

<b>Document Title</b>	Pressure Drop Criteria
<b>DRG Document No.</b>	DRG-101872-2829-I002-R00
<b>Client</b>	Airpack Nederland BV
<b>Project</b>	API 618 Design Approach 2 for 17811-00-0701

**DYNAFLOW  
RESEARCH  
GROUP.**

# Appendix D

## Pressure Drop Criteria

0	Issued for comments	For Comments	TK	MPB	FMB	18/02/2022
<b>Rev.</b>	<b>Description</b>	<b>Status</b>	<b>Prep'd</b>	<b>Chk'd</b>	<b>App'd</b>	<b>Date</b>

## **NITROGEN COMPRESSOR SYSTEM 17811-03A**

## Case 17811-03A - Tvar (Transient)

### API 618 Pressure Drop Report

Maximum static and total pressure drop per pulsation suppression device:

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PSD PSD1_Suction : Max Static Pressure Drop : 0.0167 bar (20.83%)
                  Max Total Pressure Drop : 0.0180 bar (11.20%)

PSD PSD1_Discharge : Max Static Pressure Drop : 0.0593 bar (27.88%)
                  Max Total Pressure Drop : 0.150 bar (35.23%)

PSD PSD2_Suction : Max Static Pressure Drop : 0.0544 bar (89.85%)
                  Max Total Pressure Drop : 0.0636 bar (52.48%)

PSD PSD2_Discharge : Max Static Pressure Drop : 0.0382 bar (51.97%)
                  Max Total Pressure Drop : 0.0603 bar (41.05%)

```

Static and total pressure drop over pulsation suppression device:

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PSD      : PSD1_Suction
Node Pair : 120 - 202
Moist Sep. : false
Variation : 1

```

Element	Static Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
[120,125]	9.349e-03	0.0802	11.66
[125,130]	3.438e-03	0.0802	4.29
[130,867]	5.564e-07	0.0802	0.00
[867,195]	3.751e-03	0.0802	4.68
[195,202]	1.654e-04	0.0802	0.21
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Total	0.0167	0.0802	20.83

Element	Total Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
[120,125]	9.366e-03	0.160	5.84
[125,130]	3.444e-03	0.160	2.15
[130,867]	6.250e-07	0.160	0.00
[867,195]	4.929e-03	0.160	3.07
[195,202]	2.172e-04	0.160	0.14
-----			
Total	0.0180	0.160	11.20

```

PSD      : PSD1_Discharge
Node Pair : 293 - 375
Moist Sep. : false
Variation : 1

```

Element	Static Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
[293,307]	0.0504	0.213	23.70
[307,331]	1.915e-03	0.213	0.90
[331,345]	8.861e-07	0.213	0.00
[345,370]	6.221e-03	0.213	2.93
[370,375]	7.598e-04	0.213	0.36
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Total	0.0593	0.213	27.88

Element	Total	Allowable	Percentage
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	Pressure Drop	Pressure Drop	[%]
	[bar]	[bar]	
[293,307]	0.137	0.425	32.17
[307,331]	5.201e-03	0.425	1.22
[331,345]	1.250e-06	0.425	0.00
[345,370]	6.928e-03	0.425	1.63
[370,375]	8.471e-04	0.425	0.20
	-----	-----	-----
Total	0.150	0.425	35.23

PSD : PSD2\_Suction  
 Node Pair : 608 - 685  
 Moist Sep. : false  
 Variation : 1

Element	Static	Allowable	Percentage
	Pressure Drop	Pressure Drop	[%]
	[bar]	[bar]	
[608,610]	0.0239	0.0606	39.41
[610,615]	4.109e-03	0.0606	6.78
[615,620]	1.131e-03	0.0606	1.87
[620,650]	0.000e+00	0.0606	0
[650,680]	1.387e-03	0.0606	2.29
[680,685]	0.0239	0.0606	39.50
	-----	-----	-----
Total	0.0544	0.0606	89.85

Element	Total	Allowable	Percentage
	Pressure Drop	Pressure Drop	[%]
	[bar]	[bar]	
[608,610]	0.0263	0.121	21.70
[610,615]	4.521e-03	0.121	3.73
[615,620]	1.241e-03	0.121	1.02
[620,650]	0.000e+00	0.121	0
[650,680]	1.727e-03	0.121	1.43
[680,685]	0.0298	0.121	24.60
	-----	-----	-----
Total	0.0636	0.121	52.48

PSD : PSD2\_Discharge  
 Node Pair : 781 - 880  
 Moist Sep. : false  
 Variation : 1

Element	Static	Allowable	Percentage
	Pressure Drop	Pressure Drop	[%]
	[bar]	[bar]	
[781,792]	0.0331	0.0735	45.08
[792,810]	1.162e-03	0.0735	1.58
[810,850]	2.195e-06	0.0735	0.00
[850,860]	0.000e+00	0.0735	0
[860,865]	3.334e-03	0.0735	4.54
[865,880]	5.631e-04	0.0735	0.77
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Total	0.0382	0.0735	51.97

Element	Total	Allowable	Percentage
	Pressure Drop	Pressure Drop	[%]
	[bar]	[bar]	
[781,792]	0.0543	0.147	36.96
[792,810]	1.906e-03	0.147	1.30
[810,850]	2.500e-06	0.147	0.00
[850,860]	0.000e+00	0.147	0
[860,865]	3.505e-03	0.147	2.38
[865,880]	5.925e-04	0.147	0.40
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Total	0.0603	0.147	41.05

## **EMERGENCY AIR COMPRESSOR SYSTEM 17811-03B**

## Case 17811-03B - Tvar

### API 618 Pressure Drop Report

Maximum static and total pressure drop per pulsation suppression device:

PSD PSD\_Suction : Max Static Pressure Drop : 0.0749 bar (88.76%)  
Max Total Pressure Drop : 0.0926 bar (54.84%)

PSD PSD\_Discharge : Max Static Pressure Drop : 0.0488 bar (21.07%)  
Max Total Pressure Drop : 0.154 bar (33.33%)

Static and total pressure drop over pulsation suppression device:

PSD : PSD\_Suction  
Node Pair : 160 - 215  
Moist Sep. : false  
Variation : 1

Element	Static Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
[160,170]	2.094e-04	0.0844	0.25
[170,172]	3.637e-03	0.0844	4.31
[172,175]	0.000e+00	0.0844	0
[175,180]	2.721e-03	0.0844	3.22
[180,210]	3.854e-04	0.0844	0.46
[210,215]	0.0680	0.0844	80.52
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Total	0.0749	0.0844	88.76

Element	Total Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
[160,170]	2.146e-04	0.169	0.13
[170,172]	3.730e-03	0.169	2.21
[172,175]	0.000e+00	0.169	0
[175,180]	2.811e-03	0.169	1.66
[180,210]	4.832e-04	0.169	0.29
[210,215]	0.0853	0.169	50.55
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Total	0.0926	0.169	54.84

PSD : PSD\_Discharge  
Node Pair : 315 - 400  
Moist Sep. : false  
Variation : 1

Element	Static Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
[315,320]	0.0444	0.232	19.16
[320,330]	6.000e-04	0.232	0.26
[330,340]	5.250e-05	0.232	0.02
[340,345]	2.041e-03	0.232	0.88
[345,350]	0.000e+00	0.232	0
[350,360]	1.515e-03	0.232	0.65
[360,400]	2.336e-04	0.232	0.10
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Total	0.0488	0.232	21.07

Element	Total Pressure Drop [bar]	Allowable Pressure Drop [bar]	Percentage [%]
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[315,320]	0.141	0.463	30.41
[320,330]	1.905e-03	0.463	0.41
[330,340]	1.677e-04	0.463	0.04
[340,345]	6.511e-03	0.463	1.41
[345,350]	0.000e+00	0.463	0
[350,360]	4.539e-03	0.463	0.98
[360,400]	4.041e-04	0.463	0.09
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Total	0.154	0.463	33.33