Your Global Automation Partner

TURCK

Process Wiring Application Guide

TURCK

YOUR **AUTOMATION SOLUTIONS** PROVIDER


DETECTION SENSORS


CORDSETS


I/O STATIONS


INSTRUMENTATION

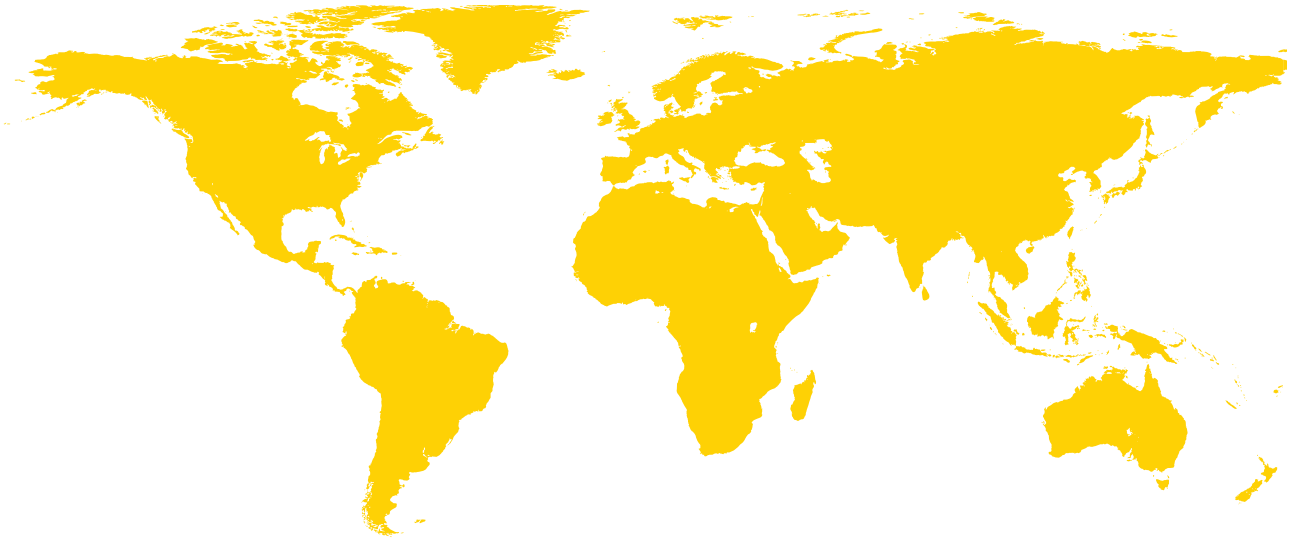

RFID


INTERFACE MODULES


CUSTOM CONNECTIVITY


MEASUREMENT


NETWORK MEDIA



TURCK's **global support** network consists of over 2,700 employees in 25 countries and 60 exclusive agencies worldwide that strive to meet customer expectations. Our sales, support and manufacturing facilities are strategically located across the world allowing us to respond to local market conditions and deliver customer specific solutions on a timely basis.

We are a world leader in **automation technology** with a diverse and broad product portfolio that provides customer specific applications with high performance, reliable and cost effective solutions. The synergy in our product portfolio and customization flexibility are key components of our value proposition.

Our expertise spans across two major industry categories: **Industrial Automation** and **Process Automation**. Each weighs in with its own unique requirements and methods of conducting business. This market centric approach ensures that we develop application specific solutions across a variety of vertical market segments.

CONTENTS

HOW TO SPECIFY THE MOST COMMON PROCESS WIRING APPLICATIONS

Questions that will be answered:

- What color of ITC cable do I specify?
- Which ITC cable do I specify and why?
- What parts go together as a system solution?

What is Type ITC cable?

Instrument Tray Cable.

Can you use ITC cable in Division 2?

In 1996, the NEC allowed ITC as a Division 2 wiring method.

NEC Article 727 - Instrumentation Tray Cable: Type ITC

Wiring for instrumentation and control circuits operating at 150 volts or less and 5 amps or less.

For industrial establishments where a qualified person services the installation.

Permitted uses:

- In cable trays
- In raceways
- Armored cable
- ITC-ER rated cable with mechanical protection

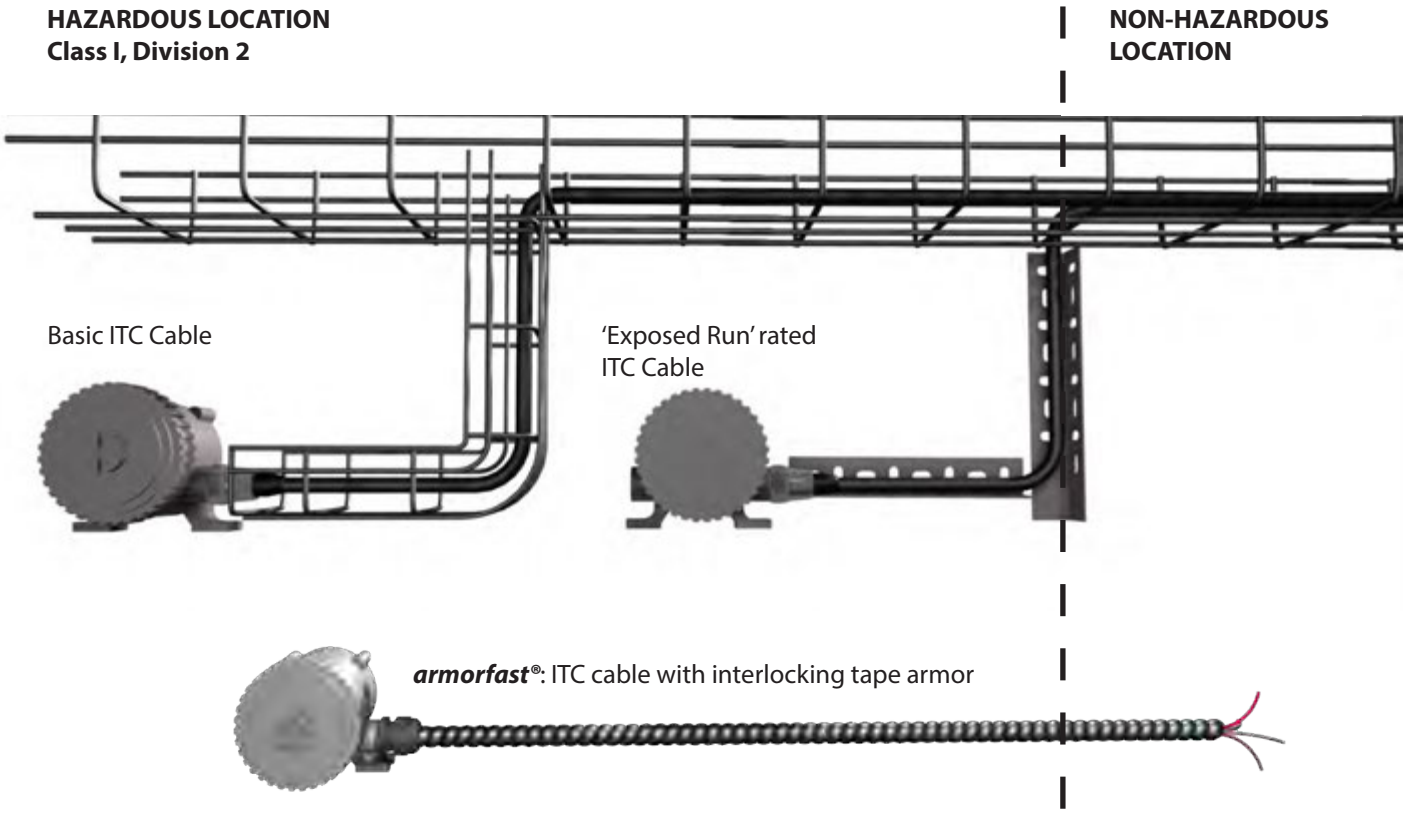
Not permitted:

- Must not be run with power, lighting, Class I, or non-power-limited circuits

HOW TO SPECIFY THE MOST COMMON PROCESS WIRING APPLICATIONS

Turck Offers 3 Types of Rated ITC Cable: Basic ITC, ITC-ER & *armorfast*®

ITC Cable is an NEC Division 2 Wiring Method



NEC 501.10(B)(1)(5):
"ITC cable as permitted in 727.4".

What Color of ITC Cable Do I Specify?

ITC cable comes in 3 colors:

Plum – original color

Black – preferred for direct sunlight applications

Blue - for intrinsically safe circuits

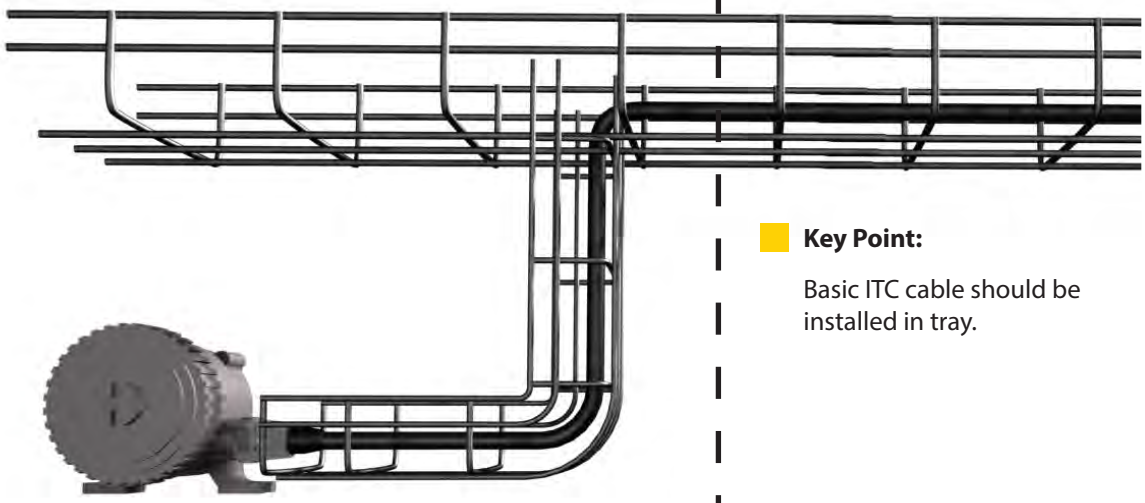
HOW TO SPECIFY THE MOST COMMON PROCESS WIRING APPLICATIONS

Which ITC Cable Do I Specify and Why?

Basic ITC Cable

HAZARDOUS LOCATION
Class I, Division 2

NON-HAZARDOUS LOCATION



Key Point:

Basic ITC cable should be installed in tray.

NEC 727.4 Uses Permitted (1) "In cable trays".

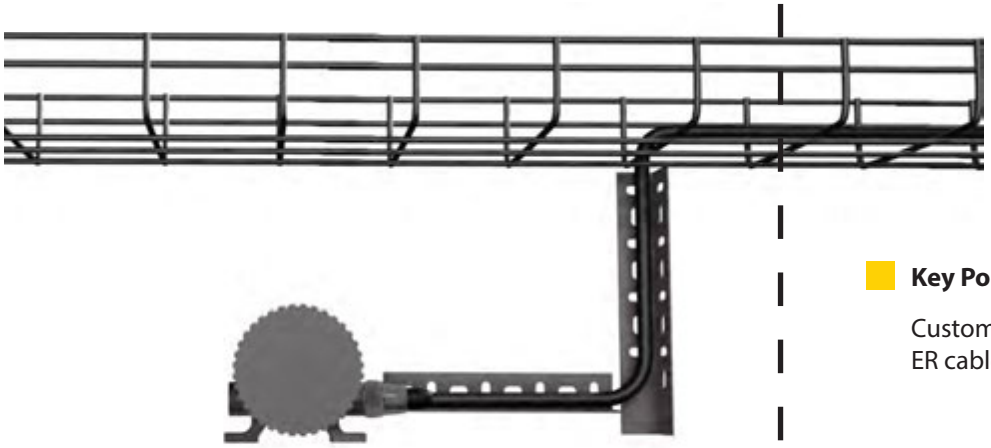
HOW TO SPECIFY THE MOST COMMON PROCESS WIRING APPLICATIONS

Which ITC Cable Do I Specify and Why?

ITC-ER Cable

HAZARDOUS LOCATION
Class I, Division 2

NON-HAZARDOUS LOCATION



Key Point:

Customer has to mechanically protect ITC-ER cable when run out of tray.

NEC 727.4 Uses Permitted (5) "Cable without a metallic sheath or armor that complies with the crush and impact requirements of type MC cable and is identified for such use with the marking ITC-ER shall be permitted to be installed exposed."

Exposed Run or ITC-ER is a VERY High-Spec Cable

Basic ITC is already a premium cable. The flammability and temperature requirements of UL 2250 dictate a rugged cable.

Crush and impact requirements for ER cable are extremely difficult for unarmored cable to meet.

- Crush – Cable is crushed 10 times between a flat plate and a ¾ inch rod. The average force to produce an electrical short must exceed 1000 lbs.
- Impact – Cable is impacted 10 times by a 10 lb. ball dropped from 1 ½ ft. At least 8 impacts must produce no electrical shorts.

Formerly identified as 'OPEN WIRING'.

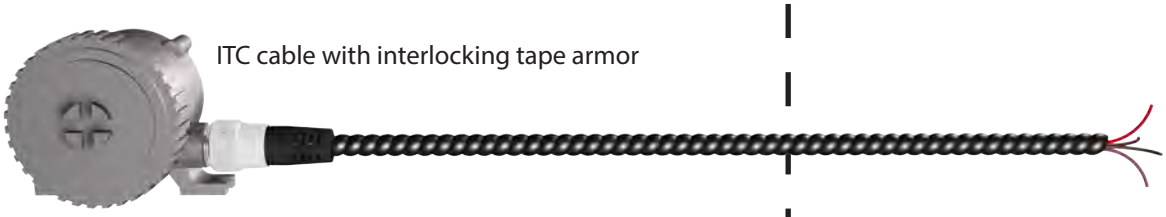
HOW TO SPECIFY THE MOST COMMON PROCESS WIRING APPLICATIONS

Which ITC Cable Do I Specify and Why?

armorfast® ITC Cable

HAZARDOUS LOCATION
Class I, Division 2

NON-HAZARDOUS LOCATION



ITC cable with interlocking tape armor

Key Point:

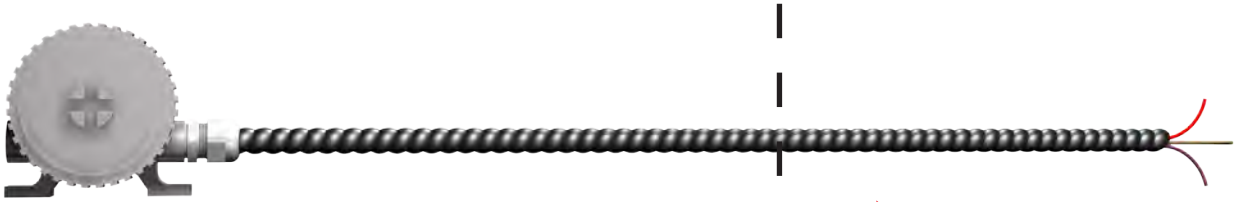
Additional mechanical protection not required.

NEC 727.4 Uses Permitted (4) "Enclosed in a smooth metallic sheath, continuous corrugated metallic sheath, or interlocking tape armor applied over the nonmetallic sheath in accordance with 727.6. The cable shall be supported and secured at intervals not exceeding 1.8 m (6 ft)."

ADDING QUICK-DISCONNECTS

HAZARDOUS LOCATION
Class I, Division 2

NON-HAZARDOUS LOCATION

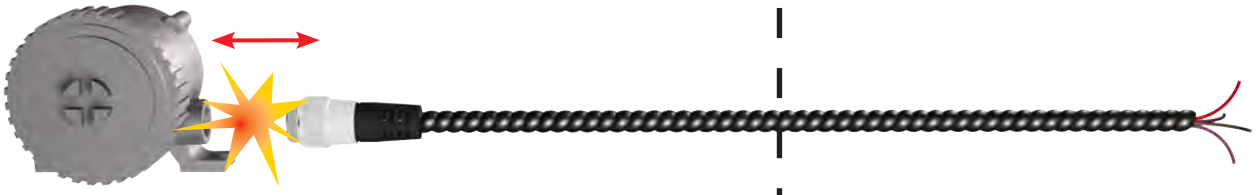


ITC rated cable

A TURCK receptacle installed in an instrument certified for Class I, Divison 2, coupled with a TURCK cordset with ITC rated cable offers the benefits of quick-disconnect wiring in hazardous locations, BUT...

HAZARDOUS LOCATION
Class I, Division 2

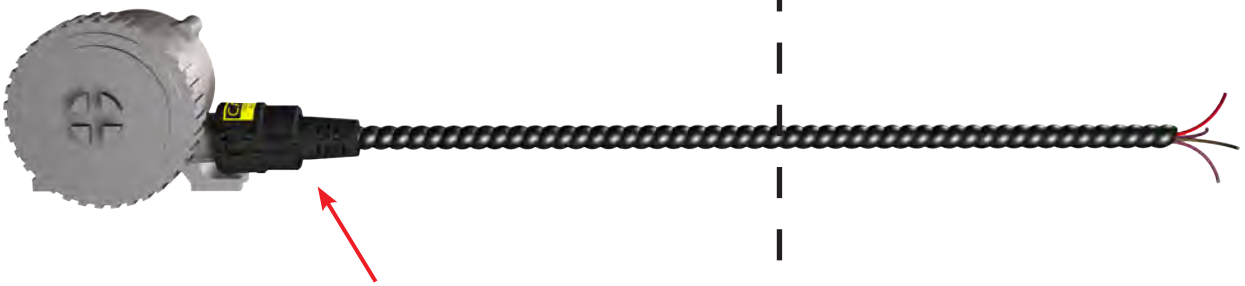
NON-HAZARDOUS LOCATION



Connectors that don't require the use of a tool to disconnect are 'normally arcing', and therefore not allowed in ignition-capable circuits in hazardous locations.

HAZARDOUS LOCATION
Class I, Division 2

NON-HAZARDOUS LOCATION



The simple addition of a ***lokfast***® guard solves this problem!

Note: All connectors in Class I, Division 2, require a ***lokfast***® guard

lokfast® GUARDS

lokfast® guards render a quick-disconnect connection not 'normally arcing' by:

- Making disconnection impossible while in place by eliminating access to coupling nut
- Warning the user to disconnect power before removing
- Requiring a tool for removal

multifast® is available with integral locks

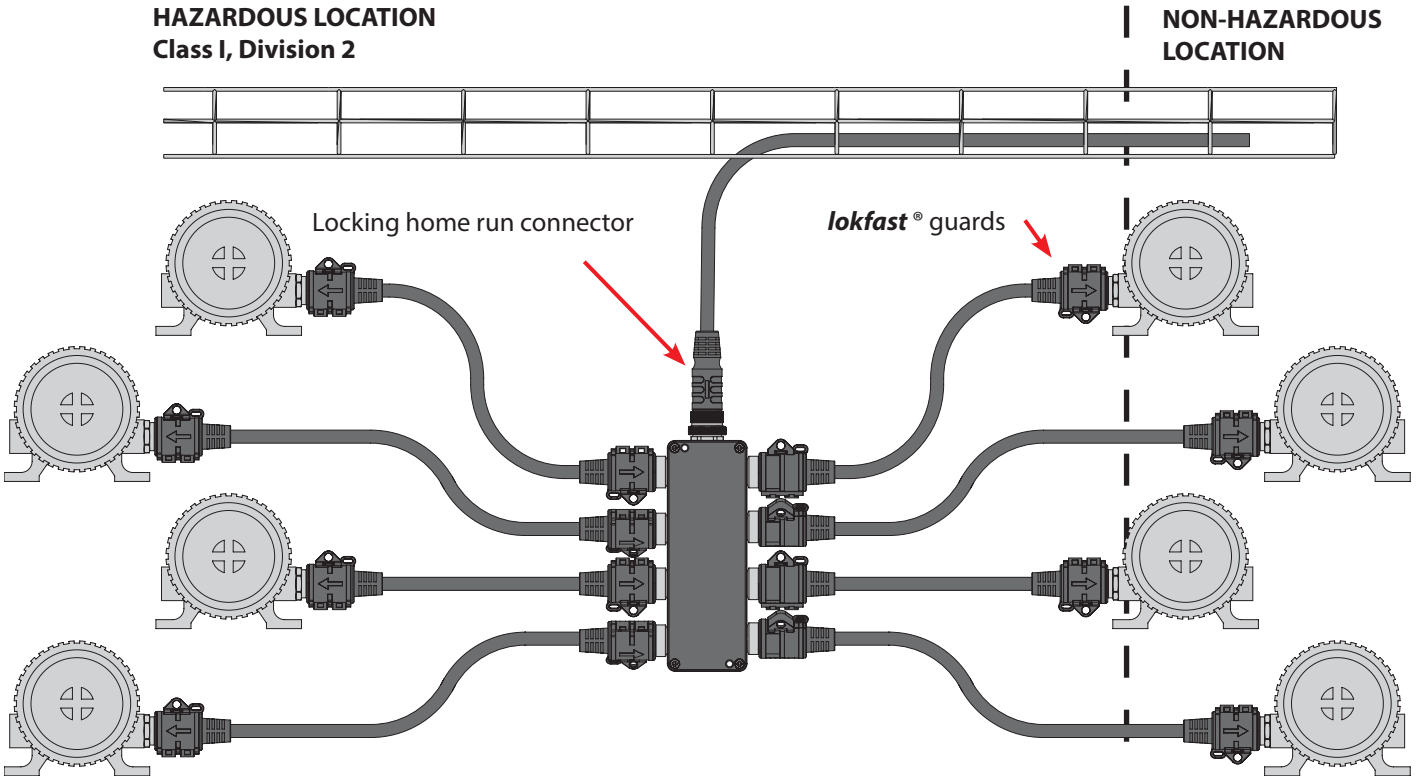
P-C.ML .. or P-C.MT ..

multifast® cords have optional locking set-screws for use in Division 2

For Class I, Division 2 hazardous areas you MUST use M23 *multifast*® with locking set-screw

lokfast® GUARDS

All Connectors in Class I, Division 2 Require a *lokfast*® Guard or Locking Home Run Connector



Available For All M12 *eurofast*® and *minifast*® Body Styles

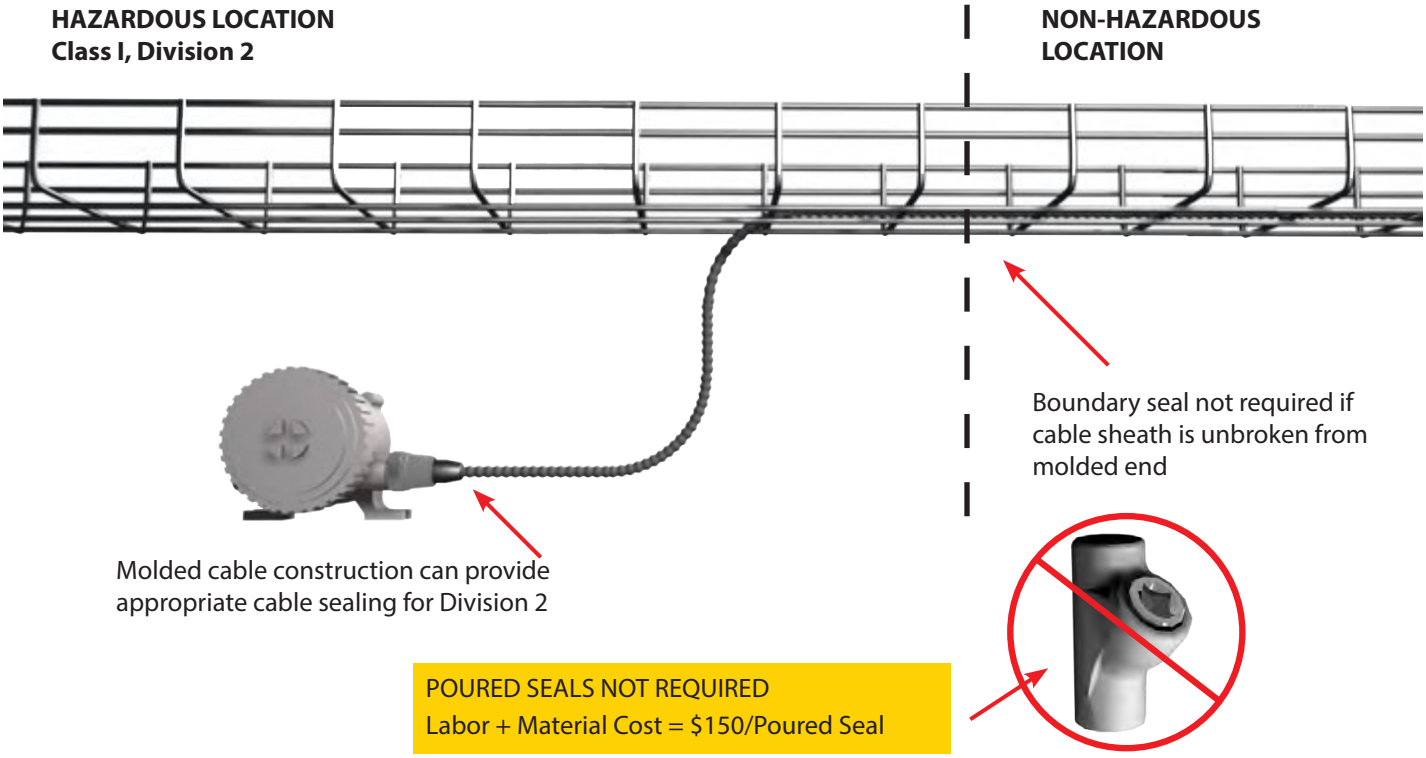
LOCK-MINI
LOCK-MINI-B&C

LOCK-MINI-FW

LOCK-EURO-A

LOCK-EURO-G
LOCK-EURO-FW

CABLE SEALS IN DIVISION 2



QUICK-DISCONNECT SOLUTION FOR EXPLOSIONPROOF DEVICES IN DIVISION 2

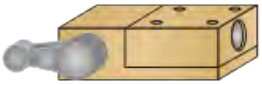
Explosion protection is suitable for Division 1 or Division 2

For installation of explosionproof rated field device with 1/2-14NPT entry threads in Class I, Division 2:

- Install 7/8 -16 UN ***minifast***®receptacle,
  e.g. P-RSFV 40EX-*14.5/NPT
- Connect with ***minifast***® cordset and ***lokfast***® guard
- Install cable per ITC rules for Class I, Division 2

Note: These are not explosionproof connectors. They are an explosionproof feed-thru that provide an explosionproof penetration into an explosionproof enclosure. The external pin/socket interface is not explosionproof.

Explosionproof Feed-Thru Applications



EXP limit switches.

EXP pressure switches, temperature switches, etc. EXP instruments without NI approval.

Bringing intrinsically safe or nonicendive circuits out of EXP enclosures.

CORDSET SOLUTION COMPONENTS

The Parts You Will Need: Class I, Division 2 Hazardous Areas

Male receptacle for field instrument

Female receptacle for customer supplied junction box or integral to TURCK junction box

Extension cordset

2 pcs of ***lokfast®*** one for each connector

Receptacles

Male receptacle visual cues:

- Male pins are visible from front view of receptacle
- Mating threads are on outside of receptacle housing
- Male threads mount to field instrument

Female receptacle visual cues:

- No pins visible from front view of receptacle
- Mating threads are on inside of receptacle housing
- Male threads mount to junction boxes

CORDSET SOLUTION COMPONENTS

Cordsets

Quick-disconnect cordset extension

Cordset extension visual cues:

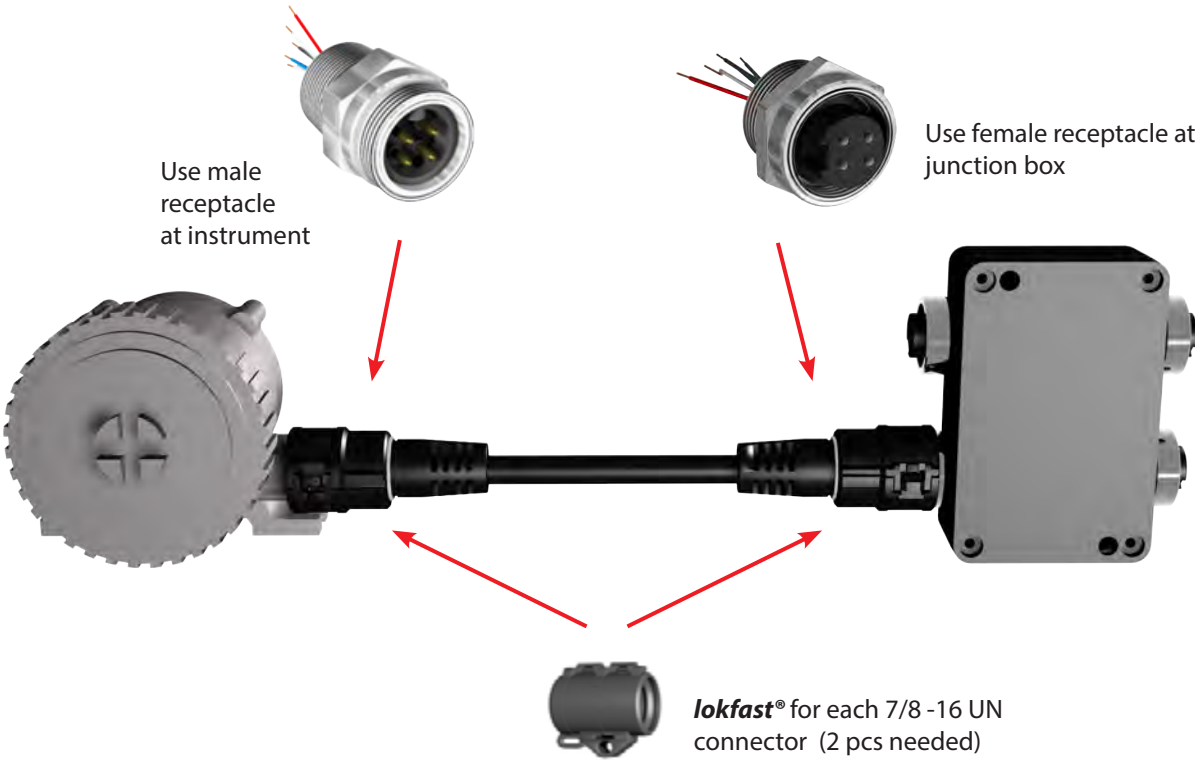
- Cable has connectors on both ends
- Male connector on one end
- Female connector on other end

Quick-disconnect single ended cord

Single ended cord visual cues:

- Cable has single connector on one end
- Connector can be male or female to meet an application
- Flying lead terminates into junction boxes with cable gland approved for hazardous area classification

Recommended Receptacle Gender Placement



CORDSET SOLUTION COMPONENTS

Installation Instructions for TURCK's 7/8-16 UN *minifast*® and M12 *eurofast*® Connectivity Products

Step One:

Many instruments are available with a TURCK receptacle pre-installed. If a receptacle is already installed, proceed to Step Two. If field installation of a receptacle is necessary, feed the receptacle leads through the instrument's conduit entry and thread the receptacle into the entry threads. Receptacles with NPT threads should be tightened per the requirements for NPT conduit fittings. Receptacles with straight threads (M20 or NPSM) should be tightened to deflect the O-ring sufficiently to create a good seal. The receptacle leads should then be connected to the terminals of the instrument. Consult the instrument manual for terminal identification and preferred method of connection. Also, please refer to the product catalog or visit www.turck.us for the pin-out of the receptacle.

Step Two:

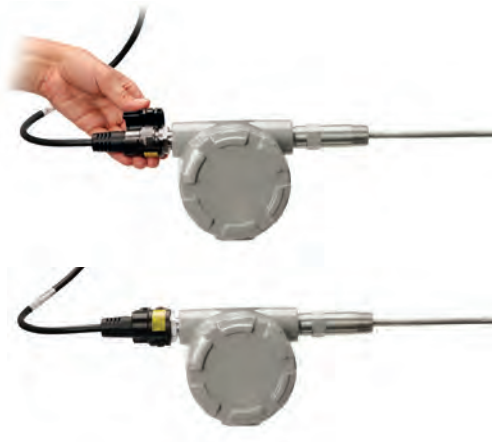
minifast® connectors are designed to industry standards SAE H1738 and ANSI/B93.55M. The environmental seal for mated connectors is formed by the 'cork and bottle' design of the pin and socket carriers in which each connection chamber is individually sealed. The connection must be properly secured to achieve this seal, as well as to ensure a good electrical performance.

The keyed cordset should be aligned with the key on the instrument receptacle. The cordset should then be pushed into the receptacle and the coupling nut turned until hand tight. The cordset should then be pushed firmly into the receptacle a second time and the coupling nut hand tightened again. This generally allows an additional 1/8 - 1/4 turn and ensures that a tight, weather-proof connection is made. No tools should be used in tightening the connections, as damage to the contacts could occur if the connection is over-tightened.

eurofast® connectors are designed to industry standard SAE H1738. The environmental seal for mated connectors is formed by an O-ring seal. The connection must be properly secured to achieve this seal, as well as to ensure a good electrical performance.

The keyed cordset should be aligned with the key on the instrument receptacle. The cordset should then be pushed into the receptacle and the coupling nut turned until hand tight. While rotating the coupling nut, the installer may notice a 'ratcheting' sensation. This is an anti-vibration feature designed to maintain the connection in high-vibration environments. No tools should be used in tightening the connection, as damage to the contacts could occur if the connection is over-tightened.

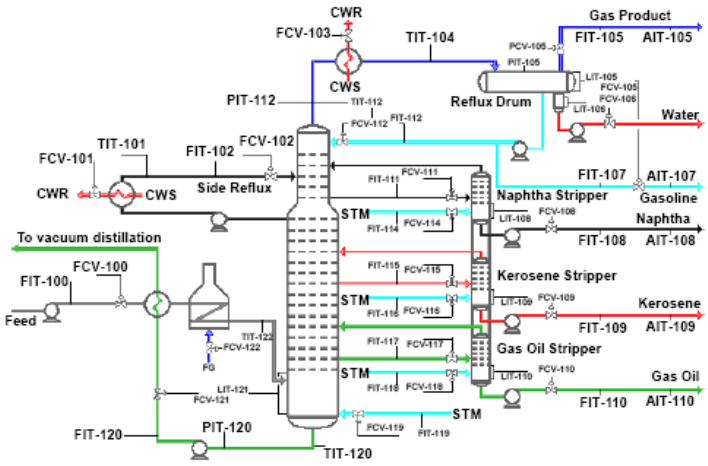
Step Three:



Most TURCK process wiring products are designed and approved for use in hazardous locations. If the installation is in a hazardous location, there may be additional actions necessary, such as locking the connection with a ***lokfast***® guard (as shown in the figure below), using an approved energy limiting source of power, or ensuring that the instrument has the appropriate approval. FM approved control drawings detail the requirements for compliant installation of TURCK products. The appropriate control drawing number will be identified in the product markings and may be viewed or downloaded from www.turck.us/fmcd. Consult the instrument manual to ensure the instrument has the appropriate approval and to determine if the approval imposes any additional constraints.

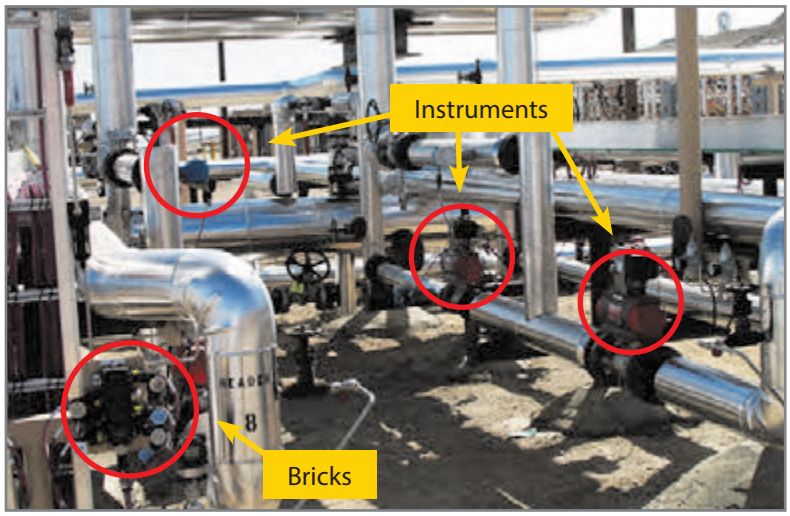
PROCESS WIRING PHYSICAL LAYER GUIDELINES

1. Define the scope of the project



2. Locate and install instruments in the field

3. Install TURCK process bricks near groups of instruments



4. Install home run cable tray or supports

5. Measure main home run cables

Method 1: Measure the cable tray during installation process.

Method 2: Use a measuring tape or rope and mark every 1 meter.

Method 3: Use a laser measuring tool.

PROCESS WIRING PHYSICAL LAYER GUIDELINES

6. Install home run cables - brick to control panel

7. Install brick to instrument tray or supports

8. Measure instruments tray using method 1 - 3, then install instrument cable

WHAT PARTS GO TOGETHER AS A SYSTEM SOLUTION?

4-Port Junction Box Options

Process Wiring Matching Assembly Part Numbers
For Class I Division 2 Areas

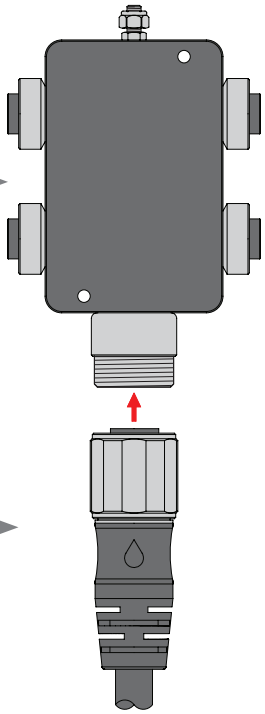
P-4 RKFV 40-RSFV100

P-RSV RKV 40-XXX-*M

162	ITC-ER Plum
947	ITC ***armorfast***® Plum
952	ITC ***armorfast***® Black
335	ITC-ER Blue
330	ITC-ER Black

P-RSV RKV 101-XXX-*M

978	Basic ITC Blue
489	ITC-ER Black 18 AWG
2031	ITC-ER Plum 18 AWG



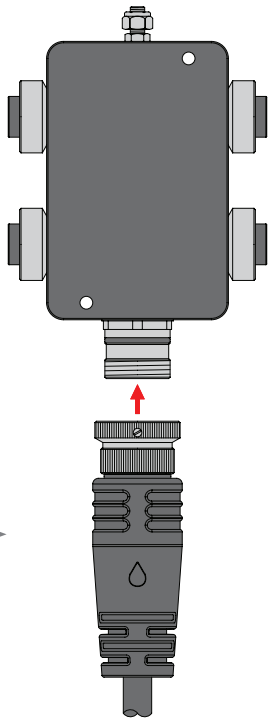
P-4 RKFV 40-CSV12

P-RSV RKV 40-XXX-*M

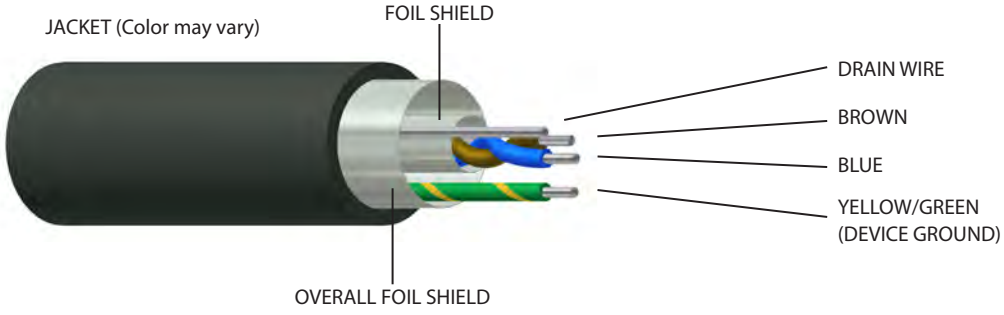
162	ITC-ER Plum
947	ITC ***armorfast***® Plum
952	ITC ***armorfast***® Black
335	ITC-ER Blue
330	ITC-ER Black

P-CSMT CKMT 12A-XXX-*

417	ITC ***armorfast***® Black
2152	ITC ***armorfast***® Black 18 AWG



Typical Field Instrument Application: Non-Armored ITC-ER



P-RSV RKV 40-XXX-*M

162	ITC-ER Plum
335	ITC-ER Blue
330	ITC-ER Black

2-wire Transmitter

Brown.....+24 VDC
Blue.....4-20 mA signal
Drain

SPST Valve Switch Contact

Brown.....+24 VDC
Blue.....Common

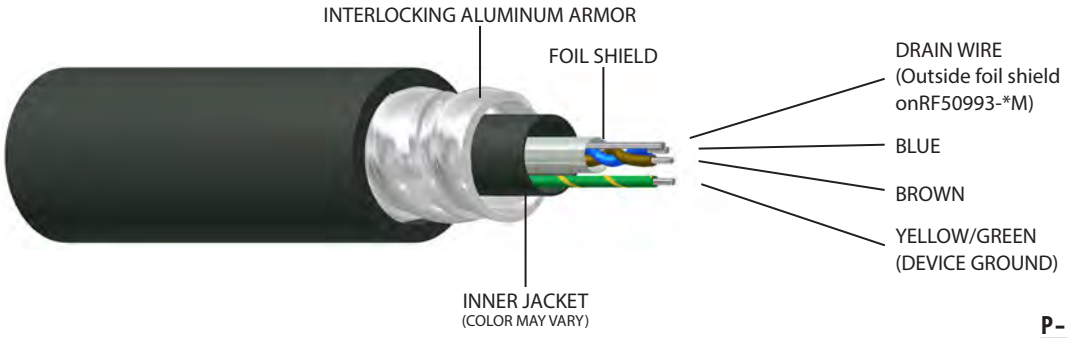
2-wire Valve Solenoid

Brown.....+24 VDC
Blue.....Common

* = length in meters

WHAT PARTS GO TOGETHER AS A SYSTEM SOLUTION?

Typical Field Instrument Application: Armored ITC (*armorfast*®)



P-RSV RKV 40A-XXX-*M

947 ITC ***armorfast***® Plum

952 ITC ***armorfast***® Black

2-wire Transmitter

Brown.....+24 VDC

Blue.....4-20 mA signal

Drain

SPST Valve Switch Contact

Brown.....+24 VDC

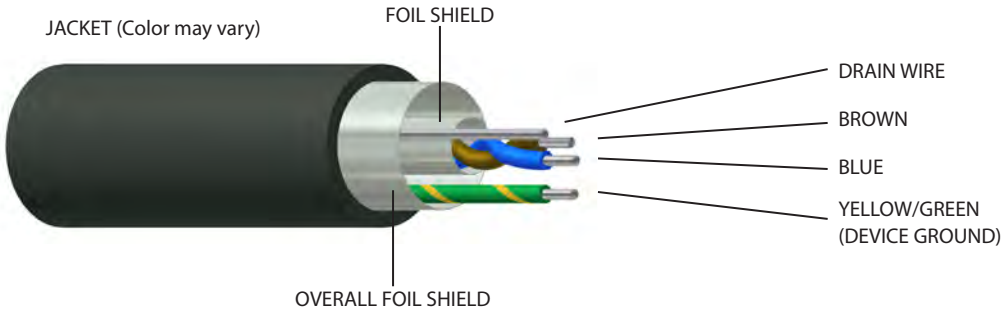
Blue.....Common

2-wire Valve Solenoid

Brown.....+24 VDC

Blue.....Common

Instrument Wire to 4-port Box Pinout



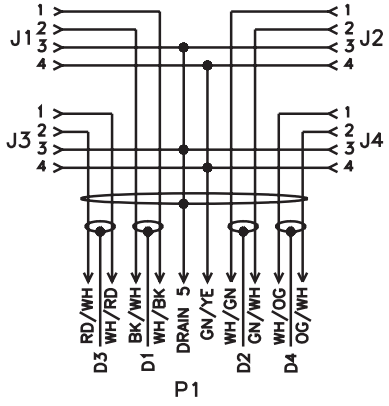
4-Port Junction Box Transmitter Application

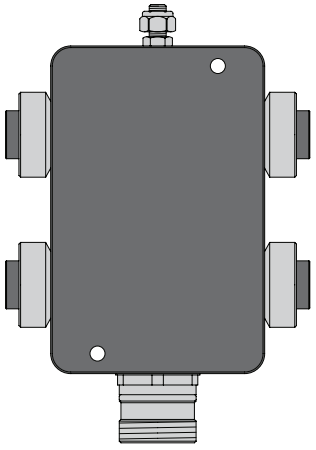
Pin 1: Blue 4-20mA

Pin 2: Brown +24 VDC

Pin 3: Drain Wire (shield)

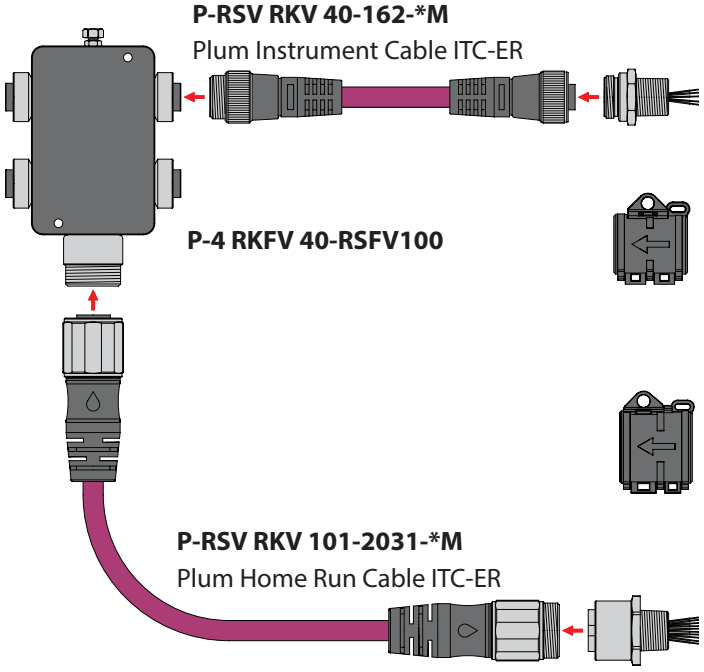
Pin 4: Transmitter Case Ground
Normally not used





WHAT PARTS GO TOGETHER AS A SYSTEM SOLUTION?

Single Analog 4-port Box with ITC-ER, Direct Burial Plum Colored Jacket



P-RSV RKV 40-162-*M
Plum Instrument Cable ITC-ER

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 40-RSFV100

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

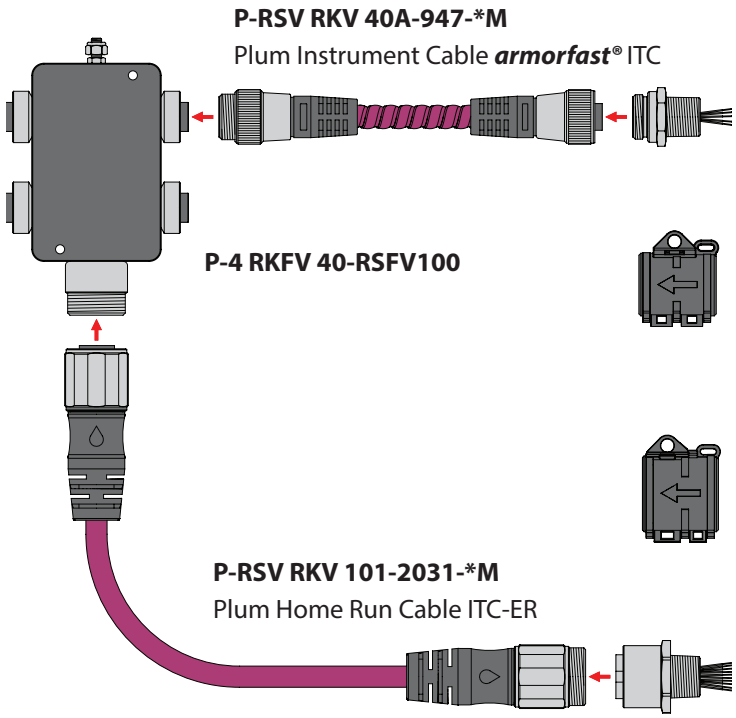
LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast***®
connector (2 needed)

P-RSV RKV 101-2031-*M
Plum Home Run Cable ITC-ER

P-RKFV 101-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

Single Analog 4-port Box with *armorfast*® Plum Colored Jacket, ITC-ER Home Run

Use ***armorfast***® Instrument drop cables when customer wants cable that appears stronger than ITC-ER cable.



P-RSV RKV 40A-947-*M
Plum Instrument Cable ***armorfast***® ITC

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 40-RSFV100

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast***®
connector (2 needed)

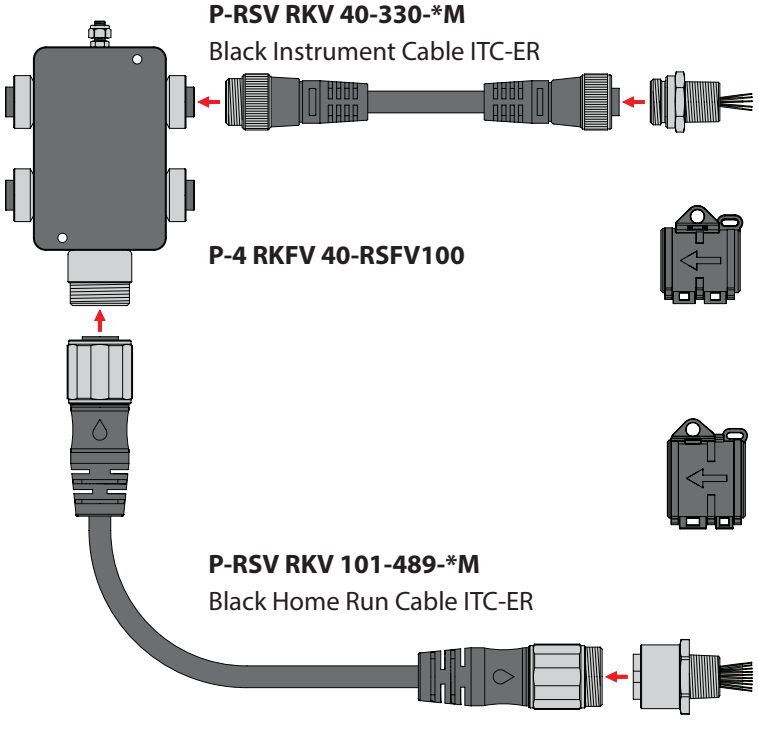
P-RSV RKV 101-2031-*M
Plum Home Run Cable ITC-ER

P-RKFV 101-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

* = length in meters

WHAT PARTS GO TOGETHER AS A SYSTEM SOLUTION?

Single Analog 4-port Box with ITC-ER, Direct Black Colored Jacket



P-RSV RKV 40-330-*M
Black Instrument Cable ITC-ER

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 40-RSFV100

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

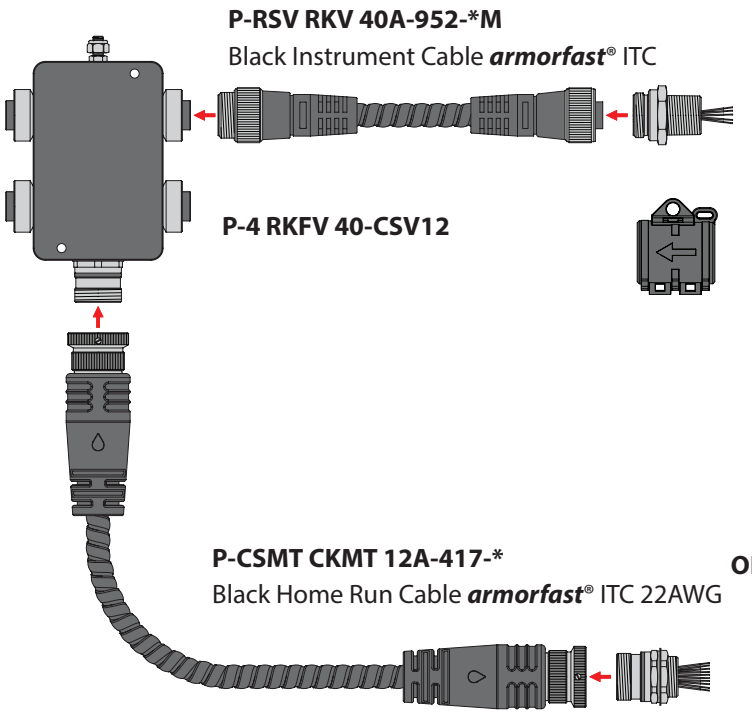
LOCK-MINI-B&C for each
11/8 -16 UN ***minifast***®
connector (2 needed)

P-RSV RKV 101-489-*M
Black Home Run Cable ITC-ER

P-RKFV 101-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

Single Analog 4-port Box with *armorfast*® Black Colored Jacket

Use ***armorfast***® cables when a cable stronger than ITC-ER is needed.



P-RSV RKV 40A-952-*M
Black Instrument Cable ***armorfast***® ITC

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 40-CSV12

Lock-mini for each
7/8 -16 UN ***minifast***®
connector (2 pcs needed)

P-CSMT CKMT 12A-417-*
Black Home Run Cable ***armorfast***® ITC 22AWG

OR

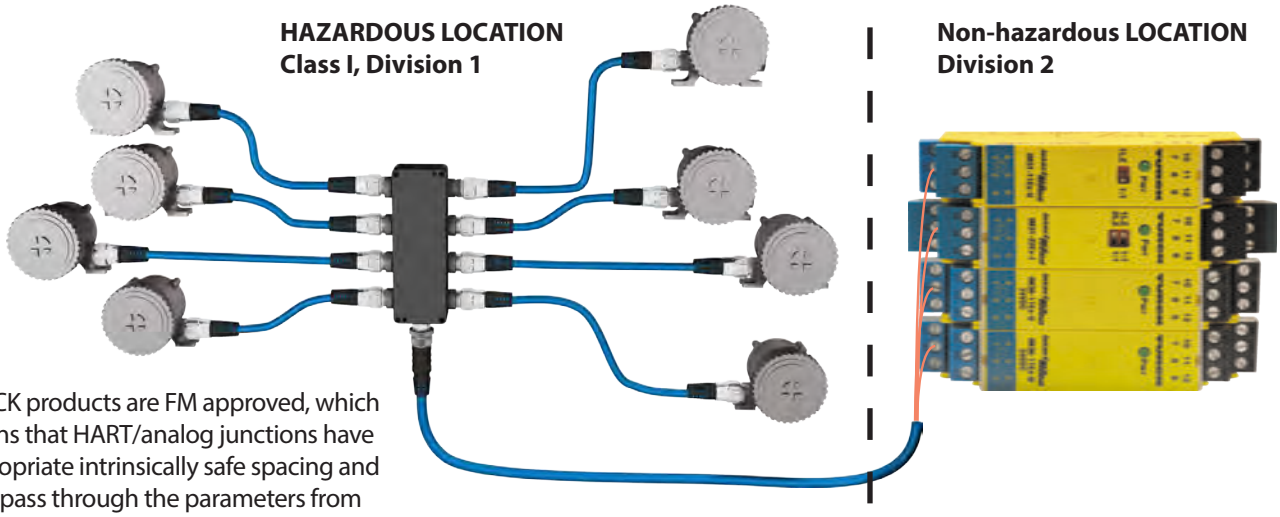
P-CSMT CKMT 12A-2152-*
Black Home Run Cable ***armorfast***® ITC 18AWG

P-CKFLV 12-*
Customer Panel Receptacle

* = length in meters

WHAT PARTS GO TOGETHER AS A SYSTEM SOLUTION?

Division 1 HART/Analog Intrinsic Safety



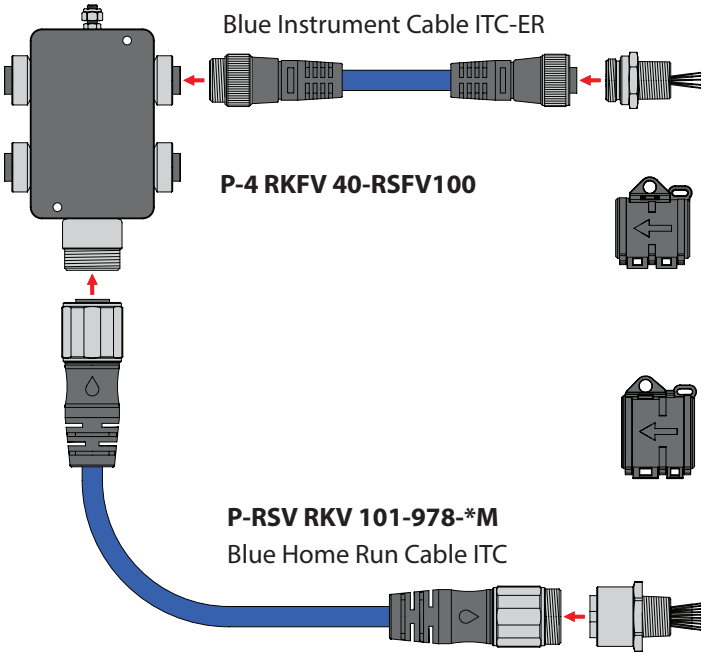
TURCK products are FM approved, which means that HART/analog junctions have appropriate intrinsically safe spacing and may pass through the parameters from the barriers.

- Intrinsic safety barrier

- Instrinsically safe field device with conduit entry-mounted receptacle

- TURCK HART ***multibox***®
- Powder-coated aluminum or nylon
- M12 ***eurofast***® or 7/8-16 UN ***minifast***® port connectors. ***eurofast***®, ***minifast***®, M16 or M23 ***multifast***® home-run connector
- Integral home-run cable (not shown)

Single Analog 4-port Box with ITC-ER Intrinsic Safe Blue Colored Jacket, ITC basic Home Run



P-RSV RKV 40-335-*M
Blue Instrument Cable ITC-ER

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 40-RSFV100

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

LOCK-MINI-B&C for each
11/8 -16 UN ***minifast***®
connector (2 needed)

P-RSV RKV 101-978-*M
Blue Home Run Cable ITC

P-RKFV 101-*/14.5/NPT
Customer Panel Receptacle

* = length in meters

4-PORT JUNCTION BOX FOR MIXING VALVE AND TRANSMITTER APPLICATIONS

Process Wiring Matching Assembly Part Numbers

Typical 2 or 3-Analog Wire and Valve Applications

P-4 RKFV 66-RSFV19

RSV RKV 66-XXX-*M

318 ITC-ER Plum

494 ITC-ER Black

1688 ITC-ER Blue

1802 ITC ***armorfast***® Black

Note: This is a 6-pin ***minifast***® cable

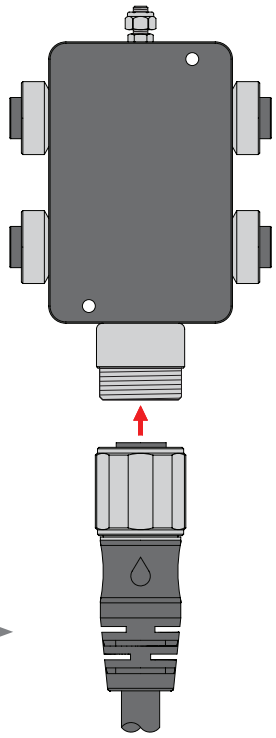
P-RSV RKV 190-XXX-*M

1230XL ITC-ER Plum

1484XL ITC-ER Black

2168XL ITC-ER Blue

Note: This is a 19-pin cable



P-4 RKFV 66-CSV19

RSV RKV 66-XXX-*M

318 ITC-ER Plum

494 ITC-ER Black

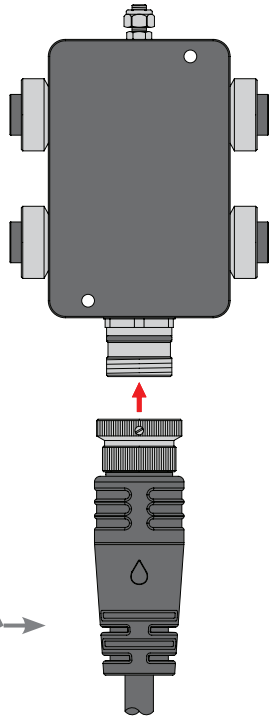
1688 ITC-ER Blue

1802 ITC ***armorfast***® Black

Note: This is a 6-pin ***minifast***® cable

P-CSMT CKMT 19A-419-*

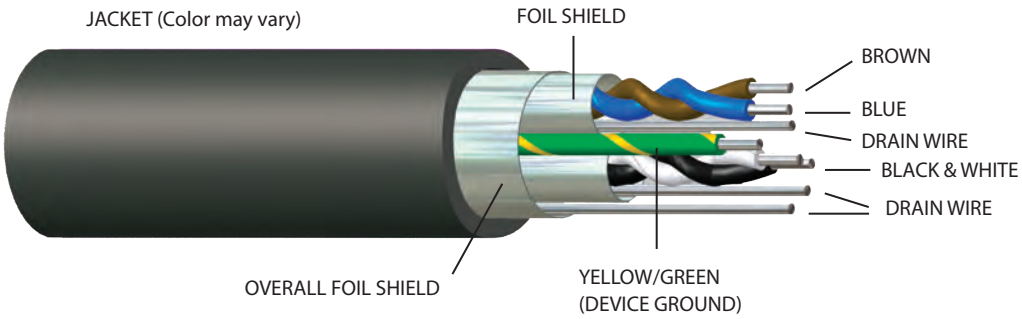
419 ITC ***armorfast***® Black



* = length in meters

4-PORT JUNCTION BOX FOR MIXING VALVE AND TRANSMITTER APPLICATIONS

Typical Field Instrument Application: ITC-ER



P-RSV RKV 66-XXX-*M

318	ITC-ER Plum
494	ITC-ER Black
1688	ITC-ER Blue

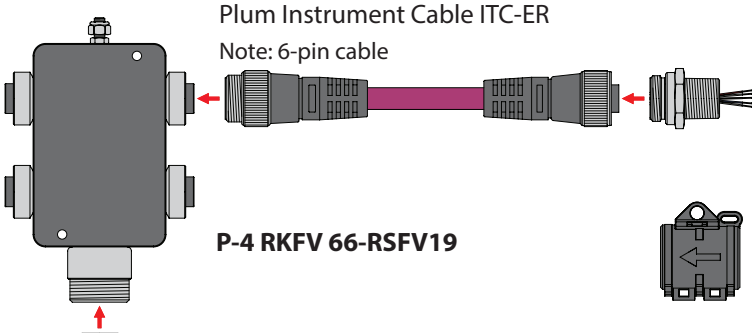
Note: These cables have 2 shielded twisted pairs with individual drains, an overall drain, and a ground conductor

Brown	STP
Blue	
Drain	
Black	STP
White	
Drain	
Green/Yellow Ground	
Overall Drain	

(6-Pin, 2 Analog/Port) 4-port Box with ITC-ER, Direct Burial Plum Colored Jacket

Use with 2 or 3-wire transmitters or valve with Form C contacts or solenoid.

P-RSV RKV 66-318-*M
Plum Instrument Cable ITC-ER
Note: 6-pin cable



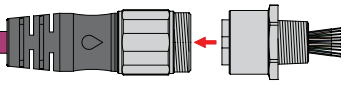
P-RSFV 66 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 66-RSFV19

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast***®
connector (2 needed)

P-RSV RKV 190-1230XL-*M
Plum Home Run Cable ITC-ER
Note: 19-pin cable

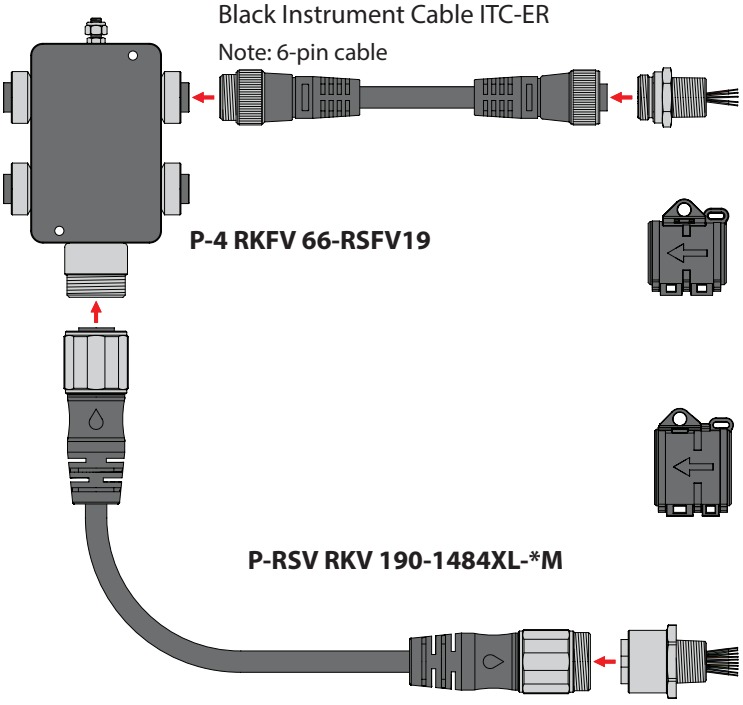


P-RKFV 190-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

4-PORT JUNCTION BOX FOR MIXING VALVE AND TRANSMITTER APPLICATIONS

(6-Pin, 2 Analog/Port) 4-port Box with ITC-ER, Direct Burial Black Colored Jacket

Use with 2 or 3-wire transmitters or valve with Form C contact or SPST with solenoid.



P-RSV RKV 66-494-*M
Black Instrument Cable ITC-ER
Note: 6-pin cable

P-RSFV 66 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 66-RSFV19

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

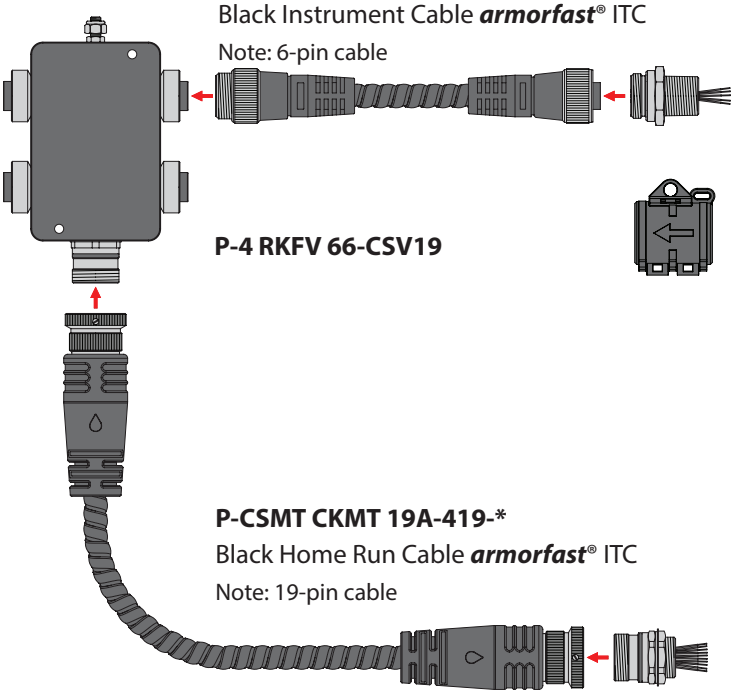
LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast***®
connector (2 needed)

P-RSV RKV 190-1484XL-*M

P-RKFV 190-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

(6-Pin, 2 Analog/Port) 4-port Box with *armorfast*® Black Colored Jacket

Use with 2 or 3-wire transmitters or valve with Form C contact or SPST with solenoid.



P-RSV RKV 66A-1802-*M
Black Instrument Cable ***armorfast***® ITC
Note: 6-pin cable

P-RSFV 66 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-4 RKFV 66-CSV19

Lock-mini for each
7/8 -16 UN ***minifast***®
connector (2 pcs needed)

Can use *armorfast*® cable in place of cable tray for mechanical protection

P-CSMT CKMT 19A-419-*
Black Home Run Cable ***armorfast***® ITC
Note: 19-pin cable

P-CKFLV 19-*
Customer Panel Receptacle

* = length in meters

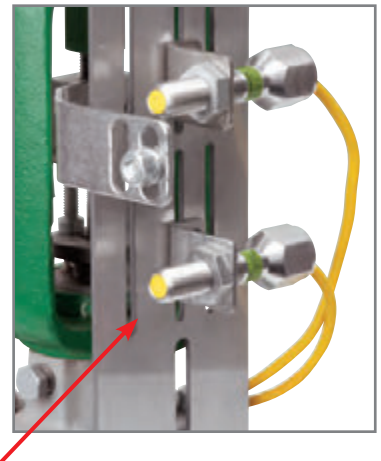
V-PROX VALVE BOX APPLICATION

In automated manufacturing and processing plants, position sensors help monitor and control plant processes by confirming that critical activities are completed as intended. More specifically, their primary function is to detect the presence, or absence, of a moving object, or 'target'.

The advantages of inductive proximity sensors:

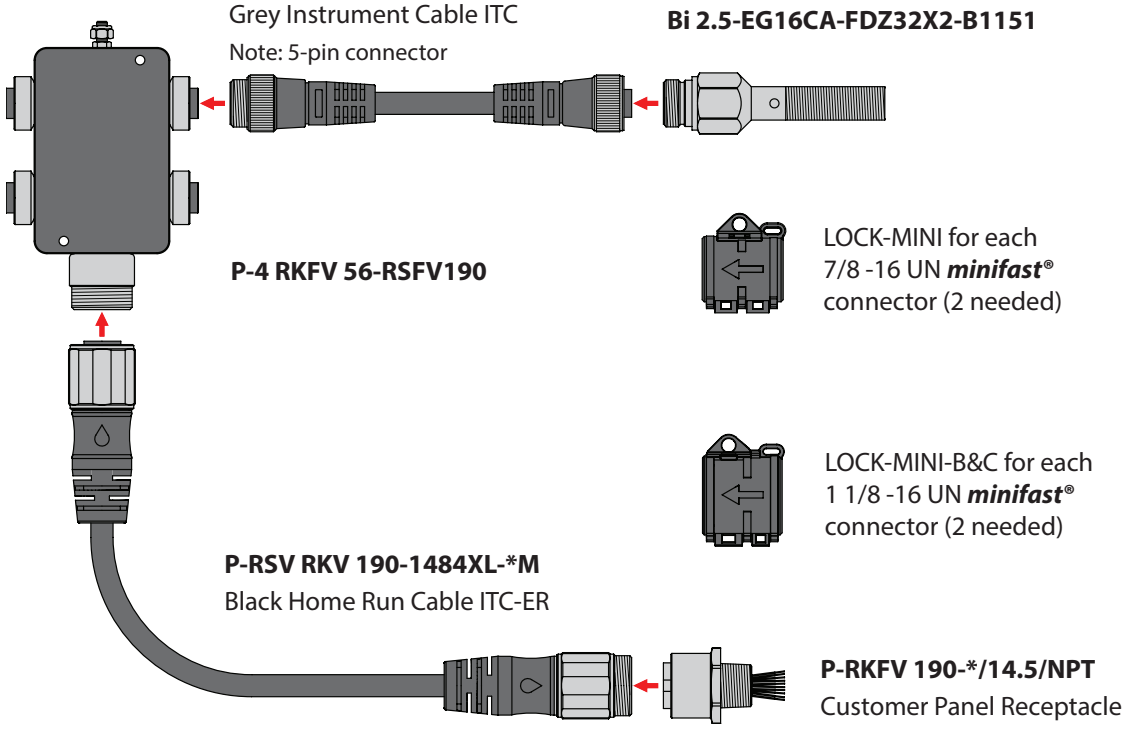
- No physical contact is required
- No moving parts to jam, wear, or break results in less maintenance
- Not affected by dust or dirt

FM APPROVED
Class I, Division 2



TURCK V-Prox
Bi 2.5-EG16CA-FDZ32X2

V-Prox 4-port box with Grey ITC drop and Black ITC-ER direct burial Colored Jacket



* = length in meters

8-PORT JUNCTION BOX OPTIONS

Process Wiring Matching Assembly Part Numbers

8- Port Junction Box Cables

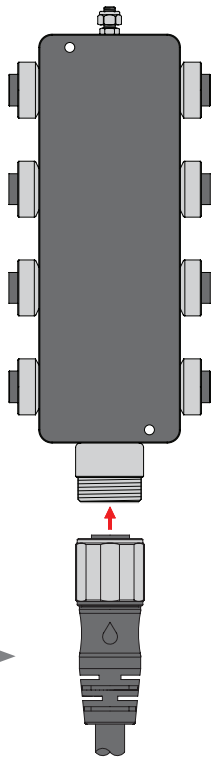
P-8 RKFV 40-RSFV190

P-RSV RKV 40-XXX-*M

162	ITC-ER Plum
947	ITC ***armorfast***® Plum
952	ITC ***armorfast***® Black
335	ITC-ER Blue
330	ITC-ER Black

P-RSV RKV 190-XXX-*M

1230XL	ITC-ER Plum
1484XL	ITC-ER Black
2168XL	ITC-ER Bue



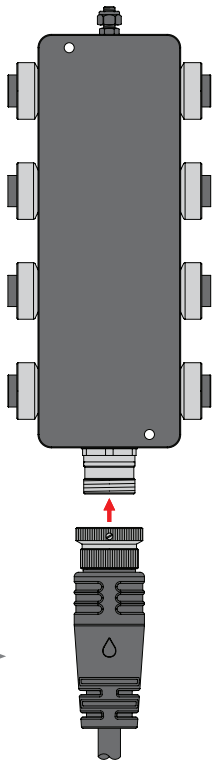
P-8 RKFV 40-CSV19

RSV RKV 40-XXX-*M

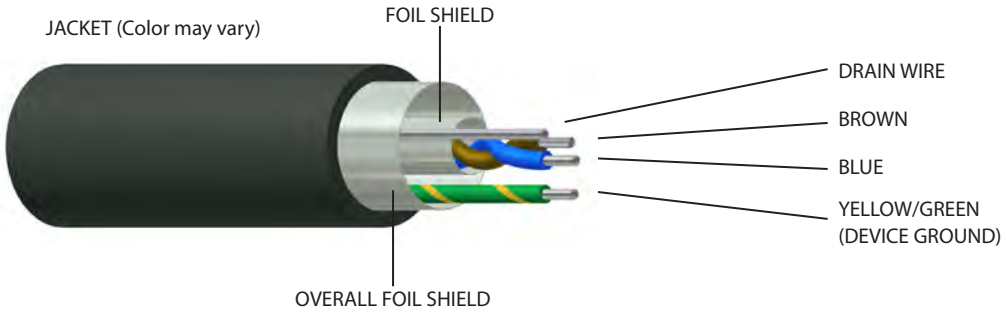
162	ITC-ER Plum
947	ITC ***armorfast***® Plum
952	ITC ***armorfast***® Black
335	ITC-ER Blue
330	ITC-ER Black

P-CSMT CKMT 19A-XXX-*

419	ITC ***armorfast***® Black
1991	ITC ***armorfast***® 18 AWG Blue
489	ITC-ER Black 18 AWG



Typical Field Instrument Applications: ITC-ER



P-RSV RKV 40-XXX-*M

162	ITC-ER Plum
335	ITC-ER Blue
330	ITC-ER Black

2-wire Transmitter

Brown.....+24 VDC

Blue.....4-20mA signal

Drain

SPST Valve Switch Contact

Brown.....+24 VDC

Blue.....Common

2-wire Valve Solenoid

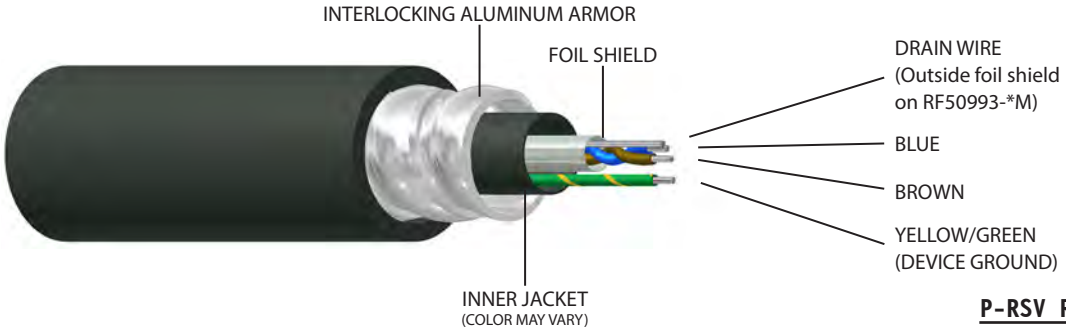
Brown.....+24 VDC

Blue.....Common

* = Length in meters

8-PORT JUNCTION BOX OPTIONS

Typical Field Instrument Applications: Armored ITC



P-RSV RKV 40-XXX-*M

947 ITC ***armorfast***® Plum

952 ITC ***armorfast***® Black

2-wire Transmitter

Brown.....+24 VDC

Blue.....4-20 mA signal

Drain

SPST Valve Switch Contact

Brown.....+24 VDC

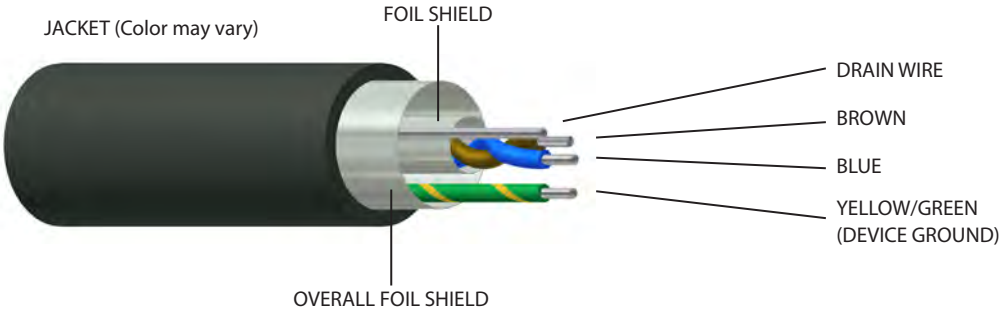
Blue.....Common

2-wire Valve Solenoid

Brown.....+24 VDC

Blue.....Common

Instrument Wire to 8-port Box Pinout



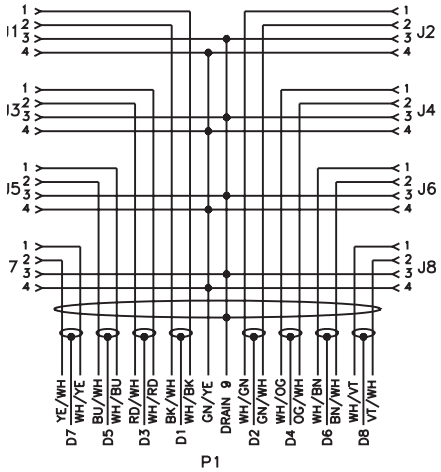
4-port Junction Box Transmitter Application

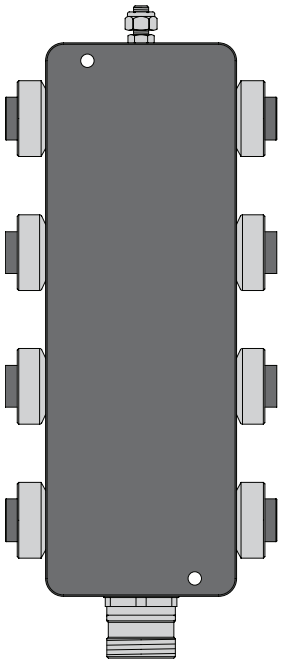
Pin 1: Blue 4-20 mA

Pin 2: Brown +24 VDC

Pin 3: Drain Wire (shield)

Pin 4: Transmitter Case Ground Normally not used

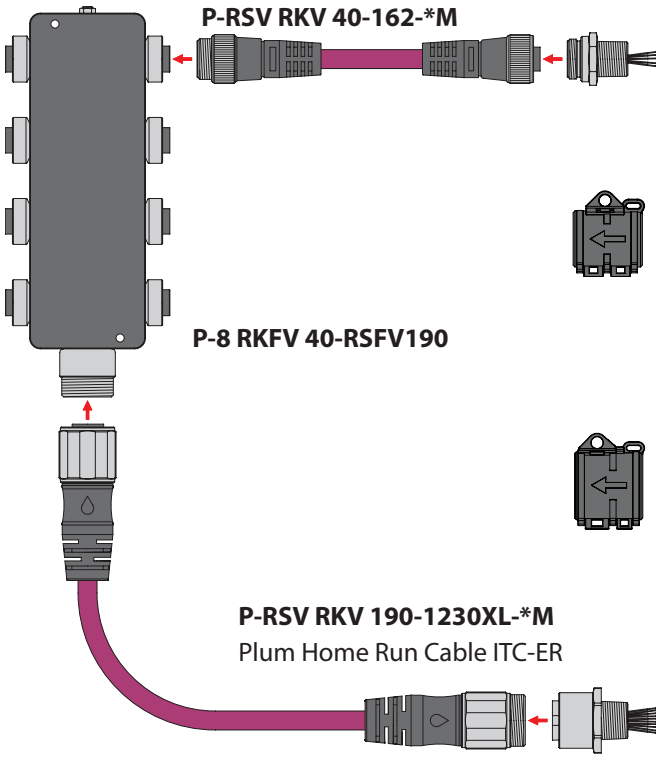




* = Length in meters

8-PORT JUNCTION BOX OPTIONS

Single Analog 8-port Box ITC-ER, Direct Burial Plum Colored Jacket



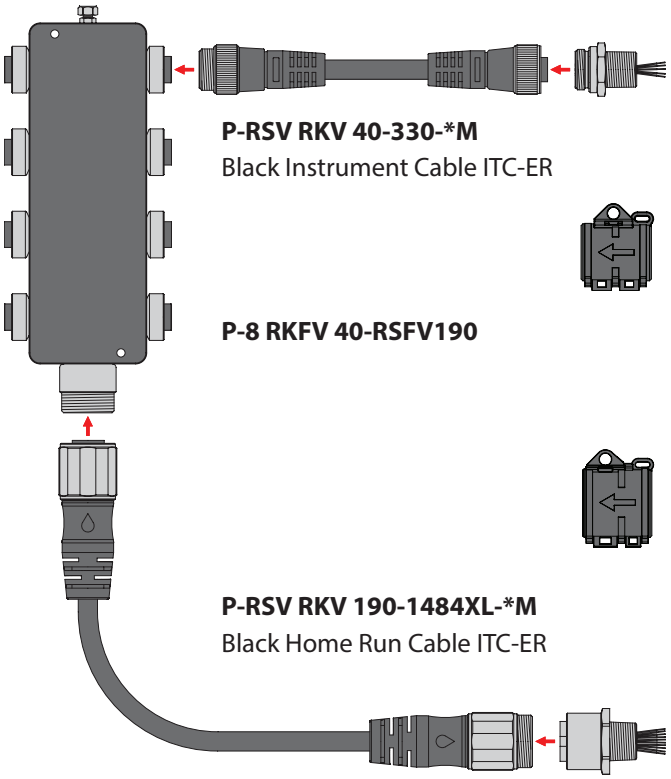
P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

LOCK-MINI for each
7/8 -16 UN ***minifast®***
connector (2 needed)

LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast®***
connector (2 pcs needed)

P-RKFV 190-*/14.5NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

Single Analog 8-port Box ITC-ER Black Colored Jacket



P-RSFV 40EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

LOCK-MINI for each
7/8 -16 UN ***minifast®***
connector (2 needed)

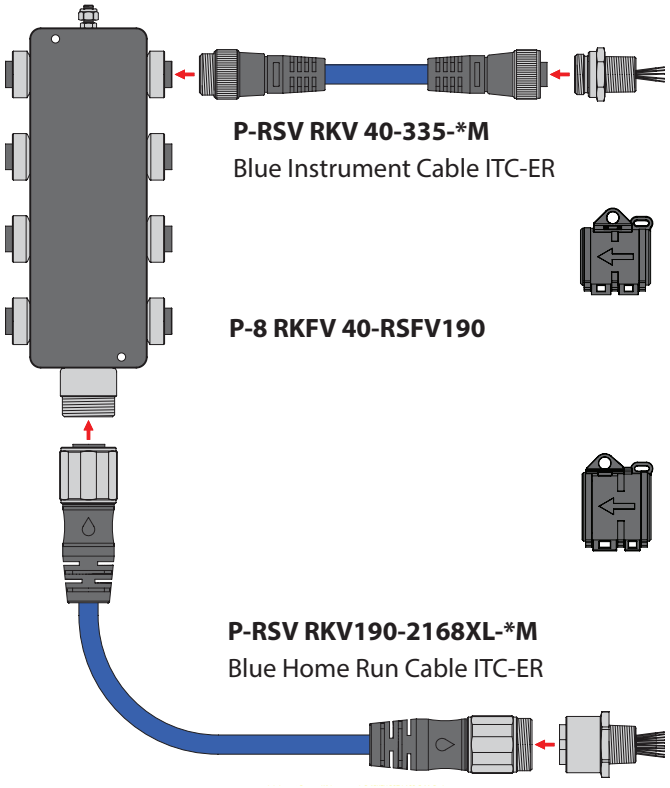
LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast®***
connector (2 pcs needed)

P-RKFV 190-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

* = Length in meters

8-PORT JUNCTION BOX OPTIONS

Single Analog 8-port Box ITC-ER Intrinsic Safe Blue Colored Jacket



P-RSV RKV 40-335-*M
Blue Instrument Cable ITC-ER

P-8 RKFV 40-RSFV190

P-RSV RKV190-2168XL-*M
Blue Home Run Cable ITC-ER

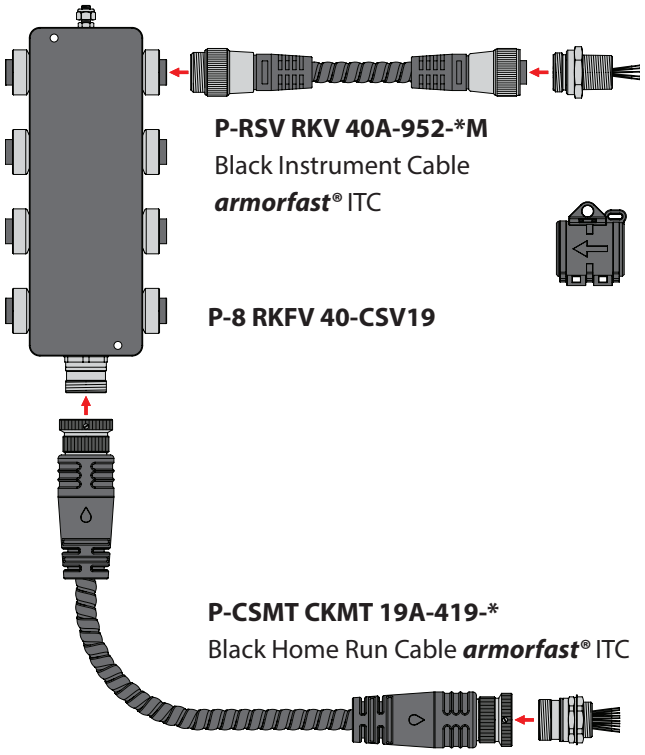
P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

LOCK-MINI for each
7/8 -16 UN ***minifast***®
connector (2 needed)

LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast***®
connector (2 pcs needed)

P-RKFV 190-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

Single Analog 8-port Box *armorfast*® Black Colored Jacket



P-RSV RKV 40A-952-*M
Black Instrument Cable
armorfast® ITC

P-8 RKFV 40-CSV19

P-CSMT CKMT 19A-419-*
Black Home Run Cable ***armorfast***® ITC

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

Lock-mini for each
7/8 -16 UN ***minifast***®
connector (2 pcs needed)

P-CKFLV 19-*
Customer Panel Receptacle

* = length in meters

RETROFIT TO EXISTING DIVISION 2 CONDUIT SYSTEMS

Process Wiring Matching Assembly Part Numbers

Division 2 Conduit System to ITC-ER Direct Burial Plum Colored Jacket

Lock-mini for each
7/8 -16 UN ***minifast®***
connector (2 pcs needed)

P-RKFV 40D EX-*/14.5/NPT
Explosionproof Feed-Thru
Instrument Receptacle

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

P-RSV RKV 40-162-*M
Plum Instrument Cable ITC-ER

Class I, Division 2 Junction

Division 2 Conduit System to ITC-ER Direct Burial Black Colored Jacket

Lock-mini for each
7/8 -16 UN ***minifast®***
connector (2 pcs needed)

P-RKFV 40 EX-*/14.5/NPT
Explosionproof Feed-Thru
Instrument Receptacle

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

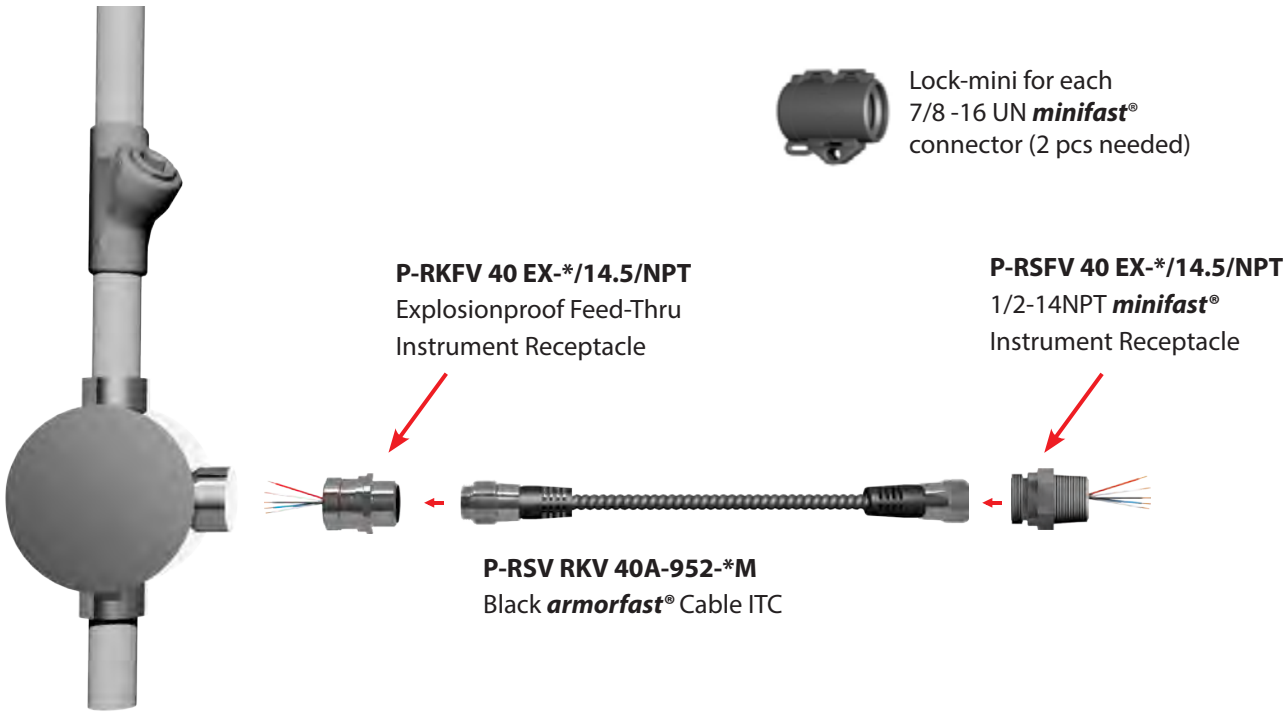
P-RSV RKV 40-330-*M
Black Instrument Cable ITC-ER

Class I, Division 2 Junction

* = length in meters

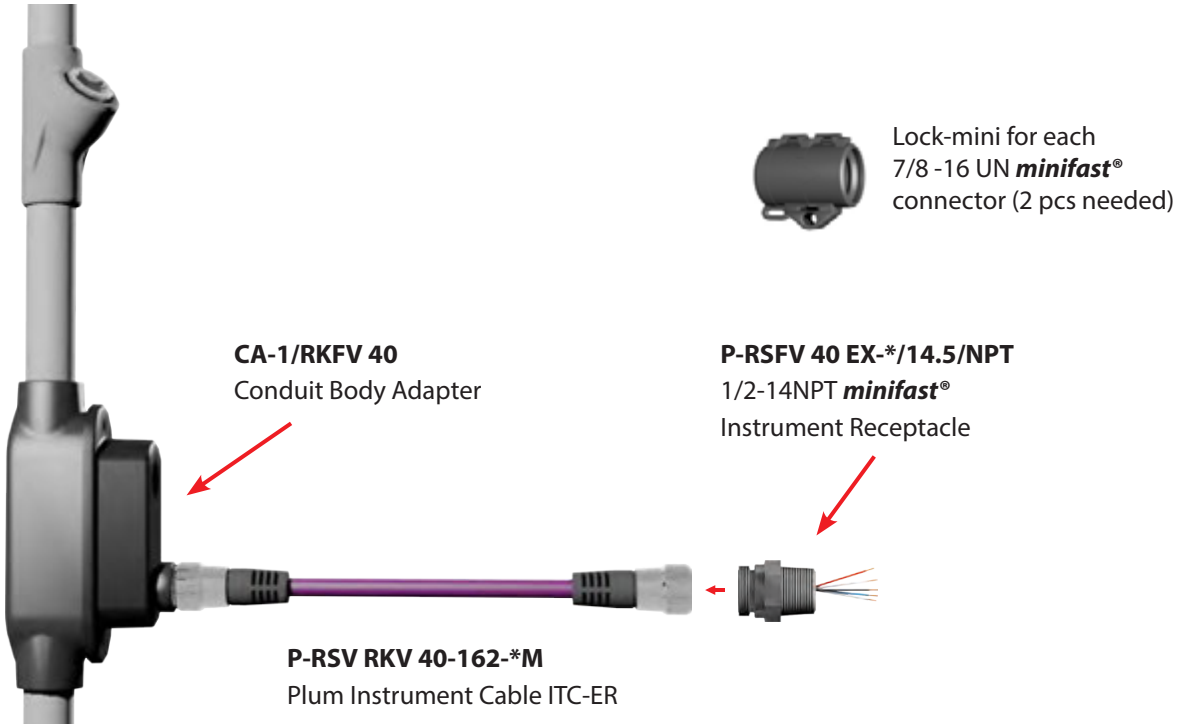
RETROFIT TO EXISTING DIVISION 2 CONDUIT SYSTEMS

Division 2 Conduit System to ITC *armorfast*® Black Colored Jacket



Class I, Division 2 Junction

Division 2 Conduit System to ITC-ER Direct Burial Plum Colored Jacket

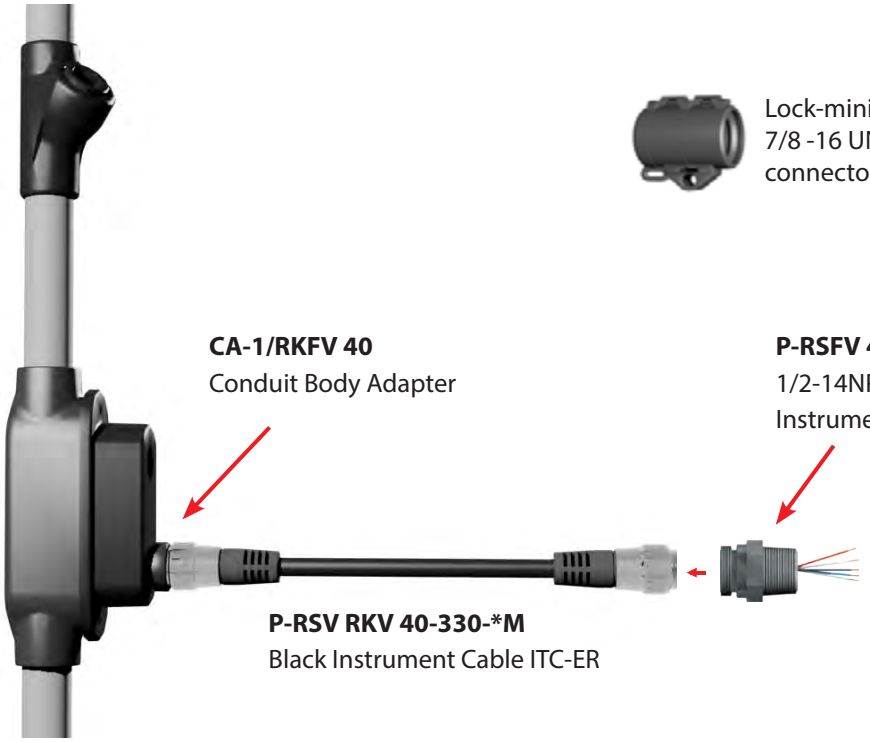


Conduit Body

* = length in meters

RETROFIT TO EXISTING DIVISION 2 CONDUIT SYSTEMS

Division 2 Conduit System to ITC-ER Direct Burial Black Colored Jacket



Lock-mini for each
7/8 -16 UN ***minifast***®
connector (2 pcs needed)

CA-1/RKFV 40
Conduit Body Adapter

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast***®
Instrument Receptacle

P-RSV RKV 40-330-*M
Black Instrument Cable ITC-ER

Conduit Body

* = length in meters

HARSH ENVIRONMENT APPLICATIONS

TURCK ***extremelife®-60*** cables are heavy duty for extreme temperature environments and provide excellent resistance to oils, sunlight, and abrasion. TURCK offers multiple single and twisted pair conductor options.

- Flexible at very cold temperatures
- XLPE insulated conductors provide superior cold perfomance
- Cables can accommodate poplular industrial networks
- Available with braided armor for extreme toughness and offshore hazardous locations

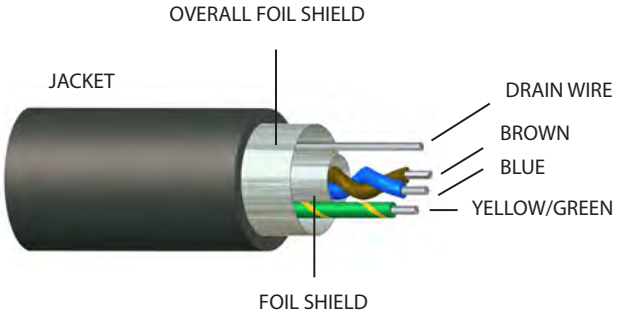
***extremelife®-60* Specifications**	
UL Rating for the US	ITC-ER DB 105°C; PLTC-ER DB, 105°C; TC-ER 908C Wet/Dry
cUL Rating for Canada	C22.2 No.239-09, CIC; C22.2 No. 230-09, CIC/TC; 90°C Wet, 90°C Dry
Wire Gauge Range	5 to 22 AWG
Cold Bend Pass Temp.	-60°C
Cold Impact Pass Temp.	-40°C
Flexible Stranding	Yes
Cut-through and Abrasion Resistance	Very Good
Moisture Resistance	Excellent
Installation Handling	Excellent
Flame Retardancy	IEEE 1202, FT4
Oil Resistance	UL Oil Res I & II
UV Resistance	UL 720 hr Xenon Arc, CSA 1000 hr Weatherometer
Braided Armor	Available with or without
Crush	Meets UL 2225 Requirement for Metal Clad Cables
Impact	

***extremelife®-60* Cables**

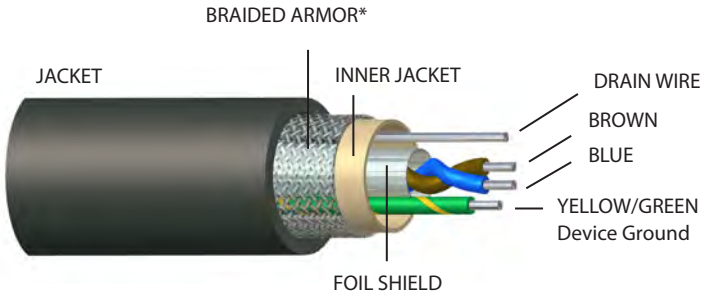
- Standard cables are stocked for quick delivery, and custom designs ship within 6 to 10 weeks
- Multiple designs and custom configurations can be built using 5 to 22 AWG wires and up to 30 conductors, shielded or unshielded
- Tinned copper braided armor
- Wide range of conductor sizes and composite cables available

HARSH ENVIRONMENT CABLE: ARMORED AND NON-ARMORED CONSTRUCTION

Non-Armored



Braided Armor
Armor braided jacket for superior mechanical protection

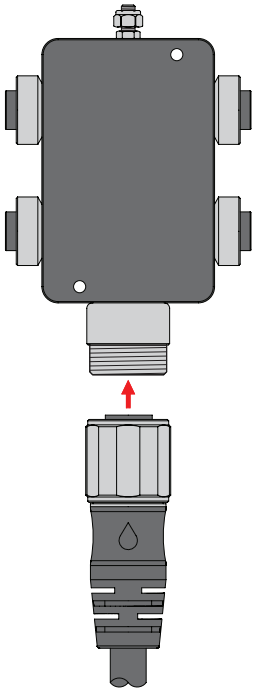


* Available on some cable types

HARSH ENVIRONMENT: 4-PORT JUNCTION BOX OPTIONS

MATCHING ASSEMBLY PART NUMBERS - CLASS I DIVISION 2 AREAS

P-4 RKFV 40-RSFV100



P-RSV RKV 40-XXX-*M

1188XL ITC-ER ***extremelife®-60*** Black (Non-Armored)

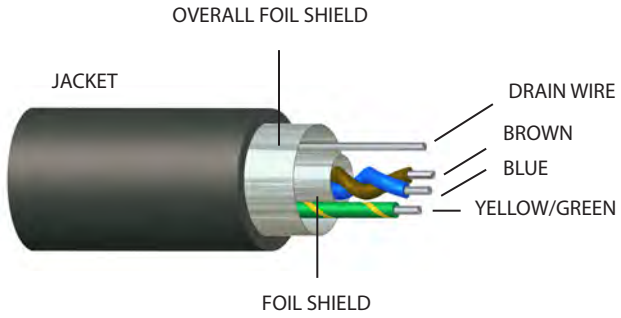
RSV RKV 101-XXX-*M

1189XL ITC-ER ***extremelife®-60*** Black (Non-Armored)

* = length in meters

HARSH ENVIRONMENT: 4-PORT JUNCTION BOX OPTIONS

Typical Field Instrument Applications



P-RSV RKV 40-XXX-*M

1188XL ITC-ER ***extremelife®-60*** Black (Non-Armored)

2-wire Transmitter

Brown.....+24 VDC

Blue.....4-20mA signal

Drain

SPST Valve Switch Contact

Brown.....+24 VDC

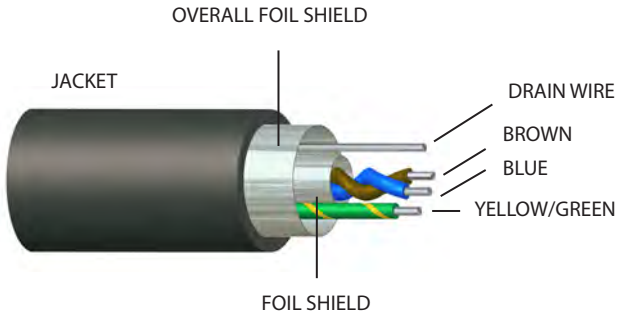
Blue.....Common

2-wire Valve Solenoid

Brown.....+24 VDC

Blue.....Common

Instrument Wire to 4-Port Box Pinout



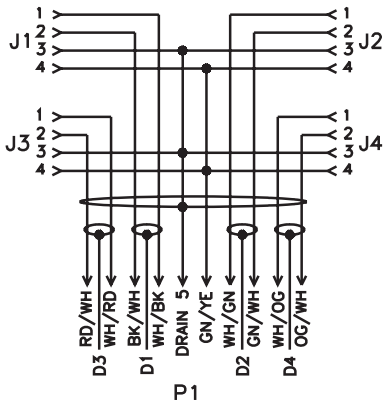
4-Port Junction Box Transmitter Application

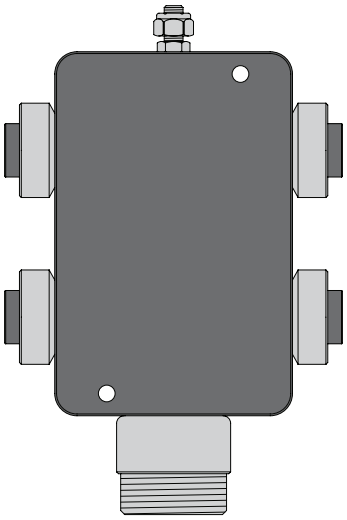
Pin 1: Blue 4-20mA

Pin 2: Brown +24 VDC

Pin 3: Drain Wire (shield)

Pin 4: Transmitter Case Ground
Normally not used

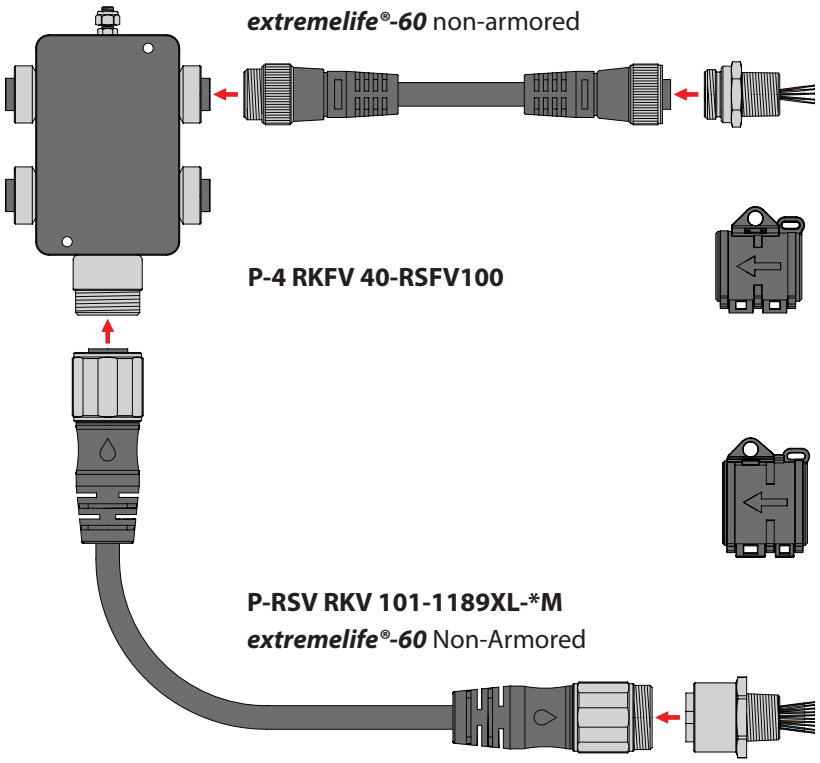




* = length in meters

HARSH ENVIRONMENT: 4-PORT JUNCTION BOX OPTIONS

Single Analog 4-Port Box with *extremelife®-60* Cable Black Colored Jacket Single Analog



P-RSV RKV 40-1188XL-*M
extremelife®-60 non-armored

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

P-4 RKFV 40-RSFV100

LOCK-MINI for each
7/8 -16 UN ***minifast®***
connector (2 needed)

LOCK-MINI-B&C for each
1 1/8 -16 UN ***minifast®***
connector (2 needed)

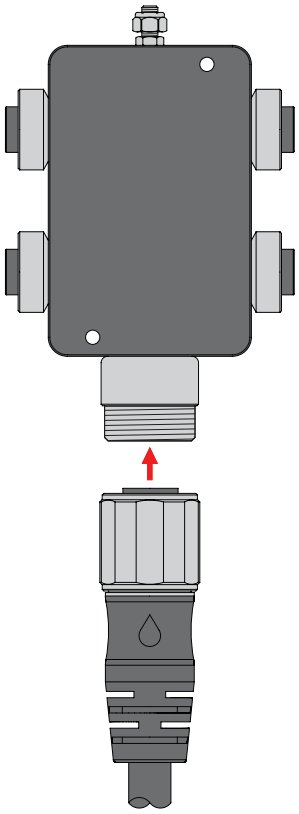
P-RSV RKV 101-1189XL-*M
extremelife®-60 Non-Armored

P-RKFV 101-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

4-PORT JUNCTION BOX OPTIONS FOR MIXING ANALOG AND DIGITAL SIGNALS

Matching Assembly Part Numbers - Class I Division 2 Areas

P-4 RKFV 66-RSFV19



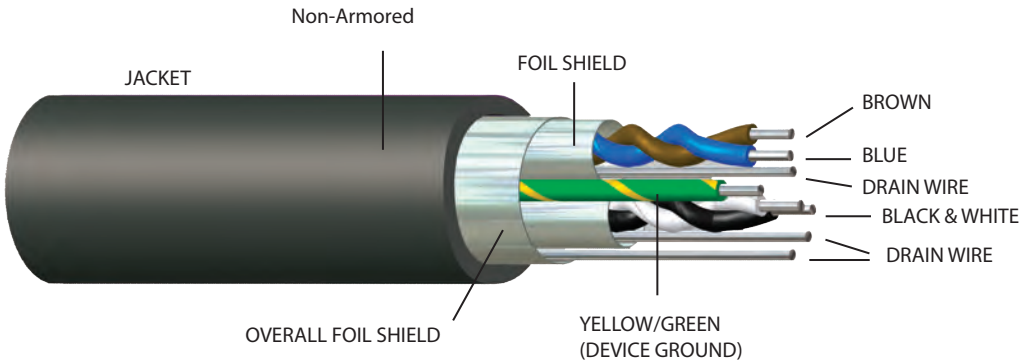
P-RSV RKV 66-XXX-*M

2176XL ITC-ER ***extremelife®-60*** Black (Non-Armored)
Note: This is a 6-pin ***minifast®*** cable

P-RSV RKV 19-1484-*M

1484XL ITC-ER ***extremelife®-60*** Black (Non-Armored)
Note: This is a 19-pin cable

Typical Field Instrument Applications



P-RSV RKV 66-XXX-*M

2176XL ITC-ER ***extremelife®-60***
Black
(Non-Armored)

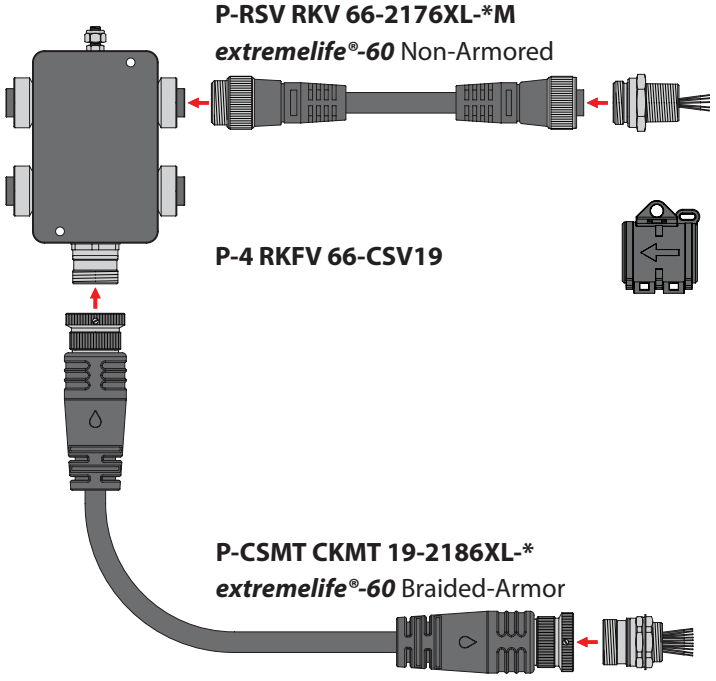
Note: These cables have 2 shielded twisted pairs with individual drains, an overall drain, and a ground conductor

Brown	STP
Blue	
Drain	
Black	STP
White	
Drain	
Green/Yellow Ground	
Overall Drain	

* = length in meters

4-PORT JUNCTION BOX OPTIONS FOR MIXING ANALOG AND DIGITAL SIGNALS

(6-pin, 2 Analog/Port) 4-Port box with *extremelife®-60* Black Colored Jacket



P-RSV RKV 66-2176XL-*M
extremelife®-60 Non-Armored

P-RSFV 66 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

P-4 RKFV 66-CSV19

Lock-mini for each
7/8 -16 UN ***minifast®***
connector (2 pcs needed)

P-CSMT CKMT 19-2186XL-*
extremelife®-60 Braided-Armor

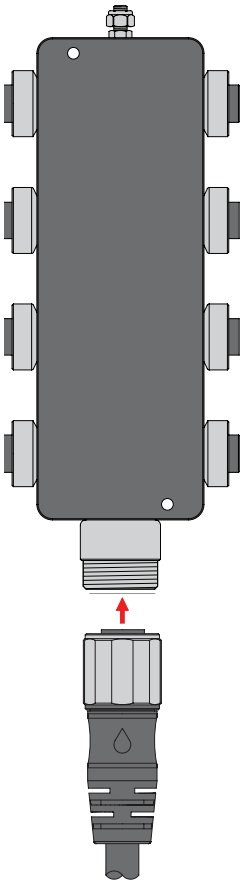
P-CKFLV 19-*
Customer Panel Receptacle

* = length in meters

HARSH ENVIRONMENT CABLE: 8-PORT JUNCTION BOX OPTIONS

Matching Assembly Part Numbers - Class I Division 2 Areas

P-8 RKFV 40-RSFV190



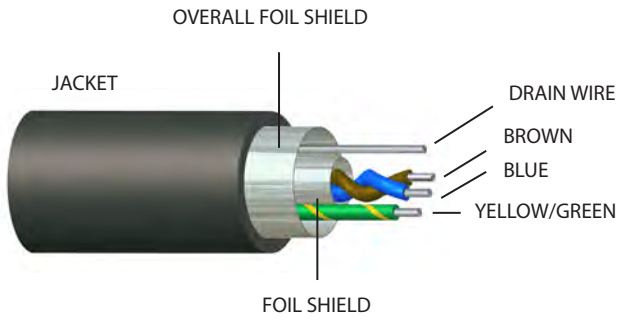
P-RSV RKV 40-XXX-*M

1188XL ITC-ER ***extremelife®-60*** Black (Non-Armored)

P-RSV RKV 190-XXX-*M

1484XL ITC-ER ***extremelife®-60*** Black (Non-Armored)

Typical Field Instrument Applications



P-RSV RKV 40-XXX-*M

1188XL ITC-ER ***extremelife®-60*** Black (Non-Armored)

2-wire Transmitter

Brown.....+24 VDC

Blue.....4-20mA signal

Drain

SPST Valve Switch Contact

Brown.....+24 VDC

Blue.....Common

2-wire Valve Solenoid

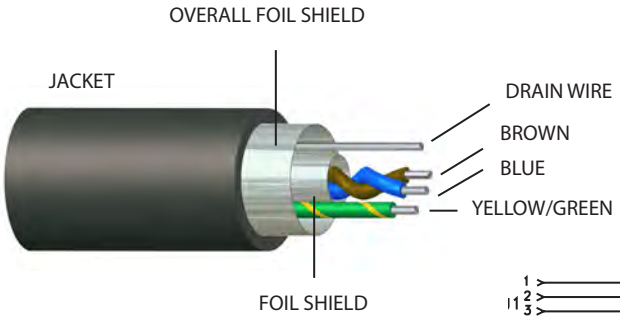
Brown.....+24 VDC

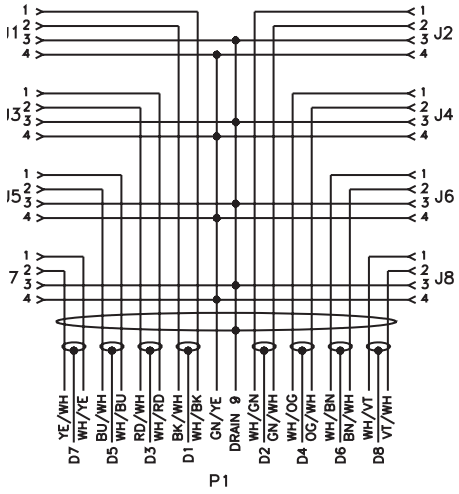
Blue.....Common

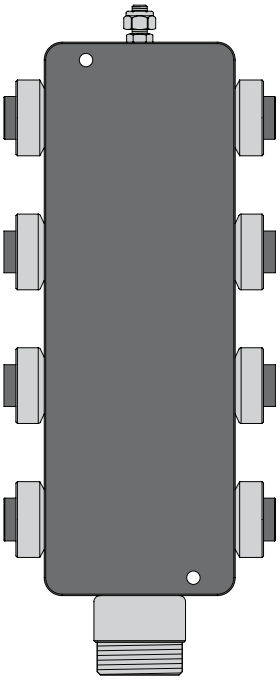
* = length in meters

HARSH ENVIRONMENT CABLE: 8-PORT JUNCTION BOX OPTIONS

INSTRUMENTS WIRE TO 8-PORT BOX PINOUT







4-port Junction Box Transmitter Application

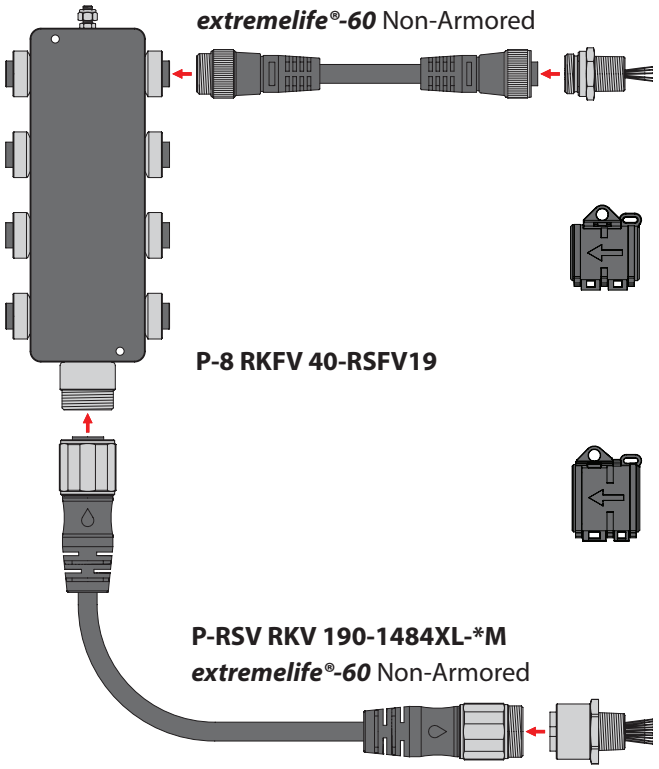
Pin 1: Blue 4-20mA

Pin 2: Brown +24 VDC

Pin 3: Drain Wire (shield)

Pin 4: Transmitter Case Ground Normally not used

Single Analog 8-Port Box with *extremelife®-60* Non-Armored Drop Cable Black Colored Jacket



P-RSV RKV 40-1188XL-*M
extremelife®-60 Non-Armored

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

LOCK-MINI for each 7/8 -16 UN ***minifast®*** connector (2 needed)

P-8 RKFV 40-RSFV19

LOCK-MINI-B&C for each 1 1/8 -16 UN ***minifast®*** connector (2 needed)

P-RSV RKV 190-1484XL-*M
extremelife®-60 Non-Armored

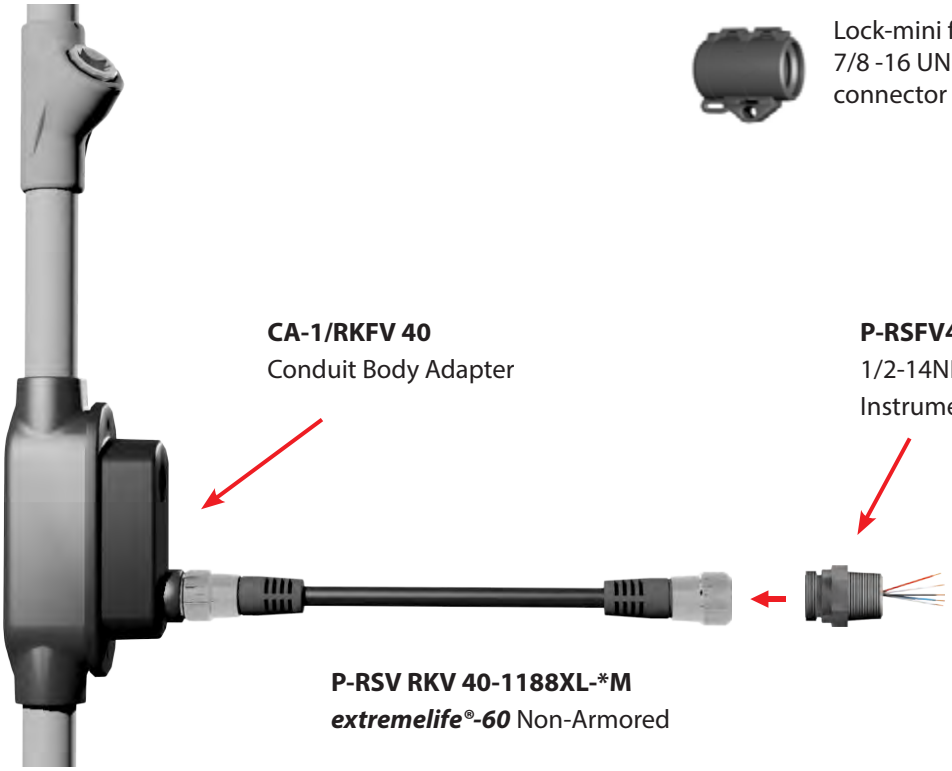
P-RKFV 190-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

* = length in meters

RETROFIT TO EXISTING CLASS I DIVISION 2 CONDUIT SYSTEM

Matching Assembly Part Numbers

Division 2 Conduit System to *extremelife®-60* Non-Armored Black Colored Jacket



Lock-mini for each
7/8 -16 UN ***minifast®***
connector (2 pcs needed)

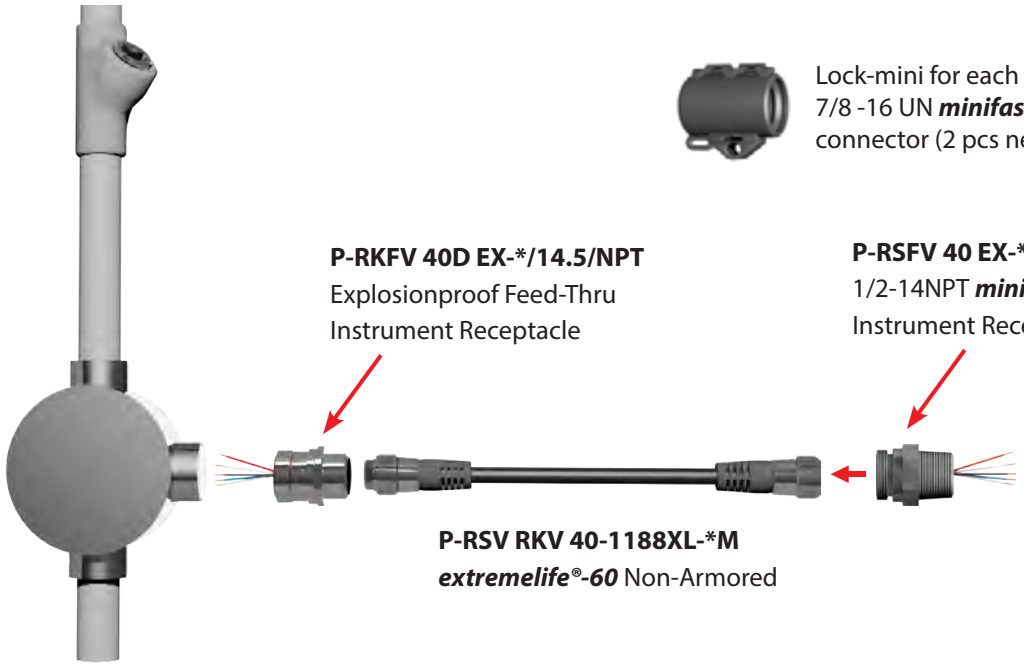
CA-1/RKFV 40
Conduit Body Adapter

P-RSFV40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

P-RSV RKV 40-1188XL-*M
extremelife®-60 Non-Armored

Conduit Body

Division 2 Conduit System to *extremelife®-60* Non-Armored Black Colored Jacket



Lock-mini for each
7/8 -16 UN ***minifast®***
connector (2 pcs needed)

P-RKFV 40D EX-*/14.5/NPT
Explosionproof Feed-Thru
Instrument Receptacle

P-RSFV 40 EX-*/14.5/NPT
1/2-14NPT ***minifast®***
Instrument Receptacle

P-RSV RKV 40-1188XL-*M
extremelife®-60 Non-Armored

Class I, Division 2 Junction

* = length in meters

AC POWER APPLICATIONS FOR CONTROL EQUIPMENT

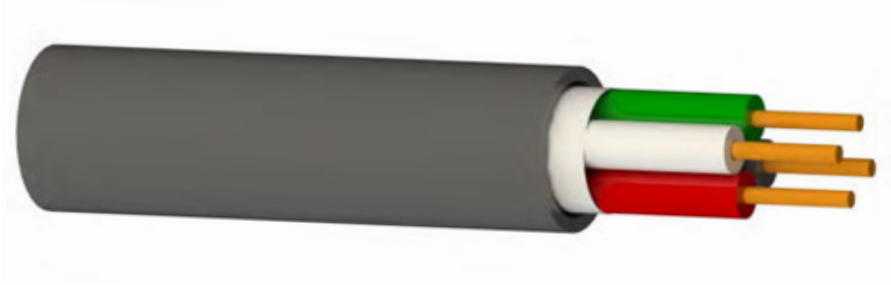
Typical TC-ER and TC-ER/STOOW Cables for AC Power

P-PWR-GSDV GKDV 30-xxx-*M
1667 TC-ER/STOOW Black
1742 TC-ER Black

P-PWR-GSDV GKDV 32-xxx-*M
1669 TC-ER/STOOW Black
1851 TC-ER Black

P-PWR-GSDV GKDV 34-xxx-*M
1671 TC-ER/STOOW Black
1198 TC-ER Black

P-PWR-RSV RKV 34-xxx-*M
1671 TC-ER/STOOW Black
1198 TC-ER Black



P-PWR-GSDV GKDV 40-xxx-*M
1666 TC-ER/STOOW Black
1743 TC-ER Black

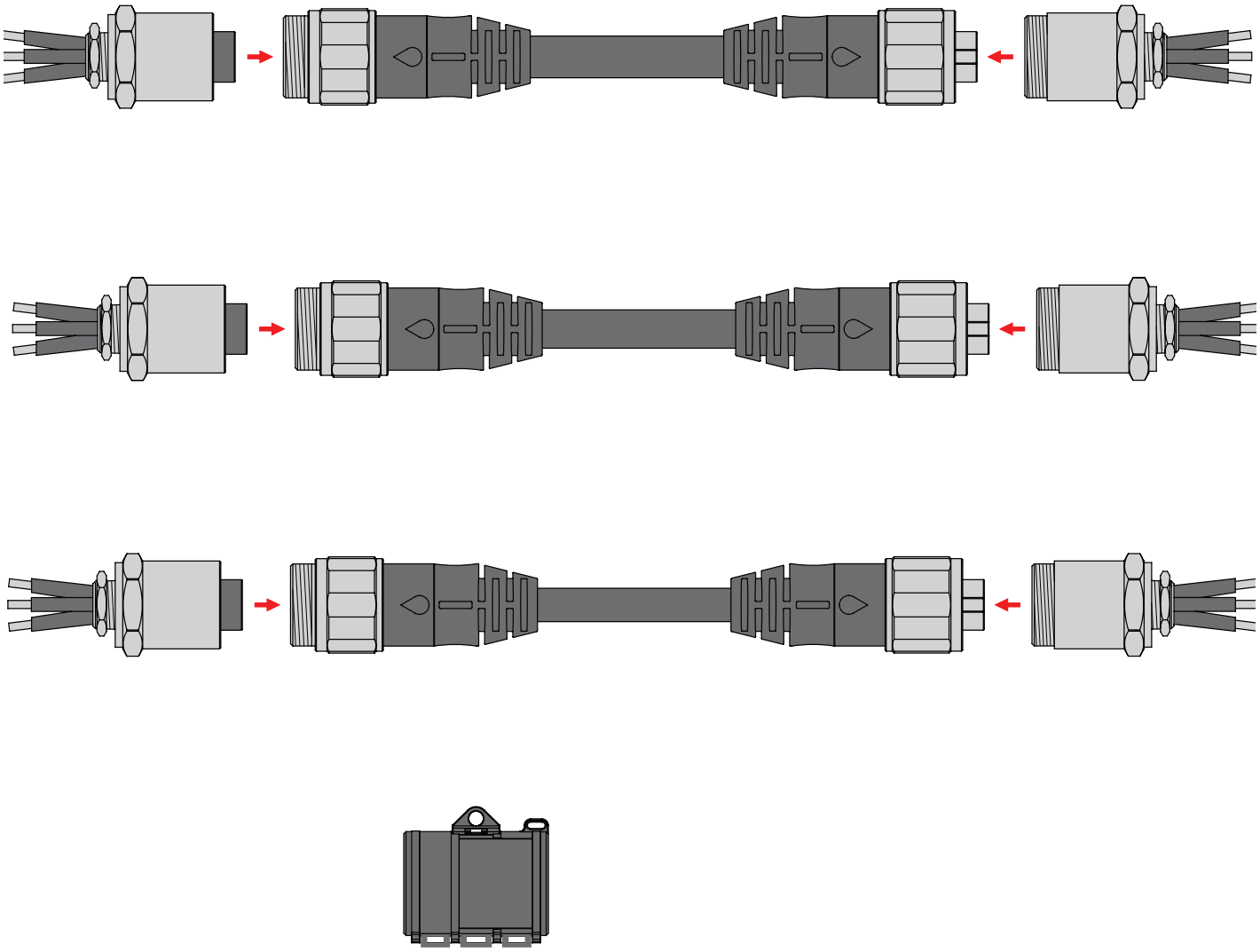
P-PWR-GSDV GKDV 42-xxx-*M
1668 TC-ER/STOOW Black
1850 TC-ER Black

P-PWR-GSDV GKDV 44-xxx-*M
1672 TC-ER/STOOW Black
1193 TC-ER Black

P-PWR-RSV RKV 44-xxx-*M
1672 TC-ER/STOOW Black
1750 TC-ER Black

AC POWER APPLICATIONS FOR CONTROL EQUIPMENT

Typical single-phase supply for actuators and small motors up to 600V/30A



AC POWER APPLICATIONS FOR CONTROL EQUIPMENT

Typical three-phase supply for actuators and small motors up to 600V/30A

P-PWR-GKDFV 40-*/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
10 AWG leads

P-PWR-GSDV GKDV 40-1666-*M
Black TC-ER/STOOW cable, 10 AWG

P-PWR-GSDFV 40-*M/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
10 AWG leads

P-PWR-GKDFV 42-*M/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
12 AWG leads

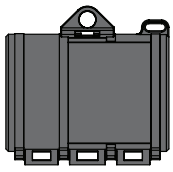
P-PWR-GSDV GKDV 42-1666-*M
Black TC-ER/STOOW cable, 12 AWG

P-PWR-GSDFV 42-*M/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
12 AWG leads

P-PWR-GKDFV 44-*M/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
14 AWG leads

P-PWR-GSDV GKDV 44-1672-*M
Black TC-ER/STOOW cable, 14 AWG

P-PWR-GSDFV 44-*M/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
14 AWG leads



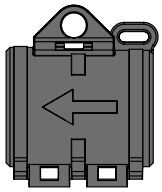
LOCK-MINI-D for each
1 3/8 UN ***powerfast***®
connector (2 needed)

Typical three-phase supply for actuators and small motors up to 600V/15A

P-PWR-RKFV 44-*/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
14 AWG leads

P-PWR-RSV RKV 44-1672-*M
Black TC-ER/STOOW cable, 14 AWG

P-PWR-RSFV 44-*/14.5/NPT
1/2-14NPT ***powerfast***® receptacle
1 3/8-16 UN female mating thread
14 AWG leads



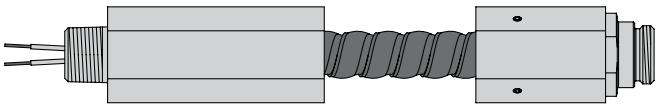
LOCK-MINI for each
7/8-16 UN ***powerfast***®
connector (2 needed)

MC-HL RECEPTACLE EXTENSIONS

MC-HL Cable: Suitable for Class I, Division 1 Installation

MC-HL Cable: Suitable for Class I, Division 1 Installation

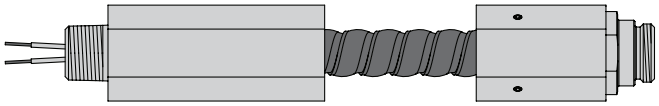
P-RSF-543-EXG-2006-*/*/14.5/NPT



1-Black
2-White
3-Housing/Armor
4-Brown
5-Blue

Twisted Pair
Twisted Pair

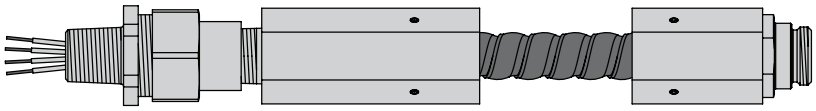
P-RSF-421-EXG-2032-*/*/14.5/NPT



1-Blue
2-Brown
3-n/c
4-Housing/Armor

Twisted Pair

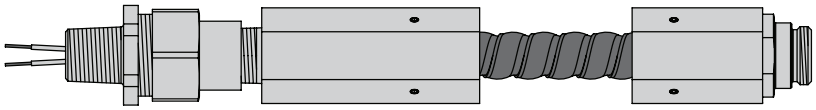
P-RSF-543-EXG-2006-*/*/14.5/NPT/UNION



1-Black
2-White
3-Housing/Armor
4-Brown
5-Blue

Twisted Pair
Twisted Pair

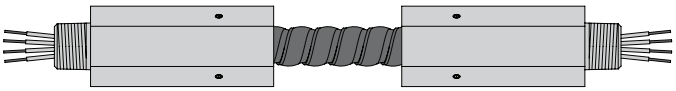
P-RSF-421-EXG-2032-*/*/14.5/NPT/UNION



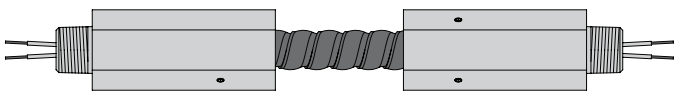
1-Blue
2-Brown
3-n/c
4-Housing/Armor

Twisted Pair

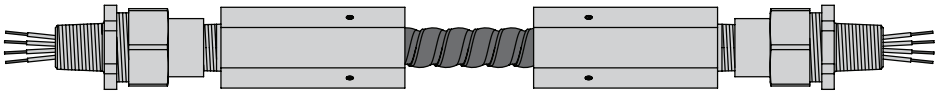
P-EXG2-2006-*/*/14.5/NPT



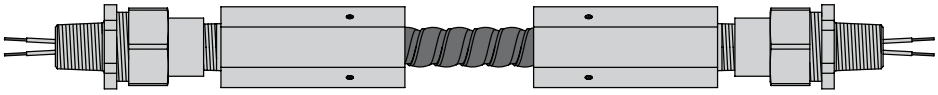
P-EXG2-2032-*/*/14.5/NPT



P-EXG2-2006-*/*/14.5/NPT/UNION



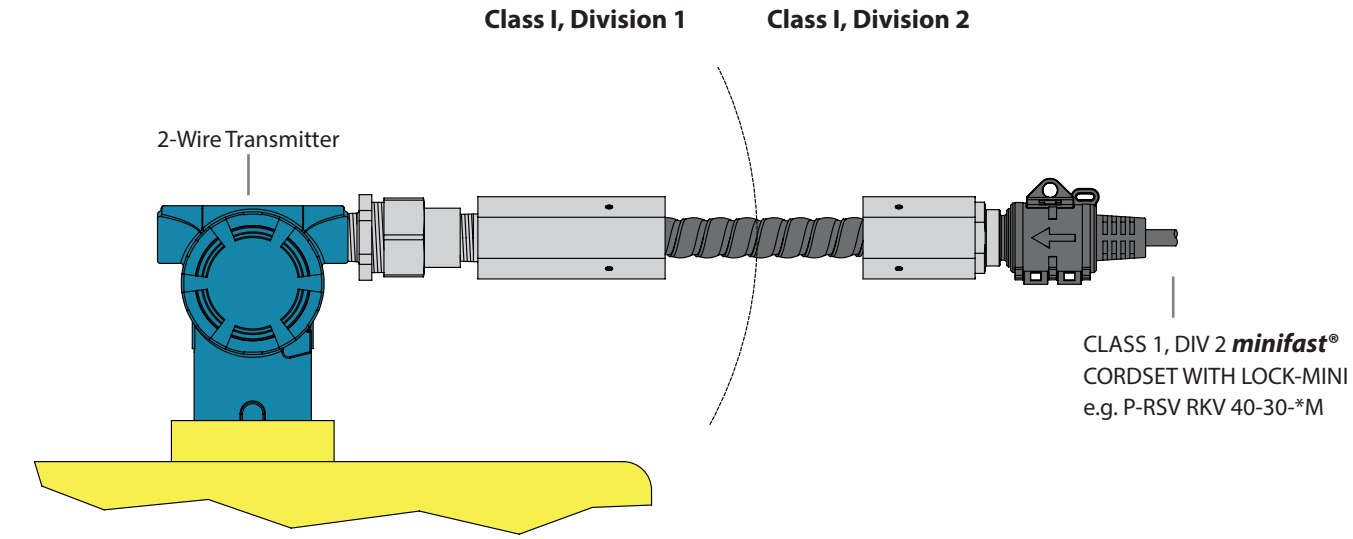
P-EXG2-2032-*/*/14.5/NPT/UNION

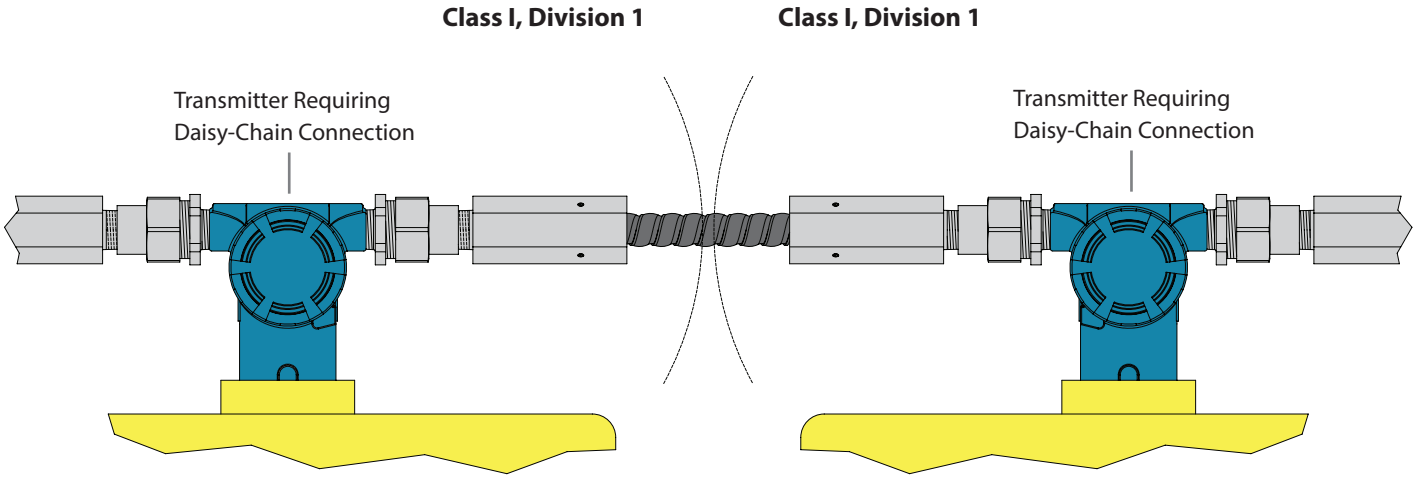


MC-HL RECEPTACLE EXTENSIONS

Typical Field Applications

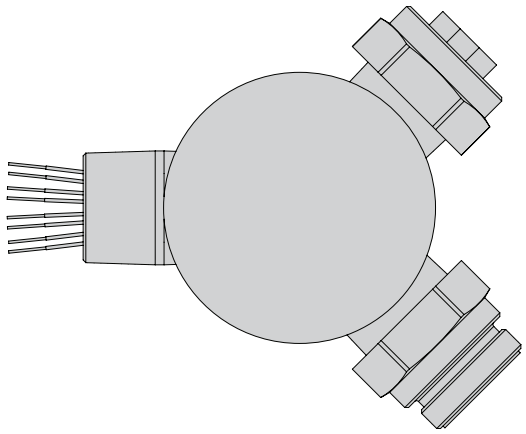
P-RSF 421-EXG-2032-*/*/14.5/NPT/UNION





2-WIRE:
P-EXG2-2032-*M/14.5/NPT/UNION
4-WIRE:
P-EXG2-2006-*M/14.5/NPT/UNION

EXPLOSIONPROOF FEED-THRU Y-FITTING



Available Options

Male-Male connectors

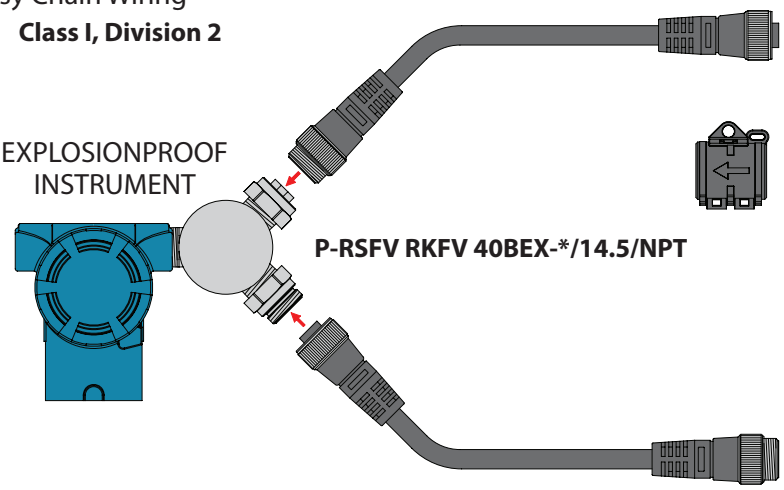
Female-Female connectors

Male-Female connectors (shown)

Typical Field Applications

Daisy Chain Wiring

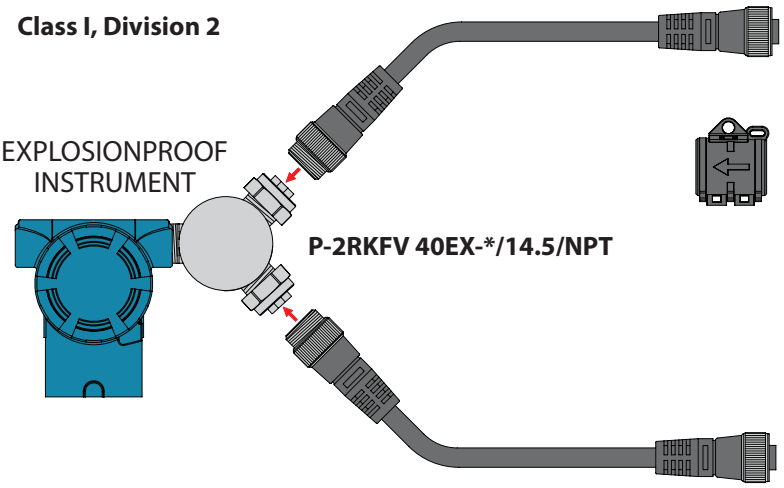
Class I, Division 2



LOCK-MINI for each 7/8 -16 UN ***minifast***® connector (4 needed)

Wiring Two Sensors Into One Entry

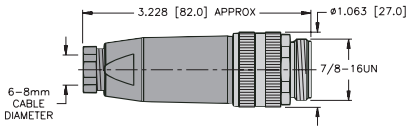
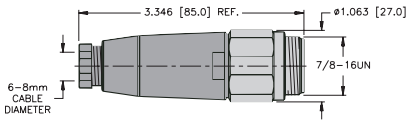
Class I, Division 2



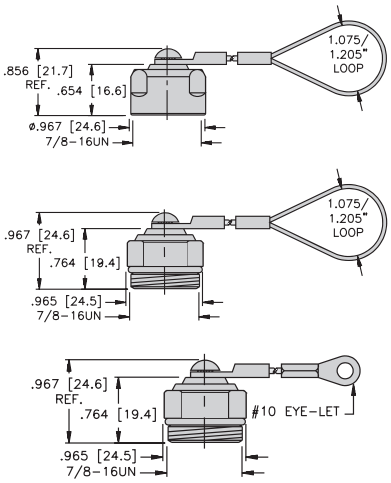
LOCK-MINI for each 7/8 -16 UN ***minifast***® connector (4 needed)

ACCESSORIES

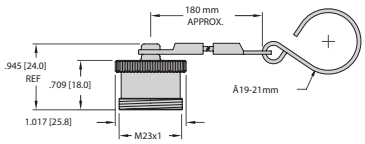
Field Wirable Connector - *minifast*®

Housing Style	Male Part Number	Features	Pinout
	**BS 4140-0/9**	Glass filled nylon, PG 9 cable gland, accepts 6-8 mm cable diameter, 90°C, 250 V, 9 A, mates with all 4-pin ***minifast***® cordsets and receptacles	Male 
	**BSV 4140-0/9**	Glass filled nylon, stainless steel coupling nut, PG 9 cable gland accepts 6-8 mm cable diameter, 90°C, 250 V, 9 A, mates with all 4-pin ***minifast***® cordsets and receptacles	Male 

Closure Caps

Connector Style	Part Number	Features
	**RKMV-CC**	Stainless steel, 7/8-16UN threads, 6" stainless steel lanyard, closure cap, mates to male cordsets, receptacles
	RSMV-CC	Stainless steel, 7/8-16UN threads, 6" stainless steel lanyard, closure cap, mates to female cordsets, receptacles
	RSFV-CC	Stainless steel, 7/8-16UN threads, 6" stainless steel lanyard, closure cap, mates to female cordsets, receptacles

M23 *multifast*®

Connector Style	Part Number	Features
	**CS-CC**	Nickel plated brass Neoprene gasket, closure caps for ***multifast***® cordset connectors

ACCESSORIES

Junction Box Mounting Kits

	Part Number	Features
	**KIT, J-BOX MOUNTING, 4-PORT METAL**	Galvanized steel mounting bracket for 4-port junction boxes. Includes mounting hardware. U-bolt fits up to 2 1/2" outside diameter pipe.
	**KIT, J-BOX MOUNTING, 8-PORT METAL**	Galvanized steel mounting bracket for 8-port junction boxes. Includes mounting hardware. U-bolt fits up to 2 1/2" outside diameter pipe.

NOTES:

Warranty Terms and Conditions

RISK OF LOSS

Delivery of the equipment to a common carrier shall constitute delivery to the Purchaser and the risk of loss shall transfer at that time to Purchaser. Should delivery be delayed due to an act or omission on the part of the Purchaser, risk of loss shall transfer to the Purchaser upon notification by TURCK Inc. that the order is complete and ready for shipment.

WARRANTIES

TURCK INC. (hereinafter "TURCK") offers five (5) WARRANTIES to cover all products sold. They are as follows:

1) The **12-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME**, **5-YEAR**, **24-MONTH** or **18-MONTH** warranty. No registration required.
2) The **18-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME** or **5-YEAR WARRANTY**. No registration is required.
3) The **24-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME**, **5-YEAR** or **18-MONTH**. No registration is required.
4) The **5-YEAR WARRANTY** is available generally for the products listed. No registration is required.
5) A **LIFETIME WARRANTY** is available for the products listed. It becomes effective when the accompanying TURCK **LIFETIME WARRANTY REGISTRATION** is completed and returned to TURCK.

GENERAL TERMS AND CONDITIONS FOR ALL WARRANTIES

- **12-MONTH STANDARD WARRANTY**
- **18-MONTH STANDARD WARRANTY**
- **24-MONTH STANDARD WARRANTY**
- **5-YEAR WARRANTY**
- **LIFETIME WARRANTY**

TURCK warrants the Products covered by the respective WARRANTY AGREEMENTS to be free from defects in material and workmanship under normal and proper usage for the respective time periods listed above from the date of shipment from TURCK. In addition, certain specific terms apply to the various WARRANTIES.

THESE EXPRESS WARRANTIES ARE IN LIEU OF AND EXCLUDE ALL OTHER REPRESENTATIONS MADE - BOTH EXPRESSED AND IMPLIED. THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE FOR PRODUCTS COVERED BY THESE TERMS AND CONDITIONS.

TURCK warrants that the goods sold are as described, but no promise, description, affirmation of fact, sample model or representation, oral or written shall be part of an order, unless set forth in these terms and conditions, or are in writing and signed by an authorized representative of TURCK. These WARRANTIES do not apply to any Product which has been subject to misuse, negligence, or accident - or to any Product which has been modified or repaired, improperly installed, altered, or disassembled - except according to TURCK's written instructions.

These WARRANTIES are subject to the following conditions:

1) These WARRANTIES are limited to the electronic and mechanical performance only, as expressly detailed in the Product specifications and NOT to cosmetic performance.
2) These WARRANTIES shall not apply to any cables attached to, or integrated with the Product. However, the **18-MONTH WARRANTY** shall apply to cables sold separately by TURCK.
3) These WARRANTIES shall not apply to any Products which are stored, or utilized, in harsh environmental or electrical conditions outside TURCK's written specifications.
4) The WARRANTIES are applicable only to Products shipped from TURCK subsequent to January 1, 1988.

ADDITIONAL SPECIFIC TERMS FOR:
(12-MONTH STANDARD WARRANTY) for Linear Displacement Transducers, EZ Track, RFID Products, Draw Wire Assemblies and Slip Rings.

(18-MONTH STANDARD WARRANTY) FOR Q-TRACK INDUCTIVE SENSORS, ULTRASONIC SENSORS, FLOW SENSORS, PRESSURE SENSORS, TEMPERATURE SENSORS, INCLINOMETERS, CABLES AND ALL NON-SENSING PRODUCTS SOLD BY TURCK INC. INCLUDING MULTI-SAFE, MULTI-MODUL, MULTI-CART AND RELATED AMPLIFIER PRODUCTS, RELAYS AND TIMERS.

(24-MONTH STANDARD WARRANTY) FOR ENCODERS excluding Draw Wire Assemblies.

5-YEAR WARRANTY FOR INDUCTIVE AND CAPACITIVE PROXIMITY SENSORS: The periods covered for the above WARRANTIES and Products shall be 12 MONTHS, 18-MONTHS, 24-MONTHS and 5-YEARS, respectively, from the date of shipment from TURCK.

LIFETIME WARRANTY (OPTIONAL - REGISTRATION REQUIRED) FOR INDUCTIVE, INDUCTIVE MAGNET OPERATED AND CAPACITIVE PROXIMITY SENSORS SOLD TO THE ORIGINAL PURCHASER FOR THE LIFETIME OF THE ORIGINAL APPLICATION.

Warranty Terms and Conditions

The following terms apply to the LIFETIME WARRANTY in addition to the General Terms:

1) This WARRANTY shall be effective only when the LIFETIME WARRANTY REGISTRATION has been completed, signed by the End User and an authorized TURCK Representative or Distributor and has been received by TURCK no later than six (6) months after installation in the End User's Plant, or two (2) years from the date product was shipped from TURCK, whichever is sooner.
2) This warranty is available only to TURCK's authorized Representatives, Distributors and to the Original User. (The term "Original User" means that person, firm, or corporation which first uses the Product on a continuous basis in connection with the operation of a production line, piece of machinery, equipment, or similar device.) In the event the ownership of the product is transferred to a person, firm or corporation other than the Original User, this WARRANTY shall terminate.
3) This WARRANTY is applicable only to the Original Application. In the event the machinery, equipment, or production line to which the Product is connected, or on which it is installed, is substituted, changed, moved or replaced, the WARRANTY shall terminate.
4) This WARRANTY shall be valid only if the Product was purchased by the Original User from TURCK, or from an authorized TURCK Distributor, or was an integral part of a piece of machinery and equipment obtained by the Original user from an Original Equipment Manufacturer, which itself, was purchased directly from TURCK or from an authorized Distributor.

PURCHASER'S REMEDIES

This Remedy shall apply to all WARRANTIES. If a TURCK Distributor desires to make a WARRANTY Claim, the Distributor shall, if requested by TURCK, ship the Product to TURCK's factory in Minneapolis, Minnesota, postage or freight prepaid. If the User desires to make a WARRANTY Claim, they shall notify the authorized TURCK Distributor from whom it was purchased or, if such Distributor is unknown, shall notify TURCK. TURCK shall, at its option, take any of the following two courses of action for any products which TURCK determines are defective in materials or workmanship.

1) Repair or replace the Product and ship the Product to the Original Purchaser or to the authorized TURCK Distributor, postage or freight prepaid; or
2) Repay to the Original Purchaser that price paid by the Original Purchaser; provided that if the claim is made under the LIFETIME WARRANTY, and such Product is not then being manufactured by TURCK, then the amount to be repaid by TURCK to the Original Purchaser shall be reduced according to the following schedule:

Number of Years Since Date of Purchase by Original Purchaser	Percent of Original Purchase Price To Be Paid by TURCK
10	50%
15	25%
20	10%
More than 20	5%

PURCHASER'S REMEDIES SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT OF REPLACEMENT, REPAIR OR REPAYMENT AS PROVIDED AND DOES NOT INCLUDE ANY LABOR COST OR REPLACEMENT AT ORIGINAL PURCHASER'S SITE. TURCK SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF ANY WARRANTY, EXPRESSED OR IMPLIED, APPLICABLE TO THE PRODUCT, INCLUDING WITHOUT LIMITATION, ANY DAMAGES RESULTING FROM PROPERTY DAMAGE, PERSONAL INJURY OR BUSINESS INTERRUPTION.

CONSIDER SAFETY AND PROTECTION PRECAUTIONS

TURCK takes great care to design and build reliable and dependable products, however, some products can fail eventually. You must take precautions to design your equipment to prevent property damage and personal injury in the unlikely event of failure. As a matter of policy, TURCK does NOT recommend the installation of electronic controls as the sole device FOR THE PROTECTION OF PERSONNEL in connection with power driven presses, brakes, shears and similar equipment and, therefore, the customer should build in redundancy or dual control using approved safety devices for these applications.

GOVERNING LAW

The sale and purchase of Products covered hereby and all terms and conditions hereof shall be governed by the law of the States of Minnesota.

TURCK sells its products through Authorized Distributors. These distributors provide our customers with technical support, service and local stock. TURCK distributors are located nationwide – including all major metropolitan marketing areas.
For Application Assistance or for the location of your nearest TURCK distributor, call:
1-800-544-7769

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Literature and Media questions or concerns?
Contact Marketing Communications TURCK USA – media@turck.com

USA

TURCK Inc.
3000 Campus Drive
Minneapolis, MN 55441
Phone: (763) 553-7300
Fax: (763) 553-0708
Application Support:
1-800-544-7769
E-mail: turckusa@turck.com

MEXICO

TURCK Mexico S. de R.L. de C.V.
Carr. Saltillo-Zacatecas km 4.5 Nave 35
Parque Industrial "La Angostura"
Saltillo, COAH. C.P. 25315
México
Phone: +52 (844) 411-6650
Fax: +52 (844) 482-6926
Local Toll Free: 01-800-01-88725
E-mail: mexico@turck.com

CANADA

TURCK Chartwell Canada Inc.
140 Duffield Drive
Markham, Ontario
Canada, L6G 1B5
Phone: (905) 513-7100
Fax: (905) 513-7101
Toll Free: 1-877-513-7769

AUSTRALIA

TURCK Australia Pty. Ltd.
Unit 5, 6-7 Gilda Court
Mulgrave, Victoria 3170
Australia
Phone: (+61) 3 9560 9066
Fax: (+61) 3 9560 1620
Local Toll Free: 1300 132 566
E-mail: turckaustralia@turck.com

GERMANY

WORLD HEADQUARTERS

Hans TURCK GmbH & Co. KG
Witzlebenstrasse 7
D-45472 Muelheim an der Ruhr
Federal Republic of Germany
Phone: (+49) 208-49 52-0
Fax: (+49) 208-49 52 264

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