

PS1200 HR/C

Solar-operated Submersible Pump System, 4" Helical Rotor (HR) or Centrifugal (C) Pump Unit



Characteristics

- lift up to 240m
- flow rate up to 21m³/h
- simple installation
- maintenance-free
- high reliability and life expectancy
- cost-efficient pumping

Applications

- drinking water supply
- livestock watering
- pond management
- irrigation
- etc.

Components

Controller PS1200

- controlling of the pump system and monitoring of the operating states
- mounted at surface (no electronic parts submerged)
- two control inputs for well probe (dry running protection), float or pressure switches, remote control etc.
- automatic reset 20 minutes after well probe turns pump off
- protected against reverse polarity, overload and high temperature
- speed control, max. pump speed adjustable to reduce flow rate to c. 30%
- solar operation: integrated MPPT (Maximum Power Point Tracking)
- battery operation: low voltage disconnect and restart after battery has recovered
- max. efficiency 92% (motor + controller)
- enclosure: IP 54 (sealed, weatherproof)

Motor ECDRIVE 1200HR/C

- brushless DC motor
- no electronics inside motor
- water filled
- IP68, pressure balanced, unlimited submersion
- dynamic slide bearings, material: carbon/ceramic
- wetted material: stainless steel (AISI 316), POM, rubber, cable drinking water approved

Pump End (PE)

- high life expectancy
- none-return valve
- dry running protection (optional)
- material: stainless steel (AISI 316), rubber

HR Pumps Only

- helical rotor pump (positive displacement pump)
- two main parts only: stator and rotor, field serviceable
- stator: geometry made of abrasion resistant rubber
- rotor: stainless steel, hard chrome plated, abrasion resistant
- more resistant to damage by sand than other pump types
- self-cleaning

Performance

| | | | | | |
|------------------------------------|--|---------|---------|----------|----------|
| PS1200 | HR-03 | HR-03H | HR-04 | HR-04H | HR-07 |
| article # | 1228-X | 1230-X | 1235-X | 1240-X | 1245-X |
| lift [m] | 0-140 | 140-240 | 0-80 | 80-160 | 40-120 |
| max. flow rate [m ³ /h] | 0.5 | 0.5 | 0.8 | 0.8 | 1.2 |
| max. efficiency [%] | 60 | 64 | 60 | 65 | 64 |
| solar operation | nominal voltage 72-96V DC, open circuit voltage max. 200V DC | | | | |
| solar generator [Wp] | 350-480 | 420-900 | 350-420 | 420-1200 | 420-1200 |
| battery operation | nominal voltage 72-96 V DC | | | | |

| | | | | | |
|------------------------------------|--|----------|----------|----------|----------|
| PS1200 | HR-10 | HR-14 | C-SJ5-8 | C-SJ8-5 | C-SJ12-3 |
| article # | 1250-X | 1255-X | 1222 | 1223 | 1224 |
| lift [m] | 30-80 | 0-60 | 0-40 | 0-24 | 0-15 |
| max. flow rate [m ³ /h] | 1.9 | 2.7 | 7.5 | 11 | 21 |
| max. efficiency [%] | 64 | 65 | 48 | 48 | 48 |
| solar operation | nominal voltage 72-96V DC, open circuit voltage max. 200V DC | | | | |
| solar generator [Wp] | 420-1200 | 350-1200 | 350-1200 | 350-1200 | 350-1200 |
| battery operation | nominal voltage 72-96 V DC | | | | |



System Sizing Table

Instructions

1. lift: Find the lift you require and read the column below it.
2. daily volume: Find the daily volume you require at an irradiation of 4.5, 6 or 7.5kWh/m²/day. 7.5 is a moderately dry summer
3. pipe sizing: Use peak flow rate for pipe sizing.
4. wire size, max. wire length

| solar generator | vertical lift | | 5 m 16 ft | | 10 m 33 ft | | 15 m 50 ft | | 20 m 65 ft | | 30 m 100 ft | | 40 m 133 ft | | 50 m 165 ft | | 60 m 200 ft | | 70 m 230 ft | | |
|--------------------------------------|------------------------|----------|--------------|---------|------------------------|---------|---------------|---------|---------------|----------------------|----------------|---------|------------------------|---------|----------------|---------|----------------|---------|----------------|---------|--|
| | array mounting | | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | |
| flow rate [m³/day] | | | | | | | | | | | | | | | | | | | | | |
| 350 Wp | irradiation | 7.5 | 52 | 78 | 22 | 30 | 23 | 29 | 18 | 26 | 14 | 20 | 6.8 | 8.7 | 6.1 | 8.3 | 5.7 | 7.9 | 4.9 | 6.8 | |
| | | 6.0 | 43 | 62 | 19 | 26 | 18 | 24 | 15 | 20 | 10 | 14 | 6.5 | 8.3 | 5.5 | 7.5 | 4.8 | 6.9 | 4.1 | 5.8 | |
| | 4.5 | 33 | 44 | 16 | 22 | 14 | 19 | 10 | 14 | 6 | 8 | 6.0 | 8.0 | 4.7 | 6.2 | 4.0 | 5.6 | 3.5 | 4.8 | | |
| | pump type | C-SJ8-5 | | | | HR-14 | | | | HR-04 | | | | | | | | | | | |
| | peak flow rate [l/min] | 125 | | | | 47 | | | | 30 | | | | 13 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 60m | | | | # 12 / 200ft | | | | 4mm ² / 70m | | | | # 12 / 230ft | | | | |
| 420 Wp | irradiation | 7.5 | 60 | 90 | 26 | 31 | 24 | 30 | 20 | 29 | 16 | 23 | 8.7 | 13 | 6.8 | 8.7 | 6.1 | 8.3 | 5.7 | 7.6 | |
| | | 6.0 | 50 | 72 | 22 | 27 | 19 | 25 | 17 | 24 | 12 | 17 | 7.5 | 11 | 6.0 | 7.9 | 5.4 | 7.2 | 4.8 | 6.4 | |
| | 4.5 | 39 | 53 | 17 | 24 | 15 | 21 | 14 | 19 | 8 | 11 | 6.5 | 8.7 | 5.0 | 7.0 | 4.5 | 6.0 | 4.0 | 5.4 | | |
| | pump type | C-SJ8-5 | | | | HR-14 | | | | HR-07 | | | | HR-04 | | | | | | | |
| | peak flow rate [l/min] | 135 | | | | 43 | | | | 38 | | | | 20 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 60m | | | | # 12 / 150ft | | | | 4mm ² / 80m | | | | # 12 / 230ft | | | | |
| 480 Wp | irradiation | 7.5 | 66 | 95 | 34 | 49 | 30 | 43 | 22 | 30 | 18 | 26 | 14 | 20 | 11 | 14 | 8.7 | 13 | 6.1 | 8.7 | |
| | | 6.0 | 56 | 80 | 28 | 38 | 24 | 32 | 19 | 27 | 15 | 19 | 10 | 14 | 8.5 | 12 | 7.0 | 10 | 5.5 | 7.4 | |
| | 4.5 | 44 | 60 | 22 | 28 | 18 | 24 | 15 | 21 | 12 | 16 | 7.0 | 9.5 | 5.5 | 7.5 | 5.0 | 6.5 | 4.5 | 6.0 | | |
| | pump type | C-SJ8-5 | | | | C-SJ5-8 | | | | HR-14 | | | | HR-07 | | | | | | | |
| | peak flow rate [l/min] | 145 | | | | 80 | | | | 75 | | | | 42 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 60m | | | | # 12 / 150ft | | | | 4mm ² / 80m | | | | # 12 / 200ft | | | | |
| 660 Wp | irradiation | 7.5 | 82 | 112 | 60 | 86 | 38 | 57 | 26 | 30 | 22 | 29 | 17 | 25 | 14 | 19 | 9.8 | 14 | 8.7 | 13 | |
| | | 6.0 | 71 | 98 | 50 | 70 | 32 | 46 | 23 | 29 | 18 | 24 | 14 | 19 | 11 | 15 | 8.5 | 12 | 7.3 | 11 | |
| | 4.5 | 56 | 74 | 36 | 47 | 24 | 33 | 19 | 25 | 14 | 19 | 10 | 14 | 8.0 | 10 | 7.0 | 9.5 | 6.0 | 8.5 | | |
| | pump type | C-SJ8-5 | | | | C-SJ5-8 | | | | HR-14 | | | | HR-07 | | | | | | | |
| | peak flow rate [l/min] | 165 | | | | 135 | | | | 90 | | | | 43 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 60m | | | | # 12 / 150ft | | | | 4mm ² / 80m | | | | # 10 / 300ft | | | | |
| 720 Wp | irradiation | 7.5 | 87 | 125 | 66 | 93 | 42 | 61 | 33 | 47 | 24 | 30 | 20 | 29 | 18 | 26 | 11 | 14 | 10 | 14 | |
| | | 6.0 | 76 | 106 | 54 | 78 | 35 | 50 | 26 | 36 | 20 | 26 | 18 | 25 | 14 | 19 | 10 | 14 | 9 | 13 | |
| | 4.5 | 59 | 80 | 39 | 53 | 25 | 34 | 22 | 30 | 17 | 24 | 16 | 21 | 9 | 12 | 9 | 12 | 8 | 11 | | |
| | pump type | C-SJ8-5 | | | | C-SJ5-8 | | | | HR-14 | | | | HR-07 | | | | | | | |
| | peak flow rate [l/min] | 175 | | | | 145 | | | | 95 | | | | 75 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 60m | | | | # 10 / 250ft | | | | 4mm ² / 80m | | | | # 10 / 300ft | | | | |
| 840 Wp | irradiation | 7.5 | 96 | 133 | 74 | 110 | 57 | 85 | 40 | 60 | 24 | 30 | 22 | 30 | 19 | 27 | 14 | 20 | 10 | 14 | |
| | | 6.0 | 84 | 110 | 63 | 91 | 45 | 65 | 33 | 47 | 22 | 29 | 21 | 28 | 16 | 23 | 12 | 17 | 10 | 14 | |
| | 4.5 | 68 | 92 | 46 | 62 | 30 | 41 | 25 | 34 | 20 | 26 | 18 | 24 | 13 | 18 | 10 | 14 | 9 | 13 | | |
| | pump type | C-SJ8-5 | | | | C-SJ5-8 | | | | HR-14 | | | | HR-10 | | | | | | | |
| | peak flow rate [l/min] | 185 | | | | 170 | | | | 150 | | | | 95 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 60m | | | | # 10 / 250ft | | | | 4mm ² / 70m | | | | # 10 / 300ft | | | | |
| 1000 Wp | irradiation | 7.5 | 145 | 205 | 84 | 125 | 66 | 100 | 43 | 60 | 34 | 48 | 23 | 30 | 21 | 29 | 17 | 25 | 14 | 20 | |
| | | 6.0 | 130 | 185 | 73 | 105 | 55 | 78 | 34 | 45 | 27 | 36 | 22 | 28 | 18 | 25 | 14 | 21 | 12 | 17 | |
| | 4.5 | 103 | 140 | 47 | 65 | 39 | 51 | 26 | 33 | 23 | 31 | 20 | 25 | 15 | 20 | 12 | 16 | 10 | 14 | | |
| | pump type | C-SJ12-3 | | | | C-SJ8-5 | | | | C-SJ5-8 * | | | | HR-14 | | | | | | | |
| | peak flow rate [l/min] | 310 | | | | 180 | | | | 160 | | | | 100 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 40m | | | | # 10 / 170ft | | | | 4mm ² / 70m | | | | # 10 / 300ft | | | | |
| 1200 Wp | irradiation | 7.5 | 160 | 225 | 120 | 180 | 78 | 110 | 60 | 88 | 42 | 60 | 32 | 45 | 22 | 30 | 18 | 26 | 15 | 21 | |
| | | 6.0 | 150 | 190 | 96 | 134 | 65 | 90 | 47 | 64 | 34 | 44 | 25 | 33 | 20 | 27 | 16 | 23 | 14 | 19 | |
| | 4.5 | 125 | 165 | 67 | 90 | 46 | 63 | 33 | 45 | 25 | 34 | 18 | 23 | 18 | 24 | 14 | 19 | 12 | 16 | | |
| | pump type | C-SJ12-3 | | | | C-SJ8-5 | | | | C-SJ5-8 (max. 40m) * | | | | HR-14 | | | | | | | |
| | peak flow rate [l/min] | 340 | | | | 285 | | | | 165 | | | | 145 | | | | | | | |
| wire size/max. length | | | | | 4mm ² / 40m | | | | # 10 / 170ft | | | | 4mm ² / 70m | | | | # 10 / 300ft | | | | |

*) For 1000Wp/30m (C-SJ5-8) and 1200Wp/40m (C-SJ5-8): use 7-8 panels, wired in series, e.g. required system voltage 84/96V

System Voltage

72-96V nominal, e.g. 6-8 standard 12V modules wired in series, Voc 200V max.

Lift Limits

These systems are selected for optimum performance. To allow unexpected drawdown, each system can handle an additional 15% lift.

Wire Sizes

Cable layout is calculated to stay within 4% power loss.

Pump cable: example: 4mm²/60m = maximum allowable length (controller to pump) for the given wire size.

Variations of Wire Length

Longer: for each 50% increase, the next larger wire size is required.

Shorter: for each 33% decrease, the next smaller wire size is possible.

Array to controller: up to 6m/20ft: min. 4mm²/#10

Controller to low-water-probe: min. 1mm²/#18, 2-conductor

Conversion for Flow Rates

| | |
|------------------|---------------------|
| 1 m ² | 264 US Gal. |
| 1 m ² | 220 Imp. Gal. |
| 1 l/min | 0.264 US Gal./min |
| 1 l/min | 0.220 Imp. Gal./min |

Conversion for Lift/Length

| | |
|-----|--------|
| 1 m | 3.3 ft |
|-----|--------|

1 lift

| | | | | | | | | | | |
|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|-----------------|
| 80 m 265 ft | 90 m 300 ft | 100 m 330 ft | 120 m 400 ft | 140 m 460 ft | 160 m 530 ft | 180 m 600 ft | 200 m 660 ft | 230 m 760 ft | vertical lift | solar generator |
| fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | fixed | tracked | |

flow rate [m³/day]

| | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|------|--|-----|-------------|------------------------|------------------------------------|------------------------|------------------------------------|------------------------|------------------------------------|--|------------------------------------|------------------------------------|-------------------|--|--------|-----|-------------------|--|---------|
| 3.8 | 5.1 | 3.4 | 5.0 | 3.2 | 4.7 | 3.0 | 4.3 | 2.7 | 4.0 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 350 Wp | | | | | | | | |
| 3.3 | 4.4 | 3.0 | 4.0 | 2.7 | 3.9 | 2.5 | 3.3 | 2.0 | 2.9 | | | | | | | | | | | |
| 2.8 | 3.8 | 2.6 | 3.5 | 2.2 | 3.0 | 1.7 | 2.3 | 1.3 | 1.8 | | | | | | | | | | | |
| HR-03 | | | | | | | | | | pump type | | 420 Wp | | | | | | | | |
| 8.3 | 7.6 | 7.2 | 6.8 | 6.4 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | | | | | |
| 4mm ² / 140m #10 / 500ft | | | | | | | | | | | | | | | | | | | | |
| 4.7 | 6.9 | 4.5 | 5.4 | 4.0 | 5.0 | 3.7 | 5.0 | 3.0 | 4.2 | 2.3 | 3.2 | 1.7 | 2.4 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 480 Wp | | | | |
| 3.9 | 5.5 | 3.7 | 4.7 | 3.2 | 4.2 | 3.0 | 4.1 | 2.5 | 3.4 | 2.0 | 2.7 | 1.4 | 1.9 | | | | | | | |
| 3.0 | 4.0 | 2.9 | 3.9 | 2.4 | 3.3 | 2.3 | 3.2 | 2.0 | 2.7 | 1.7 | 2.2 | 1.0 | 1.4 | | | | | | | |
| HR-04H | | HR-03 | | | | HR-03H | | | | pump type | | 660 Wp | | | | | | | | |
| 9.5 | 7.9 | 7.6 | 7.2 | 6.8 | 6.1 | 5.3 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | | | |
| #10 / 400ft | | 4mm ² / 140m #10 / 500ft | | | | 6mm ² / 180m #8 / 750ft | | | | | | | | | | | | | | |
| 5.7 | 8.2 | 5.5 | 8.0 | 5.0 | 7.0 | 4.5 | 6.5 | 3.3 | 4.5 | 2.8 | 4.0 | 2.3 | 3.0 | 1.9 | 2.7 | 1.6 | 2.3 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 720 Wp |
| 4.8 | 6.7 | 4.4 | 6.5 | 3.8 | 5.3 | 3.4 | 4.8 | 3.0 | 4.0 | 2.4 | 3.3 | 1.9 | 2.5 | 1.6 | 2.2 | 1.3 | 1.8 | | | |
| 3.9 | 5.2 | 3.3 | 4.5 | 2.6 | 3.5 | 2.2 | 3.0 | 2.6 | 3.5 | 1.9 | 2.5 | 1.5 | 2.0 | 1.2 | 1.6 | 1.0 | 1.3 | | | |
| HR-04H | | | | HR-03 | | | | HR-03H | | | | pump type | | 840 Wp | | | | | | |
| 12 | 11 | 10 | 9.5 | 7.2 | 6.4 | 6.1 | 6.1 | 6.1 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | |
| 4mm ² / 110m #10 / 450ft | | | | #10 / 500ft | | | | 6mm ² / 180m #8 / 750ft | | | | 8mm ² / 230m #8 / 750ft | | | | | | | | |
| 8.0 | 11.5 | 6.5 | 8.0 | 5.5 | 7.8 | 5.1 | 7.4 | 4.5 | 6.4 | 3.3 | 4.6 | 3.2 | 4.3 | 3.0 | 4.1 | 2.1 | 3.7 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 1000 Wp |
| 6.5 | 9.2 | 5.5 | 7.4 | 4.9 | 6.7 | 4.0 | 5.8 | 3.5 | 5.0 | 3.0 | 4.2 | 2.8 | 3.7 | 2.5 | 3.3 | 1.8 | 2.8 | | | |
| 5.0 | 7.0 | 4.5 | 6.0 | 4.3 | 5.5 | 3.0 | 4.2 | 2.5 | 3.5 | 2.7 | 3.7 | 2.4 | 3.2 | 2.0 | 2.5 | 1.5 | 2.0 | | | |
| HR-07 | | HR-04H | | | | HR-03H | | | | pump type | | 1200 Wp | | | | | | | | |
| 19 | 13 | 13 | 12 | 12 | 6.8 | 6.8 | 6.8 | 6.8 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | |
| #10 / 300ft | | 6mm ² / 170m #10 / 450ft | | | | 6mm ² / 180m #8 / 750ft | | | | 8mm ² / 230m #8 / 750ft | | | | | | | | | | |
| 9.4 | 14 | 8.7 | 13 | 6.0 | 8.0 | 5.7 | 8.0 | 5.3 | 7.0 | 3.7 | 5.0 | 3.5 | 4.7 | 3.3 | 4.2 | 3.0 | 4.0 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 1200 Wp |
| 8.2 | 12 | 7.4 | 11 | 5.8 | 7.0 | 5.0 | 6.5 | 4.4 | 5.9 | 3.5 | 4.7 | 3.3 | 4.4 | 3.0 | 3.9 | 2.5 | 3.4 | | | |
| 7.0 | 9.5 | 6.0 | 8.1 | 5.5 | 6.1 | 4.0 | 5.4 | 3.5 | 4.7 | 3.3 | 4.5 | 3.0 | 4.0 | 2.7 | 3.6 | 2.0 | 2.7 | | | |
| HR-07 | | HR-04H | | | | HR-03H | | | | pump type | | 1200 Wp | | | | | | | | |
| 20 | 19 | 13 | 13 | 12 | 6.8 | 6.8 | 6.8 | 6.8 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | |
| 4mm ² / 100m #10 / 350ft | | 6mm ² / 170m #10 / 500ft | | | | 6mm ² / 180m #8 / 750ft | | | | 8mm ² / 230m #8 / 750ft | | | | | | | | | | |
| 10 | 14 | 9.4 | 14 | 8.0 | 12 | 7.2 | 11 | 6.0 | 7.2 | 4.2 | 5.2 | 4.0 | 5.0 | 3.7 | 4.4 | 3.3 | 4.2 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 1200 Wp |
| 8.9 | 12 | 8.4 | 12 | 7.3 | 10 | 6.5 | 9.0 | 5.2 | 6.4 | 3.9 | 5.0 | 3.6 | 4.7 | 3.4 | 4.2 | 3.1 | 4.0 | | | |
| 7.8 | 10 | 7.3 | 9.8 | 6.5 | 8.8 | 5.5 | 7.4 | 4.4 | 6.0 | 3.5 | 4.7 | 3.2 | 4.3 | 3.0 | 4.1 | 2.8 | 3.8 | | | |
| HR-07 | | HR-04H | | | | HR-03H | | | | pump type | | 1200 Wp | | | | | | | | |
| 20 | 19 | 18 | 17 | 12 | 6.8 | 6.8 | 6.8 | 6.8 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | |
| 4mm ² / 100m #10 / 400ft | | 6mm ² / 130m #10 / 400ft | | | | #10 / 500ft | | | | 6mm ² / 180m #8 / 750ft | | | 8mm ² / 230m #8 / 750ft | | | | | | | |
| 13 | 18 | 10 | 14 | 9.0 | 13 | 8.5 | 12 | 6.5 | 8.0 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 1200 Wp | | | | | | | | |
| 11 | 15 | 9.0 | 12 | 8.0 | 11 | 7.6 | 11 | 5.8 | 7.4 | | | | | | | | | | | |
| 9.0 | 12 | 8.0 | 11 | 7.0 | 9.5 | 6.7 | 9.0 | 5.0 | 6.8 | | | | | | | | | | | |
| HR-10 | | HR-07 | | | | HR-04H | | | | pump type | | 1200 Wp | | | | | | | | |
| 30 | 19 | 18 | 17 | 12 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | | | | | |
| #10 / 300ft | | 6mm ² / 130m #10 max. 400ft | | | | #10 / 500ft | | | | | | | | | | | | | | |
| 14 | 20 | 11 | 14 | 10 | 13 | 9.5 | 12 | 7.0 | 8.3 | 7.5 6.0 4.5 | irradiation kWh/ m ² /day | 1200 Wp | | | | | | | | |
| 13 | 17 | 10 | 13 | 9.0 | 12 | 8.5 | 11 | 6.4 | 8.3 | | | | | | | | | | | |
| 11 | 15 | 9.2 | 12 | 8.0 | 11 | 7.5 | 10 | 5.7 | 7.7 | | | | | | | | | | | |
| HR-10 | | HR-07 | | | | HR-04H | | | | pump type | | 1200 Wp | | | | | | | | |
| 29 | 19 | 18 | 17 | 12 | peak flow rate [l/min] | | wire size/max. length | | | | | | | | | | | | | |
| #10 / 300ft | | 6mm ² / 130m #10 max. 400ft | | | | #10 / 500ft | | | | | | | | | | | | | | |

2 daily volume

3 peak flow for pipe sizing

4 wire size, max. wire length

Calculation of Daily Water Volume

Daily volume is calculated by integrating real flow versus realistic solar (PV) output throughout the day.

Calculations include a 10% PV output degradation (heat, dirt etc.). Cable losses are included at maximum allowable length. The solar array is fixed at tilt angle = latitude of the location.

Irradiation: kWh/m²/day = peak sun hours/day

Flow rates may vary by +/- 10%

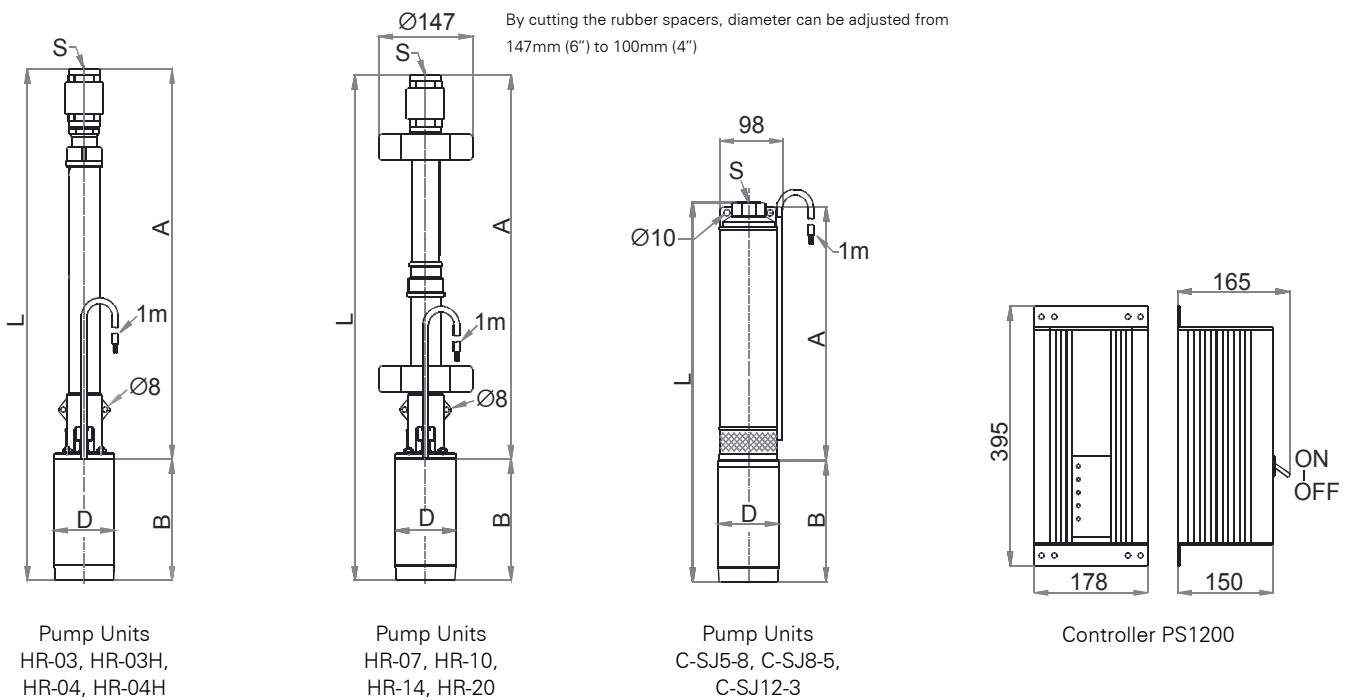
Conversion for Wire Sizes

| | |
|------|-----------------|
| AWG | mm ² |
| # 18 | 1 |
| # 12 | 4 |
| # 10 | 6 |
| # 8 | 10 |
| # 6 | 16 |

Table shows nearest larger metric cross section.

Technical Data, Dimensions and Weights

| | dimensions | | | | | shipping dimensions | | | |
|-----------------------------------|------------|-----------|-----------|-----------|-----------|---------------------|--------------------------------------|--------------------|----------------------|
| | L [mm] | A [mm] | B [mm] | D [mm] | S [mm] | packaging [mm] | shipping volume [m ³] | net weight [kg] | gross weight [kg] |
| Pump Unit (PU) (motor + pump end) | | | | | | | | | |
| HR-03, HR-03H, HR-04, HR-04 H | 780 | 595 | 185 | 96 | G 1 1/4" | 850×160×150 | 0.0204 | 11.2 | 12.0 |
| HR-07, HR-10, HR-14, HR-20 | 771 | 586 | 185 | 96 | G 1 1/4" | 850×160×150 | 0.0204 | 11.5 | 12.3 |
| C-SJ5-8 | 524 | 339 | 185 | 96 | G 1 1/2" | 660×160×150 | 0.0158 | 11.2 | 12.0 |
| C-SJ8-5 | 600 | 415 | 185 | 96 | G 2" | 660×160×150 | 0.0158 | 12.7 | 13.5 |
| C-SJ12-3 | 565 | 380 | 185 | 96 | G 2" | 660×160×150 | 0.0158 | 12.5 | 13.3 |
| Controller | | | | | | | | | |
| PS1200 | | | | | | 450×250×240 | 0.0270 | 4.5 | 5.3 |



Sand and Silt Tolerance

The pump (HR) has a higher resistance to wear from sand, clay etc. than any other pump type. In properly constructed wells the amount of particles is within the tolerance of the pump.

A concentration of particles higher than 2% (by volume) may cause blockage in the pump or the drop pipe, especially at low flow rates.

Do not use the pump to clean out a dirty well.

Pump Cable and Splice

Standard submersible cable, 3-wire + ground (total four wires). Connection to the pump is made using industry-standard splicing methods.

Drop Pipe

G 1 1/4" (optional: 1" NPT) pump outlet. If water is dirty consider a smaller sized drop pipe to increase the flow velocity. This helps to exhaust solid particles and prevent accumulation in the pipe. When considering reduced pipe size, consult a pipe sizing (friction loss) chart. Pipe can be of any standard material, rigid or flexible. A torque arrester is *not* required.

Temperature Limits

Pump end, motor: water temperature up to +40°C (+104°F)

Specify temperature range on order.

Controller: ambient temperature -30°C to +55°C (-22°F to +131°F)

Warranty

Two years manufacturer's warranty against defects in material and workmanship

Available From:

