Thermal Instrument COMPANY

217 Sterner Mill Road
Trevose, PA 19053 U.S.A.
Phone: 215-355-8400
Fax: 215-355-1789
www.ThermalInstrument.com Office@ThermalInstrument.com

OPERATIONS & INSTALLATION MANUAL

CUSTOMER ORDER DETAILS

CUSTOMER NAME: XXXX

CUSTOMER PO#: XXXX

SERIAL NUMBER: XXXXXXX

MODEL : XXXX/FS16

POWER: 24 VDC @ 1 AMP

APPLICATION SERVICE: XXXX

XX—XXX SCFM

X TO X°C

0 TO XXX PSIG

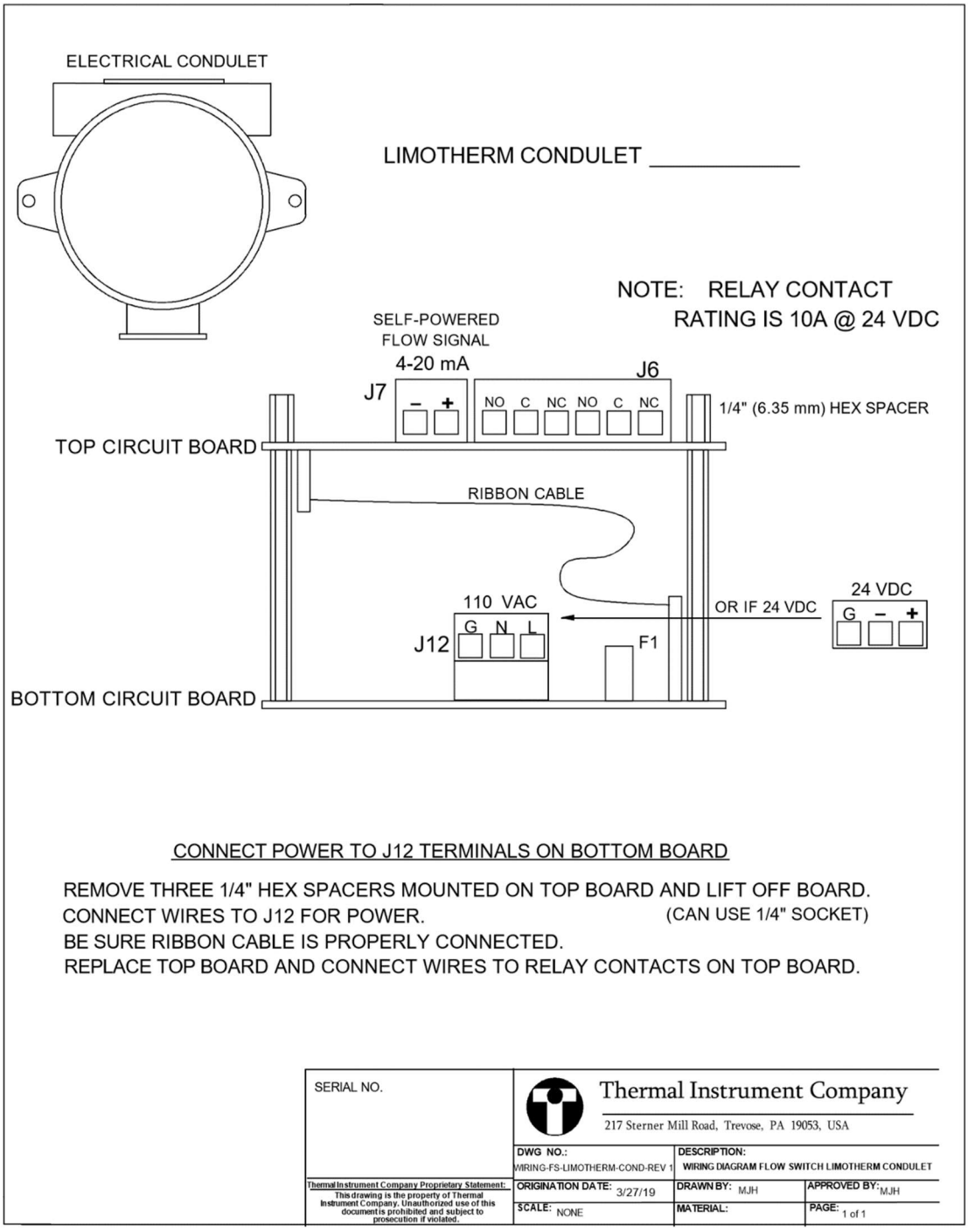
SET POINT: XX SCFM (X% FLOW RATE)

MODEL FS16 FLOW TRANSMITTER WITH INSERTION OR IN-LINE STYLE FLOW TRANSDUCER

TABLE OF CONTENTS: PAGE

Specific Outline Dimensions

Wiring Diagram — Power / 4-20mA (Optional) Board Diagram

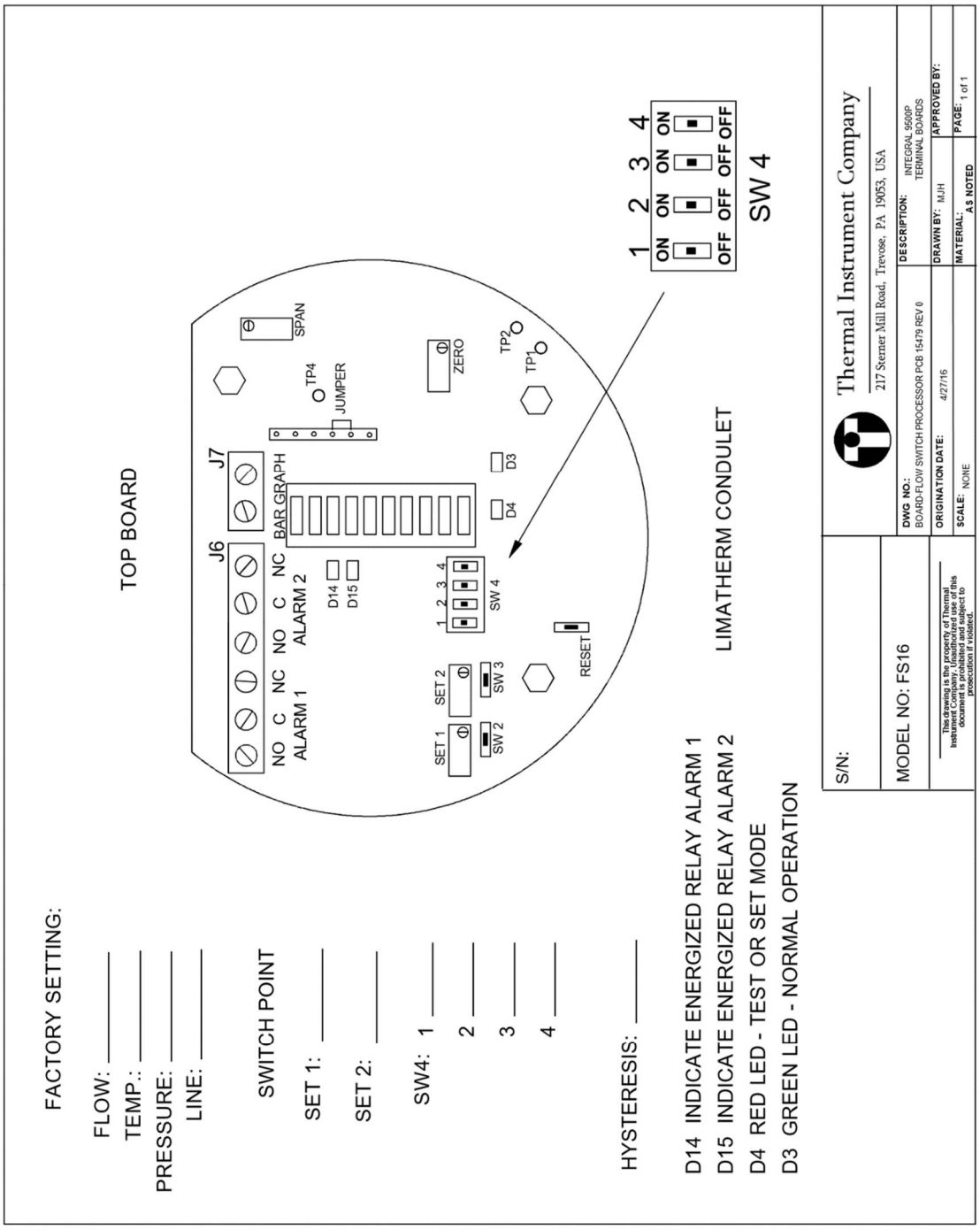


CONNECT POWER TO J12 TERMINALS ON BOTTOM BOARD

REMOVE THREE 1/4" HEX SPACERS MOUNTED ON TOP BOARD AND LIFT OFF BOARD.
CONNECT WIRES TO J12 FOR POWER. (CAN USE 1/4" SOCKET)
BE SURE RIBBON CABLE IS PROPERLY CONNECTED.
REPLACE TOP BOARD AND CONNECT WIRES TO RELAY CONTACTS ON TOP BOARD.

SERIAL NO.	Thermal Instrument Company 217 Sterner Mill Road, Trevose, PA 19053, USA		
	DWG NO.: WIRING-FS-LIMOTHERM-COND-REV 1	DESCRIPTION: WIRING DIAGRAM FLOW SWITCH LIMOTHERM CONDULET	
Thermal Instrument Company Proprietary Statement: This drawing is the property of Thermal Instrument Company. Unauthorized use of this document is prohibited and subject to prosecution if violated.	ORIGINATION DATE: 3/27/19	DRAWN BY: MJH	APPROVED BY: MJH
	SCALE: NONE	MATERIAL:	PAGE: 1 of 1

Flow Dip Switch Settings Diagram



Flow Curves & Spec Sheet

(Page left intentionally blank to be replaced with actual calibration data)

Operation & Manual Set Point Instructions

Overview

The set points can be adjusted manually by adjusting potentiometers Set1 (R30) and Set2 (R31) on the control board. The desired value of the set points can be observed in 10% increments on the LED bar graph display or by measuring the voltage at TP2 on the control board. Measuring the voltage at TP2 (+) allows for a much higher level of precision. The voltage at TP2 will vary from 0 to 10 volts corresponding to 0 to 100% of flow. The present setting of the set points can also be observed on the LED bar graph display or by measuring the voltage at TP2. The negative or ground terminal is TP1(-).

It is important to note that since the LED bar graph has 10 segments, the actual value can vary by as much as plus or minus 5%. The bar graph segments will change at the midpoints between each percent setting. For instance if 20% were indicated the actual set point can be anywhere between 15% and 25%. To obtain a precise measurement of set point, the voltage at TP2 should be used.

When the flow switch is in the set point view or set mode, the meter is not running and the red LED is illuminated. After the SET button is pressed the meter will automatically resume normal operation after 2 minutes and any ongoing adjustment process is cancelled.

Manual Changing / Adjusting Set Point

The procedure for viewing or setting the set points is the same for both alarms. The reference designations for alarm 2 will be enclosed in parentheses. It is important to remember which SET button is pressed as there is no indication which SET value is being displayed or changed after the button has been pressed. ***Note, if you are receiving a switch with the DPDT functionality you will only have SET1.***

To observe the present setting for each set point, momentarily press the SET1 (SET2) pushbutton. The bar graph display will blink once, the red LED (D4) will be illuminated, the present setting will be displayed on the bar graph and a voltage representing the set point setting will be present at TP2. To return to normal operation again momentarily press the SET1(SET2) button or the RESET button . The red LED (D4) will be off and the display will show flow.

To change the present set point, press and hold down SET1 (SET2) for about 1 second until the LED bar graph blinks twice then release the button. The LED display and TP2 will now show the present setting of R30 (R31) and the red LED will be illuminated. The present set point determined by the potentiometer is displayed on the LED display and can be measured at TP2. Adjusting the respective trimmer potentiometer will change the set point. To save the new value, press and hold the SET1 (SET2) buttons for about 2 seconds until the meter resets and the new set point value will be saved and the red LED will off.

To cancel and not save the new value, press the reset button. When either of the set buttons are pressed a timer will run for two minutes. When the timer expires the flow switch will restart automatically. Any settings not saved before the timer expires will be lost.

Flow Switch Dip Switch Operation

This document describes the functionality of the four dip switches on the flow switch processor board. The dip switch assembly is identified as **SW4,** and the individual switches are **SW4-1** to **SW4-4**.

SW4-1

Alarm 1 selects either low or high trip. Low trip = off, high trip = on. This switch selects either alarm 1 is sensing a low-level alarm or a high-level alarm. Default position is off, alarm 1 is low trip point sensing.

SW4-2

Alarm 2 selects either low or high trip. Low trip = off, high trip = on. This switch selects either alarm 2 is sensing a low-level alarm or a high-level alarm. Default position is on, alarm 2 is high trip point sensing.

SW4-3

Alarm 1 selects normally open or normally closed relay operation. NO = off, NC = on. This switch selects if alarm 1 relay contacts are as indicated on board or reversed when no alarm condition is present. Default position is on, relay contacts are not reversed. When the flow is below the set point the relay will not be energized and the NC contacts will be closed indicating a low alarm condition. This setting also provides a fail-safe condition if power is lost it will indicate a low flow alarm, when Alarm 1 is used as a low Alarm point.

SW4-4

Alarm 2 selects normally open or normally closed relay operation. NO = off, NC = on. This switch selects if alarm 2 relay contacts are as indicated on board or reversed when no alarm condition is present. Default position is on, relay contacts are reversed. When used as a high point alarm the relay will de-energize and the NC contacts will close when the high set point is reached.

Installation / Mounting of Flow Switch / Meter

Verify the Dimensions of the Flow Meter against your process connection and piping.

The Thermal Instrument Company Model 62-9 insertion probe has a variety of process mounting connections, from MNPT to welded flange, The insertion probe commonly comes with an adjustable mechanical connection which can be tightened down for permanent mounting. Verify all mounting and installation variables before tightening process packing gland.

If the installation is for Thermal Instrument Company Model 600-9 in-line flow tube design, then make certain that the pipe diameters and mounting sections are verified.

Verify the Flow Direction for the Flow Meter and Proper Placement

The 62-9 insertion probe has an indexing arrow on the flat portion of the process connection located just below the base of the enclosure. On Model 600-9 it will be on flow element body. See Figure Below.

Figure Left: Index Arrow on 62-9 Insertion Probe

Figure Right: 600-9 In-Line Flow Tube (Actual tube will have flow direction arrow)

Align the insertion probe during the installation so that the flat areas of the mechanical process connection with the arrow are parallel to the direction of the process flow, and the arrow points in the direction of the process flow.

For the 600-9 in-line flow tube assembly, the indexing arrow is etched on the flow tube, and should be pointing in the direction of the flow. If the flow device is not mounted in the proper direction, then there will be a reduction in accuracy.

Compression Fitting Mounting (62-9 Insertion Probe Style)

A. Determine the inside diameter of the process pipe at the pre-determined mounting location. If the Inner pipe diameter is 1-1/2” to 2”, then the insertion probe will utilize the dual tip design and would be inserted to the bottom of the line and withdrawn up by 1/8”. For line sizes 2-1/2” to 7”, the probe would be inserted completely to the bottom of the line, and then withdrawn 1/4”. For line sizes equal to or greater than 8”, insert the probe halfway into the line, and then insert 3” further for optimal positioning.

B. Once inserted into the line at the proper positioning, tighten down the connection to ANSI B16.5 torque specifications. Make sure that proper thread sealants are applied prior to torque down of the fitting.

General Guidelines & Precautions

Receiving / Inspection

- Unpack carefully and inspect overall condition

- Check the packing list to compare what you received is all there

If the above items are fine, then move on to the next section, otherwise contact our customer support group at (215) 355-8400 and provide us with purchase order number or serial number of the flow meter.

Factory Calibration Note

This flow meter / switch from Thermal Instrument Company has been factory calibrated to the specifications and flow range as stipulated by the customer. There is no need to perform any verification or calibration on this device prior to mounting and start-up in the application.

Prior to Installation

Qualified electrical personnel should be installing this instrument. The installation should be done per National Electrical Code and the power to the electrical wiring should be off during the installation. Where the instructions call out for use of electrical current, the operator assumes all responsibilities for conformance to safety and practices.

Alerts

Damage due to moisture ingress into the enclosure is not covered under the warranty of this product and proper conduit seals must be applied for all-weather conditions. This flow switch electronics contains electrostatic discharge (ESD) sensitive components, so use proper ESD precautions when handling the device.

Verify Mounting Area for Insertion or In-Line Flow design to make certain that everything fits properly.

Installation Point

Make sure that there are (10) ten pipe diameters upstream and (5) five pipe diameters downstream of the flow meter from any bends or interferences in the process piping or ductwork in order to achieve the greatest accuracy.

General Guidelines (Continued)

Mechanical Care of Enclosure

Be careful of the enclosed electronics when removing the condulet cover. After the initial installation, never open the condulet when the power is connected, especially in a classified hazardous area. Gently lift the cover from the flow switch electronic assembly and place it in a safe location where dirt cannot get inside. When replacing the cover, take special care that the display legend plate is centered on the display and that the cover window lugs do not hit the legend plate in the last two or three turns of the cover.

Electrical Care of Enclosure

Proper wire size or gauge selected for all connections should be the minimum allowable by your plant standards and regulations. The enclosure has limited space available for large gauge wire and we recommend no larger than 12 gauge for power. When snaking the wires around the electronic assembly, special care should be taken of any protruding parts. The parts are capable of withstanding some abuse, but still be cautious not to force the wire through.

General Precautions to be Observed in Installing Flowmeter Wiring

When the Thermal Flowmeter or Probe is supplied with an explosion-proof condulet, it must be installed with approved wiring techniques. This calls for seals where the external wiring enters these condulets.

In the case where we have a large condulet on a Probe with multiple connections, we will have a fitting with as large as a 2-inch pipe connection. If the contractor is reducing this 2-inch fitting, he must be sure that these reducers are sealed with a suitable electrical or Teflon tape. In like manner, the connectors he uses must be of the sealed conduit type.

Water entering the system from either the power wiring or the interconnecting cable system is very serious and can do damage to the metering system.

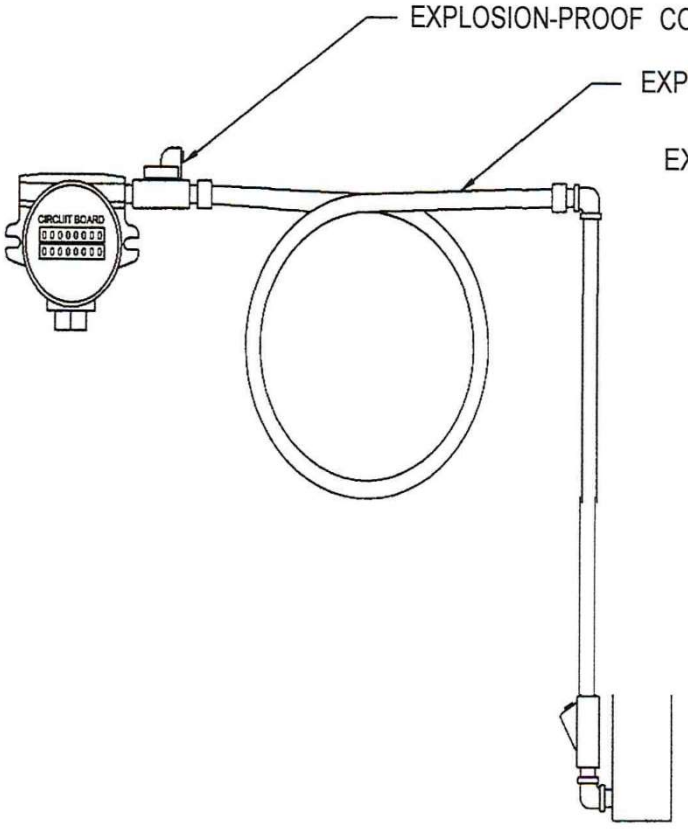
The explosion-proof type condulets are designed, water will enter. In applications where there is undue exposure, it may be well to go to auxiliary covering or sealing mechanisms. This may merely mean a plastic coating, a plastic bag, or in extreme cases a housing.

The same rules apply also where the external wiring enters the electronic housings. These can be either the explosion-proof type, or NEMA 4 type. In either case adequate attention must be paid to sealing the electrical incoming lines. The cover on the NEMA 4 case is gasketed in a very adequate manner. However, in many cases the atmospheric and liquid leaks are at the point of entry of the external wiring or through the conduit from the external wiring itself.

In cases where the NEMA 4 units are used in very hazardous or corrosive atmospheres, it is advisable to purge the system to prevent corrosive attack on the electronics.

General Precautions to be Observed in Installing Flowmeter Wiring (Continued)

The sketch below shows how commercial seals are installed.



NOTES:

1. Explosion-proof conduit seals are required in all conduit runs in Class 1, Division 1 areas per National Electric Code Article 500.
2. Easier removal of the Flow Element is possible when a sufficient length of flexible explosion-proof conduit is installed.

Enclosure Terminations and Seals

KILLARK FITTINGS

EY SERIES

SEALING FITTINGS

ENY (For Vertical or Horizontal Conduit)

ENY with Nipple (For Vertical or Horizontal Conduit)

EYS (For Vertical or Horizontal Conduit)

EYS with Nipple (For Vertical or Horizontal Conduit)

EY (For Vertical Conduit)

EY with Nipple (For Vertical Conduit)

EYD (Drain/Seal for Vertical Conduit)

EYD with Nipple (Drain/Seal for Vertical Conduit)

ENY-2 (Fixture Hanger) (See Page L146)

Class I, Div. 1 & 2, Groups A, B, C, D
Class I, Zone 1, Groups IIC, IIB, IIA
Class II, Div. 1 & 2, Groups E, F, G
Class III

FEATURES-SPECIFICATIONS

Application & Installation
Class I, Divisions 1 and 2

The purpose of seals in a Class I hazardous location is to minimize the passage of gases and vapors and prevent the passage of flames from one electrical installation to another through the conduit system. Seals are required to be installed within 18 inches on any conduit run entering an enclosure which contains devices that may produce arcs, sparks, or high temperature. Where two enclosures are connected by a run of conduit not over 3 ft. long, a single seal located at the center of the run is considered satisfactory. Only explosionproof unions, couplings, elbows, and conduit bodies similar to "L", "T", and "X" type shall be permitted between the sealing fitting and the enclosure.

Seals shall be located within 18 inches of the enclosure or fitting on each conduit run of 2 inch size or larger entering an enclosure or fitting that contains terminals, splices, or taps.

Each run of conduit from a hazardous location to a nonhazardous location should be sealed to minimize the amount of gases and vapors communicated beyond the seal.

Class II, Divisions 1 and 2

Where a raceway provides communication between an enclosure which is required to be dust-ignitionproof and one which is not, suitable means shall be provided to prevent the entrance of dust into the dust-ignitionproof enclosure through the raceway.

Consideration for selection seals:

Select the proper sealing fitting for the hazardous gas/vapor involved; i.e., Class I Groups A, B, C, or D. Zone 1, Groups IIC, IIB, IIC.

Select a sealing fitting for the proper use in respect to mounting position. This is particularly critical when the conduit runs between hazardous and nonhazardous areas. Some seals are designed to be mounted in any position; others are restricted to vertical mounting.

Drains

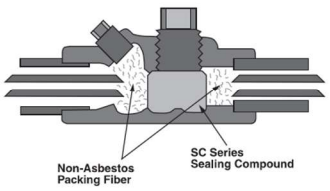
Where there is a probability that liquid or other condensed vapor may be trapped within enclosures for control equipment or at any point in the raceway system, approved means – such as installation of drain seals – shall be provided to prevent moisture accumulation.

For more complete data or special applications, consult the code or your local inspector.

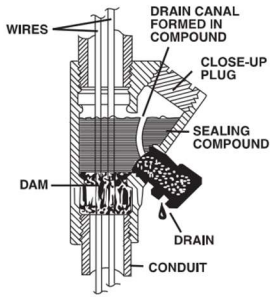
Sealing compounds shall be approved for the purpose and shall not be affected by the surrounding atmosphere or liquids, and shall not have a melting point of less than 93°C. (200°F.).

In the complete seal, the minimum thickness of the sealing compound shall not be less than the trade size of the conduit, and in no case less than 5/8 inch.

NOTE: The amount of Killark sealing compound and packing fiber required for any seal is determined by volume hub size and mounting position of the seal. Refer to installation data table on page F50 for specific amounts required.



Schematic drawings illustrate the application of sealing compound, fiber dams, and installed seal with drain.



Splices and taps shall not be made in fittings intended only for sealing with compound, nor shall other fittings in which splices or taps are made be filled with compound.

Killark sealing fittings are produced with utmost care to insure a substantial margin of safety. Threads are clean, deep, and snug. When properly installed with Killark sealing compound (SC Type) and Killark non-asbestos fiber (PF Type) for the dams, you can be sure your installation will provide more than adequate safety.

Enclosure Terminations and Seals

KILLARK FITTINGS

FITTINGS ENY/EYS SERIES

SEALING FITTINGS

ENY-3 (For Vertical or Horizontal Conduit)

ENY-3-T with Nipple (For Vertical or Horizontal Conduit)

EYS-3 (For Vertical or Horizontal Conduit)

EYS-3-T with Nipple (For Vertical or Horizontal Conduit)

ENY-1, 2, 3, 4, 5, 6
Class I, Div. 1 & 2, Groups A, B, C, D
Class I, Zone 1, Groups IIC, IIB, IIA
Class II, Div. 1 & 2, Groups E, F, G
Class III

EYS Series
Class I, Div. 1 & 2, Groups C, D
Class I, Zone 1, Groups IIB, IIA
Class II, Div. 1 & 2, Groups E, F, G
Class III

UL LISTED File No. E10514

CSP Certified File No. LR11716
See files for details or call Killark.

FEATURES-SPECIFICATIONS

Material/Finish

Copper-free Aluminum
(less than 4/10 of 1%)

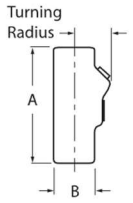
- Electrostatically applied powder coating

Duraloy Iron

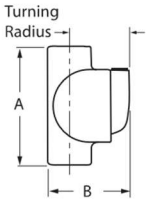
- Tri-Coat Finish of electrozinc, chromate sealant, and electrostatically applied powder coating

ENY SEALING FITTINGS						ENY WITH NIPPLE	
HUB SIZE	CATALOG NUMBER		DIMENSIONS		TURNING RADIUS	CATALOG NUMBER	
	KILLARK ALUMINUM	DURALOY IRON	A	B		KILLARK ALUMINUM	DURALOY IRON
1/2"	ENY-1	ENY-1M	4-1/16" (103)	1-9/32" (33)	1-3/32"(30)	ENY-1-T	ENY-1TM
3/4"	ENY-2	ENY-2M	4-3/16" (106)	1-1/2" (38)	1-9/32"(33)	ENY-2-T	ENY-2TM
1"	ENY-3	ENY-3M	5" (127)	1-3/4" (45)	1-13/32"(36)	ENY-3-T	ENY-3TM
1-1/4"	ENY-4	ENY-4M	5-3/8" (137)	2-3/16" (56)	1-25/32"(45)	ENY-4-T	ENY-4TM
1-1/2"	ENY-5	ENY-5M	5-11/16" (144)	2-3/8" (60)	1-29/32"(48)	ENY-5-T	ENY-5TM
2"	ENY-6	ENY-6M	6-3/8" (162)	2-3/8" (60)	2-5/16"(59)	ENY-6-T	ENY-6TM

Dimensions



ENY Series



EYS Series

EYS SEALING FITTINGS						EYS WITH NIPPLE	
HUB SIZE	CATALOG NUMBER		DIMENSIONS		TURNING RADIUS	CATALOG NUMBER	
	KILLARK ALUMINUM	DURALOY IRON	A	B		KILLARK ALUMINUM	DURALOY IRON
1/2"	EYS-1	—	2-15/16"(75)	1-13/16"(46)	1-3/16"(30)	EYS-1-T	—
3/4"	EYS-2	—	4-1/16"(103)	2-1/16"(52)	1-9/32"(33)	EYS-2-T	—
1"	EYS-3	—	4-25/32"(121)	2-11/32"(60)	1-13/32"(36)	EYS-3-T	—
1-1/4"	EYS-4	—	5-3/8"(137)	3"(76)	1-25/32"(45)	EYS-4-T	—
1-1/2"	EYS-5	—	5-11/16"(144)	3-1/4"(83)	1-29/32"(48)	EYS-5-T	—
2"	EYS-6	—	6-3/8"(162)	3-15/16"(100)	2-5/16"(59)	EYS-6-T	—
2-1/2"	EYS-7	EYS-7M	7-5/8"(194)	4-1/2"(114)	4-1/8"(105)	EYS-7-T	EYS-7TM
3"	EYS-8	EYS-8M	7-5/8"(194)	4-1/2"(114)	4-3/8"(111)	EYS-8-T	EYS-8TM
3-1/2"	EYS-9	EYS-9M	7-1/8"(181)	5-3/16"(132)	4-3/4"(121)	EYS-9-T	EYS-9TM
4"	EYS-0	EYS-0M	7-1/8"(181)	5-3/16"(132)	4-3/4"(121)	EYS-0-T	EYS-0TM

Enclosure Terminations and Seals

KILLARK FITTINGS

EY/EYD SERIES

KILLARK

SEALING FITTING


EY-3


EY-3-T with Nipple
(For Vertical Conduit)


EYD-3
(Drain/Seal for vertical conduit)


EYD-3-T with Nipple

EY & EYD Series
Class I, Div. 1 & 2, Groups C, D
Class I, Zone 1, Groups IIB, IIA
Class II, Div. 1 & 2, Groups E, F, G
Class III

File No. E10514
Certified File No. LR11716
See files for details or call Killark.

FEATURES-SPECIFICATIONS

Material/Finish

Copper-free Aluminum
(less than 4/10 of 1%)

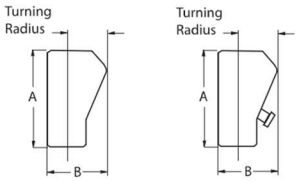
- Electrostatically applied powder coating

Duraloy Iron

- Tri-Coat Finish of electrozinc, chromate sealant, and electrostatically applied powder coating

EY SEALING FITTINGS						EY WITH NIPPLE	
HUB SIZE	CATALOG NUMBER		DIMENSIONS		TURNING RADIUS	CATALOG NUMBER	
	KILLARK ALUMINUM	DURALOY IRON	A	B		KILLARK ALUMINUM	DURALOY IRON
1/2"	EY-1	EY-1M	3-1/16"(78)	2-3/4"(70)	2-1/4"(57)	EY-1-T	EY-1TM
3/4"	EY-2	EY-2M	3-1/16"(78)	2-3/4"(70)	2-1/4"(57)	EY-2-T	EY-2TM
1"	EY-3	EY-3M	4-9/32"(109)	3-1/8"(79)	2-3/8"(60)	EY-3-T	EY-3TM
1-1/4"	EY-4	EY-4M	5-1/8"(130)	3-7/8"(98)	2-7/8"(73)	EY-4-T	EY-4TM
1-1/2"	EY-5	EY-5M	5-1/8"(130)	4-5/8"(117)	3-7/16"(87)	EY-5-T	EY-5TM
2"	EY-6	EY-6M	5-1/8"(230)	5-11/16"(144)	4-1/4"(108)	EY-6-T	EY-6TM
2-1/2"	EY-7	EY-7M	7"(178)	6-5/16"(160)	4-5/8"(117)	EY-7-T	EY-7TM
3"	EY-8	EY-8M	7"(178)	6-5/16"(160)	4-5/8"(117)	EY-8-T	EY-8TM
3-1/2"	EY-9	EY-9M	8-3/4"(222)	7-1/8"(181)	5-3/8"(138)	EY-9-T	EY-9TM
4"	EY-0	EY-0M	8-3/4"(222)	7-1/8"(181)	5-3/8"(138)	EY-0-T	EY-0TM

Dimensions



EY Series EYD Series

EYD SEALING FITTINGS						EYD WITH NIPPLE	
HUB SIZE	CATALOG NUMBER		DIMENSIONS		TURNING RADIUS	CATALOG NUMBER	
	KILLARK ALUMINUM	DURALOY IRON	A	B		KILLARK ALUMINUM	DURALOY IRON
1/2"	See New 1/2", 3/4", 1" Drain Seal offering on page F50						
3/4"							
1"							
1-1/4"	EYD-4	EYD-4M	5-1/8"(130)	3-7/8"(98)	2-7/8"(73)	EYD-4-T	EYD-4TM
1-1/2"	EYD-5	EYD-5M	5-1/8"(130)	4-5/8"(117)	3-7/16"(87)	EYD-5-T	EYD-5TM
2"	EYD-6	EYD-6M	5-1/8"(130)	5-11/16"(144)	4-1/4"(108)	EYD-6-T	EYD-6TM
2-1/2"	EYD-7	EYD-7M	7"(178)	6-5/16"(160)	4-5/8"(117)	EYD-7-T	EYD-7TM
3"	EYD-8	EYD-8M	7"(178)	6-5/16"(160)	4-5/8"(117)	EYD-8-T	EYD-8TM
3-1/2"	EYD-9	EYD-9M	8-3/4"(122)	7-1/8"(181)	5-3/8"(137)	EYD-9-T	EYD-9TM
4"	EYD-0	EYD-0M	8-3/4"(122)	7-1/8"(181)	5-3/8"(137)	EYD-0-T	EYD-0TM

Enclosure Terminations and Seals

SEALING MATERIALS

Sealing Compound


Packing Fiber

Thread Lubricants

FEATURES-SPECIFICATIONS

Series SC/PF/LUBG

Sealing Materials

SC Series Sealing compound is a cement used extensively for sealing conduit to prevent the spread of explosive gases. It is non-shrinking and a secure seal is formed. SC Series resists acids, water, oil, etc. It is UL Listed for use with Killark ENY, EY, and EYS Series. Also CSA certified for use with any CSA certified sealing fitting.

Packing Fiber

Killark's Packing Fiber is made from an environmentally safe, non-asbestos material. It is easy to use and forms a positive dam to hold compound (Killark SC Type) in ENY, EY, and EYS Series fittings.

Threaded Lubricants

Two special blends of lubricants have been developed by Killark for use with threaded joints. These lubricants are to be used to prevent galling of pipe threads when threaded into a coupling, junction box, etc. They insure a quick release of undamaged male and female threads when parts are disassembled.

LUBG is a general purpose lubricant to be used in temperatures ranging from 0° to 125°F.

LUBT is a high-quality lubricant to be used in temperatures ranging from -40° to +500°F. It is recommended to be used on hazardous location lighting fixtures.

OUNCES REQUIRED PER FITTING				
	SEALING COMPOUND			PACKING FIBER
HUB SIZE	ENY①	EYS①	EY/EYD	
1/2"	1.5 oz.	3.0 oz.	1.0 oz.	1/16 oz.
3/4"	2.0 oz.	3.0 oz.	2.0 oz.	1/8 oz.
1"	3.0 oz.	8.0 oz.	4.5 oz.	1/4 oz.
1-1/4"	6.5 oz.	8.5 oz.	7.5 oz.	1/2 oz.
1 1/2"	8.5 oz.	17.5 oz.	12.0 oz.	1 oz.
2"	15.0 oz.	27.0 oz.	24.0 oz.	2 oz.
2-1/2"	—	42.0 oz.	44.0 oz.	3 oz.
3"	—	47.0 oz.	44.0 oz.	4 oz.
3-1/2"	—	56.0 oz.	75.0 oz.	6 oz.
4"	—	56.0 oz.	75.0 oz.	9 oz.

① *ENY/EYS suitable for both horizontal or vertical applications.*

SEALING COMPOUND	
CATALOG NUMBER	SIZE PACKAGE
SC-4 OZ	4 oz.
SC-8 OZ	8 oz.
SC-1 LB	1 lb.
SC-5 LB	5 lbs.

PACKING FIBER	
CATALOG NUMBER	SIZE PACKAGE
PF-2	2 oz.
PF-4	4 oz.
PF-16	1 lb.

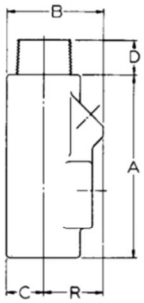
THREAD LUBRICANTS	
CATALOG NUMBER	CONTAINER PACKAGE
LUBT-2	2 oz.
LUBG-6	6 oz.

Enclosure Terminations and Seals

Explosionproof and Dust-tight Fittings and Accessories

EXPLOSIONPROOF AND DUST-TIGHT SEALING FITTINGS CLASS I, GROUPS B*, C & D; CLASS II, GROUPS E, F & G; NEMA 7 & NEMA 9

XYB-XYBM



Sealing Fittings are required in Hazardous Locations and are used to isolate arc-producing devices in conduit and wiring systems, and to prevent the passage of explosive pressures from one area to another.

FOR HORIZONTAL AND VERTICAL MOUNTING - Type XYB and XYBM are suitable for either horizontal or vertical mounting and are provided with threaded plugged openings into which fiber and cement can be placed to form effective seal. XYB has female ends for conduit entrance. The XYBM has female ends with a removable threaded nipple.

*1/2", 3/4", 1" sizes Class I, Group B, C, D, Class II, E, F, G.

1 1/4", 1 1/2", 2", 2 1/2", 3", 3 1/2", 4" sizes Class I, Group C, D Class II, E, F, G

CSA Certified LR27991

UL Listed E10493

10A–4

Catalog No. Description	Conduit Size (In.)	Ounces Req. For Each Sealing Fitting Cement	Fiber	Standard Package Qty.	Tot. Wt. Lbs.
Female-Female					
XYB-2	1/2	1	1/8	5	2.1
XYB-3	3/4	2	1/4	5	2.6
XYB-4	1	3	1/4	5	3.7
XYB-5	1-1/4	6	3/8	2	2.5
XYB-6	1-1/2	9	1/2	2	3.2
XYB-8	2	18	3/4	2	5.6
XYB-10	2-1/2	23	1-1/2	2	6.2
XYB-12	3	48	3-1/8	1	6.0
XYB-14	3-1/2	70	4-1/2	1	6.8
XYB-16	4	90	6	1	8.3

Catalog No. Description	Conduit Size (In.)	Ounces Req. For Each Sealing Fitting Cement	Fiber	Standard Package Qty.	Tot. Wt. Lbs.
Male-Female					
XYBM-2	1/2	1	1/8	5	2.2
XYBM-3	3/4	2	1/4	5	2.7
XYBM-4	1	3	1/4	5	3.8
XYBM-5	1-1/4	6	3/8	2	2.6
XYBM-6	1-1/2	9	1/2	2	3.4
XYBM-8	2	18	3/4	2	5.9
XYBM-10	2-1/2	23	1-1/2	2	6.8
XYBM-12	3	48	3-1/8	1	6.3
XYBM-14	3-1/2	70	4-1/2	1	7.3
XYBM-16	4	90	6	1	8.8

Nominal Dimensions (Inches)					
Conduit Size	A	B	C	(XYBM Series Only) D	Turn Radius R
1/2	3-19/32	1-13/16	5/8	11/16	1-3/16
3/4	3-25/32	2-1/16	3/4	15/16	1-5/16
1	4-3/8	2-5/16	7/8	15/16	1-7/16
1-1/4	5-5/32	2-13/16	1-1/16	1-1/16	1-3/4
1-1/2	5-11/16	3-3/16	1-3/16	1-3/16	2
2	6-13/16	3-7/8	1-1/2	1-7/16	2-3/8
2-1/2	7-1/2	4-1/2	1-7/8	1-5/8	2-11/16
3	9-9/16	5-1/2	2-3/16	1-7/8	3-5/16
3-1/2	9-1/2	6-1/6	2-3/8	2	3-11/16
4	9-9/16	6-1/2	2-5/8	2-1/8	3-7/8

Compliances

- NEC Class I, Groups B, C, D Class II, Groups E, F, G
- UL Standard 886 - CSA Standard C22.2 No. 30

Enclosure Terminations and Seals

Explosionproof and Dust-tight Fittings and Accessories

EXPLOSIONPROOF AND DUST-TIGHT SEALING FITTINGS CLASS I, GROUP D; CLASS II, GROUPS E, F & G; NEMA 7 & NEMA 9


XY 2-3-4


XYM 2-3-4


XY 5-6


XYM 5-6


XYC


XYCM


XYCS


XYCSM

CSA Certified LR27991

UL Listed E10493

Compliances

- NEC Class I, Group D Class II, Groups E, F, G
- UL Standard 886 - CSA Standard C22.2 No. 30

Adalet Sealing Fittings are used to isolate arc-producing devices from wiring systems and to prevent the spread of explosive gases.

FOR VERTICAL MOUNTING

Types XY and XYM Fittings are for vertical mounting, and are provided with threaded plugged openings into which the sealing cement is poured. Sizes 1-1/4" x 1-1/2" have large plugged openings in the lower hub to facilitate packing fiber around the wires to form a dam. Type XYM's have removable threaded nipples. The two hubs are tapped simultaneously to assure alignment of the conduits, especially important to equipment manufacturers using short runs of conduit.

FOR HORIZONTAL & VERTICAL MOUNTING

Type XYC Fittings are for horizontal mounting only, with the cover opening in an upright position. XYCS fittings are for vertical or horizontal mounting, with removable threaded covers which can be turned to the desired position for pouring in the sealing cement. The covers are interchangeable. The male-to-female types have removable threaded nipple.

Catalog Number		Conduit	Ounces Required per Fitting		Standard Package	
Female/ Female	Male/ Female	Size (In.)	Sealing Cement	Packing Fiber	Qty	Weight Lbs.
XY2	XYM2	1/2	1	1/8	25	10
XY3	XYM3	3/4	1	1/4	25	10
XY4	XYM4	1	2	1/4	25	12-1/2
XY5	XYM5	1-1/4	4	3/8	10	7-1/2
XY6	XYM6	1-1/2	5	1/2	10	10
XYC2	XYC2M	1/2	2	1/8	25	13
XYC3	XYC3M	3/4	2	1/4	25	13
XYC4	XYCM4	1	4-1/2	1/4	25	15
XYC5	XYC5M	1-1/4	8-1/2	3/8	10	10
XYC6	XYC6M	1-1/2	11-1/2	1/2	10	11
XYC8	XYC8M	2	13-1/2	3/4	10	12
XYC10	XYC10M	2-1/2	15	1-1/2	1	2
XYC12	XYC12M	3	31-1/2	3-1/8	1	3
XYC14	XYC14M	3-1/2	42-1/2	4-1/2	1	4
XYC16	XYC16M	4	51	6	1	5
XYC2S	XYC2SM	1/2	2	1/8	25	13
XYC3S	XYC3SM	3/4	2	1/4	25	13
XYC4S	XYC4SM	1	3	1/4	25	15
XYC5S	XYC5SM	1-1/4	6-1/2	3/8	10	10
XYC6S	XYC6SM	1-1/2	10	1/2	10	11
XYC8S	XYC8SM	2	12-1/2	3/4	10	12
XYC10S	XYC10SM	2-1/2	13-1/2	1-1/2	1	2
XYC12S	XYC12SM	3	29-1/2	3-1/8	1	3
XYC14S	XYC14SM	3-1/2	40	4-1/2	1	4
XYC16S	XYC16SM	4	48-1/2	6	1	5

Troubleshooting

First, eliminate external failure causes, check the following:

- Power not on or incorrect voltage (Ex.—Connecting 24 VDC to 110 VAC)
- Fluid not flowing through pipe
- Flow Switch Wiring incorrect
- Output Device Wiring incorrect
- If Insertion probe style, check probe insertion depth to insure sensors are a little past center line of pipe.
- Fluid flowing in same direction as Flow Direction Arrow marked under condulet

Once external Failures have been eliminated, check the following:

1. On electronic board, the D3 indicator light should be flashing GREEN. If not, check power connections and fuse.
2. If power is confirmed and meter is not responding, check excitation voltage across TP1 (-) and TP4 (+). See included flow curve for values.
3. Relays are energized if indicator lights D14 & D15 are on.

IF FLOW SWITCH IS STILL NOT OPERATING CONTACT

THERMAL INSTRUMENT AT (215) 355-8400

Summary

If you have any questions at all for Thermal Instrument Company, please do not hesitate to contact us at **(215) 355-8400**.

Spare Parts List:

110/220 VAC Fuse

They are readily available from Digi-Key (**1-800-344-4539**) as Part Number **WK4041BK-ND** or any other electronic supplier handling **Wickmann TR5 Sub-Miniature Fuses (UL 248-14)** or equivalent.

24 VDC Fuse

Wickmann Littelfuse 1 Amp Slow Blow 250 VAC - Digi-key Part # WK4048BK-ND.
www.digikey.com

Contact Thermal Instrument for other parts as needed.

www.ThermalInstrument.com

217 Sterner Mill Road

Trevose | PA | 19053 | USA

Phone: 215-355-8400

Fax: 215-355-1789

Thermal Instrument Co.
217 Sterner Mill Rd.
Trevose, PA 19053
215-355-8400
www.thermalinstrument.com

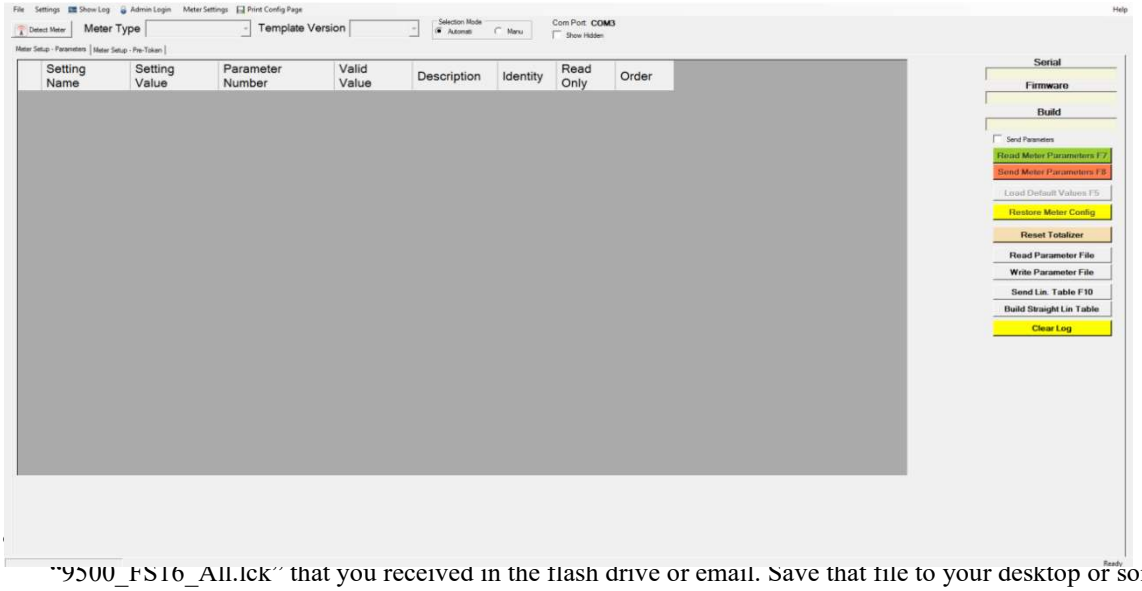
Parameter Setup Utility (PSU) Instructions for Thermal Instrument Flow Meters

Loading PSU onto your machine:

Copy PSU Setup.exe file from the flash drive provided, click on the link provided in an email, or type this link into your web browser: **https://www.thermalinstrument.com/tiuploads/psu/install/psu_setup.exe**

Clicking the above link will start downloading the software from the TIC secured site. Note: After initial download and set up, the software will retrieve any updates to the PSU software tool when your machine is connected to the internet and the PSU tool is launched on your device.

- Click and open the program "PSU_Setup.exe"
- You should have a screen that looks like this once it downloads and installs on your machine.



"9500_PS16_All.lck" that you received in the flash drive or email. Save that file to your desktop or some other folder that can be easily accessed.

- Go back into Parameter Setup Utility File.
    - Go to FILE (Top Left part of Screen)
        - Navigate down to Import Token Unlock File
        - Navigate to the file on your PC where you saved it, select file, and click OPEN.
- Close the Parameter Setup Utility Window.
- Open the Parameter Setup Utility Tool. Go to FILE - > Restore Factory Database.
    - Select "Yes" to allow the Database to be updated to most current available version.
    - Click "Restore"
- Close all windows as directed and Re-open the PSU Tool.
- Power up your flow meter.

Thermal Instrument Co.
217 Sterner Mill Rd.
Trevose, PA 19053
215-355-8400
www.thermalinstrument.com

- You are now ready to plug into your meter and begin modifying or viewing current settings.
- Connect the USB end of the adaptor into the computer and connect the micro USB end of the cable into Flowmeter's micro USB port. This connection can be viewed on next page.
- Click on "Detect Meter" on top left of screen. This will display the current flowmeter configuration. Note: If a Window Appears that says the operation has timed out your machine may not recognize the COM port. You will have to set up a COM port. Go to S*ettings -> Options -> Click on Button that looks like Radio Tower at top left*. This will list available COM ports. Select one, go back to main screen, and click "Detect Meter". If this fails unseat all cable connections and re-connect them back together.

Fields that can be Adjusted:

Note: After each parameter has been changed, select button on right side of screen "Send Meter Parameters F8"to update electronics.

- **Flow Rate Decimal Point -** This can be adjusted to show how many places after decimal point can be viewed on the Flow Rate line.
- **Flow @ 20 mADC** - NOTE: The 20mA full scale flow value cannot be lower than 10% of original full scale flow rate. The 20mA value cannot be increased above original factory set point. It can be lowered to provide greater resolution.
- **Filter Factor -** Value can be increased or decreased to help with "noisy" signal.
- **Totalizer Decimal Point -** Same as Flow Rate Decimal Point description above.
- **Zero Cutoff -** User can vary the point on the flow curve where the flow rate goes to "0" (4 mA). This value is typically set anywhere from 1% to 8% of full-scale flow rate.
- **Flow Factor -** Flow (K) Factor can be used if gas type is changing. Contact TIC for assistance in determining this value.
- **Pipe ID –** Enter the new line ID in inches. The new data will be sent to electronics and the flow rates will be calculated using the new line size data. ***Note: This option only valid on Model # 62-9 Insertion Probes.***
- **Reset Totalizer -** Located on right side of screen. Follow instructions in prompt after selecting this option.

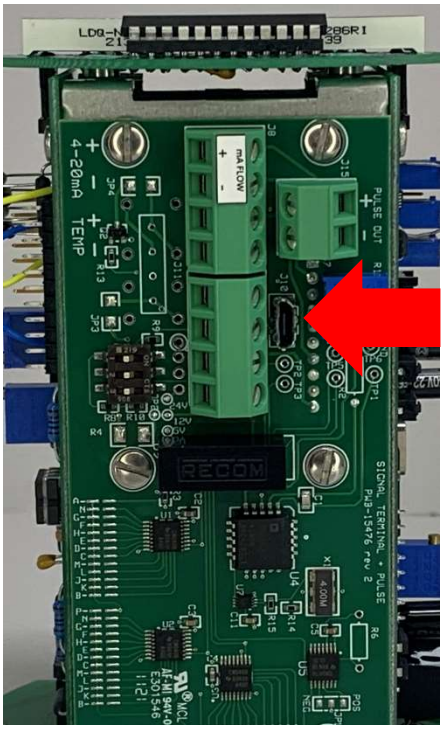
Modbus Only Options:

Note: Below Parameters can be modified to match up with customer control system.

- **Modbus Baud Rate**
- **Modbus Parity**
- **Modbus Float Order**
- **Modbus Slave ID**

Connector on 9500P:

For Meters Modbus/Pulse Output:



Connector on FS16: