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BALAJI UDHYOG

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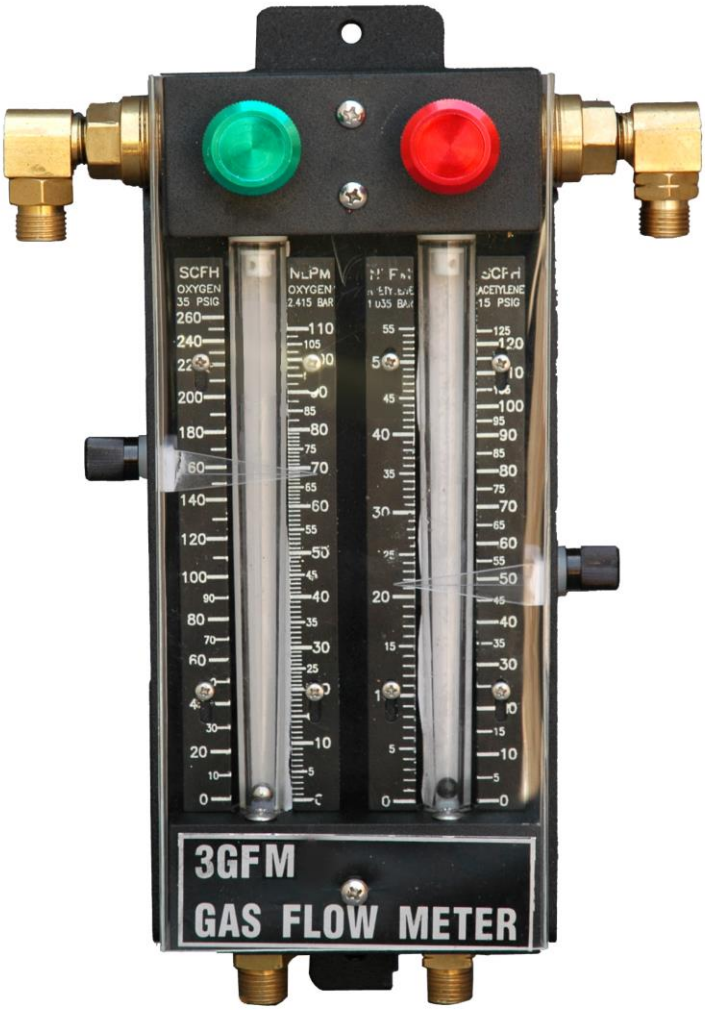
3GFM
GAS FLOWMETER



MANUL FOR OPERATION & MAINTENANCE OF 3GFM GAS FLOWMETER

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BALAJI UDYOG
PLOT NO 75 HASTINAPUR NAGAR

TABLE OF CONTENTS

GSTIN:08CAPPS0746E1ZF

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SECTION 1

DESCRIPTION

GENERAL

The BU 3GFM Gas Flow meter is dual section precision instrument for regulating and measuring the flow of oxygen and fuel gas to a combustion flame spray gun. The flow meter, connected between the gas supply and the gun, is a reliable indicator of gas flow, to warn of obstructions or leakage in the gas lines and an aid to coating quality. The gases used for flame spraying are usually supplied from standard compressed gas cylinders or in plant pipe lines. For heavy duty service, it is customary to manifold several cylinders together.

Regulators are required to reduce the high gas pressure in the cylinder to the lower gas pressure required for flame spray operation. BU has regulators which are for flame spray use.

The gauge on a pressure regulator indicates only gas pressure, not gas flow. Gas leaks or obstructions (that develop in the gas passages) can cause considerable change in gas flow without noticeably changing pressure readings.

In a flame spray gun, highest efficiency is obtained only when the flow of gases are properly balanced. Slight variations in the proportion of oxygen to fuel gas in the flame can have an influence on its thermal efficiency.

Hoses are required to connect the flow meter to the gas regulator. BU has two hose lengths available for this use, 4 feet (1.2 m) and 15 feet (4.6 m).

The 3GFM Gas Flow meter sections are completely separated from each other, as far as gas flow is concerned, but are mounted together in a single frame, for convenience of installation and operation. The readout of each meter is by means of a ball float, which rises and falls in a graduated transparent tube. The scale division in line with the center of the ball is the indicator of flow rate.

A gas flow control valve (in each section) adjusts flow rates. Sliding pointer assemblies, which can be clamped in place, are provided to indicate the proper position of each float. These pointer assemblies make it possible to check the gas flows at a glance at any time without having having to read the exact scale marking. They also show any change in flow that might be caused by leaks or obstructions in the flame spray system.

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A check valve is built into the outlet of each meter tube, allowing the gas to flow only toward the gun. This prevents oxygen from flowing back through the flowmeter to the fuel gas regulator. It also helps prevent damage from pressure surges due to gun backfire.

A plastic shield (window) covers the front of the flowmeter, to protect the meter tubes from accidental damage and to protect the operator in the event of tube breakage. In addition, there is a built-in plastic separator between the tubes to prevent any piece of a tube that might break from flying across and breaking the other tube.

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SECTION 2

INSTALLATION

MOUNTING

Mount the 3GFM Gas Flowmeter so that the hoses can be connected between the meter and the regulators without strain on the hose fittings. Position the flowmeter vertically, with the center of the meter tubes at eye level. The flowmeter can be bolted directly to a wall. However, if the wall surface is uneven, use a backboard, or standoffs, to avoid bending the meter frame when tightening the mounting bolts.

Frequently, the most convenient location for the flowmeter is on the side of the spray booth. Where an air flowmeter is included in the system, mount both meters side by side, using suitable angle brackets. Leave clearance for tightening hose connections. Leave clearance to permit cylinder valve operation and cylinder exchange without interference.

On portable installations, mount the flowmeter on the oxygen cylinder with a harness that holds the flowmeter against the cylinder, just below its shoulder. Strap the oxygen and fuel gas cylinder together to prevent hose breakage if the cylinders should fall.

HOOKING UP

The oxygen hose has standard female oxygen hose fittings at each end. The coupling nuts have right hand threads. The fuel gas hose has standard female fuel gas fittings at each end. The coupling nuts have left-hand threads and are notched centrally for identification.

WARNING

**ALWAYS OBSERVE STANDARD SAFETY PRACTICES
REGARDING THE HANDLING OF GAS.**

1. Connect the hoses to their respective pressure regulators.

2. Turn on the exhaust system.

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WARNING

ENSURE THAT NO OPEN FLAMES, SPARKS, OR OTHER POSSIBLE SOURCES OF IGNITION ARE PRESENT WHEN PERFORMING THE FOLLOWING STEP.

3. Open the cylinder valves to blow out any dirt that may be in the hoses.

4. Connect the other ends of the hoses to the respective inlet connections at the bottom of the flowmeter.

5. Connect the flame spray gun hoses to the flowmeter outlet fittings. Follow the color-code (red to red, green to green, or blue to blue). Remember, the oxygen hose has right –hand fitting threads; the fuel gas hose fittings have left-hand threads.

6. Tighten the hose connection.

CAUTION

Do Not Tighten Hose Connections Excessively, To Avoid Collapsing The Hole In The Hose Stem.

NOTE

If a hose fitting is damaged so that it will not seal without using force on the hose nut, replace the fitting.

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CAUTION

To Prevent Surges That May Damage The Flowmeter Tubes, Always Back Out The Gas Regulator Screws All The Way Before Opening The Gas Cylinder Valves. Adjust The Regulators Gradually, To The Required Pressure Settings.

7. With the flame spray gun has head valve closed and with gas pressure on the system, use a soap solution to check for leaks at all connections.

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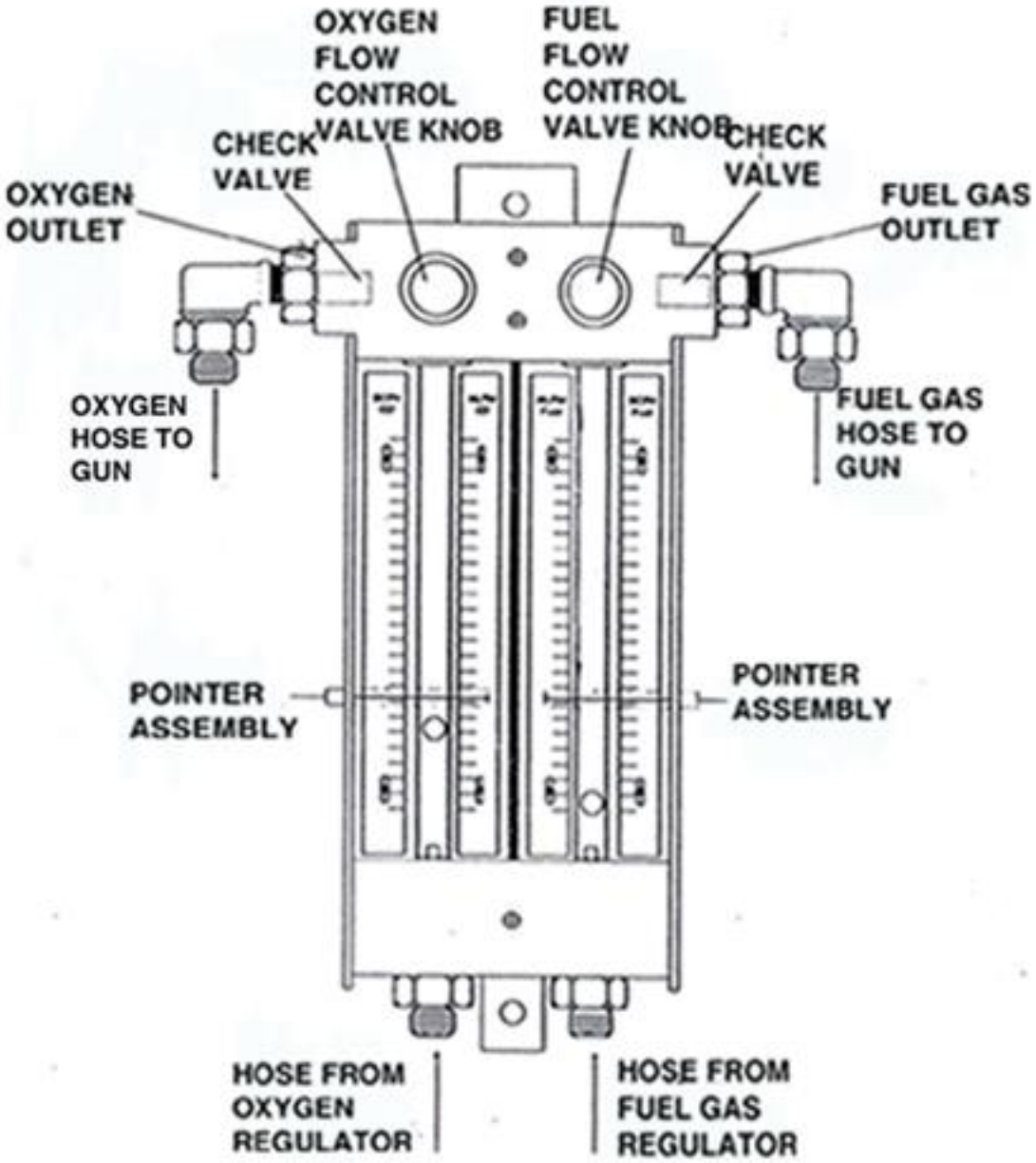

3GFM GAS FLOWMETER

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SECTION 3

OPERATION

GENERAL

Read the gun instruction manual thoroughly before lighting the gun.

WARNING

MAKE SURE THAT THERE IS ADEQUATE VENTILATION AND THAT THE EXHAUST SYSTEM IS TURNED ON BEFORE OPENING GAS VLAVES.
OXYGEN AND FUEL GAS UNDER PRESSURE CAN BE DANGEROUS IF NOT HANDLED PROPERLY.
OPERATION AT CONDITIONS ABOVE 75 PSI MAY CAUSE REPTURE OF THE METER.
DO NOT THE FLOWMETER VALVES TO SHUT OFF THE SUPPLIES OF OXYGEN AND FUEL GAS. THESE GASES MUST BE SHUT OFF AT THE SOURCE, TO AVOID PERSONAL INJURY.

SYSTEM CHECKOUT

To establish that the system is free of leaks or blockages, proceed as follows:

1. Slide the flowmeter pointer assemblies to the flow readings shown in the gun manual spraying table. Clamp the pointer assemblies in place.

2. Open the gun gas head valve.

3. Open both flowmeter inlet valve (needle valves) all the way.

4. Set the gas pressure for oxygen and fuel gas to the lighting pressure recommendation in the spraying table.

5. Close the gun has head valve half way to the lighting position.

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6. Light the gun.

7. Adjust the fuel gas and oxygen regulators until the readings on the 3GFM Gas Flowmeter correspond to the spray tables. If the flows can be obtained, observing the spray table footnotes, the system is operating properly.

WARNING

IF THE GUN FAILS TO LIGHT, OR IF THE GAS FLOWS CAN NOT BE OBTAINED, SHUT DOWN AND LOOK FOR THE SOURCE OF THE TROUBLE.
It is advisable to follow the above procedure whenever the system has been disconnected. See Section 4, Avoiding Trouble, which describes an alternate selection procedure.

FINAL ADJUSTMENTS
Shut off the gun and readjust oxygen and fuel gas pressure as follows:

1. Open the gas head valve and set the gas pressure for oxygen and any fuel gas (except acetylene) at about 5 to 10psi (0.35 to 0.70 bar) above the lighting pressure recommended in the spray table. When using acetylene, set the pressure regulator at 15psi (1.0 bar)

WARNING

USE OF ACETYLENE AT PRESSURE GREATER THAN 15 PSI (1.0 BAR) IS NOT APPROVED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS.

2. Adjust the flowmeter valves to obtain the flows shown by the pointer assemblies.

3. After lightning the gun, make final gas flow adjustment with the flowmeter valves.

4. After final adjustments on valves and pressure regulators have been completed, flow of gases through the flowmeter should remain constant. Refer to Section 4, Avoiding Trouble.

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SECTION 4

AVOIDING TROUBLE

GENERAL

Obstructions or leaks in any of the gas passages or at the gun nozzle are indicated by a change in the flowmeter reading.

NOTE

Obstructions may be caused by Damaged hoses, Collapsed hose stems, or dirt in the gas passages.

WARNING

DO NOT COMPENSATE FOR OBSTRUCTIONS BY RAISING GAS PRESSURES TO MAINTAIN OXYGEN AND FUEL GAS FLOWS. EXCESSIVE ACETYLENE PRESSURE IS DANGEROUS.

Obstructions may get worse, spoiling the job because of faulty operation. Fouled nozzle jets can lead to spattering and poor coatings. If both oxygen and fuel gas flows are low, a fouled nozzle or air cap is usually indicated.

WARNING

ABNORMALLY HIGH FLOWMETER READINGS USUALLY INDICATE A SERIOUS GAS LEAK THAT MUST BE CORRECTED IMMEDIATELY.

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SECTION 5

MAINTENANCE

GENERAL

The flowmeter requires very little maintenance, other than occasional cleaning. Since the gases used are generally clean and dry, contaminants are rarely blown into the flowmeter tubes.

The 3GFM Gas Flowmeter consists of two separate flowmeters built into a single frame. The flowmeters are identical, except for the following:

- Oxygen inlet and outlet threads are right handed. The fuel gas inlet and outlet threads are left handed.
- The fuel gas float is black; the oxygen float is polished steel.
- The lower (oxygen) float stop has three small holes, while the lower (fuel) float stop has one large hole.

DISASSEMBLY

To disassembly the flowmeter, perform the following steps:

NOTE

The top mounting block is secured to the flowmeter frame by two mounting screws. These screws are cemented in place at the factory and should not be removed unless absolutely necessary.

The oxygen outlet fitting, fuel gas outlet fitting, the two elbows, and the two check valve retainers are also sealed in place at the factory. Do not remove them unless damage to the check valves or the valve O-ring is suspected.

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1. Unscrew the set screws within the valve knobs on both the Oxygen and Fuel Gas. Remove both knobs.

2. Unscrew the three window mounting screws and remove the plastic shield (window).

NOTE

To wash the plastic shield (window), use a mild soap solution and pat it dry with a clean soft cloth or paper towel. Do not clean it with strong solvent. Replace the plastic shield (window) if it is scratched,Cracked, fogged or otherwise damaged.

3. Loosen both pointer knobs and slide the pointers all the way to the bottom of the flowmeter tubes.

4. Remove the flowmeter tubes, one at a time, as follows:

    a. Grip the top end of the tube with the fingers and pull downward to release it from the flowmeter frame.

    b. Pull the tube out of the flowmeter. Be sure to catch the ball float, which will drop out of the tube.

5. Remove the two plunger retaining screws and lock washers.

6. Remove the two plungers from the bottom-mounting block.

7. Carefully remove the lower (oxygen) float stop and the lower (fuel) float stop, two tube gaskets, and the two plunger O-rings from the plunger.

8. Remove the two plunger springs from the plunger bores.

NOTE

The two upper float stops are held in the tops of the metering tubes by two float stop O-rings. Two upper float stop O-rings seal the mating surfaces between the upper float stops and the top-mounting block.

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9. disassemble the two gas flow control valves (located at the TOP of the flowmeter) as follows:

    a. After the knobs have been removed, the plastic shield (window) is lifted off.

    b. The needle valve retainer assembly holds the valves in place. Lift this plate off the upper mounting block.
    c. Grasp each valve stem, by hand, and pull it straight out. Each valve assembly will come free. The valve stems can be unscrewed from the needle valve housing.

Remove each pointer assembly as follows:

a. Loosen knob set screw and pull poiner knob off pointer screw.

b. Slip the plastic washer off the pointer screw.

c. Remove pointer from flow meter frame.

d. Pull pointer screw and pointer nut straight out of the cavity in the pointer molding.

CLEANING

When cleaning the flowmeter and its parts, use a soft, dry, lint-free cloth. Ordinarily, washing is not required. However, if the need for washing is evident, use a warm (not hot) wash solution of mild soap and water followed by a thorough rinse in clear water.

Never use kerosene or any other oily solvent on the flowmeter or on any instrument or connection that carries oxygen. Do not blow them out with compressed air. Compressed air frequently contains oil or oil vapor that must not come in contact with the flowmeter parts or get into the tubes. If necessary, cleaning solvent can be used on the metal parts and the glass flowmeter tubes. Do not use cleaning solvent on O-rings or plastic parts.

ASSEMBLY

To assemble the flowmeter, perform the following steps

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NOTE

When replacing the upper float stops, the plungers and their related O-rings and gaskets, coat all rubber parts with a thin film of Valve lube.

Ensure that the lower float stop with one large hole is assembled on the fuel side and the lower float stop with three small holes is assembled on the oxygen side. If the configurations of the lower float stops are identical (one hole) they can be interchanged during assembly.

1. Before reassembling examine all O-ring and replace any that are worn or damaged. Use only authorized replacement.
2. If cleaning is needed, use a clean cloth lightly dampened with a thin coat of Valve lube.
3. Reverse the disassembly procedures (steps 1 through 9) given above.

NOTE

When reinstalling the needle valves, align the valve housing so that the small pin that protrudes from each shoulder slides into its respective hole in the bottom mounting block valve bore. When properly installed, the tops of the valve housings are about flush with the mounting block. Reinstall the knobs on the valve stems. Turn the valves in until bottom.

NOTE

The proper placement of color coded items on the flowmeter is important. All green or blue items go on the left side of the flowmeter. Red items go on the right side. Observe this color coding when replacing the valve knobs.

When reinstalling the flowmeter tubes, return the black float to the fuel gas tube and the steel float to the oxygen tube.

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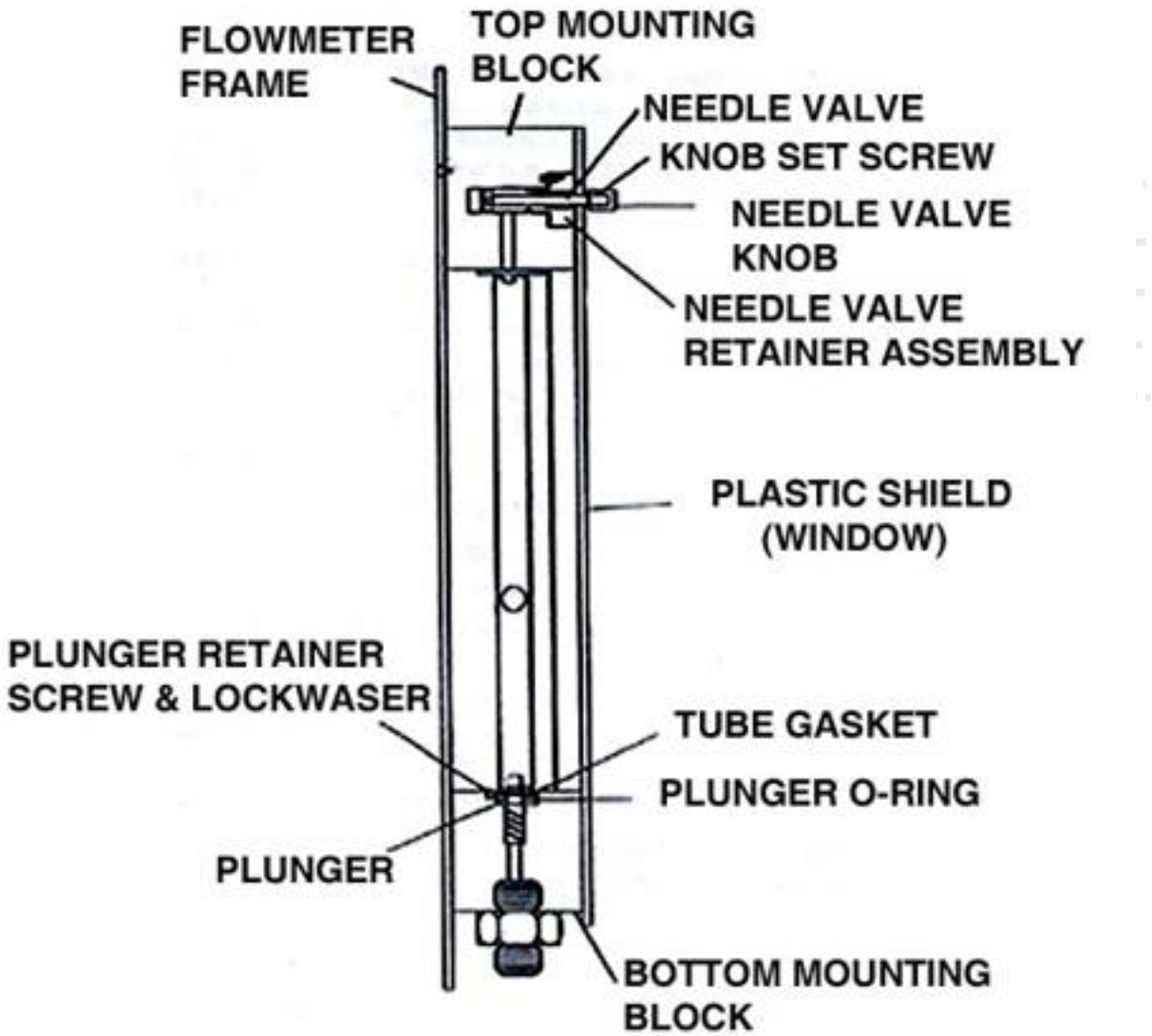
4. To assemble each pointer assembly and its related parts:

   a. Reverse the disassembly procedures provided in step 9, but do not replace the pointer knob.
   b. Turn in pointer screw until it just touches pointer nut and then back off the pointer screw two full turns.
   c. While holding the pointer, and pressing tightly on the head of the pointer screw, slide the pointer knob onto the screw until all parts are held together snugly.
   d. Securely tighten knob set screw.



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SECTION 6

GAS FLOW INFORMATION

The 2GFM Gas Flowmeter Spraying Tables are the primary source of information on gas flow parameters for the 3GFM Gas Flowmeter. Refer also to the Comparison Data Charts in Section 9 of these Instructions to convert the 2GFM readings, expressed in gas flowmeter units, into 3GFM readings, expressed in standard cubic feet per hour (SCFH) or normal liters per minute (NLPM) for both oxygen and fuel gas.

ADJUSTING FOR SPECIFIC GRAVITY OF FUEL GAS

The 3GFM Gas Flowmeter settings are based on the use of acetylene as the fuel gas. When a fuel gas other than acetylene is used, the flowmeter pointer settings must be adjusted to account for the difference in specific gravity. Proceed as follows:-

Set The Initial Flow Values

1. On the flowmeter, fully open the two gas flow control valves.
2. At the gas takes, adjust the pressure regulators to obtain the pressure required from the 2GFM spraying tables for the material to be sprayed.
3. Light the gun and adjust the needle valves on the 3GFM Flowmeter as necessary to maintain the desired gas flowmeter readings.
4. Verify pressure at the gas tanks and adjust regulators after adjusting flowmeter needle valves.

Apply the correction factor for fuel gas specific gravity

5. Multiply the fuel gas flow value at the flowmeter by the appropriate specific-gravity correction factor. This will provide flow values corrected for specific gravity.

Fuel Gas	Multiplier (SGx/SGa)
Propane	1.233
Acetylene	1.000
Hydrogen	0.263
Natural Gar	0.806

Gas flow formula: SCFH fuel gas = SCFG acetylene x (SGx/SGa)
Where: SGx/SGa = specific gravity ratio of fuel gas to acetylene

FUEL GAS FLOW CORRECTION FACTORS FOR SPECIFIC GRAVITY

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Adjust the gas flowmeter readings

6. Move the sliding pointer on the fuel gas flowmeter to the scale position corresponding to the adjust value.
7. Adjust the needle valve on the flowmeter to obtain the corrected flow.
8. If required, readjust the fuel gas regulator on the tank to correct pressure from spraying table.

NOTE

Keep a record of this revised fuel gas flowmeter setting for future use, as an addendum to the spraying tables.

DATA CORRECTION FACTORS FOR GAS PRESSURE (REFERENCE ONLY)

The 2GFM Gas Flowmeter Spraying Tables are based on the delivery of oxygen at 35 PSIG (2.415 bars), and acetylene at 15 PSIG (1.035 bars). If either gas is delivered at a different pressure, DO NOT CHANGES FLOWMETER SETTINGS. Satisfactory flow results will be obtained by using the recommended setting parameters in the spraying tables.

CAUTION

The Following Correction Factors Are Provided only As An Aid In Assessing Actual Gas Usage. DO NOT ADJUST ANY SETTINGS Based On This Reference Information. This Could Produce Incorrect Flow Results.

Correcting flow data for oxygen pressure

The correction factor (multiplier) applied to initial flow value when oxygen pressure is other than 35 PSIG (2.414 bars). The resulting information is helpful in assessing the amount of oxygen used is a given spraying operation.

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PSIG	Bars	Correction Factor
0	0	0.55
5	0.345	0.63
10	0.690	0.71
15	1.035	0.79
20	1.380	0.85
25	1.725	0.90
30	2.070	0.96
35	2.415	1.00
40	2.760	1.06
45	3.105	1.10
50	3.450	1.50

OXYGEN FLOW DATA CORRECTION FACTORS FOR PRESSURE

Correcting flow data for acetylene pressure

The correction factor (multiplier) applied to initial flow value when acetylene pressure is other than 15 PSIG (1.035 bars). The resulting information is helpful in assessing the amount of acetylene used in a given operation.

PSIG	Bars	Correction Factor
0	0	0.69
5	0.345	0.80
10	0.690	0.89
15	1.035	1.00
20	1.380	1.07
25	1.725	1.14

ACETYLENE FLOW DATA CORRECTION FACTORS FOR PRESSURE

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SECTION 7

RECOMMENDED SPARE PARTS

PART NO.	DESCRIPTION
NOT SHOWN	Valvelube
NOT SHOWN	3GFM 'O' Ring Kit
NOT SHOWN	3GFM Hardware Kit

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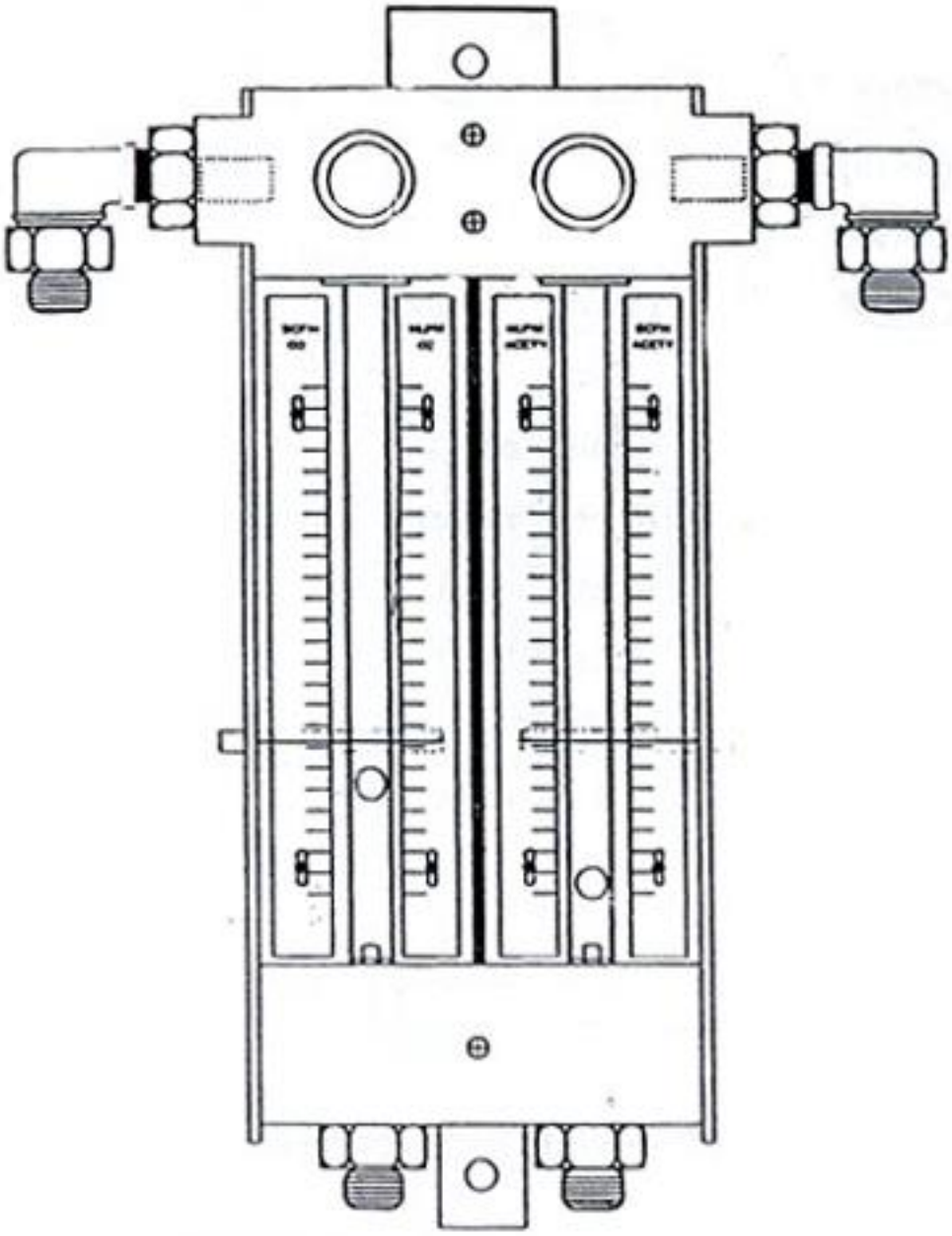
SECTION 8

REPLACEMENT PARTS



3GFM GAS FLOWMETER

GSTIN:08CAPPS0746E1ZF

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3GFM GAS FLOWMETER REPLACEMENT PARTS

PART NO.	DESCRIPTION
3GFM-204	Hose Fitting RH
3GFM-1290	Hose Fitting LH
3GFM-1914	Fuel Gas Float .250 D (Black)
3GFM-1915	Oxygen Float .250 D (polished Steel)
3GFM-54393	Pointer Assembly
3GFM-54398	Flowmeter Tube
3GFM-54403	Check Tube
3GFM-54406	Knob (Red)
3GFM54407	Knob (Orange)
3GFM-54408	Knob (Green)
3GFM-54409	Knob (Blue)
3GFM-54459	Pointer Locking Knob
3GFM-54780	O-Ring .489 x .070

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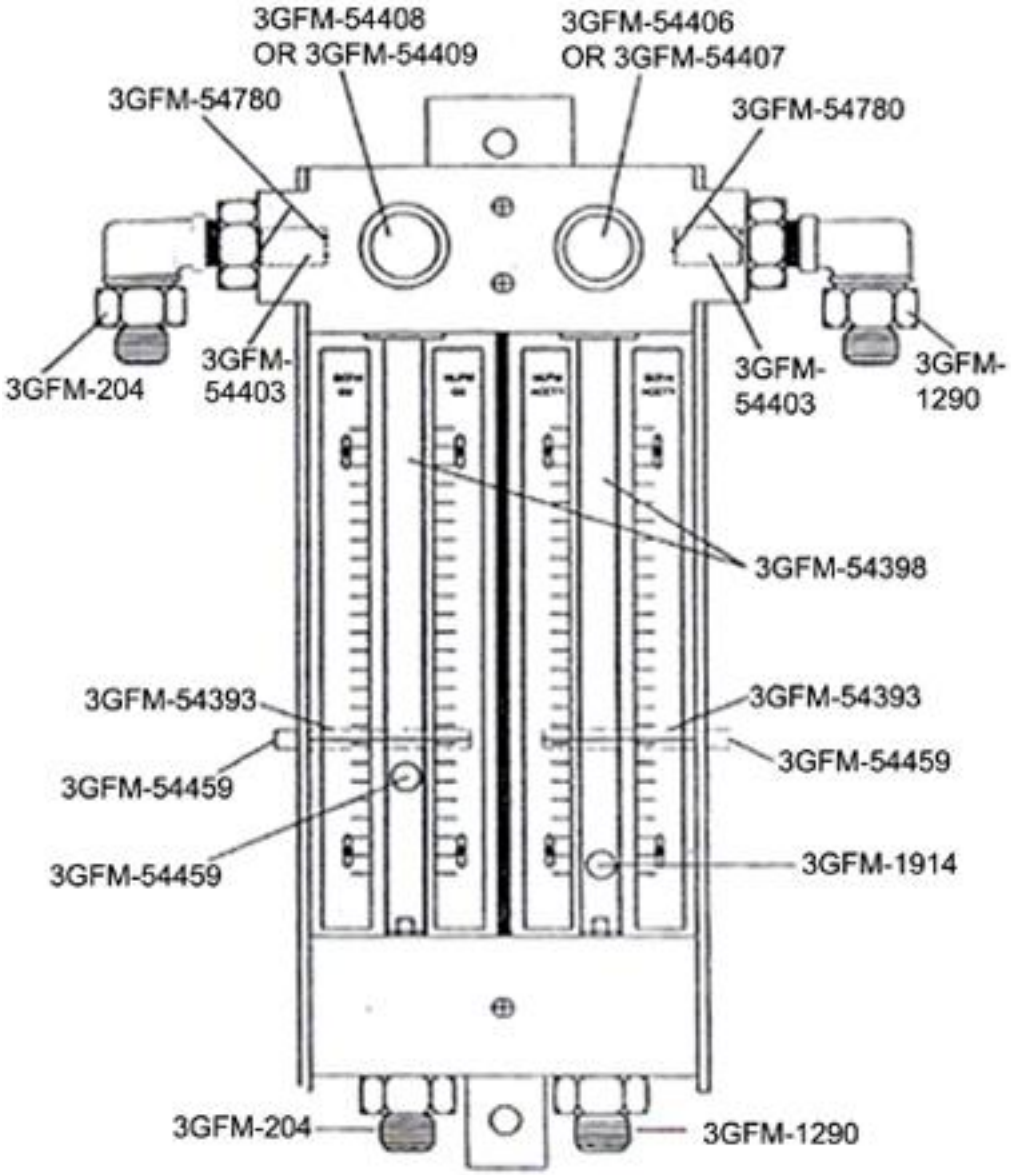

3GFM GAS FLOWMETER REPLACEMENT PARTS

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3GFM GAS FLOWMETER REPLACEMENT PARTS

PART NO.	DESCRIPTION
3GFM-2052	O-Ring .424 x .103
3GFM-3018	O-ring .237 x .103
3GFM-3084	O-ring .364 x .702
3GFM-14416	Needle Valve Housing
3GFM-14420	Needle Valve
3GFM-14424	Upper Float Stop
3GFM-14429	Plunger
3GFM-14430	Lower Float Stop (Oxy.)
3GFM-15153	O-Ring 0.237 x .103
3GFM-27519	Lower Float Stop (Fuel)
3GFM-54412	Bottom Mounting Block
3GFM-54414	Plastic Shield (Window)
3GFM-54416	Top Mounting Block
3GFM-5708	Bake Plate

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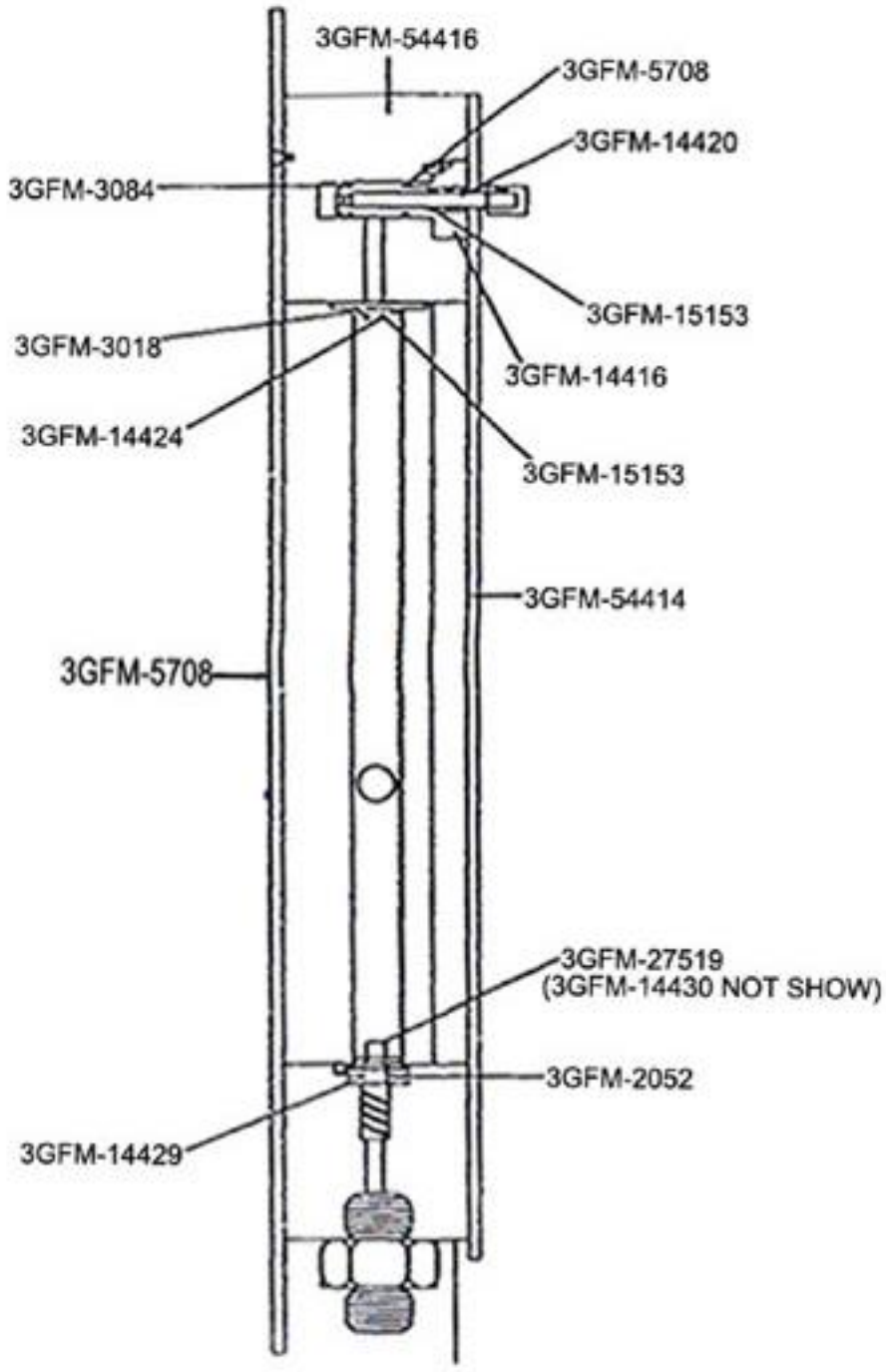

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SECTION 9

2GFM to 3GFM FLOW COMPARISON GUIDE

The following data shows a comparison of flowmeter readings between the 2GFM flowmeter with linear scale on tube and the 3GFM flowmeter, which has direct reading detachable scales. The data supplied can be used to determine actual flow rates of both oxygen and fuel gas when either meter series is used.

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COMPARISON DATA CHART OXYGEN SCFH

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	SCFH
100	258.4	0	0.55
99	254.2	5	0.63
98	249.9	10	0.71
97	245.7	15	0.79
96	241.4	20	0.85
95	237.1	25	0.9
94	233.4	30	0.96
93	229.8	35	1
92	226.1	40	1.06
91	222.4	45	1.1
90	218.7	50	1.5
89	215.6		
88	212.4		
87	209.3		
86	206.2		
85	203.1		
84	200.2		
83	197.4		
82	194.5		
81	191.7		
80	188.9		
79	186.0		
78	183.2		
77	180.3		
76	177.5		
75	174.7		
74	171.8		
73	169.0		
72	166.1		
71	163.3		
70	160.5		
69	157.6		
68	154.8		
67	151.9		

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66	149.1
65	146.3
64	143.7
63	141.1
62	138.6

COMPARISON DATA CHART OXYGEN SCFH

2GFM		3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL SCFH	
61	136.0			
60		133.5	0	0.55
59		130.9	5	0.63
58		128.4	10	0.71
57		125.8	15	0.79
56		123.3	20	0.85
55	120.7		25	0.9
54		118.1	30	0.96
53	115.6		35	1
52		113.0	40	1.06
51	110.5		45	1.1
50	107.9		50	1.5
49	105.6			
48	103.4			
47	101.1			
46	98.8			
45	96.6			
44	94.3			
43	92.0			
42	89.7			
41	87.5			
40	85.2			
39	82.9			
38	80.7			
37	78.4			
36	76.1			
35	73.8			
34	71.6			
33	69.3			
32	67.0			

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31	64.8
30	62.5
29	60.2
28	57.9
27	55.7
26	53.4
25	51.1
24	48.8
23	46.6

COMPARISON DATA CHART OXYGEN SCFH

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	SCFH
22	44.3		
21	42.0		
20	39.8	0	0.55
19	37.8	5	0.63
18	35.8	10	0.71
17	33.8	15	0.79
16	31.8	20	0.85
15	29.8	25	0.9
14	27.8	30	0.96
13	25.8	35	1
12	23.9	40	1.06
11	21.9	45	1.1
10	19.9	50	1.5
9	17.9		
8	15.9		
7	13.9		
6	11.9		
5	9.9		
4	8.0		
3	6.0		
2	4.0		
1	2.0		
0	0.0		

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COMPARISON DATA CHART OXYGEN NLPM

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	SCFH
100	113.3	0	0.55
99	111.4	5	0.63
98	109.6	10	0.71
97	107.7	15	0.79
96	105.8	20	0.85
95	104.0	25	0.9
94	102.3	30	0.96
93	100.7	35	1
92	99.1	40	1.06
91	97.5	45	1.1
90	95.9	50	1.5
89	94.5		
88	93.1		
87	91.8		
86	90.4		
85	89.0		
84	87.8		
83	86.5		
82	85.3		
81	84.0		
80	82.8		
79	81.5		
78	80.3		
77	79.1		
76	77.8		
75	76.6		
74	75.3		
73	74.1		
72	72.8		
71	71.6		
70	70.3		
69	69.1		
68	67.9		
67	66.6		
66	65.4		
65	64.1		

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COMPARISON DATA CHART OXYGEN NLPM

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	SCFH
64	63.0		
63	61.9		
62	60.8		
61	59.6		
60	58.5	0	0.55
59	57.4	5	0.63
58	56.3	10	0.71
57	55.2	15	0.79
56	54.0	20	0.85
55	52.9	25	0.9
54	51.8	30	0.96
53	50.7	35	1
52	49.6	40	1.06
51	48.4	45	1.1
50	47.3	50	1.15
49	46.3		
48	45.3		
47	44.3		
46	43.3		
45	42.3		
44	41.3		
43	40.3		
42	39.3		
41	38.3		
40	37.3		
39	36.4		
38	35.4		
37	34.4		
36	33.4		
35	32.4		
34	31.4		
33	30.4		
32	29.4		
31	28.4		
30	27.4		
29	26.4		

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28	25.4
27	24.4

COMPARISON DATA CHART OXYGEN NLPM

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL NLPM	
26	23.4		
25	22.4		
24	21.4		
23	20.4		
22	19.4		
21	18.4		
20	17.4	0	0.55
19	16.6	5	0.63
18	15.7	10	0.71
17	14.8	15	0.79
16	13.9	20	0.85
15	13.1	25	0.9
14	12.2	30	0.96
13	11.3	35	1
12	10.5	40	1.06
11	9.6	45	1.1
10	8.7	50	1.15
9	7.8		
8	7.0		
7	6.1		
6	5.2		
5	4.4		
4	3.5		
3	2.6		
2	1.7		
1	0.9		
0	0.0		

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COMPARISON DATA CHART FUEL GAS SCFH

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER	ACTUAL SCFH
100	127.7	0	0.69
99	125.9	5	0.8
98	124.1	10	0.89
97	122.3	15	1
96	120.5	20	1.07
95	118.7	25	1.14
94	117.2	30	1.22
93	115.6	35	1.26
92	114.0	40	1.33
91	112.4	45	1.4
90	110.9	50	1.45
89	109.3		
88	107.7		
87	106.2		
86	104.6		
85	103.0		
84	101.5		
83	99.9		
82	98.3		
81	96.8		
80	95.2		
79	93.6		
78	92.1		
77	90.5		
76	88.9		
75	87.4		
74	86.0		
73	84.7		
72	83.3		
71	82.0		
70	80.6		
69	79.3		
68	78.0		
67	76.6		

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66	75.3
65	73.9

COMPARISON DATA CHART FUEL GAS SCFH

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	SCFH
64	72.6		
63	71.2		
62	69.9		
61	68.5		
60	67.2	0	0.69
59	65.9	5	0.8
58	64.5	10	0.89
57	63.2	15	1
56	61.8	20	1.07
55	60.5	25	1.14
54	59.1	30	1.22
53	57.8	35	1.26
52	56.4	40	1.33
51	55.1	45	1.4
50	53.8	50	1.45
49	52.6		
48	51.5		
47	50.4		
46	49.3		
45	48.2		
44	47.0		
43	45.9		
42	44.8		
41	43.7		
40	42.6		
39	41.4		
38	40.3		
37	39.2		
36	38.1		
35	37.0		
34	35.8		
33	34.7		

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32	33.6
31	32.5
30	31.4
29	30.2
28	29.1
27	28.0

COMPARISON DATA CHART FUEL GAS SCFH

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	SCFH
26	26.9		
25	25.8		
24	24.6		
23	23.5		
22	22.4		
21	21.3		
20	20.2	0	0.69
19	19.2	5	0.8
18	18.1	10	0.89
17	17.1	15	1
16	16.1	20	1.07
15	15.1	25	1.14
14	14.1	30	1.22
13	13.1	35	1.26
12	12.1	40	1.33
11	11.1	45	1.4
10	10.1	50	1.45
9	9.1		
8	8.1		
7	7.1		
6	6.0		
5	5.0		
4	4.0		
3	3.0		
2	2.0		
1	1.0		
0	0.0		

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COMPARISON DATA CHART FUEL GAS NLPM

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER	ACTUAL NLPM
100	56.0	0	0.69
99	55.2	5	0.8
98	54.4	10	0.89
97	53.6	15	1
96	52.8	20	1.07
95	52.0	25	1.14
94	51.4	30	1.22
93	50.7	35	1.26
92	50.0	40	1.33
91	49.3	45	1.4
90	48.6	50	1.45
89	47.9		
88	47.2		
87	46.5		
86	45.9		
85	45.2		
84	44.5		
83	43.8		
82	43.1		
81	42.4		
80	41.7		
79	41.0		
78	40.4		
77	39.7		
76	39.0		
75	38.3		
74	37.7		
73	37.1		
72	36.5		
71	35.9		
70	35.4		
69	34.8		
68	34.2		
67	33.6		

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66	33.0
65	32.4
64	31.8
63	31.2

COMPARISON DATA CHART FUEL GAS NLPM

2GFM	3GFM	PRESSURE CONVERSION MULTIPLIER ACTUAL	NLPM
62	30.6		
61	30.0		
60	29.5	0	0.69
59	28.9	5	0.8
58	28.3	10	0.89
57	27.7	15	1
56	27.1	20	1.07
55	26.5	25	1.14
54	25.9	30	1.22
53	25.3	35	1.26
52	24.7	40	1.33
51	24.2	45	1.4
50	23.6	50	1.45
49	23.1		
48	22.6		
47	22.1		
46	21.6		
45	21.1		
44	20.6		
43	20.1		
42	19.6		
41	19.1		
40	18.7		
39	18.2		
38	17.7		
37	17.2		
36	16.7		
35	16.2		
34	15.7		
33	15.2		
32	14.7		

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31	14.2
30	13.7
29	13.3
28	12.8
27	12.3
26	11.8
25	11.3
24	10.8

COMPARISON DATA CHART FUEL GAS NLPM

2GFM	3GFM	PRESSURE	CONVERSION MULTIPLIER ACTUAL NLPM
23	10.3		
22	9.8		
21	9.3		
20	8.8	0	0.69
19	8.4	5	0.8
18	8.0	10	0.89
17	7.5	15	1
16	7.1	20	1.07
15	6.6	25	1.14
14	6.2	30	1.22
13	5.7	35	1.26
12	5.3	40	1.33
11	4.9	45	1.4
10	4.4	50	1.45
9	4.0		
8	3.5		
7	3.1		
6	2.7		
5	2.2		
4	1.8		
3	1.3		
2	0.9		
1	0.4		
0	0.0		