User instructions
42813894
Ref. 8520.8061/2-EN

SMARTRONIC AS-i R1313

Positioner for pneumatic actuators

amri

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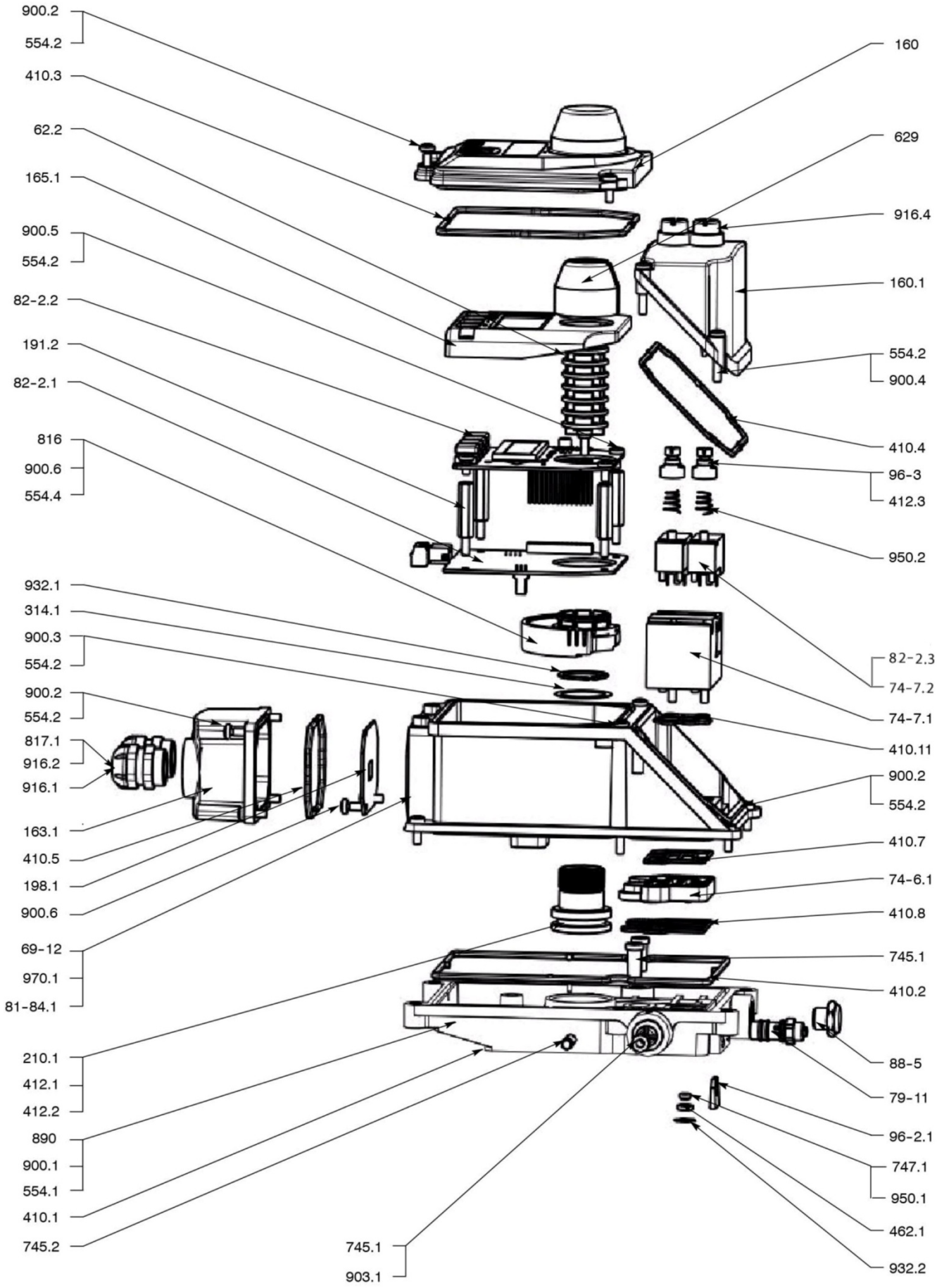
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410.8
745.1
410.2
88-5
79-11
96-2.1
747.1
950.1
462.1
932.2

Item	Designation	Materials
160	Cover	Polycarbonate SM60/0
160.1	Distributor cover	Polycarbonate SM60/0
163.1	Bonnet	Polycarbonate SM60/0
165.1	Bonnet	
191.2	Bonnet	Nickel plate brass
198.1	Connection plate	
210.1	Shaft	Polycarbonate SM60/0
314.1	Friction washer	Stainless steel 304L
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
410.11	Profile joint	NBR 70
412.1	O-ring	NBR 70
412.2	O-ring	NBR 70
412.3	O-ring	NBR 70
462.1	Conical washer	
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.4	Safety device	Steel
62.2	Sub- unit adjustable cam	
629	Sub- unit pointer	
69- 12	Case	Polycarbonate SM60/0
74- 6.1	Distribution plate	
74- 7.1	Pneumatic valve	
74- 7.2	Pilot	
745.1	Filter	
745.2	Filter	Bronze
747.1	Profile joint check valve	
79- 11	Flow control 1/8”	
81- 84.1	Wiring diagram	
816	Sub- unit angle sensor	
817.1	Packing gland	
82- 2.1	Printed circuit board	
82- 2.2	Printed circuit board	
82- 2.3	Printed circuit board electro valve	
88- 5	Silencer	Bronze
96- 2.1	Padlockable plate	Polycarbonate SM60/0
96- 3	Manual override	Polycarbonate SM60/0
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
903.1	Plug	
916.1	Screwed plug	
916.2	Protection plug	Rubber
916.4	Ball	Stainless steel
932.1	Circlip	Steel
932.2	Self- locking retaining ring	Steel
950.1	Valve spring	
950.2	Lockable override spring	Stainless steel
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 AS-i box:
The cover and housing 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
- if just one of the 2 cable glands is used, replace the unused cable gland with a watertight plug or seal the cable gland.

The pneumatic connection must be provided according to the product specification.
(see IV-I 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 AS-i box or its accessories when pressurised or powered up.

Always make sure that the actuator reservoirs are decompressed by actioning the push- buttons on the pilot emergency controls before disassembling the distributor, its solenoid valves or the unit itself.
Also, always check that the power supply are disconnected from their source before dismantling

During checks in the workshop or on site, the valve associated with the actuator and its SMARTRONIC AS-i shall be operated from full opening to full closing position.
This operation may be a highly significant injury hazard for personnel if the safety steps required are not taken to prevent access between the disc and the seat.

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I - Introduction

I – 1 General

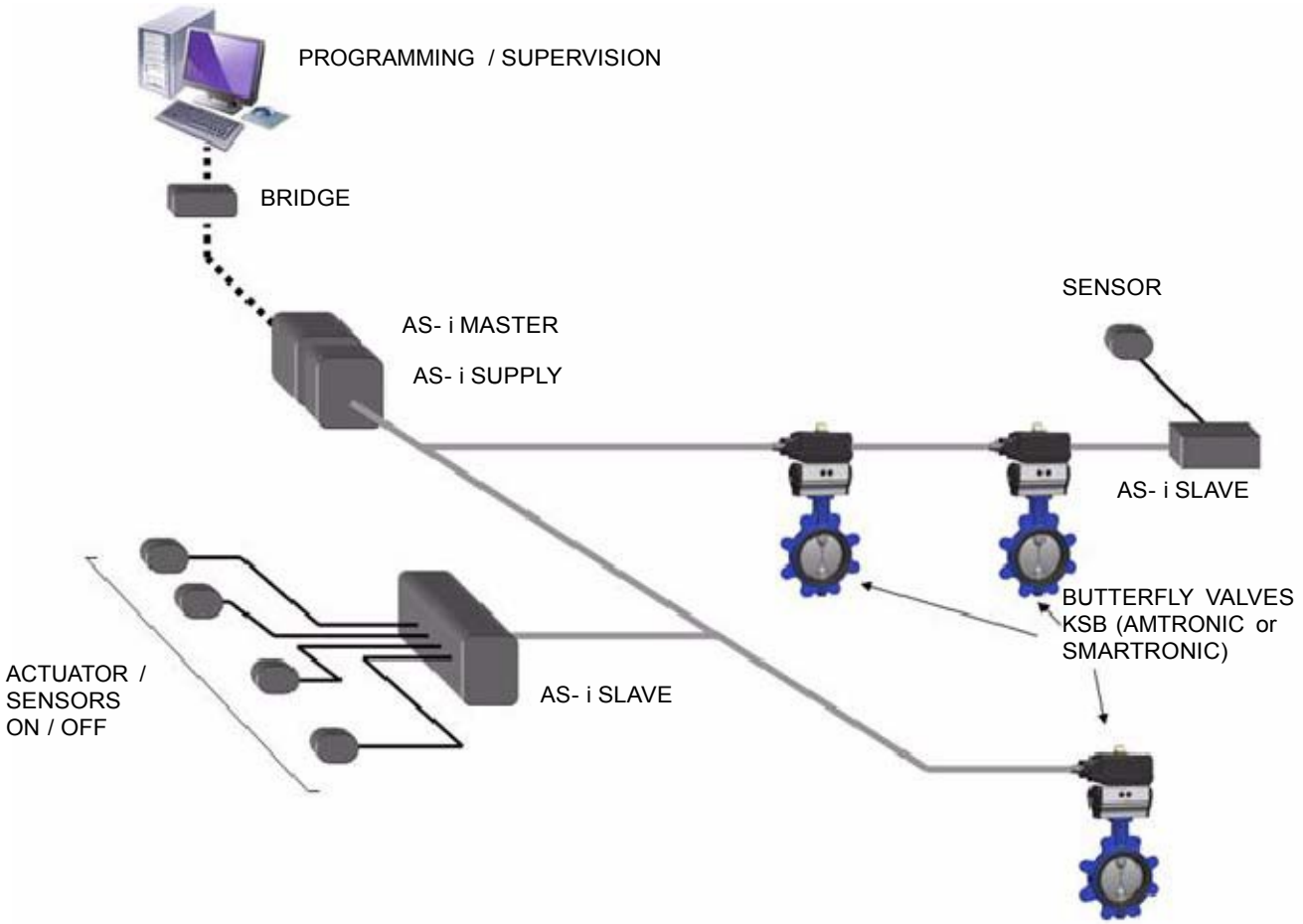
This manual describes the SMARTRONIC AS- i R1313 positioner. This device is designed to control the quarter- turn actuators of the ACTAIR and DYNACTAIR range by direct surface mounting on the standardised VDI/VDE 3845 interface. It provides both the direct pneumatic and mechanical link with the actuator chambers. The positioner can also be mounted on any other VDI/VDE 3845 actuator using an adapter kit (see §XI - Spare parts kit).

I - 2 The AS- i (Actuator Sensor- Interface) network

It is a Master/Slave type network : The PLC (master) receives control and sends cyclically the controls to each slave. This simple and robust network, mainly in the case of SMARTRONIC box, only uses the 2- wire cable to provide the power supply and carry the digital control data.

- The various parts of AS- i network:

  - Slaves including AS- i module for input/output
  - AS- i power supply.
  - Master AS- i (PLC) for the control and monitoring of slaves.



Topology	Linear and tree
Cable type	Cable with 2 unshielded wires (2 x 1,5 mm^2) for data transport and power supply of sensors and actuators (carrier current).
Cable length	100 m, extension possible to 300m by using repeaters.
Number of slaves	Amtronic : 31 (S- 3.0 profile) or 62 (S- B.A.E profile) Smartronic : 62 (S- 7.A.x.5 profile)
Access method	Cyclic polling on single master and slaves principle. Cycle time: 5 ms.
Addressing	Fixed and unique address in the slave, addressing via master possible.
Error protection	Identification and repetition of disturbed telegrams. Built- in watchdog with output power switched off in case of communication fault with the AS- i master.

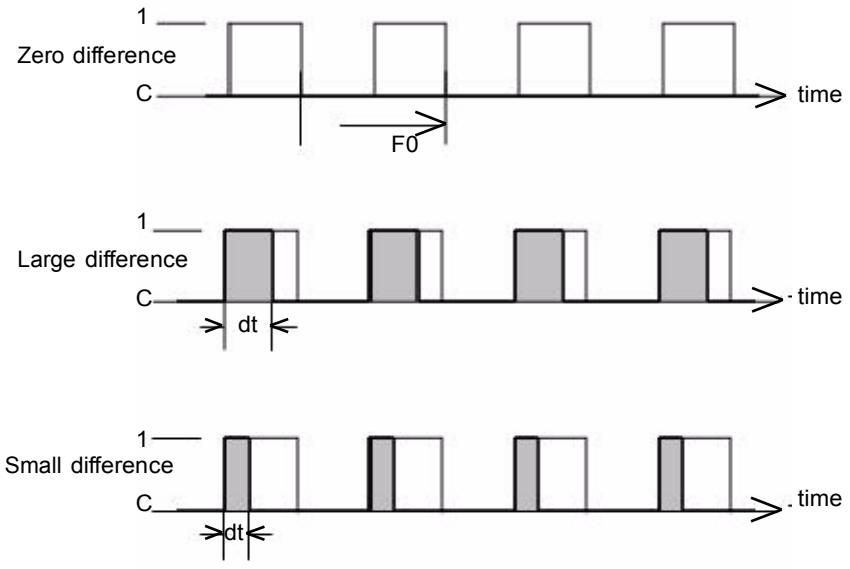
The AS- i master used with the Smartronic AS- i R1313 requires an AS- i M4 master profile as defined in the AS- i 3.0 specification.

I - 3 Operating principle

This device is a sequential digital positioner. It is equipped with a on/off 3- position center closed actuator control distributor with valves.
On loss of electrical power and in the case of lack of communication with a master AS- i, the valve moves to the safety position configured when ordering the SMARTRONIC AS- i positioner (opening, closing, stop).
The actuator is positioned by energising 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

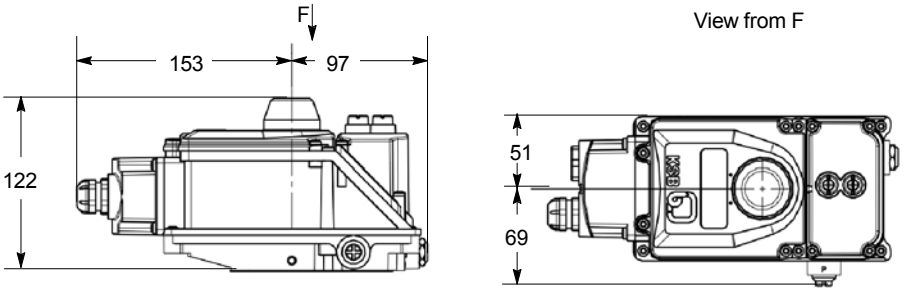
The control is of the PWM (Pulse Width Modulation) type. Using a fixed basic frequency (Fo), the principle consists in modulating the pulse width according to the position/setpoint difference.



I - 4 Technical Characteristics

Environment	
Standard protection class	IP 67 according to EN 60529
Electromagnetic Compatibility	Complies with European directive 2004/108/CE according to standards NF EN 61000- 6- 2 and 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
Box	
Material	PC 20% Fiberglass
Position signaling	By visible pointer on the cover
Pneumatic connection	2 times 1/4" gas
Electric connection	2 cable glands accepting a wire diameter 6 to 12 mm.
Internal connectors	Accepts flexible conductors with end connector and with insulating entry cone of cross-section 0,25 mm ^{2}(23 AWG) to 0,5 mm ^{2}(20 AWG)
Weight	1,70 Kg
Pneumatic distribution	
Pressure connection	Port "P" equipped with an internal filter
Exhaust connection	Port "E" equipped with a silencer or connectable to exhaust network
Operating pressure	3 to 8 bar (30 to 115 psi)
Filtration level	ISO 8573-1 (2001) Class 7 (< 40 μm)
Dew point	ISO 8573-1 (2001) Class 5 (<7 °C and in all cases <5 °C at ambient temperature)
Lubrification	ISO 8573-1 (1991) Class 5 (< 25mg/m^3)
Maximum flow rate	400 Nl/min
Consumption when idle	none
AS-i network	
Electric consumption	4 W maximum
Electric supply	By AS- i network (26.5 VDC to 31.5 VDC)
Profile	S- 7.A.x.5
Maximum quantities of slaves	62
Specifications	V3.0 (compatible with AS- i masters M4 and later)

Dimensions (mm)



II - Assembly on pneumatic actuator

II - 1 ACTAIR 3 to 200 and DYNACTAIR 1.5 to 100

A- Check that the actuator (ACTAIR / DYNACTAIR) has both plugs (item 1) on the external supply holes.

B- Remove the two communication screws with seals (item 2) (TORX T20 screwdriver)3

C- Loosen 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 its two seals (item 9).

E- Fix the base (item 5) to the actuator (ACTAIR / DYNACTAIR) with the 4 screws (item 6) (TORX T20 screwdriver).

Tightening torque = 2 Nm

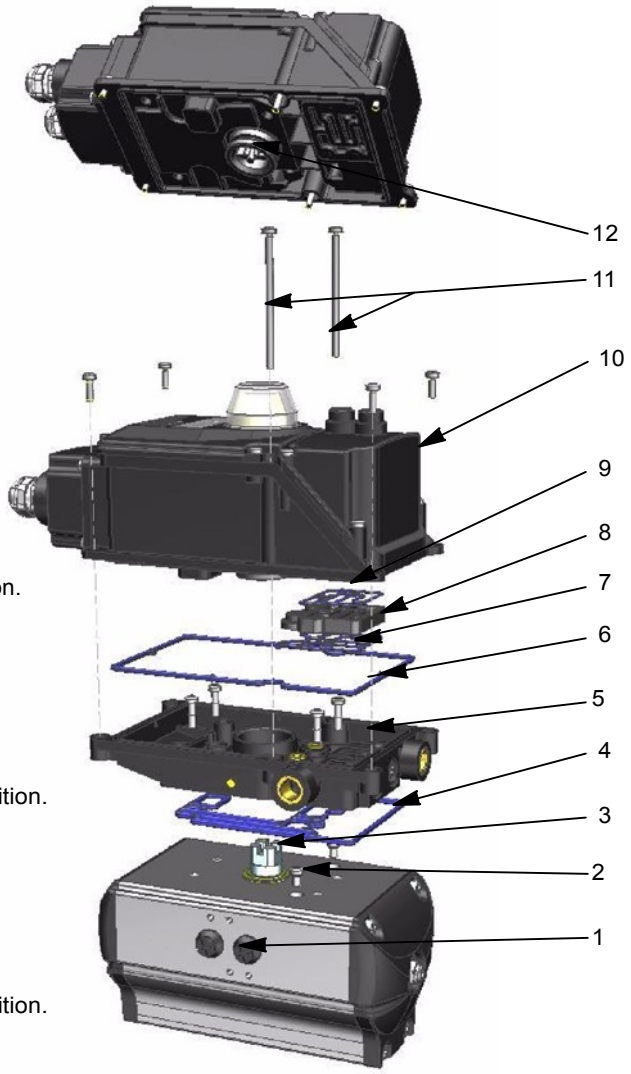
Check that the seal (item 4) is in the correct position.

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

Check that the seals (item 9) are in the correct position.

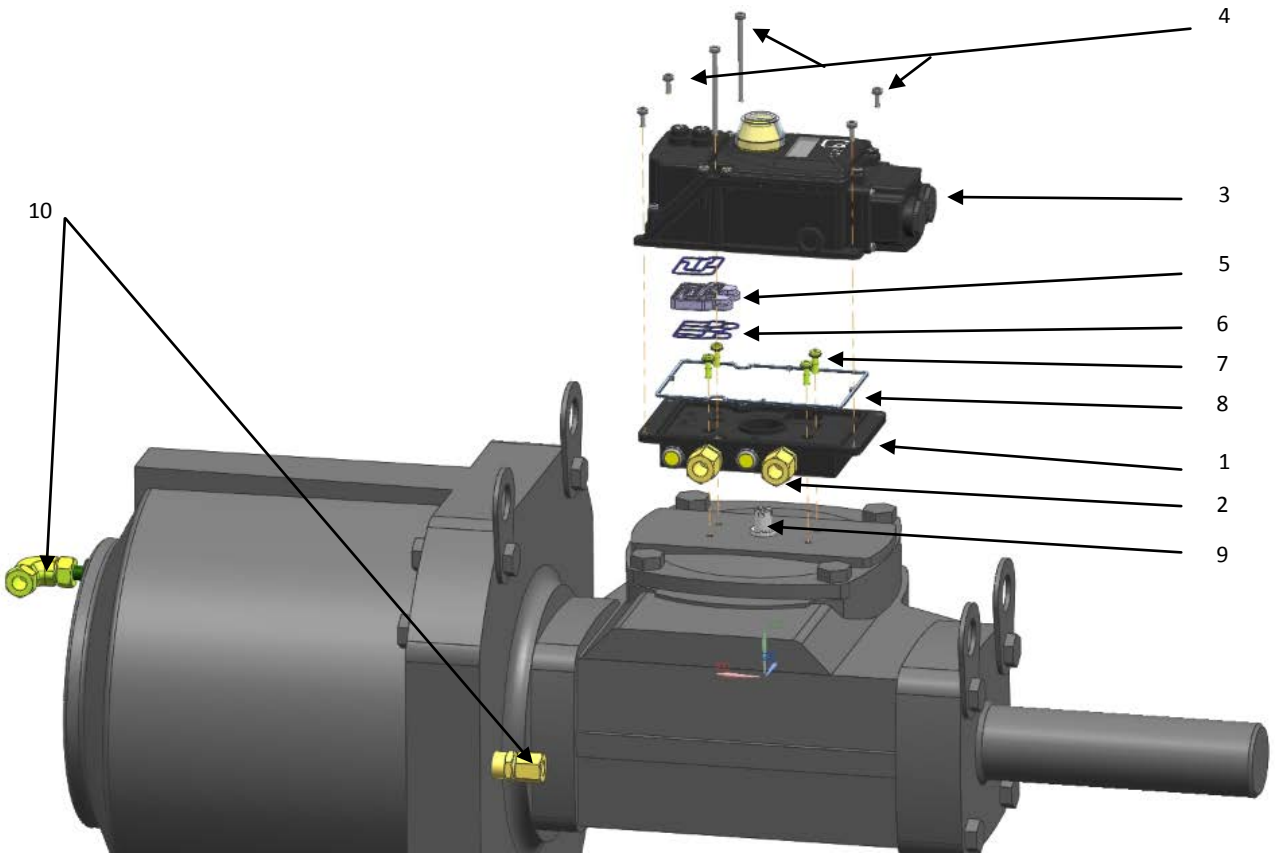
G- the unit (item 10) on the base (item 5) taking care to engage the column (item 12) with the actuator shaft (item 3).

Check that the seals (item 7) are in the correct position.



II - 2 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)

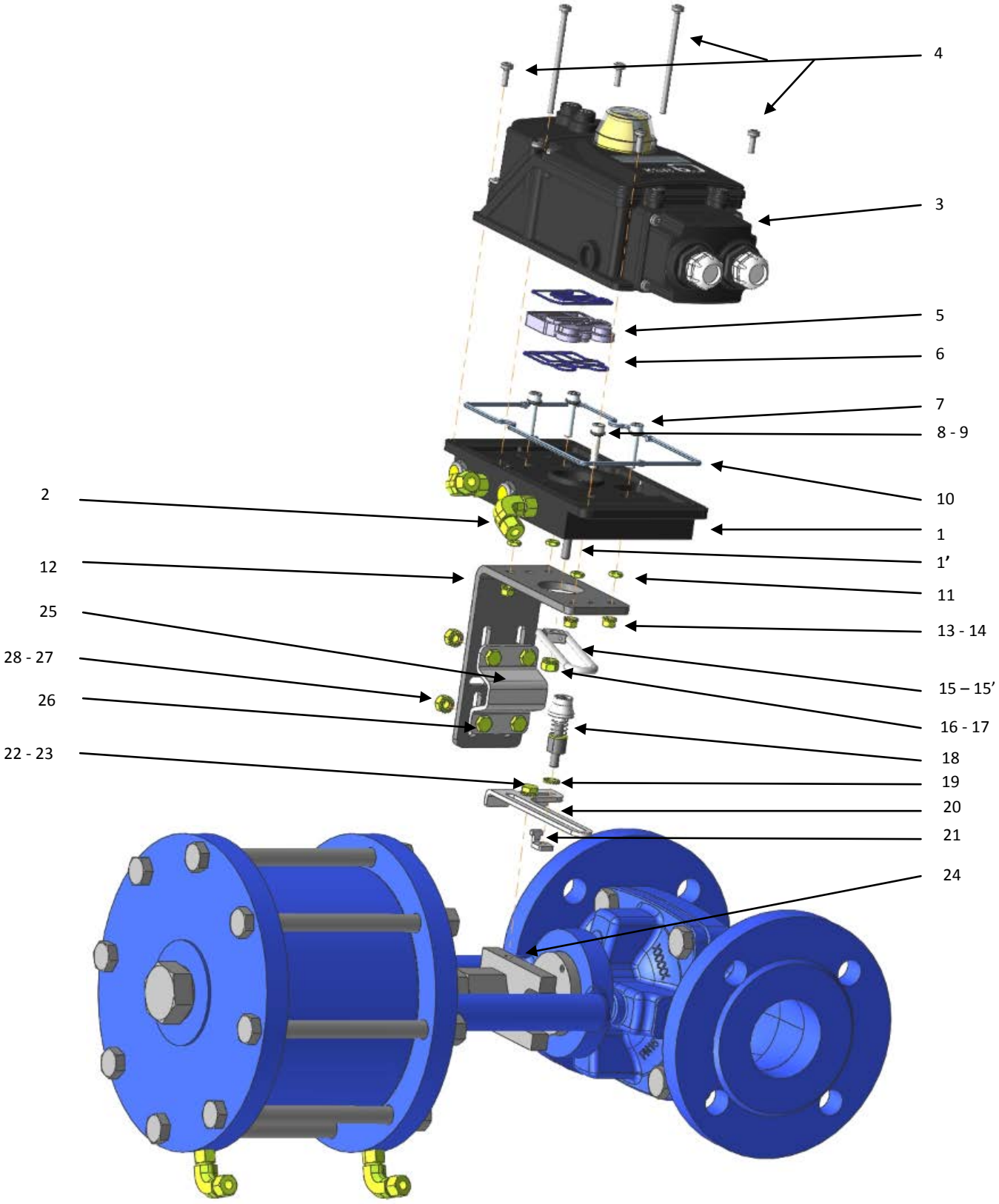
E – Reposition distribution plate A or B (item 5) with its two seals (item 6)

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 - 3 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 (item19) on the plate (item 20) by tightening it onto the counterplate (item 21)

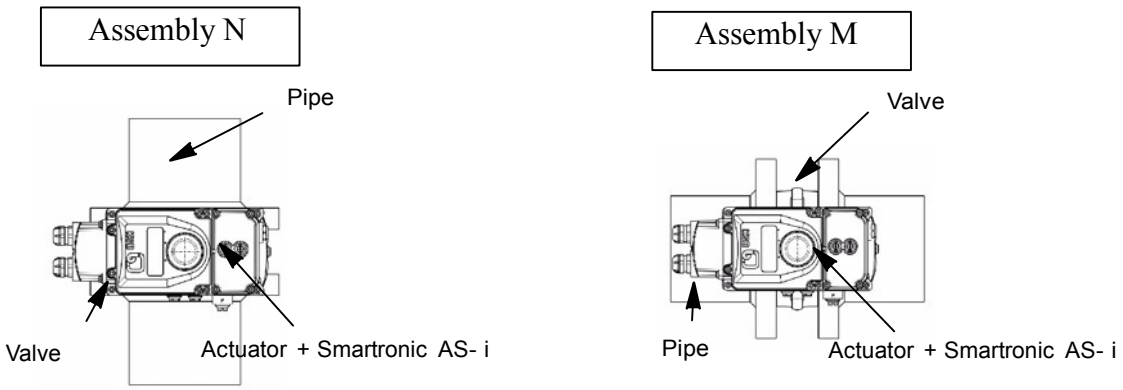
K – Fix the assembled plate (item 20) onto the valve slider (item 24) with the screws (item 22) and washers (item 23).

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 AS- i/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.

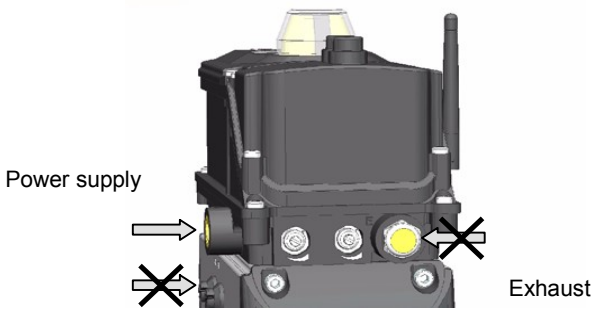


IV - Pneumatic supply

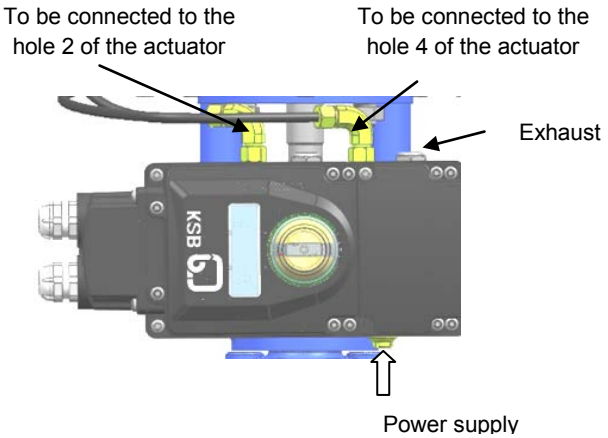
IV - 1 Pneumatic connection

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.

Direct pneumatic connection



Pneumatic connection by piping



- The connection is made on the SMARTRONIC AS- i box.
- Operating pressure: 3 to 8 bars
- pressure connection: hole ”P”
- Exhaust connection: port marked ”E” equipped with a silencer or connectable to an exhaust network.

<u>Caution</u>: When used as a position regulator, use air lubricated between 5 and 25 mg/m^3 to prevent premature wear of the actuator mechanical parts.

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 auto-calibration to be carried out correctly.

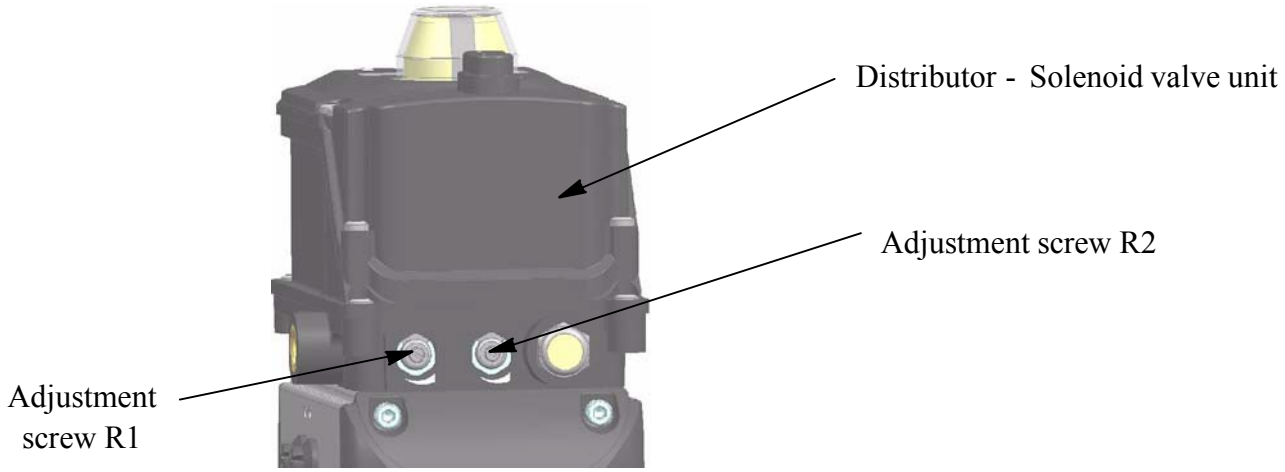
The valve operating time can be adjusted using the adjustment screws located on the side of the base, beside the exhaust hole. Adjustment is carried out directly with a 4 mm flat screwdriver.

Procedure :
- Adjust the adjustment screws depending on the type of actuator used.
- Restart auto-calibration

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



ACTAIR 3 to 200		R1	R2
Stop on closing (standard version)		Closing time	Opening time
Stop on opening (on request)		Opening time	Closing time
DYNACTAIR 1.5 to 100	Safety position on loss of pneumatic supply	R1	R2
DYNACTAIR 1.5 to 25	Closing	Closing time	Opening time
DYNACTAIR 50 and 100	Opening		
DYNACTAIR 1.5 to 25	Opening	Opening time	Closing time
DYNACTAIR 50 and 100	Closing		

IV - 3 Use of emergency manual controls

Note: The emergency manual controls are only availables when the SMARTRONIC AS- i box uses 2 solenoid valves£ normally closed:

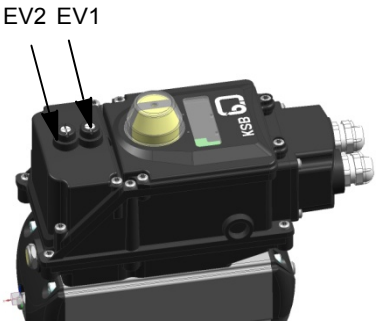
Case N° 1:
- ACTAIR 3 to 200, end- stops on closing
- DYNACTAIR 1.5 to 25, closing by air failure, end- stops on closing
- DYNACTAIR 50, opening by air failure, end- stops on opening.

Safety position on loss of electrical supply	EV1=0 EV2=0	EV1=1 EV2=0	EV1=0 EV2=1
STOP (stays in position)	STOP (stays in position)	Closed	Open
Closed	Emergency manual controls not available		
Open			

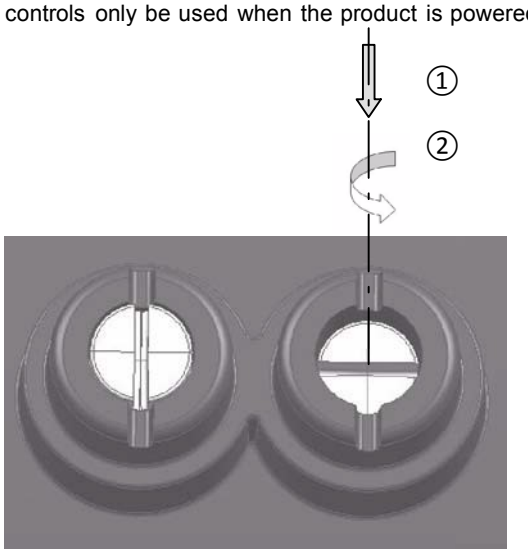
Case N° 2:
- ACTAIR 3 to 200, end- stops on opening
- DYNACTAIR 1.5 to 25, opening by air failure, end- stops on opening
- DYNACTAIR 50, closing by air failure, end- stops on closing.

Safety position on loss of electrical supply	EV1=0 EV2=0	EV1=1 EV2=0	EV1=0 EV2=1
STOP (stays in position)	STOP (stays in position)	Open	Closed
Closed	Emergency manual controls not available		
Open			

External emergency controls can be used to operate the solenoid valves manually.



To avoid any interference with the solenoid valve electrical controls, it is recommended that emergency controls only be used when the product is powered off.



EV2 = 0 EV1 = 1

The emergency controls are fitted with a locking mechanism. To activate the emergency control:

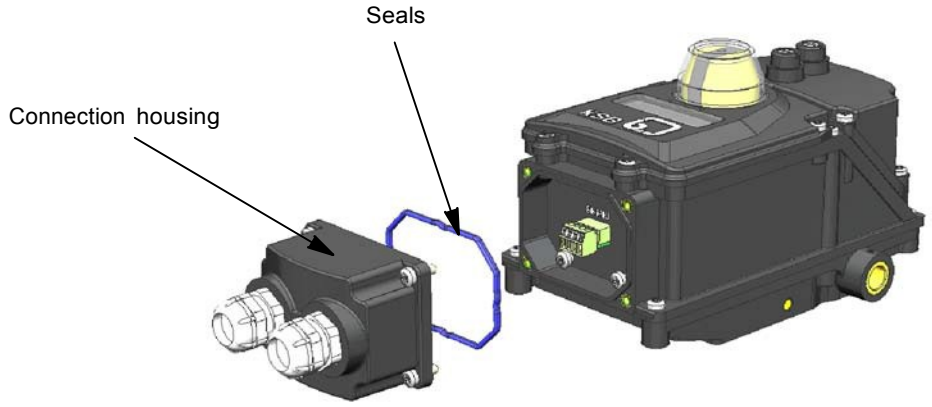
① Push the emergency control

② Rotate through 90° to lock into position.

V - Electric connections

V - 1 Connection housing

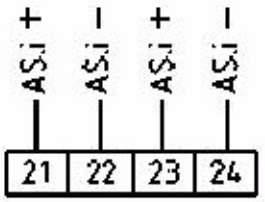
To access the electric connection terminal block, unscrew the 4 TORX screws (T 20) in the connection housing
Tightening torque: 2 Nm



V - 2 Connection to the AS- i network

The SMARTRONIC AS- i R1313 positioner is powered by the AS-i network (not need a electrical supply).

Maximum electric Consumption 4 W.



VI - AS-i communication

VI - 1 AS-i master

The AS-i master used with the SMARTRONIC AS-i R1313 requires an **AS-i M4 master profile as defined in the AS-i 3.0 specification.**

An AS-i M3 master (according to the AS-i 2.1 specification) cannot be used with the SMARTRONIC AS-i R1313.

VI - 2 SMARTRONIC AS-i R1313

VI - 2 - 1 Slave profile

The SMARTRONIC AS-i R1313 has an S-7.A.*.5 profile. It is a slave with an extended addressing mode as defined by the AS-i 3.0.2 specification. Up to 62 slaves of this type can be connected to the AS-i network.

VI - 2 - 2 Slave address

The SMARTRONIC AS-i R1313 is shipped with address 0.
To communicate with the AS-i master, the SMARTRONIC AS-i R1313 must be configured with an address chosen between 1-A and 31-B.

VI - 2 - 3 Data exchange

- On/Off inputs/outputs

The On/Off input/output bits are used as follows (refresh time < 10ms)

Input Data Image (IDI) :				
Value	Bit 4 (DI3)	Bit 3 (DI2)	Bit 2 (DI1)	Bit 1 (DI0)
0	Spare	Spare	Valve not open	Valve not closed
1	Spare	Spare	Valve open	Valve closed

Output Data Image (ODI) :				
Value	Bit 4 (DO3)	Bit 3 (DO2)	Bit 2 (DO1)	Bit 1 (DO0)
0	Spare	Not used	Spare	Spare
1	Spare	Not used	Spare	Spare

- Analog inputs/outputs

Using the CTT2 communication protocol, 1 input word and 1 output word are exchanged for the analog input/output information.

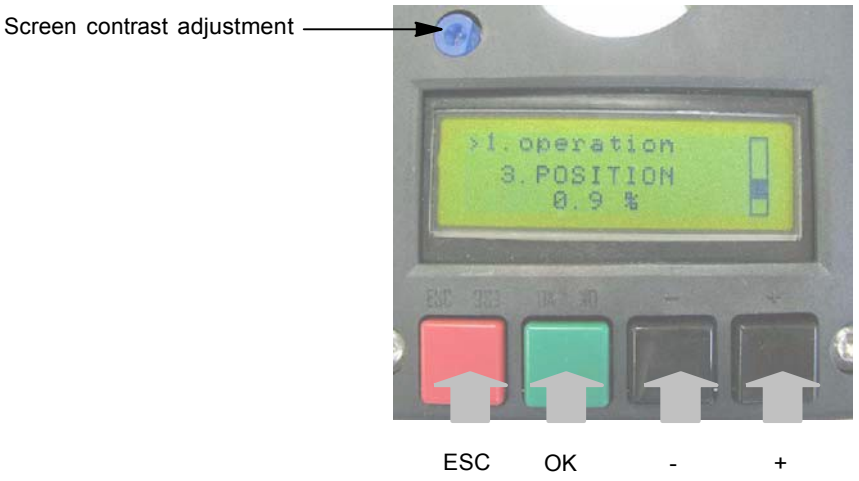
The analog variables are exchanged cyclically as follows (full duplex communication, 50 bauds in each direction)

Analog Input Data Image (AIDI) :	
Byte 0	Valve position (0,0 ... 100,0%; 0 ...255)
Byte 1	Diagnostic information: Bit 0: Operating mode (0: Local; 1: Auto) Bit 1: Auto-calibration in progress? (0 : No; 1: Yes) Bit 2: Internal fault? (0: Yes; 1: No) Bit 3: Not used

Analog Output Data Image (AODI) :	
Byte 0	Valve position setpoint (0,0 ... 100,0%; 0 ...255)
Byte 1	Diagnostic information: Bit 0: Not used Bit 1: Start of auto-calibration (0 → 1) Bit 2: Not used Bit 3: Not used

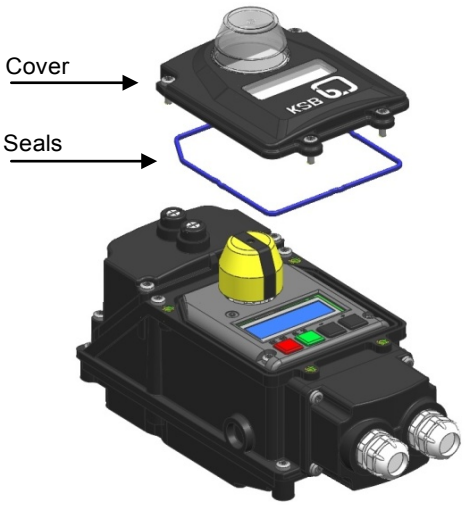
VII - Local user interface

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

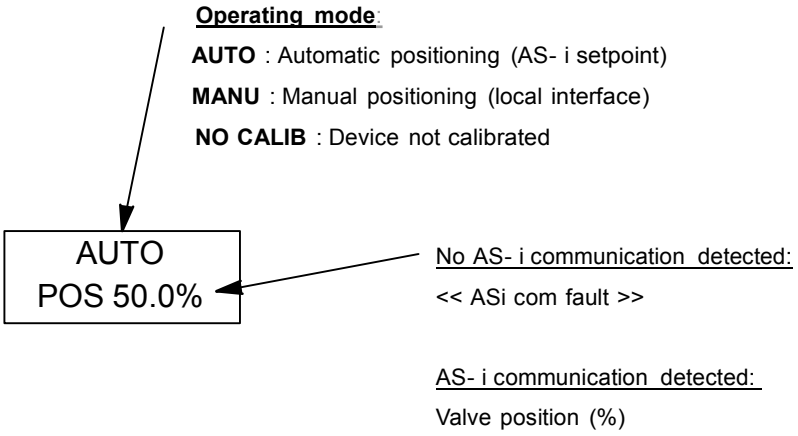


VII - 1 Cover

To access the local user interface or the cam adjustment, unscrew the 4 TORX screws (T 20) in the cover.
Tightening torque: 2 Nm

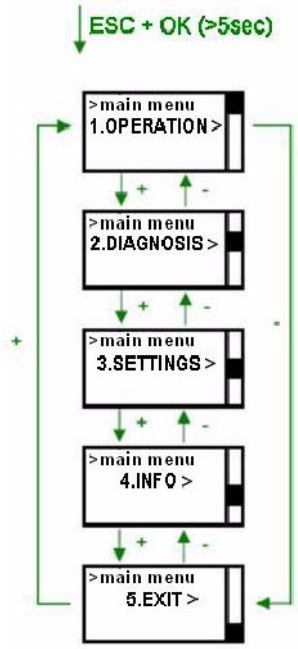


VII - 2 Main screen:

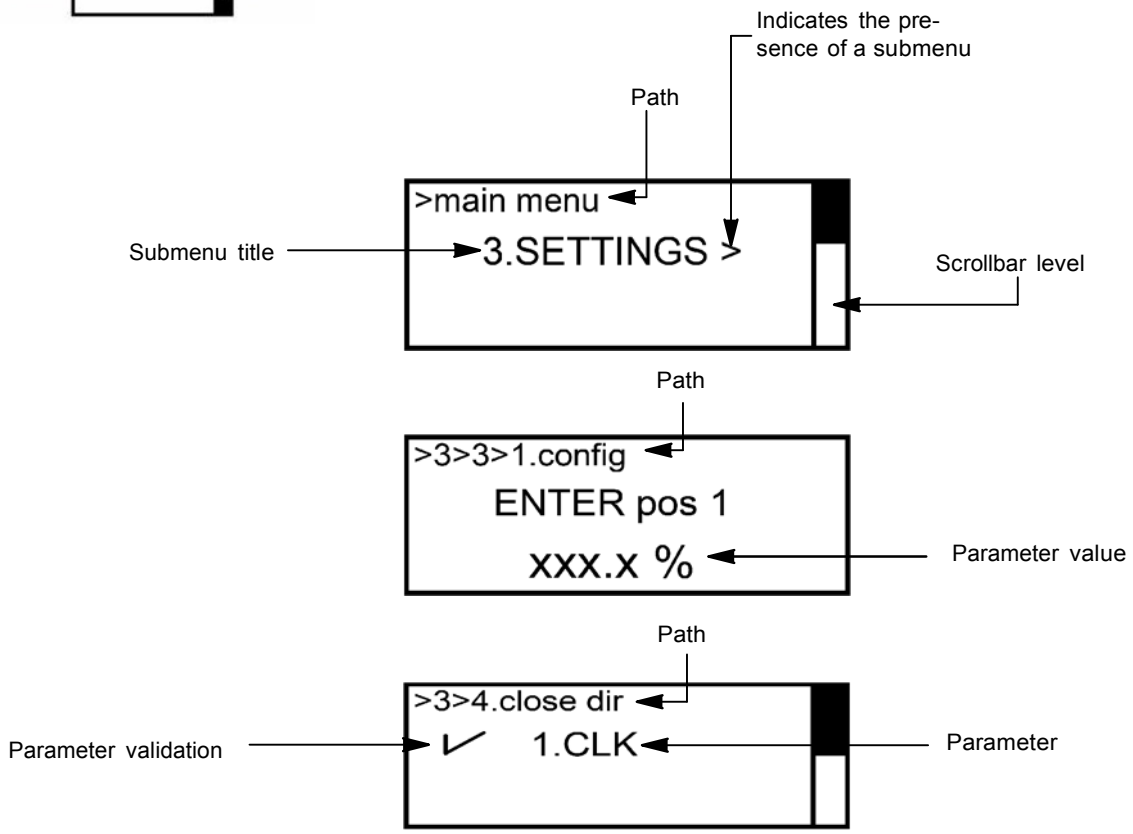


If the device has never been calibrated, the value of the position sensor in encoder steps is displayed (SSR).

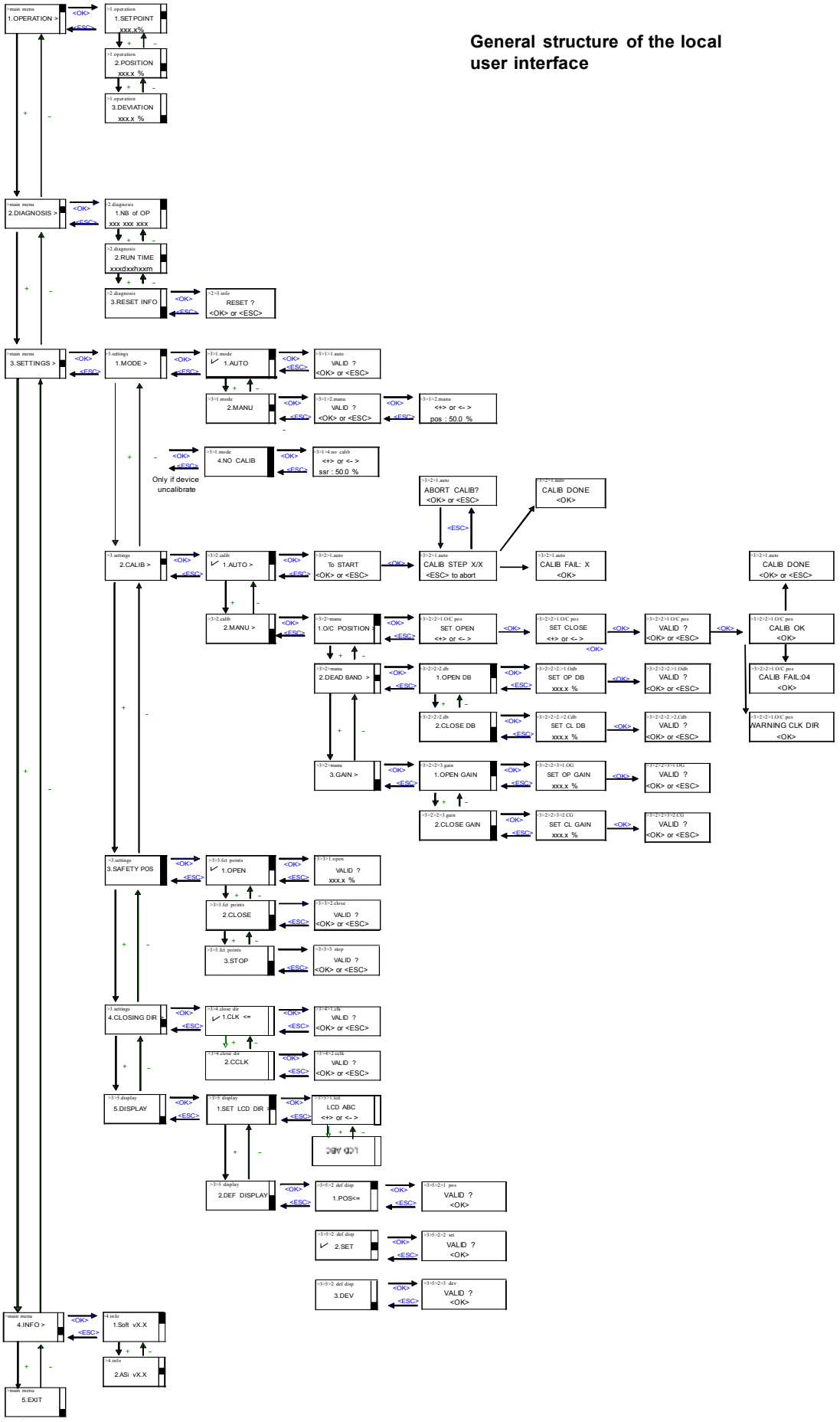
VII - 3 Submenu screen



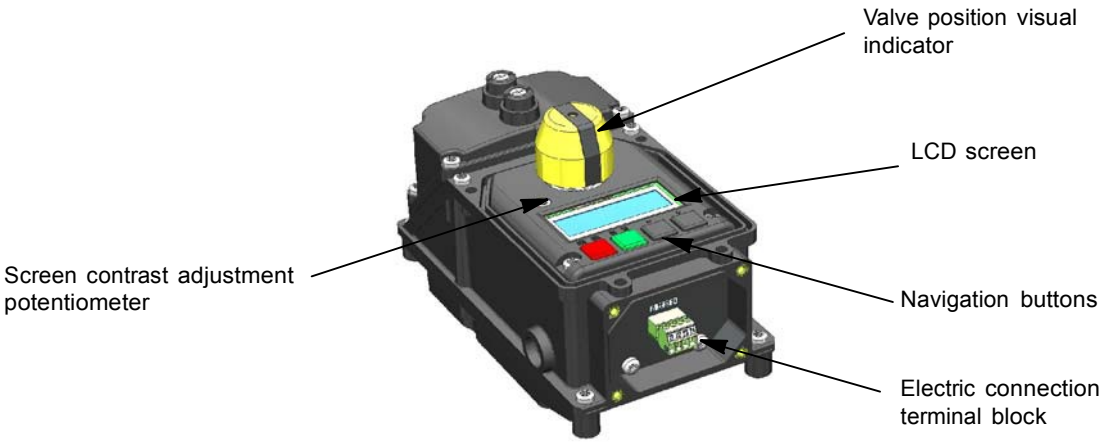
To access the submenus:
- Press buttons <OK> and <ESC> simultaneously for 5 seconds.
- Navigate with the <+> and <-> buttons.
- Validate with <OK>.
- Cancel with <ESC>.



General structure of the local user interface



VIII - Implementation of Smartronic AS-i R1313



VIII - 1 Powering up

The screen lights up when the SMARTRONIC AS- i R1313 is connected to an AS- i network.

As soon as the main screen is displayed (after the KSB code), the SMARTRONIC MA is ready to operate.

VIII - 2 Auto-calibration

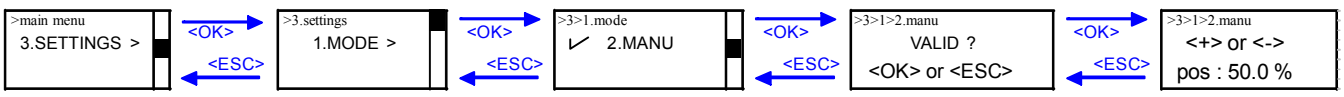
VIII - 2 - 1 Adjusting the angle sensor stroke

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 auto-calibration.



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

VIII - 2 - 2 Starting auto-calibration

Autocalibration must be carried out in the following cases:

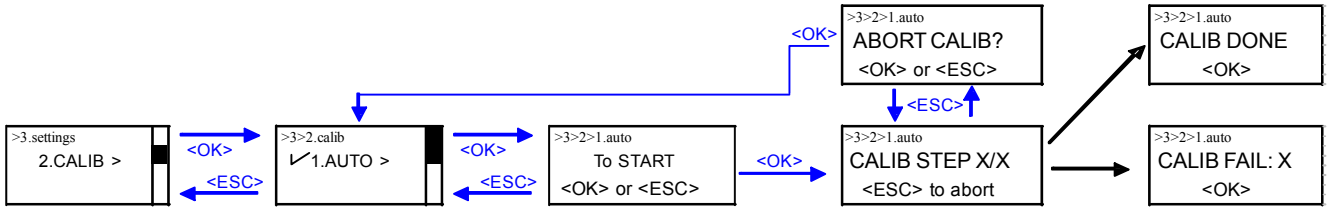
- **first time use of the positioner**
- **modification of the actuator mechanical stops**
- **modification of the mechanical adjustment of the operating time**
- **modification of an external parameter that could affect the device positioning performance**

The AS-i SMARTRONIC R1313 executes an automatic self-calibration procedure that allows to obtain quickly the optimal setting of the positioner directly on the actuator.
It allows to:

- Calibrate the angle sensor,
- Calculate and store gains, sensitivity and deadband for the opening and closing operations.

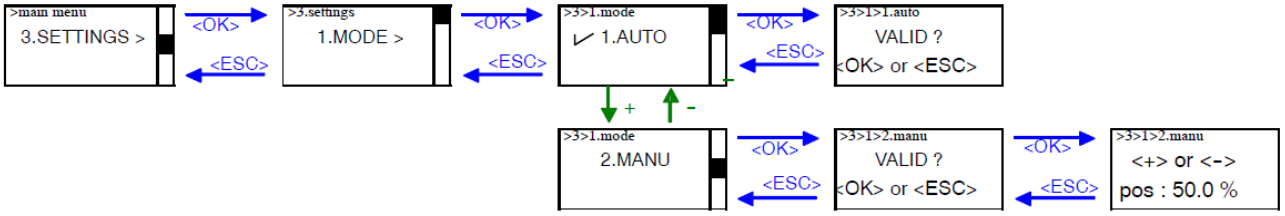
These parameters will be retained in case of switching off the power supply.

Opening and closing times of at least 0.5 s must be respected (see chapter IV - 2 Mechanical adjustment of the operating time)



VIII - 3 Operating mode

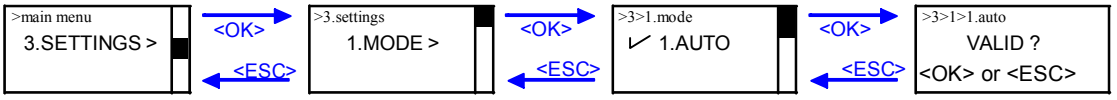
SMARTRONIC AS-i supports two operating modes: automatic (AUTO) and manual (MANU).



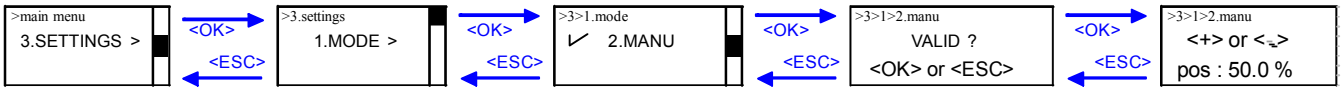
VIII - 3 - 1 Automatic mode (AUTO)

SMARTRONIC AS- i R1313 regulates the position of the valve according to AS- i setpoint.
This is the normal operating mode of the positioner.

To define the set of AS- i positioner, refer to Chapter V- 2- 3 Exchange data.



VIII - 3 - 2 Manual mode (MANU)



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.

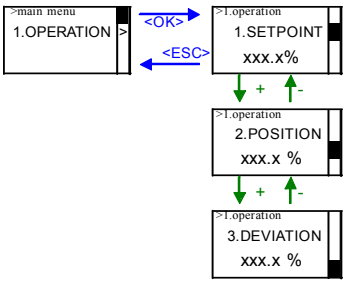
Actions	Events
Press [-] (< 3seconds)	Stepping movement in the closing direction
Press [-] (> 3seconds)	Continuous movement in the closing direction
Press [+] (< 3seconds)	Stepping movement in the opening direction
Press [+] (> 3seconds)	Continuous movement in the opening direction

VIII - 4 Other function of the SMARTRONIC AS-i R1313 positioner

VIII - 4 - 1 Displaying positioning data

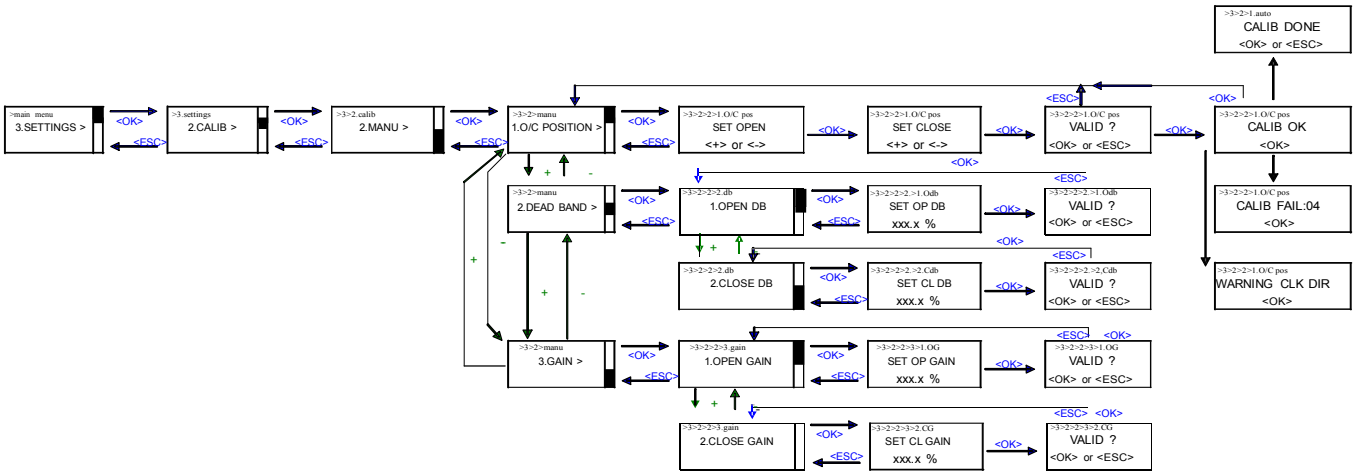
The SMARTRONIC AS-i R1313 allows read only access to the values required for its positioning, via the <<OPERATION>> menu.
- << SETPOINT>> indicates as a % the valve positioning AS-i setpoint.
- << POSITION>> indicates as a % the instantaneous value of the valve position.
- << SETPOINT>> indicates as a % the error between the setpoint and the instantaneous position of the valve.

Access to these parameters:



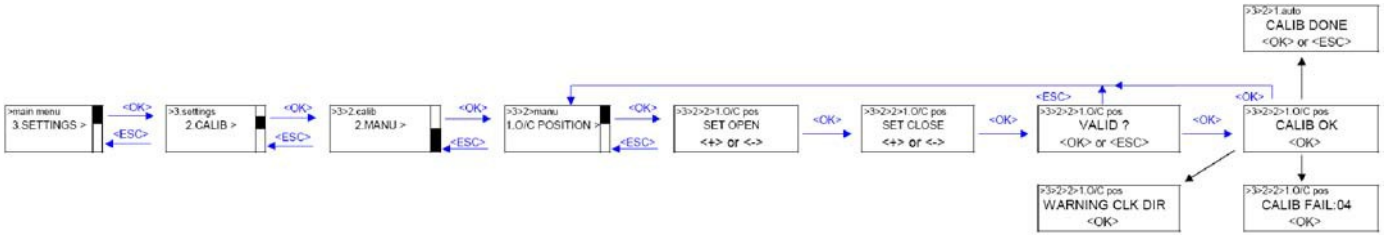
VIII - 4 - 2 Manual calibration

Once the first autocalibration has been carried out, the operator can access the gain, dead band (DB) and positioning stroke values (O/C POSITION)



VIII - 4 - 2 - 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>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>2>1.O/C pos SET CLOSE <+> or <->

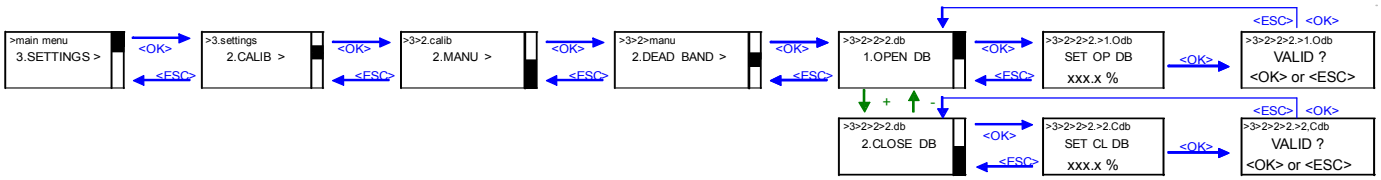
Close the valve (by pressing <+> or <->) up to the closing mechanical stop. Then validate (<OK>)

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.

VIII - 4 - 2 - 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.



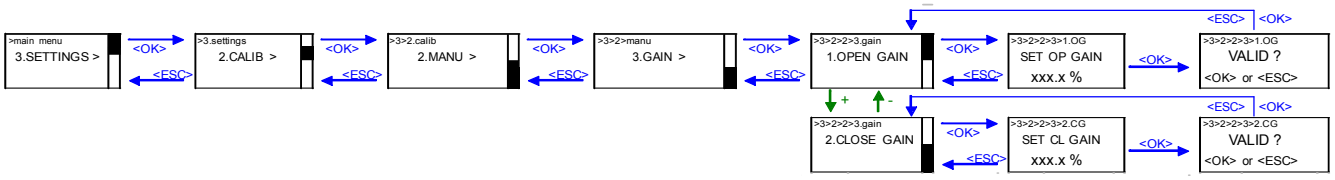
OPEN DB only acts when the valve is moving in the opening direction.
CLOSE DB only acts when the valve is moving in the closing direction.

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).

VIII - 4 - 2 - 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.

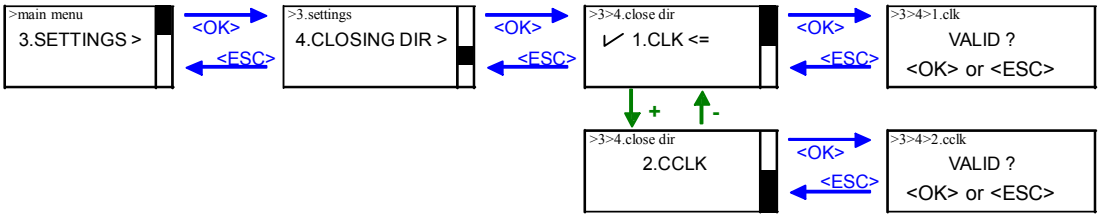
Autocalibration calculates the optimum gain parameters (best response time/stability compromise).

VIII - 4 - 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.

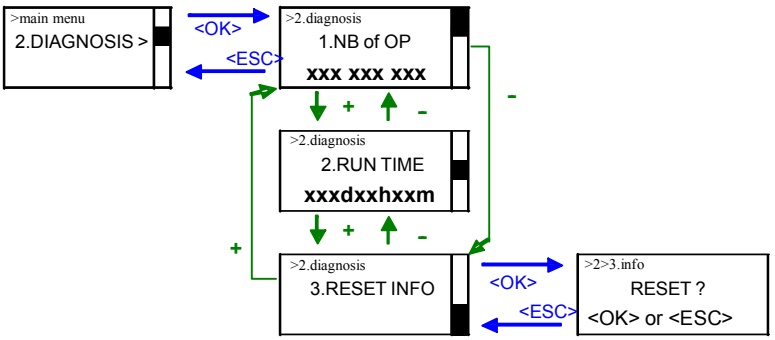
Access to these settings:



VIII - 4 - 4 Product diagnosis

The SMARTRONIC AS- i 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:

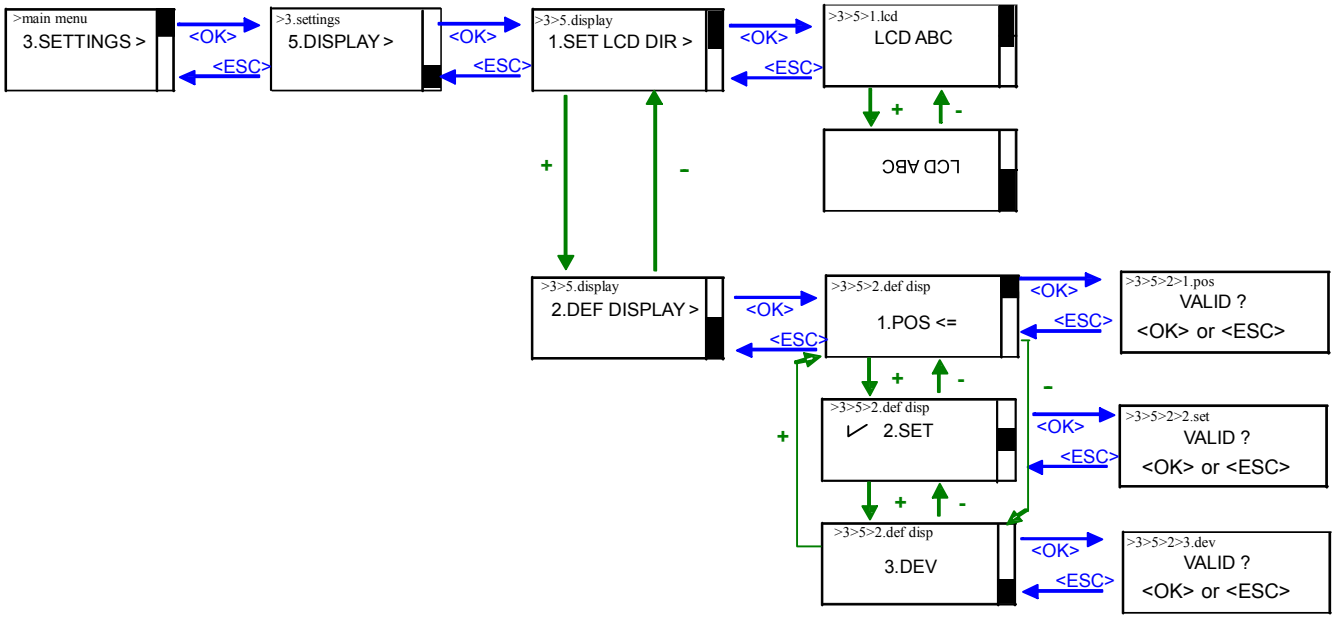


VIII - 4 - 5 Configuring the main screen display

The main screen of SMARTRONIC AS- i allows to display a parameter chosen by the operator from: the valve position in % (POS), the set value in % (SET), the positioning error in % (DEV)
This adjustment is done via the sub- menu ”DEF 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:



IX - Operating faults - Causes and solutions

Operating faults	*Causes*	*Corrections*
One or more solenoid valves are energized but the actuator does not move.	- Insufficient drive air pressure. - Drive air pressure too high (P > 8 bar). - Drive air pressure too low (P < 3 bar). - Valve blocked. - Actuator blocked or destroyed. - Distributor clogged by impurities	- Check the pneumatic supply. - Check and restore pressure P. - Check and restore pressure P. - Check that the valve can move freely. - Change the actuator. - Change the inlet filter.
Solenoid valves unstable, surging.	- SMARTRONIC AS-i not calibrated. - Mechanical adjustment (set screws) of the operating time too fast.	- Run self- calibration using the MMI. - Carry out a mechanical adjustment to make the operating time longer, then run self-calibration For optimum operation: closing time = opening time.
The SMARTRONIC AS- i unit is not responding to any control	- The unit is not being powered correctly (no LED illuminated on the card). - The SMARTRONIC AS-i is not communicating correctly with the AS-i master.	- Check the connector wiring and the power supply voltage. - Check the configuration for the AS- i master and its compatibility with the specification AS- i v3.0 (AS- i master M4).

Man Machine interface		
The valve position displayed on the screen does not correspond to its actual position.	- The SMARTRONIC AS-i unit angular sensor is not calibrated. - The angular sensor is faulty.	- Calibrate the sensor automatically using the SMARTRONIC AS-i software. - Check that the angular sensor resistance value varies linearly between opening and closing.

X - Codes

Codification	Designation
	Unit type
R001313 / 0 0 0 0 0 0 . R 7 . . 2 1 0 6 0 0	SMARTRONIC AS-i
	Detection
R------ / **0 0 0 0** 0 0 0 R 7 . . 2 1 0 6 0 0	Self-calibration
	Detection position
R------ / 0 0 0 0 **0** 0 0 R 7 . . 2 1 0 6 0 0	End stop reconstituted
	Feedback position
R------ / 0 0 0 0 0 **0** 0 R 7 . . 2 1 0 6 0 0	Without
	Electrical output
R------ / 0 0 0 0 0 0 **0** R 7 . . 2 1 0 6 0 0	With plug
R------ / 0 0 0 0 0 0 **1** R 7 . . 2 1 0 6 0 0	2 plastic packing glands M20 IP67 (dia. 6 to 12)
R------ / 0 0 0 0 0 0 **2** R 7 . . 2 1 0 6 0 0	2 metallic packing glands M20 IP67 (dia. 6 to 12)
	Pneumatic valve
R------ / 0 0 0 0 0 0 . **R** 7 . . 2 1 0 6 0 0	4/3 double- acting centre closed - position (POS)
	Pneumatic valve voltage
R------ / 0 0 0 0 0 0 . R **7** . . 2 1 0 6 0 0	24 Vdc
	Actuator
R------ / 0 0 0 0 0 0 . R 7 **2** . 2 1 0 6 0 0	Actair 3 to 200 with end - stops on closing (C)
R------ / 0 0 0 0 0 0 . R 7 **3** . 2 1 0 6 0 0	Actair 3 to 200 with end - stops on opening (O)
R------ / 0 0 0 0 0 0 . R 7 **4** . 2 1 0 6 0 0	Actair 400 to 1600
R------ / 0 0 0 0 0 0 . R 7 **6** . 2 1 0 6 0 0	Dynactair 1,5 to 25 Closing by air failure (CAF)
R------ / 0 0 0 0 0 0 . R 7 **7** . 2 1 0 6 0 0	Dynactair 1,5 to 25 Opening by air failure (OAF)
R------ / 0 0 0 0 0 0 . R 7 **8** . 2 1 0 6 0 0	Dynactair 50 to 100 Closing by air failure (CAF)
R------ / 0 0 0 0 0 0 . R 7 **9** . 2 1 0 6 0 0	Dynactair 50 to 100 Opening by air failure (OAF)
R------ / 0 0 0 0 0 0 . R 7 **A** . 2 1 0 6 0 0	Dynactair 200 to 800 Closing by air failure (CAF)
R------ / 0 0 0 0 0 0 . R 7 **B** . 2 1 0 6 0 0	Dynactair 200 to 800 Opening by air failure (OAF)
R------ / 0 0 0 0 0 0 . R 7 **W** . 2 1 0 6 0 0	Double acting 1/4 turn pneumatic actuator
R------ / 0 0 0 0 0 0 . R 7 **X** . 2 1 0 6 0 0	Single acting 1/4 turn pneumatic actuator
R------ / 0 0 0 0 0 0 . R 7 **Y** . 2 1 0 6 0 0	Double acting linear pneumatic actuator
R------ / 0 0 0 0 0 0 . R 7 **Z** . 2 1 0 6 0 0	Single acting linear pneumatic actuator
	Fallback position
R------ / 0 0 0 0 0 0 . R 7 . **A** 2 1 0 6 0 0	Closing by current failure (CCF)
R------ / 0 0 0 0 0 0 . R 7 . **B** 2 1 0 6 0 0	Opening by current failure (OCF)
R------ / 0 0 0 0 0 0 . R 7 . **C** 2 1 0 6 0 0	Held in position by current failure (HPCF)
	SMARTRONIC function
R------ / 0 0 0 0 0 4 . R 7 . . **2** 1 0 6 0 0	Intelligent positioned

Codification	Designation
	Field bus
R------ / 0 0 0 0 0 0 . R 7 . . 2 **1** 0 6 0 0	AS-i S-7.A*.5
	Heating module
R------ / 0 0 0 0 0 0 . R 7 . . 2 1 **0** 6 0 0	Without
	Visualisation
R------ / 0 0 0 0 0 0 . R 7 . . 2 1 0 **6** 0 0	By window 3D
	Configuration
R------ / 0 0 0 0 0 0 . R 7 . . 2 1 0 6 **0** 0	Without
	Diagnosis
R------ / 0 0 0 0 0 0 . R 7 . . 2 1 0 6 0 **0**	Without

Distribution possibilities

Codification	Designation
4/3 distributor centre closed	
R------ / . . . . . **R** 7 2 A	4/3 cf (POS) - Actair 3 to 200 “C” - CCF
R------ / . . . . . **R** 7 2 B	4/3 cf (POS) - Actair 3 to 200 “C” - OCF
R------ / . . . . . **R** 7 2 C	4/3 cf (POS) - Actair 3 to 200 “C” - HPCF
R------ / . . . . . **R** 7 3 A	4/3 cf (POS) - Actair 3 to 200 “O” - CCF
R------ / . . . . . **R** 7 3 B	4/3 cf (POS) - Actair 3 to 200 “O” - OCF
R------ / . . . . . **R** 7 3 C	4/3 cf (POS) - Actair 3 to 200 “O” - HPCF
R------ / . . . . . **R** 7 4 A	4/3 cf (POS) - Actair 400 to 1600 - CCF
R------ / . . . . . **R** 7 4 B	4/3 cf (POS) - Actair 400 to 1600 - OCF
R------ / . . . . . **R** 7 4 C	4/3 cf (POS) - Actair 400 to 1600 - HPCF
R------ / . . . . . **R** 7 6 A	4/3 cf (POS) - Dynactair 1,5 to 25 - CAF - CCF
R------ / . . . . . **R** 7 7 B	4/3 cf (POS) - Dynactair 1,5 to 25 - OAF - OCF
R------ / . . . . . **R** 7 8 A	4/3 cf (POS) - Dynactair 50 to 100 - CAF - CCF
R------ / . . . . . **R** 7 9 B	4/3 cf (POS) - Dynactair 50 to 100 - OAF - OCF
R------ / . . . . . **R** 7 J A	4/3 cf (POS) - Dynactair 200 to 800 - CAF - CCF
R------ / . . . . . **R** 7 K B	4/3 cf (POS) - Dynactair 200 to 800 - OAF - OCF
R------ / . . . . . **R** 7 W	4/3 cf (POS) - Double acting 1/4 turn actuator
R------ / . . . . . **R** 7 X A	4/3 cf (POS) - Single acting 1/4 turn actuator - CCF
R------ / . . . . . **R** 7 X B	4/3 cf (POS) - Single acting 1/4 turn actuator - OCF
R------ / . . . . . **R** 7 Y	4/3 cf (POS) - Double acting linear actuator
R------ / . . . . . **R** 7 Z A	4/3 cf (POS) - Single acting linear actuator - CCF
R------ / . . . . . **R** 7 Z B	4/3 cf (POS) - Single acting linear actuator - OCF

XI - Spare parts kit

Please, consult us.

Notes:

Notes:

8520.8061/2- EN 10.10.14

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