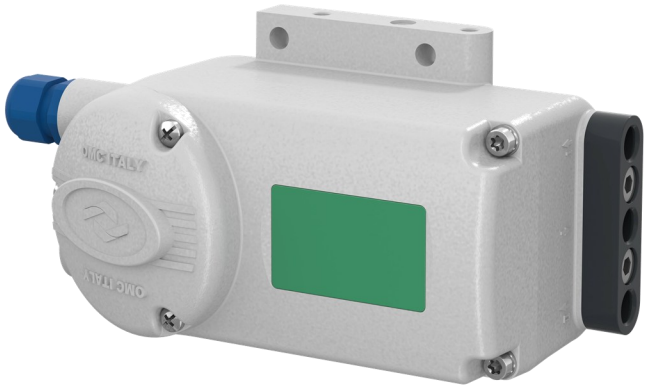
SERIE SRD998

Linear & Rotary Intelligent Positioner with HART Communication

DESCRIPTION

The intelligent positioner SRD998 is designed to operate pneumatic valve actuators and can be operated from control systems (e.g. the Foxboro I/A Series System and Foxboro Evo™), controllers or PC-based configuration and operation tools such as the FDT/DTMs VALcare™. The positioner is available with HART 7 communication protocol. The extra large multi-lingual full text graphical -LCD, in conjunction with the rotary selector, allows a comfortable and easy local configuration and operation. For installations in contact with explosive atmospheres certificates are available.

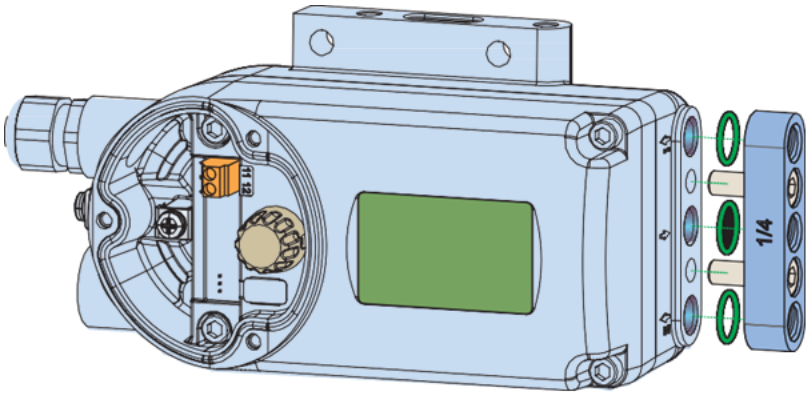


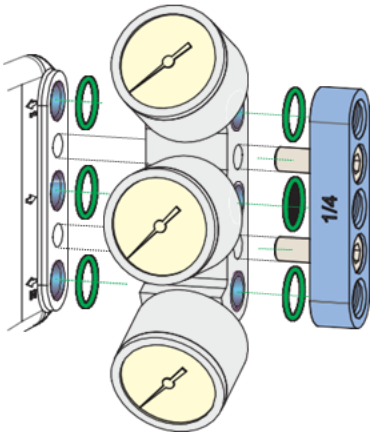
FEATURES

Intelligent

- Auto-start with self-calibration
- Self diagnostics, status- and diagnostic messages
- DTM for valve diagnostics and predictive maintenance
- Easy local operation with the rotary selector
- Extra large multi-lingual full text graphical LCD
- With HART 7 communication
- Stroke 8 to 260 mm (0.3 to 10.2 in) with standard lever; larger stroke with special lever
- Angle range up to 95 ° (up to 120 ° on request)
- Mounting onto any linear or rotary actuator
- Supply air pressure up to 10 bar (145 psig)
- Single or double acting
- Protection class IP 66
- Explosion protection: Intrinsic Safety according to ATEX / IECEx, INMETRO, NEPSI, PESO, CNS, EAC

TECHNICAL DATA





Supply

Supply air pressure

B0S, C0S..... 1.4 to 6 bar (20 to 87 psig)

B1S, B2S..... 1.4 to 10 bar (20 to 145 psig)

C2S, C3S ..... 1.4 to 10 bar (20 to 145 psig)

Output to actuator ..... 0 to ~100 % of supply air pressure (up to 5.5 bar at 6 bar supply air pressure)

Air supply . . . . . according to ISO 8573-1

- Solid particle size and density class 2
- Oil rate..... class 3
- Pressure dew point 10 K under ambient temperature

The use of a **filter regulator** for the air supply of positioner is strongly recommended. It reduces the air pressure to the actuator's maximum pressure, keeps it constant, and filters the air.

Travel range

Stroke range 8 to 260 mm (0.3 to 10.2 in) with standard feedback levers; special levers on request

Rotation angle range .....without mechanical stop up to 95 ° angle (up to 120° on request)

Response characteristic 1) 2)

Sensitivity ..... < 0.1 % of travel span

Non-linearity (terminal based adjustment) < 0.6 % of travel span

Hysteresis ..... < 0.3 % of travel span

Supply air dependence. < 0.1 % / 1 bar (15 psi) Temperature effect < 0.3 % / 10 K ...

SETTING

Mechanical vibration effect acc. IEC 60068-2-6 (2007) for 10 to 500 Hz up to 2 g

- For Pneumatics B0S, ... < ±0.25% up to 80 Hz and 1 g
  < ±0.25% up to 70 Hz and 2 g
- For Pneumatics B1S, B2S < ±0.25% up to 70 Hz and 1 g
  < ±0.25% up to 50 Hz and 2 g
- For Pneumatics C0S ... < ±0.25 % up to 400 Hz and 1 g
  < ±0.25 % up to 70 Hz and 2 g
- For Pneumatics C2S, C3S < ±0.25 % up to 55 Hz and 2 g

In case of high vibrations, we recommend using remote mounting solution.

Note for single / double acting operation

For optimal control performance, the use of *double* acting positioners onto *single* acting actuators is not recommended.

Pneumatic Performance - Air flow

Air flow at Air Input / output:	1.4 bar	3 bar	6 bar		
Pneumatic **Code B0S** (single acting - Standard Flow)					
to pressurize actuator	4000	7000	14000		Nl/h
to vent actuator	2700	5000	10000		Nl/h
Pneumatic **Code C0S** (double acting - Standard Flow)					
to pressurize actuator	3500	5000	10000		Nl/h
to vent actuator	2500	3750	7500		Nl/h

Pneumatic Performance - Air consumption [3] [Nl/h]

Air consumption at steady state:		1,4 Bar	3 bar	6 bar		
Pneumatic **Code**:	Input signal					
B0S (single acting - Standard Flow)	0 %	<100	<100	<100		Nl/h
B0S (single acting - Standard Flow)	100 %	175	250	400		
C0S (double acting - Standard Flow)	0 %	175	250	400		Nl/h
C0S (double acting - Standard Flow)	50 %	215	335	570		Nl/h
C0S (double acting - Standard Flow)	100 %	175	250	400		Nl/h

1) Data measured according to VDI/VDE 2177 and IEC 61514-2
2) With 90 °angle, rotary actuator
3) Measured according ANSI / ISA-75.13.01-2013

FUNCTIONAL SPECIFICATION

Features

Automatic start-up .....(Autostart functionality)

Automatic determination of the mechanical end positions of the valve (initial value and final value), IP motor parameters, direction of action of the spring, and control parameters. The control parameters are optimized dynamically during this routine.

This procedure makes a perfect adjustment and optimization to the actuator possible without additional manual settings! Several Autostart modes are available (details see on next pages).

Operation and Configuration

The local LCD enables a fast and easy configuration as well as clear diagnostic messages.

Local..... with local rotary selector

Display..... multi lingual graphic LCD

The positioner contains the following menu languages:

• English • German • French • Chinese • Portuguese
• Spanish • Polish • Korean • Swedish • Italian • Russian

SETTING

Manual, local and remote settings:

Actuator mode ..... linear or rotary actuator

- Linear valve ..... left or right mounted

- Rotary actuator .....opening clockwise or counter-clockwise

Valve characteristic .....linear, equal percentage, inverse-equal percentage or custom (22 points)

Valve action .....opens or closes with increasing set point

Split range..... free upper and lower values

Travel limits ..... free upper and lower values

Cutoffs.....free upper and lower values

Stroke range .....configurable

Temperature unit..... configurable (°C or °F)

Autostart ..... - Endpoints
- Standard Autostart
- Enhanced Autostart
- Smooth response
- Fast response

Control parameters ..... Determined during Autostart.

Working range ..... freely adjustable (for indication on LCD)

Manual adjustment of.....P-gain, I-time, D-time, T63-time, and dead band

Manual operation .....Manual input of set point to drive the valve in steps of 12.5 % or 1 %

Pneumatic test .....Function to test the pneumatic output

LCD orientation ..... Standard, and upside down …

Manual local and remote settings:

Actuator mode ..... linear or rotary actuator

- Linear valve ..... left or right mounted
- Rotary actuator .....opening clockwise or counter-clockwise

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Software supported configurations:

- By means of Hand Held Terminal (HART)
- PC by means of VALcare DTM Software
- I/A Series System, Foxboro Evo and other DCSs

Failure handling

In case of Single Acting, Safety position at

- Air supply failure .....pressure y1 = zero
- Electric power failure ..... pressure y1 = zero
- Failure of electronics ..... pressure y1 = zero

In case of Double Acting or spool valve amplifier, safety position at

- Air supply failure ..... pressure y1 = zero; y2 =zero
- Electric power failure ..... pressure y1 = zero; y2 = full air supply pressure
- Failure of electronics ….. pressure y1 = zero; y2 = full air supply pressure

DIAGNOSTIC

To monitor the high performance of the positioner, we offer several diagnostic utilities:

Surveillance/Function	**Basis**	**Advanced**
Configuration data	YES	YES
Imput current adjustment	YES	YES
A/D convertere	YES	YES
Position valve	YES	YES
Connection to I/P converter	YES	YES
Potentiometer	YES	YES
Angle adjustment	YES	YES
Reaching of the set pointin a specific time	YES	YES
Temperature limit min or max	YES	YES
Autostart	YES	YES
Custom characterization		YES
Auto diagnostic		YES
Alarm management		YES
Alarm output for switching (with option board)		YES
Status List acc. To NE 107		YES
Position hystory		YES
Response History		YES
Step response analyze		YES

PHYSICAL SPECIFICATIONS (common data for all versions)

Mounting

Attachment to stroke actuators

- for casting yoke acc. to IEC 534-6 (NAMUR)with attachment kit EBZG –H or –H1
- for pillar yoke acc. to IEC 534-6 (NAMUR)with attachment kit EBZG –K or –K1

Stroke range with feedback lever:

- standard (EBZG-A) 8 to 70 mm / 0.31 to 2.76 in
- extended (EBZG-B) 60 to 120 mm / 2.36 to 4.72 in

-extended (EBZG-A1) 110 to 260 mm / 4.33 to 10.24 in

Larger stroke ranges can be realized with special levers.

Attachment to rotary actuators acc. to VDI/VDE 3845

with attachment kit ..... EBZG -R

- Further attachment kits see ModelCodes page 15/16
- Mounting orientation see attachment dimensions starting from page 17

Materials

Housing and covers ..... ……..Aluminum Alloy No. 230(GD-AlSi12) Polyester Powder coated

Sealings between covers .....Silicone elastomer and silicone core with Ag/Cu particles

LCD Window ..... ……..Polycarbonate, U.V. stabilized

External Screws .....Stainless Steel V2A 1.4301

otherboard ….....……..Coated with protective resin

All moving parts of feedback ystem (e.g. shaft) ..... 1.4306 / 1.4571 / 1.4104

Attachment kits .. V4A 1.4401 or depending upon version) . Aluminum Alloy No. 230 (GD-AlSi12) finished with DD varnish

Mounting bracket ..... Aluminum Alloy No. 230 (GD-AlSi12)

Pneumatic diaphragms .... VMQ, PVMQ (Silicone elastomer, suitable for use in the paint industry)

(depending upon version)

Weight

With pneumatic B0S..... approx. 2.1 kg (4.7 lbs) C0S ..... approx. 2.3 kg (5.1 lbs)

With pneumatic B2S..... approx. 2.2 kg (4.9 lbs) C3S ..... approx. 2.2 kg (4.9 lbs)

Pneumatic connection

NAMUR mounting..... G 1/4 or 1/4-18 NPT via manifold …

Electrical Connection

Line entry ……..1 cable gland M20 x1.5, 1/2-14 NPT with Adapter AD-)

Cable diameter ..... …..6 to 12 mm (0.24 to 0.47 in)

Screw terminals .....2 terminals for input

Wire cross section .....0.3 to 2.5 mm2 (AWG 22-14) max torque 0,6 Nm

Ambient conditions:

Operating conditions - acc. to IEC 654-1

The device can be operated at a class Dx location.

Ambient temperature

Operation 1) ..... –40 to 80 °C (–40 to 176 °F)

Transport and storage.....–40 to 80 °C (–40 to 176 °F)

If the device is exposed to sunlight and the temperature may rise above 80 °C / 176 °F, we recommend a sun shade.

Storage conditions acc. to IEC 60721-3-1..... 1K5; 1B1; 1C2; 1S3; 1M2 i

Indicators

LCD (visible) 2) ..... –25 to 70 °C (–13 to 158 °F

Relative humidity .....up to 100 %

Protection class acc. to IEC 60529 . . . . . IP 66; acc. to NEMA ..... Type 4X

Electromagnetic compatibility EMC

Operating conditions - industrial environment

Immunity according to:

- EN 61326 .....fulfilled
- IEC 61326 ..... .fulfilled
- EN 61000-6-2 .....fulfilled

Emission according to EN 61326

- Class A and Class B ….fulfilled
- EN 61000-6-4 .....fulfilled
- EN 55011 Group 1,
- Class A and Class B ....fulfilled
- NAMUR recommendation
- EMV NE21 .....fulfilled …

SAFETY REQUIREMENTS

CE label

Electromagnetic

Compatibility…… 2014 / 30 / EC

Low-voltage regulation.....not applicable

See also Declaration of Conformity.

Safety

According to EN 61010-1 (or IEC 1010-1) … Safety class III Overvoltage Category I

External fuses… Limitation of power supplies for fire protection must be observed acc. to EN 61010-1, app. F, or

ELECTRICAL CLASSIFICATION 1) 2)

See Certificates of Conformity EX EVE0108 A

Intrinsically Safe according to ATEX / IEC Ex

Code A1, A2, or A3

A1 = II 2 G Ex ia IIC T4/T6 Gb / II 1 D Ex ia IIIC T100 °C Da or A2 = II 2 G Ex ib IIC T4/T6 Gb / II 2 D Ex ib IIIC T100 ° C Db

or A3 = II 3 G Ex ic IIC T4/T6 Gc / II 3 D Ex ic IIIC T100 °C Dc

For use in hazardous areas in certified safe circuits with the following maximum values:

Pi	Ui	Ii	T4	T6
900 mW	30 V	130 mA	–40°C to 80°C	
660 mW	28.1 V	130 mA	–40°C to 80°C	–40°C to 44°C
630 mW	25.7 V	130 mA	–40°C to 80°C	–40°C to 46°C
590 mW	25.3 V	130 mA	–40°C to 80°C	–40°C to 48°C
510 mW	26 V	130 mA	–40°C to 80°C	–40°C to 52°C

Li = < 10 µH

Ci = < 2.5 nF

IP degree acc. to IEC 60529 IP 66

Other electrical certifications in progress

1) With appropriate order only

2) National requirements must be observed

HART COMMUTATION

SRD998 with HART communication SRD998-Hxxxx

Signal Input …… two wire system

Reverse polarity protection… standard feature

Signal range ..... 4 to 20 mA

Operating range. ..... 3.6 to 21.5 mA

Input voltage ..... DC 12 to 36 V[1] (unloaded)

Load …… 420 Ohms, 8.4 V at 20 mA

Comm. signal … HART 7, 1200 Baud, FSK (Frequency Shift Key) modulated on 4 to 20 mA, 0.5 Vpp at 1 kOhm load

Input impedance Zi …… Z = 320 Ohms for ac voltage 0.5 to 10 kHz with < 3 dB non-linearity

Cable capacity and inducance see HART standard specifications (e.g. C < 100 nF)

Impedance of other devices at the input (parallel or serial) must be within HART spec.

Applications without communication require not to exceeding input capacitance parallel to the input not higher than 5 µF.

Start-up time ……approx. 3 sec

Interruption time without power down . . . typ. 8 ms [2]

1) On request we can specify higher voltage limits

2) Worst case conditions 4-20 mA, I/p-output with max. current

Configuration

The SRD998 can be configured via HART by any host system whatever is a PC with a HART Modem, Hand Held Terminal or a DCS.

LOCAL (by means of rotary selector and LCD display) See page 6

DTM (Device Type Manager)

We are a leading company in term of FDT-DTM technology

https://www.schneider-electric.com/en/download/range/63514-Valve%20Positioners/?docType=4889330-DTM+files

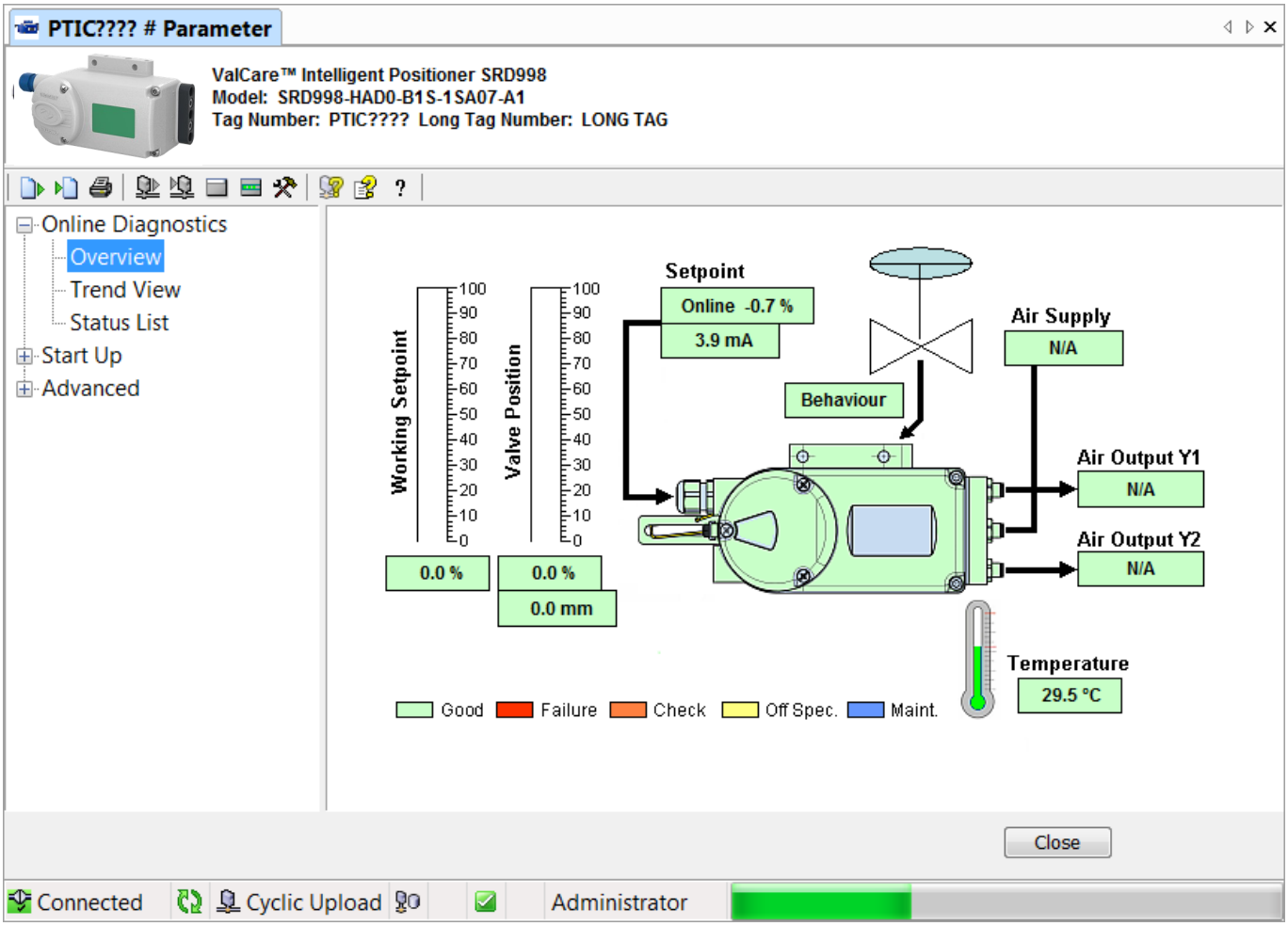
Therefore we provide a DTM fully certified for its inter- operability and with the state-of-the-art presentation and diagnostics features.

The DTM can be downloaded from our homepage.

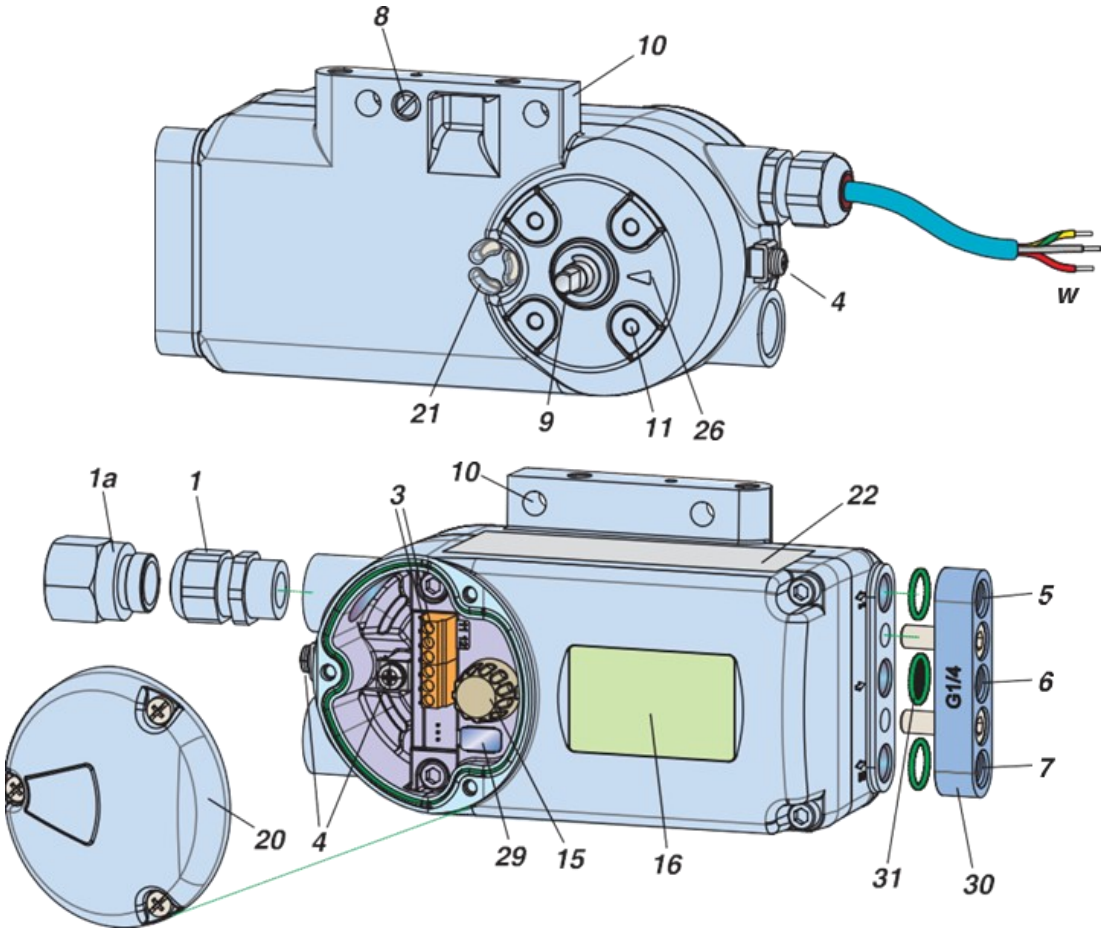
DD (Device Description) and EDD (Enhanced Device Description)

In case the host system is not supporting the FDT-DTM technology, you can download the DD and/or EDD from our homepage.

….. HART COMMUTATION



FUNCTIONAL DESIGNATION



1 Cable gland
1a Adapter, e.g. 1/2”-14 NPT
3 Screw terminals (11 / 12) for input (w)
4 Ground connection (inner and outer)
5 Output I (y1)
6 Air supply (s)
7 Output II (y2)
8 Direct attachment hole for output I (y1)
9 Feedback shaft
10 Connection manifold for attachment to stroke actuators
11 Connection base for attachment to rotary actuators
15 Rotary selector for select Menu, and press to confirm
16 LCD with true text in many languages
20 Cover for electrical connection compartment
21 Air vent, dust and water protected
22 Data label
26 Arrow is perpendicular to shaft ***9*** at angle 0 degree
29 Service only
30 Connecting manifold, G 1/4 or 1/4 NPT
31 Component O-ring with filter, for air supply

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