



AQUAVAR SOLO²™

CONSTANT PRESSURE CONTROLLERS FOR: 1Ø - 3-WIRE MOTORS,
1Ø - 2-WIRE CENTRIPRO MOTORS, 3Ø MOTORS



(317) 346-4110
www.drainagesolutionsinc.com



CentriPro
a xylem brand

Residential Water Systems

FEATURES

LED display clearly indicates actual system pressure, output frequency, current draw and error log.

Dual system set points for advanced system application.

Programmable output relay can be configured to run optional accessories such as a chlorinator, or link to a home monitoring system.

NEMA 3R Enclosure: Rainproof, outdoor/indoor rated enclosure.

Current Limit Selector Switch: Rotary switch to set current limit to match motor Service Factor Amps (SFA).

Dry Well Sensitivity Switch: Choice of low or high sensitivity.

Pressure Drop: Choose a 5 or 20 PSI pressure drop for restarts.

Low Pressure Cut-Off: Set on or off depending on application.

Constant Pressure: Provides consistent pressure even as flow requirements vary.

Controller acts as a pump protection and troubleshooting device. Flashing lights indicate system faults.

Standard pressure sensor cable is 10' long. Optional lengths of 25', 50', 100', 150' and 200' are available.

Integrated output motor filter protects the motor from voltage spikes and limits electrical interference with devices such as portable telephones, radios, televisions and garage door openers.

Cooling Fan: Allows operation in ambient temperatures up to 122°F.

AGENCY LISTINGS



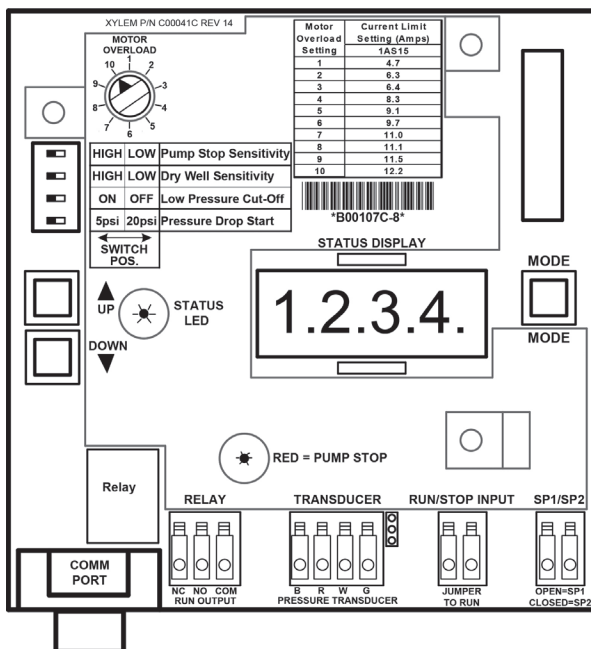
Tested to UL 508C and CSA 22.2 0-M91, 14-95 and 0.4-M1982 Standards By Canadian Standards Association File #LR38549



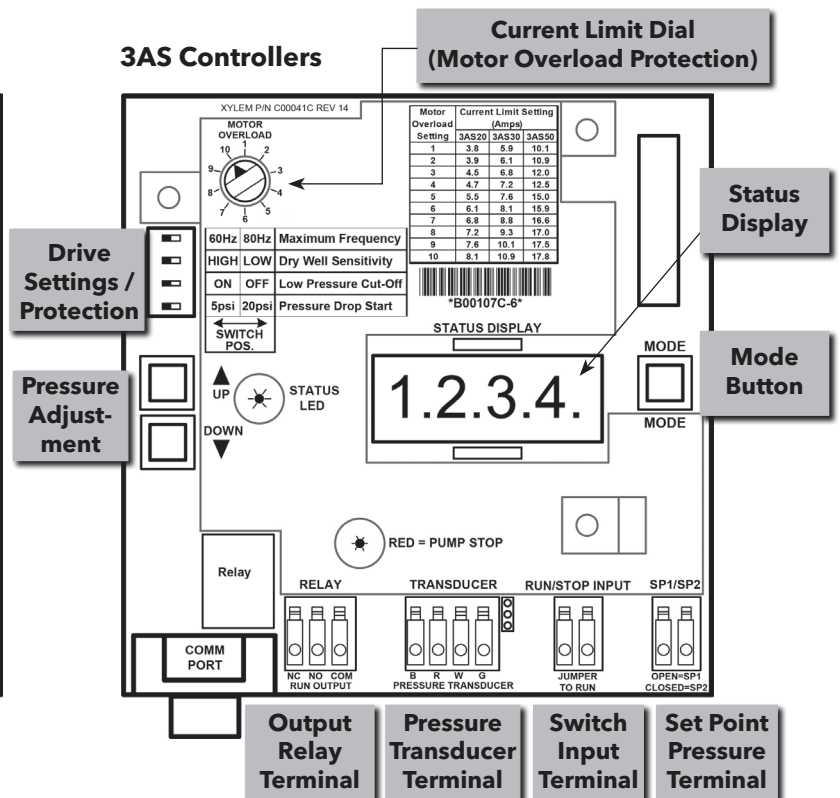
Drinking Water System Components - Health Effects & Optional Annex G - Class 6861 18 - Mechanical Devices - NSF/ANSI 61 - Certified to NSF/ANSI 61 Sect. 8 (including optional Annex G)

USER INTERFACE BOARD

1AS Controllers



3AS Controllers



SPECIFICATIONS - 3Ø MODELS / 1Ø INPUT AND 3Ø OUTPUT

Controller Temperature Range:

- Minimum Ambient Temperature: -4°F (-20°C)
- Maximum Ambient Temperature: +122°F (+50°C)

Input Voltage: single-phase, 230 Volt, two (2) wire grounded system.

Output Voltage: variable frequency, variable voltage, three-phase power to the motor.

Speed Selector Switch: Selects Output Frequency of either -

- 30 - 60 Hz - Use matched HP Water End and Motor
- 30 - 80 Hz - Use mis-matched Water End and Motor

Enclosure Dimensions:

- Height: 18.6"
- Width: 9.9"
- Depth: 5.3"

Packaged Dimensions:

- Height: 21"
- Width: 13"
- Depth: 8"

Motor Compatibility with 3AS_ _ Models

| HP | Three Phase | |
|----|-----------------------|---------------------|
| | CentriPro & Pentek XE | Franklin & Grundfos |
| ¾ | Yes | Yes |
| 1 | Yes | Yes |
| 1½ | Yes | Yes |
| 2 | Yes | Yes |
| 3 | Yes | Yes |
| 5 | Yes | ① |

① Amps may be higher than controller overload range - use of these motors will current limit and provide reduced performance.

3AS20 SPECIFICATIONS

- HP Range: ¾ to 2
- Unit Weight: 19 lbs.
- Packaged Weight: 23 lbs.
- Pressure Set point adjustable from 20 - 85 psi using the standard 100 psi sensor. ①

3AS30 SPECIFICATIONS

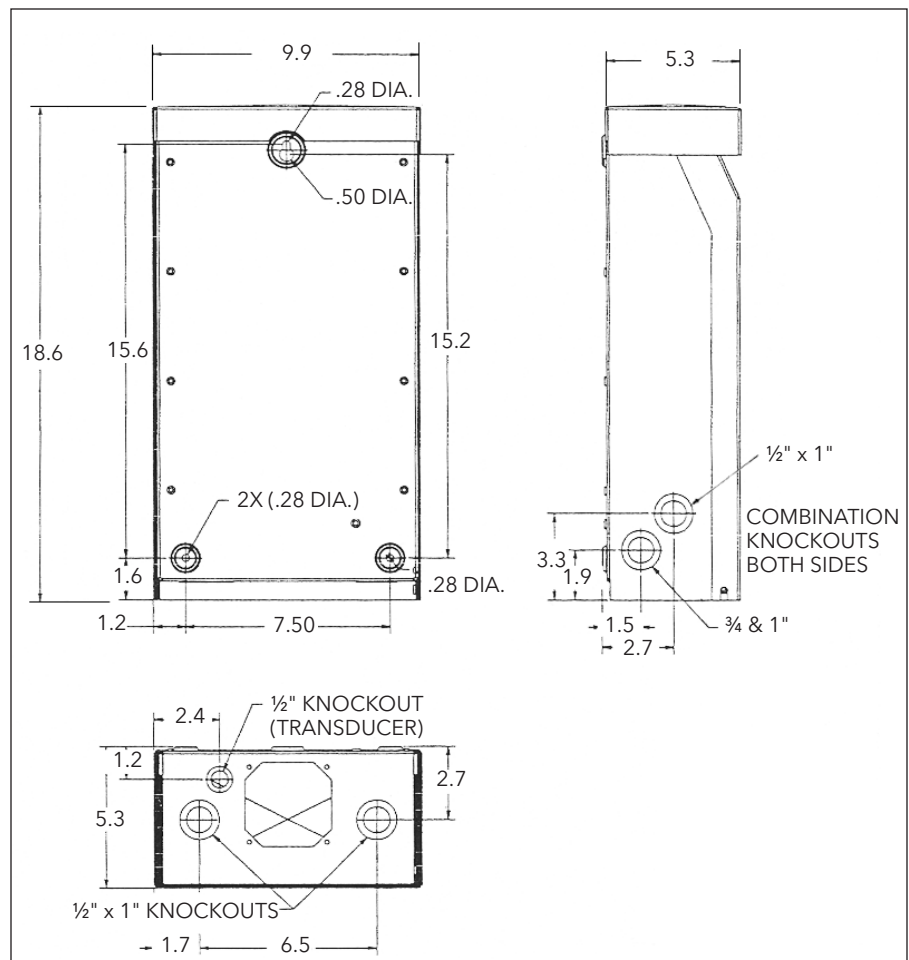
- HP Range: 1½ to 3
- Unit Weight: 20 lbs.
- Packaged Weight: 24 lbs.
- Pressure Set point adjustable from 20 - 85 psi using the standard 100 psi sensor. ①

3AS50 SPECIFICATIONS

- HP Range: 3 to 5
- Unit Weight: 25 lbs.
- Packaged Weight: 29 lbs.
- Pressure Set point adjustable from 20 - 100 psi using the standard 200 psi sensor. ①

① Higher pressures are available using a higher pressure sensor. See page 4.

DIMENSIONS (inches) - ALL MODELS



SPECIFICATIONS - 1AS15 - 1Ø MODEL - 1Ø INPUT AND 1Ø OUTPUT

Controller Temperature Range:

- Minimum Ambient Temperature: 14°F (-10°C)
- Maximum Ambient Temperature: 122°F (50°C)

Input Voltage: single-phase, 230 Volt, two (2) wire grounded system.

Output Voltage: 1Ø, variable voltage, variable frequency, single phase power to the 2-wire or 3-wire motor

Speed/Frequency: 30-60 only

Enclosure Dimensions:

- Height: 18.6"
- Width: 9.9"
- Depth: 5.3"

Packaged Dimensions:

- Height: 21"
- Width: 13"
- Depth: 8"

1AS15 SPECIFICATIONS

- Unit Weight: 19 lbs.
- Packaged Weight: 23 lbs.
- Pressure Set point adjustable from 20 - 85 psi using the standard 100 psi transducer.
- HP Range:

Motor Compatibility with Aquavar SOLO 1AS15

| HP | Single Phase 2-Wire | | Single Phase 3-Wire | |
|----|-----------------------|--|-----------------------|--|
| | CentriPro & Pentek XE | Franklin, Grundfos and Flint & Walling | CentriPro & Pentek XE | Franklin, Grundfos and Flint & Walling |
| ½ | Yes | Yes | Yes | Yes |
| ¾ | Yes | Yes | Yes | Yes |
| 1 | Yes | Yes | Yes | Yes |
| 1½ | Yes | Yes | Yes | Yes |
| 2 | No | No | Yes | ① |

① Amps are higher than controller overload range - use of these motors will current limit and provide reduced performance.

TANK SIZING

Diaphragm Tank Sizing and Pre-Set Pressure Recommendations:

Diaphragm type (captive air) tanks are required on these systems.

Table 1: Tank Sizing Selection

| Maximum Pump GPM | Recommended Tanks | |
|------------------|-------------------|--------------|
| | Total Volume | Order Number |
| 10 | 1.9 | V6P |
| 24 | 4.9 | V15P |
| 36 | 7.3 | V25P |
| 70 | 13.9 | V45 |
| 100 | 19.9 | V60 |

Use Total Tank Volume, not drawdown volume, to select the proper tank size. The total tank volume should be approximately 20% of the pump's maximum flow. For example, when using a 10 gpm pump the system requires a minimum 2 gallon (total volume) tank.

The tank sizing recommendations are field proven to prevent objectionable pressure drops on start-up and provide smooth operation for the majority of variable speed pump systems.

When using the default, 5 PSI pressure drop, setting: Set the tank pressure, while tank is empty of water, to 20 psi below the desired system pressure setting. Ex. for a 50 psi system pressure, charge the tank to 30 psi.

See IOM for other settings or if using a large tank.

Table 2: Controller, Breaker, Generator Sizing

| Motor | | Controller Model ^② | | | | Circuit Breaker ^③ | Generator ^④ (VA) | <p>① Supply voltage must be 196 VAC - 265 VAC.</p> <p>② Shaded areas indicate which controller models can be used with which motors. Lighter shading indicates combinations where controller will limit peak performance to 85% of catalog value for pump/motor.</p> <p>③ Circuit Breaker or Dual Element Time Delay Fuse Size (Amps) protecting branch circuit supplying controller.</p> <p>④ Minimum size of single phase 240 V generator required.</p> |
|-------|----------------------|-------------------------------|-------|-------|-------|------------------------------|-----------------------------|---|
| HP | Voltage ^① | 1AS15 | 3AS20 | 3AS30 | 3AS50 | | | |
| ½ | 230 | | | | | 15 | 2200 | |
| | 200 | | | | | | | |
| ¾ | 230 | | | | | | 2900 | |
| | 200 | | | | | | | |
| 1 | 230 | | | | | | 3500 | |
| | 200 | | | | | | | |
| 1½ | 230 | | | | | 20 | 4400 | |
| | 200 | | | | | | | |
| 2 | 230 | | | | | 30 | 6100 | |
| | 200 | | | | | | | |
| 3 | 230 | | | | | 40 | 8100 | |
| | 200 | | | | | | | |
| 5 | 230 | | | | | 50 | 13300 | |
| | 200 | | | | | | | |

Table 3: Service Factor Amps All Motors

| HP | 230 Volt | | | | | | 200 Volt | | | | |
|----|------------------------|-------------------|-------------------|-----------|-------------------|-------------------|-----------|----------|-------------------|-------------------|-------------------|
| | 1Ø 2-Wire | | | 1Ø 3-Wire | | | 3Ø | | | 3Ø | |
| | CentriPro ¹ | Franklin | Grundfos | CentriPro | Franklin | Grundfos | CentriPro | Franklin | Grundfos | CentriPro | Franklin |
| ½ | 4.7/4.7 | 6 | 6 | 6.3 | 6 | 6 | N/A | N/A | N/A | N/A | N/A |
| ¾ | 6.4/6.2 | 8 | 8.4 | 8.3 | 8 | 8.4 | 3.9 | 3.8 | N/A | 4.5 | 4.4 |
| 1 | 9.1/8.1 | 9.8 | 9.8 | 9.7 | 9.8 | 9.8 | 4.7 | 4.7 | N/A | 5.5 | 5.4 |
| 1½ | 11.0/10.4 | 13.1 ² | 13.1 ² | 11.1 | 11.5 | 11.6 | 6.1 | 5.9 | 7.3 | 7.2 | 6.8 |
| 2 | N/A | N/A | N/A | 12.2 | 13.2 ² | 13.2 ² | 7.6 | 8.1 | 8.7 | 8.8 | 9.3 |
| 3 | N/A | N/A | N/A | N/A | N/A | N/A | 10.1 | 10.9 | 12.2 | 12 | 12.5 |
| 5 | N/A | N/A | N/A | N/A | N/A | N/A | 17.5 | 17.8 | 19.8 ² | 20.2 ² | 20.5 ² |

- CentriPro 2-Wire motors have Generation 1 and Generation 2 amp ratings, see motor nameplate or motor data sticker that was supplied with motor.
- Amps are higher than controller overload range - use of these motors will current limit and provide reduced performance.

PRESSURE RANGES FOR ALL AVAILABLE TRANSDUCERS

| Transducer | Minimum PSI | Maximum PSI |
|----------------------|-------------|-------------|
| 100 PSI ^① | 20 | 85 |
| 200 PSI ^② | 20 | 170 |
| 300 PSI | 20 | 255 |

- ① Standard on 1AS15/3AS20, 3AS30 ② Standard on 3AS50

Warning! Exploding tank can injure or kill, some combinations of Transducer and Controller allow system pressure adjustment to exceed the maximum working pressure of the tank and piping.

Ensure system pressure is set below the maximum working pressure of the tank and system piping.

Protect tank and piping against overpressure, install a properly sized pressure relief valve (PRV) able to pass full pump flow at the maximum working pressure of the tank. In finished basements or where PRV blow-off can cause property damage, pipe the PRV to a suitable drain.

Table 4: Wire Sizing
Maximum Cable Lengths in Feet to Limit Voltage Drop to 5% for 230 V Systems ①

1A515 Controller to Motor - Controllers with 2-Wire 1Ø Motors

| Motor Lead Lengths - CentriPro 2-Wire Motors - Based on Service Factor Amps, 30° C Ambient and 5% Voltage Drop | | | | | | | | | | | | | | |
|---|----|------|------|---|-----|------|------|------|------|------|-------|-------|-------|-------|
| Motor Rating | | | | 60° C & 75° C Insulation - AWG Copper Wire Size | | | | | | | | | | |
| Volts | HP | kW | SFA | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 1/0 | 2/0 | 3/0 | 4/0 |
| 230 | ½ | 0.37 | 4.7 | 466 | 742 | 1183 | 1874 | 2915 | 4648 | 7379 | 11733 | 14803 | 18688 | 23544 |
| | ¾ | 0.55 | 6.4 | 342 | 545 | 869 | 1376 | 2141 | 3413 | 5419 | 8617 | 10871 | 13724 | 17290 |
| | 1 | 0.75 | 9.1 | 241 | 383 | 611 | 968 | 1506 | 2400 | 3811 | 6060 | 7646 | 9652 | 12160 |
| | 1½ | 1.1 | 11.0 | 199 | 317 | 505 | 801 | 1246 | 1986 | 3153 | 5013 | 6325 | 7985 | 10060 |

1A515 Controller to Motor - Controllers with 3-Wire 1Ø Motors

| Motor Lead Lengths - CentriPro 3-Wire Motors (CSIR) - Based on Service Factor Amps, 30° C Ambient and 5% Voltage Drop | | | | | | | | | | | | | | |
|--|----|------|------|---|-----|-----|------|------|------|------|------|-------|-------|-------|
| Motor Rating | | | | 60° C & 75° C Insulation - AWG Copper Wire Size | | | | | | | | | | |
| Volts | HP | kW | SFA | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 1/0 | 2/0 | 3/0 | 4/0 |
| 230 | ½ | 0.37 | 6.3 | 348 | 553 | 883 | 1398 | 2175 | 3467 | 5505 | 8753 | 11044 | 13942 | 17564 |
| | ¾ | 0.55 | 8.3 | 264 | 420 | 670 | 1061 | 1651 | 2632 | 4178 | 6644 | 8383 | 10582 | 13332 |
| | 1 | 0.75 | 9.7 | 226 | 359 | 573 | 908 | 1413 | 2252 | 3575 | 5685 | 7173 | 9055 | 11408 |
| | 1½ | 1.1 | 11.1 | 197 | 314 | 501 | 793 | 1234 | 1968 | 3124 | 4968 | 6268 | 7913 | 9969 |
| | 2 | 1.5 | 12.2 | 180 | 286 | 456 | 722 | 1123 | 1790 | 2843 | 4520 | 5703 | 7199 | 9070 |

All Models - Service Entrance to Controller

| Controller Input | Motor HP | Copper Wire Size 75°C Insulation Exposed to a Maximum of 50°C (122°F) Ambient Temperature ② | | | | | | | | | | | | | | | | | |
|------------------|----------|---|------------|------------|------------|------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 14 | 12 | 10 | 8 | 6 | 4 | 3 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | 250 | 300 | 350 | 400 | 500 |
| 230V 1 PH | ¾ | 279 | 445 | 706 | 1020 | 1608 | 2552 | 3186 | 4019 | 5065 | 6383 | 8055 | | | | | | | |
| | 1 | 226 | 360 | 571 | 824 | 1300 | 2064 | 2576 | 3250 | 4095 | 5161 | 6513 | 8201 | | | | | | |
| | 1½ | * | 286 | 455 | 657 | 1036 | 1644 | 2052 | 2589 | 3262 | 4111 | 5188 | 6533 | 8236 | 9710 | | | | |
| | 2 | * | * | 331 | 478 | 754 | 1197 | 1495 | 1886 | 2376 | 2995 | 3779 | 4759 | 5999 | 7073 | 8455 | 9852 | | |
| | 3 | * | * | 246 | 355 | 561 | 890 | 1111 | 1401 | 1766 | 2225 | 2808 | 3536 | 4458 | 5256 | 6283 | 7321 | 8343 | |
| | 5 | * | * | * | 218 | 343 | 545 | 680 | 858 | 1081 | 1363 | 1720 | 2165 | 2730 | 3219 | 3847 | 4483 | 5109 | 6348 |

3A520, 30, 50 Controller to Motor - Controllers with 3Ø Motors

| Controller Output | Motor HP | Copper Wire Size 75°C Insulation Exposed to a Maximum of 50°C (122°F) Ambient Temperature ② | | | | | | | | | | | | | | | | | |
|-------------------|----------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|
| | | 14 | 12 | 10 | 8 | 6 | 4 | 3 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | 250 | 300 | 350 | 400 | 500 |
| 230V 3 PH | ¾ | 690 | 1100 | 1748 | 2523 | 3978 | 6316 | 7884 | 9945 | | | | | | | | | | |
| | 1 | 558 | 890 | 1413 | 2040 | 3216 | 5106 | 6375 | 8041 | | | | | | | | | | |
| | 1½ | 445 | 709 | 1126 | 1625 | 2562 | 4068 | 5078 | 6406 | 8072 | | | | | | | | | |
| | 2 | 324 | 516 | 820 | 1184 | 1866 | 2963 | 3699 | 4666 | 5879 | 7410 | 9351 | | | | | | | |
| | 3 | 241 | 384 | 609 | 880 | 1387 | 2202 | 2749 | 3467 | 4369 | 5506 | 6949 | 8750 | | | | | | |
| | 5 | * | 235 | 373 | 539 | 849 | 1348 | 1683 | 2123 | 2675 | 3372 | 4255 | 5358 | 6755 | 7964 | 9520 | | | |

① Reduce lengths by 13% for 200 V systems. * Wire does not meet the N.E.C. ampacity requirement.

② Lengths in bold require 90° C wire. ■ Shading indicates 40° C maximum ambient.

The lengths in each of the Wire Sizing tables represent 100% of the allowable voltage drop when motor is running at full load. When sizing wire, the voltage drop of each wire segment must be included. The total must not exceed 100% of the allowable drop. Take for example a 1.5 HP motor with a distance from Service Entrance to Controller of 100' and 500' between the Controller and Motor.

- Service Entrance to Controller = 100' of 10 AWG (100/455) = 22 % (455' is from the S.E. to Controller chart)
 - Controller to Motor = 500' of 12 AWG (500/709) = 71 % (709' is from the Controller to Motor chart)
- Total Drop (must be ≤ 100%) = 93 %

If the distance from the Controller to Motor was 600' (600/709) = 85% + 22% = 107%, we would need to use #10 wire for that segment, ex. 600/1126 = 53% + 22% (for 100' of #10) = 75% which is acceptable. It is also acceptable to use different wire sizes for the Buried and Well sections of wire.

3Ø, 4" MOTORS - ELECTRICAL DATA, 60 HERTZ 3450 RPM

| CentriPro # | Red Jacket # | HP | kW | Volts | SF | Full Load | | Service Factor | | Locked Rotor Amps | Line - Line Resistance |
|-------------|--------------|------|------|-------|------|-----------|-------|----------------|-------|-------------------|------------------------|
| | | | | | | Amps | Watts | Amps | Watts | | |
| M07430 | 75C323 | 0.75 | 0.55 | 200 | 1.5 | 3.8 | 812 | 4.5 | 1140 | 32 | 2.6-3.0 |
| M10430 | 100C323 | 1 | 0.75 | | 1.4 | 4.6 | 1150 | 5.5 | 1500 | 29 | 3.4-3.9 |
| M15430 | 150C323 | 1.5 | 1.1 | | 1.3 | 6.3 | 1560 | 7.2 | 1950 | 40 | 1.9-2.5 |
| M20430 | 200C323 | 2 | 1.5 | | 1.25 | 7.5 | 2015 | 8.8 | 2490 | 51 | 1.4-2.0 |
| M30430 | 300C323 | 3 | 2.2 | | 1.15 | 10.9 | 2890 | 12.0 | 3290 | 71 | 0.9-1.3 |
| M50430 | 500C323 | 5 | 3.7 | | 1.15 | 18.3 | 4850 | 20.2 | 5515 | 113 | 0.4-0.8 |
| M07432 | 75C313 | 0.75 | 0.55 | 230 | 1.5 | 3.3 | 850 | 3.9 | 1185 | 27 | 3.3-4.3 |
| M10432 | 100C313 | 1 | 0.75 | | 1.4 | 4.0 | 1090 | 4.7 | 1450 | 26.1 | 4.1-5.1 |
| M15432 | 150C313 | 1.5 | 1.1 | | 1.3 | 5.2 | 1490 | 6.1 | 1930 | 32.4 | 2.8-3.4 |
| M20432 | 200C313 | 2 | 1.5 | | 1.25 | 6.5 | 1990 | 7.6 | 2450 | 44 | 1.8-2.4 |
| M30432 | 300C313 | 3 | 2.2 | | 1.15 | 9.2 | 2880 | 10.1 | 3280 | 58.9 | 1.3-1.7 |
| M50432 | 500C313 | 5 | 3.7 | | 1.15 | 15.7 | 4925 | 17.5 | 5650 | 93 | .85-1.25 |

1Ø, 4" MOTORS - ELECTRICAL DATA, 60 HERTZ 3450 RPM

| Type | Motor Order Number | | HP | KW | Volts | SF | Full Load | | Service Factor | | Locked Rotor Amps | Winding Resistance | |
|---------------|--------------------|------------|------|------|-------|-----|-----------|-------|----------------|-------|-------------------|--------------------|-----------|
| | CentriPro | Red Jacket | | | | | Amps | Watts | Amps | Watts | | Main | Start |
| 2 Wire PSC | M05422 | 50C211 | 0.5 | 0.37 | 230 | 1.6 | 3.7 | 834 | 4.7 | 1073 | 19.5 | 4.5-5.2 | - |
| | M07422 | 75C211 | 0.75 | 0.55 | | 1.5 | 5.0 | 1130 | 6.4 | 1459 | 24.8 | 3.0-4.8 | - |
| | M10422 | 100C211 | 1.0 | 0.75 | | 1.4 | 7.9 | 1679 | 9.1 | 1990 | 21.7 | 4.2-5.2 | - |
| | M15422 | 150C211 | 1.5 | 1.1 | | 1.3 | 9.2 | 2108 | 11.0 | 2520 | 42.0 | 1.9-2.3 | - |
| 3 Wire | M05412 | 50C311 | 0.5 | 0.37 | | 1.6 | 5.5 | 745 | 6.3 | 1033 | 22.3 | 4.2-4.9 | 17.4-18.7 |
| | M07412 | 75C311 | 0.75 | 0.55 | | 1.5 | 7.2 | 1014 | 8.3 | 1381 | 32.0 | 2.6-3.6 | 11.8-13 |
| | M10412 | 100C311 | 1 | 0.75 | | 1.4 | 8.4 | 1267 | 9.7 | 1672 | 41.2 | 2.2-3.2 | 11.3-12.3 |
| | M15412 | 150C311 | 1.5 | 1.1 | | 1.3 | 9.7 | 1693 | 11.1 | 2187 | 47.8 | 1.6-2.3 | 7.9-8.7 |
| | M20412 | 200C311 | 2 | 1.5 | 1.25 | 9.9 | 2170 | 12.2 | 2660 | 49.4 | 1.6-2.2 | 10.8-12.0 | |

The AQUAVAR SOLO²™ 1AS15 model 30-60 hertz speeds only.

The AQUAVAR SOLO²™ 3AS models provide the option of operating the system at either 30-60 or 30-80 hertz speeds.

| Controller | 30 - 60 Hertz (Standard Speed) Setting | | 30 - 80 Hertz (High Speed) Setting | |
|------------|--|----------|------------------------------------|----------|
| | Water End | Motor HP | Water End | Motor HP |
| 3AS20 | 1 | 1 | ½ | 1 |
| 3AS20 | 1½ | 1½ | ¾ | 1½ |
| 3AS20 | 2 | 2 | 1 | 2 |
| 3AS30 | 1½ | 1½ | ¾ | 1½ |
| 3AS30 | 2 | 2 | 1 | 2 |
| 3AS30 | 3 | 3 | 1½ | 3 |
| 3AS50 | 5 | 5 | 3 | 5 |

When using the "80 hertz" setting with mis-matched water ends and motors, use the larger pump curve as the top curve. The bottom, or 30 hertz, curve is calculated using the smaller wet end curve and the Affinity Laws. The ProPak Bulletins define performance curves. See BGPROPAK60 or BGPROPAK80 for curves.

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services, and agricultural settings. With its October 2016 acquisition of Sensus, Xylem added smart metering, network technologies and advanced data analytics for water, gas and electric utilities to its portfolio of solutions. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com



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