DREHMO
VALVE ACTUATORS

A member of the AUMA Group

Control description for actuators with integrated i-matic control unit type IM

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NOTICE
This description contains all parameters
According to the configuration some parameters may not be displayed in the actuator.

2 User management

User Login
User level: User
Default value: -/-
Description:
Selection of the user for login.

ENTER-TASTE password
User level: User
Default value: 0
Description:
Input of the password for the according user.
It consists of 4 digits.

Actual user
readble from User
Default value: Manufacturer
Description:
Output of loggedin user.

Password from user
User level: Specialist
Default value: Manufacturer
Description:
Setting for the use of password. User below the selected one do not need to enter a password.

User password
User level: User
Default value: 1234
Description:
Setting of the password for the user.

Mainten. staff password
User level: Maintenance staff
Default value: 1234
Description:
Setting of the password for maintanance staff.

Specialist password
User level: Specialist
Default value: 1234
Description:
Setting of the password for the specialist.

3 LEARN mode

3.1 Short LEARN mode

Closing direction
User level: Maintenance staff
Default value: Clockwise CW
Description:
Turning direction of the actuator if the valve is closing.

Switching off mode
User level: Maintenance staff
Default value: Final position limit sw.
Description:
Sets the switch-off conditions of the valve. During LEARN-mode, this parameter should be set to "Stop position", because the references for the set values are the positions 0% and 100%. Increases in torque due to the kind of valve need to lie outside of this range.

Tripping torque CLOSE
User level: Maintenance staff
Description:
The actuator switches off if the torque exceeds this value when closing.

Tripping torque OPEN
User level: Maintenance staff
Description:
The actuator switches off if the torque exceeds this value when opening.

Clear position CLOSE
User level: Maintenance staff
Default value: No
Description:
Clear position closed. The final position is shifted by 90 turns.

Clear position OPEN
User level: Maintenance staff
Default value: No
Description:
Clear position open. The final position is shifted by 90 turns.

Set position CLOSE
User level: Maintenance staff
Default value:
Description:
The actuator can be moved with the buttons „OPEN" and „CLOSE" as if in LOCAL mode. "ENTER" sets the final position to the current position, "EC" cancels the procedure without setting the final position.

Set position OPEN
User level: Maintenance staff
Default value:
Description:
The actuator can be moved with the buttons „OPEN" and „CLOSE" as if in LOCAL mode. "ENTER" sets the final position to the current position, "EC" cancels the procedure without setting the final position.

3.2 Change final positions

Clear position CLOSE
User level: Maintenance staff
Default value: No
Description:
Clear position closed. The final position is shifted by 90 turns.

Clear position OPEN
User level: Maintenance staff
Default value: No
Description:
Clear position open. The final position is shifted by 90 turns.

Set position CLOSE
User level: Maintenance staff
Default value:
Description:
The actuator can be moved with the buttons „OPEN“ and „CLOSE“ as if in LOCAL mode. “ENTER” sets the final position to the current position, “EC” cancels the procedure without setting the final position.

Set position OPEN
User level: Maintenance staff
Default value:
Description:
The actuator can be moved with the buttons „OPEN“ and „CLOSE“ as if in LOCAL mode. “ENTER” sets the final position to the current position, “EC” cancels the procedure without setting the final position.

3.3 Analogue position value

3.3.1 Input

Set OPEN position
User level: Maintenance staff
Default value: -/-
Description:
Defines the actual setpoint current as the setpoint value for position open. If this parameter is used, the parameter "Value OPEN" is automatically set.

Set CLOSE position
User level: Maintenance staff
Default value: -/-
Description:
Defines the actual setpoint current as the setpoint value for position closed. If this parameter is used, the parameter "Value CLOSE" is automatically set.

Value OPEN
User level: Maintenance staff
Default value: 964
Description:
Adjusts the numerical value of the A/D converter of the setpoint signal to the position OPEN.

Value CLOSE
User level: Maintenance staff
Default value: 29
Description:
Adjusts the numerical value of the A/D converter of the setpoint signal to the position CLOSE.

3.3.2 Output

Value 100%
User level: Maintenance staff
Default value: 849
Description:
Sets the value for the D/A converter which corresponds to the position of 100%.

Value 0%
User level: Maintenance staff
Default value: 62
Description:
Sets the value for the D/A converter which corresponds to the position of 0%.

3.4 Torque calibration

Delete torque OPEN
User level: Specialist
Default value: No
Description:
Deletes all calibration data of the torque sensor for opening direction. Afterwards the calibration has to be executed by using torque OPEN 50% and 100%.

Delete torque CLOSE
User level: Specialist
Default value: No
Description:
Deletes all calibration data of the torque sensor for closing direction. Afterwards the calibration has to be executed by using torque CLOSE 50% and 100%.

Zero point adjust
User level: Maintenance staff
Default value: No
Description:
Defines the actual torque as 0 Nm.

torque OPEN 50%
User level: Specialist
Description:
Sets the calibration value for the torque in opening direction with a level of 50%. The actuator opens the valve upon pushing "OPEN" and moves until the button is pressed again to set the value of 50% in opening direction. The actuator then stops automatically.
To function properly, the closing direction has to be set to „CW“!

torque OPEN 100%
User level: Specialist
Description:
Sets the calibration value for the torque in opening direction with a level of 100%. The actuator opens the valve upon pushing "OPEN" and moves until the button is pressed again to set the value of 100% in opening direction. The actuator then stops automatically.
To function properly, the closing direction has to be set to „CW“!

torque CLOSE 50%
User level: Specialist
Description:
Sets the calibration value for the torque in closing direction with a level of 50%. The actuator closes the valve upon pushing "CLOSE" and moves until the button is pressed again to set the value of 50% in closing direction. The actuator then stops automatically.
To function properly, the closing direction has to be set to „CW“!

torque CLOSE 100%
User level: Specialist
Description:
Sets the calibration value for the torque in closing direction with a level of 100%. The actuator closes the valve upon pushing "CLOSE" and moves until the button is pressed again to set the value of 100% in closing direction. The actuator then stops automatically.
To function properly, the closing direction has to be set to „CW“!

Torque centered
readble from User
Description:
Displays the current value of the excursion of the torque axle. With “ENTER-TASTE” this value can be displayed in big letters.

3.5 Maintenance Encoder

Upload calibration
User level: Maintenance staff
Default value: No
Description:
Transfer of the sensor calibration data into the control unit.

Download calibration
User level: Maintenance staff
Default value: No
Description:
Transfer of the sensor calibration data from the control unit into the sensor.

Default calibration
User level: Maintenance staff
Default value: No
Description:
Transfer preset calibration data to the sensor according to the correspondig actuator types.

NOTICE: The torque values may not be excat due to mechanical tollerances.

Calibr. gradient CLOSE
User level: Manufacturer
Default value: 0
Description:
The slope is calculated, based on the two teached points for the torque in direction CLOSE, by the equation: y=mx+b.

Calibr. gradient OPEN
User level: Manufacturer
Default value: 0
Description:
The slope is calculated, based on the two teached points for the torque in direction OPEN, by the equation: y=mx+b.

Calibr. offset CLOSE
User level: Manufacturer
Default value: 0
Description:
The offset is calculated, based on the two teached points for the torque in direction CLOSE, by the equation: y=mx+b.

Calibr. offset OPEN
User level: Manufacturer
Default value: 0
Description:
The offset is calculated, based on the two teached points for the torque in direction CLOSE, by the equation: y=mx+b.

4 Electronic name plate

4.1 Identification

Bluetooth name
readble from User
Default value:
Description:
Shows the actual name tag of the actuator that will be displayed during a bluetooth discovery.

Bluetooth address
readble from User
Default value: 0
Description:
Shows the bluetooth MAC adress of the actuator that will be displayed during a bluetooth discovery.

4.2 Description

TAG/KKS-ID
User level: Maintenance staff
Default value: _TAG_KKS_
Description:
Process-specific identification of the actuator

Application
User level: Maintenance staff
Default value: _APPLICATION_
Description:
Description of the actuator

Installation area
User level: Maintenance staff
Default value: _INSTAREA_
Description:
Process-specific part, where the actuator is installed

Assembly date
User level: Maintenance staff
Default value: _MOUNTDATE_
Description:
date when actuator was installed

Commission no.
User level: Specialist
Default value: _KOMNR_
Description:
Commission-number of the manufacturer

4.3 Actuator

Manufacturer
User level: Specialist
Default value: Drehmo GmbH
Description:
Indication about the actuators manufacturer

Actuator identifier no.
User level: Specialist
Default value: _DRIVEIDENT_
Description:
Description of the actuator according to key with output and speed (e.g. DiM30 A-25)

Actuator model
User level: Specialist
Default value: electrical
Description:
Power source of the actuator

Serial number
readble from User
Default value: -/-
Description:
Actuator serial number => setting defined by device key

Device certifications
User level: Specialist
Default value: NA
Description:
Device certifications

Mech. output form
User level: Specialist
Default value: _DROUTPUT_
Description:
Mechanical output form

Rpm
User level: Specialist
Default value: 0
Description:
Speed of the output / Rpm

Time / 90°
User level: Specialist
Default value: 0
Description:
The time needed to turn 90° (for DPiM)

Protection class
User level: Specialist
Default value: IP67
Description:
Protection class

Type of duty
User level: Specialist
Default value: S4/35%ED
Description:
Operational mode of the actuator (e.g. S2 10 min.)

max. tripping torque
readble from User
Default value: 0
Description:
Maximum available torque of the actuator output => setting defined by device key (see Control unit)

min. tripping torque
readble from User
Default value: 0
Description:
Minimum available torque of the actuator output.
Lower torques than this value cannot be detected! => setting defined by device key

max. modulating torque
readble from User
Default value: 0
Description:
Maximum available torque for modulating mode => setting defined by device key

min. ambient temp.
User level: Specialist
Default value: -25
Description:
Minimum allowed temperature when electronic unit is powered (heating is on)

max. ambient temp.
User level: Specialist
Default value: 60
Description:
Maximum allowed temperature

4.4 Control unit

Device Key
User level: User
Default value: 0000-0000-0000-0000
Description:
This key defines the configuration of the control unit (e.g. integral positioner, timer). A new key is only valid after a reset procedure.

Device Manufacturer ID
readble from User
Default value: 305
Description:
Manufacturer ID assigned by the PNO.

Device Id
readble from User
Default value: i-Matic DiM
Description:
Kind of electronic

Serial number
readble from User
Default value: -/-
Description:
Serial number of electronic unit

Snr. base plate
readble from User
Default value: -/-
Description:
Serial number of base plate

Snr. display plate
readble from User
Default value: -/-
Description:
Serial number of display plate

Snr. Interface 1
readble from User
Default value: -/-
Description:
Serial number of Interface board

Snr. Interface 2
readble from User
Default value: -/-
Description:
Serial number of additional, optional interface board

Serial number EM6
readble from User
Default value: -/-
Description:
Serial number of combined sensor Em6

Snr. EM6 Remote
readble from User
Default value: -/-
Description:
Serial number of board inside actuator for wall mounted unit

Wiring diagram
User level: Specialist
Default value: iM00X-XX-X X-X X X/X
Description:
Wiring diagram of the actuator

Electrical specification
User level: Specialist
Default value: iM00X-XX-X X-X X X/X
Description:
Lists the electronic components of the actuator

SW-Revision baseplate
readble from User
Default value: -/-
Description:
Software version of main board

HW-Revision baseplate
readble from User
Default value: -/-
Description:
Hardware version of main board

SW-Revision display
readble from User
Default value: -/-
Description:
Software version of display board

HW-Revision Display
readble from User
Default value: -/-
Description:
Hardware version of display board

HW-Revision Interface 1
readble from User
Default value: -/-
Description:
Hardware version of interface board

HW-Revision Interface 2
readble from User
Default value: -/-
Description:
Hardware version of additional, optional interface board

Internal positioner
readble from User
Default value: Disabled V003
Description:
Information, whether the internal positioner is enabled or not => setting defined by device key

Local remote control
readble from User
Default value: Disabled
Description:
Information, whether the actuator can be remote controlled using the interface of the display unit => setting defined by device key

Enhanced controller
readble from User
Default value: Disabled
Description:
This parameter controls the use of the enhanced controller that provides more complex settings for the controller.

max. electr. temp.
User level: Specialist
Default value: 85
Description:
The maximum allowed temperature of electronic

min. electronics temp.
User level: Specialist
Default value: -25
Description:
The minimum allowed temperature of electronic

4.5 Motor

Motor type
User level: Specialist
Default value: _MOTORTYPE_
Description:
Type of the motor

Motor serial no.
User level: Specialist
Default value: 123456
Description:
Serial number of the motor

Insulation class
User level: Specialist
Default value: F
Description:
Insulation class of the motor

Nominal voltage
User level: Specialist
Default value: 400
Description:
Nominal voltage

Phases
User level: Specialist
Default value: 3
Description:
Number of phases of the main power system

Nominal frequency
User level: Specialist
Default value: 50
Description:
Frequency of the main power system

Nominal current
User level: Specialist
Default value: 0.75
Description:
Nominal current

Starting current
User level: Specialist
Default value: 1.1
Description:
Maximum current when motor is energised

Nominal power
User level: Specialist
Default value: 1.1
Description:
Nominal power

Phase shift (cos phi)
User level: Specialist
Default value: 0.65
Description:
Value of $cos\,(\varphi)$ at nominal values

Motor protection
User level: Specialist
Default value: PTC
Description:
Sensor of motor temperature

Output speed / Rpm
User level: Specialist
Default value: 1360
Description:
Speed of motor at nominal values

4.6 Gear / thrust unit

Manufacturer
User level: Maintenance staff
Default value: _GEARMANUF_
Description:
Manufacturer

Add. gear model
User level: Maintenance staff
Default value: _GEARTYPE_
Description:
type of additional component

Serial number
User level: Maintenance staff
Default value: _GEARSERNR_
Description:
Serial number of component

Gearbox assembly date
User level: Maintenance staff
Default value: _GEARMOUNTDATE_
Description:
Date of installation of component

max. input torque
User level: Maintenance staff
Default value: 0
Description:
Value of maximum permissible input torque of component.
The parameter "Tripping torque CLOSE", "Tripping torque OPEN" in the submenu valve cannot exceed this value.

Gear ratio
User level: Maintenance staff
Default value: 1
Description:
Gear ratio

Gear factor
User level: Maintenance staff
Default value: 1
Description:
Gear factor

Mech. output form
User level: Maintenance staff
Default value: _GEAROUTPUT_
Description:
Mechnical form of output

4.7 Valve

Manufacturer
User level: Maintenance staff
Default value: _VALVEMANUF_
Description:
Manufacturer of the valve, which was delivered with the actuator

Valve type
User level: Maintenance staff
Default value: linear
Description:
Information about the moving of the valve

Adjustment range
User level: Maintenance staff
Default value: 90
Description:
Information about the stroke in the configured unit (see parameters>data logging>position unit)

Serial number
User level: Maintenance staff
Default value: _VALVESERNR_
Description:
Serial number of valve

max. torque OPEN
User level: Maintenance staff
Default value: 0
Description:
Maximum permissible torque of valve or gear in direction open. A value of 0 means no restriction.

max. torque CLOSE
User level: Maintenance staff
Default value: 0
Description:
Maximum permissible torque of valve or gear in direction close. A value of 0 means no restriction.

5 Oper. data acquisition

5.1 General

Calibration date
User level: Specialist
Default value: 2003-08-08
Description:
Date, when actuator was last calibrated.

Configuration date
User level: Maintenance staff
Default value: 2002-08-08
Description:
This field can be used to store the date of the last configuration changes

Maintenance date
User level: Maintenance staff
Default value: 2002-08-08
Description:
This field can be used to store the date of the last maintenance

5.2 Operation data

Valve stroke
User level: Specialist
Default value: 0
Description:
Value of the accumulated valve travel in multiples of complete stroke (= 1)

> Limit valve stroke
User level: Maintenance staff
Default value: 0
Description:
Maximum allowed valve travel in multiples of complete stroke (= 1).
If the value is exceeded, an indication "maintenance required" is generated. If value "0" is set, this check is disabled.

Motor oper. time total
readble from User
Default value: 0
Description:
Operating time of motor – this value cannot be reset

Motor operation time
User level: Specialist
Default value: 0
Description:
Accumulated operating time of motor

Position trippings total
readble from User
Default value: 0
Description:
Number of stops due to reaching a final position – this value cannot be reset.

Position trippings
User level: Specialist
Default value: 0
Description:
Number of stops due to reaching a final position

Operation cycles
User level: Specialist
Default value: 0
Description:
Number of motor startups

> Limit cycles
User level: Maintenance staff
Default value: 0
Description:
Limit of number of motor startups. If the value is exceeded, an indication "maintenance essential" is generated. If value is set to "0", this check is disabled.

Actual op. cycles/h
readble from User
Default value: 0
Description:
Information of number of motor startups during the last hour.
Value is updated continuously

max. cycles / hour
User level: Specialist
Default value: 0
Description:
Record of maximum value of "Actual op. cycles / h".

> Limit cycles / hour
User level: Maintenance staff
Default value: 0
Description:
Limit of number of motor startups during one hour.
If the value is exceeded, an indication "maintenance required" is output.

Operation time CLOSE
readble from User
Default value: 0
Description:
Duration of the last complete closing of the valve starting at open position

Operation time OPEN
readble from User
Default value: 0
Description:
Duration of last complete opening of the valve starting at close position

Actual operation time
readble from User
Default value: 0
Description:
Duration of last movement

Actual duty cycle value
readble from User
Default value: 0
Description:
Duration of energised motor during the last hour.
Value is updated continuously.

max. duty cycle value
User level: Specialist
Default value: 0
Description:
Information about longest duration of energised motor during one hour.

5.3 Dynamic maintenance

Thermal ageing
User level: Specialist
Default value: 0
Description:
Calculates the ageing process of temperature dependent components of the actuator like gaskets. Those ageing processes are depending on the ambient temperature.

> Limit thermal ageing
User level: Maintenance staff
Default value: 87600
Description:
Limit for the thermal ageing. If this value is exceeded, the indications "maintenance essential" and "Gasket change recomm." are generated. If value is set to "0", this check is disabled.

Temperature corr. value
User level: Maintenance staff
Default value: -10
Description:
Defines the difference between measured and ambient temperature. E.g. if set to 10°C, the ambient temperature is 10K less than the measured temperature.

Mechanical ageing
User level: Specialist
Default value: 0
Description:
Calculates the abrasion of components of the internal gear.

Type mech. ageing
User level: Maintenance staff
Default value: No
Description:
This parameter defines the algorithm used for the calculation of the mechanical ageing.
It is required to select the adequate actuator type in order to use the correct calculation algorithm.
Setting of the value to "No" results in a deactivation of the mechanical ageing calculation.

> Limit mechanical ageing
User level: Maintenance staff
Default value: 0
Description:
Limit for mechanical ageing. If this value is exceeded, the indications "maintenance essential" and "gear overhaul recomm." are generated. If value is set to "0", this check is disabled.

> Preset mechanical ageing
User level: Maintenance staff
Default value: No
Description:
This parameter can be used to preset the "> Limit mechanical ageing" to a limit fitting to the present actuator size.

5.4 Faults

Torque tripping
User level: Specialist
Default value: 0
Description:
Number of stops due to a torque exceeding the "Tripping torque ..."

Torque warnings
User level: Specialist
Default value: 0
Description:
Number of warnings due to a torque exceeding the "Torque warning level"

Thermal overload
readble from User
Default value: 0
Description:
Number of times when motor was overheated

Actuator start failures
readble from User
Default value: 0
Description:
This parameter can be used to preset the "> Limit mechanical ageing" to a limit fitting to the present actuator size.

5.5 System data

Up time electronic
readble from User
Default value: 0
Description:
The time the electronic was energised

Number of power on
readble from User
Default value: 0
Description:
The number of system resets

Electronics overtemp.
readble from User
Default value: 0
Description:
Accumulated duration of electronic temperature exceeding maximum allowed value.

6 Actual values/diagnosis

Simulate alarm
User level: Specialist
Default value: 0
Description:
Simulates alarms for test purposes.

6.1 Pending faults

readble from User
Default value:
Description:
This parameter contains a list of faults that are indicated as soon as the occur.

6.2 Error stack

Fault t-0 - 9
readble from User
Default value: None
Description:
Shows the kind of last error and when it occurred

Time t-0 - 9
readble from User
Default value: 0
Description:
Shows the time (Up time electronic) of the fault

6.3 Process data

Operation mode
readble from User
Default value: OFF
Description:
Displays the active mode

Actual position
readble from User
Default value: 0
Description:
Displays the position in the unit specified in parameters>data logging>position unit

Setpoint position
readble from User
Default value: 0
Description:
Displays the setpoint value in the unit specified

Torque
readble from User
Default value: 0
Description:
Displays the current torque

Fail safe
readble from User
Default value: Disabled
Description:
Information about the state of the fail safe function

Emerg. shutdown (ESD)
readble from User
Default value: Enabled
Description:
Information about the state of the emergency shutdown command.

Enabled:
External emergency shutdown is requested.

Disabled:
External emergency shutdown is not requested.

6.4 Power supply

Phase sequence
readble from User
Default value: Failure
Description:
Information about the input power

Phase 1
readble from User
Default value: Failure
Description:
Displays the state of phase L1.
The indication is reset with the next movement or with a fault acknowledgement.

Phase 2
readble from User
Default value: Failure
Description:
Displays the state of phase L2.
The indication is reset with the next movement or with a fault acknowledgement.

Phase 3
readble from User
Default value: Failure
Description:
Displays the state of phase L3.
The indication is reset with the next movement or with a fault acknowledgement.

24V internal
readble from User
Default value: Failure
Description:
Displays the state of the 24 V driven by the main power

24V external
readble from User
Default value: Failure
Description:
Displays the state of the externally powered 24 V

6.5 IO-status

Command Inputs
Default value:
Description:
Information about the command inputs (activated / deaktivated).

Analogue outputs
Default value:
Description:
Information about the analogue outputs (activated / deaktivated).

6.5.1 Outputs

Final position reached
readble from User
Default value: No
Description:
Limit position OPEN or CLOSED reached

Final position OPEN
readble from User
Default value: No
Description:
Limit position OPEN reached

Final position CLOSE
readble from User
Default value: No
Description:
Indicates that the actuator is in the final position CLOSE. According the parameter setting of "Final position indication", the actuator position is higher than the setting of end position CLOSE or the output torque exceeds the "Tripping torque close". Depends on "Switching off mode" setting for the valve too.

Intermediate position 1 - 2
readble from User
Default value: No
Description:
Indicates that the actuator position is in the range between the final position CLOSE and the parameterized "Intermediate position 1".

Actuator running
readble from User
Default value: No
Description:
Indicates that the final power control unit of the actuator is switched on.

Actuator closing
readble from User
Default value: No
Description:
Indicates that the final power control unit of the actuator is switched on in order to run into direction CLOSE.

Actuator opening
readble from User
Default value: No
Description:
Indicates that the final power control unit of the actuator is switched on in order to run into direction OPEN.

Command Inputs
Default value:
Description:
Information about the command inputs (activated / deaktivated).

Analogue outputs
Default value:
Description:
Information about the analogue outputs (activated / deaktivated).

6.6 System

Electronic temperature
readble from User
Default value: 0
Description:
Displays the temperature of electronic

LED Test
User level: User
Default value: Test LEDs
Description:
The three Local Lamps can be checked for functionality by using the buttons "Feld nach oben", "ESC-TASTE", and "Feld nach unten".
With "enter" the test is aborted.

NV-Memory failure
readble from User
Default value: No
Description:
Displays whether the non-volatile memory showed an error during the boot procedure

EM6 setup failure

readble from User
Default value: No

Description:
Information, whether the final positions are correctly set (e.g. closing direction of valve is set to CCW, limit positions are still for direction of closing the valve CW => value is "Yes")

EM6 Error code

readble from User
Default value: 0

Description:
The control unit checks the combined sensor (EM6) during the automatically performed self test.
In case of an error the indication "Combisensor failure" is activated. This parameter describes which kind of error was detected. The EM6 is checked in several steps which generate different error code groups.

Errors during general communication with EM6:

101 - no communication possible with remote EM6
102 - no communication possible with remote EM6
103 - no communication possible with remote EM6
104 - no communication possible with remote EM6
105 - no communication possible with remote EM6
106 - reference voltage is not valid
107 - communication to remote EM6 is lost
108 - reference voltage is no longer valid
109 - critical communication error with EM6

The non-volatile memory of the combined sensor EM6 is checked in regular intervals. Detected errors are coded as follows:

1 - Read error of serial number
2 - Read error of offset of angle
3 - Read error of correction factor for analogue values
4 - Read error of closing direction
5 - Read error of torque value
6 - Read error of LEARN values
7 - Read error of checksum flag

Errors with wall mounted unit:

11 - Read error of serial number
12 - Read error of serial number of board DiM-06
13 - Read error of part number of board DiM-06
14 - Read error of closing direction
15 - Read error of torque value
16 - Read error of LEARN values

HW interface failure

readble from User
Default value: No

Description:
Information, whether the communication to the interface board is OK

System test Error code

readble from User
Default value: 0

Description:
Displays the code of the error which occurred during the self test of the actuator. Depending on the kind of error the system generates a reset and after power up assumes the state failsafe or just activates this indication.
0 - (0x00) - no error detected
1 - (0x01) - error during master routine
2 - (0x02) - watchdog (hardware) was elapsed
3 - (0x03) - watchdog (software) was elapsed
8 - (0x08) - stack overflow
9 - (0x09) - stack underflow
10 - (0x0A) - unrecoverable hardware error - the electronic performs a reset until error is no longer valid!
17 - (0x11) - error during testing the flash memory
18 - (0x12) - error while reading the starting pattern of the flash memory
19 - (0x13) - error while reading the ending pattern of the flash memory
20 - (0x14) - error during checksum test of flash memory

System test history

readble from User
Default value: 00

Description:
Displays the code of the last error which occurred during the self test of the actuator (stored).
Depending on the kind of error the system generates a reset and after power up assumes the state failsafe or just activates this indication.
0 - (0x00) - no error detected
1 - (0x01) - error during master routine
2 - (0x02) - watchdog (hardware) was elapsed
3 - (0x03) - watchdog (software) was elapsed
8 - (0x08) - stack overflow
9 - (0x09) - stack underflow
10 - (0x0A) - unrecoverable hardware error - the electronic performs a reset until error is no longer valid!
17 - (0x11) - error during testing the flash memory
18 - (0x12) - error while reading the starting pattern of the flash memory
19 - (0x13) - error while reading the ending pattern of the flash memory
20 - (0x14) - error during checksum test of flash memory

System test duration

readble from User
Default value: 0

Description:
Displays the last duration for the self-test of the electronic unit in milliseconds

Discrepancy Error code
readble from User
Default value: 0
Description:
Displays the error code describing the fault detected during discrepancy analysis of the power driver. If an error was detected the actuator can't be operated any more.
0 - (0x00) - no error detected
1 - (0x01) - error in circuit+24V POW OFF
2 - (0x02) - error in circuit+24V POW ON
3 - (0x03) - error in circuit+24V ELR_POW_FB OFF
4 - (0x04) - error in circuit+24V POW OFF
5 - (0x05) - error in circuit SAUF
6 - (0x06) - error in circuit SZU
7 - (0x07) - error in circuit +24V POW OFF
8 - (0x08) - error in circuit ELRAUF
9 - (0x09) - error in circuit ELRZU
10 - (0x0A) - Ausgang POW_EN not set, FeedbackPOW_RB active
11 - (0x0B) - Ausgang POW_EN set, Feedback POW_RB inactive
12 - (0x0C) - ELR_ZU and ELR_AUF not set, Feedback ELR_RB active
13 - (0x0D) - ELR_ZU or ELR_AUF set, FeedbackELR_RB inactive

6.7 Interface

Interface type
readble from User
Default value: Relays
Description:
Information about the kind of interface card

Baudrate
readble from User
Description:
The actual transmission speed of the fieldbus interface is given

Binary inputs
readble from User
Description:
Displays the data of the telegram to the fieldbus master in hexadecimal numbers ⇒ refer to complementary operating manual for actuators with fieldbus systems.

Binary outputs
readble from User
Description:
Displays the data of the telegram from the fieldbus master in sedecimal numbers ⇒ refer to complementary operating manual for actuators with fieldbus systems.

6.7.1 Profibus

Bus profile
readble from User
Default value: DPV1
Description:
Defines, which services of the PROFIBUS system are available => setting defined by device key

Param. Error code
readble from User
Default value: 0
Description:
Coded notification of errors conscerning the configuration of the parameters for Profibus.

6.7.2 Modbus

Bus profile
readble from User
Default value: Redundant
Description:
Defines, whether the actuator is equipped with one or two transmission channels => setting defined by device key

6.7.3 Relay interface

Extension relay
readble from User
Default value: 4 latching relays
Description:
Information, which kinds of additional relays are mounted onto the relay board

Interface type
readble from User
Default value: Relays
Description:
Information about the kind of interface card

Baudrate
readble from User
Description:
The actual transmission speed of the fieldbus interface is given

Binary inputs
readble from User
Description:
Displays the data of the telegram to the fieldbus master in hexadecimal numbers ⇒ refer to complementary operating manual for actuators with fieldbus systems.

Binary outputs
readble from User
Description:
Displays the data of the telegram from the fieldbus master in sedecimal numbers ⇒ refer to complementary operating manual for actuators with fieldbus systems.

6.8 Battery Backup

State
readble from User
Default value: -/-
Description:
Display the state of the internal accumulator. The battery backup must be enabled by software to function properly.

Temperature
readble from User
Default value: -/-
Description:
Information about the temperature of the internal accumulator
Charge-/discharge range = 0...45°C of electronic unit
Discharge range = -30°C...60°C of electronic unit
Excess/insuff. Temp. = out of discharge range

6.9 Torque curves

6.9.1 Curve 0 - 3

Curve 0 -> Curve 0 - 3
User level: Maintenance staff
Default value: -/-
Description:
Stores the last recorded torque curve as curve 0.

Show
User level: Maintenance staff
Default value:
Description:
Shows the coresponding torque curve on the display.

Description curve 0 - 3
User level: Maintenance staff
Default value: Default 0
Description:
Describing text for curve x.

T CLOSE_OPEN - 0 - 3
readble from User
Default value:
Description:
Time stamp of curve x for opening.

T OPEN_CLOSE - 0 - 3
readble from User
Default value:
Description:
Time stamp of curve x for closing.

Simulate alarm
User level: Specialist
Default value: 0
Description:
Simulates alarms for test purposes.

7 Parameters

Load factory settings
User level: Maintenance staff
Default value: No
Description:
The factory setting will be loaded

Store factory settings
User level: Specialist
Default value: No
Description:
Stores the settings as factory setting.

7.1 Power supply

Phase correction
User level: Maintenance staff
Default value: Enabled
Description:
Defines the rotating field fo the connected power system. If set to "Detect", the rotating field is checked continuously.

Phase monitoring
User level: Maintenance staff
Default value: Enabled latching
Description:
If activated detects if a phase is missing. In this case the motor is de-energised, and the indication "phase failure" is given.
The indication is reset with the next movement or fault acknowledgement.

Phase monitoring delay
User level: Maintenance staff
Default value: 1
Description:
Defines the delay time of the indications "phase correction error" or "Failure of internal 24V".

7.2 Display unit

Maintain mode LOCAL
User level: Maintenance staff
Default value: Disabled
Description:
If this parameter is enabled and a local command close or open is given,
the actuator runs until a final position is reached or an error occurs.

Orientation
User level: Maintenance staff
Default value: Normal
Description:
Specifies if the display content is shown normal or 180° rotated.

Lock display unit
User level: Maintenance staff
Default value: Ignore signal
Description:
Defines how the command "Enable LOCAL" works:
- "Disable completely" is like having a lock through the enter button - no push button can be operated
- "Disable local operation" only disables the motor operation
- "Ignore signal" disables this command input

PC-interface
User level: Maintenance staff
Default value: Enabled
Description:
This parameter can block the Infrared- or bluetooth-port.

Position output
User level: Maintenance staff
Default value: Over-/underflow
Description:
Defines how the position is displayed:
- With "Over-/underflow" the position is not limited to values between CLOSE and OPEN
(see data logging -> high scale value, low scale value)
- With "Limited" the displayed position is limited to the range between CLOSE and OPEN

Bluetooth PIN
User level: Maintenance staff
Default value: 0
Description:
This parameter defines the PIN of the optional available Bluetooth interface.
The PIN is used for authentication of the actuator during connexion establishment with the master station.

Bluetooth name
User level: Maintenance staff
Default value: Serial number
Description:
Defines the distinct identification of the actuator regarding the Bluetooth interface.

LCD backlight delay
User level: User
Default value: 30
Description:
Sets the time after which the backlight is switched off if no button is pressed

Automatic logout
User level: Maintenance staff
Default value: Disabled
Description:
Defines whether and how an automatic logout is accomplished

Logout delay time
User level: Maintenance staff
Default value: 10
Description:
Sets the time after which an automatic logout is accomplished

7.2.1 Language

Language
User level: User
Default value: German
Description:
Sets the language of the display

Loaded language
User level: User
Default value: German
Description:
Sets the language of the display

7.2.2 LEDs

Running indication
User level: Maintenance staff
Default value: directional flashing
Description:
This parameter sets the indication behavior of the LOCAL LAMPS during energized motor.

Position indication
User level: Maintenance staff
Default value: Final positions
Description:
This parameter sets the indication behavior of the LOCAL LAMPS in the end positions and intermediate positions.

Colour LED OPEN
User level: Maintenance staff
Default value: Green
Description:
Selection of the colour for the LED that indicates the waypoint OPEN. There are 8 choosable colours : blue, green, red, orange, cyan, pink, white.

Colour LED Torque OPEN
User level: Maintenance staff
Default value: Orange
Description:
Selection of the colour for the LED that indicates the torque in direction OPEN. There are 8 choosable colours (see parameter Colour LED OPEN).

Colour LED Fault
User level: Maintenance staff
Default value: Red
Description:
Selection of the colour for the LED that indicates a fault. There are 8 choosable colours (see parameter Colour LED OPEN).

Colour LED Torque CLOSE
User level: Maintenance staff
Default value: Orange
Description:
Selection of the colour for the LED that indicates the torque in direction CLOSE. There are 8 choosable colours (see parameter Colour LED OPEN).

Colour LED CLOSE
User level: Maintenance staff
Default value: Yellow
Description:
Selection of the colour for the LED that indicates the waypoint CLOSE. There are 8 choosable colours : blue, green, red, orange, cyan, pink, white.

Maintain mode LOCAL
User level: Maintenance staff
Default value: Disabled
Description:
If this parameter is enabled and a local command close or open is given,
the actuator runs until a final position is reached or an error occurs.

Orientation
User level: Maintenance staff
Default value: Normal
Description:
Specifies if the display content is shown normal or 180° rotated.

Lock display unit
User level: Maintenance staff
Default value: Ignore signal
Description:
Defines how the command "Enable LOCAL" works:
- "Disable completely" is like having a lock through the enter button - no push button can be operated
- "Disable local operation" only disables the motor operation
- "Ignore signal" disables this command input

PC-interface
User level: Maintenance staff
Default value: Enabled
Description:
This parameter can block the Infrared- or bluetooth-port.

Position output
User level: Maintenance staff
Default value: Over-/underflow
Description:
Defines how the position is displayed:
- With "Over-/underflow" the position is not limited to values between CLOSE and OPEN
(see data logging -> high scale value, low scale value)
- With "Limited" the displayed position is limited to the range between CLOSE and OPEN

Bluetooth PIN
User level: Maintenance staff
Default value: 0
Description:
This parameter defines the PIN of the optional available Bluetooth interface.
The PIN is used for authentication of the actuator during connexion establishment with the master station.

Bluetooth name
User level: Maintenance staff
Default value: Serial number
Description:
Defines the distinct identification of the actuator regarding the Bluetooth interface.

LCD backlight delay
User level: User
Default value: 30
Description:
Sets the time after which the backlight is switched off if no button is pressed

Automatic logout
User level: Maintenance staff
Default value: Disabled
Description:
Defines whether and how an automatic logout is accomplished

Logout delay time
User level: Maintenance staff
Default value: 10
Description:
Sets the time after which an automatic logout is accomplished

7.3 Data logging

Torque unit
User level: Maintenance staff
Default value: Nm
Description:
Sets the unit for the torque

Torque unit old
Default value: Nm
Description:
Compares the old unit with the new one. If a change is detected a conversion into the new unit will be triggered.

Torque sign
User level: Maintenance staff
Default value: Absolute value
Description:
Defines if the torque shoul be shown as 0..100% or as -100...+100%

Output Torque
User level: Maintenance staff
Default value: Actual value
Description:
Defines the output of the torque value. With "Actual value" the current torque is output.
When using slow fieldbus or DCS systems, peaks of the torque might not be detected. "Max. value" outputs the maximum torque of the last movement. A new movement resets the value of the torque.
"Max. value wo. fin. Pos." (Maximum value without final positions) is identical to "Max. value",
except that the value of the torque is not output within the range of the final positions.
With "Trend value" the maximum value of the torque is output for 1 second, and automatically cleared afterwards.
We recommend this function for slow DCS systems.

High scale value
User level: Maintenance staff
Default value: 100
Description:
Defines which value corresponds to the final position OPEN

Low scale value
User level: Maintenance staff
Default value: 0
Description:
Defines which value corresponds to the final position CLOSE

Position unit
User level: Maintenance staff
Default value: %
Description:
Sets the dimension of the position unit for the display output. If the dimension has changed, depending parameters must be adjusted manually (e.g. scale values).

Decimal Position
User level: Maintenance staff
Default value: 1
Description:
Sets the number of digits displayed after the comma in the main screen

7.4 Valve

Closing direction
User level: Maintenance staff
Default value: Clockwise CW
Description:
Turning direction of the actuator, if the valve is closing, seen from the motor side of the actuator

Switching off mode
User level: Maintenance staff
Default value: Final position limit sw.
Description:
Sets the switch-off conditions of the valve

Max. runtime torque cut off
User level: Maintenance staff
Default value: 0
Description:
Within this time a waypoint must be followed by a torque signal. Otherwise a mechanical fault is assumed and the actuator stops giving an error indication.

Tripping torque CLOSE
User level: Maintenance staff
Description:
The actuator switches off if the torque exceeds this value when closing

Tripping torque OPEN
User level: Maintenance staff
Description:
The actuator switches off if the torque exceeds this value when opening

Torque warning CLOSE
User level: Maintenance staff
Description:
The warning indication is activated if the torque exceeds this value when closing

Torque warning OPEN
User level: Maintenance staff
Description:
The warning indication is activated if the torque exceeds this value when opening

Delay torque monitoring
User level: Maintenance staff
Default value: 0
Description:
Sets the duration the actuator ignores torque trippings to filter out peaks in torque measurement.

Limit to max. Torque
User level: Maintenance staff
Default value: Enabled
Description:
If enabled the actuator monitors for the maximum adjustable torque during monitoring delay. If disabled the actuator operates at stall torque.

Torque bypass final pos.
User level: Maintenance staff
Default value: Disabled
Description:
Disables the torque detection during the time "Delay final positions" when trying to leave a final position.
If the torque still exceeds the "tripping torque" if the actuator leaves the end position or if the delay time is exceeded,
a torque indication is generated and the actuator switches off.

Delay time final pos.
User level: Maintenance staff
Default value: 3000
Description:
Sets the duration the actuator can move with the breakdown
torque of the motor - without a torque indication - to leave a final position

Torque byp. interm. pos.
User level: Maintenance staff
Default value: Disabled
Description:
Enables the breakdown torque of the motor when trying to leave an intermediate position. The bypass is not enabled if the actuator switched off due to a high torque.

Delay time interm. pos.
User level: Maintenance staff
Default value: 400
Description:
Sets the duration of the disabled torque detection if leaving an intermediate position

Intermediate position 1 - 2
User level: Maintenance staff
Default value: 25
Description:
Sets the value for the intermediate position 1 in the current unit

Tolerance pos. CLOSE

User level: Maintenance staff
Default value: 0.5

Description:
Sets the range for the positioner to interpret a setpoint value as final position CLOSE. The actuator will move automatically until it reaches the final position if the setpoint value has a value between position CLOSE and this value. The final position is left if the setpoint value is higher than the final position plus the value of the parameter Xp.

Attention: for DPiM 30,59 and 119 the default value is set to 2%

Tolerance pos. OPEN

User level: Maintenance staff
Default value: 0.5

Description:
Sets the range for the positioner to interpret a setpoint value as final position OPEN. The actuator will move automatically until it reaches the final position if the setpoint value has a value between position OPEN and this value. The final position is left if the setpoint value is higher than the final position minus the value of the parameter Xp.

Attention: for DPiM 30,59 and 119 the default value is set to 2%

Op-time survey CLOSE

User level: Maintenance staff
Default value: 0

Description:
Sets the time which may not be exceeded when moving from OPEN to final position CLOSE at once. If the current running time is longer than this value, the indication "op-time survey" is activated. If this value is "0", the survey is disabled.

Op-time survey OPEN

User level: Maintenance staff
Default value: 0

Description:
Sets the time which may not be exceeded when moving from CLOSE to final position OPEN at once.
If the current running time is longer than this value, the indication "op-time survey" is activated.
If this value is "0", the survey is disabled.

Delay startup CLOSE

User level: Maintenance staff
Default value: 0

Description:
Sets a time delay for the activation of the command CLOSE for remote control,
i.e. the command has to be activated longer than this value before the motor will be operated.

Delay startup OPEN

User level: Maintenance staff
Default value: 0

Description:
Sets a time delay for the activation of the command OPEN for remote control,
i.e. the command has to be activated longer than this value before the motor will be operated.

7.5 Actuator

Thermal failure reset
User level: Maintenance staff
Default value: Automatic
Description:
A tripped motor protection requires the cooling down of the motor into a valid operating temperature range.
A reset of the failure indication and thus a new motor run is possible by
- automatic failure reset -> parameterisation to “Automatic”
- an explizit required manual confirmation -> parameterisation to „Manuell“
A failure confirmation can be done at the local control station as well as from a remote command or parameterisation in operation mode REMOTE.
In case of EX-proofed actuators, the parameterisation to “Automatic” is only allowed if the duty type is strictly observed.

Thermal failure delay
User level: Maintenance staff
Default value: 1
Description:
Sets the time delay between detection of a motor overtemperature, and the indication and switch-off.
The temperature sensor is only powered by the main power of the actuator.
If the main power fails, the temperature detection is not powered, and therefore the motor
temperature is detected as too high. The motor overtemperature indication will be activated.
To suppress this indication due to short power failures, the delay time can be set.

Actuator run monitor.
User level: Maintenance staff
Default value: Enabled
Description:
If enabled checks whether the position changes if the motor is energised.
This indication is reset with a new command or with a fault acknowledgement.

Delay run monit.
User level: Maintenance staff
Default value: 1000
Description:
Sets the time of the parameter "Drive start up monitoring".
If the position has not changed significantly before the time elapses,
the indication "Drive start up monit." is activated.

Reversing delay
User level: Specialist
Default value: 400
Description:
Defines the dead time between reversal of rotation direction

Power unit
User level: Specialist
Default value: Standard
Description:
Sets the type of the used power control unit.
Choose the option Standard for standard contactor unit or standard solid state relay.
Alternatively the option ATEX can be chosen for all pole disconnecting solid state relay.

7.6 DCS / PLC system

7.6.1 Emerg. shutdown (ESD)

Emerg. shutdown (ESD)
User level: Maintenance staff
Default value: 0% CLOSE
Description:
Sets the action of this function. If enabled the actuator moves to the specified final position.
The following indications can be activated to stop the movement or to be ignored.

Motor overtemperature
User level: Maintenance staff
Default value: Respect
Description:
If ignored the actuator moves to the specified final position even if the motor becomes too hot.
For explosion proofed actuators the setting has to be specified as "Respect".

Attention: The parameterization "Ignore" may result in damage and personal injury.

Torque indication
User level: Maintenance staff
Default value: Respect
Description:
This Parameter specifies the torque monitoring behaviour during an externally received emergency shutdown command.

Respect: Torque monitoring is operating normal. In case of a torque tripping in intermediate positions the actuator will stop with a fault indication.

Ignore: Torque monitoring is disabled during external emergency shutdown request. The actuator will drive into the specified direction without monitoring the torque.
This will result in an actuator movement with stall torque. If a torque final position cut off is specified in the respective direction the actuator will not stop in final position.
In this case the value "Respect in final positions" should be specified.

Respect in final positions: Torque monitoring in intermediate positions is disabled during emergency shutdown.
The torque monitoring will be activated if the parameterized final position is reached .

LOCAL mode
User level: Maintenance staff
Default value: Respect
Description:
If ignored the actuator moves even if the mode is Local.

Attention: The parameterization "Ignore" may result in damage and personal injury.

OFF mode
User level: Maintenance staff
Default value: Respect
Description:
If ignored the actuator moves even if the mode is OFF.

Attention: The parameterization "Ignore" may result in damage and personal injury.

7.6.2 Fail safe

Reaction
User level: Maintenance staff
Default value: Disabled
Description:
Sets the action of the actuator if the set-point value does not lie in the range 3.0...22 mA,
or the fieldbus communication fails for a longer duration than specified with the parameter
"Breakdown delay".

Position modulating act.
User level: Maintenance staff
Default value: 0
Description:
Sets the fail safe position for an actuator with integrated positioner

Position on-off actuator
User level: Maintenance staff
Default value: 0% CLOSE
Description:
Sets the fail safe position for an on-off or inching actuator

Breakdown delay
User level: Maintenance staff
Default value: 1
Description:
Sets the time of the delay between failure and activation of the fail safe action.

7.6.3 Collective failure 1 - 2

Failure of internal 24V
User level: Maintenance staff
Default value: Enabled
Description:
Indicates whether the internal power of 24 V DC - generated
from mains power L1, L2 - is OK or failed. Enabling this
indication makes only sense if the actuator is additionally
powered by 24 V DC (either by external source or by battery
backup). Otherwise - in case of a failure of the main power
and thus a failure of the internal power, too - the electronic
unit is deenergised, and therefore without function.

Failure of external 24V
User level: Maintenance staff
Default value: Disabled
Description:
Indicates whether the external power of 24 V DC is OK or failed.

Phase failure
User level: Maintenance staff
Default value: Enabled
Description:
Indicates whether a phase of the main power is missing. The
indication is reset with the next movement or with a fault
acknowledgement. If one of the two phases L1 and L2, which
supply the electronic fail, the electronic will be without
function. Only if the electronic is powered with additional 24 V
DC, the failure of those two phases can be indicated.

Actuator not starting
User level: Maintenance staff
Default value: Enabled
Description:
If the time "Delay run monit." elapses while the motor is energised,
and the position did not change significantly during this period,
this indication is activated. This indication can be reset by a new
movement or with a fault acknowledgement.

Torque failure
User level: Maintenance staff
Default value: Enabled
Description:
Indication is activated if the torque exceeds one of the values for the tripping torque

Torque CLOSE
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that the closing torque exceeded the "tripping torque" when closing the valve.
The indication can be reset by moving the actuator into the other direction or with a fault
acknowledgement.

Torque OPEN
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that the opening torque exceeded the "tripping torque" when opening the valve.
The indication can be reset by moving the actuator into the other direction.

Torque warning
User level: Maintenance staff
Default value: Disabled
Description:
Is activated if the torque exceeds one of the values for the torque warning

Torque warning CLOSE
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that the closing torque exceeds the warning value when closing the valve.
The indication can be reset by moving the actuator into the other direction.

Torque warning OPEN
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that the opening torque exceeds the warning value when opening the valve.
The indication can be reset by moving the actuator into the other direction.

Motor overtemperature
User level: Maintenance staff
Default value: Enabled
Description:
Indication is activated if the motor temperature exceeds the permissible value.

Discrepancy power unit
User level: Maintenance staff
Default value: Disabled
Description:
Indicates an error with the internal discrepancy analysis of the power module.

OFF mode
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that the actuator cannot move

LOCAL mode
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that the actuator can be controlled by using the display unit.

Emerg. shutdown tripped
User level: Maintenance staff
Default value: Disabled
Description:
Is activate as long as the actuator executes an emergency shutdown

Fail safe
User level: Maintenance staff
Default value: Enabled
Description:
Is active as long as the actuator is in the mode fail safe.

Hardware failure
User level: Maintenance staff
Default value: Enabled
Description:
Indicates that during self test the electronic detected defective hardware components

Systemtest fault
User level: Maintenance staff
Default value: Disabled
Description:
Indicates that during self test the electronic detected a system test fault

Combisensor failure
User level: Maintenance staff
Default value: Enabled
Description:
Indicates that the electronic detected a malfunction of the
combined sensor during self test. This indication lasts as long
as the error. While this error is active, the actuator cannot be
moved! The control unit tries to re-initialise the combined
sensor to clear the error.

Int. positioner disabled
User level: Maintenance staff
Default value: Disabled
Description:
Indicates if the positioner of an actuator of type DiMxx5 is not
enabled (command AUTOMATIC not active).

Maintenance required
User level: Maintenance staff
Default value: Disabled
Description:
Indicates if a limit of the operation data is exceeded.

Mode not REMOTE
User level: Maintenance staff
Default value: Disabled
Description:
Is active if the actuator is not in mode REMOTE

Configuration invalid
User level: Maintenance staff
Default value: Disabled
Description:
Indicates, that at least one of the tripping torques exceeds the
maximum permissible torque values of either the additional component or the valve.

Electronic overtemp.
User level: Maintenance staff
Default value: Disabled
Description:
Indicates, that the electronic temperature is exceeding the permissible value

Direction monitoring
User level: Maintenance staff
Default value: Enabled
Description:
Indicates, that the actuator is turning the wrong way.
This indication can be reset by a new movement or with a fault acknowledgement.

Handwheel operation
User level: Maintenance staff
Default value: Disabled
Description:
Indicates, that the position of the actuator is changing without giving a command to the motor.
The indication is active as long as the position changes.

Op-time survey
User level: Maintenance staff
Default value: Disabled
Description:
Indicates, if the current running time exceeds one of the two values
of "Op-time survey CLOSE" or "Op-time survey OPEN"

Battery backup malf.
User level: Maintenance staff
Default value: Disabled
Description:
Indicates an error with the internal accumulator. If this indication is active,
the control unit cannot be supplied by the battery backup in case of mains power loss.

7.6.4 Control

Control mode
User level: Maintenance staff
Default value: Inching operation
Description:
Sets the function of the REMOTE command inputs. In "Inching
operation" the command is active as long as the signal is
active. In "Maintain mode" the command is activated with an
edge triggered command and deactivated in case of final position switch off, a command in reverse direction or stop command, or actuator switch off due to failure.

Maintain in final pos.
User level: Maintenance staff
Default value: Enabled
Description:
Defines whether the actuator shall move automatically into
the final position even after removing the command, if in the
end position.
Enable only if the valve has at least one final position
with switch-off by torque!

7.6.5 Indications

Final position indication
User level: Maintenance staff
Default value: Position
Description:
Sets the indication of the final positions. If set to "Position" the indication is activated if the limit positions are reached.
If set to "Act. cut off mode" the indication is only activated if the actuator reaches the final positions.

Torque indication
User level: Maintenance staff
Default value: Ind. in final positions
Description:
Sets whether a torque exceeding the tripping torque shall or
shall not be indicated if the actuator is in an end positon.

Torque fault
User level: Maintenance staff
Default value: No ind. in final positions
Description:
Sets whether a torque exceeding the tripping torque shall or shall not be indicated as fault if the actuator is in an end position.

7.6.6 Interface

Position output
User level: Maintenance staff
Default value: Over-/underflow
Description:
Defines how the position is output:
- With "Over-/underflow" the position is not limited to values
between CLOSE and OPEN (see data logging -> high scale
value, low scale value)
- With "Limited" the displayed position is limited to the range
between CLOSE and OPEN

7.6.6.1 Profibus

7.6.6.2 Modbus

Primary slave address
User level: Maintenance staff
Default value: 247
Description:
Sets the primary address for the Modbus system in the range between 1 and 247.

Attention: Changes will only take effect after actuator restart.

Sec. slave address
User level: Maintenance staff
Default value: 247
Description:
Sets the secondary address of the Modbus system in the range between 1 and 247.

Attention: Changes will only take effect after actuator restart.

Baudrate
User level: Maintenance staff
Default value: 38400
Description:
Defines the transmission speed.

Attention: Changes will only take effect after actuator restart.

Parity
User level: Maintenance staff
Default value: None
Description:
Defines the parity.

Attention: Changes will only take effect after actuator restart.

Timeout
User level: Maintenance staff
Default value: 50
Description:
Sets the timeout in units of 100ms.

Redundancy reply
User level: Maintenance staff
Default value: Both channels
Description:
Defines, whether a telegram to the master is send on both channels,
or only on the channel where the telegram from the master has been received.

Attention: Changes will only take effect after actuator restart.

7.6.6.3 DeviceNet

Primary slave address
User level: Maintenance staff
Default value: 1
Description:
Sets the primary address of the DeviceNet system in the range between 0 and 63.

Sec. slave address
User level: Maintenance staff
Default value: 1
Description:
Sets the secondary address of the DeviceNet system in the range between 0 and 63.

Baudrate
User level: Maintenance staff
Default value: 125k
Description:
Defines the transmission speed.

7.6.6.4 Process inputs-Bus

Process input 1 - 4
User level: Maintenance staff
Default value: Disabled
Description:
Defines, whether this input is used as an input for an external
component, or as an additional command input. If disabled,
the signals of the external component are transmitted via the
fieldbus system to the master station. As an additional
command input, the possible functions can be assigned.

Logic Process input 1 - 4
User level: Maintenance staff
Default value: high-active
Description:
Sets whether the process input, if configured as command input,
is high- (active with 24 V) or low-active (active with 0 V).

7.6.6.5 Relay interface

Fail safe reaction
User level: Maintenance staff
Default value: Ignore Automatic
Description:
Defines whether for actuators with internal positioner the fail
safe action is only performed if the automatic command is
active or in every case.

7.6.6.5.1 Outputs

Output O1 - 12
User level: Maintenance staff
Default value: Final position CLOSE
Description:
Defines the functions of the outputs.
The functions can be allocated to the outputs in any way.

Logic Output O1 - 12
User level: Maintenance staff
Default value: NO contact
Description:
The physical implementation of the indication outputs are normally open contacts (NO).
If configured to normally closed contacts (NC), the relays are powered if the indication
is not active, and deenergised if the indication is active.
If power fails, these relays are released, and output thus an active signal.

7.6.6.5.2 Analogue outputs

Analogue output 1 - 2
User level: Maintenance staff
Default value: Position
Description:
Defines which kind of information should be output as a 4...20
mA signal using analogue output 1.
The calibration of the analogue signals - only possible for position output -
can be done using the parameters of the Learn mode.
The possible parameters are situated in the submenu "Analogue
signal>output", and include "Value 100%" and "Value 0%".
Those parameters have the same effect on output 1 and 2.
The range for the analogue signals is:
-Position: CLOSE...OPEN
-torque: Depending on the configuration of the parameter
"Data logging>Torque sign" either -100%...+100%, or 0...100%
Electronic temperature: -25°C...+100°C

7.6.6.5.3 Command inputs

Delay
User level: Maintenance staff
Default value: 0
Description:
Specifies the minimum impulse time for the digital command inputs.
A command must be at least valid for the duration of the parameterized delay in order to take effect.

Command input 1 - 6
User level: Maintenance staff
Default value: Stop
Description:
Defines the functions of the command inputs.
The functions can be allocated to the command inputs in any way.

Logic Command inp.1 - 6
User level: Maintenance staff
Default value: high-active
Description:
Defines if the command is active with 24 V DC (high-active) or with 0 V (low-active).

Fail safe reaction
User level: Maintenance staff
Default value: Ignore Automatic
Description:
Defines whether for actuators with internal positioner the fail
safe action is only performed if the automatic command is
active or in every case.

Position output
User level: Maintenance staff
Default value: Over-/underflow
Description:
Defines how the position is output:
- With "Over-/underflow" the position is not limited to values
between CLOSE and OPEN (see data logging -> high scale
value, low scale value)
- With "Limited" the displayed position is limited to the range
between CLOSE and OPEN

7.7 Process

Accuracy Xp
User level: Maintenance staff
Default value: 2.5
Description:
Sets the dead band around the setpoint value of the positioner.
The dead band is distributed around the setpoint value by
the value of Xp to the positive and to the negative direction.

Enhanced controller
User level: Maintenance staff
Default value: Disabled
Description:
Settings for the enhanced controller (like the inner and outer deadband).

Adaptive behaviour
Default value: Disabled
Description:
Controlling parameters are calulated automaticly with regard to the overun of the actuator.

Deadband OPEN
User level: Maintenance staff
Default value: 0.5
Description:
modulating tolerance in direction OPEN

Deadband CLOSE
User level: Maintenance staff
Default value: 0.5
Description:
modulating tolerance in direction CLOSE

Outer deadband
User level: Maintenance staff
Default value: 0.5
Description:
Delay time before the actuator reacts to another deviation from the setpoint, if the actuator had stopped already.

Dead time
User level: Maintenance staff
Default value: 0
Description:
Delay time of a reaction to a deviation from the set point value.

Step. mode pulse source
User level: Maintenance staff
Default value: Internal
Description:
Sets the source which controls whether the stepping mode is active.
If set to "Internal", the stepping mode is active from position CLOSE
to "Start pulse internal". If set to "External", the stepping mode is
active as long as the command is active and the actuator turns
into a direction the stepping mode has been enabled.

Stepping mode select
User level: Maintenance staff
Default value: linear
Description:
Sets the cyclic pulse time Ton to a fixed value (Linear),
or reduces the time Ton from the specified value to the minimum
value of 0.5 seconds during movement (Decreasing).
With decreasing stepping mode, the minimum Ton is reached in
final position CLOSE - regardless of the direction.

Start pulse internal
User level: Maintenance staff
Default value: 25
Description:
Defines the second limit of the stepping mode.
The first limit is always position CLOSE.

Stepping mode opening
User level: Maintenance staff
Default value: Disabled
Description:
Enables the stepping mode if opening the valve.

Stepping mode closing
User level: Maintenance staff
Default value: Disabled
Description:
Enables the stepping mode if closing the valve.

Stepping mode T on
User level: Maintenance staff
Default value: 500
Description:
Sets the duration the motor is energised during cyclic operation.

Stepping mode T off
User level: Maintenance staff
Default value: 700
Description:
Sets the duration the motor is deenergised during cyclic operation.

Load factory settings
User level: Maintenance staff
Default value: No
Description:
The factory setting will be loaded

Store factory settings
User level: Specialist
Default value: No
Description:
Stores the settings as factory setting.

8 Failures

[1] - Torque OPEN

Tripping torque OPEN has been exceeded.

Solution:
Is reset by movement into other direction or by acknowledgement.

[2] - Torque CLOSE

Tripping torque OPEN has been exceeded.

Solution:
Is reset by movement into other direction or by acknowledgement.

[3] - Actuator start monitor.

Valve position has not changed in spite of powered motor.

Solution:
Check mechnical parts and components of power circuit.

[4] - Direction monitoring

Actuator is running into wrong direction.

Solution:
Check setting of "phase sequence".

[5] - Thermal overload

Thermal overload.

.

Solution:
Cool down motor.

[6] - Electronic overtemp.

Electronic unit too hot.

Solution:
Cool down electronic unit.

[7] - dummy

Future use

[8] - Fail safe

Actuator is in state fail-safe.

Solution:
Is reset when state fail-safe is left.

[9] - Hardware failure

Electronic unit has detected a hardware error during selfcheck.

Solution:
Replace broken parts.

[10] - Encoder failure

Electronic unit has detected an error of the combined sensor during self-check.

Solution:
Is reset if error has been cleared. If error is still present exchange sensor.

[11] - Encoder setup failure

Limit positions are not set correctly.

Solution:
Erasing and new setting of limit positions.

[12] - Torq. inp. gear exceed.

Additional information to indication "Configuration invalid".

Solution:
Set tripping torque values smaller than the permissible input torque of the gear.

[13] - Valve torque OPEN

Additional information to indication "Configuration invalid".

Solution:
Set tripping torque values in open direction smaller than the permissible input torque of the gear.

[14] - Valve torque CLOSE

Additional information to indication "Configuration invalid".

Solution:
Set tripping torque values in close direction smaller than the permissible input torque of the gear.

[15] - Systemtest fault

Electronic unit has detected an error during self-check.

Solution:
Depending on detected error.

[16] - 24V internal failure

Failure of the internal 24V DC powered by the mains voltage system.

Solution:
Is automaticly reset if voltage returns.

[17] - 24V external failure

Failure of the additional, external 24V DC.

Solution:
Is automaticly reset if voltage returns.

[18] - Phase 1 failure

Failure of phase 1.

Solution:
Is reset with a new movement or with a fault acknowledgement.

[19] - Phase 2 failure

Failure of phase 2.

Solution:
Is reset with a new movement or with a fault acknowledgement.

[20] - Phase 3 failure

Failure of phase 3.

Solution:
Is reset with a new movement or with a fault acknowledgement.

[21] - Phase correction failure

Indicates that the automatic phase detection is not working properly.

Solution:
Set "Phase correcttion" manually.

[22] - Battery backup malf.

Battery backup is not able to power the electronic unit.

Solution:
Load if Accumulator emtpy, else exchange it if battery backup is defective.

[23] - dummy

Future use

[24] - Emerg. shutdown (ESD)

Actuator is in state emergency shutdown.

Solution:
Is reset when emergency shutdown is left.

[25] - Discrepancy error

Discrepancy between the active command and the state of the power unit.

Solution:
Acknowledgement of the according indication after fixed error.

[26] - Wrong power unit

Configured power unit does not match with the existing one (for example after a modification).

Solution:
If the configuration is wrong it has to be correctet otherwise if the power unit is wrong it has to be replaced by the correct one.

[27] - dummy

The emergency stop command is aktive.

Solution:
The command can be deaktivated after clearing the emergency situation.

[28] - OFF mode

Actuator in mode OFF.

Solution:
Change mode of opperation.

[29] - LOCAL mode

Actuator in mode LOCAL.

Solution:
Change mode of opperation.

[30] - Mode not REMOTE

Actuator not in mode REMOTE.

Solution:
Change mode of opperation to REMOTE

[31] - dummy

Future use

[32] - dummy

Future use

[33] - Configuration invalid

Tripping torque values exceed permissible values of additional components. An other possibilty is a discrepancy between configured Profibus-profile and permitted Profibus-profile by device key.

Solution:
Adjust the tripping torque or the Profibus-profile according to the given limits.

[34] - NV-Memory failure

Electronic unit has detected an error of the non-volatile memory during self-check.

Solution:
Exchange electronic unit.

[35] - HW interface failure

Electronic unit has detected an error of the interface board during self-check.

Solution:
Exchange interface board.

[36] - Device key invalid

The device key is not valid.

Solution:
Contact manufacturer for valid device key and enter it.

[37] - dummy

Future use

[38] - dummy

Future use

[39] - dummy

Future use

[40] - Limit valve strokes

The set number of motor operations has been exceeded.

Solution:
Clear current value or increase limit.

[41] - Accum. operation cycles

The permitted number of operations for the valve is exeeded.

Solution:
Will be acknowledged when the actual value of operations for the valve gets lower than the limit.

[42] - Current op. cycles/h

The set number of operation cycles per hour has been exceeded.

Solution:
Clear current value or increase limit.

[43] - Op-time survey OPEN

The current motor operation time has exceeded the limit of direction OPEN.

Solution:
Is reset if value is smaller than limit.

[44] - Op-time survey CLOSE

The current motor operation time has exceeded the limit of direction CLOSE.

Solution:
Is reset if value is smaller than limit.

[45] - Gasket change recomm.

The value for thermal age exceeds the given limit.

Solution:
Change all gaskets of the actuator to ensure its protection class and reset value "Thermal ageing" in "data oper. acquisition" afterwards.

[46] - Gear overhaul recomm.

The value for mechanical age exceeds the given limit.

Solution:
Check internal gear of the actuator and exchange exhausted parts. Reset value "Mechanical ageing" in "data oper. acuisition" afterwards

[47] - dummy

Future use

[48] - Torque warning OPEN

The current torque value has exceeded the value "Torque warning OPEN".

Solution:
Is reset by movement into other direction.

[49] - Torque warning CLOSE

The current torque value has exceeded the value "Torque warning CLOSE".

Solution:
Is reset by movement into other direction.

[50] - Handwheel operation

The position of the valve changes although the motor is not powered.

Solution:
Is cleared automatically if position does not change.

[51] - Maintenance required

A limit of the operation data has been exceeded.

Solution:
Clear current value or increase limit.

[52] - Int. positioner disabled

An actuator with internal positioner has the command "AUTOMATIC" disabled.

Solution:
Is cleared if command "AUTOMATIC" is given.

[53] - dummy

Future use

[54] - dummy

Future use

[55] - dummy

Future use

9 Collective failures

This chapter contains a description of the differences between the two collective failures.

9.1 Activation of the indications

The actual firmware allows the configuration of COLLECTIVE FAILURE 1 and COLLECTIVE FAILURE 2. Both of them contain a list of indications that can be activated. Each parameter set to **activated** triggers the collective failure under which he is activated:Is **AKTIVIERT** parametriert worden ist:

- Failure of internal 24V
- Failure of external 24V
- Phase failure
- Actuator not starting
- Torque failure
- Torque CLOSE
- Torque OPEN
- Torque warning
- Torque warning CLOSE
- Torque warning OPEN
- Motor overtemperature
- Discrepancy power unit
- OFF mode
- LOCAL mode
- Emerg. shutdown tripped
- Fail safe
- Hardware failure
- Systemtest fault
- Combisensor failure
- Int. positioner disabled
- Maintenance required
- Mode not REMOTE
- Configuration invalid
- Electronic overtemp.
- Direction monitoring
- Handwheel operation
- Op-time survey
- Battery backup malf.

If there is an indication active that is set under COLLECTIVE FAILURE 1 the LED indicating a failure will be on and there appears a bell on the display(refer to figure 9.1).

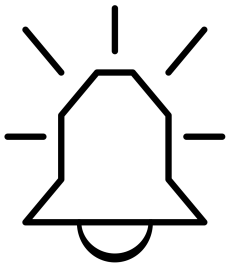

Figure 9.1: Bell

Every other indication out of the list above or the list of failures will cause a triangular warning sign to appear on the display (refer to figure 9.2).

Figure 9.2: Triangular warning sign

10 Digital In- and outputs

This chapter contains information about the possibilities of configuration for the process- and command inputs and the Outputs

10.1 Configuration of the outputs

The actual firmware allows a free configuration of the outputs. Therefor one of the following indications has to be selected for the according output.
The selectable indications are:

- Final position
- Final position CLOSE
- Final position OPEN
- Pos. b. CLOSE and Int.1
- Pos. b. Int.2 and OPEN
- Act. running-permanent
- Act. running-flashing
- Act. closing-permanent
- Act. closing-flashing
- Act. opening-permanent
- Act. opening-flashing
- Actuator not starting
- Torque tripping
- Torque tripping CLOSE
- Torque tripping OPEN
- Torque warning
- Torque warning CLOSE
- Torque warning OPEN
- Collective failure 1
- Collective failure 2
- Motor overtemperature
- Remote control
- OFF
- Local control
- Emerg. shutdown tripped
- Fail safe
- Hardware failure
- Combisensor failure
- Int. positioner disabled
- Maintenance required
- Mode not REMOTE
- Handwheel operation
- Systemtest fault

After an indication has been assigned to an output the type of the output (**NC contact** oder **NO contact**) has to be selected. Contacts that are parametrized to behave like NC contacts have to switched to this behavior by the software, because the hardware has always NO contacts. That is the reason why the control unit must be energized for the NC contacts to work properly.

10.2 Configuration of the process- and command inputs

The actual firmware allows a free configuration of the inputs. Therefor one of the following indications has to be selected for the according input. The amount of inputs may vary depending on the hardware configuration of the actuator.
The selectable commands are

- Stop
- CLOSE
- OPEN
- Automatic
- Emerg. shutdown (ESD)
- Stepping mode active
- Enable LOCAL
- Enable REMOTE
- Enable CLOSE
- Enable OPEN
- Fault acknowledge
- Force LOCAL
- Force LOCAL STOP
- Force LOCAL CLOSE
- Force LOCAL OPEN

After a command has been assigned to an input the type of the input (**HIGH-ACTIVE** or **LOW-ACTIVE**) has to be selected.

11 Anotations for explosion proof actuators

In this chapter the dependencies between some of the parameters and the protection against explosion will be described. The according parameters and their correct configuration will be shown.

11.1 The affected parameters

- Thermal failure reset
- Thermal overload
- Power unit

DANGER
If these parameters are changed the actuator may not be explosion proof anymore.

- The Information in this chapter has to be regarded.

11.2 Keeping the actuator explosion proof

11.2.1 Thermal failure reset.

This parameter regulates the behavior of the actuator after the motor got overheated. It must be set to **MANUELL** to prevent to motor from running automatically after cooling down. This is the default setting after production and if not set correctly the actuator will not longer be explosion proof. The error that is indicated when the motor gets too hot must be reset manually before the actuator can be operated again.

11.2.2 Thermal overload

Monitoring the over temperature of the motor must be set to **RESPECT** in the parameter **emergency shut down (ESD)**. Otherwise the motor will get too hot and the actuator is not longer explosion proof.

11.2.3 The power unit

This parameter adjusts the power unit to the control unit. If the actuator is not equipped with an Ex solid state relay (SSR) (solid state relay that disconnects all pins) the parameter must be set to **contactors or SSR**. Use of normal SSR (one pin is permanently conducted) is only allowed in combination with a circuit breaker that disconnects all pins (as described in the actuators operation manual). For use with an Ex SSR the parameter has to be set to **Ex solid state relay** to keep the actuator explosion proof.

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