



TECHNICAL SPECIFICATIONS

TRACCEPAK[®]



<i>Table of Contents</i>	<i>Page</i>
Model Number Description	3
Material Specifications	
Jacket	5
Insulation	5
Temperature Limits	5
Tubing Data	6
Electric Tracer Data	8
Product Specific Information	
TPL and TPH Steam Traced Bundles	9
TPE Electric Traced Bundles	14
S-Line Preinsulated Tubing	17
Accessories	
Boots	19
End Sealant	19
Entry Seal	19
Electric Tracer Connections.....	20
Electric Tracer Terminations	20
Controller	21
Line Sensing Thermostat	21
Ambient Sensing Thermostat	21

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)																																																														
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750F/400C	J	JN	JS																																																														
800F/425C	K	KN	KS																																																														
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1050F/565C	S	SN	SS																																																														
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																																																																
Options Listing (Repeat as necessary)																																																																	
/	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

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

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**	
F1	316/316L SS	Seamless	1/8"		10,900 psig	900 ft	A269, A213, A1016, MR0175, EN 10204-3.1
F2	316/316L SS	Seamless	1/4"		5,100	2,200	A269, A213, A1016, MR0175, EN 10204-3.1
F3	316/316L SS	Seamless	3/8"		3,300	1,300	A269, A213, A1016, MR0175, EN 10204-3.1
F4	316/316L SS	Seamless	1/2"		2,600	1,000	A269, A213, A1016, MR0175, EN 10204-3.1
B2	316/316L SS	Seamless	1/4"		7,500	1,300	A269, A213, A1016, MR0175, EN 10204-3.1
B3	316/316L SS	Seamless	3/8"		4,800	1,000	A269, A213, A1016, MR0175, EN 10204-3.1
B4	316/316L SS	Seamless	1/2"		3,700	750	A269, A213, A1016, MR0175, EN 10204-3.1
B6	316/316L SS	Seamless	3/4"		2,400	250	A269, A213, A1016, MR0175, EN 10204-3.1
BH3	316/316H SS	Seamless	3/8"		5,100	CF	A213, A1016, MR0175, EN 10204-3.1
BH4	316/316H SS	Seamless	1/2"		3,800	50	A213, A1016, MR0175, EN 10204-3.1
BW3	316/316L SS	Seamless	3/8"		5,700	450	A213, A1016, MR0175, EN 10204-3.1
BW4	316/316L SS	Seamless	1/2"		4,200	650	A213, A1016, MR0175, EN 10204-3.1
KW3	316/316L SS	Seamless	3/8"		6,800	CF	A213, A1016, MR0175, EN 10204-3.1
KH3	316/316H SS	Seamless	3/8"		6,800	50	A213, A1016, MR0175, EN 10204-3.1
K4	316/316L SS	Seamless	1/2"		5,100	250	A269, A213, A1016, MR0175, EN 10204-3.1
A2	316/316L SS	Welded	1/4"		4,080	2,500	A269, A1016, EN 10204-3.1
A3	316/316L SS	Welded	3/8"		2,640	2,500	A269, A1016, EN 10204-3.1
A4	316/316L SS	Welded	1/2"		2,080	2,000	A269, A1016, EN 10204-3.1
E4	316/316L SS	Welded	1/2"		2,975	1,000	A269, A1016, EN 10204-3.1
N2	Alloy 400	Seamless	1/4"		4,800	1,000	B163, B165
N3	Alloy 400	Seamless	3/8"		3,100	600	B163, B165
P4	Alloy 400	Seamless	1/2"		3,210	600	B163, B165
J2	Copper	Seamless	1/4"		1,400	2,600	B68, B75, EN 10204-3.1
C3	Copper	Seamless	3/8"		900	2,000	B68, B75, EN 10204-3.1
D4	Copper	Seamless	1/2"		800	1,000	B68, B75, EN 10204-3.1
M4	Copper	Seamless	1/2"		1,100	1000	B68, B75, EN 10204-3.1
M6	Copper	Seamless	3/4"		725	500	B68, B75, EN 10204-3.1
G2	PFA	Extruded	1/4"		155	1,000	
S2	PFA	Extruded	1/4"		180	745	
G3	PFA	Extruded	3/8"		95	1,000	
H4	PFA	Extruded	1/2"		155	1,000	
LA2	PTFE	Extruded	1/4"		180	1,000	
LB3	PTFE	Extruded	3/8"		190	600	
RS2	HDPE	Extruded	1/4"		270	1,000	
RH3	HDPE	Extruded	3/8"		290	1,000	
Following Tubes are Designations for use as SensorTube™							
G2S	PFA	Extruded	1/4"		210	1,100	Tube color: BLACK
G3S	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
MF6	316/316L SS	Seamless	6mm	1mm	460 Bar	300M	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
MF8	316/316L SS	Seamless	8mm	1mm	330	210	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
MF10	316/316L SS	Seamless		1mm	260	165	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
MF12	316/316L SS	Seamless		1mm	210	150	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
MB10	316/316L SS	Seamless			410	150	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
MB12	316/316L SS	Seamless			330	120	A269, A213, A1016, MR0175, DIN 17458 1.4401/1.4404, EN 10204-3.1
MD6	Copper	Seamless	6mm	1mm	95	600	B68, B75, EN 10204-3.1
MD8	Copper	Seamless	8mm	1mm	60	455	B68, B75, EN 10204-3.1
MD12	Copper	Seamless		1mm	55	300	B68, B75, EN 10204-3.1
MG6	PFA	Extruded	6mm	1mm	34	300	
MG8	PFA	Extruded	8mm	1mm	16	300	
MG10	PFA	Extruded		1mm	11	300	
MG12	PFA	Extruded		1mm	9	300	
MA12	316/316L SS	Welded		1mm	170	300	ASTM, A269 A1016, EN 10204-3.1
MT12	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)							
TA1	316/316L SS	Seamless	1/8"		10,900 psig	900 ft	
TT2	316/316L SS	Seamless	1/4"		5,100	2,200	
TT3	316/316L SS	Seamless	3/8"		3,300	1,300	
TrueTube EP Electropolished, A269, A213, A1016, MR0175, EN 10204 3.1 (GREEN)							
TC1	316/316L SS	Seamless	1/8"		10,900 psig	200 ft	
TE2	316/316L SS	Seamless	1/4"		5,100	600	
TE3	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)							
TB1	316/316L SS	Seamless	1/8"		10,900	900 ft	
TF2	316/316L SS	Seamless	1/4"		5,100	2,200	
TF3	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)							
TD1	316/316L SS	Seamless	1/8"		10,900	200 ft	
TS2	316/316L SS	Seamless	1/4"		5,100	600	
TS3	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)							
TQ1	316/316L SS	Seamless	1/8"		10,900	900 ft	
TR2	316/316L SS	Seamless	1/4"		5,100	2,200	
TR3	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
J5	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
J8	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
J10	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
P5	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
P8	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
P10	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
B5	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
B10	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
B15	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
B20	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
N5	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
N10	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
N15	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
N20	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
JV10	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
JV20	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
JN10	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
JN20	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

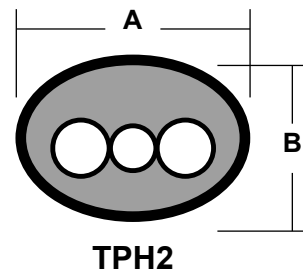
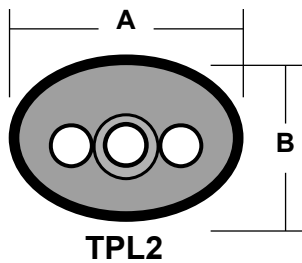
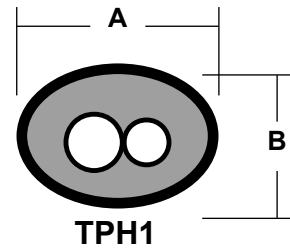
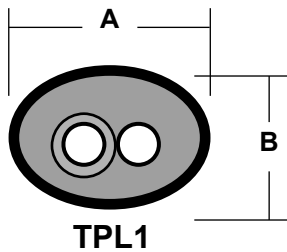
Code	V	W/ft	W/m	Max. Maint. and Exposure	Max. Inter. Exposure	T-Rating	Connection Kits	Approvals
T18	120	18	-	400F (200C)	450F (230C)	T*	T9G90-UC	Non-Hazardous Areas
TY18	208	18	-	400F (200C)	450F (230C)	T*	T9G90-UC	Non-Hazardous Areas
TN18	240	18	-	400F (200C)	450F (230C)	T*	T9G90-UC	Non-Hazardous Areas

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	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.

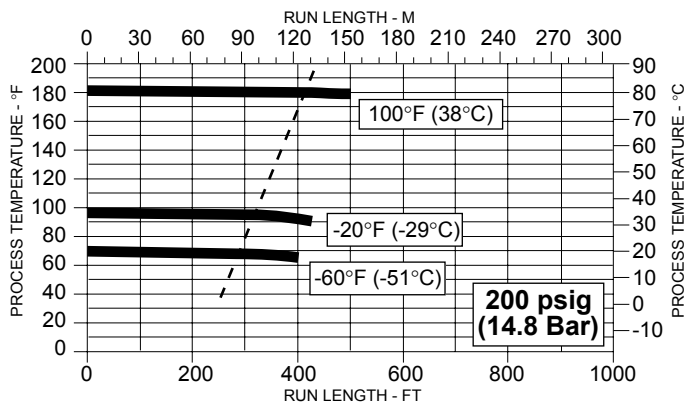
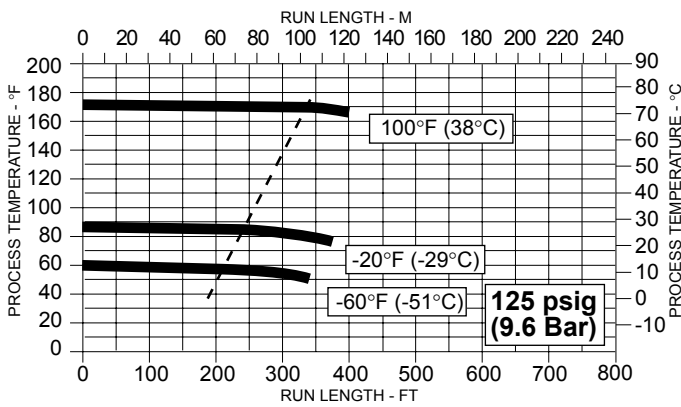
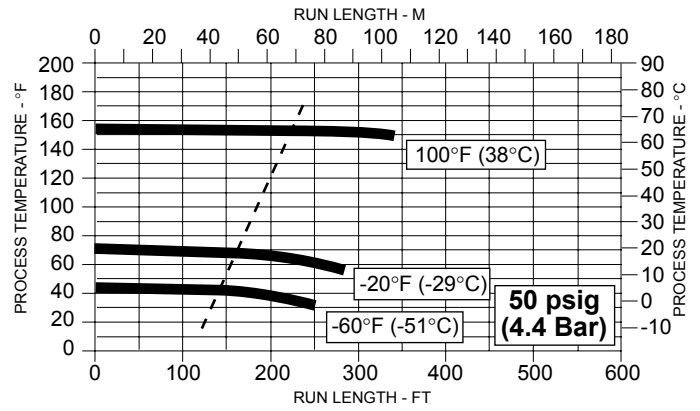
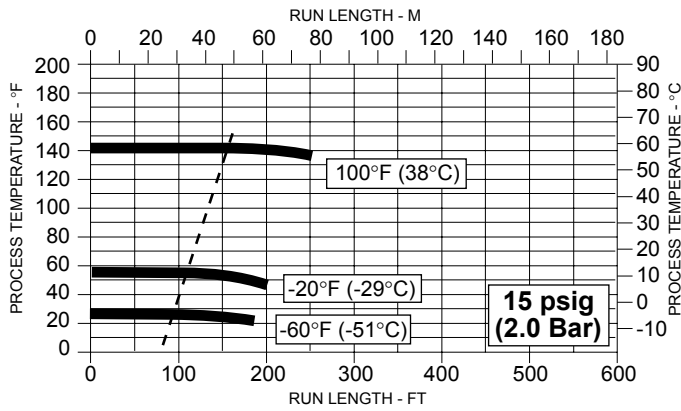
For freeze protection use 50°F (10°C) as the minimum allowable process tube temperature. This will provide a sufficient factor of safety.

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

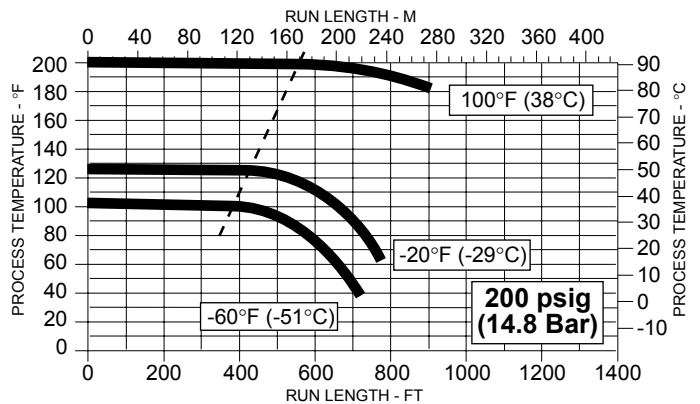
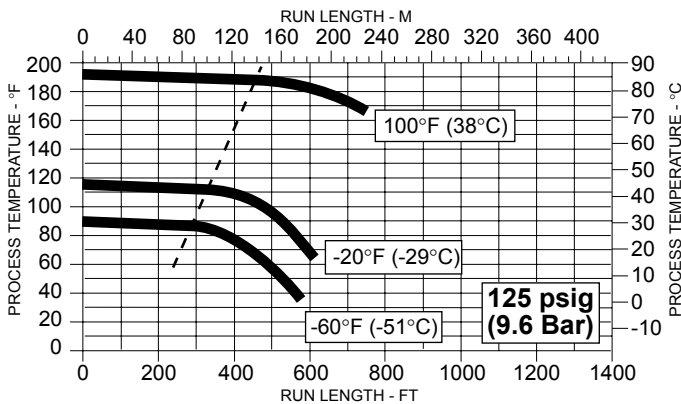
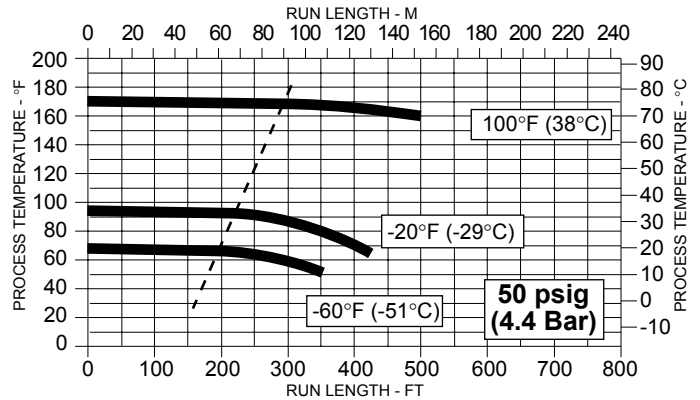
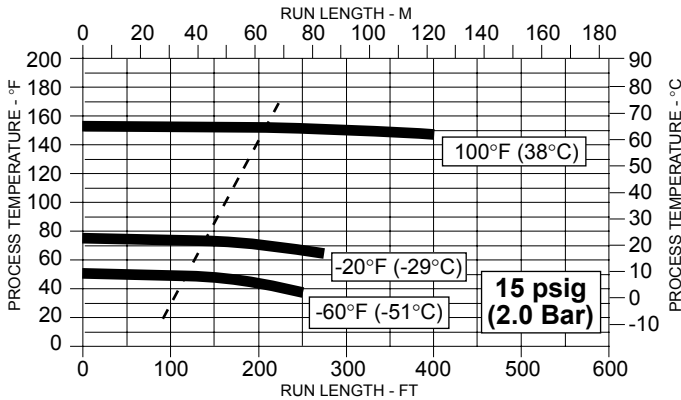
Ideal design of a steam traced installation dictates a slope of 1/4" drop per foot (20 mm/M) of run and a maximum steam pressure drop of 10%. The dashed line (---) on the graphs indicates the length at which a 10% drop in steam pressure can be expected.

Typical Performance-TPL1

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

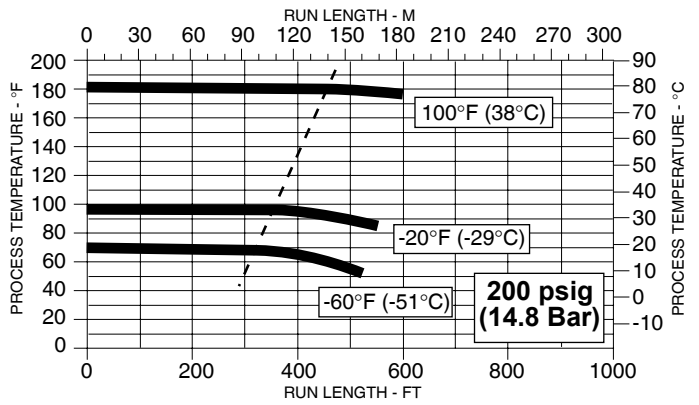
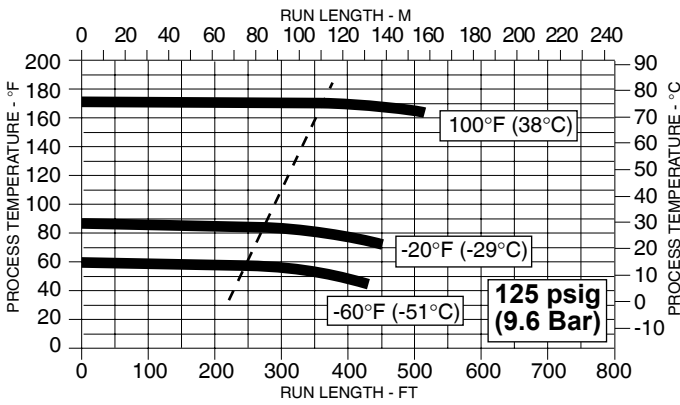
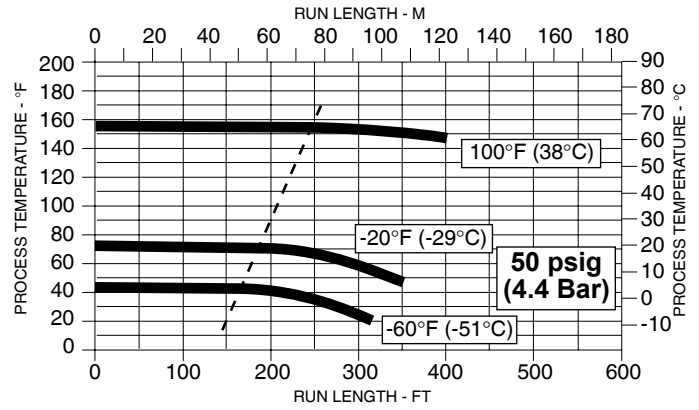
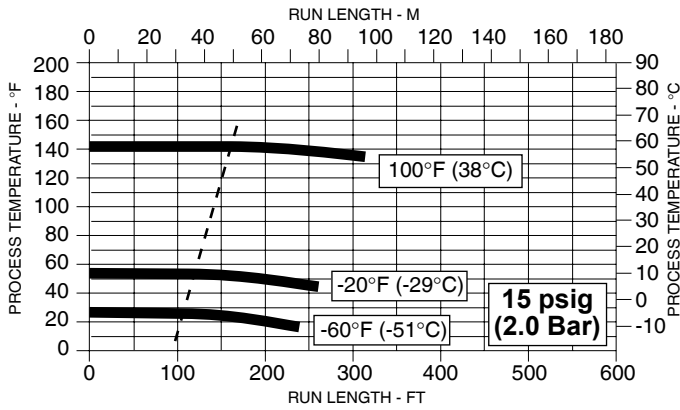


TPL1-1/2" Process with 1/2" Tracer (also 12mm Process with 12mm Tracer)

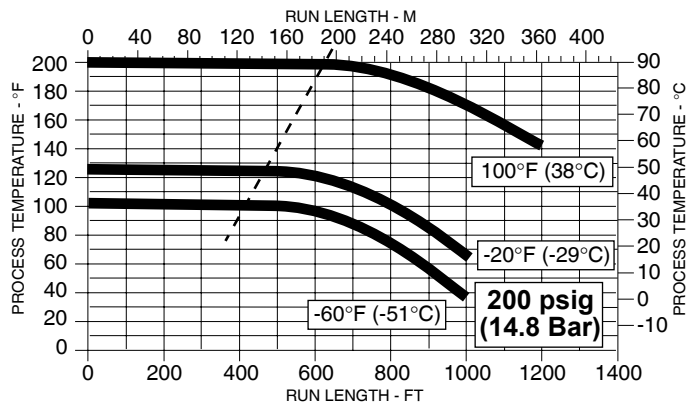
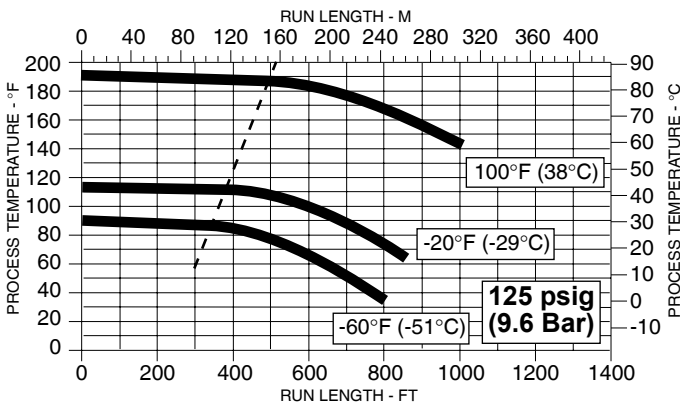
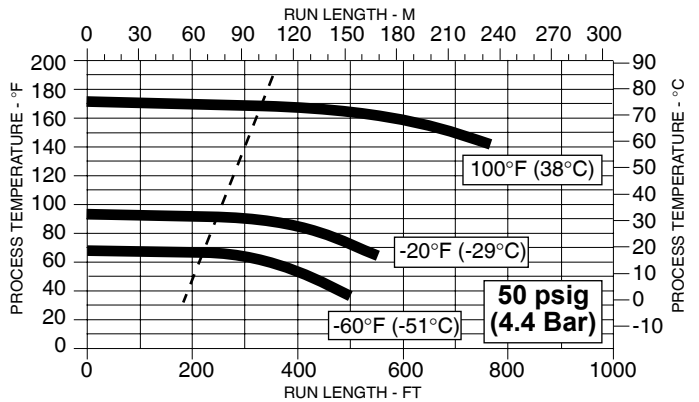
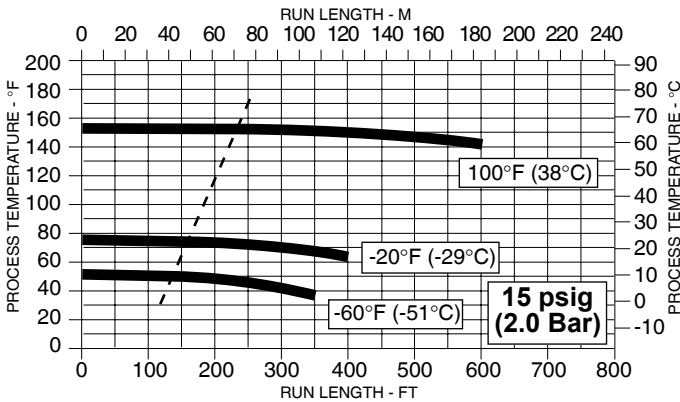


Typical Performance-TPL2

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

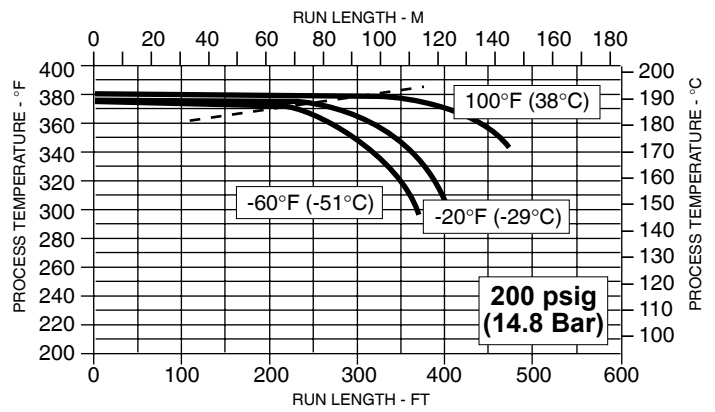
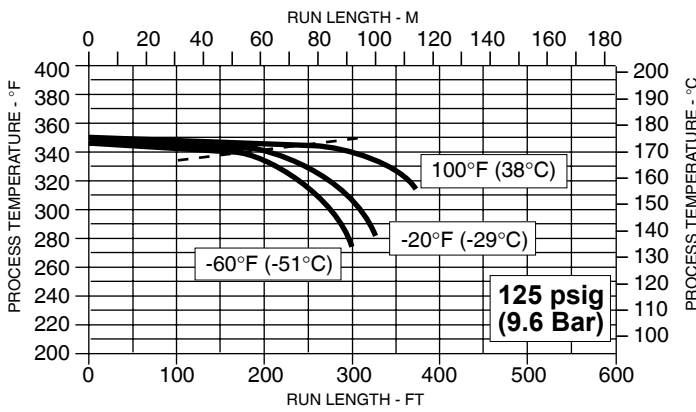
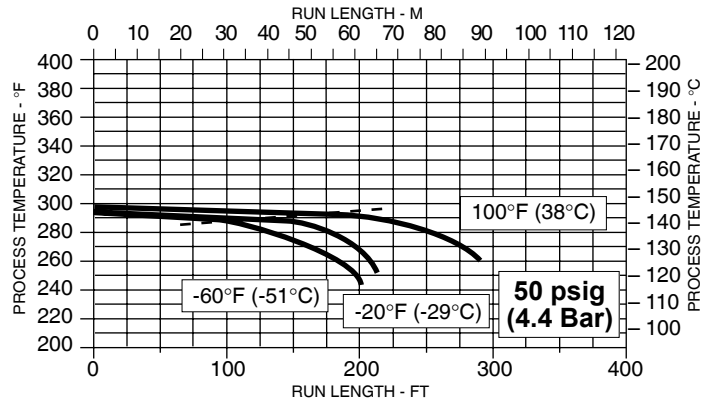
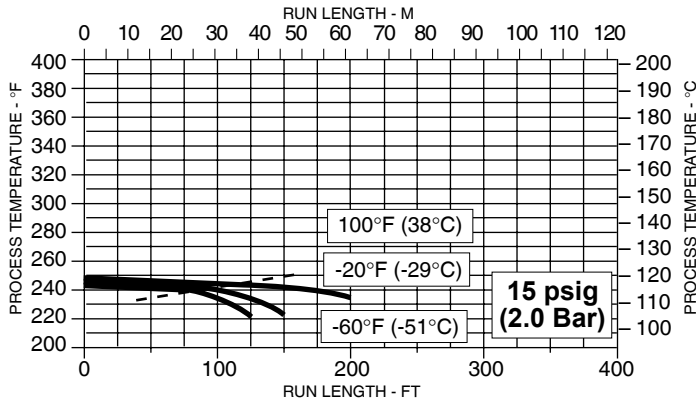


TPL2 - 1/2" Process with 1/2" Tracer (also 12mm Process with 12mm Tracer)

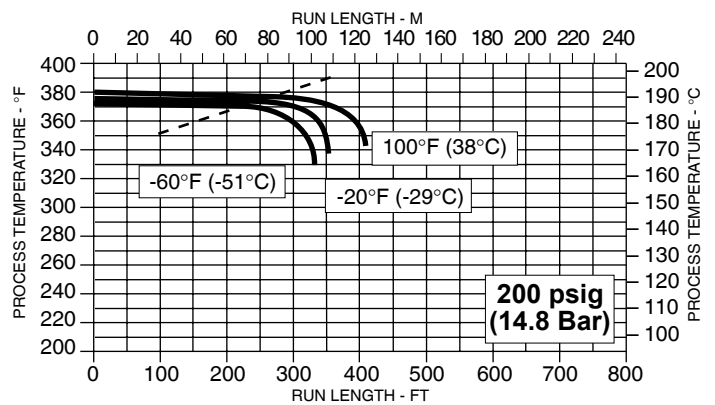
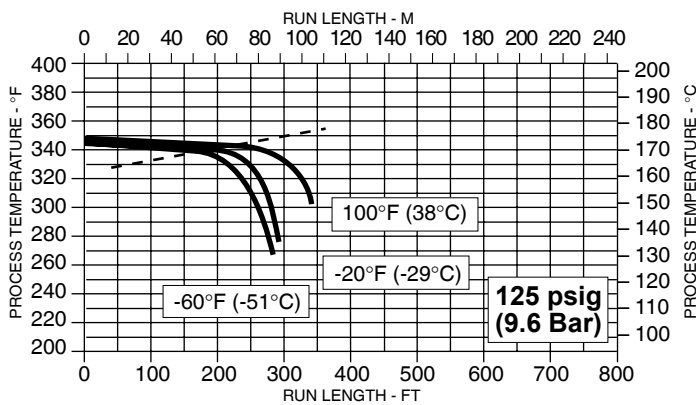
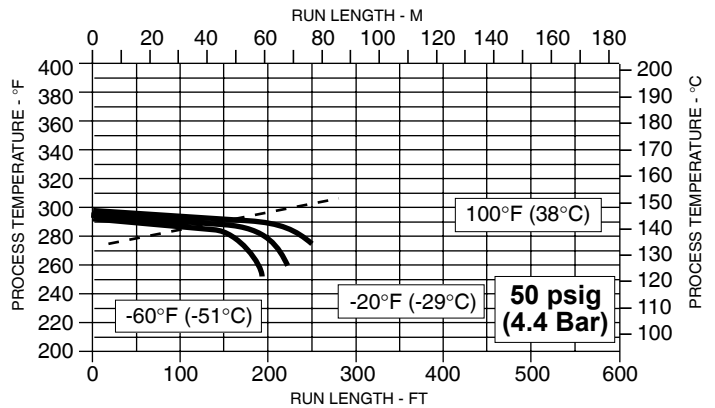
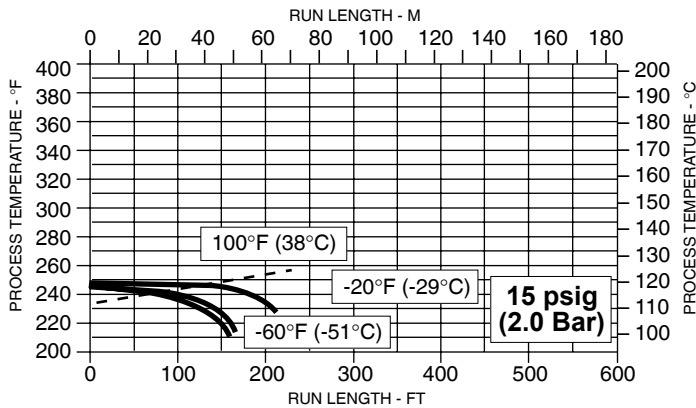


Typical Performance-TPH1

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

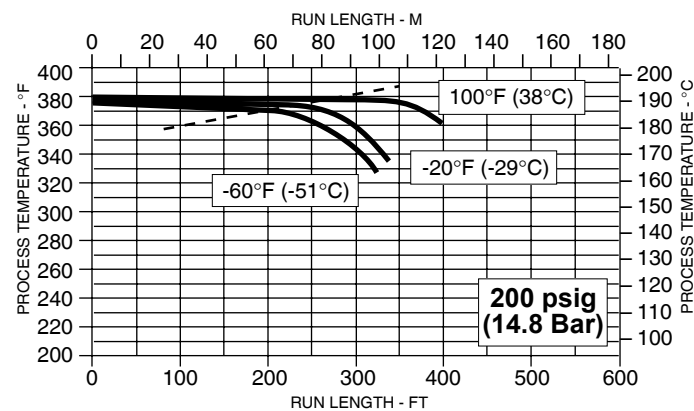
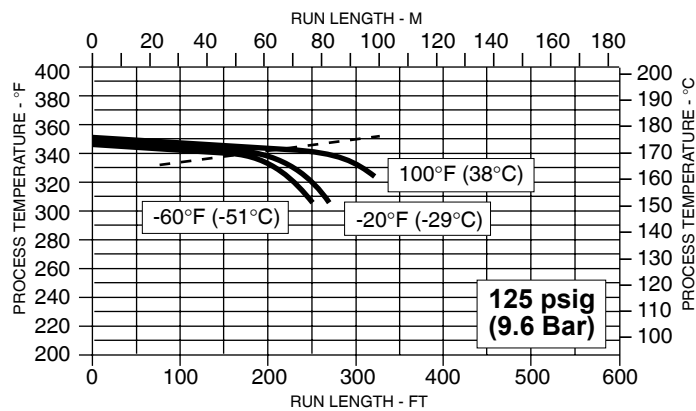
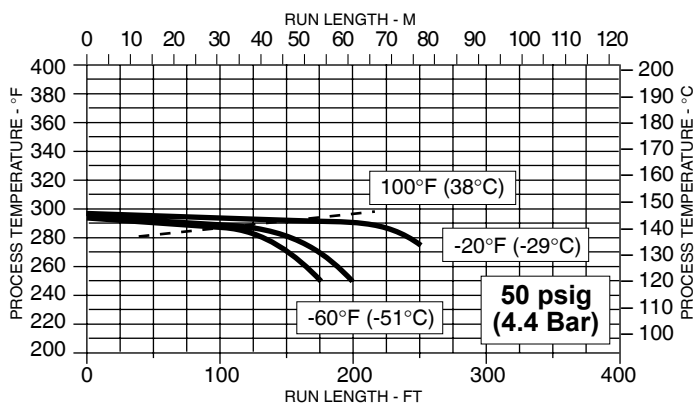
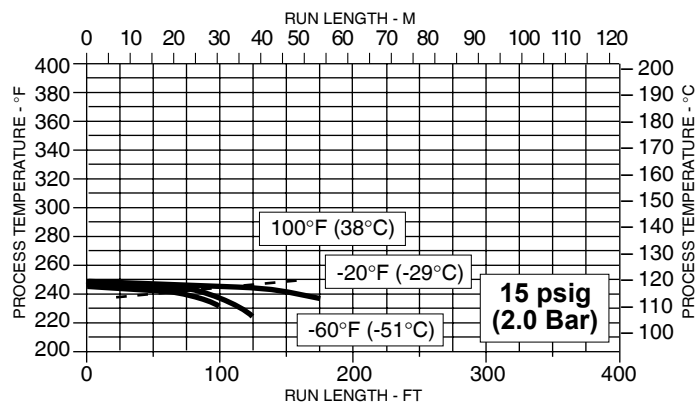


TPH1-1/2" Process with 3/8" Tracer (also 12mm Process with 8mm Tracer)

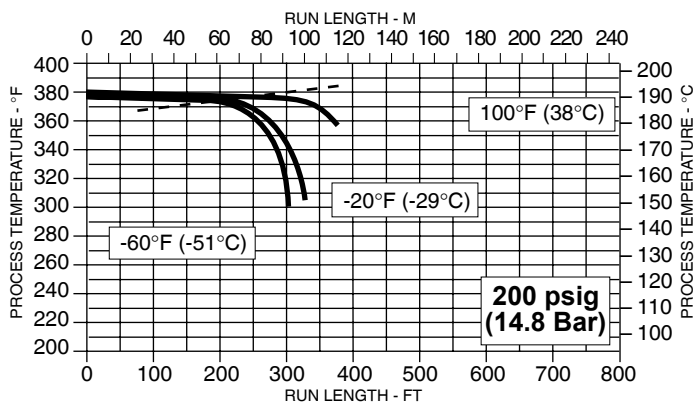
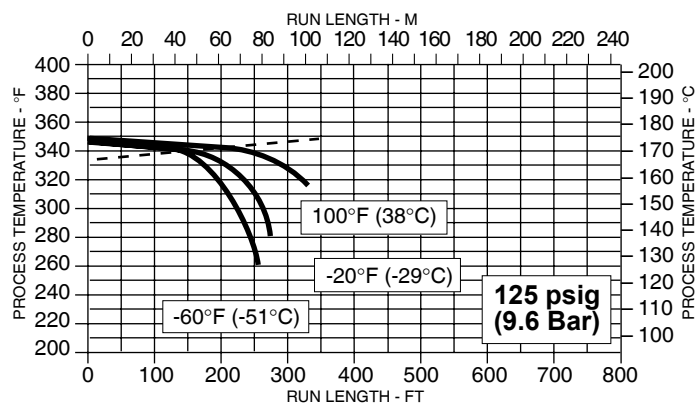
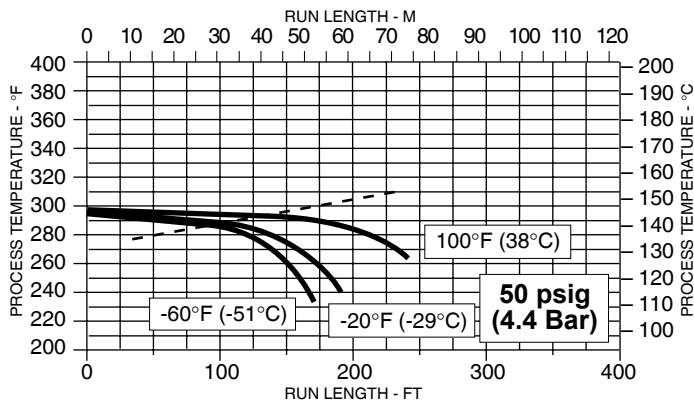
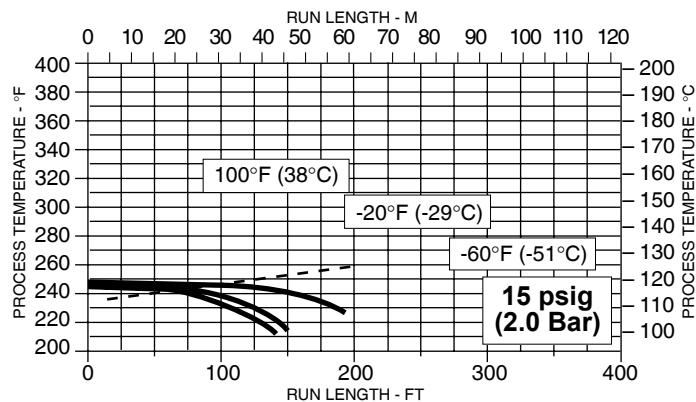


Typical Performance-TPH2

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

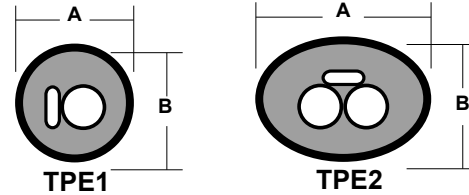
Dimensions

	NOMINAL		DIMENSIONS - IN (CM)
	WT. LB/FT (KG/M)	A B	
TPE1- ¼" Process Tube	0.3 (0.45)	1.1 (2.8)	1.0 (2.5)
TPE1- ⅜" Process Tube	0.4 (0.60)	1.3 (3.3)	1.0 (2.5)
TPE1- ½" Process Tube	0.5 (0.74)	1.4 (3.6)	1.1 (2.8)
TPE2- ¼" Process Tubes	0.4 (0.60)	1.3 (3.3)	1.1 (2.8)
TPE2- ⅜" Process Tubes	0.6 (0.89)	1.5 (3.8)	1.2 (3.0)
TPE2- ½" Process Tubes	0.8 (1.19)	1.7 (4.3)	1.4 (3.6)

Minimum bending radius 8 in. (20 cm).
Maximum support centers-ft. Horizontal 6' (2 m) Vertical 15' (4 m).

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

GENELEC APPROVED HEATERS

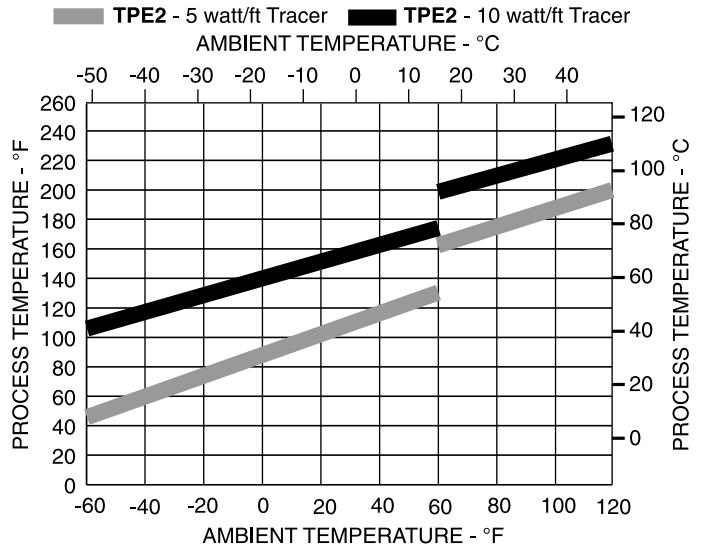
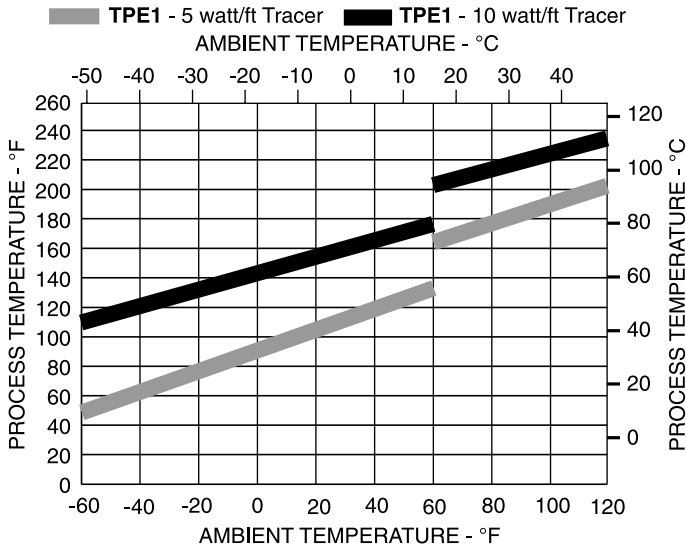
	START-UP TEMP. - °C	240 VAC		
		16A	25A	32A 40A
MN4 Heater	10	165m	250m	250m
	-20	140m	215m	250m
MN8 Heater	10	105m	165m	180m
	-20	85m	135m	175m
MN12 Heater	10	75m	120m	145m
	-20	65m	100m	130m

Typical Performance

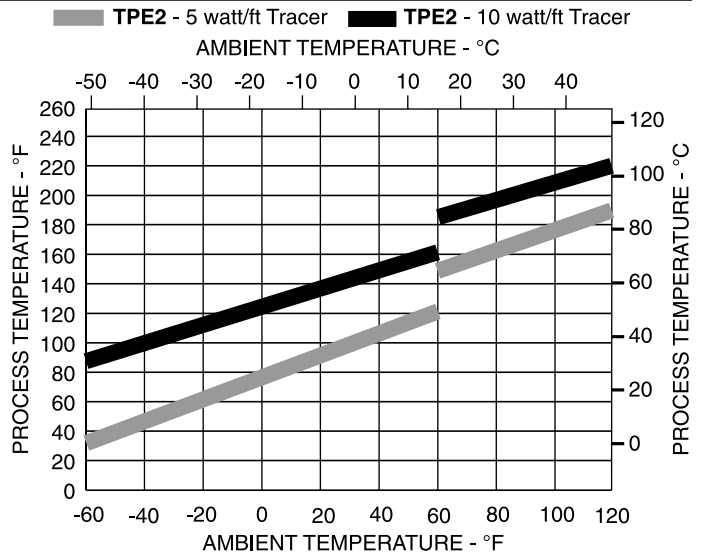
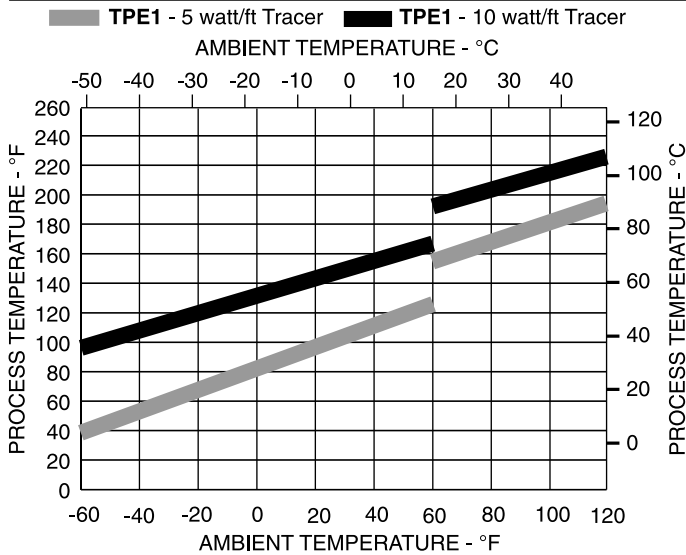
The information presented represents typical performance data for the conditions given and at the rated voltage. Actual results may vary with the conditions of installation. For critical applications, consult the factory for specific performance data. Winter ambients, below 60°F (16°C), assume a 25 mph (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

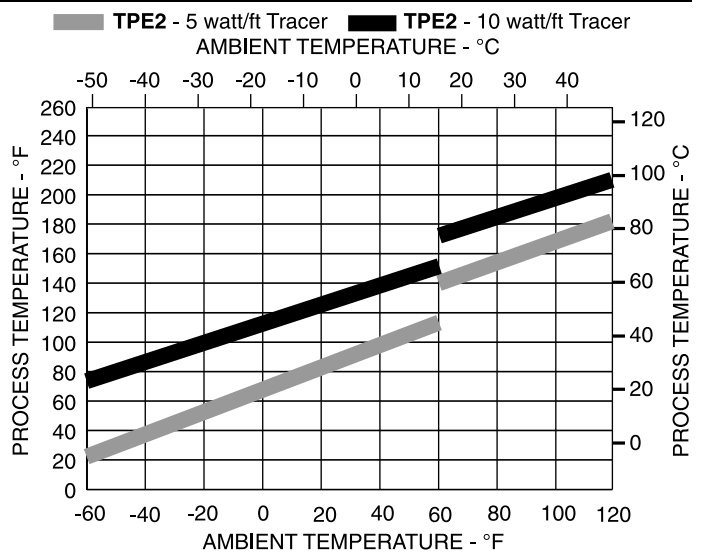
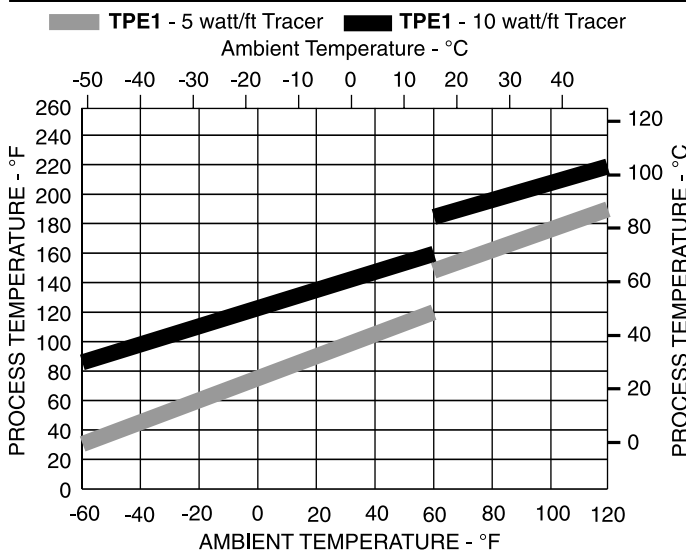
1/4" Process



3/8" Process

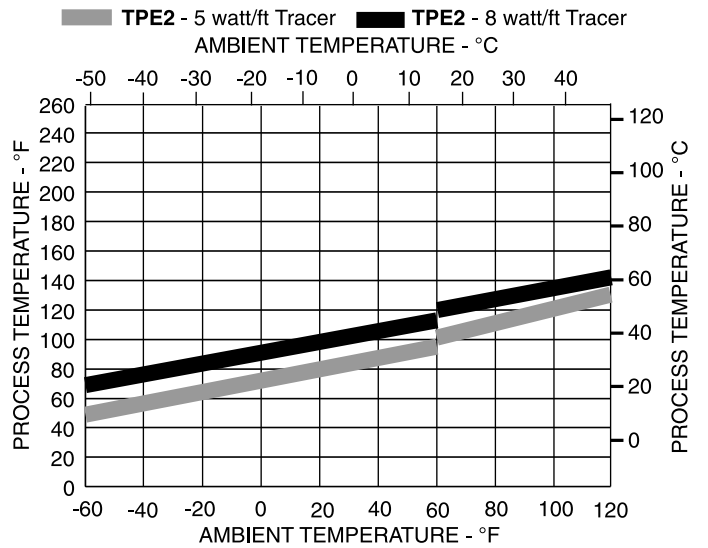
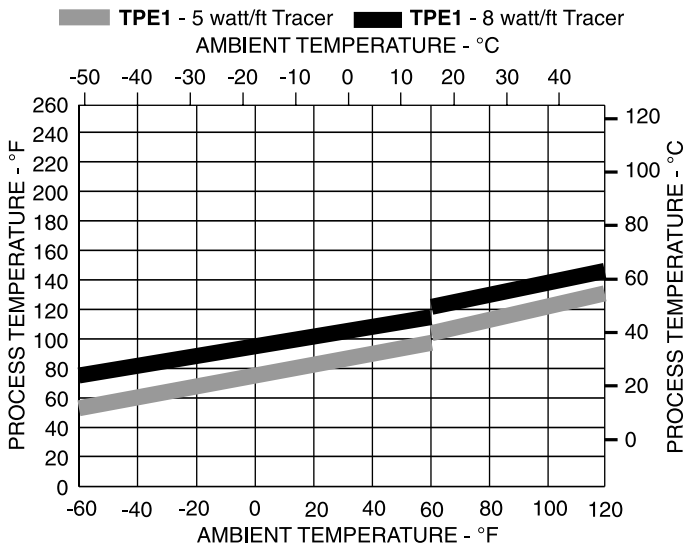


1/2" Process

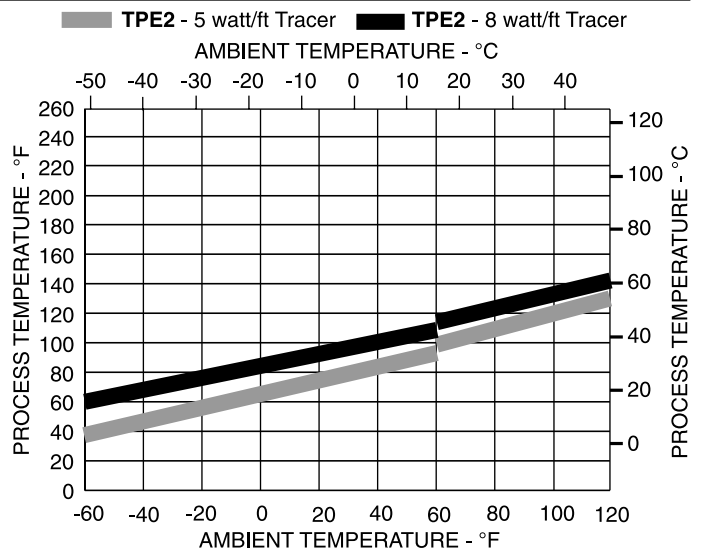
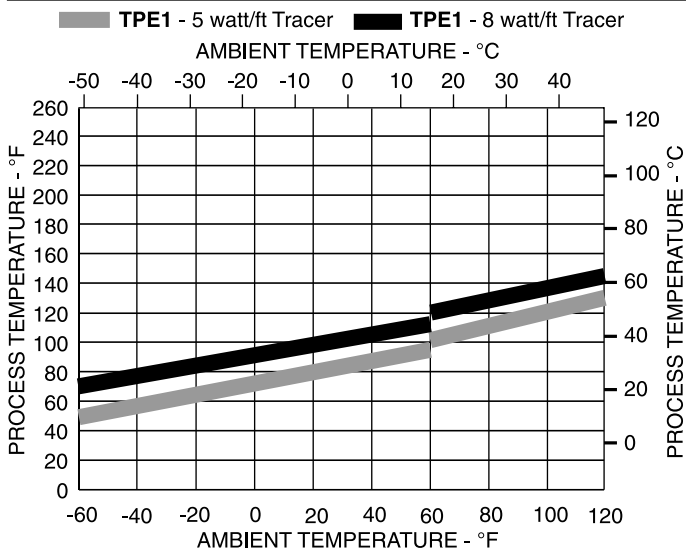


Typical Performance for Freeze Protection

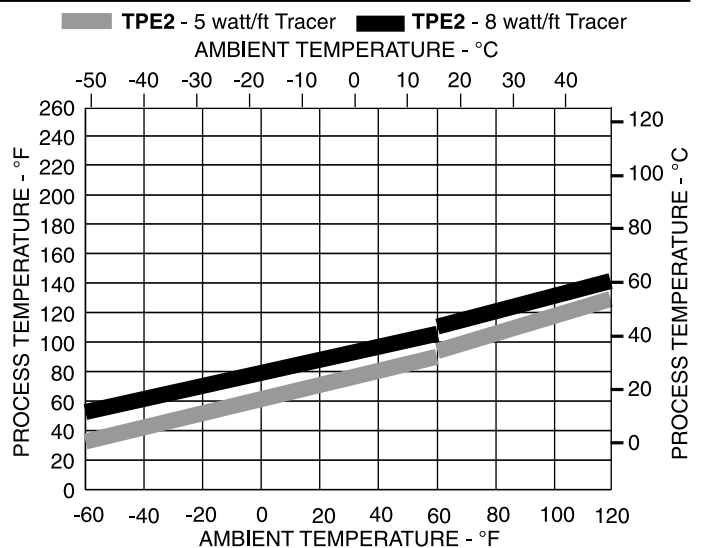
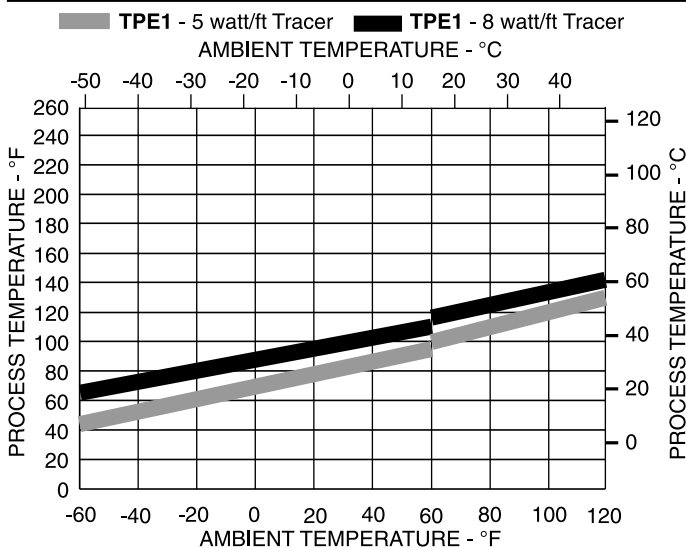
1/4" Process



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)

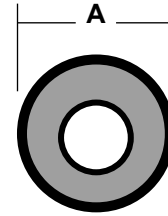
Maximum jacket surface temperature 140°F (60°C)
at ambient temperature of 80°F (27°C)
with 10 mph (16 Km/h) wind.

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)

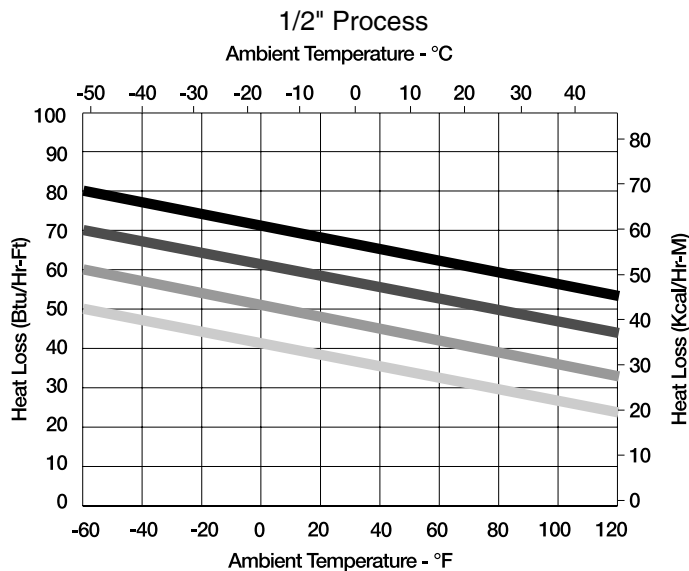
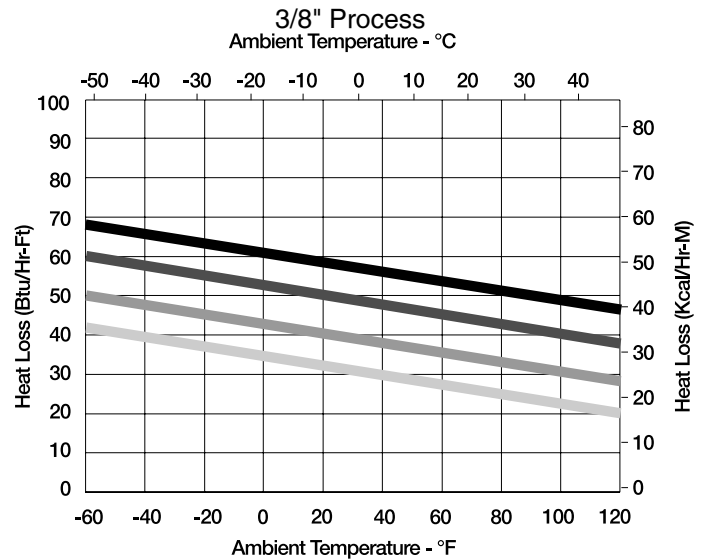
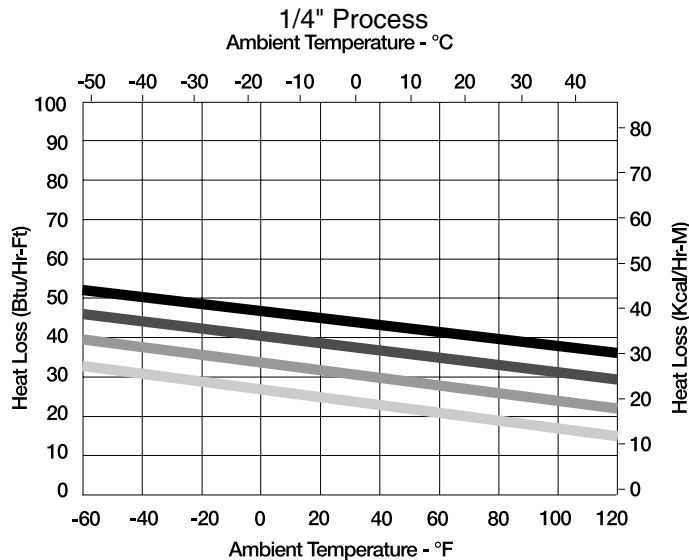
Recommended Accessories

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
 TPKHS-E1	0.375"/1.3"	-----
 TPKHS-C2	0.95"/1.90"	0.30"/0.75"
 TPKHS-D2	0.45"/1.60"	0.15"/0.55"
 TPKHS-A3	1.40"/2.40"	0.50"/1.13"
 TPKHS-B3	0.90"/1.70"	0.30"/0.80"

TPKHS Selection

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



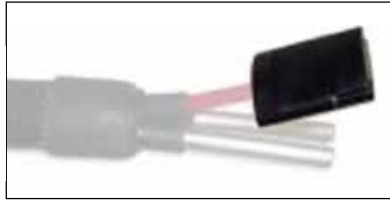
CSA Certified Class I Div. 1 power connection or end termination kit for use with any wattage B, N, J or P tracer. Installs in customer supplied junction box with 1/2" npt hub.

Tracer Termination

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



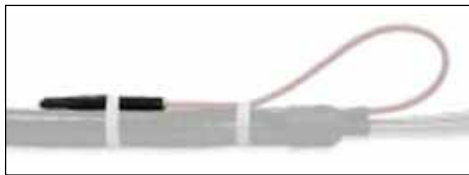
T210-ET



Specifications

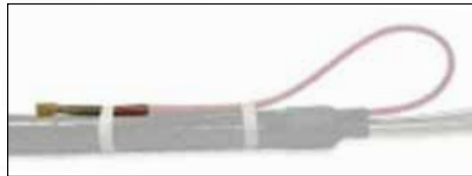
FM Approved and CSA Certified Class I Div. 2 termination kit for use with any wattage B, N, J or P tracer.

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

