

Model 40 Temperature Bulbs And Connections

Table A. Bulb Lengths (inches)

MERCURY ACTUATED						ORGANIC LIQUID ACTUATED					
TEMPERATURE SPAN		APPROX. LENGTH OF BULBS P1, P2, P4 BULBS (X DIMENSION)			UNCOILED LENGTH OF P7 BULBS (X DIMENSION)			TEMPERATURE SPAN		APPROX. LENGTH OF BULBS P1, P2, P4 BULBS (X DIMENSION)	LENGTH OF P7 BULBS (X DIMENSION)
°F	°C	600°F MAX.	900°F MAX.	1200°F MAX.	Y=.090	Y=.075	Y=.074	°F	°C		
45/55	25/30	5.69	9.13		364			17/20	9/11	9.22	
56/61	31/33	5.00	7.95		316	1167		21/25	12/13	7.17	
62/70	34/38	4.41	6.98		275	1016		26/28	14/15	6.31	
71/80	39/44	3.91	6.17		240	885		29/33	16/18	5.59	
81/92	45/51	3.47	5.44		207	766		34/39	19/21	4.97	
93/107	52/59	3.08	4.76		181	668		40/45	22/25	4.42	
108/124	60/68	2.73	4.28		157	580		46/52	26/29	3.94	528
125/143	69/79	2.44	3.72		137	505		53/61	30/33	3.52	456
144/164	80/91	2.19	3.30	4.58	119	439		62/69	34/38	3.16	396
165/189	92/105	1.97	2.94	4.11	103	381	1217	70/81	39/45	2.84	345
190/218	106/121	1.78	2.63	3.66	90	333	1062	82/93	46/51	2.56	300
219/251	122/139	1.61	2.34	3.30	78	288	918	94/107	52/59	2.34	260
252/287	140/159	1.47	2.13	2.98	68	251	802	108/123	60/68	2.13	228
288/331	160/183	1.34	1.91	2.70	59	219	697	124/145	69/80	1.94	195
332/380	184/211	1.23	1.73	2.50	51	190	605	146/170	81/94	1.75	165
381/434	212/242	1.14	1.56	2.28	44	165	528	171/195	95/108	1.61	140
435/497	242/280	1.06	1.42	2.06	39	146	466	196/205	109/113	1.53	130
498/531	281/322	1.00	1.31	1.89	33	125	397	206/237	114/131	1.45	120
532/667	323/370	0.91	1.22	1.75	28	106	338	238/277	132/153	1.36	101
668/766	371/425		1.13	1.62	25	94	300	278/328	154/182	1.28	86
767/877	426/487		1.03	1.52	22	82	261	329/385	183/218	1.20	74
878/922	488/512				20	74	236	386/460	214/255	1.13	62
878/999	488/555		0.97	1.44				461/500	256/278	1.08	53
1000/1096	556/609			1.34							
1096/1200	610/667			1.28							

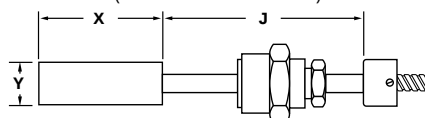
NOTE: Gas Actuated Systems: P1, P2 & P4 bulbs for all temperature spans are .760 dia., 7.75 long. (inches)

NOTE: P6 (Preformed) BULB: P6 bulbs are used only with mercury actuation. Maximum length is 6.50 (for 61 to 72°C span). Minimum length is 4.50 (for 167 to 190°C span) (inches)

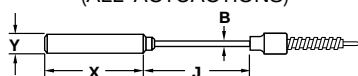
BULB TYPES

Extension diameters (B) are: 1/4" (Std.) bendable, 3/16" flexible and 3/8" rigid. Standard extension length (J) is 12". Adjustable union (P4) supplied with 12" extension unless otherwise specified.

P4—ADJUSTABLE UNION SEAT (ALL ACTUATIONS)



P2—PLAIN WITH EXTENSION (ALL ACTUATIONS)



NOTE: X dimensions given in Table A. Y dimensions given in Table 5 on page 9.

UNION BUSHINGS

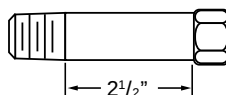
Union bushings are available in brass, 303 stainless steel and 316 stainless steel.

STANDARD



5/8" - 18 N.F.
OR
7/8" - 18 N.F.

LAGGING

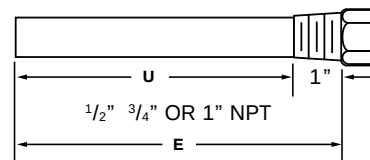


1/2" 3/4" OR 1" NPT

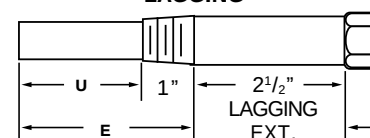
THERMOWELLS

Standard "U" lengths are 2 1/2, 5, 8, 11, 17 or 23 inches. Built-up wells in brass and 347 stainless steel are available in all above lengths. Bored thermowells in type 316 stainless steel and Monel are also available.

STANDARD



LAGGING



When using P-4 Bulb with a thermowell dimension X + J on thermal system must exceed E dimension of the well plus any lagging extension by 2 inches.

Model 40 Pilot Positioner

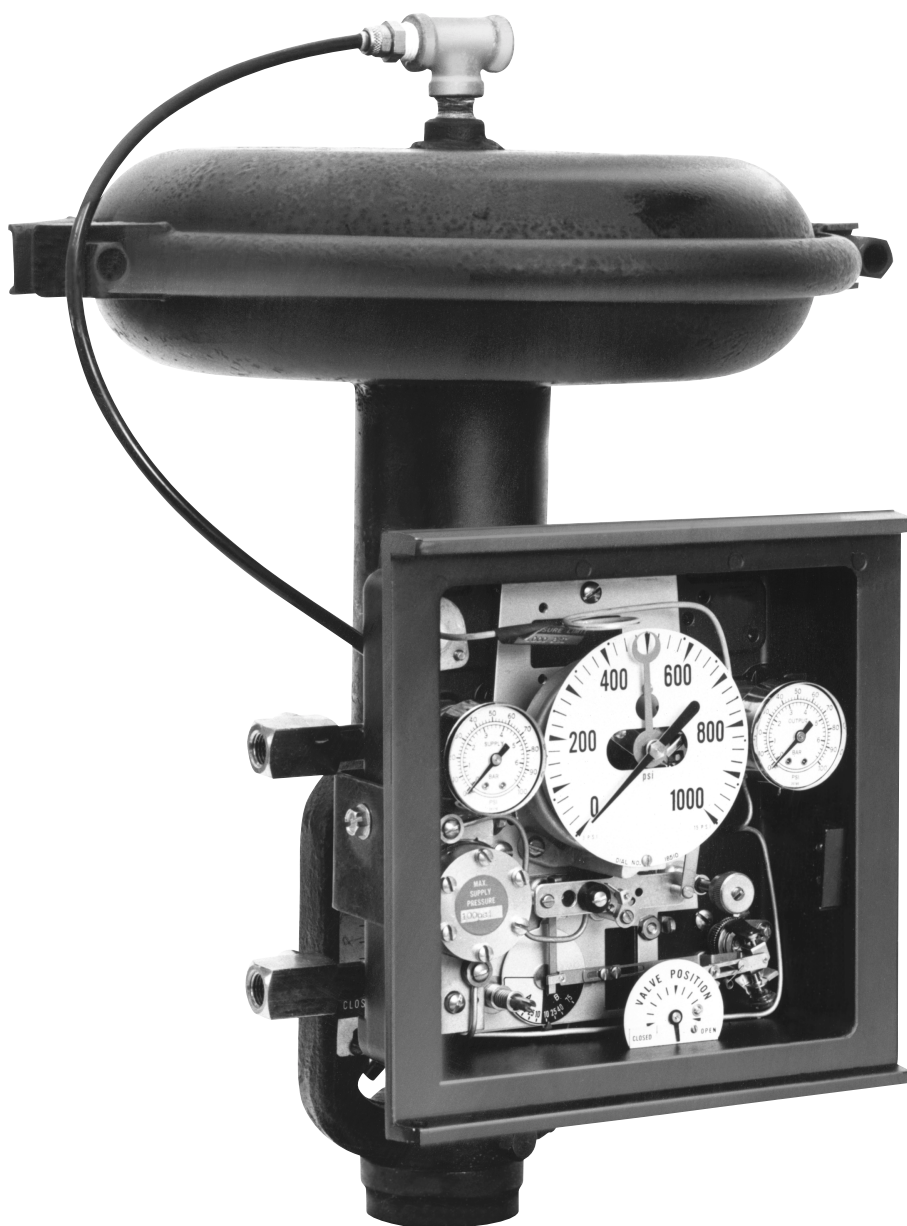
The Model 40 Controller-Positioner combines in one compact unit the functions of (a)—an indicating pneumatic controller for pressure, temperature or any pneumatically transmitted variable, and (b)—a valve positioner which amplifies air power to position a pneumatically operated control valve accurately and rapidly.

There are several advantages to the Controller-Positioner over two separate units—

- *It is located close to the process and directly on the valve for fast, accurate response.*
- *It needs only one air supply and thus reduces installation and maintenance costs.*
- *It mounts readily on all standard diaphragm valves and other pneumatic actuators.*
- *It saves space required for a second instrument.*
- *It is low in initial cost as well as maintenance and operating costs.*

This instrument accurately positions the valve in response to changes in measured variable as small as 0.1% full scale. It ensures rapid valve response even through full travel and results in economies through use of smaller topworks. Instead of pneumatic feedback from valve stem position, the instrument employs mechanical feedback to the controller through a lever system. Thus the valve is forced to assume a precise position proportional to the controlled variable.

The unit includes a high-capacity, non-bleed relay providing more rapid and accurate positioning. By means of



a unique valve stem take-off, the Controller-Positioner will actuate any diaphragm motor valve with stem travels from 3/8" to 4" in any combination of stem direction and air-to-open or air-to-close topworks. A rear mounting pad, provides for the vertical location of the instrument on virtually all makes and sizes of diaphragm motor operators.

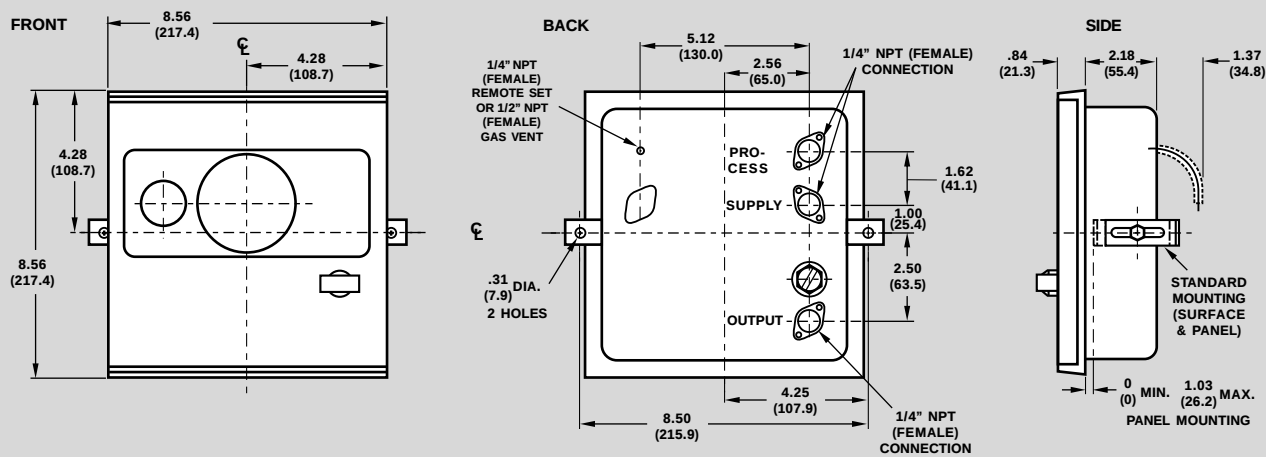
The standard Controller-Positioner operates on any air supply pressure

from 20 to as high as 65 psi and is available with 1-75% Proportional Control or 1-75% Differential Gap Action—with easy field reversibility. It may be actuated by any of the measuring elements described on pages 7, 8 and 9 (except slack diaphragms or DP capsules), or it may be used as a pneumatic receiver in conjunction with a distantly located Indicating Pneumatic Transmitter.

DIMENSIONS

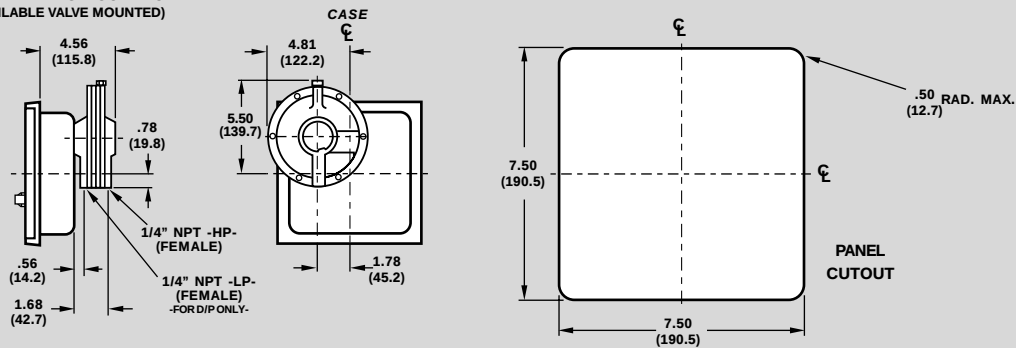
INDICATING CONTROLLER

OUTLINE DIMENSIONS



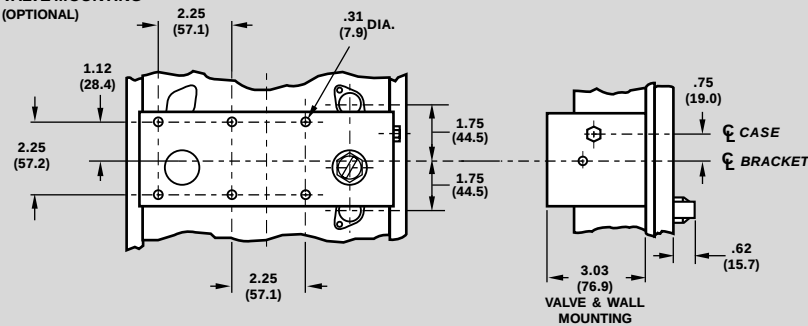
SLACK DIAPHRAGM CONTROLLER

(NOT AVAILABLE VALVE MOUNTED)



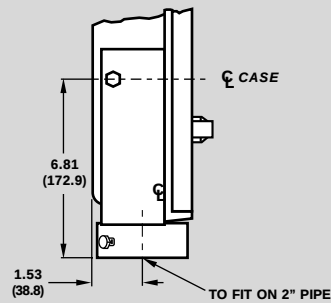
VALVE MOUNTING

(OPTIONAL)



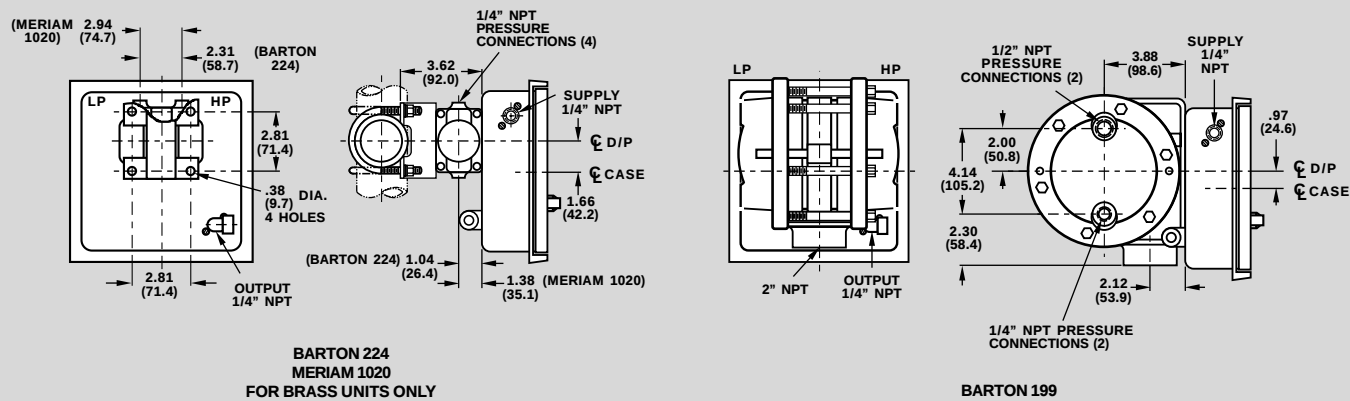
PIPE MOUNTING

(OPTIONAL)



DIFFERENTIAL PRESSURE CONTROLLER

OUTLINE DIMENSIONS



ORDERING INFORMATION

MODEL 40

CONTROL MODE

- ## OUTPUT

- ## INSTRUMENT TYPE

- ## ELEMENT TYPE

- | ELEMENT | MATERIAL |
|---------|-----------|
| 1 | Concrete |
| 2 | Steel |
| 3 | Brick |
| 4 | Wood |
| 5 | Glass |
| 6 | Plastic |
| 7 | Aluminum |
| 8 | Copper |
| 9 | Iron |
| 10 | Carbon |
| 11 | Silicon |
| 12 | Gold |
| 13 | Silver |
| 14 | Lead |
| 15 | Zinc |
| 16 | Nickel |
| 17 | Chromium |
| 18 | Manganese |
| 19 | Vanadium |
| 20 | Titanium |
| 21 | Aluminum |
| 22 | Steel |
| 23 | Concrete |
| 24 | Brick |
| 25 | Wood |
| 26 | Glass |
| 27 | Plastic |
| 28 | Aluminum |
| 29 | Copper |
| 30 | Iron |
| 31 | Carbon |
| 32 | Silicon |
| 33 | Gold |
| 34 | Silver |
| 35 | Lead |
| 36 | Zinc |
| 37 | Nickel |
| 38 | Chromium |
| 39 | Manganese |
| 40 | Vanadium |
| 41 | Titanium |
| 42 | Aluminum |
| 43 | Steel |
| 44 | Concrete |
| 45 | Brick |
| 46 | Wood |
| 47 | Glass |
| 48 | Plastic |
| 49 | Aluminum |
| 50 | Copper |
| 51 | Iron |
| 52 | Carbon |
| 53 | Silicon |
| 54 | Gold |
| 55 | Silver |
| 56 | Lead |
| 57 | Zinc |
| 58 | Nickel |
| 59 | Chromium |
| 60 | Manganese |
| 61 | Vanadium |
| 62 | Titanium |
| 63 | Aluminum |
| 64 | Steel |
| 65 | Concrete |
| 66 | Brick |
| 67 | Wood |
| 68 | Glass |
| 69 | Plastic |
| 70 | Aluminum |
| 71 | Copper |
| 72 | Iron |
| 73 | Carbon |
| 74 | Silicon |
| 75 | Gold |
| 76 | Silver |
| 77 | Lead |
| 78 | Zinc |
| 79 | Nickel |
| 80 | Chromium |
| 81 | Manganese |
| 82 | Vanadium |
| 83 | Titanium |
| 84 | Aluminum |
| 85 | Steel |
| 86 | Concrete |
| 87 | Brick |
| 88 | Wood |
| 89 | Glass |
| 90 | Plastic |
| 91 | Aluminum |
| 92 | Copper |
| 93 | Iron |
| 94 | Carbon |
| 95 | Silicon |
| 96 | Gold |
| 97 | Silver |
| 98 | Lead |
| 99 | Zinc |
| 100 | Nickel |

- ## ➔ OPTIONS

- **ENG. UNITS OR DIAL NO.**

-
- MULTIPLIER & UNITS**

- ## ➤ ELEMENT RANGE

Enter first 2 digits of desired span so that it gives the desired span when multiplied by the multiplier and the unit of measure.

Examples:

0 to 100 PSI Span is 101 (10 x 10 PSI)
3 to 15 PSI Span is 120 (12 x 1 PSI)

ORDERING INFORMATION

MODEL 40

(CALIBRATED SPAN AND
UNITS OF MEASUREMENT)

CONTROL MODE

015% Prop.
1200% Prop. & Reset
2100% Prop.
3200% Prop.
575% Prop. (Positioner Only)
7300% PID (3/15 PIS Only)

OUTPUT

13/15 PSI
23/27 PSI
36/30 PSI
512/60 PSI (Prop. Only)

INSTRUMENT TYPE

BContr. W/2 Pos. By-Pass (not with PID)
KController
PPilot Positioner (75% Prop. 12/60 Out Only)
TTransmitter (100% Prop. Only) 3/15 psi only

ELEMENT TYPE

MStandard Hg Actuated (VB)
MComp., Hg Actuated (VA)
NSuppressed Range, Std., Hg Actuated (VB)
NSuppressed Range, Comp., Hg Actuated (VA)
GStandard, Gas Actuated
OOrganic Liquid (1B)
POrganic Liquid W/Suppressed Range (1B)
TFully Compensated, Organic Liquid (1A)
USuppressed Range, Comp. Organic Liquid (1A)

BULB STYLE

2Plain W/Extension P-2
4Adjustable Union P-4

ARMOR TYPE

1302 St. Stl. Armor (1/4")
5Compensated Cap. W/No Armor (VA Only)
6Compensated Cap. W/302 St. Stl. Armor

EXTENSION TYPE

2Continuation of Comp. Line (1/8" Dia.) (VA Only)
3Flexible (3/16" Dia.)
4Bendable Std. (1/4" Dia.)

OPTIONS

ABExternal Set Point Knob
ADAir Filter, Regulator & Drip Well
AGShatterproof Glass
AHBlowout Grommet
AIEternal Reset Connection
AMMetal Tags
APVented Case (1/2" NPT)
ARSpecial Calibration
AWFast Reset Valve
BHPipe Mounting Bracket
BIValve & Wall Mounting Bracket
BKWall Mounting Bracket
BLSupply Gauge
BRBlank Shroud
—Custom Scale
DQAnodized Case, Door, Relay

RANGE & UNITS (°F OR °C)

EXTENSION LENGTH

D6"
F12"
G18"
XSpecial

CAPILLARY LENGTH

A5'
B10'
C15'
D20'
E25'
F30'
H40'
J50'
L60'
N70'
P80'
R90'
T100'
U110'
V125'
W150'
XSpecial

BULB DIAMETER

3¼" (Organic Liquid)
5½" Max. Temp. 600°F (Hg)
6½" Max. Temp. 900°F (Hg)
7½" Above 900°F (Hg)
9¾" (Gas)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



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