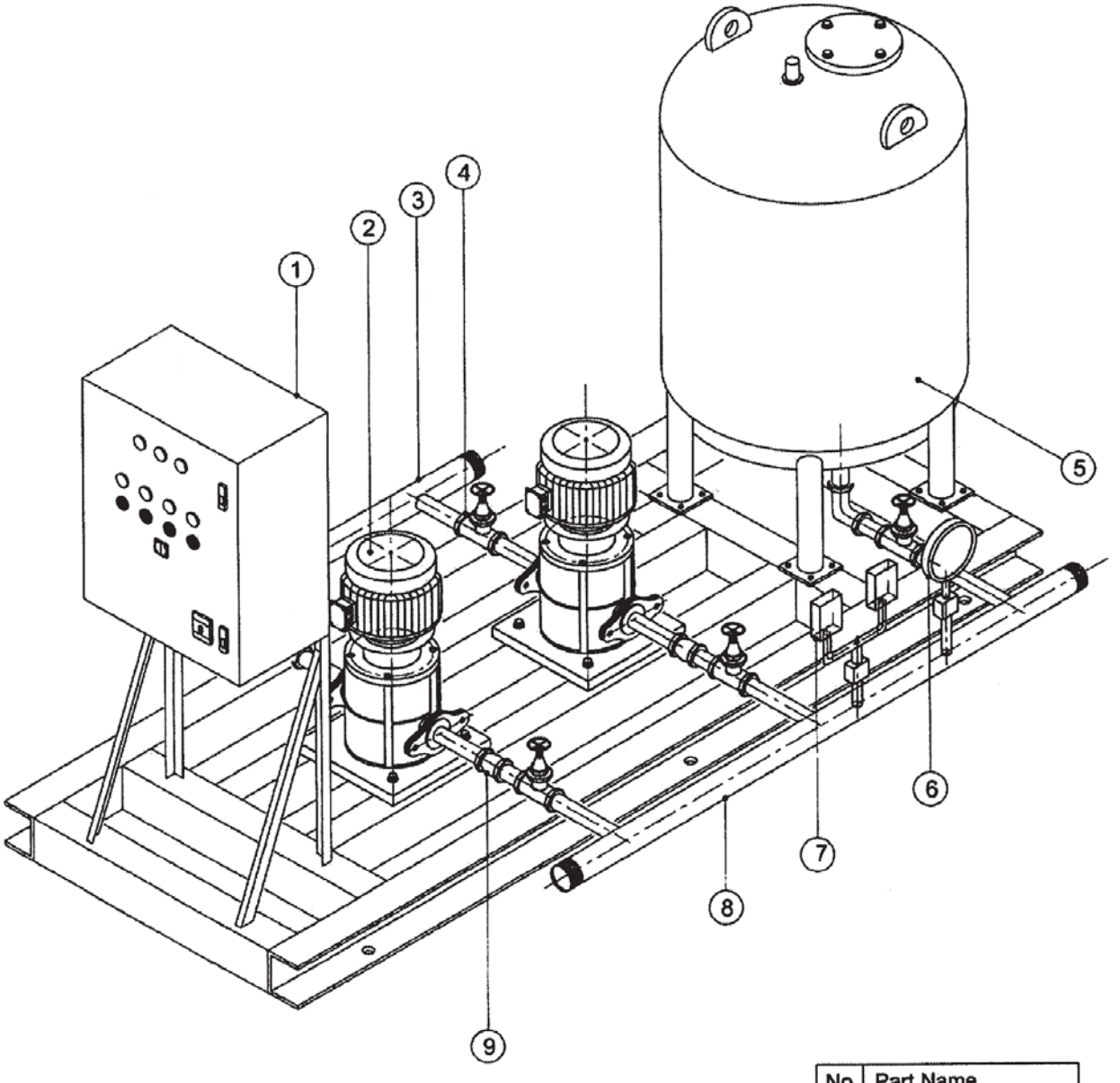
Pump type EVM 3-5-10-18	Kw / Motor	Q = Capacity l/min 0	20	40	60	75	100	130	150	200	250	300	350	400
		m³/h 0	1.2	2.4	3.6	4.5	6.0	7.8	9.0	12	15	18	21	24
		H = Total manometric head in meters												
EVM 3 2N5/0.37	0,37	18,6	16,7	14,0	10,3	6,6	-	-	-	-	-	-	-	-
EVM 3 3N5/0.37	0,37	27,9	25,1	20,9	15,5	9,9	-	-	-	-	-	-	-	-
EVM 3 4N5/0.55	0,55	37,2	33,4	27,9	20,6	13,2	-	-	-	-	-	-	-	-
EVM 3 5N5/0.55	0,55	46,5	42,0	34,9	25,8	16,5	-	-	-	-	-	-	-	-
EVM 3 6N5/0.75	0,75	56,0	50,0	42,0	30,9	19,8	-	-	-	-	-	-	-	-
EVM 3 7N5/0.75	0,75	65,0	58,5	49,0	36,1	23,1	-	-	-	-	-	-	-	-
EVM 3 9N5/1.1	1,1	84,0	75,0	63,0	46,5	29,7	-	-	-	-	-	-	-	-
EVM 3 11N5/1.1	1,1	-	92,7	77,0	56,5	36,3	-	-	-	-	-	-	-	-
EVM 3 13N5/1.5	1,5	-	-	90,5	67,0	43,0	-	-	-	-	-	-	-	-
EVM 3 15N5/1.5	1,5	-	-	-	77,5	49,5	-	-	-	-	-	-	-	-
EVM 3 18F5/2.2	2,2	-	-	-	92,5	59,5	-	-	-	-	-	-	-	-
EVM 3 22F5/2.2	2,2	-	-	-	-	72,5	-	-	-	-	-	-	-	-
EVM 3 26F5/3.0	3	-	-	-	-	86,0	-	-	-	-	-	-	-	-
EVM 5 2N5/0.37	0,37	20,2	-	18,4	16,9	15,4	12,2	6,9	-	-	-	-	-	-
EVM 5 3N5/0.55	0,55	30,2	-	27,6	25,3	23,1	18,4	10,3	-	-	-	-	-	-
EVM 5 4N5/0.75	0,75	40,5	-	36,8	33,8	30,8	24,5	13,8	-	-	-	-	-	-
EVM 5 5N5/1.1	1,1	50,5	-	46,0	42,0	38,6	30,6	17,2	-	-	-	-	-	-
EVM 5 6N5/1.1	1,1	60,5	-	55,0	50,5	46,5	36,7	20,6	-	-	-	-	-	-
EVM 5 7N5/1.5	1,5	70,5	-	64,5	59,0	54,0	43,0	24,1	-	-	-	-	-	-
EVM 5 8N5/1.5	1,5	80,5	-	73,5	67,5	61,5	49,0	27,5	-	-	-	-	-	-
EVM 5 10N5/2.2	2,2	-	-	93,5	86,0	79,0	63,0	36,6	-	-	-	-	-	-
EVM 5 11N5/2.2	2,2	-	-	-	94,5	86,5	69,5	40,5	-	-	-	-	-	-
EVM 5 12N5/2.2	2,2	-	-	-	-	94,5	75,5	44,0	-	-	-	-	-	-
EVM 5 14N5/3.0	3	-	-	-	-	-	88,0	51,0	-	-	-	-	-	-
EVM 5 16N5/3.0	3	-	-	-	-	-	-	58,5	-	-	-	-	-	-
EVM 5 18F5/4.0	4	-	-	-	-	-	-	66,0	-	-	-	-	-	-
EVM 5 19F5/4.0	4	-	-	-	-	-	-	69,5	-	-	-	-	-	-
EVM 5 22F5/4.0	4	225,0	-	206,0	189,0	173,0	139,0	80,5	-	-	-	-	-	-
EVM 5 24F5/5.5	5,5	-	-	-	-	-	-	88,0	-	-	-	-	-	-
EVM 10 2N5/0.75	0,75	22,0	-	-	-	21,0	20,4	18,9	17,6	13,2	7,8	-	-	-
EVM 10 3N5/1.1	1,1	33,0	-	-	-	31,6	30,5	28,4	26,4	19,8	11,7	-	-	-
EVM 10 4N5/1.5	1,5	44,0	-	-	-	42,0	40,5	37,8	35,2	26,4	15,6	-	-	-
EVM 10 5N5/2.2	2,2	55,0	-	-	-	52,5	51,0	47,5	44,0	33,0	19,5	-	-	-
EVM 10 6N5/2.2	2,2	66,0	-	-	-	63,0	61,0	57,0	53,0	39,5	23,4	-	-	-
EVM 10 8N5/3.0	3	88,0	-	-	-	84,0	81,5	75,5	70,5	52,5	31,2	-	-	-
EVM 10 10N5/4.0	4	-	-	-	-	-	-	94,5	88,0	66,0	39,0	-	-	-
EVM 10 11N5/4.0	4	-	-	-	-	-	-	-	97,0	72,5	43,0	-	-	-
EVM 10 12N5/5.5	5,5	-	-	-	-	-	-	-	-	86,5	55,0	-	-	-
EVM 10 14N5/5.5	5,5	-	-	-	-	-	-	-	-	-	64,5	-	-	-
EVM 10 15F5/5.5	5,5	-	-	-	-	-	-	-	-	-	69,0	-	-	-
EVM 10 16F5/7.5	7,5	-	-	-	-	-	-	-	-	-	73,5	-	-	-
EVM 10 18F5/7.5	7,5	-	-	-	-	-	-	-	-	-	83,0	-	-	-
EVM 10 20F5/7.5	7,5	-	-	-	-	-	-	-	-	-	92,0	-	-	-
EVM 18 2F5/2.2	2,2	32,0	-	-	-	-	-	31,0	30,3	28,5	25,7	21,9	17,2	11,6
EVM 18 3F5/3.0	3	48,0	-	-	-	-	-	46,0	45,5	43,0	38,6	32,8	25,7	17,4
EVM 18 4F5/4.0	4	64,0	-	-	-	-	-	61,5	60,5	57,0	51,5	44,0	34,3	23,2
EVM 18 5F5/5.5	5,5	80,0	-	-	-	-	-	77,0	75,5	71,5	64,5	54,5	43,0	29,0
EVM 18 6F5/5.5	5,5	96,0	-	-	-	-	-	92,0	91,0	85,5	77,0	65,5	51,5	34,8
EVM 18 7F5/7.5	7,5	-	-	-	-	-	-	-	-	100,0	90,0	76,5	60,0	40,5
EVM 18 8F5/7.5	7,5	-	-	-	-	-	-	-	-	-	-	87,5	68,5	46,5
EVM 18 10F5/11	11	-	-	-	-	-	-	-	-	-	-	-	93,5	69,0
EVM 18 12F5/11	11	-	-	-	-	-	-	-	-	-	-	-	-	83,0
EVM 18 14F5/15	15	-	-	-	-	-	-	-	-	-	-	-	-	96,5
EVM 18 15F5/15	15	-	-	-	-	-	-	-	-	-	-	-	-	104,0
EVM 18 16F5/15	15	-	-	-	-	-	-	-	-	-	-	-	-	110,0

PERFORMANCE TABLE

Pump type EVM 32-64	Kw / Motor	Q = Capacity l/min 0	200	350	500	600	700	900	1000	1200	1400
		m³/h 0	12	21	30	36	42	54	60	72	84
		H = Total manometric head in meters									
EVM 32 1-0F5/2.2	2,2	22,6	20,2	17,5	13,9	10,3	5,7	-	-	-	-
EVM 32 2-2F5/3.0	3	39,0	34,6	29,7	21,2	14,2	-	-	-	-	-
EVM 32 2-0F5/4.0	4	45,0	40,5	36,0	29,5	23,2	14,9	-	-	-	-
EVM 32 3-3F5/5.5	5,5	55,0	52,0	45,0	32,8	22,7	-	-	-	-	-
EVM 32 3-0F5/5.5	5,5	68,0	61,0	54,5	45,0	36,1	24,1	-	-	-	-
EVM 32 4-3F5/7.5	7,5	81,0	72,5	63,5	48,5	35,6	-	-	-	-	-
EVM 32 4-0F5/7.5	7,5	90,5	81,5	73,0	61,0	49,0	33,3	-	-	-	-
EVM 32 5-3F5/11	11	-	93,0	82,0	64,0	48,5	30,5	-	-	-	-
EVM 32 5-0F5/11	11	-	-	91,5	76,5	62,0	42,5	-	-	-	-
EVM 32 6-3F5/11	11	-	-	100,0	79,5	61,5	39,7	-	-	-	-
EVM 32 6-0F5/11	11	-	-	-	92,0	75,0	51,5	-	-	-	-
EVM 32 7-3F5/15	15	-	-	-	95,5	74,5	49,0	-	-	-	-
EVM 32 7-0F5/15	15	-	-	-	108,0	87,5	61,0	-	-	-	-
EVM 32 8-3F5/15	15	-	-	-	-	87,0	58,0	-	-	-	-
EVM 32 8-0F5/15	15	-	-	-	-	101,0	70,0	-	-	-	-
EVM 32 9-3F5/18.5	18,5	-	-	-	-	100,0	67,5	-	-	-	-
EVM 32 9-0F5/18.5	18,5	-	-	-	-	-	79,5	-	-	-	-
EVM 32 10-3F5/18.5	18,5	-	-	-	-	-	76,5	-	-	-	-
EVM 32 10-1F5/18.5	18,5	-	-	-	-	-	84,5	-	-	-	-
EVM 45 1-1F5/3.0	3	21,0	-	18,9	17,6	16,3	14,3	8,3	-	-	-
EVM 45 1-0F5/4.0	4	27,0	-	25,6	24,6	23,5	21,8	16,7	13,3	-	-
EVM 45 2-2F5/5.5	5,5	42,0	-	38,1	35,8	33,4	29,8	18,6	-	-	-
EVM 45 2-0F5/7.5	7,5	54,0	-	51,5	50,0	48,0	45,0	35,4	29,1	-	-
EVM 45 3-2F5/11	11	69,0	-	64,0	61,0	58,0	53,0	37,3	-	-	-
EVM 45 3-0F5/11	11	81,0	-	77,5	75,0	72,5	68,0	54,0	45,0	-	-
EVM 45 4-2F5/15	15	96,0	-	90,0	86,0	82,0	76,0	56,0	43,0	-	-
EVM 45 4-0F5/15	15	-	-	103,0	100,0	96,5	91,0	73,0	60,5	-	-
EVM 45 5-2F5/18.5	18,5	-	-	-	-	107,0	99,0	74,5	58,5	-	-
EVM 45 5-0F5/18.5	18,5	-	-	-	-	-	114,0	91,5	76,5	-	-
EVM 45 6-2F5/22	22	-	-	-	-	-	-	93,5	74,5	-	-
EVM 45 6-0F5/22	22	-	-	-	-	-	-	110,0	92,5	-	-
EVM 45 7-2F5/30	30	-	-	-	-	-	-	112,0	90,5	-	-
EVM 45 7-0F5/30	30	-	-	-	-	-	-	-	108,0	-	-
EVM 45 8-2F5/30	30	-	-	-	-	-	-	-	106,0	-	-
EVM 45 8-0F5/30	30	-	-	-	-	-	-	-	124,0	-	-
EVM 45 9-2F5/30	30	-	-	-	-	-	-	-	122,0	-	-
EVM 64 1-1F5/4.0	4	23,7	-	-	21,0	20,4	19,7	17,5	15,9	11,4	-
EVM 64 1-0F5/5.5	5,5	29,3	-	-	26,6	26,1	25,4	23,7	22,3	18,5	13,5
EVM 64 2-2F5/7.5	7,5	47,5	-	-	42,5	41,5	40,5	36,5	33,5	25,3	-
EVM 64 2-1F5/11	11	53,0	-	-	48,0	47,0	46,0	42,5	40,0	32,4	23,0
EVM 64 2-0F5/11	11	58,5	-	-	53,5	53,0	52,0	49,0	46,5	39,5	30,6
EVM 64 3-3F5/15	15	71,0	-	-	64,0	62,5	61,0	55,5	51,0	39,3	-
EVM 64 3-2F5/15	15	76,5	-	-	69,5	68,0	66,5	61,5	57,5	46,5	32,5
EVM 64 3-1F5/15	15	82,5	-	-	75,0	74,0	72,5	68,0	64,0	53,5	40,0
EVM 64 3-0F5/18.5	18,5	88,0	-	-	80,5	79,5	78,0	74,0	70,5	60,5	47,5
EVM 64 4-3F5/18.5	18,5	-	-	-	91,0	89,0	87,0	80,5	75,5	60,5	42,0
EVM 64 4-2F5/18.5	18,5	-	-	-	96,5	95,0	93,0	87,0	81,5	67,5	49,5
EVM 64 4-1F5/22	22	-	-	-	-	101,0	98,5	93,0	88,0	74,5	57,0
EVM 64 4-0F5/22	22	-	-	-	-	-	-	99,0	94,5	81,5	64,5
EVM 64 5-3F5/30	30	-	-	-	-	-	-	106,0	99,5	81,5	59,0
EVM 64 5-2F5/30	30	-	-	-	-	-	-	-	106,0	88,5	66,5
EVM 64 5-1F5/30	30	-	-	-	-	-	-	-	-	95,5	74,0
EVM 64 5-0F5/30	30	-	-	-	-	-	-	-	-	103,0	81,5
EVM 64 6-3F5/30	30	-	-	-	-	-	-	-	-	103,0	76,0
EVM 64 6-2F5/30	30	-	-	-	-	-	-	-	-	110,0	83,5
EVM 64 6-1F5/37	37	-	-	-	-	-	-	-	-	117,0	91,0
EVM 64 6-0F5/37	37	-	-	-	-	-	-	-	-	-	99,0
EVM 64 7-3F5/37	37	-	-	-	-	-	-	-	-	-	93,0
EVM 64 7-2F5/37	37	-	-	-	-	-	-	-	-	-	101,0
EVM 64 7-1F5/37	37	-	-	-	-	-	-	-	-	-	108,0

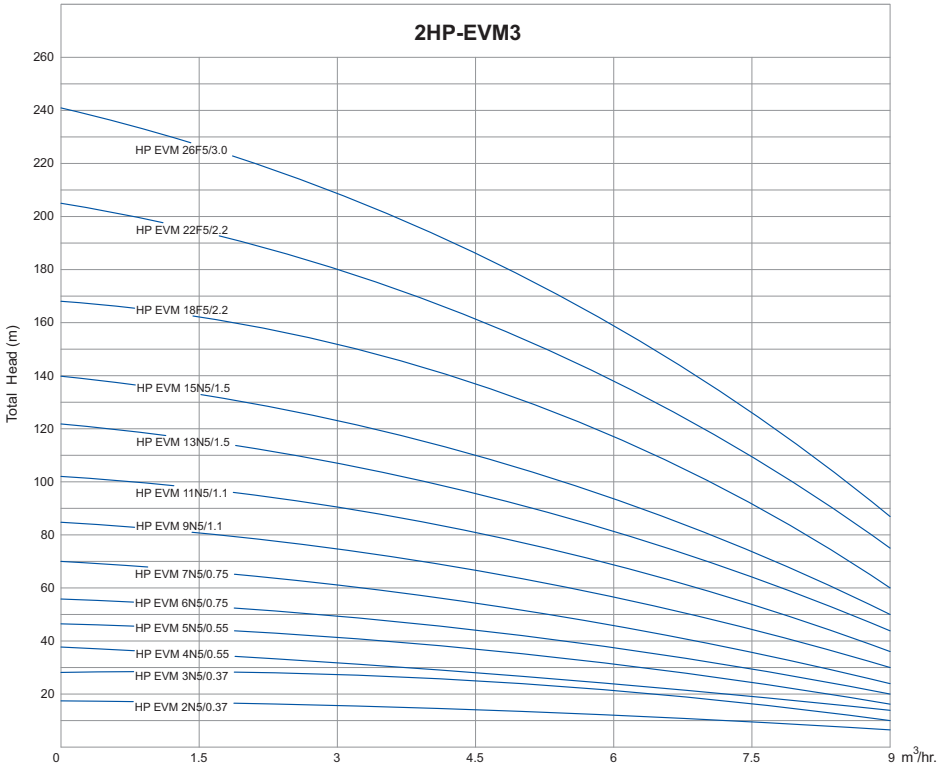
Note : Performance table shown base on one (1) pump operating capacity, if two (2) pumps system operation, please multi capacity x 2.

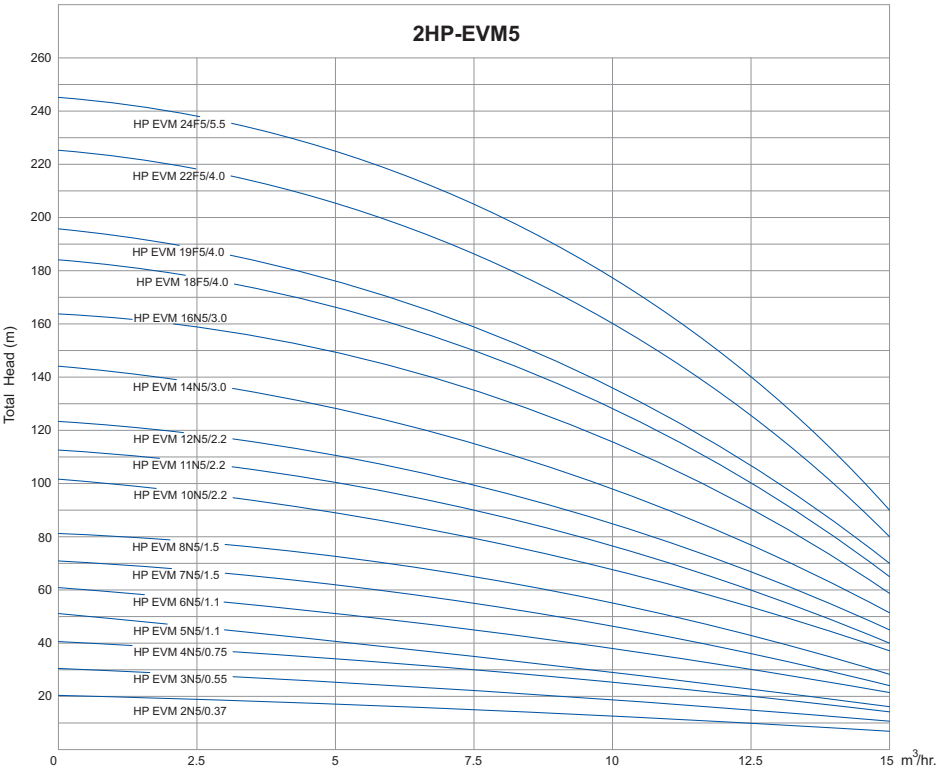
ISOMETRIC DRAWING



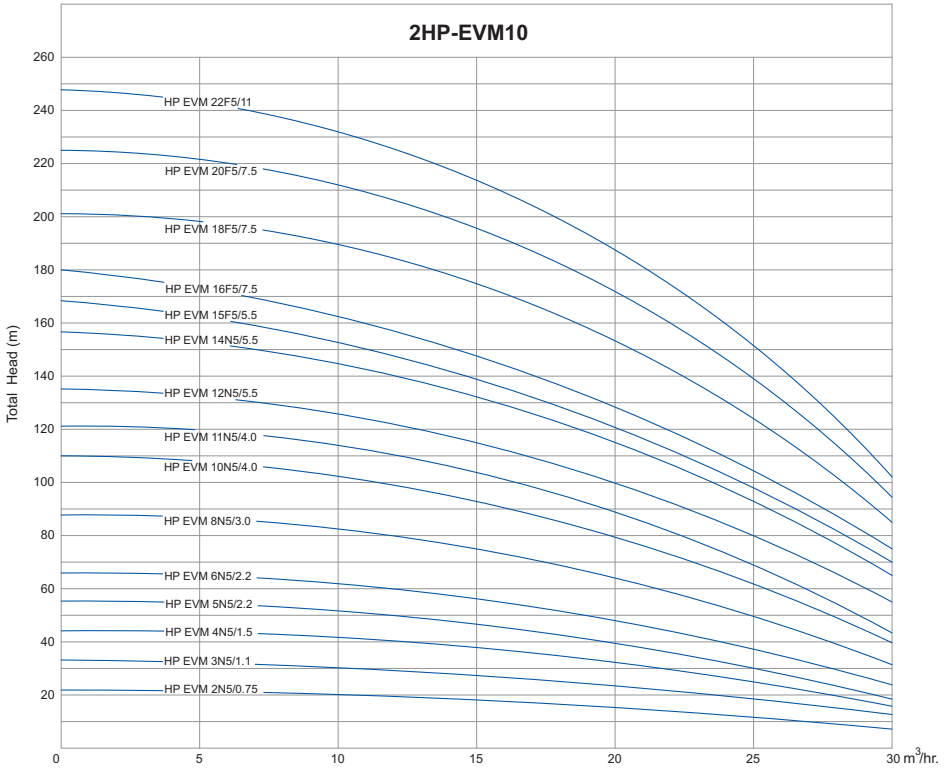
No.	Part Name
1	Control Panel
2	Pump
3	Suction Manifold
4	Gate Valve
5	Approval Tank
6	Pressure Gauge
7	Pressure Switch
8	Discharge Manifold
9	Check Valve

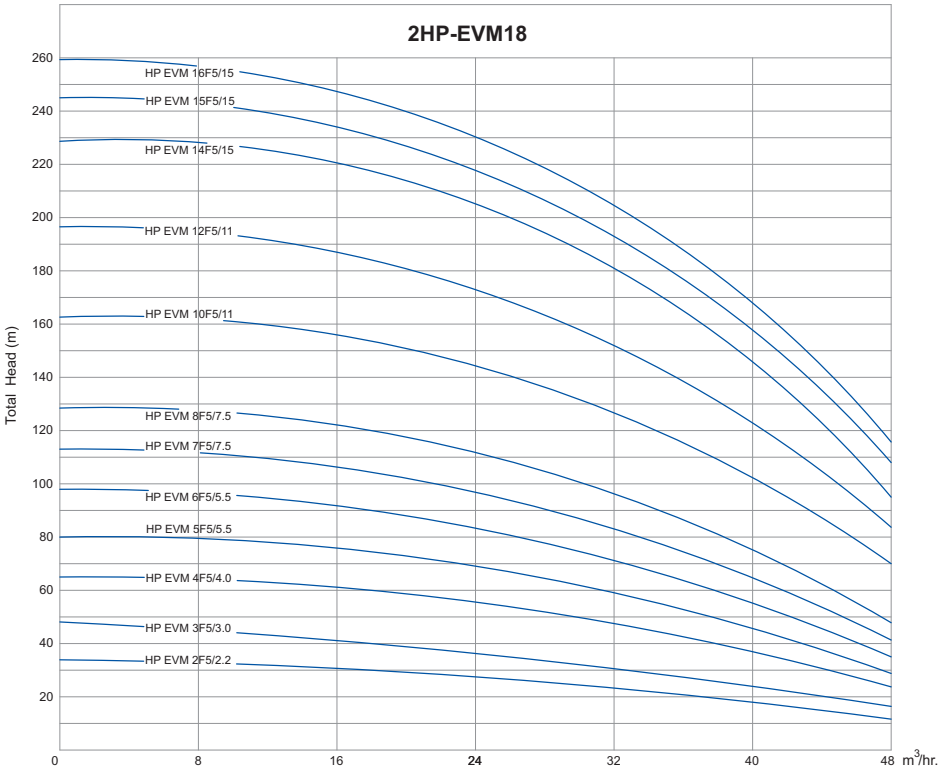
SELECTION GUIDE





SELECTION GUIDE





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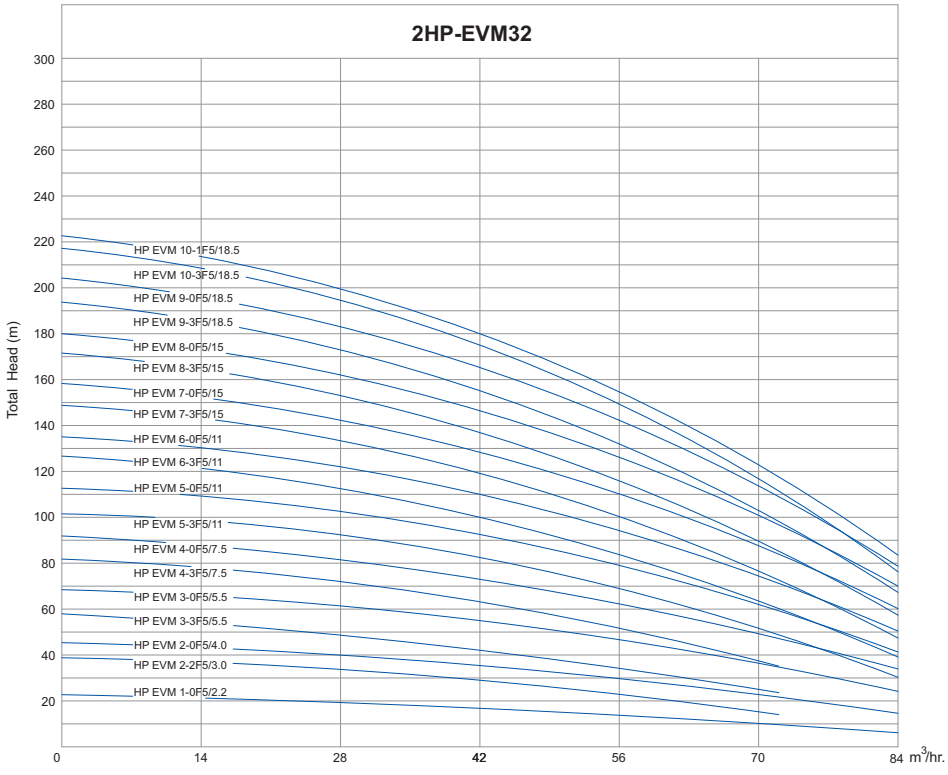
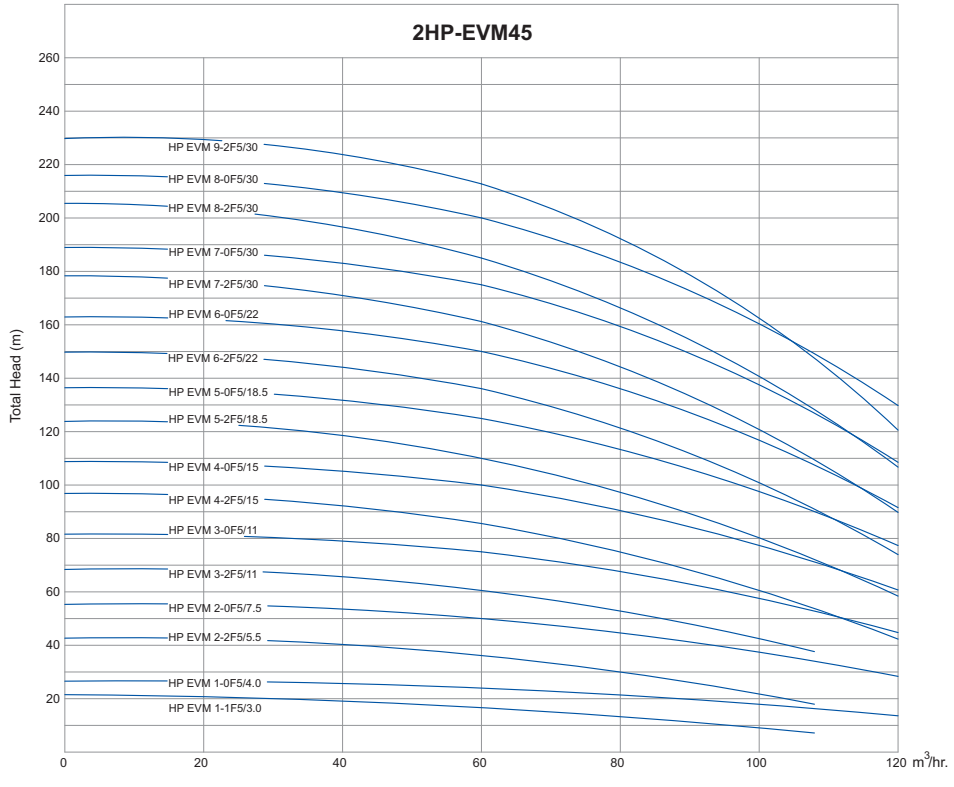
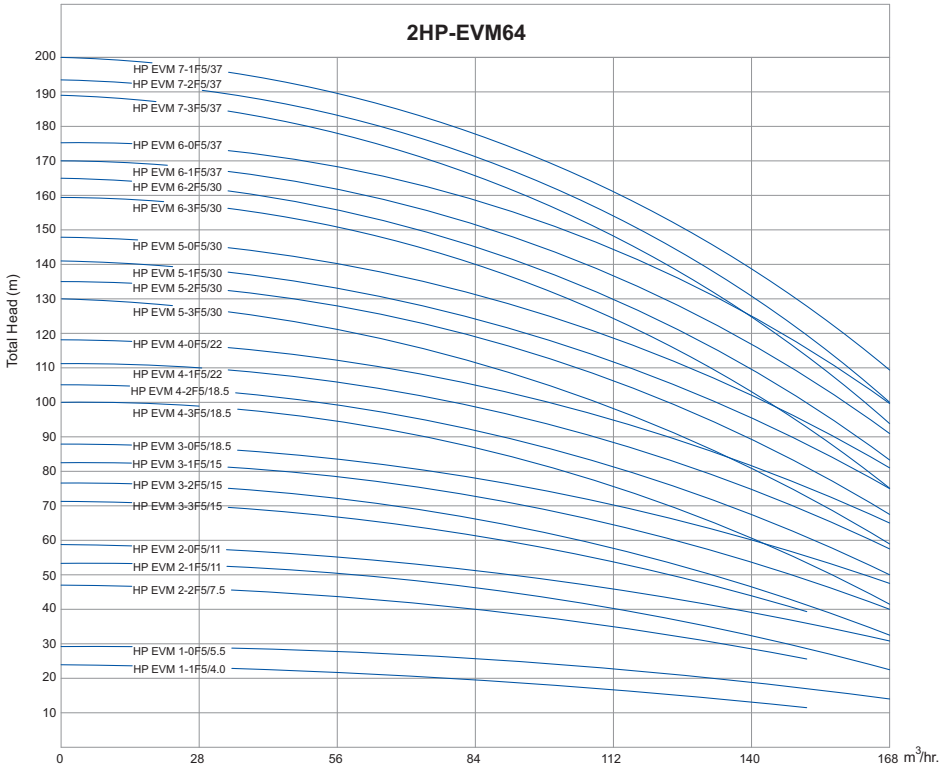
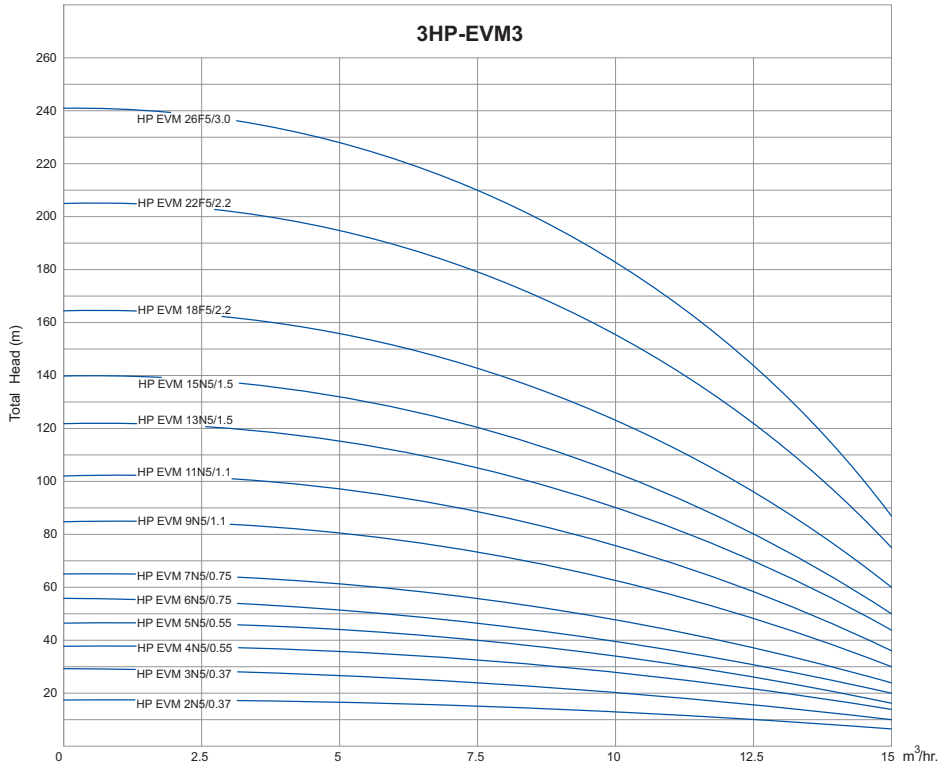




SELECTION GUIDE





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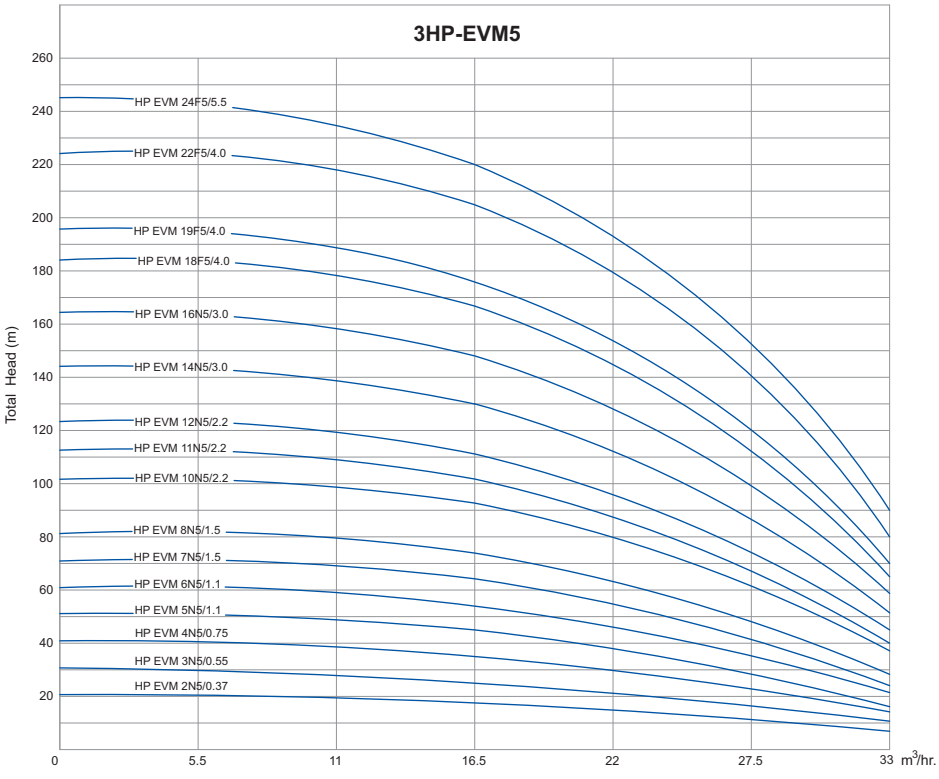

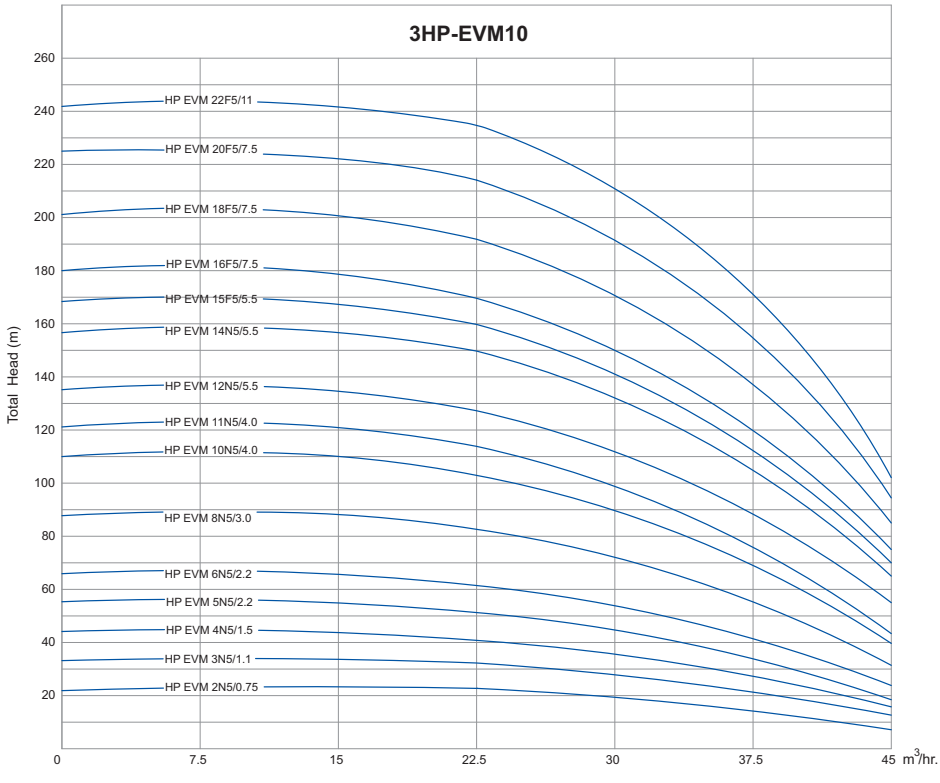

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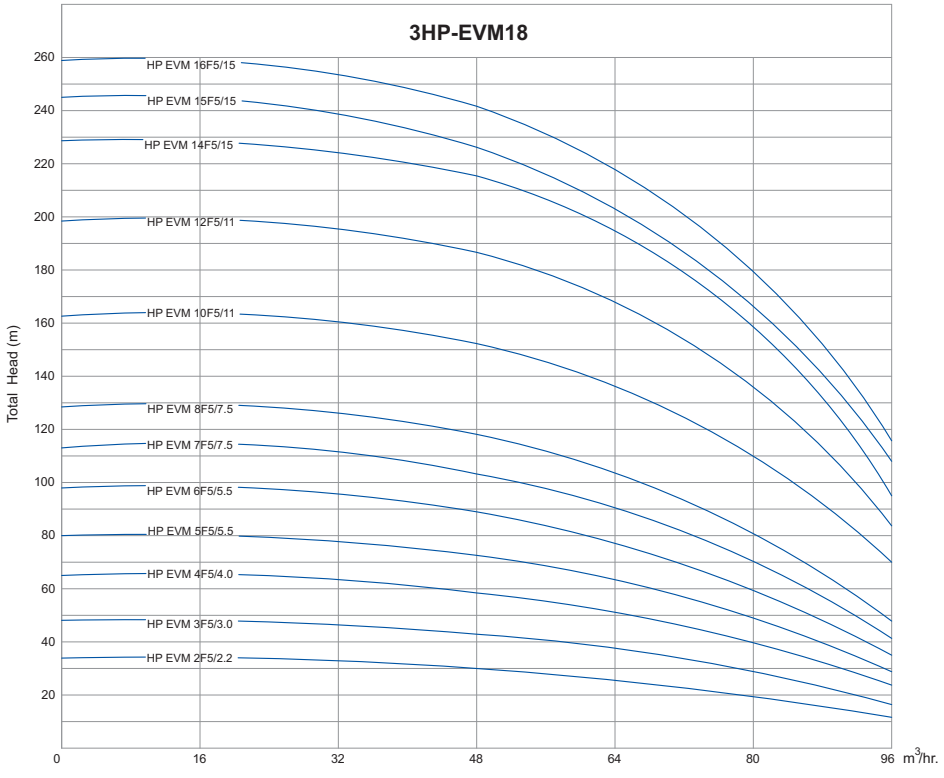

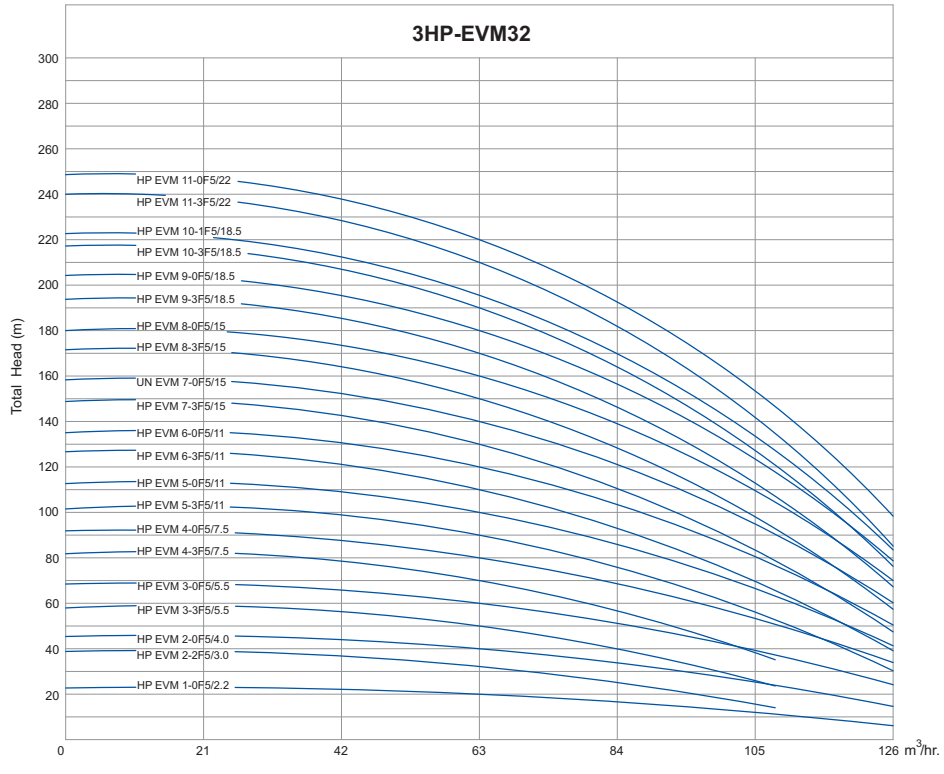

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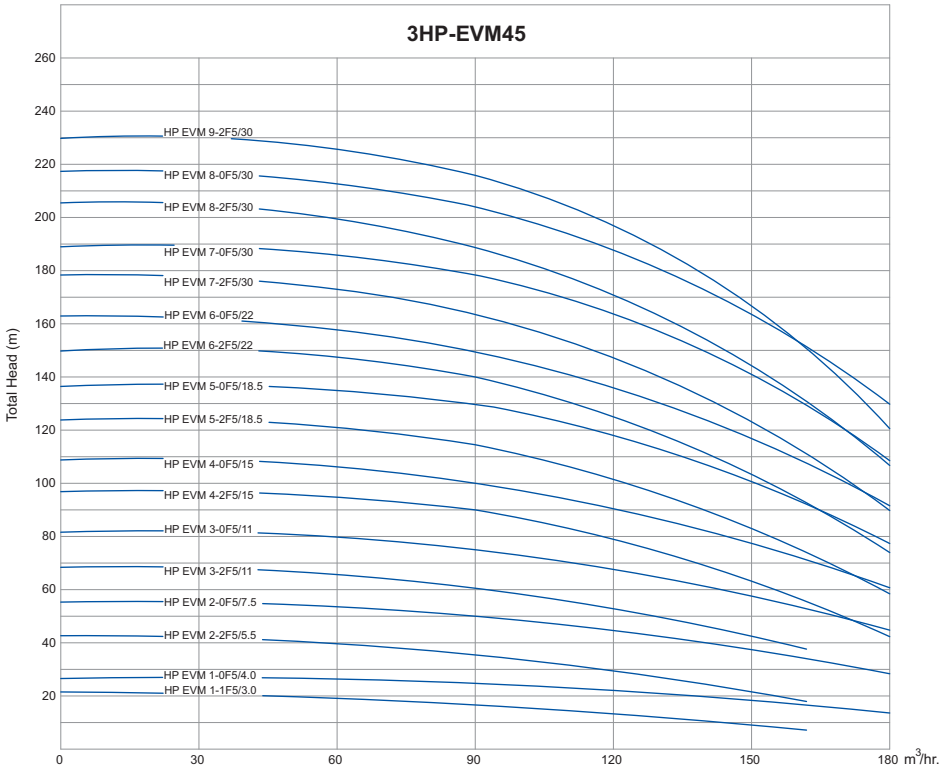
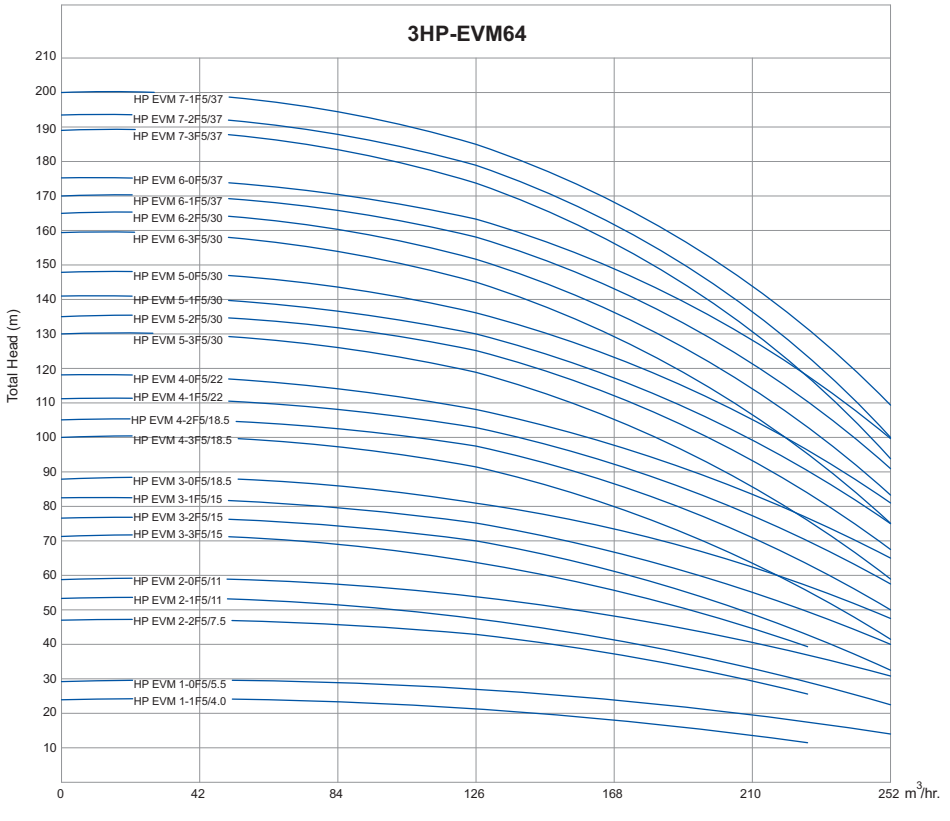
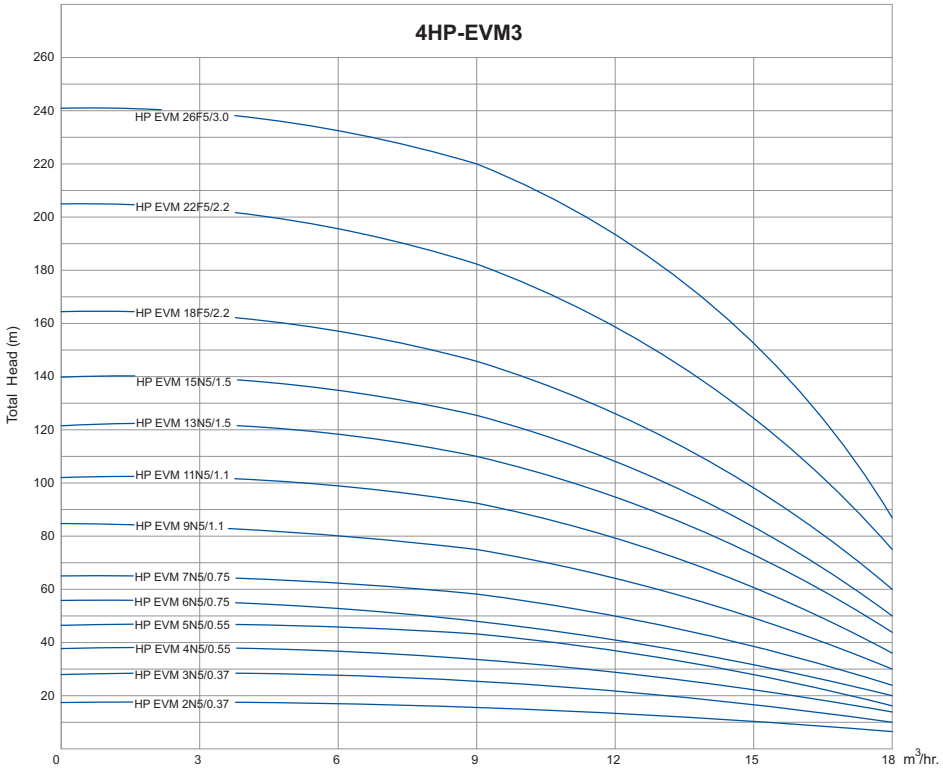
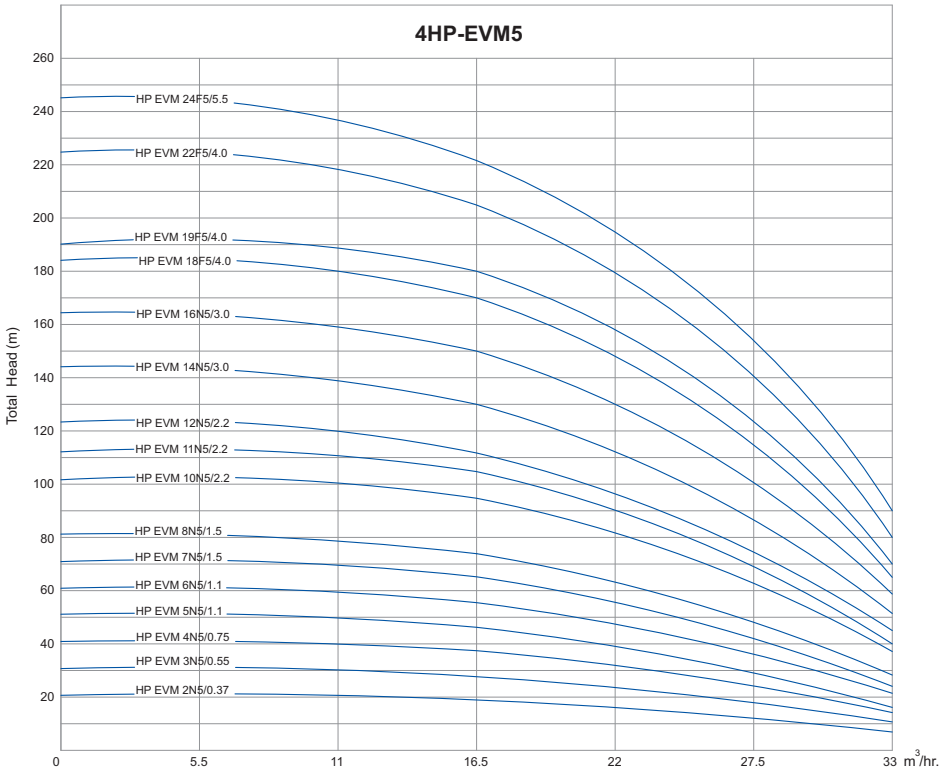




SELECTION GUIDE





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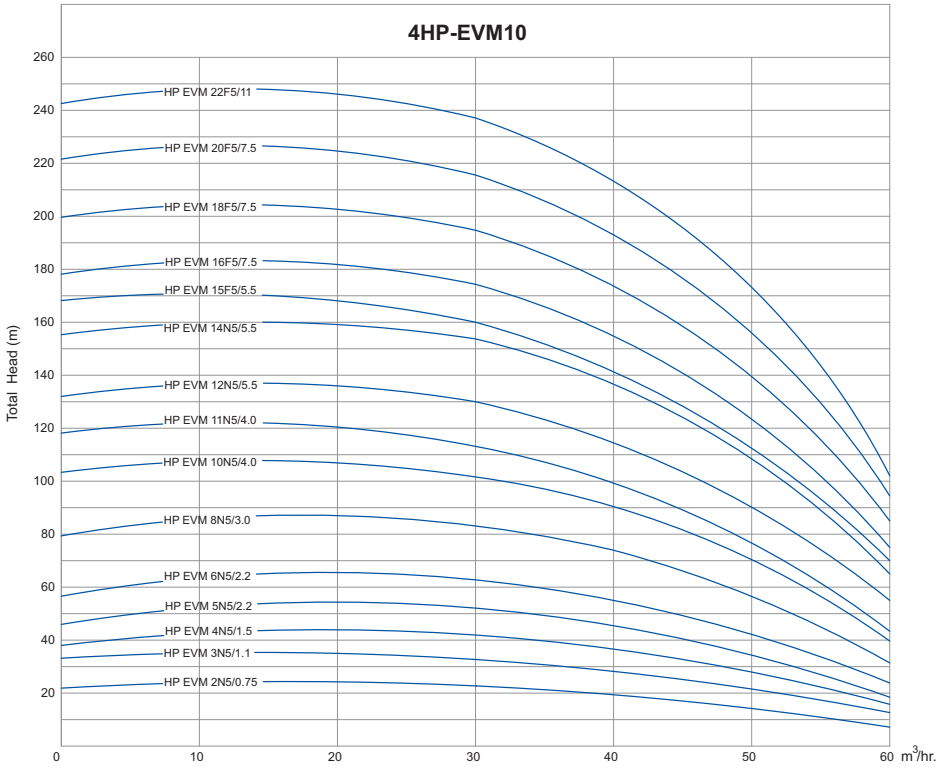

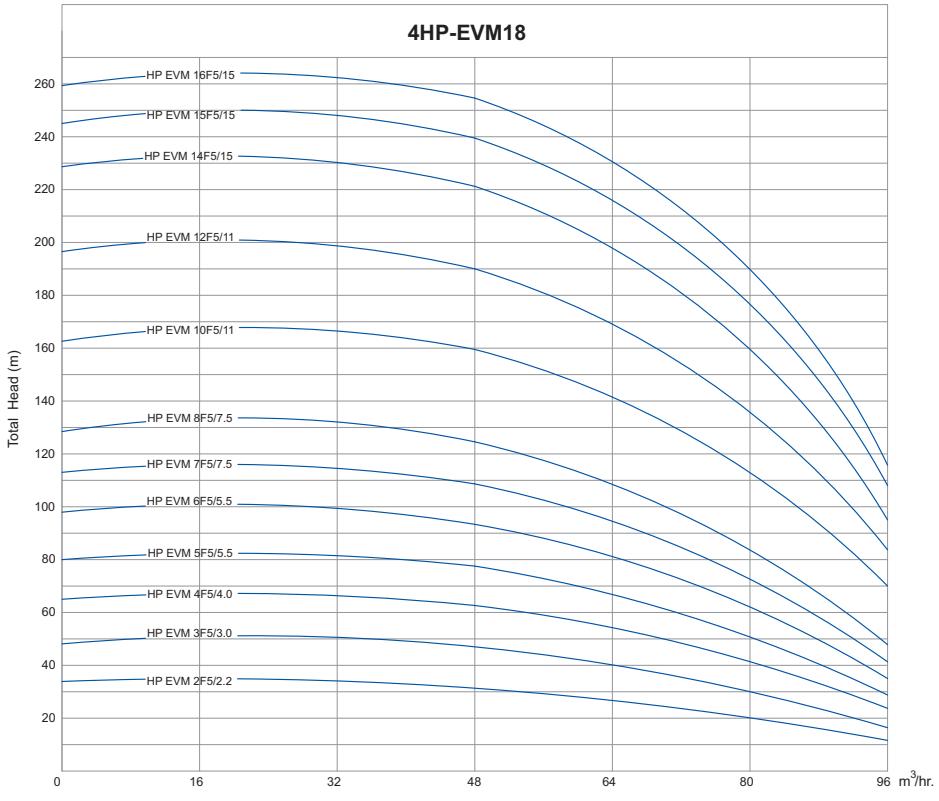

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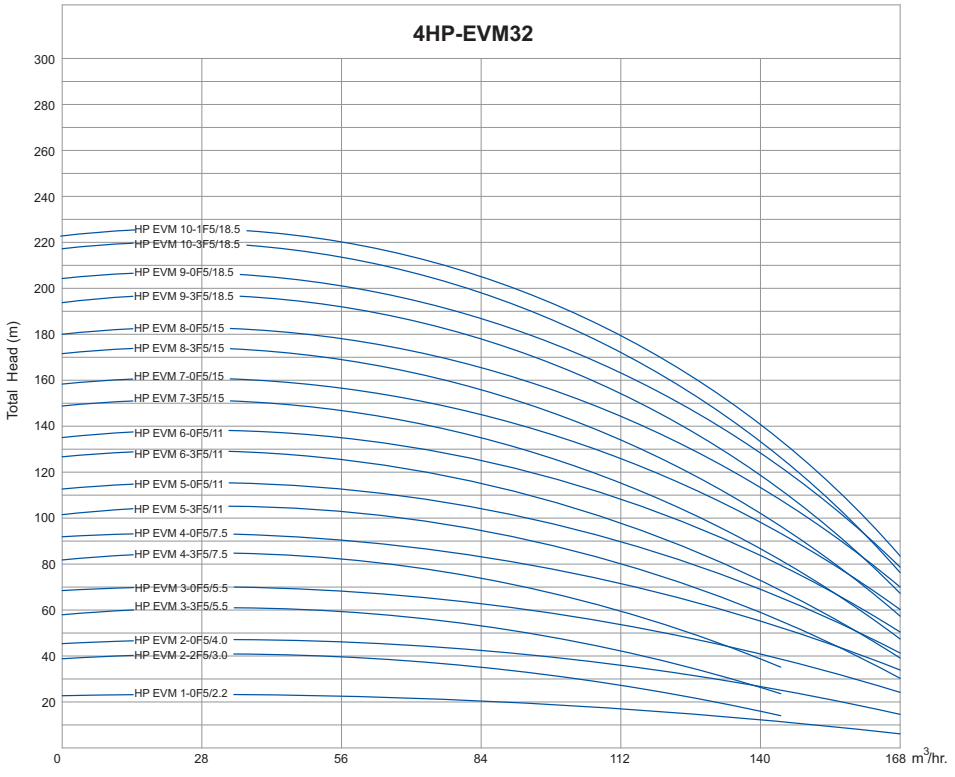

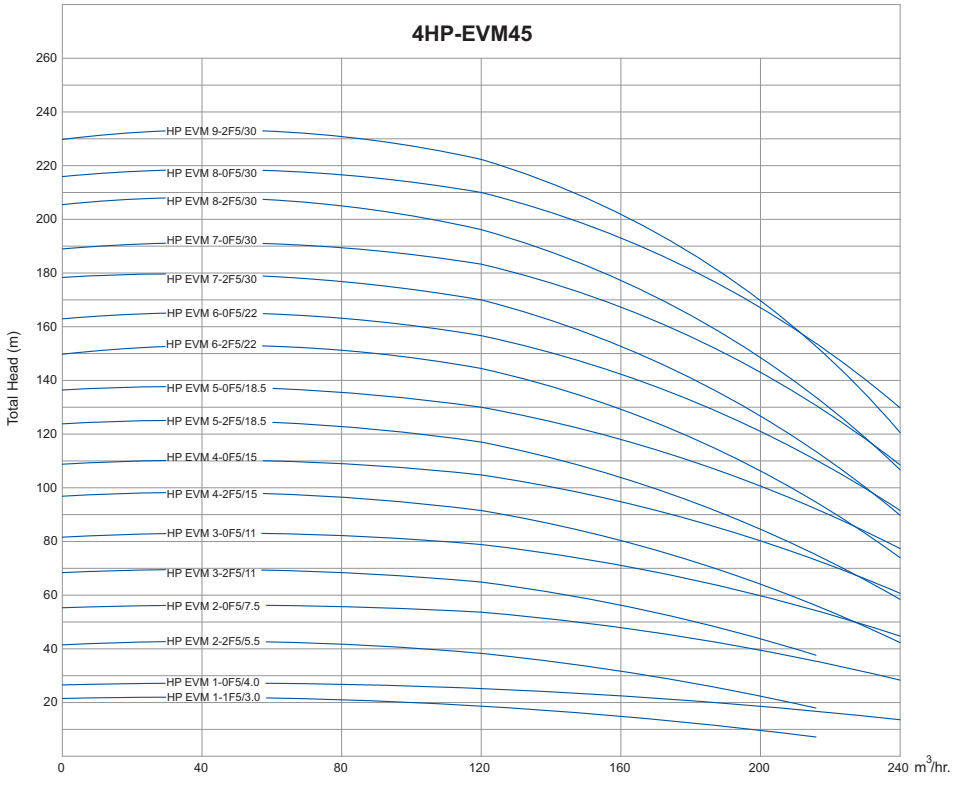

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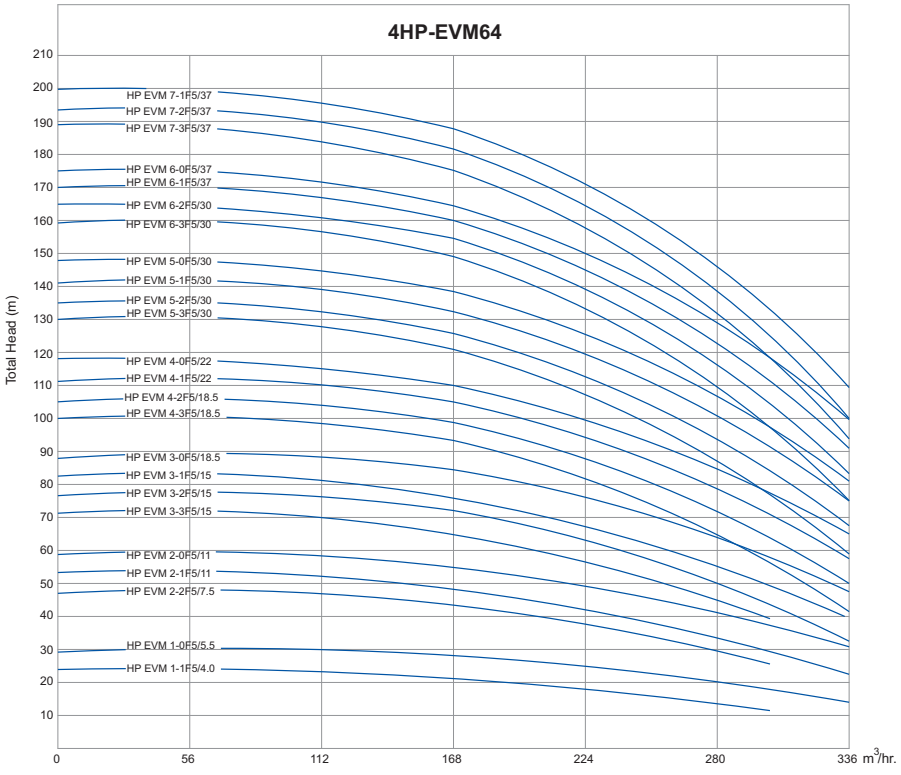

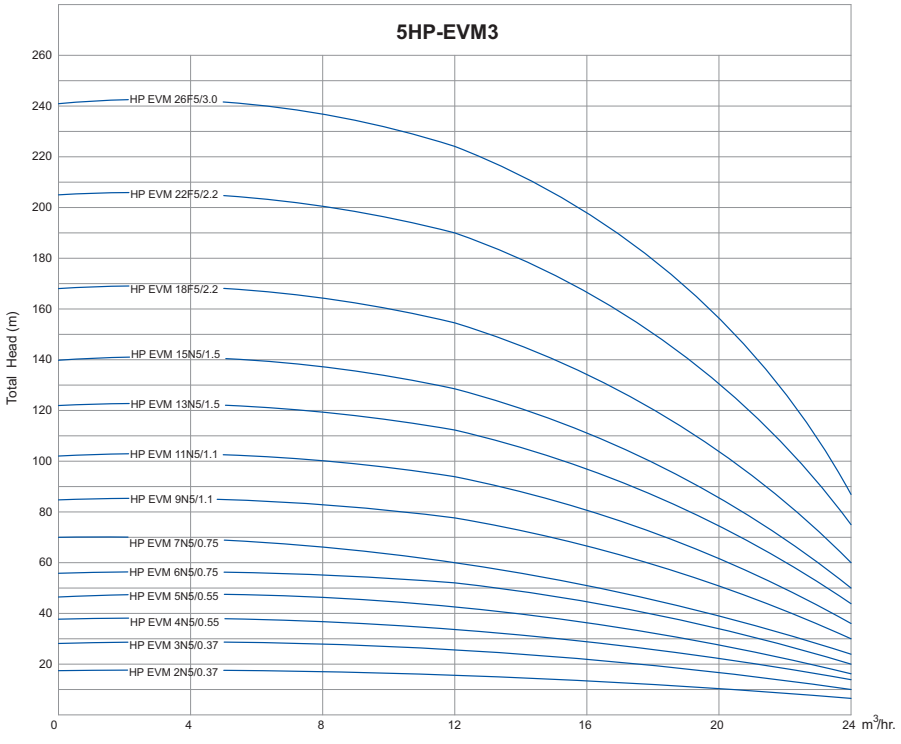

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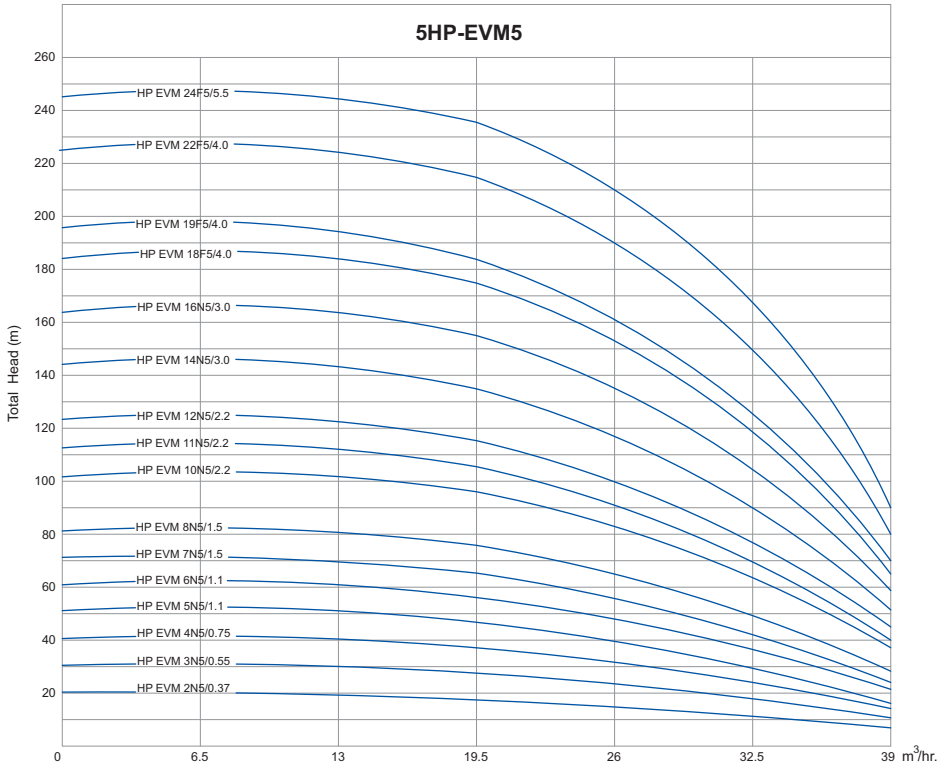

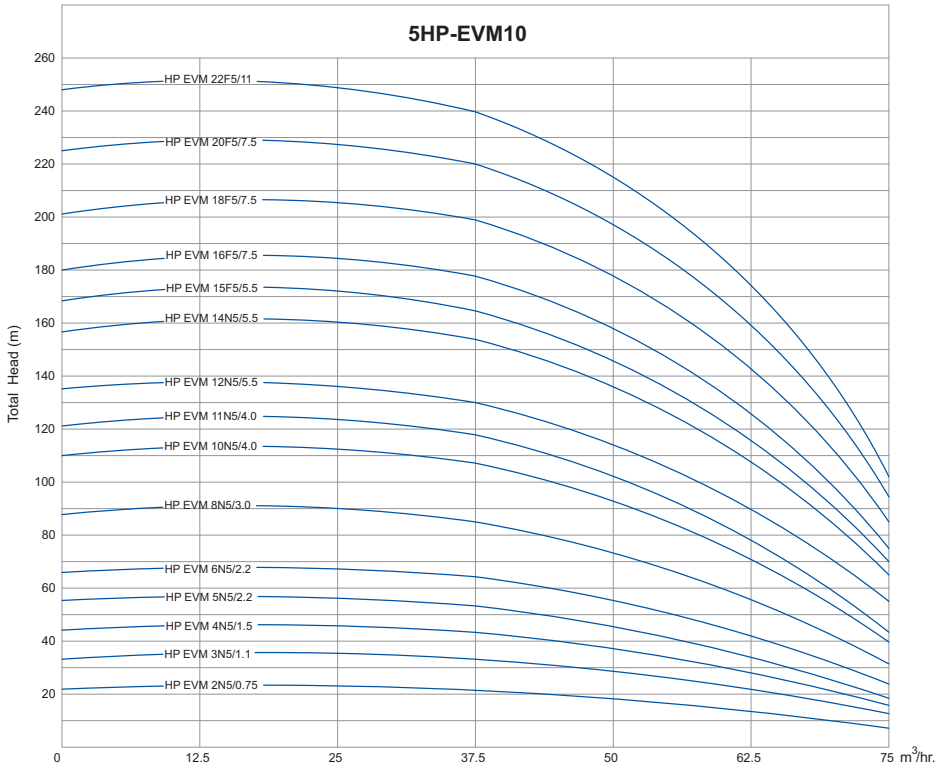

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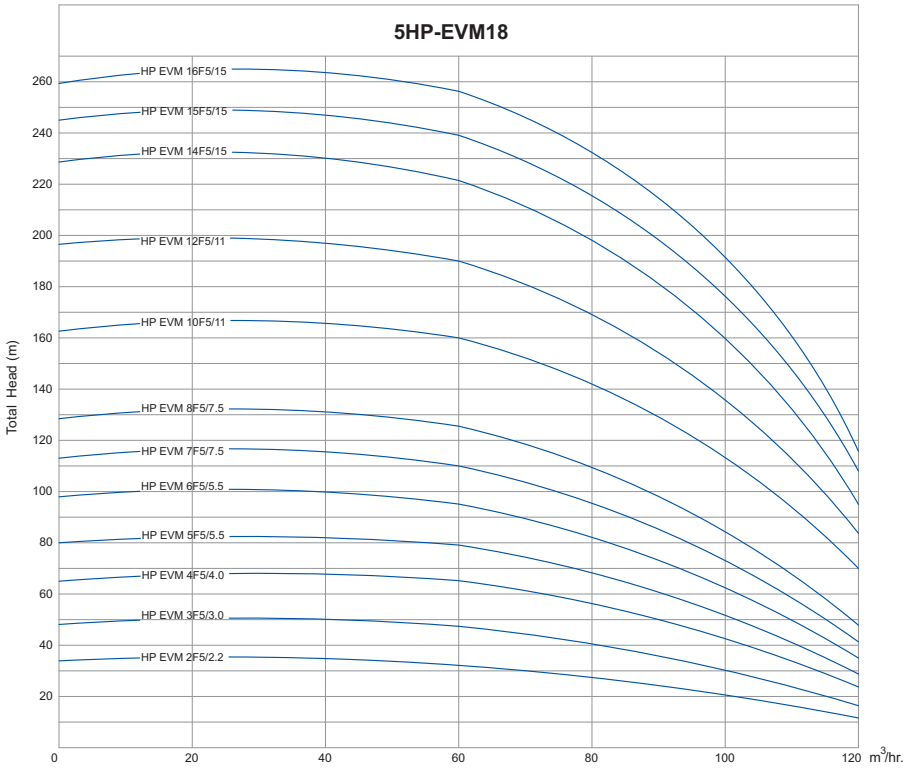

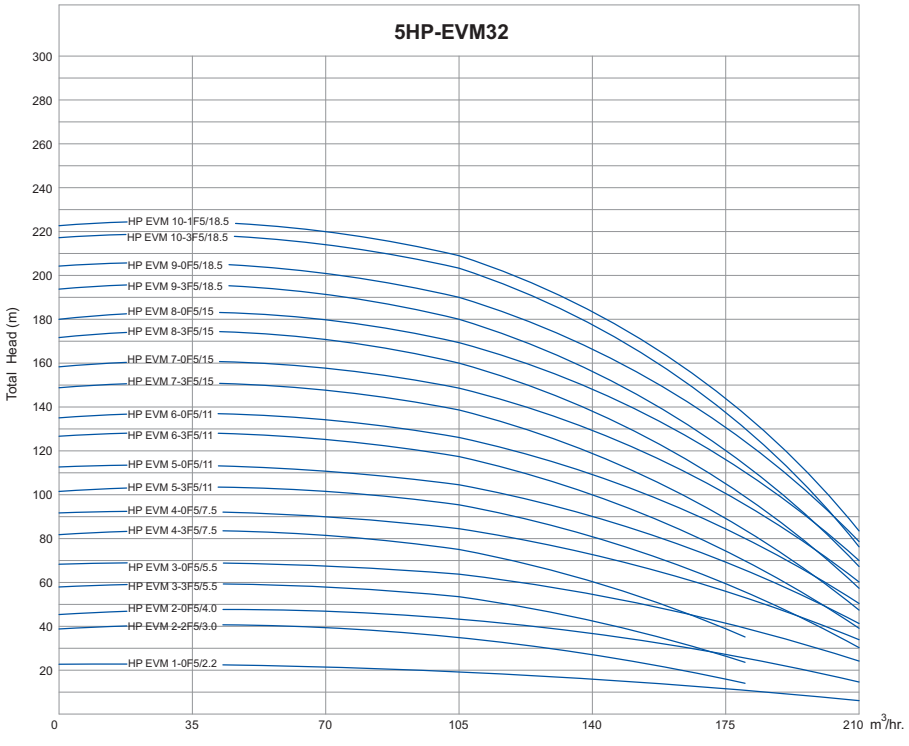

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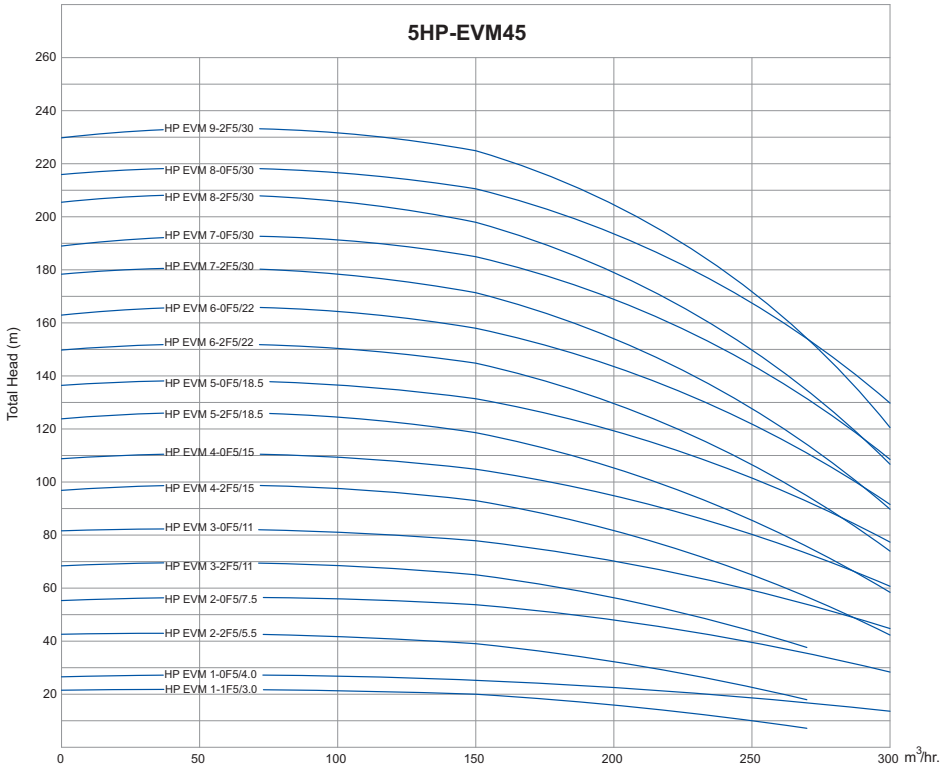
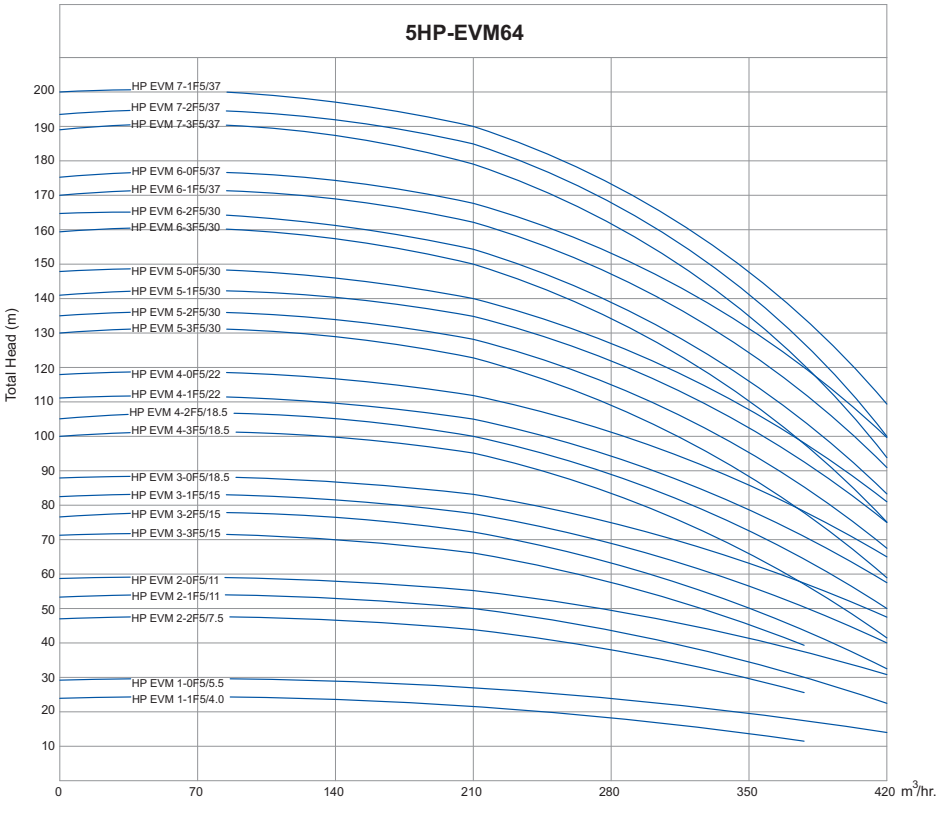
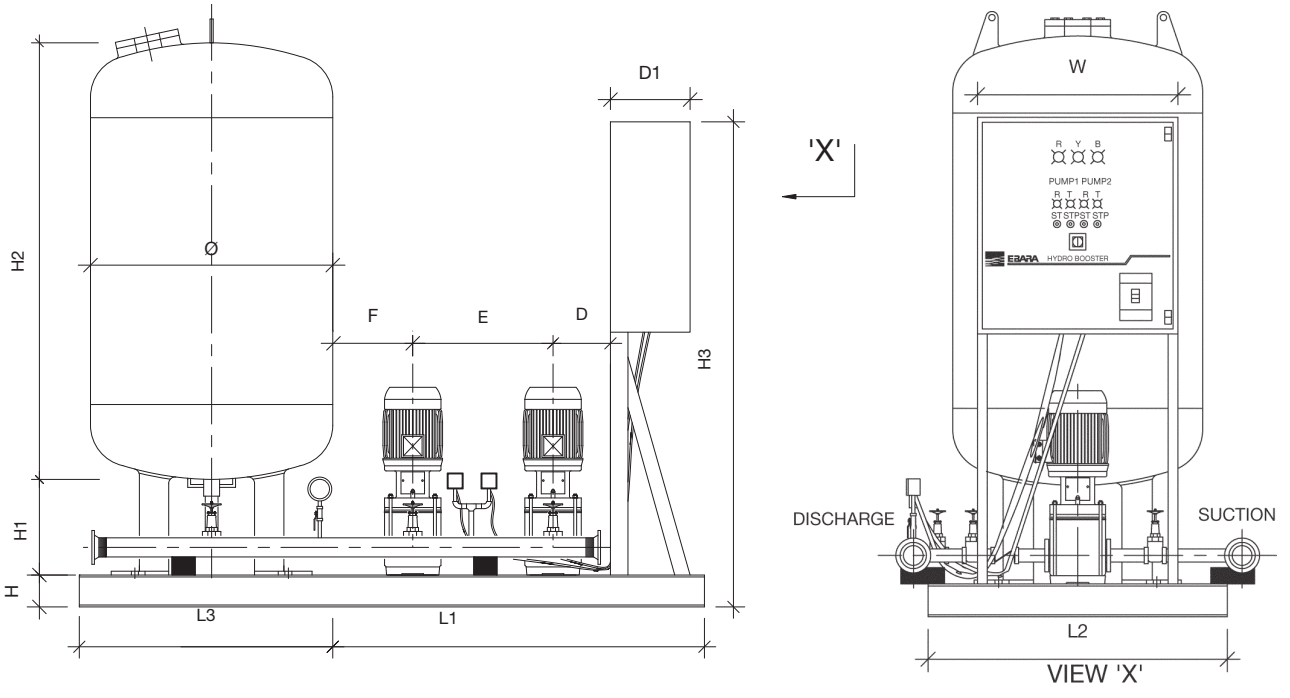


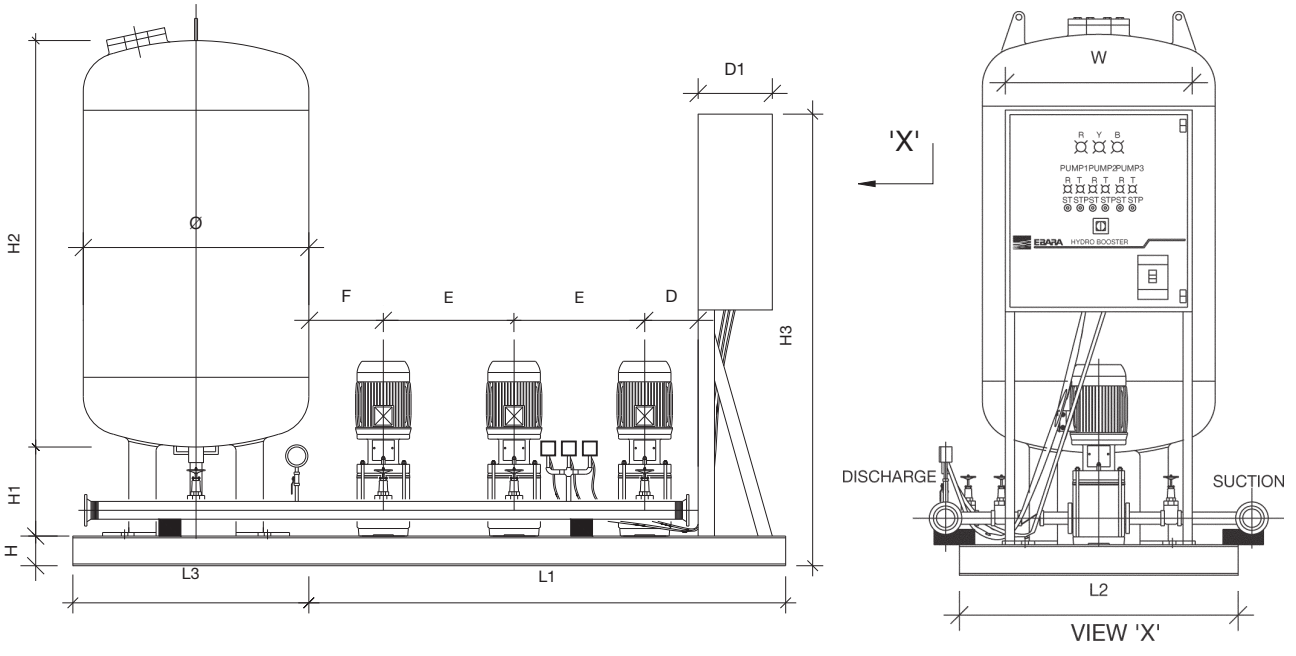


DIMENSIONAL DRAWING 2HP (EVM)



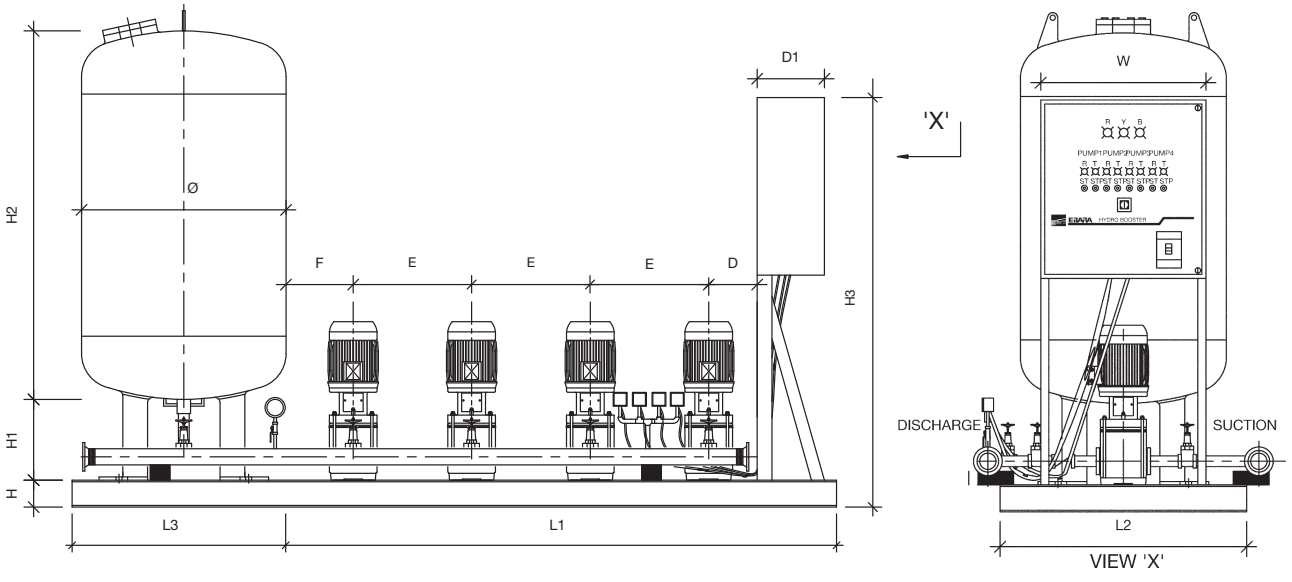
DIMENSION / MODEL	L1 mm	D mm	E mm	F mm	H3 mm	D1 mm	W mm	TANK LITER	H mm	H1 mm	H2 mm	Ø mm	L2 mm	L3 mm	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm
2HP-EVM 3	1030	180	350	250	1600	180	400	300L	100	300	1085	610	780	710	50	50
2HP-EVM 5	1030	180	350	250	1600	180	400	500L	100	300	1370	760	910	860	50	50
2HP-EVM 10	1200	210	390	250	1600	250	400	1000L	100	300	1850	760	910	860	65	65
2HP-EVM 18	1345	305	440	250	1600	250	600	1500L	100	300	1750	1000	1100	1100	80	80
2HP-EVM 32	1400	305	440	305	1600	250	600	2000L	100	300	1985	1100	1200	1200	100	100
2HP-EVM 45	1520	360	550	360	1800	500	600	2000L	100	300	1985	1100	1200	1200	150	150
2HP-EVM 64	1520	360	550	360	1800	500	600	2000L	100	300	1985	1100	1200	1200	150	150

DIMENSIONAL DRAWING 3HP (EVM)



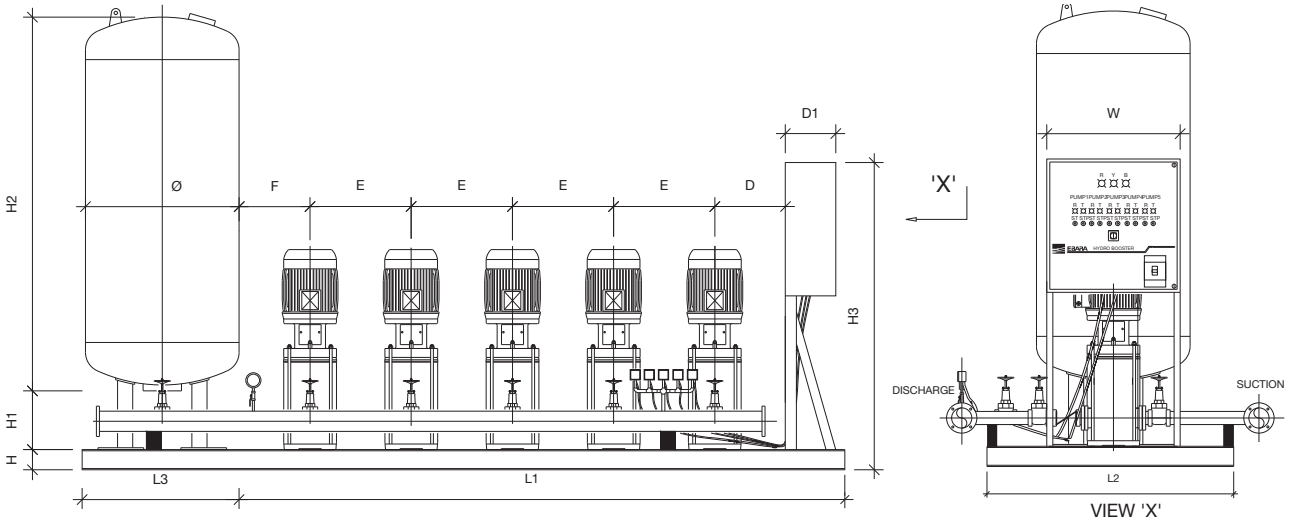
DIMENSION / MODEL	L1 mm	D mm	E mm	F mm	H3 mm	D1 mm	W mm	TANK LITER	H mm	H1 mm	H2 mm	Ø mm	L2 mm	L3 mm	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm
3HP-EVM 3	1380	180	350	250	1600	230	600	300L	100	300	1085	610	780	710	50	50
3HP-EVM 5	1380	180	350	250	1600	230	600	500L	100	300	1370	760	910	860	50	50
3HP-EVM 10	1590	210	390	250	1600	250	600	1000L	100	300	1850	760	910	860	65	65
3HP-EVM 18	1785	305	440	250	1600	250	600	1500L	100	300	1750	1000	1100	1100	100	100
3HP-EVM 32	1840	305	440	305	1600	250	600	2000L	125	300	1985	1100	1200	1200	150	150
3HP-EVM 45	2070	360	550	360	1800	500	850	2000L	125	300	1985	1100	1200	1200	150	150
3HP-EVM 64	2070	360	550	360	1800	500	850									

DIMENSIONAL DRAWING 4HP (EVM)



DIMENSION / MODEL	L1 mm	D mm	E mm	F mm	H3 mm	D1 mm	W mm	TANK LITER	H mm	H1 mm	H2 mm	Ø mm	L2 mm	L3 mm	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm
4HP-EVM 3	1730	180	350	250	1600	230	600	300L	100	300	1085	610	910	710	65	65
4HP-EVM 5	1730	180	350	250	1600	230	600	500L	100	300	1370	760	910	860	65	65
4HP-EVM 10	1980	210	390	250	1600	250	600	1000L	100	300	1850	760	910	860	80	80
4HP-EVM 18	2225	305	440	250	1600	250	650	1500L	100	300	1750	1000	1100	1100	100	100
4HP-EVM 32	2280	305	440	305	1600	250	650	2000L	125	300	1985	1100	1200	1200	150	150
4HP-EVM 45	2620	360	550	360	1800	500	850	2000L	125	300	1985	1100	1200	1200	200	200
4HP-EVM 64	2620	360	550	360	1800	500	850								200	200

DIMENSIONAL DRAWING 5HP (EVM)



DIMENSION / MODEL	L1 mm	D mm	E mm	F mm	H3 mm	D1 mm	W mm	TANK LITER	H mm	H1 mm	H2 mm	Ø mm	L2 mm	L3 mm	SUCTION MANIFOLD mm	DISCHARGE MANIFOLD mm
5HP-EVM 3	2080	180	350	250	1600	230	650	300L	100	300	1085	610	910	710	80	80
5HP-EVM 5	2080	180	350	250	1600	230	650	500L	100	300	1370	760	910	860	80	80
5HP-EVM 10	2370	210	390	250	1600	250	650	1000L	100	300	1850	760	910	860	100	100
5HP-EVM 18	2665	305	440	250	1600	250	650	1500L	100	300	1750	1000	1100	1100	150	150
5HP-EVM 32	2720	305	440	305	1600	250	650	2000L	125	300	1985	1100	1200	1200	200	200
5HP-EVM 45	3170	360	550	360	1800	500	1000	2000L	125	300	1985	1100	1200	1200	200	200
5HP-EVM 64	3170	360	550	360	1800	500	1000									