OPM 3000

Opacity/Dust Density Monitor

The OPM 3000 Opacity/Dust Density Monitor is a high-performance opacity monitoring system with double-pass transmissometer.

Features

Sensors Standard

- **USEPA ASTM D 6216** and **40 CFR 60 PS-1** grade optics
- **Alignment viewing port** enables the operator to visually check system alignment at anytime during operation
- **Double pass measurement**
  – Dual beam measurement assures high sensitivity, freedom from errors due to vibration or minor misalignment
- **Insensitive to ambient light**
  –The solid-state light modulation system eliminates possible interference due to ambient light
- **Automatic lamp aging compensation**
  – All measurements are made on a ratio basis and are independent of the absolute intensity of the light source

Remote Control Unit

- **Three user selectable displays**
- **Optional SD Card** for program backup and changes
- **Communications** via MODBUS RS485 or 4–20mA output
- **CE and (C)UL Listed**
- **Password protected settings**

OPM 3000 Opacity/Dust Density Monitor

Emerson's Rosemount Analytical OPM 3000 stack- mounting transmissometer sensor system consists of an optical transceiver mounted on one side of the stack and a retro reflector mounted on the other. The main light source is electronically modulated and projects a collimated beam of light, which is split into a reference and measurement beam.

Emerson's OPM 3000 Opacity/Dust Density Monitor ratio measurement technique provides continuous automatic compensation for variations in light source intensity to ensure prolonged instrument accuracy and stability. Since the OPM 3000 is insensitive to the absolute intensity of the light source, it is not affected by light source aging.

Specifications

Control unit

Enclosure
Panel mounted IP65/NEMA4X Dimensions 96 x 96 x 64 mm (3.8"x3.8'x2.5"). Power 20.4 to 28.8 VDC < 10 % ripple, 400 mA.

Approvals
CE and UL Listed

Digital Display
Selectable pages, LCD backlight

Ambient Temperature Range
0 to +50 °C (+32 to 122 °F)

Power Requirements
24 VDC +/- 10 %

Alarm Time Delay & set point
6 Relays for alarms

Alarm Reset
Manual or Automatic

Analog Outputs
Two 12-bit Analog outputs 4-20 mA, with user selectable ranges

Maximum range
Opacity 99.9 %, With dust option (99.9 % opacity, 2.0 O.D. and 2,000 mg/m^3)

Calibration check options
Manual zero and span calibrate with dedicated zero reflector or Zero with clear stack condition.

Communications
Modbus – RS485 port

Battery Backup
7 years typical

Transceiver/Reflector

Enclosure
NEMA 4 watertight enclosure power 120/240 VAC, 50/60 Hz

Path Length
3-50 feet (0.9 to 15.2 meters)

Optical System
Double pass Light Source Aging Compensation: Automatic
Light Source Life: 45,000 hours (> 5 years)

Ambient Temperature Limits
-40 ° to +130 °F (-40 ° to +54 °C)

Process Gas
Up to 750 °F (400 °C)
High temperature options available. Consult Factory.

Stack/duct pressure
+5–inch WC, with the proper installation of purge blowers

Alignment Verification
Built-in, through-the-lens system

Standard Mounting Flanges
3 inch IPS, 150 lb. flange, standard

Ambient Light Immunity
Solid-state electronic light modulation

Wiring
2 pair twisted shielded cable, 22 AWG

Specifications (cont)

Design and Performance

Peak and Mean Spectral Response
Photopic; 515 to 585 nm, less than 10 % of peak response outside the desired 400 to 700 nm region

Angle of View
< 4.0 ° from optical axis

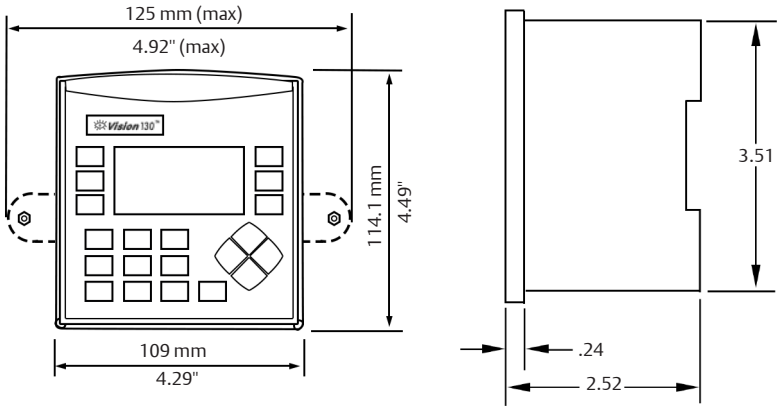
Angle of Projection
< 4.0 ° from optical axis

Calibration Error
< +2 % of full scale

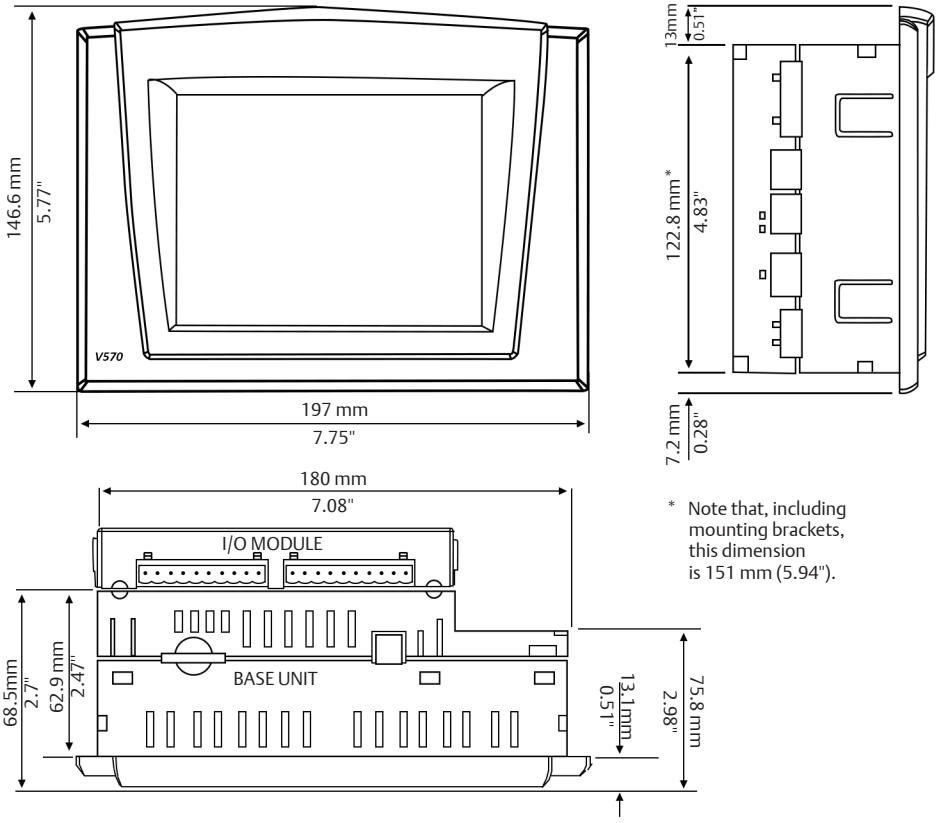
Response time
< 10 second

Zero Drift
< 1 % (24 hours)

Calibration Drift
< 1 % (24 hours)



OPM 3000 Standard Control Unit



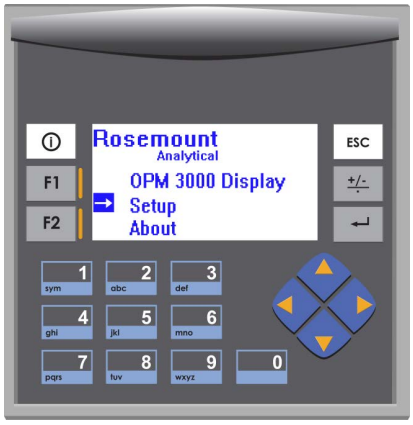
* Note that, including mounting brackets, this dimension is 151 mm (5.94").

OPM 3000 Enhanced Control Unit

Electronic Display Options

Standard Controller

- Dual beam measurement
- Clear Stack Zero
- User friendly microprocessor controller
- Easy to read numercial display



OPM 3000

Additional features with Enhanced Touch screen

- Intuitively designed 5.7" color touch screen user interface with expanded diagnostics
- 3 numerical and 2 trend display screens
- Optional SD card for program and data backup
- Color coded fault display/acknowledgement screen

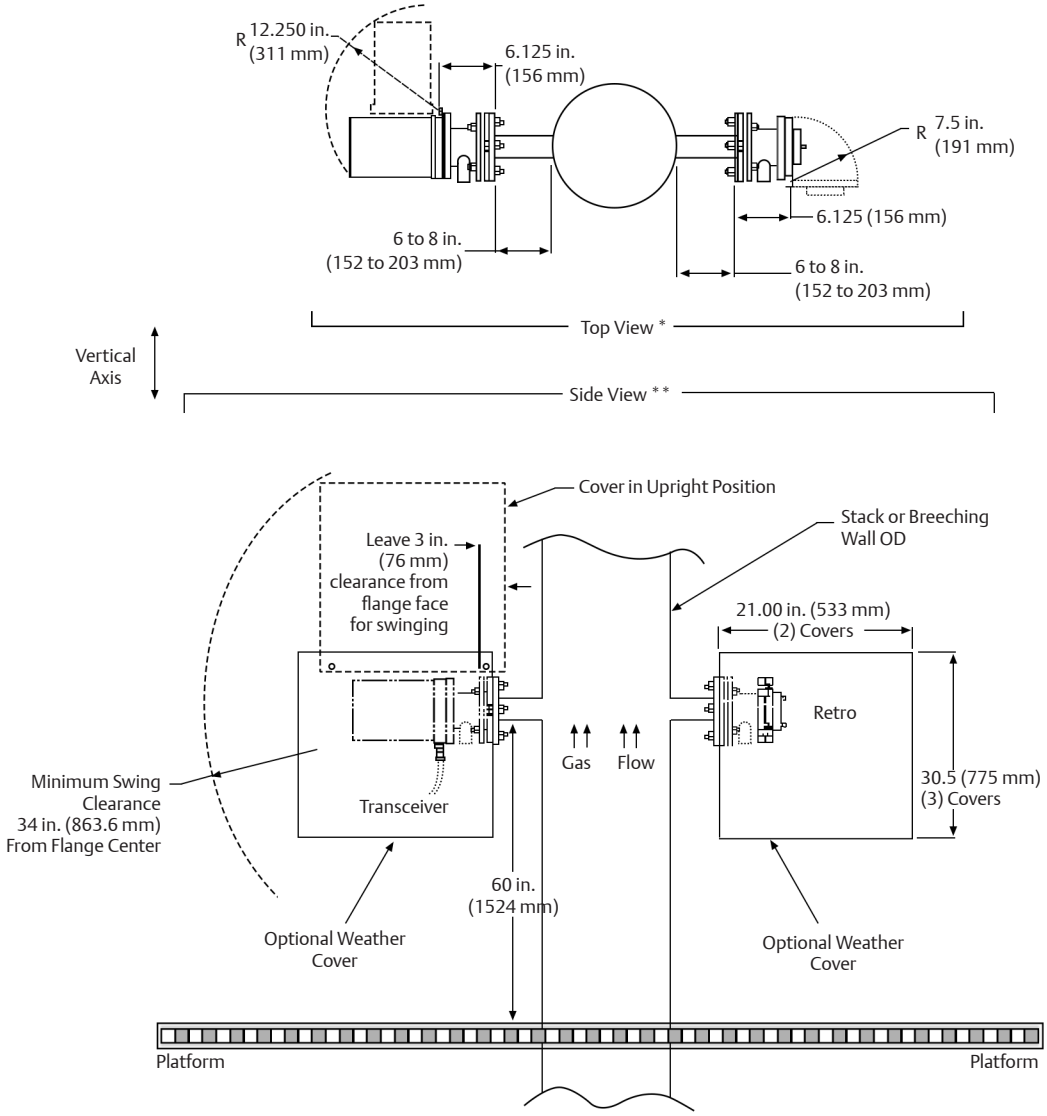
Enhanced Touch Screen

Electronic Display Comparsion Chart

	w/Touch Screen Option	Standard OPM 3000
ASTM D 6216 and PS-1 compliant optics	✓	✓
Communications via 4-20 mA and RS MODBUS	✓	✓
Clear stack zero calibration	✓	✓
Microprocessor controller	✓	✓
3 numercial display screens	✓	
Intuitively designed icon driven navigation	✓	
Standard 3 analog outputs	✓	
Icon driven 5.7" color touch screen user interface	✓	
Standard program includes % opacity, mg/m^3 and O.D.	✓	
Optional 2GB SD card for program and data backup	✓	
Real-time diagnostics for testing outputs and relays	✓	
Two selectable trend screen displays	✓	
Easy to read color coded fault screen	✓	
User display customization available	✓	

Dimensional Drawings

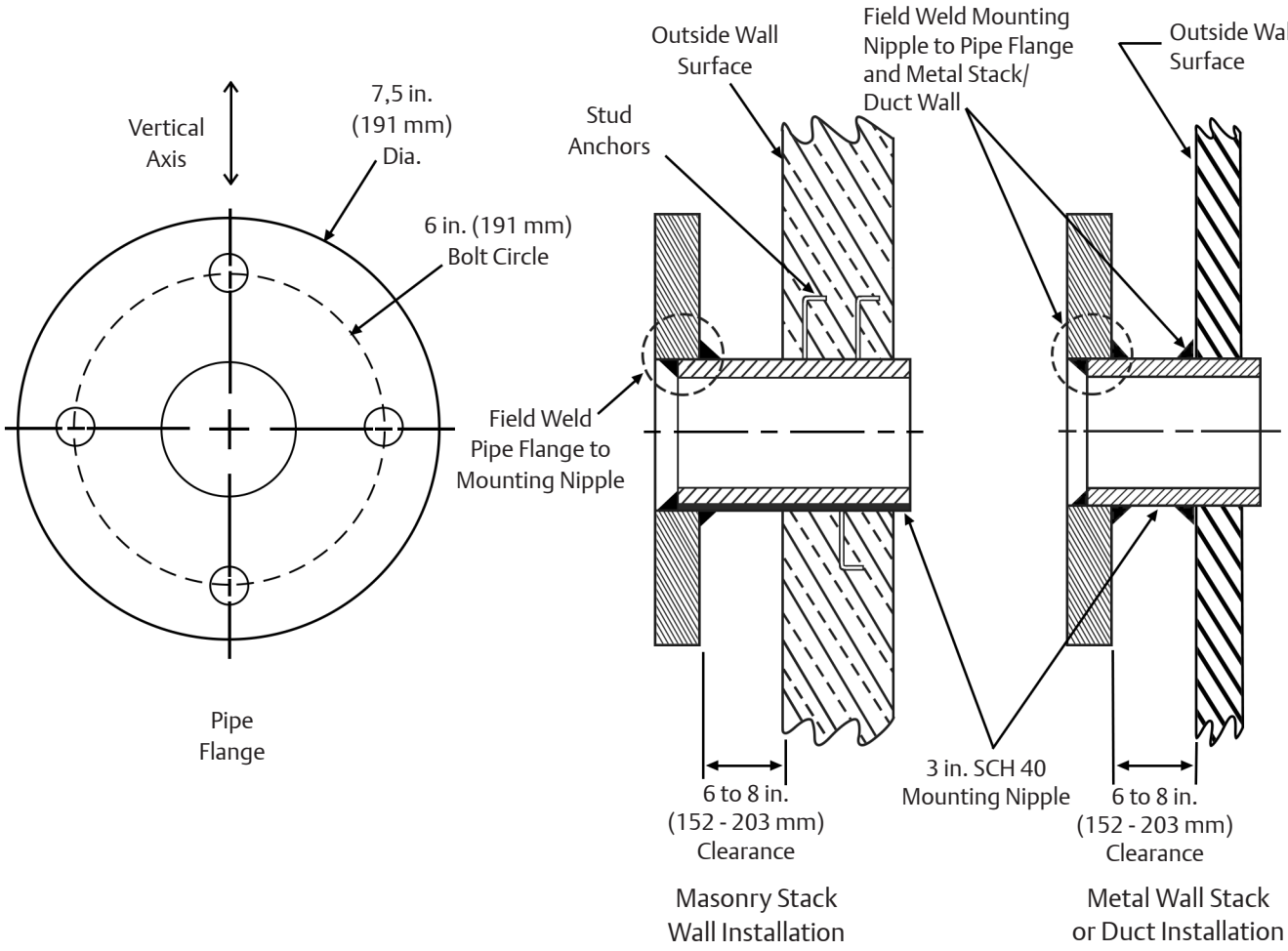
Air purge/Weather cover mechanical installation



*Note 1: *The top view represents the transceiver and retro reflector assemblies with their swing clearances. Optional weather covers are not shown.*

**Note 2: *The side view represents the installation and swing clearance dimensions for the optional weather covers.*

Flange to stack installation detail



Ordering Information

OPM 3000 Opacity/Dust Density Monitor - High performance opacity monitoring system with double-pass transmissometer.

Model	Product Description
OPM 3000	Opacity/Dust Density Monitor Non-compliant
Intelligent Electronics	
01	Basic Unit – Digital Display, (2) 4–20 mA Outputs, (6) Alarm Relays, RS 232/485, Modbus
02	Enhanced Control Unit with 5.7" LCD Color Touch Screen and SD Memory Storage
Transceiver and Path Length	
11	3–15' Path Length
12	>15–21' Path Length
13	>21–40' Path Length
14	>40–50' Path Length
Weather Cover and Blower	
00	None
01	Weather Covers
02	Weather Covers & Single Blower with Tee
03	Weather Covers & Dual Blowers
Zero Jig Type	
00	None
01	Zero Jig, 75 % Neutral Density Filter and carrying case
Calculation	
01	Opacity Calculation (%) for Standard Controller
02	Dust Density Calculation (mg/m^3) for Standard Controller
03	Opacity and Dust Density Calculation (for Enhanced Controller Only)

Ordering Information

Technical details required at time of order

Customer Company Name: _____

Location: _____

Contact: _____

NOTE: Please submit separate forms per monitor ordered.

The Opacity Monitor you have purchased will be individually built according to the information requested below. While utilizing a basic design each unit is set up and adjusted to meet the requirements set forth by your parameters. The unit is then tested based on these strict requirements to be able to perform at these parameters. If the actual parameters are in fact not the same as those stated below, the unit may need to be returned, readjusted and retested at significant cost to the customers' account. It is for this reason that we ask you to carefully fill out the information requested in this form.

NOTE: This sheet MUST be completed and submitted with purchase order. Factory requires this sheet to build product. Failure to submit this sheet will result in delay. Toll Free: +1 855 724 2638, F: +1 949 474 7250, Email: Gas.CSC@Emerson.com

Information Supplied by (name): _____

NOTE: All fields in below chart are required. Measurements must be identified with units (in, ft, mm, cm, etc.)

Description	Selection
Unit identification (i.e., boiler 1, Unit 2B, etc.):	
Stack exit I.D. (A) on page 2:	
Flange - to - Flange distance (B) on page 2:	
I.D. at measuring point (C) page 2:	
Correlate opacity to dimension (A) or to (C)?	
Blower Supply Voltage: 120/220 VAC (50/60 Hz)?	
Accessory power such as air purge blower if ordered: 120 or 220 Vac (50/60 Hz)	
(A) Stack Exit ID Measurement:	
(B) Flange-to-Flange Measurement: Min/Max: 36 inches to 46 feet (91 cm to 12 meters,) over 15 feet (4.5m) requires optional reflectors.	
(C) ID at Measuring Point: Ratio range of A/2 *C must fall between 0.3 and 1.5	

Notes:

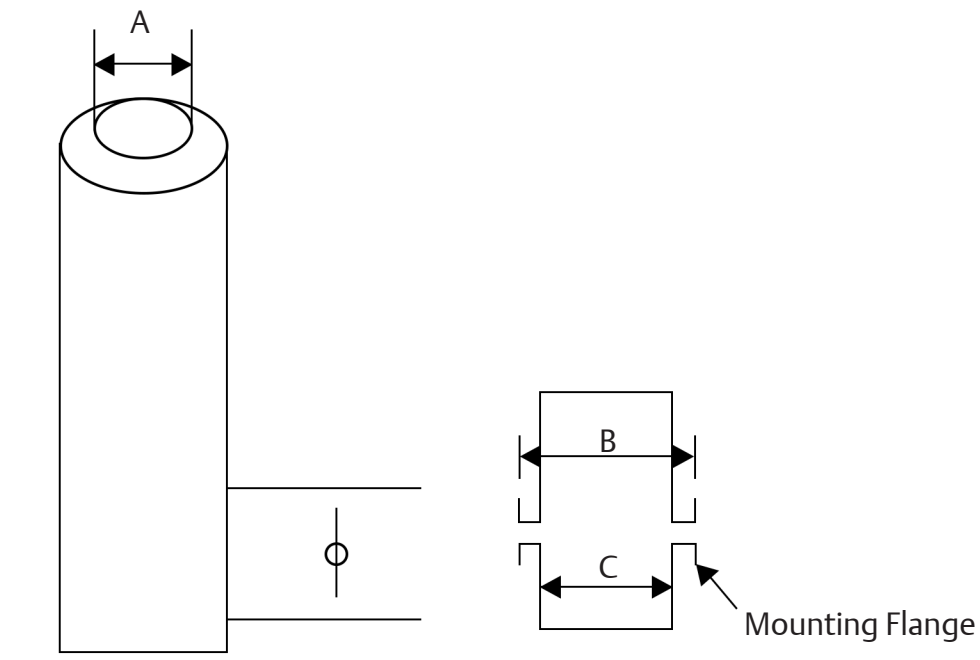
1. The stack or duct mounting flange should have a minimum O.D. of 6 inches for installation of flange bolts
2. Measurement tolerance A, B and C must be +/- 1 inch (254 mm) or 1 % of the total whichever is the smaller. In all cases the mounting flanges must be installed so that the flange-to-flange measurement (B) is greater than two (2) times the stack exit diameter (A) due to gas flow turbulence.

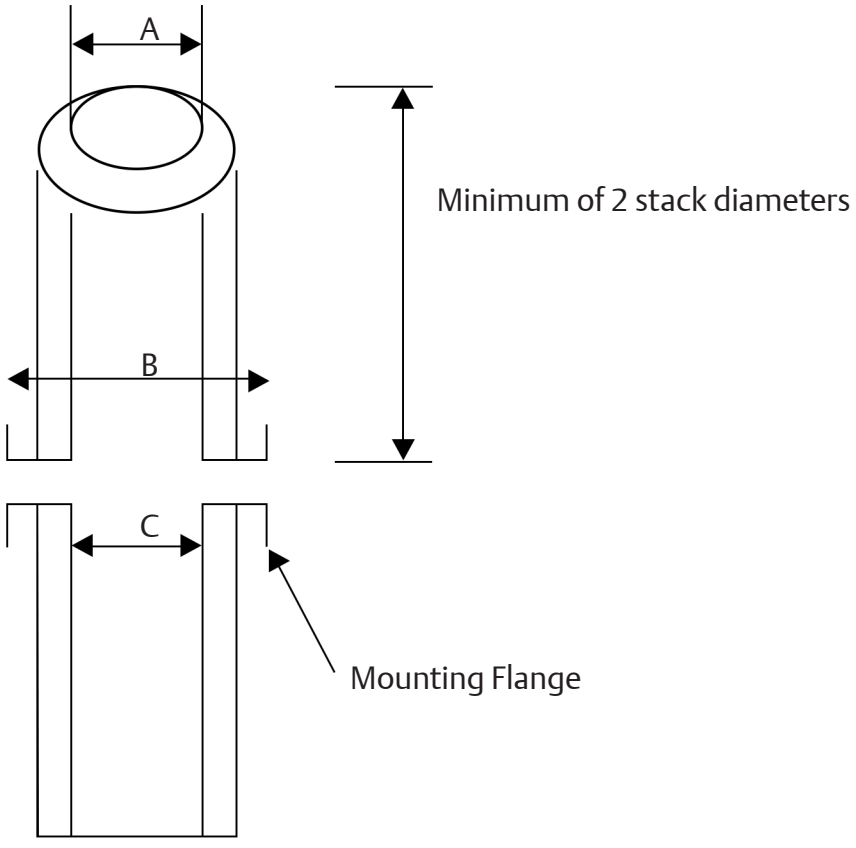
Description	Selection
Communication RS/485, Baud rate (default 9600)	
Modbus: Data Bits (default 8)	
Parity (default none)	
Flow Ctrl (default none)	
Time out (default 0.5 seconds)	
Field selectable Node I.D.# (default 1)	

NOTE: If Modbus information is not filled in, our default values will be used. Only Modbus I.D. is field selectable. Other parameters are fixed at time of final test according to the values given above or default. If changes to the communications are required after the system is shipped changes to the program must be made. All labor and shipping costs to make changes will be charged to the customer.

Ordering Information (con't)

Choose the drawing below that best fits the installation.





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