



UIR Series

Universal Isolation Relay

Installation & Operation Manual

***TRANS*DATA, INC.**

2560 TARPLEY ROAD • CARROLLTON, TEXAS 75006 • TEL (972) 418-7717 • FAX (972) 418-7774
Website: www.transdatainc.com E-mail: tdmeters@transdatainc.com

Table of Contents

UNPACKING	1
INSTALLATION INSTRUCTIONS	1
WHAT IS A UIR?	2
APPLICATIONS.....	2
FEATURES	2
MODELS.....	2
FUNCTIONAL DESCRIPTION.....	3
MECHANICAL HARDWARE	3
ELECTRICAL HARDWARE	3
<i>Inputs</i>	3
<i>Outputs</i>	3
<i>Wiring Connections</i>	4
<i>Power Supply</i>	4
INPUT/OUTPUT MAPPING.....	5
INPUT CONFIGURATION.....	5
<i>Headers J1 & J2</i>	5
OUTPUT MAPPING	5
<i>Headers E1, E2, & E3</i>	5
<i>Headers E4 & E5</i>	6
TROUBLESHOOTING.....	15
SPECIFICATIONS	17
POWER REQUIREMENTS	17
INPUTS	17
OUTPUTS.....	17
ENVIRONMENTAL AND MECHANICAL	17
APPROVALS.....	17
INDEX	18

Table of Figures

FIGURE 1: MOUNTING TEMPLATE	7
FIGURE 2: UNIVERSAL ISOLATION RELAY	8
FIGURE 3: UIR-1 FORM C OPERATION	9
FIGURE 4: UIR-1 FORM A OPERATION	10
FIGURE 5: UIR-5 FORM C OPERATION	11
FIGURE 6: UIR-5 FORM A AND FORM C OPERATION.....	12
FIGURE 7: UIR-3 FORM C OPERATION	13
FIGURE 8: UIR-3 FORM A OPERATION.....	14

UNPACKING

The shipping carton should contain the following:

- UIR - Universal Isolation Relay

Be sure to inspect the UIR for any shipping damages. If damage is evident, notify the carrier accordingly, and contact TransData.

INSTALLATION INSTRUCTIONS

**To install a UIR,
follow these
steps:**

1. Select a suitable mounting location for the UIR.
2. Using Figure 1: Mounting Template as a reference, drill 3/16" holes.
3. Mount the UIR in the upright vertical position using 4 appropriate #8 screws. Secure the screws tightly.
4. Select appropriate 5x20mm fuse ratings, depending on types of loads. Install output fuses at F1, F2, and F3, depending on UIR model. Reference Figure 2: Universal Isolation Relay.
5. Disable AC power source. If 120VAC power supply is used, connect the AC power source to the UIR using 16 gauge stranded wire with an insulation rating of at least 300 volts. If 240VAC or 277VAC power supply is used, then the wire insulation rating should be at least 600 volts.
6. If the UIR is not mounted to a grounded surface, then TransData recommends connecting 16 AWG or larger wire between one of the mounting plate screws and a suitable earth ground to insure proper operation of the UIR device.

IMPORTANT!

**The UIR must be mounted in the upright vertical position
for proper operation.**

WHAT IS A UIR?

The Universal Isolation Relay provides a pulse distribution point to various devices in remote locations. The Relay is designed to isolate and protect network components for safety and security. Reference Figure 2: Universal Isolation Relay.

Applications

The UIR can be utilized in the following applications:

- Isolation for substation pulse inputs/outputs
- Meter pulse isolation and pulse replication
- DC pilot wire signaling for long distances
- Pulse bounce filtering

Features

The UIR provides the following features:

- Two Form A or Form C inputs accepting contact closures, open collector inputs, or AC or DC voltage signals
- Power supply accepting 120 - 277 VAC without hardware configuration changes
- Input/Output mapping allowing inputs to be routed to any combination of the three outputs using field configurable PCB header shunts
- 1 Amp Fast Acting 5x20mm fuse input overcurrent protection
- Input and Output LED indicators
- Fused outputs
- Maximum 10 pulse per second throughput
- Pulse debouncing in Form A or Form C mode
- Bistable or Monostable configurable operation, depending on model
- Two or three Form C mercury wetted relay outputs, depending on model

Models

The UIR is available in three models:

<u>MODEL</u>	<u>CONFIGURATION</u>
UIR-1	2 Inputs/2 Outputs, Bistable operation
UIR-5	2 Inputs/3 Outputs, Bistable operation
UIR-3	2 Inputs/3 Outputs, Bistable & Monostable operation

FUNCTIONAL DESCRIPTION

Mechanical Hardware

The printed circuit board is fastened to an aluminum plate by means of four standoffs and #4 screws. The electronics are protected by a standard dust cover. As an option, a sealable dust cover or a NEMA 3R security enclosure can be provided.

Electrical Hardware

Inputs

The UIR provides two input connections, which can be wired to any pulse source, such as an electric meter pulse initiator output. These inputs provide the following features for the UIR:

- Form A (two-wire) or Form C (three-wire) operation, which are independently field configurable for both inputs using PCB header shunts. J1 header configures Form A or Form C operation for input 1, while J2 header configures Form A or Form C operation for input 2. Reference Figure 2: Universal Isolation Relay.
- Input to output pulse stream mapping - each of the two inputs can be mapped to any one, two, or all three of the pulse relay outputs. The two inputs, however, should not be mapped to the same output. See INPUT/OUTPUT MAPPING, page 5.
- The UIR-3 provides selection of bistable or monostable (momentary) input to output operation. With bistable operation, the output always corresponds to the last mapped input state. With monostable operation, however, the output always returns to starting state after approximately 0.25 seconds.
- An input wetting voltage of 5.5 to 8.5 VDC open circuit with a short circuit current capability of less than 5 mA.
- Input pulse rates up to 10 pulses per second are permissible during bistable operation.
- The inputs are designed to accept dry relay contacts or open collector pulse sources. If required, however, 60 VDC bipolar pilot wire operation can be implemented, as well as the use of 120 VAC signals applied to the inputs.

Outputs

Depending on the model, the UIR provides two or three, fuse protected, dry Form C mercury wetted relay outputs. As an option, the UIR can be shipped with user specified output fuses. If output fuses are not installed prior to shipment, install fuses in the fuse clips labeled F1, F2, and F3 for the corresponding output on the PC board. The recommended ratings are 1/2 - 2 A fast acting 5x20mm fuses.

Wiring Connections

User terminations are facilitated using 300V, wire clamp, terminal strips that will accommodate 18 to 12 AWG wire. The UIR is designed to operate with input wire lengths of up to 2500 feet when using twisted pair, or shielded twisted pair 18 to 12 AWG copper wire, or with a maximum input wire impedance of $1.5k\Omega$ if other wire type is used. Terminal block designations for the input and output connections as well as AC power are labeled on the printed circuit board silkscreen as shown in Figure 2: Universal Isolation Relay.

Meter Input Wiring

If Form A inputs are used, CH1 “Y” is input one and CH2 “Y” is input two. The “K” INPUT terminal is the common terminal for both inputs, regardless of the form.

If Form C inputs are used, CH1 “Y” and CH1 “Z” are input one and CH2 “Y” and CH2 “Z” are input two.

Output Wiring

Each output provides a “K”, “Y”, and “Z” terminal. Form C operation requires a “K”, “Y”, and “Z” connection for each output. Form A output connections are all achieved by using only the “K” and “Y” or “K” and “Z” terminals.

Power Supply

The AC input to the power supply accommodates 120 - 277 VAC at a maximum of 1.7 VA of burden. There are no hardware configuration changes to operate at different voltages. A 1 Amp fast acting 5x20mm line fuse (F4), with protective cover, provides input overcurrent protection.

Reference figures 3-8.

INPUT/OUTPUT MAPPING

INPUT CONFIGURATION

Headers J1 & J2

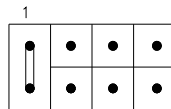
Headers J1 & J2 control the type of input which will be accepted on Input Channels 1 & 2. Header J1 controls Input Channel 1 and header J2 controls Input Channel 2. The shunt installed at the header pins labeled “C”, sets the respective input to accept a Form C contact closure. The shunt installed at the header pins labeled “A”, sets the respective input to accept a Form A contact closure or open collector. Reference Figure 2: Universal Isolation Relay.

OUTPUT MAPPING

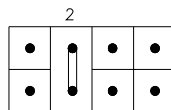
Headers E1, E2, & E3

Headers E1, E2, & E3 are used to map input channels 1 & 2 to the output relays. These headers also set bistable or monostable operation. Header E1 controls Relay 1, E2 controls Relay 2, and E3 controls Relay 3.

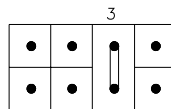
EXAMPLES:



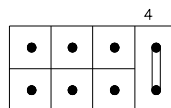
Installing the shunt in header position 1 selects input 1 for that relay. The output will be bistable.



Installing the shunt in header position 2 selects input 2 for that relay. The output will be bistable.



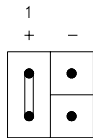
Installing the shunt in header position 3 selects input 1 and pulse generator controlled by E4. The output will be monostable.



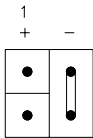
Installing the shunt in header position 4 selects input 2 and pulse generator controlled by E5. The output will be monostable.

Headers E4 & E5

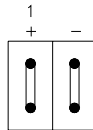
Header pins E4 & E5 control the monostable operation of any relay whose input mapping header shunt is set to the appropriate header position on E1, E2, or E3. Header E4 controls the operation of header position 3 on E1, E2, and E3. Header E5 controls the operation of header position 4 on E1, E2, and E3. The following examples show pulse input configurations. See Diagram 1.



Output Pulse on “KY” closure of input channel. See Signal “A”.



Output pulse on “KZ” closure of input channel. See Signal “B”.



Output pulse on “KY” & “KZ” closure of input channel resulting in an output to input ratio of 2:1. See Signal “C”.

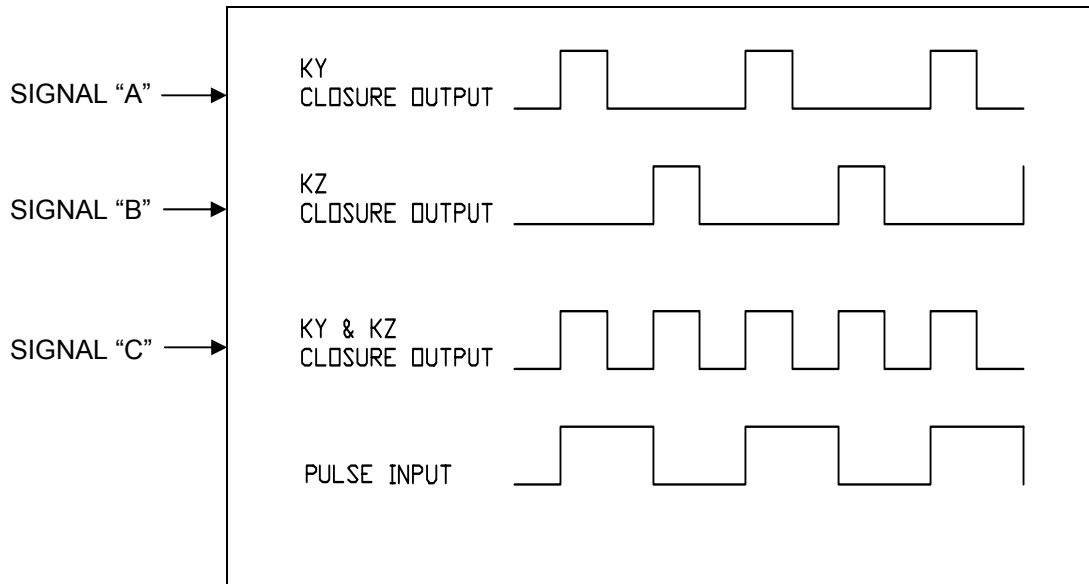
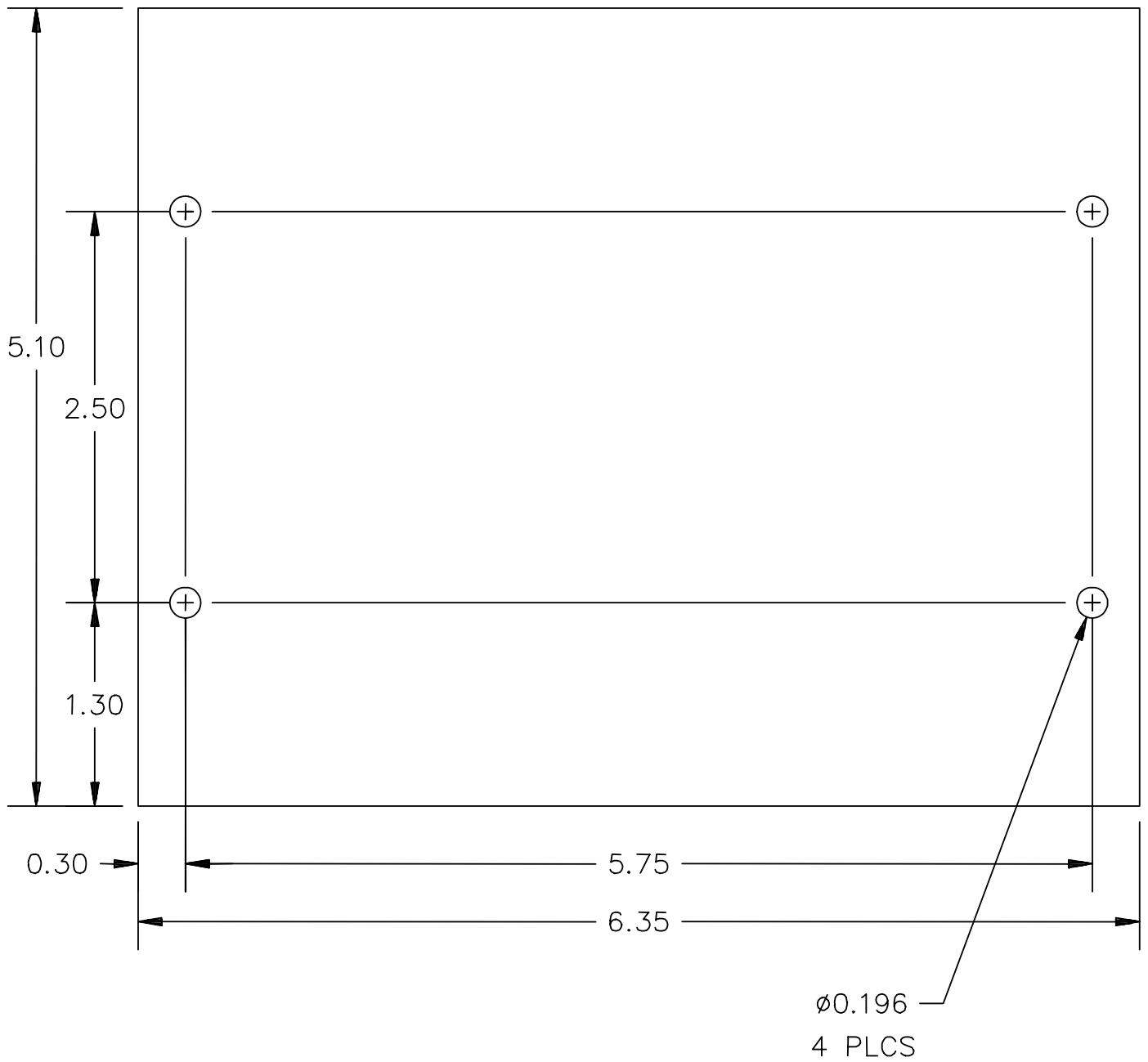


Diagram 1: I/O SIGNALS



NOTES:
MOUNTING PLATE— 0.093 THICK

Figure 1: Mounting Template

IMPORTANT!

The UIR must be mounted in the upright vertical position for proper operation.

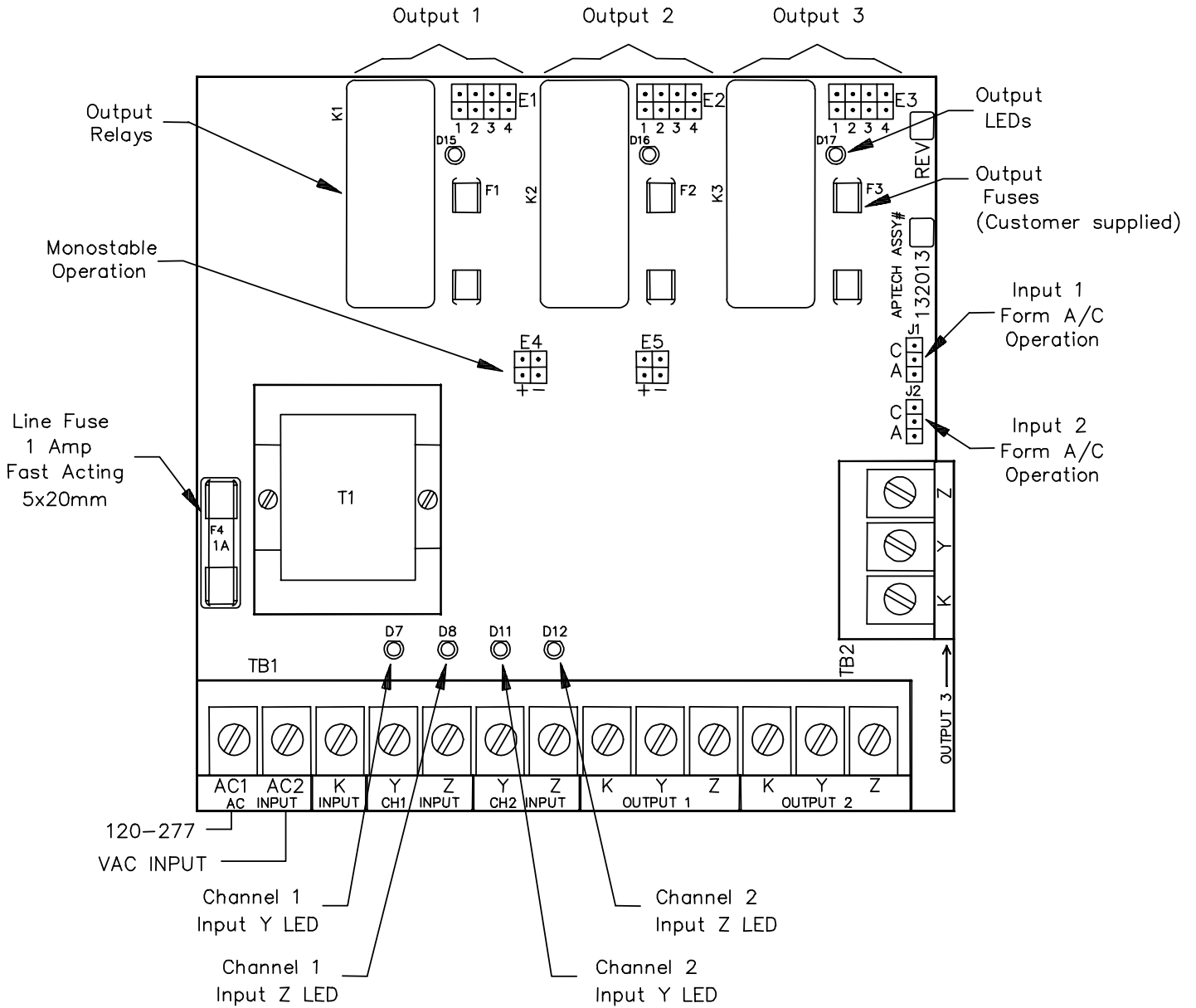
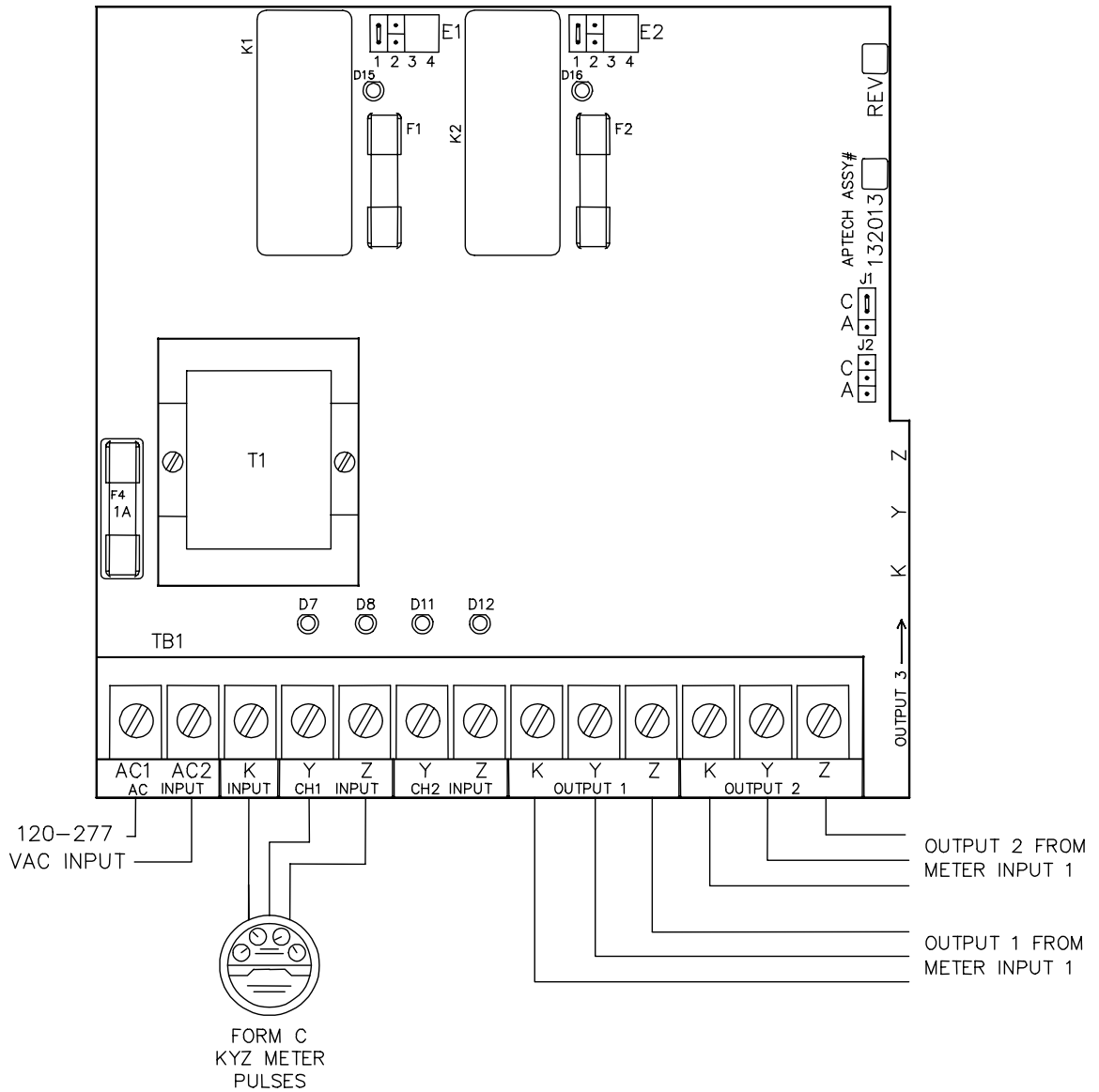


Figure 2: Universal Isolation Relay

UIR-1 CONNECTED FOR ONE KYZ METER INPUT WITH TWO OUTPUTS.
BISTABLE OPERATION.



NOTES:



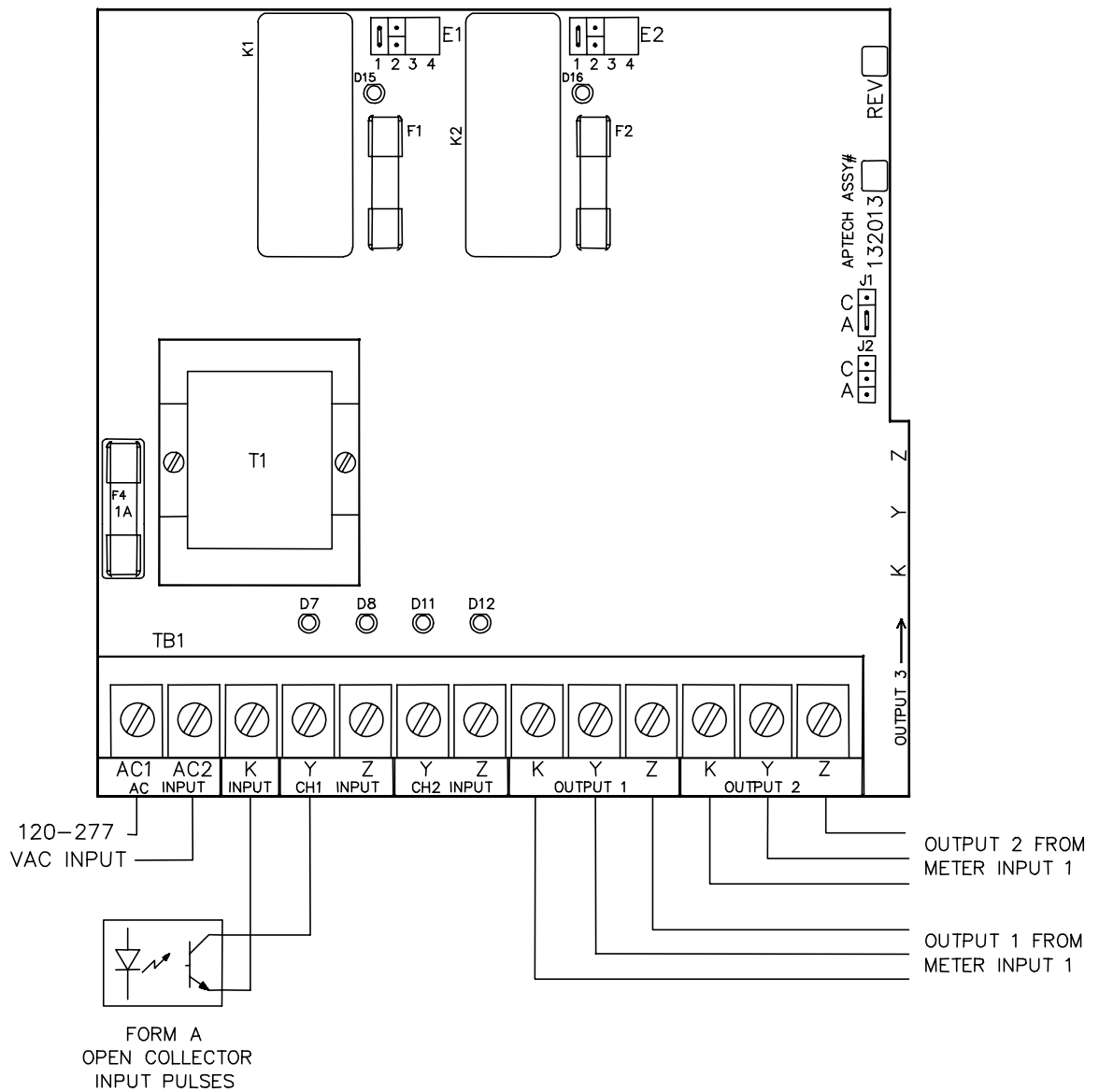
-  = Header Shunt Installed
-  = Header Shunt Not Installed

Figure 3: UIR-1 Form C Operation

UIR-1 CONNECTED FOR ONE FORM A OPEN COLLECTOR PULSE INPUT WITH TWO
 OUTPUTS.
 BISTABLE OPERATION.



NOTES:



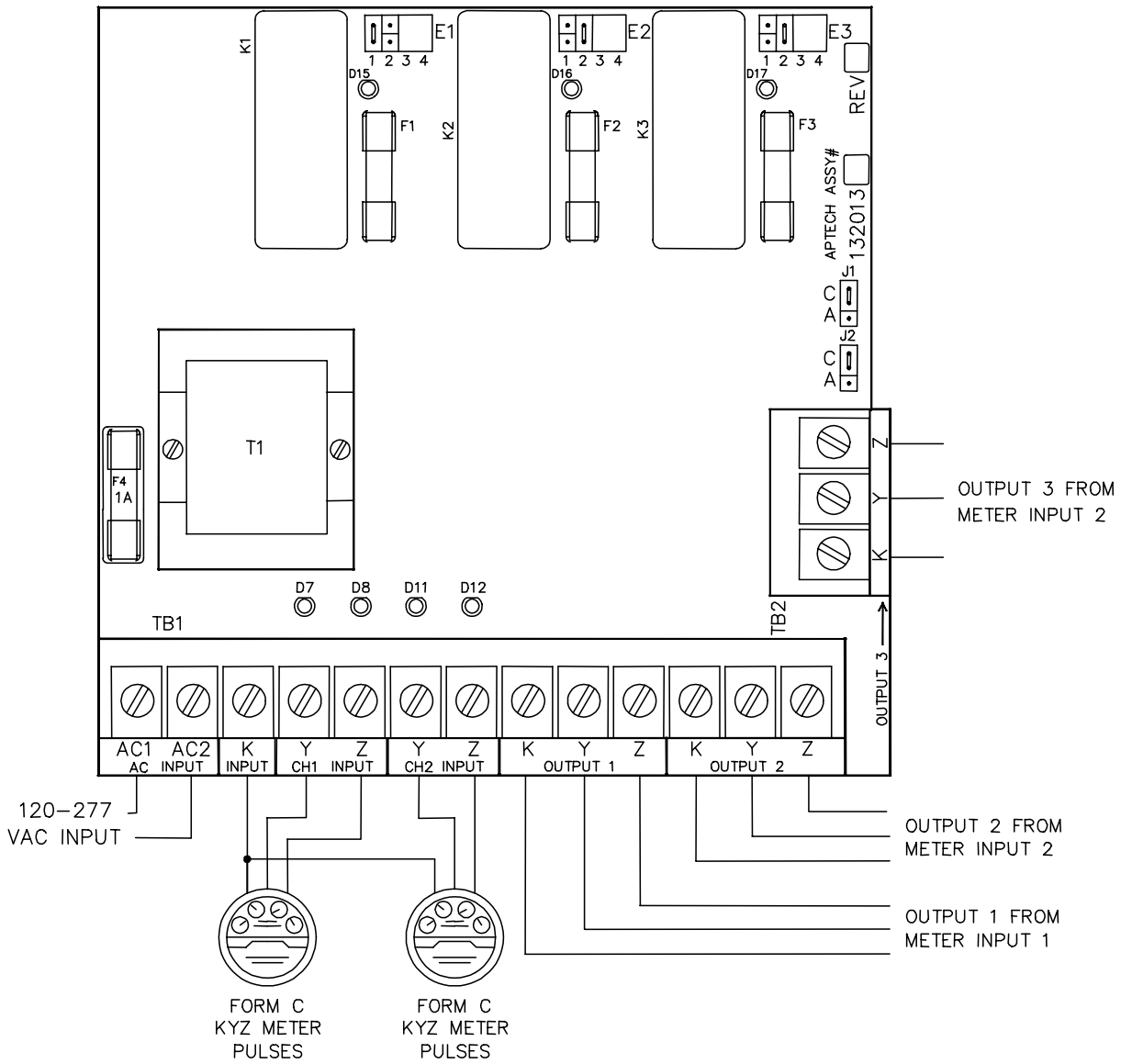
-  = Header Shunt Installed
-  = Header Shunt Not Installed

Figure 4: UIR-1 Form-A Operation

UIR-5 CONNECTED FOR TWO KYZ METER INPUTS WITH THREE OUTPUTS.
BISTABLE OPERATION.



NOTES:



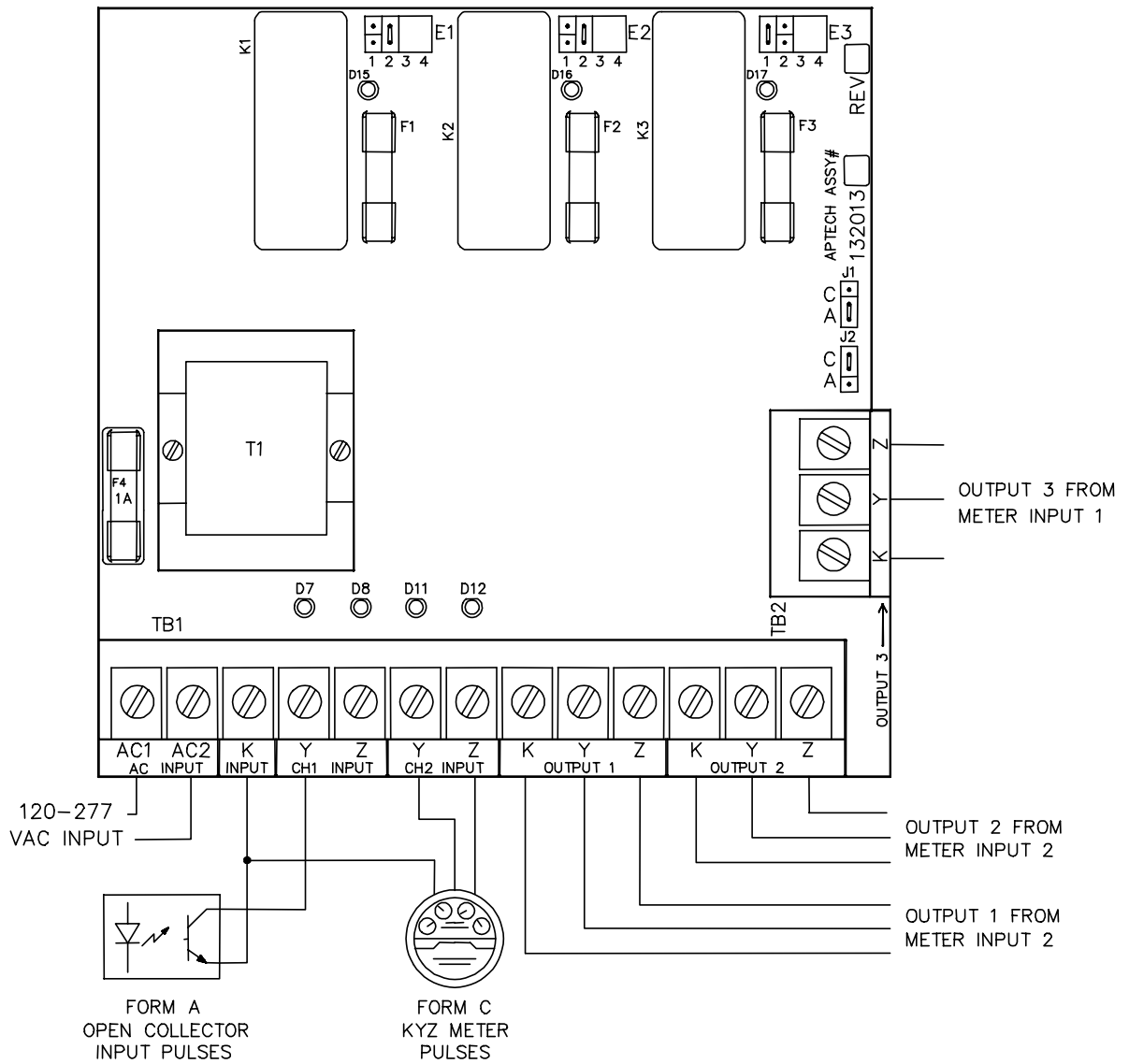
-  = Header Shunt Installed
-  = Header Shunt Not Installed

Figure 5: UIR-5 Form-C Operation

UIR-5 CONNECTED FOR ONE FORM A OPEN COLLECTOR PULSE INPUT AND
ONE KYZ METER INPUT WITH THREE OUTPUTS.
BISTABLE OPERATION.

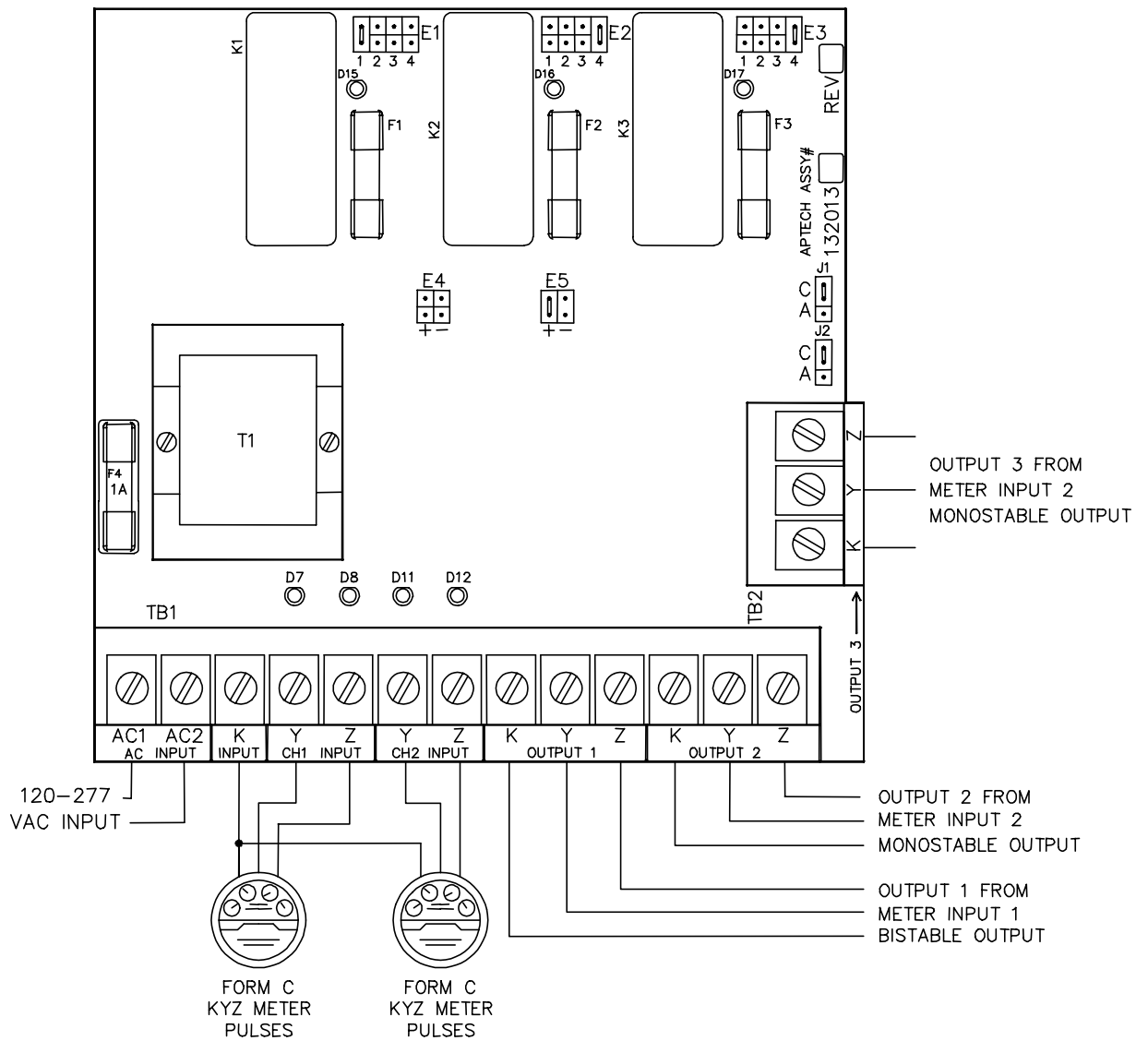


NOTES:

- = Header Shunt Installed
- = Header Shunt Not Installed

Figure 6: UIR-5 Form-A and Form-C Operation

UIR-3 CONNECTED FOR TWO KYZ METER INPUTS WITH THREE OUTPUTS.
MONOSTABLE AND BISTABLE OPERATION.



NOTES:



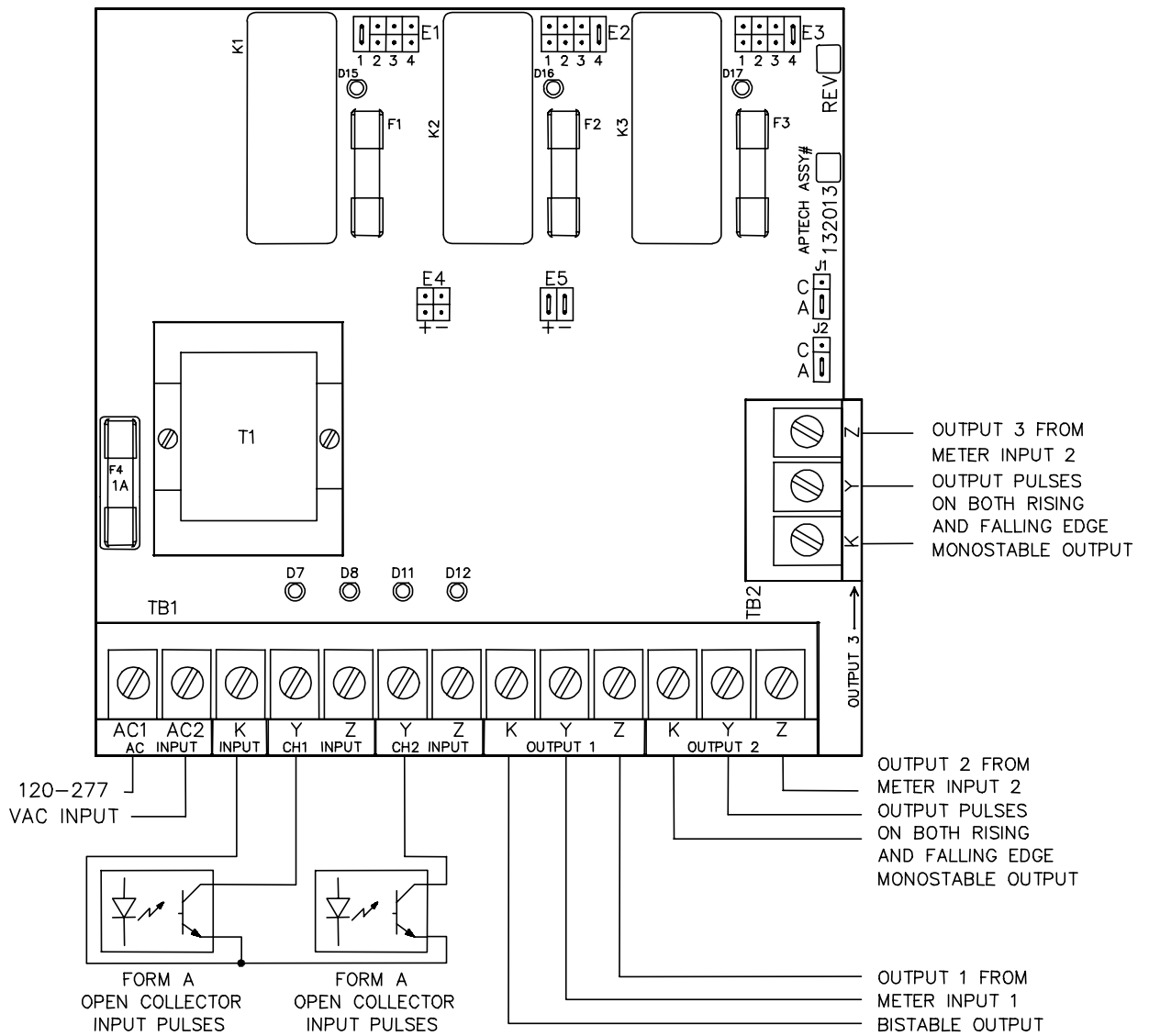
-  = Header Shunt Installed
-  = Header Shunt Not Installed

Figure 7: UIR-3 Form-C Operation

UIR-3 CONNECTED FOR TWO FORM A OPEN COLLECTOR INPUTS WITH THREE OUTPUTS.
MONOSTABLE AND BISTABLE OPERATION.



NOTES:



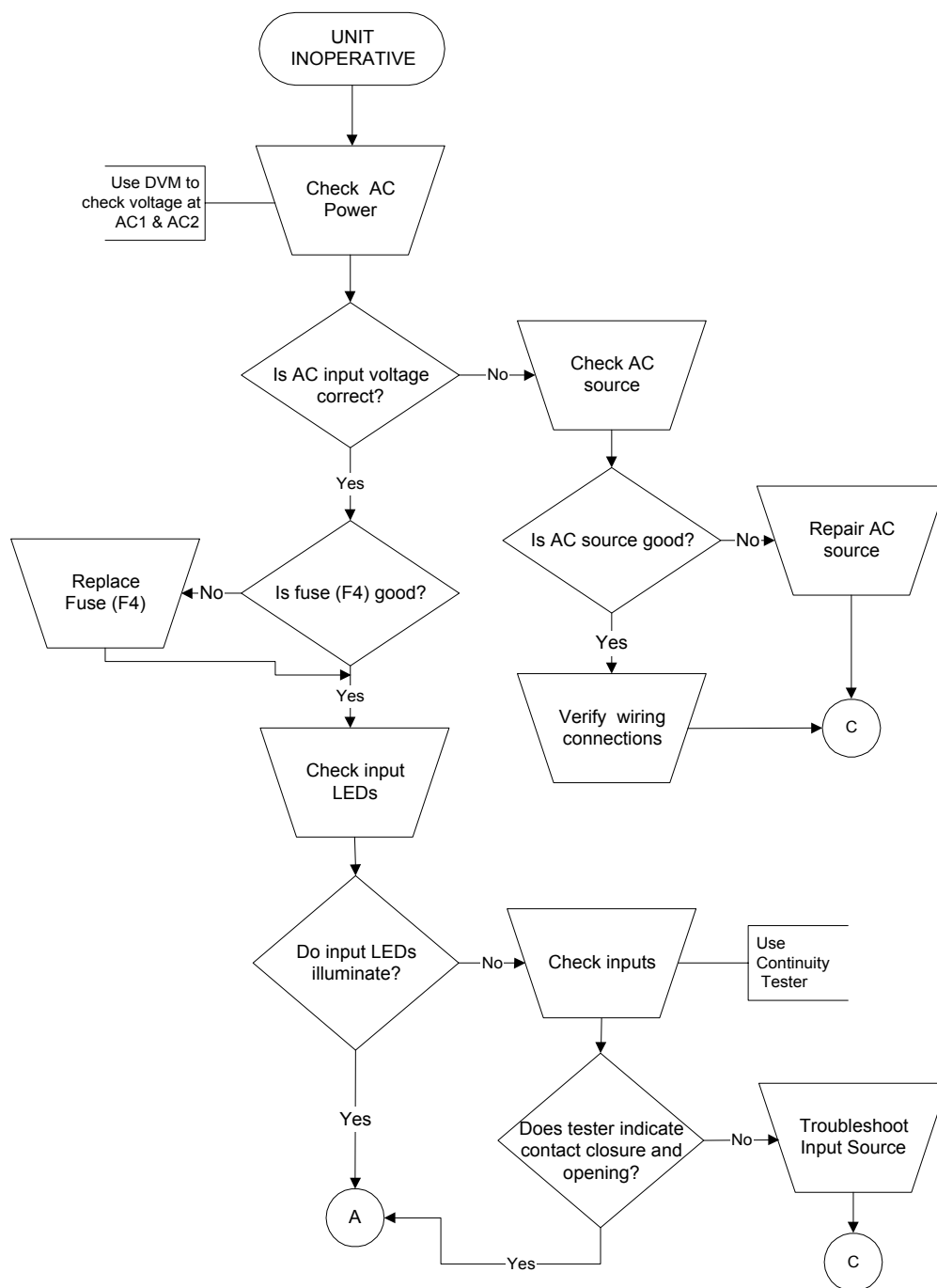
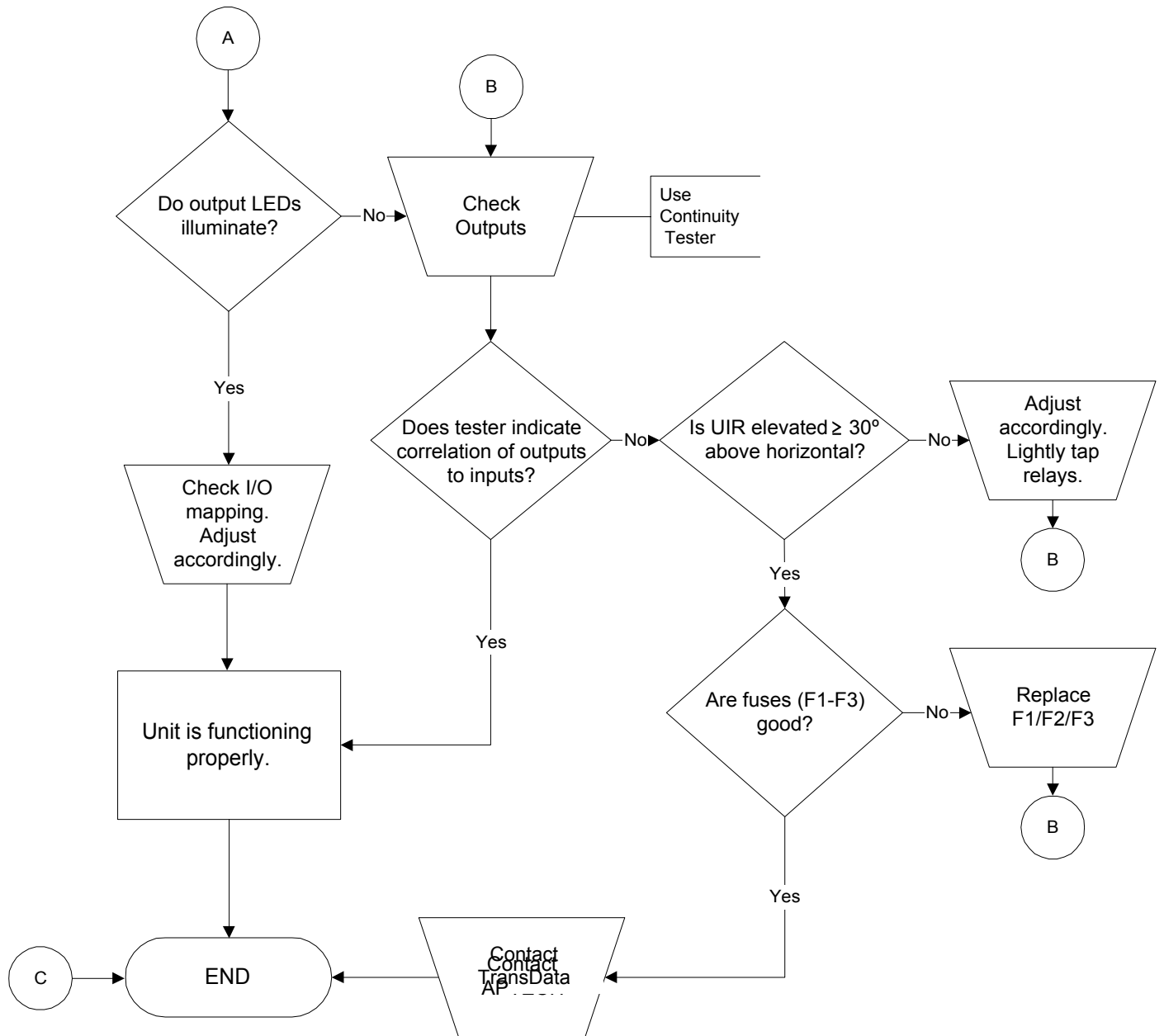
-  = Header Shunt Installed
-  = Header Shunt Not Installed

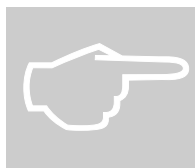
Figure 8: UIR-3 Form-A Operation

TROUBLESHOOTING





SPECIFICATIONS



Power Requirements

Voltage	120 - 277 VAC $\pm 20\%$
Frequency	50/60 Hz
Burden	Less than 1.7 VA
AC Input Surge Suppression	1500 Watts/200 Amps maximum, single surge

Inputs

Number of Inputs	
UIR-1	Two Form C (three-wire) or Form A (two-wire) Bistable operation only
UIR-5	Two Form C (three-wire) or Form A (two-wire) Bistable operation only
UIR-3	Two Form C (three-wire) or Form A (two-wire) Bistable or Monostable operation
AC/DC Input (External Supply)	Input voltage range from ± 7 to ± 65 volts
DC Input (Internal Supply)	5.5 to 8.5VDC open circuit
Current Output	5mA short circuit current max.

Outputs

Number of Outputs	
UIR-1	Two Form C (three-wire) mercury wetted relays
UIR-5	Three Form C (three-wire) mercury wetted relays
UIR-3	Three Form C (three-wire) mercury wetted relays
Voltage	500 Volts DC or peak AC maximum
Current	2 Amps switched maximum
Capacity	100 VA maximum
Max. Pulse Rate	10 pulses per second per channel – bistable operation
Input/Output Mapping	Either of the two inputs can be mapped to any of the outputs on E1, E2, and/or E3, depending on the model.

Environmental and Mechanical

Temperature	-40° to +85° Celsius
Humidity	5 to 95% non-condensing
Mounting Plate	The UIR is fastened to an aluminum plate. Dust cover included. Sealable cover or NEMA 3R security enclosure-optional.

Approvals

- Approved by the Legal Metrology Branch (LMB) of Industry Canada (IC), Approval #E-244.

INDEX

A	
Applications	2
E	
Electrical Hardware	3
F	
Features	2
Functional Description	3
H	
Headers E1, E2, & E3	5
Headers E4 & E5	6
Headers J1 & J2	5
I	
Input Configuration	5
Input/Output Mapping	5
Inputs	3
Installation Instructions	1
M	
Mechanical Hardware	3
Meter Input Wiring	4
Models	2
O	
Output Mapping	5
Output Wiring	4
Outputs	3
P	
Power Supply	4
S	
Specifications	17
T	
Troubleshooting	15
U	
Unpacking	1
W	
What is a UIR?	2
Wiring Connections	4