



# The Complete Guide to Extrusion Pressure and Temperature Measurement

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- USA
- 
- China
- 
- Czech Republic
- 
- France
- 
- Great Britain
- 
- Germany
- 
- Italy
- 
- Japan
- 
- Netherlands
- 
- 
- 
- 
- 
- 
- 
- 





Dynisco is the leading supplier of components and peripheral process equipment for the plastics industries. Your partner in polymer processing for pressure and temperature measurements, as well as melt index and viscosity measurements for both lab and online. Dynisco specializes in optimizing the extrusion process with gear pumps, screen changers, sophisticated controls, pelletizers and cleaning ovens.

Dynisco is the leader in accurate, robust and reliable pressure and temperature measurements for extrusion processing, process control and other industrial applications where pressure and temperature are critical. Dynisco has long been the industry standard in pressure measurement due to the advanced design and reliable high quality of its melt pressure and temperature transducers and instrumentation. For over 50 years, Dynisco has helped solve the challenges plastic manufacturers face in producing quality products for their customers. Dynisco's innovative approach to pressure measurement allows for more closely monitoring and controlling the extrusion processes to produce consistently higher quality yields. No one comes close to providing the widest variety of pressure and temperature measurement solutions – no matter what the application.

## The Industry Standard

The Standard Series of transducers and transmitters are the most popular pressure sensors in the extrusion industry. Dynisco has added the new DeviceNet and CANopen transmitters to the product line. They are designed for plastic OEMs and processors who want to take the next step in communication, from analog to digital output. The MRT, Multi-Range Transducer, is also part of the family and is ideal for an extruder that uses several different pressure ranges and maintains spares. The MRT is field-selectable between four of the most commonly used pressure ranges (3,000; 5,000; 7,500 and 10,000 psi).

### Models      Features & Benefits



- PT460 Series**      (± 0.5% Combined Error)
- PT460E      • Outputs including 3.33 mV/V, 4–20 mA, 0–5 Vdc and 0–10 Vdc for user-defined compatibility
  - PT462E      • 500 to 30,000 psi versions for range-specific extrusion processes
  - TPT463E      • Variety of rigid and flexible stem lengths allows for customer-defined configuration
  - PT467E      • Several diaphragm materials for increased corrosion or abrasion protection
  - PT4624/5/6      • Thermocouple and RTD configurations available for dual pressure and temperature measurement
  - PT4674/75/76      • Convenient zero and span pots available on amplified units for easy setup
  - TPT4634/5/6      • Jam nut configurations available for space-restricted areas



- MRT Series**      (± 0.5% Combined Error)
- MRT460      • Four field-selectable pressure ranges for maximum versatility from one transducer
  - MRT462      • 3.33 mV/V output for direct input into local display instrumentation
  - MRT463      • Variety of rigid and flexible stem lengths allows for customer-defined configuration
  - Several diaphragm materials for increased corrosion or abrasion protection
  - Thermocouple and RTD configurations available for dual pressure and temperature measurement



**NEW**

- Melt Monitor**
- RMM/RMMT      • Dual digital display can provide pressure and temperature measurement
  - FMM/FMMT      • Custom defined alarms with LCD display for critical pressure warning or machine shutdown
  - RMMX/RMMXT      • Peak display and digital auto zero through easy to use push buttons
  - FMMX/FMMXT      • Optional analog retransmission and MODbus communications
  - Variety of rigid and flexible stem lengths allows for customer-defined configuration
  - Pressure ranges for 500 psi to 20,000 psi versions provide added safety in the extrusion process

# Instrumentation

Dynisco offers a wide range of instruments to complement our pressure and temperature transducers, making it easy to select the combination that will perfectly match your application.

## Models      Features & Benefits



### 1/8 DIN Pressure/Process Indicators

- |      |   |
|------|---|
| 1390 | <ul style="list-style-type: none"> <li>• mA, Vdc and strain gage inputs provide versatile process monitoring</li> </ul>   |
| 1391 | <ul style="list-style-type: none"> <li>• mA and Vdc linear retransmission enables the user to log process trends</li> <li>• Field-scalable display and dual configurable alarms to meet measurement indication requirements</li> <li>• UL and CE approved to meet US and European requirements</li> <li>• Peak and valley detection allows for recall of extremes of the process</li> <li>• Transmitter power supply to power 2 and 4 wire transmitters (1391 only)</li> <li>• Optional RS485 with MODbus/Jbus selectable communications for remote data retrieval</li> </ul> |



### 1/8 DIN Temperature/Process Indicators and Controllers

- |      |   |
|------|---|
| 1400 | <ul style="list-style-type: none"> <li>• TC and RTD inputs provide versatile temperature monitoring or control</li> </ul>   |
| 1401 | <ul style="list-style-type: none"> <li>• Field-scalable display and dual configurable alarms to meet measurement indication requirements</li> </ul>   |
| 1440 | <ul style="list-style-type: none"> <li>• UL, CSA and CE approved versions available to meet US and European requirements</li> <li>• Field-configurable relay or SSR drive outputs provide maximum flexibility for control (1440)</li> <li>• mA and Vdc linear retransmission enables the user to log temperature trends (1401)</li> <li>• Optional mA and Vdc inputs provide versatile process monitoring (1400, 1401)</li> <li>• Heater-current detection capability to predict heater failure (1400)</li> <li>• Heat/cool and alarm functions for extrusion or molding temperature control (1440)</li> <li>• Unique self-tuning algorithm allows for calculation of tuning parameters (1440)</li> </ul> |



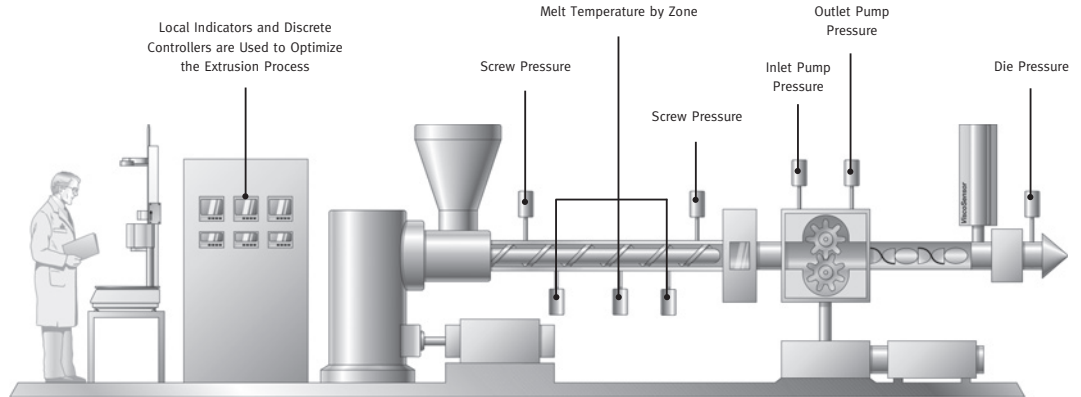
### 1/4 DIN Pressure/Process Indicators

- |        |  |
|--------|--|
| UPR700 | <ul style="list-style-type: none"> <li>• TC, RTD, mA, Vdc, and strain gage inputs provide versatile process monitoring</li> <li>• mA and Vdc linear retransmission enables the user to log process trends</li> <li>• Secondary digital display captures user-defined high or low process peak values</li> <li>• Field-scalable display with dual configurable alarms to meet measurement indication requirements</li> <li>• UL, cUL and CE approved to meet US and European requirements</li> <li>• Peak and valley detection allows for recall of extremes of the process</li> <li>• Optional transmitter power supply to power 2 and 4 wire transmitters</li> <li>• Optional RS485 with MODbus/Jbus selectable communications for remote data retrieval</li> <li>• Optional secondary input enables user to display pressure and temperature simultaneously</li> </ul> |
|--------|--|



### 1/4 DIN Pressure/Process Controllers

- |        |   |
|--------|---|
| ATC770 | <ul style="list-style-type: none"> <li>• Unique self-tuning algorithm allows for calculation of tuning parameters</li> </ul>  |
| DPC535 | <ul style="list-style-type: none"> <li>• Secondary digital display for setpoint, deviation from setpoint, % output or high low process peak values</li> <li>• Field-scalable display with three configurable alarms to meet measurement requirements</li> <li>• mA and Vdc linear retransmission enables the user to log process trends</li> <li>• mA, Vdc, and strain gage inputs provide versatile process control</li> <li>• Scalable up to 99,950 counts allows display of actual engineering units</li> <li>• UL, cUL and CE approved to meet US and European requirements</li> <li>• Optional secondary analog input for remote setpoint enables user to control the process</li> <li>• Optional transmitter power supply to power 2 and 4 wire transmitters</li> <li>• Optional RS485 with MODbus/Jbus selectable communications for remote data retrieval (ATC770)</li> <li>• Plug-in output modules for field-upgradable configurations (DPC535)</li> <li>• Dual-unit input allows for control of one variable while displaying a second (DPC535)</li> <li>• Differential pressure calculation for A - B process control (DPC535)</li> <li>• Third display line for additional control and alarm information (DPC535)</li> <li>• RTD and TC inputs provide versatile temperature control (DPC535)</li> </ul> |



## Pressure Gauges

Dynisco offers a variety of mechanical and electrical pressure gauges designed to provide safety and local indication. Indication and alarms provide a warning for over pressure situations. Dual pressure and temperature models are available.

### Models      Features & Benefits



#### Mechanical Pressure Gauges

- |                                      |  |
|--------------------------------------|--|
| <p>PG441R<br/>PG442R<br/>TPG443R</p> | <ul style="list-style-type: none"> <li>• Mechanical gauge requires no maintenance or electrical power</li> <li>• Stem up and stem down versions available for quick and easy viewing and flexible mounting</li> <li>• Stainless steel construction provides a rugged and durable measurement device</li> <li>• Gauge head rotates 300 degrees for easy viewing capability</li> <li>• 5,000 and 10,000 psi versions provide added safety in the extrusion process</li> <li>• Variety of rigid and flexible stem lengths allows for customer-defined configuration</li> <li>• Thermocouple and RTD configurations available for dual pressure and temperature measurement</li> </ul> |
|--------------------------------------|--|

## The Dyn-X Series

The Dyn-X series is designed to provide a less expensive pressure sensor for the extrusion market. With an accuracy of  $\pm 1.0\%$  the Dyn-X provides a pressure measurement that is accurate enough for safety, indication and control.

### Models      Features & Benefits



- |   |   |
|---|---|
| <p><b>Dyn-X Series</b><br/>Dyn-X<br/>Dyn-X-MA<br/>Dyn-X-V<br/>Dyn-X-TC<br/>Dyn-X-MA-TC<br/>Dyn-X-V-TC</p> | <p>(<math>\pm 1.0\%</math> Combined Error)</p> <ul style="list-style-type: none"> <li>• Outputs including 3.33 mV/V, 4–20 mA, 0–5 Vdc and 0–10 Vdc for user-defined compatibility</li> <li>• 500 to 10,000 psi versions for range-specific extrusion processes</li> <li>• Variety of rigid and flexible stem lengths allows for customer-defined configuration</li> <li>• Thermocouple and RTD configurations available for dual pressure and temperature measurement</li> <li>• Convenient zero and span pots available on amplified units for easy setup</li> </ul> |
|---|---|

## Digital Series



- |   |   |
|---|---|
| <p><b>Digital Series</b><br/>PT460DN<br/>PT462DN<br/>TPT463DN<br/>PT460CAN<br/>PT462CAN<br/>TPT463CAN</p> | <p>(<math>\pm 0.5\%</math> Combined Error)</p> <ul style="list-style-type: none"> <li>• DevideNet and CANopen (digital) outputs for network capability</li> <li>• 500 to 30,000 psi versions for range-specific extrusion processes</li> <li>• Variety of rigid and flexible stem lengths allows for customer-defined configuration</li> <li>• Several diaphragm materials for increased corrosion or abrasion protection</li> <li>• Thermocouple and RTD configurations available for dual pressure and temperature measurement</li> </ul> |
|---|---|

# Process Products

These transducers and transmitters represent the top of the line in melt pressure and temperature measurement and control. With combined errors as accurate as  $\pm 0.15\%$  including temperature effects, you can bring the ultimate in control to the extrusion process. Hazardous area approved transmitters are available.

## Models

## Features & Benefits



### PT420 Series

( $\pm 0.25\%$  Combined Error)

PT420A

PT422A

TPT432A

PT435A

- 3.33 mV/V output provides industry standard low level output
- 500 to 30,000 psi versions for range-specific extrusion processes
- Excellent thermal stability and repeatability provide ideal high temperature measurement
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Several diaphragm materials for increased corrosion or abrasion protection
- Thermocouple and RTD configurations available for dual pressure and temperature measurement
- Jam nut configurations available for space-restricted areas



### SPX Series

( $\pm 0.25\%$  or  $\pm 0.5\%$  Combined Error)

SPX2241

SPX2242

SPX2243

SPX2244

SPX2290

SPX2291

SPX2292

- 4–20 mA output provides analog output for direct PLC and DCS connection
- Hart protocol provides greater operator convenience, safety and maintenance
- 250 to 30,000 psi versions for range-specific extrusion processes
- Convenient zero and span buttons available on amplified units for easy setup
- Intrinsically safe and explosion-proof versions available for hazardous area installations
- All types of threaded and button-seal process connections designed for a variety of process connections
- Several diaphragm materials for increased corrosion or abrasion protection
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Thermocouple and RTD configurations available for dual pressure and temperature measurement
- Jam nut configurations available for space-restricted areas



### IPX I Series

( $\pm 0.15\%$  or  $\pm 0.25\%$  Combined Error including Temperature Effects)

IPX182/PX182

IPX184/PX184

IPX185/PX185

- Ambient and process temperature compensation provides highly accurate pressure measurement
- Hart protocol provides greater operator convenience, safety and maintenance
- 4–20 mA output provides analog output for direct PLC and DCS connection
- Span turndown of 5:1 provides reranging capability and reduces required inventory
- Non-incendive versions available for hazardous area installations
- 750 to 10,000 psi versions for range-specific extrusion processes
- Threaded and button-seal process connections designed for a variety of process connections
- Several diaphragm materials for increased corrosion or abrasion protection
- Variety of rigid and flexible stem lengths allows for customer-defined configuration
- Optional RTD output provides process temperature output



### IPX II Series

( $\pm 0.15\%$  or  $\pm 0.25\%$  Combined Error including Temperature Effects)

E1192/S1192

E1194/S1194

E1195/S1195

E2192/S2192

E2194/S2194

E2195/S2195

- Ambient and process temperature compensation provides highly accurate pressure measurement
- Hart protocol provides greater operator convenience, safety and maintenance
- 4–20 mA output provides analog output for direct PLC and DCS connection
- Second 4–20 mA output for process temperature makes the IPX II a multivariable transmitter
- Explosion-proof housing with display provides local indication of pressure measurement
- Span turndown of 6:1 provides reranging capability and reduces required inventory
- Intrinsically safe and explosion-proof versions available for hazardous area installations
- 750 to 10,000 psi versions for range-specific extrusion processes
- Threaded and button-seal process connections designed for a variety of process connections
- Several diaphragm materials for increased corrosion or abrasion protection
- Variety of rigid and flexible stem lengths allows for customer-defined configuration

# Food and Medical Products

Dynisco now offers a complete family of pressure transducers and transmitters designed for the food and medical applications of the extrusion market. All of these pressure sensors meet the requirements set forth by the FDA and USDA.

## Models

## Features & Benefits



### NaK Filled Series ( $\pm 0.25\%$ or $\pm 0.5\%$ Combined Error, model specific)

- PT410
  - Special fill material for processes up to 1,000 degrees designed for high temperature applications
- PT412
  - Meets FDA and USDA requirements for food and medical applications
- TPT412
  - Inconel 718 diaphragm for rugged, long-lasting transducer life
- PT415D
  - Excellent thermal stability and repeatability provide ideal high temperature measurement
  - 3.33 mV/V output for direct output into local display instrumentation
  - 500 to 10,000 psi versions for range-specific extrusion processes
  - Variety of rigid and flexible stem lengths allows for customer-defined configuration
  - Thermocouple and RTD configurations available for dual pressure and temperature measurement
  - Complete welded assembly for food applications for wash-down capability (PT 415D)



### Oil Filled Series ( $\pm 0.5\%$ Combined Error)

- PT418
  - Special oil fill material meets CFR requirements and USDA H1 status
- PT419
  - Multiple outputs including 3.33 mV/V, 4–20 mA, 0–5 Vdc, and 0–10 Vdc for user-defined compatibility
- TPT419
  - 1,000 to 10,000 psi versions for range-specific extrusion processes
- PT4104/5/6
  - Intrinsically safe and explosion-proof versions available for hazardous area installations
- TPT4104/5/6
  - Convoluted stainless steel diaphragm for added pressure measurement sensitivity
  - Variety of rigid and flexible stem lengths allows for customer-defined configuration
  - Thermocouple and RTD configurations available for dual pressure and temperature measurement
  - Convenient zero and span pots available on amplified units for easy setup
  - Optional welded assembly for food applications for wash-down capability



### Push-Rod Series ( $\pm 0.5\%$ Combined Error)

- EPR3
  - Push-Rod design provides non-liquid filled pressure measurement
- EPR-TC
  - Variety of threaded process connections designed for standard and non-standard mounting holes
- EPR4/5/6
  - Multiple outputs including 3.33 mV/V, 4–20 mA, 0–5 Vdc, and 0–10 Vdc for user-defined compatibility
- EPR4/5/6-TC
  - 1,500 to 10,000 psi versions for range-specific extrusion processes
  - Variety of rigid and flexible stem lengths allows for customer-defined configuration
  - Thermocouple and RTD configurations available for dual pressure and temperature measurement
  - Convenient zero and span pots available on amplified units for easy setup



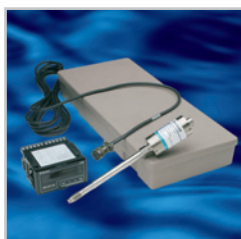
# The Dynipak Series

Dynisco offers a fast way to get started with our Dynipak kits. These kits contain everything you need to install our transducers and start using them to maximum advantage. Kits come with pressure transducers or transmitters, an indicator or controller, easy start instructions, anti-seize compound, a screwdriver and tips on use.

## Models      Features & Benefits



- Classic Dynipaks** ( $\pm 0.5\%$  or  $\pm 1.0\%$  Kits)
- PT460E
  - PT462E
  - DYN-X
- Ranges from 500 to 10,000 psi available to meet pressure measurement requirements
  - 6" stem and 6/18 stem/flex configurations provide industry standard lengths
  - 1390-2-3 indicator for local pressure indication and auto-retransmission of pressure signal
  - Cable assembly connects transducer to indicator for simple installation



- MRT Dynipaks** ( $\pm 0.5\%$  Kits)
- MRT460
  - MRT462
- Four field-selectable pressure ranges for maximum versatility from one transducer
  - 6" stem and 6/18 stem/flex configurations provide industry standard lengths
  - 1390-2-3 indicator for local pressure indication and auto-retransmission of pressure signal
  - Cable assembly connects transducer to indicator for simple installation
  - Mounting hole machining kit provides proper transducer installation



- Pressure/Temperature Dynipaks** ( $\pm 0.5\%$  or  $\pm 1.0\%$  Kits)
- TPT463E
  - MRT463
  - Dyn-X-TC
- J-Type thermocouple provides for dual pressure and temperature measurement
  - Ranges from 500 to 10,000 psi available to meet pressure measurement requirements (TPT463E)
  - Four field-selectable pressure ranges for maximum versatility from one transducer (MRT463)
  - 6" stem and 6/18 stem/flex configurations provide industry standard lengths
  - UPR700-1-0-3 dual indicator for local pressure and temperature indication
  - Cable assembly connects transducer to indicator for simple installation
  - Thermocouple mating connector for temperature output termination



- Differential Dynipaks** ( $\pm 0.5\%$  or  $\pm 1.0\%$  Kits)
- PT460E
  - PT462E
  - PT4604
  - PT4624
  - Dyn-X-MA
- Two pressure transducers or transmitters for before and after pressure measurement
  - 3.33 mV/V or 4–20 mA outputs for user-defined compatibility
  - Ranges from 500 to 10,000 psi available to meet pressure measurement requirements
  - DPC535 differential controller for local indication and localized process control
  - 6" stem and 6/18 stem/flex configurations provide industry standard lengths
  - Cable assembly connects transducer to indicator for simple installation

## Accessories



- Thermocouples, Mounting Hole Kits and Burst Plugs**
- Thermocouples for measurement of polymer melt temperature
  - Mounting hole machining kits for machining accurate and correctly sized holes
  - Mounting hole cleaning kits to maintain clean and accurate mounting holes
  - Burst plugs for safety in overpressure situations
  - Cable and connector assemblies for a wide variety of user-specified electrical terminations



[www.dynisco.com](http://www.dynisco.com)

**Dynisco LLC**

38 Forge Parkway  
Franklin, MA 02038  
USA

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

**Dynisco Europe GmbH**

Wannenäckerstr. 24  
74078 Heilbronn  
Germany

Phone +49 7131 297-0  
Fax +49 7131 23260  
Email [infoeurope@dynisco.com](mailto:infoeurope@dynisco.com)

**Dynisco Japan, Ltd.**

1-38-3 Hiranuma  
Nishi-ku, Yokohama 220-0023  
Japan

Phone +81 45 290 9400  
Fax +81 45 290 9855  
Email [infojapan@dynisco.com](mailto:infojapan@dynisco.com)