OPERATING LIMITS

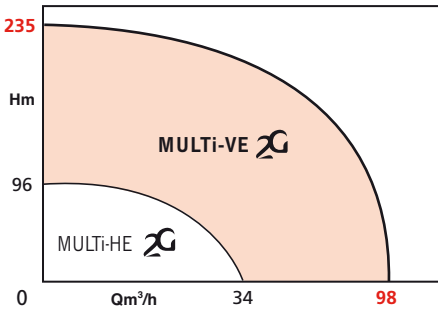
Flow rates up to:	**98 m³/h**
Head up to:	**235 m CL**
Max discharge pressure:	**16 and 25 bar**
Max suction pressure:	**10 bar**
Temperature range:	**- 15° to + 120°C***
Max ambient temperature:	**+ 50°C**
ND of ports:	**25 to 80**

* depending on mechanical seal and gaskets

MULTI-VE 1,1 to 7,5 kW

STAINLESS STEEL MULTI-STAGE VERTICAL PUMPS with integrated EVS* In-line Series - 50/60 Hz 2 ranges: stainless steel 304 and 316L

*** Electronic Variation Speed**



APPLICATIONS

Pumping of clear unfilled liquids in housing, agricultural and industrial sectors.
- Supply - Boosting
- Watering - Irrigation
- High pressure washing
- Heating - Air conditioning
- Water treatment.

Incorporation into modular booster systems dedicated to:
- hotel-keeping and,
- hospitals.

Pumped fluids:
- Range 304: clear, non- aggressive (drinking water, water glycol)
- Range 316L: aggressive liquids (demineralized water, sea water, chlorinated water...)

ADVANTAGES

- **Reduction of mechanical and electrical constraints compared to a standard pump:**
- **No more successive starts and stops,**
- **Flexible use, reduction of hammering and knocking,**
- **Limiting of starting current,**
- **Adjustment to installation by precise adjustment of speed and pressure.**
- **Automatic diagnosis to facilitate maintenance.**
- **Reduction in sound levels by adapting pump speed to requirements.**
- **Easy installation and use thanks to simple implementation and operation.**

- **SAVINGS**
- **Optimization of complete product pump + motor + converter guaranteeing energy savings.**
- **A single pump covers a full range of standard pumps.**
- **One contact, one supplier for a complete automatic system.**
- **Smaller booster size thanks to integration of frequency converter in pump.**

• MULTi-VE 806-OSE-T4-2-2G

• MULTi-VE PN25

• EVS* for MULTi-VE 2G

• EVS* for MULTi-VE

MULTI-VE 1,1 to 7,5 kW

DESIGN

• Hydraulic Part

All stainless,centrifugal.
Multi-stage with 2 to 14 stages.
Vertical shaft, suction/discharge orifices IN-LINE in bottom section. Casing equipped with:
– oval flanges NP 16
– round flanges or orifices - Victaulic couplings to NP 25.
Lower guide bearing above second stage.
Tightness at shaft passage by standardized mechanical packing.

• Motor

Closed flange with standardized shaft end for vertical operation, equipped with EVS.
Motor-pump link via coupling with safety protection.

Winding 3-phase	: 380 to 440V V ± 6%
Frequency	: 50 and 60 Hz
Insulating category	: F (155°C)
Protection index	: IP55

STANDARD CONSTRUCTION

Range	st.steel 304	st.steel 316L
	2/4/8/16/36/60	2/4/8/36/60
Main parts	**Materials**	
	non-aggressive liquids	agressive liquids
Pump attaching base	Cast iron FGL 250	
Suction casing discharge	st.steel 304 (36/60 in Cast iron FGL 250)	st.steel 316L
Motor support lantern	Cast iron FGL 250	
Impellers	st.steel 304	st.steel 316L
Cells (stage shell)	st.steel 304	st.steel 316L
Ext. liner tube	st.steel 304	st.steel 316L
Pump shaft	st.steel 316L	st.steel 316L
Intermediate bearing	Tungsten carbide	
Mechanical seal	Carbide Si/Carbon	
O-rings	EPDM*	Viton**
Plugs	st.steel 316L	st.steel 316L

* T° 120°C — ** T° 90°C
The STAINLESS 316 L pumps are only available with NP 25 casing, round flanges and Victaulic couplings.

NB: Stainless 304 (Z6CN18-9) or 316 L (Z2CND1712) recommended materials offering high resistance to corrosion. Clean conveyed liquids with fibers and containing little sand/silica (max concentration 40 g/m3). The 16m3 version is only available in 304 stainless steel.

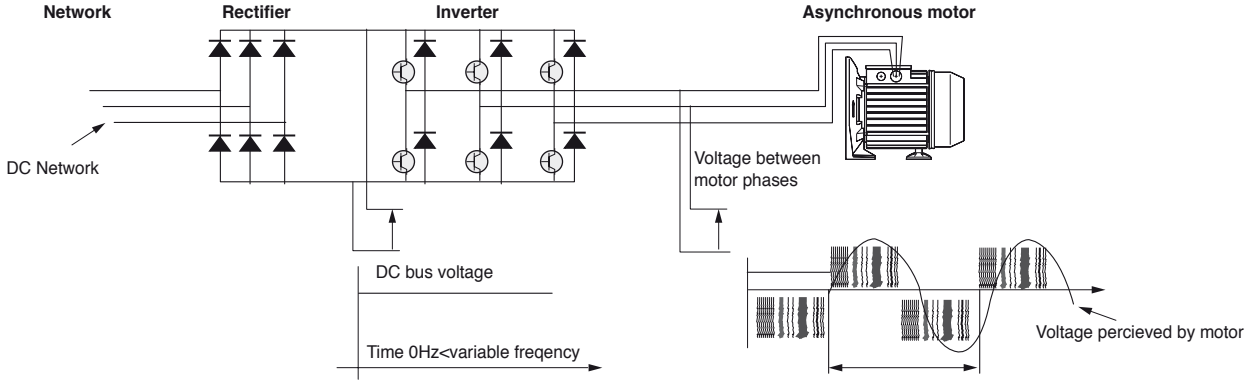
OPERATION

Electronic speed variation is applied to the asynchronous motors of the MULTI-VE centrifugal pumps. The goal is to regulate the speed of the AC motor by converting voltage and frequency of the mains inputs from 380 to 440 V ± 6% at 50 or 60 Hz into a three-phase voltage system with variable frequency and amplitude.
The frequency converter then makes it possible to control the speed of the motor.
This simultaneous action on the frequency and voltage is by means of two main elements:

- a diode rectifier
- a pulse width modulating inverter (MLI).

The rectifier is a diode bridge.
The AC voltage conducted through the diode bridge is converted into a rectified DC voltage. At this stage, to refine the quality of the DC voltage at the rectifier output, a set of capacitors and coils eliminates any residual ripple output from the rectifier.
In this way, we obtain a smooth DC voltage called the “DC bus”.
With this development, the inverter definitively adjusts the voltage at the output of the variator to optimize the magnetizing of the motor. The set voltage at the inverter input is converted again into a variable voltage by acting as voltage pulses for a variable period of time via the transistors.

This principle is referre to as pulse width modulation. These transistors are controlled by the microcontroller which activates or deactivates them so as to vary the frequency at the variator output.
The transistors (IGBT: Insulated Gate Bipolar
Transistor) therefore operate by switching and act as switches to convert the DC voltage into a variable voltage. The IGBT switching activation frequency creates variable voltage and frequency magnitudes. The frequency must be high to eliminate the noise produce by magnetization (frequency inaudible to the human ear: 8 to 16 kHz).



MULTI-VE 1,1 to 7,5 kW

PUMP IDENTIFICATION

MULTi-VE 4 02 - 7,5 - OSE - T4 / 2 - 2G

Pump code

Nominal flow in en m³/h (to 50 hz/2 pole)

Number of stages

7.5 or 11: Power for MVIE 3203 only

O = Oval flanges NP16
F = Round flanges NP25
R = Victaulic coupling

G = GJL-250 cast iron pump body + 304 stainless steel hydraulic body
S = 304 stainless steel pump body + 304 stainless steel hydraulic body
X = 316L stainless steel pump body + 316L stainless steel hydraulic body

E = O-rings: EPDM (WRAS/KTW)
V = O-rings: VITON

Nothing = no motor
T4 = Three-phase 400V
M13 = Mono-phase Mode 1-3
M2 = Mono-phase Mode 2

2 = 2 Pole

2nd Generation inverter

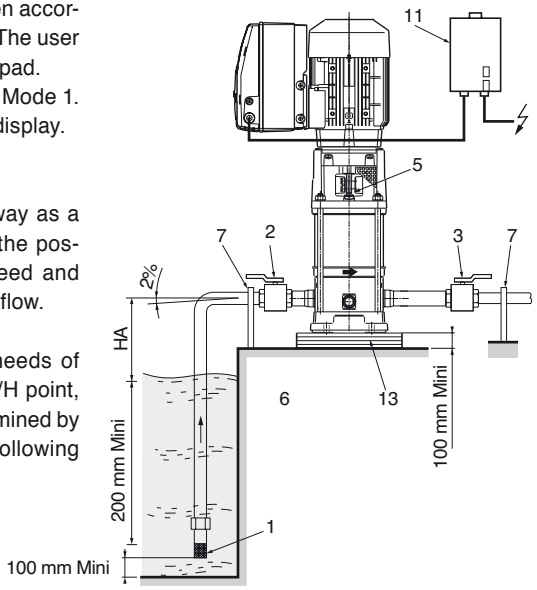
OPERATION

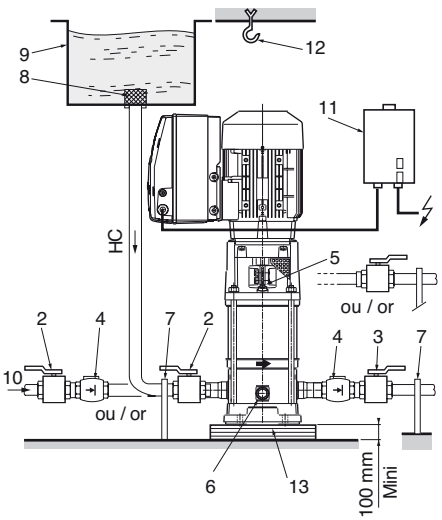
Three operating modes can be chosen according to the application and the need. The user selects the operating mode by touch pad.
On delivery, the pump is configure in Mode 1.
The information can be viewed on a display.

• Mode 1 / Manual Mode

The pump is installed in the same way as a MULTI-V standard pump but offers the possibility of manually adjusting its speed and therefore working through a range of flow.

Pressure curves according to the needs of the installation. From the required Q/H point, the operating frequency can be determined by means of a curve plotter. (see the following pages).





PART LIST
01 - Foot valve strainer
02 - Pump suction valve
03 - Pump discharge valve
04 - Non-return valve
05 - Filling plug
06 - Drain/priming plug
07 - Pipe supports or collar
08 - Strainer
09 - Storage tank
10 - City water network
11 - Switch/isolator with fuses
12 - Massif en béton
13 - Pressure sensor kit
14 - tank
15 - tank isolating valve

HA = suction head
HR = discharge head

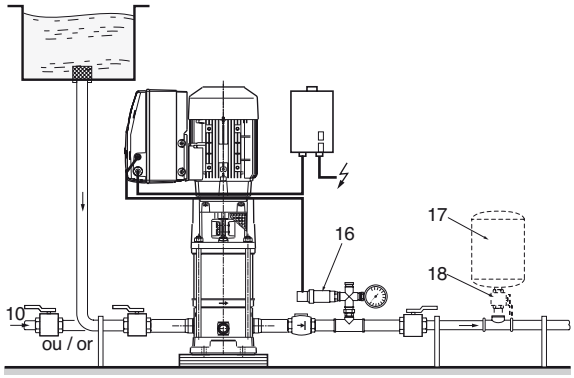
MULTI-VE 1,1 to 7,5 kW

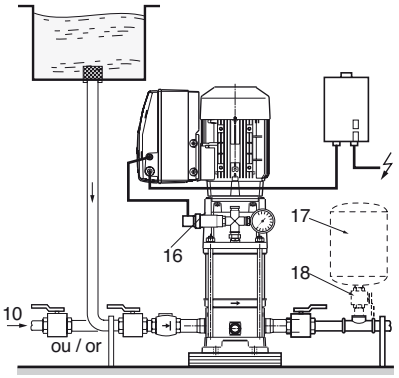
OPERATION

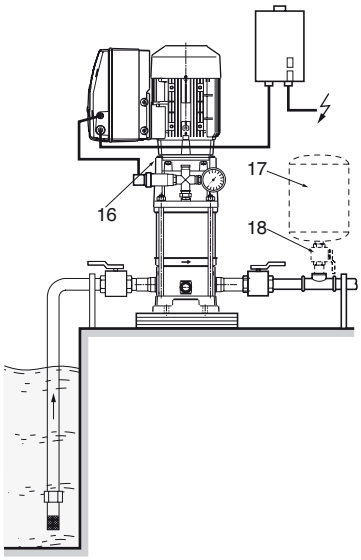
• Mode 2 / Automatic Pump Boost System

Mode with pump alone using pressure regulation. The pump is installed with its pressure sensor which can attached either to the pump or on the discharge pipe.
The setpoint pressure is adjusted when the pump is installed by means of the touch pad.

Operation: when the real pressure measured on the sensor drops below the set pressure, the pump starts and controls its speed to achieve the set pressure.
The pump stops automatically when it detects that flow is zero or that there is a lack of water.







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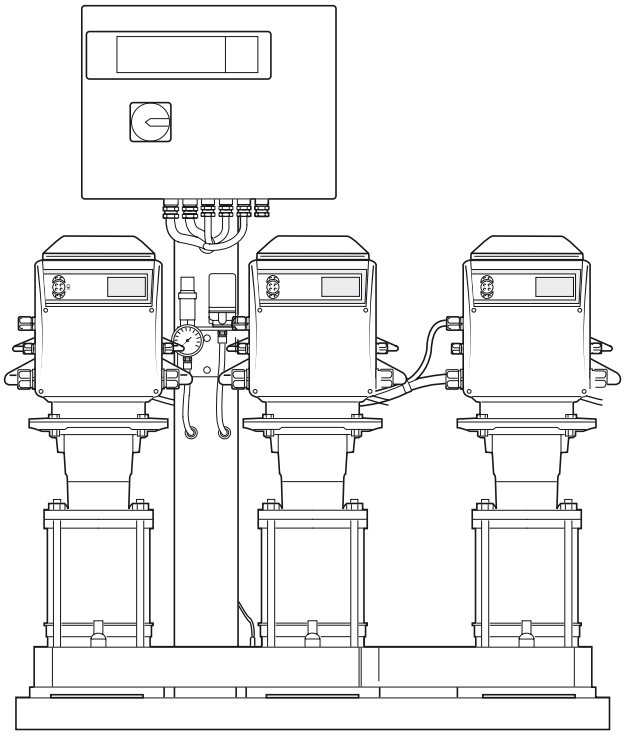
HA = suction head
HR = discharge head

• Mode 3 / Use of Pump on Booster

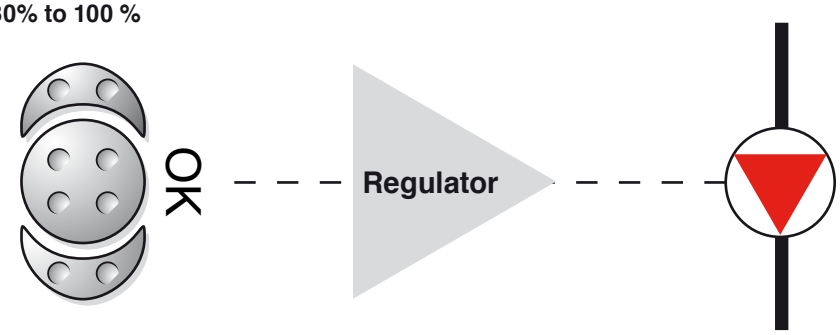
The frequency variation is managed by an external control. Starting, stopping and the speed of rotation of the pump are controlled by a 0-10 V or 4-20 mA input signal.



OPERATION

• Mode 1

Frequency adjusting from 30% to 100 %

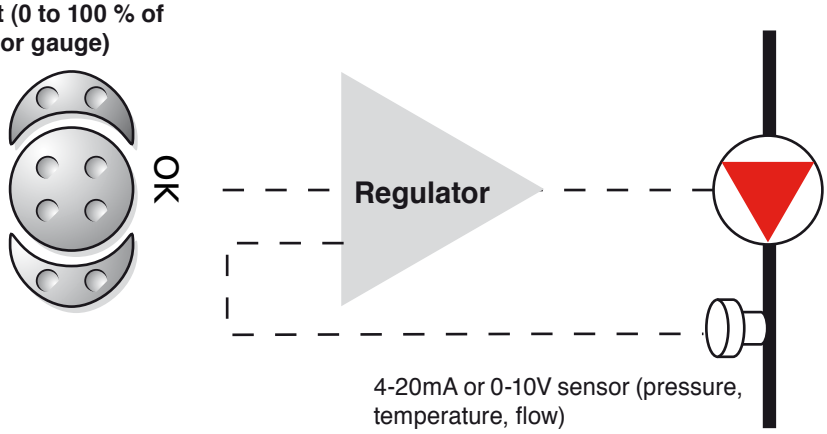


• Display
- Speed shown on the screen

• On/Off
- Remote
- With button

• Mode 2

Adjusting of the set-point (0 to 100 % of sensor gauge)



• Display
- Pressure Displaying for pressure regulation
- Displaying in % for other types of regulation

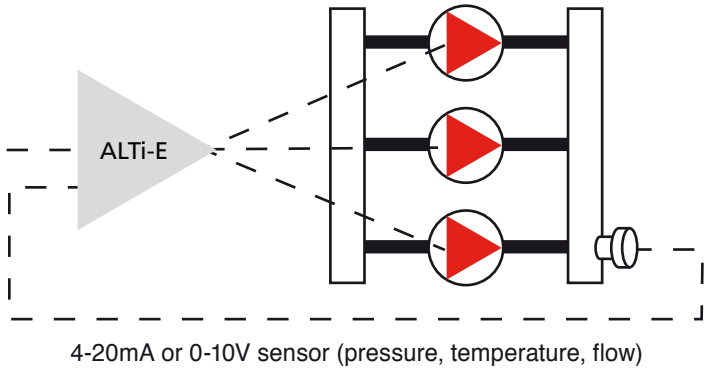
• On/Off
- Remote
- With button

• Pressure regulation
- Adjusting of the setpoint using the buttons OR
- Adjusting of the setpoint via external signal

• Other types of regulation
- Possibility of adjusting the PID corrector
- Choosing of the regulation type (flow rate, temperature, etc)

• Mode 3

Adjusting in ALTI-E setpoint



• Display
- Displaying of the rotation speed

• On/Off
- Remote
- With button

MULTI-VE 1,1 to 7,5 kW

BUILT-IN FUNCTIONS – CONNECTICS

The following functions are integrated into the pump, depending on the modes:
- Lit display
- Remote on-off or with touch pad
- Automatic zero flow detection
- Water run-out detection
- Locking of settings and setpoint
- Reducing of nominal speed according to the liquid pumped
- Protection from:
  - short-circuits
  - circuit overloads
  - over/under-voltages
  - excessive temperature
  - microbreaks
  - missing phase
- Maintenance self-troubleshooting via error code on the display

•1.1 to 4 kW unit

Display

Control connectors

Switches for locking the settings and the setpoint

SBM unavailability indicator
and SSM fault indicator relay

Phase 1 / 2 / 3 + ground power terminal block

L1	L2	L3	PE

INTEGRATED EVS CONTROL

Maintenance troubleshooting

Analysis is based on parameters such as over/undervoltage, sensor power supply failure or cut cable, short circuit, overload, etc.

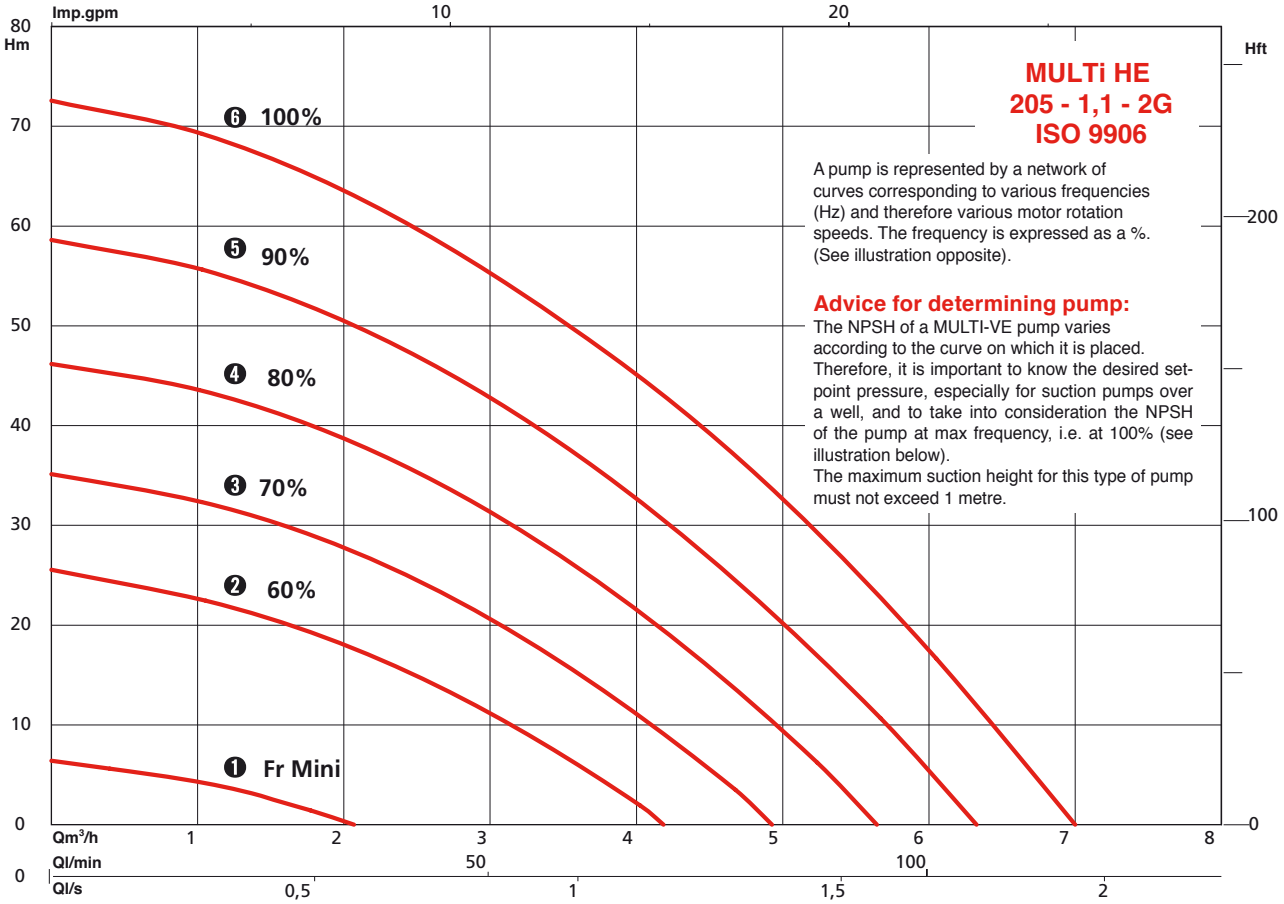
The pump then indicates any faults through the red LED and an error code shown on the display.

Fault type		Inverter behaviour			Signalling	
		Response time before stop	Response time before restart	Max. number of defaults over 24h	Fault code	Red LED state
Inverter	Temperature	3 s	5 mn*	6	E30 E31	Flashing
	Short-circuit	Immediate	5 s	6	E23	Flashing
Sector	Overvoltage	≤ 5 s	5 s*	6	E05	Flashing
	Undervoltage	≤ 5 s	5 s*	6	E04	Flashing
	Missing phase	≤ 5 s	5 s*	6	E06 (E04)	Flashing
Moteur	Temperature	3 s	5 mn*	6	E20 (E26)	Flashing
	Short-circuit	Immediate	5 mn*	6	E23	Flashing
Pompe	Pump blocked	3 s	No restart	1	E10	Flashing
	Dry operation	< 60 s	1 mn	6	E00	Flashing
	Overload	Variable	1 mn	6	E01	Flashing
Externe	Incorrect pump code	Immediate	No restart	1	E99	Flashing
	Cable cut in (only sensor 4/20mA)	5 s	No restart	1	E42	Flashing

* If fault eliminated

MULTI-VE 1,1 to 7,5 kW

PUMP PERFORMANCE

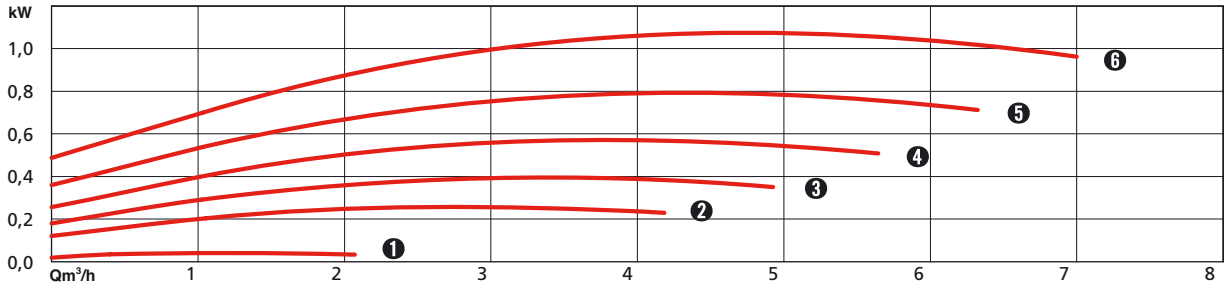


MULTi HE
205 - 1,1 - 2G
ISO 9906

A pump is represented by a network of curves corresponding to various frequencies (Hz) and therefore various motor rotation speeds. The frequency is expressed as a %. (See illustration opposite).

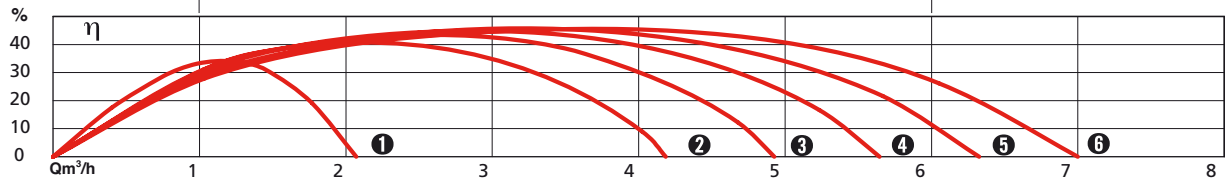
Advice for determining pump:
The NPSH of a MULTI-VE pump varies according to the curve on which it is placed. Therefore, it is important to know the desired set-point pressure, especially for suction pumps over a well, and to take into consideration the NPSH of the pump at max frequency, i.e. at 100% (see illustration below).
The maximum suction height for this type of pump must not exceed 1 metre.

An ESV (Electronic Speed Variation) pump is represented by a network of curves showing the intermediate performances covered.



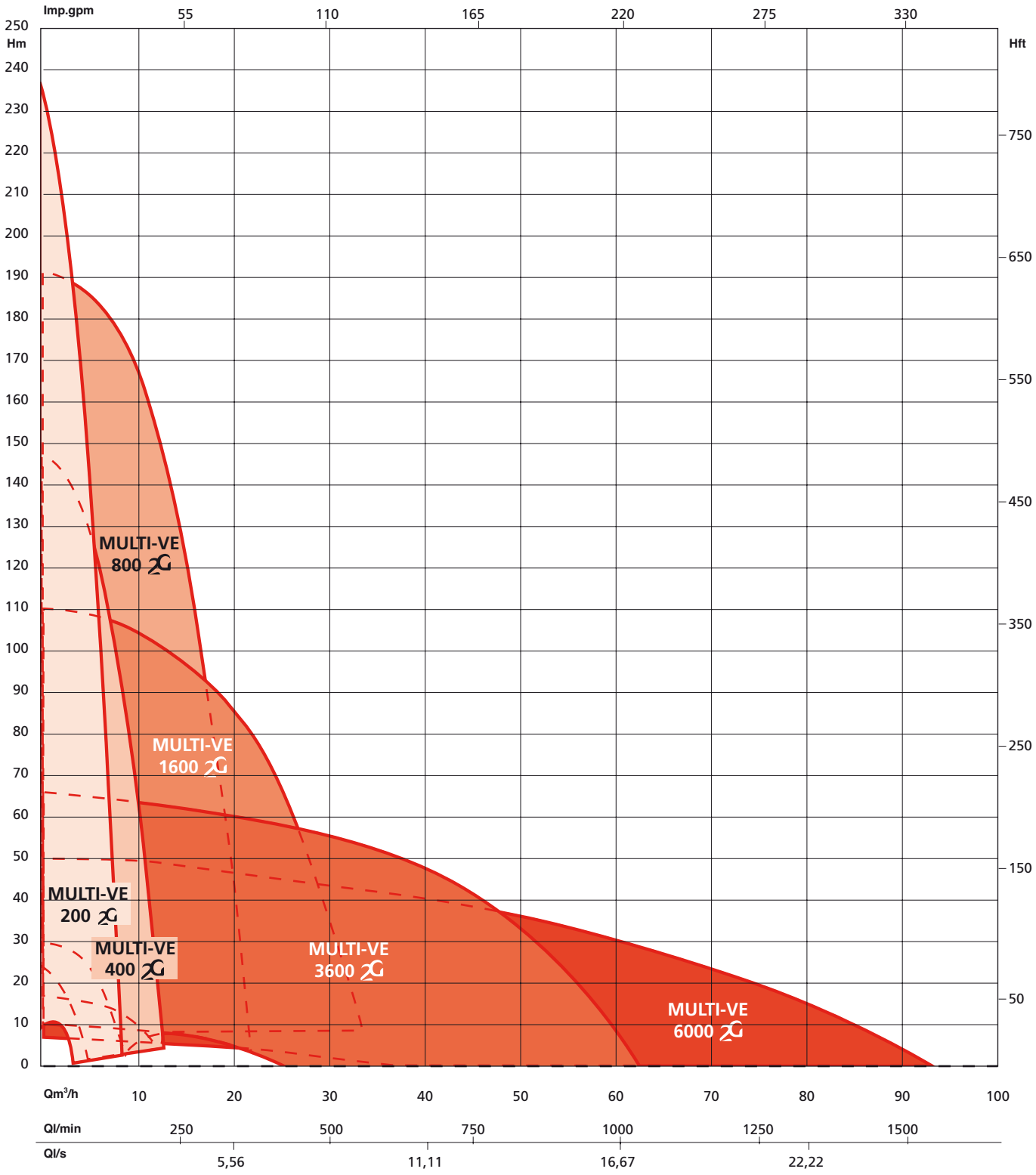
With speed variation, the power input is adapted to the H/Q need required, resulting in large energy savings.

The benefits of speed variation are once more shown by the optimum yield over a large flow rate range compared with a fixed speed pump.

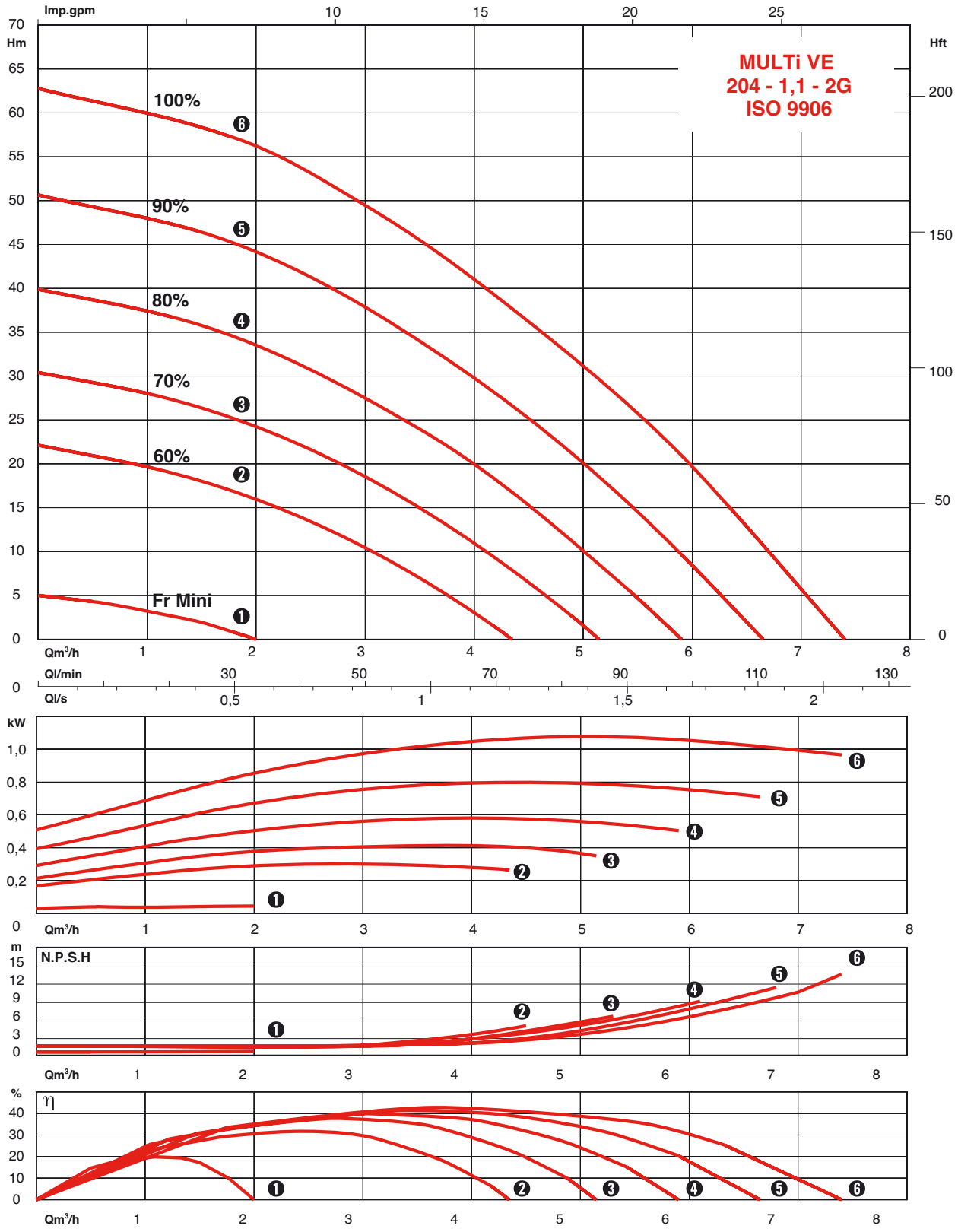


MULTI-VE 1,1 to 7,5 kW

PRE-SELECTION GRAPH

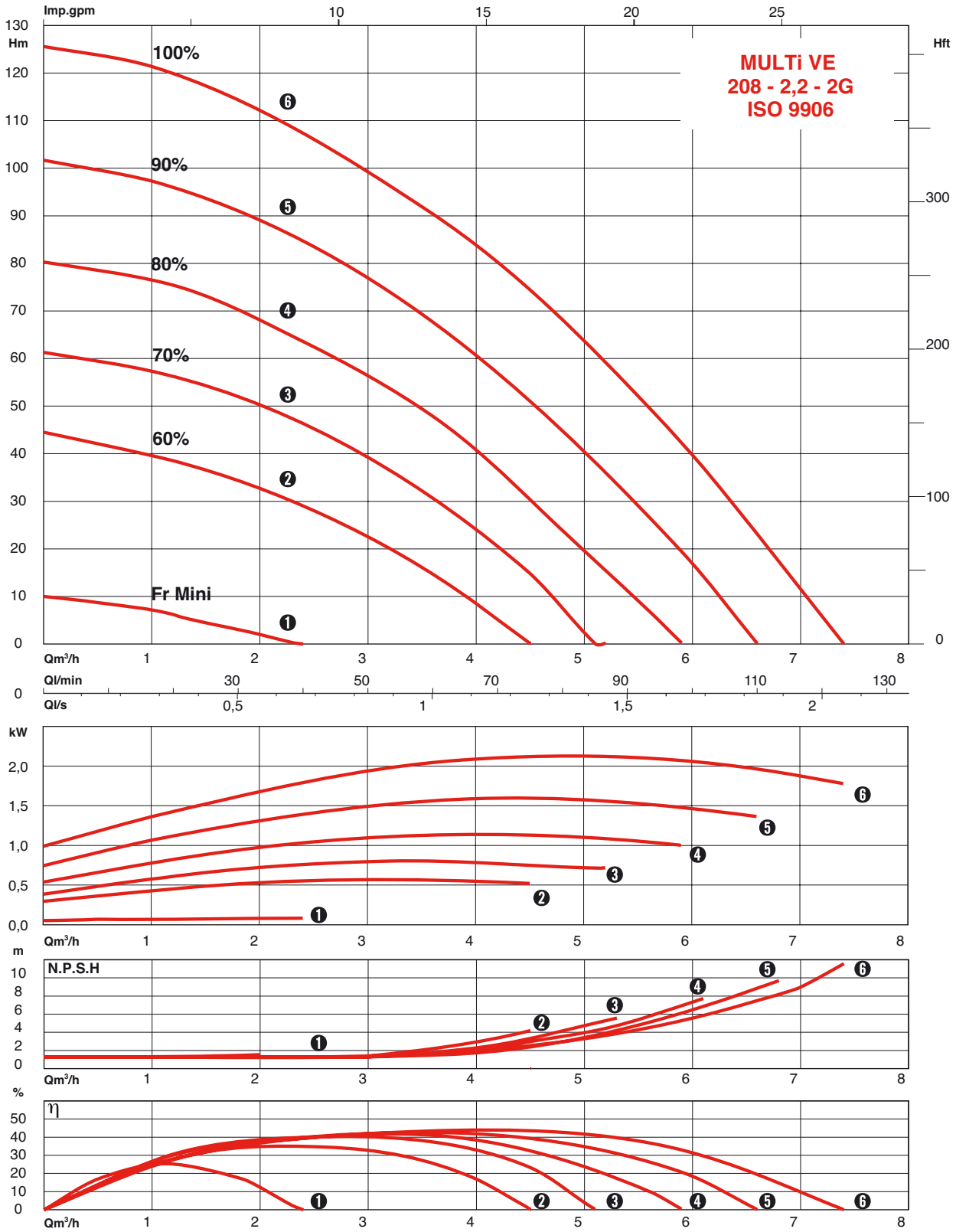


HYDRAULIC PERFORMANCE - 200 SERIE



MULTI-VE 1,1 to 7,5 kW

HYDRAULIC PERFORMANCE - 200 SERIE



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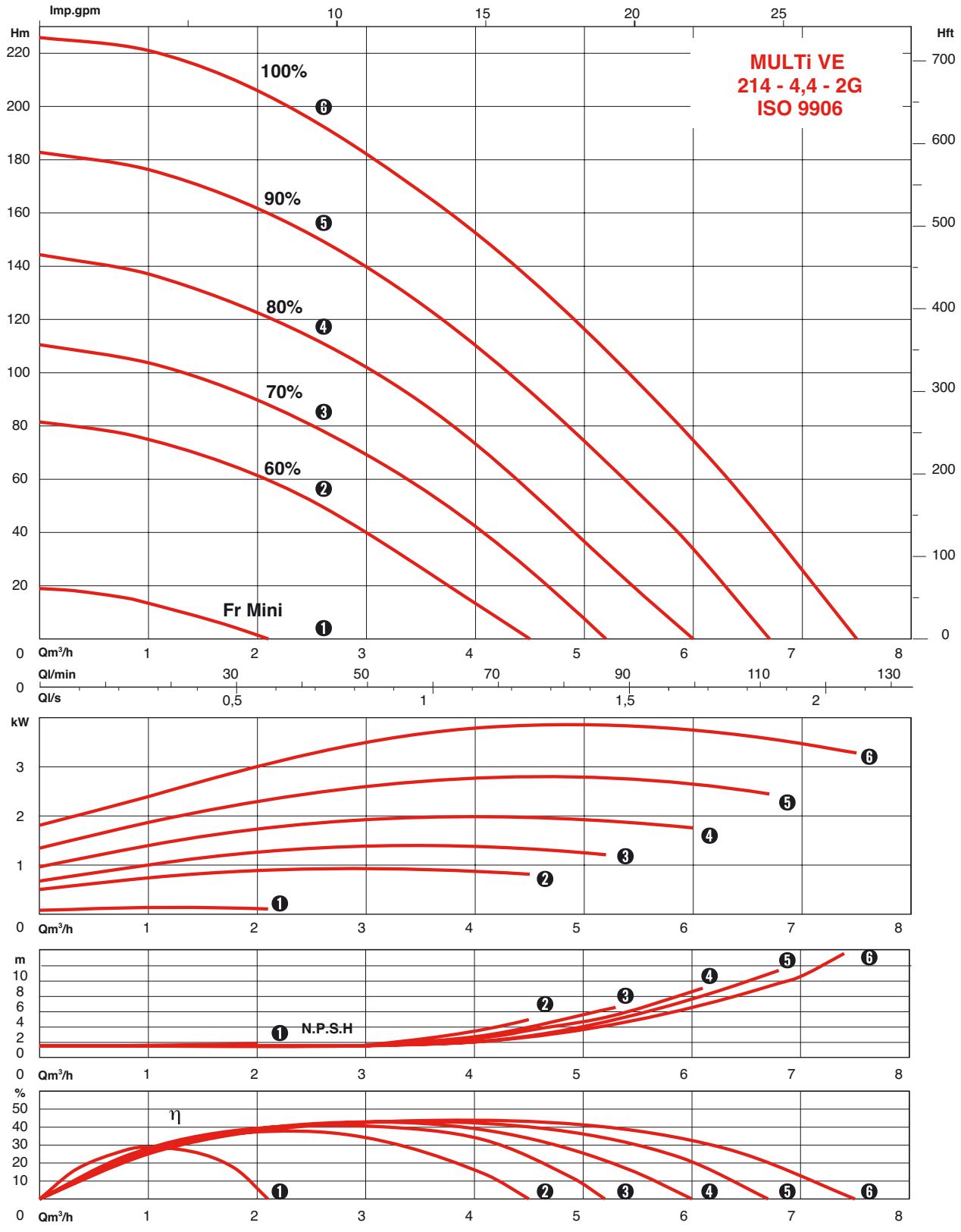
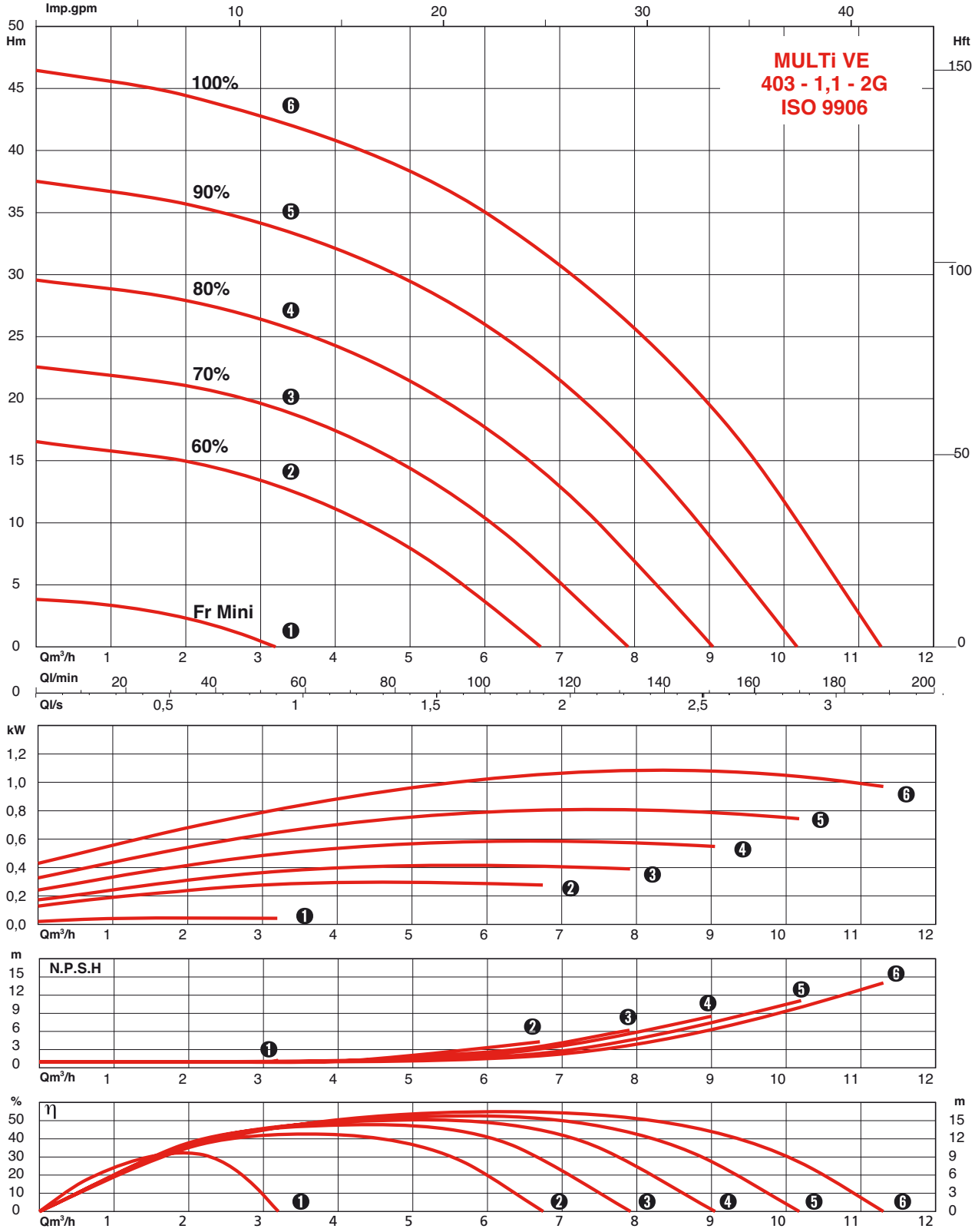
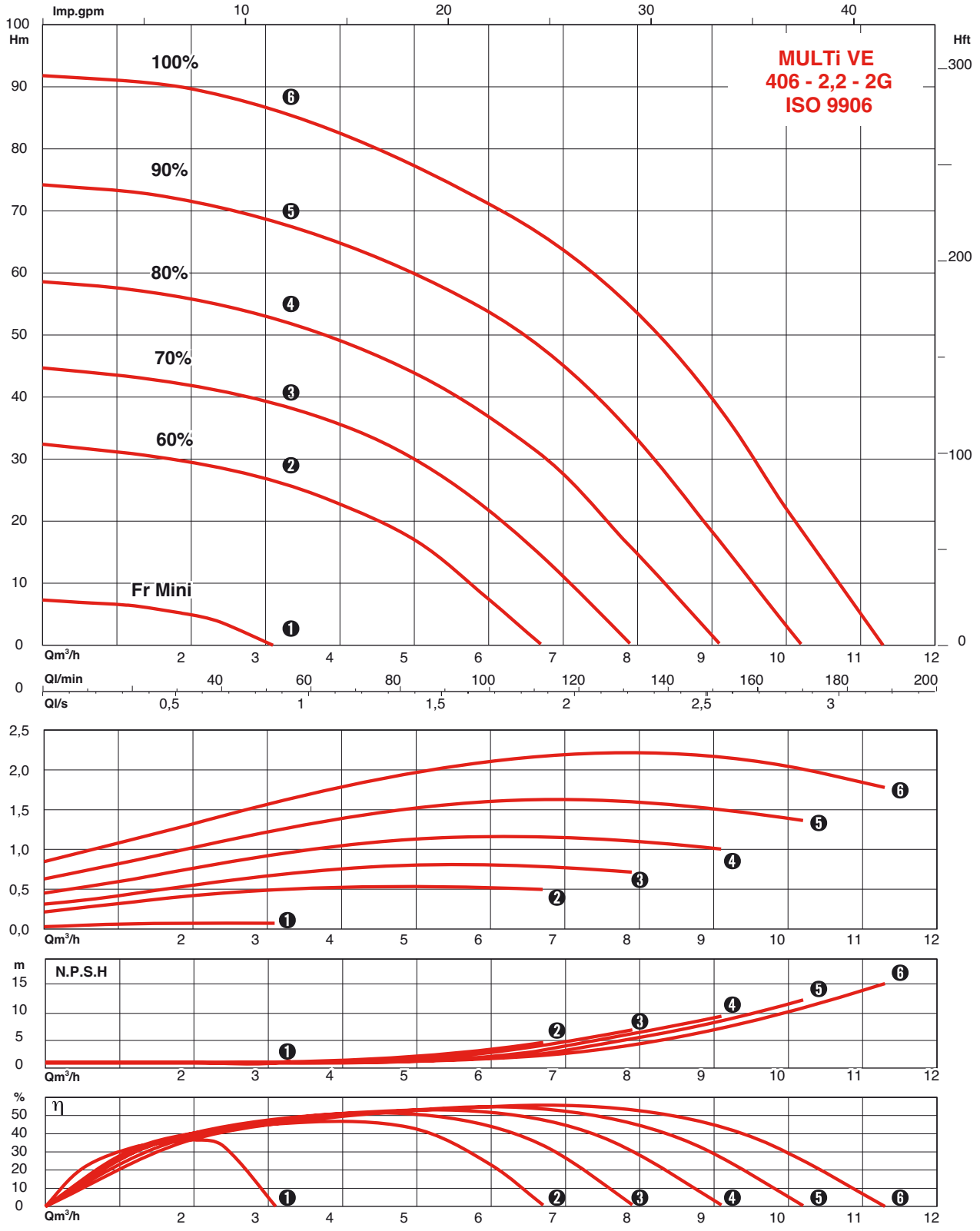


MULTI-VE 1,1 to 7,5 kW

HYDRAULIC PERFORMANCE - 400 SERIE



HYDRAULIC PERFORMANCE - 400 SERIE



MULTI-VE 1,1 to 7,5 kW

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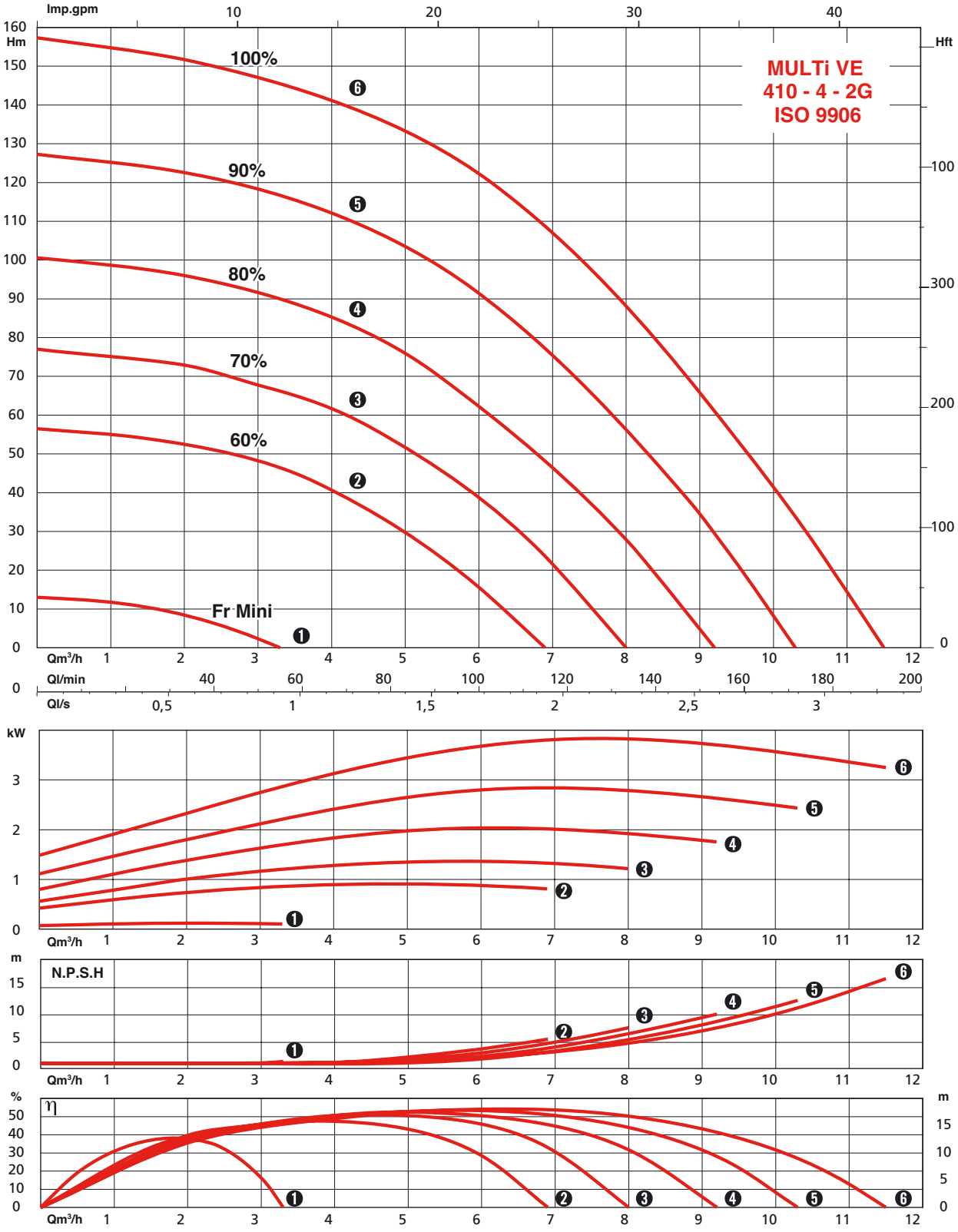

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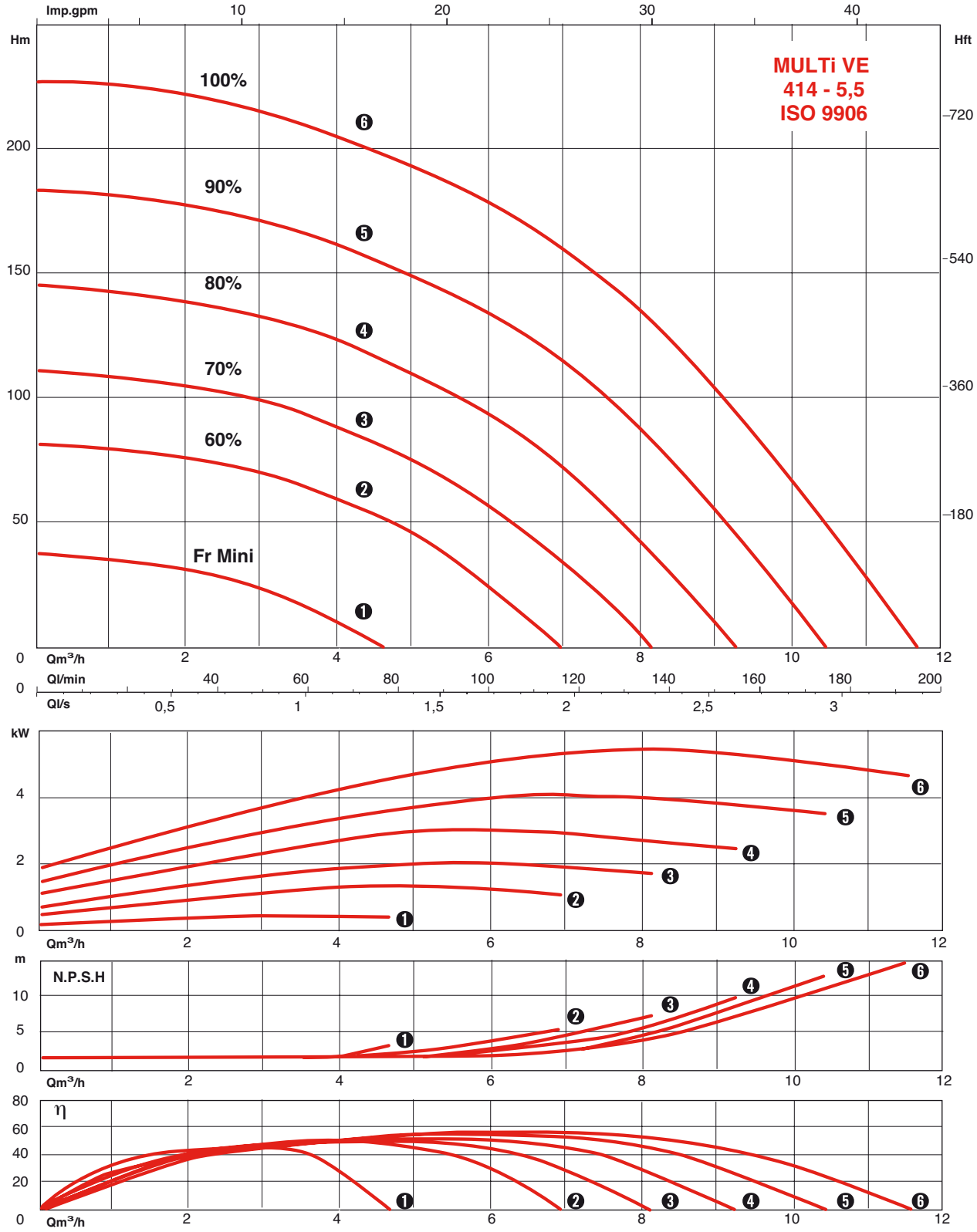
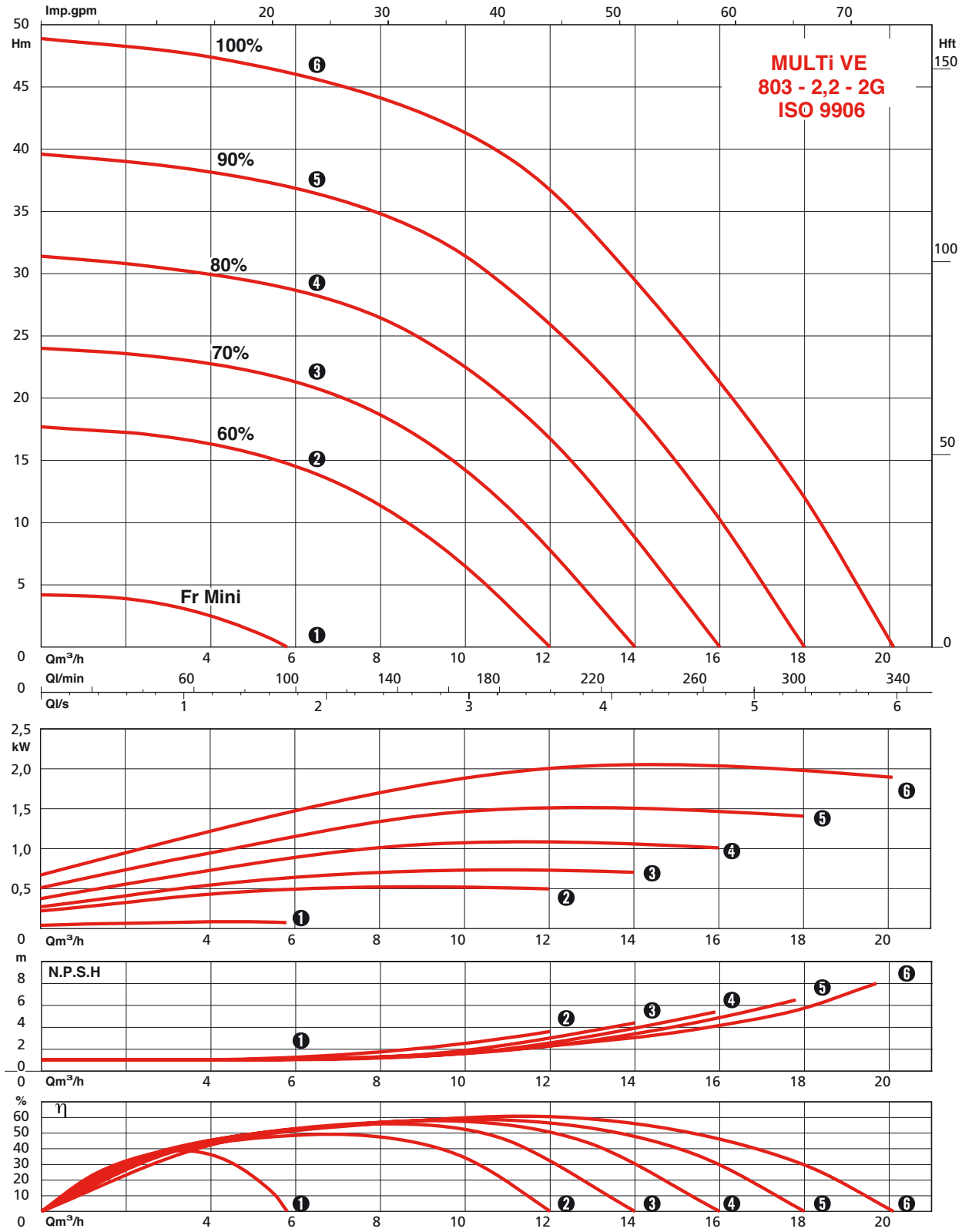
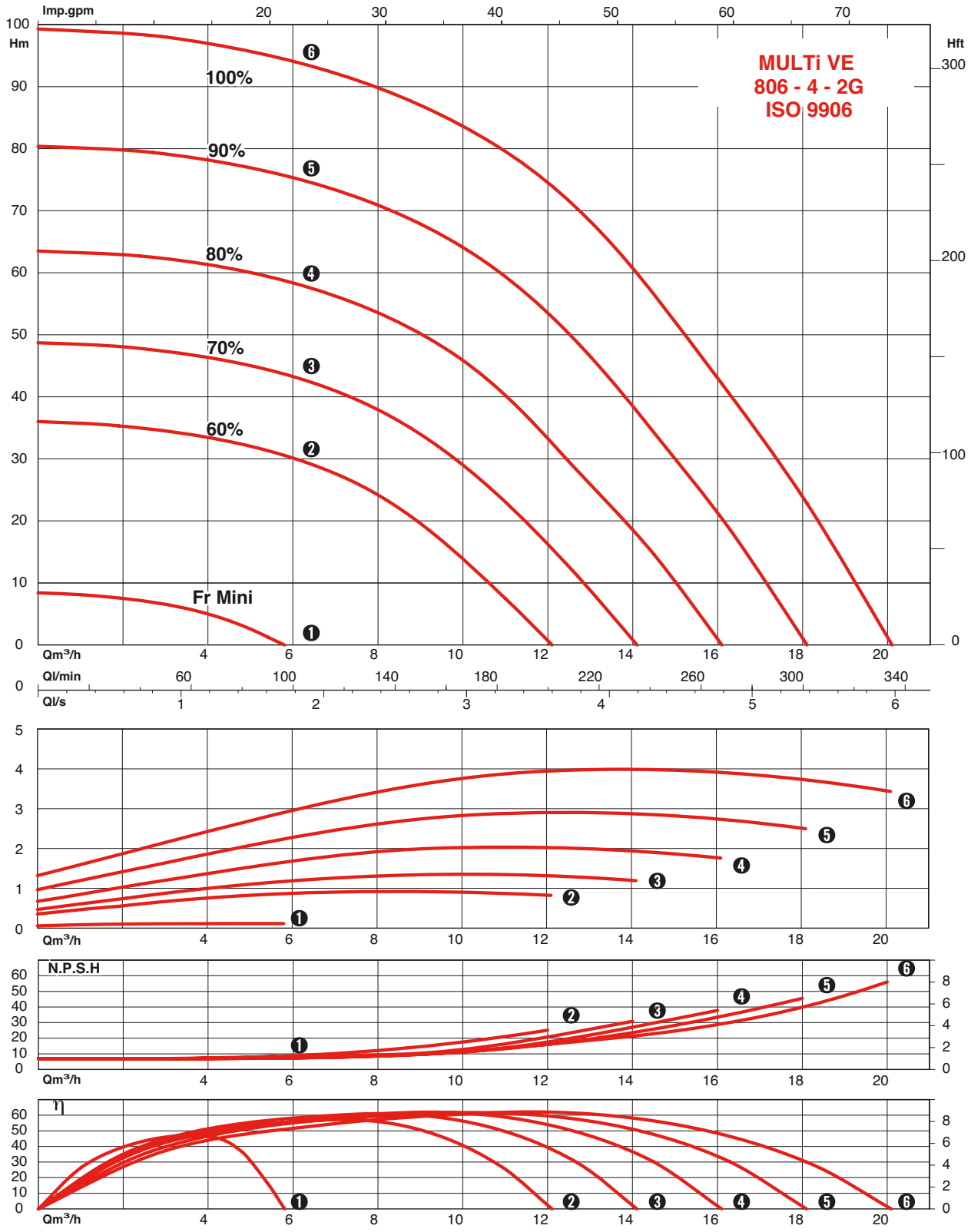


MULTI-VE 1,1 to 7,5 kW

HYDRAULIC PERFORMANCE - 800 SERIE



HYDRAULIC PERFORMANCE - 800 SERIE



MULTI-VE 1,1 to 7,5 kW

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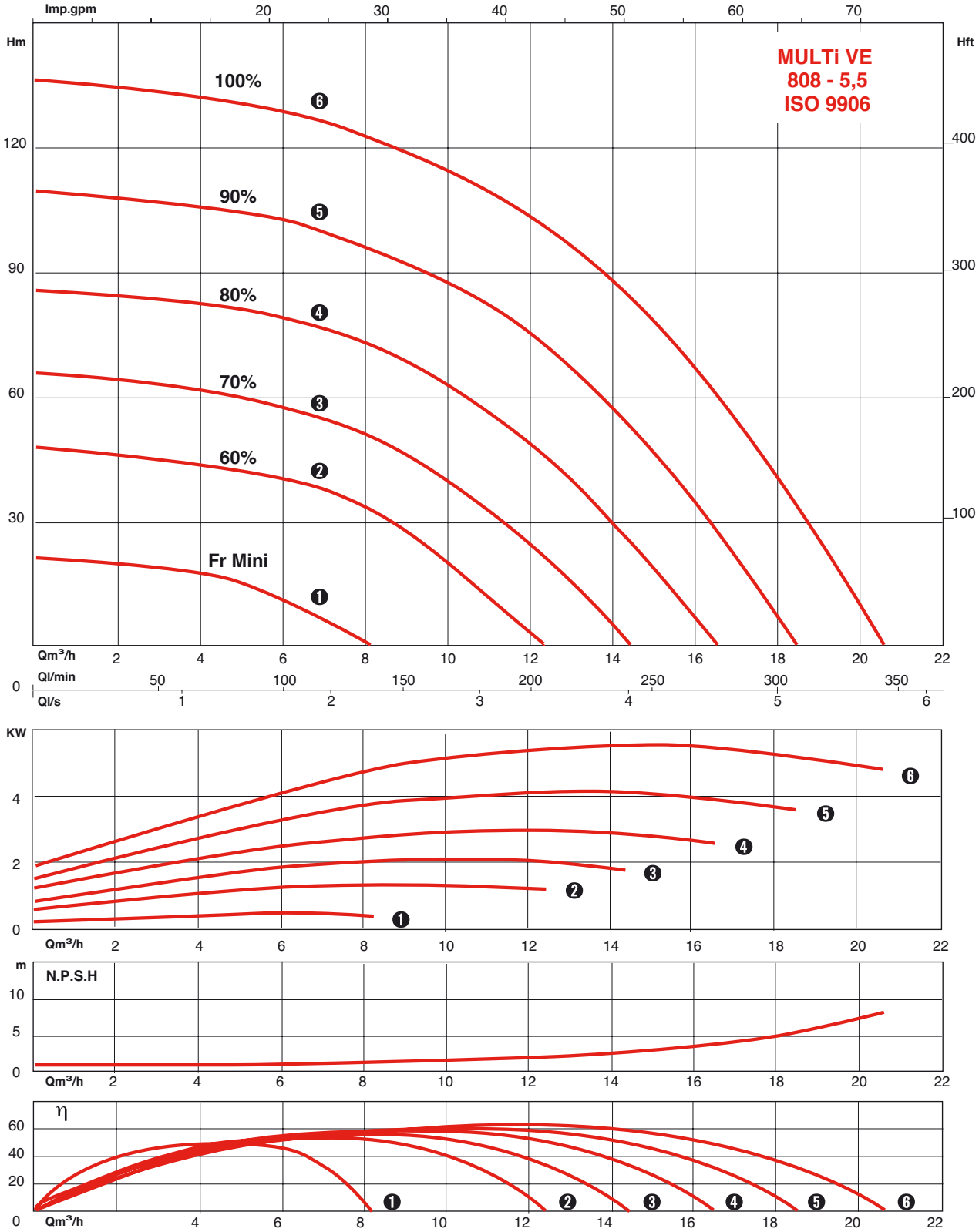

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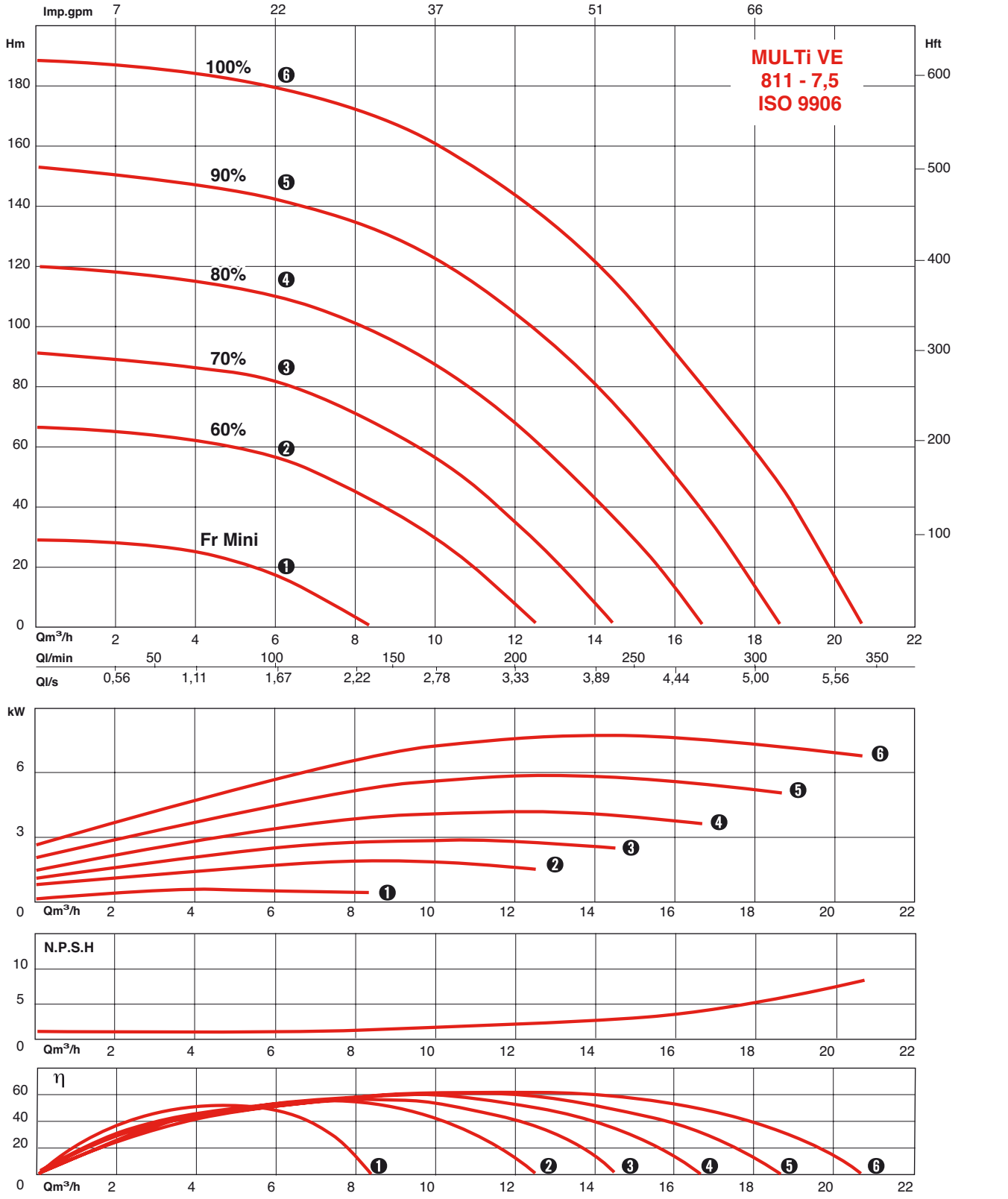
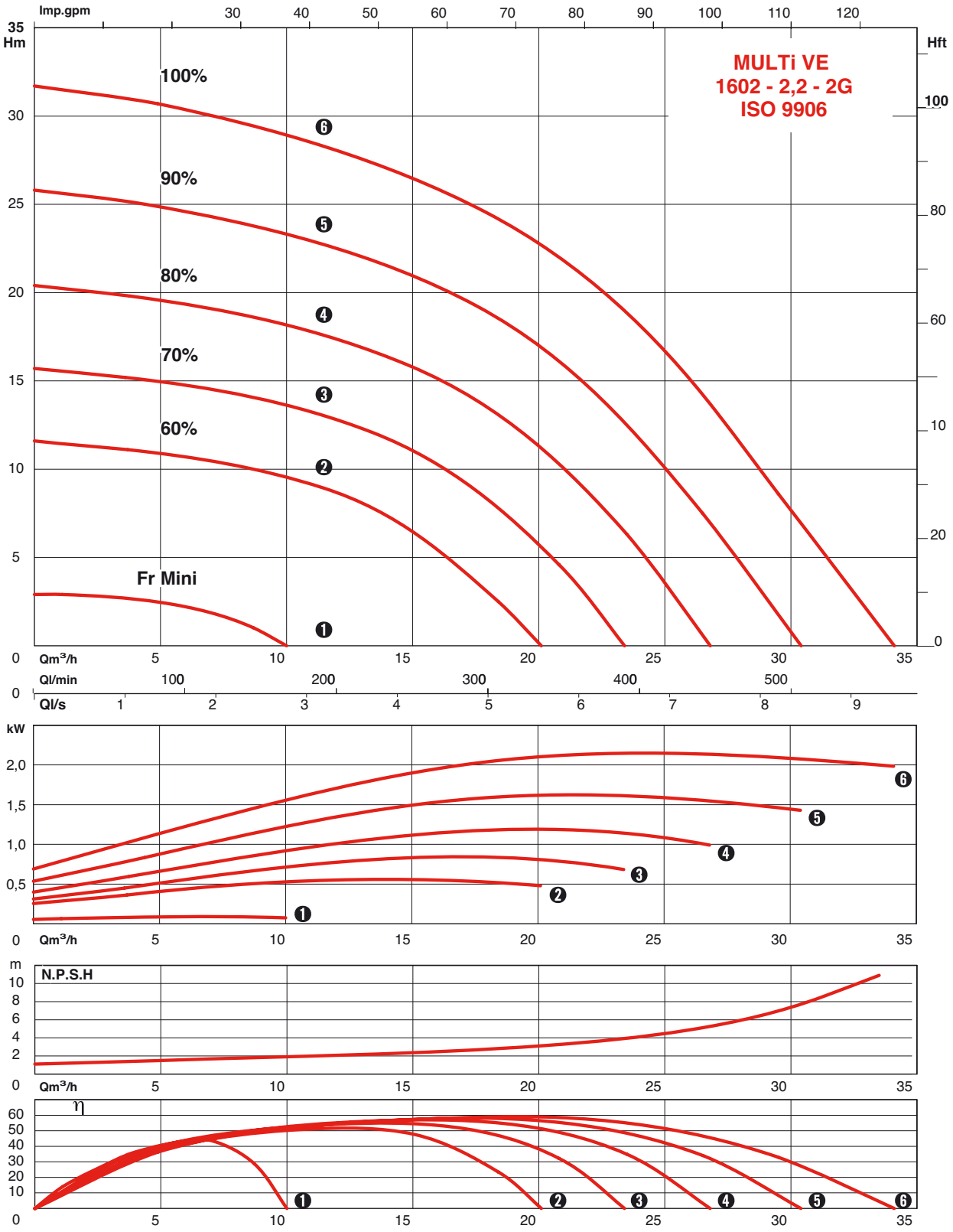
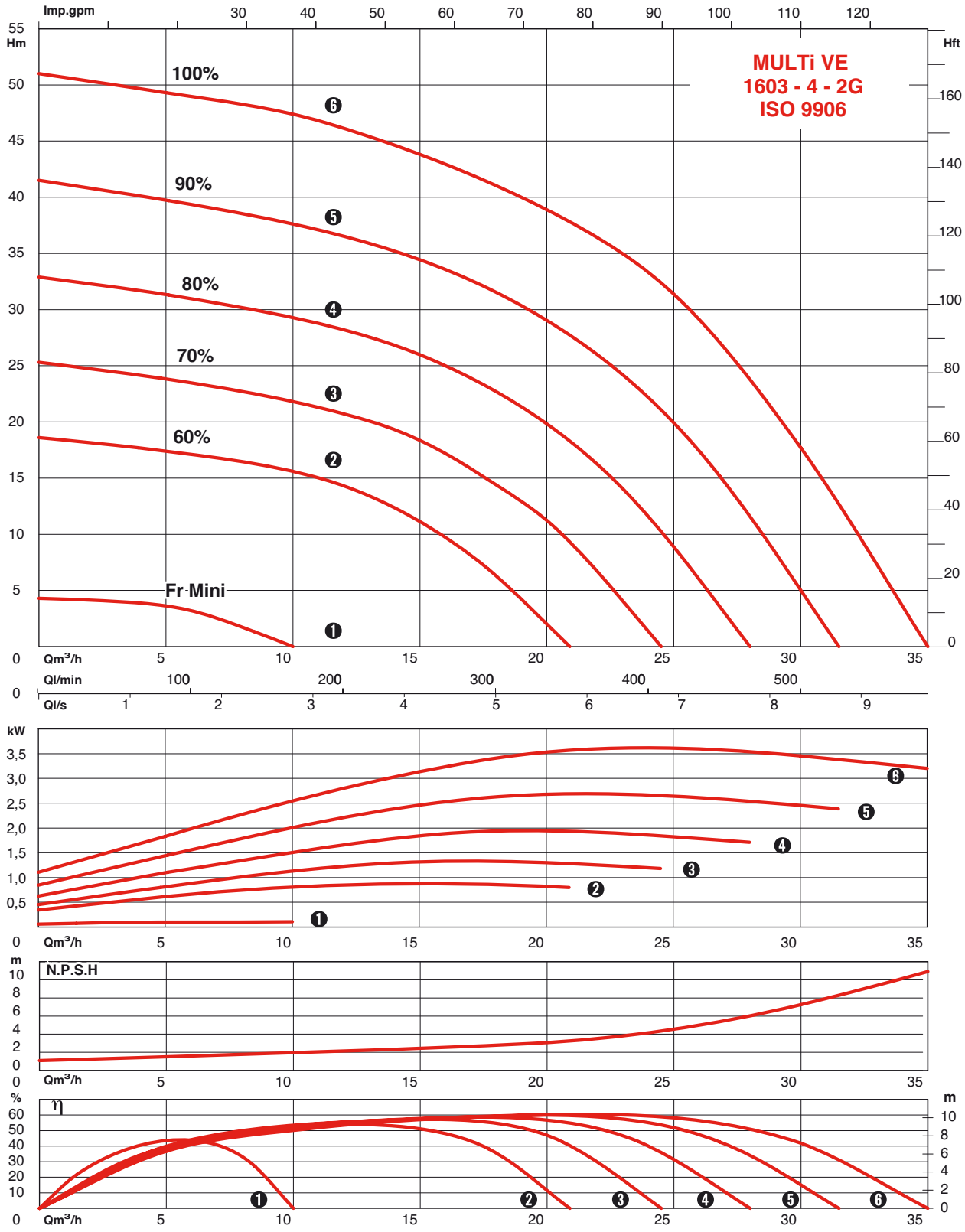


MULTI-VE 1,1 to 7,5 kW

HYDRAULIC PERFORMANCE - 1600 SERIE



HYDRAULIC PERFORMANCE - 1600 SERIE



MULTI-VE 1,1 to 7,5 kW

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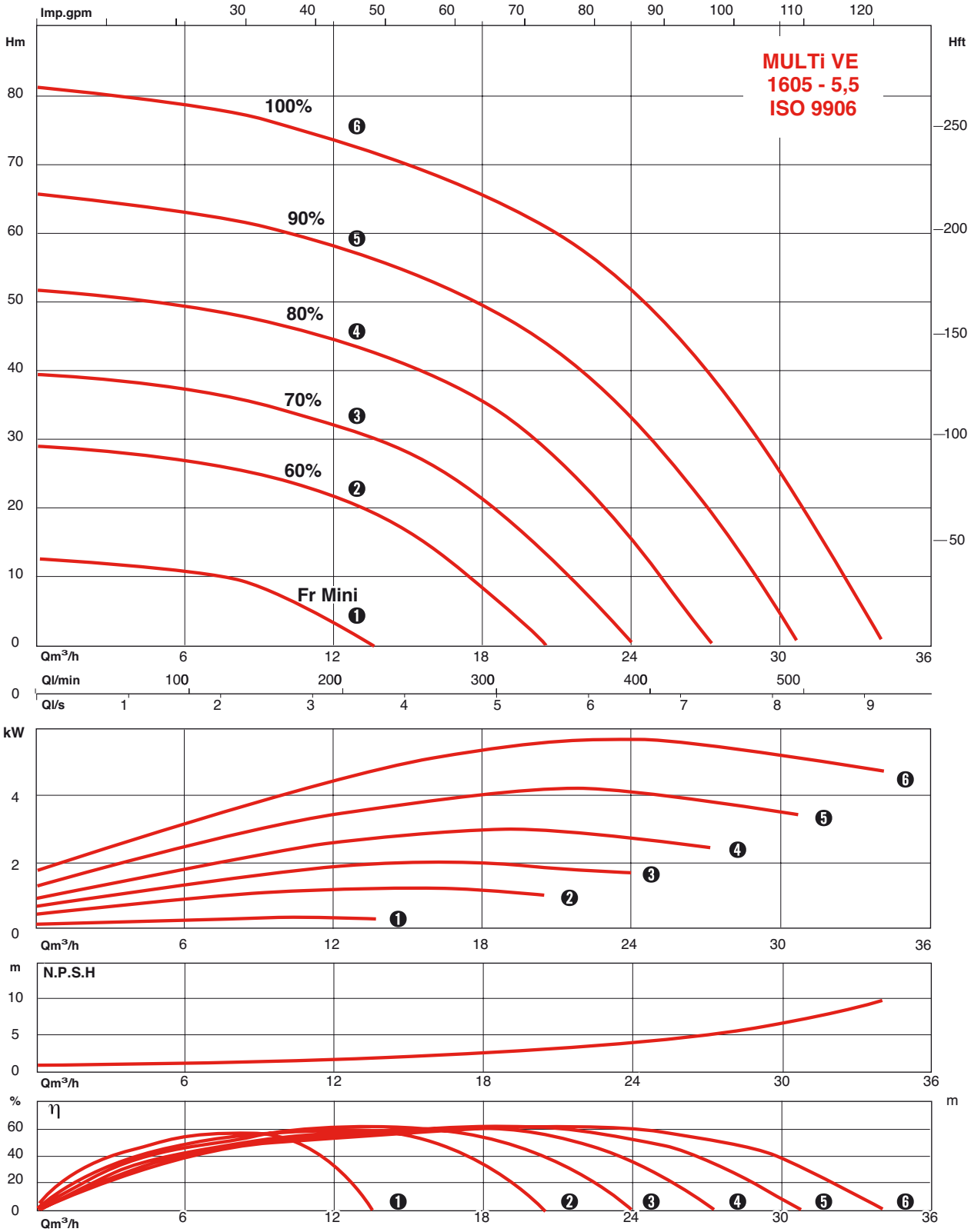

MULTI-VE 1,1 to 7,5 kW

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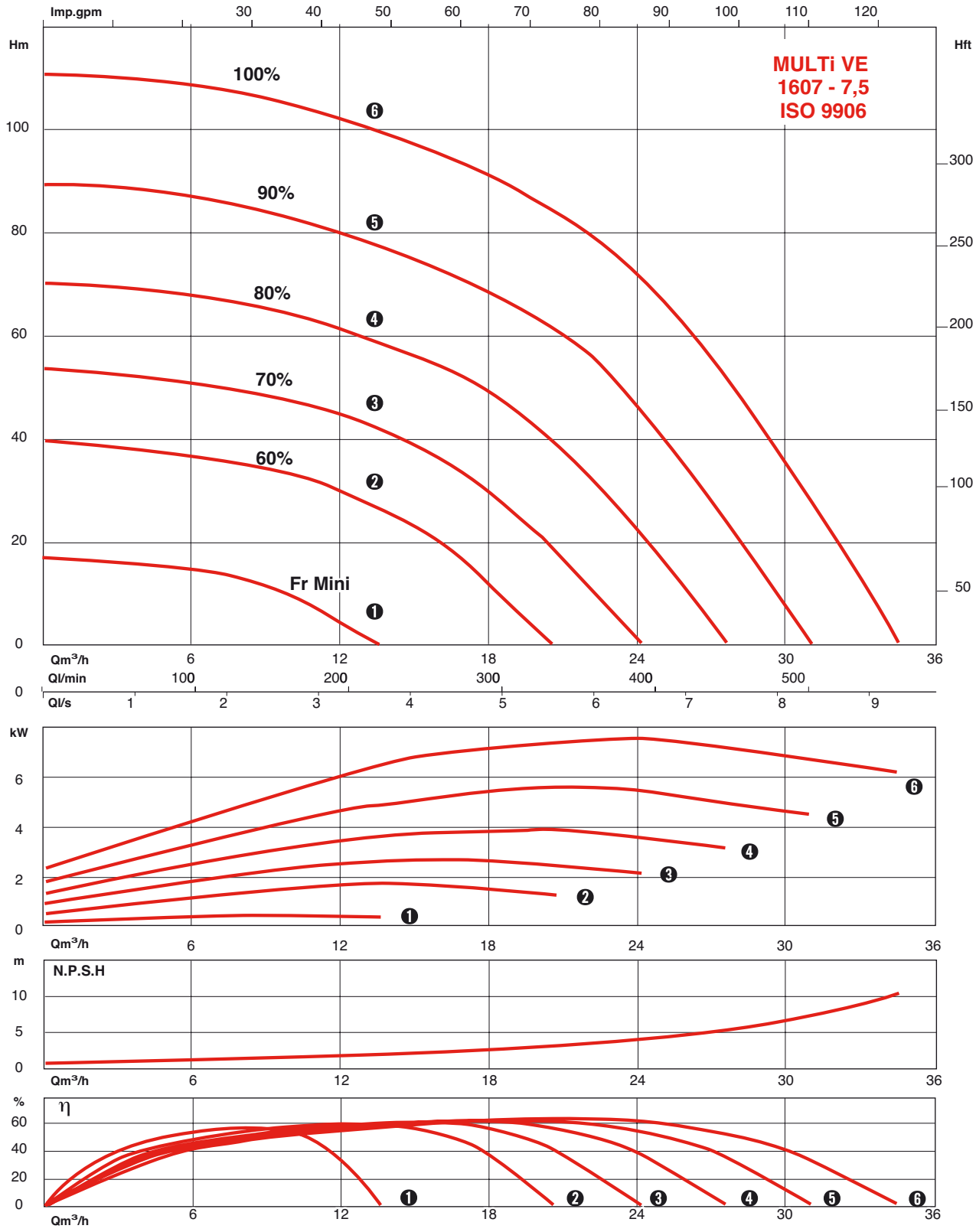
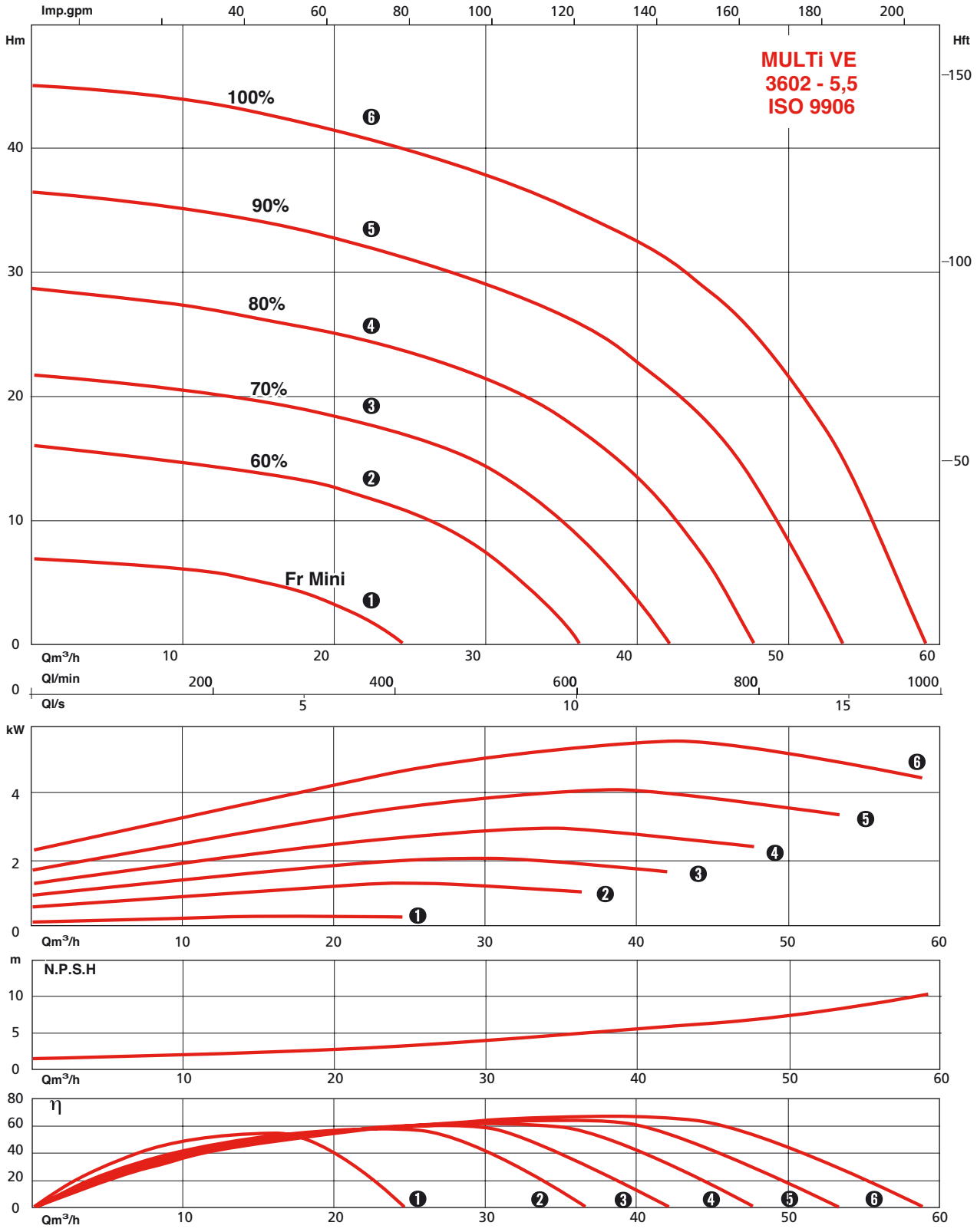
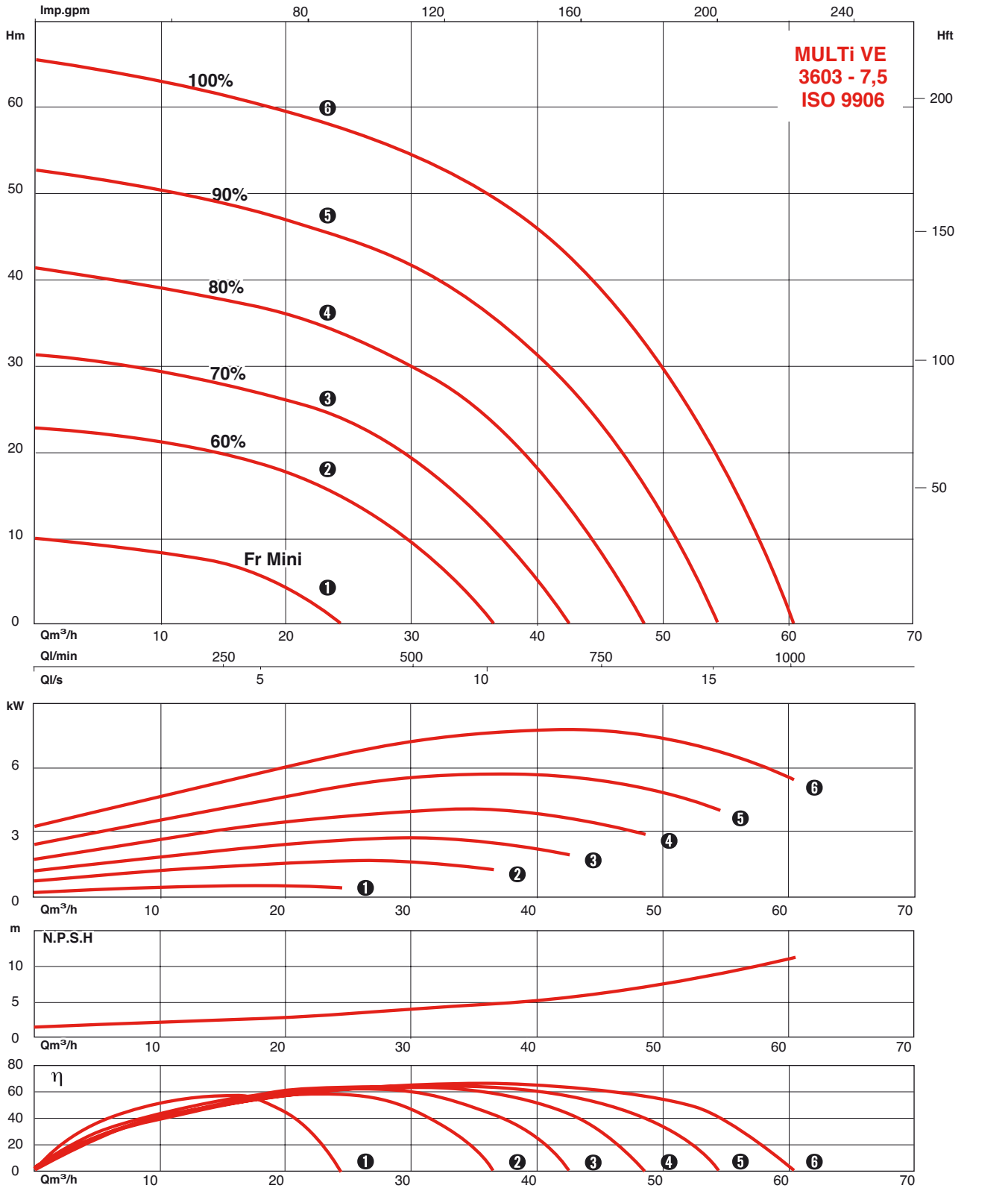


MULTI-VE 1,1 to 7,5 kW

HYDRAULIC PERFORMANCE - 3600 SERIE

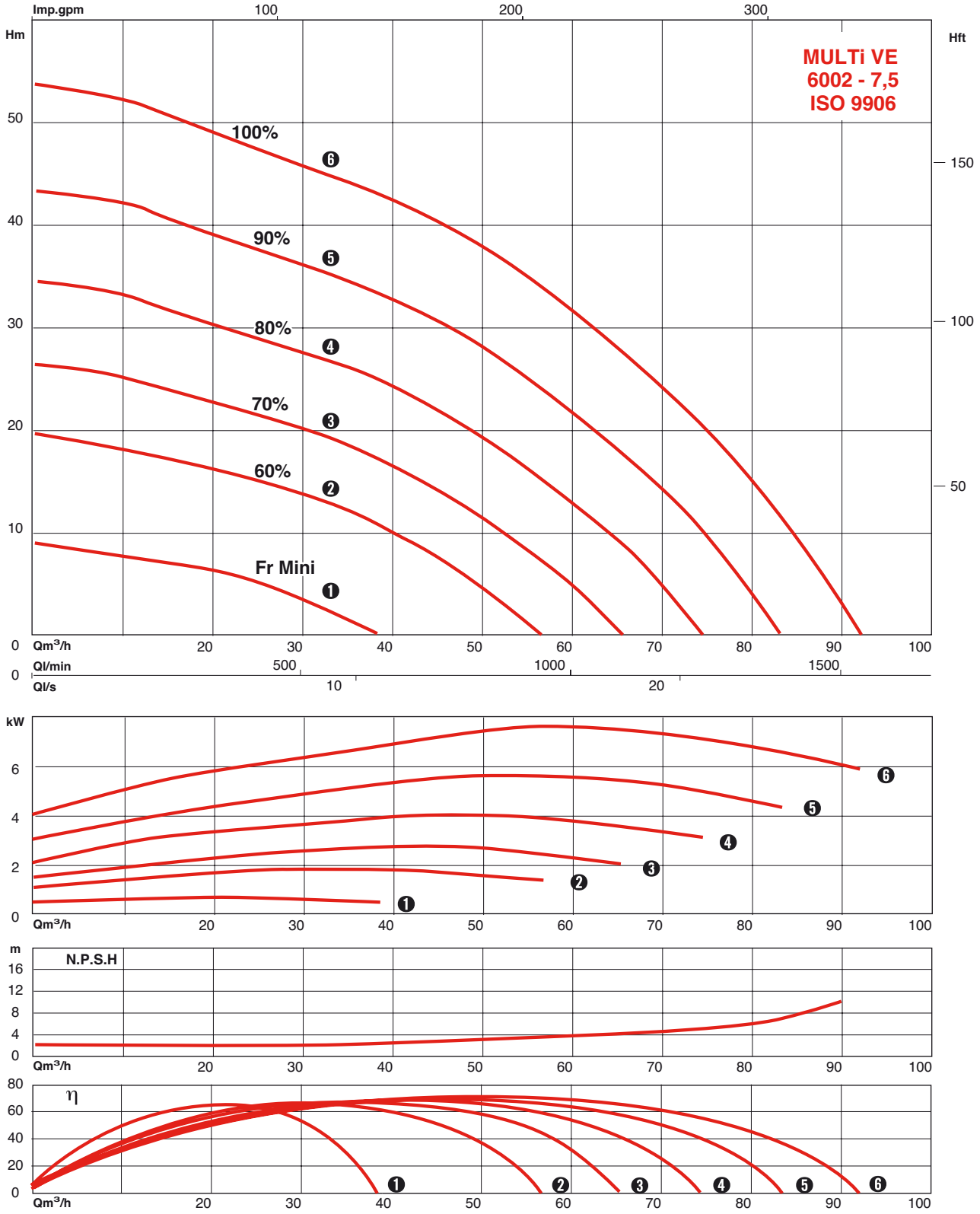


HYDRAULIC PERFORMANCE - 3600 SERIE



MULTI-VE 1,1 to 7,5 kW

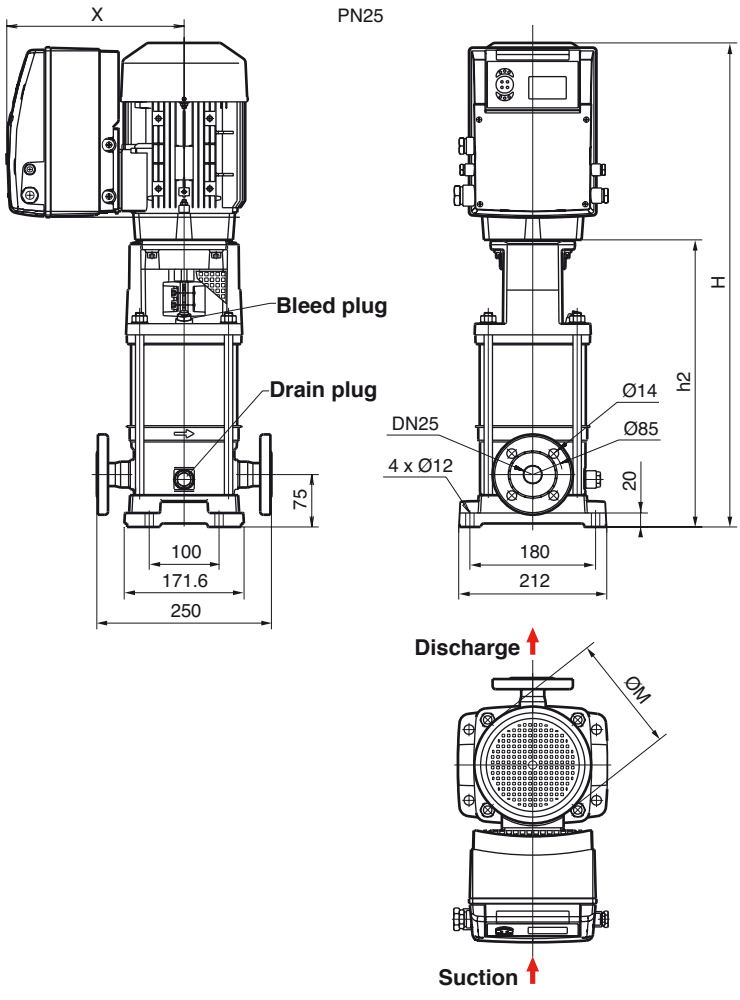
HYDRAULIC PERFORMANCE - 6000 SERIE

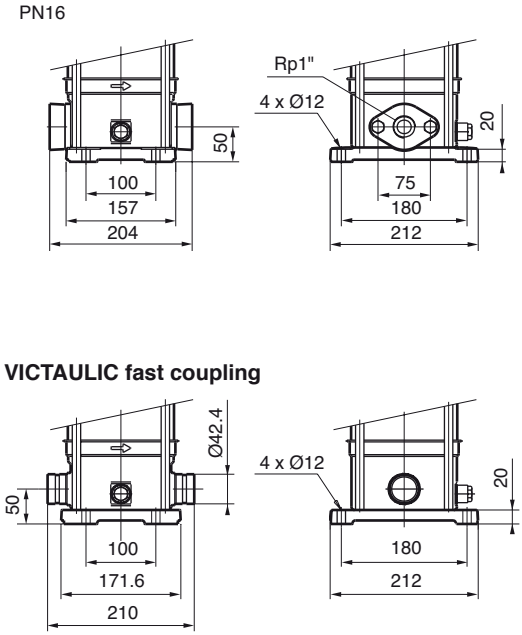


ELECTRICAL DATA AND DIMENSIONS

• 200 SERIE - NP 25 - NP 16 - Oval flanges - VICTAULIC fast coupling

TYPE	MOTOR					INVERTER		DIMENSIONS				MASS	
	P2	I	I	I	FLANGE	P2	SIZE	H	h2	ØM	X	without	with
		400V-50Hz	380V-60Hz	440V-60Hz	MOTOR							packaging	
	kW	A	A	A	A	kW		mm	mm	mm	mm		
MULTi-VE 204 (2G) PN16	1,1	4,2	2,8	2,9	FT100	1,1	TL1/TL2	599,5 •	354,5	Ø155	237	25,3	29,8
MULTi-VE 208 (2G) PN16	2,2	6,1	4,9	4,4	FT115	2,2	TL3/TL4	726,5 •	436,5	Ø170	254	37,2	42,5
MULTi-VE 204 (2G) PN25	1,1	4,2	2,8	2,9	FT100	1,1	TL1/TL2	600,5 •	355,5	Ø155	237	26,6	31,1
MULTi-VE 208 (2G) PN25	2,2	6,1	4,9	4,4	FT115	2,2	TL3/TL4	751,5 •	461,5	Ø170	254	38,6	43,9
MULTi-VE 214 (2G) PN25	4	9,8	8,1	7,6	FT130	4	TL3/TL4	955,5 •	615,5	Ø220	284	57,1	62,4
MULTi-VE 204 (2G) VICTAULIC	1,1	4,2	2,8	2,9	FT100	1,1	TL1/TL2	599,5 •	354,5	Ø155	237	26,6	31,1
MULTi-VE 208 (2G) VICTAULIC	2,2	6,1	4,9	4,4	FT115	2,2	TL3/TL4	726,5 •	436,5	Ø170	254	38,6	43,9
MULTi-VE 214 (2G) VICTAULIC	4	9,8	8,1	7,6	FT130	4	TL3/TL4	955,5 •	615,5	Ø220	284	57,1	62,4



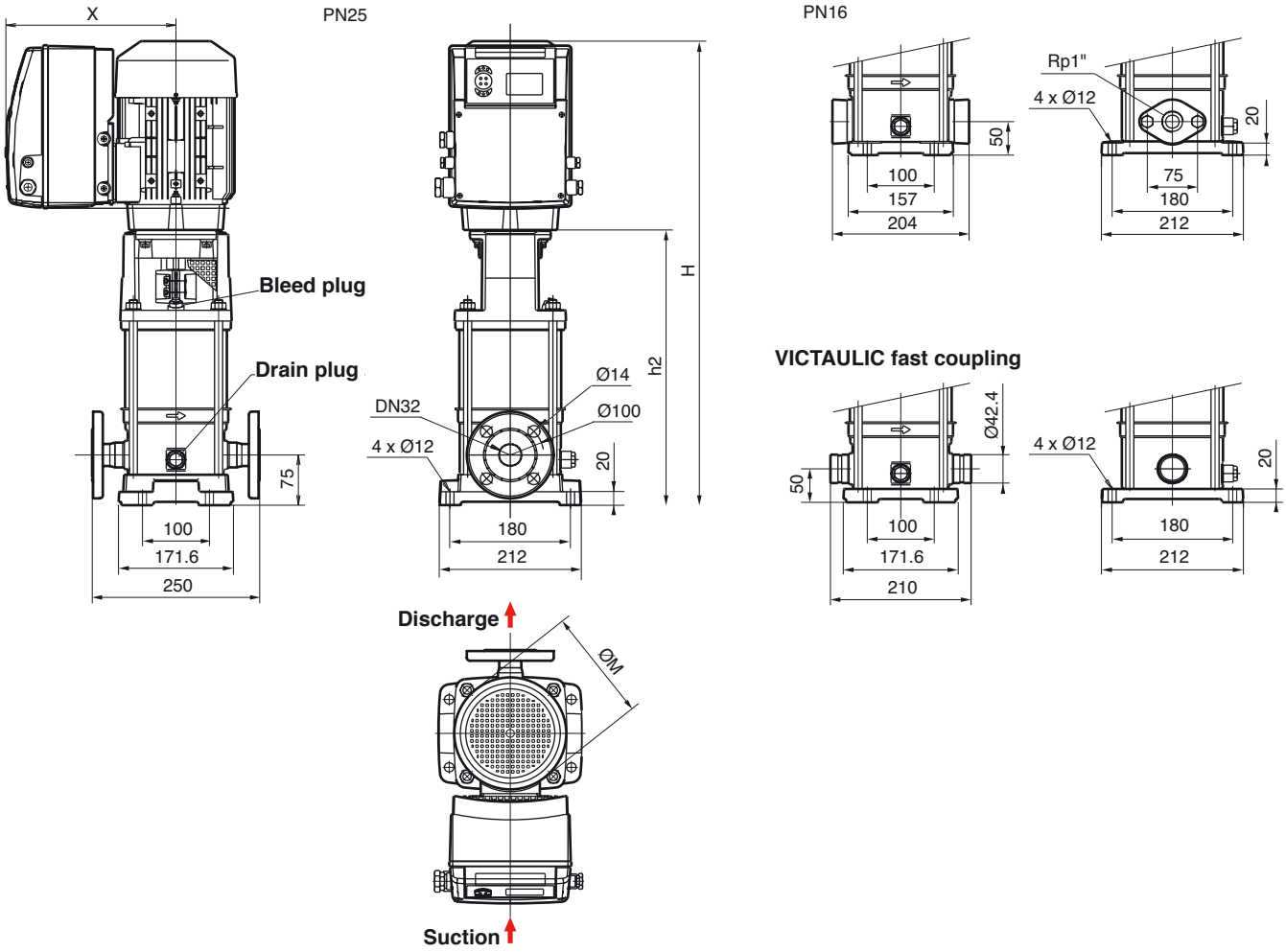


MULTI-VE 1,1 to 7,5 kW

ELECTRICAL DATA AND DIMENSIONS

• 400 SERIE - NP 25 - NP 16 - Oval flanges - VICTAULIC fast coupling

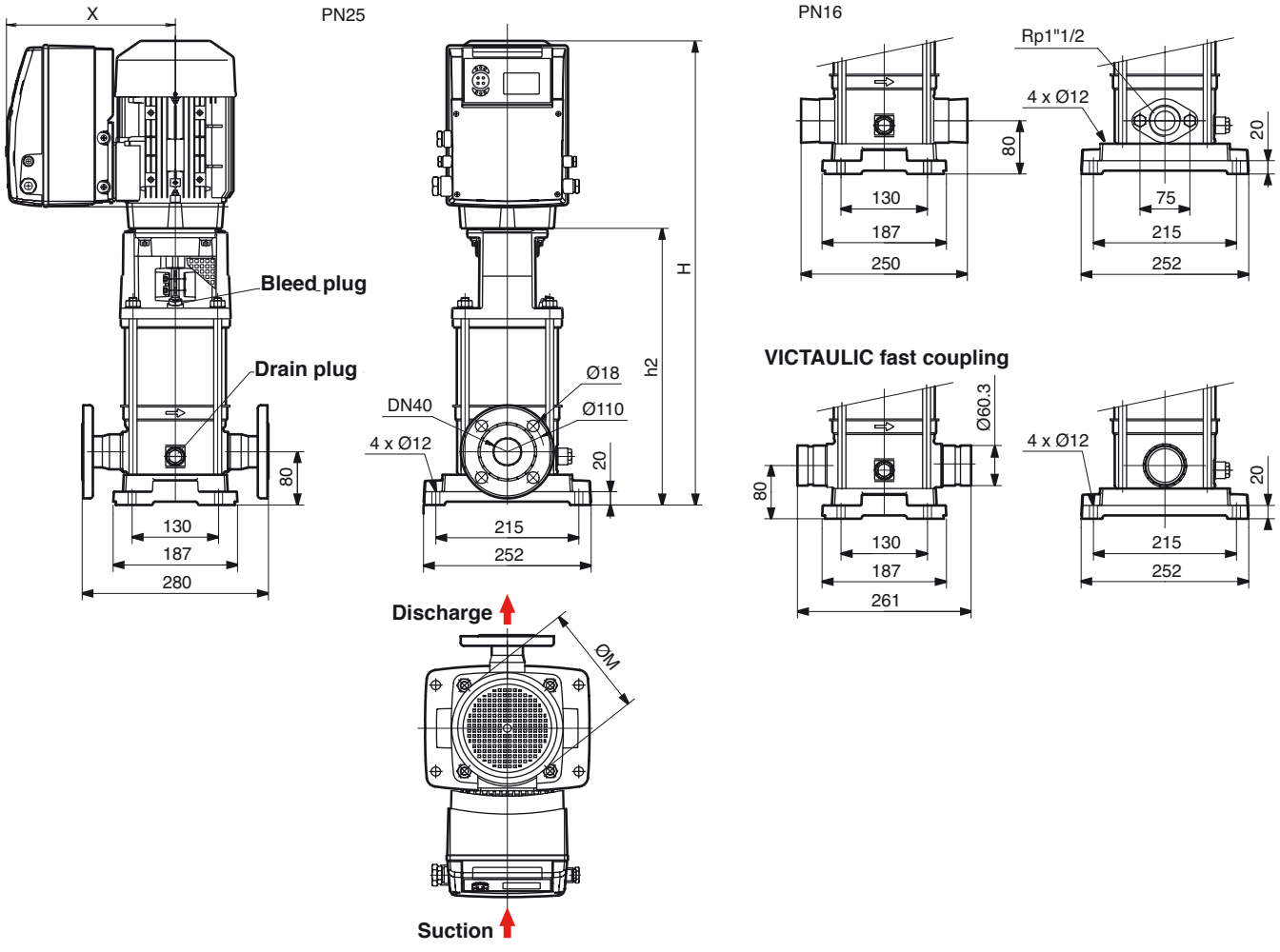
TYPE	MOTOR					INVERTER		DIMENSIONS				MASS	
	P2	I	I	I	FLANGE	P2	SIZE	H	h2	ØM	X	without	with
		400V-50Hz	380V-60Hz	440V-60Hz	MOTOR							packaging	
	kW	A	A	A	A	kW		mm	mm	mm	mm		
MULTi-VE 403 (2G) PN16	1,1	4,4	2,9	3	FT100	1,1	TL1/TL2	551,5 •	306,5	Ø155	237	25,3	29,8
MULTi-VE 406 (2G) PN16	2,2	6,1	5,2	4,7	FT115	2,2	TL3/TL4	678,5 •	388,5	Ø170	254	36,5	41,8
MULTi-VE 403 (2G) PN25	1,1	4,4	2,9	3	FT100	1,1	TL1/TL2	576,5 •	331,5	Ø155	237	26,6	31,1
MULTi-VE 406 (2G) PN25	2,2	6,1	5,2	4,7	FT115	2,2	TL3/TL4	703,5 •	413,5	Ø170	254	37,9	43,2
MULTi-VE 410 (2G) PN25	4	10	8,1	7,6	FT130	4	TL3/TL4	859,5 •	519,5	Ø220	284	54,7	60
MULTi-VE 414 PN25	6,8	10,8	11,6	10,1	FF265	5,5	TL5	1009	635	266	308	82,1	92,1
MULTi-VE 403 (2G) VICTAULIC	1,1	4,4	2,9	3	FT100	1,1	TL1/TL2	551,5 •	306,5	Ø155	237	26,6	31,1
MULTi-VE 406 (2G) VICTAULIC	2,2	6,1	5,2	4,7	FT115	2,2	TL3/TL4	678,5 •	388,5	Ø170	254	37,9	43,2
MULTi-VE 410 (2G) VICTAULIC	4	10	8,1	7,6	FT130	4	TL3/TL4	859,5 •	519,5	Ø220	284	54,7	60



ELECTRICAL DATA AND DIMENSIONS

• 800 SERIE - NP 25 - NP 16 - Oval flanges - VICTAULIC fast coupling

TYPE			MOTOR				INVERTER		DIMENSIONS			MASS	
	P2	I	I	I	FLANGE	P2	SIZE	H	h2	ØM	X	without	with
		400V-50Hz	380V-60Hz	440V-60Hz	MOTOR							packaging	
	kW	A	A	A	A	kW		mm	mm	mm	mm		
MULTi-VE 803(2G) PN16	2,2	5,9	4,8	4,2	FT115	2,2	TL3/TL4	663,5 •	373,5	Ø170	254	36,7	42
MULTi-VE 806 (2G) PN16	4	10,2	7,8	7,6	FT130	4	TL3/TL4	813,5 •	473,5	Ø220	284	52,8	58,1
MULTi-VE 808 PN16	6,8	10,8	11,6	10,1	FF265	5,5	TL5	927	553	266	308	78,6	88,6
MULTi-VE 803 (2G) PN25	2,2	5,9	4,8	4,2	FT115	2,2	TL3/TL4	663,5 •	373,5	Ø170	254	37,1	42,4
MULTi-VE 806 (2G) PN25	4	10,2	7,8	7,6	FT130	4	TL3/TL4	813,5 •	473,5	Ø220	284	53,2	58,5
MULTi-VE 808 PN25	6,8	10,8	11,6	10,1	FF265	5,5	TL5	1027,5	653,5	266	308	78,4	88,4
MULTi-VE 811 PN25	9,3	14,8	15,5	13,7	FF265	7,5	TL5	1047	673	266	308	89,9	99,9
MULTi-VE 803 (2G) VICTAULIC	2,2	5,9	4,8	4,2	FT115	2,2	TL3/TL4	663,5 •	373,5	Ø170	254	37,1	42,4
MULTi-VE 806 (2G) VICTAULIC	4	10,2	7,8	7,6	FT130	4	TL3/TL4	813,5 •	473,5	Ø220	284	53,2	58,5

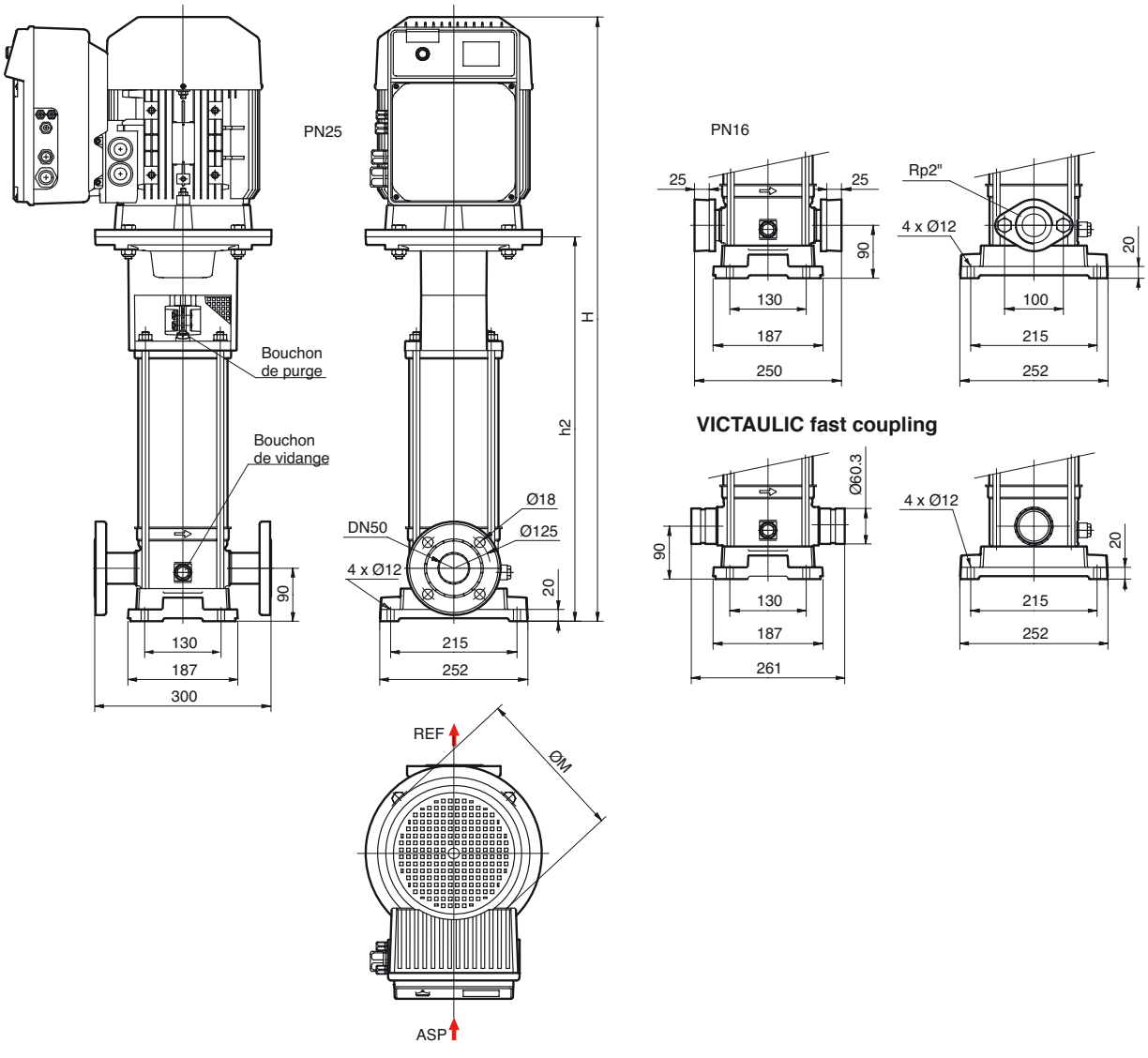


MULTI-VE 1,1 to 7,5 kW

ELECTRICAL DATA AND DIMENSIONS

• 1600 SERIE - NP 25 - NP 16 - Oval flanges - VICTAULIC fast coupling

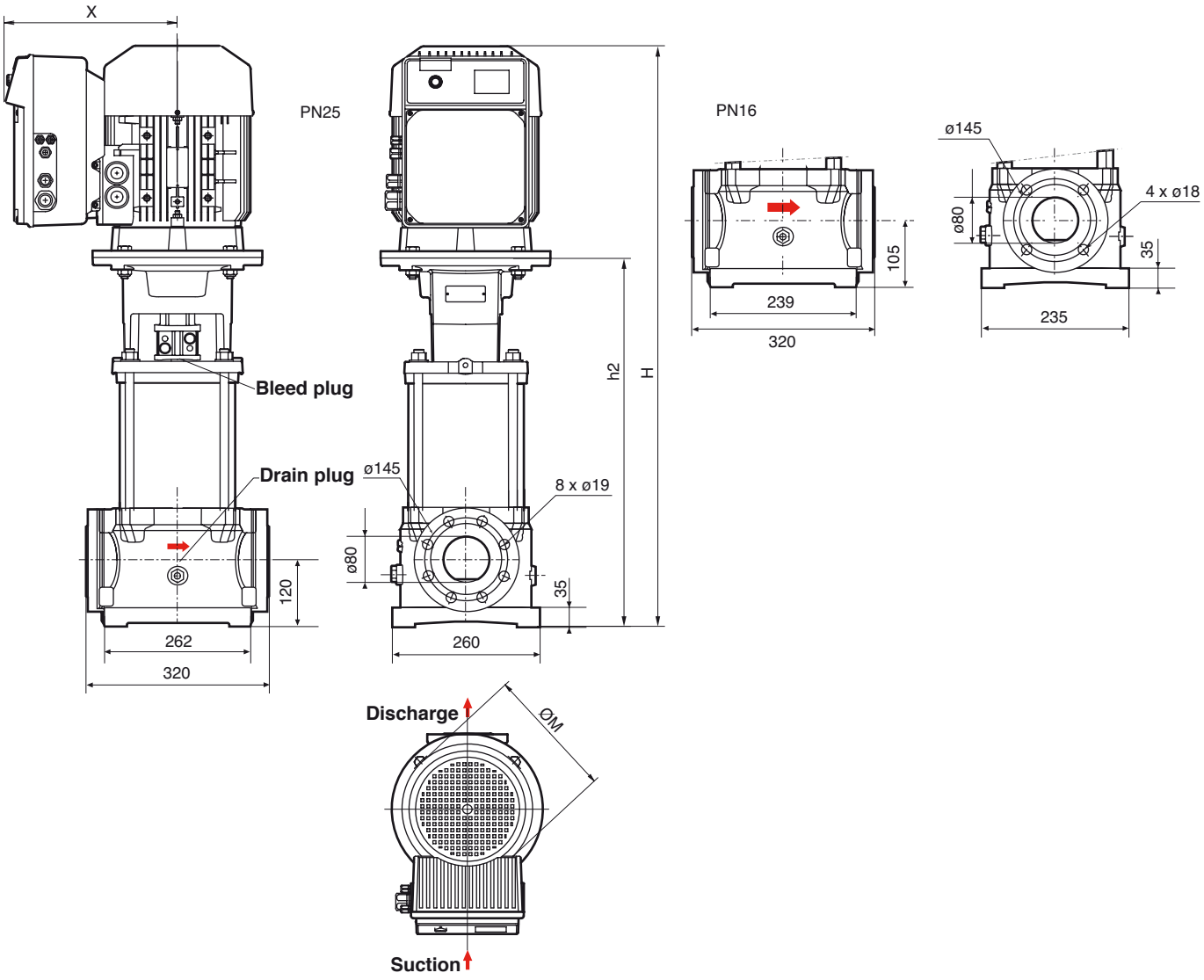
TYPE	MOTOR					INVERTER		DIMENSIONS				MASS	
	P2	I	I	I	FLANGE	P2	SIZE	H	h2	ØM	X	without	with
		400V-50Hz	380V-60Hz	440V-60Hz	MOTOR							packaging	
	kW	A	A	A	A	kW		mm	mm	mm	mm		
MULTi-VE 1602 (2G) PN16	2,2	6,2	5,5	4,9	FT115	2,2	TL3/TL4	658,5 •	368,5	Ø170	254	38	43,3
MULTi-VE 1603 (2G) PN16	4	9,5	8,3	7,6	FT130	4	TL3/TL4	793,5 •	453,5	Ø220	284	53,2	58,5
MULTi-VE 1605 PN16	6,8	10,8	11,6	10,1	FF265	5,5	TL5	922	548	266	308	84,3	94,3
MULTi-VE 1607 PN16	9,3	14,8	15,5	13,7	FF265	7,5	TL5	997	623	266	308	96,3	106,3
MULTi-VE 1602 (2G) PN25	2,2	6,2	5,5	4,9	FT115	2,2	TL3/TL4	658,5 •	368,5	Ø170	254	38	43,3
MULTi-VE 1603 (2G) PN25	4	9,5	8,3	7,6	FT130	4	TL3/TL4	793,5 •	453,5	Ø220	284	53,2	58,5
MULTi-VE 1605 PN25	6,8	10,8	11,6	10,1	FF265	5,5	TL5	922	548	266	308	84,3	94,3
MULTi-VE 1607 PN25	9,3	14,8	15,5	13,7	FF265	7,5	TL5	997	623	266	308	96,3	106,3



ELECTRICAL DATA AND DIMENSIONS

• **3600 SERIE - NP 25 - NP 16 - Round flanges**

TYPE	MOTOR					INVERTER		DIMENSIONS				MASS	
	P2	I	I	I	FLANGE	P2	SIZE	H	h2	ØM	X	without	with
		400V-50Hz	380V-60Hz	440V-60Hz	MOTOR							packaging	
	kW	A	A	A	A	kW		mm	mm	mm	mm		
MULTi-VE 3602...T/2 PN16	6,8	10,8	11,6	10,1	FF265	5,5	TL5	834	460	266	308	113,6	123,6
MULTi-VE 3603...T/2 PN16	9,3	14,8	15,5	13,7	FF265	7,5	TL5	880	506	266	308	126,1	136,1
MULTi-VE 3602 PN25	6,8	10,8	11,6	10,1	FF265	5,5	TL5	849	475	266	308	117,6	127,6
MULTi-VE 3603 PN25	9,3	14,8	15,5	13,7	FF265	7,5	TL5	895	521	266	308	128,1	138,1

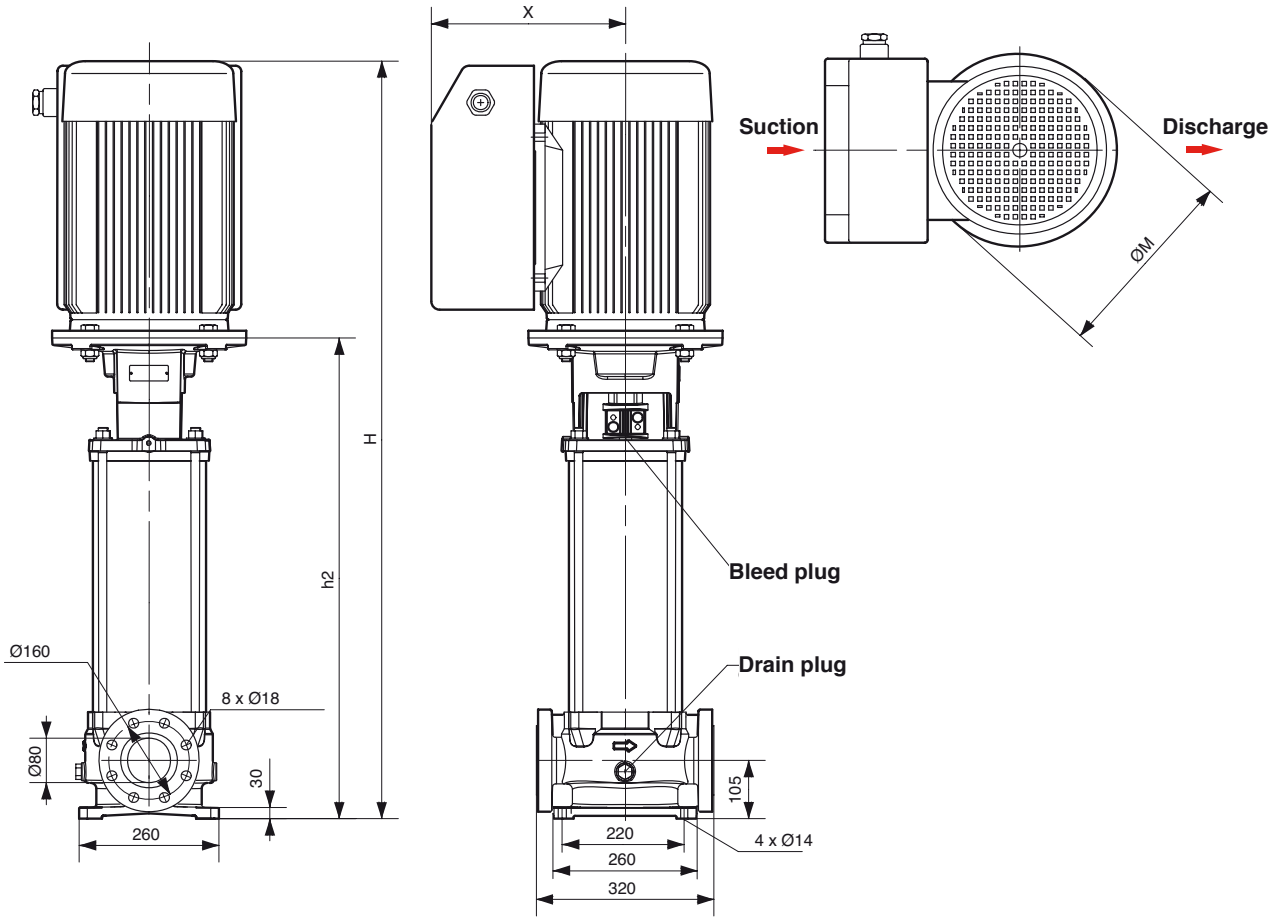


MULTI-VE 1,1 to 7,5 kW

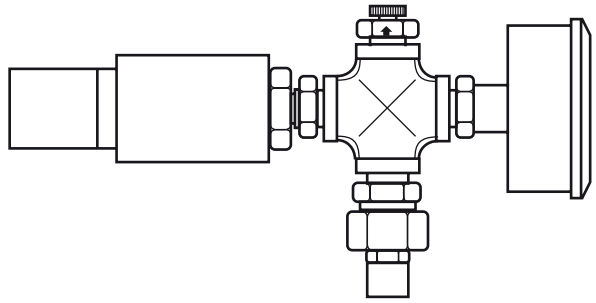
ELECTRICAL DATA AND DIMENSIONS

• **6000 SERIE - NP 25**

TYPE	MOTOR					INVERTER		DIMENSIONS				MASS	
	P2	I	I	I	FLANGE	P2	SIZE	H	h2	ØM	X	without	with
		400V-50Hz	380V-60Hz	440V-60Hz	MOTOR							packaging	
	kW	A	A	A	A	kW		mm	mm	mm	mm		
MULTi-VE 6002...T/2 PN16	7,5	14,8	15,5	13,7	FF265	7,5	TL5	865	491	266	308	126,1	136,1
MULTi-VE 6002...T/2 PN25	7,5	14,8	15,5	13,7	FF265	7,5	TL5	865	491	266	308	126,1	136,1



SENSOR KIT: KIT SENSOR : ASSEMBLY ACCESSORY



Sensor kit	Model	Order Reference	Item reference
6 bars	MULTi-VE 403	captpress 6b	4048063
	MULTi-VE 1602		
	MULTi-VE 1603		
10 bars	MULTi-VE 204	captpress 10b	4048064
	MULTi-VE 803		
	MULTi-VE 3602		
	MULTi-VE 3603		
16 bars	MULTi-VE 208	captpress 16b	4048065
	MULTi-VE 406		
	MULTi-VE 806		
	MULTi-VE 1605		
	MULTi-VE 1607		
	MULTi-VE 6002		
25 bars	MULTi-VE 214	captpress 25b	4048066
	MULTi-VE 410		
	MULTi-VE 414		
	MULTi-VE 808		
	MULTi-VE 811		

FEATURES

a) Electrical

– Three-phase 380V / 440V - 50/60 Hz, tolerance ± 6%.

b) Assembly

– Installation in an easily-reached place. For heavy pumps, install a lifting hook in line with the pump for easy disassembly.
– Assembly on concrete block > 10 cm high with attachment by anchor bolts.
– Pump axis always horizontal.

Connection to installation by counter-flanges or victaulic fast couplings.

c) Conditioning

– Oval flange pumps: delivered with oval cast-iron counter-flanges for screw-on tubes, seals and bolts.
– Round flange pumps: delivered with seals and bolts without counter-flanges (optional).
– Rapid hose coupling pumps for victaulic collars: supplied without collars (optional).

ACCESSORIES

– Isolating valves
– Counter-flanges, screw-on or weld-on (steel or stainless)
– victaulic type fast couplings
– Anti-vibration sleeves
– Bladder or galvanized vessel
– Anti-hammering tank
– Non-return valves (with ogive or flap, with spring if operation in Mode 2)
– Foot valve strainer
– Water shortage protection (mode 1)
– Control pressure sensor kit

MULTI-VE 1,1 to 7,5 kW

NOTES