Shafer™ RV-Series Rotary Vane Valve Actuators
Operating Valves in Critical Pipeline Applications
Emerson – Actuation Technologies is recognized worldwide for the reliability of its actuators under the most demanding conditions. The Shafer™ RV-Series rotary vane actuator was specifically designed for pipeline applications where rugged dependability of equipment is vital.

Shafer rotary vane actuators are used to automate ball valves or plug valves in all types of severe climatic conditions. Over the last 60 years, more than 100,000 rotary vane actuators have been successfully installed on various kinds of pipelines, and most of the actuators are still in operation.

- Full open/close operation of ball valves and plug valves
- Automation of valves on natural gas pipelines where the actuators are typically powered by natural gas using gas-over-oil technology
  - Emergency Shut Down
  - Mainline isolation
  - Linebreak protection
  - Station blow down
  - Remote valve control
  - Hi/low pressure shutoff
  - River crossings
- The rotary vane’s compact size and concentric weight distribution make it ideal for high vibration applications
  - Slurry pipelines
  - Pump and compressor stations
- Valve automation for crude oil or refined products pipelines with precise control of the stroking speed

Applications

- Torque output range:
  - 1,000 lbf-in to 17.8 million lbf-in
  - (113 Nm to 2.0 million Nm)
- Power supply pressure range:
  - 200 psi (13.8 bar) minimum, up to 3,000 psi (206.8 bar) on various models
- Ambient temperature range:
  - -20°F to 250°F (-29°C to 121°C) Standard
  - -50°F to 250°F (-46°C to 121°C) Optional
  - -76°F to 250°F (-60°C to 121°C) Consult Factory
The rotary vane actuator models an ideal torque couple. The resultant force vectors acting on the vanes are always perpendicular to the vane surface. The two opposing forces form a torque couple which is the most efficient method of producing rotation.

The balanced torque output of the rotary vane actuator will not produce any destructive side loading forces that could be transmitted to the valve stem or the actuator’s bearings.

Torque output of the rotary vane actuator remains constant throughout the full rotation of the valve. This ensures that your specified safety factor will not be jeopardized at different positions during the valve stroke. Constant torque output is an especially important feature in the following applications:

- Potentially high flow applications like blow down and line break
- Plug valves or metal to metal seated valves
- Ball valves with rotating seats
Construction

- Pressure equalizing passages in the upper head
- Vane Seal
- Shoe Seal
- Cast Iron Stationary Shoe
- Adjustable Travel Stop
- Carbon Steel Lower Head
- Carbon Steel Upper Head
- Bronze Rotor Bearing
- Bronze Wear Pads
- Carbon Steel Rotor/Vane Module
- Carbon Steel Body
Performance Features

- Life expectancy is 50 years with minimal maintenance
- Proven reliability backed by a 10 year warranty
- The most compact actuator available
- The double vane design will not generate any side loading forces on the valve stem or actuator bearings
- Constant torque output over the full 90° rotation
- Vibration resistant with the actuator body centered directly over the valve stem and weight equally distributed over the valve flange
- Maximum rated pressure and maximum operating pressure are equal
- Valve response is always smooth and always dependable
SEQUENCE 1

The actuator may be powered by a hydraulic power unit, stored gas pressure or by natural gas pressure from a pipeline. In this illustration, the actuator is fitted with gas hydraulic tanks and is powered by gas pressure. In the first sequence, the actuator is in the open position. There is no pressure in the actuator or tanks.

SEQUENCE 2

The actuator control system is used to admit high pressure gas into the closing gas hydraulic tank. The pressurized gas in the tank forces hydraulic fluid into the actuators closing port. Pressure equalizing passages allow both closing quadrants to be pressurized simultaneously providing balanced torque as the vanes push away from the stationary shoes. The actuator is rotating clockwise.

SEQUENCE 3

When the actuator reaches the fully closed position, the control system will allow all remaining pressure in the tank to vent to atmosphere, thus neutralizing the pressure in the tank and actuator.
Shafer designs, builds and tests the complete valve operating system, including the actuator, controls and accessories. When you specify Shafer, you receive a complete system, factory tested, field proven and **guaranteed**.

Shafer RV-Series actuators can be operated locally, remotely or automatically by a variety of sensory and control devices. We have developed more than 4000 individual control systems to meet the many requirements of our customers.

**TYPICAL CONTROL SYSTEMS**

- Local manual
- Remote two-way electric
- Linebreak Protection sensing rate of pressure drop
- Emergency Shutdown (ESD) or fail-safe
- High/low pressure shutoff

**COMMON ACCESSORIES**

- Manual hydraulic hand pump
- Control valves – hydraulic and pneumatic
- Sensors for automatic operation
- Power storage vessels
- Power supply units
- Limit switches and position transmitters
- Speed controls
- Regulators
- Filters

All accessories have undergone thorough testing and field evaluation to insure their performance as part of a larger system.

**Proven reliability backed by a 10 year warranty**

**More than 4000 control systems developed.**

**We design, build and test the complete valve control system**
World Area Configuration Centers (WACC) offer sales support, service, inventory and commissioning to our global customers. Choose the WACC or sales office nearest you:

NORTH & SOUTH AMERICA
19200 Northwest Freeway
Houston TX 77065
USA
T +1 281 477 4100
Av. Hollingsworth
325 Iporanga Sorocaba
SP 18087-105
Brazil
T +55 15 3413 8888

ASIA PACIFIC
No. 9 Gul Road
#01-02 Singapore 629361
T +65 6777 8211
No. 1 Lai Yuan Road
Wuqing Development Area
Tianjin 301700
P. R. China
T +86 22 8212 3300

MIDDLE EAST & AFRICA
P. O. Box 17033
Jebel Ali Free Zone
Dubai
T +971 4 811 8100
P. O. Box 10305
Jubail 31961
Saudi Arabia
T +966 3 340 8650
24 Angus Crescent
Longmeadow Business Estate East
P.O. Box 6908 Greenstone
1616 Modderfontein Extension 5
South Africa
T +27 11 451 3700

EUROPE
CRT Contrôle
16 ZA Croix Saint Mathieu
28320 Gallardon
France
T +33 2 37 90 28 10
Holland Fasor 6
Székesfehérvár 8000
Hungary
T +36 22 53 09 50
Strada Bifi 165
29017 Fiorenzuola d’Arda (PC)
Italy
T +39 0523 944 411

For complete list of sales and manufacturing sites, please visit www.emerson.com/actuationtechnologies/locations or contact us at info.actuationtechnologies@emerson.com

©2018 Emerson. All rights reserved.
The Emerson logo is a trademark and service mark of Emerson Electric Co.
Shafer™ is a mark of the Emerson family of companies. All other marks are property of their respective owners.