

# MICROVALVE



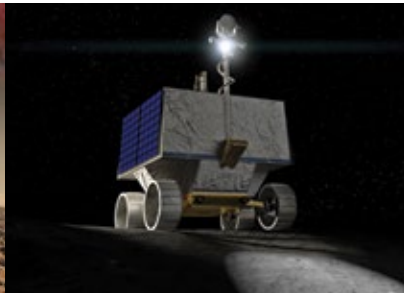
**IN SPACE, EVERY MOLECULE COUNTS.** MINDRUM PRECISION IS PROUD TO BE THE SOLE MANUFACTURER OF THE NASA-DESIGNED MICROVALVE, A MINIATURIZED DOUBLE-LATCHING SOLENOID VALVE WITH THE CLOSEST THING TO A ZERO LEAK RATE OF ANY VALVE OF ITS KIND IN EXISTENCE. USED IN BOTH COMMERCIAL AND GOVERNMENTAL AEROSPACE APPLICATIONS, THIS VALVE IS THE GO-TO CHOICE FOR ALL SPACE-BASED MASS SPECTROMETRY SYSTEMS AND INSTRUMENT SUITES, AND ITS MINIMIZED LEAK RATE WILL INCREASE BOTH THE ACCURACY AND THE WORKING LIFE OF YOUR PROJECT TO THE MAXIMUM EXTENT POSSIBLE. AS A MINIATURIZED VALVE, THE MICROVALVE HAS AN EXTREMELY SMALL FOOTPRINT IN TERMS OF BOTH MASS AND VOLUME. IN ADDITION TO PRODUCING THE VALVE ITSELF, MINDRUM PRECISION ALSO FREQUENTLY MACHINES CUSTOM COMPLEMENTARY PARTS FOR MICROVALVE MISSIONS; WE CAN MACHINE ANYTHING FROM MASS SPEC HOUSINGS TO CUSTOM MATING COMPONENTS, AND CREATE THE COMPLEMENTARY SOLUTIONS THAT YOU NEED IN ANYTHING FROM TITANIUM TO ALUMINA TO ZERODUR.

OUR MICROVALVE HAS BEEN TRUSTED ON A LARGE NUMBER OF SPACE MISSIONS BOTH IN THE USA AND ABROAD, AND THIS LIST IS STEADILY INCREASING AS COMMERCIAL SPACEFLIGHT IS CONTINUING TO EMERGE AS A GROWING INDUSTRY; SEVERAL HIGH-PROFILE PROJECTS ARE LISTED BELOW. AT MINDRUM PRECISION, WE ARE A PROUD PARTNER OF SOME OF MANKIND'S GREATEST TECHNOLOGICAL ACCOMPLISHMENTS, AND WE LOOK FORWARD TO HELPING YOUR NEXT PROJECT ACHIEVE ITS OBJECTIVES.



**CURIOSITY ROVER**

Surface Analysis at Mars (SAM)



**VIPER ROVER**

Mass Spectrometer Observing Lunar Operations (MSOLO)



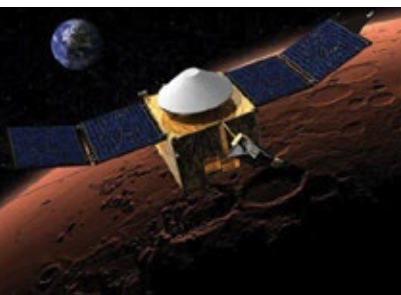
**SOLAR ORBITER**

Spectral Imaging of the Coronal Environment (SPICE)



**ORION**

Multi-Platform Air Monitor (MPAM)



**MAVEN**

Neutral Gas and Ion Mass Spectrometer (NGIMS)



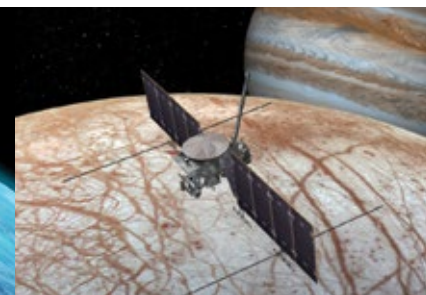
**EXOMARS**

Mars Organic Molecule Analyser (MOMA)



**INT'L SPACE STATION (ISS)**

Spacecraft Air Monitor (SAM)



**EUROPA CLIPPER**

MASS SPECTROMETER FOR PLANETARY EXPLORATION (MASPEX)

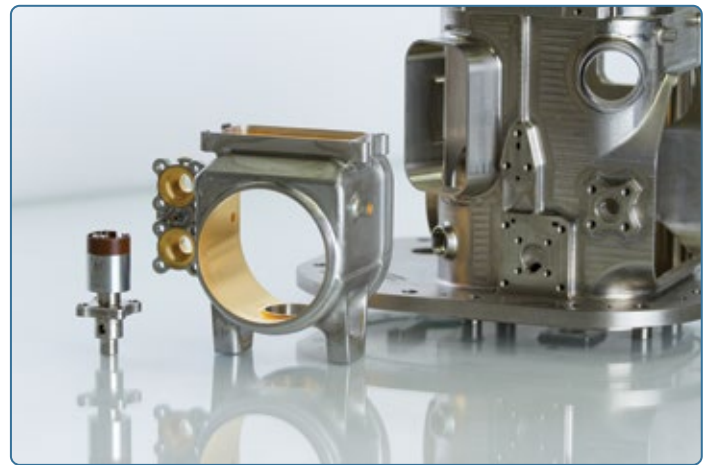


### SPECIFICATIONS

- ▣ INSTANTANEOUS HELIUM LEAK RATE: <math>< 1 \times 10^{-10}</math> ATM-CC/SEC
- ▣ STEADY STATE HELIUM LEAK RATE: <math>< 5 \times 10^{-9}</math> ATM-CC/SEC
- ▣ OPERATIONAL TEMPERATURE: -60°C TO 220°C
- ▣ ACTUATION TIME: <math>< 1</math> MILLISECOND
- ▣ OVERALL LENGTH: 1.616"
- ▣ TOTAL MASS: 25 GRAMS
- ▣ TOTAL MOVING MASS: 2 GRAMS
- ▣ POWER: 18-28 VDC

### KEY FEATURES

- ▣ FLOATING PINTLE TIP THAT SELF-SEATS
- ▣ REMOVABLE SOLENOID
- ▣ INERT, HIGH-TEMPERATURE MATERIALS
- ▣ LATCHES IN OPEN OR CLOSED POSITION WITH NO POWER
- ▣ COILS CAN BE RUN IN PARALLEL OR SERIES



**With over a half-century of manned spaceflight experience,** our parts have been trusted on some of mankind's proudest achievements. We look forward to working with you to bring your next project off of the drawing board and into reality.