UNIVERSAL CONTROL CABLE - Purchased Separately

<table>
<thead>
<tr>
<th>Length</th>
<th>Part Number</th>
</tr>
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<tbody>
<tr>
<td>2 metre</td>
<td>1001300</td>
</tr>
<tr>
<td>5 metre</td>
<td>1001301</td>
</tr>
<tr>
<td>10 metre</td>
<td>1001302</td>
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FUNCTIONS - External control of the pump, via the universal control cable

4 (four) different pump functions are available via the 5 (five) wires of the control cable

PAUSE - Brown–Black
- Open contact pump between these wires, pump will be in “PAUSE” mode.
- “PAUSE” shown on pump display, pump stopped.
- Closed contact between these wires, pump enabled, pump will run based on operating mode.
- When the cable is connected to the pump and the pause function is not used, it is necessary to close Brown - Black wires together, otherwise pump will always be in “PAUSE” mode.

CONTACT - White–Black
- Pulses between these wires will pace the pump when the pump is in contact mode.

ANALOG - Blue–Black
- For 4-20 mA input Blue + input, Black - input, Pump Impedance 120 ohms.

AUXILIARY - Grey–Black
- Open contact between these wires, pump operates as normal.
- Closed contact between these wires, pump defaults to the preset auxiliary stroking frequency.

STATUS LEDS

GREEN LED ON
- Normal operation LED blinks off with each pump stroke.

YELLOW LED ON
- In calibration mode stroke volume adjusted +/- > 10% of calibrated setting.
- “CALIB” flashing at side of display.

YELLOW LED ON
- Display flashing, low chemical tank level warning.

RED LED ON
- “MINIM” Flashing, low chemical tank level.

RED LED ON
- “ANALG” Flashing, No mA input or mA input less than 3.7 mA. (4-20 mA operation)

RED LED ON
- “FLOW” Flashing, low flow for more than preset numbers of strokes.

QUICK START PROGRAMMING GUIDE

Experts in Chem-Feed and Water Treatment

Pump face has 5 (five) push buttons, a digital display panel and 3 status LEDs.

Push Button Functions

P = Hold for 2 (two) seconds to enter into programming
or
P = Press once to confirm a setting or value

i = Steps through operating information each time when pressed

ARROW UP = Increases numeric value / Up

ARROW DOWN = Decreases numeric value / Down

START/STOP = Start/Stop pump operation

Additional Quick Start Instructions Inside
MANUAL MODE
Pump is shipped in Manual mode, set at maximum stroke frequency.
Use \( \text{ST}\) or \( \text{P}\) to change pump's stroke frequency.
Use \( \text{ST}\) to step through pump operating information each time when pressed (i.e. stroke frequency, stroke length % / totalized strokes / etc.).
Use \( \text{ST}\) to start and stop pump.

ANALOG MODE (Optional for pump)
For 4-20 mA control
Press and hold \( \text{ST}\) until display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "MODE". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "ANALOG". Press \( \text{ST}\).
The pump is now in analog mode.
If the red L.E.D. comes on and "ANALG" flashes on the display, the pump is either not getting an analog signal or the signal is below 3.7 mA. (4-20 mA operation)

To set for 4-20 mA operation
Press and hold \( \text{ST}\) until display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "SET". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "4-20 mA". Press \( \text{ST}\).
Pump will respond proportionally, 4 mA = 0 SPM 20 mA = Maximum frequency

CONTACT MODE
External pulse inputs via the universal control cable from (i.e. water meter, Dulcimeter controller).

BASIC CONTACT MODE
Press and hold \( \text{ST}\) until the display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "MODE". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "CONTACT". Press \( \text{ST}\).
The pump is now in contact mode.

TO SET MULTIPLIER/DIVIDER VALUE (when pump has this option)
Factor can be set in the range of 00.01 to 99.99
Put pump into "CONTACT" mode, as per above.
Press and hold \( \text{ST}\) until display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "SET". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "CNTC". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "OFF". Press \( \text{ST}\).
First of 4 (four) digits is flashing XX.XX
Use \( \text{ST}\) or \( \text{P}\) to set numeric value of the flashing digit. Press \( \text{ST}\) to move to next digit.
Repeat until factor is set (i.e. For multiply by 2.5 = 02.50 For divide by 2 = 00.50) Press \( \text{ST}\) to return to pump operation.

FOR QUICK PRIMING
For quick priming while on external control
Press \( \text{ST}\) until "FREQ" is shown at the right hand side of display.
Then by pressing \( \text{ST}\) and \( \text{P}\) simultaneously, pump will run at "MAX" frequency.

CALIBRATION
To calibrate the pump, have pump ready to draw from a calibration column or graduated cylinder.
Stop pump \( \text{ST}\).
Press and hold \( \text{ST}\) until display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "SET". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "CALIB". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "ON". Press \( \text{ST}\) "Start" should be flashing on display.
Note the level in the calibration column/graduated cylinder.
Press \( \text{ST}\) to start the calibration.
Run calibration as long as the calibration column allows. Press \( \text{ST}\) to stop calibration.
Determine the volume pumped (i.e. 38 ml=0.0380 litres)*.
Use \( \text{ST}\) or \( \text{P}\) to change the numeric value of the flashing digit.
Press \( \text{ST}\) to move to the next digit.
When volume setting is complete. Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) to set unit to litres*.
Press \( \text{ST}\). Calibration is complete.
By using \( \text{ST}\) , you can step through operating information, view pump rate in litres/hr and totalized capacity.
* If calibration was done in gallons, use the pumped gallon volume and set unit for gallons.

FLOW MONITORING
A flow monitor must be connected to the pump for this function. Monitor purchased separately.
Press and hold \( \text{ST}\) until display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "SET". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "FLOW". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "ON". Press \( \text{ST}\).
You can now set the number of pump strokes with low volume before a fault occurs.
Use \( \text{ST}\) or \( \text{P}\) to set numeric value of the flashing digit, press \( \text{ST}\) to move to next digit.
Repeat until the desired number is set. (up to 125)

AUXILIARY FREQUENCY
A universal control cable must be connected to the pump. When the gray wire is connected to the black, the pump strokes at the pre-set auxiliary frequency.

To set Auxiliary Frequency
Press and hold \( \text{ST}\) until display flashes. Release.
Use \( \text{ST}\) or \( \text{P}\) until you see "SET". Press \( \text{ST}\).
Use \( \text{ST}\) or \( \text{P}\) until you see "AUX". Press \( \text{ST}\).
A value can be set from 0 to maximum stroking frequency.
Use \( \text{ST}\) or \( \text{P}\) to set numeric value of the flashing digit, press \( \text{ST}\) to move to next digit.
Repeat until the desired number is set.
Press \( \text{ST}\) to return to pump operation.

Note:
- For Analog and Contact Mode Operation, an universal control cable must be connected to the pump.
- For flow monitoring, a ProMinent flow monitor must be connected.
- For low level indication, a ProMinent 2-stage level switch must be connected.
- Large knob on the pump face is for stroke volume adjustment.
  - Can be adjusted from 0% to 100%
  - Recommended 30% to 100% for standard liquid ends.
  - Recommended 50% to 100% with auto-degassing liquid ends for gamma/L