

## Watson-Marlow 530 Pump Range

### Equivalency Statement- Issue 3

Issue	Date	Comment
1	15 Feb 2016	First Issue
2	21 April 2016	Introduction of PROFIBUS information. See section 5 of this document
3	27 April 2016	Introduction of Networking clarification. See section 6 of this document

### Background

Watson-Marlow Fluid Technology Group launched the 530 pump range on February 26 2016. The pumps which are covered by this equivalency statement, comprise;

530SN/R, 530S/R, 530SN/R2, 530S/R2, 530SN/REL, 530S/REL, 530SN/REM, 530S/REM, 530SN/REH, 530S/REH

530UN/R, 530U/R, 530UN/R2, 530U/R2, 530UN/REL, 530U/REL, 530UN/REM, 530U/REM, 530UN/REH, 530U/REH

530DuN/R, 530Du/R, 530DuN/R2, 530Du/R2, 530DuN/REL, 530Du/REL, 530DuN/REM, 530Du/REM, 530DuN/REH, 530Du/REH

530BpN/R, 530Bp/R, 530BpN/R2, 530Bp/R2, 530BpN/REL, 530Bp/REL, 530BpN/REM, 530Bp/REM, 530BpN/REH, 530Bp/REH

The 520 range will still be available until 31 May 2016, however, Watson-Marlow Fluid Technology Group is confident that customers will want to upgrade to the 530 range immediately. The 530 range includes an intuitive user interface, enhanced networking, simple flow calibration and improved analogue control.

All 520 pumps which are installed will continue to be warrantied for a period of 5 years from the date of manufacture. The 520 range will continue to be supported until 2023, where this is within the control of Watson-Marlow Fluid Technology Group.

The following statement is to demonstrate equivalency of the 530 range with the 520 range in terms of control and peristaltic performance. It also communicates the functional enhancements of the 530 range relative to the 520 range

## Equivalence

### 1. Peristaltic Performance

The range of pumpheads and tube options available for the 530 range are identical to those available for the 520 range.

Pump Range	Available Pumpheads	Pump Range	Available Pumpheads
530	520R	520	520R
	520R2		520R2
	520REL		520REL
	520REM		520REM
	520REH		520REH
	505L		505L
	505CA		505CA
	313D		313D
	314D		314D

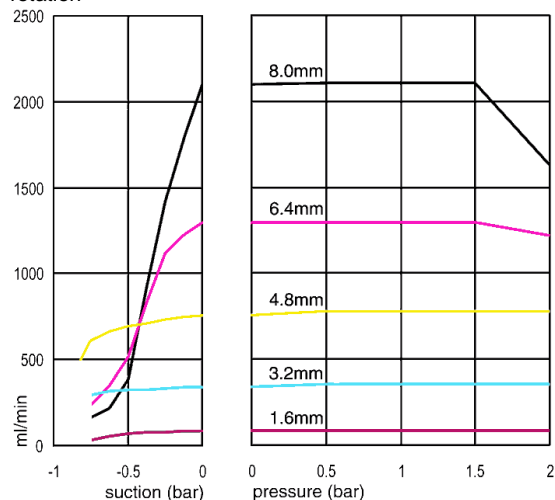
There has been no change to the wetted components of the pump to ensure that the upgraded 530 range can be installed into validated processes with minimal re-qualification. As a result a 530 drive fitted with the same pumphead and tube material of the same bore/wall will deliver identical peristaltic performance as a 520 drive with the same pumphead and tube.

#### 530 Performance Curves

Flow rates of suction and discharge pressures for the 520R pumphead at different drive speeds.

This data was produced pumping water at ambient temperature.

Bioprene continuous tubing, 1.6mm wall, 200rpm, clockwise rotation

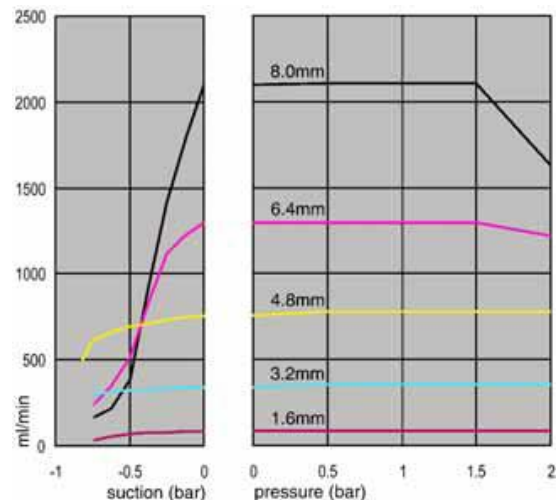


#### 520 Performance Curves

Flow rates of suction and discharge pressures for the 520R pumphead at different drive speeds.

This data was produced pumping water at ambient temperature.

Bioprene continuous tubing, 1.6mm wall, 200rpm, clockwise rotation



Please refer to the Operating Manuals for full flow performance curves.

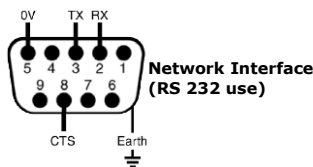
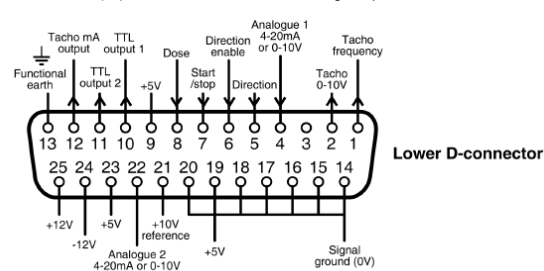
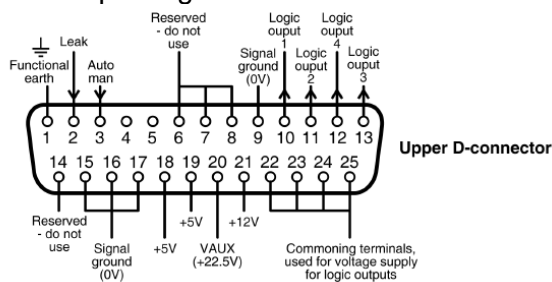
## 2. Automatic Control

Control wiring of the 530 pump range is identical to that of the 520 pump range.

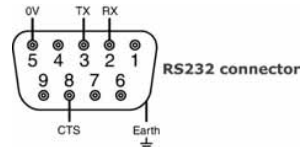
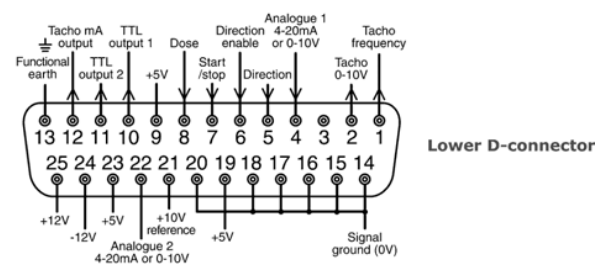
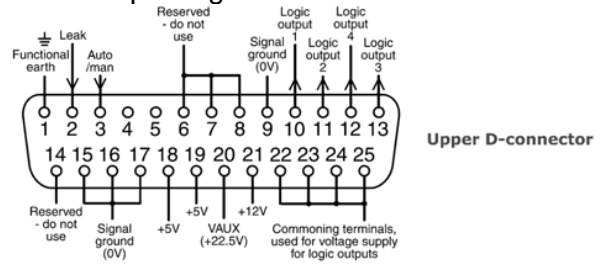
### IP31 (NEMA 2) rated Pumps

Interfacing of the pumps with other devices is by means of two D-connectors at the rear of the pump in both the 520 and 530 pump ranges. The function of each pin is identical on the D-connectors in both ranges.

#### 530 Pump Range



#### 520 Pump Range

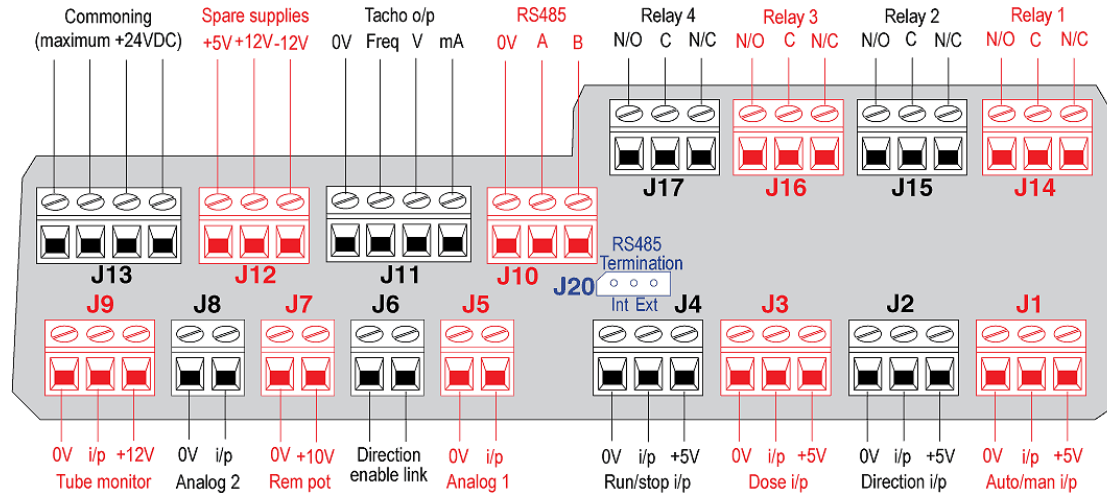


Please refer to the Operating Manuals for full wiring instructions.

## IP66 (NEMA 4X) Rated Pumps

Interfacing the pump with other devices is by means of screw-terminal connectors within the 520N watertight module at the rear of the pump. The 530 range and the 520 range use the same 520N watertight module.

### 520N Module



Please refer to the Operating Manuals for full wiring instructions.

### 3. Functional Enhancements available in the 530 Range

The 530 range is fitted with an ergonomically designed keypad, 2.5" full colour TFT display and all functionality is accessed by intuitive menus.



Icons are used to indicate functional modes and rotor direction. Pump speed or flow is indicated in large, clear characters; a choice of units is available in all models. Display background colour indicates pump status; grey= pump running, white= pump stopped, red= error condition.

#### 4. Functionality enhancements

The functionality of the 530 range has been enhanced to improve the operator experience and to help minimise the opportunity for mistakes. This functionality includes intuitive flow calibration, configurable analogue control, software configurable digital inputs and status outputs. All models include 3-level PIN protection for optimal process control. In addition to the network protocols used in the current 520Du and 520DuN pumps; the 530Du and 530DuN pumps offer the option of enhanced, more robust network protocols (RS232 or RS485 depending on the specific model).

#### 5. 530Bp and 530BpN PROFIBUS Pumps

The PROFIBUS chip in the 530Bp and 530BpN pumps has been updated to reduce communications errors and improve the stability of diagnostic signals. The pumps are supplied with an improved GSD file which is easier to programme and supplies a greater amount of diagnostic data.

Installing the new GSD file into the Master will ensure that 530Bp and 530BpN pumps can be run alongside 520 PROFIBUS pumps in the same installation. The wetted components and PROFIBUS 9-way D-connector in a 530Bp or 530BpN pump are identical to those in a 520Bp or 520BpN pump and, as such, it is not expected that the upgrades will significantly impact re-validation.

#### 6. 530Du and 530DuN Pumps, Networking Protocols

The 530Du pumps contain two RS232 protocols and the 530DuN pumps contain two RS485 protocols.

The first protocol (RS232 and RS485) is a new robust networking protocol which has more intuitive command strings and delivers reduced comms errors.

The second protocol is compatible with the previous Watson-Marlow network protocols (RS232 and RS485). The command strings and format of these are identical to the previous Watson-Marlow Protocol. However, because the 530 pump has enhanced functionality compared to a 520 pump, the status return contains more information than that returned by a 520 pump and is, therefore, not identical.

The 530Du or 530DuN status is returned in the following format:

SOM,address,pumptype,ml/rev/pumphead,tubeseize,speed,CW or CCW,pumpnumber,pump  
revs count,0 or 1(for stopped or running),Leak detect (0=Inactive,  
1=Active),Auto/Manual(0=Manual, 1=Auto),Adapter detect(0=not fitted,1=fitted),Direction  
enable(0=disabled, 1=enabled),Spare1 input4 (0=inactive, 1=active),Spare2 input5  
(0=inactive,1=active),checksum,EOM e.g.  
<1,530Du,15.12,520R,9.6,220.0,CW,123456789,12345,1,0,0,0,0,0,0,CS>

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The 520Du or 520DuN status is returned in the following format:

The status is returned to the sender in the following format: [pump type] [ml/rev] [pumphead]  
[tube size] [speed] [CW/CCW] P/N [pump number] [tacho count] [0/1(stopped / running)] !For  
example: 520Du 15.84 520R 9.6MM 220.0 CW P/N 1 123456789 1 !