



> we move it faster >



445



MultiPower

4" submersible pumps powered by renewable energy sources

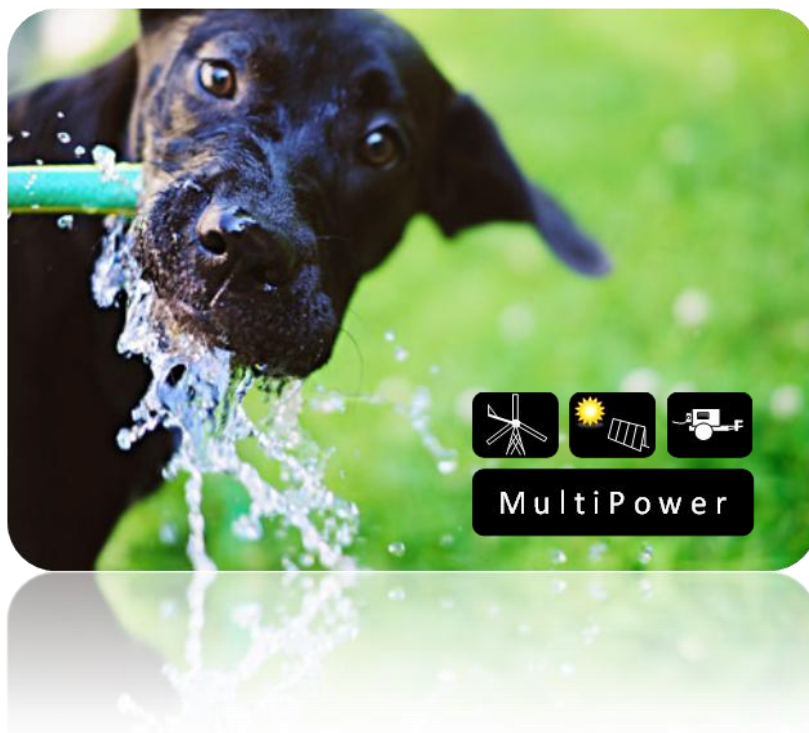
4HS technology applied to renewable energy

4HS MultiPower pumps (4HS MP), powered by renewable energy sources, is a new range coming from the 4HS pumps with built-in inverter.

4HS MultiPower pumps may be powered by AC or DC with a wide range of operating voltage (90 - 265 VAC / 90 - 340 VDC).

This means that 4HS MP pumps can be connected to solar panels, batteries, wind turbine and diesel generator.

A special software algorithm allows for adjusting the hydraulic performance to each source and to the available power while maximizing the pumped water.

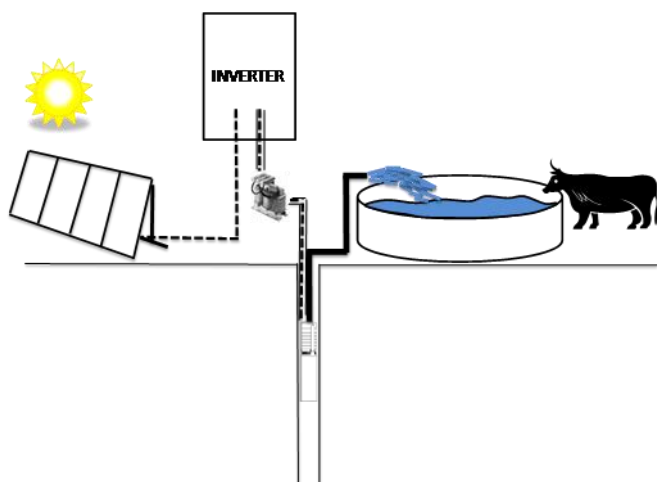


All the advantages of built-in electronics

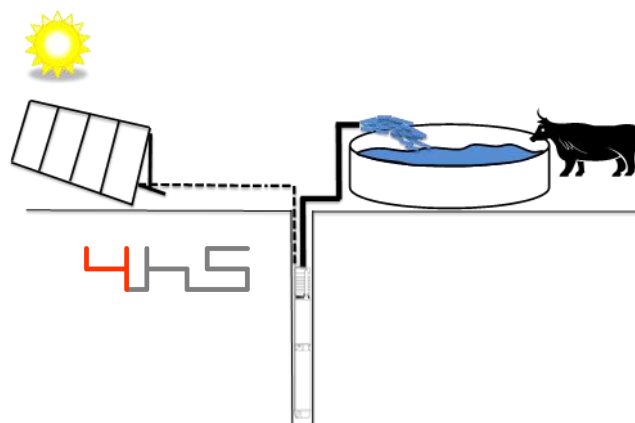
The built-in electronics inside the motor avoids the use of shielded cables and output filters and it is the ideal solution for any application in remote locations without surveillance and climatically adverse.

In fact, in the traditional solutions, the solar inverter is placed above ground and, being exposed to the weather, could suffer of:

- Overheating
- Water infiltration
- Thermal shock
- Damaging by animals or people



4HS MultiPower pumps do not need of any external electronic component; it is just enough to connect the pump cable to the power source and start to extract water.



The built-in electronic is directly cooled by the water flow; the operating temperature of the electronic components is so low as to ensure considerably longer a life than a on-surface inverter affected by high temperature, humidity, dust and solar radiation.

Simplified maintenance



4HS pumps are entirely made of stainless steel AISI 304 to grant a long life of the components.

Pump, motor and hydraulic components can be easily disassembled to have simple maintenance and replacement operations.

Pump

- Impellers and diffusers in stainless steel.
- Built-in no return valve.



Motor

- Resined and incapsulated stator made of stainless steel AISI 304.
- Water cooled rotor.
- Kingsbury thrust bearing pads.



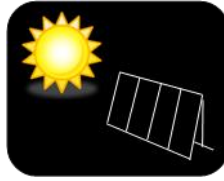
Built-in inverter module (MINT)

- Completely filled of resin.
- Removable power cable.



MPPT: Maximum Power Point Tracking

In the application with solar panel, the function MPPT (Maximum Power Point Tracking) maximizes the input power for various conditions of radiation and temperature.



When radiation grows, pump increases the rotation speed as well as the water flow .

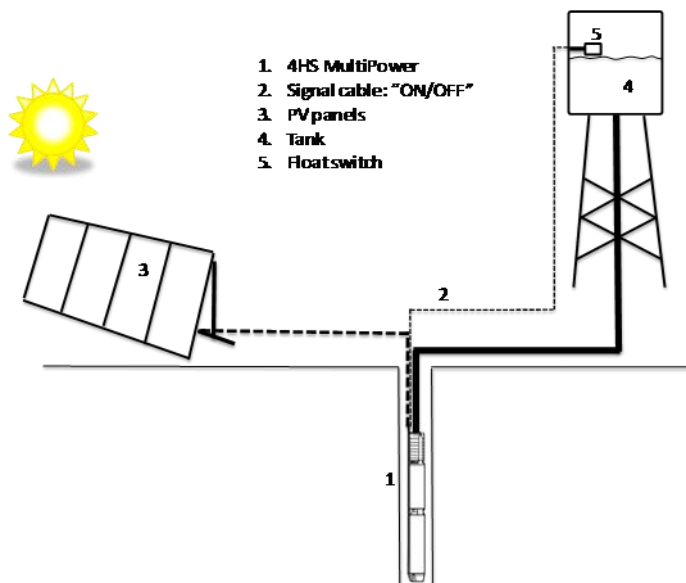
When radiation decreases (presence of clouds or different hours of the day), pumps reduces the speed and thus the water flow but still provide water until the radiation falls below the minimum value to ensure the operation.

Installation

4HS MultiPower pump can be installed with CM MultiPower control module or without it, so becoming a "plug and go" system.

If the CM MultiPower control module is not used, signal cables can be used to control pump ON/OFF the connecting, for example, a float switch.

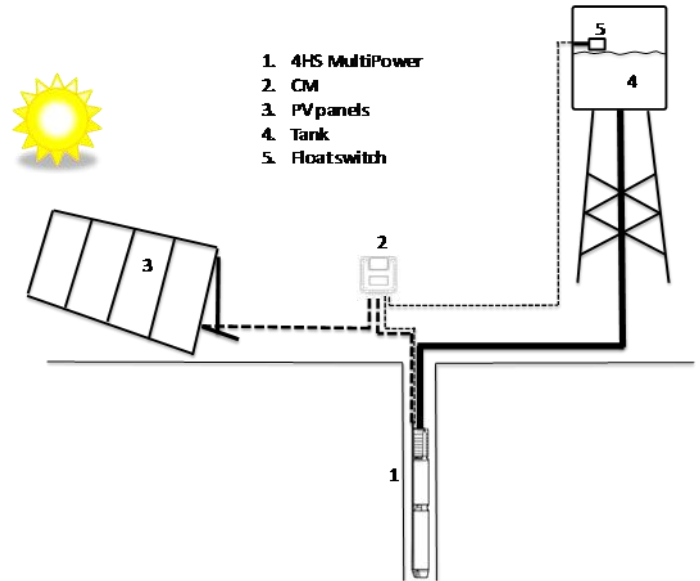
All the protections against overload, overvoltage and dry running are integrated into the on board inverter.



If the signal cables are connected to the CM MultiPower control module, it is possible to:

Control the electric parameters (current, power, voltage).

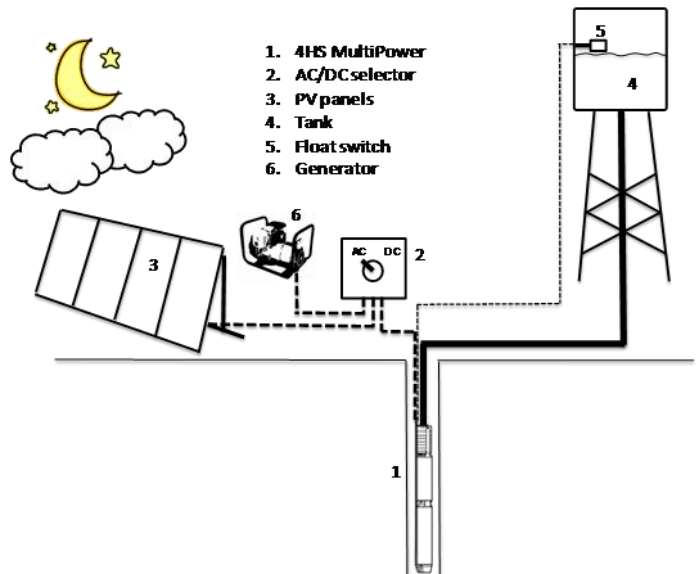
- Record and store all the alarms related to the working hours.
- Connect a pressure or a flow sensor to control the pump performances.
- Connect a pressure or float switch.
- Provide an alarm digital output for remote control.



Use of auxiliary genset

If solar energy is absent or not enough, it is possible to feed the pump with an auxiliary genset to grant the desired pump performances.

An AC/DC selector is used to change the power source.



Integrated on board protection

Protections against overvoltage, overload and dry running are integrated into the pump electronic circuit.

Electronic protection against dry running avoids the use of the probes.

Pump selection in a PV system

For the correct selection of a 4HS MultiPower pump to be used in a photovoltaic (PV) system, it is necessary to know:

- Desired daily water quantity.
- Total head (static + dynamic).
- Installation location.
- Working period (seasonal or year).

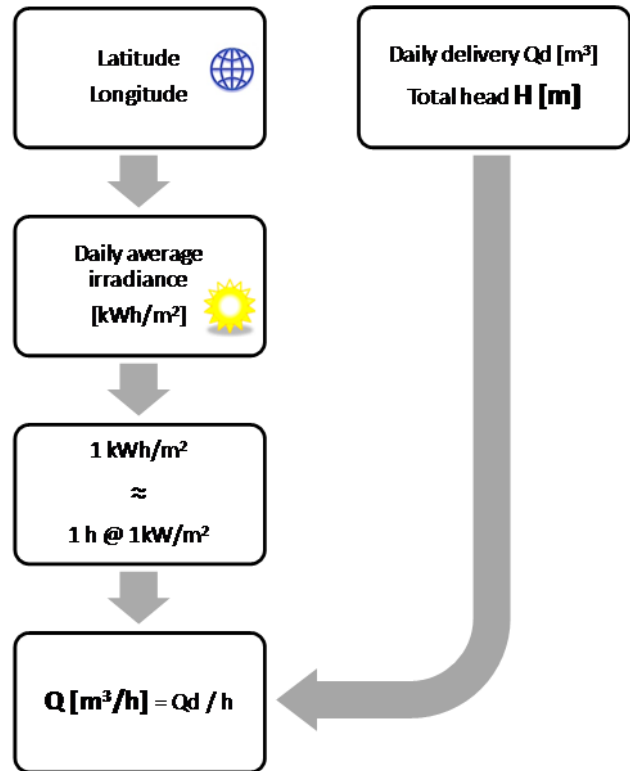
Based on location it is possible to get from maps and tables (available in the web) the following values:

- Average daily radiation per year, minimum and maximum (KWh/m²)
- Average daily radiation per months, minimum and maximum.
- Optimal tilt angle of the photovoltaic panels.

Starting from daily radiation could be considered the number of hours with 1kW/m², standard value to which PV panels performances are referred.

Dividing the required water quantity by the hours, nominal pump is calculated and, in addition to the required head, the right pump could be selected.

Our technical department is available in assisting you in this.



Sizing example

Daily delivery **Qd = 26 m³**

Total head **H = 50 m**

Location : Mossano, Vicenza, Italia

Latitude: 45° 25'

Longitude: 11° 33'

Optimal tilt angle is 35°.

If the pump is used the full year, have to be considered the average daily radiation per year that is 3,85 kWh/m² (3,85 h @ 1kW/m²) and, considering the required daily delivery Qd, a pump granting $26/3,85 = 6,75$ m³/h should be selected.

If the pump is used only in the summer (June, July, August), have to be considered the average daily radiation for the selected months that is 6,05 kWh/m² (6,05 h @ 1kW/m²).

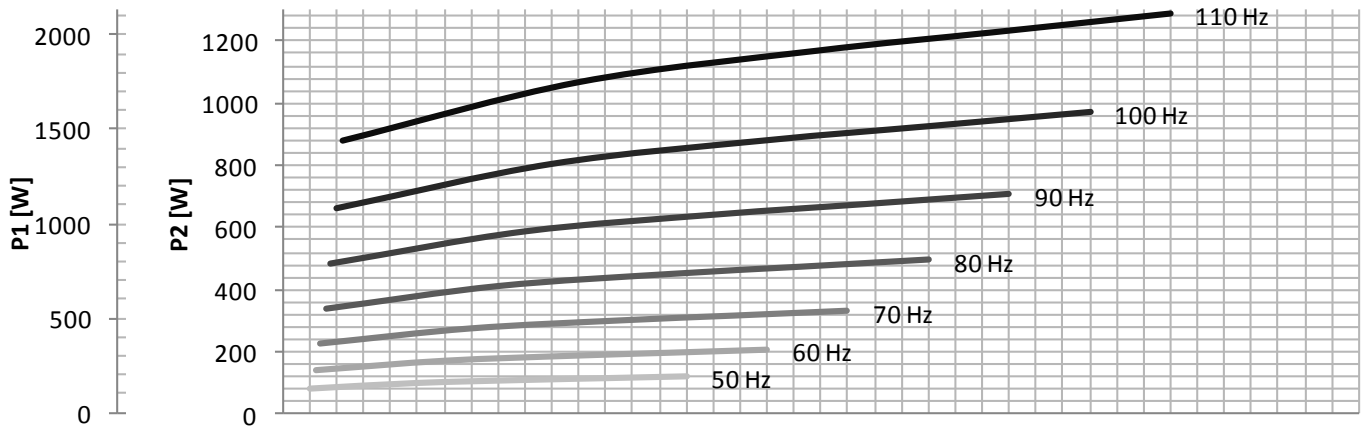
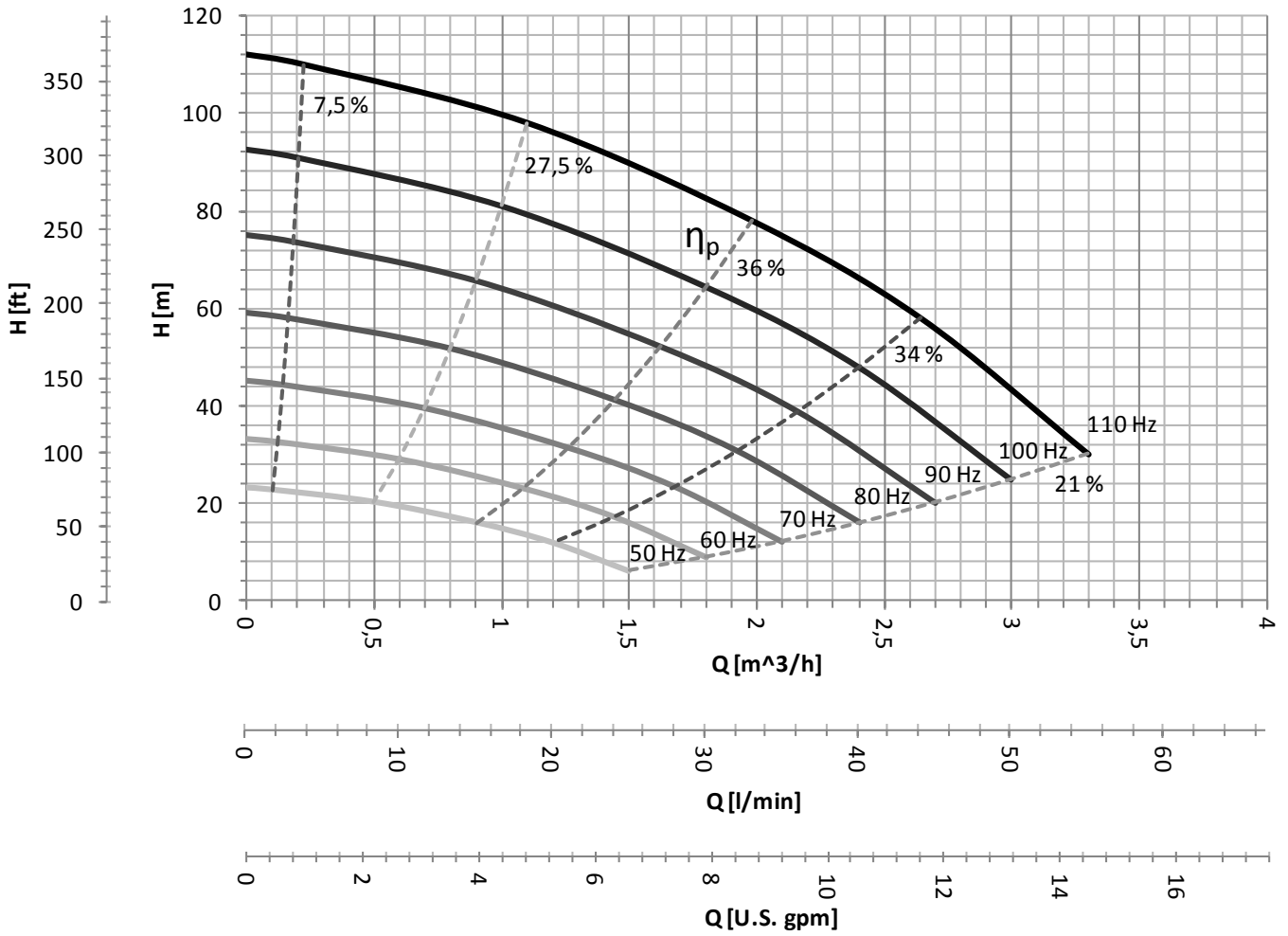


Mossano	kWh/m ²
January	1,54
February	2,44
March	3,72
April	4,81
May	5,81
June	6,34
July	6,39
August	5,42
September	4,16
October	2,69
November	1,73
December	1,19
Year	3,85

	Year	Summer
Q [m ³ /h]	6,75	4,3
H [m]	50	50
4HS MultiPower	06/04	04/03
P1 [W]	2600	2000
PV panels	12	9
Series	6	9
Parallel	2	0

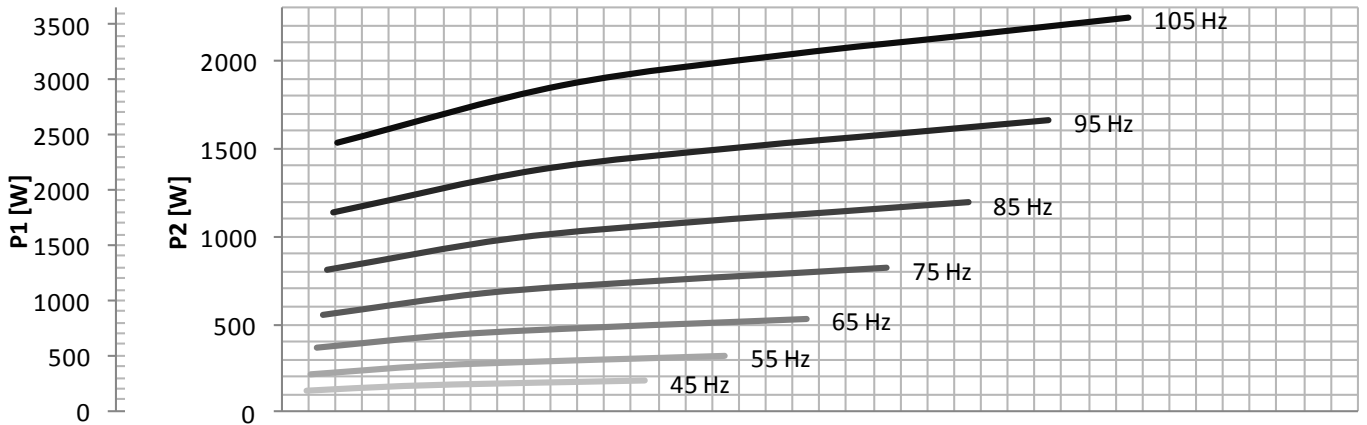
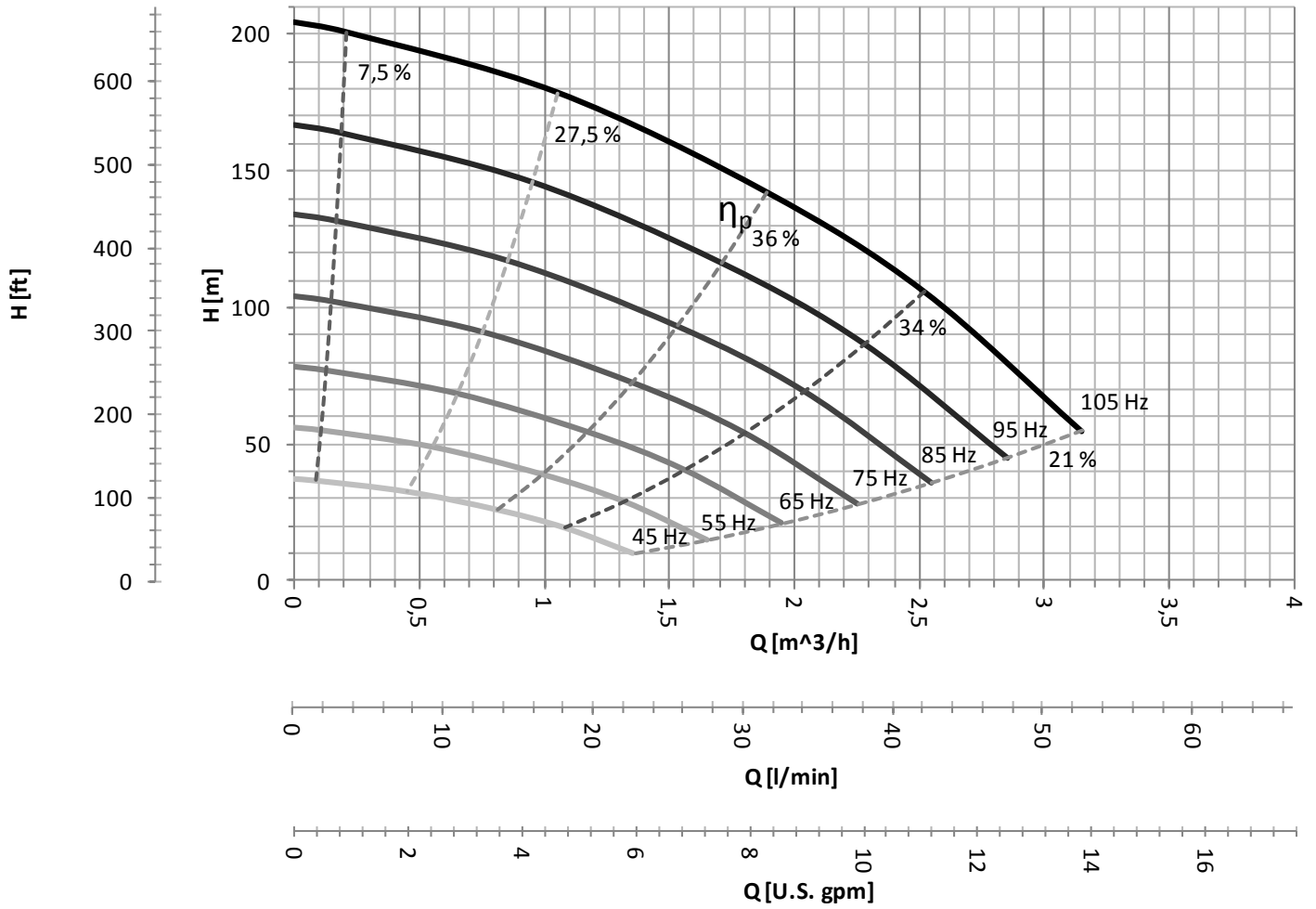
* Sizing considering 240 Wmpp photovoltaic panels, 30 Vmpp nominal voltage, 8 Impp nominal current, 38 Voc no load voltage.

Performance : 4HS 02/04



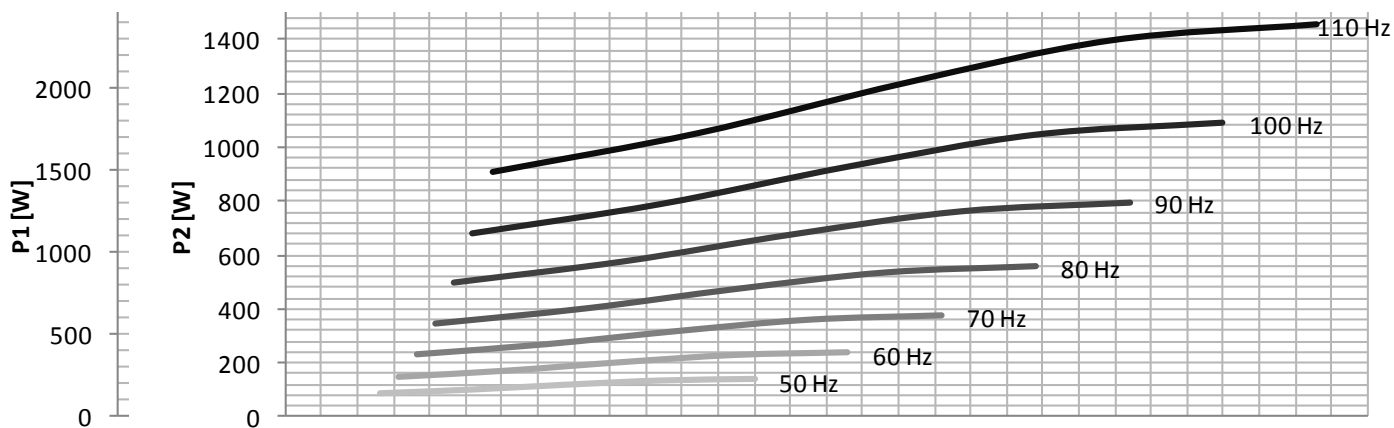
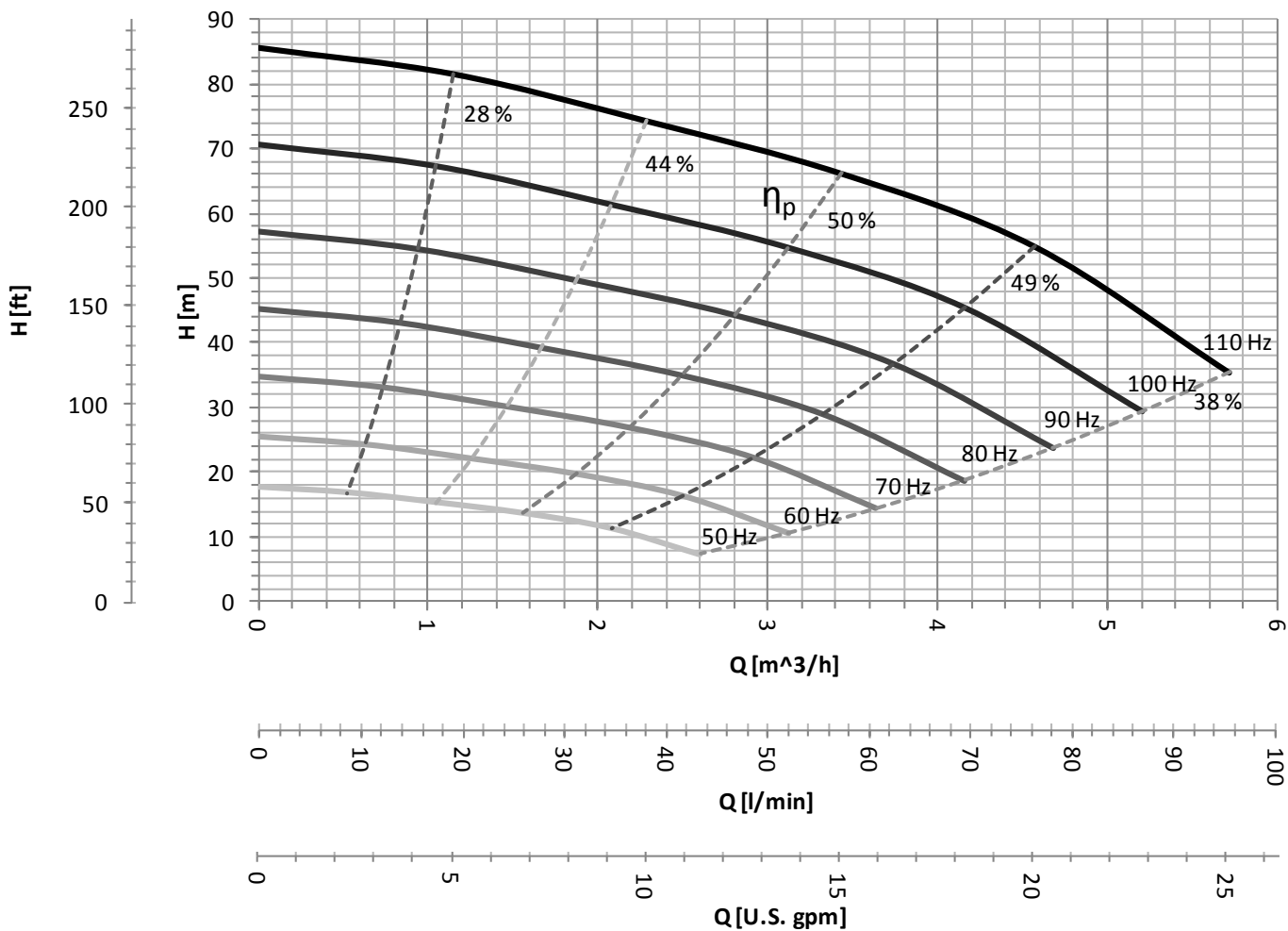
Model	Voltage	Max. absorbed current	Power factor	Max absorbed power	Dimension	Delivery	Pump weight	Max. diameter	Packing size	Total weight
4HS		[A]		P1 [W]	[mm]		[kg]	[mm]	[cm]	[Kg]
02/04 MP	90 - 340 VDC 90 - 265 VAC	16 (130 VDC) 16 (130 VAC)	1	2100	936	1 1/4 "	19,5	101 **	120x20x29	20,5

Performance : 4HS 02/08



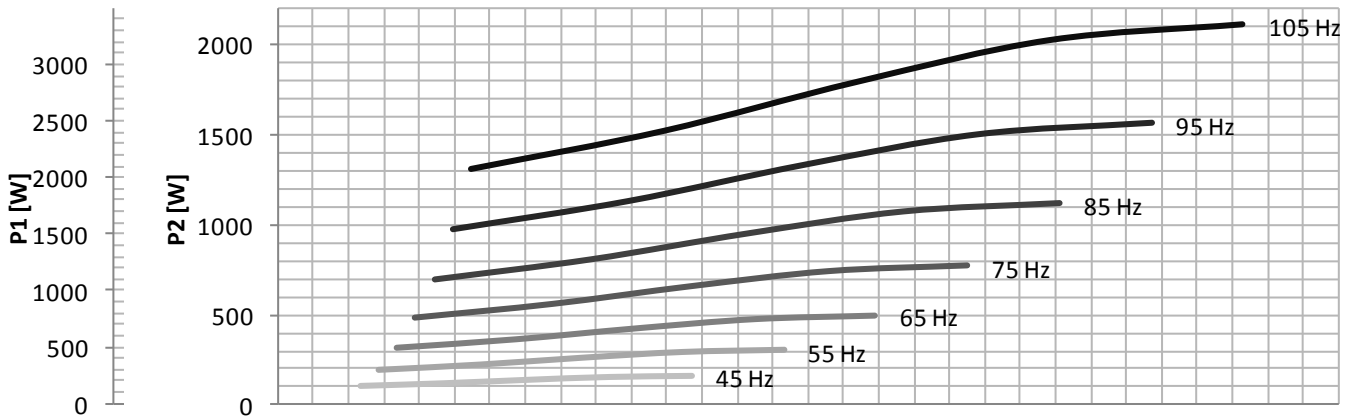
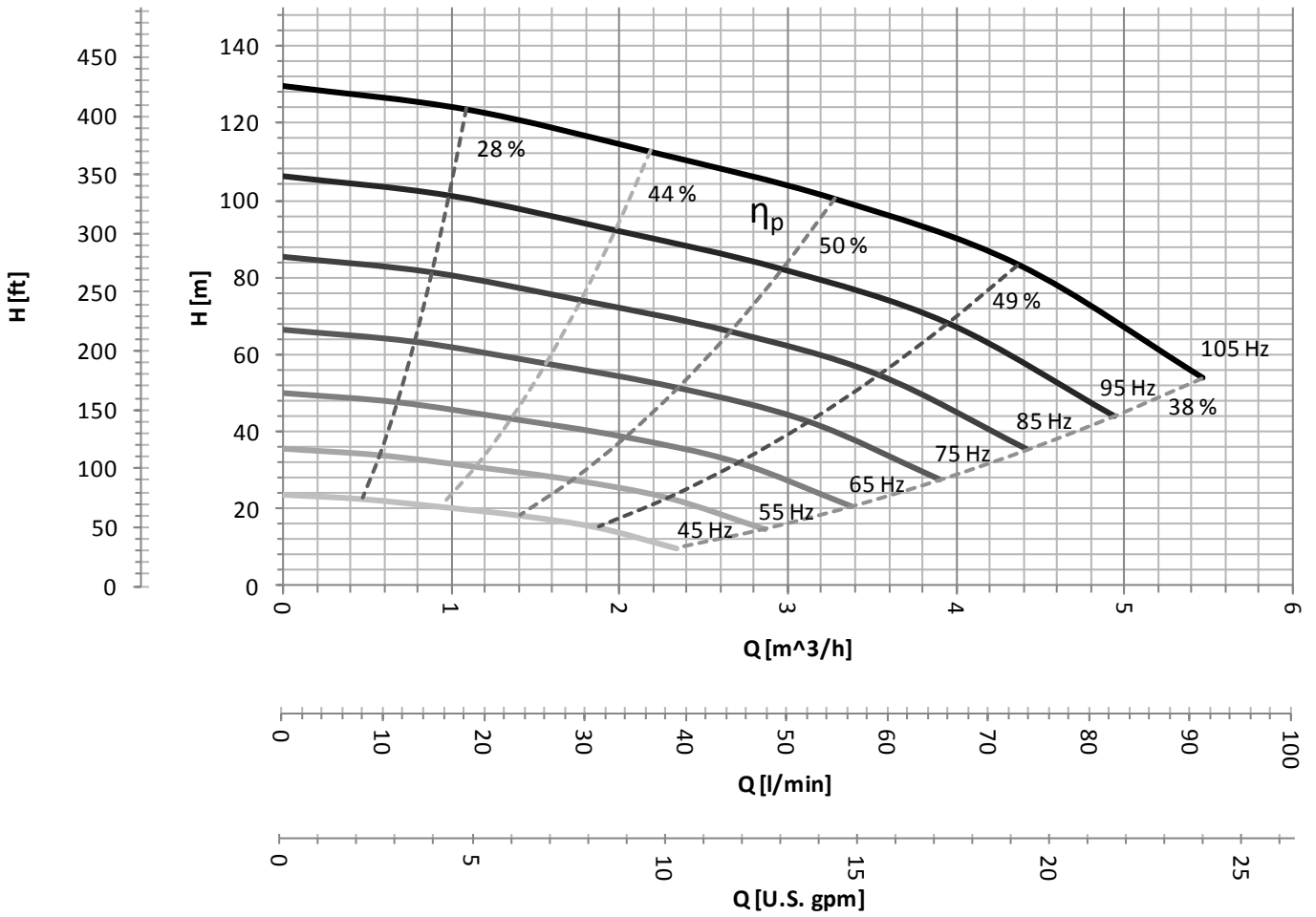
Model	Voltage	Max absorbed current	Power factor	Max. absorbed power	Dimension	Delivery	Pump weight	Max. diameter	Packing dimension	Total weight
4HS		[A]		P1 [W]	[mm]		[kg]	[mm]	[cm]	[Kg]
02/08 MP	90 - 340 VDC 90 - 265 VAC	16 (220 VDC) 16 (220 VAC)	1	3500	1065	1 1/4 "	22	101 **	120x20x29	23

Performance : 4HS 04/03



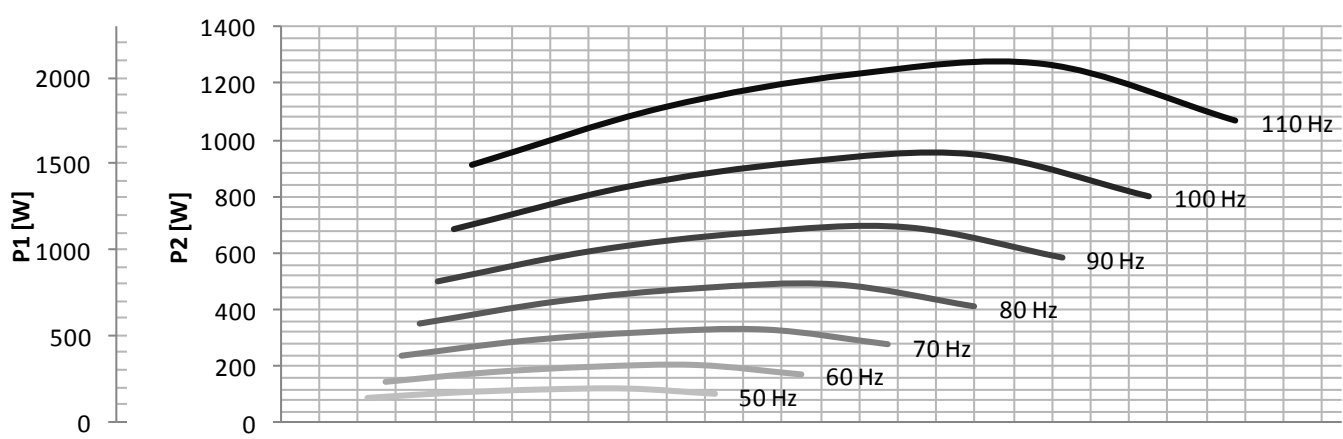
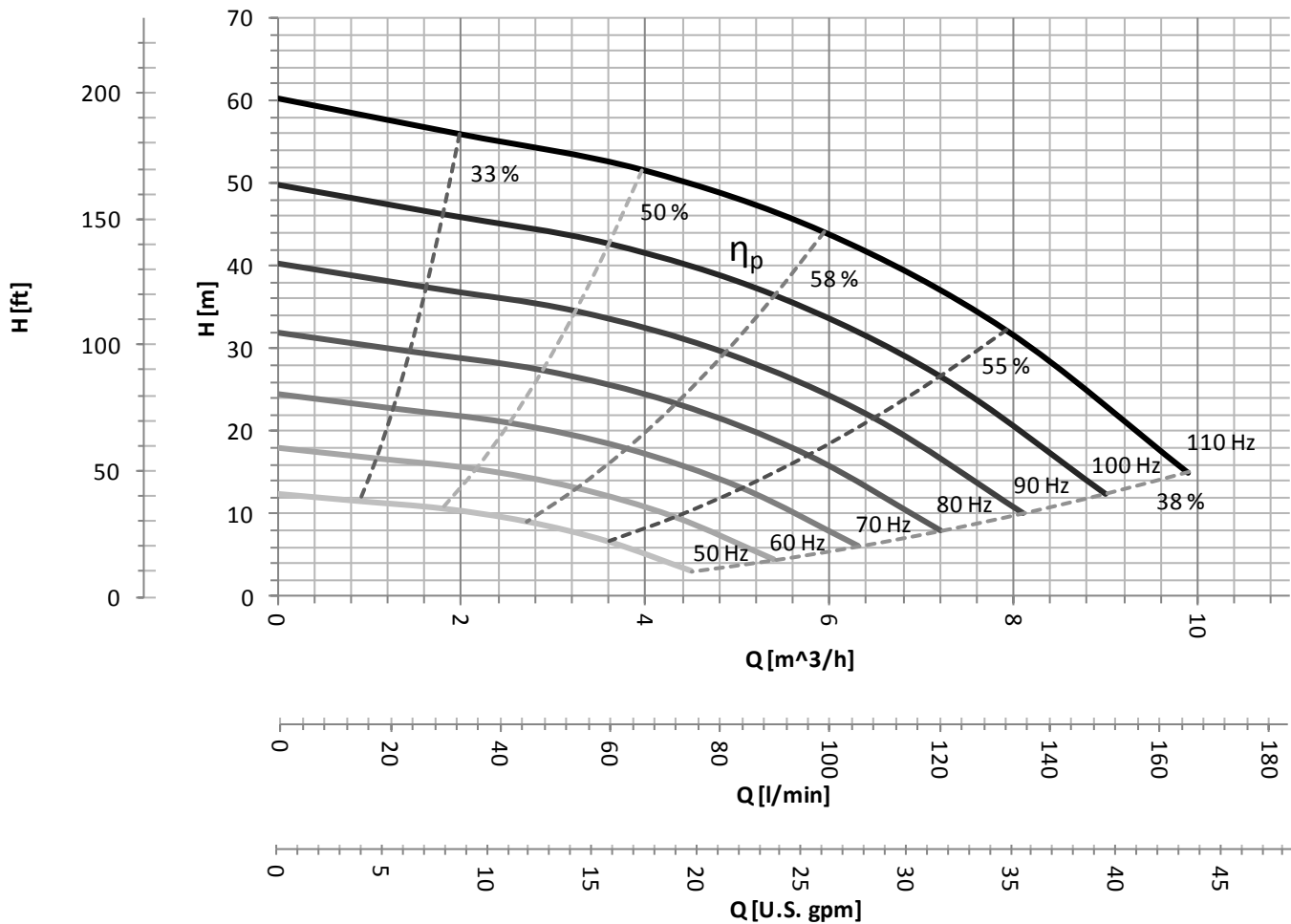
Model	Voltage	Max. absorbed current	Power factor	Max. absorbed power	Dimension	Delivery	Pump weight	Max. diameter	Packing dimension	Total weight
4HS		[A]		P1 [W]	[mm]		[kg]	[mm]	[cm]	[Kg]
04/03 MP	90 - 340 VDC 90 - 265 VAC	16 (150 VDC) 16 (150 VAC)	1	2400	915	1 1/4 "	19,4	101 **	120x20x29	20

Performance : 4HS 04/05



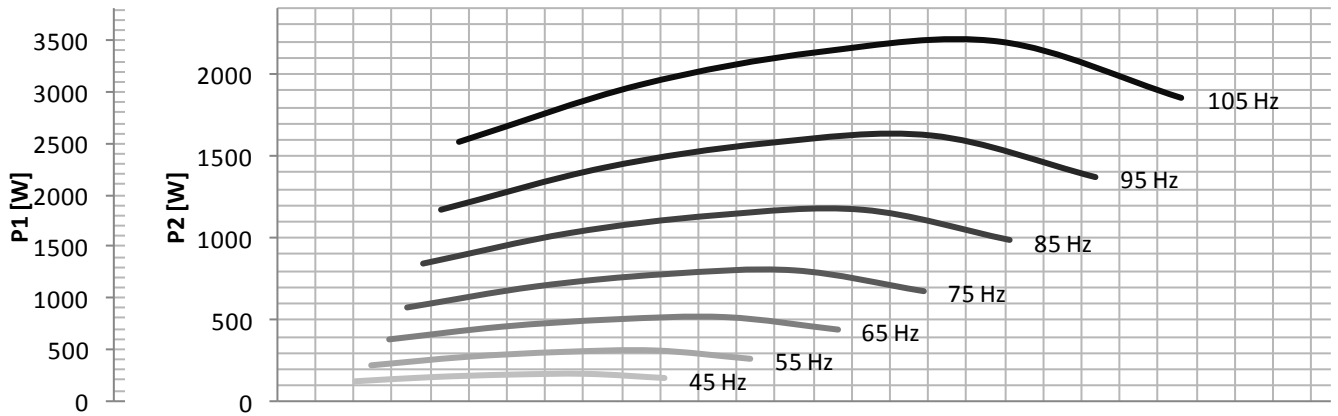
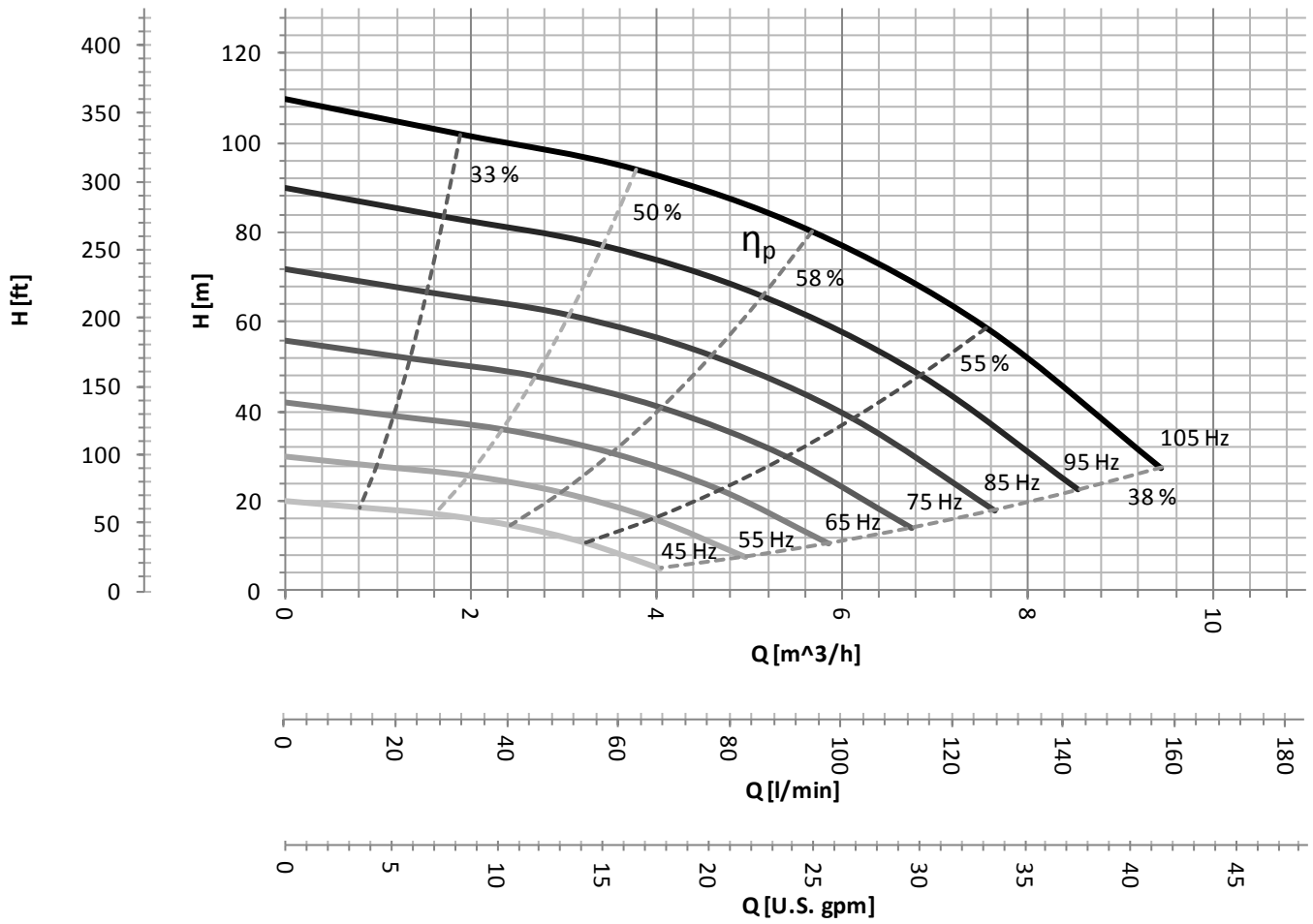
Model	Voltage	Max. absorbed current	Power factor	Max. absorbed power	Dimension	Delivery	Pump weight	Max. diameter	Packing dimension	Total weight
4HS		[A]		P1 [W]	[mm]		[kg]	[mm]	[cm]	[Kg]
04/05 MP	90 - 340 VDC 90 - 265 VAC	16 (207 VDC) 16 (207 VAC)	1	3300	1002	1 1/4 "	21	101 **	120x20x29	22

Performance : 4HS 06/02



Model	Voltage	Max. absorbed current	Power factor	Max. absorbed power	Dimension	Delivery	Pump weight	Max. diameter	Packing dimension	Total weight
4HS		[A]		P1 [W]	[mm]		[kg]	[mm]	[cm]	[Kg]
06/02 MP	90 - 340 VDC 90 - 265 VAC	16 (130 VDC) 16 (130 VAC)	1	2100	894	1 1/2 "	19,2	101 **	120x20x29	20

Performance : 4HS 06/04



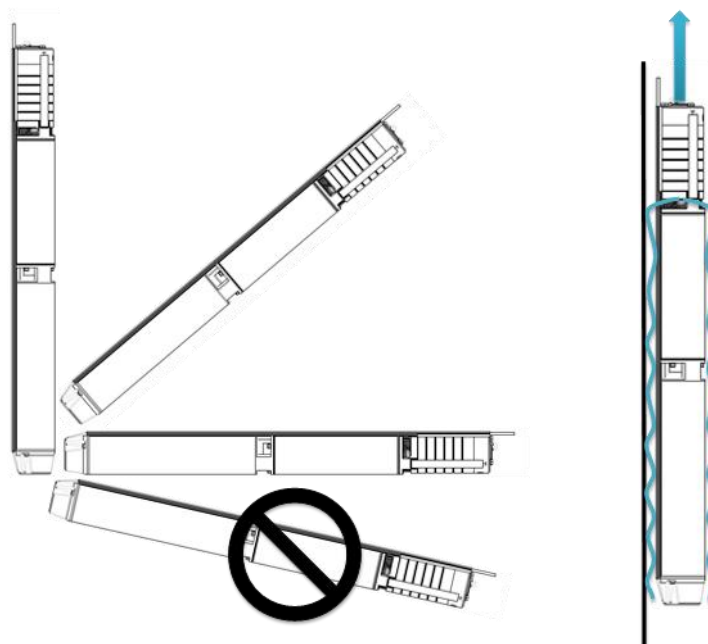
Model	Voltage	Max. absorbed current	Power factor	Max. absorbed power	Dimension	Delivery	Pump weight	Max. diameter	Packing dimension	Total weight
4HS		[A]		P1 [W]	[mm]		[kg]	[mm]	[cm]	[Kg]
06/04 MP	90 - 340 VDC 90 - 265 VAC	16 (225 VDC) 16 (225 VAC)	1	3600	981	1 1/2 "	21,4	101 **	120x20x29	22

General characteristics

4HS MultiPower	
Max. temperature of the liquid	35 °C (92 °F)
Min. cooling speed of the liquid	0.2 m/s
Characteristics of the pumped liquid	clean, chemically not aggressive, not explosive, without solids and fibres content, with max. 50 g/m ³ sand content
Protection grade	IP68
Max. immersion depth	150 m
Materials	Motor, impellers and diffusers in AISI 304 stainless steel
Cable	Flat cable ACS - WRAS - KTM approved
CM MultiPower CONTROL MODULE	
Max. ambient temperature	50 °C (122 °F)
Protection grade	IP55
Materials	Aluminium enclosure, , PVC labels , cable gland in polyamide (PA), display membrane in polyester (PE)
Analog input	2 input 4-20 mA + 2 input 4-20 mA or 0-10 V settable by the user
Digital input	4 input N.A o N.C settable by the user
Digital output	2 relays output 5 A , 250 VAC, N.A. o N.C settable by the user
User display	display LCD backlit, 16 characters x 2 rows, 5 buttons, buzzer as acoustic alarm
Shortcircuit protection	by fuse
CERTIFICATIONS	
CE	

4HS MultiPower pump can be installed both vertically and horizontally with the outlet never be lower the horizontal axis.

To ensure a proper cooling if 4HS is not installed in a well, it is necessary to use a cooling sleeve to grant the minimum cooling speed of the liquid.



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