Quick Start Guide
00825-0100-4421, Rev DD
May 2023

Emerson Wireless Field Link

IEC WirelessHART

EMERSON

NOTICE

This guide provides basic guidelines for the Emerson Wireless Field Link. It does not provide instructions for diagnostics, maintenance, service, or troubleshooting. This guide is also available electronically on www.Emerson.com.

⚠ WARNING

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

Ensure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

Installation of the transmitters in a hazardous environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Kindly review the Product Certifications section for any restrictions associated with a safe installation.

Electrical shock could cause death or serious injury.

Avoid contact with the leads and terminals. High voltage that 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 Wireless considerations

1.1 Power up sequence

To achieve a simpler and faster network installation, verify the following before the power modules are installed in any wireless field devices:

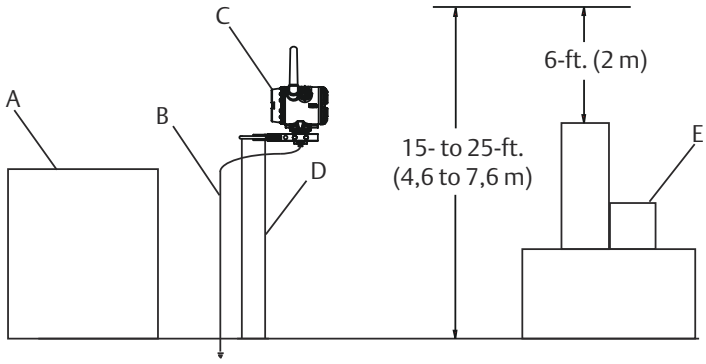
- Emerson Wireless Field Link is installed and functioning properly
- Wireless I/O is installed and functioning properly
- Beginning with the closest, wireless field devices are powered up in order of proximity to the Wireless Field Link

1.2 Mounting location

Mount the Wireless Field Link 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 Wireless 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 1-1: Mounting Location

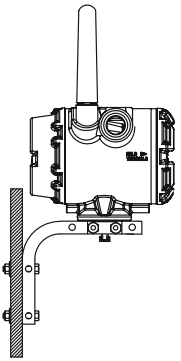


A Control room
B Ground
C Field link
D Mast or pipe
E Infrastructure

1.3 Antenna position

Position the antenna vertically, either straight up or straight down. Verify a distance of at least 3 ft. (1 m) is maintained from any large structure, building, or conductive surface to allow for clear communication to other devices.

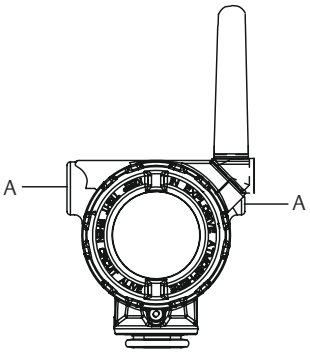
Figure 1-2: Antenna Position



1.4 Conduit plug

Replace the temporary orange plugs with the included conduit plugs using approved thread sealant.

Figure 1-3: Conduit Plugs

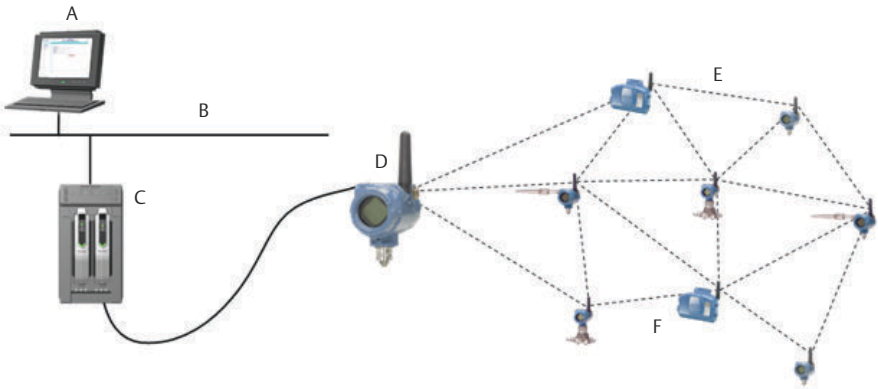


A Conduit plug

1.5 Intended use

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

Figure 1-4: Example System Architecture



A Host system

B Control network

C Network manager

D Field link

E Wireless field network

F Wireless field devices

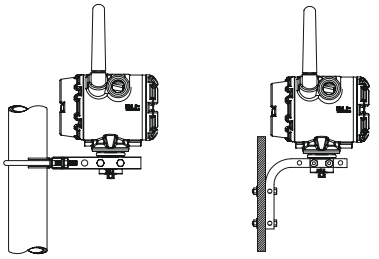
2 Physical installation

2.1 Pipe mounting

Procedure

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 Wireless 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 2-1: Mounting



2.2 Power and data wiring

⚠ WARNING

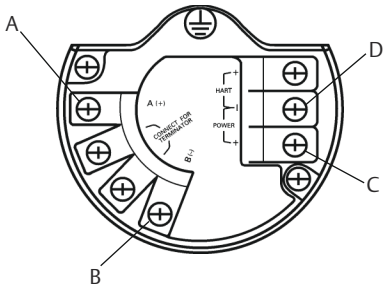
The 781 Wireless Field Link data communication terminals A (+) and B (-) must never be connected directly to a power supply. Doing so may damage the device.
After removing the terminal block cover, the communication terminals (Data A and Data B) are on the left side of the terminal block. Connecting these terminals to anything other than the corresponding data terminals of the 1410S or 1410D Gateway may damage the 781 Wireless Field Link.

Procedure

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 2-2: Emerson Wireless Field Link Terminal Diagram



A	Data A (+)	**C**	+10.5 to 30 VDC
B	Data B (–)	**D**	Power (–)

2.3 Grounding

Ground the Wireless Field Link enclosure 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 Wireless Field Link by connecting the external ground lug to earth ground. The connection should be 1 Ω or less.

3 Verify operation

3.1 Power-up sequence

Upon applying power to the Wireless 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

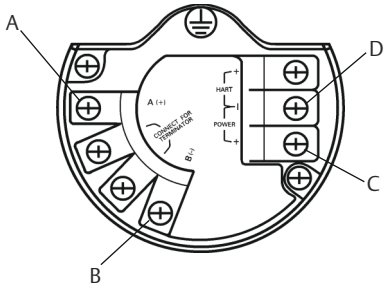
After the initial startup screens are displayed, the Wireless Field Link will cycle through the following periodic screens:

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

The Wireless Field Link continues 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 Reference information

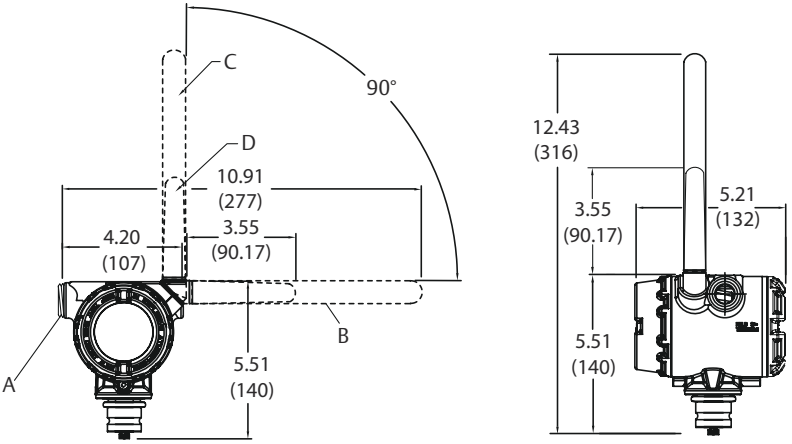
Figure 4-1: Emerson Wireless Field Link Terminal Diagram



A	Data A (+)	**C**	+10.5 to 30 VDC
B	Data B (–)	**D**	Power (–)

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

Figure 4-2: Emerson Wireless Field Link Dimensional Drawing



A 2x Conduit plug

B Possible antenna rotation shown

C Extended range antenna

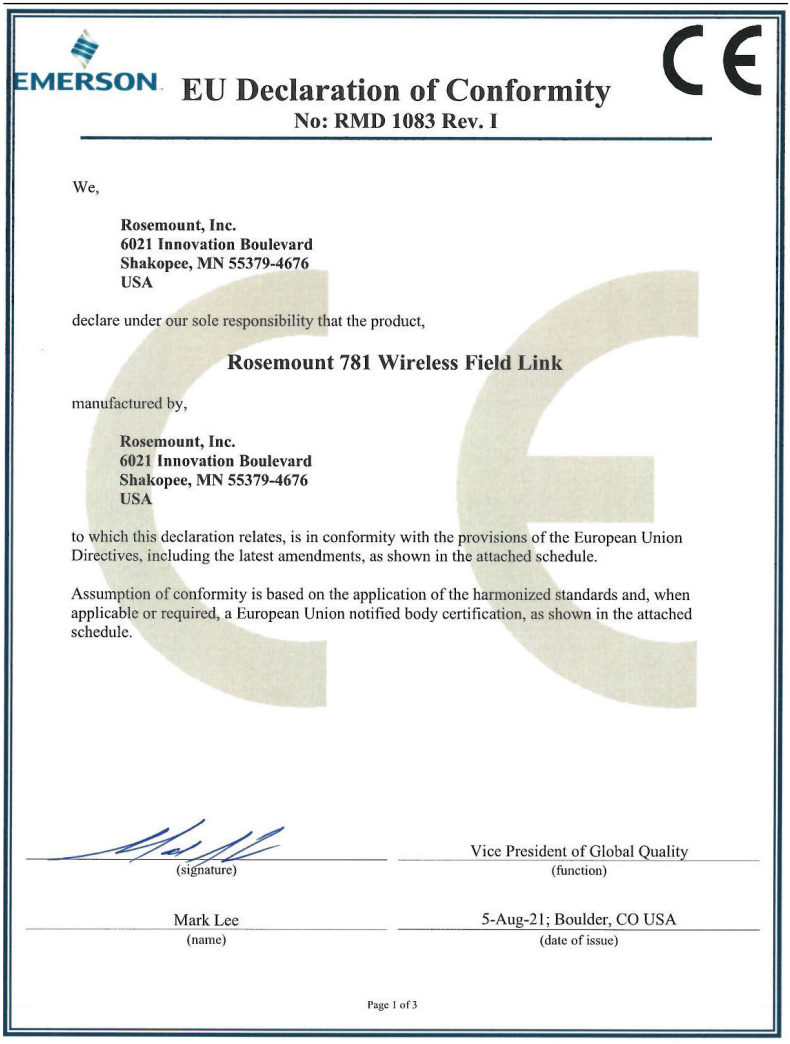
D *Wireless*HART® antenna

Table 4-1: Emerson 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(1)
Wiring (RS-485 communications)	24 AWG - 14 AWG twisted shielded pair(1) Less than 15 pF/ft capacitance.
Wiring distance	656 ft. (200 m)
Wireless protocol	*Wireless*HART, 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 maximum ambient temperature.

5 Declaration of Conformity



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EU Declaration of Conformity

No: RMD 1083 Rev. I

CE

We,

Rosemount, Inc.
6021 Innovation Boulevard
Shakopee, MN 55379-4676
USA

declare under our sole responsibility that the product,

Rosemount 781 Wireless Field Link

manufactured by,

Rosemount, Inc.
6021 Innovation Boulevard
Shakopee, MN 55379-4676
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)
Mark Lee (name)	5-Aug-21; Boulder, CO USA (date of issue)

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EU Declaration of Conformity

No: RMD 1083 Rev. I

EMC Directive (2014/30/EU)

Harmonized Standards:
EN 61326-1:2013

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

Harmonized Standards:
EN 300 328: V2.2.2: 2019
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 IEC 60079-0: 2018
EN 60079-11: 2012

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EU Declaration of Conformity

No: RMD 1083 Rev. I

ATEX Notified Body

SGS FIMKO OY [Notified Body Number: 0598]
Takomotie 8
00380 HELSINKI
Finland

ATEX Notified Body for Quality Assurance

SGS FIMKO OY [Notified Body Number: 0598]
Takomotie 8
00380 HELSINKI
Finland

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6 Product certifications

Rev 2.3

6.1 European Directive Information

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

6.2 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).

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.

6.4 USA

I5 USA Intrinsic Safety

Certificate 80011697

Markings Class I, II, III Division 1 Groups A, B, C, D, E, F, G T4; Class I, II, III Division 2, Groups A, B, C, D, F, G T4 T4(-40 °C ≤ T_a ≤ +70 °C); Class I Zone 0, AEx ia IIC T4 Ga; Class I Zone 2, AEx ic IIC T4 Gc; Zone 21 AEx ia IIIC T90 °C Db; Zone 22 AEx ic IIIC T90 °C Dc

Standards FM 3600:2011, FM 3610:2018, FM 3611:2018, ANSI/UL 60079-0:2019, ANSI/UL 60079-11:2014

Warnings/Conditions of Acceptability

1. Installed as per. Control drawing 01410-1300 for Hazardous and Non-Hazardous areas.
2. Must be installed with a Resistive Barrier.

3. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
4. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

6.5 Canada

I1 Canada Intrinsic Safety

Certificate 80011697

Markings Class I, II, III Division 1 Groups A, B, C, D, E, F, G T4; Class I, II, III Division 2, Groups A, B, C, D, F, G T4 T4(-40 °C ≤ T_a ≤ +70 °C); Ex ia IIC T4 Ga; Ex ic IIC T4 Gc; Ex ia IIIC T90 °C Db; Ex ic IIIC T90 °C Dc

Standards CAN/CSA C22.2 No 60079-0:2019, CAN/CSA C22.2 No. 60079-11:2014, CSA C22.2 No.213 – 2017

Warnings

1. Installed as per. Control drawing 01410-1300 for Hazardous and Non-Hazardous areas.
2. Must be installed with a Resistive Barrier.
3. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.
4. The measured capacitance between the equipment enclosure and metallic conduit adapter is 21pF. This must be considered only when the Model 781S is integrated into a system where the process connection is not grounded.

6.6 Europe

I1 ATEX Intrinsic Safety

Certificate Baseefa11ATEX0059X

Standards EN IEC 60079-0:2018, EN 60079-11: 2012

Markings Ⓔx II 1 G Ex ia IIC T4 Ga, T4(–40 °C ≤ T_a ≤ +70 °C)

Input parameters (power terminals)	Input parameters (RS485)	Output parameters (RS485)
U_i = 30 V	U_i = 11 V	U_o = 7.14 V

Input parameters (power terminals)	Input parameters (RS485)	Output parameters (RS485)
I_i = 200 mA	I_i = 300 mA	I_o = 112 mA
P_i = 1 W	P_i = 1 W	P_o = 1 W
C_i = 0 µF	C_i = 5.1 nF	C_o = 13.9 µF
L_i = 0 mH	L_i = 0 mH	L_o=1000 µH

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 Rosemount 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. This must be taken into account when installing the apparatus.

6.7 International

I7 IECEx Intrinsic Safety

Certificate IECEx BAS 11.0028X

Standards IEC 60079-0: 2011, IEC 60079-11: 2011

Markings Ex ia IIC T4 Ga, T4(–40 °C ≤ T_a ≤ +70 °C)

Input parameters (power terminals)	Input parameters (RS485)	Output parameters (RS485)
U_i = 30 V	U_i = 11 V	U_o = 7.14 V
I_i = 200 mA	I_i = 300 mA	I_o = 112 mA
P_i = 1 W	P_i = 1 W	P_o = 1 W
C_i = 0 µF	C_i = 5.1 nF	C_o = 13.9 µF
L_i = 0 mH	L_i = 0 mH	L_o=1000 µH

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 Rosemount 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. This must be taken into account when installing the apparatus.

6.8 EAC – Belarus, Kazakhstan, Russia

IM (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 В	U_i = 11 В	U_o = 7.14 В
I_i = 200 mA	I_i = 300 mA	I_o = 112 mA
P_i = 1 Вт	P_i = 1 Вт	P_o = 1 Вт
C_i = 0 мкФ	C_i = 5.1 НФ	C_o = 13.9 мкФ
L_i = 0 МГН	L_i = 0 МГН	L_o=0 МГН

Special Conditions for Safe Use (X)

1. See certificate for special conditions.

6.9 Japan

I4 CML Intrinsic Safety

Certificate CML20JPN2401X

Markings Ex ia IIC T4 Ga (-40 °C ≤ T_a ≤ +70 °C), Ex ic IIC T4 Gc (-40 °C ≤ T_a ≤ +70 °C)

Special Conditions for Safe Use (X)

See certificate.

6.10 Brazil

I2 INMETRO Intrinsic Safety (Rev 1 Only)

Certificate UL-BR 20.1568X

Markings Ex ia IIC T4 Ga (-40 °C ≤ T_a ≤ +70 °C), Ex ic IIC T4 Gc (-40 °C ≤ T_a ≤ +70 °C)

Standards ABNT NBR IEC 60079-0:2013, ABNT NBR IEC 60079-11:2013

Special Conditions for Safe Use (X)

See certificate.

6.11 China

I3 NEPSI 本质安全

证书 GYJ20.1394X（CCC 认证）

所用标准 GB3836.1 – 2010, GB3836.4 – 2010, GB3836.20-2010

标志 Ex ia IIC T4 Ga

特殊使用条件**(X)**

1. 产品外壳含有轻金属，用于 0 区时需注意防止由于冲击或摩擦产生的点燃危险。
2. 天线材质含非金属，使用时须防止产生静电火花，只能用湿布清理。
3. 此设备不能承受 GB3836.4-2010 标准中第 6.3.12 条规定的 500V 交流有效值试验电压的介电强度试验。

使用注意事项

1. 产品使用环境温度范围为：-40℃～+70℃
2. 本安电气参数：

输入	最高输入电压 **Ui (V)**	最大输入电流 **Ii (mA)**	最大输入功率 **Pi (W)**	最大内部等效参数	
				Ci(nF)	**Li(μH)**
Power	30	200	1	0	0
RS485	11	300	1	5.1	0

输出	最高输出电压 **Uo (V)**	最大输出电流 **Io (mA)**	最大输出功率 **Po (W)**	最大外部等效参数	
				C_o(μF)	**L_o(μH)**
RS485	7.14	112	1	13.9	0

3. 该产品必须与已通过防爆认证的关联设备配套共同组成本安防爆系统方可使用于爆炸性气体环境。其系统接线必须同时遵守本产品和所配关联设备的使用说明书要求，接线端子不得接错。
4. 用户不得自行更换该产品的零部件，应会同产品制造商共同解决运行中出现的故障，以杜绝损坏现象的发生。
5. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分：设备的修理、检修、修复和改造”、GB/T3836.15-2017“爆炸性环境 第 15 部分：电气装置的设计、选型和安装”、GB/T3836.16-2017“爆炸性环境 第 16 部分：电气装置的检查与维护”、GB/T 3836.18-2017“爆炸性环境 第 18 部分：本质安全电气系统”、GB50257-2014“电气装置安装工程爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

6.12 Combinations

KD Combination of I1, I5, and I6

KL Combination of I1, I5, I6, and I7

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