



PREPIPED LIQUID FUEL MANIFOLDS PLPM



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.

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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.



WARNING

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

A. GENERAL INFORMATION

The Hauck PLPM series liquid propane manifold is designed to meet industry-accepted standards for fuel delivery to LP fired combustion systems.

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, bearings and control panels, if applicable, to protect them from rain or excessive moisture.

C. CAPACITIES

MODEL NUMBER	CONNECTION SIZE (NPT)	MAXIMUM FLOW		FLOW FACTOR C _v
		(gpm)	(gph)	
PLPM 207-1	3/4 NPT	6.6	396	5.5
PLPM 207-2	3/4 NPT	19.3	1,160	11.7
PLPM 212-1	1-1/4 NPT	25.7	1,540	12.3
PLPM 212-2	1-1/4 NPT	38.5	2,310	14.5

Notes:

1. PLPM maximum flow based on **liquid** propane with 0.50 specific gravity at 60°F.
2. To calculate maximum Btu/hr throughput, multiply liquid propane flow in gal/hr by higher heating value (HHV) of 90,912 Btu/gallon.
3. Liquid Petroleum Gas-based fuels other than liquid propane will have different specific gravities, and consequently, different maximum flow rates. Additionally, heating values for other LPG-based fuels may vary significantly. Consult your fuel supplier for fuel heating value and specific gravity.

Table 1. PLPM Capacities

C. CAPACITIES (Continued)

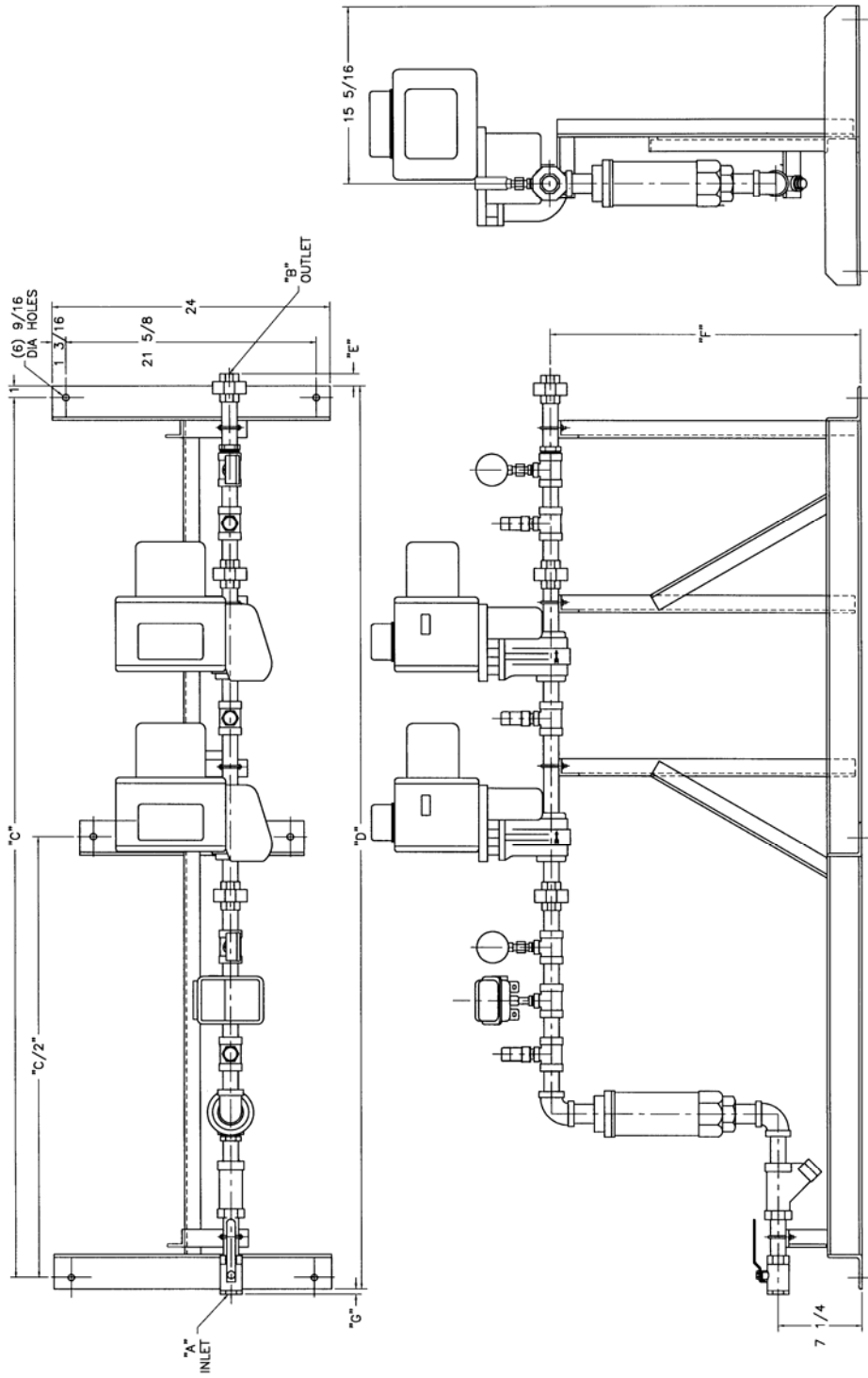
MODEL NUMBER	CONNECTION SIZE (NPT)	MAXIMUM FLOW		FLOW FACTOR C_v
		(lpm)	(lph)	
PLPM 207-1	3/4 NPT	25.0	1,500	5.5
PLPM 207-2	3/4 NPT	73.1	4,380	11.7
PLPM 212-1	1-1/4 NPT	97.3	5,840	12.3
PLPM 212-2	1-1/4 NPT	146	8,740	14.5

Notes:

1. PLPM maximum flow based on **liquid** propane with 0.50 specific gravity at 15.5°C.
2. To calculate maximum Btu/hr throughput, multiply liquid propane flow in lit/min by lower heating value (LHV) of 23.5 MJ/liter.
3. Liquid Petroleum Gas-based fuels other than liquid propane will have different specific gravities, and consequently, different maximum flow rates. Additionally, heating values for other LPG-based fuels may vary significantly. Consult your fuel supplier for fuel heating value and specific gravity.

Table 2. PLPM Metric Capacities

D. DIMENSIONS



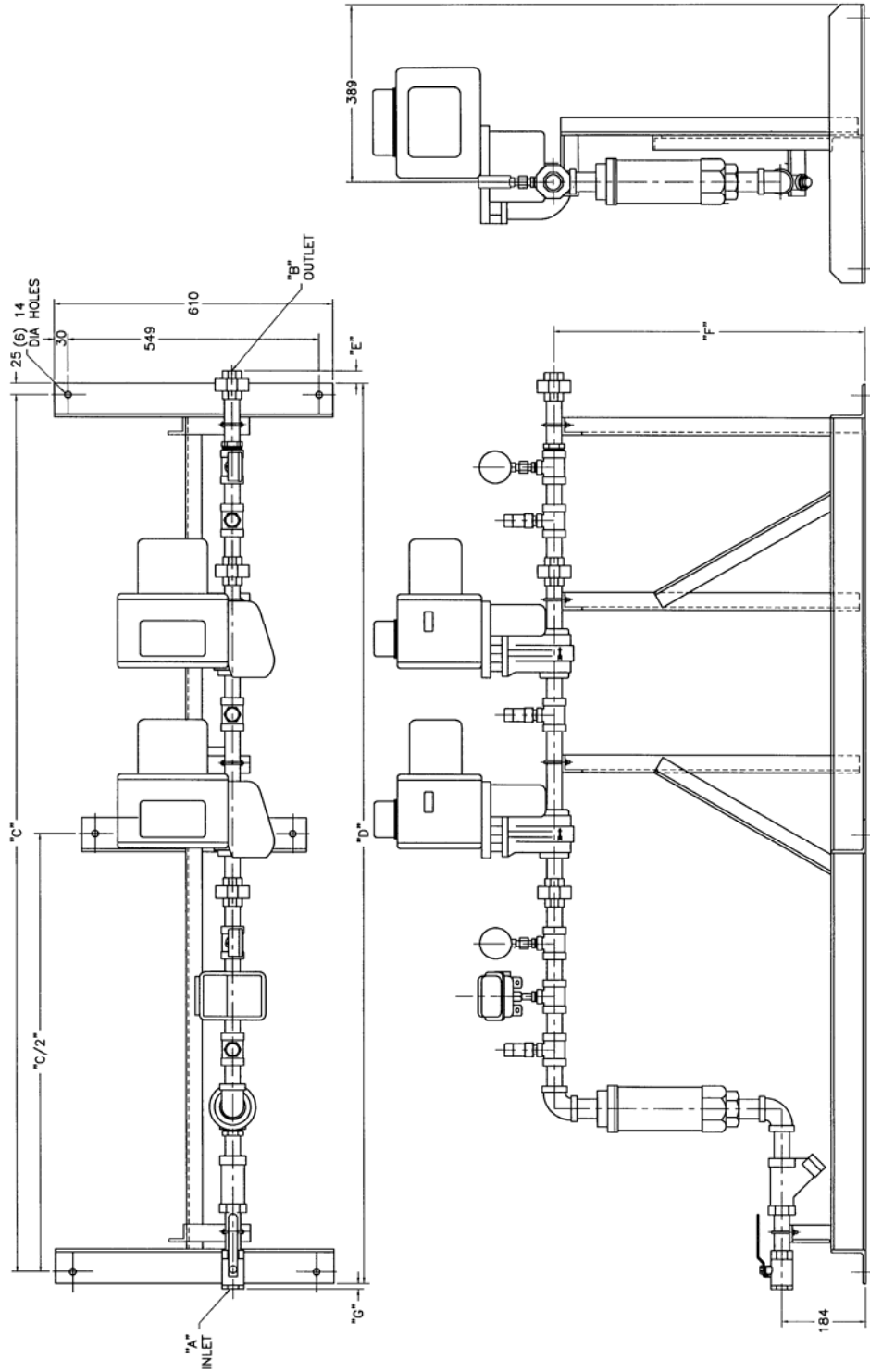
Y6053
(NOT TO SCALE)

MODEL NO.	"A"	"B"	"C"	"D"	"E"	"F"	"G"
PLPM 207-1	3/4 NPT	1/2 NPT	70	72	7/16	17 1/4	0
PLPM 207-2							
PLPM 212-1	1 1/4 NPT	1 NPT	76	78	1/2	23 1/16	1 1/8
PLPM 212-2							

Note: All dimensions are in inches.

Figure 1. Dimensions

D. DIMENSIONS (Continued)



Y6053 METRIC
(NOT TO SCALE)

MODEL NO.	"A"	"B"	"C"	"D"	"E"	"F"	"G"
PLPM 207-1	3/4 NPT	1/2 NPT	1778	1829	11	438	0
PLPM 207-2							
PLPM 212-1	1 1/4 NPT	1 NPT	1930	1981	13	586	29
PLPM 212-2							

Note: All dimensions are in mm.

Figure 2. Metric Dimensions



WARNING

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

Liquid propane is highly flammable and heavier than air. It will accumulate near the ground in the area of a leak and it dissipates relatively slowly. Under no circumstances should personnel smoke, weld or perform any work with an open flame around the propane installation area.

E. LIQUID PROPANE INSTALLATION PLPM

CAUTION

All pipe and fittings in the LP system should be Schedule 80, suitable for 350 psig (2410 kPa) service. Do not substitute Schedule 40 pipe or fittings in a liquid propane system. Hauck does not recommend the use of PVC for pipe or fittings in liquid propane systems. All hoses and flexible connections should be suitable for 350 psig (2410 kPa) LP service. Armor encased hose is preferred.

NOTE

The presence of small amounts of water in liquid propane can result in the formation of internal ice which can result in control valve and nozzle freezing. If freezing continues to be a problem, consult your propane supplier about the addition of alcohol (usually methanol) to your propane supply. The additive combines with the water making it a burnable mixture.

MECHANICAL

1. The PLPM is designed to handle liquid propane. Prepare an area within 15 ft (4.6m) of the burner oil inlet to accept the manifold. Attempt to position the manifold as close to the burner as possible. The area should be level and flat. The manifold can be mounted on metal or concrete. Using at least four of the mounting holes in the base, mount the manifold to the mounting structure with appropriate bolts and fasteners. Avoid welding the manifold to its final location unless impractical. **The location of the manifold should not be above the horizontal centerline of the burner. In making the connections to the manifold inlet, avoid excessive pressure drops. For example, minimize the number of fittings, elbows and valves.** Excessive pressure drops will cause the piping to "freeze up" and result in poor burner performance.

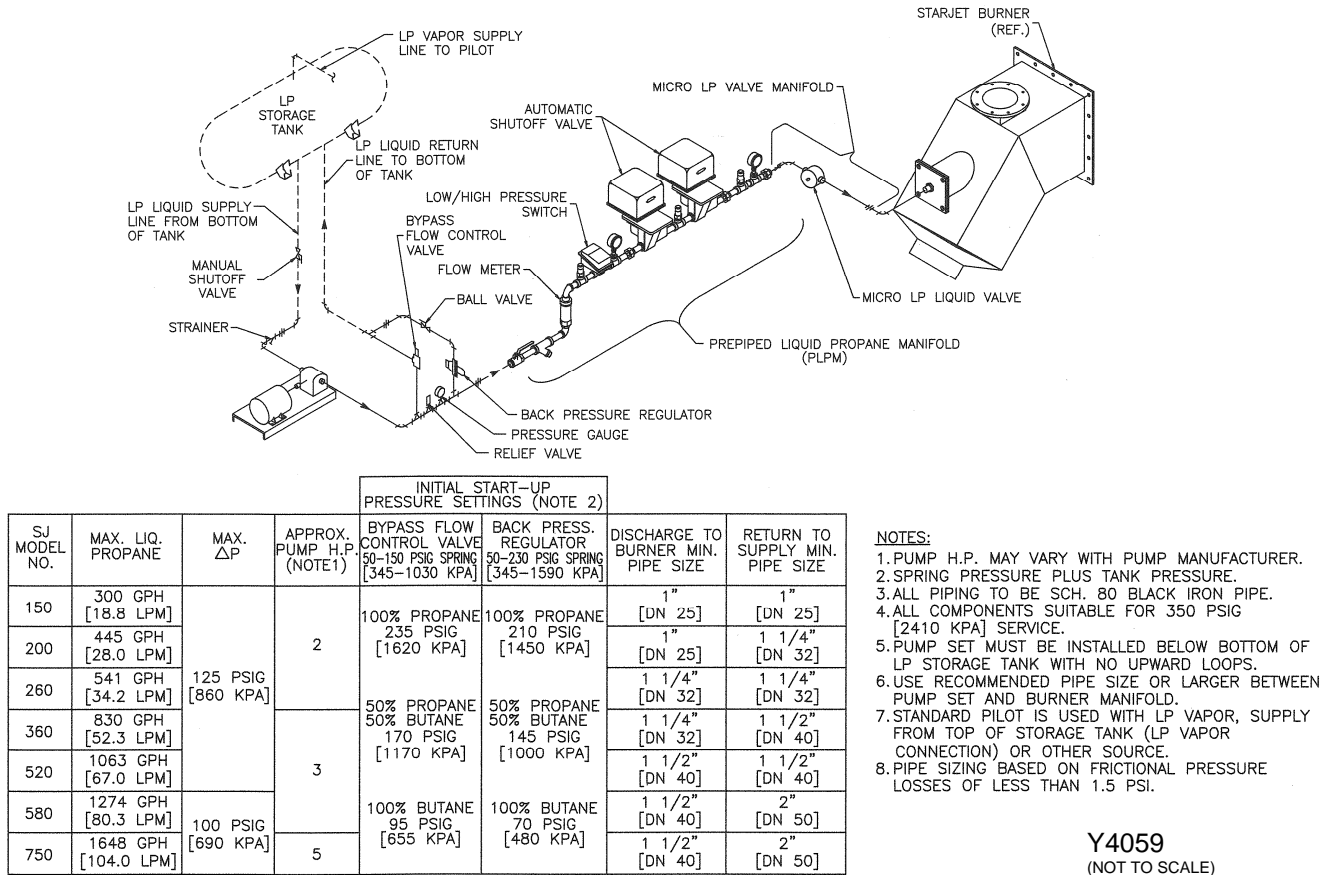


Figure 3. Typical Piping Schematic of PLPM with StarJet Burner

- The position indication windows on the automatic safety shutoff valves must be visible to equipment operators. The valve heads can be field rotated to accommodate viewing the position indication window. Do not attempt to rotate the valve head – consult Hauck or valve manufacturer for instructions.
- Once the manifold is in place, connect the LP supply piping to the PLPM inlet. It is recommended that a ball valve followed by a tee fitting with a plug in the branch connection and a union in the through connection is installed upstream of the manifold inlet. This will ease manifold maintenance and serve as a leak test pressurization point (see Figure 4).

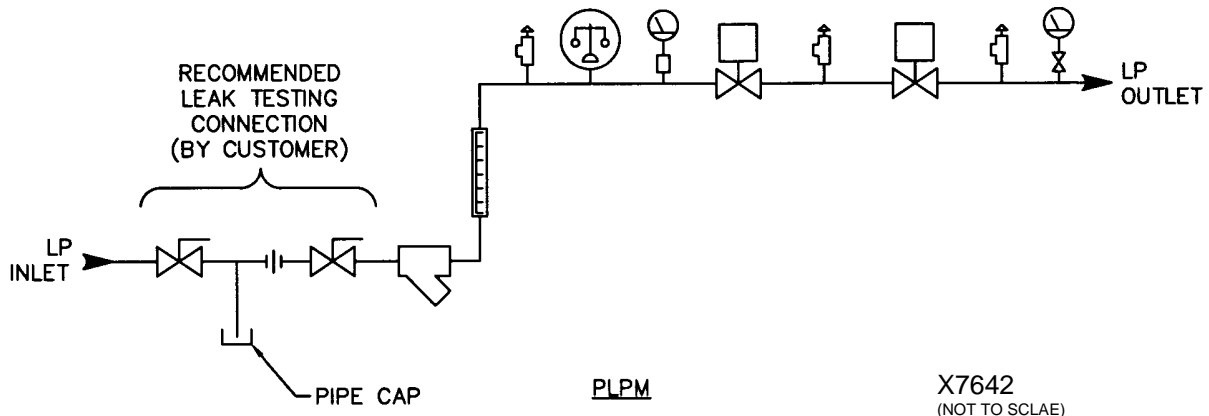


Figure 4. Typical Schematic of PLPM Leak Test Piping

4. Make the piping connection to the manifold outlet. Use an appropriate pipe sealant on all field-piping connections suitable for LP service (Hauck recommends Loctite 565 or equal). Once the piping connections are made, the electrical connections can be started.

ELECTRICAL

Each PLPM is equipped with three components that require electrical connections (see Table 3). Consult component wiring diagrams (on component cover plates) for component terminal numbers.

Component	Connection Type
Low/High LP Pressure Switch	Wired Normally Open.
Main LP Shutoff Valve, Blocking LP Shutoff Valve	Control Voltage, Neutral, Valve Closed Switch(VCS) And In Some Cases The Valve Open Switch (VOS) Must Be Wired In Accordance With Applicable Control System Schematics; Consult Drawings And Manuals Supplied With Your Control System.

Table 3. PLPM Electrical Component Wiring

F. INITIAL SET-UP

IMPORTANT
Before subjecting the manifold to fuel, cycle the automatic shutoff valves 10 times to prepare the valve seat and gate for operation.

Once all piping and electrical connections are complete, the system should be leak tested.

1. Close the ball valve at the inlet of the manifold and at the burner fuel inlet. Also close the leak test ball valve.
2. Start the LP pump and leak check all components upstream of the PLPM.
3. If any leaks exist, repair as necessary.
4. Remove the pipe plug from the PLPM leak test connection.
5. Pressurize the PLPM manifold using **250 psig** (1725 kPa).
6. Coat all piping connections with a leak test solution of liquid soap and water. If any bubbles appear, a leak exists. **Repair the leak before proceeding.**

CAUTION
 If any leaks exist downstream of the safety shutoff valves when they are in the "shut" position, contact Hauck or the valve manufacturer immediately.

7. Once all leaks on the inlet side of the manifold are repaired, energize the main safety shutoff valve and coat all piping connections downstream of the main safety shutoff valve with the leak test solution.
8. Repair any leaks as necessary.
9. Lastly, energize both safety shutoff valves and coat all piping downstream of the valves with the leak test solution.
10. Repair any leaks as necessary.
11. Depressurize manifold.

Switch Adjustment

Adjust the low/high LP pressure switch to the desired setting – each switch is factory set at **165** and **230 psig** (1140 and 1590 kPa), respectively.

G. OPERATION

Once properly installed and initially set, the prepped manifold is ready for operation. The combustion control system will automatically cycle and operate the safety shutoff valves and monitor the safety switches.

If pressure in any section of the manifold exceeds **450 psig** (3100 kPa), one of the overpressure relief valves will relieve gas to the atmosphere. Should this occur, the combustion system must be shut down immediately. **Do not remove or plug emergency relief valves.**

H. MAINTENANCE

The manifold does not require any normal maintenance.

I. RECOMMENDED SPARE PARTS

Item	Manifold Type	Part No.	Description
1	PLPM	301174	Switch, Low/High Pressure
2	PLPM	46956	Relief Valve, Overpressure
3	PLPM	37353	Gauge, Liquid Filled, 0-400 psig

Table 4. Manifold Spare Parts List

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