cdimeters

CDI 5400 Flowmeter

Installation and Operating Instructions

Application

The meter may be used with either compressed air or Nitrogen, at pressures from atmospheric to 200 psig. The air or Nitrogen must be free of oil and suspended water droplets. In a compressed-air system, the meter should be downstream of a dryer. Refer to the data sheet for the calibrated range of the particular meter. The meter will continue to read at much higher flow rates, but there may be significant inaccuracy

Location

The meter must not be installed in a hazardous location. If it must be installed where it could be exposed to moisture, consult CDI about weather-resistant modifications. For best accuracy, the meter should be installed with at least 20 diameters of straight pipe upstream and three diameters downstream. Avoid installing the meter downstream of any item that could distort or concentrate the flow, such as a partially-closed valve, a regulator, a filter or moisture separator, two closely-spaced elbows in different planes, a long-radius elbow, an increase in pipe size or a curved hose. Allow at least 30 diameters of straight pipe between any such item and the meter. Select a location that meets these requirements and also provides good visibility from the plant floor.

Preparing the Holes

When the holes are drilled, metal shavings will enter the pipe. Make sure that filters or other provisions are present downstream to prevent the shavings from damaging equipment or product or being blown out and causing injury.

Shut down the air and make sure that it will remain shut off while the meter is being installed. Before starting to drill the holes, make sure that the air pressure is completely bled down. For the larger size meters, the drill guide is a half ring with two drill bushings mounted in it. Secure this half ring in place by bolting it to the back half ring that came with the meter. For the smaller meters, the drill guide is an aluminum block with two drill bushings. Secure this block to the pipe with a C clamp, a band clamp or a chain clamp. A universal drill guide, similar to the small drill guide, is also available that can be used with all meter sizes. After mounting the drill guide, drill the holes, remove the drill guide, and remove any burrs that were formed when you drilled the holes.

Installing the Meter

Make sure the probes are clean. If there is any oil or dirt on them, clean them with alcohol or a similar degreaser. If the housing must be rotated to suit the installation, loosen (do not remove) the two small cap screws in the plate beneath the housing, rotate the housing, and tighten the screws. Insert the probes into the holes in the pipe, with the flow arrow pointing in the direction of flow. Tighten the screws carefully, alternating screws, so that the two sides of the collar are pulled together evenly. If the LED display is upside down, remove the cover of the meter, rotate it and the display panel 180 degrees, and reinstall the cover. If the yellow caution label is not visible, apply the extra caution label from the bag of parts in a visible location.

Wiring the Meter

POWER

Either use the 18-Volt dc wall-plug supply provided with the meter, or connect a 24-Volt dc supply to the DC- and DC+ terminals. The DC- terminal is connected to the pipe on which the meter is mounted.

REMOTE DISPLAY

If you are using Summing Remote Display, connect the DC-, DC+ and display terminals in the display to the corresponding terminals in the meter. The meter may be powered from the remote display if the connecting cable is 22 gauge or larger and the distance is no greater than 60 feet.

MILLIAMP OUTPUT

The mA- and mA+ terminals are optically isolated from the remainder of the circuit and may be wired as part of an externally-powered loop. When this is done, the jumper that is supplied with the meter must be removed. If you use an external supply, be sure that it has sufficient voltage to overcome an 8.2 Volt drop within the meter in addition to any other voltage drops in the loop. Powering the milliamp circuit from an external supply does not provide power to the meter itself. The meter must be powered from its wall-plug supply or a separate 24 Volt dc supply.

Alternatively, the meter's supply may be used to power the milliamp signal. Leave the jumper in place from the DC+ terminal to mA+. Wire from the mA- terminal to the positive side of the external receiver and from the negative side of the external receiver to the DC- terminal. Power the meter from its wall-plug supply or a 24V dc supply. Note that the DC- terminals are connected to the pipe on which the meter is mounted.

PULSE OUTPUT

The pulse output is an open-drain output, that is, a transistor switch connected to the meter's negative supply. To use the output, connect it to an input of the receiving device (usually a counter or PLC) and connect a pullup resistor from that input to a positive supply suitable for the receiving device. Also connect the negative supply terminal of the meter to the negative supply of the receiving device. If an isolated relay contact is required, install the CDI 5200-IPO isolated pulse output and wire it to the receiving device.

SERIAL COMMUNICATION OPTION

The RS-485 signal used with the Serial Communication option is wired to the special Serial Communication display board. The two threaded openings in the meter enclosure permit the signal to be wired from meter to meter without external splices. Please refer to the data sheet for the Serial Communication option.

Using the Outputs

The milliamp output is scaled so that four milliamps corresponds to zero flow and 20 milliamps corresponds to a flow rate that is above the calibrated range. The flow rate that corresponds to 20 milliamps is displayed for a few seconds each time the meter is powered up.

The pulse output generates a square wave signal, sending five pulses for each cubic foot of air that passes through the meter. The LED blinks with the pulse output. At zero flow it may be on or off.

Maintenance

If oil or dirt accumulates on the probes, the meter will read low. For this reason, we recommend cleaning the probes from time to time. To clean the probes, wipe them with a cloth dampened with alcohol or a similar degreaser. It may be found that the system is clean enough that cleaning is not needed.