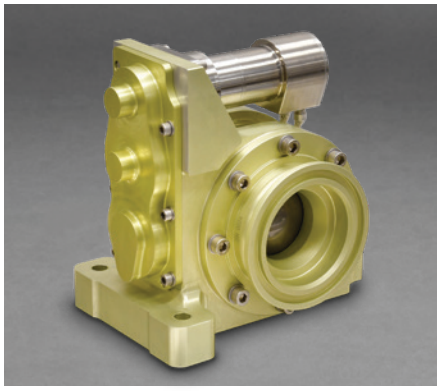
ECLSS LOW PRESSURE VALVES



Moog produces a variety of fluid control components used in human space vehicles as part of their environmental control and life support systems (ECLSS). The components include mechanical pressure regulators, manual and electrically actuated valves, and passive components such as quick disconnects. These components are used in high- and low-pressure breathing gas control systems, as well as liquid fluid control for thermal management.

KEY FEATURES

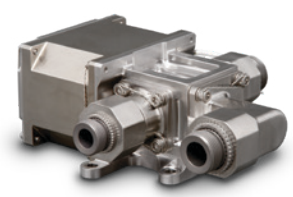
- Low pressure O_2 and fluids at 14.5 psi to 145 psi, with gas mass flow rates of 0.011 lbm/sec (O_2), liquid mass flow rates of 0.1 lbm/sec (H_2O), and volumetric flow rates of >170 ACFM O_2

Electrically-actuated valves are 28 VDC devices that use brushless DC motors and solenoids to drive the units open or closed, and include normally-open / normally-closed and latching designs. Certain designs provide position indication capability.

MOOG

ECLSS LOW PRESSURE VALVES

PERFORMANCE CHARACTERISTICS




Valve	Model 52-307 & 52-311, 52E341 & 52E342 2- and 3-way Isolation Valves	Model 50-1474 2-way Isolation Valve w/Manual Override	Model 50-1396 Motorized Ball Valve – 1.5”	Model 50-1395 Motorized Ball Valve – 2.0”
Description	Torque motor design, latching	Torque motor design, latching, manual override	Ball valve, BLDC actuated	Redundant Ball valve, BLDC actuated
Media	Oxygen, Ammonia, Propylene Glycol, Urine	Oxygen and Nitrogen	Oxygen	Oxygen
Unit Mass	3.4 lbm	4.0 lbm	4.75 lbm	14.5 lbm
Dimensions (L W H)	4.8” x 2.3” x 4.5”	4.8” x 2.3” x 5.0”	5.4” x 3.9” x 5.1”	10.4” x 6.2” x 9.6”
MEOP	145 psia	145 psia	23.5 psia	8.6 psia
MDP	145 psia	145 psia	23.5 psia	8.6 psia
Factors of Safety	Proof: 1.5x MEOP; Burst: 2.5x MEOP	Proof: 1.5x MEOP; Burst: 2.5x MEOP	Proof: 1.5x MEOP; Burst: 2.5x MEOP	Proof: 1.5x MEOP; Burst: 2.5x MEOP
Design Pressure Drop	0.88 psid H_2O @ 70°F & 0.1 lbm/sec	0.9 psid	0.8 psid	0.025 psid
Design Flowrate	0.1 lbm/sec H_2O @ 70°F	0.018 lbm/sec N_2; 0.01 lbm/sec O_2	675 lbm/hr Air @ 14.9 psia, 80°F	78 ACFM Air @ 14.7 psia, 75°F
Leakage – Internal (@ MDP, GHe)	$< 1 \times 10^{-3}$ scc/sec	$< 1 \times 10^{-3}$ scc/sec	$< 1 \times 10^{-2}$ scc/sec	$< 5 \times 10^{-3}$ scc/sec
Leakage – External (@ MDP, GHe)	$< 1 \times 10^{-3}$ scc/sec	$< 1 \times 10^{-3}$ scc/sec	$< 1 \times 10^{-3}$ scc/sec	$< 1 \times 10^{-3}$ scc/sec
Temperature (Operating)	-40°F – 160°F	-40°F – 160°F	-15°F – 160°F	+5°F – 150°F
Random Vibration	83 Grms	22 Grms	10.35 Grms	2.86 Grms* (analysed to 61.48 Grms)
Shock	3588 G	2100 G	3500 G	5500 G
Cycle Life	900 cycles	13000 cycles	900 cycles	860 cycles
Wetted Materials	CRES, PTFE	CRES, PTFE	Aluminum, CRES, PTFE	Aluminum, CRES, PTFE
Filtration	55 micron absolute	N/A	N/A	N/A
Response Time (Open/Close)	100 milliseconds	100 milliseconds	2 sec	2.5 sec
Operating Voltage	26 ± 1 VDC	28 VDC	28 VDC	21 – 26 VDC
Current Draw	0.6 Amp	0.6 Amp	0.45 Amp min, controller limited	0.625 Amp min, controller limited
Position Indication	No	Yes	No	No

*Note: * – shock isolated level*

MOOG
SPACE AND DEFENSE GROUP

For More Information:
Bill Vogt
bvogt@moog.com
www.moog.com/space

Moog Space and Defense @MoogSDG @MoogSDG @MoogSDG @MoogInc