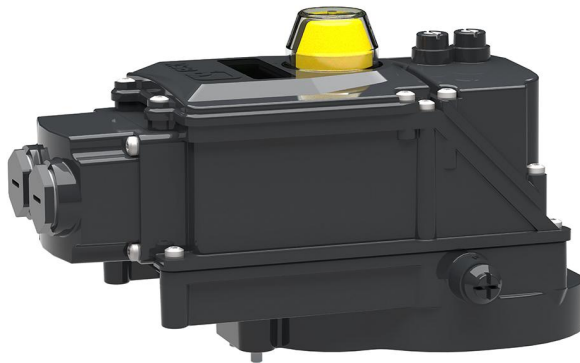


Automation

SMARTRONIC U AS-i

A1313

Type Series Booklet



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Type Series Booklet SMARTRONIC U AS-i

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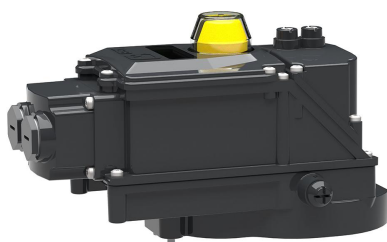
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Automation

Positioner

SMARTRONIC U AS-i



Main applications

- Water
- Waste water
- Energy
- Industry
- Shipbuilding
- Oil and gas

Operating data

Table 1: Operating properties

Ambient characteristics	Value
Min. permissible temperature [°C]	≥ -20
Max. permissible temperature [°C]	≤ +80
Enclosure	IP67 to EN 60529
Electromagnetic compatibility	To European Electromagnetic Compatibility Directive 2014/30/EU
Vibrations	IEC 68-2-6 Test Fc
Compressed air purity class	ISO 8573.1 Class 5

Design details

Design

- SMARTRONIC U AS-i is a digital, electro-pneumatic positioner for connection to an AS-i field bus.
- For automation of:
 - Quarter-turn actuators of the ACTAIR EVO, DYNACTAIR EVO type series and all previous KSB actuator generations
 - Quarter-turn actuators with standardised VDI/VDE 3845 interface
 - Linear actuators to NAMUR
- Position indicator under sight glass for remote indication
- SMARTRONIC U AS-i features a LEXAN housing (polycarbonate with 20% glass fibre) accommodating the following 3 components:
 - Electrical connection
 - Printed circuit board
 - Control air supply
- The control air supply is connected via the aluminium base:
 - Directly to ACTAIR EVO, DYNACTAIR EVO and all previous KSB actuator generations
 - Via external piping for quarter-turn actuators with standardised VDI/VDE 3845 interface and for linear actuators to NAMUR
- The actuating times for open/close operations are set via the easily accessible air flow reducers.
- The autoadaptive angle sensor adjusts its travel automatically to the actuator travel.

Product benefits

- In automation applications, the positioner can be connected to an AS-i field bus capable of controlling up to 62 SMARTRONIC U AS-i.
- Intuitive, user-friendly interface for local control and configuration via display and pushbuttons
- Quick, straightforward installation and commissioning thanks to auto-calibration
- A single aluminium base allows the positioner to be mounted directly on actuators of all sizes and generations, without installation components, ensuring direct control air supply without external piping.
- TORX T20 captive screws for easier installation

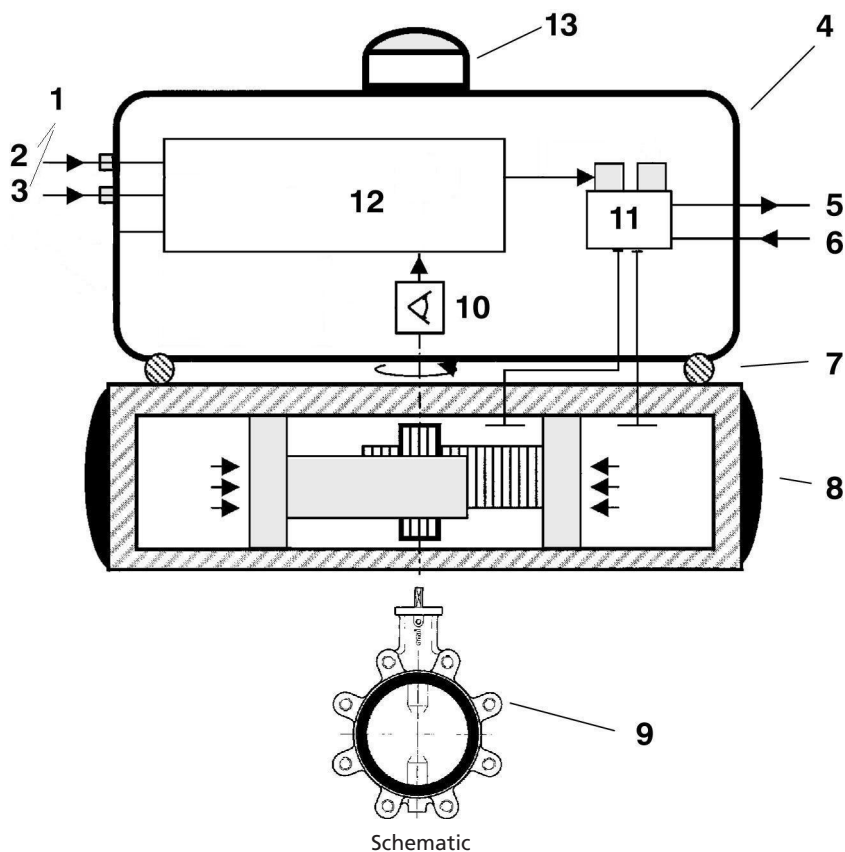
Related documents

Table 2: Information/documents

Document	Reference number
SMARTRONIC U AS-i A1313 operating manual	8520.8064

Technical data

Functional schematic



Key:

1. Connections

2. Connection to user interface

Both the configuration of SMARTRONIC U AS-i and the real-time display of process data are performed via a serial interface, Ethernet or Wi-Fi using a computer.

3. Connection to process control system

The open- and closed-loop control information of SMARTRONIC U AS-i can be transmitted to the PLC or the monitoring system via the AS-i field bus.

4. SMARTRONIC U AS-i

5. Exhaust

6. Control air supply

7. VDI/VDE interface

8. Pneumatic actuator

9. Valve

10. Position monitoring

The angle sensor mounted on the actuator's actuating shaft determines the valve's disc position. This information is transmitted to the microprocessor and the PLC for processing. The angle sensor automatically adapts the sensor travel to the actuator's position.

A 4-20 mA signal provides actual-position feedback to the process control system.

11. Integrated pneumatic control

The pneumatic directional control valve is integrated in the SMARTRONIC U AS-i. The control air is supplied via the VDI/VDE interface, external pneumatic connections are not required (up to ACTAIR EVO 120 and DYNACTAIR EVO 50). The directional control valve is an on/off valve with 4 ports and 3 positions. It is controlled via two pilot solenoid valves. The fail-safe (Fail Open or Fail Closed) position when power is lost or removed must be specified in the purchase order for each directional control valve.

12. Integrated microprocessor

13. Position indicator

Technical specification

Housing	
Material	Polycarbonate with 20 % glass fibre + aluminium alloy
Position indicator	Visual position indicator on the cover
Control air connection	2 x 1/4" threaded gas ports
Electrical connection	2 cable glands for diameters of 6 to 12 mm
Integrated connectors	For flexible conductors with a cross-section of 0.14 mm ² (26 AWG) to 0.5 mm ² (20 AWG) For flexible conductors with wire end sleeve and with insulating input sleeve, with a cross-section of 0.25 mm ² (23 AWG) to 0.5 mm ² (20 AWG)
Weight	2.4 kg

Control air supply	
Control air supply port	Port "P", 1/4" threaded gas port, filter fitted in the base
Exhaust port	Port "E", 1/4" threaded gas port, with silencer or for connection to an exhaust system
Operating pressure	3 to 8 bar (44 to 115 psi)
Filtration	ISO 8573-1 Class 7 (< 40 µm)
Dew point	ISO 8573-1 Class 5 (< 7 °C and in all cases 5 °C below the ambient temperature)
Lubrication	ISO 8573-1 Class 5 (< 25 mg/m ³)
Max. flow rate	400 NI/min (at 25 °C)
Consumption while idle	Zero

AS-i field bus	
Power consumption	4 W max.
Power supply	Via AS-i field bus (26.5 V DC to 31.5 V DC)
Profile	S-7.A.x.5
Max. number of slave components	62
Specifications	V3.0 (compatible with AS-i M4 master and higher)

Control air supply

The control air is connected to the SMARTRONIC U AS-i.

A sintered bronze filter is fitted in the housing's inlet port for safety reasons to prevent clogging and damage to the pneumatic directional control valve.

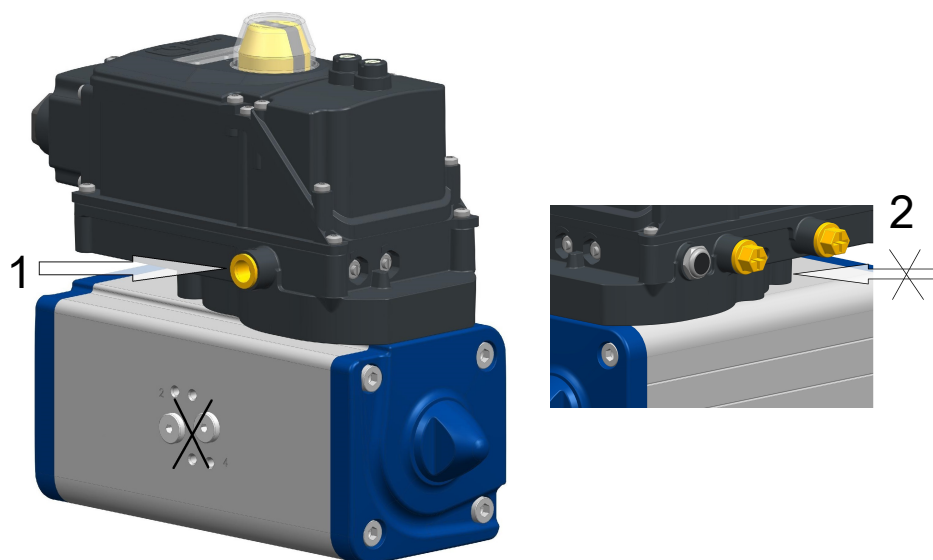


Fig. 1: View of control air connection

1 - Control air supply

2 - Exhaust

Control air port: port "P"

Exhaust port: port "E" with silencer or for connection to an exhaust system

To prevent any premature wear of mechanical components, especially actuator components, the use of lubricated air (between 5 and 25 mg/m³) is recommended.

Base "UNLIMITED"

The base type UNLIMITED has a rotatable distribution plate with 4 positions, allowing direct connection without installation components and is suitable for ACTAIR/DYNACTAIR (old generation), ACTAIR/DYNACTAIR NG(V) and ACTAIR/DYNACTAIR EVO(E). This new robust base type UNLIMITED and its actuating shaft are made from die-cast aluminium. The captive screws facilitate installation and maintenance.

This unique base provides ports for either direct control air or external control air connection.

Direct control air connection

The base type UNLIMITED can be fitted to ACTAIR and DYNACTAIR actuators (all generations) without the need for a bracket and external piping

This mounting method is compatible with the following products:

- ACTAIR EVO 2 to 160
- DYNACTAIR EVO 1 to 80
- ACTAIR NG 2 to 160
- DYNACTAIR NG 1 to 80
- ACTAIR 3 to 200
- DYNACTAIR 1.5 to 100

A VDI/VDE 3845 interface eliminates the need for external piping and saves space.

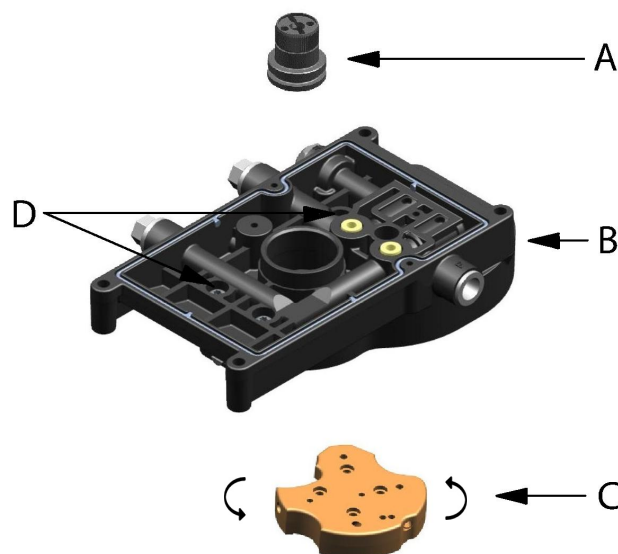


Fig. 2: Base UNLIMITED

- A: Actuating shaft made of aluminium
- B: Base made of aluminium
- C: Rotatable distribution plate with 4 positions + 4 sealing elements
- D: Mounting via VDI/VDE 3845 interface

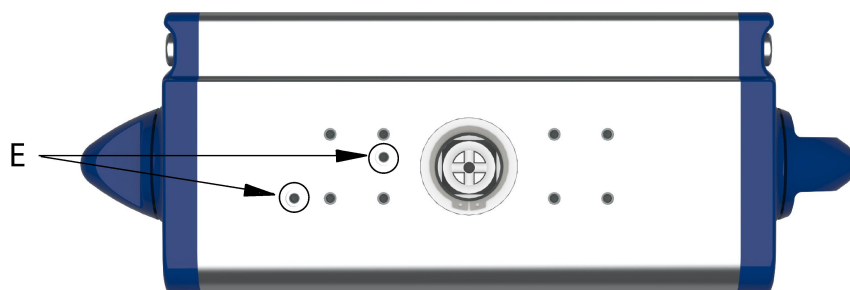


Fig. 3: Top view of ACTAIR EVO

- E: Ports for direct control air supply (KSB system)

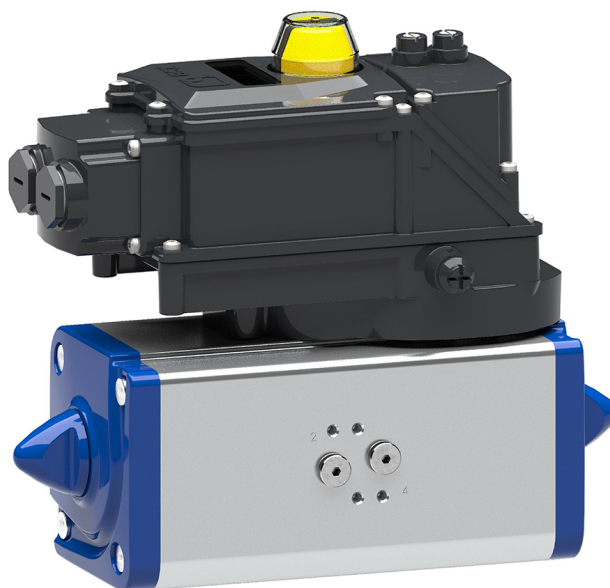


Fig. 4: SMARTRONIC U AS-i mounted on ACTAIR EVO

Control air connection with piping

The base type UNLIMITED allows positioners to be mounted on ACTAIR/DYNACTAIR actuators (all generations) with piping. This mounting option is used for actuators which do not have control air connections compatible with the VDI/VDE 3845 interface.

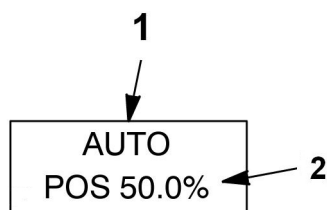
This mounting method is compatible with the following products:

- ACTAIR EVO 240 to 700
- DYNACTAIR EVO 120 to 350
- ACTAIR 400 to 1600
- DYNACTAIR 200 to 800
- ACTAIR NG 240 to 700
- DYNACTAIR NG 120 to 350
- Actuators with VDI/VDE 3845 interface



Fig. 5: SMARTRONIC U AS-i mounted on ACTAIR EVO 340

Display



Display schematic

1

Operating mode:

AUTO: Automatic positioning (4-20 mA setpoint)

MANU: Manual positioning (local control)

NO CALIB: SMARTRONIC U AS-i is not calibrated

The display provides information about the operating mode and the valve position.

If the instrument has never been calibrated, the angle sensor value is displayed (SSR).

Text display may be adjusted according to the positioner's installation position.

2

No AS-i communication: "ASi com fault"

Communication with AS-i: valve position (%)

Materials

SMARTRONIC U AS-i materials

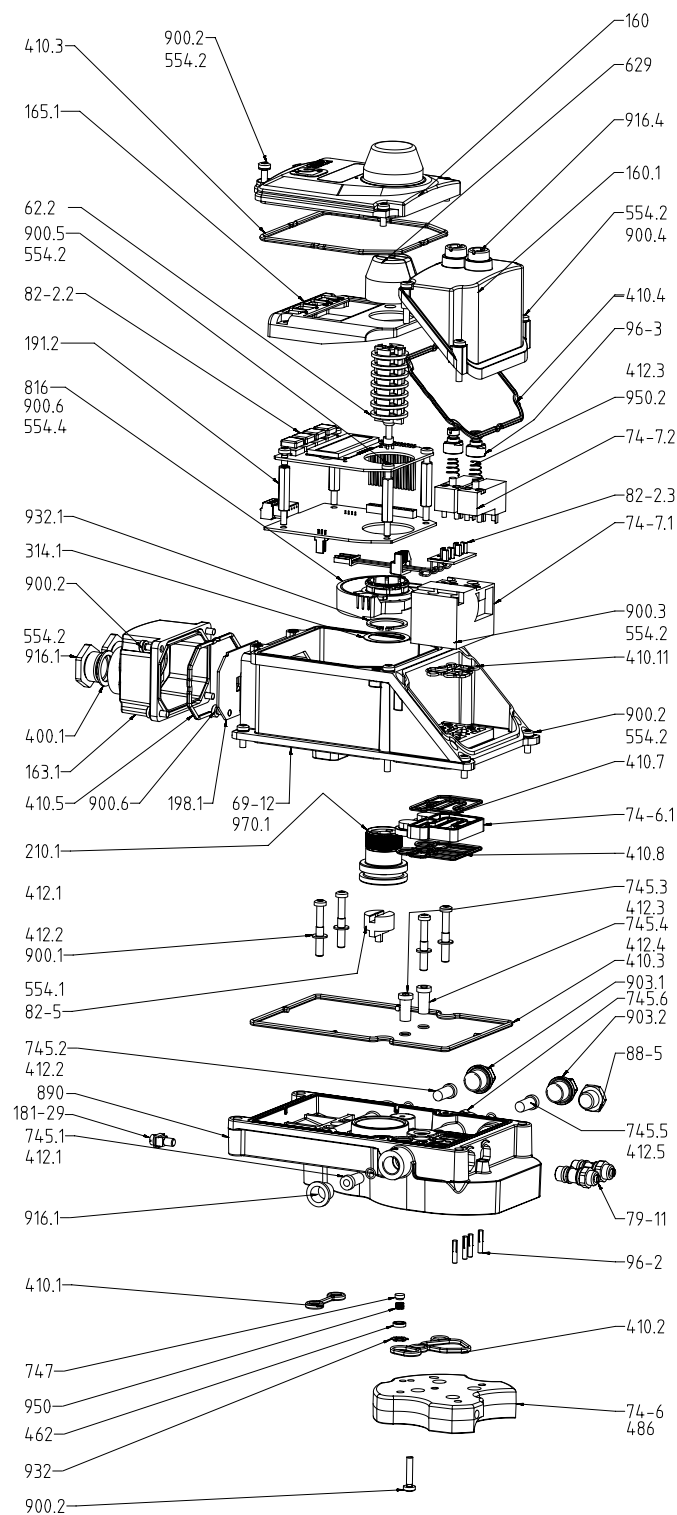


Fig. 6: Exploded view of A1313

Table 3: List of components

Part No.	Description	Materials
160	Cover	Polycarbonate with 20 % glass fibre
160.1	Cover (directional control valve)	Polycarbonate with 20 % glass fibre
163.1	Housing (directional control valve)	Polycarbonate with 20 % glass fibre
165.1	Bonnet	Polycarbonate with 20 % glass fibre
181-29	Earth terminal	Steel
191.2	Spacer, PCB	Nickel-plated brass
198.1	Connection plate	Polyamide
210.1	Actuating shaft	Aluminium alloy
314.1	Anti-friction disc	Stainless steel, type 304L
400.1	Gasket	Neoprene
410.1	Profile seal	NBR80
410.2	Profile seal	NBR80
410.3	Profile seal	NBR70
410.4	Profile seal	NBR70
410.5	Profile seal	NBR70
410.7	Profile seal	NBR70
410.8	Profile seal	NBR70
410.11	Profile seal	NBR70
412.1	O-ring	NBR70
412.2	O-ring	NBR70
412.3	O-ring	NBR70
412.4	O-ring	NBR70
412.5	O-ring	NBR70
462	Bearing disc	Polyamide
486	Ball	Steel
554.1	Washer	Stainless steel
554.2	Washer	Stainless steel
554.4	Serrated lock washer	Steel
629	Position indicator assembly	
62-2	Adjustable cam assembly	
69-12	Housing	Polycarbonate with 20 % glass fibre
745.1	Sintered filter	Bronze
745.2	Sintered filter	Bronze
745.3	Sintered filter	Bronze
745.4	Sintered filter	Bronze
745.5	Sintered filter	Bronze
745.6	Sintered filter	Bronze
74-6	Sintered filter	Bronze
74-6.1	Distribution plate A/B	
74-7.1	Directional control valve	
74-7.2	Pilot valve	
747	Profile seal	
79-11	Flow reducer RP 1/8"	
816	Angle sensor assembly	
82-2.2	Communication card assembly	
82-2.3	Actual-position feedback	
82.5	Adapter, shaft	Thermoplastic
88-5	Silencer 1/4" BSP	Bronze
890	Base	Aluminium alloy
96-2	Grooved pin	Stainless steel
96-3	Emergency control	Polycarbonate with 20 % glass fibre
900.1	Bolt/screw	A2-70
900.2	Hexagon socket head cap screw	A2-70
900.3	Hexagon socket head cap screw	A2-70
900.4	Hexagon socket head cap screw	A2-70
900.5	Hexagon socket head cap screw	A2-70
900.6	Self-tapping screw	A2-80
903.1	Plug	Polyamide

Part No.	Description	Materials
903.2	Plug	Polyamide
916.1	Screw plug	Polyamide
916.4	Elastomer string	Nitrile
932	Reinforced circlip	Steel
932.1	Circlip	Steel
950	Spring	Stainless steel
950.2	Manual override spring	Stainless steel
970.1	Sticker	Adhesive polyester

Variants

Adaptation for mounting on linear actuators to NAMUR

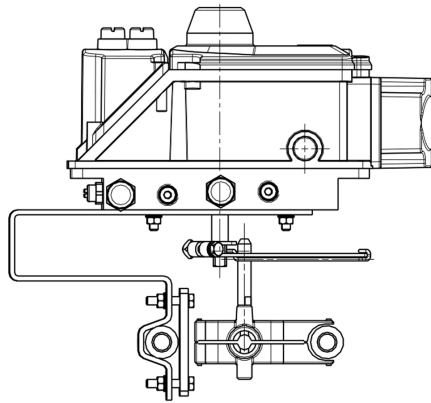


Fig. 7: Front view

Dimensions

SMARTRONIC U AS-i dimensions

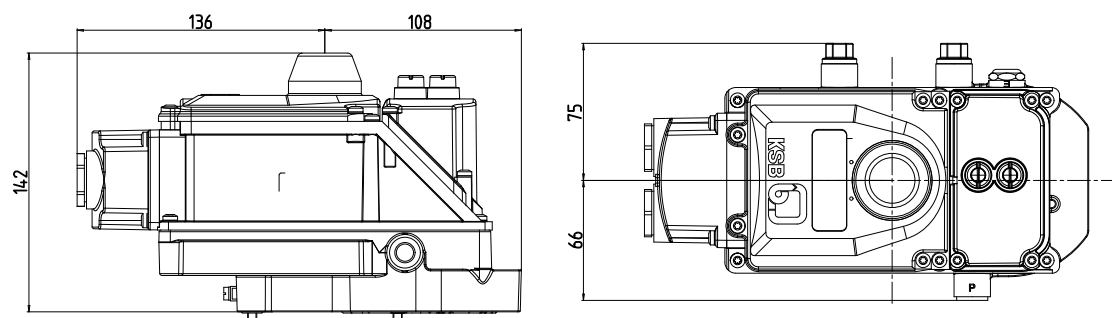


Fig. 8: SMARTRONIC U AS-i / type A1313 dimensions

Purchase order specifications
Table 4: Type code for SMARTRONIC U AS-i A1313

SMARTRONIC U AS-i	R001313	0	0	0	0	0	0	0	.	R	7	.	.	2	1	0	6	0	0	.
Sensors																				
Auto-calibrating		0	0	0	0															
Position																				
Fictitious open/closed						0														
Actual-position feedback																				
None							0													
Electrical output																				
With plug									0											
2 cable glands, plastic, M20, IP67 (diameter: 6 to 12 mm)									1											
2 cable glands, metal, M20, IP67 (diameter: 6 to 12)									2											
Directional control valve																				
4/3 centre closed										R										
Voltage, directional control valve																				
24 V DC											7									
Actuator																				
ACTAIR 3 to 200, with closed-position travel stop																			2	
ACTAIR 3 to 200, with open-position travel stop																			3	
ACTELEC 400 to 1600																			4	
DYNACTAIR 1.5 to 25, Fail Closed in the event of control air failure																			6	
DYNACTAIR 1.5 to 25, Fail Open in the event of control air failure																			7	
DYNACTAIR 50 to 100, Fail Closed in the event of control air failure																			8	
DYNACTAIR 50 to 100, Fail Open in the event of control air failure																			9	
DYNACTAIR 200 to 800, Fail Closed in the event of control air failure																			J	
DYNACTAIR 200 to 800, Fail Open in the event of control air failure																			K	
DYNACTAIR 200 to 800, Fail Closed in the event of control air failure																			A	
DYNACTAIR 200 to 800, Fail Open in the event of control air failure																			B	
DYNACTAIR 200 to 800, Fail Closed in the event of control air failure																			C	
DYNACTAIR 200 to 800, Fail Open in the event of control air failure																			D	
ACTAIR NG / EVO 2																			E	
ACTAIR NG / EVO 5 - 20																			F	
ACTAIR NG / EVO 30 - 160																			G	
ACTAIR NG / EVO 240 - 700																			H	
DYNACTAIR EVO 1, Fail Closed in the event of control air failure																			P	
DYNACTAIR EVO 2 - 8, Fail Closed in the event of control air failure																			Q	
DYNACTAIR EVO 12 - 80, Fail Closed in the event of control air failure																			R	
DYNACTAIR EVO 120 - 350, Fail Closed in the event of control air failure																			S	
DYNACTAIR EVO 1, Fail Open in the event of control air failure																			T	
DYNACTAIR EVO 2 - 8, Fail Open in the event of control air failure																			W	
DYNACTAIR EVO 12 - 80, Fail Open in the event of control air failure																			X	
DYNACTAIR EVO 120 - 350, Fail Open in the event of control air failure																			Y	
ACTAIR / DYNACTAIR (all sizes and generations) + external connection																			Z	
Pneumatic quarter-turn actuator, double-acting																				
Pneumatic quarter-turn actuator, single-acting																				
Pneumatic linear actuator, double-acting																				
Pneumatic linear actuator, single-acting																				

SMARTRONIC U AS-i	R001313	0	0	0	0	0	0	.	R	7	.	.	2	1	0	6	0	0	.
Fail-safe position																			
Fail Closed in the event of power failure												A							
Fail Open in the event of power failure												B							
Fail-in-last-position in the event of power failure												C							
SMARTRONIC																			
Intelligent positioner													2						
Field bus																			
AS-i S-7.A.*.5														1					
Heating resistor																			
None															0				
Display																			
3D sight glass																6			
Configuration																			
None																	0		
Diagnosis																			
None																		0	
Protection against accumulation of water																			
None																			0
Yes																			1



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