

# Emerson™ Smart Wireless Field Link



**NOTICE**

This guide provides basic guidelines for the Smart Wireless Field Link. It does not provide instructions for diagnostics, maintenance, service, or troubleshooting. This guide is also available electronically on [www.emersonprocess.com](http://www.emersonprocess.com).

**⚠ WARNING**

**Failure to follow these installation guidelines could result in death or serious injury.**

- Make sure only qualified personnel perform the installation.

**Explosions could result in death or serious injury.**

- Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the Product Certifications section for any restrictions associated with a safe installation.

**Electrical shock can result in death or serious injury.**

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

**This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:**

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.
- This device must be installed to ensure a minimum antenna separation distance of 8-in. (20 cm) from all persons.

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# 1.0 Wireless considerations

## 1.1 Power up sequence

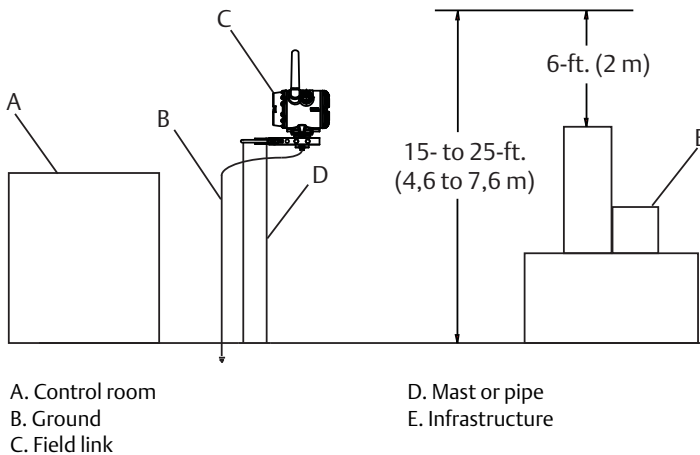
The Smart™ Wireless Field Link and wireless I/O should be installed and functioning properly before the power modules are installed in any wireless field devices. Wireless field devices should also be powered up in order of proximity from the Field Link beginning with the closest. This will result in a simpler and faster network installation.

## 1.2 Mounting location

The Field Link should be mounted in a location that allows convenient access to the host system network (wireless I/O) as well as the wireless field device network.

Find a location where the Field Link has optimal wireless performance. Ideally this will be 15 to 25 ft. (4,6 to 7,6 m) above the ground or 6 ft. (2 m) above obstructions or major infrastructure.

**Figure 1. Mounting Location**

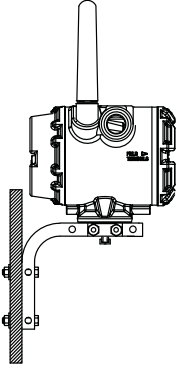


### 1.3 Antenna position

The antenna should be positioned vertically, either straight up or straight down, and should be approximately 3 ft. (1 m) from any large structure, building, or conductive surface to allow for clear communication to other devices.

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**Figure 2. Antenna Position**



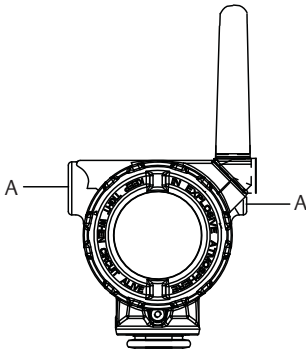
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### 1.4 Conduit plug

The temporary orange plugs should be replaced with the included conduit plugs using approved thread sealant.

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**Figure 3. Conduit Plugs**



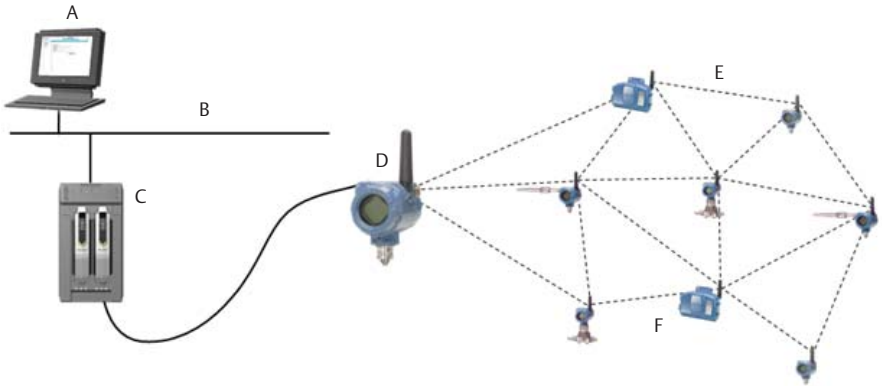
A. Conduit plug

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## 1.5 Intended use

The Field Link must be used in conjunction with a network manager or network Gateway. The Field Link then functions as a translator between the wired network and a wireless field network.

**Figure 4. Example System Architecture**



A. Host system  
B. Control network  
C. Network manager

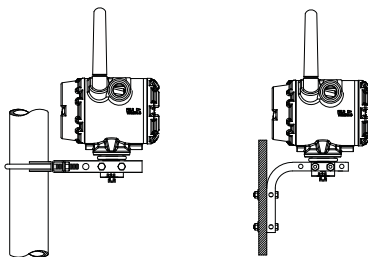
D. Field link  
E. Wireless field network  
F. Wireless field devices

## 2.0 Physical installation

### 2.1 Pipe mounting

1. Insert larger U-bolt around 2 in. pipe/mast, through the saddle, through the L-shaped bracket, and through the washer plate.
2. Use a 1/2-in. socket-head wrench to fasten the nuts to the U-bolt.
3. Insert smaller U-bolt around base the Field Link and through the L-shaped bracket.
4. Use a 1/2-in. socket-head wrench to fasten the nuts to the U-bolt.

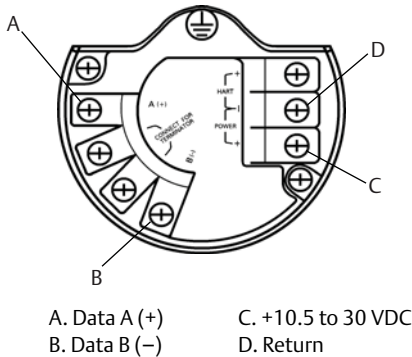
**Figure 5. Mounting**



## 2.2 Power and data wiring

1. Remove housing cover labeled “Field Terminals.”
2. Connect the positive power lead to the “+” power terminal and the negative power lead to the “-” terminal.
3. Connect the Data + lead to the “A (+)” terminal and the Data - lead to the “B (-)” terminal.
4. Plug and seal any unused conduit connections.
5. Replace the housing cover.

**Figure 6. Smart Wireless Field Link Terminal Diagram**



## 2.3 Grounding

The Field Link enclosure should always be grounded in accordance with national and local electrical codes. The most effective grounding method is a direct connection to earth ground with minimal impedance. Ground the Field Link by connecting the external ground lug to earth ground. The connection should be 1  $\Omega$  or less.

## 3.0 Verify operation

### 3.1 Power-up sequence

Upon applying power to the Field link the LCD display meter will activate and display a series of startup screen. The following screens are displayed during startup.

1. Startup Screen 1 – All segments on
2. Startup Screen 2 – Device Identification
3. Startup Screen 3 – Tag
4. Startup Screen 4 – Status

## 3.2 Normal operation

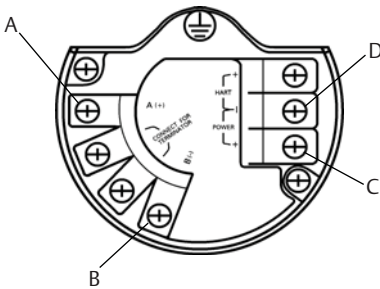
After the initial startup screens the Field Link will cycle through several periodic screens.

1. Electronics Temperature Screen
2. Percent Range Screen
3. Wired Interface Usage
4. Radio Interface Usage

The Field Link will continue to rotate through each periodic screen through the course of normal operation. If any diagnostic or fault condition occurs, a corresponding diagnostics screen will appear.

## 4.0 Reference information

**Figure 7. Smart Wireless Field Link Terminal Diagram**



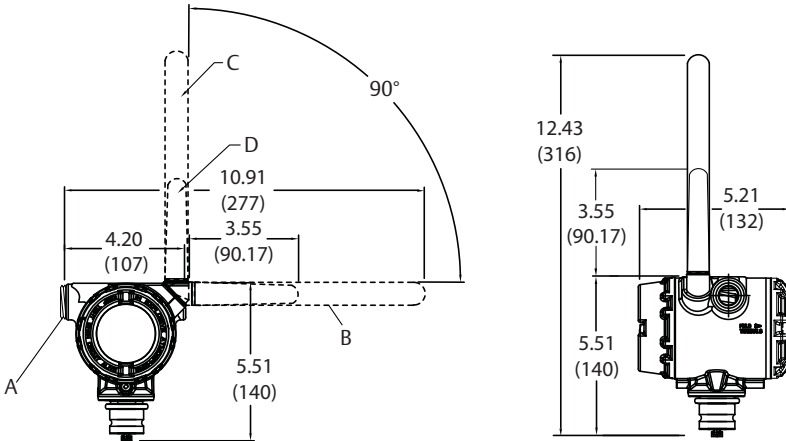
A. Data A (+)  
B. Data B (-)

C. +10.5 to 30 VDC  
D. Return

### Note

The Smart Wireless Field Link requires separate twisted shield pairs (four wires) for power and data.

**Figure 8. Smart Wireless Field Link Dimensional Drawing**



A. 23 Conduit plug

B. Possible antenna rotation shown

C. Extended range antenna

D. *WirelessHART*<sup>®</sup> antenna

**Table 1. Smart Wireless Field Link Specifications**

Item	Specifications
Input Power	10.5 – 30 VDC
Operating Temperature	–40 to 185 °F (–40 to 85 °C)
Wiring (Power)	24 AWG - 14 AWG twisted shielded pair <sup>(1)</sup>
Wiring (RS-485 Communications)	24 AWG - 14 AWG twisted shielded pair <sup>1</sup> Less than 15 pF/ft capacitance.
Wiring Distance	656 ft. (200 m)
Wireless Protocol	<i>WirelessHART</i> , 2.4 – 2.5 GHz DSSS
Wireless Output Power, EIRP	10 dBm with WK antenna and 12.5 dBm with WM antenna
Mounting	All SST, 2-in. pipe and panel mount bracket
Humidity	0 – 90% relative humidity

1. Ambient temperatures above 60 °C require wiring rated to at least 5 °C above max ambient temperature.



## 5.0 Ordering information

**Table 2. Smart Wireless Field Link**

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	Product description	
781	Smart Wireless Field Link	
<b>Physical connection</b>		
A1	RS485	★
<b>Housing</b>		
D	Dual compartment housing - Aluminum	★
E	Dual compartment housing - Stainless Steel	★
<b>Conduit threads</b>		
1	1/2 – 14 NPT	★
2	M20	★
<b>Product certifications</b>		
I5	FM Intrinsically Safe, Non-incendive	★
I6	CSA Intrinsically Safe	★
I1	ATEX Intrinsically Safe	★
I7	IECEx Intrinsic Safety	★
KL	FM & CSA Class 1 Division 1, ATEX Zone 0 Intrinsically Safe	★
NA	No Approvals	★
<b>Wireless update rate, operating frequency and protocol</b>		
WA3	User configurable update rate, 2.4 GHz DSSS, <i>WirelessHART</i>	★
<b>Omnidirectional wireless antenna and SmartPower™</b>		
WK3	External antenna, line power 10 – 30 VDC	★
WM3	Extended range, external antenna, line power 10 – 30 VDC	★

### Options (Include with selected model number)

<b>Meter</b>		
M5	LCD display	★
<b>Gland and connector options</b>		
G2	Cable gland (7,5 mm – 11,9 mm)	
G4	Thin wire cable gland (3 mm – 8 mm)	
<b>Typical model number: 781 A1 D 1 KL WA3 WK3 M5</b>		

## 6.0 Product Certifications

Rev 1.1

### 6.1 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 [www.rosemount.com](http://www.rosemount.com).

### 6.2 Ordinary Location Certification

As standard, the transmitter has been examined and tested to determine 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).

### 6.3 Installing in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

#### USA

##### 15 USA Intrinsically Safe (IS), Nonincendive (NI) and Dust-ignitionproof

Certificate: FM 3040398

Standards: FM Class 3600 – 1998, FM Class 3610 – 2010, FM Class 3611 – 2004,

FM Class 3810 – 2005, ANSI/NEMA 250 – 2003, ANSI/IEC 60529 – 2004;

Markings: IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III T4;

Class 1, Zone 0 AEx ia IIC T4;

NI CL I, DIV 2, GP A, B, C, D T4;

DIP CL II, DIV 1, GP E, F, G; CL III T4;

when installed per drawing 00781-1010

T4(-40 °C ≤ T<sub>a</sub> ≤ +70 °C)

Input parameters (power terminals)	Input parameters (sensor terminals)	Output parameters (sensor terminals)
$V_{MAX}/U_i = 30 \text{ V}$	$V_{MAX}/U_i = 11 \text{ V}$	$V_{oc}/U_o = 7.14 \text{ V}$
$I_{MAX}/I_i = 200 \text{ mA}$	$I_{MAX}/I_i = 300 \text{ mA}$	$I_{sc}/I_o = 112 \text{ mA}$
$P_{MAX}/P_i = 1 \text{ W}$	$P_{MAX}/P_i = 1 \text{ W}$	$P_{MAX}/P_o = 640 \text{ mW}$
$C_i = 10 \text{ nF}$	$C_i = 5 \text{ nF}$	$C_d/C_o = 10 \text{ nF}$
$L_i = 3.3 \text{ } \mu\text{H}$	$L_i = 2.2 \text{ } \mu\text{H}$	$L_a/L_o = 3.3 \text{ } \mu\text{H}$

#### Special Conditions for Safe Use (X):

1. The Model 781 transmitter housing contains aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact and friction.
2. The surface resistivity of the unit is greater than 1 gigaohm. To avoid electrostatic charge buildup, it must not be rubbed or cleaned with solvents or a dry cloth.
3. The Model 781 transmitter will not pass the 500 Vrms electric strength test and this must be taken into account during installation.

## Canada

### I6 Canada Intrinsically Safe

Certificate: CSA 2330424

Standards: CSA C22.2 No. 0-10, CSA C22.2 No.94-M91, CSA Std. C22.2 No. 142-1987, CSA-C22.2 No. 157-92, CSA Std. C22.2 No. 60529 – 2005


Markings: Intrinsically Safe Class I, Division 1, Groups A, B, C, and D T3C ( $T_a \leq +60\text{ }^\circ\text{C}$ )  
Type 4X; IP 66/67; when installed per 00781-1011

## Europe

### I1 ATEX Intrinsic Safety

Certificate: Baseefa11ATEX0059X

Standards: EN 60079-0: 2009, EN 60079-11: 2007

Markings:  II 1 G Ex ia IIC T4 Ga, T4( $-40\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$ )

Input parameters (power terminals)	Input parameters (RS485)	Output parameters (RS485)
$U_i = 30\text{ V}$	$U_i = 11\text{ V}$	$U_o = 7.14\text{ V}$
$I_i = 200\text{ mA}$	$I_i = 300\text{ mA}$	$I_o = 112\text{ mA}$
$P_i = 1\text{ W}$	$P_i = 1\text{ W}$	$P_o = 1\text{ W}$
$C_i = 0\text{ }\mu\text{F}$	$C_i = 5.1\text{ nF}$	$C_o = 13.9\text{ }\mu\text{F}$
$L_i = 0\text{ mH}$	$L_i = 0\text{ mH}$	$L_o = 1000\text{ }\mu\text{H}$

### Special Conditions for Safe Use (X):

1. The plastic antenna may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth.
2. The Model 781 enclosure is made of aluminum alloy and given a protective paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 environment.
3. The apparatus is not capable of withstanding the 500 V isolation test required by EN 60079-11:2007 Clause 6.3.12. This must be taken into account when installing the apparatus.

## International

### I7 IECEx Intrinsic Safety

Certificate: IECEx BAS 11.0026X

Standards: IEC 60079-0: 2004, IEC 60079-0: 2007-10, IEC 60079-11: 2006

Markings: Ex ia IIC T4 Ga, T4( $-40\text{ }^\circ\text{C} \leq T_a \leq +70\text{ }^\circ\text{C}$ )

Input parameters (power terminals)	Input parameters (RS485)	Output parameters (RS485)
$U_i = 30\text{ V}$	$U_i = 11\text{ V}$	$U_o = 7.14\text{ V}$
$I_i = 200\text{ mA}$	$I_i = 300\text{ mA}$	$I_o = 112\text{ mA}$
$P_i = 1\text{ W}$	$P_i = 1\text{ W}$	$P_o = 1\text{ W}$
$C_i = 0\text{ }\mu\text{F}$	$C_i = 5.1\text{ nF}$	$C_o = 13.9\text{ }\mu\text{F}$
$L_i = 0\text{ mH}$	$L_i = 0\text{ mH}$	$L_o = 1000\text{ }\mu\text{H}$

**Special Conditions for Safe Use (X):**

1. The plastic antenna may present a potential electrostatic ignition hazard and must not be rubbed or cleaned with a dry cloth.
2. The Model 781 enclosure is made of aluminum alloy and given a protective paint finish; however, care should be taken to protect it from impact or abrasion if located in a zone 0 environment
3. The apparatus is not capable of withstanding the 500 V isolation test required by EN 60079-11:2007 Clause 6.3.12. This must be taken into account when installing the apparatus.

**China****I3** China Intrinsic Safety

Certificate: GYJ13.1444X

Standards: GB3836.1-2010, GB3836.4-2010, GB3836.20-2010

Markings: Ex ia IIC T4 Ga, -40 ~ + 70 °C

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

**EAC – Belarus, Kazakhstan, Russia****IM** Technical Regulation Customs Union (EAC) Intrinsic Safety

Certificate: RU C-US.Gb05.B.00643

Markings: 0Ex ia IIC T4 Ga X




Input parameters (power terminals)	Input parameters (RS485)	Output parameters (RS485)
$U_i = 30 \text{ B}$	$U_i = 11 \text{ B}$	$U_o = 7.14 \text{ B}$
$I_i = 200 \text{ mA}$	$I_i = 300 \text{ mA}$	$I_o = 112 \text{ mA}$
$P_i = 1 \text{ BT}$	$P_i = 1 \text{ BT}$	$P_o = 1 \text{ BT}$
$C_i = 0 \text{ мкФ}$	$C_i = 5.1 \text{ нФ}$	$C_o = 13.9 \text{ мкФ}$
$L_i = 0 \text{ мГн}$	$L_i = 0 \text{ мГн}$	$L_o = 0 \text{ мГн}$

**Special Condition for Safe Use (X):**

1. See certificate for special conditions.

**Combinations****KD** Combination of I1, I5, and I6**KL** Combination of I1, I5, I6, and I7

Figure 9. Rosemount 781 Declaration of Conformity

 	
<b>EU Declaration of Conformity</b> No: RMD 1083 Rev. F	
<p>We,</p> <p><b>Rosemount, Inc.</b>  <b>8200 Market Boulevard</b>  <b>Chanhasen, MN 55317-9685</b>  <b>USA</b></p> <p>declare under our sole responsibility that the product,</p> <p style="text-align: center;"><b>Rosemount 781 Wireless Field Link</b></p> <p>manufactured by,</p> <p><b>Rosemount, Inc.</b>  <b>8200 Market Boulevard</b>  <b>Chanhasen, MN 55317-9685</b>  <b>USA</b></p> <p>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.</p> <p>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.</p>	
 _____ (signature)	Vice President of Global Quality _____ (function)
Chris LaPoint _____ (name)	6-June-2017 _____ (date of issue)
Page 1 of 3	



# EU Declaration of Conformity



No: RMD 1083 Rev. F

## EMC Directive (2014/30/EU)

Harmonized Standards:  
EN 61326-1:2013

## Radio Equipment Directive (RED) (2014/53/EU)

Harmonized Standards:  
EN 300 328: V2.1.1  
EN 301 489-17: V3.2.0  
EN 60950-1: 2006+A11+A12+A1+A2  
EN 50371:2002

## ATEX Directive (2014/34/EU)

### Baseefa11ATEX0059X – Intrinsic Safety Certificate

Equipment Group II, Category 1 G  
Ex ia IIC T4 Ga

Standards Used:

EN 60079-0: 2009 (A review against EN60079-0:2012, which is harmonized, shows no significant changes relevant to this equipment so EN60079-0:2009 continues to represent “State of the Art”)  
EN 60079-11: 2007 (A review against EN60079-11:2012, which is harmonized, shows no significant changes relevant to this equipment so EN60079-11:2007 continues to represent “State of the Art”)



# EU Declaration of Conformity



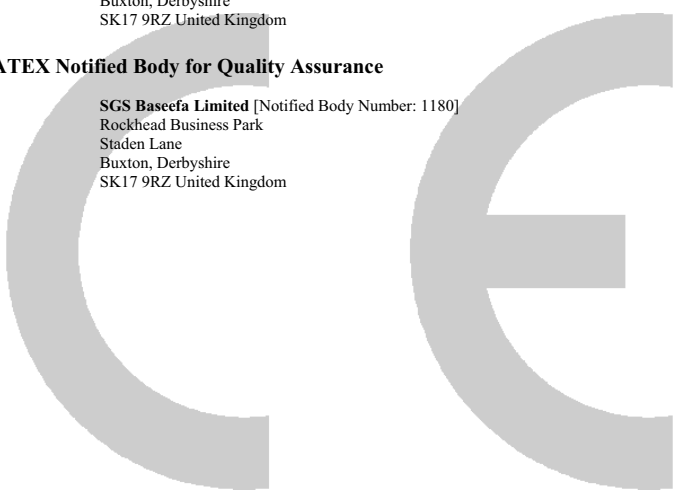
No: RMD 1083 Rev. F

## ATEX Notified Body

**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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含有China RoHS管控物质超过最大浓度限值的部件型号列表 Rosemount 781  
List of Rosemount 781 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)
电子组件 Electronics Assembly	X	O	O	O	O	O
壳体组件 Housing Assembly	X	O	O	X	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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