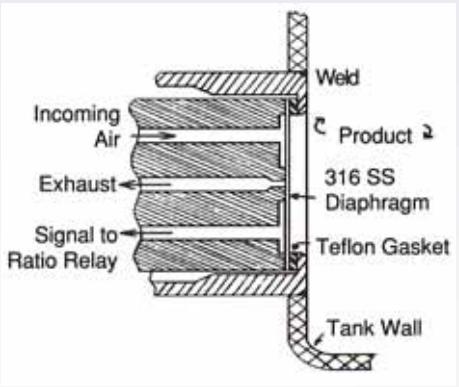
ALL PNEUMATIC SANITARY TANK GAUGING SYSTEM



TANK MATE pneumatic level sensor

To implement the all pneumatic master gauging system aTank Mate pneumatic level sensor is mounted at or as near as possible to the bottom of a vessel to provide a constant measure of the hydrostatic pressure of the liquid in the vessel. The liquid pressure is matched in a 1:1 ratio by an air pressure against a flexible stainless steel diaphragm in the sensor to provide an accurate, useful output for gauging or process control functions. The liquid pressure signal can then be transmitted pneumatically hundreds of feet to the circular scale gauge where it can be displayed in gallons, pounds or other units. The system requires only a clean air supply at 20 PSI to operate.

SANITARY LEVEL SENSORS

Sanitary level sensors are available for either flush weld-in mounting, or 2” sanitary clamp mounting. Sensor designations are: 200CF-2” (for clamp mounting to a 2” ferrule), 200WFC (weld-in to single shell tank), 205WFC (weld-in to insulated tanks 4-1/2” insulation max.) and 208WF (weld-in to insulated tanks, 7-1/2” insulation max.).
Sensors are cast and machined 316L stainless steel, and the sensitive diaphragms are also stainless steel with a Teflon seal between housing and diaphragm.

These sensors are suitable for use in sanitary clean in place (CIP) installations, and bears the 3A symbol.

MASTER TANK GAUGES

The Tank Mate Master Gauge is an 8-1/2” easy to read circular scale gauge with a very accurate 15 PSI movement pretested for linearity and sensitivity. A scale up to 19” long with as many as 300 graduations can be furnished ,inscribed to match the tank and product with units as specified. The clarity of this gauge is such that the relative position of the indicator can be observed from more than 25 feet.

NO FLUIDS

The Master Tank Gauge is a bourdon tube gauge that is wholly pneumatic. No gauging fluids such as mercury are required.

HOW THE SYSTEM WORKS

There is a constant flow of air to the sensor diaphragm opposite the material in the tank that is allowed to escape through the exhaust nozzle. A slight inward flexing of the diaphragm restricts the nozzle and causes the air pressure to build up within the sensor. Relaxation of the diaphragm allows the air to escape and the pressure to decrease.
In operation an increase in the product pressure (or level) causes the diaphragm to flex inward, causing air pressure in the sensor to rise until the air pressure equals (achieves a 1:1 ratio with) the product pressure. Decreasing product pressure (or level) allows the air to escape until a new pressure balance is reached.
The flexing action is rapid and the output air pressure (signal air) essentially equals product pressure at all times.

RATIO RELAY

A Ratio Relay matches the liquid pressure to the 15 PSI gauge movement. The tank air pressure signal is either increased or reduced depending on the head of liquid when the tank is full. The Ratio Relay is frictionless and consists of a stacked diaphragm construction. It contains no links, lever, bearing or springs.

GAUGE CALIBRATION

Each dial is inscribed to suit the particular tank and product in the tank. Calibration can be in pounds, gallons or metric units. If desired, a gauge with dual calibration can be provided. Systems can be calibrated in either of two ways. Predictable vessels such as silo tank are most often pre-calibrated at the Tank Mate factory and are ready to operate immediately. Irregular vessels such as horizontal cylindrical tanks that are difficult to predict are usually wet calibrated in the field after installation.

ACCURACY

A Tank Mate pneumatic level sensor will reproduce a pressure to within 1" W.C. from 0 to 15 PSI. Complete gauging systems are shop assembled and tested to an accuracy of better than .5% of full scale. The final installed accuracy is usually in the order of 1% or better.

P/I CONVERTER (Pressure to electrical current)

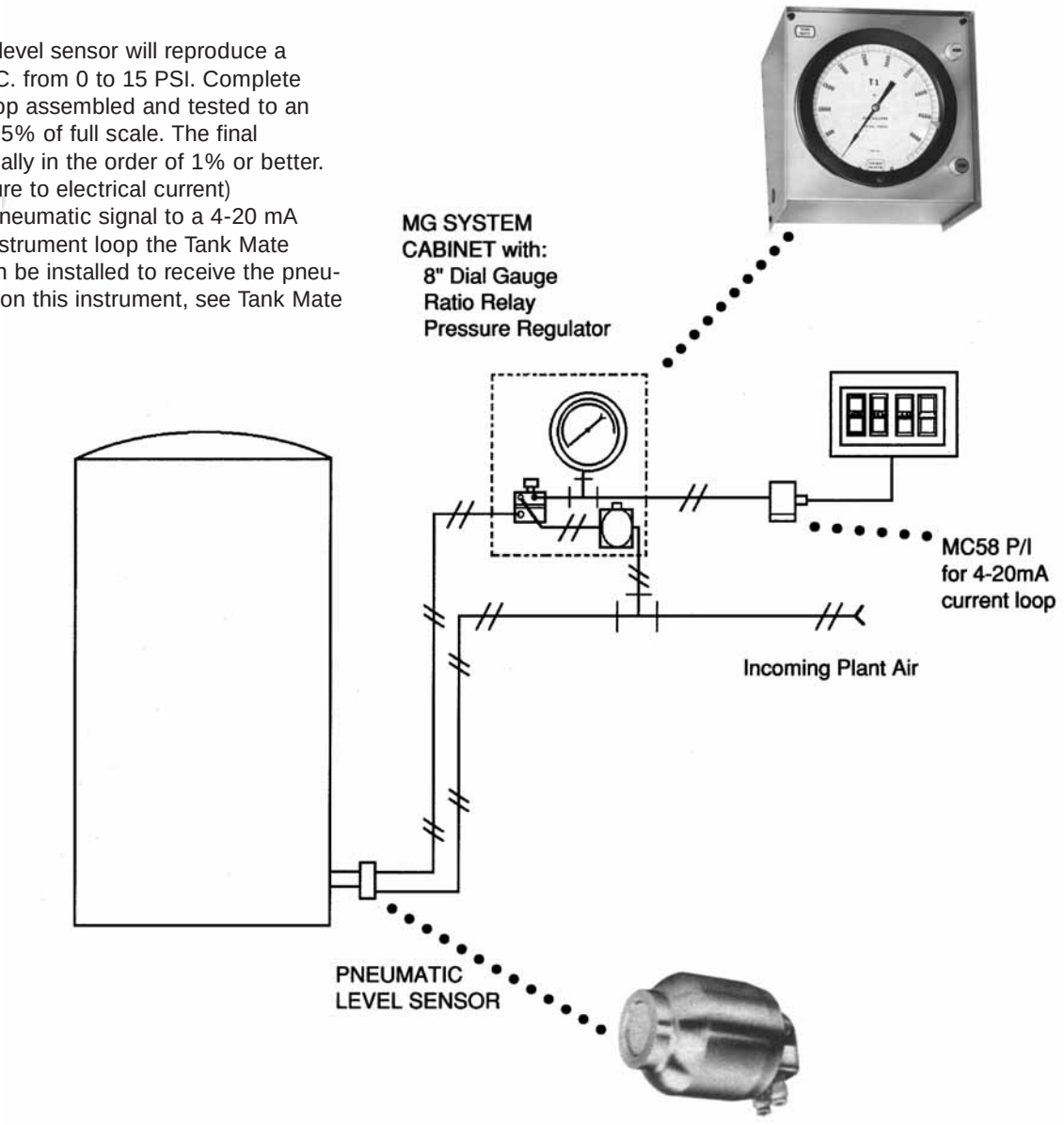
In order to convert the pneumatic signal to a 4-20 mA electrical signal for an instrument loop the Tank Mate MC58 P/I transmitter can be installed to receive the pneumatic signal. For details on this instrument, see Tank Mate bulletin No. 820.

OPTIONAL EXTRAS

Repeater Gauges - A second gauge can be connected into the circuit after the first gauge to provide a second reading at some other remote location. The second gauge can be either flush or wall mount, and 6-1/2" or 8" diameter.

Pressure switches - Level signals can be provided at any point on the scale. In certain applications as many as six contact closures have been supplied. Pressure switches can be interlocked with many process variables such as pumps, agitators, refrigeration, heating, etc.

Alarm Systems - Complete level alarm systems for high and/or low levels can be furnished including warning horn and flashing signal lights.



K Systems Corporation
4931 Butterfield Road • Hillside, Illinois 60162
Phone:708-449-0400 • Fax: 708-449-8251 • www.ksystems.net • www.tank-mate.com