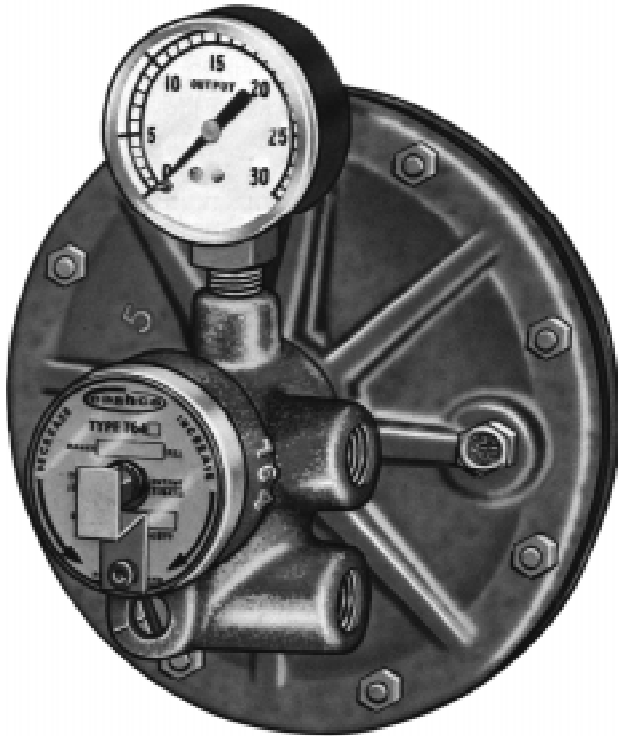


MODEL 764P / PD

PRESSURE CONTROLLERS



Model 764P

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 with Opt-29.
- Gauge:** 1-1/2" (38 mm) output signal gauge.

APPLICATIONS

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

SPECIFICATIONS

Control Ranges: Model 764P
 2"–30" Hg Vac. (50–760 mm 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.

Diaphragm Casing Materials: Cast iron – ASTM A126, Class B.
 316 SST – ASTM A479.
 The non-pressurized lower diaphragm case of the 764P is cast 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.

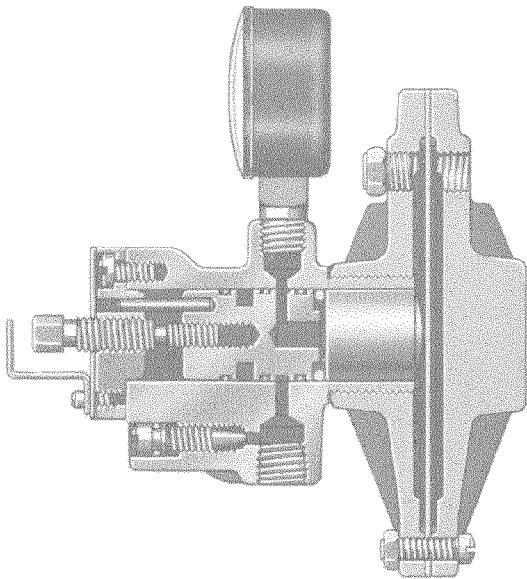
Maximum Static Pressure: See Tables 1 and 2.

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.

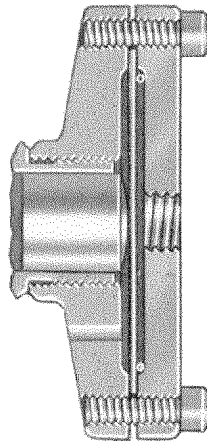
Control Housing Sub-Assembly: Brass housing, Buna-N O-ring seals, SST adjusting screws, etc.

Figure 1

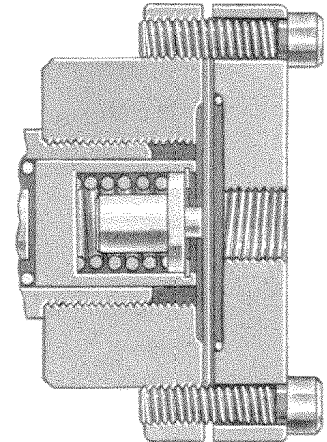
MODEL 764P



**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 "Hg Vac./psig (mm Hg Vac./Barg)	Diaphragm	Diaphragm Case	O-Ring Seal	Max. Static Pressure	
				psig	(Barg)
2"–30" (50–760 mm)	Beryllium Copper	Cast Iron	Buna-N	250	(17.2)
1–30 (.07–2.1)	316 SST Cover	316 SST	TFE	250	(17.2)
20–100 (1.4–6.9)	Beryllium Copper	Cast Iron	Buna-N	300	(20.7)
50–150 (3.5–10.3)	316 SST Cover	316 SST	TFE	300	(20.7)
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	3000	(207)

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 – 1/8" NPT female pipe connections.

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

Sensitivity: Better than 0.05% of sensing diaphragm span.

Repeatability: ±0.2% of sensing diaphragm span.

Sensing Diaphragm Span:

Pressure Range		Span	
"HgVac/psig	(mm HgVac/Barg)	psig	(Barg)
2"-30"	(50-760mm)	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

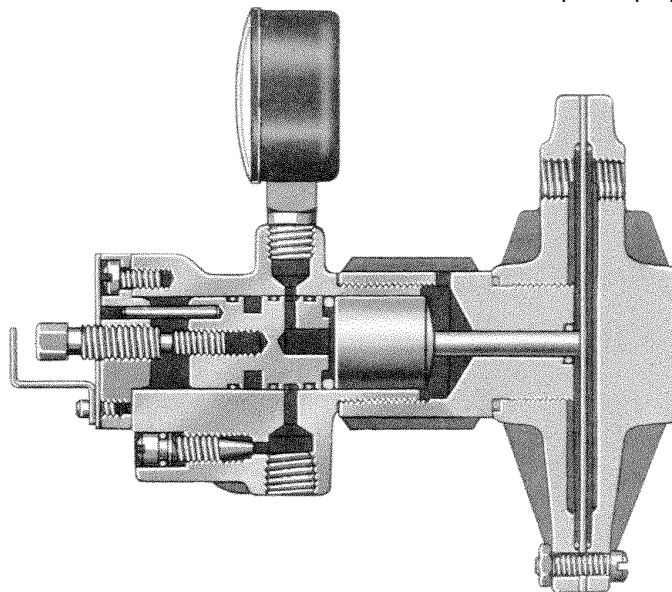


Figure 2

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)
"Hg Vac/psid	(mm Hg Vac/Bard)					
1–30	(.07–2.1)	Beryllium Copper	Cast Iron	316 SST	Buna-N & FC Elast	250 (17.2)
20–100	(1.4–6.9)	Beryllium Copper	Cast Iron	316 SST	Buna-N & FC Elast	300 (20.7)
50–150	(3.5–10.3)	Beryllium Copper	Cast Iron	316 SST	Buna-N & FC Elast	300 (20.7)
1–30	(.07–2.1)	316 SST Cover	316 SST	316 SST	TFE & FC Elast	250 (17.2)
20–100	(1.4–6.9)	316 SST Cover	316 SST	316 SST	TFE & FC Elast	300 (20.7)
50–150	(3.5–10.3)	316 SST Cover	316 SST	316 SST	TFE & FC Elast	300 (20.7)

FC Elast = Fluorocarbon Elastomer

OPTIONS

- Option -23:** Bracket Mounting. Utilizes a steel bracket with two steel machine screws for mounting the 764 controller to the actuator of a control valve or a fixed structural appendage.
- Option -29:** Tapped Connection. 1/4" NPT female connection on center of diaphragm case.
- 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. Includes 1/4" NPT 764P-29 Option. The lower housing process connection is 1/2" female NPT. (See Ashcroft Bulletin DS-1 for complete technical information.)

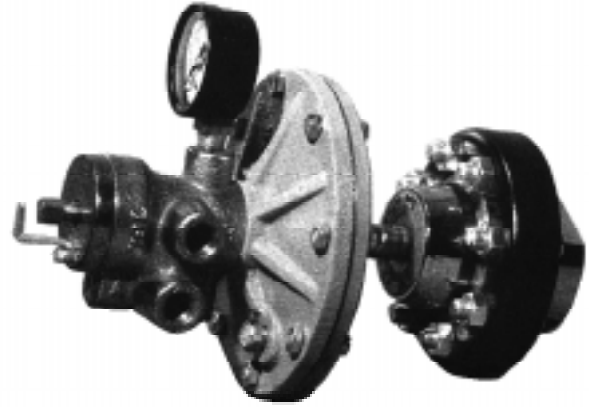


Figure 3
764P-75 with Diaphragm Seal

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→+204.8)
	Sil.		-40→+400 (-40→+204.8)
	H.C.		-40→+300 (-40→+149.2)
Fluorocarbon Elastomer	Glyc.	500 (34.5)	0→+400 (-17→+204.8)
	Sil.		-40→+400 (-40→+204.8)
	H.C.		-40→+300 (-40→+149.2)

Materials

- Upper Housing:* Steel.
- Lower Housing:* 316 SST, 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 5100P is nipple mounted to the supply port with a 1/4" NPT brass nipple. A 1-1/2" (38 mm) supply pressure gauge is included.

- Mounting on a Control Valve:** Factory mounted, using a bracket and impolene tubing, on the Ranger, Premier, Model 987, Model 964, Model 988 and Model 2266 valves with or without positioners. The 764P/PD can be pipe nipple mounted on the same valve actuator casings listed above when used without positioners.

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.

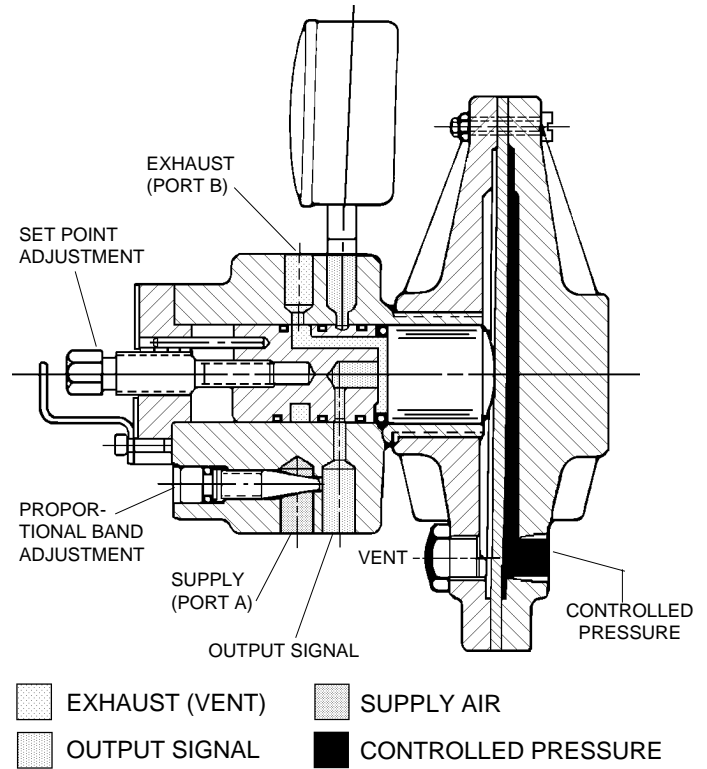


Figure 4
Direct Action 764P

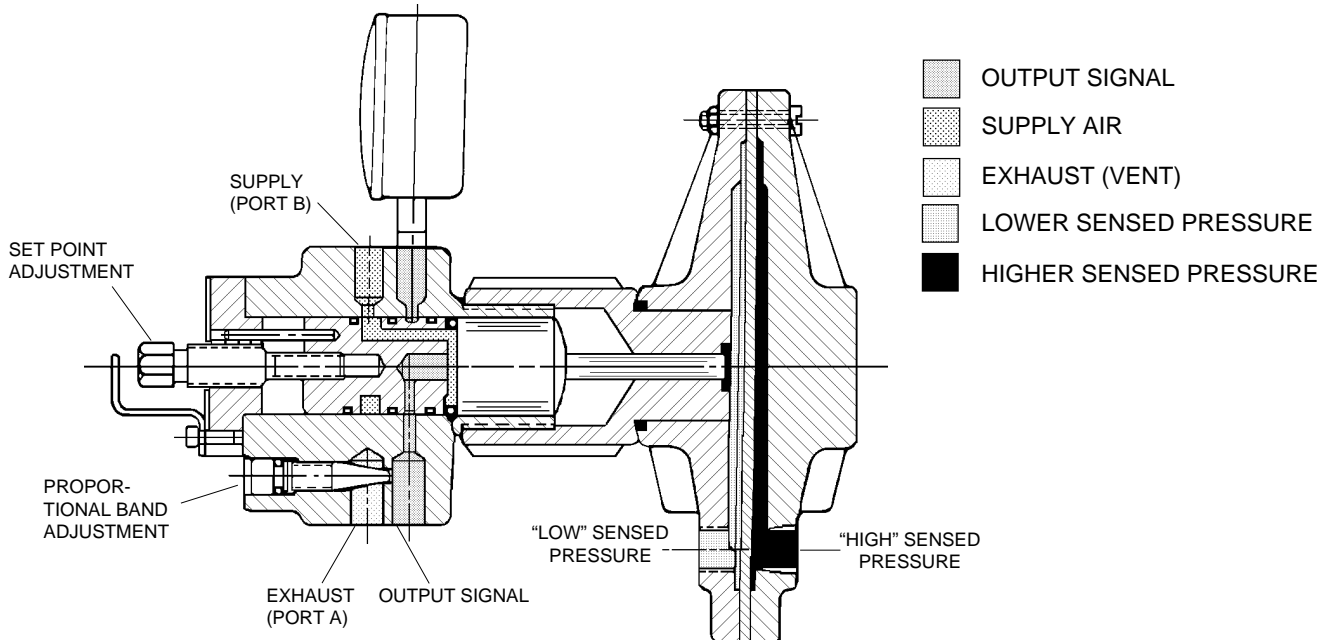
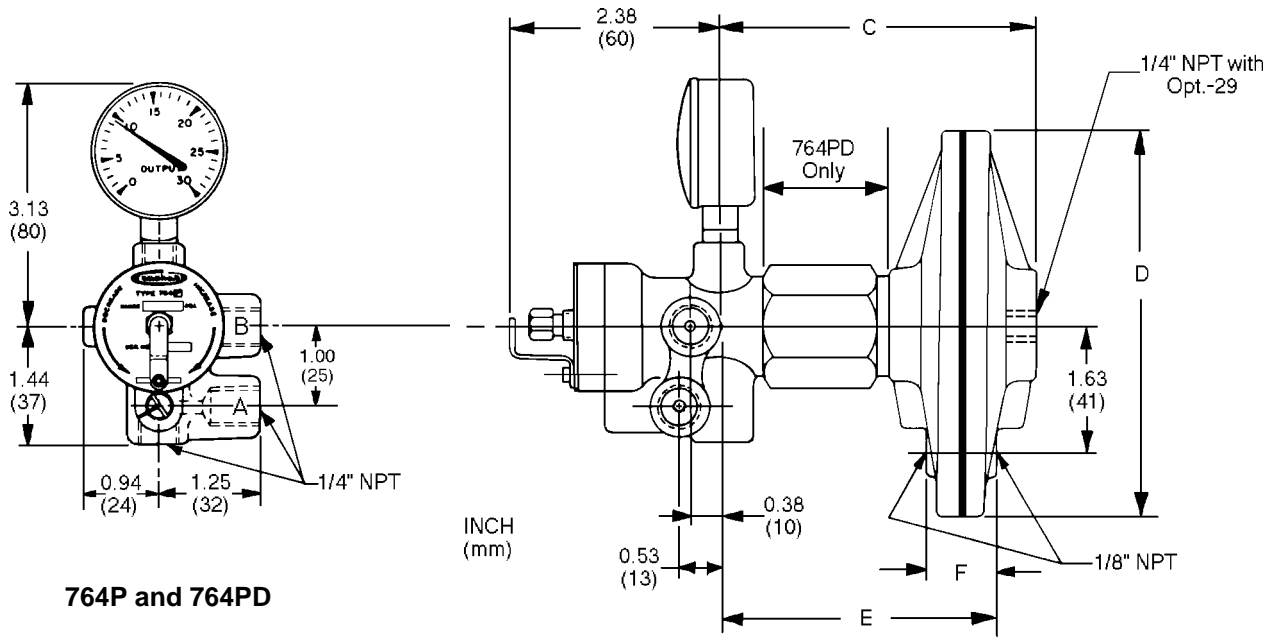


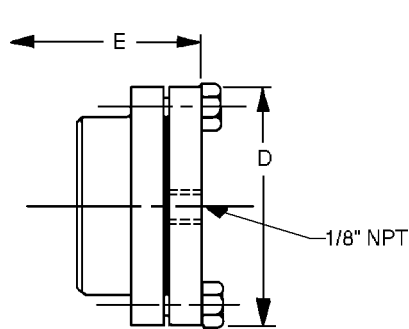
Figure 5
Reverse Action 764PD

DIMENSIONS & WEIGHTS

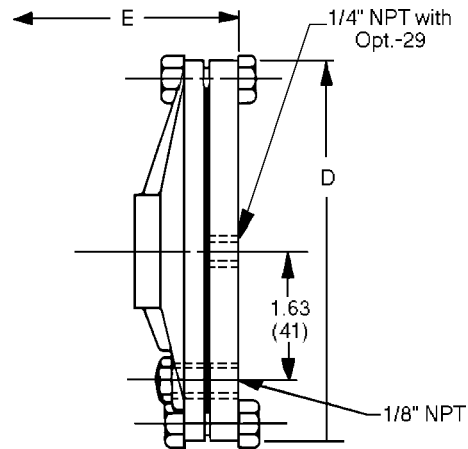


764P and 764PD

**REPRESENTATIVE OF 764PD WITH IR CASE
(764P Similar)**



**REPRESENTATIVE OF 764P
450-2500 psig**



764P - SST CASE

DIMENSION	764P								764PD			
	CI Case		SST Case		SST Case		SST Case		CI 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 holes for the process connection will probably be located at positions other than shown in these views.

NOTES

PRODUCT CODE 10/15/98

TABLE 3

CONST. DESIGN	(WETTED)	MATERIALS	APPLIC. RANGES	CODE
764P	Standard	CI Casing	30" Vac. thru	A
		BeCU Diaph	150 psig	
	316 SST	316 SST diaph	SST Casing	30" Vac. thru
316 SST Diaph			500 psig	
SST Casing		450 thru	C	
764PD	Standard	CI Casings	ALL	A
		BeCU Diaph		
	316 SST	SST Casings	ALL	D
		316SST Diaph		

TABLE 4

CONTROL RANGES		
PRESSURE RANGE	APPLICABLE WETTED CONSTRUCTION	CODE
764P		
2" to 30" 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

TABLE 2

SIGNAL OUTPUT	CODE
3-15 psig	1
* Variable Output	2
6-30 psig	3

* Used with 1000HP "Accelerator".

TABLE 5

SPECIAL CLEANED (-55 Opt.)	CODE
No	0
Yes (Wetted Parts Only)	1

TABLE 6

CONNECTIONS			
764P			
PROCESS CONN.	APPLICABLE PRESS. RANGE	OPT.	CODE
Std.-1/8" NPT	ALL	-	1
1" Tri-Clamp® (Sanitary)	0-30, 20-100, 50-150	-37	S
1/4" NPT, Center of Upper Diaph Casing	ALL	-29*	A
764PD			
Std-(2) 1/8" NPT	ALL	-	2

* Required for use with -75 Opt. Diaph.Seal.

Output

Material

Special Clean

Control Range

Connection

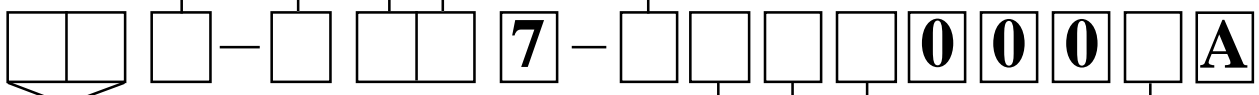


TABLE 1

DESCRIPTION	CODE
MODEL "764P" PNEUMATIC CONTROLLER	CA
MODEL "764PD" PNEU PRESS DIFF CONTROLLER	CC

TABLE 7

DIAPHRAGM SEAL FOR 764P ONLY (-75 OPTION)					
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

TABLE 8

SPECIAL CONSTRUCTION	CODE
DESCRIPTION	CODE
No Airset *	0
5100P Airset (Filter Regulator) 0-30 psig range (w/gauge)	A
5100P Airset (Filter Regulator) 0-60 psig range (w/gauge)	B

*Select "0" code when 764 P/PD to use shared airset supplying P/P positioner.

TABLE 9

VALVE MOUNTING	CODE
NONE	0
Pipe Nipple Mounted ¹ (Models 2266, 988 & 964 only)	1
764P/PD + Airset ²	9
764P (Shared Airset)	9

¹ Shipped loose; must be interconnected in the field.
² Use of a "9" code requires that a "99 Coder" Sheet be completed.

TABLE 10

PAINTING	CODE
Standard	0
Epoxy Paint 764P/PD	1
Epoxy Paint 764P/PD + Accessories	2

Cashco, Inc.
 P.O. Box 6
 Ellsworth, KS 67439-0006
 PH (785) 472-4461
 FAX (785) 472-3539
 E-mail: sales@cashco.com
 exportsales@cashco.com

