

OPERATING LIMITS

| | |
|--------------------------|----------------------|
| Flow rates up to: | 34 m ³ /h |
| Head up to: | 96 m CL |
| Max discharge pressure: | 10 bar |
| Max suction pressure: | 6 bar |
| Temperature range: | - 15° to +110°C* |
| Max ambient temperature: | + 50°C |
| ND of ports: | 1" à 2" |

* depending on mechanical seal and gaskets

MULTI-HE

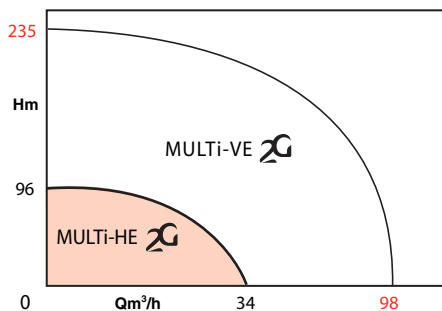
HORIZONTAL MULTI-STAGE STAINLESS STEEL PUMPS

with integrated EVS*

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.

- Water supply - Boosting
- Watering - Irrigation
- High pressure washing
- Heating - Air conditioning
- Water treatment.

Incorporation into modular booster sets dedicated to:

- Hotel
- Hospitals.

Pumped fluids:

- **Range 304:** clear, non-aggressive liquids (drinking water, water with glycol)
- **Range 316L:** aggressive liquids (demineralized water, sea water, chlorinate water).



• EVS* for MULTI-HE 2G



• MULTI-HE 403 2G

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.**
 - **une seule pompe couvre une gamme complète de pompes standard.**
 - **One contact, one supplier for a complete automatic system.**
 - **Smaller booster size thanks to integration of frequency converter in pump.**

DESIGN

- **Hydraulic part**
- All stainless steel.
- Centrifugal multistage with 2 to 6 stages.
- Horizontal axis
- Suction / Discharge orifices tapped.
- Axial suction, radial discharge upwards.
- Tightness at shaft passage by standardized mechanical seal.

- **Motor**
- Dry motor, 2 pole equipped with VEV.

Winding 3-phase : 380 to 440 V \pm 6%
 Frequency : 50 and 60 Hz
 Insulation class : F (155°C)
 Protection index : IP 54

OPERATION

Electronic speed variation is applied to the asynchronous motors of the MULTI-HE centrifugal pumps.
 The goal is to regulate the speed of the AC motor by converting the voltage and frequency of the mains inputs from 380 to 440 V \pm 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.

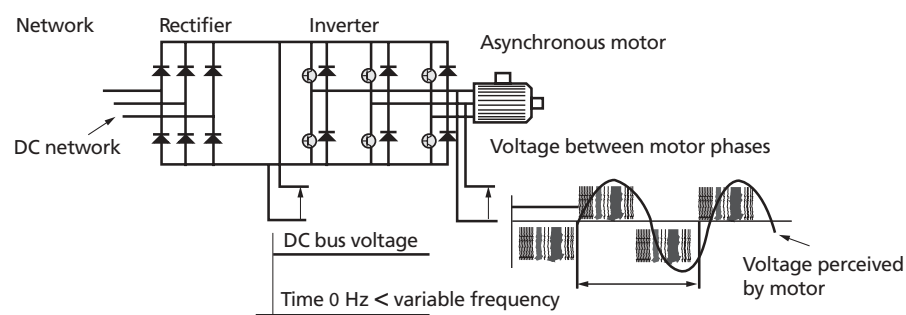
In this way, we obtain a smooth DC voltage called the "DC bus".

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 referred to as pulse width modulation. These transistors are controlled by the micro-controller 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 produced by magnetization (frequency inaudible to the human ear: 8 to 16 kHz).



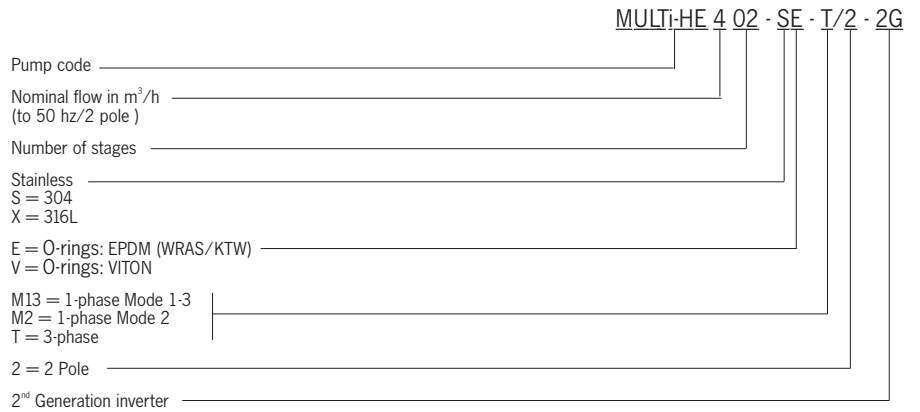
STANDARD CONSTRUCTION

| Range | Stainless 304 | Stainless 316L |
|-----------------|------------------------|--------------------|
| | 2/4/8/16 | 2/4/8 |
| Main parts | Materials | |
| | non-aggressive liquids | aggressive liquids |
| Pump casing | Stainless 304 | Stainless 316L |
| Impellers | Stainless 304 | Stainless 316L |
| Cells (stage) | Stainless 304 | Stainless 316L |
| Pump shaft | Stainless 316L | Stainless 316L |
| Mechanical seal | Si carbide | Tg carbide |
| | Carbon | Carbon |
| O-rings | EPDM* | Viton** |
| Plugs | Stainless 316L | Stainless 316L |

* T° 110°C – **T°90°C

NB: Stainless 304 (Z6CN18-9) or 316 L (Z2CND17-12) recommended materials offering high resistance to corrosion. Clean conveyed liquids with fibers and containing little sand/silica (max concentration 40 g/m³).

IDENTIFICATION

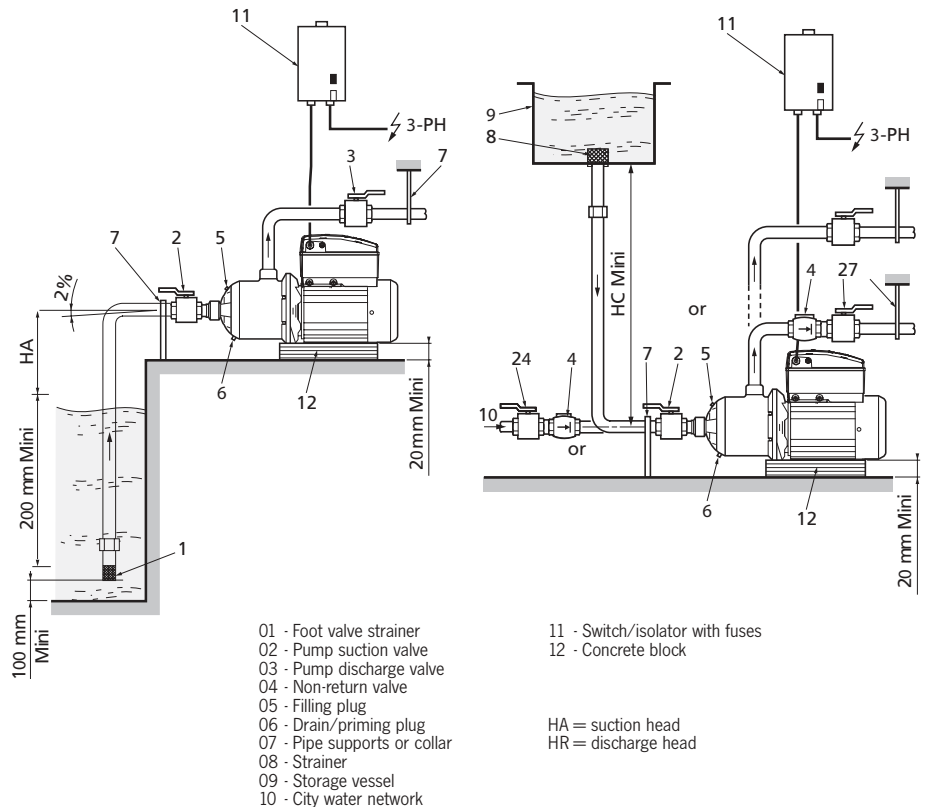


OPERATION

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 configured in Mode 1. The information is viewed on a display.

Mode 1 / manual mode

The pump is installed in the same way as a MULTI-H 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).

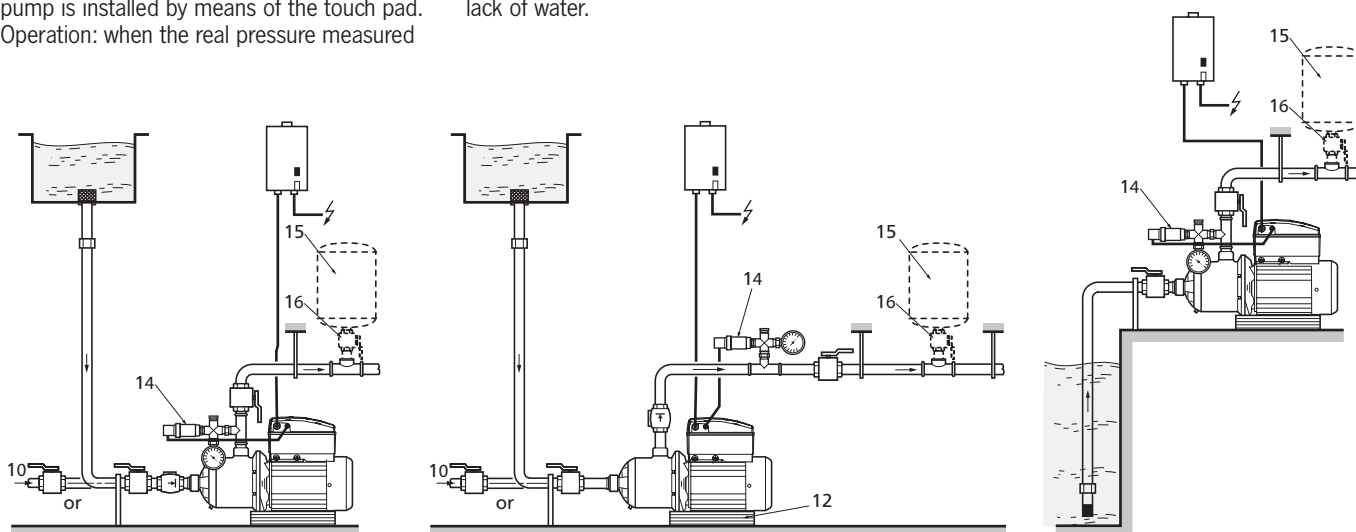


OPERATION

Mode 2 / automatic pump boost system

Mode with pump alone using pressure regulation. The pump is installed with its pressure sensor which can be 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.



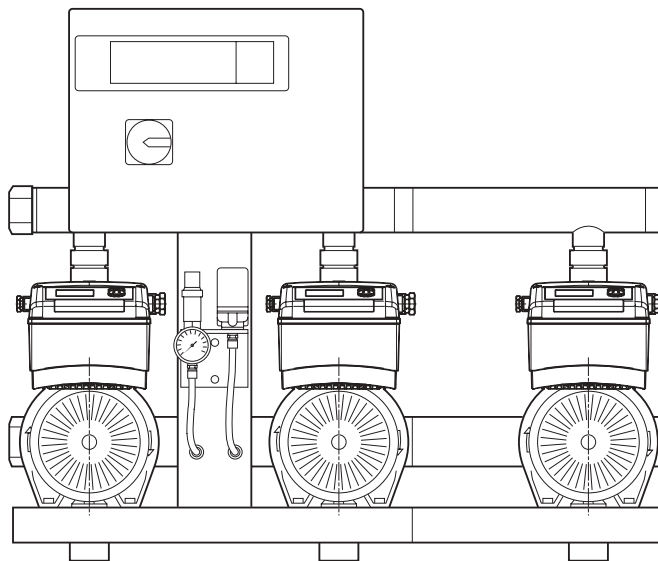
Mode 3/ use of pump on booster

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.

KEY

- 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 vessel
- 10 - City water network
- 11 - Switch/isolator with fuses
- 12 - Concrete block
- 14 - Pressure sensor kit
- 15 - Vessel
- 16 - Vessel isolating valve

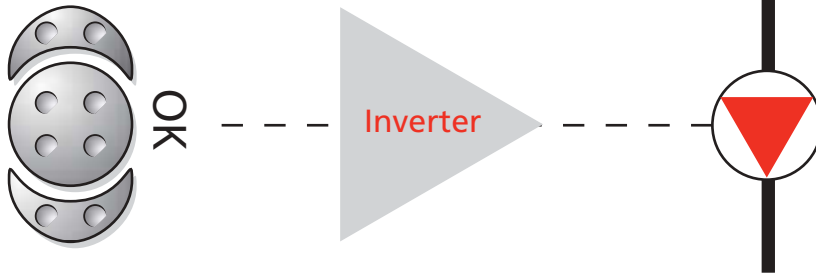
HA = suction head
HR = discharge head



OPERATING OF 1.1 TO 4 kW UNITS

Mode 1

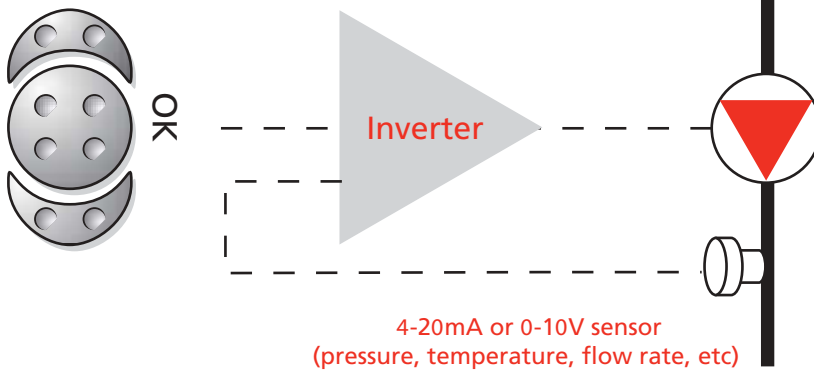
Adjusting of the frequency from 30% to 100%



- **Display**
 - Speed shown on the screen
- **On/Off**
 - Remote
 - With button

Mode 2

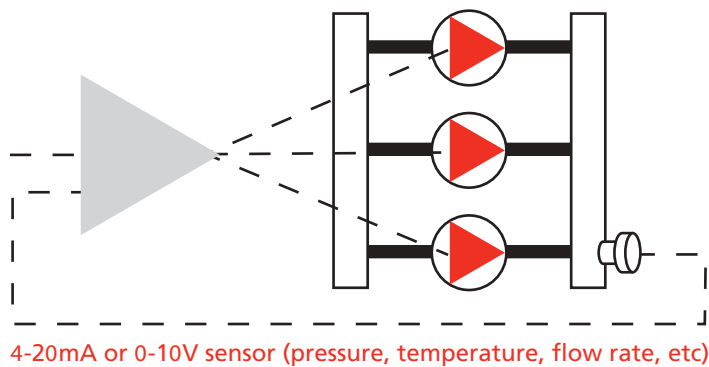
Adjusting of the setpoint (0 to 100% of the sensor's rating)



- **Display**
 - Displaying of pressure for pressure regulation
 - Displaying of % 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 of ALTi-E setpoint

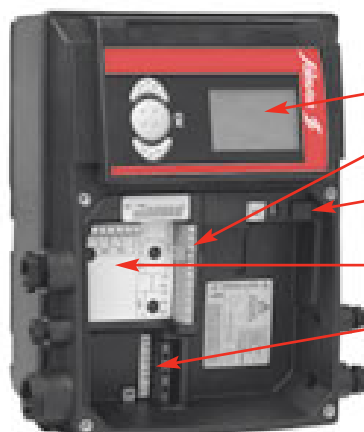


- **Display**
 - Displaying of the rotation speed
- **On/Off**
 - Remote
 - With button

FONCTIONS INTÉGRÉES - CONNECTIQUE

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
- Reducing of the 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 ESV (VEV) CONTROL

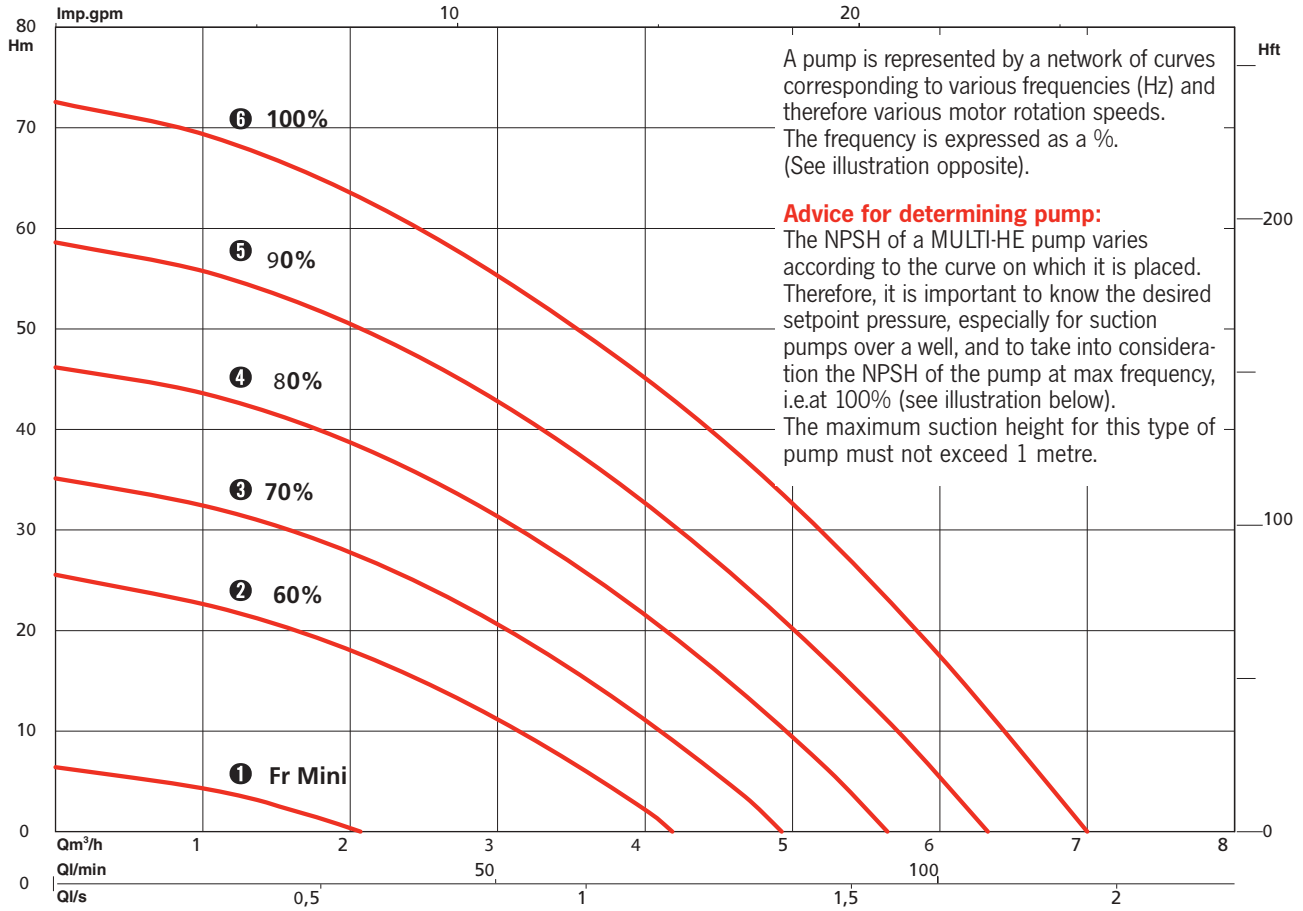
Maintenance troubleshooting

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.

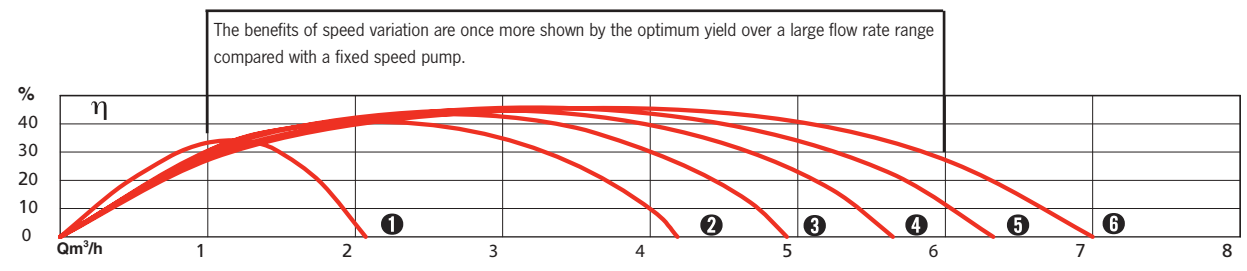
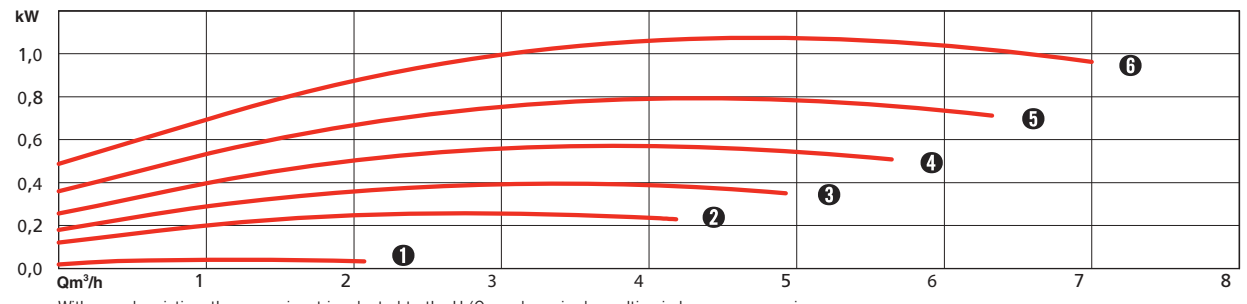
| Fault type | | Inverter behaviour | | | Signaling | |
|------------|--------------------------------------|--------------------------|-----------------------------|---------------------------------|------------|---------------|
| | | Waiting time before stop | Waiting time before restart | Max number of defaults over 24h | Fault code | State LED red |
| Variator | Temperature | 3 s | 5 mn* | 6 | E30 E31 | Flashing |
| | Short-circuit | Immediate | 5 s | 6 | E23 | Flashing |
| Line | 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 |
| Motor | Temperature | 3 s | 5 mn* | 6 | E20 (E26) | Flashing |
| | Short-circuit | Immediate | 5 mn* | 6 | E23 | Flashing |
| Pump | 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 |
| External | Incorrect pump code | Immediate | No restart | 1 | E99 | Flashing |
| | Cable cut in (only w.sensor 4/20 mA) | 5 s | No restart | 1 | E42 | Flashing |

* If the fault is eliminated

PUMP PERFORMANCE

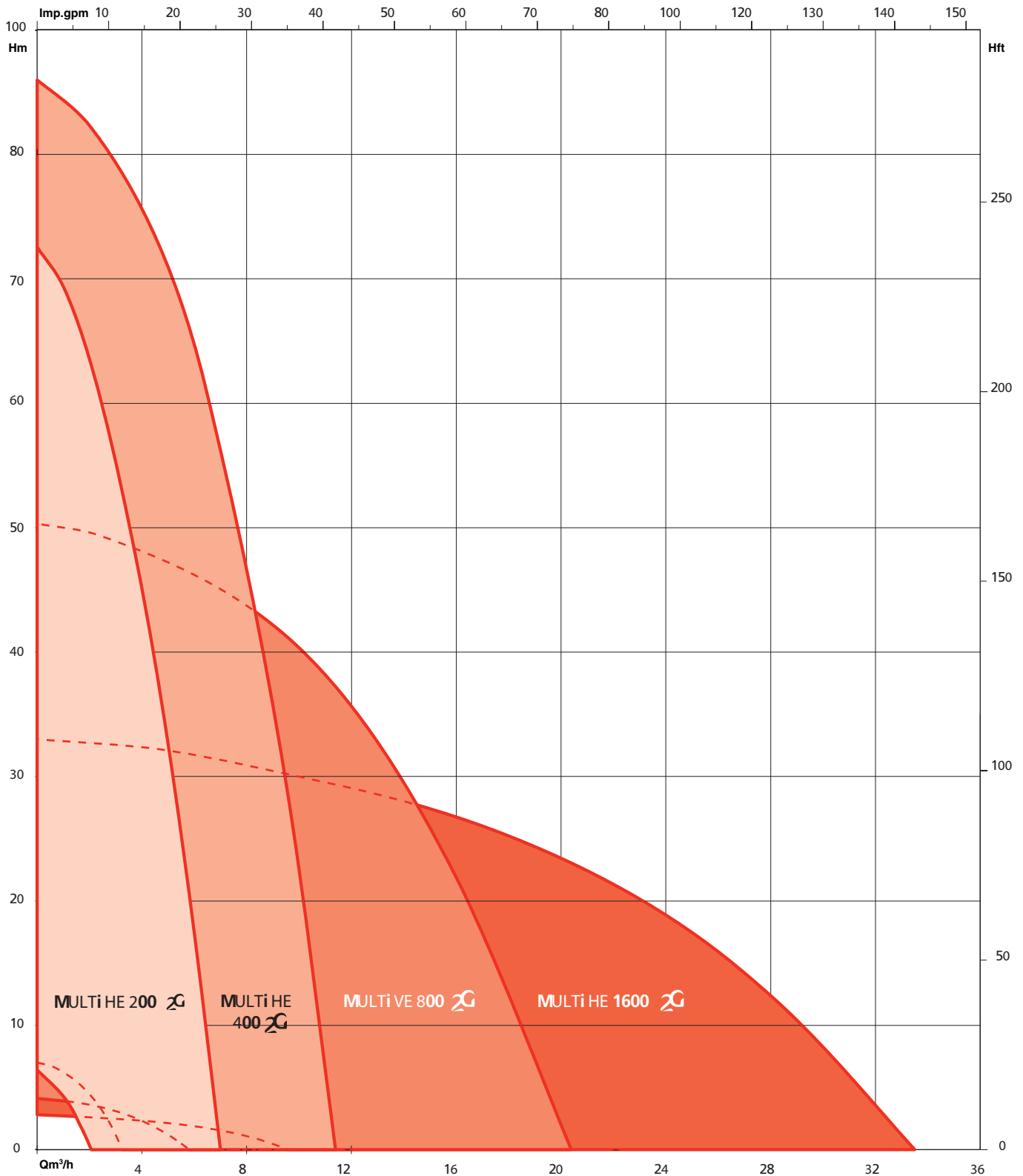


An ESV (Electronic Speed Variation) pump is represented by a network of curves showing the intermediate performances covered.

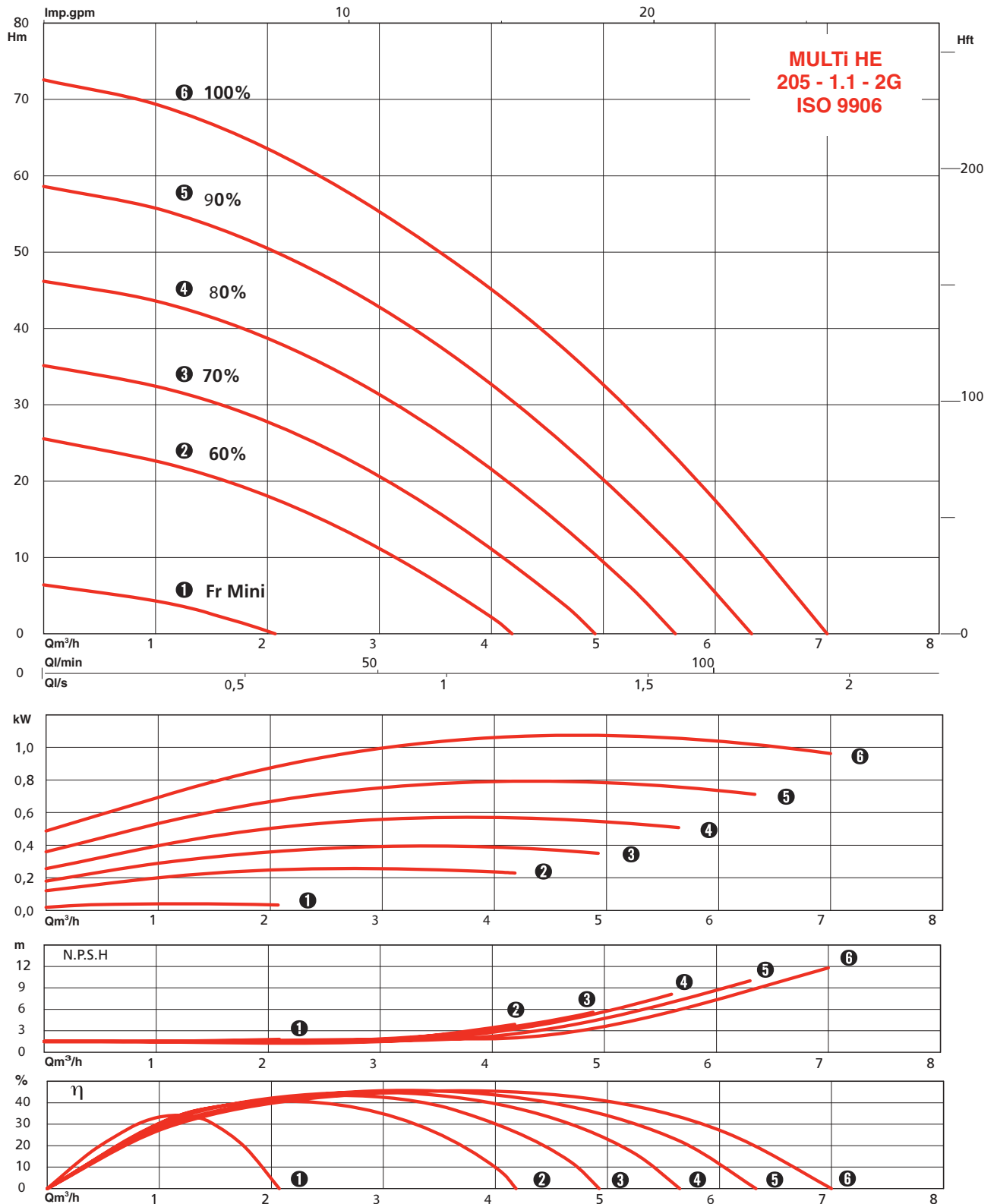


MULTI-HE 2G

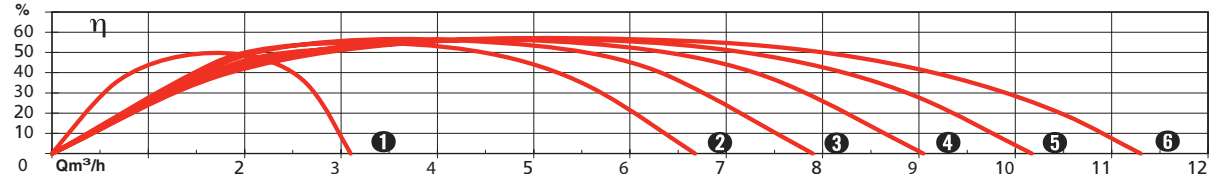
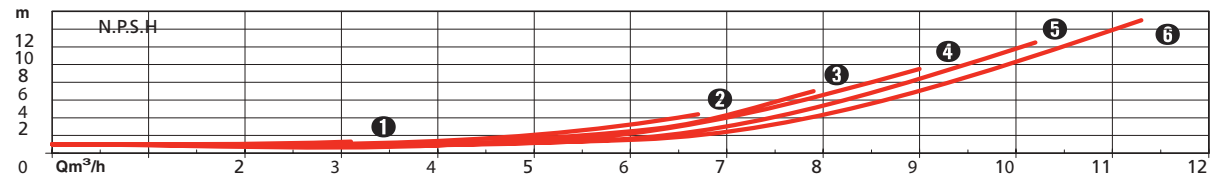
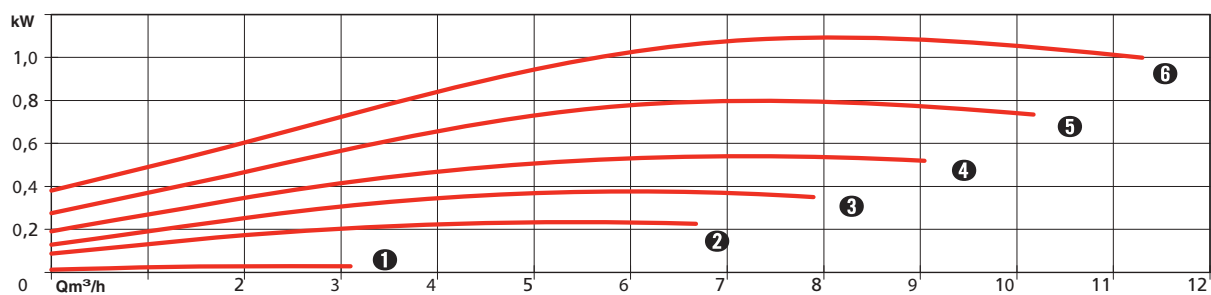
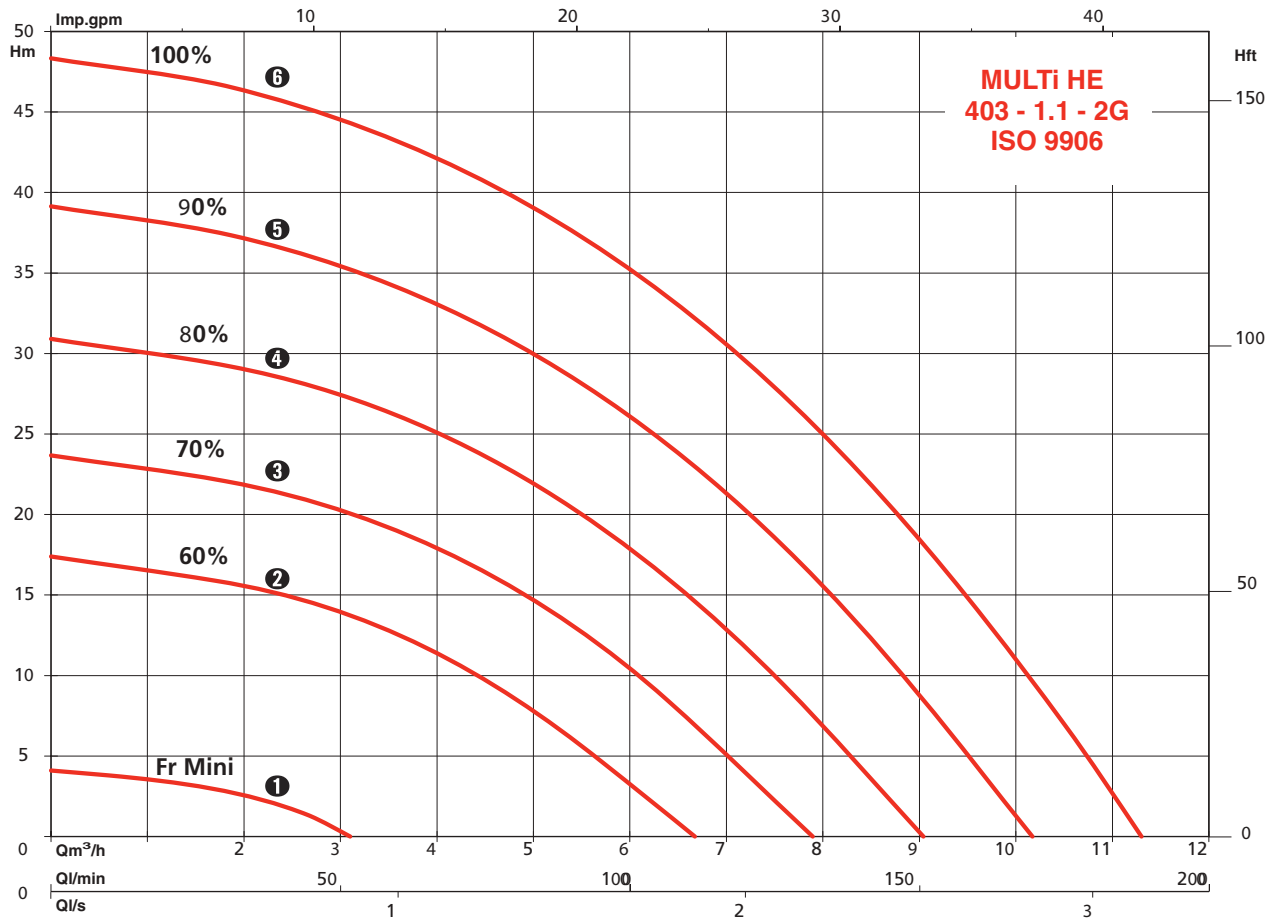
HYDRAULIC PERFORMANCE



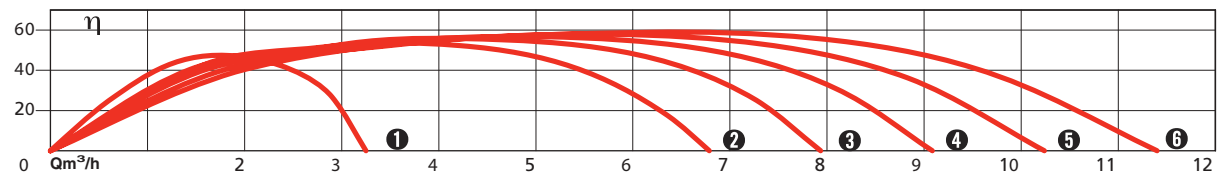
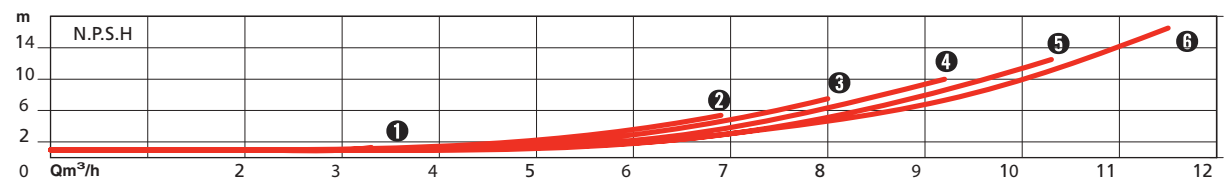
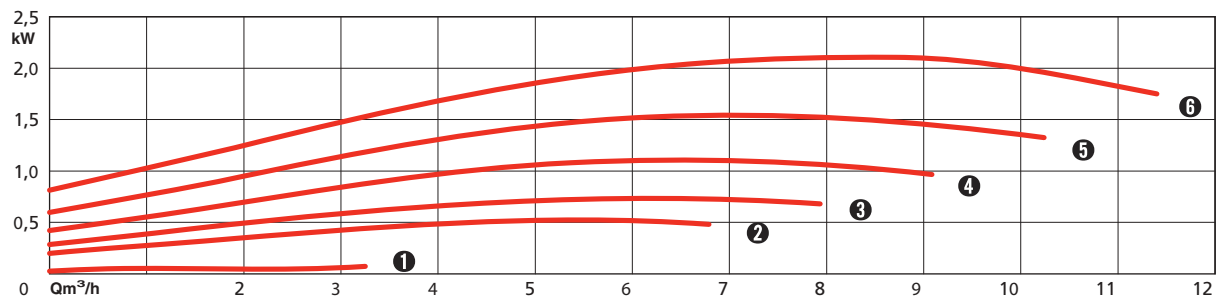
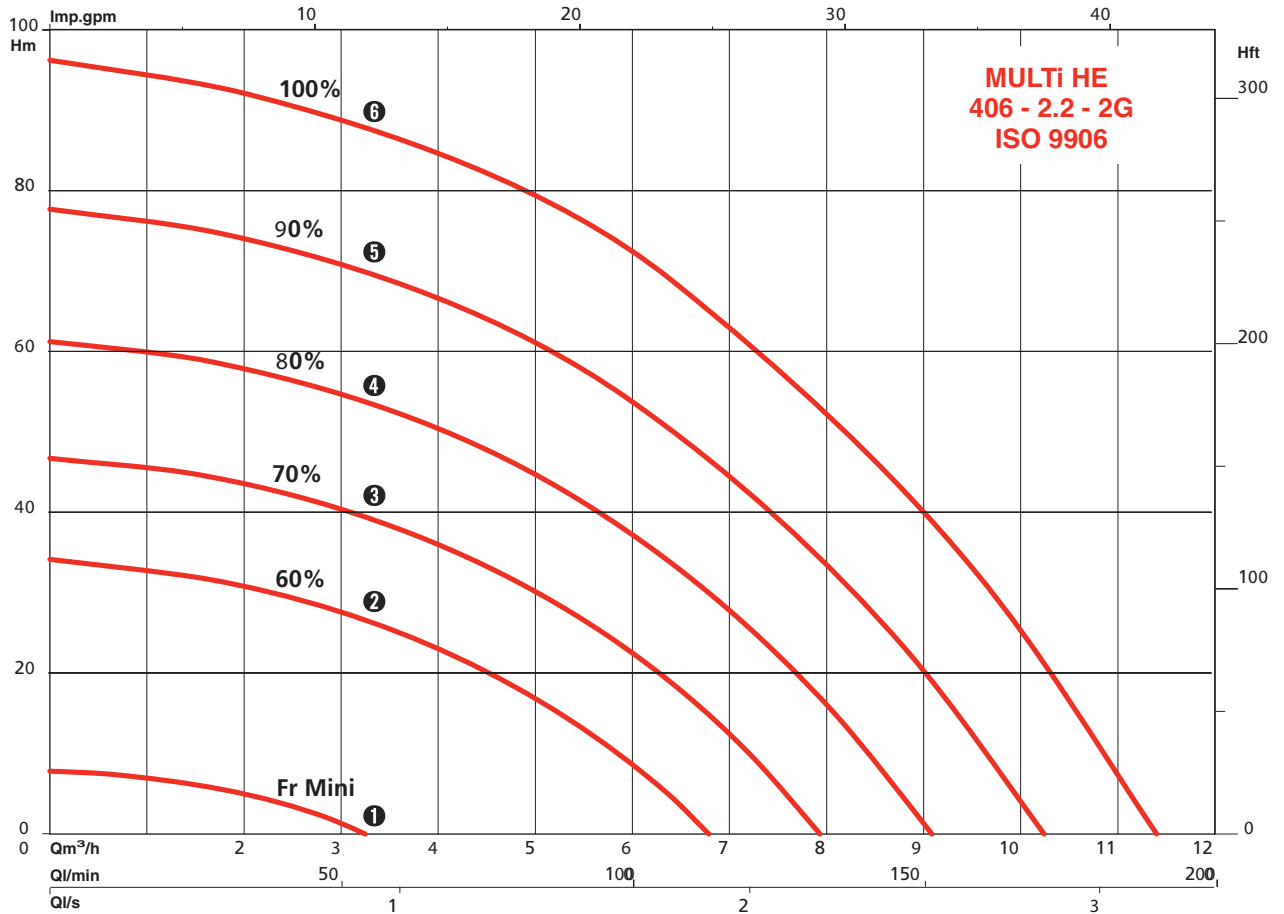
HYDRAULIC PERFORMANCE - 200 SERIE



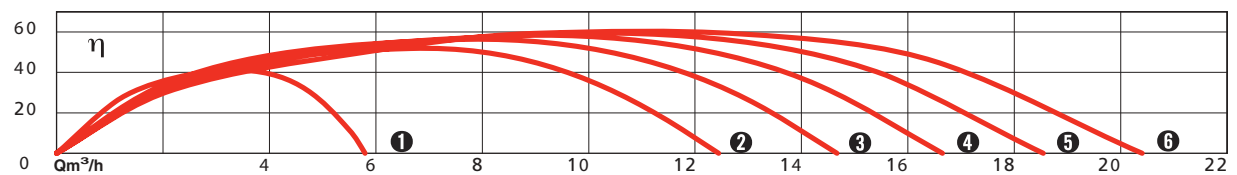
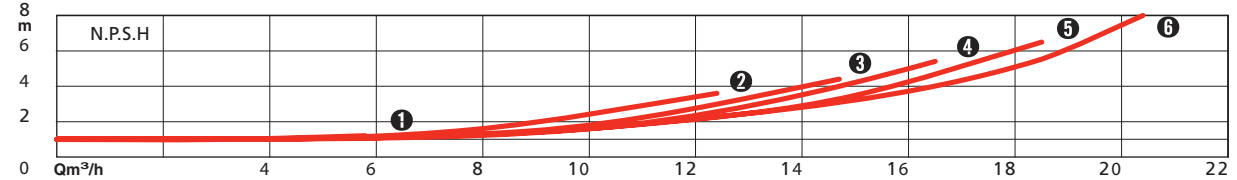
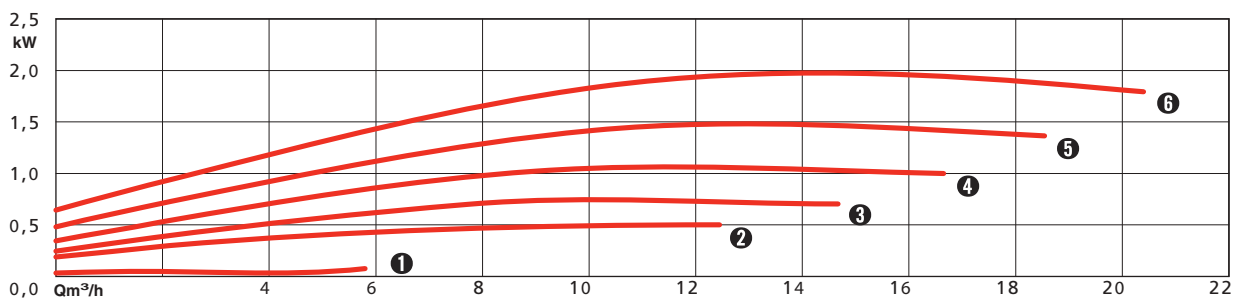
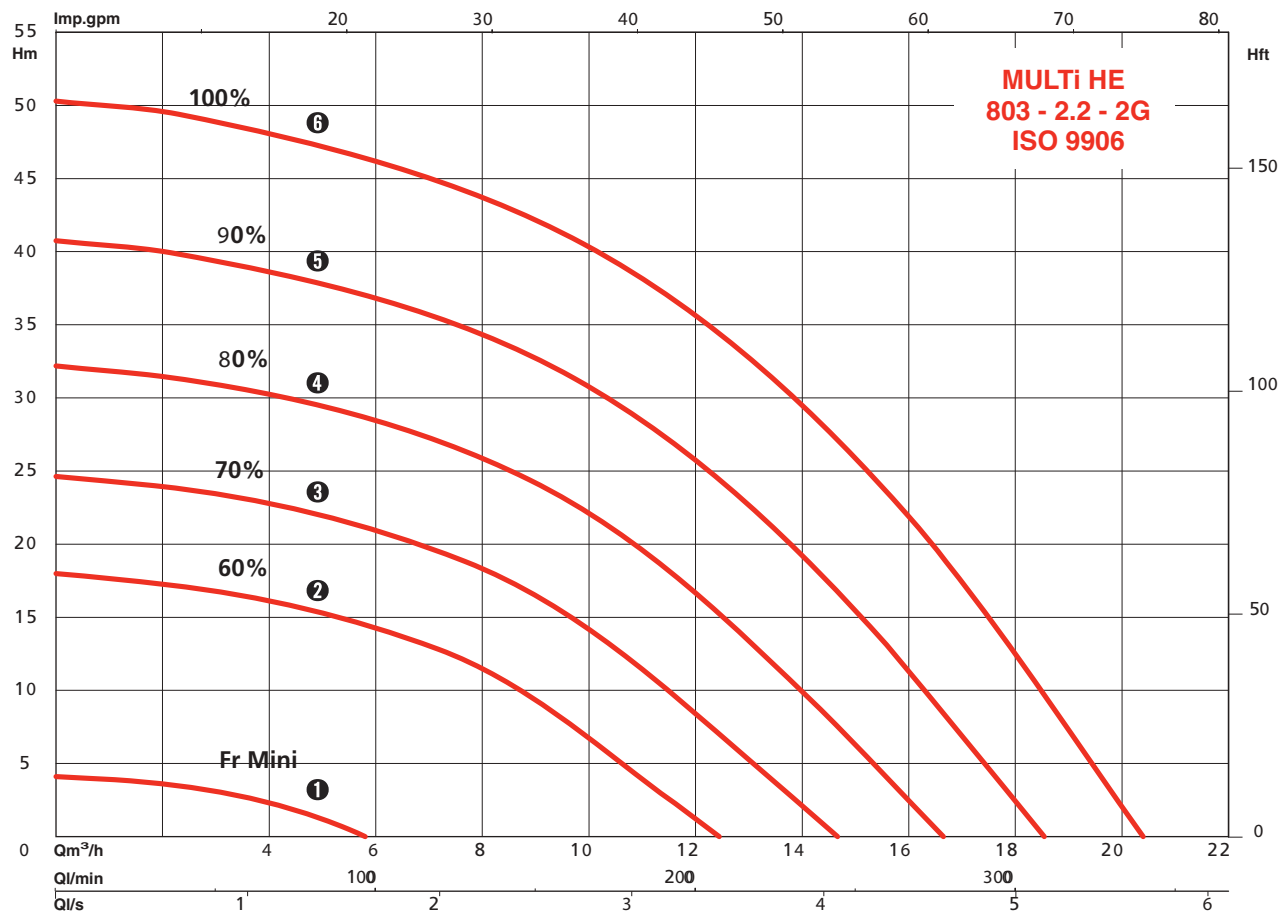
HYDRAULIC PERFORMANCE - 400 SERIE



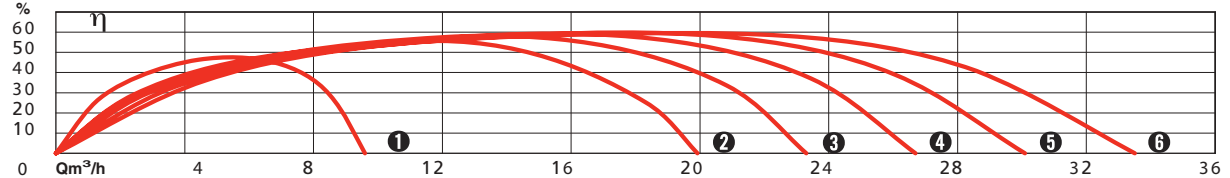
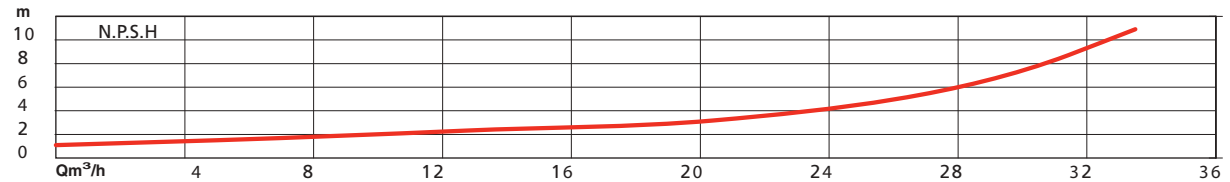
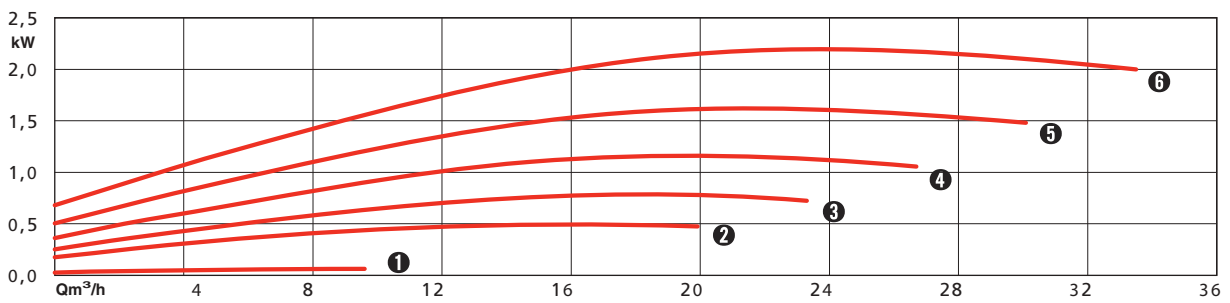
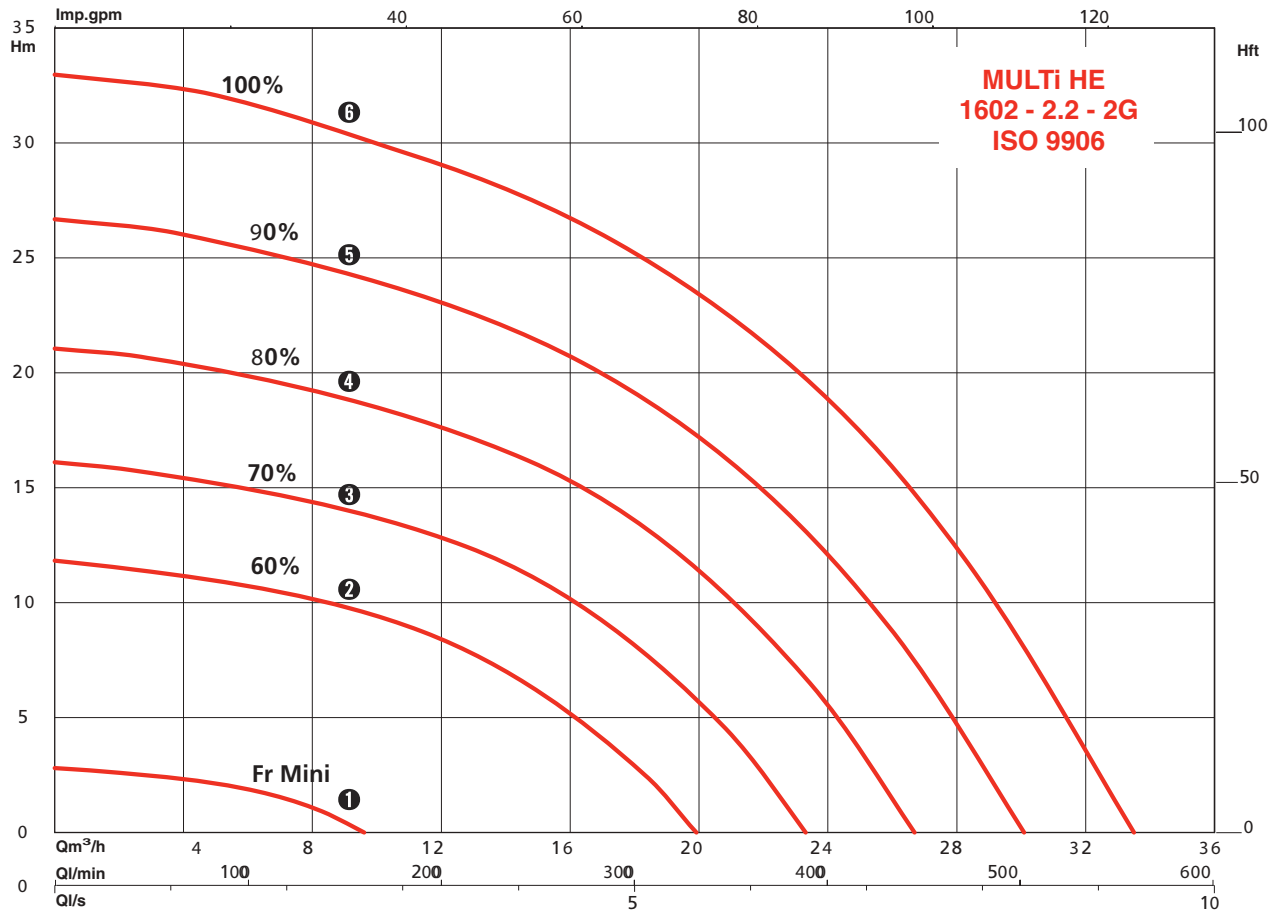
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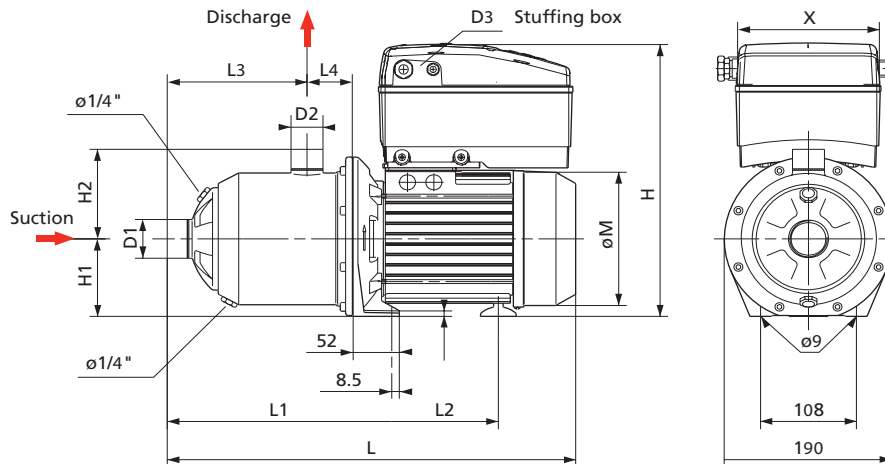
HYDRAULIC PERFORMANCE - 800 SERIE



HYDRAULIC PERFORMANCE - 1600 SERIE

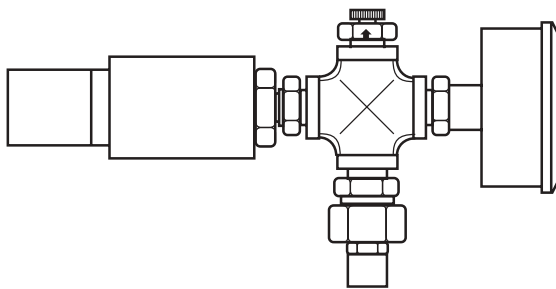


ELECTRICAL DATA AND DIMENSIONS



| Order Reference | P2 kW | I Plaque 400V-50Hz A | I Plaque 380V-60Hz A | I Plaque 440V-60Hz A | L mm | L1 mm | L2 mm | L3 mm | L4 mm | L5 mm | D1 tapped | D2 tapped | H mm | H1 mm | H2 mm | ØM mm | MASSE Kg with without pack. |
|-----------------|-------|----------------------|----------------------|----------------------|-------|-------|-------|-------|-------|-------|-------------------|-------------------|------|-------|-------|-------|-----------------------------|
| MULTI-HE 205 | 1.1 | 4 | 3.2 | 2.9 | 448 | 252 | 103.5 | 157.5 | 51 | 158 | 1" | 1" | 322 | 90 | 104 | Ø154 | 14.6 16.8 |
| MULTI-HE 403 | 1.1 | 4.1 | 2.9 | 2.7 | 400 | 204 | 103.5 | 109.5 | 51 | 158 | 1 ^{11/4} | 1" | 322 | 90 | 104 | Ø154 | 14.6 16.8 |
| MULTI-HE 406 | 2.2 | 6.6 | 5.3 | 4.7 | 511 | 276 | 136.5 | 181.5 | 51 | 182 | 1 ^{11/4} | 1" | 350 | 100 | 104 | Ø172 | 21.5 23.7 |
| MULTI-HE 803 | 2.2 | 6 | 4.6 | 4.1 | 451 | 216 | 136.5 | 121.5 | 51 | 182 | 1 ^{11/2} | 1 ^{11/4} | 350 | 100 | 104 | Ø172 | 19.7 21.9 |
| MULTI-HE 1602 | 2.2 | 6.2 | 5.4 | 4.8 | 470.5 | 235.5 | 136.5 | 138 | 54 | 182 | 2" | 1 ^{11/2} | 350 | 100 | 105 | Ø172 | 19.3 21.5 |

SENSOR KITS : MOUNTING ACCESSORY



| Sensor Kits | Model | order reference | item reference |
|-------------|---------------|-----------------|----------------|
| 6 bar | MULTI-HE 403 | CAPTPRESS 6b | 4048063 |
| | MULTI-HE 1602 | | |
| 10 bar | MULTI-HE 205 | CAPTPRESS 10b | 4048064 |
| | MULTI-HE 406 | | |
| | MULTI-HE 803 | | |

FEATURES

a) Electrical

- Three-phase 380 V/ 440 V - 50/60 Hz, tolerance $\pm 6\%$, 2 pole.

b) Assembly

- Installation in an easily-reached place on suction or load side
- Mounting on block or directly on smooth and horizontal surface
- Pump attachment by 2 holes for Ø M8 studs.

Connection to installation by flexible pipe with reinforcing spiral or rigid pipe.

c) Conditioning

- Pump supplied in cardboard package without connection accessories.

ACCESSORIES

- Suction kit
- Isolating valves
- Anti-vibration sleeves
- Bladder or galvanized vessel
- Anti-hammering vessel
- Check valves (with ogive or flap, with spring if operation in Mode 2)
- Foot valve strainer
- Dry running protection (mode 1)
- Control pressure sensor kit

