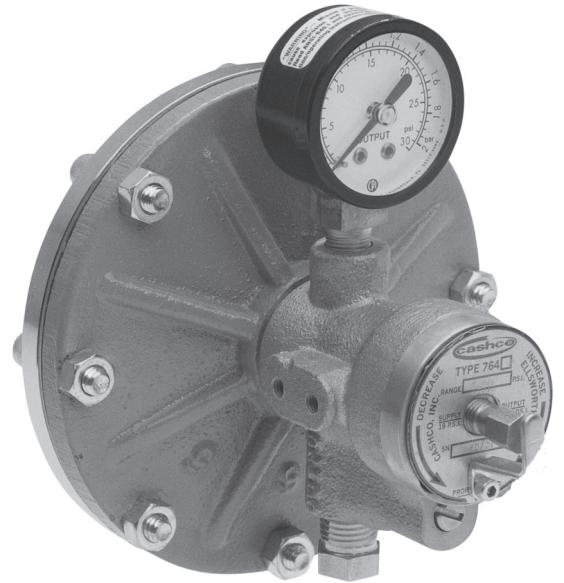




ISO Registered Company

MODEL 764P/PD

PRESSURE CONTROLLERS



MODEL 764P

OVERVIEW

The Models 764P and 764PD are pneumatic pressure controllers. They measure the controlled or differential pressure and develop an output signal that varies linearly with changes in the controlled pressure. The 764P controls pressure between 30" Hg vacuum and 2500 psig (760 mm Hg Vac. and 172.4 Barg) using six ranges. The 764PD variation controls differential pressures between 1 and 150 psid (.07 and 10.3 Bard) using three ranges.

FEATURES

- Adjustments:** Proportional band and setpoint.
- Diaphragm Seals:** Available for corrosive fluids.
- Field Reversible:** Easily changed from direct acting to reverse acting.
- Small Size:** Easily supported at process piping connection.
- Gauge:** 1-1/2" (38 mm) output signal gauge.

APPLICATIONS

Suitable for use on air, inert gases, liquids and steam applications.



END CONNECTIONS

1/4" (DN8) NPT



COMMON APPLICATIONS

AIR, INERT GASES, LIQUIDS, STEAM



DESIGN PRESSURE

CONTROLS DIFFERENTIAL PRESSURES BETWEEN 1-150 psig (0.07-10.3 Barg)

SPECIFICATIONS

Control Ranges: Model 764P
 2"-30" Hg Vac. (50-760mm Hg Vac.)
 1-30 psig (.07-2.1 Barg)
 20-100 psig (1.4-6.9 Barg)
 50-150 psig (3.5-10.3 Barg)
 90-500 psig (6.2-34.5 Barg)
 450-2500 psig (31.0-172.4 Barg)

Model 764PD
 1-30 psid (.07-2.1 Bard)
 20-100 psid (1.4-6.9 Bard)
 50-150 psid (3.5-10.3 Bard)

Sensing Diaphragm: Beryllium copper, ASTM B194.
 Alloy 25 – half hard is standard.

 316 SST wetted parts – uses a 316 SST cover, or covers, on the beryllium copper diaphragm.

Vent Screen: Brass, 1/8" NPT (764P only).

Diaphragm Casing Materials:

Ductile Iron – ASTM A395
 316 SST – ASTM A479.

The non-pressurized lower diaphragm case of the 764P is iron on all units, except the 2500 psig (172 Barg) units use steel.

For process fluid wetted parts, see Table 1 for Model 764P. See Table 2 for Model 764PD.

Maximum Static Pressure:

See Tables 1 and 2.

Ambient Temperature Range:

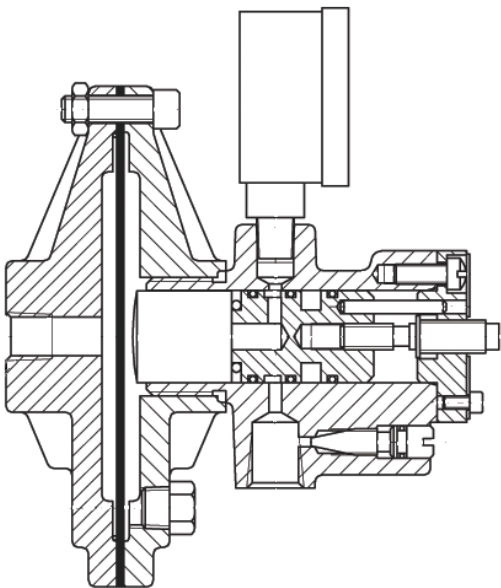
-20° to +180°F (-28.5° to +82.5°C).
 Steam service requires a pigtail siphon in the sensing line to keep the diaphragm's O-ring seal cool.

Sensing Temperature Range:

Buna-N: -20 to 212°F (-28.5° to 100°C)
 FKM: -20 to 400°F (-28.5° to 204.4°C)
 Note: Some options and materials may further alter temperature limits.

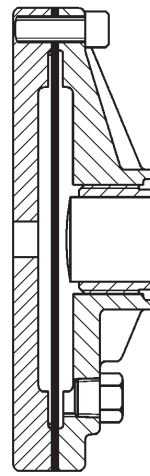
Figure 1

MODEL 764P

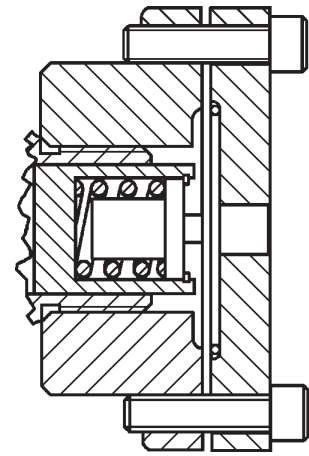


**764P 20-100 psig
(2"-30" Hg Vac.,**

1-30 psig and 50-150 psig are similar)



**Diaphragm Sub-Assembly
for 90-500 psig**



**Diaphragm Sub-Assembly
for 450-2500 psig**

**TABLE 1
MODEL 764P PROCESS FLUID WETTED PARTS**

Pressure Range		Diaphragm	Diaphragm Case	O-Ring Seal	Max. Static Pressure	
"Hg Vac./psig	(mm Hg Vac./Barg)				psig	(Barg)
2"-30" Hg Vac. or 1-30	(50-760mm Hg Vac) or (.07-2.1)	Beryllium Copper	Ductile Iron	Buna-N	250	(17.2)
		316 SST Cover	316 SST	TFE		
20 - 100 or 50 - 150	(1.4 - 6.9) or (3.5 - 10.3)	Beryllium Copper	Ductile Iron	Buna-N	300	(20.7)
		316 SST Cover	316 SST	TFE		
90 - 500	(6.2 - 34.5)	316 SST Cover	316 SST	TFE	750	(51.7)
450 - 2500	(31.0 - 172.4)	316 SST Cover	316 SST	TFE	2750	(190)

Control Housing Sub-Assembly: Brass housing, Buna-N O-ring seals, SST adjusting screws, etc.

Output Signal: 3–15 psig (0.2–1.03 Barg).
6–30 psig (0.4–2.1 Barg).

Supply Pressure: 18–20 psig (1.2–1.4 Barg) for 3-15 psig output; 32–35 psig (2.2–2.4 Barg) for 6-30 psig output.

Output Signal Gauge: 0–30 psig (0–2.1 Barg) range for 3–15 psig output signal; 0–60 psig (0–4.1 Barg) for 6–30 psig output signal.

Diaphragm Casing Connections: 764P and 764PD – Upper case (center) – 1/4" NPT, lower case – 1/8" NPT.

Supply and Output Signal Connections: 1/4" NPT female pipe connections.

Sensitivity: Better than 0.05% of sensing diaphragm span.

Repeatability: Sensing ±0.2% of sensing diaphragm span.

Diaphragm Span:

Pressure Range		Span	
"HgVac/ psig	(mm HgVac Barg)	psig	(Barg)
2" – 30"Hg	(50 – 760mm Hg)	30	(2.1)
1 – 30	(.07 – 2.1)	30	(2.1)
20 – 100	(1.4 – 6.9)	100	(6.9)
50 – 150	(3.5 – 10.3)	100	(6.9)
90 – 500	(6.2 – 34.5)	500	(34.5)
450 – 2500	(31.0 – 172.4)	2500	(172.4)

Proportional Band:

Adjustable 3–20% of sensing diaphragm span with 18–20 psig (1.2–1.4 Barg) supply. Proportional band doubles for 6-30 psig (0.4-2.1 Barg) output signal with 35 psig (2.4 Barg) supply pressure.

Steady State Air Consumption:

Output Signal					
3-15 psig (0.2-1.03 Barg)			6-30 psig (0.4-2.1 Barg)		
Flow Rate *		Prop. Band %	Flow Rate *		Prop. Band %
SCFH	(M ³ /Hr)		SCFH	(M ³ /Hr)	
4.2	(0.12)	3	4.2	0.12	6
50	(1.41)	20	80	2.27	40

* Mid-span at proper supply pressure.

Figure 2
MODEL 764PD

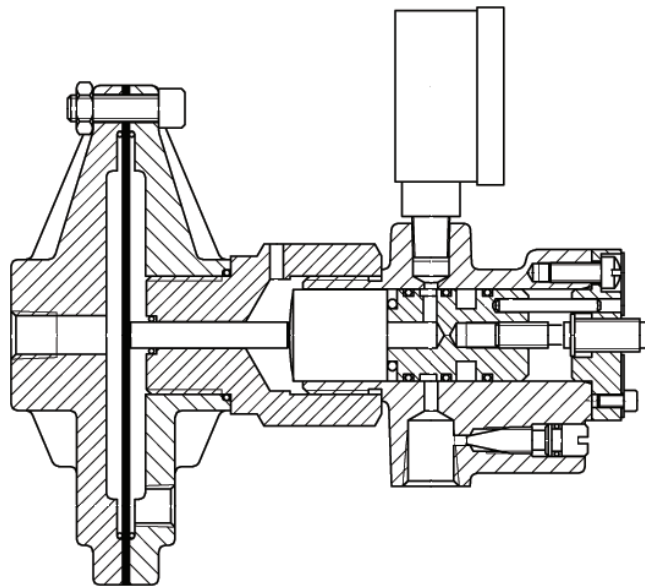


TABLE 2
MODEL 764PD PROCESS FLUID WETTED PARTS

Differential Pressure Range		Diaphragm	Diaphragm Cases	Diaphragm Case Adapter & Pusher Post	O-Ring Seals	Max. Static Pressure	
psid	(Bard)					psid	(Bard)
1 – 30	(.07 – 2.1)	Beryllium Copper	Ductile Iron	316 SST	Buna-N & FKM	250	(17.2)
20 – 100	(1.4 – 6.9)	Beryllium Copper	Ductile Iron	316 SST	Buna-N & FKM	300	(20.7)
50 – 150	(3.5 – 10.3)	Beryllium Copper	Ductile Iron	316 SST	Buna-N & FKM	300	(20.7)
1 – 30	(.07 – 2.1)	316 SST Cover	316 SST	316 SST	TFE & FKM	250	(17.2)
20 – 100	(1.4 – 6.9)	316 SST Cover	316 SST	316 SST	TFE & FKM	300	(20.7)
50 – 150	(3.5 – 10.3)	316 SST Cover	316 SST	316 SST	TFE & FKM	300	(20.7)

FKM = Fluorocarbon Elastomer

OPTIONS

Option -29: Tapped Connection. 1/4" NPT female connection on center of diaphragm case. **NOTE: This feature has been updated and is now included with standard construction.**

Option-37: Sanitary Pressure Controller. See Bulletin 764P-37-TB for technical specifications.

Option -55: SPECIAL CLEANING. Cleaned and packaged per Cashco Specifications #S-1134. Process side only. Suitable for oxygen service. Not available for Opt. -37.

Option -75: Diaphragm Seals. An Ashcroft Type 300 diaphragm seal is available with the 764P to protect the sensing diaphragm from corrosive fluid attack. The diaphragm seal is close mounted to the 764P with a 1/4" steel pipe nipple. The process connection on the diaphragm seal is 1/2" female NPT. (See Ashcroft Bulletin DS-1 for complete technical information.)

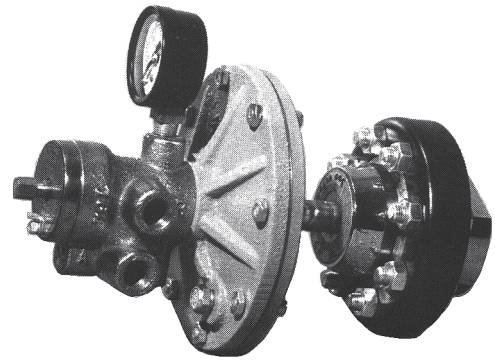


Figure 3
764P-75 with Diaphragm Seal

TABLE 3
DIAPHRAGM SEAL –
PROCESS PRESSURE/TEMPERATURE

Diaphragm Seal Mat'l.	Fill Liquid	Pressure		Temperature	
		psig	(Barg)	°F	(°C)
TFE	Glyc.	2500	(172.4)	0 – +400	(-17 to +204.8)
	Sil.			-40 – +400	(-40 to +204.8)
	H.C.			-40 – +300	(-40 to +149.2)
Fluorocarbon Elastomer	Glyc.	500	(34.5)	0 – +400	(-17 to +204.8)
	Sil.			-40 – +400	(-40 to +204.8)
	H.C.			-40 – +300	(-40 to +149.2)

Materials

Upper Housing: Steel.
 Lower Housing: 316SST, Carpenter 20, Monel 400 or Hastelloy C.
 Clamps & Bolts: Steel.
 Diaphragm Seal: TFE or Fluorocarbon Elastomer.
 Fill Liquid: Glycerine, Silicone or Halocarbon.

ACCESSORIES

Volume Booster: 1:1 ratio for improving the stroking speed of diaphragm motor valves when no positioner is used. Incorporates a stabilizing bypass needle valve between input and output (Moore Products – Model 61H).

Air Filter Regulator: Model 5200P Airset can be mounted to a control valve actuator. A 1-1/2" (38 mm) supply pressure gauge is included.

PRINCIPLE OF OPERATION

The 764 controllers employ laminar flow to produce the 3–15 psig (nominal 0.2–1.0 Barg) output signal. Laminar flow eliminates the need for range springs, levers, pivots and other parts that produce friction and lost motion.

The sensing diaphragm in the 764P and 764PD, has a high spring rate and any change in the sensed pressure produces a minute diaphragm movement which strokes the sensor plate. The sensor plate, in turn, throttles the flow of instrument air through the sensor to develop the 3–15 psig (0.2–1.0 Barg) output signal.

On direct acting controllers (see Figure 4) the supply air enters PORT A and passes through the proportional band restriction. With an increase in the controlled pressure the flow through the sensor is reduced which increases the output signal. The proportional band restriction regulates the flow rate of supply air into Port A. PORT B is the exhaust port.

On reverse acting controllers (see Figure 5) the supply enters PORT B (not Port A). With an increase in the controlled pressure the supply air flowing through the sensor decreases, which reduces the output signal. The proportional band restriction regulates the flow of exhaust through Port A.

Closing the proportional band adjusting screw reduces the proportional band. Opening the screw increases the proportional band.

The set point adjustment positions the sensor so the diaphragm must deflect its maximum for its highest controlled pressure and hardly deflects for the lowest controlled pressure.

Using a 764P/PD controller to produce a 6–30 psig (0.4–2.1 Barg) output signal operates similarly, but at higher air consumption levels.

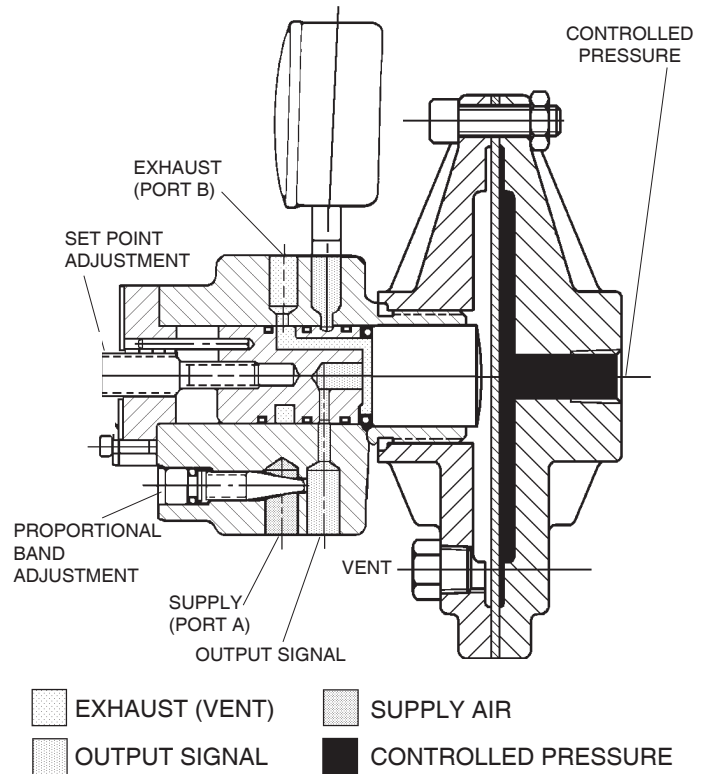


Figure 4
Direct Action 764P

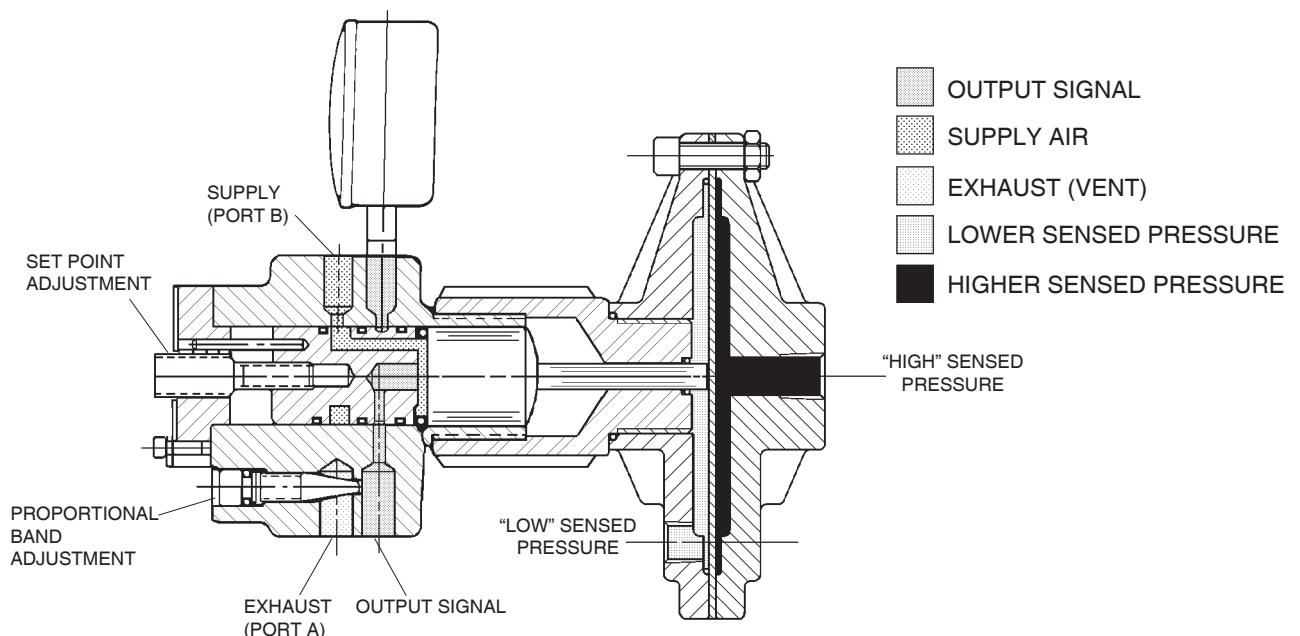
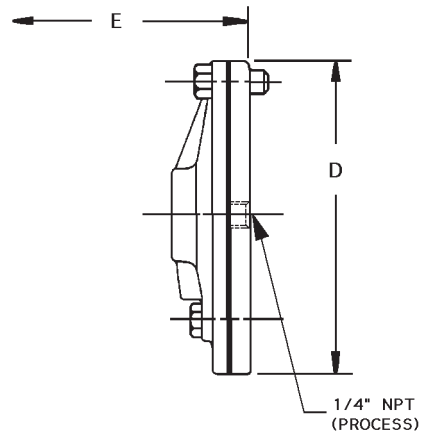
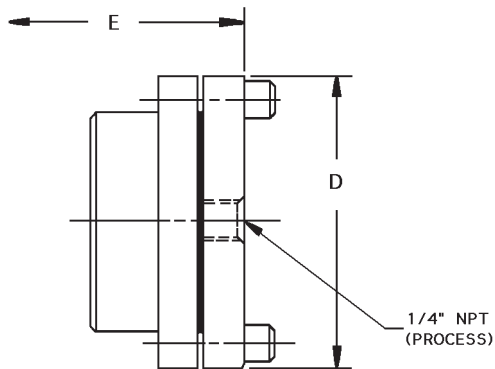
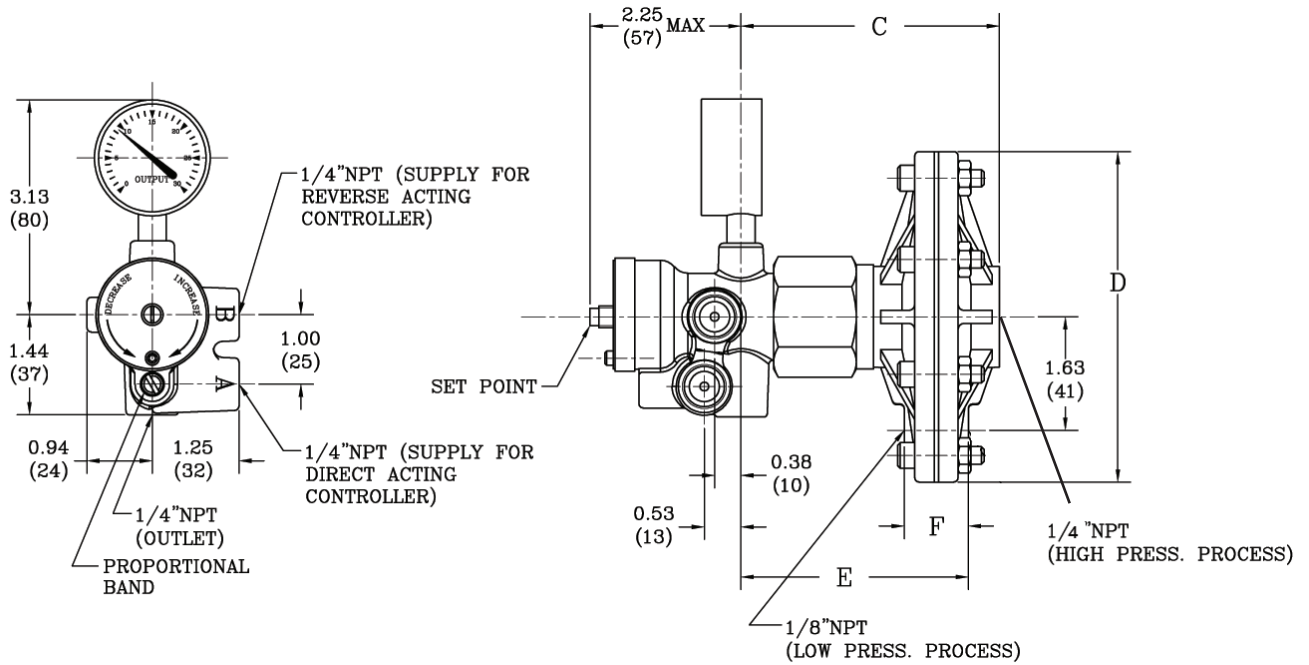


Figure 5
Reverse Action 764PD

DIMENSIONS & WEIGHTS



DIMENSION	764P								764PD			
	Iron Case		SST Case		SST Case		SST Case		Iron Case		SST Case	
	2–30" Hg Vac 1–30, 20–100, 50–150 psig		2–30" Hg Vac 1–30, 20–100, 50–150 psig		90–500 psig		450–2500 psig		1–30, 20–100, 50–150 psid		1–30, 20–100, 50–150 psid	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
C	2.28	58	NA	NA	NA	NA	NA	NA	3.72	94	NA	NA
D	4.75	121	4.75	121	3.75	95	3	76	4.75	121	4.75	121
E	1.84	47	1.75	44	1.75	44	2.03	52	3.28	83	3.19	81
F	NA	NA	NA	NA	NA	NA	NA	NA	.88	22	.69	17
WEIGHT	5.25 lbs. 2.38 kg.								5.93 lbs. 2.69 kg.			

The diaphragm casing assembly screws onto the pilot housing assembly and the 1/8" NPT tapped hole for the 764PD "Low" process connection will probably be located at positions other than shown in these views.

NOTES

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MODELS 764P / PD PRODUCT CODER 02/07/20

An "X" in POS 12 followed by a 5-digit control number overrides remaining selections.

POS 1 & 2	POS 3	—	POS 5	POS 6	POS 7	7	—	POS 10	POS 11	POS 12	0	0	0	0	0	B
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POSITIONS 1 & 2 - MODEL TYPE	
Description	CODE
Model "764P" Pneumatic Controller *	CA
Model "764PD" Pneu. Press. Diff. Controller	CC
* Use Code "CA" for Opt-37 (Ref to 764P-37-TB for Specifications)	

POSITION 3 - OUTPUT	
Signal Output	CODE
3-15 psig	1
* Variable Output	2
6-30 psig	3
* Used with 1000HP "Accelerator"	

POSITION 5 - MATERIALS				
Const. Design	(Wetted) Casing	Diaphragm Material	Applic. Ranges	CODE
764P	Ductile Iron	Be Cu	30" Vac. thru 150 psig	A
	316 SST	Be Cu with 316 SST Cover	30" Vac. thru 500 psig	B *
		Be Cu with 316 SST Cover	450 thru 2500 psig	C
764PD	Ductile Iron	BeCu Diaph	All	A
	316 SST	Be Cu with 316 SST Cover	All	D
* Standard Material Selection for Opt-37				

POSITION 6 - CONTROL RANGES		
Pressure Range	Applicable Wetted Construction	CODE
764P		
2" to 30" Hg Vac.	All	1
1-30 psig *	All	2
20-100 psig *	All	3
50-150 psig *	All	4
90-500 psig	316 SST	5
450-2500 psig	316 SST	6
764PD		
1-30 psid	All	A
20-100 psid	All	B
50-150 psid	All	C
* Only Selections for Opt-37. See Position 10.		

POSITION 7 - SPECIAL CLEAN	
Special Clean per Spec #S1134 Opt.-55	CODE
No	0
Yes - SST Casing 764P (Process Side Only) 764PD (High Process Side Only) Not available for Opt-37	1

POSITION 10 - CONNECTIONS			
764P			
Process Connection	Applicable Press. Range	Opt.	CODE
Std. - 1/4" NPT, Center of Upper Diaph Casing	All	Std.	A
1" Tri-Clamp (Sanitary)	0-30, 20-100, 50-150	-37 *	S
764PD			
Std. - 1/4" NPT, Center of Upper Diaph Casing	All	Std.	2
* Special Cleaned per #S-1576.			

POSITION 11 - DIAPHRAGM SEAL FOR 764P ONLY (OPT-75)					
None					CODE
					0
Teflon Diaphragm Seal					
Fill Liquid	Applic. Ranges (psig)	Diaph. Seal Lower Housing Material			
		316 SST	Carp. 20	Mon. 400	Hast. C.
		CODE	CODE	CODE	CODE
Glycerin	1-2500	1	4	7	A
Silicone	1-2500	2	5	8	B
Halocarbon	1-2500	3	6	9	C
Fluorocarbon Elastomer Diaphragm Seal					
Fill Liquid	Applic. Ranges (psig)	Diaph. Seal Lower Housing Material			
		316 SST	Carp. 20	Mon. 400	Hast. C
		CODE	CODE	CODE	CODE
Glycerin	1-500	D	G	K	N
Silicone	1-500	E	H	L	P
Halocarbon	1-500	F	J	M	R

POSITION 12 - AIRSET *	
Description	CODE
No Airset	0
5200P Airset (Filter Regulator) 0-30 psig range (w/gauge)	A
5200P Airset (Filter Regulator) 0-60 psig range (w/gauge)	B
For Special Construction Contact Cashco for Special Code	X
* Choose "0" when 764P or 764PD Controller and Airset are ordered with a Control Valve.	

*** For information on ATEX see pages 13 & 14 on the IOM.**

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