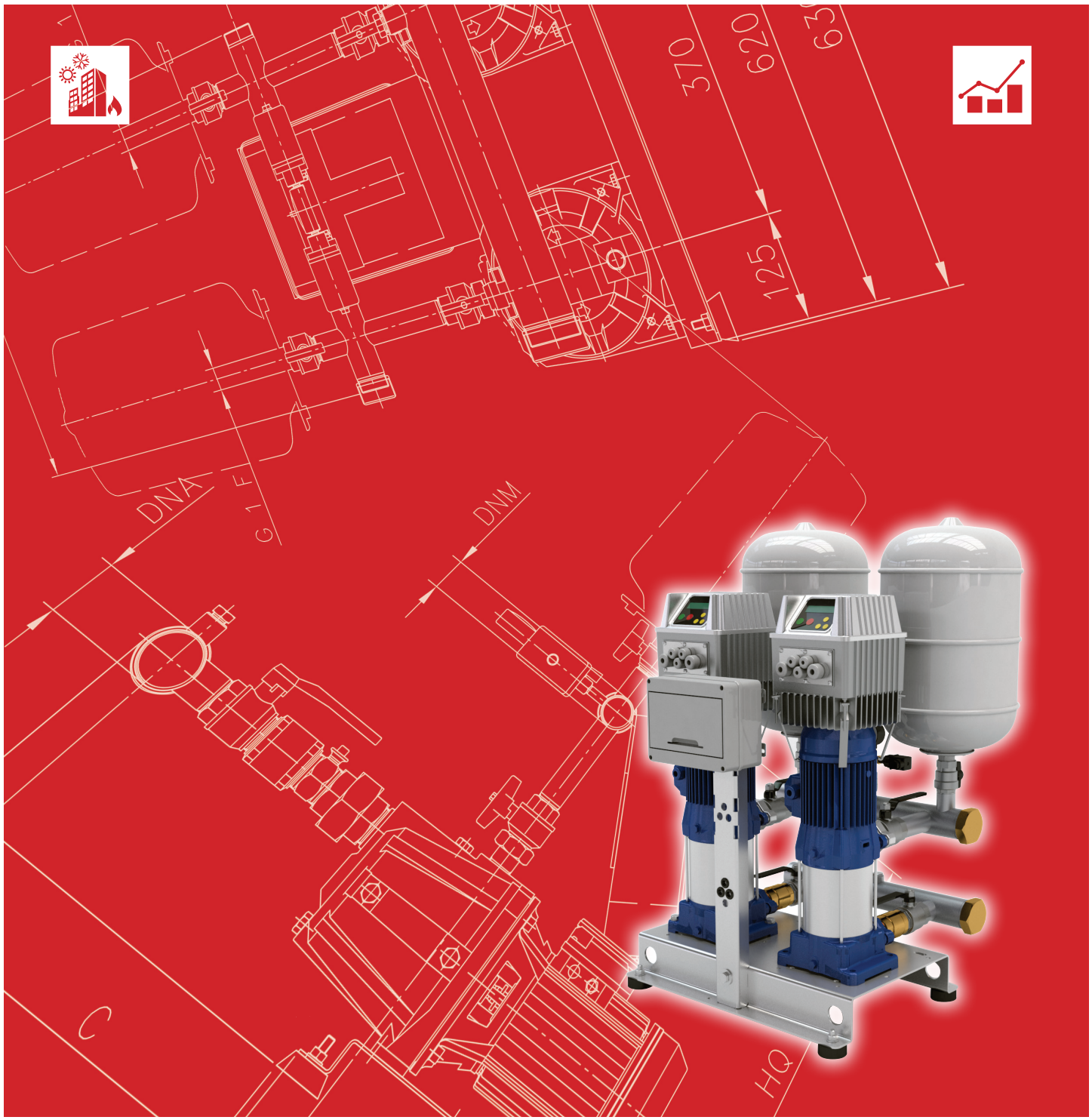




Japanese Technology since 1912

## CVM Booster Sets

Data Book 50Hz



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### DEFINITION AND USE OF PRESSURISATION UNITS

In situations in which a municipal water mains is lacking or insufficient for the proper operation of the services, one must install a pressurization unit to provide acceptable pressure and flow rates to even in the most unfavourable services. Pressurisation units are used wherever there is a need to increase the pressure, or to pressurise a water circuit. **EBARA GP pressurisation units** are automatic systems with 2 or more pumps operating in parallel, designed to provide a simple and reliable solution to the most common requirements for maintenance of water supply pressure for apartment buildings, hotels, centres, offices and schools as well as providing auxiliary service in industrial and agricultural applications. They stand out for their robust construction, compact size, excellent efficiency and silent operation. GP units are equipped for connection to membrane and air cushion autoclaves. They are controlled by pressure switches or, for units with INVERTER control, by the signal from a pressure transmitter.

### TYPICAL APPLICATIONS

INDUSTRY	BUILDING SERVICE	WATER SUPPLY
		

### PRINCIPLE OF OPERATION OF GP PRESSURISATION UNITS

When water is demanded, it is first drawn from the autoclave tank (if present). This demand for water, with the pumps stopped, lowers the pressure until the pressure transmitter starts the first electropump. If the output flow is greater than the delivery capacity of a single pump, the pressure continues falling until the pressure transmitter, thus starting the second pump. This happens for all pumps in the unit. When the water demand stops or reduces, the system pressure rises, the pressure transmitter shutting off the pumps one by one. This is done in inverse order to that in which the motors were started up, the number of hourly starts per pump is reduced and they are all used to the same extent.

NB: By connecting a float switch or minimum pressure switch to the control panel (both for demand from the first accumulation tank and from the water circuit itself) one can prevent the most frequent cause of pump failure: dry running

### PRINCIPLE OF OPERATION OF GPE PRESSURISATION UNITS

**GPE** units are designed to operate with a pump controlled by an **INVERTER** in the control panel, on board the motor, or in-line. The unit thus maintains constant pressure in the water circuit.

There are various versions of GPE unit:

- With INVERTER in the control panel (Standard **EFC** version)  
With a single INVERTER controlling a single pump which is alternated with the others at each start up (MFC version, on request, in which each pump is INVERTER controlled).
- With multiple INVERTERS, each pump controlled by its own INVERTER (**MFC versions**, versions with INVERTER on board motor or in-line INVERTER)

**Note: Not all control options shown in the introduction are available with CVM pumps**

## OPERATING CONDITIONS

EBARA GP-GPE pressurisation units can be used, in their standard versions, for civil, industrial and agricultural applications, as follows:

- building service
- water lifting and handling
- A/C
- heating
- irrigation
- washing systems

The conveyed fluid must be: clean, potable, ground or mixed water, free of solid or fibrous suspensions and aggressive chemical substances.

The units must be installed under cover, protected from the weather and freezing.

- Conveyed water temperature 0 - 50°C (depending on pumps).
- Ambient operating temperature 0 - 40°C, no higher than 1000 m above sea level.
- Max relative humidity 50% at +40°C.

NB: The system available NPSH must be greater than the NPSH demanded from the pump. For applications with different technical specifications, uses and climatic conditions (type of vector fluid, marine and aggressive industrial conditions), please contact our sales network.

## TESTS AND TRIALS

Before shipping, all EBARA pressurisation units are subject to hydraulic, mechanical and electrical testing.

### MECHANICAL AND HYDRAULIC TESTS

- Pressure switch calibration
- Pump direction of rotation
- Mechanical testing of moving parts and running noise (on each pump)
- Tightness test with delivery port closed and nameplate rating tests
- MANUAL trials (using button on control panel) for each pump
- AUTOMATIC trials (using switch on control panel) for unit

### ELECTRICAL TESTS

- Earthing system continuity
- Applied voltage (dielectric rigidity)
- Insulation resistance

### Principle of Operation of GPE Pressurisation UNITS with E-drive and E-SPD

GPE units with E-drive and E-SPD are designed to operate with each pumps controlled by an INVERTER installed on board its motor, E-drive up the fan cover, E-SPD on the terminal box. The system is controlled by an MASTER INVERTER in relation to the reference signal supply by a pressure transmitters (4 - 20 mA passive). As the system pressure varies, the MASTER pump varies its rotary speed to restore it to the setpoint. If the water demand exceeds the capacity of the pump, the second variable speed pump cuts in and, pump goes into regulation mode to maintain the pressure setpoint; this happens for all the pumps in the unit. If the water demand drops off, the pressure tends to increase and the latest pump gradually reduces its speed to restore the correct operating pressure. This results in the regulation of the speed of the other pumps, until they gradually turn off. Once the system pressure has been restored and the water demand is 0, the MASTER pump switches off automatically.

### Principle of Operation of GPE Pressurisation UNITS with E-power and Hydrocontroller

GPE units with E-power and Hydrocontroller are two pumps unit and are designed to operate with pumps controlled by an INVERTER in-line type. As the system pressure varies, the MASTER pump varies its rotary speed to restore it to the setpoint. If the water demand exceeds the capacity of the pump, the second variable speed pump cuts in and, the two pumps rotate at variable synchronous speed to restore the operating pressure. If the water demand drops off, the pressure tends to increase and both pumps gradually reduces its

speed to restore the correct operating pressure. This results in the regulation of the speed of the other pumps, until they gradually turn off when the water demand is 0.

#### **Principle of Operation of GPE Pressurisation UNITS with an EFC control panel**

EFC multiple pump control units power pump n. 1 with the INVERTER to modulate system performance in relation to the reference signal while the other pumps are run at maximum nominal speed (around 2900 rpm) and started and stopped in relation to demand. These means there are two distinct primary electrical circuits:

- n. 1 - INVERTER startup/control of a single pump,
- n. 2 - contactor startup (direct or star/delta) of the other pumps.

The system is controlled by an electronic controller in relation to the reference signal supply by a pressure transmitter, flow meter or other unified control signal (4 - 20 mA passive).

If the electronic controller or pressure transmitter fails, a system of pressure switches controls the pumps directly (if present).

- In case of water distribution at constant pressure (Fig.1), the electronic controller is connected to the pressure transmitter on the units' delivery manifold, which outputs a signal proportional to the circuit pressure. When the pressure drops due to water demand, the pressure transmitter signal also drops and the controller starts and controls the speed of the first pump with the INVERTER to restore the reference/ operating pressure. If the pump's flow rate is lower than demand, the circuit pressure will continue to drop and the system responds by increasing the pump's speed. Once pump n. 1 reaches its maximum speed and demand is still in excess of its delivery, the controller will start pump n. 2 at maximum speed. The speed of pump n. 1 is immediately modulated so as to establish the operating pressure. If the pressure drops even further and pump n. 1 is once again running at maximum speed, the controller starts up pump n. 3, and so on for all pumps in the unit. If the water demand drops off, the pressure tends to increase and the controller reduces the speed of pump n. 1 to restore the correct operating pressure. At this point, the controller will stop one of the pumps running at maximum speed, while the speed of pump n. 1 is modulated to maintain the reference pressure. As the pressure continues to increase due to reduced demand, once the minimum speed of pump n. 1 is reached once more the controller will stop pump n. 3 and then pump n. 2. Once the demand for water has completely ceased, the controller reduces the speed of pump n. 1 to its minimum and after a set delay (around 1 minute) stops this pump too. The next time the system is started up, the INVERTER controlled pump will no longer be pump n. 1, but n. 2. The INVERTER controlled pump thus rotates through all pumps in sequence.

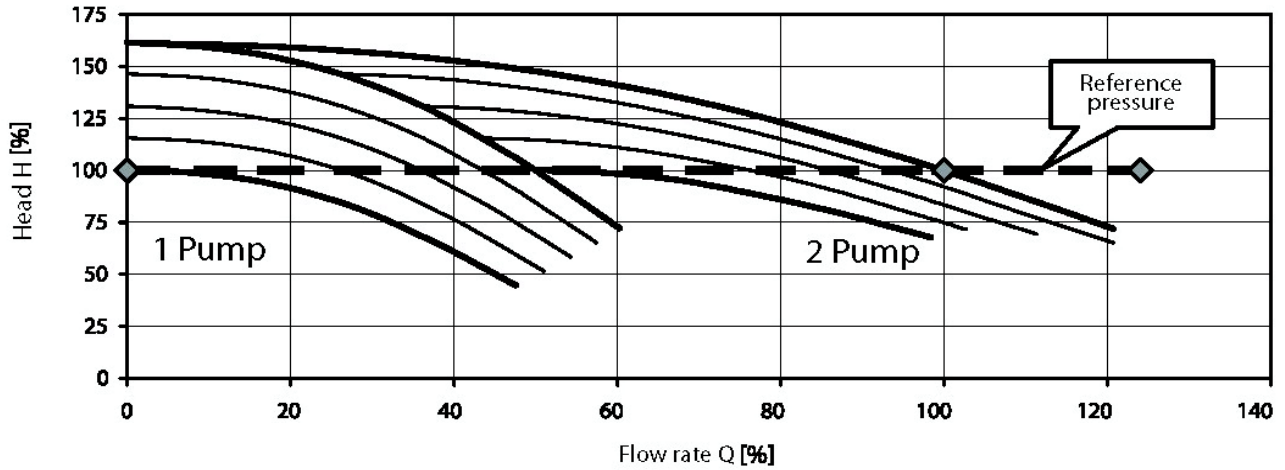
#### **Principle of Operation of GPE Pressurisation UNITS with an MFC control panel**

MFC multiple pump control panels power each pump with an INVERTER to modulate system performance in relation to the reference signal. MFC controllers differ from EFC controller from the point of view of their construction, since instead of having a single INVERTER to control all the pumps, each pump has its own INVERTER. The two types of control panel differ in construction, but they have the same type of operation by the controller, which responds to the reference signal output by a pressure transmitter or other unified control (4 - 20 mA passive). If the electronic controller or pressure transmitter fails, a system of pressure switches controls the INVERTERS directly.

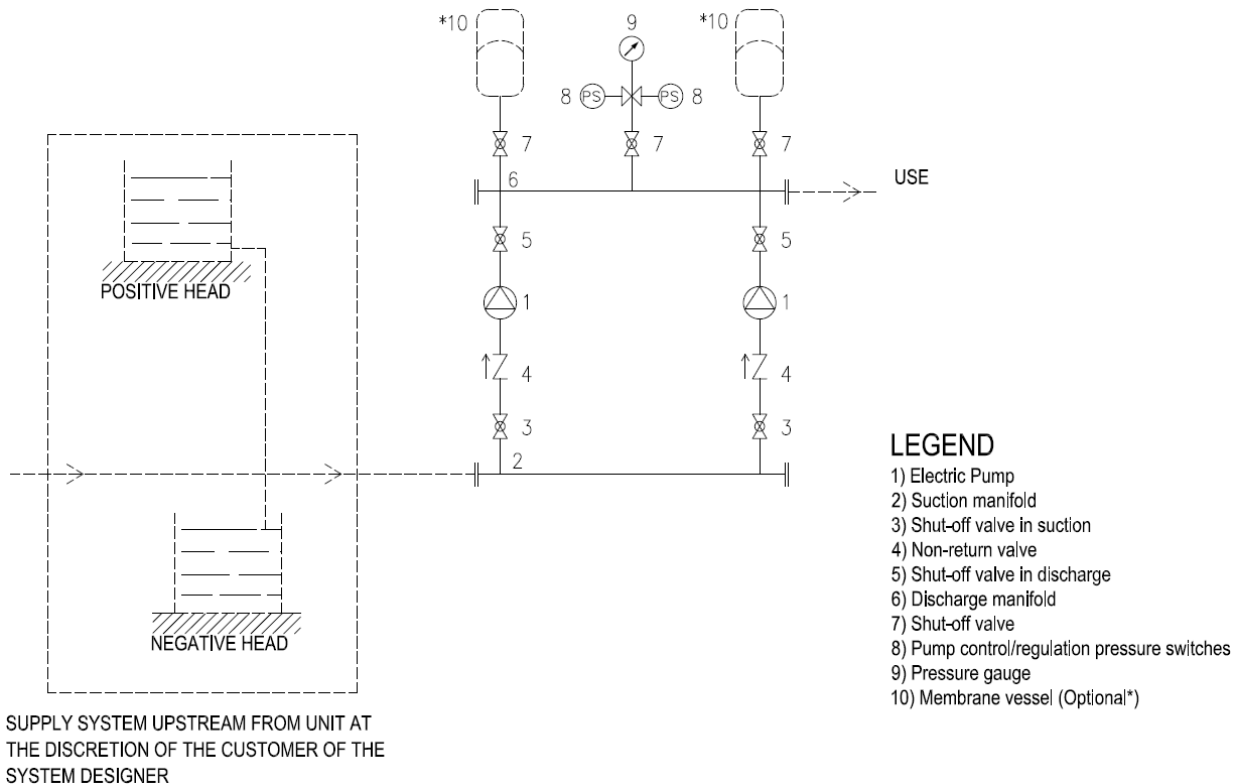
- In case of water distribution at constant starting pressure (Fig.1), the electronic controller is connected to the pressure transmitter on the units' delivery manifold, which outputs a signal proportional to the circuit pressure. When the pressure drops due to water demand, the pressure transmitter signal also drops and the controller starts and controls the speed of the first pump with the INVERTER to restore the reference/ operating pressure. If the pump's flow rate is lower than demand, the circuit pressure will continue to drop and the system responds by increasing the pump's speed. Once pump n. 1 reaches its maximum speed and demand is still in excess of its delivery, the controller will start pump n. 2, also at variable synchronous speed. The controller will modulate the speed of the two pumps to restore the operating pressure; the modulating frequency is the same for both pumps. If the pressure drops even further and pumps n. 1 and 2 are once again running at maximum speed, the controller starts up pump n. 3, and then pump n. 4, if present. When the water demand is reduced the pressure will end to increase, as does the pressure transmitter output value. The controller thus reduces the speed of pumps n. 1, 2, 3 and 4 (they are all controlled at the same speed) to restore the reference/ operating pressure. If the pumps' flow rate is greater than demand, the circuit pressure will continue to increase and the system responds by decreasing the speed of the pumps until it reaches the minimum speed setting. At this point, the controller will stop pump n. 4, while the speed of pumps n. 1, 2 and 3 is modulated to maintain the reference pressure. As the pressure continues to increase due to reduced demand, once the minimum speed

setting is reached again, the controller will stop pump n. 3 and modulate the speed of pumps n. 1 and 2. This continues in sequence as the demand continues to fall, until the unit is completely stopped.

Fig. 1 - TWO PUMP UNIT WITH CONSTANT PRESSURE REGULATION

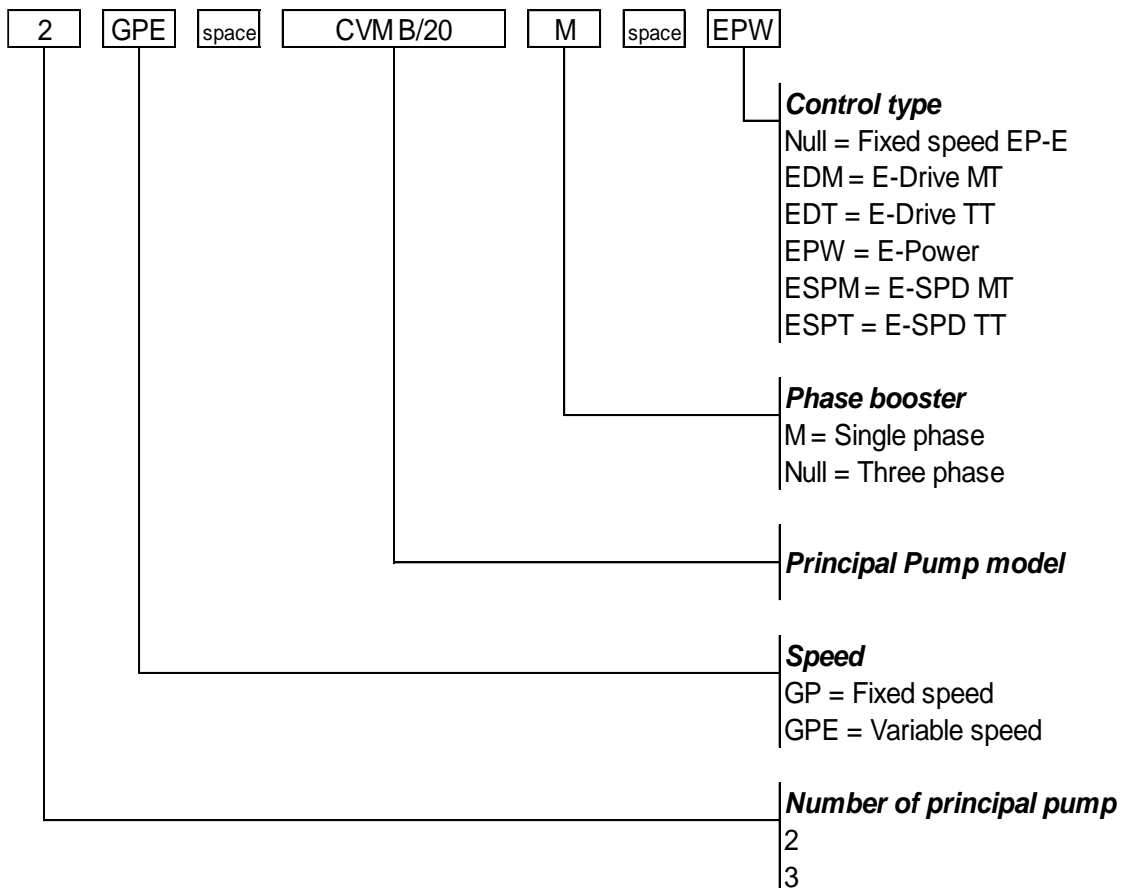


PRESSURISATION UNIT WATER CIRCUIT DIAGRAM







### TYPE KEY 2-3GP(E) CVM



### NAME PLATE

 <b>EBARA</b> Via Campo Sportivo, 30 38023 CLES (TN) ITALY		 MADE IN ITALY
BOOSTER UNIT		
TYPE	①	
P/N	②	
S/N	③	

- 1) "TYPE" booster model
- 2) "P/N" booster item number
- 3) "S/N" booster serial number

INTENTIONALLY EMPTY PAGE

### PRODUCT SPECIFICATIONS HYDRAULIC COMPONENTS AND CONTROL

BOOSTER SET					
CVM					
Operating range	Version		A	B	
	Nominal flow rate ( m <sup>3</sup> /h )	Single pump		4.8	7.2
		2GP(E)		9.6	14.4
		3GP(E)		14.4	21.6
	Maximum working pressure		10 bar		
	Liquid temperature range		+5 ÷ +40°C		
	Ambient operating temperature (no higher than 1000 m above sea level)		0÷40°C		
Hydraulic components	Frame		Omega sheet Galvanized steel		
	Manifold suction / discharge		Threaded manifold AISI 304		
	Closing manifold		Threaded female cap Brass		
	Check valve		Threaded check valve Brass / NBR		
	Ball valve		Threaded ball valve Brass / PTFE		
	Socket for air feeders (only for "GP" version)		Threaded socket Brass		
Control	Pressure gauge		M3A-ABS 50/FR / plastic-copper alloy		
	Pressure switches		Only for GPE version with SP EFC / MFC panel with inverter XMP / -25°C...+70°C		
	Pressure transmitter		GP version with EP-E panel fixed speed GPE version with E-drive and with E-SPD EN 10088-1.4301 (AISI 304) / 1.4404 (AISI 316L)		

## ELECTRIC PANEL

BOOSTER SET					
CVM					
Operating Range	Version		A	B	
	Nominal flow rate ( m <sup>3</sup> /h )	Single pump		4.8	7.2
		2GP(E)		9.6	14.4
		3GP(E)		14.4	21.6
Control panel	Principal Electric panel	EP-E fixed speed ( only for GP )	•	•	
		SP EFC/MFC variable speed ( only for GPE )	○	○	
	E-power ( EPW ) [1]	single-phase supply inverter ( only for GPE )	•	•	
	E-drive ( EDM-EDT ) [1]	supply inverter ( only for GPE )	•	•	
	E-SPD ( ESPM-ESPT ) [1]	supply inverter ( only for GPE )	•	•	
		supply inverter ( only for GPE )	•	•	

• : Standard ○ : Optional

[1] To be assemble with protection panel (to see "PROTECTION PANEL" section)

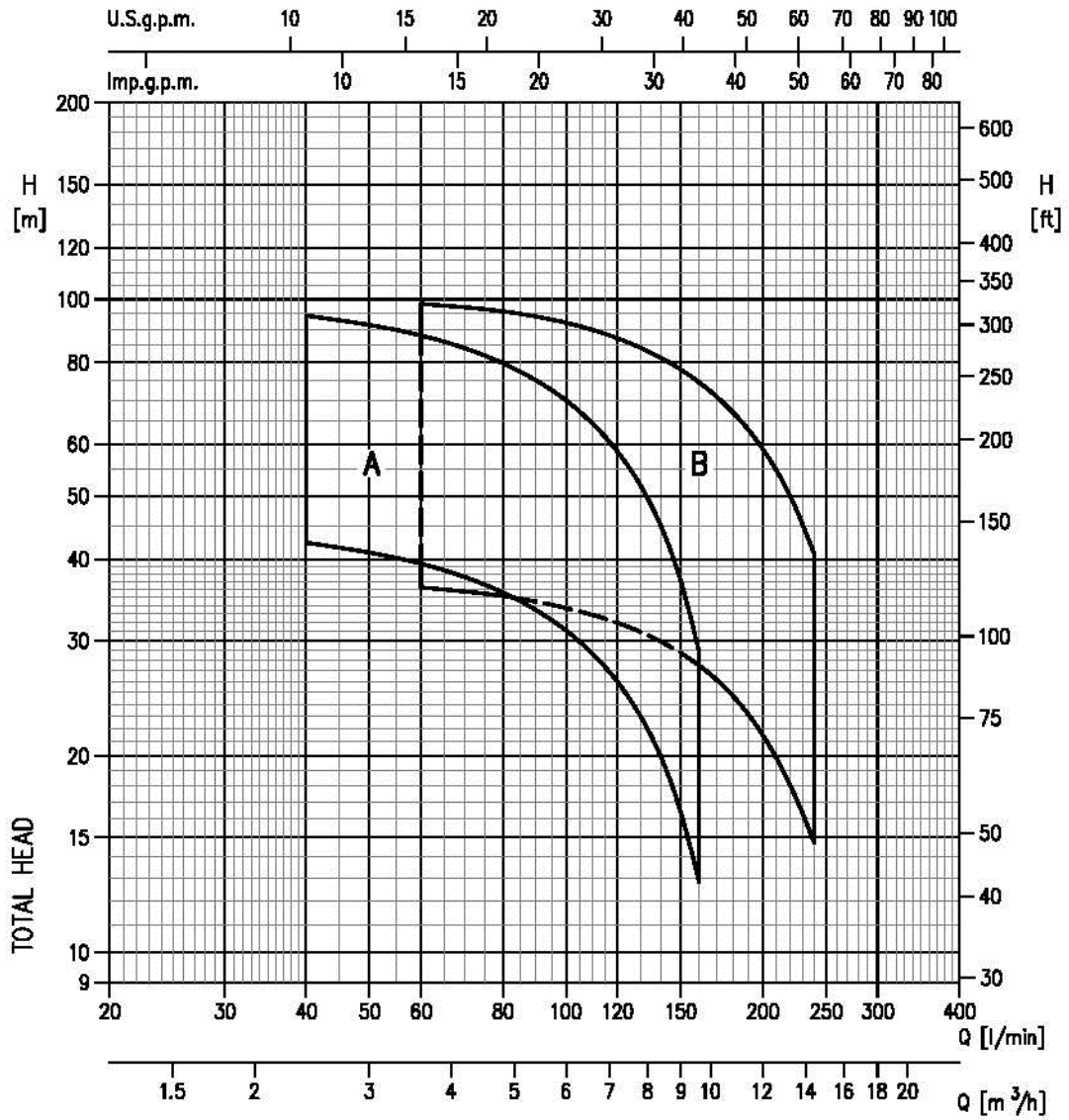
### TECHNICAL PUMP DATA

PUMP			
CVM			
Operating range	Version	A	B
	Maximum working pressure	1.1 MPa ( 11 bar )	
	Liquid temperature range	+5°C to +40°C	
Liquid handled	Liquid type	Clean water	
Key components material	Casing	Cast iron	
	Impeller	PPE+PS Glass fibre reinforced	
	Shaft seal	Ceramic/Carbon/NBR	
	Shaft	AISI 416	
	Bracket	Cast iron	
	Diffuser	PPE+PS Glass fibre reinforced	
Pipe connection	Suction	G 1" ¼ UNI ISO 228	
	Discharge		

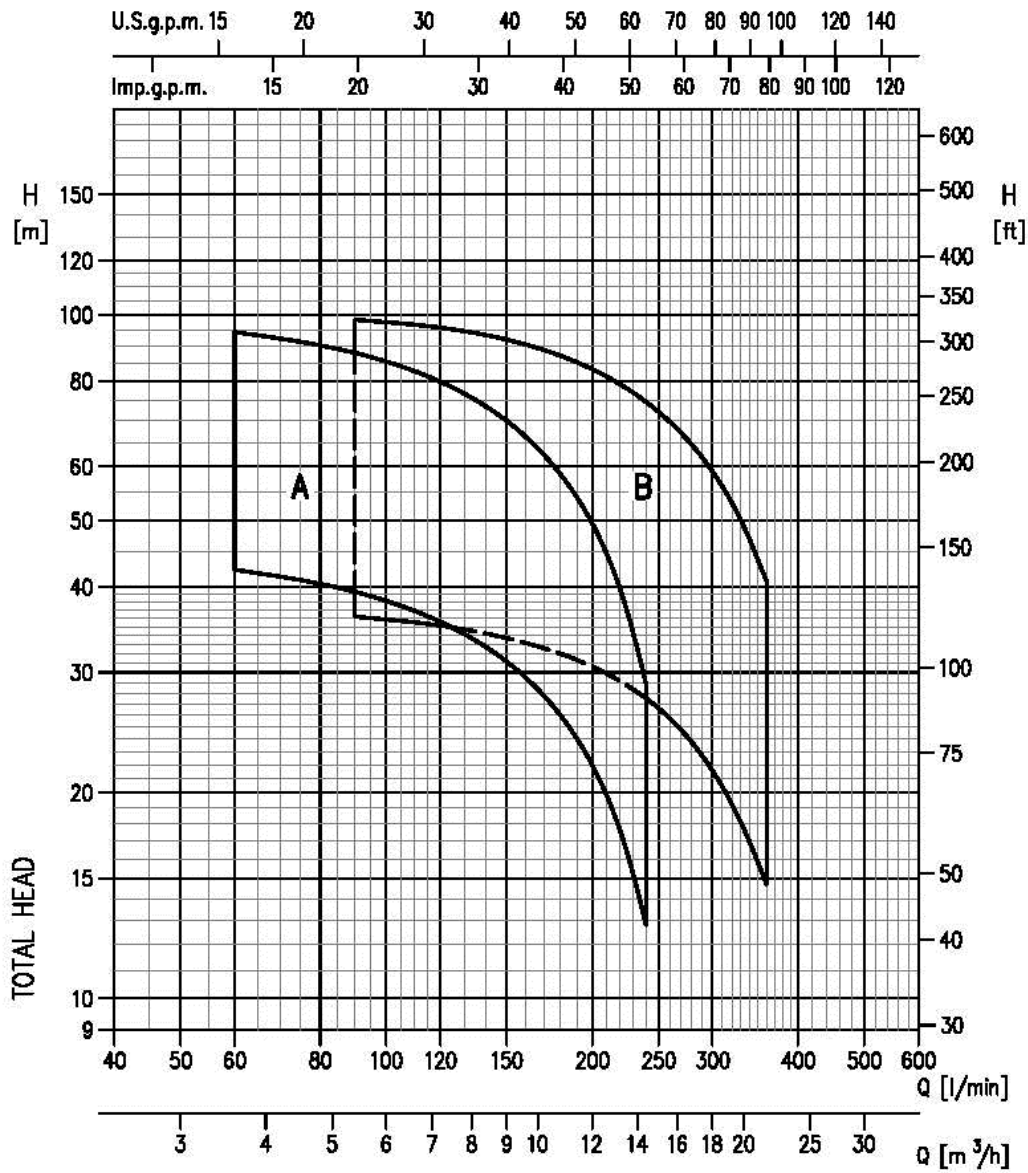
## TECHNICAL MOTOR DATA

MOTOR				
CVM				
Power source	Frequency	50 Hz		
	Phase	Single-phase	Three-phase	
	Rotation speed	2850 min <sup>-1</sup>		
	Power rating	0.6 ÷ 1.7 kW	0.6 ÷ 1.85 kW	
		0.8 ÷ 2.3 HP	0.8 ÷ 2.5 HP	
Voltage	230 ± 10% V	230/400 ± 10%		
Type	Type	Electric asynchronous - TEFC		
	Efficiency level	-	0.6 kW IE3 from 0.75 kW up to 1.85 kW	
	N° of poles	2		
	Protection degree	IP 44		
	Insulation class	F		
Others	Capacitor	Built in	-	
	Overload protection	Built in	Provided by the user	
	Casing Material	Aluminium		

### PERFORMANCE RANGE RESEAU BOOSTER SET 2GP(E) CVM



RESEAU BOOSTER SET 3GP(E) CVM





### CURVE SPECIFICATION 2GP(E) MINIMUM EFFICIENCY INDEX (MEI)

The specifications below qualify the curves shown on the following pages.

Tolerances according to ISO 9906 Annex A

The curves refer to effective speed of asynchronous motors at 50 Hz

Measurements were carried out with clean water at 20°C of temperature and with a kinematic viscosity of  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt)

The NPSH curve is an average curve obtained in the same conditions of performance curves.

The continuous curves indicate the recommended working range. The dotted curve is only a guide.

In order to avoid the risk of over-heating, the pumps should not be used at a flow rate below 10% of best efficiency point.

Symbols explanation:

Q = volume flow rate

H = total head

P2 = pump power input (shaft power)

$\eta$  = pump efficiency

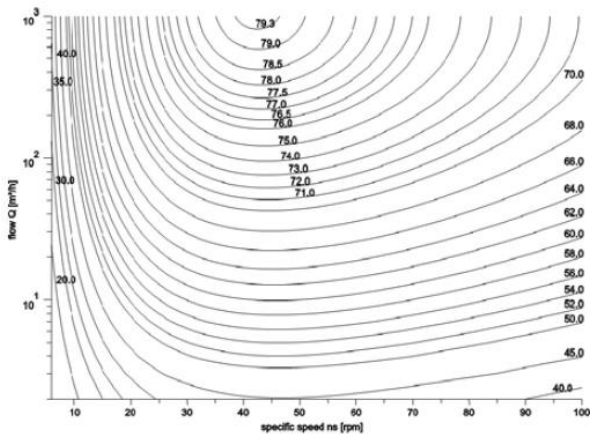
NPSH = net positive suction head required by the pump

MEI = minimum efficiency index

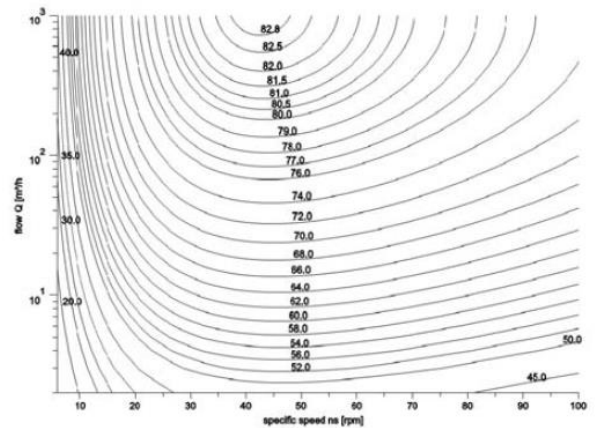
The minimum efficiency index (MEI) is a measure of the quality of a pump size respect to its mean efficiency.

The minimum efficiency index is based on the hydraulic efficiency and on the head at the best efficiency point.

MEI = 0.4 for Multistage Vertical 2900rpm



MEI=0.7 for Mutistage Vertical 2900 rpm

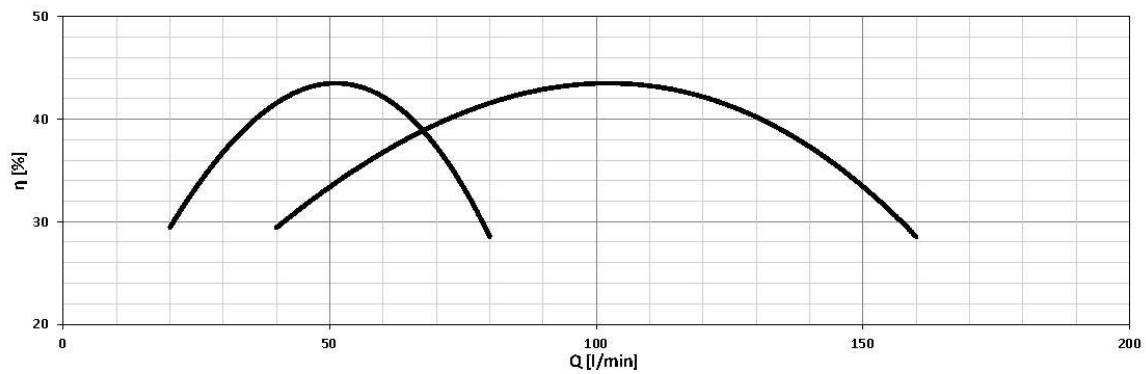
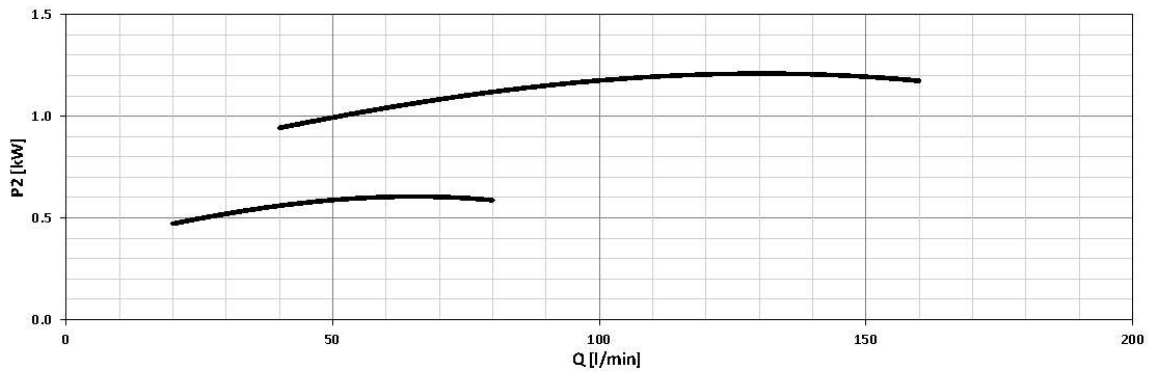
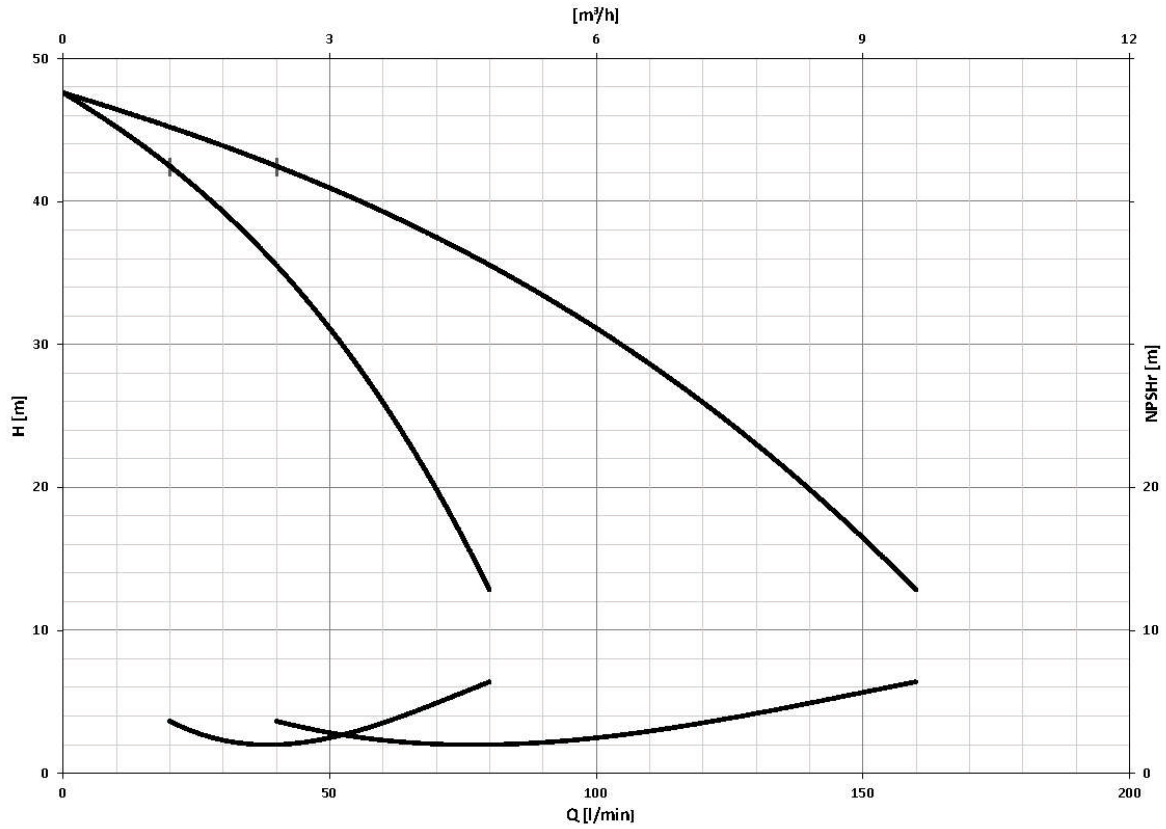


## SELECTION CHART 2GP(E) CVM A-B

Model	Supply		Motor		Maximum working pressure (MPa)	Q=Capacity								
	Single phase	Three phase	kW	HP		l/min	40	60	80	100	120	160	200	240
						m <sup>3</sup> /h	2.4	3.6	4.8	6.0	7.2	9.6	12.0	14.4
H=Total manometric head in meters														
2GP(E) CVM A/8(M)	●	●	0.6+0.6	0.8+0.8	1.0	47.5	42.5	39.4	35.6	31.1	25.9	12.8	-	-
2GP(E) CVM A/10(M)	●	●	0.75+0.75	1+1		62.5	57.5	54.0	49.5	43.5	36.6	19.5	-	-
2GP(E) CVM A/12(M)	●	●	0.9+0.9	1.2+1.2		75.0	69.0	65.0	59.5	52.5	44.0	23.4	-	-
2GP(E) CVM A/15(M)	●	●	1.1+1.1	1.5+1.5		87.5	80.5	75.5	69.5	61.0	51.0	27.3	-	-
2GP(E) CVM A/18(M)	●	●	1.3+1.3	1.8+1.8		103.0	94.5	88.0	80.0	70.0	58.5	28.8	-	-
2GP(E) CVM B/10(M)	●	●	0.75+0.75	1+1		38.1	-	36.2	35.1	33.7	32.0	27.5	21.6	14.7
2GP(E) CVM B/12(M)	●	●	0.9+0.9	1.2+1.2		51.0	-	48.0	46.8	45.0	42.6	36.6	28.8	19.6
2GP(E) CVM B/15(M)	●	●	1.1+1.1	1.5+1.5		63.5	-	60.5	58.5	56.2	53.3	45.8	36.0	24.5
2GP(E) CVM B/20(M)	●	●	1.5+1.5	2+2		78.5	-	74.0	72.0	69.0	65.5	56.0	44.5	30.6
2GP(E) CVM B/23(M)	●	●	1.7+1.7	2.3+2.3		91.5	-	86.0	84.0	80.5	76.5	65.5	51.5	35.7
2GP CVM B/25	-	●	1.85+1.85	2.5+2.5		105.0	-	98.5	96.0	92.0	87.0	74.5	59.0	41.0

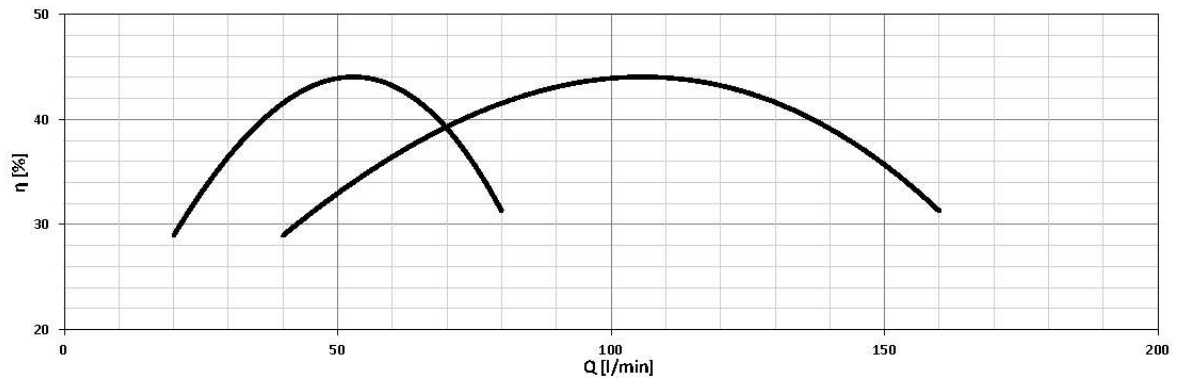
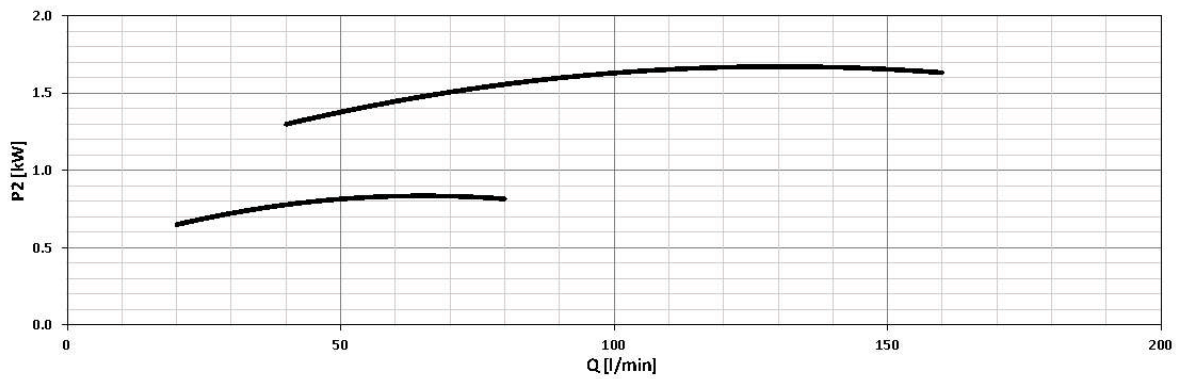
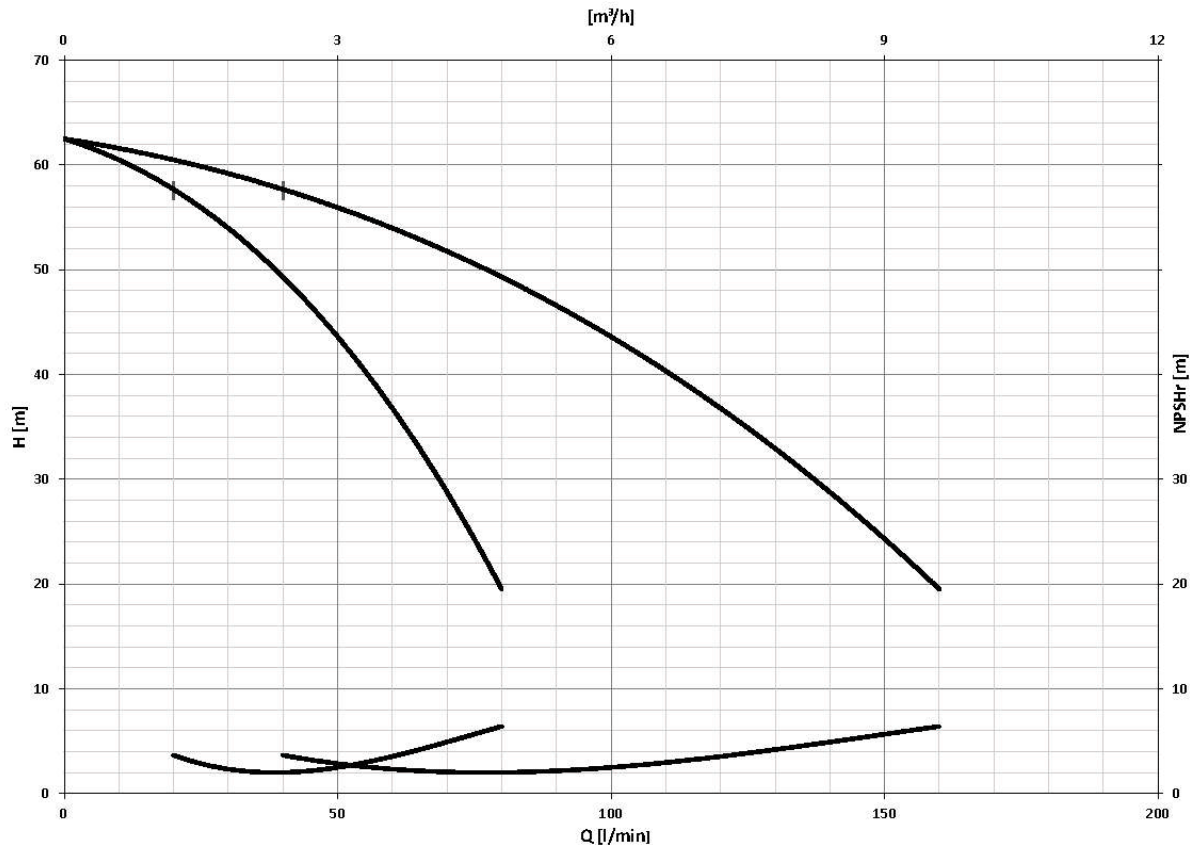
● : Standard ○ : On request

### PERFORMANCE CURVE 2GP(E) 2GP(E) CVM A/8(M)

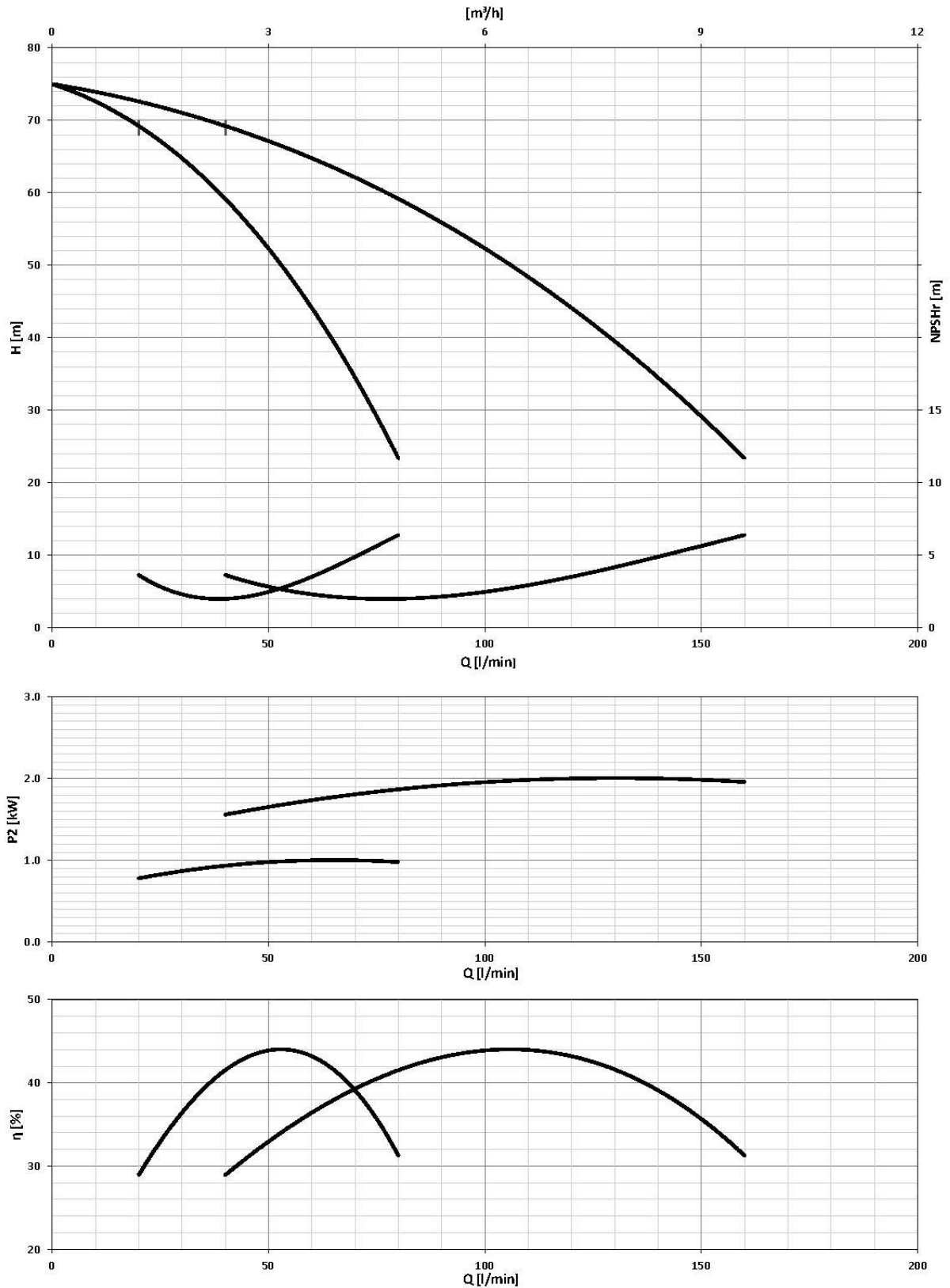


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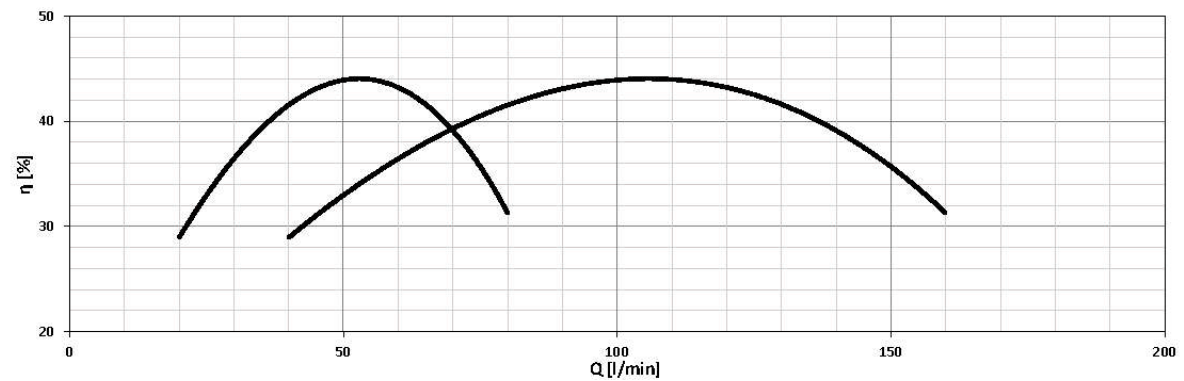
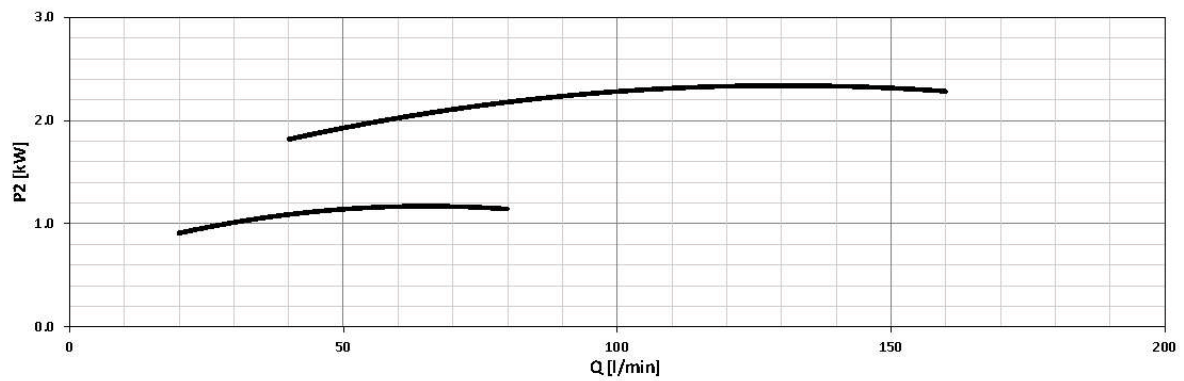
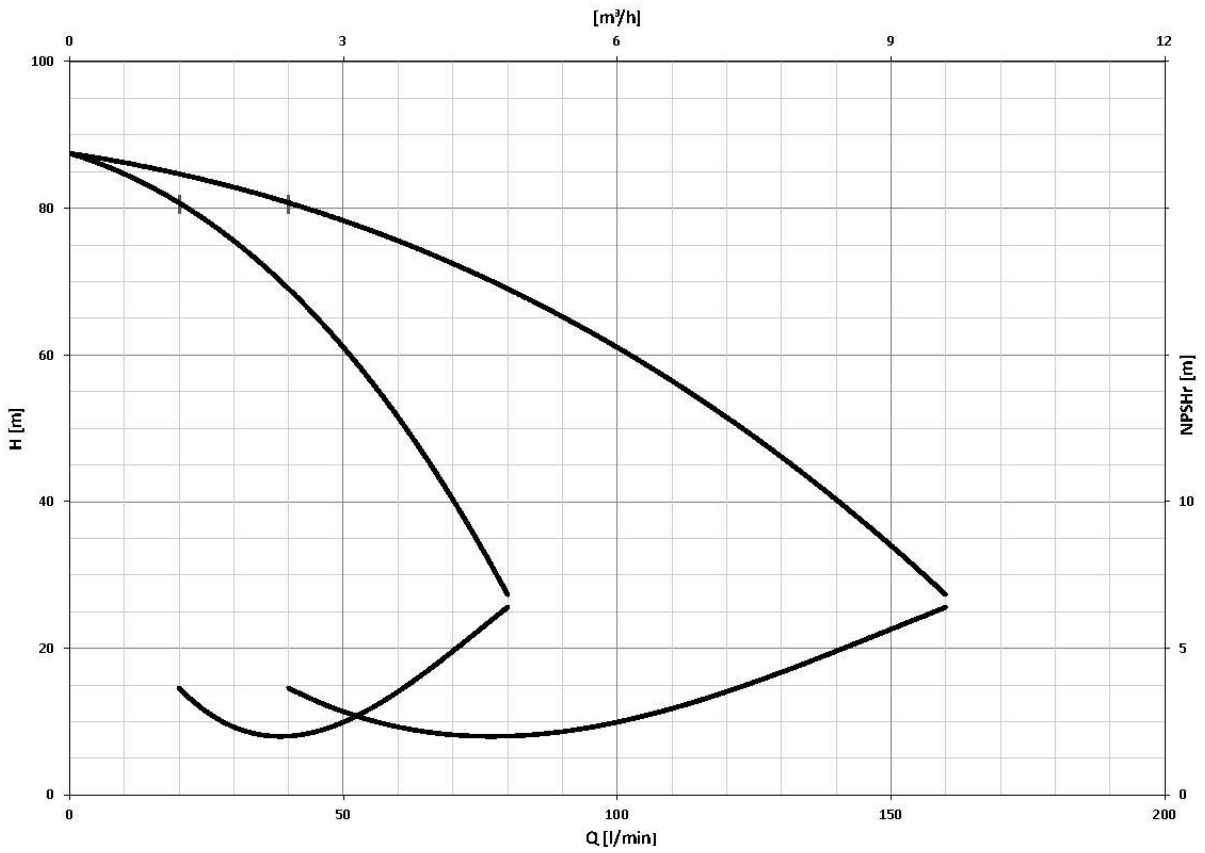
2GP(E) CVM A/10(M)



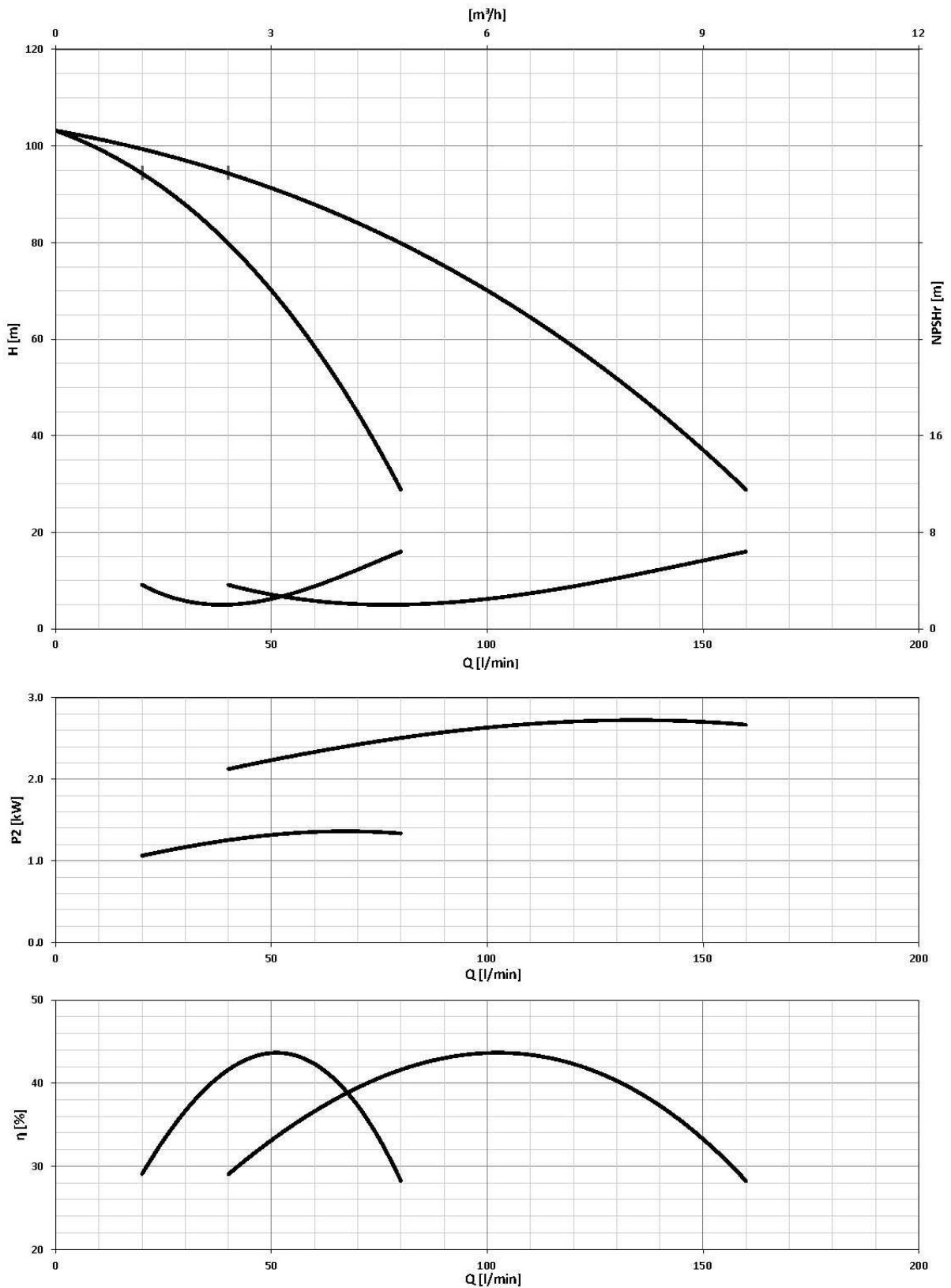
### 2GP(E) CVM A/12(M)



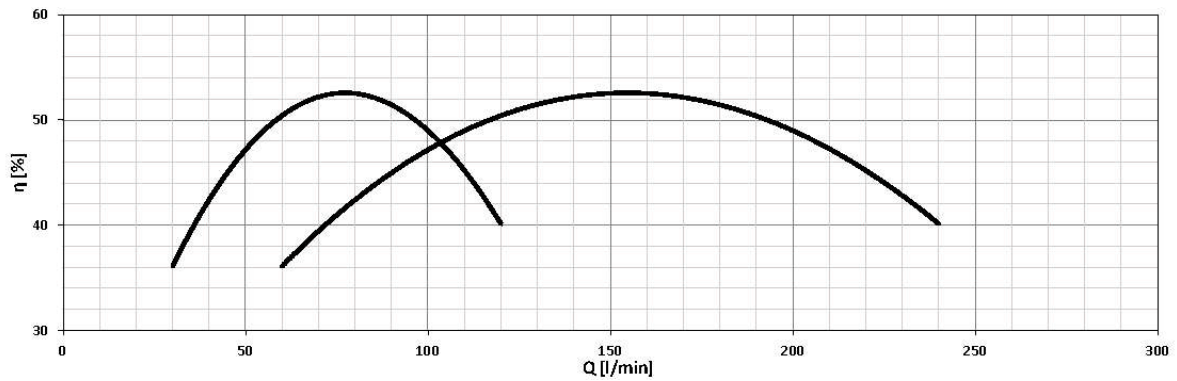
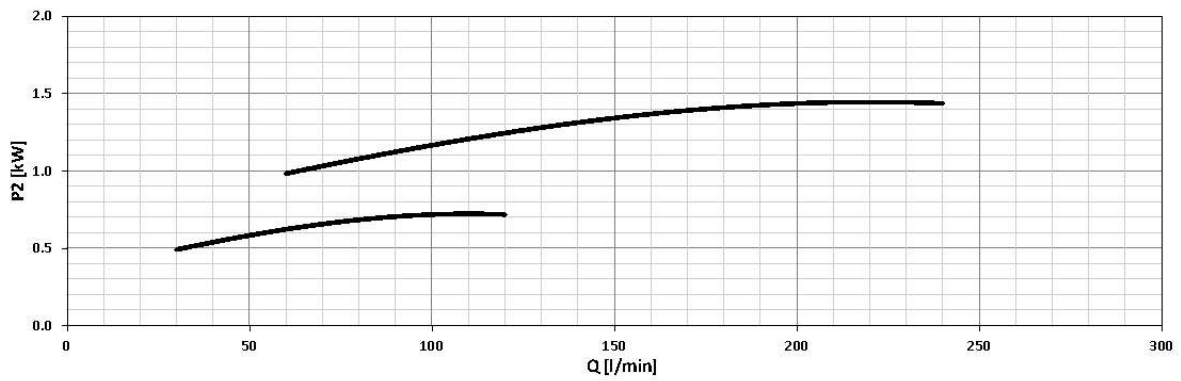
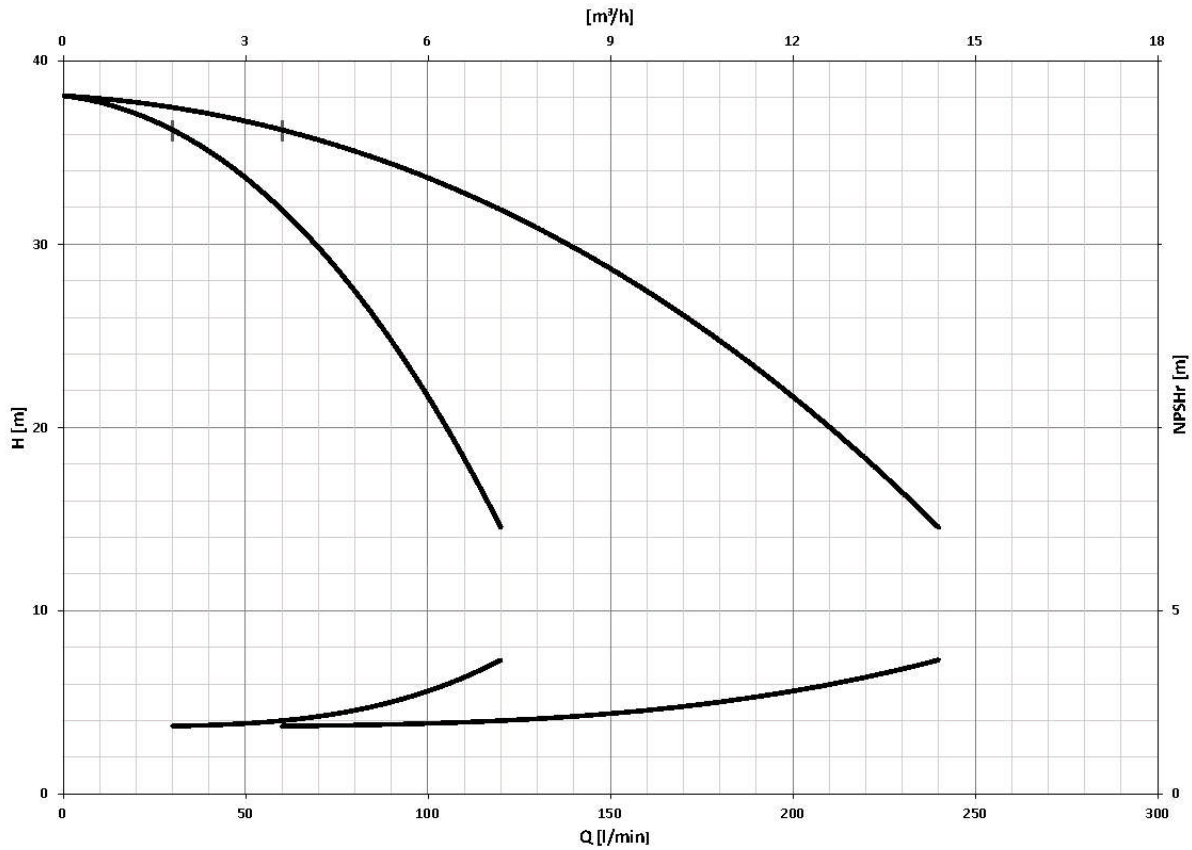
2GP(E) CVM A/15(M)



### 2GP CVM A/18(M)

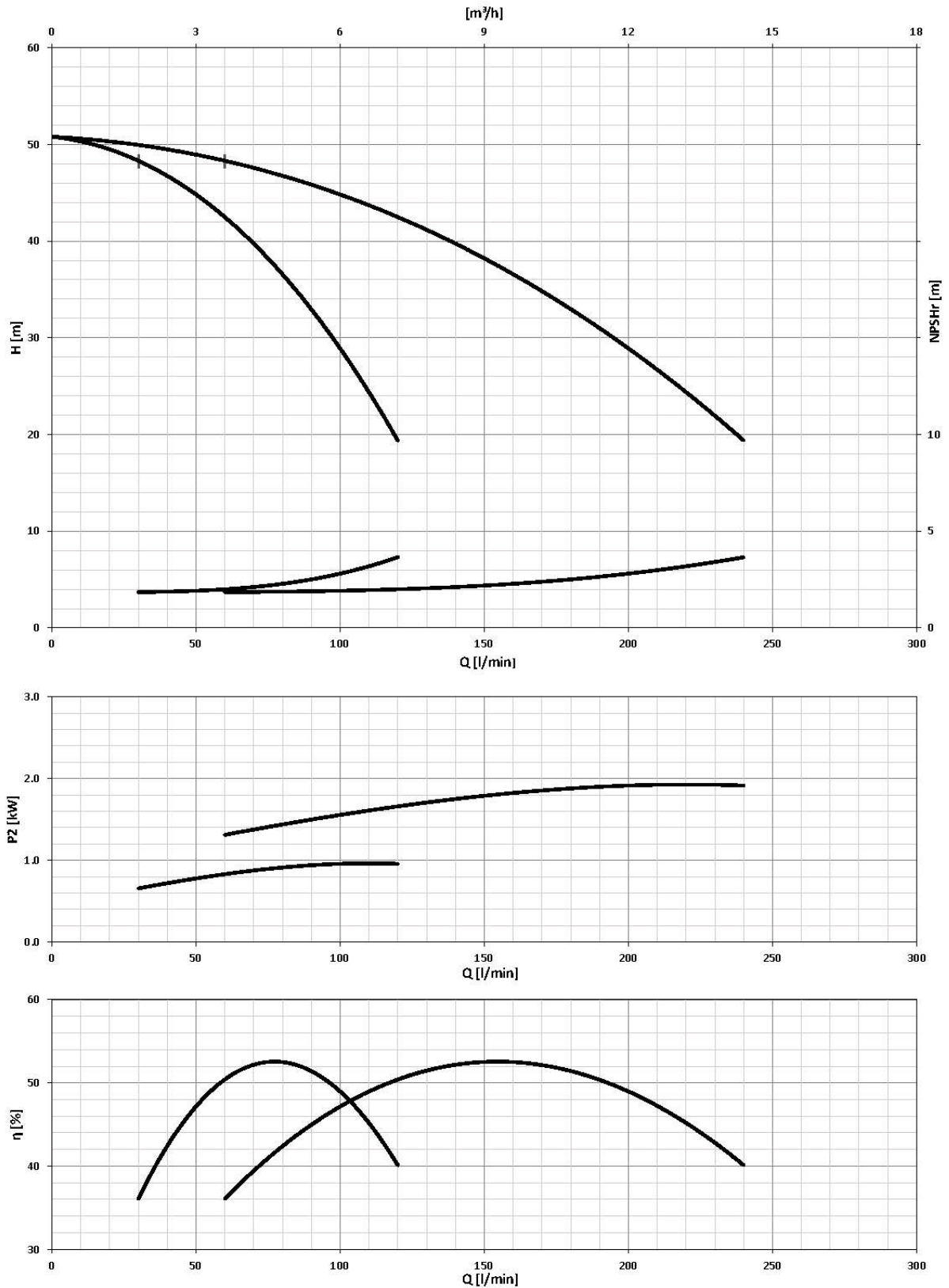


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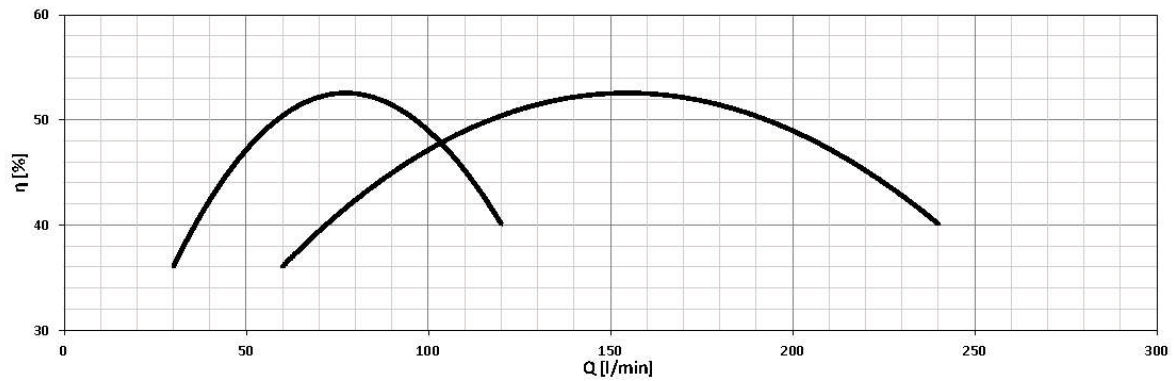
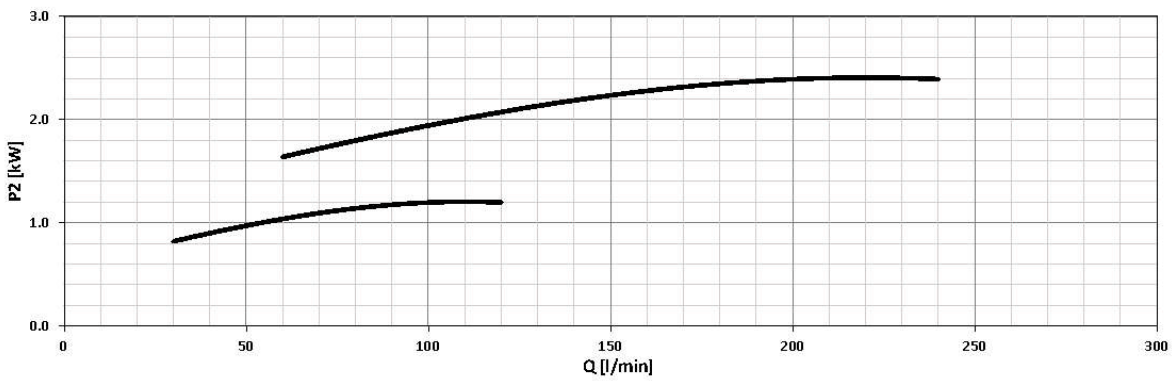
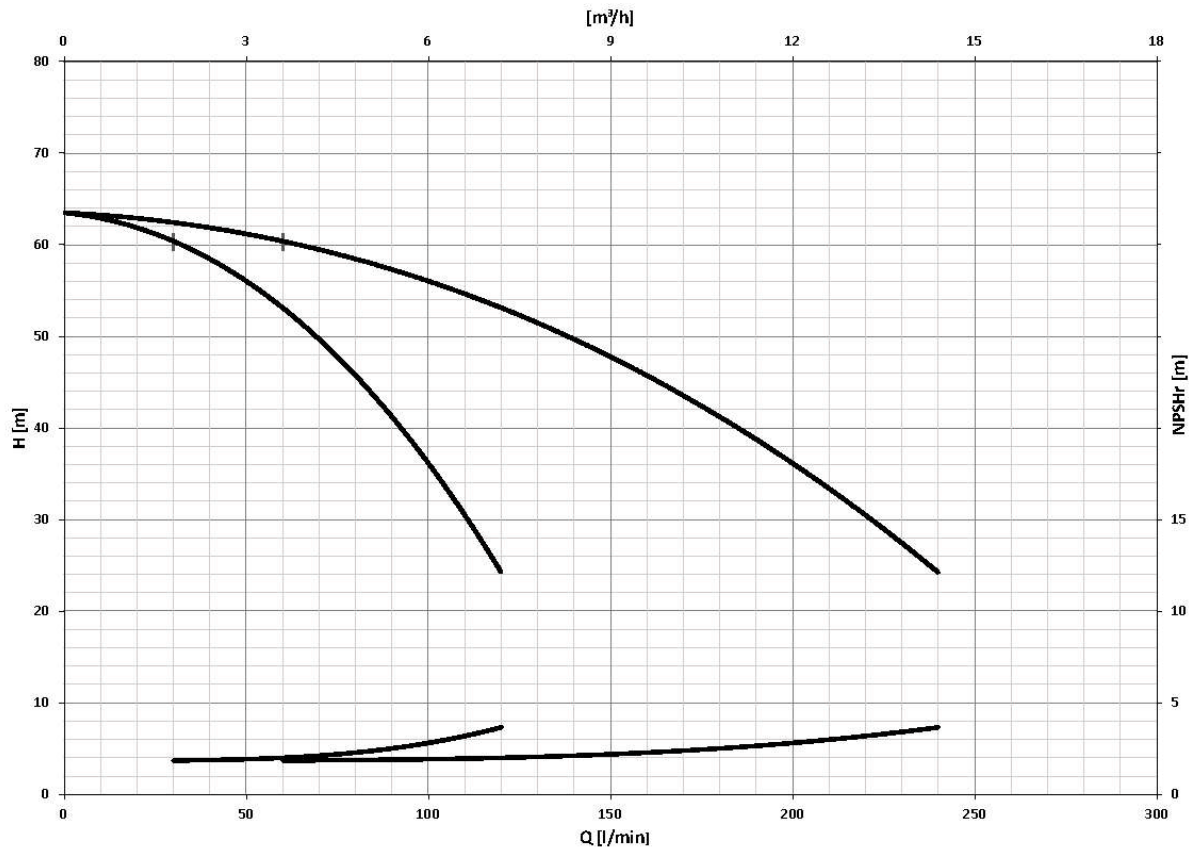




### 2GP(E) CVM B/12(M)

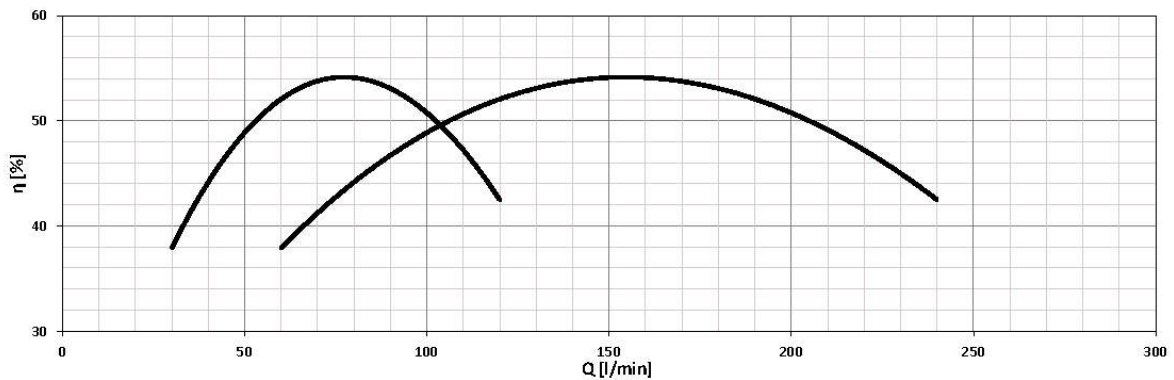
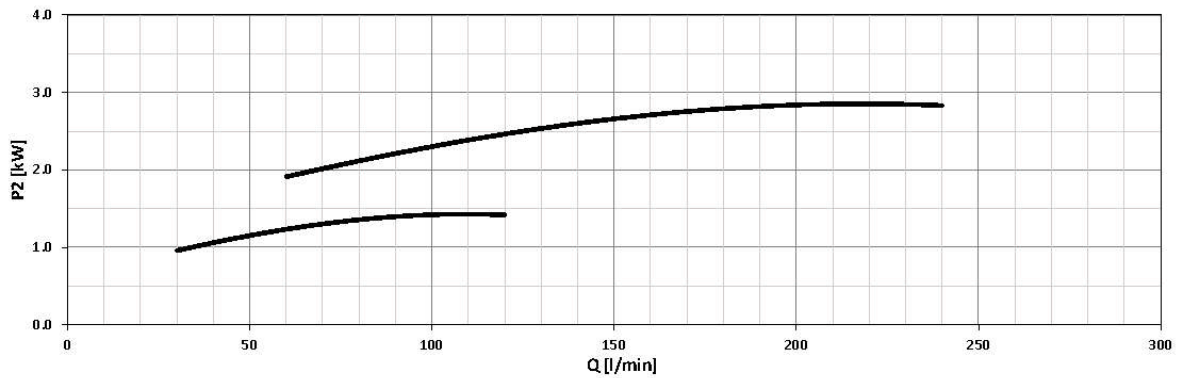
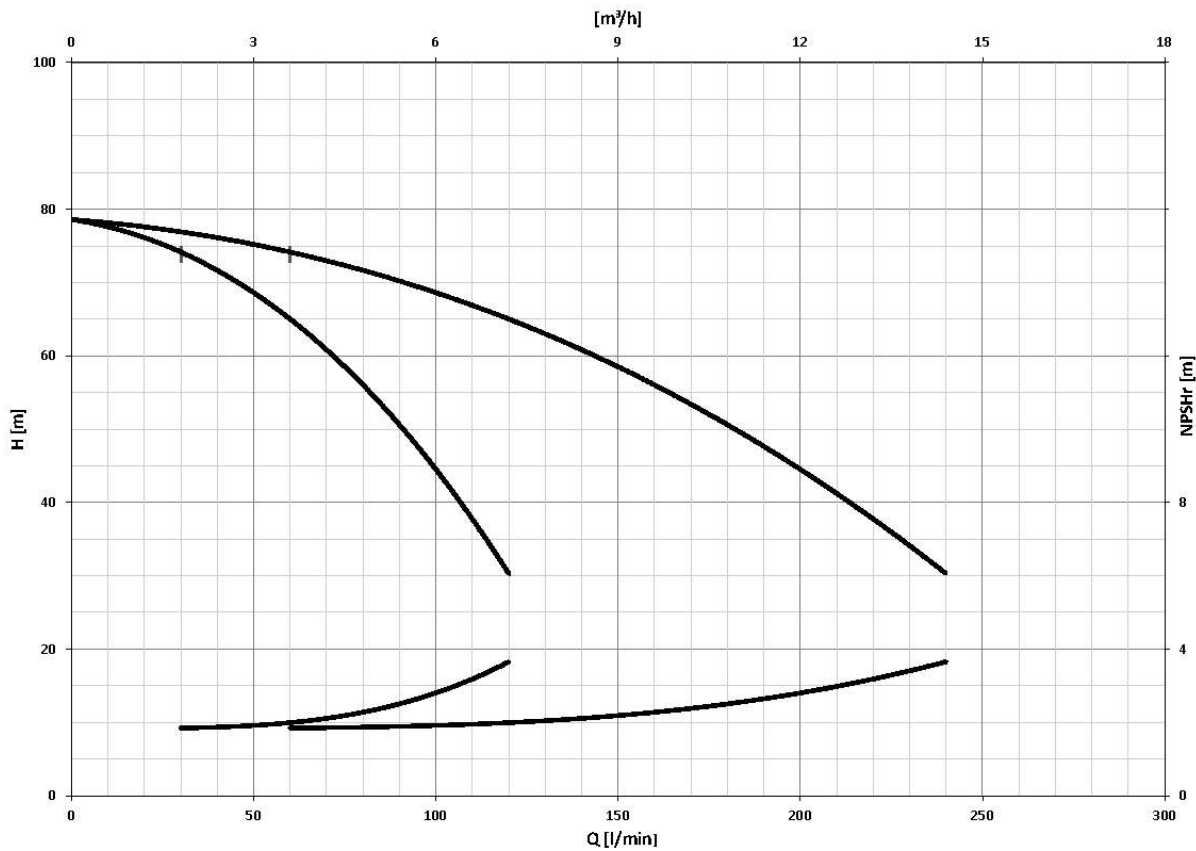


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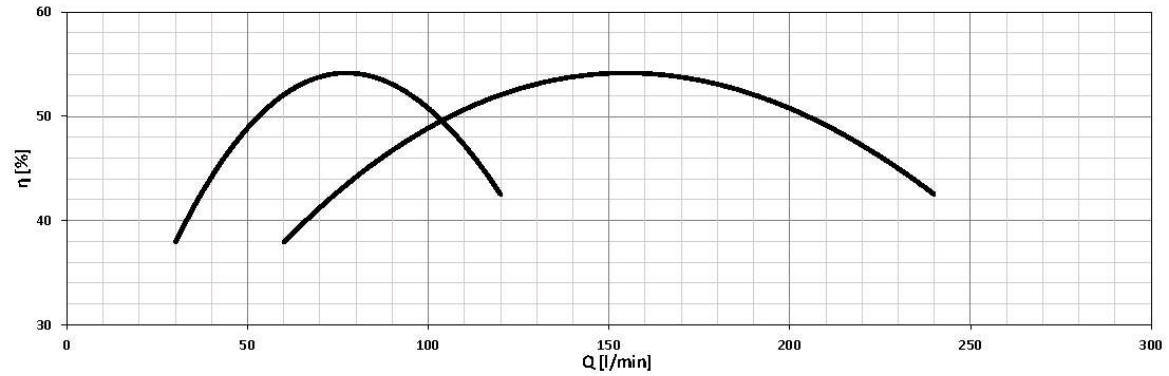
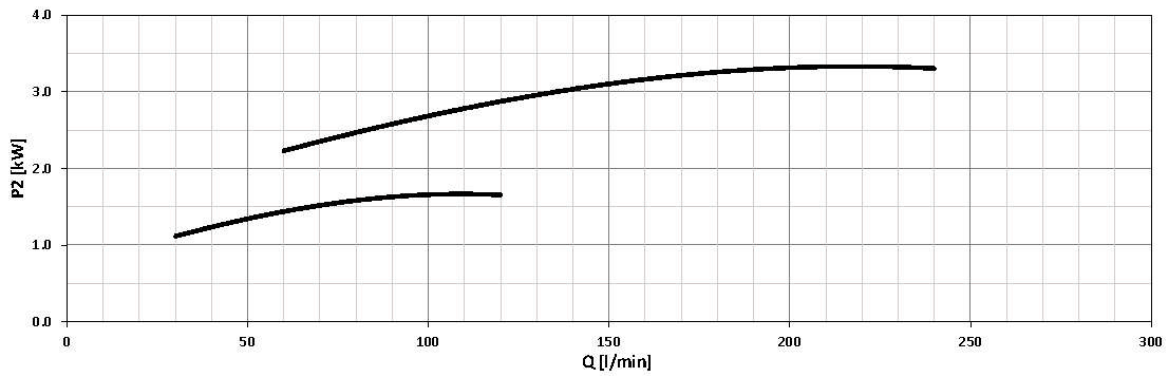
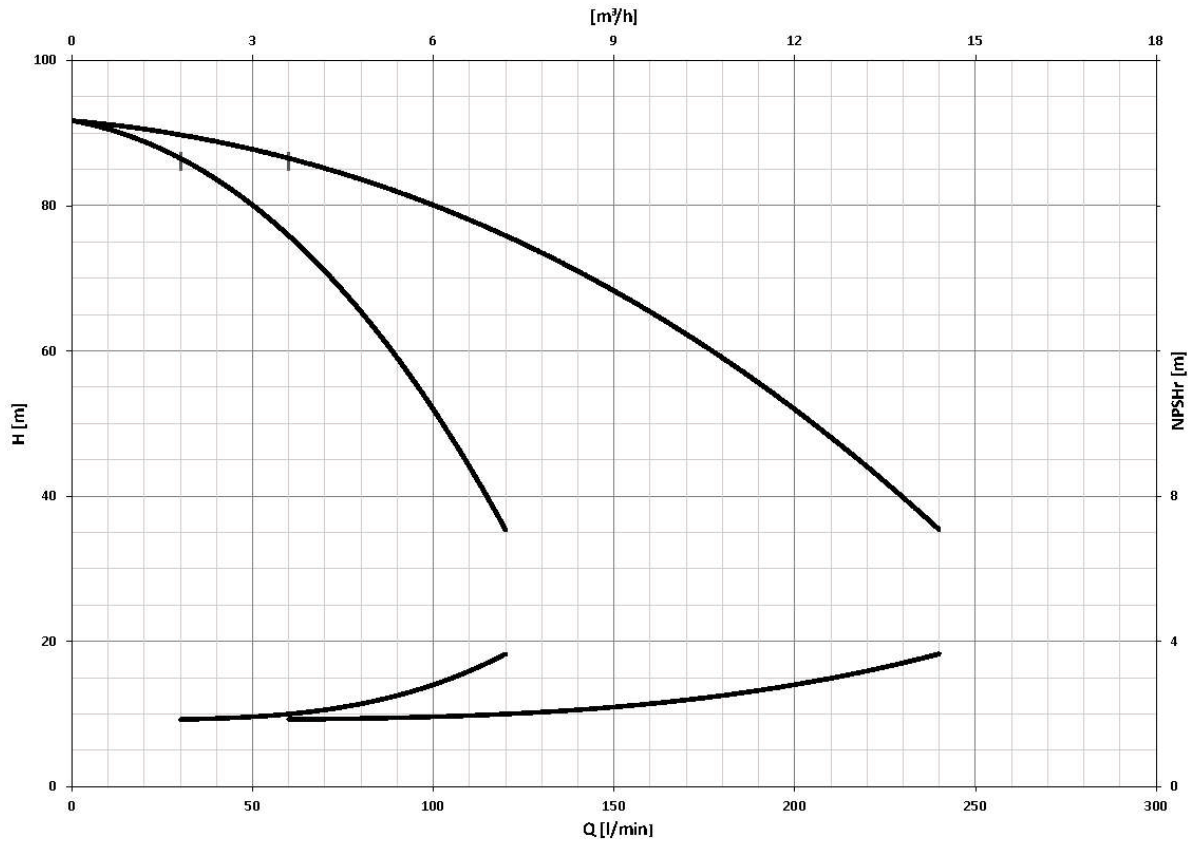


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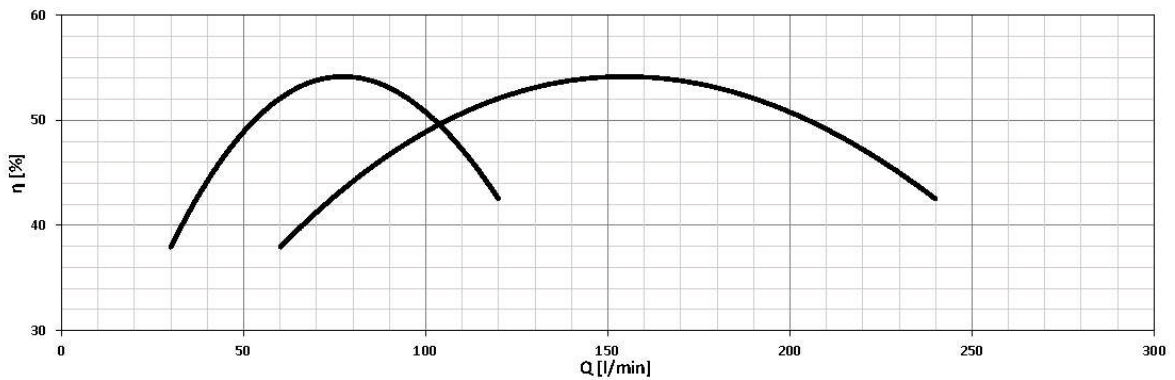
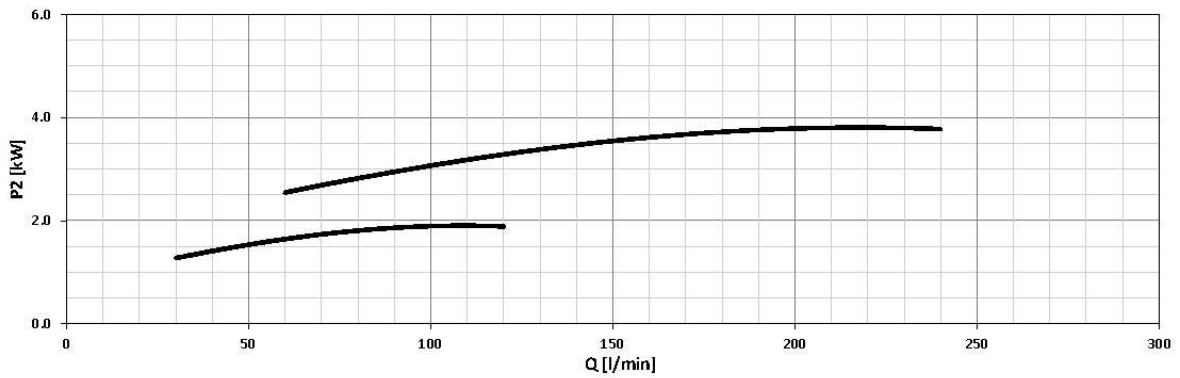
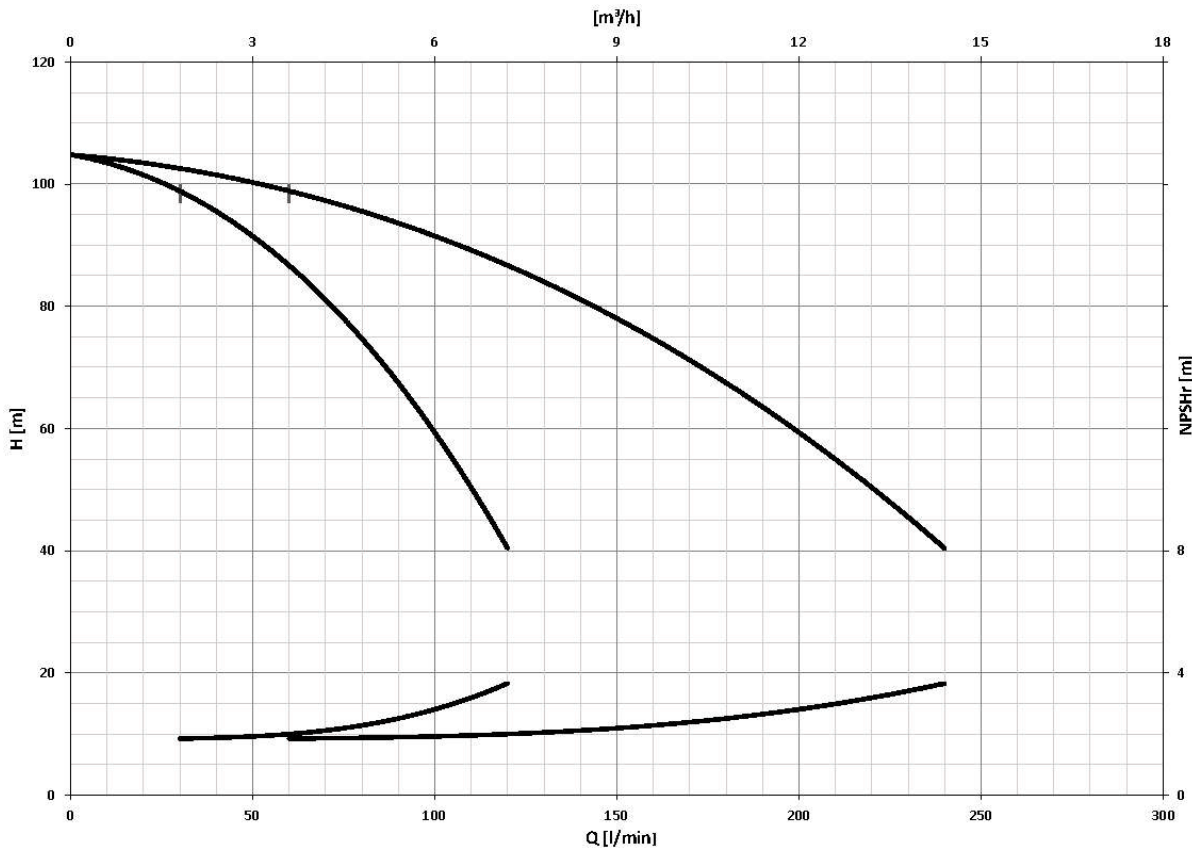
### 2GP(E) CVM B/20(M)



2GP(E) CVM B/23(M)



### 2GP CVM B/25



**50**Hz

PERFORMANCE CURVE

**GP-GPE**

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PERFORMANCE CURVE

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### CURVE SPECIFICATION 3GP(E)

#### MINIMUM EFFICIENCY INDEX (MEI)

The specifications below qualify the curves shown on the following pages.

Tolerances according to ISO 9906 Annex A

The curves refer to effective speed of asynchronous motors at 50 Hz

Measurements were carried out with clean water at 20°C of temperature and with a kinematic viscosity of  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt)

The NPSH curve is an average curve obtained in the same conditions of performance curves.

The continuous curves indicate the recommended working range. The dotted curve is only a guide.

In order to avoid the risk of over-heating, the pumps should not be used at a flow rate below 10% of best efficiency point.

Symbols explanation:

Q = volume flow rate

H = total head

P2 = pump power input (shaft power)

$\eta$  = pump efficiency

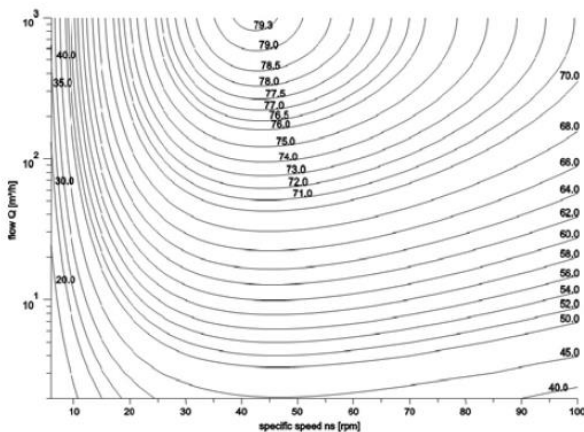
NPSH = net positive suction head required by the pump

MEI = minimum efficiency index

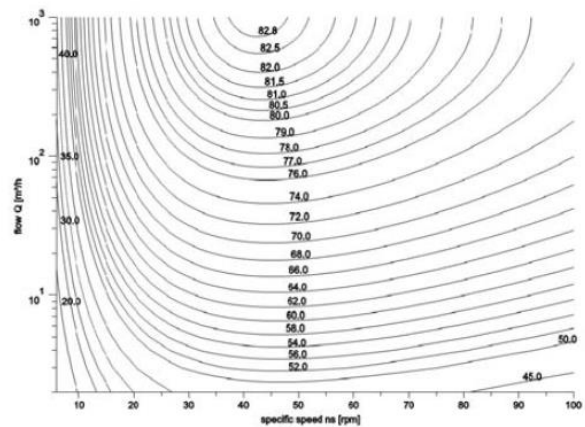
The minimum efficiency index (MEI) is a measure of the quality of a pump size respect to its mean efficiency.

The minimum efficiency index is based on the hydraulic efficiency and on the head at the best efficiency point.

MEI = 0.4 for Multistage Vertical 2900rpm



MEI=0.7 for Mutistage Vertical 2900 rpm



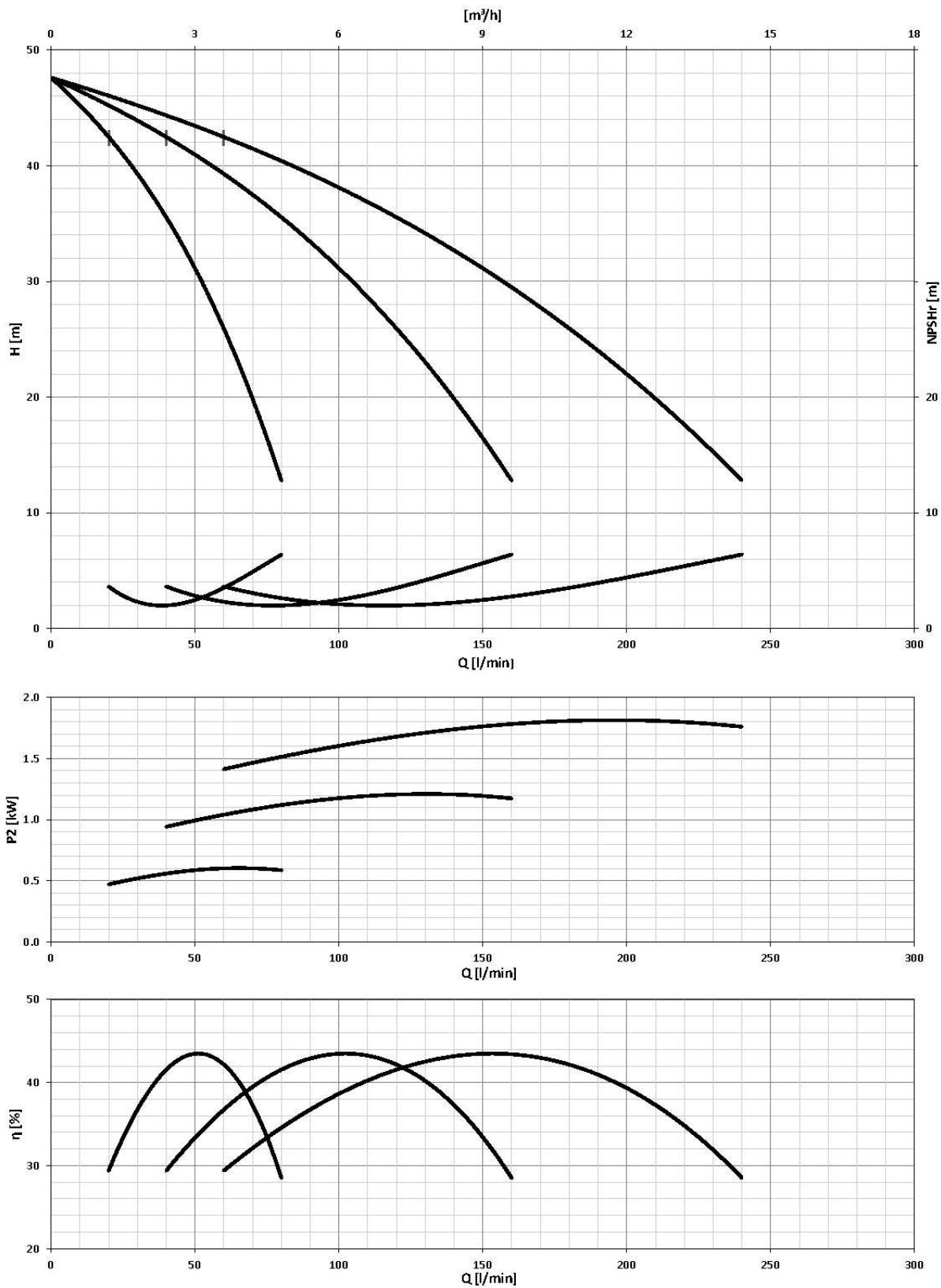
## SELECTION CHART 3GP(E) CVM A-B

Model	Supply		Motor		Maximum working pressure (MPa)	Q=Capacity									
	Single phase	Three phase	kW	HP		l/min	60	90	120	150	180	240	300	360	
						m <sup>3</sup> /h	0	3.6	5.4	7.2	9.0	10.8	14.4	18.0	21.6
						H=Total manometric head in meters									
3GP CVMA/8	-	•	0.6+0.6+0.6	0.8+0.8+0.8	1.0	47.5	42.5	39.4	35.6	31.1	25.9	12.8	-	-	
3GP CVMA/10	-	•	0.75+0.75+0.75	1+1+1		62.5	57.5	54.0	49.5	43.5	36.6	19.5	-	-	
3GP CVMA/12	-	•	0.9+0.9+0.9	1.2+1.2+1.2		75.0	69.0	65.0	59.5	52.5	44.0	23.4	-	-	
3GP(E) CVMA/15	-	•	1.1+1.1+1.1	1.5+1.5+1.5		87.5	80.5	75.5	69.5	61.0	51.0	27.3	-	-	
3GP(E) CVMA/18	-	•	1.3+1.3+1.3	1.8+1.8+1.8		103.0	94.5	88.0	80.0	70.0	58.5	28.8	-	-	
3GP CVMB/10	-	•	0.75+0.75+0.75	1+1+1		38.1	-	36.2	35.1	33.7	32.0	27.5	21.6	14.7	
3GP CVMB/12	-	•	0.9+0.9+0.9	1.2+1.2+1.2		51.0	-	48.0	46.8	45.0	42.6	36.6	28.8	19.6	
3GP CVMB/15	-	•	1.1+1.1+1.1	1.5+1.5+1.5		63.5	-	60.5	58.5	56.2	53.3	45.8	36.0	24.5	
3GP(E) CVMB/20	-	•	1.5+1.5+1.5	2+2+2		78.5	-	74.0	72.0	69.0	65.5	56.0	44.5	30.6	
3GP(E) CVMB/23	-	•	1.7+1.7+1.7	2.3+2.3+2.3		91.5	-	86.0	84.0	80.5	76.5	65.5	51.5	35.7	
3GP CVMB/25	-	•	1.85+1.85+1.85	2.5+2.5+2.5		105.0	-	98.5	96.0	92.0	87.0	74.5	59.0	41.0	

• : Standard    ○ : On request

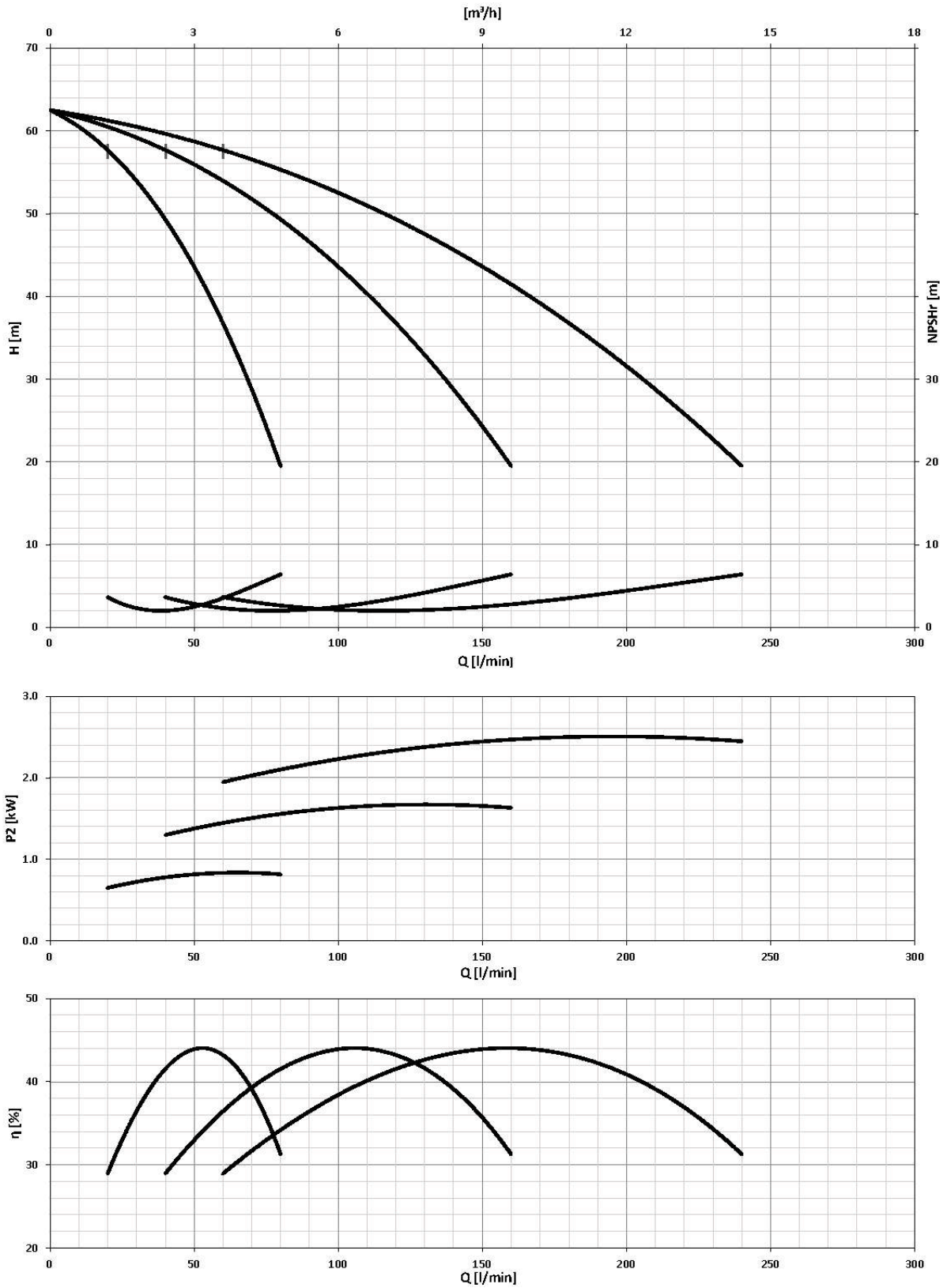


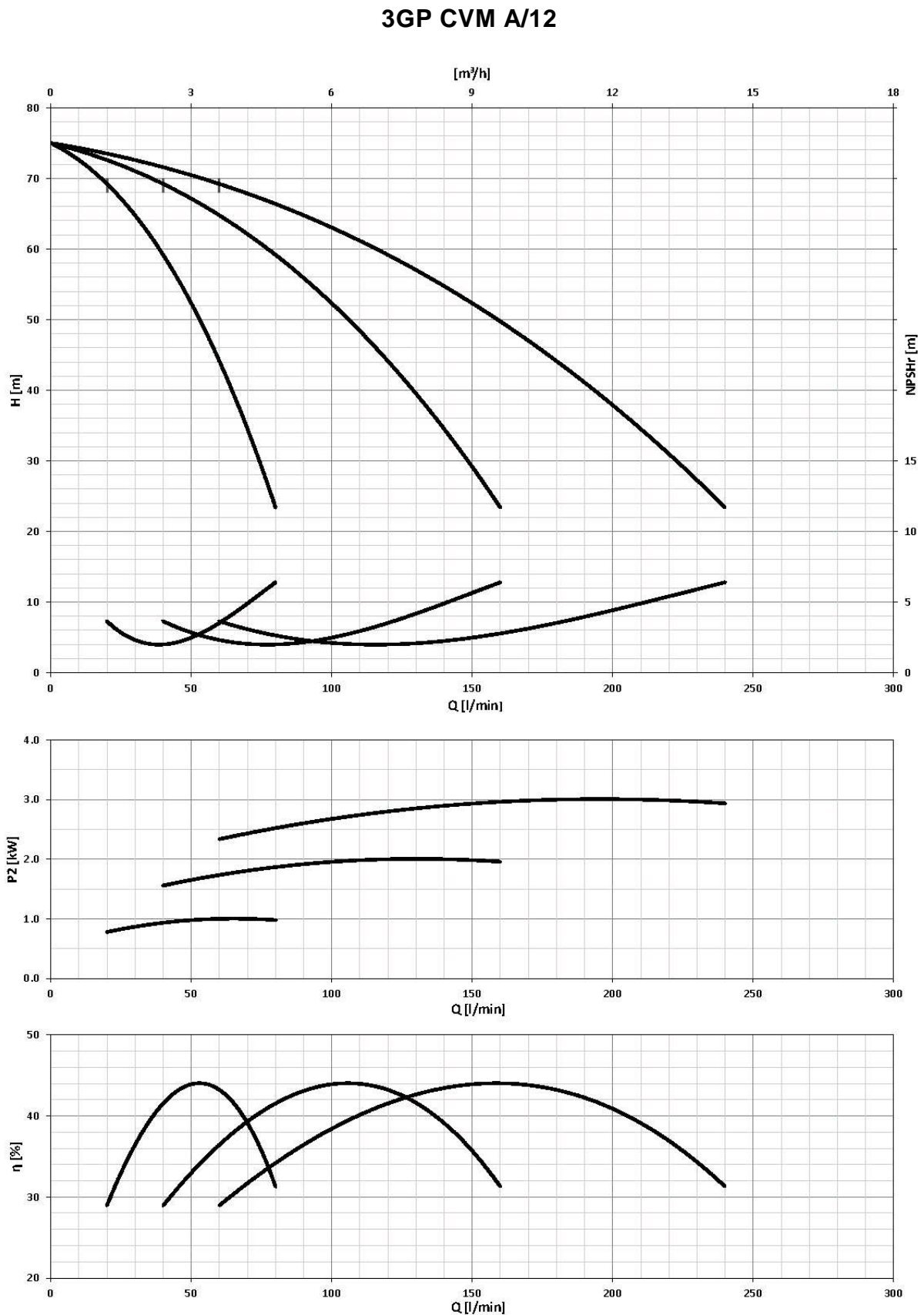
### PERFORMANCE CURVE 3GP(E) 3GP CVM A/8



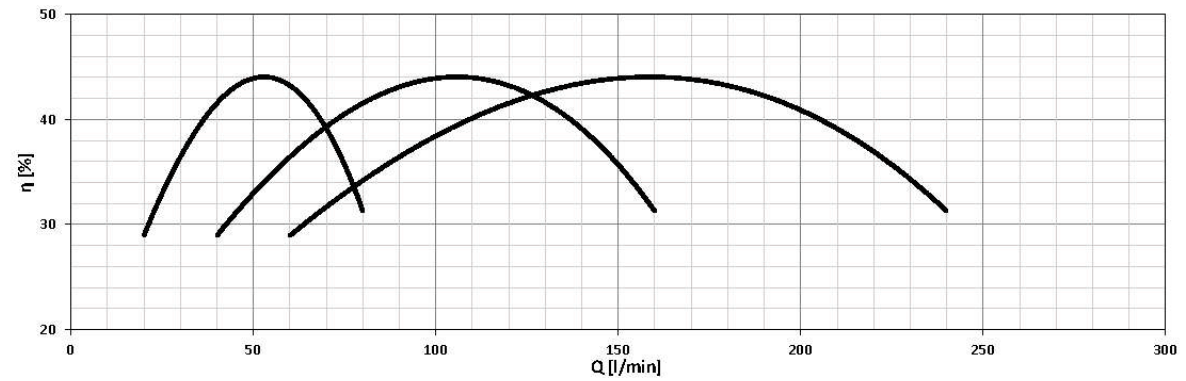
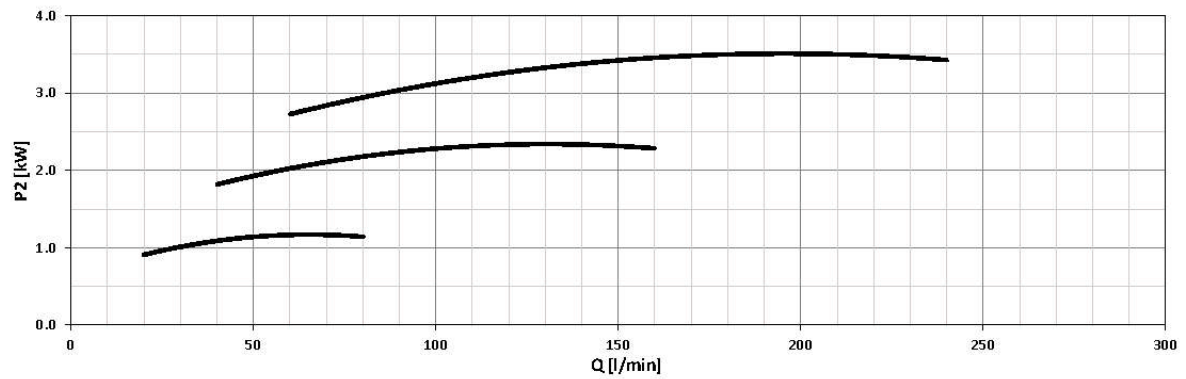
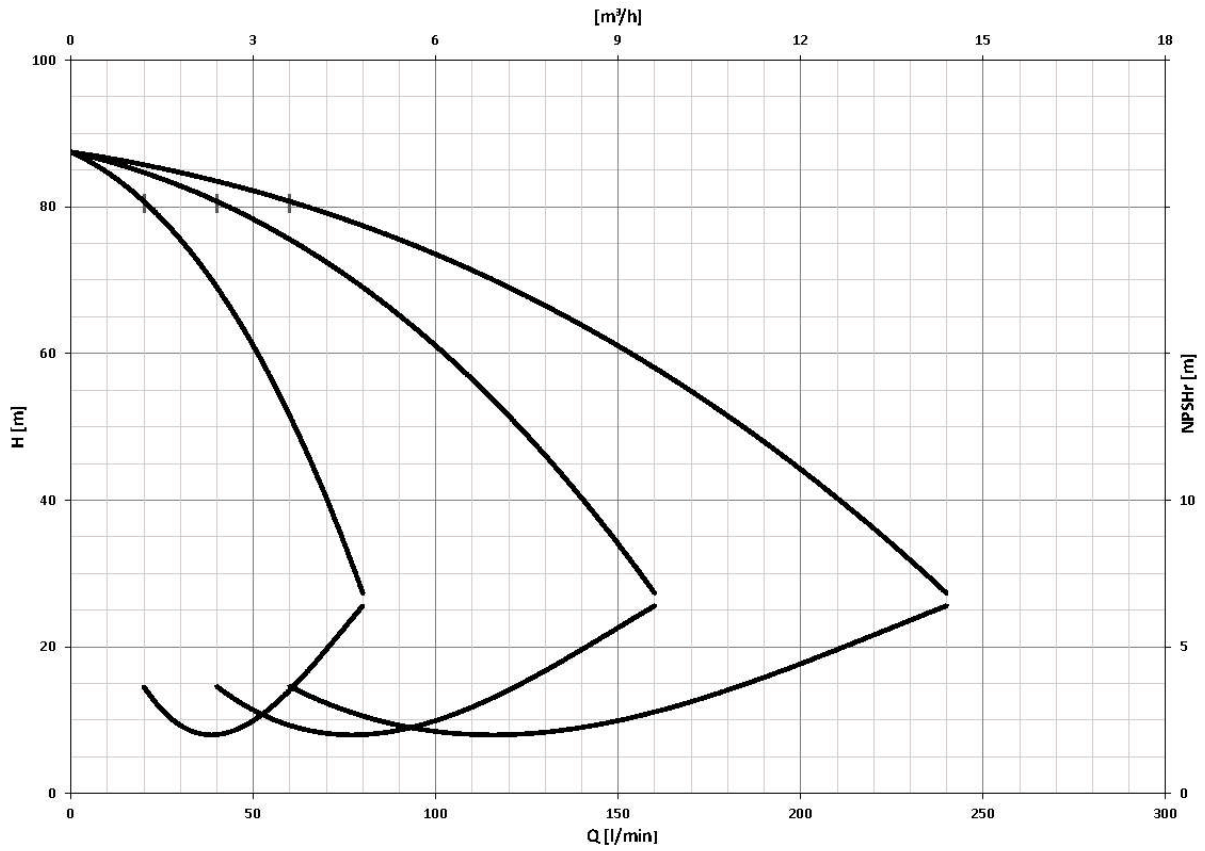
417

3GP CVM A/10

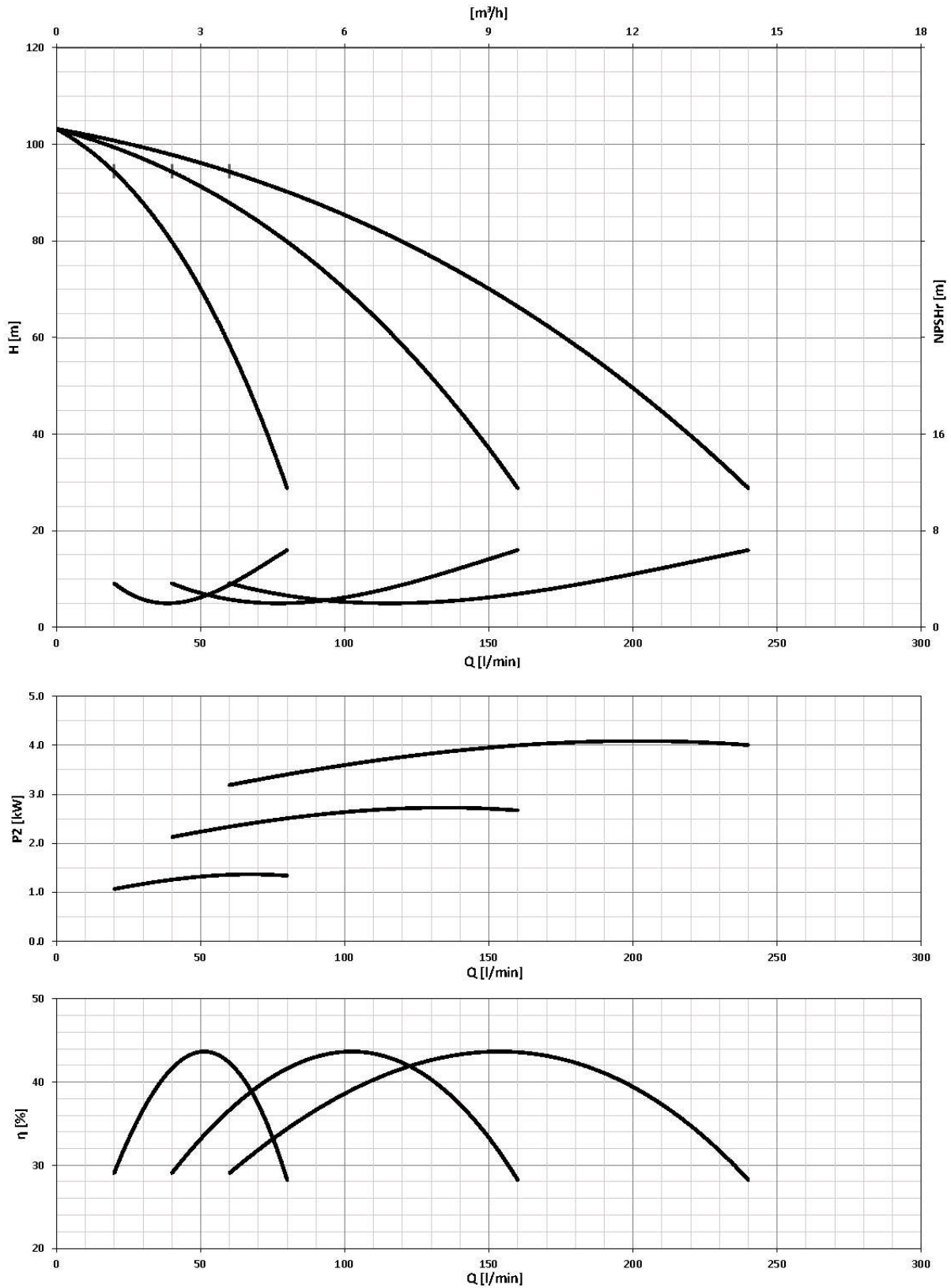




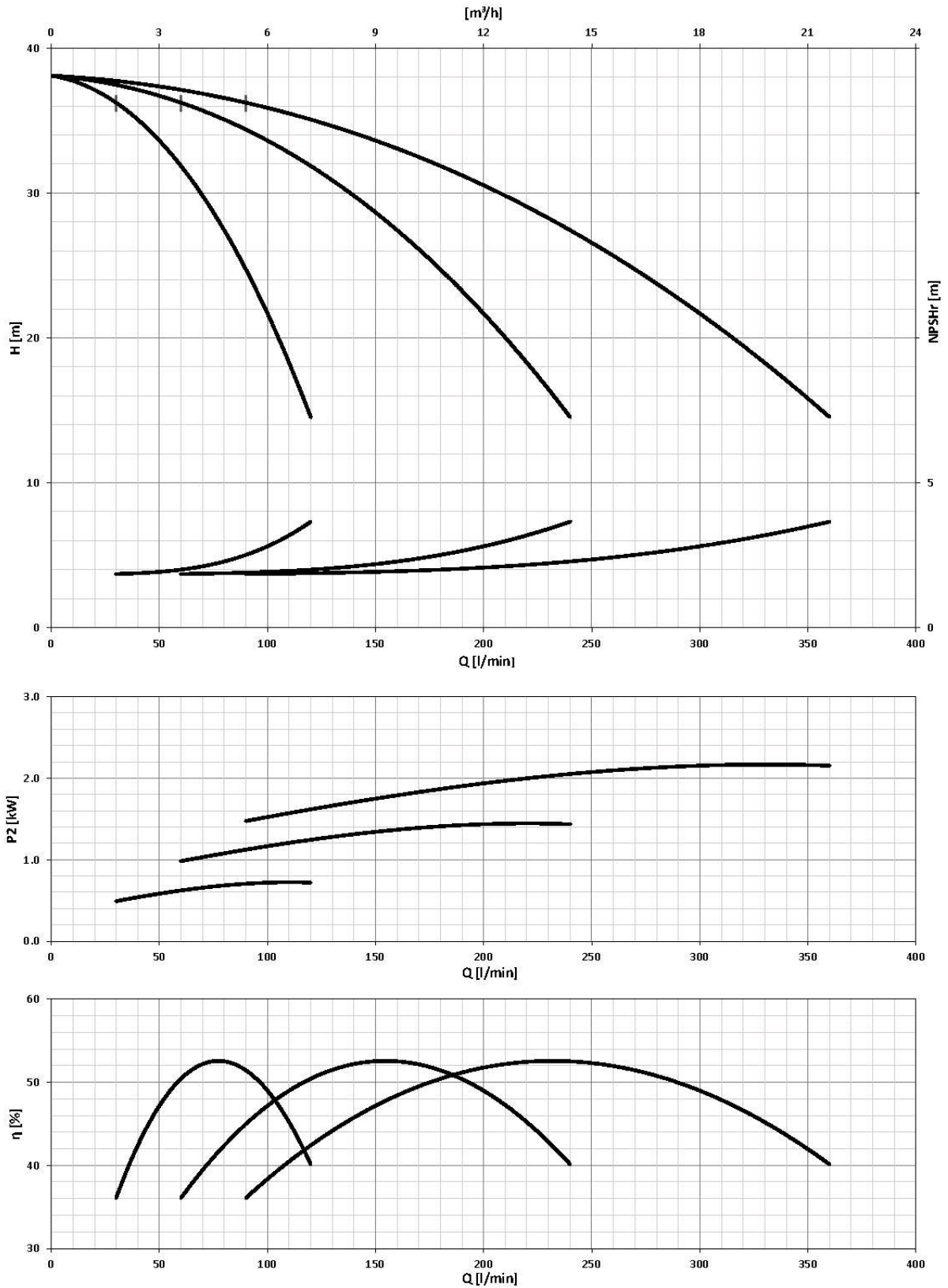
3GP(E) CVM A/15

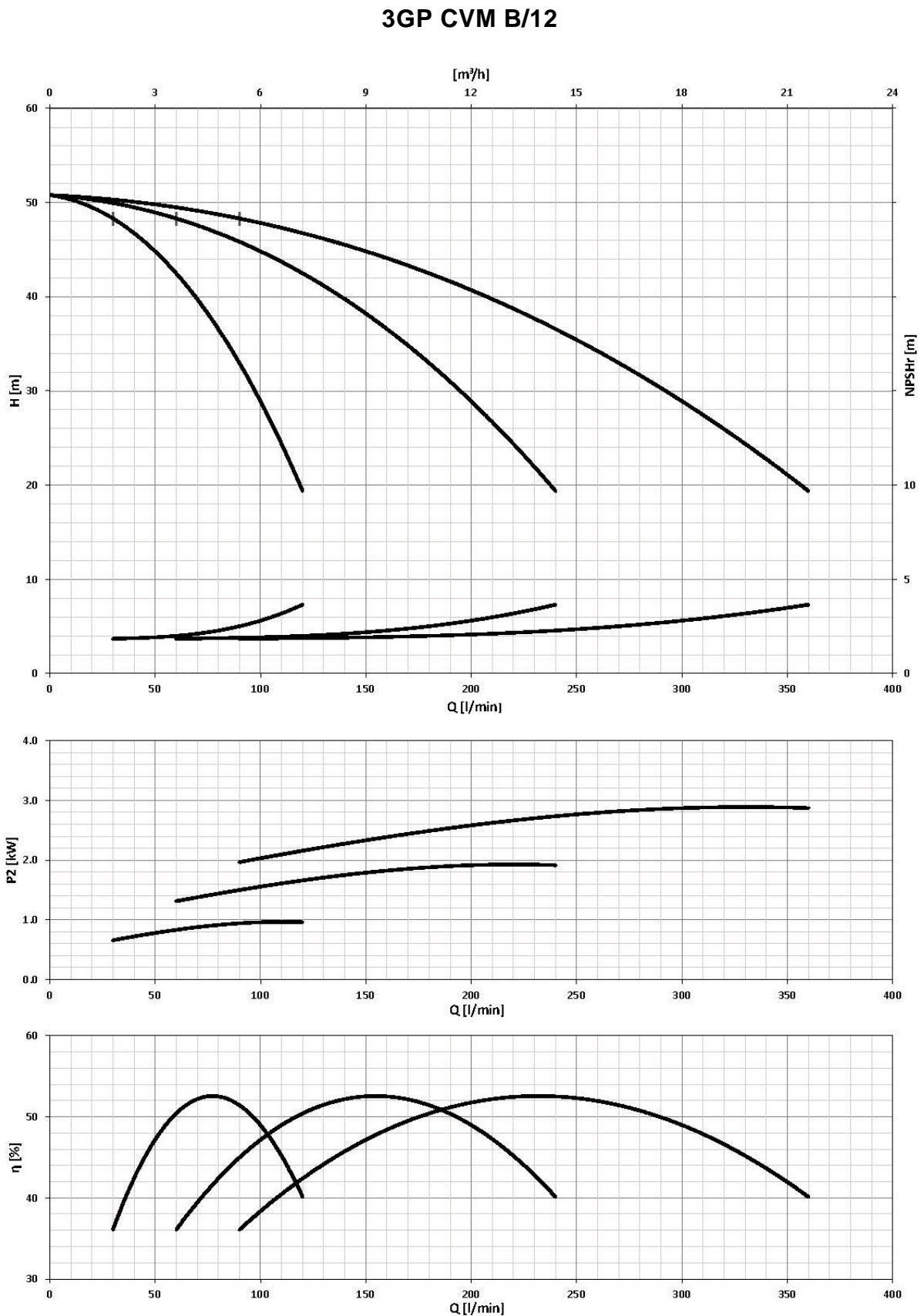


### 3GP(E) CVM A/18

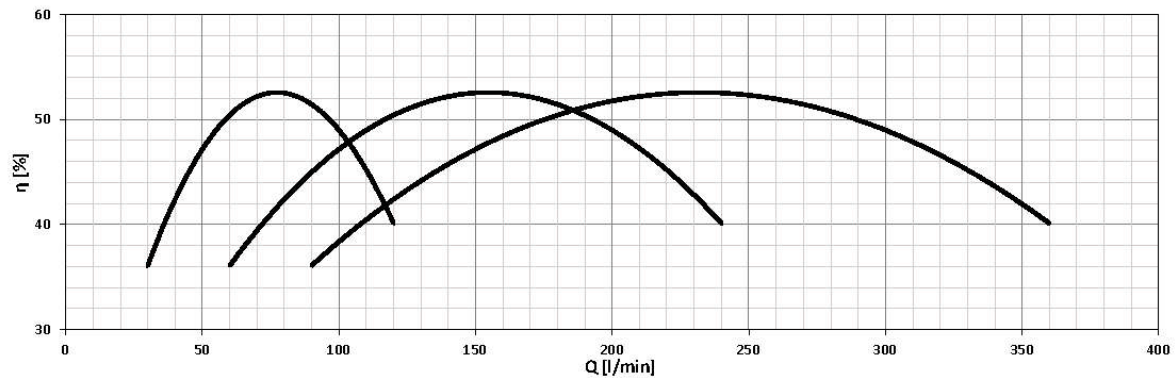
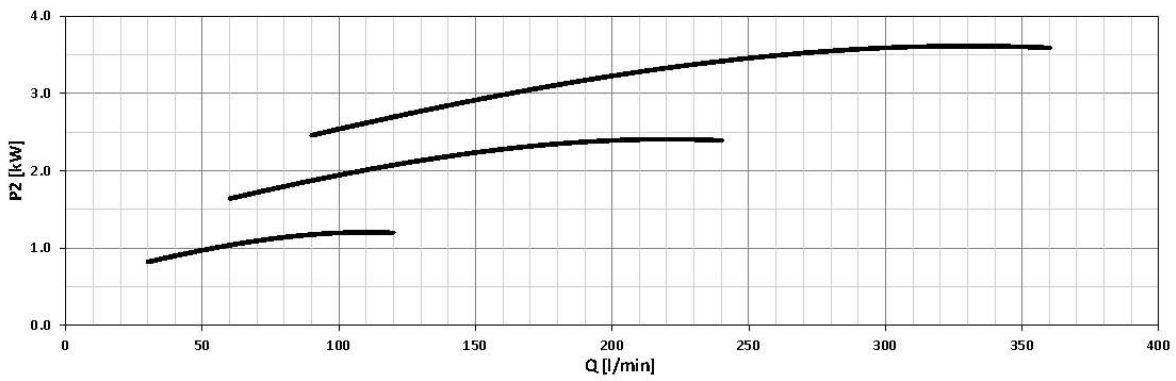
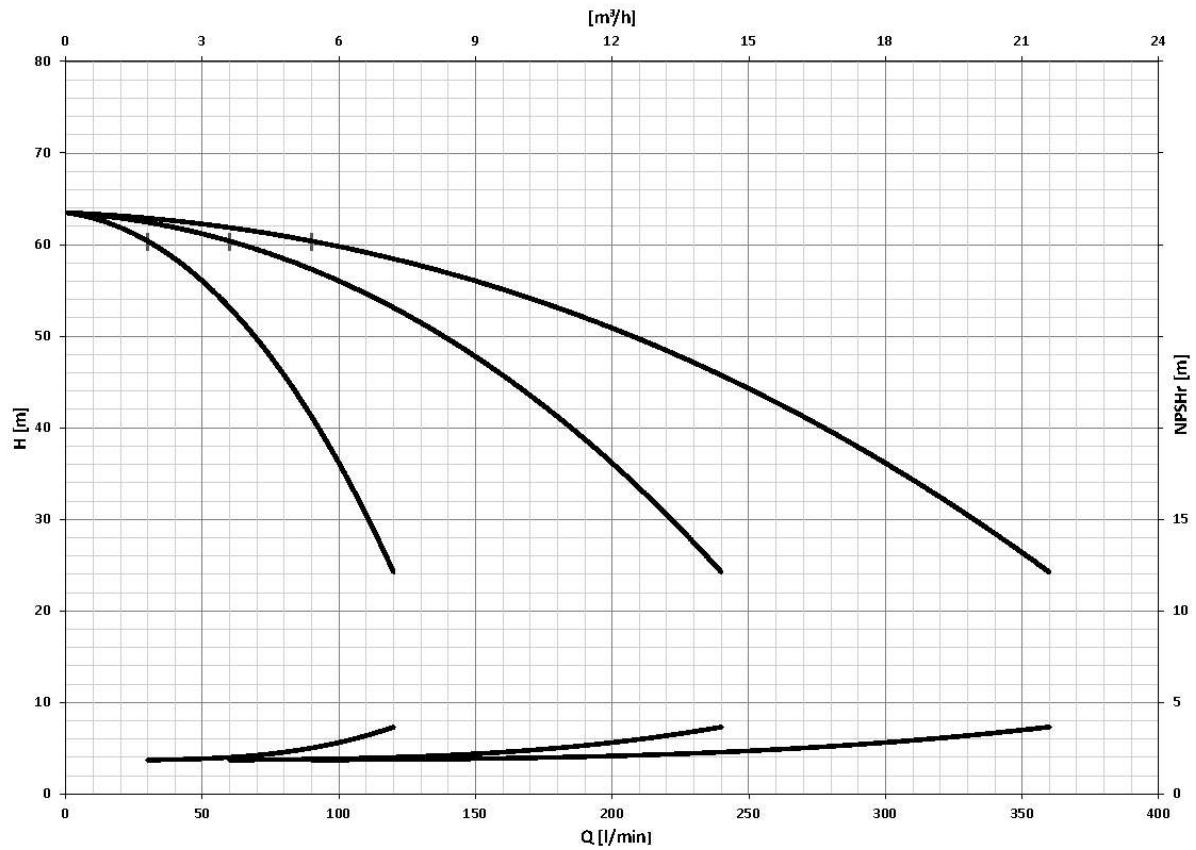


3GP CVM B/10



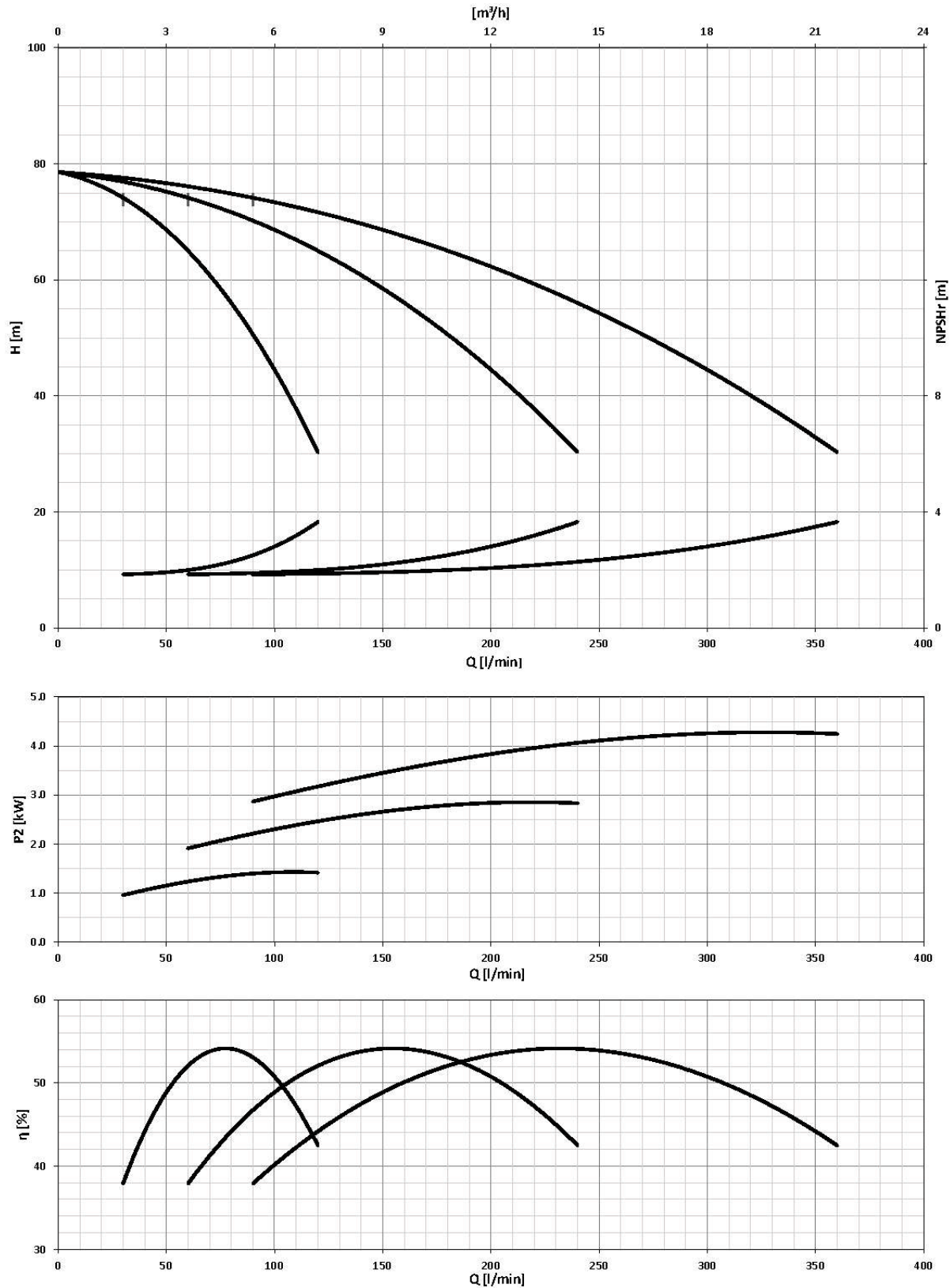


3GP CVM B/15

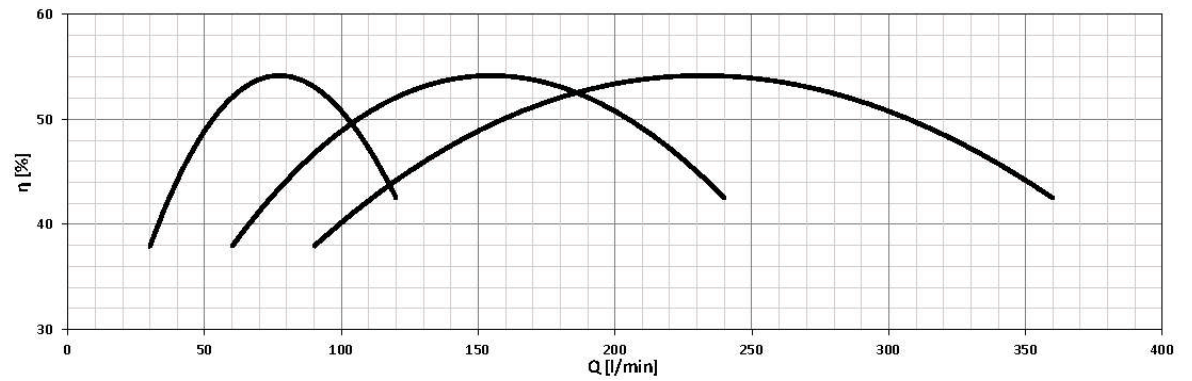
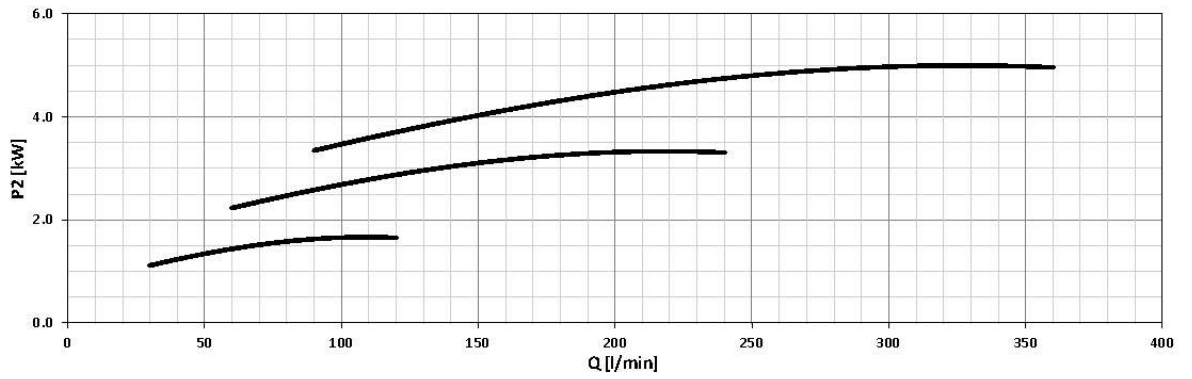
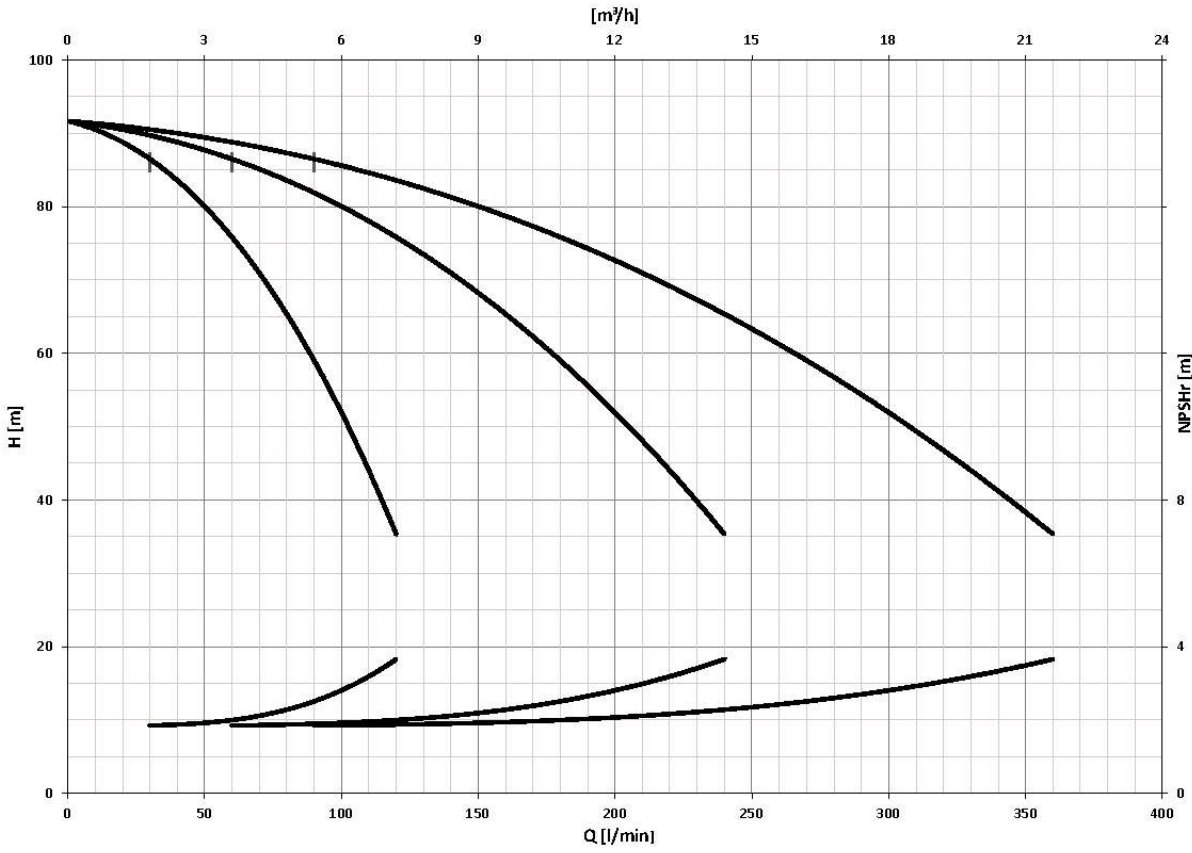




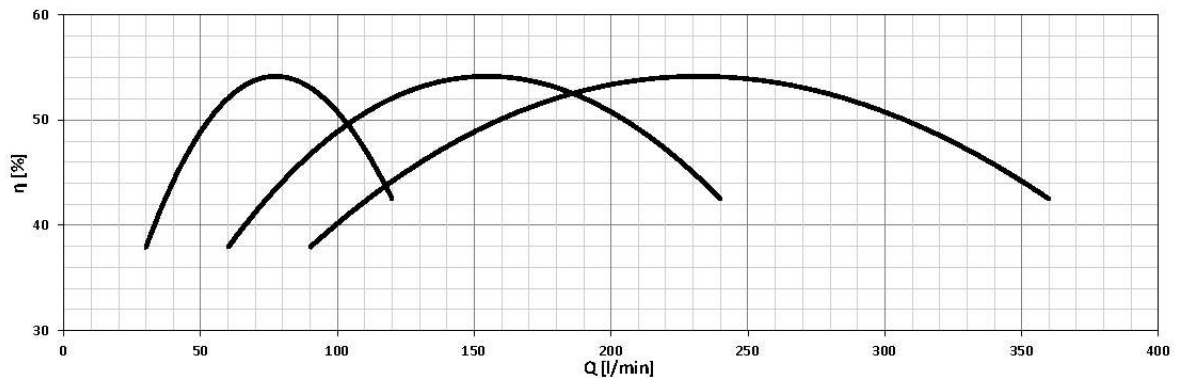
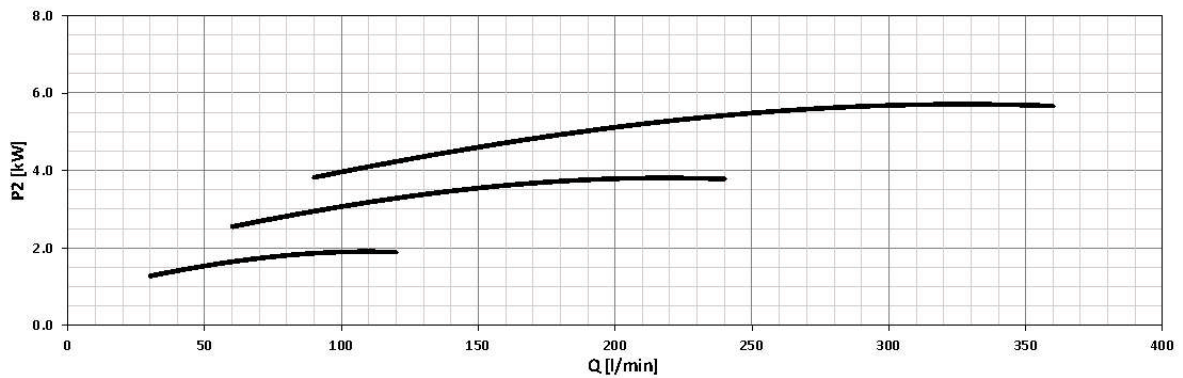
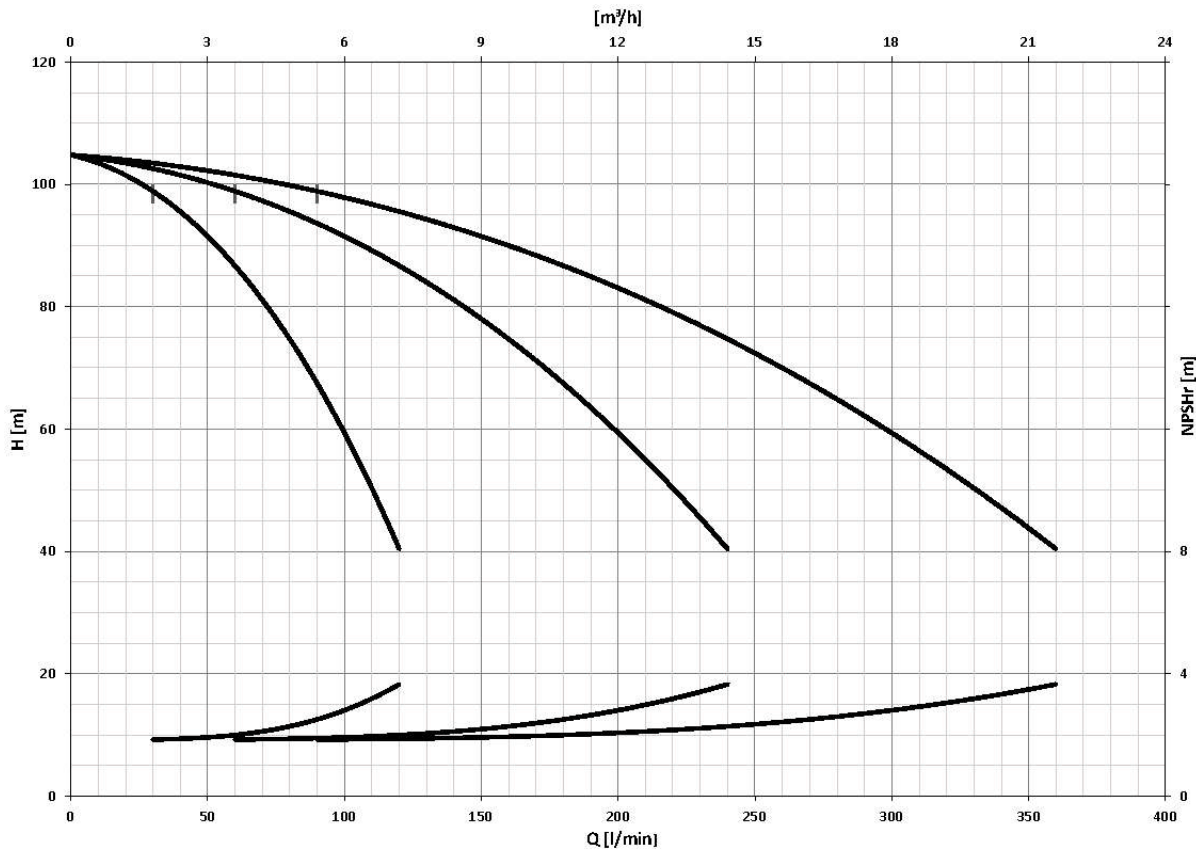
### 3GP(E) CVM B/20



3GP(E) CVM B/23



### 3GP CVM B/25



**50**Hz

PERFORMANCE CURVE

**GP-GPE**

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PERFORMANCE CURVE

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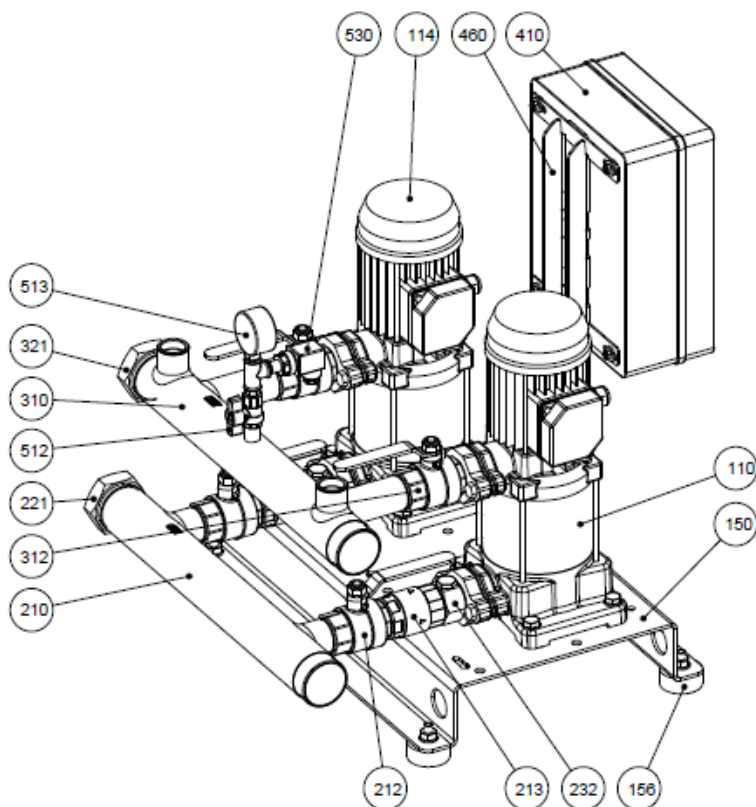
**428**

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### 2GP CONSTRUCTION EXTERNAL VIEW 2GP CVM

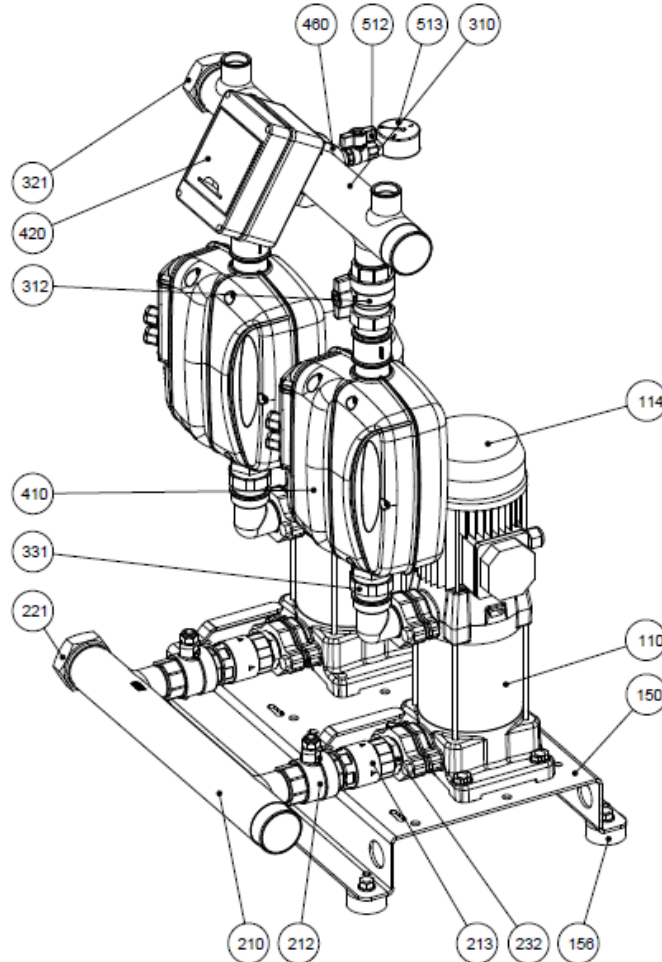


N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	2
114	Electric motor	-	2
150	Basement	Galvanized steel	1
156	Basement foot	SBR	4
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	2
213	Check valve	Brass / NBR	2
221	Threaded female cap	Galvanized steel	1
232	Nipple for air feeders	Yellow brass	2
310	Discharge manifold	AISI 304	1
312	Ball valve	CW617N / CW614N	2
321	Threaded female cap	Galvanized steel	1
410	Control panel	-	1
460	Control panel frame	Galvanized steel	1
512	Ball valve	CW617N / CW614N	1
513	Pressure gauge	Copper alloy / plastic	1
520	Pressure transmitter	-	1

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## 2GPE CONSTRUCTION

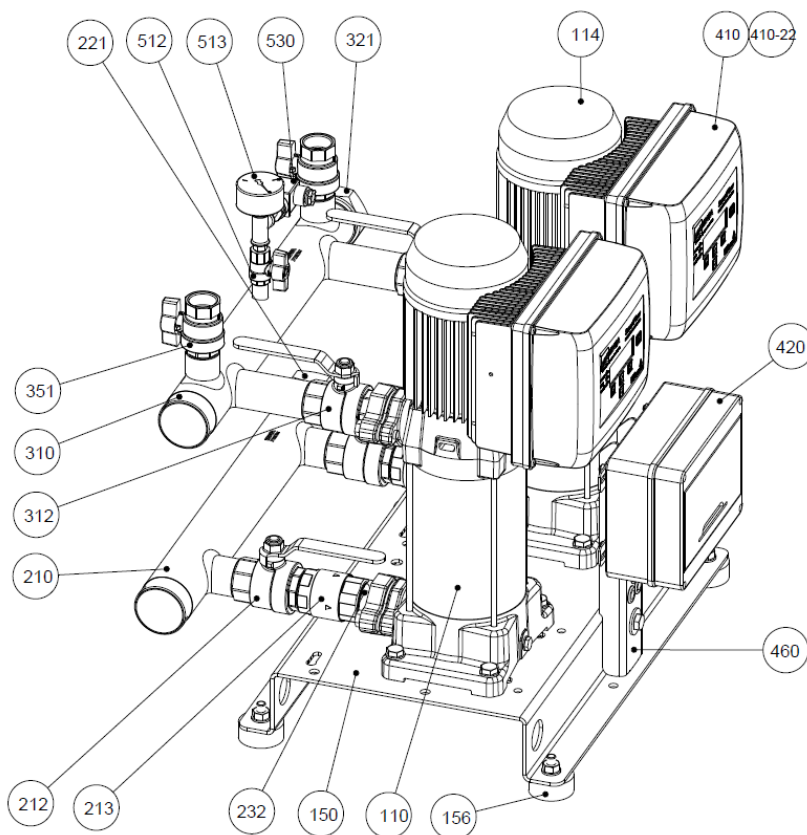
## EXTERNAL VIEW 2GPE CVM E-POWER



N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	2
114	Electric motor	-	2
150	Basement	Galvanized steel	1
156	Basement foot	SBR	4
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	2
213	Check valve	Brass / NBR	2
221	Threaded female cap	Galvanized steel	1
232	Nipple	Yellow brass	2
310	Discharge manifold	AISI 304	1
312	Union ball valve	CW617N / CW614N	2
321	Threaded female cap	Galvanized steel	1
331	Union 3pcs.	Yellow brass	2
410	E-power	-	2
420	Protection panel	-	1
512	Ball valve	CW617N / CW614N	1
513	Pressure gauge	Copper alloy / plastic	1

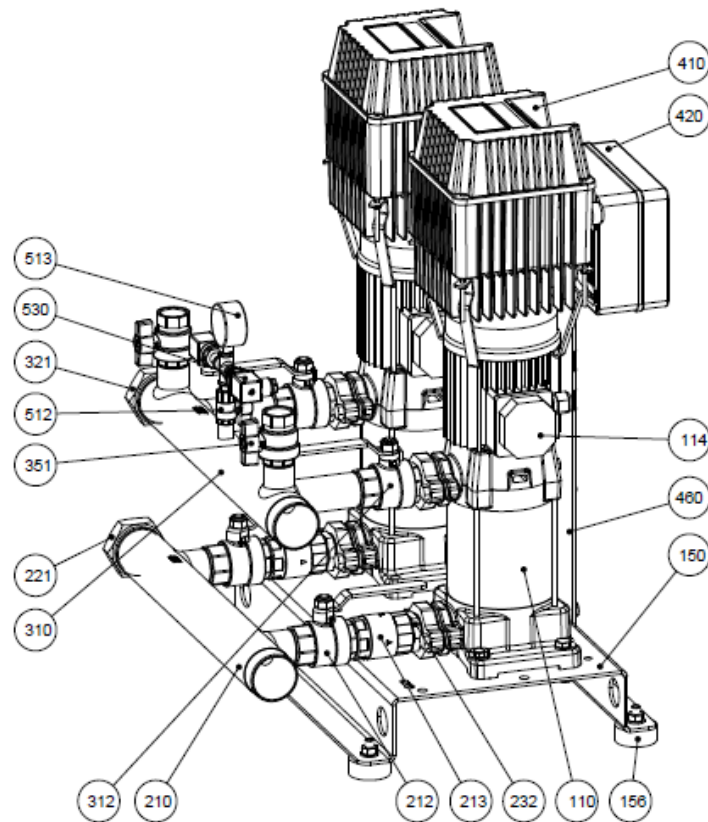
602

### EXTERNAL VIEW 2GPE CVM E-SPD



N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	2
114	Electric motor	-	2
150	Basement	Galvanized steel	1
156	Basement foot	SBR	4
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	2
213	Check valve	Brass / NBR	2
221	Threaded female cap	Galvanized steel	1
232	Nipple	Yellow brass	2
310	Discharge manifold	AISI 304	1
312	Ball valve	CW617N / CW614N	2
321	Threaded female cap	Galvanized steel	1
351	Ball valve	CW617N / CW614N	2
410	E-SPD	-	2
410-22	E-SPD adaptor	-	2
420	Protection panel	-	1
460	Protection panel frame	Galvanized steel	1
512	Ball valve	CW617N / CW614N	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	1

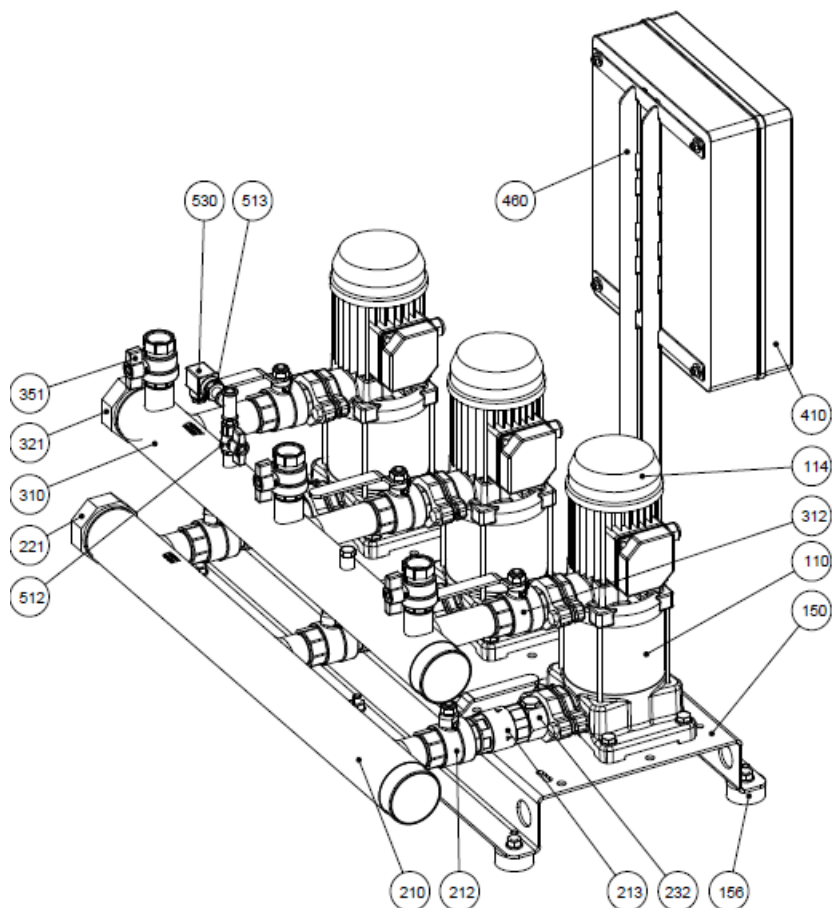
## EXTERNAL VIEW 2GPE CVM E-DRIVE



N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	2
114	Electric motor	-	2
150	Basement	Galvanized steel	1
156	Basement foot	SBR	4
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	2
213	Check valve	Brass / NBR	2
221	Threaded female cap	Galvanized steel	1
232	Nipple	Yellow brass	2
310	Discharge manifold	AISI 304	1
312	Ball valve	CW617N / CW614N	2
321	Threaded female cap	Galvanized steel	1
351	Ball valve	CW617N / CW614N	2
410	E-Drive	-	2
420	Protection panel	-	1
460	Protection panel frame	Galvanized steel	1
512	Ball valve	CW617N / CW614N	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	2



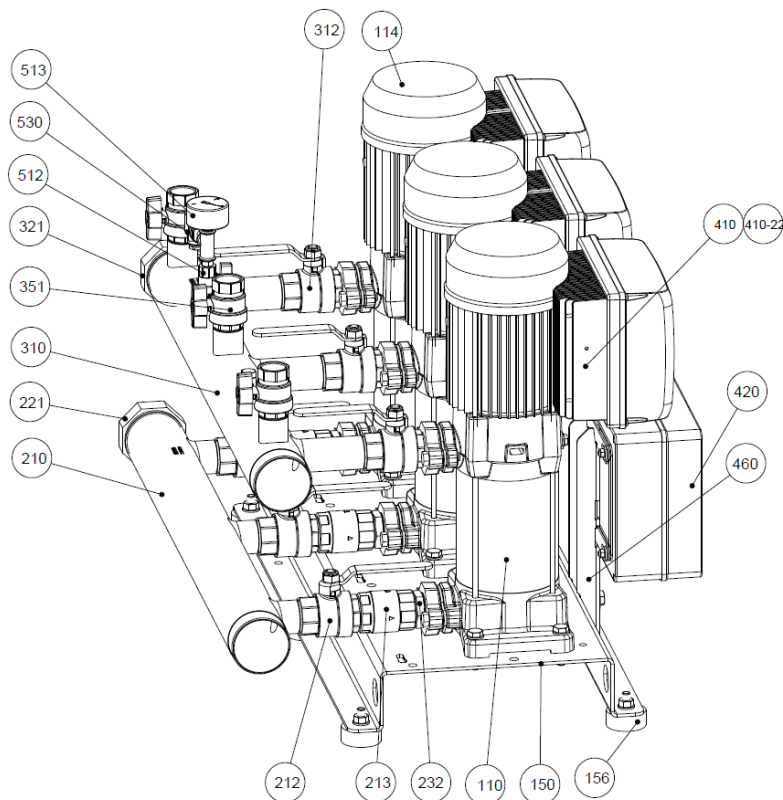
### 3GP CONSTRUCTION EXTERNAL VIEW 3GP CVM



N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	3
114	Electric motor	-	3
150	Basement	Galvanized steel	1
156	Basement foot	SBR	6
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	3
213	Check valve	Brass / NBR	3
221	Threaded female cap	Galvanized steel	1
232	Nipple for air feeders	Yellow brass	3
310	Discharge manifold	AISI 304	1
312	Ball valve	CW617N / CW614N	3
321	Threaded female cap	Galvanized steel	1
351	Ball valve	CW617N / CW614N	3
410	Control panel	-	1
460	Control panel frame	Galvanized steel	1
512	Ball valve	CW617N / CW614N	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	1

## 3GPE CONSTRUCTION

## EXTERNAL VIEW 3GPE CVM E-SPD



N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	3
114	Electric motor	-	3
150	Basement	Galvanized steel	1
156	Basement foot	SBR	6
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	3
213	Check valve	Brass / NBR	3
221	Threaded female cap	Galvanized steel	1
232	Nipple	Yellow brass	3
310	Discharge manifold	AISI 304	1
312	Ball valve	CW617N / CW614N	3
321	Threaded female cap	Galvanized steel	1
351	Ball valve	CW617N / CW614N	3
410	E-SPD	-	3
410-22	E-SPD adaptor	-	3
420	Protection panel	-	1
460	Protection panel frame	Galvanized steel	1
512	Ball valve	CW617N / CW614N	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	1

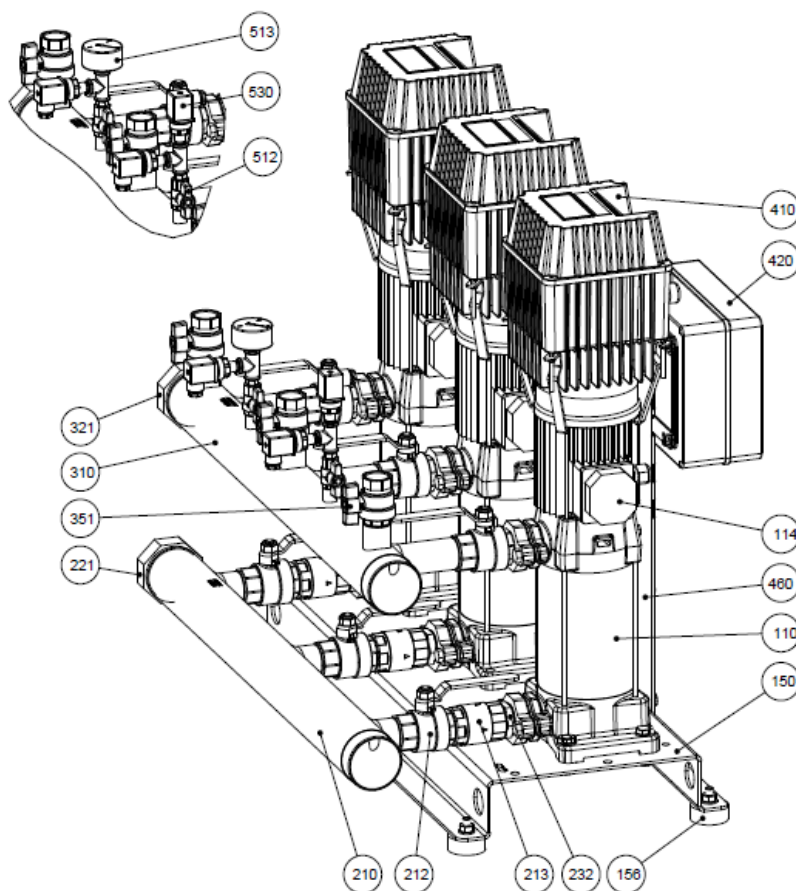
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### EXTERNAL VIEW 3GPE CVM E-DRIVE

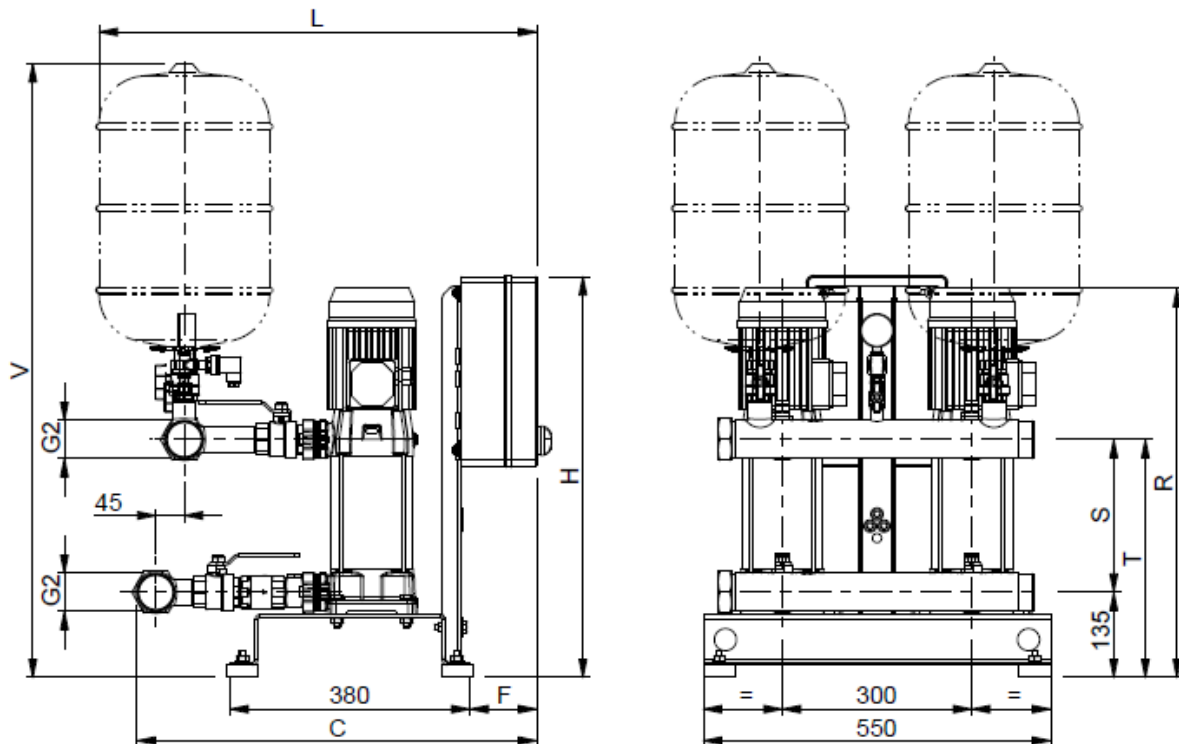


N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	3
114	Electric motor	-	3
150	Basement	Galvanized steel	1
156	Basement foot	SBR	6
210	Suction manifold	AISI 304	1
212	Ball valve	CW617N / CW614N	3
213	Check valve	Brass / NBR	3
221	Threaded female cap	Galvanized steel	1
232	Nipple	Yellow brass	3
310	Discharge manifold	AISI 304	1
321	Threaded female cap	Galvanized steel	1
351	Ball valve	CW617N / CW614N	3
410	E-Drive	-	3
420	Protection panel	-	1
460	Protection panel frame	Galvanized steel	1
512	Ball valve	CW617N / CW614N	2
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	3

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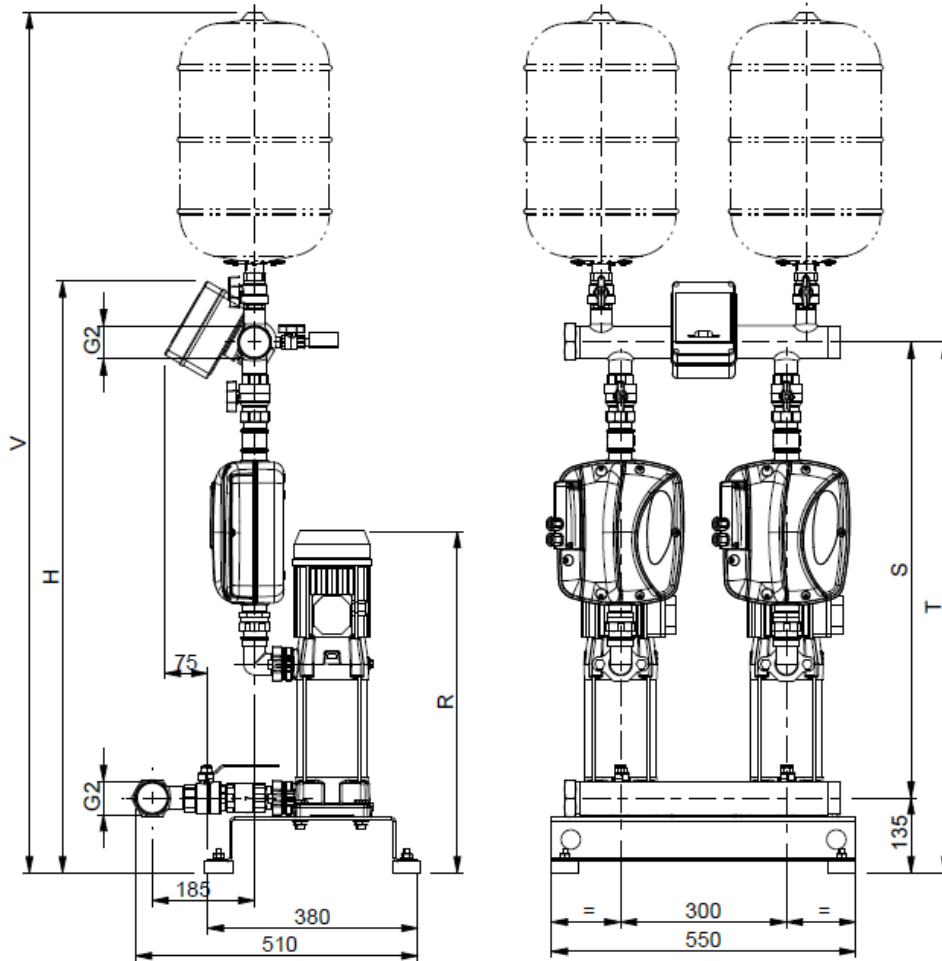
### OVERALL DIMENSIONS 2GP BOOSTER SET

#### 2GP CVM



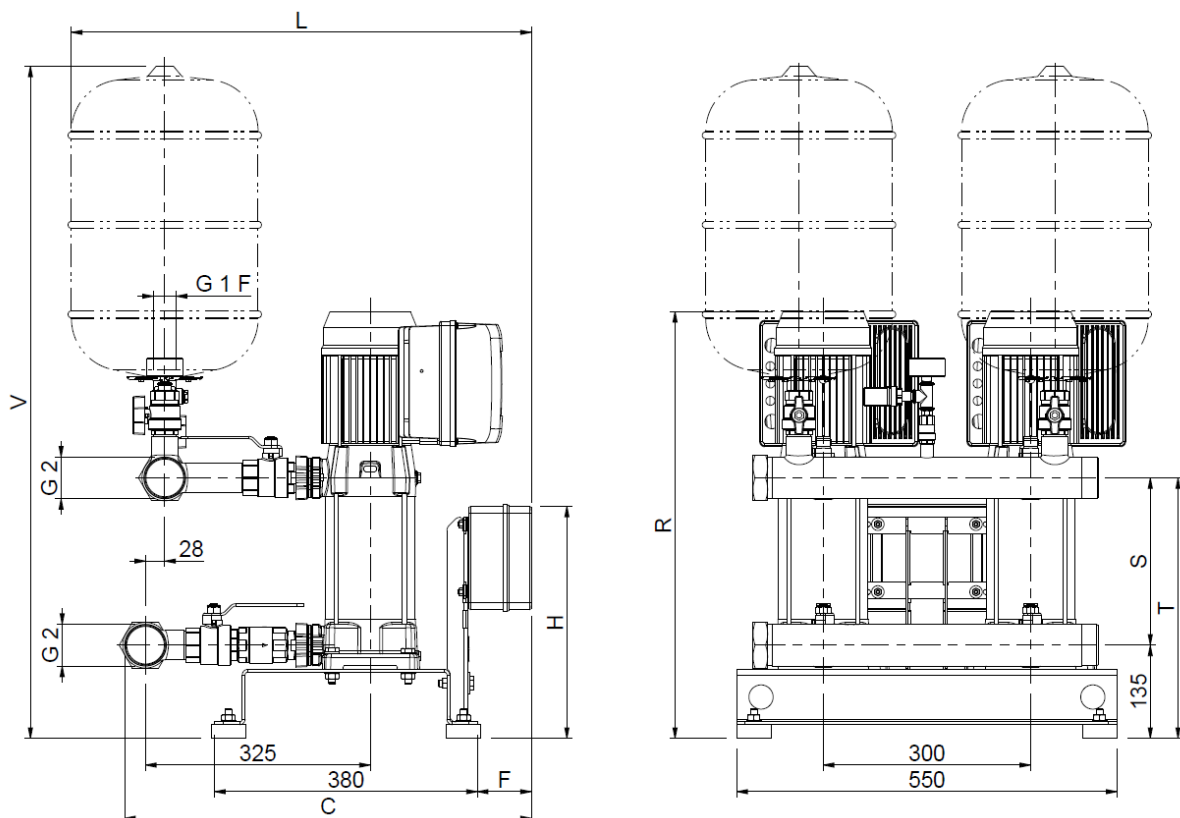
Booster Type	Dimensions [mm]												Weight [kg]		
	1~	3~	1~	3~	1~	3~	1~	3~	1~	3~	S	T	V	1~	3~
	C		F		H		L		R						
2GP CVM A/8(M)	605	635	75	105	630	635	665	695	490	490	165	300	895	62	61
2GP CVM A/10(M)	605	635	75	105	630	635	665	695	550	550	190	325	920	69	69
2GP CVM A/12(M)	605	635	75	105	630	635	665	695	580	590	215	350	945	71	73
2GP CVM A/15(M)	605	635	75	105	630	635	665	695	615	615	240	375	975	73	73
2GP CVM A/18(M)	605	635	75	105	630	635	665	695	665	665	270	405	1000	79	82
2GP CVM B/10(M)	605	635	75	105	630	635	665	695	500	500	140	275	870	68	68
2GP CVM B/12(M)	605	635	75	105	630	635	665	695	525	540	165	300	895	70	71
2GP CVM B/15(M)	605	635	75	105	630	635	665	695	565	565	190	325	920	72	72
2GP CVM B/20(M)	605	635	75	105	630	635	665	695	615	625	215	350	945	79	84
2GP CVM B/23(M)	605	635	75	105	630	915	665	695	650	650	240	375	975	81	85
2GP CVM B/25	-	635	-	105	-	915	-	695	-	680	270	405	1000	-	85

OVERALL DIMENSIONS 2GPE BOOSTER SET  
2GPE CVM E-POWER



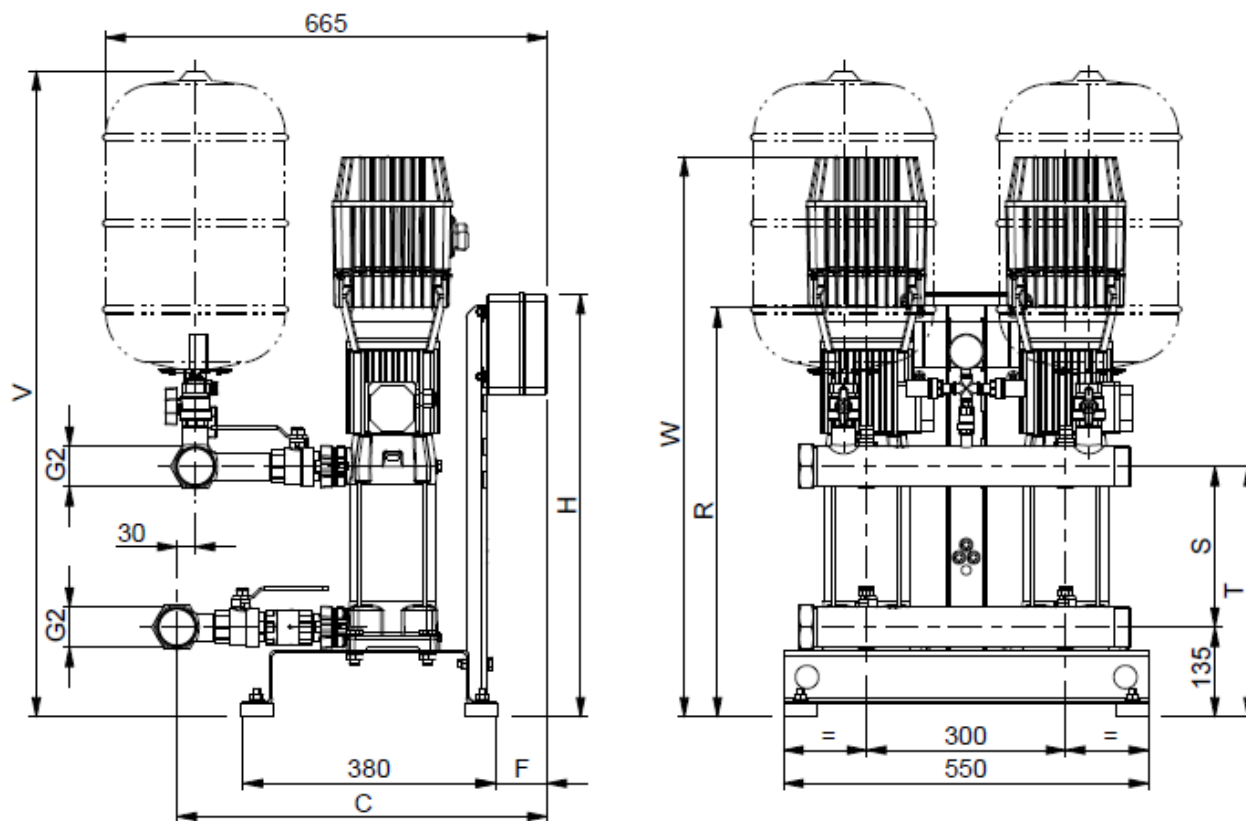
Booster Type	Dimensions [mm]					Weight [kg]
	H	S	T	R	V	
2GPE CVM A/8 EPW	990	745	880	490	1470	63
2GPE CVM A/10 EPW	1015	770	905	550	1495	71
2GPE CVM A/12 EPW	1040	795	930	590	1520	74
2GPE CVM A/15 EPW	1070	825	960	615	1550	75
2GPE CVM B/10 EPW	965	720	855	500	1445	69
2GPE CVM B/12 EPW	990	745	880	540	1470	72
2GPE CVM B/15 EPW	1015	770	905	565	1495	73
2GPE CVM B/20 EPW	1040	795	930	625	1520	85

### 2GPE CVM E-SPD



Booster Type	Dimensions [mm]												Weight	
	ESPM	ESPT	ESPM	ESPT	ESPM	ESPT	ESPM	ESPT	R	S	T	V	1~	3~
	C		F		H		L							
2GPE CVM A/10 ESPT(ESPM)	586	588	76	78	331	336	663	665	554	190	325	921	61	61
2GPE CVM A/12 ESPT(ESPM)	586	588	76	78	331	336	663	665	592	216	351	947	65	65
2GPE CVM A/15 ESPT(ESPM)	586	588	76	78	331	336	663	665	618	242	377	973	65	65
2GPE CVM B/12 ESPM	586	-	76	-	331	-	663	-	540	164	299	895	63	-
2GPE CVM B/15 ESPT(ESPM)	586	588	76	78	331	336	663	665	566	190	325	921	64	64
2GPE CVM B/20 ESPT(ESPM)	586	588	76	78	331	336	663	665	626	216	351	947	75	75
2GPE CVM B/23 ESPT	-	588	-	78	-	336	-	665	652	242	377	973	-	77

2GPE CVM E-DRIVE



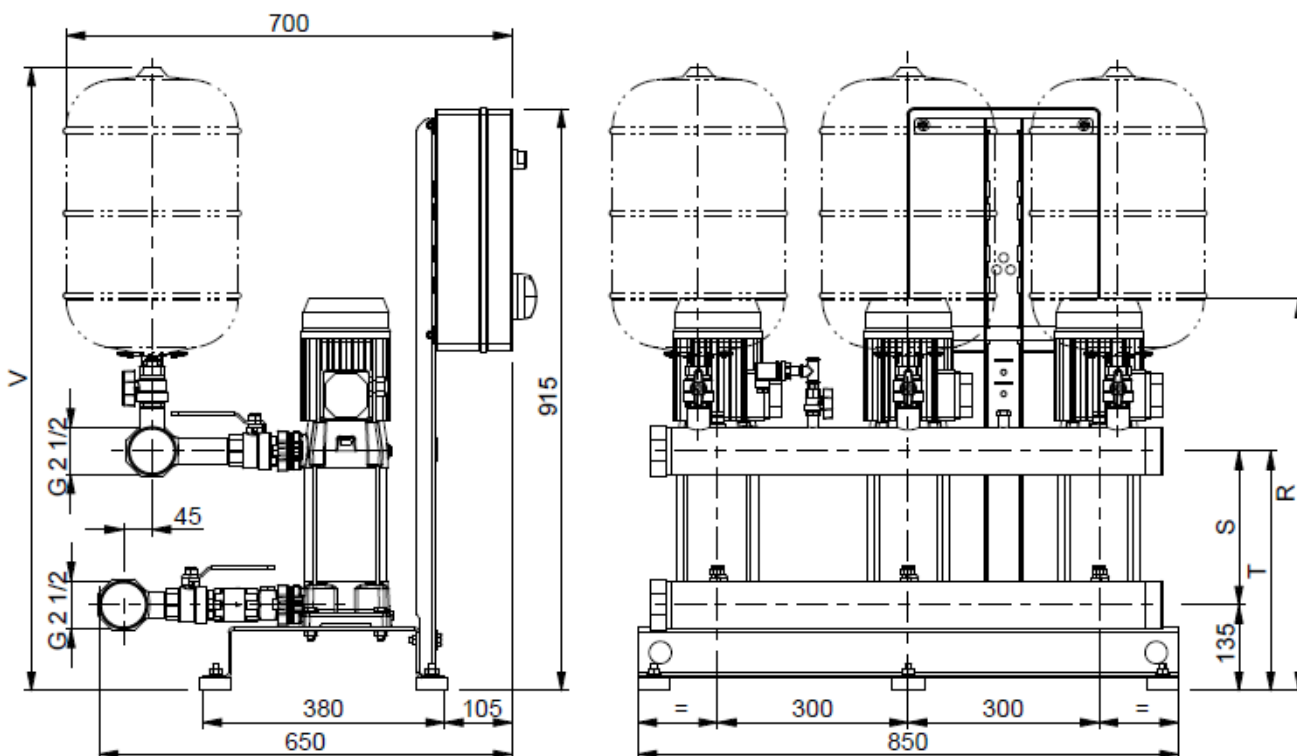
Booster Type	Dimensions [mm]									Weight [kg]			
	EDM	EDT	EDM	EDT	EDM	EDT	R	S	T	V	W	1~	3~
	C		F		H								
2GPE CVM A/10 EDT(EDM)	585	590	75	80	910	915	550	190	325	920	780	65	65
2GPE CVM A/12 EDT(EDM)	585	590	75	80	910	915	590	215	350	945	820	69	69
2GPE CVM A/15 EDT(EDM)	585	590	75	80	910	915	615	240	375	975	845	69	69
2GPE CVM B/15 EDT(EDM)	585	590	75	80	910	915	565	190	325	920	790	68	68
2GPE CVM B/20 EDT(EDM)	585	590	75	80	910	915	625	215	350	945	855	80	80
2GPE CVM B/23 EDT	585	590	75	80	-	915	650	240	375	975	880	-	81

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### OVERALL DIMENSIONS 3GP BOOSTER SET

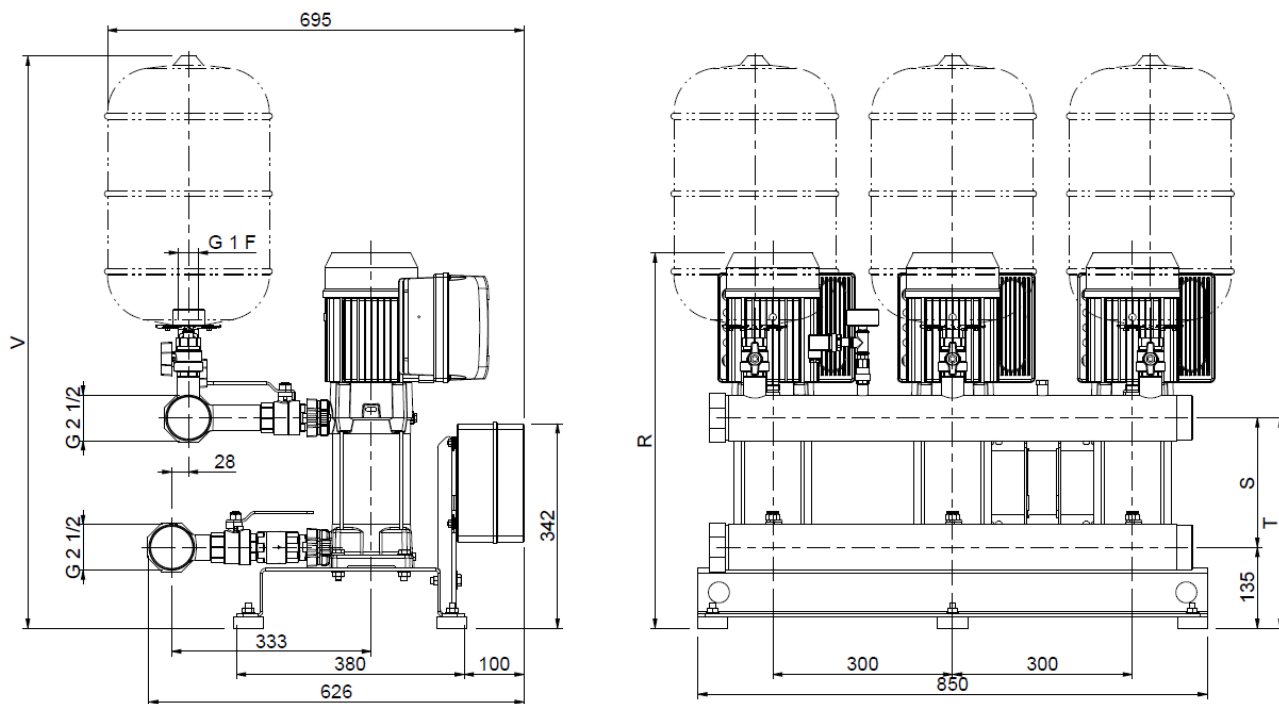
#### 3GP CVM



Booster Type	Dimensions [mm]				Weight [kg]
	R	S	T	V	
3GP CVM A/8	490	165	300	895	99
3GP CVM A/10	550	190	325	920	111
3GP CVM A/12	590	215	350	945	116
3GP CVM A/15	615	240	375	975	117
3GP CVM A/18	665	270	405	1000	129
3GP CVM B/10	500	140	275	870	109
3GP CVM B/12	540	165	300	895	114
3GP CVM B/15	565	190	325	920	115
3GP CVM B/20	625	215	350	945	132
3GP CVM B/23	650	240	375	975	134
3GP CVM B/25	680	270	405	1000	135

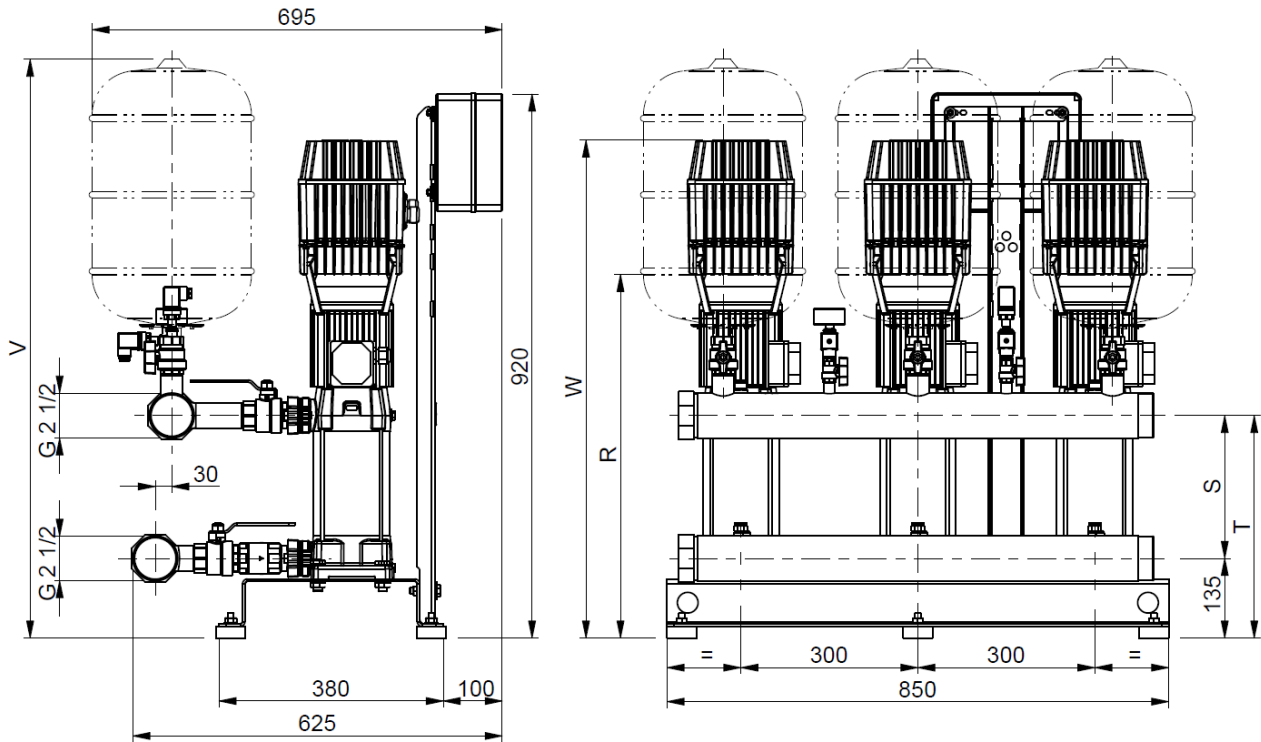
OVERALL DIMENSIONS 3GPE BOOSTER SET

3GPE CVM E-SPD



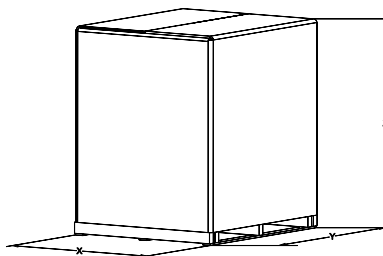
Booster Type	Dimensions [mm]				Weight [kg]
	R	S	T	V	
3GPE CVM B/20 ESPT	626	216	351	954	114
3GPE CVM B/23 ESPT	652	242	377	980	116

### 3GPE CVM E-DRIVE



Booster Type	Dimensions [mm]					Weight [kg]
	R	S	T	V	W	
3GPE CVM A/15 EDT	615	240	375	980	845	105
3GPE CVM A/18 EDT	565	270	405	1005	795	117
3GPE CVM B/20 EDT	625	215	350	955	855	120
3GPE CVM B/23 EDT	650	240	375	980	880	122

## 2-3GP(E) CVM PACKING



## 2GP(E) CVM

	Booster type	Overall dimensions packing			Booster+packing Weight [kg]
		X	Y	Z	
2GP	2GP CVM A/8(M)	1230	830	1365	87
	2GP CVM A/10(M)				94
	2GP CVM A/12(M)				98
	2GP CVM A/15(M)				98
	2GP CVM A/18(M)				107
	2GP CVM B/10(M)				93
	2GP CVM B/12(M)				96
	2GP CVM B/15(M)				97
	2GP CVM B/20(M)				109
	2GP CVM B/23(M)				110
	2GP CVM B/25				110
	2GPE E-POWER				2GPE CVM A/8 EPW
2GPE CVM A/10 EPW		96			
2GPE CVM A/12 EPW		99			
2GPE CVM A/15 EPW		100			
2GPE CVM B/10 EPW		94			
2GPE CVM B/12 EPW		97			
2GPE CVM B/15 EPW		98			
2GPE CVM B/20 EPW		110			
2GPE E-SPD	2GPE CVM A/10 ESPT(ESPM)	1230	830	1365	86
	2GPE CVM A/12 ESPT(ESPM)				90
	2GPE CVM A/15 ESPT(ESPM)				90
	2GPE CVM B/12 ESPM				88
	2GPE CVM B/15 ESPT(ESPM)				89
	2GPE CVM B/20 ESPT(ESPM)				100
	2GPE CVM B/23 ESPT				102
2GPE E-DRIVE	2GPE CVM A/10 EDT(EDM)	690	780	1215	90
	2GPE CVM A/12 EDT(EDM)				94
	2GPE CVM A/15 EDT(EDM)				94
	2GPE CVM B/15 EDT(EDM)				93
	2GPE CVM B/20 EDT(EDM)				105
	2GPE CVM B/23 EDT				106

## 3GP(E) CVM

	Booster	Overall dimensions packing			Booster+packing Weight [kg]
		X	Y	Z	
3GP	3GP CVM A/8	830	1230	1365	124
	3GP CVM A/10				136
	3GP CVM A/12				141
	3GP CVM A/15				142
	3GP CVM A/18				154
	3GP CVM B/10				134
	3GP CVM B/12				139
	3GP CVM B/15				140
	3GP CVM B/20				157
	3GP CVM B/23				159
	3GP CVM B/25				160
3GPE E-SPD	3GPE CVM B/20 ESPT	830	1230	1365	139
	3GPE CVM B/23 E ESPT				141
3GPE E-DRIVE	3GPE CVM A/15 EDT	830	1230	1365	130
	3GPE CVM A/18 EDT				142
	3GPE CVM B/20 EDT				145
	3GPE CVM B/23 EDT				147

INTENTIONALLY EMPTY PAGE

### CONTROL PANEL FIXED SPEED

#### 2 EP-E SPECIFICATION

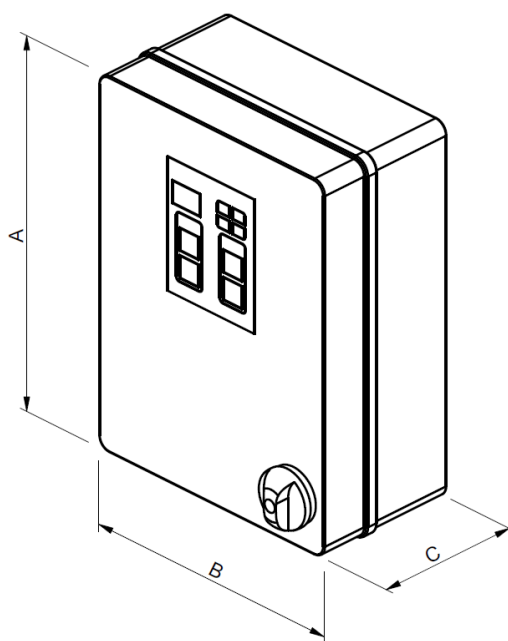
- **SERIES 2EP-E M UA (single-phase power output)**
- **SERIES 2EP-E T UA (three-phase power output)**

Electrical panel (protection and control) for two electropumps. Manual or automatic operation through pressure transmitter or/and pressure switches. The panel is configured to start the two pumps alternately in stand-by to pressure transmitter or/and pressure switch. The electrical panel protects the motors against overload and phase failure. Any protection devices that intervene are signalled on the panel itself and remotely through no voltage contacts. The protection device against overload and phase failure resets automatically three times, and manually after the fourth intervention.

#### TECHNICAL FEATURES

- P.MIN= Operation against dry running (tripped by a level float or minimum pressure switch) with automatic reset once water supply is restored, with warning lamp.
- TRP= control by pressure transmitter
- PR1= Pump n. 1 start/stop ( not included in the pressure set )
- PR2= Pump n. 2 start/stop ( not included in the pressure set )
- Automatic start sequence alternation
- Motor protection against overload with automatic reset for three times and manual reset the fourth time
- Motor line protection against short-circuits with fuses for motor startup
- Transformer and auxiliary circuit protection with fuses
- Remote signalling, through NC-NO no voltage contact, of the protection devices that intervene

Version		2EP-E M UA	2EP-E T UA
Power source	Frequency	50/60 Hz	
	Phase	Single-phase	Three-phase
	Voltage	230 V ± 10%	400 V ± 10%
	Power	0.55 ÷ 2.2 kW	1.1 ÷ 7.5 kW
Others	Protection degree	IP 56	
	Ambient Temperature	-10°C + 50°C up to 7.5 kW	
	Pressurisation units	2 pumps	
	Relative humidity	50% a 40°C MAX (90% a 20°C)	
	Max altitude	1000 m (a.s.l.)	
Directives	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)		



2EP-E M UA MODELS TABLE

Model	Single pump Power [kW]	I Calibration [A]	Motor fuse	Dimensions AxBxC [mm]	Weight [kg]
2EP-E 0,55 M	0,55	2x4,5	6A aM (10x38)	240 x 190 x 90	1,5
2EP-E 1,1 M	1,1	2x9	10A aM (10x38)	240 x 190 x 90	1,5
2EP-E 1,5 M	1,5	2x12	12A aM (10x38)	240 x 190 x 90	1,5
2EP-E 2,2 M	2,2	2x15	20A aM (10x38)	300 x 220 x 120	2,2

2EP-E T UA MODELS TABLE

Model	Single pump Power [kW]	I Calibration [A]	Motor fuse	Dimensions AxBxC [mm]	Weight [kg]
2EP-E 1,1 T	1,1	2x3,5	4A am (10x38)	300 x 220 x 120	3,5
2EP-E 2,2 T	2,2	2x5	8A am (10x38)	300 x 220 x 120	3,5
2EP-E 4 T	4	2x9	12A am (10x38)	300 x 220 x 120	3,5
2EP-E 7,5 T	7,5	2x15	20A am (10x38)	300 x 220 x 120	3,5

Notes: 4 pumps version are available with EP control panel on request

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### 3 EP-E SPECIFICATION

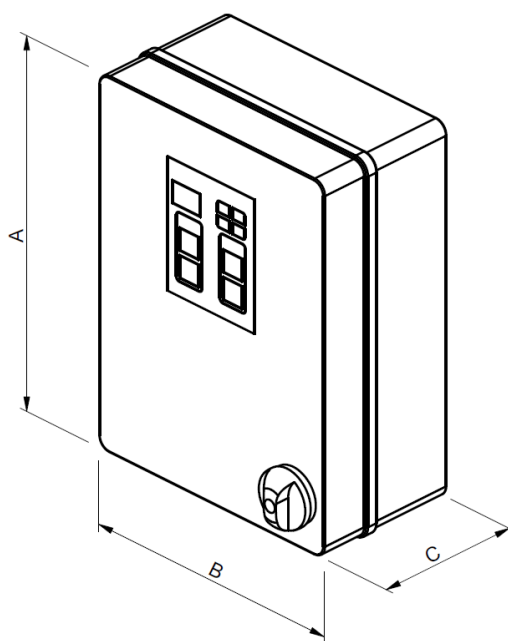
• **SERIES 3EP-E T UA (three-phase power output)**

Electrical panel (protection and control) for three electropumps. Manual or automatic operation through pressure transmitter or/and pressure switches. The panel is configured to start the two pumps alternately in stand-by to pressure transmitter or/and pressure switch. The electrical panel protects the motors against overload and phase failure. Any protection devices that intervene are signalled on the panel itself and remotely through no voltage contacts. The protection device against overload and phase failure resets automatically three times, and manually after the fourth intervention.

**TECHNICAL FEATURES**

- P.MIN= Operation against dry running (tripped by a level float or minimum pressure switch) with automatic reset once water supply is restored, with warning lamp.
- TRP= control by pressure transmitter
- PR1= Pump n. 1 start/stop ( not included in the pressure set )
- PR2= Pump n. 2 start/stop ( not included in the pressure set )
- PR3= Pump n. 3 start/stop ( not included in the pressure set )
- Automatic start sequence alternation
- Motor protection against overload with automatic reset for three times and manual reset the fourth time
- Motor line protection against short-circuits with fuses for motor startup
- Transformer and auxiliary circuit protection with fuses
- Remote signalling, through NC-NO no voltage contact, of the protection devices that intervene

	Version	3 EP-E
<b>Power source</b>	Frequency	50/60 Hz
	Phase	Three-phase
	Voltage	400 V ± 10%
	Power	1.1 ÷ 7.5 kW
<b>Others</b>	Protection degree	IP 56
	Ambient Temperature	-10°C + 50°C
	Relative humidity	50% a 40°C MAX (90% a 20°C)
	Relative humidity	1000 m (a.s.l.)
	Pressurisation units	3 pumps
<b>Directives</b>	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)	



3EP-E T UA MODELS TABLE

Model	Single pump Power [kW]	I Calibration [A]	Motor fuse	Dimensions AxBxC [mm]	Weight [kg]
3EP-E 1,1 T	1,1	3x3,5	4A aM (10x38)	380x300x120	9,5
3EP-E 2,2 T	2,2	3x5	8A aM (10.3x38)	380x300x120	9,5
3EP-E 4 T	4	3x9	12A aM (10.3x38)	380x300x120	9,5
3EP-E 7,5 T	7,5	3x15	20A aM (10.3x38)	380x300x120	9,5

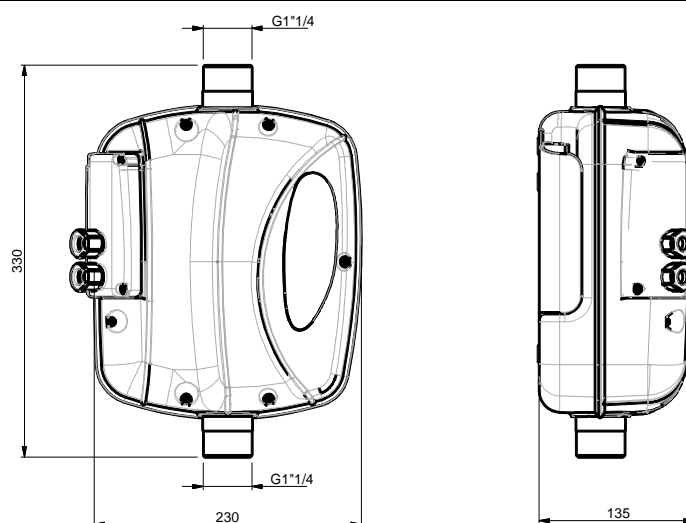
Notes: 4 pumps version are available with EP control panel on request

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### CONTROL PANEL VARIABLE SPEED E-POWER SPECIFICATION

In-line electronic device for controlling electropumps, employing inverter technology. Starts and stops the pump and modulates the speed of the motor in relation to the water demand on the system, to maintain the operating pressure setting. Provides excellent comfort for the end user, significant energy savings and increased service life, the typical advantages of inverter controlled autoclave systems. E-power use the Master/slave mode that allows to connect two inverters on the same system in order to improve its performance in a coordinate mode. The connection for this mode is made by communication line ON/OFF.

E-POWER MT		
<b>Power</b>	Power Voltage	Single-phase 230 V
	Output Voltage (pump)	Three-phase 230 V
	Phase current	Max 10 A
	Output frequency	5 ÷ 60Hz
	Maximum pump power	2.2 kW
<b>Others</b>	Pressure setpoint	0.3 ÷ 8 bar
	Max overpressure	12 bar
	Protection degree	IP 65
	Ambient Temperature	0 ÷ 40°C
	Liquid temperature	+1 ÷ 40°C
	Liquid type	Water with no chemical add (ph 5÷9) and no debris
	Pressurisation units	2 pumps
	Hydraulic Connection	G1"1/4 Male
	Weight	2 kg
	Protection	Dry-running Over/under voltage Short-circuit Overload Overtemperature Low pressure Pressure sensor fault
<b>Directives</b>	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)	

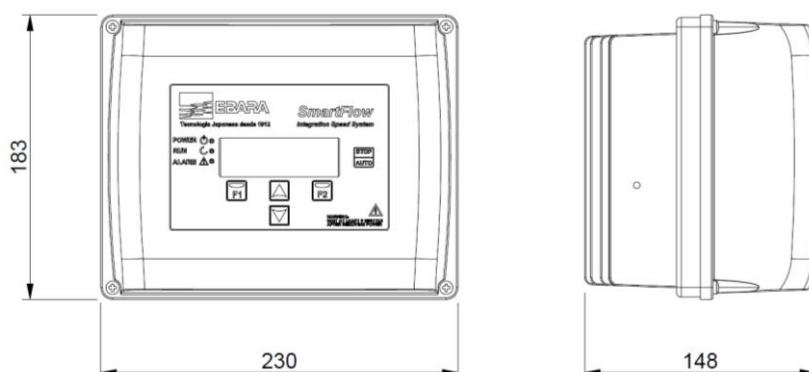


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## E-SPD SPECIFICATION

In-line electronic device for controlling electropumps, employing inverter technology. Starts and stops the pump and modulates the speed of the motor in relation to the water demand on the system, to maintain the operating pressure setting. Provides excellent comfort for the end user, significant energy savings and increased service life, the typical advantages of inverter controlled autoclave systems. E-SPD is an inverter that could be installed on the terminal box. It can be adapted on horizontal and vertical pumps. E-SPD can protect the system against overpressure, overcurrent, voltage fluctuation, dry run and water leak. The connection for this mode is made by communication line ON/OFF.

E-SPD				
Power	Version	MT	TT	
	Power Voltage	Single-phase 230 V	Three-phase 400 V	
	Output Voltage (pump)	Three-phase 230 V	Three-phase 400 V	
	Output frequency	50 ÷ 60Hz		
	Maximum pump power	2.2 kW	4 kW	
	Max I in	20 A	12 A	
	Max I out	11 A	11 A	
Others	Pressure setpoint	0.5 ÷ 25 bar		
	Protection degree	IP 55		
	Ambient Temperature	-10 ÷ 40°C		
	Pressurisation units	2-3 pumps		
	Weight	2,7 Kg		
	Protection	Dry-running		
		Over/under voltage		
		Short-circuit		
Overload				
Overtemperature				
Low pressure				
Pressure sensor fault				
Directives	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)			



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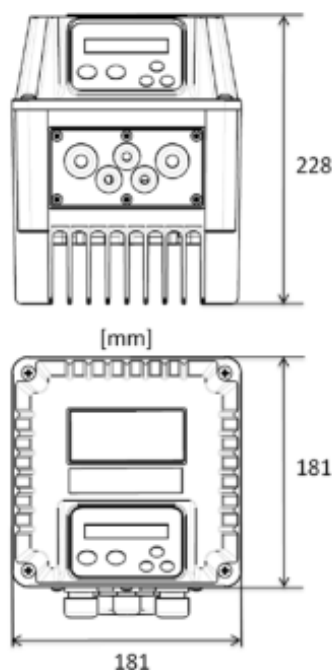


### E-DRIVE SPECIFICATION

Electronic device with external control for controlling electropumps, employing inverter technology. Starts and stop the pump and modulates the speed of the motor in relation to the water demand on the system, to optimise system operation. Provides excellent comfort for the end user, significant energy savings and increased service life, the typical advantages of inverter controlled autoclave systems.

		E-DRIVE		
version		EDM		EDT
		1500	3000	2200
Power	Power Voltage	Single-phase 230V		Three-phase 400V
	Output Voltage (pump)	Three-phase 230V		Three-phase 400V
	Output frequency	5 ÷ 60 Hz		
	Maximum pump power	1.5 kW	3 kW	2.2 kW
	Max I in	15 A	20 A	10 A
	Max I out	7 A	11 A	6 A
Others	Pressure sensor	0 ÷ 16 or 0 ÷ 25 Bar		
	Protection degree	IP 55		
	Temperature range	Max 40°C		
	Pressurisation units	2 or 3 pumps		
	Weight	4	4.3	4.4
	Analogue inputs	4-20mA (10 or 15Vdc)		
	Digital outputs	NO or NC for: Running motor signal and Alarm		
	Digital inputs	NO or NC for: Start and stop motor		
Directives	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)			

E-Drive 1500; 2200; 3000.



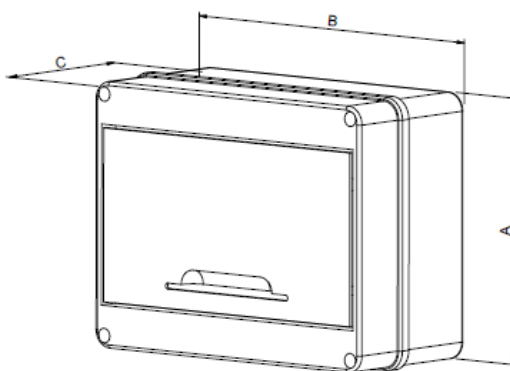
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## PROTECTION PANEL SPECIFICATION

Connection box for inverter :

- Connects the inverters with the power supply point.
- Equipped with circuit breakers on individual lines

<b>Power source</b>	Frequency	50/60 Hz	
	Phase	Single-phase	Three-phase
	Voltage	230 V ± 10%	400 V ± 10%
	Power	0.37 ÷ 3 kW	0.37 ÷ 15 kW
<b>Others</b>	Protection degree	IP 55	
	Ambient Temperature	-5°C + 40°C	
	Pressurisation units	2 pumps	
	Relative humidity	50% a 40°C MAX (90% a 20°C)	
	Max altitude	1000 m (a.s.l.)	
<b>Directives</b>	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)		



Model	N° Pumps	Power [kW]	Dimensions A-B-C [mm]	Max Current [A]
PROT 2E-DR 1.5-3M	2	2x3	160x120x90	2x20
PROT 2E-DR 4T		2x4	160x200x90	2x16
PROT 2E-DR 5.5T		2x5.5	160x200x90	2x20
PROT 2E-DR 7.5T		2x7.5	160x200x90	2x25
PROT 2E-DR 15T		2x15	160x200x90	2x32
PROT 3E-DR 1.5-3M	3	3x3	160x120x90	3x20
PROT 3E-DR 4T		3x4	200x250x110	3x16
PROT 3E-DR 5.5T		3x5.5	200x250x110	3x20
PROT 3E-DR 7.5T		3x7.5	200x250x110	3x25
PROT 3E-DR 15T		3x15	200x250x110	3x32



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