

# PT140/PT274 Series 4 - 20 mA Industrial Hydraulic Pressure Transmitters










OPERATING MANUAL



P/N 974136  
01/06 Rev. A  
ECO # 30965

 **Dynisco**

## TABLE OF CONTENTS

	Content	Page	Icon
1.	General	3	
2.	Notes on Safety	5	
3.	Technical Data	6	
4.	Transport/Delivery	10	
5.	Installation	11	
6.	Commissioning	12	
7.	Maintenance	14	
8.	Troubleshooting	15	
10.	CE-Declaration of Conformity	16	



# 1. GENERAL

1.1	Important Information .....	3
1.2	Copyright .....	3
1.3	Explanation of Icons .....	3
1.4	Abbreviations .....	4
1.5	Overview .....	4
1.6	Transmitter Principle of Operation .....	4

## 1.1 IMPORTANT INFORMATION

This manual applies to the PT140 and PT274 products only. It must be kept near the equipment in a readily and immediately accessible location at all times. The content of this manual must be read, understood and followed in its entirety. This applies in particular to the notes on safety. Following the safety instructions will help to prevent accidents, defects and malfunctions.

**DYNISCO** will not be held liable for any injury, loss or damage resulting from failure to follow the instructions in this manual.

If the product malfunctions, in spite of having followed the operating instructions, please contact the **DYNISCO** customer service department (See the back of the manual for contact information). This applies in particular during the warranty period.

## 1.2 COPYRIGHT

Copyright law requires that this manual be used for intended purposes only.

It is strictly forbidden to allow reproduction of any kind “in whole or in part” to persons outside of Dynisco, without approval from Dynisco.

## 1.3 EXPLANATION OF ICONS

The manual uses icons to indicate information pertaining to safety:

**ATTENTION** Risk of destruction or damage to equipment, machines or installations



General danger to life or limb



Specific danger to life or limb



You **MUST** do this

The safety instructions are provided again in the individual chapters of the manual.

## 1.4 ABBREVIATIONS

The following abbreviations are used:

OM	Operating Manual
PT	Pressure Transmitter
f.s.	of full scale
BFSL	Best Fit Straight Line

## 1.5 OVERVIEW

The Dynisco PT140 and PT274 are 4 - 20 mA pressure transmitter. The pressure sensing technology is bonded foil strain gage the same as other Dynisco products, proven in such rugged applications such as automotive hydraulic applications. The rugged construction is ideal for harsh industrial environments.

## 1.6 TRANSMITTER PRINCIPLE OF OPERATION

Through a diaphragm, the pressure transmitter furnishes an electrical signal that is proportional to the pressure of the medium.

The pressure applied by the medium is forwarded to the measuring diaphragm. The deflection of the measuring diaphragm changes the resistance of the strain gauge bonded to the measuring diaphragm. The strain gage is a Wheatstone bridge.

## 2. NOTES ON SAFETY



The operator or owner of the larger overall system is responsible for following the safety and accident prevention regulations that apply to the specific application.

The equipment is designed and manufactured to:

- Avoid physical injury or harm, which may be caused by direct or indirect contact.
- Assure that the surface temperature of accessible parts or radiation, which would cause danger, is not produced.
- Eliminate non-electrical dangers, which are revealed by experience.
- Assure that foreseeable conditions of overload shall not give rise to dangerous situations.



When planning machinery and using the PT, follow the safety and accident prevention regulations that apply to your application, e.g.:

- EN 60204, Electrical equipment in machines.
- EN 292, Machine safety, general design guidelines.
- DIN 57 100 Part 410, Protection against electric shock.

Higher temperatures can result in damage and malfunction. Do not install the pressure transmitter in places where this temperature is exceeded.



Mounting and electrical connection of the PT must be done by specialists with EMC training, following all applicable regulations, and in **pressureless, voltage-free, intrinsically safe** condition with the **machine switched off**.

**The machine must be secured against being switched back on!**

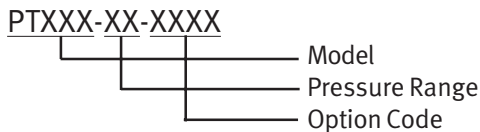


### 3. TECHNICAL DATA

3.1	Ordering Guide .....	6
3.2	Ordering Example .....	6
3.3	Process Connections .....	6
3.4	Pressure Range - Full Scale .....	7
3.5	Option Codes .....	7
3.6	Output .....	7
3.7	Zero & Span Adjustments .....	7
3.8	Performance Characteristics .....	7
3.8.1	Combined Error (Accuracy) .....	7
3.8.2	Repeatability .....	7
3.8.3	Max. Pressure (without Influencing Operating Data) .....	8
3.8.4	Burst Pressure .....	8
3.8.5	Input Voltage .....	8
3.9	Temperature Influence .....	8
3.10	EMC Requirements .....	8
3.11	Materials .....	8
3.12	Environmental Protection .....	8
3.13	Dimensions .....	9

#### 3.1 ORDERING GUIDE

The exact meanings of the letter/digit combinations are given in the corresponding sections of Chapter 3.



#### 3.2 ORDERING EXAMPLE



#### 3.3 PROCESS CONNECTIONS

PT140: 1/8-27 NPT Internal  
 PT274: 1/4-18 NPT External

Other process connections are available. Please consult factory for appropriate option code.



### 3.4 PRESSURE RANGE - FULL SCALE

PTXXX-XX-XXX

psi	Order Code		
15	15	1000	1M
25	25	1500	1.5M
50	750	2000	2M
100	1C	3000	3M
250	2.5C	5000	5M
500	5C	7500	7.5M
750	7.5C	10000	10M

Other ranges and pressure configurations may be available, please consult factory.

### 3.5 OPTION CODES

PTXXX-XX-XXX

Please consult factory for list of approved options.

### 3.6 OUTPUT

4 - 20 mA

### 3.7 ZERO & SPAN ADJUSTMENTS

PT140: No zero and span adjustments

PT274: Zero and span adjustments

### 3.8 PERFORMANCE CHARACTERISTICS

#### 3.8.1 COMBINED ERROR (ACCURACY)

Combined error is also known as accuracy which includes linearity, hysteresis and repeatability, and is determined by BFSL (Best Fit Straight Line).

PT274: ±0.25% of full scale

PT140: ±0.5% of full scale

#### 3.8.2 REPEATABILITY

±0.1% of full scale



### 3.8.3 MAX. PRESSURE (WITHOUT INFLUENCING OPERATING DATA)

2 x full scale pressure

### 3.8.4 BURST PRESSURE

5x full scale pressure

### 3.8.5 INPUT VOLTAGE

14 - 36 Vdc

## 3.9 TEMPERATURE INFLUENCE

### ELECTRONICS HOUSING

Housing Temperature Range                      -29°C to +85°C (-20°F to +185°F)

Zero shift due to temperature change on electronics housing

2% f.s./100°F max.

Sensitivity shift due to temperature change on the diaphragm.

2% f.s./100°F max.

### 3.10 EMC REQUIREMENTS

Conforming to CE in accordance with EMC directive.

Emitted interference              DIN EN 50081-1 (residential area)

Immunity                              DIN EN 50082-2 (industrial area)

### 3.11 MATERIALS

Standard Diaphragm                      15-5PH & 17-4PH Stainless Steel

### 3.12 ENVIRONMENTAL PROTECTION TO IEC 529

IP54      Pressure Transmitter without Connector

IP40      Pressure Transmitter with 711600 Connector

IP65      Pressure Transmitter with Do6 option

IP67      Pressure Transmitter with Do5 option

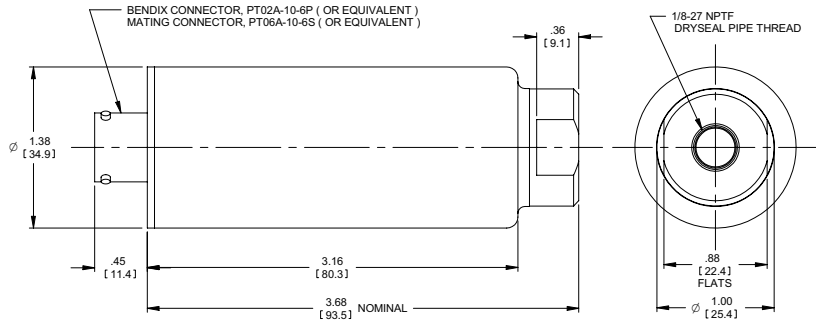




### 3.13 DIMENSIONS

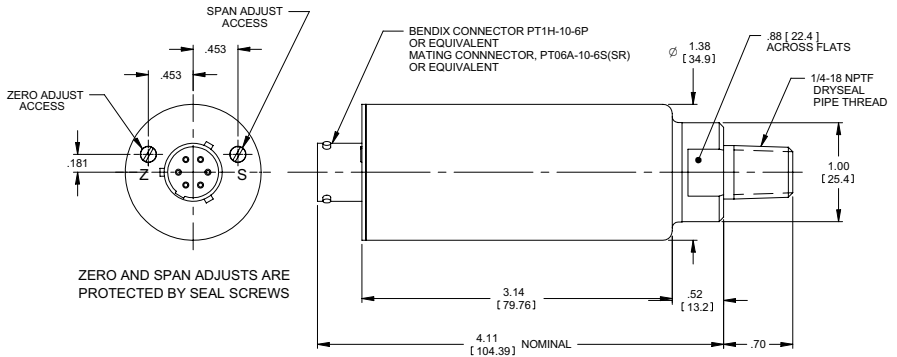
**Fig. 3-1 PT140**

WIRING	
PIN	FUNCTION
A	INPUT+
B	INPUT-



**Fig. 3-2 PT274**

WIRING	
PIN	FUNCTION
A	SIGNAL+
B	SIGNAL-
C	NO CONNECTION
D	NO CONNECTION
E	SHUNT CALIBRATION
F	SHUNT CALIBRATION



ZERO AND SPAN ADJUSTS ARE PROTECTED BY SEAL SCREWS

TECHNICAL DATA



## 4. TRANSPORT/DELIVERY

4.1	Transport/Packing/Transport Damage .....	15
4.2	Storage .....	15
4.3	Scope of Delivery .....	15

### 4.1 TRANSPORT/PACKING/TRANSPORT DAMAGE

- Do not let the PT be damaged by other items during transit.
- Use only the original packaging.
- Report transport damage to **DYNISCO** immediately in writing.

### 4.2 STORAGE

- Store the PT in original packaging only.
- Protect against dust and moisture.

### 4.3 SCOPE OF DELIVERY

- Pressure transmitter
- Calibration sheet
- Operating manual CD



# 5. INSTALLATION

5.1 General Mounting Information ..... 11  
 5.2 Wiring ..... 11

## 5.1 GENERAL MOUNTING INFORMATION

Insure the mounting hole is clear of any debris and is machined to the proper dimensions.

Install unit into/onto the process connection. (Do NOT torque transmitter at this time!) Allow time for the transmitter temperature to equalize to the process temperature. This will help eliminate thread galling and ease removal later. There should be NO pressure applied at this time.

Always use a torque wrench. Do not apply the tool to the housing or housing/sensor connection.

After temperatures have equalized tighten transmitter into process connection.

Before mounting the PT, check the process connection carefully.

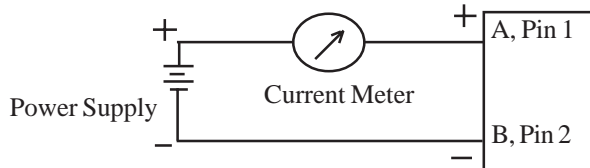
When removing the PT, carefully clean the process connection of the transmitter with a soft cloth while the medium is still malleable (if measuring a solid).

Careful attention should be paid in correctly machining the process connection. Failure to use the recommended mounting port may result in erroneous pressure measurement, difficult transducer removal, premature sensor failure, process 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 the threaded surfaces.

## 5.2 WIRING

Bendix Connector PTO2A-10-6P (or equivalent).

- Pin 1: Excitation +
- Pin 2: Excitation -
- Pin 3: Not Used
- Pin 4: Not Used
- Pin 5: Calibration
- Pin 6: Calibration





## 6. COMMISSIONING

6.1	Supply Voltage .....	12
6.2	Calibration and Zero .....	12
6.3	Zero and Span Adjustment - PT140 Only .....	12
6.4	Zero and Span Adjustment - PT274 Only .....	12

Before putting the PT into operation, make sure the PT is securely mounted and sealed.

### 6.1 SUPPLY VOLTAGE

Using supply voltage which is different from that stated in the technical specifications can cause the transmitter to malfunction.

Dynisco recommends 24 Vdc. Supply voltages of 14 - 36 Vdc are permitted.

### 6.2 CALIBRATION AND ZERO

All pressure transmitters have an internal calibration signal. Connecting pins 5 and 6 switches the calibration signal to the signal output. It is 80% of the full scale of the transmitter.

Calibrate in pressureless state and at room temperature. Other ambient temperatures will corrupt the signal.

Do not change the installed position of the PT after calibration. If the position is changed you must recalibrate.

#### 6.2.1 ZERO AND SPAN ADJUSTMENT - PT140 ONLY

The PT140 does not have zero and span adjustment....follow these steps to zero the transmitter.

- 1) Connect a meter or suitable display unit to the signal output.
- 2) Connect terminals 5 and 6. The calibration signal is connected to the output.
- 3) Set the calibration value (80% of nominal value) on the display unit.
- 4) Check the zero point setting on the display unit once again.
- 5) Readjust the zero point at operating temperature. Wait until a steady operating temperature is reached.
- 6) Set the zero point on the display unit.

#### 6.2.2 ZERO AND SPAN ADJUSTMENT - PT274 ONLY

The adjustment is made at two potentiometer screws in the cover section of the electronic housing.



1) Remove the cap screws from the potentiometers.

Zero pot is labelled as Z.

Span pot is labelled as S.

2) Connect a meter or suit

3) Adjust the zero pot adjusting screw “Z” and verify on the display.

4) Connect terminals 5 and 6. The calibration signal is connected to the output.

5) Adjust the calibration value (80% of nominal value) using the span pot adjusting screw “S” and verify on the display unit.

6) Check the zero point setting on the display unit once again.

7) Readjust the zero point if required, as noted in step 3.

8) Readjust the zero point at operating temperature. Wait until a steady operating temperature is reached.

9) Set the zero point, if required.



## 7. MAINTENANCE

7.1	Maintenance .....	25
7.2	Repair/Disposal .....	25
7.3	Warranty .....	25

### 7.1 MAINTENANCE

#### Installation and Removal Instructions

- PRIOR TO INITIAL INSTALLATION, VERIFY CORRECT MACHINING OF MOUNTING HOLE.
- WHEN REINSTALLING, MAKE SURE MOUNTING HOLE IS CLEAR OF DEBRIS.
- ALWAYS REMOVE THE PT BEFORE CLEANING THE MACHINE WITH ABRASIVES OR STEEL WIRE BRUSHES, ETC.
- DO NOT CLEAN THE “SCREWED-IN” SECTION OF THE PT WITH HARD OBJECTS – THIS WILL DAMAGE THE PT.
- ELECTROSTATIC DISCHARGE MAY DAMAGE THE PT – TAKE ESD PRECAUTIONS.

### 7.2 REPAIR/DISPOSAL

Please send defective PT units back to your DYNISCO representative.

For DYNISCO addresses, see the back cover of the operating manual.

### 7.3 WARRANTY

Dynisco Pressure transmitters will provide excellent service and superior performance if proper care is taken during handling, installation, and use. This DYNISCO product is warranted under terms and conditions set forth in the DYNISCO web pages. Go to [www.dynisco.com](http://www.dynisco.com) and click “warranty” at the bottom of any page for complete details.

MAINTENANCE



## 8. TROUBLESHOOTING

### Symptom

Output Not at Zero

### Corrective Actions

1) Perform Zero Adjustment

Output is Negative at Zero Pressure

1) Process temperature has cooled down since last Set Zero. Wait for process to fully heat up to operating temperature.

No response to changes in applied pressure

1) Check Port/Piping for blockage

Erroneous Pressure Reading

1) ) Was transmitter zeroed at process operating temperature with no pressure applied

Strong zero shift when screwing in

1) Mounting hole incorrectly produced (alignment error)  
2) Mounting torque too high...adjust to max 22NM.



## 10. CE DECLARATION OF CONFORMITY

ON-FILE AT DYNISCO





DyniscoLLC  
38 Forge Parkway  
Franklin, MA 02038  
USA

Tel: +1 508 541 9400  
Fax: +1 508 541 6206  
Email: [Infolnst@dynisco.com](mailto:Infolnst@dynisco.com)

Dynisco Europe GmbH  
Wannenäckerstraße 24  
74078 Heilbronn  
Deutschland

Tel: +49 7131 2970  
Fax: +49 7131 23260  
Email: [DyniscoEurope@dynisco.com](mailto:DyniscoEurope@dynisco.com)

Dynisco Instruments S.a.r.l.  
466, rue du Marché Rollay  
94500 Champigny sur Marne  
France

Tel: +33 1 4881 8459  
Fax: +33 1 4881 8334  
Email: [DyniscoFrance@dynisco.com](mailto:DyniscoFrance@dynisco.com)

Dynisco.s.r.l.  
Via Adriatico, 2/2  
20162 Milano  
Italia

Tel: +39 02 661 01733  
Fax: +39 02 661 02908  
Email: [DyniscoItaly@dynisco.com](mailto:DyniscoItaly@dynisco.com)

Dynisco UK Ltd.  
Unit 2B Crowood House  
Gipsy Lane  
Swinden NN2 8YY  
United Kingdom

Tel: +44 1527 577077  
Fax: +44 1527 577070  
Email: [DyniscoUK@dynisco.com](mailto:DyniscoUK@dynisco.com)

Dynisco SPOL, S.R.O.  
cp. 579  
756 55 Dolni Becva  
Czech Republic

Tel: +42 0571 647228  
Fax: +42 0571 647224  
Email: [Dynisco\\_cz@ova.pvtnet.cz](mailto:Dynisco_cz@ova.pvtnet.cz)

DDynisco B.V.  
Weidehek 53A  
4824 At Breda  
The Netherlands

Tel: +31 (0) 76 549 0530  
Fax: +31 (0) 76 549 0540  
Email: [Dynisco-BV@dynisco.com](mailto:Dynisco-BV@dynisco.com)

