CDI 5400

FLOWMETER FOR COMPRESSED-AIR SYSTEMS - Rev. 3

- **Easy to install**
- **No moving parts**
- **Weather resistant and surge protected (new with Rev. 3)**
- **Milliamp output**
- **Pulse output convertible to threshold output**
- **User-configurable scaling, filtering and units of measure**
- **Optional RS-485 output for networking**
- **Housing rotates to suit vertical or horizontal installation**

The CDI 5400 clamps onto a pipe, with two flow-sensing probes projecting into the pipe through 3/16-in. drilled holes. It seals directly to the pipe; no cutting or welding is required for installation. Because each flowmeter is made and calibrated for a specific size of pipe, the digital display indicates flow directly, with no setup or adjustment.

The meter measures flow by maintaining one probe warmer than the other. It determines the mass flow rate from the amount of heat required. The flow rate, in scfm or equivalent units, is shown on a large, four-digit display; a 4-20 mA output and a pulse output permit remote display, totalizing and data collection.

AVAILABLE SIZES			
Nominal Size [a]	Range [b] (scfm)	Model No. for Sch 40 Steel	Model No. for Type L Copper
2 in.	600	5400-20S	5400-20C
2.5 in.	800	5400-25S	5400-25C
3 in.	1200	5400-30S	5400-30C[b]
4 in.	2000	5400-40S	5400-40C
5 in.	3000	5400-50S	--
6 in.	5000	5400-60S	5400-60C[b]
8 in.	6000	5400-80S	--

(a) Meters are also available for several sizes of Aluminum pipe. For metering smaller pipe sizes, please see our 5200-Series flowmeters.

(b) Range of milliamp output and recommended maximum flow. Flowmeters for copper pipe have smaller ranges. Meters will function at somewhat higher flow rates but at reduced accuracy.

SPECIFICATIONS

Accuracy:
5 percent of reading plus 1 percent of range for flows from 10 percent to 100 percent of indicated range at air temperatures between 20 and 120 degrees Fahrenheit

Fluids:
Compressed air and nitrogen

Operating pressure:
200 psig maximum on Sch. 40 steel and on Type L Copper below three inch; consult CDI for other materials and higher pressures.

Input power:
250 mA at 24 Vdc

Output resistance:
600 Ohms max.

Materials exposed to measured fluid:
Stainless steel, gold, thermal epoxy and Viton (seal)

Ring material:
Aluminum

Display:
Four-digit LED display

Response time:
One second to 63 percent of change in value at flows above 30 percent of range

US Patent 6,802,217

APPLICATION

The meter is designed for use with compressed air and nitrogen. If the meter will be used at pressures below 15 psig, consult CDI about velocity limitations. The air must be free of oil, dirt that could foul the probes, and suspended water droplets. In a compressed-air application, the meter should be installed downstream of a dryer. Each meter is calibrated for a specific size and type of pipe. If a meter will be used in a type or size of pipe that is not listed, consult CDI about a special calibration.

The meter is not to be used in safety or life-support applications. It should not be used as a sole means of determining required capacity of air compressors and related equipment. The meter must not be used in hazardous locations.

INSTALLATION

Drilling the holes to install the meter will release some metal shavings into the pipe. When planning the installation, make sure that all downstream equipment is protected by filters, or take other precautions to ensure that shavings do not reach critical equipment or get blown out in a way that could cause injury.

For best accuracy, the meter should be installed with at least 20 diameters of straight pipe upstream and five 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 or a curved hose. Allow at least 30 diameters of straight pipe between any such item and the meter. If a valve or other restriction will be immediately downstream of the meter, provide at least five diameters downstream. Select a location that meets these requirements and also provides good visibility from the plant floor. If this is not possible, consider using the remote display discussed below.

To install the meter, first shut off the supply of air to the pipe where the meter will be mounted and allow the pressure to bleed down. Clamp the drill guide firmly to the pipe, orienting it for best visibility of the meter. Drill the two holes and remove any resulting burrs from the outside of the pipe. Make sure the outside surface of the pipe is clean and smooth.

Before mounting the meter on the pipe, orient the display relative to the ring for best visibility. The display and cover can be removed and rotated 180 degrees relative to the meter housing, and the meter housing can be rotated 90 degrees relative to the ring, using screws behind the housing.

Next remove the back half of the ring, insert the probes into the holes in the pipe with the flow arrow pointing in the proper direction, and re-assemble the rings. Tighten the cap screws firmly and evenly so that the gaps between the halves of the rings are about equal on both sides of the pipe.

MILLIAMP AND PULSE OUTPUTS

The meter has an isolated, unpowered, milliamp output. The meter is shipped with a jumper in place to power the output from the instrument's dc supply. With the jumper in place, the meter will source a dc signal. The pulse output is an open collector, referenced to the instrument ground. For applications in which a contact-closure output is required, the isolated pulse output (CDI 5200-IPO) should be used. It installs inside the meter. The pulse output can be made into a threshold output by using the optional configuration cable.

DISPLAY CONTROL AND CONFIGURATION

The display can be cycled through rate, daily usage and cumulative usage using a button indicated by a circle on the front of the meter. The same button can be used to select a default display option, reset totals and select units of measure.

METER CONFIGURATION

Several parameters of the meter's configuration can be changed by the user using an optional configuration cable and software available from CDI. These parameters include milliamp scaling, pulse scaling, conversion from pulse output to threshold output, filtering (smoothing) of the output, pipe inside diameter, and pressure compensation for high-pressure applications. For most applications, none of these parameters need to be changed.

POWER SUPPLY

Each meter is furnished with a wall-plug dc supply for 110 V to 230 Volt AC main with a 6-foot (1.5 M) cable plus a 14-foot (4.2 M) extension cable. Prongs for Australian, European, UK and US outlets are provided, as appropriate. The meter may alternatively be hard wired to a 24-Volt dc supply. Eighteen-Volt supplies furnished with some earlier CDI flowmeters must not be used.

DRILL GUIDE

A single drill guide, the CDI 5000-DG, can be used with all CDI 5400 flowmeters. Each of the drill guides is furnished with a 3/16 inch drill bit and a hex wrench.

LIMITED 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.