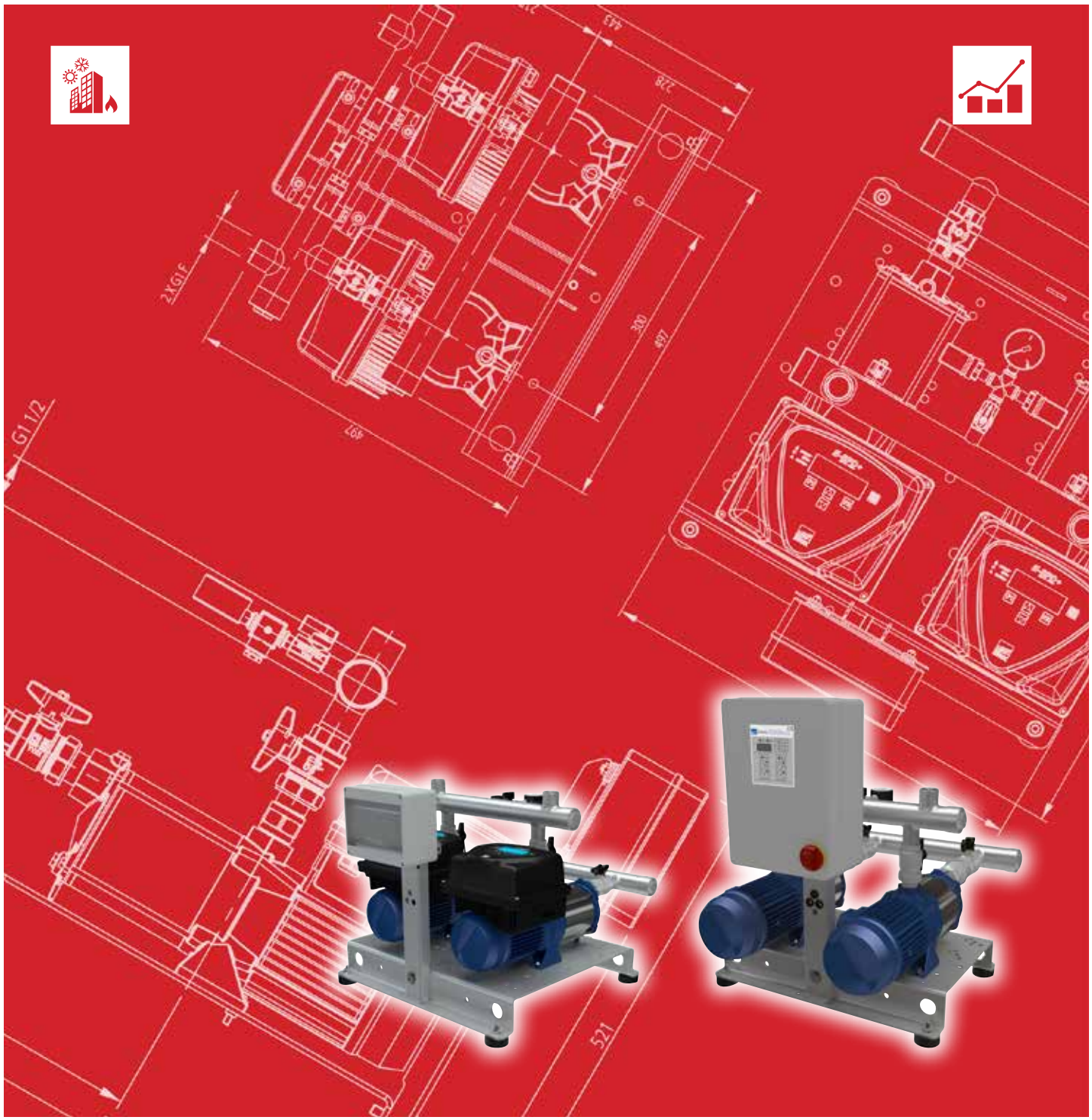


Looking ahead,  
going beyond expectations  
*Ahead > Beyond*



## GP - GPE COMPACT

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 transmitter for EP-E and by pressure switches for EP. GPE units (with INVERTER) are controlled by pressure transmitter.

### TYPICAL APPLICATIONS

INDUSTRY	BUILDING SERVICE	WATER SUPPLY
		

### 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 (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 ( only if present )
- 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 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 first pressure switch (for EP version) or the pressure transmitter (for EP-E version) starts the first electropump. If the output flow is greater than the delivery capacity of a single pump, the pressure continues falling until the second pressure switch (for EP version) or the pressure transmitter (for EP-E version), 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 switches (for EP version) or the pressure transmitter (for EP-E version) 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 with E-SPD+

GPE units with E-SPD+ are designed to operate with each pumps controlled by an INVERTER installed on board its motor. 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 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

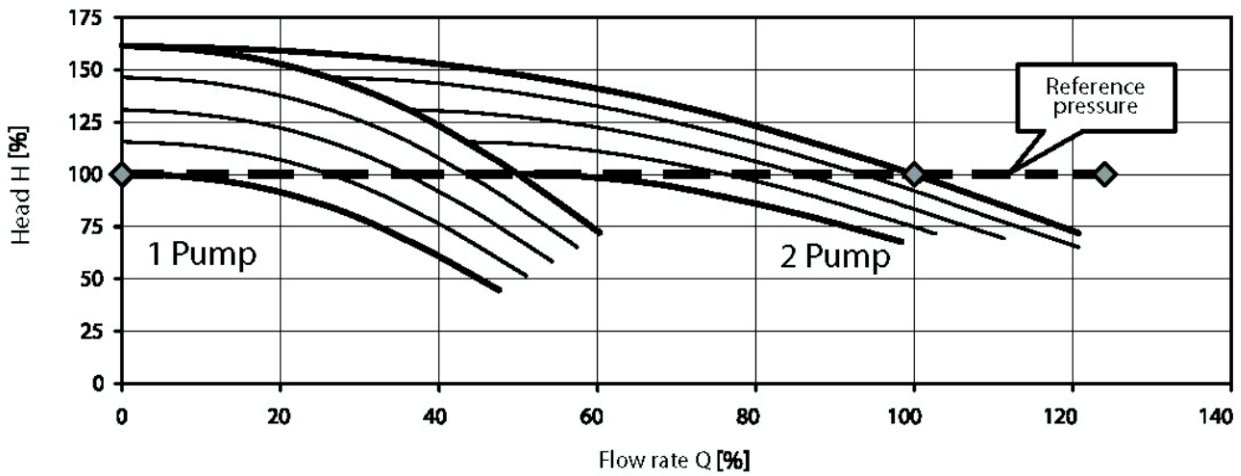
restore the correct operating pressure. At this point, the controller will stop one of the pumps running at maximum speed, while the speed of pump n. 1 is modulated to maintain the reference pressure. As the pressure continues to increase due to reduced demand, once the minimum speed of pump n. 1 is 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

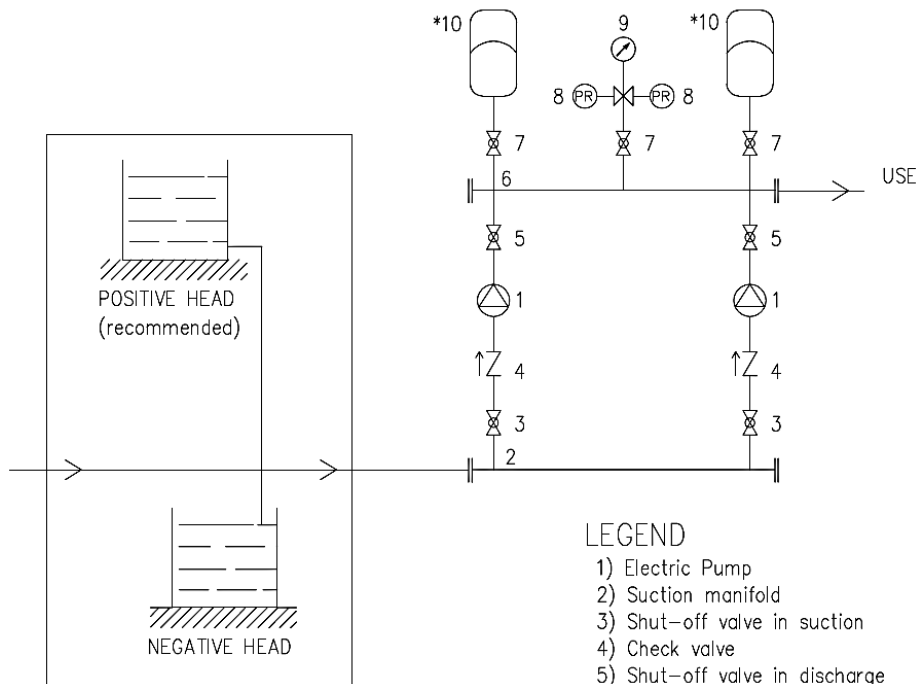
MFC multiple pump control panels power each pump with an INVERTER to modulate system performance in relation to the reference signal. MFC controllers differ from EFC controller from the point of view of their construction, since instead of having a single INVERTER to control all the pumps, each pump 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**



### GP PRESSURISATION UNIT WATER CIRCUIT DIAGRAM

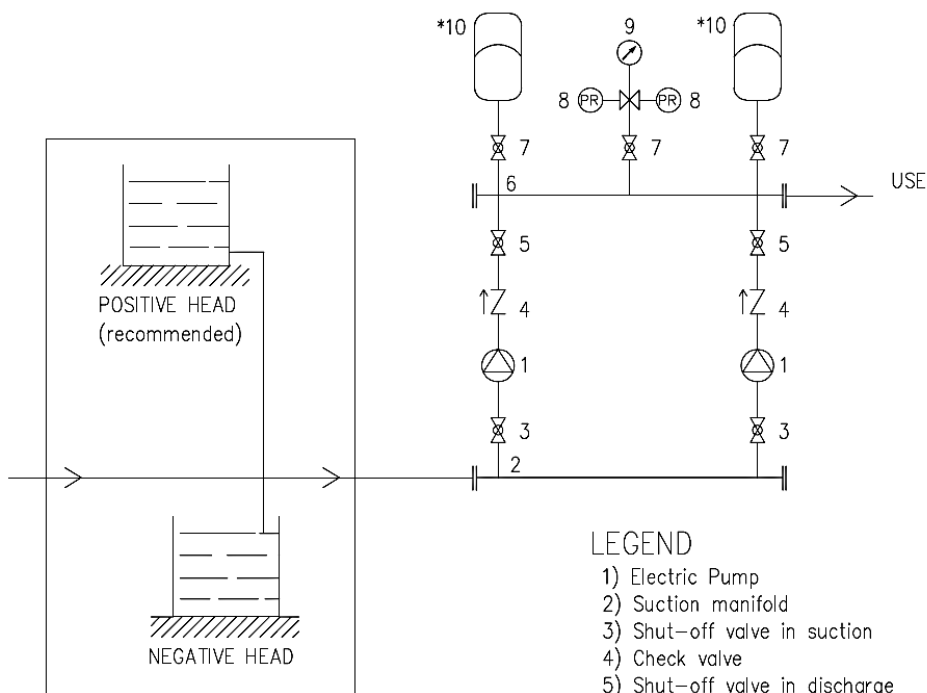


SUPPLY SYSTEM UPSTREAM FROM UNIT AT THE DISCRETION OF THE CUSTOMER OR THE SYSTEM DESIGNER.

#### LEGEND

- 1) Electric Pump
- 2) Suction manifold
- 3) Shut-off valve in suction
- 4) Check valve
- 5) Shut-off valve in discharge
- 6) Discharge manifold
- 7) Shut-off valve (Optional\*)
- 8) Pump control/regulation pressure transmitter/pressure switch
- 9) Pressure gauge
- 10) Membrane vessel (Optional\*)

### GPE PRESSURISATION UNIT WATER CIRCUIT DIAGRAM



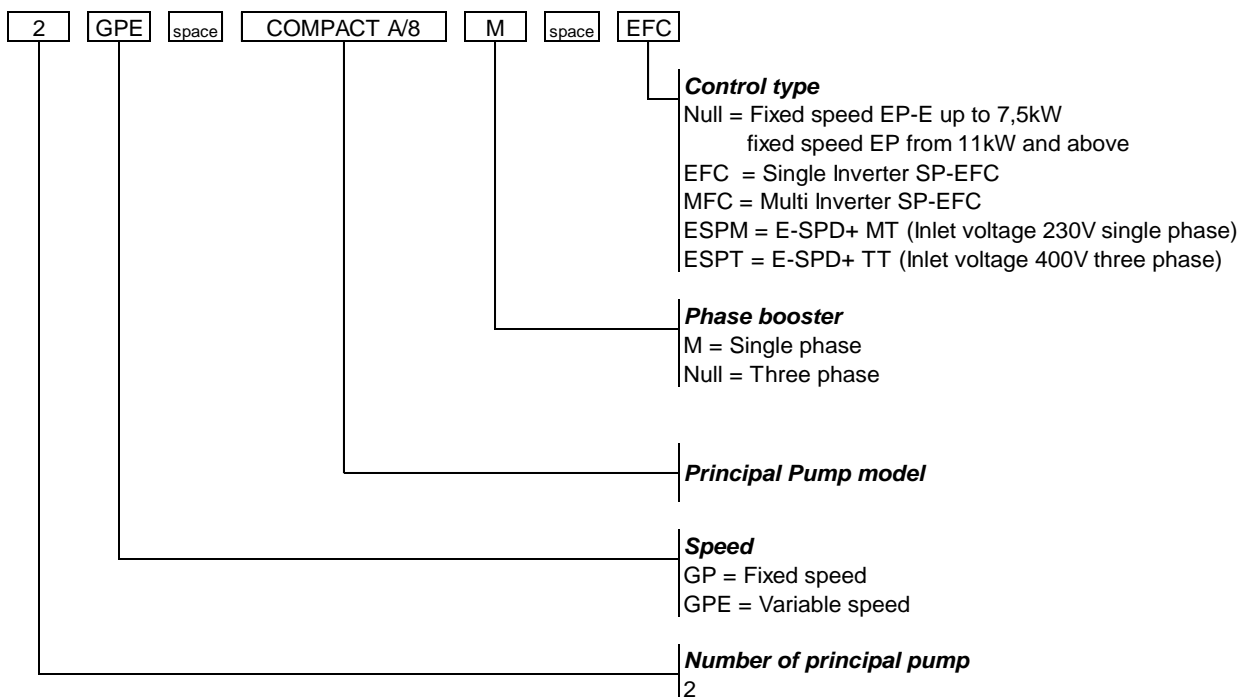
SUPPLY SYSTEM UPSTREAM FROM UNIT AT THE DISCRETION OF THE CUSTOMER OR THE SYSTEM DESIGNER.

#### LEGEND

- 1) Electric Pump
- 2) Suction manifold
- 3) Shut-off valve in suction
- 4) Check valve
- 5) Shut-off valve in discharge
- 6) Discharge manifold
- 7) Shut-off valve (Optional\*)
- 8) Pump control/regulation pressure transmitter/pressure switch
- 9) Pressure gauge
- 10) Membrane vessel (Optional\*)



### TYPE KEY 2GP(.) COMPACT



### NAME PLATE

 <b>EBARA Pumps Europe S.p.A.</b> Via Campo Sportivo, 30 38023 Cles (TN), ITALY Phone +39 0444 706811 V.A.T.: 01234660221		   <b>MADE IN ITALY</b>
<b>GRUPPO DI PRESSURIZZAZIONE IDRICA</b>		
TYPE	①	
P/N	②	
S/N	③	

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

### PRODUCT SPECIFICATIONS HYDRAULIC COMPONENTS AND CONTROL

BOOSTER SET					
COMPACT					
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
	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 AISI 304		
	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 transmitter		GP version and GPE version with E-SPD+ EN 10088-1.4301 (AISI 304) / 1.4404 (AISI 316L)		

### ELECTRIC PANEL

BOOSTER SET					
COMPACT					
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
Control panel	Principal Electric panel	EP-E fixed speed ( only for GP )	●	●	
		SP EFC/MFC variable speed ( only for GPE )	○	○	
	E-SPD+ [1]	ESPDM single-phase supply inverter ( only for GPE )	●	●	
		ESPDT three-phase supply inverter ( only for GPE )	●	●	

● : Standard ○ : Optional

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

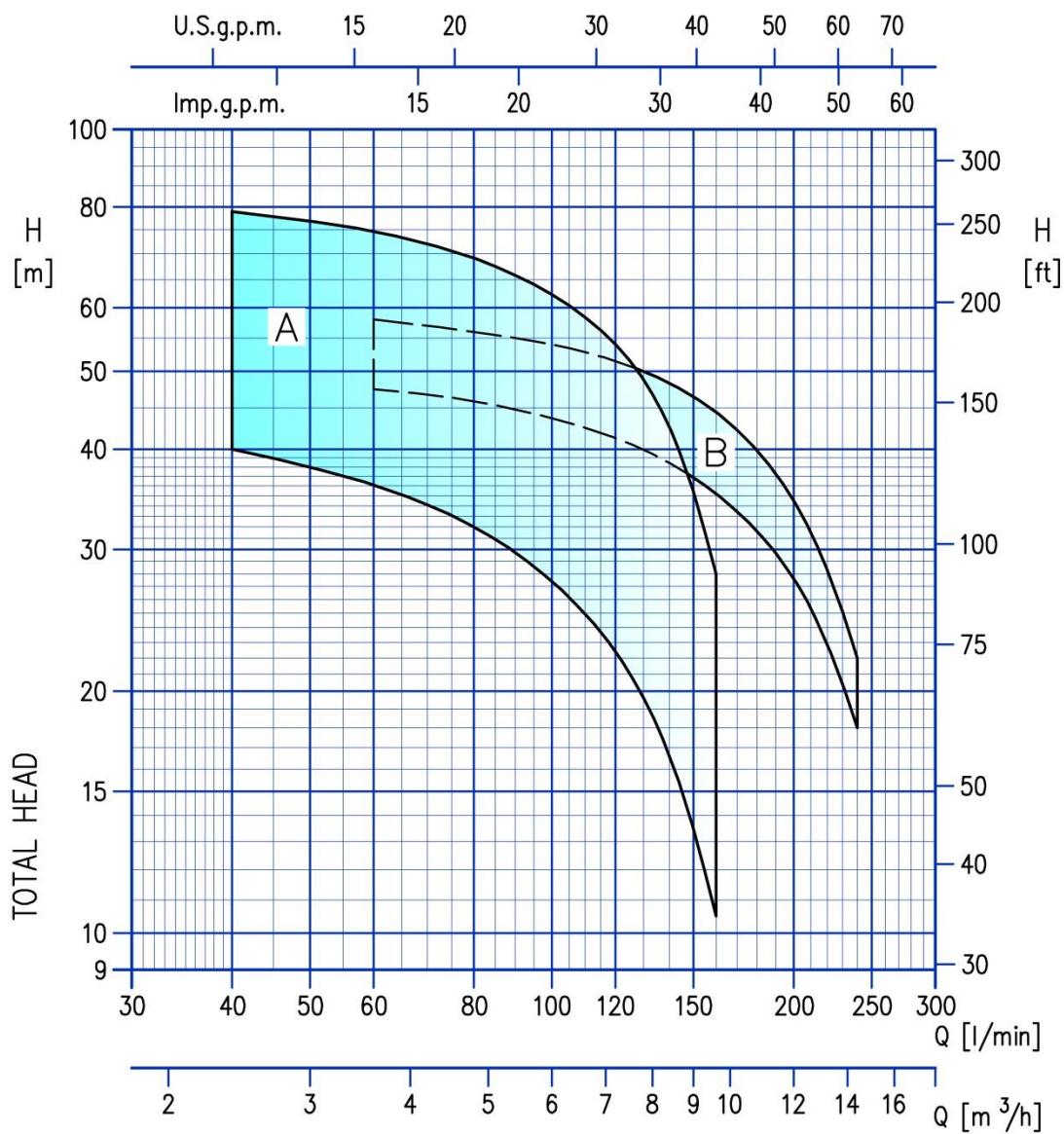
### TECHNICAL PUMP DATA

PUMP			
COMPACT			
Operating range	Version	A	B
	Maximum working pressure	1 MPa ( 10 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 fiber reinforced	
	Shaft seal	Ceramic/Carbon/NBR	
	Shaft	AISI 416	
	Bracket	Cast iron	
	Diffuser	PPE+PS Glass fiber reinforced	
Pipe connection	Suction	G 1"	G 1 " ¼
		UNI ISO 228	
	Discharge	G 1" UNI ISO 228	

### TECHNICAL MOTOR DATA

MOTOR				
COMPACT				
Power source	Frequency	50 Hz		
	Phase	Single-phase	Three-phase	
	Rotation speed	2800 min <sup>-1</sup>		
	Power rating	0.6 ÷ 1.1 kW	0.6 ÷ 1.1 kW	
		0.8 ÷ 1.5 HP	0.8 ÷ 1.5 HP	
Voltage	230 ± 10% V	230/400 ± 10%		
Type	Type	Electric – TEFC		
	Efficiency level	-	IE3	
	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		
	Motor support	Cast iron		

### PERFORMANCE RANGE RESEAU BOOSTER SET 2GP(.) COMPACT



### CURVE SPECIFICATION 2GP(.)

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

Tolerances according to ISO 9906:2012 – Grade 3B.

The curves refer to effective speed of asynchronous motors at 50 Hz 2 poles

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.

During the pump selection, consider to get a safety margin of at least 0.5 m.

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. The performance curves refer to 2-pumps booster sets.

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
- 1 = one pump on work performance curve
- 2 = two pumps on work performance curve

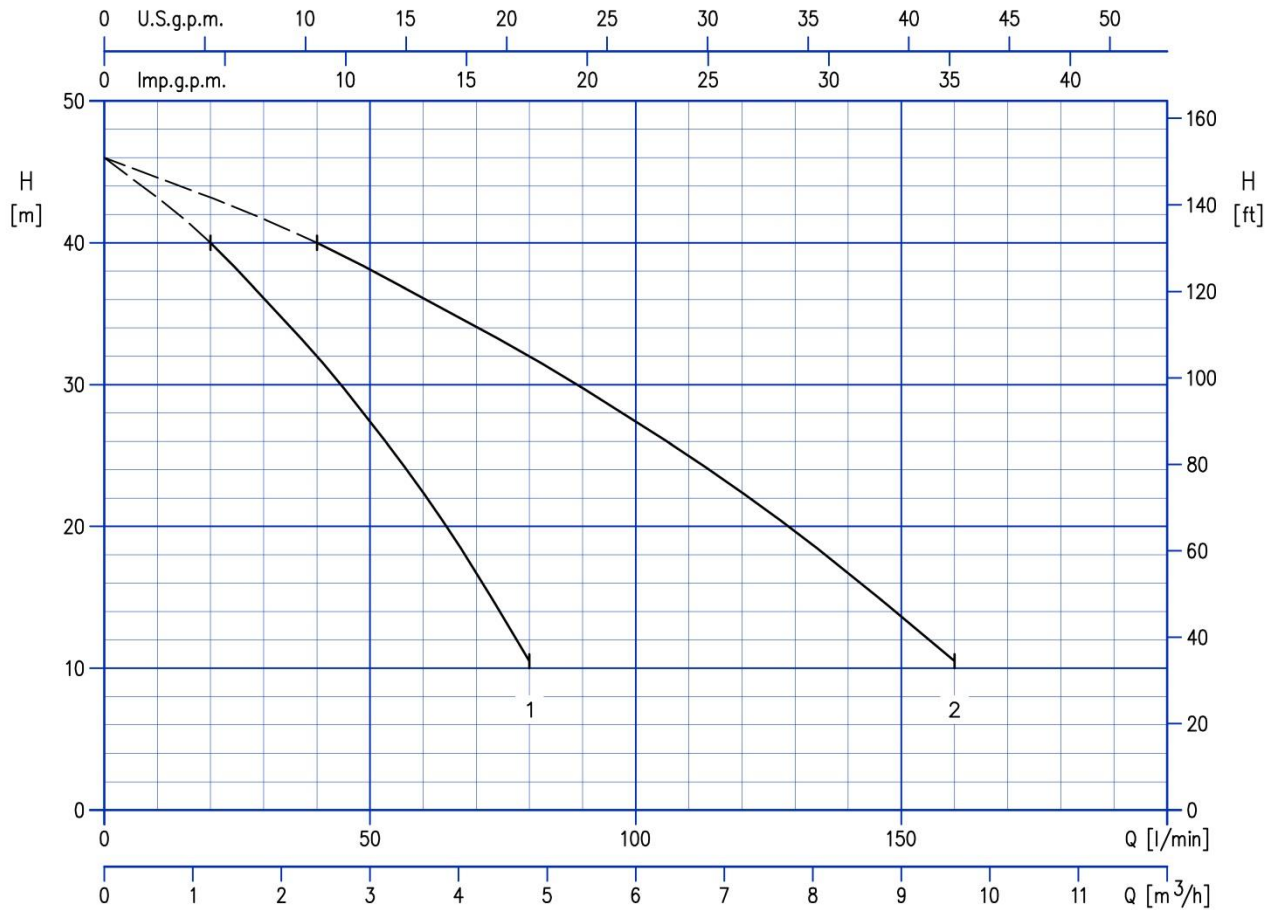
***Pressure drops of the booster's fittings are not considered***

### SELECTION CHART 2GP(.) COMPACT

Model	Motor		Maximum working pressure (MPa)	Q=Capacity								
	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(.) COMPACT A/8	0.6+0.6	0.8+0.8	0.8	46.0	39.7	36.1	32.0	27.4	22.4	10.5	-	-
2GP(.) COMPACT A/10	0.75+0.75	1+1		62.0	56.5	53.0	48.5	43.5	37.1	20.0	-	-
2GP(.) COMPACT A/12	0.9+0.9	1.2+1.2		74.0	67.5	63.5	58.5	52.5	45.0	24.0	-	-
2GP(.) COMPACT A/15	1.1+1.1	1.5+1.5		86.0	79.0	74.5	69.0	62.5	54.0	28.0	-	-
2GP(.) COMPACT B/12	0.9+0.9	1.2+1.2	0.6	51.0	-	47.5	46.0	43.5	41.5	35.2	27.6	18.0
2GP(.) COMPACT B/15	1.1+1.1	1.5+1.5		63.0	-	58.0	56.0	54.0	51.5	44.5	34.5	22.0

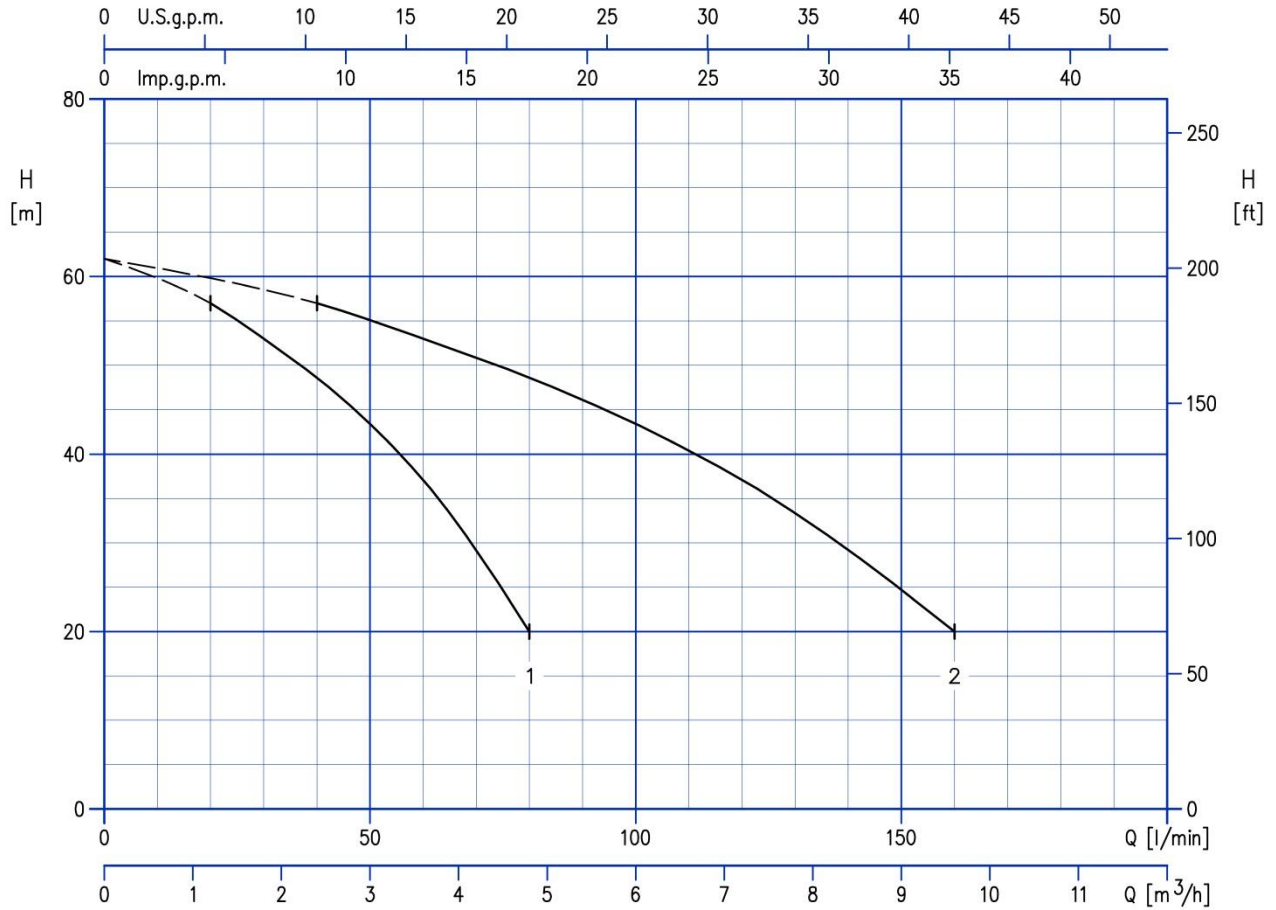


### PERFORMANCE CURVE 2GP(.) 2GP(.) COMPACT A/8



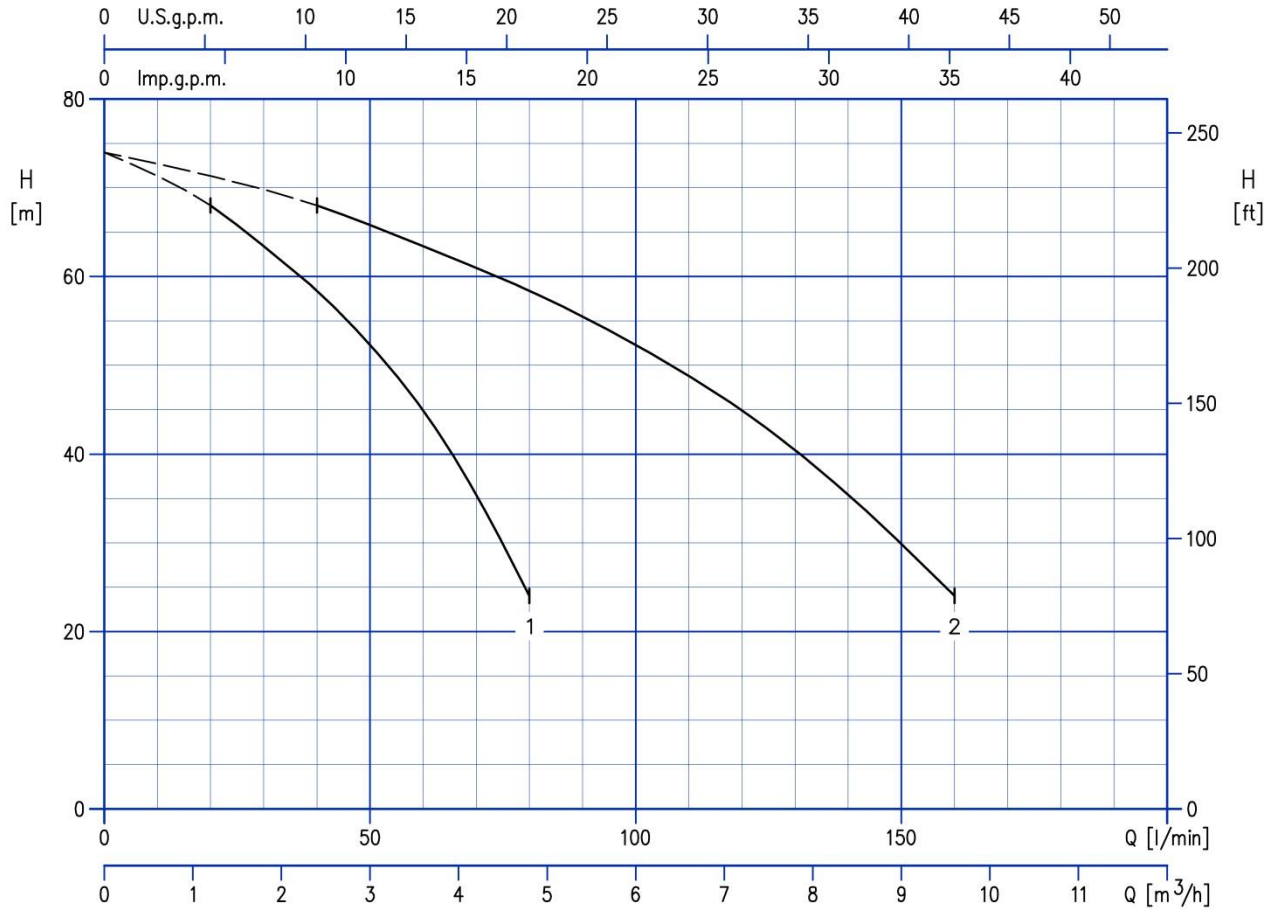
Test standard: ISO 9906: 2012 - Grade 3B

### 2GP(.) COMPACT A/10



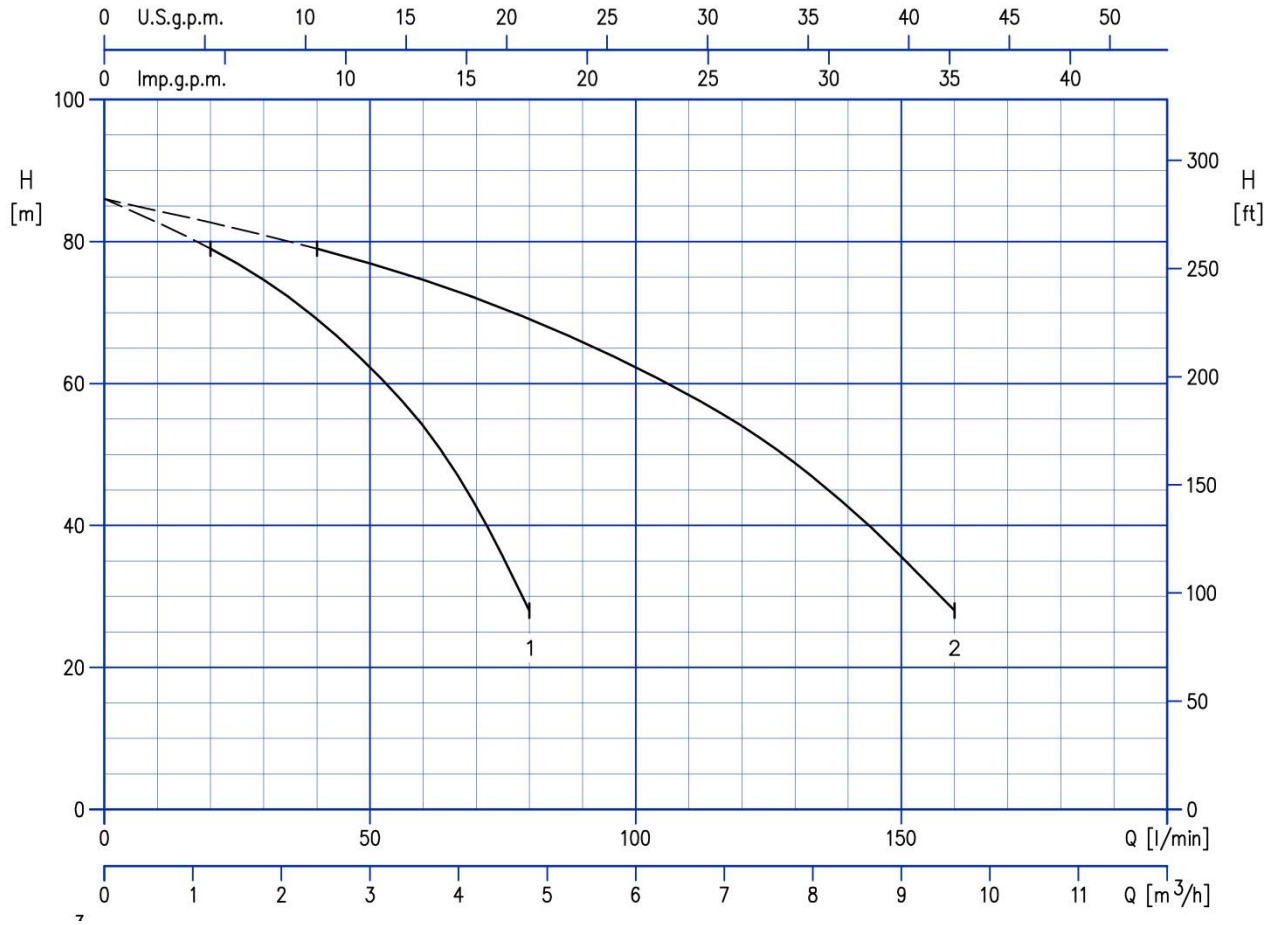
Test standard: ISO 9906: 2012 - Grade 3B

### 2GP(.) COMPACT A/12



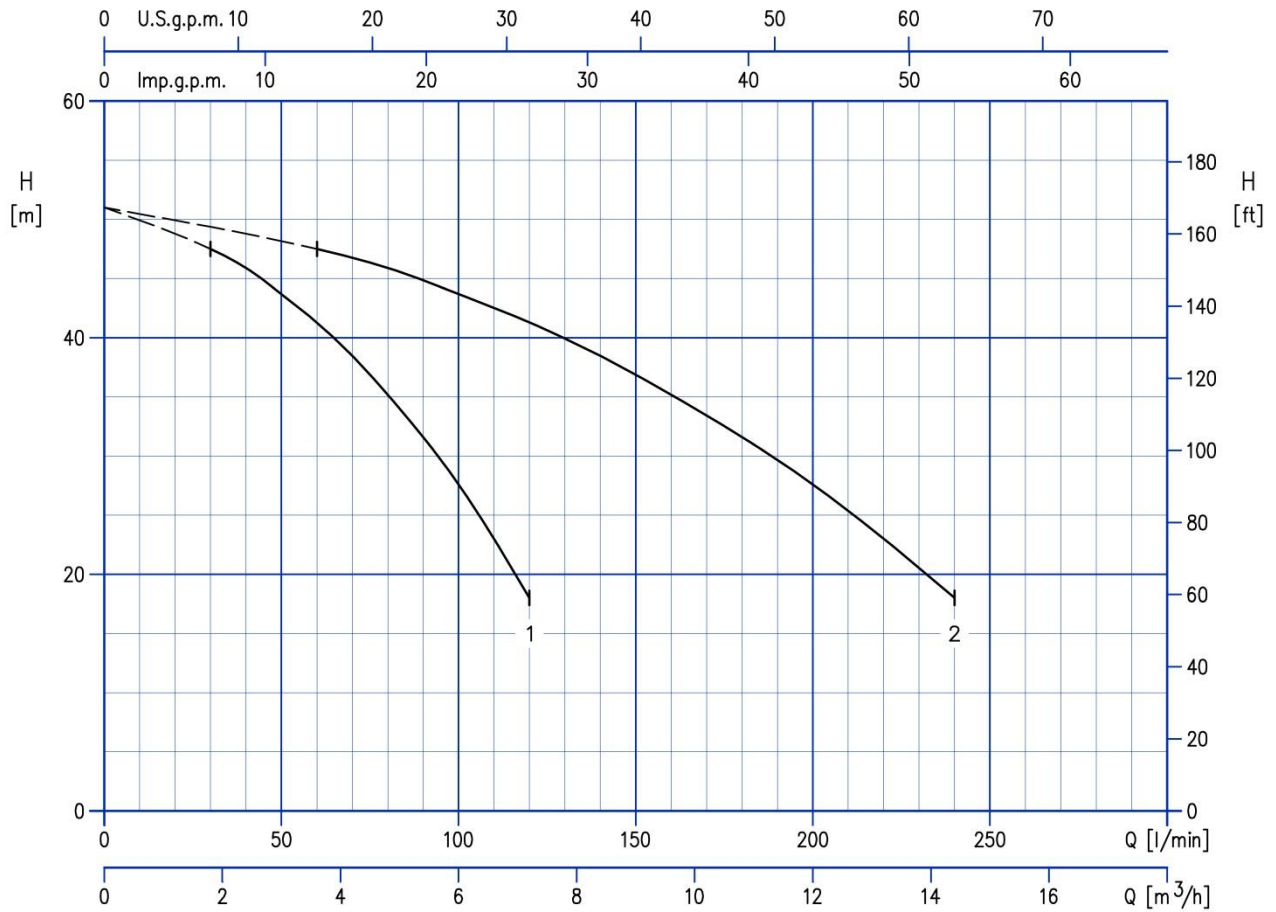
Test standard: ISO 9906: 2012 - Grade 3B

### 2GP(.) COMPACT A/15



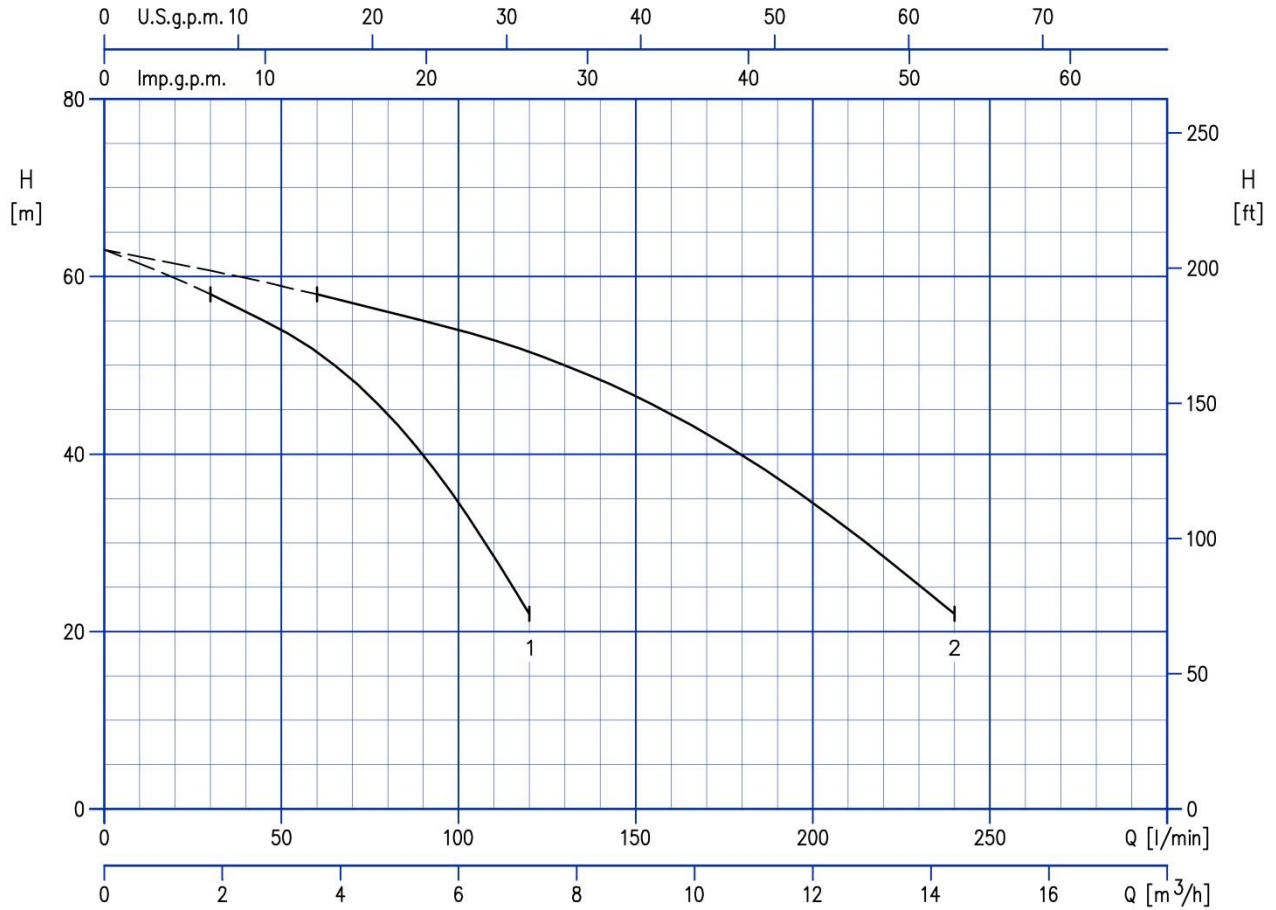
Test standard: ISO 9906: 2012 - Grade 3B

### 2GP(.) COMPACT B/12



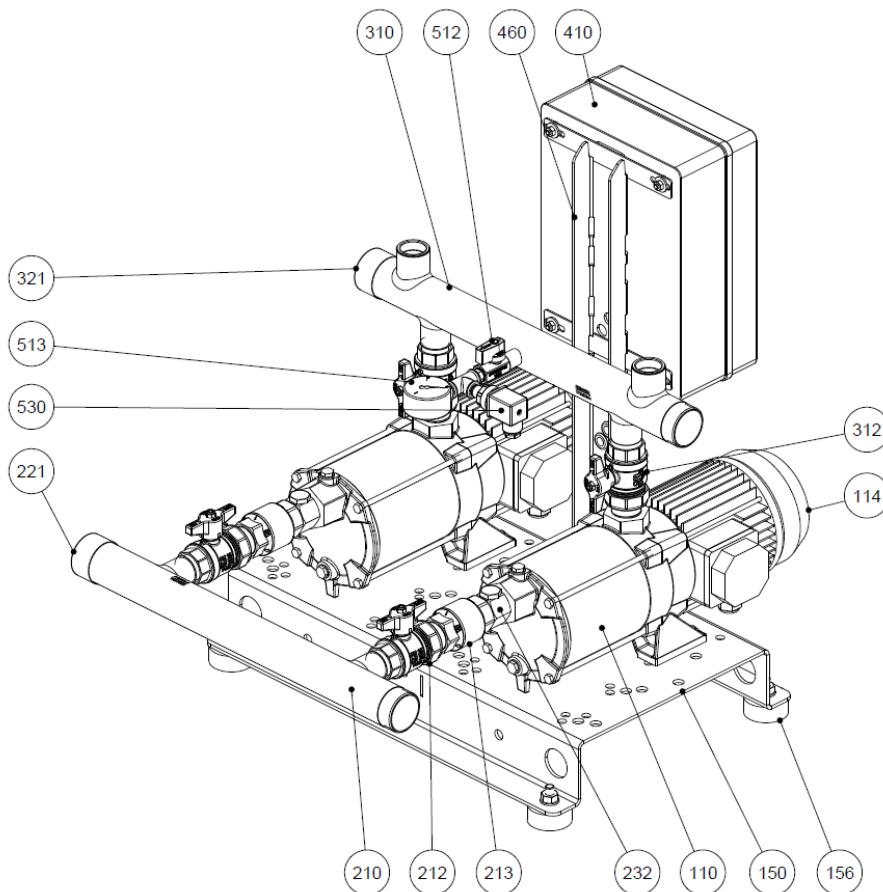
Test standard: ISO 9906: 2012 - Grade 3B

### 2GP(.) COMPACT B/15



Test standard: ISO 9906: 2012 - Grade 3B

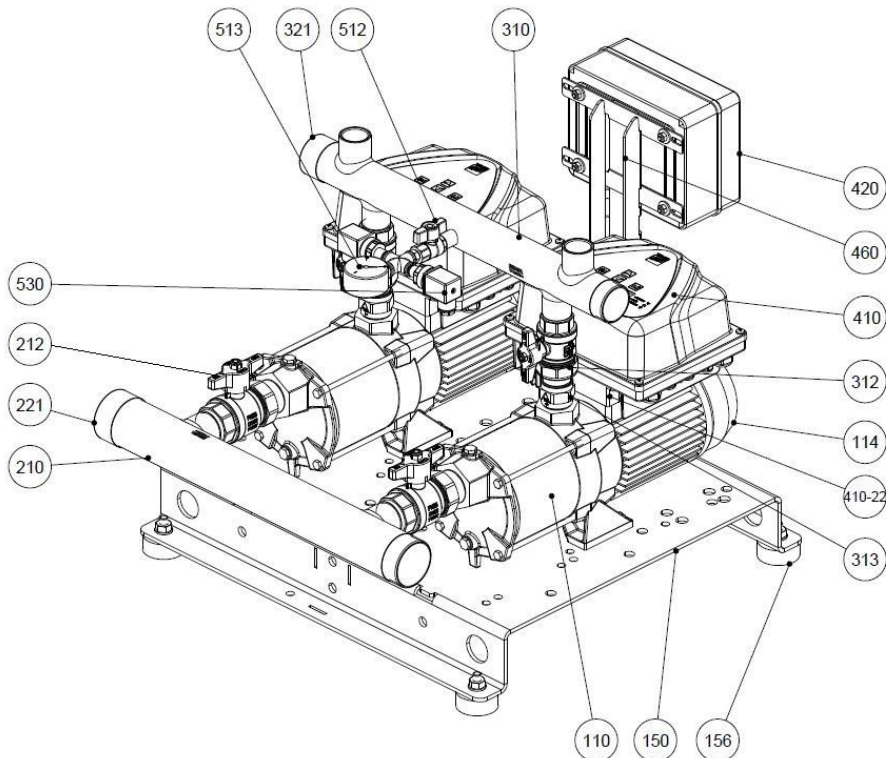
### 2GP CONSTRUCTION EXTERNAL VIEW 2GP COMPACT SINGLEPHASE



N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	2
114	Electric motor	-	2
150	Baseplate	Galvanized steel	1
156	Baseplate foot	SBR	4
210	Suction manifold	AISI 304	1
212	Union ball valve	Brass / P.T.F.E	2
213	Check valve	Brass / NBR	2
221	Threaded female cap	AISI 304	1
232	Nipple for air feeders	Yellow brass	2
310	Discharge manifold	AISI 304	1
312	Union ball valve	Brass / P.T.F.E	2
321	Female cap	AISI 304	1
410	Control panel	-	1
460	Control panel frame	Galvanized steel	1
512	Ball valve	Brass / P.T.F.E	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure Transmitter	-	1

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### EXTERNAL VIEW 2GPE COMPACT E-SPD+

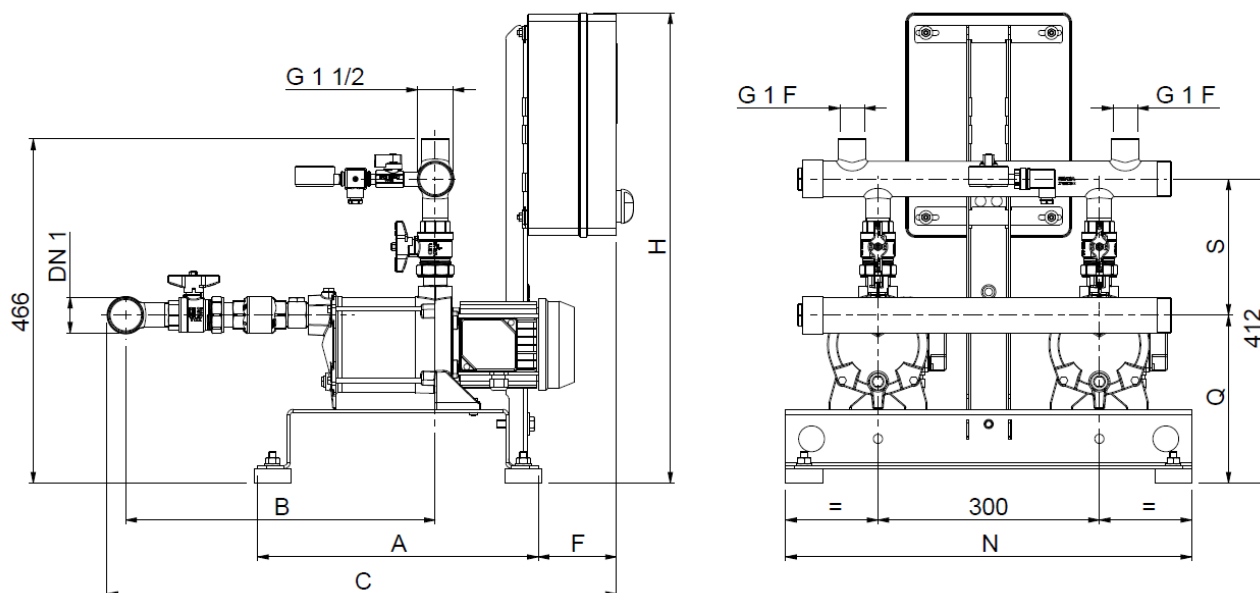


N°	PART NAME	MATERIAL	Quantity
110	Principal pump	-	2
114	Electric motor	-	2
150	Baseplate	Galvanized steel	1
156	Baseplate foot	SBR	4
210	Suction manifold	AISI 304	1
212	Union ball valve	Brass / P.T.F.E	2
221	Threaded female cap	AISI 304	1
310	Discharge manifold	AISI 304	1
312	Union ball valve	Brass / P.T.F.E	2
313	Check valve	Brass / NBR	2
321	Threaded female cap	AISI 304	1
410	E-SPD+	-	2
410-22	E-SPD+ adaptor	-	2
420	Protection panel	-	1
460	Control panel frame	Galvanized steel	1
512	Ball valve	Brass / P.T.F.E	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure Transmitter	-	2



### OVERALL DIMENSIONS 2GP BOOSTER SET

#### 2GP COMPACT

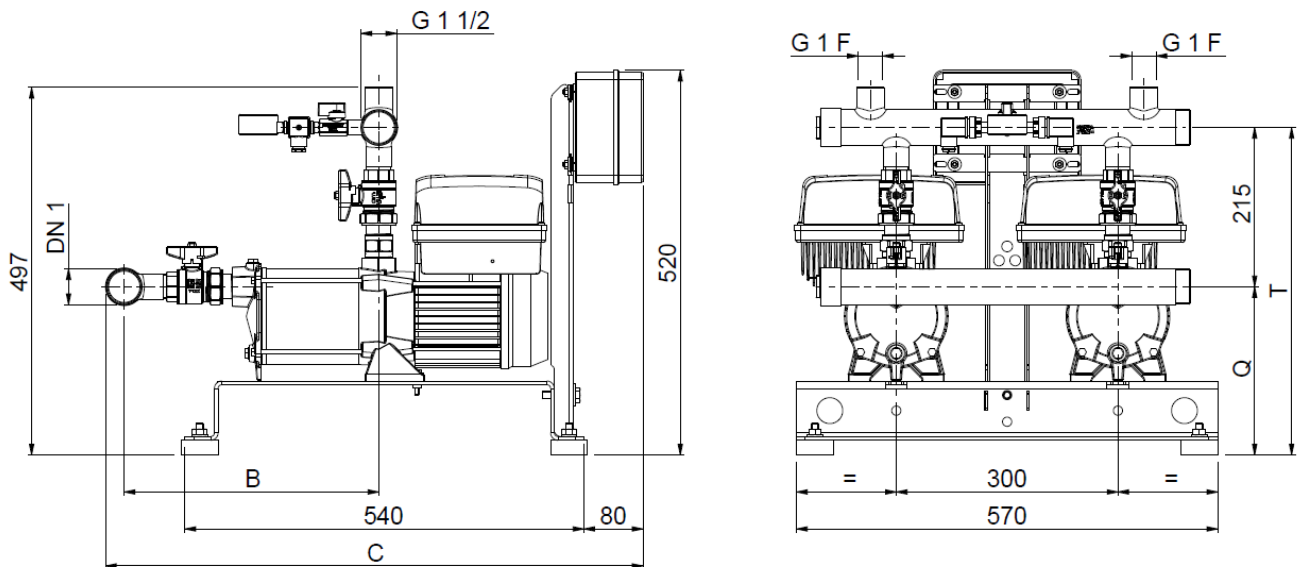


Booster Type	Dimensions [mm]												Weight [kg]	
	DN1	A	B	C		F		H		N	Q	S	1~	3~
				1~	3~	1~	3~	1~	3~					
2GP COMPACT A/8 (M)	G 1 1/2	380	420	660	690	75	105	630	635	550	230	185	51	53
2GP COMPACT A/10 (M)	G 1 1/2	380	445	685	715	75	105	630	635	550	230	185	59	61
2GP COMPACT A/12 (M)	G 1 1/2	380	470	710	740	75	105	630	635	550	230	185	61	65
2GP COMPACT A/15 (M)	G 1 1/2	540	495	875	905	75	105	630	635	570	230	185	64	66
2GP COMPACT B/12 (M)	G 2	380	450	700	730	75	105	630	635	550	225	190	62	66
2GP COMPACT B/15 (M)	G 2	380	480	725	755	75	105	630	635	550	225	190	64	66

Approximate dimensions ± 20mm.  
The dimensions may change without notice.

DIMENSIONS AND WEIGHT

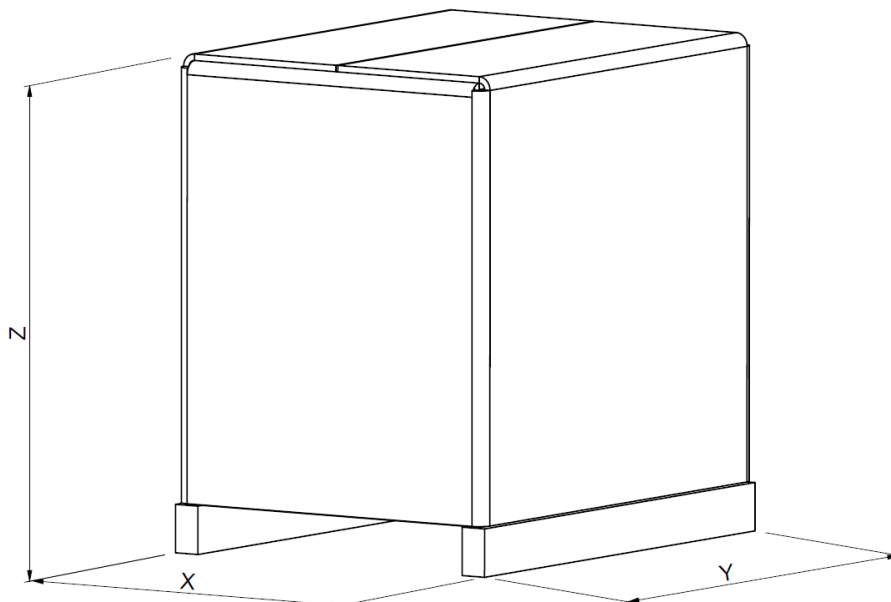
### 2GPE COMPACT E-SPD+



Booster Type	Dimensions [mm]					Weight [kg]
	DN1	B	C	Q	T	
2GPE COMPACT A/10 ESPM	G 1 1/2	345	725	230	445	60
2GPE COMPACT A/12 ESPM	G 1 1/2	370	755	230	445	63
2GPE COMPACT A/15 ESPM	G 1 1/2	395	780	230	445	65
2GPE COMPACT B/12 ESPM	G 2	335	725	225	440	63
2GPE COMPACT B/15 ESPM	G 2	360	750	225	440	64

Approximate dimensions  $\pm 20$ mm.  
The dimensions may change without notice.

### PACKING



	Booster type	Overall dimensions packing			Booster+packing Weight [kg]
		X	Y	Z	
2GP	2GP COMPACT A/8(M)	690	890	930	78
	2GP COMPACT A/10(M)				86
	2GP COMPACT A/12(M)				90
	2GP COMPACT A/15(M)				91
	2GP COMPACT B/12(M)				91
	2GP COMPACT B/15(M)				91
2GPE E-SPD+	2GPE COMPACT A/10 ESPM	690	890	780	87
	2GPE COMPACT A/12 ESPM				90
	2GPE COMPACT A/15 ESPM				92
	2GPE COMPACT B/12 ESPM				90
	2GPE COMPACT B/15 ESPM				81

The dimensions may change without notice.

### CONTROL PANEL FIXED SPEED

#### 2EP-E SPECIFICATION

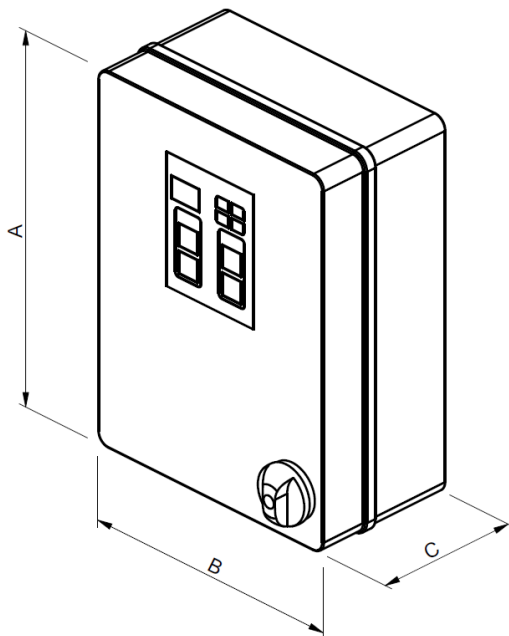
- **SERIES 2EP-E M UA (single-phase power output)**
- **SERIES 2EP-E T UA (three-phase power output)**

Electrical panel (protection and control) for two electropumps. Manual or automatic operation through pressure transmitter. The panel is configured to start the two pumps alternately in stand-by to pressure transmitter. 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 II)		



**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

The dimensions may change without notice.

**2EP-E T UA MODELS TABLE**

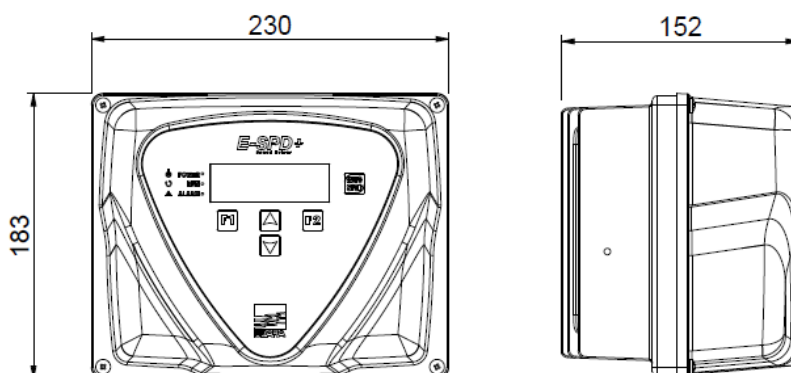
Model	Single pump Power [kW]	I Calibration [A]	Motor fuse	Dimensions AxBxC [mm]	Weight [kg]
2EP-E 1,1 T	1,1	2x3.5	4A am (10x38)	300 x 220 x 120	3,5

The dimensions may change without notice.

### CONTROL PANEL VARIABLE SPEED E-SPD+ SPECIFICATION

On board 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 ÷ 40 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				
Pressure sensor fault				
Directives	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS II)			



The dimensions may change without notice.

### SP (EFC and MFC) SPECIFICATION

The control panels SP EFC/MFC series inverters modulate the operation of electropumps in response to control by the pressure transmitter (transducer measuring flow or other external signal 4-20 mA), regulating the speed of the electropumps to keep system demand constant. If the electronic controller or pressure transmitter fails, a system of pressure switches controls the pumps directly (if present).

#### VERSION

- “EFC”: Control panel for two or more electric pumps, with a single inverter with pump exchange
- “MFC”: Control panel for two or more electric pumps, with an inverter for each individual electropump

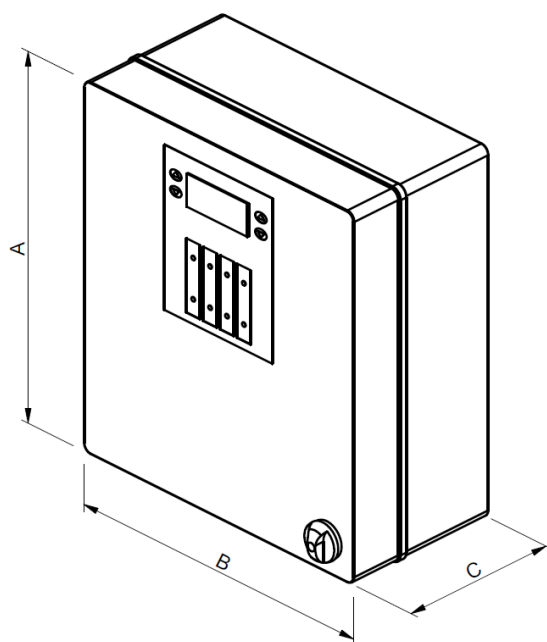
EFC / MFC		
<b>Power</b>	Power Voltage	Three-phase 400 V
	N° phases	Three phase without the use of neutral
	Frecuence	50/60Hz
	Pump power	From 1.5kW up to 30kW
	Protection degree	IP55 up to 2.2kW IP44 3kW and above
	Ambient Temperature	-10°C + 40°C
	Pressurisation units	2 or 3 pumps
<b>Directives</b>	2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS)	

#### Single inverter with exchange pump ( SP EFC )

Panel type	Pump motor power (Three-phase)	Starting (Emergency / fixed speed pumps)	Option
2/3 pumps	1.5÷7.5 kW	Direct	Inverter pump Exchange
	11÷30kW	Star-Delta	

#### Multi-inverter: one inverter for each pump ( SP MFC )

Panel type	Pump motor power (Three-phase)	Starting (Emergency / fixed speed pumps)
2/3 pumps	1.5 - 7,5 kW	Inverter ramp
	11 - 30 KW	Inverter ramp



### 2SP EFC MODELS TABLE

Model	Motor power [kW]	Current [A]	Dimensions A-B-C [mm]	Weight [Kg]
2SP EFC 1,5T-2	2x1.5	2x3,7	450x400x200	25

The dimensions may change without notice.

### 2SP MFC MODELS TABLE

Model	Motor power [kW]	Current [A]	Dimensions A-B-C [mm]	Weight [Kg]
2SP EFC 1,5T-2	2x1.5	2x3.7	500x400x200	28

The dimensions may change without notice.

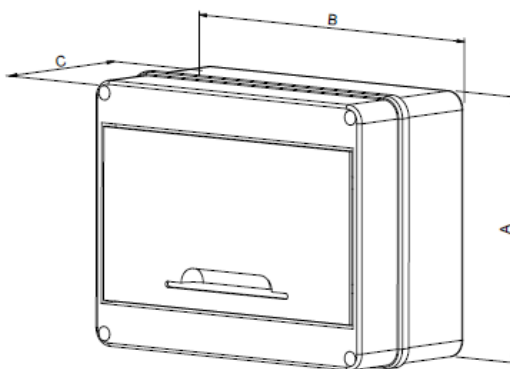


### PROTECTION PANEL SPECIFICATION

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 II)		



Model	N° Pumps	Power [kW]	Dimensions A-B-C [mm]	Max Current [A]
PROT.IP65 2P. 3M 20A NJ	2	2x3	160x200x90	2x20
PROT.IP65 2P. 4T 16A J		2x4	200x250x110	2x16

The dimensions may change without notice.



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