



The Leader of RF
and Sonic Level

For Assistance Call 1-800-527-6297
Outside North America 1-215-674-1234

Installation and Operating Instructions

Series 401-10-XX
Push-to-Test Unit

*(215) 674-1234 Outside North America
1-800-527-6297 US and Canada
<http://www.drexelbrook.com>
e-mail: Service@Drexelbrook.com*

AMETEK Drexelbrook makes no warranty of any kind with regard to the material contained in this manual, including, but not limited to, implied warranties or fitness for a particular purpose. Drexelbrook shall not be liable for errors contained herein or for incidental or consequential damages in connection with the performance or use of material.

Copyright 2000 AMETEK Drexelbrook

EDO #2-89-257
401-10-XX-LM

Series 401-10-XX Push-to-Test Unit

 **AMETEK**[®]
DREXELBROOK

An ISO 9001 Certified Company

205 Keith Valley Road Horsham, PA 19044

US Sales 800-553-9092

24 Hour Service 800-527-6297

International 215-674-1234

Fax 215-674-2731

E-mail deinfo@drexelbrook.com

Web www.drexelbrook.com

Table of Contents

- SECTION 1 INTRODUCTION..... 1**
- 1.0 Preface 1
- 1.1 Functional Description 1
- 1.2 Model Numbers 2
- 1.3 Specifications 2

- SECTION 2 INSTALLATION 3**
- 2.1 Unpacking 3
- 2.2 Mounting the Unit 3
- 2.3 Wiring the Unit 3
- 2.4 Cables 3

- SECTION 3 OPERATION 5**
- 3.1 Operating Controls 5
- 3.2 Start-up 5
 - 3.2.1 Start-up of Explosionproof Units 5
- 3.3 Calibration 5
 - 3.3.1 Conducting Liquids 5
 - 3.3.2 Insulating Liquids or Granulars 5

- SECTION 4 MAINTENANCE 6**
- 4.1 Maintenance Schedule and Spare Parts 6
- 4.2 Telephone Assistance 6
- 4.3 Equipment Return 6
- 4.4 Field Service 6
- 4.5 Customer Training 6

Section 1 - Introduction

1.0 Preface

This manual describes the installation and operation of the 401-10-XX Push-To-Test Unit. Section 1 includes a functional description of the unit, along with the different models and specifications. Section 2 provides installation instructions. Section 3 describes the operation of the unit, including calibration. Customer service information is given in Section 4.

1.1 Functional Description

The Push-To-Test unit is used in conjunction with an electronic on/off control unit to verify that the control unit is functioning properly. The test verifies that the push-to-test unit actuates the control unit at the predetermined control point. The test includes the following checks:

- a) control unit is adjusted properly
- b) cable is not broken
- c) sensing element is connected
- d) relay is operable
- e) all connections are good

Figure 1-1 depicts the 401-10-9 and 401-10-10 units in a system diagram. Figure 1-2 shows the 401-10-11 and 401-10-12 units.

The push-to-test unit can be actuated manually or automatically (e.g., computer, programmable controller, scanner). It should be used with control applications where some form of checking is needed, such as flammable or explosive material, lethal material, environmental pollution control, or a fully automated operation.

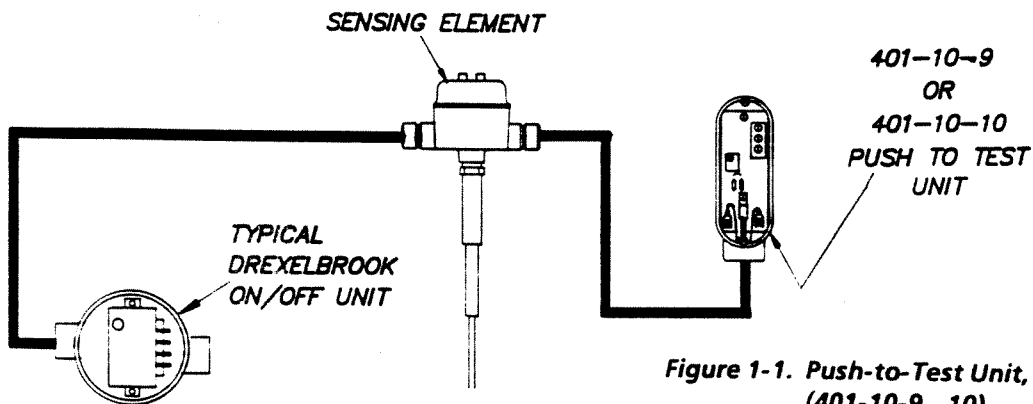


Figure 1-1. Push-to-Test Unit, System Diagram (401-10-9, -10)

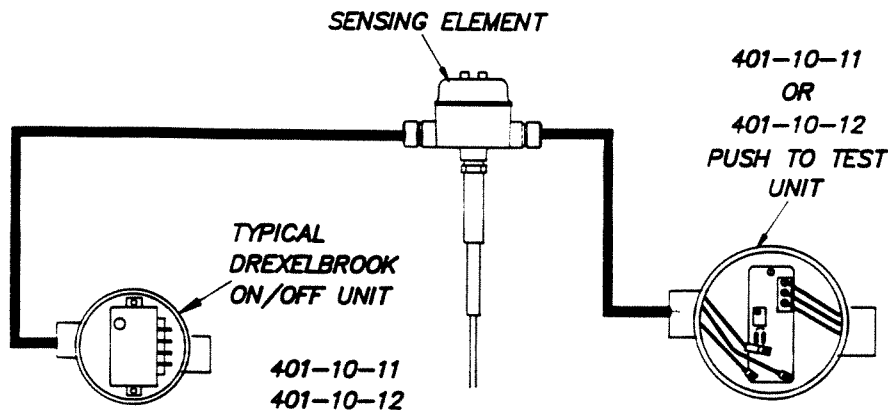


Figure 1-2. Push-to-Test Unit, System Diagram (401-10-11, -12)

INTRODUCTION

1.2 Model Numbers

The following models of the push-to-test unit are available:

- 401-10-9 Push-To-Test unit (HLFS only)
- 401-10-10 Push-To-Test unit with remote relay (HLFS only)
- 401-10-11 Push-To-Test unit in explosionproof housing
- 401-10-12 Push-To-Test unit with remote relay in explosionproof housing.

The 401-10-9 and -10 units, in the standard housing, meets the Nema I General Purpose classification.

The 401-10-11 and -12 units, in the explosionproof housing, meets Class 1 Groups C and D, Class 2 Groups E, F, and G, Division 1 and 2 classifications.

NOTE: The explosionproof housing units must be equipped with an explosionproof seal fitting that is not supplied by Drexelbrook Eng. Co. Also, an explosionproof pushbutton (not supplied by Drexelbrook) must be used for Model 401-10-11.

1.3 Specifications

The following specifications describe the 401-10-XX series units.

- A. Power requirement: 24 vdc (401-10-10 and 401-10-12 units) . No power required for 401-10-9 and -11 units.
- B. Ambient Temperature: -40°F to 140°F recommended. The units will operate above 140°F, but with reduced component life.
- C. Adjustment Range: .25-115 pF high range; .25-15 pF low range. Adjustment range is field-changeable.
- D. Cable Length: 0-25 feet (For greater length, consult factory.)

Section 2 - Installation

2.1 Unpacking

Carefully remove the contents of the carton and check each item against the packing list before destroying any packing materials. If there is any shortage or damage, report it to the factory immediately.

Usually, the instrument and cables are packed in the same shipping carton; the probe is packed separately.

2.2 Mounting the Unit

The instrument is designed for field-mounting. It is recommended that it be mounted in a location as free as possible from vibration, corrosive atmospheres, and the possibility of mechanical damage. For start-up convenience, it is best to mount the unit in an easily accessible location. It may be mounted in any position: ambient temperatures should be between -40°F and 140°F. Figures 2-1 and 2-2 give the mounting dimensions for the regular and explosionproof housings respectively.

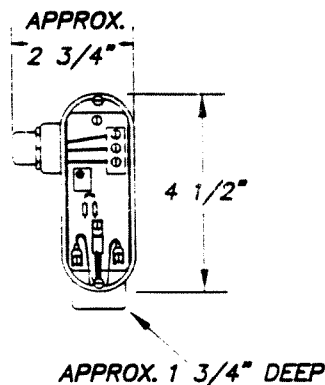


Figure 2-1. Push-to-Test Unit, Mounting Dimensions (401-10-9, -10)

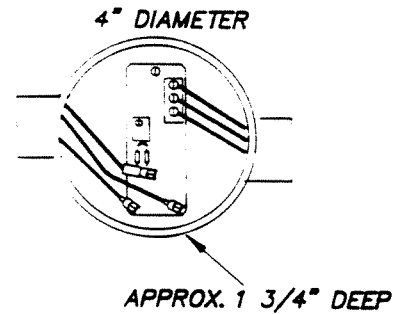


Figure 2-2. Push-to-Test Unit, Mounting Dimensions (401-10-11, -12)

2.3 Wiring the Unit

Models 401-10-9 and 401-10-11 are manually-operated, local units that do not require power.

Models 401-10-10 and 401-10-12 units are designed to be operated remotely using an internal 24 Vdc relay. These versions allow the test function to be performed at a greater distance from the on/off unit than the local versions (401-10-9, -11).

Figures 2-3 and 2-4 show the wiring for the regular and explosionproof units respectively.

Alternate wiring of the Push-To-Test button is also possible where the power is connected directly, such as from a local source, with the Push-To-Test button connected to separate terminals.

2.4 Cables

Only coaxial cables supplied by DREXELBROOK ENGINEERING COMPANY should be used to connect the control unit to the measuring probe. For cable lengths greater than 25 feet between probe and instrument, the remote version of the unit (401-10-10, -12) should be used.

Padding of the instrument is not required, regardless of cable length. If cable terminations are modified in the field, care must be taken to prevent shorting to ground of the center wire or shield.

INSTALLATION

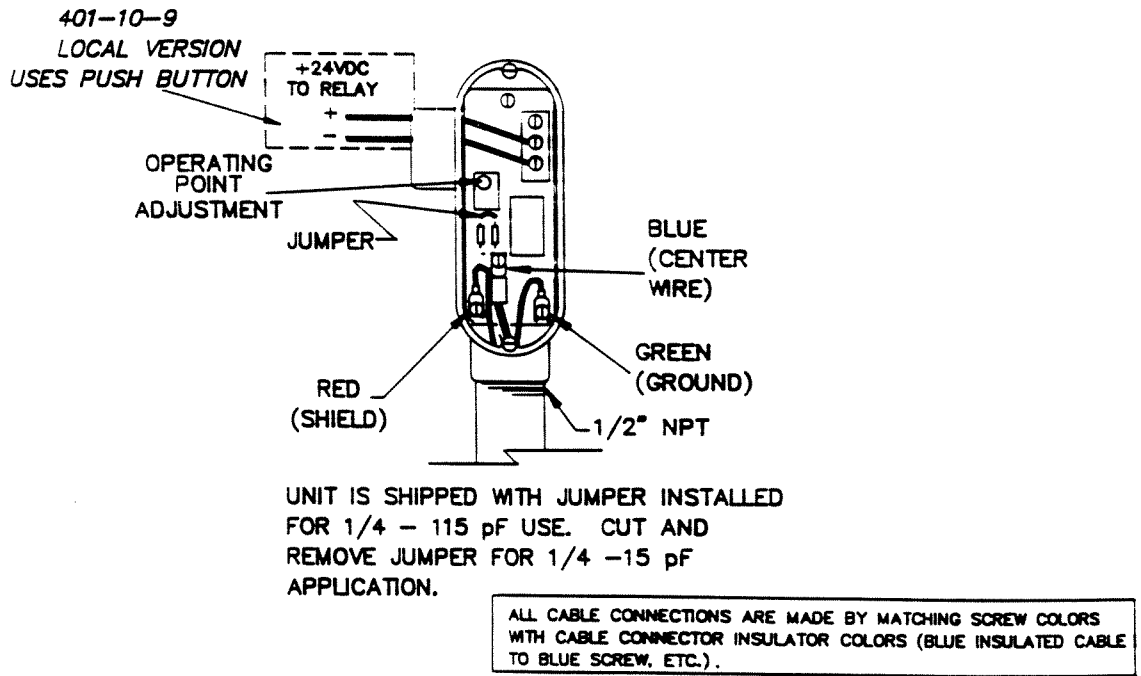


Figure 2-3. Push-to-Test Unit, Wiring Diagram
(401-10-9, -10)

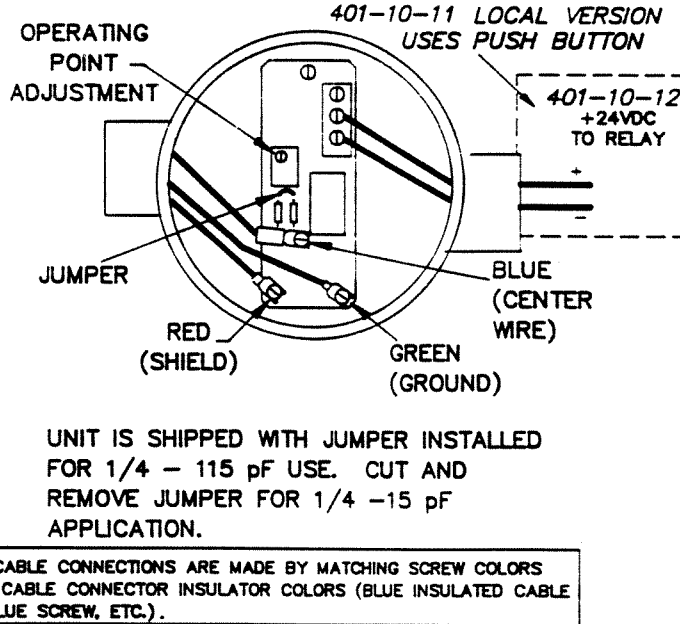


Figure 2-4. Push-to-Test Unit, Wiring Diagram
(401-10-11, -12)

Section 3 - Operation

3.1 Operating Controls

There is a single operating adjustment that controls the amount of capacity needed to simulate test conditions. The adjustment range of the unit is field-changeable. The high range is .25-115 pF and the low range is .25-15 pF. Each revolution of the adjustment is equal to approximately 5 pF. The low range is used where the simulated capacity is small.

Turning the adjustment clockwise adds test capacity; turning the adjustment counter-clockwise reduces the test capacity.

3.2 Start-Up

Before applying power to the instrument, ensure that the input power is 24 Vdc for the 401-10-10, and -12 units. Also, check that the power is connected to the appropriate terminals.

3.2.1 Start-up of Explosionproof Units (401-10-11, -12)

Special start-up conditions exist for unit equipped with explosionproof housings. Before the explosionproof housing cover is removed to calibrate the unit, the area must be checked and known to be non-hazardous. When calibration is complete, the cover must be replaced. Each lead from the explosionproof case must be equipped with an approved seal fitting.

3.3 Calibration

Use the following procedures to calibrate the push-to-test unit. Calibration adjustments must be made with the insulated tool supplied with the unit. Also, the push-to-test unit should be used in conjunction with an on/off unit.

3.3.1 Conducting Liquids (any aqueous base)

- a) Turn the push-to-test adjustment fully clockwise. Calibration of push-to-test is now complete.
- b) With the level of material below the probe, turn operating point adjustment of the on/off control unit until relay just operates.

- c) Turn operating point adjustment of the control unit an additional 1 1/2 turns clockwise.

- d) Replace covers. Calibration is now complete.

3.3.2 Insulating Liquids or Granulars

- a) With the level of material above the probe, turn operating point adjustment of on/off control unit until relay just drops out (push-to-test button should not be engaged).

- b) Lower material below the probe.

- c) Turn the push-to-test adjustment fully counterclockwise.

- d) Push and hold button to engage the push-to-test unit and turn push-to-test adjustment until relay just drops out.

- e) Push-to-Test unit is now calibrated to simulate probe cover with material. Release push button.

- f) Note the position of the pointer on the insulated calibration tool on the on/off control unit.

- g) Turn on/off control adjustment slowly counterclockwise, carefully counting turns and fractions until relay just operates.

- h) Turn adjustment clockwise 1/2 the number of turns counter in Step g).

- i) Remove tool and replace covers. Calibration is now complete.

MAINTENANCE

Section 4 - Maintenance

4.1 Maintenance Schedule and Spare Parts

The 401-10-XX series instruments are designed to give years of unattended service. No periodic or scheduled maintenance is required.

There are no specific parts that are recommended to be stocked by the user. However, if the application is critical, it is best to have a spare chassis available in the event of a component failure. The failed chassis should be returned to the factory for repair.

4.2 Telephone Assistance

If you are having difficulty with your Drexelbrook equipment, and attempts to solve the problem have failed, notify your local Drexelbrook representative, or call the factory service department direct using the toll-free number (1-800-527-6297). Drexelbrook Engineering Company is located at 205 Keith Valley Road, Horsham, PA 19044. To help solve your problem quickly, please have the following information available:

Instrument Model # _____

Probe Model # _____

P.O. # _____

& Date _____

Cable Length _____

Application _____

Material Being Measured _____

Temperature _____

Pressure _____

Agitation _____

Brief Description of the Problem _____

Checkout Procedures that Failed _____

4.3 Equipment Return

Do not return equipment without first contacting the factory for a return authorization number. Any equipment being returned must include the following information in addition to that above.

Reason for Return _____

Return Authorization # _____

Person to Contact at Your Company _____

"Ship-To" Address _____

If available, please include the original P.O. # and the original Drexelbrook order # also.

To keep the paperwork in order, include a purchase order with returned equipment, even though it may be coming back for warranty repair. There will be no repair charge if the equipment is covered under warranty. Please return your equipment with freight charges prepaid. Collect shipments cannot be accepted.

Standard electronic units are generally in factory stock. If the application is critical, a spare electronic chassis should be kept on hand.

4.4 Field Service

Trained field servicemen are available on a time-plus-expense basis to assist in start-ups, diagnosing difficult application problems, or in-plant training of personnel. Contact the Service Department for further details.

4.5 Customer Training

Periodically, Drexelbrook instrument training seminars for customers are held at the factory. These sessions are guided by Drexelbrook engineers and specialists, and provide detailed information on all aspects of level measurement, including theory and practice of instrument operation. For more information about these valuable workshops, write to Drexelbrook Engineering, Attn: Communications/ Training Group, or call direct (215) 674-1234.

AMETEK[®]
DREXELBROOK

An ISO 9001 Certified Company

205 Keith Valley Road Horsham, PA 19044

US Sales 800-553-9092

24 Hour Service 800-527-6297

International 215-674-1234

Fax 215-674-2731

E-mail deinfo@drexelbrook.com

Web www.drexelbrook.com