

**Aeroquip® Brand**  
Aerocheck™ Hydraulic Directional Control Valves

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



---

## 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.

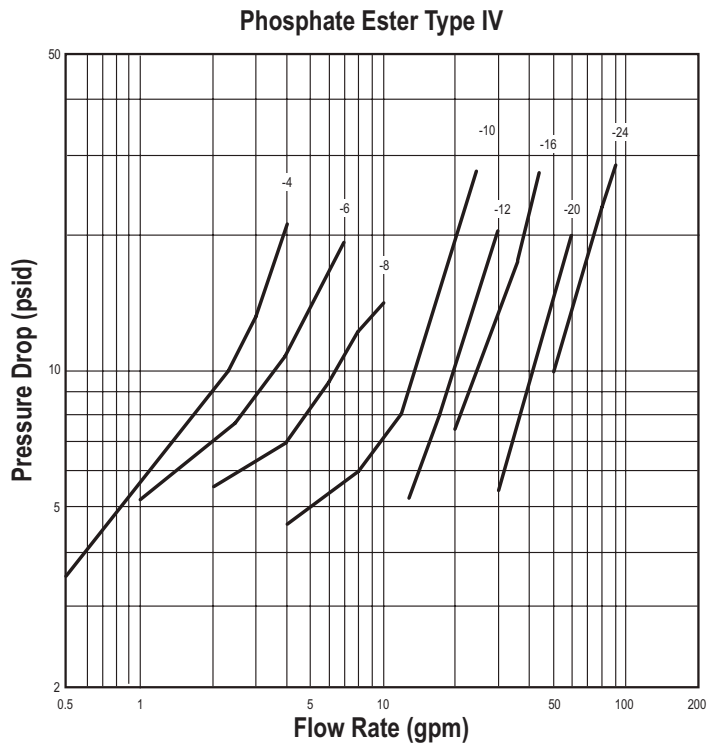
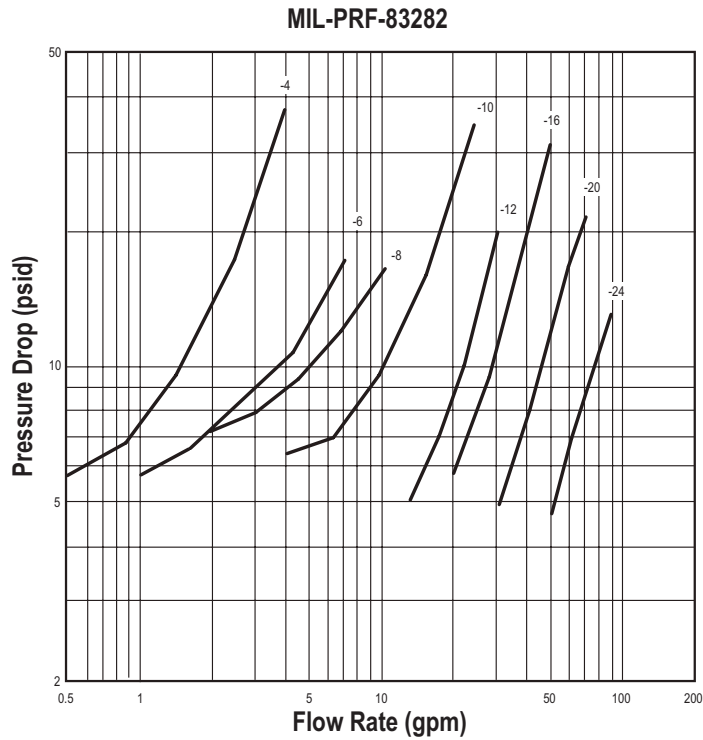


Aerocheck valves were also chosen for the Lockheed Martin F-35, which are used in the filter/reservoir installation.

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

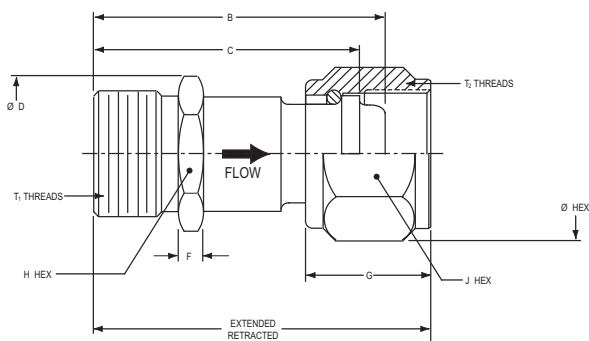
**Temperature Range:**  
-65°F - 400°F (-54°C - 204°C)

**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)

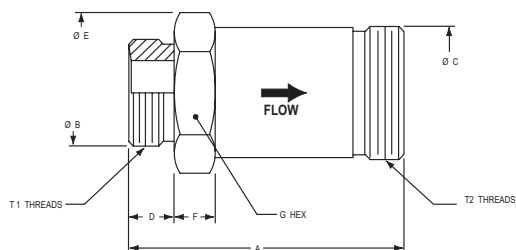
## AS33514, Flareless, Male to Female (M:F) Dimensions:

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



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**  
**Aerospace Group**  
**Conveyance Systems Division**  
**300 South East Avenue**  
**Jackson, Michigan 49203-1972**  
**Phone: (517) 787 8121**  
**Fax: (517) 789 2947**

Eaton  
Aerospace Group  
Conveyance Systems Division  
90 Clary Connector  
Eastanollee, Georgia 30538  
Phone: (706) 779 3351  
Fax: (706) 779 2638

Eaton  
Aerospace Group  
Conveyance Systems Division  
9650 Jeronimo Road  
Irvine, California 92618  
Phone: (949) 452 9500  
Fax: (949) 452 9992

Eaton  
Aerospace Group  
Conveyance Systems Division  
11642 Old Baltimore Pike  
Beltsville, Maryland 20705  
Phone: (301) 937 4010  
Fax: (301) 937 0134

Eaton  
Aerospace Group  
Conveyance Systems Division  
15 Pioneer Ave.  
Warwick, Rhode Island 02888  
Phone: (401) 781 4700  
Fax: (401) 785 4614

Eaton S. A.  
Aerospace Group  
Conveyance Systems Division  
2 Rue Lavoisier BP 54 78310  
Coignieres, France  
Phone: (33) 130 69 30 00  
Fax: (33) 130 69 30 56

Eaton Limited  
Aerospace Group  
Conveyance Systems Division  
Broad Ground Road  
Lakeside, Redditch  
Worcestershire  
B98 8YS  
United Kingdom  
Phone: (44) 1527 517555  
Fax: (44) 1527 517556

Eaton S.A  
Aerospace Group  
Conveyance Systems Division  
62 Chemin De Pau  
64121 Serres-Castet  
France  
Phone: (33) 559 333 864  
Fax: (33) 559 333 865

Eaton Germany GmbH  
Aerospace Group  
Conveyance Systems Division  
Rudolf-Diesel-Str. 8  
82205 Gilching  
Germany  
Phone: (49) 8105 75 0  
Fax: (49) 8105 75 55

Vickers Systems Pte Ltd  
Aerospace Group  
Conveyance Systems Division  
Lot 512, Jalan Delima,  
Batamindo Industrial Park  
Batam 294533, Indonesia  
Phone: (62) 770 611823  
Fax: (62) 770 611821