

# On-line Particle Counter

- 2  $\mu\text{m}$  DETECTION LIMIT at a 3:1 signal-to-noise ratio.
- DYNAMIC RANGE: 2 - 400  $\mu\text{m}$ .
- EIGHT USER-ADJUSTABLE PARTICLE-SIZE CHANNELS allow maximum measurement flexibility.
- CONSTANT HEAD OVERFLOW SAMPLER ensures constant flow rate and reproducible particle counts.
- LARGE EXTERNAL FLOW CELL minimizes clogging and eliminates potential damage to instrument from leaking sample.
- FOUR-LINE DISPLAY shows size range, counts/mL, operating mode, and sample number.
- USE WITH TRACWARE SOFTWARE to display trends, prepare reports, and do calculations.
- MULTI-DROP UP TO 32 PARTICLE COUNTERS on a single RS485 loop.
- FOUR ANALOG INPUTS accept flow, turbidity, etc. data from other analyzers.
- FOUR ANALOG OUTPUTS proportional to particle counts in first four channels.



## FEATURES AND BENEFITS

Rosemount Analytical Model PC-1 on-line Particle Counter is intended for the determination of particle count and size distribution in a variety of liquid streams. Applications range from monitoring filter performance in potable water and wastewater treatment plants to measuring suspended iron and copper corrosion particles in steam electric power plants. Particle counting is generally more sensitive than turbidity measurements for early detection of filter breakthrough.

The Model PC-1 has a dynamic range of 2-400  $\mu\text{m}$  with a signal-to-noise ratio of 3:1 at 2  $\mu\text{m}$ . The coincidence limit at 15,000 particles/mL is less than 10%, which makes the PC-1 reading extremely reliable. The volumetric method used to determine particle counts is performed by means of light blockage of an infrared laser onto a photo-cell.

The analyzer features an entirely external sampling and measurement system. There is no danger of sample leaks damaging sensitive electronic components. The constant head overflow cup ensures stable reproducible flow and accurate particle counts. The large (1 mm x 1 mm) flow cell is easy to clean and resists clogging.

Using Tracware digital interface with the Model PC-1 is strongly recommended. Tracware lets the user customize particle size ranges, change sampling duration and frequency, plot trends, and prepare reports. Tracware runs on Windows 3.1, Windows 95/98, or Windows NT. The user must provide the personal computer for running Tracware. For direct connection to a SCADA system, DDE and OPC servers with client software are available on the same disk with Tracware.

Digital communication is through a non-proprietary serial interface. Thirty-two particle counters can be multi-dropped on a RS485 serial communications loop. The maximum network length is 4000 ft.

The Model PC-1 has four 4-20 mA outputs and accepts four 0-5 VDC inputs. The four 4-20 mA outputs are assigned to the first four channels. These channels are jumper configurable to three ranges: 0-200 c/mL; 0-2,000 c/mL; and 0-20,000 c/mL. The four 0-5 VDC inputs can be used to accept additional information from turbidity analyzers, flow meters, etc. A backwash terminal is available to alert the user that a filter backwash is occurring.

## SPECIFICATIONS

### GENERAL

**Electronics Enclosure:** Polycarbonate, NEMA 4X

**Overall Dimensions of PC-1 and water weir assembly:** H 36 inch, W 22 inch, D 6 inch  
(H 914 mm, W 559 mm, D 153 mm)

**Mounting:** Wall

**Ambient Temperature:** 32 to 122°F (0-50°C)

**Humidity:** 20 to 85% (non-condensing)

**Power:** 100 to 240 VAC, 50 to 60 Hz, 0.5 A

**Flow cell dimensions:** 1 mm x 1 mm

**Wetted materials (overflow sampler):** PVC

**Wetted materials (sensor):** Sapphire sensor windows,  
Nituff®-coated aluminum walls

**Total Weight:** 14.5 lb (6.6 kg)

**Total Shipping Weight:** 18 lb (8.5 kg). Analyzer is shipped in two packages.

**RFI/EMI:** EN-50081-2  
EN-50082-2

**LVD:** EN-61010-1



### SAMPLE REQUIREMENTS

**Temperature:** 32 to 122°F (0 to 50°C)

**Pressure (maximum):** 120 psi (8.3 bar)

**Flow:** 300 to 1000 mL/min, (overflow sampler maintains 100 mL/min sample flow to sensor)

**Minimum Sample Head:** 20 in. (508 mm) of water

**Inlet Fitting:** Barbed fitting accepts ¼ in. ID soft plastic tubing

### MEASUREMENT

**Method:** Light blockage, volumetric

**Light Source:** Laser diode (780 nm, 3mW)

**Detector:** Photodiode

**Dynamic Range:** 2 to 400 µm

**Size threshold settings:** Eight (maximum); default values: 2-5, 5-10, 10-15, 15-25, 25-50, 50-75, 75-100, and >100 µm. Default settings can be changed only through a personal computer running Tracware.

**Signal-to-Noise Ratio:** 3:1 at 2 µm

**Coincidence Limit:** <10% at 15,000 particles/mL at 10 µm

### CALIBRATION

**Standards:** Latex microspheres

**Method:** Six standards, normally 2, 3, 5, 7, 10, and 15 µm (nominal)

**Recommended calibration frequency:** Yearly (factory calibration recommended)

### INPUTS

**Function:** The PC-1 accepts up to four output signals from other analyzers.

**Range:** 0 to 5 VDC (For instruments providing a 4 to 20 mA output, use a 250 Ω input resistor.)

### OUTPUTS

**Number and range:** Four, 4 to 20 mA, assigned to first four size ranges

**Maximum load:** 600 Ω

**Ranges:** 0-200 cts/mL; 0-2000 cts/mL; 0-20,000 cts/mL (jumper-selectable)

### BACKWASH TERMINAL

**Purpose:** Wire the backwash terminal to a contact closure (user-provided) that closes when the filter backwash starts. When the contacts close, Tracware shows that the filter is in backwash.

**Power:** Internal or external (3 to 32 VDC)

### TRACWARE COMPUTER REQUIREMENTS

**Operating system:** Windows 3.1, Windows 95/98, or Windows NT

**Computer:** IBM-compatible 486DX 33 or better; 8 megs of RAM, 250 megs of hard drive space, 3.5 in. floppy drive.

### DIGITAL COMMUNICATIONS

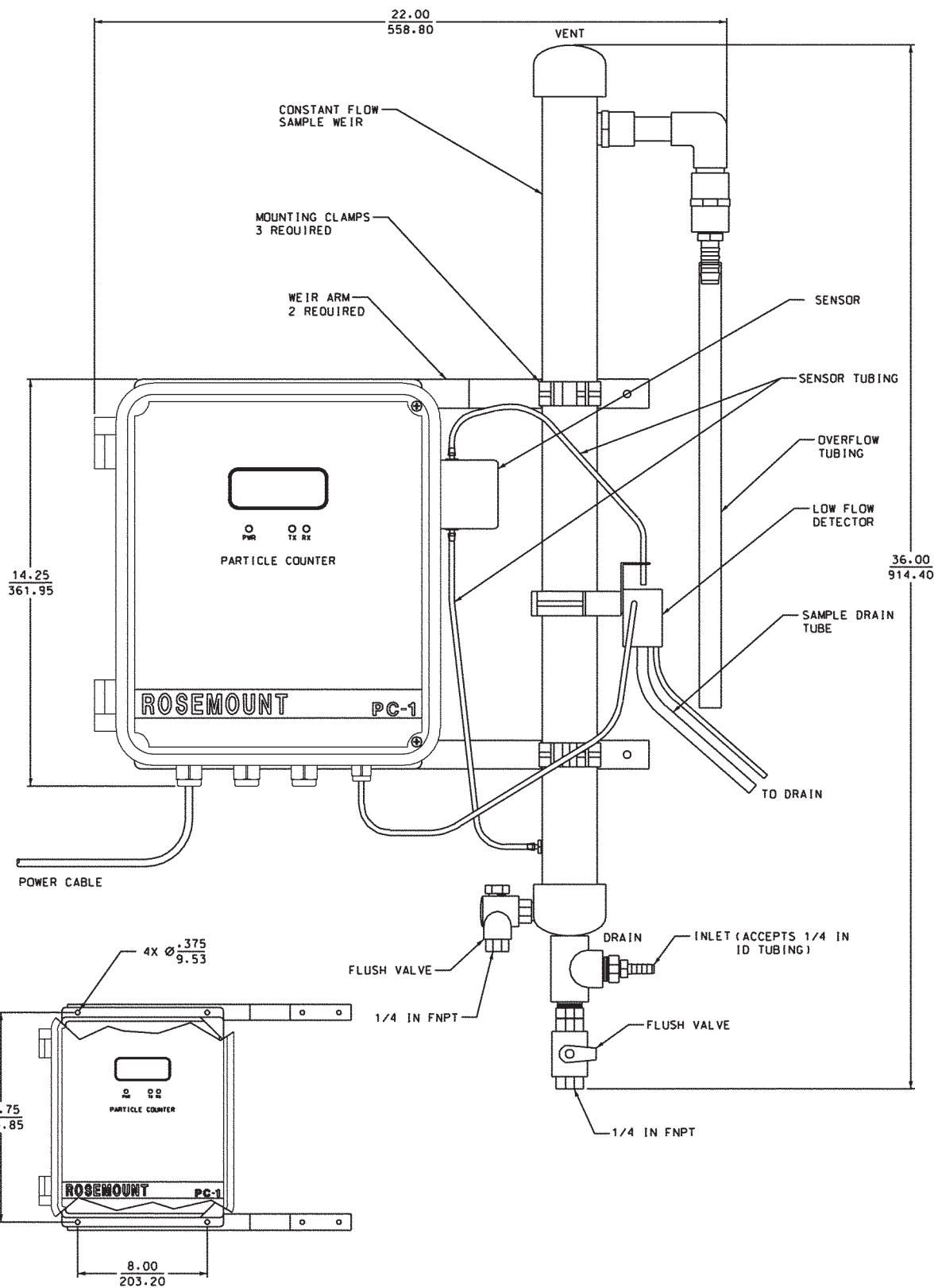
**Serial Communication:** Non-proprietary

**Serial Standard:** RS485. RS485 to RS232 interface kit must be ordered separately.

**Maximum network length:** 4000 ft (1220 m)

**Maximum number of analyzers on network:** 32

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**DIMENSIONS: MODEL PC-1**

## ORDERING INFORMATION

The **Model PC-1 on-line particle counter** includes the electronics module, sensor, constant flow weir sampler, and connecting tubing. Tracware particle counting software and the RS485/RS232 interface must be ordered separately. The user must also provide a personal computer. (See **TRACWARE COMPUTER REQUIREMENTS**). For maximum flexibility, the use of Tracware with the Model PC-1 is strongly recommended.

MODEL PC-1 ON-LINE PARTICLE COUNTER	
Code	Description
PC-1	On-line particle counter, complete with electronics module, sensor, and constant flow sampler.

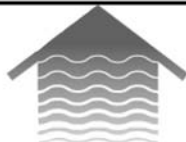
## ACCESSORIES

PN	Description
9160539	Tracware software
9160540	RS485/RS232 interface kit, includes converter, cable, and 12 Vdc power supply



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