

CDI 5400 Flowmeter Rev. 3

Installation and Operating Instructions

Limitations and Cautions

CDI 5400 flowmeters are not for use in hazardous areas or on pipes containing gasses other than air or Nitrogen. They are not designed for installation under pressure and they are not for use in control or safety applications. High-pressure seals are required for all applications above 200 psig (14 barg). Contact CDI about pressure limitations for applications above 200 psig and for all applications on types of pipe other than Sch. 40 Steel or Type L Copper. The temperature compensation of the meters is suitable for use from 20 to 120°F (-7 to 49°C).

Locating the Meter

For accurate and reliable readings, the meters must be installed with adequate straight pipe upstream, and, in compressed-air applications, they must be installed downstream of a dryer.

Select a location with a straight run of pipe upstream equal to at least twenty times the pipe diameter. If the meter is downstream of something that could distort or concentrate the flow, such as a sweep elbow, a partially-closed valve, an increase in pipe size or a hose, the run of pipe should be as long as possible; thirty times the diameter at a minimum. Five diameters of straight downstream piping is sufficient, unless the meter is immediately upstream of something that would restrict the flow, such as a valve. If possible, locate and orient the meter for good visibility from the plant floor.

The meters may, when necessary, be installed outdoors. For best visibility, avoid direct sunlight.

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 shavings from damaging equipment or product or being blown out and causing injury.

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; it can be used with all 5400 meter sizes.

Before starting to drill the holes, make sure that the air pressure is completely bled down. With the drill guide firmly clamped to the pipe, drill the holes, using moderate pressure, pressing squarely on the drill, and retracting the bit from time

to time to clear the chips and cool the bit. After drilling the holes, remove any burrs that were formed and make sure the pipe is reasonably smooth in the area around the holes. Apply the “Holes in Pipe” decal so that it will be hidden when the meter is in place but will be revealed when it is removed.

Installing the Meter

First prepare the meter for the pipe orientation and the direction of flow. To switch the 5400 between horizontal and vertical orientation, loosen the screws on the back of the housing, rotate the display, then re-tighten the screws. Be careful to loosen the screws no more than necessary, and then tighten them securely. The flow arrow on the meter must be oriented to match the direction of flow in the pipe. If doing so will cause the display to be upside-down, remove the cover of the meter, lift out the display, rotate both 180° and re-install.

Now mount the meter on the pipe and tighten the cap screws evenly. The torque should be sufficient to seal the gasket but not so great that it will crush the gasket or distort or over-stress a thin-walled pipe.

Wiring the Meter

Wiring must be in accordance with applicable codes and standards. In areas where electrical interference may be present, signal wiring should be shielded with the shield grounded remote from the meter. Signal cables must not be run in conduit or cable trays shared with power wiring. The main terminal block inside the meter is accessed by removing the cover and lifting out the display circuit board.

POWER

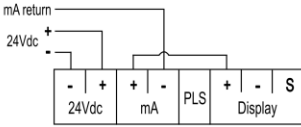
Either use the dc wall-plug supply furnished with the meter, or connect the terminals marked “24V dc” to a distributed dc power supply and seal the unused power opening with the plastic plug provided. The meter will draw a maximum of 250 mA. Unlike earlier 5200 and 5400 meters, the Rev. 3 meters do not connect the dc- terminal to the pipe on which they are mounted. Please note that 18 Volt dc supplies furnished with some earlier CDI flowmeters do not provide the voltage required for Rev. 3 meters.

REMOTE DISPLAY

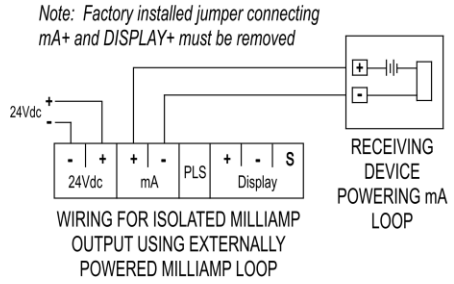
If you are using the summing remote display (SRD), connect the three terminals marked “display” to the corresponding terminals in the remote display. The meter may be powered from the remote display if the cable is 22 gauge or heavier and the distance is no greater than 200 feet.

MILLIAMP OUTPUT

The 4 - 20 milliamp output is optically isolated within the meter and it is provided with a factory-installed jumper which allows it to source a milliamp signal powered from the meter. The resistance of the loop connected to the output should not exceed 600 Ohms.

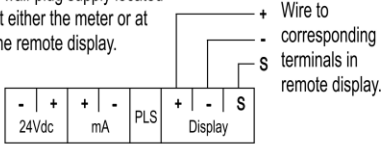


CONNECTING METER AS A THREE-WIRE TRANSMITTER

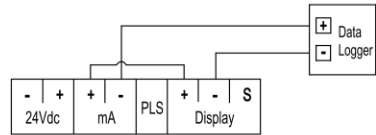


WIRING FOR ISOLATED MILLIAMP OUTPUT USING EXTERNALLY POWERED MILLIAMP LOOP

Power the meter from its 24Vdc terminals or from a wall-plug supply located at either the meter or at the remote display.



CONNECTING TO A REMOTE DISPLAY



CONNECTING TO A DATA LOGGER

PULSE OUTPUT

The pulse output is open-collector, that is, a transistor switch to the meter's negative supply. To use it, connect it to the input of the receiving device; also connect that input through a 10K Ohm resistor to a suitable positive supply and connect the negative supply of the receiving device to the negative supply of the meter. 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 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 the range of the meter indicated on the data sheet. The meter will display the milliamp full-scale value for a few seconds on startup. It will also display it if the button on the main (lower) circuit board is pressed twice.

The pulse output generates a square wave signal, sending one pulse 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. The pulse output can be configured as a threshold output, and the scaling of both the pulse output and the milliamp output can be changed, using the optional configuration cable.

Using the Display

Pressing a button indicated by a circle on the front of the meter cycles the display through four display options: rate, daily usage, cumulative usage and units of measure, the last indicated by a digit: (0) for scfm, (1) for m^3/min and (2) for m^3/hr . The cumulative values are indicated in thousands of cubic feet or cubic meters. Holding the button pressed in either of the cumulative modes (daily usage or cumulative usage) will reset that value to zero. The display normally defaults to the rate display, but this can be changed, as can the units of measure and the decimal point location in the cumulative modes. Please refer to information on configuring the display.

Maintenance

If oil or dirt accumulates on the probes, the meter will read inaccurately. 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.

Warranty

CDI warrants solely to the buyer that the Model 5400 Flowmeter shall be free from defects in materials and workmanship, when given normal, proper and intended usage, for three years from the date of purchase. During the warranty period, CDI will repair or replace (at its option) any defective product at no cost to the buyer. The foregoing warranty is in lieu of any other warranty, express or implied, written or oral (including any warranty of merchantability or fitness for a particular purpose). CDI's liability arising out of the manufacture, sale or supplying of the flowmeter, whether based on warranty, contract, tort or otherwise, shall not exceed the actual purchase price paid by the buyer, and in no event shall CDI be liable to anyone for special, incidental or consequential damages.

cdimeters