

# Quantum LX Pressure Input Signal Testing



**Frick**  
BY JOHNSON CONTROLS

Johnson  
Controls

## Quantum LX Pressure Input Signal Testing

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- The Quantum LX control panel is capable of reading external analog devices, such as pressure transducers. It uses these input signals for the purpose of monitoring and control.
- These input signals from the pressure transducers are received on an analog board input channel.
- The analog board provides the supply voltage to the pressure transducer.
- The typical pressure transducer outputs a 1-5 VDC signal.
- Refer to the Quantum LX Analog board wiring diagram for detailed wiring and connections. The standard pressure inputs are on analog board 1, connectors P5A, P5B, P6A and P6B.
- Review the following instructions in their entirety before beginning the testing. Example Quantum LX screens and pictorials are provided for your reference.

## Quantum LX

### Pressure Input Signal Testing

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- Check the supply voltage to the transducer from the analog board across the red and black wires, terminals 1 & 3 or 4 & 6. You should read a steady voltage in the range between 12 vdc & 15 vdc. Refer to the Analog board wiring diagram for the correct channel and connector.
- If this voltage is outside this range, remove the connector from the analog board and measure the voltage directly on the analog board pins (for the connector).
- If the voltage remains out of range, with the connectors disconnected, you may have a defective analog board.
- If the voltage is within the proper range with the connectors disconnected, reconnect the each connector to the analog board one at a time and recheck the voltage at the analog board to determine which channel is causing the problem.
- Once the problem channel is determined, unplug the connector at the transducer for that channel. Recheck the voltage at the analog board.

## Quantum LX Pressure Input Signal Testing

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- If the voltage is outside the proper range, you may have a defective cable.
- If the voltage is within the proper range with the transducer disconnected, you may have a defective transducer.
- If the supply voltage is within the proper range with all connectors connected, check the voltage of the signal from the transducer across the white and black wires, terminals 2 & 3 or 5 & 6. Refer to the Analog board wiring diagram for the correct channel and connector. If the signal voltage is erratic and the actual pressure is steady, you may have a defective transducer.
- If the measured voltage is steady, compare the voltage to the Pressure/Voltage chart for the range of the transducer, to see if it is in the acceptable window for the actual pressure. If it is out of the window, you may have a defective transducer.

# Quantum LX

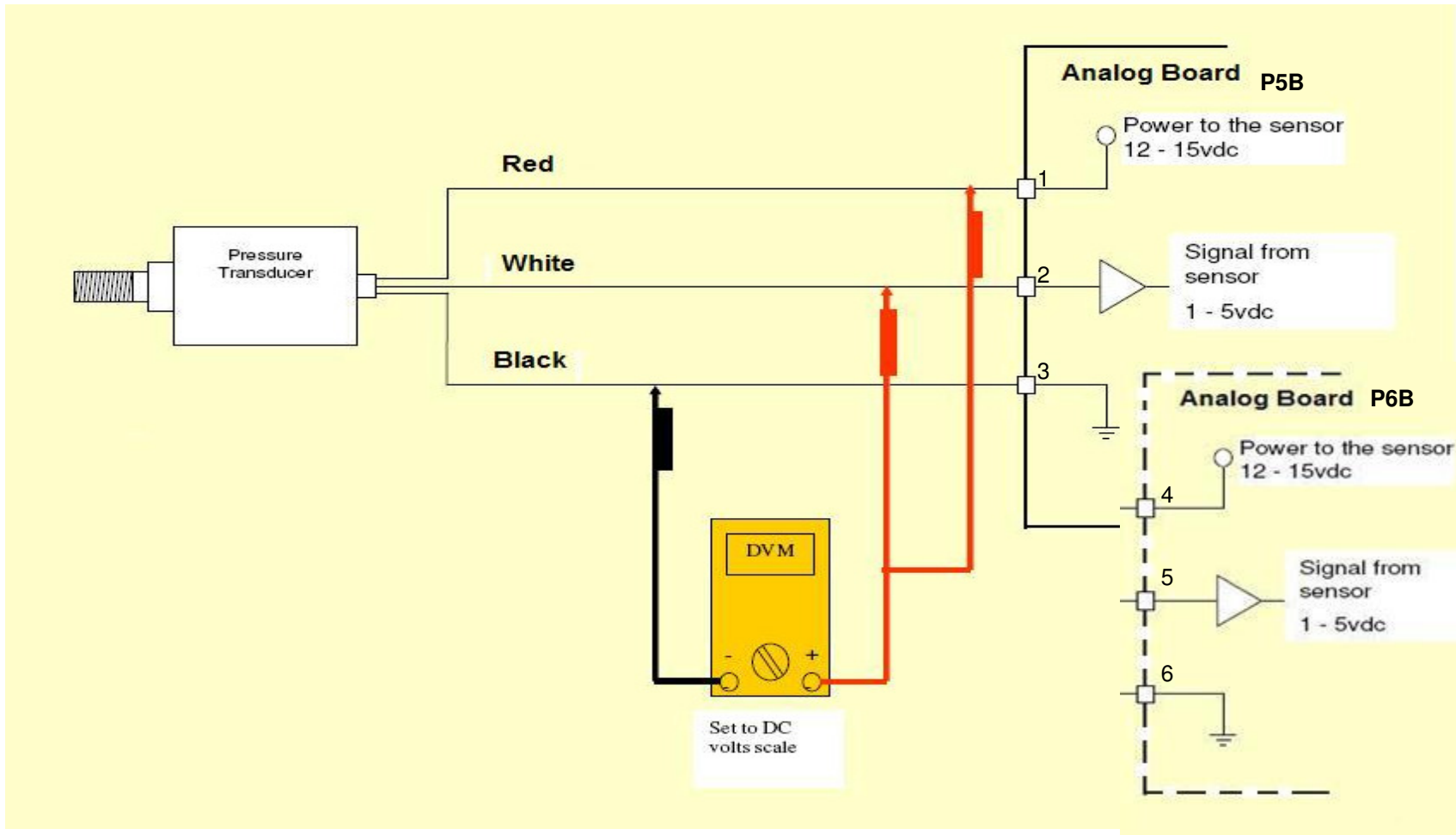
## Pressure Input Signal Testing

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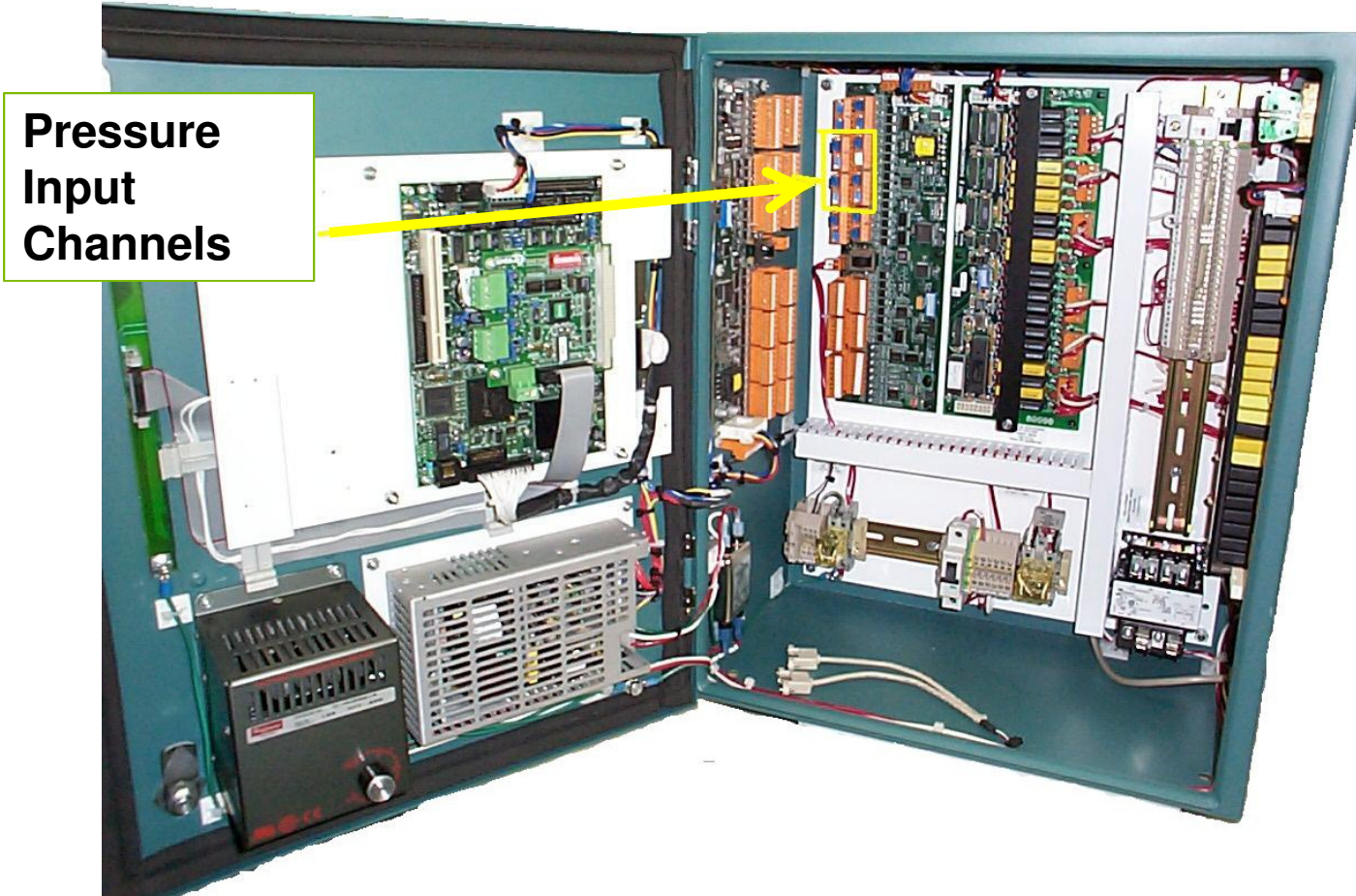


- If the measured signal voltage from the transducer to the analog board is steady and within the correct window, check the Service screen readings and the displayed pressure value on the Quantum LX.
- If it is erratic or out of the acceptable window (of the Pressure/Voltage chart ), confirm that the “Sensor Signal” type and the range of the transducer on the Calibration Screen for that analog channel is correct. If this is correct, the problem may be a defective analog board.
- A problem that is effecting all or several of the analog channels is most likely caused by a wiring problem (short to ground, cable shield not grounded, etc.).

# Quantum LX Pressure Input Signal Testing

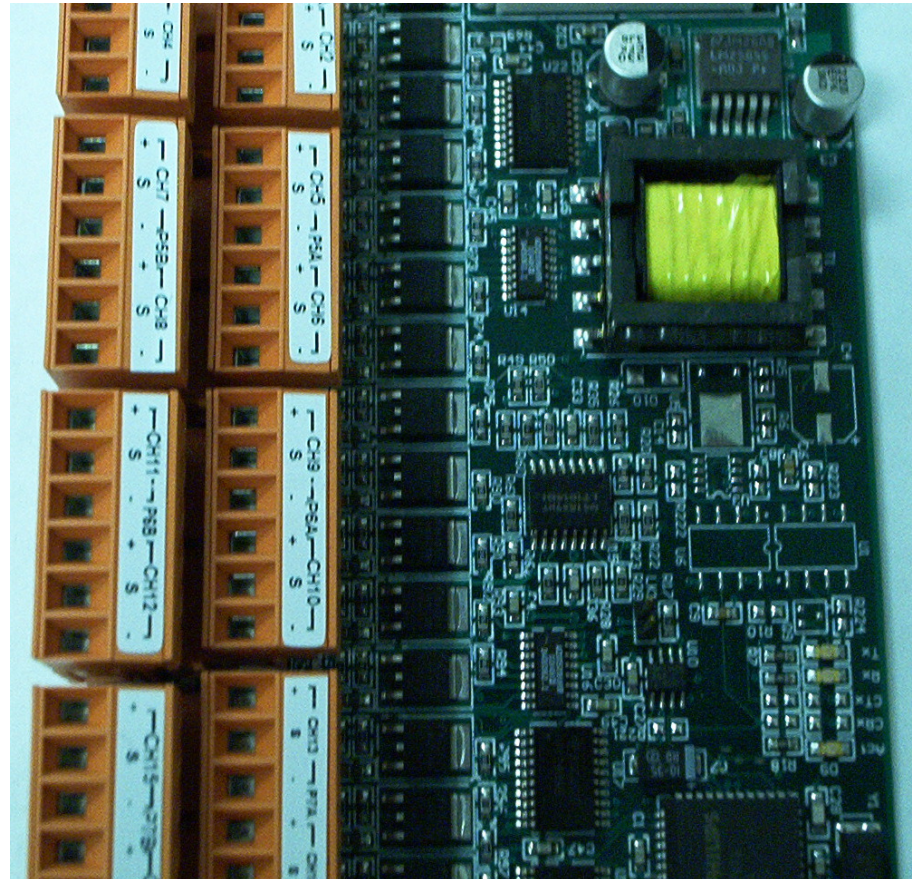


# Quantum LX Pressure Input Signal Testing

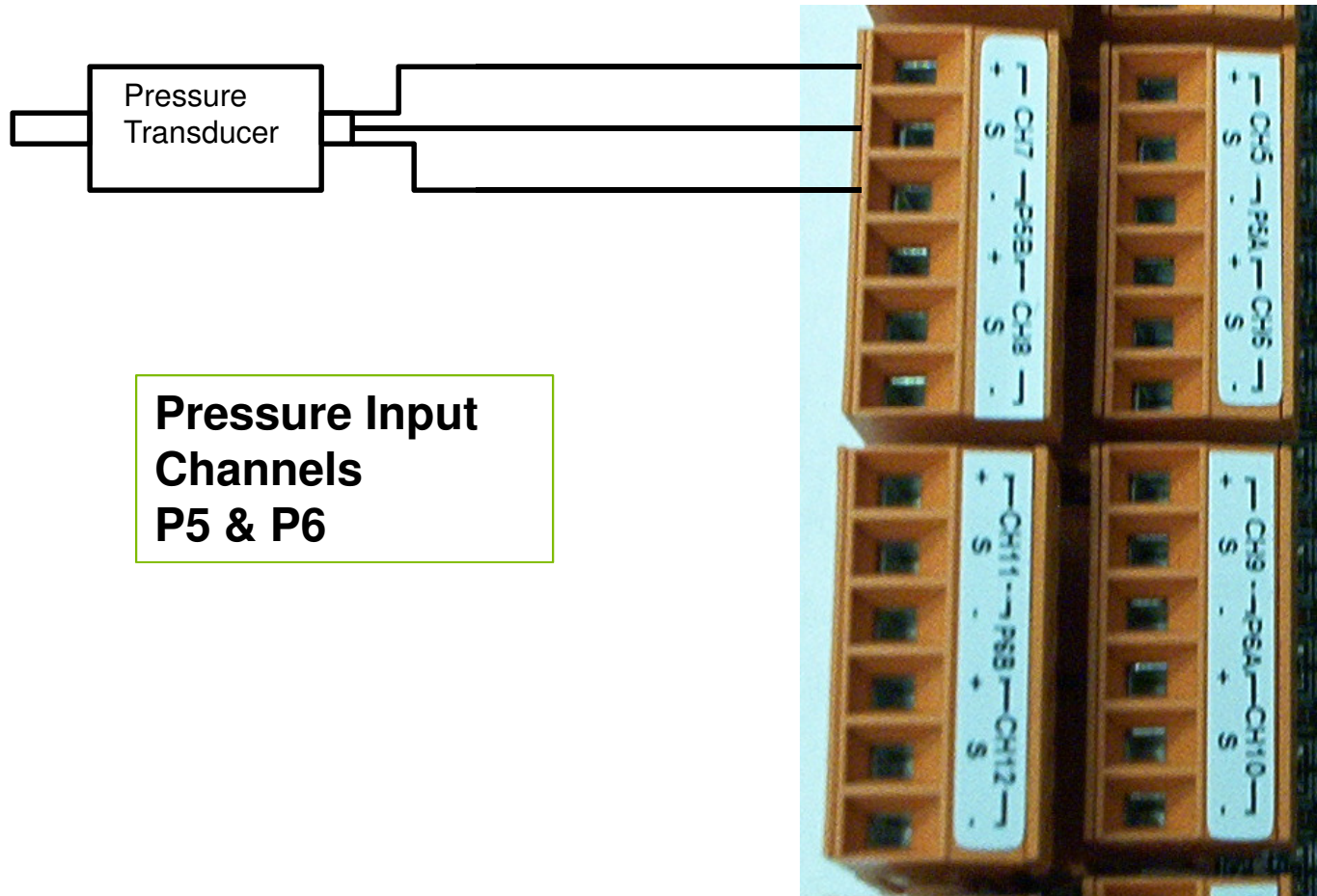


# Quantum LX Pressure Input Signal Testing

Pressure  
Input  
Channels



# Quantum LX Pressure Input Signal Testing



**Pressure Input  
Channels  
P5 & P6**

# Quantum LX Pressure Input Signal Testing Service Screen



Analog Inputs (data units are Volts DC)

Board 1 Channels

1	0.00	13	0.00
2	0.00	14	0.00
3	0.00	15	0.00
4	0.00	16	0.00
5	0.00		
6	0.00		
7	0.00		
8	0.00		
9	0.00		
10	0.00		
11	0.00		
12	0.00		

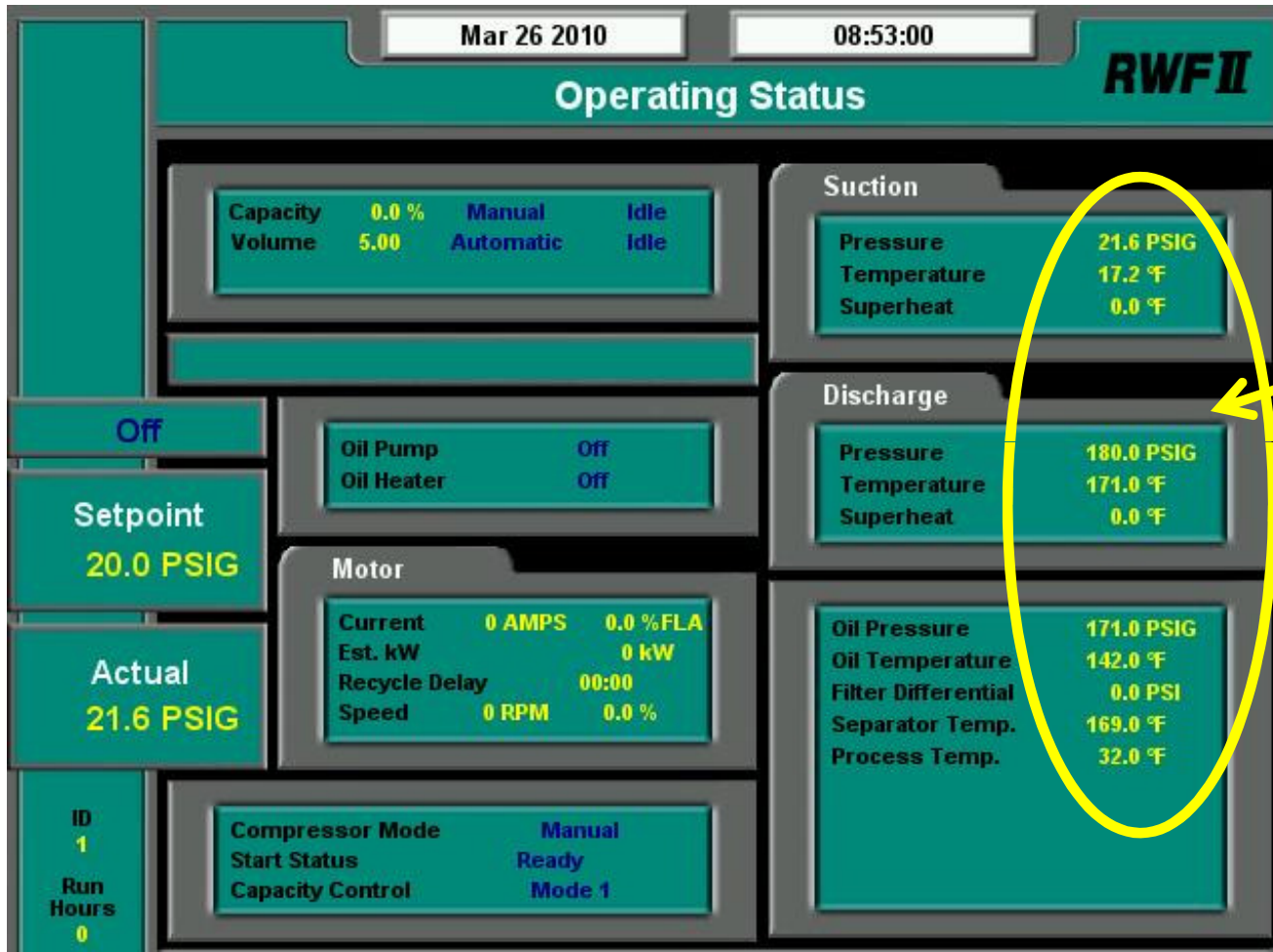
Analog Outputs (data units are Volts DC)

Board 1 Channels

1	0.00	5	0.00
2	0.00	6	0.00
3	0.00	7	0.00
4	0.00	8	0.00

Pressure Inputs

# Quantum LX Pressure Input Signal Testing Home Screen



Are the pressure readings steady?

# Quantum LX Pressure Input Signal Testing Calibration Screen



Mar 26 2010 08:43:28

**RWF II** Calibration Off

Setpoint 20.0 PSIG  
Actual 21.6 PSIG

**Pressure**

	Current Value	Offset	Range		Sensor Signal
			Low	High	
Suction	21.6 PSIG	0.0 PSI	30.0 Hg	185.3 PSIG	1-5V
Discharge	180.0 PSIG	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
Oil	171.0 PSIG	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
Filter Pressure	7.0 PSIG	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
Economizer	30.0 Hg	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
Balance Piston	30.0 Hg	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
System Discharge	30.0 Hg	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
Main Oil Injection	30.0 Hg	0.0 PSI	30.0 Hg	485.3 PSIG	1-5V
Manifold	30.0 Hg	0.0 PSI	30.0 Hg	57.8 PSIG	1-5V

Range

Sensor Signal

# Quantum LX

## Pressure Input Signal Testing



### PRESSURE TRANSDUCER / VOLTAGE CONVERSION DATA

Sensor Voltage	100 psi		200 psi		300 psi		500 psi	
	Range – psig*		Range - psig*		Range - psig*		Range - psig*	
	Low	High	Low	High	Low	High	Low	High
1.0	29.92"	19.74"	29.92"	9.57"	29.92"	7.0"	29.92"	4.1
1.1	29.92"	14.65"	29.92"	0.3	29.92"	4.1	29.92"	16.6
1.2	29.92"	9.57"	29.92"	5.3	22.3"	11.6	17.1"	29.1
1.3	24.83"	4.48"	19.74"	10.3	7.0"	19.1	4.1	41.6
1.4	19.74"	0.3	9.57"	15.3	4.1	26.6	16.6	54.1
1.5	14.65"	2.8	0.3	20.3	11.6	34.1	29.1	66.6
1.6	9.57"	5.3	5.3	25.3	19.1	41.6	41.6	79.1
1.7	4.48"	7.8	10.3	30.3	26.6	49.1	54.1	91.6
1.8	0.3	10.3	15.3	35.3	34.1	56.6	66.6	104.1
1.9	2.8	12.8	20.3	40.3	41.6	64.1	79.1	116.6
2.0	5.3	15.3	25.3	45.3	49.1	71.6	91.6	129.1
2.1	7.8	17.8	30.3	50.3	56.6	79.1	104.1	141.6
2.2	10.3	20.3	35.3	55.3	64.1	86.6	116.6	154.1
2.3	12.8	22.8	40.3	60.3	71.6	94.1	129.1	166.6
2.4	15.3	25.3	45.3	65.3	79.1	101.6	141.6	179.1
2.5	17.8	27.8	50.3	70.3	86.6	109.1	154.1	191.6

# Quantum LX

## Pressure Input Signal Testing



### PRESSURE TRANSDUCER / VOLTAGE CONVERSION DATA

Sensor Voltage	100 psi		200 psi		300 psi		500 psi	
	Range – psig*		Range - psig*		Range - psig*		Range - psig*	
	Low	High	Low	High	Low	High	Low	High
2.6	20.3	30.3	55.3	75.3	94.1	116.6	166.6	204.1
2.7	22.8	32.8	60.3	80.3	101.6	124.1	179.1	216.6
2.8	25.3	35.3	65.3	85.3	109.1	131.6	191.6	229.1
2.9	27.8	37.8	70.3	90.3	116.6	139.1	204.1	241.6
3.0	30.3	40.3	75.3	95.3	124.1	146.6	216.6	254.1
3.1	32.8	42.8	80.3	100.3	131.6	154.1	229.1	266.6
3.2	35.3	45.3	85.3	105.3	139.1	161.6	241.6	279.1
3.3	37.8	47.8	90.3	110.3	146.6	169.1	254.1	291.6
3.4	40.3	50.3	95.3	115.3	154.1	176.6	266.6	304.1
3.5	42.8	52.8	100.3	120.3	161.6	184.1	279.1	316.6
3.6	45.3	55.3	105.3	125.3	169.1	191.6	291.6	329.1
3.7	47.8	57.8	110.3	130.3	176.6	199.1	304.1	341.6
3.8	50.3	60.3	115.3	135.3	184.1	206.6	316.6	354.1
3.9	52.8	62.8	120.3	140.3	191.6	214.1	329.1	366.6
4.0	55.3	65.3	125.3	145.3	199.1	221.6	341.6	379.1

# Quantum LX

## Pressure Input Signal Testing



### PRESSURE TRANSDUCER / VOLTAGE CONVERSION DATA

Sensor Voltage	100 psi		200 psi		300 psi		500 psi	
	Range – psig*		Range - psig*		Range - psig*		Range - psig*	
	Low	High	Low	High	Low	High	Low	High
4.1	57.8	67.8	130.3	150.3	206.6	229.1	354.1	391.6
4.2	60.3	70.3	135.3	155.3	214.1	236.6	366.6	404.1
4.3	62.8	72.8	140.3	160.3	221.6	244.1	379.1	416.6
4.4	65.3	75.3	145.3	165.3	229.1	251.6	391.6	429.1
4.5	67.8	77.8	150.3	170.3	236.6	259.1	404.1	441.6
4.6	70.3	80.3	155.3	175.3	244.1	266.6	416.6	454.1
4.7	72.8	82.8	160.3	180.3	251.6	274.1	429.1	466.6
4.8	75.3	85.3	165.3	185.3	259.1	281.6	441.6	479.1
4.9	77.8	87.8	170.3	190.3	266.6	289.1	454.1	491.6
5.0	80.3	90.3	175.3	195.3	274.1	296.6	466.6	504.1
<b>At zero psig</b>	<b>1.388 V</b>	<b>1.788 V</b>	<b>1.094 V</b>	<b>1.494 V</b>	<b>1.046 V</b>	<b>1.346 V</b>	<b>0.968 V</b>	<b>1.268 V</b>