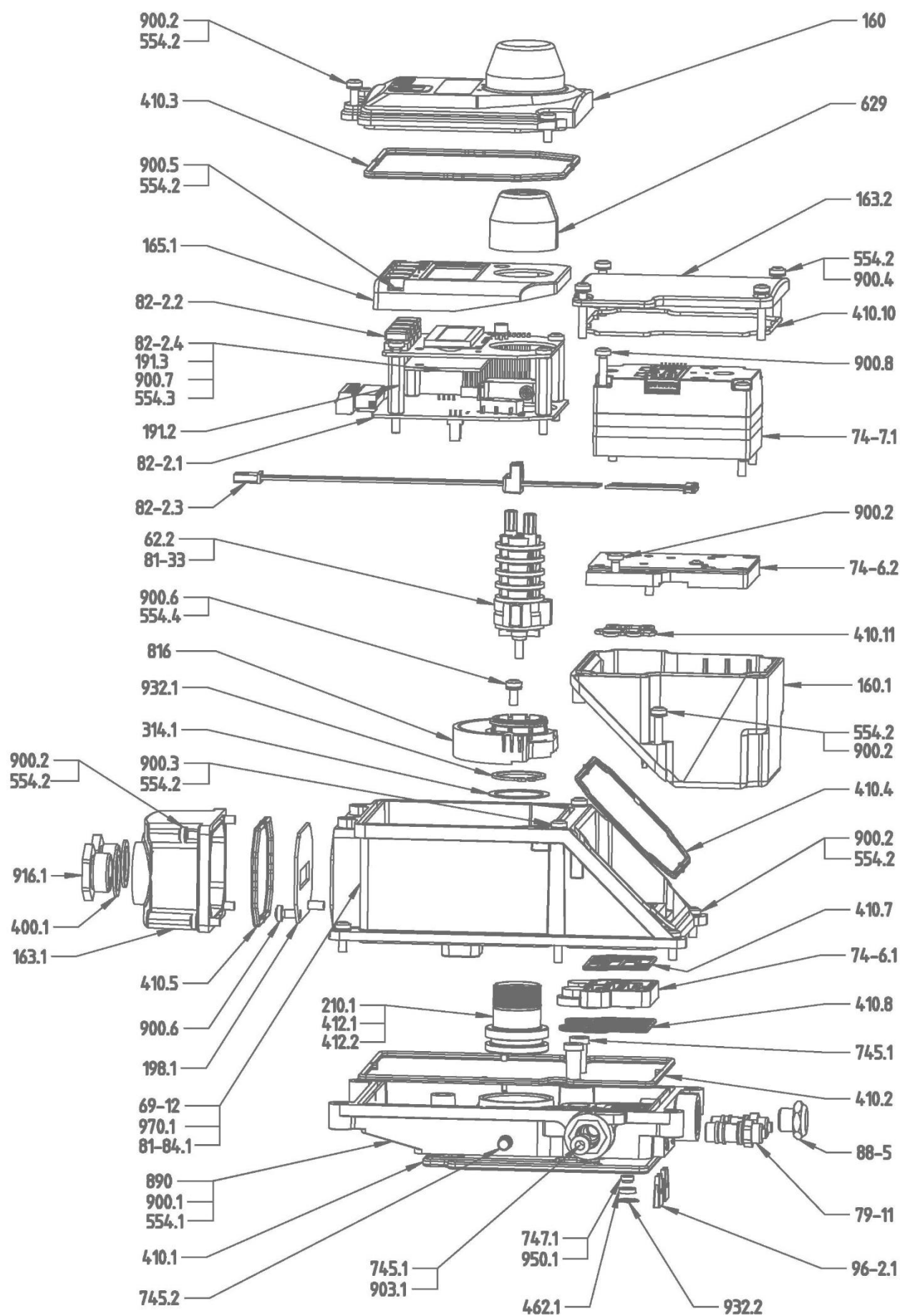


SMARTRONIC MA R1310 positioner





Item	Designation	Materials
160	Cover	Polycarbonate SM60/0
160.1	Distributor cover	Polycarbonate SM60/0
163.1	Bonnet	Polycarbonate SM60/0
163.2	Bonnet	Polycarbonate
165.1	Bonnet	
191.2	Support	Laiton nickelée
191.3	Spacer	
198.1	Connection plate	
210.1	Shaft	Polycarbonate SM60/0
314.1	Friction washer	Inox 304L
400.1	Gasket	Neoprene
410.1	Profile joint	NBR 70
410.2	Profile joint	NBR 70
410.3	Profile joint	NBR 70
410.4	Profile joint	NBR 70
410.5	Profile joint	NBR 70
410.7	Profile joint	NBR 70
410.8	Profile joint	NBR 70
410.10	Profile joint	NBR 70
410.11	Profile joint	NBR 70
412.1	O-Ring	NBR 70
412.2	O-Ring	NBR 70
462.1	Conical washer	
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.3	Plain washer	Steel
554.4	Safety device	Steel
629	Sub-unit Pointer	
62.2	Sub-unit adjustable cam	
69-12	Case	Polycarbonate SM60/0
745.1	Filter	
745.2	Filter	Bronze
74-6.1	Distribution plate	
74-6.2	Distribution plate	
74-7.1	Pneumatic valve	
747.1	Profile joint check valve	
79-11	Flow control	
816	Sub-unit Angle sensor	
81-33	Detection plate	Steel
81-84.1	Wiring diagram	
82-2.1	Printed circuit board	
82-2.2	Printed circuit board	
82-2.3	"Piezo" Sub unit cordon	
82-2.4	Feed-back position	
88-5	Silencer	Bronze
890	Base	Polycarbonate SM60/0
900.1	Screw	A2- 70
900.2	Screw	A2- 70
900.3	Screw	A2- 70
900.4	Screw	A2- 70
900.5	Screw	A2- 70
900.6	Screw	A2- 80
900.7	Cheese- head screw	A2- 80
900.8	Screw	A2- 70
903.1	Plug	
916.1	Screwed plug	
932.1	Circlip	Steel
932.2	Self-locking retaining ring	Steel
950.1	Valve spring	
96-2.1	Padlockable plate	Polycarbonate SM60/0
970.1	Identity plate	Adhesive polyester

Warnings



CAUTION !

Installation and commissioning of the electropneumatic actuators must be carried out in accordance with instrumentation professional standards, and in particular:

Piping:

When commissioning a new or modified installation, the piping must be blown through before connecting the actuator in order to clear the circuit of any impurities, which cannot be avoided during construction (iron filings, scale, Teflon, welding flux, etc.).

Electric wiring: The power supply voltage and the value of the control signal must be checked before final connection.

SMARTRONIC MA box:

The covers and housings of the unit must be properly closed to protect the contents from humidity and, generally, from the outer atmosphere ("aggressive" atmosphere, dust, etc.) and any incidents which could damage the internal parts.

Connection by cable gland:

When the electric connection is made through a cable gland, make sure that:

- the cable gland is suitable for the cable diameter
- the cable gland is correctly tightened on the cable

The pneumatic connection must be provided according to the product specification.
(see IV-1 Pneumatic connection)

Never exceed the values indicated in this manual!

This box is an electrical device which contains pressurized gas components. As such, it may be a source of danger for property or even personnel. Exceeding the values indicated could result in damage.

Never uncouple or dismantle the SMARTRONIC MA box or its accessories when pressurised or powered up.

Always make sure that the actuator and positioner reservoirs are decompressed before dismantling the distributor, its solenoid valves or the unit itself.

Also, always check that the power supply is disconnected from its source before any dismantling.

During checks in the workshop or on site, the valve associated with the actuator and positioner must be operated from fully open to fully closed.
This operation could present a very high risk of injury unless minimum safety measures are taken to prevent access between the disc and the seat.

Contents

	Page
I - Introduction	7
I- 1 General	7
I-2 Operating principle	7
I-3 Technical characteristics	8
II - Assembly on pneumatic actuator	9
II- 1 ACTAIR 3 to 200, ACTAIR NG 2 to 160, DYNACTAIR 1.5 to 100 and DYNACTAIR NG 1 to 80	9
II-2 ACTAIR NG 240 to 700 et DYNACTAIR NG 120 to 350	10
II-2 ACTAIR 400 to 1600 and DYNACTAIR 200 to 800 and other ¼ turn actuators	11
II – 3 Linear actuators	12
III-Assembling the SMARTRONIC MA/Actuator assembly on the valve	14
IV- Pneumatic supply	14
IV- 1 Pneumatic connection	14
IV-2 Mechanical adjustment of the operating time	15
IV-3 Safety position on loss of current	16
V- Electric connections	18
V- 1 Connection housing	18
V-2 Connections to the 4- 20mA current loop	18
V-3 End stop connection	19
V-4 Feed- back position (Option)	20
V-5 HART console connection	20
VI- Local user interface	21
VI- 1 Cover	21
VI-2 Main screen	22
VI-3 Submenu screen	23
VII - Implementing the SMARTRONIC MA	25
VII- 1 Powering up	25
VII-2 Autocalibration	25
VI - 2 - 1 Adjusting the angle sensor stroke	25
VI - 2 - 2 Starting auto-calibration	26

VII-3 Operating mode	26
VII - 3 - 1 Automatic mode	26
VII - 3 - 2 Manual mode	27
VII - 3 - 3 HART mode	27
VII-4 Adjusting the end stop detectors	28
VII-5 function of the SMARTRONIC MA positioner	29
VII - 5 - 1 Manual calibration	29
VII - 5 - 1 - 1 Positioning stroke	29
VII - 5 - 1 - 2 Positioning dead band	30
VII - 5 - 1 - 3 Positioner gain	30
VII - 5 - 2 Adjusting the setpoint according to the 4- 20 mA signal	31
VII - 5 - 3 Adjusting the valve closing direction	31
VII - 5 - 4 Safety position by lack of power	32
VII - 5 - 5 Configuring the main screen display	32
VII - 5 - 6 Product diagnosis	32
VII - 5 - 7 Configuring the main screen display	33
VII - 5 - 8 Displaying HART version - addressing dat	33
VII - 5 - 9 HART compatibility	33
VIII - HART parameters	34
VIII-1 Installing the Device Description (DD) file	34
VIII - 1 - 1 SDC625	34
VIII - 1 - 2 Pocket 375	34
VIII - 1 - 3 Simatic PDM	34
VIII-2 Global organisation	34
VIII-3 Detail of the file tree structure content	35
VIII - 3 - 1 "KSB Hart Positioner" directory	35
VIII - 3 - 2 "Operation" directory	35
VIII - 3 - 2 - 1 "System" directory	35
VIII - 3 - 2 - 2 "Endstop sensors" directory	35
VIII - 3 - 2 - 3 "HART setpoint" directory	36
VIII - 3 - 3 "Diagnosis" directory	36
VIII - 3 - 3 - 1 "Number of Operations" directory	36
VIII - 3 - 3 - 2 "Run time" directory	36
VIII - 3 - 4 "Settings" directory	36
VIII - 3 - 4 - 1 "Regulator" directory	36
VIII - 3 - 4 - 2 "O/C fct point" directory	37
VIII - 3 - 4 - 3 "Closing direction" directory	37
VIII - 3 - 4 - 4 "Safety position" directory	37
VIII - 3 - 4 - 5 "Ana. In/Out calib." directory	37
VIII - 3 - 5 "Info" directory	38
VIII - 3 - 5 - 1 "Device" directory	38
VIII - 3 - 5 - 2 "Positioner" directory	38
VIII - 3 - 5 - 3 "Actuator" directory	38
VIII - 3 - 5 - 4 "Valve" directory	39
VIII - 3 - 5 - 5 "HART" directory	39
IX - Operating faults - Causes and solutions	40
X - Codes	41
XI - Spare parts kit	42

I - Introduction

I - 1 General

This manual describes the SMARTRONIC MA positioner. This device is designed to control the quarter- turn actuators of the ACTAIR and DYNACTAIR range by direct surface mounting on the standardized VDI/VDE 3845 interface. It provides both the direct pneumatic and mechanical link with the actuator chambers.

The positioner can also be mounted on any other VDI/VDE 3845 actuator using an adapter kit (see §XII - Spare parts kit)

I - 2 Operating principle

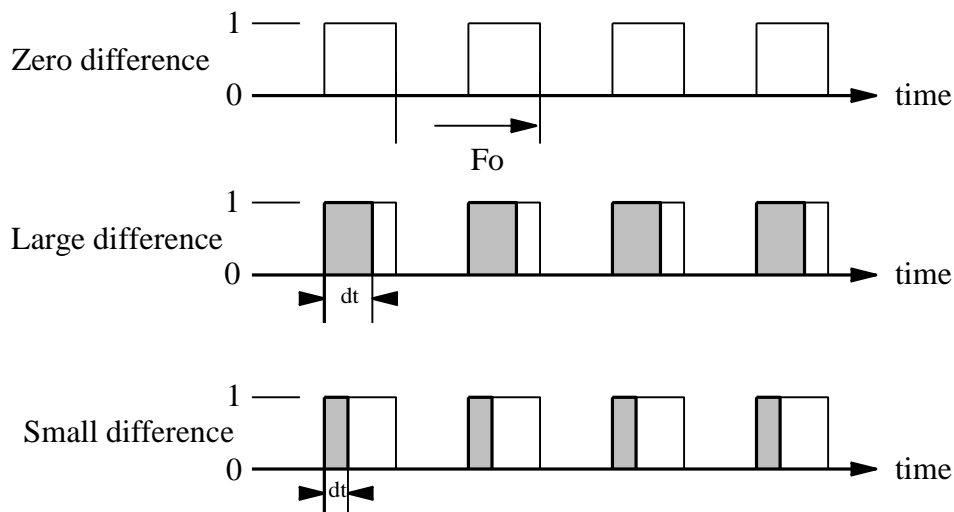
This device is a sequential digital positioner. It is equipped with an on/off 3- position actuator control distributor with valves. On loss of electrical power, the valve moves to the safety position configured when ordering the SMARTRONIC MA positioner.

The actuator is positioned by energizing either of the control solenoid valves.

These solenoid valves are controlled by the electronic board which reacts according to the difference between the position (angle sensor signal) and the control signal by adopting one of the three possible states:

- **Positive difference** = Opening
- **Zero difference** = Position held (no action)
- **Negative difference** = Closing

The control is of the PWM (Pulse Width Modulation) type. Using a fixed basic frequency (F_0), the principle consists in modulating the pulse width according to the position/set point difference.

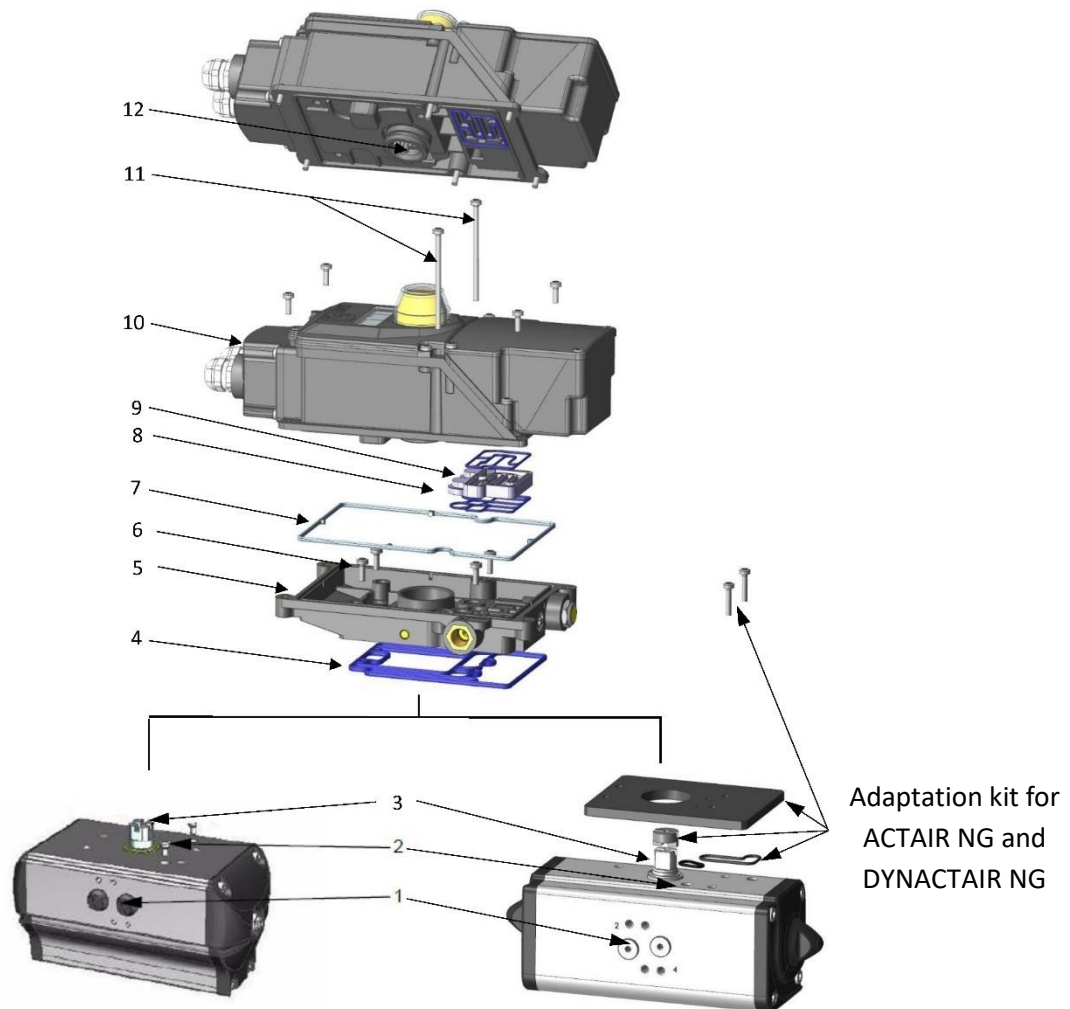


I - 3 Technical Characteristics

Electric connections	Accepts flexible conductors with end connector and with insulating entry cone of cross- section 0.25 mm ² to 0,5 mm ²
Weight	1,70 Kg
Environment	
Standard protection class	IP 67 according to EN 60529
Electromagnetic Compatibility	Complies with European directive EMC 2004/108/EC according to standards NF EN 61000- 6- 2 et NF EN 61000- 6- 4
Climatic class	- Storage temperature: - 30 ° C to + 80 ° C - Working temperature: - 20 ° C to + 80 ° C
Vibrations	- According to IEC 68- 2- 6 Test Fc
Pneumatic distribution	
Pressure connection	Port 1/4" gas marked "P" equipped with an internal filter on the base
Centralized exhaust connection	Port 1/4" gas marked "E" equipped with a silencer or connectable to exhaust network
Operating pressure	2 to 7 bar
Filtration level	ISO 8573-1 Class 4 (< 15 µm)
Dew point	ISO 8573-1 Class 4 (< 3 ° C, mini. < 10 ° C at ambient temperature)
Lubrication	ISO 8573-1 Class 4 (< 5 mg/m ³ permanent, 25 mg/m ³ admitted for 24h max)
Maximum flow rate	300 NI/min (at 25 ° C)
Pneumatic consumption when idle	< 0,4 NI/min (at 25 ° C)
Electronic system	
Electrical supply	By 4- 20 mA current loop
Consumption	from 40 mW (under 4mA) to 200mW (under 20mA)
Control signal	4 - 20 mA
Minimum operating current	3,8 mA
Required load voltage	10 VDC
Protection against polarity inversions	yes (up to 20 VDC)
Protection against over-voltage	yes
Load resistance	500 to 515 Ohm under 20 mA
Static destruction limit	40 mA
Positioning characteristics	
Hysteresis + dead band	< ± 1%
Linearity	< ± 1%
Repeatability	< ± 0,5%
Variation law	Linear
Offset adjustment (zero) and full scale adjustment	Manual adjustments using the interface screen+buttons
Standard direct action or indirect action - Dead band and gains automatically adjusted - Auto-calibration by pushbuttons	
Position recopy (option)	
Output	4- 20 mA two- wire, with galvanic / electronic isolation
Sampling period	0,4 seconds
Resolution	CAN 16 bits
Linearity	< ± 0,01%
Temperature effect from T _{min} to T _{max}	< ± 0,05% - 10 ° C
Position detectors (option)	
Adjustment on all the travel by cams	
Inductive proximity detectors, mechanical micro switches or ATEX- certified inductive proximity <u>detectors</u>	

II - Assembly on pneumatic actuator

II - 1 ACTAIR 3 to 200, ACTAIR NG 2 to 160, DYNACTAIR 1.5 to 100 et DYNACTAIR NG 1 to 80



- A- Check that the actuator has both plugs (item 1) on the external supply holes.
 - B- Remove the two screws with seals (item 2) (TORX T20 screwdriver).
 - C- Separate the unit (item 10) from the base (item 5) by unscrewing the 6 screws (item 11) (TORX T20 screwdriver).
 - D- Remove distribution plate A or B (item 8) with both gaskets, item 9.
 - E- Attach the base (item 5) to the actuator with the 4 screws (item 6) (TORX T20 screwdriver).
- Tightening torque = 2.5 Nm



Check the correct position of the seal, item 4.

- F- Reposition distribution plate A or B (item 8) with its two seals, item 9



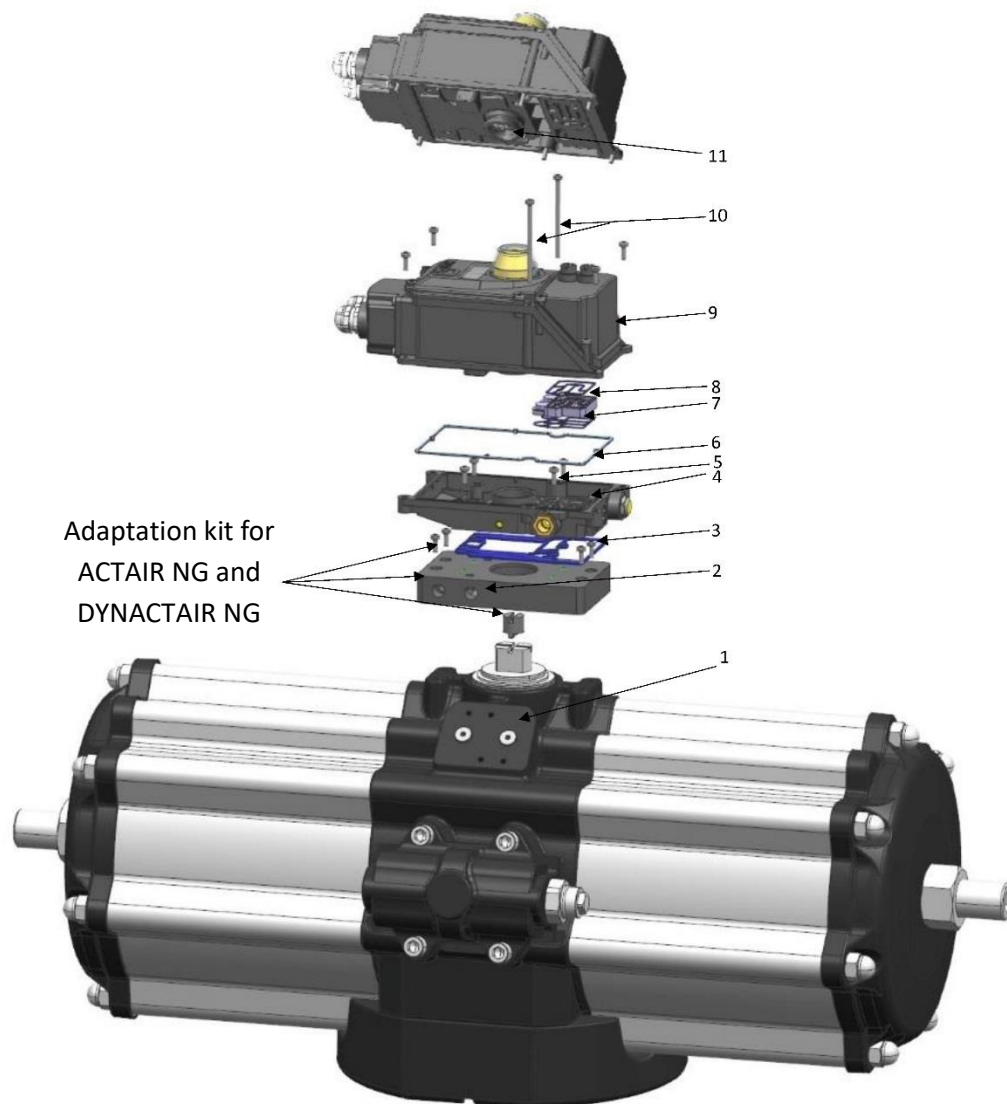
Check the correct position of the seal, item 9.

- G- Position the unit (item 10) on the base (item 5) taking care to engage the column (item 12) with the actuator shaft (item 3) and tighten the 6 M4 screws (item 11) (TORX T20 screwdriver).



Check the correct position of the seal, item 7.

II – 2 ACTAIR NG 240 à 700 et DYNACTAIR NG 120 à 350



A- Position the adaptations elements for ACTAIR NG and DYNACTAIR NG B- Fix the adapter kit plate to the actuator interface with 4 M5 screws

C- Separate the unit (item 9) from the base (item 4) by unscrewing the 6 screws (item 10) (TORX T20 screwdriver). D- Remove distribution plate A or B (item 7) with its two seals (item 5).

E- Fix the base (item 4) to the actuator using 4 M5 screws + seals + washers (item 5) (TORX T20 screwdriver). Tightening torque = 2.5 Nm



Check the correct position of the seal (item 3).

F- Reposition distribution plate A or B (item 7) with its two seals (item 8).



Check the correct position of the seal (item 8).

G- Position the unit (item 9) on the base (item 4) taking care to engage the column (item 11) with the adapter and tighten the 6 M4 screws (item 10) (TORX T20 screwdriver).

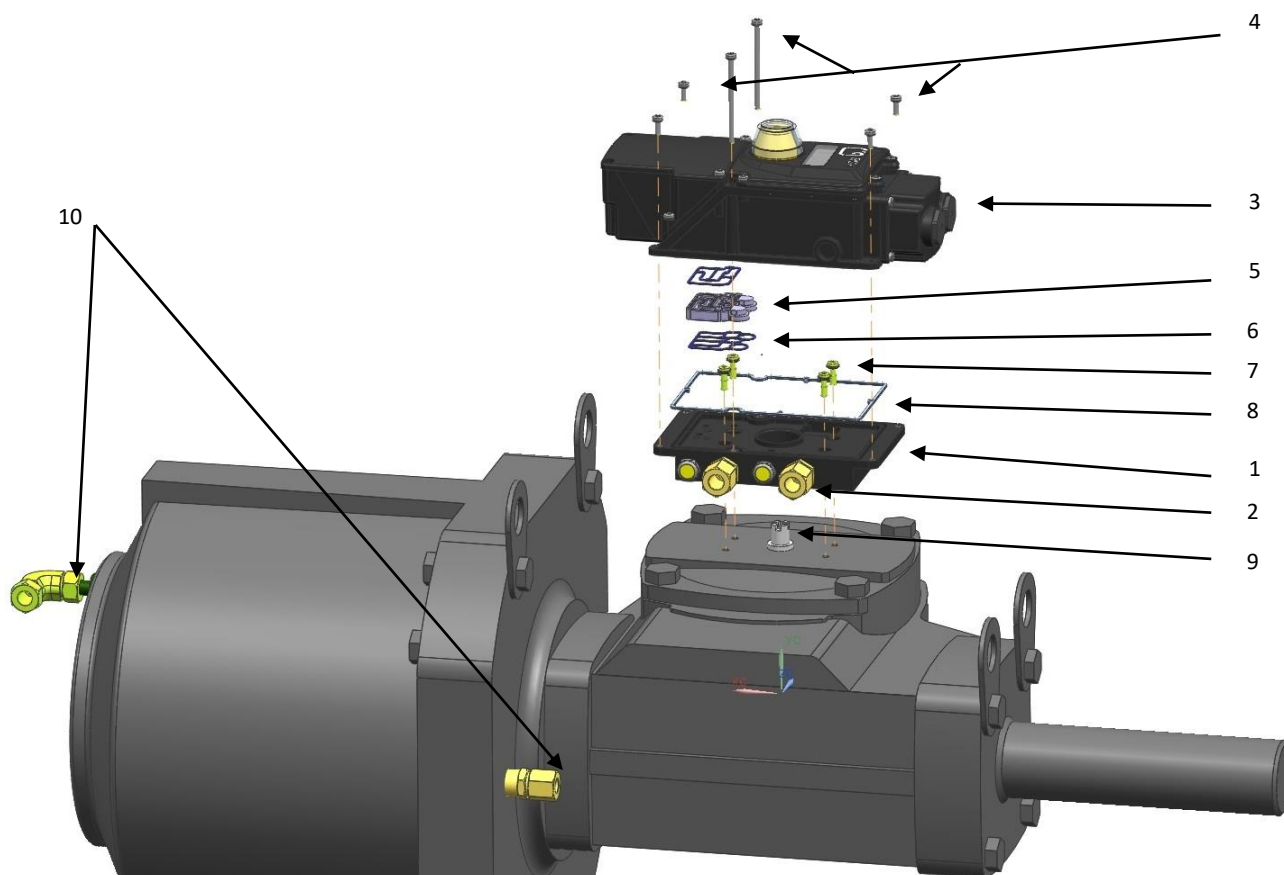


Check the correct position of the seal (item 6).

II - 3 ACTAIR 400 to 1600 and DYNACTAIR 200 to 800 and other ¼ turn actuators



These instructions only relate to pneumatic ¼ turn actuators whose flange complies with VDI/VDE 3845 with the following dimensions: A = 80 mm; B = 20 mm (actuator shaft height).
For the other VDI/VDE dimensions, please contact us.



A – Check that the base (item 1) supplied with the unit is intended for this type of actuator.
It must have two ¼" gas pneumatic openings (item 2 - connections not supplied) on the side, to supply the actuator chambers).

B – Separate the unit (item 3) from the base (item 1) by unscrewing the 6 M4 screws (item 4) (TORX T20 screwdriver).

C – Remove distribution plate A or B (item 5) with its two seals (item 6)

D – Fix the base (item 1) to the actuator using 4 M5 screws + seals + washers (item 7) (TORX T20 screwdriver)

E – Reposition distribution plate A or B (item 5) with its two seals (item 6)

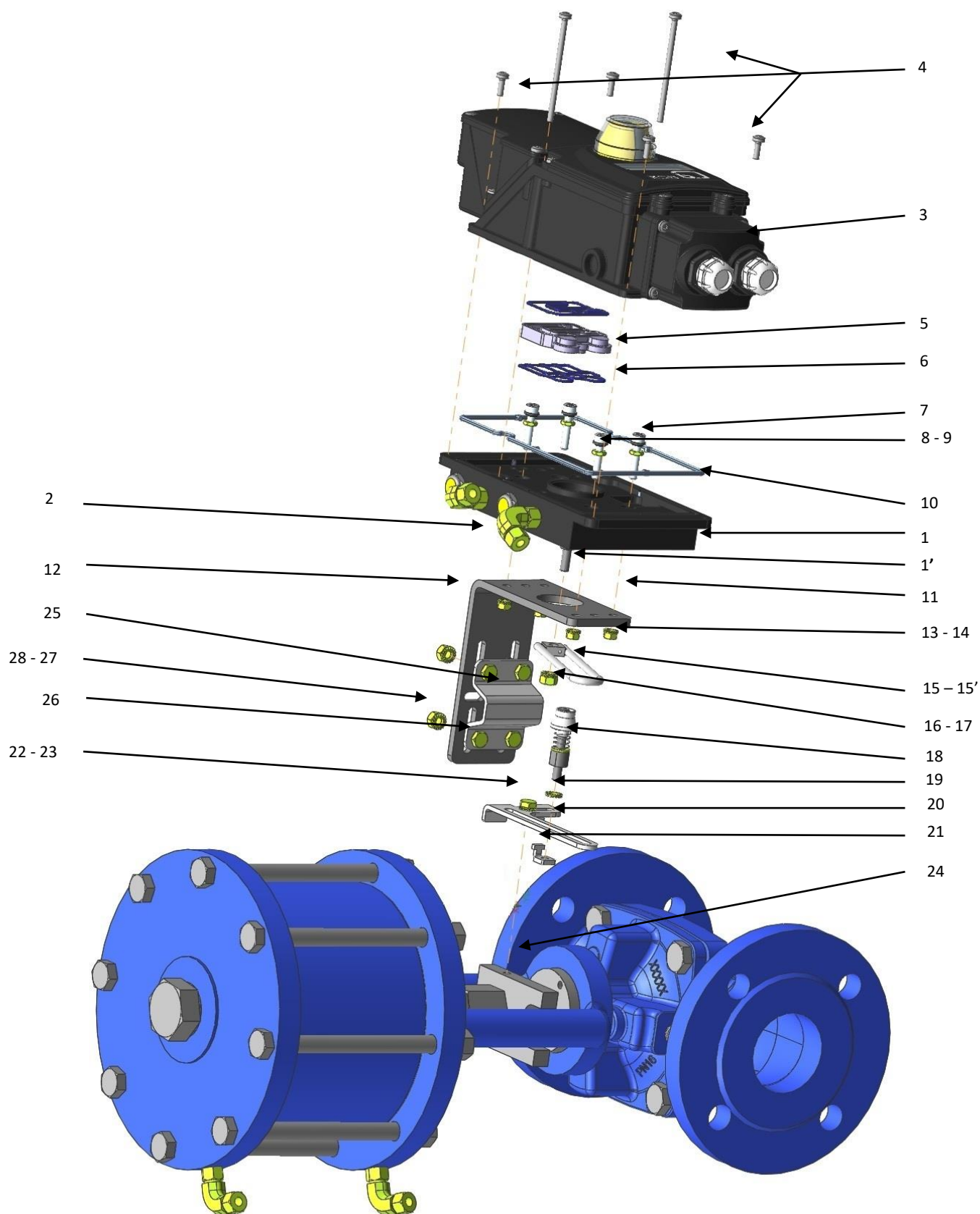


Check that the seal is correctly positioned (item 8)

F – Position the unit (item 3) on the base (item 1) taking care to engage the white shaft of the unit with the shaft (item 9) of the actuator and tighten the 6 M4 screws (item 4) (TORX T20 screwdriver)

G – The openings of the base (2 x ¼" G) (item 2) must be connected to the pneumatic actuator (item 10) as shown in the actuator instructions.

II - 4 Linear actuators





These instructions only relate to linear pneumatic actuators which comply with VDI/VDE 3847 with rod-shaped pillars:
For the other actuator types, please contact us.

A – Check that the base (item 1) supplied with the unit is intended for this type of actuator.
It must have two ¼" gas pneumatic openings (item 2 - connections not supplied) on the side, to supply the actuator chambers).

B – Separate the unit (item 3) from the base (item 1) by unscrewing the 6 M4 screws (item 4) (TORX T20 screwdriver).

C – Remove distribution plate A or B (item 5) with its two seals (item 6)

D – Fit a washer (item 9) and an O-ring (item 8) on each of the 4 M5 screws (item 7)

E – Tighten these 4 screws onto the base (item 1) with the 4 low-profile nuts (item 11)

F – Fix the base (item 1) to the plate (item 12) by tightening the 4 screws (item 7) and the washers (item 13) and nuts (item 14)



The base can be positioned every 180° according to requirements/ constraints

G – Mount the fluted rivet (item 15') on the driver (item 15). Mount the unit onto the shaft (item 1') and tighten with the nut (item 17) and washer (item 16)

H – Reposition distribution plate A or B (item 5) with its two seals (item 6)



Check that the seal is correctly positioned (item 10)

I – Position the unit (item 3) on the base (item 1) taking care to engage the white shaft of the unit with the shaft (item 1) of the base and tighten the 6 M4 screws (item 4) (TORX T20 screwdriver)

J – Mount the sub-assembly (item 18) fitted with the washer (item 19) on the plate (item 20) by tightening it onto the counterplate (item 21)

K – Fix the assembled plate (item 20) onto the valve slider (item 24) with the screws (item 22) and washers (item 23).

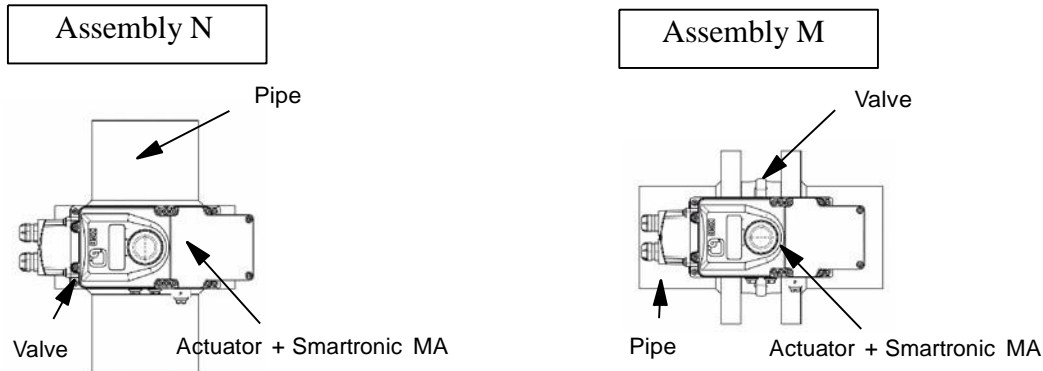
L – Fix the plate (item 12) to one of the actuator pillars using the plate (item 25) by tightening the 4 screws (item 26) and the washers (item 27) and nuts (item 28)



Adjust the position of the plate (item 12) and the sub-assembly (item 18) so that the sub-assembly (item 18) slides in the driver (item 15) (without exiting) over the entire valve stroke.

III - Assembling the SMARTRONIC MA/Actuator assembly on the valve

Use of an angle sensor with no mechanical stops makes it easier to assemble the positioner on the valve. It is essential to perform a complete opening/closing cycle up to the actuator mechanical stops so that the angle sensor takes up the correct position.

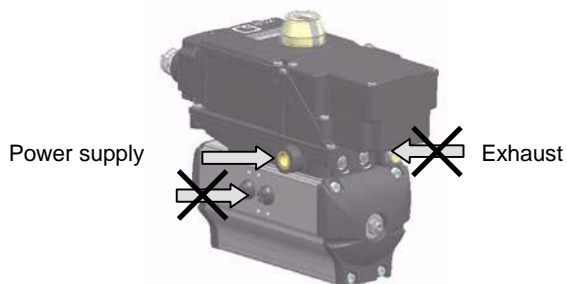


IV - Pneumatic supply

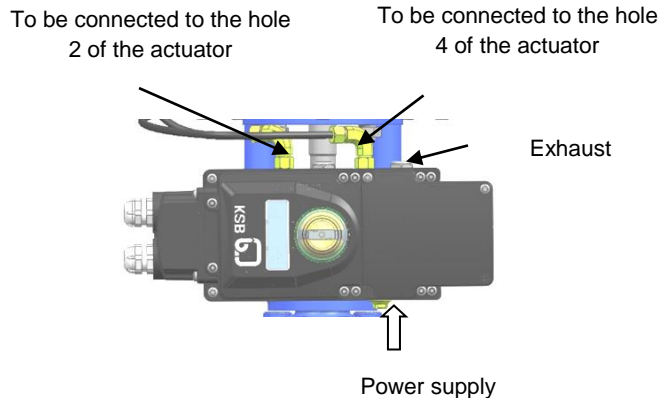
IV - 1 Pneumatic connection

The pneumatic distributor operates with air filtered to 15 µm. Before making any pneumatic connections, check that there are no impurities in the piping, especially when starting the installation. As a safety measure, a sintered bronze filter is fitted in the unit intake hole to prevent the pneumatic distributor from being blocked or damaged by impurities. This filter can be cleaned if it becomes clogged. Take it out and clean it with a solvent and/or compressed air (blower).

Direct pneumatic connection



Pneumatic connection by piping



- The connection is made on the SMARTRONIC MA box.
- Operating pressure: 2 to 7 bars
- Pressure connection: hole "P"
- Exhaust connection: hole "E" equipped with a silencer or connectable to an exhaust network.

Caution: When used as a position regulator, use air lubricated with 5 mg/m³ to prevent premature wear of the actuator mechanical parts.

Attention: If severe vibrations are expected or excessive tensile strain (max. 80 kg) needs to be prevented at the 1/4" gas thread connections, the use of flexible tubing is strongly recommended for pneumatic connection.

IV - 2 Mechanical adjustment of the operating time

Mechanical adjustment of the operating time is carried out in the factory to obtain the best accuracy/speed compromise for the positioner.

Mechanical modification of the operating times could prevent the positioner from operating correctly.

After making these modifications, it is essential to perform autocalibration.

Opening and closing times of at least 0.5 s must be respected for autocalibration to be carried out correctly.

The valve operating time can be adjusted using the adjustment screws located on the side of the base, beside the exhaust hole. Adjustment is carried out directly with a 4 mm flat screwdriver.

Procedure :

- Adjust the adjustment screws depending on the type of actuator used.
- Use MANUAL operation to test adjustment of the operating time (MANUAL mode: see § VII - 3 - 2).
- Restart autocalibration (see § VII - 2)

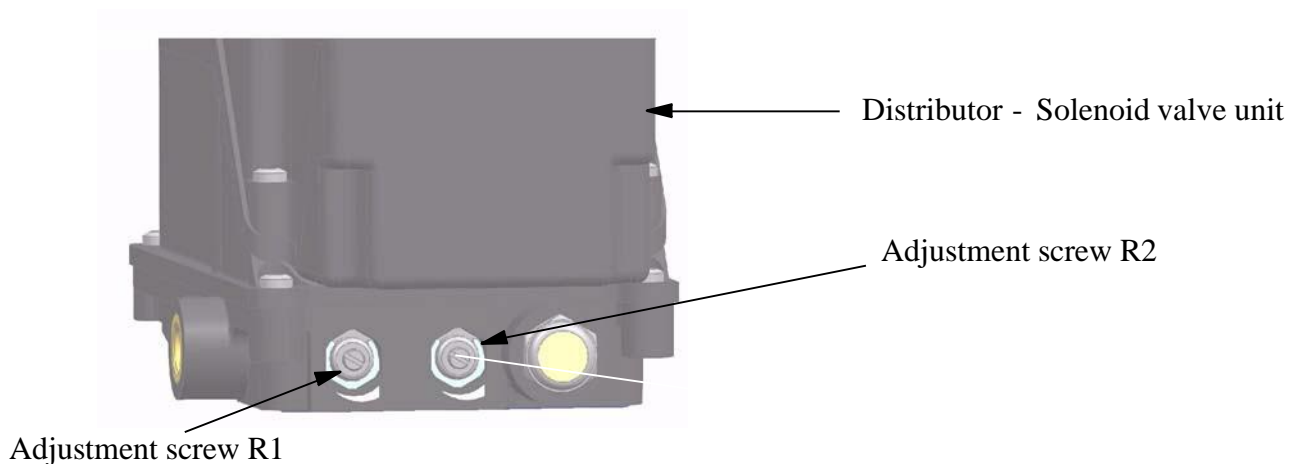
For information, the following minimum operating times can be obtained:
(reducing the operating time may impair the positioning accuracy)

Double-acting actuators	
Type	Min. operating time
ACTAIR 3	1 second
ACTAIR 6	1 second
ACTAIR 12	2 seconds
ACTAIR 25	4 seconds
ACTAIR 50	5 seconds
ACTAIR 100	6 seconds
ACTAIR 200	9 seconds
ACTAIR 400	25 seconds
ACTAIR 800	50 seconds
ACTAIR 1600	90 seconds

Single-acting actuators	
Type	Min. operating time
DYNACTAIR 1.5	2 seconds
DYNACTAIR 3	2 seconds
DYNACTAIR 6	2 seconds
DYNACTAIR 12	4 seconds
DYNACTAIR 25	6 seconds
DYNACTAIR 50	10 seconds
DYNACTAIR 100	15 seconds
DYNACTAIR 200	45 seconds
DYNACTAIR 400	90 seconds
DYNACTAIR 800	180 seconds

Single-acting actuators	
Type	Min. operating time
ACTAIR NG 2	1 second
ACTAIR NG 5	1 second
ACTAIR NG 10	1 second
ACTAIR NG 15	2 seconds
ACTAIR NG 20	2 seconds
ACTAIR NG 30	3 seconds
ACTAIR NG 4020	4 seconds
ACTAIR NG 60	5 seconds
ACTAIR NG 80	7 seconds
ACTAIR NG 120	8 seconds
ACTAIR NG 160	10 seconds
ACTAIR NG 240	17 seconds
ACTAIR NG 340	18 seconds
ACTAIR NG 500	30 seconds
ACTAIR NG 700	40 seconds

Single-acting actuators	
Type	Min. operating time
DYNACTAIR NG 1	1 second
DYNACTAIR NG 2	1 second
DYNACTAIR NG 4	1 second
DYNACTAIR NG 6	3 seconds
DYNACTAIR NG 8	3 seconds
DYNACTAIR NG 12	4 seconds
DYNACTAIR NG 16	4 seconds
DYNACTAIR NG 25	5 seconds
DYNACTAIR NG 35	6 seconds
DYNACTAIR NG 50	8 seconds
DYNACTAIR NG 80	11 seconds
DYNACTAIR NG 120	18 seconds
DYNACTAIR NG 160	20 seconds
DYNACTAIR NG 240	35 seconds
DYNACTAIR NG 350	50 seconds



Action direction of brakes R1 and R2

ACTAIR 3 to 1600		R1	R2
Stop on closing (standard version)		Closing time	Opening time
Stop on opening (upon request)		Opening time	Closing time
DYNACTAIR 1.5 to 800	Safety position on loss of pneumatic supply	R1	R2
DYNACTAIR 1.5 to 25	Closing	Closing time	Not active
DYNACTAIR 50 to 800	Opening	Not active	Opening time
DYNACTAIR 1.5 to 25	Opening	Opening time	Not active
DYNACTAIR 50 to 800	Closing	Not active	Closing time

IV - 3 Safety position on loss of current

The safety position on loss of current of the SMARTRONIC MA is configured in the factory according to the order.

IV – 3 - 1 STOP function by lack of power (R131* / ****1**SB*C2*0600)

This function is only available for SMARTRONIC MA units (DOUBLE ACTION version).

A specific version of the pneumatic valve is used for this feature.

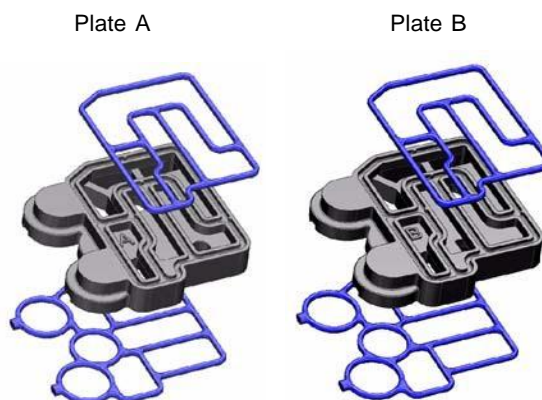
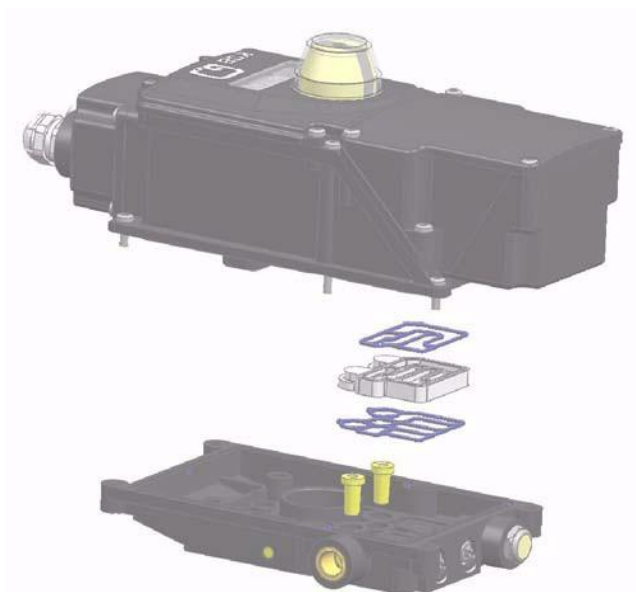
Either plate A or B can be used.

Note : If plate A is replaced by plate B (or conversely), self-calibration must be initiated.

IV – 3 - 2 OPENING/CLOSING function by lack of power (R131* / ****1***B*B2*0600 and R131* / ****1***B*A2*0600)

The opening/closing function by lack of power is defined by the distribution plate (Plate A or B).

See chapter on spare parts kit to change the safety position



The 2 plate types

Location of the plate affecting the safety position

Depending on the plate used (A or B) and depending on the actuator size, we obtain different safety positions on loss of current.

Safety position on loss of electrical supply

Single-acting distributors

	Plate type	
	A	B
Double-acting actuator		
ACTAIR 3 to 200 (End- stops on closing)	Opening	Closing
ACTAIR NG 2 to 160 (End- stops on closing)	Opening	Closing
ACTAIR 3 to 200 (End- stops on opening)	Closing	Opening
ACTAIR NG 2 to 160 (End- stops on opening)	Closing	Opening

Single-acting distributor P11 – 3 - FS – E reference: 42809288 (Until August 2019)

	Plate type	
	A	B
Single-acting actuator		
DYNACTAIR 1.5 to 25 (Air fail close)		Closing
DYNACTAIR 1.5 to 25 (Air fail open)		Opening
DYNACTAIR 50 and 100 (Air fail close)	Closing	
DYNACTAIR NG 1 to 80 (Air fail close)	Closing	
DYNACTAIR 50 and 100 (Air fail open)	Opening	
DYNACTAIR NG 1 to 80 (Air fail open)	Opening	

Single-acting distributor P13 – 3 – FS – E reference: 01918988 (From September 2019)

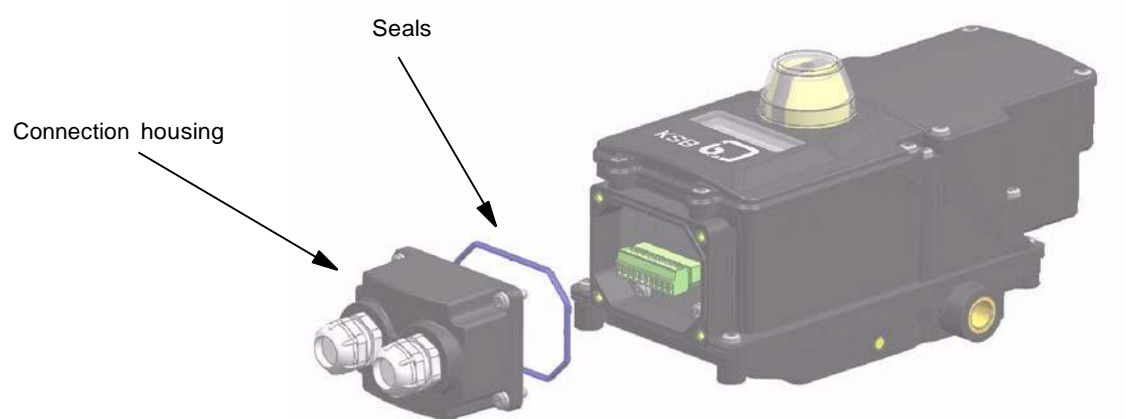
	Plate type	
	A	B
Single-acting actuator		
DYNACTAIR 1.5 to 25 (Air fail close)	Closing	
DYNACTAIR 1.5 to 25 (Air fail open)	Opening	
DYNACTAIR 50 and 100 (Air fail close)		Closing
DYNACTAIR NG 1 to 80 (Air fail close)		Closing
DYNACTAIR 50 and 100 (Air fail open)		Opening
DYNACTAIR NG 1 to 80 (Air fail open)		Opening

V - Electric connections

V - 1 Connection housing

To access the electric connection terminal block, unscrew the 4 TORX screws (T 20) in the connection housing

Tightening torque: 2 Nm



V - 2 Connections to the 4- 20 mA current loop

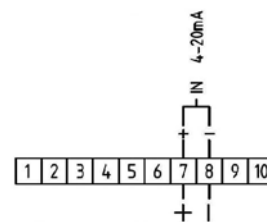
Use a screened cable for the 4- 20 mA signal with the screening connected to the current generator earth, since the Smartronic MA box has no earthing.



Current generator characteristics:

- Minimum operating current 3.8 mA
- Required load voltage 10 VDC
- Load resistance: 500Ω to 515Ω under 20mA

SMARTRONIC MA unpluggable terminal block



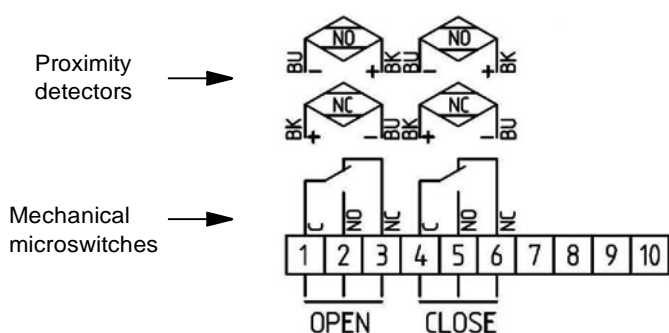
Terminals 7 and 8: Connection of the 4 - 20 mA setpoint signal

Connection on unpluggable terminal block:

- Length to be stripped: 7 mm
- Cross-section of rigid or flexible conductor: 0.14mm² to 1.5 mm²
- Cross- section of flexible conductor with end connector without insulating entry cone: 0.25 mm² to 1.5 mm²
- Cross- section of flexible conductor with end connector with insulating entry cone: 0.25 mm² to 0.5 mm²

V - 3 End stop connection

SMARTRONIC MA R1310 terminal block



Technical characteristics of mechanical microswitches (Crouzet ref.: 83181)

Material:

- Box: thermoplastic polyester loaded with glass fibre,
- Button: polyamide UL 94 V0 loaded with glass fibre,
- Contact: nickel- plated silver.

Rating:

- Heat transmission power: 6 A,
- Cut-off power according to IEC 947.5.1.

Endurance, lifetime:

- electrical:

- under $I = 5A$: 10^5 cycles,
- under $I = 1A$: 10^6 cycles,
- under $I = 0,2A$: 10^7 cycles

- mechanical: $3 \cdot 10^7$ cycles

Acceptable maximal current in A	Alternating current				Direct current		
	220 V	127 V	48 V	24 V	115 V	48 V	24 V
Control of pure resistive load and static loads with isolation by optocouplers	5	5	5	5	0,6	2	5
Control of static loads with transformer isolation	2,5	3	4	4	0,3	1	3
Control of electromagnetic loads	2,5	3	4	4	0,04	0,15	0,6

Technical characteristics of proximity detectors (IFM ref.: XC0035)

Housing material: Polybutylenetherephthalate

Power supply voltage: 5 to 36 VDC

Maximum output current:

inrush: 200 mA

continuous: 200 mA

Minimum output current: 4 mA

Maximum voltage drop: $\leq 4,6$ V

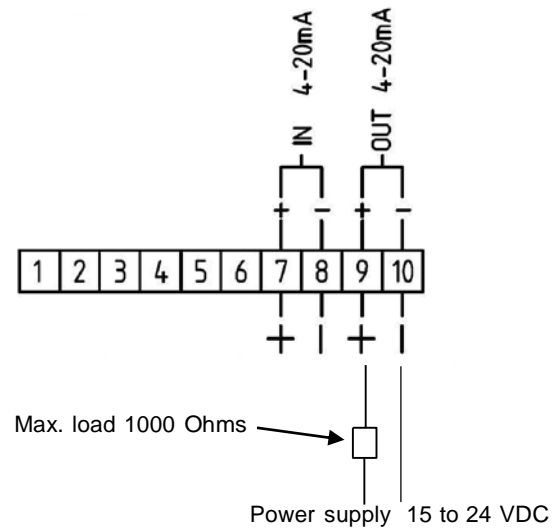
Residual current: $\leq 0,8$ mA

Maximum switching frequency: 2 kHz

Operation indication: By LED

V - 4 Feed - back position (Option)

The SMARTRONIC MA positioner may be fitted with an optional position recopy board delivering a 4- 20 mA output signal.

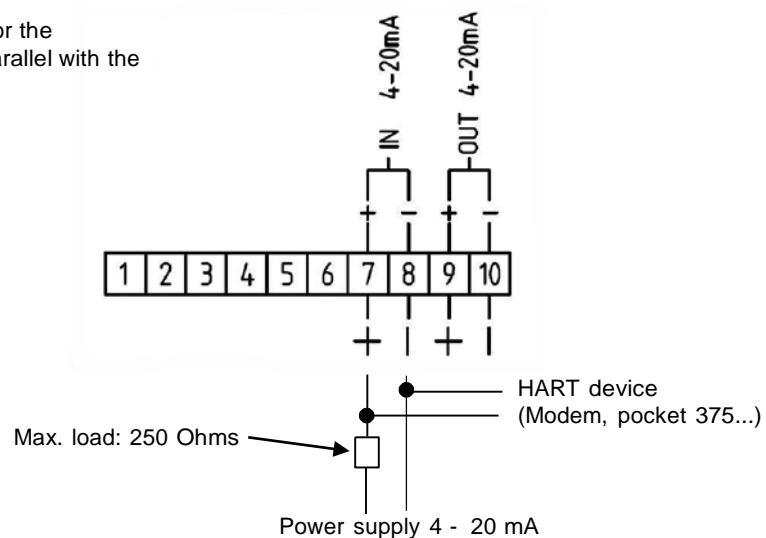


Technical Characteristics

Power Supply	15 to 24 VDC
Output	4- 20 mA two- wire, with galvanic / electronic isolation
Load resistance	0 - 1000 Ohms
Hysteresis + dead band	< $\pm 0,1$ % of full scale
Linearity	< $\pm 0,1$ % of full scale
Temperature effect from T ° C min to T ° C max	< $\pm 0,05$ % of full scale

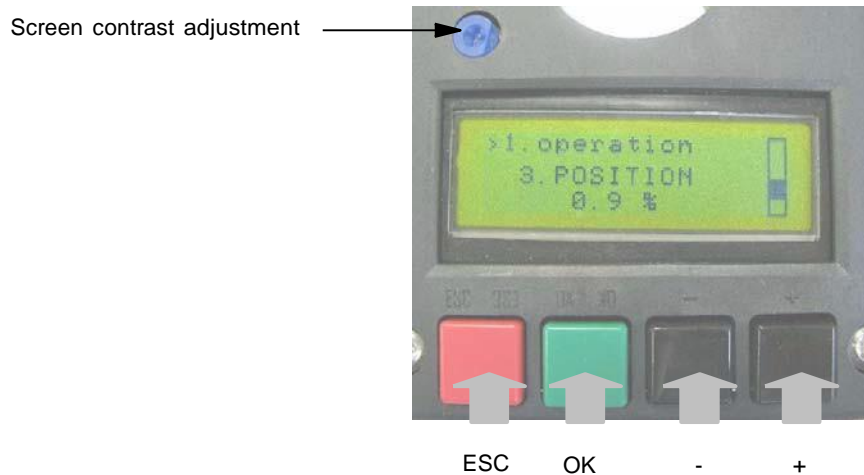
V - 5 HART console connection

The positioner board can communicate with a HART console.
Simply connect the HART modem or the input of the Pocket 375 or 475 in parallel with the positioner 4- 20 mA input.



VI - Local user interface

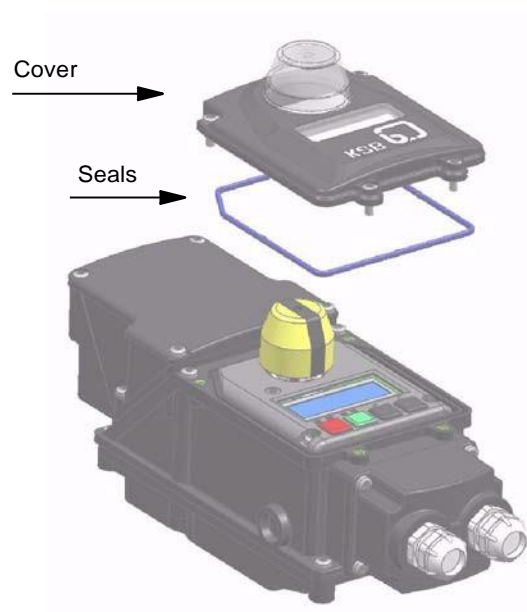
The local user interface consists of four buttons <+>, <->, <OK>, <ESC> and an LCD screen segmented as follows:

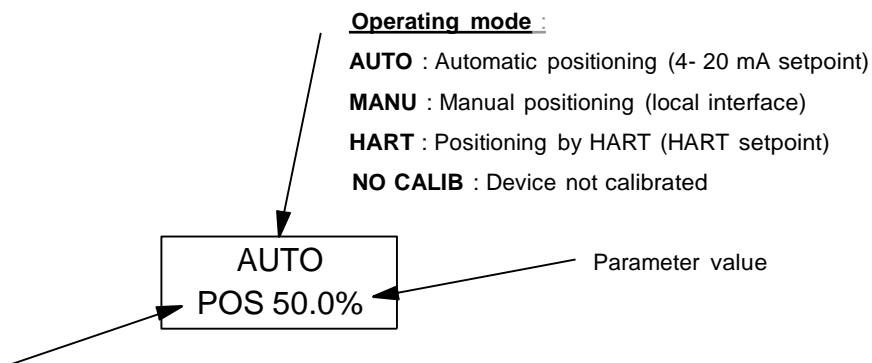


VI - 1 Cover

To access the local user interface or the cam adjustment, unscrew the 4 TORX screws (T 20) in the cover.

Tightening torque: 2 Nm



VI - 2 Main screen:**Parameter:**

POS : Valve position

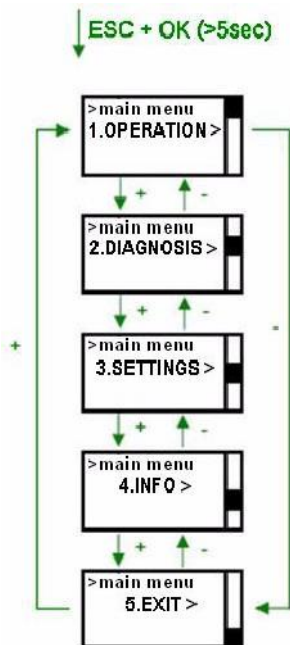
SSR : value of the position sensor (if NO CALIB)

The main screen provides information about the operating mode and the position.

If the device has never been calibrated, the value of the position sensor in encoder steps is displayed (SSR).

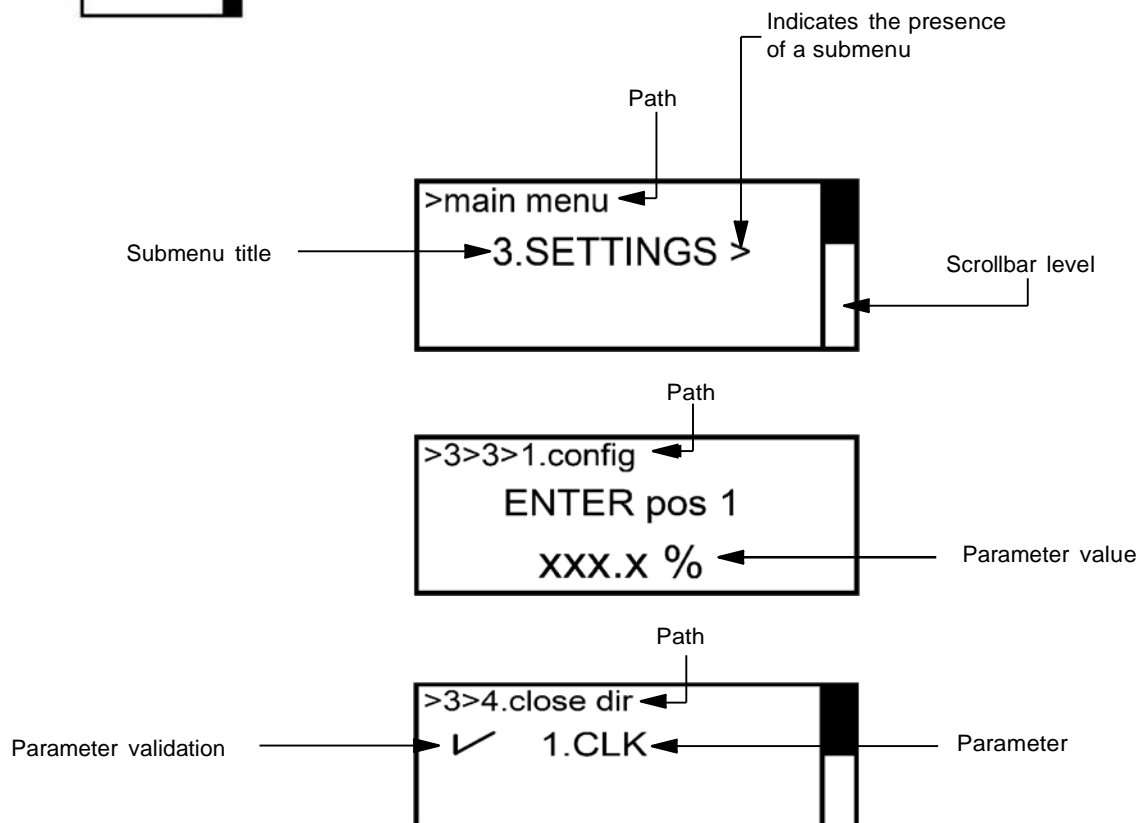
The text display direction can be reversed depending on how the positioner is mounted (paragraphs II and III)

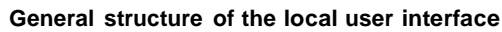
VI - 3 Submenu screen



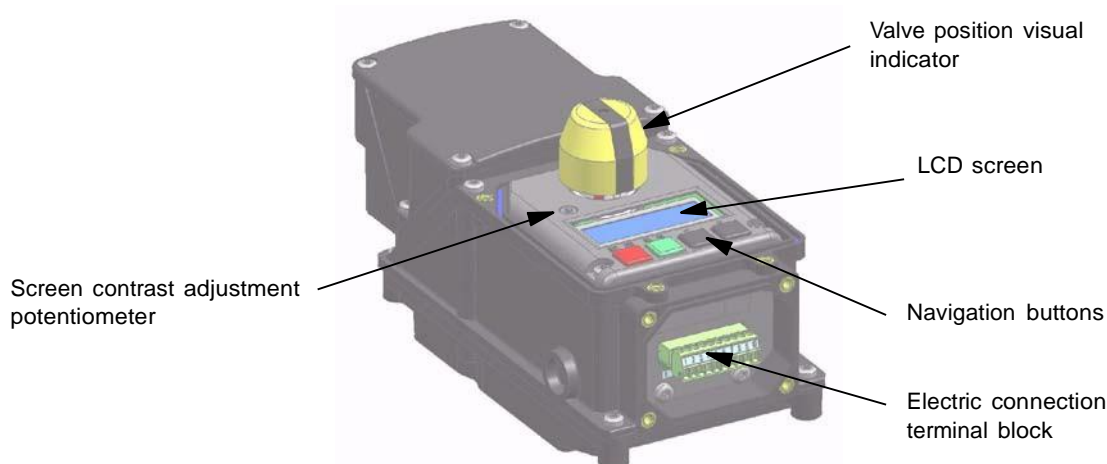
To access the submenus:

- Press buttons <OK> and <ESC> simultaneously for 5 seconds.
- Navigate with the <+> and <-> buttons.
- Validate with <OK>.
- Cancel with <ESC>.





VII - Implementation of the SMARTRONIC MA



Please note: To achieve a stable control process and prevent premature wear of the valve/actuator/positioner assembly, we strongly recommend defining a control dead band at the PID regulator in order to limit the setpoint variations transmitted to the positioner.
This control dead band should be as wide as possible to suit the requirements of the control process.

VII - 1 Powering up

The screen comes on 3 seconds after switching on the SMARTRONIC MA by the 4-20 mA current loop, with a current greater than or equal to 3.8 mA.
Progress of the startup procedure is displayed on the LCD screen, it lasts less than one minute.

As soon as the main screen is displayed, the SMARTRONIC MA is ready to operate.

VII - 2 Auto-calibration

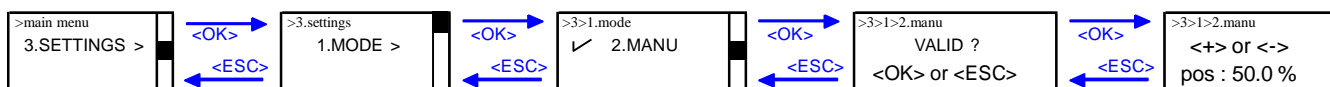
VII - 2 - 1 Adjusting the angle sensor stroke

The device uses an angle sensor with no mechanical stops (disconnectable system) which automatically adapts the angle sensor stroke to the actuator stroke.

To perform this adjustment, make a complete opening/closing cycle up to the actuator mechanical stops in the following cases:

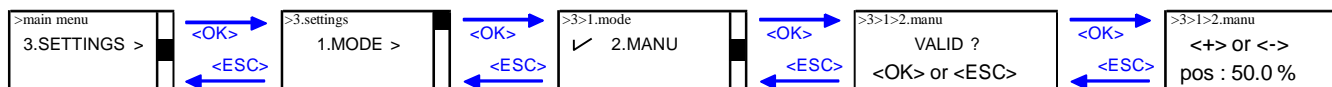
- First time use of the positioner,
- Modification of the actuator mechanical stops

This operation must be carried out in manual mode before starting autocalibration.



Press <+> up to the actuator mechanical stop. Then press <-> until you reach the other actuator mechanical stop.





VII - 3 - 2 Manual mode



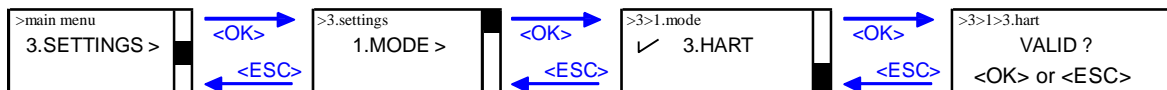
The operator can:

- Position the valve manually,
- The angle sensor stroke automatically by moving to the actuator mechanical stops (see §VII-2-1).

The operator can open or close the valve by pressing the <+> or <-> buttons.

Actions		Events
	Press [-] (< 3seconds)	Stepping movement in the closing direction
	Press [-] (> 3seconds)	Continuous movement in the closing direction
	Press [+] (< 3seconds)	Stepping movement in the opening direction
	Press [+] (> 3seconds)	Continuous movement in the opening direction

VII - 3 - 3 HART mode



The SMARTRONIC MA positions the valve according to the setpoint supplied by the HART communication using a HART device management tools such as the Pocket 375 (Emerson).

To define the position setpoint via the HART network, refer to chapters VII - HART parameters and VIII-3-2-3 "HART setpoint" directory.

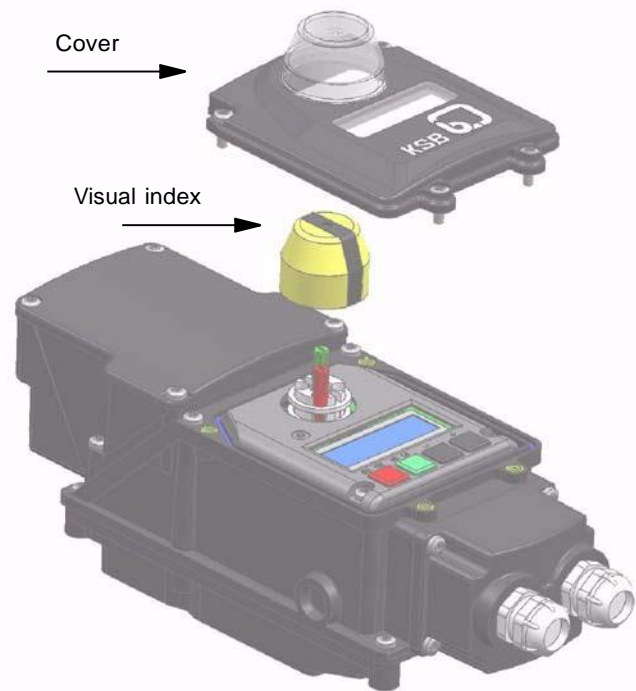
VII - 4 Adjusting the end stop detectors

The cams are preset in the factory.

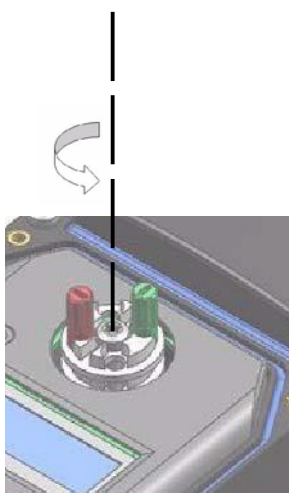
Their positions can be adjusted if the actuator mechanical stops are modified.

To access the cam adjustment, unscrew the 4 TORX screws (T 20) in the cover.

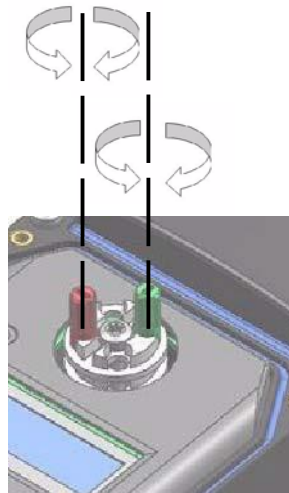
Tightening torque: 2 Nm



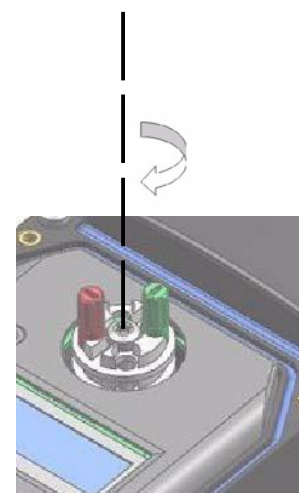
- Make the electric connections of the end stops (see §V - 3)
- Bring the positioner to an extreme position (O or C) in manual mode (see §VII - 3 - 2)
- Remove the visual index
- Loosen the central screw of the cam (Torx screwdriver T20)
- Adjust triggering of the required contact by turning the coloured screw corresponding to the colour of the cam to be adjusted (Red: closing; green: opening)
- Repeat the procedure for the opposite contact.
- Each cam is set independently and has no impact on the setting of the other cam.
- When the settings are finished, tighten the central screw of the cam moderately to lock the settings.



1 - Unscrew the central screw



2 - Set the cams

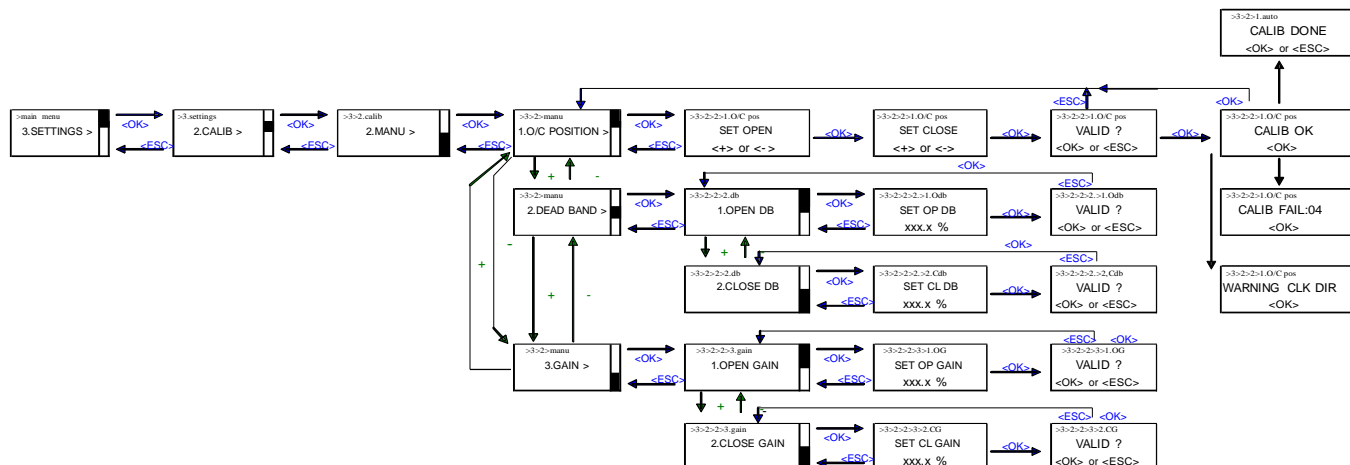


3 - Screw the central screw

VII - 5 Other function of the SMARTRONIC MA positioner

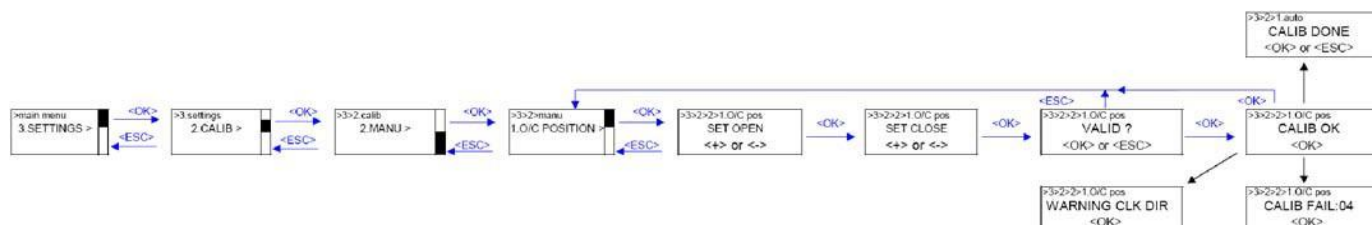
VII - 5 - 1 Manual calibration

Once the first autocalibration has been carried out, the operator can access the gain, dead band (DB) and positioning stroke values (O/C POSITION see § VII - 5 - 1 - 1).



VII - 5 - 1 - 1 Positioning stroke

This setting is used to adjust the positioner operation on the actuator mechanical stops. Although it is carried out automatically during autocalibration, this parameter can be adjusted manually.



Once the O/C POSITION has been validated (by pressing <OK>), the mechanical stop adjustment procedure starts:

>3>2>3>2>1.O/C pos
SET OPEN
<+> or <->

Open the valve (by pressing <+> or <->) up to the opening mechanical stop. Then validate (<OK>)

>3>2>3>2>1.O/C pos
SET CLOSE
<+> or <->

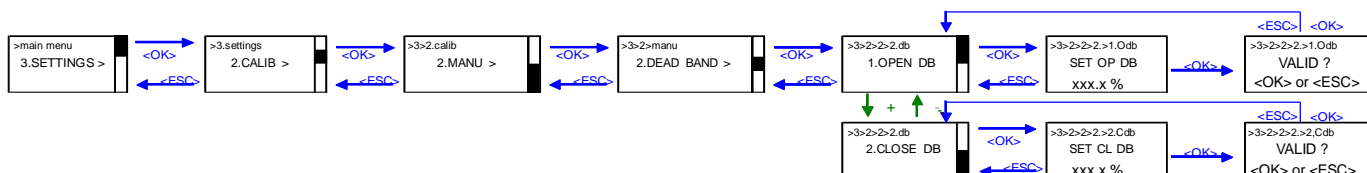
Close the valve (by pressing <+> or <->) up to the closing mechanical stop. Then validate (<OK>)

The difference between the two extreme positions must be greater than 45°.

If the positioner detects a difference between the closing direction (clockwise or counterclockwise) configured during the previous autocalibration and the operations carried out during this manual procedure, a warning will be displayed indicating that the closing direction has been changed.

VII - 5 - 1 - 2 Positioning dead band

This setting is used to adjust the positioner dead band. Although it is calculated automatically during autocalibration, this parameter can be adjusted manually.



OPEN DB only acts when the valve is moving in the opening direction.
CLOSE DB only acts when the valve is moving in the closing direction.

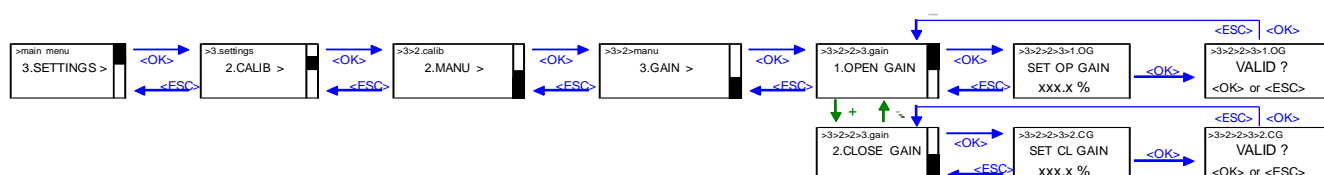
If a dead band is increased, the stability is improved at the expense of the positioning accuracy.

If the dead band is decreased, the accuracy is improved at the expense of the system stability.

Autocalibration calculates the optimum dead band parameters (best accuracy/stability compromise).

VII - 5 - 1 - 3 Positioner gain

This setting is used to adjust the positioner gain. Although it is calculated automatically during autocalibration, this parameter can be adjusted manually.



OPEN GAIN acts only on the valve opening gain.
CLOSE GAIN acts only on the valve closing gain.

If the gain is increased, the response time is reduced at the expense of the system stability.

Excessive gain may result in system instability.

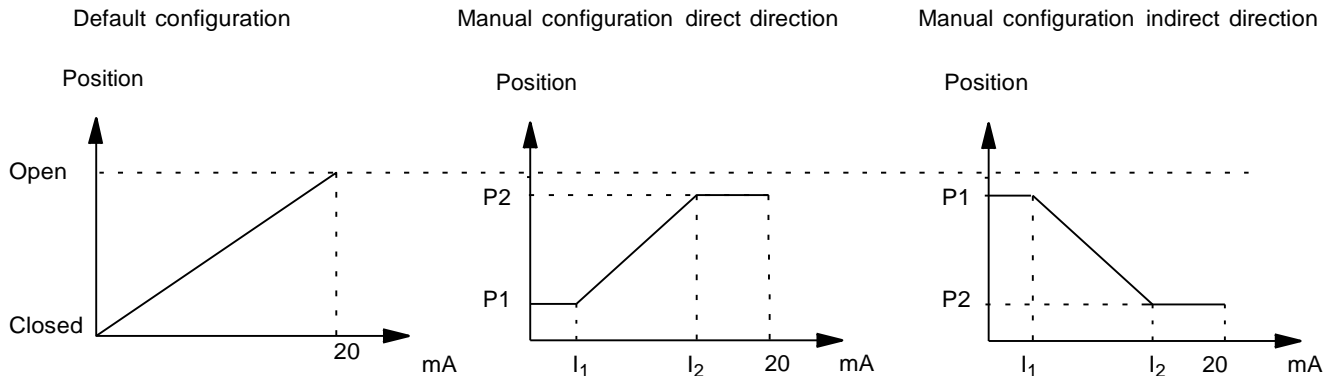
If the gain is decreased, the system stability is improved at the expense of the response time.

Autocalibration calculates the optimum gain parameters (best response time/stability compromise).

VII - 5 - 2 Adjusting the setpoint according to the 4- 20 mA signal

The operator can define two setpoint current values I1 (mA) and I2 (mA) which are associated with two position setpoints, respectively P1 and P2.

The positioner will move linearly between these two points.



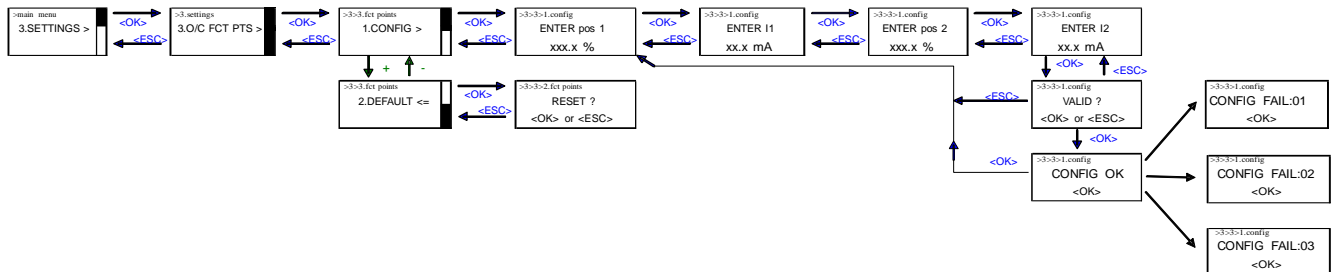
This procedure can be used to define a direct and indirect action of the positioner as well as "split range" mode operations.

Caution: The settings can only be validated if the following conditions are respected:

- minimum difference of 6 mA between I1 and I2,
- minimum difference of 20° between positions P1 and P2.

The operator can use the <+> and <-> with the buttons to modify the values, then validate with <OK>.

Access to these settings:



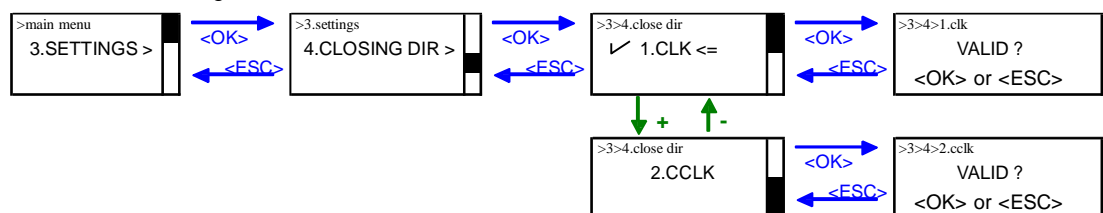
VII - 5 - 3 Adjusting the valve closing direction

By default, butterfly valves normally close in the clockwise (CLK) direction.

This parameter can be modified, however, in order to close the butterfly valve by moving in the counterclockwise (CCLK) direction.

Caution: This setting must comply with the configuration of the actuator/valve assembly to which the positioner is mounted.

Access to these settings:



VII - 5 - 4 Safety position by lack of power

Warning : This parameter is factory set and must correspond to the equipment configuration of the non-functional product.

The values "1 - UNDEF" "3-CLOSE" and "OPEN-4" are interchangeable from a functional point of view.

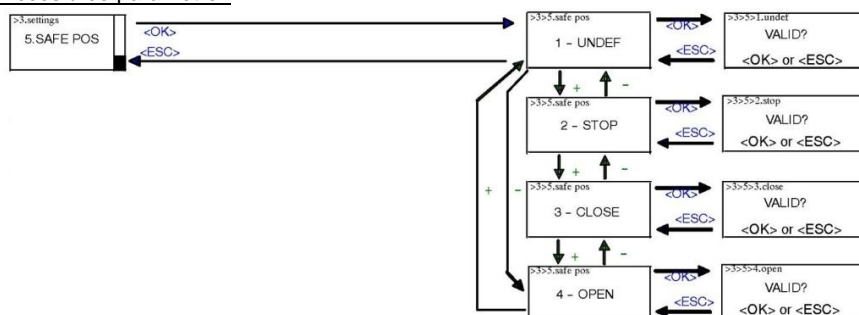
They are used for the boxes with the following references:

- R131 * / **** 1 *** B * B2 * 0600
- R131 * / **** 1 *** B * A2 * 0600

The value "2-STOP corresponds to a particular type of distributor. It is used for the case with the following reference:

- R131* / ****1***B*C2*0600

Accès à ce paramètre :

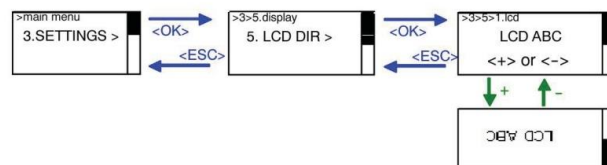


VII - 5 - 5 Configuring the main screen display

The text display direction can be reversed to make it easier to read, depending on how the positioner is mounted.

This is carried out via the "LCD DIR" submenu.

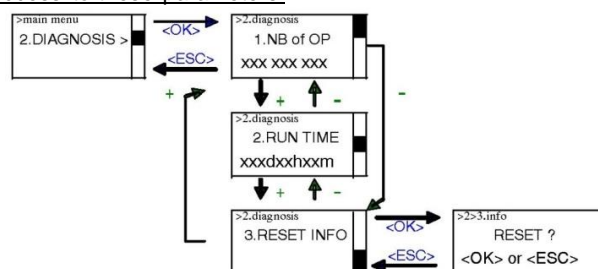
Access to these settings:



VII - 5 - 6 Product diagnosis

The SMARTRONIC MA positioner can display the number of opening/closing cycles carried out since the last Reset ("NB of OP" parameter ranging from 0 to 3 999 999 999 opening/closing cycles), the run time since the last Reset ("RUN TIME" parameter ranging from 0day- 0hour- 0minute to 3650days- 0hour- 0minute) and can be used to reset these parameters (RESET INFO). When one of the maxima is reached, both parameters are reset in order to keep consistent values for diagnosis purposes. This information can be accessed via the "DIAGNOSIS" menu.

Access to these parameters:

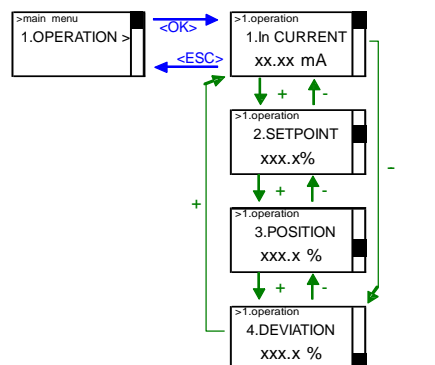


VII - 5 - 7 Displaying positioning data

The SMARTRONIC MA allows read only access to the values required for its positioning, via the "OPERATION" menu.

- "In CURRENT" indicates in mA the setpoint current in the 4- 20mA input loop
- "SETPOINT" indicates as a % the valve positioning setpoint.
- "POSITION" indicates as a % the instantaneous value of the valve position.
- "SETPOINT" indicates as a % the error between the setpoint and the instantaneous position of the valve.

Access to these parameters:

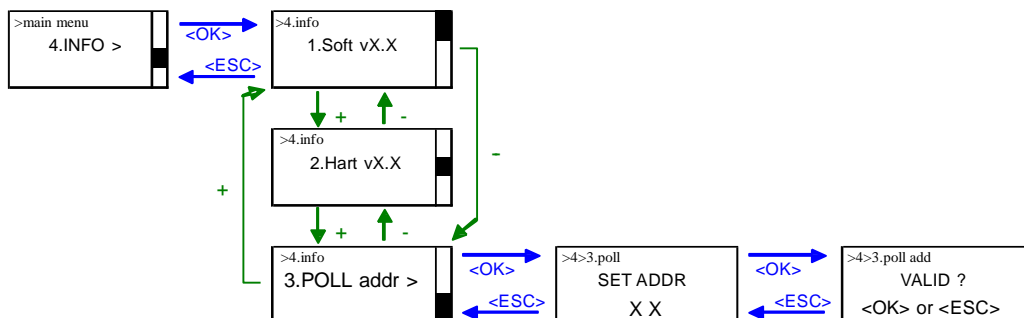


VII - 5 - 8 Displaying HART version - addressing data

The "INFO" menu provides access to the embedded software version number and the compatible HART version number of the product.

This menu can also be used to read and configure the product address in a HART network (POLL addr).

Access to these parameters:



VII - 5 - 9 HART compatibility

This positioner is HART compatible. The HART protocol can be used to communicate with the instrumentation via a Pocket, computer or programmable unit. It is therefore easy to configure the instrument, save this configuration, perform a product diagnosis, display the measured values, and much more (see §VIII - 1 - 1 HART parameter). Communication is carried out by frequency modulation (FSK type) injected on the 4- 20 mA setpoint signal.

To connect a HART console, refer to paragraph V - 5.

VIII - HART parameters

VIII - 1 Installing the Device Description (DD) file

VIII - 1 - 1 SDC625

Add the content of the Device description file in directory:

C:\HCF\DDL\Library

VIII - 1 - 2 Pocket 375

Add the content of the Device description file in directory:

C:\Program Files\375 Easy Upgrade Utility\PC Database\DD\HART

Then add this DD to the Pocket 375 database using the program:

375 Easy Upgrade Programming Utility*

*The Pocket 375 requires the Easy Upgrade option.

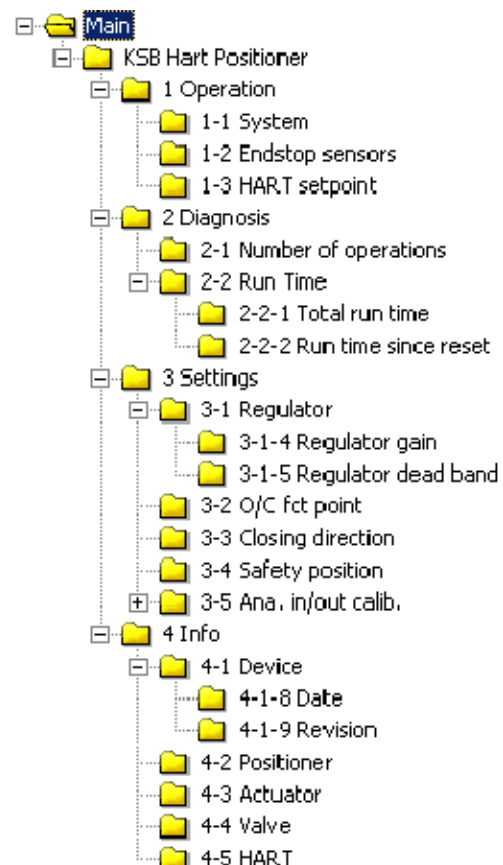
VIII - 1 - 3 Simatic PDM

Using "Hardware catalogue management" supplied with Simatic PDM, add the file:

AMRI_KSB_fm6.ddl.

VIII - 2 Global organisation

Communication via HART provides access to several parameters. Each parameter is stored in a directory so that it is easier to understand and access its value. These directories form a tree structure. The data structure is the same as that of the local interface (Operation, Diagnosis, Setting and Info).



The "Main" directory is the source directory containing the entire data tree structure.

The "Operation" directory contains the values of the signals specific to positioning:

- Values of the main signals: System
- Theoretical state of the end stop sensors
- Position setpoint if the product is operating in HART mode: HART setpoint

The "Diagnosis" directory contains the values specific to device diagnosis:

- Number of operations (opening/closing cycle)
- Total run time since installation
- Run time since last reset

The "Settings" directory contains the value specific to product configuration:





- Adjustment of position regulation performance: Regulator
- Input current/setpoint correlation: O/C fct point
- Closing direction
- Safety position on loss of electrical supply
- Analogue input/output calibration

The "Info" directory contains the usual information concerning:

- The device
- The positioner
- The actuator
- The valve
- The typical HART data

VIII - 3 Details of the file tree structure content

VIII - 3 - 1 "KSB Hart Positioner" directory

-  Operation (cf. VIII - 3 - 2)
-  Diagnosis (cf. VIII - 3 - 3)
-  Settings (cf. VIII - 3 - 4)
-  Info (cf. VIII - 3 - 5)

VIII - 3 - 2 "Operation" directory

VIII - 3 - 2 - 1 "System" directory

Loop current: value of the 4-20 mA signal in input in mA (read only)

- **Position value (PV):** Valve position as a % (read only)
- **Setpoint (SV):** Position setpoint as a % (read only)
- **Deviation (TV):** Error between the setpoint and the true valve position as a % (read only)
- **Output current (QV):** Theoretical current present in the current output loop in mA (read only)
- **Control mode:** Product operating mode: Auto, manual or HART (read only)

VIII - 3 - 2 - "Endstop sensors" directory

- **Open Endstop:** Theoretical state of the "opening" end stop sensor (read only):
0: not in open position
1: in open position
- **Close Endstop:** Theoretical state of the "closing" end stop sensor (read only):
0: not in close position
1: in close position

VIII - 3 - 2 - 3 "HART setpoint" directory

- **HART position Setpoint:** Position setpoint as a % if product is operating in HART mode (read/write)

VIII - 3 - 3 "Diagnosis" directory

VIII - 3 - 3 - 1 "Number of operations" directory

- **Number of operation:** Number of opening/closing cycles (read only, but can be reset)

VIII - 3 - 3 - 2 "Run time" directory



Total run time (read only)

- **Days:** Number of days operation since the 1st time the product was started
- **Hours:** Number of hours operation since the 1st time the product was started
- **Minutes:** Number of minutes operation since the 1st time the product was started



Run time since reset (read only)

- **Days:** Number of days operation since the last reset
- **Hours:** Number of hours operation since the last reset
- **Minutes:** Number of minutes operation since the last reset

VIII - 3 - 4 "Settings" directory

VIII - 3 - 4 - 1 "Regulator" directory

- **Autocalibration status**

Autocalibration procedure step (read only):

- End - Standby
- Working ...: Auto-calibration in progress.

- **Auto-calibration**


Function to start the autocalibration procedure (write only).


HART communication is no longer possible during autocalibration.

- **Positioner status :**

Positioner calibration status (read only)

- Run
- Calibration Run
- Calibration Done
- Calibration Fail
- Calibration change rotation direction
- Calibration Start
- Calibration Pause
- Calibration Stop
- Calibration Abort
- Calibration Fail: hardware
- Calibration Fail: regulator

-  Regulator gain (read/write)
 - **Opening gain:** (see §VII - 5 - 1 - 3)
 - **Closing gain:** (see §VII - 5 - 1 - 3)

-  Regulator dead band (read/write)
 - **Opening dead band** as a % (see §VII - 5 - 1 - 2)
 - **Closing dead band** as a % (see §VII - 5 - 1 - 2)

VIII - 3 - 4 - 2 "O/C fct point" directory

Used to define the relation between the input current and the position setpoint.
(For further details, see VII - 5 - 2)

- **Current No. 1:** Current value associated with position 1 (read/write)
- **Position No. 1:** Current value associated with current 1 (read/write)
- **Current No. 2:** Current value associated with position 2 (read/write)
- **Position No. 2:** Current value associated with current 2 (read/write)


VIII - 3 - 4 - 3 "Closing direction" directory


- **Closing direction:** Defines the valve closing direction. (read/write) (see §VII - 5 - 3)

VIII - 3 - 4 - 4 "Safety position" directory

- **Safety position:** Defines the valve safety position on loss of electrical supply (read/write)
Caution: Must comply with the plate type (A or B) and distributor used (see §IV - 3)

VIII - 3 - 4 - 5 "Ana. In/Out calib." directory In/out calib."

-  Ana. Input calib. (read/write)
 - **Start ana. In calib.:** function used to calibrate the 4- 20 mA analogue input

-  Ana. ouput calib. (read/write)
 - **Real out 4mA. :** Real value of the 4- 20 mA output when variable "Ana. Output Control" is set to "Send 4 mA output" (read/write).
 - **Real out 20mA.:** Real value of the 4- 20 mA output when variable "Ana. Output Control" is set to "Send 20mA output" (read/write).
 - **Ana. Output Control.:** Variable used to control the 4- 20 mA analogue output manually (read/write):
 - End -- stanby : analogue output in automatic mode (image of valve position)
 - Send 4mA output: analogue output forced manually to low level (close to 4 mA)
 - Send 20 mA output: analogue output forced manually to high level (close to 20 mA)

- **Start ana. out calib.:** Function used to calibrate the 4- 20 mA analogue output

VIII - 3 - 5 "Info" directory

VIII - 3 - 5 - 1 "Device" directory

- **Manufacturer:** Name of positioner manufacturer (KSB) (read only)
- **Model:** Product name (Smartronic MA) (read only)
- **Tag:** Free text (max. 8 characters). It is recommended to use a unique name for each device in the HART network. (read/write)
- **Descriptor:** Free text (max. 16 characters). (read/write)
- **Long tag:** Free text (max. 16 characters). It is recommended to use a unique name for each device in the HART network. (read/write)
- **Message:** Free text (max. 32 characters). (read/write)
- **Final assembly num:** Unique final assembly number. It is assigned during manufacture (read only)



Date (read/write)

- **Date:** Free date. By default, date of 1st configuration



Revision (read only)

- **Universal rev:** HART version number (7).
- **Fld dev rev:** Product version number.
- **Software rev:** Embedded firmware version number.
- **Hardware rev:** Electronic board version number.

VIII - 3 - 5 - 2 "Positioner" directory

- **Eex_la:**
Device compatible with ATEX zone. This parameter is provided for information only.
It does not certify in any way that the product is ATEX compliant (read only)
 - Yes
 - No
- **Analog feedback:**
Presence of a current output indicating the true position of the valve (read/write)
 - Yes
 - No
- **End stops:**
Type of end stop used (read only):
 - Mechanical
 - DPI
 - DPI ATEX

VIII - 3 - 5 - 3 "Actuator" directory

- **Vendor:** Name of actuator manufacturer (read/write):
- **Type:**
Actuator type (read/write):
 - Single action
 - Double action
If KSB actuator:
 - Actair
 - Dynactair
- **Safety position:** Valve safety position on loss of pneumatic supply (read/write)
- **Size :** Actuator size (read/write)
- **Write actuator info:** recommended) Function used to complete all the information fields concerning the actuator (write only)

VIII - 3 - 5 - 4 "Valve" directory

- **Vendor:** Name of valve manufacturer (read/write)
- **Type:** Valve type (read/write)
- **Size:** Valve size (read/write)
- **Write valve info:** (recommended) Function used to complete all the information fields concerning the valve and save them (write only)

VIII - 3 - 5 - 5 "HART" directory

- **Poll addr :** Network polling address (read/write)

IX - Operating faults - Causes and solutions

<i>Operating faults</i>	<i>Causes</i>	<i>Corrections</i>
On power up, the display does not come on after 3 seconds	<ul style="list-style-type: none"> - Check the current loop: incorrect wiring and loop current $I < 3.8 \text{ mA}$ - Adjust the contrast - Electronic board out of service 	<ul style="list-style-type: none"> - Set the installation in conformity - Turn the blue potentiometer - Replace the board (see Spare parts kit)
On power up, the display turns black	<ul style="list-style-type: none"> - Adjust the contrast - Electronic board out of service 	<ul style="list-style-type: none"> - Turn the blue potentiometer - Replace the board (see Spare parts kit)
The positioner is not controlled by the 4- 20mA signal	<ul style="list-style-type: none"> - SMARTRONIC MA not calibrated - SMARTRONIC MA in manual mode - Insufficient motor air pressure - Valve blocked - Actuator blocked or destroyed - Electrodistributor defective - Electronic board defective 	<ul style="list-style-type: none"> - Start the autocalibration procedure - Change the operating mode to AUTO (see § VII - 3 - 1) - Check the supply pressure $7 \text{ bar} > P > 2 \text{ bar}$ - Check that the valve can move freely - Check / replace the actuator (see § XI - Spare parts kit) - Replace the pilots or the electro distributor (see § XI Spare parts kit) - Replace the board (see § XI - Spare parts kit)
Positioner shifts or oscillates slowly with a stable input signal	<ul style="list-style-type: none"> - "P" leak to one of the chambers: unit not fastened correctly to the actuator - "P" leak to one of the chambers: leak from the actuator piston seal - "P" leak to one of the chambers: leak inside the electro distributor - The regulation parameters (gain, dead bands) are not suitable 	<ul style="list-style-type: none"> - Screw the unit attachment without exceeding the maximum torque - Repair or replace the actuator - Replace the distributor: spare parts kit (see § XI Spare parts kit) - Restart an auto-calibration procedure (see § VII - 4 auto-calibration) - Adjust the regulation parameters manually (see § VII - 6 - 1 Manual calibration)
Operating time too long	<ul style="list-style-type: none"> - Insufficient air pressure ($< 2 \text{ bar}$) - Dynamic sealing damaged between the chambers of the actuator cylinder - The distributor does not provide the flow rate of 400 L/min - The actuator displacement does not correspond to the required operating time 	<ul style="list-style-type: none"> - Restore a correct pressure - Repair or replace the actuator - Check the minimum operating times of the actuators - Check the minimum operating times of the actuators

X - Codifications

Codification	Designation
R001310 / 1 . . . B . . 2 . 0 6 0 0	Box SMARTRONIC MA
R----- / 1 0 0 0 1 . . . B . . 2 . 0 6 0 0	Detection Microswitches on printed circuit board
R----- / 2 0 0 0 1 . . . B . . 2 . 0 6 0 0	Detector on printed circuit board
R----- / 1 . . . B . . 2 . 0 6 0 0	Position detection 1/O and 1/C
R----- / 1 0 . . B . . 2 . 0 6 0 0	Feed- back position Without feed- back
R----- / 1 4 . . B . . 2 . 0 6 0 0	With feed- back 4- 20 mA - Passive (2 wires)
R----- / 1 . 0 . B . . 2 . 0 6 0 0	Electrical output Without
R----- / 1 . 1 . B . . 2 . 0 6 0 0	2 plastic packing glands M20 IP67 (dia. 6 to 12)
R----- / 1 . 2 . B . . 2 . 0 6 0 0	2 metallic packing glands M20 IP67 (dia. 6 to 12)
R----- / 1 . . S B . . 2 . 0 6 0 0	Pneumatic valve 4/3 double-acting centre closed-position (POS)
R----- / 1 . . T B . . 2 . 0 6 0 0	3/3 single-acting centre closed-position (POS)
R----- / 1 . . . B . . 2 . 0 6 0 0	Pneumatic valve voltage 230 V DC (Piezo)
R----- / 1 . . S B 2 . 2 . 0 6 0 0	Actuator Actair 3 to 200 with end- stops on closing (C)
R----- / 1 . . S B 3 . 2 . 0 6 0 0	Actair 3 to 200 with end- stops on opening (O)
R----- / 1 . . S B 4 . 2 . 0 6 0 0	Actair 400 to 1600
R----- / 1 . . T B 6 . 2 . 0 6 0 0	Dynactair 1,5 to 25 Air fail close (FMA)
R----- / 1 . . T B 7 . 2 . 0 6 0 0	Dynactair 1,5 to 25 Air fail open (OMA)
R----- / 1 . . T B 8 . 2 . 0 6 0 0	Dynactair 50 and 100 Air fail close (FMA)
R----- / 1 . . T B 9 . 2 . 0 6 0 0	Dynactair 50 and 100 Air fail open (OMA)
R----- / 1 . . T B J . 2 . 0 6 0 0	Dynactair 200 to 800 Air fail close (FMA)
R----- / 1 . . T B K . 2 . 0 6 0 0	Dynactair 200 to 800 Air fail open (OMA)
R----- / 1 . . T B L . 2 . 0 6 0 0	Actair NG 2 à 700
R----- / 1 . . T B M . 2 . 0 6 0 0	Dynactair NG 1 to 350 Air fail close (FMA)
R----- / 1 . . T B N . 2 . 0 6 0 0	Dynactair NG 1 to 350 Air fail open (OMA)
R----- / 1 . . S B W . 2 . 0 6 0 0	Double acting ¼- turn pneumatic actuator
R----- / 1 . . T B X . 2 . 0 6 0 0	Single acting ¼- turn pneumatic actuator
R----- / 1 . . S B Y . 2 . 0 6 0 0	Double acting linear pneumatic actuator
R----- / 1 . . T B Z . 2 . 0 6 0 0	Single acting linear pneumatic actuator
R----- / 1 . . . B . A 2 . 0 6 0 0	Fallback position Closing by lack of power (FMC)
R----- / 1 . . . B . B 2 . 0 6 0 0	Opening by lack of power (OMC)
R----- / 1 . . . B . C 2 . 0 6 0 0	Maintain in position due to lack of power (MPMC)

Codification	Designation
R----- / 1 . . . B . . 2 . 0 6 0 0	Smartronic function Intelligent positioner
R----- / 1 . . . B . . 2 D 0 6 0 0	Field bus Hart
R----- / 1 . . . B . . 2 . 0 6 0 0	Heating module Without
R----- / 1 . . . B . . 2 . 0 6 0 0	Visualization By porthole 3D
R----- / 1 . . . B . . 2 . 0 6 0 0	Configuration Without
R----- / 1 . . . B . . 2 . 0 6 0 0	Diagnosis Without

Distribution opportunities

Codification	Designation
R----- / S B 2 A	4/3 cf (POS) - Actair 3 to 200 "C" - FMC
R----- / S B 2 B	4/3 cf (POS) - Actair 3 to 200 "C" - OMC
R----- / S B 3 A	4/3 cf (POS) - Actair 3 to 200 "O" - FMC
R----- / S B 3 B	4/3 cf (POS) - Actair 3 to 200 "O" - OMC
R----- / S B 4 A	4/3 cf (POS) - Actair 400 to 1600 - FMC
R----- / S B 4 B	4/3 cf (POS) - Actair 400 to 1600 - OMC
R----- / T B 6 A	3/3 cf (POS) - Dynactair 1,5 to 25 - FMA - FMC
R----- / T B 7 B	3/3 cf (POS) - Dynactair 1,5 to 25 - OMA - OMC
R----- / T B 8 A	3/3 cf (POS) - Dynactair 50 and 100 - FMA - FMC
R----- / T B 9 B	3/3 cf (POS) - Dynactair 50 and 100 - OMA - OMC
R----- / T B J A	3/3 cf (POS) - Dynactair 200 to 800 - FMA - FMC
R----- / T B K B	3/3 cf (POS) - Dynactair 200 to 800 - OMA - OMC
R----- / T B L A	4/3 cf (POS) - Actair NG 2 to NG 700 - FMC
R----- / T B L B	4/3 cf (POS) - Actair NG 2 to NG 700 - OMC
R----- / T B L C	4/3 cf (POS) - Actair NG 2 to NG 700 - MPMC
R----- / T B M A	3/3 cf (POS) - Dynactair NG 1 to NG 350 FMA - FMC
R----- / T B N B	3/3 cf (POS) - Dynactair NG 1 to NG 350 - OMA - OMC
R----- / S B W	4/3 cf (POS) - Double acting ¼- turn actuator
R----- / T B X	3/3 cf (POS) - Single acting ¼- turn actuator
R----- / S B Y	4/3 cf (POS) - Double acting linear actuator
R----- / T B Z	3/3 cf (POS) - Single acting linear actuator

XI - Spare parts kit

Please, consult us

