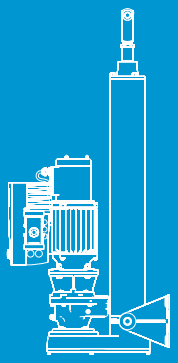
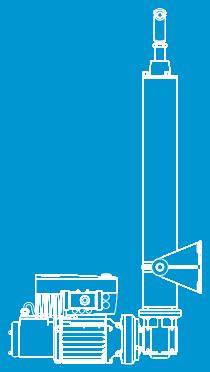
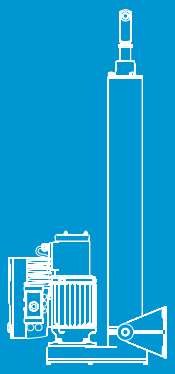
RACO

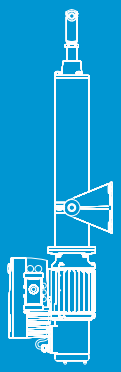




RACOmatic®

intelligent electric actuators





RACOmatic®

MORE THAN THE SUM OF ITS PARTS

The RACOmatic® expands the functionality of RACO electric actuators to ready-to-use, highly precise linear actuation drives. Mechanical components, software, and sensors have been perfectly matched to the equipment architecture and the relevant requirements. RACO thus provides a customized solution for any actuation profile across a wide range of thrust ranges and designs - all with the typical reliability you have become accustomed to with RACO products.

When it comes to maximum process reliability and consistent manufacturing quality, the exact and fully reproducible control of movements in automation is indispensable.

In combination with the RACOmatic®, RACO drives can fully leverage their strengths. In daily operation, RACO drives achieve a measurable increase in productivity, availability, and flexibility.

The key to this is the high-precision control of thrust, acceleration and position and the ability to integrate these into all industrial standard control systems. In addition, there is the unique and highly user-friendly operator interface.

This ensures that the operating parameters are easy to adjust. As a designer or operator, you rely on the results of good engineering that consolidates the expertise of many decades into a systematic actuation system - efficient, a safe investment, and absolutely in line with real-life requirements.
Something you can always expect from RACO.

MOVEMENT PROFILE

FINDING AN OPTIMUM DRIVE SOLUTION

Maximum customer benefit - at RACO this means that you no longer have to deal with the question of which combination of electric motor, brake, clutch, thrust unit, power electronics, and programming is the right one for you.

We focus on the movement profile our customer needs for thrust, stroke, and speed. We evaluate the boundary conditions, such as the mass to be moved, the acceleration ramps, and the number of positions to be reached in a reproducible fashion and take the technical specifications for the equipment layout into consideration to determine the optimum drive solution.

The modular design of our products is based on our tried-and-tested assembly system, which consists of components specially developed and tested by RACO. You can be certain that we achieve the optimum for you - lasting, at low cost, and as a safe investment.

THE RACOmatic® TOOL

BECAUSE EASY IS EASIER

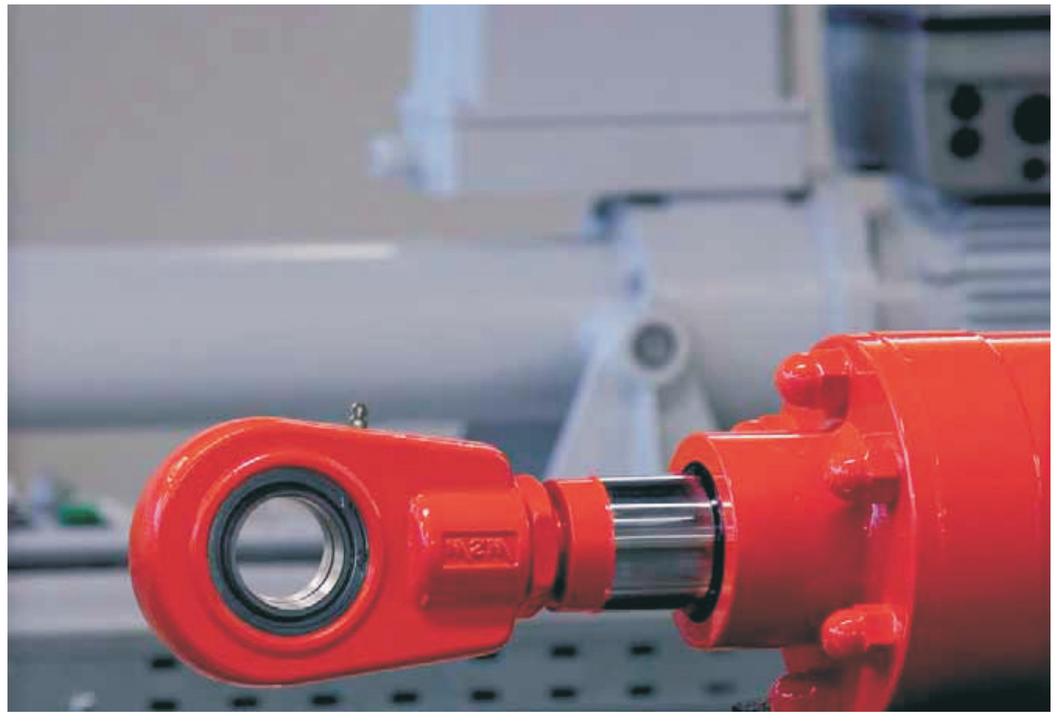
Integrated drive systems with RACOmatic® are pre-configured for your operational requirements and are ready for operation as soon as they have been connected.
RACO analyzes and documents all pre-configured systems parameters and can restore them at any time.

The unique RACOmatic® Tool application software efficiently reduces the approximately 800 control variables resulting from the combination of the variable frequency drive and the sensor electronic to just a few parameters needed for your application.

The electronic handwheel function can be enabled during installation and startup to retract and extend the actuator independently from the customer's control equipment. The RACOmatic® Tool also supports the configuration of field bus systems.

EVERYTHING
IN ITS PLACE

All RACOmatic® components are integrated into the actuator with obvious benefits:
Communication between the drive and the supervisory control system can be reduced to essential control functions. Susceptibility to failure decreases, and the availability of the actuation system increases.



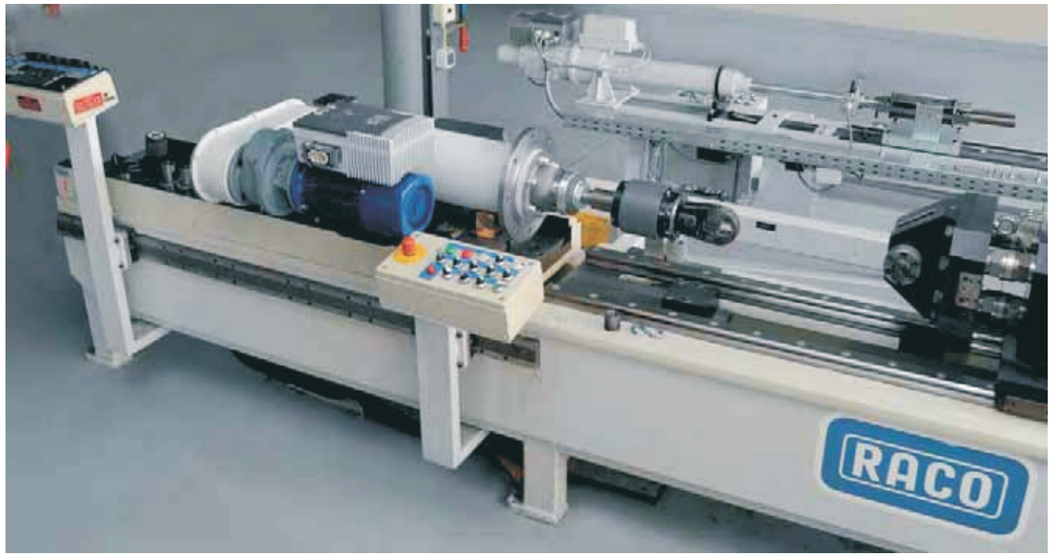
With the RACOmatic® system, reproducible dynamic movement profiles as well as speed and thrust control across the entire speed and thrust range can be achieved. In many cases, this eliminates the need for a gearbox.

This improves the ratio of foreign mass inertia to own mass inertia in the drivetrain.

We can design the RACOmatic® with smaller dimensions in combination with the high efficiency of the durable RACO electric actuator, which improves the lifecycle cost balance considerably.

FULL CONTROL,
YOU CAN TRUST

The sophisticated RACO sensor system provides the basis for extensive control functions and automated safety mechanisms. Together with the mechanical benefits of RACO electric actuators, a high level of operational reliability and easy maintenance are reached - one of the main reasons why renowned companies worldwide put their trust in RACO products.



RACOmatic® offers continuous monitoring of the actuator system. Parameters such as temperature, voltage, and power consumption provide information about the condition of the actuator system. All safety features have been integrated into the RACOmatic® system. Tailored-to-suit maintenance work can be performed as needed; in critical situations the actuator can be stopped automatically.

If maintenance is required, the RACOmatic® allows individually integrated drives to be replaced quickly. Control parameters are simply transferred to the new VFD, either at your site or at our factory. This makes the new VFD ready to operate immediately and significantly reduces downtime. This is another good reason why more and more plant operators place their trust in the RACOmatic®.

CEMENT PLANT OR POLAR CIRCLE

RACO IS ALWAYS IN THE RIGHT PLACE

Difficult environmental conditions test an actuator's capacity to meet its requirements. RACO is at home everywhere – even in places with extreme temperatures or where pollution and humidity challenge the survival of the actuator.

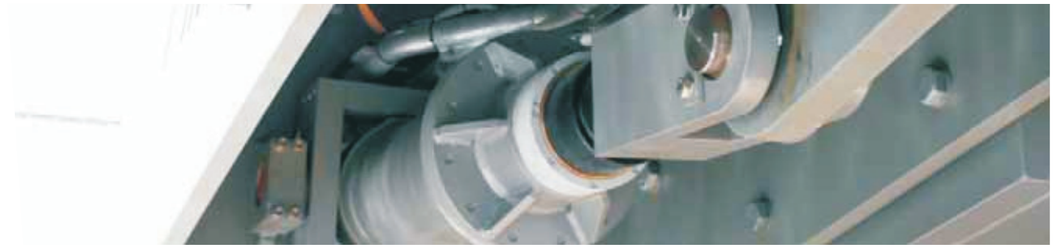
RACO electric actuators can be used under extreme environmental conditions. This also applies when they are operated as an integrated system through the RACOmatic®.

Whether an offshore drilling rig, a food processing facility, a steel plant, or a polar station – we know the underlying challenges of all operating conditions and are prepared to provide the applicable answer.

EFFICIENCY FROM THE GROUND UP:

ADVANTAGES OF PROJECT PLANNING WITH RACO

When it comes to integrated actuator systems with the RACOmatic®, plant engineers benefit from RACO's expertise from the first moment of the project planning phase. The sizing of each component no longer has to be specified and calculated using a large number of components.



RACO provides a functioning, optimum solution for the conventional hardwired I/O terminal control systems as well as for field bus standards such as PROFIBUS, PROFINET, CANopen, DeviceNet, and EtherCAT.

Project planning time is reduced significantly because planning for control panels and wiring is simplified and often eliminated.

Implementation reliability is also improved. Signal and control wires are preconfigured, wired, and tested at the factory. Heavy-duty industrial connectors are used for power and control connections that are simple and safe.

PRECISE, EFFICIENT, AND FLEXIBLE

RACOmatic® BENEFITS AT A GLANCE

Cost Benefits

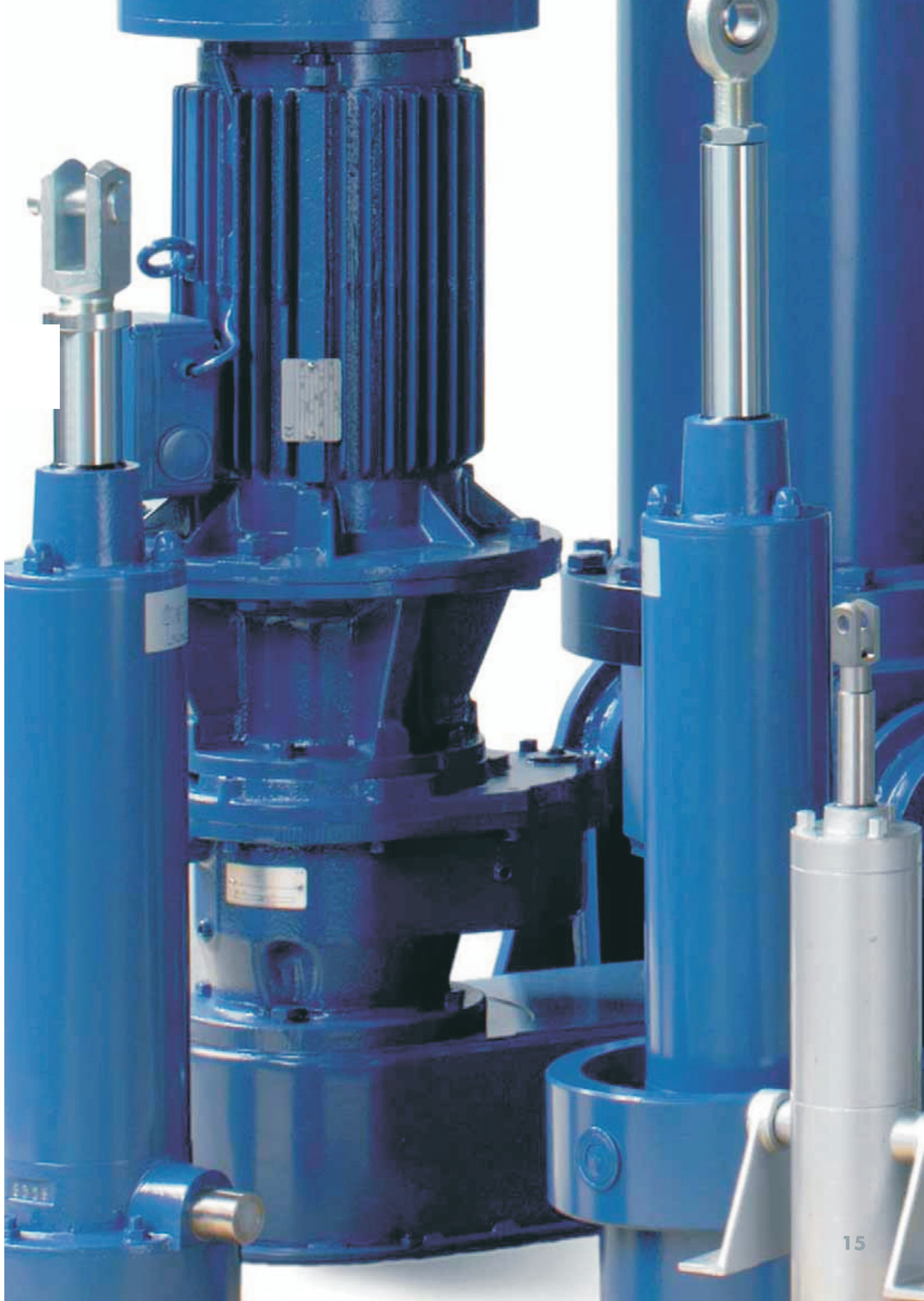
- Shorter, simpler planning phase
- Reduced operating costs
- Increased energy efficiency
- Less time required for installation and initial operation
- Downsizing and potential elimination of gearboxes
- No wear on brakes
- Longer actuator life expectancy
- Longer lifetime of all driven mechanical components
- Shorter unplanned downtimes
- Faster diagnosis

Operational Reliability

- No uncontrolled overrun, no coasting
- Brake does not have to be applied for an exact stop
- Precise, reproducible movement profiles
- Reduced susceptibility to failure
- Monitoring of operating parameters

Improved Performance

- Increased availability
- Increased flexibility
- Increased productivity
- Consistent product quality



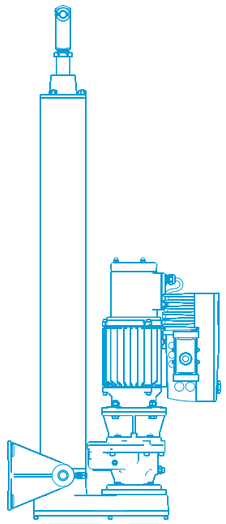
CONFIGURATION A

TWO ADJUSTABLE END POSITONS

- Accurate approach to two adjustable end positions
- Adjustable acceleration and deceleration ramps
- Thrust limitation up to the preset maximum thrust
- Position signal output
- Limitation of adjustment options for position parameters as a safety feature
- Speed adjustment via potentiometer
- Fault output

Standard functions/components		
2 digital inputs	>	jog mode retract / extend
1 digital output	>	general fault
4 feedback signals	>	programmed position reached
1 analog output	>	actual position
Potentiometer	>	adjustable speed
10 position step switch	>	adjustable thrust limit
Thrust overload	>	factory adjusted thrust limit

Options		
Holding brake	>	internal brake control
4 Q-operation	>	internal brake resistor
Control voltage	>	integrated 24V DC power supply



Configuration

The RACOmatic® will be controlled via two digital input signals: extend and retract. The extend or retract instruction will be executed as long as the respective signal is activated or the programmed positions are reached precisely.

End positions are signaled via digital outputs in the form of dry relay output contacts. In addition, a general fault output signal is available. The operating speed of the actuator can be adjusted easily in a selective range with the integrated potentiometer.

Application Examples

Feedback control for positioning, adjustable acceleration and deceleration ramps for flaps, mass flow, continuous blending, and mixing applications.

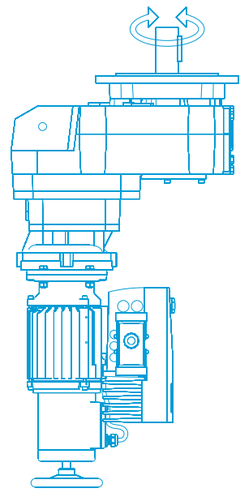
CONFIGURATION B

8 SELECTABLE POSITIONS

- Precise approach to 8 selectable positions
- Adjustable acceleration and deceleration ramps
- Thrust limitation up to the specified maximum thrust
- Position signal output
- Limitation of adjustment options for position parameters as a safety feature
- Speed adjustment via potentiometer
- Fault output

Standard functions/components	
3 digital inputs	> 8 selectable positions
1 digital input	> enable
1 digital output	> position reached
4 feedback signals	> programmed position reached
1 analog output	> actual position
Potentiometer	> adjustable speed
10 position step switch	> adjustable thrust
Thrust overload	> factory adjusted thrust limit

Options	
Holding brake	> internal brake control
4 Q operation	> internal brake resistor
Control voltage	> integrated 24V DC power supply



Configuration

Up to eight fixed positions can be selected and used for precise stopping points. These stop points can be changed over the entire stroke length via a Windows-based tool or pre-programmed at the factory. The selection of the stop positions is realized by the binary combination of the three input signals.
As soon as the enable signal has been activated, the selected position is approached accurately using the preset ramps and speeds.
A digital output provides a feedback signal when this new position has been reached.
Position parameters can only be set within the limits specified by the factory. Your drive is fully protected. The adjustment speed of the RACOmatic® can be set using the integrated potentiometer.

Application Examples

Up to eight selectable stop positions for trim size adjustment, packaging formats, stacking, edge guide, elevation with multiple levels, or sorting and diversion gates.

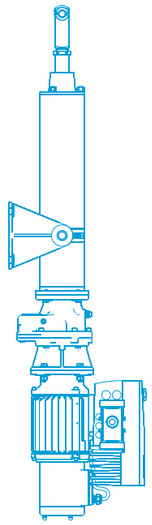
CONFIGURATION C

ANALOG INPUT FOR VARIABLE POSITION

- Infinite variable stroke position
- Adjustable acceleration and deceleration ramps
- Thrust limitation up to the specified maximum thrust
- Position signal output
- Digital output "position reached"
- Speed adjustment via potentiometer

Standard functions/components		
1 digital input	>	enable
1 analog input	>	setpoint position 0-100%
1 digital output	>	position reached
4 feedback signals	>	programmed position reached
1 analog output	>	actual position 0-100%
Potentiometer	>	adjustable speed
Thrust overload	>	factory adjusted thrust limit

Options		
Holding brake	>	internal brake control
4 Q operation	>	internal brake resistor
Control voltage	>	integrated 24V DC power supply



Configuration

An analog 4-20mA signal generates the position setpoint signal and follows a linear scale over the selected two end points. The feedback position control loop will be activated by means of a binary enable signal. With the enable signal the actuator will accelerate to the set speed, pre-calculate the end position, decelerate prior to the setpoint position, come to a stop, and then hold at the precise setpoint position.

The RACOmatic® generates position feedback at any point in time via analog output signal. In addition, the digital output signal “position reached” is generated if the setpoint and the actual position match. The operating speed of the actuator can be easily adjusted in a selective range with the integrated potentiometer.

Application Examples

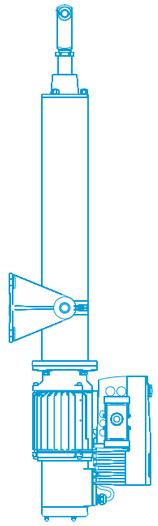
For positioning and control tasks, e.g., metering valve, diverter gate, gate valves with continuous stroke range. Positioning accuracy is approximately 1% of the adjustment stroke. Ramps can be adjusted for the gentle acceleration and deceleration of large masses as well as analog and digital position feedback.

CONFIGURATION D

THRUST-CONTROLLED ELECTRIC ACTUATOR

- Control signal retract and extend
- Thrust-controlled stopping and holding of thrust
- Adjustable thrust limitation up to the specified maximum thrust
- Analog output of actual position and actual thrust
- Speed adjustment via potentiometer
- Fault output

Standard functions/components		
2 digital inputs	>	jog mode retract / extend
1 analog input	>	thrust limit 0-100%
1 digital output	>	general fault
4 feedback signals	>	programmed position reached
1(2) analog output(s)	>	actual position and / or thrust
Potentiometer	>	adjustable speed
Thrust overload	>	factory adjusted thrust limit



Options		
Holding brake	>	internal brake control
4 Q operation	>	internal brake resistor
Control voltage	>	integrated 24V DC power supply

Configuration

The actuator's thrust can be varied from 0-100% by means of an analog input 4-20mA signal, whereby 100% represents the maximum rated thrust. If the setpoint force is reached, the actuator will maintain that force and the associated position until the binary input Open/Close signal is removed.
This means that the RACOmatic® will generate up to 100% force at zero RPM. End positions are signaled via digital outputs in the form of dry relay output contacts. In addition, a general fault output signal is available. The operating speed of the actuator can easily be adjusted in a selective range with the integrated potentiometer.

Application Examples

Ideal solution for force control used in joining, assembly, forming, press control applications, material testing, lid and valve closures with defined force requirements. Analog feedback control signals for force and stroke are available. Analog target thrust specifications and analog signal feedback for displacement and thrust permit the process to be controlled and monitored.

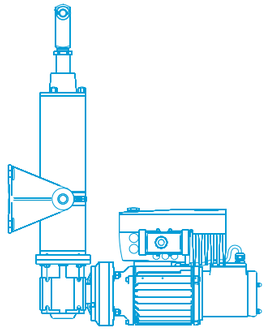
CONFIGURATION E

VARIABLE CONTROL VIA FIELD BUS INTERFACE

- Control of operating parameters (acceleration, thrust, position)
- Switchable control parameters, even under operating conditions
- Integration via field bus interface
- Readout of operating parameters in digital format
- Thrust limitation can be adjusted up to the maximum thrust
- Fault output

Standard functions/components		
Field bus interface	>	PROFIBUS, PROFINET, CANopen, DeviceNet, EtherCAT
Thrust overload	>	factory adjusted thrust limit

Options		
Holding brake	>	internal brake control
4 Q operation	>	internal brake resistor



Configuration

The control of the RACOmatic® actuator is accomplished by utilizing one of the above specified field-bus protocols. With communication capability directly to the RACOmatic® bus interface, all functional and operational parameters are accessible to the user. Force, position, speed, acceleration, and deceleration can be changed and monitored. Actual values such as position, motor moment, utilization of the actuator capability, systems and diagnostic parameters can be accessed via the communication interface.

RACOmatic® internal digital input and output channels are usable for connection to additional customer sensors and outputs. This enables the customer to have a high degree of flexibility. In the event that the main power is turned off, a 24V DC power supply for the communication module must be provided by the customer to guarantee the availability of the field-bus interface.

Application Examples

Suitable for numerical control of multiple axes for free movement with very precise control. It is also capable of alternating between position and force control for joining, forming, and press applications.

Additional uses include: robotic assembly, assembly lines, material handling between machines, welding, and spray applications. Integration of multiple actuators is possible via the communication network to generate independent motion movements. All crucial information can be uploaded and visualized on a centralized control system.

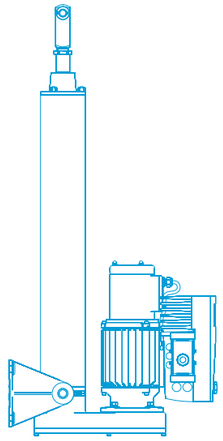
CONFIGURATION F

SYNCHRONIZATION CONTROL

- Accurate positioning of up to 4 RACO electric actuators with synchronous speed and position
- Adjustable acceleration and deceleration ramps
- Thrust limitation up to the preset maximum thrust
- Position signal output
- Fault output

Standard functions / components		
2 digital inputs	>	jog mode retract / extend
1 digital input	>	general fault
2 feedback signals	>	end positions reached
1 analog output	>	actual position
Thrust overload	>	factory adjusted thrust limit

Options		
Holding brake	>	internal brake control
4 Q operation	>	internal brake resistor
Control voltage	>	integrated 24V DC power supply



Configuration

This option provides synchronized movement of up to four RACOmatic® actuators. With digital extend and retract commands the master RACOmatic® generates the setpoint for position and speed signal per programmed acceleration ramp. These setpoint signals are broadcasted via the internal CANopen bus system to the attached slave RACOmatic® units and interpreted as their setpoint signals. The supervisory PLC/MMI with its alphanumeric and graphic display, function key interface will coordinate via the system bus the initial setup as well as the synchronized movement. Extensive error detection, communications supervision, and clear text interaction are provided.

Application Examples

Motion profile is useful for factory automation, lift tables, press forms, automatic assembly, lifting and adjustment of large structures such as locks on dams, bridges, ferry terminals, doors, and gates in mining, as well as steel mill applications.

YOUR ASSIGNMENT - OUR COMMON GOAL

WE PUT YOU ON THE RIGHT TRACK

RACO electric actuators have offered client-oriented, proven, and cost effective solutions for more than 60 years. We handle the interface design, feedback control, and supervision of the electric actuators for you. You can concentrate on your main objective – RACO manages everything else.

Challenge us – together we will find the right track

RACOmatic®

intelligent electric actuators

RACO-ELEKTRO-MASCHINEN GMBH
Jesinghauser Str. 56-64
D-58332 Schwelm

Tel.: +49 2336 4009-0
Fax: +49 2336 4009-10

info@raco.de
www.raco.de