centork
VALVE CONTROL

# Centork quarter-turn electric actuators series 480 centronik units with Profibus DP

*Installation and maintenance user manual*

**THIS USER MANUAL HAS BEEN DEVELOPED FOR centork ELECTRIC ACTUATOR 482, 483, 484 AND 485 SERIES WITH PROFIBUS-DP, AND CENTRONIK UNIT**

## ⚠ CAUTION

**centork Electric actuators are a high value devices. In order to prevent damage in their handling, setting and use it is essential to follow and observe all the points in this user manual, operate under actuators' designated use, and observe health and safety rules, standards and directives, as other national regulations as well.**

**centork Electric actuators must be handled with care and caution.**

| IMPORTANT NOTE |
| --- |
| **The contents in this manual is subject to change due to the quality improvement without individual notice** |

# Index

# 1 CENTORK ELECTRIC ACTUATORS: INTRODUCTION

The electric actuator is a device designed to be coupled to a general purpose industrial valve, to carry out its movement. The movement is stopped by limit switching or by torque switching. Other applications should be consulted CENTORK before. CENTORK is not liable for any possible damages resulting from use in other than designated applications. Such risk lies entirely on the user.

# 2 SAFETY INSTRUCTIONS

The scope of this manual is to enable a competent user to install, operate, adjust and inspect a CENTORK electric actuator. These instructions must be observed, otherwise a safe operation of the actuator in no longer warrantee.

**When handling electric equipment, the health and safety standards (EN 60.204, 73/23/EEC directives) and any other national legislation applicable must be observed.**

**As electric device, during electrical operation certain parts inevitably carry lethal voltages and currents (ELECTRICAL RISKS).**

Works on the electrical system or equipment must only be carried out by a skilled electrician himself or by specially instructed personnel, in accordance with the applicable electrical engineering rules, health and safety Directives and any other national legislation applicable.

**Electric actuators are powerful apparatus. A negligence handling might cause severe damages to valves, people, and actuator as well. Under no circumstances should any modification or alteration be carried out on the actuator as this could very well invalidate the conditions which the device was designed.**

**Under operation, motor enclosure surfaces can reach high temperatures (up to 100ºC). Protection measures should be taken into acount in order to prevent people and goods from it.**

# 3 TRANSPORT AND STORAGE

## 3.1 Transport

- CENTORK electric actuators must be transported in sturdy packing. During transport measures should be adopt in order to prevent impacts, hits. CENTORK delivers its actuators ex-work.
- Hits or impacts against wall, surfaces or objects might cause severe damage on Electric actuator. In this cases, after such events, a technical inspection must be done by CENTORK technicians.
- Do not attach to the handwheel ropes or hooks to lift by hoist.
- The valve-actuator unit can NOT be lifted/manipulated employing any lifting point of the actuator; Actuator has beend designed and sized in order to motorize industrial valves, and withstand the forces and torque required.
- Each Actuator is delivered with a set of technical documentation (User manual, datasheet, diagrams…) which has to be carefully stored.

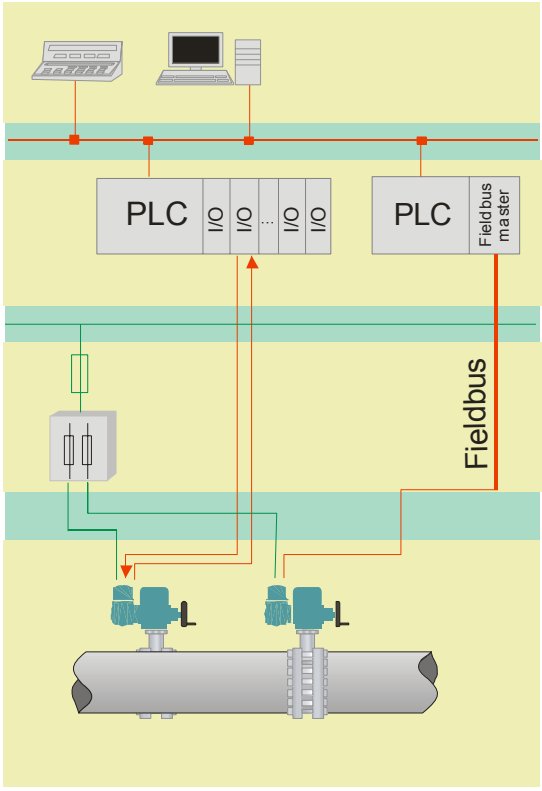
## 3.2 Storage and commissioning

- **Store in a clean, cool, dry and ventilated place. For other storage conditions or, and long time periods (More than 5 months) contact to manufacturer.**
- Check that electrical connection cover and switching and signalling unit cover and are correctly closed ant tight.
- Cable entries on electrical connection cover must be sealed. Protection plug supplied by CENTORK are only adequate for storing in dry and ventilated places, for short period of time. In other conditions **protection plug must be replaced with metallic plug sealed with PTFE tape.**


- Do not store the actuator directly on the ground!
- Cover it to protect it from dust and dirt. Cover the machined parts with suitable protection against corrosion.
- Do not handle it by picking it up by the handwheel.
- **Just when commissioning, CENTORK recommend a visual inspection in order to detect any anomaly caused during the transport, and during the storage as well. Checking should include a visual inspection of electric compartment, and switching and signalling unit .**
- Each Actuator is delivered with a set of technical documentation (User manual, datasheet, diagrams…) which has to be carefully stored.
- For further details, consult the technical sheet ‘Conditions for Transport and Storage’.

# 4 CONDITIONS OF SERVICE FOR ELECTRIC ACTUATORS

## 4.1 Electric actuator: Main description and purpose




- Electric actuator is an apparatus or device formed by a electric motor, coupled to a main gearbox unit, which transmits motion and torque to valves.
- Power supply and controls elements (transformer, relays, leds, electronic boards…) are included in the Centronik unit. Centronik unit has CPU microprocessor and electronic boards: Electric actuator is operated and controlled by means of these electronic and electric device of the centronik unit, being supplyied with main power.
- Electric actuator can be controlled in LOCAL mode from the centronik front panel or in REMOTE mode.
- Electric actuators actuators are provided with a declutchable manual override system in order to operate manually in case of emergency or fail of power supply.
- Electric actuator can be coupled directly to valve,
- The electric actuator is a device designed to be coupled to a general purpose industrial valve, to carry out its movement. The movement is stopped by limit switching or by torque (thrust) switching. Other applications should be consulted CENTORK before. CENTORK is not liable for any possible damages resulting from use in other than designated applications. Such risk lies entirely on the user.

## 4.2 Operation modes: OFF, LOCAL and REMOTE mode

Electric actuator can be controlled by the control station (REMOTE mode) and at the local control (LOCAL mode). Centronik unit is equipped with local controls. The lockable selector switch LOCAL/OFF/REMOTE allows the operation mode to be set.

### 4.2.1 OFF mode.

- In this operation mode, the actuator remains connected but does not responds to any order from the front panel or from the remote control. The front panel control indicates only the power supply status (led 5).

### 4.2.2 LOCAL mode.

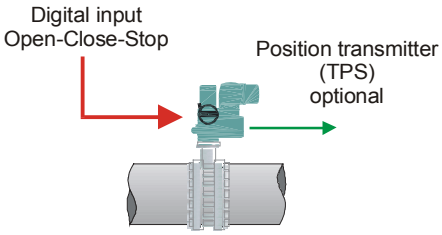
- With the push buttons OPEN-CLOSE-STOP located on the centronik front panel, the actuator is operated locally. 5 indication lights (LEDs) show the actuator status from the centronik front panel (chapter 9.12.2).
- Push buttons are self-retaining type: Once the push button has been pressed , its order or action is generated, and it remains “active” until a new order or command is generated, or any operation event takes place such us a limit switch or torque signal, an anomaly action or any centronik function or event. It is NOT necessary to keep “pressing” the pushbutton or the remote input.

4.2.3 REMOTE mode.

**Electric actuator with ON/OFF duty control:**

- Electric actuator can be controlled by the control station (REMOTE) with the commands OPEN-CLOSE-STOP (self- retaining) or OPEN-CLOSE as option (push to run operation), or with Fieldbus communication.
- ON/OFF duty control means open loop control.
- With self-retaining operation, the actuator continues to run as long as the STOP command from the control system (digital input) is not being generated, or any centronik operation condition takes place.
- With push to run operation (Inching mode) the actuator continues to run as long as this command from the control system (digital input) remains. It is necessary to keep "pressing" the pushbutton or the remote input.
- Electronic position transmitter (0-4/20mA, 0-2/10V or resistive value) can be employed, as option, which in order to provide the real valve position indication.

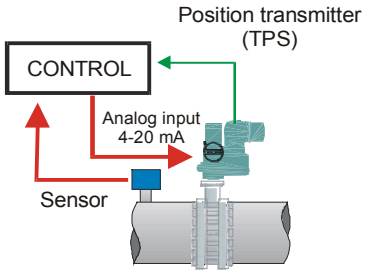
OPEN loop control
centronik ON/OFF duty




**Electric actuator with Modulating duty control:**

- Electric actuator is equipped with an electronic integral positioner which automatically positions the valve in accordance with the analog input control signal (4/20mA current signal and voltage signal as option) or the input control from Fieldbus communication.
- Modulating duty control means close loop control. The modulating duty registers and compares the analog input control and the actual position value (Feedback signa given by actuator position transmitter). The electric actuator runs to OPEN or CLOSE direction, according to the deviation detected.
- The modulationg behaviour is stabilised by determining inner (internal) and outer (external) dead bands, rest time and therefore the wear of valve and actuator can be reduced.

CLOSE loop control
centronik Modulating duty




## 4.3 Temperature range

CENTORK Electric actuators work in a temperature range from -20ºC to +65ºC.

## 4.4 Actuator and motor duty service

Electric actuator has been designed for valve motorization which requires ON-OFF and inching or modulating duty service.

- ON-OFF duty service: Electric actuator has been designed as S2 20-50% Max 30min duty cycle at nominal torque, according to IEC standards: Nominal torque is rated to 50% of max tripping torque (100%), value marked on actuator nameplates. Higher nominal torques can reduce the actuator's service life and S2 duty cycle.
- Inching or modulating duty service: Electric actuators has been designed as S4 30-50%, at 1.200-300 starts per hour, at nominal torque. Nominal torque is rated to 50% of max tripping torque (100%), value marked on actuator nameplates. Higher nominal torques can reduce the actuator's service life and S4 duty cycle conditions.

## 4.5 IP protection degree

- CENTORK Electric actuators are designed in their standard version with IP67 (acc. EN 60.529) environmental protection although IP68 protection may be supplied on request.
- **IP67 and IP68 protection degree is only guarantee employing proper protection plug and cable gland (For cable entries**), according to IP degree (See chapter ELECTRIC CONNNECTIONS) .
- It is necessary to observe storing and maintenance rules written on TRANSPORT AND STORAGE chapter as well.

## 4.6 Painting and protection against corrosion

- CENTORK has designed three protection degree: Standard protection, P1 and P2. For technical details, consult CENTORK technical datasheets.
- Electric actuator are coated with a epoxy- two components primer (Film thickness depends on protection class selected, actuators are coated with intermediates primers) followed by a polyurethane component paint coat. The standard colour is blue RAL 5.003. Other colours are possible (Option). Other film thickness under request.

# 5 ABOUT PROFIBUS-DP

Nowadays information technology (IT) is increasingly determining growth in the world of automation. The communications capability of devices and continuous, transparent information routes are indispensable components of future-oriented automation concepts. ProfiBus represents one of the best-known industrial FieldBus protocols from Europe. ProfiBus can be used in a very wide range of applications as a multi-application communications link for industrial devices, as well as cell-level communication.

Standardized as EN50.170, ensures manufacturers and users investments and guarantees the independence of the manufacturer.

These user manual does not pretend to provide a detailed introduction to PROFIBUS-DP. If more detailed information were needed, please refer to specialized bibliography.

## 5.1 General description

ProfiBus utilizes a non-powered two-wire (RS485) network. A ProfiBus Network may have up to 126 nodes. It can transfer a maximum of 244 bytes data per node per cycle. Communication (baud) rates are selectable but overall end-to-end network distance varies with speed. Maximum Communication (baud) rate is 12Mbps with a maximum distance of 100M (328ft). The maximum distance is 1200M (3936 ft) at 93.75Kbps without repeaters.

ProfiBus connects to a wide variety of field devices including discrete and analog I/O, drives, robots, HMI/MMI products, pneumatic valves, actuators, transducers, and flow measuring equipment.

The data flows by the field cyclically. The Master devices of the fieldbus, are the ones to control the data flow cycles in the fieldbus. They are capable of sending messages without an external request. The Slave devices are those that only can listen to the messages sent by a master and answer that message if was sent to its address. CENTRONIK PROFIBUS-DP actuators can only be slave devices. Typical slave devices are input/output devices, actuators and plant sensors. They never have bus access, they only acknowledge or reply messages coming from a master.

## 5.2 Network overview

The media for the fieldbus is a shielded copper cable consisting of a twisted pair. The baudrate for the bus is between 9.6 Kbaud to max. 12 Mbaud. The PROFIBUS-DP network can consist of 126 nodes and the total amount of data for PROFIBUS-DP are 244 Byte out per node and 244 Byte in per node.

NOTE: Node No. 126 is only used for commissioning purposes and should not be used to exchange user data.

## 5.3 Technical features for PROFIBUS-DP

The table below gives a summary of the technical features and the figure on the next side shows the bus cycle time of a PROFIBUS-DP system.

| Summary Technical Features for PROFIBUS-DP | |
|---|---|
| **Transmission technique:**<br><br>**PROFIBUS DIN 19245 Part 1** | EIA RS 485 twisted pair cable or fiber optic<br><br>9.6 Kbit/s up to 12Mbit/s, max. distance 200m at 1.5 Mbit/s extendible with repeaters |
| **Medium access: Hybrid medium access protocol according to DIN 19245 Part 1** | Mono-Master or Multi-Master systems supported<br><br>Master Slave Devices, max. 126 stations possible |
| **Communications: Peer-to-Peer (user data transfer) or Multicast (synchronization)** | Cyclic Master-Slave transfer and acyclic Master-Master data transfer |
| **Operation Modes:** | Operate: cyclic transfer of input and output data<br><br>Clear: inputs are read and outputs are cleared<br><br>Stop: Only Master-Master functions are possible |
| **Synchronization: enables synchronization of the inputs and/or outputs of all DP Slaves** | Sync-Mode: Outputs are synchronized<br><br>Freeze-Mode: Inputs are synchronized |
| **Functionality:** | Cyclic user data transfer between DP-Master(s) and DP Slave(s)<br><br>Activation or deactivation of individual DP-Slaves<br><br>Checking of the configuration of the DP-Slaves<br><br>Powerful diagnosis mechanisms, 3 hierarchical levels of the diagnosis messages<br><br>Synchronization of inputs and/or outputs<br><br>Address assignments for the DP-Slaves over the bus with Master class 2<br><br>Configuration of the DP-Master (DPM1) over the bus<br><br>Max. 244 bytes input and output data per DP-Slave, typical 32 bytes |
| **Security and protection mechanisms:** | All messages are transmitted with Hamming Distance HD=4<br><br>Watch-Dog Timer at DP-Slaves<br><br>Access protection for the inputs/outputs at the DP-Slaves<br><br>Data transfer monitoring with configurable timer interval at the DP-Master (DPM1) |
| **Cabling and installation:** | Connecting or disconnecting of stations without affection of other stations |

# 6 CENTORK PROFIBUS-DP INTERFACE OVERVIEW

This section provides an overview over the PROFIBUS-DP interface of the CENTRONIK electric actuators.

## 6.1 Mechanical overview

The interface for Profibus-DP, located in the centroniik unit, is a slave node that can be read and written to, from a Profibus-DP master station. The interface Profibus-DP will not initiate communication to other nodes, it will only respond to incoming commands.

## 6.2 Protocol & Supported Functions

- Fieldbus type: PROFIBUS-DP EN 50.170 (DIN 19.245)
- Protocol version: ver. 1.10
- Protocol stack supplier: SIEMENS
- Extended functions supported: Diagnostics & User Parameter data.
- Auto baudrate detection supported. Baudrate range: 9.6 Kbit-12Mbit
- Hardware prepared for DP-V1 extensions.
- Save/Load configuration in Flash supported.

## 6.3 Physical Interface

- Transmission media: Profibus bus line, type A or B specified in EN50.170
- Topology: Master-Slave communication
- Fieldbus connectors: Standard Centork connecting terminals,9 pin female DSUB, on demand.
- Cable: Shielded copper cable, Twisted pair
- Isolation: The bus is galvanically separated from the other electronics with an on board DC/DC converter. Bus signals (A-line and B-line) are isolated via opto-couplers.
- Profibus-DP communication ASIC: SPC3 chip from Siemens.

## 6.4 Configuration & Indications

- Address range: 1-99.
- Maximum cyclic I/O data size: 244 bytes in, max 244 bytes out, max. 416 bytes total
- Maximum User Parameter data/Diagnostics length: 237 bytes.
- Bus termination switch onboard.
- LED-indications: ON-line, OFF-line, Fieldbus related diagnostic.

## 6.5 Data Exchange

- I/O data transmission: The interface only supports cyclic I/O data transmission.

# 7 MOUNTING TO THE VALVE

## 7.1 Pre-Installation Inspection

- Verify the actuators nameplate to insure correct model number, torque, operating speed, voltage and enclosure type before installation or use.
- It is important to verify that the output torque of the actuator is appropriate for the torque requirements of the valve and that the actuator duty cycle is appropriate of the intended application

## 7.2 ACTUATOR MOUNTING

- **Do not lift the actuator by the handwheel. Do not attach to the handwheel ropes or hooks to lift by hoist.**
- The actuator may be mounted in any position
- The CENTORK quarter turn electric actuator Series are supplied with a female drive output. ISO5211. Bolt patterns are provided for actuator mounting. The actuator drive bush is removable for ease of machining (except for 480.006). To remove the drive bush, just take out the 2 fixing screws.
- It is mandatory that the actuator be firmly secured to a sturdy mounting bracket or directly mounted to the valve's ISO mounting pad. High tensile bolts or studs with spring locking washers must be used.
- The valve output shaft must be inline with the actuator output drive to avoid side-loading the shaft. To avoid any backlash no flexibility in the mounting bracket or mounting should be allowed.
- Reserve the space for maintenance routines and tasks.

# 8 ELECTRICAL CONNECTIONS

**CAUTION: Safety instructions on chapter 2 must be observed. Work on electrical system or equipment must only be carried out by skilled electrician.**

## 8.1 Wiring diagram (electric manoeuvre)

Electric actuator datasheet, supplied with the actuator, includes a **PROPOSED WIRING DIAGRAM**, delivered with other technical documentation**.**

**Capacitors** for single-phase A.C. motors are delivered with electric actuators. Each capacitor is dimensioned according to motor voltage and power.

Features of electric and electronic components listed on appendix. Wiring diagram are included on appendix.

## 8.2 Terminal plan and wiring

**The electric connection diagram or terminal plan is depicted on Electric actuator datasheet, supplied with the electric actuator, and it can be found printed on a label inside of electrical compartment cover.**

- Open the electrical cover.
- **Feed the cable(s) through the cable glands . Fix proper cable glands according to IP67 or IP68 protection degree.**

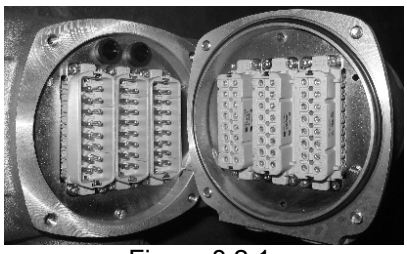


Figure 8.2.1

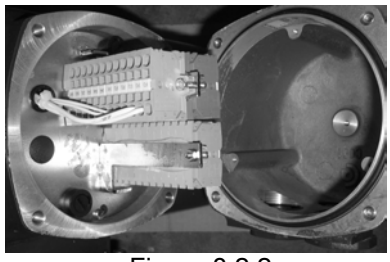


Figure 8.2.2

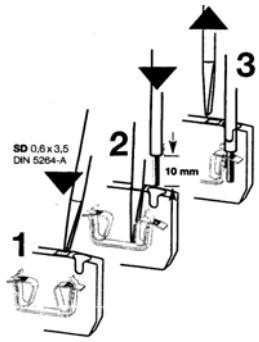



Figure 8.2.3

A) Electric actuator with **Plug-socket connectors** (Figure 8.2.1) with screws

- Unscrew the attachment plate from the connection cover.
- With a suitable screwdriver, connect the cables for the control signals according to the electric connection diagram.

B) Electric actuator with **Terminals connection** (Figure 8.2.2)

- With a suitable screwdriver (SD 0,6x3,5 DIN 5264-A), connect the cables for the control signals according to the electric connection diagram (Figure 8.2.3).

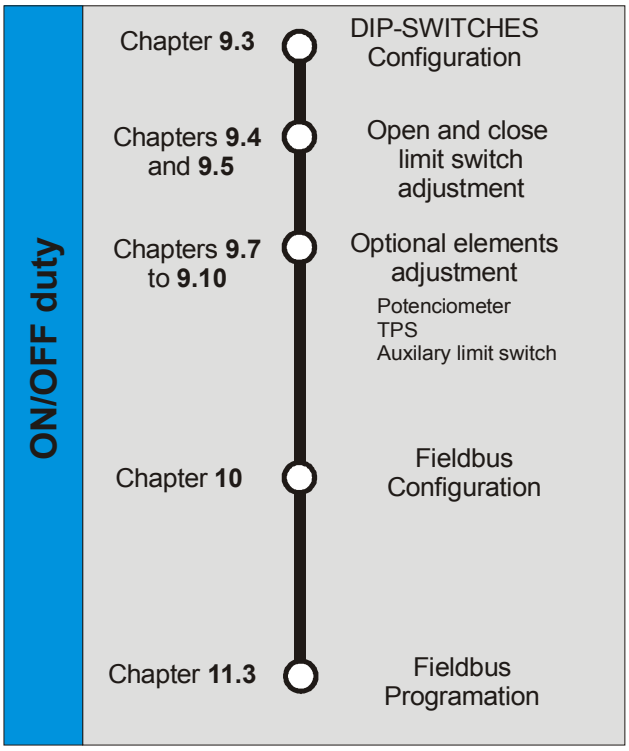
### Caution!

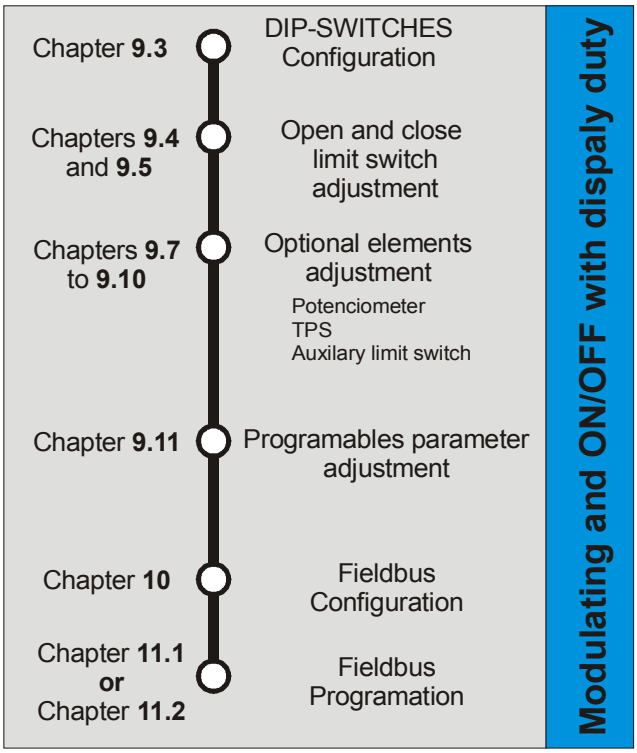
- Connect the earth cable terminal ⏚ to the earth connection located inside of electric connection cover (M5 screw hole).
- Once you have checked that the connections have been properly carried out, close the connection cover and check the proper connection, the state of the o-ring seal and the proper installation of the latter, greasing it slightly. Fasten the 4 screws crosswise.
- Fix proper cable glands according to IP67 or IP68 protection degree. **Replace the protection plug with suitable metallic protection plug sealed with PTFE** . Tighten cable glands and protection plugs to ensure enclosure IP67 (IP68 if applicable).
- Check that all cable glands are correctly tighten.
- Clean sealing faces at terminal cover and check whether O-ring is in good condition. Mount cover and tighten cover bolts.

# 9 PRELIMINARY TEST AND SETTINGS

**CAUTION: SAFETY INSTRUCTIONS described on chapter 2 must be observed. Work on electrical system or equipment must only be carried out by skilled electrician.**

- Before to start with the preliminary test, actuator should be correctly mounted on valve and correctly wired as well, according to previous chapters (7 and 8).
- Operate or move the valve manually (Chapter 9.2) and check that the actuator rotates in the right direction (Visual disc indicator or valve shaft could help for this). Instructions have been made for standard electric actuators: CLOCKWISE TO CLOSE.
- Achieve the following setting procedure:



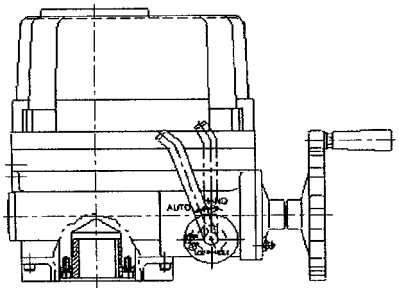
## 9.1 Handwheel and Declutching

**Quarter turn electric actuators are provided with a declutchable manual override system. The override engagement lever returns automatically to auto position when the actuator is operated electrically.**

***For 480.006 models***

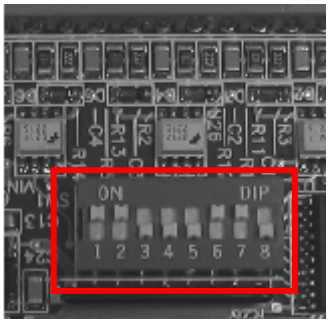

- In order to manually operate the actuator, take the key wrench tool (See picture)
- Key wrench tool has to be coupled to square shaft of the actuator in order to operate it.
- Turn clockwise to close and anti-clockwise to open.

***For 480.010 models and higher***



- In order to manually operate the actuator, pull the manual override
- Engagement lever towards the handwheel until it remains in position.
- Turn the handwheel until the valve reaches the required position
- Turn clockwise to close and anti-clockwise to open

## 9.2 DIP-SWITCHES configuration




### Caution!

**This is a sensitive electronic device. Manipulation of setting switches should be mde very carrefuly, in a way that other electronic components are not damaged.**

In order to confugurate the Dip-switches, switch-off the Centronik unit (led 5 OFF) and open the centronik front panel carefully. In the CPU board, the Dip-switches are located as indicated in the next figure.

### 9.2.1 Operation mode

| SW1 | SW2 | SW3 | Operation mode |
|---|---|---|---|
| **ON** | **OFF** | **OFF** | Open by limit switching and close by torque switching |
| **OFF** | **ON** | **OFF** | Open and close by limit switching |
| **ON** | **ON** | **OFF** | Open and close by torque switching |

Note: Open or close by torque switching means that the Centronik consider that the valve is close or open when the open/close limit switch and the open/close torque switch are activated. Limit switch must be adjust as in Open and close by limit switch.

9.2.2 Digital or Relay Outputs configuration (only in ON/OFF duty)

| SW5 | SW6 | SW7 | OUTPUT 1 | OUTPUT 2 | OUTPUT 3 | OUTPUT 4 | OUTPUT 5 |
|---|---|---|---|---|---|---|---|
| **OFF** | **OFF** | **OFF** | Valve OPEN | Valve CLOSE | LOCAL | REMOTE | ANOMALY |
| **ON** | **OFF** | **OFF** | Overtorque reached in OPEN | Overtorque reched in CLOSE | LOCAL | REMOTE | ANOMALY |
| **OFF** | **ON** | **OFF** | Valve OPEN | Overtorque reched in CLOSE | LOCAL | REMOTE | ANOMALY |
| **ON** | **ON** | **OFF** | Valve OPEN | Valve CLOSE | Overtorque reched in OPEN | Overtorque reched in CLOSE | ANOMALY |
| **OFF** | **OFF** | **ON** | Valve OPEN | Valve CLOSE | Overtorque | Not used | ANOMALY |

Anomaly: Motor protection tripped, limit switch fault, torque switch fault, blinker fault or lost phase.

9.2.3 Actuator and valve (Sense of rotation)

Electric actuator and valve sense of rotation must be the same. Electric actuator sense of rotation criteria is CLOCKWISE TO CLOCK. Sense of rotation is critical for many components (Microswitches, potentiometer,4-20 mA transmitter). **A correct operation cannot be warranty in case of different sense of rotation valve/actuator)**

- Operate the Electric actuator via handwheel (See Manual operation chapter).
- Check that running the handwheel clockwise, valve moves to close. If the turn direction is not correct, stop immediately and verify.
- Configurate the dip-switch 4

| SW4 | Direction to close |
|---|---|
| **ON** | Anti-clockwise |
| **OFF** | Clockwise |

**Instructions have been made for standard electric actuators: CLOCKWISE TO CLOSE**

9.2.4 Posicion transmitter range (only in Modulating duty and ON/OFF duty with display)

| SW6 | TPS range |
|---|---|
| **OFF** | 0/20mA |
| **ON** | 4/20mA |

Note: the SW6 must be configurated in accordance to the TPS setting (Chapter 9.10).

9.2.5 Remote mode selection

| SW8 | Remote mode selection |
|---|---|
| **ON** | Analog input control (modulating duty)<br>Paralel input control (ON/OFF duty): |
| **OFF** | Fieldbus control. |

**Once the dip switches have been configureted, close the frontal panel: Check that any wire is not tripped by frontal planel, when closing and verify that o-ring is not damaged or cut. Centronik frontal panel has to be correctly tighten.**

## 9.3 Mechanical Travel Stop Adjustment

***(Not available for 480.006 models)***

Adjust the top end in the valve closed position first.

- Loosen both travel stop stud bolt nuts by 3~4 threads
- Manually operated the actuator to valve closed position until its makes trip contact with the closed limit switch.
- Forward adjust travel stop stud bolt until it contacts the worm wheel (in this position the stud bolt should not be able to travel any further).
- Adjust the travel stop stud back one turn and tighten the lock nut

Repeat the same setting operation for the open travel stop

## 9.4 Limit Switch Setting

***480.006 models***

**Operate the actuator manually to closed position**

- Using an Allen key, loosen the set screw in the CLOSE limit switch cam (For 480.010 and higher, it is normally marked with a “CLS” indication, see picture).
- Rotate the CLS cam towards CW limit switch lever until the switch ‘clicks’ .
- Tighten set screw with hex wrench
- Lower cam marked CLS

⚠ **NOTE: Instructions have been made for standard electric actuators: CLOCKWISE TO CLOSE**

***480.010 models and higher***

**Operated the actuator manually to valve open position**

- Using an Allen key, loosen the set screw in the OPEN limit switch cam. (For 480.010 and higher, it is normally marked with a “OLS” indication, see picture).
- Rotate the OLS cam towards CCW limit switch lever until the switch ‘clicks’
- Raise cam marked OLS
- Tighten set screw with hex wrench

## 9.5 Torque Switch Setting

⚠ **The torque switches are adjusted from factory to protect actuator and valve against overloading and should normally NOT be adjusted or modified on site.**

Should adjustment be necessary, please contact our factory or distributor before adjusting.

**Torque switches NOT AVAILABLE in 480.006 and 480.010 models!**

**Torque switches bolts has been sealed with a red wax. Warranty would be invalid if broken.**

## 9.6 Mechanical Position indicator Setting

- Manually rotate actuator to fully closed position
- Remove actuator cover.
- Loosen indicator screw.
- Adjust indicator to correct orientation.
- Tighten indicator screw.
- Replace cover.
- Check indicator alignment.

## 9.7 Potentiometer setting

Potentiometer gives a signal proportional to valve position. Potentiometer nominal is 10 K Ohms. For other values, consult CENTORK. Potentiometer has been already set in Centork Facilities, when a new adjustment is required, then:

- Manually rotate actuator to fully closed position
- Remove actuator cover.
- Loosen potentiometer wheel-gear (pinion) screw.
- Turn the pinion in order to reduce the potentiometer signal to its lowest or desired minimum value. Give some margin (backlash). Potentiometer has to end tops.
- Tighten wheel-gear (pinion) screw.
- Manually or electrically run the actuator to fully open position. Check potentiometer value.
- Replace cover, check O-ring, and tight it.

## 9.8 TPS 4-20 mA transmitter setting

TPS Transmitter gives a signal (Current or Voltage) proportional to valve position. Check Voltage supply polarity before!. **Transmitter has been already set in Centork Facilities**, when a new adjustment is required, then:


Manually rotate actuator to fully closed position

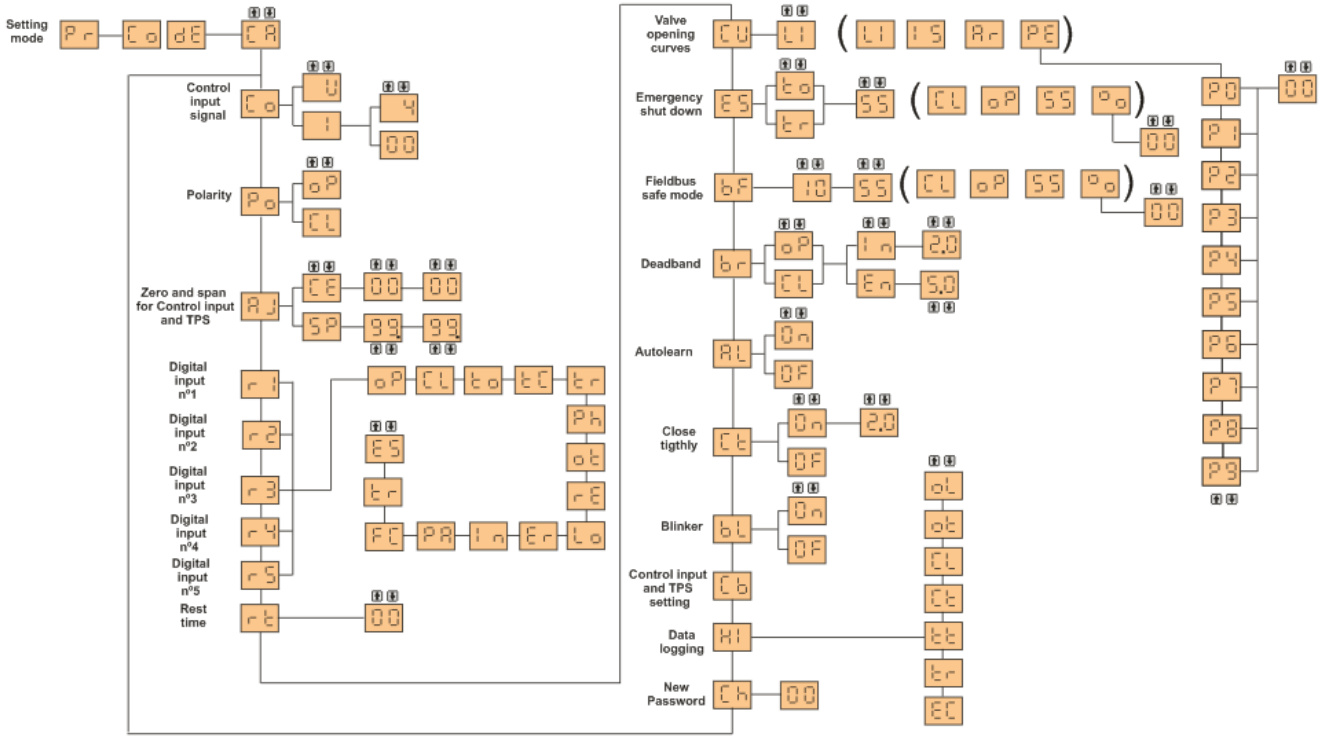
- Remove actuator cover.
- Loosen potentiometer wheel-gear (pinion) screw.
- Turn the pinion in order to reduce the potentiometer signal to its lowest or desired minimum value.
- Tighten wheel-gear screw.
- With a suitable screwdriver turn the “Zero” potentiometer trimmer in order to set the minimum value (4 mA, 0 mA or 0 Volts, depending on configuration chosen). Potentiometer is marked with “Zero” on electronic board or with a label, depending on model.
- Manually or electrically run the actuator to fully open position. With a suitable screwdriver turn the “Span” potentiometer trimmer in order to set the minimum value (20 mA or 10 Volts, depending on configuration chosen)
- Replace cover.

## 9.9 CENTRONIK setting procedure (only in Modulating and ON/OFF with display duty)

All the setting functions are stored in a non-volatile memory in the CENTRONIK unit. The front panel enables the user to view all the functions via the display. As each function is viewed its setting can be checked and, if required, changed within the bounds of that function.

The setting procedure include the following functions:

- Control input signal
- Polarity
- Control input and TPS setting
- Deadband
- Rest time
- Close tightly
- Valve opening curves
- Zero and span for Control input and TPS
- Autolearn
- Digital outputs
- Emergency shut down
- Fieldbus safe mode
- Blinker
- Data logging
- Password



### 9.9.1 Setting mode – Password

To enable setting and adjustment of the actuator functions the selector must be in LOCAL position and the correct password must be entered. The factory set (default) password is **"CA"**.

Procedure:

- Press the ↵ key during 3 seconds.
- The display will change to Pr .
- Press the ↵ key.
- The display will change to Co dE .
- Press the ↵ key.
- The display will change to 00 .
- Use the ↑ or ↓ keys to scroll through the available password 00-FF (hexadecimal).
- With the correct password diplay press the ↵ key.
- If the password is incorrect, diplay will cahnge to 88 . Press the ↵ key and enter the correct password.
- In order to return to the valve position display there are 2 ways: Press the DES key or select OFF Control using the selector.

### 9.9.2 Control input signal (only in Modulating duty)

Note: Only necesary if SW6 adjusted in ON (Analog input control). The control input signal is factory standard 4-20mA.

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Control input signal menu Co.
- Press the ↵ key.
- The display will change to 00 .
- Use the ↑ or ↓ keys to scroll through the available password 00-FF (hexadecimal). The password will only b provided if necessary. Consult CENTORK.
- With the correct password diplay press the ↵ key.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the Control input mode:

  U Voltage control input  I Current control input

Note: Voltage control input is an optional control device. Check actuator wiring diagram for inclusion.

- With the selected mode press the ↵ key.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the Control input range in case of Current control input:

  4 4-20mA  00 0-20mA

- With the selected range press the ↵ key.
- Press the ↵ key.

9.9.3 Polarity (only in Modulating duty)

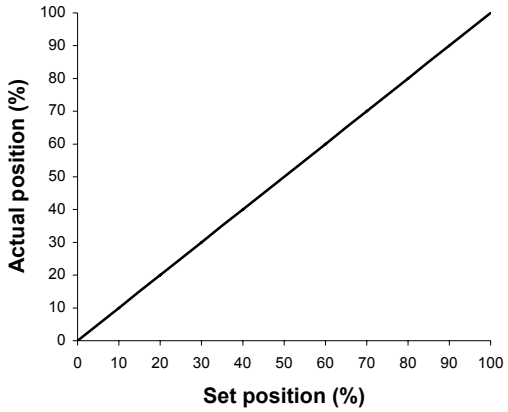
Note: Only necesary if SW6 adjusted in ON (Analog input control). The Polarity is factory standard CLOSE.

Procedure:

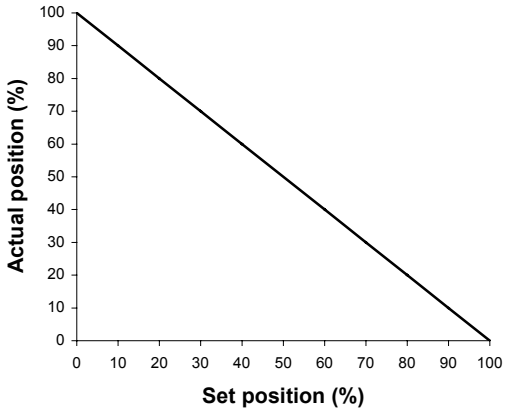
- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Polarity menu Po .
- Press the ↵ key.
- Press the ↑ or ↓ key to select the Polarity mode:

  CL Minimal control input for CLOSE  oP Minimal control input for OPEN

- With the selected polarity press the ↵ key.
- Press the ↵ key.




Minimal control input for CLOSE




Minimal control input for OPEN

9.9.4 Zero and span for Control input and TPS (only in Modulating duty)

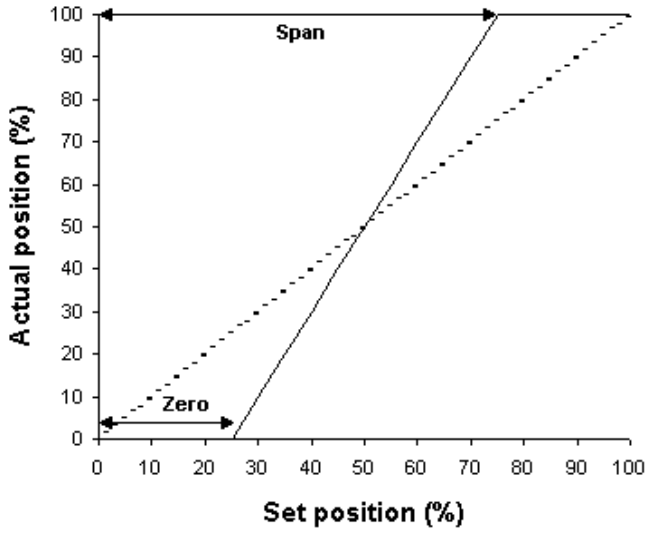
This additional function enables the Control input range (zero, span) to be fitted to the valve stroke and this one to be limited to a given MIN (zero) and MAX (span) percentage. This section is also useful for programming the split range working mode. Split range allows the adaptation of the positionner to control input ranges which are for example necessary to individually control several actuators with the same control input signal. Typical values for two actuators are 0-10mA and 10-20mA.

The zero for Control input and TPS is factory standard 0%(00). The span for Control input and TPS is factory standard 100% (99.).

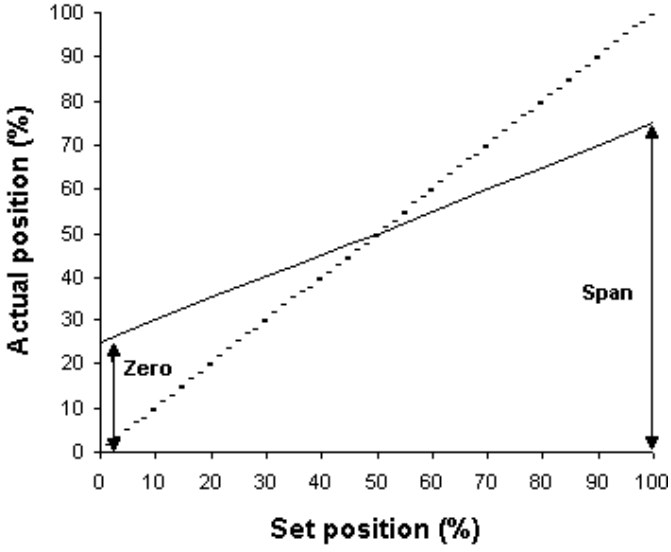
Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the zero and span menu AJ.
- Press the ↵ key.
- The display will change to CE .
- Press the ↵ key.

- Press the ↑ or ↓ key to select the zero for Control input.
- With the selected value press the ↵ key.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the zero for TPS.
- With the selected value press the ↵ key.
- Press the ↵ key.
- The display will change to SP .
- Press the ↵ key.
- Press the ↑ or ↓ key to select the span for Control input.
- With the selected value press the ↵ key.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the span for TPS.
- With the selected value press the ↵ key.
- Press the ↵ key.




Zero and span for Set position (Control input)




Zero and span for TPS (position transmitter)

### 9.9.5 Digital outputs

Digital outputs R1, R2, R3, R4 and R5 may each be set to trip for the desired function.

The digital outputs is factory standard:

r1 = oP  r2 = CL  r3 = ot

r4 = rt  r5 = tr

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the digital outputs menu r1.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the required function:

| | | | |
|---|---|---|---|
| oP | Valve OPEN | Er | Anomaly |
| CL | Valve CLOSE | Lo | Local selected |
| to | Overtorque reched in OPEN | In | Intermediate position |
| tC | Overtorque reched in CLOSE | PA | Position reached |
| tr | Not used | FC | Command signal failure |
| Ph | Lost phase | rt | Rest time |
| ot | Overtorque | ES | ESD signal |
| rE | Remote selected | | |

Anomaly:Limit switch fault, torque switch fault, movement fault or lost phase.

- With the selected function press the ↵ key.
- Press the ↵ key.

The procedure for setting up digital outputs R2, R3, R4 and R5 are the same as those shown for R1.

### 9.9.6 Rest time

**The Rest time prevents the operation to a new nominal position within a predetermine time.**

The rest time is factory standard 0s.

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Rest time menu tr.
- Press the ↵ key.
- Press the ↑ or ↓ key to select between Opening oP and Closing CL deadbands.
- Press the ↵ key.

- Press the ↑ or ↓ key to select between Inner In or Outer En deadbands.
- Press the ↵ key.
- Press the ↑ or ↓ key to change the Rest time between 0 and 60 in 1s step.
- With the selected deadband value press the ↵ key.
- Press the ↵ key.

Note: LEDs 1, 2 and 3 light yellow when the Centronik unit execute the rest ime

**CAUTION**: **It must be ensured via the control that the maximum permissible number of starts of the actuator is not exceeded. This can be achieved by setting the rest time to a sufficiently high enough value.**

9.9.7 Valve opening curves (only in Modulating duty)

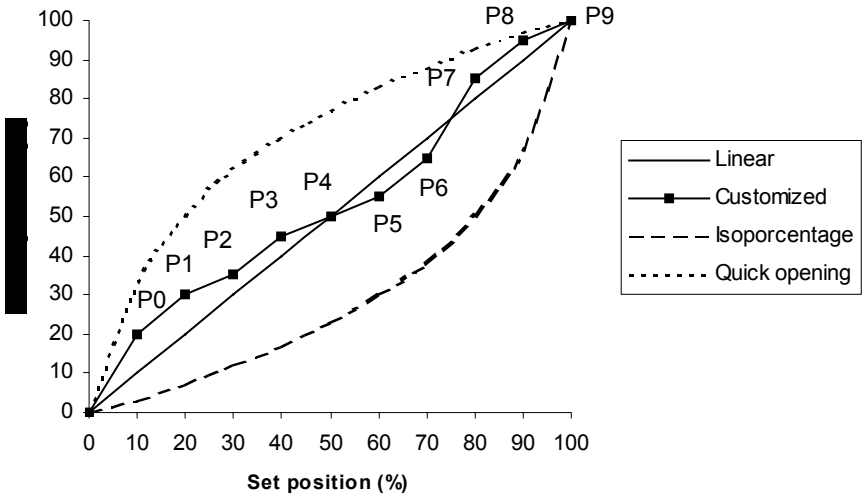
This additional function enables a transmition characteristic curve with regard to the desired value of set position (Control input) and vlve stroke for correction of the flow or operating curve to be chosen.

The Valve opening curves is factory standard Linear.

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the valve opening curves menu CU.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the valve opening curve required:

| | |
|---|---|
| LI Linear opening curve | Ar Quick opening opening curve |
| IS Isoporcentage opening curve | PE Customized opening curve |




Valve opening curve

- With the selected valve opening curve press the ↵ key.
- Press the ↵ key.
- If the customized opening curve is selected, press the ↑ or ↓ key to select the valve opening point (P0 to P9.).

| Point | P0 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 |
|---|---|---|---|---|---|---|---|---|---|---|
| Control input (%) | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| Position required (%) | | | | | | | | | | |

- Press the ↵ key.
- With the selected point value press the ↵ key.
- Press the ↵ key.
- Repeat this procedure for each valve opening point (P0 to P9.)
- In order to return to previous menu press the DES key.

### 9.9.8 Emergency shut down

In remote mode, an ESD signal applied to the actuator will override any existing or applied remote control signal. ESD can be configured to ignore all securities except the override setting (torque limit switches).

The factory standard under an active signal is “standstill” position.

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the ESD menu  .
- Press the ↵ key.
- Press the ↑ or ↓ key to select the required ESD override setting:

 Not used  Torque limit switches

- With the selected ESD override press the ↵ key.
- Press the ↵ key.
- Press the ↑ or ↓ key to select the required ESD action:

 OPEN on ESD  “Standstill” on ESD

 CLOSE on ESD  Reach the ESD desired position.

- With the selected ESD action press the ↵ key.
- Press the ↵ key.
- In case of  action, Use the ↑ or ↓ keys to scroll through the available desired position 00-100.
- With the selected value press the ↵ key.
- Press the ↵ key.

### 9.9.9 Fieldbus safe mode (BF)

In remote mode, a safety operation is only initiated when SW8 OFF (Fieldbus control) and if fieldbus communication fail.The actuator will operate in these conditions the BF action).

The factory standard under is “standstill” position and 10s for BF time.

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the BF menu bF .
- Press the ↵ key.
- Press the ↑ or ↓ key to select the required BF time between 0 and 100 in 1s step (this parameter refers to the time after which a bus signal fail will be considered as a BusFail error).
- Press the ↵ key.
- Press the ↑ or ↓ key to select the required BF action:

| | | | |
|---|---|---|---|
| oP | OPEN | SS | “Standstill” |
| CL | CLOSE | Po | Reach the BF desired position. |

- With the selected BF action press the ↵ key.
- Press the ↵ key.
- In case of Po action, Use the ↑ or ↓ keys to scroll through the available desired position 00-100.
- With the selected value press the ↵ key.
- Press the ↵ key.

### 9.9.10 Deadband (only in Modulating duty)

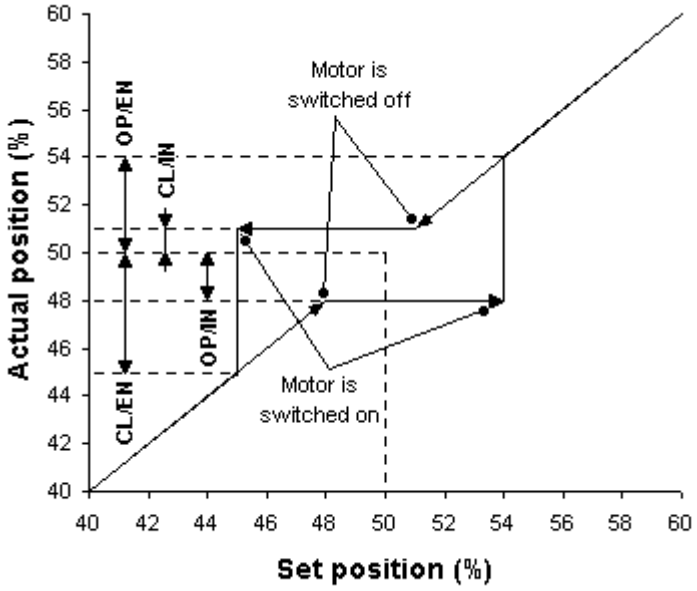
There are two deadbands for each operation sense (opening and closing), the outer deadband and the inner deadband:

- The outer deadband determines the switching-on point of the actuator.
- The inner deadband determines the switching-off point of the actuator.

The deadband is factory standard 2% for inner deadbands and 5% for outer deadbands.

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Deadband menu br .
- Press the ↵ key.
- Press the ↑ or ↓ key to select between Opening oP and Closing CL deadbands.
- Press the ↵ key.
- Press the ↑ or ↓ key to select between Inner In or Outer En deadbands.
- Press the ↵ key.
- Press the ↑ or ↓ key to change the value for the selected deadband between 0,5 and 2,0 for the inner deadband and between 0,5 and 5,0 for the outer deadband in 0,5% step.
- With the selected deadband value press the ↵ key.
- Press the ↵ key.
- In order to return to previous menu press the DES key.




Example for 50% Set position

**CAUTION: Outer deadbands must be greater than inner deadband. If the actuator hunts or responds unnecesarily to a fluctuating set position signal (control input) the deadband must be increased. If more accurate control is required the deadband may be decreased.**

If the Autolearn menu is activated (ON), it is not necessary to adjust the deadband values.

### 9.9.11 Autolearn (only in Modulating duty)

An automatic adaptation of the deadbands is suitable with Autolearn function.

The Autolearn is factory standard 0FF (deactivated).

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the autolearn menu AL.
- Press the ↵ key.
- Press the ↑ or ↓ key to select between On (autolearn activated) or OF (autolearn deactivated).
- With the selected activation/deactivation press the ↵ key.
- Press the ↵ key.

### 9.9.12 Close tightly (only in Modulating duty)

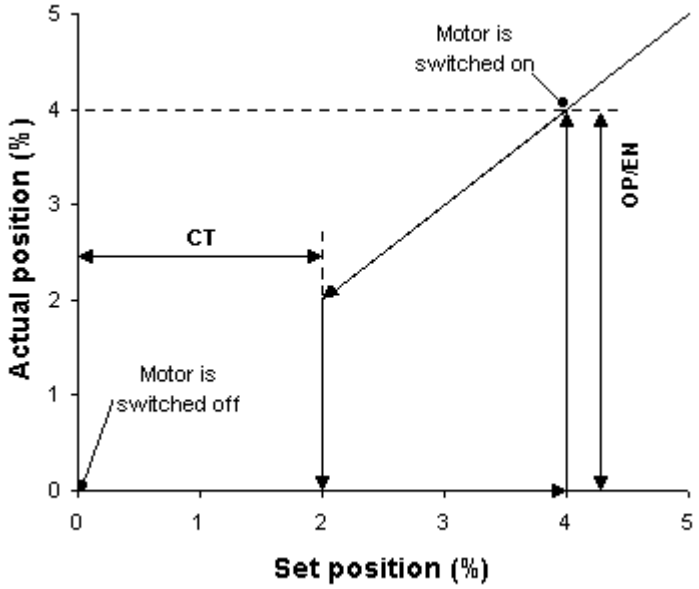
**Close tightly ensures that the actuator opens and closes fully.**

If the set position (control input) value 0/4mA or 20mA for the approaching of the end positions is not reached, a “close tightly” value for the nominal value can be set. If the set position exceed or reached the “close tightly” value, the actuator continues the operation until the full end position has been reached.

The close tightly is factory standard OFF (deactivated).

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Close tightly menu Ct .
- Press the ↵ key.
- Press the ↑ or ↓ key to select between On (close tightly activated) or OF (close tightly deactivated).
- With the selected activation/deactivation press the ↵ key.
- Press the ↵ key.
- If close tightly is activated (ON), press the ↑ or ↓ key to select the close tightly range between 0.5 and 2 in 0,5 step.
- With the selected value press the ↵ key.
- Press the ↵ key.




Close tightly functionality in CLOSE position

9.9.13 Blinker

**Note: Blinker transmitter is not suitable for 480 actuator serie**

Position transmitter allows to detect movement of the actuator. Blinker detection must be switched OFF.

The blinker is factory standard 0FF (activated).

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the blinker menu bL .
- Press the ↵ key.
- Press the ↑ or ↓ key to select between On (blinker activated) or OF (blinker deactivated).
- With the selected activation/deactivation press the ↵ key.
- Press the ↵ key.

### 9.9.14 Control input and TPS setting

**Limit switches and 0/4-20 mA transmitter must be set before! This calibration will ensure a correct operation in Remote mode.**

Procedure:

- Before making the calibration, the valve should be brought to the maximum opening position, therefore the TPS should be supplying the maximum current (20mA). If SW6 adjusted in ON (Analog input control), the control input signal should be supplying the maximum current (20mA).
- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Calibration menu [Cb].
- Press the ↵ key.
- The display will change to a blinking hexadecimal value. If SW6 adjusted in ON (Analog input control), the value will be close to E3 (control input signal value). If SW6 adjusted in OFF (Fieldbus control), the value will change to 00.
- Press the ↑ and ↵ key simultaneously to record the calibration. The disply will stop blinking.
- Press the ↵ key.

### 9.9.15 Data logging

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the data logging menu [HI] .
- Press the ↵ key.
- Press the ↑ or ↓ key to select the data logging required.

| | | | |
|---|---|---|---|
| [oL] | Nº of opening operations | [tt] | Total running hours |
| [ot] | Nº Open torque faults | [tr] | Not used |
| [CL] | Nº of closing operations | [EC] | Nº of powerings |
| [Ct] | Nº Close torque faults | | |

- With the selected data logging press the ↵ key.
- As an example, if the Total running hours is 130012, it will display “” (blank),”13”,”00”,”12”,””blank,…
- Press the ↵ key.
- In order to return to previous menu press the DES key.

### 9.9.16 New Password

Procedure:

- Enter in the setting mode (chapter 9.11.1)
- Press the ↑ or ↓ key to select the Password menu [Ch] .
- Press the ↵ key.
- Use the ↑ or ↓ keys to scroll through the desired password 00-FF (hexadecimal).
- Press the ↵ key.

**CAUTION: Password changing is a delicate operation. Write it down.**

## 9.10 LOCAL mode: Control and displays elements

The Centronik unit is equipped with local controls. The selector LOCAL - OFF - REMOTE allows the control mode to be set. With the push buttons OPEN - STOP - CLOSE, the actuator can be operated locally.

Push buttons are self-retaining type.

5 indication lights and a “position” display (only in Modulating and ON/OFF with display duty) shows the actuator status from the front panel (chapter 9.12.2).

### 9.10.1 Lockable selector

The selector LOCAL - OFF –REMOTE is lockable in all three positions. Unauthorized operation at the local controls is therefore prevented.


- **OFF**: In this operation mode, the actuator remains connected but does not responds to any order from the front panel or from the remote control. the front panel control indicate only the power supply status (led 5).
- **LOCAL**: With the push buttons OPEN-CLOSE-STOP located on the front panel, the actuator is operated locally.
- **REMOTE**: With the remote commands, the actuator is operated remotely.

9.10.2 Push-buttons


OPEN


"UP" scroll/change value

STOP or ALARM RESET


"ENTER" confirm selection


CLOSE


"DOWN" scroll/change value

UNLOCK or "ESCAPE"

Pressing 

and 
with an open troque fault enable the user to open.

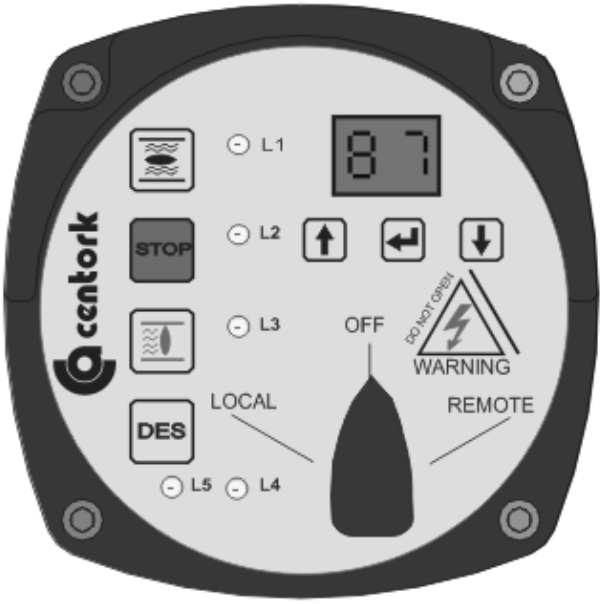
Pressing 

and 
with an open troque fault enable the user to close.

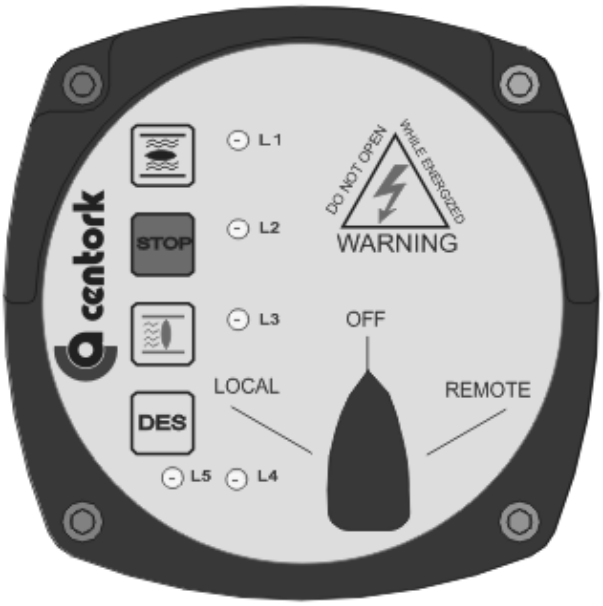
9.10.3 LED indications

Five local LEDs indicate different signal:

| | | |
|---|---|---|
| L1 | Red:<br>Red blinking:<br>Yellow blinking: | OPEN<br>OPENING<br>Limit switch failure |
| L2 | Yellow: | Movement fault |
| L3 | Green:<br>Green blinking:<br>Yellow blinking: | CLOSE<br>CLOSING<br>Limit switch failure |
| L4 | Red:<br>Green:<br>Yellow blinking:: | OPEN torque fault<br>CLOSE torque fault<br>Torque switch failure |
| L5 | Green:<br>Red:<br>Yellow: | Correct phase connection<br>Lost Phase<br>Inverse phase connection |




Modulating and ON/OFF with display duty front panel




ON/OFF front panel

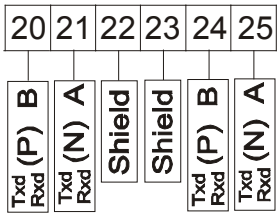
# 10 FIELDBUS CONFIGURATION

## 10.1 Fieldbus Connector

Depending on the protection class and type of application, other connector designs are also allowed.

Guideline: If the interface should be used with larger data transfer rates than 1500kbit/s, the 9 pin female D-sub connector is recommended to use.

### 10.1.1 Centork connector

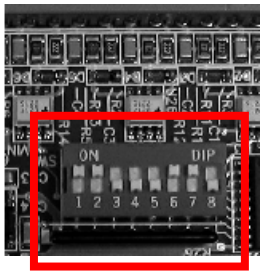



### 10.1.2 D-SUB connector pinout (OPTIONAL)

| Pin | Name | Function |
|---|---|---|
| Housing | Shield | Connected to PE |
| 1 | Not Connected | - |
| 2 | Not Connected | - |
| 3 | B-Line | Positive RxD/TxD according to RS 485 specification |
| 4 | Not Connected | - |
| 5 | Not Connected | - |
| 6 | Not Connected | - |
| 7 | Not Connected | - |
| 8 | A-Line | Negative RxD/TxD according to RS 485 specification |
| 9 | Not Connected | - |

## 10.2 Configuration

### 10.2.1 CENTRONIK unit configuration




Before configuring the PROFIBUS-DP interface, make sure that the DIP switches of the CENTRONIK are correctly configured. Overall, make sure that switch 8 is set to OFF for fieldbus control (Chapter 9.3.5).

### 10.2.2 Baudrate

The baudrate on a Profibus-DP network is set during configuration of the master and only one baudrate is possible in a Profibus-DP installation. The Profibus-DP interface has an auto baudrate detection function and the user does not have to configure the baudrate on the interface. Baudrates supported by the Profibus-DP interface are listed on table:

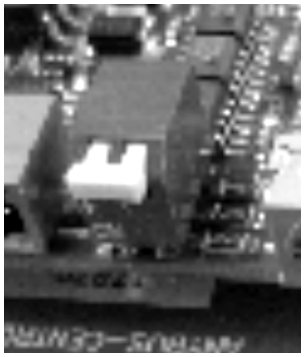
| Baudrates supported by Profibus DP Interface |
|---|
| 9.6 kbit/s |
| 19.2 kbit/s |
| 93.75 kbit/s |
| 187.5 kbit/s |
| 500 kbit/s |
| 1.5 Mbit/s |
| 3 Mbit/s |
| 6 Mbit/s |
| 12 Mbit/s |

### 10.2.3 Termination

The end nodes in a Profibus-DP network has to be terminated to avoid reflections on the bus line. The Profibus-DP interface is equipped with a termination switch to accomplish this in an easy way. If the actuator is used as the first or last device in a network the termination switch has to be in ON position. Otherwise the switch has to be in OFF position.

Termination switch is located on BUS electronic board, mounted on centronik unit. Open centronik frontal to access. Handle with care, wires and cables may be damaged.

**PLEASE NOTE: If an external termination connector is used the switch must be in OFF position. Warning: An incorrect setting of termination switch may cause problems and Fails on BUS COMUNICATION!**

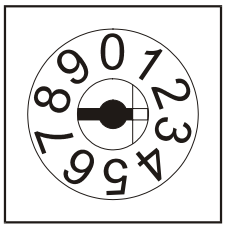


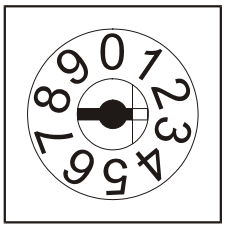
| | |
|---|---|
| **Termination switch ON** | Bus termination enabled. If the actuator is the last or first device, the bus termination has to be set on, or an external termination connector has to be used |
| **Termination switch OFF** | Bus termination disabled |

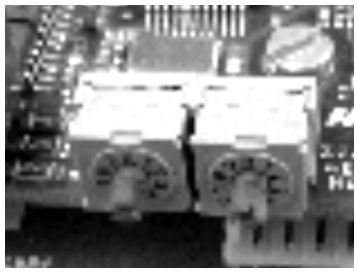
### 10.2.4 Node Address

**Before powering the Centronik Unit address has to be set**. This is done with two rotary switches on the interface, located on BUS electronic board, mounted on centronik unit. This enables address settings from 1-99 in decimal format. Looking at the front of the interface, the leftmost switch is used for the ten setting and the rightmost switch is used for the setting of the integers.

***Address = (Left Switch Setting x 10) + (Right Switch Setting x 1)***



**The node address can not be changed during operation. Incorrect node address may cause problems and Fails on BUS COMUNICATION!**

10.2.5 GSD file

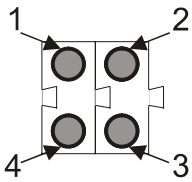
Each device on a Profibus-DP network is associated with a GSD file, containing all necessary information about the device. This file is used by the network configuration program during configuration of the network.

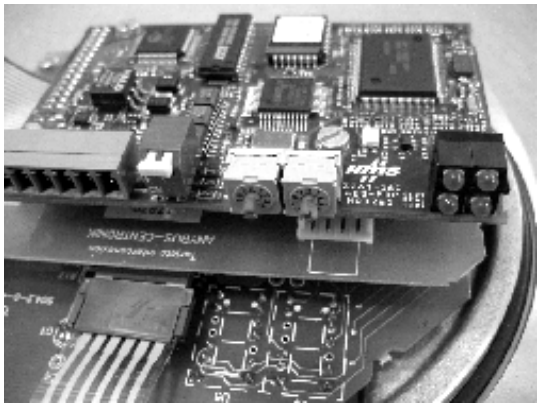
**The latest version of GSD file can either be delivered by contacting CENTORK.**

10.2.6 Indications

The interface is equipped with four LED's mounted at the front and one LED on the board, used for debugging purposes. The function of the LED's are described in the table and figure below.

1. Not used
2. On-Line
3. Off-Line
4. Fieldbus diagnostics



| Name | Colour | Function |
|---|---|---|
| **Fieldbus Diagnostics** | **Red** | Indicates certain faults on the Fieldbus side. |
| **On-Line** | **Green** | Indicates that the interface is On-Line on the fieldbus. |
| | | **Green**- Interface is On-Line and data exchange is possible. |
| | | **Turned Off** - Interface is not On-Line |
| **Off-Line** | **Red** | Indicates that the interface is Off-Line on the fieldbus. |
| | | **Red**- Interface is Off-Line and no data exchange is possible. |
| | | **Turned Off** - Interface is not Off-Line |

# 11 FIELDBUS PROGRAMMING

## 11.1 MODULATING CENTRONIK units

This section describes the input and output data to/from the interface and that form the communication during the data exchange.

The data exchanged in this model, has the following configuration:

**Master outputs↔Centork Inputs**

| Nominal | |
|---|---|
| T | Instr.Code. |

**Centork Outputs↔Master inputs**

| Opening | |
|---|---|
| Diagnostic | |
| T | Instr.Code / Error |
| Data 1 | |
| Data 2 | |
| | |

| |
|---|
| |
| Data n |

The structure is formed by 22 bytes max. that will be transferred by the PROFIBUS-DP fieldbus.

Master instructions:

- Nominal is the % of opening the user wants to open the valve.
- Command is composed by the instruction code and the Toggle bit.

  The possible instruction codes are:

  **0x01** Read Status
  **0x02** Read Data logging
  **0x04** Read parameter group1
  **0x05** Actuator reset in case of alarm.
  **0x08** Read parameter group2

Slave response:

- Opening: Is the actual % of opening of the valve.
- Diagnostic: Alarm codes from the actuator. Possible values are:

  **0x01** Not used
  **0x02** Travel limit switches error
  **0x04** Torque limit switches error
  **0x08** Lost phase
  **0x10** Movement error.
  **0x20** ESD signal received
  **0x40** Nominal signal (4/20mA) fail

- Response : The CENTRONIK unit will answer giving back an echo and a changed toggle, indicating that the command was correctly processed. If any kind of error occurred in the communication, in the code, etc., an error code will be sent instead of the echo. The structure of this code will be:

  **b7**: Toggle

  **b6**: Error in Instruction code

  **b5**: Not used

  **b4…b0**: Instruction code

– The data bytes, depending on the instruction, are defined as indicated in the next table:

| Byte Nr | Status | Parameter Group 1 | Parameter Group 2 | Historics (Data logging) |
|---|---|---|---|---|
| Data 1 | Selector-dip | Nominal input type | Close Tightly | Nr. OP Limit |
| Data 2 | P1 | Nominal input (mA) | Tightly value (%) | Nr. OP Limit + 1 |
| Data 3 | P2 | Polarity | BF Mode | Nr. OP Limit + 2 |
| Data 4 | Remote inputs | Nominal input zero | BF Time | Nr. CL Limit |
| Data 5 | Remote outputs | % opening zero | BF(%) | Nr. CL Limit + 1 |
| Data 6 | Phase | Nominal input span | Curve Type | Nr. CL Limit + 2 |
| Data 7 | Overtravel Opening | % opening span | Curve P0 | Nr. OP Torque |
| Data 8 | Overtravel Closing | Rest time | Curve P1 | Nr. OP Torque + 1 |
| Data 9 | Nominal input | Autolearn | Curve P2 | Nr. OP Torque + 2 |
| Data 10 | | Relay 1 | Curve P3 | Nr. CL Torque |
| Data 11 | | Relay 2 | Curve P4 | Nr. CL Torque + 1 |
| Data 12 | | Relay 3 | Curve P5 | Nr. CL Torque + 2 |
| Data 13 | | Relay 4 | Curve P6 | Nr. Hours |
| Data 14 | | Relay 5 | Curve P7 | Nr. Hours + 1 |
| Data 15 | | Int. Dead Band OP | Curve P8 | Nr. Hours + 2 |
| Data 16 | | Ext. Dead Band OP | Curve P9 | Not used |
| Data 17 | | Int. Dead Band CL | ESD Mode | Not used |
| Data 18 | | Ext . Dead Band CL | ESD | Nr. powering |
| Data 19 | | Blinker | ESD (%) | Nr. powering +1 |

**The “Command toggle bit” sent must be equal to the “Response toggle bit”. The “Response toggle bit” will be always the opposite of the “Command toggle bit”. When “the Repsonse toggle” bit change, the slave device indicate that the last instruction was received.**

11.1.1 Status

The following data will be exchanged when a *Read Status* instruction is sent.

*11.1.1.1 Selector-dip*

Indicates the state of the DIPSWITCHES of the CENTRONIK unit.

*11.1.1.2 P1*

Indicates the state of every microswitch located inside the actuator

P1.0:Closed limit switch
P1.1 Open limit switch
P1.2 Opening overtorque switch
P1.3 Closing overtorque switch
P1.4 Not used
P1.5 Not used
P1.6 Lost phase
P1.7 Inverse phase connection.

*11.1.1.3 P2*

Variable only available for CENTORK technicians.

*11.1.1.4 Remote inputs*

Indicates the state of the remote inputs at the user connector.

*11.1.1.5 Remote outputs*

Indicates the state of the remote outputs at the user connector.

*11.1.1.6 Phase*

Indicates the state of the valve, previous to the byte stream reception.

1: Stop
2: Opening
3: Opened
4: Closing
5: Closed
6: Unlock & Closing
7: Unlock & Opening
8: Unlock deactivated
9: Overtorque openining
10: Overtorque closing
11: Travel limit switch fault
12: Not used
13: Torque limit switch fault
14: Lost phase
15: Movement fault
16: Alarm ESD

*11.1.1.7 Overtravel OP*

Variable only available for CENTORK technicians.

*11.1.1.8 Overtravel CL*

Variable only available for CENTORK technicians.

*11.1.1.9 Nominal input*

Variable only available for CENTORK technicians.

### 11.1.2 Parameter group1

The following data will be exchanged when a Read Parameter group 1 instruction is sent.

#### *11.1.2.1 Nominal input type*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| Nominal Input Type | Data 1 |
|---|---|
| Voltage nominal input | 30 |
| Current nominal input | 31 |

The default value for this parameter is **31**.

#### *11.1.2.2 Nominal input (mA)*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| Nominal input (mA) | Data2 |
|---|---|
| Current nominal input 4...20 mA | 32 |
| Current nominal input 0...20 mA | 33 |

The default value for this parameter is **32**.

#### *11.1.2.3 Polarity*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| Polarity type | Data3 |
|---|---|
| Closed | 22 |
| Open | 23 |

- **Closed** means, a 4 mA nominal input, will make the actuator run to close position.
- **Open** means, a 4 mA nominal input, will make the actuator run to open position.

The default value for this parameter is **22**.

#### *11.1.2.4 Nominal input zero*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| Nominal input zero | Data4 |
|---|---|
| Value | 0-100 % |

This parameter refers to the % of the nominal input value for the zero position of the split range setting.

The default value for this parameter is **0**.

#### *11.1.2.5 % opening zero*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| % opening | Data5 |
|---|---|
| Value | 0-100 % |

This parameter refers to the % of opening of the valve stroke for the zero position of the split range setting.

The default value for this parameter is **0**.

#### *11.1.2.6 Nominal input span*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| Nominal input span | Data6 |
|---|---|
| Value | 0-100 % |

This parameter refers to the % of the nominal input value for the span position of the split range setting. The default value for this parameter is **100**.

#### *11.1.2.7 % opening span*

Not used in ProfiBus control. Possible values for this variable are enclosed on table:

| % opening | Data7 |
|---|---|
| Value | 0-100 % |

This parameter refers to the % of opening of the valve stroke for the span position of the split range setting.

The default value for this parameter is **100**.

*11.1.2.8 Rest time*

Possible values for this variable are enclosed on table:

This parameter refers to the minimum time the motor will be stopped between two start commands. This parameter allows to fulfil the motor service requirements independently of the valve service requirements.

The default value for this parameter is **0**.

| Reset time | Data8 |
|---|---|
| Value | 0-60 s |

*11.1.2.9 Autolearn*

Possible values for this variable are enclosed on table:

This parameter refers to the capability of the CENTRONIK of learning about the state of the valve and making the modulation referring to this state.

The default value for this parameter is **0**.

| Autolearn | Data9 |
|---|---|
| Off | 0 |
| On | 1 |

*11.1.2.10 Relay 1*

Possible values for this variable are enclosed on table:

The default value for this parameter is **15.**

| Relay 1 | Data10 |
|---|---|
| Valve opened | 15 |
| Valve closed | 14 |
| Overtorque opening | 13 |
| Overtorque closing | 12 |
| Not used | 11 |
| Phase missing | 10 |
| Overtorque | 9 |
| Error | 8 |

| Relay 1 | Data10 |
|---|---|
| Local mode | 7 |
| Remote mode | 6 |
| Intermediate position | 5 |
| Position reached | 4 |
| Nominal input missing | 3 |
| Rest time | 2 |
| ESD | 1 |
| | |

*11.1.2.11 Relay 2*

Possible values for this variable are enclosed on table:

The default value for this parameter is **14.**

| Relay 2 | Data11 |
|---|---|
| Valve opened | 15 |
| Valve closed | 14 |
| Overtorque opening | 13 |
| Overtorque closing | 12 |
| Not used | 11 |
| Phase missing | 10 |
| Overtorque | 9 |
| Error | 8 |

| Relay 2 | Data11 |
|---|---|
| Local mode | 7 |
| Remote mode | 6 |
| Intermediate position | 5 |
| Position reached | 4 |
| Nominal input missing | 3 |
| Rest time | 2 |
| ESD | 1 |
| | |

*11.1.2.12 Relay 3*

Possible values for this variable are enclosed on table.

The default value for this parameter is **9.**

| Relay 3 | Data12 |
|---|---|
| Valve opened | 15 |
| Valve closed | 14 |
| Overtorque opening | 13 |
| Overtorque closing | 12 |
| Not used | 11 |
| Phase missing | 10 |
| Overtorque | 9 |
| Error | 8 |

| Relay 3 | Data12 |
|---|---|
| Local mode | 7 |
| Remote mode | 6 |
| Intermediate position | 5 |
| Position reached | 4 |
| Nominal input missing | 3 |
| Rest time | 2 |
| ESD | 1 |
| | |

*11.1.2.13 Relay 4*

Possible values for this variable are enclosed on table.

The default value for this parameter is **2**

| Relay 4 | Data13 |
|---|---|
| Valve opened | 15 |
| Valve closed | 14 |
| Overtorque opening | 13 |
| Overtorque closing | 12 |
| Not used | 11 |
| Phase missing | 10 |
| Overtorque | 9 |
| Error | 8 |

| Relay 4 | Data13 |
|---|---|
| Local mode | 7 |
| Remote mode | 6 |
| Intermediate position | 5 |
| Position reached | 4 |
| Nominal input missing | 3 |
| Rest time | 2 |
| ESD | 1 |
| | |

*11.1.2.14 Relay 5*

Possible values for this variable are enclosed on table.

The default value for this parameter is **11**

| Relay 5 | Data14 |
|---|---|
| Valve opened | 15 |
| Valve closed | 14 |
| Overtorque opening | 13 |
| Overtorque closing | 12 |
| Not used | 11 |
| Phase missing | 10 |
| Overtorque | 9 |
| Error | 8 |

| Relay 5 | Data14 |
|---|---|
| Local mode | 7 |
| Remote mode | 6 |
| Intermediate position | 5 |
| Position reached | 4 |
| Nominal input missing | 3 |
| Rest time | 2 |
| ESD | 1 |
| | |

*11.1.2.15 Internal Dead Band OP (Opening)*

| Int. Dead Band OP | Data15 |
|---|---|
| Value | 5-20 |

Possible values for this variable are enclosed on table.

This parameter refers to the % of the valve stroke for the internal dead band setting in open direction. The value xx in Data15, will be fixed as the desired value multiplied by ten (e.g. if the internal dead band has to be 1.5% the stroke of the valve, the value at Data15 will be adjusted to 15).

The default value for this parameter is **20**.

*11.1.2.16 External Dead Band OP(Opening)*

| Ext. Dead Band OP | Data16 |
|---|---|
| Value | 5-50 |

Possible values for this variable are listed on table.

This parameter refers to the % of the valve stroke for the external dead band setting in open direction. The value xx in Data16, will be fixed as the desired value multiplied by ten (e.g. if the external dead band has to be 3.5% the stroke of the valve, the value at Data16 will be adjusted to 35).

The default value for this parameter is **50.**

*11.1.2.17 Internal Dead Band CL (Closing)*

| Int. Dead Band CL | Data17 |
|---|---|
| Value | 5-20 |

Possible values for this variable are listed on table.

This parameter refers to the % of the valve stroke for the internal dead band setting in close direction. The value xx in Data17, will be fixed as the desired value multiplied by ten (e.g. if the internal dead band has to be 1.5% the stroke of the valve, the value at Data17 will be adjusted to 15).

The default value for this parameter is **20**

*11.1.2.18 External. Dead Band CL (Closing)*

| Ext. Dead Band CL | Data18 |
|---|---|
| Value | 5-50 |

Possible values for this variable are listed on table

This parameter refers to the % of the valve stroke for the external dead band setting in close direction. The value xx in Data18, will be fixed as the desired value multiplied by ten (e.g. if the external dead band has to be 3.5% the stroke of the valve, the value at Data18 will be adjusted to 35).

The default value for this parameter is **50**

*11.1.2.19 Blinker*

| Blinker | Data19 |
|---|---|
| Blinker ON | 1 |
| Blinker OFF | 0 |

Possible values for this variable are listed on table.

This parameter refers to the possibility of ignoring the blinker as actuators shaft movement detector. In case of adjusting to zero, the output shaft movement detection will be done with the potentiometer.

The default value for this parameter is **0**

### 11.1.3 Parameter group2

The following data will be exchanged when a Read Parameter group 2 instruction is sent.

#### *11.1.3.1 Close tightly*

Possible values for this variable are listed on table :

| Close tightly | Data1 |
|---|---|
| Close tightly ON | 1 |
| Close tightly OFF | 0 |

This parameter sets the possibility of activating a mode in which, when a modulation command inside a % of opening (in the close zone) is received, the actuator will close totally.

The default value for this parameter is **0**.

#### *11.1.3.2 Tightly Value*

Possible values for this variable are listed on table:

| Tightly | Data2 |
|---|---|
| Value | 50 |

The value xx in Data2, will be fixed as the desired value multiplied by ten (e.g. if the Tightly Value has to be 4.5% the stroke of the valve, the value at Data2 will be adjusted to 45).

The default value for this parameter is **50**.

#### *11.1.3.3 BF Mode*

Possible values for this variable are listed on table:

| BF Mode | Data3 | Data4 |
|---|---|---|
| Open | 103 | |
| Close | 102 | |
| Stand Still | 101 | |
| % opening | 100 | 0-100% |

This parameter controls the action to do when the bus lines fails in the Fieldbus. The % opening refers to the % of the opening of the valve stroke the actuator will run the valve. The value xx in Data3, will be fixed as the desired value multiplied by ten (e.g. if the close tightly has to be 4.5% the stroke of the valve, the value at Data3 will be adjusted to 45).

The default value for this parameter (data3) is **101**, and the default value for data4 is **0**.

#### *11.1.3.4 BF Time*

Possible values for this variable are listed on table:

| BF Time | Data5 |
|---|---|
| Value | 0-100 |

This parameter refers to the time after which a bus signal fail will be considered as a BusFail error.

The default value for this parameter is **10**.

#### *11.1.3.5 Curve Type*

Possible values for this variable are:

| Curve Type | Data6 | Data7 | Data8 | Data9 | Data10 | Data11 | Data12 | Data13 | Data14 | Data15 | Data16 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Linear | 43 | | | | | | | | | | |
| Isopercentage | 42 | | | | | | | | | | |
| Quick openning | 41 | | | | | | | | | | |
| Customized | 40 | **P0** | **P1** | **P2** | **P3** | **P4** | **P5** | **P6** | **P7** | **P8** | **P9** |

This parameter controls the type of modulation will run the actuator.

In the $P_n$ values, a % of opening, between 10 and 100% should be selected. The ten $P_n$ parameters, correspond to each 10 % split of the nominal input signal.

The default value for this parameter is **43** and the default value for each $P_n$ is **0**.

*11.1.3.6 ESD Mode*

Possible values for this variable are:

This parameter, controls the actuators protection mode when an ESD signal is received. In the Torque mode, the actuator will run until a torque signal occurs. In the Thermo-switch Tripping Mode, the actuator will run until the Thermo-switches trip.

The default value for this parameter is **99**.

| ESD Mode | Data17 |
|---|---|
| Torque mode | 98 |
| Not used | 99 |

*11.1.3.7 ESD*

Possible values for this variable are:

The *percentage open*, refers to, the % of opening of the valve stroke, the actuator will run the valve, when an ESD order is input.

The default value for this parameter is **101**.

The default value for data19 is **0**.

| ESD | Data18 | Data19 |
|---|---|---|
| Open | 103 | |
| Close | 102 | |
| Stand Still | 101 | |
| Percentage open | 100 | **0-100%** |

11.1.4 Records (Data logging)

The following parameters will be replaced whenever a command “read records” is send.

*11.1.4.1 Num Op Limit*

Specifies the number of opening manoeuvrings made using the travel limit switching. It’s a decimal number composed by three two-digits groups: Num Op Limit; Num Op Limit+1; Num Op Limit+2. Whereas Num Op Limit is the most significant group.

| Num Op Limit | Data 1 | Data 2 | Data 3 |
|---|---|---|---|
| | Num Op Limit | Num Op Limit +1 | NumOp Limit +2 |

*Example:*

*If the number of opening manoeuvrings achieved by travel limit switching is 215365 the value of these parameters must be:*

*Num Op Limit = 21*

*Num Op Limit +1= 53*

*Num Op Limit +2= 65*

*11.1.4.2 Num Cl Limit*

This parameter specifies the number of closing manoeuvrings achieved by travel limit switching. It is a decimal number composed by three two-digits groups: Num CL Limit; Num CL Limit+1; Num CL Limit+2. Whereas Num CL Limit is the most significant group.

| Num Cl Limit | Data 4 | Data 5 | Data 6 |
|---|---|---|---|
| | Num Cl Limit | Num Cl Limit +1 | Num Cl Limit +2 |

*Example:*

*If the number of closing manoeuvrings achieved by travel limit switching is 215365 the value of these parameters must be:*

*Num Cl Limit = 21*

*Num Cl Limit +1= 53*

*Num Cl Limit +2= 65*

*11.1.4.3 Num Op torque*

Specifies the number of opening manoeuvrings made using the torque limit switching. It's a decimal number composed by three two-digits groups:: Num Op torque; Num Op torque +1; Num Op torque +2. Whereas Num Op torque is the most significant group.

| Num Op Par | Data 7 | Data 8 | Data 9 |
|---|---|---|---|
| | Num Op torque | Num Op torque +1 | Num Op torque +2 |

*Example:*

*If the number of opening manoeuvrings achieved by torque limit switching is 215365 the value of these parameters must be:*

*Num Op torque = 21*

*Num Op torque +1= 53*

*Num Op torque +2= 65*

*11.1.4.4 Num Cl torque*

This parameter specifies the number of closing manoeuvrings achieved by torque limit switching. It's a decimal number composed by three two-digits groups: Num CL torque; Num CL torque +1; Num CL torque +2. Whereas Num CL torque is the most significant group.

| Num Cl torque | Data 10 | Data 11 | Data 12 |
|---|---|---|---|
| | Num Cl torque | Num Cl torque +1 | Num Cl torque +2 |

*Example:*

*If the number of closing manoeuvrings achieved by torque limit switching is 215365, the value of these parameters must be:*

*Num Cl torque = 21*

*Num Cl torque +1= 53*

*Num Cl torque +2= 65*

*11.1.4.5 Num Hours*

This parameter specifies the number of service hours (with the motor running)

It's a decimal number composed by three two-digits groups: Num hours; Num hours +1; Num hours +2. Whereas Num hours is the most significant group.

| Num hours | Data 13 | Data 14 | Data 15 |
|---|---|---|---|
| | Num hours | Num hours +1 | Num hours +2 |

*Example:*

*If the number of service hours (with the motor running) is 215.365, the value of these parameters must be:*

*Num hours = 21*

*Num hours +1= 53*

*Num hours +2= 65*

*11.1.4.6 Num Powering*

Specifies how many times has been powered on the main power supply.

It is a decimal number composed by two two-digits groups: Num powering; Num powering +1. Whereas Num powering is the most significant group.

| Num powering | Data 18 | Data 19 |
|---|---|---|
| | Num powering | Num powering +1 |

*Example:*

*If the device has been powered on 2153 times, the value of these parameters must be:*

*Num powering = 21*

*Num powering +1= 53*

11.1.5 Writing and reading code samples

If we want to make a records reading (instruction code 0x02), the bytes stream to send is showed in the following table. It's supposed that the real valve's opening is 50% and we do not want to change it.

**Bytes to send:**

| | | |
|---|---|---|
| Byte 0 | Nominal | 50 |
| Byte 1 | Command | 0x82 |
| Byte 2 | Data 1 | - |
| Byte 3 | Data 2 | - |
| … | … | … |

**Received Bytes:**

| | | |
|---|---|---|
| Byte 0 | Opening | 50 |
| Byte 1 | Diagnostic | 0x00 |
| Byte 2 | Response | 0x02 |
| Byte 3 | Num OP Rec | 6 (Examp.) |
| … | … | … |

If, later, we want to make a reading of the parameters included in the group 1 (instruction 0x04) we must change the Toggle bit (most significant bit in the control Byte) to indicate that this is a new instruction. We want to change the valve opening to 80%. The byte stream to send is:

**Bytes to send:**

| | | |
|---|---|---|
| Byte 0 | Nominal | 80 |
| Byte 1 | Command | 0x04 |
| Byte 2 | Data 1 | - |
| Byte 3 | Data 2 | - |
| Byte 4 | Data 3 | - |
| … | … | … |

**Received Bytes :**

| | | |
|---|---|---|
| Byte 0 | Opening | 80 |
| Byte 1 | Diagnostic | 0x00 |
| Byte 2 | Response | 0x84 |
| Byte 3 | Nominal Input Type | 30 (Ex.) |
| Byte 4 | Nominal Input (mA) | 32 (Ex.) |
| … | … | … |

## 11.2 ON /OFF with position display CENTRONIK units

This section describes the input and output data to/from the interface and that form the communication during the data exchange.

The data exchanged in this model, has the following configuration:

**Master outputs↔Centork Inputs**

| | |
|---|---|
| T | Control |
| T | Instruction Code |
| | |
| | |
| | |
| | |

| |
|---|
| |
| |
| |

**Centork Outputs↔Master inputs**

| | |
|---|---|
| Opening | |
| Diagnostic | |
| | Instruction code./ Error |
| Data 1 | |
| Data 2 | |
| | |

| |
|---|
| |
| |
| Data n |

The structure is formed by 22 bytes max. that will be transferred by the PROFIBUS-DP fieldbus.

Master instructions:

- Control: The meaning of the process variables is the same as in the previous case but the variable Control which has the following code:

  **0x01** Close valve

  **0x02** Open valve

  **0x04** Stop.

  **0x08** Unlock opening

  **0x10** Unlock closing

  Inside the “Control” process variable the toggle bit is used just in case that an order needs to be resent; this is usually done to resend the “stop” Control to rearm the valve in case that an alarm is detected. No echo of this toggle is generated.

- Command: Is composed by the instruction code and the Toggle bit.

  The possible instruction codes are:

  **0x01** Read Status

  **0x02** Read Data logging

Slave response:

- Opening: Is the actual % of opening of the valve.
- Diagnostic: Alarm codes from the actuator. Possible values are:

  **0x01** Motor thermo-switches tripped

  **0x02** Not used

  **0x04** Torque limit switches error

  **0x08** Lost phase

  **0x10** Movement error

  **0x20** ESD signal received

- Response : The CENTRONIK unit will answer giving back an echo and a changed toggle, indicating that the command was correctly processed. If any kind of error occurred in the communication, in the code, etc., an error code will be sent instead of the echo. The structure of this code will be:

  **b7**: Toggle

  **b6**: Error in Instruction code

  **b5**: Error in Control

  **b4…b0**: Instruction code

– The data bytes, depending on the instruction, are defined as indicated in the next table:

| Byte Nr | Status | Historics (Data logging) |
|---|---|---|
| Data 1 | Selector-dip | Nr. OP Limit |
| Data 2 | P1 | Nr. OP Limit + 1 |
| Data 3 | P2 | Nr. OP Limit + 2 |
| Data 4 | Remote inputs | Nr. CL Limit |
| Data 5 | Remote outputs | Nr. CL Limit + 1 |
| Data 6 | Phase | Nr. CL Limit + 2 |
| Data 7 | | Nr. OP Torque |
| Data 8 | | Nr. OP Torque + 1 |
| Data 9 | | Nr. OP Torque + 2 |
| Data 10 | | Nr. CL Torque |
| Data 11 | | Nr. CL Torque + 1 |
| Data 12 | | Nr. CL Torque + 2 |
| Data 13 | | Nr. Hours |
| Data 14 | | Nr. Hours + 1 |
| Data 15 | | Nr. Hours + 2 |
| Data 16 | | Not used |
| Data 17 | | Not used |
| Data 18 | | Nr. powering |
| Data 19 | | Nr. powering +1 |

**The “Command toggle bit” sent must be equal to the “Response toggle bit”. The “Response toggle bit” will be always the opposite of the “Command toggle bit”. When “the Repsonse toggle” bit change, the slave device indicate that the last instruction was received.**

### 11.2.1 Status

The following data will be exchanged when a *Read Status* instruction is sent.

#### *11.2.1.1 Selector-dip*

Indicates the state of the DIPSWITCHES of the CENTRONIK unit.

#### *11.2.1.2 P1*

Indicates the state of every microswitch located inside the actuator

P1.0:Closed limit switch
P1.1 Open limit switch
P1.2 Opening overtorque switch
P1.3 Closing overtorque switch
P1.4 Not used
P1.5 Not used
P1.6 Lost phase
P1.7 Inverse phase connection.

#### *11.2.1.3 P2*

Variable only available for CENTORK technicians.

#### *11.2.1.4 Remote inputs*

Indicates the state of the remote inputs at the user connector.

#### *11.2.1.5 Remote outputs*

Indicates the state of the remote outputs at the user connector.

#### *11.2.1.6 Phase*

Indicates the state of the valve, previous to the byte stream reception.

1: Stop
2: Opening
3: Opened
4: Closing
5: Closed
6: Unlock & Closing
7: Unlock & Opening
8: Unlock deactivated
9: Overtorque openining
10: Overtorque closing
11: Travel limit switch fault
12: Not used
13: Torque limit switch fault
14: Lost phase
15: Movement fault
16: Alarm ESD

### 11.2.2 Records (Data logging)

The following parameters will be replaced whenever a command “read records” is send.

#### *11.2.2.1 Num Op Limit*

Specifies the number of opening manoeuvrings made using the travel limit switching. It’s a decimal number composed by three two-digits groups: Num Op Limit; Num Op Limit+1; Num Op Limit+2. Whereas Num Op Limit is the most significant group.

| Num Op Limit | Data 1 | Data 2 | Data 3 |
|---|---|---|---|
| | Num Op Limit | Num Op Limit +1 | NumOp Limit +2 |

*Example:*

*If the number of opening manoeuvrings achieved by travel limit switching is 215365 the value of these parameters must be:*

*Num Op Limit = 21*

*Num Op Limit +1= 53*

*Num Op Limit +2= 65*

#### *11.2.2.2 Num Cl Limit*

This parameter specifies the number of closing manoeuvrings achieved by travel limit switching. It is a decimal number composed by three two-digits groups: Num CL Limit; Num CL Limit+1; Num CL Limit+2. Whereas Num CL Limit is the most significant group.

| Num Cl Limit | Data 4 | Data 5 | Data 6 |
|---|---|---|---|
| | Num Cl Limit | Num Cl Limit +1 | Num Cl Limit +2 |

*Example:*

*If the number of closing manoeuvrings achieved by travel limit switching is 215365 the value of these parameters must be:*

*Num Cl Limit = 21*

*Num Cl Limit +1= 53*

*Num Cl Limit +2= 65*

#### *11.2.2.3 Num Op torque*

Specifies the number of opening manoeuvrings made using the torque limit switching. It’s a decimal number composed by three two-digits groups:: Num Op torque; Num Op torque +1; Num Op torque +2. Whereas Num Op torque is the most significant group.

| Num Op Par | Data 7 | Data 8 | Data 9 |
|---|---|---|---|
| | Num Op torque | Num Op torque +1 | Num Op torque +2 |

*Example:*

*If the number of opening manoeuvrings achieved by torque limit switching is 215365 the value of these parameters must be:*

*Num Op torque = 21*

*Num Op torque +1= 53*

*Num Op torque +2= 65*

*11.2.2.4 Num Cl torque*

This parameter specifies the number of closing manoeuvrings achieved by torque limit switching. It's a decimal number composed by three two-digits groups: Num CL torque; Num CL torque +1; Num CL torque +2. Whereas Num CL torque is the most significant group.

| Num Cl torque | Data 10 | Data 11 | Data 12 |
|---|---|---|---|
| | Num Cl torque | Num Cl torque +1 | Num Cl torque +2 |

*Example:*

*If the number of closing manoeuvrings achieved by torque limit switching is 215365, the value of these parameters must be:*

*Num Cl torque = 21*

*Num Cl torque +1= 53*

*Num Cl torque +2= 65*

*11.2.2.5 Num Hours*

This parameter specifies the number of service hours (with the motor running)

It's a decimal number composed by three two-digits groups: Num hours; Num hours +1; Num hours +2. Whereas Num hours is the most significant group.

| Num hours | Data 13 | Data 14 | Data 15 |
|---|---|---|---|
| | Num hours | Num hours +1 | Num hours +2 |

*Example:*

*If the number of service hours (with the motor running) is 215.365, the value of these parameters must be:*

*Num hours = 21*

*Num hours +1= 53*

*Num hours +2= 65*

*11.2.2.6 Num Powering*

Specifies how many times has been powered on the main power supply.

It is a decimal number composed by two two-digits groups: Num powering; Num powering +1. Whereas Num powering is the most significant group.

| Num powering | Data 18 | Data 19 |
|---|---|---|
| | Num powering | Num powering +1 |

*Example:*

*If the device has been powered on 2153 times, the value of these parameters must be:*

*Num powering = 21*

*Num powering +1= 53*

11.2.3 Reading and writing examples

Let's assume that we want to open the valve and read the Status. Then the byte stream to send is:

**Bytes to send:**

| | | |
|---|---|---|
| Byte 0 | Control | 0x02 |
| Byte 1 | Instruction Code | 0x81 |
| Byte 2 | - | - |
| Byte 3 | - | - |
| Byte 4 | - | - |
| Byte 5 | - | - |
| Byte 6 | - | - |

**Received Bytes:**

| | | |
|---|---|---|
| Byte 0 | Opening | 55 |
| Byte 1 | Diagnostic | 0x00 |
| Byte 2 | Instruction Code | 0x01 |
| Byte 3 | High Word,high byte | 0x60 |
| Byte 4 | High Word, Low byte | 0x00 |
| Byte 5 | Low Word,High byte | 0x90 |
| Byte 6 | Low bajo, Low byte | 0x60 |

If later we want to open the valve…

**Bytes to send:**

| | | |
|---|---|---|
| Byte 0 | Control | 0x04 |
| Byte 1 | Instruction Code | 0x01 |
| Byte 2 | - | - |
| Byte 3 | - | - |
| Byte 4 | - | - |
| Byte 5 | - | - |
| Byte 6 | - | - |

**Received Bytes**:

| | | |
|---|---|---|
| Byte 0 | Opening | 45 |
| Byte 1 | Diagnostic | 0x00 |
| Byte 2 | Instruction Code | 0x81 |
| Byte 3 | High Word,High byte | 0x60 |
| Byte 4 | High Word,Low byte | 0x94 |
| Byte 5 | Low Word,High byte | 0x00 |
| Byte 6 | Low Word,Low byte | 0x60 |

## 11.3 ON/OFF CENTRONIK units

This section describes the input and output data to/from the interface and that form the communication during the data exchange.

The data exchanged in this model, has the following configuration:

**Master outputs↔Centork Inputs**

| T | Control |
|---|---|
| T | Instruction code |
| | |
| | |
| | |

| |
|---|
| |
| |

**Centork Outputs↔Master inputs**

| Diagnostic | |
|---|---|
| T | Instruction code/ Error |
| Data 1 | |
| Data 2 | |
| | |

| |
|---|
| |
| Data n |

The structure is formed by 10 bytes max. that will be transferred by the PROFIBUS-DP fieldbus.

Master instructions:

- Control: The meaning of the process variables is the same as in the previous case but the variable Control which has the following code:

  **0x01** Close valve

  **0x02** Open valve

  **0x04** Stop.

  **0x08** Unlock opening

  **0x10** Unlock closing

  Inside the “Control” process variable the toggle bit is used just in case that an order needs to be resent; this is usually done to resend the “stop” Control to rearm the valve in case that an alarm is detected. No echo of this toggle is generated.

- Command: Is composed by the instruction code and the Toggle bit.

  The possible instruction code is:

  **0x01** Read Status

Slave response:

- Diagnostic: Alarm codes from the actuator. Possible values are:

  **0x01** Not used

  **0x02** Travel limit switches error

  **0x04** Torque limit switches error

  **0x08** Lost phase

  **0x10** Movement error

- Response : The CENTRONIK unit will answer giving back an echo and a changed toggle, indicating that the command was correctly processed. If any kind of error occurred in the communication, in the code, etc., an error code will be sent instead of the echo. The structure of this code will be:

  **b7**: Toggle

  **b6**: Error in Instruction code

  **b5**: Error in Control

  **b4…b0**: Instruction code

– The data bytes, depending on the instruction, are defined as indicated in the next table:

| Byte Nr | Status |
|---|---|
| Data 1 | Selector-dip |
| Data 2 | P1 |
| Data 3 | P2 |
| Data 4 | Remote inputs |
| Data 5 | Remote outputs |
| Data 6 | Phase |
| Data 7 | |
| Data 8 | |

**The "Command toggle bit" sent must be equal to the "Response toggle bit". The "Response toggle bit" will be always the opposite of the "Command toggle bit". When "the Repsonse toggle" bit change, the slave device indicate that the last instruction was received.**

11.3.1 Status

The following data will be exchanged when a *Read Status* instruction is sent.

*11.3.1.1 Selector-dip*

Indicates the state of the DIPSWITCHES of the CENTRONIK unit.

*11.3.1.2 P1*

Indicates the state of every microswitch located inside the actuator

P1.0:Closed limit switch

P1.1 Open limit switch

P1.2 Opening overtorque switch

P1.3 Closing overtorque switch

P1.4 Not used

P1.5 Not used

P1.6 Lost phase

P1.7 Inverse phase connection.

*11.3.1.3 P2*

Variable only available for CENTORK technicians.

*11.3.1.4 Remote inputs*

Indicates the state of the remote inputs at the user connector.

*11.3.1.5 Remote outputs*

Indicates the state of the remote outputs at the user connector.

*11.3.1.6 Phase*

Indicates the state of the valve, previous to the byte stream reception.

1: Stop
2: Opening
3: Opened
4: Closing
5: Closed
6: Unlock & Closing
7: Unlock & Opening
8: Unlock deactivated
9: Overtorque openining
10: Overtorque closing
11: Travel limit switch fault
12: Not used
13: Torque limit switch fault
14: Lost phase
15: Movement fault
16: Alarm ESD

11.3.2 Reading and writing examples

Let's assume that we want to open the valve and read the Status. Then the byte stream to send is:

**Bytes to send:**

| | | |
|---|---|---|
| Byte 0 | Control | 0x02 |
| Byte 1 | Command | 0x81 |
| Byte 2 | - | - |
| Byte 3 | - | - |
| Byte 4 | - | - |
| Byte 5 | - | - |

**Received Bytes:**

| | | |
|---|---|---|
| Byte 0 | Diagnostic | 0x00 |
| Byte 1 | Response | 0x01 |
| Byte 2 | High Word,high byte | 0x60 |
| Byte 3 | High Word, Low byte | 0x00 |
| Byte 4 | Low Word,High byte | 0x90 |
| Byte 5 | Low bajo, Low byte | 0x60 |

If later we want to open the valve…

**Bytes to send:**

| | | |
|---|---|---|
| Byte 0 | Control | 0x04 |
| Byte 1 | Instruction Code | 0x01 |
| Byte 2 | | |
| Byte 3 | | |
| Byte 4 | | |
| Byte 5 | | |

**Received Bytes**:

| | | |
|---|---|---|
| Byte 0 | Diagnostic | 0x00 |
| Byte 1 | Instruction Code | 0x81 |
| Byte 2 | High Word,High byte | 0x60 |
| Byte 3 | High Word,Low byte | 0x94 |
| Byte 4 | Low Word,High byte | 0x00 |
| Byte 5 | Low Word,Low byte | 0x60 |

# 12 TROUBLE SHOOTING

The following instructions are offered for the most common difficulties encounter during installation and start-up.

## 12.1 Front panel indication fault

- **L1 and L3 yellow blinking**:
  - **Cause**: Limit switch failure. Both limit switch are activated or an opposite limit switch is activated during a CLOSE or OPEN operation.
  - **Solution**: Check the limit switch setting (Chapter 9.4 and 9.5) and SW4 setting(Chapter 9.3.3).
- **L4 yellow blinking**:
  - **Cause**:Torque switch failure. An opposite limit switch is activated during a CLOSE or OPEN operation.
  - **Solution**: Check the SW4 setting(Chapter 9.3.3).
- **L2 yellow**:
  - **Cause:** Movement fault. During a CLOSE or OPEN operation and after 7 seconds, the value of position transmitter not changed, movement is not detected. TPS or motor damaged
  - **Solution**: Check the TPS setting (Chapter 9.8) and if the motor work correctly.
- **L5 red**:
  - **Cause:** Lost Phase.
  - **Solution:** Check if the 3 phases power supply is correct.
- **L5 yellow**:
  - **Cause:** Inverse phase connection. The Centronik unit include a 3 phase correction system therefore this indication is not an alarm/fault.
  - **Solution:** Change the 3 phases sense.
- **L1, L2 and L3 yellow:** Rest time executing (Chapter 9.11.6)
- **All LEDs switch off:**
  - **Cause:** Power supply fault, fuse burned or display board disconnected.
  - **Solution:** Check if the 3 phases power supply is correct, fuses state and display board connection.

## 12.2 Actuator does not operate in LOCAL mode

- Check front panel indication fault.
- Check SW1, SW2 and SW3 setting (Chapter 9.3.1).
- Check the connection between the front panel board and the CPU board .

## 12.3 Actuator does not operate correctly in REMOTE mode

- Check front panel indication fault.
- Check SW8 setting (Chapter 9.3.5).
- In case of Fieldbus control, check the communication and the response errors. Check if ESD is not activated.
- In case of analog input control (Modulating duty), check the correct connection, the SW6 setting (Chapter 9.3.4) and the setting procedure (Chapter 9.11) . Check if ESD is not activated.
- In case of parallel control (ON/OFF duty), check the correct connection. Check if ESD is not activated.

## 12.4 Actuator turn in the wrong sense

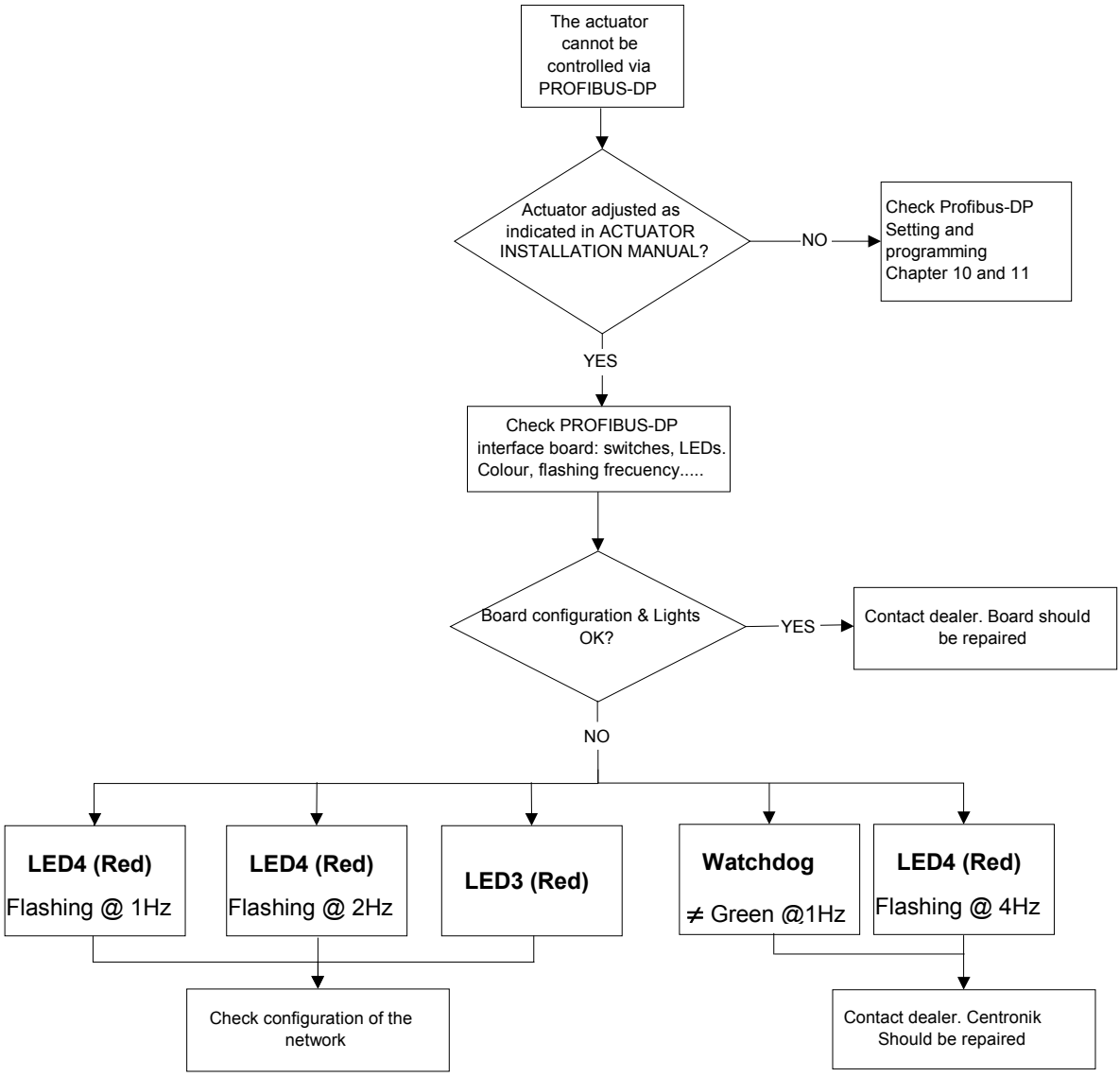
- Check the SW4 setting(Chapter 9.3.3).

## 12.5 Digitals outputs does not work

- Check the digitals outputs setting(Chapter 9.3.2 for ON/OFF duty and chapter 9.11.5 for Modulating and ON/OFF with display duty).
- Check the correct connection.

## 12.6 Fieldbus communication

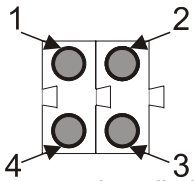
### 12.6.1 Troubleshooting diagram




### 12.6.2 Front mounting LED's

The interface is equipped with four LED's mounted at the front and one LED on the board, used for debugging purposes. The function of the LED's are described in the table and figure below.

1. Not used
2. On-Line
3. Off-Line



| Name | Colour | Function |
|---|---|---|
| **Fieldbus Diagnostics** | **Red** | Indicates certain faults on the Fieldbus side. |
| | | **Flashing Red 1 Hz** - Error in configuration: IN and/or OUT length set during initialisation of the interface is not equal to the length set during configuration of the network. |
| | | **Flashing Red 2 Hz** - Error in User Parameter data: The length/contents of the User Parameter data set during initialisation of the interface is not equal to the length/contents set during configuration of the network. |
| | | **Flashing Red 4 Hz** - Error in initialisation of the Profibus communication ASIC. |
| | | **Turned Off** - No diagnostics present |
| **On-Line** | **Green** | Indicates that the interface is On-Line on the fieldbus. |
| | | **Green**- Interface is On-Line and data exchange is possible. |
| | | **Turned Off** - Interface is not On-Line |
| **Off-Line** | **Red** | Indicates that the interface is Off-Line on the fieldbus. |
| | | **Red**- Interface is Off-Line and no data exchange is possible. |
| | | **Turned Off** - Interface is not Off-Line |

### 12.6.3 Watchdog LED

There is also a bicolour (red/green) watchdog LED on the circuit board, indicating the interface status according to the table below.

| Watchdog function | Colour | Frequency |
|---|---|---|
| ASIC and FLASH ROM check fault | **Red** | **2Hz** |
| Interface not initialised | **Green** | **2Hz** |
| Interface initialised and running OK | **Green** | **1Hz** |
| RAM check fault | **Red** | **1Hz** |
| DPRAM check fault | **Red** | **4Hz** |

# 13 MAINTENANCE

CENTORK actuators are supplied greased from the factory for their lifetime, needing practically no maintenance.

## 13.1 After commissioning

- Check for damage on paint caused by transport, assembly or handling and repair the damage carefully in order to ensure complete protection against corrosion.
- Make sure that all the o-ring seals are correctly mounted and that the cable glands are firmly fastened , and protection plug for cable entry not used have been replaced with metallic protection plug sealed with PTFE tape, in order to ensure the IP67, IP68 protection.
- The most important condition for reliable service of the CENTORK actuators is the fact of having carried out a correct commissioning and set-up procedure.

## 13.2 Maintenance for service

CENTORK recommends for a preventive maintenance programme:

Approximately 3 months after commissioning and then every 9/12 months:

- Check the correct tightening of the bolts between the actuator and the valve.
- Take advantage of each revision to check the proper tightening of the covers, of the handwheel lock and the external electric connection.
- Check cable entries
- Visual inspection inside of switching and signalling, and electrical compartments.
- Contact with valve manufacturer in order to know about maintenance routines of valve.

In the event of infrequent service, perform a test run every 6 months in order to ensure the availability of service of the actuator.

## 13.3 Electric actuator's service life

- Electric actuator service life is rated to 20.000 cycles.
- Each cycle is formed by an opening manoeuvre (Valve close position to valve open position) and a closing manoeuvre (Valve open position to valve close position).
- 50 turns has been considered as standard valve stroke reference.

## 13.4 Fuse replacement

- The Centronik unit presents 2 fuses. In order to replace the fuses SAFETY INSTRUCTION must be observed (Chapter 2).
- With power off, open the electrical cover.
- Open the fuse holders and replace the fuses according to the table below.

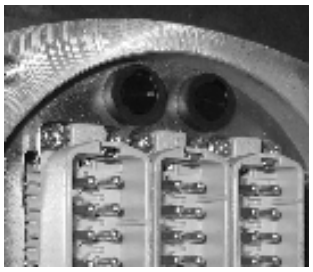


Figure 13.4.1

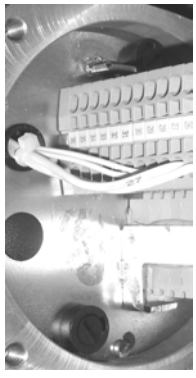


Figure 13.4.2

| TENSION | CARACT. FUSE |
|---|---|
| 110/120Volts | 2A (5X20mm) |
| 220/230Volts | 1A (5X20mm) |

| TENSION | CARACT. FUSE |
|---|---|
| 380 to 440 Volts | 500mA (6.3X32mm) |
| 460 to 600 Volts | 250mA (6.3X32mm) |

- Once you have checked that the fuse holders have been properly carried out, close the connection cover, the state of the o-ring seal and the proper installation of the latter, greasing it slightly. Fasten the 4 screws crosswise.

# 14 TECHNICAL SUPPORT

Each actuator is supplied with a datasheet on A4 format. The following is included:

- The nameplates attached to the actuator.
- Electric actuador datasheet.
- The electric connection diagram for each actuator (also stuck inside the connections cover of the actuator).
- This electric actuator user manual.

For any claim or information request, the SERIAL NUMBER included on this datasheet or on the Electric actuator nameplates should be used.

Electric actuator manufacturer address: See on Manual covers.

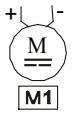
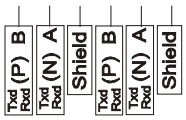
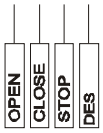
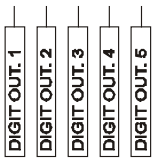
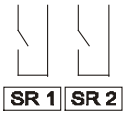
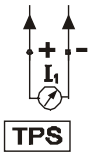
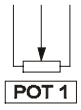
# APPENDIX

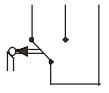
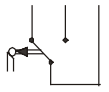
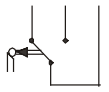
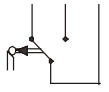
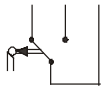
## FASTEN BOLTS (CLASS 8.8)

| | FRICTION FACTOR | | |
|---|---|---|---|
| BOLT | LOW | MEDIUM | HIGH |
| **M4** | 4.2 | 6 | 8 |
| **M6** | 6.2 | 8.2 | 10 |
| **M8** | 15 | 21 | 24 |
| **M10** | 30 | 41 | 48 |
| **M12** | 49 | 68 | 85 |
| **M14** | 85 | 108 | 130 |
| **M16** | 130 | 165 | 200 |
| **M18** | 170 | 240 | 280 |
| **M20** | 240 | 340 | 410 |
| **M30** | 800 | 1150 | 1350 |
| **M36** | 1450 | 2050 | 2400 |

Torque values in N.m
Steel bolts class 8.8

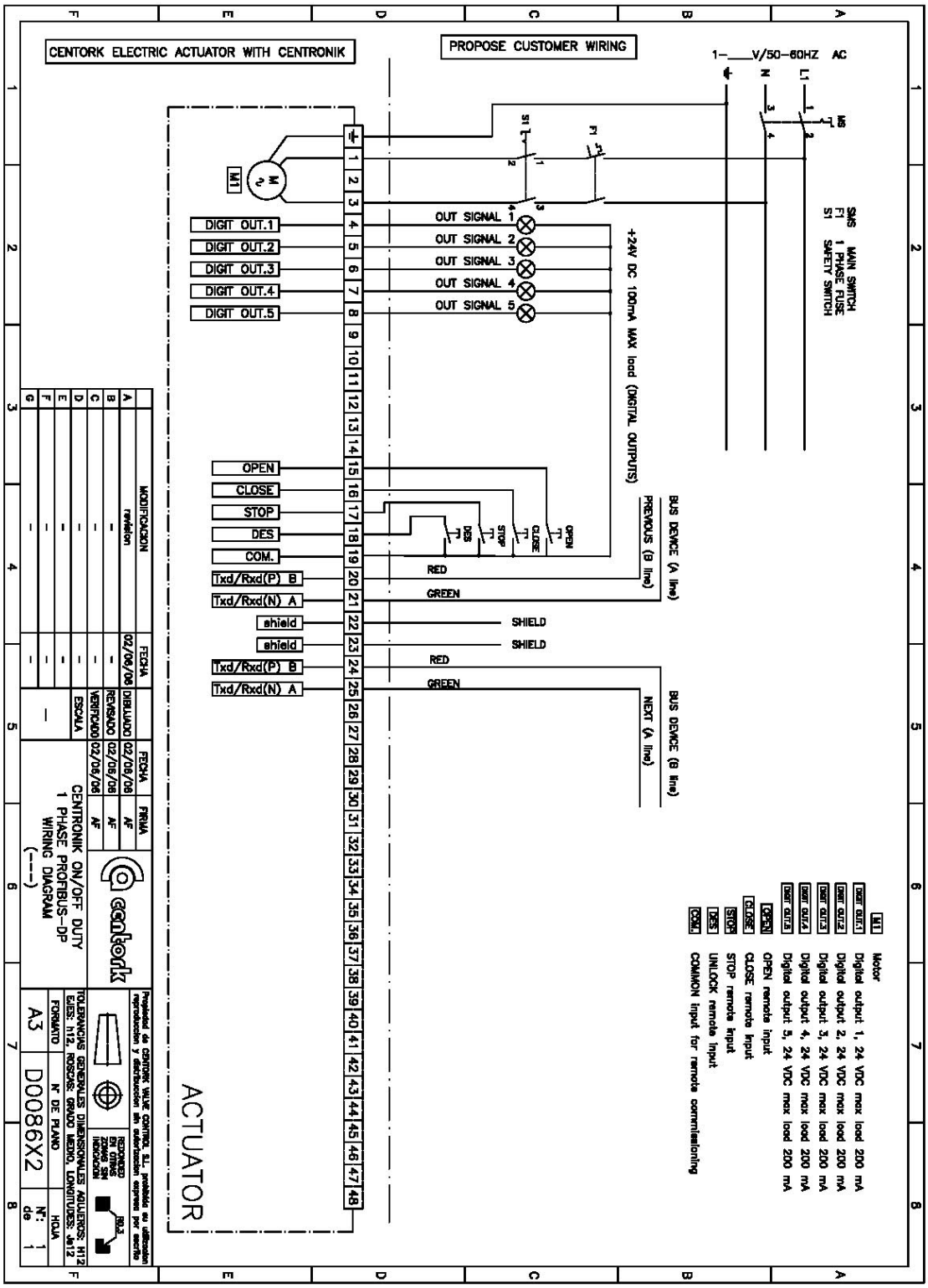
# WIRING DIAGRAMS, TERMINAL PLANS, LEGENDS AND SYMBOLS

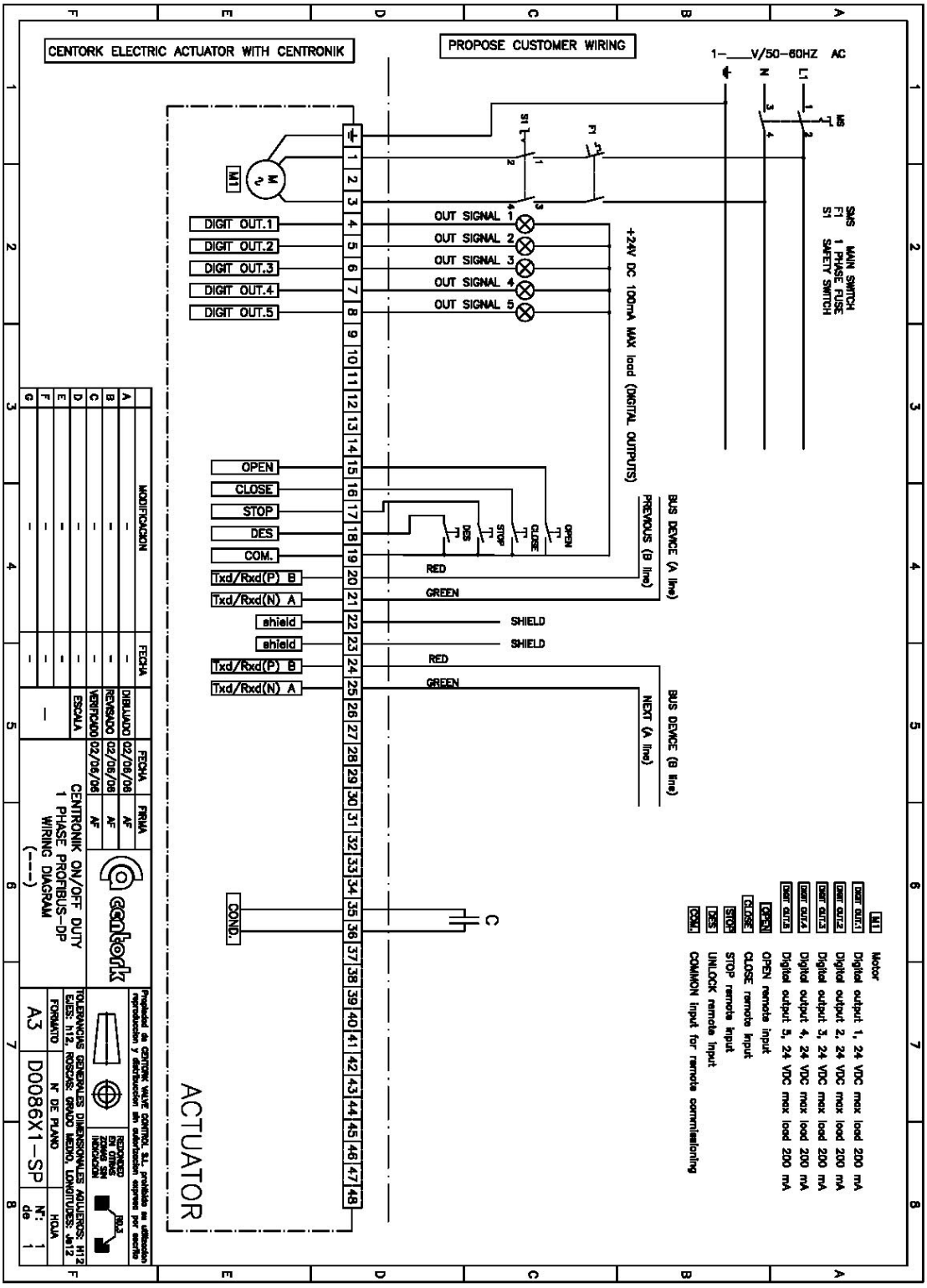
| SYMBOL | DESCRIPTION | TECHNICAL FEATURES |
|---|---|---|
|  | M1<br>Main power supply (single and three-phase) | Main power supply: See Centronik nameplates.<br>Main voltage supply tolerance: ±5%<br>Frequency tolerance: ±5% |
|  | M1<br>Main power supply (DC) | Main power supply: See Centronik nameplates.<br>Main voltage supply tolerance: ±5% |
|  | Profibus network | Non-powered two-wire (RS485) network (See Chapter 5, 6 and 10). |
|  | remotel inputs:<br>OPEN, CLOSE, STOP, UNLOCK remote input signal | |
|  | ESD<br>Emergency Shut Down remote input signal | |
|  | Digital outputs | Programmable digital outputs<br>24VDC, 100mA max. |
|  | SR1, SR2....SR5<br>Relay outputs | Programmable relay outputs<br>SR1 to SR4: 250VAC/24VDC, 5A max.<br>SR5: 250VAC/24VDC, 2A max. |
|  | POSIC./COMUN<br>Control input | Analog input 0/4-20mA or 0/5V (0/10V as option) |
|  | TPS:<br>0/4-20 mA transmitter | Output Signal (current) :<br>2 wires :0/4-20 mA .<br>Maximum resistance :600 Ohms<br>Precision : <1%.<br>Temperature : -25ºC to +70ºC |
|  | POT:<br>Precision Potentiometer | 10 kOhms (other values on request).<br>Ohmic value tolerance : ±20% std. (±10% optional).<br>Linearity : <1%.<br>Power : 1W max.<br>Turning angle : 340º± 5%<br>Life : $10^6$ cycles. |

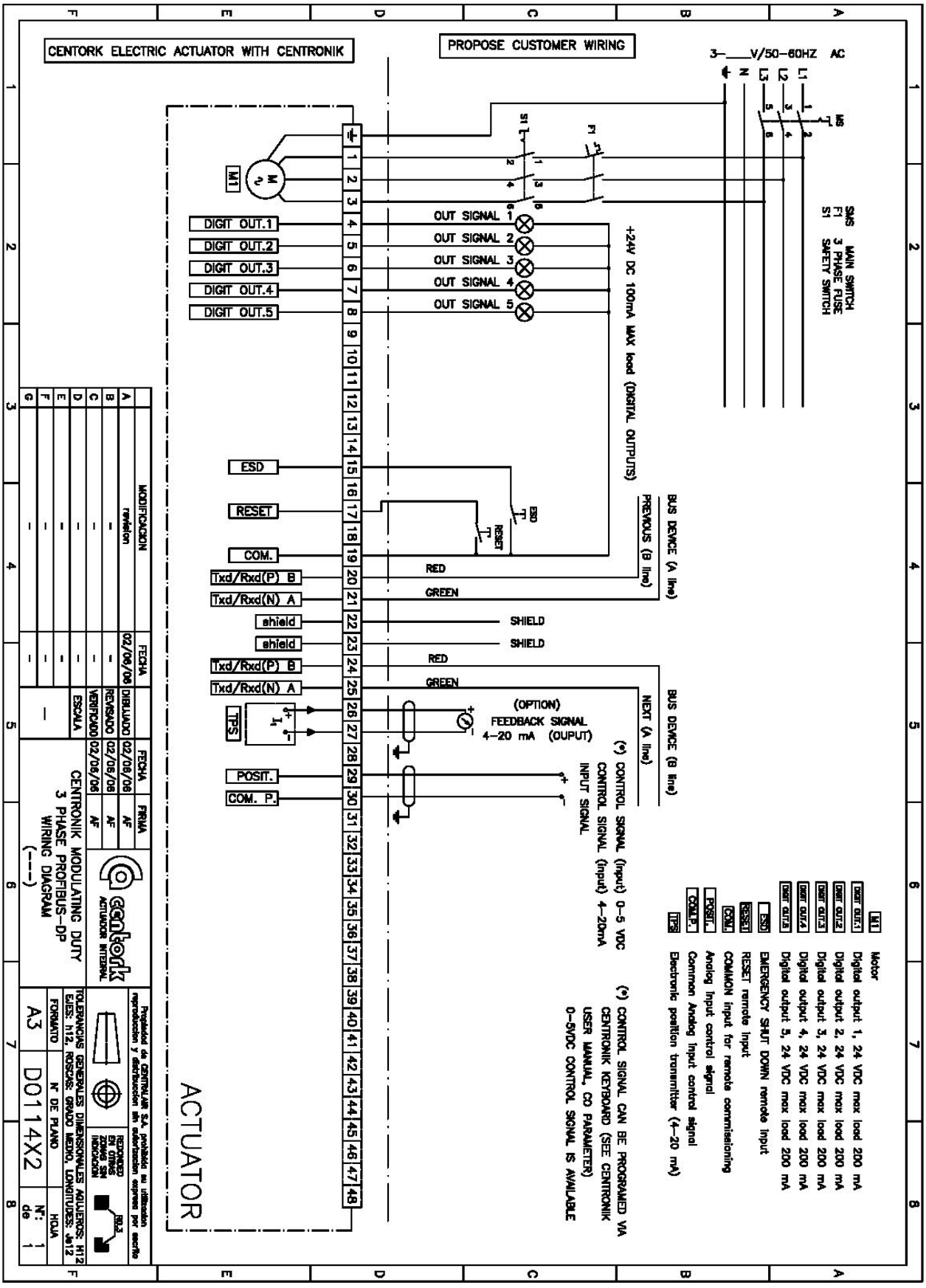
| | | |
|---|---|---|
|  | FPC:<br>CLOSE torque microswitch. | Open/close SPDT, 250VAC 10A rating |
|  | FPA:<br>OPEN torque microswitch. | |
|  | FRC:<br>CLOSE limit microswitch.<br>(CLOSE end position) | |
|  | FRA:<br>OPEN limit microswitch.<br>(OPEN end position) | |
|  | AUX1:<br>Auxiliary switches for middle-valve positions | Open/close SPDT, 250VAC 10A rating |

***For further technical information, consult CENTORK technical datasheet or contact directly with CENTORK. CENTORK address can be found printed on manual covers.***

OTHER wiring diagram are available and are included with each actuator provided.


CENTORK ELECTRIC ACTUATOR WITH CENTRONIK
PROPOSE CUSTOMER WIRING
1~___V/50~60HZ AC
L1
N
MS
SMS MAIN SWITCH
F1 1 PHASE FUSE
S1 SAFETY SWITCH
M1
DIGIT OUT.1
DIGIT OUT.2
DIGIT OUT.3
DIGIT OUT.4
DIGIT OUT.5
OUT SIGNAL 1
OUT SIGNAL 2
OUT SIGNAL 3
OUT SIGNAL 4
OUT SIGNAL 5
+24V DC 100mA MAX load (DIGITAL OUTPUTS)
OPEN
CLOSE
STOP
DES
COM.
Txd/Rxd(P) B
Txd/Rxd(N) A
shield
shield
Txd/Rxd(P) B
Txd/Rxd(N) A
BUS DEVICE (A line)
PREVIOUS (B line)
BUS DEVICE (B line)
NEXT (A line)
RED
GREEN
SHIELD
SHIELD
RED
GREEN
M1 Motor
DIGIT OUT.1 Digital output 1, 24 VDC max load 200 mA
DIGIT OUT.2 Digital output 2, 24 VDC max load 200 mA
DIGIT OUT.3 Digital output 3, 24 VDC max load 200 mA
DIGIT OUT.4 Digital output 4, 24 VDC max load 200 mA
DIGIT OUT.5 Digital output 5, 24 VDC max load 200 mA
OPEN OPEN remote input
CLOSE CLOSE remote input
STOP STOP remote input
DES UNLOCK remote input
COM. COMMON input for remote commiwiohing
ACTUATOR
CENTRONIK ON/OFF DUTY
1 PHASE PROFIBUS-DP
WIRING DIAGRAM
(---)
A3
D0086X2
1
1


CENTORK ELECTRIC ACTUATOR WITH CENTRONIK
PROPOSE CUSTOMER WIRING
1~___V/50-60HZ AC
L1
N
MS
SMS MAIN SWITCH
F1 1 PHASE FUSE
S1 SAFETY SWITCH
M1
DIGIT OUT.1
DIGIT OUT.2
DIGIT OUT.3
DIGIT OUT.4
DIGIT OUT.5
OUT SIGNAL 1
OUT SIGNAL 2
OUT SIGNAL 3
OUT SIGNAL 4
OUT SIGNAL 5
+24V DC 100mA MAX load (DIGITAL OUTPUTS)
OPEN
CLOSE
STOP
DES
COM.
Txd/Rxd(P) B
Txd/Rxd(N) A
shield
shield
Txd/Rxd(P) B
Txd/Rxd(N) A
BUS DEVICE (A line)
PREVIOUS (B line)
BUS DEVICE (B line)
NEXT (A line)
RED
GREEN
SHIELD
SHIELD
RED
GREEN
COND.
C
M1 Motor
DIGIT OUT.1 Digital output 1, 24 VDC max load 200 mA
DIGIT OUT.2 Digital output 2, 24 VDC max load 200 mA
DIGIT OUT.3 Digital output 3, 24 VDC max load 200 mA
DIGIT OUT.4 Digital output 4, 24 VDC max load 200 mA
DIGIT OUT.5 Digital output 5, 24 VDC max load 200 mA
OPEN OPEN remote input
CLOSE CLOSE remote input
STOP STOP remote input
DES UNLOCK remote input
COM. COMMON input for remote commissioning
MODIFICACION
FECHA
DIBUJADO
REVISADO
VERIFICADO
ESCALA
FIRMA
CENTRONIK ON/OFF DUTY
1 PHASE PROFIBUS-DP
WIRING DIAGRAM
(----)
ACTUATOR
FORMATO A3
Nº DE PLANO D0086X1-SP
HOJA Nº de 1 1


CENTORK ELECTRIC ACTUATOR WITH CENTRONIK
PROPOSE CUSTOMER WIRING
3~___V/50-60HZ AC
L1
L2
L3
N
MS
S1
F1
M1
DIGIT OUT.1
DIGIT OUT.2
DIGIT OUT.3
DIGIT OUT.4
DIGIT OUT.5
OUT SIGNAL 1
OUT SIGNAL 2
OUT SIGNAL 3
OUT SIGNAL 4
OUT SIGNAL 5
+24V DC 100mA MAX load (DIGITAL OUTPUTS)
ESD
RESET
COM.
Txd/Rxd(P) B
Txd/Rxd(N) A
shield
shield
Txd/Rxd(P) B
Txd/Rxd(N) A
TPS
POSIT.
COM. P.
BUS DEVICE (A line)
PREVIOUS (B line)
RED
GREEN
SHIELD
SHIELD
BUS DEVICE (B line)
NEXT (A line)
RED
GREEN
(OPTION)
FEEDBACK SIGNAL
4-20 mA (OUPUT)
(*) CONTROL SIGNAL (input) 0-5 VDC
CONTROL SIGNAL (input) 4-20mA
INPUT SIGNAL
(*) CONTROL SIGNAL CAN BE PROGRAMED VIA
CENTRONIK KEYBOARD (SEE CENTRONIK
USER MANUAL, CO PARAMETER)
0-5VDC CONTROL SIGNAL IS AVAILABLE
MS MAIN SWITCH
F1 3 PHASE FUSE
S1 SAFETY SWITCH
M1 Motor
DIGIT OUT.1 Digital output 1, 24 VDC max load 200 mA
DIGIT OUT.2 Digital output 2, 24 VDC max load 200 mA
DIGIT OUT.3 Digital output 3, 24 VDC max load 200 mA
DIGIT OUT.4 Digital output 4, 24 VDC max load 200 mA
DIGIT OUT.5 Digital output 5, 24 VDC max load 200 mA
ESD EMERGENCY SHUT DOWN remote input
RESET RESET remote input
COM. COMMON input for remote commissioning
POSIT. Analog input control signal
COM.P. Common Analog input control signal
TPS Electronic position transmitter (4-20 mA)
MODIFICACION
revision
FECHA
DIBUJADO
REVISADO
VERIFICADO
ESCALA
FIRMA
CENTRONIK MODULATING DUTY
3 PHASE PROFIBUS-DP
WIRING DIAGRAM
(---)
ACTUATOR
FORMATO
A3
D0114X2
Nº DE PLANO
HOJA
Nº: 1
de 1

centork
VALVE CONTROL

# Declaración de Conformidad

Centork Valve Control S.L. declara que los actuadores eléctricos, series:

***1482. 1483.***
***1484. 1485.***

han sido diseñados, producidos como accionamientos eléctricos para operar válvulas industriales y de acuerdo con los requerimientos de las Directivas CE reseñadas,

*Directiva 98/37/CE Máquinas, 22 de Junio 1.998*
*Directiva 73/23/CE Directiva de Baja Tensión, 19 Febrero 1.973*
*Directiva 89/336/CE Directiva Compatibilidad Electromagnética.*

aplicándose las siguientes normas,

| | | |
|---|---|---|
| **ISO 5210 Sept. 1.991** | **EN 50.014 Dic.1.999** | **EN 60.204-1 Febr. 1.999** |
| **ISO 5211 Febr. 2.001** | **EN 50.018 Dic. 2.001** | **EN 60529 Marzo 2.000** |
| **EN 292-1 Abr. 1.993** | **EN 50.019 Ene. 2.002** | **DIN VDE 0100 Ene 1.997** |
| **EN 292-2 Abr.1.993** | **EN 50.020 Sept. 2.003** | **DIN VDE 0530 Dic. 1982** |

Si el mencionado aparato es montado en una máquina o instalado junto con otras máquinas o dispositivos, está prohibida la puesta en marcha de la máquina o conjunto de máquinas hasta que se verifique su conformidad con los requisitos de las directivas aplicables, así como con los requisitos y normas de seguridad aplicables.

Esta declaración queda sin efecto si el aparato ha sido modificado sin nuestra autorización escrita.

San Sebastián, 3 de Octubre de 2.003

Francisco Lazcano
–Director general-

(Sede social)
**Centork Valve Control S.L.**
Portuetxe 23-25
San Sebastián 20.018 ESPAÑA

(Centro fabricación)
**Centork Valve Control S.L.**
Zikuñaga 19
Hernani 20.120 ESPAÑA

# PROFIBUS CERTIFICATE

## Certificate

PROFIBUS Nutzerorganisation e.V. grants to

**HMS Industrial Networks AB**
**Pilefeltsgatan 93 - 95, S-30250 Halmstad**
the Certificate No.: **Z00456** for the following product:

**Name:** **Anybus-S PDP**
**Model:** **Fieldbus Interface**
**Revision: 1.4; SW: 1.2**
**GSD:** **HMS_1003.gsd**

This certificate confirms that the device has successfully passed the conformance tests for PROFIBUS DP Slave devices.

The tests were executed according to "Test Specifications for PROFIBUS DP Slaves, Version 2.0" from February 2000, at Siemens AG in Fürth which is an authorized test laboratory of PROFIBUS Nutzerorganisation. The detailed test procedure and the test results are recorded in the inspection report 296-2.

This certificate is granted according to the PNO guideline for testing and certification (PRZ) dated August 1, 1999 and is valid for 3 years, i.e. until November 18, 2006.

Karlsruhe, December 19, 2003

.....
(Official in Charge)

Board of PROFIBUS Nutzerorganisation e. V.

(Edgar Küster)

(Prof. K. Bender)

## NOTES

centork
VALVE CONTROL

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**1497.MANE1483X001** **Edition: 03.06**