



Remote Meters with 4-20 Output Instruction and Operation Manual

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Remote Meters with 4-20 Output Instruction and Operation Manual

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I. SAFETY PRECAUTIONS

GENERAL: Be sure to follow all applicable and prudent safety precautions when working with chemical and electrical equipment.

ELECTRICAL: The circuit board and incoming A/C power line do include electrical shock risk. Take care to avoid electrical shocks and do not touch any part of the circuit board or A/C power line unless you are certain that A/C power has been disconnected from the system.

CHECK FOR DAMAGE: Before removing the product from the shipping packaging, carefully check the equipment for damage. If any product is found damaged, do not put it into operation or install it. Contact Hydro Instruments to discuss repair or replacement of the damaged sensor.

II. THEORY OF OPERATION

These remote meters work like a variable area flow meter, but with a slight twist. As with most variable area flow meters, as flow is increased/decreased it applies a certain amount of force to the float moving it up/down the tube, thus changing the surface area between the float and the glass wall until enough flow can go around the float and an equilibrium level is reached. The flow rate can then be determined based on calibrated markings on the tube. Hydro Instruments has taken this technology one step further by incorporating the use of magnetic fields. Implanted in the float is a magnet and behind the flow tube is a circuit board with Hall Effect sensors spaced out to the graduations on the tube. Thus as the magnet passes these sensors, a current is generated based on the float position which allows for remote monitoring of the flow rate.

III. SPECIFICATIONS

Available Capacities: 500 PPD (10 kg/hr) with 6" meter tube
1000 PPD (20 kg/hr) with 12" meter tube
2000 PPD (40 kg/hr) with 12" meter tube
8000 PPD (160 kg/hr) with 20" meter tube

Compatibility: Chlorine or Sulfur Dioxide gas

Power requirements: 12-24 VDC

Outputs: (1) 4-20 mA output

Accuracy: 5% of full scale

Connections: 500 PPD (10 kg/hr) – ½" FPT ports on the rear and side.
1000 PPD (20 kg/hr) and 2000 PPD (40 kg/hr) – 1" NPT Sch.80 PVC unions.
8000 PPD (160 kg/hr) – 1.5" or 2" NPT Sch.80 PVC unions.

All meters have a ¼" FPT (6.5mm) port for connecting a vacuum gauge and/or differential pressure regulator.

IV. INSTALLATION

1. Find a suitable location to mount the remote meter to a wall, panel or appropriate fixture. Four mounting holes are provided in the meter back panel.
2. Connect the red wire coming from the circuit board to the V+ terminal on a 12 to 24 VDC power supply board.
3. Connect the black wire coming from the circuit board to the V- terminal on the power supply board.
4. Connect the green wire coming from the circuit board to the positive terminal on the 4-20 mA receiver
5. Connect the white wire coming from the circuit board to the common/ground on the 4-20 mA receiver.
6. Install inlet and outlet chemical piping.

NOTE: Should the connector and cable included with the unit become broken or damaged or the operator has chosen not to use it, the four pin terminals on the circuit board (from left to right) correspond to V+, V-, AO+, AO-. (See diagram, page 11.)

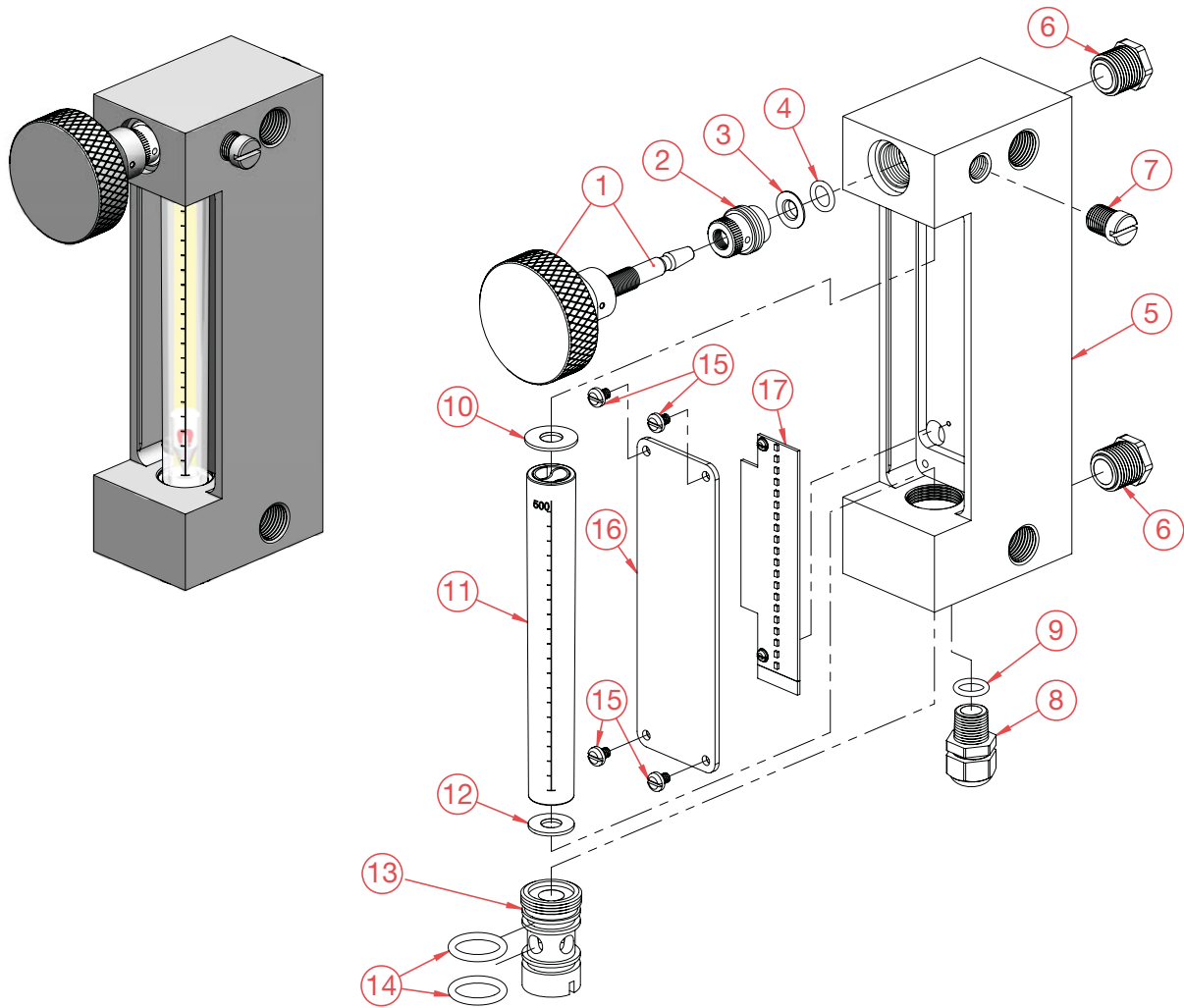
V. MAINTENANCE

Remote meters should be serviced at least once a year or sooner based on site conditions. Hydro Instruments provides parts and maintenance kits to ensure that the appropriate materials are used. Please reference the appropriate parts drawing when installing maintenance parts.

1. Using appropriate procedures evacuate all chemical from the feed line and isolate the remote meter from the system.
2. Unscrew the inlet plug and remove the flow tube and float.
3. Inspect and replace all gaskets and O-rings. Refer to the appropriate parts and maintenance kit and parts drawing for appropriate items and their locations.
4. Using warm water only, clean and rinse the flow meter tube and float.
5. Dry and re-install flow meter tube and float.

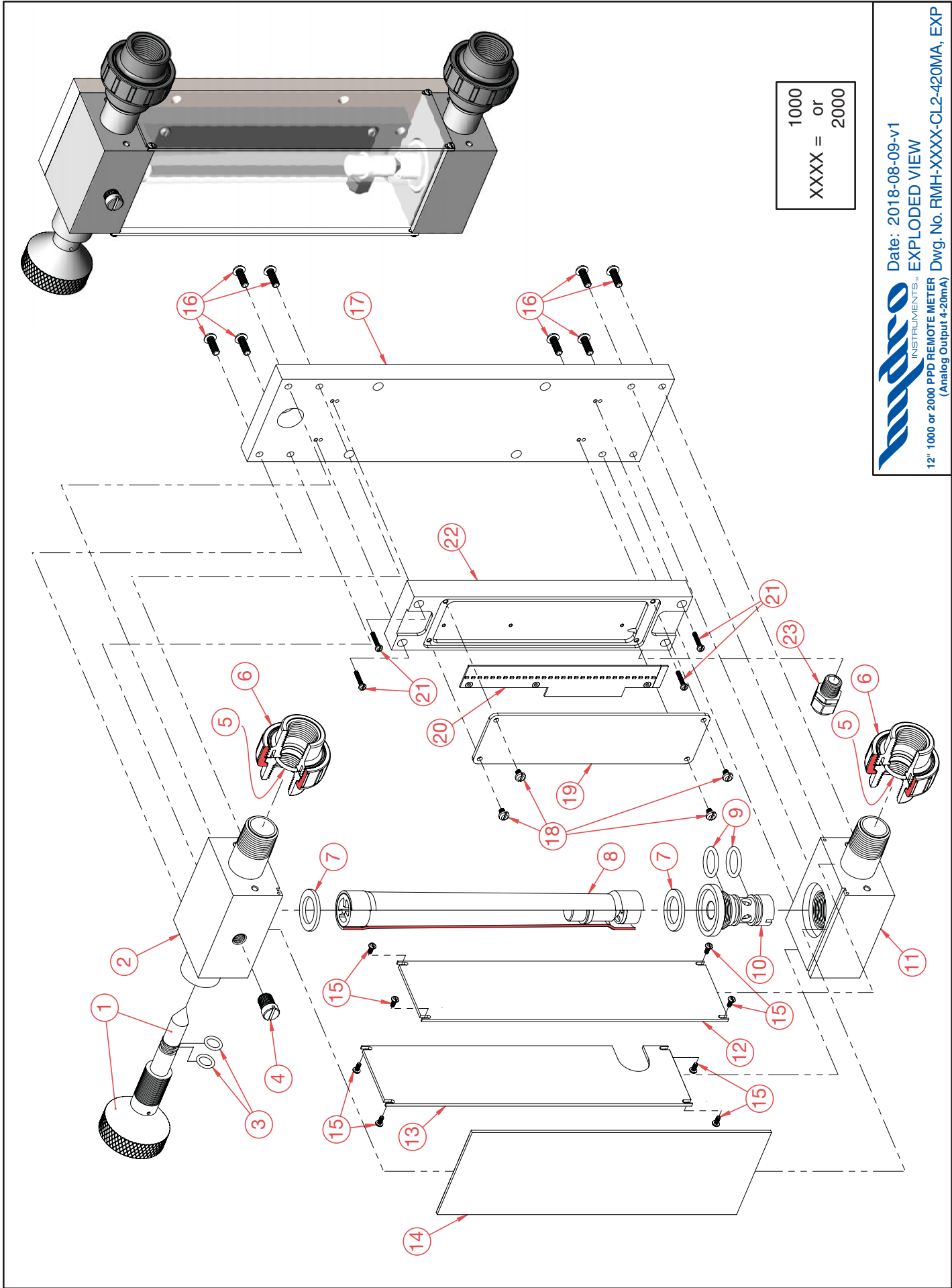
VI. TROUBLESHOOTING

Problem	Probable Cause	Corrective Actions
No mA output	Improper wiring	Check wiring
	Power supply disconnected	Check wiring & Molex connector on circuit board
	Float/circuit board damage	Inspect float and circuit board, replace if necessary
No chemical feed	Rate valve closed	Rotate rate valve knob to ensure open
	Vacuum leak	Check and correct leaks
	Ejector	Ejector Ensure ejector is creating vacuum




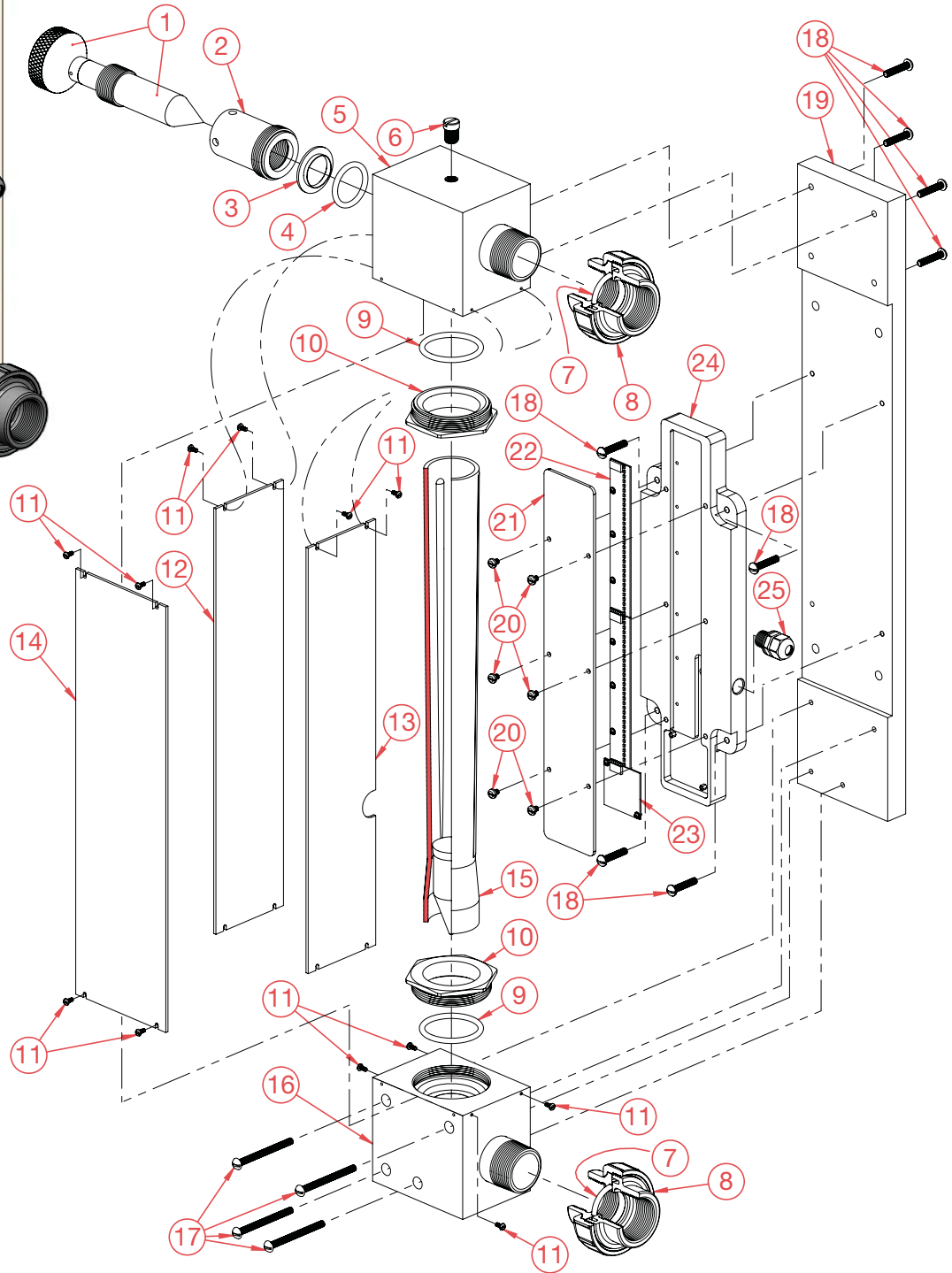
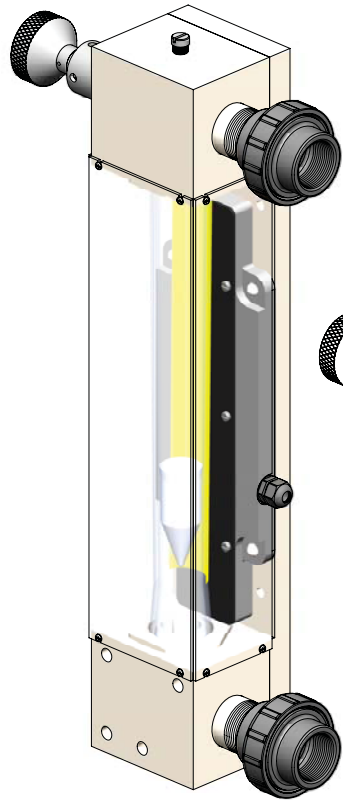
Item No.	Description	Quantity	Part No.	Item No.	Description	Quantity	Part No.
1	Rate Valve Stem & Large Knob	1	S-495-CAB-500	11	6" Meter Tube with Magnet Float (500 PPD)	1	MTH-420-500
2	Rate Valve Bonnet	1	S-493	12	^{PM} Bottom Meter Gasket	1	G-162
3	^{PM} Shaft Seal (Teflon)	1	SA-498	13	Meter Inlet	1	MIH-232-500
4	^{PM} O-Ring	1	3PS-111	14	^{PM} O-Ring	2	OH-VIT-212
5	Meter Panel Body (4-20mA)	1	MPH-261-420	15	Screw	4	10-24 x 1/4"
6	1/2" NPT Plug	2	850-005	16	Circuit Board Cover	1	MPH-500-CBC
7	1/4" NPT Plug	1	PLH-108-250	17	Circuit Board	1	MPH-500-PCB
8	Liquid Tight Fitting	1	RD09NA-BK	*	Float with magnet (500 PPD)	1	MTH-420-500-FL
9	Required O-Ring for Liquid Tight Fitting	1	OH-VIT-212	*	Not shown. Float located inside meter tube.		
10	^{PM} Top Meter Gasket	1	G-161	^{PM}	Part & Maintenance Kit		KTM-500-RMP


 Date: 2018-08-09-v1
 EXPLODED VIEW AND BOM
 Dwg. No. MPH-500-CAB-420MA
6" CABINET MOUNTED REMOTE METER
 500 PPD (10 kg/hr)(Analog Output 4-20mA)




mpdpro
INSTRUMENTS™
Date: 2018-08-09-v1
EXPLODED VIEW
12" 1000 or 2000 PPD REMOTE METER
Dwg. No. RMH-XXXX-CL2-420MA, EXP
(Analog Output 4-20mA)

Item No.	Description	Quantity	Part No.	Item No.	Description	Quantity	Part No.
1	Rate Valve Stem with Knob and Pin	1	RVH-411-000	15	Shield Screws	8	#6-32 x 5/16"
2	Top Meter Block	1	MBH-410-40	16	Meter Block Screws	8	BTH-STA-189
3	PM O-Ring	2	OH-VIT-112	17	Meter Base	1	MBH-418-CAB-1
4	1/4" NPT Plug (included with Top Meter Block)	1	PLH-108-250	18	Screw	4	10-24 x 1/4"
5	PM O-Ring for 1" PVC Union	2	OH-VIT-215	19	Circuit Board Cover	1	MPH-1000-CBC
6	1" PVC Union	2	U-4475	20	Circuit Board (1000 PPD)	1	MPH-1000-PCB
7	PM Top/Bottom Meter Gasket	2	MG-40KG	20	Circuit Board (2000 PPD)	1	MPH-2000-PCB
8	12" Meter Tube with Magnet (1000 PPD)	1	MT-20-420MA	21	Screw	4	8-32 x 3/4" PHMS
8	12" Meter Tube with Magnet (2000 PPD)	1	MT-40-420MA	22	Mounting Plate	1	MPH-1000-MP
9	PM O-Ring	2	OH-VIT-212	23	Liquid Tight Fitting	1	RD09NA-BK
10	Inlet Plug	1	MIH-452-000	-	Required O-Ring for Liquid Tight Fitting	1	OH-VIT-212
11	Bottom Meter Block	1	MBH-419-40	*	Float with magnet (1000 PPD)	1	MT-20-420MA-FL
12	Side Shield (Right)	1	MBH-414-000	*	Float with magnet (2000 PPD)	1	MT-40-420MA-FL
13	Side Shield (Left)	1	MBH-414-002	*	Float located inside meter tube.		
14	Front Shield	1	MBH-413-000	PM	Parts & Maintenance Kit	1	KTH-2000-RMS
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> 1000 XXXX = or 2000 </div>							
							
Date: 2018-08-09-v1 BILL OF MATERIALS 12" 1000 or 2000 PPD REMOTE METER Dwg. No. RMH-XXXX-CL2-420MA, BOM (Analog Output 4-20mA)							




	4000
XXXXX =	6000
	8000


 Date: 2018-10-15-v1
BILL OF MATERIALS
 20" HIGH CAPACITY REMOTE METER,
 4000-8000 PPD (80-160 kg/hr) (Analog Output 4-20mA)
 Dwg. No. RMH-XXXXX-CL2-420MA, EXP

Item No.	Description	Quantity	Part No.
1	Rate Valve Stem & Knob	1	RVH-412-10000
2	Valve Bonnet	1	MBH-VB-10000
3	^{PM} Shaft Seal	1	RVH-852-SEAL
4	^{PM} O-Ring (for Rate Valve)	1	OH-VIT-325
5	Top Meter Block (for 1.5" Union)	1	MBH-UB2-10000
6	¼" NPT Plug	1	PLH-108-250
7	^{PM} O-Ring (for 1.5" Union)	2	OH-VIT-328
8	1.5" Union	2	U-4298
9	^{PM} O-Ring (for Meter Tube)	2	OH-VIT-330
10	Meter Tube Hex Nut	2	MBH-THN-10000
11	Shield Screws	12	#6-32 x 5/16"
12	Side Shield	1	MSS-10000
13	Side Shield (4-20mA)	1	MSS-10000-1
14	Front Shield	1	MSF-10000
15	20" Meter Tube (4000 PPD / 80 kg/hr) with Magnet Float	1	MTB-080KG-20-420MA
15	20" Meter Tube (6000 PPD / 120 kg/hr) with Magnet Float	1	MTB-120KG-20-420MA
15	20" Meter Tube (8000 PPD / 160 kg/hr) with Magnet Float	1	MTB-160KG-20-420MA
16	Bottom Meter Block (for 1.5" Union)	1	MBH-LB2-10000
17	¼-20 x 3" Bolt	4	BTH-STA-279
18	¼-20 x 1 ¼" Bolt	8	BTH-STA-130
19	Meter Base	1	MBH-MB-10000-1
20	Screw	6	10-24 x ¼"
21	Circuit Board Cover	1	MPH-10000-CBC
22	Sensors Board	2	MPH-10000-PCB-SEN
23	Circuit Board (4000 PPD)	1	MPH-04000-PCB
23	Circuit Board (6000 PPD)	1	MPH-06000-PCB
23	Circuit Board (8000 PPD)	1	MPH-08000-PCB
24	Mounting Plate	1	MPH-10000-MP
25	Liquid Tight Fitting	1	RD09NA-BK
-	Required O-Ring for Liquid Tight Fitting	1	OH-VIT-112
*	Float with magnet (4000 PPD / 80 kg/hr)	1	MTB-080KG-20-420MA-FL
*	Float with magnet (6000 PPD / 120 kg/hr)	1	MTB-120KG-20-420MA-FL
*	Float with magnet (8000 PPD / 160 kg/hr)	1	MTB-160KG-20-420MA-FL
*	Float located inside meter tube.		
^{PM}	Part & Maintenance Kit	1	KTH-10000-MPS

4000
XXXXX = 6000
8000



Date: 2018-10-15-v1
BILL OF MATERIALS
 20" HIGH CAPACITY REMOTE METER,
 4000-8000 PPD (80-160 kg/hr) (Analog Output 4-20mA)
 Dwg. No. RMH-XXXXX-CL2-420MA, BOM

TITLE

Remote Meter with 4-20mA Output

DATE

6/21/2013

SCALE

40%

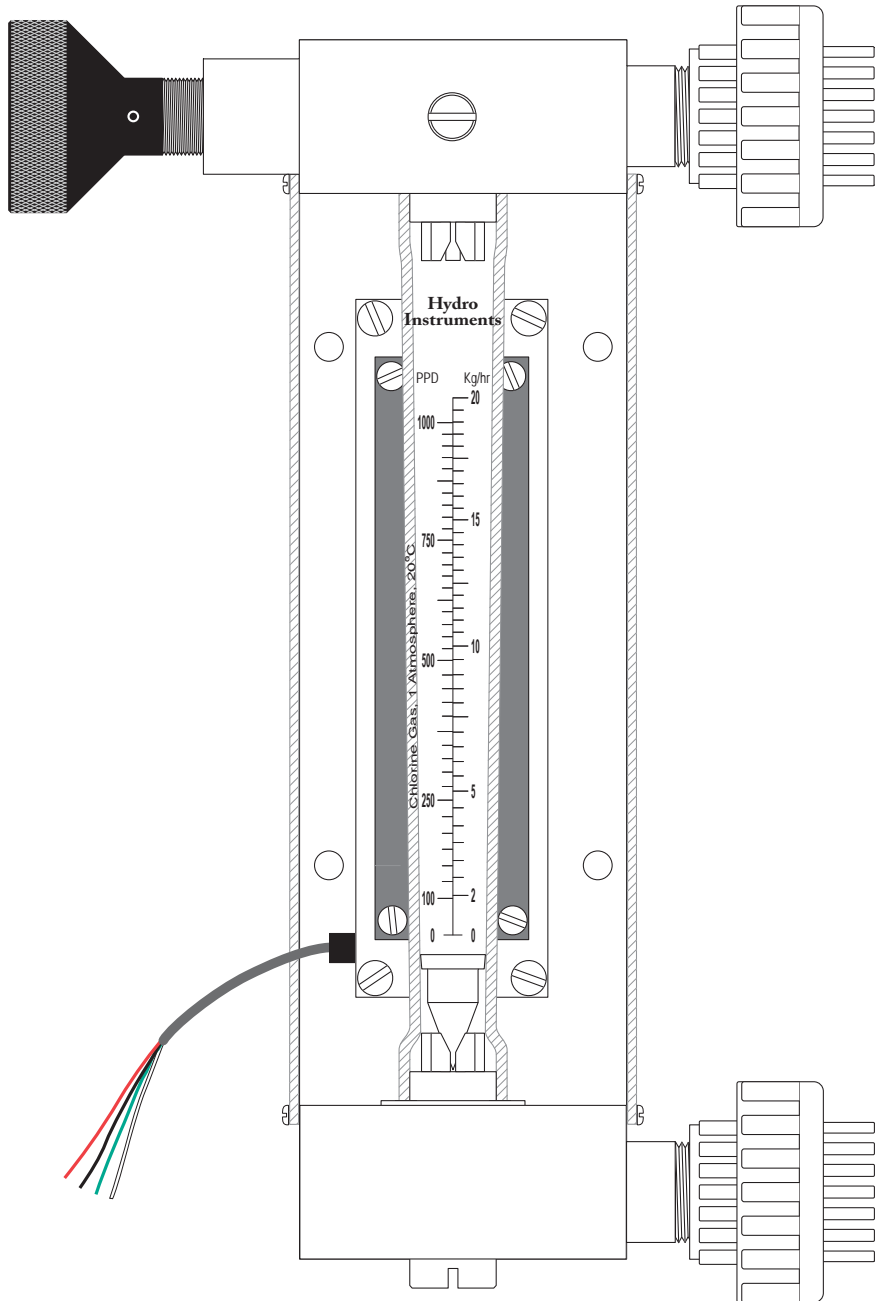
MEASUREMENTS

Inches

Millimeters

DWG. NO.

Wiring Diagram



**Red
V+**

**Black
V-**

**Green
AO+**

**White
AO-**