



Series D Temperature Controls – Bulb Selection

RANGE TABLE – NO. 2 BULB

Standard 11/16" Diameter Series D Bulb & 3/4" NPT Connection

Optional 11/16" Bulb & 1/2" NPT Connection

See Note for "E" & "B" Dims. STANDARD 3/4" NPT PROCESS CONNECTION 	Bulb (1)/ 6 ft. Cap. Tubing	RANGE NUMBERS			OPTIONAL 11/16" BULB WITH 1/2" NPT PROCESS CONN.	RANGE NUMBERS		
		1N, 3N, 4N, 5N, 7N, 10N	8N, 11N	9N		1N, 3N, 4N, 5N, 7N, 10N	8N, 11N	9N
	S.S. Bulb/ Copper Capillary	E = 2 1/8" B = 2 5/8" Standard	N.A.	N.A.	E = 3 1/2" B = 2 5/8"	N.A.	N.A.	
	S.S. Bulb/ S.S. Cap.	E = 2 1/8" B = 2 1/8" Option	E = 2 1/8" B = 2 1/8" Standard	E = 4 7/8" B = 4 7/8" Standard	E = 3 1/2" B = 2 1/8"	E = 3 1/2" B = 2 1/8"	E = 5 1/2" B = 4 7/8"	

RANGE TABLE – NO. 2 BULB

Standard 1/2" & 3/8" Diameter Bulbs with 3/4" NPT Connection

Optional 1/2" & 3/8" Bulbs with 1/2" NPT Connection

	Bulb (1)/ 6 ft. Cap. Tubing	RANGE NUMBERS			OPTIONAL 1/2" BULB WITH 1/2" NPT	RANGE NUMBERS		
		1N, 3N, 4N, 5N, 7N, 10N	8N, 11N	9N		1N, 3N, 4N, 5N, 7N, 10N	8N, 11N	9N
OPTIONAL 1/2" DIAMETER BULB WITH 3/4" NPT PROCESS CONNECTION	S.S. Bulb/ Copper	E = 5 3/4" B = 5 3/4"	N.A.	N.A.	E = 6 3/4" B = 5 3/4"	N.A.	N.A.	
	S.S. Bulb/ S.S. Cap.	E = 5 3/4" B = 5 3/4"	E = 5 3/4" B = 5 3/4"	E = 10" B = 10"	E = 6 3/4" B = 5 3/4"	E = 6 3/4" B = 5 3/4"	E = 10 3/4" B = 10"	
OPTIONAL 3/8" DIAMETER BULB WITH 3/4" NPT PROCESS CONNECTION	S.S. Bulb/ Copper	E = 11 3/8" B = 11 3/8"	N.A.	N.A.	E = 11 3/8" B = 11 3/8"	N.A.	N.A.	
	S.S. Bulb/ S.S. Cap.	E = 11 3/8" B = 11 3/8"	E = 11 3/8" B = 11 3/8"	E = 19 3/8" B = 19 3/8"	E = 11 3/8" B = 11 3/8"	E = 11 3/8" B = 11 3/8"	E = 19 3/8" B = 19 3/8"	

RANGE TABLE – NO. 1 BULB

11/16" Diameter Series D Bulb for Open Tank Use

See Note for "B" Dims. (No process connection.) 	Bulb (1)/ 6 ft. Cap. Tubing	RANGE NUMBERS		
		1N, 3N, 4N, 5N, 7N, 10N	8N, 11N	9N
	S.S. Bulb/ Copper	B = 2 1/8" Standard	N.A.	N.A.
	S.S. Bulb/ S.S. Cap.	B = 2 1/8" Option	B = 2 1/8" Standard	B = 4 7/8" Standard

NOTES:

Dim. "E" = MINIMUM INSERTION DEPTH.
Minimum clearance distance for bulb insertion: measured from the top outside surface of female NPT.

Dim. "B" = ACTIVE BULB LENGTH.
Length of bulb that responds to temperature change: measured from the free end. Process fluid must have good contact with the bulb over this length.

(1) All bulbs, including those with a copper capillary, are made of Type 304 Stainless Steel.

PROTECTIVE WELL & SLEEVE ASSEMBLIES FOR SERIES D. NO. 2 BULB.

(Standard 11/16" Diameter)

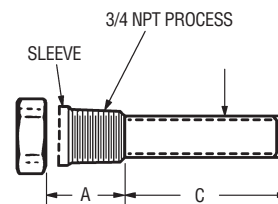
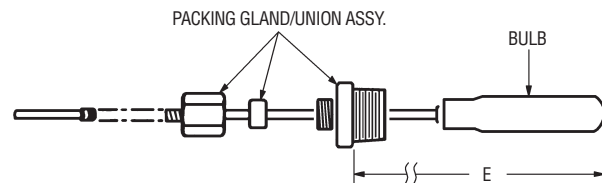
RANGE	BULB ASSY WELL DIM.		WELL ASSY #	
	E (MIN.)	C	BRASS	S.S.
1N, 3N, 4N, 5N, 7N, 10N	2 7/8"	3 1/4"	49-543	49-251SS-1
8N, 11N	2 7/8"	3 1/4"	N/A	49-251SS-1
9N	4 7/8"	5 1/4"	N/A	49-253SS-1

WELL PRESSURE RATINGS

TEMP.	BRASS	S.S.
70°F (21°C)	1000 psi 68.9 bar	2400 psi 165.5 bar
200°F (95°C)	900 psi 62.1 bar	2250 psi 155.1 bar
300°F (150°C)	500 psi 34.5 bar	2150 psi 148.2 bar
400°F (205°C)	160 psi 11.0 bar	–
550°F (285°C)	Do Not Use	2000 psi 137.9 bar

GENERAL INFORMATION

The bulbs of Series D temperature controls must be completely immersed in the media being monitored. All bulbs are made of 304 stainless steel: capillary material is either copper or 316 stainless steel, as shown in the range table. The maximum pressure of bulbs with a process connection is 300 psi. Other bulbs are for non-pressurized (e.g., open tank) use only. Consult the factory for higher pressure applications. Unlike vapor pressure systems, the new Series D gas actuation system does not exhibit any cross ambient effect. Also, since there are no liquids in the capillary line there are no limitations on height differential between the bulb and control, even with capillaries as long as 100 feet. The use of protective wells is recommended to protect the bulb from physical damage by solid materials in the media, to permit removal of the bulb without shutting down the process or draining the system and to allow monitoring the temperature of media at pressures above 300 psi. A well will increase the lag of the temperature control unit because the temperature changes in the systems media must pass through the well before contacting the bulb. Be sure that the well dimension "C" is equal to or greater than bulb length dimension "E" to insure that all of the sensing bulb is within the system media.



For non-standard well assemblies, contact factory and provide dimensions - A & C desired. NOTE - dimension C normally must be greater than bulb dimension E (from chart above).

Well assemblies shown are the shortest available for the particular bulb. Longer wells may be used where greater insertion depth is required. Extended sleeves are available for insulated pipe applications. Std. sleeve length, dimension A is 1 1/8".

Bulb supports are available and recommended where fluid velocities are greater than 15 feet per second or where it is desired to insert the bulb at a depth within a vessel or tank. For insulated surfaces, an extension sleeve is also available. Consult the factory for details.