REflex

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Control and Shut-Off Valves | Variety of Trim Designs in Different Materials | Electric and Pneumatic Actuators as Standard

General Stem-Guided Control Valves

NPS ½ - 12 (DN 15 - 300)

CL 150 - 900 (PN 16 - 160)

www.rtk.de

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REflex Product Information

REflex

BROADEST RANGE IN THE INDUSTRY

The REflex line of two and three way valves offers more possibilities than any other valve brand in the industry. It is an all-purpose stem guided control valve, suitable for use in a wide range of industries. Using a modular design, and with numerous trim styles and materials available, there is a valve for nearly every application. **All valves are available either as ANSI or DIN, ensuring that direct replacement is always possible.**

TRIM OPTIONS

Interchangeable plugs and seats offer maximum versatility in flow control applications.

Plug variations include:

- **On/Off Plug** – Provides maximum flow with minimum pressure drop.
- **Parabolic Plug** – Covers all Cv ranges and is especially suitable for low differential pressures.
- **V-Port Plug** – Shorter stroke allows smaller actuators to be used.
- **Perforated Plug** – Reduces noise and offers protection against cavitation.
- All trims are also available with **Quick Change** option, which allows an easy replacement of the seat ring.

TRIM MATERIALS

Standard valve trim consists of series 400 stainless steel plugs with 316 stainless steel seats. In addition, 316 stainless steel plugs are available offering superior corrosion resistance. Seating surfaces (both plug and seat ring) are available with a nickel/cobalt overlay (Stellite®) or in a hardened version which provides significantly longer service life. Complete trims (plug and seat) are also available in Ferro-Titanium offering a trim for the most demanding applications.

WIDE VARIETY OF STEM PACKINGS

Including: Maintenance free self-adjusting multilayer PTFE packing, pure graphite packing, Bellows seal and chloroprene packing (for refrigeration). The REflex can be delivered with a stem packing for the given application. On top of the wide selection of different packings available, all valve stems are roller burnished preventing burrs that can damage the packing, thus extending the service life of the packing.

HIGH FLOW CAPACITIES

Widest Cv range in the industry, coupled with optimized flow geometry, reduces body velocities and pressure losses, maximizing valve body life.

PNEUMATIC AND ELECTRIC ACTUATORS AVAILABLE

Large range of standard pneumatic and electric actuators. Other industry typical electric, pneumatic and hydraulic actuators can easily be mounted on the REflex giving greater flexibility to tailor to the requirements of each plant.

REflex Product Information

PNEUMATIC ACTUATORS

A full range of compact and robust multi-spring actuators available from 15 – 155 sq. in. All actuators are powder coated as standard for long service life and are also available in stainless steel for use in demanding environments. All actuators can be easily reversed between direct and reverse-acting function and the simple design allows easy mounting of all Industry standard positioners and other typical accessories.

ELECTRIC ACTUATORS

The robust modular design covers a wide range of actuating forces from 675 – 3370 lbs. force. A wide range of actuating speeds and all standard voltages are available, giving the customer an actuator to suit their needs. Many options and accessories are available, including two extra limit switches (for the customer) as standard. These actuators are also available with a certified hydraulic fail close function and come with a hand wheel for manual operation as standard.

OPTIONS

Hydraulic and electrical Emergency Closing Unit. This unit gives valves with electric actuators a proven and reliable fail safe option. The unit closes/opens smoothly even at large differential pressures. The closing time can be adjusted to meet the system requirements. Automatic return to closed loop control is possible without any external components or wiring. This ensures that the valve resumes normal duties as soon as the plant returns to normal operations.

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REflex Specifications

Body Assembly:

Style: Single seated, top entry bolted bonnet, globe style body, stem guided unbalanced plug

Size, Ratings:

Two Way

CL 150	NPS ½ – 12
CL 300	NPS ½ – 12
CL 600	NPS ½ – 12
CL 900	NPS 1 – 6

Three Way

CL 150	NPS 1 – 12
CL 300	NPS 1 – 12

All sizes are also available in DIN versions.

Body Materials:

Carbon Steel, SA216 WCB
Stainless Steel, SA351 CF8M
Chrome Moly, SA217 WC6
Chrome Moly, SA217 WC9

End Connections:

Flanges according to ANSI B16.5 - 2017 RF (Raised Face) and RTJ* (Ring Type Joint)
Butt Weld Ends according to ASME B16.25 - 2012*
Threaded NPT Connections according to ASME B16.11 – 2016 up to NPS 2)*
Socked Weld Ends according to ASME B16.11 – 2016 up to NPS 2)*
Face-to-face dimensions per ANSI / ISA-S75.03
*(two way only)

Trim Types: Plug & Flow Characteristics

Two Way
On/Off Plug (Quick Opening)
Parabolic Plug (Equal Percentage or Linear)
V-Port Plug (Equal Percentage or Linear)
Perforated Plug (Equal Percentage or Linear)
Three Way
Mixing Plug (Linear)
Diverting Plug (Linear)

Seat:

Screwed Seat Ring (CL 150 – 300)
Welded Seat Ring (CL 600 – 900)
Quick Change Seat Ring 1-Stage (CL 150 – 600)
Quick Change Seat Ring 2-Stage (CL 150 – 600)

Trim Materials:

Plug 1.4122 (Martensitic)
Stem and Seat AISI 316 Ti
Retainer SA487 CA6NM (Quick Change) (iron-chromium-nickel-molybdenum alloy)
Optional
Plug AISI 316 Ti
Parabolic Plug stellited or hardened
Perforated Plug hardened
Seat Ring stellited or hardened

Shutoff Class (according to ANSI/FCI 70-2):

Leakage Class IV, metal seat (Standard)
Leakage Class V, lapped in metal seat (Optional)
Leakage Class VI, soft seat, max 392°F (200°C) (Optional)
Diverting plug port B Leakage Class III

Bonnet:

Bolted Bonnet
Bonnet with cooling fins for high temperatures
Extended Bonnet for valves with bellow seal

Stem Packing:

PTFE/Graphite:	-76°F to 482°F	(-60°C to 250°C)
Pure Graphite:	-76°F to 986°F	(-60°C to 530°C)
Bellow Seal:	-76°F to 662°F	(-60°C to 350°C)
Chloroprene:	-40°F to 212°F	(-40°C to 100°C)

Actuators:

Standard: Pneumatic Spring & Diaphragm and Electric
Optional: Customer specified actuators (Electric, Pneumatic and Hydraulic)

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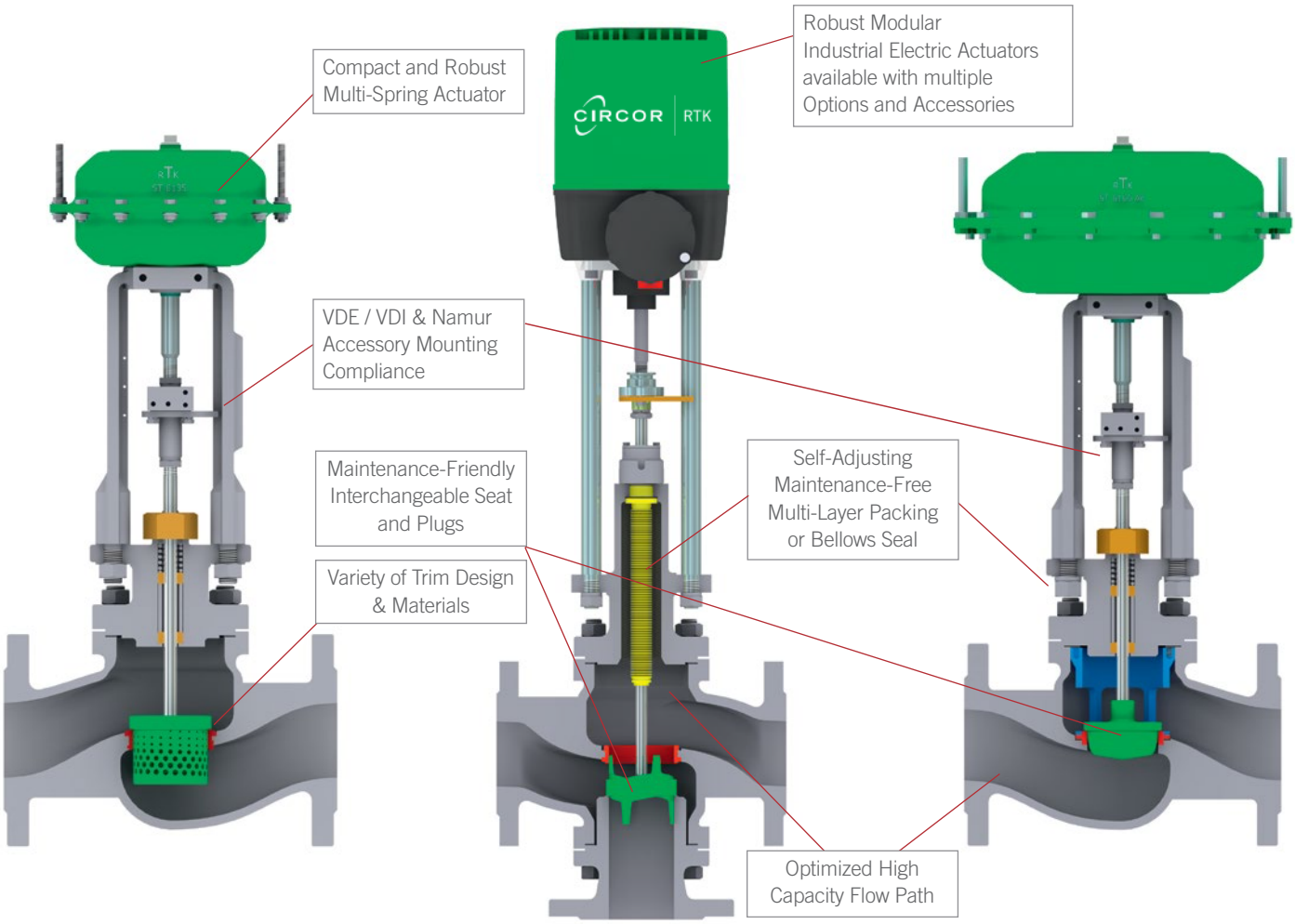
REflex Features & Benefits

Full range of ANSI and DIN Valves Available as Standard



Feature	Advantage	Benefit
Full Range of ANSI & DIN Valves Available	Interchangeability With Control Valves From Other Manufacturers	Application Accessibility
Variety of Trim Designs and Materials	Longer Life and Greater Flexibility	Reduced Operating and Maintenance Costs, Longer Service Life
Self-Adjusting, Maintenance-Free Multi-Layer Packing or Bellows Seal	Reduced Leakage Lower Fugitive Emissions	Improved Environmental Compliance No Adjustment Necessary
Interchangeable, Top-Entry Trim	Application Flexibility & Ease of Access	Reduces Spare Inventory Costs
Optimized High Capacity Flow Path	Per Size Cv Higher Than Most Valves In Its Class	Lower Initial Costs
Compact Multi-Spring Actuator	Reduced Height & Weight	Lower Installation Costs
Industry Standard Accessory Mounting	Accommodates Most Valve Automation Products	Lower Automation Costs
Modular Industrial Designed Electric Actuator	Covers Wide Array of Application Capabilities	Lower Inventory Costs
Multitude of Options and Accessories Available for Electric Actuator	Provides Product Modification Agility Necessary to Satisfy Market Requirements	Application Rangeability

REflex Trim Designs

Two-Way On/Off

Characteristic: On/Off (Quick Opening)

Flow direction: To open or to close

This plug provides maximum flow with minimum pressure drop and is ideal when large flows are required just after opening.

Two-Way Parabolic

Characteristic: Linear or Equal Percentage

Flow direction: To open

This plug covers all Cv ranges and is especially suitable for low differential pressures. The equal percentage flow characteristic provides excellent low flow control.

Two-Way V-Port

Characteristic: Linear or Equal Percentage

Flow direction: To open or to close

This plug is ideally suited when actuator selection is critical, and the shorter stroke means smaller actuators can often be used.

Two-Way Perforated

Characteristic: Linear or Equal Percentage

Flow direction: To open or to close

The perforated plug is suitable for use where high differential pressures are present. It can also be used where noise is an issue, typically reducing the noise level by 10 dBA. The hardened version improves life expectancy in cavitation and/or flashing conditions.

Quick Change One-Stage

Characteristic: Linear or Equal Percentage

Flow direction: To open or close

This trim offers an easy tool-free seat exchange and can be combined with all on/off, parabolic, perforated and V-port plugs.

Quick Change Two-Stage

Characteristic: Linear or Equal Percentage

Flow direction: To close

This trim offers an easy tool-free seat exchange and is used for high differential pressures to provide cavitation and for noise reduction.

Three-Way Mixing

Characteristic: Linear

Flow direction: A + B > AB

Three-Way Diverting

Characteristic: Linear

Flow direction: AB > A , B

All Plugs available with Soft Seat, offering Class VI Shut Off (Not Diverting)

REflex C_v Table [gpm]											
Valve Size		On/Off Plug		Parabolic Plug		V-Port Plug		Perforated Plug		Mixing Plug	Diverting Plug
NPS	DN	Min	Max	Min	Max	Min	Max	Min	Max		
½	15	2	3.8	0.58	3.8			1.9	3		
¾	20	2	7	0.58	7		7	2	5.3		
1	25	2	10.7	0.58	10.7	8.7	10.7	2	8.4	10.7	8.7
1½	40	7.9	28	0.58	28	13	28	2	22	28	22
2	50	14	43	1.2	43	21	43	2	34	43	35
2½	65	22	73	2	73	22	73	5.6	57	73	55
3	80	36	110	7.9	110	36	110	8.8	86	110	92
4	100	56	172	14	172	56	172	8.8	135	172	140
6	150	147	386	56	386	147	386	23	303	386	339
8	200	225	687	87	687	225	687	35	540	687	487
10	250	350	1074	147	1074	350	1074	60	842	1074	867
12	300	540	1546	225	1546	540	1546	91	1223	1546	1306

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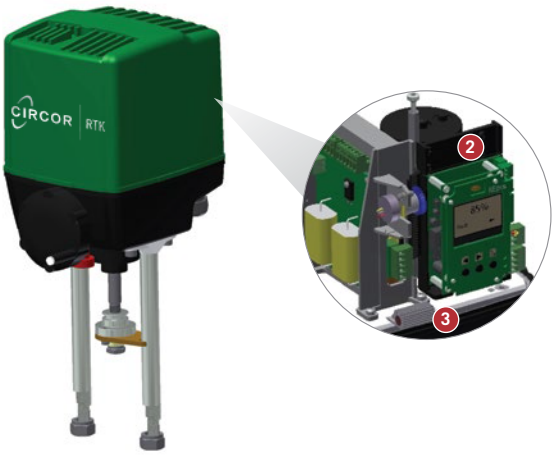
Standard Actuator Offerings

Spring & Diaphragm Actuator

The REflex is available with a multi-spring diaphragm actuator which delivers excellent control performance in a compact package. This actuator design is based on decades-proven and highly reliable diaphragm technology. The spring and diaphragm actuator provides for inherent fail safe operation and can be easily converted between direct and reverse acting functions. Standard positioners and a variety of accessories cleanly mount on this actuator.

1. Compact multi-spring actuator is field reversible. Can install anywhere from 2 to 7 springs depending on thrust requirements.



Electric Actuator

All valves are available with an electrically-operated actuator. These actuators provide higher actuating forces than comparable pneumatic actuators. A wide range of operating voltages and actuating speeds are available for each actuator version, ensuring the actuator is tailor made for each application. Due to the inherent stiffness of the gear wheels and motors these actuators effectively buffer high fluid dynamic forces experienced in extreme flow conditions. A variety of accessories, including feed-back potentiometers, positioners, hydraulic and electrical fail safe units are available for these actuators, providing the best range in industry. Approved according to industrial standards like NEMA, NRTL, CE and IP.

2. Robust modular industrial design covering a wide range of actuating forces, speeds and operating voltages.

3. Wide range of options available including feedback potentiometer, positioner and two extra limit switches as standard.

Standard REflex Accessories

Pneumatic Actuators

- Several electro-pneumatic Positioners
- Pneumatic Positioner
- Air Filter / Regulator
- Solenoid Valves
- Limit / Proximity Switches
- Manual Override Handwheels

Electric Actuators

- Feedback Potentiometer
- Feedback Transducer
- Digital Valve Positioner
- CANopen/Profibus Systems
- Hydraulic Emergency Closing Units
- Electrical Fail Safe Units

Noise Reduction Devices

- Integrated Silencer on Valve Outlet
- Perforated Disc for Noise Reduction
- Silencing Orifice

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Specialty Valves

Feedwater Valve with Recirculation

Specially designed to Protect Feedwater Pumps against cavitation by combining boiler feedwater valve and By-pass valve in one. Adjustable recirculation rate up to 10% of Cv value. Hardened recirculation plug and seat for low wear operation.

Continuous Blowdown Valve

Parabolic Plug with linear characteristic for precise control of blowdown rate. Hardened trim for low wear operation. Available with or without manual sample valve.

Steam Converting Valve

Combined Pressure Reducing and Desuperheating in one valve. Optimized control characteristics with specially adapted Trim for Low Wear operation.

Bottom Blowdown Valve

Available in either pneumatic or manual design. Hardened trim for low wear operation. Protection of stem packing by back sealing when the valve is opened.

Valve with Silencer

Used to Reduce Noise for steam and gases. Also used to suppress cavitation and reduce noise for liquids. Available with two to four throttle plates included in pipe expansion.

Applications

- Automotive Industry
- Boiler Feedwater Control
- Bottom Blowdown
- Chemical Industry
- Continuous Blowdown
- District Heating
- Flow Control
- Food & Beverage Industry
- Gases
- Industrial Boilers
- Industrial Refrigeration
- Level Control
- Liquids
- Marine
- Mining
- Oil & Gas Industry
- Power Industry
- Pressure Reducing Desuperheating System (PRDS)
- Pressure Control
- Steam
- Steel Industry
- Temperature Control
- Textile Industry
- Thermal Oil
- Water
- Water Treatment
- Wood Industry

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CIRCOR is a market-leading, global provider of integrated flow control solutions, specializing in the manufacture of highly engineered valves, instrumentation, pipeline products and services, and associated products, for critical and severe service applications in the oil and gas, power generation, process, aerospace, and defense industries.

Excellence In Flow Control

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Max-Planck-Strasse 3
D-70806
Kornwestheim, Germany
rtk@circor.com

circor.com | rtk.de

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