

Rosemount™ 4600 Oil & Gas Panel Pressure Transmitter



NOTICE

This guide provides basic guidelines for the Rosemount 4600 Oil & Gas Panel Pressure 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](#) for more instruction. This manual is also available electronically on Emerson.com/Rosemount.

⚠ 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.
- Connection to transmitter housing uses a 1/2-14 NPT thread form. For hazardous location installations, the 4600 shall be connected using a suitable junction box, e.g. in the type of protection flameproof enclosure “d” or increased safety “e”. Use appropriately rated Ex adapters, blanking elements, and glands during installation.
- Keep process insulation at least 1-in. [25 mm] from transmitter connection.

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.

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1.0 Mount the transmitter

1.1 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.

1.2 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.

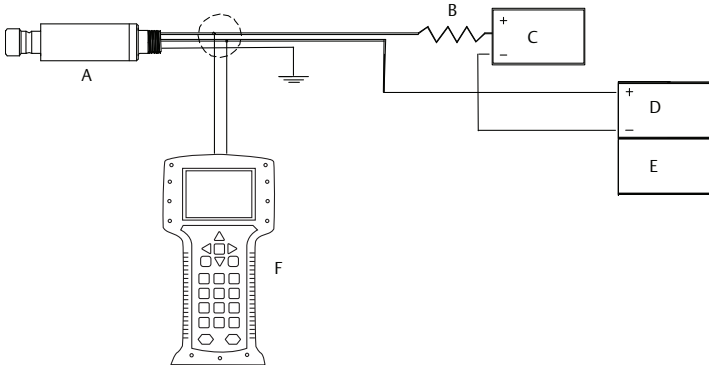
2.0 Connect the wiring and power

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.

Figure 1. Rosemount 4600 Field Wiring



A. Rosemount 4600
 B. $R_i > 250$ ohm
 C. Power supply

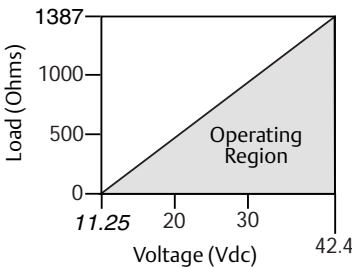
D. I/A card
 E. PLC
 F. Field Communicator

2.1 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 2. Load Limitation

Maximum Loop Resistance = 43.5 (Power Supply Voltage – 11.25)



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

3.0 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

Table 1. Field Communicator Fast Key Sequence

Function	Fast Key sequence
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

4.0 Trim the transmitter

Note

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

4.1 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.

4.2 Using the Field Communicator

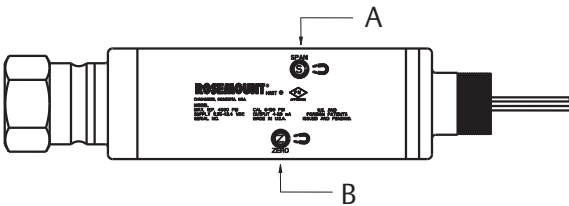
Fast Keys	1, 3, 3, 2
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1. Vent the transmitter to atmosphere and connect Field Communicator.
2. At the main menu, input the Fast Key sequence.
3. Follow the commands to perform a zero trim.

4.3 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 10 seconds for the zero function to activate.
3. Verify the output is 4 mA.

Figure 3. Local Zero and Span Target Locations



- A. Magnetic span target
B. Magnetic zero target

5.0 Safety Instrumented Systems

The following section applies to Rosemount 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

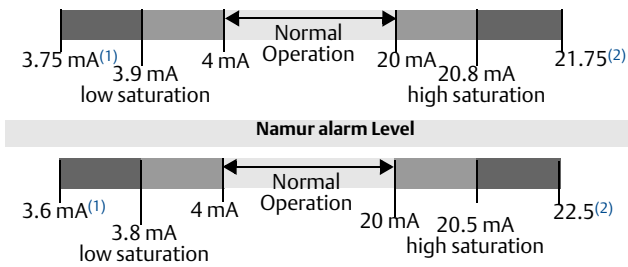
Use any HART® compliant master to communicate with and verify configuration of the Rosemount 4600.

User-selected damping will affect the transmitter's 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 4](#) identifies the two alarm levels available and their operation values. Change the alarm direction to the required HI or LO alarm position.

Figure 4. Alarm Levels



1. Transmitter Failure, alarm in LO position.
2. Transmitter Failure, alarm in HI position.

Reference [Table 1](#) for the Fast Keys 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.

6.0 Operation and maintenance

Proof test and inspection

The following proof tests are recommended. Proof test results and corrective actions taken must be documented at Emerson.com/Rosemount/Safety-Products/Equipment-List in the event that an error is found in the safety functionality.

Reference [Table 1](#) for the Fast Keys to perform a Loop Test, Analog Output Trim, or Sensor Trim. See the Rosemount 4600 [Reference Manual](#) for additional information.

Proof test

This proof test will detect 90 percent of DU failures not detected by the Rosemount 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 4–20 mA range points as the calibration points.
 - a. If necessary, use one of the trim procedures available in the Rosemount 4600 [Reference Manual](#) to calibrate.

Note

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

Product repair

All failures detected by the transmitter diagnostics or by the proof-test must be reported. Feedback can be submitted electronically at Emerson.com/Rosemount/Safety-Products/Equipment-List

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 test will not detect any failures of the sensor.

6.1 Reference

Specifications

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

Failure rate data

The FMEDA report includes failure rates. This report is available at Emerson.com/Rosemount.

Rosemount 4600 safety failure values

Safety accuracy: 2.0%⁽¹⁾

Safety response time- 1.5 seconds

Product life

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

1. A two percent 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 two percent.

7.0 Product Certifications

Rev 1.5

7.1 European directive information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at Emerson.com/Rosemount.

7.2 Ordinary Location Certification

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

North America

- E5** US Explosionproof (XP) and Dust-Ignitionproof (DIP)
 Certificate: 3012302
 Standards: FM Class 3600 - 2011; Class 3615 - 2006; FM Class 3810 - 2005; NEMA 250 - 1991; ANSI/ISA-S12.0.01 - 1998; ANSI/ISA-S12.22.01 - 1998; ANSI/ISA-60079-0 - 2009
 Markings: Explosionproof for Class I, Division 1, Groups B, C, and D; Flameproof for Class 1, Zone 1 AEx d IIC T5 (-40 °C to 85 °C); Dust-ignition proof for Class II and Class III, Division 1, Groups E, F, and G; Temperature Code T5 ($T_{amb} = -40\text{ °C to }85\text{ °C}$); Enclosure Type 4X; Conduit seal not required.
- I5** US Intrinsic Safety (IS), Nonincendive (NI)
 Certificate: 3012302
 Standards: FM Class 3600 - 2011; Class 3610 - 2010; Class 3611-2004; NEMA 250 - 1991; ANSI/ISA-S12.0.01 - 1998; ANSI/ISA-S12.22.01 - 1998; ANSI/ISA-60079-0-2009; ANSI/ISA-60079-11 - 2009
 Markings: Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D; Temperature Code T4 (-50 °C to 70 °C); Intrinsically Safe for use in Class I, Zone 0 AEx ia IIC T4 (-50 °C to 70 °C) in accordance with control drawing 04620-5007; Nonincendive for Class I, Division 2, Groups A, B, C, and D when connected in accordance with Rosemount drawing 04620-5007; Enclosure Type 4X
- E6** Canada Explosionproof and Division 2
 Certificate: 1384913
 Standards: CSA Std C22.2 No. 25-1966; CSA Std C22.2 No. 30-M1986; CAN/CSA-C22.2 No. 94-M91; CSA Std C22.2 No. 142-M1987; CAN/CSA-C22.2 No. 157-92; CSA Std C22.2 No. 213-M1987; CAN/CSA-E79-0-95; CAN/CSA-E79-1-95; CAN/CSA-E79-11-95; ANSI/ISA No. 12.27.01-2011
 Markings: Explosionproof for Class I, Division 1, Groups B, C, and D; Dust-Ignitionproof for Class II and Class III, Division 1, Groups E, F, and G; Temperature Code T5 (-50 °C to 40 °C); Explosion-proof for Class 1, Zone 1 Ex d IIC T5 (-20 °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 Canada Intrinsic Safety

Certificate: 1384913


Standards: CSA Std C22.2 No. 25-1966; CSA Std C22.2 No. 30-M1986;
 CAN/CSA-C22.2 No. 94-M91; CSA Std C22.2 No. 142-M1987;
 CAN/CSA-C22.2 No. 157-92; CSA Std C22.2 No. 213-M1987;
 CAN/CSA-E79-0-95; CAN/CSA- E79-1-95; CAN/CSA- E79-11-95;
 ANSI/ISA No. 12.27.01-2011

Markings: Intrinsically Safe for use in Class I, Division 1, Groups A, B, C, and D;
 Temperature Code T3C (-50 °C to 70 °C); Intrinsically Safe for use in Class I,
 Zone 0 Ex ia IIC T4 (-50 °C to 70 °C) when connected in accordance with
 Rosemount drawing 04620-5005; Enclosure Type 4X; For entity parameters
 see control drawing 04620-5005

Europe**E1** ATEX Flameproof

Certificate: KEMA02ATEX2231X

Standards: EN60079-0:2006; EN60079-1:2014; EN60079-26:2015;

Markings:  II 1/2 G Ex db IIC T6...T4 Ga/Gb T4/T5 (-60 °C ≤ T_a ≤ +80 °C),
 T6 (-60 °C ≤ T_a ≤ +70 °C)

Special Conditions for Safe Use (X):

1. The device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between Category 1 (process connection) and Category 2 (all other parts of the equipment). The model code and data sheet are to be consulted for details of the diaphragm material. During installation, maintenance, and use the environmental conditions to which the diaphragm will be subjected shall be taken into account. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. Flameproof joints are not intended for repair.

I1 ATEX Intrinsic Safety

Certificate: Baseefa03ATEX0114X

Standards: EN60079-0: 2012+A11:3013, EN60079-11:2012

Markings:  II 1 G Ex ia IIC T4 Ga (-40 °C ≤ T_a ≤ +70 °C)

Parameters	HART
Voltage U _i	30 V
Current I _i	200 mA
Power P _i	1.0 W
Capacitance C _i	35 nF
Inductance L _i	390 μH

Special Condition for Safe Use (X):

1. The equipment with the Transient Protection (T1) option is not capable of withstanding the 500 V insulation test required by Clause 6.3.13 of EN60079-11:2012. This must be taken into account when installing the equipment.

N1 ATEX Type n

Certificate: Baseefa03ATEX0115X

Standards: EN60079-0:2012+A11:2013, EN60079-15:2010

Markings:  II 3G Ex nA IIC T5 Gc (-40 °C ≤ T_a ≤ +70 °C)U_i = 42.4V


Special Condition for Safe Use (X):

1. The equipment with the Transient Protection (T1) option is not capable of withstanding the 500 V insulation test required by Clause 6.5.1 of EN60079-15:2010. This must be taken into account when installing the equipment.

ND ATEX Dust Ignition-proof

Certificate: KEMA02ATEX2231X

Standards: EN60079-0:2012+A11:2013, EN 60079-31:2014

Markings:  II 2 D Ex tb IIIC T135 °C Db (-60 °C ≤ T_a ≤ +80 °C)**Special Conditions for Safe Use (X):**

1. The device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between Category 1 (process connection) and Category 2 (all other parts of the equipment). The model code and data sheet are to be consulted for details of the diaphragm material. During installation, maintenance, and use the environmental conditions to which the diaphragm will be subjected shall be taken into account. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. Flameproof joints are not intended for repair.

International**E7** IECEx Flameproof and Dust

Certificate: IECEx DEK 13.0017X

Standards: IEC 60079-0:2011; IEC 60079-1:2014; IEC 60079-26:2014; IEC 60079-31:2013

Markings: Ex db IIC T6...T4 Ga/Gb T4/T5(-60 °C ≤ T_a ≤ +80 °C), T6 (-60 °C ≤ T_a ≤ +70 °C)
Ex tb IIIC T135 °C Db (-60 °C ≤ T_a ≤ +80 °C)**Special Conditions for Safe Use (X):**

1. The device contains a thin wall diaphragm less than 1 mm thick that forms a boundary between Category 1 (process connection) and Category 2 (all other parts of the equipment). The model code and data sheet are to be consulted for details of the diaphragm material. During installation, maintenance, and use the environmental conditions to which the diaphragm will be subjected shall be taken into account. The manufacturer's instructions for installation and maintenance shall be followed in detail to assure safety during its expected lifetime.
2. Flameproof joints are not intended for repair.

Brazil**E2** INMETRO Flameproof

Certificate: UL-BR 15.0509X

Standards: ABNT NBR IEC 60079-0: ABNT NBR IEC 60079-1:
ABNT NBR IEC 60079-26.Markings: Ex d IIC Ga/Gb, T6(-60 °C ≤ T_a ≤ +70 °C), T5/T4(-60 °C ≤ T_a ≤ +80 °C)**Special Condition for Safe Use (X):**

1. 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 in order to assure safety during its expected lifetime.

Technical Regulations Customs Union (EAC)

EM EAC Flameproof

Certificate: RU C-US.GB05.B.00401

Markings: Ga/Gb Ex d IIC T6...T4 X, T6(-60 °C ≤ T_a ≤ +70 °C), T4/T5(-60 °C ≤ T_a ≤ +80 °C)**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

IM EAC Intrinsically Safe

Certificate: RU C-US.GB05.B.00401

Markings: 0Ex ia IIC T4 Ga X (-40 °C ≤ T_a ≤ +70 °C)**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

Combinations

K1 Combination of E1, I1, and N1**K5** Combination of E5 and I5**K6** Combination of E6 and I6**KA** Combination of E1, I1, E6, and I6**KB** Combination of E5, E6, I5, and I6**KC** Combination of E1, E5, I1, and I5**KM** Combination of EM and IM

Figure 5. Rosemount 4600 Declaration of Conformity

CE

EU Declaration of Conformity
No: RMD 1048 Rev. H

We,

Rosemount Inc.
8200 Market Boulevard
Chanhasen, MN 55317-9685
USA

declare under our sole responsibility that the product,


Rosemount 4600 Pressure Transmitters

manufactured by,

Rosemount Inc.
8200 Market Boulevard
Chanhasen, MN 55317-9685
USA

to which this declaration relates, is in conformity with the provisions of the European Union Directives, including the latest amendments, 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 Union notified body certification, as shown in the attached schedule.



(signature)

Vice President of Global Quality

(function name - printed)

Chris LaPoint

(name - printed)

13-September-2017

(date of issue)

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Document Rev: 2016_G



EU Declaration of Conformity

No: RMD 1048 Rev. H

EMC Directive (2014/30/EU)

All Models 4600 Pressure Transmitters
EN 61326-1:2013, EN 61326-2-3:2013

ATEX Directive (2014/34/EU)

Model 4600 Pressure Transmitter

Baseefa03ATEX0114X - Intrinsic Safety Certificate

Equipment Group II Category 1 G
Ex ia IIC T4 Ga
Harmonized Standards Used:
EN60079-0:2012, EN60079-11:2012,

Baseefa03ATEX0115X - Type n Certificate

Equipment Group II Category 3 G
Ex nA IIC T5 Gc
Harmonized Standards Used:
EN60079-0:2012, EN60079-15:2010

KEMA02ATEX2231X – Flameproof and Dust Certificate

Equipment Group II Category 1/2 G
Ex db IIC T6...T4 Ga/Gb
Equipment Group II Category 2 D
Ex tb IIIC T135°C Db
Harmonized Standards Used:
EN60079-0:2012+A11:2013, EN60079-1:2014, EN60079-26:2015,
EN60079-31:2014

EU Declaration of Conformity

No: RMD 1048 Rev. H



ATEX Notified Bodies for EC Type Examination Certificate

DEKRA [Notified Body Number: 0344]
Utrechtseweg 310, 6812 AR Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
Postbank 6794687

SGS Baseefa Limited [Notified Body Number: 1180]
Rockhead Business Park
Staden Lane
Buxton, Derbyshire
SK17 9RZ United Kingdom

ATEX Notified Body for Quality Assurance

SGS Baseefa Limited [Notified Body Number: 1180]
Rockhead Business Park
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Buxton, Derbyshire
SK17 9RZ United Kingdom

含有China RoHS管控物质超过最大浓度限值的部件型号列表 Rosemount 4600
List of Rosemount 4600 Parts with China RoHS Concentration above MCVs

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
传感器组件 Sensor Assembly	X	O	O	O	O	O

本表格系依据SJ/T11364的规定而制作。

This table is proposed in accordance with the provision of SJ/T11364.

O: 意为该部件的所有均质材料中该有害物质的含量均低于GB/T 26572所规定的限量要求。

O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

X: 意为在该部件所使用的所有均质材料里，至少有一类均质材料中该有害物质的含量高于GB/T 26572所规定的限量要求。

X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.



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NEMA is a registered trademark and service mark of the National Electrical Manufacturers Association.

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