



Junction Box Installation & Operation Manual

Junction Box Installation & Operation Manual

CONTENTS

I.	HANDLING AND STORAGE.....	1
	Inspection And Handling	
	Disposal And Recycling	
	Storage	
II.	GENERAL SAFETY	2
	Authorized Personnel	
	Use	
	Misuse	
III.	PRODUCT DESCRIPTION.....	3
	Function	
	Features	
	Technical Specifications	
IV.	MECHANICAL INSTALLATION	4
	Mounting the Junction box	
V.	ELECTRICAL INSTALLATION.....	6
	General Safety	
	Disconnect Requirements For Permanently Installed Equipment	
	Installation	
	Guidelines	
	Wiring Sensors to Junction Box (Half Bridge: KM Mircocell, LCell, LD2, LD3, LD360)	
	Wiring Sensors to Junction Box (Full Bridge: KM LD3xi, LD3xiC, TC-1)	
	Wiring Sensors to Junction Box (Half Bridge to Full Bridge)	
	Wiring Sensors to Juction Box (Full Bridge to Half Bridge)	
	Wiring Junction Box to Controller	

SAFETY SYMBOLS



WARNING:

IDENTIFIES CONDITIONS OR PROCEDURES, WHICH IF NOT FOLLOWED, COULD RESULT IN SERIOUS INJURY. RISK OF ELECTRICAL SHOCK.



CAUTION:

IDENTIFIES CONDITIONS OR PROCEDURES, WHICH IF NOT FOLLOWED, COULD RESULT IN SERIOUS DAMAGE OR FAILURE OF THE EQUIPMENT.

Junction Box Installation & Operation Manual

I. HANDLING AND STORAGE

SAVE THESE INSTRUCTIONS

INSPECTION AND HANDLING

Do not dispose of the carton or packing materials.

Each package should be inspected upon receipt for damage that may have occurred due to mishandling during shipping. If the unit is received damaged, notify the carrier or the factory for instructions. Failure to do so may void your warranty. If you have any problems or questions, consult Customer Support at 800-426-9010.

DISPOSAL AND RECYCLING

This product can be recycled by specialized companies and must not be disposed of in a municipal collection site. If you do not have the means to dispose of properly, please contact for return and disposal instructions or options.

STORAGE

If the device is not scheduled for immediate installation following delivery, the following steps should be observed:

1. Following inspection, repackage the unit into its original packaging.
2. Select a clean dry site, free of vibration, shock and impact hazards.
3. If storage will be extended longer than 30 days, the unit must be stored at temperatures between 32° and 104° F (0° to 40° C) in non-condensing atmosphere with humidity less than 85%.



CAUTION: DO NOT STORE A NON-POWERED UNIT OUTDOORS FOR A PROLONGED PERIOD.

II. GENERAL SAFETY

AUTHORIZED PERSONNEL

All instructions described in the document must be performed by authorized and qualified service personnel only. Before installing the unit, please read these instructions and familiarize yourself with the requirements and functions of the device. The required personal protective equipment must always be worn when servicing this device.

USE

The device is solely intended for use as described in this manual. Reliable operation is ensured only if the instrument is used according to the specifications described in this document. For safety and warranty reasons, use of accessory equipment not recommended by the manufacturer or modification of this device is explicitly forbidden. All servicing of this equipment must be performed by qualified service personnel only. This device should be mounted in locations where it will not be subject to tampering by unauthorized personnel.

MISUSE

Improper use or installation of this device may cause the following:

- Personal injury or harm
- Application specific hazards such as vessel overflow
- Damage to the device or system

If any questions or problems arise during installation of this equipment, please contact Customer Support at 800-426-9010.

III. PRODUCT DESCRIPTION

FUNCTION

Junction Boxes (J-Box) are used with bolt-on sensors and direct support products to assemble all connections, wires and fittings.

FEATURES

- Half or full bridge circuits available
- Adjustable watertight strain relief fittings are provided for the sensor cable with plugs provided for unused cable entry holes
- Water seal design consists of knife-edge contact with a flat gasket between the cover and box resulting in high contact pressure to keep moisture out
- Cable and conduit entry holes are in the bottom of the junction box to protect against water seepage

TECHNICAL SPECIFICATIONS

PHYSICAL	
STAINLESS STEEL	
Dimensions	5.9 x 4.2 in. (15 x 11 cm)
Approval	NEMA 4X
Options	One hole, 3/4 in. conduit entry Two hole, PG13.5 conduit entry
PLASTICS	
Dimensions	4.7 x 5.7 in. (12 x 12 cm)
Approval	NEMA 4X
Options	One hole, 3/4 in. conduit entry Two hole, PG13.5 conduit entry
ALUMINUM (ADALET, IN-LINE)	
Dimensions	Adalet, Four hole 1/4 in. conduit entry
Approval	NEMA 7

IV. MECHANICAL INSTALLATION



WARNING: REMOVE POWER FROM THE UNIT BEFORE INSTALLING, REMOVING, OR MAKING ADJUSTMENTS.

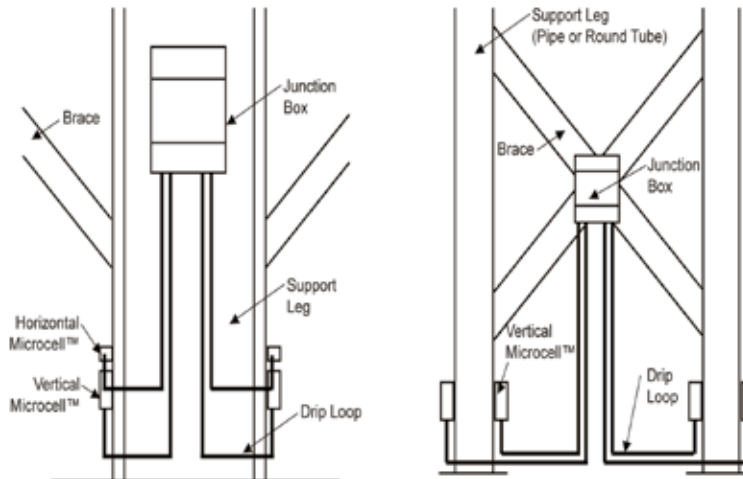


CAUTION: DO NOT INSTALL JUNCITON BOXES WHEN RAINING; MOISTURE WILL CAUSE CORROSION AND SYSTEM ERRORS.

GUIDELINES

There are two aspects to successful use of Load Stands — properly functioning Load Stands and appropriate vessel support characteristics. Review the following list of error sources, and make the recommended corrections before you install Load Stands:

- If mounting on a pipe leg, use the center mounting holes.
- Each Junction Box can be wired to a maximum of two Microcell sets (four units total).
- Rosette arrays - the four Microcells on a support leg (two sets, each consisting of a vertical and a horizontal).
- Vertical Microcells - one Junction Box can be wired to Microcells from two support legs if the legs are sufficiently close to each other to allow the cables to reach.
- Locate the Junction Box on the support leg web or on a brace. Vertically, locate Junction Boxes at a convenient height, approximately 4 ft (1.2 m) from the ground. The exact location is not critical, but ensure there is sufficient cable length and that a drip loop will be formed by the Microcell cables when wired to the Junction Box.
- When mounting, be sure there is enough clearance to open the front door completely. Removal, insertion, and wiring of the modular PCB is done through the front of the unit.



NOTES:

1. Mounting hardware is not supplied by Kistler-Morse; #8-32 socket head cap screws and flat washers are recommended.

TO MOUNT THE JUNCTION BOX

1. Hold the enclosure against the wall in the desired location and mark the positions of the mounting holes. Place the enclosure in a safe location.
2. Drill the mounting holes in the wall.
3. Attach the enclosure to the wall using hardware that will secure it firmly in place.

For the adalet version of the Junction Box, place the Junction Box in line with the conduit.

V. ELECTRICAL INSTALLATION



WARNING: REMOVE POWER FROM THE UNIT BEFORE INSTALLING, REMOVING, OR MAKING ADJUSTMENTS



CAUTION: ONLY USE SIKAFLEX 1A POLYURETHANE SEALANT OR DOW CORNING RTV 738 OR RTV739. OTHER SEALANTS MAY CONTAIN ACETIC ACID, WHICH IS HARMFUL TO SENSORS AND ELECTRONICS.

GENERAL SAFETY

When using electrical equipment, you should always follow basic safety precautions, including the following:

- The installation and wiring of this product must comply with all national, federal, state, municipal, and local codes that apply.
- Properly ground the enclosure to an adequate earth ground.
- Do not modify any factory wiring. Connections should only be made to the terminals described in this section.
- All connections to the unit must use conductors with an insulation rating of 300 V minimum, rated for 212° F (105° C), a minimum flammability rating of VW-1, and be of appropriate gauge for the voltage and current required (see specifications).
- Do not allow moisture to enter the electronics enclosure. Conduit should slope downward from the unit housing. Install drip loops and seal conduit with silicone rubber product.

DISCONNECT REQUIREMENTS FOR PERMANENTLY INSTALLED EQUIPMENT

A dedicated disconnecting device (circuit breaker) must be provided for the proper installation of the unit. If independent circuits are used for power input and main relay outputs, individual disconnects are required.

Disconnects must meet the following requirements:

- Located in close proximity to the device
- Easily accessible to the operator
- Appropriately marked as the disconnect for the device and associated circuit
- Sized appropriately to the requirements of the protected circuit (See specifications)

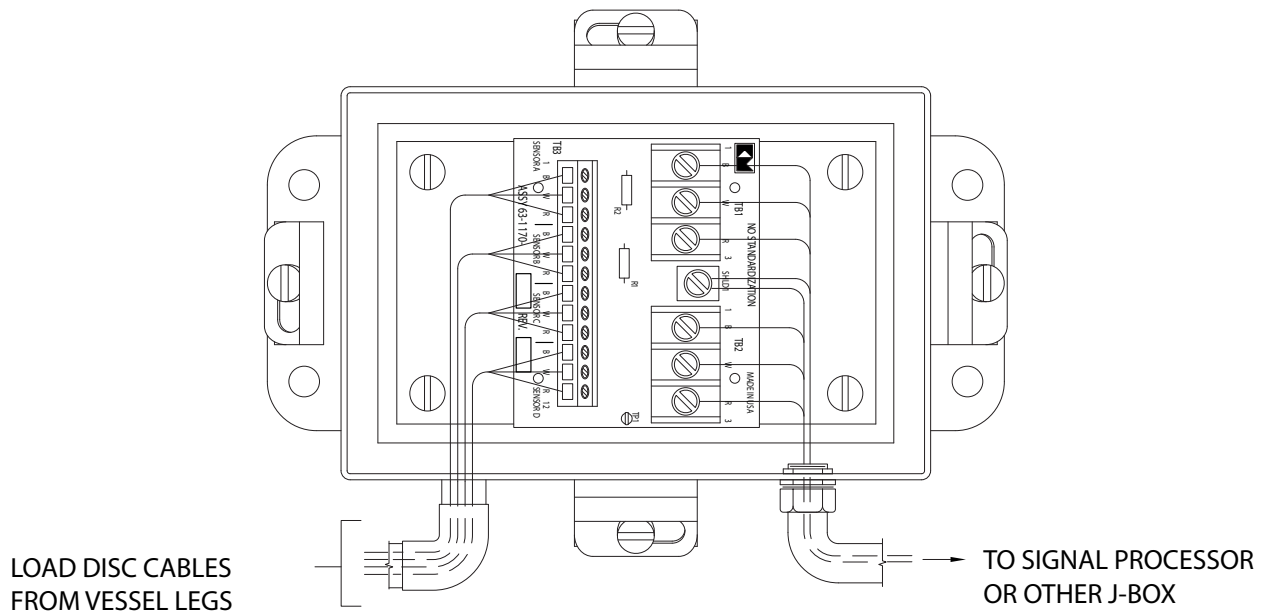
WIRING SENSORS TO THE JUNCTION BOX (HALF BRIDGE: KM MICROCELLS, LCELL, LD2, LD3, LD360)

1. Remove the Junction Box cover.
2. Place a plastic washer on a water-tight fitting. Thread the sensor cable through a cap and water-tight fitting. Leave an adequate length of cable between the sensor and fitting to provide a drip loop.
3. In the bottom of the Junction Box, locate one of the small holes closest to the terminal being used for the sensor. Screw the water-tight fitting into the hole.

NOTE: TB3 terminal block has 12 terminals to accommodate up to four sensors (A, B, C and D). Locate the terminal labeled for the sensor that is being wired.

4. Estimate the required length of cable to the terminal strip; allowing a little extra for strain relief. Cut the excess cable.

5. Strip back approximately 3 in. (76 mm) of the cable sheathing to expose the three wires inside. Strip back 1/4 in. (6 mm) of insulation from the end of each of the wires.
6. Connect the wires from the sensor to the selected TB3 terminals; black wire to B terminal, white wire to W terminal, and red wire to R terminal.
7. Perform Steps 2 through 6 for each sensor that needs to be wired to this particular Junction Box (up to four)
8. Spread of generous bead of sealant (Sikaflex 1A polyurethane or Dow Corning RTV 738 or RTV 739) around the water-tight fitting and the sides of the plug for each hole not being used. Screw a plug into each hole.
9. Replace the Junction Box cover and screws if not ready to begin wiring them to ensure that no moisture enters the Junction Box enclosure.

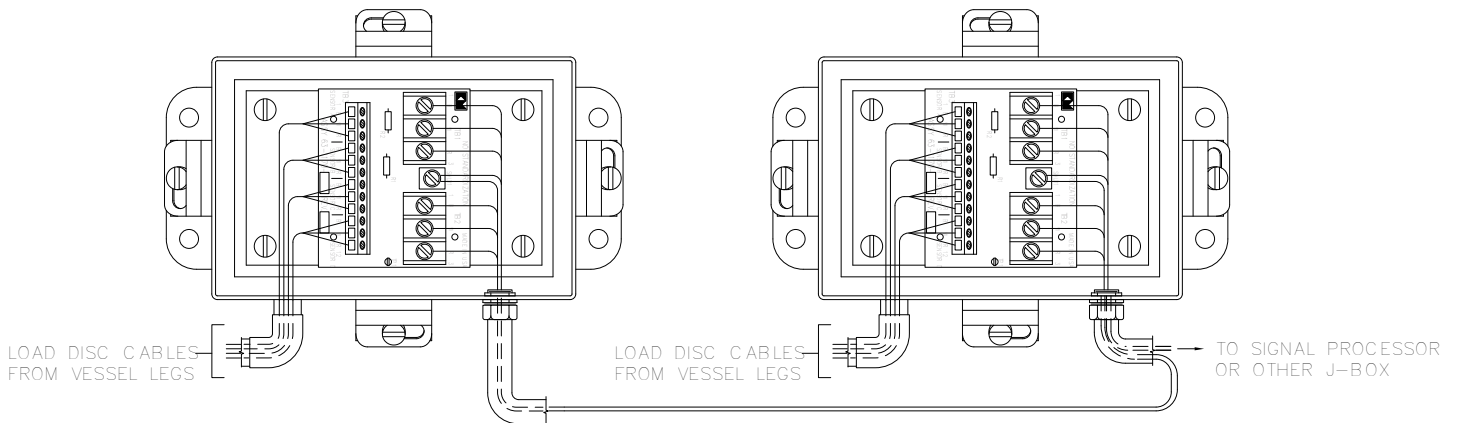


WIRING JUNCTION BOXES TOGETHER AND TO CONTROLLER (HALF BRIDGE)

GUIDELINES

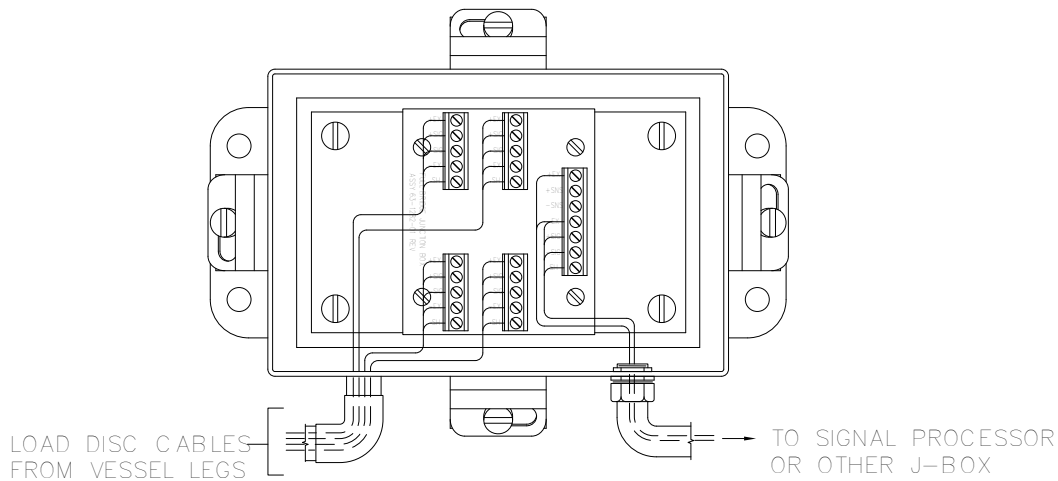
- One large hole for conduited installation: The large hole, which accommodates a 3/4 in. conduit fitting, is for wiring the Junction Box to the other Junction Boxes and to the controller.
- Two large holes for non-conduited installation: The two large holes, which accommodate PG13.5 cable fittings, are for wiring the Junction Box to the other Junction Boxes and to the controller.
- The following procedure assumes the conduit/cable trays have been installed.
- Seal all conduit fittings against water entry. Install drain holes at the conduit's lowest elevation(s) to allow condensation to drain.
- Use Belden 3-conductor shielded interconnect cable or equivalent to wire Junction Boxes together and to the controller. For lengths up to 1,000 ft (305 m), use 18-gauge Belden 8791 cable. For lengths from 1,000 to 2,000 ft (305 to 610 m), use 16-gauge Belden 8616 cable.
- When wiring cable to Junction Box terminals, strip back 3 inches (76 mm) of cable sheathing to expose the 3-conductor wires and shield wire inside. Strip 1/4 inch (6 mm) of insulation from the end of each of the conductor wires.

1. Remove the Junction Box cover.
 2. Route the 3-conductor cable through the fitting into the junction box farthest from the controller.
 3. Connect the wires from the cable to the TB3 terminal in the Junction Box.
Black wire to B Terminal
White wire to W Terminal
Red wire to R Terminal
 4. Connect the cable shield wire to the Shield Terminal between TB1 and TB2.
- NOTE: The shield terminal will not connect to anything; be sure to connect on the device side though.
5. Route the cable through the conduit/cable tray to the next Junction Box.
 6. Estimate the required length of cable to the terminal strip, allowing for a little extra for strain relief. Cut the excess cable.
 7. Connect wires from the cable to the TB1 Terminal in the Junction Box - see Step 3 above.
 8. Route another 3-conductor cable through the fitting into this Junction Box and attach wires to the TB2 Terminal - see Step 3 above.
 9. Repeat until all vessels are wired together.
 10. Route the cable from the last Junction Box through the conduit/cable tray to the controller. Refer to the controller manual for wiring diagrams required to wire the Junction Box to the controller. One vessel takes up one channel in the controller; the channel shows the average value from all the sensors on the vessel supports.



WIRING SENSORS TO JUNCTION BOX (FULL BRIDGE: KM LD3XI, LD3XIC, TC-1)

1. Install liquid tight fittings.
2. Seal fittings with Sikaflex or electrical grade sealant.
3. Thread the sensor cable through the desired conduit fitting; see Figure.
4. Estimate the required length of cable to terminal strip, allowing a little extra for strain relief. Cut the excess cable.
5. Strip back 3 in. (76 mm) of the cable sheathing to expose the four wires and the shield inside. Strip back 1/4 in. (6 mm) of insulation from the end of each of the wires.
6. Connect the sensor wires to the selected TB2-5 terminals on the left side of the Junction Box:
 - Red or brown wire to +EX
 - White wire to +SIG
 - Black wire to -EX
 - Blue wire to -SIG
7. Perform Steps 3 through 5 for each sensor you wire to the Junction Box. Up to two sensors can be wired to each terminal.
8. Replace the Junction Box cover, if not ready to begin wiring the Junction Boxes together.



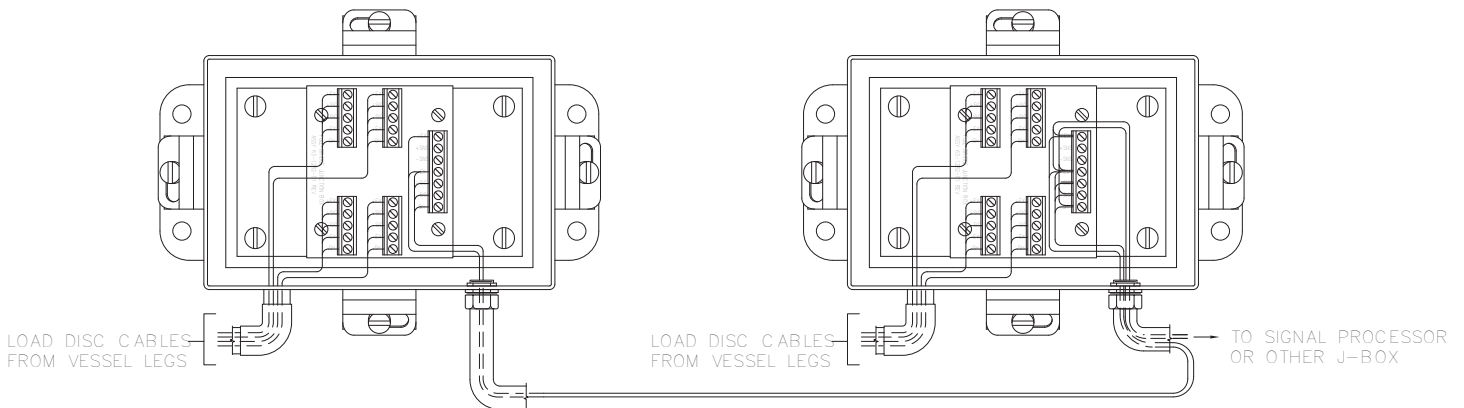
WIRING JUNCTION BOXES TOGETHER AND TO CONTROLLER (FULL BRIDGE)

GUIDELINES

- One large hole for conduited installation: The large hole, which accommodates a 3/4 in. conduit fitting, is for wiring the Junction Box to the other Junction Boxes and to the controller.
- Two large holes for non-conduited installation: The two large holes, which accomodates PG13.5 cable fittings, are for wiring the Junction Box to the other Junction Boxes and to the controller.
- The following procedure assumes the conduit/cable trays have been installed.
- Seal all conduit fittings against water entry. Install drain holes at the conduit's lowest elevation(s) to allow condensation to drain.

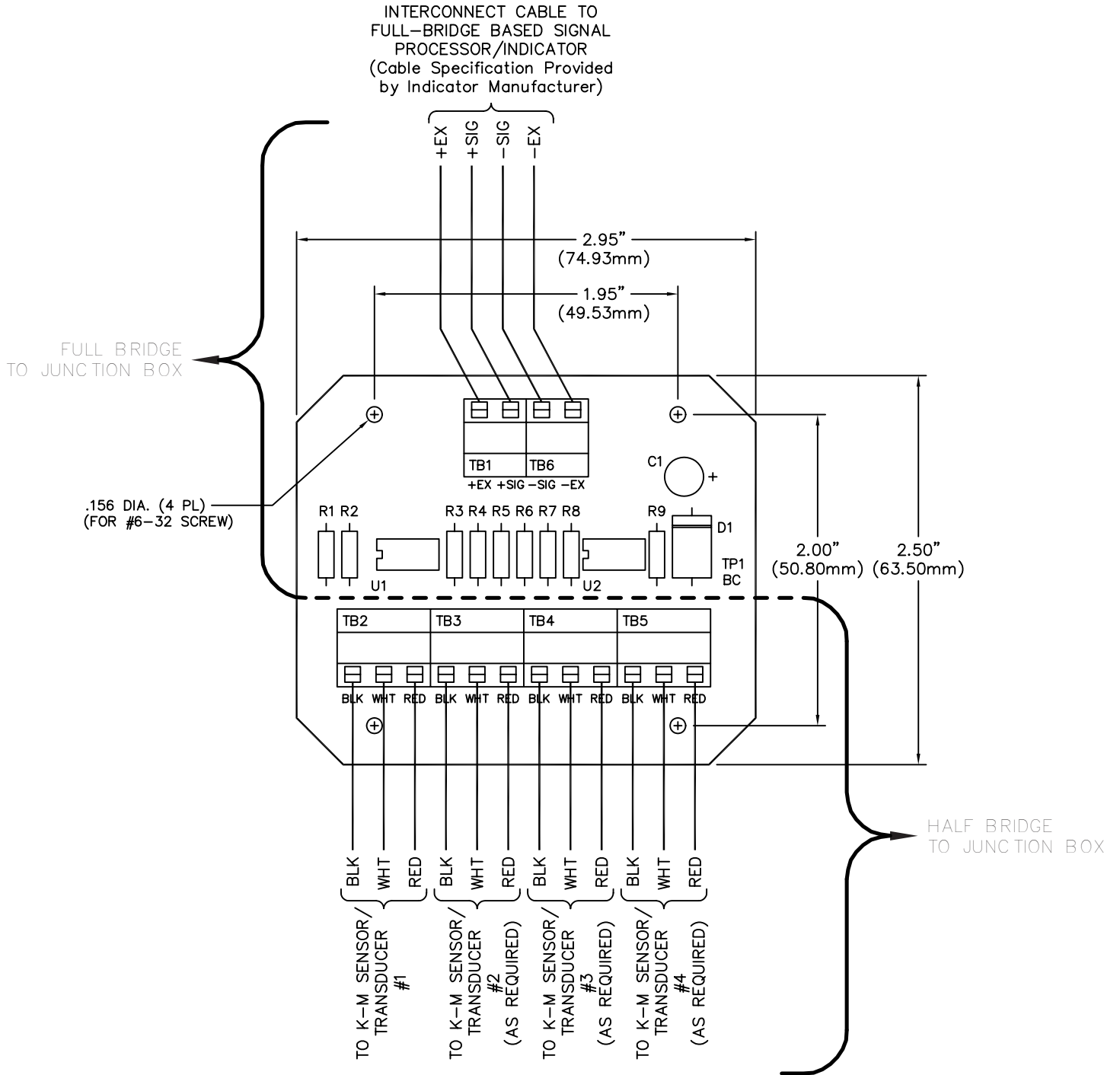
- Use Belden 4-conductor shielded interconnect cable or equivalent to wire Junction Boxes together and to the controller. For lengths up to 50 ft (15.2 m), use Belden 8723 cable.
- When wiring cable to Junction Box terminals, strip back 3 inches (76 mm) of cable sheathing to expose the 4-conductor wires and shield wire inside. Strip 1/4 inch (6 mm) of insulation from the end of each of the conductor wires.
- All spliced wiring routed between Junction Boxes and controller must be soldered and encapsulated in waterproof heatshrink.

1. Remove the Junction Box cover.
2. Route the 4-conductor cable through the fitting into the Junction Box farthest from the controller. Connect wires from the cable to the TB1 terminal in the Junction Box:
Red or brown wire to +EX
White wire to +SIG
Black wire to -EX
Blue or yellow wire to -SIG
3. Route the cable through conduit to the next Junction Box. Estimate the required length of cable to the terminal strip, allowing a little extra strain relief. Cut the excess cable. Connect wires from the cable to the TB1 terminal in the Junction Box; see Step 2 for wiring.
4. Route another cable through the fitting into this Junction Box, and attach wires to the TB1 terminal; see Step 2 for wiring.
5. Repeat Steps 3 and 4 until all Junction Boxes on the vessel are wired together.
6. Route the cable from the last Junction Box through conduit to the controller. Refer to the controller manual for wiring the Junction Box to the controller. One vessel takes up one channel in the controller - the channel shows the average value from all the sensors under the vessel.



HALF BRIDGE SENSOR TO FULL BRIDGE INDICATOR CONVERTER

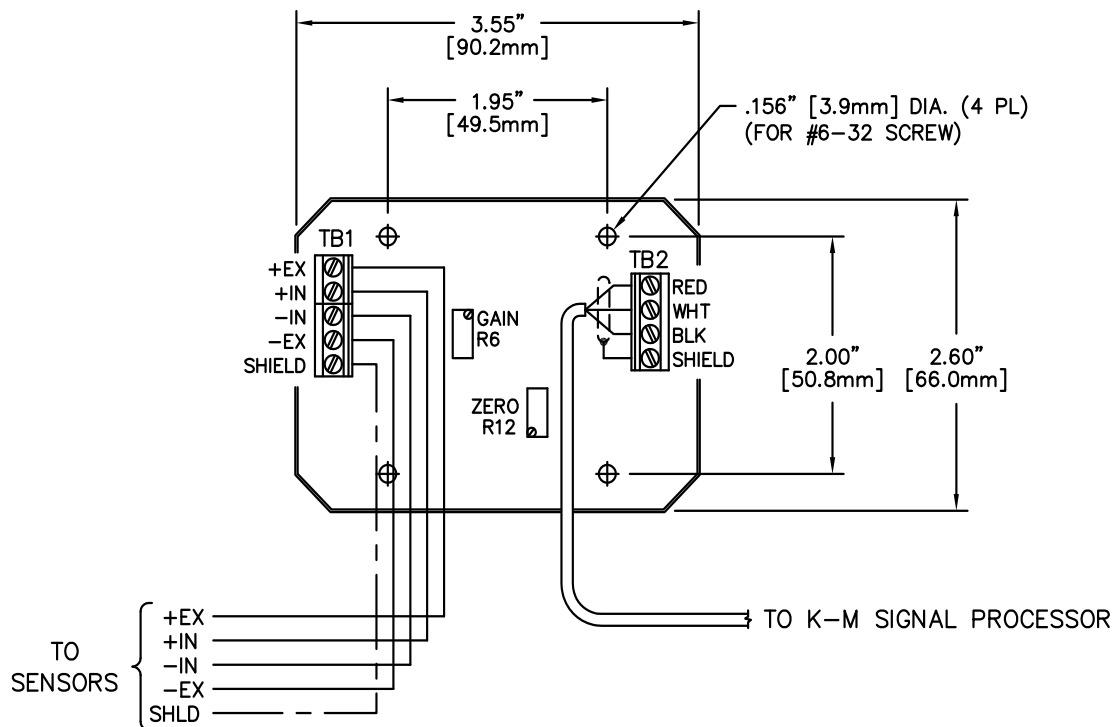
See previous sections in this manual for instructions to wire each half of the converter; also reference wiring diagram below.



FULL BRIDGE SENSOR TO HALF BRIDGE INDICATOR CONVERTER

NOTES:

1. For transducer signal processor separation distances up to 1,000 ft, use 18-AWG, three-conductor shielded cable (Belden 8791 or equivalent) at interconnect junction boxes. Distances up to 2,000 ft requires 16-AWG, three-conductor shielded cable (Belden 8617 or equivalent)
2. Combination of long cable length and wide temperature change may degrade performance. Distances less than 200 ft, use 22-AWG (Belden 8723 or equivalent); distances greater than 20 ft requires 18-AWG, (Belden 9368 or equivalent)





150 Venture Boulevard
Spartanburg, SC 29306
Tel: (800) 426-9010
Tel: (864) 574-2763 [Local]
Fax: (864) 574-8063
sales@kistlermorse.com
www.kistlermorse.com

venture
MEASUREMENT

2015 All rights reserved.

All data subject to change without notice.

97-1076-01 Rev. C