CUSTOMER	CUST. P.O.No	REF.CURVE NUMBER
COLE-PARMER INSTRUMENTS	58076	0897-OS-10

Max.Flow	Min.Flow	Units	Metered Fluid	Date
94	10	scfh	air	08/12/97

Model Number	P14/1	Metering Temperature	70.0 °F
Tube Number	N044-07ST	Metering Pressure	14.70 psia
Serial Number	137793	Metering Density	0.001200 g/ml
Float Material	316 Stainless Steel	Density at STD.Cond	0.001200 g/ml
Float Density	8.04 g/ml	Metering Viscosity	0.01812 cp
STD. Conditions	STP: 1 atm @ 70 °F	Accuracy	±5%
Room Temperature	72.5 °F	Barometric pressure	762.0 mm of Hg

SCALE READINGS AT CENTER OF FLOAT

Scale Readings [scfh]	Flow [flow units]
90	94
80	84
70	73
60	62
50	51
40	41
30	31
20	20
10	10

TEST EQUIPMENT

		Calibration Due
CS96100014	Calibrator	12/09/97

This instrument is certified against standards which are traceable to N.I.S.T. test #18030C.

The calibration is performed by passing a calibrated flow through a calibrated instrument and then is collected in a calibrator. Here timing, collected volume, pressure and flow temperature measurements are performed. All instruments used in the calibration procedure are certified against standards traceable to N.I.S.T.

Certified by: T. Barbakow Date: 08.12.97

COLE-PARMER INSTRUMENT COMPANY
625 East Bunker Court, Vernon Hills, IL 60061 USA
Phone: 1-847-549-7600 or Toll-free 1-800-323-4340

FLOWMETER INSTRUCTIONS

GENERAL INFORMATION

Inspect instrument for possible visible damage resulting from shipping. Notify UPS or other carrier as well as the distributor where the flowmeter was purchased of any claims.

Flowmeters always must be installed in a vertical position, any significant deviation from vertical will effect the readings.

Valves should be closed before installation and opened gradually after all connections are carefully inspected. A leak test is highly recommended especially when hazardous fluids are involved.

CAUTION: excessive tightening of valves may damage the orifice.

It is important that all lines to be connected to the flowmeter are purged of any dust or other residual contamination prior to installing the meter. All P and S style flowmeters are equipped with a filter in the inlet port. In some applications an additional filter should be installed at the inlet of the flowmeter.

STICKING FLOATS

Before installing open the valve of the flowmeter and check to make sure that the float or floats are moving freely in the flowtube. This is best done by slowly tilting the flowmeter from horizontal to vertical while observing if the float is rolling freely.

All meters are thoroughly inspected at the factory prior to shipping and are sealed in polyethylene bags to prevent dirt from entering into the flow passages. Certain small bore flowtubes have a clearance between the float and the inside walls of the flowtube of only a few ten thousandths of an inch. In some cases these flowtubes are found to have floats that are sluggish or not moving due to condensation resulting from temperature changes during shipping.

It is advisable to blow a dry clean gas through the meter to free the float.

SAFETY INFORMATION

P and S style flowmeters are designed to be operated at pressures not exceeding 200 psig (13.6 bars), or temperatures not exceeding 250 degrees F (121 deg. C).

T style flowmeters are designed to be operated at pressures not exceeding 100 psig (6.8 bars), or temperatures not exceeding 150 degrees F (65.5 deg. C).

NOTE: When using a T style Teflon flowmeter at a pressure and/or temperature greater than standard the leak integrity approaches 1×10^{-6}. Standard conditions are considered to be 14.7 psia (1 bar) and 70 degrees F (21 deg. C).

All meters are factory tested for leakage prior to shipping. For hazardous fluids the flowmeter must be retested at the time of installation in the system, prior to usage. It is also important that a leak integrity test is performed periodically to maintain safe operating conditions.

Flowmeters must be protected from breakage due to external conditions such as objects bumping into or hitting the instrument, extreme vibrations, or attack by corrosive materials. It is the responsibility of the customer to acquaint the operator(s) of this flowmeter with all appropriate safety information.

VALVE ALIGNMENT

The built-in needle valve may be positioned at either the inlet or outlet of the flowmeter. Valves are factory installed at the inlet of the flowmeter unless otherwise requested.

APPLICATION	VALVE POSITION
Exhaust pressure at Atmospheric conditions	Valve at Inlet
Exhaust pressure other than Atmospheric conditions *	Valve at Outlet
Vacuum	Valve at Outlet
Liquid flow	Valve at Inlet or Outlet

* When using a flowmeter with exhaust pressure greater than atmospheric conditions the standard calibrations can not be used. A calibration for the operating pressure must be obtained.

OPERATING INSTRUCTIONS

Close valve (if applicable) before initial use, then pressurize the system.

Slowly open the valve until the float is at the desired flow rate. The flow rate is read at the center of the float.

FLOWTUBE INSTALLATION OR REMOVAL

Remove the Front Shield and Back Plate. **Do not** remove the side panels from the flowmeter.

To remove the flowtube:

P style meters: insert a 5/32" hex wrench into the Pressure Nut at the top of the flowmeter. While holding the flowtube between your thumb and forefinger, turn the wrench counter clockwise to release the flowtube. Carefully remove the flowtube as not to damage it.

S and T style meters: insert a 3/32" diameter rod in the holes of the Lock Nut at the top of the flowtube. While holding the flowtube between your thumb and forefinger, turn the tool clockwise to release the flowtube. It may be necessary to push the Tube Adaptor into the upper block to remove the flowtube.

To reinstall the flowtube reverse the above procedure. Take care to assure that the flowtube is centered, in the meter, at the top and bottom before tightening.

T style meters require additional tightening to insure proper sealing at the flowtube ends. The flowmeter should be tightened again 24 hours after the initial tightening.

A leak integrity test is recommended after disassembling any flowmeter.

FLOWTUBE CLEANING

If necessary, remove the flowtube from the frame as explained above, and clean as follows:

Insert a plastic rod that will fit into the flowtube with no obstruction, into the bottom of the flowtube and push the retaining plugs and float out of the flowtube. Use tweezers to handle the float and store the float and the plugs in a lint free container. Before removing note the position of the plugs for reference when reassembling.

Using a suitable solvent clean all the parts including the flowtube, dry them by means of a clean stream of air or gas.

To reassemble the flowtube use the push rod to first install the lower plug, next insert the float and then the upper plug.

Test by slowly tilting the flowtube from horizontal to vertical to assure that the float is moving freely. If the float is free follow the instructions above to reinstall the flowtube in the frame.

MAINTENANCE

Under normal operating conditions no special maintenance is required. Dirt or contamination may create problems within the flowtube by causing a restriction in the flow passage. Such conditions can be diagnosed by examining the flowtube. The most obvious indication of obstructions is the float being stuck in the flowtube. If the existence of contaminations is determined the condition may be rectified in a number of ways. The easiest being (if possible), to disconnect the inlet and the outlet of the flowmeter and purge the instrument by using a clean and dry stream of gas. The action of the float within the bore of the flowtube very often causes particles to be dislodged through the outlet of the flowmeter.