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Series 18D Hydraulic Pressure Switch

Series 32D Electronic Pressure Switch for
  Hydraulic and High Pressure Applications

Series 31D Electronic Pressure Switch for
  Pneumatic Applications

Series 18D Pneumatic Pressure Switch
Norgren and Herion have joined forces to create one of the largest manufacturers of pressure control instruments in the world.

Herion is the international market leader in high technology pressure switches with a comprehensive range of electronic and electrical products for the most demanding applications.

The combination of Herion’s technical expertise and Norgren’s Global strength makes the perfect fit, bringing benefits to customers worldwide.

Norgren Herion pressure switches provide:

- Safe operation
- Long life
- Cost efficiency
- Easy handling
- Compact design

**Pneumatics/Vacuum**

- Switching pressure ranges vacuum to 435 psi (30 bar)
- Electro-mechanical and electronic models

**Hydraulics**

- Switching pressure ranges 0 to 10,000 psi (700 bar)
- Electro-mechanical and electronic models

Guaranteed Quality
Rugged Designs

Look inside our Model 18D pressure switch

- Convenient setpoint adjustment with locking screw
- Anodized aluminum housing machined from barstock
- Pressure transmission
- Elastomer diaphragm supported by steel piston head (pneumatic versions)
- Heavy-duty range spring
- 5 amp microswitch with gold plated contacts. UL & CSA approved
- Negative stop limits for overpressure
- Choice of pressure port thread options (port is stainless steel on hydraulic versions)
- Plug-in electrical connections DIN 43650
- O-ring for environmental protection of adjustment mechanism

Pressure switch applications and industries

- Vacuum handling and transfer equipment
- Packaging and production machines
- Automated test stands
- Hydraulic power units
- Machine tools
Pressure Switches

Pneumatics/ Vacuum

18D

Competitively priced switches for pneumatic applications

- Rugged, compact design
- Port options: 1/4” NPT, G 1/4, or flange mount
- Convenient setpoint adjustment
- Plug-in electrical connections
- UL and CSA approved microswitch

Pressure range selection

- -14 to 0 psi (-1 to 0 bar)
- 3 to 30 psi (.2 to 2 bar)
- 7 to 120 psi (.5 to 8 bar)
- 15 to 230 psi (1 to 16 bar)
- 15 to 435 psi (1 to 30 bar)

31D

The “Intelligent” choice for pneumatic pressure monitoring

- Solid state technology
- Real-time LCD display of actual pressure
- Extremely long cycle life – up to 100 million cycles
- Adjustable hysteresis and window mode capability
- Can be calibrated without applied pressure

Pressure range selection

- -14 to 15 psi (-1 to 1 bar)
- 0 to 150 psi (0 to 10 bar)
- 0 to 360 psi (0 to 25 bar)
Hydraulics

18D

Cost effective hydraulic pressure switches

- Rugged, compact design
- Port options: 1/4” NPT, 7/16-20 UNF, G 1/4, or flange mount
- Convenient setpoint adjustment
- Plug-in electrical connections
- UL and CSA approved microswitch

Pressure range selection

- 70 to 1015 psi (5 to 70 bar)
- 150 to 2320 psi (10 to 160 bar)
- 360 to 3600 psi (25 to 250 bar)
- 580 to 6100 psi (40 to 250 bar)

32D

Advanced solid state features – rugged industrial performance

- Extremely long cycle life – up to 100 million cycles
- Real-time LCD display of actual pressure
- Adjustable hysteresis and window mode capability
- Can be calibrated without applied pressure
- Optional 4-20 mA and 0-10V analog output

Pressure range selection

- 0 to 100 bar
- 0 to 160 bar
- 0 to 250 bar
- 0 to 350 bar
- 0 to 700 bar
Series 18D
Pneumatic Pressure Switches

- Rugged compact design
- Convenient setpoint adjustment
- High cycle life
- Vibration resistant to 15g
- Microswitch approved by UL and CSA
- Gold plated contacts – suitable for use in intrinsically safe circuits
- Plug-in electrical connections

Technical Data

Fluid:
Neutral gasses and light oil

Construction:
Diaphragm Actuated

Port Size:
1/4 NPT, G1/4 (BSPP), Flange

Adjustment Range:
28" Hg to 435 psi (-1 to 30 bar)

Ambient Temperature:
14° to 175°F (-10° to 80°C)

Maximum Viscosity:
450 SSU (1000 mm²/s)

Fluid Temperature:
-4° to 175°F (-20° to 80°C)

Maximum Switching Rate:
100 cycles/min

Repeatability:
± 3%, for vacuum ± 4%

Electrical Connection:
DIN 43650 Table A

Switching Element:
Microswitch

Environmental Protection:
IP65

Mounting:
Arbitrary

Weight:
.4 lbs (0.2 kg)

Graphic Symbol

Switching function: Microswitch SPDT
Terminals 1 - 3: Contacts close on rising pressure.
Terminals 1 - 2: Contacts open on rising pressure.
### General Information
(Part numbers include mating connector)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Pressure Range psi (bar)</th>
<th>Switching Pressure Difference (Hysteresis)* psi (bar)</th>
<th>Maximum Over Pressure ** psi (bar)</th>
<th>Materials</th>
<th>Fluid Connection</th>
<th>Dimension Drawing No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Range</td>
<td>Upper Range</td>
<td>Housing</td>
<td>Seal</td>
<td>Type</td>
<td>Size</td>
</tr>
<tr>
<td>0880100</td>
<td>-14 – 0 (11 – 0)</td>
<td>2 (0.15)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>FKM/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880120</td>
<td>-14 – 0 (11 – 0)</td>
<td>2 (0.15)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>FKM/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0881100</td>
<td>-14 – 0 (11 – 0)</td>
<td>2 (0.15)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>FKM/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880200</td>
<td>3 – 30 (0.2 – 2)</td>
<td>2 (0.15)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>FKM/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880220</td>
<td>3 – 30 (0.2 – 2)</td>
<td>2 (0.15)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>FKM/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0881200</td>
<td>3 – 30 (0.2 – 2)</td>
<td>2 (0.15)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880300</td>
<td>7 – 120 (0.5 – 8)</td>
<td>4 (0.25)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880320</td>
<td>7 – 120 (0.5 – 8)</td>
<td>4 (0.25)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0881300</td>
<td>7 – 120 (0.5 – 8)</td>
<td>4 (0.25)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880400</td>
<td>15 – 230 (1 – 16)</td>
<td>4 (0.30)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880420</td>
<td>15 – 230 (1 – 16)</td>
<td>4 (0.30)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0881400</td>
<td>15 – 230 (1 – 16)</td>
<td>4 (0.30)</td>
<td>1150 (80)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880600</td>
<td>15 – 435 (1 – 30)</td>
<td>15 (1.0)</td>
<td>73 (5.00)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
<tr>
<td>0880620</td>
<td>15 – 435 (1 – 30)</td>
<td>15 (1.0)</td>
<td>73 (5.00)</td>
<td>Al</td>
<td>NBR/NBR</td>
<td>Female</td>
</tr>
</tbody>
</table>

* Switching pressure difference (hysteresis) is not adjustable. Maximum values are shown.
** Do not subject switch to maximum allowable pressure during normal operation. Even short pressure peaks must not exceed this value.

### Making And/Or Breaking Capacity

<table>
<thead>
<tr>
<th>Load Level*</th>
<th>Type of Current</th>
<th>Type of Load</th>
<th>Vmin [V]</th>
<th>Maximum Permanent Current</th>
<th>Imax [A] at V</th>
<th>Contact life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 V</td>
<td>125 V</td>
<td>250 V</td>
</tr>
<tr>
<td>Standard</td>
<td>AC</td>
<td>Resistive</td>
<td>12</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>Inductive</td>
<td>12</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>DC</td>
<td>Resistive</td>
<td>12</td>
<td>5</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>DC</td>
<td>Inductive</td>
<td>12</td>
<td>3</td>
<td>.05</td>
<td>-</td>
</tr>
<tr>
<td>Low</td>
<td>AC</td>
<td>Resistive</td>
<td>5</td>
<td>.34</td>
<td>.08</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>DC</td>
<td>Inductive</td>
<td>5</td>
<td>.1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Load Level Explanation
Series 18D Pressure Switches have microswitch contacts with gold-plating over silver base metal. The gold plating remains intact when "low level" voltage / current levels are observed. This feature assures highly reliable switching in low-level electronic circuits.

Standard applications do not require the gold plating which will decay naturally when switching larger electrical loads.

### Notes:
1. Reference conditions: 30 cycles per min and 86°F (30°C) ambient.
2. Reducing load current to 50% of I max approximately doubles contact life.
3. Creepage and clearance distances correspond to insulation group B per VDE Reg. 0110 (except contact clearance of microswitch.)
Series 18D Pneumatic Pressure Switches

All Dimensions in Inches (mm)

Dimensional drawing 01

Dimensional drawing 02

Dimensional drawing 03 (flange mount)

Dimensional drawing 04 (flange mount)

Protective Cover
An optional elastomer cover for protection of the switch adjustment against dirt and splashing liquids

Part No. 0554737
Switch Selection and Mounting Instructions

- Select a switch such that the desired switching point falls roughly in the middle of the adjustment range.
- Do not exceed switch electrical ratings. Use an appropriately sized relay when switching larger electrical loads.
- For liquid media with pressure spikes and/or pulsating pressures, install a pressure snubber.
- For outdoor applications, sufficient protection must be provided.

Adjustment of Switching Point

Either the upper or the lower switching point may be adjusted. The opposite one is then fixed by the hysteresis characteristics of the switch.

Use a pressure gauge for exact adjustment. Proceed as follows:
1. Loosen locking screw.
2. Adjust the switching point using a 5 mm hexagon wrench. Clockwise rotation increases switching pressure and counter-clockwise rotation decreases switching pressure.
   Low-end of adjustment range is reached when top of adjustment barrel is approximately level with top of switch housing. High-end of adjustment range is reached when adjustment barrel is fully CW.
3. Re-tighten locking screw.
Series 18D
Hydraulic Pressure Switches

- Rugged compact design
- Convenient setpoint adjustment
- High cycle life
- Vibration resistant to 15g
- Microswitch approved by UL and CSA
- Gold plated contacts - suitable for use in intrinsically safe circuits
- Plug-in electrical connections

Technical Data

Fluid:
  - Hydraulic, lubricating and light fuel oils

Construction:
  - Piston actuated

Port Size:
  - 1/4 NPT, 7/16-20 UNF (SAE-4), G1/4 (BSPP), Flange

Adjustment range:
  - 70 – 6100 psi (5 - 420 bar)

Ambient Temperature:
  - -13° to 175°F (-25° to 80°C )

Maximum Viscosity:
  - 450 SSU (1000 mm²/s)

Fluid Temperature:
  - -13° to 175°F (-25° to 80°C )

Maximum Switching Rate:
  - 100 cycles/min

Repeatability:
  - ± 3%

Electrical Connection:
  - DIN 43650 Table A

Switching Element:
  - Microswitch

Environmental Protection:
  - IP65

Mounting:
  - Arbitrary

Weight:
  - .4 lbs (0.2 kg)

Graphic Symbol

Switching function: Microswitch SPDT
Terminals 1 - 3: Contacts close on rising pressure.
Terminals 1 - 2: Contacts open on rising pressure.
### General Information

**Series 18D Hydraulic Pressure Switches**

*Part numbers include mating connector*

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Pressure Range psi (bar)</th>
<th>Switching Pressure Difference (Hysteresis)* psi (bar)</th>
<th>Maximum Over Pressure ** psi (bar)</th>
<th>Materials</th>
<th>Fluid Connection</th>
<th>Drawing No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0882100</td>
<td>70 – 1015 (5 – 70)</td>
<td>152 (10.5)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>G1/4</td>
</tr>
<tr>
<td>0883100</td>
<td>70 – 1015 (5 – 70)</td>
<td>152 (10.5)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Flange -</td>
</tr>
<tr>
<td>0882119</td>
<td>70 – 1015 (5 – 70)</td>
<td>152 (10.5)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0882120</td>
<td>70 – 1015 (5 – 70)</td>
<td>152 (10.5)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 1/4 NPT</td>
</tr>
<tr>
<td>0882200</td>
<td>150 – 2320 (10 – 160)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0883200</td>
<td>150 – 2320 (10 – 160)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 1/4 NPT</td>
</tr>
<tr>
<td>0882219</td>
<td>150 – 2320 (10 – 160)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0882220</td>
<td>150 – 2320 (10 – 160)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 1/4 NPT</td>
</tr>
<tr>
<td>0882300</td>
<td>360 – 3600 (25 – 250)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 1/4 NPT</td>
</tr>
<tr>
<td>0883300</td>
<td>360 – 3600 (25 – 250)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 1/4 NPT</td>
</tr>
<tr>
<td>0882319</td>
<td>360 – 3600 (25 – 250)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0882320</td>
<td>360 – 3600 (25 – 250)</td>
<td>160 (11)</td>
<td>5800 (400)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 1/4 NPT</td>
</tr>
<tr>
<td>0882400</td>
<td>580 – 6100 (40 – 420)</td>
<td>247 (17)</td>
<td>8700 (600)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0883400</td>
<td>580 – 6100 (40 – 420)</td>
<td>247 (17)</td>
<td>8700 (600)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0882419</td>
<td>580 – 6100 (40 – 420)</td>
<td>247 (17)</td>
<td>8700 (600)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
<tr>
<td>0882420</td>
<td>580 – 6100 (40 – 420)</td>
<td>247 (17)</td>
<td>8700 (600)</td>
<td>Al/Steel</td>
<td>PTFE/NBR</td>
<td>Female 7/16-20 UNF</td>
</tr>
</tbody>
</table>

* Switching pressure difference (hysteresis) is not adjustable. Maximum values are shown.
** Do not subject switch to maximum allowable pressure during normal operation. Even short pressure peaks must not exceed this value.

### Making And/Or Breaking Capacity

<table>
<thead>
<tr>
<th>Load Level*</th>
<th>Type of Current</th>
<th>Type of Load</th>
<th>Vmin [V]</th>
<th>Maximum Permanent Current I max [A] at V 24 V</th>
<th>Electrical Contact life at I max</th>
<th>Mechanical Contact life at I = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>AC</td>
<td>Resistive</td>
<td>12</td>
<td>5</td>
<td>5 x 10⁴ switching cycles</td>
<td>approx 10⁷ switching cycles</td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>Inductive</td>
<td>12</td>
<td>3</td>
<td>.7</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>DC</td>
<td>Resistive</td>
<td>12</td>
<td>5</td>
<td>.4</td>
<td>-</td>
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<tr>
<td></td>
<td>DC</td>
<td>Inductive</td>
<td>12</td>
<td>3</td>
<td>L/R = 10 ms</td>
<td>.05</td>
</tr>
<tr>
<td>Low</td>
<td>AC</td>
<td>Resistive</td>
<td>5</td>
<td>.34</td>
<td>.08</td>
<td>.04</td>
</tr>
<tr>
<td>electronic</td>
<td>DC</td>
<td>Inductive</td>
<td>5</td>
<td>.1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Load Level Explanation

Series 18D Pressure Switches have microswitch contacts with gold-plating over silver base metal. The gold plating remains intact when "low level" voltage / current levels are observed. This feature assures highly reliable switching in low-level electronic circuits.

Standard applications do not require the gold plating – which will decay naturally when switching larger electrical loads.

### Notes:

1. Reference conditions:
   - 30 cycles per min and 86°F (30°C) ambient.
2. Reducing load current to 50% of I max approximately doubles contact life.
3. Creepage and clearance distances correspond to insulation group B per VDE Reg. 0110 (except contact clearance of microswitch).
**Series 18D Hydraulic Pressure Switches**

All Dimensions in Inches (mm)

---

**Dimensional drawing 01**

- 1.18 (30)
- 0.79 (20)
- 2.95 (75)
- 1.18 (30)

- Pressure port material: 430 SS (1.4104)
- ⅞ NPT, G1/4 or 7/16-20 UNF

**Dimensional drawing 02 (flange mount)**

- 1.18 (30)
- 3.15 (8) dia recess at pressure inlet for O-ring. (O-ring supplied with switch)

---

**Protective Cover**

An optional elastomer cover for protection of the switch adjustment against dirt and splashing liquids

---

**Part No. 0554737**
Switch Selection and Mounting Instructions

- Select a switch such that the desired switching point falls roughly in the middle of the adjustment range.
- Do not exceed switch electrical ratings. Use an appropriately sized relay when switching larger electrical loads.
- For liquid media with pressure spikes and/or pulsating pressures, install a pressure snubber.
- For outdoor applications, sufficient protection must be provided.

Adjustment of Switching Point

Either the upper or the lower switching point may be adjusted. The opposite one is then fixed by the hysteresis characteristics of the switch.

Use a pressure gauge for exact adjustment. Proceed as follows:

1. Loosen locking screw.
2. Adjust the switching point using a 5 mm hexagon wrench. Clockwise rotation increases switching pressure and counter-clockwise rotation decreases switching pressure.
   
   Low-end of adjustment range is reached when top of adjustment barrel is approximately level with top of switch housing. High-end of adjustment range is reached when adjustment barrel is fully CW.
3. Re-tighten locking screw.

![Diagram of Switch Adjustment](image-url)
Series 31D
Electronic Pressure Switches for Pneumatic Applications

- Digital Display Panel
  - Real-time display of actual pressure
  - LED status indication
- Adjustable Hysteresis
  - Independent setting of switching and reset pressures
- Window Mode Capability
- Off-line Calibration
  - Switching points can be preset without applied pressure
- Extremely Long Service Life
  - No moving parts, no mechanical contacts
  - Up to 100 million cycles
- Fast Accurate Response
  - 5ms switching time
  - .5% full scale linearity
- Full 1 Amp Switching Capability
  - “Normally on” or “Normally off” operation

Technical Data
Fluid:
  Filtered compressed air, lubricated or unlubricated
Fluid Connection:
  Female 1/4 NPT, G 1/4
Mounting:
  Arbitrary
Electrical Connection:
  DIN 43650 Table A plug-in
Adjustment Range:
  -14 to 350 psi (-1 to 25 bar)
Ambient Temperature:
  14° to 140°F (-10° to 60°C)
Fluid Temperature:
  14° to 175°F (-10° to 80°C)
Temperature sensitivity (zero point):
  0.4% of FS value/10 K
Temperature sensitivity (range):
  0.2% of FS value/10 K
Switching point:
  Adjustable between 0 and 100% of FS value
Reset point:
  Adjustable between 0 and 100% of FS value
Display format:
  3-1/2 digit LCD
Linearity:
  < 0.5% of FS value
Environmental Protection
  IP65
Housing Material:
  Die-cast zinc

Series 31D pressure switches are electronic devices for pressure monitoring. The switches consist essentially of an integral pressure sensor, microprocessor evaluation circuitry, and a solid state output driver.
### General Information

( Part numbers include mating connector )

Pressure display in PSI

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Switching Pressure Range (psi)</th>
<th>Maximum Pressure (psi)</th>
<th>Fluid Connection</th>
<th>Type of Fluid Connection</th>
<th>Step Size of Display (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0886120</td>
<td>-14 – 15</td>
<td>150</td>
<td>1/4 NPT Female</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>0886620</td>
<td>0 – 150</td>
<td>440</td>
<td>1/4 NPT Female</td>
<td>.6 - .7</td>
<td></td>
</tr>
<tr>
<td>0886720</td>
<td>0 – 350</td>
<td>580</td>
<td>1/4 NPT Female</td>
<td>1 - 2</td>
<td></td>
</tr>
</tbody>
</table>

Pressure display in Bar

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Switching Pressure Range (bar)</th>
<th>Maximum Pressure (bar)</th>
<th>Fluid Connection</th>
<th>Type of Fluid Connection</th>
<th>Step Size of Display (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0886100</td>
<td>-1 – 1</td>
<td>10</td>
<td>G1/4 Female</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>0886600</td>
<td>0 – 10</td>
<td>30</td>
<td>G1/4 Female</td>
<td>.04 - .05</td>
<td></td>
</tr>
<tr>
<td>0886700</td>
<td>0 – 25</td>
<td>40</td>
<td>G1/4 Female</td>
<td>.1</td>
<td></td>
</tr>
</tbody>
</table>
### Electrical Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>DIN 43650 Table A</td>
</tr>
<tr>
<td>Power supply (polarity safe)</td>
<td>18 to 32V dc</td>
</tr>
<tr>
<td>Permissible residual ripple</td>
<td>10% (within 18 to 32V)</td>
</tr>
<tr>
<td>Current consumption</td>
<td>&lt;50 mA (plus load current)</td>
</tr>
</tbody>
</table>

#### Switching Output

**Switching mode**
- Open collector PNP switched to supply
  - (suited for inductive load)

**Output voltage**
- Supply voltage minus 1.5V (approx)

**Contact rating**
- $I_{max} = 1$A (short-circuit proof)

**Switching time**
- < 5ms

**Service life**
- 100 million switching cycles

**Switching logic**
- Signal “on” with rising pressure, if $SP > RP^{**}$
- Signal “on” with falling pressure, if $SP < RP$

---

* $SP = $ Switching point
** $RP = $ Reset point
Adjusting the Switching Points (SP) and Reset Points (RP)

a) Adjusting the switching point.

Case 1 or Case 2

Press and hold the SP button. The display will show the previous switching pressure setting, and the dotted bar will flash while the button is pressed down (case 1).

You can now use the cursor keys to adjust the switching point upwards or downwards. If a cursor key is held down, the values will change faster. When the cursor key is released again, the switch-on pressure setting will cease to change. This setting is stored and activated when the SP button is released, after which the display will show the current pressure value and the bar will quit flashing.

c) Setting a buffering time.

In order to prevent brief pressure “spikes” or “surges” from causing undesired switching, a buffering time can be entered. The effect of this is that pressure changes are evaluated only if the pressure signal in question is present for longer than the buffering time. In order to set a buffering time, press the button SP before the power supply is switched on. Release this button again after the power supply has been switched on. The display will then show the buffering time in milliseconds (e.g. 03) or seconds. The cursor buttons ▼, ▲ can be used to set the buffering time to 03, 06, 12, 24. When this has been done, press SP to store the setting.

d) Setting the pressure switch to ambient pressure = 0.

Since ambient pressure varies according to altitude, the user may re-calibrate the zero point to match local conditions.

Press the button RP before the power supply is switched on. Release this button again after the power supply has been switched on and the display test has run. The display will then show “OFS”. The cursor buttons ▼, ▲ can be used to set the pressure display to 0. When this has been done, press SP to store the setting.

b) Adjusting the reset point.

Case 3 or Case 4

Press and hold the RP button. The display will show the previous reset pressure setting, and the dotted bar will flash while the button is pressed down.

You can now use the cursor keys to adjust the reset point in the same manner as described above.

During both adjustment operations, it may occur that the hysteresis graph changes from one state to another at the time a transition is made through the point “Switching pressure = Reset pressure“. When both points are correctly set, the hysteresis graph will also be correct. You can change between SP and RP as often as you wish until the settings are correct.
e) Hysteresis mode

If it is desired to operate with a fixed hysteresis value instead of the reset point, this value can be selected as desired.

In order to set a hysteresis value, the two buttons SP and ▼ must be pressed simultaneously before the power supply is switched on.

Release these buttons again after the power supply has been switched on and the display test has run. The display will then show the operating mode. The cursor buttons ▲,▼ can now be used to change the operating mode until "HYS" appears in the display. When this has been done, press SP to store the setting.

The SP button can be used to display the switching-point setting, which can be modified by means of the cursor buttons ▲,▼.

The button RP can be used to display the hysteresis setting, which can also be modified by means of the cursor buttons ▲,▼.

Negative hysteresis means: Signal "on" with rising pressure (case 1).
Positive hysteresis means: Signal "on" with falling pressure (case 2).

If the switching point is modified, this will automatically also result in a change in the reset point by a value equal to the hysteresis setting.

Case 1

<table>
<thead>
<tr>
<th>Negative hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching point</td>
</tr>
<tr>
<td>p</td>
</tr>
</tbody>
</table>

Case 2

<table>
<thead>
<tr>
<th>Positive hysteresis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching point</td>
</tr>
<tr>
<td>p</td>
</tr>
</tbody>
</table>

f) Window mode

If it is desired to monitor whether the pressure lies within a certain range, a switching window can be created for this purpose. The pressure switch will then indicate cases in which the actual pressure lies above or below this area. In order to set a switching window, the two buttons SP and ▼ must be pressed simultaneously before the power supply is switched on.

Release these buttons again after the power supply has been switched on and the display test has run. The display will then show the operating mode. The cursor buttons ▲,▼. can now be used to change the operating mode until "FEn" (standing for "Window") in the display. When this has been done, press SP to store the setting. The button SP can be used to display the switching-point setting, which can be modified by means of the cursor buttons ▼,▲.

The distance between the switching point and reset point is the switching window. If the switching point is lower than the reset point, a signal will be output as long as the pressure lies within the preset window (case 1, rising pressure). If the switching point is higher than the reset point, a signal will be output as long as the pressure lies outside the preset window (case 2, rising pressure). In the case of falling pressure, the signal is inverted.

Case 1

<table>
<thead>
<tr>
<th>On = Pressure within window</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP &lt; RP</td>
</tr>
</tbody>
</table>

Case 2

<table>
<thead>
<tr>
<th>Off = Pressure within window</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP &lt; SP</td>
</tr>
</tbody>
</table>

Std = Standard mode, switching and reset points adjustable
HYS = Hysteresis mode, switching point and hysteresis adjustable
FEn = Window mode, switching window adjustable
Switching Characteristic Graphs

Signal “on” with **rising** pressure
Setting SP\(^*\) > RP\(^**\)

![Graph showing pressure and time with SP higher than RP]

Signal “off” with **rising** pressure
Setting RP > SP

![Graph showing pressure and time with RP higher than SP]

Signal “on” with **falling** pressure
Setting SP < RP

![Graph showing pressure and time with SP lower than RP]

Signal “off” with **falling** pressure
Setting RP < SP

![Graph showing pressure and time with RP lower than SP]

Explanation:
When the switching point (SP) is adjusted **HIGHER** than the reset point (RP), then the switching output will be “normally off”. When the switching point (SP) is adjusted **LOWER** than the reset point (RP), then the switching output will be “normally on”.

Position of operating elements
### Error messages

Display of hardware errors or malfunctions

<table>
<thead>
<tr>
<th>Display</th>
<th>Meaning</th>
<th>Cause / Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>O.Er</td>
<td>Output error</td>
<td>Error at switching output: Circuit-breaker defective, feedback loop to processor open circuit. Repair necessary.</td>
</tr>
<tr>
<td>E.Er</td>
<td>E²PROM error</td>
<td>E²PROM module defective or connection to processor faulty. Repair necessary.</td>
</tr>
<tr>
<td>I.Er</td>
<td>Initialization error</td>
<td>Checksum of initialization data incorrect. Remedy: Call up any SETUP function and acknowledge the setting with SP. This error message is caused by a data error. All setup values should therefore be checked and corrected if necessary.</td>
</tr>
<tr>
<td>C.Er</td>
<td>Calibration error</td>
<td>Checksum of calibration data incorrect. Recalibration necessary.</td>
</tr>
<tr>
<td>S.C.L</td>
<td>Short-circuit low</td>
<td>Short-circuit between output and ground. Check wiring: Power supply may be too weak for connected load (leading to collapse of voltage, particularly with loads with a high switch-on current such as incandescent lamps or capacitances).</td>
</tr>
<tr>
<td>U.FL</td>
<td>Underflow</td>
<td>The applied pressure is below the measuring range: Increase pressure until it is within the measuring range.</td>
</tr>
<tr>
<td>O.FL</td>
<td>Overflow</td>
<td>The applied pressure is above the measuring range: Decrease pressure until it is within the measuring range.</td>
</tr>
</tbody>
</table>

Display of hardware errors or malfunctions (can be switched off)

<table>
<thead>
<tr>
<th>Display</th>
<th>Meaning</th>
<th>Cause / Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.C.H</td>
<td>Short-circuit high</td>
<td>Short-circuit between output and power supply. Check wiring. If the switching line from the load (e.g. electrical control device, PLC or similar) is being held at an open-circuit potential of &gt; 3V, or if several pressure switches are being operated in parallel, this function should be switched off. Disconnection: ▼ during display test, then adjust with ▼ or ▲</td>
</tr>
<tr>
<td>U.LO</td>
<td>Voltage low</td>
<td>Power supply voltage too low (&lt;17V). Check power supply: Load may be too large. Disconnection: ▲ during display test, then adjust with ▼ or ▲</td>
</tr>
</tbody>
</table>

Messages generated by calling SETUP functions

<table>
<thead>
<tr>
<th>Cod</th>
<th>Meaning</th>
<th>Requested code or code programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLC</td>
<td>Clear code</td>
<td>Deletion of current code</td>
</tr>
<tr>
<td>bx</td>
<td>Delay time</td>
<td>Setting of filter time constant</td>
</tr>
<tr>
<td></td>
<td>(Buffering time)</td>
<td>xx = Switching output delay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>xx c: (03, 06, 12, 24, 50) in ms and</td>
</tr>
<tr>
<td>OFS</td>
<td>Offset</td>
<td>Request for offset adjustment using ▼ and ▲ buttons.</td>
</tr>
<tr>
<td>S.C.H</td>
<td>Short-circuit high</td>
<td>Short-circuit monitoring activated</td>
</tr>
<tr>
<td>U.LO</td>
<td>Voltage low</td>
<td>Voltage monitoring activated</td>
</tr>
<tr>
<td>OFF</td>
<td>Off</td>
<td>Short-circuit or voltage monitoring deactivated.</td>
</tr>
<tr>
<td>Std</td>
<td>Standard mode</td>
<td>Standard mode activated</td>
</tr>
<tr>
<td>HYS</td>
<td>Hysteresis mode</td>
<td>Hysteresis mode activated</td>
</tr>
<tr>
<td>FEn</td>
<td>Window mode</td>
<td>Window mode activated</td>
</tr>
</tbody>
</table>
Norgren offers electronic solutions for your pneumatic circuit design.

In addition to printed catalogs, Norgren offers a wide variety of valuable information at our web site.

This is a great source for additional pneumatic product catalogs, CAD files, circuit design software, distributor locations, customer service and application engineering contacts.

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5400 South Delaware Street
Littleton, Colorado 80120-1663
Phone: 303-794-2611 Fax: 303-795-9487
www.usa.norgren.com
e-mail: inquiry@usa.norgren.com
Series 32D

Electronic Pressure Switches for Hydraulic and High Pressure Applications

- Digital Display Panel
  - Real-time display of actual pressure
  - LED status indication
- Adjustable Hysteresis
  - Independent setting of switching and reset pressures
- Window Mode Capability
- Off-line Calibration
  - Switching points can be preset without applied pressure
- Extremely Long Service Life
  - No moving parts, no mechanical contacts
  - Up to 100 million cycles
- Fast Accurate Response
  - 5ms switching time
  - .5% full scale linearity
- Full 1 Amp Switching Capability
  - “Normally on” or “Normally off” operation
- Optional Versions with Analog Output

Technical Data

Fluid:
  - Gaseous, liquid, aggressive and neutral fluids
Fluid Connection:
  - Flange (mount plates purchased separately)
Mounting:
  - Arbitrary
Electrical Connection:
  - Versions without analog output option have DIN 43650 Table A connector. Optional versions with analog output have DIN 43651 (7 pin) circular connector.
Adjustment Range:
  - 0 to 700 bar
Ambient Temperature:
  - 14° to 140°F (-10° to 60°C)
Fluid Temperature:
  - 14° to 175°F (-10° to 80°C)
Temperature sensitivity (zero point):
  - 0.4% of FS value/10 K
Temperature sensitivity (range):
  - 0.3% of FS value/10 K
Switching point:
  - Adjustable between 0 and 100% of FS value
Reset point:
  - Adjustable between 0 and 100% of FS value
Display format:
  - 3-1/2 digit LCD
Linearity:
  - <0.5 % of FS ± 1 digit
Environmental Protection:
  - IP65
Housing Material:
  - Die-cast zinc
Wetted Materials:
  - Sensor – 304 SS (1.4548)
  - O-ring – Viton

Series 32D pressure switches are electronic devices for pressure monitoring. The switches consist essentially of an integral pressure sensor, microprocessor evaluation circuitry, and a solid state output driver.
## General Information

*Part numbers include mounting screws, o-ring, and electrical mating connector*

Pressure display in Bar

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Switching Pressure (bar)</th>
<th>Proof/Burst Pressure (bar)</th>
<th>Electrical Connection</th>
<th>Analog Output 0–10V and 4–20mA</th>
<th>Step Size of Display (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0875100</td>
<td>0 – 100</td>
<td>200/300</td>
<td>DIN 43650</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>0875130</td>
<td>0 – 100</td>
<td>200/300</td>
<td>DIN 43651</td>
<td>x</td>
<td>0.5</td>
</tr>
<tr>
<td>0875200</td>
<td>0 – 160</td>
<td>300/400</td>
<td>DIN 43650</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>0875230</td>
<td>0 – 160</td>
<td>300/400</td>
<td>DIN 43651</td>
<td>x</td>
<td>0.8</td>
</tr>
<tr>
<td>0875300</td>
<td>0 – 250</td>
<td>500/750</td>
<td>DIN 43650</td>
<td></td>
<td>1–2</td>
</tr>
<tr>
<td>0875330</td>
<td>0 – 250</td>
<td>500/750</td>
<td>DIN 43651</td>
<td>x</td>
<td>1–2</td>
</tr>
<tr>
<td>0875400</td>
<td>0 – 350</td>
<td>500/750</td>
<td>DIN 43650</td>
<td></td>
<td>1–2</td>
</tr>
<tr>
<td>0875430</td>
<td>0 – 350</td>
<td>500/750</td>
<td>DIN 43651</td>
<td>x</td>
<td>1–2</td>
</tr>
<tr>
<td>0875500</td>
<td>0 – 500</td>
<td>750/1000</td>
<td>DIN 43650</td>
<td></td>
<td>2–3</td>
</tr>
<tr>
<td>0875530</td>
<td>0 – 500</td>
<td>750/1000</td>
<td>DIN 43651</td>
<td>x</td>
<td>2–3</td>
</tr>
<tr>
<td>0875600</td>
<td>0 – 700</td>
<td>1000/1200</td>
<td>DIN 43650</td>
<td></td>
<td>3–4</td>
</tr>
<tr>
<td>0875630</td>
<td>0 – 700</td>
<td>1000/1200</td>
<td>DIN 43651</td>
<td>x</td>
<td>3–4</td>
</tr>
</tbody>
</table>

**Notes:**
1) Mounting plates purchased separately see p. 27.
2) For hydraulic applications with pressure spikes or surges install a pressure snubber.
**Electrical parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical connection</td>
<td>DIN 43650 Table A without analog output</td>
</tr>
<tr>
<td></td>
<td>DIN 43651 (7 pin), with analog output</td>
</tr>
<tr>
<td>Power supply (polarity safe)</td>
<td>18 to 32V dc</td>
</tr>
<tr>
<td>Permissible residual ripple:</td>
<td>10% (within 18 to 32V)</td>
</tr>
<tr>
<td>Current consumption:</td>
<td>&lt;50 mA (plus load current)</td>
</tr>
</tbody>
</table>

**DIN 43651 with analog output**

- **1 +24V**
- **2 0V**
- **3 U out Imax = 1A**
- **4 4 – 20mA**
- **5 0 – 10V**
- **PE**

**Electromagnetic compatibility**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interference emission</td>
<td>Acc. to EN 50081. Part 1</td>
</tr>
<tr>
<td>Interference immunity</td>
<td>Acc. to EN 50082. Part 2</td>
</tr>
</tbody>
</table>

**Switching output**

- **Switching mode**: Open collector PNP transistor switched to supply (suited for inductive load)
- **Output voltage**: Supply voltage minus 1.5V (approx)
- **Analog output**: 0 to 10V and 4 to 20mA
- **Contact rating**: Imax = 1 A (short-circuit proof)
- **Switching time**: < 5ms
- **Service life**: 100 million switching cycles
- **Switching logic**: Signal “on” with rising pressure, if SP > RP
  Signal “on” with falling pressure, if SP < RP

*SP = Switching point  
*RP = Reset point
Adjusting the Switching Points (SP) and Reset Points (RP)

a) Adjusting the switching point.

Case 1 or Case 2

Press and hold the SP button. The display will show the previous switching pressure setting, and the dotted bar will flash while the button is pressed down (case 1).

You can now use the cursor keys to adjust the switching point upwards or downwards. If a cursor key is held down, the values will change faster. When the cursor key is released again, the switch-on pressure setting will cease to change. This setting is stored and activated when the SP button is released, after which the display will show the current pressure value and the bar will quit flashing.

b) Adjusting the reset point.

Case 3 or Case 4

Press and hold the RP button. The display will show the previous reset pressure setting, and the dotted bar will flash while the button is pressed down.

You can now use the cursor keys to adjust the reset point in the same manner as described above.

During both adjustment operations, it may occur that the hysteresis graph changes from one state to another at the time a transition is made through the point "Switching pressure = Reset pressure". When both points are correctly set, the hysteresis graph will also be correct. You can change between SP and RP as often as you wish until the settings are correct.

c) Setting a buffering time.

In order to prevent brief pressure "spikes" or "surges" from causing undesired switching, a buffering time can be entered. The effect of this is that pressure changes are evaluated only if the pressure signal in question is present for longer than the buffering time. In order to set a buffering time, press the button SP before the power supply is switched on. Release this button again after the power supply has been switched on. The display will then show the buffering time in milliseconds (e.g. 03) or seconds. The cursor buttons ▼, ▲ can be used to set the buffering time to 03, 06, 12, 24 or 50 ms or 0.1, 0.2 or 0.4 seconds. When this has been done, press SP to store the setting.

d) Setting the pressure switch to ambient pressure = 0.

Since ambient pressure varies according to altitude, the user may re-calibrate the zero point to match local conditions.

Press the button RP before the power supply is switched on. Release this button again after the power supply has been switched on and the display test has run. The display will then show "OFS". The cursor buttons ▼, ▲ can be used to set the pressure display to 0. When this has been done, press SP to store the setting.
e) Hysteresis mode

If it is desired to operate with a fixed hysteresis value instead of the reset point, this value can be selected as desired.

In order to set a hysteresis value, the two buttons SP and ▼ must be pressed simultaneously before the power supply is switched on.

Release these buttons again after the power supply has been switched on and the display test has run. The display will then show the operating mode. The cursor buttons ▲,▼ can now be used to change the operating mode until "HYS" appears in the display. When this has been done, press SP to store the setting.

The SP button can be used to display the switching-point setting, which can be modified by means of the cursor buttons ▲,▼.

The button RP can be used to display the hysteresis setting, which can also be modified by means of the cursor buttons ▲,▼.

Negative hysteresis means: Signal “on” with rising pressure (case 1).

Positive hysteresis means: Signal “on” with falling pressure (case 2).

If the switching point is modified, this will automatically also result in a change in the reset point by a value equal to the hysteresis setting.

![Negative hysteresis](image1)

Case 1

![Positive hysteresis](image2)

Case 2

f) Window mode

If it is desired to monitor whether the pressure lies within a certain range, a switching window can be created for this purpose. The pressure switch will then indicate cases in which the actual pressure lies above or below this area. In order to set a switching window, the two buttons SP and ▼ must be pressed simultaneously before the power supply is switched on.

Release these buttons again after the power supply has been switched on and the display test has run. The display will then show the operating mode.

The cursor buttons ▲,▼ can now be used to change the operating mode until "FEn" (standing for "Window") in the display. When this has been done, press SP to store the setting. The button SP can be used to display the switching-point setting, which can be modified by means of the cursor buttons ▲,▼.

The distance between the switching point and reset point is the switching window. If the switching point is lower than the reset point, a signal will be output as long as the pressure lies within the preset window (case 1, rising pressure). If the switching point is higher than the reset point, a signal will be output as long as the pressure lies outside the preset window (case 2, rising pressure). In the case of falling pressure, the signal is inverted.

![Window mode](image3)
General Dimensions

Note: All 32D switches are shipped with mounting screws, o-ring and mating electrical connector

Mounting Plates

G 1/4 Pressure Port
Part No. 0522259 Material: Aluminum
Part No. 0522233 Material: Stainless 304 (1.4301)

1/4 NPT Pressure Port
Part No. 0522260 Material: Aluminum
Part No. 0522232 Material: Stainless Steel 304 (1.4301)

Note: Stainless steel mounting plate suggested for pressures above 250 bar – and for any aggressive fluids.
Switching Characteristic Graphs

Signal “on” with rising pressure
Setting SP* > RP**

Signal “off” with rising pressure
Setting RP > SP

Signal “on” with falling pressure
Setting SP < RP

Signal “off” with falling pressure
Setting RP < SP

Explanation:
When the switching point (SP) is adjusted **HIGHER** than the reset point (RP), then the switching output will be “normally off”.
When the switching point (SP) is adjusted **LOWER** than the reset point (RP), then the switching output will be “normally on”.

Position of operating elements

- Pressure display
- Switching function graph
- Switching output LED
- Switching point button
- Reset point button
- Raise switching or reset point button
- Lower switching or reset point button
## Error messages

**Display of hardware errors or malfunctions**

<table>
<thead>
<tr>
<th>Display</th>
<th>Meaning</th>
<th>Cause / Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>O.Er</td>
<td>Output error</td>
<td>Error at switching output: Circuit-breaker defective, feedback loop to processor open circuit. Repair necessary.</td>
</tr>
<tr>
<td>E.Er</td>
<td>(E^{2})PROM error</td>
<td>(E^{2})PROM module defective or connection to processor faulty. Repair necessary.</td>
</tr>
<tr>
<td>I.Er</td>
<td>Initialization error</td>
<td>Checksum of initialization data incorrect. Remedy: Call up any SETUP function and acknowledge the setting with SP. This error message is caused by a data error. All setup values should therefore be checked and corrected if necessary.</td>
</tr>
<tr>
<td>C.Er</td>
<td>Calibration error</td>
<td>Checksum of calibration data incorrect. Recalibration necessary.</td>
</tr>
<tr>
<td>SC.L</td>
<td>Short-circuit low</td>
<td>Short-circuit between output and ground. Check wiring: Power supply may be too weak for connected load (leading to collapse of voltage, particularly with loads with a high switch-on current such as incandescent lamps or capacitances).</td>
</tr>
<tr>
<td>U.Fl</td>
<td>Underflow</td>
<td>The applied pressure is below the measuring range: Increase pressure until it is within the measuring range.</td>
</tr>
<tr>
<td>O.Fl</td>
<td>Overflow</td>
<td>The applied pressure is above the measuring range: Decrease pressure until it is within the measuring range.</td>
</tr>
</tbody>
</table>

**Display of hardware errors or malfunctions (can be switched off)**

<table>
<thead>
<tr>
<th>Display</th>
<th>Meaning</th>
<th>Cause / Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC.H</td>
<td>Short-circuit high</td>
<td>Short-circuit between output and power supply. Check wiring. If the switching line from the load (e.g. electrical control device, PLC or similar) is being held at an open-circuit potential of &gt; 3V, or if several pressure switches are being operated in parallel, this function should be switched off. Disconnection: (\downarrow) during display test, then adjust with (\downarrow) or (\uparrow).</td>
</tr>
<tr>
<td>U.Lo</td>
<td>Voltage low</td>
<td>Power supply voltage too low (&lt;17V). Check power supply: Load may be too large. Disconnection: (\uparrow) during display test, then adjust with (\downarrow) or (\uparrow).</td>
</tr>
</tbody>
</table>

**Messages generated by calling SETUP functions**

<table>
<thead>
<tr>
<th>Cod</th>
<th>Meaning</th>
<th>Requested code or code programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLC</td>
<td>Clear code</td>
<td>Deletion of current code</td>
</tr>
</tbody>
</table>
| bxx   | Delay time (Buffering time) | Setting of filter time constant  
\(xx = \) Switching output delay  
\(xx \in \{03, 06, 12, 24, 50\}\) in ms and  
\(xx \in \{0.1, 0.2, 0.4\}\) in s. |
| QFS   | Offset                   | Request for offset adjustment using \(\downarrow\) and \(\uparrow\) buttons. |
| SC.H  | Short-circuit high       | Short-circuit monitoring activated                                       |
| U.Lo  | Voltage low              | Voltage monitoring activated                                              |
| OFF   | Off                      | Short-circuit or voltage monitoring deactivated.                          |
| Std   | Standard mode            | Standard mode activated                                                   |
| HYS   | Hysteresis mode          | Hysteresis mode activated                                                 |
| FEn   | Window mode              | Window mode activated                                                     |
| U-C   | Voltage calibration      | Voltage output selected                                                   |
| I-C   | Current calibration      | Current output selected                                                   |
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- take advantage of built-in sizing programs to ensure product suitability
- view product animation sequences
- make use of integrated software for configuring valve manifolds

5400 South Delaware Street
Littleton, Colorado 80120-1663
Phone: 303-794-2611 Fax: 303-795-9487
www.usa.norgren.com
e-mail: inquiry@usa.norgren.com
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