



**ELECTRIC
ACTUATORS**



CENTORK. ESPECIALISTS IN VALVE ACTUATION

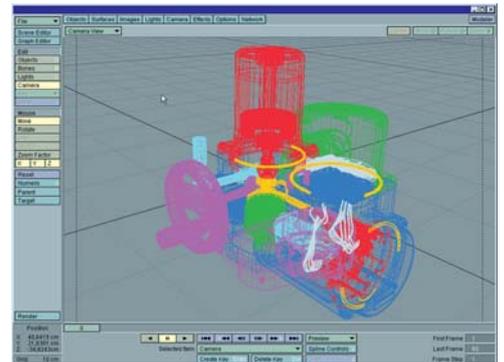
With its wide range of actuation products- electric actuators, pneumatic actuators and positioners- Centork covers virtually any need in the actuation and control of valves.

Inheriting the experience acquired during the last 30 years by Centralair and pushed by its dynamic R+D department, Centork has developed valve actuation products, from the standard product to the special product according to the customers high specifications, that are successfully competing in the international market. Centork has the experience, know-how and product range to supply any valve actuation solution.

From a water sewage treatment plant to an offshore oil platform, through a power generation facility, Centork is present to deliver the best customer service anywhere in the world.

Our international partners network ensures a local answer to our customers, from the initial enquiry through to after-sales service, maintenance or retrofitting.

In a world more and more specialized, with the introduction of the new digital technologies, being able to rely on an actuation specialist like Centork is a warranty for the future.

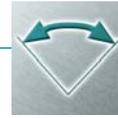


MODULAR DESIGN: ANY APPLICATION IN OUR HAND

QUARTER-TURN

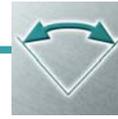
► 480 Series

- Torques from 30 to 1100 Nm
- TIME(90°) 9 to 33 sec.



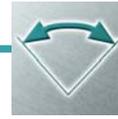
QUARTER-TURN: MULTITURN+WORM GEARBOX

- On-Off duty: 400-460 Series + CW
- Modulating duty: 410-470 Series + CW
 - Torques from 280 to 350.000 Nm
 - TIME(90°) 6 to 900 sec.



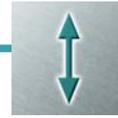
QUARTER-TURN WITH LEVER

- On-Off duty: 400-460 Series + FCW
- Modulating duty: 410-470 Series + FCW
 - Torques from 280 to 350.000 Nm
 - TIME(90°) 6 to 900 sec.



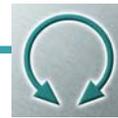
LINEAR ELECTRIC ACTUATOR

- On-Off duty: 400-460 Series + LC
- Modulating duty: 410-470 Series + LC
 - Thrust from 7 to 200 KN
 - Stroke from 25 to 500 mm.



MULTITURN ELECTRIC ACTUATOR: RISING STEM

- On-Off duty: 400/461 Series
- Modulating duty: 411/471 Series
 - Torques from 15 to 4000 Nm
 - Speed 2.75 to 224 rpm.



MULTITURN ELECTRIC ACTUATOR: NON-RISING STEM

- On-Off duty: 400/460 Series
- Modulating duty: 410/470 Series
 - Torques from 15 to 4000 Nm
 - Speed 11 to 224 rpm.



CENTORK ELECTRIC ACTUATOR FEATURES

The CENTORK electrical actuators are compact units that, thanks to its modular design, can be used to drive electrically any type of valve.

STANDARD CONFIGURATION

1 MOTOR

The actuator reliability is guaranteed by the three-phase squirrel cage motor designed by CENTORK for valve actuation.

The main features are:

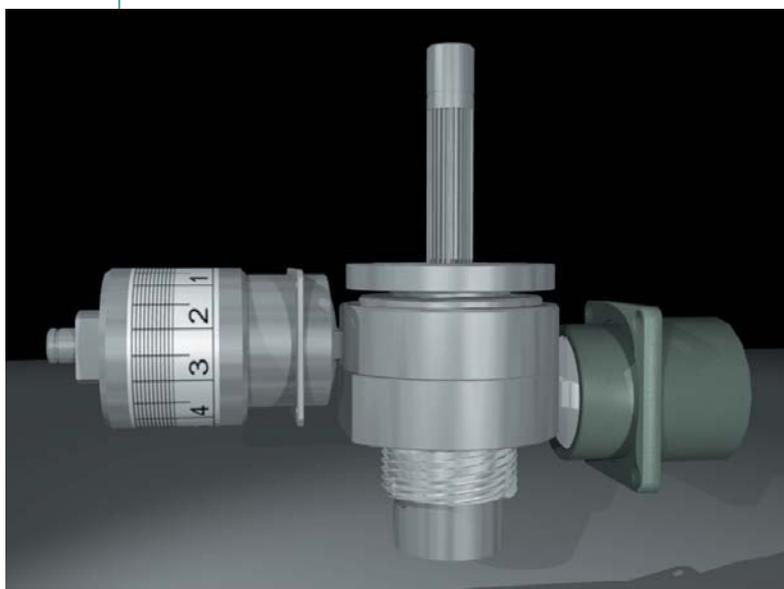
- ▶ Low inertia and high torque, which guarantee a tight closing and a safe opening.
- ▶ Tropicalized Class F insulation (155°C Max. Temp.).
- ▶ S2-15 min. intermittent type of service (or S4-25% for modulating duty).
- ▶ Overheating protection by means of embedded thermostats.
- ▶ Correct function even with voltage and frequency drops.
- ▶ IP-67 environmental protection (IP-68 Optional).

Optionally, actuators can be supplied with single phase AC or direct current motors. (For details of motor performance, please refer to the corresponding technical data sheet).

2 GEARINGS

The new **PTCS** system (Planetary Torque Control System) based on planetary gears, sets these actuators a step ahead in valve actuation.

This new patented system increases considerably the mechanical efficiency, reducing noise level and volume/torque ratio, and controlling the applied torque with great accuracy.

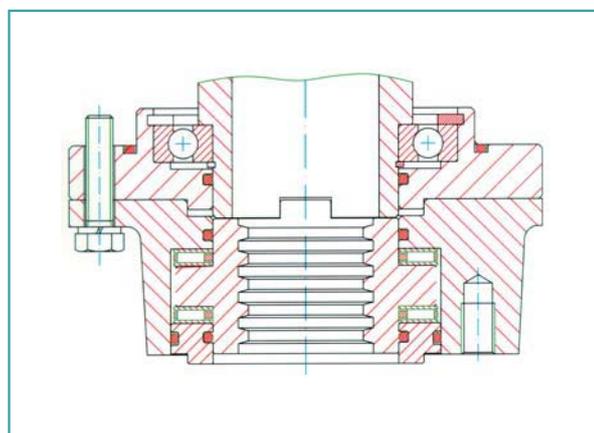


3 MANUAL OPERATION

All the CENTORK electrical actuators come with a manual operation handwheel which can actuate the valve in any situation. The motor drive is always priority so not to cause any risk to the user.

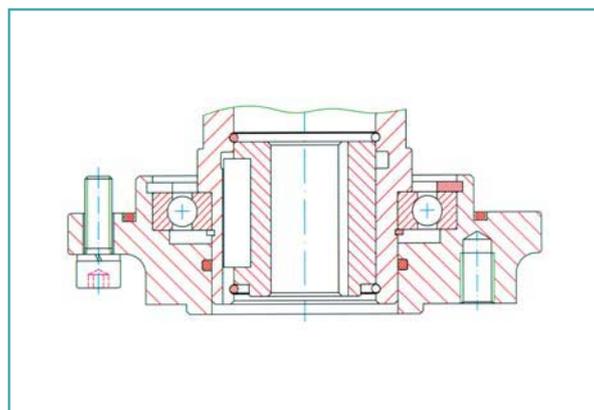
4 VALVE-ACTUATOR COUPLING

The CENTORK actuators can take on different types of coupling depending on the type of valve to be actuated. All the types and sizes have been designed according to ISO 5210/5211 and DIN 3338 Standards.



Type A: Able to withstand axial thrust. Used with threaded stems.

Easily removable bushing for a precise machining.



The B1, B2, B3, B4, and B0 types cannot withstand axial thrust, they only transmit torque.

5 ENVIRONMENTAL PROTECTION

WEATHERPROOF PROTECTION:

IP67 degree of protection.

Centork actuators are standard IP67 according to EN 60529

IP68 degree of protection.

Centork actuators are available with IP68 enclosure protection as an option. Centork IP 68 conditions are defined for 6m. deep submersion for a maximum of 72 hours. During submersion up to 10 Open-Close cycles are allowed.

CORROSION PROTECTION:

Standard-CK protection.

High quality Epoxy coating suitable for outdoor installation and slightly aggressive atmospheres.

P1 and **P1+** protection.

Centork recommends this protection for aggressive atmospheres.

P1+ is recommended for shipping industry.

P2 protection.

Using a special marine coating this protection is recommended for extremely aggressive atmospheres

Special protections

Other corrosion protections according to customers needs can be used. Consult Centork.

AMBIENT TEMPERATURES:

Standard temperature:	- 25 °C ... +70 °C
High temperature:	0 °C ... +120 °C (optional)
Low temperature:	- 60 °C ... + 60 °C (optional)

EXPLOSION PROTECTION:

For the installation of electric actuators in potentially hazardous or explosive areas, special protective measures are needed.

Centork multiturn actuators comply with EN standards and ATEX directive:



Centork Multiturn actuators:

40A/41A/40B/41B Series.....II 2G Eex de IICT4
II 2G Eex de iaIICT4

Centronik Multiturn actuators:

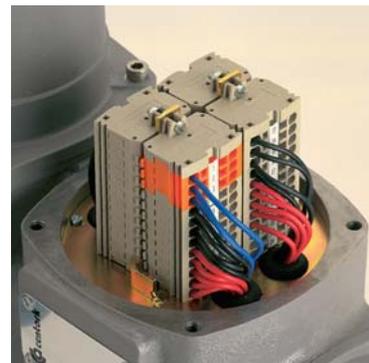
40C/41E/40D/41F Series.....II 2G Eex d IIBT4

CE All the Centork actuators are in accordance with the EC directives: Low voltage, EMC, ATEX and Machines European Directives.

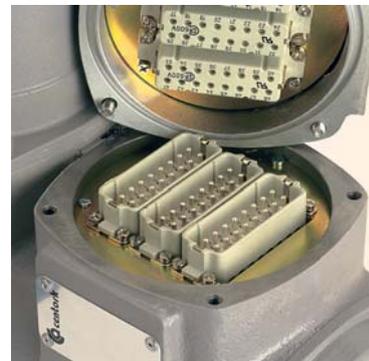
6 ELECTRICAL CONNECTION

The CENTORK actuators electrical connection presents 3 options according to the customer's application/specification:

The different EK terminal plans are available in the corresponding technical sheets. The threaded conduit entries available as standard are: 2xPG21 + 1 PG 16, even though other alternatives (NPT, metric) can be supplied. (2 x M25x1,5 + 1 x M20x1,5 or 2 x 3/4" NPT + 1 x 1/2" NPT)



Terminal connection



Plug-socket connectors with screw



Plug-socket connectors with CRIMP

CENTORK ELECTRIC ACTUATORS 400 / 410 SERIES

MODULAR

RELIABLE

SIMPLE

MOTOR

Especially designed for valve actuation with low inertia and high torque, guarantees a precise and reliable service.

S2-15 min or S4 Service according to the On/Off or modulating duty.

It includes thermostats to protect the motor from overheating and class F insulation.

The motor shaft is independent enabling a quick replacement of the motor.

MANUAL OPERATION

It provides emergency manual operation. It always maintains the priority on the motor drive, not turning the handwheel when the actuator is running.

In emergency situations, for a quicker manual operation, it can be activated with a thread machine.

PTCS

The transmission uses planetary gears with a patented torque/thrust control system that features:

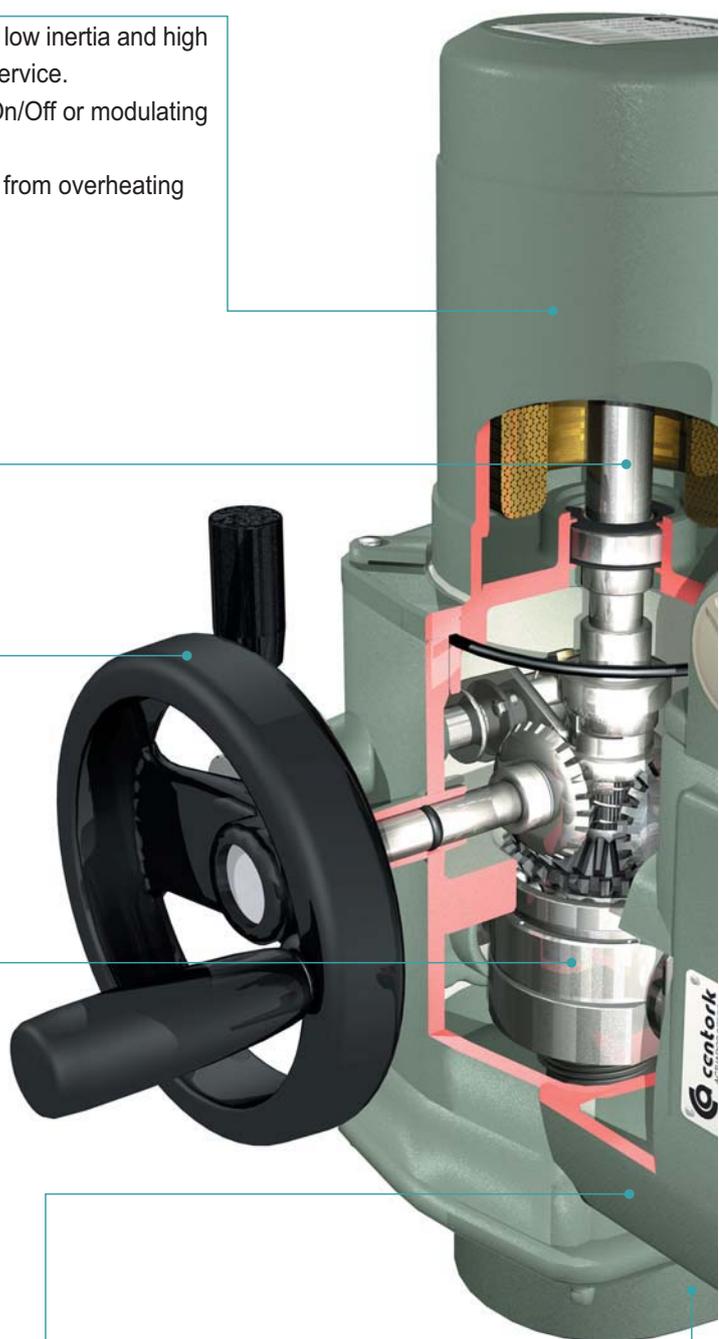
- ▶ A High mechanical performance (>95%)
- ▶ A precise control of the applied torque/thrust, especially at high speeds.
- ▶ A more silent service.
- ▶ Reduced volume.

The transmission has been lubricated for life, therefore reducing maintenance.

PROTECTION

All the CENTORK electrical actuators feature, as standard, a high degree of protection (IP67 according to EN60529), this guarantees a correct working in the most extreme weather conditions (IP 68 optional).

Eex protection available.



ACTUATOR-VALVE COUPLING

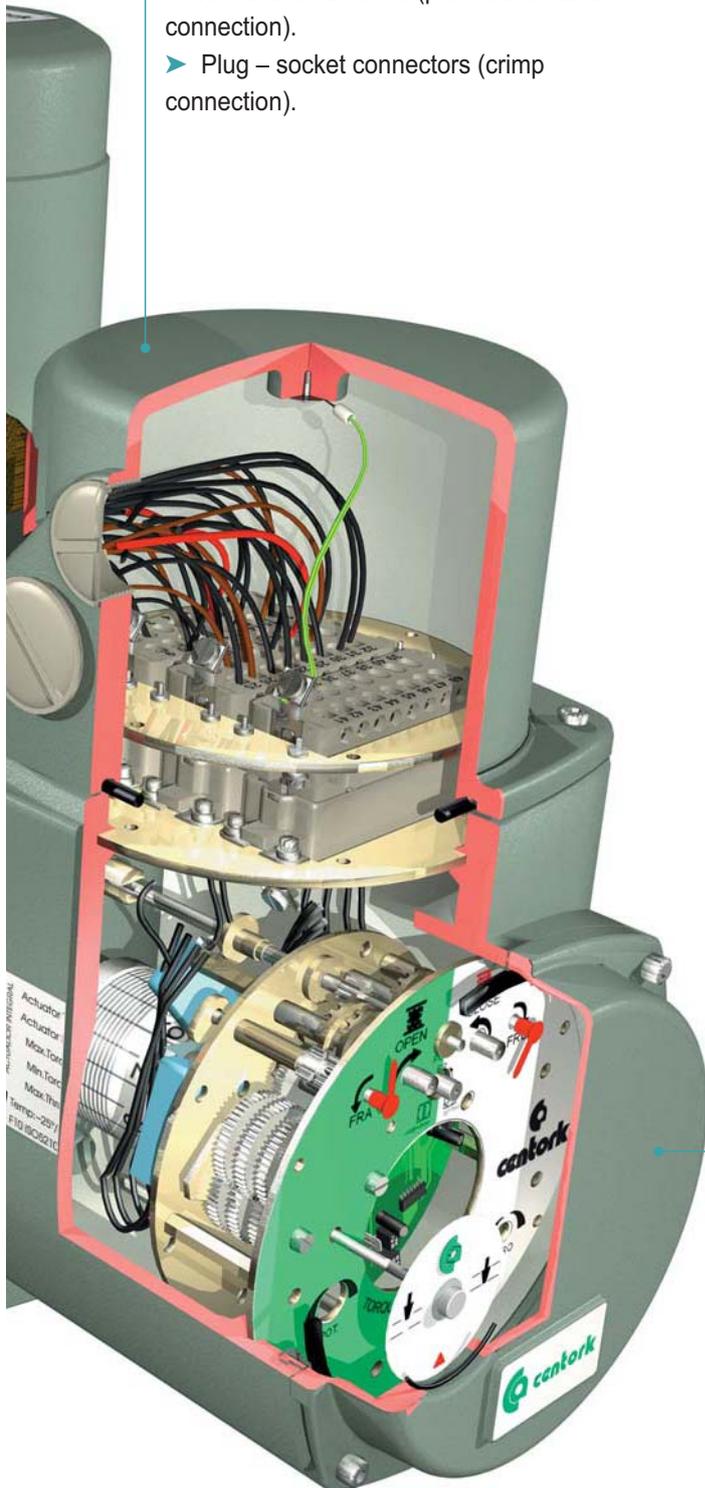
Features different couplings to be adapted onto the different types of valves.

A, B1/B2, B3/B4, B0, C and D type, according to ISO 5210/5211 or DIN 3338 Standards.

ELECTRICAL CONNECTION

Depending on the customer's needs, 3 different solutions are provided to connect the motor power and control electrical signals:

- Plug – socket connectors (screw connection).
- Terminal connectors (pressed terminal connection).
- Plug – socket connectors (crimp connection).



SWITCHING AND SIGNALLING UNIT



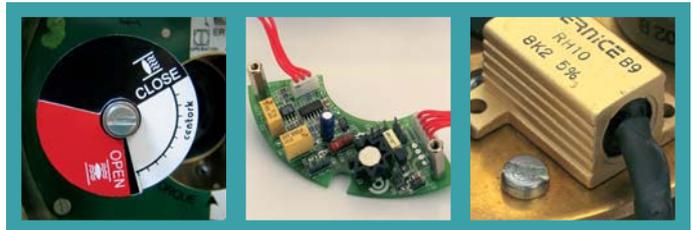
It is the CENTORK electrical actuator "brain"

Its main features are:

- Reliability and accuracy: The torque and limit microswitches are critical in the electrical actuators. Its IP67 protection guarantees its performance under any condition.
 - Its modular design enables to cover any need.
 - Easy commissioning, fitting and setting.
- It has two independent control mechanisms
- The torque/thrust switching, based on the PTCS system.
 - The limit switching with two independent high precision and repetitive counters.

Both mechanisms feature easy field setting.

OPTIONS



Mechanical position indication

TPS position transmitter:
- 4/20mA (2 wires)
- 0/20mA (3, 4 wires)
- 0/10V (2 wires)

Heater



Precision potentiometer

Double signals:
- Torque switching
- Limit switching

Intermediate position signals

CENTORK ELECTRIC ACTUATORS RANGE

The CENTORK electrical actuators have been designed to work under the difficult conditions of the process industry: adverse and changeable environmental conditions, long inactivity periods, corrosive surroundings, low maintenance, remote control, etc.

Through the use of the well-proven mechanical design of the 400 Series actuators and the application of the latest electronic developments, the new 460 series Digital actuators are born.

ELECTRICAL ACTUATORS 400-410 SERIES



DIGITAL ACTUATORS 460-470 SERIES



MULTITURN ACTUATORS

Torque range: 15 to 4000 Nm
Operating speeds: 2,75 to 224 rpm.



QUARTER-TURN ACTUATORS

Torque range: 280 to 350.000 Nm
Operating times (90°): 2 to 900 sec.



LINEAR ACTUATORS

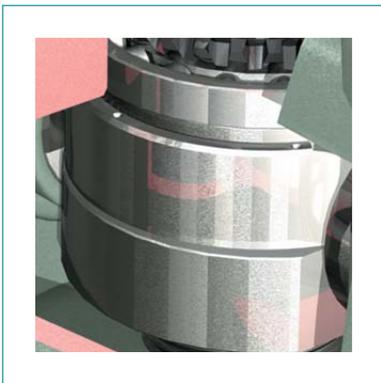
Thrust range: 7 to 200 KN.
Stroke: 25 to 500 mm.

CENTORK DIGITAL ACTUATORS 400 / 470 SERIES

Through the applications of the latest electronic technology to the patented PTCS (planetary gearbox), Centork has created the new range of Digital multiturn actuators: the 460 and 470 Series.

TORQUE AND POSITION SENSING.

► **Torque sensor.** Directly sensing the torque in the planetary gearbox. It gives higher accuracy and speed than other indirect measuring systems. Can be transmitted to the remote control for maintenance control of the valve torque through the entire valve stroke (TTS transmitter).



► **Position sensor:** Through the use of Reed sensors the position is controlled, from 1 to 100.000 output turns with a high accuracy. This avoids the use of small gearboxes for the electronic position transmitter.

Even in case of loss of power, the microprocessor controls the position.



WITH OR WITHOUT CENTRONIK UNIT

The only digital (non intrusive) actuator in the world that can work with or without integral controls Centronik unit. Modular design is maintained.

THE D.S.U.: DIGITAL SWITCHING AND SIGNALLING UNIT.

► Digital display and pushbuttons: With its non-intrusive design, we can surf through the menu and options:

- Setting options, protected by password.
- Torque and position as a % percentage.
- Serial number
- Output signal status
- Historical working data available
- Several different languages can be selected
- Basic configuration: 2 Limit switches and 2 Torque switches signals. The same output signals than in a conventional electromechanical actuator.
- 7 Extra configurable Switches (Optional)
- TPS and TTS: Analogue (4-20 mA) output signals for Position (TPS) and Torque (TTS) remote transmission.



NON INTRUSIVE SETTING

All setting and parameterisation can be done without opening the actuator.

- No tools are needed for setting
- Great savings in the setting time needed.
- Electronic and electrical internal parts are better protected from water ingress and dust.
- Password protection against parameter change. Higher warranty and safety.



CENTORK DIGITAL ACTUATORS 460-470 SERIES

MODULAR

RELIABLE

DIGITAL TECHNOLOGY

With the design of a new Digital switching and signalling unit (DSU) that controls continuously both position and torque/thrust of the actuator using microprocessor based electronics, a big step forward has been done by Centork in the Valve actuation technology.

Based in the same well proven mechanical design of Centork actuators (including a planetary gearbox) this new range of actuators includes innovative electronic solutions in a modular design.

MOTOR

Specifically designed for valve actuation with low inertia and high torque. It includes thermostats in motor windings to protect against overheating and class F insulation.

MANUAL OPERATION

It provides reliable emergency manual operation, always maintaining motor priority.

PTCS

Using a patented planetary control system that features:

- High mechanical performance (>95%)
- Precise control of the Torque/Thrust applied
- Silent service
- Reduced volume

PROTECTION

All the CENTORK electrical actuators feature, as standard, a high degree of protection (IP67 according to EN60529), this guarantees a correct working in the most extreme weather conditions (IP 68 optional). Eex protection available.

VALVE COUPLING

Features different couplings to be adapted onto the different types of valves.

A, B1/B2, B3/B4, B0, C and D type, according to ISO 5210/5211 or DIN 3338 Standards.



D.S.U.:DIGITAL SWITCHING AND SIGNALLING UNIT

ELECTRICAL CONNECTION

Separated from the DSU, provides 3 different solutions for cable wiring, ensuring the integrity of electrical equipment even during site wiring.



Allows a digital continuous control of valve position and torque applied by the actuator, and a non-intrusive setting of all parameters.

DIGITAL DISPLAY AND PUSHBUTTONS.

- Setting options, protected by password.
- Torque and position as a % percentage.
- Serial number
- Output signal status
- Historical working data available
- Several different languages can be selected

OPTIONS

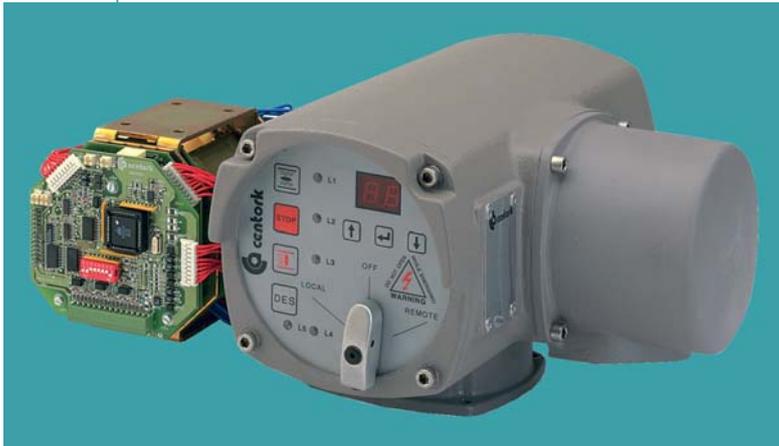
- Output signals board: 7 configurables Relays according to user needs (intermediate positions, double torque switches, double limit switches)
- TPS: Electronic Position transmitter (0/4-20 mA or 0/2-10V.)
- TTS: Electronic Torque transmitter (0/4-20 mA or 0/2-10V.)
- Anti-condensation Heater.

NON-INTRUSIVE SETTING

All setting and parameterisation can be done without opening the actuator, thus a higher protection against water ingress and security is warranted.



CENTRONIK INTEGRAL CONTROL UNIT



MODULAR DESIGN

The modular design allows easy field modifications or to incorporate optional boards/modules: positioner board, standard bus communication, profibus-DP, Modbus, Device net, radiocontrol, GSM, etc.

The separate mounting of the centronik unit from the actuator can be necessary in applications where the temperature, vibration or mounting conditions makes unsuitable the direct mounting.

CENTRONIK ELECTRONIC CONTROL

The Centronik programmable electronic control is made up of the following modules:

- ▶ Keyboard for non-intrusive local control with 5 indications LEDs.
- ▶ Non-intrusive local - off - remote selector (by reed switches).
- ▶ Reversing/contactors for motor power control (Thyristor optional).
- ▶ Internal supply transformer.
- ▶ Power supply board with phase control circuit.
- ▶ Easily accessible main fuses.
- ▶ Interface board with relays for remote signal and remote control via CentralCom 2 wires communication system.
- ▶ Main control board with microprocessor. Programmable according to the application needs.
- ▶ Electrical connection identical to the standard Centork actuator. It enables the easy retrofitting of an actuator when incorporating a Centronik module without dismantling it.

Two Centronik versions are possible:

Centronik for On/Off service.

Centronik for modulating service

Please check the "Centronik Electrical actuators" and corresponding technical sheets for more information on the Centronik module.

ADVANTAGES DURING ENGINEERING DESIGN.

- The functionality and flexibility simplifies the integration in the design and planning process.
- The correct control signals management is guaranteed by the actuator manufacturer
- Centork wiring diagrams help the design, avoiding costly and complicated installation drawings.
- Fixed and calculated final costs.
- Internal supply of the electronics options (TPS, heater...)
- Easy integration into fieldbus systems, only a fieldbus electronic board needs to be added into Centronik.

ADVANTAGES DURING INSTALLATION.

- Important time and materials savings by high reduction of needed cables.
- Installation of an additional control cabinet is not necessary.
- No additional separate wiring and switchgear required for the local control, being included in the Centronik.
- Wiring mistakes between control cabinet and actuator are eliminated. Complete unit tested by Centork.

ADVANTAGES DURING START-UP.

- Fast and easy start-up: connect, power on, ready to work.
- Automatic phase control avoids reverse sense of rotation, avoiding damages both in the valve and the actuator.
- Wide variety of adaptations to the process local conditions.
- All actuators tested in Centork. Faults in wiring, switches, etc. are thus excluded.

ADVANTAGES FOR THE USER.

- Local pushbuttons protected against non-authorized use by security lock.
- The high enclosure protection (IP67 or IP68) and the high corrosion protection ensure reliable service and no-maintenance in the hardest environments.
- Fast switching off the motor without undesired signal delays.
- Flexible programming functions allow adaptation to the process working conditions.
- Diagnostic functions facilitate a preventive maintenance and a fast trouble shooting.



ENVIRONMENTAL PROTECTION

Standard protection IP67 (IP 68 optional)
Centronik actuators.
40C/41E/40D/41F Series.....II2G Eex d IIBT4.



The Centronik actuators are in accordance with the EC directives: low voltage, EMC, ATEX and Machines european directives.

ELECTRIC ACTUATOR CONTROLS

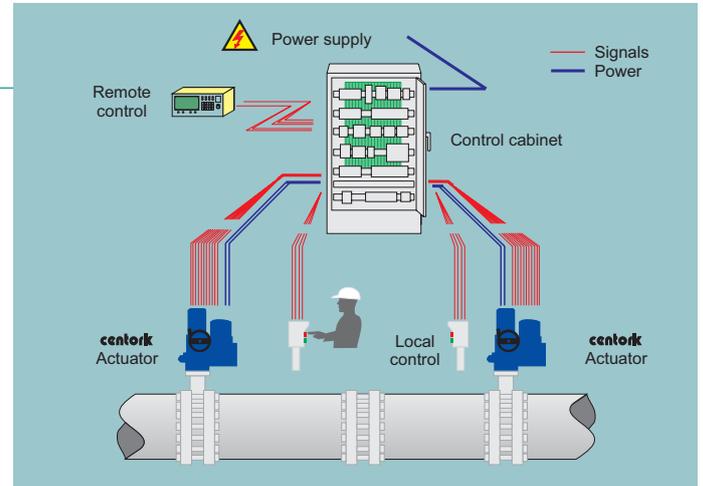
The CENTRONIK unit is designed to cover the need to reduce the high costs of installation of the controls needed for the conventional Centork actuators. Following the trend to move the 'intelligence'

CENTORK ACTUATOR EXTERNAL CONTROL

If an external control is used the following has to be considered:

- Reversing contactors or other motor power control devices for each actuator.
- Control device (Hard+Software) to manage the control signals and the reversing contactors.
- Control signals (Torque & limit switches) wiring. Power supply wiring.
- Additional power supply for the internal options (TPS, heater)
- If a local control (pushbutton) is needed, additional wiring to the control cabinet has to be considered.

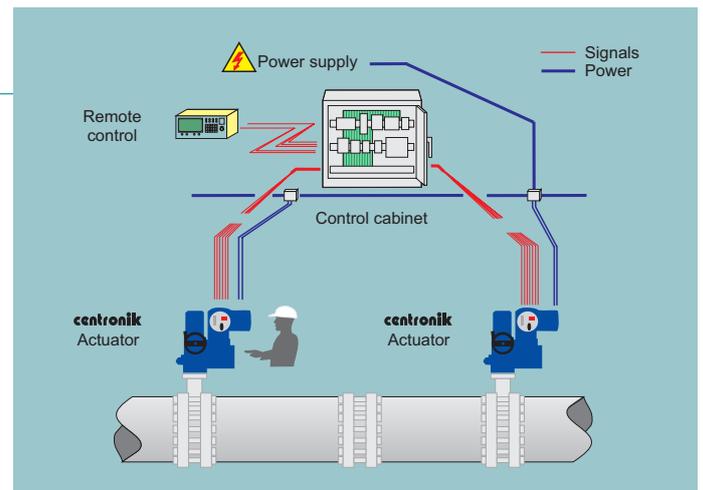
as close as possible to the final control device in the field, this can be summarised in the next diagram:



CENTRONIK ACTUATOR INTEGRAL CONTROL

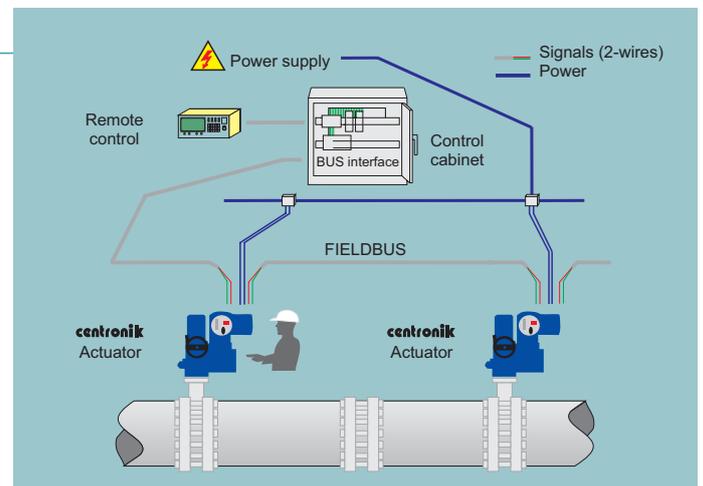
In the actuators with integral controls all these elements are integrated within the Centronik unit. This makes everything simpler:

- Only Power supply is needed.
- The Control is internal, so only the remote control signals are needed: OPEN /CLOSE and , if needed, the actuator status signals.
- The local control (pushbuttons) is included.
- The internal electronics supply (contactors, heater, TPS...) are internally supplied.



CENTRONIK+ FIELDBUS

If the CENTRONIK actuators are integrated in a FieldBus, the costs are further reduced and the quantity of information transmitted can be even higher. All the signals from the Master are transmitted using a two wire series communication. Different standard fieldbuses can be mounted in the actuators.



Centork supply different standard Fieldbuses.

CENTORK PRODUCT RANGE

ELECTRIC ACTUATORS



MULTITURN



**MULTITURN
DIGITAL**



**SPECIAL
ACTUATORS**



LINEAR



**QUARTER-TURN:
MULTITURN+
WORM GEARBOX**



QUARTER-TURN



**QUARTER-TURN
WITH LEVER**



GEARBOXES



**MULTITURN
GEARBOXES**



**QUARTER-TURN
GEARBOXES**



PNEUMATIC ACTUATORS



LINEAR



QUARTER-TURN



SPECIAL SOLUTIONS



POSITIONERS



LINEAR



QUARTER-TURN



CONTROL & COMMUNICATION



► Digital communication. Fieldbuses.



► Centronik control unit.



STANDARDS

ATEX
European machine directive CE



CENTORK VALVE CONTROL, S.L.

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