Temperature Probe Selection Guide

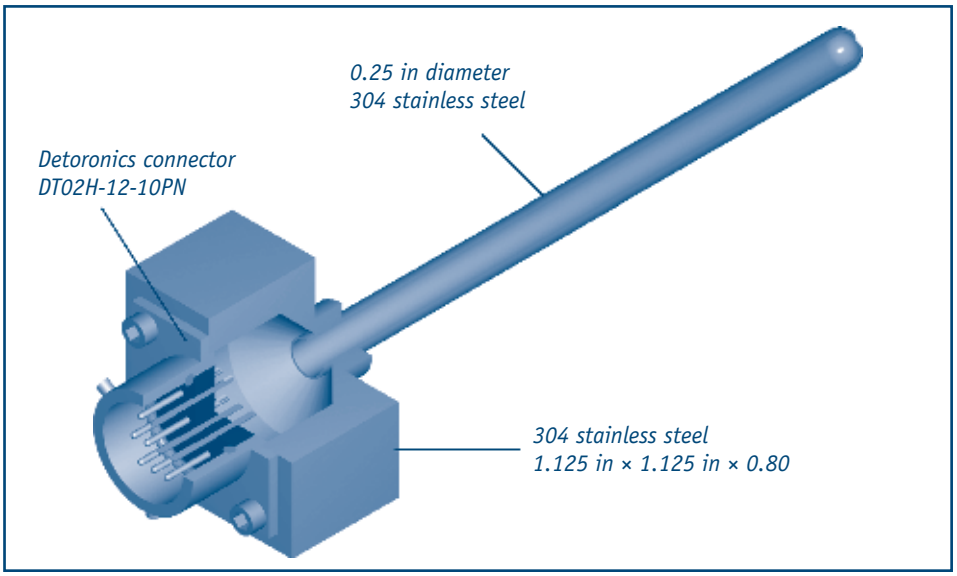
The flexibility of Lake Shore sensors make them ideal candidates for incorporating into various probes and thermowells. The individualized nature of applications usually demand customized designs.

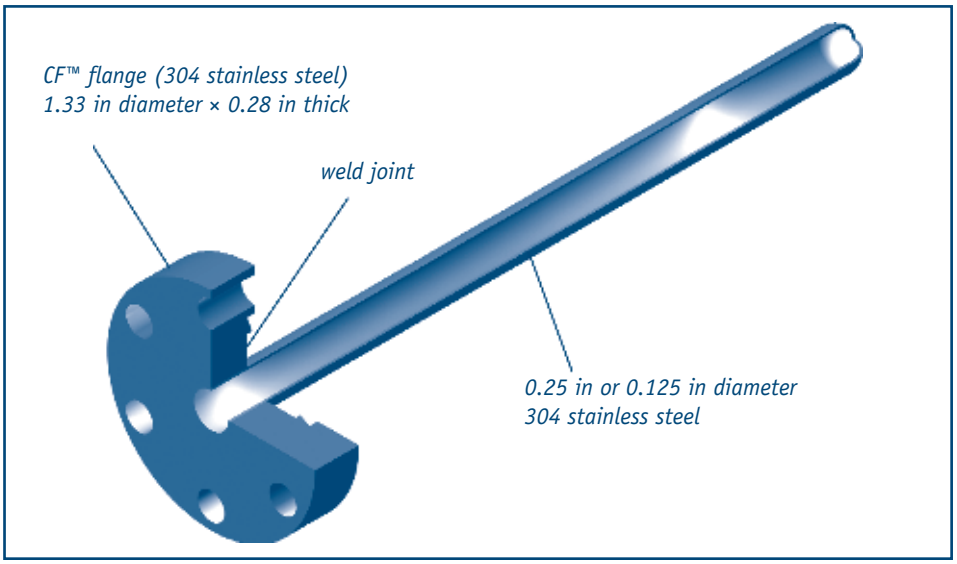
Lake Shore offers a wide variety of probes for many applications. Following are configurations of probes that can be purchased from Lake Shore.

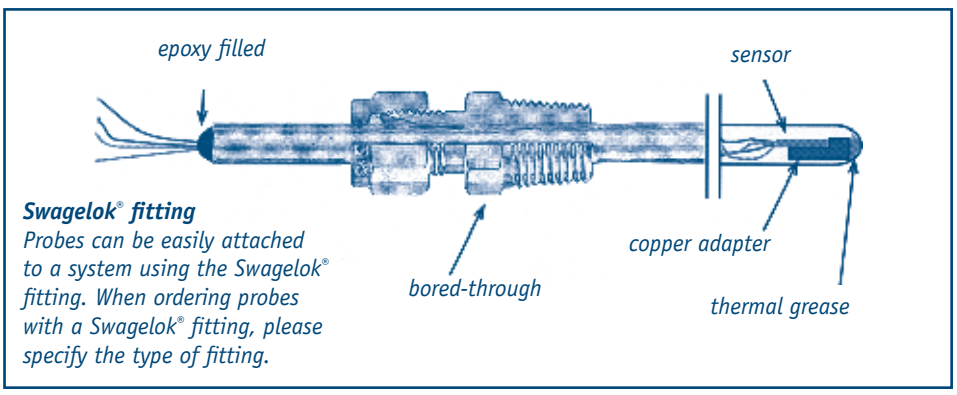
If you don't find a design that fits your application, please call us and let our engineers assist you in customizing a probe for your application.

Design considerations include allowable heat leak down the probe and the type of atmosphere on the warm end of the probe.

Standard Probe Mounts







Swagelok® fitting
Probes can be easily attached to a system using the Swagelok® fitting. When ordering probes with a Swagelok® fitting, please specify the type of fitting.

Specify probe TP-a-bcd-e-f-g, where:

a = probe length in inches – offered in whole inch increments from 1 to 28 inches

b = tube diameter[1]

2	1/8 in
4	1/4 in

[1] *Probes over 20 inches long are only available in 1/4-inch diameter*

c = probe mount

N	no probe mount adapter
S	Swagelok® fitting[2]
F	CF™ flange fitting[3]

[2] *For 1/8 in diameter probe, Swagelok® fitting uses a 1/8 in NPT male thread; for 1/4 in diameter probe, Swagelok® fitting uses a 1/4 in NPT male thread*
[3] *The CF™ flange is welded to the probe*

Ordering Example

TP- a - bcd - e - f - g
TP-**06** - **2FS** - **B** - **03** -**S19**

(6 in probe, 1/8 in diameter, flange, S1 coax cable, BNC connector, 3 ft cable length, DT-470-SD-13 calibrated 1.4 K to 325 K)

d = external cable/wire type[4]

N	no external cable (usually used with Detoronics connector)
S	S1 coax cable (2-lead) with upper temperature limit of 473 K (Teflon®)
I	30 AWG instrument cable (4-lead) with upper temperature limit of 473 K (Teflon®)
T	DT-32 (twisted pair of 32 AWG phosphor bronze wire) with upper temperature limit of 493 K (polyimide)
Q	QT-36 (two twisted pairs of 36 AWG phosphor bronze wire) with upper temperature limit of 378 K (Formvar®)
L	QL-32 (four 32 AWG wires in a ribbon configuration) with upper temperature limit of 378 K (Formvar®)
C	CryoCable™ (4-lead cryogenic coaxial cable) with upper temperature limit of 473 K (Teflon®)

[4] *Lake Shore strongly recommends that all RTD temperature sensors use a 4-lead cable/wire type*

e = terminator

N	no connector (leads stripped and tinned)
B	BNC connector
D	10-pin Detoronics connector (for 1/4 in diameter tubing only)[5]
L	4-pin Lemo® connector
211	connector wired for the Model 211 temperature monitor (25-pin D-shell connector)
218	connector wired for the Model 218 temperature monitor (25-pin D-shell connector)
321	connector wired for the Model 321 temperature monitor (6-pin round)
331	connector wired for the Model 331 temperature monitor (6-pin round)
332	connector wired for the Model 332 temperature monitor (6-pin round)
340	connector wired for the Model 340 temperature controller (6-pin round)

[5] *Selecting a Detoronics connector limits the following selections: d = N and f = 0*
The Detoronics connector is o-ring sealed to the probe

f = external cable length in feet – offered in whole foot increments from 1 to 25 feet (enter '0' for no external cable)

g = temperature sensor type[6] – specify sensor model number with calibration range, if applicable (see individual sensor sections for more information)

[6] *Due to indium solder use, all SD sensors have an upper temperature usage limit of 400 K*

Probes are offered with DT-471, DT-470, DT-670, TG-120, Cernox™, and platinum temperature sensors. When probe-mounted, DT-471, DT-470, DT-670, TG-120, and Cernox sensors are only available in the SD package. Platinum sensors are available in their own unique package. Platinum probe-mounted sensors are not available in the 14J and 70J calibration ranges.

All temperature sensor calibrations are performed before the device is installed into the probe – at this time, Lake Shore does not perform recalibrations on probes

Contact Lake Shore for custom probe availability

Calibration range suffix codes

Numeric figure is the low end of the calibration
Letters represent the high end: B = 40 K, D = 100 K, L = 325 K, H = 500 K

Silicon Diodes

Uncalibrated	**S01**	DT-471-SD	**S02**	DT-470-SD-11	**S07**	DT-670A-SD
			S03	DT-470-SD-11A	**S08**	DT-670B-SD
			S04	DT-470-SD-12	**S09**	DT-670C-SD
			S05	DT-470-SD-12A	**S10**	DT-670D-SD
			S06	DT-470-SD-13		
Calibrated	**S11**	DT-471-SD-2S	**S16**	DT-470-SD-13-2S	**S26**	DT-670-SD-1.4D
	S12	DT-471-SD-10L	**S17**	DT-470-SD-13-3S	**S27**	DT-670-SD-1.4L
	S13	DT-471-SD-10H	**S18**	DT-470-SD-13-1.4D	**S28**	DT-670-SD-1.4H
	S14	DT-471-SD-70L	**S19**	DT-470-SD-13-1.4L	**S29**	DT-670-SD-4D
	S15	DT-471-SD-70H	**S20**	DT-470-SD-13-1.4H	**S30**	DT-670-SD-4L
			S21	DT-470-SD-13-4D	**S31**	DT-670-SD-4H
			S22	DT-470-SD-13-4L		
			S23	DT-470-SD-13-4H		
			S24	DT-470-SD-13-70L		
			S25	DT-470-SD-13-70H		

GaAlAs Diodes

Uncalibrated	**G01**	TG-120-SD
Calibrated	**G02**	TG-120-SD-1.4B
	G03	TG-120-SD-1.4D
	G04	TG-120-SD-1.4L
	G05	TG-120-SD-1.4H
	G06	TG-120-SD-4B
	G07	TG-120-SD-4D
	G08	TG-120-SD-4L
	G09	TG-120-SD-4H
	G10	TG-120-SD-70L
	G11	TG-120-SD-70H

Cernox™ RTDs

Uncalibrated	**C01**	CX-1010-SD	**C02**	CX-1030-SD	**C03**	CX-1050-SD	**C04**	CX-1070-SD	**C05**	CX-1080-SD
Calibrated	**C06**	CX-1010-SD-0.1B	**C14**	CX-1030-SD-0.3B	**C23**	CX-1050-SD-1.4B	**C29**	CX-1070-SD-4B	**C32**	CX-1080-SD-20L
	C07	CX-1010-SD-0.1L	**C15**	CX-1030-SD-0.3D	**C24**	CX-1050-SD-1.4D	**C30**	CX-1070-SD-4D		
	C08	CX-1010-SD-0.3B	**C16**	CX-1030-SD-0.3L	**C25**	CX-1050-SD-1.4L	**C31**	CX-1070-SD-4L		
	C09	CX-1010-SD-0.3D	**C17**	CX-1030-SD-1.4B	**C26**	CX-1050-SD-4B				
	C10	CX-1010-SD-0.3L	**C18**	CX-1030-SD-1.4D	**C27**	CX-1050-SD-4D				
	C11	CX-1010-SD-1.4B	**C19**	CX-1030-SD-1.4L	**C28**	CX-1050-SD-4L				
	C12	CX-1010-SD-1.4D	**C20**	CX-1030-SD-4B						
	C13	CX-1010-SD-1.4L	**C21**	CX-1030-SD-4D						
			C22	CX-1030-SD-4L						

Platinum RTDs

Uncalibrated	**P01**	PT-102	**P02**	PT-103	**P03**	PT-111
Calibrated	**P04**	PT-102-2S	**P11**	PT-103-2S	**P18**	PT-111-2S
	P05	PT-102-3S	**P12**	PT-103-3S	**P19**	PT-111-3S
	P06	PT-102-14D	**P13**	PT-103-14D	**P20**	PT-111-14D
	P07	PT-102-14L	**P14**	PT-103-14L	**P21**	PT-111-14L
	P08	PT-102-14H	**P15**	PT-103-14H	**P22**	PT-111-14H
	P09	PT-102-70L	**P16**	PT-103-70L	**P23**	PT-111-70L
	P10	PT-102-70H	**P17**	PT-103-70H	**P24**	PT-111-70H