



180°

60°

**Aerospace
Fluid Conveyance**

Aeroquip® Brand Aerocheck™ Hydraulic
Directional Control Valves

- Ultra Low Pressure Drops
- Leak-free Metal to Metal Sealing
- Withstands Large Range of Temperatures
- Long Life



Patent Pending

Table of Contents

Introduction	3
Design Features	3
Basic Operation & Technical Data	4
Weight and Performance Characteristics	6
Design Data	5
Dimensions: AS33514, Flareless, Male to Female	5
Dimensions: AS85421/1, Beam Seal, Male to Male	5
Part Numbers (Tables)	
Low Pressure Series: 0 - 1500 psi	6
Intermediate Pressure Series: 0 - 3500 psi	6
High Pressure Series: 0 - 5000 psi	7

Introduction

Eaton Aerospace is proud to add Aerocheck, Aeroquip brand hydraulic directional control valves, to their portfolio of high quality fluid conveyance products. Aerocheck valves are superior in attaining ultra low pressure drops, which conserves energy and ultimately saves operational costs over the life of the program. These check valves were selected for the Airbus A380 and Lockheed Martin F-35 Joint Strike Fighter because of their superior performance and reliability.

Design Features

- Spring outside the fluid flow path
- One piece housing
- Leak free* metal to metal sealing
- Constant Flow Area
- Hardened poppet valve
- Hydraulic dampening

Aerocheck valves were selected for their design parameters and performance including low weight, small envelope, minimal pressure drops, and high reliability. Eaton-Aeroquip used the latest software techniques to optimize flow path through the valve to limit eddies and minimize acceleration of the fluid which effectively reduces energy loss. The design incorporates leak free (1 drop per min max)* metal to metal sealing versus polymeric seals which allows for a greater range of temperatures that this check valve can operate under. The hardened interior poppet valve gives the check valve greater strength and durability for a long life. The one piece housing increases reliability eliminating any possibility for potential leak paths found in two piece housing designs. The hydraulic dampening feature decreases the energy of impact during valve cycling which increases the lifetime of the valve.

* Leak-free in aerospace industry can be considered 1 drop/min .



Aerocheck valves were chosen for the Airbus A380 for use in the landing gear and isolation package systems.

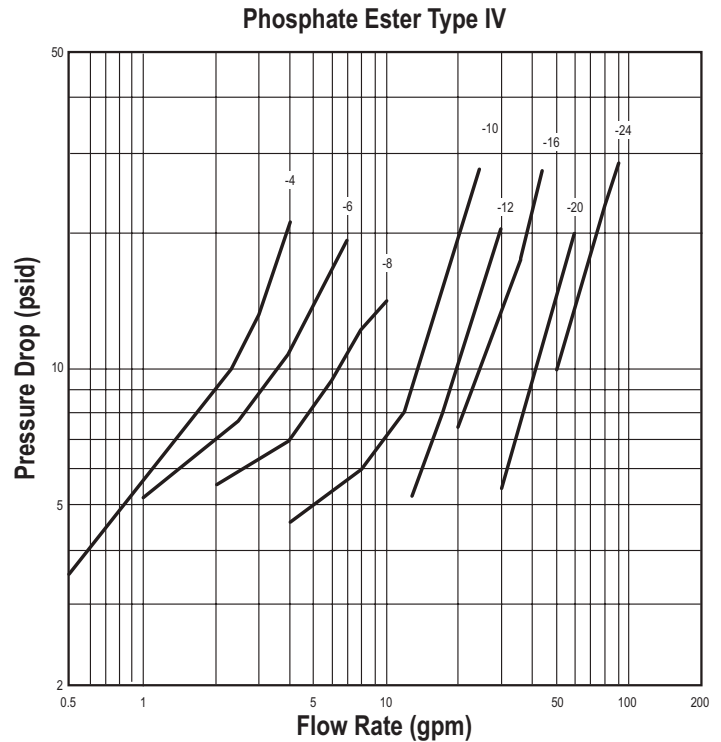
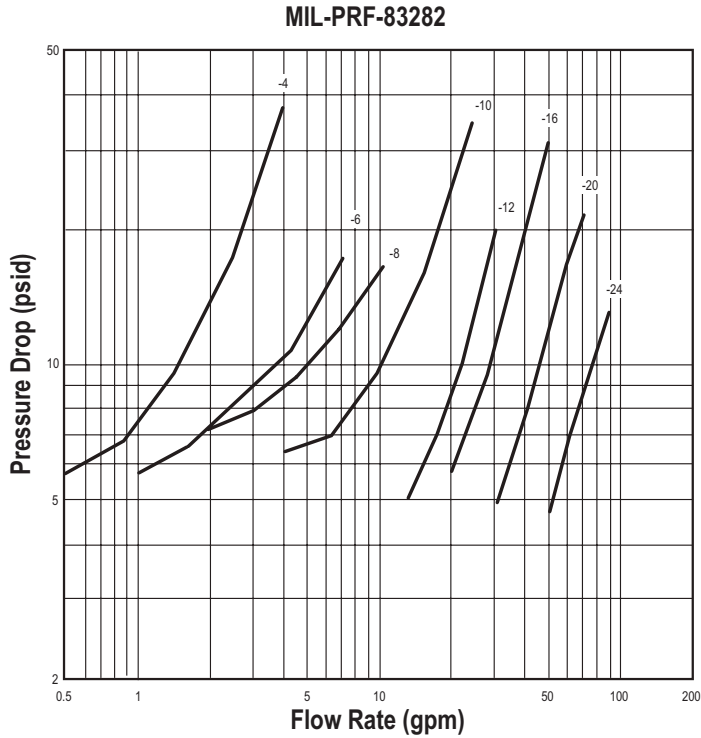


Aerocheck valves were also chosen for the Lockheed Martin F-35, which are used in the filter/reservoir installation.

Pressure Drop Flow Chart

Average Pressure Drop is significantly less for MIL-PRF-83282 and for Phosphate Ester fluids compared to maximum pressure drop at rated flow requirements of MIL-V-190698 (10 psig) and PRF-25675C (15 psig).*

*Meets the performance requirements of: MIL-PRF-25675C & ARP 4946



Design Data

Temperature Range:

-65°F - 400°F (-54°C - 204°C)

Applicable Fluid

Coolant per MIL-PRF-87252

Phosphate Ester Type IV and V per AS1241

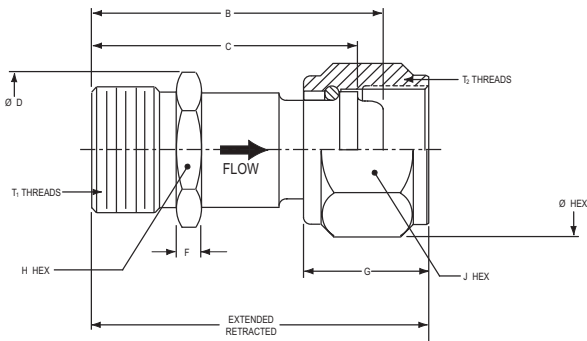
MIL-PRF-83282, 87257, 5606

End Fitting	Spec	End Fitting Type:
Beam Seal, Dynatube	AS85421/1	Male to Male (M:M)
Flareless	AS33514	Male to Female (M:F)

Design Data

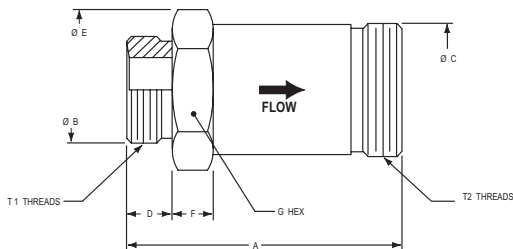
AS33514, Flareless, Male to Female (M:F) Dimensions:

Letter Code	Inlet Size	Outlet Size	DIMENSIONS-- (inches)										T1 Threads	T2 Threads
			EXTEND	RETRACT	B	C	D	E	F	G	H HEX	J HEX		
E	4	4	1.61	1.355	1.355	1.199	0.505	0.65	0.16	0.64	0.44	0.56	.4375-20 UNJF-3A	.4375-20 UNJF-3B
G	6	6	1.809	1.532	1.532	1.38	0.649	0.79	0.171	0.718	0.56	0.69	.5625-18 UNJF-3A	.5625-18 UNJF-3B
H	8	8	2.241	1.932	1.932	1.73	0.938	1.01	0.21	0.843	0.812	0.875	.7500-16 UNJF-3A	.7500-16 UNJF-3B
J	10	10	2.353	1.995	1.995	1.793	1.083	1.15	0.191	0.968	0.937	1	.8750-14 UNJF-3A	.8750-14 UNJF-3B
K	12	12	2.736	2.37	2.37	2.165	1.299	1.44	0.2	1.015	1.13	1.25	1.0625-12 UNJ-3A	1.0625-12 UNJ-3B
M	16	16	3.096	2.731	2.731	2.53	1.59	1.73	0.22	1.126	1.375	1.5	1.3125-12 UNJ-3A	1.3125-12 UNJ-3B
N	20	20	3.28	2.9	2.9	2.7	1.87	2.3	0.23	1.168	1.625	2	1.625-12 UNJ-3A	1.625-12 UNJ-3B
P	24	24	3.6	3.23	3.23	3.03	2.2	2.6	0.25	1.41	2	2.25	1.8750-12 UNJ-3A	1.8750-12 UNJ-3B



AS85421/1, Beam Seal, Male to Male (M:M) Dimensions:

Letter Code	Inlet Size	Outlet Size	DIMENSIONS-- (inches)							T1 Threads	T2 Threads
			A	B	C	D	E	F	G HEX		
G	6	8	1.83	0.558	0.715	0.295	0.866	0.375	0.75	.5625-20 UNJS-3A	.7188-20 UNJS-3A
H	8	10	1.89	0.715	0.84	0.308	1.01	0.5	0.875	.7188-20 UNJS-3A	.8348-18 UNJS-3A
J	10	12	2.23	0.84	1	0.37	1.15	0.2	1	.8348-18 UNJS-3A	1.0000-16 UNJ-3A
K	12	16	2.5	1	1.245	0.412	1.5	0.218	1.188	1.0000-16 UNJS-3A	1.2500-14 UNJS-3A
M	16	20	2.667	1.245	1.51	0.46	1.732	0.585	1.5	1.2500-14 UNJS-3A	1.5781-14 UNJS-3A
N	20	24	3.1	1.51	1.776	0.752	2.237	0.534	1.937	1.5781-14 UNJS-3A	1.8438-14 UNJS-3A



Design Data

Options below available upon request in jump size and size to size configurations

M:M Flared (AS33656) M:F Flared (AS33656) M:M Flareless (AS33514)

Low pressure Series: 0-1500 psi

Material Fitting Dash Size	Body: Aluminum, Nut: Aluminum	
	AS33514, Flareless, M:F	
	Part Number	Weight (lbs)
-4	AE75432E	0.04
-6	AE75432G	0.06
-8	AE75432H	0.13
-10	AE75432J	0.14
-12	AE75432K	0.31
-16	AE75432M	0.34
-20	AE75432N	0.66
-24	AE75432P	0.78

Intermediate Pressure Series: 0-3500 psi

Material Fitting Dash Size	Body: Stainless Steel, Nut: Stainless Steel		Body: Stainless Steel, Nut: Titanium		Body: Titanium, Nut: Titanium	
	AS33514, Flareless, M: F		AS33514, Flareless, M: F		AS33514, Flareless, M: F	
	Part Number	Weight (lbs)	Part Number	Weight (lbs)	Part Number	Weight (lbs)
-4	AE75433E	0.07	AE75434E	0.06	AE75435E	0.05
-6	AE75433G	0.11	AE75434G	0.10	AE75435G	0.08
-8	AE75433H	0.22	AE75434H	0.20	AE75435H	0.16
-10	AE75433J	0.27	AE75434J	0.25	AE75435J	0.18
-12	AE75433K	0.52	AE75434K	0.48	AE75435K	0.38
-16	AE75433M	0.66	AE75434M	0.61	AE75435M	0.44
-20	AE75433N	1.20	AE75434N	1.10	AE75435N	0.80
-24	AE75433P	2.30	AE75434P	1.70	AE75435P	1.13

High Pressure Series: 0-5000 psi

Material Fitting Jump Sizes	Stainless Steel Series		Titanium Series	
	A4207, Beam Seal, M: M		A4207, Beam Seal, M: M	
	Part Number	Weight (lbs)	Part Number	Weight (lbs)
-4 to -6	AE75436E	0.072	AE75437E	0.068
-6 to -8	AE75436G	0.13	AE75437G	0.08
-8 to -10	AE75436H	0.20	AE75437H	0.12
-10 to -12	AE75436J	0.26	AE75437J	0.15
-12 to -16	AE75436K	0.42	AE75437K	0.24
-16 to -20	AE75436M	0.78	AE75437M	0.45
-20 to -24	AE75436N	1.47	AE75437N	0.85

Material Fitting Dash Size	Body: Stainless Steel, Nut: Stainless Steel		Body: Stainless Steel, Nut: Titanium		Body: Titanium, Nut: Titanium	
	AS33514, Flareless, M:F		AS33514, Flareless, M:F		AS33514, Flareless, M:F	
	Part Number	Weight (lbs)	Part Number	Weight (lbs)	Part Number	Weight (lbs)
-4	AE75453E	0.07	AE75454E	0.06	AE75455E	0.05
-6	AE75453G	0.11	AE75454G	0.10	AE75455G	0.08
-8	AE75453H	0.23	AE75454H	0.21	AE75455H	0.17
-10	AE75453J	0.28	AE75454J	0.25	AE75455J	0.19
-12	AE75453K	0.55	AE75454K	0.50	AE75455K	0.40
-16	AE75453M	0.71	AE75454M	0.63	AE75455M	0.47
-20	AE75453N	1.38	AE75454N	1.20	AE75455N	0.91

The user should carefully observe the precautions listed in this catalog or brochure, including the recommendations on the selection of Aerocheck™ valve on the relevant pages and the pages on fluid compatibility. Maximum application operating pressure should not exceed operating pressure listed.

WARNING: Application considerations must be observed in selecting appropriate components for the application of these products contained herein. The failure to follow the recommendations set forth in this catalog may result in

an unstable application, which may result in serious personal injury or property damage.

EATON OR ANY OF ITS AFFILIATES OR SUBSIDIARIES SHALL NOT BE SUBJECT TO AND DISCLAIMS ANY OBLIGATIONS OR LIABILITIES (INCLUDING BUT NOT LIMITED TO ALL CONSEQUENTIAL INCIDENTAL AND CONTINGENT DAMAGES) ARISING OUT OF BREACH OF CONTRACT OR OF WARRANTY OR ARISING FROM TORT CLAIMS (INCLUDING WITHOUT LIMITATION NEGLIGENCE AND STRICT LIABILITY) OR OTHER THEORIES

OF LAW WITH RESPECT TO ANY AEROCHECK™ VALVE ASSEMBLY NOT PRODUCED FROM GENUINE EATON COMPONENTS AND ASSEMBLED IN CONFORMANCE USING GENUINE EATON COMPONENTS WITH THE PROCESS AND PRODUCT INSTRUCTIONS SET FORTH HEREIN.

Eaton Corporation
Fluid Conveyance
Rt. 2, Box 361
Meadowbrook Road
Eastanollee, Georgia 30538
Phone: (706) 779-3351
Fax: (706) 779-2638

Eaton Corporation
Fluid Conveyance
300 South East Avenue
Jackson, Michigan 49203-1972
Phone: (517) 787-8121
Fax: (517) 787-5758

Eaton LTD
Fluid Conveyance
Broad Ground Road
Lakeside
Redditch
Worcs B98 8YS
England
Phone: (44) 152-751-7555
Fax: (44) 152-751-7556

Eaton Corporation
Fluid Conveyance
2500 W. Argyle St.
P.O. Box 1845
Jackson, Michigan 49202-1845
Phone: (517) 787-8121
Fax: (517) 789-4716

Eaton LTD
Fluid Conveyance
Chemin De Pau
64121 Serres-Castet
France
Phone: (33) 559-333-864
Fax: (33) 559-333-865

Eaton Aerospace
Fluid Conveyance
11642 Old Baltimore Pike
Beltsville, Maryland 20705
Phone: (301) 937-4010

Eaton Aerospace
Fluid Conveyance
2 Rue Lavoistier BP 54 78310
Coignieres, France
Phone: +33 1-30-69-3000

Eaton Aerospace
Fluid Conveyance
15 Pioneer Ave.
Warwick, RI 02888
Phone: (401) 781-4700

Eaton LTD
Fluid Conveyance
Posttach 1026
Carl -Benz-Strasse 9
D-82205 Gilching
Germany
Phone: (49) 810-575-0
Fax: (49) 810-575-27

