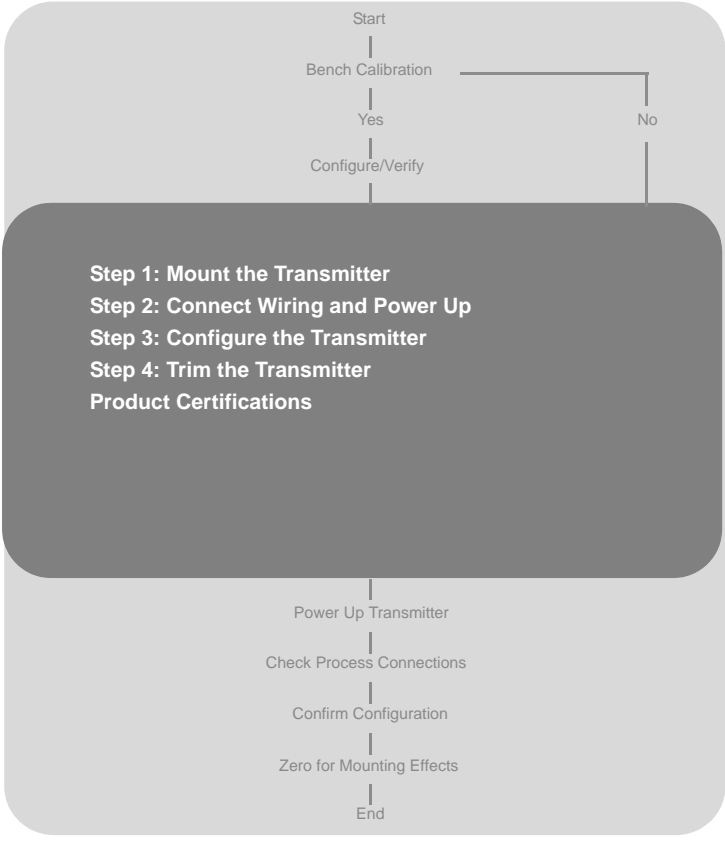


Rosemount 4600 Oil & Gas Panel Pressure Transmitter



ROSEMOUNT

www.rosemount.com



Rosemount 4600

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Rosemount Inc.

8200 Market Boulevard
Chanhassen, MN USA 55317
T (US) (800) 999-9307
T (Intl) (952) 906-8888
F (952) 949-7001

Emerson Process Management Asia Pacific Private Limited

1 Pandan Crescent
Singapore 128461
T (65) 6777 8211
F (65) 6777 0947/65 6777 0743

Emerson Process Management GmbH & Co. OHG

Argelsrieder Feld 3
82234 Wessling
Germany
T 49 (8153) 9390
F49 (8153) 939172

Beijing Rosemount Far East Instrument Co., Limited

No. 6 North Street,
Hepingli, Dong Cheng District
Beijing 100013, China
T (86) (10) 6428 2233
F (86) (10) 6422 8586

IMPORTANT NOTICE

This installation guide provides basic guidelines for Rosemount 4600 transmitter. It does not provide instructions for diagnostics, maintenance, service, troubleshooting, explosion-proof, flameproof, or intrinsically safe (I.S.) installations.

Refer to the Rosemount 4600 reference manual (document number 00809-0100-4022) for more instruction. This manual is also available electronically on www.rosemount.com

WARNING

Explosions can result in death or serious injury

- Transmitters located in hazardous areas should be installed in accordance with local codes and requirements for that area.

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and the terminals. High voltage that may be present on leads can cause electrical shock.

CAUTION

Apply torque only to the hex flat located at the process end of the transmitter. Do not apply torque to the transmitter body or electrical connection - severe damage could result. Do not exceed 100 ft-lbs.

STEP 1: MOUNT THE TRANSMITTER

Electrical Connection

1. Pull the leads through the threaded mounting hole in the panel wall.
2. Hand tighten the electrical connection into the mounting hole.
- ⚠ 3. Using a wrench on the hex flat at the process connection, apply sufficient torque to prevent transmitter vibration. Do not exceed 100 ft-lbs.

Process Connection

- ⚠ 1. Hand tighten the appropriate sized impulse piping connector into the process connection.
- ⚠ 2. Using a wrench on the hex flat at the impulse piping connection, apply enough torque to prevent process fluid leakage. Do not exceed 100 ft-lbs.

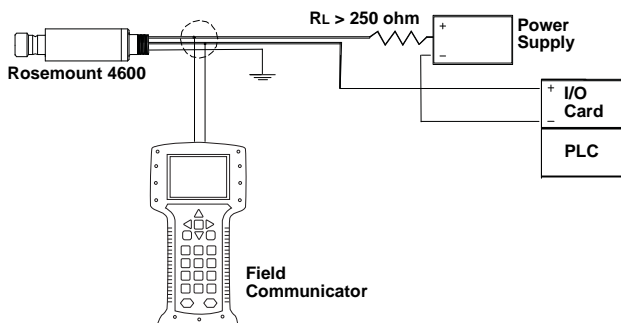
STEP 2: CONNECT THE WIRING AND POWER

Use the following steps to wire the transmitter:

1. Connect the red lead to the "+" terminal of the power supply.
2. Connect the black lead to the "-" terminal of the I/O card on the PLC.
3. Connect the green lead to panel ground.

The figure below shows the wiring connections necessary to power a Rosemount 4600 and enable communications with a hand-held Field Communicator.

Rosemount 4600 Field Wiring



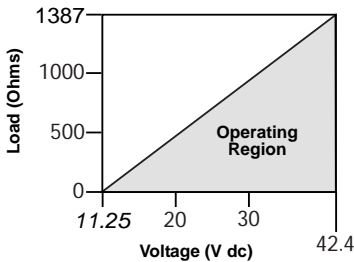
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STEP 2 CONTINUED...**Power Supply**

The dc power supply should provide power with less than two percent ripple. The total resistance load is the sum of the resistance of the signal leads and the load resistance of the controller, indicator, and related pieces. Note that the resistance of intrinsic safety barriers, if used, must be included.

Figure 1. Load Limitation

$$\text{Maximum Loop Resistance} = 43.5 * (\text{Power Supply Voltage} - 11.25)$$



The Field Communicator requires a minimum loop resistance of 250Ω for communication.

STEP 3: CONFIGURE THE TRANSMITTER

NOTE:

A check (✓) indicates the basic configuration parameters. At a minimum, these parameters should be verified as part of the configuration and startup procedure.

Table 1. Field Communicator Fast Key Sequence

Function	Fast Key Sequence
Alarm Level Config.	1, 4, 2, 7, 7
Alarm and Saturation Levels	1, 4, 2, 7
Analog Output Alarm Direction	1, 4, 2, 7, 6
Analog Output Trim	1, 2, 3, 2
Burst Mode On/Off	1, 4, 3, 3, 3
Burst Options	1, 4, 3, 3, 4
✓ Damping	1, 3, 6
Date	1, 3, 4, 1
Descriptor	1, 3, 4, 2
Digital To Analog Trim (4-20 mA Output)	1, 2, 3, 2, 1
Field Device Information	1, 4, 4, 1
Loop Test	1, 2, 2
Lower Sensor Trim	1, 2, 3, 3, 2
Message	1, 3, 4, 3
Number of Requested Preambles	1, 4, 3, 3, 2
Pressure Alert Config.	1, 4, 3, 5, 3
Poll Address	1, 4, 3, 3, 1
Poll a Multidropped Transmitter	Left Arrow, 4, 1, 1
Re-mapping	1, 4, 3, 6, 4
Rerange- Keypad Input	1, 2, 3, 1, 1
Saturation Level Config.	1, 4, 2, 7, 8
Scaled D/A Trim (4–20 mA Output)	1, 2, 3, 2, 2
Scaled Variable Config.	1, 4, 3, 4, 7
Self Test (Transmitter)	1, 2, 1, 1
Sensor Information	1, 4, 4, 2
Sensor Temperature	1, 1, 4
Sensor Trim	1, 2, 3, 3
Sensor Trim Points	1, 2, 3, 3, 5
Status	1, 2, 1, 2
✓ Tag	1, 3, 1
Temperature Alert Config.	1, 4, 3, 5, 4
Transmitter Security (Write Protect)	1, 3, 4, 5
✓ Units (Process Variable)	1, 3, 2
Upper Sensor Trim	1, 2, 3, 3, 3
Zero Trim	1, 2, 3, 3, 1

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STEP 4: TRIM THE TRANSMITTER**NOTE**

Transmitters are shipped from Emerson Process Management fully configured per request or by the factory default of full scale (span = upper range limit.)

Zero Trim

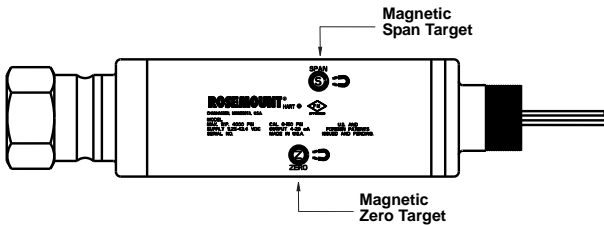
A zero trim is a single-point adjustment to compensate mounting position and sealed gauge pressure effects. When performing a zero trim, ensure the transmitter is vented to atmosphere.

Using the Field Communicator

Fast Keys	Steps
1, 3, 3, 2	1. Vent the transmitter to atmosphere and connect Field Communicator.
	2. At the main menu, input the Fast Key sequence.
	3. Follow the commands to perform a zero trim.

Using the Transmitter Zero Adjustment Target

1. Vent the transmitter.
2. Set the 4 mA point by touching the magnetic end of the provided adjustment tool to the zero target (Z) on the transmitter. You must maintain contact for at least two seconds, but no longer than ten seconds for the zero function to activate.
3. Verify that the output is 4 mA.

Local Zero and Span Target Locations

Safety Instrumented Systems

The following section applies to 4600 transmitters used in SIS applications.

NOTE

Transmitter output is not safety-rated during the following: configuration changes, multidrop, loop test. Alternative means should be used to ensure process safety during transmitter configuration and maintenance activities.

Installation

No special installation is required in addition to the standard installation practices outlined in this document.

The loop must be designed so the terminal voltage does not drop below 11.25 Vdc when the transmitter output is 22.5 mA.

Configuration

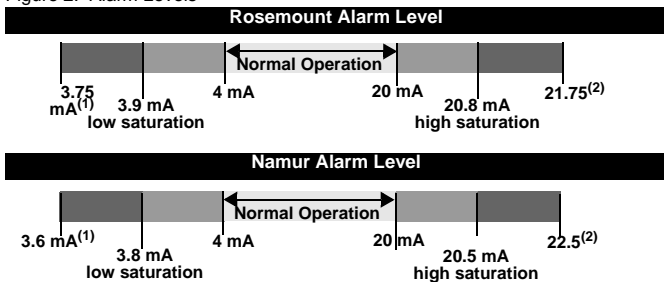
Use any HART-compliant master to communicate with and verify configuration of the 4600.

User-selected damping will affect the transmitters ability to respond to changes in the applied process. The *damping value + response time* must not exceed the loop requirements.

NOTE

DCS or safety logic solver must be configured to match transmitter configuration. Figure 2 identifies the two alarm level available and their operation values. Change the alarm direction to the required HI or LO alarm position.

Figure 2. Alarm Levels



(1) Transmitter Failure, alarm in LO position.

(2) Transmitter Failure, alarm in HI position.

Use "Table 1 Field Communicator Fast Key Sequence" to change alarm position.

NOTE

Some detected faults are indicated on the analog output at a level above high alarm regardless of the alarm selection.

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Operation and Maintenance

Proof Test and Inspection

The following proof tests are recommended. Proof test results and corrective actions taken must be documented at www.emersonprocess.com/rosemount/safety/certtechdocumentation.htm in the event that an error is found in the safety functionality.

Use "Table 1 Field Communicator Fast Key Sequence" to perform a Loop Test, Analog Output Trim, or Sensor Trim. See the 4600 reference manual (00809-0100-4022) for additional information.

Proof Test

This proof test will detect 90% of DU failures not detected by the 4600 automatic diagnostics.

1. Conduct a Loop Test. On Field Communicator enter the Fast Key Sequence 1,2,2.
 - a. Enter the milliampere value representing a high alarm state and verify that the analog current reaches that value⁽¹⁾.
 - b. Enter the milliampere value representing a low alarm state and verify that the analog current reaches that value⁽²⁾
2. Perform a two-point sensor calibration check⁽³⁾ using the 4-20mA range points as the calibration points.
 - a. If necessary, use one of the "Trim" procedures available in the 4600 reference manual to calibrate.

NOTE

The user determines the proof-test requirements for impulse piping.

Visual Inspection

Not required.

Special Tools

Not required

Product Repair

All failures detected by the transmitter diagnostics or by the proof-test must be reported.

Feedback can be submitted electronically at

www.emersonprocess.com/rosemount/safety/certtechdocumentation.htm.

Reference

Specifications

The 4600 must be operated in accordance to the functional and performance specifications provided in the 4600 reference manual.

Failure Rate Data

The FMEDA report includes failure rates. This report is available at www.rosemount.com.

4600 Safety Failure Values

Safety accuracy: 2.0%⁽⁴⁾

Safety response time- 1.5 sec

Product Life

50 years – based on worst case component wear-out mechanisms – not based on wear-out process wetted materials.

(1) This tests for compliance voltage problems such as a low loop power supply voltage or increased wiring resistance. This also tests for other possible failures.

(2) This tests for possible quiescent current related failures.

(3) If the two-point calibration is performed with electrical instrumentation, this proof tests will not detect any failures of the sensor.

(4) A 2% variation of the transmitter mA output is allowed before a safety trip. Trip values in the DCS or safety logic solver should be derated by 2%.

PRODUCT CERTIFICATIONS

Approved Manufacturing Locations

Emerson Process Management - Rosemount Inc. — Chanhassen, Minnesota, USA

Emerson Process Management GmbH & Co. — Wessling, Germany

Emerson Process Management Asia Pacific Private Limited — Singapore

European Directive Information

The EC declaration of conformity can be found on page 12. The most recent revision can be found at www.emersonprocess.com.

ATEX Directive (94/9/EC)

Emerson Process Management complies with the ATEX Directive.

European Pressure Equipment Directive (PED) (97/23/EC)

Rosemount 4600 Pressure Transmitters-
Sound Engineering Practice

EMC Directive (2004/108/EC)

All model 4600 Pressure Transmitter
EN 61326-1:2006

Hazardous Locations Certifications

North American Certifications

Factory Mutual (FM) Approvals


- E5** Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G hazardous locations;
Temperature Code T5
($T_{amb} = -40^{\circ}\text{C}$ to 85°C);
Explosion-Proof for Class 1, Zone 1 AEx d IIC
T5 ($T_{amb} = -40^{\circ}\text{C}$ to 85°C);
Enclosure Type 4X
Conduit seal not required
- I5** Intrinsically Safe for use in Class I, Division 1,
Groups A, B, C, and D;
Temperature Code T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C);
Intrinsically Safe for use in Class I, Zone 0 AEx ia IIC
T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C);
Non-incendive for Class I, Division 2, Groups A, B, C, and D;
When connected in accordance with
Rosemount drawing 04620-5007;
Enclosure Type 4X
For entity parameters see control drawing 04620-5007

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Canadian Standards Association (CSA) Approvals

- E6** Explosion-Proof for Class I, Division 1, Groups B, C, and D; dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G hazardous locations;
 Temperature Code T5 ($T_{amb} = -50^{\circ}\text{C}$ to 40°C); Explosion-proof for Class 1, Zone 1 Ex d IIC T5 ($T_{amb} = -20^{\circ}\text{C}$ to 40°C);
 Suitable for Class I, Division 2, Groups A, B, C, and D, when installed per Rosemount drawing 04620-5005;
 Enclosure Type 4X
 Conduit seal not required
- I6** Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D;
 Temperature Code T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C);
 Intrinsically Safe for use in Class I, Zone 0 Ex ia IIC T4 ($T_{amb} = -50^{\circ}\text{C}$ to 70°C);
 When connected in accordance with
 Rosemount drawing 04620-5007;
 Enclosure Type 4X
 For entity parameters see control drawing 04620-5005

European Certifications

- I1** ATEX Intrinsic Safety
 Certificate No. Baseefa03ATEX0114X
 ATEX Marking:  II 1 G
 Ex ia IIC T4 ($-40 \leq T_a \leq 70^{\circ}\text{C}$)
CE 1180
 Input Parameters (I1):
 $U_i = 30\text{V}$
 $I_i = 200\text{mA}$
 $P_i = 1.0\text{W}$
 $C_i = 35\text{nF}$
 $L_i = 390\mu\text{H}$

Special Conditions for safe use (x):

The apparatus (with T1 option) is not capable of withstanding the 500V insulation test required by Clause 6.3.12 of EN60079-11: 2007. This must be taken into account when installing the apparatus.

Quick Installation Guide

00825-0100-4022, Rev DA

July 2010

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E1 ATEX Flameproof

Certificate No. KEMA02ATEX2231X

ATEX Marking: Ⓔ II 1/2 G

Ex d IIC T6 (-40 ≤ Ta ≤ 70°C)

CE 1180

Special Conditions for safe use (x):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

The Rosemount 4600 Pressure transmitter is provided with a permanently connected unterminated cable. The free end of the cable shall be connected using a suitable junction box, e.g. in type of explosion protection flameproof enclosure "d" or increased safety "e".

N1 ATEX Non-incendive

Certificate No. Baseefa03ATEX0115X

ATEX Marking: Ⓔ II 3 G

Ex nA II T5 (-40 ≤ Ta ≤ 70°C)

U_i = 42.4V MAXIMUM

Special Conditions for safe use (x):

The apparatus (with T1 option) is not capable of withstanding the 500V insulation test required by Clause 6.8.1 of EN60079-15: 2005. This must be taken into account when installing the apparatus.

ND ATEX Dust Ignition-proof

Certificate No. KEMA02ATEX2231X

ATEX Marking: Ⓔ II 1 D

Ex tD A20 T85C (-40 ≤ T_{amb} ≤ 70°C)

IP66 / IP68

CE 1180

V = 42.4 Volts MAX

A = 24mA

Special Conditions for safe use (x):

This device contains a thin wall diaphragm. Installation, maintenance, and use shall take into account the environmental conditions to which the diaphragm will be subjected. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.

The Rosemount 4600 is provided with a permanently connected unterminated cable. The free end of the cable shall be connected using a suitable junction box, e.g. in type of explosion protection flameproof enclosure "d" or increased safety "e".

Figure 3. EC Declaration of Conformity

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EC Declaration of Conformity

No: RMD 1048 Rev. C

We,

**Rosemount Inc.
8200 Market Boulevard
Chanhassen, MN 55317-6985
USA**

declare under our sole responsibility that the product,

Model 4600 Pressure Transmitter

manufactured by,

**Rosemount Inc.
12001 Technology Drive
Eden Prairie, MN 55344-3695
USA**

and

**8200 Market Boulevard
Chanhassen, MN 55317-9687
USA**

to which this declaration relates, is in conformity with the provisions of the European Community Directives as shown in the attached schedule.

Assumption of conformity is based on the application of the harmonized standards and, when applicable or required, a European Community notified body certification, as shown in the attached schedule.

(signature)

12 - November - 2008

(date of issue)

Timothy Layer
(name - printed)

Vice President, Global Quality
(function name - printed)



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Schedule

EC Declaration of Conformity RMD 1048 Rev. C

EMC Directive (2004/108/EC)

All model 4600 Pressure Transmitters
EN 61326-1: 2006

ATEX Directive (94/9/EC)

Model 4600 Pressure Transmitter

Certificate: BAS03ATEX0114X
Intrinsically Safe- Group II Category 1 G
Ex ia IIC T4 (-50°C to +70°C)
Harmonized standards used:
EN60079-0:2006; EN60079-11:2007

Certificate: BAS03ATEX0115X
Type n- Group II Category 3 G
Ex nA II T5 (-50°C to +70°C)
Harmonized standards used:
EN60079-0:2006; EN60079-15:2005

Certificate: KEMA02ATEX2231X
Flameproof- Group II Category 1/2 G
Ex d IIC T6 (-40°C to +70°C)
Dust- Group II Category 1 D
Ex tD A21 Tamb (-40°C to +70°C)
Harmonized standards used:
EN60079-0:2006; EN60079-1:2007; EN 60079-26:2007; EN 61241-0:2006;
EN 61241-1:2004 + C11:2006



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ATEX Notified Bodies for EC Type Examination Certificates

KEMA (KEMA) [Notified Body Number: 0344]

Utrechtseweg 310, 6812 AR Arnhem

P.O. Box 5185, 6802 ED Arnhem

The Netherlands

Postbank 6794687

BASEEFA [2001] Limited [Notified Body Number: 1180]

Rockhead Business Park

Staden Lane

Buxton, Derbyshire

SK17 9RZ United Kingdom

ATEX Notified Body for Quality Assurance

BASEEFA [2001] Limited [Notified Body Number: 1180]

Rockhead Business Park

Staden Lane

Buxton, Derbyshire

SK17 9RZ United Kingdom



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