

# PRESSURE REGULATOR AND VALVE SELECTION GUIDE

## Technical Bulletin #208H

**Scope:** This document is a reference guide to help customers determine an appropriate AP Tech valve and regulator to be used in process gas systems. For information and specifications related to the specific model, please refer to the catalog data sheet.

# General Notes and Definitions

**Source Regulator:** Pressure regulator closest to the gas source cylinder or vessel (first regulator in the system)

**Source Valve:** Valves upstream (inlet side) of the source regulator

**Distribution Regulator:** Any regulator downstream (outlet side) of the source regulator

**Distribution Valve:** Any valve downstream (outlet side) of the source regulator

**Valve Recommendation:** Valve model recommendations limited for sake of brevity. Different models with same basic size and rating may also be used. Example: 3600, 3650 and 3657 may be used in place of 3625.

**1225/1210:** Two stage regulation required, two regulators in series

**1200S:** Red indicates heating required, refer to PN 407

**Conditions:** Standard conditions of temperature and pressure

**Inlet Pressure Assumption:** Source<sup>1</sup> 150 psig (10 bar) or vapor pressure of liquified gas  
Distribution<sup>2</sup> 30 psig (2 bar) unless low vapor pressure gas

**Outlet Pressure Assumption:** Minimum outlet pressure > 10 psig (0.7 bar)

<sup>1</sup>Source pressure for non-liquified gas assumed at worst case for an empty cylinder

<sup>2</sup>Distribution assumed to be typical usage, specific operating conditions may require different selection

**Caution:** Read and understand definitions prior to utilizing the guide's recommendations.

**Caution:** Product selection is the sole responsibility of the user, regardless of any recommendations or suggestions made by the factory, such as this Technical Bulletin. The user shall make selections based upon their own analysis and testing with regard to function, material compatibility and product ratings. Proper installation, operation and maintenance are also required to assure safe, trouble free performance.

**Caution:** One may achieve higher or lower flow capacities than stipulated in this guide due to the parameters and conditions of a specific application and system design.

**Caution:** Please consult the factory for recommendations beyond the scope of this document or if any doubt exists.

GENERAL NOTES

SOURCE VALVE GUIDELINE

DISTRIBUTION VALVE GUIDELINE

SOURCE REGULATOR GUIDELINE

DISTRIBUTION REGULATOR GUIDELINE

Process Gas	Maximum Flow (slpm)	Source Valves AP, AZ or AK	Maximum Flow (slpm)	Distribution Valves AP, AZ or AK	Maximum Flow (slpm)	Source Regulator AP, AZ or AK	Maximum Flow (slpm)	Distribution Regulator AP, AZ or AK
Acetylene* (C <sub>2</sub> H <sub>2</sub> )	230	3000 3625	25	3550 3625	3	1500S*	3	1000S
	280	4000 3625	45	4550 4625	50	1400TS*	6	1000S HF
					75	1200S*	50	1400TS
					400	3700 3800	75	1200S
Air	185	3000 3625	90	3550 3625	30	1500S	30	1000S
	225	4000 3625	160	4550 4625	100	1900S	50	1000S HF
					200	1400TS	150	1400TS
	550	3100 3130	890	3800 3700	800	1200S HR	400	1200S
					600	1200S HF	600	1200S HF
600					1300S	600	1300S	
Ammonia (NH <sub>3</sub> )	250	3550 3625	100	3550 3625	5	1500S	5	1000S
	450	4550 4625	225	4550 4625	50	1400TS	30	1000S HF
					75	1200S	60	1400TS
	1000	3113 3125	1000	3700 3800	400	1200S	125	1200S
					600	1200S HF	250	1200S HF
1100					9100S	250	1300S	
Argon (Ar)	200	3000 3625	80	3550 3625	10	1500S	10	1000S
	350	4000 3625	150	4550 4625	100	1900S	25	1000S HF
					300	1900S HF	50	1400TS
	1000	3130 3125	800	3700 3800	600	1200S HR	100	1200S
					200	1200S HF	200	1200S HF
					200	1300S	200	1300S
							400	1200S FC
							1000	9100S

Model number applies to all applicable series - AP, AZ and AK  
Example: 1000 means AP, AZ and AK 1000

Red highlight denotes heating required to achieve stated flow.  
\*15 psig maximum source regulator outlet pressure

Process Gas	Maximum Flow (slpm)	Source Valves	Maximum Flow (slpm)	Distribution Valves	Maximum Flow (slpm)	Source Regulator	Maximum Flow (slpm)	Distribution Regulator
	AP, AZ or AK		AP, AZ or AK		AP, AZ or AK			AP, AZ or AK
	SOURCE VALVE GUIDELINE		DISTRIBUTION VALVE GUIDELINE		SOURCE REGULATOR GUIDELINE			DISTRIBUTION REGULATOR GUIDELINE
Arsine (AsH <sub>3</sub> )	140	3550 3625	55	3550 3625	5	1500S 1400TS	5	1000S 1000S HF
	240	4550 4625	95	4550 4625	40		20	
Arsine Mixtures (Nitrogen Balance)	185	3000 3625	90	3550 3625	15	1500S 1900S	15	1000S 1000S HF
	225	4000 3625	160	4550 4625	50 150	1400TS	50 150	1400TS
Boron Trichloride (BCl <sub>3</sub> )	20	4550 4625	15	4550 4625	6	1402TSA	0.4 6	1101SH 1402TSA
Boron Trichloride Mix (Nitrogen Balance)	185	3000 3625	90	3550 3625	15	1500S 1400TS	15	1000S 1000S HF
	225	4000 3625	160	4550 4625	60		30 60	1400TS
Boron Trifluoride (BF <sub>3</sub> )	115	3000 3625	60	3550 3625	5	1500S 1400TS	5	1000S 1000S HF
	145	4000 3625	100	4550 4625	25		10 25	1400TS
Boron 11 Trifluoride (11BF <sub>3</sub> )	115	3000 3625	60	3550 3625	5	1500S 1400TS	5	1000S 1000S HF
	145	4000 3625	100	4550 4625	25		10 25	1400TS
Butadiene (C <sub>4</sub> H <sub>6</sub> )	60	4550 4625	60	4550 4625	3	1500S 1400T	3	1000S 1000S HF
					40		5	
Butane (normal) (C <sub>4</sub> H <sub>10</sub> )	60	4550 4625	60	4550 4625	3	1500S 1400T	3	1000S 1000S HF
					40		5	
Butene-1 (C <sub>4</sub> H <sub>8</sub> )	65	4550 4625	60	4550 4625	3	1500S 1400TS	3	1000S 1000S HF
					50		5	
Carbon Dioxide (CO <sub>2</sub> )	500	3000 3625	75	3550 3625	3	1500S 1400TS	8	1000S 1000S HF
	700	4000 3625	140	4550 4625	75 150	1200S VS	20 40	1400TS
		3113 3125		3700 3800	500	1225S VS & 1200S HF VS	100	1200S
	2500		750		1000	9030S VS & 9100S VS	160 160 325 800	1200S HF 1300S 1200S FC 9100S
Carbon Monoxide (CO)	185	3000 3625	90	3550 3625	5	1500S 1900S	5	1000S 1000S HF
	225	4000 3625	160	4550 4625	50	1400TS	15 50	1400TS
Carbonyl Fluoride (COF <sub>2</sub> )	115	3000 3625	60	3550 3625	5	1500S 1400TS	3	1000S 1000S HF
	200	4000 3625	100	4550 4625	25		10	
Chlorine (Cl <sub>2</sub> )	75	3550 3625	50	3550 3625	3	1500SH 1400TS	5	1000SH 1000SH HF
	150	4550 4625	100	4550 4625	50 75	1200SH	15 30	1400TS
	300	3113 3125	400	3700 3800	200	1200SH HF	75 125 125 250	1200SH 1200SH HF 1300S 1200SH FC
Chlorine Trifluoride (ClF <sub>3</sub> )	20	4550 4625	15	4550 4625	6	1402TSA	0.5 6	1101S 1402TSA
Diborane Mixtures (Nitrogen Balance)	185	3000 3625	90	3550 3625	5	1700S 2700S	10	1000S 1000S HF
	225	4000 3625	160	4550 4625	225		20	
Dichlorosilane (SiH <sub>2</sub> Cl <sub>2</sub> )	20	4550 4625	20	4550 4625	7	1402TSA	1 7	1001S 1402TSA

Model number applies to all applicable series - AP, AZ and AK  
Example: 1000 means AP, AZ and AK 1000

Red highlight denotes heating required to achieve stated flow.  
\*15 psig maximum source regulator outlet pressure

Process Gas	Maximum Flow (slpm)	Source Valves	Maximum Flow (slpm)	Distribution Valves	Maximum Flow (slpm)	Source Regulator	Maximum Flow (slpm)	Distribution Regulator
		AP, AZ or AK		AP, AZ or AK		AP, AZ or AK		AP, AZ or AK
<b>Diethyltelluride</b> (Te(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> )	70	<b>3000</b> <b>3625</b>	35	<b>3550</b> <b>3625</b>	3	<b>1500S</b> <b>1900S</b>	3	<b>1000S</b> <b>1000S HF</b>
	85	<b>4000</b> <b>3625</b>		<b>4550</b> <b>4625</b>		5 25		<b>1400TS</b>
<b>Difluoroethylene</b> (C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> )	140	<b>3000</b> <b>3625</b>	55	<b>3550</b> <b>3625</b>	3	<b>1500S</b> <b>1400TS</b>	3	<b>1000S</b> <b>1000S HF</b>
	200	<b>4000</b> <b>3625</b>		<b>4550</b> <b>4625</b>		50 75		<b>1200S</b>
<b>Dimethylsilane</b> (C <sub>2</sub> SiH <sub>6</sub> )	14	<b>4550</b> <b>4625</b>	7	<b>4550</b> <b>4625</b>	3	<b>1500S</b> <b>1400TS</b>	3	<b>1000S</b> <b>1400TS</b>
	150	<b>3700</b> <b>3800</b>		<b>3700</b> <b>3800</b>		50 75		<b>1200S</b>
<b>Disilane</b> (Si <sub>2</sub> H <sub>6</sub> )	14	<b>4550</b> <b>4625</b>	7	<b>4550</b> <b>4625</b>	1	<b>1000S</b> <b>1402TSA</b>	1	<b>1000S</b> <b>1402TSA</b>
	380	<b>3000</b> <b>3625</b>		<b>3550</b> <b>3625</b>		3		<b>1500S</b> <b>1400TS</b>
<b>Ethylene</b> (C <sub>2</sub> H <sub>4</sub> )	485	<b>4000</b> <b>3625</b>	160	<b>4550</b> <b>4625</b>	75	<b>1200S</b>	50 75	<b>1400TS</b> <b>1200S</b>
	Consult Factory	Consult Factory		Consult Factory		Consult Factory		Consult Factory
<b>Fluorine</b> (F <sub>2</sub> )	185	<b>3000</b> <b>3625</b>	90	<b>3550</b> <b>3625</b>	5	<b>1500SH</b> <b>1400TS</b>	5	<b>1000SH</b> <b>1000SH HF</b>
	225	<b>4000</b> <b>3625</b>		<b>4550</b> <b>4625</b>		25		
<b>Fluorine Mixtures</b> (10%, 500 psig) (Nitrogen Balance)	10	<b>3550</b> <b>3625</b>	4	<b>3550</b> <b>3625</b>	1	<b>1000S</b> <b>1402TSA</b>	1	<b>1000S</b> <b>1402TSA</b>
	18	<b>4550</b> <b>4625</b>		<b>4550</b> <b>4625</b>		7		
<b>Germane</b> (GeH <sub>4</sub> )	185	<b>3000</b> <b>3625</b>	90	<b>3550</b> <b>3625</b>	10	<b>1500S</b> <b>1900S</b>	10	<b>1000S</b> <b>1000S HF</b>
	225	<b>4000</b> <b>3625</b>		<b>4550</b> <b>4625</b>		20 50		<b>1400TS</b>
<b>Germane Mixtures</b> (Nitrogen Balance)	55	<b>4550</b> <b>4625</b>	40	<b>4550</b> <b>4625</b>	3	<b>1500S</b> <b>1400TS</b>	3	<b>1000S</b> <b>1000S HF</b>
	15	<b>4550</b> <b>4625</b>		<b>4550</b> <b>4625</b>		50		<b>1400TS</b>
<b>Halocarbon 12</b> (CCl <sub>2</sub> F <sub>2</sub> )	15	<b>4550</b> <b>4625</b>	15	<b>4550</b> <b>4625</b>	5	<b>1400TSA</b>	0.5 5	<b>1101S</b> <b>1402TSA</b>
	140	<b>3000</b> <b>3625</b>		<b>3550</b> <b>3625</b>		3		<b>1500S</b> <b>1400TS</b>
<b>Halocarbon 12B2</b> (CBr <sub>2</sub> F <sub>2</sub> )	170	<b>4000</b> <b>3625</b>	70	<b>4550</b> <b>4625</b>	50	<b>1400TS</b>	50	<b>1400TS</b>
	110	<b>3550</b> <b>3625</b>		<b>3550</b> <b>3625</b>		3		<b>1500S</b> <b>1400TS</b>
<b>Halocarbon 13</b> (CClF <sub>3</sub> )	190	<b>4550</b> <b>4625</b>	65	<b>4550</b> <b>4625</b>	50	<b>1400TS</b>	50	<b>1400TS</b>
	110	<b>3550</b> <b>3625</b>		<b>3550</b> <b>3625</b>		3		<b>1500S</b> <b>1400TS</b>
<b>Halocarbon 13B1</b> (CBrF <sub>3</sub> )	200	<b>4000</b> <b>3625</b>	100	<b>4550</b> <b>4625</b>	80	<b>1900S HF</b> <b>1200S HR</b>	30 60	<b>1400TS</b> <b>1200S</b>
	600	<b>3130</b> <b>3125</b>		<b>3700</b> <b>3800</b>		500		
<b>Halocarbon 14</b> (CF <sub>4</sub> )	25	<b>4550</b> <b>4625</b>	15	<b>4550</b> <b>4625</b>	5	<b>1402TSA</b>	0.5 0.5 5	<b>1101S</b> <b>1001S</b> <b>1402TSA</b>
	115	<b>3000</b> <b>3625</b>		<b>3550</b> <b>3625</b>		10		<b>1500S</b> <b>1400TS</b>
<b>Halocarbon 21</b> (CHCl <sub>2</sub> F)	140	<b>4000</b> <b>3625</b>	250	<b>4550</b> <b>4625</b>	50	<b>1400TS</b>	50	<b>1400TS</b>
	115	<b>3000</b> <b>3625</b>		<b>3550</b> <b>3625</b>		10		<b>1500S</b> <b>1400TS</b>
<b>Halocarbon 23</b> (CHF <sub>3</sub> )	140	<b>4000</b> <b>3625</b>	250	<b>4550</b> <b>4625</b>	50	<b>1400TS</b>	50	<b>1400TS</b>

SOURCE VALVE GUIDELINE

DISTRIBUTION VALVE GUIDELINE

SOURCE REGULATOR GUIDELINE

DISTRIBUTION REGULATOR GUIDELINE

Model number applies to all applicable series - AP, AZ and AK  
 Example: 1000 means AP, AZ and AK 1000

Process Gas	Maximum Flow (slpm)	Source Valves	Maximum Flow (slpm)	Distribution Valves	Maximum Flow (slpm)	Source Regulator	Maximum Flow (slpm)	Distribution Regulator			
		AP, AZ or AK		AP, AZ or AK		AP, AZ or AK		AP, AZ or AK			
Halocarbon 32 (CH <sub>2</sub> F <sub>2</sub> )	140	3000	55	3550	3	1500S	3	1000S			
		3625		3625		50		1400TS	6	1000S HF	
	175	4000		4550		75		1200S	50	1400TS	
		3625		4625					75	1200S	
Halocarbon 114 (C <sub>2</sub> ClF <sub>4</sub> )	30	4550	25	4550	7	1402TSA	0.5	1101S			
		4625		4625					1	1000S	
									7	1402TSA	
Halocarbon 115 (C <sub>2</sub> ClF <sub>5</sub> )	60	4550	40	4550	3	1500S	3	1000S			
		4625		4625		50		1400TS	5	1000S HF	
						75		1200S	50	1400TS	
Halocarbon 116 (C <sub>2</sub> F <sub>6</sub> )	60	3000	40	3550	3	1500S	3	1000S			
		3625		3625		50		1400TS	10	1000S HF	
	100	4000		4550		75		1200S	25	1400TS	
		3625		4625		125		1200S HF	50	1200S	
	275	3113		3700				90	1200S HF		
		3125		3800				90	1300		
			175	1200S FC							
					450	9100S					
Halocarbon 125 (C <sub>2</sub> HF <sub>5</sub> )	180	4550	70	4550	3	1500S	3	1000S			
		4625		4625		25		1400TS	5	1000S HF	
						75		1200S	25	1400TS	
Halocarbon 134A (C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> )	55	4550	40	4550	3	1500S	3	1000S			
		4625		4625		50		1400TS	5	1000S HF	
		3100		3800		75		1200S	50	1400TS	
	350	3700		3800					75	1200S	
Halocarbon R218 (C <sub>3</sub> F <sub>8</sub> )	35	3550	20	3550	3	1500S	3	1000S			
		3625		3625		50		1400TS	5	1000S HF	
Halocarbon C318 (C <sub>4</sub> F <sub>8</sub> )	60	4550	40	4550	75	1200S	50	1400TS			
		4625		4625					75	1200S	
Helium (He)	25	4550	20	4550	6	1402TSA	1	1101S			
		4625		4625					6	1402TSA	
	750	3000		250		3550		125	1500S	65	1000S
	1000	3625		450		3625		500	1900S	125	1000S HF
Hexafluoropropane (C <sub>3</sub> H <sub>2</sub> F <sub>6</sub> )		4000	2500	4550	625	1900S HF	275	1400TS			
		3625		4625		2000		1200S HR	625	1200S	
	2500	3130		3700					900	1200S HF	
		3125		3800					900	1300	
									1200	1200S FC	
									2500	9100S	
Hexafluoropropylene (C <sub>3</sub> F <sub>6</sub> )	20	4550	15	4550	6	1402TSA	6	1402TSA			
		4625		4625							
Hydrogen (H <sub>2</sub> )	60	4550	40	4550	3	1500S	3	1000S			
		4625		4625		50		1400TS	5	1000S HF	
						75		1200S	50	1400TS	
									75	1200S	
Hydrogen Bromide (HBr)	800	3000	300	3550	125	1500S	65	1000S			
		3625		3625		500		1900S	125	1000S HF	
	1600	4000		4550		625		1900S HF	275	1400TS	
		3625		4625		900		2700S	625	1200S	
	3000	3130		3700		1200		1200S HR	900	1200S HF	
	3125	3800			900	1300S					
						1200	1200S FC				
						3000	9100S				
Hydrogen Bromide (HBr)	155	3000	55	3550	1	1500SH	1	1000SH			
		3625		3625		30		1400TS	2	1000SH HF	
	190	4000		4550		50		1200SH	30	1400TS	
	3625	4625				50	1200SH				

Model number applies to all applicable series - AP, AZ and AK  
Example: 1000 means AP, AZ and AK 1000

Red highlight denotes heating required to achieve stated flow.

Process Gas	Maximum Flow (slpm)	Source Valves	Maximum Flow (slpm)	Distribution Valves	Maximum Flow (slpm)	Source Regulator	Maximum Flow (slpm)	Distribution Regulator
	AP, AZ or AK		AP, AZ or AK		AP, AZ or AK		AP, AZ or AK	
Hydrogen Chloride (HCl)	350	3000 3625	75	3550 3625	2	1500SH	8	1000SH
	500	4000	150	4550	90	1400TS	20	1000SH HF
	2000	3625	850	4625	150	1200SH	40	1400TS
		3113	850	3700	600	1225SH & 1210SH HF	85	1200SH
		3125	850	3800	2000	9030S & 9110S	160	1200SH HF
160						160	1300S	
							300	1200SH FC
							800	9100S
Hydrogen Chloride Mixtures (Nitrogen Balance)	210	3000 3625	105	3550 3625	10	1500SH	10	1000SH
	265	4000	190	4550	20	1900SH	20	1000SH HF
		3625	190	4625	40	1400TS	40	1400TS
Hydrogen Fluoride (HF)	20	4550 4625	20	4550 4625	5	1402TSA	5	1402TSA
Hydrogen Selenide (H <sub>2</sub> Se)	125	3550 3625	55	3550 3625	5	1500S	5	1000S
	215	4550	95	4550	40	1400TS	20	1000S HF
		4625	95	4625			40	1400TS
Hydrogen Selenide Mixtures (Nitrogen Balance)	185	3000 3625	90	3550 3625	10	1500S	10	1000S
	225	4000	160	4550	20	1900S	20	1000S HF
		3625	160	4625	50	1400TS	50	1400TS
Hydrogen Sulfide (H <sub>2</sub> S)	210	3000 3625	80	3550 3625	5	1500S	5	1000S
	260	4000	140	4550	40	1400TS	10	1000S HF
		3625	140	4625			40	1400TS
Krypton (Kr)	105	3000 3625	50	3550 3625	20	1500S	20	1000S
	130	4000	90	4550	60	1400TS	30	1000S HF
		3625	90	4625			60	1400TS
Methane (CH <sub>4</sub> )	245	3000 3625	120	3550 3625	10	1500S	10	1000S
	295	4000	210	4550	20	1900S	20	1000S HF
		3625	210	4625	40	1400TS	40	1400TS
Methanol (CH <sub>3</sub> OH)	70	4550 4625	40	4550 4625	3	1500S	3	1000S
					50	1400TS	5	1000S HF
Methyl Bromide (CH <sub>3</sub> Br)	25	4550 4625	15	4550 4625	5	1402TSA	5	1402TSA
Methyl Chloride (CH <sub>3</sub> Cl)	60	4550 4625	45	4550 4625	1	1000S	10	1402TSA
					10	1402TSA		
Methylsilane (CH <sub>3</sub> SiH <sub>3</sub> )	200	3550 3625	70	3550 3625	3	1500S	3	1000S
	350	4550	120	4550	50	1400TS	5	1000S HF
		4625	120	4625	75	1200S	50	1400TS
						75	1200S	
Methyl Fluoride (CH <sub>3</sub> F)	400	3000 3625	120	3550 3625	5	1500S	5	1000S
	490	4000	200	4550	50	1400TS	10	1000S HF
		3625	200	4625			50	1400TS
Neon (Ne)	215	3000 3625	110	3550 3625	20	1500S	20	1000S
	260	4000	190	4550	40	1900S	40	1000S HF
		3625	190	4625	300	1200S HR	100	1400TS
Nitrogen (N <sub>2</sub> )	250	3000 3625	100	3550 3625	50	1500S	25	1000S
	400	4000	200	4550	200	1900S	50	1000S HF
		3625	200	4625	250	1900S HF	150	1400TS
	1000	3130	1000	3700	350	2700	250	1200S
		3125	1000	3800	1000	1200S HR	300	1200S HF
						300	1300S	
						400	1200S FC	
						1000	9100S	

Model number applies to all applicable series - AP, AZ and AK  
Example: 1000 means AP, AZ and AK 1000

Process Gas	Maximum Flow (slpm)	Source Valves AP, AZ or AK	Maximum Flow (slpm)	Distribution Valves AP, AZ or AK	Maximum Flow (slpm)	Source Regulator AP, AZ or AK	Maximum Flow (slpm)	Distribution Regulator AP, AZ or AK	
Nitrogen Trifluoride (NF <sub>3</sub> )	75	3000	60	3550	5	1500S	6	1000S	
		3625		3625		1400TS		15	1000S HF
	100	4000		4550		1400TS		30	1400TS
		3625		4625		2700S		75	1200S
	350	3130		500		3700		150	1200 S HF
	3125		3800	400	1200S	125	1300S		
				1000	9030 & 9110	125	1200S FC		
						250	9100S		
						600			
Nitric Oxide (NO)	310	3000	75	3550	3	1500S	3	1000S	
		3625		3625		1400TS		6	1000S HF
	380	4000		4550		1200S		50	1400TS
		3625	4625		75	1200S			
Nitrous Oxide (N <sub>2</sub> O)	300	3000VS	70	3550	3	1500S VS	8	1000S	
		3625VS		3625		1400TS VS		20	1000S HF
		3002VS		4550		1200S VS		35	1400TS
	500	3625VS		140		4625		150	1200S
		3113VS		750		3700		500	1200S HF
	3125VS		3800	1000	9030S VS & 9100S VS	160	1300S		
						160	1200S FC		
						320	9100S		
						800			
Octafluorocyclopentene (C <sub>5</sub> F <sub>8</sub> )	15	4550	15	4550	5	1402TSA	0.3	1101S	
		4625		4625				5	1402TSA
Oxygen (O <sub>2</sub> )	250	3000	75	3550	10	1500S	10	1000S	
		3625		3625		1900S		25	1000S HF
	400	4000		4550		1900S HF		50	1400TS
		3625		4625		1200S HR		120	1200S
				1000		3700		200	1200S HF
			3800	1000	200	1300S			
						400	1200S FC		
						1000	9100S		
Perfluoropropane* (C <sub>3</sub> F <sub>8</sub> )	70	3550	35	3550	2	1500S	2	1000S	
		3625		3625		1400TS		4	1000S HF
		4550	60	4550			20	1400TS	
		4625		4625					
Perfluorobutadiene (C <sub>4</sub> F <sub>6</sub> )	25	4550	25	4550	5	1402TSA	0.5	1101S	
		4625		4625				5	1402TSA
Phosphine (PH <sub>3</sub> )	320	3000	80	3550	5	1500S	5	1000S	
		3625		3625		1400TS		10	1000S HF
	390	4000		4550					
		3625	145	4625					
Phosphine Mixtures (Nitrogen Balance)	185	3000	90	3550	10	1500S	10	1000S	
		3625		3625		1900S		20	1000S HF
	225	4000		4550					
		3625	160	4625					
Phosphorous Pentafluoride (PF <sub>5</sub> )	15	3000	5	3550	10	1500S	10	1000S	
		3625		3625		1900S		20	1000S HF
	19	4000		9		4550			
		3625		4625					
		3130	52	3700					
		3125		3800					
Propane (C <sub>3</sub> H <sub>8</sub> )	65	3550	42	3550	3	1500S	3	1000S	
		3625		3625		1400TS		5	1000S HF
	115	4550		4550		1200S		50	1400TS
		4625	75	4625					
Propene (C <sub>3</sub> H <sub>6</sub> )	185	3550	75	3550	3	1500S	3	1000S	
		3625		3625		1400TS		5	1000S HF
		4550	125	4550					
		4625		4625					

SOURCE VALVE GUIDELINE

DISTRIBUTION VALVE GUIDELINE

SOURCE REGULATOR GUIDELINE

DISTRIBUTION REGULATOR GUIDELINE

Model number applies to all applicable series - AP, AZ and AK  
 Example: 1000 means AP, AZ and AK 1000

Red highlight denotes heating required to achieve stated flow.  
 \*Same as Halocarbon R218

Process Gas	Maximum Flow (slpm)	Source Valves	Maximum Flow (slpm)	Distribution Valves	Maximum Flow (slpm)	Source Regulator	Maximum Flow (slpm)	Distribution Regulator	
	AP, AZ or AK		AP, AZ or AK		AP, AZ or AK		AP, AZ or AK		
SOURCE VALVE GUIDELINE	Silane (SiH <sub>4</sub> )	150	3000	75	3550	5	1500S	10	1000S
		250	3625	150	3625	40	1400TS	25	1000S HF
			4000		4550	50	2700S	50	1400TS
	600	3625	750	4625	60	1200S	120	1200S	
		3130		3700	100	1200S HF	200	1200S HF	
		3125		3800	500	1225S & 1200S HF	200	1300S	
	Silane Mixtures (Nitrogen Balance)	185	3000	90	3550	10	1500S	10	1000S
		225	3625	160	3625	20	1900S	20	1000S HF
			4000		4550	40	1400TS	40	1400TS
	Silicon Tetrachloride (SiCl <sub>4</sub> )	10	4550	10	4550	5	1402TSA	0.5	1101S
		4625		4625			5	1402TSA	
SOURCE VALVE GUIDELINE	Silicon Tetrafluoride (SiF <sub>4</sub> )	95	3000	45	3550	10	1500S	10	1000S
		115	3625	80	3625	40	1400TS	20	1000S HF
	4000		4550		40	1400TS	40	1400TS	
Sulfur Dioxide (SO <sub>2</sub> )	80	4550	30	4550	1	1000S	6	1402TSA	
		4625		4625	6	1402TSA			
SOURCE VALVE GUIDELINE	Sulfur Hexafluoride (SF <sub>6</sub> )	125	3000	35	3550	3	1500S	5	1000S
		200	3625	75	3625	40	1400TS	12	1000S HF
			4000		4550	60	1200S	25	1400TS
	500	3625	400	4625	150	1200S HF	60	1200S	
		3113		3700	500	9100S	90	1200S HF	
	3125		3800			90	1300S		
Sulfur Tetrafluoride (SF <sub>4</sub> )	200	4550	80	4550	3	1500S	3	1000S	
		4625		4625	15	1400TS	5	1000S HF	
Trichlorosilane (SiHCl <sub>3</sub> )	35	4550	30	4550	10	1402TSA	0.5	1101S	
		4625		4625			10	1402TSA	
Trimethylsilane ((CH <sub>3</sub> ) <sub>3</sub> SiH)	30	4550	25	4550	7	1402TSA	0.5	1101S	
		4625		4625			7	1402TSA	
Tungsten Hexafluoride (WF <sub>6</sub> )	10	4550	10	4550	5	1402TSA	0.3	1101SH	
		4625		4625			5	1402TSA	
Xenon (Xe)	85	3000	40	3550	5	1500S	5	1000S	
	100	3625	70	3625	25	1400TS	10	1000S HF	
		4000		4550		25	1400TS		
	3625		4625						

Model number applies to all applicable series - AP, AZ and AK  
Example: 1000 means AP, AZ and AK 1000

Red highlight denotes heating required to achieve stated flow.

### Alphabetical Listing by Gas Formula

11BF <sub>3</sub> Boron 11 Trifluoride	C <sub>3</sub> H <sub>2</sub> F <sub>6</sub> Hexafluoropropane	CH <sub>3</sub> F Methyl Fluoride	He Helium	SiH <sub>4</sub> Silane
Ar Argon	C <sub>3</sub> H <sub>6</sub> Propene	CH <sub>3</sub> OH Methanol	HF Hydrogen Fluoride	SiHCl <sub>3</sub> Trichlorosilane
AsH <sub>3</sub> Arsine	C <sub>3</sub> H <sub>8</sub> Propane	CH <sub>3</sub> SiH <sub>3</sub> Methylsilane	Kr Krypton	SO <sub>2</sub> Sulfur Dioxide
BCl <sub>3</sub> Boron Trichloride	C <sub>4</sub> F <sub>6</sub> Perfluorobutadiene	CH <sub>4</sub> Methane	N Nitrogen	Te(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> Diethyltelluride
BF <sub>3</sub> Boron Trifluoride	C <sub>4</sub> F <sub>8</sub> Halocarbon C318	CHCl <sub>3</sub> Chloroform	N <sub>2</sub> O Nitrous Oxide	WF <sub>6</sub> Tungsten Hexafluoride
B <sub>2</sub> H <sub>6</sub> Diborane	C <sub>4</sub> H <sub>6</sub> Butadiene	CHF <sub>3</sub> Halocarbon 23	Ne Neon	Xe Xenon
C <sub>2</sub> ClF <sub>4</sub> Halocarbon 114	C <sub>4</sub> H <sub>8</sub> Butene-1	Cl <sub>2</sub> Chlorine	NF <sub>3</sub> Nitrogen Trifluoride	
C <sub>2</sub> ClF <sub>5</sub> Halocarbon 115	C <sub>4</sub> H <sub>10</sub> Butane (normal)	ClF <sub>3</sub> Chlorine Trifluoride	NH <sub>3</sub> Ammonia	
C <sub>2</sub> F <sub>6</sub> Halocarbon 116	C <sub>5</sub> F <sub>8</sub> Octafluorocyclopentene	CO Carbon Monoxide	NO Nitric Oxide	
C <sub>2</sub> H <sub>2</sub> Acetylene	CBrF <sub>2</sub> Halocarbon 12B2	CO <sub>2</sub> Carbon Dioxide	O <sub>2</sub> Oxygen	
C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> Difluoroethylene	CBrF <sub>3</sub> Halocarbon 13B1	COF <sub>2</sub> Carbonyl Fluoride	PF <sub>5</sub> Phosphorous Pentafluoride	
C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> Halocarbon 134A	CCl <sub>2</sub> F <sub>2</sub> Halocarbon 12	F <sub>2</sub> Fluorine	PH <sub>3</sub> Phosphine	
C <sub>2</sub> H <sub>4</sub> Ethylene	CClF <sub>3</sub> Halocarbon 13	GeH <sub>4</sub> Germane	SF <sub>4</sub> Sulfur Tetrafluoride	
C <sub>2</sub> H <sub>6</sub> Halocarbon 125	CF <sub>4</sub> Halocarbon 14	H <sub>2</sub> Hydrogen	SF <sub>6</sub> Sulfur Hexafluoride	
C <sub>2</sub> SiH <sub>8</sub> Dimethylsilane	CH <sub>3</sub> F <sub>3</sub> Halocarbon 32	H <sub>2</sub> Se Hydrogen Selenide	Si <sub>2</sub> H <sub>6</sub> Disilane	
C <sub>3</sub> F <sub>6</sub> Hexafluoropropylene	(CH <sub>3</sub> ) <sub>3</sub> SiH Trimethylsilane	H <sub>2</sub> S Hydrogen Sulfide	SiCl <sub>4</sub> Silicon Tetrachloride	
C <sub>3</sub> F <sub>8</sub> Halocarbon R218	CH <sub>3</sub> Br Methyl Bromide	HBr Hydrogen Bromide	SiF <sub>4</sub> Silicon Tetrafluoride	
C <sub>3</sub> F <sub>8</sub> Perfluoropropane	CH <sub>3</sub> Cl Methyl Chloride	HCl Hydrogen Chloride	SiH <sub>2</sub> Cl <sub>2</sub> Dichlorosilane	