

NEO-DYN[®]

MODEL 100P ENCLOSURE 7

ADJUSTABLE EXPLOSION-PROOF PRESSURE SWITCH

INSTALLATION AND OPERATION MANUAL



ITT Industries

Engineered for life

Manual No. 610-0006 Rev F
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ITT

Important Information

The product warranty applicable to this ITT Neo-Dyn® instrument is as stated on page 16 of this manual.

Should any after-delivery problems arise, please contact ITT Neo-Dyn's Customer Service using the information above. Our normal business hours are weekdays, 7:00 am to 3:30 pm, Pacific Time.

Before installing this Adjustable Pressure Switch, become familiar with the installation and adjustment instructions in Chapters 2 and 3.

WARNING Indicates a hazard, which can cause severe personal injury, death, or substantial property damage if the warning is ignored.

CAUTION Indicates a hazard, which will or can cause minor personal injury or property damage if the caution is ignored.

**SPECIAL
CONDITIONS
FOR SAFE USE**

The electrical wiring must be connected to the switch by means of conduit or flameproof cable gland certified to BS EN 60079-1. The electrical wiring must be 105 °C rated minimum copper conductors only. If replacement of the setscrew that secures the threaded cover of the electronics housing is necessary, it must be replaced with a 0.138-32 UNC-2A (6-32) Hex Socket Head Cap Screw, 300 series CRES or CAD Plated Grade 5 Steel.

NOTE Indicates additional information about a particular item necessary to the operation of the unit.

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CHAPTER

1

INTRODUCTION

The Neo-Dyn® Model 100P Enclosure 7 Adjustable Pressure Switch is an explosion-proof, electromechanical pressure switch designed for a wide range of applications in pneumatic and hydraulic systems up to 3,000 psig. The most common wetted materials include a polyimide (Kapton) sensing diaphragm, nitrile O-ring, and aluminum alloy or corrosion resistant steel (CRES) pressure port. CRES diaphragms and all-welded construction are also available for corrosive pressure media.

Setpoint adjustments are easily made through the adjustable range of the Pressure Switch using either the increasing or decreasing handles. These handles are accessed by removing the unit's front cover.

Model 100P Enclosure 7 may be ordered to switch 125 to 600 VAC, or 28 to 125 VDC, with currents from microamperes to 15 amperes.

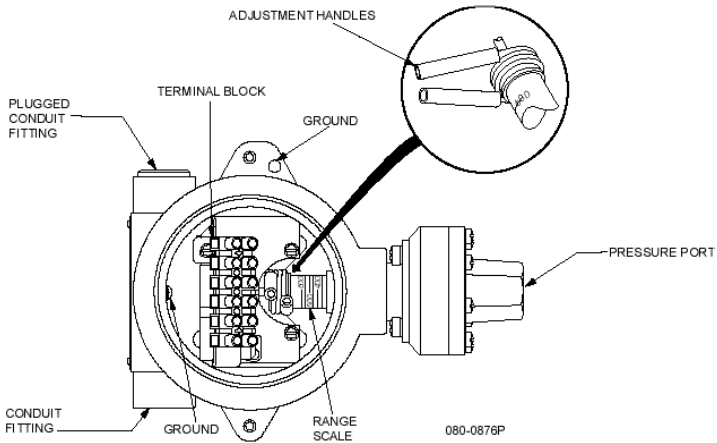


Figure 1. Model 100P Enclosure 7
Adjustable Pressure Switch for Hazardous Locations

The standard electrical conduit connections are $\frac{3}{4}$ " - 14 NPT female. The standard pressure connection is either a $\frac{1}{4}$ " - 18 or $\frac{1}{2}$ "-14 NPT female port; see Chapter 2.

Chapter 4 on page 11 contains complete specifications for the 100P Enclosure 7 Adjustable Pressure Switch.

CUSTOMER SERVICE

If you have any questions about the 100P Adjustable Pressure Switch that are not covered in this manual, you can contact Neo-Dyn in several ways.

The customer service phone number is (661) 295-4000. Our customer service department is open from 7:00 am to 3:30 p.m. Pacific Time.

Our Internet site is www.neodyn.com.

CHAPTER

2

INSTALLATION

Installation of Model 100P Enclosure 7 is straightforward. However, this Adjustable Pressure Switch must be installed by a qualified electrician, in compliance with all local and national electrical codes.

WARNING Electrical Hazard

WARNING Do not make electrical connections while power is on.

WARNING Always check for multiple circuits.

WARNING Always make sure grounding is adequate.

MOUNTING

The Adjustable Pressure Switch can be mounted directly to the pressure connection if there is no significant vibration and the pressure lines are capable of supporting the weight, or it can also be attached to a flat surface, such as a wall.

Space the Range 1 unit at least .375 inch (0.95 cm) from the mounting surface, or allow the pressure fitting to overhang an edge of the mounting surface.

PRESSURE CONNECTION

The standard pressure inlet for model 100P Pressure Switches is either a ¼" - 18 NPT female pipe thread for Wetted Material 1 (aluminum alloy port), or ½" - 14 NPT female pipe thread for Wetted Materials 4, 5, 7 and 9 (CRES port). When installing the 100P Adjustable Pressure Switch always:

- Make sure that the unit and your system have matching threads.
- Use the wrench flats provided.
- Seal all joints with pipe joint sealing compound.

CAUTION Avoid excessive torque on all threaded connections.

WARNING **Do not exceed the marked Maximum Operating Pressure in normal operation.**

WARNING **Do not use as a safety device.**

The marked Proof Pressure is provided to give the maximum allowable pressure without causing permanent damage to the pressure switch in the event of an over-pressure condition. Set pressure relief/safety valves below this setting.

ELECTRICAL CONNECTIONS

One terminal block is located on the inside of the unit.

Electrical connections are made through either of the two $\frac{3}{4}$ "-14 NPT conduit openings. Model 100P Enclosure 7 is shipped from the factory with a threaded plug in one of these conduit openings. This plug is suitable for use in hazardous locations.

All field wiring for Model 100P must comply with requirements of the NEC or applicable local electrical codes, including wire gauges and insulation temperature ratings. Conduit seals may be required.

With no power to the wires, remove the unit's cover, move the insulator flap to the side (exposing the terminal block), and connect the wires to the terminal block. (See Figure 1.) There are three ways of wiring model 100P Enclosure 7, depending on which Electrical Form the unit is; Figure 2 shows the electrical schematics for Forms CC, C, and Z.

NOTE On forms C and CC, it is not mandatory to connect both NC and NO wires to the switch.

Return the the insulator flap to its position over the terminal block. If the setpoints are not to be adjusted at this time, reinstall the unit's cover, making sure that it is bottomed and compressing its O-ring.

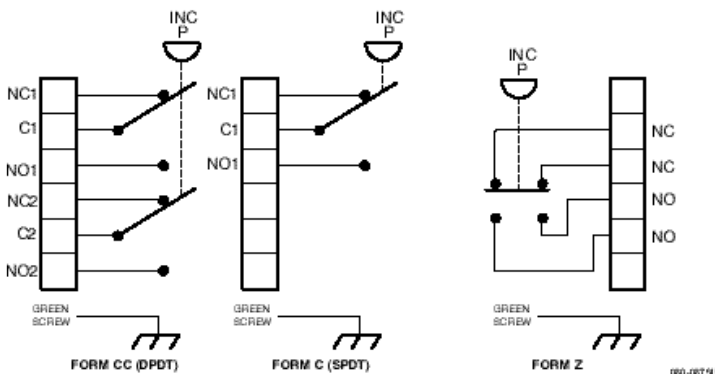


Figure 2. Schematics Shown at Zero PSIG

CHAPTER

3

ADJUSTMENTS AFTER INSTALLATION

This section describes the adjustments needed after the Adjustable Pressure Switch has been properly installed.

Pressure settings are internally adjustable using the adjustment handles.

WARNING Never remove the cover in a hazardous environment with the power on.

ADJUSTMENTS

1. It is recommended that the unit be in a non-hazardous location during adjustment.
2. Disconnect the electrical power. Check for multiple circuits.
3. Remove the access cover. Lift the insulator flap that contains the adjustment diagram, exposing the adjustment handles.
4. To change the setpoint, the adjustment spring handles can be manipulated by hand or with a small-shafted screw driver or similar tool inserted into the end of the desired handle. The handle for decreasing the setpoints is next to the housing wall adjacent to the pressure port; the other handle, closer to the center of the housing, increases the setpoints. See Figure 1.

5. Rock the appropriate handle back and forth, to rotate the adjustment nut to increase or decrease load on the internal adjustment spring. The silver-colored range scale, visible past the end of the adjustment nut, gives an approximate value of the increasing setpoint. For precise adjustment of the increasing or decreasing setpoint, check the setpoints with a calibrated pressure gauge.
6. To check the setpoint, connect a pressure source (and a calibrated pressure gauge if desired) to the pressure port and slowly apply increasing pressure until the switch actuates. Actuation can be noted by listening to the audible snap of the Belleville spring, or with an ohmmeter across the appropriate terminals of the terminal block.
7. If you want to check the decreasing setpoint, slowly decrease the pressure after the switch has actuated and note the pressure at which the audible snap or ohmmeter indicates deactuation. Deadband may be calculated if desired by subtracting the decreasing setpoint pressure from the increasing setpoint pressure.

CAUTION

Replace the cover onto the unit and tighten it until it is snug against the O-ring. Do not overtighten the cover, as this can make it difficult to remove later.

8. Tighten the setscrew.

CHAPTER

4

TROUBLESHOOTING

In-service problems are unlikely, but the following paragraphs suggest ways to verify any problems that might arise:

1. Leaks

If a leak is suspected, connect the pressure switch and a calibrated pressure gauge downstream from a pressure source and shutoff valve. Apply normal system pressure, isolate the gauge and Pressure Switch from the pressure source with the shutoff valve for at least one minute, and check for leaks as evidenced by a drop in the gauge reading.

Leaks may be repaired by replacing the sensing diaphragm and O-ring (wetted materials 1 and 4 only). Contact ITT for replacement parts and instructions, or return the unit to ITT for this repair.

2. Failure to Switch

If application of pressure 10% greater than the adjusted setpoint fails to produce actuation, first check for contamination in the pressure line, and verify that pressure is reaching the sensing diaphragm. If the Belleville spring can be heard to audibly snap, but an ohmmeter indicates no electrical switching, the cause is probably stuck or burned switch contacts, and the switch element needs to be replaced. Return the unit to ITT for this repair.

If application of pressure 10% greater than the adjusted setpoint fails to produce an audible snap of the Belleville spring, there is probably a mechanical failure or binding due to contamination. Return the unit to ITT for repair.

3. Calibration Shifts

If it is suspected that the setpoints have shifted, recheck them per paragraphs 6 and 7 of Chapter 3. If you verify unstable or drifting setpoints, return the unit to ITT for repair.

CHAPTER

5

SPECIFICATIONS

This section shows the standard specifications and available options for the 100P Adjustable Pressure Switch.

STANDARD

Interface

The Model 100P Enclosure 7 weighs approximately 4 pounds (1.8 kg).

$\frac{3}{4}$ " - 14 NPT Conduit Connections

$\frac{1}{4}$ " - 18 or $\frac{1}{2}$ " - 14 NPT Female Pressure Port

Temperature Range

Ambient: -40°F (-40°C) to +167°F (+75°C)

Media: -40°F (-40°C) to +300°F (+149°C)

Listing Agency Approvals

UL

CSA

ATEX

CE Mark

Part Number

The part number contains information about which configurations and options are included in your Adjustable Pressure Switch. To determine the pressure range, electrical rating, and options, compare the part number of your unit with the information below in Figure 3.

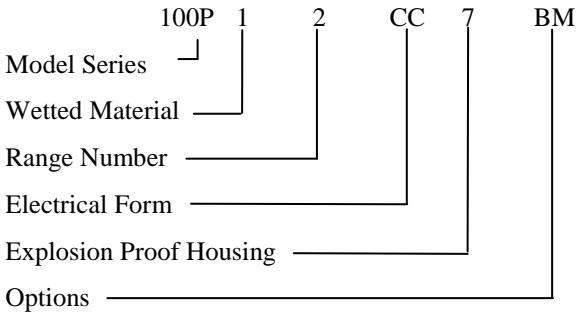


Figure 3. Part Number Breakdown

Pressure Ratings

Part No	Range No	Max Operating Pressure, psig (bar)	Proof Pressure PSIG (bar)
100P*1*7*	1	600 (41.37)	1000 (68.95)
100P*2*7*	2	3000 (206.85)	5000 (344.8)
100P*4*7*	4	3000 (206.85)	5000 (344.8)
100P*5*7*	5	3000 (206.85)	5000 (344.8)
100P*7*7*	7	3000 (206.85)	5000 (344.8)
100P*8*7*	8	3000 (206.85)	5000 (344.8)

* See Figure 3 above for part number breakdown

Actuation Points

Table 2			
Adjustable Set Point Range PSIG (KPAG)			
Range No	Increasing, psig (bar)	Decreasing, psig (bar)	Deadband Approx., psi (bar)
1	5 to 75 (0.35 to 5.2)	2.3 to 73.3 (0.15 to 5.0)	2.7 (0.2)
2	15 to 150 (1.0 to 10.3)	9 to 144 (0.6 to 9.9)	6 (0.4)
4	50 to 300 (3.4 to 20.7)	36 to 286 (2.5 to 19.7)	14 (1)
5	125 to 600 (8.6 to 41.4)	100 to 575 (6.9 to 39.6)	25 (2)
7	500 to 1500 (34.4 to 103.4)	440 to 1440 (30.3 to 99.3)	60 (4)
8	800 to 2800 (55.2 to 193.1)	675 to 2675 (46.5 to 184.4)	125 (9)

Wetted Materials

Table 3	
No	Description
1	Aluminum alloy port, teflon coated polyimide (Kapton) diaphragm and nitrile O-ring
4	UNS S31600 CRES port, teflon coated polyimide diaphragm and nitrile O-ring.
5	UNS S31600 CRES port and diaphragm, heliarc welded.
9	Monel port and inconel diaphragm, heliarc welded; not offered in range "1"

Explosion Proof/ Weather Proof Ratings:

Class I, Div 1, Groups C and D

Class II, Div 1, Groups E, F and G

Class III, Div 1



II 2 G D

Ex d II B T6 Gb

Ex tb IIIC T85 °C Db, IP65

Enclosure type 4X, 13 (NEMA)

Electrical Ratings

Form C (SPDT)

15 amp at 125, 250, or 480 VAC, 2 amp at 600VAC, 1/8 hp at 125 VAC, ¼ hp at 250 VAC, .5 amp resistive, .04 amp inductive at 125 VDC.

Form CC (DPDT):

11 amp and ¼ hp at 125 or 250 VAC, 5 amp resistive , 3 amp inductive at 28 VDC, .5 amp resistive at 125 VDC.

Form Z (Double Break):

15 amp at 125, 250, or 480 VAC, ¼ hp at 125 VAC, 1/2 hp at 250 VAC, 1 amp resistive, .5 amp inductive at 125 VDC.

Form C or CC with M option

1 amp at 125 VAC

OPTIONS

The available options are listed below. You can combine these options, but every option ordered should be indicated in the part number of the unit.

Table 4	
Option	Description
B	Viton O-Ring – Refer to Wetted Materials
C	EPR O-Ring – Refer to Wetted Materials
E	7/16 – 20 SAE Port (Wetted Material 1 Only)
F	Fire Fuse – For Fire Tested Equipment (Wetted Materials 4 and 5 only)
M	Gold Electrical Contacts For Extremely Low Current Applications
S	Corrosion-Resistant Steel Diaphragm (Wetted Material 4 Only)
W	Corrosion-Resistant Steel Screws – Exterior (Standard on Wetted Materials 4, 5 and 9)

WARRANTY INFORMATION

A. Warranty:

ITT Industries (ITT) warrants that at the time of shipment, the products manufactured by ITT Neo-Dyn and sold hereunder, will be free from defects in material and workmanship and will conform to the specifications furnished or approved by ITT.

B. Warranty Adjustment:

If any defect within this warranty appears, the Buyer shall notify ITT immediately.

ITT agrees to repair or furnish a replacement for, but not install, any product which, within one (1) year from the date of shipment by ITT shall, upon test and examination by ITT, prove defective within the above warranty.

No product will be accepted for return or replacement without the written authorization of ITT. Upon such authorization, and in accordance with instructions by ITT, the product will be returned with shipping charges prepaid by the Buyer. Replacements made under this warranty will be shipped prepaid.

C. Exclusion from Warranty:

THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS, OR OTHERWISE.

Components manufactured by any supplier other than ITT shall bear only the warranty made by the manufacturer of that product, and ITT assumes no responsibility for the performance or reliability of the unit as a whole.

“In no event shall ITT be liable for indirect, incidental or consequential damages nor shall the liability of ITT arising in connection with any products sold hereunder (whether such liability arises from a claim based on contract, warranty, tort or otherwise) exceed the actual amount paid by Buyer to ITT for the products delivered hereunder.”

The warranty does not extend to any product manufactured by ITT, which has been subject to misuse, neglect, accident, improper installation, or to use in violation of instructions furnished by ITT.

The warranty does not extend to or apply to any unit, which has been repaired or altered at any place other than at ITT's factory or service locations, by persons not expressly approved by ITT.