

MODEL DAP

LARGE PISTON DO-ALL HIGH PRESSURE REDUCING REGULATOR, PRESSURE LOADED LARGE PISTON: 1/2" - 2"



MODEL DAP

APPLICATIONS

“DO-ALL” concept allows application of all types of clean gases. Excellent for atmospheric industrial gases – GN₂, GOX, Ar, He, H₂, CO₂, CO – as well as a natural gas regulator. Corrosive and non-corrosive chemical services are possible with broad materials range. Special variations available for cryogenic gas or liquid service.

Topworks actuation may be by pressure-loading schemes or pilot-operated schemes.

Model DAP is a high performance, piston-style, pressure reducing regulator with balanced trim. Primarily applied in high outlet pressure applications.

NOTE: Must be applied where the fluids are the same in topworks and main valve. Can only be applied in clean gas or liquid service. May be pressure-loaded or pilot-operated.

FEATURES

- Versatile:** Three basic body materials and multiple trim material combinations to select from. Multiple methods of pressure loading.
- Tight Shutoff:** Multiple composition materials provide Class IV or VI inboard leakage rates. Designed as a soft-seated valve.
- Capacity:** High capacity allows smaller body sizes than competitors in majority of applications.
- High Pressure Droop:** Highly accurate outlet pressure control, due to absence of range spring in design; provides negligible “droop effect”.
- Pressure Drop:** One of highest in the industry when coupled with high flow capacity.
- Trim Design:** “DO-ALL” trim design provides FTO and pressure balancing for higher inlet pressure. Results in unmatched sensitivity and stability. Internals are cage-contained within easily removable quick change trim.
- Rangeability:** Basic valve gives outstanding rangeability due to close tolerances, balanced trim, and multiple soft seats. Can be as high as 2000:1.
- Triple Heavy-Duty Guiding:** Top and bottom guided to maintain stability and increased trim and seal life.
- Failure Position:** Fails closed on loss of loading pressure. Fails open on loss of P1 or P2 pressures with loading pressure still applied.

STANDARD / GENERAL SPECIFICATIONS

Body / Cover Dome Materials

CS/SST BRZ/BRZ SST/SST

CS = Carbon Steel BRZ = Bronze
SST = Stainless Steel

Body Sizes

1/2", 3/4", 1", 1-1/2", 2"

End Connections

Female NPT (screwed).

ANSI Flanged: 150#, 300#, 600#, 900#, 1500#; integral or Opt-30.

DIN Flanged: PN40; Opt-30.

Opt-31: BSP female screwed.

Opt-32: P.E. Extended Pipe Nipples.

Opt-41: Extension Tube Ends.

See Table DAG-6.

Inlet Pressure Range

Maximum Inlet Pressure - psig			
End Conns	Body Material		
	BRZ	CS	SST
NPT/BSP	700	3300	3300
Flgd	500	3300	3300

Minimum Inlet Pressure = 50 psig.
See Table 2 for design P vs. T limits.

Cv Capacity

Body Size	Port			Port
	Full	Wide-Open	Reduced	Wide-Open
1/2"	4.0	4.0	3.0	3.0
3/4"	6.0	6.0	3.0	3.0
1"	12	12	3.0	3.0
1-1/2"	30	30	8.0	8.0
2"	50	50	15	15
Cv Capacity				

Outlet Pressure Range

Maximum Outlet Pressure - psig			
End Connsq	Body Material		
	BRZ	CS	SST
NPT/BSP	700	2160	2160
Flgd	500	2160	2160

Minimum Outlet Pressure = 5 psig when pressure-loaded; = 10" WC when pilot-operated. See Table 3 for design P vs. T limits.

Pressure Drop Limits

15–3000 psid

Function of service fluid, base trim material, and dynamic seal design. See Table DAG-2, DAG-3 & DAG-4. (**NOTE**: Max. Operating Inlet Pressure and Max. Pressure Drop are "equal" for Model DAP.)

Temperature Range

-50° to +425°F

Limited by body/cover dome material combinations and by elastomeric - seat, static seal, dynamic seals - materials. See Tables DAG-1A through -1H and Table DAG-5. (Consult Factory for cryogenic applications.)

Inboard Leakage

Class IV or VI. Function of seat material, dynamic seal design and materials. See Tables DAG-9 and DAG-10.

Optional Constructions

Opt-12: Reduced Port
Opt-30: Weld-on Flanges
Opt-31: BSP End Conns.
Opt-32: Ext. Pipe Nipples
Opt-40: NACE
Opt-41: Ext. Tube Ends
Opt-55: Oxygen Cleaned
Opt-57: Chlorine Cleaned
Opt-85: Pressure Taps
Opt-95: Epoxy Paint

ABBREVIATIONS

FK = Fluorosilicone

HK = Fluorocarbon Elastomer

EPR = Ethylene Propylene

PA = PolyAll Ployurethane

NBR = Buna-N

HC = Hastelloy

ELG = Elgiloy

TFE = Polytetrafluoroethylene

V-TFE = Virgin TFE

CTFE = Chlorotrifluoroethylene

MATERIAL SPECIFICATIONS

Body

CS – ASTM A216, Grade WCB.
BRZ – ASTM B62, Alloy 83600.
 (85%-Cu, 5%-Sn, 5% Pb, 5% Zn).
SST – ASTM A351, Grade CF3M.

CS = Carbon Steel BRZ = Bronze
 SST = Stainless Steel

See Tables DAG-1A through DAG-1H for material specs.

Cover Dome

BRZ – ASTM B505 or 584, Alloy C93200; cast barstock.
SST – ASTM A479, Alloy S31603; Type 316L barstock.

Metallic Trim

Plug, Cage, Piston: 17-4PH SST, 316L SST, Monel.
Lower Guide Bushing: Function of trim basic material:
 17-4PH trim = 17-4PH SST bushing,
 Monel or 316L trim = Monel 400
 bushing.
Lower Piston Spring: Std. 17-7PH SST
 NACE – Inconel X-750
Cage: Standard burnished finish.

(NOTE: Monel recommended for NACE. 316L SST alternate.) See Table DAG-4 for pressure drop limits for base trim material.

See Table A for Metallic Trim Material Combinations.

Bolting

Bolts: ASTM F593, 316 SST (Cond. CW)
Nuts: ASTM F594, 316 SST (Cond. CW)

Seat

PolyAll, V-TFE, CTFE

Static Seals (See Fig. DAG-F1)

NBR, HK, FK, EPR, TFE/SST U-Cup

Dynamic Seals

U-Cup Designs

Actuator Seal (Upper): Std. - 302 SST/TFE,
 Opt. - ELG/TFE or HC/TFE.

Balancing Side Seal (Lower): Std. - 301 SST/TFE
 Opt. - ELG/TFE or HC/TFE

(NOTE: ELG/TFE required for NACE)

Painting

CS: **Std.** – Enamel;
Opt-95 – Epoxy coating.
BRZ & SST: Unpainted.

Cleaning

Std.: Cleaned per Cashco cleaning spec. No. S-1542. Not suitable for oxygen service.

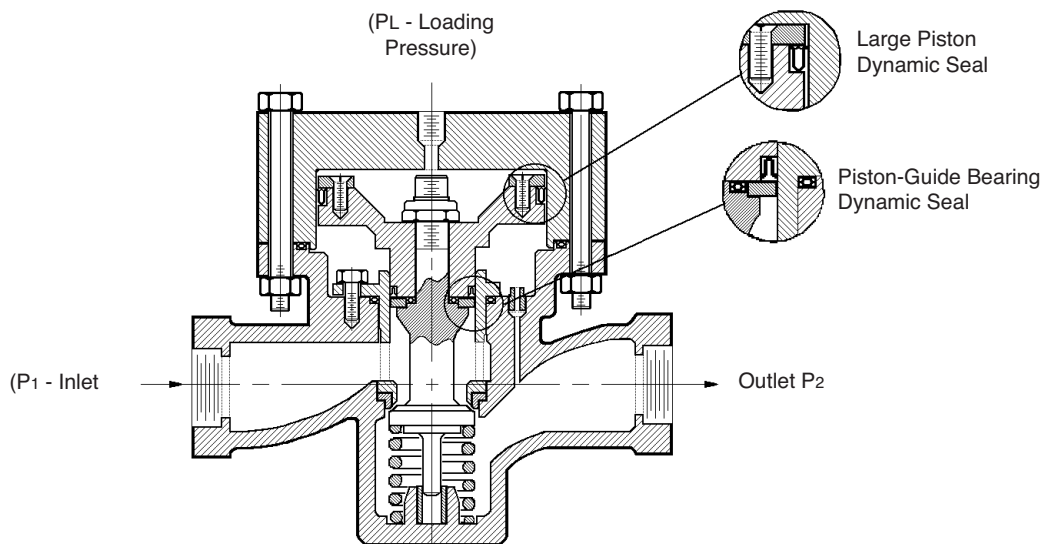


FIGURE 1 - Model DAP

OPTION SPECIFICATIONS

OPT-12: **REDUCED PORT.** Special plug that reduces internal passageways clearances enough to limit the Max. Cv available.

OPT-30: **FLANGED END CONNECTIONS.** CS or SST body materials only. 1/2" - 1" body sizes only. Welded-on flange of same general chemistry as body. Available in ANSI 150# RF, 300# RF, 600# RF, 900# RF, 1500# RF and 1500# RTJ. DIN PN40.

NOTES:

1. OPT-30 used for 2" body size with 1500# RTJ flanged end connections; affects face-to-face dimension.
2. The body P vs. T ratings are the limiting variables for flanged end connections, unless further restricted by ASME B16.5.
3. No post-weld stress relieving performed.

OPT-31: **BSP END CONNECTIONS.** Alternate BSP female screwed end connections.

OPT-32: **EXTENDED PIPE NIPPLES.** Schedule 80 plain end extension pipe nipples available for CS and SST bodies.

OPT-40: **NACE CONSTRUCTION.** Internal wetted portions meet NACE Std. MR0175; for application in sour gas/crude service. Exterior of unit to not be directly buried, insulated, or otherwise denied direct atmospheric exposure. CS/SST or SST/SST body/

spring chamber materials only. **MUST** select ELG/TFE dynamic seals. Monel or CF3M/316L SST trim materials only. Available in all end connections. All welded portions heat treated to stress relieve weldments. Reference DAG-TB for comparison of NACE Trim Specifications.

OPT-41: **EXTENDED TUBE END CONN.** SST body material only. Schedule 10S SST extension pipe nipples welded to body. P₁ Max - see Table 4. **NOT FOR HIGH PURITY REQUIREMENTS.**

OPT-55: **SPECIAL CLEANING - GOX.** BRZ or SST body and cover dome materials only. Cleaning, assembly and packaging per Cashco Spec No. S-1134, making unit suitable for oxygen service.

OPT-57: **SPECIAL CLEANING - Cl₂.** CS or SST body materials only. Cleaning per Cashco Spec. No. S-1589. For chlorine gas service.

OPT-85: **PRESSURE TAPS.** Provides inlet and outlet 1/4" - FPT taps with plugs (same basic material as body) on backside of body. Includes second remote sensing vent.

OPT-95: **EPOXY PAINTED.** Two-step epoxy coated for severe ambient conditions to minimize external corrosion. Applied to all exposed parts, except those of SST. Procedures and specifications per Cashco Spec. No. S-1547.

APPLICATION & SELECTION

Table XX: Denotes table within this technical bulletin.

Table DAG-XX: Denotes table within General Technical Appendix, "DAG-TB", a separate technical reference.

Figure DAG-FXX: Denotes figure within General Technical Appendix, "DAG-TB", a separate technical reference.

Following the procedure steps below will give a selection that will technically be correct.

1. **Correct Product. NOTE: "Process Fluid" MUST be the same basic fluid as the inlet flowing fluid.** This product controls P₂ - Outlet Pressure. A reliable "process fluid" at a pressure at least 15 psid greater than the desired P_{sp} - Pressure Setpoint (controlled pressure) is required.

Applications which have a broad variance in P₁ - Inlet Pressure will exhibit "ISR" effect (Inverse Sympathetic Ratio), causing an inverse deviation in P₂ - Outlet Pressure. When P₁ decreases, P₂ increases; the amount of ISR effect should be evaluated to the process needs for accuracy. Putting two reducers in series helps minimize ISR effects. Loading as a pilot-operated unit eliminates its effect. See DAG-15 to calculate ISR effects.

If plan is to include a constant P_L - Loading Pressure and the above deviations are expected, P₂ controlled pressure will vary. When neither the flow rate nor the P₁ pressure

vary by more than 10-15% for each, P₂ pressure will be normally acceptable. When pressure loading a Model DAP without lower piston spring, P₂ ≈ 0.97 x P_L; thus this valve is sometimes referred to as a "mimic valve". A Model DAP with the lower piston spring will have a deviation/variance due to "spring effect"; such a valve will operate with a higher P_L pressure to get the same P₂, and the controlled pressure will deviate according to the lower piston spring's rate. When pilot-operated, a lower piston spring **MUST** be selected.

2. **Prelim Cv Req'd.** Using a computer sizing program, calculate a Cv Req'd. Evaluate the velocities and estimated noise per Tables DAG-11 or DAG-13 limits.
3. **Body Size.** Using Cv Req'd., go to Max. usable Cv, pg. 2, and determine the appropriate body size.
4. **Final Cv Req'd.** Repeat Step 2, previous, with the proper body size and its Cv Max. from Table DAG-7.

5. **Metallic Materials.** Using suitable corrosion guides and SEP (Sound Engineering Practice) for the fluid handled, determine a compatible body and trim material. Cover dome must be of BRZ or SST material because of U-cup piston seal contact surface. (See Article 10 in this section.)

Ensure that basic trim material does not exceed the pressure drop limits found in Table DAG-4 or 3000 psid, whichever is smaller.

6. **Inlet P vs. T vs. End Conns.** Ensure that body design pressure and temperature do not exceed the limits given in Tables DAG-1A and DAG-1H for the utilized end connection, and body/ cover dome materials.

7. **Seat Material.** Best shutoff at seat will be had when using PolyAll, as it is most resilient. Next best shutoff would be V-TFE, which is not resilient. CTFE is "harder", and will not provide as good seat leakage. See Table DAG-10 for leakage classes.

Using suitable elastomeric chemical resistance guides and SEP for the fluid handled, determine a compatible seat material. Table DAG-14 provides recommendations for some common fluids.

Ensure that the seat can withstand the throttling ΔP -Pressure Drop limits of Table DAG-2, and the min/max temperature limits of Table DAG-5. Maximum Operating Inlet Pressure and Maximum Pressure Drop are the same for Model DAP.

8. **Outlet Pressure Limit.** Ensure that the P_2 Max. does not exceed the limits indicated in "Outlet Pressure Range", pg. 2 herein. If P_1 - Inlet Pressure is greater than the Max. P_2 - Outlet Pressure, a safety relief valve or rupture (bursting) disc is required for installation.

9. **Static Seal Material.** Using suitable elastomeric chemical resistance guide and SEP for the fluid handled, determine a compatible o-ring material. Table DAG-14 provides recommendations for some common fluids.

Ensure that the o-ring static seals will be acceptable for the application's full temperature range, including all ambient

temperature conditions and process "upset" conditions. See Table DAG-5.

10. **Dynamic Seal Design & Materials.** Dynamic seal contributes to total inboard leakage together with seat leakage. If P_1 -to- P_2 inlet-to-outlet leakage is critical, reference Table DAG-10 for the inboard leakage rates for the various designs. Model DAP incorporates only U-cup seals for the Piston-Guide Bearing and the Large Piston. Maximum ΔP -Pressure Drop is 3000 psid.

Std. SST/TFE U-cup seals are of 301/302 SST material. If higher corrosion resistance is required, MUST go to Hastelloy-C/TFE or ELG/TFE U-cup seals; i.e. NACE construction.

11. **Lower Piston Spring.** Model DAP is recommended with a lower piston spring. If pilot-operated, the lower piston spring is required. Not using a lower piston spring should be limited to ΔP 's < 15 psid.

Reference Table DAG-9 for requirements as to spring rates for the lower piston spring.

12. **Sensing. All Fluids** – When velocities exceed those "recommended" values from Table DAG-11 and when downstream pipe is two pipe sizes larger than valve body size, then external sensing is recommended.

13. **Strainer.** Pipeline strainer is recommended before inlet to remove typical pipeline debris from entering valve and damaging internal "soft goods", primarily the dynamic seals and seat.

14. **Pilot or Loader System.** Determine the method to be used for pressurizing the cover dome. There are three basic methods-

- Pilot Valve.
- Loading PRV (reducer).
- Unloading BPV (back pressure).

Most common hookup schematics are given in Appendix DAHU.

Pressure - Temperature ratings must not exceed those listed on each of the hookup schematics. See Table 1 below for P vs. T ratings for high pressure tubing.

TECHNICAL SPECIFICATIONS

TABLE 1

**PRESSURE LOADING OR PILOTING SYSTEMS TUBING & FITTINGS
MAXIMUM CONTAINMENT PRESSURE PROCESS FLUIDS**

TUBE	FITTINGS	PRESSURE vs. TEMPERATURE	
		psig	°F
CU *	BR	1450	-325 to +100
		1330	200
		1150	300
		730	400
SST√	SST	3300	-325 to +400

* 1/4" O.D. X 0.030" WALL THICKNESS.
√ 1/4" O.D. X 0.035" WALL THICKNESS.

1. For CU + BR Systems - if P₁ pressure exceeds above limits, tubing & fitting materials as well as other system components **MUST** be switched over to SST materials.
2. Consult Factory for T₁ > 400° F.
3. Use Heat Exchange "coils" when loading fluid (process, auxiliary) T₁ > 140°F.
4. Use Heat Exchange "coils" when T₁ < 0°F.
5. Other components of a given loading or piloting system may have lower limits of pressure or temperature than the tubing & fittings.

TABLE 2

MATERIAL INLET PRESSURE vs. TEMPERATURE LIMITS

Material-Body/Cover Dome	Temperature °F	End Construction - <u>Inlet</u> Pressure Class					
		Working Pressure - psig					
		End Connection - Pressure Class - ANSI					
		NPT	150#	300#	600#	900#	1500#
* CS/SST	-50 to +100	1980	165	430	860	1290	1980
* SST/SST	-50 to +100	3300	275	720	1440	2160	3300
CS/SST or SST/SST	-20 to +100	3300	275	720	1440	2160	3300
	200	3000	235	620	1240	1860	3095
	300	2750	215	560	1120	1680	2750
	400	2500	195	515	1025	1540	2500
	425	2400	185	505	1005	1510	2400
BRZ/BRZ	-50 to +150	700	225	500			
	175	480	220	480			
	200	465	210	465			
	225	445	205	445			
	250	425	195	425	-	-	-
	275	410	190	410			
	300	390	180	390			
	350	350	165	350			
	400	315	150	315			

* Data included for low ambient temperature operation together with Joule-Thompson cooling effects that may be present to further suppress actual valve temperature.

TABLE 3

MATERIAL OUTLET PRESSURE vs. TEMPERATURE LIMITS

Material-Body/Cover Dome	Temperature °F	End Construction - <u>Outlet</u> Pressure Class					
		Working Pressure - psig					
		End Connection - Pressure Class - ANSI					
		NPT	150#	300#	600#	900#	1500#
* CS/SST	-50 to +100	1175	165	430	860	1175	1175
* SST/SST	-50 to +100	1960	275	720	1440	1960	1960
CS/SST or SST/SST	-20 to +100	1960	275	720	1440	1960	1960
	200	1860	235	620	1240	1860	1860
	300	1680	215	560	1120	1680	1680
	400	1540	195	515	1025	1540	1540
	425	1510	185	505	1005	1510	1510
BRZ/BRZ	-50 to +150	700	225	500			
	175	480	220	480			
	200	465	210	465			
	225	445	205	445			
	250	425	195	425	-	-	-
	275	410	190	410			
	300	390	180	390			
	350	350	165	350			
	400	315	150	315			

* Data included for low ambient temperature operation together with Joule-Thompson cooling effects that may be present to further suppress actual valve temperature.

TABLE 4

**OPT - 41 SCH 10S EXT. PIPE NIPPLES MATERIAL
PRESSURE vs. TEMPERATURE LIMITS**

Body Size	Temperature Range - °F	Pressure - psig
1/2", 3/4", 1"	-50 to +425	3300
1-1/2"	-50 to +300	2575
	400	2375
	425	2415
2"	-50 to +300	1900
	400	1750
	425	1720

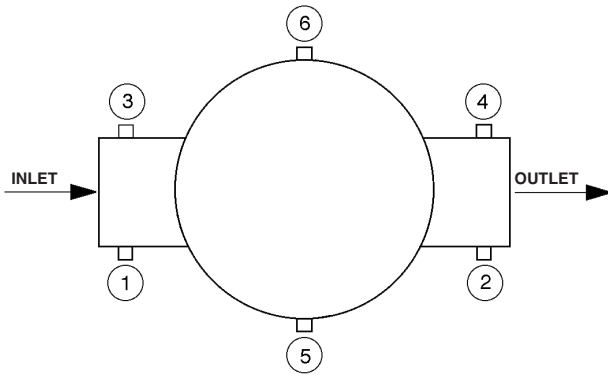
TABLE A

METALLIC TRIM MATERIAL COMBINATIONS

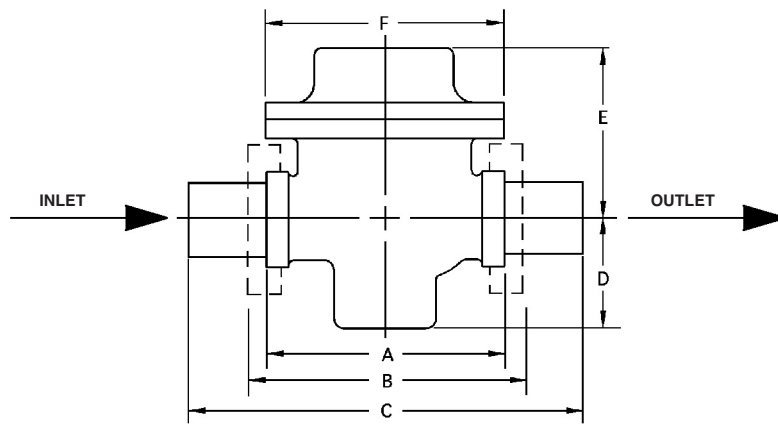
PART	TRIM DESIGNATION				
	S	P	M	T	H*
Plug	316L SST	17-4 PH SST	Monel†	17-4 PH SST	Hastelloy C†
Guide Bearing	316L SST	17-4 PH SST	Monel†	17-4 PH SST	Hastelloy C†
Cage	316L SST	17-4 PH SST	Monel†	Monel†	Hastelloy C†
Body Bushing	Monel†	17-4 PH SST	Monel†	Monel†	Hastelloy C†

* Sizes 1/2" - 2" (DN15-50); Except NO 1-1/4" (DN32).
† Hastelloy® and Monel™ are registered trade names:
Hastelloy® is a mark owned by Stellite Div., Cabot Corp.
Monel™ is a mark owned by International Nickel Co.

TECHNICAL SPECIFICATIONS



PRESSURE TAP LOCATIONS						
Body Mat'l	①	②	③	④	⑤	⑥
BRZ	Std	Std	Std	Opt-85	Std	Opt-85
CS	Std	Std	Opt-85	Opt-85	Std	Opt-85
SST	Std	Std	Opt-85	Opt-85	Std	Opt-85



Model DAP

TABLE 5

DIMENSIONS AND WEIGHTS - ENGLISH UNITS					
Dimension	End Conn.	Body Mat'l.	Body Size		
			1/2", 3/4" & 1"	1-1/2"	2"
A	NPT, BSP	BRZ	6.00	9.88	9.88
		CS, SST	8.25	9.88	9.88
B	150# FF	BRZ	9.63	11.50	11.50
	300# FF	BRZ	9.63	11.50	11.50
	150# RF	CS, SST	10.75	12.38	10.00
	300# RF	CS, SST	10.75	12.38	10.50
	600# RF	CS, SST	10.75	12.38	11.25
	1500# RF	CS, SST	11.50	–	14.50
	1500# RTJ	CS, SST	11.50	–	14.50
C	Opt-32	CS, SST	14.00	15.75	15.75
	Opt-41	SST	14.00	15.75	15.75
D	All	All	2.56	3.69	4.00
E	All	All	5.19	5.56	6.56
F	All	All	6.00	7.00	8.00
Approx. Weight	w/o/Flanges	All	45	65	85
	w/Flanges	All	55	75	100

DIMENSIONS AND WEIGHTS - METRIC UNITS					
Dimension	End Conn.	Body Mat'l.	Body Size		
			DN15, DN20 & DN25	DN40	DN50
A	NPT, BSP	BRZ	152	251	251
		CS, SST	210	251	251
B	150# FF	BRZ	245	292	292
	300# FF	BRZ	245	292	292
	150# RF	CS, SST	273	314	254
	300# RF	CS, SST	273	314	267
	600# RF	CS, SST	273	314	286
	1500# RF	CS, SST	292	–	368
	1500# RTJ	CS, SST	292	–	368
C	Opt-32	CS, SST	355	400	400
	Opt-41	SST	355	400	400
D	All	All	65	94	102
E	All	All	132	141	167
F	All	All	152	178	203
Approx. Weight	w/o/Flanges	All	20.5	29.6	38.7
	w/Flanges	All	25.0	34.1	45.5

TABLE 3B - SEAT MATERIALS		
PA CODE	V-TFE CODE	CTFE CODE
P	V	K

TABLE 3A - METALLIC TRIM PARTS	
Plug/Cage/Piston	CODE
17-4PH SST	P
Monel	M
316L SST	S
17-4PH/Monel/17-4PH	T

TABLE 2 - BODY/SPRING CHAMBER MATERIALS	
Materials	CODE
BRZ/BRZ - 500 WOG	3
BRZ/BRZ - 700 WOG	B
CS/SST	T
SST/SST	A

TABLE 1 - SIZE		
Size in	Size (mm)	CODE
1/2"	(DN15)	4
3/4"	(DN20)	5
1"	(DN25)	6
1-1/2"	(DN40)	8
2"	(DN50)	9

TABLE 4 - SEALS		
Static	Dynamic	
	SST/TFE UC CODE	Service
NBR	Z	WOG
EPR	7	WOG
FK	Q	GOX
HK	K	Chemical
SST/TFE	8	

TABLE 5 - END CONNECTIONS							
Size	Material	End Conn.	CODE	End Conn.	CODE	End Conn.	CODE
1/2"-2"	ALL	NPT	1				
1", 1-1/2", 2"	BRZ	150#FF	6	300#FF	7		
1/2"-2"	CS,SST	150#RF	4	300#RF	5	600#RF	8
1/2"-2"	CS, SST	900#RF	9	1500#RF	F	1500#RTJ	R
1/2"-2"	ALL	BSP	P				
1/2"-2"	CS, SST	Extended Nipples			E		
1/2"-2"	SST	Non-High Purity Tube Ends			T		
DN15-25, 40, 50	BRZ	PN40 FF - will mate with PN16, 25 and 40					J
DN15-25, 40, 50	CS, SST	PN40 RF - will mate with PN16, 25 and 40					D

TABLE 6 - SENSING & LOWER SPRING			
Sensing	No Spring	2-5 psig	4-10 psig
	CODE	CODE	CODE
Internal	1	5	S
External	2	6	T
Large Internal	4	8	V

TABLE 7 - LOADING CONFIGURATION	
Option	CODE
None	0
Yes	L*

*Requires Additional Loading Schematic. See Product Coders 92 thru 98.

DP - **7** - **D**

KM MODEL DAP LARGE PISTON PILOT-OPERATED PRESSURE REDUCING REGULATOR - PORV

TABLE 8 - OPTIONS		
Description	Option	CODE
Special Construction	---	X
Reduced Port Orifice - Size 1/2" - 1"	-12	A
Special Cleaning: Per Cashco Spec #S-1134. W/ properly selected materials, this procedure suitable for oxygen service. BRZ or SST body material.	-55	M
Special Cleaning: Per Cashco Spec #S-1542. SST,CS & Cl body/spring chamber materials	-56	N
Special Cleaning: Per Cashco Spec #S-1589 Cl ₂ Service	-57	P
1/4" (DN8) FNPT Body Pressure Taps & Plugs	-85	T
Epoxy Painted	-95	W

- ASSIGNMENT OF "OPTION" CODES**
- When ordering a valve per one of Cashco's special drawings, the code "X" and the 5-digit number following override all other options. Otherwise, proceed with the following.
 - NUMERIC digits assigned first in "ascending" order.
 - ALPHA designations are assigned second (excluding the "X") in "alphabetical" order.
 - Left justify.
 - Add "0" to all unused squares.
 - If insufficient quantity of squares, consult factory for proper code.