

Reineke



Ein Unternehmen mit Tradition und Zukunft
A company with tradition and a future

Hydraulischer Hubantrieb
Hydraulic linear actuator

ISO 9001
Qualität



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1 General

The hydraulic actuator type **RKA “REINEKE KOMPAKT ANTRIEB”** is the latest edition of the famous self contained actuator series with the mechanical “Reineke Servo Valve”.

1.1 Application

The RKA actuators are used for linear control valves (RKA-H) and large butterfly valves (RKA-D). The robust construction proved over more than four decades guarantees to be free of trouble and long life operation not only in high temperature, corrosive and abrasive industrial areas as in boiler houses for power stations (fossil and nuclear) and steam utilities, chemical and steel plants, but also in arctic, tropical, desert and on/off shore conditions.

These high quality Reineke hydraulic actuators are designed for operating control valves (with linear actuators) and butterfly valves (with rotary actuators) on those special demands regarding to dynamic regulation, thrust/torque and fail safe action in the event of power or signal failure. Typical users are power plants, steel industry, chemical industry, pipeline industry, mining, research establishments, environmentalism etc.

1.2 Codes and standards

RKA actuators are suitable in accordance of all international codes and standards for weather and explosion proof conditions (DIN, ATEX) as well as earthquake approved.

2 Design

The Reineke RKA electro hydraulic actuator is a self contained actuator type. All relevant components as motor-pump unit, piston, servo valve or proportional control valve, mechanical feedback, filters, check valves, relief valves, pressure gauges, pressure, level and temperature alarm sensors are mounted inside and on the bonnet of the container. All pipings between those components are inside the container and therefore a total sealed system. A junction box for electric power and signal cables is also mounted on the bonnet of the container.

The RKA electro hydraulic actuator has two main features; as Linear Actuator (RKA-H) and as Rotary Actuator (RKA-D). The RKA actuators are available in three sizes of containers depending on the output force.

Standard

- Oil container
- Motor – pump unit (single or three phase)
- Pressure filter unit
- Pressure relief valve
- Reineke servo valve (4-20 mA) with integral locking device
- Hydraulic cylinder (piston and rod)

Options

- Nitrogen filled bladder accumulator type with add. filling and safety valve for two selectable functions: (a) to move in case of emergency the control valve in a fail safe position or (b) to hold supplemental power to supply the specified number of valve strokes. In both cases the fail mode actions caused by motor power or input signal failure and / or an override remote signal from the control room.
- Motor- Pump unit with a two stage gear pump
- Explosion proof design
- Open – closed function
- Input signal monitoring device for add. fail mode functions (“fail fix” in last position)
- Position transmitter for the feedback signal to the control room
- Disc spring pile for spring return function

Accessories

- Yoke / lever
- Manual pump with manual selector
- Throttle valve to adjust the piston rod speed
- Sun or rain shelter
- Limit switches (mechanical or inductive)
- Oil cooler or heater

2.1 Technical features

Technical Features	
Oil Flow at delta P = 10 bar (145 PSI) and input signal alteration delta I > 3mA	12 l/min (3,17 US gallon/ min)
Sensitivity	< = 0.2% of full scale
Hysteresis	< = 0.4 % of full scale
Linearity	< = 0.2% of max. input signal
Max. operation pressure	60 bar (870 PSI)
Temperature effect	< = 0.05 % / ° of ambient temperature
Input signal	0 – 20 / 4 –20 mA DC
Inductance of coil	3.24 H at 60 Hz (Cs)
Position feedback from cylinder	mechanical with feedback rod

2.2 Forces

Linear Actuator RKA - H			
Cont. Size	Output Forces	Stroke	Speed
1	1,5 – 15 kN	20 – 80 mm	5 – 40 mm / sec
	337 – 3 372 lbf	¾" – 3"	0.20 – 1.57"/s
2	12 – 50 kN	20 – 100 mm	4 – 12 mm / sec
	2697–11 240 lbf	¾" – 4"	0.157 – 0.472"/s
3	40 – 200 kN	20 - 260 mm	2 – 6 mm/ sec
	8 992 - 44 960 lbf	¾" – 10"	0.078 – 0.236"/s
Available on request: larger force , longer stroke, higher speed			

2.3 Torque

Rotary Actuator RKA - D			
Cont. Size	Output Torque	Max. Angle	Speed
1	40 – 300 Nm	70 °	2 – 6 sec over 70 °
	29 502 – 221 268 lbf-ft		
2	250 – 1500 Nm	70 °	4 – 14 sec over 70 °
	184 390 – 1 106 342 lbf-ft		
3	900 – 4500 Nm	70 °	2 – 6 sec over 70 °
	663 804 – 3 319 025 lbf-ft		
Available on request : larger torque, higher speed			

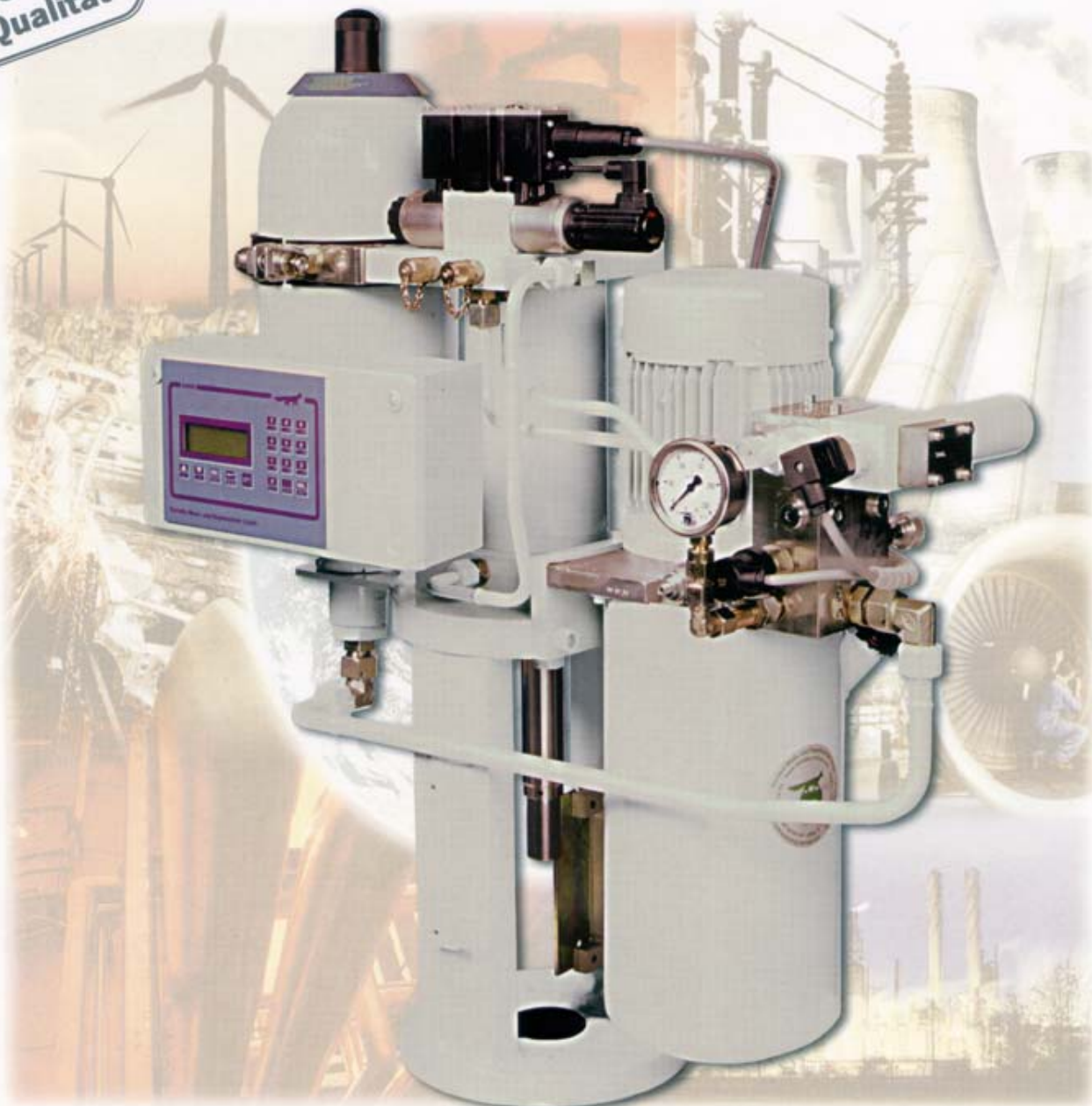
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Selbstadaptierender hydraulischer Stellantrieb Typ: SARA
Self adapting hydraulic linear actuator type: SARA

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Qualität



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- Fail safe function
 - by nitrogen bladder
 - springlocked in last position
fail safe open or closed
fast open or closed
- Electric engine
standard 3- phase- engine, 230/400 V, 50 Hz or
265/460 V, 50 Hz
- Hydraulic pump
radial piston pump
- Hydraulic fluid
mineral oil or synthetic oil for
individual applications
- Status report
SARA generates continuously the status of oil
pressure and temperature, position of the cylinder
- Codes and Standards
Programming according to IEC 1131-3
- Accessories optional
manual pump, sun or rain shelter, yoke and
coupling

The company Reineke installed over 25.000 self contained electro-hydraulic actuators world wide since 1960 in fossil and nuclear power stations. Steam utilities, steam and gas turbines, compressor and pump systems, process industry, steel plants, coke plants, gas and oil pipelines.

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Elektrohydraulisches Stellsystem
Electro-hydraulic actuator system

ISO 9001
Qualität



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Meß- und Regeltechnik GmbH

Hydraulisches Stellsystem

Speziell für den jeweiligen Anwendungsfall ausgelegte Systeme für alle Ansprüche der Regelungs- und Steuertechnik.

Gleichzeitige Bestätigung mehrerer, voneinander unabhängiger Stellglieder durch ein gemeinsames Hydrauliksystem.

Stellkräfte bis 2.000.000 N
Stellmomente bis 700.000 Nm

- Stetige Regelung mit Servoventilen/Proportionalventilen
- Schrittsteuerung und Auf-Zu-Funktionen
- TÜV-Bauteilgeprüfte Sicherheitsventilsteuerungen gemäß TRD 421 mit Dreifach-Druckmeßeinrichtung (Dampfprüfstock - DESY 3)
- Möglichkeit zum Verhalten bei Energieausfall:
 - Verblocken in der letzten Regelstellung
 - Endstellung anfahren durch Hydrospeicher
 - oder durch Federkraft
 - Speicherdimensionierung für mehrere „Nothübe“
- Redundante Motor-Pumpen-Aggregate mit automatischer Umschaltung
- Interne Steuerung, Überwachung und Signalaustausch mit Leittechnik über speicherprogrammierbare Steuerung (SPS)
- Möglichkeit zur Einbindung in BUS-Systeme
- Auf Wunsch Klartextanzeige der Betriebszustände, Signalisierungen und Störmeldungen, Bedienfelder
- Ausführung für den Einsatz in explosionsgefährdeten Bereichen
- Ausführung für den Betrieb mit Mineralöl oder mit schwerentflammbarer Hydraulikflüssigkeit, z.B. HFD-R.
- Aufstellung und Rohrleitungs montage
- Verlegung der elektrischen Verbindungsleitungen
- Inbetriebnahme
- Service

Hydraulic Actuator System

In compliance with customers specifications and international standards designed systems for all requirements of control applications.

Simultaneous actuating of several, independent control valves with one hydraulic system.

Linear actuator force up to 2.000.000 N
Rotary actuator torques up to 700.000 Nm

- Analogous position control with servo-valves/ proportional valves
- Step control or open-close functions
- Safety-control devices with tripple pressure test units according to german „Technical Standards for Steam Boilers“ TRD 421, with type-test approval mark of the german TÜV
- Possible designs for failsafe position in case of electric power supply failure:
 - Blocking in the last control position
 - Moving to limit position open or close by using hydraulic
 - Accumulators or with spring force
 - Accumulators for severel emergency strokes
- Double motor-pump-units with automatic change over
- Internal control, monitoring and transfer of signals to the main control room with programmable controller (PLC)
- Connection to BUS-systems possible
- Text display or local control panel for indication of operating modes, signalisations and alarms on request
- Special designs for operation in potentially explosive atmospheres
- Design for mineral oil or for fire resistant hydraulic fluid, e.g. HFD-R.
- Installation of the hydraulic unit and of the interconnecting pipe
- Installation of inter connecting cables
- Commissioning
- Service

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Hydraulikzylinder
Hydraulic cylinder

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Technische Daten

Hydraulische Stellzylinder

Zylinder für alle Ansprüche der Regelungs- und Steuertechnik.

Stellkräfte bis 3.000.000 N

- Stetige Regelung mit Servoventilen / Proportionalventilen
- Schrittsteuerung und Auf-Zu-Funktionen
- TÜV-Bauteilgeprüfte Sicherheitsventilsteuerungen gemäß TRD 421 mit Dreifach-Druckmeßeinrichtung (Dampfprüfstock - DESY 3)
- Möglichkeit zum Verhalten bei Energieausfall:
 - Verblocken in der letzten Regelstellung
 - Anfahren einer Sicherheitsstellung
- Ausführung für den Einsatz in explosionsgefährdeten Bereichen
- Ausführung für den Betrieb mit Mineralöl oder mit schwerentflammbarer Hydraulikflüssigkeit, z.B. HFD-R.
- Inbetriebnahme
- Service

Technical Datas

Hydraulic Actuator Cylinders

Cylinders for all requirements of control applications.

Linear actuator force up to 3.000.000 N

- Analogous position control with servo-valves / proportional valves
- Step control or open-close functions
- Safety-control devices with tripple pressure test units according to german "Technical Standards for Steam Boilers" TRD 421, with type-test approval mark of the german TÜV
- Possible designs for failsafe position in case of electric power supply failure:
 - Blocking in the last control position
 - Moving in a safety position
- Special designs for operation in potentially explosive atmospheres
- Design for mineral oil or for fire resistant hydraulic fluid, e.g. HFD-R.
- Commissioning
- Service

Scotch yoke actuator with control, Type: RETORC



The actuators work according to the Scotch- Yoke- Principle.

Due to the different output-torque curves each recommended torque can be ideally adjusted to suit the optimal working performance.

Frame and fork are made of fabricated steel construction and are suitable for various types of actuators as manual operation, gas-over-oil, hydraulic and solar.



Features

- Output-torque 10.000 – 350.000 Nm
- Turn range 80 – 90° ± 3°
- Design pressure 6 to 160 bar
- Design temperature -60°C to +80°C
- Auxiliary energy:
 - Pneumatic max. 16 bar
 - Gas- pneumatic max. 160 bar
 - Hydraulic max. 160 bar
 - Electrical max. 160 bar
 - Electro- hydraulic max. 160 bar
 - Solar- hydraulic max. 160 bar

Basic Control

- Local control
- Manual safety operation

Options

- Remote control
- Emergency shut down (ESD)
- Line break device
- Torque limit switch
- Electrical control signal < 20 Watt
- All ex-proof classifications
- Sea water resistant

1. Actuator Design

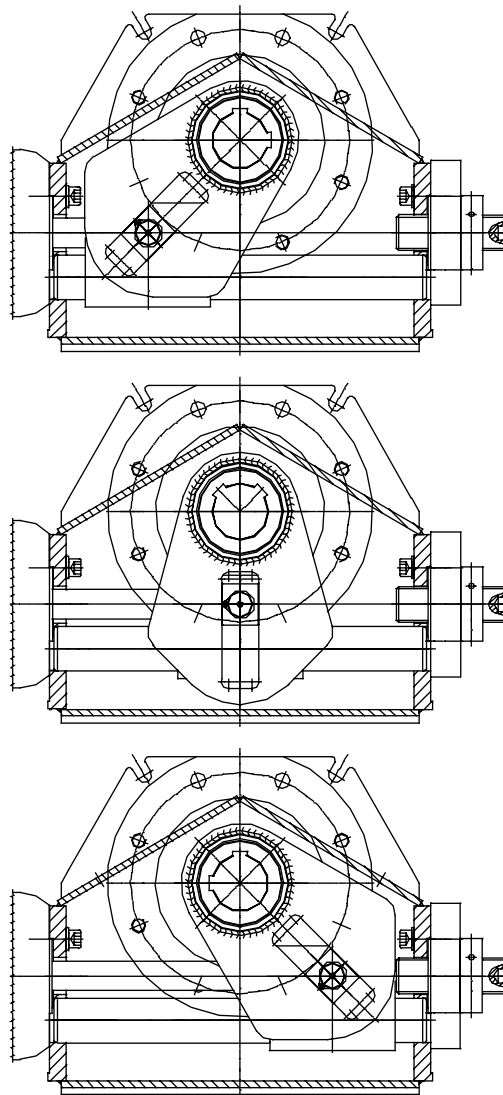
RETORC, Reineke Quarter Turn Actuator is designed for six different Torque Capacities with a maximum torque of 350 000 Nm.

In arrangement of Gas over Oil, Hydraulic and Pneumatic systems with interchangeable cylinder for right or left position.

The Actuator is a Scotch Yoke type, Frame and Bonnet are a fabricated steel construction and totally weather proof, fitted with a relief valve venting any over pressure which might occur. (e.g. a gas leakage through the valve stem)

All bearings used are non-lubricated synthetic coated bearings. Therefore, no grease or oil are required for operation.

Following drawings show the position of 0, 45 and 90 degree.



Gas hydraulic piston rod actuator with automatic level equalizing of the gas / hydraulic reservoirs (Oil Circulation System).