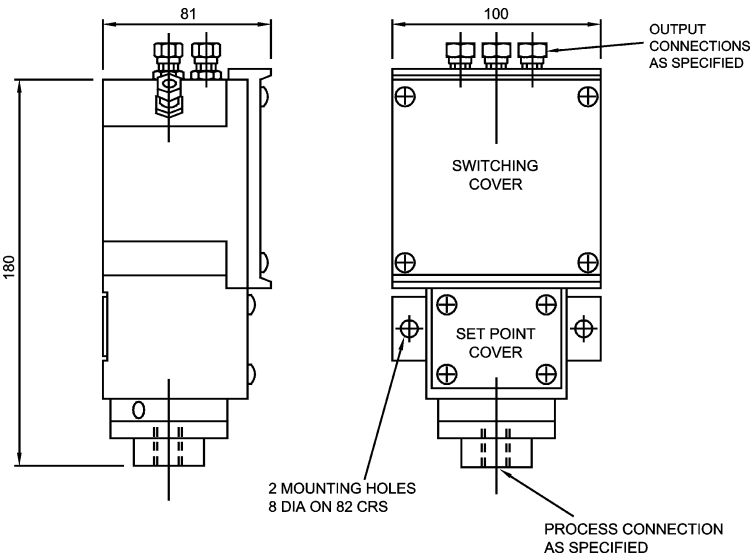
PRESSURE & DP SWITCHES

SERIES 700 FOR PNEUMATIC CONTROL APPLICATIONS



TYPICAL SERIES 700 DIMENSIONED OUTLINE

MANUFACTURED IN THE U.K.

The Series 700 Pressure and Differential Pressure switches offer accurate, reliable switching in a robust cast enclosure.

- ***RANGES FROM 16 mBAR TO 600 BAR***
- ***HIGH OVERLOAD RATINGS***
- ***SIMPLE MAINTENANCE***
- ***SAFETY VENT RING***

These switches provide excellent repeatability and long in-service life, under both continuous cycling and overload conditions, due to the mechanical restriction of diaphragm travel.

A standard feature of the design is the inclusion of a venting and isolation chamber which (in the unlikely event of the process diaphragm failure) will prevent the process entering the switching enclosure.

The setpoint of the switch is adjusted by means of a capstan head screw, located within the lower section of the enclosure.

Series 700 pneumatic output switches make extensive use of the HNL precision pilot valve (PPV) as the prime sensing device to detect the process diaphragm movement. This valve provides a final switching differential equal to that obtained by the use of a sensitive electrical microswitch.

The photograph on the back page of this data sheet illustrates features described above.

With over 40 pressure and DP ranges and a wide selection of output switches, diaphragm and pressure chamber materials, and process connections (including flanges), Series 700 switches meet the requirements of a wide range of applications.

In addition HNL can offer many non-standard options (see back page for details) or customise this product to meet your unique requirements.

HNL's Series 700 switches can provide many years of maintenance free operation. All models are serviceable and spares, including diaphragm kits and output switch kits are readily available. Drawings and technical data sheets are supplied as standard.

Our extensive stockholding of components and the modular design allows this product to be supplied rapidly to meet customers delivery requirements.

QUALITY ASSURANCE

Designed and manufactured by HNL in accordance with BS EN ISO 9001:2000.

SERIES 700 PRESSURE & DP SWITCHES
SPECIFICATIONS & CODING

PRESSURE RANGES

SETPOINT RANGES					DIAPHRAGM MATERIAL			CHAMBER PROOF RATING (BAR)			TYPICAL DIMENSIONS (CENTRELINE VERTICAL) H x W x D
RANGE CODE	MIN	MAX	UNITS	% RESET	1	2	7	ALUM. 1	ST.ST. 5	HAST.C 7	
714 PZ	-8	8	mBar	2	●	●	–	–	0.5	–	266 x 300 x 316
715 PZ	-15	15			●	●	–	–	0.5	–	
724 PZ	-25	25	mBar	2	●	●	●	2	2	■	243 x 185 x 195
725 PZ	-50	50			●	●	●	2	2	■	
734 PZ	-125	125	mBar	2	●	●	●	10	10	■	236 x 108 x 114 (as photo on front page)
735 PZ	-250	250			●	●	●	10	10	■	
736 PZ	-500	500			●	●	●	10	10	■	
744 PZ	-0.6	0.6	Bar	2	●	●	●	30	30	■	211 x 100 x 81
745 PZ	-1	1.4			●	●	●	30	30	■	
746 PZ	-1	6.0			●	●	●	30	30	■	
734 P	25	250	mBar	2	●	●	●	10	10	■	236 x 108 x 114 (as photo on front page)
735 P	50	500			●	●	●	10	10	■	
736 P	100	1200			●	●	●	10	10	■	
737 P	300	3500			●	●	●	10	10	■	
744 P	0.1	1.4	Bar	2	●	●	●	30	30	30	196 x 100 x 81 (see dimensioned outline on front page)
745 P	0.2	3.0			●	●	●	30	30	30	
746 P	0.7	7.0			●	●	●	30	30	30	
74B P	1	10			●	●	●	30	30	30	
747 P	2	21			●	●	●	35	35	35	
754 P	1.2	12	Bar	3	–	●	●	–	250	250	206 x 100 x 81
755 P	3	30			–	●	●	–	250	250	
756 P	7	70			–	●	●	–	250	250	
757 P	20	210			–	●	●	–	350	350	
758 P	60	600			–	–	●	–	1000	1000	

DIFFERENTIAL PRESSURE RANGES

714 DPZ	-8	8	mBar	2.5	●	●	–	–	0.5	–	276 x 300 x 316
715 DPZ	-15	15			●	●	–	–	0.5	–	
724 DPZ	-25	25	mBar	2.5	●	●	●	2	2	■	279 x 185 x 195
725 DPZ	-50	50			●	●	●	2	2	■	
734 DPZ	-125	125	mBar	2.5	●	●	●	10	10	–	281 x 108 x 110
735 DPZ	-250	250			●	●	●	10	10	–	
734 DPZM	-100	100	mBar	3	–	–	●	–	300	–	300 x 104 x 114
735 DPZM	-200	200			–	–	●	–	300	–	
736 DPZM	-400	400			–	–	●	–	300	–	
744DPZ	-0.9	0.9	Bar	3	●	●	●	–	30	–	249 x 100 x 81
745DPZ	-1	2			●	●	●	–	30	–	
734 DP	25	250	mBar	2.5	●	●	●	10	10	■	281 x 108 x 110
735 DP	50	500			●	●	●	10	10	■	
736 DP	100	1200			●	●	●	10	10	■	
737 DP	300	3500			●	●	●	10	10	■	
734 DPM	20	200	mBar	3	–	–	●	–	300	–	300 x 104 x 114
735 DPM	40	400			–	–	●	–	300	–	
736 DPM	100	1000			–	–	●	–	300	–	
737 DPM	300	3000			–	–	●	–	300	–	
744DP	0.2	2	Bar	2.5	●	●	●	30	30	30	249 x 100 x 81
745DP	0.4	4			●	●	●	30	30	30	
746DP	1	10			●	●	●	30	30	30	
747DP	2	21			●	●	●	35	35	35	
746 DPM	0.7	7	Bar	3	–	–	●	–	300	–	300 x 104 x 114
747 DPM	2	21			–	–	●	–	300	–	
748 DPM	10	100			–	–	●	–	300	–	

Key to options : ● = available – = not available ■ = check availability with HNL Technical Sales

SERIES 700 PRESSURE & DP SWITCHES
SPECIFICATIONS & CODING

Output Switch

Code	Pilot Pressure	Switched Pressure	Notes
61	3 to 8 Bar	Vacuum to 8 Bar	Pilot operated, spring return, **3 port** sliding spool relay valve - fixed differential
64	2 to 8 Bar	Vacuum to 8 Bar	Pilot operated, bistable, **3 port** sliding spool relay valve - adjustable differential (12% max.)
67	1 to 4 Bar	As pilot	Non-bleed valve, Supply pressure fed forward above the setpoint (0/1) - fixed differential
68	1 to 4 Bar	As pilot	Non-bleed valve, Supply pressure fed forward below the setpoint (1/0) - fixed differential
71	1.4 to 1.7 Bar	As pilot	Pilot operated valve, switching supply on rising (0/1) or falling (1/0) setpoint - fixed differential
81	1.4 to 1.7 Bar	0 to 2 Bar	Pilot operated, spring return, **3 port** diaphragm seal valve - fixed differential

Range Code from table on previous page

Coding:

735DP . 8 1 4 5 . 6 1 . 7 5 0 3

Housing

Housing Material:

Aluminium housing with epoxy hardened ...	8 1 4
... with stoved enamel finish	
Austenitic stainless steel housing with self finish	8 4 4

Bulkhead Connections:

1/8" NPT INT.	4
Nut and olive for 1/4" outside diameter (o.d.) tube	5
Nut and resilient seal for 1/4" or 6mm o.d. tube	6
Nut and olive for 6mm o.d. tube	7

Process

Process Connection:

0 1	Rc 1/4 (1/4" BSP.T INT)
0 3	1/4" NPT INT.
0 6	1/2" NPT INT.
0 8	1/2" NPT Male

Chamber Material:

1	Anodised Aluminium
5	316 Stainless Steel
7	Hastelloy C

Diaphragm Material:

1	Nitrile	-25°C to 90°C
2	PTFE	-40°C to 180°C
7	Hastelloy C	-40°C to 200°C

Notes on Output Switch Selection:

1. Output codes 61, 64 and 81 are 3 port valves. These have a separate pilot bulkhead in addition to the 3 bulkheads for the valve. Generally the centre bulkhead is the output and the other two bulkheads are the switched supply and the vent. Swapping these two connections determines if the output pressure is present on a falling or rising process pressure.
2. Output codes 67 and 68 are two port valves, having a supply and output bulkhead. They are designed not to vent continuously (above or below the setpoint) and are particularly suited to operation using natural gas for the pilot supply. All other output switch codes have a continuous consumption of pilot gas in at least one state (above or below the setpoint). A bulkhead is provided to the switch enclosure that enables gas vented during operation of the valve to be piped away.
   The use of output switch codes 67 and 68 will increase the basic reset by typically 1%.
3. Output code 71 is a two port valve, with two bulkhead connections, the pilot supply and the output.
4. All output switches must be supplied with a clean, dry and filtered inert gas at the recommended pilot pressure for correct operation.

Notes:

1. Typical dimensions shown on range table are for a 1/4" internal connection and may increase for alternative connection sizes.
2. Dust and weatherproof ratings are IP66 to BS EN 60529 (IEC 60529).
3. An 'M' within the range code signifies DP connections suitable for direct mounting of standard equalising manifolds.
4. On some ranges 1/2" NPT connections are via a supplied adaptor.
5. A 'Z' within the range code signifies at or below zero. This is achieved with the use of a stainless steel biasing assembly within the process chamber. If stainless steel is not compatible with the process an alternative 'X' option is available (e.g. 744PX instead of 744PZ).
6. A large number of flanged, chemical seal and alternative threaded connections are available as special options. Please contact HNL Technical Sales for details.

SERIES 700 PRESSURE & DP SWITCHES
TECHNICAL SPECIFICATIONS

Scale Accuracy & Setpoint Calibration:
A 0-100 scale is fitted to all switches and provides an approximate indication of the setpoint relative to the range of the switch. The scale is not intended for precise calibration purposes. For precise calibration the scale should be used for initial guidance and the final adjustment made against an instrument sufficiently accurate to meet the site requirements.

Combined Switching Errors & Maximum Working Pressure (MWP):
In accordance with BS6134 1991:

The sum of the average switching errors and the operating value repeatability will typically not exceed 0.3% of range span, at setpoints of 10%, 50% and 90% of span, at constant calibration and measurement temperatures.

The maximum working pressure of the Series 700 switches is 0.67 x the proof pressure. It should be noted that diaphragm type switches generally have a high overload capability.

Reset (Switching Differential):
The reset varies throughout the range, normally increasing with setpoint, and the figure quoted in the range table is the switching differential value (as defined in BS6134) expressed as a percentage of the span at the mid range setpoint.

Ambient Temperature Ratings:
Enclosures are rated for continuous use over the temperature range –20°C to +60°C.

It is essential that the dewpoint of both pilot and switched supplies is at least 10°C below the ambient temperature, otherwise there is the risk of freezing up the valve.

Storage limits for all enclosures are –50°C to +80°C.

Exposure of the enclosure to direct sunlight should be such that the heat gain due to absorption of radiant energy does not cause the enclosure temperature to exceed the recommended maximum. Sufficient signal line cooling must always be provided to ensure that heat conduction from the process will not cause the switch enclosure to operate outside the stated ambient temperature limits.

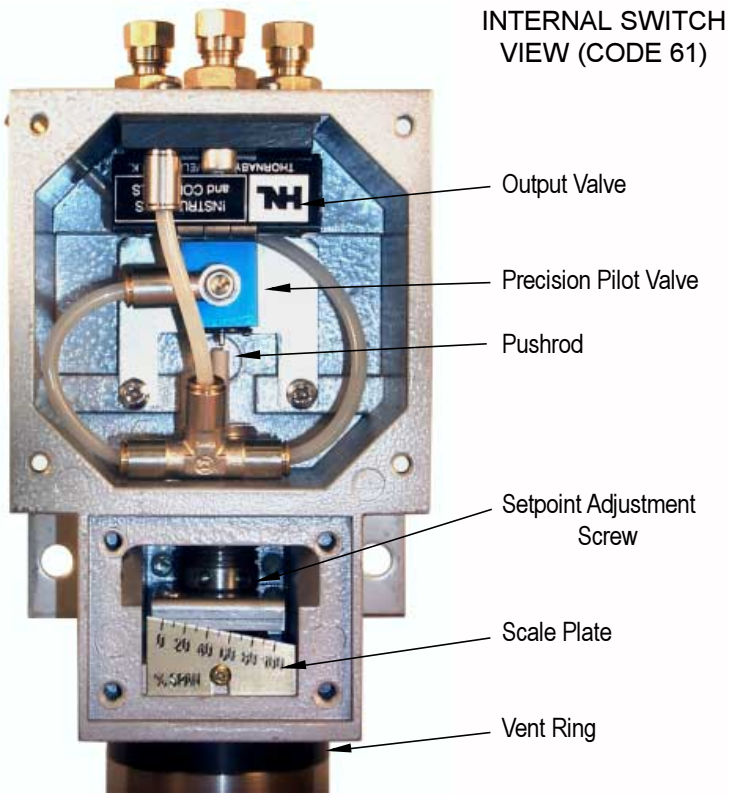
Temperature Coefficient:
The additional error, relative to a setpoint calibration of 20°C, will not exceed 0.3% per 10°C change within the normal ambient temperature range of the switch enclosure.

Process Options:
For switches fitted with metallic diaphragms, a PTFE ring is incorporated on some ranges to provide additional sealing. Should PTFE not be compatible with the process media please contact HNL Technical Sales for advice on alternatives.

Special Options & Specifications:
For additional Pressure and DP ranges, degreasing of process wetted materials for oxygen service and accessories, refer to data sheet TD OPT. For additional diaphragms, chamber materials and connections, refer to data sheet TD SPO.

Specifications
Parameter definitions are in accordance with BS6134:1991 (Pressure and Vacuum Switches).

INTERNAL SWITCH VIEW (CODE 61)



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