



CIRCOR
AEROSPACE
Technology Takes Flight

Circle Seal Controls

Motor Operated Valves
Overview
Product Line Summary

CIRCLE SEAL CONTROLS

Corona, California



Lot Size 237,000 S.F.
(72,000 S.M.)

Building

1st Floor 68,000 S.F.
(21,000 S.M.)

2nd Floor 17,000 S.F.
(5,200 S.M.)

Available Expansion

(2nd Floor) 30,000 S.F.
(9,100 S.M.)

HISTORY OF THE ELECTRO-MECHANICAL (EM) PRODUCT LINE

- Circle Seal started in the motor operated valve business in the mid 1970's at the request of Douglas Aircraft Company in Long Beach California.
- The product offering expanded with the acquisition of the ZEVCO Valve Company in 1995.
- Continuous organic growth brought innovative designs to the market with EMI suppression, modulating actuators and cam bus feed back available.

**Overview Of
Various
Motor Operated Valves
Currently Available From
Circle Seal Controls**

VALVE TYPES - BALL



**3/8 Inch To 1 1/2 Inch Line
Sizes (9.5MM to 30.5MM)**

**Operating Pressures To
3,000 PSI (206 Bar)**

**Excellent for Hydraulic,
Fuel and Water System
Applications**

AC and DC Voltages

VALVE TYPES - PLUG



**Line Sizes: 3/8 To 1 Inches
(9.5MM to 25.4MM)**

**Operating Pressures To
3000 PSI (206 Bar)**

**Hydraulic and Pneumatic
Applications**

AC and DC Voltages

VALVE TYPE - BUTTERFLY



**Line Sizes: 3 To 5 Inches
(76MM to 127MM)**

**Operating Pressures To
400 PSI (27.5 Bar)**

**Hydraulic and
Pneumatic Applications**

AC and DC Voltages

VALVE TYPE - SPOOL



**Line Sizes: 1/4 To 1
Inch (6.3MM to 25.4MM)**

**Operating Pressures
To 3000 PSI (206 Bar)**

**Excellent for Hydraulic
Applications**

AC and DC Voltages

VALVE TYPE - LIGHTWEIGHT



**3/8 Inch To 1 1/2 Inch
Line Sizes (9.5MM to
30.5MM)**

**Operating Pressures To
3,000 PSI (206 Bar)**

**Excellent for Hydraulic,
Fuel and Water
System Applications**

AC and DC Voltages

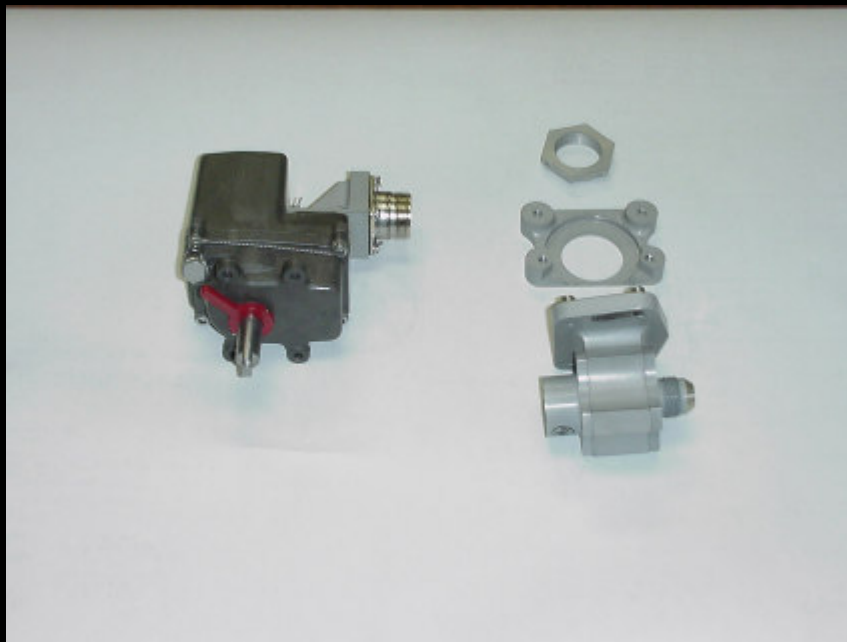
SPECIAL FEATURES – AVAILABLE THERMAL RELIEF



Typical thermal relief valves allow trapped media to relief excess pressure due to thermal expansion.

Thermal relief valves can provide one way or two way pressure relief.

SPECIAL FEATURES – AVAILABLE SEMI-SUBMERSIBAL



Semi-Submersible motor operated valves are designed to isolate the actuator assembly from the independent valve. The valve would operate while being totally or partially submerged in a fluid media.

ACTUATORS



Circle Seal offers motor driven actuators for applications where a valves is not required.

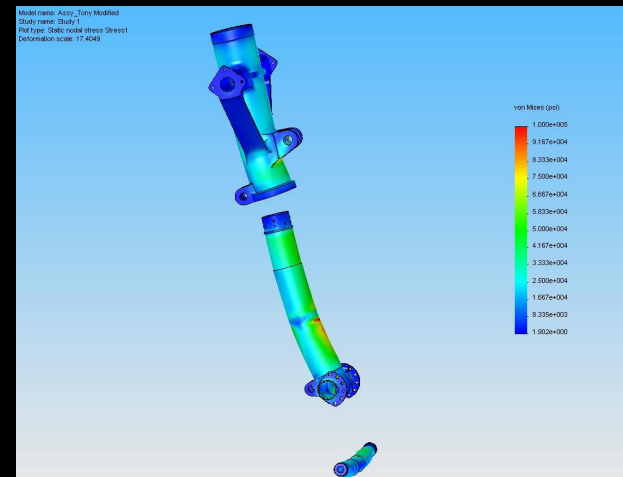
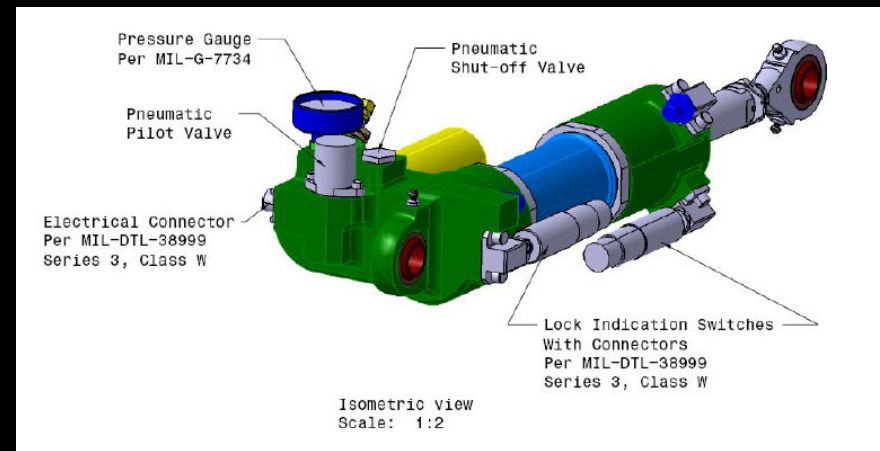
APPLICATIONS

WORK IN PROCESS

- BALL VALVE: EM91-102-2, 1", FUEL SYS LEAR 45
- BALL VALVE: EM91-167-12, 3/4", FUEL SYS FALCON 7X (LIGHTWEIGHT DESIGN)
- GATE VALVE; ZMV20, 2", FUEL SYS, IAI G150/200
- SPOOL VALVE; EM95-6-5 737,767,747

Engineering Design Tools

- CAD:
 - CATIA V5
 - NX V4
 - SolidWorks
- Dynamic/System Analysis:
 - Kinematics (ADAMS)
 - Hydraulic/Pneumatics (EASY5)
- Stress:
 - PATRAN/MARC
 - Cosmos
 - Other Canned Routines in MathCad



Engineering Test

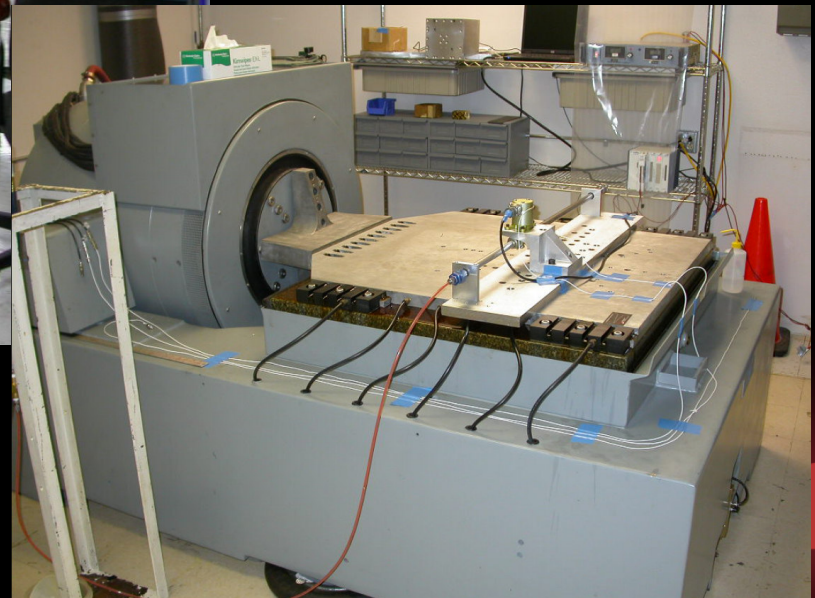
- Test Fixture Design
 - Simulated Aircraft Geometry
 - Aircraft Orientation
 - Aircraft Compliance

- Closed Loop Test Capability
 - Based on National Instruments Equipment and LabView Software
 - Endurance
 - Fatigue/Impulse

- Environment Testing
 - Humidity Chamber
 - Cold and Hot Temperature
 - Vibration/Shock (T-1000)

- Test Benches
 - Skydrol (5,000 psig)
 - Red Oil (5,000 psig)
 - High Pressure Pneumatics (4400 psig)
 - Fuel

Engineering Test Lab





Water



Hydraulic Power Generation



Steering Control



Landing Gear Systems



Landing Gear Actuation



Fuel



Pneumatic



Micro Switches



Weapon Release



Actuation

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