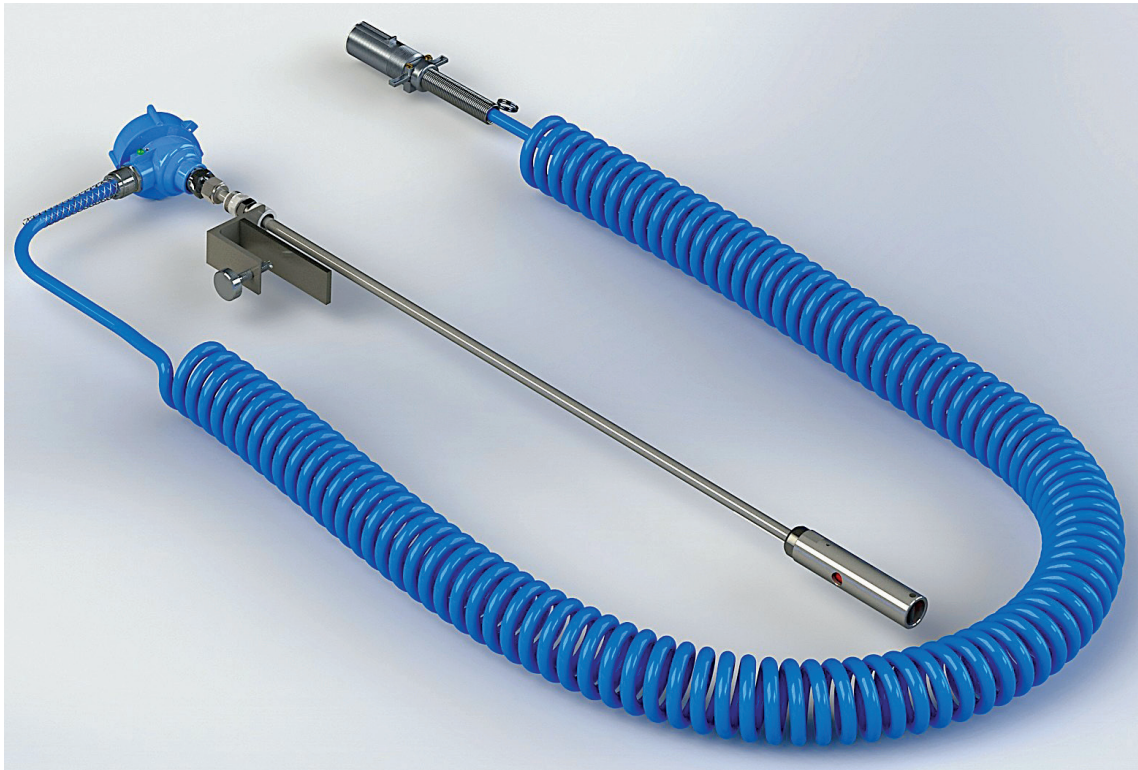




The Right Connection®

Maintenance and Operating Instructions

FT160 and FT180 Series Cane Probes



Dixon
7280 Union Centre Blvd
West Chester, Ohio
Phone: 877.582.3569
Fax: 410.778.4702
Toll Free: 800.355.1991
E-mail: dixonbayco@dixonvalve.com



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Dixon® FT160/FT180-Series Cane Probes

Table of Contents

Specific conditions of use	3
Product overview	4
Model details	5
Product diagram	6
Technical specifications	7
Entity parameters	7
Installation	8-9
Installing into service	8-9
Electrical Connections	10-12
Maintenance	13
Operation	14
Warranty	15

Dixon® FT160/FT180-Series Cane Probes

Declaration of Conformity

The Dixon cane probe is intended for installation and operation at industrial fluid transfer facilities, handling both hazardous and non-hazardous materials. As such, the FT160 and FT180-Series of probes are designed to meet all required safety standards to operate in these hazardous environments.

Table of applied design standards:

CSA C22.2 NO. 60079-0	UL 60079-0
CSA C22.2 NO. 60079-11	UL 60079-11
CSA C22.2 NO. 61010-1-12	UL 61010-1
CSA C22.2 NO. 157-92	UL 913

The table below summarizes the hazardous gas groups in which the FT160-Series probes are designed for:

	NEC 500 CLASS I DIVISION		NEC 505 CLASS I ZONE		
	1	2	0	1	2
Installation in	CD	CD	IIB	IIB	IIB
Connection to	CD	CD	IIB	IIB	IIB

CD/IIB = Ethylene and Propane

The use of cane probe in the hazardous locations listed above assumes the following conditions are met and that all installation requirements are observed.

Specific Conditions of Use

1. The functionality of the probe, and complete overfill system must be verified by the installer as part of the commissioning process. Repeated verification through the life of the system is recommended.
2. Substitution of parts may impair functionality or safety. Repair with only genuine Dixon components, following approved procedures.
3. The electrical safety of the system is dependent upon pairing the probe with an appropriately rated controller. Consult an intrinsic safety system designer before connecting equipment to ensure the probe is used in accordance with Dixon control drawing 11470EX.
4. Do not service or repair in a hazardous environment.
5. Do not install or remove the probe from a vessel during the transfer operation.
6. Do not operate the probe without the included shroud.

Product Overview

Dixon prides itself on the quality and reliability of our products. Our mechanical and electronic equipment is designed to withstand the harsh environments that overfill prevention equipment is routinely exposed to. Products are developed with safety, reliability, usability, and customer satisfaction as our primary focus.

Our overfill prevention equipment has been in use in the field since 2000 and continues to set the standard for reliability in the industry. Dixon's cane probe lineup represents an essential piece of equipment for the liquid transfer industry. With Dixon products end-to-end, racks and haulers can operate with less downtime and greater confidence in the reliability of their rack.

Compatibility

The FT160/FT180-Series Cane Probes are designed for use in industrial liquid transfer applications. The probe is used in conjunction with an API1004 and/or EN13922 compliant overfill monitoring system such as the Dixon FT7200 RackmateSC controller. Together, the probe and controller form a system to monitor the liquid-loading process and prevent overfills and spills.

The probe is designed for use with stationary tanks being loaded with transparent, hazardous, and non-hazardous liquids. The probe features an integrated industry-standard process connection, so that it can be installed and removed from a tank vessel, and is not intended for permanent installation. Applications requiring permanent sensing equipment should consider Dixon's FT100 or FT150-Series probe lines.

Dixon® FT160/FT180-Series Cane Probes

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Model details

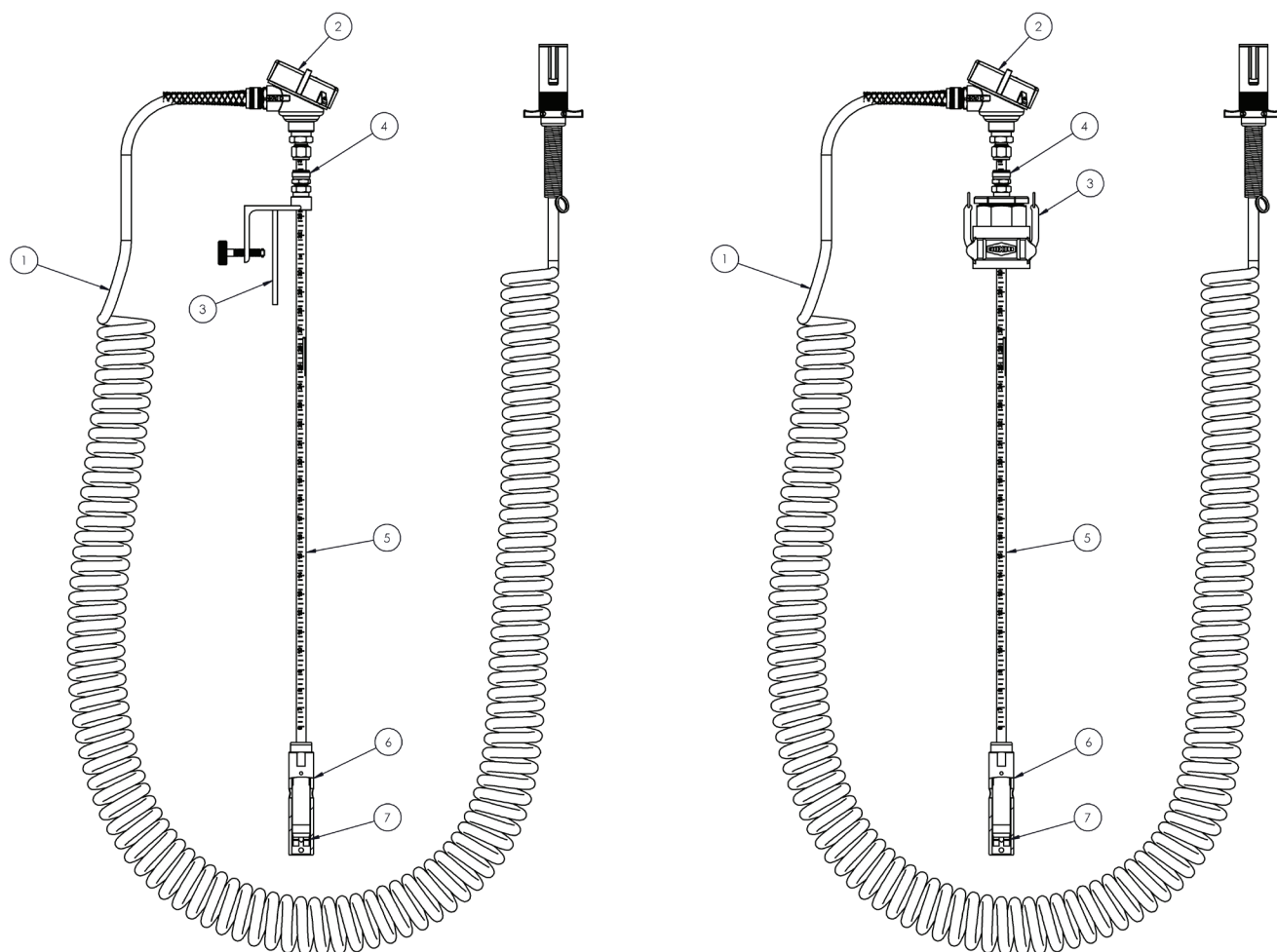
FT160-Series Part Number Key

FT160-Series Cane Probe Part Number Key Example: FT160AL36C20P		Series	Buildout	Wetted Material	Probe Length	Cable Type	Cable Length	Connector
		FT16	0	AL	36	C	20	P
Series	Code							
FT16 (2-wire thermistor type signal)	FT16							
Buildout	Code							
Dome adapter	0							
2" Camlock Cam & Groove fitting	1							
Wetted Material	Code							
Aluminum	AL							
Stainless Steel	SS							
Probe Length	Code							
20" (50.8 cm)	20							
36" (88.9 cm)	36							
48" (121.9 cm)	48							
62" (157.5 cm)	62							
Cable Type	Code							
Coiled	C							
Straight	S							
Cable Length	Code							
15' (4.6 m) cable	15							
20' (6.1 m) cable	20							
30' (9.2 m) cable	30							
Connector	Code							
No connector, flying leads	BLANK							
4-way plug	P							

FT180-Series Part Number Key

FT180-Series Cane Probe Part Number Key Example: FT180AL36C20P		Series	Buildout	Wetted Material	Probe Length	Cable Type	Cable Length	Connector
		FT18	0	AL	36	C	20	P
Series	Code							
FT18 (5-wire optic type signal)	FT18							
Buildout	Code							
Dome adapter	0							
2" Camlock Cam & Groove fitting	1							
Wetted Material	Code							
Aluminum	AL							
Stainless Steel	SS							
Probe Length	Code							
20" (50.8 cm)	20							
36" (88.9 cm)	36							
48" (121.9 cm)	48							
62" (157.5 cm)	62							
Cable Type	Code							
Coiled	C							
Straight	S							
Cable Length	Code							
15' (4.6 m) cable	15							
20' (6.1 m) cable	20							
30' (9.2 m) cable	30							
Connector	Code							
No connector, flying leads	BLANK							
7-way plug	P							

Product Diagram



1. Cable
2. Housing
3. Dome adapter/Cam & groove adapter
4. Slide fitting
5. Probe shaft
6. Sensor shroud
7. Optic sensor element

Technical Specifications

	Min	Max	Nominal
operating temperature	-40°C/-40°F	60°C/140°F	
storage temperature	-40°C/-40°F	60°C/140°F	
humidity	0%	100%	
altitude		2000M above sea level	
pollution degree		2	
wet location			permitted
indoor & outdoor use			permitted
weight			12.4 lbs (5.62 kg)
probe length	20" (50.8 cm)	62" (157.5 cm)	316 stainless steel
probe shaft diameter			1/2"
probe material			aluminum or stainless steel
probe diameter			shroud O.D.: 1.3" (33.4 mm)
housing width			3.6" (93 mm)
housing length			5.1" (130 mm)

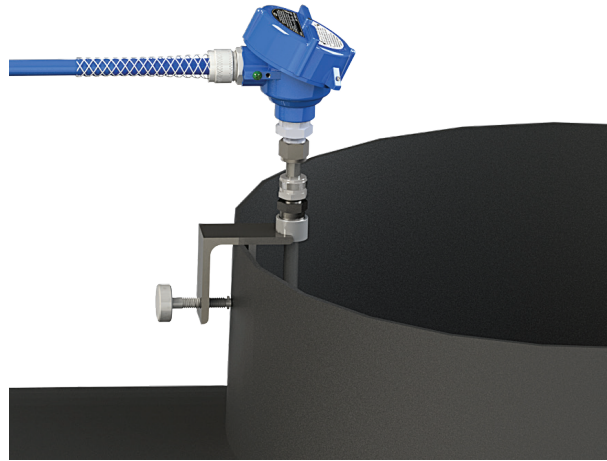
Entity Parameters

Ui	30V
Ii	250mA
Pi	---
Ci	0uF
Li	0mH

Installation

Installing into open dome loading

FT160/FT180 models built with a dome adapter are suitable for use in open-dome loading applications. These include tanks and vessels that are not air-tight, and have a collared port of some sort on the top of the tank.

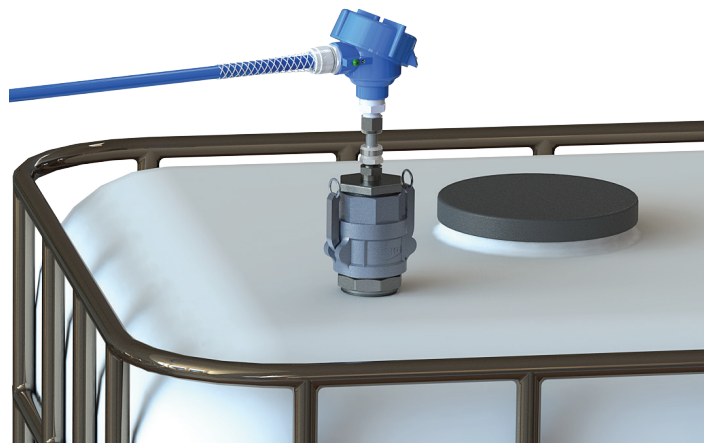
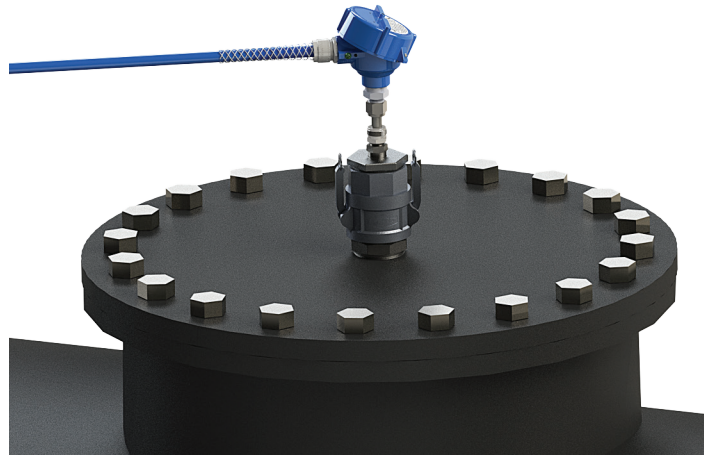


1. Verify the sensor and overfill prevention system are operational by testing in a safe liquid.
2. Insert the probe sensor into the tank until the dome adapter captures the collar of the entry port.
3. Tighten the dome adapter set-screw,
4. Loosen the slide adapter if the outage level needs to be adjusted.
5. Slide the probe through the slide fitting and dome adapter until the desired outage is shown on the probe shaft graduations.
6. Tighten the slide adapter.
7. Begin the loading process, closely observing the system throughout the process.
8. When the loading process has finished, loosen the collar set-screw, then withdraw the probe from the port.

Dixon® FT160/FT180-Series Cane Probes

Installing into Closed dome with vapor recovery

FT160/FT180 models built with a cam & groove/camlock adapter are suitable for use with standard industrial 2" cam & groove fittings commonly found on road and rail mobile tank cars. These tanks are typically vapor tight, and bottom loaded.



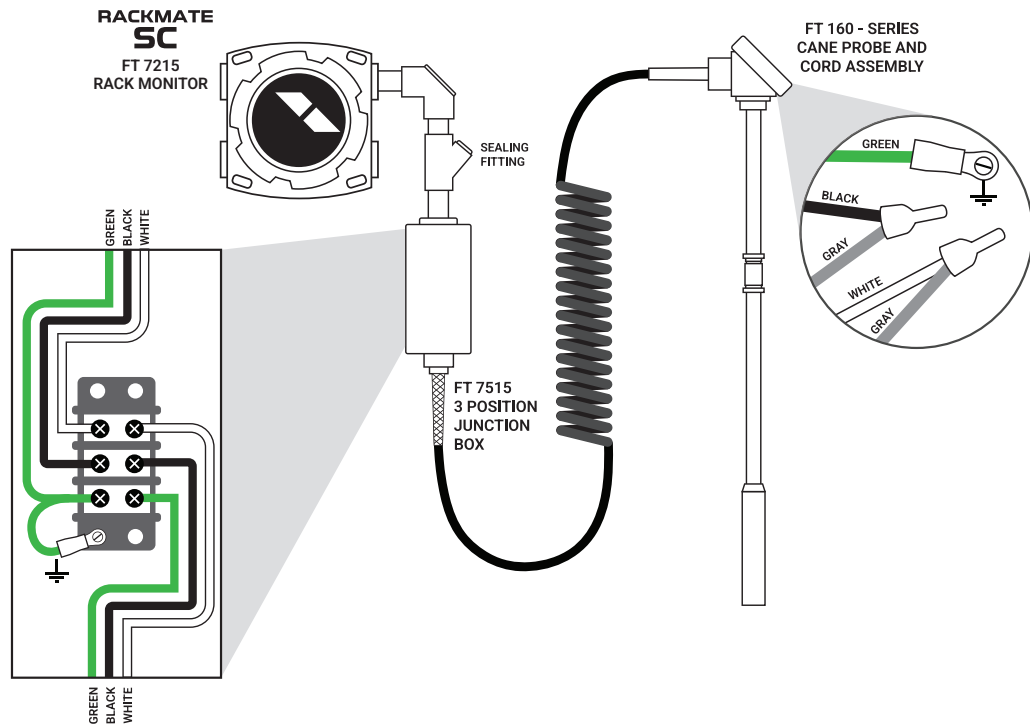
1. Verify the sensor and overfill prevention system are operational by testing in a safe liquid.
2. Insert the probe sensor into the tank until the cam & groove adapter meets the mating cam & groove fitting on the tank.
3. Lock the cam & groove arms to secure the fittings together.
4. Loosen the slide adapter if the outage level needs to be adjusted.
5. Slide the probe through the slide fitting until the desired outage is shown on the probe shaft graduations.
6. Tighten the slide adapter.
7. Begin the loading process, closely observing the system throughout the process.
8. When the loading process has finished, disengage the cam & groove fitting arms, then withdraw the probe. Typically, a cap will be placed back onto the fitting to maintain a vapor tight tank.

Electrical Connections

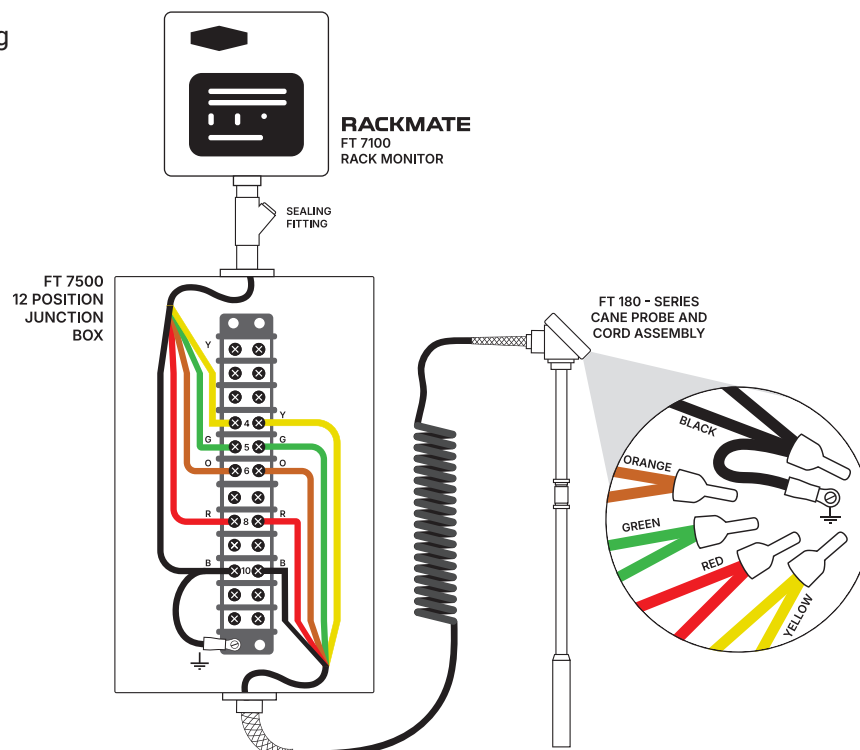
Non-plug-and-play systems

Non-plug-and-play systems will need to be wired into a service point such as a junction box. The cane probe should not be wired directly into a flameproof housing.

FT160-Series direct wiring



FT180-Series direct wiring



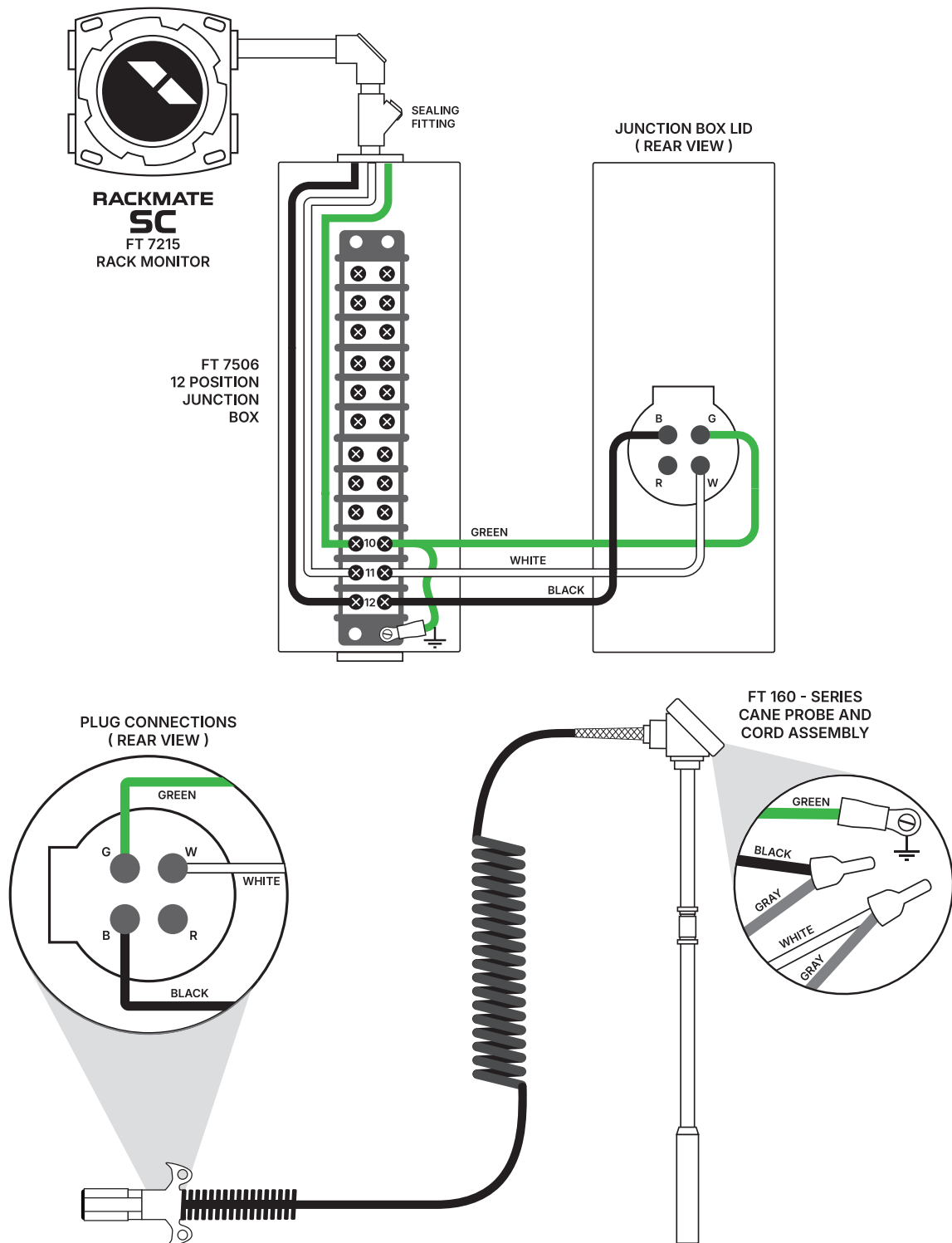
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Plug-and-Play systems

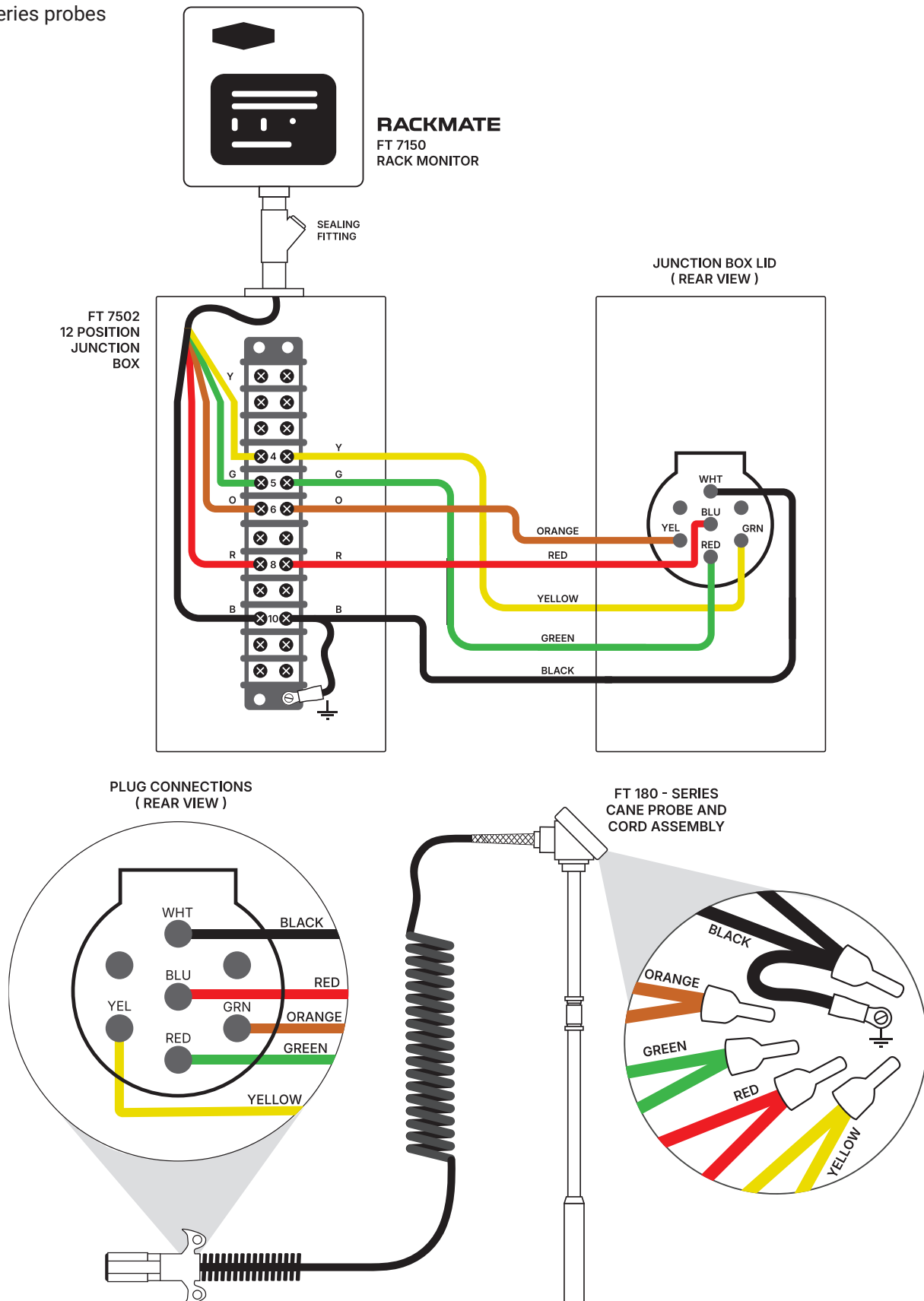
Models that include a connector will be factory wired to work out-of-the-box with compatible overfill monitors. If the cable becomes damaged, a replacement cable can be purchased from Dixon and the damaged cabled can be replaced by observing the following wiring diagram:

FT160-Series probes



Dixon® FT160/FT180-Series Cane Probes

FT180-Series probes



Maintenance

The FT160/FT180-Series Cane Probes have few wear items. The probe's cable is built to last many years of daily service, but will eventually wear out and require replacing. Refer to the wire diagrams in electrical connections section above for guidance on replacing the cable.

The bottom of the sensor shroud features a small nylon bridge. This bridge ensures safe operation of the sensor and should be inspected regularly to ensure it is not damaged.

Scuffs and dings along the probe shaft can decrease legibility of the integrated graduations, and increase abrasion on the integrated slide fitting which can eventually leak. This cannot be repaired, so care should be exercised to preserve the smooth factory finish of the probe shaft.

Replacement Parts

Dixon's FT160/FT180-Series Cane Probes have few parts that will require regular maintenance. If needed, clean only with a damp cloth. All surfaces are made of corrosion resistant materials that should withstand any harsh liquids it may come in contact with during fluid transfer operations, and normal environmental elements.

The cord is designed with longevity in mind. When properly installed, the cable will operate for many years before failing.

The sensor shroud may suffer cosmetic damage from striking it on hard or abrasive surfaces, but should remain functional. If the internal sensor element fails, it can be replaced as well.

FT9084 – Replacement Sensor Shroud

FT9085 – Replacement Aluminum 2-Wire Probe

FT9086 – Replacement Aluminum 5-Wire Probe

FT9087 – Replacement Stainless Steel 2-Wire Probe

FT9088 – Replacement Stainless Steel 5-Wire Probe

FT9089 – Replacement Probe cord

FT9090 – Replacement 7-way connector

FT9091 – Replacement 4-way connector

FT9092 – Replacement Probe cord with 7-way connector

FT9093 – Replacement Probe cord with 4-way connector

Operation

The FT160/FT180-Series Cane Probe is a portable overfill detection device designed for top-loading operations where fixed sensors are not installed. It serves as a critical safety link between the liquid being loaded and a compatible rack monitor to prevent spills.

Functional Overview

The probe utilizes optic sensor technology to monitor liquid levels in real-time.

- **Normal State:** While the sensor remains dry, it provides a "**permissive**" signal to the connected loading rack monitor, allowing the transfer process to continue.
- **Overfill Detection:** When liquid reaches the sensing element at the tip of the probe, the signal changes to a "**non-permissive**" state.
- **System Response:** This state change triggers the loading rack monitor's relay contacts, which should be interlocked with the facility's equipment to automatically shut down or prevent further loading.

Operator procedure

To ensure safe and reliable operation, follow these general steps during each loading cycle:

1. **Pre-Operation Verification:** Before use, verify that the sensor and the complete overfill prevention system are operational. It is recommended to test the probe in a safe liquid to ensure the monitor enters a non-permissive state upon contact.
2. **Deployment and Adjustment**
 - o **Attachment:** Secure the probe to the tank using the integrated process connection. For open-dome loading, use the **dome adapter** to capture the port collar. For closed-loading, lock the **cam & groove arms** onto the mating tank fitting. Refer to the sections above for detailed procedures of both situations.
 - o **Setting the Outage:** Loosen the slide adjustment knob to set the desired shut-off depth. Use the graduations on the probe shaft to determine the correct level, then tighten the knob securely to prevent the probe from moving during the transfer.
3. **Loading Monitoring:** If the probe is not already connected to the load controller, connect the probe's plug to the rack's junction box socket. Once a "permissive" status is achieved on the rack monitor, begin the loading process.

NOTE: End users must closely observe the system throughout the entire transfer operation.

4. **Post-Loading Removal:** Once the loading process is complete, disengage the process connection (loosen the set-screw or disengage cam arms) and carefully withdraw the probe from the vessel. For closed systems, replace the tank cap immediately to maintain a vapor-tight seal.



Dixon® FT160/FT180-Series Cane Probes

Important Safety Note: Do not install or remove the probe while liquid transfer is actively in progress. To maintain the integrity of the sensor, never operate the probe without the included sensor shroud.

FAQ and Troubleshooting

Warranty

For warranty claims and information regarding coverage, please contact Dixon Support at +1 513.874.8499

Support

Dixon

7280 Union Center Blvd
West Chester Ohio 45014
+1 513.874.8499



The Right Connection®

For Sales and Service Contact

Europe:

Dixon Group Europe Ltd.
Preston, England
Phone: +44 (0) 1772 323529
Fax: +44 (0) 1772 314664
Email: enquiries@dixoneurope.co.uk

USA:

Dixon
Chestertown, Maryland
Phone: 877.963.4966
Fax: 410-778-4702
Toll Free: 800-355-1991
E-mail: dixonbayco@dixonvalve.com

Asia Pacific:

Dixon (Asia Pacific) Pty Ltd
Wingfield, South Australia
Phone: +61 8 8202 6000
Fax: +61 8 8202 6099
E-mail: enquiries@dixonvalve.com.au

Canada:

Dixon Group Canada Limited
Mississauga, Ontario
Phone: 905.673.5999
Toll Free: 866.436.1125
E-mail: isales@dixongroupcanada.com

Mexico:

Dixva, S. de R.L. de C.V.
Mexico City
Phone: 01-800-00-DIXON (34966)
Fax: 01-81-8354-8197
E-mail: contactenos@dixonvalve.com.mx

Dixva, S. de R.L. de C.V.
Monterrey, N.L.
Phone: 01-800-00-DIXON (34966)
Fax: 01-81-8354-8197
E-mail: contactenos@dixonvalve.com.mx

Singapore:

Dixon Valve (Singapore) Pte Ltd
Phone: 66.6232.5272
Fax: 65.6232.5270
E-mail: customerservice@dixonvalve.com.sg



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