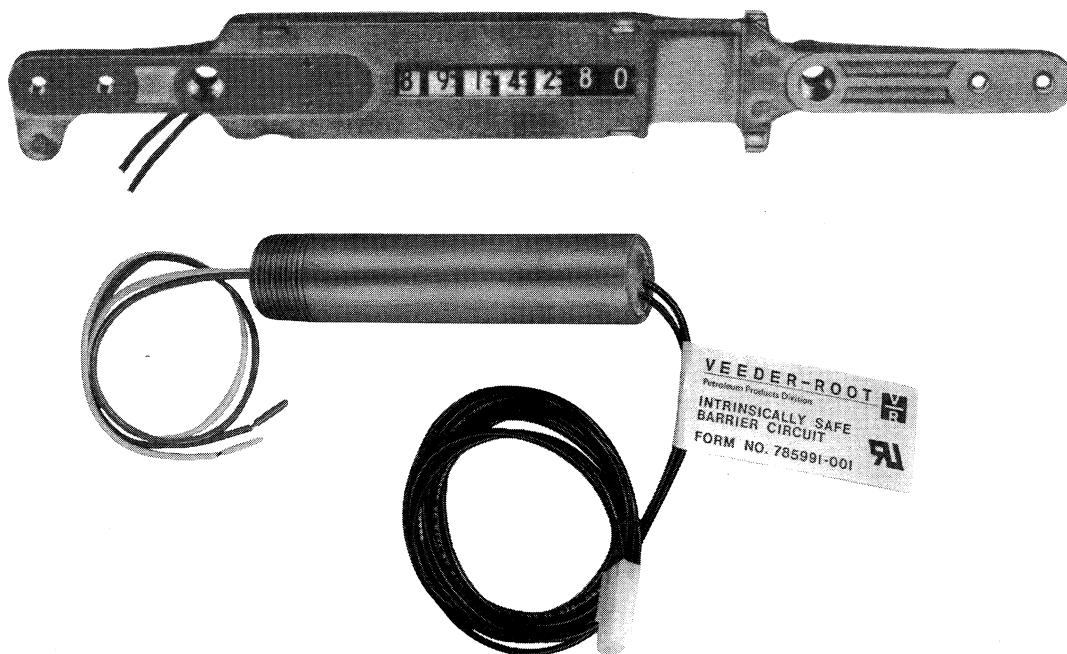




SERIES 7874 RETROFIT KITS

FOR PULSER/TOTALIZER AND INTRINSICALLY SAFE PROTECTIVE BARRIER

Manual No. 251610, Rev. B





**Installation Instructions, Series 7874 Retrofit Kits
For Pulser/Totalizer and Intrinsically Safe Protective Barrier**

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WARNINGS:

IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH THE NATIONAL ELECTRICAL CODE; FEDERAL, STATE AND LOCAL CODES; AND ANY OTHER APPLICABLE SAFETY CODES. IN ADDITION, DISCONNECT POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

BEFORE STARTING WORK ON THE DISPENSER, ENSURE THAT ALL CIRCUIT BREAKERS THAT CONTROL POWER TO THE DISPENSER ARE IN THE OFF POSITION. TAKE NECESSARY PRECAUTIONS TO PREVENT CIRCUIT BREAKERS FROM BEING TURNED ON UNTIL ALL WORK IS COMPLETED. MORE THAN ONE BREAKER MAY HAVE TO BE TURNED OFF TO OBTAIN A COMPLETE SHUTDOWN OF POWER TO THE SELECTED POSITION. FAILURE TO COMPLY WITH THIS WARNING MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

TO MAINTAIN INTRINSIC SAFETY, DO NOT ROUTE WIRES NEAR OR TIE TO OTHER WIRING OF ANY KIND EXCEPT ANOTHER INTRINSICALLY SAFE CIRCUIT.

HIGH VOLTAGES ARE PRESENT IN THE SELF-SERVICE INTERCONNECTION BOX(ES). BE SURE TO TURN OFF ALL POWER BEFORE OPENING BOX(ES). MORE THAN ONE DISCONNECT MAY BE REQUIRED TO COMPLETELY DE-ENERGIZE THE BOX(ES). FAILURE TO COMPLY WITH THIS WARNING MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

BE SURE THAT NO UNPLUGGED HUBS OR OTHER OPENINGS EXIST IN JUNCTION BOX. CLOSE OR PLUG ANY SUCH HUBS OR OPENINGS BEFORE PROCEEDING FURTHER. FAILURE TO COMPLY WITH THIS WARNING MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.



SECTION 1. INTRODUCTION

The instructions in this manual are intended for use when retrofitting gasoline dispensers with a pulser/totalizer and an intrinsically safe protective barrier assembly for use with Veeder-Root's MBSS or 7800 Series Self-Service Control Systems or TLS 350R System. This manual does not provide instructions for installing self-service systems.

When a vertical bar **|** appears adjacent to text or illustrations, information has been added or changed at the last issue date.

Each retrofit kit contains all the necessary components to accomplish this modification, except in the case where an elbow is needed or where two barriers are to be installed in a dispenser with only one available junction box hub. In this case, Adapter Package 312020-520 must be used to install the retrofit kits.

Table 1. Retrofit Kit Applications.

Retrofit Kit Form Number	Fits Computer Type	Self-Serve System	Totalizer Type	Pulse Density*	Totalizer Form Number (Ref.)
787491-001 or **787401-001	4 Wheel VR-56 or VR-101	MBSS	Money	5 Pulse Edges Per Penny	773381-001
787491-002 or **787401-002	VR-2001 or VR-2002	MBSS	Money	5 Pulse Edges Per Penny	773383-001
787491-003 or **787401-003	4 Wheel VR-56 or VR-101 VR-2001 or VR-2002 VR-2002E or VR-10	MBSS	Quantity	5 Pulse Edges Per 1/10 Gallon	773387-001
787491-004 or **787401-004	VR-B2002	MBSS	Quantity	5 Pulse Edges Per 1/100 Gallon	773389-001
787491-005 or **787401-005	4 Wheel VR-56 or VR-101	7800	Money	1 Pulse Per Penny	773380-001
787491-006 or **787401-006	VR-2001 or VR-2002 or VR-B2002	7800	Money	1 Pulse Per Penny	773382-001
787491-007 or **787401-007	VR-2002E or VR-10/4	MBSS	Money	5 Pulse Edges Per Penny	773385-001
787491-008 or **787401-008	VR-2002E or VR-10/4	7800	Money	1 Pulse Per Penny	773384-001
787491-009 or **787401-009	VR-10	MBSS	Money	2 Pulses Per 2 Pennies	773380-601

* **Note:** The MBSS counts 5 pulse edges (2.5 pulses) for each penny or unit of volume from pulser totalizer kits -001 thru -004 and -007, or 4 pulse edges (2.0 pulses) for each 2 pennies from the -009 kit.

Pulse Density: 2 pulses, 2.5 pulses or 1 pulse per figure.

The 7800 Self-Serve System counts pulses. For retrofitting existing systems or installation of new 7800 Systems, single pulse per penny retrofit kits are available. Since the pulser/totalizer is not resettable, contact closure does not occur at a fixed relationship to the money wheel and an error of up to 1 cent may occur in use of this kit. **Acceptance of this error by local weights and measures authorities may vary.**

**These kit numbers are for Canadian installations.



**Installation Instructions, Series 7874 Retrofit Kits
For Pulser/Totalizer and Intrinsically Safe Protective Barrier**

**SECTION 2. INSTALLATION
REQUIREMENTS**

A dispenser must meet certain requirements in order to install the retrofit kit. If all the requirements are not met, DO NOT attempt to install the retrofit kit. The requirements are:

1. The dispenser junction box must have at least one unused threaded conduit hub; either 1/2" or 3/4" trade size. The hub may be anywhere on the junction box.
2. Sufficient clearance must exist around the hub for installation of the barrier pipe nipple including space to swing a pipe wrench.
3. The junction box must have sufficient volume to accommodate the extra wiring to be installed. The required volume for any dispenser can be calculated using the information in Table 2. Be sure to consider the extra wiring required to install the self-service equipment. Refer to the self-service installation instructions for details.

Table 2. Size of Dispenser Junction Boxes.

Size Of Conductor AWG	Free Space within Box for Each Conductor, Cubic Inches	
	Box with Hubs	*Box without Hubs
16 or Smaller	1.3	1.5
14	1.8	2.0
12	2.0	2.25
10	2.2	2.5
8	2.7	3.0

Note: A conductor passing through the box and each conductor terminating in the box is counted as one conductor. No unplugged openings are permitted.

*Note: Use of a conduit bushing (not supplied with kit) is required when installation is in a box without hubs.

SECTION 3. RETROFIT KITS

**FORM NOS. 787491-001 THROUGH -009
PARTS LIST**

Part Number	Description	Qty.
785991-001	Intrinsically Safe Protective Barrier	1
See Table 1	Pulser/Totalizer	1
576008-285	Clips, Wire Retaining	2
510901-337	Plastic Wire Ties	12
28698-K-060	Totalizer Security Plugs	2
514100-167	Conduit Hub Enlarger 1/2" to 3/4"	1
510500-327	Totalizer Screws	2
326536-001	Label-Wiring Diagram	1
251610	Instruction Manual	1

NOTICE TO CANADIAN CUSTOMERS

CAUTION

INSTALLATION AND USE OF THIS RETROFIT KIT IS SUBJECT TO REGULATIONS OF AND INSPECTION BY LOCAL AUTHORITIES HAVING JURISDICTION.

ATTENTION

L'INSTALLATION DE CET APPAREIL EST SOUMISE AUX RÈGLEMENTS DES AUTORITÉS D'INSPECTION LOCALES COMPÉTENTES.

**FOR NOS. 787401-001 THROUGH -009
PARTS LIST**

Part Number	Description	Qty.
785971-001	Intrinsically Safe Protective Barrier	1
See Table 1	Pulser/Totalizer	1
576008-285	Clips, Wire Retaining	2
510901-337	Plastic Wire Ties	12
28698-K-060	Totalizer Security Plugs	2
514100-167	Conduit Hub Enlarger 1/2" to 3/4"	1
510500-327	Totalizer Screws	2
251610	Instruction Manual	1



SECTION 4. RECOMMENDED TOOLS (NOT a part of Retrofit Kit)

Screwdrivers:

- 1/8" Straight Blade
- 1/4" Straight Blade
- #2 Phillips

3/8" Drive Socket Set with sockets from 1/4" to 9/16"

Pipe Wrench

Ball Peen Hammer

1/4" dia. Punch or Drift

5/8" Open End Wrench or Medium Crescent Wrench

TORX T20 Tool:

- Snap-On #SSTX-20 Screwdriver or
- Snap-On #TTX-20 (1/4" Drive Socket) or
- APEX Machine and Tool Co. #TX-20
(Bit for 1/4" Hex Socket) or
- Magna Products #37999-8 with T20 or
- Sears-Roebuck #9-41145 TORX Wrench Kit or
- Veeder-Root #251052

Note: This list represents the minimum tool requirements and is intended as a guide.

SECTION 5. INSTALLATION INSTRUCTIONS

A. INSPECTION.

WARNING: IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH THE NATIONAL ELECTRICAL CODE; FEDERAL, STATE AND LOCAL CODES; AND ANY OTHER APPLICABLE SAFETY CODES. IN ADDITION, DISCONNECT POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

1. Be sure that the dispenser to be retrofitted can accept the retrofit kit. See Section 2 for installation requirements.
2. Check contents of retrofit kit against the applicable parts in Table 1 and Parts List in Section 3 to be sure all parts are included.

Note: Procedures in these instructions must be performed by authorized and qualified personnel.

B. DISASSEMBLY.

WARNING: BEFORE STARTING WORK ON THE DISPENSER, ENSURE THAT ALL CIRCUIT BREAKERS THAT CONTROL POWER TO THE DISPENSER ARE IN THE OFF POSITION. TAKE NECESSARY PRECAUTIONS TO PREVENT CIRCUIT BREAKERS FROM BEING TURNED ON UNTIL ALL WORK IS COMPLETED. MORE THAN ONE BREAKER MAY HAVE TO BE TURNED OFF TO OBTAIN A COMPLETE SHUTDOWN OF POWER TO THE SELECTED POSITION. FAILURE TO COMPLY WITH THIS WARNING MAY RESULT IN PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.

1. Turn all power off and remove upper and lower front panels from dispenser to be modified.

Note: It may be necessary to remove both front and rear panels to gain access to junction box.

2. Remove faceplate (if required) and computer dial face and retain for reassembly.
3. Permanently record amount indicated on totalizer to be removed.
4. Remove security plugs over totalizer mounting screws by piercing plug with a 1/8" straight blade screwdriver or pointed object and prying out of recess in totalizer.
5. Remove totalizer mounting screws and totalizer using TORX T20 tool.
6. Remove junction box cover and applicable pipe plug from junction box hub. Retain cover and bolts for reassembly.

C. INSTALLATION (See Figures 1 and 2).

1. Install Pulsar/Totalizer (refer to application Table 1 for proper totalizer) and secure with new screws. Make sure die cast gear on pulser/totalizer is in mesh with steel gear on computer wheel. Insert Security Plugs, Part No. 28698-K-060 in mounting screw recesses on pulser/totalizer with cupped side facing screw heads. Secure plugs by hitting the center with a 1/4" diameter punch to expand the plug tightly in the recess.

Note: Permanently record the amount indicated on new pulser/totalizer.

2. Route pulser/totalizer wires down side frame of computer and secure wires with Wire Retaining Clips, Part No. 576008-285. Barbed side of clips slide onto computer side frame. Refer to Figure 1.

CAUTION: BE SURE PULSER/TOTALIZER WIRES DO NOT BEND INTO THE COMPUTER MECHANISM. DAMAGE TO MECHANISM AND PULSER/TOTALIZER WILL RESULT.

3. Remove plastic cap-plug (if provided) from threaded end of the protective barrier by sliding plug off orange and white wires.
4. Insert white and orange wires, from barrier, through threaded opening in junction box. Screw barrier in junction box and tighten. **AT LEAST 5 FULL THREADS MUST BE ENGAGED.** Use 1/2" to 3/4" Hub Enlarger, Part No. 514100-167 (if required) supplied in retrofit kit. See Figure 1.
5. Connect mating plugs for the pulser/totalizer and protective barrier.

Note: Check to see that the WARNING labels on totalizer wires and on barrier wires are still attached to wires. These labels must be attached to wires at all times. If these labels are missing or wording is not legible, they must be replaced. See Figures 3 and 4. Refer to Figure 1 for locations.



Installation Instructions, Series 7874 Retrofit Kits For Pulsar/Totalizer and Intrinsically Safe Protective Barrier

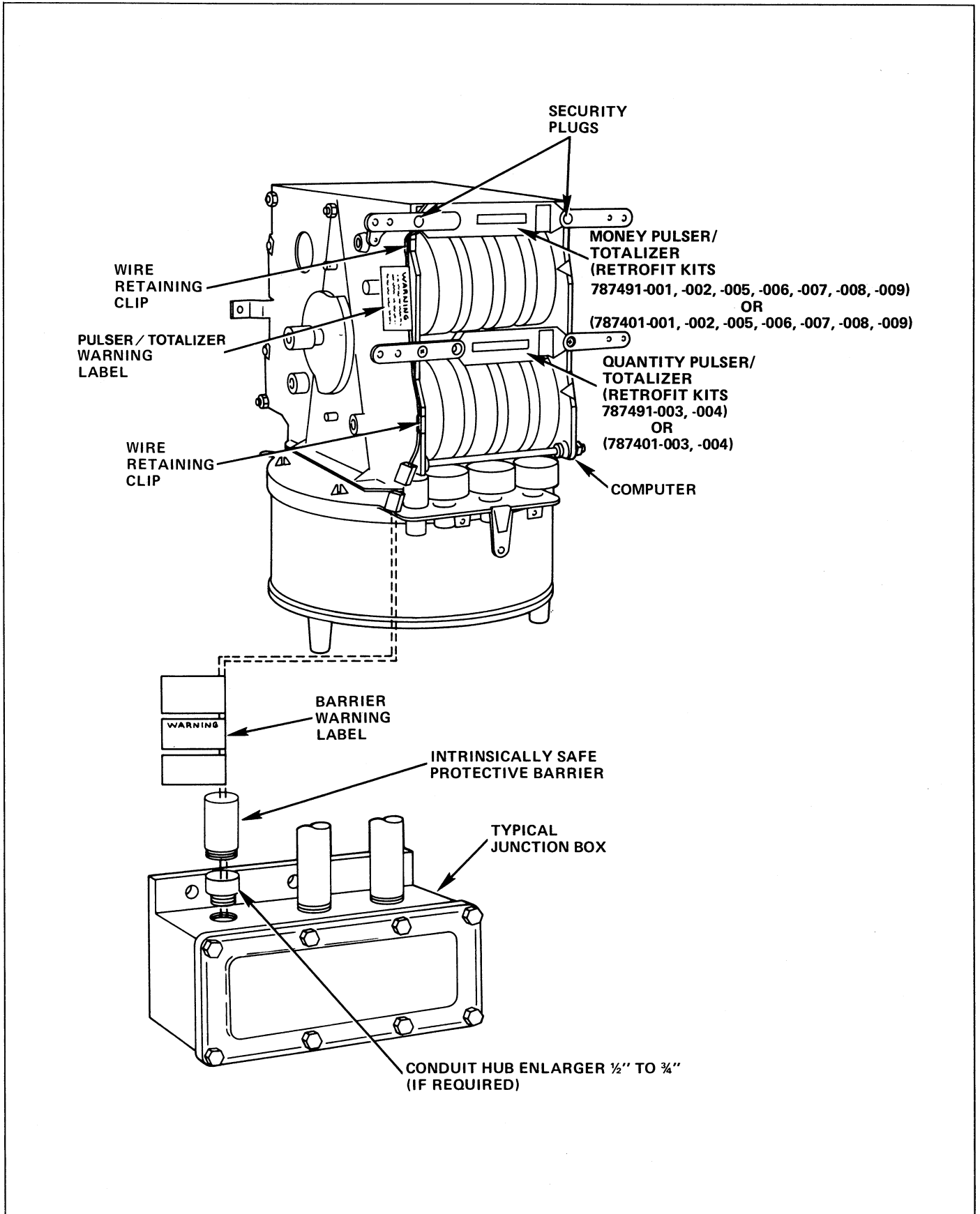


Figure 1. Pulsar/Totalizer and Intrinsically Safe Barrier Typical Installation.



WARNING
**USE WITH INTRINSICALLY
SAFE CIRCUITS ONLY.**
**ISOLATE LEADS FROM WIRES
CARRYING OTHER VOLTAGES.**

Figure 3. Pulsar/Totalizer WARNING Label Part No. 326391-001.

WARNING
**TO MAINTAIN INTRINSIC SAFETY,
DO NOT INSTALL THESE WIRES
NEAR WIRING FOR ANY
OTHER CIRCUIT.**

Figure 4. Barrier WARNING Label Part No. 326429-001.

**WARNING: TO MAINTAIN INTRINSIC SAFETY, DO NOT
ROUTE WIRES NEAR OR TIE TO OTHER WIRING
OF ANY KIND EXCEPT ANOTHER INTRINSICALLY
SAFE CIRCUIT.**

6. Route and secure protective barrier wiring with Plastic Wire Ties, Part No. 510901-337. The wiring may be tied to plumbing and structural members of the pump frame. **Wiring must not be tied to sharp edges or moving parts.** Any remaining slack may be looped and tied at a convenient point.

**WARNING: HIGH VOLTAGES ARE PRESENT IN THE
SELF-SERVICE INTERCONNECTION BOX(ES). BE
SURE TO TURN OFF ALL POWER BEFORE OPEN-
ING BOX(ES). MORE THAN ONE DISCONNECT
MAY BE REQUIRED TO COMPLETELY DE-ENER-
GIZE THE BOX(ES). FAILURE TO COMPLY WITH
THIS WARNING MAY RESULT IN PERSONAL
INJURY, PROPERTY LOSS AND EQUIPMENT
DAMAGE.**

D. ASSEMBLY.

**WARNING: BE SURE THAT NO UNPLUGGED HUBS OR
OTHER OPENINGS EXIST IN JUNCTION BOX.
CLOSE OR PLUG ANY SUCH HUBS OR OPENINGS
BEFORE PROCEEDING FURTHER. FAILURE TO
COMPLY WITH THIS WARNING MAY RESULT IN
PERSONAL INJURY, PROPERTY LOSS AND
EQUIPMENT DAMAGE.**

1. PLACE COVER ON JUNCTION BOX AND ENSURE THAT ALL COVER SCREWS ARE REPLACED AND TIGHT.
2. Visually check to be sure that security plugs, pulser/totalizer, protective barrier and all wiring is secure.
3. Affix Wiring Diagram Label Part No. 326536-001 to inside of dispenser front or rear panel, adjacent to factory wiring diagram.
4. Install dial face, faceplate and dispenser panels.

E. POST INSTALLATION CHECKOUT.

1. Check to see that pump handle is OFF.
2. Place power to dispenser ON.
3. From the Self-Service console, authorize modified pump to dispense product.
4. Note the total indicated on the pulser/totalizer.
5. Pump product into an appropriate container and check the additional amount indicated on pulser/totalizer against the amounts indicated on the computer and the console. All three should be the same.
6. If amounts are not the same, check the following:
 - a. If mechanical computer and pulser/totalizer do not agree, the wrong pulser/totalizer may be installed. Refer to Application Table in Section 1 and Parts List in Section 3.
 - b. If the mechanical totalizers are registering properly but there is no signal to the console, the pulser switch could be damaged, there is an open wire in pulser, the barrier wires are not properly connected, or the system is malfunctioning.



**Installation Instructions, Series 7874 Retrofit Kits
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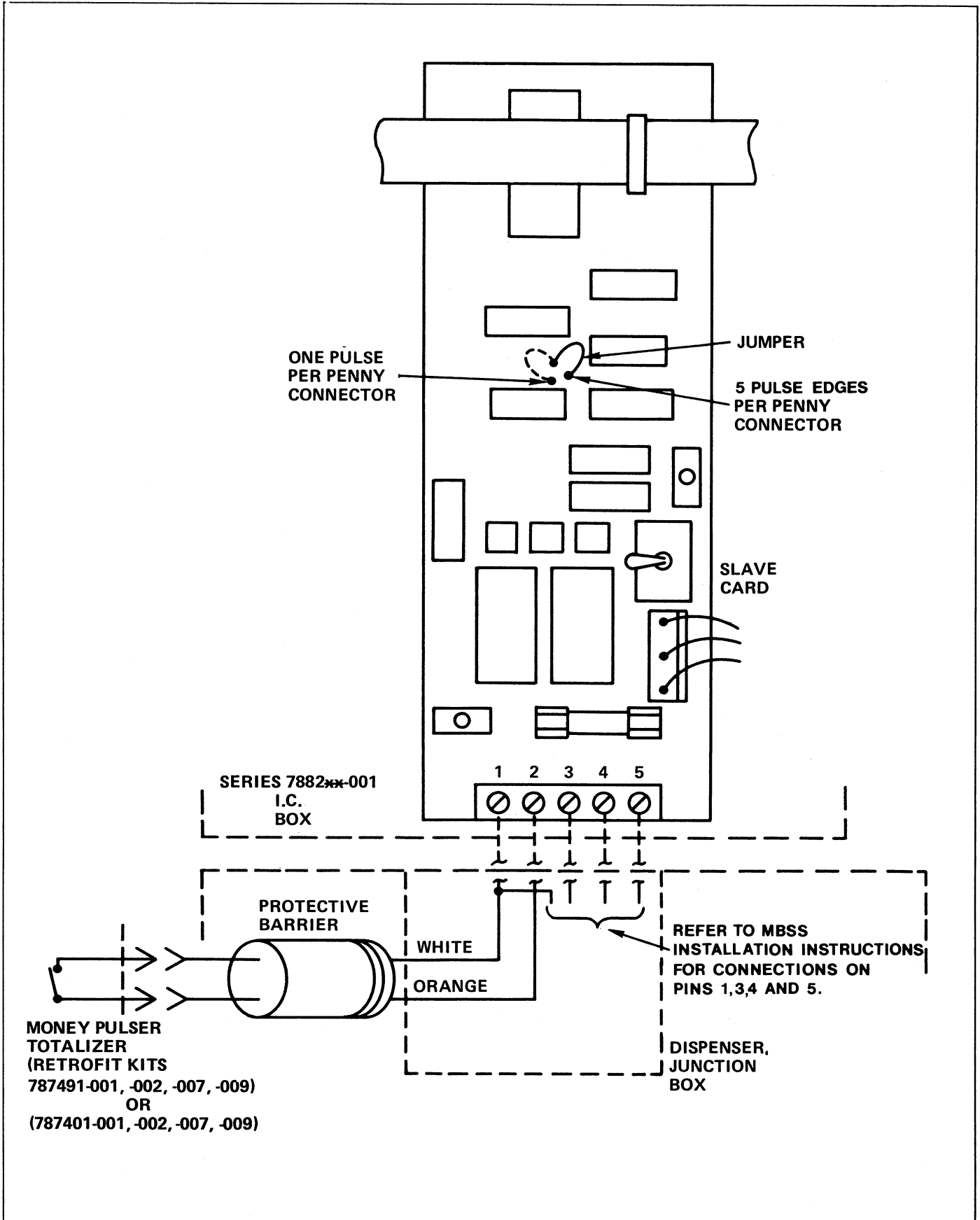


Figure 5. Protective Barrier Wiring Diagram for MBSS Systems Using I.C. Box Series 7882*-001.

NOTE: FOR RETROFIT KIT 787491-003, OR 787401-003, REMOVE JUMPER P1-P2. FOR 787491-004 OR 787401-004 LEAVE P1-P2 CONNECTED.

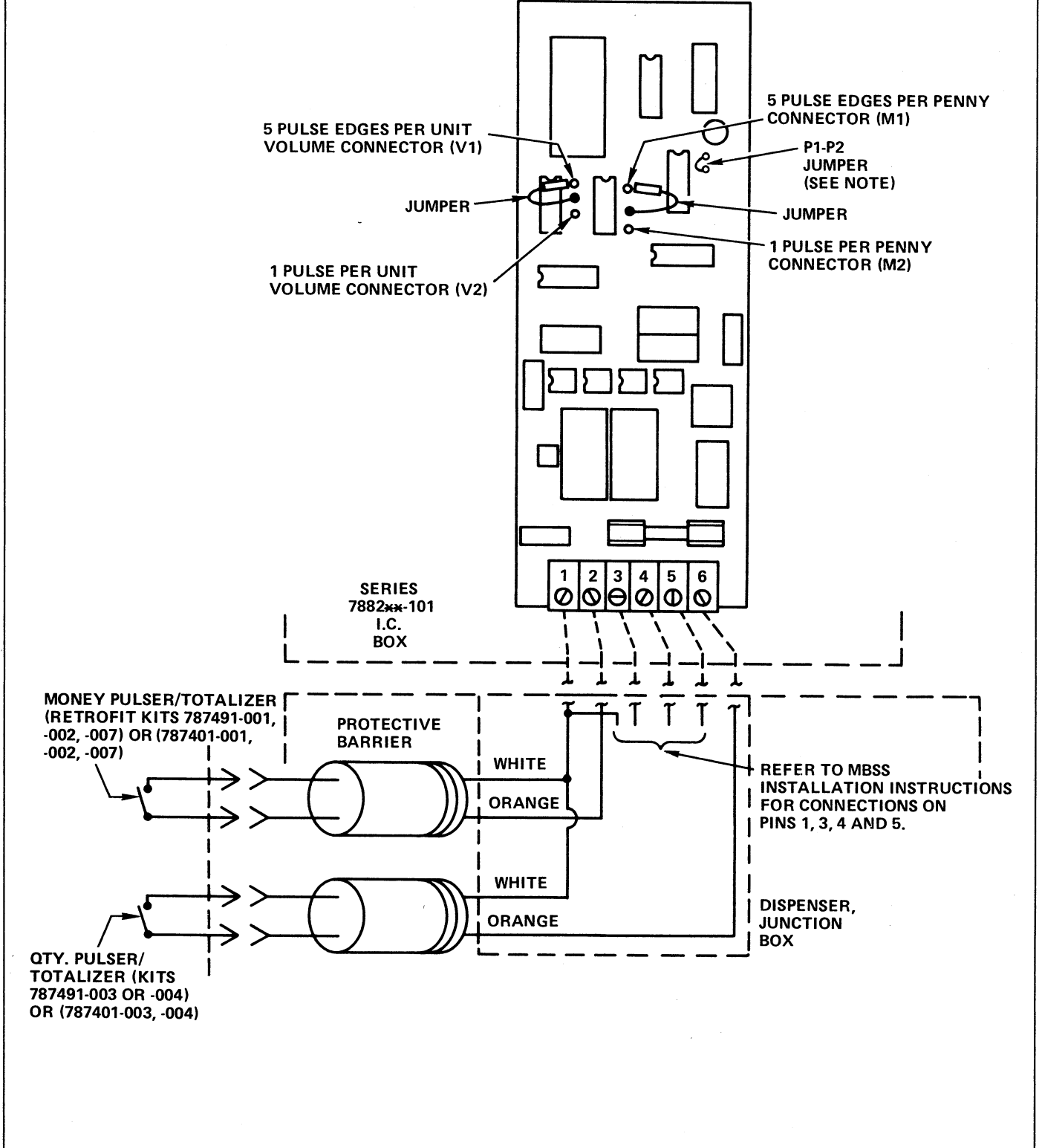


Figure 6. Protective Barrier Wiring Diagram for MBSS Blender Systems Using I.C. Box Series 7882**-101.

VR Installation Instructions, Series 7874 Retrofit Kits
 For Pulsar/Totalizer and Intrinsically Safe Protective Barrier

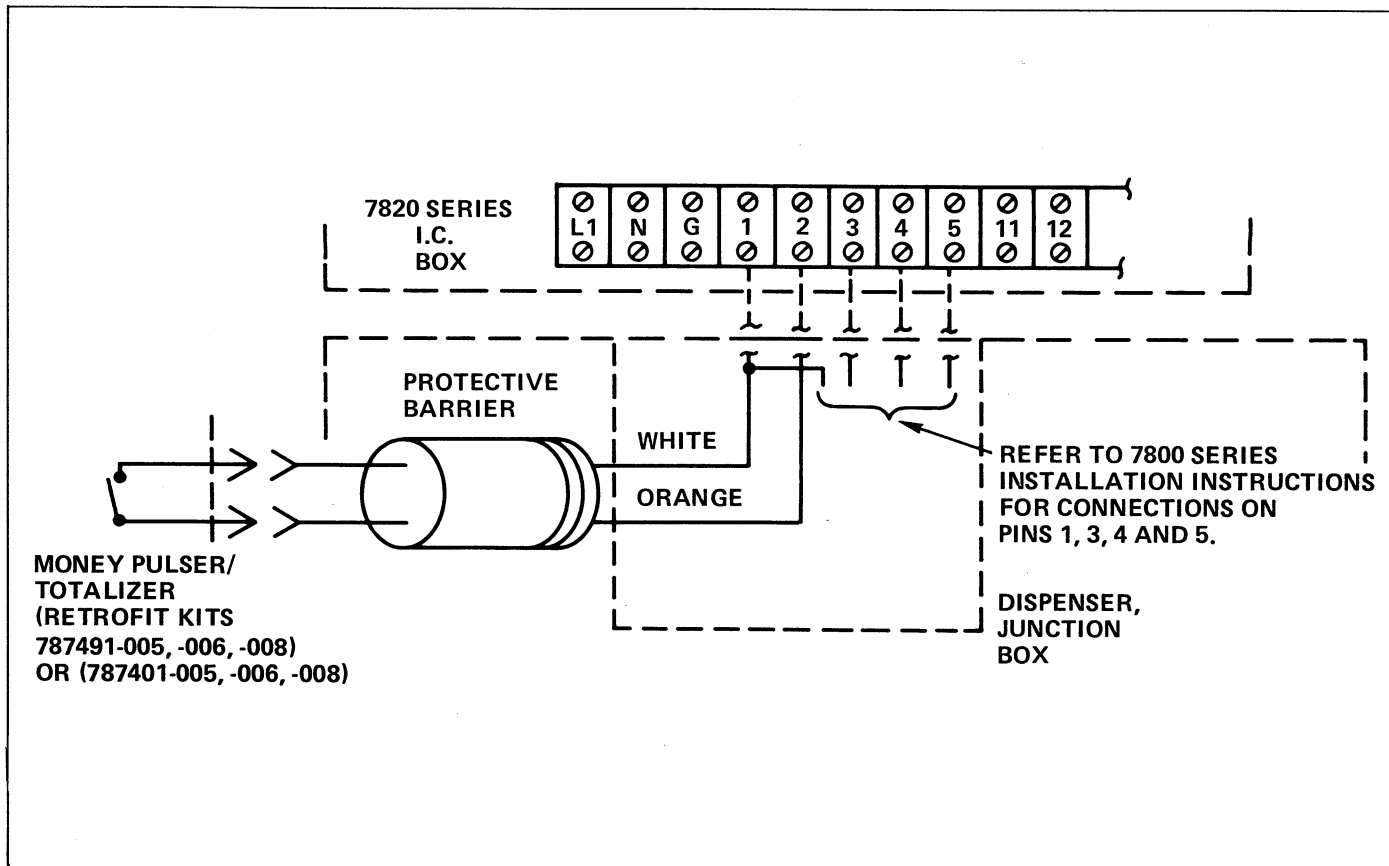


Figure 7. Protective Barrier Wiring Diagram for 7800 Series Systems.

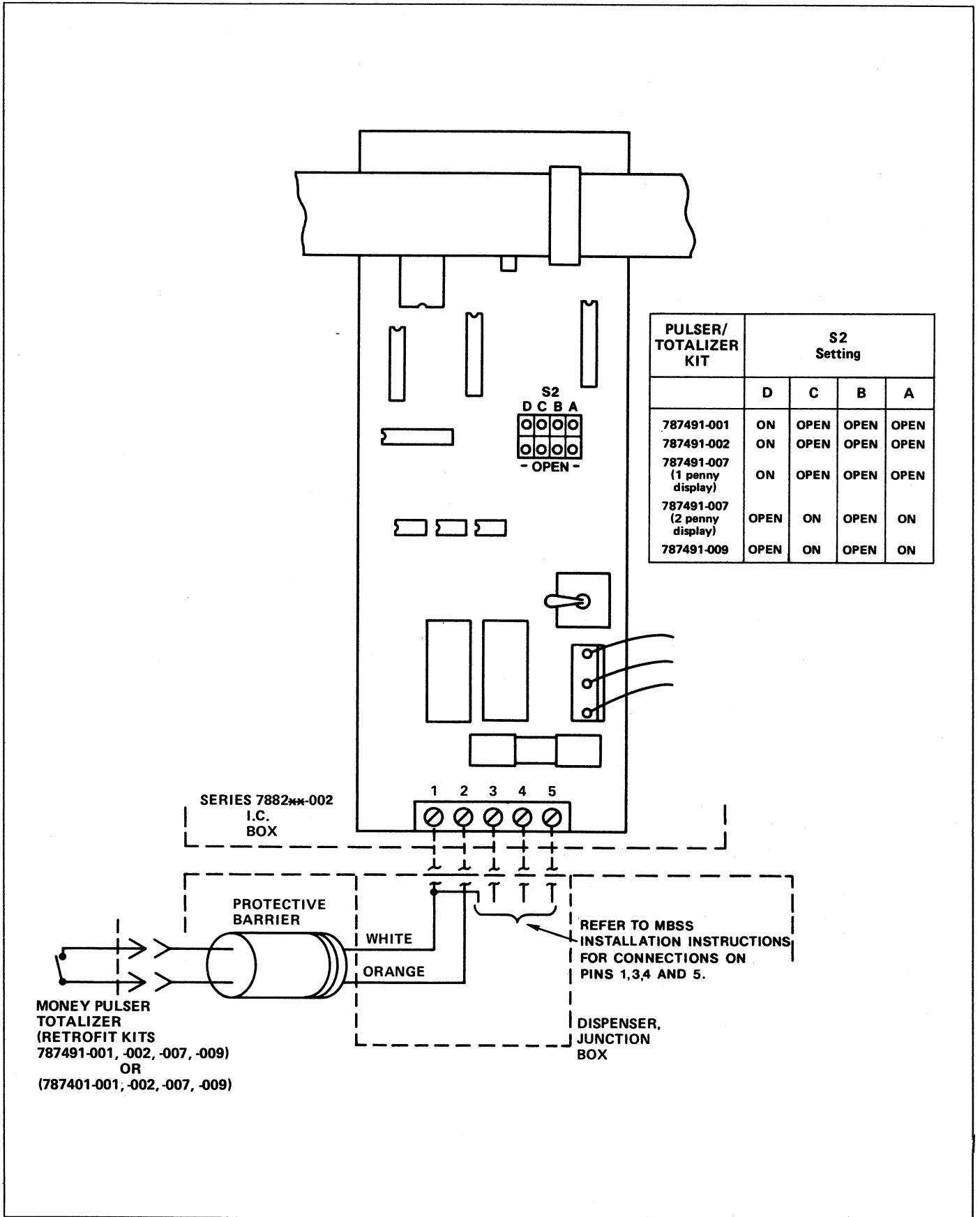


Figure 8. Protective Barrier Wiring Diagram for MBSS Systems using I.C. Box Series 7882**-002.



**Installation Instructions, Series 7874 Retrofit Kits
For Pulser/Totalizer and Intrinsically Safe Protective Barrier**

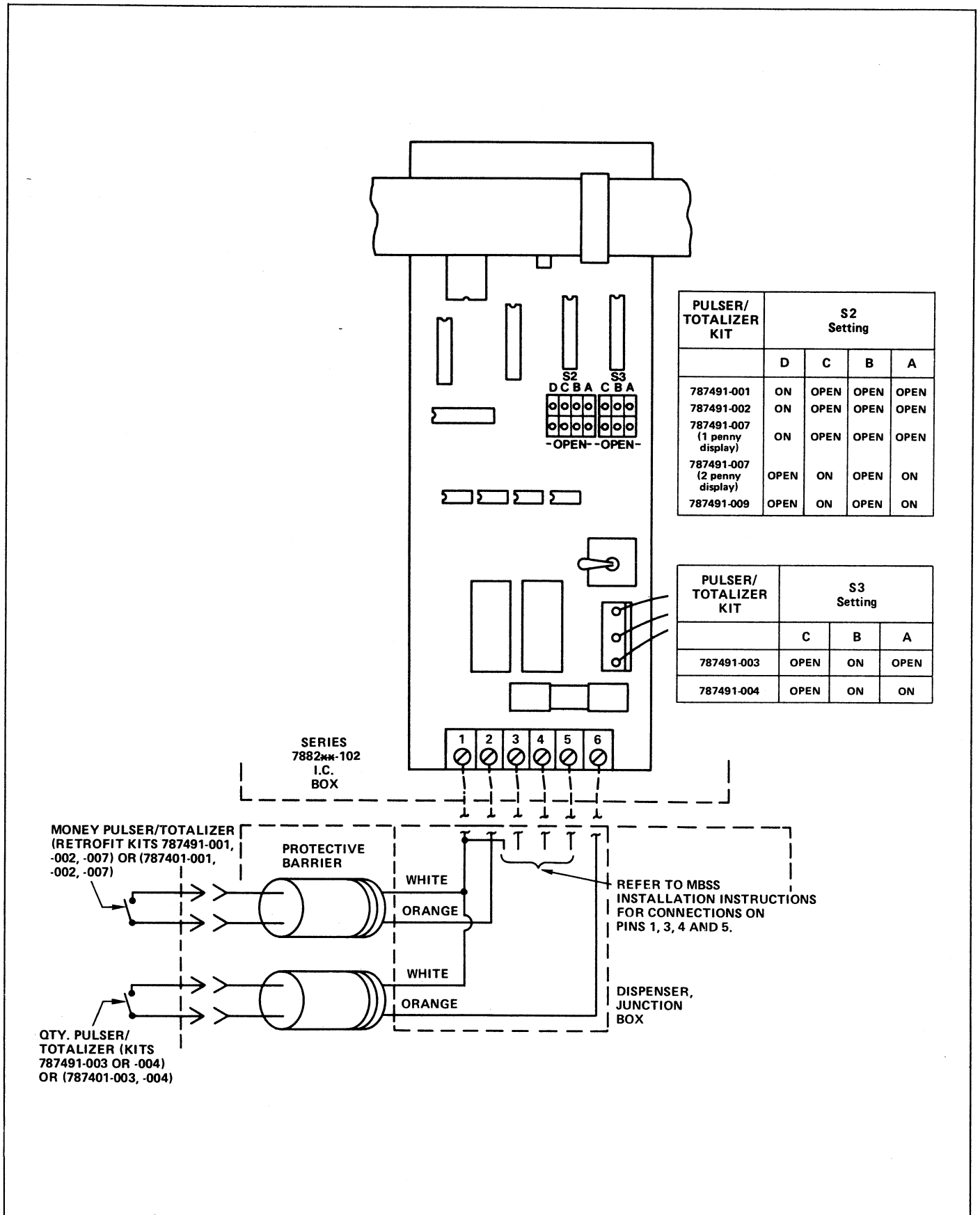


Figure 9. Protective Barrier Wiring Diagram for MBSS Blender Systems using I.C. Box Series 7882**-102.



SECTION 6. CLAIMS AND WARRANTY

A. DAMAGE CLAIMS

1. Thoroughly examine the enclosure as soon as it is received. If damaged, write on the face of the freight bill a complete and detailed description of the damage. Have the carrier's agent sign the description.

Note: Insist that the carrier's agent verify the inspection and sign the description.

2. Immediately notify the delivering carrier of damage or loss. This notification may be given either in person or by telephone. Written confirmation must be mailed within 48 hours. Railroads and motor carriers are understandably reluctant to make adjustments for damaged merchandise unless inspected and reported promptly.

3. Risk of loss of, or damage to merchandise remains with the Buyer. It is the Buyer's responsibility to file a claim with the carrier involved.

4. Immediately advise your Veeder-Root representative, distributor, or the factory so that we may assist you.

B. RETURN SHIPPING. All shipments of Veeder-Root products must be prepaid. Equipment must be packed in a strong exterior container and surrounded by shock absorbing material. Veeder-Root will accept no liability for damage caused by improper packing. It is suggested that the original shipping container be used if it is available. Address shipment to Veeder-Root Co., 6th Avenue at Burns Crossing, P.O. Box 1673, Altoona, PA 16603.

C. WARRANTY AND CONDITIONS

1. WARRANTY. We warrant that our products shall be free from defects in material and workmanship for a period of one year from the date of shipment thereof or the product's total rated life, whichever first occurs. Within the warranty period we shall repair or replace such products which are returned to us with shipping charges prepaid and which are determined by us to be defective. This warranty will not apply to any product which has been subjected to misuse, negligence, or accident; or misapplied; or used in violation of product manuals, instructions, or warnings; or modified or repaired by unauthorized persons; or improperly installed.

2. INSPECTION. You shall inspect the product promptly after receipt and shall notify us at our Altoona office, in writing, of any claims, including claims of breach of warranty, within thirty days after you discover or should have discovered the facts upon which the claim is based. Your failure to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

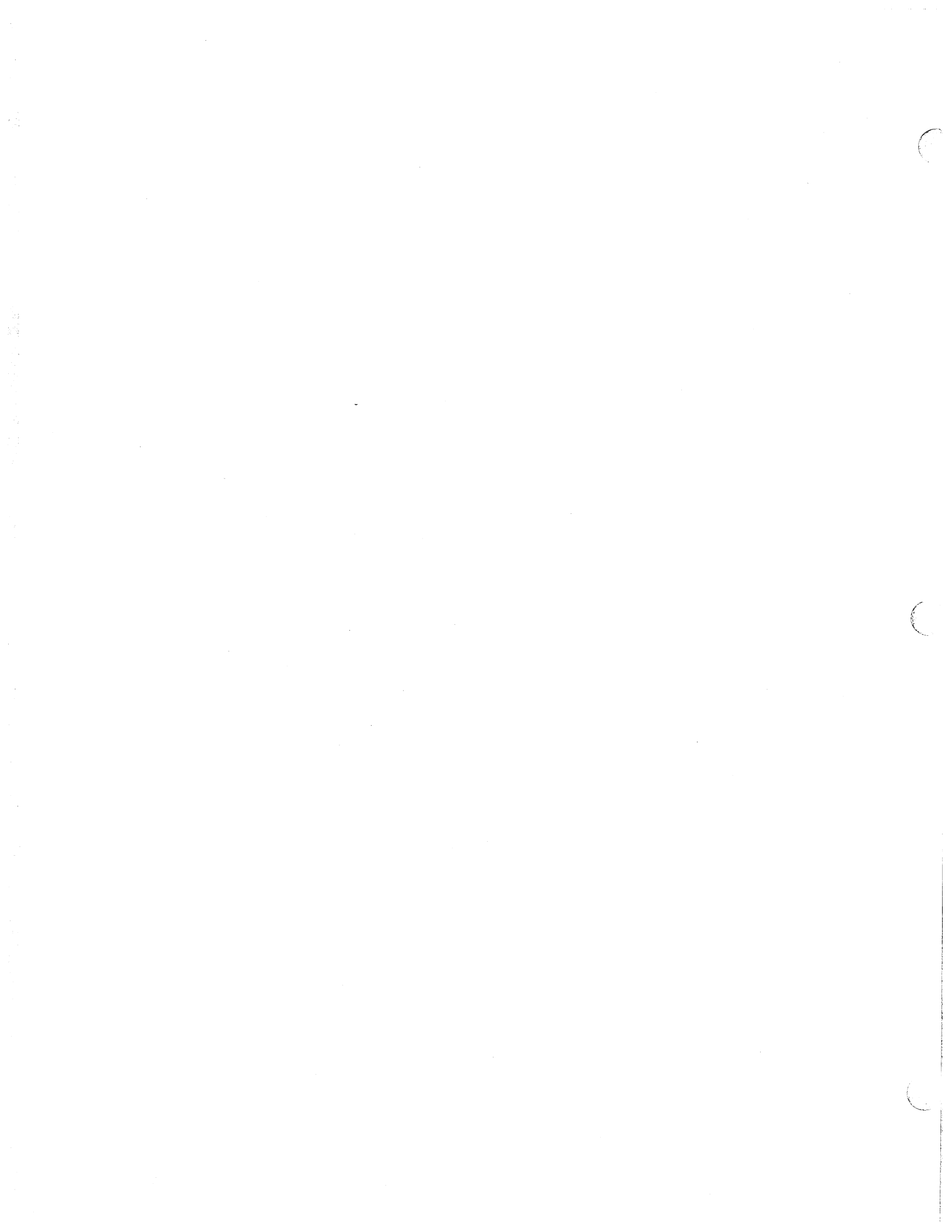
3. LIMITATION OF REMEDY AND WARRANTY. The provisions of Paragraph 1 are our sole obligation and exclude all other remedies or warranties, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to you or to any other person for injury to person or damage to or loss of property or value caused by any product which has been subjected to misuse, negligence, or accident; or misapplied; or used in violation of product manuals, instructions, or warnings; or modified or repaired by unauthorized persons; or improperly installed.

4. LIMITATION OF DAMAGES. Under no circumstances shall we be liable for any incidental, consequential or special damages, losses or expenses arising from this contract or its performance or in connection with the use of, or inability to use, our product for any purpose whatsoever.

5. LIMITATION OF ACTIONS. No action regardless of form arising out of this contract may be commenced more than one year after the cause of action has accrued, except an action for nonpayment.

6. COLLATERAL PROMISES. There are no representations, warranties, or conditions express or implied, statutory or otherwise except those herein contained, and no agreements or waivers collateral hereto contained, and no agreements or waivers collateral hereto shall be binding on either party unless in writing and signed by you and accepted by us at our Altoona office.

7. INTERPRETATION. Rights and liabilities arising out of any contract with us shall be determined under the Uniform Commercial Code as enacted in Connecticut.





6th Avenue at Burns Crossing, P.O. Box 1673, Altoona, PA 16603-1673 Phone (814) 695-4476, or (800) 873-3313, Fax (814) 695-7605, or (800) 234-5350
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