

SQ, SQE, CU 331, and SP

Submersible pumps, motors, and accessories
60 Hz



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1. SQ, SQE introduction

3-inch SQ, SQE submersible well pumps for 3-inch and larger wells

SQ, SQE pumps are suitable for both continuous and intermittent operation for a variety of applications:

- Domestic water supply
- light commercial
- irrigation
- tank applications.

SQ, SQE features and benefits

SQ, SQE pumps offer these features:

- Dry-run protection
- high efficiency pump and motor
- protection against up-thrust
- soft-start
- over-voltage and under-voltage protection
- over-temperature protection
- high starting torque.

Additionally, SQE pumps offer these advantages:

- Constant pressure control
- variable speed
- electronic control and communication.

SQ, SQE innovative motor technology

SQ, SQE pumps feature an innovative motor design incorporating permanent-magnet technology. By combining permanent-magnet motors and a Grundfos micro-frequency converter, we are able to deliver unmatched performance and the ability to control and communicate with the pump in ways never before possible. A few of the features that result from this combined technology are Constant Pressure Control, Soft-Start, and Integrated Dry-Run Protection, but these are just a few of the features these pumps offer.

SQ pump models operate at a constant speed much like today's conventional pumps. The difference is that SQ delivers the benefits of an electronically controlled permanent-magnet motor that cannot be achieved with a conventional induction motor.

SQ pumps are available for single-phase power; a simple 2-wire design makes installation easy.

SQE pumps are equipped with a Grundfos "Smart Motor." Like the SQ models, SQE pumps have a high efficiency permanent-magnet motor - but we add the ability to communicate.

The "Smart Motor" communicates via the CU301 status box through the power leads.

It is not necessary to run any additional wires down the well. Communication with the pump provides Constant Pressure Control and the highly useful ability to change the pump performance while the pump is installed in the well. Like the SQ motor, this is also a 2-wire motor designed for single-phase operation.

Dry-running protection

The pumps are protected against dry running. A value of $P_{\text{cut-out}}$ ensures cut-out of the pump in case of lack of water in the borehole thus preventing a burnout of the motor.

$P_{\text{cut-out}}$ is factory-set both for the SQ and SQE pumps.

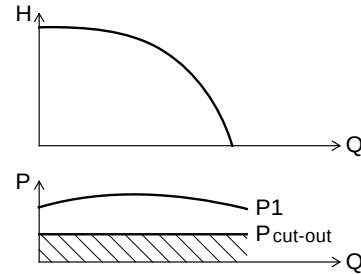


Fig. 1 $P_{\text{cut-out}}$ curve

High pump efficiency

The hydraulic pump components are polyamide reinforced with 30 % glass fiber. The hydraulic design provides for high pump efficiency resulting in low energy consumption and therefore low energy costs.

High motor efficiency

The motors are based on a permanent magnet rotor (PM motor) featuring high efficiency within a wide load range.

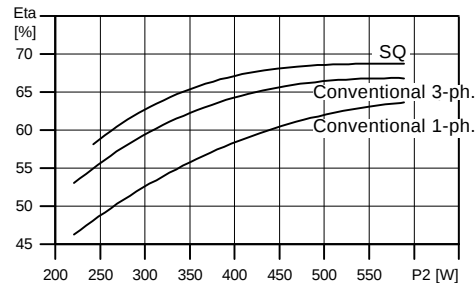


Fig. 2 Efficiency curves of Grundfos SQ motor versus conventional motors

Wear resistance

The pump design features "floating" impellers (not fastened to the shaft). Each impeller has its own tungsten carbide/ceramic bearing. The construction and materials ensure high wear resistance to sand for long product life.



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Fig. 3 Example of Grundfos floating impeller

Protection against upthrust

Starting up a pump with a very low counter pressure involves the risk of the entire impeller stack being lifted, also called upthrust. Upthrust may cause breakdown of both pump and motor.

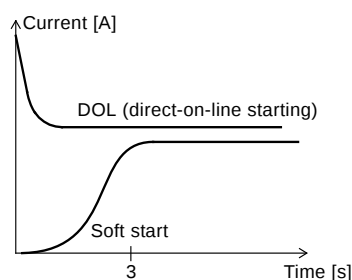
SQ, SQE motors are fitted with a top bearing protecting both pump and motor against upthrust, thus preventing breakdown during the critical start-up phase.

Excellent starting capabilities

The integrated electronic unit of the motor features soft starting. Soft start reduces the starting current and thus gives the pump a smooth and steady acceleration.

The soft starter minimizes the risk of wear on the pump and prevents overloading of the mains during start-up.

The excellent starting capabilities are a result of the high locked-rotor torque of the permanent magnet motor together with the few pump stages. The high starting reliability also applies in case of low voltage supply.



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Fig. 4 Soft-start feature

Overvoltage and undervoltage protection

Overvoltage and undervoltage may occur in case of unstable voltage supply.

The integrated protection of all motors prevents damage to the motor in case the voltage moves outside the permissible voltage range.

The pump will cut out if the voltage falls below 150 V or rises above 315 V. The motor is automatically cut in again when the voltage again falls within the permissible voltage range. Therefore no extra protection relay is needed.

Overload protection

Exposure of the pump to heavy load causes the current consumption to rise. The motor will automatically compensate for this by reducing the speed to 3000 rpm. Further overload will lead to stop. If the rotor is being prevented from rotating, this will automatically be detected and the power supply will be cut out. Consequently, no extra motor protection is needed.

Overtemperature protection

A permanent magnet motor gives off very little heat to its surroundings. In combination with an efficient internal circulation system leading the heat away from the rotor, stator and bearings, this ensures optimum operating conditions for the motor.

As an extra protection, the electronic unit has a built-in temperature sensor. When the temperature rises too high, the motor is cut out; when the temperature has dropped, the motor is automatically cut in again.

Reliability

The motors are built for high reliability and feature:

- Tungsten carbide / ceramic bearings
- thrust bearings protecting against downthrust
- product life time equal to conventional AC motors.

Variable speed

The SQE motor enables continuously variable speed control from 3,000 to 10,700 rpm. The pump can be set to operate in any duty point in the range between the 3,000 and 10,700 rpm performance curves of the pump. Consequently, the pump performance can be adapted to any specific requirement.

The variable speed control facility requires the use of the CU 300 or CU 301 control unit.

For the calculation of pump speed, the program "SQE Speed Calculation" is available on CD-ROM as an accessory.

SQ, SQE identification

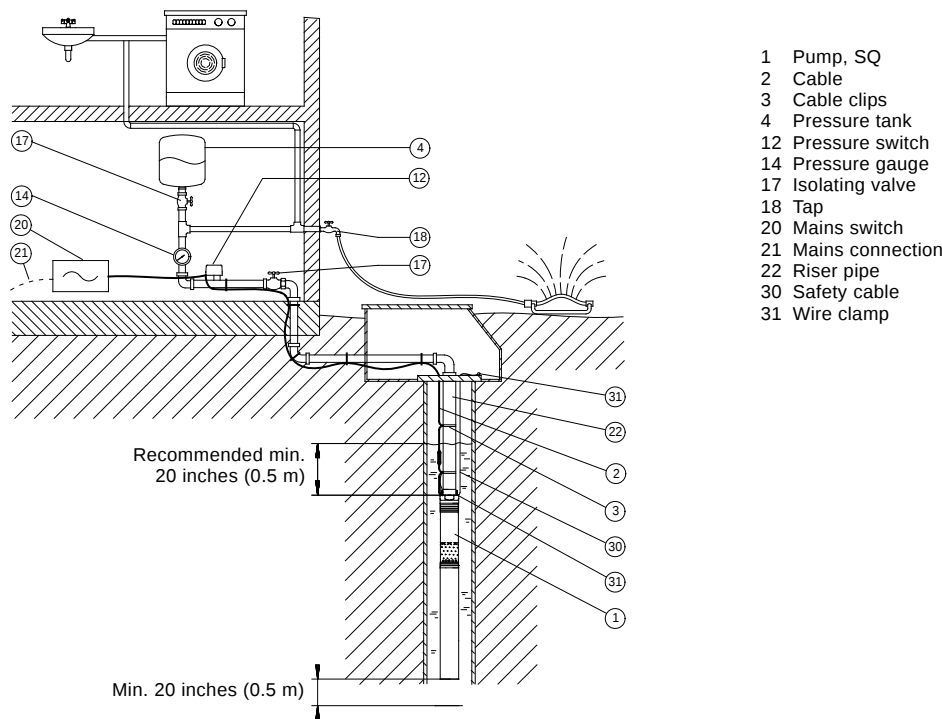
Type key example SQ, SQE

	10	SQ	E	05	- 160
Rated gallons per minute					
Basic version (without communication)					
Electronic communication					
Horsepower					
Total Dynamic Head in (ft) at rated flow					

2. SQ, SQE applications

SQ with pressure switch and pressure tank

SQ is ideally suited for domestic water supply in single-family dwellings or summer homes which are not connected to municipal waterworks. SQ is easy to install and operate.



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Fig. 5 Application example: SQ with pressure switch and pressure tank

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQ				
2	Cable					
3	Cable clips					
4	Pressure tank					
12	Pressure switch					
14	Pressure gauge					
20	Mains switch					
30	Safety cable					
31	Wire clamp					

Constant-pressure control with CU 301, residential water supply

The system maintains a constant pressure within the maximum pump performance in spite of a varying water consumption.

The pressure is registered by the pressure sensor and transmitted to the CU 301. The CU 301 adjusts the pump performance accordingly.

Function

When a tap is opened the pressure in the tank will start to drop. At a flow lower than approximately 1 gpm (0.18 m³/h), the pressure will drop slowly.

When the pressure in the tank is 7 psi (0.5 bar) below setpoint, the pump will start. The pump will run until the pressure is 7 psi (0.5 bar) above setpoint. This way of operation is called on/off operation.

At a flow higher than approximately 1 gpm (0.18 m³/h), the pressure will drop quickly and the pump will start immediately and maintain a constant pressure.

During operation, the CU 301 will regulate the pump speed to maintain a constant pressure. If there is no consumption, the pump will boost the pressure to 7 psi (0.5 bar) above setpoint and stop after a few seconds.

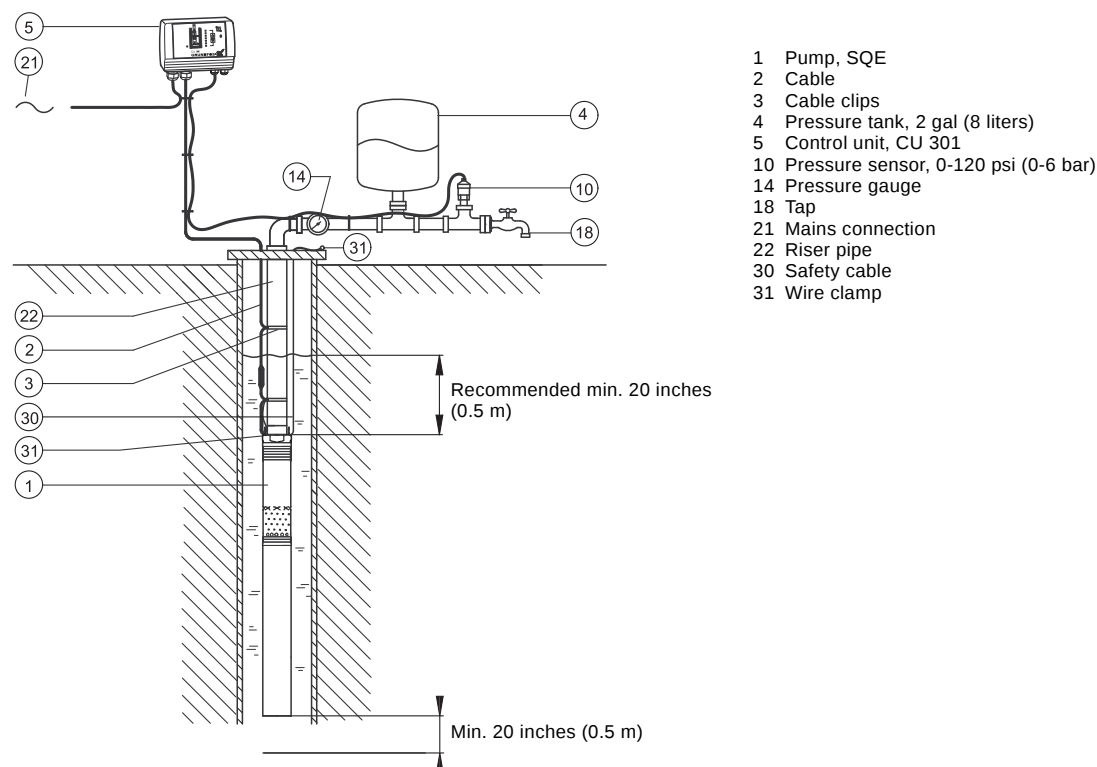


Fig. 6 Application example: Constant-pressure control with CU 301 - residential water supply

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQE				
2	Cable					
3	Cable clips					
4	Pressure tank	2 gal (8 liters)				
5	Control unit	CU 301				
10	Pressure sensor	0-120 psi (0-6 bar)				
14	Pressure gauge					
30	Safety cable					
31	Wire clamp					

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Constant-pressure control with CU 301, irrigation

The system maintains a constant pressure within the maximum pump performance in spite of a varying water consumption.

The pressure is registered by means of the pressure sensor and transmitted to the CU 301. The CU 301 adjusts the pump performance accordingly.

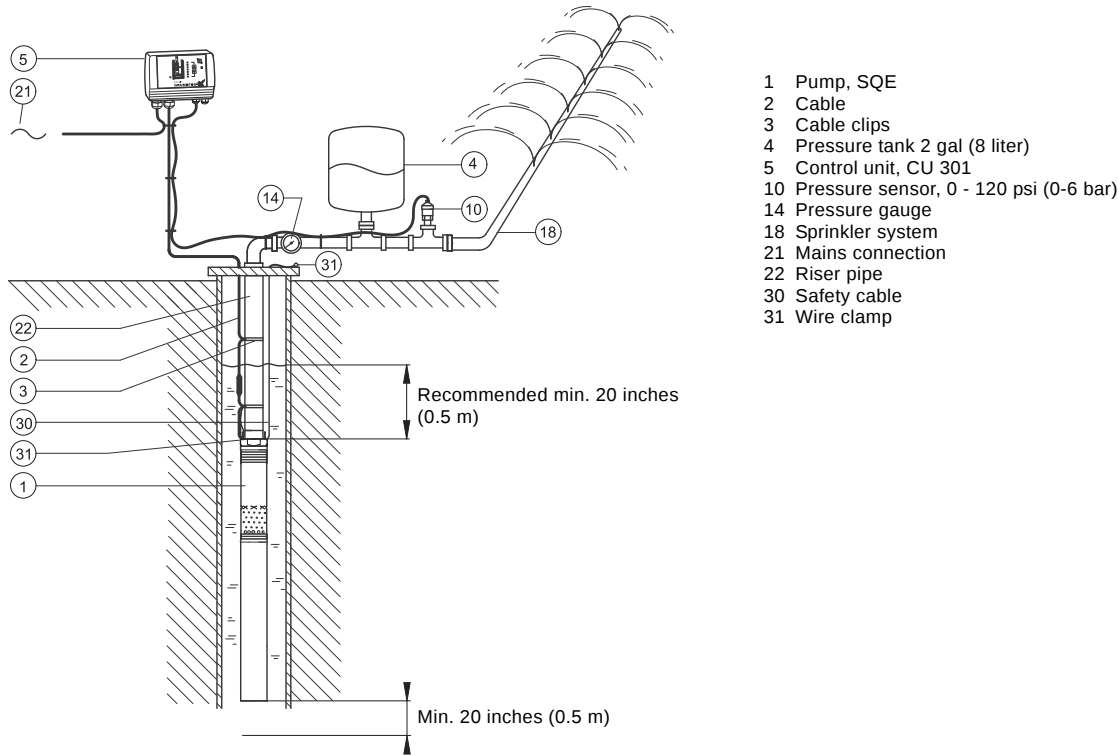
Function

When the sprinkler system is started, the pressure in the tank will start to drop.

At a flow lower than approximately 1 gpm (0.18 m³/h), the pressure will drop slowly. When the pressure in the tank is 7 psi (0.5 bar) below setpoint, the pump will start. The pump will run until the pressure is 7 psi (0.5 bar) above setpoint. This way of operation is called on/off operation.

At a flow higher than approximately 1 gpm (0.18 m³/h), the pressure will drop quickly and the pump will start immediately and maintain a constant pressure.

During operation, the CU 301 will regulate the pump speed to maintain a constant pressure. If there is no consumption, the pump will boost the pressure to 7 psi (0.5 bar) above setpoint and stop after a few seconds.



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Fig. 7 Application example: Constant-pressure control with CU 301 - irrigation

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQE				
2	Cable					
3	Cable clips					
4	Pressure tank	2 gal (8 liter)				
5	Control unit	CU 301				
10	Pressure sensor	0-120 psi (0-6 bar)				
14	Pressure gauge					
30	Safety cable					
31	Wire clamp					

Maintaining a constant water table

A constant water table can be maintained by adjusting pump performance. It may be important to maintain a constant water table, e.g. in connection with keeping out the groundwater on a building site or water remediation projects.

The example shows how to maintain a constant water table by adjusting pump performance.

Sensors

Level	Description	Reaction
Level sensor (pos. 11)		
Warning (max.)	Too high water level. Possible cause: Insufficient pump capacity.	Alarm relay operates.
Desired level	The water level which should be maintained.	
Warning (min.)	Too low water level. Possible cause: Too high pump capacity.	Alarm relay operates.

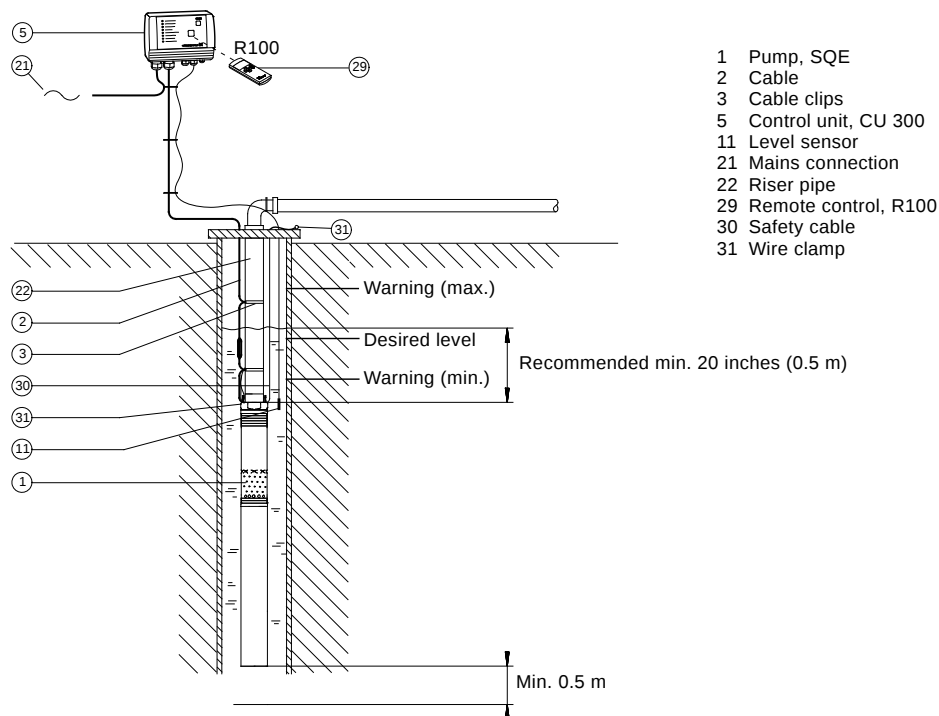


Fig. 8 Application example: Maintaining a constant water table

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQE				
2	Cable					
3	Cable clips					
5	Control unit	CU 300				
11	Level sensor					
29	Remote control	R100				
30	Safety cable					
31	Wire clamp					

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Emptying or filling a tank

The SQE pump with CU 300 is ideal for emptying or filling a tank.

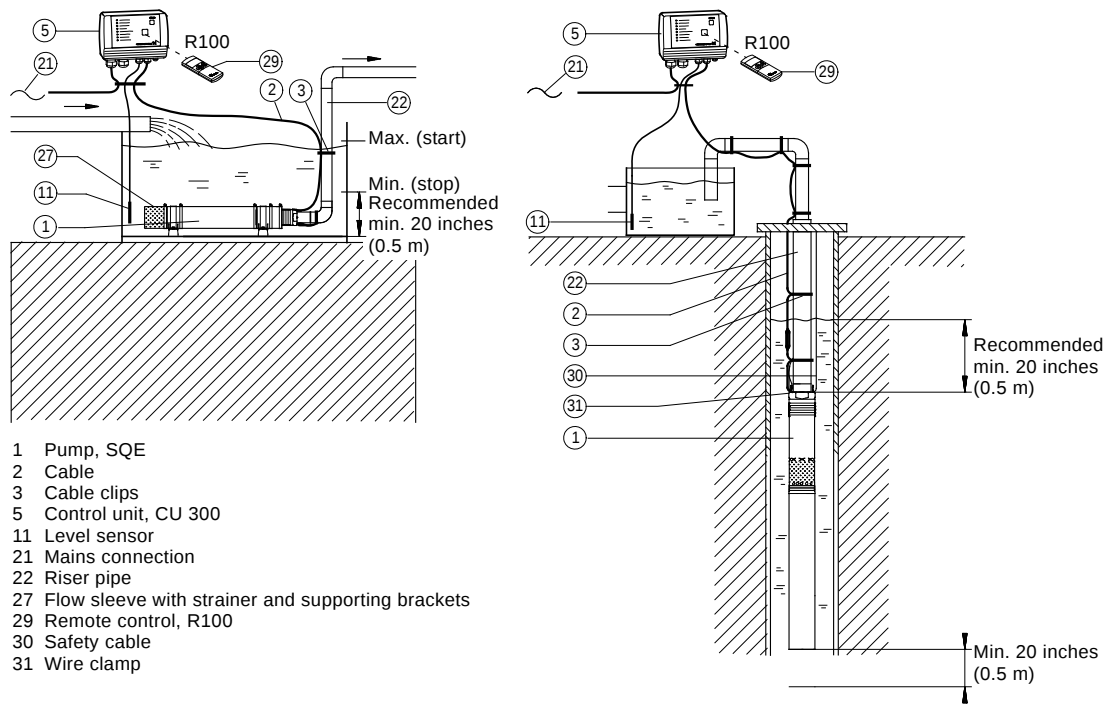


Fig. 9 Application example: Emptying or filling a tank

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQE				
2	Cable					
3	Cable clips					
5	Control unit	CU 300				
11	Level sensor					
22	Riser pipe					
27	Flow sleeve with strainer and supporting brackets					
29	Remote control	R100				
30	Safety cable					
31	Wire clamp					

Pumping from one tank to another

The SQE pump is ideal for pumping water from one tank to another.

Sensors

Level	Description	Light indication on CU 300
Level sensor (pos. 11, tank at top)		
Max. (stop)	When the water has reached this level, the pump stops.	Green indicator light in on/off button is flashing.
Min. (start)	When the water has dropped to this level, the pump starts.	Green indicator light in on/off button is permanently on.
Level sensor (pos. 11, tank at bottom)		
Max. (start)	When the water has reached this level, the pump starts.	Green indicator light in on/off button is on.
Min. (stop)	When the water has dropped to this level, the pump stops.	Green indicator light in on/off button is flashing.

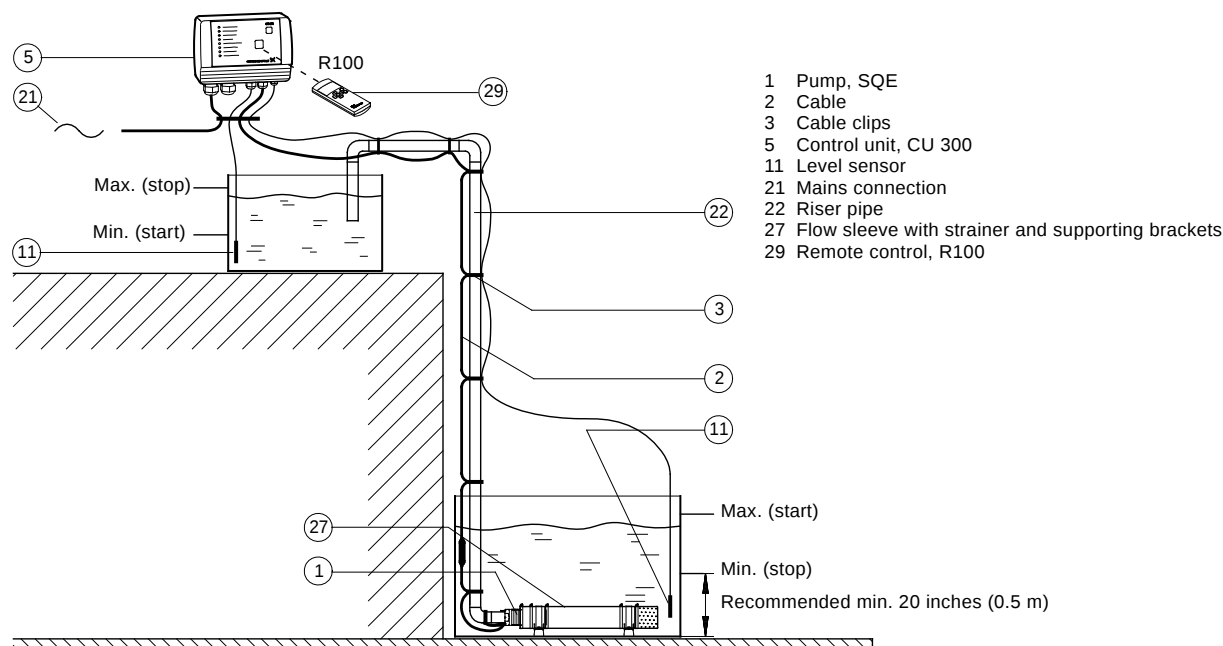


Fig. 10 Application example: Pumping from one tank to another

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQE				
2	Cable					
3	Cable clips					
5	Control unit	CU 300				
11	Level sensor					
27	Flow sleeve with strainer and supporting brackets					
29	Remote control	R100				

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Setting of operating parameters

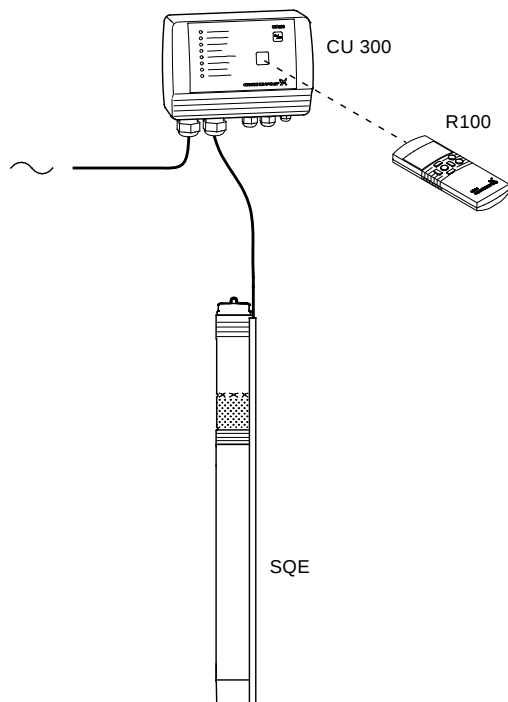
Using the R100 and the CU 300 enables change of the motor speed and thereby setting of the pump to a specific performance.

The software program "SQE Speed Calculation" has been developed for the calculation of the speed in order to obtain the required flow rate and head.

Dry-running protection

The value $P_{\text{cut-out}}$, ensuring dry-running protection, is factory-set for the SQE pump.

If the speed of the SQE pump is reduced by more than 1000 rpm, the $P_{\text{cut-out}}$ value must be readjusted by means of the CU 300 and R100.



Note: The SQE pump must not be started until the pump has been completely submerged below the water table. However, the change of the motor speed can be made even if the pump is not submerged.

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Fig. 11 Application example: Workshop setting of operating parameters

Part	Type	No. of units	Product number	Unit price	Total price
Pump	SQE				
Remote control	R100				
Control unit	CU 300				
SQE Speed Calculation program					

SQE with manual speed control

Functioning and benefits

Manual speed control of the SQE pumps is possible by means of R100 and an SPP 1 potentiometer.

This application is especially suitable for sampling from groundwater monitoring wells. The monitoring well is purged at high speed and the sample is taken at a low speed (quiet flow). For contaminated groundwater the SQE-NE type range is recommended.

In case frequent sampling is required, dedicated installation of the pump is recommended, thus eliminating wear caused by frequent assembly and dismantling the installation.

Furthermore, dedicated installations saves the costs of assembling and dismantling the installation.

Important: Through dedicated installation the transfer of contamination from one monitoring well to another is avoided.

Dry-running protection

The value $P_{\text{cut out}}$, ensuring dry-running protection, is factory-set for the SQE pump. If the speed of the pump is reduced more than 1,000 rpm, the value of $P_{\text{cut out}}$ must be readjusted by means of CU 300 and R100.

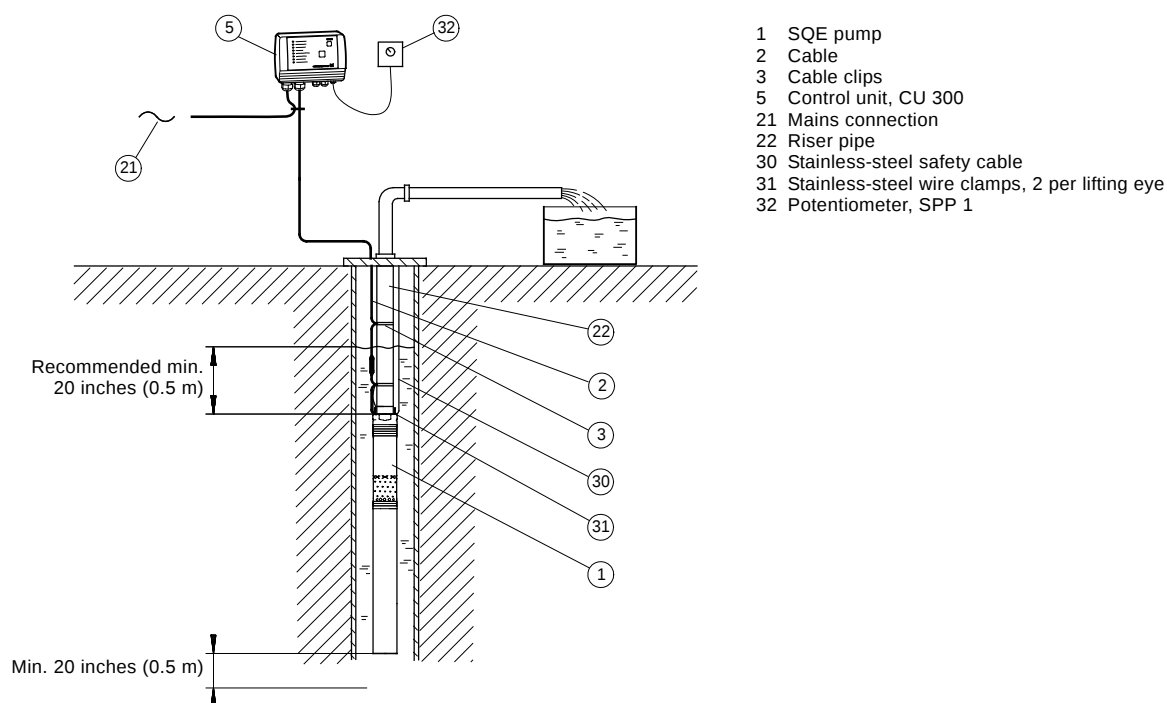
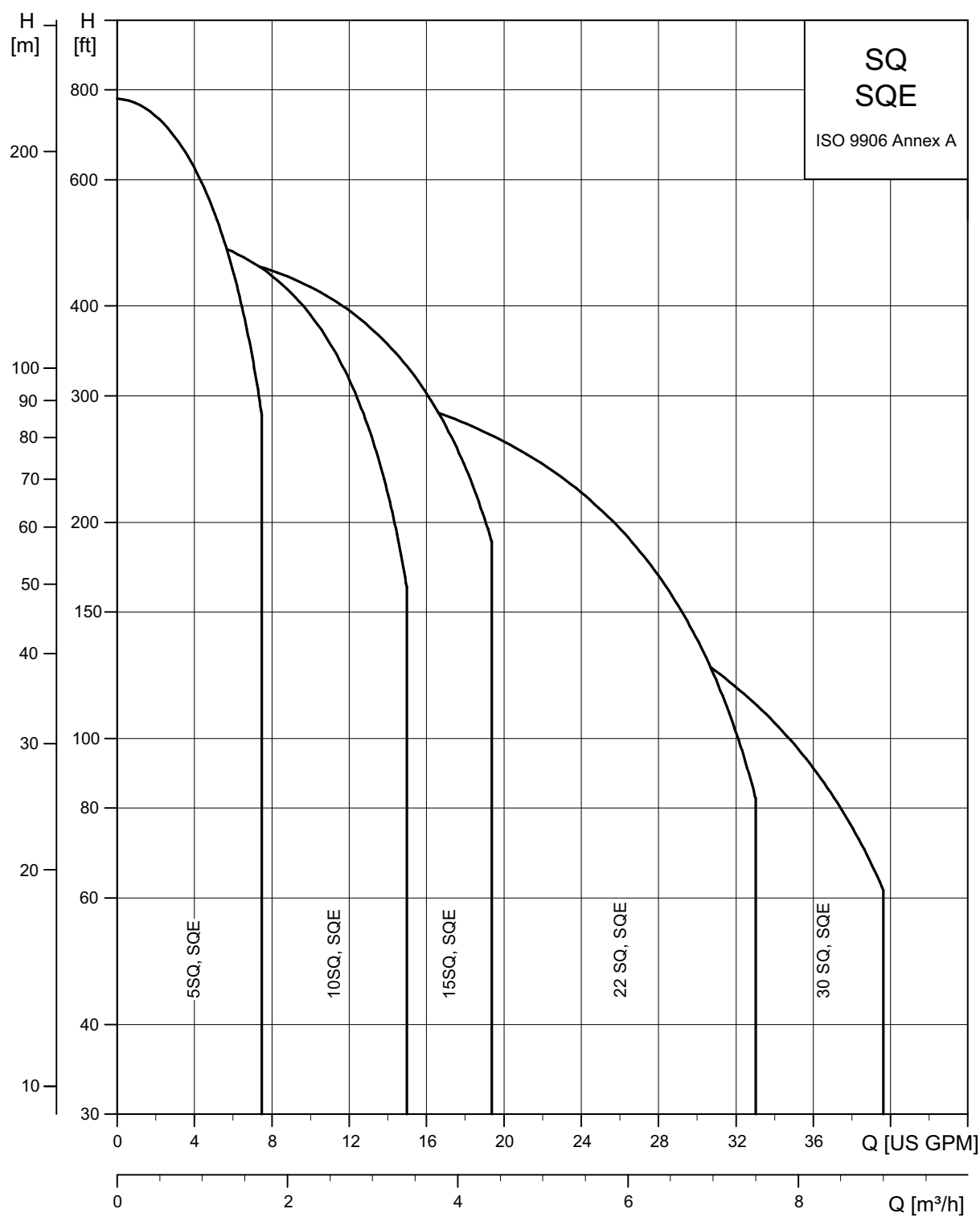


Fig. 12 Application example: Sampling/manual speed control of SQE

Pos.	Part	Type	No. of units	Product number	Unit price	Total price
1	Pump	SQE				
2	Cable					
3	Cable clips					
5	Control unit	CU 300				
22	Riser pipe					
30	Stainless-steel safety cable					
31	Wire clamps	2 per lifting eye				
32	Potentiometer	SPP 1				

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3. Performance range



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4. SQ, SQE installation

The SQ and SQE may be installed vertically, horizontally or in any position in between.

Note: The pump must not fall below the horizontal level in relation to the motor.

The following features ensure simple installation of the pump:

- Built-in check valve with spring
- low weight ensuring user-friendly handling
- installation in 3" or larger boreholes
- only on/off switch is needed, which means that no extra motor starter / starter box is necessary.

For horizontal installation a flow sleeve is recommended in order to:

- ensure sufficient flow velocity past the motor and thus provide sufficient cooling
- prevent motor and electronic unit from being buried in sand or mud.

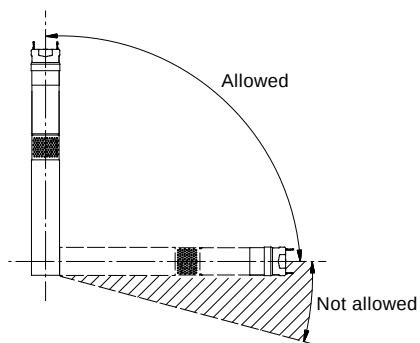


Fig. 13 SQE installation

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5. Sizing and selection

System sizing guide

Step 1

Calculate minimum head requirements at no flow conditions:

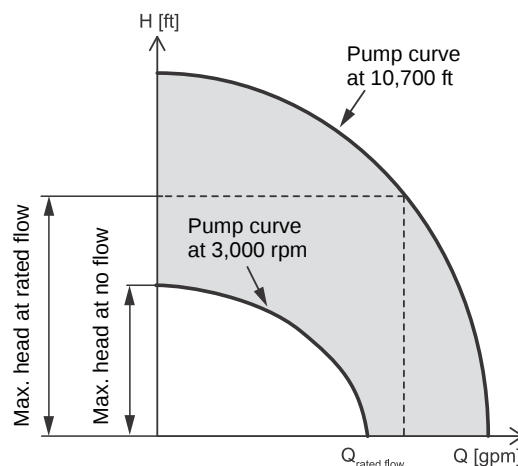
$$H_{\max} \text{ (required)} = \text{dynamic head} + \text{system pressure (in feet)} + \text{above grade elevation} + \text{friction loss}$$

Step 2

Select pump from chart as follows:

- Choose model family based on the desired flow rate (i.e. 15SQE for a flow rate of 15 gpm)
- Select the first model with a value in Column 2 greater than the $H_{\max}$ calculated in Step 1 (For example: the choice for a 22 gpm model with an $H_{\max}$ of 140 ft would be the 22SQE-160).
- Double check your selection in the performance curves; see [SQ, SQE curve charts](#) on page 19.

System sizing matrix		
	Column 1	Column 2
Pump type Model B	Shutoff head (0 gpm) @ 3000 rpm min. speed	Head @ rated gpm @ 10700 rpm max. speed
	TDH [feet]	TDH [feet]
5SQE-90	11	86
5SQE-140	17	131
5SQE-180	22	177
5SQE-230	28	222
5SQE-270	34	270
5SQE-320	39	315
5SQE-360	45	360
5SQE-410	51	405
5SQE-450	56	450
10SQE-110	12	105
10SQE-160	17	164
10SQE-200	23	215
10SQE-240	29	267
10SQE-290	34	328
10SQE-330	40	390
15SQE-70	10	75
15SQE-110	14	123
15SQE-150	19	164
15SQE-180	24	205
15SQE-220	29	246
15SQE-250	33	287
15SQE-290	38	328
22SQE-40	5	36
22SQE-80	9	77
22SQE-120	14	117
22SQE-160	18	159
22SQE-190	23	200
22SQE-220	27	240
30SQE-40	5	33
30SQE-90	11	82
30SQE-130	16	126



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Fig. 14 Recommended sizing

Note: All calculated head requirements must lie between the selected pump models minimum and maximum speed curves.

6. Cable sizing

Cable sizing chart

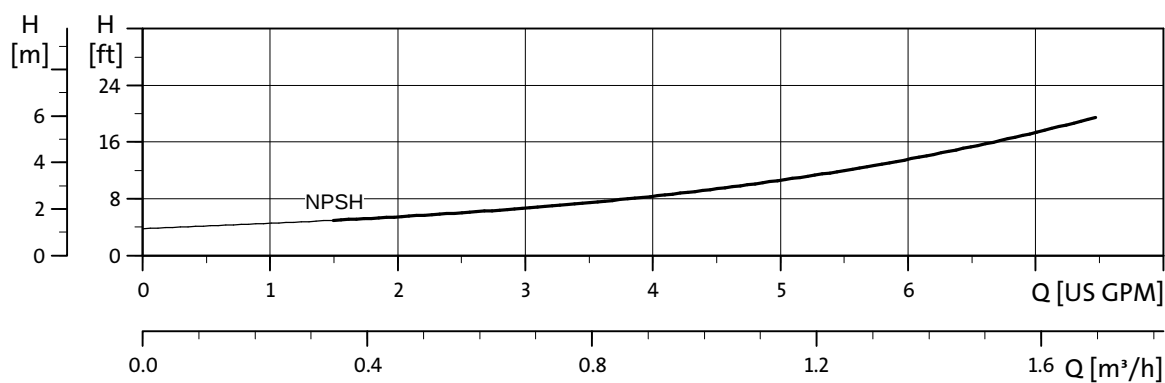
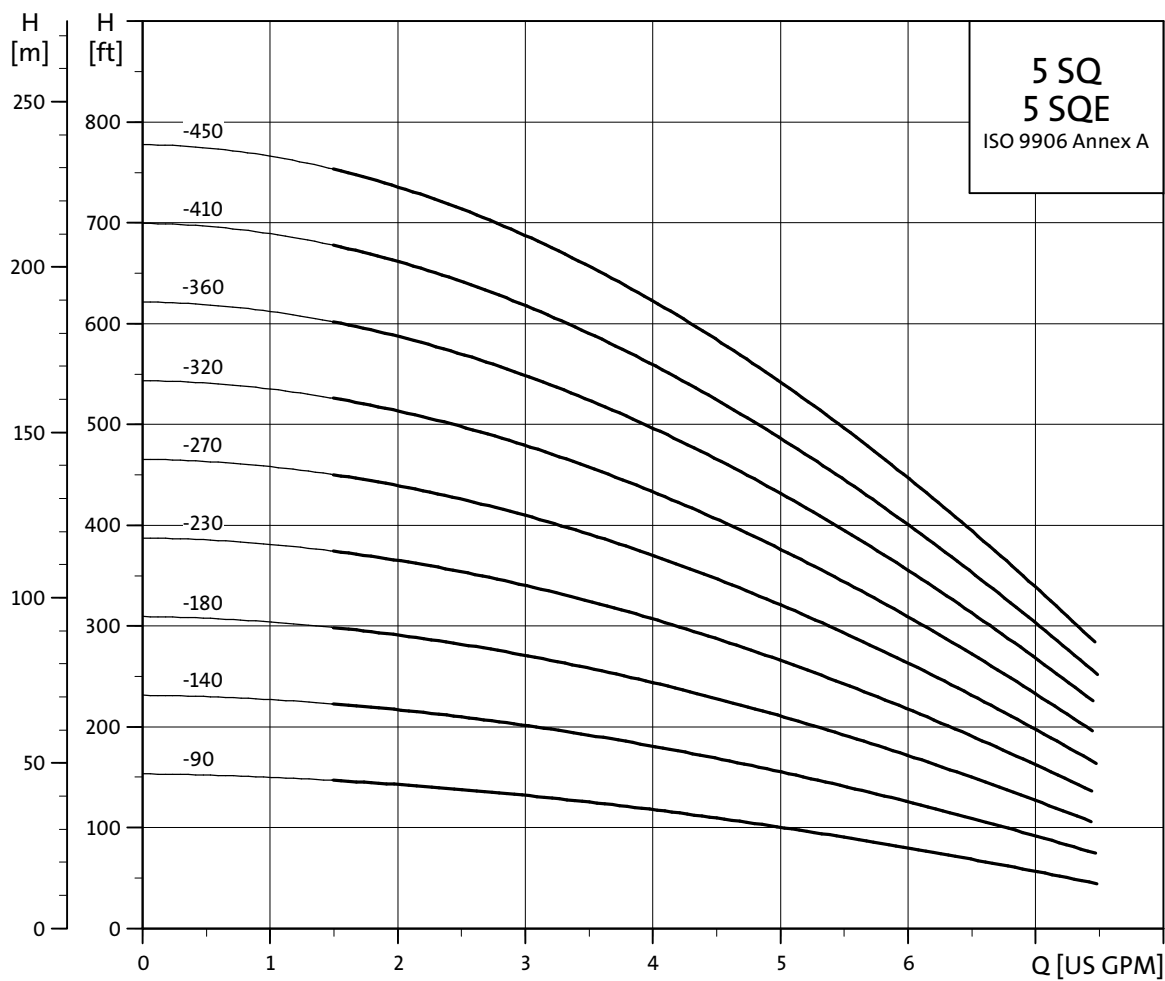
Motor rating			Copper wire size (AWG)						
Volts	Hp	Amps	14	12	10	8	6	4	2
115	0.5	12	140	220	360	550	880	1390	2260
230	0.5	5.2	640	1000	1660	2250	4060	-	-
230	0.75	8.4	400	620	1030	1580	2510	3970	-
230	1	11.2	300	460	770	1190	1890	2980	4850
230	1.5	12	280	430	720	1110	1760	2780	4530

Cable length in feet.

Note: shaded values do not apply when using a CU 301 as its max. recommended cable length is 650 ft.

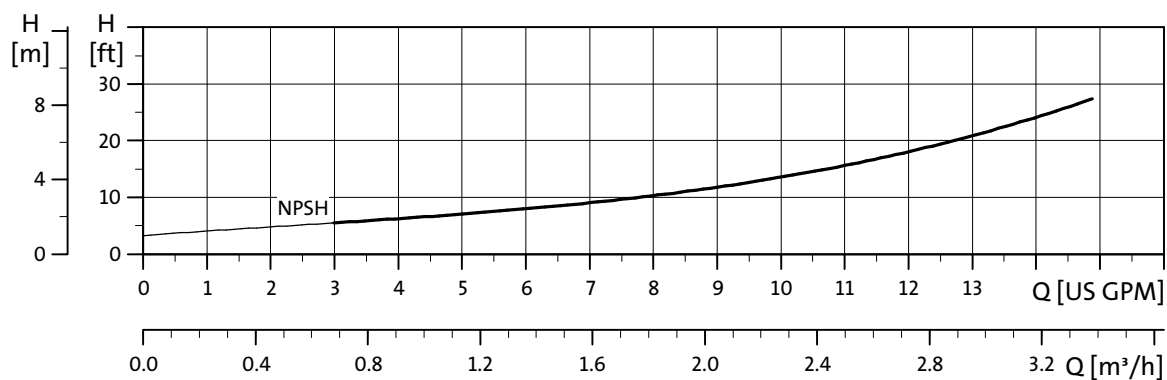
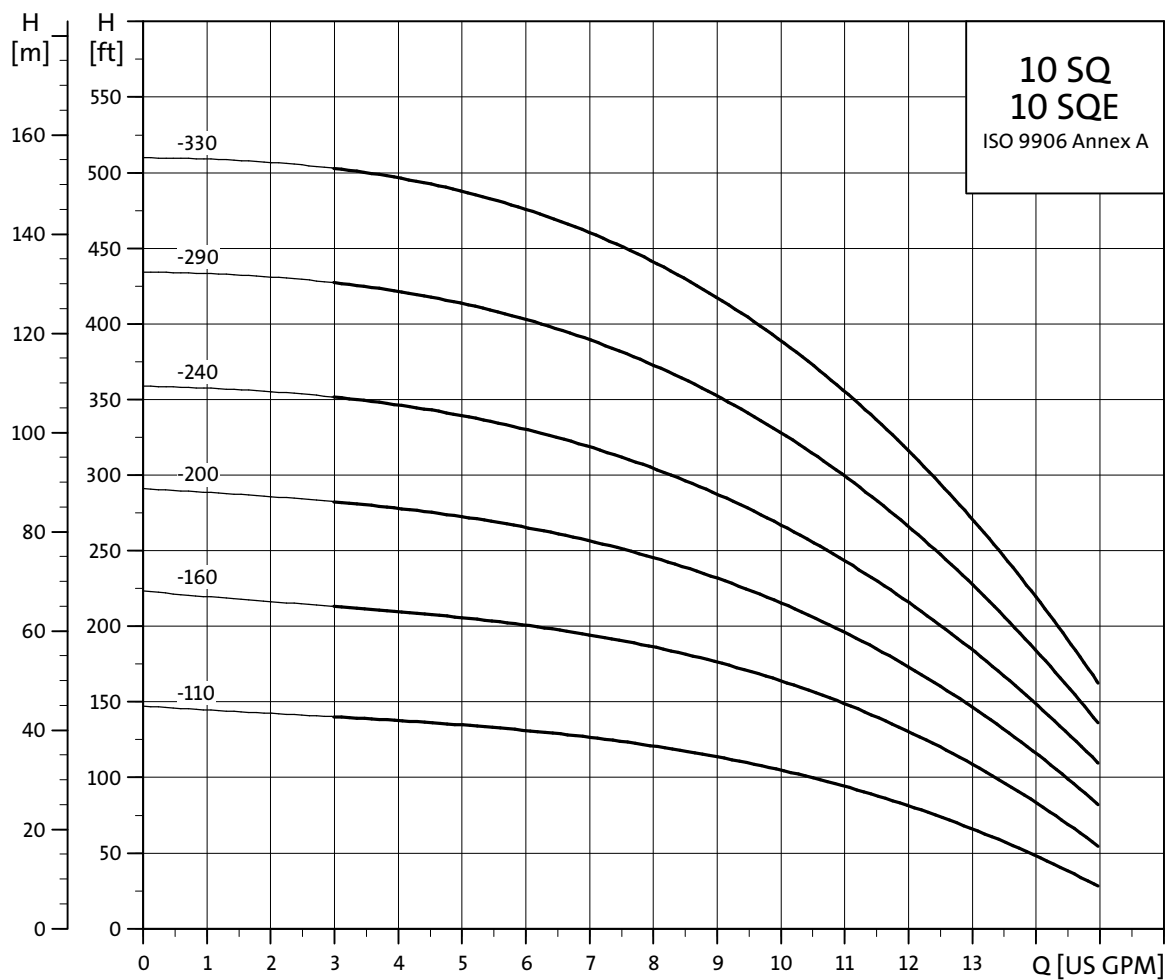
7. SQ, SQE curve charts

5 SQ, SQE



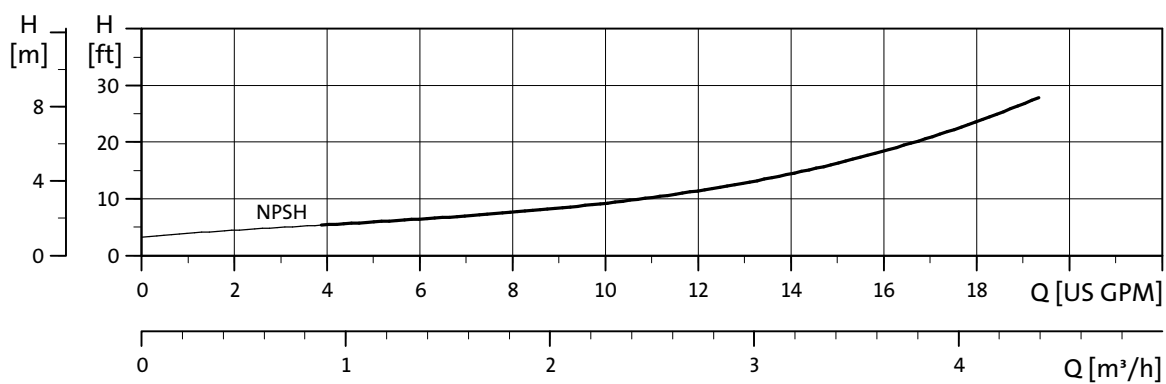
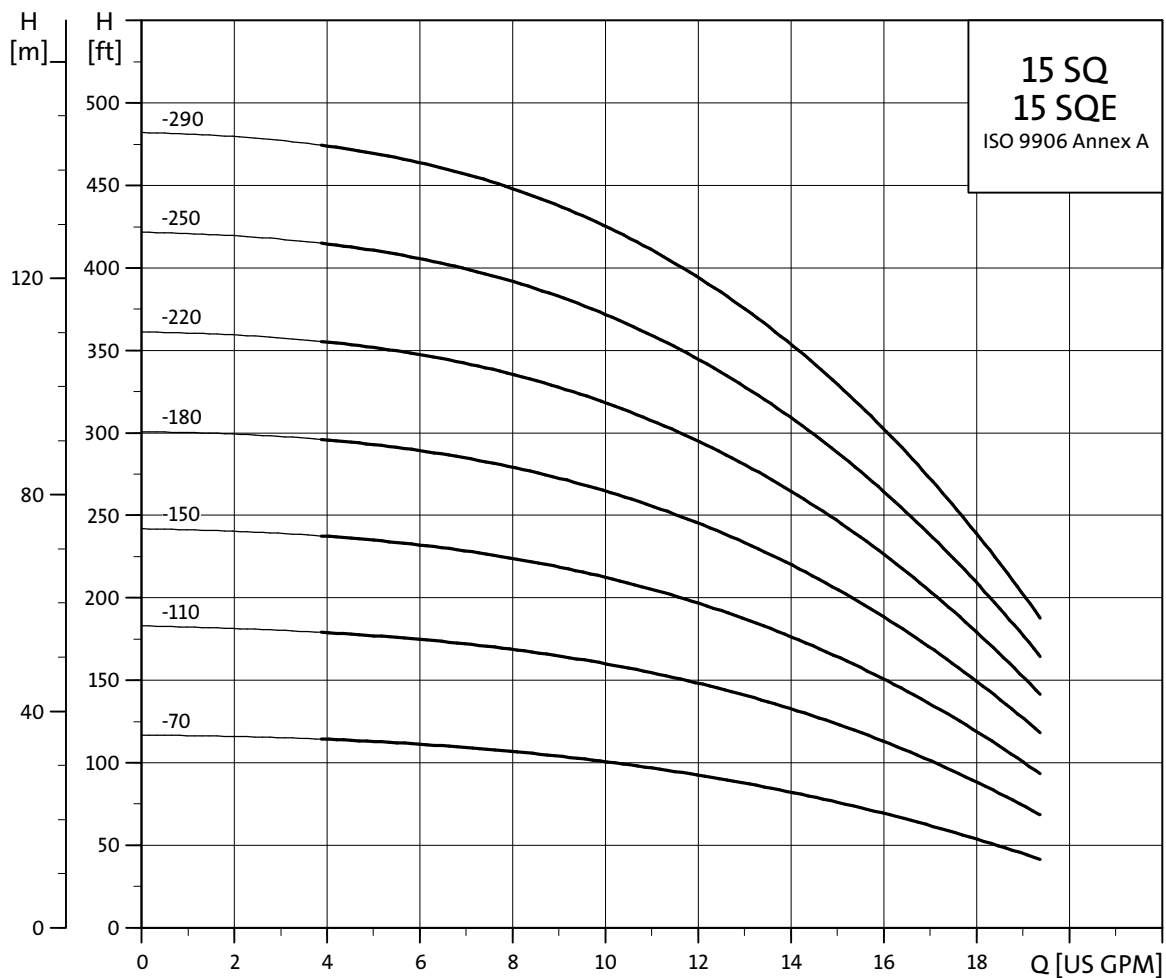
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10 SQ, SQE



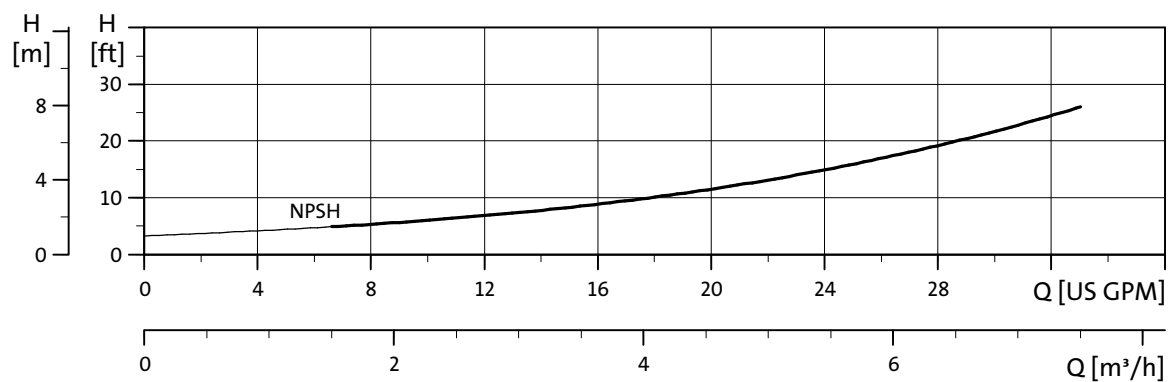
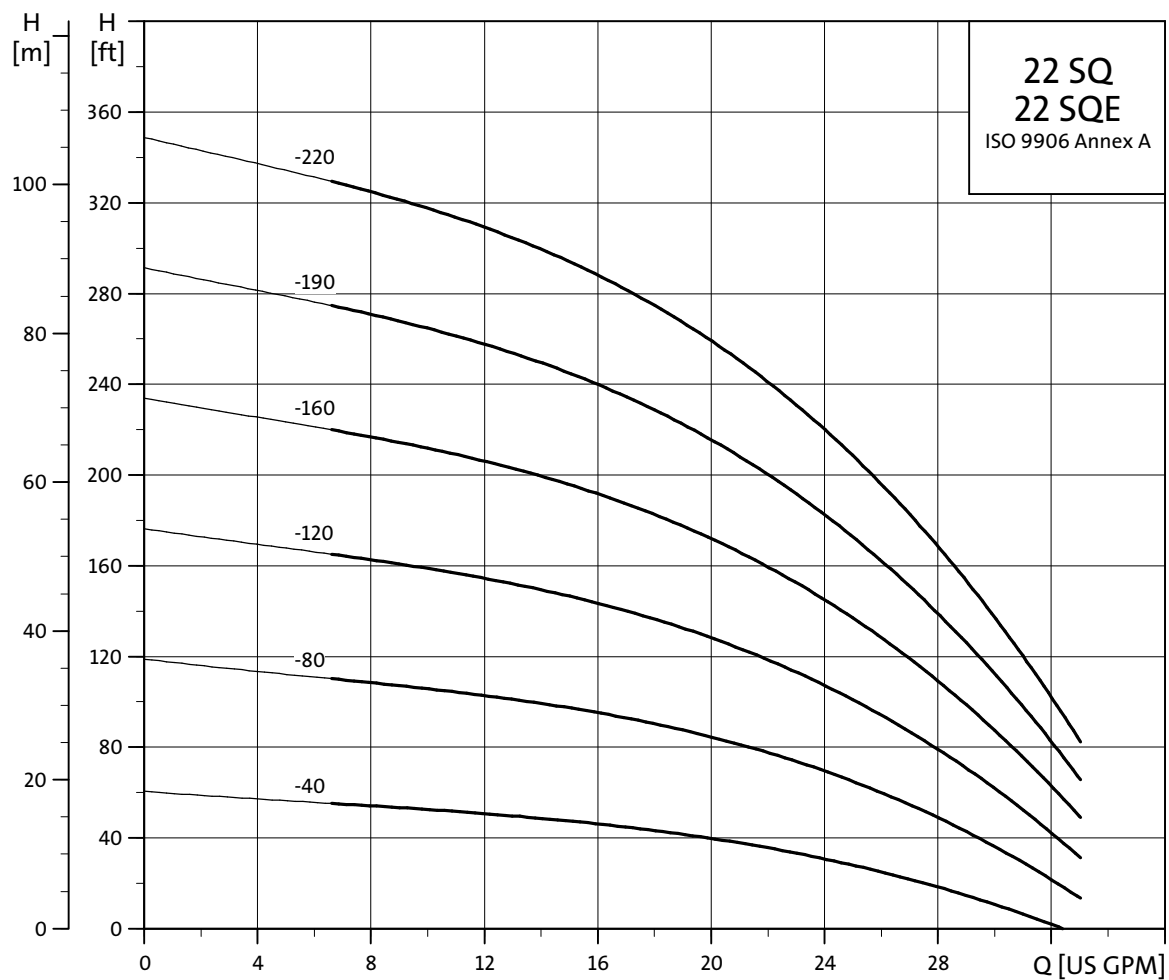
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15 SQ, SQE



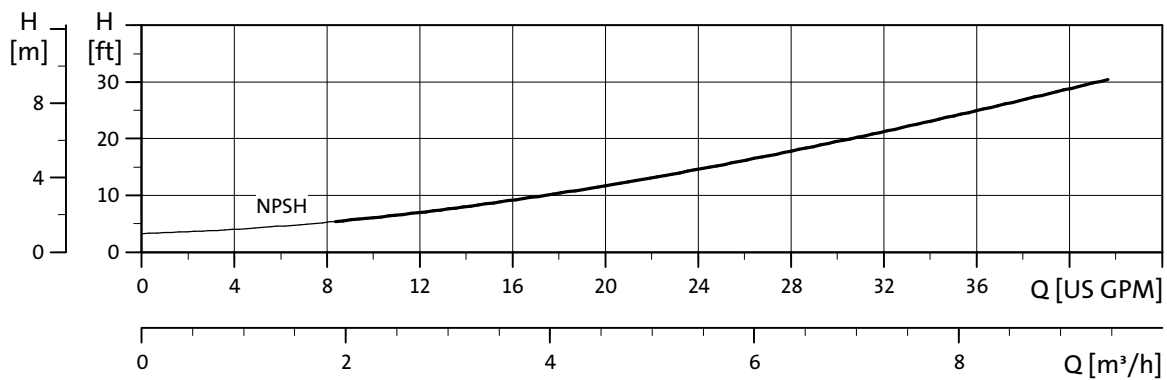
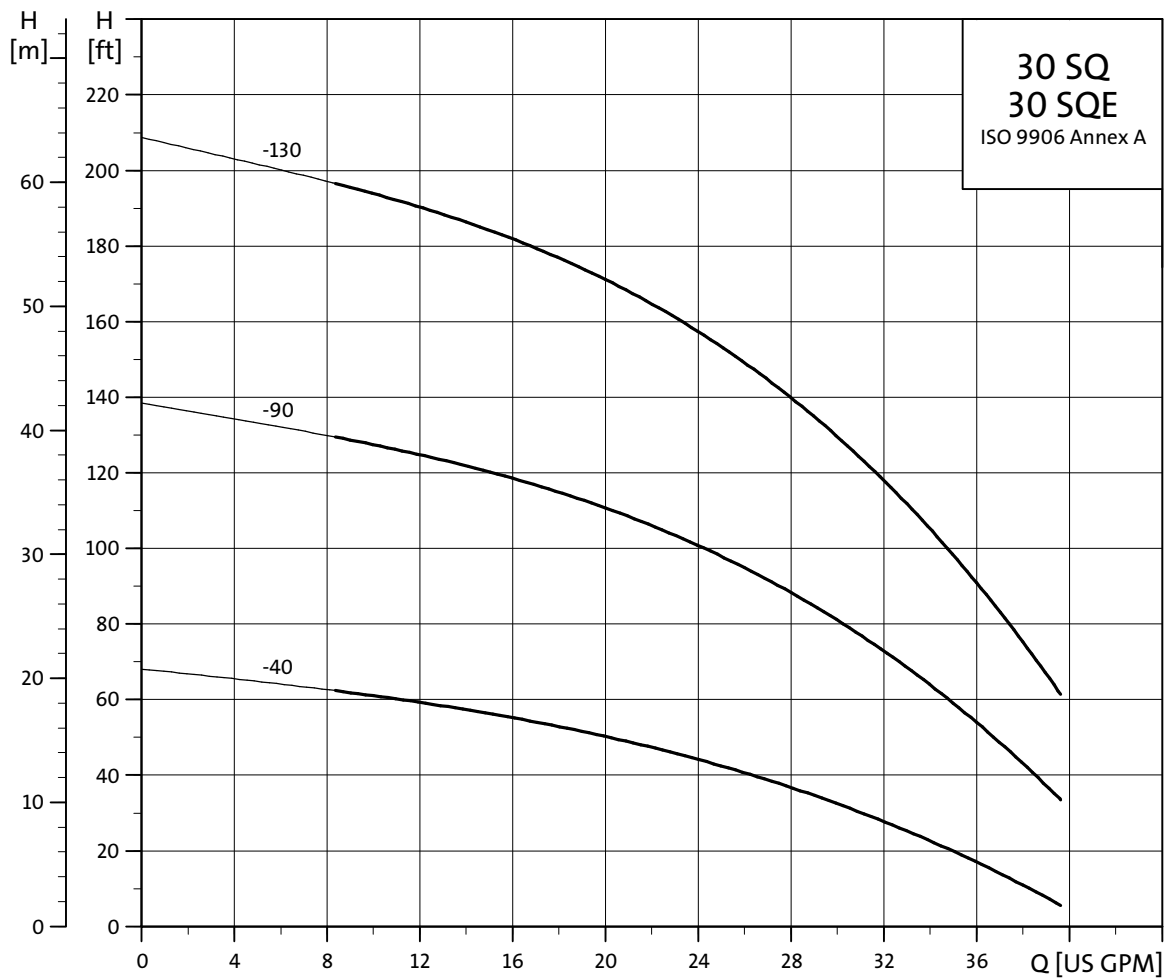
TM04 7465 2010

22 SQ, SQE



TM04 7466 2010

30 SQ, SQE



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8. SQ, SQE technical data

Electrical data

Supply voltage:	1 x 200-240 V + 6 %/- 10 %, 50/60 Hz, PE 1 x 100-115 V + 6 %/- 10 %, 50/60 Hz, PE
Operation via generator:	As a minimum, the generator output must be equal to the motor P1 [kw] + 10 %
Starting current:	The motor starting current is equal to the highest value stated on the motor nameplate
Starting:	Soft Start
Run-up time:	Maximum: 2 seconds
Motor protection:	Motor is protected against: – Dry running – overvoltage – undervoltage – overload – overtemperature.
Power factor:	PF = 1
Motor cable:	3 wire, 14AWG XLPE, 5 ft
Motor liquid:	Type SML 2
pH Values:	SQ and SQE: 5 to 9 SQE-NE: 2 to 13
Liquid temperature:	The temperature of the pumped liquid must not exceed 86 °F (30 °C)

Note: If liquids with a viscosity higher than that of water are to be pumped, please contact Grundfos.

Control units CU 300 and CU 301

Voltage:	1 x 100-240 V - 10 %/+ 6 %, 50/60 Hz, PE
Power consumption:	5 W
Current consumption:	Maximum 130 mA
Enclosure class:	IP55
Ambient temperature:	During operation: -22 °F to +122 °F (-30 °C to +50 °C) During storage: -22 °F to 140 °F (-30 °C to +60 °C)
Relative air humidity:	95 %.
Pump cable:	Maximum length between CU 300 or CU 301 and pump: 650 ft (198 m)
Back-up fuse:	Maximum: 16 A
Radio noise:	CU 300 and CU 301 comply with EMC Directive 89/336/EEC. Approved according to the standards EN 55014 and EN 55014-2
Marking:	CE, cUL (CU 301)
Load:	Max. 100 mA

Operating conditions

Minimum ambient fluid temperature:	+34 °F (+1 °C)
Maximum ambient fluid temperature:	+86 °F (+30 °C)
Well diameter:	3-inch or larger
Installation depth (maximum):	500 feet below static water level

Storage conditions

Minimum ambient temperature:	-4 °F (-20 °C)
Maximum ambient temperature:	+140 °F (+60 °F)
Frost protection:	If the pump has to be stored after use, it must be stored at a frost-free location, or it must be ensured that the motor liquid is frost-proof.

Motor data

Pump type	Hp	Voltage	Full load amps		Overload amps		Min. well diameter	Discharge
			230 V	115 V	230 V	115 V		
5SQE05-90	1/2	230 V / 115 V	2.1	4.2	5	11	3"	1" NPT
5SQE05-140	1/2	230 V / 115 V	2.9	6.0	5	11	3"	1" NPT
5SQE05-180	1/2	230 V / 115 V	3.7	7.7	5	11	3"	1" NPT
5SQE07-230	3/4	230 V	4.6	-	8	-	3"	1" NPT
5SQE07-270	3/4	230 V	5.3	-	8	-	3"	1" NPT
5SQE07-320	3/4	230 V	6.2	-	8	-	3"	1" NPT
5SQE10-360	1	230 V	7.2	-	11	-	3"	1" NPT
5SQE10-410	1	230 V	8.1	-	11	-	3"	1" NPT
5SQE15-450	1 1/2	230 V	9.2	-	12	-	3"	1" NPT
10SQE05-110	1/2	230 V / 115 V	2.9	6.1	5	11	3"	1 1/4" NPT
10SQE05-160	1/2	230 V / 115 V	4.1	8.6	8	11	3"	1 1/4" NPT
10SQE07-200	3/4	230 V	5.3	-	8	-	3"	1 1/4" NPT
10SQE7-240	3/4	230 V	6.0	-	8	-	3"	1 1/4" NPT
10SQE10-290	1	230 V	7.7	-	11	-	3"	1 1/4" NPT
10SQE15-330	1 1/2	230 V	8.9	-	12	-	3"	1 1/4" NPT
15SQE05-70	1/2	230 V / 115 V	2.9	6.0	5	11	3"	1 1/4" NPT
15SQE05-110	1/2	230 V / 115 V	4.0	8.3	5	11	3"	1 1/4" NPT
15SQE07-150	3/4	230 V	5.1	-	8	-	3"	1 1/4" NPT
15SQE07-180	3/4	230 V	6.2	-	8	-	3"	1 1/4" NPT
15SQE10-220	1	230 V	7.4	-	11	-	3"	1 1/4" NPT
15SQE10-250	1	230 V	8.4	-	11	-	3"	1 1/4" NPT
15SQE15-290	1 1/2	230 V	9.7	-	12	-	3"	1 1/4" NPT
22SQE05-40	1/2	230 V / 115 V	1.9	3.9	5	-	3"	1 1/2" NPT
22SQE05-80	1/2	230 V / 115 V	3.4	7.2	5	-	3"	1 1/2" NPT
22SQE07-120	3/4	230 V	4.9	-	8	-	3"	1 1/2" NPT
22SQE10-160	1	230 V	6.4	-	8	-	3"	1 1/2" NPT
22SQE10-190	1	230 V	7.9	-	11	-	3"	1 1/2" NPT
22SQE15-220	1 1/2	230 V	9.5	-	12	-	3"	1 1/2" NPT
30SQE05-40	1/2	230 V / 115 V	2.8	5.7	5	-	3"	1 1/2" NPT
30SQE07-90	3/4	230 V	5.2	-	8	-	3"	1 1/2" NPT
30SQE10-130	1	230 V	7.6	-	11	-	3"	1 1/2" NPT

Dimensions and weights

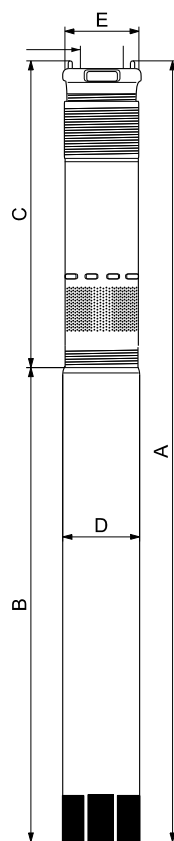
SQ, SQE

Model	Hp	Motor size	Discharge size	Dimensions in inches					Approx. ship. wt.
				A	B	C	D	E	
5SQ/SQE05-90	1/2	3"	1" NPT	30.4	19.8	10.6	2.6	2.9	12
5SQ/SQE05-140	1/2	3"	1" NPT	30.4	19.8	10.6	2.6	2.9	12
5SQ/SQE05-180	1/2	3"	1" NPT	31.5	19.8	11.6	2.6	2.9	12
5SQ/SQE07-230	3/4	3"	1" NPT	33.6	19.8	13.7	2.6	2.9	13
5SQ/SQE07-270	3/4	3"	1" NPT	33.6	19.8	13.7	2.6	2.9	13
5SQ/SQE07-320	3/4	3"	1" NPT	34.6	19.8	14.8	2.6	2.9	13
5SQ/SQE10-360	1	3"	1" NPT	38.2	21.3	16.9	2.6	2.9	16
5SQ/SQE10-410	1	3"	1" NPT	38.2	21.3	16.9	2.6	2.9	16
5SQ/SQE15-450	1 1/2	3"	1" NPT	39.3	21.3	18.0	2.6	2.9	16
10SQ/SQE05-110	1/2	3"	1 1/4" NPT	30.4	19.8	10.6	2.6	2.9	12
10SQ/SQE05-160	1/2	3"	1 1/4" NPT	30.4	19.8	10.6	2.6	2.9	12
10SQ/SQE07-200	3/4	3"	1 1/4" NPT	31.5	19.8	11.6	2.6	2.9	13
10SQ/SQE07-260	3/4	3"	1 1/4" NPT	33.6	19.8	13.7	2.6	2.9	13
10SQ/SQE10-290	1	3"	1 1/4" NPT	35.0	21.3	13.7	2.6	2.9	16
10SQ/SQE15-330	1 1/2	3"	1 1/4" NPT	36.14	21.3	14.8	2.6	2.9	16
15SQ/SQE05-70	1/2	3"	1 1/4" NPT	30.4	19.8	10.6	2.6	2.9	12
15SQ/SQE05-110	1/2	3"	1 1/4" NPT	30.4	19.8	10.6	2.6	2.9	12
15SQ/SQE07-150	3/4	3"	1 1/4" NPT	31.5	19.8	11.6	2.6	2.9	13
15SQ/SQE07-180	3/4	3"	1 1/4" NPT	33.6	19.8	13.7	2.6	2.9	13
15SQ/SQE10-220	1	3"	1 1/4" NPT	35.0	21.3	13.7	2.6	2.9	16
15SQ/SQE10-250	1	3"	1 1/4" NPT	36.1	21.3	14.8	2.6	2.9	16
15SQ/SQE10-290	1 1/2	3"	1 1/4" NPT	38.2	21.3	16.9	2.6	2.9	16
22SQ/SQE05-40	1/2	3"	1 1/2" NPT	30.4	19.8	10.6	2.6	2.9	12
22SQ/SQE05-80	1/2	3"	1 1/2" NPT	30.4	19.8	10.6	2.6	2.9	12
22SQ/SQE07-120	3/4	3"	1 1/2" NPT	31.5	19.8	11.6	2.6	2.9	13
22SQ/SQE10-160	1	3"	1 1/2" NPT	33.6	19.8	13.7	2.6	2.9	13
22SQ/SQE10-190	1	3"	1 1/2" NPT	38.2	21.3	16.9	2.6	2.9	16
22SQ/SQE15-220	1 1/2	3"	1 1/2" NPT	38.2	21.3	16.9	2.6	2.9	16
30SQ/SQE05-40	1/2	3"	1 1/2" NPT	30.4	19.8	10.6	2.6	2.9	12
30SQ/SQE07-90	3/4	3"	1 1/2" NPT	30.4	19.8	10.6	2.6	2.9	13
30SQ/SQE10-130	1	3"	1 1/2" NPT	35.0	21.3	13.7	2.6	2.9	13

9. SQ, SQE construction

Materials of construction

SQ, SQE	
Component	Splined shaft
Valve casing	Polyamide
Discharge chamber	304 stainless steel
Valve guide	Polyamide
Valve spring	316LN stainless steel
Valve cone	Polyamide
Valve seat	NBR rubber
O-ring	NBR rubber
Lock ring	310 stainless steel
Top bearing	NBR rubber
Top chamber	Polyamide
Guide vanes	Polyamide
Impeller	Polyamide w/ tungsten carbide bearings
Bottom chamber	Polyamide
Neck ring	TPU / PBT
Bearing	Aluminum oxide
Suction interconnector	Polyamide
Ring	304 stainless steel
Pump sleeve	304 stainless steel
Pressure equalization cone	Polyamide
Spacer	Polyamide
Sand trap	316 stainless steel
Shaft w/coupling	304 stainless steel
Cable guard	304 stainless steel



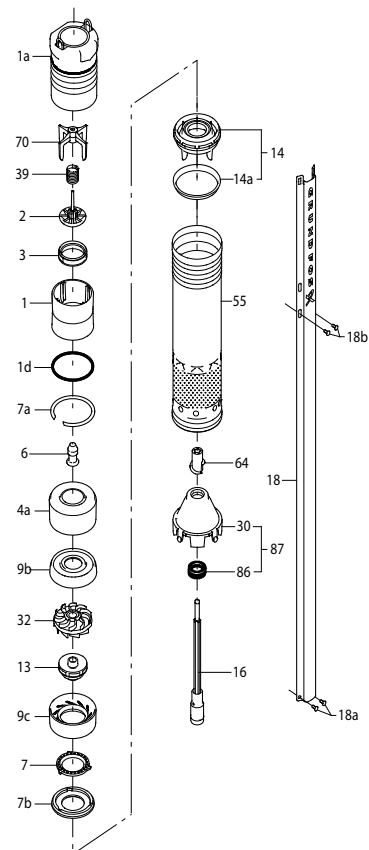
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Discharge sizes:

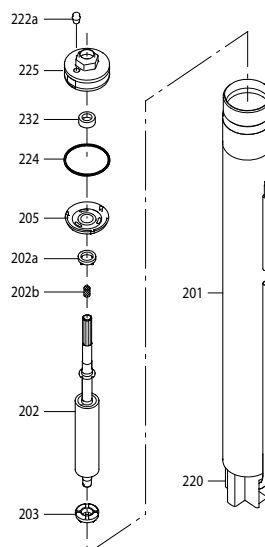
1" NPT	5 SQ/SQE
1 1/4" NPT	10-15 SQ/SQE
1 1/2" NPT	22-30 SQ/SQE

SQ, SQE material specification

Pump				
Pos.	Component	Material	DIN W-Nr. SQ/SQE	AISI
1	Valve casing	Polyamide	1.4301	304
1a	Discharge chamber	Stainless steel		
1d	O-ring	NBR rubber		
2	Valve cup	Polyamide		
3	Valve seat	NBR rubber		
4a	Empty chamber	Polyamide		
6	Top bearing	NBR rubber		
7	Neck ring	TPU / PBT		
7a	Lock ring	Stainless spring steel	1.4301	310
7b	Neck ring retainer	Polyamide		
9b	Chamber top	Polyamide		
9c	Chamber bottom	Polyamide		
13	Impeller with tungsten carbide bearing	Polyamide		
14	Suction inter-connector	Polyamide		
14a	Ring	Stainless steel	1.4301	304
16	Shaft with coupling	Stainless steel	1.4301	304
18	Cable guard	Stainless steel	1.4301	304
18a	Screws for cable guard	Stainless steel	1.4301	316
18b				
30	Cone for pressure equalization	Polyamide		
32	Guide vanes	Polyamide		
39	Spring	Stainless spring steel	1.4406	316LN
55	Pump sleeve	Stainless steel	1.4301	304
64	Priming screw	Polyamide		
70	Valve guide	Polyamide		
86	Lip seal ring	NBR rubber		
87	Cone for pressure equalization complete	Polyamide / NBR rubber		



Motor				
Pos.	Component	Material	DIN W-Nr. SQ-SQE	AISI
201	Stator	Stainless steel	1.4301	304
202	Rotor	Stainless steel	1.4301	304
202a	Stop ring	PP		
202b	Filter	Polyester		
203	Thrust bearing	Carbon		
205	Radial bearing	Ceramic tungsten carbide		
220	Motor cable with plug	EPR		
222a	Filling plug	MS 3: NBR MSE 3: FKM		
224	O-ring	FKM		
225	Top cover	PPS		
232	Shaft seal	MS 3: NBR MSE 3: FKM		
	Motor liquid	SML-2		



TM01 2745 2010

Control units for SQ, SQE

CU 301

The CU 301 is a control and communication unit developed especially for the SQE submersible pumps in constant-pressure applications.

The CU 301 control unit provides:

- Full control of the SQE pumps
- two-way communication with the SQE pumps
- possibility of adjusting the pressure
- alarm indication (LED) when service is needed
- possibility of starting, stopping and resetting the pump simply by means of a push-button
- configuration with R100 remote control.

The CU 301 communicates with the pump via mains borne signalling (Power Line Communication), meaning that no extra cables are required between the CU 301 and the pump.

The CU 301 features the following indications (see drawing in right column):

1. Pump running indicator
2. System pressure setting
3. System ON/OFF
4. Button lock indicator
5. Dry-running indicator
6. Service needed in case of:
 - no contact to pump
 - overvoltage
 - undervoltage
 - speed reduction
 - overtemperature
 - overload
 - sensor defective.

The CU 301 incorporates:

- External signal input for pressure sensor
- connection to an operating relay for indication of pump operation.

Optional R100 remote control

Wireless infrared remote control of the CU 301 is possible by means of the R100.

Using the R100, it is possible to monitor and change the operating parameters, see the R100 menu structure on page 30.

The R100 is a valuable tool in case fault finding is required.

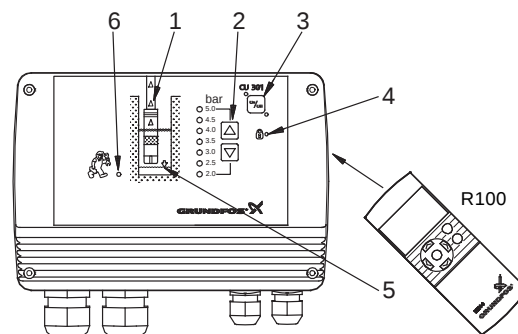


Fig. 15 CU 301 control unit

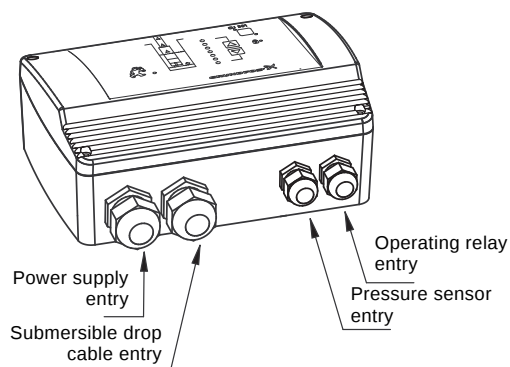


Fig. 16 CU 301 entry ports

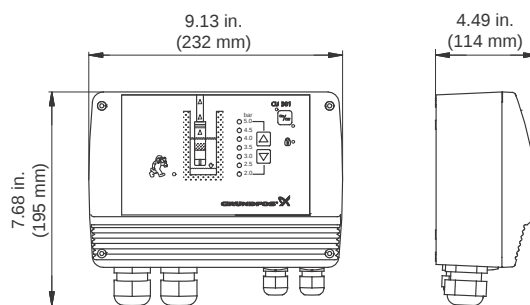


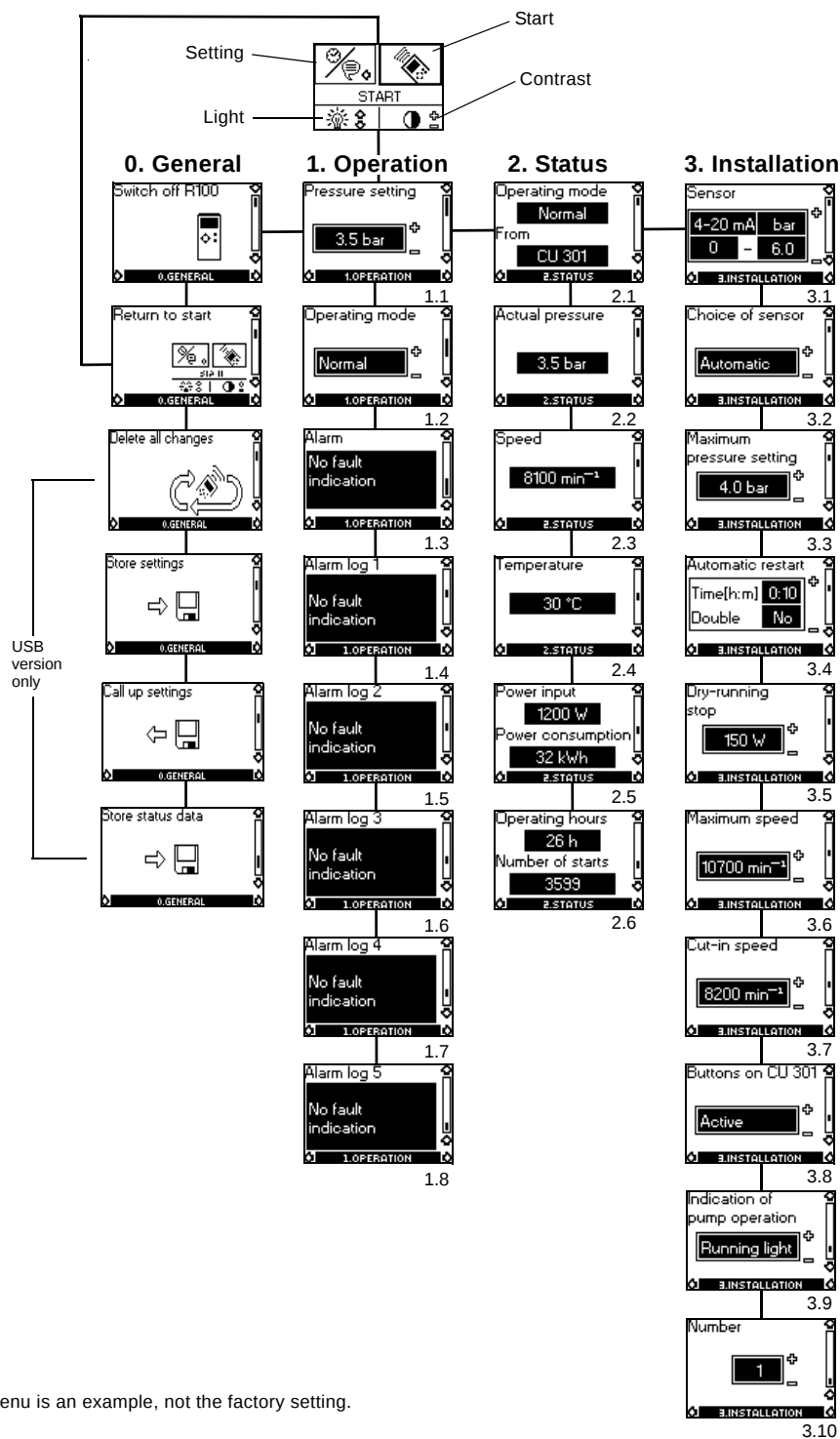
Fig. 17 CU 301 dimensions

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TM02 3427 0406

TM03 3003 2010

R100 menu structure for CU 301 control unit



R100 menus for CU 301

0. General

1. Operation

- 1.1 Setpoint setting
- 1.2 Selection of operating mode
- 1.3 Alarm indication.

2. Status

The indication of:

- 2.1 Actual operating mode
- 2.2 Actual pressure
- 2.3 Actual motor speed
- 2.4 Actual motor temperature
- 2.5 Actual power input and accumulated motor power consumption
- 2.6 Accumulated number of operating hours and accumulated number of starts.

3. Installation

- 3.1 Sensor parameters
- 3.2 Choice of sensor
- 3.3 Setting of maximum pressure setpoint
- 3.4 Setting of automatic restart time
- 3.5 Setting of the dry-running stop limit
- 3.6 Setting of the maximum motor speed
- 3.7 Setting of the cut-in motor speed
- 3.8 Activating or deactivating the on/off-button and the buttons for system pressure setting on the CU 301
- 3.9 Indication of pump operation
- 3.10 Allocation of identification number.

CU 300

The CU 300 is a control and communication unit developed especially for the SQE submersible pumps for control applications other than constant pressure.

The CU 300 control unit provides:

- Flexible pump control based on various sensor inputs
- two-way communication with the SQE pumps
- alarm indication of pump operation by LED's on the front
- possibility of starting, stopping and resetting the pump simply by means of a push-button
- communication with R100 remote control.

The CU 300 communicates with the pump via mains borne signalling (Power Line Communication), meaning that no extra cables are required between the CU 300 and the pump.

The following alarms can be indicated by the CU 300:

- No contact
- overvoltage
- undervoltage
- dry running
- speed reduction
- overtemperature
- overload
- sensor alarm.

The CU 300 incorporates:

- External signal input for two analog sensors and one digital sensor
- relay output for external alarm indication
- control according to the signals received, e.g. of flow, pressure, water level and conductivity.

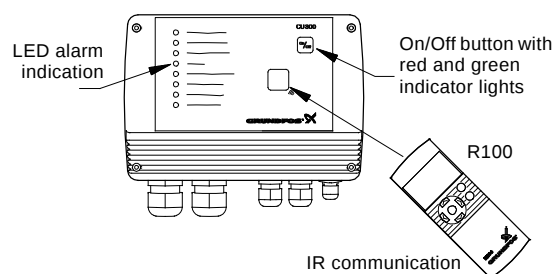


Fig. 18 CU 300 control unit with R100

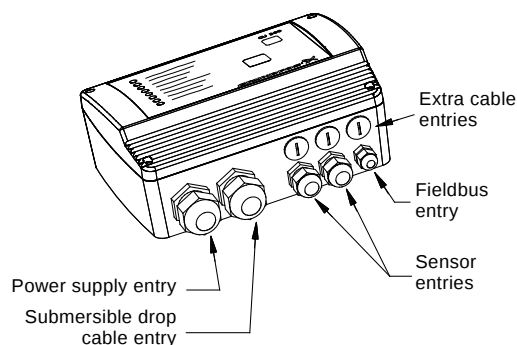


Fig. 19 CU 300 control unit, external entry ports

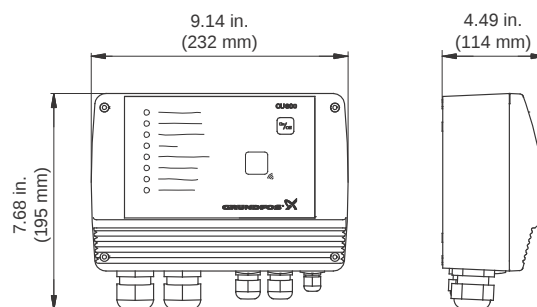


Fig. 20 CU 300 dimensions

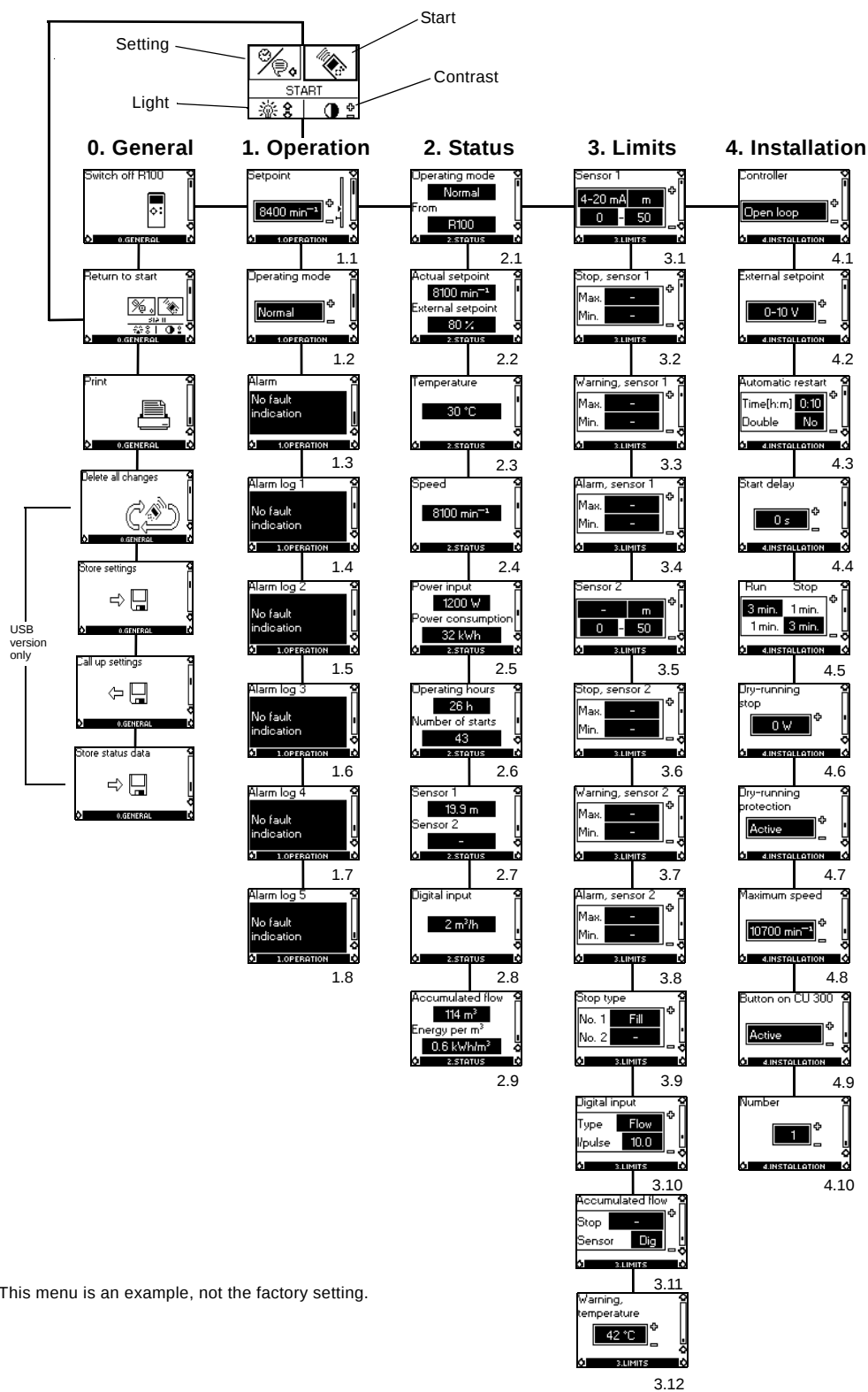
R100 remote control

Wireless infrared remote control of the CU 300 is possible by means of the R100.

Using the R100, it is possible to monitor and change the operating parameters, see the R100 menu structure on page 33.

The R100 is a valuable tool in case fault finding is required.

R100 menu structure for the CU 300



R100 menus for CU 300

0. General

1. Operation

- 1.1 Setpoint setting
- 1.2 Selection of operating mode
- 1.3 Alarm indication.

2. Status

The indication of:

- 2.1 Actual operating mode
- 2.2 Actual and external setpoint
- 2.3 Actual motor temperature
- 2.4 Actual motor speed
- 2.5 Actual power input and accumulated motor power consumption
- 2.6 Accumulated number of operating hours and accumulated number of starts
- 2.7 Actual values of sensors 1 and 2, respectively
- 2.8 Actual values of the digital input
- 2.9 Accumulated flow, and the power used to pump.

R100 offers the possibility of making a number of settings.

3. Limits

The setting of:

- 3.1 Sensor 1 parameters
- 3.2 Min. and max. stop limits of sensor 1
- 3.3 Min. and max. warning limits of sensor 1
- 3.4 Min. and max. alarm limits of sensor 1
- 3.5 Sensor 2 parameters
- 3.6 Min. and max. stop limits of sensor 2
- 3.7 Min. and max. warning limits of sensor 2
- 3.8 Min. and max. alarm limits of sensor 2
- 3.9 Filling or emptying
- 3.10 Setting of the function of the digital sensor connected to the digital input
- 3.11 The setting of the water quantity stop limit and the setting of the sensor to detect water quantity
- 3.12 The setting of the temperature warning limits of the motor electronics.

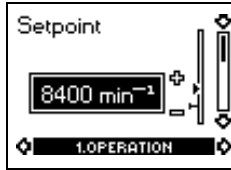
4. Installation

- 4.1 Selection of controller - open loop, closed loop
- 4.2 Setting of external setpoint
- 4.3 Setting of automatic restart time
- 4.4 Allocation of individual start delays
- 4.5 Setting of the stop and run times for the dewatering function
- 4.6 Setting of the dry-running stop limit
- 4.7 Activating or deactivating the dry-running protection
- 4.8 Setting of the maximum motor speed
- 4.9 Activating or deactivating the on/off-button on the CU 300
- 4.10 Allocation of ID number where more than one CU 300 is installed.

Examples of R100 displays

Menu OPERATION

Setpoint setting



1.1

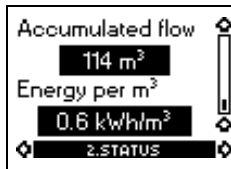
From factory, the pump is set to maximum speed, 10,700 rpm. R100 makes it possible to reduce the pump speed by changing the setpoint. The speed can be set to 3,000 - 10,700 rpm, at 100 rpm intervals. The unit of the setpoint is automatically changed according to the unit of the sensor connected to sensor input 1.

Example: Sensor input 1 is connected to a pressure sensor using the unit feet (ft) and the range 0-60. Consequently, the setpoint of display 1.1 can be set to between 0-60 ft.

Menu STATUS

The displays appearing in this menu are status displays only. It is not possible to change settings in this menu.

Accumulated flow



2.9

In display 2.9, the water quantity (m³)* pumped is shown. The value shown is the accumulated flow registered by the sensor selected in display 3.11.

The power used to pump 1 m³ is shown in the display as energy per m³ (kWh/m³).

It is possible to read the status of the accumulated flow and energy per m³ at any time.

* Water quantity in units of gpm can be chosen.

Accumulated number of operating hours and number of starts



2.6

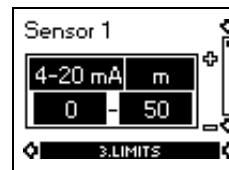
The number of operating hours and the number of starts are values accumulated from the time of installation and they cannot be reset.

Both values are stored in the motor electronics, and they are kept even if the CU 300 is replaced.

The number of operating hours is registered every two hours of continuous operation.

Menu LIMITS

Sensor 1



3.1

The setting of sensor 1.

Depending on the type of sensor, the following settings can be made:

- Sensor outputs:
 - (not active), 0-10 V, 2-10 V, 0-20 mA, 4-20 mA
- setting range unit: m³/h, m, %, gpm, ft
- sensor minimum value: 0-249 (0, 1, 2, 3.....249)
- sensor maximum value: 1-250 (1, 2, 3, 4.....250).

10. CU331SP variable frequency drive

Features

User interface

The user interface offers these possibilities:

- Local operation via a control panel with graphic display where the menu structure is based on the well-known system from Grundfos E-pumps.
- Monitoring of operating status via indicator lights and signal relays.
- Display of alarm or warning and logging of the last five alarms and warnings.

Functions

Control mode: Constant pressure

The CU331SP has only one control mode, Constant pressure. The pressure is kept constant, independently of the flow rate.

Start-up guide

The CU331SP has a start-up guide, which is launched at the first power up. Parameters are set manually on the basis of the installation. The start-up guide can be repeated, if necessary.

Thanks to the start-up guide, the installer can quickly set a few parameters and put the CU331SP into operation.

Direction of rotation test

During start-up, the CU331SP automatically tests and sets the correct direction of rotation without changing the cable connections. The direction of rotation test can be performed manually if it fails for any reason.

Dry-running protection

To protect the pump, the CU331SP will automatically set up dry-run protection so that water shortage can be detected. The dry-run alarm will automatically reset 30 minutes after the alarm is declared.

Low-flow stop function

The low-flow stop function is used for changing between on/off operation at low flow rate and continuous operation at high flow rate.

The low-flow stop function protects the pump and saves energy.

Applications

For 4" or larger wells. Main applications:

- Domestic and light commercial water supply
- irrigation
- livestock watering
- water transfer.

System components

- Compact, efficient, and reliable variable frequency drive
- rugged stainless steel pump end and proven, reliable, 3-phase motor
- pressure sensor
- diaphragm tank (sold separately).



Fig. 21 CU331SP variable frequency drive and sensor

TM05 5801 4012

Identification

Nameplate

The CU331SP can be identified by means of the nameplate. An example is shown below.



TM05 6001 4012

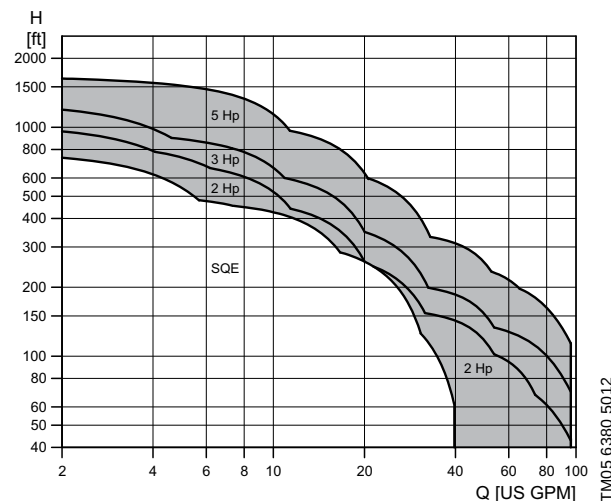
Fig. 22 Example of nameplate

Key	
Text	Description
T/C:	CU-331 (product name)
Prod. no:	Product number (98370280)
S/N:	Serial number (000201H462) The last four digits indicate the production date. In this case, 46 is the week, and 2 is the year 2012.
3.0 hp	Typical shaft power on the motor
IN:	Supply voltage, frequency and maximum input current.
OUT:	Motor voltage, frequency and maximum output current. The maximum output frequency usually depends on the pump type.
Type 12 / IP55	Enclosure class
Tamb.	Maximum ambient temperature

CU331SP product range

Enclosure type	NEMA	Hp	Input Ph	Input volts
Indoor	Type 12	2	1	200-240
		3	1	200-240
		5	1	200-240
Outdoor	Type 4X	2	1	200-240
		3	1	200-240
		5	1	200-240

CU331SP performance range



TM05 6380 5012

CU331SP sizing

Step 1

Calculate maximum head requirements at rated flow conditions:

$H_{\max} = \text{dynamic head} + \text{system psi (in feet)} + \text{friction loss} + \text{above grade elevation.}$

Step 2

Select pump from performance curves as follows:

Select a model in which the calculated value of $H_{\max}$ is within the maximum performance curve of the pump. Refer to section [CU331SP curve charts](#) on page 51.

Step 3

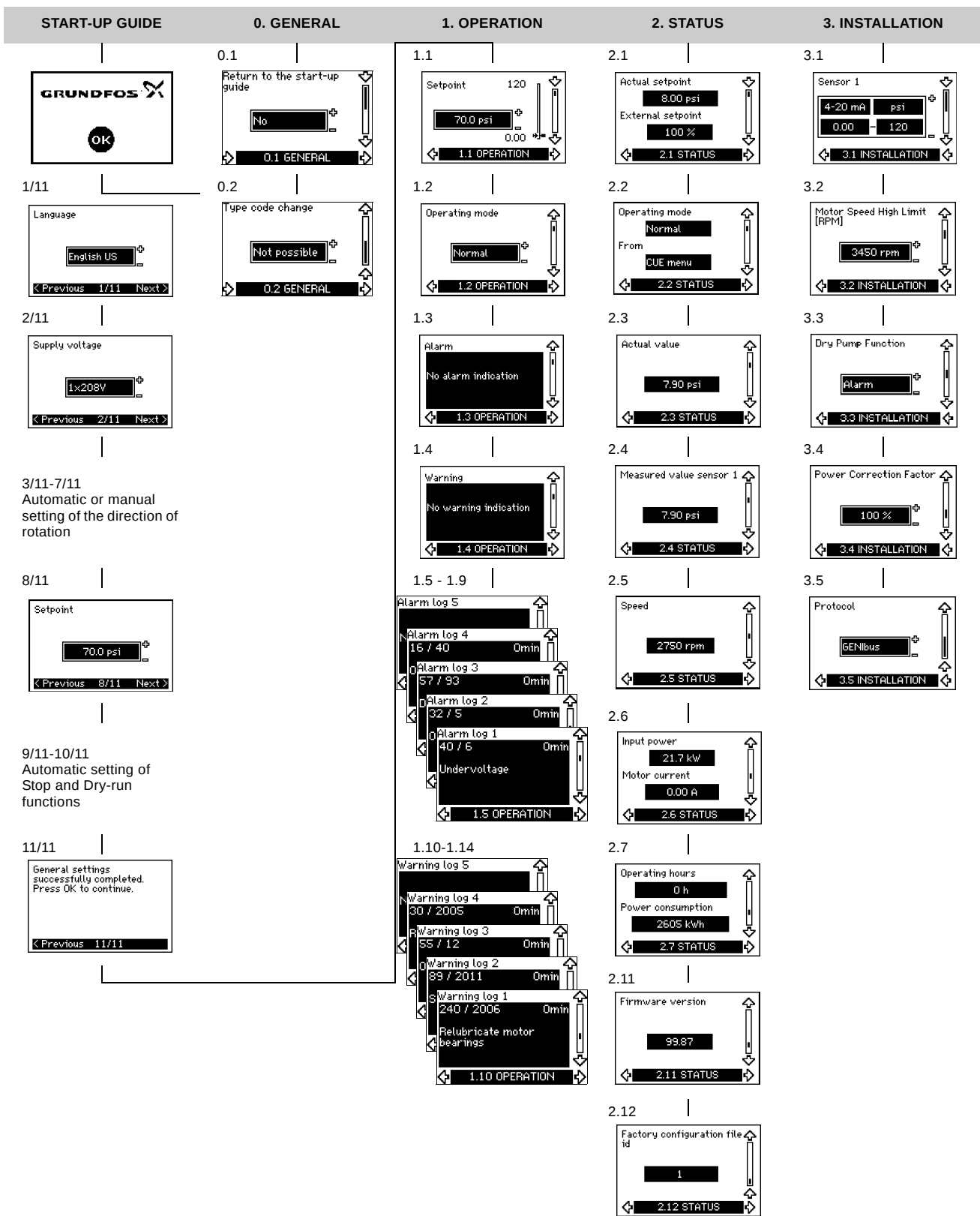
Select the CU331SP that corresponds to the correct motor Hp and enclosure type.

CU331SP operation

Menu structure

The CU331SP has a start-up guide, which is launched at the first power up. After the start-up guide, the CU331SP has a menu structure divided into four main menus:

0. **GENERAL** gives access to the start-up guide for the general setting of the CU331SP.
1. **OPERATION** enables the setting of setpoint and resetting of alarms. It is also possible to see the latest five warnings and alarms.
2. **STATUS** shows the status of the CU331SP and the pump. It is not possible to change or set values.
3. **INSTALLATION** gives access to available parameters.



Operating modes

These operating modes can be selected with the CU331SP:

- Normal
- Stop
- Min.
- Max.

The operating modes can be set without changing the setpoint setting.

Normal

The pump operates in constant pressure mode.

Stop

The pump has been stopped by user.

Min. curve

The pump is running at a set minimum speed value. See fig. 24.

For instance, this operating mode can be used during periods with a very small flow requirement.

Max. curve

The pump is running at a set maximum speed value.

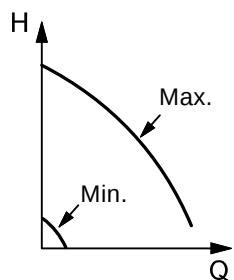


Fig. 24 Min. and max. curves

Control mode

The CU331SP has been developed specifically to operate submersible pumps in Constant Pressure mode. This Closed-Loop control mode uses an analog pressure transducer to provide pressure feedback to the drive.

Constant pressure with stop function

The outlet pressure is kept constant at high flow rate ($Q > Q_{min}$). On/off operation at low flow rate. See fig. 25.

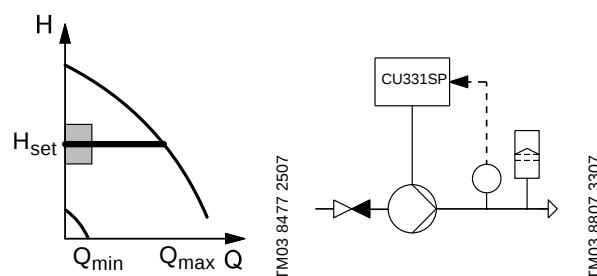


Fig. 25 Constant pressure with stop function

The pump is controlled according to a constant pressure measured after the pump. This means that the pump offers a constant pressure in the Q_{min} to Q_{max} range, represented by the horizontal line in the QH diagram.

Setting the setpoint by means of the OPERATION menu

The setpoint can be set or changed during operation using the setpoint display in the "OPERATION" menu shown below. It is not necessary to run the start guide to change the setpoint.

Low flow and stop functions

The pump will check the flow regularly by reducing the speed for a short time. If there is no or only a small change in pressure, this means that there is low flow.

The speed will be increased until the stop pressure (actual setpoint + $0.5 \times \Delta H$) is reached and the pump will stop after a few moments. The pump will restart at the latest when the pressure has fallen to the start pressure (actual setpoint - $0.5 \times \Delta H$).

Operating conditions for the stop function

It is only possible to use the stop function if the system incorporates a pressure sensor, a non-return valve and a diaphragm tank.

The non-return valve must always be installed before the pressure sensor.

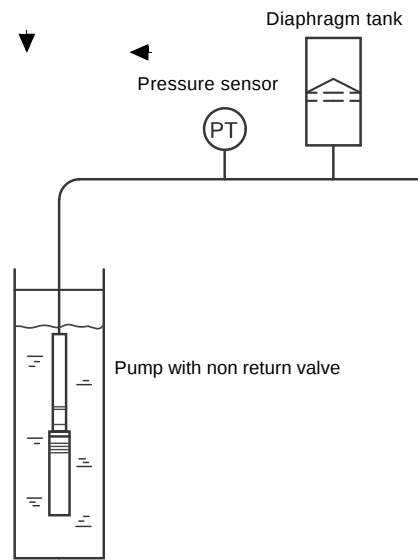


Fig. 26 Position of the pressure sensor and diaphragm tank

Diaphragm tank

The stop function requires a diaphragm tank of a certain minimum size. The tank must be installed as close as possible after the pump and the precharge pressure must be 0.7 x actual setpoint.

Recommended diaphragm tank size:

Rated flow of pump [gpm (m³/h)]	Typical diaphragm tank size [gal (l)]
0-26 (0-6)	2 (7.5)
27-105 (7-24)	4 (15.1)

If a diaphragm tank of the above size is installed in the system, the factory setting of ΔH is the correct setting.

If the tank installed is too small, the pump will start and stop too often.

Setting the direction of rotation

The start-up guide is started the first time the CU331SP is connected to supply voltage. Then while going through the start-up guide, the CU331SP tests and sets the correct direction of rotation without changing the cable connections to the motor.

The correct direction of rotation can be set in these ways:

- automatic setting.
- manual setting when the direction of rotation is not visible.

Automatic setting

The CU331SP automatically tests and sets the correct direction of rotation without changing the cable connections.

Automatic setting requires a sensor.

This test is not suitable for all pump types and will in certain cases not be able to determine for certainty the correct direction of rotation. In these cases, the CU331SP changes over to manual setting where the direction of rotation is determined on the basis of the installer's observations.

Manual setting when the direction of rotation is not visible

The correct direction of rotation is set manually without changing the cable connections. This requires that it is possible to observe the head or flow rate.

Status functions

The CU331SP shows the following data:

- power consumption
- operating hours
- measured value
- speed
- input power
- motor current.

The status information can be shown in the display.

Power consumption

The value of the power consumption is an accumulated value calculated from the pump's startup date and cannot be reset. No additional sensor is required.

Operating hours

The value of operating hours is an accumulated value calculated from the pump's startup date and cannot be reset. No additional sensor is required.

Measured value

Sensor display will show the actual pressure as received from the pressure transducer.

Speed

Display will show the motor speed in RPM's (calculated).

Input power

Display will show the power consumption in kW.

Motor current

Display will show the actual motor current being used.

Logging functions

Alarm and warning log

The latest five alarms and five warnings are logged with a timestamp corresponding to the power-on time after the fault has occurred. The alarm and warning log can be shown directly on the display.

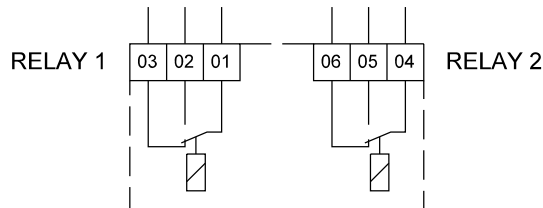
See section [Warning and alarm list](#) on page 48.

Signal relays

The table shows the function of the signal relays.

Type	Function
Relay 1	Pump running
Relay 2	Alarm

See also fig. 27.



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Fig. 27 Terminals for signal relays (normal state, not activated)

Terminal		Function
C1	C2	Common
NO 1	NO 2	Normally open contact
NC1	NC2	Normally closed contact

CU331SP installation

Mechanical installation

The individual CU331SP cabinet sizes are characterized by their enclosures. The table in section [CU331SP technical data](#) on page 49 shows the relationship of enclosure class and enclosure type.

Reception and storage

Check on receipt that the packaging is intact, and the unit is complete. In case of damage during transport, contact the transport company to file a claim.

Note that the CU331SP is delivered in a packaging which is not suitable for outdoor storage.

Transportation and unpacking

The CU331SP must only be unpacked at the installation site to prevent damage during the transport to the site.

The packaging contains accessory bag(s), documentation and the unit itself. See fig. 28.



Fig. 28 CU331SP packaging

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Space requirements and air circulation

CU331SP units can be mounted side by side, but as a sufficient air circulation is required for cooling these requirements must be met:

- Sufficient free space above and below the CU331SP
- Ambient temperature up to 122°F (50 °C)
- Hang the CU331SP directly on the wall, or fit it with a back plate. See fig. 29.

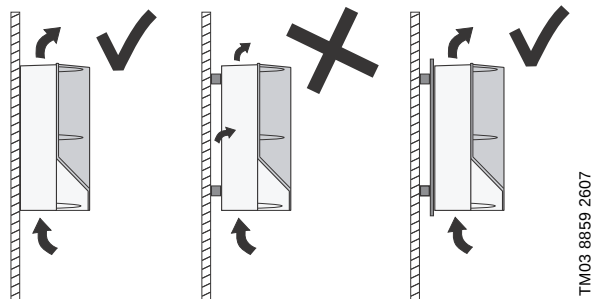


Fig. 29 CU331SP hung directly on the wall or fitted with a back plate

Required free space above and below the CU331SP:

Enclosure	Space [in (mm)]
B1	7.9 (200)

For information about enclosure, see section [Enclosure](#) on page 49.

Mounting

The CU331SP must be mounted securely on a firm surface. Ensure that screws are sized appropriately for the weight of the CU331SP (approximately 60 lbs) and anchored securely to the mounting surface.

1. Mark and drill holes. See fig. 30; also see section [Main dimensions and weight](#) on page 49.
2. Fit the screws, but leave loose. Mount the CU331SP, and tighten the four screws.

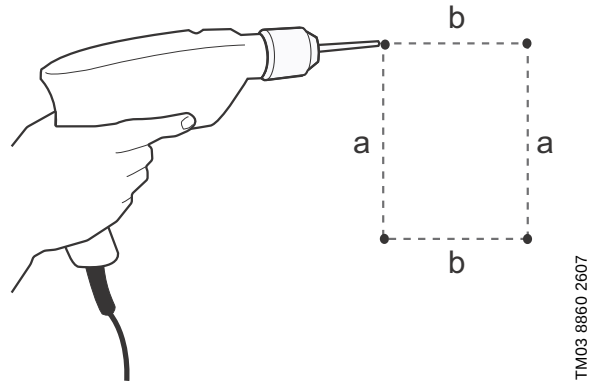


Fig. 30 Drilling holes for mounting

CU331SP electrical connection

Ensure the correct grounding and protection procedures are used for the installation. Before the electrical installation, ensure that the power supply and other voltage inputs are switched off.

Electrical protection

Protection against electric shock, indirect contact

The leakage current to ground exceeds 3.5 mA, and a reinforced ground connection is required.

Protective conductors must always have a yellow/green (PE) or yellow/green/blue (PEN) color marking.

Instructions according to EN IEC 61800-5-1:

- The CU331SP must be stationary, installed permanently and connected permanently to the mains supply.
- The ground connection must be carried out with duplicate protective conductors or with a single reinforced protective conductor with a cross-section of minimum AWG 7 (10 mm²).

Protection against short-circuit, fuses

The CU331SP and the supply system must be protected against short-circuit.

Grundfos requires that the back-up fuses are used for protection against short-circuit.

The CU331SP offers complete short-circuit protection in case of a short-circuit on the motor output.

Additional protection

The leakage current to ground exceeds 3.5 mA.

If the CU331SP is connected to an electrical installation where an earth leakage circuit breaker (ELCB) is used as additional protection, the circuit breaker must be of a type marked with the following symbols:

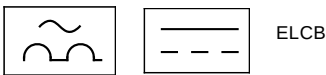


Fig. 31 Circuit breaker type B

The total leakage current of all the electrical equipment in the installation must be taken into account.

During start and in asymmetrical supply systems, the leakage current can be higher than normal and may cause the ELCB to trip.

Motor protection

The motor requires no external motor protection. The CU331SP protects the motor against thermal overloading and blocking.

Protection against overcurrent

The CU331SP has an internal overcurrent protection for overload protection on the motor output.

Protection against mains voltage transients

The CU331SP is protected against mains voltage transients according to EN 61800-3, second environment.

Mains and motor connection

The supply voltage and frequency are marked on the CU331SP nameplate. Make sure that the CU331SP is suitable for the power supply of the installation site.

The maximum output voltage of the CU331SP is equal to the input.

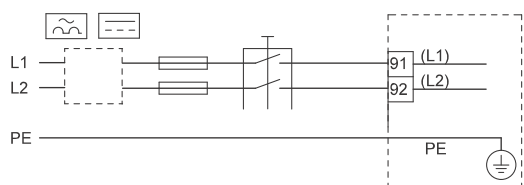
Example: if the supply voltage is rated at 208V choose a 208V motor for operation.

Mains switch

A mains switch can be installed before the CU331SP according to local regulations. See fig. 32.

Wiring diagram

The wires in the terminal box must be as short as possible. Excepted from this is the ground wire, which must be so long that it is the last one to be disconnected in case the cable is inadvertently pulled out of the cable entry.



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Fig. 32 CU331SP wiring diagram

Terminal	Function
91 (L1)	Single-phase supply
92 (L2)	
95/99 (PE)	Ground connection

For single-phase connection, use L1 and L2.

Mains connection

Check that mains voltage and frequency correspond to the values on the nameplate of the CU331SP and the motor.

1. Connect the ground wire to terminal 95 (PE). See fig. 33.
2. Connect the power leads to the terminals 91 (L1), 92 (L2).
3. Fix the mains cable with a cable clamp.

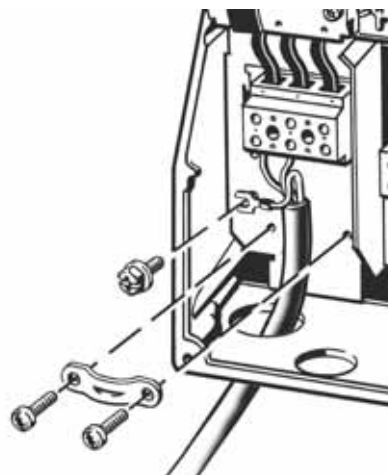


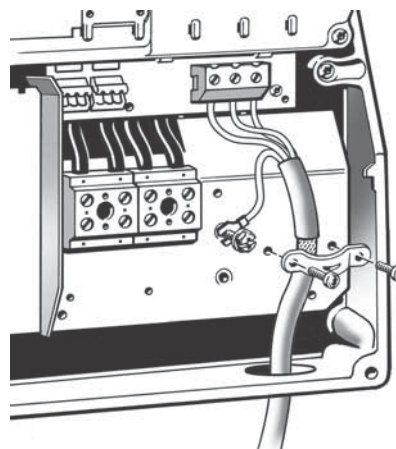
Fig. 33 Mains connection

CU331SP drive is usable with 3-phase input power by connecting leads to 91 (L1), 92 (L2), and 93 (L3).

Motor connection

The motor cable must be screened for the CU331SP to meet EMC requirements.

1. Connect the ground wire to terminal 99 (PE). See fig. 34.
2. Connect the motor leads to the terminals 96 (U), 97 (V), 98 (W).
3. Fix the screened cable with a cable clamp.



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Fig. 34 Motor connection

The cable screen must be exposed and in physical contact with the mounting plate and clamp.

Connecting the signal terminals

As a precaution, signal cables must be separated from other groups by reinforced insulation in their entire lengths.

If no external on/off switch is connected, short-circuit terminals 18 and 20 using a short wire.

Connect the signal cables according to the guidelines for good practice to ensure EMC-correct installation. See section *EMC-correct installation* on page 46.

- Use screened signal cables with a conductor cross-section of min. AWG 20 (0.5 mm²) and max. AWG 16 (1.5 mm²).
- Use a 3-conductor screened bus cable in new systems.

Minimum connection, signal terminal

Operation is only possible when the terminals 18 and 20 are connected, for instance by means of an external on/off switch or a short wire.

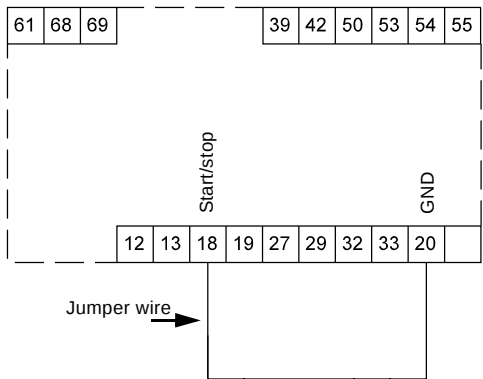


Fig. 35 Required minimum connection, signal terminal

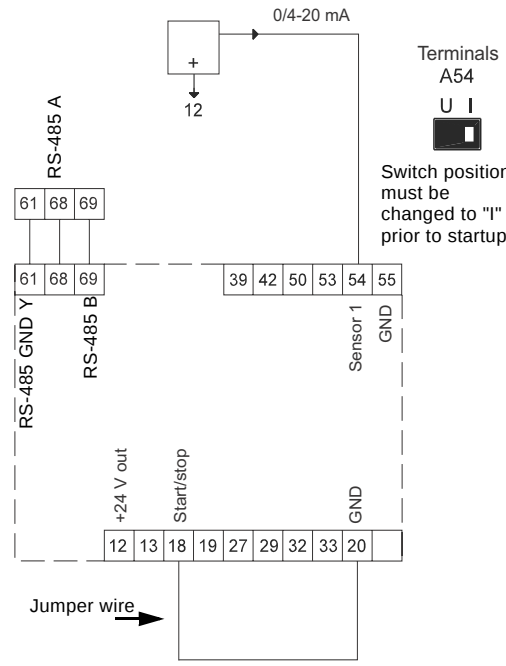


Fig. 36 Wiring diagram for CU331SP

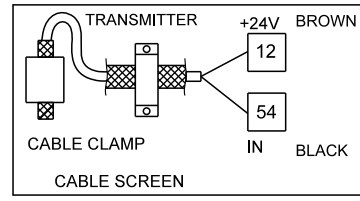


Fig. 37 Sensor wiring diagram

Setting the analog input 54

The contact A54 is positioned behind the control panel and is used for setting the signal type of the analog input.

The factory setting of the inputs is voltage signal "U". This setting must be changed to "I" prior to starting the CU331SP. Be sure the power supply is switched off.

Remove the control panel to set the contact. See fig. 38.

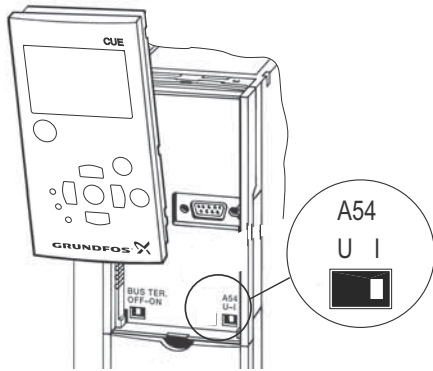


Fig. 38 Setting contact A54 to current signal "I"

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Terminal key

Terminal	Type	Function
12	+24 V out	Supply to sensor
18	DI 1	Digital input, start/stop
20	GND	Common frame for digital inputs
55	GND	Common frame for analog inputs
54	AI 2	Sensor input, sensor 1, 0/4-20 mA
61	RS-485 GND Y	GENIbus, frame
68	RS-485 A	GENIbus, signal A (+)
69	RS-485 B	GENIbus, signal B (-)

The RS-485 screen must be connected to frame.

Access to signal terminals

All signal terminals are behind the terminal cover of the CU331SP front. Remove the terminal cover as shown in fig. 39.

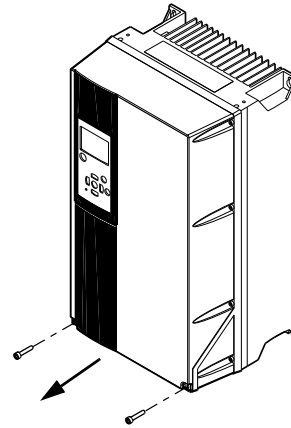


Fig. 39 Access to signal terminals

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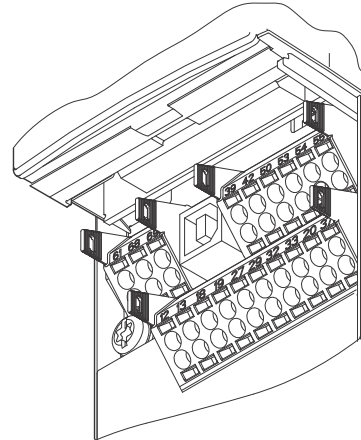


Fig. 40 Signal terminals

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Fitting the conductor

1. Remove the insulation at a length of 0.35 to 0.40 inches (9 to 10 mm).
2. Insert a screwdriver with a tip of maximum 0.015 x 0.1 in (0.4 x 2.5 mm) into the square hole.
3. Insert the conductor into the corresponding round hole. Remove the screwdriver. The conductor is now fixed in the terminal.

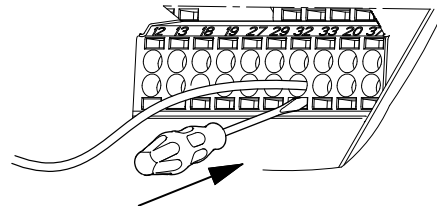


Fig. 41 Fitting the conductor into the signal terminal

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Connecting the signal relays

As a precaution, signal cables must be separated from other groups by reinforced insulation in their entire lengths.

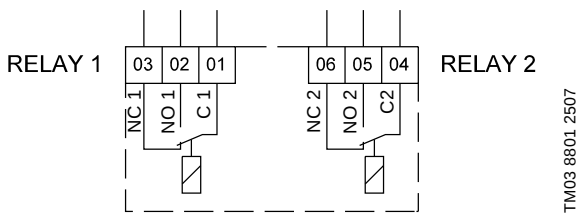


Fig. 42 Terminals for signal relays (normal state, not activated)

Terminal		Function
C 1	C 2	Common
NO 1	NO 2	Normally open contact
NC 1	NC 2	Normally closed contact

Signal relay

The signal relays on the CU331SP are predefined as follows:

- Relay 1: Pump running
- Relay 2: Alarm

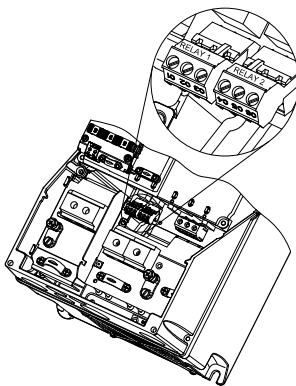


Fig. 43 Terminals for relay connection

EMC-correct installation

This section gives guidelines for good practice when installing the CU331SP. Follow these guidelines to meet EN 61800-3, first environment.

- Use only motor and signal cables with a braided metal screen in applications without output filter.
- There are no special requirements to supply cables, apart from local requirements.
- Leave the screen as close to the connecting terminals as possible. See fig. 44.
- Avoid terminating the screen by twisting the ends. See fig. 45. Use cable clamps or EMC screwed cable entries instead.
- Connect the screen to frame at both ends for both motor and signal cables. If the controller has no cable clamps, connect only the screen to the CU331SP.
- Avoid unscreened motor and signal cables in electrical cabinets with variable frequency drives.
- Make the motor cable as short as possible in applications without output filter to limit the noise level and minimize leakage currents.
- Screws for frame connections must always be tightened whether a cable is connected or not.
- Keep main cables, motor cables and signal cables separated in the installation, if possible.

Other installation methods may give similar EMC results if the above guidelines for good practice are followed.

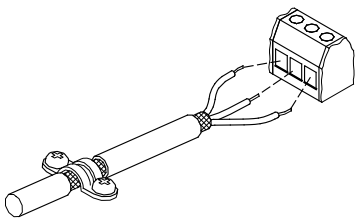


Fig. 44 Example of stripped cable with screen

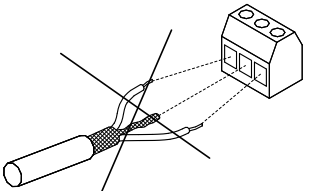


Fig. 45 Do not twist the screen ends

Line disturbance and transient protection

To protect itself from AC line voltage disturbances, the CU331SP monitors the input power supply and interrupts drive operation in the event of phase loss or imbalance. Transients on the AC line are suppressed by MOVs as well as zener diodes for extreme transients. The CU331SP meets VDE 0160 (European standard - 2.3 x line voltage for 1.3 msec) for transient protection.

RFI filters

To meet the EMC requirements, the CU331SP comes with the following types of built-in radio frequency interference filter (RFI).

Voltage	Typical shaft power P2	RFI filter type
1 x 200-240 V*	1.5 - 10 hp	C1

* Single-phase input - three-phase output.

Description of RFI filter types

C1: For use in domestic areas.

RFI filter types are according to EN61800-3

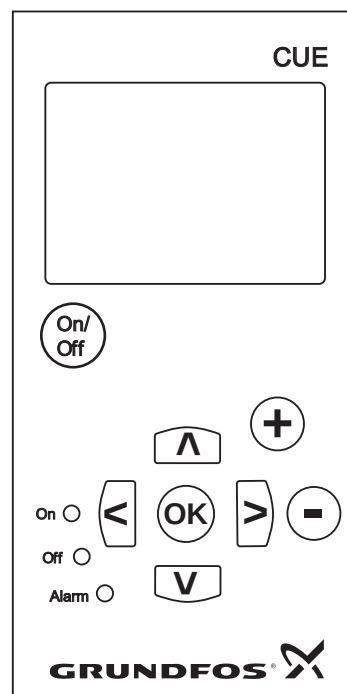
Control panel

The on/off button on the control panel does not disconnect the CU331SP from the power supply and must therefore not be used as a safety switch.



The On/Off button has the highest priority. In "Off" condition, pump operation is not possible.

The control panel is used for local setting of the CU331SP. The functions available are preset in the CU331SP.



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Fig. 46 Control panel of the CU331SP

Editing buttons

Button	Function
	Makes the pump ready for operation/starts and stops the pump.
	Saves changed values, resets alarms and expands the value field.
	Changes values in the value field.

Navigating buttons

Button	Function
	Navigates from one menu to another. When the menu is changed, the display shown will always be the top display of the new menu.
	Navigates up and down in the individual menu.

Adjusting the display contrast

Press OK and + for darker display.

Press OK and - for brighter display.

Button lock

To lock the buttons on the panel press and hold the up and down arrows simultaneously.

Indicator lights

The operating condition of the pump is indicated by the indicator lights on the front of the control panel. See fig. 46.

The table shows the function of the indicator lights.

Indicator light	Function
On (green)	The pump is running or has been stopped by a stop function. If flashing, the pump has been stopped by the user (CU331SP menu), external start/stop or bus.
Off (orange)	The pump has been stopped with the on/off button.
Alarm (red)	Indicates an alarm or a warning.

Displays, general terms

Figures 47 and 48 show the general terms of the display.

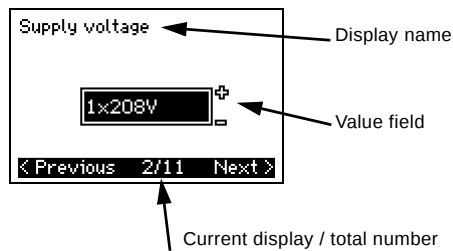


Fig. 47 Example of display in the start-up guide

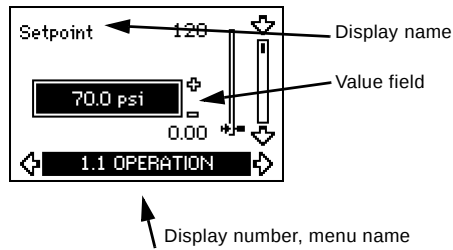


Fig. 48 Example of display in the user menu

Warning and alarm list

Code and display text		Status			Operating mode	Resetting
		Warning	Alarm	Locked alarm		
1	Too high leakage current			•	Stop	Man.
2	Mains phase failure		•		Stop	Aut.
3	External fault		•		Stop	Man.
16	Other fault		•		Stop	Aut.
32	Overvoltage	•			-	Aut.
40	Undervoltage	•			Stop	Aut.
48	Overload		•		Stop	Man.
49	Overload		•		Stop	Aut.
55	Overload	•			-	Aut.
57	Dry running		•		Stop	Aut.
64	Too high CU331SP temperature		•		Stop	Aut.
89	Sensor 1 outside range		•		1)	Aut.
96	Setpoint signal outside range		•		1)	Aut.
155	Inrush fault		•		Stop	Aut.
241	Motor phase failure	•			-	Aut.
			•		Stop	Aut.

1) In case of an alarm, the CU331SP will change the operating mode depending on the pump type. Warning is reset in display 3.20.

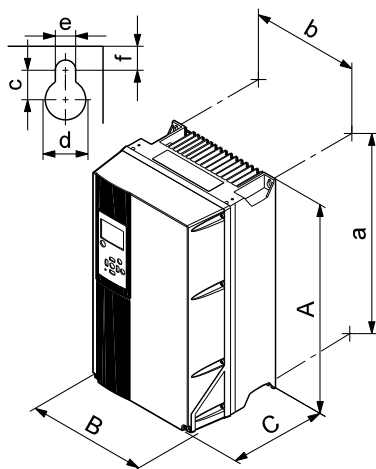
CU331SP technical data

Enclosure

All CU331SP enclosures are size B1.

The enclosure rating can be either IP55 / TYPE 12 or IP66 / TYPE 4X.

Main dimensions and weight



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Fig. 49 Enclosure B1

Note: Dimensions shown here for the CU331SP enclosures are maximum height, width and depth.

Enclosure	Height [in]		Width [in]		Depth [in]
	A	a	B	b	C
	18.9	17.9	9.5	8.3	10.2
B1	Screw holes [in]				Weight [lbs]
	c	d	e	f	
	0.47	0.75	0.35	0.35	50.7

Surroundings

Relative humidity	5-95 % RH
Ambient temperature	Max. 122 °F (50 °C)
Average ambient temperature over 24 hours	Max. 113 °F (45 °C)
Minimum ambient temperature at full operation	32 °F (0 °C)
Minimum ambient temperature at reduced operation	14 °F (-10 °C)
Temperature during storage and transportation	-13 to 150 °F (-25 to 65 °C)
Storage duration	Max. 6 months
Maximum altitude above sea level without performance reduction	3280 ft (1000 m)
Maximum altitude above sea level with performance reduction	9840 ft (3000 m)

The CU331SP comes in a packaging which is not suitable for outdoor storage.

Terminal tightening torques

Enclosure	Tightening torque [ft-lb]			
	Mains	Motor	Earth	Relay
B1	1.3	1.3	2.2	0.4

Cable length

Maximum length, screened motor cable	500 ft (152 m)
Maximum length, unscreened motor cable	1000 ft (305 m)
Maximum length, signal cable	1000 ft (305 m)

Fuses and cable cross-section

Always comply with national and local regulations as to cable cross-sections.

Cable cross-section to signal terminals

Maximum cable cross-section to signal terminals, rigid conductor	AWG 14
Maximum cable cross-section to signal terminals, flexible conductor	AWG 18
Minimum cable cross-section to signal terminals	AWG 20

Non-UL fuses and conductor cross-section to mains and motor

Typical shaft power P2 [Hp]	Maximum fuse size [A]	Fuse type	Maximum conductor cross section ¹⁾	
			[AWG]	[mm ²]
2	40	gG	7	10
3	40	gG	7	10
5	80	gG	7	10

¹⁾ Screened motor cable, unscreened supply cable.

UL fuses and conductor cross-section to mains and motor

Typical shaft power P2 [Hp]	Maximum fuse size [A]	Bussmann RK1	Maximum conductor cross section ¹⁾ [AWG]
2	40	KTN-R40	7
3	40	KTN-R40	7
5	80	KTN-R80	7

¹⁾ Screened motor cable, unscreened supply cable.

Inputs and outputs

Mains supply (L1, L2)

Supply voltage	200-240 V ± 10 %
Supply frequency	60 Hz
Maximum temporary imbalance between phases	3 % of rated value
Leakage current to earth	> 3.5 mA
Number of cut-ins	Max. 1 time/min.

Do not use the power supply for switching the CU331SP on and off.

Motor output (U, V, W)

Output voltage	0-100 % ¹⁾
Output frequency	0-60 Hz
Switching on output	Not recommended

¹⁾ Output voltage in % of supply voltage.

RS-485 GENIbus connection

Terminal number	68 (A), 69 (B), 61 GND (Y)
-----------------	----------------------------

The RS-485 circuit is functionally separated from other central circuits and galvanically separated from the supply voltage (PELV).

Digital inputs

Terminal number	18
Voltage level	0-24 VDC
Voltage level, open contact	> 19 VDC
Voltage level, closed contact	< 14 VDC
Maximum voltage on input	28 VDC
Input resistance, R _i	Approx. 4 kΩ

All digital inputs are galvanically separated from the supply voltage (PELV) and other high-voltage terminals.

Signal relays

Relay 01 , terminal number	1 (C), 2 (NO), 3 (NC)
Relay 02 , terminal number	4 (C), 5 (NO), 6 (NC)
Maximum terminal load (AC-1) ¹⁾	240 VAC, 2 A
Maximum terminal load (AC-15) ¹⁾	240 VAC, 0.2 A
Maximum terminal load (DC-1) ¹⁾	50 VDC, 1 A
Minimum terminal load	24 VDC 10 mA 24 VAC 20 mA

¹⁾ IEC 60947, parts 4 and 5.

- C Common
- NO Normally open
- NC Normally closed

The relay contacts are galvanically separated from other circuits by reinforced insulation (PELV).

Analog input

Terminal number	54
Current signal	A54 = "I" ¹⁾
Current range	0-20, 4-20 mA
Input resistance, R _i	Approx. 200 Ω
Maximum current	30 mA
Maximum fault, terminals 53, 54	0.5 % of full scale

¹⁾ The factory setting is voltage signal "U".

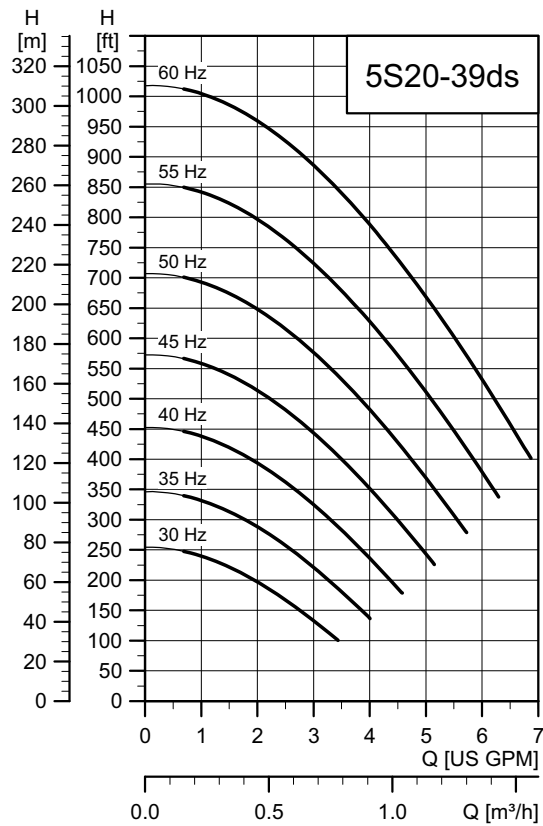
All analog inputs are galvanically separated from the supply voltage (PELV) and other high-voltage terminals.

Sound pressure level

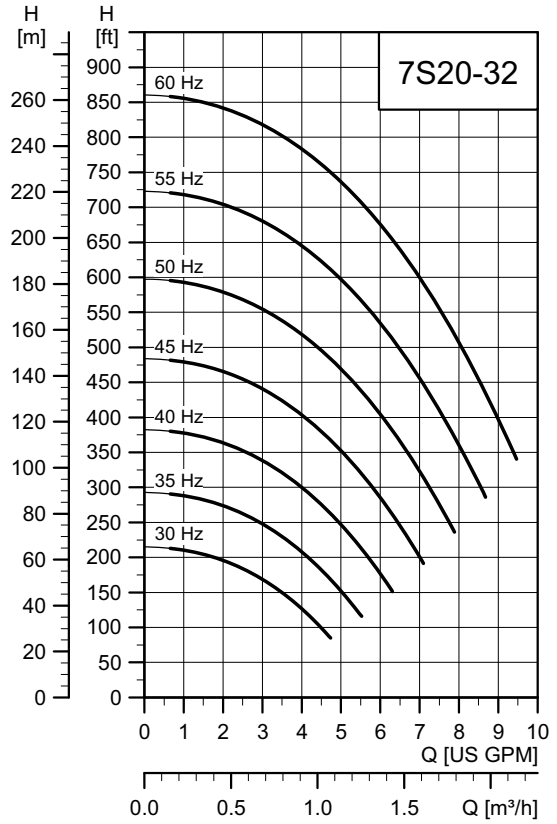
The sound pressure of the CU331SP is maximum 70 dB(A).

The sound pressure level of a motor controlled by a Variable frequency drive may be higher than that of a corresponding motor which is not controlled by a variable frequency drive.

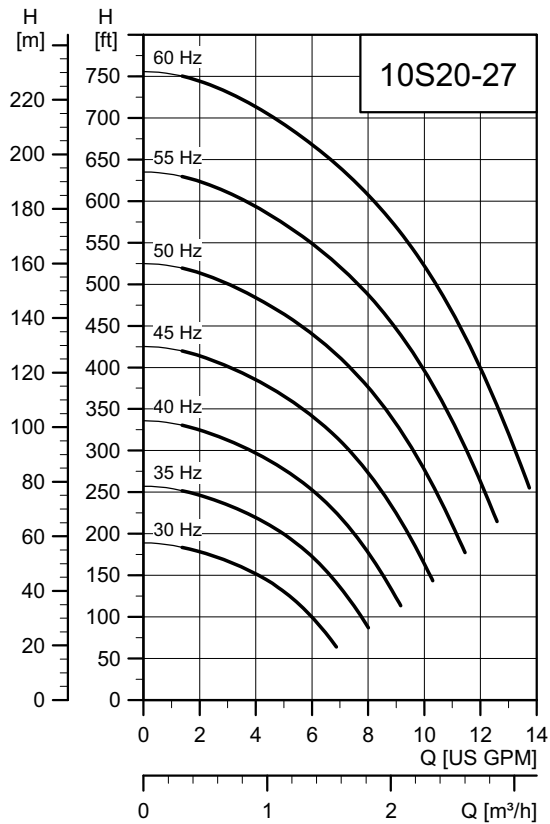
CU331SP curve charts



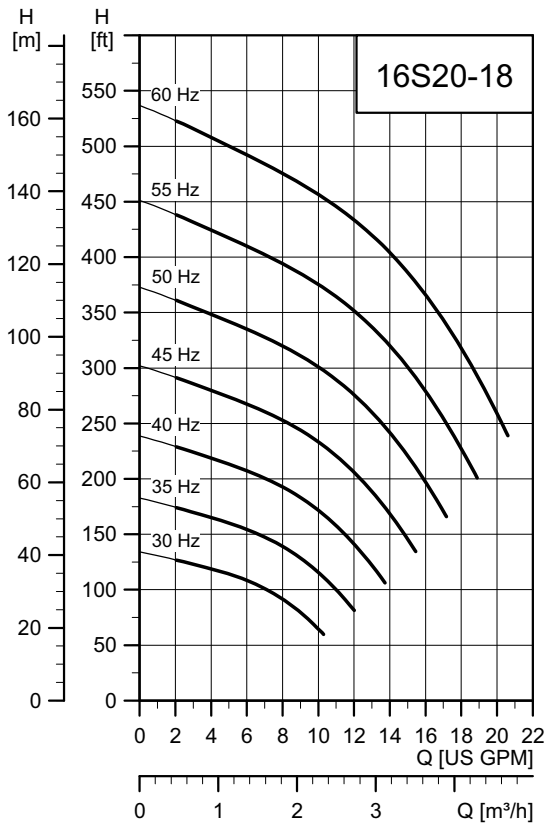
TM05 6410 5012



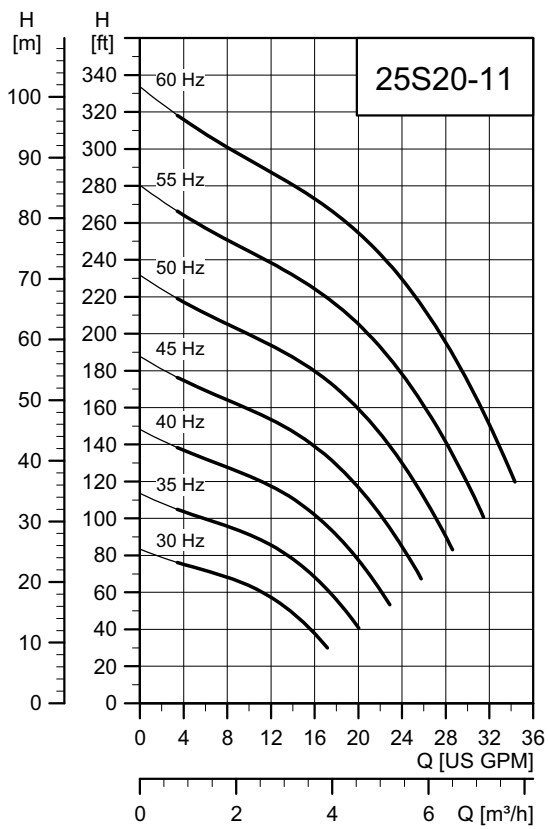
TM05 6411 5012



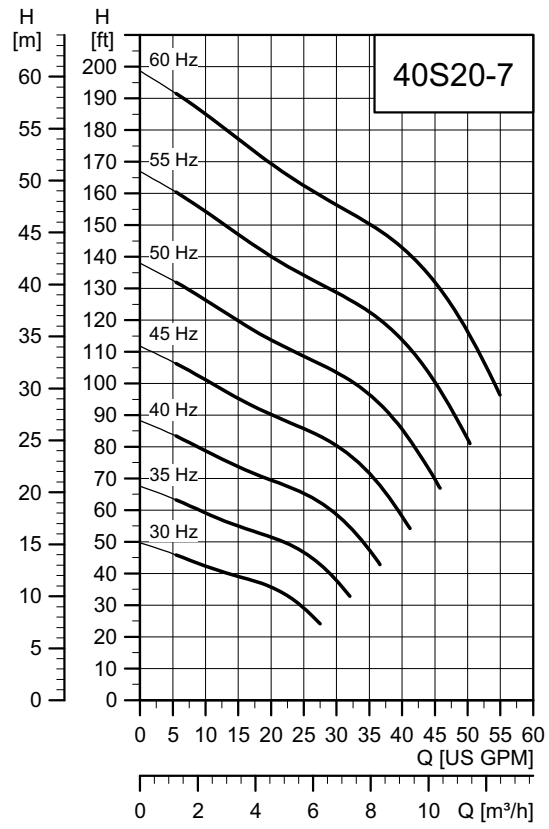
TM05 6412 5012



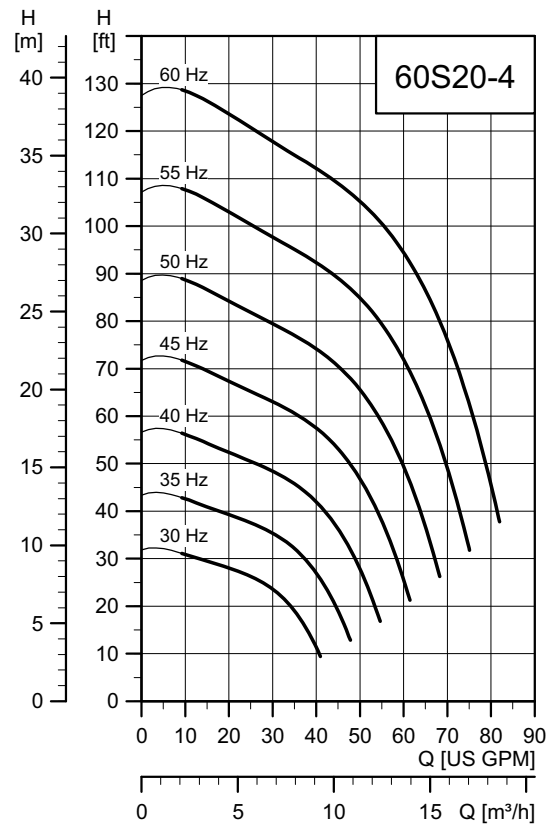
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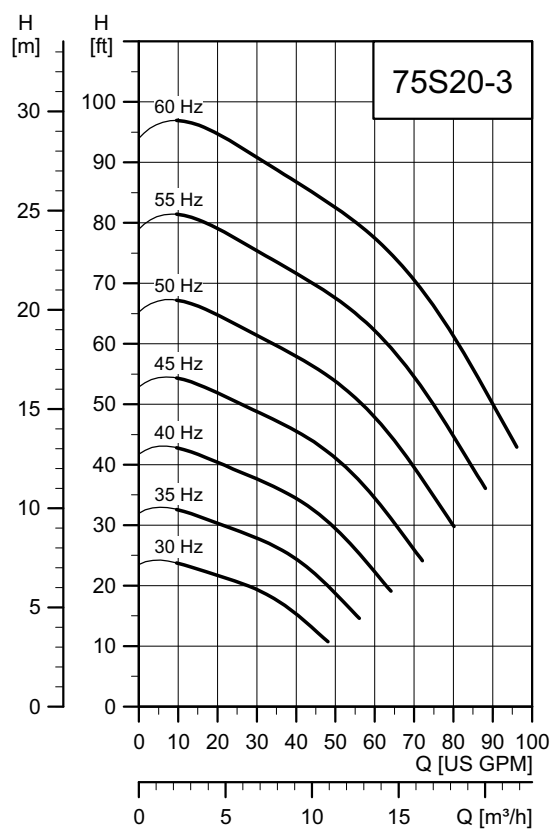
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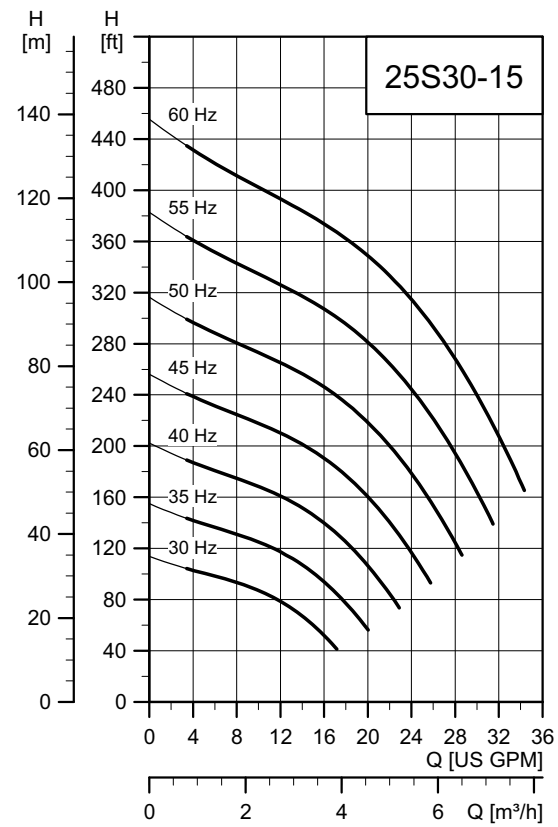
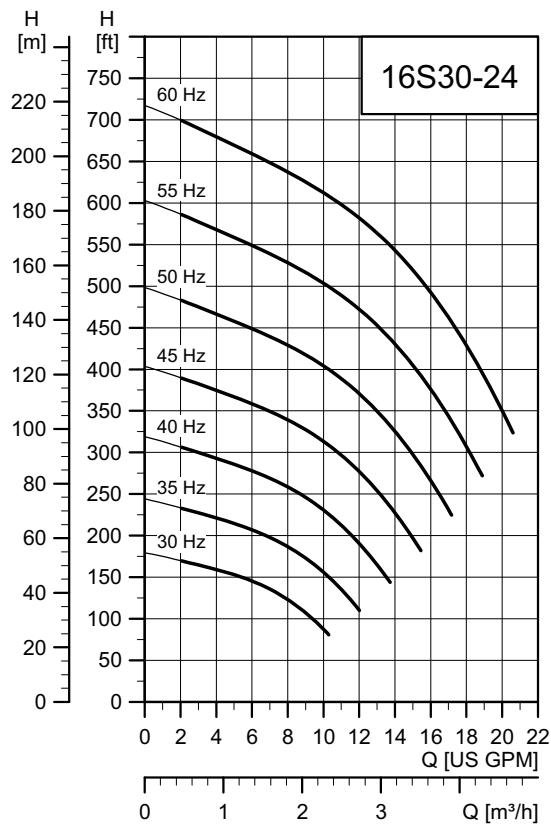
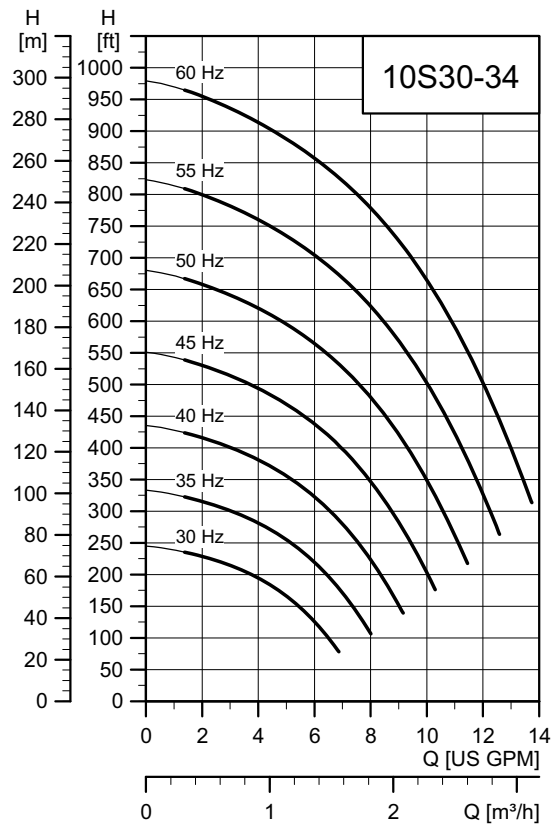
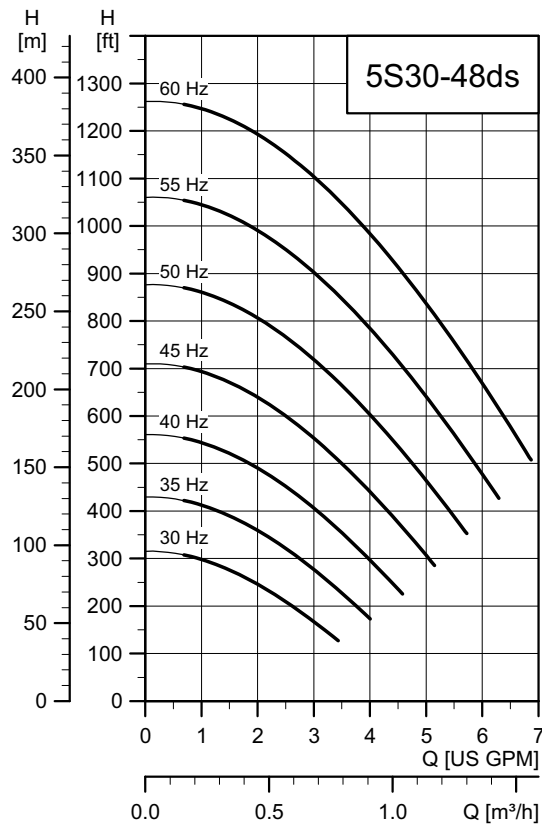
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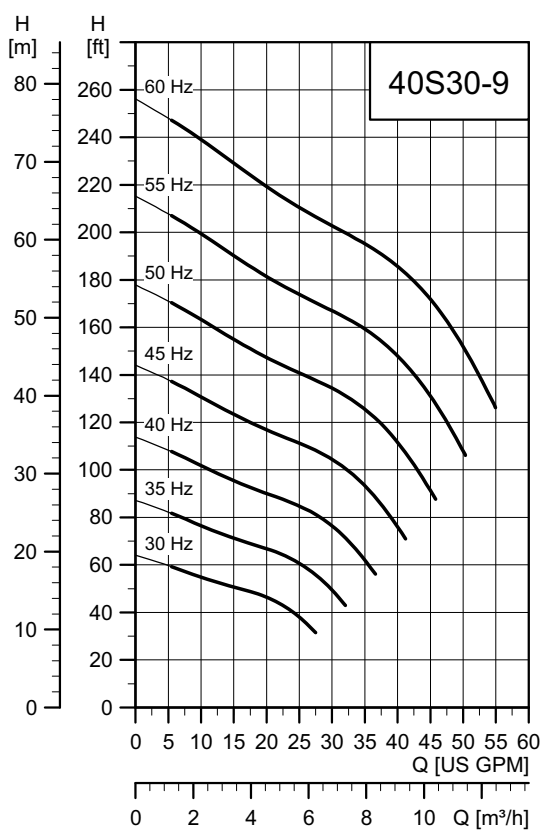


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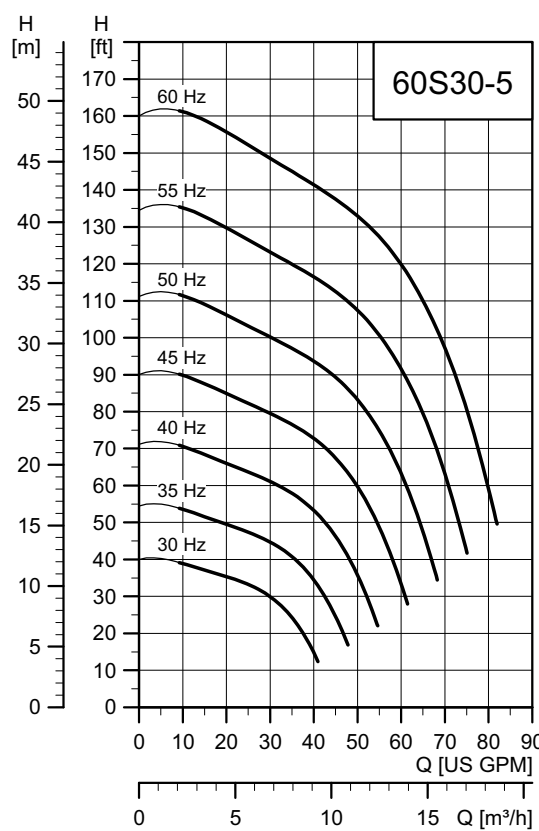


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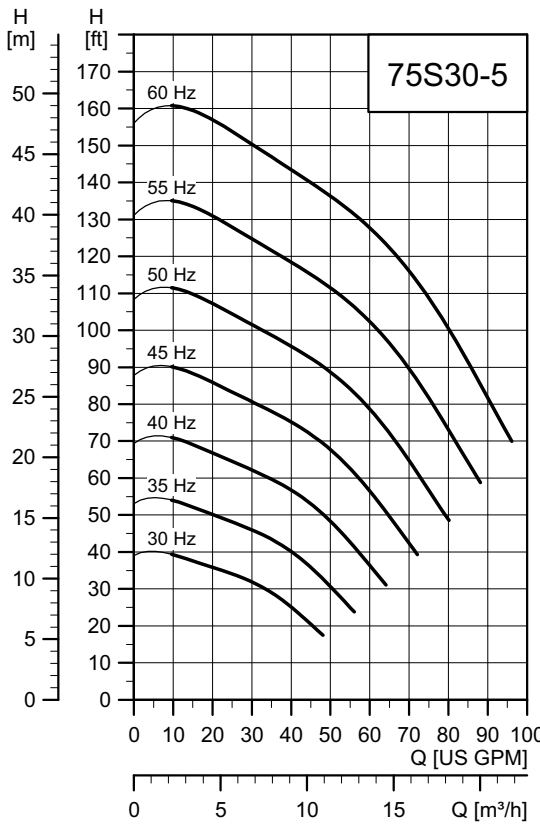




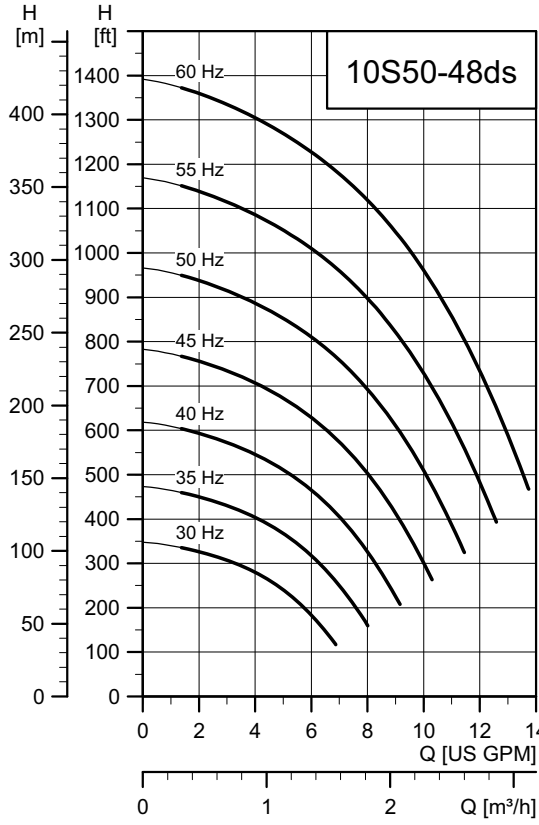
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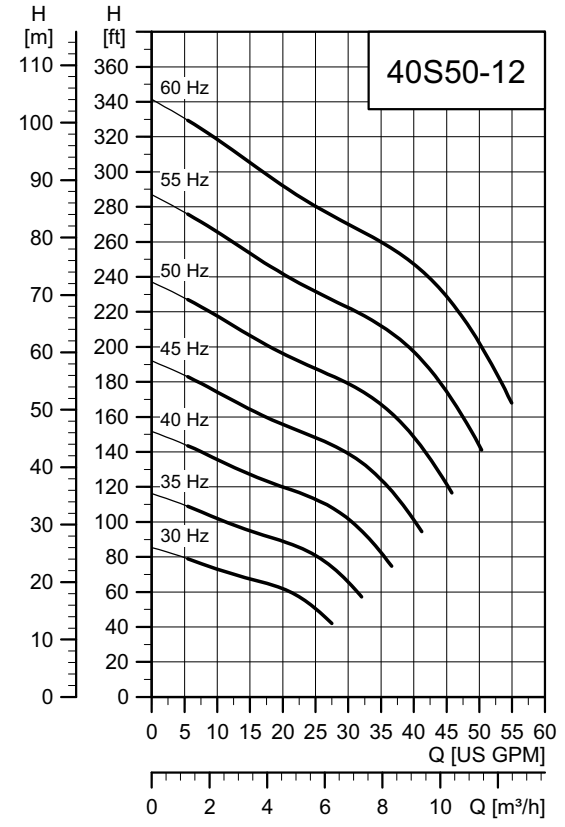
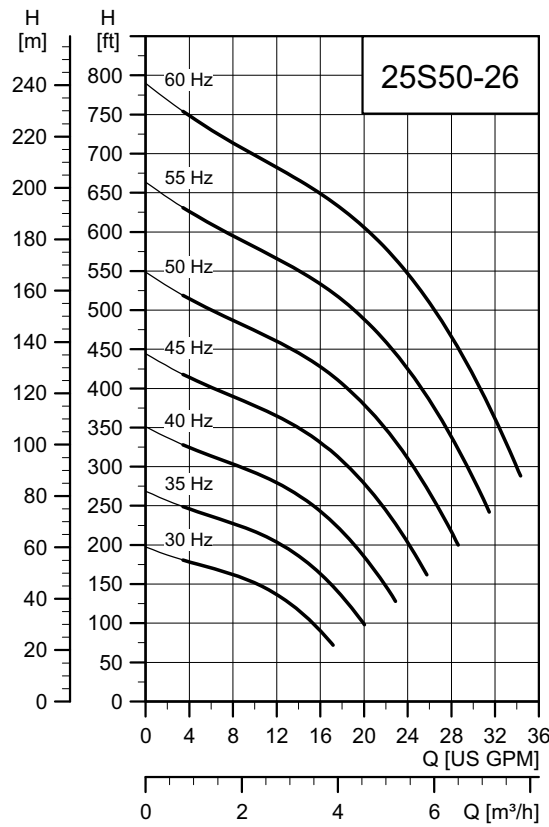
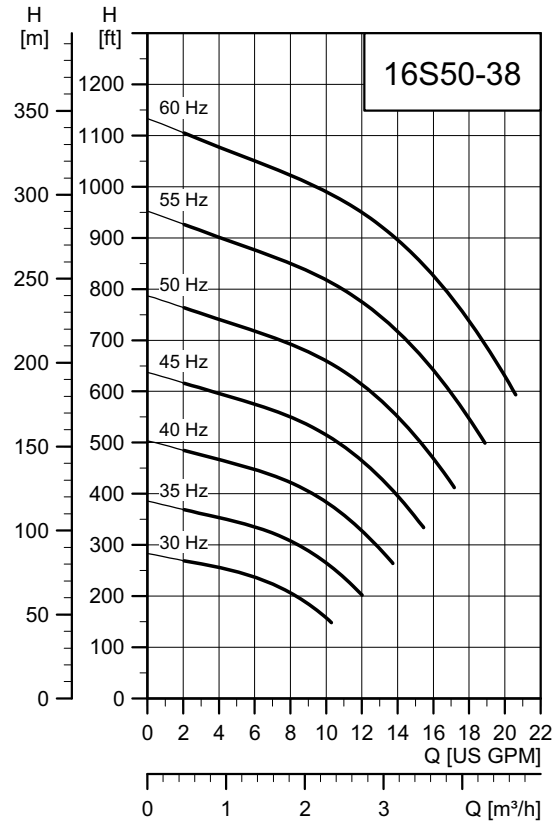
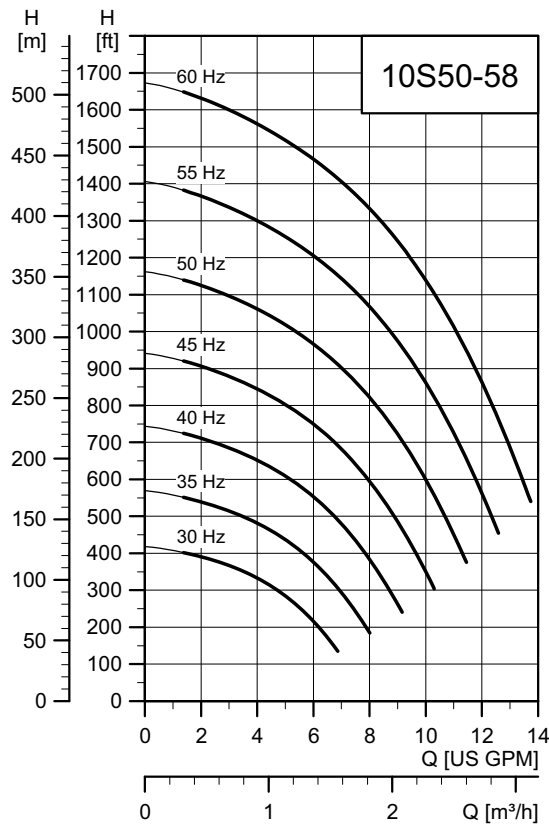
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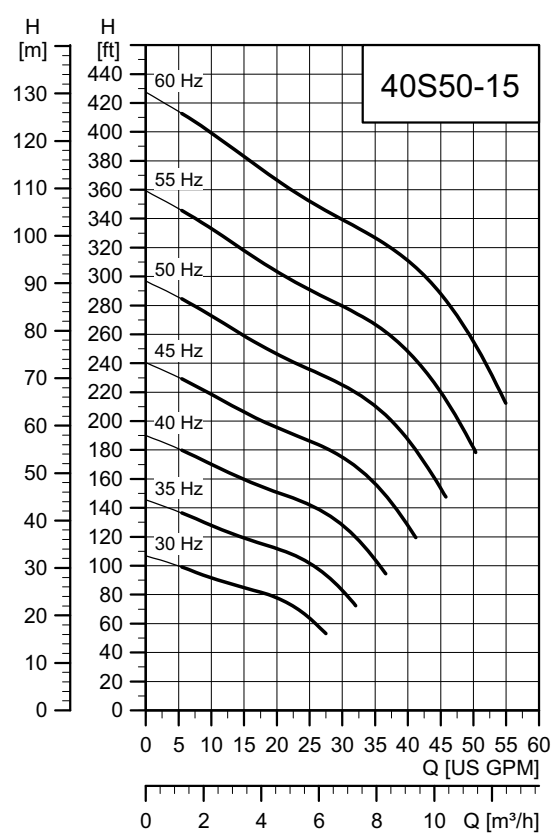


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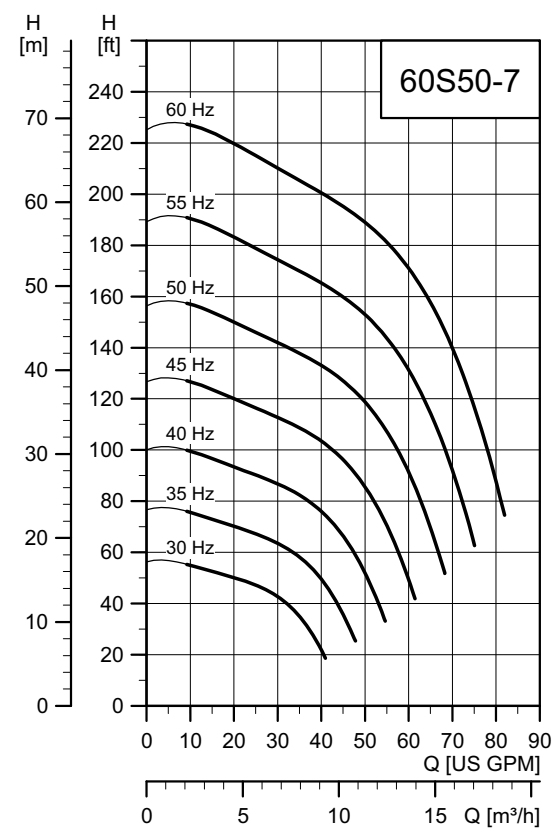


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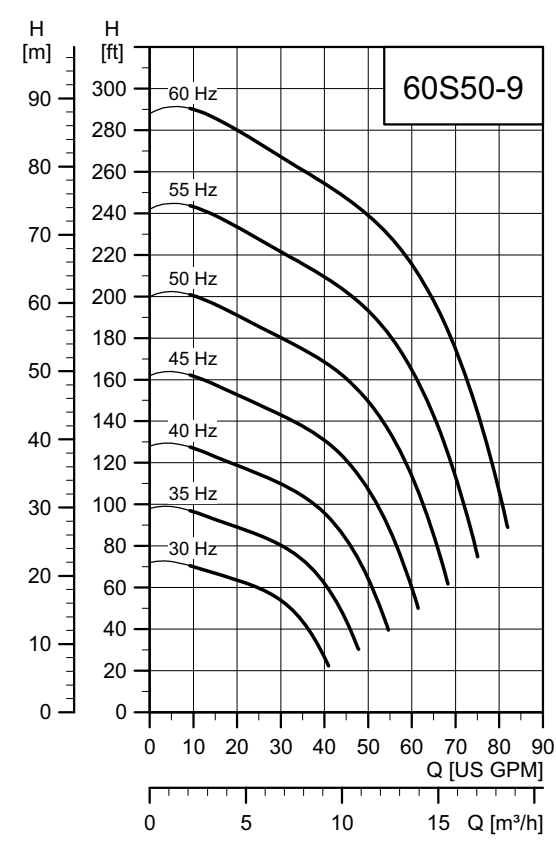




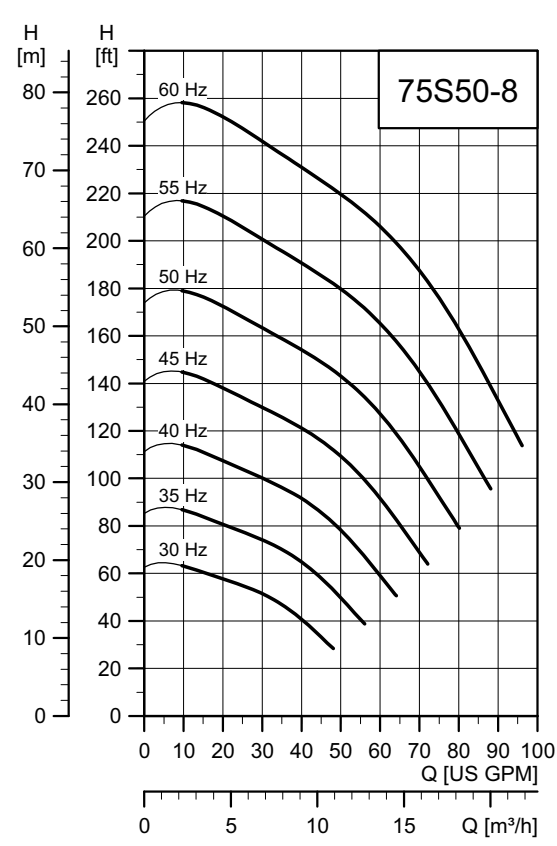
TM05 6430 5012



TM05 6431 5012



TM05 6432 5012



TM05 6433 5012

11. Accessories

CU 301 Constant Pressure System



TM04 7509 2110

Description	Product number
Constant Pressure Kit (CU 301 and Transducer)	96438895

CU 300 Status Box & R100

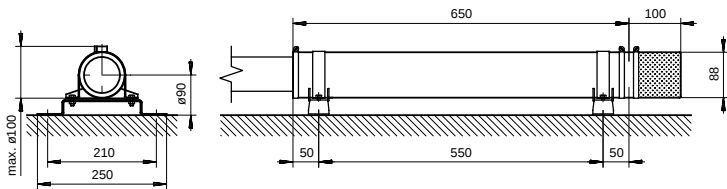


TM04 7508 2110

Description	Product number
CU300 Status Box	96422776

Description	Product number
R100 (for wireless infrared communication with the CU 301 / CU 300)	96615297

SQ, SQE flow sleeves



TM01 3292 3798

Description	Product number
SQ, SQE flow sleeve, complete	98148594

12. SP introduction

Introduction

The Grundfos SP range of submersible pumps is renowned for high efficiency and reliability. Made entirely of corrosion resistant stainless steel, SP pumps are ideal for a wide variety of applications. Grundfos SP pumps represent state-of-the-art hydraulic design. Built to deliver optimum efficiency during periods of high demand, SP pumps provide low long-term costs and high operating reliability regardless of the application.

The SP range offers high efficiency, high resistance to sand and other abrasives, motor burnout protection, and easy maintenance. A complete monitoring and control system is available for constant optimization of the pumping system.



Fig. 50 Grundfos SP pumps

TM06 4950 3315

Applications

Grundfos Large SP submersible pumps are suitable for:

- Groundwater supply to waterworks
- Irrigation in horticulture and agriculture
- Groundwater lowering (dewatering)
- Pressure boosting
- Industrial applications
- Domestic water supply.

Pumped liquids

Grundfos SP pumps are suitable for pumping clean, thin, non-aggressive liquids without solid particles or fibers.

SP offers stainless steel construction which ensures good wear resistance and a reduced risk of corrosion where the water has minor chloride content.

Optional, upgraded stainless steel construction is available for pumping more aggressive liquids:

- A complete range of zinc anodes for cathodic protection is available; see page 138 for applications (for example, sea water applications).
- For slightly polluted liquids (for example, containing oil), Grundfos offers a complete range of stainless steel SP NE pumps with all rubber parts made of FKM.

Features and benefits

Grundfos SP submersible pumps offer these features and benefits:

- State-of-the-art hydraulics provide high efficiency and low operating costs
- 100 % stainless steel components inside and outside for long service life
- Sand resistant
- Resistant to aggressive water
- Dry-running protection
- Monitoring, protection and communication via
 - protection unit MP 204
 - Grundfos GO.

A wide pump range

Grundfos offers energy-efficient SP submersible pumps with a performance range of up to 1,400 gpm and 2,100 ft of head.

The pump range consists of many pump sizes, and each pump size is available with an optional number of stages to match any duty point.

High pump efficiency

Often pump efficiency is given less consideration than the price of a pump; however, owners who choose efficiency will find substantial savings in energy costs over time. See fig. 51 for an illustration of SP efficiencies in relation to flow.

Example

For example, a pump and motor with a 10 % higher efficiency than a cheaper, less efficient pump, can save its owner more than \$80,000.00 over 10 years*.

* If producing 880 gpm at 325 ft of head for 10 years @ 13.8 cents per kWh. U.S. kWh costs range from 6 cents to more than 20 cents, depending on region.

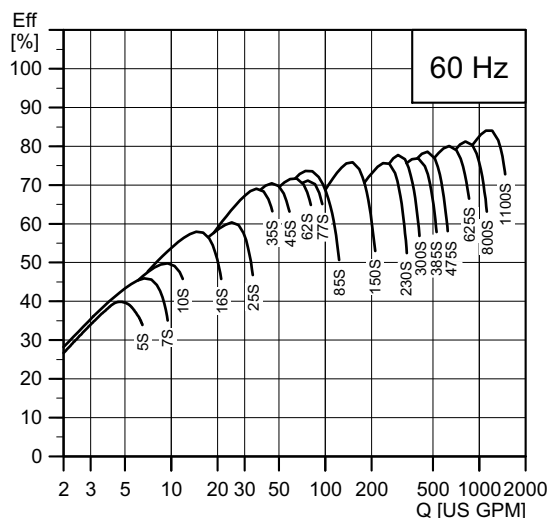


Fig. 51 SP pump/motor efficiencies in relation to flow

TM05 0057 3215

Pump design

Grundfos SP submersible pumps feature components that contribute to the superior performance and durability of the range.

Lower installation costs

Stainless steel means low weight for ease in the handling of pumps, resulting in lower equipment costs and reduced installation and service time.

Bearings with sand channels

All bearings are water-lubricated and have a squared shape enabling sand particles, if any, to leave the pump together with the pumped liquid.

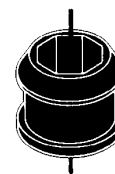


Fig. 52 Bearing

TM00 7301 1096

Inlet strainer

The inlet strainer prevents particles over a certain size from entering the pump.



Fig. 53 Fig. Inlet strainer

TM00 7302 1096

Check valve

All pumps are equipped with a reliable check valve in the valve casing preventing back flow in connection with pump stoppage.

Furthermore, the short closing time of the check valve means that the risk of destructive water hammer is reduced to a minimum.

The valve casing is designed for optimum hydraulic properties to minimize the pressure loss across the valve and thus to contribute to the high efficiency of the pump.

Note: As shown in fig. 54 the check valve is spring assisted intended for vertical pump applications. When installing pump at an angle, installation requires an additional check valve installed in the discharge piping. This prevents misalignment or failure to seat the pump check valve at an angle. Additional check valve in discharge piping sold separately.

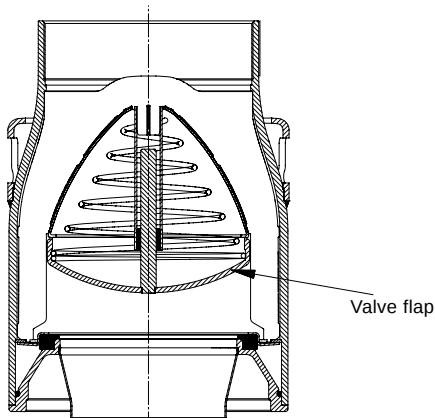


Fig. 54 Check valve

TM01 2499 1798

Priming screw

All Grundfos 4" pumps are fitted with a priming screw. Consequently, dry running is prevented, because the priming screw will make sure that pump bearings are always lubricated.

Due to the semi-axial impellers of large SP pumps this priming is provided automatically.

However, it applies to all pump types that if the water table is lowered to a level below the pump inlet neither pump nor motor will be protected against dry running.

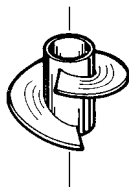


Fig. 55 Priming screw

TM00 7304 1096

Stop ring

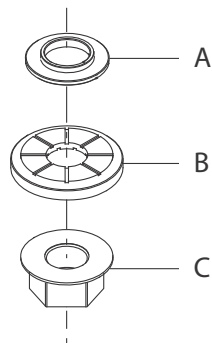
The stop ring prevents damage to the pump during transport and in case of up-thrust in connection with start-up.

The stop ring, which is designed as a thrust bearing, limits axial movements of the pump shaft.

Example: SP 385S

The stationary part of the stop ring (A) is secured in the upper intermediate chamber.

The rotating part (B) is fitted above the split cone (C).



TM01 3327 0412

Fig. 56 Stop ring (rotating and stationary part) and the split cone

Grundfos submersible motors

A complete motor range

Grundfos offers a complete submersible motor range in different voltages. For an overview of motor types, sizes and voltages, see page 131.

- MS 402 is designed for the domestic ground water market and covers outputs.
- The MS 4000 and MS 6000C series are designed for use in a variety of applications in water supply. When equipped with features like oversized motor, temperature measurement, cooling jacket, and SiC/SiC mechanical shaft seals, these motors are suitable for heavy-duty industrial applications such as dewatering operations.

As a standard, all external surfaces of the Grundfos MS motors in contact with water are made of AISI 304 stainless steel. For aggressive water, such as seawater or brackish water, R versions made of AISI 904L are available.

Grundfos rewindable MMS motor range

Grundfos MMS motors are suitable for any submersible installation, including heavy-duty industrial applications and dewatering operations (when equipped with temperature control, oversized motor, cooling jacket, and SiC/SiC mechanical shaft seals).

As standard the MMS motors are supplied with black cast-iron end-bells. Optionally, the range is available in all-stainless steel AISI 316 or AISI 904L versions.

The 2-pole Grundfos MMS submersible motors are all easy to rewind. The windings of the stator are made of a special waterproof wire of pure electrolytic copper sheathed with special non-hydroscopic thermoplastic material. The fine dielectric properties of this material allow direct contact between the windings and the liquid for efficient cooling of the windings.



TM00 7305 1096 - Gr/A4011 - Gr/A4013

Fig. 57 Grundfos MS motors



TM03 3478 0406

Fig. 58 Grundfos MMS motors

Industrial submersible motors and MS 6000C T60 versions

For heavy-duty applications Grundfos offers a complete motor range of industrial motors with up to 5 % higher efficiency than that of Grundfos' standard motors.

The cooling of the motor is very efficient due to the large motor surface. The efficient cooling makes it possible to increase the liquid temperature to 140 °F (60 °C) at a minimum flow of 0.49 fps (0.15 m/s) past the motor.

The industrial motors are for customers who value low operating costs and long life higher than price.

Grundfos industrial motors are developed for difficult operating conditions. These motors will stand a higher thermal load than standard motors and thus have a longer life when subjected to high load. This applies whether the high load is caused by bad power supply, hot water, bad cooling conditions, high pump load etc.

Please note that heavy duty motors are longer than motors for standard conditions.

Overtemperature protection

Accessories for protection against overtemperature are available for both Grundfos MS and MMS submersible motors. When the temperature becomes too high, the protection device will cut out so damage to the pump and motor can be avoided.

Restart of the motor after cut-out can be achieved in two ways:

- manual restart
- automatic restart.

Automatic restart means that the MP 204 attempts to restart the motor after 15 minutes. If the first attempt is not successful, restarting will be reattempted at 30-minute intervals.

MS: The Grundfos MS submersible motors (with the exception of MS 402) are available with a built-in Tempcon temperature transmitter for protection against overtemperature. By means of the transmitter, it is possible to read out and/or monitor the motor temperature via an MP 204 or a PR 5714 relay.

The Grundfos MS 6000C submersible motors can be fitted with a Pt100. The Pt100 is fitted in the motor and connected directly to the MP 204 or monitored by the PR 5714 relay.

MMS: For the protection of the Grundfos MMS submersible motors against overtemperature, Grundfos offers the Pt100 temperature sensor as an optional extra.

The Pt100 is fitted in the motor and connected directly to the MP 204 or monitored by the PR 5714 relay.

Protection against upthrust

In case of a very low counter pressure in connection with start-up, there is a risk that the entire chamber stack may rise. This is called upthrust. Upthrust may damage both pump and motor. Grundfos pumps and motors are protected against upthrust as standard, preventing upthrust from occurring during the critical start-up phase. The protection consists of either a built-in stop ring or hydraulic balancing.

Built-in cooling chambers

In all Grundfos MS submersible motors, efficient cooling is ensured by cooling chambers at the top and at the bottom of the motor, and by an internal circulation of motor liquid. See fig. 59.

As long as the required flow velocity past the motor is maintained, cooling of the motor will be efficient.

Lightning protection

The smallest Grundfos submersible motors, such as the MS 402, are all insulated in order to minimize the risk of motor burnout caused by lightning strike.

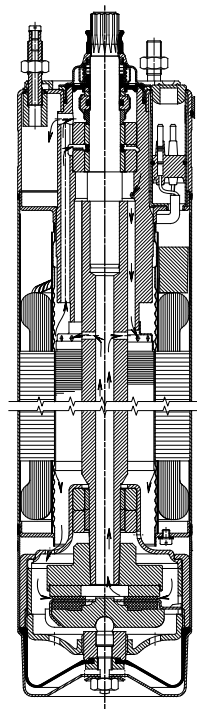


Fig. 59 MS 4000

Reduced risk of short-circuit

The embedded stator winding in the Grundfos MS submersible motor is hermetically enclosed in stainless steel. The result is high mechanical stability and optimum cooling. Also, this eliminates the risk of short-circuit of the windings caused by water condensation.

TM00 5698 0996

Shaft seal

MS 402

The shaft seal is of the lip seal type characterized by low friction against the rotor shaft.

The rubber material offers good wear resistance, good elasticity and resistance to particles, and it is approved for use in drinking water.

MS 4000

Ceramic/tungsten carbide materials provide the MS shaft seals with optimum sealing, optimum wear resistance and long life.

MS 6000C

The MS 6000C shaft seal material is SiC/SiC. The spring loaded shaft seal is designed with a large surface and a sand shield. The result is a minimum exchange of pumped and motor liquids and no penetration of particles.

Motors, version R, are supplied with a SiC/SiC shaft seal. Other combinations are available request. See fig. 60 and fig. 61 for an illustration of shaft seal components and configuration.

MMS rewindable motors

The standard shaft seal is a SiC/SiC mechanical shaft seal. The shaft seal is replaceable.

The material features good wear resistance and resistance to particles.

Together with the shaft seal housing, the sand shield forms a labyrinth seal, which during normal operating conditions prevents penetration of sand particles into the shaft seal.

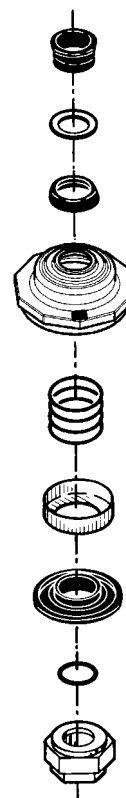


Fig. 60 Shaft seal, MS 4000



Fig. 61 Shaft seal, MS 6000C

TM00 7306 0412

TM03 9225 3607

Identification

Type key, SP pumps

Example	475	S	500 -	5 -	A	B
Rated flow rate in gpm						
Type range						
Stainless steel parts of material						
S = AISI 304						
N = AISI 316						
R = AISI 904L						
Hp of motor						
Number of impellers						
First reduced-diameter impeller (A, B or C)						
Second reduced-diameter impeller (A, B or C)						

Type key, MS 402 motors

Example	MS	4	02
Motor submersible			
Min. well casing diameter in inches			
Generation			
= Stainless steel AISI 304			

Type key, MS 4000 motors

Example	MS	4	000	R
Motor submersible				
Min. well casing diameter in inches				
Generation				
= Stainless steel AISI 304				
R = Stainless steel AISI 904L				
I = Stainless steel AISI 304 + De-rated				
RE = Stainless steel AISI 904L + FKM				
EI = Stainless steel AISI 304 + De-rated + FKM				

MS 6000C

Example pump: MS 6000CQFT40 3 x 460/60 25 Hp

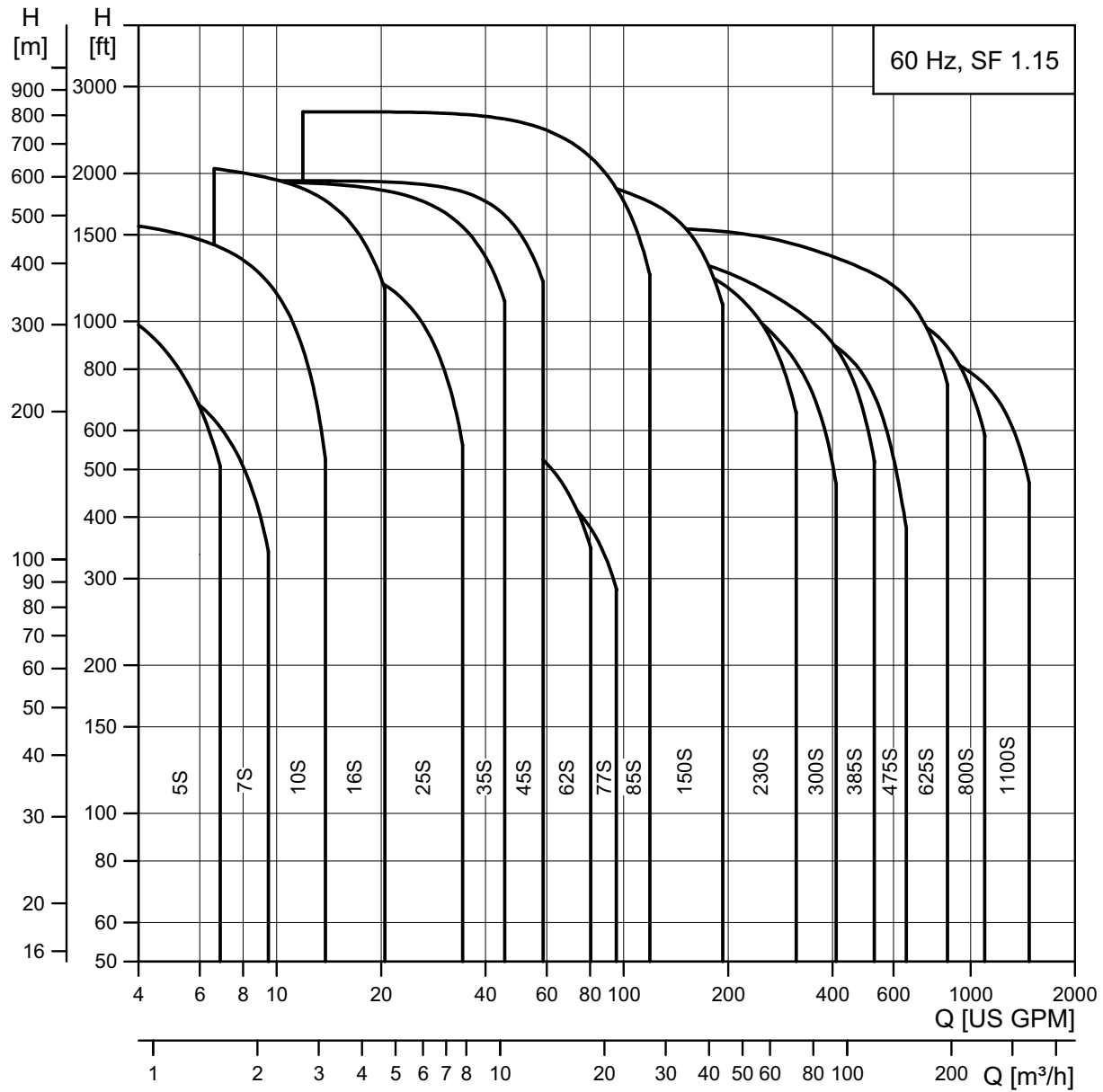
Description	MS 6000C	Q	F	T40	3 x 460/60	25 Hp
Motor type						
Material type						
= AISI 304 Stainless Steel (EN 1.4301)						
R = AISI 904L stainless steel (EN 1.4539)						
Rubber						
= NBR						
E = FKM						
Shaft seal						
= Ceramic/carbon BXPFF/NBR						
S = SiC/SiC Q1Q1VFF/FKM						
Q = SiC/SiC Q1Q1PFF/NBR						
Radial bearings						
= Ceramic/hard metal						
W = SiC/Tungsten carbide						
Motor liquid						
= SML-3						
D = Demineralized water						
H = Glycol 60 vol % HTF						
Flange extension						
= Without						
F = With						
Tempcon						
= With						
X = Without						
Max. liquid temperature						
T40 = 104 °F (40 °C)						
T60 = 140 °F (60 °C)						
Voltage						
35 3 x 460/60 = 3 x 440-460-480 V, 60 Hz						
30 3 x 208-230/60 = 3 x 208-220-230 V, 60 Hz						
39 3 x 575/60 = 3 x 575 V, 60 Hz						
Method of starting						
= DOL						
SD = SD						
Motor power						
7.5 Hp 5.5 kW						
10 Hp 7.5 kW						
15 Hp 11 kW						
20 Hp 15 kW						
25 Hp 18.5 kW						
30 Hp 22 kW						
40 Hp 30 kW						

Type key, MMS motors

Example	MMS	6	000	N
Type range				
Min. well casing diameter in inches				
Generation				
Material:				
= Cast iron EN-JL1040				
N = DIN/EN 1.4401 (AISI 316)				

13. SP product overview

SP performance range 60 Hz



TM05 0056 3215

Pump range

Type	5S	10S	16S	25S	35S	45S	62S	77S	85S	150S	230S	300S	385S	475S	625S	800S	1100S
AISI 304 stainless steel	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AISI 316 stainless steel			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
AISI 904L stainless steel				•					•	•	•	•	•	•	•	•	•
Connection ★	NPT	1"	1.25"	1.25"	1.5"	1.5" (2")	2" (2")	2"	(3")	(3")	3" (4")	3" 4"	5"	5"	6"	6"	6"
Flange connection: Grundfos flange													5"	5"	6"	6"	6"

★ Figures in brackets () indicate connection for pumps with sleeve.

Motor range

Motor output [Hp]	0.5	0.75	1.0	1.5	1.5	3.0	5.0	7.5	10.0	15	20	25	30	40	50	60	75	100	125	150	175	200	250
Single-phase	•	•	•	•	•	•																	
Three-phase	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Industrial motor						•	•	•	•	•	•	•	•		•								
Rewindable motor							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Steel: AISI 304	•	•	•	•	•	•	•	•	•	•	•	•	•	•									
Steel: AISI 304 and cast iron							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Steel: AISI 316							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Steel: AISI 904L			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			
Built-in temperature transmitter in motor		•	•	•	•	•	•	•	•	•	•	•	•	•									

Direct-on-line starting is recommended up to 100 Hp.
Soft starter or autotransformer is recommended above 100 Hp.
Motors with star/delta are available from 7.5 Hp.

Motor protection and controllers

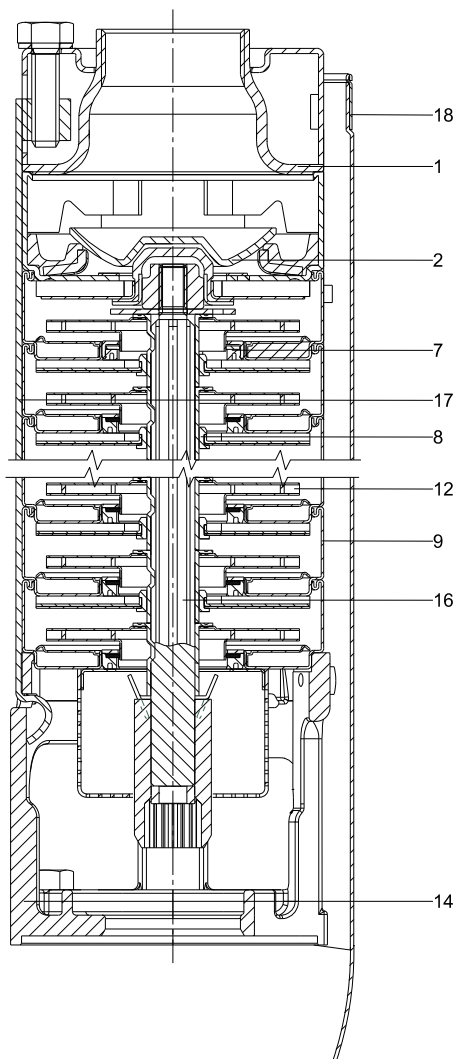
Motor output [Hp]	0.5	0.75	1.0	1.5	1.5	3.0	5.0	7.5	10.0	15	20	25	30	40	50	60	75	100	125	150	175	200	250
MP 204	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Pt100							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Zinc anode				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Vertical flow sleeve	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Horizontal flow sleeve	•	•	•	•	•	•		•	•	•	•	•	•	•									
SA-SPM	•	•	•	•	•	•	•																
GO remote	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RS-485 communication module	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
G100	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Motor protection of single-phase motors, see [page 98](#).

14. SP construction

Sectional drawing, SP pump 4" spline shaft

(SP 5S - 25S)



TM06 1193 1614

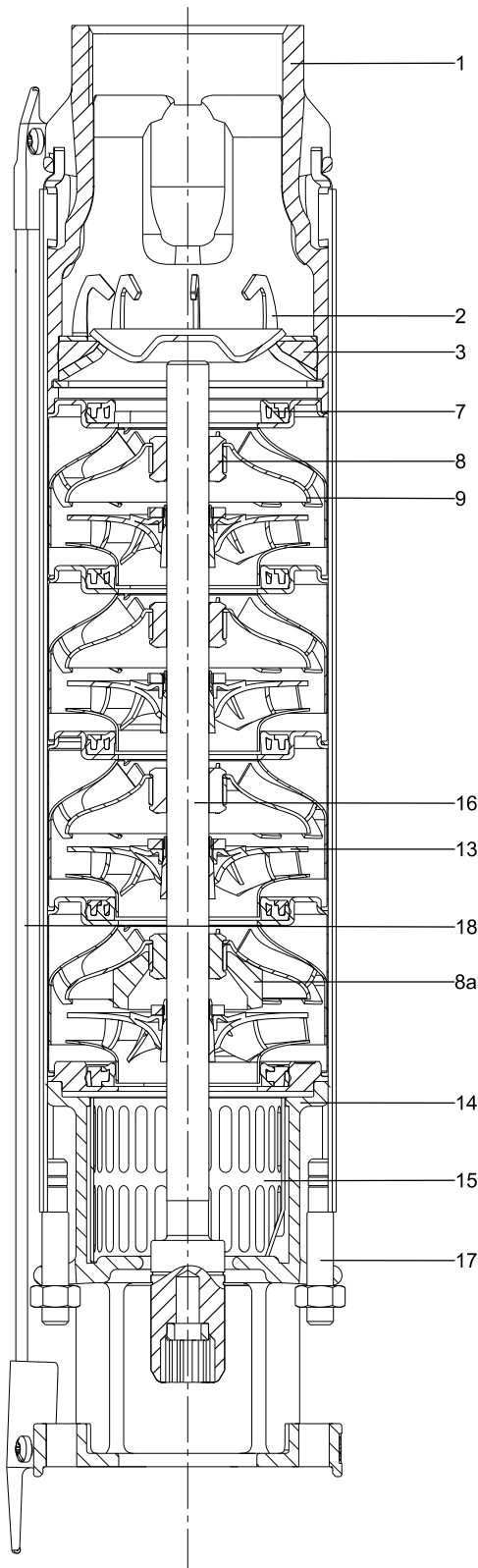
Fig. 62 SP pump, 4" spline shaft (SP 5S - 25S)

Material specification

Pos.	Component	Material	Standard	N-version	R-version
			[AISI (EN)]		
1	Valve casing	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
2	Valve cup	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
7	Neck ring	NBR/TPU			
8	Bearing	NBR			
9	Chamber	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
12	Impeller	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
14	Suction interconnector	Cast stainless steel	304 (1.4308)	316 (1.4408)	904L (1.4517)
16	Shaft complete	Stainless steel	431 (1.4057)	329 (1.4460)	904L (1.4462)
17	Strap	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
18	Cable guard	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
	Washer for stop ring	Carbon/graphite HY22 in PTFE mass			
	Strainer	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
	Valve seat	Rubber type	NBR	NBR-FKM	NBR-FKM

Sectional drawing, SP pump 4" smooth shaft

(SP 35S - 77S)



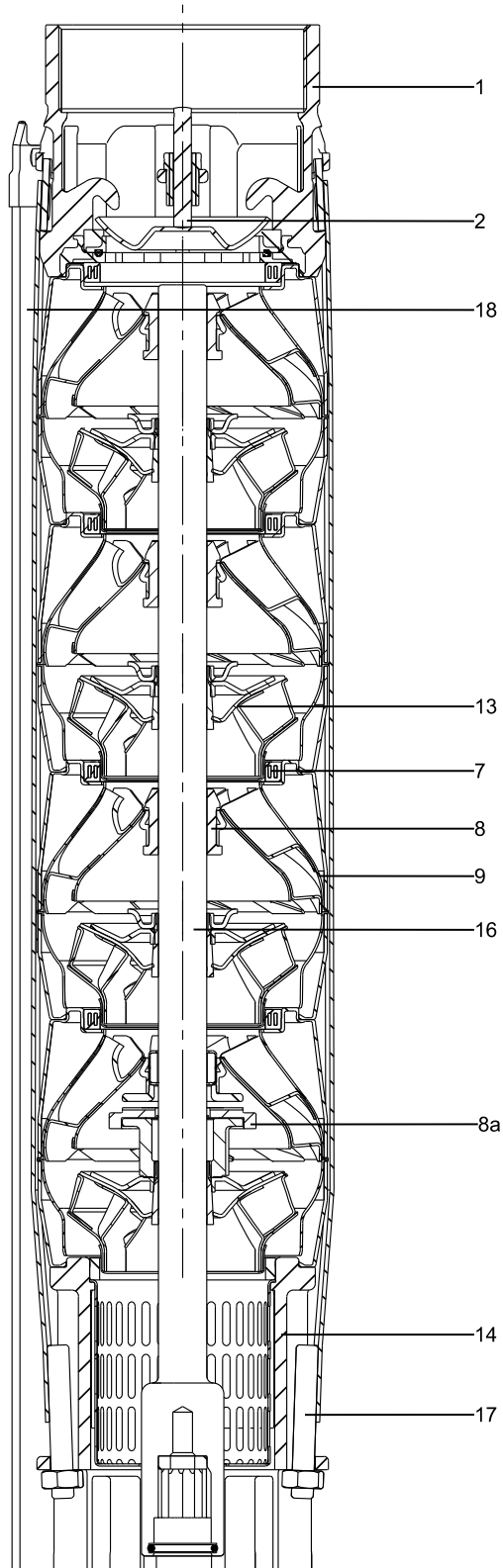
Material specification

Pos.	Component	Material	Standard	N-version	R-version
			[AISI (EN)]		
1	Valve casing	Cast stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
2	Valve cup	Cast stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
3	Valve seat	NBR-FKM	NBR-FKM	NBR-FKM	NBR-FKM
7	Neck ring	TPU/PPS-FKM	TPU/PPS-FKM	TPU/PPS-FKM	TPU/PPS-FKM
8	Bearing	LSR-FKM	LSR/FKM	LSR/FKM	LSR/FKM
8a	Washer for stop ring	Carbon/graphite HY22 in PTFE mass			
9	Chamber	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
13	Impeller	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
14	Suction interconnector	Cast stainless steel	304 (1.4308)	316 (1.4408)	904L (1.4517)
16	Shaft complete	Stainless steel	1.4057	1.4460	1.4462
17	Strap	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
18	Cable guard	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
	Strainer	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)

Fig. 63 SP pump, 4" smooth shaft (SP 35S - 77S)

TM06 1110 1614

Sectional drawing, SP pump 6" (SP 85S - 300S)



TM06 1521 1614

Material specification

Pos.	Component	Material	Standard	N-version	R-version
			[AISI (EN)]		
1	Valve casing	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
2	Valve cup	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
	Valve seat	NBR-FKM	NBR-FKM	NBR-FKM	NBR-FKM
7	Neck ring	NBR-FKM	NBR-FKM	NBR-FKM	NBR-FKM
8	Bearing	NBR-FKM-LSR	NBR-FKM-LSR	NBR-FKM-LSR	NBR-FKM-LSR
	Washer for stop ring	Carbon/graphite HY22 in PTFE mass			
9	Chamber	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
13	Impeller	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
14	Suction interconnector	Cast stainless steel	304 (1.4308)	316 (1.4408)	904L (1.4517)
	Strainer	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
16	Shaft complete	Stainless steel	431 (1.4057)	329 (1.4460)	904L (1.4462)
17	Strap	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
18	Cable guard	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)

Fig. 64 Example, 6" (SP 85S - 300S)

Sectional drawing, SP pump 8" (SP 385S - 475S)

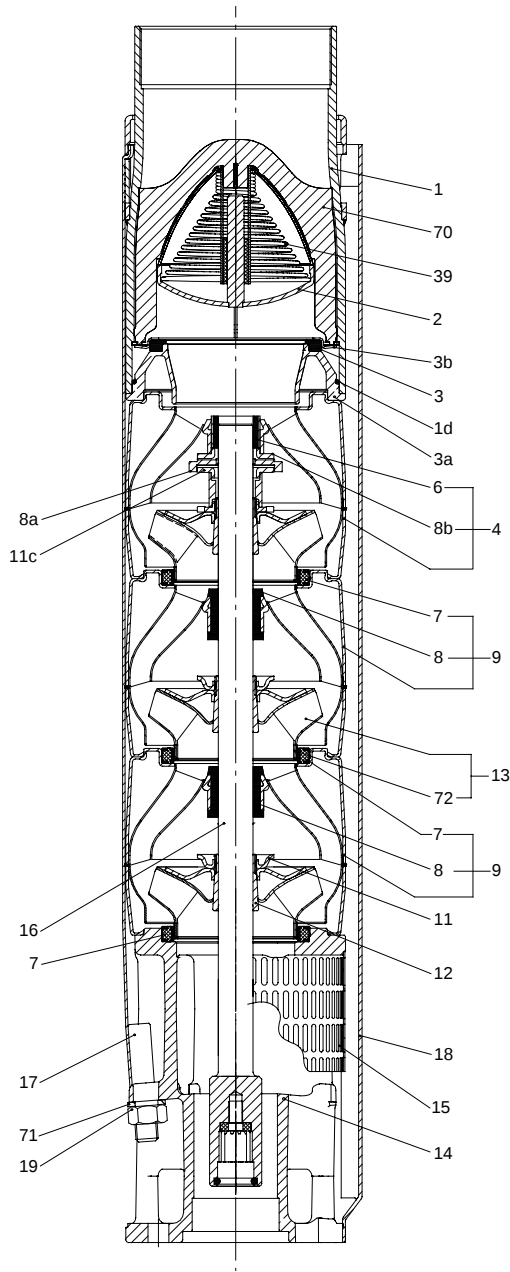


Fig. 65 SP pump, 8" (SP 385S - 475S)

TM01 2359 2301

Material specification

Pos.	Component	Materials	Standard	N version	R version
			[AISI (EN)]		
1	Valve casing	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
1d	O-ring	NBR			
2	Valve cup	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
3	Valve seat	Standard/ N- version: NBR R-version: FKM			
3a	Lower valve seat retainer	Stainless steel	316 (1.4401)	316 (1.4401)	904L (1.4517)
3b	Upper valve seat retainer	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
4	Top chamber	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
6	Upper bearing	Stainless steel/NBR	304 (1.4301)	316 (1.4401)	904L (1.4539)
7	Neck ring	NBR/PPS			
8	Bearing	NBR			
8a	Washer for stop ring	Carbon/ graphite HY22 in PTFE mass			
8b	Stop ring	Stainless steel	316 (1.4401)	316 (1.4401)	904L (1.4539)
9	Chamber	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
11	Split cone nut	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
11c	Nut for stop ring	Stainless steel	316 (1.4401)	316 (1.4401)	904L (1.4539)
12	Split cone	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
13	Impeller	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
14	Suction interconnector	Stainless steel	CF8M	A744 CD4-MCu	904L (1.4517)
15	Strainer	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
16	Shaft complete	Stainless steel	431 (1.4057)	329 (1.4460)	329 (1.4460)
17	Strap	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
18	Cable guard	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
19	Nut for strap	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
39	Spring for valve cup	Stainless steel	304 (1.4301)	316 (1.4401)	SAF 2205
70	Valve guide	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)
71	Washer	Stainless steel	316 (1.4401)	316 (1.4401)	904L (1.4539)
72	Wear ring	Stainless steel	304 (1.4301)	316 (1.4401)	904L (1.4539)

Sectional drawing, SP pump 10" (SP 625S - 1100S)

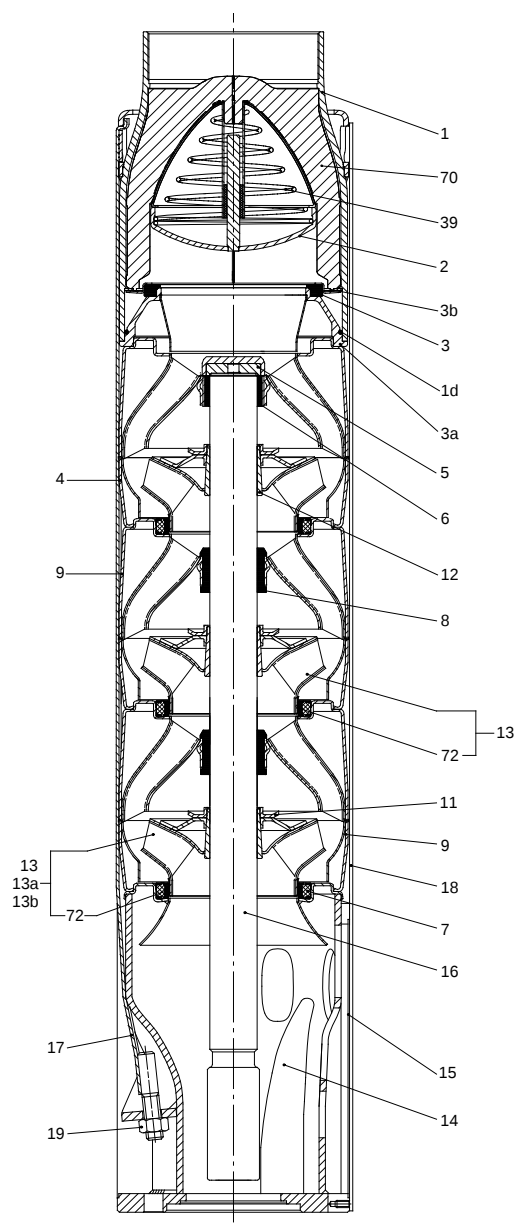


Fig. 66 SP pump, 10" (SP 625S - 1100S)

TM01 2363 2701

Material specification

Pos.	Description	Material	Standard	N version
			[AISI (EN)]	
Valve casing				
1	Valve casing	Stainless steel	304 (1.4301)	316 (1.4401)
1d	O-ring	NBR		
2	Valve cup	Stainless steel	304 (1.4301)	316 (1.4401)
3	Valve seat	Stainless steel	304 (1.4301)	316 (1.4401)
3a	Lower valve seat retainer	Stainless steel	304 (1.4301)	316 (1.4401)
3b	Upper valve seat retainer	Stainless steel	304 (1.4301)	316 (1.4401)
39	Spring for valve cup	Stainless steel	301 (1.4310)	316 (1.4401)
70	Valve guide	Stainless steel	304 (1.4301)	316 (1.4401)
78	Nameplate	Stainless steel	304 (1.4301)	316 (1.4401)
79	Rivet	Stainless steel	304 (1.4301)	316 (1.4401)
63	Connecting piece	Stainless steel	304 (1.4301)	316 (1.4401)
Chamber stack				
4	Top chamber	Stainless steel	304 (1.4301)	316 (1.4401)
5	Upthrust disc	Carbon/ graphite HY22 in PTFE mass		
6	Top bearing	Stainless steel/ NBR	304 (1.4301)	316 (1.4401)
7	Neck ring	NBR/PPS		
8	Bearing	NBR		
9	Chamber	Stainless steel	304 (1.4301)	316 (1.4401)
11	Nut for split cone	Stainless steel	304 (1.4301)	316 (1.4401)
12	Split cone	Stainless steel	304 (1.4301)	316 (1.4401)
13	Impeller	Stainless steel	304 (1.4301)	316 (1.4401)
16	Shaft with coupling	Stainless steel	431 (1.4057)	329 (1.4460)
18	Cable guard	Stainless steel	304 (1.4301)	316 (1.4401)
18a, 18b	Screw for cable guard	Stainless steel	304 (1.4301)	316 (1.4401)
23	Rubber guard	NBR		
72	Wear ring	Stainless steel	304 (1.4301)	316 (1.4401)
Suction interconnector				
14	Suction interconnector	Stainless steel	304 (1.4301)	316 (1.4401)
15	Strainer	Stainless steel	304 (1.4301)	316 (1.4401)
17	Strap	Stainless steel	304 (1.4301)	316 (1.4401)
19	Nut for strap	Stainless steel	304 (1.4301)	316 (1.4401)
19a	Nut	Stainless steel	316 (1.4401)	316 (1.4401)
20	Motor cable			
22	Bolts	Stainless steel	316 (1.4401)	316 (1.4401)
28, 28a	Lock for strainer	Stainless steel	329 (1.4460)	329 (1.4460)

Sectional drawing, MS motors

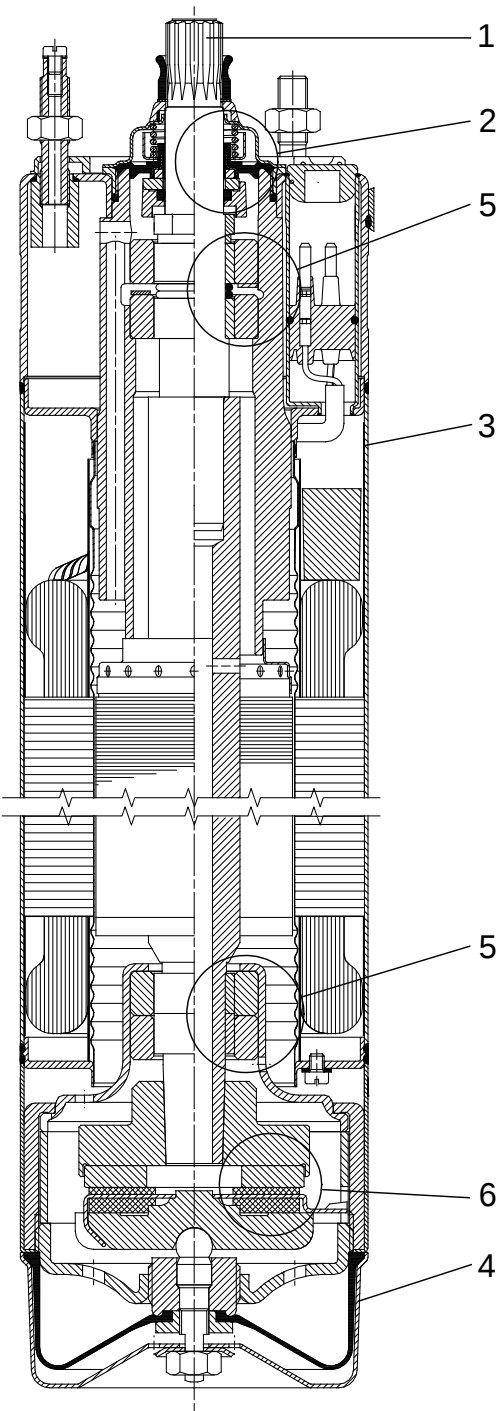


Fig. 67 MS 4000 motor

TM00 7865 2196

Material specification, MS 402, MS 4000, and MS 6000C motors

Pos.	Part	MS 402	MS 4000 MS 6000C
		[AISI (EN)]	
1	Shaft	431	431
2	Shaft seal	NBR	NBR/SiC/SiC
3	Motor sleeve	304 (1.4301)	304 (1.4301)
4	Motor end shield	304 (1.4301)	304 (1.4301)
5	Radial bearing	Ceramic	Ceramic/ tungsten carbide
6	Axial bearing	Ceramic/carbon	Ceramic/carbon
Rubber parts		NBR	NBR

R-version motor

Pos.	Part	MS 4000 MS 6000C
1	Shaft	318 LN
2	Shaft seal	SiC/SiC
3	Motor sleeve	904L (1.4539)
4	Motor end shield	904L (1.4539)
5	Radial bearing	Ceramic/tungsten carbide
6	Thrust bearing	Ceramic/carbon
Rubber parts		NBR

Sectional drawing, MMS motors

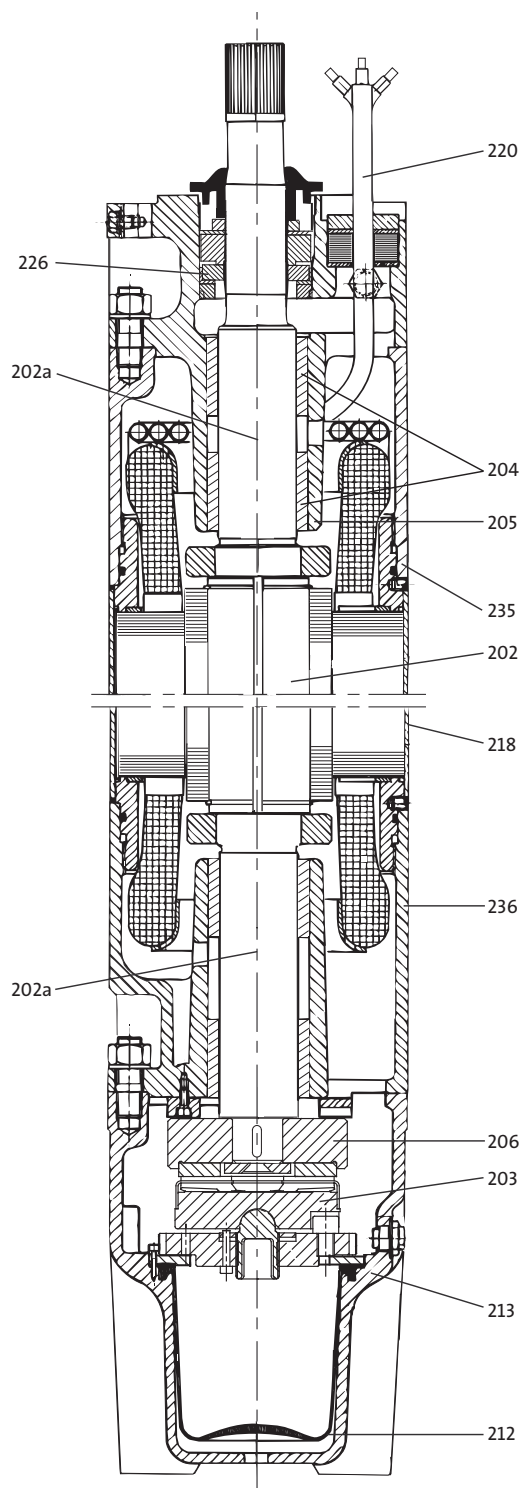


Fig. 68 MMS 10000

Material specification

MMS motors, submersible rewindable versions

Pos.	Component	Material	[AISI (EN)]
202	Shaft	Steel	(1.0533)
202a	Shaft ends	Stainless steel	316/329 (1.4401/1.4460)
203/ 206	Thrust bearing Stationary/ rotating part	6", 0.5 - 20 Hp 6", 25-50 Hp 8" - 10"	Hardened steel/EPDM Ceramic/ carbon
204	Bearing bush	6" - 10"	Carbon
205	Bearing housing, upper	Cast iron	A126 Class B
212	Diaphragm	CR	
213	Motor end shield	Cast iron	A126 Class B
218	Motor sleeve	Stainless steel	304 (1.4301)
220	Motor cable	EPDM	
226	Shaft seal	SiC/SiC	
235	Intermediate housing	Cast iron	A126 Class B
236	Bearing housing, lower	Cast iron	A126 Class B

MMS motors, N and R versions

Pos.	Component	Material	Version	
			N	R*
			[AISI (EN)]	
202	Shaft	Steel	(1.0533)	
202a	Shaft ends	Stainless steel	316/329 (1.4401/ 1.4460)	318LN (1.4462)
203/ 206	Thrust bearing	6", 0.5 - 20 Hp	Hardened steel/EPDM	
	Stationary/ rotating part	6", 25-50 Hp	Ceramic/ carbon	
		8" - 10"		
204	Bearing bush	6" - 10"	Carbon	
205	Bearing housing, upper	Stainless steel	316 (1.4401)	904L (1.4539)
212	Diaphragm	CR		
213	Motor end shield	Stainless steel	316 (1.4401)	904L (1.4539)
218	Motor sleeve	Stainless steel	316 (1.4401)	904L (1.4539)
220	Motor cable	EPDM		
226	Shaft seal	SiC/SiC		
235	Intermediate housing	Stainless steel	316 (1.4401)	904L (1.4539)
236	Bearing housing, lower	Stainless steel	316 (1.4401)	904L (1.4539)

* Only MMS 6 and MMS 8000 are available in R versions

15. SP operating conditions

Operating conditions

Flow rate, Q: 0.44 - 1475 gpm (0.1 - 335 m³/h).
Head, H: Maximum 2657 ft (810 m).

Maximum liquid temperature

Motor	Installation		
	Flow velocity past motor	Vertical [°F (°C)]	Horizontal [°F (°C)]
Grundfos MS 4" and MS 6000C T-40 versions	0.49 fps (0.15 m/s)	104 (40)	104 (40)
Grundfos 4" MS industry versions	0.49 fps (0.15 m/s)	140 (60)	140 (60)
Grundfos MS 6000C T60-versions	3.28 fps (1.0 m/s)	140 (60)	140 (60)
Grundfos MMS 6" to 12" rewindable with PVC in the windings	0.49 fps (0.15 m/s)	77 (25)	77 (25)
	1.64 fps (0.50 m/s)	86 (30)	86 (30)
Grundfos MMS 6" to 12" rewindable with PE/PA in the windings	0.49 fps (0.15 m/s)	104 (40)	104 (40)
	1.64 fps (0.50 m/s)	113 (45)	113 (45)

Note: For MMS 6, 50 Hp; MMS 8000, 150 Hp; the maximum liquid temperature is 9 °F (5 °C) lower than the values stated in the table. For MMS 10000, 250 Hp, the temperature is 18 °F (10 °C) lower.

Operating pressure

Motor	Maximum operating pressure
Grundfos MS 4" and 6"	870 psi (6 Mpa) (60 bar)
Grundfos MMS 6" to 10" rewindable	

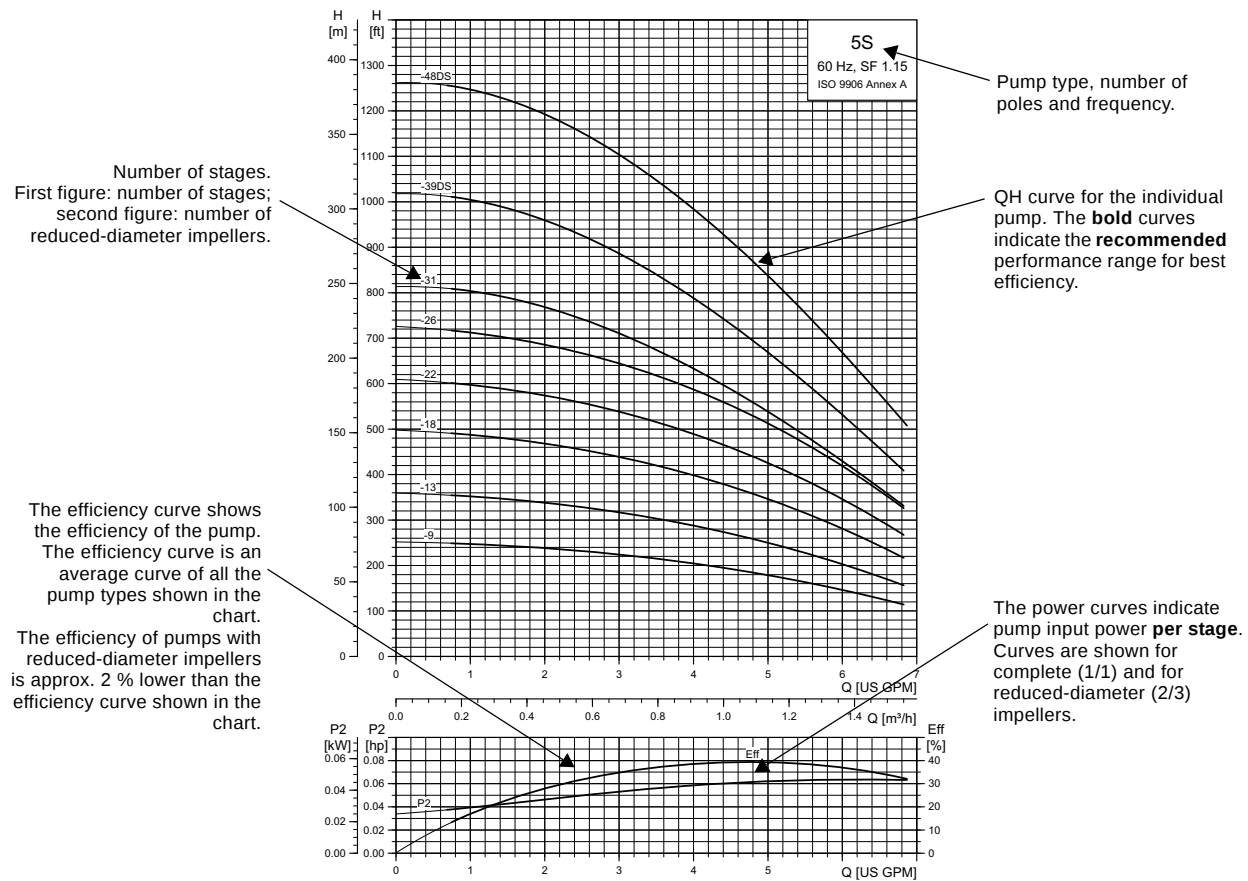
Curve conditions

The conditions below apply to the curves in section [17. SP curve charts and technical data](#):

General

- Curve tolerances according to ISO 9906, Annex A.
- The performance curves show pump performance at actual speed, cf. standard motor range.
The speeds of the motors are approximately these:
4" motors: n = 3470 rpm
6" motors: n = 3460 rpm
8" motors: n = 3480 rpm
10" motors: n = 3520 rpm
- The measurements were made with airless water at a temperature of 68 °F (20 °C). The curves apply to a kinematic viscosity of 1 mm²/s (1 cSt). When pumping liquids with a density higher than that of water, use motors with correspondingly higher outputs.
- The **bold** curves indicate the recommended performance range.
- The performance curves are inclusive of possible losses such as check valve loss.
- **Q/H:** The curves are inclusive of valve and inlet losses at the actual speed.
Operation without check valve will increase the actual head at rated performance by 1.6 ft to 3.3 ft (0.5 m to 1.0 m).
- **NPSH:** The curve is inclusive of pressure loss in the suction interconnector and shows required inlet pressure.
- **Power curve:** P₂ shows pump power input [Hp] at the actual speed of each individual pump size.
- **Efficiency curve:** Eta shows pump stage efficiency. If Eta for the actual pump size is needed, please consult Grundfos Product Center.

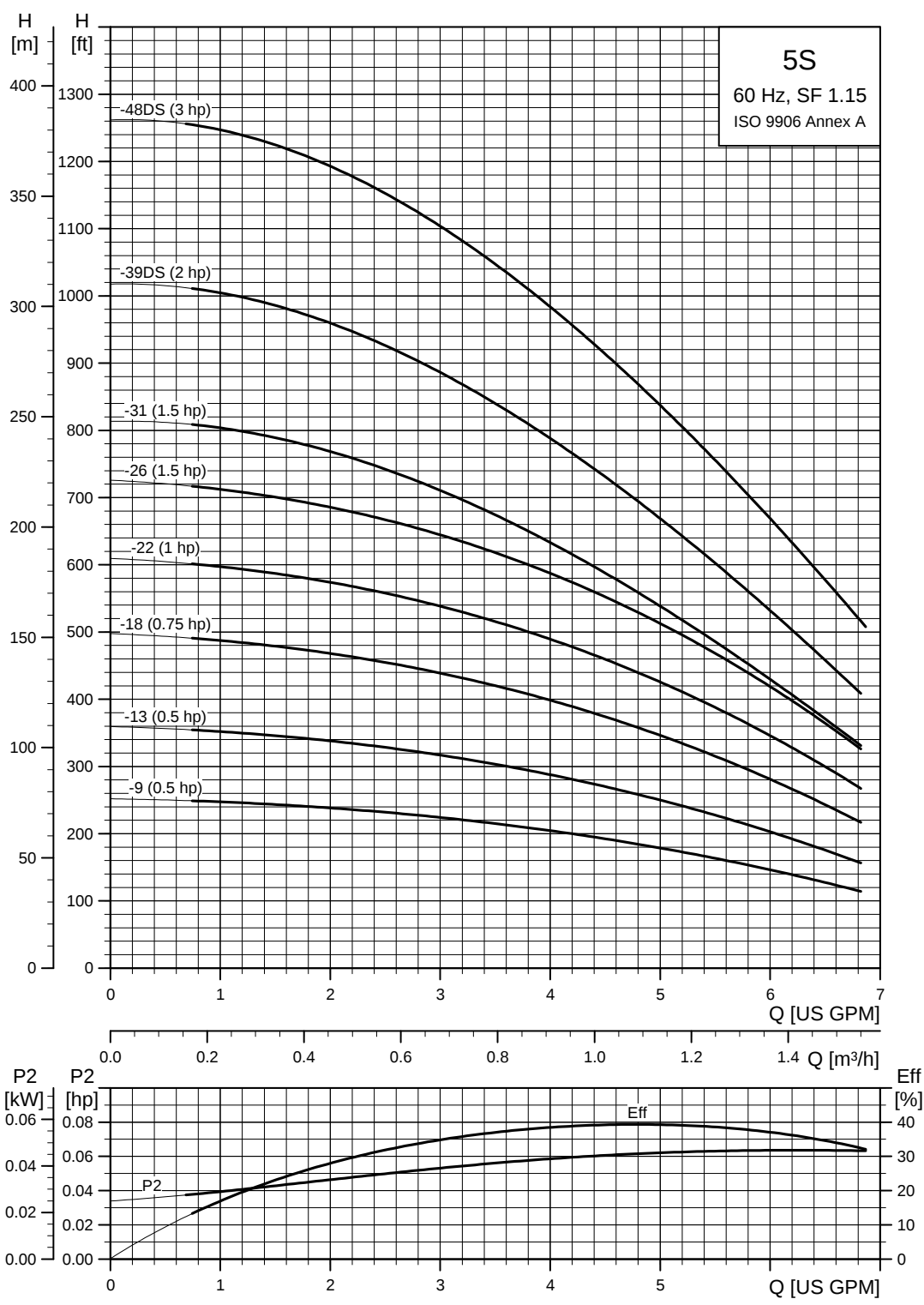
16. How to read the curve charts



TM05 0229 10112

17. SP curve charts and technical data

4" and larger wells
SP 5S (5 gpm)



TM05 0229 2112

4" and larger wells - continued

SP 5S (5 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]		
					A	B	C	D	E			
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]			
5S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 5 gpm (1" NPT)												
5S05-9	171	1	230	0.5	■	24.57 (624)	11.03 (280)	13.55 (344)	3.74 (95)	3.98 (101)	21.6	
5S05-13	247	1	115	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.98 (101)	26.9	
			230	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.98 (101)	26.1	
5S07-18	343	1	230	0.75	■	32.60 (828)	11.62 (295)	20.99 (533)	3.74 (95)	3.98 (101)	29.7	
5S10-22	419	1	230	1	■	36.50 (927)	12.21 (310)	24.30 (617)	3.74 (95)	3.98 (101)	32.4	
5S15-26	495	1	230	1.5	■	41.30 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.98 (101)	41.4	
5S15-31	527	1	230	1.5	■	47.21 (1199)	13.71 (348)	33.51 (851)	3.74 (95)	3.98 (101)	47.7	
5S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 5 gpm (1" NPT)												
5S05-9	171	1	230	0.5	■	24.57 (624)	11.03 (280)	13.55 (344)	3.74 (95)	3.98 (101)	22.5	
5S05-13	247	1	115	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.98 (101)	26.9	
			230	0.5	■	27.88 (708)	11.03 (280)	16.86 (428)	3.74 (95)	3.98 (101)	25.2	
5S07-18	343	1	230	0.75	■	32.60 (828)	11.62 (295)	20.99 (533)	3.74 (95)	3.98 (101)	28.8	
5S10-22	419	1	230	1	■	36.50 (927)	12.21 (310)	24.30 (617)	3.74 (95)	3.98 (101)	32.4	
5S15-26	495	3	1	230	1.5	■	41.30 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.98 (101)	37.8
			230	1.5	■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.98 (101)	38.7	
			460	1.5	■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.98 (101)	38.7	
5S15-31	527	3	1	230	1.5	■	47.21 (1199)	13.71 (348)	33.51 (851)	3.74 (95)	3.98 (101)	47.7
			230	1.5	■	45.71 (1161)	12.21 (310)	33.51 (851)	3.74 (95)	3.98 (101)	45.0	
			460	1.5	■	45.71 (1161)	12.21 (310)	33.51 (851)	3.74 (95)	3.98 (101)	45.0	
5S20-39DS	663	3	1	230	2	●	59.61 (1514)	19.49 (495)	40.12 (1019)	3.74 (95)	4.25 (108)	57.6
			230	2	■	53.82 (1367)	13.71 (348)	40.12 (1019)	3.74 (95)	4.25 (108)	54.0	
			460	2	■	53.82 (1367)	13.71 (348)	40.12 (1019)	3.74 (95)	4.25 (108)	54.0	
5S30-48DS	816	3	1	230	3	●	70.16 (1782)	22.60 (574)	47.56 (1208)	3.74 (95)	4.25 (108)	77.4
			230	3	●	65.56 (1665)	18.00 (457)	47.56 (1208)	3.74 (95)	4.25 (108)	77.4	
			460	3	●	65.56 (1665)	18.00 (457)	47.56 (1208)	3.74 (95)	4.25 (108)	77.4	

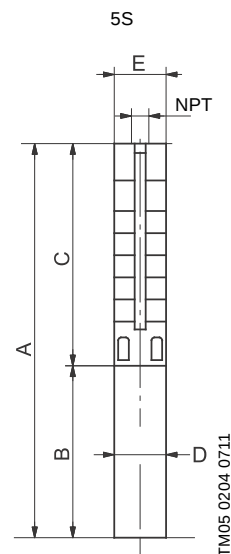
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

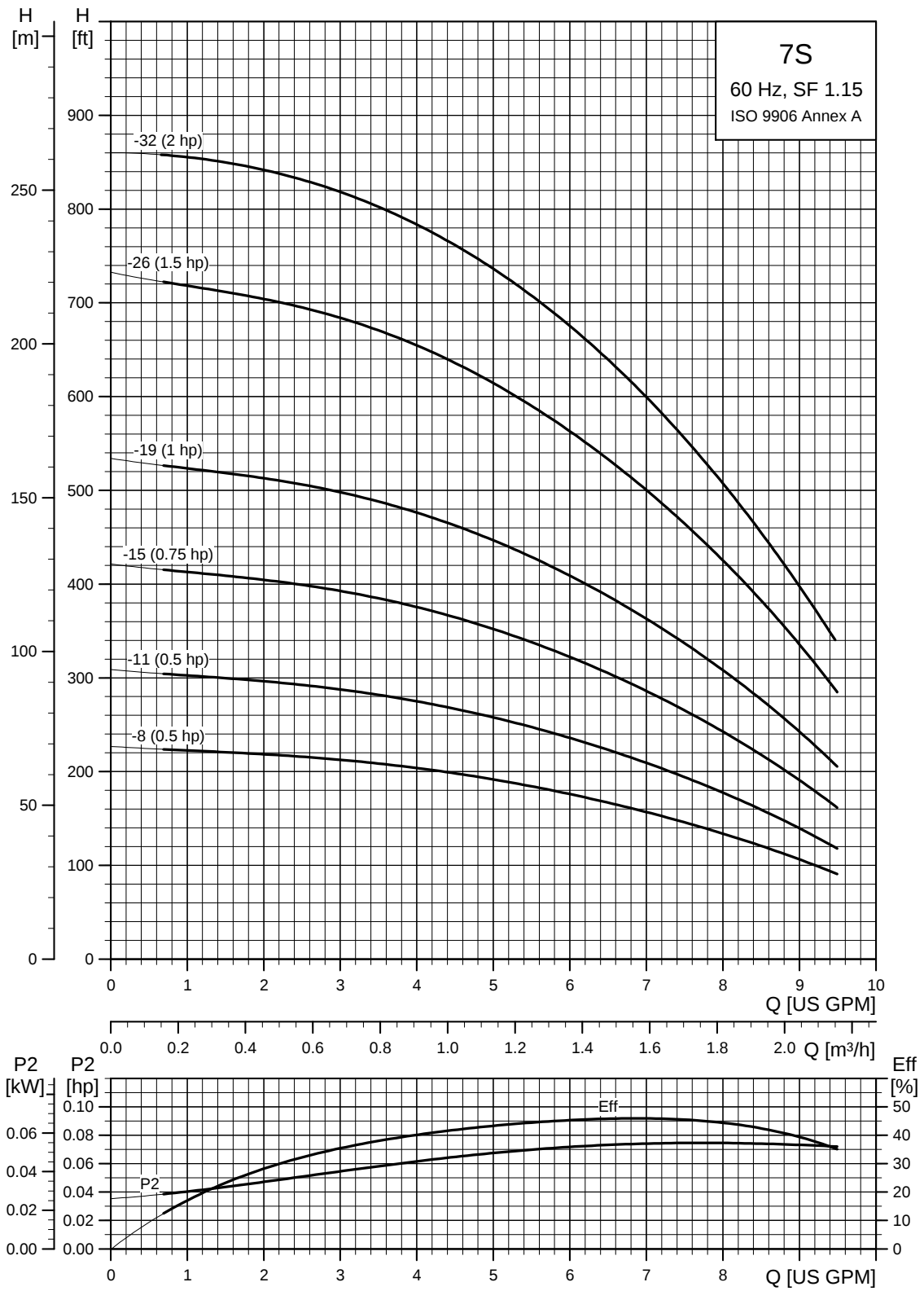
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 7S (7 gpm)



TM05 0982 2112

4" and larger wells - continued

SP 7S (7 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
7S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 7 gpm (1" NPT)											
7S05-8	151	1	230	.5 ■	23.75 (603)	11.03 (280)	12.72 (323)	3.74 (95)	3.98 (101)	21.6	
7S05-11	208	1	115	.5 ■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.98 (101)	29.7	
			230	.5 ■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.98 (101)	24.3	
7S07-15	283	1	230	.75 ■	30.12 (765)	11.62 (295)	18.51 (470)	3.74 (95)	3.98 (101)	29.7	
7S10-19	358	1	230	1 ■	34.02 (864)	12.21 (310)	21.82 (554)	3.74 (95)	3.98 (101)	32.4	
7S15-26	491	1	230	1.5 ■	41.3 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.98 (101)	41.4	
7S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 7 gpm (1" NPT)											
7S05-8	151	1	230	.5 ■	23.75 (603)	11.03 (280)	12.72 (323)	3.74 (95)	3.98 (101)	21.6	
7S05-11	208	1	115	.5 ■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.98 (101)	21.6	
			230	.5 ■	26.23 (666)	11.03 (280)	15.20 (386)	3.74 (95)	3.98 (101)	30.6	
7S07-15	283	1	230	.75 ■	30.12 (765)	11.62 (295)	18.51 (470)	3.74 (95)	3.98 (101)	27.9	
7S10-19	358	1	230	1 ■	34.02 (864)	12.21 (310)	21.82 (554)	3.74 (95)	3.98 (101)	39.6	
7S15-26	491	1	230	1.5 ■	41.30 (1049)	13.71 (348)	27.60 (701)	3.74 (95)	3.98 (101)	38.7	
		3	230	1.5 ■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.98 (101)	38.7	
			460	1.5 ■	39.81 (1011)	12.21 (310)	27.60 (701)	3.74 (95)	3.98 (101)	38.7	
7S20-32	604	1	230	2 ●	52.05 (1322)	19.49 (495)	32.56 (827)	3.74 (95)	3.98 (101)	48.5	
		3	230	2 ■	46.26 (1175)	13.71 (348)	32.56 (827)	3.74 (95)	3.98 (101)	48.5	
			460	2 ■	46.26 (1175)	13.71 (348)	32.56 (827)	3.74 (95)	3.98 (101)	48.5	

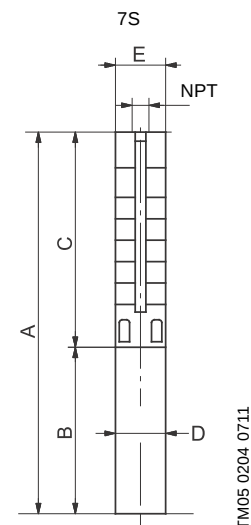
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

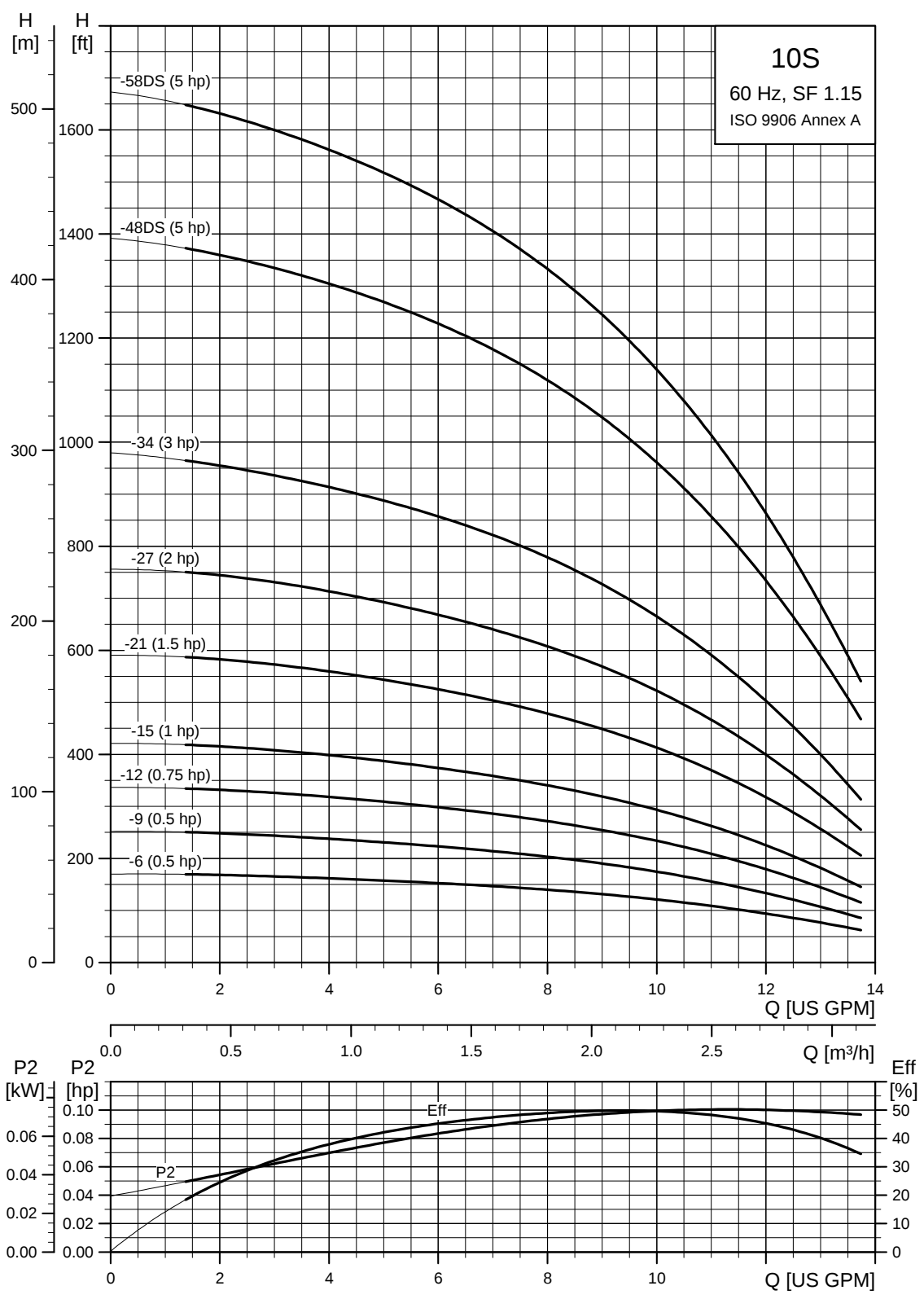
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 10S (10 gpm)



TM05 0230 1812

4" and larger wells - continued

SP 10S (10 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
10S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 10 gpm (1.25" NPT)											
10S05-6	116	1	230	.5 ■	22.05 (560)	10.99 (279)	11.07 (281)	3.74 (95)	3.98 (101)	20.7	
10S05-9	174	1	115	.5 ■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.98 (101)	24.3	
			230	.5 ■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.98 (101)	23.4	
10S07-12	233	1	230	.75 ■	27.60 (701)	11.58 (294)	16.03 (407)	3.74 (95)	3.98 (101)	24.3	
10S10-15	291	1	230	1 ■	30.67 (779)	12.17 (309)	18.51 (470)	3.74 (95)	3.98 (101)	29.7	
10S15-21	407	1	230	1.5 ■	37.17 (944)	13.71 (348)	23.47 (596)	3.74 (95)	3.98 (101)	35.1	
10S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 10 gpm (1.25" NPT)											
10S05-6	116	1	230	.5 ■	24.77 (629)	13.71 (348)	11.07 (281)	3.74 (95)	3.98 (101)	21.6	
10S05-9	174	1	115	.5 ■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.98 (101)	25.4	
			230	.5 ■	24.53 (623)	10.99 (279)	13.55 (344)	3.74 (95)	3.98 (101)	24.3	
10S07-12	233	1	230	.75 ■	27.60 (701)	11.58 (294)	16.03 (407)	3.74 (95)	3.98 (101)	28.8	
10S10-15	291	1	230	1 ■	30.67 (779)	12.17 (309)	18.51 (470)	3.74 (95)	3.98 (101)	29.7	
10S15-21	407	3	230	1.5 ■	37.17 (944)	13.71 (348)	23.47 (596)	3.74 (95)	3.98 (101)	35.1	
			230	1.5 ■	35.63 (905)	12.17 (309)	23.47 (596)	3.74 (95)	3.98 (101)	32.4	
			460	1.5 ■	35.63 (905)	12.17 (309)	23.47 (596)	3.74 (95)	3.98 (101)	36.0	
10S20-27	524	3	230	2 ●	47.92 (1217)	19.49 (495)	28.43 (722)	3.74 (95)	3.98 (101)	45.9	
			230	2 ■	42.13 (1070)	13.71 (348)	28.43 (722)	3.74 (95)	3.98 (101)	44.1	
			460	2 ■	42.13 (1070)	13.71 (348)	28.43 (722)	3.74 (95)	3.98 (101)	44.1	
10S30-34	659	3	230	3 ●	58.59 (1488)	22.6 (574)	35.99 (914)	3.74 (95)	3.98 (101)	81.9	
			230	3 ●	53.98 (1371)	18.00 (457)	35.99 (914)	3.74 (95)	3.98 (101)	74.7	
			460	3 ●	53.98 (1371)	18.00 (457)	35.99 (914)	3.74 (95)	3.98 (101)	74.7	
10S50-48DS	931	3	230	5 ●	74.18 (1884)	26.62 (676)	47.56 (1208)	3.74 (95)	4.25 (108)	103.5	
			230	5 ●	70.16 (1782)	22.60 (574)	47.56 (1208)	3.74 (95)	4.25 (108)	103.5	
			460	5 ●	70.16 (1782)	22.60 (574)	47.56 (1208)	3.74 (95)	4.25 (108)	103.5	
10S50-58DS	1124	3	230	5 ●	89.49 (2272)	26.62 (676)	62.88 (1597)	3.74 (95)	4.25 (108)	132.3	
			230	5 ●	85.48 (2171)	22.60 (574)	62.88 (1597)	3.74 (95)	4.25 (108)	132.3	
			460	5 ●	85.48 (2171)	22.60 (574)	62.88 (1597)	3.74 (95)	4.25 (108)	132.3	

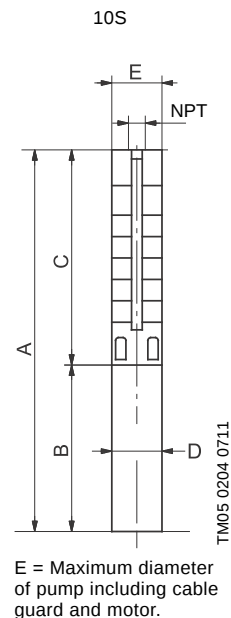
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

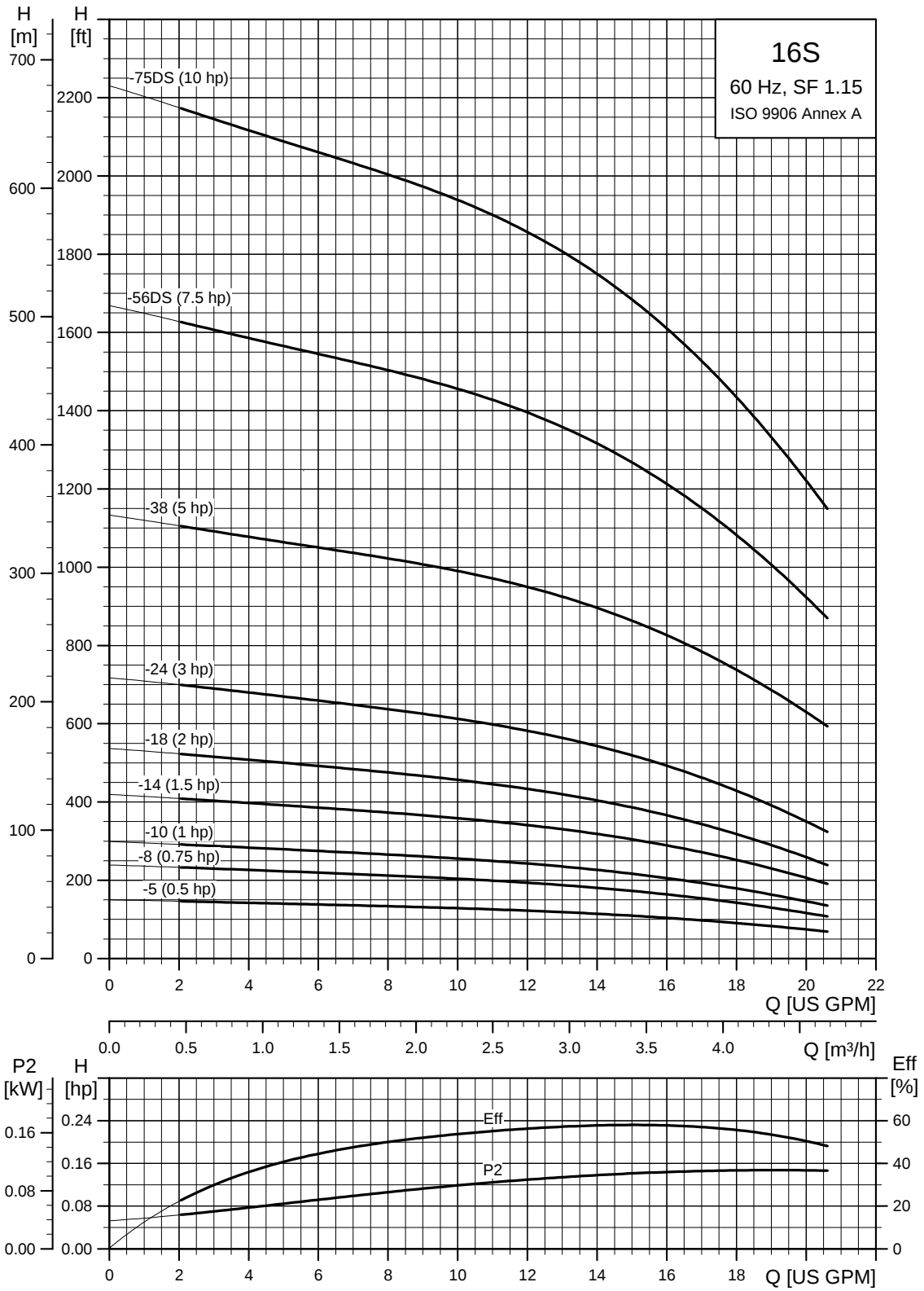
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 16S (16 gpm)

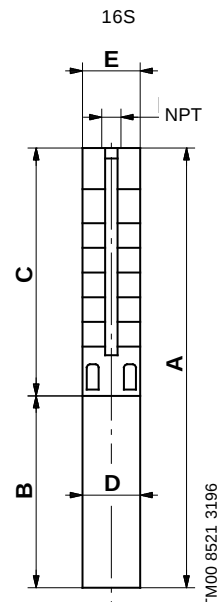


TM05 0231 0112

4" and larger wells - continued

SP 16S (16 gpm) / 4, 6 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
16S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 16 gpm (1.25" NPT)										
16S05-5	102	1	115	.5 ■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.98 (101)	21.6
			230	.5 ■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.98 (101)	23.4
16S07-8	162	1	230	.75 ■	24.34 (618)	11.62 (295)	12.72 (323)	3.74 (95)	3.98 (101)	24.3
16S10-10	203	1	230	1 ■	26.58 (675)	12.21 (310)	14.38 (365)	3.74 (95)	3.98 (101)	27.9
16S15-14	284	1	230	1.5 ■	31.38 (797)	13.71 (348)	17.68 (449)	3.74 (95)	3.98 (101)	36.0
16S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 16 gpm (1.25" NPT)										
16S05-5	102	1	115	.5 ■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.98 (101)	21.6
			230	.5 ■	21.26 (540)	11.03 (280)	10.24 (260)	3.74 (95)	3.98 (101)	21.6
16S07-8	162	1	230	.75 ■	24.34 (618)	11.62 (295)	12.72 (323)	3.74 (95)	3.98 (101)	27.0
16S10-10	203	1	230	1 ■	26.58 (675)	12.21 (310)	14.38 (365)	3.74 (95)	3.98 (101)	27.9
16S15-14	284	1	230	1.5 ●	31.38 (797)	13.71 (348)	17.68 (449)	3.74 (95)	3.98 (101)	32.4
		3	230	1.5 ■	29.89 (759)	12.21 (310)	17.68 (449)	3.74 (95)	3.98 (101)	28.8
			460	1.5 ■	29.89 (759)	12.21 (310)	17.68 (449)	3.74 (95)	3.98 (101)	28.8
16S20-18	366	1	230	2 ●	40.48 (1028)	19.49 (495)	20.99 (533)	3.74 (95)	3.98 (101)	36.0
		3	230	2 ■	34.69 (881)	13.71 (348)	20.99 (533)	3.74 (95)	3.98 (101)	36.0
			460	2 ■	34.69 (881)	13.71 (348)	20.99 (533)	3.74 (95)	3.98 (101)	36.0
16S30-24	487	1	230	3 ●	48.55 (1233)	22.60 (574)	25.95 (659)	3.74 (95)	3.98 (101)	62.1
		3	230	3 ●	43.94 (1116)	18.00 (457)	25.95 (659)	3.74 (95)	3.98 (101)	57.6
			460	3 ●	43.94 (1116)	18.00 (457)	25.95 (659)	3.74 (95)	3.98 (101)	57.6
16S50-38	814	1	230	5 ●	65.91 (1674)	26.62 (676)	39.30 (998)	3.74 (95)	3.98 (101)	97.2
		3	230	5 ●	62.01 (1575)	22.72 (577)	39.30 (998)	3.74 (95)	3.98 (101)	90.0
			460	5 ●	62.01 (1575)	22.72 (577)	39.30 (998)	3.74 (95)	3.98 (101)	90.0
SP 16S, motor dia. 6 inch, 60 Hz - rated flow 16 gpm (1.25" NPT)										
16S75-56DS	1200	3	230	7.5 ▲	92.28 (2344)	23.50 (597)	68.78 (1747)	5.63 (143)	5.51 (140)	165.1
			460	7.5 ▲	92.28 (2344)	23.50 (597)	68.78 (1747)	5.63 (143)	5.51 (140)	165.1
16S100-75DS	1607	3	460	10 ▲	109.18 (2773)	24.69 (627)	84.49 (2146)	5.63 (143)	5.51 (140)	190.0



E = Maximum diameter of pump including cable guard and motor.

Notes:

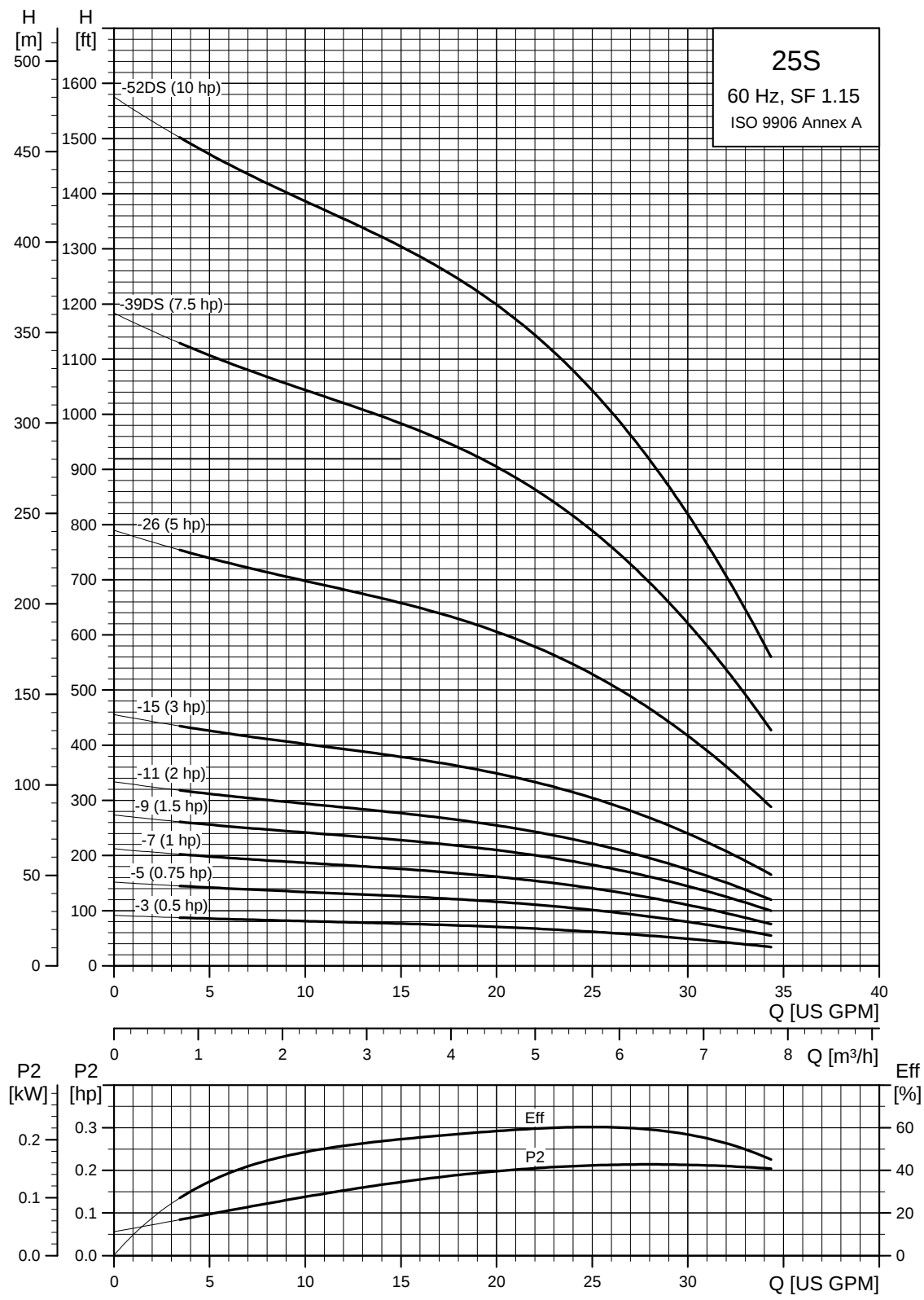
Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.
- ▲ MS 6000C motor.

4" and larger wells - continued
SP 25S (25 gpm)



TM05 0232 1812

4" and larger wells - continued

SP 25S (25 gpm) / 4, 6 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
25S, motor dia. 4 inch, 2 wire motor, 60 Hz - rated flow 25 gpm (1.5" NPT)										
25S05-3	60	1	115	.5 ■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.98 (101)	21.6
			230	.5 ■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.98 (101)	21.6
25S07-5	99	1	230	.75 ■	21.86 (555)	11.62 (295)	10.24 (260)	3.74 (95)	3.98 (101)	23.4
25S10-7	139	1	230	1 ■	24.10 (612)	12.21 (310)	11.89 (302)	3.74 (95)	3.98 (101)	25.2
25S15-9	179	1	230	1.5 ■	27.25 (692)	13.71 (348)	13.55 (344)	3.74 (95)	3.98 (101)	28.8
25S, motor dia. 4 inch, 3 wire motor, 60 Hz - rated flow 25 gpm (1.5" NPT)										
25S05-3	60	1	115	.5 ■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.98 (101)	21.6
			230	.5 ■	19.61 (498)	11.03 (280)	8.59 (218)	3.74 (95)	3.98 (101)	21.6
25S07-5	99	1	230	.75 ■	21.86 (555)	11.62 (295)	10.24 (260)	3.74 (95)	3.98 (101)	23.4
25S10-7	139	1	230	1 ■	24.10 (612)	12.21 (310)	11.89 (302)	3.74 (95)	3.98 (101)	25.2
25S15-9	179	1	230	1.5 ■	27.25 (692)	13.71 (348)	13.55 (344)	3.74 (95)	3.98 (101)	29.7
			230	1.5 ■	25.75 (654)	12.21 (310)	13.55 (344)	3.74 (95)	3.98 (101)	27.0
		3	460	1.5 ■	25.75 (654)	12.21 (310)	13.55 (344)	3.74 (95)	3.98 (101)	28.8
			1	230	2 ●	34.69 (881)	19.49 (495)	15.20 (386)	3.74 (95)	3.98 (101)
25S20-11	219	3	230	2 ■	28.90 (734)	13.71 (348)	15.20 (386)	3.74 (95)	3.98 (101)	37.0
			460	2 ■	28.90 (734)	13.71 (348)	15.20 (386)	3.74 (95)	3.98 (101)	33.3
25S30-15	298	1	230	3 ●	41.11 (1044)	22.60 (574)	18.51 (470)	3.74 (95)	3.98 (101)	61.2
			230	3 ●	36.50 (927)	18.00 (457)	18.51 (470)	3.74 (95)	3.98 (101)	53.1
		3	460	3 ●	36.50 (927)	18.00 (457)	18.51 (470)	3.74 (95)	3.98 (101)	53.1
			1	230	5 ●	54.22 (1377)	26.62 (676)	27.60 (701)	3.74 (95)	3.98 (101)
25S50-26	517	3	230	5 ●	50.32 (1278)	22.72 (577)	27.60 (701)	3.74 (95)	3.98 (101)	72.9
			460	5 ●	50.32 (1278)	22.72 (577)	27.60 (701)	3.74 (95)	3.98 (101)	72.9
SP 25S, motor dia. 6 inch, 60 Hz - rated flow 25 gpm (1.5" NPT)										
25S75-39DS	775	3	230	7.5 ▲	66.06 (1678)	23.50 (597)	42.56 (1081)	5.63 (143)	5.43 (138)	122.1
			460	7.5 ▲	66.06 (1678)	23.50 (597)	42.56 (1081)	5.63 (143)	5.43 (138)	122.1
25S100-52DS	1034	3	460	10 ▲	90.17 (2290)	24.69 (627)	65.48 (1663)	5.63 (143)	5.51 (140)	163.1

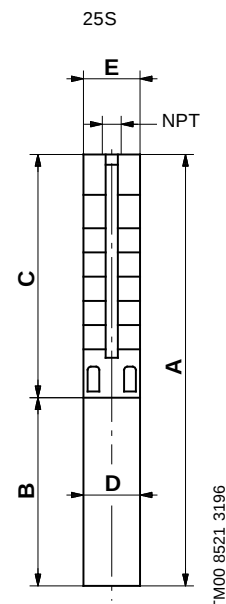
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

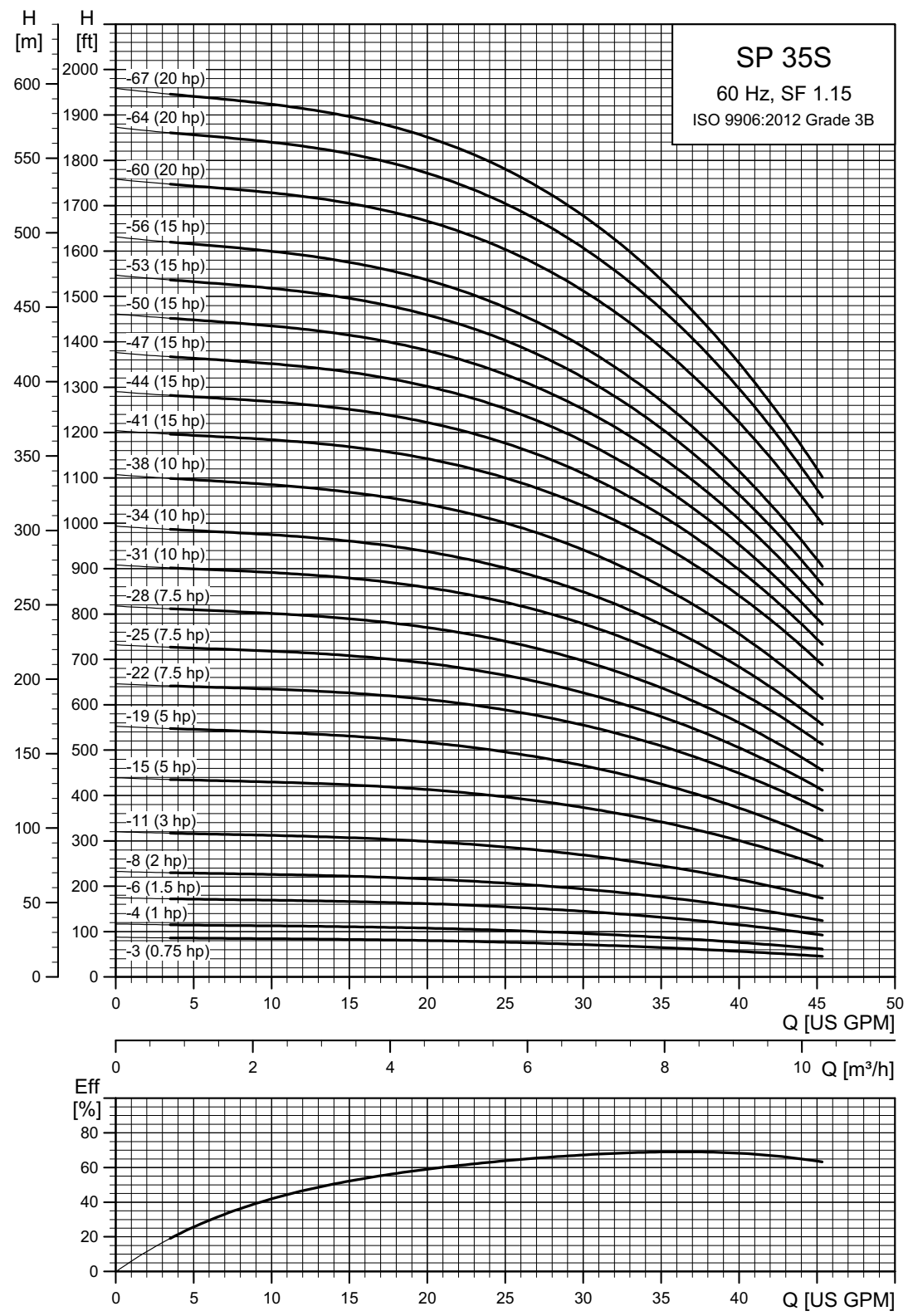
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.
- ▲ MS 6000C motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 35S (35 gpm)



TM06 4614 3215

4" and larger wells - continued

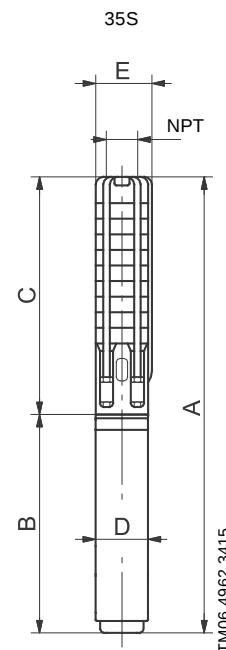
SP 35S (35 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
35S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 35 gpm (1 1/2" NPT)										
35S07-3	63	1	230	.75 ■	28.35 (720)	13.08 (332)	15.28 (388)	3.75 (95)	3.98 (101)	29.9
		3	230	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.9
		3	460	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.9
		3	575	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.9
35S10-4	85	1	230	1 ■	30.91 (785)	13.67 (347)	17.25 (438)	3.75 (95)	3.98 (101)	32.8
		3	230	1 ■	29.73 (755)	12.49 (317)	17.25 (438)	3.75 (95)	3.98 (101)	30.1
		3	460	1 ■	29.73 (755)	12.49 (317)	17.25 (438)	3.75 (95)	3.98 (101)	29.9
		3	575	1 ■	29.73 (755)	12.49 (317)	17.25 (438)	3.75 (95)	3.98 (101)	29.9
35S15-6	130	1	230	1.5 ■	36.42 (925)	15.24 (387)	21.19 (538)	3.75 (95)	3.98 (101)	39.1
		3	230	1.5 ■	34.85 (885)	13.67 (347)	21.19 (538)	3.75 (95)	3.98 (101)	35.5
		3	460	1.5 ■	34.85 (885)	13.67 (347)	21.19 (538)	3.75 (95)	3.98 (101)	35.5
		3	575	1.5 ■	34.85 (885)	13.67 (347)	21.19 (538)	3.75 (95)	3.98 (101)	35.3
35S20-8	175	1	230	2 ●	44.69 (1135)	19.57 (497)	25.12 (638)	3.75 (95)	3.98 (101)	57.3
		3	230	2 ■	40.36 (1025)	15.24 (387)	25.12 (638)	3.75 (95)	3.98 (101)	41.9
		3	460	2 ■	40.36 (1025)	15.24 (387)	25.12 (638)	3.75 (95)	3.98 (101)	42.1
		3	575	2 ■	40.36 (1025)	15.24 (387)	25.12 (638)	3.75 (95)	3.98 (101)	41.9
35S30-11	242	1	230	3 ●	53.75 (1365)	22.72 (577)	31.03 (788)	3.75 (95)	3.98 (101)	69.9
		3	208-230	3 ●	49.02 (1245)	18.00 (457)	31.03 (788)	3.75 (95)	3.98 (101)	56.7
		3	460	3 ●	49.02 (1245)	18.00 (457)	31.03 (788)	3.75 (95)	3.98 (101)	56.7
35S50-15	331	1	230	5 ●	65.56 (1665)	26.66 (677)	38.90 (988)	3.75 (95)	3.98 (101)	86.1
		3	208-230	5 ●	61.62 (1565)	22.72 (577)	38.90 (988)	3.75 (95)	3.98 (101)	75.1
		3	460	5 ●	61.62 (1565)	22.72 (577)	38.90 (988)	3.75 (95)	3.98 (101)	75.1
35S50-19	420	1	230	5 ●	73.43 (1865)	26.66 (677)	46.78 (1188)	3.75 (95)	3.98 (101)	91.2
		3	208-230	5 ●	69.49 (1765)	22.72 (577)	46.78 (1188)	3.75 (95)	3.98 (101)	80.2
		3	460	5 ●	69.49 (1765)	22.72 (577)	46.78 (1188)	3.75 (95)	3.98 (101)	80.2
35S75-22	487	3	208-230	7.5 ●	79.34 (2015)	26.66 (677)	52.68 (1338)	3.75 (95)	3.98 (101)	95.0
		3	460	7.5 ●	79.34 (2015)	26.66 (677)	52.68 (1338)	3.75 (95)	3.98 (101)	95.0
		3	575	7.5 ●	79.34 (2015)	26.66 (677)	52.68 (1338)	3.75 (95)	3.98 (101)	95.0
35S75-25	554	3	208-230	7.5 ●	85.24 (2165)	26.66 (677)	58.59 (1488)	3.75 (95)	3.98 (101)	98.9
		3	460	7.5 ●	85.24 (2165)	26.66 (677)	58.59 (1488)	3.75 (95)	3.98 (101)	98.9
		3	575	7.5 ●	85.24 (2165)	26.66 (677)	58.59 (1488)	3.75 (95)	3.98 (101)	98.9
35S75-28	621	3	208-230	7.5 ●	91.15 (2315)	26.66 (677)	64.49 (1638)	3.75 (95)	3.98 (101)	102.7
		3	460	7.5 ●	91.15 (2315)	26.66 (677)	64.49 (1638)	3.75 (95)	3.98 (101)	102.7
		3	575	7.5 ●	91.15 (2315)	26.66 (677)	64.49 (1638)	3.75 (95)	3.98 (101)	102.7
35S100-31	688	3	460	10 ●	100.99 (2565)	30.60 (777)	70.40 (1788)	3.75 (95)	3.98 (101)	115.4
		3	575	10 ●	100.99 (2565)	30.60 (777)	70.40 (1788)	3.75 (95)	3.98 (101)	115.4
35S100-34	755	3	460	10 ●	106.89 (2715)	30.60 (777)	76.30 (1938)	3.75 (95)	3.98 (101)	119.2
		3	575	10 ●	106.89 (2715)	30.60 (777)	76.30 (1938)	3.75 (95)	3.98 (101)	119.2
35S100-38	844	3	460	10 ●	114.77 (2915)	30.60 (777)	84.18 (2138)	3.75 (95)	3.98 (101)	124.3
		3	575	10 ●	114.77 (2915)	30.60 (777)	84.18 (2138)	3.75 (95)	3.98 (101)	124.3

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

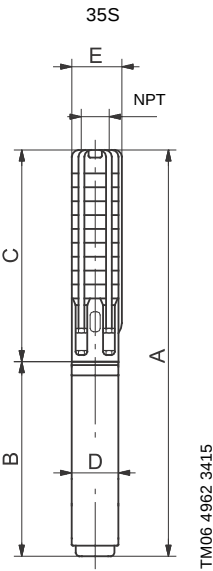
- MS 402 motor.
- MS 4000 motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 35S (35 gpm) / 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
35S - Motor dia. 6 inch, 60 Hz, rated flow 35 gpm (1 1/2" NPT)										
35S75-22	487	3	208-230	7.5 ▲	78.67 (1998)	23.51 (597)	55.16 (1401)	5.50 (140)	5.50 (140)	123.6
		3	460	7.5 ▲	78.67 (1998)	23.51 (597)	55.16 (1401)	5.50 (140)	5.50 (140)	123.6
		3	575	7.5 ▲	78.67 (1998)	23.51 (597)	55.16 (1401)	5.50 (140)	5.50 (140)	123.6
35S75-25	554	3	208-230	7.5 ▲	84.57 (2148)	23.51 (597)	61.07 (1551)	5.50 (140)	5.50 (140)	127.5
		3	460	7.5 ▲	84.57 (2148)	23.51 (597)	61.07 (1551)	5.50 (140)	5.50 (140)	127.5
		3	575	7.5 ▲	84.57 (2148)	23.51 (597)	61.07 (1551)	5.50 (140)	5.50 (140)	127.5
35S75-28	621	3	208-230	7.5 ▲	90.48 (2298)	23.51 (597)	66.97 (1701)	5.50 (140)	5.50 (140)	131.4
		3	460	7.5 ▲	90.48 (2298)	23.51 (597)	66.97 (1701)	5.50 (140)	5.50 (140)	131.4
		3	575	7.5 ▲	90.48 (2298)	23.51 (597)	66.97 (1701)	5.50 (140)	5.50 (140)	131.4
35S100-31	688	3	208-230	10 ▲	97.56 (2478)	24.69 (627)	72.88 (1851)	5.50 (140)	5.50 (140)	142.0
		3	460	10 ▲	97.56 (2478)	24.69 (627)	72.88 (1851)	5.50 (140)	5.50 (140)	142.0
		3	575	10 ▲	97.56 (2478)	24.69 (627)	72.88 (1851)	5.50 (140)	5.50 (140)	142.0
35S100-34	755	3	208-230	10 ▲	103.47 (2628)	24.69 (627)	78.78 (2001)	5.50 (140)	5.50 (140)	145.9
		3	460	10 ▲	103.47 (2628)	24.69 (627)	78.78 (2001)	5.50 (140)	5.50 (140)	145.9
		3	575	10 ▲	103.47 (2628)	24.69 (627)	78.78 (2001)	5.50 (140)	5.50 (140)	145.9
35S100-38	844	3	208-230	10 ▲	111.34 (2828)	24.69 (627)	86.66 (2201)	5.50 (140)	5.50 (140)	151.1
		3	460	10 ▲	111.34 (2828)	24.69 (627)	86.66 (2201)	5.50 (140)	5.50 (140)	151.1
		3	575	10 ▲	111.34 (2828)	24.69 (627)	86.66 (2201)	5.50 (140)	5.50 (140)	151.1



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.
▲ MS 6000C motor.

4" and larger wells - continued

SP 35S (35 gpm) / 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
35S - Motor dia. 6 inch, 60 Hz, rated flow 35 gpm (2" NPT)										
35S150-41 DS	911	3	208-230	15	▲ 131.23 (3333)	27.05 (687)	104.18 (2646)	5.50 (140)	5.50 (140)	217.3
		3	460	15	▲ 131.23 (3333)	27.05 (687)	104.18 (2646)	5.50 (140)	5.50 (140)	217.3
		3	575	15	▲ 131.23 (3333)	27.05 (687)	104.18 (2646)	5.50 (140)	5.50 (140)	217.3
35S150-44 DS	978	3	208-230	15	▲ 137.13 (3483)	27.05 (687)	110.08 (2796)	5.50 (140)	5.50 (140)	223.1
		3	460	15	▲ 137.13 (3483)	27.05 (687)	110.08 (2796)	5.50 (140)	5.50 (140)	223.1
		3	575	15	▲ 137.13 (3483)	27.05 (687)	110.08 (2796)	5.50 (140)	5.50 (140)	223.1
35S150-47 DS	1044	3	208-230	15	▲ 143.04 (3633)	27.05 (687)	115.99 (2946)	5.50 (140)	5.50 (140)	228.8
		3	460	15	▲ 143.04 (3633)	27.05 (687)	115.99 (2946)	5.50 (140)	5.50 (140)	228.8
		3	575	15	▲ 143.04 (3633)	27.05 (687)	115.99 (2946)	5.50 (140)	5.50 (140)	228.8
35S150-50 DS	1111	3	208-230	15	▲ 148.94 (3783)	27.05 (687)	121.89 (3096)	5.50 (140)	5.50 (140)	234.6
		3	460	15	▲ 148.94 (3783)	27.05 (687)	121.89 (3096)	5.50 (140)	5.50 (140)	234.6
		3	575	15	▲ 148.94 (3783)	27.05 (687)	121.89 (3096)	5.50 (140)	5.50 (140)	234.6
35S150-53 DS	1178	3	208-230	15	▲ 154.85 (3933)	27.05 (687)	127.80 (3246)	5.50 (140)	5.50 (140)	240.3
		3	460	15	▲ 154.85 (3933)	27.05 (687)	127.80 (3246)	5.50 (140)	5.50 (140)	240.3
		3	575	15	▲ 154.85 (3933)	27.05 (687)	127.80 (3246)	5.50 (140)	5.50 (140)	240.3
35S150-56 DS	1245	3	208-230	15	▲ 160.75 (4083)	27.05 (687)	133.71 (3396)	5.50 (140)	5.50 (140)	246.1
		3	460	15	▲ 160.75 (4083)	27.05 (687)	133.71 (3396)	5.50 (140)	5.50 (140)	246.1
		3	575	15	▲ 160.75 (4083)	27.05 (687)	133.71 (3396)	5.50 (140)	5.50 (140)	246.1
35S200-60 DS	1334	3	208-230	20	▲ 171.19 (4348)	29.61 (752)	141.58 (3596)	5.50 (140)	5.50 (140)	269.2
		3	460	20	▲ 171.19 (4348)	29.61 (752)	141.58 (3596)	5.50 (140)	5.50 (140)	269.2
		3	575	20	▲ 171.19 (4348)	29.61 (752)	141.58 (3596)	5.50 (140)	5.50 (140)	269.2
35S200-64 DS	1424	3	208-230	20	▲ 179.06 (4548)	29.61 (752)	149.45 (3796)	5.50 (140)	5.50 (140)	276.9
		3	460	20	▲ 179.06 (4548)	29.61 (752)	149.45 (3796)	5.50 (140)	5.50 (140)	276.9
		3	575	20	▲ 179.06 (4548)	29.61 (752)	149.45 (3796)	5.50 (140)	5.50 (140)	276.9
35S200-67 DS	1491	3	208-230	20	▲ 184.97 (4698)	29.61 (752)	155.36 (3946)	5.50 (140)	5.50 (140)	282.7
		3	460	20	▲ 184.97 (4698)	29.61 (752)	155.36 (3946)	5.50 (140)	5.50 (140)	282.7
		3	575	20	▲ 184.97 (4698)	29.61 (752)	155.36 (3946)	5.50 (140)	5.50 (140)	282.7

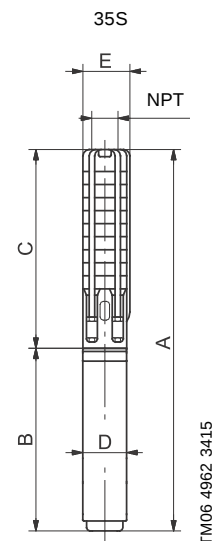
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 2" NPT, 6" minimum well diameter.

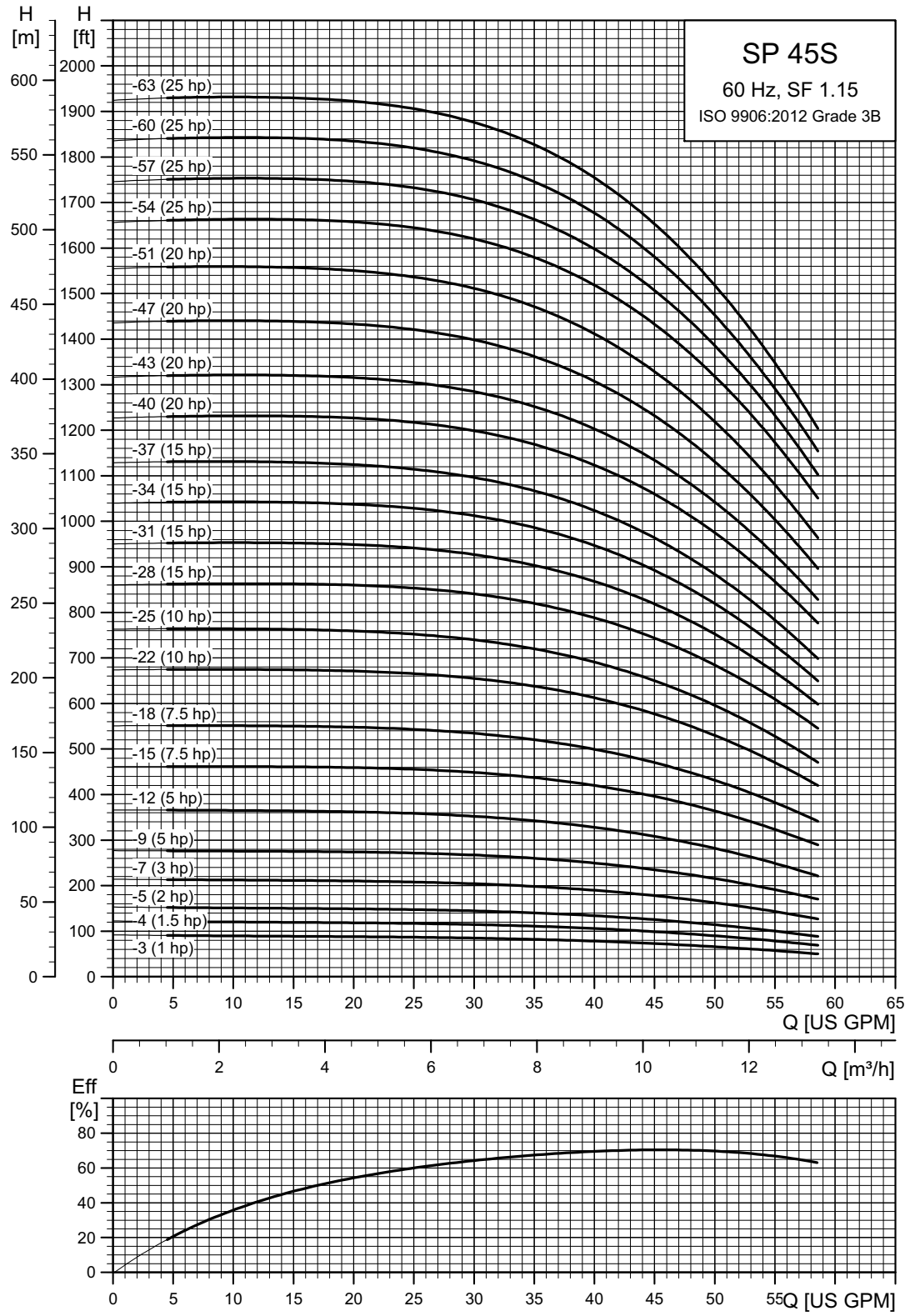
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

▲ MS 6000C motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 45S (45 gpm)



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4" and larger wells - continued

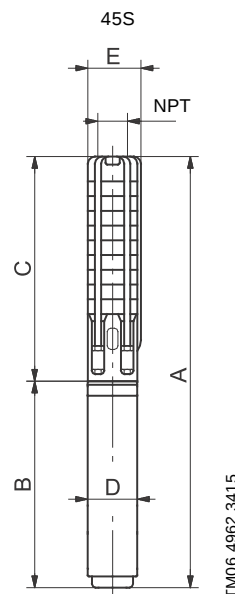
SP 45S (45 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
45S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 45 gpm (2" NPT)										
45S10-3	72	1	230	1 ■	28.94 (735)	13.67 (347)	15.28 (388)	3.75 (95)	3.98 (101)	31.5
		3	230	1 ■	27.76 (705)	12.49 (317)	15.28 (388)	3.75 (95)	3.98 (101)	28.8
		3	460	1 ■	27.76 (705)	12.49 (317)	15.28 (388)	3.75 (95)	3.98 (101)	28.6
		3	575	1 ■	27.76 (705)	12.49 (317)	15.28 (388)	3.75 (95)	3.98 (101)	28.6
45S15-4	97	1	230	1.5 ■	32.49 (825)	15.24 (387)	17.25 (438)	3.75 (95)	3.98 (101)	36.5
		3	230	1.5 ■	30.91 (785)	13.67 (347)	17.25 (438)	3.75 (95)	3.98 (101)	33.0
		3	460	1.5 ■	30.91 (785)	13.67 (347)	17.25 (438)	3.75 (95)	3.98 (101)	33.0
		3	575	1.5 ■	30.91 (785)	13.67 (347)	17.25 (438)	3.75 (95)	3.98 (101)	32.8
45S20-5	123	1	230	2 ●	38.78 (985)	19.57 (497)	19.22 (488)	3.75 (95)	3.98 (101)	53.4
		3	230	2 ■	34.45 (875)	15.24 (387)	19.22 (488)	3.75 (95)	3.98 (101)	38.0
		3	460	2 ■	34.45 (875)	15.24 (387)	19.22 (488)	3.75 (95)	3.98 (101)	38.2
		3	575	2 ■	34.45 (875)	15.24 (387)	19.22 (488)	3.75 (95)	3.98 (101)	38.0
45S30-7	174	1	230	3 ●	45.87 (1165)	22.72 (577)	23.15 (588)	3.75 (95)	3.98 (101)	64.8
		3	208-230	3 ●	41.15 (1045)	18.00 (457)	23.15 (588)	3.75 (95)	3.98 (101)	51.6
		3	460	3 ●	41.15 (1045)	18.00 (457)	23.15 (588)	3.75 (95)	3.98 (101)	51.6
45S50-9	225	1	230	5 ●	53.75 (1365)	26.66 (677)	27.09 (688)	3.75 (95)	3.98 (101)	78.4
		3	208-230	5 ●	49.81 (1265)	22.72 (577)	27.09 (688)	3.75 (95)	3.98 (101)	67.4
		3	460	5 ●	49.81 (1265)	22.72 (577)	27.09 (688)	3.75 (95)	3.98 (101)	67.4
45S50-12	302	1	230	5 ●	59.65 (1515)	26.66 (677)	33.00 (838)	3.75 (95)	3.98 (101)	82.2
		3	208-230	5 ●	55.71 (1415)	22.72 (577)	33.00 (838)	3.75 (95)	3.98 (101)	71.2
		3	460	5 ●	55.71 (1415)	22.72 (577)	33.00 (838)	3.75 (95)	3.98 (101)	71.2
45S75-15	379	3	208-230	7.5 ●	65.56 (1665)	26.66 (677)	38.90 (988)	3.75 (95)	3.98 (101)	86.1
		3	460	7.5 ●	65.56 (1665)	26.66 (677)	38.90 (988)	3.75 (95)	3.98 (101)	86.1
		3	575	7.5 ●	65.56 (1665)	26.66 (677)	38.90 (988)	3.75 (95)	3.98 (101)	86.1
45S75-18	455	3	208-230	7.5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	89.9
		3	460	7.5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	89.9
		3	575	7.5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	89.9
45S100-22	558	3	460	10 ●	83.27 (2115)	30.60 (777)	52.68 (1338)	3.75 (95)	3.98 (101)	103.8
		3	575	10 ●	83.27 (2115)	30.60 (777)	52.68 (1338)	3.75 (95)	3.98 (101)	103.8
45S100-25	634	3	460	10 ●	89.18 (2265)	30.60 (777)	58.59 (1488)	3.75 (95)	3.98 (101)	107.7
		3	575	10 ●	89.18 (2265)	30.60 (777)	58.59 (1488)	3.75 (95)	3.98 (101)	107.7

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

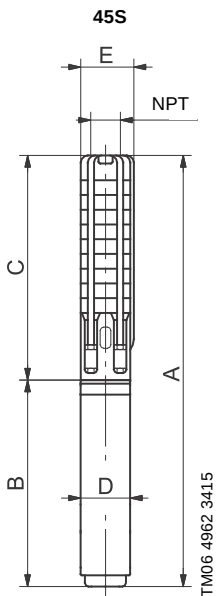
- MS 402 motor.
- MS 4000 motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued SP 45S (45 gpm) / 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
45S - Motor dia. 6 inch, 60 Hz, rated flow 45 gpm (2" NPT)										
45S75-15	379	3	208-230	7.5 ▲	64.89 (1648)	23.51 (597)	41.38 (1051)	5.50 (140)	5.50 (140)	114.4
		3	460	7.5 ▲	64.89 (1648)	23.51 (597)	41.38 (1051)	5.50 (140)	5.50 (140)	114.4
		3	575	7.5 ▲	64.89 (1648)	23.51 (597)	41.38 (1051)	5.50 (140)	5.50 (140)	114.4
45S75-18	455	3	208-230	7.5 ▲	70.79 (1798)	23.51 (597)	47.29 (1201)	5.50 (140)	5.50 (140)	118.3
		3	460	7.5 ▲	70.79 (1798)	23.51 (597)	47.29 (1201)	5.50 (140)	5.50 (140)	118.3
		3	575	7.5 ▲	70.79 (1798)	23.51 (597)	47.29 (1201)	5.50 (140)	5.50 (140)	118.3
45S100-22	558	3	208-230	10 ▲	79.85 (2028)	24.69 (627)	55.16 (1401)	5.50 (140)	5.50 (140)	130.2
		3	460	10 ▲	79.85 (2028)	24.69 (627)	55.16 (1401)	5.50 (140)	5.50 (140)	130.2
		3	575	10 ▲	79.85 (2028)	24.69 (627)	55.16 (1401)	5.50 (140)	5.50 (140)	130.2
45S100-25	634	3	208-230	10 ▲	85.75 (2178)	24.69 (627)	61.07 (1551)	5.50 (140)	5.50 (140)	134.1
		3	460	10 ▲	85.75 (2178)	24.69 (627)	61.07 (1551)	5.50 (140)	5.50 (140)	134.1
		3	575	10 ▲	85.75 (2178)	24.69 (627)	61.07 (1551)	5.50 (140)	5.50 (140)	134.1
45S150-28	711	3	208-230	15 ▲	94.02 (2388)	27.05 (687)	66.97 (1701)	5.50 (140)	5.50 (140)	160.6
		3	460	15 ▲	94.02 (2388)	27.05 (687)	66.97 (1701)	5.50 (140)	5.50 (140)	160.6
		3	575	15 ▲	94.02 (2388)	27.05 (687)	66.97 (1701)	5.50 (140)	5.50 (140)	160.6
45S150-31	788	3	208-230	15 ▲	99.93 (2538)	27.05 (687)	72.88 (1851)	5.50 (140)	5.50 (140)	164.7
		3	460	15 ▲	99.93 (2538)	27.05 (687)	72.88 (1851)	5.50 (140)	5.50 (140)	164.7
		3	575	15 ▲	99.93 (2538)	27.05 (687)	72.88 (1851)	5.50 (140)	5.50 (140)	164.7
45S150-34	864	3	208-230	15 ▲	105.83 (2688)	27.05 (687)	78.78 (2001)	5.50 (140)	5.50 (140)	168.8
		3	460	15 ▲	105.83 (2688)	27.05 (687)	78.78 (2001)	5.50 (140)	5.50 (140)	168.8
		3	575	15 ▲	105.83 (2688)	27.05 (687)	78.78 (2001)	5.50 (140)	5.50 (140)	168.8
45S150-37	941	3	208-230	15 ▲	111.74 (2838)	27.05 (687)	84.69 (2151)	5.50 (140)	5.50 (140)	172.9
		3	460	15 ▲	111.74 (2838)	27.05 (687)	84.69 (2151)	5.50 (140)	5.50 (140)	172.9
		3	575	15 ▲	111.74 (2838)	27.05 (687)	84.69 (2151)	5.50 (140)	5.50 (140)	172.9
45S200-40DS	1018	3	208-230	20 ▲	131.82 (3348)	29.61 (752)	102.21 (2596)	5.50 (140)	5.50 (140)	230.8
		3	460	20 ▲	131.82 (3348)	29.61 (752)	102.21 (2596)	5.50 (140)	5.50 (140)	230.8
		3	575	20 ▲	131.82 (3348)	29.61 (752)	102.21 (2596)	5.50 (140)	5.50 (140)	230.8
45S200-43DS	1095	3	208-230	20 ▲	137.72 (3498)	29.61 (752)	108.12 (2746)	5.50 (140)	5.50 (140)	236.6
		3	460	20 ▲	137.72 (3498)	29.61 (752)	108.12 (2746)	5.50 (140)	5.50 (140)	236.6
		3	575	20 ▲	137.72 (3498)	29.61 (752)	108.12 (2746)	5.50 (140)	5.50 (140)	236.6
45S200-47DS	1197	3	208-230	20 ▲	145.60 (3698)	29.61 (752)	115.99 (2946)	5.50 (140)	5.50 (140)	244.2
		3	460	20 ▲	145.60 (3698)	29.61 (752)	115.99 (2946)	5.50 (140)	5.50 (140)	244.2
		3	575	20 ▲	145.60 (3698)	29.61 (752)	115.99 (2946)	5.50 (140)	5.50 (140)	244.2
45S200-51DS	1299	3	208-230	20 ▲	153.47 (3898)	29.61 (752)	123.86 (3146)	5.50 (140)	5.50 (140)	251.9
		3	460	20 ▲	153.47 (3898)	29.61 (752)	123.86 (3146)	5.50 (140)	5.50 (140)	251.9
		3	575	20 ▲	153.47 (3898)	29.61 (752)	123.86 (3146)	5.50 (140)	5.50 (140)	251.9



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
DS designation = Built into sleeve, 2" NPT, 6" minimum well diameter.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.
▲ MS 6000C motor.

4" and larger wells - continued

SP 45S (45 gpm) / 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
45S - Motor dia. 6 inch, 60 Hz, rated flow 45 gpm (2" NPT)											
45S250-54DS	1376	3	208-230	25 ▲	161.54 (4103)	31.78 (807)	129.77 (3296)	5.50 (140)	5.50 (140)	267.6	
		3	460	25 ▲	161.54 (4103)	31.78 (807)	129.77 (3296)	5.50 (140)	5.50 (140)	267.6	
		3	575	25 ▲	161.54 (4103)	31.78 (807)	129.77 (3296)	5.50 (140)	5.50 (140)	267.6	
45S250-57DS	1453	3	208-230	25 ▲	167.45 (4253)	31.78 (807)	135.67 (3446)	5.50 (140)	5.50 (140)	273.4	
		3	460	25 ▲	167.45 (4253)	31.78 (807)	135.67 (3446)	5.50 (140)	5.50 (140)	273.4	
		3	575	25 ▲	167.45 (4253)	31.78 (807)	135.67 (3446)	5.50 (140)	5.50 (140)	273.4	
45S250-60DS	1529	3	208-230	25 ▲	173.35 (4403)	31.78 (807)	141.58 (3596)	5.50 (140)	5.50 (140)	279.1	
		3	460	25 ▲	173.35 (4403)	31.78 (807)	141.58 (3596)	5.50 (140)	5.50 (140)	279.1	
		3	575	25 ▲	173.35 (4403)	31.78 (807)	141.58 (3596)	5.50 (140)	5.50 (140)	279.1	
45S250-63DS	1606	3	208-230	25 ▲	167.64 (4258)	31.78 (807)	135.87 (3451)	5.50 (140)	5.50 (140)	233.7	
		3	460	25 ▲	167.64 (4258)	31.78 (807)	135.87 (3451)	5.50 (140)	5.50 (140)	233.7	
		3	575	25 ▲	167.64 (4258)	31.78 (807)	135.87 (3451)	5.50 (140)	5.50 (140)	233.7	

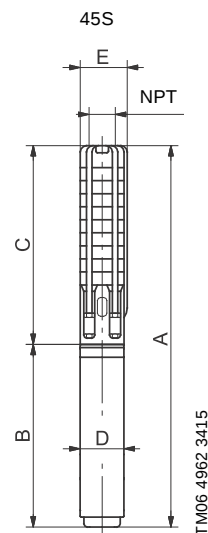
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 2" NPT, 6" minimum well diameter.

Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

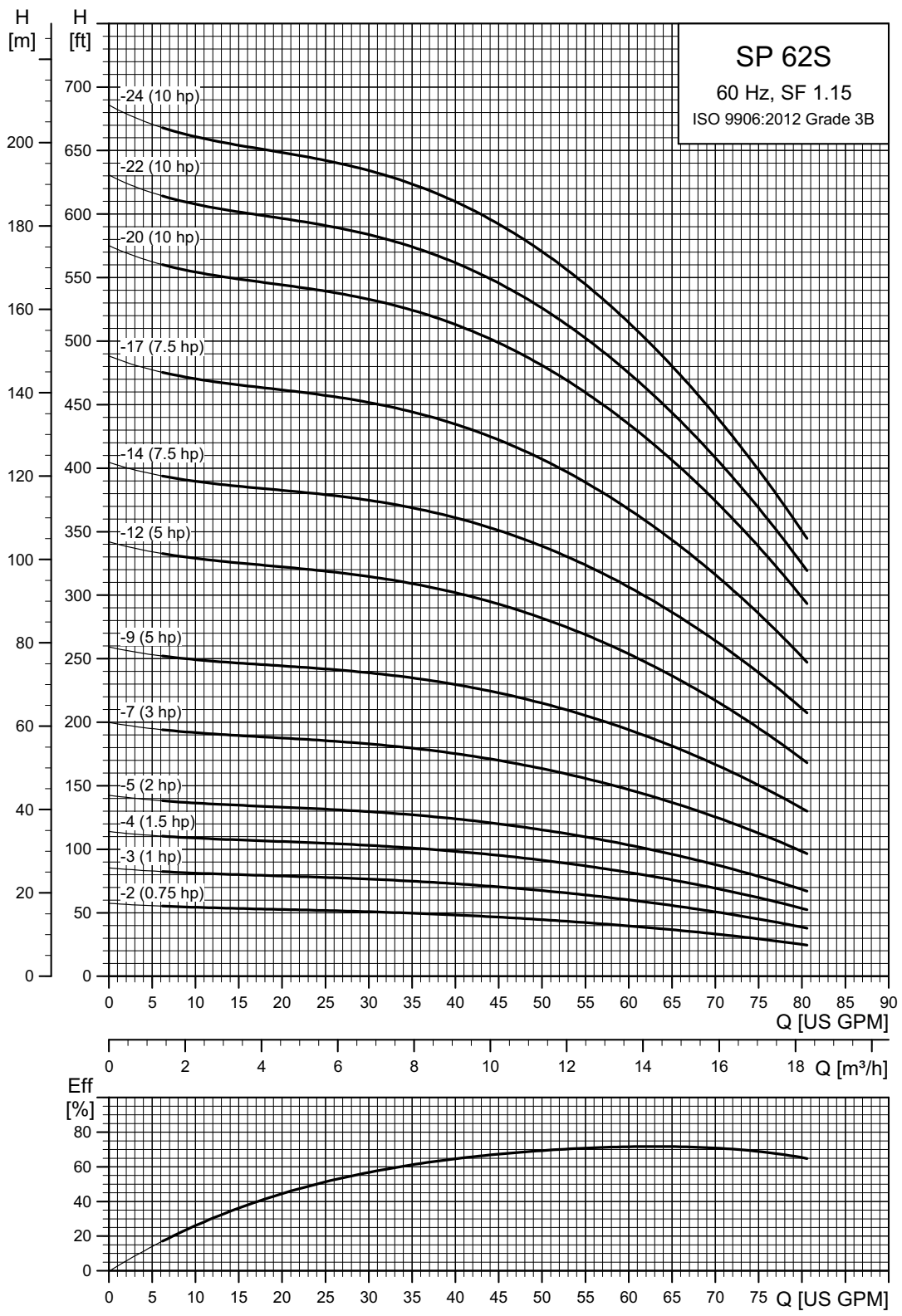
▲ MS 6000C motor.



E = Maximum diameter of pump including cable guard and motor.

TM06 4962 3415

4" and larger wells - continued
SP 62S (62 gpm)



TM06 4618 3215

4" and larger wells - continued

SP 62S (62 gpm) / 4 inch motor

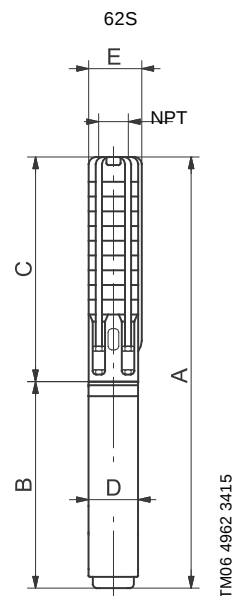
Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
62S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated 62 gpm (2" NPT)											
62S07-2	38	1	230	.75 ■	28.35 (720)	13.08 (332)	15.28 (388)	3.75 (95)	3.98 (101)	29.7	
		3	230	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.7	
		3	460	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.7	
		3	575	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.7	
62S10-3	58	1	230	1 ■	31.89 (810)	13.67 (347)	18.23 (463)	3.75 (95)	3.98 (101)	33.0	
		3	230	1 ■	30.71 (780)	12.49 (317)	18.23 (463)	3.75 (95)	3.98 (101)	30.4	
		3	460	1 ■	30.71 (780)	12.49 (317)	18.23 (463)	3.75 (95)	3.98 (101)	30.2	
		3	575	1 ■	30.71 (780)	12.49 (317)	18.23 (463)	3.75 (95)	3.98 (101)	30.2	
62S15-4	79	1	230	1.5 ■	36.42 (925)	15.24 (387)	21.19 (538)	3.75 (95)	3.98 (101)	38.5	
		3	230	1.5 ■	34.85 (885)	13.67 (347)	21.19 (538)	3.75 (95)	3.98 (101)	35.0	
		3	460	1.5 ■	34.85 (885)	13.67 (347)	21.19 (538)	3.75 (95)	3.98 (101)	35.0	
		3	575	1.5 ■	34.85 (885)	13.67 (347)	21.19 (538)	3.75 (95)	3.98 (101)	34.8	
62S20-5	100	1	230	2 ●	43.71 (1110)	19.57 (497)	24.14 (613)	3.75 (95)	3.98 (101)	56.0	
		3	230	2 ■	39.38 (1000)	15.24 (387)	24.14 (613)	3.75 (95)	3.98 (101)	40.5	
		3	460	2 ■	39.38 (1000)	15.24 (387)	24.14 (613)	3.75 (95)	3.98 (101)	40.7	
		3	575	2 ■	39.38 (1000)	15.24 (387)	24.14 (613)	3.75 (95)	3.98 (101)	40.5	
62S30-7	141	1	230	3 ●	52.76 (1340)	22.72 (577)	30.04 (763)	3.75 (95)	3.98 (101)	68.3	
		3	208-230	3 ●	48.04 (1220)	18.00 (457)	30.04 (763)	3.75 (95)	3.98 (101)	55.1	
		3	460	3 ●	48.04 (1220)	18.00 (457)	30.04 (763)	3.75 (95)	3.98 (101)	55.1	
62S50-9	182	1	230	5 ●	62.60 (1590)	26.66 (677)	35.95 (913)	3.75 (95)	3.98 (101)	82.8	
		3	208-230	5 ●	58.67 (1490)	22.72 (577)	35.95 (913)	3.75 (95)	3.98 (101)	71.8	
		3	460	5 ●	58.67 (1490)	22.72 (577)	35.95 (913)	3.75 (95)	3.98 (101)	71.8	
62S50-12	244	1	230	5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	88.1	
		3	208-230	5 ●	67.52 (1715)	22.72 (577)	44.81 (1138)	3.75 (95)	3.98 (101)	77.1	
		3	460	5 ●	67.52 (1715)	22.72 (577)	44.81 (1138)	3.75 (95)	3.98 (101)	77.1	
62S75-14	285	3	208-230	7.5 ●	77.37 (1965)	26.66 (677)	50.71 (1288)	3.75 (95)	3.98 (101)	91.6	
		3	460	7.5 ●	77.37 (1965)	26.66 (677)	50.71 (1288)	3.75 (95)	3.98 (101)	91.6	
		3	575	7.5 ●	77.37 (1965)	26.66 (677)	50.71 (1288)	3.75 (95)	3.98 (101)	91.6	
62S75-17	347	3	208-230	7.5 ●	86.23 (2190)	26.66 (677)	59.57 (1513)	3.75 (95)	3.98 (101)	96.9	
		3	460	7.5 ●	86.23 (2190)	26.66 (677)	59.57 (1513)	3.75 (95)	3.98 (101)	96.9	
		3	575	7.5 ●	86.23 (2190)	26.66 (677)	59.57 (1513)	3.75 (95)	3.98 (101)	96.9	
62S100-20	409	3	460	10 ●	99.02 (2515)	30.60 (777)	68.43 (1738)	3.75 (95)	3.98 (101)	111.0	
		3	575	10 ●	99.02 (2515)	30.60 (777)	68.43 (1738)	3.75 (95)	3.98 (101)	111.0	
62S100-22	450	3	460	10 ●	104.93 (2665)	30.60 (777)	74.34 (1888)	3.75 (95)	3.98 (101)	114.5	
		3	575	10 ●	104.93 (2665)	30.60 (777)	74.34 (1888)	3.75 (95)	3.98 (101)	114.5	
62S100-24	491	3	460	10 ●	110.83 (2815)	30.60 (777)	80.24 (2038)	3.75 (95)	3.98 (101)	118.0	
		3	575	10 ●	110.83 (2815)	30.60 (777)	80.24 (2038)	3.75 (95)	3.98 (101)	118.0	

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.

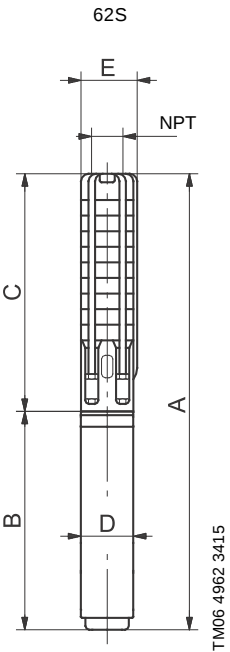


E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued
SP 62S (62 gpm) / 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
62S - Motor dia. 6 inch, 60 Hz, rated 62 gpm (2" NPT)										
62S75-14	285	3	208-230	7.5 ▲	76.70 (1948)	23.51 (597)	53.19 (1351)	5.50 (140)	5.50 (140)	119.3
		3	460	7.5 ▲	76.70 (1948)	23.51 (597)	53.19 (1351)	5.50 (140)	5.50 (140)	119.3
		3	575	7.5 ▲	76.70 (1948)	23.51 (597)	53.19 (1351)	5.50 (140)	5.50 (140)	119.3
62S75-17	347	3	208-230	7.5 ▲	85.56 (2173)	23.51 (597)	62.05 (1576)	5.50 (140)	5.50 (140)	124.6
		3	460	7.5 ▲	85.56 (2173)	23.51 (597)	62.05 (1576)	5.50 (140)	5.50 (140)	124.6
		3	575	7.5 ▲	85.56 (2173)	23.51 (597)	62.05 (1576)	5.50 (140)	5.50 (140)	124.6
62S100-20	409	3	208-230	10 ▲	95.60 (2428)	24.69 (627)	70.91 (1801)	5.50 (140)	5.50 (140)	136.4
		3	460	10 ▲	95.60 (2428)	24.69 (627)	70.91 (1801)	5.50 (140)	5.50 (140)	136.4
		3	575	10 ▲	95.60 (2428)	24.69 (627)	70.91 (1801)	5.50 (140)	5.50 (140)	136.4
62S100-22	450	3	208-230	10 ▲	101.50 (2578)	24.69 (627)	76.82 (1951)	5.50 (140)	5.50 (140)	139.9
		3	460	10 ▲	101.50 (2578)	24.69 (627)	76.82 (1951)	5.50 (140)	5.50 (140)	139.9
		3	575	10 ▲	101.50 (2578)	24.69 (627)	76.82 (1951)	5.50 (140)	5.50 (140)	139.9
62S100-24	491	3	208-230	10 ▲	107.41 (2728)	24.69 (627)	82.72 (2101)	5.50 (140)	5.50 (140)	143.4
		3	460	10 ▲	107.41 (2728)	24.69 (627)	82.72 (2101)	5.50 (140)	5.50 (140)	143.4
		3	575	10 ▲	107.41 (2728)	24.69 (627)	82.72 (2101)	5.50 (140)	5.50 (140)	143.4

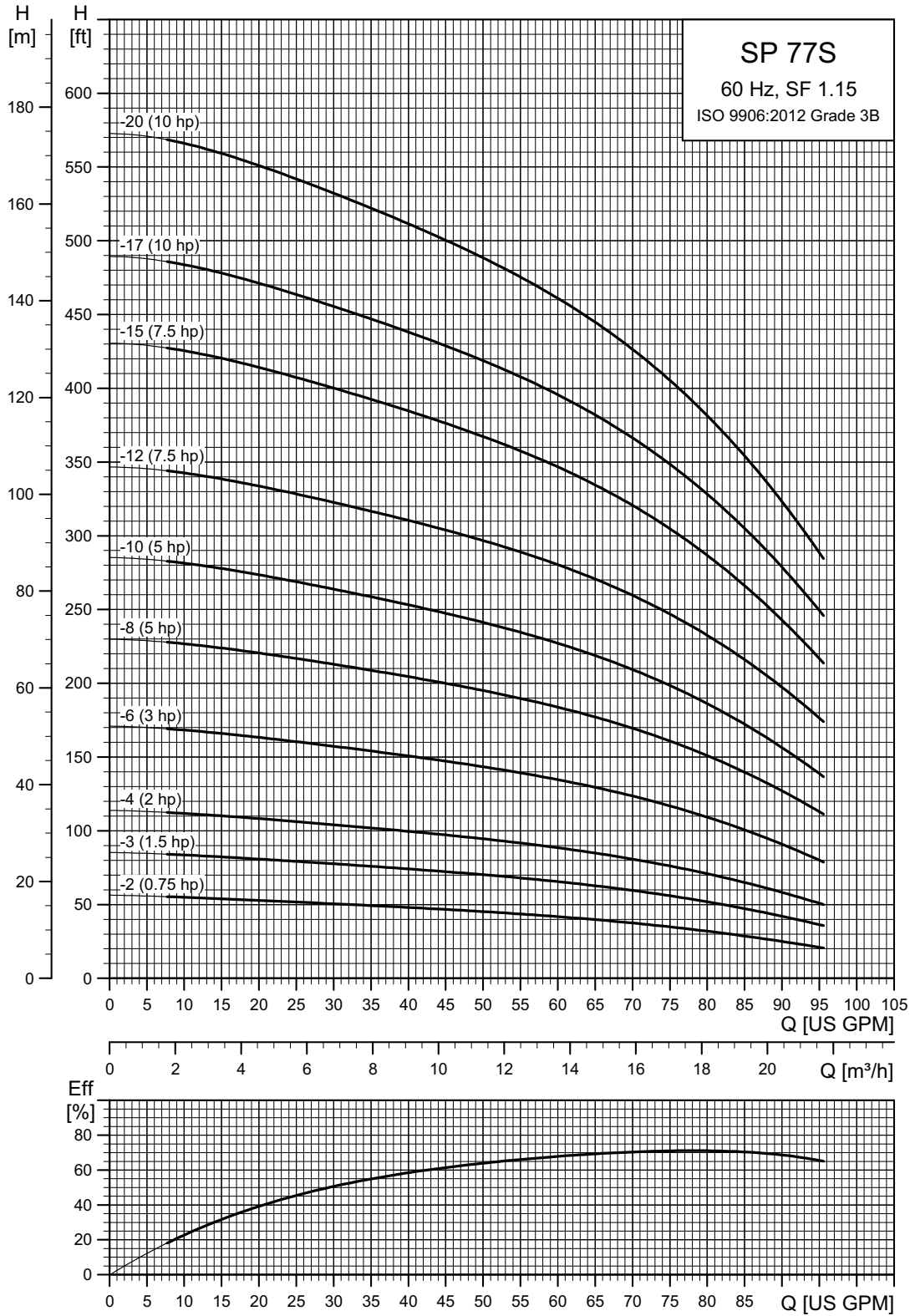
Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.
▲ MS 6000C motor.



E = Maximum diameter of pump including cable guard and motor.

4" and larger wells - continued

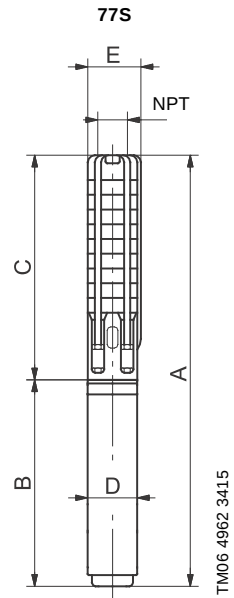
SP 77S (77 gpm)



TM06 4620 3215

4" and larger wells - continued
SP 77S (77 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
77S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated 77 gpm (2" NPT)										
77S07-2	34	1	230	.75 ■	28.35 (720)	13.08 (332)	15.28 (388)	3.75 (95)	3.98 (101)	29.7
		3	230	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.7
		3	460	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.7
		3	575	.75 ■	26.97 (685)	11.70 (297)	15.28 (388)	3.75 (95)	3.98 (101)	26.7
77S15-3	53	1	230	1 ■	33.47 (850)	15.24 (387)	18.23 (463)	3.75 (95)	3.98 (101)	36.8
		3	230	1.5 ■	31.89 (810)	13.67 (347)	18.23 (463)	3.75 (95)	3.98 (101)	33.3
		3	460	1.5 ■	31.89 (810)	13.67 (347)	18.23 (463)	3.75 (95)	3.98 (101)	33.3
		3	575	1.5 ■	31.89 (810)	13.67 (347)	18.23 (463)	3.75 (95)	3.98 (101)	33.0
77S20-4	73	1	230	2 ●	40.75 (1035)	19.57 (497)	21.19 (538)	3.75 (95)	3.98 (101)	54.2
		3	230	2 ■	36.42 (925)	15.24 (387)	21.19 (538)	3.75 (95)	3.98 (101)	38.8
		3	460	2 ■	36.42 (925)	15.24 (387)	21.19 (538)	3.75 (95)	3.98 (101)	39.0
		3	575	2 ■	36.42 (925)	15.24 (387)	21.19 (538)	3.75 (95)	3.98 (101)	38.8
77S30-6	112	1	230	3 ●	49.81 (1265)	22.72 (577)	27.09 (688)	3.75 (95)	3.98 (101)	66.5
		3	208-230	3 ●	45.08 (1145)	18.00 (457)	27.09 (688)	3.75 (95)	3.98 (101)	53.3
		3	460	3 ●	45.08 (1145)	18.00 (457)	27.09 (688)	3.75 (95)	3.98 (101)	53.3
77S50-8	152	1	230	5 ●	59.65 (1515)	26.66 (677)	33.00 (838)	3.75 (95)	3.98 (101)	81.1
		3	208-230	5 ●	55.71 (1415)	22.72 (577)	33.00 (838)	3.75 (95)	3.98 (101)	70.1
		3	460	5 ●	55.71 (1415)	22.72 (577)	33.00 (838)	3.75 (95)	3.98 (101)	70.1
77S50-10	191	1	230	5 ●	65.56 (1665)	26.66 (677)	38.90 (988)	3.75 (95)	3.98 (101)	84.6
		3	208-230	5 ●	61.62 (1565)	22.72 (577)	38.90 (988)	3.75 (95)	3.98 (101)	73.6
		3	460	5 ●	61.62 (1565)	22.72 (577)	38.90 (988)	3.75 (95)	3.98 (101)	73.6
77S75-12	230	3	208-230	7.5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	88.1
		3	460	7.5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	88.1
		3	575	7.5 ●	71.46 (1815)	26.66 (677)	44.81 (1138)	3.75 (95)	3.98 (101)	88.1
		3	208-230	7.5 ●	80.32 (2040)	26.66 (677)	53.67 (1363)	3.75 (95)	3.98 (101)	93.4
77S75-15	289	3	460	7.5 ●	80.32 (2040)	26.66 (677)	53.67 (1363)	3.75 (95)	3.98 (101)	93.4
		3	575	7.5 ●	80.32 (2040)	26.66 (677)	53.67 (1363)	3.75 (95)	3.98 (101)	93.4
		3	460	10 ●	90.16 (2290)	30.60 (777)	59.57 (1513)	3.75 (95)	3.98 (101)	105.7
77S100-17	329	3	575	10 ●	90.16 (2290)	30.60 (777)	59.57 (1513)	3.75 (95)	3.98 (101)	105.7
		3	460	10 ●	99.02 (2515)	30.60 (777)	68.43 (1738)	3.75 (95)	3.98 (101)	111.0
77S100-20	388	3	575	10 ●	99.02 (2515)	30.60 (777)	68.43 (1738)	3.75 (95)	3.98 (101)	111.0



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.

4" and larger wells - continued

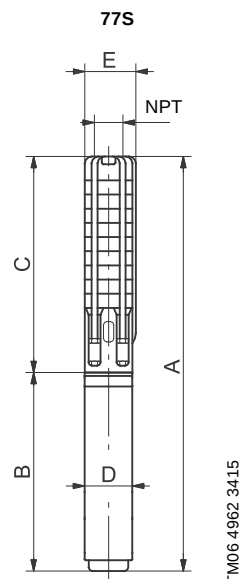
SP 77S (77 gpm) / 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
77S - Motor dia. 6 inch, 60 Hz, rated 77 gpm (2" NPT)										
77S75-12	230	3	208-230	.75 ▲	70.79 (1798)	23.51 (597)	47.29 (1201)	5.50 (140)	5.50 (140)	115.8
		3	460	.75 ▲	70.79 (1798)	23.51 (597)	47.29 (1201)	5.50 (140)	5.50 (140)	115.8
		3	575	.75 ▲	70.79 (1798)	23.51 (597)	47.29 (1201)	5.50 (140)	5.50 (140)	115.8
77S75-15	289	3	208-230	.75 ▲	79.65 (2023)	23.51 (597)	56.15 (1426)	5.50 (140)	5.50 (140)	121.1
		3	460	.75 ▲	79.65 (2023)	23.51 (597)	56.15 (1426)	5.50 (140)	5.50 (140)	121.1
		3	575	.75 ▲	79.65 (2023)	23.51 (597)	56.15 (1426)	5.50 (140)	5.50 (140)	121.1
77S100-17	329	3	208-230	10 ▲	86.74 (2203)	24.69 (627)	62.05 (1576)	5.50 (140)	5.50 (140)	131.2
		3	460	10 ▲	86.74 (2203)	24.69 (627)	62.05 (1576)	5.50 (140)	5.50 (140)	131.2
		3	575	10 ▲	86.74 (2203)	24.69 (627)	62.05 (1576)	5.50 (140)	5.50 (140)	131.2
77S100-20	388	3	208-230	10 ▲	95.60 (2428)	24.69 (627)	70.91 (1801)	5.50 (140)	5.50 (140)	136.4
		3	460	10 ▲	95.60 (2428)	24.69 (627)	70.91 (1801)	5.50 (140)	5.50 (140)	136.4
		3	575	10 ▲	95.60 (2428)	24.69 (627)	70.91 (1801)	5.50 (140)	5.50 (140)	136.4

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

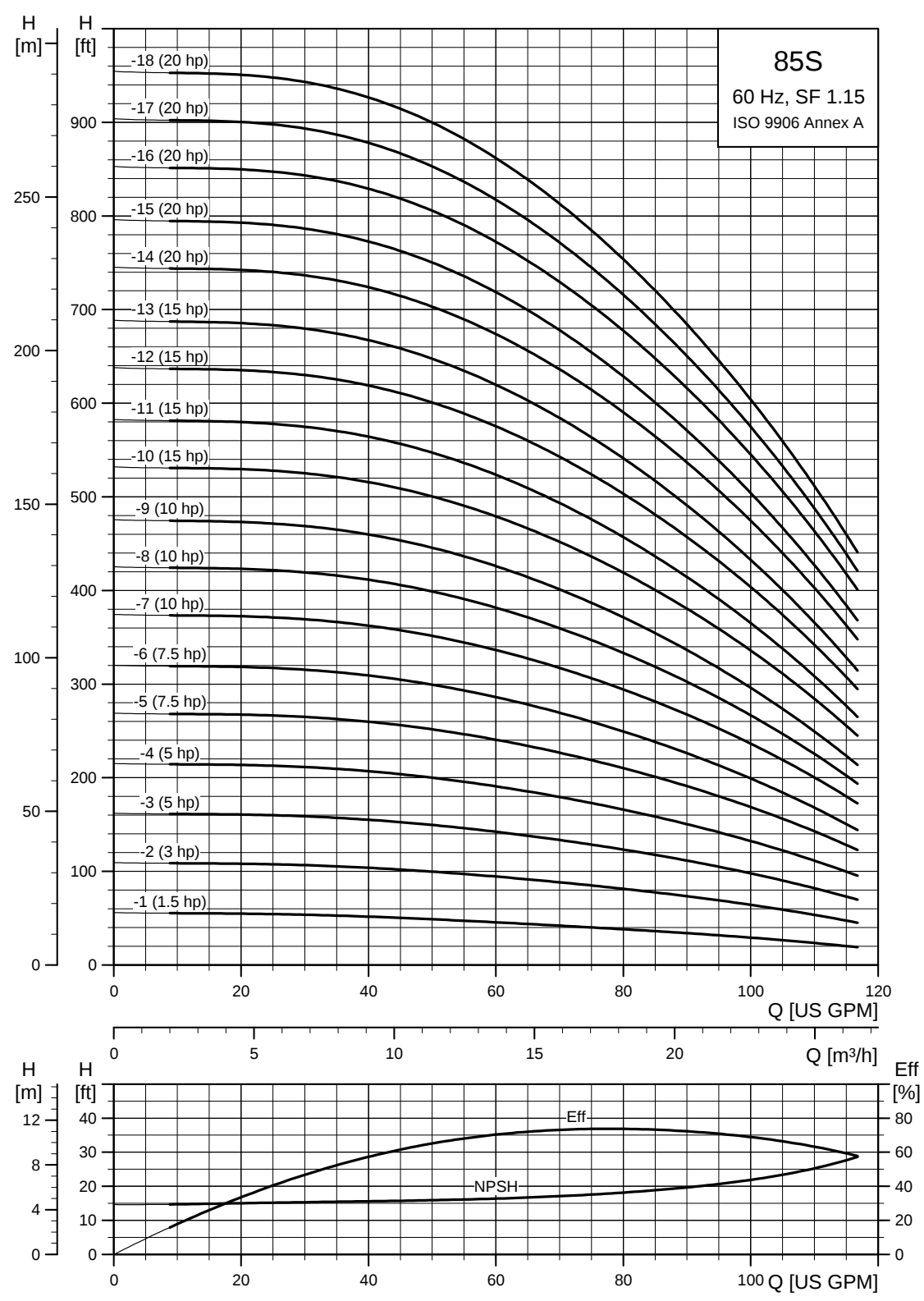
▲ MS 6000C motor.



TMO6 4962 3415

E = Maximum diameter of pump including cable guard and motor.

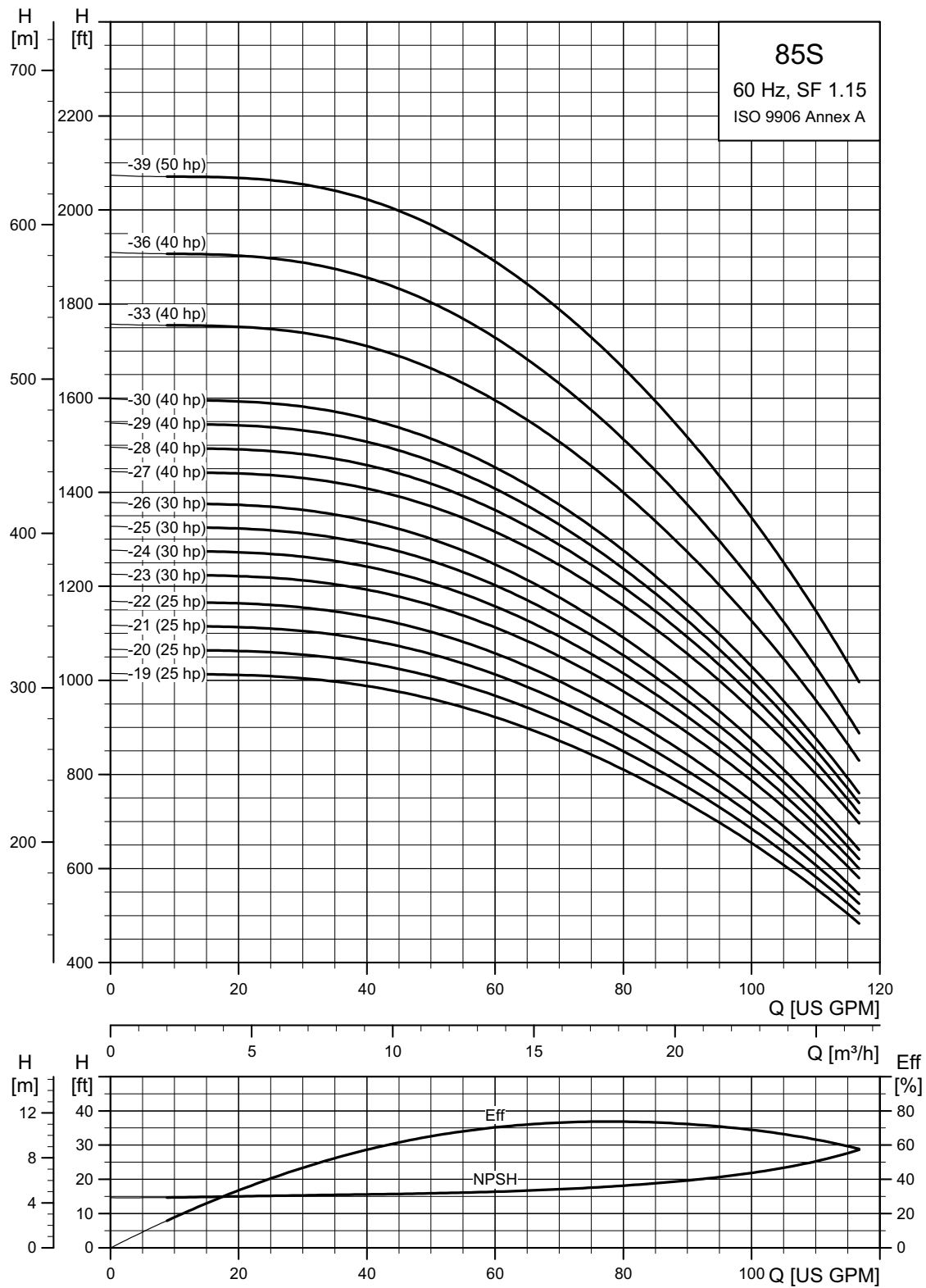
6" and larger wells
SP 85S (85 gpm)



TM05 0235 1812

6" and larger wells - continued

SP 85S (85 gpm)

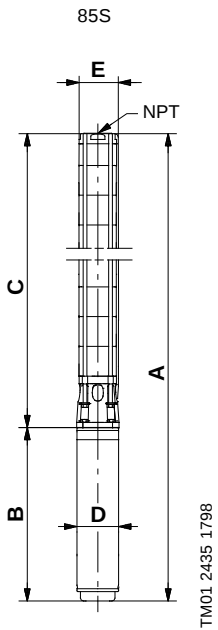


TM05 0236 3815

6" and larger wells - continued

SP 85S (85 gpm) / 4, 6 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
85S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 85 gpm (3" NPT)											
85S15-1	35	1	230	1.5	■	28.04 (712)	15.24 (387)	12.80 (325)	3.75 (95)	5.28 (134)	29.7
		3	230	1.5	■	26.46 (672)	13.67 (347)	12.80 (325)	3.75 (95)	5.28 (134)	29.7
		3	460	1.5	■	26.46 (672)	13.67 (347)	12.80 (325)	3.75 (95)	5.28 (134)	29.7
85S30-2	74	1	230	3	●	37.88 (962)	22.72 (577)	15.16 (385)	3.75 (95)	5.28 (134)	55.8
		3	230	3	●	33.12 (841)	17.96 (456)	15.16 (385)	3.75 (95)	5.28 (134)	47.7
		3	460	3	●	33.12 (841)	17.96 (456)	15.16 (385)	3.75 (95)	5.28 (134)	47.7
85S50-3	114	1	230	5	●	44.22 (1123)	26.66 (677)	17.56 (446)	3.75 (95)	5.28 (134)	67.5
		3	230	5	●	40.24 (1022)	22.68 (576)	17.56 (446)	3.75 (95)	5.28 (134)	51.3
		3	460	5	●	40.24 (1022)	22.68 (576)	17.56 (446)	3.75 (95)	5.28 (134)	51.3
85S50-4	154	1	230	5	●	46.58 (1183)	26.66 (677)	19.93 (506)	3.75 (95)	5.28 (134)	69.3
		3	230	5	●	42.60 (1082)	22.68 (576)	19.93 (506)	3.75 (95)	5.28 (134)	61.2
		3	460	5	●	42.60 (1082)	22.68 (576)	19.93 (506)	3.75 (95)	5.28 (134)	61.2
85S75-5	194	3	230	7.5	●	48.94 (1243)	26.62 (676)	22.33 (567)	3.75 (95)	5.28 (134)	73.8
		3	460	7.5	●	48.94 (1243)	26.62 (676)	22.33 (567)	3.75 (95)	5.28 (134)	73.8
85S75-6	234	3	230	7.5	●	51.30 (1303)	26.62 (676)	24.69 (627)	3.75 (95)	5.28 (134)	85.5
		3	460	7.5	●	51.30 (1303)	26.62 (676)	24.69 (627)	3.75 (95)	5.28 (134)	76.5
85S100-7	274	3	460	10	●	57.64 (1464)	30.56 (776)	27.09 (688)	3.75 (95)	5.28 (134)	136.8
85S100-8	314	3	460	10	●	60.00 (1524)	30.56 (776)	29.45 (748)	3.75 (95)	5.28 (134)	138.6
85S100-9	353	3	460	10	●	62.41 (1585)	30.56 (776)	31.86 (809)	3.75 (95)	5.28 (134)	140.4
85S - Motor dia. 6 inch, 3 wire motor, 60 Hz, rated flow 85 gpm (3" NPT)											
85S75-5	194	3	230	7.5	▲	46.58 (1183)	23.51 (597)	23.08 (586)	5.52 (140)	5.52 (140)	98.1
		3	460	7.5	▲	46.58 (1183)	23.51 (597)	23.08 (586)	5.52 (140)	5.52 (140)	98.1
85S75-6	234	3	230	7.5	▲	48.94 (1243)	23.51 (597)	25.44 (646)	5.52 (140)	5.52 (140)	99.9
		3	460	7.5	▲	48.94 (1243)	23.51 (597)	25.44 (646)	5.52 (140)	5.52 (140)	99.9
85S100-7	274	3	230	10	▲	52.52 (1334)	24.69 (627)	27.84 (707)	5.52 (140)	5.52 (140)	103.5
		3	460	10	▲	52.52 (1334)	24.69 (627)	27.84 (707)	5.52 (140)	5.52 (140)	103.5
85S100-8	314	3	230	10	▲	54.89 (1394)	24.69 (627)	30.20 (767)	5.52 (140)	5.52 (140)	105.3
		3	460	10	▲	54.89 (1394)	24.69 (627)	30.20 (767)	5.52 (140)	5.52 (140)	105.3
85S100-9	353	3	230	10	▲	57.29 (1455)	24.69 (627)	32.60 (828)	5.52 (140)	5.52 (140)	108.0
		3	460	10	▲	57.29 (1455)	24.69 (627)	32.60 (828)	5.52 (140)	5.52 (140)	108.0
85S150-10	393	3	230	15	▲	62.01 (1575)	27.05 (687)	34.97 (888)	5.52 (140)	5.52 (140)	122.4
		3	460	15	▲	62.01 (1575)	27.05 (687)	34.97 (888)	5.52 (140)	5.52 (140)	122.4
85S150-11	433	3	230	15	▲	64.41 (1636)	27.05 (687)	37.37 (949)	5.52 (140)	5.52 (140)	126.0
		3	460	15	▲	64.41 (1636)	27.05 (687)	37.37 (949)	5.52 (140)	5.52 (140)	126.0
85S150-12	473	3	230	15	▲	66.78 (1696)	27.05 (687)	39.73 (1009)	5.52 (140)	5.52 (140)	133.2
		3	460	15	▲	66.78 (1696)	27.05 (687)	39.73 (1009)	5.52 (140)	5.52 (140)	133.2
85S150-13	513	3	230	15	▲	69.18 (1757)	27.05 (687)	42.13 (1070)	5.52 (140)	5.52 (140)	135.0
		3	460	15	▲	69.18 (1757)	27.05 (687)	42.13 (1070)	5.52 (140)	5.52 (140)	135.0



E = Maximum diameter of pump including cable guard and motor.

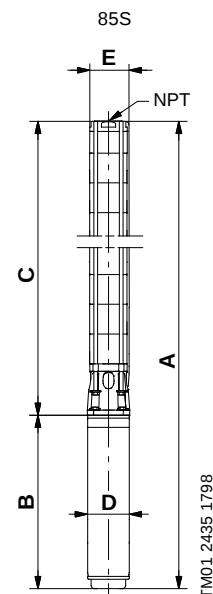
Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.
- ▲ MS 6000C motor.

6" and larger wells - continued

SP 85S (85 gpm) / 6, 8 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
85S - Motor dia. 6 inch, 60 Hz, rated flow 85 gpm (3" NPT)											
85S200-14	533	3	230	20	▲	74.10 (1882)	29.61 (752)	44.49 (1130)	5.52 (140)	5.52 (140)	143.1
		3	460	20	▲	74.10 (1882)	29.61 (752)	44.49 (1130)	5.52 (140)	5.52 (140)	143.1
85S200-15	593	3	230	20	▲	76.50 (1943)	29.61 (752)	46.89 (1191)	5.52 (140)	5.52 (140)	147.6
		3	460	20	▲	76.50 (1943)	29.61 (752)	46.89 (1191)	5.52 (140)	5.52 (140)	147.6
85S200-16	633	3	230	20	▲	78.86 (2003)	29.61 (752)	49.26 (1251)	5.52 (140)	5.52 (140)	157.5
		3	460	20	▲	78.86 (2003)	29.61 (752)	49.26 (1251)	5.52 (140)	5.52 (140)	157.5
85S200-17	672	3	230	20	▲	81.26 (2064)	29.61 (752)	51.66 (1312)	5.52 (140)	5.52 (140)	160.2
		3	460	20	▲	81.26 (2064)	29.61 (752)	51.66 (1312)	5.52 (140)	5.52 (140)	160.2
85S200-18	712	3	230	20	▲	83.63 (2124)	29.61 (752)	54.02 (1372)	5.52 (140)	5.52 (140)	161.1
		3	460	20	▲	83.63 (2124)	29.61 (752)	54.02 (1372)	5.52 (140)	5.52 (140)	179.0
85S250-19	752	3	230	25	▲	88.19 (2240)	31.78 (807)	56.42 (1433)	5.52 (140)	5.52 (140)	191.7
		3	460	25	▲	88.19 (2240)	31.78 (807)	56.42 (1433)	5.52 (140)	5.52 (140)	191.7
85S250-20	792	3	230	25	▲	90.56 (2300)	31.78 (807)	58.78 (1493)	5.52 (140)	5.52 (140)	195.3
		3	460	25	▲	90.56 (2300)	31.78 (807)	58.78 (1493)	5.52 (140)	5.52 (140)	195.3
85S250-21	832	3	230	25	▲	92.96 (2361)	31.78 (807)	61.19 (1554)	5.52 (140)	5.52 (140)	198.0
		3	460	25	▲	92.96 (2361)	31.78 (807)	61.19 (1554)	5.52 (140)	5.52 (140)	198.0
85S250-22	872	3	230	25	▲	95.32 (2421)	31.78 (807)	63.55 (1614)	5.52 (140)	5.52 (140)	199.8
		3	460	25	▲	95.32 (2421)	31.78 (807)	63.55 (1614)	5.52 (140)	5.52 (140)	199.8
85S300-23	912	3	230	30	▲	100.08 (2542)	34.14 (867)	65.95 (1675)	5.52 (140)	5.52 (140)	199.8
		3	460	30	▲	100.08 (2542)	34.14 (867)	65.95 (1675)	5.52 (140)	5.52 (140)	199.8
85S300-24	952	3	230	30	▲	102.45 (2602)	34.14 (867)	68.31 (1735)	5.52 (140)	5.52 (140)	216.0
		3	460	30	▲	102.45 (2602)	34.14 (867)	68.31 (1735)	5.52 (140)	5.52 (140)	216.0
85S300-25	991	3	230	30	▲	104.85 (2663)	34.14 (867)	70.71 (1796)	5.52 (140)	5.52 (140)	219.6
		3	460	30	▲	104.85 (2663)	34.14 (867)	70.71 (1796)	5.52 (140)	5.52 (140)	219.6
85S300-26	1031	3	230	30	▲	107.21 (2723)	34.14 (867)	73.08 (1856)	5.52 (140)	5.52 (140)	221.4
		3	460	30	▲	107.21 (2723)	34.14 (867)	73.08 (1856)	5.52 (140)	5.52 (140)	221.4
85S400-27	1071	3	460	40	▲	109.61 (2784)	34.14 (867)	75.48 (1917)	5.52 (140)	5.52 (140)	234.9
85S400-28	1111	3	460	40	▲	117.09 (2974)	39.26 (997)	77.84 (1977)	5.52 (140)	5.52 (140)	246.6
85S400-29	1151	3	460	40	▲	119.49 (3035)	39.26 (997)	80.24 (2038)	5.52 (140)	5.52 (140)	248.4
85S400-30	1191	3	460	40	▲	121.86 (3095)	39.26 (997)	82.60 (2098)	5.52 (140)	5.52 (140)	270.0
85S400-33DS	1310	3	460	40	▲	142.88 (3629)	39.26 (997)	103.63 (2632)	5.52 (140)	6.89 (175)	515.5
85S400-36DS	1430	3	460	40	▲	150.00 (3810)	39.26 (997)	110.75 (2813)	5.52 (140)	6.89 (175)	454.8
85S500-39DS	1510	3	460	50	▲	173.94 (4418)	56.03 (1423)	117.92 (2995)	5.63 (143)	6.89 (175)	469.0
85S - Motor dia. 8 inch, 60 Hz, rated flow 85 gpm (3" NPT)											
85S400-33DS	1310	3	460	40	?	145.12 (3686)	43.71 (1110)	101.42 (2576)	7.56 (192)	7.56 (192)	652.7
85S400-36DS	1310	3	460	40	?	152.25 (3867)	43.71 (1110)	108.55 (2757)	7.56 (192)	7.56 (192)	592.0
85S400-39DS	1510	3	460	50	?	159.41 (4049)	43.71 (1110)	115.71 (2939)	7.56 (192)	7.56 (192)	537.2



E = Maximum diameter of pump including cable guard and motor.

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

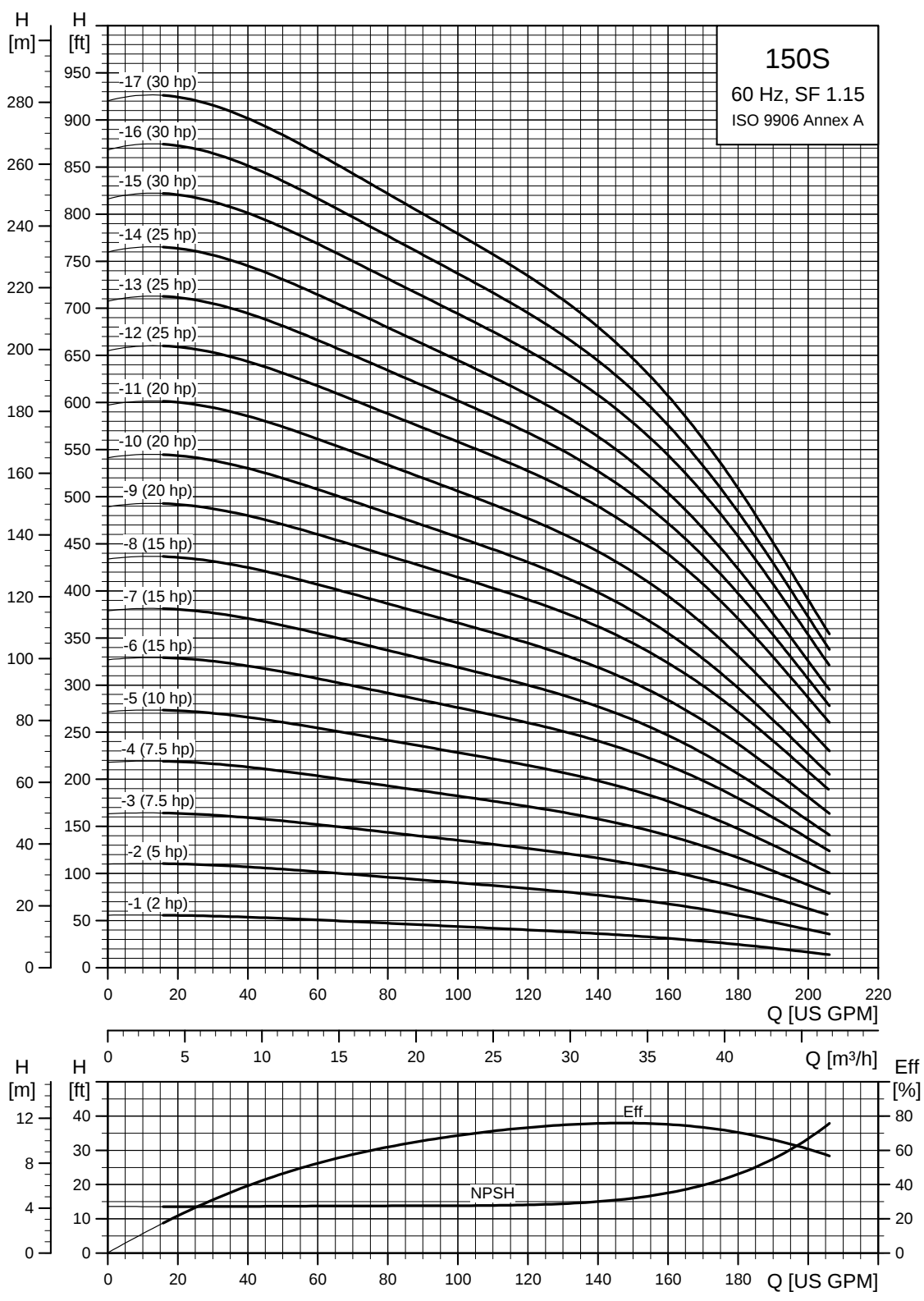
DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

▲ MS 6000C motor.

? MMS 8000 motor.

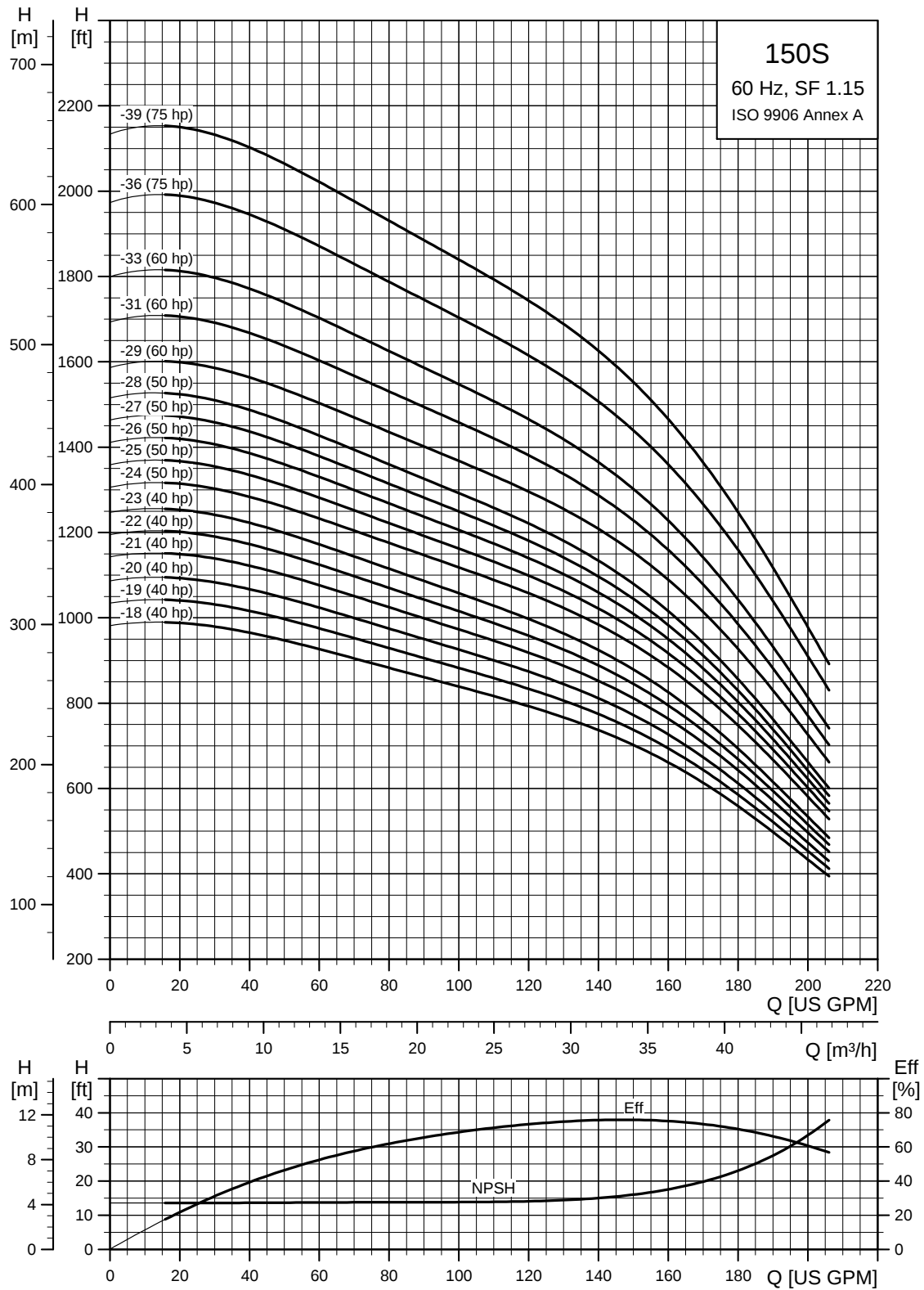
6" and larger wells - continued
SP 150S (150 gpm)



TM05 0239 1812

6" and larger wells - continued

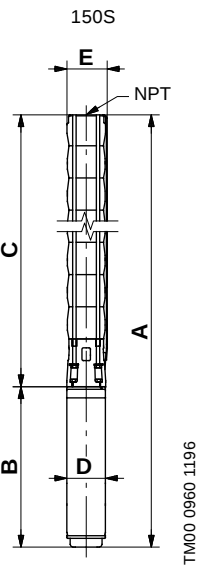
SP 150S (150 gpm)



TM05 0240 1812

6" and larger wells - continued SP 150S (150 gpm) / 4 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
150S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 150 gpm (3" NPT)											
150S20-1	33	1	230	2	●	33.67 (855)	19.57 (497)	14.10 (358)	3.75 (95)	5.28 (134)	49.5
		3	230	2	■	29.34 (745)	15.24 (387)	14.10 (358)	3.75 (95)	5.28 (134)	45.0
		3	460	2	■	29.34 (745)	15.24 (387)	14.10 (358)	3.75 (95)	5.28 (134)	45.0
150S50-2	71	1	230	5	●	44.53 (1131)	26.66 (677)	17.88 (454)	3.75 (95)	5.28 (134)	67.5
		3	230	5	●	40.56 (1030)	22.68 (576)	17.88 (454)	3.75 (95)	5.28 (134)	42.3
		3	460	5	●	40.56 (1030)	22.68 (576)	17.88 (454)	3.75 (95)	5.28 (134)	42.3
150S75-3	108	3	230	7.5	●	48.27 (1226)	26.62 (676)	21.66 (550)	3.75 (95)	5.28 (134)	51.3
		3	460	7.5	●	48.27 (1226)	26.62 (676)	21.66 (550)	3.75 (95)	5.28 (134)	82.8
150S75-4	146	3	230	7.5	●	52.05 (1322)	26.62 (676)	25.44 (646)	3.75 (95)	5.28 (134)	85.5
		3	460	7.5	●	52.05 (1322)	26.62 (676)	25.44 (646)	3.75 (95)	5.28 (134)	85.5
150S100-5	184	3	460	10	●	59.77 (1518)	30.56 (776)	29.22 (742)	3.75 (95)	5.28 (134)	135.9
150S - Motor dia. 6 inch, 60 Hz, rated flow 150 gpm (3" NPT)											
150S75-4	146	3	230	7.5	▲	49.69 (1262)	23.51 (597)	26.19 (665)	5.52 (140)	5.52 (140)	99.9
		3	460	7.5	▲	49.69 (1262)	23.51 (597)	26.19 (665)	5.52 (140)	5.52 (140)	99.9
150S100-5	184	3	230	10	▲	54.65 (1388)	24.69 (627)	29.97 (761)	5.52 (140)	5.52 (140)	73.8
		3	460	10	▲	54.65 (1388)	24.69 (627)	29.97 (761)	5.52 (140)	5.52 (140)	73.8
150S150-6	222	3	230	15	▲	60.79 (1544)	27.05 (687)	33.75 (857)	5.52 (140)	5.52 (140)	119.7
		3	460	15	▲	60.79 (1544)	27.05 (687)	33.75 (857)	5.52 (140)	5.52 (140)	119.7
150S150-7	260	3	230	15	▲	64.57 (1640)	27.05 (687)	37.52 (953)	5.52 (140)	5.52 (140)	127.8
		3	460	15	▲	64.57 (1640)	27.05 (687)	37.52 (953)	5.52 (140)	5.52 (140)	127.8
150S150-8	297	3	230	15	▲	68.35 (1736)	27.05 (687)	41.30 (1049)	5.52 (140)	5.52 (140)	137.7
		3	460	15	▲	68.35 (1736)	27.05 (687)	41.30 (1049)	5.52 (140)	5.52 (140)	137.7
150S200-9	335	3	230	20	▲	74.69 (1897)	29.61 (752)	45.08 (1145)	5.52 (140)	5.52 (140)	141.3
		3	460	20	▲	74.69 (1897)	29.61 (752)	45.08 (1145)	5.52 (140)	5.52 (140)	141.3
150S200-10	373	3	230	20	▲	78.47 (1993)	29.61 (752)	48.86 (1241)	5.52 (140)	5.52 (140)	151.2
		3	460	20	▲	78.47 (1993)	29.61 (752)	48.86 (1241)	5.52 (140)	5.52 (140)	151.2
150S200-11	411	3	230	20	▲	82.25 (2089)	29.61 (752)	52.64 (1337)	5.52 (140)	5.52 (140)	166.5
		3	460	20	▲	82.25 (2089)	29.61 (752)	52.64 (1337)	5.52 (140)	5.52 (140)	166.5
150S250-12	448	3	230	25	▲	88.19 (2240)	31.78 (807)	56.42 (1433)	5.52 (140)	5.52 (140)	188.1
		3	460	25	▲	88.19 (2240)	31.78 (807)	56.42 (1433)	5.52 (140)	5.52 (140)	188.1
150S250-13	486	3	230	25	▲	91.97 (2336)	31.78 (807)	60.20 (1529)	5.52 (140)	5.52 (140)	201.6
		3	460	25	▲	91.97 (2336)	31.78 (807)	60.20 (1529)	5.52 (140)	5.52 (140)	201.6
150S250-14	524	3	230	25	▲	95.75 (2432)	31.78 (807)	63.98 (1625)	5.52 (140)	5.52 (140)	206.1
		3	460	25	▲	95.75 (2432)	31.78 (807)	63.98 (1625)	5.52 (140)	5.52 (140)	206.1



E = Maximum diameter of pump including cable guard and motor.

TM00 0960 1196

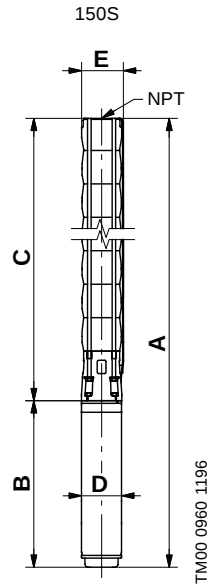
Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.
- ▲ MS 6000C motor.

6" and larger wells - continued

SP 150S (150 gpm) / 6, 8 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
150S - Motor dia. 6 inch, 60 Hz, rated flow 150 gpm (3" NPT)										
150S300-15	562	3	230	30	▲ 101.89 (2588)	34.14 (867)	67.76 (1721)	5.52 (140)	5.52 (140)	209.7
		3	460	30	▲ 101.89 (2588)	34.14 (867)	67.76 (1721)	5.52 (140)	5.52 (140)	209.7
150S300-16	600	3	230	30	▲ 105.67 (2684)	34.14 (867)	71.54 (1817)	5.52 (140)	5.52 (140)	211.5
		3	460	30	▲ 105.67 (2684)	34.14 (867)	71.54 (1817)	5.52 (140)	5.52 (140)	211.5
150S300-17	637	3	230	30	▲ 109.45 (2780)	34.14 (867)	75.32 (1913)	5.52 (140)	5.52 (140)	216.0
		3	460	30	▲ 109.45 (2780)	34.14 (867)	75.32 (1913)	5.52 (140)	5.52 (140)	246.6
150S400-18	675	3	460	40	▲ 118.35 (3006)	39.26 (997)	79.10 (2009)	5.52 (140)	5.52 (140)	246.6
150S400-19	713	3	460	40	▲ 122.13 (3102)	39.26 (997)	82.88 (2105)	5.52 (140)	5.52 (140)	248.4
150S400-20	751	3	460	40	▲ 125.91 (3198)	39.26 (997)	86.66 (2201)	5.52 (140)	5.52 (140)	291.0
150S400-21	789	3	460	40	▲ 129.69 (3294)	39.26 (997)	90.44 (2297)	5.52 (140)	5.52 (140)	271.8
150S400-22	826	3	460	40	▲ 133.47 (3390)	39.26 (997)	94.22 (2393)	5.52 (140)	5.52 (140)	305.9
150S400-23	864	3	460	40	▲ 137.25 (3486)	39.26 (997)	98.00 (2489)	5.52 (140)	5.52 (140)	277.2
150S500-24	902	3	460	50	☼ 157.88 (4010)	56.11 (1425)	101.78 (2585)	5.67 (144)	5.67 (144)	411.8
150S500-25	940	3	460	50	☼ 161.66 (4106)	56.11 (1425)	105.56 (2681)	5.67 (144)	5.67 (144)	419.0
150S500-26	977	3	460	50	☼ 165.44 (4202)	56.11 (1425)	109.34 (2777)	5.67 (144)	5.67 (144)	426.2
150S500-27	1015	3	460	50	☼ 169.22 (4298)	56.11 (1425)	113.12 (2873)	5.67 (144)	5.67 (144)	433.4
150S500-28	1053	3	460	50	☼ 173.00 (4394)	56.11 (1425)	116.89 (2969)	5.67 (144)	5.67 (144)	440.6
150S600-29DS	1091	3	460	60	-	-	134.53 (3417)	-	6.89 (175)	-
150S600-31DS	1166	3	460	60	-	-	142.09 (3609)	-	6.89 (175)	-
150S600-33DS	1242	3	460	60	-	-	149.65 (3801)	-	6.89 (175)	-
150S - Motor dia. 8 inch, 60 Hz, rated flow 150 gpm (3" NPT)										
150S500-24	902	3	460	50	* 162.45 (4126)	45.67 (1160)	116.78 (2966)	7.56 (192)	7.56 (192)	484.5
150S500-25	940	3	460	50	* 166.23 (4222)	45.67 (1160)	120.56 (3062)	7.56 (192)	7.56 (192)	491.7
150S500-26	977	3	460	50	* 170.00 (4318)	45.67 (1160)	124.34 (3158)	7.56 (192)	7.56 (192)	498.9
150S500-27	1015	3	460	50	* 173.78 (4414)	45.67 (1160)	128.12 (3254)	7.56 (192)	7.56 (192)	506.1
150S500-28	1053	3	460	50	* 177.56 (4510)	45.67 (1160)	131.89 (3350)	7.56 (192)	7.56 (192)	513.3
150S600-29DS	1091	3	460	60	* 182.33 (4631)	50.00 (1270)	132.33 (3361)	7.56 (192)	7.56 (192)	612.7
150S600-31DS	1166	3	460	60	* 189.89 (4823)	50.00 (1270)	139.89 (3553)	7.56 (192)	7.56 (192)	623.7
150S600-33DS	1242	3	460	60	* 197.45 (5015)	50.00 (1270)	147.45 (3745)	7.56 (192)	7.56 (192)	639.1
150S750-36DS	1355	3	460	75	* 211.93 (5383)	53.15 (1350)	158.78 (4033)	7.56 (192)	7.56 (192)	689.2
150S750-39DS	1469	3	460	75	* 223.27 (5671)	53.15 (1350)	170.12 (4321)	7.56 (192)	7.56 (192)	704.6



E = Maximum diameter of pump including cable guard and motor.

Notes:

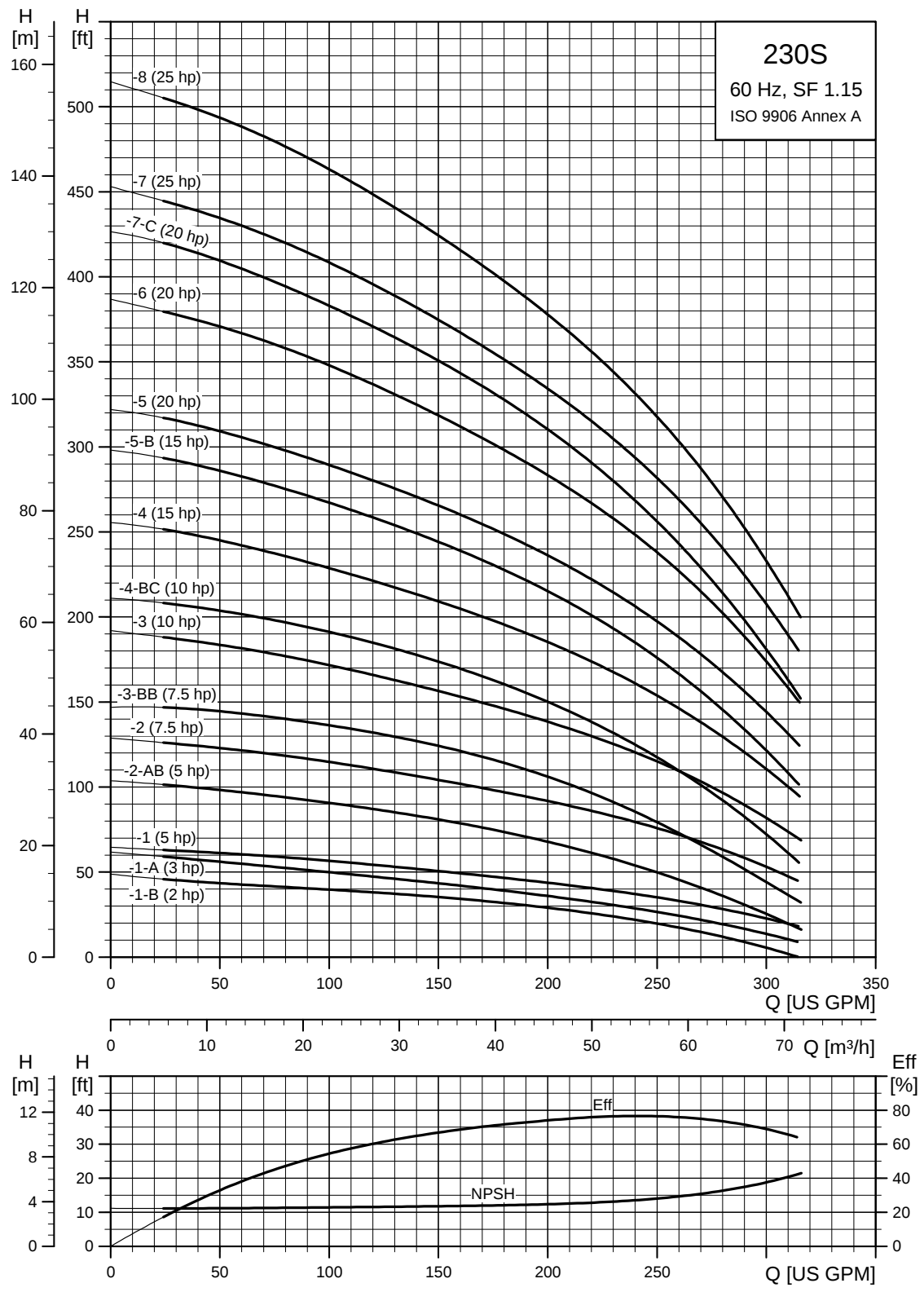
Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- ▲ MS 6000C motor.
- ☼ Takes MMS 6 motor; not available as complete.
- * Takes MMS 8000 motor; not available as complete.

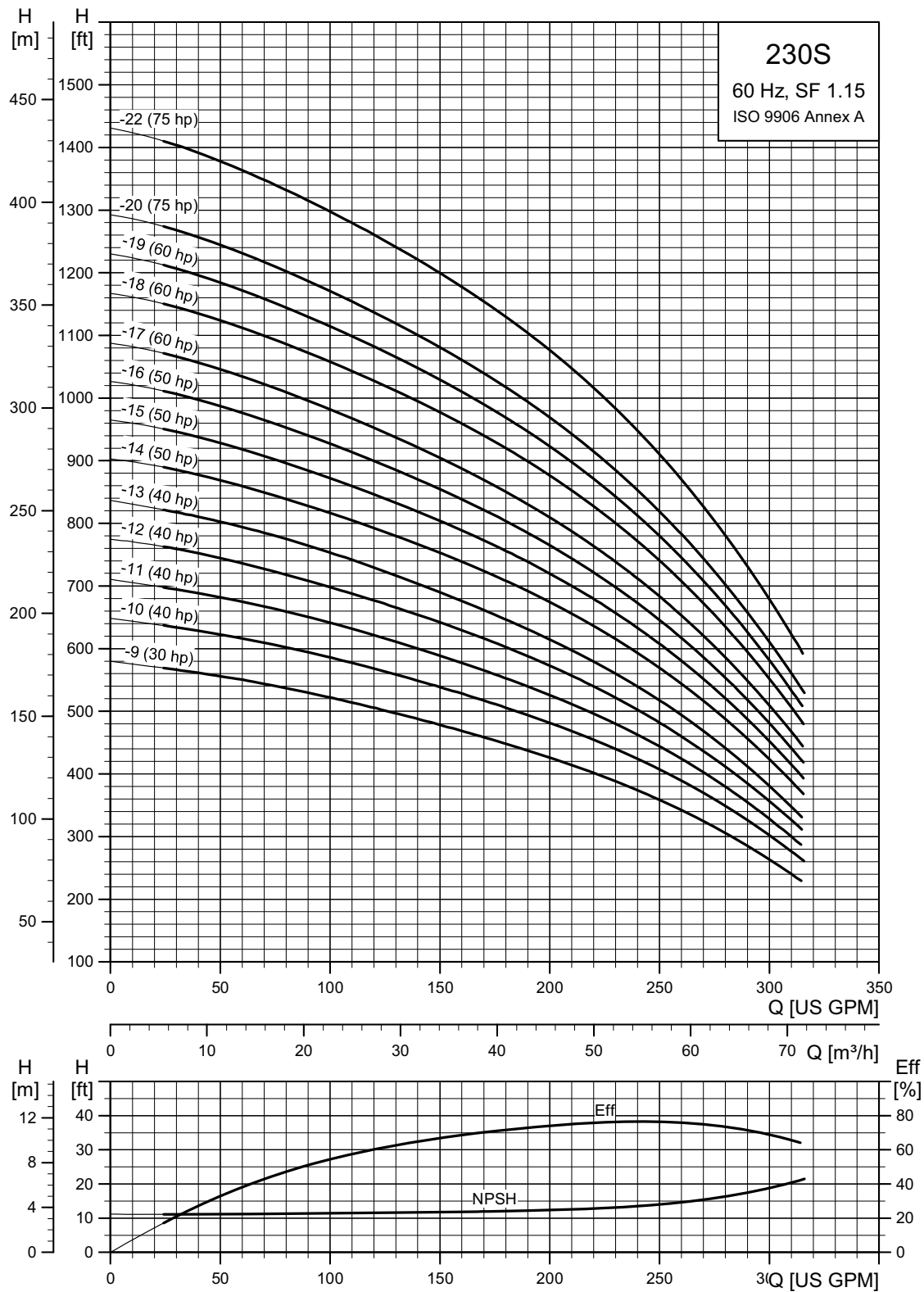
6" and larger wells - continued
SP 230S (230 gpm)



TM05 0243 1812

6" and larger wells - continued

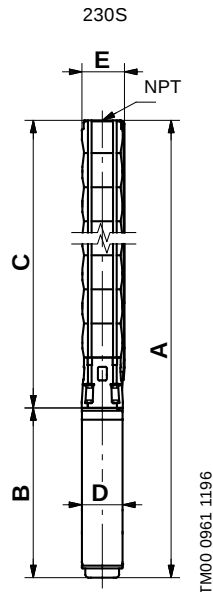
SP 230S (230 gpm)



TM05 0244 5014

6" and larger wells - continued
SP 230S (230 gpm) / 4, 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
230S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 230 gpm (3" NPT)											
230S20-1B	24	1	230	2	●	34.45 (875)	19.57 (497)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
		3	230	2	●	30.12 (765)	15.24 (387)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
		3	460	2	■	30.12 (765)	15.24 (387)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
230S30-1A	30	1	230	3	●	37.60 (955)	22.72 (577)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
		3	230	3	●	32.84 (834)	17.96 (456)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
		3	460	3	●	32.84 (834)	17.96 (456)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
230S50-1	37	1	230	5	●	41.54 (1055)	26.66 (677)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
		3	230	5	●	37.56 (954)	22.68 (576)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
		3	460	5	●	37.56 (954)	22.68 (576)	14.89 (378)	3.75 (95)	5.75 (146)	49.5
230S50-2AB	56	1	230	5	●	45.99 (1168)	26.66 (677)	19.34 (491)	3.75 (95)	5.75 (146)	49.5
		3	230	5	●	42.01 (1067)	22.68 (576)	19.34 (491)	3.75 (95)	5.75 (146)	79.2
		3	460	5	●	42.01 (1067)	22.68 (576)	19.34 (491)	3.75 (95)	5.75 (146)	79.2
230S75-2	80	3	230	7.5	●	45.95 (1167)	26.62 (676)	19.34 (491)	3.75 (95)	5.75 (146)	79.2
		3	460	7.5	●	45.95 (1167)	26.62 (676)	19.34 (491)	3.75 (95)	5.75 (146)	79.2
230S75-3BB	90	3	230	7.5	●	50.40 (1280)	26.62 (676)	23.78 (604)	3.75 (95)	5.75 (146)	126.0
		3	460	7.5	●	50.40 (1280)	26.62 (676)	23.78 (604)	3.75 (95)	5.75 (146)	126.0
230S100-3	123	3	460	10	●	54.34 (1380)	30.56 (776)	23.78 (604)	3.75 (95)	5.75 (146)	126.0
230S100-4BC	131	3	460	10	●	58.78 (1493)	30.56 (776)	28.23 (717)	3.75 (95)	5.75 (146)	144.9
230S - Motor dia. 6 inch, 60 Hz, rated flow 230 gpm (3" NPT)											
230S75-2	80	3	230	7.5	▲	43.47 (1104)	23.51 (597)	19.97 (507)	5.52 (140)	5.79 (147)	111.6
		3	460	7.5	▲	43.47 (1104)	23.51 (597)	19.97 (507)	5.52 (140)	5.79 (147)	111.6
230S75-3BB	90	3	230	7.5	▲	47.92 (1217)	23.51 (597)	24.41 (620)	5.52 (140)	5.79 (147)	131.4
		3	460	7.5	▲	47.92 (1217)	23.51 (597)	24.41 (620)	5.52 (140)	5.79 (147)	131.4
230S100-3	123	3	230	10	▲	49.10 (1247)	24.69 (627)	24.41 (620)	5.52 (140)	5.79 (147)	126.0
		3	460	10	▲	49.10 (1247)	24.69 (627)	24.41 (620)	5.52 (140)	5.79 (147)	126.0
230S100-4BC	131	3	230	10	▲	53.55 (1360)	24.69 (627)	28.86 (733)	5.52 (140)	5.79 (147)	144.9
		3	460	10	▲	53.55 (1360)	24.69 (627)	28.86 (733)	5.52 (140)	5.79 (147)	144.9
230S150-4	166	3	230	15	▲	55.91 (1420)	27.05 (687)	28.86 (733)	5.52 (140)	5.79 (147)	144.9
		3	460	15	▲	55.91 (1420)	27.05 (687)	28.86 (733)	5.52 (140)	5.79 (147)	144.9
230S150-5B	195	3	230	15	▲	60.36 (1533)	27.05 (687)	33.31 (846)	5.52 (140)	5.79 (147)	161.1
		3	460	15	▲	60.36 (1533)	27.05 (687)	33.31 (846)	5.52 (140)	5.79 (147)	161.1
230S200-5	208	3	230	20	▲	62.92 (1598)	29.61 (752)	33.31 (846)	5.52 (140)	5.79 (147)	161.1
		3	460	20	▲	62.92 (1598)	29.61 (752)	33.31 (846)	5.52 (140)	5.79 (147)	161.1
230S200-6	251	3	230	20	▲	67.37 (1711)	29.61 (752)	37.76 (959)	5.52 (140)	5.79 (147)	167.4
		3	460	20	▲	67.37 (1711)	29.61 (752)	37.76 (959)	5.52 (140)	5.79 (147)	167.4
230S200-7C	276	3	230	20	▲	71.82 (1824)	29.61 (752)	42.21 (1072)	5.52 (140)	5.79 (147)	181.8
		3	460	20	▲	71.82 (1824)	29.61 (752)	42.21 (1072)	5.52 (140)	5.79 (147)	181.8



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 402 motor.
- MS 4000 motor.
- ▲ MS 6000C motor.

6" and larger wells - continued

SP 230S (230 gpm) / 6, 8 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
230S - Motor dia. 6 inch, 60 Hz, rated flow 230 gpm (3" NPT)										
230S250-7	294	3	230	25 ▲	73.98 (1879)	31.78 (807)	42.21 (1072)	5.52 (140)	5.79 (147)	149.9
		3	460	25 ▲	73.98 (1879)	31.78 (807)	42.21 (1072)	5.52 (140)	5.79 (147)	181.8
230S250-8B	329	3	230	25 ▲	78.43 (1992)	31.78 (807)	46.66 (1185)	5.52 (140)	5.79 (147)	188.1
		3	460	25 ▲	78.43 (1992)	31.78 (807)	46.66 (1185)	5.52 (140)	5.79 (147)	188.1
230S250-8	336	3	230	25 ▲	78.43 (1992)	31.78 (807)	46.66 (1185)	5.52 (140)	5.79 (147)	188.1
		3	460	25 ▲	78.43 (1992)	31.78 (807)	46.66 (1185)	5.52 (140)	5.79 (147)	188.1
230S250-9BB	352	3	230	25 ▲	82.88 (2105)	31.78 (807)	51.11 (1298)	5.52 (140)	5.79 (147)	205.2
		3	460	25 ▲	82.88 (2105)	31.78 (807)	51.11 (1298)	5.52 (140)	5.79 (147)	205.2
230S300-9	379	3	230	30 ▲	85.24 (2165)	34.14 (867)	51.11 (1298)	5.52 (140)	5.79 (147)	205.2
		3	460	30 ▲	85.24 (2165)	34.14 (867)	51.11 (1298)	5.52 (140)	5.79 (147)	205.2
230S400-10	422	3	460	40 ▲	94.81 (2408)	39.26 (997)	55.56 (1411)	5.52 (140)	5.79 (147)	241.2
230S400-11	465	3	460	40 ▲	99.26 (2521)	39.26 (997)	60.00 (1524)	5.52 (140)	5.79 (147)	245.7
230S400-12	507	3	460	40 ▲	103.71 (2634)	39.26 (997)	64.45 (1637)	5.52 (140)	5.79 (147)	251.1
230S400-13	550	3	460	40 ▲	108.15 (2747)	39.26 (997)	68.90 (1750)	5.52 (140)	5.79 (147)	255.6
230S500-14	593	3	460	50 ▲	129.45 (3288)	56.11 (1425)	73.35 (1863)	5.67 (144)	5.79 (147)	356.0
230S500-15	635	3	460	50 ▲	133.90 (3401)	56.11 (1425)	77.80 (1976)	5.67 (144)	5.79 (147)	360.5
230S500-16	678	3	460	50 ▲	138.35 (3514)	56.11 (1425)	82.25 (2089)	5.67 (144)	5.79 (147)	365.0
230S600-17	721	3	460	60 ☼	-	-	86.70 (2202)	-	5.79 (147)	-
230S600-18	763	3	460	60 ☼	-	-	91.15 (2315)	-	5.79 (147)	-
230S600-19	806	3	460	60 ☼	-	-	95.60 (2428)	-	5.79 (147)	-
230S - Motor dia. 8 inch, 60 Hz, rated flow 230 gpm (3" NPT)										
230S600-17	721	3	460	60 ★	138.47 (3517)	50.00 (1270)	88.47 (2247)	7.56 (192)	7.56 (192)	546.0
230S600-18	763	3	460	60 ★	142.92 (3630)	50.00 (1270)	92.92 (2360)	7.56 (192)	7.56 (192)	568.5
230S600-19	806	3	460	60 ★	147.37 (3743)	50.00 (1270)	97.37 (2473)	7.56 (192)	7.56 (192)	591.0
230S750-20DS	849	3	460	75 ★	164.69 (4183)	53.15 (1350)	111.54 (2833)	7.56 (192)	7.56 (192)	549.9
230S750-22DS	934	3	460	75 ★	173.59 (4409)	53.15 (1350)	120.44 (3059)	7.56 (192)	7.56 (192)	620.4

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.

DS designation = Built into sleeve, 1 - 1/2" NPT, 6" minimum well diameter.

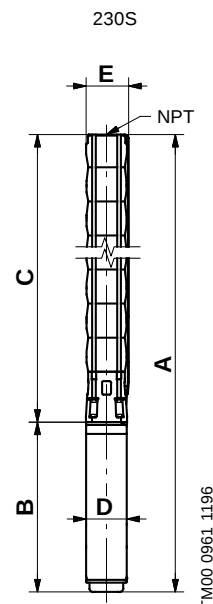
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

▲ MS 6000C motor.

▲ MMS 6 motor.

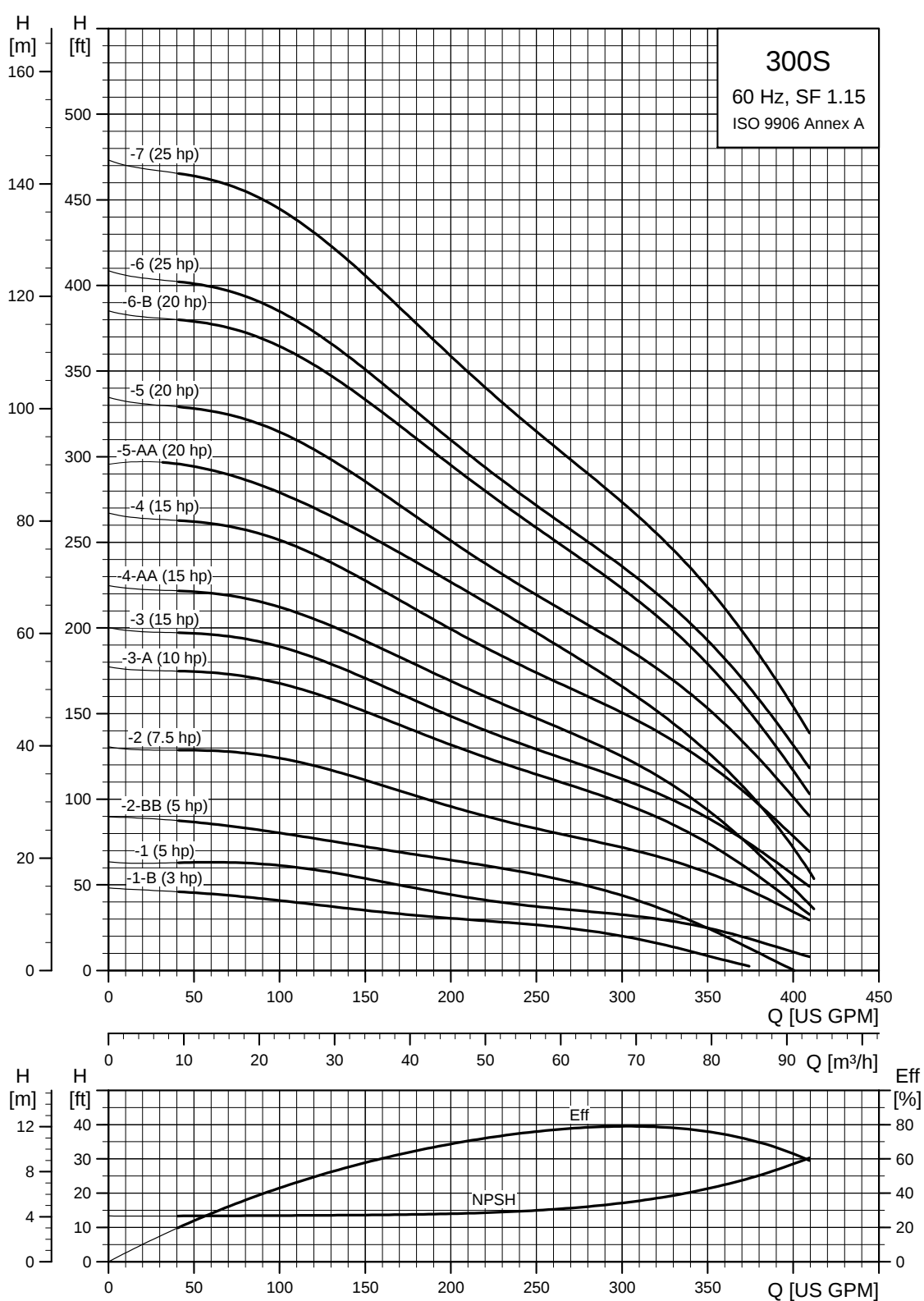
★ MMS 8000 motor.

☆ Takes MMS 6 motor; not available as complete.



E = Maximum diameter of pump including cable guard and motor.

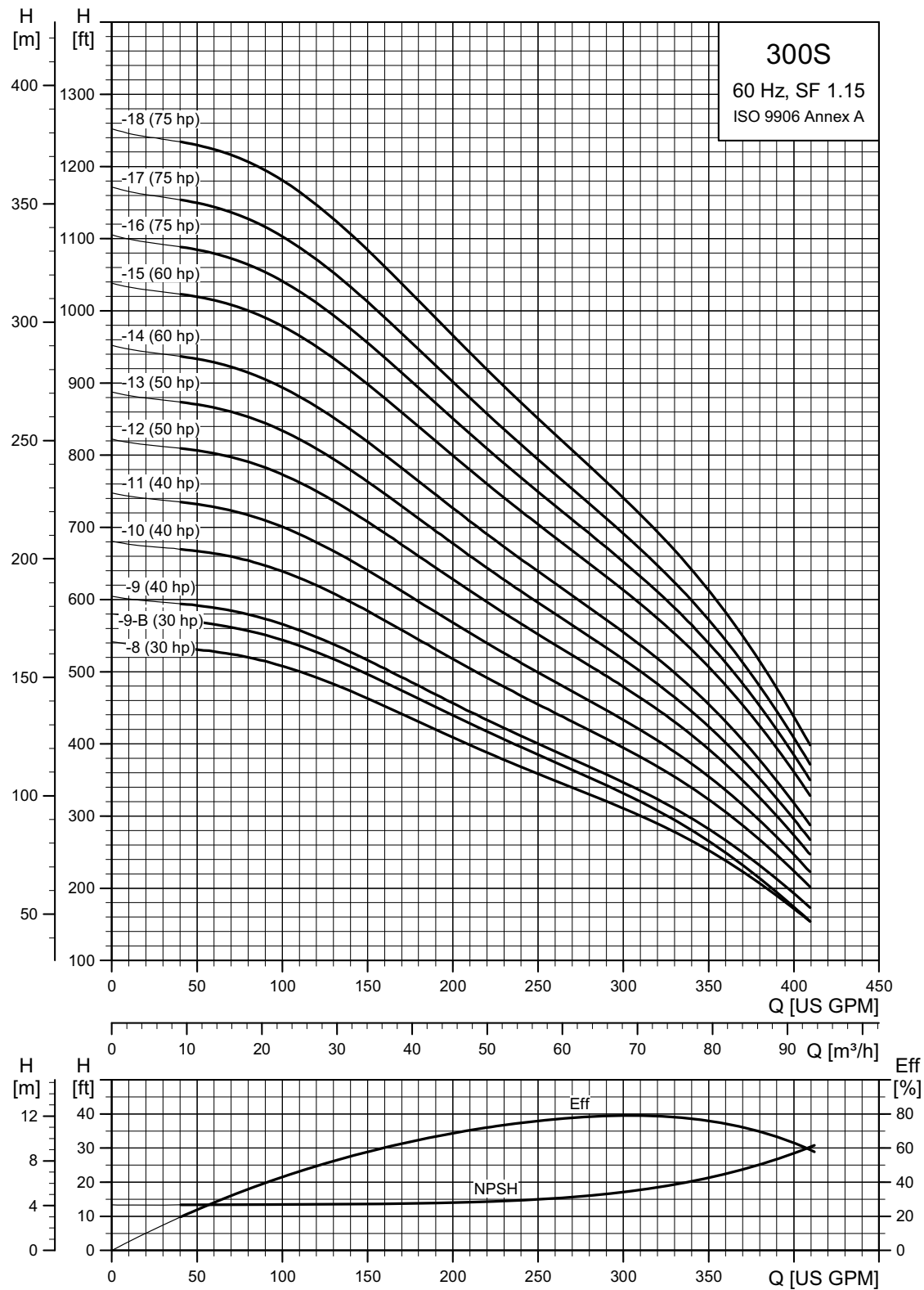
6" and larger wells - continued
SP 300S (300 gpm)



TM05 0247 1812

6" and larger wells - continued

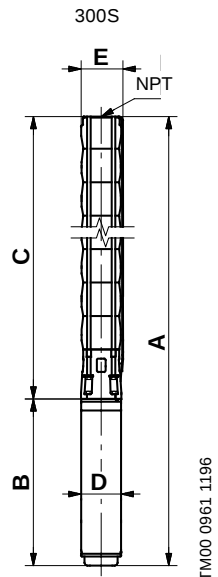
SP 300S (300 gpm)



TM05 0248 5014

6" and larger wells - continued SP 300S (300 gpm) / 4, 6 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
300S - Motor dia. 4 inch, 3 wire motor, 60 Hz, rated flow 300 gpm (3" NPT)											
300S30-1B	19	1	230	3	●	37.60 (955)	22.72 (577)	14.89 (378)	3.75 (95)	5.75 (146)	72.0
		3	230	3	●	32.84 (834)	17.96 (456)	14.89 (378)	3.75 (95)	5.75 (146)	72.0
		3	460	3	●	32.84 (834)	17.96 (456)	14.89 (378)	3.75 (95)	5.75 (146)	72.0
300S50-1	31	1	230	5	●	41.54 (1055)	26.66 (677)	14.89 (378)	3.75 (95)	5.75 (146)	74.7
		3	230	5	●	37.56 (954)	22.68 (576)	14.89 (378)	3.75 (95)	5.75 (146)	74.7
		3	460	5	●	37.56 (954)	22.68 (576)	14.89 (378)	3.75 (95)	5.75 (146)	74.7
300S50-2BB	42	1	230	5	●	45.99 (1168)	26.66 (677)	19.34 (491)	3.75 (95)	5.75 (146)	135.0
		3	230	5	●	42.01 (1067)	22.68 (576)	19.34 (491)	3.75 (95)	5.75 (146)	135.0
		3	460	5	●	42.01 (1067)	22.68 (576)	19.34 (491)	3.75 (95)	5.75 (146)	135.0
300S75-2	70	3	230	7.5	●	45.95 (1167)	26.62 (676)	19.34 (491)	3.75 (95)	5.75 (146)	101.7
		3	460	7.5	●	45.95 (1167)	26.62 (676)	19.34 (491)	3.75 (95)	5.75 (146)	101.7
300S100-3A	97	3	460	10	●	54.34 (1380)	30.56 (776)	23.78 (604)	3.75 (95)	5.75 (146)	145.8
300S - Motor dia. 6 inch, 60 Hz, rated flow 300 gpm (3" NPT)											
300S75-2	70	3	230	7.5	▲	43.47 (1104)	23.51 (597)	19.97 (507)	5.52 (140)	5.79 (147)	167.4
		3	460	7.5	▲	43.47 (1104)	23.51 (597)	19.97 (507)	5.52 (140)	5.79 (147)	167.4
300S100-3A	97	3	230	10	▲	49.10 (1247)	24.69 (627)	24.41 (620)	5.52 (140)	5.79 (147)	216.0
		3	460	10	▲	49.10 (1247)	24.69 (627)	24.41 (620)	5.52 (140)	5.79 (147)	216.0
300S150-3	110	3	230	15	▲	51.46 (1307)	27.05 (687)	24.41 (620)	5.52 (140)	5.79 (147)	216.0
		3	460	15	▲	51.46 (1307)	27.05 (687)	24.41 (620)	5.52 (140)	5.79 (147)	216.0
300S150-4AA	123	3	230	15	▲	55.91 (1420)	27.05 (687)	28.86 (733)	5.52 (140)	5.79 (147)	222.3
		3	460	15	▲	55.91 (1420)	27.05 (687)	28.86 (733)	5.52 (140)	5.79 (147)	222.3
300S150-4	149	3	230	15	▲	55.91 (1420)	27.05 (687)	28.86 (733)	5.52 (140)	5.79 (147)	222.3
		3	460	15	▲	55.91 (1420)	27.05 (687)	28.86 (733)	5.52 (140)	5.79 (147)	222.3
300S200-5AA	170	3	230	20	▲	62.92 (1598)	29.61 (752)	33.31 (846)	5.52 (140)	5.79 (147)	194.4
		3	460	20	▲	62.92 (1598)	29.61 (752)	33.31 (846)	5.52 (140)	5.79 (147)	194.4
300S200-5	188	3	230	20	▲	62.92 (1598)	29.61 (752)	33.31 (846)	5.52 (140)	5.79 (147)	194.4
		3	460	20	▲	62.92 (1598)	29.61 (752)	33.31 (846)	5.52 (140)	5.79 (147)	194.4
300S200-6B	211	3	230	20	▲	67.37 (1711)	29.61 (752)	37.76 (959)	5.52 (140)	5.79 (147)	198.0
		3	460	20	▲	67.37 (1711)	29.61 (752)	37.76 (959)	5.52 (140)	5.79 (147)	198.0
300S250-6	228	3	230	25	▲	69.53 (1766)	31.78 (807)	37.76 (959)	5.52 (140)	5.79 (147)	198.0
		3	460	25	▲	69.53 (1766)	31.78 (807)	37.76 (959)	5.52 (140)	5.79 (147)	198.0



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- MS 4000 motor.
- ▲ MS 6000C motor.

6" and larger wells - continued

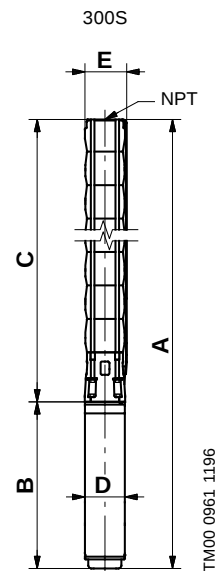
SP 300S (300 gpm) / 6, 8 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
300S - Motor dia. 6 inch, 60 Hz, rated flow 300 gpm (4" NPT)											
300S250-7AA	249	3	230	25 ▲	73.98 (1879)	31.78 (807)	42.21 (1072)	5.52 (140)	5.79 (147)	217.8	
		3	460	25 ▲	73.98 (1879)	31.78 (807)	42.21 (1072)	5.52 (140)	5.79 (147)	217.8	
300S300-7	267	3	230	30 ▲	76.34 (1939)	34.14 (867)	42.21 (1072)	5.52 (140)	5.79 (147)	217.8	
		3	460	30 ▲	76.34 (1939)	34.14 (867)	42.21 (1072)	5.52 (140)	5.79 (147)	217.8	
300S300-8	307	3	230	30 ▲	80.79 (2052)	34.14 (867)	46.66 (1185)	5.52 (140)	5.79 (147)	224.1	
		3	460	30 ▲	80.79 (2052)	34.14 (867)	46.66 (1185)	5.52 (140)	5.79 (147)	224.1	
300S300-9B	329	3	230	30 ▲	85.24 (2165)	34.14 (867)	51.11 (1298)	5.52 (140)	5.79 (147)	261.0	
		3	460	30 ▲	85.24 (2165)	34.14 (867)	51.11 (1298)	5.52 (140)	5.79 (147)	261.0	
300S400-9	346	3	460	40 ▲	90.36 (2295)	39.26 (997)	51.11 (1298)	5.52 (140)	5.79 (147)	296.0	
300S400-10	385	3	460	40 ▲	94.81 (2408)	39.26 (997)	55.56 (1411)	5.52 (140)	5.79 (147)	300.5	
300S400-11	425	3	460	40 ☼	99.26 (2521)	39.26 (997)	60.00 (1524)	5.52 (140)	5.79 (147)	352.0	
300S500-12	464	3	460	50 ☼	120.56 (3062)	56.11 (1425)	64.45 (1637)	5.67 (144)	5.79 (147)	348.8	
300S500-13	504	3	460	50 ☼	125.00 (3175)	56.11 (1425)	68.90 (1750)	5.67 (144)	5.79 (147)	355.1	
300S600-14	543	3	460	60 *	-	-	73.35 (1863)	-	5.79 (147)	-	
300S600-15	582	3	460	60 *	-	-	77.80 (1976)	-	5.79 (147)	-	
SP 300S - Motor dia. 8 inch, 60 Hz, rated flow 230 gpm (4" NPT)											
300S600-14	543	3	460	60 *	125.12 (3178)	50.00 (1270)	75.12 (1908)	7.56 (192)	7.56 (192)	479.4	
300S600-15	582	3	460	60 *	129.57 (3291)	50.00 (1270)	79.57 (2021)	7.56 (192)	7.56 (192)	519.4	
300S750-16	622	3	460	75 *	137.17 (3484)	53.15 (1350)	84.02 (2134)	7.56 (192)	7.56 (192)	569.1	
300S750-17	661	3	460	75 *	141.62 (3597)	53.15 (1350)	88.47 (2247)	7.56 (192)	7.56 (192)	575.4	
300S750-18	701	3	460	75 *	146.07 (3710)	53.15 (1350)	92.92 (2360)	7.56 (192)	7.56 (192)	581.7	

Notes:

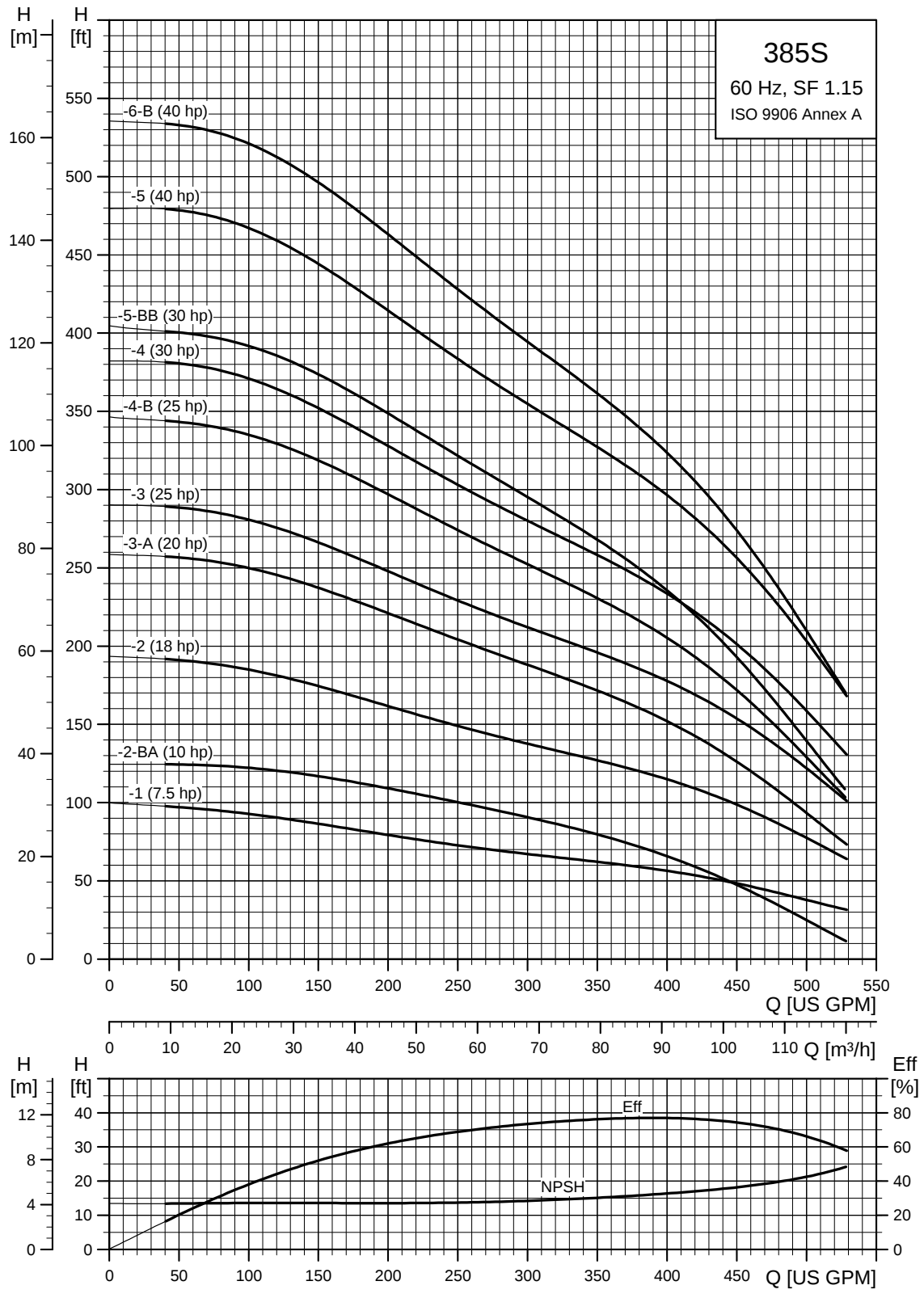
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906 Annex A @ 8 ft. minimum submergence.

- ▲ MS 6000C motor.
- ☼ Takes MMS 6 motor; not available as complete.
- * Takes MMS 8000 motor; not available as complete.



E = Maximum diameter of pump including cable guard and motor.

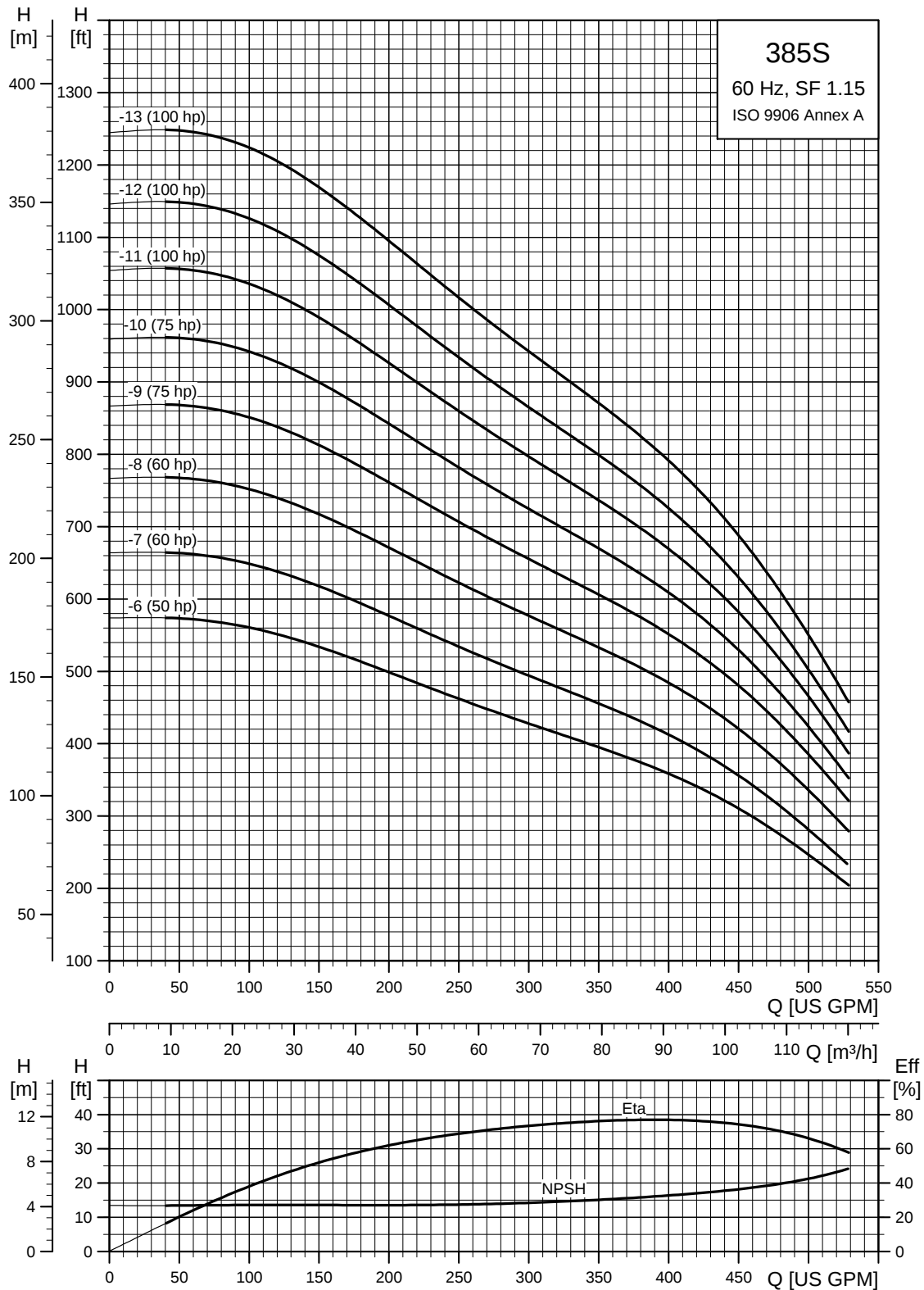
8" and larger wells
SP 385S (385 gpm)



TM05 0251 1812

8" and larger wells - continued

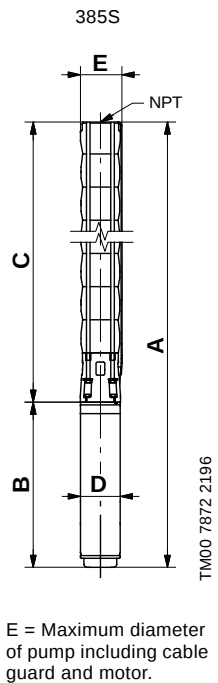
SP 385S (385 gpm)



TM05 0252 1812

8" and larger wells - continued SP 385S (385 gpm) / 6, 8, 10 inch motor

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
385S - Motor dia. 6 inch, 60 Hz, rated flow 385 gpm (4" NPT)											
385S75-1	57	3	230	7.5 ▲	46.58 (1183)	22.25 (565)	24.34 (618)	5.63 (143)	7.01 (178)	135.9	
		3	460	7.5 ▲	46.58 (1183)	22.25 (565)	24.34 (618)	5.63 (143)	7.01 (178)	135.9	
385S100-2BA	69	3	230	10 ▲	52.6 (1336)	23.23 (590)	29.38 (746)	5.63 (143)	7.01 (178)	169.2	
		3	460	10 ▲	52.6 (1336)	23.23 (590)	29.38 (746)	5.63 (143)	7.01 (178)	169.2	
385S150-2	117	3	230	15 ▲	57.25 (1454)	27.88 (708)	29.38 (746)	5.63 (143)	7.01 (178)	169.2	
		3	460	15 ▲	57.25 (1454)	27.88 (708)	29.38 (746)	5.63 (143)	7.01 (178)	169.2	
385S200-3A	155	3	230	20 ▲	65.24 (1657)	30.83 (783)	34.41 (874)	5.63 (143)	7.01 (178)	188.1	
		3	460	20 ▲	65.24 (1657)	30.83 (783)	34.41 (874)	5.63 (143)	7.01 (178)	188.1	
385S250-3	177	3	230	25 ▲	67.41 (1712)	33.00 (838)	34.41 (874)	5.63 (143)	7.01 (178)	188.1	
		3	460	25 ▲	67.41 (1712)	33.00 (838)	34.41 (874)	5.63 (143)	7.01 (178)	188.1	
385S250-4B	210	3	230	25 ▲	72.45 (1840)	33.00 (838)	39.45 (1002)	5.63 (143)	7.01 (178)	239.4	
		3	460	25 ▲	72.45 (1840)	33.00 (838)	39.45 (1002)	5.63 (143)	7.01 (178)	239.4	
385S300-4	237	3	230	30 ▲	75.00 (1905)	35.56 (903)	39.45 (1002)	5.63 (143)	7.01 (178)	239.4	
		3	460	30 ▲	75.00 (1905)	35.56 (903)	39.45 (1002)	5.63 (143)	7.01 (178)	239.4	
385S300-5BB	343	3	230	30 ▲	80.04 (2033)	35.56 (903)	44.49 (1130)	5.63 (143)	7.01 (178)	247.5	
		3	460	30 ▲	80.04 (2033)	35.56 (903)	44.49 (1130)	5.63 (143)	7.01 (178)	247.5	
385S400-5	297	3	460	40 ▲	84.77 (2153)	40.28 (1023)	44.49 (1130)	5.63 (143)	7.01 (178)	247.5	
385S400-6B	330	3	460	40 ▲	89.81 (2281)	40.28 (1023)	49.53 (1258)	5.63 (143)	7.01 (178)	252.0	
385S500-6	357	3	460	50 ☼	110.99 (2825)	56.11 (1425)	54.88 (1394)	5.67 (144)	7.88 (200)	-	
385S500-7A	400	3	460	50 ☼	110.99 (2825)	56.11 (1425)	54.88 (1394)	5.67 (144)	7.88 (200)	-	
385S600-7	416	3	460	60 †	-	-	55.12 (1400)	-	7.88 (200)	-	
385S600-8	476	3	460	60 †	-	-	55.12 (1400)	-	7.88 (200)	-	
385S - Motor dia. 8 inch, 60 Hz, rated flow 385 gpm (4" NPT)											
385S400-6B	330	3	460	40 *	93.78 (2382)	43.71 (1110)	50.08 (1272)	7.56 (192)	7.88 (200)	428.3	
385S500-6	357	3	460	50 *	95.75 (2432)	45.67 (1160)	50.08 (1272)	7.56 (192)	7.88 (200)	451.2	
385S500-7A	400	3	460	50 *	100.79 (2560)	45.67 (1160)	55.12 (1400)	7.56 (192)	7.88 (200)	461.1	
385S600-7	416	3	460	60 *	105.12 (2670)	50.00 (1270)	55.12 (1400)	7.56 (192)	7.88 (200)	507.3	
385S600-8	476	3	460	60 *	110.16 (2798)	50.00 (1270)	60.16 (1528)	7.56 (192)	7.88 (200)	517.2	
385S750-9	536	3	460	75 *	118.35 (3006)	53.15 (1350)	65.2 (1656)	7.56 (192)	7.88 (200)	558.7	
385S750-10	596	3	460	75 *	123.39 (3134)	53.15 (1350)	70.24 (1784)	7.56 (192)	7.88 (200)	568.6	
385S1000-11	656	3	460	100 *	137.88 (3502)	62.60 (1590)	75.28 (1912)	7.56 (192)	7.88 (200)	677.5	
385S1000-12	716	3	460	100 *	142.92 (3630)	62.60 (1590)	80.32 (2040)	7.56 (192)	7.88 (200)	687.4	
385S1000-13	776	3	460	100 *	147.96 (3758)	62.60 (1590)	85.36 (2168)	7.56 (192)	7.88 (200)	697.3	



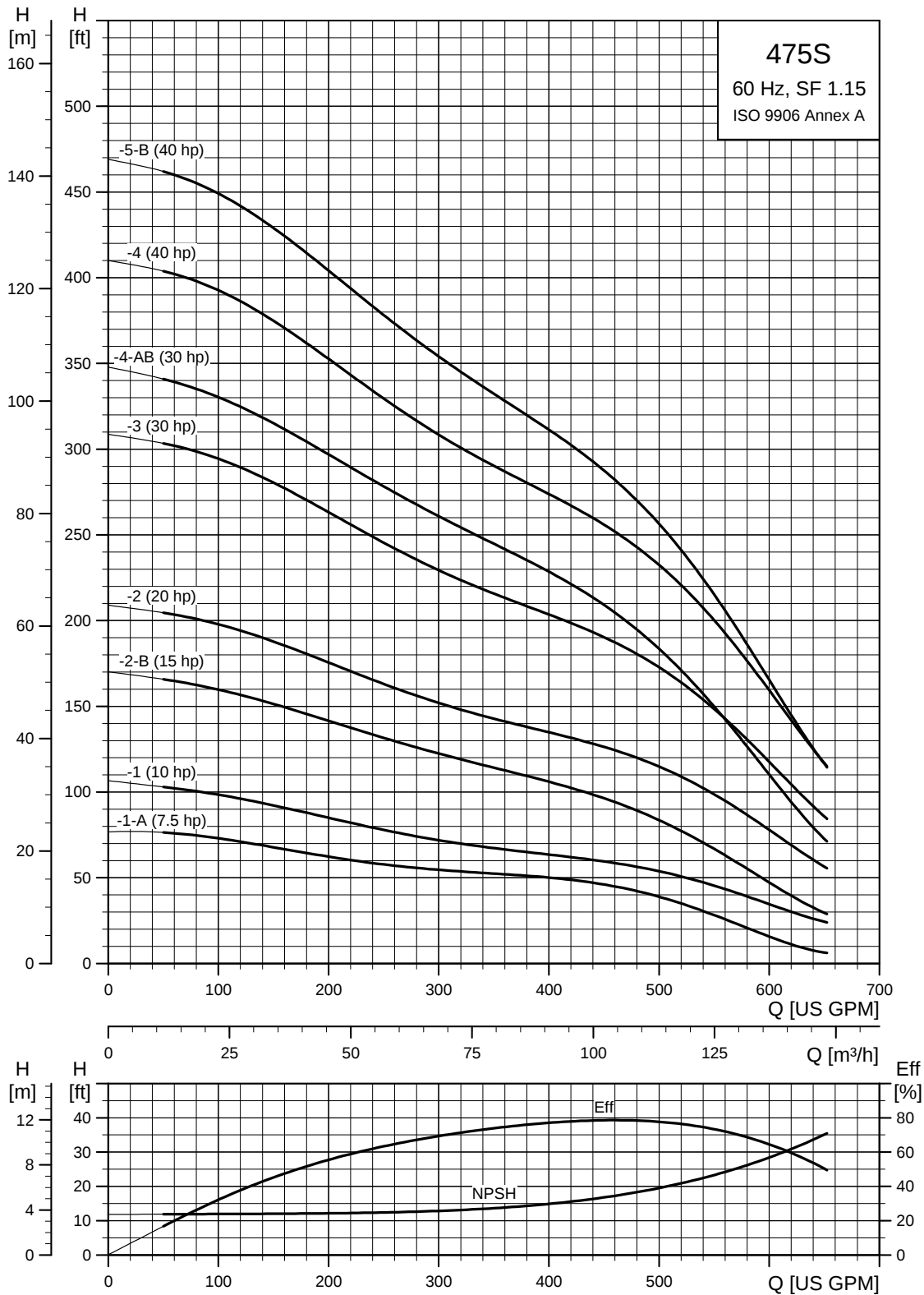
Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906 Annex A @ 8 ft. minimum submergence.

- ▲ MS 6000C motor.
- ☼ Takes MMS 6 motor; not available as complete.
- * Takes MMS 8000 motor; not available as complete.
- † Takes MMS 10000 motor; not available as complete.

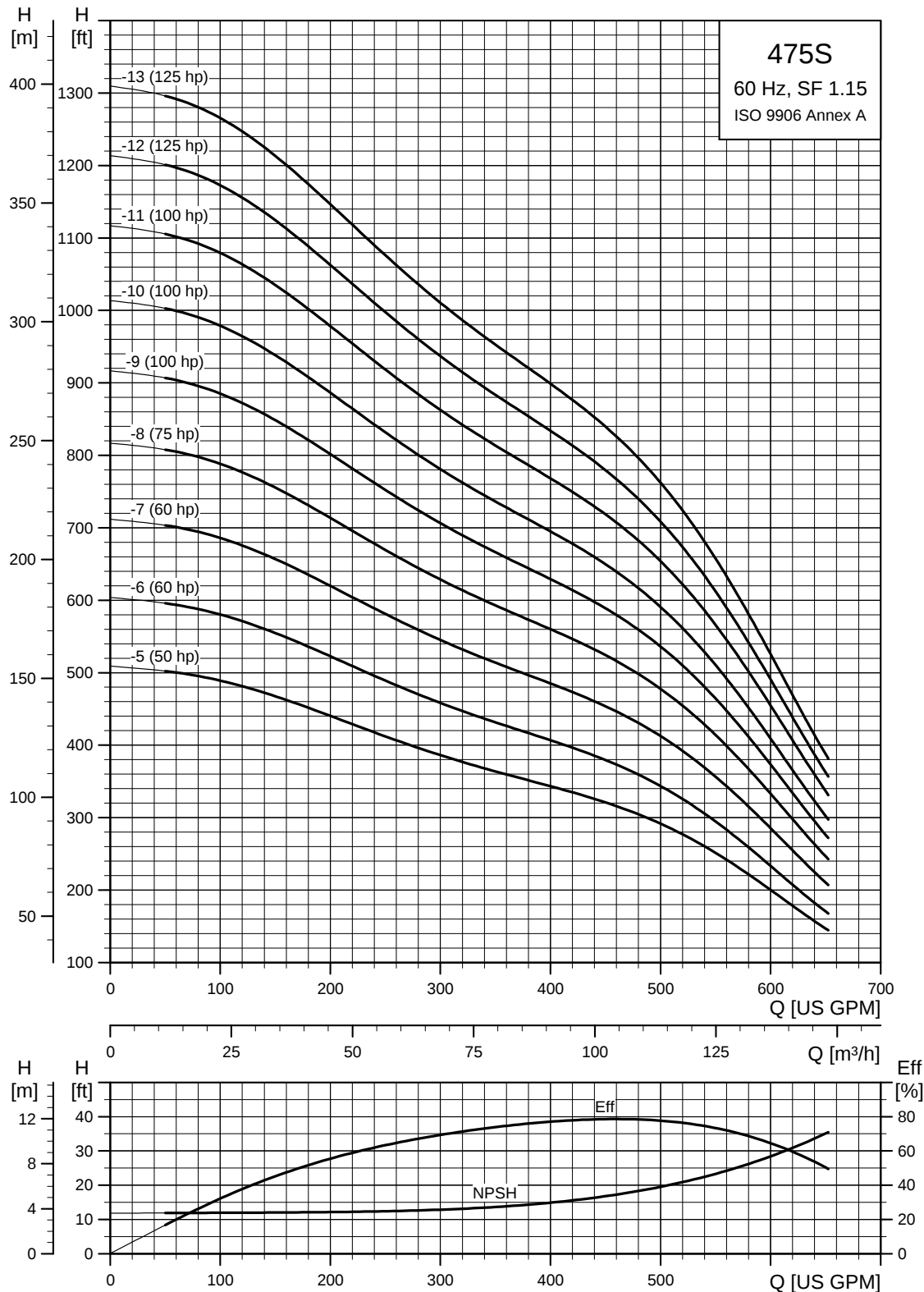
8" and larger wells - continued

SP 475S (475 gpm)



TM05 0255 2112

8" and larger wells - continued
SP 475S (475 gpm)

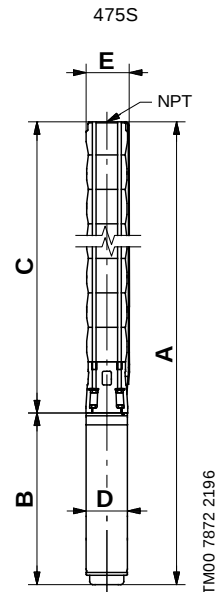


TM05 0256 2112

8" and larger wells - continued

SP 475S (475 gpm) / 6, 8 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
475S - Motor dia. 6 inch, 60 Hz, rated flow 475 gpm (5" NPT)										
475S75-1A	42	3	230	7.5 ▲	46.58 (1183)	22.25 (565)	24.34 (618)	5.63 (143)	7.05 (179)	132.3
		3	460	7.5 ▲	46.58 (1183)	22.25 (565)	24.34 (618)	5.63 (143)	7.05 (179)	132.3
475S100-1	58	3	230	10 ▲	47.56 (1208)	23.23 (590)	24.34 (618)	5.63 (143)	7.05 (179)	132.3
		3	460	10 ▲	47.56 (1208)	23.23 (590)	24.34 (618)	5.63 (143)	7.05 (179)	132.3
475S150-2B	89	3	230	15 ▲	57.25 (1454)	27.88 (708)	29.38 (746)	5.63 (143)	7.05 (179)	170.1
		3	460	15 ▲	57.25 (1454)	27.88 (708)	29.38 (746)	5.63 (143)	7.05 (179)	170.1
475S200-2	117	3	230	20 ▲	60.20 (1529)	30.83 (783)	29.38 (746)	5.63 (143)	7.05 (179)	198.7
		3	460	20 ▲	60.20 (1529)	30.83 (783)	29.38 (746)	5.63 (143)	7.05 (179)	198.7
475S250-3A	166	3	230	25 ▲	67.41 (1712)	33.00 (838)	34.41 (874)	5.63 (143)	7.05 (179)	218.2
		3	460	25 ▲	67.41 (1712)	33.00 (838)	34.41 (874)	5.63 (143)	7.05 (179)	218.2
475S300-3	177	3	230	30 ▲	69.97 (1777)	35.56 (903)	34.41 (874)	5.63 (143)	7.05 (179)	233.6
		3	460	30 ▲	69.97 (1777)	35.56 (903)	34.41 (874)	5.63 (143)	7.05 (179)	233.6
475S300-4A B	168	3	230	30 ▲	75.00 (1905)	35.56 (903)	39.45 (1002)	5.63 (143)	7.05 (179)	239.9
		3	460	30 ▲	75.00 (1905)	35.56 (903)	39.45 (1002)	5.63 (143)	7.05 (179)	239.9
475S400-4	236	3	460	40 ▲	79.73 (2025)	40.28 (1023)	39.45 (1002)	5.63 (143)	7.05 (179)	268.5
475S - Motor dia. 6 inch, 60 Hz, rated flow 475 gpm (6" NPT)										
475S400-5B	268	3	460	40 ▲	84.77 (2153)	40.28 (1023)	44.49 (1130)	5.63 (143)	7.05 (179)	356.0
475S500-5	296	3	460	50 ☼	100.6 (2555)	56.11 (1425)	44.49 (1130)	5.67 (144)	7.05 (179)	384.0
475S500-6A	344	3	460	50 ☼	105.63 (2683)	56.11 (1425)	49.53 (1258)	5.67 (144)	7.05 (179)	385.0
475S600-6	355	3	460	60 *	-	-	50.08 (1272)	-	7.05 (179)	-
475S600-7	415	3	460	60 *	-	-	55.12 (1400)	-	7.05 (179)	-
475S - Motor dia. 8 inch, 60 Hz, rated flow 475 gpm (6" NPT)										
475S400-4	236	3	460	40 *	83.71 (2126)	43.71 (1110)	40.00 (1016)	7.56 (192)	8.08 (205)	406.5
475S400-5B	268	3	460	40 *	88.75 (2254)	43.71 (1110)	45.04 (1144)	7.56 (192)	8.08 (205)	-
475S500-5	296	3	460	50 *	90.71 (2304)	45.67 (1160)	45.04 (1144)	7.56 (192)	8.08 (205)	420.4
475S500-6A	344	3	460	50 *	95.75 (2432)	45.67 (1160)	50.08 (1272)	7.56 (192)	8.08 (205)	-
475S600-6	355	3	460	60 *	100.08 (2542)	50.00 (1270)	50.08 (1272)	7.56 (192)	8.08 (205)	476.0
475S600-7	415	3	460	60 *	105.12 (2670)	50.00 (1270)	55.12 (1400)	7.56 (192)	8.08 (205)	482.6
475S750-8	534	3	460	75 *	113.31 (2878)	53.15 (1350)	60.16 (1528)	7.56 (192)	8.08 (205)	524.4
475S1000-9	534	3	460	100 *	127.8 (3246)	62.60 (1590)	65.20 (1656)	7.56 (192)	8.08 (205)	631.0
475S1000-10	593	3	460	100 *	132.84 (3374)	62.60 (1590)	70.24 (1784)	7.56 (192)	8.08 (205)	637.6
475S1000-11	653	3	460	100 *	137.88 (3502)	62.60 (1590)	75.28 (1912)	7.56 (192)	8.08 (205)	644.3
475S1250-12	712	3	460	125 *	152.37 (3870)	72.05 (1830)	80.32 (2040)	7.56 (192)	8.08 (205)	754.1
475S1250-13	772	3	460	125 *	157.41 (3998)	72.05 (1830)	85.36 (2168)	7.56 (192)	8.08 (205)	760.7



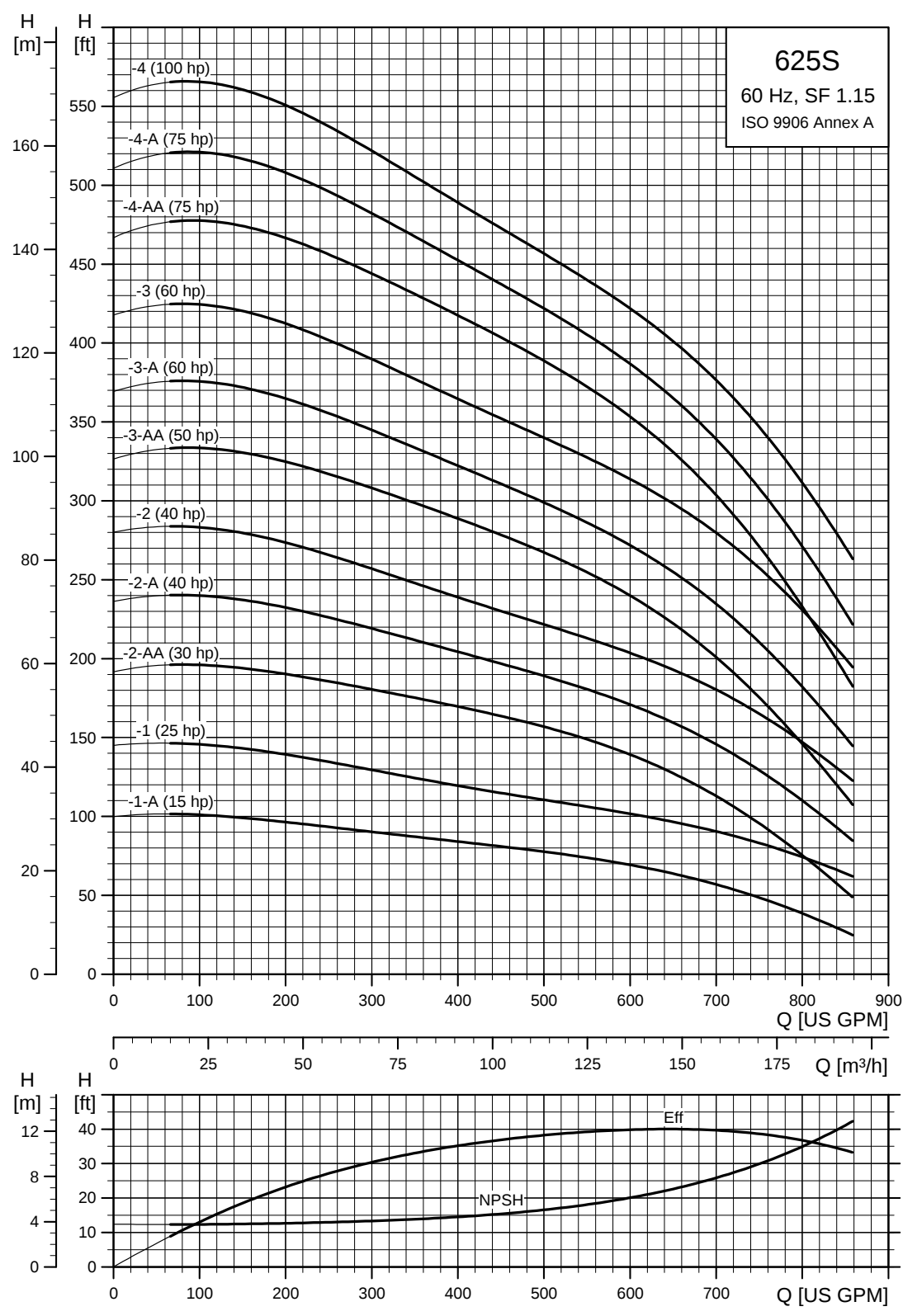
E = Maximum diameter of pump including cable guard and motor.

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box. Performance conforms to ISO 9906: 1999 (E) Annex A. Minimum submergence is 2 feet.

- ▲ MS 6000C motor.
- ☼ Takes MMS 6 motor; not available as complete.
- * Takes MMS 8000 motor; not available as complete.

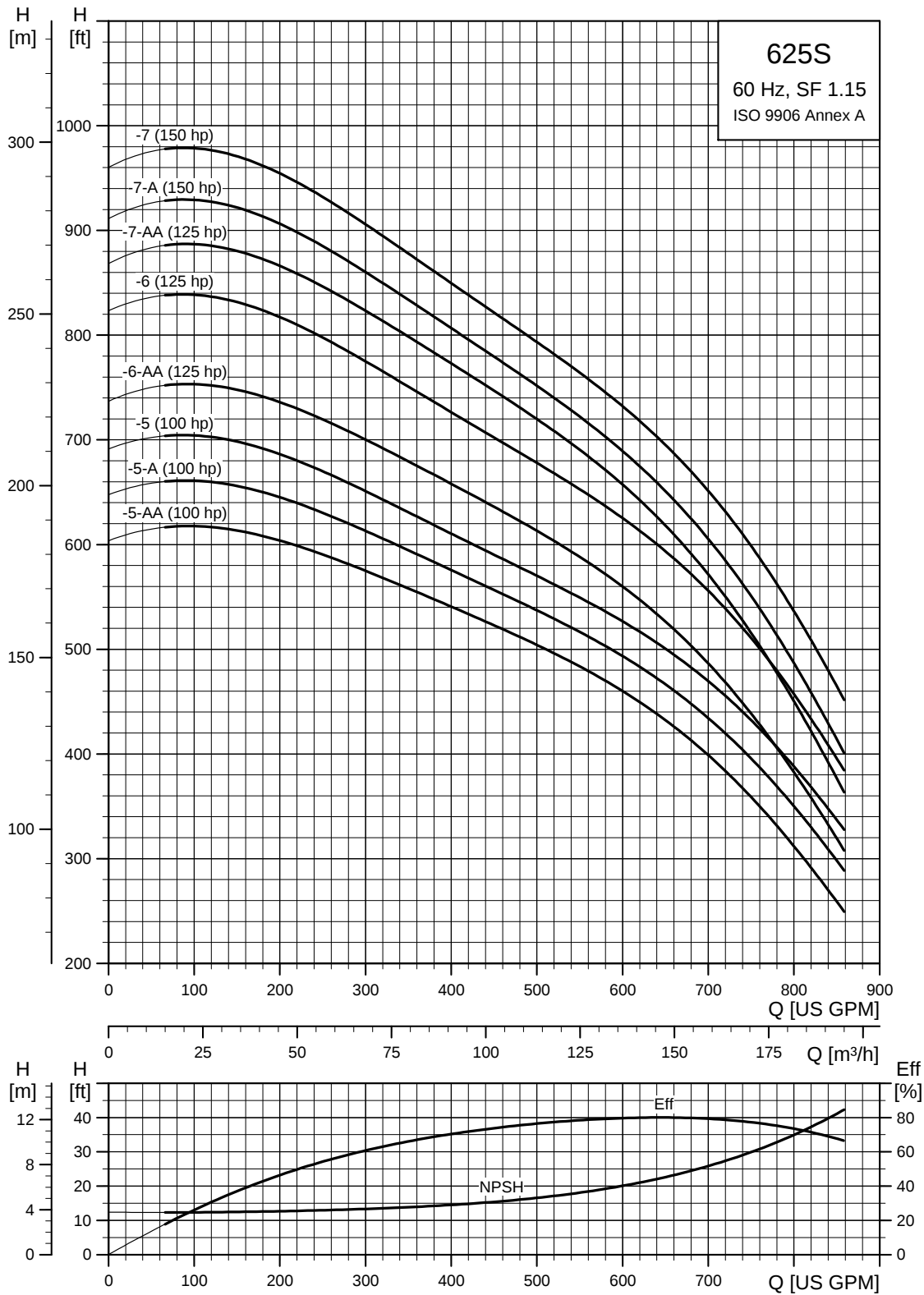
10" and larger wells
SP 625S (625 gpm)



TM05 0259 1812

10" and larger wells - continued

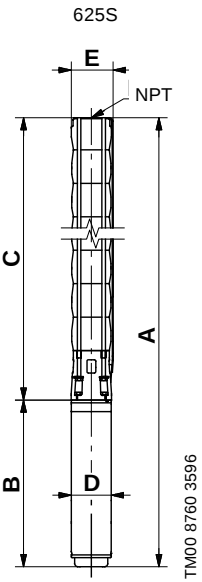
SP 625S (625 gpm)



TM05 0260 1812

10" and larger wells - continued
SP 625S (625 gpm) / 6, 8 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
625S - Motor dia. 6 inch, 60 Hz, rated flow 625 gpm (6" NPT)											
625S150-1A	65	3	230	15	▲	53.51 (1359)	27.88 (708)	25.63 (651)	5.63 (143)	8.31 (211)	193.0
		3	460	15	▲	53.51 (1359)	27.88 (708)	25.63 (651)	5.63 (143)	8.31 (211)	193.0
625S250-1	95	3	230	25	▲	58.63 (1489)	33.00 (838)	25.63 (651)	5.63 (143)	8.31 (211)	189.9
		3	460	25	▲	58.63 (1489)	33.00 (838)	25.63 (651)	5.63 (143)	8.31 (211)	198.9
625S300-2AA	130	3	230	30	▲	67.33 (1710)	35.56 (903)	31.78 (807)	5.63 (143)	8.31 (211)	213.0
		3	460	30	▲	67.33 (1710)	35.56 (903)	31.78 (807)	5.63 (143)	8.31 (211)	222.3
625S400-2A	159	3	460	40	▲	72.05 (1830)	40.28 (1023)	31.78 (807)	5.63 (143)	8.31 (211)	333.8
625S400-2	194	3	460	40	▲	72.05 (1830)	40.28 (1023)	31.78 (807)	5.63 (143)	8.31 (211)	333.8
625S500-3AA	224	3	460	50	◆	94.02 (2388)	56.11 (1425)	37.94 (963)	5.63 (143)	8.31 (211)	376.4
625S600-3A	258	3	460	60	*	-	-	37.92 (963)	-	8.31 (211)	-
625S600-3	292	3	460	60	*	-	-	37.92 (963)	-	8.31 (211)	-
625S - Motor dia. 8 inch, 60 Hz, rated flow 625 gpm (6" NPT)											
625S400-2	194	3	460	40	*	76.03 (1931)	43.71 (1110)	32.33 (821)	7.56 (192)	8.39 (213)	409.4
625S500-3AA	224	3	460	50	*	83.59 (2123)	45.67 (1160)	37.92 (963)	7.56 (192)	8.39 (213)	444.6
625S600-3A	258	3	460	60	*	87.92 (2233)	50.00 (1270)	37.92 (963)	7.56 (192)	8.39 (213)	490.8
625S600-3	292	3	460	60	*	87.92 (2233)	50.00 (1270)	37.92 (963)	7.56 (192)	8.39 (213)	490.8
625S750-4AA	322	3	460	75	*	97.21 (2469)	53.15 (1350)	44.06 (1119)	7.56 (192)	8.39 (213)	534.8
625S750-4A	357	3	460	75	*	97.21 (2469)	53.15 (1350)	44.06 (1119)	7.56 (192)	8.39 (213)	534.8
625S1000-4	391	3	460	100	*	106.66 (2709)	62.60 (1590)	44.06 (1119)	7.56 (192)	8.39 (213)	633.8
625S1000-5AA	421	3	460	100	*	112.76 (2864)	62.60 (1590)	50.16 (1274)	7.56 (192)	8.39 (213)	649.3
625S1000-5A	455	3	460	100	*	112.76 (2864)	62.60 (1590)	50.16 (1274)	7.56 (192)	8.39 (213)	649.3
625S1000-5	490	3	460	100	*	112.76 (2864)	62.60 (1590)	50.16 (1274)	7.56 (192)	8.39 (213)	649.3
625S1250-6AA	520	3	460	125	*	128.31 (3259)	72.05 (1830)	56.26 (1429)	7.56 (192)	8.39 (213)	761.5
625S1250-6	554	3	460	125	*	128.31 (3259)	72.05 (1830)	56.26 (1429)	7.56 (192)	8.39 (213)	761.5
625S1250-7AA	618	3	460	125	*	134.45 (3415)	72.05 (1830)	62.41 (1585)	7.56 (192)	8.39 (213)	774.7
625S1500-7A	653	3	460	150	*	143.51 (3645)	81.11 (2060)	62.41 (1585)	7.56 (192)	8.39 (213)	884.7
625S1500-7	687	3	460	150	*	143.51 (3645)	81.11 (2060)	62.41 (1585)	7.56 (192)	8.39 (213)	884.7



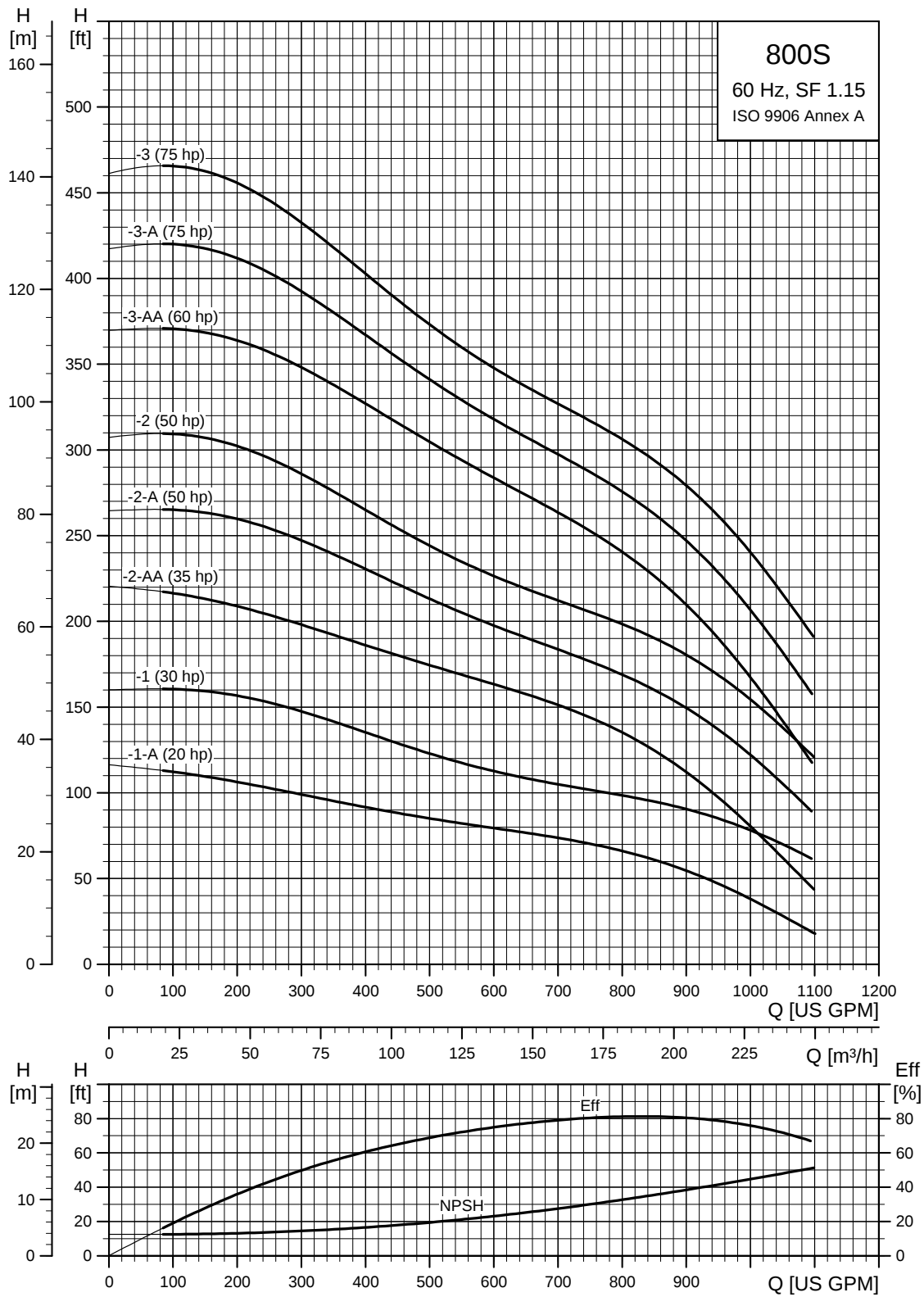
E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- ▲ MS 6000C motor.
- ♦ Takes MS 6000C motor; not available as complete.
- * Takes MMS 8000 motor; not available as complete.

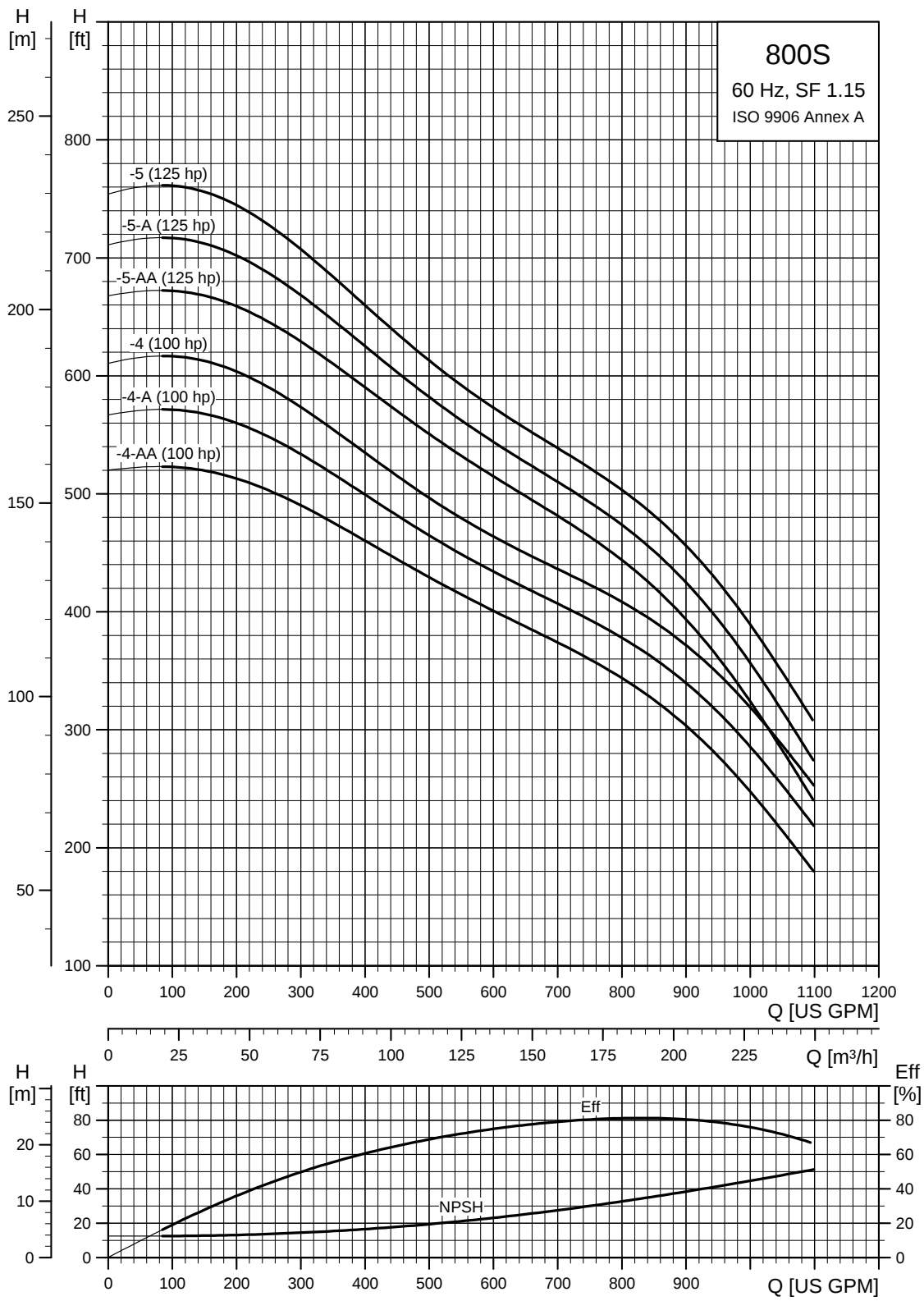
10" and larger wells - continued

SP 800S (800 gpm)



TM05 0263 1812

10" and larger wells - continued
SP 800S (800 gpm)

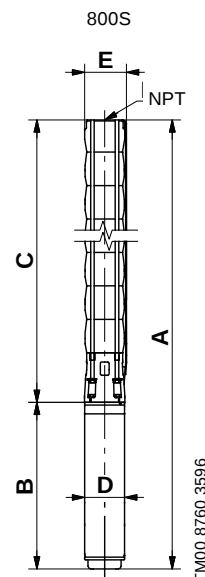


TM05 0264 1812

10" and larger wells - continued

SP 800S (800 gpm) / 6, 8 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]	
					A	B	C	D	E		
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]		
800S - Motor dia. 6 inch, 60 Hz, rated flow 800 gpm (6" NPT)											
800S200-1A	64	3	230	20 ▲	56.50 (1435)	30.83 (783)	25.67 (652)	5.63 (143)	8.31 (211)	180.0	
		3	460	20 ▲	56.50 (1435)	30.83 (783)	25.67 (652)	5.63 (143)	8.31 (211)	180.0	
800S300-1	96	3	230	30 ▲	61.23 (1555)	35.56 (903)	25.67 (652)	5.63 (143)	8.31 (211)	202.5	
		3	460	30 ▲	61.23 (1555)	35.56 (903)	25.67 (652)	5.63 (143)	8.31 (211)	202.5	
800S400-2AA	131	3	460	40 ▲	72.05 (1830)	40.28 (1023)	31.78 (807)	5.63 (143)	8.31 (211)	257.4	
800S500-2A	162	3	460	50 ☼	88.00 (2235)	56.11 (1425)	31.87 (810)	7.56 (192)	8.39 (213)	363.2	
800S500-2	194	3	460	50 ☼	88.00 (2235)	56.11 (1425)	31.87 (810)	7.56 (192)	8.39 (213)	363.2	
800S600-3AA	197	3	460	60 *	87.92 (2233)	50.00 (1270)	37.92 (963)	7.56 (192)	8.39 (213)	490.8	
800S - Motor dia. 8 inch, 60 Hz, rated flow 800 gpm (6" NPT)											
800S400-2AA	131	3	460	40 *	75.48 (1917)	43.71 (1110)	31.78 (807)	7.56 (192)	8.39 (213)	409.4	
800S500-2A	162	3	460	50 *	77.45 (1967)	45.67 (1160)	31.78 (807)	7.56 (192)	8.39 (213)	431.4	
800S500-2	187	3	460	50 *	77.45 (1967)	45.67 (1160)	31.78 (807)	7.56 (192)	8.39 (213)	438.0	
800S600-3AA	229	3	460	60 *	87.92 (2233)	50.00 (1270)	37.92 (963)	7.56 (192)	8.39 (213)	490.8	
800S750-3A	260	3	460	75 *	91.07 (2313)	53.15 (1350)	37.92 (963)	7.56 (192)	8.39 (213)	523.8	
800S750-3	292	3	460	75 *	91.07 (2313)	53.15 (1350)	37.92 (963)	7.56 (192)	8.39 (213)	523.8	
800S1000-4AA	327	3	460	100 *	106.62 (2708)	62.60 (1590)	44.02 (1118)	7.56 (192)	8.39 (213)	633.8	
800S1000-4A	358	3	460	100 *	106.62 (2708)	62.60 (1590)	44.02 (1118)	7.56 (192)	8.39 (213)	633.8	
800S1000-4	389	3	460	100 *	106.62 (2708)	62.60 (1590)	44.02 (1118)	7.56 (192)	8.39 (213)	633.8	
800S1250-5AA	426	3	460	125 *	122.21 (3104)	72.05 (1830)	50.16 (1274)	7.56 (192)	8.39 (213)	748.3	
800S1250-5A	456	3	460	125 *	122.21 (3104)	72.05 (1830)	50.16 (1274)	7.56 (192)	8.39 (213)	748.3	
800S1250-5	487	3	460	125 *	122.21 (3104)	72.05 (1830)	50.16 (1274)	7.56 (192)	8.39 (213)	746.6	



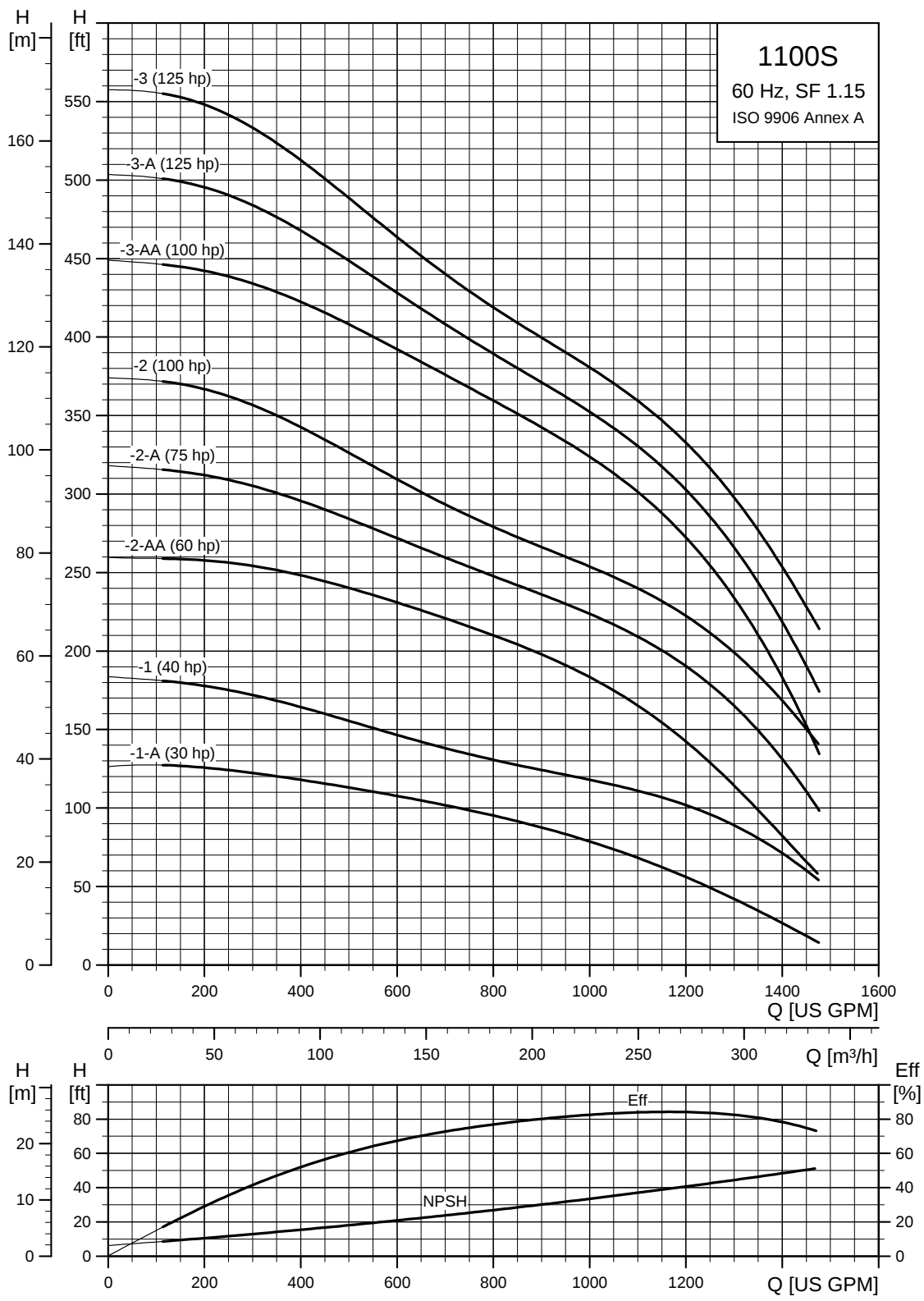
E = Maximum diameter of pump including cable guard and motor.

Notes:

Control box is required for 3-wire, single-phase applications. Data does not include control box. Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

- ▲ MS 6000C motor.
- ☼ Takes MMS 6 motor; not available as complete.
- * Takes MMS 8000 motor; not available as complete.

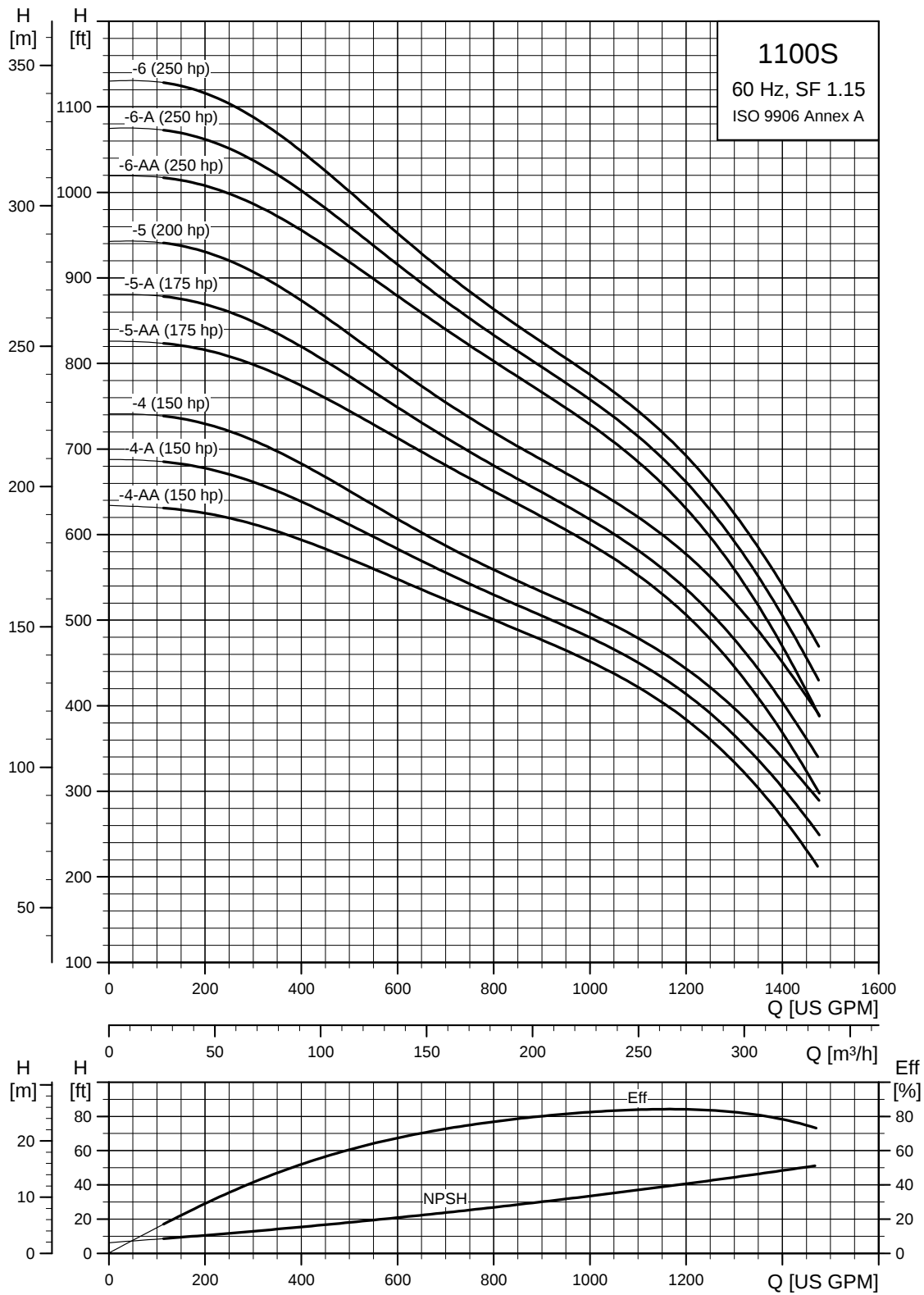
10" and larger wells - continued
SP 1100S (1100 gpm)



TM05 0267 1812

10" and larger wells - continued

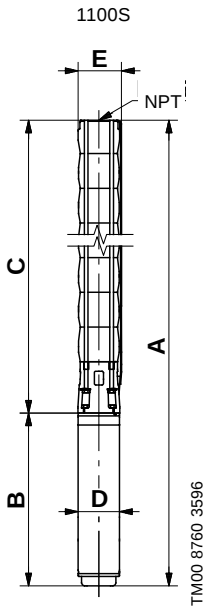
SP 1100S (1100 gpm)



TM05 0268 1812

10" and larger wells - continued
SP 1100S (1100 gpm) / 6, 8, 10 inch motors

Pump model	Nom. head [ft]	Ph	Volts [V]	Motor [Hp]	Dimensions					Net weight (complete) [lb]
					A	B	C	D	E	
					[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	[in. (mm)]	
1100S - Motor dia. 6 inch, 60 Hz, rated flow 1100 gpm (6" NPT)										
1100S300-1A	67	3	230	30 ▲	66.66 (1693)	35.56 (903)	31.11 (790)	5.63 (143)	9.30 (236)	261.0
		3	460	30 ▲	66.66 (1693)	35.56 (903)	31.11 (790)	5.63 (143)	9.30 (236)	261.0
1100S400-1	108	3	460	40 ▲	71.38 (1813)	40.28 (1023)	31.11 (790)	5.63 (143)	9.30 (236)	290.6
1100S600-2AA	155	3	460	60 †	-	-	38.04 (966)	-	9.30 (236)	-
1100S - Motor dia. 8 inch, 60 Hz, rated flow 1100 gpm (6" NPT)										
1100S400-1	108	3	460	40 *	74.81 (1900)	43.71 (1110)	31.11 (790)	7.56 (192)	9.41 (239)	407.2
1100S600-2AA	155	3	460	60 *	88.04 (2236)	50.00 (1270)	38.04 (966)	7.56 (192)	9.41 (239)	501.8
1100S750-2A	197	3	460	75 *	91.19 (2316)	53.15 (1350)	38.04 (966)	7.56 (192)	9.41 (239)	534.8
1100S1000-2	227	3	460	100 *	100.63 (2556)	62.60 (1590)	38.04 (966)	7.56 (192)	9.41 (239)	633.8
1100S1000-3AA	286	3	460	100 *	107.56 (2732)	62.60 (1590)	44.97 (1142)	7.56 (192)	9.41 (239)	655.9
1100S1250-3A	316	3	460	125 *	117.01 (2972)	72.05 (1830)	44.97 (1142)	7.56 (192)	9.41 (239)	757.1
1100S1250-3	346	3	460	125 *	117.01 (2972)	72.05 (1830)	44.97 (1142)	7.56 (192)	9.41 (239)	757.1
1100S1500-4AA	405	3	460	150 *	133.00 (3378)	81.11 (2060)	51.89 (1318)	7.56 (192)	9.41 (239)	889.1
1100S1500-4A	435	3	460	150 *	133.00 (3378)	81.11 (2060)	51.89 (1318)	7.56 (192)	9.41 (239)	889.1
1100S1500-4	465	3	460	150 *	133.00 (3378)	81.11 (2060)	51.89 (1318)	7.56 (192)	9.41 (239)	889.1
1100S1750-5AA	524	3	460	175 *	-	-	58.82 (1494)	-	9.41 (239)	-
1100S1750-5A	554	3	460	175 *	-	-	58.82 (1494)	-	9.41 (239)	-
1100S2000-5	584	3	460	200 *	-	-	58.82 (1494)	-	9.41 (239)	-
1100S - Motor dia. 10 inch, 60 Hz, rated flow 1100 gpm (6" NPT)										
1100S1750-5AA	524	3	460	175 †	132.45 (3364)	73.63 (1870)	58.82 (1494)	9.34 (237)	9.85 (250)	1142.2
1100S1750-5A-1800	554	3	460	175 †	132.45 (3364)	73.63 (1870)	58.82 (1494)	9.34 (237)	9.85 (250)	1137.0
1100S2000-5	584	3	460	200 †	140.32 (3564)	81.5 (2070)	58.82 (1494)	9.34 (237)	9.85 (250)	1285.2
1100S2500-6AA-2600	703	3	460	250 †	160.24 (4070)	94.49 (2400)	65.75 (1670)	9.34 (237)	9.85 (250)	1478.0
1100S2500-6A-2600	673	3	460	250 †	160.24 (4070)	94.49 (2400)	65.75 (1670)	9.34 (237)	9.85 (250)	1483.2
1100S2500-6-2600	703	3	460	250 †	160.24 (4070)	94.49 (2400)	65.75 (1670)	9.34 (237)	9.85 (250)	1483.2



E = Maximum diameter of pump including cable guard and motor.

Notes:
Control box is required for 3-wire, single-phase applications. Data does not include control box.
Performance conforms to ISO 9906. 1999 (E) Annex A. Minimum submergence is 2 feet.

▲ MS 6000C motor.
* Takes MMS 8000 motor; not available as complete.
† Takes MMS 10000 motor; not available as complete.

18. SP electrical data

Grundfos submersible pump motors - 60 Hz											
Hp	Ph	Volt [V]	S.F.	Circuit breaker or fuses		Amperage		Full load		Max. thrust [lb]	Product number
				Std.	Delay	Start [A]	Max. [A]	Eff. [%]	PF [%]		
4-inch, single-phase, 2-wire motors (control box not required)											
.5	1	115	1.60	35	15	55.0	12.0	62	76	900	96465574
.5	1	230	1.60	15	7	34.5	6.0	62	76	900	96465616
.75	1	230	1.50	20	9	40.5	8.4	62	75	900	96465618
1	1	230	1.40	25	12	48.4	9.8	63	82	900	96465620
1.5	1	230	1.30	35	15	62.0	13.1	64	85	900	96465622
4-inch, single-phase, 3-wire motors											
.5	1	115	1.60	35	15	42.5	12.0	61	76	900	96023039
.5	1	230	1.60	15	7	21.5	6.0	62	76	900	96465606
.75	1	230	1.50	20	9	31.4	8.4	62	75	900	96465608
1	1	230	1.40	25	12	37.0	9.8	63	82	900	96465610
1.5	1	230	1.30	35	15	45.9	11.6	69	89	900	96465612
2	1	230	1.25	35	20	57.0	13.2	72	86	1500	96449947
3	1	230	1.15	45	30	77.0	17.0	74	93	1500	96449948
5	1	230	1.15	70	45	110.0	27.5	77	92	1500	96449949
4-inch, three-phase motors											
1.5	3	230	1.30	15	8	40.3	7.3	75	72	900	96465629
1.5	3	460	1.30	10	4	20.1	3.7	75	72	900	96465651
1.5	3	575	1.30	10	4	16.1	2.9	75	72	900	96785912
2	3	230	1.25	20	10	48	8.7	76	75	900	96465630
2	3	460	1.25	10	5	24	4.4	76	75	900	96465652
2	3	575	1.25	10	4	19.2	3.5	76	75	900	96785917
3	3	230	1.15	30	15	56	12.2	77	75	1500	96405801
3	3	460	1.15	15	7	28	6.1	77	75	1500	96405810
3	3	575	1.15	15	6	22	4.8	77	75	1500	96405815
5	3	230	1.15	40	25	108	19.8	80	82	1500	96405802
5	3	460	1.15	20	12	54	9.9	80	82	1500	96405811
5	3	575	1.15	15	9	54	7.9	80	82	1500	96405816
7.5	3	230	1.15	60	30	130	25.0	81	82	1500	96405805
7.5	3	460	1.15	35	15	67	13.2	81	82	1500	96405814
7.5	3	575	1.15	30	15	67	10.6	81	82	1500	96405819
10	3	460	1.15	50	30	90	18	81	80	1500	96440318
6-inch, three-phase motors											
7.5	3	208-230	1.15	65	40	114-130	23.4 - 27.5	81	85-84	6070	96166181
7.5	3	460	1.15	30	17	68	13.2	81	85	6070	96166161
7.5	3	575	1.15	30	17	51	10.2	81	85	6070	96166141
10	3	208-230	1.15	90	50	126-142	30.0 - 37.5	82	86-84	6070	96166182
10	3	460	1.15	40	25	75	17.4	82	85	6070	96166162
10	3	575	1.15	40	25	56.5	13.4	82	85	6070	96166142
15	3	208-230	1.15	130	75	198-224	44.5 - 53.5	83	86-84	6070	96166184
15	3	460	1.15	60	35	112	25	83	84	6070	96166164
15	3	575	1.15	60	35	84	19.4	83	84	6070	96166144
20	3	208-230	1.15	175	100	310-350	57.5 - 71.5	84	86-84	6070	96166186
20	3	460	1.15	80	45	186	33.5	84	84	6070	96166166
20	3	575	1.15	80	45	144	26	84	84	6070	96166146
25	3	208-230	1.15	200	125	395-445	71-87	84	87-84	6070	96166187
25	3	460	1.15	100	60	236	41	84	84	6070	96166167
25	3	575	1.15	100	60	180	32	84	84	6070	96166147
30	3	208-230	1.15	250	150	445-500	81-104	84	87-84	6070	96166188
30	3	460	1.15	125	70	265	48	85	85	6070	96166168
30	3	575	1.15	125	70	194	37	85	85	6070	96166148
40	3	460	1.15	170	90	330	65	85	84	6070	96166170
40	3	575	1.15	170	90	250	49.5	85	84	6070	96166150
50	3	460	1.15	225	125	405	73.0	83	83	6182	96879560
8-inch, three-phase motors											
40	3	460	1.15	175	100	380	55.7	83	85	13000	96023204
50	3	460	1.15	225	125	550	67.8	84	85	13000	96023205
60	3	460	1.15	250	150	640	80.4	86	85	13000	96023206
75	3	460	1.15	300	175	580	97.4	86	86	13000	96023207
100	3	460	1.15	400	225	570	130.4	87	86	13000	96023208
125	3	460	1.15	500	300	600	160.0	87	87	13000	96023209
150	3	460	1.15	600	350	580	191.3	86	87	13000	96023210
10-inch, three-phase motors											
175	3	460	1.15	700	400	570	230.4	88	85	13000	96937300
200	3	460	1.15	800	500	620	265.2	87	82	13000	96937302
250	3	460	1.15	1100	600	610	352.2	87	79	13000	96937316

Other motor manufacturers: For Hitachi motors refer to the Hitachi submersible motors application maintenance manual; for Franklin motors refer to the Franklin submersible motors application maintenance manual.

19. Accessories

MP 204

The MP 204 is an electronic motor protector, designed for the protection of an asynchronous motor or a pump.

The motor protector consists of:

- a cabinet incorporating transformers and electronics
- a control panel with operating buttons and display for reading of data.

The MP 204 operates with two sets of limits:

- a set of warning limits and
- a set of trip limits.

If one or more of the warning limits are exceeded, the motor continues to run, but the warnings will appear in the MP 204 display.

Some values only have a warning limit.

The warning can also be read out by means of the Grundfos GO.

If one of the trip limits is exceeded, the trip relay will stop the motor. At the same time, the signal relay is operating to indicate that the limit has been exceeded.

Applications

The MP 204 can be used as a stand-alone motor protector.

The MP 204 can be monitored via a Grundfos GENIbus.

The power supply to the MP 204 is in parallel with the supply to the motor. Motor currents up to 120 A are passed directly through the MP 204. The MP 204 protects the motor primarily by measuring the motor current by means of a true RMS measurement. The MP 204 disconnects the contactor if, for example, the current exceeds the preset value.

Secondarily, the motor is protected via temperature measuring by a Tempcon sensor, a Pt100/Pt1000 sensor and a PTC sensor/thermal switch.

The MP 204 is designed for single- and three-phase motors. In single-phase motors, the starting and run capacitors are also measured. Cos ϕ is measured in both single- and three-phase systems.

Benefits

The MP 204 offers these benefits:

- Suitable for both single- and three-phase motors
- Dry-running protection
- Overload protection
- Very high accuracy
- Made for submersible pumps.

Many monitoring options

The MP 204 monitors the following parameters:

- Insulation resistance before start-up
- Temperature (Tempcon, Pt sensor and PTC/thermal switch)
- Overload/underload
- Overvoltage/undervoltage
- Phase sequence
- Phase failure
- Power factor
- Power consumption
- Harmonic distortion
- Operating hours and number of starts.



Fig. 69 MP 204

TM03 1471 2205

Five sizes of single-turn transformers, 120-999 A.

Note: Monitoring of motor temperature with Tempcon sensor is not possible when single-turn transformers are used.

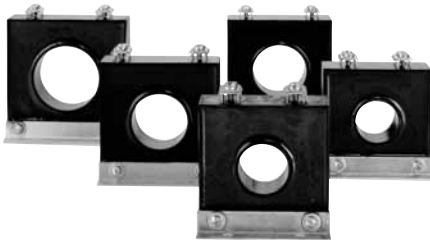


Fig. 70 Single-turn transformers

TM03 2033 3505

Product numbers

Product	Description	Product number
MP 204	Motor protector	96079927
MI 202	Dongle for iPhone 4/4s, iPad, or iPod touch (30 pin connector compatible)	98046376
MI 204	Dongle for iPhone 5/5s, iPad, or iPod touch (lightening connector compatible)	98424092
MI 301	Universal Bluetooth dongle for Android or iOS device	98046408
MI 204	MI204 Kit with MI204 dongle, Apple iPod 5, sleeve and cover	98612711

Functions

- Phase-sequence monitoring
- Indication of current or temperature (user selection)
- Indication of temperature in °F or °C (user selection)
- 4-digit, 7-segment display
- Setting and status reading with the Grundfos GO.
- Setting and status reading via the GENIbus.

Tripping conditions

- Overload
- Underload (dry running)
- Temperature (Tempcon sensor, PTC/thermal switch and Pt sensor)
- Phase failure
- Phase sequence
- Overvoltage
- Undervoltage
- Power factor ($\cos \phi$)
- Current unbalance.

Warnings

- Overload
 - Underload
 - Temperature (Tempcon and Pt sensor)
 - Overvoltage
 - Undervoltage
 - Power factor ($\cos \phi$)
- Note:** In connection with single- and three-phase connection.
- Run capacitor (single-phase operation)
 - Starting capacitor (single-phase operation)
 - Loss of communication in network
 - Harmonic distortion.

Learning function

- Phase sequence (three-phase operation)
- Run capacitor (single-phase operation)
- Starting capacitor (single-phase operation)
- Identification and measurement of Pt100/Pt1000 sensor circuit.

External current transformers

When fitted with external current transformers, the MP 204 unit can handle currents from 120 to 999 A. Grundfos can supply approved current transformers from stock (200/5A, 300/5A, 500/5A, 750/5A, 1000/5A).

Grundfos GO

The GO from Grundfos allows for wireless infrared remote control of your MP 204 unit.

With the GO, you get access to a full range of options such as factory setting adjustment, service and fault finding.

Ready for bus communication

The MP 204 allows for monitoring and communication via GENIbus, a Grundfos-designed bus for exchange of pump data, alarms, status information, and setpoints. This enables users to connect the MP 204 to, for instance, SCADA systems.

Technical data - MP 204

Enclosure class	IP20
Ambient temperature	-4 °F to +140 °F (-20 °C to +60 °C)
Relative air humidity	99 %
Voltage range	100-480 VAC
Current range	3-999 A
Frequency	50 to 60 Hz
IEC trip class	1-45
Special Grundfos trip class	0.1 to 30 s
Voltage variation	- 25 %/+ 15 % of nominal voltage
Approvals	EN 60947, EN 60335, UL/CSA 508
Marking	CE, cUL, C-tick
Consumption	Max. 5 W
Plastic type	Black PC / ABS

	Measuring range	Accuracy	Resolution
Current without external current transformers	3-120 A	± 1 %	0.1 A
Current with external current transformers	120-999 A	± 1 %	1 A
Phase-to-phase voltage	80-610 VAC	± 1 %	1 V
Frequency	47-63 Hz	± 1 %	0.5 Hz
Power	0-1 MW	± 2 %	1 W
Power factor	0 - 0.99	± 2 %	0.01
Energy consumption	0-4 x 10 ⁹ kWh	± 5 %	1 kWh

IO 112	Description	Product number
	The IO 112 is a measuring module and a 1-channel protection unit for use in connection with the MP 204 motor protection unit. The module can be used for protection of pump against other factors than the electrical conditions, for instance dry-running. It can also be used as a stand-alone protection module. The IO 112 interface has three inputs for measured values one potentiometer for setting of limits indicator lights indicating the • measured value of the input • value of the limit set • alarm source • pump status. Electrical data: • Supply voltage: 24 VAC ± 10 % 50/60 Hz or 24 VDC ± 10 % • Supply current: Min. 2.4 A; max. 8 A • Power consumption: Max. 5 W - Ambient temperature: -13 °F to +149 °F (-25 °C to +65 °C) • Enclosure class: IP20	96651601

Control functions

This table describes the protection provided by MP 204.

Control parameters	Function	Problem	Advantages
Temperature	MS The motor temperature is measured by means of the built-in Tempcon temperature transmitter and a signal is sent to MP 204 via the phase leads. In MP 204 the measured temperature is compared with the factory-set value of 167 °F (75 °C).	Overload, frequent starts/stops, operation against blocked discharge pipe, insufficient flow velocity past the motor.	Longer motor life, safe operating conditions, service indication.
	MMS The motor temperature is measured by means of the Pt100. The signal is sent to the MP 204 where the measured temperature is compared with the factory-set value. Temperature protection requires a submersible motor with a Pt100. The motor temperature must be monitored during variable frequency drive operation.		
Overvoltage/undervoltage	If the set trip value is exceeded, the motor will stop.	The installation is close to a transformer. The mains do not absorb load variations.	Important installation parameter, possibility of improving operating conditions.
Overload	The motor power input is measured on each of the three phases. The registered power input is an average of these three values. If the factory-set value is exceeded, the motor will stop.	Incorrect sizing of pump/motor, voltage supply failure, defective cable, blocking, wear or corrosion.	Longer pump life, safe operating conditions, service indication.
Underload (dry running)	The motor power input is measured on each of the three phases. The registered power input is an average of these three values. If the average value is lower than the factory-set value, the motor will stop.	Pump exposed to dry running or underload, for example caused by wear.	Traditional dry-running protection is no longer necessary, no extra cables.
Current unbalance	The power input of the motor is measured on each of the three phases.	Mains load is uneven, incipient motor defect, phase voltages diverging.	Motor protection against overload, service indication.
Phase sequence	MP 204 and motor are installed so that the phase sequence corresponds to correct direction of rotation. MP 204 monitors changes in the phase sequence.	Two phases are wrongly connected.	Ensures correct pump performance.
Phase failure	MP 204 checks the phases connected, phase failure will cause an alarm.	Phase failure	Indication of phase failure, and alarm.

CU331SP constant pressure drive kits

Includes pressure sensor



TM05 5801 4012

Enclosure type	NEMA	Hp	Input Ph	Input volts	Product number	Approx. ship wt. [lbs]
Indoor	Type 12	2	1	200-240	98370277	60
		3	1	200-240	98370280	60
		5	1	200-240	98370304	60
Outdoor	Type 4X	2	1	200-240	98370279	60
		3	1	200-240	98370301	60
		5	1	200-240	98370305	60

Grundfos GO remote app and Grundfos GO CAPS

Grundfos GO is the mobile tool box for professional users on the go. The Grundfos GO app can be used to establish wireless connection to Grundfos products. Grundfos GO gives you intuitive handheld pump control, and full access to all the Grundfos Online tools on the go. Grundfos GO consists of two Apps: GO Remote and GO CAPS. It is available from Apple App Store and Google Play.

The Grundfos GO app must be used in conjunction with one of these MI (mobile interface) devices:

- Grundfos MI 202
- Grundfos MI 204
- Grundfos MI 301.

The mobile interfaces are modules with built-in IR and radio communication.

The Grundfos product must support either IR communication or radio communication.

Grundfos GO Remote

Grundfos GO Remote works with all our E-pumps and communicates both using both radio and infrared technology. It provides easy-to-follow tips and guidance as well as live pump data feeds.

To communicate with the pumps, special hardware (Mobile Interfaces) from Grundfos is required. The Grundfos GO Remote app can be downloaded for free for both Apple iOS and Android devices.

While connected to a Grundfos product, the following features are available:

- Product dashboard - gives the user a quick overview of the connected product
- Status data - monitor status data from the Grundfos product
- Alarms and warnings - see detailed alarm information with timestamps
- Configuration/commissioning
- Create installation report in pdf format
- Read / write profiles - copy configuration from one product to another
- Supports 28 languages

Grundfos GO CAPS

GO CAPS works online and supports all the basic CAPS functionalities. It is available for Apple iOS devices only, and is free to download. Features:

- Search product by: Number, Name or QR code
- Size a product (Heating, Air-conditioning, Pressure boosting & Wastewater)
- Catalog
- Replace product
- Compare products
- Product view
- Projects
- Favorites
- Supports 11 languages

MI 202 and MI 204

The MI 202 and MI 204 are add-on modules for Apple devices. For Apple iPod touch 4 and iPhone 4 and 4S, use the MI 202. For Apple products with Lightning connector, e.g. iPhone 5 and iPhone 6, use the MI 204.

Note: "Made for iPod, iPhone" means that an electronic accessory has been designed to connect specifically to iPod or iPhone and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod may affect wireless performance.



Fig. 71 MI 202 and MI 204

TM05 3887 1612
TM05 7704 1513

MI 301

The MI 301 is a module that connects to an Android or iOS-based smart device via Bluetooth. The MI 301 has a rechargeable Li-ion battery and must be charged separately.



TM05 3890 1612

Fig. 72 MI 301**Supported devices**

The smart devices listed below have been tested and are supported by Grundfos GO.

Make	Model	MI 202	MI 204	MI 301
Apple	iPod touch 4G	•		•
	iPod touch 5G		•	•
	iPhone 4, 4S	•		•
	iPhone 5, 5S, 5C, 6, 6 Plus		•	•
	iPad, iPad Mini		•	•
Asus	Nexus 7			•
	Transformer TF101, TF300			•
Google	Galaxy Nexus, Nexus 4, Nexus 10			•
HTC	Desire S, One S, Sensation			•
Motorola	Xoom2 , Moto X (XT1053)			•
Samsung	Galaxy S II, Galaxy S III			•
	Galaxy tab 2 7.0			•
Sony	Xperia Arc, Arc S, Xperia Tipo, Xperia V			•

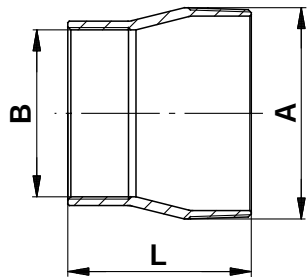
Note: Similar Android and iOS-based devices may work as well, but have not been tested by Grundfos.

For further details, features and screens, see Grundfos GO instructions part number 98133717 that are included with GO Remote product.

Connecting pieces

The tables below show the range of connecting pieces for connection of thread-to-flange and thread-to-thread.

Thread-to- thread



TM01 2397 1698 - GrA2555

Fig. 73 Dimensional sketch and photo of connecting piece thread-to-thread

Type	Connecting piece	Dimensions			Product number	
		Thread-to-thread		L [in. (mm)]	304 stainless steel	316 stainless steel
		A	B			
385S	NPT 5→ NPT 4	NPT 5	NPT 4	4.76 (121)	190064	190586
475S	NPT 5→ NPT 6	NPT 5	NPT 6	5.91 (150)	190070	190592
625S 800S 1100S	NPT 6→ NPT 5	NPT 6	NPT 5	5.91 (150)	200135	200645

Zinc anodes

Application

Cathodic protection by means of zinc can be used for corrosion protection of SP pumps in chloride-containing liquids such as brackish water and seawater.

Sacrificial anodes are placed on the outside of the pump and motor as protection against corrosion.

The number of anodes required depends on the pump and motor in question.

Please contact Grundfos for further details.

Liquid temperatures

- Seawater:
Up to 95 °F (35 °C).
- Brackish water (min. 1500 ppm (g/m³) chloride):
Up to 95 °F (35 °C).

Anode life

The zinc anodes have a life of one to four years, depending on operating conditions (temperature, flow and chloride content).

Product numbers of zinc anodes

Zinc anodes for pumps										
Product number	Used for pump type									
	SP 55 to 77S	85S	150S	230S	300S	385S	475S	625S	800S	1100S
	96421444	•	-	-	-	-	-	-	-	-
96421445	-	•	•	•	•	-	-	-	-	-
96421447	-	-	-	-	-	•	•	-	-	-
96421448	-	-	-	-	-	-	•	-	-	-
96421449	-	-	-	-	-	-	-	•	-	-
96421450	-	-	-	-	-	-	-	•	•	•
Zinc anodes for motors										
4" motors	6" motors	8" motors	10" motors							
96421444	96421446	96421450	96564808							

SA-SPM 6 control boxes

Application

SA-SPM 6 control boxes are used as starting units for single-phase, 3-wire motors ranging from 0.5 Hp to 5 Hp (.37 kW to 3.7 kW).

SA-SPM 6 from 1.5 Hp to 5 Hp (1.1 kW to 3.7 kW) is available in two versions, standard and deluxe.

The standard version incorporates a motor -protective circuit breaker and thus protects the motor against overload.

The deluxe version is identical to the standard version with the following addition a motor contactor is included for connection and disconnection of the power supply.

Technical data

Enclosure class: IP42.

Ambient temperature: -4 °F to +140 °F
(-20 °C to +60 °C).

Relative humidity: Maximum 95 %, normal non-aggressive atmosphere.

SA-SPM 6 control box part numbers

Version	Single phase	Volts		[Hp]							Product number
		115 V	230 V	.5	.75	1	1.5	2	3	5	
Standard	•	•		•							98315240 98821580
Standard	•		•	•							98315251 98821631
Standard	•		•		•						98315252 98821632
Standard	•		•			•					98315253 98821633
Standard	•		•				•				98315254
Deluxe	•		•				•				98315255
Standard	•		•					•			98315256
Deluxe	•		•					•			98315257
Standard	•		•						•		98315258
Deluxe	•		•						•		98315259
Standard	•		•							•	98315260
Deluxe	•		•							•	98315261



TM03 8150 0607

Fig. 74 SA-SPM 6 control box

Pt100

The Pt100 sensor offers these features:

- Continuous monitoring of the motor temperature
- Protection against too high motor temperature.

Protecting the motor against too high motor temperature is the simplest and cheapest way of avoiding that motor lifetime is reduced. Pt100 ensures that operating conditions are not exceeded and indicates when it is time for service of the motor.

Monitoring and protection by means of Pt100 require the following parts:

- Pt100 sensor
- Relay, type PR 5714
- Cable.

The PR 5714 relay is fitted with a Pt100 module. For both relays the following temperature limits are preset on delivery:

- 60 °C (140 °F) warning limit
- 75 °C (167 °F) stop limit.

Technical data

	Relay type
	PR 5714
Enclosure class	IP65 (mounted in a control panel)
Ambient temperature	-4 °F to +140 °F (-20 °C to +60 °C)
Relative humidity	95 % (condensating)
Voltage variation	• 1 x 24-230 VAC ± 10 %, 50-60 Hz. • 24-250 VDC ± 20 %.
Approvals	UL, DNV
Mark	CE

Pt100 sensor with/without PR 5714 relay and cable	Cable length [ft (m)]	PR 5714	Product number		
			MS 6000C	MMS 6 MMS 8000	MMS 10000
	65.6 (20)	Yes	96408953	96494596	96437287
	131.2 (40)	Yes	96408681	96494597	96437288
	196.9 (60)	Yes	96408954	96494598	96437289
	262.5 (80)	Yes	96408955	96494599	96437290
	328.1 (100)	Yes	96408956	96494610	96437291
	65.6 (20)	No	96658626	96658629	96658633
	131.2 (40)	No	96658627	96658630	96658634
	196.9 (60)	No	96658628	96658631	96658635
	262.5 (80)	No	96658637	96658632	96658636
	328.1 (100)	No	96658638	96658639	96658640

PR 5714 relay	Voltage	Product number
	24-230 VAC, 50/60 Hz / 24-250 VDC	96621274

Pt100 sensor including cable	Cable length [ft (m)]	Product number	
		MS 6000C MMS 6 MMS 8000	MMS 10000
	65.6 (20)	96408957	96437784
	131.2 (40)	96408684	96437785
	196.9 (60)	96408958	96437786
	262.5 (80)	96408959	96437787
	328.1 (100)	96408960	96437788

Staybolts for Pt100	Description	Product number
	Bolt KIT for Pt100 (for MS 6000C)	96611899

20. Energy consumption

Energy consumption of submersible pumps

The percentage distribution of service life costs of a submersible pump for water supply is:

5 % initial costs (pump)

85 % operating costs / energy consumption

10 % maintenance costs.

It is obvious that the highest savings can be achieved within energy consumption!

The annual energy consumption, E, of a submersible pump can be calculated as follows:

$$E = c \times h \times P_1 \text{ (USD)}$$

c = specific energy price (USD/kWh)

h = operating hours/year (hours)

P₁ = power input of the submersible pump (Hp).

Example: Calculation of the annual energy consumption of the submersible pump, type 625S-3. 625S-3 with MMS 8000, 60 Hp, 3 x 460 V, 60 Hz.

Duty point:

Flow rate: Q = 528 GPM

Total head: H = 335 ft

Specific energy price: c = USD 0.15/kWh (consisting of day and night rate)

Operating hours/year: h = 3200.

$$P_1 = \frac{Q \times H \times \rho}{367 \times \eta_{\text{pump}} \times \eta_{\text{motor}}} \text{ in kW}$$

Q = GPM

H = ft

Density ρ = lb/ft³ (assumed 1)

367 = conversion factor

η_{motor} = (example 84.5 %, in equation 0.845)

η_{pump} = (not to be confused with the stage efficiency curve).

By showing the P₂/Q curve we make it easier for you to calculate the energy consumption.

$$P_1 = \frac{P_2}{\eta_{\text{motor}}}$$

P₂ = 35 Hp (power requirement of 625S-3 pump at 88 GPM, from curve P₂/Q).

Calculation of motor efficiency at duty point

As standard the SP 625S-3 is equipped with a 60 Hp (45 kW for P₁) MS 6000C motor.

At duty point (Q = 528 GPM) the pump requires 59 Hp (44 kW for P₁), thus:

a motor load of 87 % (44 kW / 45 kW) and a power reserve of 2 %.

From the table on page 86 the motor efficiency can be read as:

84.6 % at a load of 75 %. ($\eta_{75\%}$)

85.6 % at a load of 100 %. ($\eta_{100\%}$)

The interpolated value in this example is

$$\eta_{\text{motor}} = 85.1 \%, \eta_{\text{motor}} = 0.851.$$

$$P_1 = \frac{44}{0.851} = 51.7 \text{ kW}$$

$$E = 0.15 \text{ USD/kWh} \times 3200 \text{ h} \times 51.7 \text{ kW}.$$

The annual energy costs amount to USD 24816.

The pay-off time, A, (months) is calculated as follows:

$$A = \frac{\text{Purchase price of energy - efficiency pump}}{\text{Energy savings / year}} \times 12$$

Cable sizing

In order to obtain an economical duty of the pump the voltage drop should be low.

Today large water works already size cables for a maximum voltage drop of 1 %).

The hydraulic resistance in the discharge pipe should be as low as possible.

21. Cables

Cables for Grundfos 4" submersible motors are available with or without plugs. The submersible drop cable is chosen according to application and type of installation.

Standard version: Max. liquid temperature 140 °F (60 °C).

Hot water version: Max. liquid temperature 158 °F (70 °C), for short periods up to 194 °F (90 °C) (for MS only).

Tables indicating cable dimension in borehole

The tables indicate the maximum length of drop cables in meters from motor starter to pump at direct-on-line starting at different cable dimensions.

If star/delta starting is used the current will be reduced by $\sqrt{3}$ ($I \times 0.58$), meaning that the cable length may be $\sqrt{3}$ longer ($L \times 1.73$) than indicated in the tables.

If for example the operating current is 10 % lower than the full-load current, the cable may be 10 % longer than indicated in the tables.

The calculation of the cable length is based on a maximum voltage drop of 1 % to 3 % of the rated voltage and a water temperature of maximum 86 °F (30 °C).

In order to minimize operating losses the cable cross section may be increased compared to what is indicated in the tables. This is economical only if the borehole provides the necessary space, and if the operational time of the pump is long, especially if the operating voltage is below the rated voltage.

The table values are calculated on the basis of the formula:

Max. cable length of a single-phase submersible pump:

$$L = \frac{U \times \Delta U}{I \times 2 \times 100 \times \left(\cos \varphi \times \frac{\rho}{q} + \sin \varphi \times X_L \right)} [\text{ft}]$$

Max. cable length of a three-phase submersible pump:

$$L = \frac{U \times \Delta U}{I \times 1.73 \times 100 \times \left(\cos \varphi \times \frac{\rho}{q} + \sin \varphi \times X_L \right)} [\text{ft}]$$

where

U = Rated voltage [V]

ΔU = Voltage drop [%]

I = Rated current of the motor [A]

q = Cross-section of submersible drop cable [in^2]

X_L = Inductive resistance: 0.024×10^{-3} [Ω/ft]

$\cos \varphi$ = Power factor

$\sin \varphi = \sqrt{1 - \cos^2 \varphi}$

ρ = Specific resistance: 9.5×10^{-6} [$\Omega \text{ in}^2/\text{ft}$]

Example

Motor size: 40 Hp, MMS 8000

Rated current: 64.0 A

Rated voltage: 3 x 460 V, 60 Hz

Starting method: Direct-on-line

Power factor: $\cos \varphi = 0.85$

Voltage drop: 3 %

Cross-section: 0.025 in^2

$\sin \varphi$: 0.53

$$L = \frac{460 \times 3}{64.0 \times 1.73 \times 100 \times \left(0.85 \times \frac{0.0000095}{0.025} + 0.53 \times 0.024 \times 10^{-3} \right)}$$

L = 370 ft

Cable dimensions at 1 x 220 V, 60 Hz

Motor	Hp	I_n [A]	0.002 in^2	0.004 in^2	0.006 in^2	0.009 in^2	0.016 in^2
4"	0.33	3.3	315	522	833	1243	2047
	0.50	4.4	239	397	630	938	1548
	0.75	6.6	157	262	417	620	1020
	1.00	7.7	121	203	321	482	797
	1.50	9.0	98	164	259	387	643

Maximum cable length in feet from motor starter to pump.

Cable sizing charts

115 V and 230 V, 1 ph 60 Hz

Maximum submersible power cable length (max. cable length in feet - starter to motor)																	
Motor rating	[Hp]	AWG copper wire size [ft (m)]												MCM copper wire size			
		14	12	10	8	6	4	3	2	1	0	00	000	0000	250	300	350
115 V 1 ph 60 Hz	0.33	130 (40)	210 (64)	340 (104)	540 (165)	840 (256)	1300 (396)	1610 (491)	1960 (597)	2390 (728)	2910 (887)	3540 (1079)	4210 (1283)	5060 (1542)	5680 (1731)	6390 (1948)	7110 (2167)
	0.5	100 (30)	160 (49)	250 (76)	390 (119)	620 (189)	960 (293)	1190 (363)	1460 (445)	1780 (543)	2160 (658)	2630 (802)	3140 (957)	3770 (1149)	4240 (1292)	4770 (1454)	5320 (1622)
230 V 1 ph 60 Hz	0.33	550 (168)	880 (268)	1390 (424)	2190 (668)	3400 (1036)	5250 (1600)	6520 (1987)	7960 (2426)	9690 (2954)	11770 (3587)	14320 (4365)	17050 (5197)	20460 (6236)	22980 (7004)	25850 (7879)	28750 (8763)
	0.5	400 (122)	650 (198)	1020 (311)	1610 (491)	2510 (765)	3880 (1183)	4810 (1466)	5880 (1792)	7170 (2185)	8720 (2658)	10620 (3237)	12660 (3859)	15210 (4636)	17100 (5212)	19260 (5870)	21440 (6535)
	0.75	300 (91)	480 (146)	760 (232)	1200 (366)	1870 (570)	2890 (881)	3580 (1091)	4370 (1332)	5330 (1625)	6470 (1972)	7870 (2399)	9380 (2859)	11250 (3429)	12640 (3853)	14220 (4334)	15810 (4819)
	1	250 (76)	400 (122)	630 (192)	990 (302)	1540 (469)	2380 (725)	2960 (902)	3610 (1100)	4410 (1344)	5360 (1634)	6520 (1987)	7780 (2371)	9350 (2850)	10510 (3203)	11840 (3609)	13180 (4017)
	1.5	190 (58)	310 (94)	480 (146)	770 (235)	1200 (366)	1870 (570)	2320 (707)	2850 (869)	3500 (1067)	4280 (1305)	5240 (1597)	6300 (1920)	7620 (2323)	8630 (2630)	9810 (2990)	10980 (3347)
	2	150 (46)	250 (76)	390 (119)	620 (189)	970 (296)	1530 (466)	1910 (582)	2360 (719)	2930 (893)	3620 (1103)	4480 (1366)	5470 (1667)	6700 (2042)	770 (235)	8890 (2710)	10080 (3072)
	3	120 (37)	190 (58)	300 (91)	470 (143)	750 (229)	1190 (363)	1490 (454)	1850 (564)	2320 (707)	2890 (881)	3610 (1100)	4470 (1362)	5550 (1692)	6450 (1966)	7580 (2310)	8690 (2649)
	5	-	110* (34*)	180 (55)	280 (85)	450 (137)	710 (216)	890 (271)	1110 (338)	1390 (424)	1740 (530)	2170 (661)	2680 (817)	3330 (1015)	3870 (1180)	4550 (1387)	5210 (1588)
	7.5	-	-	120* (37*)	200 (61)	310 (94)	490 (149)	610 (186)	750 (229)	930 (283)	1140 (347)	1410 (430)	1720 (524)	2100 (640)	2400 (732)	2790 (850)	3120 (951)
	10	-	-	-	160* (49*)	250 (76)	390 (119)	490 (149)	600 (183)	750 (229)	930 (283)	1160 (354)	1430 (436)	1760 (536)	2030 (619)	2370 (723)	2700 (823)
	15	-	-	-	-	170* (52*)	270 (82)	340 (104)	430 (131)	530 (162)	660 (201)	820 (250)	1020 (311)	1260 (384)	1460 (445)	1700 (518)	1940 (591)

NOTE:

* Indicates single conductor only. (Not jacketed).

No * indicates both jacketed cable and single conductor cables.

- Table based on copper wire. If aluminum wire is used, multiply lengths by 0.5.
Maximum allowable length of aluminum is considerably shorter than copper wire of same size.
- The portion of the total cable which is between the service entrance and a motor starter/controller should not exceed 25 % of the total maximum length to assure reliable starter operation. Single-phase control boxes may be connected at any point of the total cable length.
- Table based on a maintaining motor terminal voltage at 95 % of service entrance voltage, running at maximum nameplate amperes. In general, voltage drop should be maintained at 3 V / 100 ft or less.
- 1 foot = .305 meter (1 meter = 3.28 feet).

200-208 V, 3 Ph 60 Hz

Maximum submersible power cable length (max. cable length in feet - starter to motor)																	
Motor rating	[Hp]	AWG copper wire size [ft (m)]													MCM copper wire size		
		14	12	10	8	6	4	3	2	1	0	00	000	0000	250	300	350
200-208 V 3 ph 60 Hz	.5	710 (216)	1140 (347)	1800 (549)	2840 (866)	4420 (1347)	-	-	-	-	-	-	-	-	-	-	-
	.75	510 (155)	810 (245)	1280 (390)	2030 (619)	3160 (963)	-	-	-	-	-	-	-	-	-	-	-
	1	430 (131)	690 (210)	1080 (329)	1710 (521)	2670 (814)	4140 (1262)	5140 (1567)	-	-	-	-	-	-	-	-	-
	1.5	310 (94)	500 (152)	790 (241)	1260 (384)	1960 (597)	3050 (930)	3780 (1152)	-	-	-	-	-	-	-	-	-
	2	240 (73)	390 (119)	610 (186)	970 (296)	1520 (463)	2360 (719)	2940 (896)	3610 (1100)	4430 (1350)	5420 (1652)	-	-	-	-	-	-
	3	180 (55)	290 (88)	470 (143)	740 (226)	1160 (354)	1810 (552)	2250 (686)	2760 (841)	3390 (1033)	4130 (1259)	-	-	-	-	-	-
	5	110* (34*)	170 (52)	280 (85)	440 (134)	690 (210)	1080 (329)	1350 (411)	1660 (506)	2040 (622)	2490 (759)	3050 (930)	3670 (1119)	4440 (1353)	5030 (1533)	-	-
	7.5	-	-	200 (61)	310 (94)	490 (149)	770 (235)	960 (293)	1180 (360)	1450 (442)	1770 (539)	2170 (661)	2600 (792)	3150 (960)	3560 (1085)	-	-
	10	-	-	-	230* (70*)	370 (113)	570 (174)	720 (219)	880 (268)	1090 (332)	1330 (405)	1640 (500)	1970 (600)	2390 (728)	2720 (829)	3100 (945)	3480 (1061)
	15	-	-	-	160* (49*)	250* (76*)	390 (119)	490 (149)	600 (183)	740 (226)	910 (277)	1110 (338)	1340 (408)	1630 (497)	1850 (564)	2100 (640)	2350 (716)
	20	-	-	-	-	190* (58*)	300* (91*)	380 (116)	460 (140)	570 (174)	700 (213)	860 (262)	1050 (320)	1270 (387)	1440 (439)	1650 (503)	1850 (564)
	25	-	-	-	-	-	240* (73*)	300* (91*)	370* (113*)	460 (140)	570 (174)	700 (213)	840 (256)	1030 (314)	1170 (357)	1330 (405)	1500 (457)
	30	-	-	-	-	-	-	250* (76*)	310* (94*)	380* (116*)	470 (143)	580 (177)	700 (213)	850 (259)	970 (296)	1110 (338)	1250 (381)

NOTE:

* Indicates single conductor only. (Not jacketed).

No * indicates both jacketed cable and single conductor cables.

1. Table based on copper wire. If aluminum wire is used, multiply lengths by 0.5.

Maximum allowable length of aluminum is considerably shorter than copper wire of same size.

2. The portion of the total cable which is between the service entrance and a motor starter/controller should not exceed 25 % of the total maximum length to assure reliable starter operation. Single-phase control boxes may be connected at any point of the total cable length.

3. Table based on a maintaining motor terminal voltage at 95 % of service entrance voltage, running at maximum nameplate amperes. In general, voltage drop should be maintained at 3 V / 100 ft or less.

4. 1 foot = .305 meter (1 meter = 3.28 feet).

230 V, 3 Ph 60 Hz

Maximum submersible power cable length (max. cable length in feet - starter to motor)																	
Motor rating	[Hp]	AWG copper wire size [ft (m)]												MCM copper wire size			
		14	12	10	8	6	4	3	2	1	0	00	000	0000	250	300	350
230 V 3 ph 60 Hz	0.5	930 (283)	1490 (454)	2350 (716)	3700 (1128)	5760 (1756)	8910 (2716)	-	-	-	-	-	-	-	-	-	-
	0.75	670 (204)	1080 (329)	1700 (518)	2580 (786)	4190 (1277)	6490 (1978)	8060 (2457)	9860 (3005)	-	-	-	-	-	-	-	-
	1	560 (171)	910 (277)	1430 (436)	2260 (689)	3520 (1073)	5460 (1664)	6780 (2067)	8290 (2527)	-	-	-	-	-	-	-	-
	1.5	420 (128)	670 (204)	1060 (323)	1670 (509)	2610 (796)	4050 (1234)	5030 (1533)	6160 (1878)	7530 (2295)	9170 (2795)	-	-	-	-	-	-
	2	320 (98)	510 (155)	810 (247)	1280 (390)	2010 (613)	3130 (954)	3890 (1186)	4770 (1454)	5860 (1786)	7170 (2185)	8780 (2676)	-	-	-	-	-
	3	240 (73)	390 (119)	620 (189)	990 (302)	1540 (469)	2400 (732)	2980 (908)	3660 (1116)	4480 (1366)	5470 (1667)	6690 (2039)	8020 (2444)	9680 (2950)	-	-	-
	5	140* (43*)	230 (70)	370 (113)	590 (180)	920 (280)	1430 (436)	1790 (546)	2190 (668)	2690 (820)	3290 (1003)	4030 (1228)	4850 (1478)	5870 (1789)	6650 (2027)	7560 (2304)	8460 (2579)
	7.5	-	160* (49*)	260 (79)	420 (128)	650 (198)	1020 (311)	1270 (387)	1560 (475)	1920 (585)	2340 (713)	2870 (875)	3440 (1049)	4160 (1268)	4710 (1436)	5340 (1628)	5970 (1820)
	10	-	-	190* (58*)	310 (94)	490 (149)	760 (232)	950 (290)	1170 (357)	1440 (439)	1760 (536)	2160 (658)	2610 (796)	3160 (963)	3590 (1094)	4100 (1250)	4600 (1402)
	15	-	-	-	210* (64*)	330 (101)	520 (158)	650 (198)	800 (244)	980 (299)	1200 (366)	1470 (448)	1780 (543)	2150 (655)	2440 (744)	2780 (847)	3110 (948)
	20	-	-	-	-	250* (76*)	400 (122)	500 (152)	610 (186)	760 (232)	930 (283)	1140 (347)	1380 (421)	1680 (512)	1910 (582)	2180 (664)	2450 (747)
	25	-	-	-	-	-	320* (98*)	400 (122)	500 (152)	610 (186)	750 (229)	920 (280)	1120 (341)	1360 (415)	1540 (469)	1760 (536)	1980 (604)
	30	-	-	-	-	-	260* (79*)	330* (101*)	410* (125*)	510 (155)	620 (189)	760 (232)	930 (283)	1130 (344)	1280 (390)	1470 (448)	1650 (503)

NOTE:

* Indicates single conductor only. (Not jacketed).

No * indicates both jacketed cable and single conductor cables.

1. Table based on copper wire. If aluminum wire is used, multiply lengths by 0.5.

Maximum allowable length of aluminum is considerably shorter than copper wire of same size.

2. The portion of the total cable which is between the service entrance and a motor starter/controller should not exceed 25 % of the total maximum length to assure reliable starter operation. Single-phase control boxes may be connected at any point of the total cable length.

3. Table based on a maintaining motor terminal voltage at 95 % of service entrance voltage, running at maximum nameplate amperes. In general, voltage drop should be maintained at 3 V / 100 ft or less.

4. 1 foot = .305 meter (1 meter = 3.28 feet).

460 V, 3 ph 60 Hz

Maximum submersible power cable length (max. cable length in feet - starter to motor)																
Motor rating [Hp]	AWG copper wire size [ft (m)]													MCM copper wire size		
	14	12	10	8	6	4	3	2	1	0	00	000	0000	250	300	350
460 V 3 ph 60 Hz	.5	3770 (1149)	6020 (1835)	9460 (2883)	-	-	-	-	-	-	-	-	-	-	-	-
	.75	2730 (832)	4350 (1326)	6850 (2088)	-	-	-	-	-	-	-	-	-	-	-	-
	1	2300 (701)	3670 (1119)	5770 (1759)	9070 (2765)	-	-	-	-	-	-	-	-	-	-	-
	1.5	1700 (518)	2710 (826)	4270 (1301)	6730 (2051)	-	-	-	-	-	-	-	-	-	-	-
	2	1300 (396)	2070 (631)	3270 (997)	5150 (1570)	8050 (2454)	-	-	-	-	-	-	-	-	-	-
	3	1000 (305)	1600 (488)	2520 (768)	3970 (1210)	6200 (1890)	-	-	-	-	-	-	-	-	-	-
	5	590 (180)	950 (290)	1500 (457)	2360 (719)	3700 (1128)	5750 (1753)	-	-	-	-	-	-	-	-	-
	7.5	420 (128)	680 (207)	1070 (326)	1690 (515)	2640 (805)	4100 (1250)	5100 (1554)	6260 (1908)	7680 (2341)	-	-	-	-	-	-
	10	310 (94)	500 (152)	790 (241)	1250 (381)	1960 (597)	3050 (930)	3800 (1158)	4680 (1426)	5750 (1753)	7050 (2149)	-	-	-	-	-
	15	-	340* (104*)	540 (165)	850 (259)	1340 (408)	2090 (637)	2600 (792)	3200 (975)	3930 (1198)	4810 (1466)	5900 (1798)	7110 (2167)	-	-	-
	20	-	-	410 (125)	650 (198)	1030 (314)	1610 (491)	2000 (610)	2470 (753)	3040 (927)	3730 (1137)	4580 (1396)	5530 (1686)	-	-	-
	25	-	-	330* (101*)	530 (162)	830 (253)	1300 (396)	1620 (494)	1990 (607)	2450 (747)	3010 (917)	3700 (1128)	4470 (1362)	5430 (1655)	-	-
	30	-	-	270* (82*)	430 (131)	680 (207)	1070 (326)	1330 (405)	1640 (500)	2030 (619)	2490 (759)	3060 (933)	3700 (1128)	4500 (1372)	5130 (1564)	5860 (1786)
	40	-	-	-	320* (98*)	500* (152*)	790 (241)	980 (299)	1210 (369)	1490 (454)	1830 (558)	2250 (686)	2710 (826)	3290 (1003)	3730 (1137)	4250 (1295)
	50	-	-	-	-	410* (125*)	640 (195)	800 (244)	980 (299)	1210 (369)	1480 (451)	1810 (552)	2190 (668)	2650 (808)	3010 (917)	3420 (1042)
	60	-	-	-	-	-	540* (165*)	670* (204*)	830 (253)	1020 (311)	1250 (381)	1540 (469)	1850 (564)	2240 (683)	2540 (774)	2890 (881)
	75	-	-	-	-	-	440* (134*)	550* (168*)	680* (207*)	840 (256)	1030 (314)	1260 (384)	1520 (463)	1850 (564)	2100 (640)	2400 (732)
	100	-	-	-	-	-	-	500* (152*)	620 (189*)	760* (232*)	940 (287)	1130 (344)	1380 (421)	1560 (475)	1790 (546)	2010 (613)
	125	-	-	-	-	-	-	-	-	600* (183*)	740* (226*)	890* (271*)	1000 (305)	1220 (372)	1390 (424)	1560 (475)
	150	-	-	-	-	-	-	-	-	-	630* (192*)	760* (232*)	920* (280*)	1050 (320)	1190 (363)	1340 (408)
	175	-	-	-	-	-	-	-	-	-	-	670* (204*)	810* (247*)	930* (283*)	1060 (323)	1190 (363)
	200	-	-	-	-	-	-	-	-	-	-	590* (180*)	710* (216*)	810* (247*)	920* (280*)	1030 (314)

NOTE:

- * Indicates single conductor only. (Not jacketed).
- No * indicates both jacketed cable and single conductor cables.
- 1. Table based on copper wire. If aluminum wire is used, multiply lengths by 0.5.
Maximum allowable length of aluminum is considerably shorter than copper wire of same size.
- 2. The portion of the total cable which is between the service entrance and a motor starter/controller should not exceed 25 % of the total maximum length to assure reliable starter operation. Single-phase control boxes may be connected at any point of the total cable length.
- 3. Table based on a maintaining motor terminal voltage at 95 % of service entrance voltage, running at maximum nameplate amperes. In general, voltage drop should be maintained at 3 V / 100 ft or less.
- 4. 1 foot = .305 meter (1 meter = 3.28 feet).

575 V, 3 ph 60 Hz

Maximum submersible power cable length (max. cable length in feet - starter to motor)																	
Motor rating	[Hp]	AWG copper wire size [ft (m)]												MCM copper wire size			
		14	12	10	8	6	4	3	2	1	0	00	000	0000	250	300	350
575 V 3 ph 60 Hz	5	5900 (1798)	9410 (2868)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	.75	4270 (1301)	6810 (2076)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	3630 (1106)	5800 (1768)	9120 (2780)	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.5	2620 (799)	4180 (1274)	6580 (2006)	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	2030 (619)	3250 (991)	5110 (1558)	8060 (2457)	-	-	-	-	-	-	-	-	-	-	-	-
	3	1580 (482)	2530 (771)	3980 (1213)	6270 (1911)	-	-	-	-	-	-	-	-	-	-	-	-
	5	920 (280)	1480 (451)	2330 (710)	3680 (1122)	5750 (1753)	-	-	-	-	-	-	-	-	-	-	-
	7.5	660 (201)	1060 (323)	1680 (512)	2650 (808)	4150 (1265)	-	-	-	-	-	-	-	-	-	-	-
	10	490 (149)	780 (238)	1240 (378)	1950 (594)	3060 (933)	4770 (1454)	5940 (1811)	-	-	-	-	-	-	-	-	-
	15	330* (101*)	530 (162)	850 (259)	1340 (408)	2090 (637)	3260 (994)	4060 (1237)	-	-	-	-	-	-	-	-	-
	20	-	410* (125*)	650 (198)	1030 (314)	1610 (491)	2520 (768)	3140 (957)	3860 (1177)	4760 (1451)	5830 (1777)	-	-	-	-	-	-
	25	-	-	520 (158)	830 (253)	1300 (396)	2030 (619)	2530 (771)	3110 (948)	3840 (1170)	4710 (1436)	-	-	-	-	-	-
	30	-	-	430* (131*)	680 (207)	1070 (326)	1670 (509)	2080 (634)	2560 (780)	3160 (963)	3880 (1183)	4770 (1454)	5780 (1762)	7030 (2143)	8000 (2438)	-	-
	40	-	-	-	500* (152*)	790 (241)	1240 (378)	1540 (469)	1900 (579)	2330 (710)	2860 (872)	3510 (1070)	4230 (1289)	5140 (1567)	5830 (1777)	-	-
	50	-	-	-	410* (125*)	640* (195*)	1000 (305)	1250 (381)	1540 (469)	1890 (576)	2310 (704)	2840 (866)	3420 (1042)	4140 (1262)	4700 (1433)	5340 (1628)	5990 (1826)
	60	-	-	-	-	540* (165*)	850 (259)	1060 (323)	1300 (396)	1600 (488)	1960 (597)	2400 (732)	2890 (881)	3500 (1067)	3970 (1210)	4520 (1378)	5070 (1545)
	75	-	-	-	-	-	690* (210*)	860 (262)	1060 (323)	1310 (399)	1600 (488)	1970 (600)	2380 (725)	2890 (881)	3290 (1003)	3750 (1143)	4220 (1286)
	100	-	-	-	-	-	-	640* (195*)	790* (241*)	970 (296)	1190 (363)	1460 (445)	1770 (539)	2150 (655)	2440 (744)	2790 (850)	3140 (957)
	125	-	-	-	-	-	-	-	630* (192*)	770* (235*)	950 (290)	1160 (354)	1400 (427)	1690 (515)	1920 (585)	2180 (664)	2440 (744)
	150	-	-	-	-	-	-	-	-	660* (202*)	800* (244*)	990* (302*)	1190 (363)	1440 (439)	1630 (497)	1860 (567)	2080 (634)
	175	-	-	-	-	-	-	-	-	-	700* (214*)	870* (265*)	1050* (320*)	1270 (387)	1450 (442)	1650 (503)	1860 (567)
	200	-	-	-	-	-	-	-	-	-	-	760* (232*)	920* (280*)	1110* (338*)	1260 (384)	1440 (439)	1620 (494)

NOTE:

* Indicates single conductor only. (Not jacketed).

No * indicates both jacketed cable and single conductor cables.

1. Table based on copper wire. If aluminum wire is used, multiply lengths by 0.5.

Maximum allowable length of aluminum is considerably shorter than copper wire of same size.

2. The portion of the total cable which is between the service entrance and a motor starter/controller should not exceed 25 % of the total maximum length to assure reliable starter operation. Single-phase control boxes may be connected at any point of the total cable length.

3. Table based on a maintaining motor terminal voltage at 95 % of service entrance voltage, running at maximum nameplate amperes. In general, voltage drop should be maintained at 3 V / 100 ft or less.

4. 1 foot = .305 meter (1 meter = 3.28 feet).

22. Friction loss tables

		Friction loss table - SCH 40 steel pipe								
[US gpm]	[US gph]	.5"	.75"	1"	1.25"	1.5"	2"	2.5"	3"	4"
		ID 0.622"	ID 0.824"	ID 1.049"	ID 1.380"	ID 1.610"	ID 2.067"	ID 2.469"	ID 3.068"	ID 4.026"
		Friction loss in feet of head per 100 feet of pipe								
2	120	4.8								
3	180	10.0	2.5							
4	240	17.1	4.2							
5	300	25.8	6.3	1.9						
6	360	36.5	8.9	2.7						
7	420	48.7	11.8	3.6						
8	480	62.7	15.0	4.5						
9	540	78.3	18.8	5.7						
10	600	95.9	23.0	6.9						
12	720		32.6	9.6	2.5	1.2				
14	840		43.5	12.8	3.3	1.5				
16	960		56.3	16.5	4.2	2.0				
20	1,200		86.1	25.1	6.3	2.9				
25	1,500			38.7	9.6	4.5	1.3			
30	1,800			54.6	13.6	6.3	1.8			
35	2,100			73.3	18.2	8.4	2.4			
40	2,400			95.0	23.5	10.8	3.1	1.3		
45	2,700				29.4	13.5	3.9	1.6		
50	3,000				36.0	16.4	4.7	1.9		
60	3,600				51.0	23.2	6.6	2.7		
70	4,200				68.8	31.3	8.9	3.6	1.2	
80	4,800				89.2	40.5	11.4	4.6	1.6	
90	5,400					51.0	14.2	5.8	2.0	
100	6,000					62.2	17.4	7.1	2.4	
120	7,200						24.7	10.1	3.4	
140	8,400						33.2	13.5	4.5	1.2
160	9,600						43.0	17.5	5.8	1.5
200	12,000						66.3	27.0	8.9	2.3
260	15,600							45.0	14.8	3.7
300	18,000							59.6	19.5	4.9

Friction loss table - SCH 40 PVC pipe										
[US gpm]	[US gph]	.5"	.75"	1"	1.25"	1.5"	2"	2.5"	3"	4"
		ID 0.622"	ID 0.824"	ID 1.049"	ID 1.380"	ID 1.610"	ID 2.067"	ID 2.469"	ID 3.068"	ID 4.026"
		Friction loss in feet of head per 100 feet of pipe								
2	120	4.1								
3	180	8.7	2.2							
4	240	14.8	3.7							
5	300	22.2	5.7	1.8						
6	360	31.2	8.0	2.5						
7	420	41.5	10.6	3.3						
8	480	53.0	13.5	4.2						
9	540	66.0	16.8	5.2						
10	600	80.5	20.4	6.3	1.7					
12	720		28.6	8.9	2.3	1.1				
14	840		38.0	11.8	3.1	1.4				
16	960		48.6	15.1	4.0	1.9				
20	1,200		60.5	22.8	6.0	2.8				
25	1,500			38.7	9.1	4.3	1.3			
30	1,800				12.7	6.0	1.8			
35	2,100				16.9	8.0	2.4			
40	2,400				21.6	10.2	3.0	1.1		
45	2,700				28.0	12.5	3.8	1.4		
50	3,000					15.4	4.6	1.7		
60	3,600					21.6	6.4	2.3		
70	4,200					28.7	8.5	3.0	1.2	
80	4,800					36.8	10.9	3.8	1.4	
90	5,400					45.7	13.6	4.8	1.8	
100	6,000					56.6	16.5	5.7	2.2	
120	7,200						23.1	8.0	3.0	
140	8,400						30.6	10.5	4.0	1.1
160	9,600						39.3	13.4	5.0	1.4
200	12,000						66.3	20.1	7.6	2.1
260	15,600							32.4	12.2	3.4
300	18,000							42.1	15.8	4.4

Nominal size of fitting and pipe								
Type of fitting and application	Pipe and fitting	1/2"	3/4"	1"	1.25"	1.5"	2"	2.5"
Friction loss in equivalent length of straight pipe in feet								
Insert coupling	Plastic	3	3	3	3	3	3	3
Threaded adapter (plastic to thread)	Plastic	3	3	3	3	3	3	3
90 ° standard elbow	Steel	2	2	3	4	4	5	6
	Plastic	2	2	3	4	4	5	6
Standard tee (flow through run)	Steel	1	2	2	3	3	4	4
	Plastic	1	2	2	3	3	4	4
Standard tee (flow through side)	Steel	4	5	6	7	8	11	13
	Plastic	4	5	6	7	8	11	13
Gate valve	Steel	1	1	1	1	2	2	2
Swing check valve	Steel	5	7	9	12	13	17	21

Notes:

Based on Schedule 40 steel and plastic fittings.

Friction loss figures are for screwed valves and are based on equivalent lengths of steel pipe.

23. Grundfos Product Center

Grundfos Product Center is an online search and sizing tool to help you make the right choice.

<http://product-selection.grundfos.com>



SIZING enables you to size a pump based on entered data and selection choices.

REPLACEMENT enables you to find a replacement product. Search results will include information on

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.

The screenshot shows the Grundfos Product Center website. At the top is a dark header with the Grundfos logo and 'PRODUCT CENTER'. Below this is a navigation bar with links: HOME, FIND PRODUCT, COMPARE, YOUR PROJECTS, SAVED ITEMS, and HELP. A search bar is prominently displayed with the placeholder text 'Input product number or a whole or partial product name' and a 'SEARCH' button. Below the search bar are four main category tiles: 'SIZING' (with a subtext 'Enter pump sizing'), 'CATALOG' (with a subtext 'Product and services'), 'REPLACEMENT' (with a subtext 'Replace an old pump with a new'), and 'LIQUIDS' (with a subtext 'Find liquid pump'). The 'SIZING' tile is expanded, showing a 'QUICK SIZING' section with input fields for 'Flow (Q)*' and 'Head (H)*', each with a unit dropdown (US gpm and ft respectively). There are also radio buttons for 'Select what to size by:' with options: 'Size by application', 'Size by pump design', and 'Size by pump family'. A 'START SIZING' button is at the bottom right of this section. Below the quick sizing section is an 'ADVANCED SIZING' section with two toggle switches: 'Advanced sizing by application' and 'Guided selection'. Callout boxes from the text blocks above point to the 'SIZING', 'REPLACEMENT', 'CATALOG', and 'LIQUIDS' tiles and the 'START SIZING' button.

CATALOG gives you access to the Grundfos product catalog.

LIQUIDS enables you to find pumps designed for aggressive, flammable or other special liquids.

All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

Downloads

On the product pages, you can download installation and Operating Instructions, data booklets, service instructions, etc. in PDF format.

Subject to alterations.

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ECM: 1169375

Grundfos Kansas City

17100 West 118th Terrace
Olathe, Kansas 66061
Phone: 913-227-3400
Fax: 913-227-3500
www.grundfos.us

Grundfos Canada

2941 Brighton Road
Oakville, Ontario L6H 6C9 Canada
Phone: +1-905-829-9533
Fax: +1-905-829-9512
www.grundfos.ca

Grundfos México

Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
C.P. 66600 Apodaca, N.L. Mexico
Phone: 011-52-81-8144 4000
Fax: 011-52-81-8144 4010
www.grundfos.mx