



***TECHNICAL SPECIFICATIONS***

**TRACCEPAK<sup>®</sup>**



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# TRACEPAK® TUBING BUNDLES

## Technical Specifications

This brochure contains specifications and technical information about O'Brien Tracepak and S-Line tubing bundles. Custom bundles may contain materials, tubes and design specifications that differ from these. Special bundles are designated with a four digit code and special marking on the jacket and supported with specific product data sheets.

### TRACEPAK Model Number

Tracepak Model Number X = Alpha # = Numeric	Description																																																																
X	Unit of measure – only used for bundle sold and marked in Meters No prefix designates product is sold and marked in feet M = meters																																																																
/	Separator																																																																
T	Tracepak Product Designation																																																																
P	This location in the model number will indicate the maximum exposure temperature and duration (continuous or intermittent.) Standard exposure will be assigned a P. Standard exposure is defined as any non-isolated bundle or any bundle with a temperature rating of no more than 400F. Exception to this; bundles with a rating higher than 400F but for maintain only. <u>Any temperature rating other than the exact temperatures shown below will be assigned a Z.</u> Standard exposure P <table border="0" style="margin-left: 40px;"> <tr> <td></td> <td>Steam and Continuous</td> <td>Intermittent Add 'N' to temperature designation</td> <td>One Minute MAX Add 'S' to temperature designation (020730)</td> </tr> <tr> <td>450F/230C</td> <td>A</td> <td>AN</td> <td>AS</td> </tr> <tr> <td>500F/260C</td> <td>B</td> <td>BN</td> <td>BS</td> </tr> <tr> <td>550F/290C</td> <td>C</td> <td>CN</td> <td>CS</td> </tr> <tr> <td>600F/315C</td> <td>D</td> <td>DN</td> <td>DS</td> </tr> <tr> <td>650F/345C</td> <td>F</td> <td>FN</td> <td>FS</td> </tr> <tr> <td>700F/370C</td> <td>G</td> <td>GN</td> <td>GS</td> </tr> <tr> <td>750F/400C</td> <td>J</td> <td>JN</td> <td>JS</td> </tr> <tr> <td>800F/425C</td> <td>K</td> <td>KN</td> <td>KS</td> </tr> <tr> <td>850F/455C</td> <td>M</td> <td>MN</td> <td>MS</td> </tr> <tr> <td>900F/480C</td> <td>N</td> <td>NN</td> <td>NS</td> </tr> <tr> <td>950F/510C</td> <td>Q</td> <td>QN</td> <td>QS</td> </tr> <tr> <td>1000F/540C</td> <td>R</td> <td>RN</td> <td>RS</td> </tr> <tr> <td>1050F/565C</td> <td>S</td> <td>SN</td> <td>SS</td> </tr> <tr> <td>1100F/595C</td> <td>T</td> <td>TN</td> <td>TS</td> </tr> <tr> <td>Other</td> <td>Z</td> <td>ZN</td> <td>ZS</td> </tr> </table>		Steam and Continuous	Intermittent Add 'N' to temperature designation	One Minute MAX Add 'S' to temperature designation (020730)	450F/230C	A	AN	AS	500F/260C	B	BN	BS	550F/290C	C	CN	CS	600F/315C	D	DN	DS	650F/345C	F	FN	FS	700F/370C	G	GN	GS	750F/400C	J	JN	JS	800F/425C	K	KN	KS	850F/455C	M	MN	MS	900F/480C	N	NN	NS	950F/510C	Q	QN	QS	1000F/540C	R	RN	RS	1050F/565C	S	SN	SS	1100F/595C	T	TN	TS	Other	Z	ZN	ZS
	Steam and Continuous	Intermittent Add 'N' to temperature designation	One Minute MAX Add 'S' to temperature designation (020730)																																																														
450F/230C	A	AN	AS																																																														
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700F/370C	G	GN	GS																																																														
750F/400C	J	JN	JS																																																														
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1100F/595C	T	TN	TS																																																														
Other	Z	ZN	ZS																																																														
X	Type of bundle/tracer E = electric H = heavy steam trace L = light steam trace S = single insulated tubing bundle																																																																
#	Number of process tubes 1 = one process tube 2 = two process tubes																																																																
X	Jacket Material S = SV47-O'Brien PVC U = TPU																																																																
-	Separator																																																																
XX	Process tube material, construction & wall thickness - See Tube List																																																																
	Process tube size in 1/8" or mm																																																																
##	Separator																																																																
- XX	Tracer – electric tracer family or steam tube material, construction & wall thickness																																																																
##	Electric output in w/ft or steam tube size in 1/8" or mm																																																																
<b>Options Listing (Repeat as necessary)</b>																																																																	
/	Separator between each option – repeat as necessary																																																																
X	Length in units of measure																																																																
X##	Temperature sensor J = J- thermocouple K = K-thermocouple T = T-thermocouple R= 100W / 100PT 3 wire RTD ## = distance from power end in units of measure																																																																
#M	#M designates the quantity of messenger wires (eg. /3M designates three messenger wires)																																																																
X	Jacket Color A = gray      N = orange      U = brown B = blue      P = purple      W = white G = green      R = red      Y = yellow																																																																
LC	designation for large cross section - requires special handling																																																																
STK	bundle supplied in straight stick form																																																																
####	Specials identifier – if "Z" is used in model number																																																																

## STACKPAK™ Model Number

X = Alpha # = Numeric	Description
X	Unit of measure – only used for bundle sold and marked in Meters No prefix designates product is sold and marked in feet M = meters
/	Separator
S	STACKPAK Product Designation
X	Jacket Material S = SV47-O'Brien PVC U = TPU
-	Separator
X#	Heated tube/core type and quantity. For tube Designation refer to tubing lists. Multiple, like tubes/cores designated by multiple number codes. (i.e. H33S2 to designate (2) heated H3 tubes and (1) heated S2 tube) . Different tube types designated by including additional tube codes. Hose cores will include the prefix H. (i.e. HC06). Tube OD is given 1/8" increments or mm. Hose cores are given in 1/16" increments.
/	Separator only if unheated tubes are present
X#	Unheated tube(s) using same method as heated tubes.
-	Separator
X#	Tracer – electric tracer family and wattage. See tracer lists for heater codes. X = Heater is not included
Options Listing (Repeat as necessary)	
/	Separator between each option – repeat as necessary
#	Length, exact and continuous (ft. by default, meters if M/ called out as prefix)
X##	Temperature sensor J = J- thermocouple K = K- thermocouple R= 100Ω / 100PT 3 wire RTD XX = distance from power end (50' / 15m maximum)
#M	XM will call out the quantity of messenger wires. (i.e. /3M will call out 3 messenger wires)
LC	designation for large cross section – requires special handling
- #####	Specials identifier

# TRACEPAK® TUBING BUNDLES

## Technical Specifications

### Material Specifications

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#### Jacket

**SV47** is a proprietary thermoplastic formulation that exceeds the requirements of 105C PVC and outperforms other PVC jacket materials in UV resistance as well as providing low temperature flexibility.

**TPU** is a thermoplastic polyurethane jacket that offers excellent abrasion resistance and extreme cold temperature workability. TPU also contains no chlorides so it should be selected for applications where chloride stress cracking is a problem.

	O'Brien SV47	TPU
Abrasion Resistance	G	E
Tensile Strength PSI	2200	3800
Elongation %	350	700
Hardness, Shore A	80	80
Minimum Service Temperature	-30°F/-35°C*	-67°F/-58°C
Minimum Installation Temperature	-10°F/-23°C*	-40°F/-40°C
UL94 Flame	V2	V0 to V2
Halogenated (Chlorides)	YES	NO
Maximum Temperature	220°F/105°C	250°F/120°C
Weathering	G	E
UV Resistance	G	E

**E = Excellent G = Good F = Fair P = Poor**

\* Minimum service and installation temperature for SV47 have been determined by test on tubing bundles. The base material is rated at -40° by the manufacture when used as jacket for wire and cable. However, this is a false indication of performance when used as a weatherproof jacket on a tubing bundle. Tubing bundles are typically much larger in diameter, more flexible and have a softer 'core' than wire and cable. Consequently the advertised temperatures for what are termed Arctic PVC overstate the useful temperature range on tubing bundles.

#### Insulation

Nonflammable

Nonhygroscopic

Chemically inert

Water soluble chloride content of 45 ppm average with a maximum level of 100 ppm.

### Temperature Limits

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Maximum process temperature and duration as designated in model number.

Maximum jacket surface temperature +140°F (60°C) at ambient temperature of +80°F (27°C) with 10 mph (16 Km/h) wind.

# TUBING DATA

Designation	Material	Construction	OD	Wall	Max. Pressure*	Max. Continuous	Specifications
						Length Possible**	
<b>F1</b>	316/316L SS	Seamless	1/8"		10,900 psig	900 ft	A269, A213, A1016, MR0175, EN 10204-3.1
<b>F2</b>	316/316L SS	Seamless	1/4"		5,100	2,200	A269, A213, A1016, MR0175, EN 10204-3.1
<b>F3</b>	316/316L SS	Seamless	3/8"		3,300	1,300	A269, A213, A1016, MR0175, EN 10204-3.1
<b>F4</b>	316/316L SS	Seamless	1/2"		2,600	1,000	A269, A213, A1016, MR0175, EN 10204-3.1
<b>B2</b>	316/316L SS	Seamless	1/4"		7,500	1,300	A269, A213, A1016, MR0175, EN 10204-3.1
<b>B3</b>	316/316L SS	Seamless	3/8"		4,800	1,000	A269, A213, A1016, MR0175, EN 10204-3.1
<b>B4</b>	316/316L SS	Seamless	1/2"		3,700	750	A269, A213, A1016, MR0175, EN 10204-3.1
<b>B6</b>	316/316L SS	Seamless	3/4"		2,400	250	A269, A213, A1016, MR0175, EN 10204-3.1
<b>BH3</b>	316/316H SS	Seamless	3/8"		5,100	CF	A213, A1016, MR0175, EN 10204-3.1
<b>BH4</b>	316/316H SS	Seamless	1/2"		3,800	50	A213, A1016, MR0175, EN 10204-3.1
<b>BW3</b>	316/316L SS	Seamless	3/8"		5,700	450	A213, A1016, MR0175, EN 10204-3.1
<b>BW4</b>	316/316L SS	Seamless	1/2"		4,200	650	A213, A1016, MR0175, EN 10204-3.1
<b>KW3</b>	316/316L SS	Seamless	3/8"		6,800	CF	A213, A1016, MR0175, EN 10204-3.1
<b>KH3</b>	316/316H SS	Seamless	3/8"		6,800	50	A213, A1016, MR0175, EN 10204-3.1
<b>K4</b>	316/316L SS	Seamless	1/2"		5,100	250	A269, A213, A1016, MR0175, EN 10204-3.1
<b>A2</b>	316/316L SS	Welded	1/4"		4,080	2,500	A269, A1016, EN 10204-3.1
<b>A3</b>	316/316L SS	Welded	3/8"		2,640	2,500	A269, A1016, EN 10204-3.1
<b>A4</b>	316/316L SS	Welded	1/2"		2,080	2,000	A269, A1016, EN 10204-3.1
<b>E4</b>	316/316L SS	Welded	1/2"		2,975	1,000	A269, A1016, EN 10204-3.1
<b>N2</b>	Alloy 400	Seamless	1/4"		4,800	1,000	B163, B165
<b>N3</b>	Alloy 400	Seamless	3/8"		3,100	600	B163, B165
<b>P4</b>	Alloy 400	Seamless	1/2"		3,210	600	B163, B165
<b>J2</b>	Copper	Seamless	1/4"		1,400	2,600	B68, B75, EN 10204-3.1
<b>C3</b>	Copper	Seamless	3/8"		900	2,000	B68, B75, EN 10204-3.1
<b>D4</b>	Copper	Seamless	1/2"		800	1,000	B68, B75, EN 10204-3.1
<b>M4</b>	Copper	Seamless	1/2"		1,100	1000	B68, B75, EN 10204-3.1
<b>M6</b>	Copper	Seamless	3/4"		725	500	B68, B75, EN 10204-3.1
<b>G2</b>	PFA	Extruded	1/4"		155	1,000	
<b>S2</b>	PFA	Extruded	1/4"		180	745	
<b>G3</b>	PFA	Extruded	3/8"		95	1,000	
<b>H4</b>	PFA	Extruded	1/2"		155	1,000	
<b>LA2</b>	PTFE	Extruded	1/4"		180	1,000	
<b>LB3</b>	PTFE	Extruded	3/8"		190	600	
<b>RS2</b>	HDPE	Extruded	1/4"		270	1,000	
<b>RH3</b>	HDPE	Extruded	3/8"		290	1,000	
Following Tubes are Designations for use as SensorTube™							
<b>G2S</b>	PFA	Extruded	1/4"		210	1,100	Tube color: BLACK
<b>G3S</b>	PFA	Extruded	3/8"		135	1,500	Tube color: BLACK

\*Maximum Pressure @ 72F (23C)

Values calculated using S values as specified in ANSI B31.3 code.

\*\* Consult Factory for availability of longer continuous lengths.

Teflon® is a registered trademark of E.I. DuPont  
 Monel® is a registered trademark of INCO Alloys International

## Pressure Correction Factors

	PFA Teflon	Copper	316SS	Monel
200F (93C)	0.84	0.80	1.00	0.88
400F (204C)	0.30	0.50	0.95	0.79
600F (316C)	-	-	0.82	0.79
800F (427C)	-	-	0.79	0.76

# TUBING DATA

Designation	Material	Construction	OD	Wall	Max. Pressure*	Length Possible**	Specifications
<b>MF6</b>	316/316L SS	Seamless	6mm	1mm	460 Bar	300M	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
<b>MF8</b>	316/316L SS	Seamless	8mm	1mm	330	210	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
<b>MF10</b>	316/316L SS	Seamless		1mm	260	165	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
<b>MF12</b>	316/316L SS	Seamless		1mm	210	150	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
<b>MB10</b>	316/316L SS	Seamless			410	150	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
<b>MB12</b>	316/316L SS	Seamless			330	120	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
<b>MD6</b>	Copper	Seamless	6mm	1mm	95	600	B68, B75, EN 10204-3.1
<b>MD8</b>	Copper	Seamless	8mm	1mm	60	455	B68, B75, EN 10204-3.1
<b>MD12</b>	Copper	Seamless		1mm	55	300	B68, B75, EN 10204-3.1
<b>MG6</b>	PFA	Extruded	6mm	1mm	34	300	
<b>MG8</b>	PFA	Extruded	8mm	1mm	16	300	
<b>MG10</b>	PFA	Extruded		1mm	11	300	
<b>MG12</b>	PFA	Extruded		1mm	9	300	
<b>MA12</b>	316/316L SS	Welded		1mm	170	300	ASTM, A269 A1016, EN 10204-3.1
<b>MT12</b>	316TI SS	Welded		1mm	170	150	DIN 17457, 1.4571, EN 10204-3.1

## TrueTube™

Designation	Material	Construction	OD	Max. Wall	Max. Continuous Pressure*	Length**	Specifications (Identification COLOR in Bundle)
TrueTube CP Chemically Polished and Passivated, A269, A213, A1016, MR0175, EN 10204-3.1 (BLACK)							
<b>TA1</b>	316/316L SS	Seamless	1/8"		10,900 psig	900 ft	
<b>TT2</b>	316/316L SS	Seamless	1/4"		5,100	2,200	
<b>TT3</b>	316/316L SS	Seamless	3/8"		3,300	1,300	
TrueTube EP Electropolished, A269, A213, A1016, MR0175, EN 10204 3.1 (GREEN)							
<b>TC1</b>	316/316L SS	Seamless	1/8"		10,900 psig	200 ft	
<b>TE2</b>	316/316L SS	Seamless	1/4"		5,100	600	
<b>TE3</b>	316/316L SS	Seamless	3/8"		3,300	600	
TrueTube FS Chemically Polished and Passivated with SilcoNert 2000 ID Coating, A269, A213, A1016, MR0175, EN 10204-3.1 (LT BLUE)							
<b>TB1</b>	316/316L SS	Seamless	1/8"		10,900	900 ft	
<b>TF2</b>	316/316L SS	Seamless	1/4"		5,100	2,200	
<b>TF3</b>	316/316L SS	Seamless	3/8"		3,300	1,300	
TrueTube EPS Electropolished with SilcoNert 2000 ID Coating, A269, A213, A1016, MR0175, EN 10204-3.1 (RED)							
<b>TD1</b>	316/316L SS	Seamless	1/8"		10,900	200 ft	
<b>TS2</b>	316/316L SS	Seamless	1/4"		5,100	600	
<b>TS3</b>	316/316L SS	Seamless	3/8"		3,300	600	
TrueTube HCR Chemically Polished and Passivated with Dursan™ ID Coating, A269, A213, A1016, MR0175, EN 10204-3.1 (YELLOW)							
<b>TQ1</b>	316/316L SS	Seamless	1/8"		10,900	900 ft	
<b>TR2</b>	316/316L SS	Seamless	1/4"		5,100	2,200	
<b>TR3</b>	316/316L SS	Seamless	3/8"		3,300	1,300	

**Electric Heater Data**

**Low Temperature Self Regulating Tracers**

Code	V	W/ft	W/m	Max. Maint. and Exposure	Max. Inter. Exposure	T-Rating	Connection Kits Power	Termination	Approvals
<b>J5</b>	120	5	-	150F (65C)	185F (85C)	T6	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert. CI I, II Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>J8</b>	120	8	-	150F (65C)	185F (85C)	T6	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert. CI I, II Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>J10</b>	120	10	-	150F (65C)	185F (85C)	T6	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert. CI I, II Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>P5</b>	240	5	16	150F (65C)	185F (85C)	T6	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert. CI I, II Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET10	CENELEC EEx e II T6
<b>P8</b>	240	8	25	150F (65C)	185F (85C)	T6	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert. CI I, II Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET10	CENELEC EEx e II T6
<b>P10</b>	240	10	32	150F (65C)	185F (85C)	T6	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert. CI I, II Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET10	CENELEC EEx e II T6

**High Temperature Self Regulating Tracers**

Code	V	W/ft	W/m	Max. Maint. and Exposure	Max. Inter. Exposure	T-Rating	Connection Kits Power	Termination	Approvals
<b>B5</b>	120	5	-	250F (121C)	500F (260C)	T3	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>B10</b>	120	10	-	250F (121C)	500F (260C)	T3	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>B15</b>	120	15	-	250F (121C)	500F (260C)	T2D	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>B20</b>	120	20	-	250F (121C)	500F (260C)	T2C	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
<b>N5</b>	240	5	15	250F (121C)	500F (260C)	T3	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET13	CENELEC EEx e II T3
<b>N10</b>	240	10	30	250F (121C)	500F (260C)	T3	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET13	CENELEC EEx e II T3
<b>N15</b>	240	15	47	250F (121C)	500F (260C)	T3	T210-PC	T210-ET	FM Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET13	CENELEC EEx e II T3
<b>N20</b>	240	20	63	250F (121C)	500F (260C)	T2C	T210-PC	T210-ET FM	Appvd. CI I, II, III Div. 2, Gr. A, B, C, D, F, G
							T210-PC or TPC1	T210-ET or TPC1	CSA Cert.. CI I, II, III Div. 1, 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T310-ET13	CENELEC EEx e II 240°C (T2)

**Power Limiting Tracers**

Code	V	W/ft	W/m	Max. Maint. and Exposure	Max. Inter. Exposure Power Off	T-Rating	Connection Kits Power	Termination	Approvals
<b>JV10</b>	120	10	-	400F (200C)	500F (260C)	T*	T210-PC	T250-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC	T250-ET	CSA Cert. CI I, II Div. 2, Gr. A, B, C, D, E, F, G
<b>JV20</b>	120	20	-	300F (150C)	500F (260C)	T*	T210-PC	T250-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC	T250-ET	CSA Cert. CI I, II Div. 2, Gr. A, B, C, D, E, F, G
<b>JN10</b>	208	10	30	425F (220C)	500F (260C)	T*	T210-PC	T250-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC	T250-ET	CSA Cert. CI I, II Div. 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T355-ET	CENELEC EEx es II T*
							T210-PC	T250-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
<b>JN20</b>	208/240	20	60	300F (150C)	500F (260C)	T*	T210-PC	T250-ET	FM Appvd. CI I, II, III Div. 2, Gr. B, C, D, F, G
							T210-PC	T250-ET	CSA Cert. CI I, II Div. 2, Gr. A, B, C, D, E, F, G
							T9355-PC	T355-ET	CENELEC EEx es II T*

**Constant Wattage Tracers**

Code	V	W/ft	W/m	Max. Maint. and Exposure	Max. Inter. Exposure	T-Rating	Connection Kits	Approvals
<b>T18</b>	120	18	-	400F (200C)	450F (230C)	T*	T9G90-UC	Non-Hazardous Areas
<b>TY18</b>	208	18	-	400F (200C)	450F (230C)	T*	T9G90-UC	Non-Hazardous Areas
<b>TN18</b>	240	18	-	400F (200C)	450F (230C)	T*	T9G90-UC	Non-Hazardous Areas

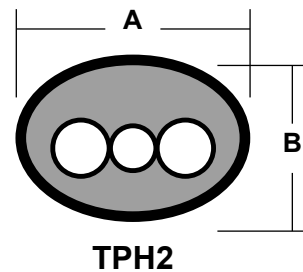
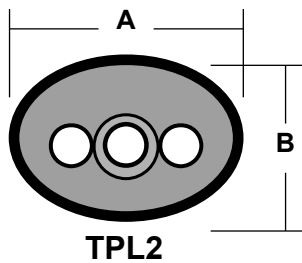
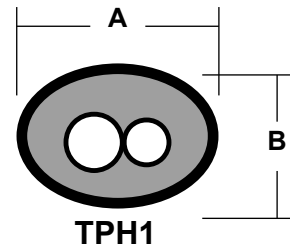
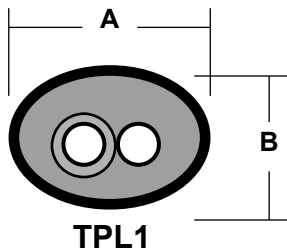
T\* - established by application



# TRACEPAK® TPL and TPH

## Dimensions

	MIN. BEND (CM) HORIZ.	SUPPORT CENTERS - FT. (M)		NOMINAL WT. DIMENSIONS A - IN (CM)		NOMINAL RADIUS - IN (CM)	
		VERT.	LB/FT (KG/M)	A	B		
TPL1 - One 3/8" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.5 (0.74)	1.6 (4.1)	1.1 (2.8)	
TPL1 - One 1/2" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.6 (0.89)	1.9 (4.8)	1.2 (3.0)	
TPL1 - One 1/2" Process with 1/2" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.7 (1.04)	1.9 (4.8)	1.2 (3.0)	
TPL2 - Two 3/8" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.6 (0.89)	2.3 (5.8)	1.2 (3.0)	
TPL2 - Two 1/2" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.8 (1.19)	2.6 (6.6)	1.3 (3.3)	
TPL2 - Two 1/2" Process with 1/2" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.9 (1.34)	2.6 (6.6)	1.3 (3.3)	
TPH1 - One 3/8" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.5 (0.74)	1.5 (3.8)	1.2 (3.0)	
TPH1 - One 1/2" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.6 (0.89)	1.6 (4.1)	1.2 (3.0)	
TPH1 - One 1/2" Process with 1/2" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.7 (1.04)	1.7 (4.3)	1.2 (3.0)	
TPH2 - Two 3/8" Process with 3/8" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.6 (0.89)	2.0 (5.1)	1.2 (3.0)	
TPH2 - Two 1/2" Process with 1/2" Tracer	8" (20)	6' (1.8)	15' (4.6)	0.8 (1.19)	2.2 (5.6)	1.2 (3.0)	



## Recommended Accessories

End Seal Kit	Model TPKSK-10
End Seal Boot	Model TPKHS-C2, D2, A3 or B3
Jacket Patch Kit	Model TPKJP-1 or -2

## Typical Performance

The information presented represents typical performance data for the conditions given. Actual results may vary with the conditions of installation. For critical or special applications, consult the factory for specific performance data.

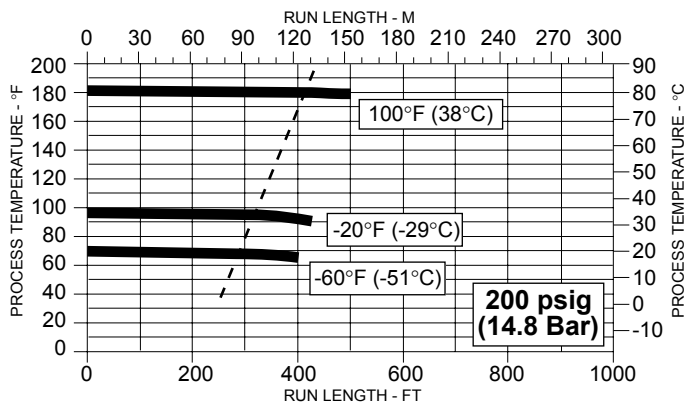
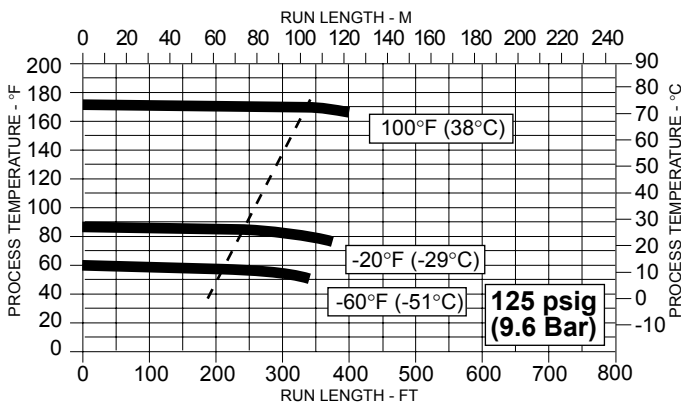
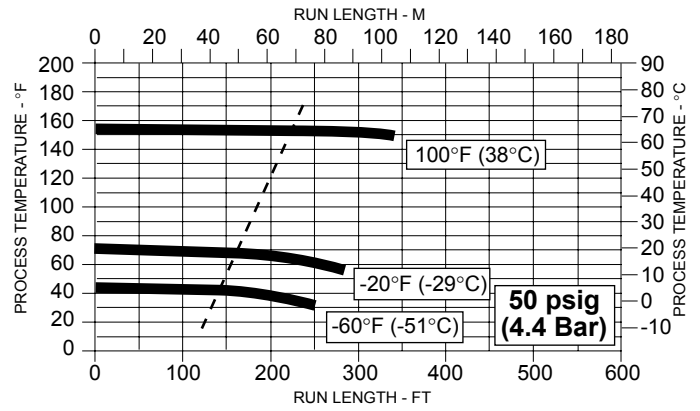
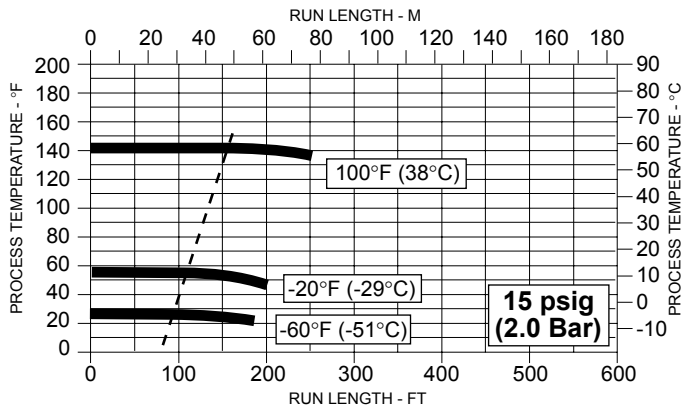
For freeze protection use 50°F (10°C) as the minimum allowable process tube temperature. This will provide a sufficient factor of safety.

Winter ambients assume a 25 mph (40 Km/h) wind and summer ambients assume a 10 mph (16 Km/h) wind.

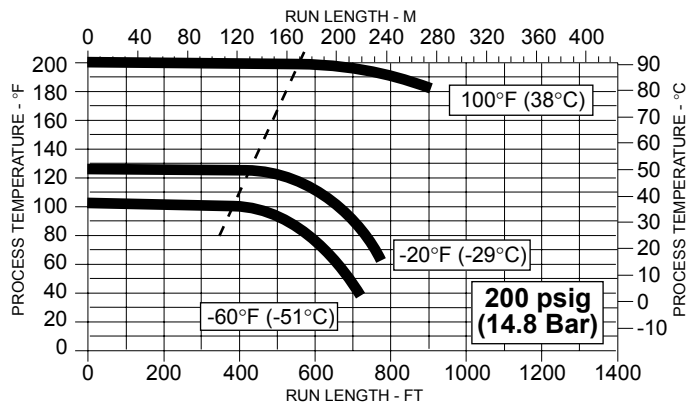
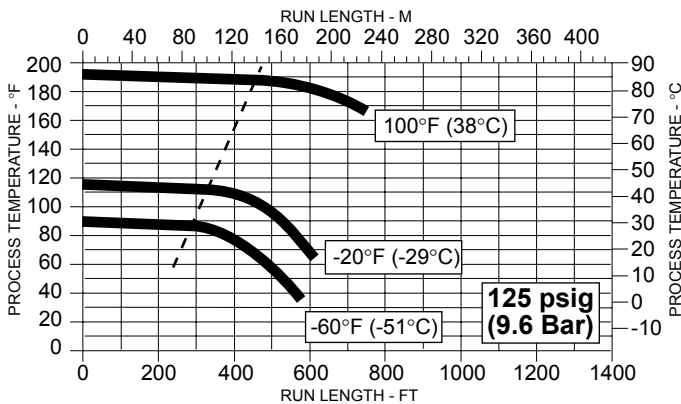
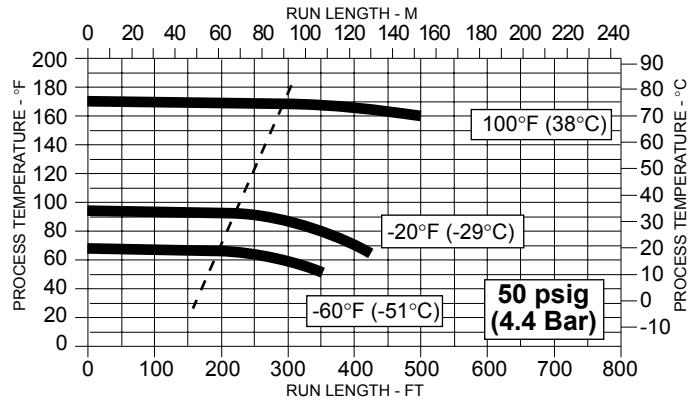
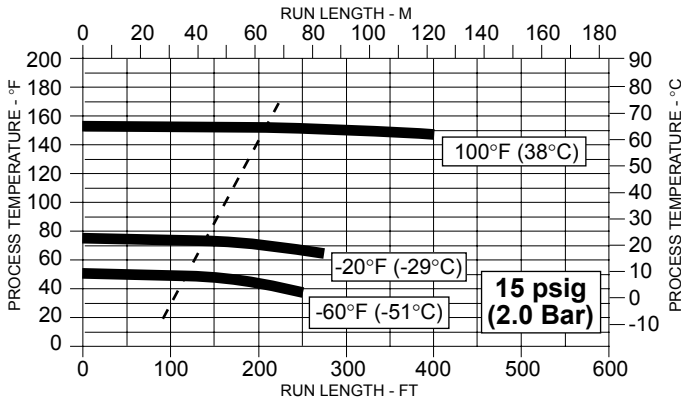
Ideal design of a steam traced installation dictates a slope of 1/4" drop per foot (20 mm/M) of run and a maximum steam pressure drop of 10%. The dashed line (---) on the graphs indicates the length at which a 10% drop in steam pressure can be expected.

# Typical Performance-TPL1

## TPL1-1/2" Process with 3/8" Tracer (also 12mm Process with 8mm Tracer)

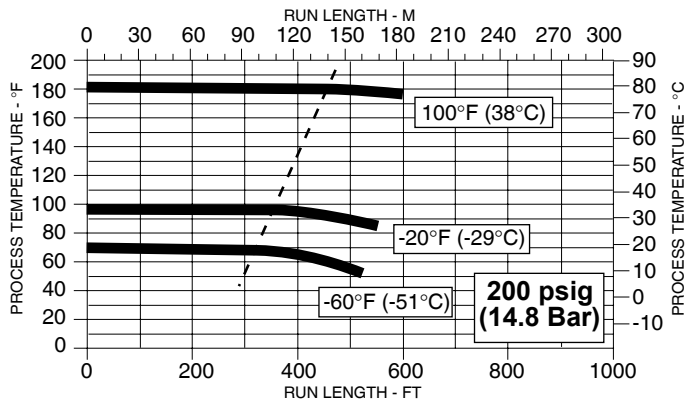
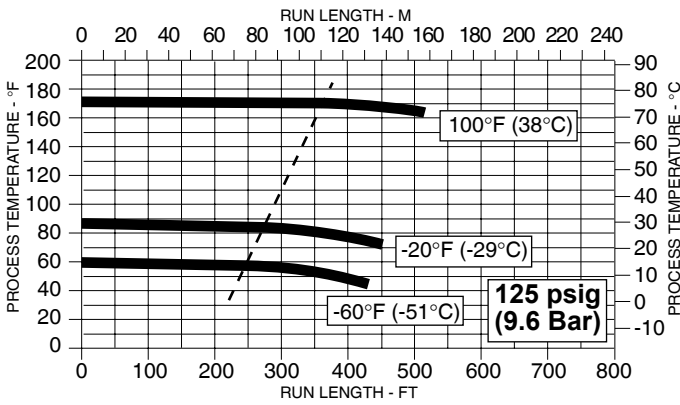
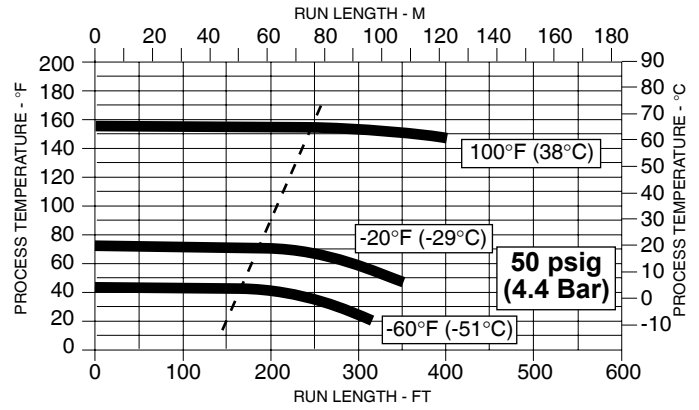
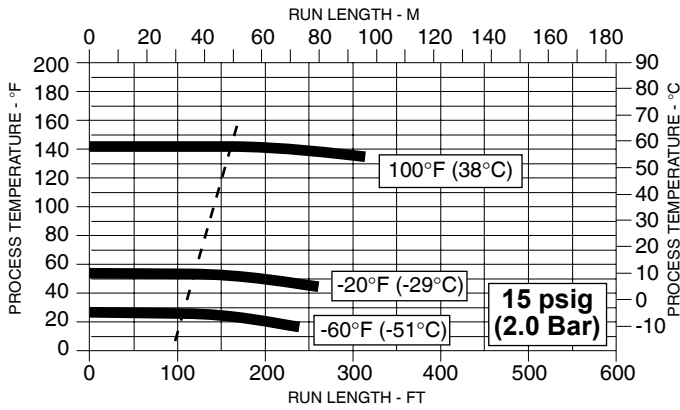


## TPL1-1/2" Process with 1/2" Tracer (also 12mm Process with 12mm Tracer)

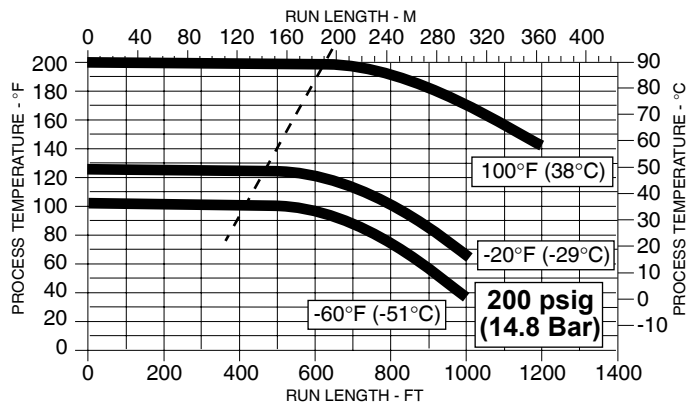
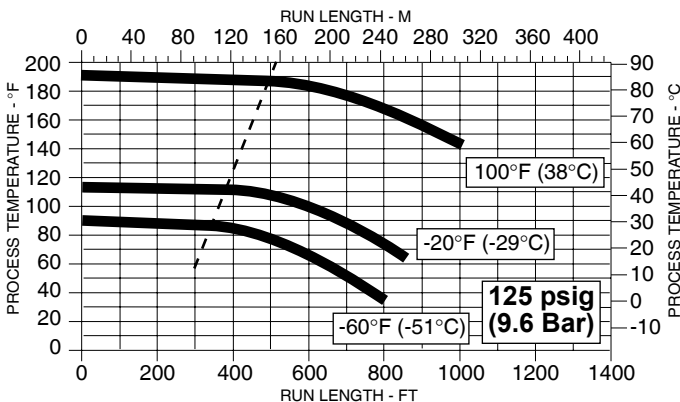
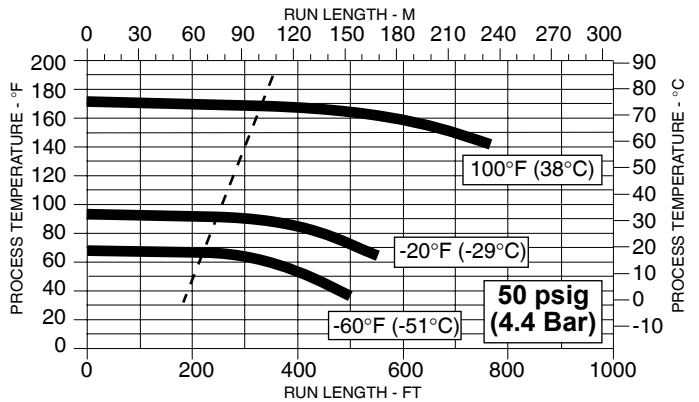
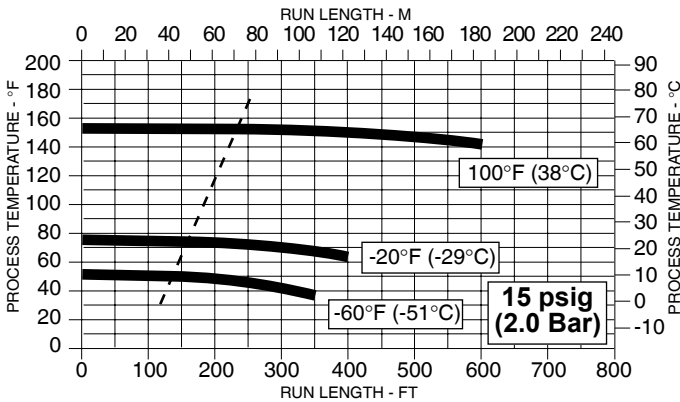


# Typical Performance-TPL2

## TPL2 - 1/2" Process with 3/8" Tracer (also 12mm Process with 8mm Tracer)

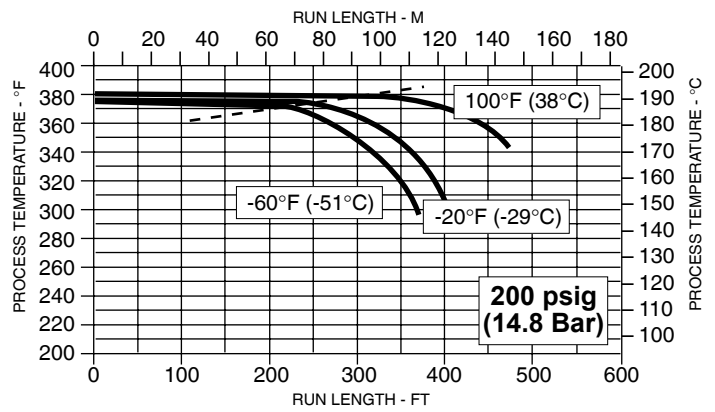
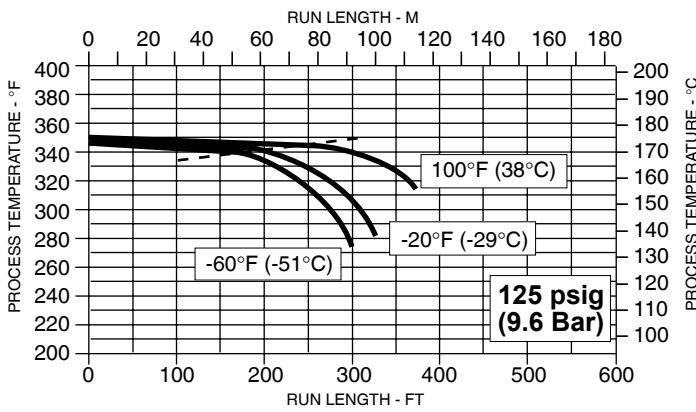
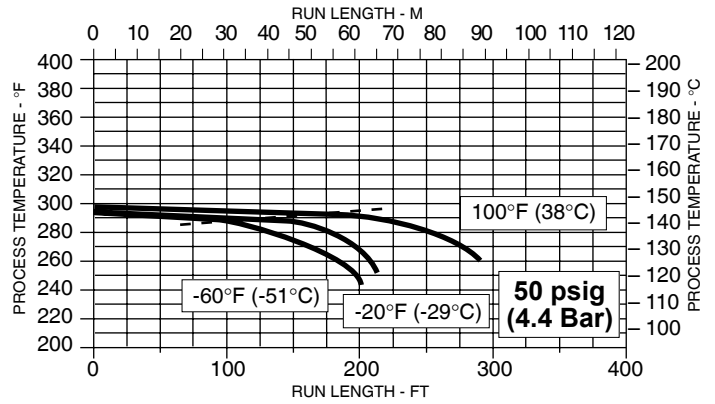
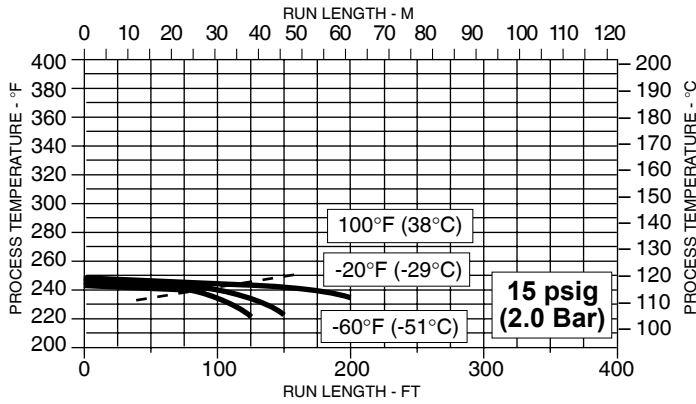


## TPL2 - 1/2" Process with 1/2" Tracer (also 12mm Process with 12mm Tracer)

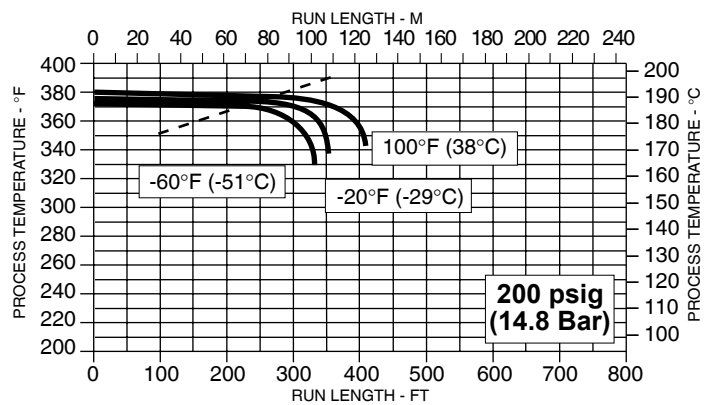
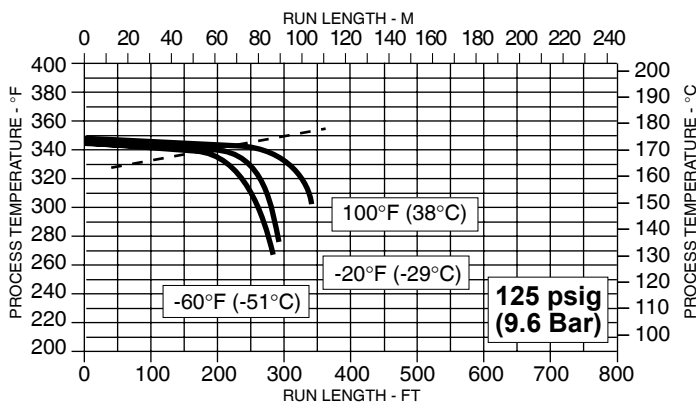
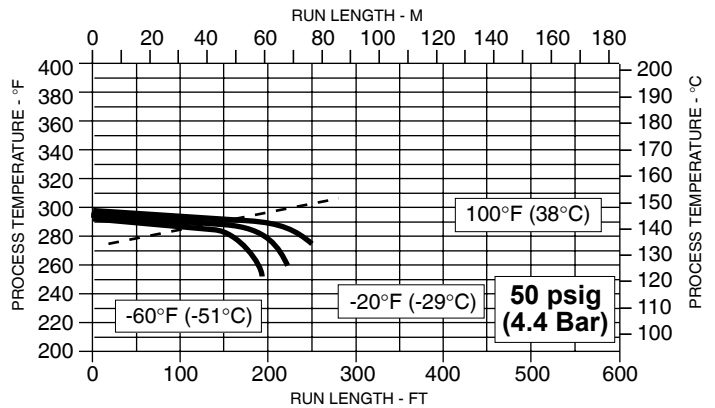
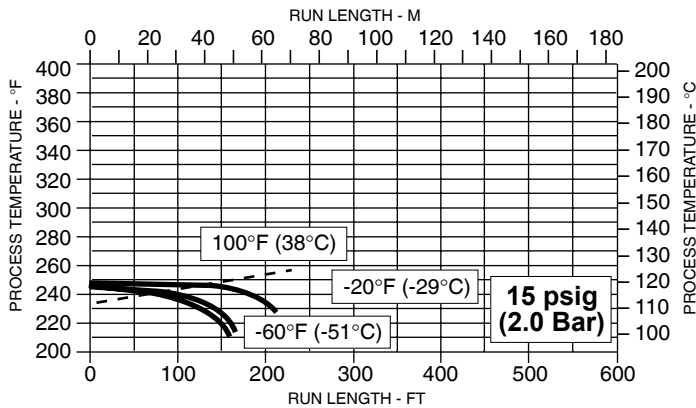


# Typical Performance-TPH1

## TPH1-3/8" Process with 3/8" Tracer (also 8mm Process with 8mm Tracer)

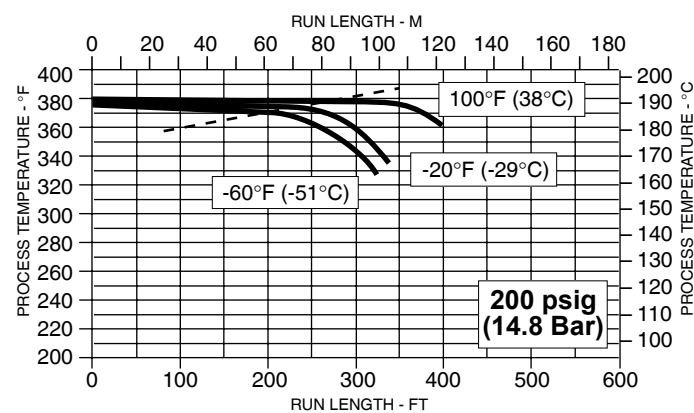
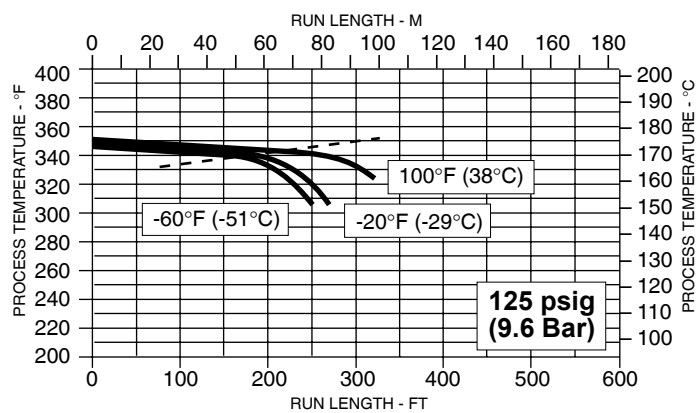
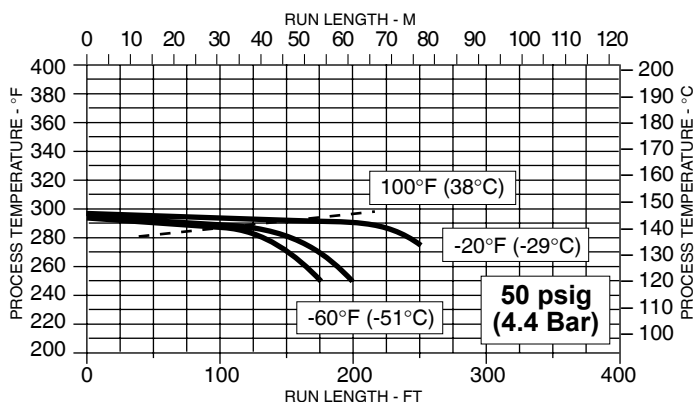
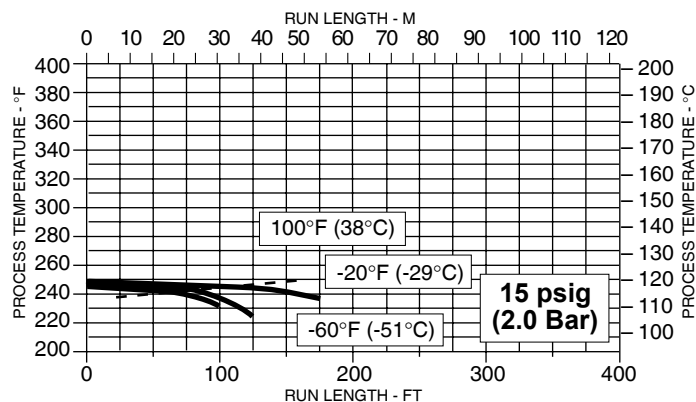


## TPH1-1/2" Process with 3/8" Tracer (also 12mm Process with 8mm Tracer)

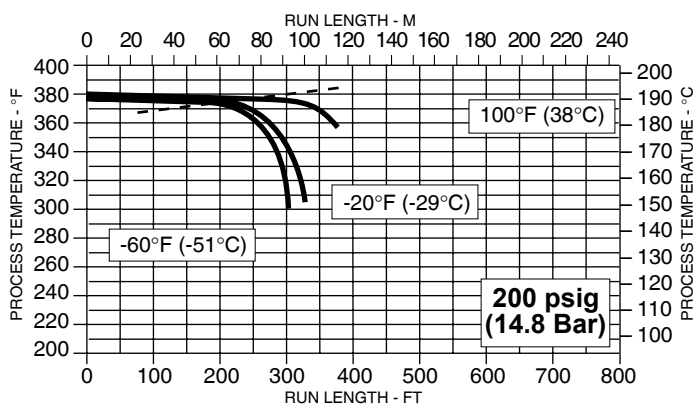
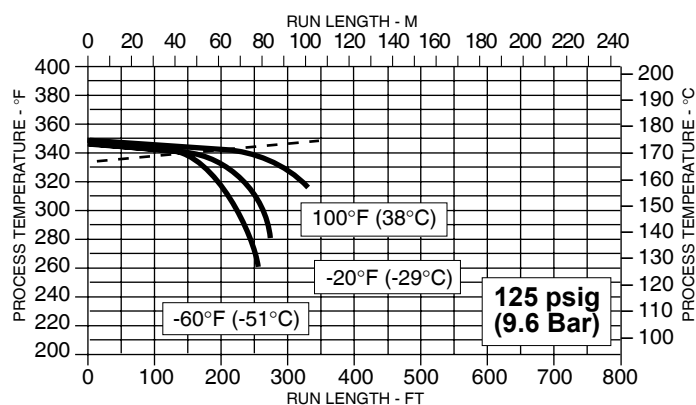
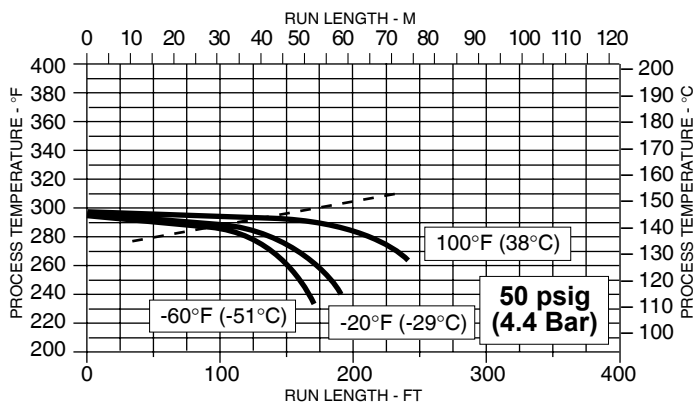
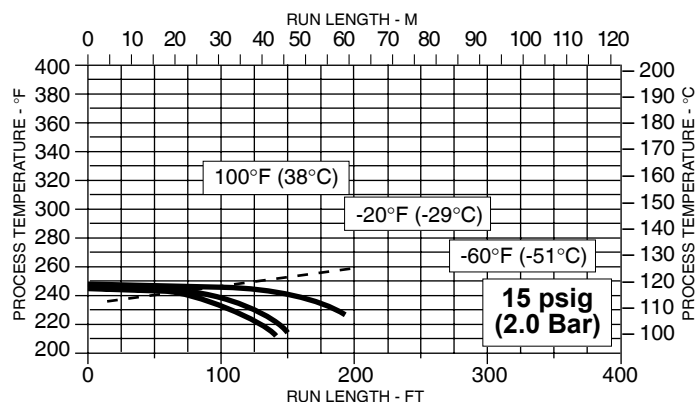


# Typical Performance-TPH2

## TPH2 - 3/8" Process with 3/8" Tracer (also 8mm Process with 8mm Tracer)



## TPH2 - 1/2" Process with 3/8" Tracer (also 12mm Process with 8mm Tracer)



# TRACEPAK®TPE

## Self Regulating Technical Specifications

### Recommended Accessories

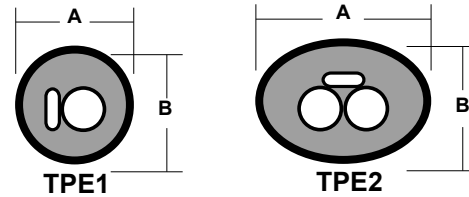
End Seal Kit	Model TPKSK-10
End Seal Boot	Model TPKHS-D2 or B3
Jacket Patch Kit	Model TPKJP-1 or -2
Power Connection Kit	Model T210-PC
	Model T9310-PC
	Model TPC1
Termination Kit	Model T210-ET
	Model T310-ET10
	Model T310-ET13

### Dimensions

	NOMINAL		DIMENSIONS - IN (CM)
	WT. LB/FT (KG/M)	A B	
<b>TPE1- ¼" Process Tube</b>	0.3 (0.45)	1.1 (2.8)	1.0 (2.5)
<b>TPE1- ⅜" Process Tube</b>	0.4 (0.60)	1.3 (3.3)	1.0 (2.5)
<b>TPE1- ½" Process Tube</b>	0.5 (0.74)	1.4 (3.6)	1.1 (2.8)
<b>TPE2- ¼" Process Tubes</b>	0.4 (0.60)	1.3 (3.3)	1.1 (2.8)
<b>TPE2- ⅜" Process Tubes</b>	0.6 (0.89)	1.5 (3.8)	1.2 (3.0)
<b>TPE2- ½" Process Tubes</b>	0.8 (1.19)	1.7 (4.3)	1.4 (3.6)
<b>Minimum bending radius 8 in. (20 cm).</b>			
<b>Maximum support centers-ft. Horizontal 6' (2 m) Vertical 15' (4 m).</b>			

### Optional Accessories

General Purpose J or K Thermocouple Controller - HC5 Series  
 Ambient Sensing Temperature Controller - Model TPKTS-A-7  
 Line Sensing Temperature Controller - Model TPKTS-B-7



### Maximum Circuit Length Vs. Circuit Breaker Rating

(To determine maximum circuit length in Meters - M = FT x 0.3048)

START-UP TEMP. - °F (°C)	120 VAC					240 VAC				
	15A	20A	30A	40A	50A	15A	20A	30A	40A	50A
<b>B5 (120 VAC)</b>	<b>50 (10)</b>	180'	240'	360'	380'	360'	480'	720'	765'	765'
<b>N5 (240 VAC)</b>	<b>0 (-18)</b>	160'	215'	325'	380'	320'	425'	640'	765'	765'
<b>Heater</b>	<b>-20 (-28)</b>	155'	210'	315'	380'	305'	410'	615'	765'	765'
	<b>-40 (-40)</b>	150'	200'	305'	380'	295'	390'	590'	765'	765'
<b>B10 (120 VAC)</b>	<b>50 (10)</b>	110'	145'	220'	270'	220'	295'	440'	540'	540'
<b>N10 (240 VAC)</b>	<b>0 (-18)</b>	95'	130'	195'	265'	195'	260'	390'	520'	540'
<b>Heater</b>	<b>-20 (-28)</b>	95'	125'	190'	255'	185'	245'	370'	495'	540'
	<b>-40 (-40)</b>	90'	120'	180'	245'	175'	235'	355'	475'	540'
<b>B15 (120 VAC)</b>	<b>50 (10)</b>	76'	101'	151'	201'	151'	202'	302'	403'	425'
<b>N15 (240 VAC)</b>	<b>0 (-18)</b>	66'	88'	133'	176'	132'	177'	265'	353'	425'
<b>Heater</b>	<b>-20 (-28)</b>	63'	84'	126'	168'	126'	168'	252'	336'	420'
	<b>-40 (40)</b>	60'	80'	120'	160'	120'	161'	241'	321'	401'
<b>B20 (120 VAC)</b>	<b>50 (10)</b>	60'	80'	119'	159'	115'	153'	229'	305'	360'
<b>N20 (240 VAC)</b>	<b>0 (-18)</b>	55'	73'	109'	145'	104'	139'	208'	277'	347'
<b>Heater</b>	<b>-20 (-28)</b>	53'	71'	106'	141'	101'	134'	201'	268'	335'
	<b>-40 (40)</b>	51'	69'	103'	137'	97'	130'	195'	259'	324'
<b>J5 (120 VAC)</b>	<b>50 (10)</b>	230'	270'	270'	270'	460'	540'	540'	540'	540'
<b>P5 (240 VAC)</b>	<b>0 (-18)</b>	150'	200'	270'	270'	300'	400'	540'	540'	540'
<b>Heater</b>	<b>-20 (-28)</b>	130'	175'	260'	270'	260'	345'	520'	540'	540'
<b>J8 (120 VAC)</b>	<b>50 (10)</b>	150'	200'	210'	210'	295'	390'	420'	420'	420'
<b>P8 (240 VAC)</b>	<b>0 (-18)</b>	105'	140'	210'	210'	195'	260'	390'	420'	420'
<b>Heater</b>	<b>-20 (-28)</b>	95'	125'	185'	210'	170'	230'	340'	420'	420'
<b>J10 (120 VAC)</b>	<b>50 (10)</b>	115'	150'	180'	180'	230'	305'	360'	360'	360'
<b>P10 (240 VAC)</b>	<b>0 (-18)</b>	70'	95'	145'	180'	150'	200'	300'	360'	360'
<b>Heater</b>	<b>-20 (-28)</b>	60'	85'	125'	165'	135'	180'	270'	360'	360'

### GENELEC APPROVED HEATERS

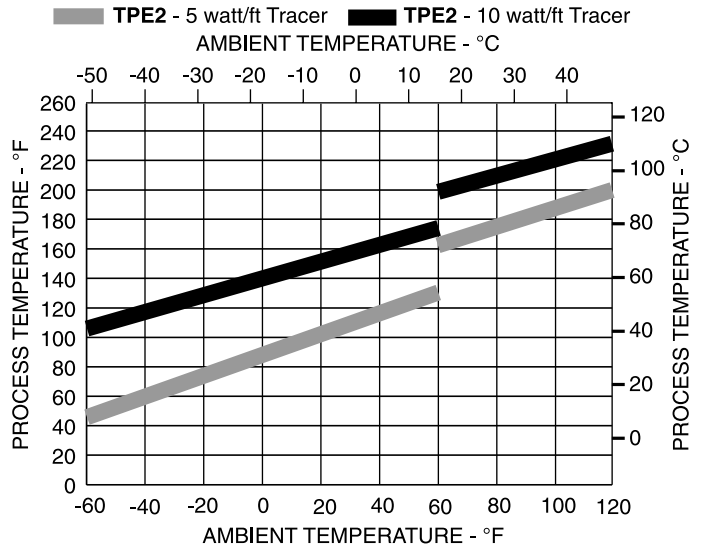
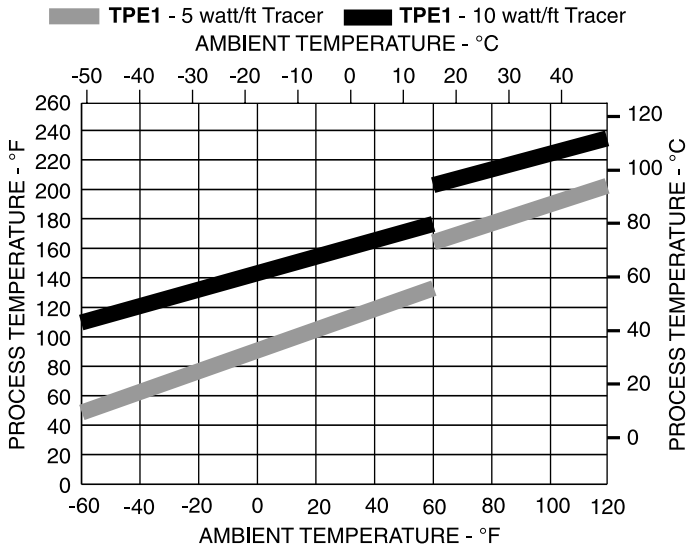
	START-UP TEMP. - °C	240 VAC		
		16A	25A	32A 40A
<b>MN4 Heater</b>	<b>10</b>	165m	250m	250m
	<b>-20</b>	140m	215m	250m
<b>MN8 Heater</b>	<b>10</b>	105m	165m	180m
	<b>-20</b>	85m	135m	175m
<b>MN12 Heater</b>	<b>10</b>	75m	120m	145m
	<b>-20</b>	65m	100m	130m

### Typical Performance

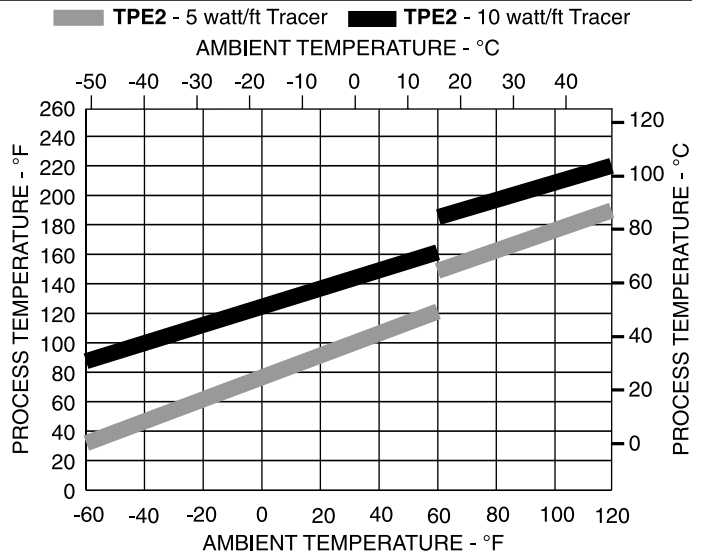
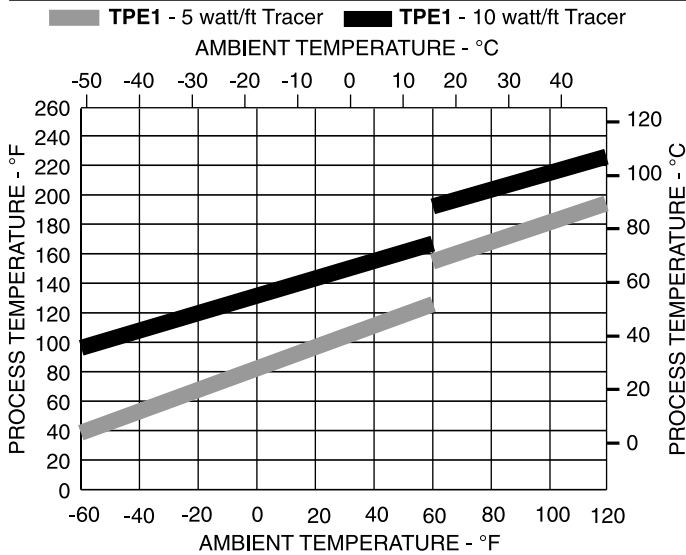
The information presented represents typical performance data for the conditions given and at the rated voltage. Actual results may vary with the conditions of installation. For critical applications, consult the factory for specific performance data. Winter ambients, below 60°F (16°C), assume a 25 mph (40 Km/H) wind and summer ambients, above 60°F (16°C), assume a 10 mph (16 Km/H) wind. For freeze protection use 50°F (10°C) as the minimum allowable process tube temperature. This will provide sufficient factor of safety.

# Typical Performance for High Temperature

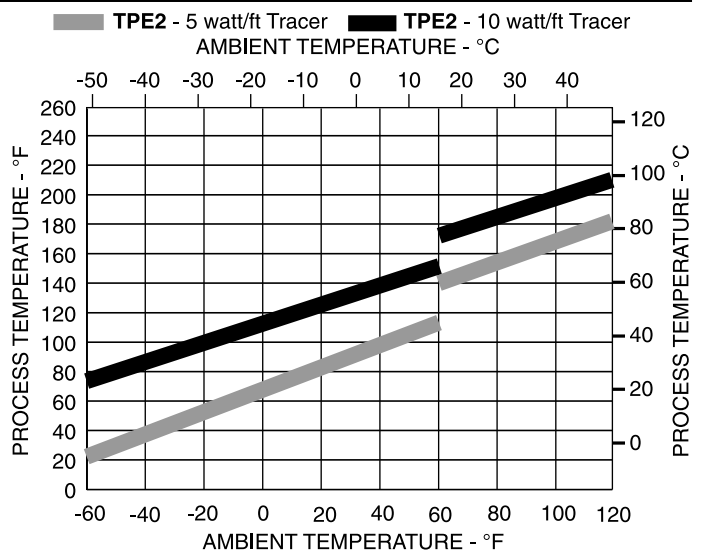
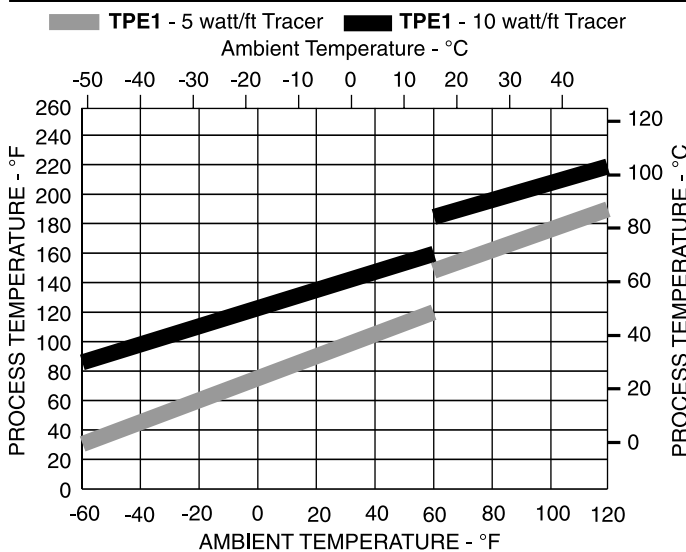
## 1/4" Process



## 3/8" Process

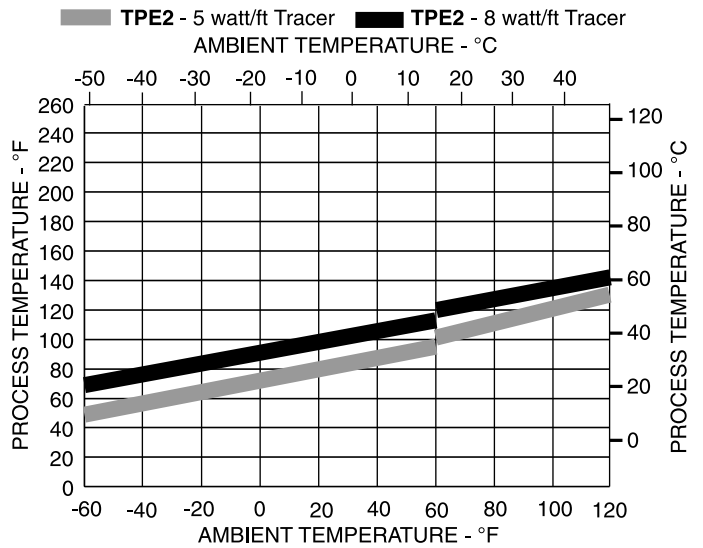
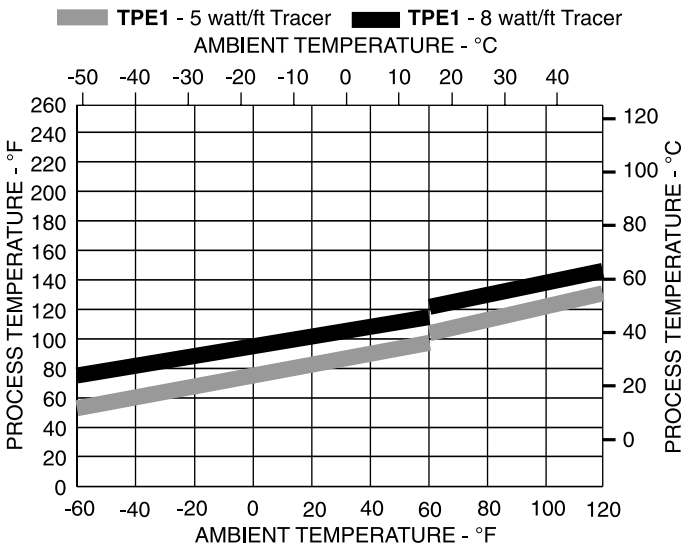


## 1/2" Process

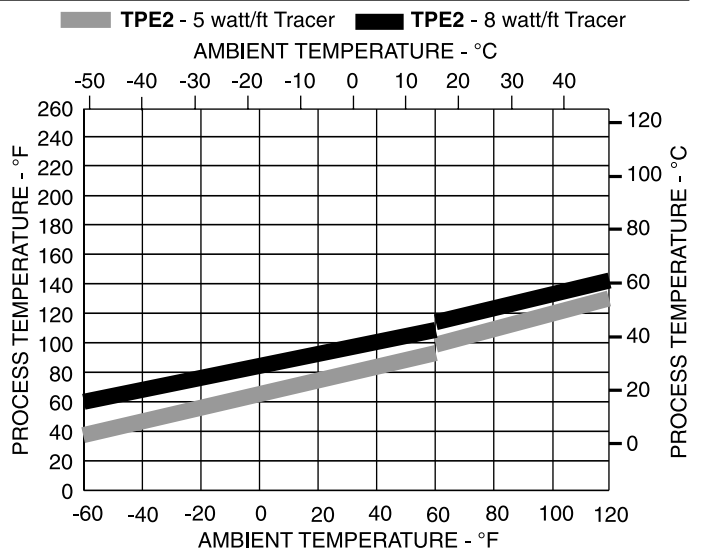
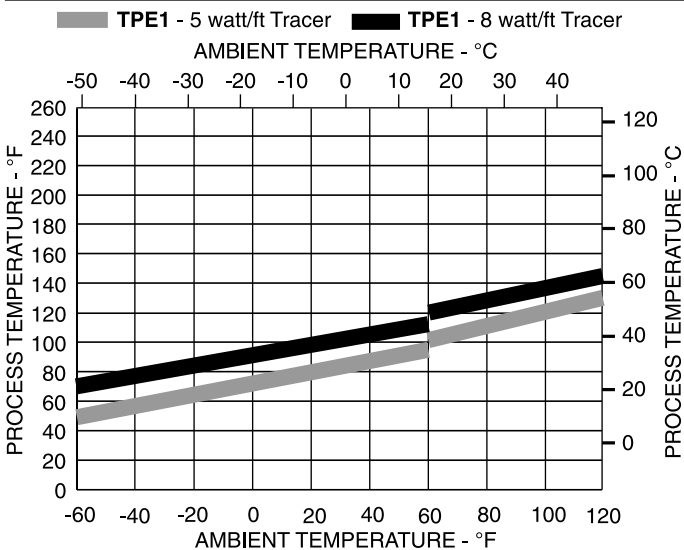


# Typical Performance for Freeze Protection

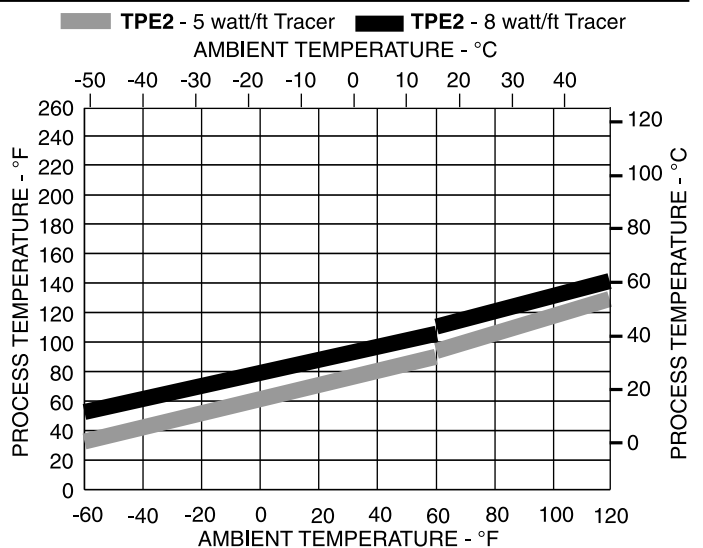
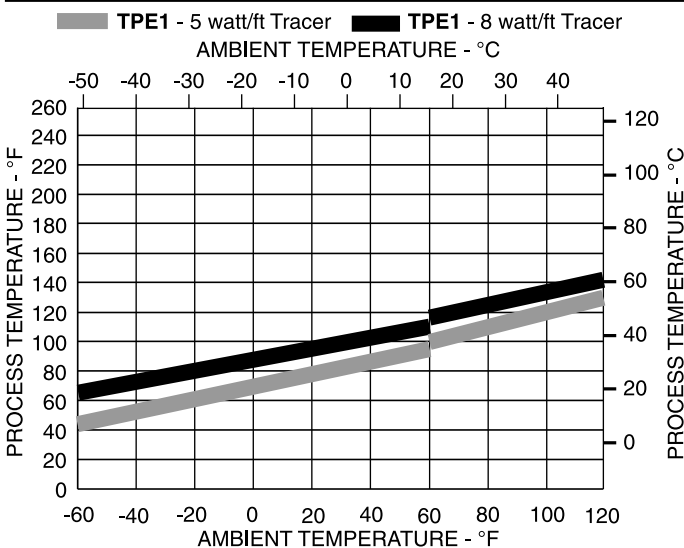
## 1/4" Process



## 3/8" Process



## 1/2" Process





## Technical Specifications

### Model Number

Product Family

**S**-Preinsulated Single Process Tube

Process Tube (Select from below.)

- A2** ¼" x 0.035 wall welded 316 SS
- A3** ⅜" x 0.035 wall welded 316 SS
- A4** ½" x 0.035 wall welded 316 SS
- F2** ¼" x 0.035 wall seamless 316 SS
- F3** ⅜" x 0.035 wall seamless 316 SS
- F4** ½" x 0.035 wall seamless 316 SS
- B3** ⅜" x 0.049 wall seamless 316 SS
- B4** ½" x 0.049 wall seamless 316 SS
- J2** ¼" x 0.030 wall copper
- C3** ⅜" x 0.032 wall copper
- D4** ½" x 0.035 wall copper
- M4** ½" x 0.049 wall copper
- M6** ¾" x 0.049 wall copper
- MF6** 6mm OD x 1mm wall seamless 316 SS
- MF8** 8mm OD x 1mm wall seamless 316 SS
- MF10** 10mm OD x 1mm wall seamless 316 SS
- MF12** 12mm OD x 1mm wall copper
- MB10** 10mm OD x 1.5mm wall seamless 316 SS
- MB12** 12mm OD x 1.5mm wall seamless 316 SS
- MD6** 6mm OD x 1mm wall copper
- MD8** 8mm OD x 1mm wall copper
- MD12** 12mm OD x 1mm wall copper

**Example:**

- SC3** One preinsulated ⅜" x 0.032 wall copper process line.

### Material Specifications

**Jacket**

**SV47**

SV47 is a proprietary thermoplastic formulation that exceeds the requirements of 105C PVC and outperforms other PVC jacket materials in UV resistance as well as providing low temperature flexibility to -40° F/C.

	O'Brien SV47
Abrasion Resistance	G
Tensile Strength PSI	2200
Elongation %	350
Hardness, Shore A	80
Minimum Service Temperature	-30°F/-35°C*
Minimum Installation Temperature	-10°F/-23°C*
UL94 Flame	V2
Halogenated (Chlorides)	YES
Maximum Temperature	220°F/105°C
Weathering	G
UV Resistance	G

**E = Excellent    G = Good    F = Fair    P = Poor**

### Insulation

**Nonflammable**

**Nonhygroscopic**

**Chemically inert**

**Water soluble chloride content of 45 ppm average with a maximum level of 100 ppm.**

### Temperature Limits

Minimum installation temperature -10°F (-23°C)

Maximum process temperature 400°F (204°C)

Maximum jacket surface temperature 140°F (60°C)

at ambient temperature of 80°F (27°C)

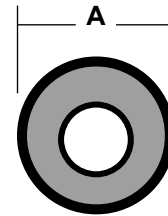
with 10 mph (16 Km/h) wind.

## Dimensions

	MIN. BEND (CM) HORIZ.	SUPPORT CENTERS - FT. (M) VERT.	NOMINAL LB/FT (KG/M) FT. (M)	NOMINAL WT. DIMENSIONS A - IN (CM)	NOMINAL RADIUS - IN (CM)
S-LINE - One 1/4" Process Line	8" (20)	6' (1.8)	15' (4.6)	0.2 (0.30)	1.0 (2.5)
S-LINE - One 3/8" Process Line	10" (25)	6' (1.8)	15' (4.6)	0.3 (0.45)	1.1 (2.8)
S-LINE - One 1/2" Process Line	12" (30)	6' (1.8)	15' (4.6)	0.4 (0.60)	1.2 (3.0)

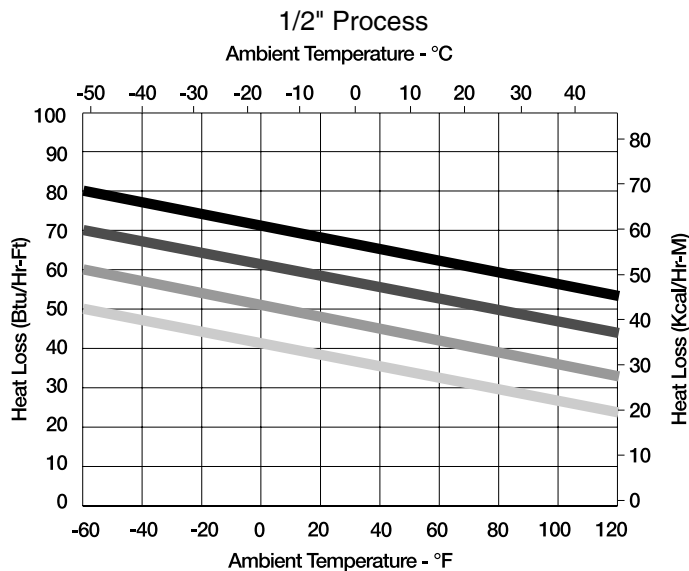
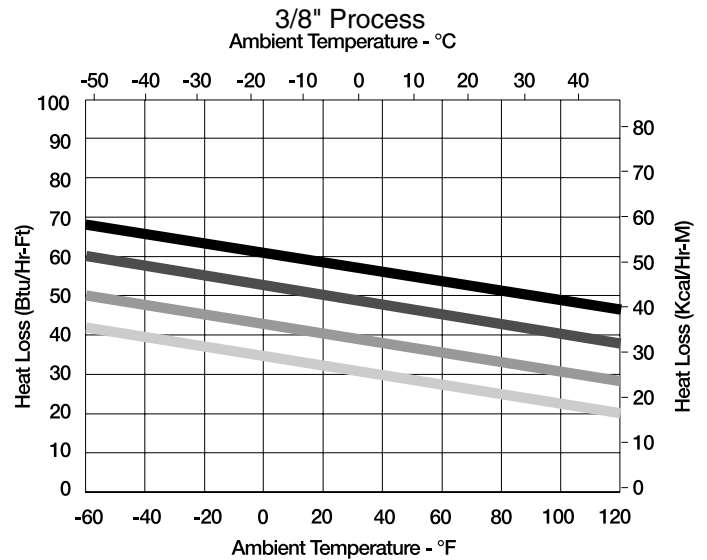
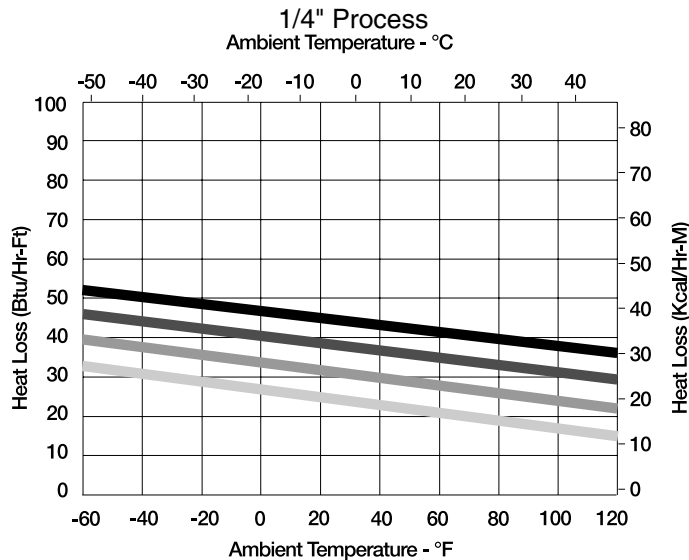
## Recommended Accessories

End Seal Kit	Model TPKSK-10
End Seal Boot	Model TPKHS-E1
Jacket Patch Kit	Model TPKJP-1 or -2



S-LINE

## Typical Performance



- 200 psig (14.8 Bar) Steam 388°F (198°C)
- 125 psig (9.6 Bar) Steam 353°F (178°C)
- 50 psig (4.4 Bar) Steam 299°F (148°C)
- 15 psig (2.0 Bar) Steam 250°F (121°C)

The information presented represents typical performance data for the conditions given. Actual results may vary with the conditions of installation. Heat loss calculated with 25 mph (40km/h) wind.




# TRACEPAK® END SEALS

## TPKSK, TPKHS and TPKEs

Even though O'Brien's TRACEPAK products use a non-hygroscopic, non-wicking insulation, all bundle ends must be sealed to prevent contamination of the insulation.

### TPKHS - Boots

**TPKHS** is a series of heat-shrinkable end seal boots made of a thermally stabilized, modified polyolefin. They are designed to provide a weatherproof seal at the end of tubing bundles. These boots may be used for process temperatures up to 400°F (204°C).

	Body Min/Max	Leg Min/Max
 <b>TPKHS-E1</b>	0.375"/1.3"	-----
 <b>TPKHS-C2</b>	0.95"/1.90"	0.30"/0.75"
<b>TPKHS-D2</b>	0.45"/1.60"	0.15"/0.55"
 <b>TPKHS-A3</b>	1.40"/2.40"	0.50"/1.13"
<b>TPKHS-B3</b>	0.90"/1.70"	0.30"/0.80"

### TPKHS Selection

TRACEPAK Family	Process Tube	Tracer Tube	Model Number-Size
<b>S-LINE</b>	3/8" (8mm)	----	TPKHS-E1
	1/2" (12mm)	----	TPKHS-E1
<b>TPL1</b>	3/8" (8mm)	3/8" (8mm)	TPKHS-C2
	3/8" (8mm)	1/2" (12mm)	TPKHS-C2
	1/2" (12mm)	3/8" (8mm)	TPKHS-C2
	1/2" (12mm)	1/2" (12mm)	TPKHS-C2
<b>TPL2</b>	3/8" (8mm)	3/8" (8mm)	TPKHS-B3
	3/8" (8mm)	1/2" (12mm)	*TPKHS-A3
	1/2" (12mm)	3/8" (8mm)	*TPKHS-A3
	1/2" (12mm)	1/2" (12mm)	TPKHS-A3
<b>TPH1</b>	3/8" (8mm)	3/8" (8mm)	TPKHS-C2
	3/8" (8mm)	1/2" (12mm)	TPKHS-C2
	1/2" (12mm)	3/8" (8mm)	TPKHS-C2
	1/2" (12mm)	1/2" (12mm)	TPKHS-C2
<b>TPH2</b>	3/8" (8mm)	3/8" (8mm)	TPKHS-B3
	3/8" (8mm)	1/2" (12mm)	TPKHS-B3
	1/2" (12mm)	3/8" (8mm)	TPKHS-A3
	1/2" (12mm)	1/2" (12mm)	TPKHS-A3
<b>TPE1</b>	1/4" (6mm)	----	TPKHS-D2
	3/8" (8mm)	----	TPKHS-C2
	1/2" (12mm)	----	TPKHS-C2
<b>TPE2</b>	3/8" (8mm)	----	TPKHS-B3
	1/2" (12mm)	----	TPKHS-B3

\*Boot leg should be pinched with pliers while hot and held until cool to reduce leg diameter.

### TPKSK - Sealant

**TPKSK** is a black silicone RTV sealant used to prevent moisture from contaminating the bundle. The cure time is approximately 24 hours at 77°F (25°C). Service temperature is from -50°F (-46°C) to 400°F (204°C). It has excellent resistance to weather, oil, and many chemicals. This option should be used to seal both ends of the tubing bundle. TPKSK-10 will seal approximately 10 bundles.

Order **TPKSK-10**.

### TPKES - Entry Seal

**TPKES** The heat-shrinkable entry seal provides a waterproof fitting where TRACEPAK enters an enclosure. They can be added to parting line or surface mounted plates on VIPAK enclosures or any enclosure. The thermally stabilized, modified polyolefin entry seal consists of an O-ring assembly that seals at the enclosure and a heat-shrinkable nose that seals to the TRACEPAK bundle.

### TPKES Selection

\*Different panel thickness than VIPAK ES options

Model Number	Max. Panel* Thickness (A)	Maximum I.D. Nose (B)	Minimum I.D. Nose (C)	Mounting Hole Diameter (D)
TPKES-4	0.50"	1.60"	0.75"	2.00"
TPKES-4S	1.00"	2.10"	0.75"	2.38"
TPKES-5	1.00"	2.75"	1.43"	3.50"
TPKES-6X	1.00"	3.55"	1.50"	4.50"



# TRACEPAK® ACCESSORIES

## Power connection, Tracer termination, Controllers and Thermostats

### ***Power Connection***

Used to power the tracer when the bundle is used by itself.

They are also used when the bundle is powered from the end opposite the enclosure.



***T210-PC***



### ***Specifications***

FM Approved and CSA Certified Class I Div. 2 power connection kit for use with any wattage B, N, J, or P tracer. Includes junction box and bundle mounting bracket with adjustable straps. Junction also includes surface mounting feet.



***T9310-PC***



Approved to CENELEC standards for hazardous area locations. Use with any wattage P, MN and N15 or N20 tracers. Installs in customer supplied junction box with M25 hub.



***TPC1***



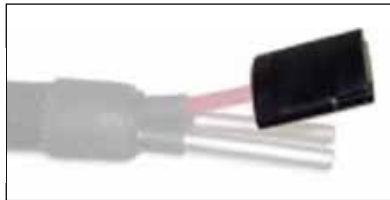
CSA Certified Class I Div. 1 power connection or end termination kit for use with any wattage B, N, J or P tracer. Installs in customer supplied junction box with 1/2" npt hub.

## Tracer Termination

End fitting is FM approved and CSA certified for XTV and BTV self-regulating tracer.



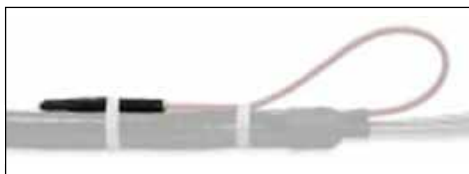
**T210-ET**



## Specifications

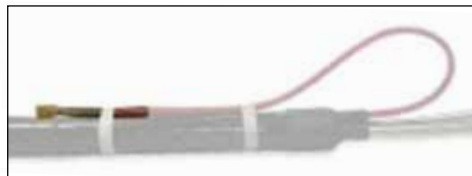
FM Approved and CSA Certified Class I Div. 2 termination kit for use with any wattage B, N, J or P tracer.

**T310-ET10**



Approved to CENELEC standards for hazardous area locations. Use with any wattage P tracer.

**T310-ET13**



Approved to CENELEC standards for hazardous area locations. Use with any wattage MN and N15 or N20 tracers.

## Controller

The O'Brien 1017 series controllers are compact, full featured, microprocessor based single and dual point heat trace controllers. They provide control and monitoring of Tracepak and Stackpak tubing bundles designed for freeze protection and temperature maintenance. The controllers can be set to monitor and alarm high and low temperature, high and low current, ground fault trip and voltage.



The 1017 series controllers are supplied with a solid-state relay (SSR) for use in nonhazardous and Class I Div. 2 / Zone 2 hazardous areas.

## Thermostats

When used with electrically traced tubing bundles, optional thermostats are used to control the temperature of the process tube or to turn on the heater at a specified ambient temperature.

Both thermostats are:

FM approved for Class I, II Div. 1,2 Gr. B, C, D, E, F, G  
 CSA Certified for Class I, II Gr. C, D, E, F, G  
 CSA Certified for Class III

**TPKTS-A-7**

Ambient Sensing Thermostat with adjustable temperature range and external adjustment knob, NEMA 7 and 9 Housing, 22 amp 125/250 VAC

**TPKTS-B-7**

Line Sensing Thermostat with adjustable temperature range, external adjustment knob and 10 ft. long capillary without armor, NEMA 7 and 9 Housing, 22 amp 125/250 VAC



**TPKTS-A-7**



**TPKTS-B-7**

