Dynisco SPX 5-Series

General Purpose Smart Pressure Sensors for Hazardous Locations

Description

The Dynisco SPX 5-Series is a smart 4-20mA pressure transmitter that includes Dynalarity™, a Dynisco innovation that uses an advanced algorithm that will linearize offsets due to process effects on the sensor. The SPX 5-Series is an all welded construction designed for use in hazardous locations and is available with a variety of process and electrical connections.

These amplified transmitters eliminate the need for external signal conditioning. All models can interface directly with distributed control systems, PLC’s, computers, and similar high level control devices. Optional thermocouple or RTD configurations are available to provide melt temperature.

Features

- A 20mA loop-powered output
- Improved accuracy with Dynalarity ±0.2% available
- Wide selection of pressure ranges available
- Turndown 3:1
- Configurations available for use in hazardous locations
- Remotely configurable via HART™
- Precise, repeatable pressure measurements
- Output supplied directly to DSC or PLC
- Meets CE requirements
- CE ATEX Intrinsically Safe Approved
- IECEx Intrinsically Safe
- FM Explosion Proof Approved
- CSA Explosion Proof Approved
- SIL 2 Certified (Pressure Output)
- PL‘c’ Certified (Relay Output)
- Additional approvals are available
### Performance Characteristics SPX5- Series

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
<td>4 - 20 mA, with optional HART™</td>
</tr>
<tr>
<td><strong>Input Voltage</strong></td>
<td>16 - 36 Vdc (Std); 16 - 30 Vdc (ATEX IS)</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>Accuracy is defined as the combined error expressed as a percentage of full scale output with the specifications of: Electronics ambient temperature, capillary of ≤ 36˚, DyMax coated 15-5 SST diaphragm; Best Straight Line (BSL) %FS per ISA-37.1 Consult Factory for availability and specifications of other configurations. All Models ± 0.20%</td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>±0.1%</td>
</tr>
<tr>
<td><strong>Rangeability</strong></td>
<td>3:1 Turndown</td>
</tr>
<tr>
<td><strong>Over Pressure</strong></td>
<td>2X FSO or 35,000 psi, whichever is less (5390, 5391, &amp; 5392 1.5 x FSO for 10,000 psi)</td>
</tr>
<tr>
<td><strong>Zero Balance Adjustment Range</strong></td>
<td>-40% to +10%; -80% to 20% for FSP &lt; 500 psi</td>
</tr>
<tr>
<td><strong>Load Resistance</strong></td>
<td>500 Ω @ 24 Vdc; 1,000 Ω @ 36 Vdc</td>
</tr>
<tr>
<td><strong>Electronics Ambient Temperature</strong></td>
<td>70°F (20°C)</td>
</tr>
<tr>
<td><strong>Electronics Operating Temperature</strong></td>
<td>-20 to 185°F (-29 to 85°C)</td>
</tr>
<tr>
<td><strong>Diaphragm Temperature</strong></td>
<td>750°F (400°C) max [Models 5344, 5390, 5391, 5392 limited to 600°F (315°C)]</td>
</tr>
<tr>
<td><strong>Zero Shift (Electronics Temp Change)</strong></td>
<td>All Models: 0.01% F.S./°F max (0.02% F.S./°C max)</td>
</tr>
<tr>
<td><strong>Span Shift (Electronics Temp Change)</strong></td>
<td>All Models: 0.01% F.S./°F max (0.02% F.S./°C max)</td>
</tr>
<tr>
<td><strong>Zero Shift (Snout Temp Change)</strong></td>
<td>5344/5390/5391/5392: 1 psi/100°F (from 75-450°F) typical 2 psi/100°F (from 450-600°F) typical 5342/5343: 15 psi/100°F (27 psi/100°C) typical</td>
</tr>
</tbody>
</table>

### Mechanical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard Wetted Parts</strong></td>
<td>DyMax coated 15-5 PH SST</td>
</tr>
</tbody>
</table>

### Approvals & Certifications

- ATEC/IECEx Intrinsically Safe
- SIL 2 (pressure output) & PL‘c’ (relay output)
- FM & CSA Explosion Proof
- Additional Approvals are Available
Ordering Guide for Models SPX5342

Model 342

Approval
E = Explosion Proof
S = ATEX/Intrinsically Safe
N = No Approvals

Diaphragm Material
A = DyMax Coated 15-5 PH SST
M = Hastelloy
P = Inconel

Process Connection
00 = 1/2-20 UNF
05 = M18 x 1.5 Thread

Pressure Units
B = BAR
C = KPa
K = Kgf/cm²
M = MPa
P = PSI

Pressure Range
14 = 500 psi  35 Bar  35 kgf/cm²  3.5 MPa
15 = 750 psi  50 Bar  50 kgf/cm²  5.0 MPa
16 = 1,000 psi 70 Bar  70 kgf/cm²  7.0 MPa
17 = 1,500 psi 100 Bar 100 kgf/cm² 10.0 MPa
20 = 3,000 psi 200 Bar 200 kgf/cm² 20.0 MPa
21 = 5,000 psi 350 Bar 350 kgf/cm² 35.0 MPa
22 = 7,500 psi 500 Bar 500 kgf/cm² 50.0 MPa
23 = 10,000 psi 700 Bar 700 kgf/cm² 70.0 MPa
24 = 15,000 psi 1,000 Bar 1,000 kgf/cm² 100.0 MPa
25 = 20,000 psi 1,400 Bar 1,400 kgf/cm² 140.0 MPa
27 = 30,000 psi 2,000 Bar 2,000 kgf/cm² 200.0 MPa

Other configurations are available. Please consult factory.
Ordering Guide for Models SPX5343

Model
343

Approval
E = Explosion Proof
S = ATEX/Intrinsically Safe
N = No Approvals

Diaphragm Material
A = DyMax Coated 15-5 PH SST
M= Hastelloy
P= Inconel

Mounting Flange
25 = Standard Flange

Pressure Units
B = BAR
C = KPa
K = Kgf/cm²
M = MPa
P = PSI

Pressure Range
14 = 500 psi  35 Bar  35 kgf/cm²  3.5 MPa
15 = 750 psi  50 Bar  50 kgf/cm²  5.0 MPa
16 = 1,000 psi  70 Bar  70 kgf/cm²  7.0 MPa
17 = 1,500 psi  100 Bar  100 kgf/cm²  10.0 MPa
20 = 3,000 psi  200 Bar  200 kgf/cm²  20.0 MPa
21 = 5,000 psi  350 Bar  350 kgf/cm²  35.0 MPa
22 = 7,500 psi  500 Bar  500 kgf/cm²  50.0 MPa
23 = 10,000 psi  700 Bar  700 kgf/cm²  70.0 MPa
24 = 15,000 psi  1,000 Bar  1,000 kgf/cm²  100.0 MPa
25 = 20,000 psi  1,400 Bar  1,400 kgf/cm²  140.0 MPa
27 = 30,000 psi  2,000 Bar  2,000 kgf/cm²  200.0 MPa

Temperature Sensor
ZZ = No Thermocouple / RTD
AA = Single J TC with 3" Flex

Electrical Connections
AC = PT1H-10-6P Connector
CA = 1/2-14 NPT Conduit with 42" Leads
AF = PCIH-12-8P Connector Threaded Style

Communications
A = No Protocol
B = HART™ Protocol

Flex Length
DD = 18", 46cm Flex
FF = 30", 76cm Flex

Snout Length
CE = 6", 15.0 cm

Other configurations are available. Please consult factory.
Ordering Guide for Models SPX5344¹

Model
344

Approval
E = Explosion Proof
S = ATEX/Intrinsically Safe
N = No Approvals

Diaphragm Material
A = DyMax Coated 15-5 PH SST

Mounting Flange
88 = Flat Faced Mounting Flange

Pressure Units
B = BAR
C = KPa
K = Kgf/cm²
M = MPa
P = PSI

Temperature Sensor
ZZ = No Thermocouple / RTD

Electrical Connections
AC = PT1H-10-6P Connector
CA = 1/2-14 NPT Conduit with 42” Leads
AF = PCIH-12-8P Connector Threaded Style

Communications
A = No Protocol
B = HART™ Protocol

Flex Length
DD = 18”, 46 cm Flex

Snout Length
NE = 2.031”, 5.16 cm

Pressure Range
13 = 250 psi 17.5 Bar 7.5 kgf/cm² 1.75 MPa
14 = 500 psi 35 Bar 35 kgf/cm² 3.5 MPa
15 = 750 psi 50 Bar 50 kgf/cm² 5.0 MPa
16 = 1,000 psi 70 Bar 70 kgf/cm² 7.0 MPa
17 = 1,500 psi 100 Bar 100 kgf/cm² 10.0 MPa
20 = 3,000 psi 200 Bar 200 kgf/cm² 20.0 MPa
21 = 5,000 psi 350 Bar 350 kgf/cm² 35.0 MPa
22 = 7,500 psi 500 Bar 500 kgf/cm² 50.0 MPa

¹Other configurations are available. Please consult factory.
Ordering Guide for Models SPX5390

Model
390

Approval
E = Explosion Proof
S = ATEX/Intrinsically Safe
N = No Approvals

Diaphragm Material
A = DyMax Coated 15-5 PH SST

Mounting Flange
69 = No Mounting Flange

Pressure Units
B = BAR
C = KPa
K = Kgf/cm²
M = MPa
P = PSI

Option Code

Temperature Sensor
ZZ = No Thermocouple / RTD

Electrical Connections
AC = PT1H-10-6P Connector
CA = 1/2-14 NPT Conduit with 42" Leads
AF = PCIH-12-8P Connector Threaded Style

Communications
A = No Protocol
B = HART™ Protocol

Flex Length
MM = 60", 152 cm Flex
SS = 6", 15 cm Rigid

Snout Length
BU = 5", 12.7 cm
CE = 6", 15.2 cm

Pressure Range

<table>
<thead>
<tr>
<th>Pressure Range</th>
<th>psi</th>
<th>Bar</th>
<th>Kgf/cm²</th>
<th>MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>08</td>
<td>25</td>
<td>1.75</td>
<td>1.75</td>
<td>0.175</td>
</tr>
<tr>
<td>09</td>
<td>50</td>
<td>3.5</td>
<td>3.5</td>
<td>0.35</td>
</tr>
<tr>
<td>11</td>
<td>100</td>
<td>7</td>
<td>7</td>
<td>0.7</td>
</tr>
<tr>
<td>13</td>
<td>250</td>
<td>17.5</td>
<td>17.5</td>
<td>1.75</td>
</tr>
<tr>
<td>14</td>
<td>500</td>
<td>35</td>
<td>35</td>
<td>3.5</td>
</tr>
<tr>
<td>15</td>
<td>750</td>
<td>50</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>1,000</td>
<td>70</td>
<td>70</td>
<td>7</td>
</tr>
<tr>
<td>17</td>
<td>1,500</td>
<td>100</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>3,000</td>
<td>200</td>
<td>200</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>5,000</td>
<td>350</td>
<td>350</td>
<td>35</td>
</tr>
<tr>
<td>22</td>
<td>7,500</td>
<td>500</td>
<td>500</td>
<td>50</td>
</tr>
<tr>
<td>23</td>
<td>10,000</td>
<td>700</td>
<td>700</td>
<td>70</td>
</tr>
</tbody>
</table>

Other configurations are available. Please consult factory.
Pressure ranges below 250 psi are supplied with rigid capillary.
Ordering Guide for Models SPX5391¹

<table>
<thead>
<tr>
<th>Model 391</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval</td>
</tr>
</tbody>
</table>
E = Explosion Proof  
S = ATEX/Intrinsically Safe  
N = No Approvals  
Diaphragm Material  
A = DyMax Coated 15-5 PH SST  
Mounting Flange  
48 = Flat Faced Flange  
Pressure Units  
B = BAR  
C = KPa  
K = Kgf/cm²  
M = MPa  
P = PSI  
Option Code  
Temperature Sensor  
ZZ = No Thermocouple  
AA = Single JTC with 3” Flex  
Electrical Connections  
AC = PT1H-10-6P Connector  
CA = 1/2-14 NPT Conduit with 42” Leads  
AF = PCIH-12-8P Connector Threaded Style  
Communications  
A = No Protocol  
B = HART™ Protocol  
Flex Length  
FF = 30”, 76 cm Flex  
MM = 60”, 152 cm Flex  
SS = 6”, 15 cm Rigid  
TT = 12”, 31 cm Rigid  
Snout Length  
BU = 5”, 12.7 cm  
Pressure Range  
08¹ = 25 psi 1.75 Bar 1.75 Kgf/cm² 0.175 MPa  
09¹ = 50 psi 3.5 Bar 3.5 Kgf/cm² 0.35 MPa  
11¹ = 100 psi 7 Bar 7 Kgf/cm² 0.7 MPa  
13 = 250 psi 17.5 Bar 17.5 Kgf/cm² 1.75 MPa  
14 = 500 psi 35 Bar 35 Kgf/cm² 3.5 MPa  
15 = 750 psi 50 Bar 50 Kgf/cm² 5 MPa  
16 = 1,000 psi 70 Bar 70 Kgf/cm² 7 MPa  
17 = 1,500 psi 100 Bar 100 Kgf/cm² 10 MPa  
20 = 3,000 psi 200 Bar 200 Kgf/cm² 20 MPa  
21 = 5,000 psi 350 Bar 350 Kgf/cm² 35 MPa  
22 = 7,500 psi 500 Bar 500 Kgf/cm² 50 MPa  
23 = 10,000 psi 700 Bar 700 Kgf/cm² 70 MPa  
¹Other configurations are available. Please consult factory.  
²Pressure ranges below 250 psi are supplied with rigid capillary
Ordering Guide for Models SPX5392

<table>
<thead>
<tr>
<th>5XXX X X XX X XX XX XX XX XXXX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 392</td>
</tr>
<tr>
<td>Approval</td>
</tr>
<tr>
<td>E = Explosion Proof</td>
</tr>
<tr>
<td>S = ATEX/Intrinsically Safe</td>
</tr>
<tr>
<td>N = No Approvals</td>
</tr>
<tr>
<td>Diaphragm Material</td>
</tr>
<tr>
<td>A = DyMax Coated 15-5 PH SST</td>
</tr>
<tr>
<td>Process Connection</td>
</tr>
<tr>
<td>89 = 1 1/2-16 UN2A Thread</td>
</tr>
<tr>
<td>Pressure Units</td>
</tr>
<tr>
<td>B = BAR</td>
</tr>
<tr>
<td>C = KPa</td>
</tr>
<tr>
<td>K = Kgf/cm²</td>
</tr>
<tr>
<td>M = MPa</td>
</tr>
<tr>
<td>P = PSI</td>
</tr>
<tr>
<td>Option Code</td>
</tr>
<tr>
<td>Temperature Sensor</td>
</tr>
<tr>
<td>ZZ = No Thermocouple</td>
</tr>
<tr>
<td>Electrical Connections</td>
</tr>
<tr>
<td>AC = PT1H-10-6P Connector</td>
</tr>
<tr>
<td>CA = 1/2-14 NPT Conduit with 42&quot; Leads</td>
</tr>
<tr>
<td>AF = PCIH-12-8P Connector Threaded Style</td>
</tr>
<tr>
<td>Communications</td>
</tr>
<tr>
<td>A = No Protocol</td>
</tr>
<tr>
<td>B = HART™ Protocol</td>
</tr>
<tr>
<td>Flex Length</td>
</tr>
<tr>
<td>MM = 60° Flex</td>
</tr>
<tr>
<td>SS = 6° Rigid</td>
</tr>
<tr>
<td>Snout Length</td>
</tr>
<tr>
<td>AW = 3&quot;, 7.6 cm</td>
</tr>
<tr>
<td>CE = 6&quot;, 15 cm</td>
</tr>
<tr>
<td>Pressure Range</td>
</tr>
<tr>
<td>08 = 25 psi 1.75 Bar 1.75 Kgf/cm² 0.175 MPa</td>
</tr>
<tr>
<td>09 = 50 psi 3.5 Bar 3.5 Kgf/cm² 0.35 MPa</td>
</tr>
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<td>11 = 100 psi 7 Bar 7 Kgf/cm² 0.7 MPa</td>
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<td>13 = 250 psi 17.5 Bar 17.5 Kgf/cm² 1.75 MPa</td>
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<td>14 = 500 psi 35 Bar 35 Kgf/cm² 3.5 MPa</td>
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</tr>
<tr>
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</tr>
<tr>
<td>22 = 7,500 psi 500 Bar 500 Kgf/cm² 50 MPa</td>
</tr>
<tr>
<td>23 = 10,000 psi 700 Bar 700 Kgf/cm² 70 MPa</td>
</tr>
</tbody>
</table>

1Other configurations are available. Please consult factory.
2Pressure ranges below 250 psi are supplied with rigid capillary.
NOTES:
1. ALL DIMENSIONS ARE INCHES
   [MILLIMETERS]
2. EXPOSED SURFACES ARE STAINLESS STEEL.
NOTES:
1. ALL DIMENSIONS ARE INCHES [ MILLIMETERS ]
2. EXPOSED SURFACES ARE STAINLESS STEEL.
NOTES:

1. ALL DIMENSIONS ARE IN INCHES (MILLIMETERS)
2. EXPOSED SURFACES ARE STAINLESS STEEL.

DETAIL 'A'

ELECTRICAL HOUSING, CONDUIT

- 18 AWG STRANDED CABLE WIRE
- 1/2-14 NPT
- 81 ([20.7])
- CABLE LEAD LENGTH
- 148 ([37.6])
- CONDUIT FITTING

RIGID STEM TYPE

- Ø 0.719 x 0.375 W ([Ø18.26 x 9.52 W])
- GASKET
- 2X Ø 0.719 x 0.375 W ([Ø18.26 x 9.52 W]) JACKET

ARMORED CABLE, SST (COVERED CAPILLARY)

- ARMORED CABLE, SST
- COVERED CAPILLARY

FLEX TYPE

- 88 ([22.9])
- FLATS

VIEW A-A

- 3 CONDUCTOR SHOWN
- ZERO AND SPAN ADJUSTS ARE PROTECTED BY SEAL SCREWS

CONNECTION WIRING

- A: POWER + / SIGNAL +
- B: POWER - / SIGNAL -
- D: CONNECTION
- E: TRAT -
- F: TRAT +

CABLE WIRING

- RED: POWER + / SIG +
- BLACK: POWER - / SIG -
- GREEN: GROUND
- ORANGE: Rcal +
- BLUE: Rcal -

VIEW A-A

3 CONDUCTOR SHOWN

- ZERO ADJUST ACCESS
- SPAN ADJUST ACCESS

ELECTRICAL HOUSING, CONNECTOR CONFIGURATION

- CONNECTOR, PT14-10-8P BENDIX OR EQUIVALENT (MATING CONNECTOR REQUIRED)
- WEATHER TIGHT, 6 PIN CONNECTOR, P/N 711610
**GUARDIAN SERIES CONNECTORS**

**NOTE:**
1. THESE CONNECTOR OPTIONS ARE AVAILABLE ON MOST OF THE CONFIGURATIONS SHOWN ON THE PREVIOUS SHEETS.

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**GUARDIAN CONNECTOR WIRING**

<table>
<thead>
<tr>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>POWER +</td>
</tr>
<tr>
<td>B</td>
<td>SIGNAL -</td>
</tr>
<tr>
<td>C</td>
<td>POWER -</td>
</tr>
<tr>
<td>D</td>
<td>NO CONNECTION</td>
</tr>
<tr>
<td>E</td>
<td>Rcal -</td>
</tr>
<tr>
<td>F</td>
<td>Rcal +</td>
</tr>
<tr>
<td>G</td>
<td>RELAY CONTACT</td>
</tr>
<tr>
<td>H</td>
<td>RELAY CONTACT</td>
</tr>
</tbody>
</table>

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**INSTRUMENTS**

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**DRAWING INFORMATION**

- **MODEL NO.**: X
- **DO NOT SCALE DRAWING**: X
- **MATERIAL**: X
- **FINISH**: ✓
- **SCALE**: NONE
- **SHEET**: 1 of 1