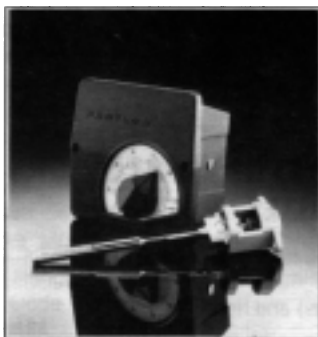
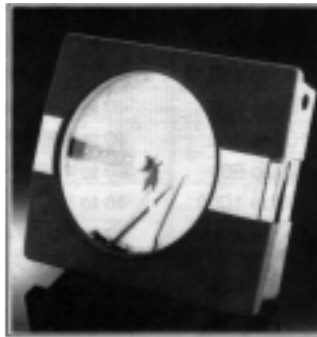
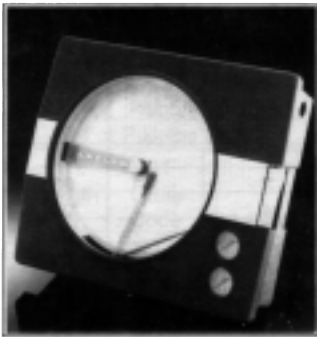


MECHANICAL INSTRUMENTATION PRODUCTS Elements



Elements

How to Order

Elements are specified by a single matrix number which can be 9 to 15 digits long. The basic unit requires the first nine digits; the adders such as of sleeves, stuffing boxes and coatings are called out in the remaining six boxes. If none of the adders are required, leave the boxes blank. *However, if only one or two of these items is required, fill in the unused boxes with zeros.*

A - Operating Range

Select the three digit code number representing the temperature range and insert the number in the first three boxes of the ordering matrix.

B - Head Assembly

In selecting the two digit number for head assembly operating temperature, be sure to note the high and low ambient choices. The hollow L-Type plunger is for all non indicating, indicating and recording instruments, except O and N model instruments and Indicator 194, which take the solid B Type plunger. Mechanical gas valves require the spring loaded M Type plunger.

C - Capillary Length

Next select capillary length.

D - Optional Bulb Sizes

Note the order code used when Teflon® or Geon® coating is specified.

E, F, G

When Sleeves, Stuffing Boxes and/or Coatings are required, continue with E, F, and G.

(A)

OPERATING RANGE AND MATERIAL

Base unit includes 5' capillary

Temperature Range		Element Material	Order Code
F	C		
120 to 220	50 to 105	Stainless	099
60 to 180	15 to 80	Stainless	096
30 to 160	0 to 70	Stainless	093
30 to 180	0 to 80	Stainless	095
30 to 230	0 to 110	Stainless	100
0 to 700	-25 to 375	Stainless	110
0 to 900	-25 to 475	Stainless	112
0 to 1100	-25 to 600	Stainless	114
0 to 350	-20 to 180	Stainless	103
0 to 450	-20 to 230	Stainless	105
0 to 550	-20 to 290	Stainless	107
20 to 120	-5 to 50	Stainless	091
-30 to 170	-35 to 75	Stainless	094
50 to 250	10 to 120	Stainless	101
100 to 350	40 to 175	Stainless	104
100 to 450	40 to 230	Stainless	106
100 to 550	40 to 290	Stainless	108
100 to 650	40 to 340	Stainless	109
100 to 800	40 to 425	Stainless	111
100 to 1000	40 to 540	Stainless	113
100 to 1100	40 to 600	Stainless	115

(B)

HEAD ASSEMBLY

High Ambient Temperature 32° to 150°F	
Plunger Type	Order Code
L	51
B	53
M	55
Low Ambient Temperature -30° to 125°F	
Plunger Type	Order Code
L	52
B	54
M	56

Note: Ambient temperature refers to the temperature the element head and unit will be exposed to, not the process temperature.

(C)

CAPILLARY LENGTH

Standard length is 5 feet

Length (feet)	Order Code
1	01
2	02
3	03
4	04
5	05
7	07
10	10
12	12
15	15
20	20
25	25
30	30
35	35
40	40
50	50
60	52
70	54
80	56
90	58
100	60
110	62
120	64

** Lengths are not 1 to 1 after 50 feet

**

(D)

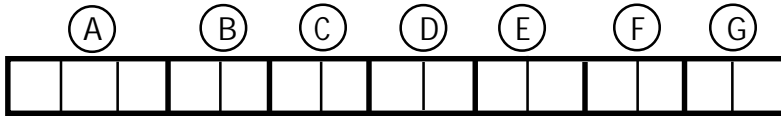
BULB SIZES

If standard bulb is desired, order code 20 (if no sleeve is required) or code 43 (if sleeve is required).

If no adders are required (sleeves, stuffing box, coatings) end here.

Bulb Type	O.D. (")	Gauge	Range Code	Range Code	Range Code	Range Code	Range Code	Range Code	Range Code	Range Code	Range Code	Range Code	Range Code	Order Code	
			093	095	096	099	100	103	105	107	110	112	114	For Sleeve	No Sleeve
U*	.137	.095"	192.27	N/A	N/A	N/A	124.76	72.18	57.42	47.40	37.05	29.34	24.21	N/A	15
Y*†	3/16	21	114.41	N/A	124.54	146.80	74.00	42.78	33.87	27.97	21.87	17.29	14.23	N/A	16
P	1/4	20	N/A	N/A	N/A	N/A	N/A	20.58	16.37	3.57	10.77	8.59	7.19	40	17
	5/16	18	N/A	N/A	N/A	N/A	24.94	14.63	11.69	9.70	7.67	6.16	5.15	41	18
Standard	3/8	9/32"	22.55	N/A	N/A	28.72	14.77	8.84	7.13	5.99	4.83	3.69	3.36	43	20
	7/16	18	N/A	N/A	N/A	20.11	10.53	6.45	5.26	4.48	3.68	N/A	N/A	45	22
	1/2	18	11.54	N/A	12.49	14.55	7.74	4.83	4.00	3.44	N/A	2.44	2.16	46	23
	9/16	17	N/A	N/A	N/A	12.03	6.55	4.20	3.51	3.06	N/A	2.25	2.02	47	24
	5/8	17	7.68	6.79	8.26	9.57	5.36	3.55	3.03	2.68	2.33	2.06	N/A	48	25

† If Teflon or Geon coating is specified for Y-Bulb, use Order Code 51.



(G) COATINGS

If Teflon or Geon coating is specified for Y-bulb, use order code 51 for bulb code.

TEFLON Y-Bulbs Only																
Maximum operating temperature 400°F (205°C). Applies to 091,094, 101, 104, 106 ranges																
Length in Feet	5		10		15		20		25		30		35		40	
	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code
		02		03		04		05		06		07		08		09
GEON Applies to Range Codes 091, 094, and 101. Maximum operating temperature 175°F (80°C)																
Length in Feet	5		10		15		20		25		30		35		40	
	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code
P-Bulb		29		30		31		32		33		34		35		36
P-Bulb & Sleeve		20		21		22		23		24		25		26		27
Y-Bulb		11		12		13		14		15		16		17		18
LEAD 3/8" O.D. x 9/32" I.D. Bulbs only; sleeves 15". Applies to Range Codes 091, 094, 101, 104. Max. operating temp. 350°F (175°C)																
Length in Feet	5		10		15		20		25		30		35		40	
	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code	Adder	Order Code
Stainless		47		48		49		50		51		52		53		54
SST & Sleeve		73		75		77		79		81		83		85		87

(E) SLEEVES

5/16" O.D.
For P-Bulbs Only

Length (")	SST Order Code	Adder
0	00	No sleeve required
5	05	
6	06	
7	07	
8	08	
9	09	
10	10	
15	15	

Enter 00 only if additional options such as Stuffing Box or Coatings are needed.

(F) STUFFING BOXES

Not available if coating is selected, enter 00

Type	NPT Size (")	SST	Order Code
None	N/A	N/A	00
21-T-105 Capillary Only	1/4		02
	3/8		03
	1/2		04
	3/4		05
21-T-105 with 5/16" Sleeve	1/4		20
	3/8		21
	1/2		22
	3/4		23
T112 Capillary Only	3/8		54
	1/2		55
	3/4		56
131 with 5/16" Sleeve	3/8		78
	1/2		79
	3/4		80

A 1/4" NPT can be used for a bulb size up to and including 3/8" bulb.

A 3/8" NPT can be used for a bulb size up to and including 1/2" bulb.

A 1/2" NPT can be used for a bulb size up to and including 5/8" bulb.

A 3/4" NPT can be used for a bulb size up to and including 3/4" bulb.

(D) BULB SIZES (CONT.)

If standard bulb is desired, order code 20 (if no sleeve is required) or code 43 (if sleeve is required).
If no adders are required (sleeves, stuffing box, coatings) end here.

Bulb Type	O.D. (")	Gauge	Range Code 091	Range Code 094	Range Code 101	Range Code 104	Range Code 106	Range Code 108	Range Code 109	Range Code 111	Range Code 113	Range Code 115	Order Code	
													For Sleeve	No Sleeve
U*	.137	.095"	N/A	122.05	124.76	102.10	73.60	57.42	47.10	37.36	29.40	26.66	N/A	15
Y*†	3/16	21	146.80	72.39	74.00	60.74	43.61	33.87	27.78	21.99	17.34	15.63	N/A	16
P	1/4	20	N/A	N/A	N/A	28.76	20.86	16.37	13.52	10.82	8.61	7.85	40	17
	5/16	18	N/A	24.41	24.94	20.48	14.87	11.69	9.67	7.75	6.17	5.63	41	18
	3/8	9/32"	28.72	14.47	14.77	12.21	8.97	7.13	5.97	4.86	3.97	3.65	43	20
	7/16	18	20.11	10.32	10.53	8.75	6.53	5.26	4.46	3.70	3.08	2.86	45	22
	1/2	18	14.55	7.59	7.74	6.48	4.90	4.00	3.43	2.89	2.45	2.29	46	23
	9/16	17	12.03	6.43	6.55	5.53	4.24	3.51	3.05	2.61	2.25	2.13	47	24
	5/8	17	9.57	5.27	5.36	4.58	3.59	3.03	2.67	2.34	2.06	1.97	48	25

For coiling of U and Y bulbs, see Form 3323 for available coil dimensions. Acc. 407 for Y bulb, Acc. 408 for U bulb. Add list for either accessory.

Standard

† If Teflon or Geon coating is specified for Y-Bulb, use Order Code 51.

ELEMENT ACCESSORIES

STUFFING BOXES - FIELD INSTALLED

Acc. 143 - Slotted pipe for mechanical holding of capillary only. Material - stainless steel.

<u>P/N</u>	<u>Bushing Thread Size NPT</u>
1431H	3/8"
1431J	1/2"
1431K	3/4"

SST-105 - Pressure Connection, 200 PSI, for field application to capillary or sleeve. 3/4" pipe size accommodates bulbs up to 1/2" in diameter; the 1" pipe size handles all bulb sizes. When ordering select pipe size and whether is to be applied to capillary or sleeve from part numbers listed below.

<u>P/N</u>	<u>Bushing Thread Size NPT</u>
10035105	3/4" for capillary
10035106	3/4" for sleeve
10035205	1" for capillary
10035206	1" for sleeve

SEPARABLE SOCKET

Separable sockets are used where it is desirable to change or replace thermal elements in a vessel without disturbing the contents of the vessel. They also act to protect the bulb from corrosion or mechanical damage.

Sockets to fit standard 3/8" O.D. pencil-type bulbs are carried in stock. Of Type 304 stainless, they are available with 3/4" and 1" NPT external threads. Since the internal thread for sealing the element is 3/8", standard elements should be ordered with Acc. 1431H stuffing box, or, if desired, pressure-type 21-T-105S or SS(3/8"). Socket dimensions are listed in the table below.

Stainless Steel, 1" External Thread - "E"

<u>P/N</u>	<u>Immersion Length - "A"</u>
63701018	5.00"
63701016	7.25
63701015	8.44
63701012	16.00

Stainless Steel, 3/4" External Thread - "E"

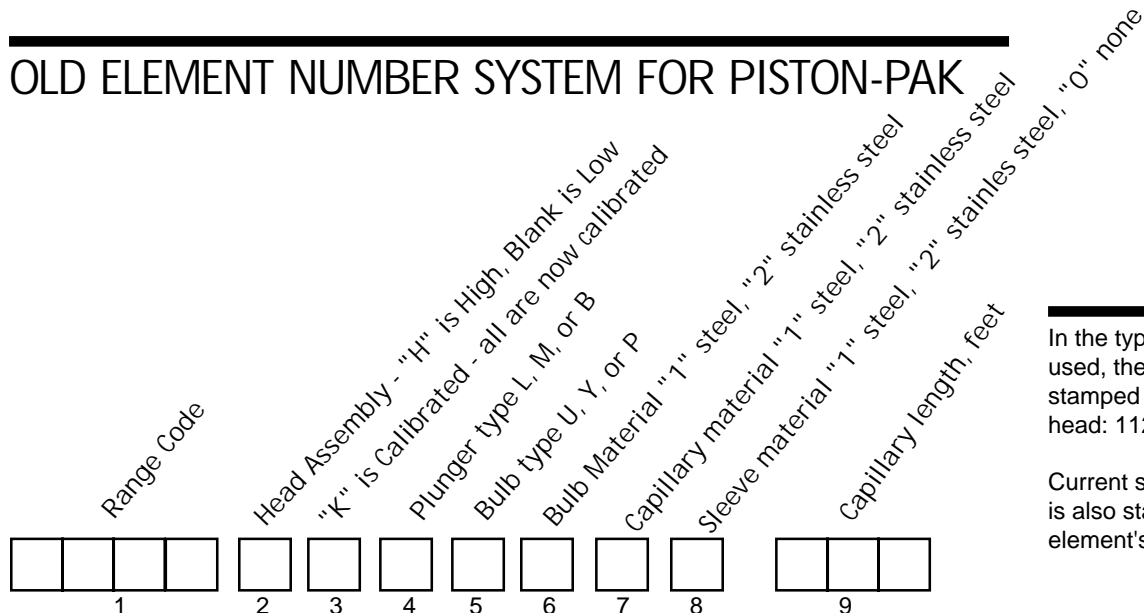
63701008	6.00
63701007	7.00
63701006	8.25
63701005	9.44
63701004	11.25
63701003	14.38
63701002	17.00
63701010	30.75

RANGE CODE CROSS REFERENCE

Old Range Code Used for all materials	Discontinued Carbon Steel Range Code	Current Stainless Steel Replacement	
112K	20 To 120F	117	091
115K	50 to 150F	118	N/A
120K	100 to 200F	N/A	N/A
122K	120 to 220F	N/A	099
1:218K	60 to 180F	N/A	096
1:220K	80 to 200F	N/A	N/A
1:316K	30 to 160F	N/A	093
1:518K	30 to 180F	N/A	095
A1956	30 to 180F	N/A	131*
1:527K	120 to 270F	N/A	N/A
217K	-30 to 170F	119	094
220K	0 to 200F	N/A	N/A
223K	30 to 230F	N/A	100
225K	50 to 250F	121	101
322K	-30 to 220F	N/A	N/A
335K	100 to 350F	237	104
435K	0 to 350F	122	103
445K	100 to 450F	123	106
545K	0 to 450F	N/A	105
555K	100 to 550F	125	108
655K	0 to 550F	N/A	107
665K	100 to 650F	126	109
770K	0 to 700F	N/A	110
780K	100 to 800F	128	111
990K	0 to 900F	N/A	112
910K	100 to 1000F	130	113
1011K	100 to 1100F	N/A	115
1111K	0 to 1100F	N/A	114

*Useable only on RFJ771 and RFJ786 series recorders.
N/A = Not Available.

OLD ELEMENT NUMBER SYSTEM FOR PISTON-PAK



In the typical system formerly used, the number was stamped under the element's head: 112KLP2205

Current system for same unit is also stamped under the element's head: 091510520

ORDERING A MECHANICAL INSTRUMENT

Partlow Mechanical Instruments are known for providing long, reliable service. However, over the years many products manufactured were discontinued for a variety of reasons. Because of this we have some suggestions to assist in ordering a new mechanical instrument when replacing an obsolete model.

Indicating

Only two switch controllers remain. If an LFS would have been first choice, the LF15-79 can substitute since one switch can remain inactive.

Reset Switches

Manual reset switches were discontinued except in the recognized high limit safety switches, because a redundant system (controller and separate high limit with element failure protection) is a safer way to go.

Accessories

Toggle switch and signal light accessories can be installed on a panel or in separate electrical boxes using standard electric components, probably at lower cost, by the user or his contractor.

Gas Controls

Those sizes of gas control valves which have shared common internal parts have been consolidated into the largest pipe size in each group. Since the only difference between them was the pipe thread machining, it is proper to reduce the large sizes by common, locally available pipe brushings, to the needed smaller size. Previous published flow characteristics for the smaller sizes after being bushed-down are still appropriate. Some codes may not allow the use of standard reducing bushings. If this is the case, a standard pipe concentric reducing coupling and pipe nipple may be allowed. We recommend that local codes be checked to be sure acceptable fittings are used.