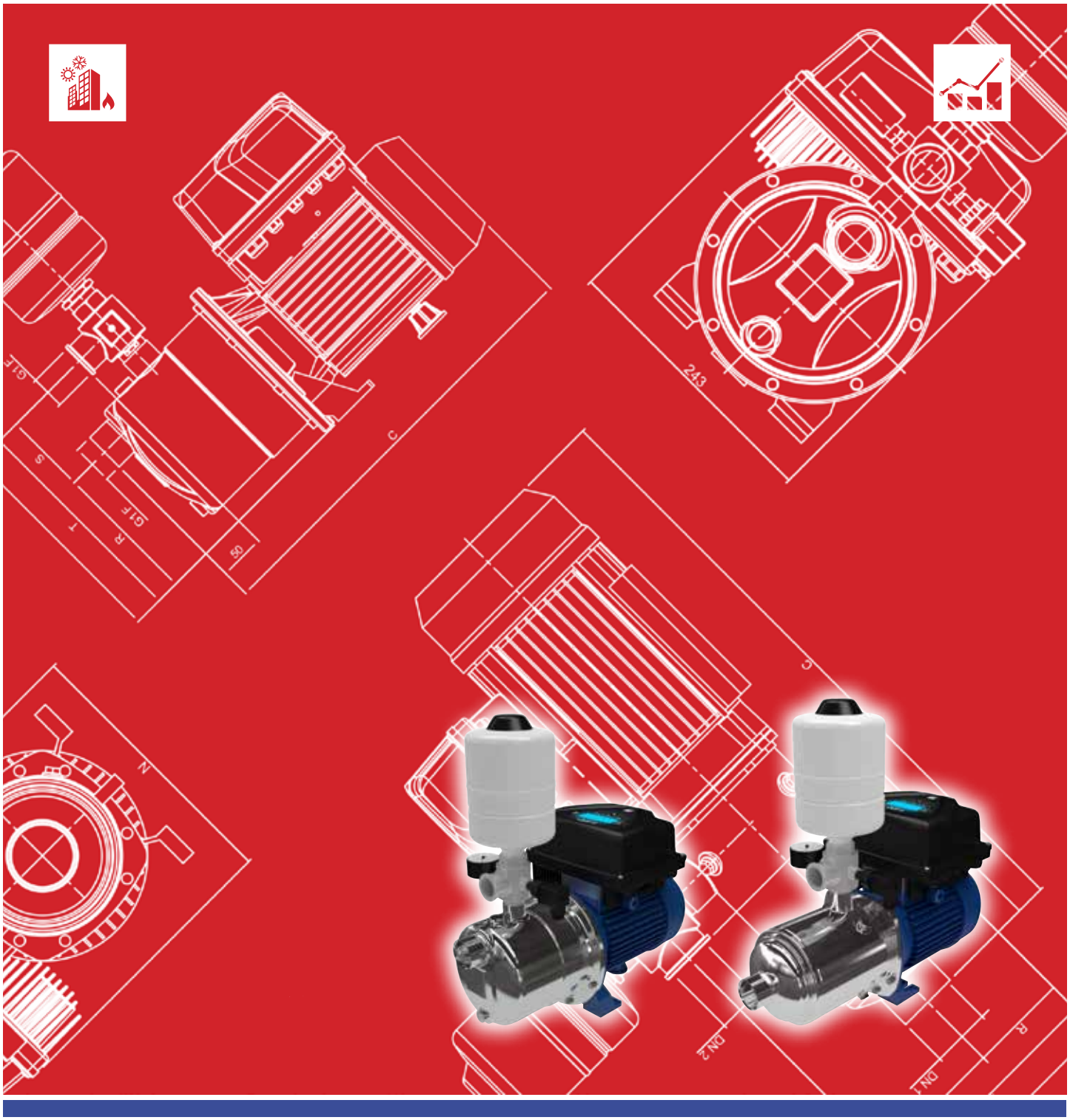
Looking ahead,
going beyond expectations

Ahead Beyond

EBARA

1GPE

Data Book 50Hz



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CONTENTS

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 GPE pressurisation units** are automatic systems with a pump 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. GPE units are equipped with INVERTER and controlled by pressure transmitter. They are also equipped for connection to expansions vessels.

TYPICAL APPLICATIONS

INDUSTRY	BUILDING SERVICE	WATER SUPPLY
		

OPERATING CONDITIONS

EBARA 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

- Pump direction of rotation
- Mechanical testing of moving parts and running noise

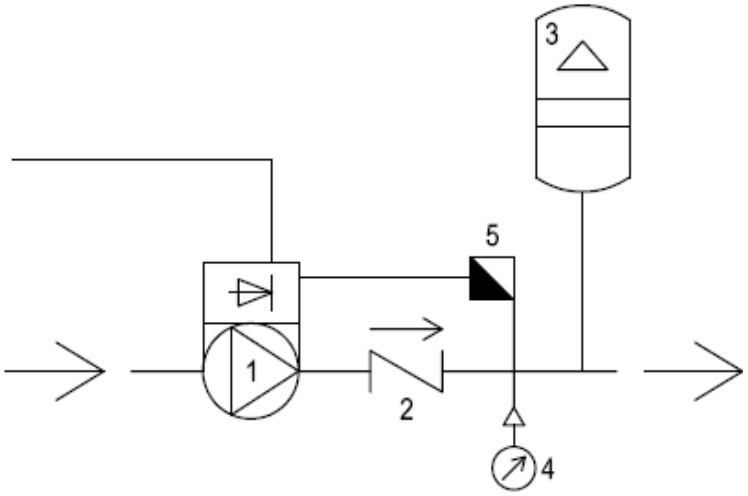
ELECTRICAL TESTS ON THE PUMP

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

Principle of Operation of 1GPE Pressurisation UNITS with E-SPD+

1GPE units with E-SPD+ are designed to operate with pump controlled by an INVERTER installed on board its motor. The system is controlled by E-SPD+ in relation to the reference signal supply by a pressure transmitters (4 - 20 mA passive). As the system pressure varies, the pump varies its rotary speed to restore it to the setpoint.

1GPE PRESSURISATION UNIT WATER CIRCUIT DIAGRAM



Supply system upstream from unit at the discretion of the customer of the system designer

1 – Pump with inverter

2 – Check Valve

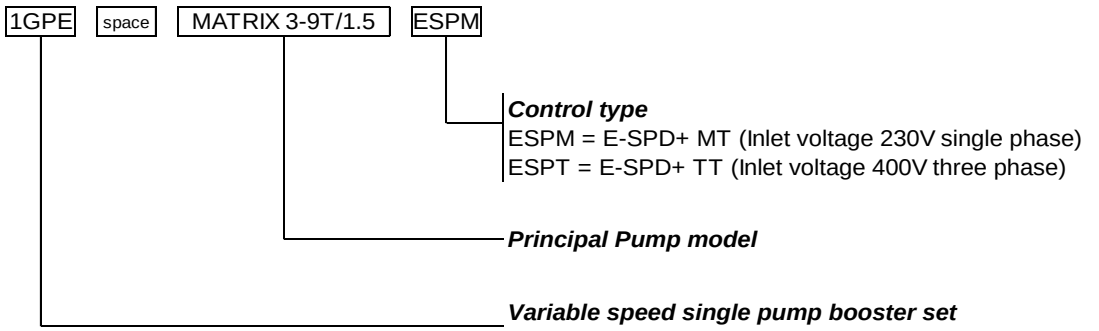
3 – Pressure tank

4 – Pressure gauge

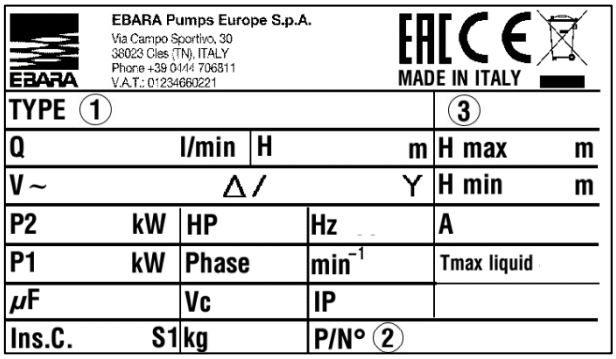
5 – Pressure Transmitter

TYPE KEY

1GPE(.)



NAME PLATE



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

PRODUCT SPECIFICATIONS
HYDRAULIC COMPONENTS AND CONTROL

BOOSTER SET					
MATRIX					
Operating range	Version	3	5	10	18
	Maximum working pressure	10 bar			
	Liquid temperature range	0 ÷ 80°C			
	Ambient operating temperature (no higher than 1000 m above sea level)	0÷40°C			
Hydraulic components	5-Way Check Valve	AISI 304			
	Membrane vessel	-			
Control	Pressure gauge	M3A-ABS 50/FR / plastic-copper alloy			
	Pressure transmitter	EN 10088-1.4301 (AISI 304) / 1.4404 (AISI 316L)			

BOOSTER SET			
JEX			
Operating range	Version	120	150
	Nominal flow rate (m3/h)	4.2	4.5
	Maximum working pressure	6 bar	
	Liquid temperature range	5 ÷ 45°C	
	Ambient operating temperature (no higher than 1000 m above sea level)	0÷40°C	
Hydraulic components	5-Way Check Valve	AISI 304	
	Membrane vessel	-	
Control	Pressure gauge	M3A-ABS 50/FR / plastic-copper alloy	
	Pressure transmitter	EN 10088-1.4301 (AISI 304) / 1.4404 (AISI 316L)	

INVERTER UNIT

1GPE MATRIX						
MATRIX						
Operating range	Version		3	5	10	18
Control panel	E-SPD+	ESPDM single-phase supply inverter (up to 2.2 kW)	●	●	●	-
		ESPDT three-phase supply inverter	●	●	●	●

● : Standard ○ : Optional

1GPE JEX				
JEX				
Operating range	Version		120	150
	Nominal flow rate (m3/h)	Single pump	4.2	4.5
Control panel	E-SPD+	ESPDM single-phase supply inverter (up to 2.2 kW)	●	●
		ESPDT three-phase supply inverter	●	●

● : Standard ○ : Optional

TECHNICAL PUMP DATA

PUMP					
MATRIX					
Operating range	Version	3	5	10	18
	Maximum working pressure	1 MPa (10 bar)			
	Liquid temperature range	-15°C to +85°C			
Liquid handled	Liquid type	Water, moderate aggressive solutions, glycol solutions, moderate viscous fluids			
Key components material	Casing	EN 1.4301 (AISI 304)			
	Impeller				
	Casing cover				
	Shaft seal	Ceramic/Carbon/EPDM			
	Shaft	EN 1.4301 (AISI 304) wet extension			
	Bracket	EN AB-AlSi11Cu2(Fe) (Die cast Aluminium)			
Pipe connection	Suction	G 1”	G 1” ¼	G 1” ½	G 2”
		UNI ISO 228			
	Discharge	G 1”		G 1” ¼	G 1” ½
		UNI ISO 228			

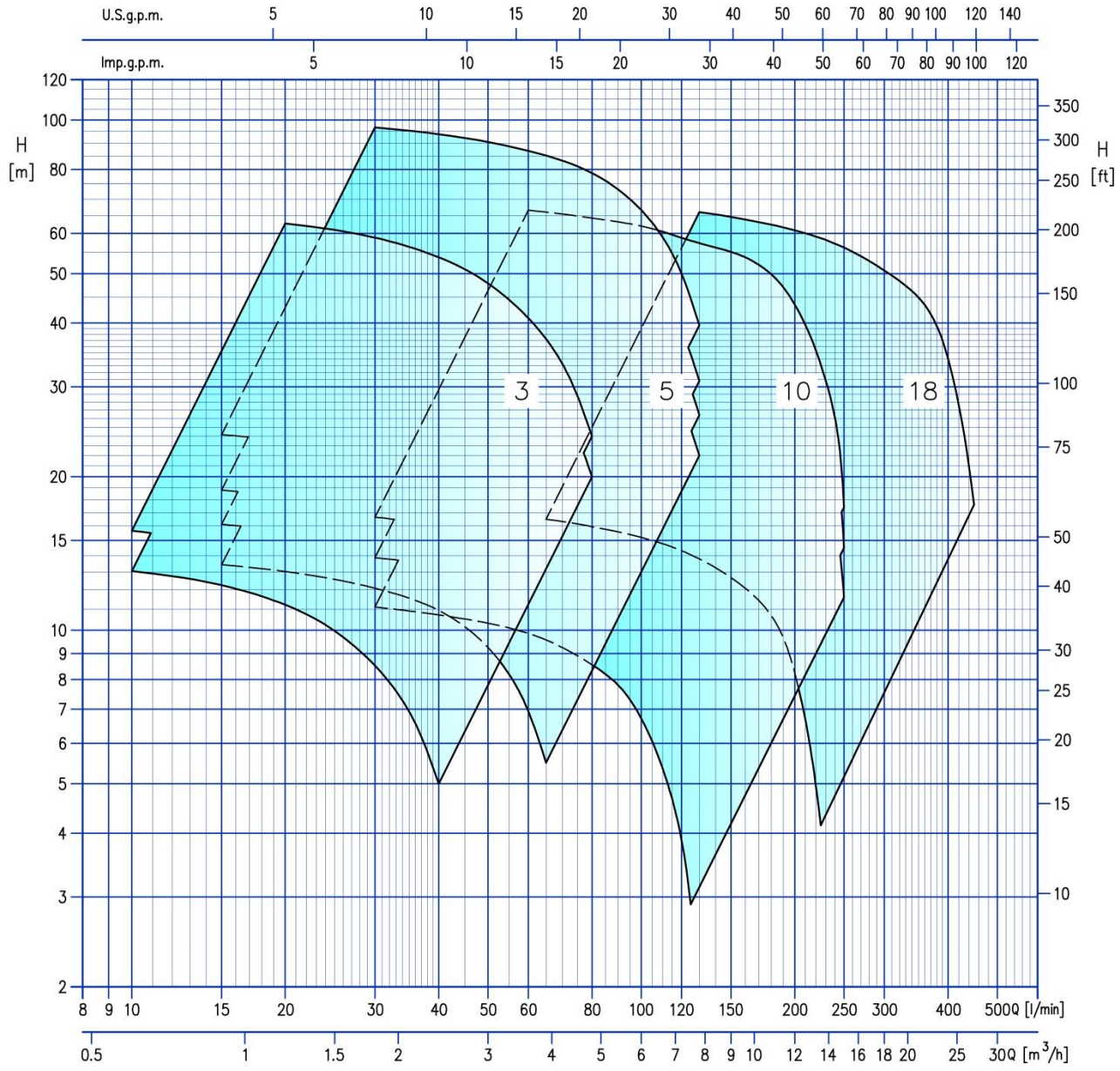
PUMP					
JEX					
Operating range	Version	3	5	10	18
	Maximum working pressure	0.6 MPa (6 bar)			
	Liquid temperature range	+5°C to +45°C			
Liquid handled	Liquid type	Clean water			
Key components material	Casing	EN 1.4301 (AISI 304)			
	Impeller				
	Casing cover				
	Shaft seal	Ceramic/Carbon/NBR			
	Shaft	AISI 303 Wet extension			
	Bracket	Aluminum			
Pipe connection	Suction	G 1” ¼			
		UNI ISO 228			
	Discharge	G 1”			
		UNI ISO 228			

TECHNICAL MOTOR DATA

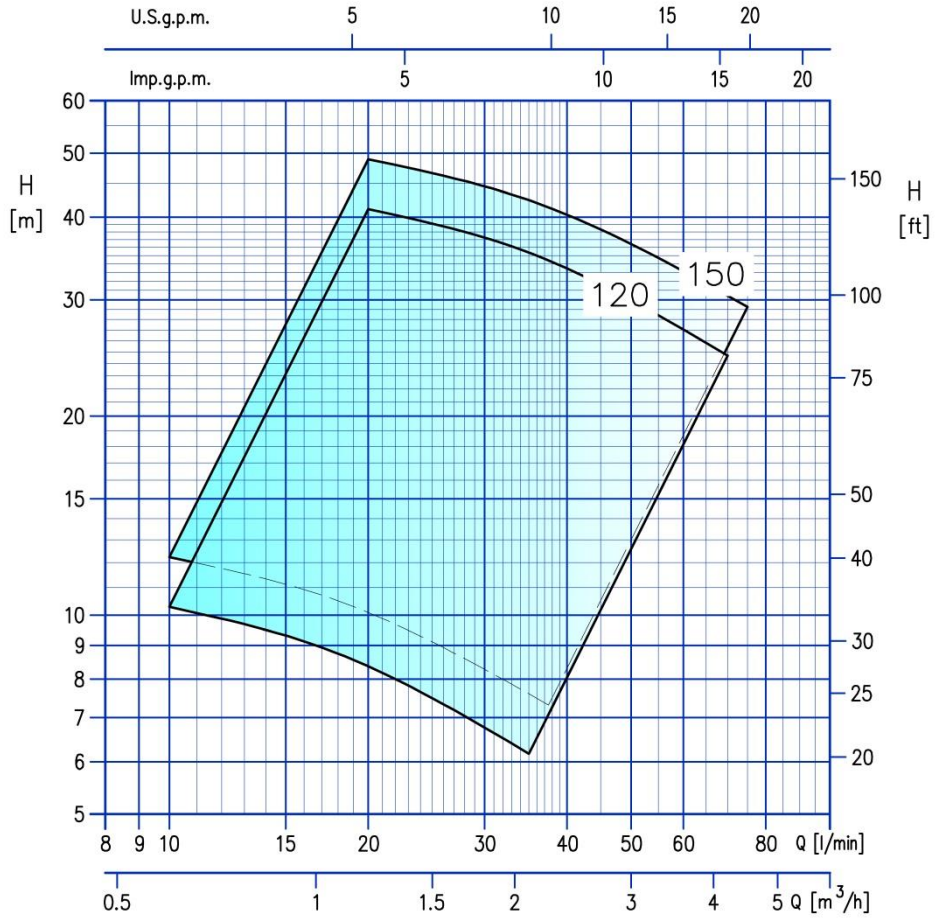
MOTOR		
MATRIX		
Power source	Frequency	50 Hz
	Phase	Three-phase
	Rotation speed	2850 min-1
	Power rating	0.65 ÷ 4.0 kW
		0.9 ÷ 5.5 HP
	Voltage	230/400 ± 10%
Type	Type	Electric - TEFC
	Efficiency level	IE3
	N° of poles	2
	Protection degree	IP 55
	Insulation class	F
Others	Capacitor	-
	Overload protection	Provided by the user
	Casing Material	Aluminium
	Motor support	Aluminium

MOTOR		
JEX		
Power source	Frequency	50 Hz
	Phase	Three-phase
	Rotation speed	2800 min-1
	Power rating	0.6 ÷ 1.1 kW
		0.8 ÷ 1.5 HP
	Voltage	230/400 ± 10%
Type	Type	Electric - TEFC
	Efficiency level	IE3
	N° of poles	2
	Protection degree	IP 54 IP 55 (on request)
	Insulation class	F
Others	Capacitor	-
	Overload protection	Provided by the user
	Casing Material	Aluminium
	Base material / Motor support	Aluminium

PERFORMANCE RANGE
RESEAU 1GPE MATRIX



RESEAU 1GPE JEX



CURVE SPECIFICATION 1GPE

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 ν = 1 mm2/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.

Symbols explanation:

Q = volume flow rate
H = total head
P2 = pump power input (shaft power)
η = pump efficiency
NPSH = net positive suction head required by the pump

Pressure drops of the unit's fittings are not considered

SELECTION CHART

1GPE MATRIX

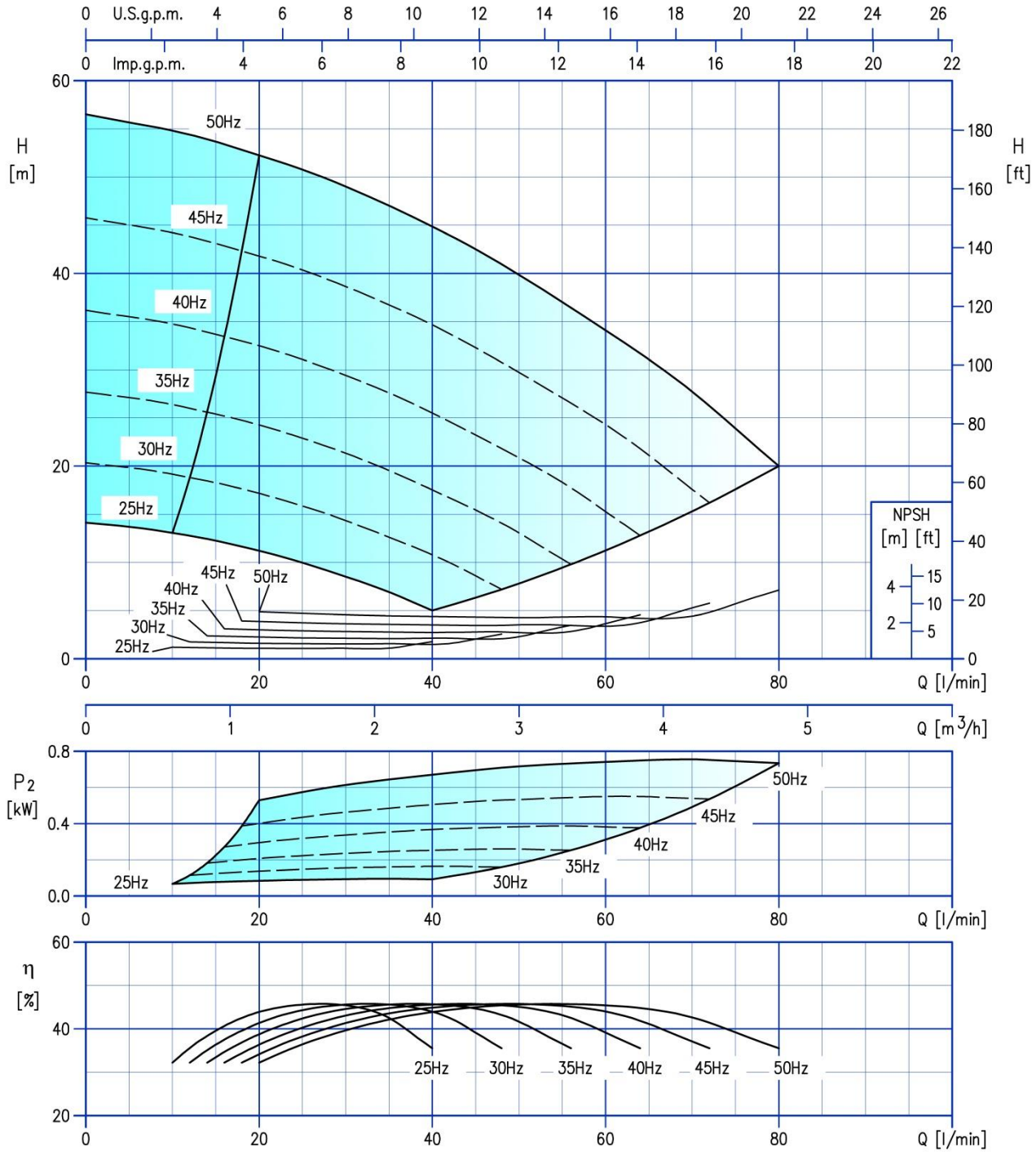
Model	Motor		Maximum working pressure (MPa)	Q=Capacity														
				l/min 0	20	30	45	60	80	100	130	160	200	250	300	350	400	450
	kW	HP		m³/h 0	1.2	1.8	2.7	3.6	4.8	6.0	7.8	9.6	12.0	15.0	18.0	21.0	24.0	27.0
				H=Total manometric head in meters														
1GPE MATRIX 3-5/0.75	0.75	1.0	1.0	56.5	52.5	49.0	42.5	34.0	20.0	-	-	-	-	-	-	-	-	-
1GPE MATRIX 3-6/0.9	0.9	1.2		68.0	62.5	58.5	51.0	41.0	24.0	-	-	-	-	-	-	-	-	-
1GPE MATRIX 5-5/1.3	1.3	1.8		57.5	-	54.0	51.0	48.5	43.5	36.7	22.0	-	-	-	-	-	-	-
1GPE MATRIX 5-6/1.3	1.3	1.8		69.0	-	64.5	61.5	58.0	52.0	44.0	26.4	-	-	-	-	-	-	-
1GPE MATRIX 5-7/1.5	1.5	2.0		80.5	-	75.5	72.0	67.5	61.0	51.5	30.8	-	-	-	-	-	-	-
1GPE MATRIX 5-9/2.2	2.2	3.0		104.0	-	97.0	92.0	87.0	78.0	66.0	39.6	-	-	-	-	-	-	-
1GPE MATRIX 10-4/1.5	1.5	2	0.8	48.0	-	-	-	44.5	43.0	41.0	38.1	34.0	25.7	11.6	-	-	-	-
1GPE MATRIX 10-5/2.2	2.2	3.0		60.0	-	-	-	55.5	53.5	51.5	47.5	42.5	32.1	14.5	-	-	-	-
1GPE MATRIX 10-6/2.2	2.2	3.0		72.0	-	-	-	66.5	64.5	62.0	57.0	51.0	38.5	17.4	-	-	-	-
1GPE MATRIX 18-6/4	4.0	5.5		72.5	-	-	-	-	-	-	66.0	64.0	60.5	56.0	50.5	42.5	30.9	15.6

1GPE JEX

Model	Motor		Maximum working pressure (MPa)	Q=Capacity							
				l/min 0	20	30	40	50	60	70	75
	kW	HP		m³/h 0	1.2	1.8	2.4	3.0	3.6	4.2	4.5
				H=Total manometric head in meters							
1GPE JEX 120	0.88	1.2	0.6	50.0	41.0	37.0	34.0	30.5	27.5	24.5	-
1GPE JEX 150	1.1	1.5		59.0	49.0	44.5	40.5	37.0	34.0	31.0	29.5

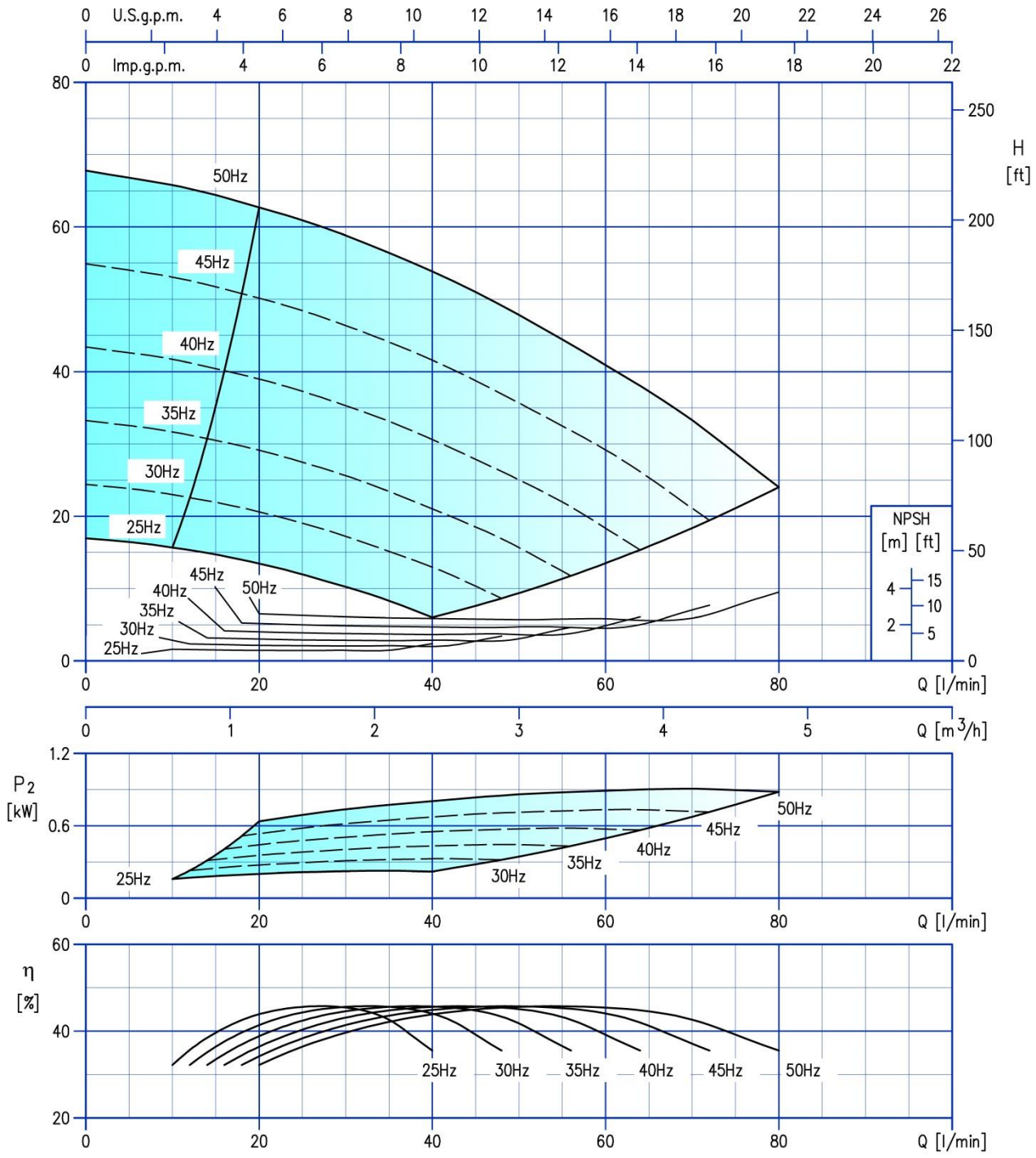
PERFORMANCE CURVE 1GPE

1GPE MATRIX 3-5T/0.75



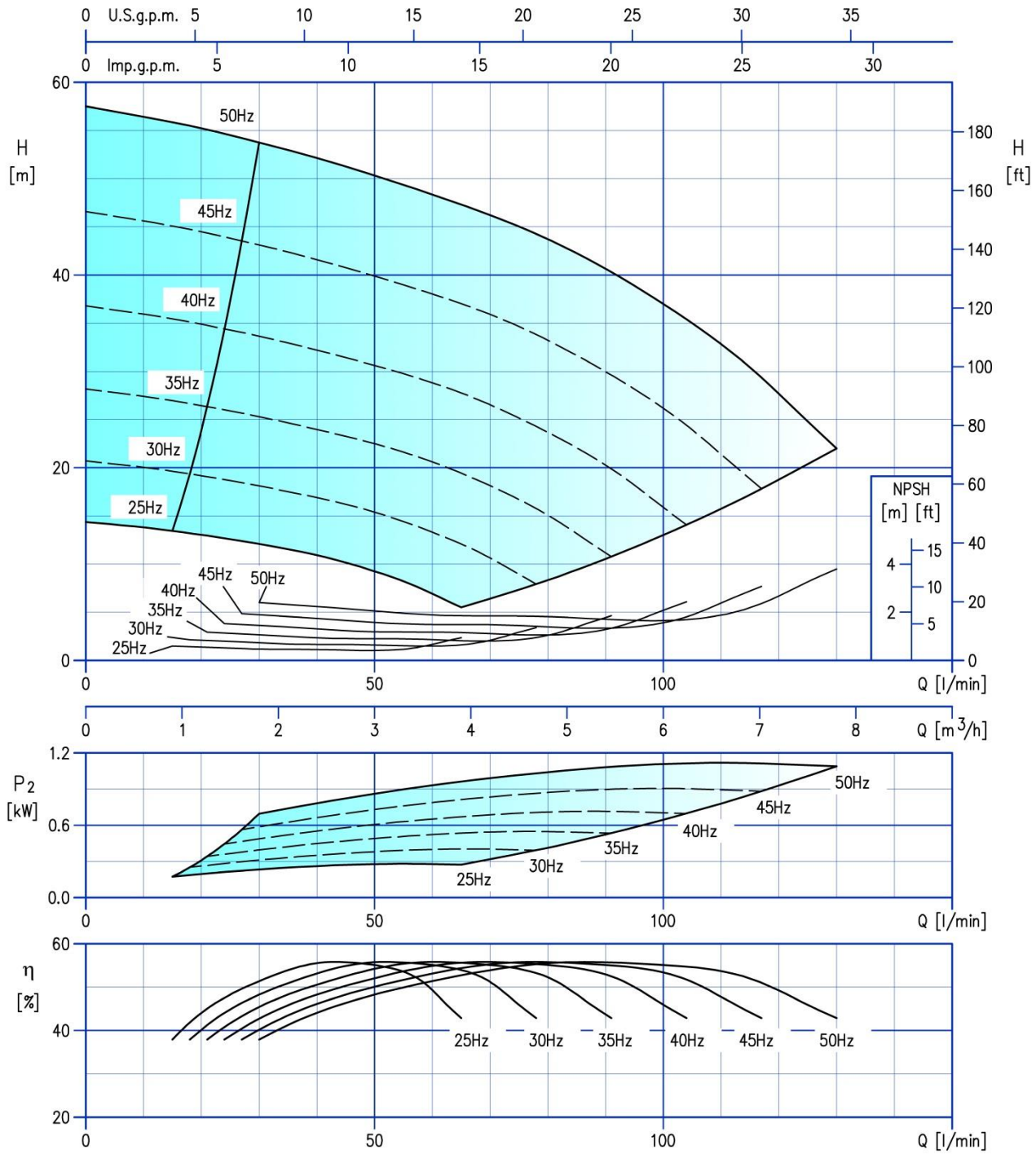
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 3-6T/0.9



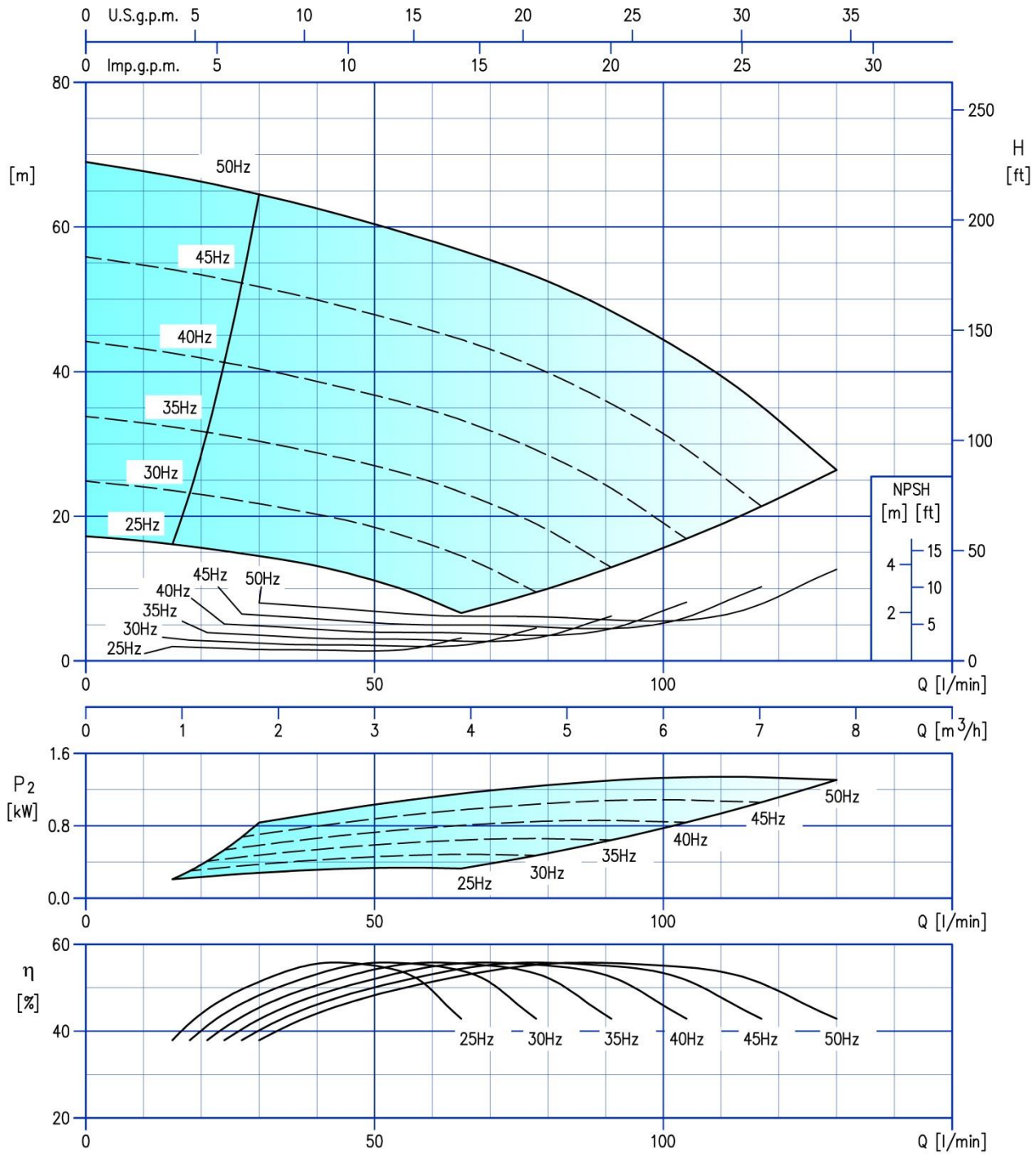
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 5-5T/1.3



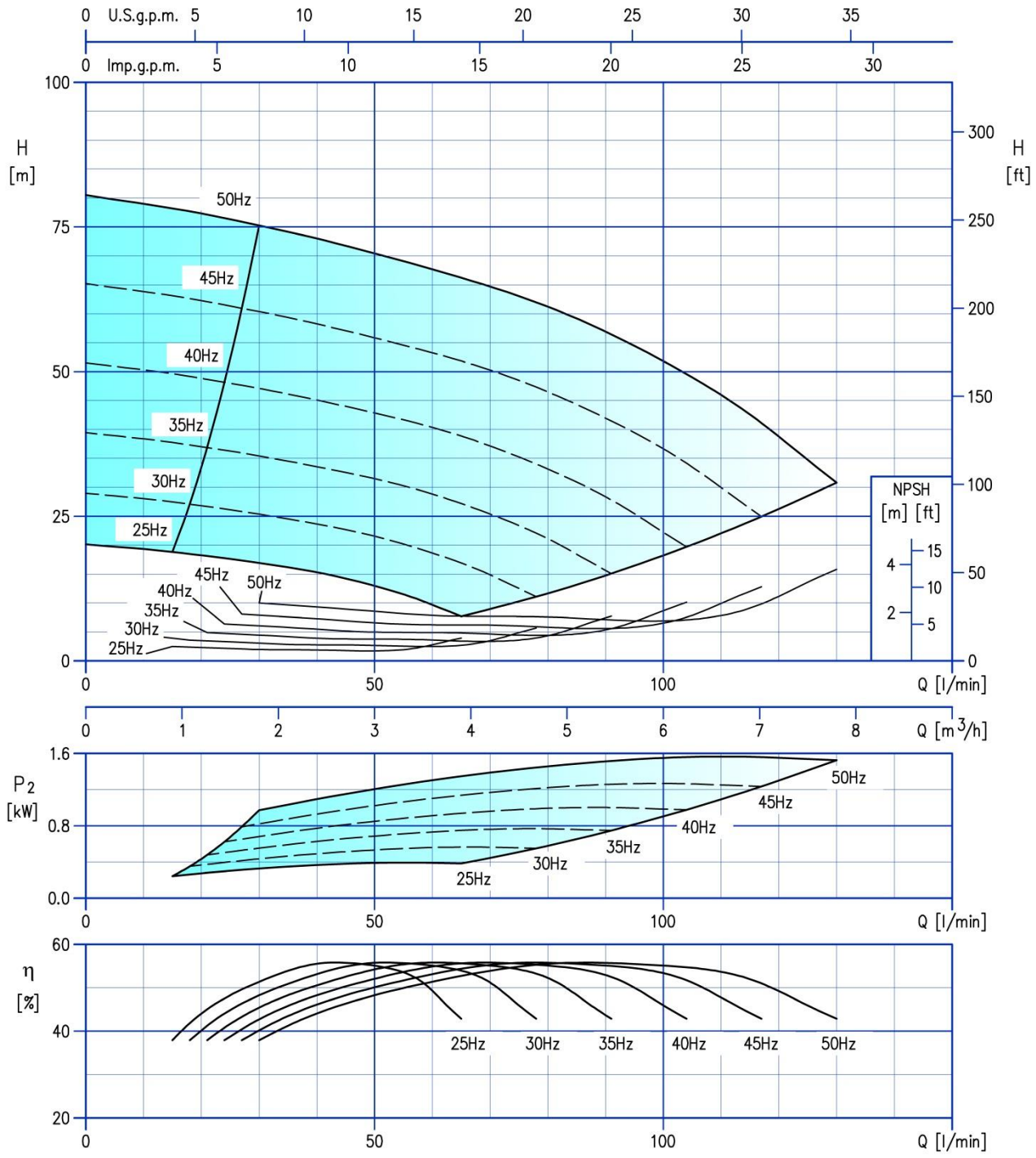
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 5-6T/1.3



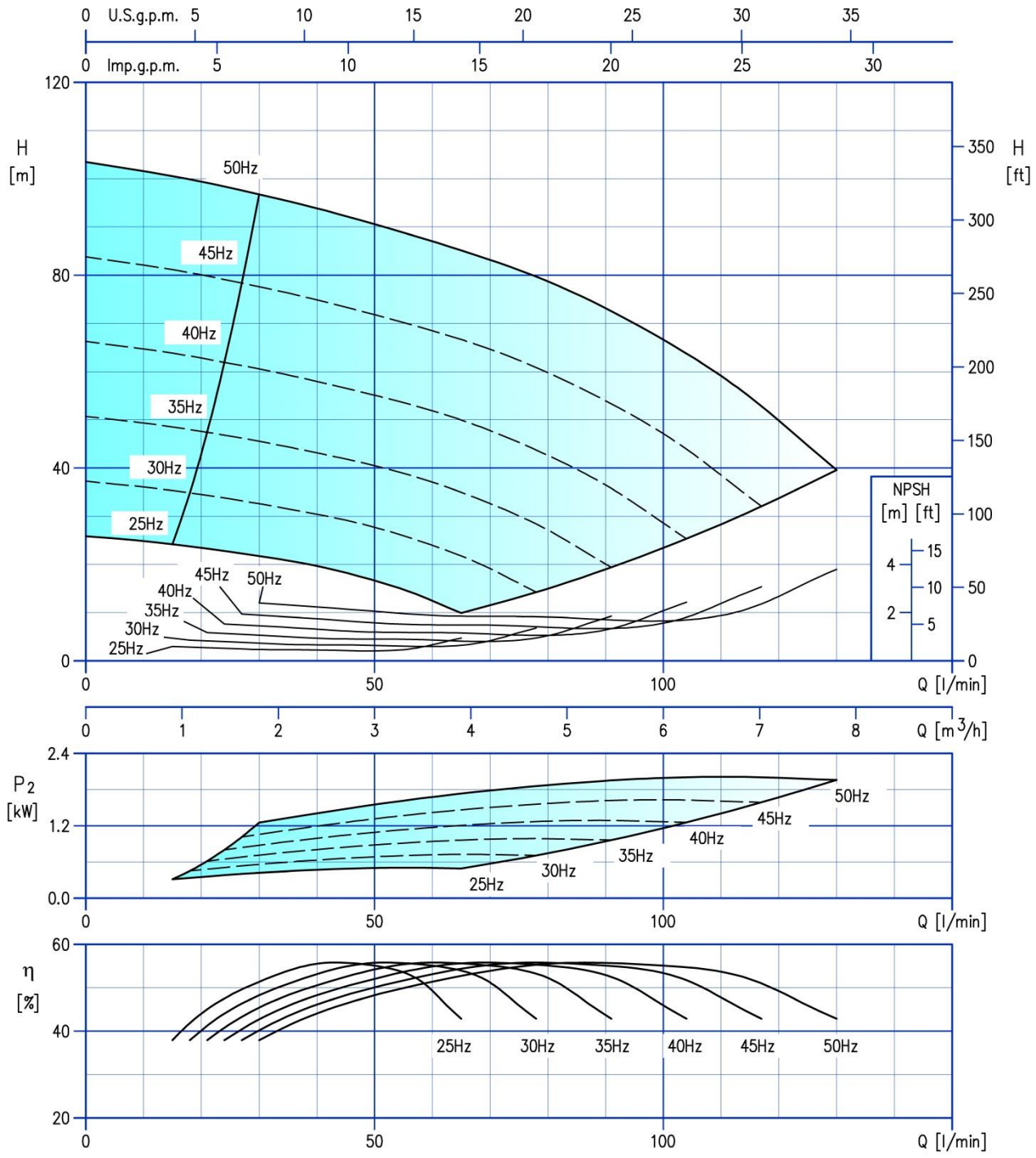
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 5-7T/1.5



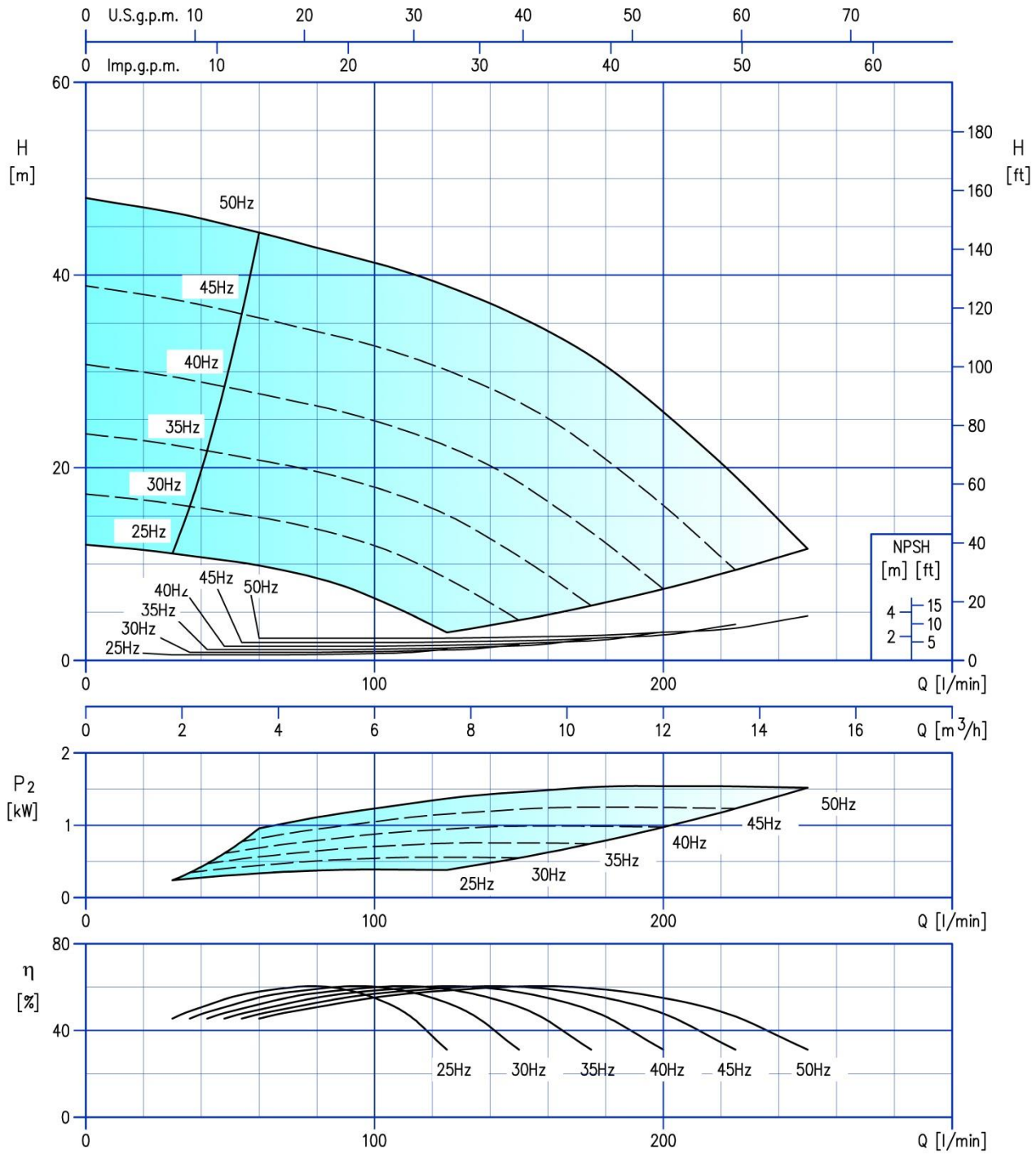
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 5-9T/2.2



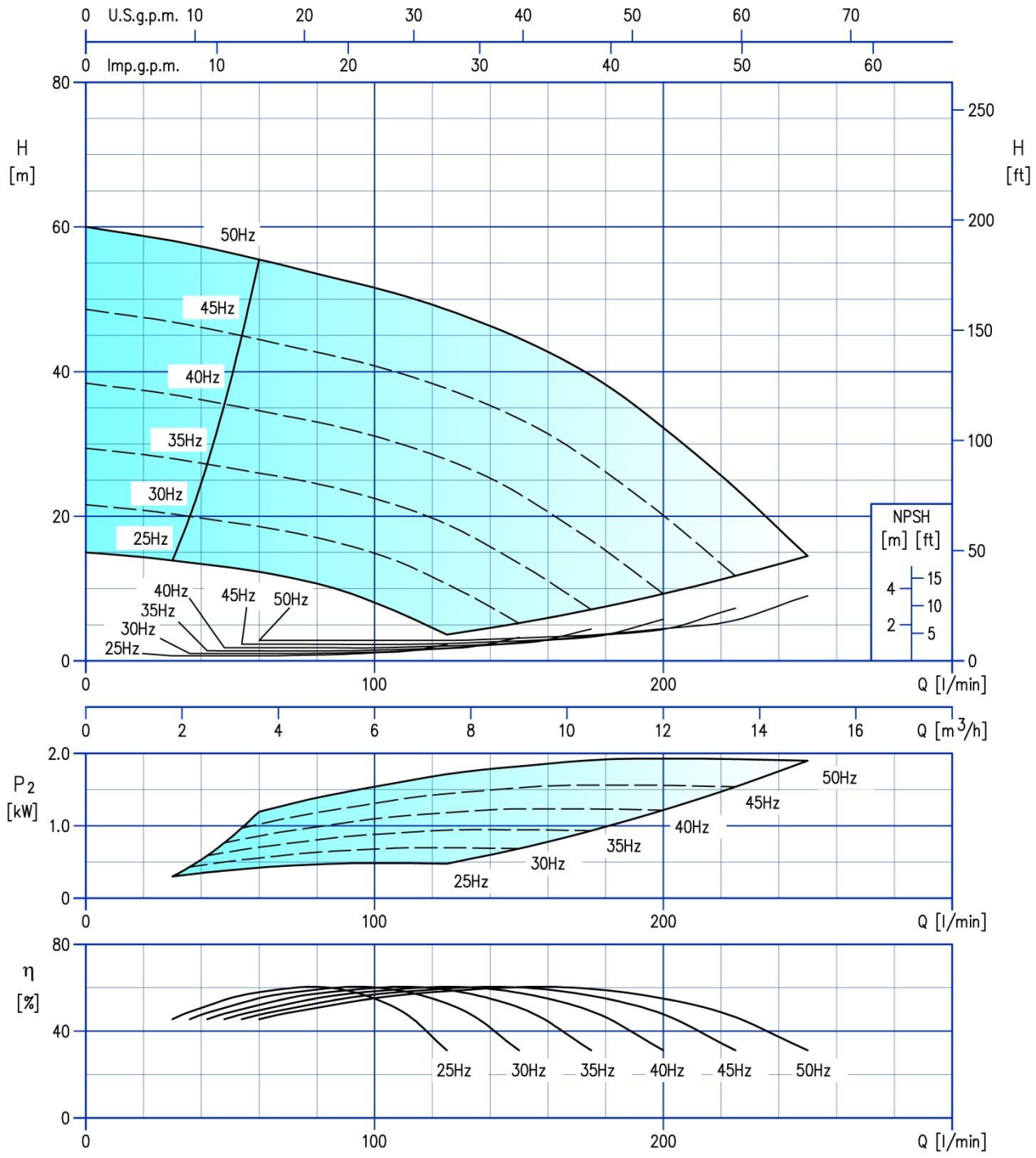
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 10-4T/1.5



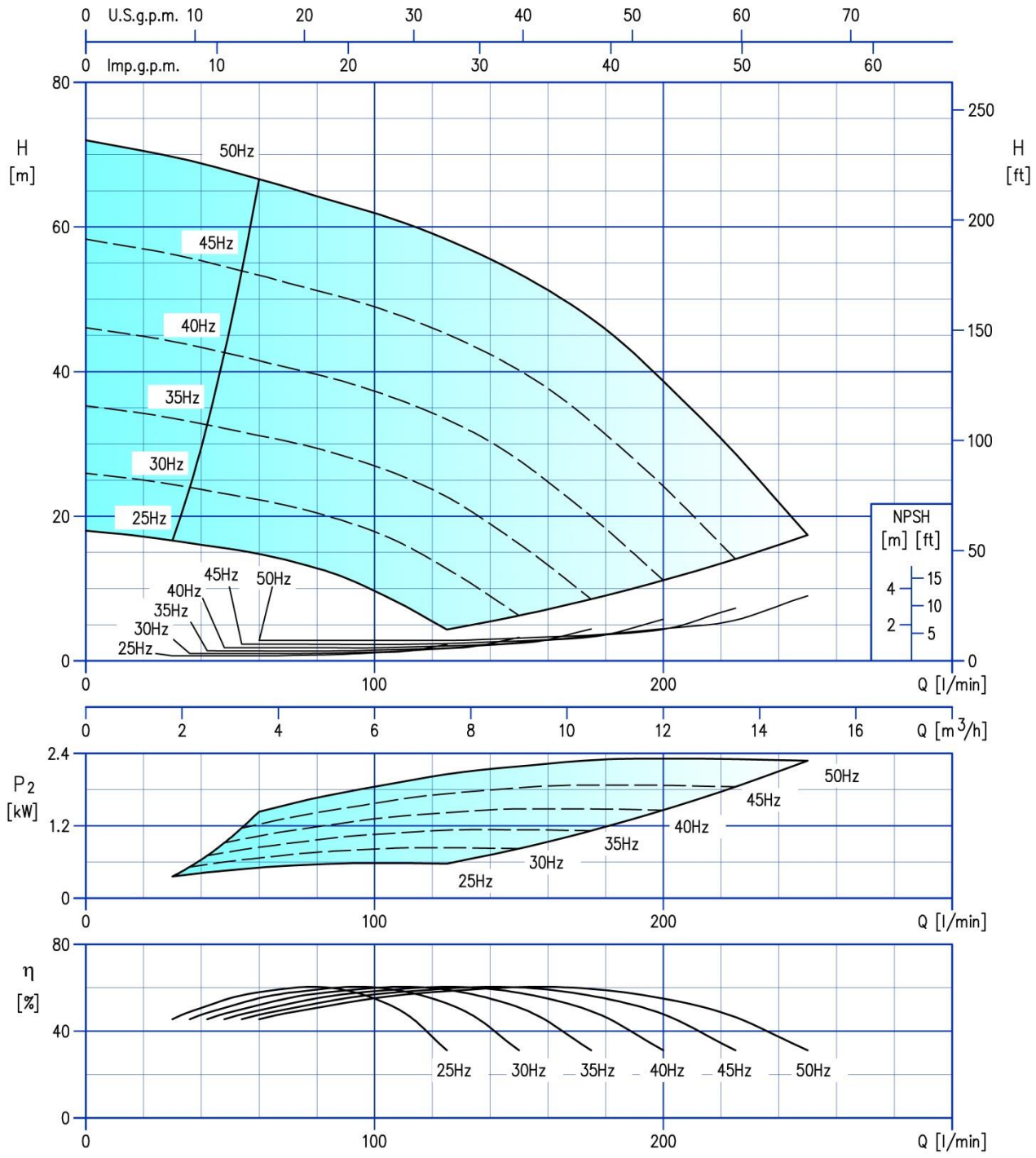
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 10-5T/2.2



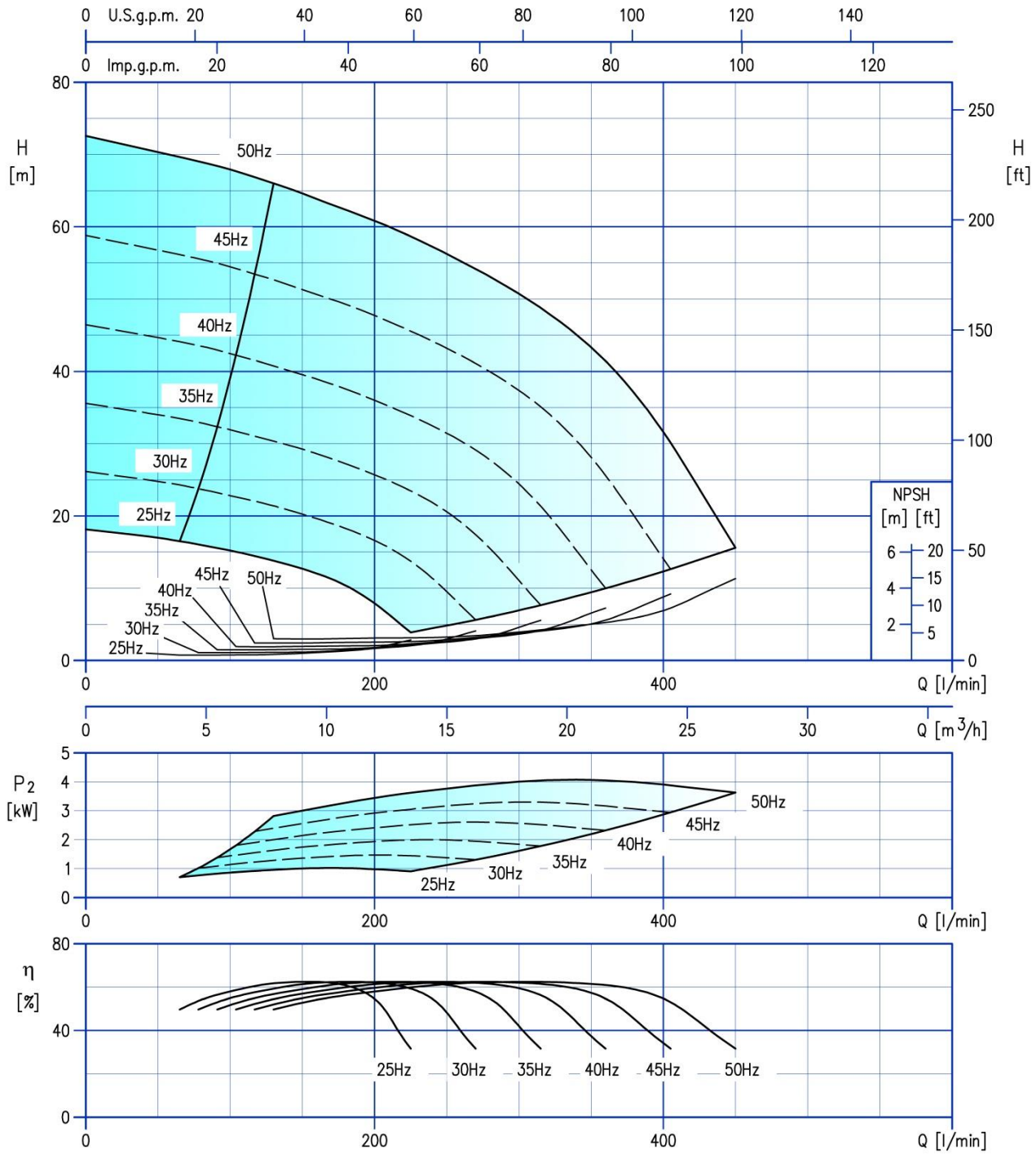
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 10-6T/2.2



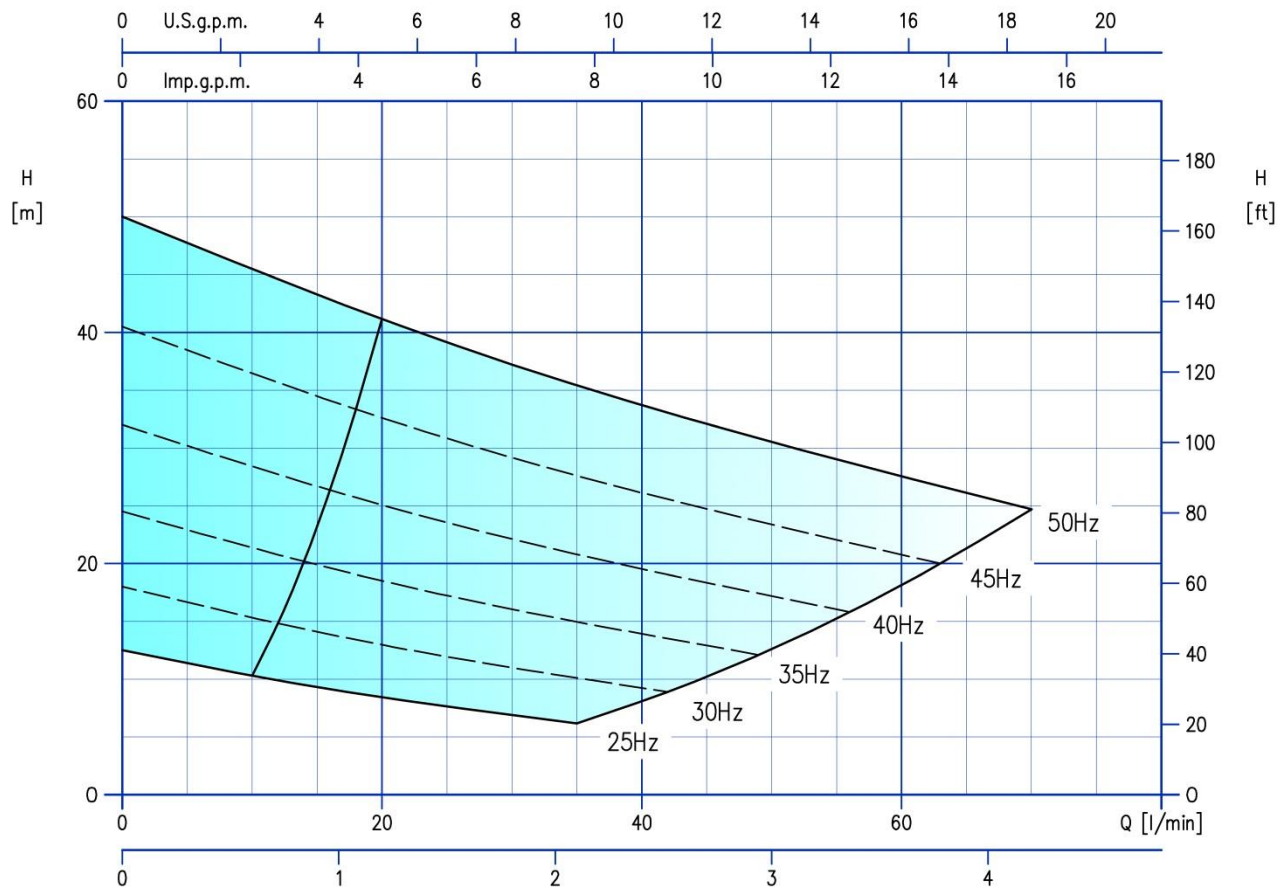
Test standard: ISO 9906: 2012 - Grade 3B

1GPE MATRIX 18-6T/4



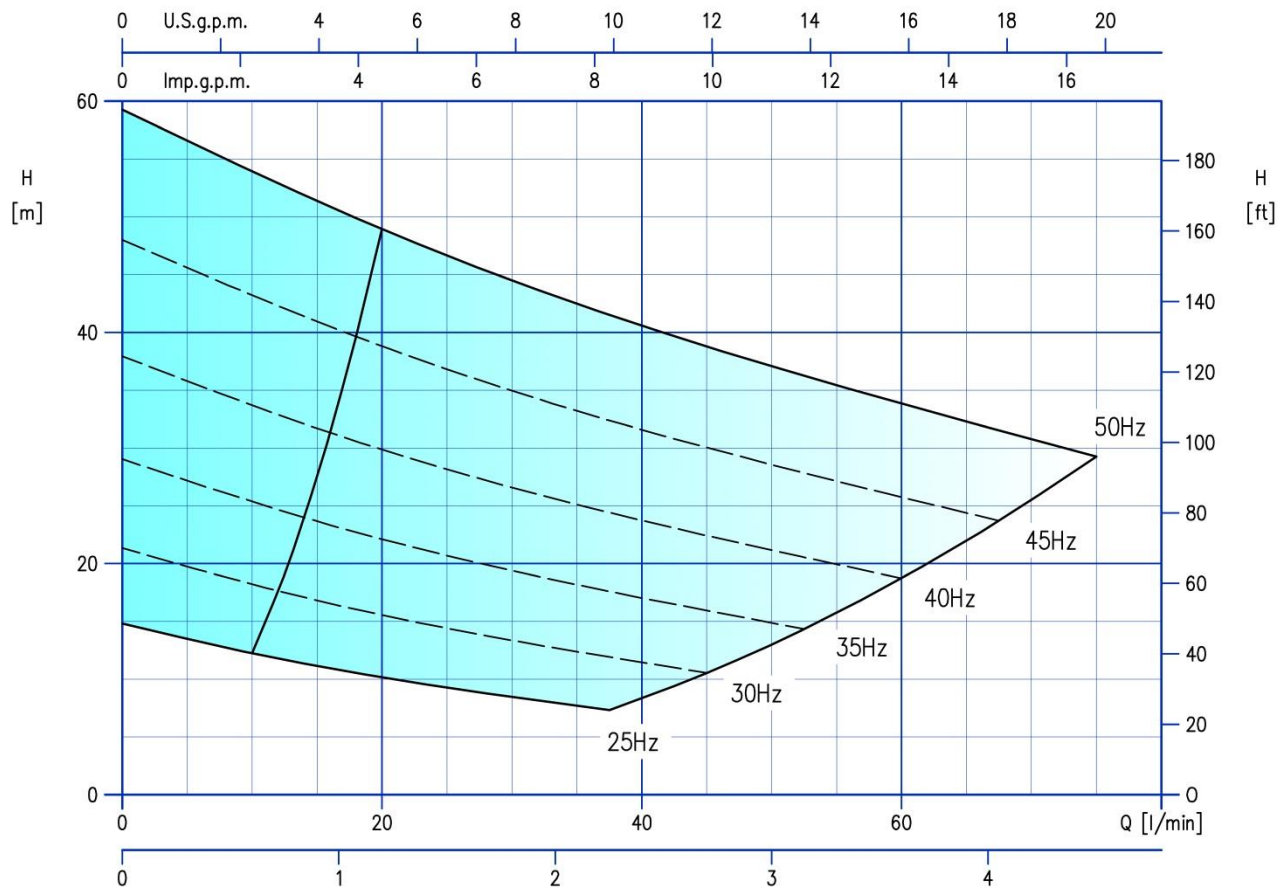
Test standard: ISO 9906: 2012 - Grade 3B

1GPE JEX 120



Test standard: ISO 9906: 2012 - Grade 3B

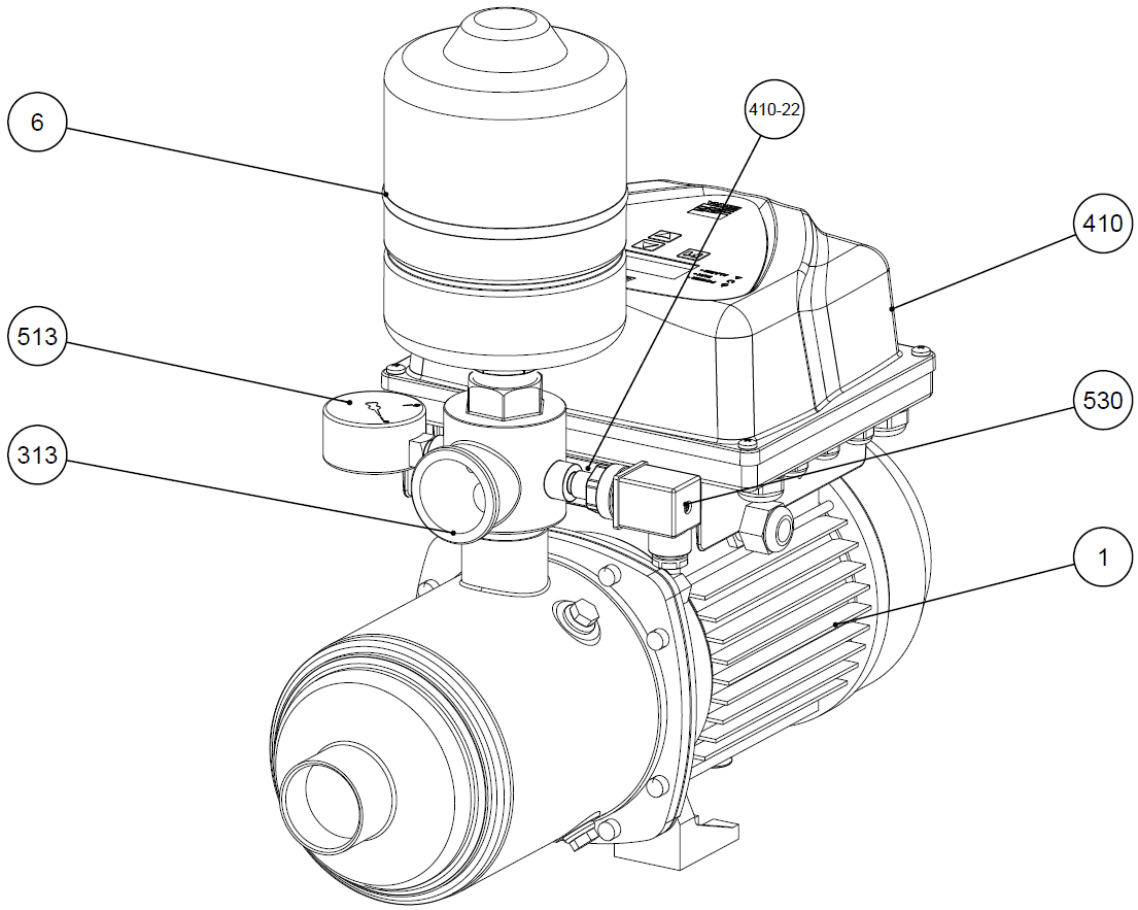
1GPE JEX 150



Test standard: ISO 9906: 2012 - Grade 3B

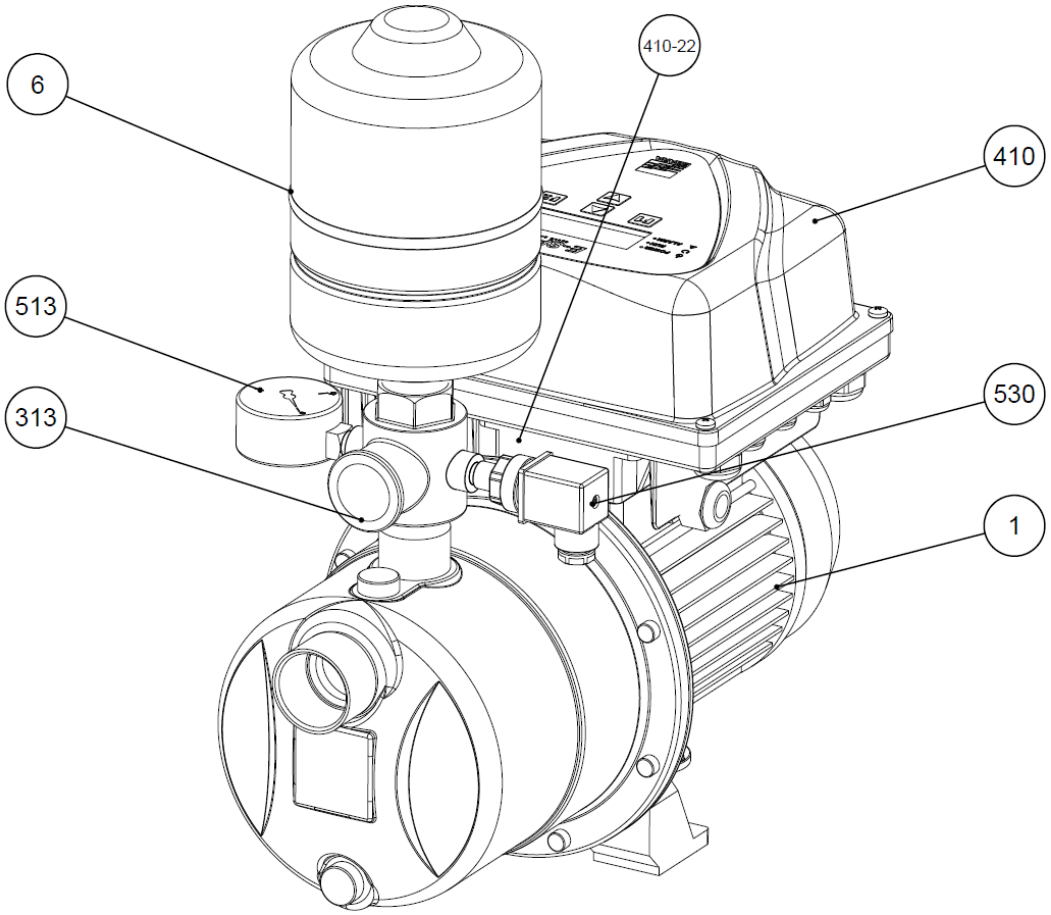
CONSTRUCTION

1GPE MATRIX



N°	PART NAME	MATERIAL	Quantity
1	Electropump	-	1
6	Membrane Vessel	-	1
313	5-Way Check Valve	AISI 304	1
410	E-SPD+	-	1
410-22	E-SPD+ adaptor	-	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	1

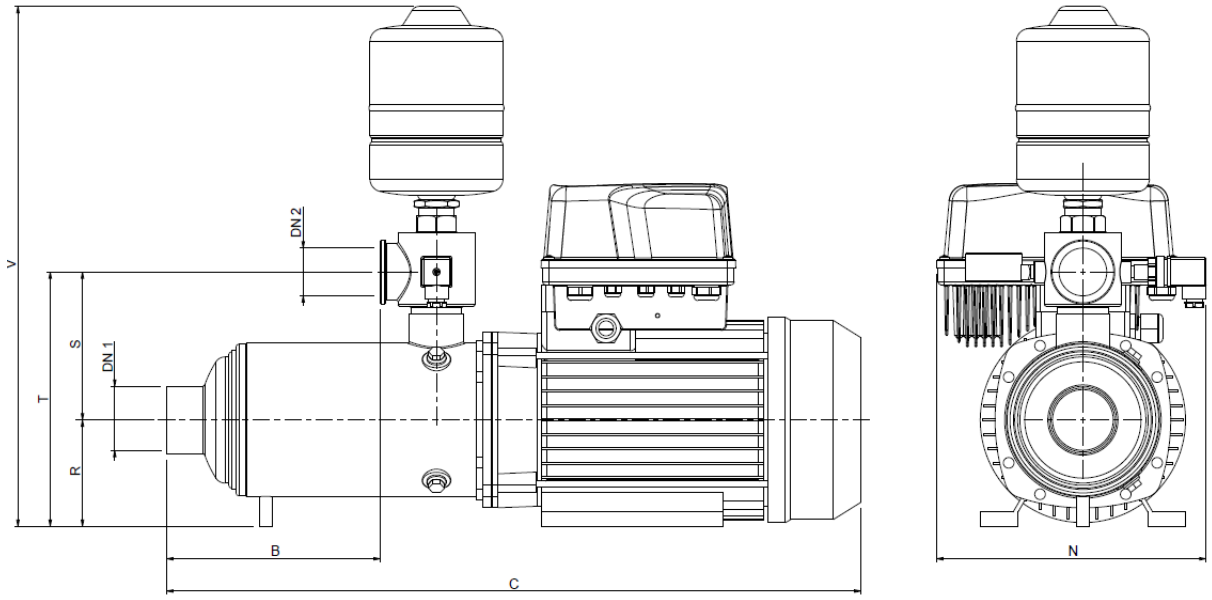
1GPE JEX



N°	PART NAME	MATERIAL	Quantity
1	Electropump	-	1
6	Membrane Vessel	-	1
313	5-Way Check Valve	AISI 304	1
410	E-SPD+	-	1
410-22	E-SPD+ adaptor	-	1
513	Pressure gauge	Copper alloy / plastic	1
530	Pressure transmitter	-	1

OVERALL DIMENSIONS BOOSTER SET

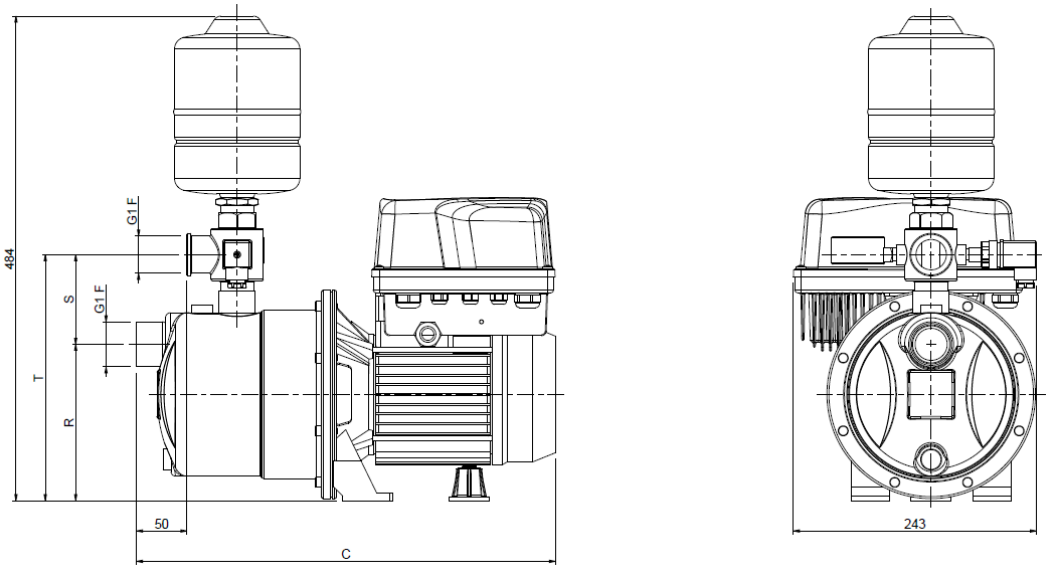
1GPE MATRIX



Booster type	Dimensions									Weight [kg]
	DN1	DN2	B	C	N	R	S	T	V	
1GPE MATRIX 3-5T/0.75 ESPT(ESPM)	G 1 F	G 1 F	101	408	243	90	133	223	461	16.9
1GPE MATRIX 3-6T/0.9 ESPT(ESPM)	G 1 F	G 1 F	125	444	243	90	133	223	461	18.1
1GPE MATRIX 5-5T/1.3 ESPT(ESPM)	G 1 ¼ F	G 1 F	101	443	243	90	133	223	461	18.4
1GPE MATRIX 5-6T/1.3 ESPT(ESPM)	G 1 ¼ F	G 1 F	125	467	243	90	133	223	461	21.6
1GPE MATRIX 5-7T/1.5 ESPT(ESPM)	G 1 ¼ F	G 1 F	149	504	243	90	133	223	461	23
1GPE MATRIX 5-9T/2.2 ESPT(ESPM)	G 1 ¼ F	G 1 F	197	552	243	90	133	223	461	27.6
1GPE MATRIX 10-4T/1.5 ESPT(ESPM)	G 1 ½ F	G 1 ¼ F	97	457	249	90	132	222	469	22.7
1GPE MATRIX 10-5T/2.2 ESPT(ESPM)	G 1 ½ F	G 1 ¼ F	127	487	249	90	132	222	469	23.3
1GPE MATRIX 10-6T/2.2 ESPT(ESPM)	G 1 ½ F	G 1 ¼ F	157	517	249	90	132	222	469	23.7
1GPE MATRIX 18-6T/4 ESPT	G 2 F	G 1 ½ F	201	652	253	100	139	239	488	38.7

The dimensions may change without notice.

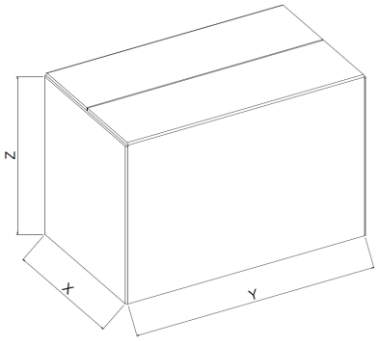
1GPE JEX



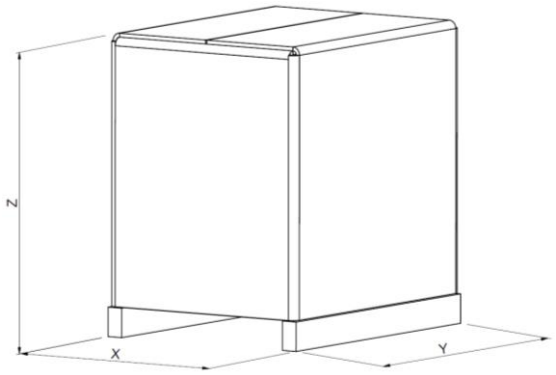
Booster type	Dimensions				Weight [kg]
	C	R	S	T	
1GPE JEX120 ESPT (ESPM)	418	106	50	156	17
1GPE JEX150 ESPT (ESPM)	469	156	90	246	20.7

The dimensions may change without notice.

PACKING



TYPE 1



TYPE 2

1GPE MATRIX

	Booster type	Type	Overall dimensions packing			Booster+packing Weight [kg]
			X	Y	Z	
1GPE	1GPE MATRIX 3-5T/0.75 ESPT(ESPM)	1	320	515	300	18.9
	1GPE MATRIX 3-6T/0.9 ESPT(ESPM)	1	320	515	300	20.1
	1GPE MATRIX 5-5T/1.3 ESPT(ESPM)	2	320	550	370	23.6
	1GPE MATRIX 5-6T/1.3 ESPT(ESPM)	2	320	550	370	23.6
	1GPE MATRIX 5-7T/1.5 ESPT(ESPM)	2	320	550	370	28.2
	1GPE MATRIX 5-9T/2.2 ESPT(ESPM)	2	320	670	380	32.8
	1GPE MATRIX 10-4T/1.5 ESPT(ESPM)	2	320	550	370	24.7
	1GPE MATRIX 10-5T/2.2 ESPT(ESPM)	2	320	550	370	25.3
	1GPE MATRIX 10-6T/2.2 ESPT(ESPM)	2	320	550	370	25.7
	1GPE MATRIX 18-6T/4 ESPT	2	320	670	380	40.7

The dimensions may change without notice.

1GPE JEX

	Booster type	Type	Overall dimensions packing			Booster+packing Weight [kg]
			X	Y	Z	
1GPE	1GPE JEX120 ESPT (ESPM)	1	320	550	370	18.2
	1GPE JEX150 ESPT (ESPM)	2	320	550	370	25.6

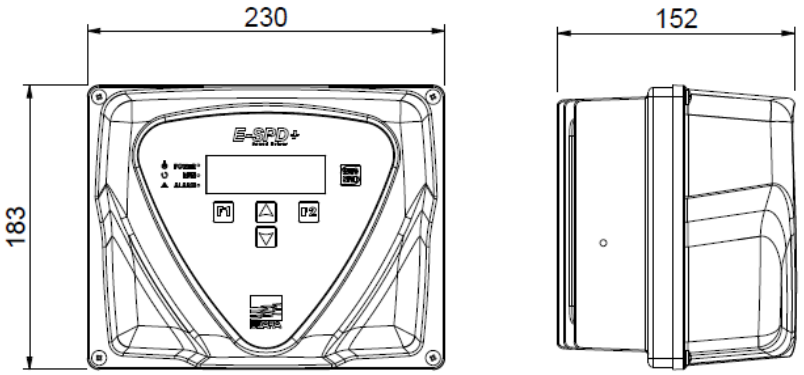
The dimensions may change without notice.

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 frequence	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	1-2-3 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.

EBARA Pumps Europe S.p.A.
Via Torri di Confine 2/1 int. C
36053 Gambellara (Vicenza),
Italia Tel.: +39 0444 706811
Fax: +39 0444 405811
ebarapumps.epe@ebara.com
www.ebaraeurope.com

EBARA Corporation
11-1, Haneda Asahi-cho, Ota-ku,
Tokyo 144-8510
Japan
Tel. +81 3 6275 7598
Fax +81 3 5736 3193
www.ebara.com

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