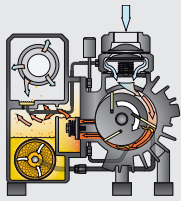


Busch Technology

Vacuum and Low Pressure Solutions



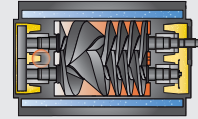
R5

- › Rotary Vane Vacuum Pumps
- › Oil-lubricated
- › Easy to service and maintain
- › Special versions available
- › Proven performance and reliability



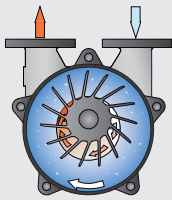
Mink

- › Rotary Claw Vacuum Pumps
- › Dry-running, non-contacting
- › High level of efficiency
- › Minimal maintenance
- › Vacuum and pressure versions available



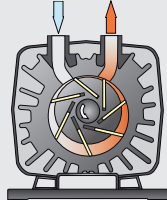
COBRA

- › Screw Vacuum Pumps
- › Dry-running, non-contacting
- › High level of efficiency
- › Variable pitch screw design
- › Chemical and semiconductor versions available



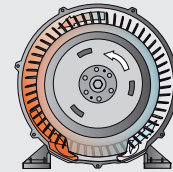
Dolphin

- › Liquid Ring Vacuum Pumps
- › Water-sealed
- › Rugged and reliable
- › Ideal for wet process applications
- › Multiple configurations available



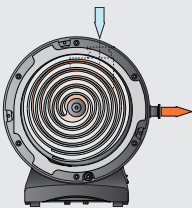
Seco

- › Rotary Vane Vacuum Pumps
- › 100% oil-free operation
- › Economical design
- › Minimal maintenance
- › Compact size



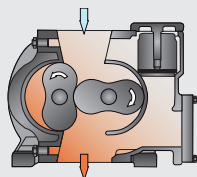
Samos

- › Regenerative Blowers
- › 100% oil-free operation
- › Maintenance free
- › Reliable, proven design
- › Vacuum and pressure versions available



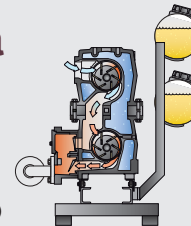
Fossa

- › Scroll Vacuum Pumps
- › Dry-running, non-contacting
- › Reduced power consumption
- › Easy to service and maintain
- › Compact and lightweight



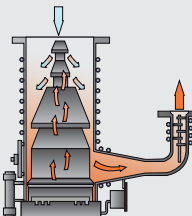
Panda / Puma

- › Rotary Lobe Boosters
- › Dry-running, non-contacting
- › High suction capacity
- › Minimal maintenance
- › Internal bypass valve (Panda)



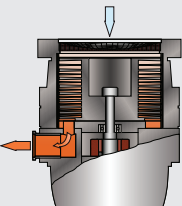
Huckepack

- › Rotary Vane Vacuum Pumps
- › Once-through-sealing
- › Rugged and reliable
- › High vapor tolerance
- › Chemical duty



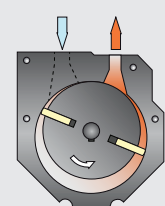
Rangu

- › Diffusion Vacuum Pumps
- › Multi-stage jet design
- › Rugged and reliable
- › Highly efficient
- › Tolerates high gas loads



Turbo

- › Turbomolecular Vacuum Pumps
- › Compact, oil-free design
- › Very low maintenance
- › Withstands heavy use
- › Integrated electronic controls



Zebra

- › Two-stage Rotary Vane Vacuum Pumps
- › Quick pump-down times
- › Energy efficient
- › Excellent oil separation
- › Ideal for medium



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Vacuum Reference Guide

Vacuum Equivalence Table

Microns	Torr / mmHg	mbar	PSIA	"Hga	"Hg	atm	%vacuum
760000	760	1013	14.7	29.92	0	1	0
750000	750	1000	14.5	29.52	0.4	0.987	1.3
700000	700	933	13.5	27.56	2.36	0.921	7.9
600000	600	800	11.6	23.62	6.3	0.789	21
500000	500	667	9.7	19.68	10.24	0.658	34
400000	400	533	7.7	15.75	14.17	0.526	47
380000	380	507	7.3	14.96	14.96	0.5	50
300000	300	400	5.8	11.81	18.11	0.395	61
200000	200	267	3.9	7.87	22.05	0.264	74
100000	100	133.3	1.93	3.94	25.98	0.132	87
90000	90	120	1.74	3.54	26.38	0.118	88
80000	80	107	1.55	3.15	26.77	0.105	89
70000	70	93	1.35	2.76	27.16	0.0921	90.8
60000	60	80	1.16	2.36	27.56	0.0789	92.1
50000	50	67	0.97	1.97	27.95	0.0658	93.4
40000	40	53	0.77	1.57	28.37	0.0526	94.7
30000	30	40	0.58	1.18	28.74	0.0395	96.1
25400	25.4	33.8	0.491	1	28.92	0.034	96.6
20000	20	26.7	0.39	0.785	29.13	0.0264	97.4
10000	10	13.33	0.193	0.394	29.53	0.0132	98.7
7600	7.6	10.13	0.147	0.299	29.62	0.01	99
1000	1	1.33	0.01934	0.0394	29.88	0.00132	99.9
750	0.75	1	0.0145	0.0295	29.89	0.000987	99.9
500	0.5	0.6664	0.00967	0.01968	29.9	0.00066	99.93
100	0.1	0.1333	0.00193	0.00394	29.916	0.000132	99.99
10	0.01	0.0133	0.000193	0.000394	29.9196	0.0000132	99.999
1	0.001	0.00133	0.0000193	0.0000394	29.91996	0.0000013	99.9999
0.1	0.0001	0.000133	0.0000019	0.0000039	29.91999	0.0000001	99.99999
0	0	0	0	0	29.92	0	100

Conversion Factors

Pressure

1" Hg = 25.4 Torr
 25.4 mm
 33.85 mbar
 .491 PSI

1" H₂O = 0.0735" Hgv
 0.0361 PSI

1 atm = 14.7 PSIA

Volume

1 ft³ = 1728 in³
 28.32 liters
 7.48 gallons

1 cfm = 1.7 m³/h

Temperature

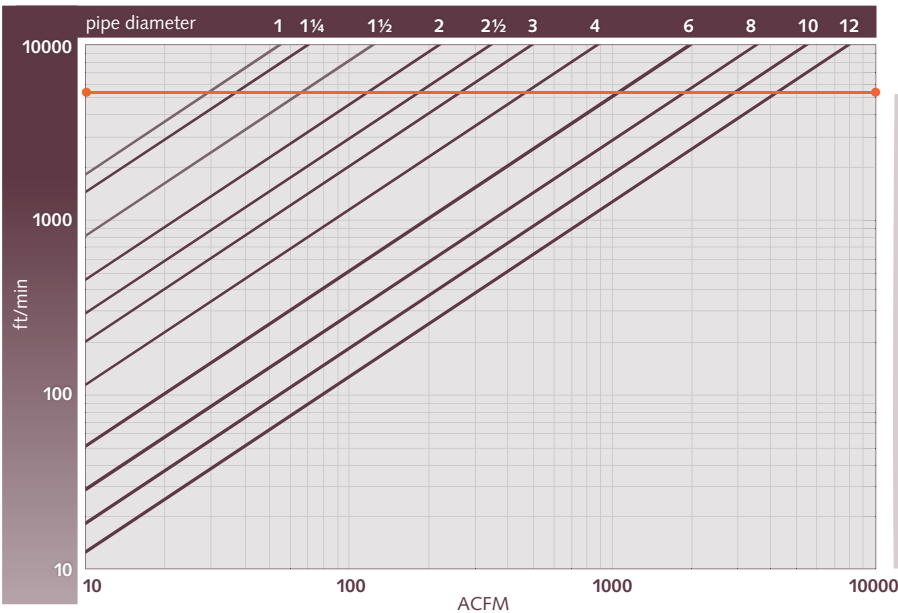
F = (1.8)(C) + 32
 C = (F-32) / 1.8

Orifice Chart

Flow (SCFM) through a square-edge orifice
 Flow coefficient = .61

Orifice	Area in ²	"Hg		
		5	10	15-30
1/16	0.0031	0.48	0.63	0.67
1/8	0.0123	2.04	2.55	2.71
3/16	0.0276	4.37	5.56	6.10
1/4	0.0491	7.54	9.72	10.75
5/16	0.0767	11.07	14.64	16.83
3/8	0.1104	16.07	20.90	24.35
7/16	0.1503	22.07	28.76	33.54
1/2	0.1963	28.90	37.61	43.38
3/4	0.4418	67.06	86.63	97.92
1	0.7854	119.21	154.01	174.08

Velocity Chart



Notes

- › V (Velocity) = Q (Flow) ÷ A (Area)
- › Pipe should be designed for minimum pressure loss
- › Use a velocity of 5,500 ft/min for main header diameter estimation
- › Contact Busch for technical assistance

