Vacuum Insulated Transfer Pipe (VIP)

Constructed in modular sections with smooth inner bore pipe size, VJP comes with periodic internal bellows to minimize pressure drop and improve flow characteristics. It has the lowest heat leak and lowest cooldown loss in its class.

Suitable for use in a wide variety of industrial applications such as Electronic Assembly & Test, Food & Beverage, Petrochemical, Industrial Gas Plant, LNG etc.

Rigid Module Quick Sizing Chart

The following table can be used as an initial estimate of required pipe size. It is strongly suggested that a detailed analysis of the actual expected pressure drop be considered with respect to the allowable pressure drop for the process of interest.

Required Pipe Size												
Flow	Equivalent Length of Pipe											
LPH	50' / 15 m	100' / 30 m	200' / 61 m	300' / 91 m	400' / 122 m	500' / 152 m	600' / 183 m	700' / 213 m	800' / 244 m	900' / 274 m	1,000' / 305 m	1,500' / 457 m
500	R5T	R5T	R5T	R5T	R5T	R5P	R10T	R10T	R10T	R10T	R10T	R10T
1,000	R5T	R10T	R10T	R10T	R10T	R10T	R10T	R10T	R10T	R10T	R10T	R10T
2,000	R10T	R10T	R10T	R10T	R10P	R10P	R15T	R15T	R15T	R15T	R15T	R15P
3,000	R10T	R10T	R15T	R15T	R15T	R15T	R15P	R15P	R15P	R15P	R15P	R15P
4,000	R10P	R15T	R15T	R15P	R15P	R15P	R15P	R15P	R15P	R15P	R15P	R20P
5,000	R15T	R15T	R15P	R15P	R15P	R15P	R15P	R15P	R20P	R20P	R20P	R20P
6,000	R15T	R15P	R15P	R15P	R15P	R20P	R20P	R20P	R20P	R20P	R20P	R20P
7,000	R15P	R15P	R15P	R15P	R20P	R20P	R20P	R20P	R20P	R20P	R20P	R20P
8,000	R15P	R15P	R15P	R20P	R20P	R20P	R20P	R20P	R20P	R20P	R20P	R30P
9,000	R15P	R15P	R20P	R20P	R20P	R20P	R20P	R20P	R30P	R30P	R30P	R30P
10,000	R15P	R15P	R20P	R20P	R20P	R20P	R20P	R30P	R30P	R30P	R30P	R30P
15,000	R20P	R20P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P
20,000	R20P	R20P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R40P
25,000	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R30P	R40P

Notes:

1. This table is intended to be used as a guide only and should not be substituted for a complete analysis.
2. Suggested sizes assume an allowable pressure drop of 0.3 bar (4.5 psi).
3. Equivalent length of pipe (metre) = Length of pipe + (1.5 x # of elbows and tees) + (12 x # of valves)
   Example: System requires 2300 LPH through a pipe system that has 45 m of pipe, 4 elbows, 2 tees and 1 valve.
   Equivalent length of pipe = 45 + 1.5 m x (4 + 2) + 12 m x (1) = 66 m (200 ft). Table look-up with 2300 LPH and 66 m thus suggested pipe size is R10T (29 mm ID).
4. Add 0.07 bar (1 psi) pressure drop for every 0.9 m (3 ft) of vertical rise with LN2.
5. Larger pipe sizes such as 6" to 14" available. Please contact factory for details.

VIP Pressure Drop (bar/meter) Performance Overview

Model	Flow (kg / hr)							
	450	1200	2200	3400	11400	17000	23000	34000
R5T	0.0028	0.0185	0.060	0.142				
R5P	0.00194	0.0126	0.041	0.096				
R10T		0.0018	0.0056	0.0129	0.140			
R10P		0.00094	0.0030	0.0069	0.074	0.162	0.295	
R15P			0.0004	0.0009	0.0093	0.0204	0.037	0.080
R20P				0.00028	0.0028	0.0061	0.0109	0.0237
R30P					0.00036	0.00077	0.0014	0.0030

Notes:
1. LN_2 at 3 bar (45 psi) & -181 °C (-294 °F)
2. Pressure drop numbers listed do not account for elevation changes. CSM recommends pressure drop be kept to 0.3 bar (4.35 psi) or less.
3. This table is intended to be used as a guide only and should not be substituted for a complete analysis

VIP Thermal Performance Overview

Model	Cool Down			Static Heat Leak ②		LN_2 Bayonet Pair Heat Leak ②	
	kJ/m	kg/m ①	lb of LN_2 /ft	BTU/hr/ft	W/m	BTU/hr	W
R5T	59	0.4	0.26	0.42	0.40	4.0	1.2
R5P	85	0.6	0.38	0.45	0.43	8.1	2.4
R10T	88	0.6	0.39	0.49	0.47	8.1	2.4
R10P	139	0.9	0.62	0.50	0.48	7.8	2.3
R15P	204	1.4	0.91	0.52	0.50	9.2	2.7
R20P	256	1.7	1.15	0.71	0.69	11.3	3.3
R30P	482	3.2	2.15	1.25	1.20	16.7	4.9

Notes:
① LN_2 at 3 bar (45 psi) & -181 °C (-294 °F)
② LN_2 at 5 bar (72.5 psi)

VIP Flow Performance Overview

Model	Actual Flow Diameter (mm)	Nominal Flowrate @ 30 m, ΔP 0.1 bar (1.45 psi)			Max. Flowrate @ 30 m, ΔP 0.3 bar (4.35 psi)		
		GPM	LPM	kg/hr ①	GPM	LPM	kg/hr ①
R5T	16.6	3.1	11.7	500	5.2	19.8	850
R5P	18.0	3.7	14.0	600	6.1	23.3	1000
R10T	26.6	9.2	35.0	1500	17.8	67.7	2900
R10P	30.0	13.5	51.3	2200	24.6	93.3	4000
R15P	45.0	38.1	144.7	6200	73.7	280.0	12000
R20P	57.0	73.7	280.0	12000	128.9	490.0	21000
R30P	85.0	214.9	816.7	35000	380.7	1446.7	62000

Notes:
① Based on liquid nitrogen at 6.0 bar (90 psi) saturation pressure for 30 m (100 ft) piping length, exclude pressure drop due to elevation changes