ORIFICE METERS

WARNING

These instructions are intended for use only by experienced, qualified combustion start-up personnel.

Adjustment of this equipment and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

TABLE OF CONTENTS

Subject	Page
A. General Information	2
B. Receiving and Inspection	2
C. Installation	3
D. Manometer Adjustment	3
E. Operation	3
F. Maintenance	4
Attached: Hauck Orifice Meter Capacity Charts	

These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.

A. GENERAL INFORMATION

The Hauck Orifice Metering System is a family of assemblies of threaded or welded design used for measuring the flow of either combustion air or any industrial gas. These meters may be used in the main gas and air lines or in the gas and air lines of individual burners. The former configuration allows the monitoring of total flow while the latter method allows precise setting of each burner.

B. RECEIVING AND INSPECTION

Upon receipt, check each item on the bill of lading/and or invoice to determine that all equipment has been received. A careful examination of all parts should be made to ascertain if there has been any damage in shipment.

IMPORTANT

If the installation is delayed and the equipment is stored outside, provide adequate protection as dictated by climate and period of exposure. Special care should be given to all motors and bearings, if applicable, to protect them from rain or excessive moisture.

C. INSTALLATION

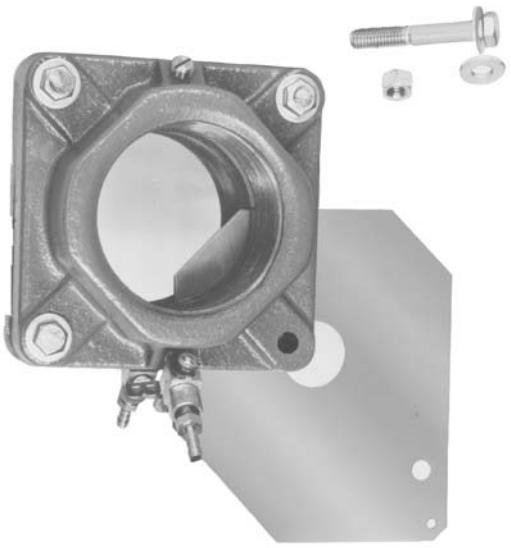
1. Install the orifice meter in any position in the appropriate line. Most orifice meters are available in either of two configurations: one designed specifically for a welded connection, the other for a threaded female connection. The location chosen for installation should permit easy access to both pressure cocks and allow sufficient space to remove the orifice plate, if required. When used in the gas and air lines of individual burners, mount the orifice meter between a flow control valve and the burner.

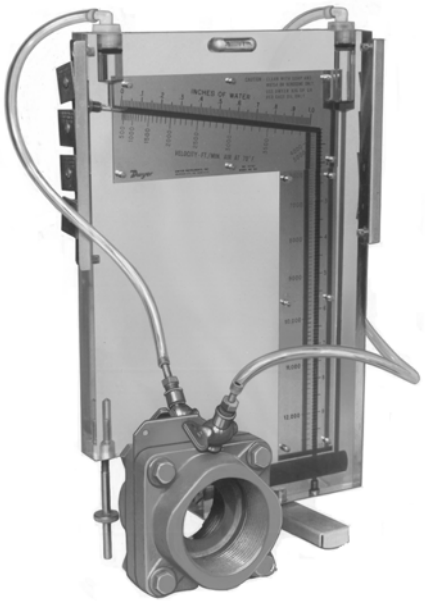
NOTE

For maximum accuracy provide 10 pipe diameters of straight piping without fittings immediately preceding the orifice meter and 5 pipe diameters downstream of the orifice.

2. Insert and loosely tighten the three (3) connecting bolts not required to hold the orifice plate in position.

3. Insert the orifice plate and secure it in place by insertion of the fourth connecting bolt.





4. Firmly tighten all bolts.

5. Insert a threaded plug in the unused cock openings.

D. MANOMETER ADJUSTMENT

1. Place the manometer on a rigid support.

2. Insert the proper amount of fluid into the manometer and adjust the fluid height until a 0.0" manometer reading is obtained.

3. Connect the orifice meter pressure cocks to the manometer, using EQUAL lengths of vinyl tubing, such as Tygon, or equivalent.

E. OPERATION

The orifice metering system is designed so that the specific water column (wc) differential observed on the manometer corresponds to a specific flow rate through the orifice (for the specific plate being used).

1. Fully open the orifice meter pressure cocks.

NOTE

To reduce the risk of "blowing" the manometer (forcing the fluid out of the manometer into the tubing) tubing clips or valves can be located in the vinyl tubing lines near the manometer.
The clips or valves are first closed and then the orifice meter cocks are opened. The clips or valves are then opened. Locating the shutoff near the manometer minimizes the gas volume being compressed when the opposite leg of the manometer is opened to system pressure.
Reducing this volume limits movement of fluid in the manometer.

2. Read the water column differential in inches and tenths of an inch. If the reading differs from the desired reading, adjust the flow control valve until the manometer coincides with the desired reading.

3. Fully close the orifice meter pressure cocks (and tubing clips if applicable).

4. Disconnect the connecting tubing, if desired.

F. MAINTENANCE

The design of the orifice plate and brackets requires no service or maintenance.

If it ever becomes necessary to change the orifice plate:

1. Loosen all four (4) connecting bolts.
2. Completely remove the plate positioning bolt.
3. Remove the old plate and insert the new one.
4. Securely tighten all connecting bolts.

Periodically check the quantity of fluid in the manometer and refill as required.

OMG SERIES ORIFICE METERS

AIR & NATURAL GAS FLOW CAPACITY (SCFH)

100 – 200 Series Threaded / Weld-In
3/8" Through 1 ½" Pipe Size

Pipe Size	OMG Model Number	Orifice Bore Size	Air				Natural Gas			
			0.5" w.c.Δ P	**1" w.c.Δ P**	**3" w.c.ΔP**	**5" w.c.ΔP**	**0.5" w.c.ΔP**	**1" w.c.Δ P**	**3" w.c.ΔP**	**5" w.c.ΔP**
3/8"	103	0.197	24	33	57	73	30	43	73	94
		0.232	33	46	80	103	42	60	103	132
		0.266	44	62	107	137	57	80	137	177
		0.307	61	85	147	189	78	110	189	244
		0.350	84	118	203	261	108	152	262	336
1/2"	105	0.232	32	45	78	100	41	58	100	129
		0.266	42	60	103	133	55	77	133	171
		0.317	61	86	149	191	79	111	192	247
		0.368	85	120	206	265	109	154	266	342
		0.423	118	166	286	368	152	214	369	475
3/4"	107/207	0.273	44	62	107	137	57	80	137	177
		0.324	62	87	151	194	80	113	194	250
		0.379	86	121	208	268	110	156	269	346
		0.437	116	163	282	363	149	211	363	468
		0.508	162	228	394	507	208	294	508	654
		0.585	221	322	555	714	294	415	716	921
1"	110/210	0.324	61	86	149	192	79	111	192	247
		0.384	86	122	210	270	111	157	271	349
		0.452	120	170	293	378	155	219	378	487
		0.523	163	230	398	513	211	297	513	661
		0.613	231	326	562	724	297	420	725	935
		0.715	331	467	806	1039	427	602	1040	1340
1 ¼"	112/212	0.456	120	170	294	379	155	219	379	488
		0.533	165	233	403	520	213	301	520	671
		0.630	233	330	570	734	301	425	735	947
		0.735	324	457	790	1018	418	590	1020	1314
		0.850	447	632	1092	1407	577	815	1409	1816
		0.986	641	905	1564	2015	827	1168	2018	2600
1 ½"	115/215	0.533	164	232	400	516	212	299	517	666
		0.635	234	331	572	737	302	427	738	951
		0.744	325	459	794	1023	419	593	1024	1320
		0.867	450	636	1100	1417	581	821	1419	1829
		1.005	626	885	1530	1972	808	1142	1974	2544
		1.156	881	1245	2151	2771	1137	1607	2776	3576

Notes:
1. Orifice Bore Size Equals The Orifice Plate Inside Diameter. All Bore Sizes In Inches. Pipe Size Equals Schedule 40 Pipe.
2. Capacity Based On 60°F @ 1 psig Upstream Pressure. Natural Gas Specific Gravity At 0.60; Air Specific Gravity At 1.0.
3. 1__ Model Number Designates NPT Threaded Connection. 2__ Model Number Designates Weld-In Connection.
4. All Flow Rates At Standard Barometric Pressure: 29.92" Hg (Sea Level).
5. Design Capacity Is Based On 3" W.C.ΔP.

Continued

OMG SERIES ORIFICE METERS

AIR & NATURAL GAS FLOW CAPACITY (SCFH)

100 – 200 Series Threaded / Weld-In
2" Through 6" Pipe Size

Pipe Size	OMG Model Number	Orifice Bore Size	Air				Natural Gas			
			0.5" w.c.ΔP	**1" w.c.ΔP**	**3" w.c.ΔP**	**5" w.c.ΔP**	**0.5" w.c.ΔP**	**1" w.c.ΔP**	**3" w.c.ΔP**	**5" w.c.ΔP**
2"	120/220	0.640	238	335	577	743	307	432	744	958
		0.754	334	470	808	1039	430	605	1041	1339
		0.875	455	640	1100	1415	586	824	1417	1823
		1.034	650	914	1568	2016	836	1175	2019	2597
		1.203	911	1278	2192	2817	1170	1644	2822	3629
		1.375	1250	1753	3003	3858	1605	2253	3865	4967
2 ½"	125/225	0.754	330	465	800	1030	425	599	1031	1328
		0.890	464	652	1123	1445	597	840	1447	1863
		1.048	651	916	1576	2027	838	1180	2030	2613
		1.236	926	1302	2237	2877	1191	1676	2881	3707
		1.423	1266	1778	3053	3925	1628	2288	3932	5056
		1.625	1730	2428	4164	5353	2223	3123	5362	6894
3"	130/230	0.894	462	651	1122	1444	595	839	1446	1863
		1.056	649	914	1575	2027	836	1178	2030	2614
		1.252	923	1300	2237	2879	1188	1674	2884	3712
		1.452	1262	1776	3056	3932	1625	2287	2938	5068
		1.688	1753	2466	4238	5452	2256	3174	5460	7026
		1.963	2483	3489	5993	7706	3193	4491	7719	9929
4"	140/240	1.261	919	1295	2234	2877	1184	1670	2881	3710
		1.470	1258	1773	3056	3935	1621	2285	3941	5075
		1.722	1748	2462	4242	5461	2251	3173	5468	7041
		2.029	2479	3491	6009	7734	3192	4497	7746	9971
		2.345	3418	4810	8275	10648	4400	6195	10665	13725
		2.691	4731	6655	11440	14716	6088	8568	14741	18966
6"	160/260	1.735	1729	2439	4211	5425	2229	3146	5432	6998
		2.067	2470	3484	6011	7743	3184	4493	7754	9988
		2.437	3468	4890	8434	10863	4469	6305	10878	14011
		2.879	4924	6941	11965	15408	6344	8947	15429	19870
		3.314	6685	9420	16231	20897	8611	12140	20928	26946
		3.850	9423	13272	22856	29419	12135	17101	29466	37931
		4.388	13055	18381	31638	40712	16809	23679	40781	52484

Notes:

6. Orifice Bore Size Equals The Orifice Plate Inside Diameter. All Bore Sizes In Inches. Pipe Size Equals Schedule 40 Pipe.
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