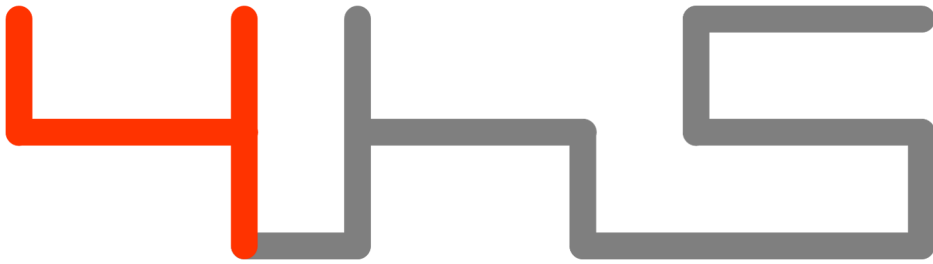




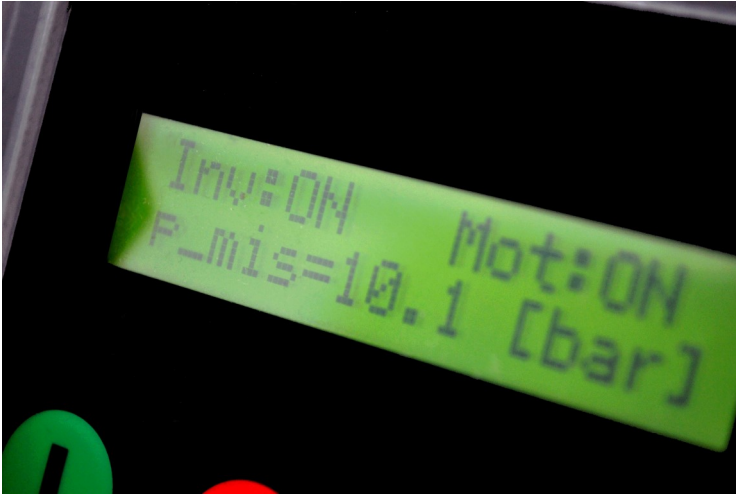
> we move it faster >



4" variable speed submersible pumps



The electronic revolution



4HS is a range of 4" electric submersible pumps for well applications, featuring:

- Three-phase water-filled permanent magnet synchronous motor with encapsulated resin stator, fully constructed of AISI 304 stainless steel.
- Built-in integrated inverter controlled by CM control module.
- Multistage pump made of AISI 304 stainless steel.

Inverter allows 4HS to:

- Change pump speed to maintain set-pressure regardless of water demand. Thus, the pump is

operated only when and as needed without wasting energy, and extending pump life.

- Starts and stops pump gently, thus reducing peak absorption, mechanical stress.
- Protects pump and drive from overload, surges, under/over-voltage, dry running, and any abnormal conditions.

Integrated onboard inverter avoids the use of expensive filters and shielded cables reducing to minimum electromagnetic emissions.

4HS product range matches applications in commercial and residential markets for water supply, water pressurization and irrigation.

Compared to conventional solutions 4HS offers:

- Energy-saving operation.
- Quick and simplified application.
- System reliability.

Construction characteristics and use of specific materials allow 4HS to be suitable for drinking water applications.

A ready to use product

The 4HS range submersible pumps are designed to provide customers a ready-to-use product and so come packaged in a kit including:

- 4HS pump including 2,5 m / 8 ft flat cable lead (ACS-WRAS - KTM compliant)
- Surface control module (CM)
- Cable junction kit
- Pressure transducer 0-16 bar / 0-250 psi
- Operating Manual

In this way, installation becomes quicker and easier.

Nastec, upon request, can provide the communication and power cables of the desired length.



Inverter, motor, pump, all integrated



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.

Centrifugal pump

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



Motor

- Three phase permanent magnet synchronous motor
- Resined and incapsulated stator made of stainless steel AISI 304.
- Water cooled rotor.
- Kingsbury thrust bearing.



Built-in inverter module (MINT)

- Completely filled of resin.
- Removable power cable.



CM: Control Module

CM control module, mounted above-ground, manages the pump operation by changing pump speed to maintain the desired pressure in the system regardless of water demand.

Simply connect the pressure transducer, supplied as standard, and perform a quick set-up of the sensor to configure the pressure range in relation to the system.

During operation, the CM control unit continuously monitors the electrical, hydraulic and thermal parameters providing complete protection against under/over-voltage, overload and dry-running.



Cable junction kit

The waterproof junction between the pump lead and drop cables is made using a provided kit consisting of:

- Polymer sheath containing the cable junctions
- Polyurethane resin
- Hardener
- Stick for mixing resin-hardener
- Insulated cable connectors
- Instruction manual



Constant pressure

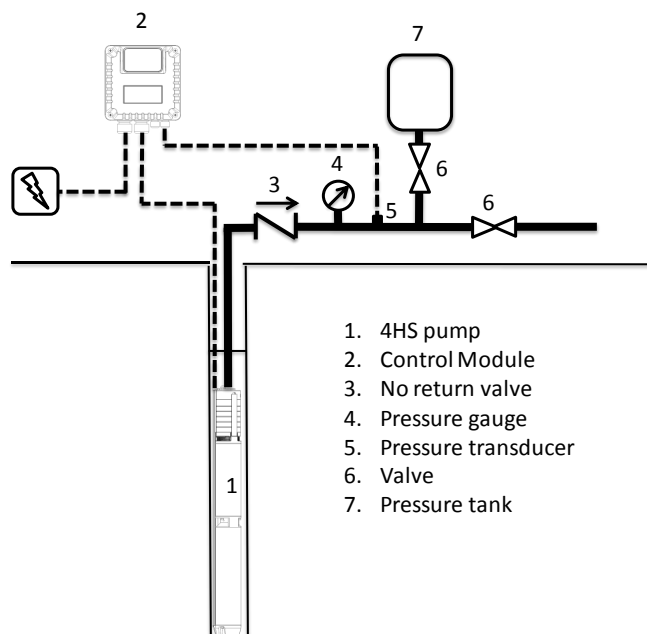
To set-up the system in a constant pressure application simply install the 4HS pump, connect the CM control module and wire the pressure sensor.

A small pressure tank is normally used to compensate for water losses while the pump is not running.

The control module receives the pressure signal from the pressure transducers and varies pump speed to maintain a constant set pressure regardless of water demand.

In addition to the constant pressure control, CM can also manage the following control modes:

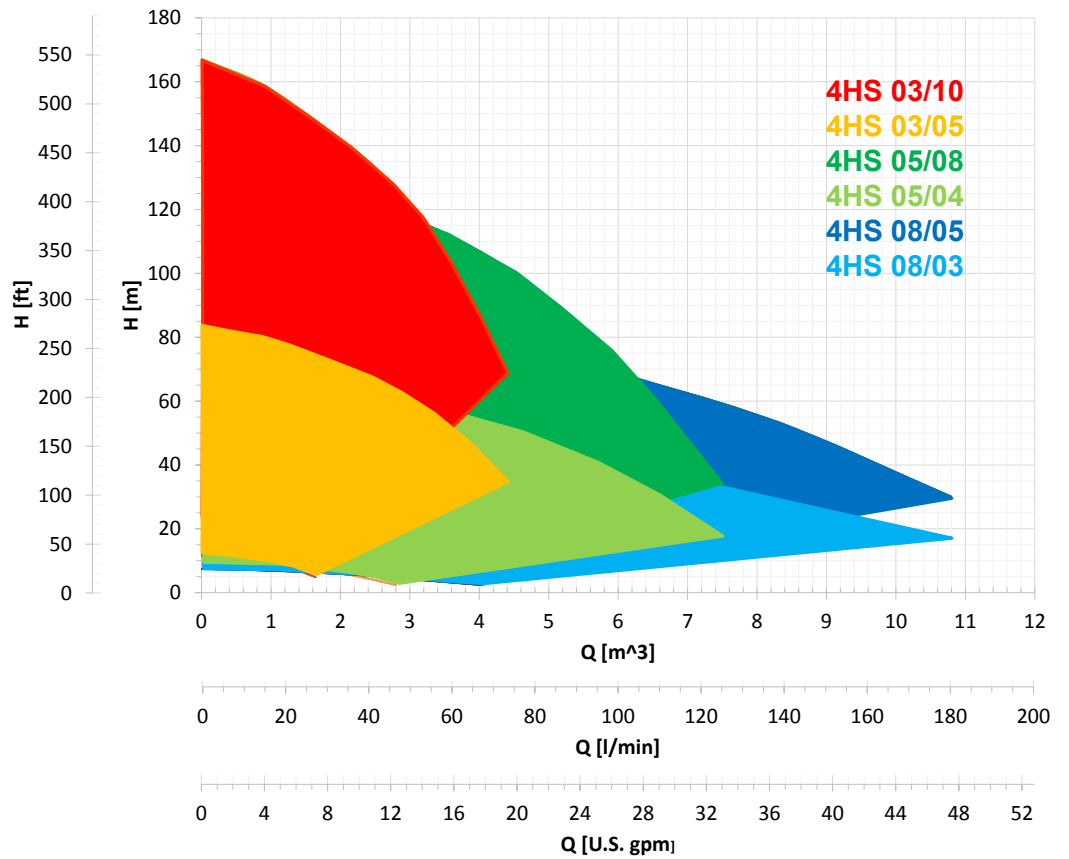
- fixed frequency
- constant flow
- constant temperature



Pump selection

Variable speed allows 4HS to cover a wide range of water flow and heads with only few models; selecting the proper pump model for an application will help maximize the performance and overall efficiency of the application.

Use the diagram below to select the most suitable 4HS pump model for your application.



Energy saving

If the water demand decreases, 4HS will reduce the speed (proportional to the frequency) to keep constant pressure.

As you can note from the chart, a speed reduction corresponds a significant decrease of the power consumption: for example, always keeping the 6 bar (197 psi), if speed changes from 4800 rpm down to 4200 rpm, input power drops from 1600W to 700 W.

Thousand pumps

4HS can be used with fixed speed by setting the working frequency.

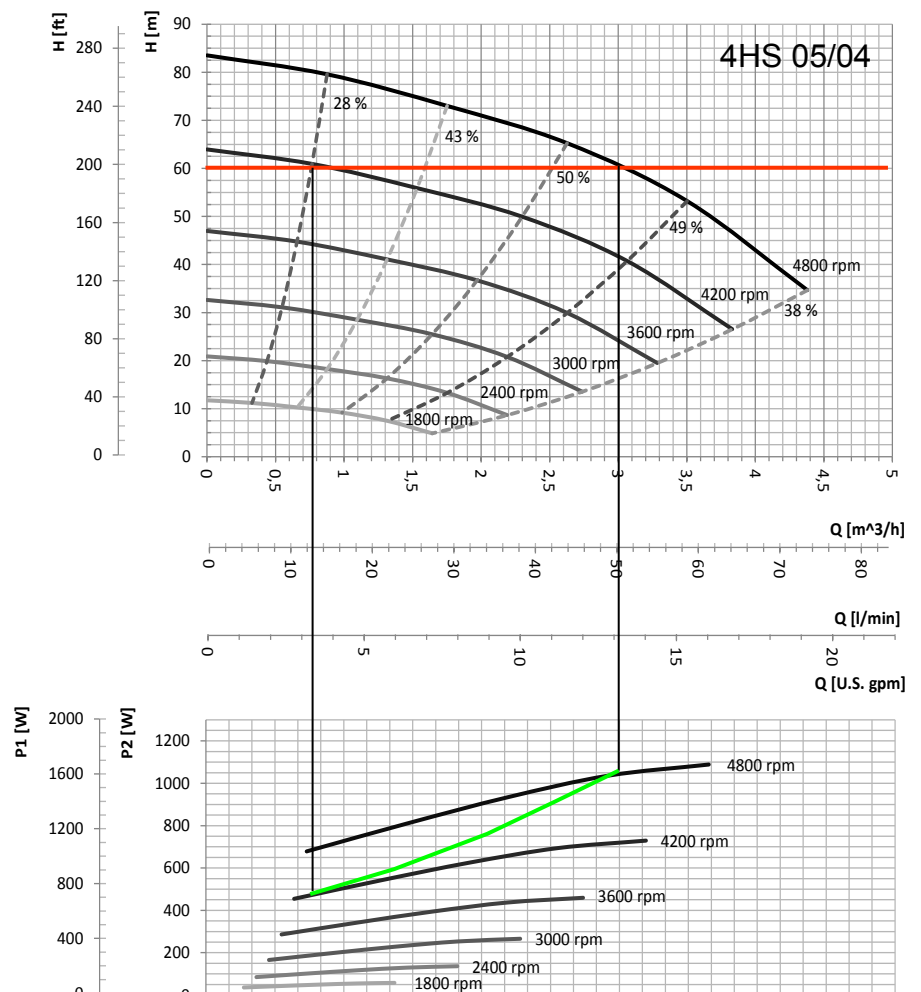
At any given frequency curve corresponds different hydraulic performances and consumption powers.

This means that each 4HS model covers the performances given by several standard pumps at fixed speed.

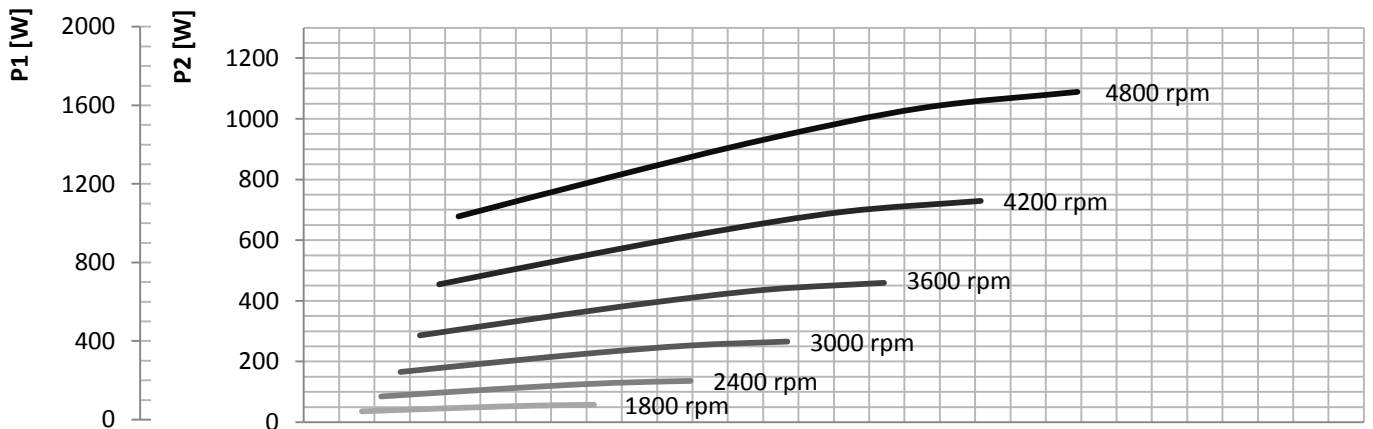
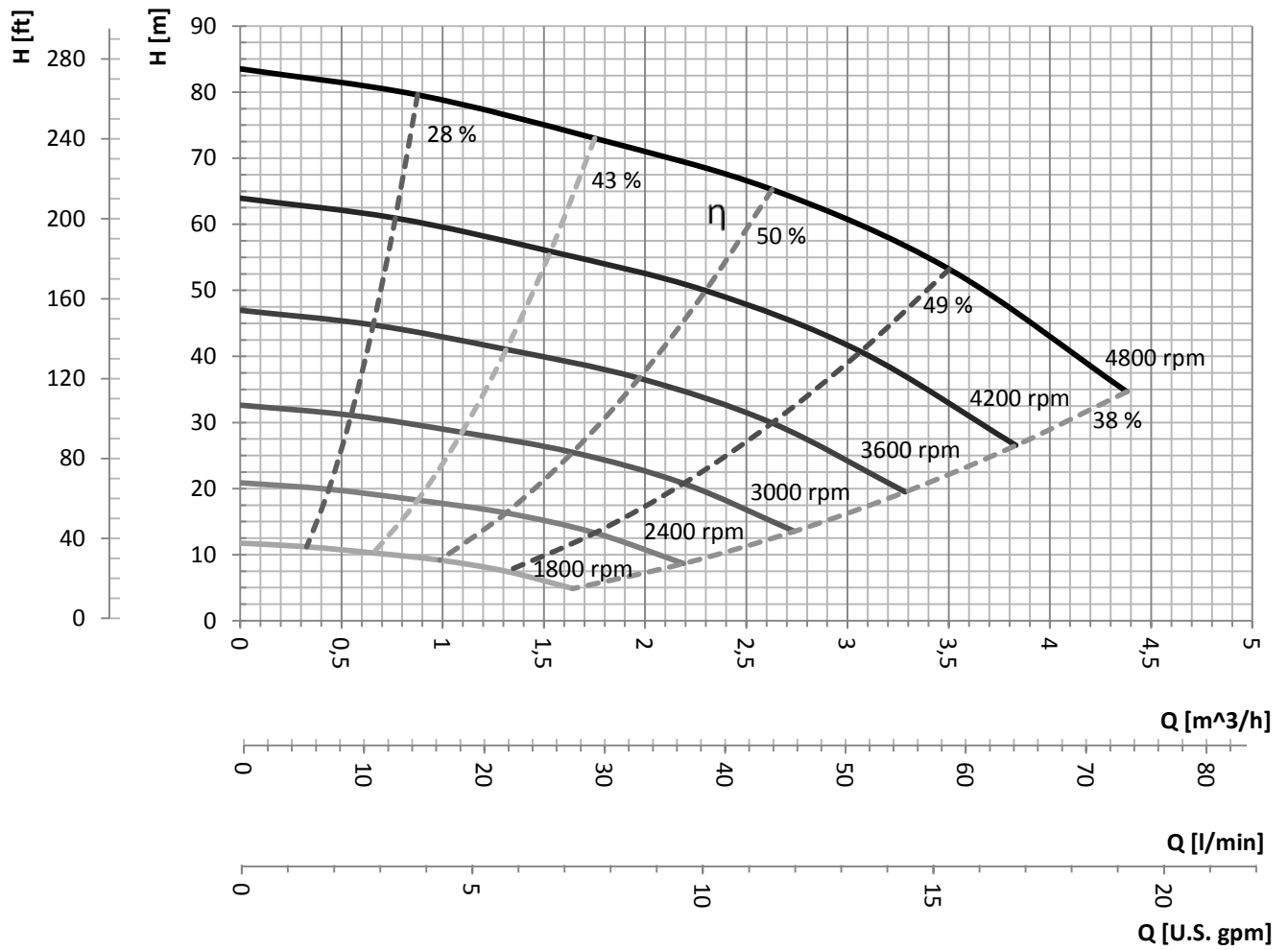
Performance adapting

Among the parameters to be set in the CM control module, is particularly useful the possibility of limiting the maximum current absorbed by the pump.

Exceeding this threshold, for example in case of drop of the input voltage, the control will reduce the 4HS pump speed to always ensure the operation.



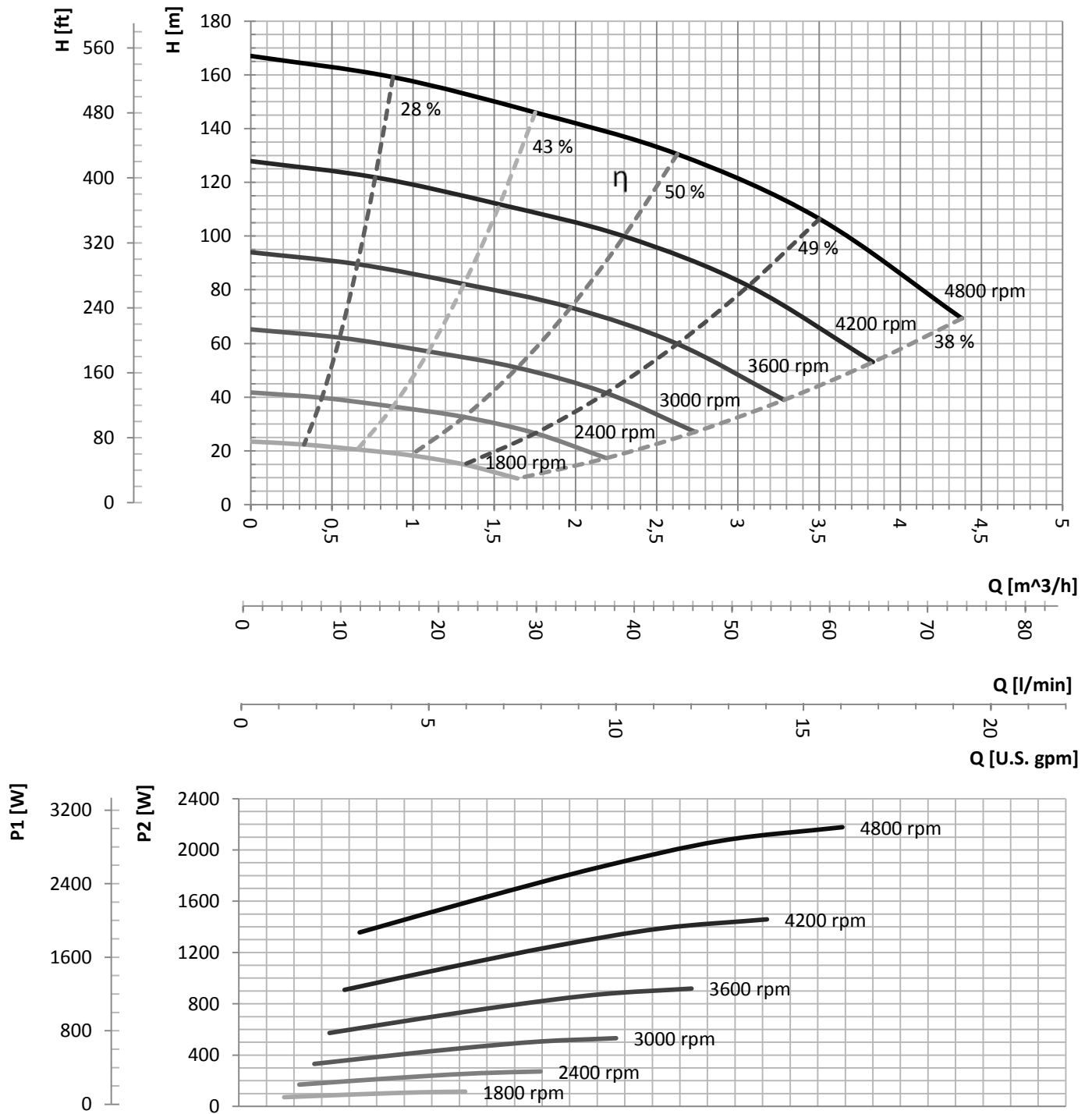
Performance: 4HS 03/05



Rated input voltage	Max. input current	Power factor	Max input power	Lenght	Delivery	Pump weight	Max. diameter	Packing dimension	Packing weight
[VAC]	[A]		[W]	[mm]		[kg]	[mm]	[cm]	[Kg]
1 x 190 - 265	9,5	1	1800	900	1 1/4 "	19,7	101 *	120x20x29	21,2

* Max. external diameter including cable and cable cover

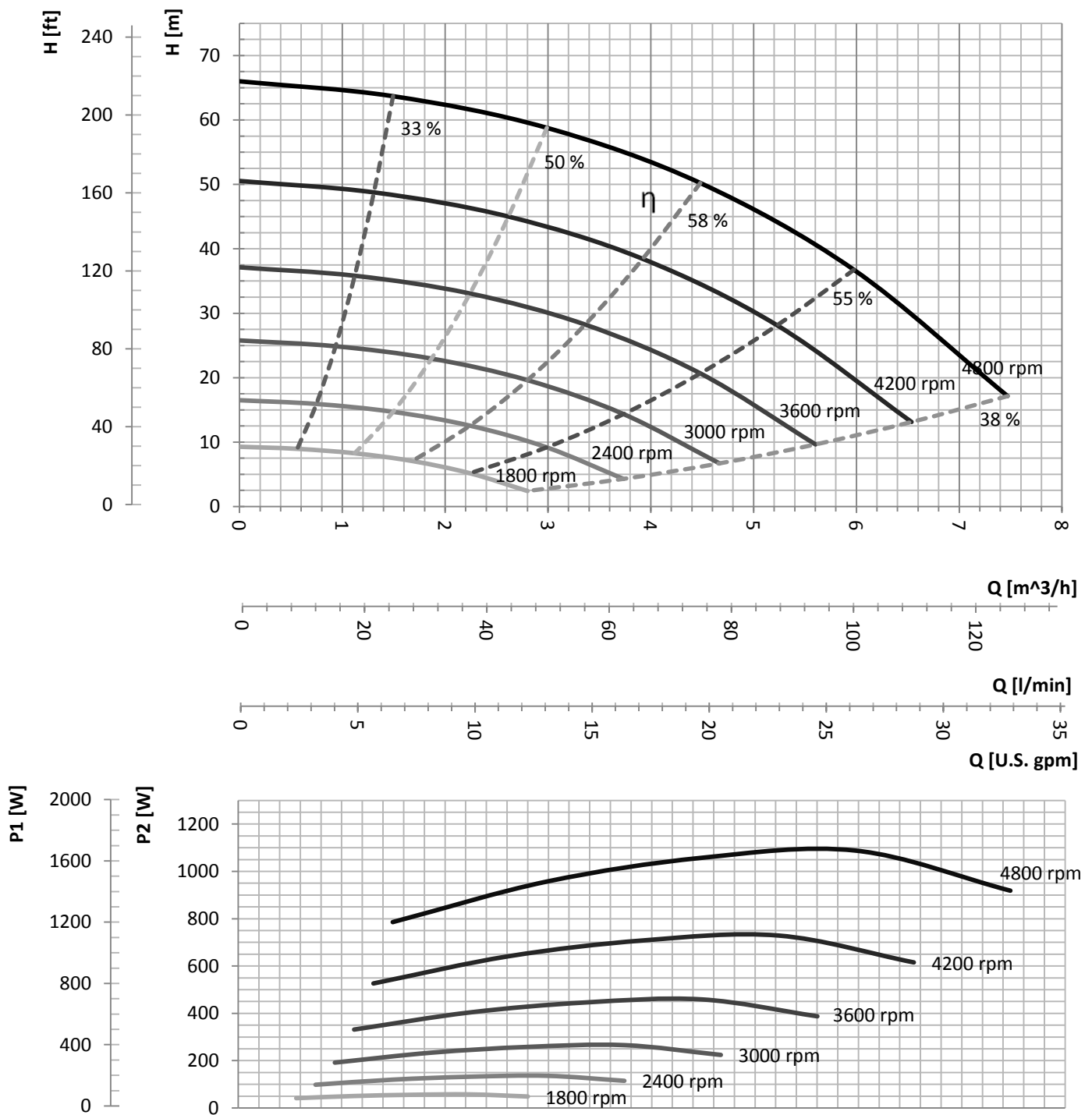
Performance: 4HS 03/10



Rated input voltage	Max. input current	Power factor	Max input power	Lenght	Delivery	Pump weight	Max. diameter	Packing dimension	Packing weight
[VAC]	[A]		[W]	[mm]		[kg]	[mm]	[cm]	[Kg]
1 x 190 - 265	16	1	3200	1055	1 1/4 "	22,2	101 *	120x20x29	23,2

* Max. external diameter including cable and cable cover

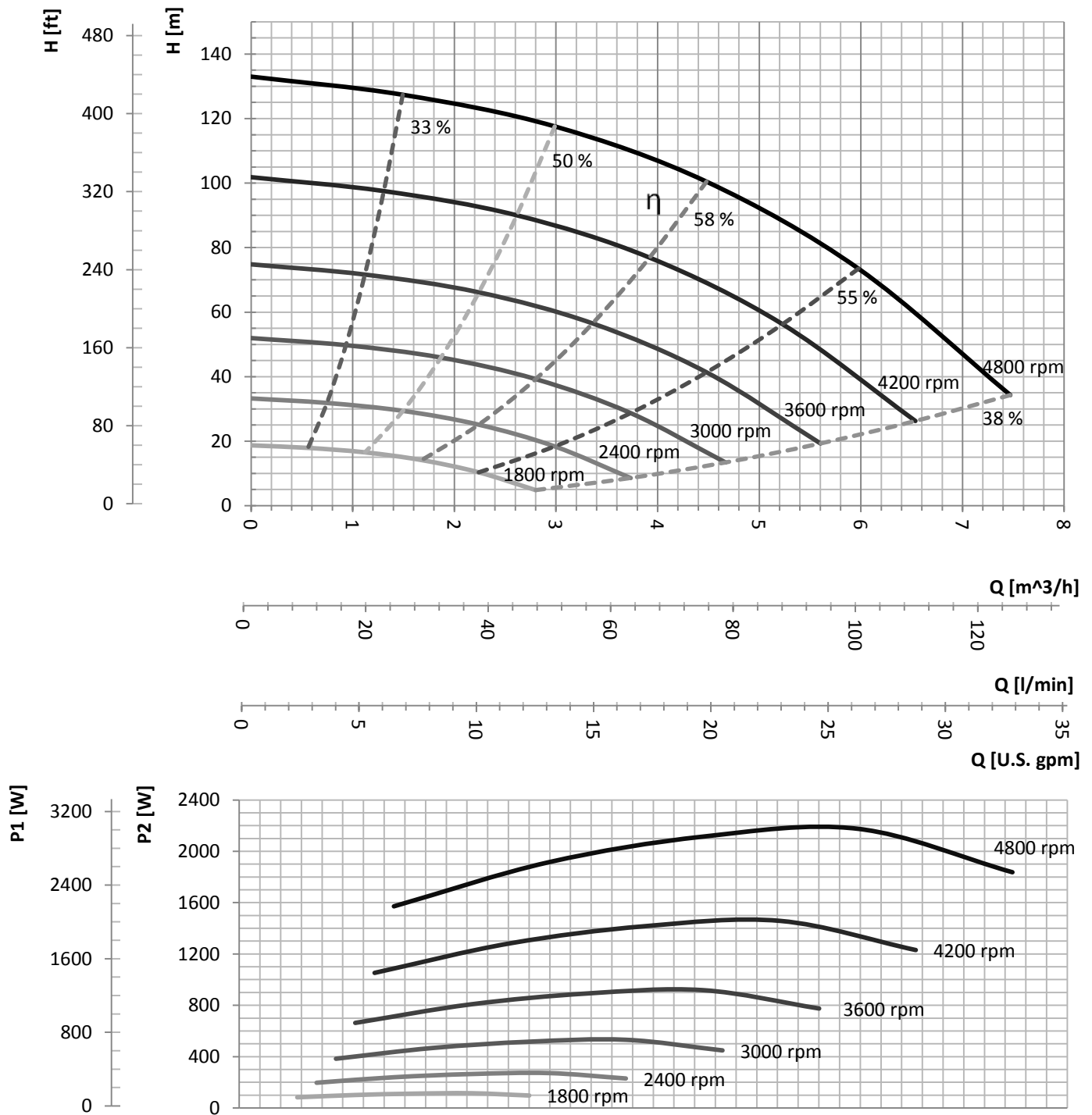
Performance: 4HS 05/04



Rated input voltage	Max. input current	Power factor	Max input power	Lenght	Delivery	Pump weight	Max. diameter	Packing dimension	Packing weight
[VAC]	[A]		[W]	[mm]		[kg]	[mm]	[cm]	[Kg]
1 x 190 - 265	9,5	1	1800	879	1 1/2 "	19,5	101 *	120x20x29	21

* Max. external diameter including cable and cable cover

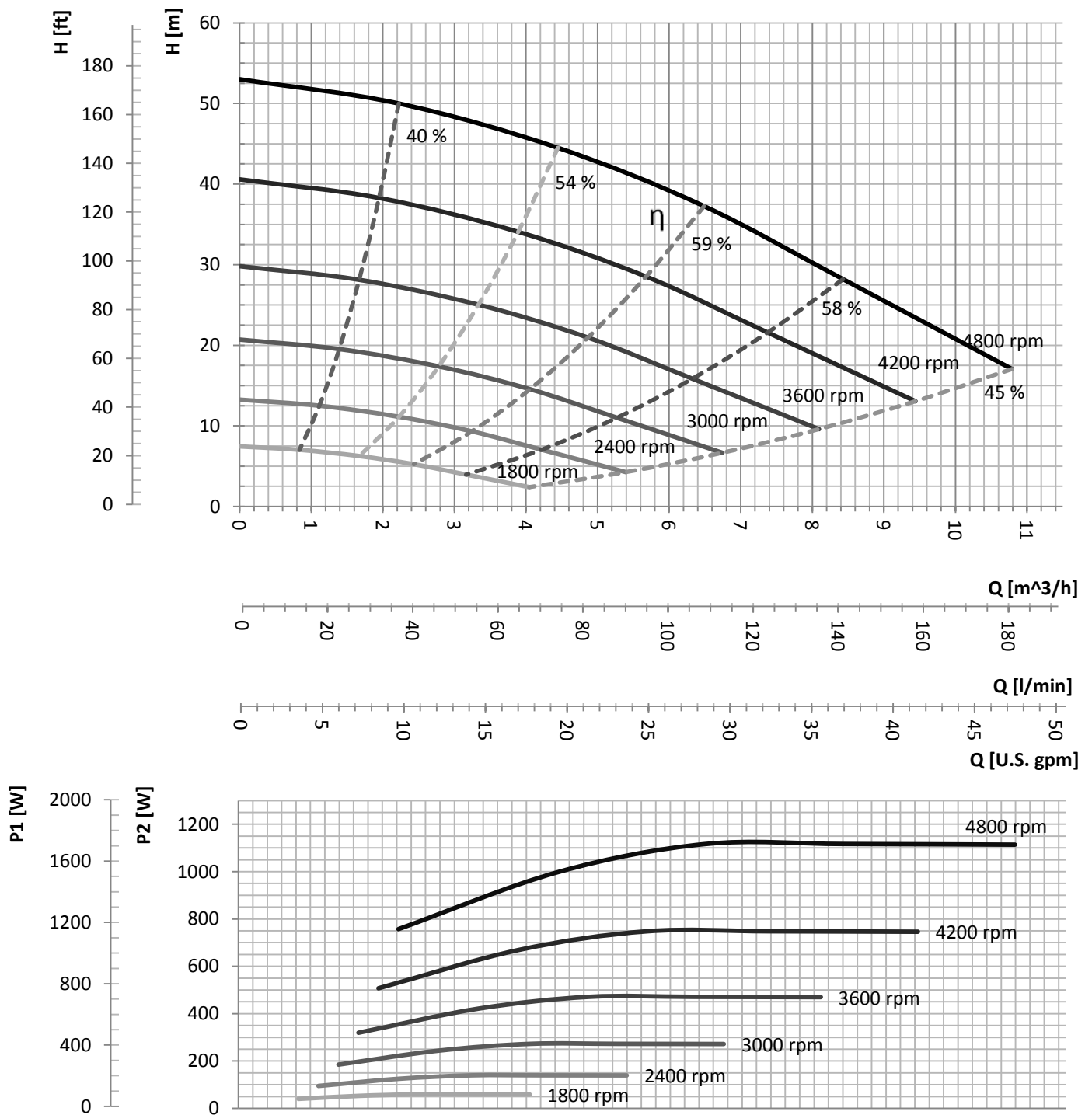
Performance: 4HS 05/08



Rated input voltage	Max. input current	Power factor	Max input power	Lenght	Delivery	Pump weight	Max. diameter	Packing dimension	Packing weight
[VAC]	[A]		[W]	[mm]		[kg]	[mm]	[cm]	[Kg]
1 x 190 - 265	16	1	3200	1013	1 1/2 "	22	101 *	120x20x29	23

* Max. external diameter including cable and cable cover

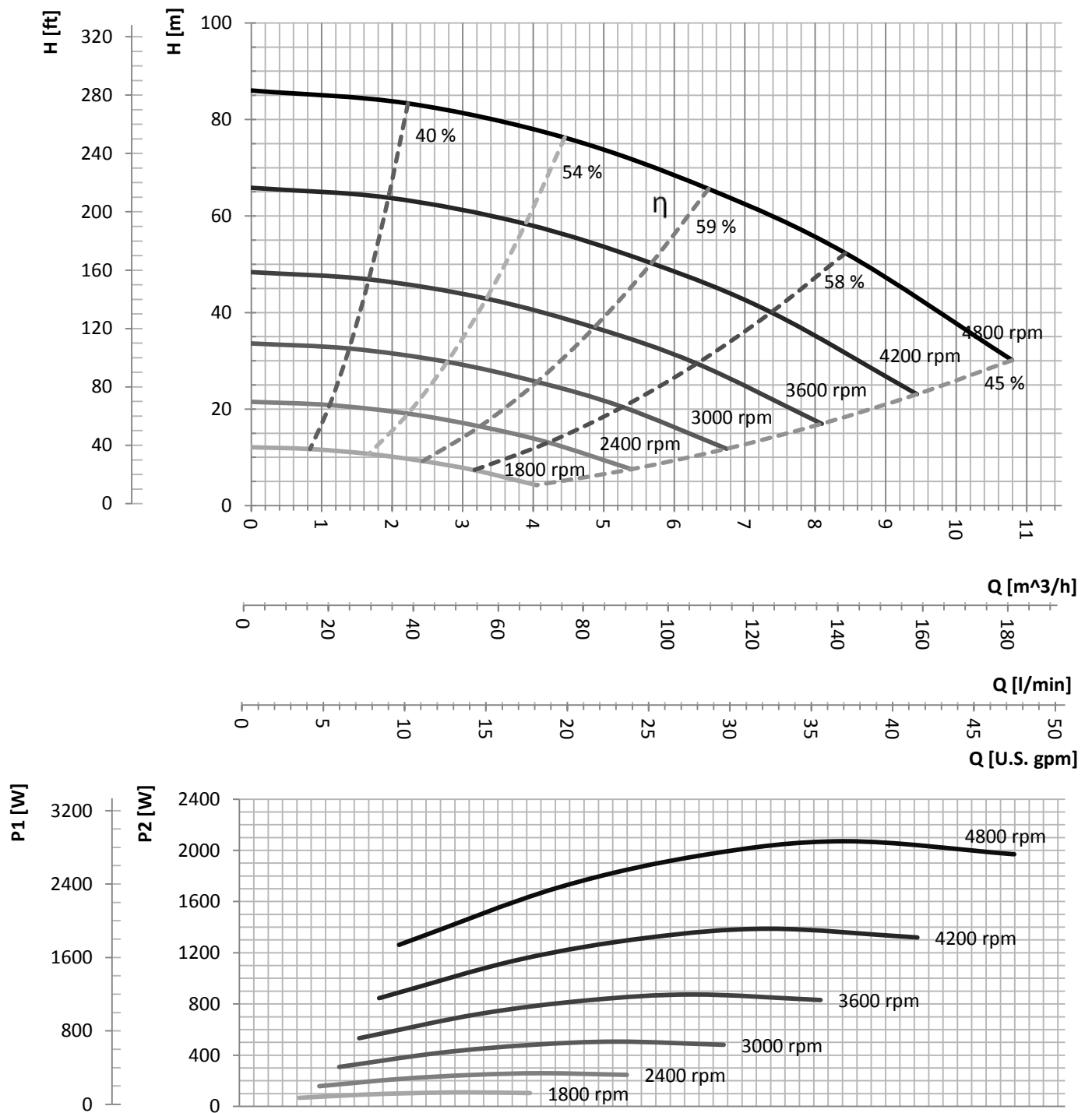
Performance: 4HS 08/03



Rated input voltage	Max. input current	Power factor	Max input power	Lenght	Delivery	Pump weight	Max. diameter	Packing dimension	Packing weight
[VAC]	[A]		[W]	[mm]		[kg]	[mm]	[cm]	[Kg]
1 x 190 - 265	9,5	1	1800	858	1 1/2 " 2"	19,4	101 *	120x20x29	21

* Max. external diameter including cable and cable cover

Performance: 4HS 08/05



Rated input voltage	Max. input current	Power factor	Max input power	Lenght	Delivery	Pump weight	Max. diameter	Packing dimension	Packing weight
[VAC]	[A]		[W]	[mm]		[kg]	[mm]	[cm]	[Kg]
1 x 190 - 265	16	1	3200	950	1 1/2 " 2"	21	101 *	120x20x29	22

* Max. external diameter including cable and cable cover

General characteristics

4HS PUMP	
Max. temperature of the liquid	35 °C (92 °F)
Min. cooling speed of the liquid	0.2 m/s
Characteristics of pumped liquid	Clean , chemically not-aggressive, not explosive, without solids and fibers content, with max. 50 g/m3 sand content
Protection grade	IP68
Max . Immersion depth	150 m
Materials	Motor, impeller and diffuser in AISI 304 stainless steel
Cavo	Flat cable ACS - WRAS - KTM approved
CM CONTROL MODULE	
Max. ambient temperature	50 °C (122 °F)
Protection Class	IP55 (Nema 4)
Materials	Alluminium enclosure, , PVC labels, cables gland in polyamide (PA) , display membrane in polyester (PE).
Analog input	2 inputs 4-20 mA + 2 input 4-20 mA or 0-10 V settable by the user
Digital input	4 input N.O or N.C settable by the user
Digital output	2 relays output 5 A , 250 VAC, N.O. or N.C settable by the user
Auxiliary power supply	24 Vdc (300 mA), 10 Vdc (5 mA)
User display	display LCD backlit, 16 characters x 2 rows, 5 buttons, buzzer for acoustic indication
Shortcircuit protection	By fuse
CERTIFICATION	
CE	

4HS pumps can be installed both vertically and horizontally with the outlet never be lower than 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.

