Dynisco
Instruments

INSTALLATION & OPERATION MANUAL
IPX/PX SERIES OF SMART
MULTI-VARIABLE PRESSURE
TRANSMITTERS

The following models are covered in this manual:

IPX/PX182

IPX/PX184

IPX/PX185

IPX/PX192

IPX/PX194

IPX/PX195

Contents

PREFACE

Notice

Read this manual before working with these products. For personal and system safety, and for the optimum product performance, make sure you thoroughly understand the contents before using or servicing this product.

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Parts of this manual are provided by Fisher-Rosemount Systems, Inc.

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INTRODUCTION

Using this manual

This manual is designed to assist in installing, operating, and maintaining the Dynisco IPX/PX series of Smart Multivariable Pressure Transmitters with the Model 275 HART Communicator.

Chapter 1 - IPX/PX Smart Pressure Transmitter describes the IPX/PX Technology and general theory of operation (mechanically and electrically) of the transmitter.

Chapter 2 – A condensed version HART Communicator manual describes the Model 275 communicator and its capabilities. It also explains how to connect the communicator to transmitter for communications.

Chapter 3 - Commissioning explains the procedures for commissioning the transmitter on the bench or in the loop. Included are descriptions of how to test the communicator and the transmitter. This chapter also shows how to review transmitter configuration data.

Chapter 4 - Installation provides electrical and mechanical installation instructions. (See chapter 8 for mounting hole drawings.)

Chapter 5 - Configuration describes how to configure the transmitter. It includes instructions on changing transmitter properties such as range, tag identification, and damping time constant etc...

Chapter 6 - Maintenance discusses process mounting considerations and hardware troubleshooting.

Chapter 7 - Support describes the warranty and service available.

Chapter 8 – Mounting Port Configurations. Drawings and illustration are provided for various mounting port options.

Chapter 9 – Outline Drawings. Includes outline drawings of the basic models:

IPX 182, 184, &185, 192, 194, and 195.
PX 182, 184, &185, 192, 194, and 195.

1. IPX/PX Sᴍᴀʀᴛ Pʀᴇssᴜʀᴇ Tʀᴀɴsᴍɪᴛᴛᴇʀ

Description

The Dynisco IPX/PX Series of Smart Pressure Transmitters are microprocessor-based instruments that incorporate advanced software techniques and modern sensor design. New, proprietary sensor processing methods ensure the highest quality and reliability to meet Dynisco's standards.

The IPX/PX Series is designed for applications that require high accuracy, even under wide variations in process temperature. With the capability for up to 5-to-1 span turndown, one pressure range can be used in several different applications, reducing spare parts inventory. And the IPX/PX Series' remote digital communication utilizing the industry standard HART protocol allows transmitter parameter changes to be made from safe areas, increasing operator safety.

The IPX/PX Series of Smart Pressure Transmitters are characterized for process temperature effects, providing a linearized, temperature stable 4-20 mA output. **Figure 1** illustrates the operation of the transmitter in the form of a block diagram. The process temperature signal is available through the HART protocol. An optional two line LCD will display both pressure and temperature measurements in real-time.

Fig. 1
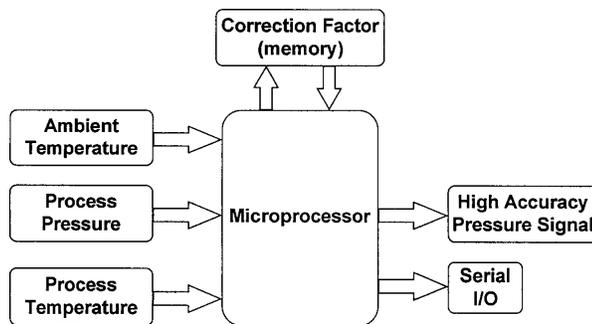
In addition to the standard analog output, the IPX/PX Series supports remote digital communications compatible with the HART Communicator (product of Fisher Rosemount). The Model 275 can communicate with IPX/PX Series transmitters from the control room, at the transmitter site, or from any convenient junction box or wiring termination point in the measurement loop. The model 275 may be used to configure the IPX/PX Series of transmitters or to test the control loop.

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Theory of Operation

The IPX/PX (Smart Transmitter) is a microprocessor-based device capable of measuring process pressure to within 0.15% of the specified range. It is compensated for pressure and temperature effects on the process end as well as the electronics end by using compensating software customized for each unit.

The IPX/PX can be broken down into two distinct subsections, mechanical and electrical. The following describes each in detail.

Mechanical

The mechanical system (filled assembly) consists of a lower diaphragm, a filled capillary tube, and an upper diaphragm with a sputtered thin film strain gage. The filled assembly transmits pressure from the process to the strain gaged diaphragm where it is converted to an electrical signal. The filled assembly isolates the electronics from the high process temperatures.

The lower diaphragm is the surface in contact with the media being measured. This diaphragm can be made from a choice of materials. The standard material is heat-treated 15-5 stainless steel. This has average corrosion and abrasion resistance and is similar to 17-4 stainless steel. Other materials include Hastelloy C-276 for excellent corrosion resistance (but not good for abrasion).

Behind the lower diaphragm is a filled capillary to the upper diaphragm. As the process pressure deflects the lower diaphragm, the fill is displaced through the capillary tube to deflect the upper diaphragm.

The upper diaphragm has a 5000 ohm thin film strain gauge element deposited on it in the configuration of a Wheatstone bridge. The deflection of the upper diaphragm causes a change in the resistance of the strain gauges and hence a change in the balance of the bridge. The amount of imbalance is directly proportional to the applied pressure. This completes the translation of pressure applied to the lower diaphragm into a usable electrical signal.

Electrical

The low level output signal from the bridge is amplified via an instrumentation amp circuit. The amplified signal then goes to the input of the analog-to-digital (A/D) converter.

The A/D has additional inputs into it. These are the lower diaphragm and gauge RTDs along with a reference voltage. The RTDs are used to measure the temperature at the diaphragm end (lower diaphragm) and the gauge end (upper diaphragm). These temperature measurements are necessary because they are two of the three input parameters to the compensation algorithms (the third being the pressure measurement itself). The reference voltage is proportional to the bridge excitation voltage. Measuring this reference voltage allows for a ratiometric signal calculation, canceling out any changes in this bridge excitation voltage due to temperature effects.

Once the microprocessor has the converted voltages input to it from A/D, the compensation algorithms are executed. The unit is compensated for any errors introduced by temperature effects on the gauge, snout, and the nonlinearities of the pressure measurement itself. The corrected digital word is sent to a digital-to-analog (D/A) which modulates the current of the unit's power supply between 4 and 20 milliamps for an output current proportional to the applied pressure.

NEW FEATURE - *AVAILABLE ON SOME MODELS*

Process Temperature Input

This new feature will allow the user to input a process temperature into the IPX algorithm to correct for process temperature affects in the event of an RTD failure.

In the event of an RTD failure in the IPX unit, a manual override of the RTD (process temperature) may be manually entered into the HART 275 communicator. The menu structure for this entry will be located in the diagnostics and services group, under calibration, after sensor trim. The function is named "Temperature Override". After the switch yes/no to use the RTD, a manual temperature input would be required.

This is designed as a backup mode of operation until the customer has the opportunity to remove the unit from service.

Basic logic: If the RTD signal is ok, then it will provide the process temperature signal to the IPX microprocessor for the temperature compensation algorithm. If the RTD fails, the user will be able to use the HART 275 communicator to manually select RTD or PTO. After PTO is entered, (process temperature) a menu screen requesting the actual temperature to input will be displayed. User would enter an actual temperature and confirm the entry. It will be possible to input a process temperature in place of a functioning or non-functioning RTD.

2. MODEL 275 HART COMMUNICATION

A condensed version of the HART 275 Communicator manual is provided in this section. Please reference the complete manual prior to installation of the IPX/PX products.

Introduction

The HART (Highway Addressable Remote Transducer) Communicator is a hand-held interface that provides a common communication link to all HART-compatible, microprocessor-based instruments. See **Figure 2-1.**

This section discusses the HART Communicator Connections, Liquid Crystal Display, Keypad, Offline and Online Menu, Battery Pack, Memory Module, Data Pack, and Maintenance. It also includes short overviews on some of the communicator's functionality.

Your HART Communicator interfaces with any HART-compatible device from any wiring termination point using a 4-20 mA loop, provided a minimum load resistance of 250 ohms is present between the communicator and power supply. Your HART Communicator uses the Bell 202 frequency shift key (FSK) technique of high-frequency digital signals superimposed on a standard transmitter current loop of 4-20mA. Because the high-frequency signal voltage added to the loop averages to zero, communication to and from a HART-compatible device does not disturb the 4-20 mA signal.

Fig. 2-1 The HART Communicator

LCD
FUNCTION KEYS
ACTION KEYS
ALPHANUMERIC KEYS
SHIFT KEYS
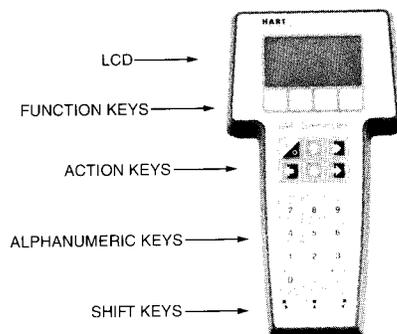
Hart Communicator Connections

The HART Communicator can interface with a transmitter from the control room, the instrument site, or any wiring termination point in the loop through the rear connection panel as shown in **Figure 2-2.**

To interface, connect the HART Communicator with the appropriate connectors in parallel with the instrument or load resistor. All connections are non-polarized.

WARNING

Explosion can result in death or serious injury. Do not connect to the serial port or NiCard recharger jack in an explosive atmosphere.

Fig. 2-2

Loop Connectors
Serial Port
Optional NiCad
Recharger Jack
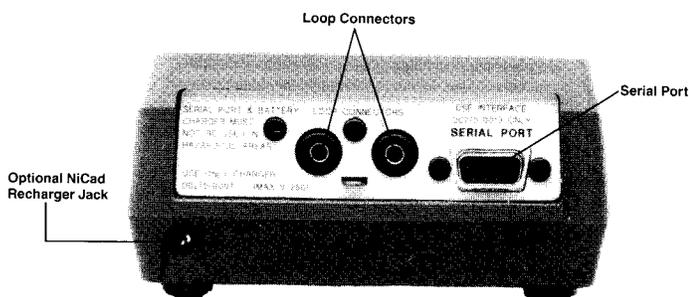
NOTE: For the HART Communicator to function properly, a minimum of 250 ohms resistance *must be* present in the loop. The HART Communicator does not measure loop current directly.

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| Fig. 2-3 | *Connecting the HART Communicator to a Transmitter Loop.* |

Figure 2-3 illustrates recommended wiring connections between the HART Communicator and the IPX I Series Pressure Transmitter.

A minimum 250 ohm Sensor Resistor is required to communicate correctly.
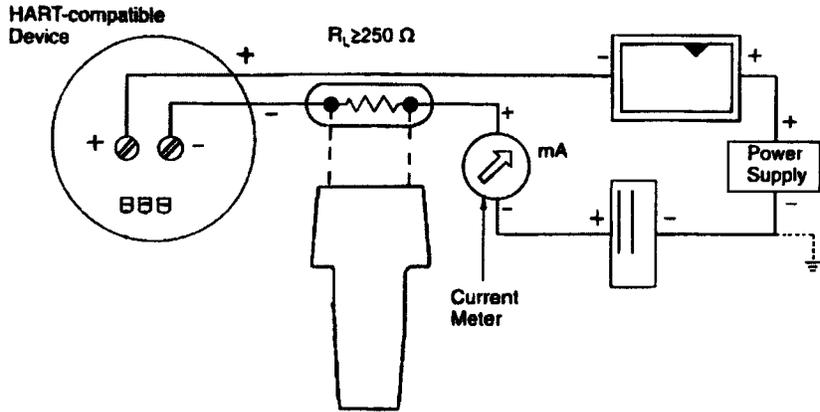
WARNING

Explosion can result in death or serious injury. Before connecting the HART Communicator in an explosive atmosphere, make sure the instruments in the loop are installed in accordance with intrinsically safe or nonincentive fields wiring practices. For intrinsically safe CSA and FM wiring connections, see Appendix C in the HART 275 Communication Manual.

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Liquid Crystal Display

The LCD is an 8-line by 21-character display that provides communication between you and the connected device. When you connect to a HART-compatible device, the top line of each online menu displays the model name of the device and its tag. In addition, the bottom line of each menu is reserved for the dynamic labels for each software-defined function key, F1-F4 (found directly below the display).

These dynamic labels display available functions. For example, the label **HELP** appears above the F1 key when access to online help is available.

The Action Keys

As shown in **Figure 2-1,** the action keys are the six blue, white, and black keys located above the alphanumeric keys. The function of each key is described as follows:

ON/OFF Key

Use this key to power on and power off the HART communicator.

When you power up the communicator it automatically searches for a HART-compatible device on the 4-20mA loop. If a device is not found, the communicator displays the message "No Device Found and prompts for polling (yes/no). Press the no function key "F4"-The Main Menu. Ref. **Figure 2-5.**

If a HART-compatible device is found, the communicator displays the Online Menu as illustrated in **Figure 2-6.**

Also, you can select the Polling option to direct the HART Communicator to look for devices at multidrop addresses. See **Polling on page 28** for details.

Refer to **Getting to Know the HART Communicator on page 14.**

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UP Arrow Key

Use this key to move the cursor up through a menu or list of options. You can also use it to scroll through lists of available characters when editing fields that accept both alpha and numeric data.

DOWN Arrow Key

Use this key to move the cursor down through a menu or list of options. You can also use it to scroll through lists of available characters when editing fields that accept alpha and numeric data.

LEFT Arrow and Previous Menu Key

Use this dual-function key to move the cursor to the left or back to the previous menu.

RIGHT Arrow and Select Key

Use this dual-function key to move the cursor to the right or to select a menu option.

HOT Key

Use this key to quickly access important, user-defined options **when** connected to a HART-compatible device. When the HART communicator is turned off and you press the Hot Key, it automatically powers up and displays your predefined Hot Key Menu. When powered up online and you press the Hot Key, the communicator immediately displays the Hot Key Menu.

Disabled Off Key

When performing certain operations, the message "OFF KEY DISABLED" indicates that you cannot turn the HART Communicator off. This feature helps you avoid situations when the power to the HART Communicator might unintentionally be turned off while the output of a device is fixed or when you are editing a device variable.

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Software-Defined Function Keys

| F1 | F2 | F3 | F4 |

Use the four software-defined function keys, marked F1 through F4, located below the LCD to perform software functions as indicated by the dynamic labels. On any given menu, the label appearing above a function key indicates the function of that key for the current menu. As you move among menus, different function key labels appear over the four keys. For example, in menus providing access to online help, the **HELP** label appears above the F1 key. In menus providing access to the Home Menu, the **HOME** label appears above the F3 key.

Table 2-1   Function Key Labels

Table 2-1 describes the labels that appear above each function key throughout the various communicator menus.

F1	F2	F3	F4
HELP Access online help	ON/OFF Activates or deactivates a bit-enumerated binary variable	ABORT Terminate current task	OK Acknowledge information on screen
RETRY Try to re-establish communication	DEL Delete current character or Hot Key Menu item	ESC Leave a value unchanged	ENTER Accept user-entered data
EXIT Leave the current menu	SEND Send configuration data to device	QUIT Terminate session because of a communication error	EXIT Leave the current menu
YES Answer to yes/no question	PGUP Move up one help screen	PGDN Move down one help screen	NO Answer to yes/no question
ALL Include current Hot Key item on Hot Key Menu for all devices	PREV Go to previous message in a list of messages	NEXT Go to next message in a list of messages	ONE Include Hot Key item for one device
NEXT Go to the next variable in offline edit	SAVE Saves information to Memory Module or Data Pack	HOME Go to the top menu in the device description	
FILTR Opens customization menu to sort configurations	MARK Toggles marked configuration variables for sending to a field device	BACK Go back to the menu from which HOME was pressed	
	XPAND Opens detailed configuration information	EDIT Edit a variable value	
	CMPRS Closes detailed configuration information	ADD Add current item to Hot Key Menu	

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Alphanumeric And Shift Keys

The alphanumeric keys perform two functions - the fast selection of menu options and data entry. See **Figure 2-4.**

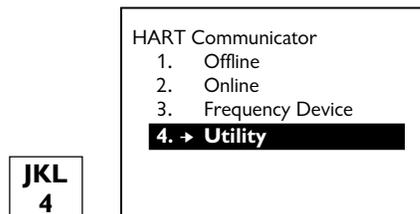*Fig. 2-4.   HART Communicator Alphanumeric and Shift Keys*
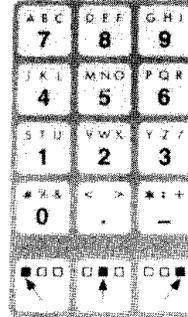
Using the Fast Select Feature to Select Options

From within any menu, you can select available options in two ways. First, you can use the up and down arrow keys and the select key to access available options.

Simply press the corresponding number on the alphanumeric keypad to select the desired option. **Figure 2-5** shows how to quickly access the Utility Menu from within the Main Menu by pressing the indicated fast key.

Fig. 2-5   Quickly Accessing Menus

HART Communicator
1.   Offline
2.   Online
3.   Frequency Device
4. → **Utility**

JKL
4

Using Shift Keys for Data Entry

Some menus require data entry. Use the up and down arrow keys when available, or use the alphanumeric and shift keys to enter the alphanumeric information into the HART Communicator.

If you press only the alphanumeric key within an edit menu, only the bold character in the center of the key will appear. These large characters include the numbers zero through nine, the decimal point (.), and the dash symbol (-). To enter the other characters on the keys, first press and release the appropriate shift key. Do not press the keys simultaneously.

Example: to enter the letter **"R"** press the following key sequence:
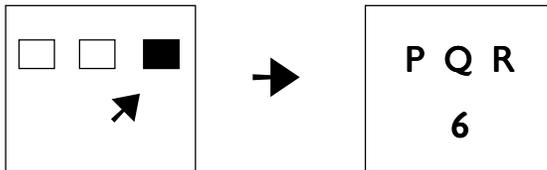
Pressing the right shift key activates shift and causes the right shift arrow icon to appear in the upper right corner of the display. Pressing the shift key again deactivates shift. With right shift activated, pressing the **"6"** key causes an **"R"** to appear in the editable field.

Using the Home Key

When the **HOME** label appears above the F3 key, you can press F3 to return directly to the Online Menu.

Press **BACK** (F3) to return to the screen from which **HOME** was pressed.
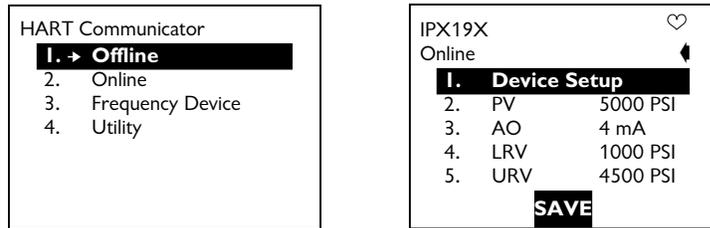
Getting To Know The Hart Communicator

The HART Communicator is generally used in two environments - offline (not connected to a device) and online (connected to a device). The opening menu displayed when you power the communicator is different for offline and online.
See **Figure 2-6.**

Powering the communicator when disconnected from a device displays the message "No Device Found," and inquiries whether or not you want to poll for devices. Press "No" function key [F4] and the Main Menu appears. Powering the communicator when connected to a device displays the Online Menu for the device. From the Online Menu, you can access the Main Menu by pressing the left-arrow key (previous menu key).

Fig. 2-6   Powering Up Offline or Online

```
HART Communicator
   1. → Offline
   2.    Online
   3.    Frequency Device
   4.    Utility
```

```
IPX19X                       ♡
Online                        ◀
   1.    Device Setup
   2.    PV        5000 PSI
   3.    AO        4 mA
   4.    LRV       1000 PSI
   5.    URV       4500 PSI
                 SAVE
```

Main Menu   Online Menu

Software Icons

The HART Communicator menus display icons that represent specific keys on the keypad.

Fig. 2-7   Menu Icons and Associated Keys

HART Communication (♥ indicates connected device is configured in the burst node)

Low Battery

```
HART Communicator     ▶ ♡ ▮
Device Info                  ◀
↓ 2     Dev type
  3     Dev id            0
  4     Tag
  5     MM/DD/YY 10/10/97
↑ 6. → Write protect   Yes
            HOME
```

Access Additional Menu Items
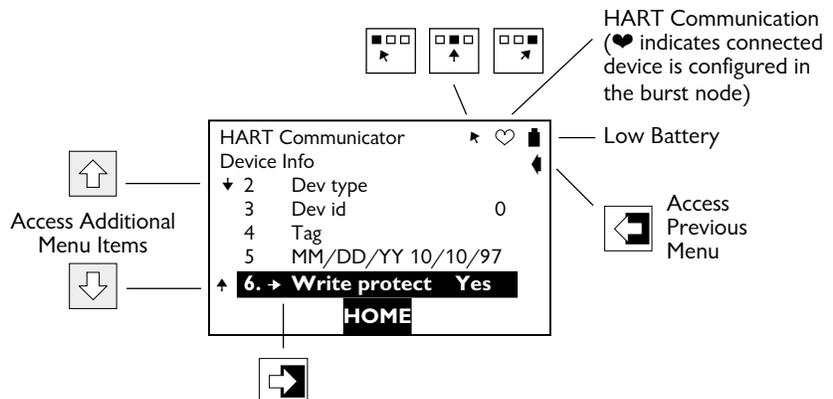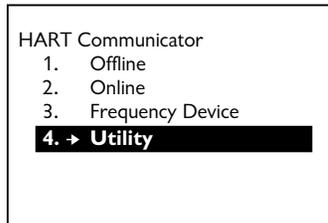
Access Previous Menu
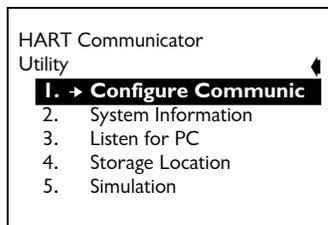
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Figure 2-7 shows all possible icons.

Learning The Menu Structure

Use the following steps to power the communicator offline, move through the menu structure, and then turn off the communicator:
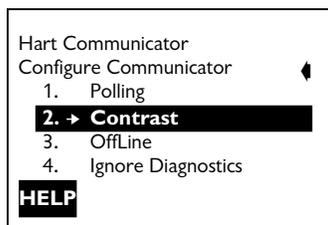
1. Turn the HART Communicator on.

2. Access the Utility Menu by
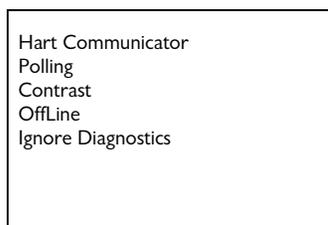   Pressing ⬇ three times
    and then pressing ➡

```
HART Communicator
    1.     Offline
    2.     Online
    3.     Frequency Device
    4. →  Utility
```

3. Access the Configure
    Communicator Menu from
    the Utility Menu by
    pressing ➡

```
HART Communicator
Utility                          ◀
    1. → Configure Communic
    2.     System Information
    3.     Listen for PC
    4.     Storage Location
    5.     Simulation
```

4. Access the Contrast Menu by
    pressing ⬇ Once and
    then pressing ➡

```
Hart Communicator
Configure Communicator           ◀
    1.     Polling
    2. →  Contrast
    3.     OffLine
    4.     Ignore Diagnostics
 HELP
```

ESC

5. Press **ESC**   (F3) to return
    to the Configure Communicator
    Menu.

```
Hart Communicator
Polling
Contrast
OffLine
Ignore Diagnostics
```

6. Press ⬅ two times to return to the Main Menu.

7. Turn the HART Communicator off.

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Reviewing Installed Devices

The HART Communicator Memory Module contains device descriptions for specific HART-compatible devices. These descriptions define the application software that the communicator needs to recognize particular devices. The device types can be found in the Utility Menu under Simulator or the Offline Menu under New Configurations.

If you cannot find a specific HART-compatible device on your communicator, then the device revision you are looking for is not programmed into the Memory Module. In this instance you are limited to what is available within a generic device description.

NOTE: IF YOUR EXISITNG MODEL 275 HART COMMUNICATOR DOES NOT HAVE THE IPX/PX SERIES OF DEVICE DESCRIPTIONS LOADED, THE UNIT WILL NEED TO BE RETURNED TO DYNISCO FOR SOFTWARE UPLOADING.   PLEASE CALL DYNISCO FOR THIS SERVICE.

Follow these steps to review the device descriptions programmed into your HART Communicator:

1. From within the Main Menu, press $\boxed{\begin{array}{c}\textbf{JKL}\\\textbf{4}\end{array}}$ to access the Utility Menu.

2. From within the Utility Menu, press $\boxed{\begin{array}{c}\textbf{MNO}\\\textbf{5}\end{array}}$ to access the simulation mode.

    The Manufacturer Menu appears. The Manufacturer Menu contains a list of each manufacturer with device descriptions currently installed in your communicator's Memory Module. Dynisco will provide the 8 MB Memory Module that contains <u>all</u> product device descriptions.

3. Once you select a manufacturer, the Model Menu appears. The Model Menu contains a list of models for which the device descriptions are currently installed.

4. Review the different manufacturers and models to determine the installed HART-compatible devices in your communicator.

MAIN MENU

When the HART Communicator is not connected to a device, the first menu to appear after the "Device Not Found" message is the Main Menu as displayed in **Figure 2-8.**

Fig. 2-8   Main Menu

```
HART Communicator
  1. → Offline
  2.    OnLine
  3.    Frequency Device
  4.    Utility
```
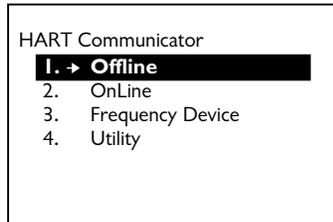
If the communicator is powered on when connected to a device, you can access the Main Menu by pressing the previous menu key. Depending on the current online menu, you may need to press the previous menu key several times or the **HOME** key plus ◄ to return to the Main Menu.

Offline Menu

From the Main Menu as shown in **Figure 2-8**, press "1" to access the Offline Menu, as displayed in **Figure 2-9**. From the Offline Menu you can access the options: *New Configuration and Saved Configuration.*

A HART- compatible device does not have to be connected to use the offline options, except when sending saved configuration data to a connected device.

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Offline New Configuration

Use this option to compile a custom set of device configuration data for downloading to any HART-compatible device. You can download repeatedly to multiple devices so that they store identical configuration data.

Offline configuration may not be available for all devices. Steps 2 and 3 will help you verify if the desired manufacturer and device model are programmed into the communicator's Memory Module.

Use the following steps to enter new configuration data offline:

1. Press $\boxed{\begin{array}{c} \textbf{STU} \\ \textbf{1} \end{array}}$ on the Main Menu to access the Offline Menu screen.

Fig. 2-9   Offline Menu

```
HART Communicator
Offline
   1. →  New Configuration
   2.    Saved Configuration
 HELP

```
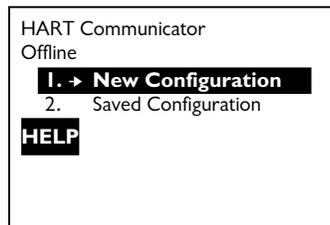
This menu allows you to enter a new device configuration, or edit a saved device configuration. To enter a New Configuration, press **"1"** and go to Step 2. To edit a Saved Configuration, press **"2"** and go to **Offline Saved Configuration on Fig. 2-15**.

2. The Manufacturer Menu appears next and contains a list of manufacturers with device descriptions currently installed in your HART Communicator. When you select a manufacturer, the Model menu appears.

3. The Model Menu contains a list of the currently installed device models provided by the manufacturer. When you select a device model for configuration, the Field Device Revision (Fld dev rev) menu appears.

4. The Field Device Revision menu contains the currently installed software revisions for the Field Device and Device Descriptions (DD) for the Model selected from the previous screen.

   If you are unsure of the device revision, connect the HART Communicator to the device and determine its device revision level.

   This information is most commonly accessed from the Device Information option located in *Detailed Setup* under the *Device Setup* function under the *Online Device Setup* Menu.

   You must select a device revision to access the Blank Template Menu screen as displayed in **Figure 2-10.**

FIG. 2-10 Blank Template Menu

```
Unnamed
From Blank Template              ◀
  1. → Mark all
  2.    Unmark all
  3.    Edit individually
  4.    Save as...
HELP   SAVE
```

Mark All

Select **Mark All** to flag all configurable variables to be sent to a HART-compatible device.

Configuration variables are those that appear when you edit variables in the configuration using the Edit Individually option.

Unmark All

Select **Unmark All** to remove the flags from all configurable variables in the configuration.

Unmarked configuration variables are not sent to a connected HART-compatible device.

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Edit Individually

Select **Edit Individually** to open the Edit Individually menu containing the numerous configuration variables.

Fig. 2-11   Edit Individually

```
Unnamed
Edit individually
   Unit
            PSI


Not Marked To Send
NEXT  MARK  EDIT  EXIT
```
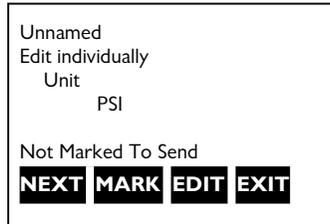
Example: to change the engineering units from PSI to BAR, find the configuration variable press the Edit function key, highlight the new unit, and press the **ENTER** function key. The Esc key returns you to the previous screen as displayed in **Figure 2-12**. Press the Exit function key to return to the Blank Template screen when completed.

Fig. 2-12   Unit Variable Menu

```
Unnamed
Unit
  PSI

BAR
                 ESC  ENTER
```

Save As

Selecting the **Save As…** saves your new configuration to either the Memory Module or the Data Pack. **See Figure 2-13** and **Figure 2-14**. The Memory Module holds up to 10 typical configurations, and contains the operating system software, and device application software in nonvolatile memory. The Data Pack stores up to 100 typical configurations in nonvolatile removable memory.
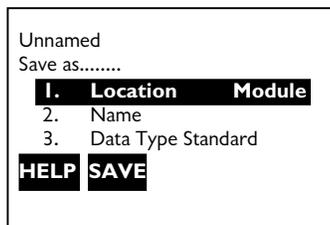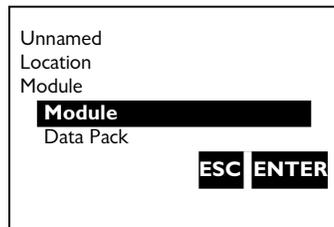
Fig. 2-13   Save As…Menu

```
Unnamed
Save as........
  1.    Location      Module
  2.    Name
  3.    Data Type Standard
HELP  SAVE
```

Fig. 2-14   *Location*

```
Unnamed
Location
Module
   Module
   Data Pack

              ESC ENTER
```

You may also use this menu to enter or edit the configuration Name
and Data Type. Data Type Standard refers to a set of all editable
variables when defining a new device configuration. Data Type Partial
refers to a set of all marked variables. Data Type Full refers to a set
of all device variables.

When all changes have been made, save your new configuration to a
storage location and return to the Offline Menu screen.

Offline Saved Configuration

Use the Saved Configuration menu to access configuration data stored
in your HART Communicator.

5.   Press **"2"** from the Offline Menu and the Saved Configuration
Menu screen appears as displayed in **Figure 2-15**.

Fig. 2-15   *Saved Configuration*

```
HART Communicator
Saved Configuration            ◄
   1. → Module Contents
   2.    Data Pack Contents
   3.    PC
HELP
```
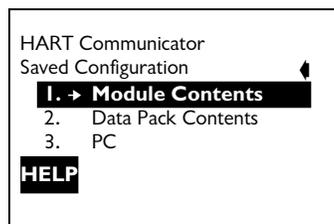
Select either Module contents or Data Pack Contents to open your
stored configurations. Both storage locations list all saved
configurations by assigned Tag. See **XPAND on page 22**
for more configuration identification details.

FILTR

The **FILTR** function key opens a menu that provides both Sort and filter options. These options allow you to customize your view of saved device configurations.

Sort allows you to group and display device configurations according to your choice of Tag, Descriptor, or Name.

Filter allows you to customize your group for viewing according to what you entered with Sort by picking characters from the device Tag, Descriptor, or Name.

When setting up a Filter, you can use two special characters: the period (.) and the asterisk (*). The period replaces a single character of any value. The asterisk replaces zero or more alphanumeric characters of any value.

For example, if you entered **A-*-.1**, it should match all device tags starting with **A-,** followed by any number of **characters**, followed by -, followed by any **single character**, and ending with **a.1.** That means, devices starting with **A-** and ending in 1, out of your list of saved device configurations, will display as a group on the communicator's screen.

XPAND

The **XPAND** function key allows you to view the Tag, Descriptor, and Name for the current configuration. Selecting the **"Compress"** function key returns you to the previous compressed screen with the current Tag or Descriptor or Name.

6. Press ⏩ to open the Saved Configuration Menu, as shown in **Figure 2-16**.

> ### *Fig. 2-16   Saved Configuration Menu*

```
A-P-501
Saved Configuration              ◀
  1. → Edit
  2.    Copy to
  3.    Send
  4.    Print
  5.    Delete
 HELP
```
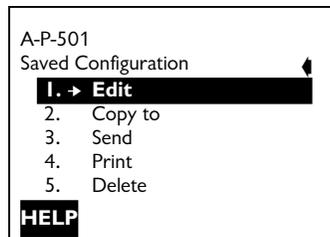
Edit

Selecting **Edit** displays the Edit Menu. These edit functions are the same as described under **Edit Individually on page 20**.

If you are editing online remember that only stored data may be edited, and if the data was stored as a Partial configuration, you must convert it to a Standard configuration before saving it.

Copy To...

Selecting **Copy To...** specifies the storage location where you want the copy to be stored. You may also change the configuration name when using this option.

Send

Selecting **Send** will send your saved configuration to a "connected" device.

Print

Not implemented with this release. This option is intended for the future.

Delete

Selecting **Delete** will remove a saved configuration from the memory storage location. A confirmation message will appear. Press Yes or No to complete the function.

Rename

Select **Rename** to access the Configuration Name editing menu. After making name changes, enter and save the data to return to the previous storage location menu.

Compare

The **Compare** option compares a selected device configuration from a stored location with another device configuration. The HART Communicator compares device types, variables, marked lists, etc. Messages will appear indicating whether the configurations compared are the same or different. Press OK to return to the storage location and your list of device configurations. Find and make any necessary changes resulting from your comparisons.
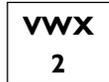
In order to produce a "Same/Differ" result, the following conditions must be met when comparing two configurations:

1. Device type (including manufacturer), device type number, device revision, and DD revision must match exactly.

2. Configurations can only be compared against other configurations containing the same set of variables. The communicator will notify you if this condition is not met.

3. The format of data storage must match exactly. The communicator will notify you if this condition is not met.

User assigned configuration names are not considered as they will differ.
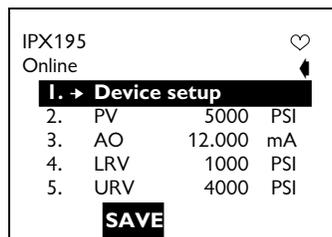
Online Menu

From the Main Menu and with a HART-compatible device connected, press ⏐ **VWX 2** ⏐ to access the Online Menu, as

displayed in **Figure 2-17**.

Fig. 2-17   Online Menu

```
IPX195                        ♡
Online                        ◀
 1. → Device setup
 2.    PV          5000   PSI
 3.    AO          12.000 mA
 4.    LRV         1000   PSI
 5.    URV         4000   PSI
            SAVE
```

The Online Menu displays the name of the device at the top of the LCD. You have complete functionality for a specific device only when that device description is present in the HART communicator. If the device description is not present in the HART Communicator, contact the manufacturer for the specific device.

Also, the Online Menu can be different depending on the device you have connected.

Whenever the device description for a specific device is not available, your HART Communicator provides a generic interface. This generic interface enables you to perform those functions common to all HART-compatible devices.

The Online (Generic) Menu is the first menu in the generic interface. This menu displays critical, up-to-date device information such as the process variable, analog output, lower range value, and upper range value. Configuration parameters for the connected device may be accessed using the *Device Setup* option.

The **SAVE** function key, as illustrated in **Figure 2-13**, allows you to save a configuration from a transmitted device. See **Changing a Saved Configuration on page 30** for more details.

Fig. 2-18   IPX/PX Online Menu

25
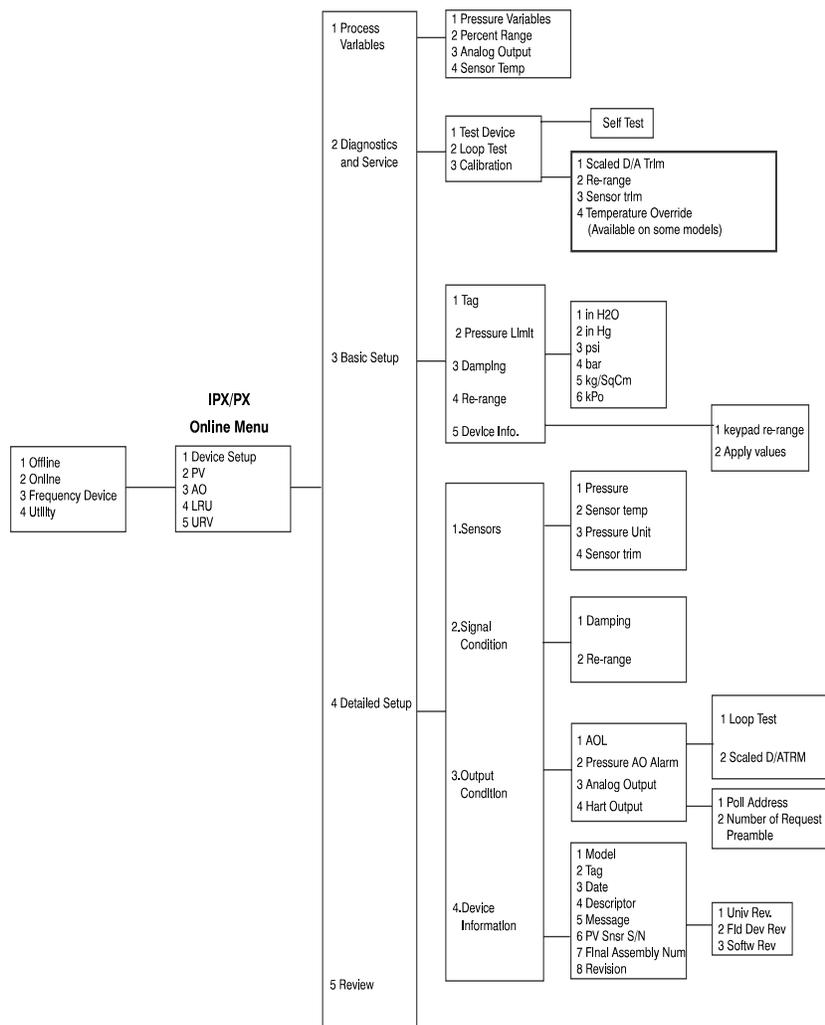
Device Setup

The *Device Setup* option provides access to the Device Setup Menu. Configurable device parameters common to all HART-compatible devices can be accessed from this menu.

Primary Variable (PV)

The Online Menu displays the dynamic primary variable and the related engineering units. When the primary variable contains too many characters to display on the Online menu, you can access the PV Menu to view the primary variable and related engineering units by pressing **"2"**.

Analog Output (AO)

The Online Menu displays the dynamic analog output and the related engineering units. The analog output is the signal on the 4-20 mA scale that corresponds to the primary variable. When the analog output contains too many characters to display on the Online Menu, you can access the AO Menu to view the analog output and related engineering units by pressing **"3"**.

Lower Range Value (LRV)

The Online Menu displays the current lower range value and the related engineering units. When the lower range value contains too many characters to display on the Online Menu, you can access the LRV Menu to view the lower range value and related engineering units by pressing **"4"**.

Upper Range Value (URV)

The Online Menu displays the current upper range value; and the related engineering units. When the upper range value contains too many characters to display on the Online Menu, you can access the URV Menu to view the upper range value and related engineering units by pressing **"5"**.
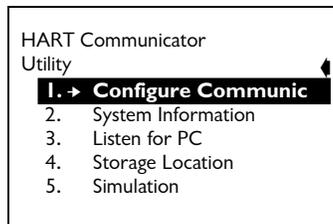
Utility Menu

From within the Main Menu, see **Figure 2-8**, press
to access the Utility Menu as displayed below
in **Figure 2-19**.

```
┌─────┐
│ JKL │
│  4  │
└─────┘
```

```
┌──────────────────────────────┐
│ Fig. 2-19   Utility Menu      │
└──────────────────────────────┘
```

```
┌────────────────────────────────┐
│ HART Communicator              │
│ Utility                      ◄ │
│   I. ► Configure Communic      │
│   2.   System Information      │
│   3.   Listen for PC           │
│   4.   Storage Location        │
│   5.   Simulation              │
│                                │
└────────────────────────────────┘
```
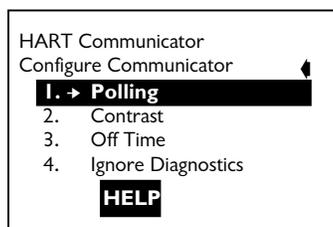
The Utility menu provides access to functions that affect only the
operation of the HART Communicator.

Configure Communicator

From within the Utility Menu press **"I"** to access the Configure
Communicator Menu as displayed in **Figure 2-20**.

```
┌──────────────────────────────────────┐
│ Fig. 2-20.  Configure Communicator Menu │
└──────────────────────────────────────┘
```

```
┌────────────────────────────────┐
│ HART Communicator              │
│ Configure Communicator       ◄ │
│   I. ► Polling                 │
│   2.   Contrast                │
│   3.   Off Time                │
│   4.   Ignore Diagnostics      │
│        HELP                    │
└────────────────────────────────┘
```

Use this menu to set the polling, adjust the contrast of the liquid
crystal display, set the communicator off time, or set the number of
ignore diagnostics messages.

Polling

Use the Polling options to configure your HART Communicator to automatically search for all or specific connected devices. The HART protocol allows you to communicate with multiple HART devices on a single twisted pair of wires over leased telephone lines.

When several devices are connected in the same loop, each device must be assigned a unique address. To find the individual device addresses, use the Digital Poll option to find each connected device in the loop and list them by tag number. This concept is known as "multidropping."

Communication between the communicator and multidropped transmitters takes place digitally, with the analog output fixed. In a multidrop installation, each transmitter is identified by a unique Polling address of 0 or 1-15 and responds to the commands defined in the HART protocol.
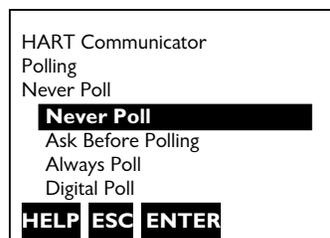
The Polling options are:

1. Never Poll: connects to a device at address 0, and if not found will not poll for devices at address 1-15.

2. Ask before Polling: connects to a device at address 0, and if not found asks if you want to poll for devices at address 1-15.

3. Always Poll: connects to a device at address 0, and if not found will automatically poll for devices at address 1-15.

4. Digital Poll: will automatically poll for devices at address 0-15 regardless.

Use the following steps to select and enter your Polling option:

1. From within the Configure Communicator Menu, see **Figure 2-21**, press **STU 1** to access the Polling Menu as displayed in

   Figure 2-21.

Fig. 2-21   Polling Menu

```
┌─────────────────────────────────┐
│ HART Communicator               │
│ Polling                         │
│ Never Poll                      │
│   ▐ Never Poll          ▌       │
│     Ask Before Polling          │
│     Always Poll                 │
│     Digital Poll                │
│ ▐HELP▌ ▐ESC▌ ▐ENTER▌            │
└─────────────────────────────────┘
```

2. Use the up and down arrow keys to highlight any of the listed
   Polling options: Press **ENTER** (F4) to enter the highlighted
   option and return to the configure Communicator Menu. Or,
   press **ESC** (F3) to return to the Configure Communicator
   Menu without changing the Polling.

Refer to your device-specific manual for more information onchanging
a device polling address.

Contrast

You can adjust the contrast on the LCD. However, the first time you
reset and save the contrast it is entered permanently. When you turn
the communicator off then on, the adjusted setting; will reappear. If;
you need help call your service center for assistance. Follow these
steps to adjust the contrast:

1. From within the configure Communicator Menu, see **Figure
   2-20**, press **VWX 2** to access the Contrast Menu, as

   displayed in **Figure 2-22**.

Fig. 2-22   Contrast Menu

```
HART Communicator
Contrast
Use Up/Down arrows to
change contrast.
Press ENTER when done.
                    ESC ENTER
```

2. Follow the on-screen instructions to adjust the display contrast.
   Press **ESC** (F3) to return to the configure Communicator
   Menu without adjusting the contrast. To save the changes to the
   contrast, press **ENTER** (F4) and the Configure Communicator
   Menu appears. **ENTER**

Off Time

Use the following steps to set the automatic turn off option. This is the amount of time that elapses before your HART Communicator turns off automatically when not in use:

1. From within the configure Communicator Menu, press **YZ/ 3** to access the Off Time Menu. See **Figure 2-23**.

Fig. 2-23. Off Time Menu

```
HART Communicator
Off Time
   5 min

  5
HELP DEL ESC ENTER
```
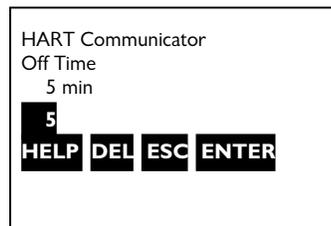
Use the numeric keys to select the automatic turnoff time. Press **ESC** (F3) to return to the Configure Communicator Menu without adjusting the off time. To save the off time change, press **ENTER** (F4) and the Configure Communicator Menu appears. Entering Zero (0) will disable this option. The maximum time allowed is 255 minutes.

Changing A Saved Configuration

Selecting the **SAVE** function from any online menu allows you to save a configuration transmitted from a connected device to a permanent storage location. Use the following steps when you need to save, change, and send a stored configuration:

1. Select **SAVE**

2. Enter a storage location (Memory Module or Data Pack).

3. Enter a Name and configuration Data Type. Name defaults to the online device Tag, and the Data Type defaults to Standard with all editable variables marked.

    Only select Full for a configuration Data Type if there is no list of transmitted device variables to edit.

    Warnings appear if there is not enough memory to store the transmitted configuration or if there is no list of configurable variables with Data Type set to standard.

The **SAVE** key disappears until you change any configuration data.

4. To change the configuration data, go into the Device Setup menu options and change the required data. For example, if the Tag needs to be changed, start with the Device Setup menu and go into the Basic Setup menu options, open Tag, and change the data.

    Press **ENTER** to load the changed data, then press **SEND** to send your changes to the connected device.

5. After each data configuration is sent, the **SAVE** function key appears. At this stage you have the option to save the individual variable for continue to change all of the variables and save them all at once.

6. If you choose not to **SAVE** data but want to continue, the **SEND** key will reappear after each selection is entered.

7. Repeat the above process where necessary to modify each device configuration.

    When saving a new configuration or changing a saved configuration offline, you will not encounter the send key. The process of finding, changing, entering, and saving data to a permanent storage location is the same.

## *Using The Hot Key*

Reference the HART Communicator Manual

Calibration of the HART Communicator

It is not necessary or possible to calibrate your HART Communicator. It has no measurement circuitry and does not measure analog output from the field device. The communicator is strictly a communication interface that communicates digitally with HART-compatible devices. It is not subject to calibration.

Battery Pack

The HART Communicator is available with a battery pack that holds five AA alkaline cells, or with a rechargeable nickel-cadmium power pack. The alkaline cells last approximately 150 hours, and the NiCad cells last approximately 60 hours with normal usage. When approximately one hour of battery life remains, a low-battery icon appears in the upper right corner of the display.

Fig. 2-24   Hart Communicator Exploded View
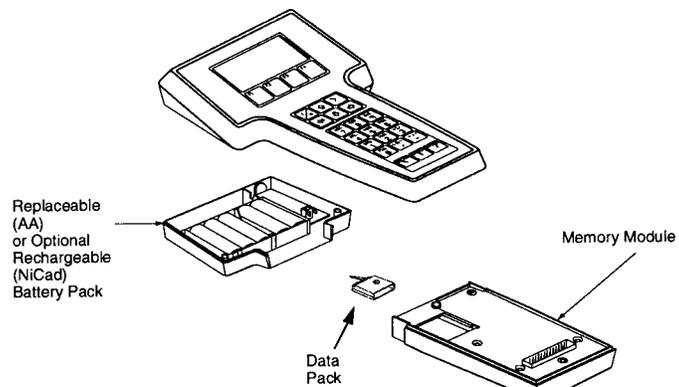
Refer to **Figure 2-25** and use the following steps to change alkaline batteries:

Fig. 2-25   Battery Pack Removal

1. Completely loosen the three captive screws holding the communicator battery pack.

2. Grasp the battery pack and pull it away from the communicator. Make sure not to bend the pins connecting the battery pack to the communicator.

3. Remove and properly dispose of batteries.

4. Referring to the battery orientation diagram inside the battery pack, insert five AA alkaline batteries.

5. Carefully align the pins with the communicator base and replace the battery pack.

6. Tighten the three screws.

7. Turn on the communicator to ensure the batteries are installed properly.

Recharging the Battery Pack

WARNING

Explosion can result in death or serious injury. Do not recharge the NiCard battery pack in an explosive atmosphere.

NiCad battery packs are shipped from the factory discharged. Prior to the first use, charge the battery pack while it is disconnected from the communicator. Subsequent charges may be performed while using or storing the HART Communicator, without removing the battery pack.

To recharge while using the communicator, plug the recharger into an AC outlet or power source. To recharge while storing the communicator, plug the recharger into an AC outlet or power source, make sure the HART Communicator is *off* and charge for 16 hours. Overcharging will not harm the communicator battery pack.

NOTE: For optimum performance, periodically discharge (use battery power until the low battery icon appears) and then fully recharge the battery pack.
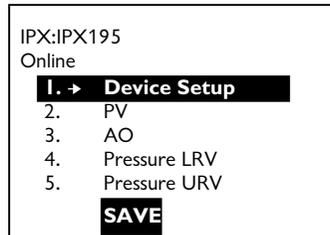
3. COMMISSIONING ON THE BENCH

The Model IPX/19X or PX19X may be commissioned before or after installation. To commission after installation, refer to Chapter 5 - Online Configuration, and then return to this chapter. To commission on the bench, connect the transmitter and the Model 275 as shown in Figure 2-4.   Ensure that the 275 is OFF. A power supply with an output of 17 - 36 Vdc and a current meter are necessary. A resistance of at least 250 ohms, between the Model 275 and the power supply, is necessary for digital communications.
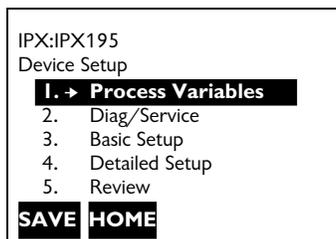
Communications Test

After the equipment is connected as shown is Figure 2-4, turn on the power supply and wait 30 seconds for the Model IP X19X or PX19X to perform its internal self-test. Turn on the Model 275 by pressing the ON/OFF key. The Model 275 will perform a brief self test while displaying a wait message.
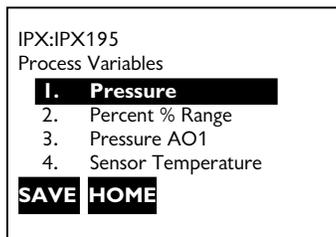
Upon successful start-up, the Model 275 will display an initial start screen confirming it is ready for communications.

```
IPX:IPX195
Online
 I. →   Device Setup
 2.     PV
 3.     AO
 4.     Pressure LRV
 5.     Pressure URV
        SAVE
```

Using the up/down keys – select "device setup" and the [→] to confirm.

```
IPX:IPX195
Device Setup
     1. →  Process Variables
     2.    Diag/Service
     3.    Basic Setup
     4.    Detailed Setup
     5.    Review
SAVE HOME
```

Select "Process Variable" and enter the ⬛➡ key. The new screen
will display...

```
IPX:IPX195
Process Variables
     1.    Pressure
     2.    Percent % Range
     3.    Pressure AO1
     4.    Sensor Temperature
SAVE HOME
```

By selecting "Pressure" – the unit will display the actual pressure
value (ie. 5,000 PSI). Next, press the F4 button to go back the
previous screen. By selecting "Percent % Range", the value will be
displayed in terms of percent range. When complete, press the F4
button to go back the previous screen. By selecting "Pressure
AO1", the Analog output will be displayed. When complete, press
the F4 button to go back the previous screen. By selecting
"Sensor Temperature", the sensor temperature from the snout
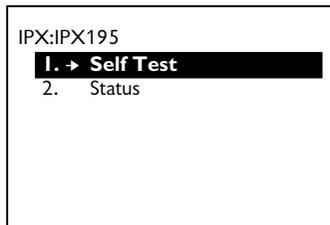RTD will be displayed.

Press the **HOME** function key to return the online menu screen.

```
IPX:IPX195
Device Setup
     1.    Process Variables
     2. →  Diag/Service
     3.    Basic Service
     4.    Detailed Setup
     5.    Resume
SAVE HOME
```
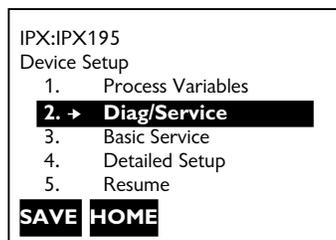
Using the Arrow keys, select number 2. "Diagnostics/Service".
The new screen menu is displayed.

```
IPX:IPX195
Diag/Service
   1. →   Test Device
   2.      Loop Test
   1.      Calibration
```
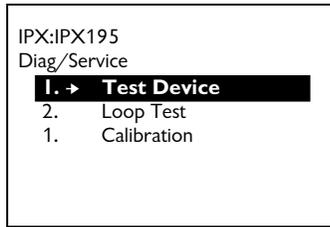
Press the ⬅️ key to select the **"Test Device"**. The new screen shown...

```
IPX:IPX195
   1. →  Self Test
   2.      Status
```

If the unit is performing without problems the message: **"No Device Problems"** will appear. This is only seen during a Self Test. The Status will display the status of the unit. Press F4 to go back the Diag/Service screen.

```
IPX:IPX195
Diag/Service
   1.      Test Device
   2.      Loop Test
   3.      Calibration
```
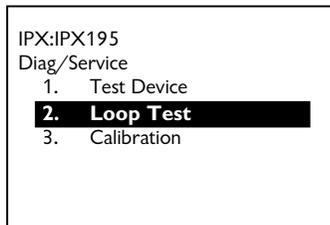
Press the ⬅️ key to select the Loop Test.

A message will be shown: Pressure Warning- loop should be removed from automatic control. Press OK and the display below appears.

```
IPX:IPX195
Choose analog output level
   1.      4 mA
   2.      20mA
   3.      Other
```
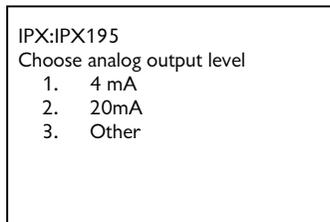
Choose a desired Analog output level and verify loop current. Press F4 to go back the Diag/Service screen.

4. INSTALLATION

IMPORTANT

Please read the appropriate sections of this manual prior to installation and use.

- Do not remove protective cap until ready to install
- Prior to initial installation, verify correct machining of mounting hole.
- When re-installing, make sure mounting hole is clear of frozen plastic.
- Transducer should be removed when at operating temperature (no pressure in system)

Mechanical Guidelines

Hazardous Area Installations

Dynisco's IPX/PX Series of Intelligent Pressure Transmitters was designed with circuitry suitable for operation in a Class I - Div. II hazardous area (certain models). An explosion-proof housing is standard on all IPX19X/PX19X models. The specific approvals carried by individual transmitters are marked on the label. Refer to the product data sheet for the most current information on these approvals.

Temperature Environment

IPX/PX Series transmitter Electronics will operate within specifications over the ambient temperature range of 0 °C (+32°F) to +70°C (+158°F). The location of the electronics housing should be in an area where the ambient temperature is within this range.

Electrical Guidelines

Dynisco's IPX/PX Series of Smart Multivariable Pressure Transmitters provide a digitally enhanced (HART) 4-20 mA dc current signal output that is transmitted to the control room via two wires. The signal is relatively insensitive to electrical noise and lead length. Proper electrical installation is necessary to prevent errors due to electrical noise.

Power Supply

The power supply should provide 17-36 Vdc. The load resistance is the sum of the resistance of the signal leads and the load resistance of any indicator, controller, or other devices in the loop. Total load resistance must be 250 ohms or greater for communication with the Model 275 HART Communicator.

4A. MOUNTING HOLE PREPARATION - 1/2 " 20 UNF THREADED CONVERTER

Careful attention should be paid to correctly machining the mounting hole. A set of mounting hole machining tools (Dynisco P/N 200925) is available with all the necessary drills, taps, and reamers. Detailed instructions are given in Dynisco Bulletin 200925 available on request.

When machining the hole pay careful attention to the concentricity, between the threads and the .312/.314 diameter. Since the pressure seal is on the 45 degree seating surface, this surface should be examined for good finish, free from burs, etc.

It is generally good practice to check the mounting hole before installing the transducer. One procedure is to coat a guage plug (Dynisco P/N 200908) with Dykem machine blueing on surfaces below the thread. Insert the gauge plug into the mounting hole and rotate until surface binding is encountered. Remove and inspect. Blueing should only be scraped off of the 45 degree sealing chamber. If blueing has been removed from other surfaces, the mounting hole has not been machined properly.

4B. TRANSMITTER INSTALLATION - 1/2" 20 UNF

To prevent galling, the transmitter threads should be lubricated with a high-temperature anti-seize compound.

In a properly machined mounting hole, an adequate seal should be obtained with 100 inch-pounds of mounting torque. The maximum recommended installation torque is 500 inch-pounds.

When re-installing the transmitter, the mounting hole must be free of frozen plastic. A mounting hole cleaning tool kit is available (Dynisco P/N 200100) to aid in removing material from .312 diameter, 45 degree seat and the threads. A gauge plug to check the hole is included in this kit.

4C. BUTTON SEAL PX185, PX195, IPX185, IPX195

The transmitters will provide excellent service and superior performance if proper care is taken during handling, installation and use.

The tip of the transducer consists of a stainless steel diaphragm which must be protected from severe abrasives, dents and scores.

The most common causes of transducer damage are: installation in improperly machined or plugged mounting holes and cold starts.

4D. MOUNTING AND INSTALLATION BUTTON SEAL UNITS

Different mounting configurations are available. Refer to the correct mounting configuration for proper installation.

PRESSURE RANGE	GASKET P/N	RECOMMENDED MTG BOLT TORQUE
0 - 3M	494602 (ALUMINUM)	15 FT / LBS
0 - 10M	634001 PARKERIZED CARBON STEEL 634002 (HASTELLOY) 634004 (303 SST)	60 FT / LBS

Grounding

The Model IPX19X and PX19X will operate with the current signal loop either floating or grounded. If the signal on the readout device appears noisy or erratic, grounding the signal loop at one point may solve the problem. The preferred place to ground the loop is at the negative terminal of the power supply. Alternately, one side of the readout device may be grounded. The current signal loop should be grounded at only one point.

Installations involving multiple transmitters using a single, shared power supply are also possible. The system should be grounded at the negative terminal of the power supply only.

For shielded cable, ground the cable shield to earth ground at one end (preferably at the power supply end).

Electrical Installation

Ensure that the loop power supply is OFF. Connect the transmitter to a mating connector wired per Figure 4-1. Turn the loop power supply ON.

Fig. 4-1. Connector Pin Wiring

18X STD 6-PIN CONN.	FUNCTION	CABLE P/N 929020 6-CONN.
A	+Power supply/EXE	Red
B	-Power supply/EXE	Black
	N.C.	
	N.C.	

18X M315 8-PIN CONN.	FUNCTION	CABLE P/N INTEGRAL
A	+Power supply/EXE	Red
B	-Power supply/EXE	Black
C	N.C.	
D	+RTD	Orange
E	-RTD	Blue
F	-RTD	Green

19X STD	FUNCTION	CABLE
+ terminal	+Power Supply	N/A
- terminal	- Power Supply	N/A

*M315 Option on 18x only

5. CONFIGURATION

Configuring the IPX Smart Multivariable Pressure Transmitter enables you to obtain the most accurate measurement of the process pressure. The transmitter output can be scaled to your operating range to maximize the resolution of the measurement and control of the process.

Communicator

The IPX Series of Smart Multivariable Pressure Transmitters is configured using the Model 275 HART Communicator. Configuration may be verified or changed either on the bench (as discussed in Section-3) or on-line (i.e. with the IPX transmitter installed in the process).

Connect the transmitter as shown in fig.s 2-3 or 2-4 observing the following notes.

Notes-
1.0 When connecting to or disconnecting from a loop, ensure that the communicator is OFF.
2.0 Connect the communicator to the transmitter loop at any convenient junction, provided there is at least 250 ohms impedance between the communicator and the loop power supply (see Fig 2-3 or 2-4).
3.0 **Caution:** On-line configuration enables the user to directly modify transmitter operating parameters, therefore, the transmitter signal loop should put in Manual mode before proceeding.
4.0 Configuration data entered into the communicator is sent to the transmitter in the form of a frequency modulated sinusoidal signal superimposed on the 4-20 mA signal. The process loop (4-20 mA signal) will remain unaffected by communication between the Communicator and the IPX transmitter.

The instructions that follow (in this section), assume the operator has an understanding of the operation of the communicator: if not, please refer to section 2.0 "Hart Communicator (Model 275)".
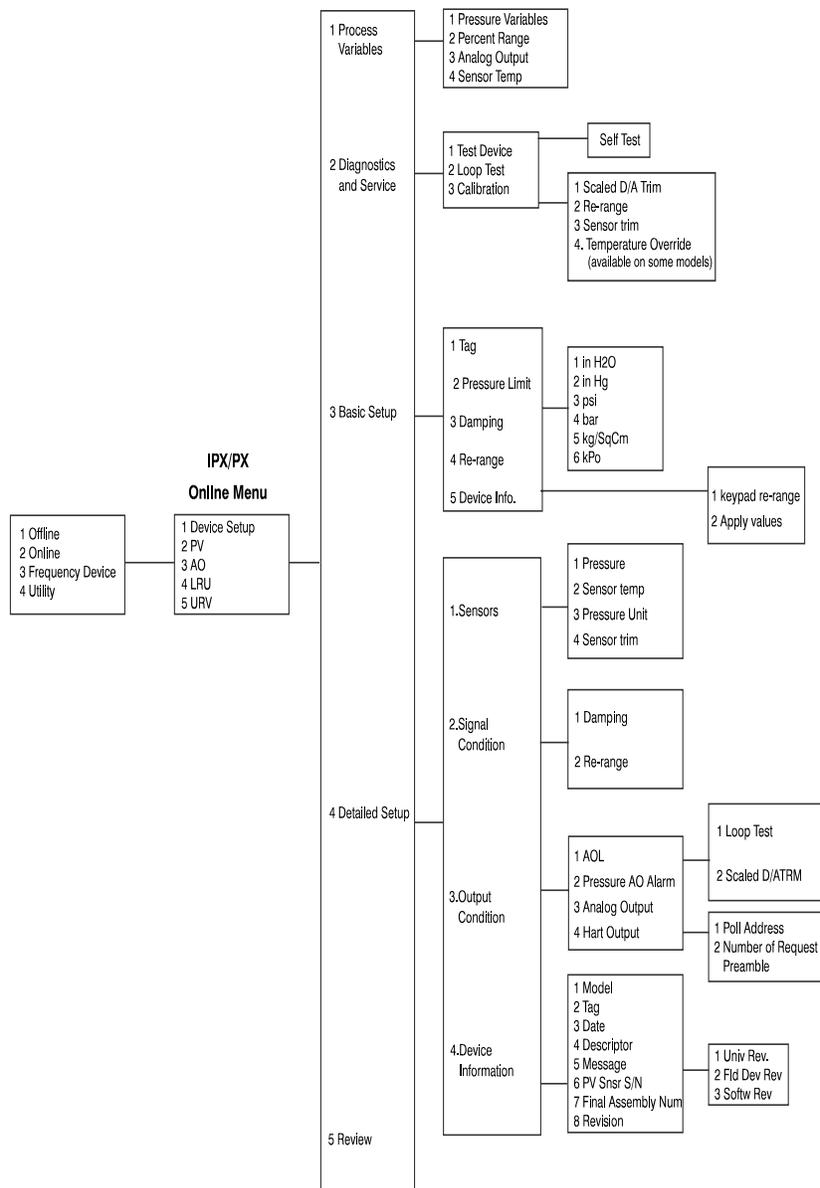
Model IPX/PX Instructions

This Quick Set-up Guide is designed for existing users
of the HART 275 Communicator and loop
powered instrumentation.

1. Install unit into process connection. Insure the hole is clean and
precise to prevent diaphragm damage.

   There should be NO pressure to the unit at this time.

2. Connect power to the unit (12-36VDC)

   (17-36 for IPX/PX 19X series with display)

3. Connect 275HC to loop power

4. Scroll to Device Set-up
   a. Scroll to Basic Setup

      • enter tag
      • enter engineering unit
      • rerange
   b. Set-up range unit
   c. Set-up LRV
   d. Set-up URV

5. Scroll to Detailed Device Set-up
   a. Scroll to Sensors
   b. Scroll to sensor trim
   c. After unit is mounted in desired position, and with no pressure
      set 4mA trim
      • apply zero input to sensor
      • ok
      • sensor input stabilizing
      • sensor zero succeeded
      • Loop can now be put back into automatic

6. Remove HART 275 from Loop

Fig. 5-1   IPX/PX Online Menu

IPX/PX

OnlIne Menu

1 Offline
2 Online
3 Frequency Device
4 Utility

1 Device Setup
2 PV
3 AO
4 LRU
5 URV

1 Process Variables
1 Pressure Variables
2 Percent Range
3 Analog Output
4 Sensor Temp

2 Diagnostics and Service
1 Test Device
2 Loop Test
3 Calibration

Self Test

1 Scaled D/A Trim
2 Re-range
3 Sensor trim
4. Temperature Override
   (available on some models)

3 Basic Setup
1 Tag
2 Pressure Limit
3 Damping
4 Re-range
5 Device Info.

1 in H2O
2 in Hg
3 psi
4 bar
5 kg/SqCm
6 kPo

1 keypad re-range
2 Apply values

4 Detailed Setup

1.Sensors
1 Pressure
2 Sensor temp
3 Pressure Unit
4 Sensor trim

2.Signal Condition
1 Damping
2 Re-range

3.Output Condition
1 AOL
2 Pressure AO Alarm
3 Analog Output
4 Hart Output

1 Loop Test
2 Scaled D/ATRM

1 Poll Address
2 Number of Request Preamble

4.Device Information
1 Model
2 Tag
3 Date
4 Descriptor
5 Message
6 PV Snsr S/N
7 Final Assembly Num
8 Revision

1 Univ Rev.
2 Fld Dev Rev
3 Softw Rev

5 Review

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Connect the communicator (as shown in **Fig 2-3** or **2-4**) onto a loop containing a HART compatible device. Turn the communicator on. After initialization, the communicator will display the "Online" menu (**Fig 5-2**).

Fig. 5-2. Online Menu

```
IPX 195
  Online
  1.→ Device Setup
  2    PV        0 PSI
  3.   AO        4 mA
  4.   LRV       0 PSI
  5.   URV    5000 PSI
```

TAG I.D

The Tag ID is an 8 character alphanumeric descriptor used to identify the transmitter and appears at the top of the Online Menu. The I.D. is factory set to "18x" or "19x". The operator should input some descriptor to easily identify the device and prior to changing any configuration parameters, confirm the "Tag ID" of the device.

Tag ID is modified by moving through the menu structure as follows: Online menu, 'Device Setup, 'Basic Setup, 'Tag (see **Fig 5-3**).

Fig. 5-3 Menu/Selection sequence for confirming TAG ID.

```
IPX 195
  Online
  1.→ Device Setup
  2    PV        0 PSI
  3.   AO        4 mA
  4.   LRV       0 PSI
  5.   URV    5000 PSI
```

```
HART Communicator
  Device Setup
  1.   Process Variables
  2    Diagnostics
  3.→ Basic Setup
  4.   Detailed Setup
  5.   Review
```

```
IPX195
  Basic Setup
  1.→ Tag
  2    Unit
  3.   Range Values
  4.   Device Info
  5.   Xfer fnct Linear
```

If there are no changes made, return to the Basic Setup menu by pressing the "ESC" function key, otherwise, after entering the Tag I.D the device will return to the Basic Setup menu.

After changing device parameters, use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Online Menu by pressing the "HOME" function key.

PRESSURE VARIABLE (PV):

The pressure variable is displayed on the Online menu. The IPX can be configured to transmit the pressure in different user selected engineering units (see Pressure Units section following) or as a percentage of Full Scale (F.S.).

The desired selection (pressure or percent) is made by the moving through the menus in the following sequence:

Online menu, →Device Setup, →Process Variables and then selecting either "Pressure" or "Percent Range"

After changing device parameters, use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Online menu by pressing the "Home" function key.

PRESSURE UNITS:

The engineering units that the process variable (pressure) is displayed in can be selected from the "Pressure Units" menu. This menu is accessed by moving through the menu structure as follows:

Online menu, →Device Setup, →Basic Setup, →Pressure Units.

The available units are determined by (i.e. stored in) the transmitter. Scroll through and select the desired units by pressing the "ENTER" function key and accepting with the "OK" function key.

After changing device parameters, use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Main menu by pressing the "Home" function key.

LOWER RANGE VALUE (LRV):

LRV is the input value (pressure) for which the analog output is intended to be 4mA. This value can be adjusted between 0 and 80 % of the devices range.

Caution-As noted above, remove the transmitter from any process control loop prior to modification of LRV.

LRV is accessed by moving through the menu structure as follows:

Online menu, →Device Setup, →Basic Setup, →Rerange

The operator is then prompted as to whether direct modification (→Keypad rerange) of the current LRV value is desired or an applied pressure (→Apply values) will be used.

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After changing device parameters, use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Online menu by pressing the "HOME" function key.

Note- An optional analog re-zero is available on IPX18x models.

UPPER RANGE VALUE (URV):

URV is the input value (pressure) for which the analog output is intended to be 20mA. Adjustment of URV effectively establishes the turn-down of the transmitter (i.e. entering a URV which corresponds to 25% of the devices Range corresponds to 4:1 turndown). Refer to the each Models Specification for specific turn-down capability.

URV is accessed by moving through the menu structure as follows:

Online menu, →Device Setup, →Basic Setup, →Rerange

Selecting "URV" from this menu will result in the current value being displayed and prompt the operator as to whether direct modification (→Keypad rerange) of the current URV value is desired or an applied pressure(→Apply values) will be used.

After changing device parameters, use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Online menu by pressing the "HOME" function key

DAMPING :

Output damping basically implements a running average of the digitized pressure values. Three different levels of damping are available: Fast (no damping), Moderate (128 sample average), Slow (255 sample average).

The Damping function is accessed by moving through the menu structure as follows:

Online menu, →Device Setup, →Basic Setup.   Select the desired damping level and the device returns to the Basic Setup menu.

After changing device parameters, use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Online menu by pressing the "HOME" function key.

MESSAGE:

Message is a 35 character string used for descriptive information.

The message function is accessed by moving through the menu structure as follows:

Online menu, →Detailed Setup, →Device Info,

Use the down arrow key (↓) to scroll down the menu list to item-8 "→Message".

After changing device parameters, press "ENTER" function key to return to the Device Info menu.

Use the "SEND" function key to transmit the modified parameter to the transmitter.

Return to the Online menu by pressing the "HOME" function key.

CALIBRATION:

The IPX transmitters are rigorously calibrated over the entire process and ambient temperature operating conditions and have correction tables stored in memory. These tables cannot be altered by the customer. The customer, however, can rezero or respan the device effectively introducing additional corrections that are used in conjunction with the tables. While the device is theoretically corrected for process temperature, there is an allowance of 0.15%/55° C for ambient temperature shifts. The customer may be eliminating this portion of the error by re-zero-ing at operating temperatures provided he is assured there is no pressure being applied to the sensing tip.

Sensor Trim:

Consult the Factory...Customer adjustment of this parameter is not recommended.

D/A Trim:

Consult the Factory...Customer adjustment of this parameter is not recommended.

6A. MAINTENANCE

How to achieve the highest possible measurement accuracy and extend the life of your Intelligent Pressure Transmitter.

Proper handling and installation practices will help ensure optimum performance from Dynisco's IPX/PX Series of Intelligent Pressure Transmitters. The largest single contributor to premature pressure transmitter failure continues to be improper mounting and handling. The mounting hole drawings have been designed to provide reliable operation while utilizing standard machine tool dimensions.

6B. TROUBLESHOOTING HART NETWORK COMMUNICATION PROBLEMS

Synopsis:

Methods for troubleshooting HART Networks that are experiencing problems communicating between a Field Device and a 275 HART Communicator.

• Required information for technical assistance and documentation

Hardware: Manufacturer and model of Control Systems?
Manufacturer and model of Field Device?
Loop diagram of the problem loop

Location: Look at plant layout, proximity to other equipment?
Does HART Communication work when certain devices or processes are not running?
What is the total cable length run from the termination panel to the Field device?

Alarms: What does the 275 say on its screen when attempting to communicate with field device?
(i.e. device not found)

Quantities: How many HART loops are there in facility?
How many HART loops are failing
(i.e. no communication?)

• Troubleshooting Tips

1. Verify loop current and voltage on the Field device. Almost all field devices need at least 4mA and 12 VDC to operate properly.
2. If the field device is set for multidrop mode then set HART Communicator to digital polling mode?

3. Inspection of the loop wiring can often times reveal problems. The shield is normally grounded at one end only, which is usually the control systems. If so, then it should be floating (taped back at the Field device end). See Figure1.
4. Does the control system have HART communication capabilities? Is it configured to communicate HART currently? If so, is it reporting communication problems? If not, stop HART communications on the control system and test communication with the 275 HART Communicator again.
5. If an Analog input point verify that the loop has a minimum of 250 ohms resistance. This can be calculated by measuring the DC voltage across the control system field termination blocks and dividing the current that the transmitter is currently putting on the loop (i.e. Voltage = Current * Resistance—→ Resistance = Voltage / Current) or consulting the control system manuals for value. Regardless of the value measured, add an additional 250 ohms of resistance in series with the loop and place 275 HART Communicator leads across resistor and verify if communication is restored. See Figure 1.
6. Try placing an external 0.1 microfarad (uF) to 0.22uF (Capacitor parameters: working voltage: 100 VDC, no polarity) across the terminal blocks going out to transmitter. Verify if communication has been restored to the loop by connecting the 275 Communicator. If communication improves, this may indicate a noise problem. See Figure 1.
7. If step 6 allows communication, but not reliably then try adding an additional 250 ohms of resistance in series with the loop.
8. If an oscilloscope is available for use then use it to look for noise on the loop. It is necessary to use a scope with differential mode capablity to avoid grounding one side of the loop. Noise with a frequency of 800 Hz to 3300 Hz is of particular interest, as this represents frequencies near the HART frequencies of 1200 and 2200 Hz.

Figure 1

49
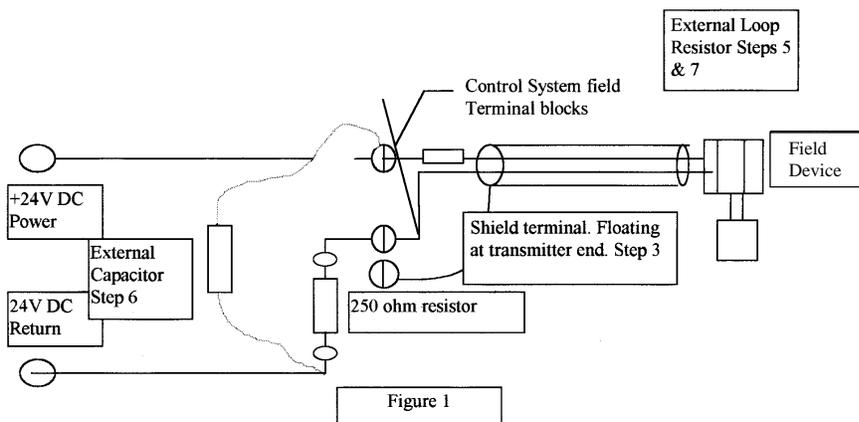
7. SUPPORT

7.1 Warranty

The IPX/PX is sold subject to the mutual agreement that it is warranted by us to be free from defects of material and constructions but our liability in connection with it shall be limited to repairing or replacing without charge at our factory any material or construction defects which become apparent within one year from the date on which the equipment is shipped, that we have no liability for damages of any kind arising from the installation and/or use of the apparatus by anyone and the purchaser by the acceptance of this equipment will assume all liability from any damages which may result from its use or misuse by the purchaser, his or her employees or by others. There is no guarantee, warranty or liability except as here stated.

7.2 Service

Should the equipment require service or repair, please call the Dynisco Service Department at 508-541-9400 or 1-800-DYNISCO for a Return Authorization Number. Return it freight prepaid to...

DYNISCO MEASUREMENT & CONTROL

38 Forge Parkway

Franklin, MA 02038

8. MOUNTING PORT CONFIGURATIONS

Mounting

The recommended mounting port for IPX/PX Series transmitters are shown below. Failure to use the recommended mounting hole may result in erroneous pressure measurement, difficult transmitter removal, premature sensor failure, process fluid leaks, and personnel hazard. In applications involving high temperature operation and/or repeated thermal cycling a good, high quality anti-seize compound should be applied to threaded surfaces.

The electronics housing may require separate support using the optional pipe-mounting bracket, particularly in high vibration environments.

IPX 182/IPX 192 Mounting Port
PX 182/PX 192 Mounting Port

1/2-20 UNF-2B

⊚ | Ø.004Ⓢ | A

.17
(4.3) MAX

Ø.314
.312

(Ø7.98
7.92)

-A-

Ø.515
(Ø13.08) MIN

Ø.458
.451

(Ø11.63
11.46)

46°
45°

.225
(5.72) MIN

.75
(19)
MIN FULL THD

SNOUT LENGTH - .200
(5.08)

DIMENSIONS ARE IN   IN
(MM)

51
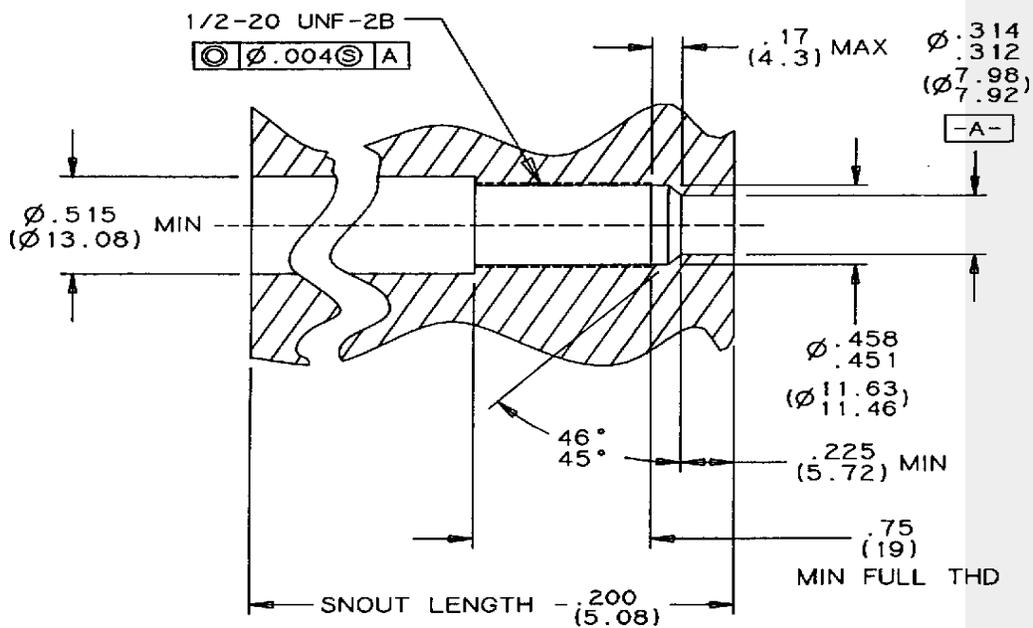
IPX 184/IPX 194 Mounting Port
PX 184/PX 194 Mounting Port
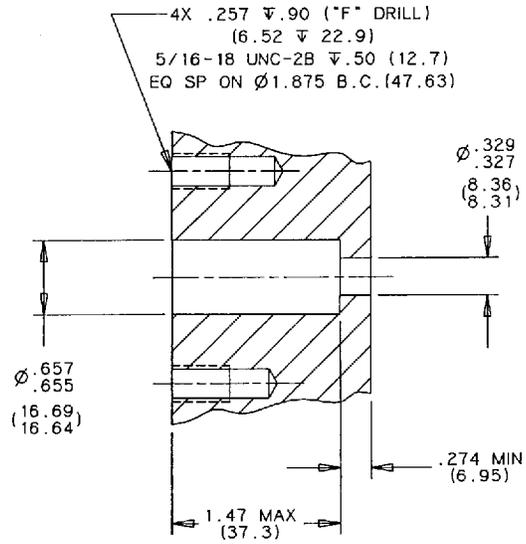
IPX 185/IPX 195 Mounting Port
PX 185/PX 195 Mounting Port
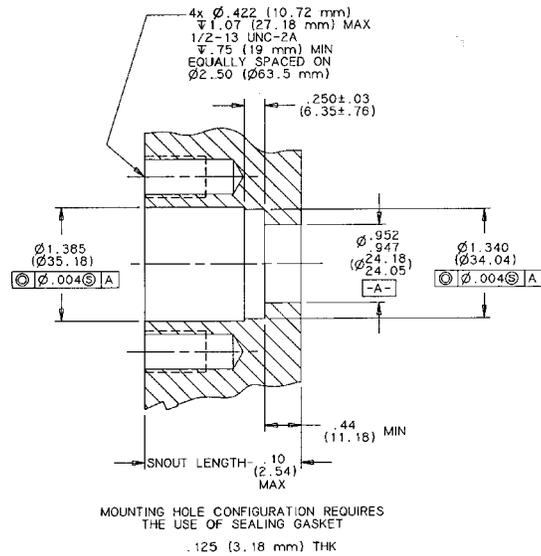
DIMENSIONS ARE IN IN (MM)

9. OUTLINE DRAWINGS

IPX /PX 182 C-182001

NOTES:

1. ALL DIMENSIONS ARE IN INCHES (MILLIMETERS)

△ 2. FLEX LENGTH + RIGID STEM LENGTH NOT TO EXCEED 36 inches TOTAL.
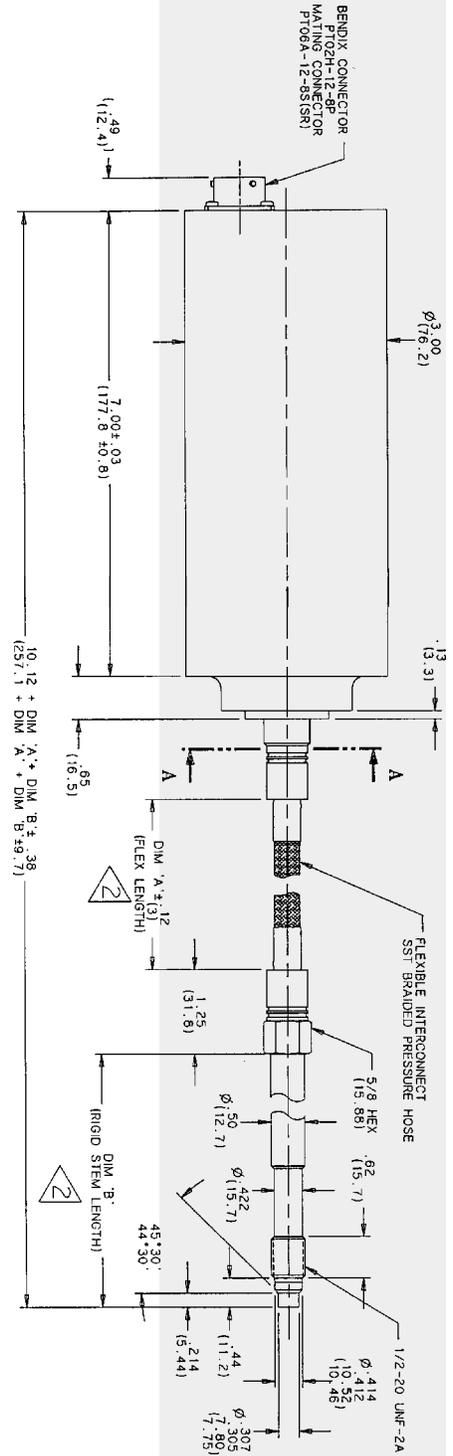
ELECTRICAL CONNECTIONS:
BENDIX CONN PT02H-12-8P

PIN A FUNCTION EXC+/SIG+
PIN B FUNCTION EXC-/SIG-
PIN C NO CONNECTION
PIN D FUNCTION RTD (+)
PIN E FUNCTION RTD (-)
PIN F FUNCTION RTD (-)
PIN G NO CONNECTION
PIN H NO CONNECTION

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IPX/PX 184 C-184007

IPX/PX 185 C-185001 (flex)

FOR MODEL NUMBER:

IPX185X - XX - XX/XX - M252

BASIC MODEL NO.

DIAPHRAGM TIP MATERIAL
BLANK = 17-4 PH SST TIP
H = HASTELLOY TIP

PRESSURE RANGE
7.5C = 0- 750 PSIG
1.5M = 0-1500 PSIG
3M = 0-3000 PSIG
5M = 0-5000 PSIG

RIGID STEM LENGTH - (VARIABLE)
(DIM 'B' IN INCHES
(DIM 'B' IN (MILLIMETERS)

FLEXIBLE LENGTH - (VARIABLE)
(DIM 'A' IN INCHES
(DIM 'A' IN (MILLIMETERS)
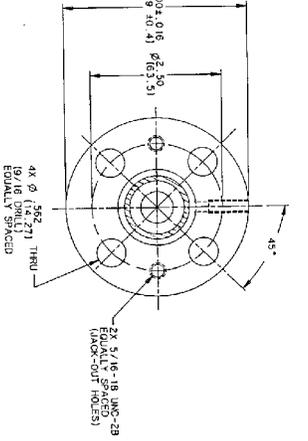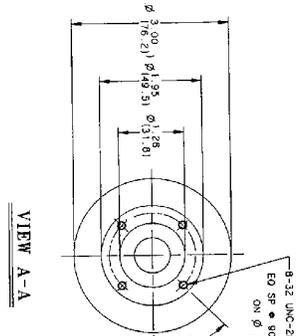
OPTION CODE
FOR SETSCREW
SECURED FLANGE

VIEW A-A

VIEW B-B

ELECTRICAL CONNECTIONS: BENDIX CONN PT02H-12-8P
PIN A FUNCTION EXC+/SIG+   PIN E FUNCTION RTD (-)
PIN B FUNCTION EXC-/SIG-   PIN F FUNCTION RTD (-)
PIN C NO CONNECT   PIN G NO CONNECT
PIN D FUNCTION RTD (+)   PIN H NO CONNECT

DIMENSIONS ARE IN   IN
                     (MM)

55

IPX/PX 185 C-185004 (rigid)
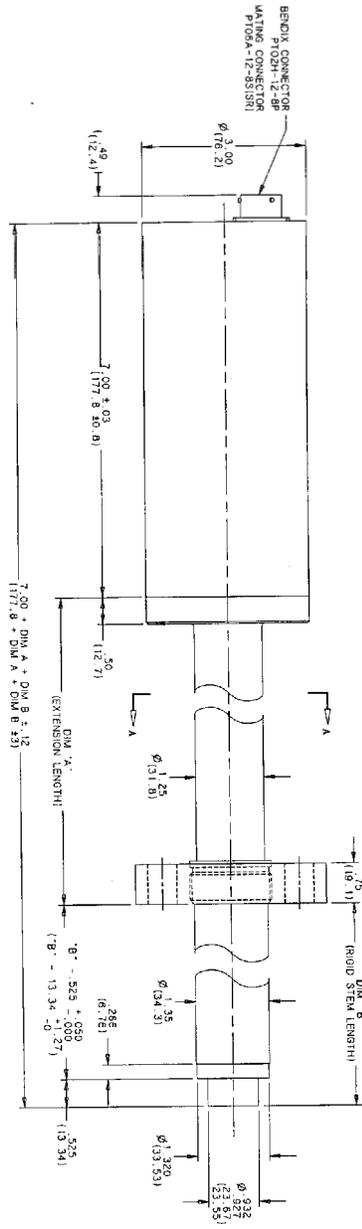
FOR MODEL NUMBER:

IPX185X - XX - XX/RX

BASIC MODEL

DIAPHRAGM TIP MATERIAL
BLANK = 17-4 PH SST
"H" = HASTELLOY

PRESSURE RANGE
7.5C = 0-750 PSIG
1.5M = 0-1500 PSIG
3M = 0-3000 PSIG
5M = 0-5000 PSIG

RIGID STEM LENGTH
- VARIABLE -
"INCHES"
(DIM "B" IN (MILLIMETERS))

EXTENSION LENGTH
- VARIABLE -
INCHES
(DIM "A" IN (MILLIMETERS))

ELECTRICAL CONNECTIONS: BENDIX CONN PT02H-12-8P
PIN A FUNCTION EXC+/SIG+   PIN E FUNCTION RTD (-)
PIN B FUNCTION EXC-/SIG-   PIN F FUNCTION RTD (-)
PIN C NO CONNECT   PIN G NO CONNECT
PIN D FUNCTION RTD (+)   PIN H NO CONNECT

VIEW A-A

DIMENSIONS ARE IN
IN
(MM)

IPX/PX 192

NPT PORT PLUG(S)

3.88
(98.55)

2.51
(63.7)

1.92
(48.9)

FLEXIBLE
BRAIDED
HOSE

DIM "A" ± .12 in/ft
(±10mm /M)

2.25
(57.1)

Bracket / Mtg Kit
Ordered Separately
P/N 195901

U-CLAMP 3/8-16 THD
PIPE TO BRKT MTG

1.25
(31.75)

5/8 HEX

DIM "B"
RIGID STEM LENGTH

$\varnothing$ .50
(12.7)

$\varnothing$ .42
(10.7)

1/2-20 UNF-2A

.44
(11.2)

45° ±30'

.214
(5.44)

$\varnothing$ .412 -. 414
(10.46- 10.52)

$\varnothing$ .305 - .307
(7.75 - 7.80)

4.43
(112.5)

$\varnothing$ 3.28
(83.3)

ELEC CONNECTIONS
1/2-14 NPT, BOTH SIDES

4X 8-32 SHCS
HOUSING TO
BRACKET MTG

4.76
(120.9)

4.13
(105)

ANSI 2" PIPE
($\varnothing$ 2.375)

4X $\varnothing$ 11/32
MTG HOLES

90°
(ALT MTG)

2.88 typ
(73.2)

4.00
(101.6)

FOR MODEL NUMBER:

IPX192 XX-XX-XXX/XX-XXXX @XXX

BASIC MODEL NO.

DIAPHRAGM MATERIAL
BLANK = 15-5 PH SST
H = HASTELLOY

BLANK (STD)
"I" = LOCAL LCD DISPLAY

PRESSURE RANGE
750 PSIG - 10.000 PSIG (OR METRIC EQUIVALENTS)
B = BAR, K = kg/cm², mPA = MEGAPASCALS UNIT
ABBREVIATIONS AS FOLLOWS: 100'S = C, 1000'S = M

SNOUT LENGTH IN INCHES
(VARIABLE, 24" MAX)
DIM "B"

BLANK (FUTURE USE)

FLEX LENGTH IN INCHES
(VARIABLE, 36" MAX)
DIM "A"

APPROVED OPTION CODES
M535 = COMPENSATED TO 400°C. (PROCESS TEMP)
B228 = ALTERNATE FULL SCALE SETTING
M625 = TEMPERATURE COMPENSATION TO 350°C
M626 = RANGES GREATER THAN 1.5M ARE .15% F.S.B.S.L.

ALTERNATE FULL SCALE
PRESSURE RANGE SETTING

NOTES:
1. ALL TRANSDUCERS SUPLIED WITH A SNOUT PROTECTIVE CAP, P/N 598029.
2. BRACKET MOUNTING KIT, P/N 195901 ORDERED SEPARATELY.
3. ALL DIMENSIONS ARE in. / mm .

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IPX/PX 194

NPT PORT PLUG(S)

3.88 (98.55)

2.51 (63.8)

1.92 (48.8)

FLEXIBLE BRAIDED HOSE

DIM "A" ±.12 in/ft (± 10mm /M)

2.25 ±.25 (57.2 ± 6.3)

1.00 (25.4 mm) WRENCH FLATS

A — A

DIM "B" RIGID SNOUT LENGTH

.50 (12.7)

.688 (17.5)

⌀.65 (16.5)

SEE DETAIL "A"

.266 (6.8)

.09 (2.3)

⌀.618 (15.7)

⌀.303 - .305 (7.75 - 7.8)

2.25 (57.1)

Bracket / Mtg Kit Ordered Separately P/N 195901

U-CLAMP 3/8-16 THD PIPE TO BRKT MTG

FOR MODEL NUMBER: *IPX194 XX-XX-XXX/XX-XXXX@XXX*

BASIC MODEL NO

DIAPHRAGM MATERIAL
BLANK = 15-5 PH SST
H = HASTELLOY

BLANK (STD)
"I" = LOCAL LCD DISPLAY

PRESSURE RANGE
750 PSIG - 10,000 PSIG (OR METRIC EQUIVALENTS)
B = BAR, K = kg/cm², mPa = MEGAPASCALS UNIT
ABBREVIATIONS AS FOLLOWS: 100'S = C, 1000'S = M

SNOUT LENGTH IN INCHES
(VARIABLE, 24" MAX)
DIM "B"

BLANK = STANDARD FLANGE
"LETTER" = ANSI-TYPE FLANGE
(SEE DYNISCO DWG 000069)

FLEX LENGTH IN INCHES
(VARIABLE, 36" MAX)
DIM "A"

ALTERNATE FULL SCALE
PRESSURE RANGE SETTING

APPROVED OPTION CODES
M480 = W/ 2.00" DIA B.C.
M535 = COMPENSATED TO 400°C, (PROCESS TEMP)
B228 = ALTERNATE FULL SCALING SETTING
M625 = TEMPERATURE COMPENSATION TO 350°C
M626 = RANGES GREATER THAN 1.5M ARE 0.15% F.S.B.S.L

NOTES:
1. EACH TRANSDUCER SUPPLIED WITH A DIAPHRAGM PROTECTIVE CAP, P/N 593427.
2. RECOMMENDED MOUNTING TORQUE FOR (STD) FLANGE BOLTS IS 55 ± 15 in/LBS.
◁ 3. GROOVE DESIGNED FOR VENTED METAL O-RING, P/N 652116.
4. BRACKET MOUNTING KIT, P/N 195901 ORDERED SEPARATELY.
5. ALL DIMENSIONS ARE in. / mm .

4.43 (112.5)

⌀ 3.28 (83.3)

ELEC CONNECTIONS 1/2-14 NPT, BOTH SIDES

4X 8-32 SHCS HOUSING TO BRACKET MTG

4.76 (120.9)

4.13 (105)

ANSI 2" PIPE (⌀ 2.375)

4X ⌀ 11/32 MTG HOLES

2.88 typ (73.2)

90° (ALT MTG)

4.00 (101.6)

DETAIL "A"

⌀.507 +.000 −.002
(⌀12.88 +0 −0.05)

.042 - .047 (1.07 - 1.2)

.082 (2.08)

◁3

O-RING GROOVE

VIEW A-A

2.500 (63.5)

⌀ 1.876 (47.7)

45°

2X 5/16-24 THD THRU EQ SP 180° APART

4X ⌀.344 THRU (8.74)

⌀.500 ⌵.344
(12.7 ⌵ 8.74)

NOTES:
1. EACH TRANSDUCER SUPPLIED W/ SNOUT PROTECTIVE CAP, P/N 593427.
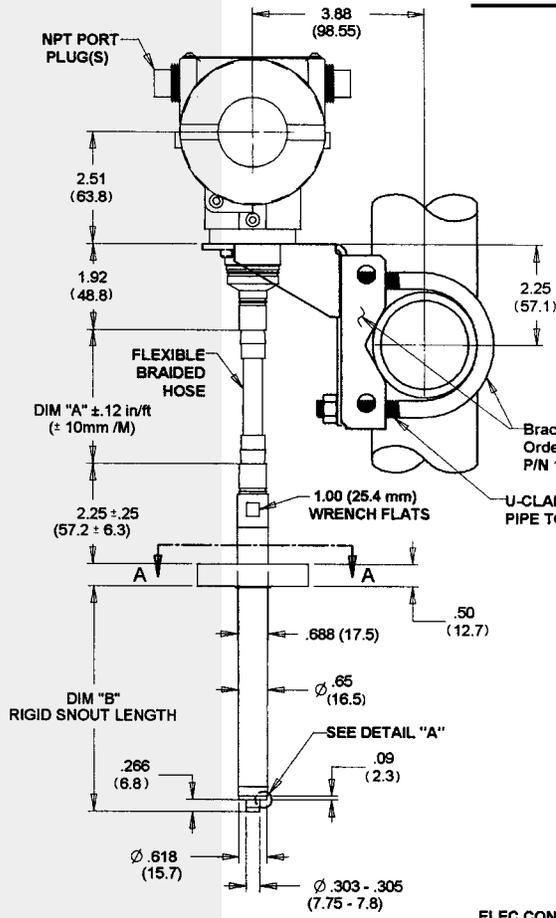2. RECOMMENDED MTG TORQUE FOR FLANGE BOLTS IS 55± 15 in/lbs.
◁3. GROOVE DESIGNED FOR VENTED METAL O-RING, P/N 652116.
4. BRACKET / MOUNTING KIT P/N 195901, ORDERED SEPARATELY.
5. ALL DIMENSIONS ARE in. / (mm).

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IPX/PX 195

NPT PORT PLUG(S)

3.88 (98.55)

2.51 (63.7)

1.92 (48.9)

FLEXIBLE BRAIDED HOSE

DIM "A" ± .12 in/ft (±10mm /M)

.76 (19.4)

1.35 (34.2)

1.25 Ø (31.7)

2.25 (57.1)

Bracket / Mtg Kit Ordered Separately P/N 195901

U-CLAMP 3/8-16 THD PIPE TO BRKT MTG

A   A

.75 (19.1)

1.00 in.FLATS (25.4 mm)

1/4-20 SET-SCR (FLANGE-LOCK)

DIM "B" RIGID STEM LG

1.35 Ø (34.3)

.27 (6.8)

.53 (13.3)

1.32 Ø (33.5)

OPTIONAL GASKET

Ø .927 - .932 (23.55 - 23.67)

4.43 (112.5)

Ø 3.28 (83.3)

ELEC CONNECTIONS 1/2-14 NPT, BOTH SIDES

4X 8-32 SHCS HOUSING TO BRACKET MTG

4.76 (120.8)

4.13 (105)

ANSI 2" PIPE (Ø 2.375)

4X Ø 11/32 MTG HOLES

2.88 typ (73.2)

90° (ALT MTG)

4.00 (101.6)

SECTION A-A

4X Ø .562 THRU EQ SPACED (14.3)

2X 5/16-18 UNC-2B EQUALLY SPACED (JACK-OUT HOLES)

Ø 3.50 ±.016 (88.9 ±0.4)

Ø 2.50 (63.5)

NOTES:

.525 (13.3)

45°

1/4-20 SET-SCREW

OPTIC

1.320 (33.53)

Ø.938 (23.55-2

FOR MODEL NUMBER:

IPX195 XX-XX-XXX/XX-XXXX @XXX

BASIC MODEL NO.

DIAPHRAGM MATERIAL
BLANK = 15-5 PH SST
H   = HASTELLOY

BLANK (STD)
"I" = LOCAL LCD DISPLAY

PRESSURE RANGE
500 PSIG - 10,000 PSIG (OR METRIC EQUIVALENTS)
B = BAR, K = kg/cm², mPA = MEGAPASCALS UNIT
ABBREVIATIONS AS FOLLOWS: 100'S = C, 1000'S = M

SNOUT LENGTH IN INCHES
(VARIABLE, 18" MAX)
DIM "B"

ALTERNATE FULL SCALE PRESSURE RANGE SETTING

APPROVED OPTION CODES
M555 = PT290-STYLE SNOUT
M571 = WELDED FLANGE
B228 = ALTERNATE FULL SCALE SETTING
M625 = TEMPERATURE COMPENSATION TO 350°C
M626 = RANGES GREATER THAN 1.5M ARE .15% F.S.B.S.L.

FLEX LENGTH IN INCHES
(VARIABLE, 36" MAX)
DIM "A"

BLANK = STANDARD FLANGE
"LETTER" = ANSI-TYPE FLANGE
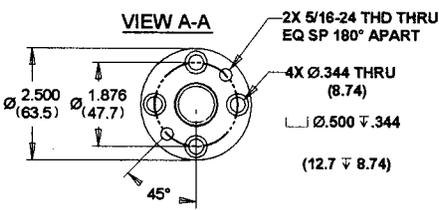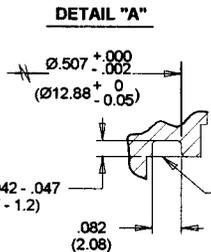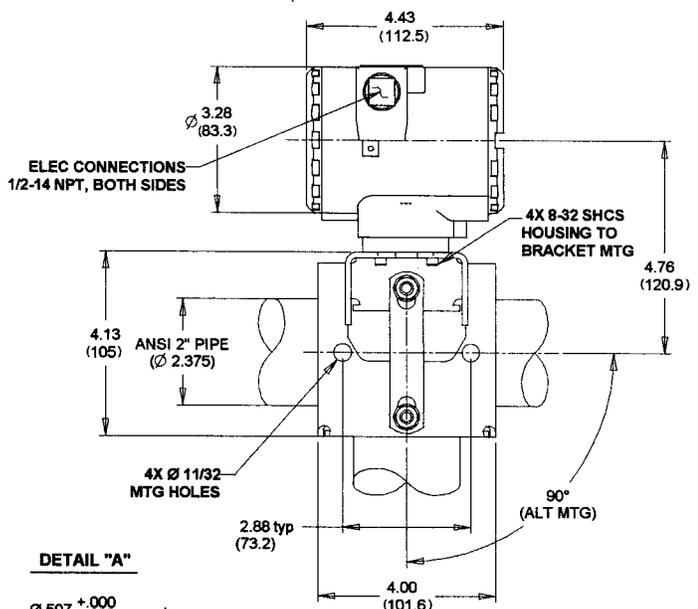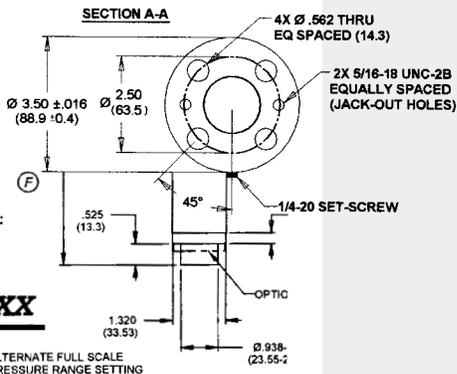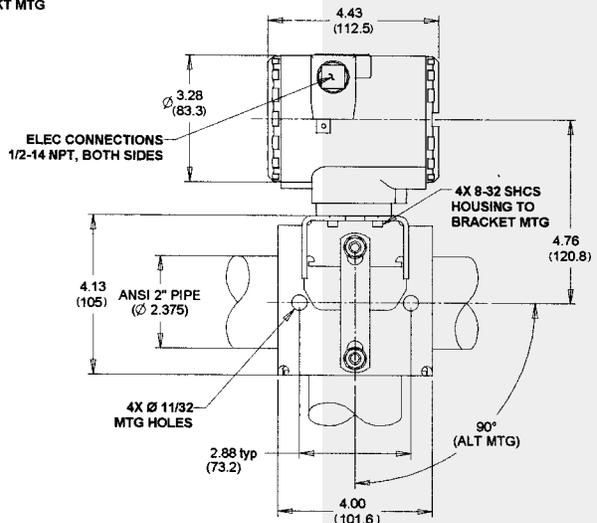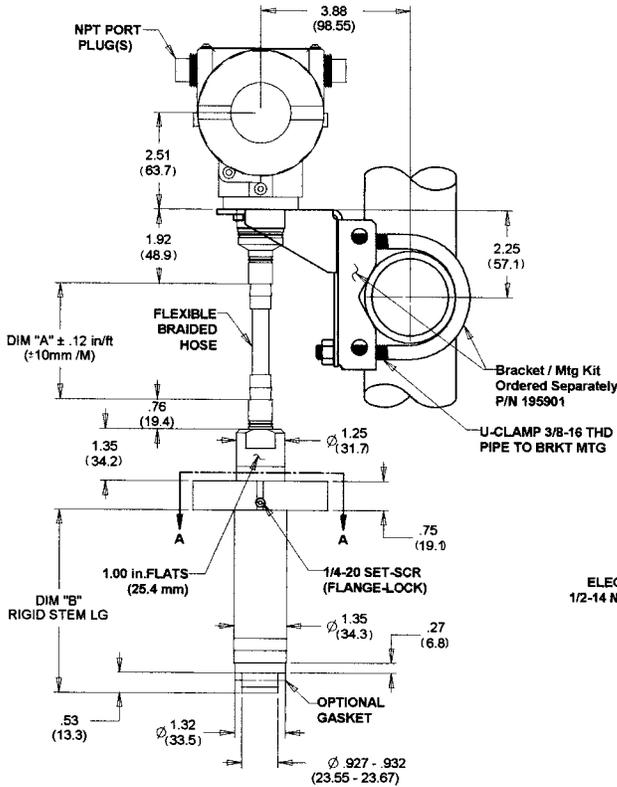(SEE DYNISCO DWG 000069)

NOTES:

1. ALL TRANSDUCERS SUPLIED WITH A DIAPHRAGM PROTECTIVE CAP, P/N 450636.
2. BRACKET MOUNTING KIT, P/N 195901 ORDERED SEPARATELY.
3. ALL DIMENSIONS ARE in. / mm .

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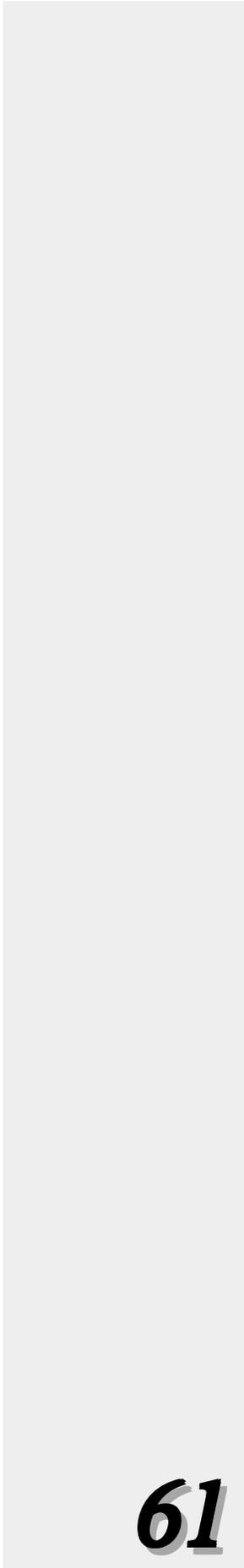
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DYNISCO INSTRUMENTS

38 Forge Parkway

Franklin, MA 02038

Tel.: 508-541-9400

Fax: 508-541-9436

Dynisco
Instruments

Model IPX/PX Quick Start Instructions

This Quick Set-up Guide is designed for existing users of the HART 275 Communicator and loop powered instrumentation.

1. Install unit into process connection. Insure the hole is clean and precise to prevent diaphragm damage.
There should be NO pressure to the unit at this time.

2. Connect power to the unit (12-36VDC)

(17-36 for IPX/PX 19X series with display)

3. Connect 275HC to loop power

4. Scroll to Device Set-up
   a. Scroll to Basic Setup
   - enter tag
   - enter engineering unit
   - rerange
   b. Set-up range unit
   c. Set-up LRV
   d. Set-up URV

5. Scroll to Detailed Device Set-up
   a. Scroll to Sensors
   b. Scroll to sensor trim
   c. After unit is mounted in desired position, and with no pressure set 4mA trim
   - apply zero input to sensor
   - ok
   - sensor input stabilizing
   - sensor zero succeeded
   - Loop can now be put back into automatic

6. Remove HART 275 from Loop

IPX/PX Online Menu Tree

IPX/PX

Onllne Menu

| 1 Offline |
| 2 Online |
| 3 Frequency Device |
| 4 Utility |

| 1 Device Setup |
| 2 PV |
| 3 AO |
| 4 LRU |
| 5 URV |

1 Process Variables
- 1 Pressure Variables
- 2 Percent Range
- 3 Analog Output
- 4 Sensor Temp

2 Diagnostics and Service
- 1 Test Device — Self Test
- 2 Loop Test
- 3 Calibration
  - 1 Scaled D/A Trim
  - 2 Re-range
  - 3 Sensor trim
  - 4 Temperature Override (Available on some models)

3 Basic Setup
- 1 Tag
- 2 Pressure Limit
  - 1 in H2O
  - 2 in Hg
  - 3 psi
  - 4 bar
  - 5 kg/SqCm
  - 6 kPo
- 3 Damping
- 4 Re-range
- 5 Device Info.
  - 1 keypad re-range
  - 2 Apply values

4 Detailed Setup
- 1.Sensors
  - 1 Pressure
  - 2 Sensor temp
  - 3 Pressure Unit
  - 4 Sensor trim
- 2.Signal Condition
  - 1 Damping
  - 2 Re-range
- 3.Output Condition
  - 1 AOL
  - 2 Pressure AO Alarm
  - 3 Analog Output
  - 4 Hart Output
    - 1 Loop Test
    - 2 Scaled D/ATRM
    - 1 Poll Address
    - 2 Number of Request Preamble
- 4.Device Information
  - 1 Model
  - 2 Tag
  - 3 Date
  - 4 Descriptor
  - 5 Message
  - 6 PV Snsr S/N
  - 7 Final Assembly Num
  - 8 Revision
    - 1 Univ Rev.
    - 2 Fld Dev Rev
    - 3 Softw Rev

5 Review

Dynisco *Instruments*

Dynisco
Instruments

WARRANTY REGISTRATION CARD

MODEL NUMBER _____

SERIAL NUMBER _____

DATE PURCHASED _____

PURCHASED FROM: _____

NAME _____

COMPANY _____

DIVISION _____

STREET _____

CITY _____ STATE _____ ZIP _____

COUNTRY _____

TELEPHONE _____ FAX _____

My application is _____

Is this your first purchase from Dynisco?   YES _____   NO _____

How did you first hear of Dynisco?   ADVERTISING _____ REP _____

PREVIOUS USE _____ COLLEAGUE _____ DIRECTORY _____

I need further product information on _____

I need application help on _____

Please send complete catalog_____

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PLEASE FOLD AND STAPLE OR TAPE

Dynisco
Instruments

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ATTN: MARKETING DEPT.