# **Salec**®

## we control your comfort

general catalogue

#### Company

**Eatec srl** was founded in **2012** through the collaboration of experts with many years of experience in the heating, ventilation, air-conditioning and refrigeration field.

We are paying constant attention to the needs of national and international markets. Eatec stands for its innovative and dynamic approach to its offer and for its great flexibility with which it approaches the market and adapts to specific customer needs. Thanks to



its long experience in the HVAC/R field, **Eatec** has successfully introduced new product lines, placing the company at excellent Italian and international standard.

### Mission

We control your comfort summarizes effectively the principles and the values of the company's mission: quality, satisfaction, customer care and service, but also professionalism, dynamism, flexibility to adapt to every need and, above all, constant attention to markets and innovative products.

The customers' needs and benefits stay in the foreground when it comes to quality and partnership. Our value system towards the employees, customers and suppliers places human beings in the focus of the organization.

*"I believe in strong teamwork and play to win"* (*Elke de Biase, General Manager*)

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## violetline

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Cast Alimenti BRESCIA



Old Wild West ITALIA



LSG Skychefs, Lavaggio e Plonge FIUMICINO



Sun City Resort SOUTH AFRICA



Università Nicolò Cusano ROMA



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Centre Hospitalier du Sud Seine et Marne a Fontainebleau FRANCE



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Medical diagnostic Center KRASNODAR



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Studentato Stonehill BOLOGNA



Ipermercato Conad VELLETRI



Quellenhof Luxury Resort LAZISE

## redline

thermostats

#### Frost protection thermostat

#### Description

The frost protection thermostat serie TD is suitable for the protection of hot-water heating registers, downstream air heaters in ventilation and climate control systems as well as heat exchangers in cooling systems. The thermostats can also be used to control electrical heating systems and to switch acoustic or optical alarm signals and measure temperature in non aggressive gases or liquid medium.

-

ТD

Technical specifications	
Measurement range	-15+15°C
Factory calibration	on 5°C, off 0°C
Differential	adjustable from 1 to 15° C
Electrical rating	8 A, 250 V AC
Reset	Automatic, the switiching contact moves back to its normal position if temperature moves to normal range. Manual, the switching contact is moved back by pressing the reset button on the housing.
Sensibile element	Gas-filled copper capillary
Cable entry	Cable gland Ø 6…13 mm
Housing	Metal base with ABS cover
Wiring terminals	Screw terminals for wires of up to 1,5 mm <sup>2</sup> cross-section
Cooling of capillary coil	The 3 and 6 m capillaries are sensitive over the entire length and detect, with a minimum length of 30 cm, a temperature change from the set point. The 1,8 m capillary is only sensitive on the bulb.
Max. overload temperature	150°C (max. 1 hour)
Dimensions	See drawing
Protection type	IP55
Protection class	I
Working range RH	595% RH, non-condensing
Working temperature °C	-20+55°C
Storage temperature	-30+60°C
Accessories (optionally)	Set of 6 pieces mounting brackets, model ATD1
Installation	See drawing
Standards	CE-conformity, RoHS

Models	Reset	Capillary length m
TD1	automatic	1,8
TD2	automatic	3,0
TD3	automatic	6,0
TDR1	manual	1,8
TDR2	manual	3,0
TDR3	manual	6,0
Accessories:	ATD1 Set of 6 pieces mounting brackets	

#### Electrical wirings



#### Function

The frost protection thermostat switches when the temperature sensed by capillary for a minimum length of 30 cm drops below the temperature set on the knob. When temperature increases, the contact returns automatically to the initial position. For TDR versions it is necessary a manual reset from user to allow the contact to return to the initial position.

The gas inside the sensible element increases his volume and with a mechanism acts on the microswitch. The capillary is sensible to temperature for the whole length.

#### Installation



The thermostat is available with 3 different sensible elements that allow the use in different applications.

The version with 1,8 m capillary lenght has a bulb that allows the use of a pocket. The versions with 3 and 6 m can be used in air ducts or battery exchanger. The capillary must be applied uniformly on the surface to be controlled, see drawing besides. This surface must not be folded with a radius of curvature lower than 20 mm and there must not be any bottlenecks. Therefore the use with mounting bracket model ATD1 is recommended. In addition avoid to put the capillary across iron plate wall without any protection. The room temperature around the unit must never be below the setpoint temperature.

#### **Dimensions (mm)**



Mounting bracket, model ATD1





#### Electromechanical room thermostat

#### Description

The room thermostat TAM, designed simply and elegant, combines simplicity of operation and use with ease of installation.

#### Technical specifications

Measurement range	10+30°C
Differential	<0,7° K
Electrical rating	10 (2) A, 250 V AC
Min. current	200 mA
Max. temperature	0+50°C
Protection	IP30
Dimensions	84 x 84 x 36 mm
Standards	CE-conformity

. 20	· 25 0
10	30
• *	

Models	Power supply	Features
TAM31	230 Vac / 24 Vac	Basic version, changeover contact
TAM32	230 Vac	with LED for closed contact
TAM33	230 Vac	with LED for closed contact and on/off switch
TAM34	230 Vac	with LED for closed contact and summer/winter switch
TAM42	24 Vac	with LED for closed contact
TAM43	24 Vac	with LED for closed contact and on/off switch
TAM44	24 Vac	with LED for closed contact and summer/winter switch







#### Electrical wirings



#### Installation

WARNING! The installation described below must be carried out by qualified personnel observing the safety rules and regulations in force.

Verify that the data plate (power supply, contact, etc.) are suitable to the installation conditions. Make sure that the thermostat is not affected by drafts, direct sunlight or other heat sources (Fig. 1). Install the thermostat on a flat surface. If the device is mounted on a metal surface to ensure that the same are properly grounded.

- ${\bf 1}$  . Loosen the screw on the lid, then remove the cover and knob .
- DO NOT EVER TURN THE SHAFT OF THE KNOB: THE THERMOSTAT CAN LOOSE THE SETTING.
- 2 . Secure the device to the wall using screws
- 3. Make the electrical connections using the appropriate terminals according to the corresponding electrical wiring above.
- 4 . Replace the knob and the cover by tightening the screw.



#### **Dimensions (mm)**





#### Industrial electromechnical room thermostat

#### Description

The industrial room thermostat TA is suitable for temperature control in industrial rooms such as greenhouses, industrial buildings, warehouses etc.

#### Technical specifications

Measurement range	see schedule
Tolerance	±3° C
Differential	2 ±1°C
Electrical rating	16 (4) A, 250 V AC
Max. temperature	+70°C
Protection	IP55
Isolation class	1
Overvoltage category	II
Nominal impulse voltage	4 kV
Bulb	Spiral capillary in stainless steel
Dimensions	97 x 120 x 56 mm
Standards	CE-conformity



Models	Range °C	External knob	Internal knob
TA1	-15+40	•	
TA2	0+60	•	
TA2S	0+60		•
TA3	0+40	•	
TA3S	0+40		•

#### Electrical wirings



#### Dimensions (mm)





#### **Electromechnical capillary thermostat**

The electromechnical capillary thermostat TK, three available ranges, is suitable for most of temperature control requirements for heating and cooling applications. The thermostats are available with external, internal range knob and with fix temperature calibration.

#### Technical specifications

Measurement range
Differential
Tolerance
Electrical rating
Max. housing temperature
Max. bulb temperature
Temperature gradient
Isolation class
Overvoltage category
Nominal impulse voltage
Dimensions
Standards





Models	Range °C	Protection (*)	Differential	Internal knob	External knob	Reset	Capillary length mm
TK1	0+60	IP43	3±1°C		•		1000
TK1S	0+60	IP55	3±1°C	•			1000
TK2	0+90	IP43	4±2°C		•		1000
TK2S	0+90	IP55	4±2°C	•			1000
ТК3	-35+35	IP43	2±1°C		•		1500
TKL100	fissa 100°C	IP55				manual	1000
TKL1	+90+110	IP55		•		manual	1000

(\*)The degree of protection is ensured by placing the unit horizontally or vertically with the cable entry facing down.

#### Electrical wirings



#### Dimensions (mm)





#### Electromechnical immersion thermostat with pocket

#### Description

The electromechnical immersion thermostat TI, three available ranges, is suitable for most of temperature control requirements for heating and cooling applications. The thermostats are available with external, internal range knob and with fix temperature calibration.

#### Technical specifications

Measurement range	see schedule
Differential	6±2°C
Tolerance	Min. temp. ±6°C, max. temp. ±4°C
Temperature gradient	1 °C/min
Electrical rating	16 (4) A, 250 V AC - 6 (1) A, 400 V AC
Max. housing temperature	Т 85
Max. bulb temperature	T 120
Protection	IP43 (*)
Isolation class	I
Overvoltage category	II
Nominal impulse voltage	4 kV
Dimensions	84 x 84 x 36 mm
Standards	CE-conformity, PED group 2



(\*)The degree of protection is ensured by placing the unit horizontally or vertically with the cable entry facing down.

Models	Range °C	Internal knob	External knob	Reset
TI1	0+60		•	
TI1S	0+60	•		
TI2	0+90		•	
TI2S	0+90	•		
ТІ3	+30+70		•	
TIL100	Fix 100°C			manual
TIL1	+90+100	•		manual

#### Electrical wirings



#### Dimensions (mm)







TI

#### Description

The electromechanical strap-on pipe thermostat TC with liquid expansion sensor, two available ranges, is suitable for most of temperature control requirements for heating and cooling applications. The thermostats are available with external, internal range knob and as safety limiter. The thermostat comes with a spring band and a 20 g bag of thermal paste.

#### Technical specifications

Measurement range	see schedule
Tolerance	see schedule
Differential	see schedule
Electrical rating	16 (4) A, 250 V AC - 6 (1) A, 400 V AC
Max. temperature	T 85
Protection	IP40
Isolation class	1
Overvoltage category	II
Nominal impulse voltage	4 kV
Dimensions	105 x 42 x 38 mm
Accessory	Spring band and thermal paste (included)
Standards	CE-conformity



Models	Range °C	Differential	Tolerance	External knob	Internal knob	Reset
TC1	+5+60	6±2°C	±5°C	•		
TC1S	+5+60	6±2°C	±5°C		•	
TC2	+10+90	6±2°C	±5°C	•		
TC2S	+10+90	6±2°C	±5°C		•	
TCL65	Fix 65		+0 -6°C			manual
TCL1	+30+70		+0 -6°C		•	manual

#### Electrical wirings



#### Dimensions (mm)









#### Digital fan coil 2- and 4-pipe controller

#### Description

The RTA02 controller is designed to control fan coil in heating and cooling systems. RTA02 controls heating and/or cooling valves, fan speeds with 2 or 4-pipe fan coil.

#### Technical specifications

- · 2 and 4 pipes selectable fan coil applications
- · Fan control with manual 3-speeds setting
- · ON-OFF control action for actuators
- · Analog input for water temperature sensor
- · Output voltage for valves 230 V AC, fan motor 230 V AC
- Power supply: 230 Vac, 50/60 Hz
- · Frost protection function
- · Display with blue backlight
- · CE certification

#### **Technical features**











#### Electrical wiring







#### Mounting











## RTA34

#### Description

The RTA34 thermostat, in its various versions, is suitable for application in heating, air conditioning and refrigeration systems.

The RTA34 can be configured with the following temperature ranges:  $+5...+35^{\circ}C$ -10...+20°C -35...+5°C +35...+65°C

The choice of temperature range must be made at startup by acting on the dip switches. Then place the label, with the chosen temperature scale, on the front of the housing.



#### Technical specifications

Power supply	24 VAC/DC, 50/60 Hz
Relay output with switch contact	max 16 (6) A, 230 VAC
Adjusting action	ON-OFF
Adjustable differential	1-8 K
Control output	ON-OFF
Temperature probe connection	NTC10K
Screw clamps for cables with maximum cross-sectional area	2,5 mm <sup>2</sup>
Working temperature °C	050°C
Working range RH	<80% RH
Storage temperature	-20+70°C <80% RH
Protection type	IP40
Rail mounting	DIN
Standards	CE conformity, RoHS

#### Functioning

The RTA34 thermostat provides temperature control with ON-OFF action with a differential set by dip switches.

#### **Cooling action**

The RTA34 thermostat is equipped with a relay with a switching contact. The relay is energized when the temperature detected by the NTC probe exceeds the temperature value set on the knob plus the value of the differential. The contact between terminals C-NO is closed.

When the temperature drops to the set value (set point), the relay de-energizes, opens the contact between the C-NO terminals, and closes the contact between the C-NC terminals.





## RTA34

#### **Heating action**

For operation with heating action, dip switch 6 must be set to OFF.

The relay is energized when the temperature detected by the NTC probe falls below the temperature value set on the knob minus the value of the differential. The contact between terminals C-NO is closed.

When the temperature drops to the set value (set point), the relay de-energizes, opens the contact between the C-NO terminals and closes the contact between the C-NC terminals.



#### Electrical wirings

The above connections refer to cooling operation. For heating operation, dip switch 6 must be set to OFF. In the factory configuration, the dip switches are set to OFF.





Dimensions (mm)







Setting DIP switches



#### Description

The RTA37 thermostat, in its various versions, is suitable for application in heating, air conditioning and refrigeration systems.

The RTA37 can be configured with the following temperature ranges: +5...+35°C -10...+20°C -35...+5°C +35...+65°C

The choice of temperature range must be made at startup by acting on the dip switches. Then place the label, with the chosen temperature scale, on the front of the housing.



#### Technical specifications

Power supply	230 VAC, 50/60 Hz
Relay output with switch contact	max 3 A, 230 VAC
Adjusting action	ON-OFF
Adjustable differential	1-8 K
Control output	ON-OFF
Temperature probe connection	NTC10K
Screw clamps for cables with maximum cross-sectional area	2,5 mm <sup>2</sup>
Working temperature °C	050°C
Working range RH	<80% RH
Storage temperature	-20+70°C
Protection type	IP40
Rail mounting	DIN
Standards	CE conformity, RoHS

#### Functioning

The RTA37 thermostat provides temperature control with ON-OFF action with a differential set by dip switches.

#### **Cooling action**

The RTA37 thermostat is equipped with a relay with a switching contact. The relay is energized when the temperature detected by the NTC probe exceeds the temperature value set on the knob plus the value of the differential. The contact between terminals C-NO is closed.

When the temperature drops to the set value (set point), the relay de-energizes, opens the contact between the C-NO terminals, and closes the contact between the C-NC terminals.





## **RTA37**

#### **Heating action**

For operation with heating action, dip switch 6 must be set to OFF.

The relay is energized when the temperature detected by the NTC probe falls below the temperature value set on the knob minus the value of the differential. The contact between terminals C-NO is closed.

When the temperature drops to the set value (set point), the relay de-energizes, opens the contact between the C-NO terminals and closes the contact between the C-NC terminals.



#### Electrical wirings

The above connections refer to cooling operation. For heating operation, dip switch 6 must be set to OFF.

In the factory configuration, the dip switches are set to OFF.







**Dimensions (mm)** 







## violetline

## flow switches

#### Description

The flow switch serie FS is designed for controlling flow rates in pipes and ducts employed in HVAC applications from 1" up to 8", optionally up to 10". In particular for monitoring flow in water, for pumps in oil circulation, cooling and lubrication systems, heat exchangers, compressors and is used as flow control device or as water failure protection switch. Models available with brass and stainless steel body for aggressive media.

#### Technical specifications

Flow rate	See schedule
Switching output	Dustproof microswitch as potential-free SPDT contact
Electrical rating	16 (8) A, 24 - 250 VAC, at 24 VAC min. 150 mA
Lifetime	100.000 cycles at nominal load
Electrical connection	Screw terminal, wire up to 1,5 mm <sup>2</sup> , cable $\emptyset$ 6…9 mm
Max. pressure	See schedule
Calibration	The flowswitch is factory calibrated at its min. sensitivity. To increase the set value turn clockwise the adjustment screw. The cut-out value must be >- the minimum flow necessary to guarantee the protection of the plant. The units without "T" fittings are supplied with 4 paddles, which must be cut off according to the pipe. All devices can be supplied with "T" connection on request as schedule indications.
Housing	ABS, RAL 9010, UV resistant
Cable conduit	M20 x 1,5 mm
Body and lever material	1" GAS, brass or stainless steel Aisi 316, optionally with 1" NPT thread
Paddles material	Stainless steel Aisi 316
Dimensions	See drawing
Weight	600 gr
Protection type	IP65
Protection class	III
Max. fluid temperature	-25+120°C
Working humidity RH	1095% RH, non-condensing
Working temperature °C	-40+85°C
Storage temperature	-20+60°C
Installation	Horizontal and vertical, screw-in thread, Rp 1" (ISO7/1) shall be installed far from elbows or throttlings, with arrow on flow direction. If pipe is vertical, recalibrate range to balance paddle weight. If the device is downwards mounted take care to slags, and apply it in a straight pipe far from filters, valves, etc with length at least 5 times the diameter of pipe upstream and downstream the unit. The paddles must be installed starting from the shortest.

Standards

CE conformity, RoHS

Models	Fluid	Max. pressure	Body material
FS1	normal	15 bar	brass
FS2	aggressive	30 bar	stainless steel Aisi 316

Option suffix NPT for body with 1" NPT thread suffix -10 with 8" paddle for 10" pipe size

## <sup>24</sup> 9 tec



#### Flow rates in m<sup>3</sup>/h

		Flow m <sup>3</sup> /h				
Line pipe size	Paddle size	Flow increase Min. flow rate R to B closes	Flow increase Max. flow rate R to B closes	Flow decrease Min. flow rate R to Y closes	Flow decrease Max. flow rate R to Y closes	Max. recommended flow m³/h
1"	1	0,8	2,2	1,2	2,3	3,6
1" 1/4	1	0,93	2,52	1,5	2,8	6,1
1" 1/2	1, 2	1,1	3,9	2,37	4,3	9,2
2"	1, 2	2,0	6,05	3,8	6,5	15
2" 1/2	1, 2, 3	3,0	7,3	4,4	8,4	24
3"	1, 2, 3	5,0	11,7	6,2	12,6	36
4"	1, 2, 3	10,0	30,0	8,06	36,0	60
5"	1, 2, 3	21,1	51,4	24,0	69,0	94
<b>6</b> "	1, 2, 3, 4	12.4	29,0	20,0	33,7	120
0	1, 2, 3	24,0	72,0	32,7	90,0	120
0"	1, 2, 3, 4	23,9	83,4	34,6	96,0	240
ď"	1, 2, 3	48,4	174	66,8	200	240
10" *	1, 2, 3, 5	51	180	69	198	360

The values of minimum and maximum flow rate can be changed during installation shortening the paddles. The values in the table were measured by mounting the flow switch with the body horizontally. \* Flow rates for this size are calculated.

#### Dimensions (mm)



#### ATTENTION

If flowswitch is used as a minimum flow controller, it is necessary to add another device downstream for alarm condition activation.





#### Description

The flow switch serie FL is designed for controlling flow rates in pipes and ducts employed in HVAC applications from 3/8" up to 2". In particular for monitoring flow of liquid media, pumps in oil circulation, cooling and lubrication systems, heat exchangers, compressors and is used as flow control device or as water failure protection switch.

#### Technical specifications

Flow rate	See schedule
Switching output	Dustproof microswitch SPDT contact
Electrical rating	3 A, 250 V AC; 5 A, 125 V AC
Lifetime	100.000 cycles at nominal load
Electrical connection	DIN 43650A connector
Max. pressure	25 bar
Average pressure loss	0.01 bar at Q max
Hysteresis	min. 0,7 l/min.
Housing	ABS, black
Connection	Female thread T-fitting
Body and lever material	Nickel plated brass
Paddles material	Stainless steel Aisi 316L
Dimensions	See drawing
Weight	See schedule
Protection type	IP65
Protection class	I
Max. pipe temperature	-20+110°C
Working humidity	1095% RH, non-condensing
Working temperature	-40+90°C
Storage temperature	-40+90°C
Installation	Horizontal or vertical, shall be installed far from e If pipe is vertical, recalibrate range to balance pate ted take care to slags, and apply it in a straight of

elbows or throttlings, with arrow on flow direction. addle weight. If the device is downwards mounted take care to slags, and apply it in a straight pipe far from filters, valves, etc with length at least 5 times the diameter of pipe upstream and downstream the unit.

#### Standards

CE conformity, RoHS

Models	Connection	Flow rate I/min H <sub>2</sub> O	Max. recommended flow rate I/min $\rm H_2O$
FL10	G 3/8	4.4 (3.7) - 5.9 (5.1)	10
FL15	G 1/2	4.4 (3.7) - 5.9 (5.1)	20
FL20	G 3/4	9.4 (8.0) - 12.8 (10.8)	40
FL25	G 1	14.7 (12.5) - 19.9 (16.9)	60
FL32	G 1 1/4	24.1 (20.5) - 32.7(27.8)	80
FL40	G 1 1/2	37.7 (32.1) - 51.0 (43.4)	100
FL50	G 2	59.0 (50.1) - 79.8 (67.8)	150

Note: The flow rate values indicate operating point. The values between the brackets indicate reset point and were measured by mounting the flow switch with the body horizontally.





#### Electrical wirings



#### Installation





Attention: the flow direction should be the same as the arrow direction, do not pull the black plastic shell.

#### Dimensions (mm)



A mm	B mm	C mm	Weight kg
28	G 3/8	58	0,33
28	G 1/2	58	0,30
28	G 3/4	58	0,32
34	G 1	58	0,40
34	G 1 1/4	72	0,47
34	G 1 1/2	72	0,57
46	G 2	72	0,72





#### Description

The flow switch serie FL200 is designed for controlling flow rates in pipes and ducts employed in HVAC applications from DN32 up to DN200. In particular for monitoring flow in water, for pumps in oil circulation, cooling and lubrication systems, heat exchangers, compressors and is used as flow control device or as water failure protection switch. Models available with brass and stainless steel body for aggressive media.

#### Technical specifications

Flow rate	See schedule
Switching output	Dustproof microswitch as potential-free SPDT contact
Electrical rating	See schedule
Lifetime	100.000 cycles at nominal load
Electrical connection	DIN 43650A connector
Max. pressure	25 bar
Average pressure loss	0.01 bar at Q max
Hysteresis	min. 0.7 l/min.
Housing	ABS, black
Connection	Male thread fitting 1/2" ISO
Body and lever material	Nickel plated brass
Paddles material	Beryllium copper alloy
Dimensions	See drawing
Protection type	IP65
Protection class	Ш
Max. pipe temperature	-25+110°C
Working humidity	1095% RH, non-condensing
Working temperature	-25+80°C
Storage temperature	-40+80°C
Installation	Horizontal or vertical, shall be installed far from elbows or throttlings, with arrow on flow direction. If pipe is vertical, recalibrate range to balance paddle weight. If the device is downwards mounted take care to slags, and apply it in a straight pipe far from filters, valves, etc with length at least 5 times the diameter of pipe upstream and downstream the unit.
Standards	CE conformity, RoHS

Models	Electrical rating
FL200A	0,1 A, 125 V AC; min. 1 mA, 5 V DC
FL200B	3 A, 250 V AC; 5 A, 125 V AC; min. 160mA, 5 V DC

Note: The values in the table were measured by mounting the flow switch with the body horizontally.





FL200A



FL200

#### Electrical wirings



	Flow m <sup>3</sup> /h						
Pipe DN	Paddle 1	Paddles 1, 2	Paddles 1, 2, 3	Paddles 1, 2, 3, 4	Max. recommended flow m³/h		
32	1,7 (1,4)1,8 (1,5)	-	-	-	6		
40	1,7 (2,4)1,8 (2,0)	-	-	-	9		
50	4,5 (3,8)4,9 (4,2)	1,2 (1,0)1,4 (1,2)	-	-	15		
65	9,5 (8,1)11,2 (9,5)	3,2 (2,7)3,6 (3,1)	-	-	24		
80	13,5 (11,5)14,8 (12,6)	5,9 (5,0)7,4 (6,3)	1,4 (1,2)2,7 (2,3)	-	36		
100	25,8 (21,9)30,2 (25,7)	8,3 (7,1)8,8 (7,5)	3,3 (2,8)3,9 (3,3)	2,3 (2,0)3,8 (3,2)	60		
125	35,5 (30,2)41,6 (35,4)	11,7 (9,9)13,1 (11,1)	5,1 (4,3)5,8 (4,9)	3,1 (2,6)3,8 (3,2)	85		
150	49,6 (42,2)54,7 (46,5)	14,8 (12,6)16,9 (14,4)	6,2 (5,3)6,6 (5,6)	4,0 (3,4)4,5 (3,8)	110		
200	88,2 (75,0)97,3 (82,7)	26,3 (22,4)30,0 (25,5)	11,0 (9,4)11,7 (9,9)	7,1 (6,0)8,0 (6,8)	203		
/alues with increasing flow, in brackets values with decreasing flow.							

#### Installation





Flow direction

Attention: the flow direction should be the same as the arrow direction, do not pull the black plastic shell.

#### Dimensioni (mm)









#### Description

The flow switch serie FLUS001 is designed for controlling flow rates in pipes and ducts employed in HVAC applications from 3/4" up to 8". The reed contact guarantees a complete isolation between the electrical and the mechanical part.

FLUS001

Technical specifications	
Flow rate	See schedule
Switching output	Reed SPST, max. 26 VA, 20 W
Electrial rating	1 A, 230 VAC, 48 VDC
Electical connection	1,5 m cable 2x0,5 mm <sup>2</sup> , 300/500V UV and weather resistant
Max pressure	10 bar
Average pressure loss	0.01 bar at Q max
Hysteresis	min. 0.7 l/min.
Housing	PPO, black
Connection	Threaded female 3/4 ring brass nickeled
Body and lever material	Brass
Paddles material	Stainless steel
Dimensions	See drawing
Protection type	IP65
Protection class	I
Max. fluid temperature	-25+100°C
Working temperature	-25+70°C
Installation	Horizontal or vertical, far from elbows or narrowing, with the arrow in the direction of flow. If the device is mounted downwards protect it from scale or impurities and apply it in a straight line away from the filters, valves, etc with a distance of at least 5 times the diameter of the pipe upstream and downstream of the unit.

Standards

CE conformity, RoHS

		Flow ra	Max.	
Pipe	Length of paddle cut (mm)	Increasing flow ON	Decreasing flow OFF	recommended flow rate m³/h H <sub>2</sub> O
DN20	9	1,08	0,9	4
DN25	15	1,32	1,08	5
DN32	20	1,92	1,62	8
DN40	30	2,1	1,8	10
DN50	40	2,7	2,4	14
DN80	60	5,1	4,68	30
DN100	80 (do not cut)	6,36	5,82	40
DN150	80 (do not cut)	15,48	14,22	100
DN200	80 (do not cut)	30	28,98	180

Note: The values in the table were measured by mounting the flow switch with the body horizontally.



#### Electrical wirings



#### Installation



#### Dimensions (mm)







#### Description

The flow switch serie FLUS is designed for controlling flow rates in pipes and ducts employed in HVAC applications from 1" up to 2". The reed contact guarantees a complete isolation between the electrical and the mechanical part.

**FLUS** 

#### Technical specifications

Flow rate	See schedule	
Switching output	Reed SPST, max. 26 VA, 20 W	
Electrial rating	1 A, 230 VAC, 48 VDC	
Electical connection	RVV cable 2x0,5 mm <sup>2</sup> , 300/500V UV and weather resistant	
Max pressure	10 bar	
Average pressure loss	0,01 bar at Q max	
Hysteresis	min. 0,7 l/min.	
Housing	PPE, black	OBLY OF
Connection	Female threaded T-fitting (besides FLUS09AW), nut brass nickeled	
Body and lever material	Brass	
Paddles material	Brass	
Sealing	NBR	
Dimensions	See drawing	
Protection type	IP65	
Protection class	I	
Max. fluid temperature	-25+100°C	
Working temperature	-25+70°C	
Installation	Horizontal or vertical, far from elbows or narrowing, with the arrow in the direction device is mounted downwards protect it from scale or impurities and apply it in a from the filters, valves, etc with a distance of at least 5 times the diameter of the downstream of the unit.	n of flow. If the straight line away pipe upstream and

Standards

CE conformity, RoHS

				Flow rate m <sup>3</sup> /h H <sub>2</sub> O		Max.
Models	Connection	Cable m	Setting m³/h	Increasing flow ON	Decreasing flow OFF	recommended flow rate m³/h H <sub>2</sub> O
FLUS002AW	G 3/4	2	0,3	0,5	0,3	4,8
FLUS006AW	G 1	2	0,4	0,6	0,4	7,8
FLUS007AW	G 1	1	0,95	0,78 - 0,99	0,74 - 0,95	7,8
FLUS011AW	G 1 1/4	4	1,92	-	-	10,8
FLUS010AW	G 1 1/2	1,5	1,6	1,62 - 2,01	1,53 - 1,95	18
FLUS009AW	-	4	2,76	2,49 - 3,21	2,44 - 3,17	21

Note: The values in the table were measured by mounting the flow switch with the body horizontally.



FLUS

#### Electrical wirings



#### Installation





#### Dimensions (mm)



FLUS002AW



FLUS006AW / FLUS007AW



FLUS011AW









#### Description

The level switch serie FG is designed to control fluid level in tanks in an simple and effective way. The switching function through the reed contact (N/O or N/C contact) is determined by the installation position. The switching function can be reversed by simply rotating the level switch for 180°.

#### Technical specifications

Connector	Male thread G 1/2	
Max. pressure	FG1, FG2 10 bar - FGP 4 bar	
Contact	N/O or N/C depending on the installation	
Electrical rating	Reed, max 240 V AC DC, max 40 W, max 0,5 A	
Contact resistance	max 80 mOhm	
Min. contact force	400 V DC / 1 sec.	
Collegamenti elettrici	PVC braided cable AWG 24, 2 wires, 1 m length	
Material	Polypropylene	
Specific fluid weight	> 0,6 g/cm <sup>3</sup>	
Installation	Horizontal ±30°	
Protection type	IP68	
Standards	CE conformity, RoHS	



FG

Model	Fluid	Temperature	Body material	Connections
FG1	not aggressive	-10+80° C	Polypropylene	single
FG2	not aggressive	-10+80° C	Polypropylene	double
FGP	not aggressive	-10+80° C	Polypropylene	single

#### Dimensions (mm)







#### Description

The air flow switch serie FSA is designed for controlling flow rates od air and non aggressive gases in pipes and ducts employed in HVAC applications.

#### Technical specifications

Switching output	Dustproof microswitch as potential-free SPDT contact		
Electrical rating	16 (8) A, 24 - 250 V AC, at 24 V AC min. 150 mA		
Lifetime	100.000 cycles at nominal load		
Electrical connection	Screw terminal, wire up to 1,5 mm², cable Ø 69 mm		
Housing	ABS, white		
Cable conduit	M20 x 1,5 mm		
Lever material	Brass		
Paddles material	Stainless steel Aisi 301		
Dimensions	See drawing		
Weight	600 gr		
Protection type	IP65		
Protection class	III		
Max. fluid temperature	-10+85°C		
Working humidity RH	1095% RH, non-condensing		
Working temperature °C	-40+85°C		
Storage temperature	-40+85°C		
Standards	CE conformity, RoHS		



**FSA** 

Model	Min. cut-out value	Min. cut-in value	Max cut-out value	Max cut-in value
	m/sec.	m/sec.	m/sec.	m/sec.
FSA1	1,0	2,5	8,0	9.2

#### Electrical wirings



#### Dimensions (mm)



#### ATTENTION

The units are calibrated at the minimum switch-off value. A higher value can be adjusted by turning the range screw clockwise. Due to the risk of fracture at air speed higher than 5 m/s the paddle must be cut off on the marked side. When the paddle is cut off, the minimum cut-out value increases from 1 m/s to 2,5 m/s. Straights zones should be provided for a length of 5 x diameter upstream and downstream the location of installation to avoid air swirl and paddle instability.


# blueline

## pressure switches

Air differential pressure switch serie PA for monitoring overpressure, vacuum and differential pressure of air or other non-combustible, non-aggressive gases. The switching pressure can be adjusted without a manometer at the adjustment knob with the guide value scale. Various versions are available for this with overlapping adjustment ranges of between 20 and 5000 Pa (0,2 and 50 mbar). Possible fields of application are monitoring air filters and ventilators, industrial cooling-air circuits, flows in ventilation ducts, overheating protection for fan heaters, controlling air and fire-protection flaps, frost protection for heat exchangers.

#### Technical specifications

Medium	Air, non-combustible and non-aggressive gases
Measurement range	20300 Pa (0,23 mbar), 30400 Pa (0,34 mbar), 50500 Pa (0,55 mbar), 50700 PA (0,57 mbar), 2001000 Pa (210 mbar), 5002500 Pa (525 mbar), 10005000 Pa (1050 mbar), 1001000 Pa (110 mbar)
Accuracy	±15%, min. ±10 Pa, drift <±15%
Mechanical working life	Over 10 <sup>6</sup> switching operations
Electrical rating	Max 1.5 (0.4) A / 250 VAC (low voltage version max. 0,1 A, 24 VDC on request)
Electrical connection	AMP flat plug 6.3 x 0.8 mm, acc. DIN 46244 or push-on screw terminals
Max. operating pressure	10 kPa (100 mbar) for all pressure ranges
Housing material	Switch body made of PA 6.6, cover made of PS
Cable conduit	M16x1,5 connection made of polyamide
Diaphragm material	Silicone, tempered at 200°C, free of gas emissions (NBR optionally)
Housing	approx. Ø 85 x 58 mm, weight 150 g
Protection type	IP54 (IP65 in version <b>G</b> )
Working humidity	095% RH, non-condensing
Working temperature	-20+85°C
Storage temperature	-40+85°C
Accessories (optionally)	Connection set (PVC-hose 2 m Ø 6 with 2 ABS nippels and 4 screws) and snap-on plastic brackets
Installation	Screw fastening
Installation position	Preferred vertical
Standards	CE-conformity, RoHS, EN1854 class A. Models available on request with UL508, CSA, ATEX approvals.
• ·· ·	

Optional

multiply packing (45 pcs/cardboard), models with range in mbar, UL / CSA approval (not available for IP65 models), IP65 protection, ATEX directive, low voltage version max. 0,1 A, 24 VDC, NBR diaphragm

Models	Measuring range	Repeatability	Differential*
PA1	20300 Pa (0,23 mbar)	±5%, min. ±5 Pa	10 Pa (0,1 mbar)
PA2	30400 Pa (0,34 mbar)	±5%, min. ±5 Pa	15 Pa (0,15 mbar)
PA3	50500 Pa (0,55 mbar)	±2,5%, min. ±5 Pa	20 Pa (0,2 mbar)
PA4	2001000 Pa (210 mbar)	±1%, min. ±5 Pa	100 Pa (1 mbar)
PA5	5002500 Pa (525 mbar)	±1%	150 Pa (1,5 mbar)
PA6	10005000 Pa (1050 mbar)	±1%	250 Pa (2,5mbar)
PA7	1001000 Pa (110 mbar)	±2,5%, min. ±5 Pa	50 Pa (0,5 mbar)
PA8	50700 Pa (0,57 mbar)	±2,5%, min. ±5 Pa	20 Pa (0,2 mbar)
Accessories:	<ul> <li>APA1 Snap-on plastic bracket, L-sh.</li> <li>APA2 Snap-on plastic bracket, S-sh</li> <li>APA3 PVC-hose 2 m Ø 6 with 2 ABS</li> </ul>	aped aped S nippels and 4 screws	

\*typically, at beginning of setting range

Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards. If the switches are installed horizontally with the tab terminals uppermost, the switching values are approx. 20 Pa higher.





#### Order matrix

Configurable pressure ranges	20300 Pa	(0,23 mbar) PA	1						
	30400 Pa	(0,3…4 mbar)	2						
	50500 Pa	(0,55,0 mbar)	3						
	2001000 Pa	(210 mbar)	4						
	5002,5 kPa	(525 mbar)	5						
	15 kPa	(10…50 mbar)	6						
	0,1 1 kPa	(110 mbar)	7						
	50700 Pa	(0,57,0 mbar)	8						
Unit of measure	Pascal								
	Millibar			в					
Protetion	IP54								
	IP65				G				
Low voltage version	low voltage version max. 0,	1 A, 24 VDC				LC			
Approval	Standard								
	UL						UL		
Directive	ATEX (II 2G Ex ia IIB T4 Gb / 2D Ex ia IIIB T135°C Db)*							Х	
Packaging	Unit								
	45 pcs packaging								М

\* Electrical rating: 2G: max 60 mA / 30 VDC or 100 mA 24 VDC 2D: max 60 mA / 30 VDC 0,6 W

#### Electrical wirings



#### Dimensions (mm)



APA1 Snap-on plastic bracket, L-shaped







APA2 Snap-on plastic bracket, S-shaped







#### Liquid column manometer

#### Description

The MM liquid column manometer is engineered for HVAC/R applications. The device detects air and non-corrosive gas pressure and provides a clear analog display of the measured values. It is designed with a reservoir to protect the manometer liquid from leaking into the duct during overpressure situation. It is provided with screws, 2 meters of pipe, labels and a bottle of red liquid.

#### **Technical specifications**

Gas	air and non-corrosive gas
Range	see schedule
Accuracy	see schedule
Material	white ABS housing, cover PMMA
Max working pressure	200 kPa
Working temperature	-40+60 °C
Gauge fluid	Isopar M, colour red 0.786 kg/dm (15°C)
Dimensioni	190x153x45 mm
Standards	CE conformity, RoHS



ΜM

Model	Range	Accuracy	Liquid
MM6	0200600 Pa	0200 Pa ±5%, 200600 Pa ±25%	Red

#### Installation



- 1) Mount the device horizontally in the desired location.
- 2) Unscrew the zero adjustment knob (lower one) so that it is completely open and then turn one round backwards. Open the fill plug (upper one) and pour in the gauge fluid until it reaches the zero on the scale. Finetune with the zero adjustment knob until the fluid is exactly at the zero level. Screw the fill plug back to its place.
- 3) Connect the pressure tubes. Connect positive pressure to port labeled "+" and negative pressure to port "-"

SAFETY: Product equipped with integral reservoir to prevent gauge fluid leakage during overpressure situation. NOTE! Use only the liquid supplied with the device to ensure accuracy and performance.





# orangeline

damper actuators

Damper actuator serie S2 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 0.5 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac
- \* Control: Open-close or 3-point and proportional

 Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 6 to 15,5 mm round / 5 to 11 mm square, minimum shaft length 35 mm, anti-rotation bracket provided for stability, adjustable angle of rotation with mechanical end stops, 0,9 m cable connection, manual override with push-button possible (the gear train is disengaged for as long as the button is pressed), the actuator is overload protected, requires no limit switches and automatically stops when the end is reached.

#### Technical features



Actuator model		S2A	S2B	S2AM	S2BM			
Damper area	m²	0.5						
Nominal torque	Nm	2						
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC			
Frequency	Hz		50/	60				
Power consumption								
- in operation	W	2,0	2,8	2,0	2,8			
- at rest	W	0,5	0,7	0,5	0,7			
- for wire sizing	VA		4,	5				
Running time	S		20	.45				
Sound power level	max. db (A)		45	5				
Control signal		2-3 point	2-3 point	010 V DC	010 V DC			
Auxiliary switch rating			3 (1,5) A,	250 VAC				
Life Cycle	cycles		60.0	000				
Rotation angle			max.	.95°				
Rotation way			L/R sv	witch				
Protection class			II					
Protection degree			IPS	54				
Working range °C			-20+	70° C				
Working range % RH			595% RH, nor	n-condensating				
Storage temperature			-40+	70° C				
Maintenance		free						
Weight	g	g 600						
Standards			CE-conform	nity, RoHs				
Option	suffix S for models with 1 SPDT auxiliary switch							



U

0...10V

0...10V

#### Electrical wirings





1

\_ ⊥

2...10V

2...10V

#### Auxiliary switch



#### Setting

#### Change of rotation way



#### Angle of rotation limiting







Damper actuator serie S4 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: Open-close or 3-point and proportional •

 Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 16 mm round / 10 to 12 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation with mechanical end stops, manual override with push-button possible (the gear train is disengaged for as long as the button is pressed), the actuator is overload protected, requires no limit switches and automatically stops when the end is reached.

#### Technical features

Actuator model		S4A	S4B	S4AM	S4BM		
Damper area	m²		1				
Nominal torque	Nm	4					
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC		
Frequency	Hz		50/	60			
Power consumption							
- in operation	W	2.2	3.2	2.2	3.2		
- at rest	W	0.5	0.7	0.5	0.7		
- for wire sizing	VA	4.4	6.4	4.4	6.4		
Running time	S		45	5			
Sound power level	max. db (A)		45	5			
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA		
Auxiliary switch rating			3 (1.5) A, 2	250 V AC			
Life Cycle	cycles		60.0	000			
Rotation angle							
- operating			0-9	0°			
- limitation			5-85° (ste	ps of 5°)			
Protection class			II				
Protection degree			IPS	54			
Working range °C			-20+	70° C			
Working range RH			595% RH, nor	n-condensating			
Storage temperature		-40+70° C					
Maintenance		free					
Weight	g	900	1000	1000	900		
Standards		CE-conformity, RoHs					
Option		suffix S for models with 2 SPDT auxiliary switches					
9 tec							



 $\mathbf{S4}$ 

> max. 5

#### 

Parallel connections

 $\bigcirc$  $\bigcirc$ 

> 2 3

 $\odot \odot \odot$ 

3

1

#### Electrical wirings for models at 2 / 3 point

#### Wiring diagram



#### Settings

Changing direction of rotation



#### Electrical wirings for proportional models

Wiring diagram





#### Dimensions (mm)



#### Auxiliary switches



actuator in position 0°

Auxiliary switch adjustment Factory setting: switch a at 10° - switch b at 80° The switching position can be changed manually.

# аb $\bigcirc$ 00

DIP 1

Feedback signal

OFF: 0(2)...10 V

ON: 0(4)...20 mA

ON

## 1 2- point Ĺ 1 3- point Max 5 actuators

Angle of rotation limiting The angle of rotation at 90° can be reduced by up to 30° from each end position with screw 1 and 2.



Screw 2

## **DIP** settings DIP 2 Input signal starting point DIP 3 Input signal

ON

Γ

OFF: 0...10 V o 0...20 mA

ON: 2...10 V o 4...20 mA









Damper actuator serie S8 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1,5 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 100...240 Vac •
- Control: Open-close or 3-point and proportional •

• Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators, manual override with push-button possible (the gear train is disengaged for as long as the button is pressed), the actuator is overload protected, requires no limit switches and automatically stops when the end is reached.

#### Technical features

Actuator model		S8A	S8B	S8AM	S8BM			
Damper area	m²	1,5						
Nominal torque	Nm	8						
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC			
Frequency	Hz		50/60	)				
Power consumption	W		4.5					
- at rest	W	0.5	0.7	0.5	07			
- for wire sizing	VA		7.0		•			
Running time	S		306	0				
Sound power level	max. db (A)		45					
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA			
Auxiliary switch rating			3 (1.5) A, 23	30 V AC				
Life Cycle	cicli		60.00	0				
Rotation angle								
- operating			0-90'	þ				
- limitation			5-85° (step	s of 5°)				
Protection class		III	II	III	II			
Protection degree			IP54					
Working range °C			-20+70	)° C				
Working range RH			595% RH, non-	condensating				
Storage temperature			-40+80	)° C				
Maintenance		free						
Weight	g <1300							
Standards			CE-conformi	ty, RoHs				
Option		suffix S	for models with 2 S	PDT auxiliary switch	nes			





#### 

#### Electrical wirings for models at 2 / 3 points

#### Wiring diagram



#### Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Parallel connections



#### Electrical wirings for proportional models

#### Wiring diagram 230 V AC



#### Settings DIP switches





OFF: 0(2)...10 V ON: 0(4)...20 mA

ON 1 2 34

DIP 2

Input signal starting point

OFF: 0...10 V o 0...20 mA ON: 2...10 V o 4...20 mA

#### Wiring diagram 24 V AC



DIP 3

Input signal

OFF: 0(2)...10 V

ON: 0(4)...20 mA

ON

Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°



Rotation direction option



S2

OFF: With the increase of the signal, the actuator rotate couterclockwise ON: With the increase of the signal, the actuator rotate clockwise

## **S8**

#### 

Auxiliary switch adjustment Factory setting: switch a at 10° switch b at 80° The switching position can be changed manually.



#### Angle of rotation limiting











Damper actuator serie S16 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 3 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 100...230 Vac
- · Control: Open-close or 3-point and proportional

· Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators, manual override with push-button possible (the gear train is disengaged for as long as the button is pressed), the actuator is overload protected, requires no limit switches and automatically stops when the end is reached.

#### Technical features

Actuator model		S16A	S16B	S16AM	S16BM			
Damper area	m <sup>2</sup>	3						
Nominal torque	Nm		16					
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC			
Frequency	Hz		50/60	)				
Power consumption - in operation	W		4.5					
- at rest	W	0.5	0.7	0.5	0.7			
- for wire sizing	VA		7.0					
Running time	S		7010	0				
Sound power level	db (A)		45					
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA			
Auxiliary switch rating			3 (1.5) A, 23	0 V AC				
Life Cycle	cycles		60.00	0				
Rotation angle								
- operating			0-90°					
- limitation			5-85° (steps	s of 5°)				
Protection class		III	Ш	III	Ш			
Protection degree			IP54					
Working range °C			-20+70	)° C				
Working range RH			595% RH, non-o	condensating				
Storage temperature			-40+80	)° C				
Maintenance			free					
Weight	g	<1300						
Standards			CE-conformit	y, RoHs				
Option	suffix S for models with 2 SPDT auxiliary switches							



**S16** 



## S16

#### Electrical wirings for models at 2 / 3 points

#### Wiring diagram



#### Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Parallel connections



#### Electrical wirings for proportional models

Wiring diagram 230 V AC



#### **Settings DIP switches**

DIP 1 Feedback signal



OFF: 0(2)...10 V ON: 0(4)...20 mA





DIP 2

OFF: 0...10 V o 0...20 mA ON: 2...10 V o 4...20 mA

Wiring diagram 24 V AC



Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

S2 Rotation direction

DIP 3 Input signal



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 4 Rotation direction



OFF: With the increase of the signal, the actuator rotate couterclockwise ON: With the increase of the signal, the actuator rotate clockwise



## **S16**

#### 

#### Auxiliary switch adjustment Factory setting: switch a at 10°

switch a at 10° switch b at 80° The switching position can be changed manually.



#### Angle of rotation limiting













Damper actuator serie S24 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 4.5 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional

Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators, manual override with push-button possible (the gear train is disengaged for as long as the button is pressed), the actuator is overload protected, requires no limit switches and automatically stops when the end is reached.

#### Technical features

Actuator model		S24A	S24B	S24AM	S24BM			
Damper area	m²	4.5						
Nominal torque	Nm	24						
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC			
Frequency	Hz		50/6	0				
Power consumption								
- in operation	W		4,5					
- at rest	W	0,5	0,7	0,5	0,7			
- for wire sizing	VA		7,0					
Running time	S		1301	60				
Sound power level	db (A)		45					
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA			
Auxiliary switch rating			3 (1,5) A, 23	30 V AC				
Life Cycle	cycles		60.00	00				
Rotation angle								
- operating			0-90	0				
- limitation			5-85° (step	s of 5°)				
Protection class		III	II	III	II			
Protection degree			IP54	1				
Working range °C			-20+7	0° C				
Working range RH			595% RH, non-	condensating				
Storage temperature			-40+8	0° C				
Maintenance		free						
Weight	g	<1300						
Standards			CE-conform	ity, RoHs				
Option	suffix S for models with 2 SPDT auxiliary switches							



S24



#### Electrical wirings for models at 2 / 3 points

#### Wiring diagram



#### Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Parallel connections



#### Electrical wirings for proportional models

Wiring diagram 230 V AC



#### Settings DIP switches

DIP 1 Feedback signal



OFF: 0(2)...10 V ON: 0(4)...20 mA





OFF: 0...10 V o 0...20 mA ON: 2...10 V o 4...20 mA

Wiring diagram 24 V AC



Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

DIP 3 Input signal



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 4 Rotation direction





OFF: With the increase of the signal, the actuator rotate couterclockwise ON: With the increase of the signal, the actuator rotate clockwise





Auxiliary switch adjustment Factory setting: switch a at 10° switch b at 80° The switching position can be changed manually.



#### Angle of rotation limiting













Damper actuator serie S32 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 6 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional

Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators, manual override with push-button possible (the gear train is disengaged for as long as the button is pressed), the actuator is overload protected, requires no limit switches and automatically stops when the end is reached.

#### Technical features

Actuator model		S32A	S32B	S32AM	S32BM			
Damper area	m²	6						
Nominal torque	Nm	32						
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC			
Frequency	Hz		50/6	60				
Power consumption								
- in operation	W		4,5	5				
- at rest	W	0,5	0,7	0,5	0,7			
- for wire sizing	VA		7,0	)				
Running time	S		180	ס				
Sound power level	db (A)		45					
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA			
Auxiliary switch rating			3 (1,5) A, 2	30 V AC				
Life Cycle	cycles		60.0	00				
Rotation angle								
- operating			0-90	)°				
- limitation			5-85° (ste	os of 5°)				
Protection class		III	II	Ш	II			
Protection degree			IP5	4				
Working range °C			-20+7	70° C				
Working range RH			595% RH, non	-condensating				
Storage temperature			-40+8	30° C				
Maintenance			free	e				
Weight	g	g 1300						
Standards			CE-conform	nity, RoHs				
Option	suffix S for models with 2 SPDT auxiliary switches							



# 



S32





#### Electrical wirings for models at 2 / 3 points



#### Auxiliary switches



<sup>3 (1,5)</sup> A 230 Vac actuator in position 0°

#### Parallel connections



#### Electrical wirings for proportional models





#### Settings DIP switches

DIP 1 Feedback signal



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 2 Input signal starting point



OFF: 0...10 V o 0...20 mA ON: 2...10 V o 4...20 mA

Wiring diagram 24 V AC



Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

DIP 4



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 3

Rotation direction



S2 Rotation direction



OFF: With the increase of the signal, the actuator rotate couterclockwise ON: With the increase of the signal, the actuator rotate clockwise



## **S32**

#### 

Auxiliary switch adjustment Factory setting: switch a at 10° switch b at 80° The switching position can be changed manually.



#### Angle of rotation limiting













## Damper actuators fast running, 8 Nm

#### Description

Damper actuator serie S8 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1,5 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 100...240 Vac •
- Control: Open-close or 3-point and proportional •

· Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / a 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators.

#### Technical features

Actuator model		S8AF	S8BF	S8AMF	S8BMF		
Damper area	m²		1,5				
Nominal torque	Nm	8					
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC		
Frequency	Hz		50/6	0			
Power consumption - in operation	W		12				
- at rest	W	0.5	0.7	0.5	0.7		
- for wire sizing	VA		7.0				
Running time	S		8				
Sound power level	max. db (A)		65				
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA		
Auxiliary switch rating			3 (1.5) A, 23	30 V AC			
Life Cycle	cicli		60.00	00			
Rotation angle							
- operating			0-90	٥			
- limitation			5-85° (step	s of 5°)			
Protection class		III	II	III	II		
Protection degree			IP54	1			
Working range °C			-20+7	0° C			
Working range RH			595% RH, non-	condensating			
Storage temperature			-40+8	0° C			
Maintenance			free	•			
Weight	g		<130	0			
Standards			CE-conform	ity, RoHs			
Option	suffix S for models with 2 SPDT auxiliary switches						



S8F

# Alter



#### Electrical wirings for models at 2 / 3 points

#### Wiring diagram



#### Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Parallel connections



#### Electrical wirings for proportional models

#### Wiring diagram 230 V AC



Wiring diagram 24 V AC



Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Settings

DIP 1 Feedback signal



OFF: 0(2)...10 V ON: 0(4)...20 mA DIP 2 Input signal starting point



OFF: 0...10 V o 0...20 mA ON: 2...10 V o 4...20 mA Setting DIP

DIP 3 Input signal



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 4 Rotation direction



OFF: With the increase of the signal, the actuator rotate couterclockwise ON: With the increase of the signal, the actuator rotate clockwise





#### Auxiliary switch adjustment Factory setting: switch a at 10°

switch a at 10° switch b at 80° The switching position can be changed manually.



#### Angle of rotation limiting



#### Adapter release









Damper actuator serie S16 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 3 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional

Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round
 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators.

#### Technical features

Actuator model		S16A	S16B	S16AM	S16BM	
Damper area	m²		3			
Nominal torque	Nm		16			
Power supply	V	24 AC/DC	100240 AC	24 AC/DC	100240 AC	
Frequency	Hz		50/60			
Power consumption						
- in operation	W		12			
- at rest	W	0.5	0.7	0.5	0.7	
- for wire sizing	VA		7.0			
Running time	S	16				
Sound power level	db (A)	65				
Control signal		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA	0(2)10 V DC 0(4)20 mA	
Auxiliary switch rating			3 (1.5) A, 23	0 V AC		
Life Cycle	cycles	60.000				
Rotation angle						
- operating		0-90°				
- limitation		5-85° (steps of 5°)				
Protection class		III	11	III	II	
Protection degree		IP54				
Working range °C		-20+70° C				
Working range RH		595% RH, non-condensating				
Storage temperature		-40+80° C				
Maintenance		free				
Weight	g	<1300				
Standards		CE-conformity, RoHs				
Option	suffix S for models with 2 SPDT auxiliary switches					



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#### Electrical wirings for models at 2 / 3 points

#### Wiring diagram



#### Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Parallel connections



#### Electrical wirings for proportional models

Wiring diagram 230 V AC



#### Wiring diagram 24 V AC



Auxiliary switches



3 (1,5) A 230 Vac actuator in position 0°

#### Settings

DIP 1 Feedback signal



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 2 Input signal starting point



OFF: 0...10 V o 0...20 mA ON: 2...10 V o 4...20 mA DIP 3

Setting DIP

Input signal



OFF: 0(2)...10 V ON: 0(4)...20 mA

DIP 4 Rotation direction



OFF: With the increase of the signal, the actuator rotate couterclockwise ON: With the increase of the signal, the actuator rotate clockwise







Auxiliary switch adjustment Factory setting: switch a at 10° switch b at 80° The switching position can be changed manually.



#### Angle of rotation limiting











#### Spring-return damper actuator, 2,5 Nm

#### Description

Damper actuator serie SR2 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 0,5 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions max Ø 12 mm, □ 8x8mm minimum shaft length 80 mm, anti-rotation bracket provided for stability,

selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### Technical features

Actuator model		SR2A	SR2AM	SR2B	
Damper area	m²		0,5		
Nominal torque	Nm		2,5		
Power supply	V	24 AC/DC	24 AC/DC	230 AC	
Frequency	Hz		50/60		
Power consumption					
- in operation	W	2,5	2,5	2,5	
- at rest	W		1,6		
Running time for motor	s		60 / 70		
Running time for spring	s	25 / 30			
Sound power level	db (A)		circa 50		
Control signal		2 point, on-off	010 V DC	2 point, on-off	
Auxilary switch rating			3 (1,5) A, AC 230 V		
Life Cycle	cycles		70.000		
Rotation angle					
- operating		90° (95° mechanical)			
- limitation		5-85° (steps of 5°)			
Protection class		III III II			
Protection degree		IP54			
Working range °C		-20+50° C			
Working range RH		595% RH, non-condensating			
Storage temperature			-30+80° C		
Maintenance			free		
Weight	g	1000			
Standards		CE-conformity, RoHs			
Option		suffix S for models with 2 SPDT auxiliary switches			



SR2



#### Electrical wirings



#### Wiring diagram proportional







#### Settings

Limitation of rotation angle from 5° to 85°



#### For 5° to 45° (diagram 1)

- 1. Loosen screw of the mechanical limiter plate.
- 2. Move the limiter plate to the appropriate position.
- 3. Tighten the screw.

For 45° to 85° (diagram 2)

- Release the secure ring of the adapter.
   Remove the adapter and turn negative 45° as shown.
- 3. Insert adapter and secure the adapter ring.
- 4. Loosen screw of the mechanical limiter plate.
- 5. Move the limiter plate to the appropriate position.
- 6. Tighten the screw.

#### Dimensions (mm)







## Spring-return damper actuator, 3 Nm

#### Description

Damper actuator serie SR3 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 0,5 m<sup>2</sup> Nominal voltage 24 Vac/dc and 230 Vac
- · Control: 2-point, on-off
- · Caracteristics: universal spindle clamp fo easy direct mounting, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### Technical features



SR3

Actuator model		SR3A	SR3B	
Damper area	m <sup>2</sup>	0,6		
Nominal torque	Nm	3		
Power supply	V	24 AC/DC	100240 AC	
Frequency	Hz	50/60		
Power consumption				
- in operation	W	5		
- at rest	W	2		
Running time for motor	S	<75		
Running time for spring	S	<20 (spring reset)		
Sound power level	db (A)	circa 50		
Control signal		2 point, on-off		
Auxilary switch rating		3 (1,5) A, AC 230 V		
Life Cycle	cycles	70.000		
Rotation angle				
- operating		90° (95° mechanical)		
- limitation		5-85° (steps of 5°)		
Protection class		III	II	
Protection degree		IP54		
Working range °C		-20+50° C		
Working range RH		595% RH, non-condensating		
Storage temperature		-40+80° C		
Maintenance		free		
Maintenance	mm	>90		
Shaft length	mm	○1016 □7x712x12	2	
Weight	g	1300		
Standards		CE-conformity, RoHs		
Option		suffix S for models with 2 SPDT aux	iliarv switches	



#### Electrical wirings





#### Settings



Limitation of rotation angle from 5° to 85°

For 5° to 45° (diagram 1)

- 1. Loosen screw of the mechanical limiter plate.
- 2. Move the limiter plate to the appropriate position.

3. Tighten the screw.

- For 45° to 85° (diagram 2) 1. Release the secure ring of the adapter.
- 2. Remove the adapter and turn negative 45° as shown.
- 3. Insert adapter and secure the adapter ring.
- 4. Loosen screw of the mechanical limiter plate.
- 5. Move the limiter plate to the appropriate position.
- 6. Tighten the screw.









## Spring-return damper actuator, 5 Nm

#### Description

Damper actuator serie SR5 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- · Caracteristics: universal spindle clamp fo easy direct mounting, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### Technical features

Actuator model		SR5A	SR5AM	SR5B	
Damper area	m²		0,5		
Nominal torque	Nm		5		
Power supply	V	24 AC/DC	24 AC/DC	100240 AC	
Frequency	Hz		50/60		
Power consumption					
- in operation	W	5.0	5.0	6.0	
- at rest	W		2.5		
- for wire sizing	VA		7.0		
Running time for motor	S	<70	<120	<70	
Running time for spring	S	<20 (spring reset)			
Sound power level	db (A)	< 45			
Control signal		2 point, on-off	0(2)10 VDC / 0(4)20 mA	2 point, on-off	
Auxilary switch rating		3 (1.5) A, AC 250 V			
Life Cycle	cycles	70.000			
Rotation angle					
- operating		90° (95° mechanical)			
- limitation		5-85° (steps of 5°)			
Protection class		Ш	III	Ш	
Protection degree		IP54			
Working range °C		-20+50° C			
Working range RH		595% RH, non-condensating			
Storage temperature		-40+70° C			
Manual override		by means of hand crank and locking switch			
Maintenance		free			
Shaft length	mm	>90			
Shaft diameter	mm	○ 1016 □ 8x812x12			
Weight	g	1800	1800	1900	
Standards		CE-conformity, RoHs			
Option	suffix S for models with 2 SPDT auxiliary switches				



SR5



#### Electrical wirings



#### Settings

Limitation of rotation angle from 5° to 85°



**Manual ovverride:** By using the hand crank the damper ca be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage.









### Spring-return damper actuator, 10 Nm

## **SR10**

#### Description

Damper actuator serie SR10 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 2 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac •
- Control: 2-point, on-off and proportional •
- · Caracteristics: universal spindle clamp fo easy direct mounting, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### Technical features



Actuator model		SR10A	SR10AM	SR10B	
Damper area	m²		1,5		
Nominal torque	Nm		10		
Power supply	V	24 AC/DC	24 AC/DC	100240 AC	
Frequency	Hz		50/60		
Power consumption					
- in operation	W	5.0	5.0	6.5	
- at rest	W		2.5		
- for wire sizing	VA		10.0		
Running time for motor	s	<100	<120	<100	
Running time for spring	s		<25		
Sound power level	db (A)	50 (motor), 62 (spring)			
Control signal		2 point, on-off	0(2)10 VDC / 0(4)20 mA	2 point, on-off	
Auxilary switch rating			3 (1,5) A, AC 250 V		
Life Cycle	cycles	70.000			
Rotation angle					
- operating			0-90°		
- limitation			5-85° (steps of 5°)		
Protection class		Ш	III	II	
Protection degree			IP54		
Working range °C			-20+50° C		
Working range RH		595% RH, non-condensating			
Storage temperature		-40+70° C			
Manual override		by means of hand crank and locking switch (only ON-OFF models)			
Maintenance			free		
Shaft length	mm	>90			
Shaft diameter	mm	○1021 □ 8x815x15			
Weight	g	2300 3000 2300			
Standards		CE-conformity, RoHs			
Option		suffix S for models with 2 SPDT auxiliary switches			
# **SR10**

#### 

#### Electrical wirings

#### Wiring diagram, On-Off



# 1 2 3 4 1 2 3 4 1 2 3 4 2 2 4 V AC/DC 0...10 V DC Output 0...10 V DC

Wiring diagram, Proportional

# Auxiliary switches



#### Settings

Limitation of rotation angle from 5° to 85°



**Manual ovverride:** By using the hand crank the damper ca be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage.











# Spring-return damper actuator, 15 Nm

# **SR15**

# Description

Damper actuator serie SR15 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 3 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- · Caracteristics: universal spindle clamp fo easy direct mounting, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

# Technical features

Actuator model		SR15A	SR15AM	SR15B		
Damper area	m <sup>2</sup>		3			
Nominal torque	Nm		15			
Power supply	V	24 AC/DC	24 AC/DC	240 AC		
Frequency	Hz		50/60			
Power consumption						
- in operation	W	6,5	6,5	7,0		
- at rest	W		3,0			
- for wire sizing	VA		10,0			
Running time for motor	S	<150	<120	<150		
Running time for spring	S		25 (spring reset)			
Sound power level	db (A)		50 (motor), 62 (spring)			
Control signal		2 point, on-off	0(2)10 VDC / 0(4)20 mA	2 point, on-off		
Auxilary switch rating		3 (1,5) A, AC 250 V				
Life Cycle	cicli	70.000				
Rotation angle						
- operating			0-90°			
- limitation			5-85° (steps of 5°)			
Protection class		Ш	III	П		
Protection degree			IP54			
Working range °C			-20+50° C			
Working range RH			595% RH, non-condensating			
Storage temperature			-40+70° C			
Manual override		by means of hand	d crank and locking switch (only ON	-OFF models)		
Maintenance			free			
Shaft length	mm		>90			
Shaft diameter	mm		01021 □8x815x15			
Weight	g	2600	3000	2600		
Standards			CE-conformity, RoHs			
Option		suffix S fo	or models with 2 SPDT auxiliary swi	tches		



# **SR15**

#### Electrical wirings

# Wiring diagram, On-Off





Wiring diagram, Proportional





# Settings

Limitation of rotation angle from 5° to 85°



**Manual ovverride:** By using the hand crank the damper ca be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage.











# Spring-return damper actuator, 20 Nm

# Description

Damper actuator serie SR20 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 4 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac •
- Control: 2-point, on-off and proportional •
- · Caracteristics: universal spindle clamp fo easy direct mounting, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### Technical features



**SR20** 

Actuator model		SR20A	SR20AM	SR20B		
Damper area	m²		4			
Nominal torque	Nm		20			
Power supply	V	24 AC/DC	24 AC/DC	240 AC		
Frequency	Hz		50/60			
Power consumption						
- in operation	W	6,5	6,5	7,0		
- at rest	W		3,0			
- for wire sizing	VA		10,0			
Running time for motor	S		<180			
Running time for spring	s		<30 (spring reset)			
Sound power level	db (A)		50 (motor), 62 (spring)			
Control signal		2 point, on-off	0(2)10 VDC / 0(4)20 mA	2 point, on-off		
Auxilary switch rating		3 (1,5) A, AC 250 V				
Life Cycle	cicli	70.000				
Rotation angle						
- operating			0-90°			
- limitation			5-85° (steps of 5°)			
Protection class		111	Ш	Ш		
Protection degree			IP54			
Working range °C			-20+50° C			
Working range RH			595% RH, non-condensati	ng		
Storage temperature			-40+70° C			
Manual override		by means of hand	crank and locking switch (or	nly ON-OFF models)		
Maintenance			free			
Shaft length	mm		> 90			
Shaft diameter	mm		○1021 □8x815x15			
Weight	g		2700			
Standards			CE-conformity, RoHs			
Option		suffix S fo	r models with 2 SPDT auxilia	ary switches		





#### 

#### Electrical wirings

#### Wiring diagram, On-Off



#### Wiring diagram, Proportional



#### Auxiliary switches



#### Settings

Limitation of rotation angle from 5° to 85°



**Manual ovverride:** By using the hand crank the damper ca be actuated manually and engaged with the locking switch at any position. Unlocking is carried out manually or automatically by applying the operating voltage.











# Fire and smoke spring return damper actuator, 3 Nm

# Description

Damper actuator serie ST3 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 0,6 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions standard □12/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

#### Technical features

Actuator model		ST3AT	ST3BT		
Damper area	m²		0,6		
Nominal torque	Nm		3		
Power supply	V	24 AC/DC	100240 AC		
Frequency	Hz	:	50/60		
Power consumption					
- in operation	W		5		
- at rest	W		3		
- for wire sizing	VA		7,0		
Running time for motor	S		<75		
Running time for spring	S		< 25		
Sound power level	db (A)		45		
Control signal		2 point, on-off			
Auxiliary switch rating		3 (1,5) A, AC 230 V			
Life cycle	cycles	6	60.000		
Rotation angle					
- operating		90° (95°	mechanical)		
- limitation		5-85° (	steps of 5°)		
Thermal temperature trip		:	> 72°		
Protection class		Ш	Ш		
Protection degree			IP54		
Working temperature °C		-20.	+50° C		
Working humidity RH		595% RH,	non-condensating		
Storage temperature		-30.	+80° C		
Maintenance			free		
Weight	g	<	<1300		
Standards		CE-conf	ormity, RoHs		

ST3



Wiring diagram



Auxiliary switches

Thermal sensor





Setting





# Dimensions (mm)







#### Thermal sensor



The thermal sensor controls the temperature in two areas: room and duct. The damper actuator will open when the temperature reaches  $72^{\circ}C$  in one of the two zones. There is a test button on the sensor.



# Fire and smoke spring return damper actuator, 5 Nm

# Description

Damper actuator serie ST5 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions standard □12/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

#### Technical features

Actuator model		ST5AT	ST5BT	
Damper area	m²	1	l i i i i i i i i i i i i i i i i i i i	
Nominal torque	Nm	5	5	
Power supply	V	24 AC/DC	100240 AC	
Frequency	Hz	50/	60	
Power consumption				
- in operation	W	5	5	
- at rest	W	3	3	
- for wire sizing	VA	7,	0	
Running time for motor	S	<7	70	
Running time for spring	S	<2	20	
Sound power level	db (A)	4:	5	
Control signal		2 point, on-off		
Auxiliary switch rating		3 (1,5) A, AC 230 V		
Life cycle	cycles	60.0	000	
Rotation angle				
- operating		90° (95° m	echanical)	
- limitation		5-85° (ste	eps of 5°)	
Thermal temperature trip		> 7	72°	
Protection class		Ш	Ш	
Protection degree		IP	54	
Working temperature °C		-20+	50° C	
Working humidity RH		595% RH, noi	n-condensating	
Storage temperature		-30+	80° C	
Maintenance		fre	e	
Weight	g	<20	000	
Standards		CE-conforr	mitv. RoHs	

<sup>80</sup> 9 1 e c °



ST5



2 1 S1 Т 24 V AC ±10% ~ \_ + 24 V DC ±10% Ν 100...240 V AC L S1 ON OFF 90° 0

90

Wiring diagram

Auxiliary switches



Thermal sensor



Setting

Manual override



# Dimensions (mm)



Thermal sensor



The thermal sensor controls the temperature in two areas: room and duct. The damper actuator will open when the temperature reaches  $72^\circ\text{C}$ in one of the two zones. There is a test button on the sensor.



# Fire and smoke spring return damper actuator, 10 Nm

#### Description

Damper actuator serie ST10 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1,5 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off

 Caracteristics: shaft dimensions 
 <sup>12/12</sup> mm square, minimum shaft length 90 mm, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

# Technical features

Actuator model		ST10AT	ST10BT	
Damper area	m²		1,5	
Nominal torque	Nm		10	
Power supply	V	24 AC/DC	100240 AC	
Frequency	Hz	:	50/60	
Power consumption				
- in operation	W		5	
- at rest	W		3	
- for wire sizing	VA		7,0	
Running time for motor	S	<100	7595	
Running time for spring	S		< 25	
Sound power level	db (A)		45	
Control signal		2 point, on-off		
Auxiliary switch rating		3 (1,5) A, AC 230 V		
Life cycle	cycles	60.000		
Rotation angle				
- operating		90° (95°	<sup>°</sup> mechanical)	
- limitation		5-85° (	(steps of 5°)	
Thermal temperature trip		:	> 72°	
Protection class		Ш	П	
Protection degree			IP54	
Working temperature °C		-20	+50° C	
Working humidity RH		595% RH, non-condensating		
Storage temperature range		-30	+80° C	
Maintenance			free	
Weight	g	•	<2300	
Standards		CE-conf	formity, RoHs	

<sup>82</sup> 9 tec



# **ST10**



# Electrical wirings

Wiring diagram



Auxiliary switches

#### Thermal sensor





Setting

Manual override



# Dimensions (mm)







The thermal sensor controls the temperature in two areas: room and duct. The damper actuator will open when the temperature reaches  $72^{\circ}C$  in one of the two zones. There is a test button on the sensor.



# Fire and smoke spring return damper actuator, 15 Nm

#### Description

Damper actuator serie ST15 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 3 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions 
  <sup>12</sup>/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.



**ST15** 

# Technical features

Actuator model		ST15AT	ST15BT		
Damper area	m²	3			
Nominal torque	Nm	15			
Power supply	V	24 AC/DC	100240 AC		
Frequency	Hz	50/60			
Power consumption					
- in operation	W	8			
- at rest	W	2,5			
- for wire sizing	VA	7,0			
Running time for motor	S	<150			
Running time for spring	S	< 25			
Sound power level	db (A)	45			
Control signal		2 point, on-off			
Auxiliary switch rating		3 (1,5) A, AC 230 V			
Life cycle	cycles	60.000			
Rotation angle					
- operating		90° (95° mechanical)			
- limitation		5-85° (steps of 5°)			
Thermal temperature trip		> 72°			
Protection class		III	Ш		
Protection degree		IP54			
Working temperature °C		-20+50° C			
Working humidity RH		595% RH, non-condens	ating		
Storage temperature range		-30+80° C			
Maintenance		free			
Weight	g	<2600			
Standards		CE-conformity, RoHs			

<sup>84</sup> 9 1 e c



# Electrical wirings

Wiring diagram



Auxiliary switches

#### Thermal sensor





Setting

Manual override



# Dimensions (mm)



Thermal sensor



The thermal sensor controls the temperature in two areas: room and duct. The damper actuator will open when the temperature reaches  $72^{\circ}C$  in one of the two zones. There is a test button on the sensor.



# Fire and smoke spring return damper actuator, 20 Nm

#### Description

Damper actuator serie ST20 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 4  $m^{2}$
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions 
  <sup>12</sup>/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.



**ST20** 

# Technical features

Actuator model		ST20AT	ST20BT		
Damper area	m²	4			
Nominal torque	Nm	20			
Power supply	V	24 AC/DC	100240 AC		
Frequency	Hz	50/60			
Power consumption					
- in operation	W	8			
- at rest	W	2,5			
- for wire sizing	VA	7,0			
Running time for motor	S	<180			
Running time for spring	S	< 30			
Sound power level	db (A)	<45			
Control signal		2 point, on-o	ff		
Auxiliary switch rating		3 (1,5) A, AC 230 V			
Life cycle	cycles	60.000			
Rotation angle					
- operating		90° (95° mechar	nical)		
- limitation		5-85° (steps of	5°)		
Thermal temperature trip		> 72°			
Protection class		III	II		
Protection degree		IP54			
Working temperature °C		-20+50° C	;		
Working humidity RH		595% RH, non-con	densating		
Storage temperature range		-30+80° C	;		
Maintenance		free			
Weight	g	<2600			
Standards		CE-conformity, F	RoHs		

<sup>86</sup> 9 tec



# Electrical wirings

Wiring diagram



Auxiliary switches

Thermal sensor





Setting

Manual override



# Dimensions (mm)



Thermal sensor



The thermal sensor controls the temperature in two areas: room and duct. The damper actuator will open when the temperature reaches  $72^{\circ}C$  in one of the two zones. There is a test button on the sensor.



# Smoke control damper actuator, 10 Nm

# Description

Damper actuator serie SF10 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1,5 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2 and 3-point

• Caracteristics: shaft dimensions standard □12/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection.

# Technical features

Actuator model		SF10A	SF10B
Damper area	m²	1,5	
Nominal torque	Nm	10	
Power supply	V	24 AC/DC	100240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	5	
- at rest	W	0,5	
- for wire sizing	VA	7,0	
Running time	S	<45	
Sound power level	db (A)	45	
Control signal		2 and 3 point	
Auxiliary switch rating		3 (1,5) A, AC 230 V	
Life cycle	cycles	60.000	
Rotation angle			
- operating		90° (95° mechanical)	
- limitation		5-85° (steps of 5°)	
Protection class		III	П
Protection degree		IP54	
Working temperature °C		-20+50° C	
Working humidity RH		595% RH, non-condensa	ting
Storage temperature		-30+80° C	
Maintenance		free	
Weight	g	<1800	
Standards		CE-conformity, RoHs	

**SF10** 



<sup>88</sup> 9 1 6 6











Setting

Manual override







# Smoke control damper actuator, 15 Nm

# Description

Damper actuator serie SF15 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 2 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2 and 3-point

• Caracteristics: shaft dimensions standard □12/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection.

# Technical features

Actuator model		SF15A	SF15B		
Damper area	m²	2	2		
Nominal torque	Nm	1	5		
Power supply	V	24 AC/DC	100240 AC		
Frequency	Hz	50/	60		
Power consumption					
- in operation	W	5	i		
- at rest	W	0,	5		
- for wire sizing	VA	7,	0		
Running time	S	<3	60		
Sound power level	db (A)	4	5		
Control signal		2 and 3	3 point		
Auxiliary switch rating		3 (1,5) A, .	AC 230 V		
Life cycle	cycles	60.0	000		
Rotation angle					
- operating		90° (95° m	echanical)		
- limitation		5-85° (ste	eps of 5°)		
Protection class		III	Ш		
Protection degree		IP	54		
Working temperature °C		-20+	50° C		
Working humidity RH		595% RH, no	595% RH, non-condensating		
Storage temperature		-30+	80° C		
Maintenance		fre	e		
Weight	g	<18	00		
Standards		CE-conform	nity, RoHs		

**SF15** 









Auxiliary switches



Setting









# Smoke control damper actuator, 30 Nm

# Description

Damper actuator serie SF30 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 4 m<sup>2</sup>
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2 and 3-point
- Caracteristics: shaft dimensions standard 
  <sup>1</sup>12/12 mm square, minimum shaft length 90 mm, antirotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection.

#### Technical features

Actuator model		SF30A	SF30B		
Damper area	m²	4			
Nominal torque	Nm	30	)		
Power supply	V	24 AC/DC	100240 AC		
Frequency	Hz	50/6	60		
Power consumption					
- in operation	W	7	8		
- at rest	W	2.0	2.5		
- for wire sizing	VA	8.0	0		
Running time	S	11	5		
Sound power level	db (A)	<4	5		
Control signal		2 and 3 point			
Auxiliary switch rating		3 (1,5) A, AC 230 V			
Life cycle	cycles	60.000			
Rotation angle					
- operating		90° (95° mechanical)			
- limitation		5-85° (ste	ps of 5°)		
Protection class		Ш	II		
Protection degree		IP5	54		
Working temperature °C		-20+	50° C		
Working humidity RH		595% RH, non-condensating			
Storage temperature		-30+	80° C		
Maintenance		fre	e		
Weight	g	<22	00		
Standards		CE-conform	nity, RoHs		



# SF30





Auxiliary switches



Setting







# **Damper actuator, ATEX version**

#### Description

Damper actuator SX serie to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 3 m<sup>2</sup> up to 9 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac
- · Control: 3-point
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10...16 mm / 7...11 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### Technical features



Actuator model		SX10A	SX10B	SX20A	SX20B	SX30A	SX30B
Damper area	m <sup>2</sup>	3		6		9	I
Nominal torque	Nm	10		20	)	30	C
Power supply	V	24 AC/DC	230 V AC	24 AC/DC	230 V AC	24 AC/DC	230 V AC
Frequency	Hz			50/	60		
Power consumption							
- in operation	W	7		1(	)	12	2
- at rest	W			3			
Running time	S			< 1	50		
Sound power level	db (A)	50					
Control signal				3 points	, on-off		
Auxilary switch rating				3 (1,5) A, A	AC 250 V		
Life Cycle	cycles			> 70.	000		
Rotation angle				Max	93°		
Protection class		Ш	II	Ш	П	Ш	П
Protection degree				IP6	6		
Working range °C				-20+	60° C		
Working range RH			5.	95% RH, nor	n-condensating		
Storage temperature		-40+70° C					
Maintenance	free						
Standards			Confor	mità CE, RoHs	, ATEX 2014/3	4/UE	
ATEX				Ex d II B Ex IIIC T	T6 Gb 35°C Db		
Application			Zone 1	and zone 2, z	one 21 and zor	ne 22	

#### Directives:

IEC60079-0:2011, EN60079-0:2012 electrical apparatus in explosive gas atmosphere General requirements. IEC60079-1:2007, EN60079-1:2007 electrical apparatus in explosive gas atmosphere part1: flameproof "d". IEC60079-31:2008, EN60079-31:2009 Equipment dust ignition protection by enclosure "t".



#### Use and maintenance

- Cable gland and thread on the M16 × 1.5 housing, cable diameter from 6 to 8 mm. When the actuator is installed on site, the cable gland must be installed by the user and whose degree of protection must not be less than II2D Ex tb IIIC T85 ° C Db.
- Earth terminal tightening torque 2 Nm.
- Tightening torque of the flameproof joint 3,2 Nm.
- External ground bolt M4x6, by pressing the 4 mm<sup>2</sup> conductor.
- Disassembly is prohibited without authorization. Do not open with the power on. Do not open the lid in the presence of explosive gas. Use a damp cloth when opening.
- Repair of flanged joints must be performed in accordance with the structural specifications provided by the manufacturer. Repairs must not be carried out on the basis of the specifications in table 3 and table 4 of the EN 60079-1: 2007 directive.
- The cable gland must have a degree of protection compatible with the intended use.
- During assembly, operation and maintenance, the operator must follow the requirements of the EN 60079-14 standard and this instruction manual.
- Repair and overhaul must comply with EN 60079-19.







# Spring-return damper actuator, ATEX version

#### Description

Damper actuator SRX serie to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1 m<sup>2</sup> up to 4,5 m<sup>2</sup>
- Nominal voltage 24 Vac/dc and 230 Vac •
- Control: 2-point with spring return
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft diameter 10x10 mm / 12x12 mm, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

#### **Technical features**

- at rest



Ex d II B T6 Gb Ex IIIC T85°C Db

Zone 1 and zone 2, zone 21 and zone 22

#### Directives:

Application

ATEX

IEC60079-0:2011, EN60079-0:2012 electrical apparatus in explosive gas atmosphere General requirements. IEC60079-1:2007, EN60079-1:2007 electrical apparatus in explosive gas atmosphere part1: flameproof "d". IEC60079-31:2008, EN60079-31:2009 Equipment dust ignition protection by enclosure "t ".









# Use and maintenance

- Cable gland and thread on the M16 × 1.5 housing, cable diameter from 6 to 8 mm. When the actuator is installed on site, the cable gland must be installed by the user and whose degree of protection must not be less than II2D Ex tb IIIC T85 ° C Db.
- Earth terminal tightening torque 2 Nm.
- Tightening torque of the flameproof joint 3,2 Nm.
- External ground bolt M4x6, by pressing the 4 mm<sup>2</sup> conductor.
- Disassembly is prohibited without authorization. Do not open with the power on. Do not open the lid in the presence of explosive gas. Use a damp cloth when opening.
- Repair of flanged joints must be performed in accordance with the structural specifications provided by the manufacturer. Repairs must not be carried out on the basis of the specifications in table 3 and table 4 of the EN 60079-1: 2007 directive.
- The cable gland must have a degree of protection compatible with the intended use.
- During assembly, operation and maintenance, the operator must follow the requirements of the EN 60079-14 standard and this instruction manual.
- Repair and overhaul must comply with EN 60079-19.







# greenline

# motorized valves

# Motorized valve with electrothermal actuator

#### Description

The motorized valve serie VB are intercepting, diverting or mixing fluids in heating and cooling systems and are motorized by the electrothermal actuator serie SVB. The 2-way valves are used for opening and closing, while the 3-way and 4-way valves can be used as diverting or mixing valves. When the stem is pressed the valve is closed.

VB, SVB

The small sizes allow easy installation in fan coils and terminal unit coils. The actuator-valve assembly is easily made thanks to its threaded ring nut, which allows a comfortable cable positioning.

#### Technical specifications valve VB

Medium	Hot and chilled water, water with up to 50% glycol		
Fluid temperature	+2+120°C		2107-50-50Hz 2.5W
Nominal pressure	16 bar		CET 11954 CE Add x max 730 md mode to hady
Stroke	3 mm		
Leakage	Perfect sealing		
Connection type	Male thread		
Installation position	See drawing	J.	
Maintenance	Free		
Valve body	Forged brass		
Valve stem	Stainless steel Aisi 301		
Sealing	HNBR		
Dimensions and weights	See schedule		

Models	Thread	Ways	KVs	Max differential pressure (bar)
VB215	G 1/2	2	1.6	2.5
VB220	G 3/4	2	2.5	2.5
VB225	G 1"	2	4,5	1.0
VB315	G 1/2	3	1.6	2.5
VB320	G 3/4	3	2.5	2.5
VB325	G 1"	3	4,5	1.0
VB415	G 1/2	3 (4 ports)	1.6	2.5
VB420	G 3/4	3 (4 ports)	2.5	2.5
VB425	G 1"	3 (4 ports)	4.5	1.0

# Technical specifications actuator SVB

Power consumption	2,5 W (by starting)
Stroke	4 mm (4,5 mm proportional version)
Running time	approx. 5 min.
Connection	Metal ring M30 x 1.5
Materials	Self-extinguishing V0
Cable	PVC 2 x 0,50 mm <sup>2</sup>
Protection degree	IP54
Protection class	11
Working range RH	095% RH, non-condensing
Working range °C	-5+50°C
Storage temperature	-25+60°C
Standards	CE-conformity, RoHS



# VB, SVB

# 

Models	Power supply	Action	Force	Contact rating
SVB230	230 V AC	2 punti / on/off	110 N	-
SVB230C	230 V AC	2 punti / on/off	110 N	Max 700 m A – 250 V AC
SVB24	24 V AC	2 punti / on/off	110 N	-
SVB24C	24 V AC	2 punti / on/off	110 N	Max 700 m A – 250 V AC
SVB24M	24 V AC	Modulante	170 N	-

#### Installation

Before mounting the valve body be sure that the pipes are clean, free of soldering scraps and that the plug can glide freely. Note direction of flow reported on the valve body.



	1 1			1
V	aive type	close valve	open valve	► = flow
	- <u>+</u> →+	×	∑ <b>.</b> ⊀	▷ = no flow
	Mixing	Ø.₩	<b>∑</b> - <b>∑</b>	
	Diverting	₹.	<b>₩</b>	
	Mixing		t ↓ t ↓	
	Diverting		+ + ₩ + +	

#### Wiring

2 points / on/off





M = Brown (24 VAC - 50/60 Hz) W = White (Signal 0-10 Vcc) B = Blue (Common)

# Indication



#### Stroke indicator

On the actuator there is a transparent window where the position of the valve stroke is indicated:

Red: Actuator off, direct way of valve close Black: Actuator on, direct way of valve open

Diack. Actuator on, unect way of valve ope

# Dimensions (mm)

Models	Way	L	G	н	Т	J
VB215	2	53	G 1/2		88	
VB220	2	56	G 3/4		88	
VB225	2	65	G 1		88	
VB315	3	53	G 1/2		88	30
VB320	3	56	G 3/4		88	30
VB325	3	65	G 1		90	35
VB415	3 (4 port)	53	G 1/2	40	88	
VB420	3 (4 port)	56	G 3/4	40	88	
VB425	3 (4 port)	65	G 1	50	90	





Proportional

#### Description

The AVC series provides floating or proportional control in HVAC applications. The compact design of this actuator makes it suitable for installation in confined spaces, such as fan coil, chilled ceiling, manifolds, etc.

The AVC series actuator is designed for field mounting onto VB terminal unit valves.

Due to the innovative concept of different strokes setting the AVC can be installed over most of the terminal unit valve in the market.

#### Technical specification

Power supply	230 V AC or 24 V AC/DC, 50-60 Hz
Power consumption	1,5 W for 24 V AC/DC, 2,2 W for 230 V AC
Signal input	0 (2)10 V / 0 (4) 20 mA selectable via dip-switches
Force	120 N +30% -20%
Action	floating and proportional
Max stroke	6,3 mm
Actuator speed	13 sec/mm
Connection	Metal ring M30 x 1.5
Cable	1,5 m cable lenght 3 x 0,35 mm <sup>2</sup>
Maintenance	Free
Status indications	Internal LED
Protection degree	IP43
Working range RH	non-condensing
Working range °C	0+50°C
Storage temperature	-20+65°C
Standards	CE-conformity, RoHS



AVC

Models	Power supply	Action
AVC230	230 V AC	floating
AVC24	24 V AC	floating
AVC24M	24 V AC/DC	proportional

#### LED indicator

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# Settings for proportional version





DIP Switch 1, 2, 3, and 6: DIP switch 1, 2, and 3 allow the user to change the analog input ranges. To change from voltage analog input to current analog input set DIP switch 6 accordingly. DIP Switch 4: DIP switch 4 allows the user to change the action of the actuator in relation to the analog input. DIP switch 4 is off (DA) when the signal increases and the actuator stem extends. **DIP Switch 5**: DIP switch 5 allows the user to change the control characteristic of the actuator in order to obtain a combination of valve and actuator Linear or Almost Equal Percentage. DIP Switch 5 OFF (Linear): When DIP switch 5 is set to Off, we recommend you use the valve with the linear or equal percentage control characteristic.

DIP Switch 5 ON (Almost Equal Percentage): When DIP switch 5 is set to On, we recommend you use the valve with the quick opening or on/off control characteristic.











# Description

The AVS series provides on-off and proportional control in HVAC applications. The compact design of this actuator makes it suitable for installation in confined spaces, such as fan coil, chilled ceiling, manifolds, etc. The AVS series actuator is designed for field mounting onto VS terminal unit valves. Due to the innovative concept the AVS can be installed over most of the terminal unit valve in the market.

# Technical specifications

Power supply	24 VAC or 230 VAC ±10%, 50 Hz	
Power consumption	2 W or 3 W proportional version	
Signal input	0 (2)10 VDC / 0 (4) 20 mA selectable by jumper	
Feedback	0 (2)10 VDC	
Torque	See schedule	
Action	on-off and proportional	
Max stroke	90°	
Electrical connection	50 cm cable length	a
Materials	PC cover, PA66 housing	
Maintenance	Free	Ļ
Protection degree	IP54	
Protection class	I	1
Working range RH	595% no condense	
Working range °C	-10+50°C	
Storage temperature	-40+50°C	
Fluid temperature	+595°C	
Standards	CE-conformity, RoHS	



**AVS** 

Models	Power supply	Torque	Action	Wiring	Running time
AVS2A2	24 VAC	2 Nm	ON-OFF	2-wire	40-50 sec.
AVS2A3	24 VAC	2 Nm	ON-OFF	3-wire	40-50 sec.
AVS2B2	230 VAC	2 Nm	ON-OFF	2-wire	40-50 sec.
AVS2B3	230 VAC	2 Nm	ON-OFF	3-wire	40-50 sec.
AVS3AM	24 VAC	3,5 Nm	proportional		40-50 sec.

# Electrical wiring



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# Installation instructions





#### 

#### Settings of proportional version

1. Function of each short-circuit socket: W1: mA /VDC. W2 to select the signal type of the input signal of socket J1 (COM VDC/mA). W2: 0-10 VDC (0-20 mA) 2 -10 VDC (4-20 mA). W1 to select the signal type of input signal J1. W3: DA (direct) RA (reverse). Select direct way: when the input signal of J1 increases, the valve opens gradually; when the signal decreases, the valve closes gradually. Select the reverse way: when the input signal of J1 increases, the valve closes gradually and when the signal decreases, the valve opens gradually.

2. Function of each J1: COM 24 VDC: power(24VAC) input terminal. COM VDC /mA: input signal, 0-10 VDC (0-20 mA) or 2-10 VDC (4-20 mA) COM FB: feedback signal output terminal, the value is 0-10 VDC or 2-10 VDC, which is equal to the input signal when the valve does not work. J2: 3 cores. Connected potentiometer gives the valve state. Phase 1, 2 and 3 of potentiometer and phase 1, 2 and 3 of J2 are connected respectively. J3: 3 cores. Connect to 24 VDC motor.

3. "Work" indicator status: Normai working status: slow flashing (on in 1 second and off in 1 second). Adaptive working state: fast flashing (on in 0.25 second and off in 0.25 second). Adaptive failure status: lamp flashes twice quickly and is off for a long time (on/ off twice in 0.25 second, off at 1.25 seconds).

4. The motor rotation direction indicator: When D50 lamp is on, the valve turns to close. When the valve turns to the end, the microswitch S50 works and the lamp turns off automatically after the valve stops working in 25 seconds. When D60 lamp is on, the valve turns to be open. When the valve turns to the end, the microswitch S60 works and the lamp turns off automatically after the valve stops working in 25 seconds.

5. Process of "adaptive" stroke: Adjust the position of the potentiometer to set the valve stroke in the middle of the potentiometer. Press and hold the "adaptive" key for 3 seconds to enter the working status. The "work" lamp flashes (on in 0.25 second and off in 0.25 second). The valve first moves in the closing direction until reaching the end. When the valve does not move for 25 seconds, it moves to the opening direction until reaching the end. If the valve does not move for 25 seconds, the adaptation process ends. If the adaptation is successful (the adaptive data replaces the previous data), it returns to the normal working state. If the adaptation fails (the adaptive data does not replace the previous data), it comes to the adaptation failure state. The "work" lamp flashes twice and is off for a long time (on/off twice in 0.25 second, off at 1.25 seconds). User can press the "adaptive" key for 3 seconds to enter the adaptive working state or turn off and then turn on to enter the normal working state.





Т

AVS2



Valve	mm	in	L	н	x	Y
VS215	15	1/2	63	30	190	75
VS220	20	3/4	73	35	190	75
VS225	25	1	94	38	193	75
VS315	15	1/2	63	32	190	75
VS320	20	3/4	66	35	190	75
VS325	25	1	94	38	193	75









# Description

The valve serie VZ coupled to the actuator serie SVZ is suitable for applications in heating, cooling and air conditioning systems of domestic and commercial areas and is typically used on fan coil and air handling units. The actuator can be mounted after valve body has been installed onto the system.

VZ, SVZ

# Technical specifications valve VZ

Medium	Hot and chilled water, water	with up to 50% glycol	
Fluid temperature	+2+94°C		
Nominal pressure	16 bar		
Stroke	3,5 mm		
Leakage	< 0,02% of KVs		
Connection type	Female thread		
Installation position	See drawing		
Maintenance	Free		
Valve body	Forged brass		PULL
Valve stem	Stainless steel 302		- 10 13 X4 1
Sealing	NBR		
Dimensions and weights	See schedule		

Models	Thread	Ways	KVs	Max. differential pressure (bar)
VZ215	G 1/2	2	2,5	2,5
VZ220	G 3/4	2	3,5	1,0
VZ225	G 1	2	4,0	0,6
VZ315	G 1/2	3	2,5	2,5
VZ320	G 3/4	3	3,5	1,0
VZ325	G 1	3	4,0	0,6

# Technical specifications actuator SVZ

Power supply	230 V AC, 24 V AC 50-60 Hz
Power consumption	7 W
Control signal	On/Off, 2 points, spring return
Running time	Opening $\leq$ 10 s, closing $\leq$ 5 s
Materials	Aluminium base. Cover: ABS self-extinguishing
Protection degree	IP20
Protection class	II
Working range °C	0+60°C
Working range RH	595% RH, non-condensing
Standards	CE-conformity, RoHs

Models	Power supply	Auxiliary switch
SVZ230	230 V AC	-
SVZ230C	230 V AC	•
SVZ24	24 V AC ±10%	-
SVZ24C	24 V AC ±10%	•

<sup>106</sup>9 [ec°





#### Installation



**2-way valves** normally closed: the flow direction is shown in the figure (the valve closes against the water flow, fig.1).

# **3-way diverting valves:** inlet is the normally closed end and the normally open end is the by-pass port (the inlet part is unmarket, fig. 2 and 3)



Valve motor and gear train will not operate properly when wet. Motor housing must be proteced from drip. The actuator with valve body do not need to be protected against condensation when installed horizontally or up to 85°C from upright potision (see figure on side). When mounted in vertical piping, motor housing must be protected from drip.







Models	Dimensio	Dimensions in mm		
	Α	В	kg	
VZ215	55	113	0,60	
VZ220	66	124	0,65	
VZ225	71	129	0,70	
VZ315	55	128	0,60	
VZ320	66	137	0,65	
VZ325	71	145	0,70	





# Description

The ball valves VS serie are control valves with perfect sealing, that thanks to the shaping of the adjustment disk guarantees a percentage flow characteristic.

# Technical specifications

Valve type	BSP 2 way, 3 way mixing / diverting
Fluid	Hot and cold water (with glycole max. 50%) and 15% (103 kPa) saturated steam
Fluid temperature	-5+120°C at an ambient temperature of 40°C
Nominal pressure	PN20
Leakage	0,01 % of KVs
Control flow characteristics	Equal-percentage A-C, linear for port B bypass
Leakage	Perfect sealing
Max. closing pressure	13 bar
Max. diff. pressure (close-off)	See table below
Maintenance	Free
Valve	Forged brass (from DN15 to DN50), cast iron (DN65 and DN80)
Plug	Stainless steel V2A
Stem	Brass
Seat	EPDM
Seal	HNVR double O-ring
Standards	CE-conformity, RoHS



Models			K\/e	Actuator	Actuator	Actuator type	
2-way	3-way	DN	NV5	type(*)	type	with spring return(**)	
VS215	VS315	15	4.0	S4	S5V	SR5	
VS220	VS320	20	6.3	S4	S5V	SR5	
VS225	VS325	25	10	S4	S5V	SR5	
VS232	VS332	32	16	S8	S5V	SR10	
VS240	VS340	40	25	S8	S10V	SR10	
VS250	VS350	50	40	S16	S10V	SR15	
VS250B	VS350B	50	63	S16	S10V	SR15	
VS265	-	65	63	S16		SR15	
VS280	-	80	100	S16		SR15	
VS2100	-	100	120	S32		-	

(\*) For coupling valve and actuator adapter VSA is required (\*\*) For coupling valve and spring return actuator adapter VSAR is required

## Maximum close-off pressure [kPa] with actuator

Model	torque (Nm)	DN15	DN20	DN25	DN32	DN40	DN50
S5	5	1000	1000	1000	1000	690	400
S10	10	1400	1400	1400	1400	1000	1000


# Control flow characteristics



A-C equal-percentage way B-C bypass lineare way 3-way used as mixing inlet in A and B, outlet C 3-way used as diverting inlet in C, outlet from A and B

C way	constant flow
A way	variable flow
B (bypass) way	variable flow

# Installation



outlet (C).

Mixing application: Fluid enters through two inlets (A & B) and exits through one





# VS

# Dimensions with actuator S4...S32 (mm)









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2	OT	TO	2	
Ø	' C	6	16	)
51	C	P	Je	5
T.	0-	0	F	
	_			

VS280

DN mm	G	L	н	SW	D	Flange	Weight 2 way (kg)	Weight 3 way (kg)
15	G 1/2	60	179,20	26	-	-	0,2	0,25
20	G 3/4	67	187,80	32	-	-	0,35	0,4
25	G 1"	89	193,80	39	-	-	0,55	0,7
32	G 1" 1/4	99	204	48	-	-	0,85	1,1
40	G 1" 1/2	106	212,80	56	-	-	1,2	1,4
50	G 2"	128	224,70	70	-	-	1,95	2,2
65	Flange 145	97	136	-	105	4-18	4,5	-
80	Flange 160	108	140	-	125	8-18	6,8	-
100	Flange 180	120	202	-	125	8-18	8,6	-

# Dimensions with actuator S5..V and S..10V (mm)



DN mm	G	L	н	sw	Ρ	Weight 2 way (kg)	Weight 3 way (kg)
15	G 1/2	60	137	26	31	0,2	0,25
20	G 3/4	67	142	32	32	0,35	0,4
25	G 1"	89	148	39	46	0,55	0,7
32	G 1" 1/4	99	159	48	49	0,85	1,1
40	G 1" 1/2	106	181,60	56	52	1,2	1,4
50	G 2"	128	192.70	70	69	1,95	2,2
65	Flange 145	97	136	-		4,5	-
80	Flange 160	108	140	-		6,8	-
100	Flange 180	120	202	-		8,6	-

lec

# Actuator for ball valves, 5 Nm

# Description

The electric actuator series S5..V for ball valves are used in heating, refrigeration and air conditioning systems.

- For valves from DN15 to DN32
- Power supply 24 VAC / DC and 230 VAC
- Function: open / closed or 3 point and proportional action
- Direction of rotation selectable by switch
- Actuator with 1 m connection cable
- Optional 1 adjustable SPDT auxiliary switch



# Technical specifications

Models		S5AV	S5BV	S5AMV
Nominal torque	Nm		5	
Power supply	V	24 AC/DC ±10%	230 AC	24 AC/DC ±10%
Frequency	Hz		50/60	
Power consumption				
- in operation	W		4.0	
- end position	W		2.0	
Rated power	VA		14	
Running time	s		6080	
Electrical connection			1 m PVC cable	
Auxiliary switch rating			3 (1.5) A / 250 VAC	
Sound power level	max. db (A)		40	
Control signal (input)		2-3 point	2-3 point	0(2)10 VDC
Position signal (output)				010 VDC
Life Cycle	rotations		60.000	
Angle of rotation			90° (95° mechanical limitation)	
Direction of rotation			CW / CCW	
Protection class		Ш	Ш	Ш
Protection degree			IP54	
Working range °C			-20+50°C	
Working range RH			595% RH, non-condensing	
Storage temperature			-30+60°C	
Maintenance			free	
Weight	g		800	
Standards			CE-conformity, RoHs	
Option		suffix S	for models with 1 SPDT auxiliary	switch







#### 

# Electrical wirings



#### Wiring diagram S5AV / S5BV Parallel connection



Parallel connection of maximum 5 S5..V (S1) actuators is possible. Power consumption must be observed!

# Installation



Ball valve actuators must operate CCW!





Wiring diagram S5AMV



#### Wiring diagram S5AMV Parallel connection



During parallel operation, the output signal (terminal 6, 0...10 VDC) of the master actuator must be connected to terminal 5 of the next slave actuator.

#### Actuator position

0°

90°

Always

counter-clockwise

rotation (CCW)!

oper





Wiring diagram S5AV / S5BV Auxiliary switch





Diverting application: Fluid enters through one inlet (B) and exits through two outlets (A & C).



#### Change of rotation direction



Factory setting: clockwise (CW). Direction of rotation can be changed by toggling between CW/CCW switch on the actuator housing.



S5..V

# Control flow characteristics



A-C equal-percentage way B-C bypass lineare way 3-way used as mixing inlet in A and B, outlet C 3-way used as diverting inlet in C, outlet from A and B

C way	constant flow
A way	variable flow
B (bypass) way	variable flow

# Dimensions (mm)





G	L	н	sw	Ρ	weight 2 way (kg)	weight 3 way (kg)
G 1/2	60	137	26	31	0,2	0,25
G 3/4	67	142	32	32	0,35	0,4
G 1"	89	148	39	46	0,55	0,7
G 1" 1/4	99	159	48	49	0,85	1,1
	G 1/2 G 3/4 G 1" G 1" 1/4	G      1/2      60        G      3/4      67        G      1"      89        G      1" 1/4      99	G      L      H        G 1/2      60      137        G 3/4      67      142        G 1"      89      148        G 1" 1/4      99      159	GLHSWG 1/26013726G 3/46714232G 1"8914839G 1" 1/49915948	GLHSWPG 1/2601372631G 3/4671423232G 1"891483946G 1" 1/4991594849	GLHSWPweight 2 way (kg)G 1/26013726310,2G 3/46714232320,35G 1"8914839460,55G 1" 1/49915948490,85



# Actuator for ball valves, 10 Nm

# Description

The electric actuator series S10..V for ball valves are used in heating, refrigeration and air conditioning systems.

- For valves from DN40 to DN50
- Power supply 24 VAC / DC and 230 VAC
- · Function: open / closed or 3 point and proportional action
- Shaft dimension 
   <sup>□</sup> 9 mm square (fixed)
- Direction of rotation selectable by switch
- Actuator with 1 m connection cable
- Optional 1 adjustable SPDT auxiliary switch



S10..V

# Technical specifications

Models		S10AV	S10BV	S10AMV
Nominal torque	Nm		10	
Power supply	V	24 AC/DC ±10%	230 AC	24 AC/DC ±10%
Frequency	Hz		50/60	
Power consumption				
- in operation	W		6.0	
- end position	W		4.0	
Rated power	VA		14	
Running time	s		7090	
Electrical connection			1 m PVC cable	
Auxiliary switch rating			3 (1.5) A / 250 VAC	
Sound power level	max. db (A)		40	
Control signal (input)		2-3 point	2-3 point	0(2)10 V DC 0(4)20 mA
Position signal (output)				010 VDC
Life Cycle	rotations		60.000	
Angle of rotation			90° (95° mechanical limitation)	
Direction of rotation			CW / CCW	
Protection class		III	II	III
Protection degree			IP54	
Working range °C			-20+50°C	
Working range RH			595% RH, non-condensating	
Storage temperature			-30+60°C	
Maintenance			free	
Weight	g		1100	
Standards			CE-conformity, RoHs	
Option		suffix S	for models with 1 SPDT auxiliary	switch



# S10..V

М

3 (1.5) A / 250 VAC Actuator at 0° position

Coil

Wiring diagram S10AV / S10BV Auxiliary switch

Green Blue

S2 S3

3-way diverting

С

Return

Diverting application:

Fluid enters through one inlet (B) and exits through two outlets

(A & C).

R

в

Yellow

\_

Supply

A

Return

S1

# Electrical wirings





Parallel connection of maximum 5 S10..V (S1) actuators is possible. Power consumption must be observed!

# Installation



Ball valve actuators must operate CCW!





Mixing open





# Wiring diagram S10AMV



Wiring diagram S10AMV Parallel connection



During parallel operation, the output signal (terminal 6, 0...10 VDC) of the master actuator must be connected to terminal 5 of the next slave actuator.

#### Actuator position





#### Change of rotation direction



Factory setting: clockwise (CW). Direction of rotation can be changed by toggling between CW/CCW switch on the actuator housing.



S10..V

# Control flow characteristics



# Dimensions (mm)





н



DN mm	G	L	н	sw	Р	weight 2 way (kg)	weight 3 way (kg)
40	G 1" 1/2	106	181,60	56	52	1,2	1,4
50	G 2"	128	192.70	70	69	1,95	2,2
65	Flange 145	97	136	-		4,5	-
80	Flange 160	108	140	-		6,8	-
100	Flange 180	120	202	-		8,6	-



# Description

The globe valves in brass serie VG are used in heating, refrigeration and air-conditioning systems for the flow control of heated or chilled water for domestic and industrial applications. The valves are motorized by the electric actuators serie AVG at 600 and 1000 N.

# Technical specifications

Fluids type	Hot and cold water (with glycol max. 50%)	4	
Fluid temperature	-10100°C	T	
Nominal pressure	1600 kPa max (16 bar)		
Control flow characteristics	Equal-percentage (linear on angle way)		
Rangeability	50 : 1		
Leakage	< 0,05% of KVs		BZWAYA]
Connections	BSP female thread		ABWAYAB
Stroke	See schedule	Constraints	
Installation position	Horizontal or vertical		
Maintenance	Free		
Body	Brass		
Plug	Ottone		
Valve stem	Stainless steel 302		
Stem packing	PTFE		
Dimensions and weight	See schedule		

Moo 2 ways	dels 3 ways	DN	KVs	Max differential pressure (bar) <sup>(*)</sup>	Stroke	Actuator
VG215	VG315	15	4.0	2.5 (6)	15	AVG6(M)
VG220	VG320	20	6.3	2.5 (6)	15	AVG6(M)
VG225	VG325	25	8	2.5 (6)	20	AVG6(M)
VG232	VG332	32	16	2.5 (5.5)	20	AVG6(M)
VG240	VG340	40	25	2.5 (4.5)	20	AVG6(M)
VG250	VG350	50	40	2 (3)	20	AVG10(M)
VG265	VG365	65	63	2 (2.5)	20	AVG10(M)
VG280	VG380	80	78	2 (2)	20	AVG10(M)

(\*) The values in the brackets are the max. dfferential pressure when valve is fully closed and actuator is still able to open or close the valve with security. In order to avoid wear between plug and seat, we recommend not to overcome the nominal values.

# Caution

Before valves are mounted, make sure that pipes are clean, free from welding slags, that are perfectly lined up with valve body and not subjected to vibrations. The valve can be mounted in any position except upside-down. While assembling, respect the flow directions indicated by the arrows located on the valve body.

In the 2-way valve, when stem is up, the direct way is open, with stem down direct way is closed.

In the 3-way valve, when stem is up, the direct way is closed, with stem down direct way is open.



VG

# VG

# 

# Installation





# Control flow characteristics



A-AB equal-percentage way B-AB bypass lineare way 3-way used as mixing inlet in A and B, outlet AB 3-way used as diverting inlet in AB, outlet from A and B

AB way	constant flow
A way	variable flow
B (bypass) way	variable flow

# Dimensions and weights

Madala	Throad	Di	Weight		
woders	Inreau	Α	В	С	kg
VG215	G1/2	84	38	130	2.2
VG315	G1/2	84	48	130	2.4
VG220	G3/4	84	38	130	2.3
VG320	G3/4	84	48	130	2.5
VG225	G1	104	48,5	135.5	3.5
VG325	G1	104	57,5	135.5	3.8
VG232	G1 1/4	110	50	138	3.7
VG332	G1 1/4	110	62,5	138	4.2
VG240	G1 1/2	120	55	144.5	4.4
VG340	G1 1/2	120	65,5	144.5	5.0
VG250	G2	134	58,5	143.5	5.7
VG350	G2	134	72,5	143.5	6.7
VG265	G2 1/2	160	72,5	152.5	8.5
VG365	G2 1/2	160	90	152.5	9.5
VG280	G3	180	80	158.5	9.5
VG380	G3	180	98,5	158.5	10.5



# Actuator for screwed globe valve

# Description

The actuator series AVG6 has been designed to control the screwed globe valves series VG up to DN40. The actuator is equipped by a bidirectional synchronous motor at 600 N and available in ON-OFF, floating and proportional version. Fast and easy assembly. The actuator is equipped, for the proportional version, with a button for self-adjustment. The on-off switch is fitted with magnetic clutch.

# Technical specifications

Power supply	See schedule
Electrical connection	Screw terminal
Torque	600 N
Max. stroke	20 mm
Running time	See schedule
Materials	ABS cover, self-extinguishing
Protection degree	IP54
Protection class	II
Working range °C	-10+50°C
Storage temperature and humidity	-40+50°C, 195% RH, non-condensing
Fluid temperature	< 150°C
Maintenance	Free



AVG6

Models	Supply	Action	Consumption	Running time
AVG6	24 VAC, 50/60 Hz	on-off, floating	5,5 VA	70 sec. w/stroke 15 mm 92 sec. w/stroke 20 mm
AVG6B	230 VAC, 50/60 Hz	on-off, floating	7,5 VA	105 sec.
AVG6M	24 VAC, 50/60 Hz	proportional	5,5 VA	70 sec. w/stroke 15 mm 92 sec. w/stroke 20 mm

# Electrical wiring

#### AVG6M (proportional)

W1: mA/VDC. Allows to choose whether the input signal is in voltage or in current. This jumper must be set along with W2 to select the input signal to J1. W2: 4...20 mA (2...10 VDC) / 0...20 mA (0...10 VDC). This jumper must be set with W1 to select the input signal to J1.

W3: Reverse operation. Moving the jumper inverts the logic of operation compared to the input signal.

#### **J1 Socket function**

~24 V COM: 24 VAC power input

IN COM: Analog input signal, 0(2)~10 V or 0(4)~20 mA. W1 and W2 should be selected accordingly

FB COM: Analog feedback signal, 0(2)~10 V (load impedance > 500 Ω) or 0(4)~20 mA (load impedance ≤ 500 Ω), voltage and current automatically switch.



# AVG6

### 

#### AVG6, AVG6B (on-off, floating)

1: Common 2: Stem down (direct way open)

**3**: Stem up (direct way close)

# Installation

Place motor on the valve and, having placed in seat, tighten the locking screw (1). Screw the brass nut of the motor shaft on the valve stem (2) and tighten the counter nut (3). Make the electrical connections as shown in the previous diagrams and (only for AVG6M) provide for the jumper settings.

#### LED status indicator AVG6M

LED status	Equipment status
Flash slowly (1 sec on, 1 sec off).	Normal operating
Flash quickly (0,25 sec on, 0,25 sec off)	Self-adjustment
Flash twice (0,25 sec on and off twice, 1,25 sec off)	Self-adjustment failure
Flash once quickly (0,25 sec on and off, 1,75 sec off)	Motor timeout alarm

# Motor rotation indication

D50 light on, valve sharft upward

D60 light on, valve sharft downward

Self-adjustment in an error state: flash twice quickly and off for a long time (0,25 sec on, 0,25 sec off, twice, then 1,25 sec off)

# Self-adjustment

Note:

1. Do not start adaptation at the top of the valve stem. When adaptive, the voltage value of the simulated feedback signal 0-10 VDC corresponds to the actual position value of the valve stem.

2. The adaptive process is best carried out when the valve is unloaded or lightly loaded. If the motor timeout alarm is triggered due to high resistance during adaptation, the adaptation will fail or incorrect valve travel will be obtained.

Press and hold the "AUTO SET" key for 3 sec, the actuator automatically will enter the self-adjustment. The LED "work" is flashing rapidly (0,25 sec on, 0,25 sec off). The valve shaft moves down to the bottom, and then maintains the position for 25 sec and then move upward until the upper point. Theself-adjustment does not end until the valve shaft does not hold the final position for 25 sec.

Note: If the analog feedback signal does not meet the requirements during adaptive (that is, the potentiometer slips when the valve stem goes to both ends), the position of the potentiometer needs to be adjusted and then re-adaptive. Otherwise, although adaptive may be successful, the two ends of the drive will not go in place and cause the valve to close loosely.

To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (0,25 sec on, 0,25 sec off, twice, then 1,25 sec off. You can hold down the "AUTO SET" key for 3 sec to retry the process of self-adjustment, or rebot (power cycle) of the actuator to return to normal working state.

Reasons for self-adjustment failure:

1. The adaptive valve stem stroke is too short, shorter than half of the maximum stroke.

2. The potentiometer wire connection is wrong or the line is disconnected. It is correct that the potentiometer value is maximum at the top of the valve stem and minimum at the bottom.

# Dimensions (mm)





# Actuator for screwed globe valve

# Description

The actuator series AVG10 has been designed to control the screwed globe valves series VG from DN50 up to DN80. The actuator is equipped by a bidirectional synchronous motor at 1000 N and available in ON-OFF, floating and proportional version. Fast and easy assembly. The actuator is fitted with manual override for the drive in case of power failure.

#### Technical specifications

See schedule
Screw terminal
1000 N
20 mm
see schedule
ABS cover, self-extinguishing
IP54
II
-10+50°C
-10+50°C, 195% RH, non-condensing
< 150°C
Free



AVG10

Models	Supply	Action	Consumption	Running time
AVG10	24 V AC, 50/60 Hz	on-off, floating	5,8 VA	
AVG10B	230 V AC, 50/60 Hz	on-off, floating	7,5 VA	50 Hz, 160 sec. 60 Hz, 130 sec.
AVG10M	24 V AC, 50/60 Hz	proportional	5,8 VA	, ·••• ••••

# Electrical wiring

#### AVG10M (proportional)

Terminal **J1**:

- **02**: When short-circuiting with T2 (o -), then the stem goes completely up (direct way close). The position of W3 has no effect.
- **01**: When short-circuiting with T2 (o -), then the stem goes completely down (direct way open). The position of W3 has no effect.
- T1 T2: input terminal at 24 V AC. T2 is common terminal (T2 is connected with -).
- -+: Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). W2 and W4 must be set according to the input signal.
- F: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC depending on the setting of W2.

#### AVG10 (on-off, floating)

- 5: Common
- 4: Stem down (direct way open)
- 3: Feedback with stem down (24 V AC Ver.)
- 2: Stem up (direct way close)





# AVG10B (on-off, floating)

- 1: Common
- 2: Stem down (direct way open)
- 3: Stem up (direct way close)







# AVG10

#### Installation

Place motor on the valve and, having placed in seat, tighten the locking screw (1).

Push the steel plate (2) and raise the valve stem or, alternatively, drive down the actuator shaft by manual override (3).

Make the electrical connections as shown in the previous diagrams and (only for AVG10M) provide for the jumper settings.

# Setting (AVG10M)

W1: 0%, 50%, 100%. Set the position of valve stroke in case of misfunction or failure of input signal.

0% stem completely up 50% stem at halfway 100% stem completely down

Moving the jumper W3, the situation is reversed.

0% stem completely down 50% stem at halfway 100% stem completely up

W2: 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). This jumper must be set according to W4 to select the input signal to J1.

W3: Reverse operation. Moving the jumper inverts the logic of operation as compared to the input signal.

W4: mA / V DC. This jumper must be set along with W2 to select the input signal to J1.

LED Status Indicator (work): Normal operating status: flashing slowly (1 sec on, one sec off). During the self-adaptation of the actuator on the valve (after pressing S1 for at least 3 sec) flashes rapidly (0.25 sec on, 0.25 sec off).

Self-adjustment in an error state: blinks twice quickly and off for a long time (on 0.25 sec, off for 0.25 sec, twice, then off by 1.25 sec).

LED indication of the rotation direction of the motor:

When the LED D50 lights up, the valve rod moves downward. When the valve rod reaches the bottom and hold the position for 25 seconds, the LED turns off.

When the LED D60 lights up, the valve rod moves upward. When the valve rod reaches the top and hold the position for 25 seconds, the LED turns off.

Self-adjustment of the actuator to the valve. Each actuator must be adapted to the valve to which it is coupled. Do not start adaptation at the bottom of the valve stem.

Press and hold the "**S1**" key for 3 sec, the actuator automatically will enter the self-adjustment. The LED "work" is flashing rapidly (on 0.25 sec., off 0.25 sec.). The valve shaft moves down to the bottom, and then maintains the position for 25 sec and then move upward until the upper point. The self-adjustment does not end until the valve shaft does not hold the final position for 25 sec.

To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1" key for 3 sec to retry the process of self-adjustment, or reboot (power cycle) of the actuator to return to normal working state.

Possible problems of self-adjustment:

1: It occurs in the case where the stroke is reached less than half the nominal stroke.

2: The connection of the potentiometer is wrong (terminal J2). Correct way: when the valve shaft is downward the potentiometer has the maximum value, when the valve shaft is upward the potentiometer has the minimum value.







# Description

The globe valves in cast-iron serie VF are used in heating, refrigeration and air-conditioning systems for the flow control of heated or chilled water for domestic and industrial applications. The valves are motorized by the electric actuators serie AVF.

# Technical specifications

Fluids type	Hot and cold water (with glycol max. 50%)
Fluid temperature	-10120°C
Nominal pressure	1600 kPa max (16 bar)
Control flow characteristics	Equal-percentage on direct way Linear on angle way
Rangeability	50:1
Leakage	< 0,1% of KVs
Connections	Flange according EN1092-2
Stroke	See schedule
Installation position	Horizontal or vertical
Maintenance	Free
Body	Cast-iron G25
Plug	Brass
Valve stem	Stainless steel 302
Stem packing	PTFE
Dimensions and weight	See schedule



Мо	Models DN KVs		K\/e	Max differential	Stroko	Actuator
2 ways	3 ways	DIN	1143	pressure (bar) <sup>(*)</sup>	STORE	Actuator
VF250	VF350	50	50	2,5 (6)	20	AVF12(M)
VF265	VF365	65	75	2,0 (6)	20	AVF12(M)
VF280	VF380	80	100	1,5 (6)	20	AVF12(M)
VF2100	VF3100	100	125	1,5 (6)	38	AVF18(M)
VF2125	VF3125	125	200	2 (5)	38	AVF30(M)
VF2150	VF3150	150	285	2,0 (5)	38	AVF70(M)
VF2200	VF3200	200	400	1,5 (4)	38	AVF70(M)

(\*) The values in the brackets are the max. dfferential pressure when valve is fully closed and actuator is still able to open or close the valve with security. In order to avoid wear between plug and seat, we recommend not to overcome the nominal values.

# Caution

Before valves are mounted, make sure that pipes are clean, free from welding slags, that are perfectly lined up with valve body and not subjected to vibrations. The valve can be mounted in any position except upside-down. While assembling, respect the flow directions indicated by the arrows located on the valve body.

When stem is up, the direct way is closed, with stem down direct way is open.



VF

VF

#### 

# Installation







2-way-valve

# Control flow characteristics



A-AB equal-percentage way B-AB bypass lineare way 3-way used as mixing inlet in A and B, outlet AB 3-way used as diverting inlet in AB, outlet from A and B

AB way	constant flow
A way	variable flow
B (bypass) way	variable flow





# Dimensions and weights

Madala	Thread	Dimensions (mm) Weight					
woders	DN	D	d	L	Α	в	kg
VF250	50	165	125	230	133	166	14
VF350	50	165	125	230	115	166	11,8
VF265	65	185	145	290	164	178	19,7
VF365	65	185	145	290	145	178	16,4
VF280	80	200	160	310	177	182	23,2
VF380	80	200	160	310	155	182	20,4
VF2100	100	220	180	350	200	264	39,5
VF3100	100	220	180	350	175	264	33,7
VF2125	125	250	210	400	228	275	54,5
VF3125	125	250	210	400	200	275	46
VF2150	150	285	240	480	268	290	76,3
VF3150	150	285	240	480	240	290	65
VF2200	200	340	290	600	330	315	135
VF3200	200	340	290	600	300	315	120





# Actuator for flanged globe valve

# Description

The actuator series AVF has been designed to control the flanged globe valves serie VF. The actuator is equipped by a double bidirectional synchronous motor at 1200 and 1800 N and available in ON-OFF, floating and proportional version. Fast and easy assembly. The actuator is fitted with manual override for the drive in case of power failure.

#### Technical specifications

Power supply	24 V AC 50/60 Hz, 12 VA
Electrical connection	Screw terminal
Torque	See schedule
Max. stroke	See schedule
Running time	See schedule
Materials	ABS cover, self-extinguishing Aluminium bracket
Protection degree	IP54
Protection class	II
Working range °C	-10+50°C
Storage temperature and humidity	-40+50°C, 195% RH, non-condensing
Fluid temperature	< 150°C
Maintenance	Free



AVF

Models	Torque N	Action	Stroke mm	Running time
AVF12	1200	on-off, floating	20	114 sec. with 50 Hz 95 sec: with 60 Hz
AVF12M	1200	proportional	20	114 sec. with 50 Hz 95 sec: with 60 Hz
AVF18	1800	on-off, floating	40	210 sec. with 50 Hz 175 sec: with 60 Hz
AVF18M	1800	proportional	40	210 sec. with 50 Hz 175 sec: with 60 Hz

# Electrical wiring

#### AVF..M (proportional)

Terminal J1:

- 02: When short-circuiting with T2 (o -), then the stem goes completely up (direct way close). The position of W3 has no effect.
- 01: When short-circuiting with T2 (o -), then the stem goes completely down (direct way open). The position of W3 has no effect.
- T1 T2: input terminal at 24 V AC. T2 is common terminal (T2 is connected with -).
- -+: Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). W2 and W4 must be set according to the input signal.
- F: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC depending on the setting of W2.

#### AVF.. (on-off, floating)

- 1: 24 V AC Stem down (direct way open)
- 4: Feedback with stem down (24 V AC)
- 5: 24 V AC (common)
- 6: 24 V AC Stem up (direct way close)
- 7: Feedback with stem up (24 V AC)



	UP	$\oplus$	8
	DOWN		
	24 V AC POWER		1
		$ \oplus$	17
	24 V AC COMMON	$  \oplus$	12
•	SIGNAL COMMON	$\oplus$	ı.
+	0(2)10 V / 0(4)20 mA	$\oplus$	+
	0(2)10 V Feedback	$\oplus$	п



# AVF

#### Installation

Place motor on the valve and, having placed in seat, tighten the 4 locking screw (1).

Push the steel plate (2) and raise the valve stem or, alternatively, drive down the actuator shaft by manual override (3).

Make the electrical connections as shown in the previous diagrams and (only for AVF..M) provide for the jumper settings. (3).

# Setting (AVF..M)

- W1: 0%, 50%, 100%. Set the position of valve stroke in case of misfunction or failure of input signal.
  0% stem completely up
  50% stem at halfway
  100% stem completely down
  Moving the jumper W3, the situation is reversed.
  0% stem completely down
  50% stem at halfway
  100% stem completely up
- W2: 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). This jumper must be set according to W4 to select the input signal to J1.

W3: Reverse operation. Moving the jumper inverts the logic of operation as compared to the input signal.

W4: mA / V DC. This jumper must be set according to W2 to select the input signal to J1.

LED Status Indicator (work): Normal operating status: flashing slowly (1 sec on, one sec off). During the self-adaptation of the actuator on the valve (after pressing S1 for at least 3 sec) flashes rapidly (0.25 sec on, 0.25 sec off).

Self-adjustment in an error state: blinks twice quickly and off for a long time (on 0.25 sec, off for 0.25 sec, twice, then off by 1.25 sec).

**LED** indication of the rotation direction of the motor:

When the LED D60 lights up, the valve rod moves downward. When the valve rod reaches the bottom and hold the position for 25 seconds, the LED turns off.

When the LED **D50** lights up, the valve rod moves upward. When the valve rod reaches the top and hold the position for 25 seconds, the LED turns off.

Self-adjustment of the actuator to the valve. Each actuator must be adapted to the valve to which it is coupled.

Press and hold the "S1" key for 3 sec, the actuator automatically will enter the self-adjustment. The LED "work" is

flashing rapidly (on 0.25 sec.), off 0.25 sec.). The valve shaft moves down to the bottom, and then maintains the position for 25 sec and then move upward until the upper point. The self-adjustment does not end until the valve shaft does not hold the final position for 25 sec.

To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1" key for 3 sec to retry the process of self-adjustment, or reboot (power cycle) of the actuator to return to normal working state.

Possible errors of self-adjustment:

1: It occurs in the case where the stroke is reached less than half the nominal stroke.

2: The connection of the potentiometer is wrong (terminal J2). Correct way: when the valve shaft is downward the potentiometer has the maximum value, when the valve shaft is upward the potentiometer has the minimum value.

# Dimensions (mm)







3



<sup>126</sup>9 tec

# Actuator for flanged globe valve



# Description

The actuator series AVF30 has been designed to control the flanged globe valves serie VF, size DN125. The actuator is equipped by a double bidirectional synchronous motor at 3000 N and available in ON-OFF, floating and proportional version. Fast and easy assembly. The actuator is fitted with manual override for the drive in case of power failure.

# Technical specifications

Power supply	24 V AC ±10%, 50/60 Hz, 12 VA	
Electrical connection	Screw terminal	
Torque	3000 N	
Max. stroke	40 mm	AREA .
Running time	See schedule	
Materials	ABS cover, self-extinguishing Aluminium bracket	0 · ·
Protection degree	IP54	
Protection class	П	
Working range °C	-10+50°C	5
Storage temperature and humidity	-40+50°C, 195% RH, non-condensing	2
Fluid temperature	< 150°C	
Maintenance	Free	

Models	Action	Stroke mm	Running time
AVF30	on-off, floating	40	105 sec. with 50 Hz
AVF30M	proportional		90 sec: with 60 Hz

# Electrical wiring

# AVF30M (proportional)

- Terminal J1:
- 02: When short-circuiting with T2 (o -), then the stem goes completely up (direct way close). The position of W3 has no effect.
- 01: When short-circuiting with T2 (o -), then the stem goes completely down (direct way open). The position of W3 has no effect.
- T1 T2: input terminal at 24 V AC. T2 is common terminal (T2 is connected with -).
- Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). - +:
- Feedback signal. There is a signal 0...10 V DC or 2...10 V DC F:

# AVF30 (on-off, floating)

- 1: 24 V AC Stem down (direct way open)
- 4: Feedback with stem down (24 V AC)
- 5: 24 V AC (common)
- 6: 24 V AC Stem up (direct way close)
- 7: Feedback with stem up (24 V AC)

#### **Dimensions (mm)**





AVF30							
M							
1	2	3	4	5			
- descen	- closed	- ascend	- open si	~24V			
ď	signal	-	gnal				







## Installation

Set the actuator into neck of the body top. Lock the two semi-rings into the groove above the stem top. Pull up the nut and connect it to the thread under the actuator. Tighten the bolt up with 4 mm inside hexagonal wrench. Note: tighten the right side bolt. Ensure the stem is fastened and the connection is finished.

# Setting (AVF..M)

W1: 0%, 50%, 100%. Set the position of valve stroke in case of misfunction or failure of input signal. The factory default setting is 50%.

0% stem completely up 50% stem at halfway 100% stem completely down

Moving the jumper W3, the situation is reversed.

0% stem completely down 50% stem at halfway 100% stem completely up

W2: 420 mA (210 V DC) / 020 mA (010 V DC). This jumper must be set according to W4 to select the input signal to J1.	420mA 020mA 420mA 020mA LED "work"	DA RA W3 W1	MA V W4
<ul><li>W3: Reverse operation. Moving the jumper inverts the logic of operation as compared to the input signal.</li><li>W4: mA / V DC. This jumper must be set according to W2 to select the input signal to J1.</li></ul>		S1	
LED Status Indicator (work): Normal operating status: flashing slowly (1 sec on, one sec off). During the self-adaptation of the actuator on the valve (after pressing S1 for at least 3 sec) flashes rapidly (0.25 sec on, 0.25 sec off).		<u> </u>	
Self-adjustment in an error state: blinks twice quickly and off for a long time (on 0.25 sec, off for 0.25 sec, twice, then off by 1.25 sec).	)		250
LED indication of the rotation direction of the motor:			D50
When the LED $D60$ lights up, the valve rod moves downward. When the valve rod reaches the bottom and hold the position for 25 seconds, the LED turns off.	J1 2 01 11 2 01 11 2 01 11 11 11 11 11 11 11 11 11 11		D60
When the LED <b>D50</b> lights up, the valve rod moves upward. When the valve rod reaches the top and hold the position for 25 seconds, the LED turns off.	⊕ ⊕ ⊕	$\oplus \oplus \oplus \oplus \oplus$	]

**AVF30** 

Self-adjustment of the actuator to the valve. Each actuator must be adapted to the valve to which it is coupled.

Press and hold the "S1" key for 3 sec, the actuator automatically will enter the self-adjustment. The LED "work" is flashing rapidly (on 0.25 sec., off 0.25 sec.). The valve shaft moves down to the bottom, and then maintains the position for 25 sec and then move upward until the upper point. The self-adjustment does not end until the valve shaft does not hold the final position for 25 sec.

To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1" key for 3 sec to retry the process of self-adjustment, or reboot (power cycle) of the actuator to return to normal working state.

Possible errors of self-adjustment:

1: It occurs in the case where the stroke is reached less than half the nominal stroke.

2: The connection of the potentiometer is wrong (terminal J2). Correct way: when the valve shaft is downward the potentiometer has the maximum value, when the valve shaft is upward the potentiometer has the minimum value.



# Actuator for flanged globe valve

# AVF70

# Description

The actuator series AVF70 has been designed to control the flanged globe valves serie VF, size DN150 and DN200. The actuator is equipped by a double bidirectional synchronous motor at 7000 N and available in ON-OFF, floating and proportional version. Fast and easy assembly. The actuator is fitted with manual override for the drive in case of power failure.

# Technical specifications

Power supply	24 V AC ±10%, 50/60 Hz, 12 VA	- CR
Electrical connection	Screw terminal	Contraction of the
Torque	7000 N	
Max. stroke	38 mm	0
Running time	See schedule	
Materials	ABS cover, self-extinguishing Aluminium bracket	
Protection degree	IP54	
Protection class	II	
Working range °C	-10+50°C	ELIN
Storage temperature and humidity	-40+50°C, 195% RH, non-condensing	
Fluid temperature	< 150°C	
Maintenance	Free	

Models	Action	Stroke mm	Running time
AVF70	on-off, floating	38	240 sec. with 50 Hz
AVF70M	proportional	50	175 sec: with 60 Hz

# Electrical wiring

# AVF70M (proportional)

- Terminal **J1**:
- 02: When short-circuiting with T2 (o -), then the stem goes completely up (direct way close). The position of W3 has no effect.
- 01: When short-circuiting with T2 (o -), then the stem goes completely down (direct way open). The position of W3 has no effect.
- T1 T2: input terminal at 24 V AC. T2 is common terminal (T2 is connected with -).
- +: Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC).
- F: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC

# AVF70 (on-off, floating)

- 1: 24 V AC Stem down (direct way open)
- 4: Feedback with stem down (24 VAC)
- 5: 24 V AC (common)
- 6: 24 V AC Stem up (direct way close)
- 7: Feedback with stem up (24 V AC)

# Dimensions (mm)





	AVF70					
M						
	1	2	3	4	5	
	descend	- closed signal	- ascendl	- open signal	~24V	









# Installation

Set the actuator into neck of the body top. Lock the two semi-rings into the groove above the stem top. Pull up the nut and connect it to the thread under the actuator. Tighten the bolt up with 4 mm inside hexagonal wrench. Note: tighten the right side bolt. Ensure the stem is fastened and the connection is finished.

# Setting (AVF..M)

W1: 0%, 50%, 100%. Set the position of valve stroke in case of misfunction or failure of input signal. The factory default setting is 50%.

0% stem completely up 50% stem at halfway 100% stem completely down

Moving the jumper W3, the situation is reversed.

0% stem completely down 50% stem at halfway 100% stem completely up

W2: 420 mA (210 V DC) / 020 mA (010 V DC). This jumper must be set according to W4 to select the input signal to J1.	420mA 020mA LED "work"	DA RA W3 W1	W4
W3: Reverse operation. Moving the jumper inverts the logic of operation as compared to the input signal.			
W4: mA / V DC. This jumper must be set according to W2 to select the input signal to J1.		000	
LED Status Indicator (work): Normal operating status: flashing slowly (1 sec on, one sec off). During the self-adaptation of the actuator on the valve (after pressing S1 for at least 3 sec) flashes rapidly (0.25 sec on, 0.25 sec off).		J2	
Self-adjustment in an error state: blinks twice quickly and off for a long time (on 0.25 sec, off for 0.25 sec, twice, then off by 1.25 sec).	)		050
LED indication of the rotation direction of the motor:			D50
When the LED $\textbf{D60}$ lights up, the valve rod moves downward. When the valve rod reaches the bottom and hold the position for 25 seconds, the LED turns off.	2 01 T1 ⊕		D60
When the LED <b>D50</b> lights up, the valve rod moves upward. When the valve rod reaches the top and hold the position for 25 seconds, the LED turns off.	⊕ ⊕ ⊕ 12 - + F	$\oplus \oplus \oplus \oplus \oplus$	
		1	

Self-adjustment of the actuator to the valve. Each actuator must be adapted to the valve to which it is coupled.

Press and hold the "S1" key for 3 sec, the actuator automatically will enter the self-adjustment. The LED "work" is flashing rapidly (on 0.25 sec., off 0.25 sec.). The valve shaft moves down to the bottom, and then maintains the position for 25 sec and then move upward until the upper point. The self-adjustment does not end until the valve shaft does not hold the final position for 25 sec.

To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1" key for 3 sec to retry the process of self-adjustment, or reboot (power cycle) of the actuator to return to normal working state.

Possible errors of self-adjustment:

1: It occurs in the case where the stroke is reached less than half the nominal stroke.

2: The connection of the potentiometer is wrong (terminal J2). Correct way: when the valve shaft is downward the potentiometer has the maximum value, when the valve shaft is upward the potentiometer has the minimum value.









# Description

The VM series of butterfly valves (Wafer) are used in heating, refrigeration and air-conditioning systems for the flow control of heated or chilled water for domestic and industrial applications. The valves can be coupled with our 24 or 230 VAC modulating or 2-3 points actuators with or without auxiliary switches.

# Technical specifications

Hot and cold water (with glycole max. 50%)
DN40 - DN150
Equal-percentage
Aluminium ADC12
EPDM
X30Cr13 (AISI 420)
Nodular iron GJS500
PN10
free
-15+90°C
+20+80°C, dry and dust-free, far from direct sunlight
CE-conformity, RoHS



Models	KVs	Max diff. pressure (bar)	Actuator type
VM 40	50	12	S16
VM 50	126	10	S16
VM 65	226	8	S16
VM 80	390	8	S16
VM 100	620	6	S16
VM 125	860	6	S24
VM 150	1710	4	S32

# Flow control characteristic



The flow characteristic of VM valves is equipercentage (see diagram).





VM

#### 

# Dimensions (mm)

DN	Α	в	С	D	Е
40	151	217	83	284	33
50	166	239	104	306	43
65	172	258	121	325	46
80	170	260	132	327	46
100	187	295	154	362	52
125	205	324	189	391	56
150	217	349	218	416	56





# Electrical wirings for models at 2 / 3 points

Wiring diagram

3- point

 $\otimes \otimes \otimes$ 

L

~ +

L

1 2 3

2- point

 $\otimes \otimes \otimes$ 

1 2 3







Auxiliary switch adjustment

Factory setting: switch a at 10° switch b at 80° The switching position can be changed manually.





# Angle of rotation limiting

-94.5

0







# Diagram of pressure losses for liquids



Example for fluids with specific gravity 1 kg/dm<sup>3</sup> (water)

Flow: 7.5 m<sup>3</sup>/h water

Pressure drop: 55 kPa

Locate the crossing point between the line with starting point at flow value 7.5 m<sup>3</sup>/h and the line at pressure drop value 55 kPa. This point corresponds to flow coefficient KVs 10, therefore control valve must have KVs = 10.

Example for fluids with specific gravity different than 1 kg/dm<sup>3</sup>

Flow: 30 m<sup>3</sup>/h fluid with specific gravity 0.9 kg/dm<sup>3</sup>

Pressure drop: 20 kPa

Locate the crossing point (right side of diagram) between the line with starting point at specific gravity value 0.9 kg/dm<sup>3</sup> and the sloping line at flow value 30 m<sup>3</sup>/h.

Locate the crossing point between the line with starting point at above crossing point and the line at pressure drop value 20 kPa. This point corresponds to flow coefficient KVs 63, therefore control valve must have size KVs = 63 (DN65).



# grayline

# humidistats



**Room humidistat** 

# Description

The room humidistat HR1 is controlling the relative humidity in domestic, commercial or industrial applications and can drive fans, humidifiers or dehumidifiers bringing the moisture level of the value set on his knob. The modern and elegant housing to complement any type of interior design.

# Technical specifications

Sensible element	Stabilised synthetic textile tape
Wiring terminals	Screw terminals for wires up to 1,5 mm <sup>2</sup>
Electrical rating	max 5 (3) A, 250 VAC min 100 mA, 24 VAC
Working range	3090% RH
Differential	8% RH
Accuracy	±5% RH*
Humidity calibration	55% RH at 23°C
Long term stability	approx1,5% RH/year
Time constand in moving air (0.2 m/s)	approx. 5 minutes
Working temperature	050°C
Storage temperature	-2570°C no condense
Admissible ambient humidity	1095% RH no condense
Materials	Housing of flame-retardant thermoplastic
Protection type	IP30
Protection class	П
Standards	CE-conformity, RoHS



HR1



# Operation

the humidistat may drift prematurely and alter the linearity.

When the relative humidity rises and reaches the upper switching point, contacts 1-2 open and 1-3 close. The setpoint XS corresponds to the upper switching point. The contacts revert to their original position when the humidity has fallen below the upper switching point by the amount of the fixed switching difference ( $\Delta$ ) of 6% RH.



# Electrical wirings



# Installation

# Anger Danger

Electrical connection

- Danger of electrocution! The removal of this cover exposes parts which carry mains voltage. The unit should be opened only by a qualified electrician or by the manufacturer's service personnel.
- Before starting any work on the electrical connections, separate the unit from the mains power supply.
- Do not apply power to the unit until it has been completely re-assembled and the housing has been closed.
- To prevent access by unqualified persons and, in particular, children, do not leave the opened unit unattended.





# Dimensions (mm)









# Description

The duct humidistat HD1 is controlling the relative humidity in pipes and air ducts, in commercial or industrial applications and can drive fans, humidifiers or dehumidifiers bringing the moisture level of the value set on his knob. It comes supplied with plastic bracket for wall mounting and gasket for mounting on air ducts.

Technical specifications		3
Sensible element	Stabilised synthetic textile tape, tempera- ture-compensated	
Wiring terminals	Screw terminals for wires up to 1,5 mm <sup>2</sup>	
Electrical rating	Max 5 (3) A, 250 VAC Min 100 mA, 24 V	:
Setting range	1595% RH	
Working range	3090% RH no condense	•
Differential	4% RH (after umidity calibration)	•
Accuracy	±5% RH*	
Humidity calibration	55% RH at 23°C	
Max. air speed	10 m/sec.	
Long term stability	approx1,5% RH/year	
Time constand in moving air (0.2 m/s)	approx. 3 minutes	
Working temperature	070°C	
Storage temperature	-2070°C no condense	
Admissible ambient humidity	1095% RH no condense	
Materials	Housing of flame-retardant thermoplastic	
Protection type	IP30	
Protection class	II	
Standards	CE-conformity, RoHS	Precisione

(\*) The setting accuracy of the humidistat at the calibration point is ± 5% rh at 55% rh, 23°C after initial calibration at the factory. Setting accuracy see diagram "Setting accuracy". In general, humidity sensors (humidistats) are subject to increased ageing if they are used and/or stored in very contaminated air or aggressive gases. Under these conditions, the humidistat may drift prematurely and alter the linearity.



HD1

# Operation

When the relative humidity rises and reaches the upper switching point, contacts 1-2 open and 1-3 close. The setpoint corresponds to the upper switching point. The contacts revert to their original position when the humidity has fallen below the upper switching point by the amount of the fixed switching difference ( $\Delta$ ) of 4% RH.





# HD1

# Electrical wirings



# Installation

# 

Electrical connection

- Danger of electrocution! The removal of this cover exposes parts which carry mains voltage.
- The unit should be opened only by a qualified electrician or by the manufacturer's service personnel.
- Before starting any work on the electrical connections, separate the unit from the mains power supply.
- Do not apply power to the unit until it has been completely re-assembled and the housing has been closed.
- To prevent access by unqualified persons and, in particular, children, do not leave the opened unit unattended.









#### Dimensions (mm)







# yellowline

# transmitters

# Description

The room humidity/temperature transmitter serie KTI measures the temperature and humidity by capacitive sensors and converts the value into a linear output signal 0...10 VDC or 4...20 mA.

# Technical specifications

Measurement range RH	0100 % RH
Accuracy RH	2 % RH
Measurement range °C	050°C, 0100°C, -30+70°C, -40+60°C
Accuracy °C	0,5°C
Power supply	24 VAC (±5%) 50-60 Hz / 1535 VDC
Power consumption	< 2,5 W
Working resistance at 010 VDC	min. 1 kOhm
Working resistance at 420 mA	max 500 Ohm
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Housing	ABS
Dimensions	See drawing
Protection type	IP41
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	-30+80°C
Standards	CE conformity, RoHS



**KTI** 



# Order matrix

Model	Accuracy		Output 1 Humidity		Output 2 Temperature		Option
KTI	<b>2</b> % RH	0	no output	0	no output	м	Modbus
		1	010 V	1	010 V	D	Display
		2	210 V	2	210 V	R	Relay*
		3	05 V	3	05 V		
		4	15 V	4	15 V		
		5	420 mA	5	420 mA		

\*It is recommandable to order the relay version with display option.

# **DIP Switch**



DIP	Response
	1 sec.
	5 sec.
	10 sec.
	30 sec.

KTI

# Transmitter hardware



SW1

DIP Switch for configuration range and response time

X1 TERMINAL		
11	24V	1535 VDC or 24 VAC (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
15	AO3	analog output 3
X2 TERMINAL		
21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication negative pair
TR1 TR2 RLY1 & RLY2	not used not used relav 1 and relav	2
	·····	-
X3 TERMINAL		
31	NU - KL1	relay 1 dry contact max. rating 1A @ 230 VAC
32	NU - KL1	relay 1 dry contact max. rating 1A @ 230 VAC

#### Electrical wirings



Relay contact rating is max. 1A at 230 VAC. We kindly advise using 24 VAC for avoiding high voltage harmonics and external power relay for bigger loads. Please use shielded and twisted paired cables for Modbus connections.



# ΚΤΙ

# Display & Buttons

keep pressing until entering MENU, click for next parameter

press for EXIT



main screen transmitter is working



press for increasing the value or choosing the next parameter

press for decreasing the value or choosing the previous parameter



keep pressing MENU button until seeing 0 transmitter is not working in MENU mode

# Parameters for Relay & Buzzer

Main Screen >>>> r1 L > r1 H > r1 A > Main Screen



LOW set point for Relay



HIGH set point for Relay



ACTION selection for Relay

# Actions for Relay & Buzzer

action 0, relay contact is always OPEN buzzer is always SILENCE
action 1, relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint buzzer is WARNING between points, SILENCE under LOWpoint and SILENCE over HIGHpoint
action 2, relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint buzzer is SILENCE between points, WARNING under LOWpoint and SILENCE over HIGHpoint
action 3, relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysterisis between points buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint, hysterisis between points
action 4, relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysterisis between points buzzer is SILENCE over HIGHpoint, WARNING under LOWpoint, hysterisis between points


## 

ΚΤΙ

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open	Open	Open
1:0.1.0	Open	Closed	Open
2 : 1.0.1	Closed	Open	Closed
3 : 0.X.I	Open	Hysteresis	Closed
4 : I.X.0	Closed	Hysteresis	Open

0 : Relay Contact is OPEN, Buzzer is in Silent mode

I : Relay Contact is CLOSED, Buzzer is in Warning mode

X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

## Modbus RS485 protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, new parameter is activated instantly and you should have to configure master device according to new parameters. For every reboot/initializing, Modbus is activated with default parameters for 3 seconds. After 3 seconds, Modbus is reconfigured according your parameter settings. Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

Register	R/W	Range	Description
1	R & W	1254	Modbus Address
2	R & W	04	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	03	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R		Humidity as %RH x10, divide by 10 for exact value
5	R		Temperature as C x10, divide by 10 for exact value
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	01.000	Relay 1, LOW point
8	R	01.000	Relay 1, HIGH point
9	R	04	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	01.000	Relay 2, LOW point
12	R	01.000	Relay 2, HIGH point
13	R	04	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	01.000	Buzzer, LOW point
16	R	01.000	Buzzer, HIGH point
17	R	04	Buzzer, ACTION
18-29	R		Only for service needs
30	R		Blank
31	R		Temperature as C x10, divide by 10 for exact value
32	R		Temperature as C
33	R		Temperature as F x10, divide by 10 for exact value
34	R		Temperature as F
35	R		Humidity as %RH x10, divide by 10 for exact value
36	R		Humidity as %RH



Dimensions (mm)







## Outdoor humidity & temperature transmitter

## Description

The outdoor temperature/humidity transmitter serie KTO measures the temperature and humidity by capacitive sensors and converts the value into a linear output signal 0...10 VDC or 4...20 mA.

## Technical specifications

0100 % RH
2 % RH
050°C, 0100°C, -30+70°C, -40+60°C
0,5°C
24 VAC (±5%) 50-60 Hz / 1535 VDC
< 2,5 W
min. 1 kOhm
max 500 Ohm
Screw terminals max. 1,5 mm <sup>2</sup>
ABS
See drawing
IP41
098% RH in contaminant-free, non-condensing air
-30+80°C
CE conformity, RoHS



**KTO** 

## Order matrix

Model	Accuracy	Output 1 Humidity			Output 2 - Temperature		Option
кто	<b>2</b> %RH	0	no output	0	no output	м	Modbus
		1	010 V	1	010 V	D	Display
		2	210 V	2	210 V	R	Relay*
		3	05 V	3	05 V		
		4	15 V	4	15 V		
		5	420 mA	5	420 mA		

\*It is recommandable to order the relay version with display option.

### **DIP Switch**



DIP	Response
	1 sec.
	5 sec.
	10 sec.
	30 sec.



KTO

#### Transmitter hardware



2 / 2 / 1   		UP ME
	Ø₹	DD

SW1

DIP Switch for configuration range and response time

X1 LERMINAL		
11	24V	1535 VDC or 24 VAC (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
X2 TERMINAL		
21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication negative pair
LED	bead LED, period modbus commun	lically lights ON and OFF ication, blinks when there is a communication
TR1	not used	
TR2	not used	
ZERO / TR3	not used	_
RL1 & RL2	relay 1 and relay	2
BZ	buzzer	
X3 TERMINAL		
31	NO - RL1	relay 1 dry contact max. rating 1A @ 230 VAC
32	NO - RL1	relay 1 dry contact max. rating 1A @ 230 VAC

## Electrical wirings



Relay contact rating is max. 1A at 230 VAC. We kindly advise using 24 VAC for avoiding high voltage harmonics and external power relay for bigger loads. Please use shielded and twisted paired cables for Modbus connections.





## Display & Buttons



press for increasing the value or choosing the next parameter

press and wait to enter MENU,  $^{\cup}\,$  click to navigate between sub menus one by one

 ${\tt DDWN}\,$  press for decreasing the value or choosing the previous parameter





main screen transmitter is working

keep pressing MENU button until seeing 0 transmitter is not working in MENU mode

## Parameters for Relay & Buzzer

Main Screen >>>> r1 L > r1 H > r1 A > Main Screen







ACTION selection for Relay

## Actions for Relay & Buzzer

U.	action 0, relay contact is always OPEN buzzer is always SILENCE
	action 1, relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint buzzer is WARNING between points, SILENCE under LOWpoint and SILENCE over HIGHpoint
	action 2, relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint buzzer is SILENCE between points, WARNING under LOWpoint and SILENCE over HIGHpoint
	action 3, relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysterisis between points buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint, hysterisis between points
~ [] _ LJ	action 4, relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysterisis between points buzzer is SILENCE over HIGHpoint, WARNING under LOWpoint, hysterisis between points



## .....

**KTO** 

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open	Open	Open
1 : 0.I.0	Open	Closed	Open
2 : 1.0.1	Closed	Open	Closed
3 : 0.X.I	Open	Hysteresis	Closed
4 : I.X.0	Closed	Hysteresis	Open

0 : Relay Contact is OPEN, Buzzer is in Silent mode

I : Relay Contact is CLOSED, Buzzer is in Warning mode

X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

## Modbus RS485 protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, new parameter is activated instantly and you should have to configure master device according to new parameters. For every reboot/initializing, Modbus is activated with default parameters for 3 seconds. After 3 seconds, Modbus is reconfigured according your parameter settings. Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

Register	R/W	Range	Description
1	R & W	1254	Modbus Address
2	R & W	04	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	03	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R		Humidity as %rH x10, divide by 10 for exact value
5	R		Temperature as C x10, divide by 10 for exact value
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	01.000	Relay 1, LOW point
8	R	01.000	Relay 1, HIGH point
9	R	04	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	01.000	Relay 2, LOW point
12	R	01.000	Relay 2, HIGH point
13	R	04	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	01.000	Buzzer, LOW point
16	R	01.000	Buzzer, HIGH point
17	R	04	Buzzer, ACTION
18-29	R		Only for service needs
30	R		Blank
31	R		Temperature as C x10, divide by 10 for exact value
32	R		Temperature as C
33	R		Temperature as F x10, divide by 10 for exact value
34	R		Temperature as F
35	R		Humidity as %RH x10, divide by 10 for exact value
36	R		Humidity as %RH

# КТО

## Dimensions (mm)





## Duct humidity & temperature transmitter

## Description

The duct temperature/humidity transmitter serie KTD measures the temperature and humidity by capacitive sensors and converts the value into a linear output signal 0...10 VDC or 4...20 mA.

## Technical specifications

Measurement range RH	0100 % RH
Accuracy RH	2 % RH
Measurement range °C	050°C, 0100°C, -30+70°C, -40+60°C
Accuracy °C	0,5°C
Power supply	24 VAC (±5%) 50-60 Hz / 1535 VDC
Power consumption	< 2,5 W
Working resistance at 010 VDC	min. 1 kOhm
Working resistance at 420 mA	max 500 Ohm
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Housing	ABS
Dimensions	See drawing
Protection type	IP41
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	-30+80°C
Standards	CE conformity, RoHS



**KTD** 

## Order matrix

Model	Accuracy	Output 1 Humidity			Output 2 Temperature		Option
KTD	<b>2</b> %RH	0	no output	0	no output	м	Modbus
		1	010 V	1	010 V	D	Display
		2	210 V	2	210 V	R	Relay*
		3	05 V	3	05 V		
		4	15 V	4	15 V		
		5	420 mA	5	420 mA		

\*It is recommandable to order the relay version with display option.

### **DIP Switch**



DIP	Response
	1 sec.
	5 sec.
	10 sec.
	30 sec.

# KTD

#### Transmitter hardware



SW1 DIP Switch for configuration range and response time X1 TERMINAL 11 24V 15...35 VDC or 24 VAC (± %5, 50-60 Hz) 12 GND ground for power and reference for outputs 13 AO1 analog output 1 AO2 analog output 2 14 X2 TERMINAL 21 A/RS485 modbus communication positive pair 22 B / RS485 modbus communication negative pair LED bead LED, periodically lights ON and OFF modbus communication, blinks when there is a communication TR1 not used TR2 not used ZERO / TR3 not used RL1 relay 1 B7 buzzer X3 TERMINAL relay 1 dry contact max. rating 1A @ 230 VAC 31 **NO - RL1** 32 NO - RL1 relay 1 dry contact max. rating 1A @ 230 VAC

### Electrical wirings



Relay contact rating is max. 1A at 230 VAC. We kindly advise using 24 VAC for avoiding high voltage harmonics and external power relay for bigger loads. Please use shielded and twisted paired cables for Modbus connections.





## Display & Buttons



press for increasing the value or choosing the next parameter

press and wait to enter MENU, click to navigate between sub menus one by one

<sub>N</sub> press for decreasing the value or choosing the previous parameter



main screen transmitter is working



keep pressing MENU button until seeing 0 transmitter is not working in MENU mode

## Parameters for Relay & Buzzer

Main Screen >>>> r1 L > r1 H > r1 A > Main Screen



LOW set point for Relay



HIGH set point for Relay



ACTION selection for Relay

## Actions for Relay & Buzzer

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0

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U.	action 0, relay contact is always OPEN buzzer is always SILENCE
	action 1, relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint buzzer is WARNING between points, SILENCE under LOWpoint and SILENCE over HIGHpoint
	action 2, relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint buzzer is SILENCE between points, WARNING under LOWpoint and SILENCE over HIGHpoint
	action 3, relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysterisis between points buzzer is WARNING over HIGHpoint, SILENCE under LOWpoint, hysterisis between points
~ [] _ Y	action 4, relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysterisis between points buzzer is SILENCE over HIGHpoint, WARNING under LOWpoint, hysterisis between points

## .....

**KTD** 

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open	Open	Open
1 : 0.1.0	Open	Closed	Open
2 : 1.0.1	Closed	Open	Closed
3 : 0.X.I	Open	Hysteresis	Closed
4 : I.X.0	Closed	Hysteresis	Open

0 : Relay Contact is OPEN, Buzzer is in Silent mode

I : Relay Contact is CLOSED, Buzzer is in Warning mode

X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

## Modbus RS485 protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, new parameter is activated instantly and you should have to configure master device according to new parameters. For every reboot/initializing, Modbus is activated with default parameters for 3 seconds. After 3 seconds, Modbus is reconfigured according your parameter settings. Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

Register	R/W	Range	Description
1	R & W	1254	Modbus Address
2	R & W	04	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	03	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R		Humidity as %rH x10, divide by 10 for exact value
5	R		Temperature as C x10, divide by 10 for exact value
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	01.000	Relay 1, LOW point
8	R	01.000	Relay 1, HIGH point
9	R	04	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	01.000	Relay 2, LOW point
12	R	01.000	Relay 2, HIGH point
13	R	04	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	01.000	Buzzer, LOW point
16	R	01.000	Buzzer, HIGH point
17	R	04	Buzzer, ACTION
18-29	R		Only for service needs
30	R		Blank
31	R		Temperature as C x10, divide by 10 for exact value
32	R		Temperature as C
33	R		Temperature as F x10, divide by 10 for exact value
34	R		Temperature as F
35	R		Humidity as %RH x10, divide by 10 for exact value
36	R		Humidity as %RH

KTD

## Dimensions (mm)







## Description

The KSIC  $CO_2$  room sensor measures air quality through the presence of carbon dioxide in the range between 0 and 10k ppm. The measurement of  $CO_2$  concentration happens through a maintenance free NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product is provided different outputs.

## Technical specifications

Measurement range CO <sub>2</sub>	4002000, 02k, 05k, 010k ppm selectable
Accuracy CO <sub>2</sub>	± 70 ppm +3% reading
Accuracy temperature (*)	±0,3°C (560°C) + 1% FS
Accuracy humidity (*)	±2% RH (2080%RH) + 2% FS
Power supply	24 VAC (±5%), 1535 VDC
Consumption	< 2,5 W
Sensible element	NDIR self adjusting
Output	05 VDC, 010 VDC, 420 mA, Modbus 485
Electrical connection	Pluggable screw terminal for cables 1,5 mm <sup>2</sup>
Protection type	IP41
Working range RH	1095% RH in contaminant-free, non-condensing air
Working temperature °C	-30+70°C
Storage temperature	-20+50°C
Standards	CE conformity, RoHS



**KSIC** 

## Order matrix

Model		Output 1 CO <sub>2</sub>	Output 2 Temperature			Output 3 Humidity		Option	
KSIC	0	no output	0	no output	0	no output	М	Modbus	
	1	010 V	1	010 V	1	010 V	D	Display	
	2	210 V	2	210 V	2	210 V	R	Relay*	
	3	05 V	3	05 V	3	05 V			
	4	15 V	4	15 V	4	15 V			
	5	420 mA	5	420 mA	5	420 mA			

\*It is recommandable to order the relay version with display option.

## DIP Switch



DIP 4	Response
	60 sec.
	20 sec.



KSIC

### 

#### Transmitter hardware



SW1	DIP Switch for configuration range and response time		
X1 TERMINAL			
11	24V	1535 VDC or 24 VAC (± %5, 50-60 Hz)	
12	GND	ground for power and reference for outputs	
13	AO1	analog output 1	
14	AO2	analog output 2	
15	AO3	analog output 3	
X2 TERMINAL			
21	A / RS485	modbus communication positive pair	
22	B / RS485	modbus communication negative pair	
RLY1 & RLY2	relay 1 and relay 2		
X3 TERMINAL			
31	NO - RL1	relay 1 dry contact max. rating 1A @ 230 VAC	
32	NO - RL1	relay 1 dry contact max. rating 1A @ 230 VAC	

## Electrical wirings



Relay contact rating is max. 1A at 230 VAC We kindly advise using 24V for avoiding high voltage harmonics and external power relay for bigger loads Please use shielded and twisted paired cables for Modbus connections



## **KSIC**

## Display & Buttons

keep pressing until entering MENU, click for next parameter

press for EXIT



main screen transmitter is working





press for increasing the value or choosing the next parameter

press for decreasing the value or choosing the previous parameter



keep pressing MENU button until seeing 0 transmitter is not working in MENU mode

## Parameters for Relay & Buzzer

Main Screen >>>> r1 L > r1 H > r1 A > Main Screen





HIGH set point for Relay 1



ACTION selection for Relay 1

## Actions for Relay & Buzzer

action 0, relay contact is always OPEN
action 1, relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint
action 2, relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint
action 3, relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysterisis between points
action 4, relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysterisis between points



## KSIC

### 

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0:0.0.0	Open	Open	Open
1 : 0.1.0	Open	Closed	Open
2 : 1.0.1	Closed	Open	Closed
3 : 0.X.I	Open	Hysteresis	Closed
4 : I.X.0	Closed	Hysteresis	Open

0 : Relay Contact is OPEN, Buzzer is in Silent mode

I : Relay Contact is CLOSED, Buzzer is in Warning mode

X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

## Modbus RS485 protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, new parameter is activated instantly and you should have to configure master device according to new parameters. For every reboot/initializing, Modbus is activated with default parameters for 3 seconds. After 3 seconds, Modbus is reconfigured according your parameter settings. Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

Register	R/W	Range	Description
1	R & W	1254	Modbus Address
2	R & W	04	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	03	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R		CO2 level as ppm
5	R		Temperature as C x100, divide by 100 for exact value
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	01.000	Relay 1, LOW point
8	R	01.000	Relay 1, HIGH point
9	R	04	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	01.000	Relay 2, LOW point
12	R	01.000	Relay 2, HIGH point
13	R	04	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	01.000	Buzzer, LOW point
16	R	01.000	Buzzer, HIGH point
17	R	04	Buzzer, ACTION
18-29	R		Only for service needs
30	R		CO2 level as ppm
31	R		Temperature as C x100, divide by 100 for exact value
32	R		Temperature as C
33	R		Temperature as F x100, divide by 100 for exact value
34	R		Temperature as F
35	R		Humidity as %rH x100, divide by 100 for exact value
36	R		Humidity as %rH



Dimensions (mm)







## Description

The KSDC  $CO_2$  sensor measures air quality through the presence of carbon dioxide in air ducts in the range between 0 and 10k ppm. The measurement of  $CO_2$  concentration happens through a maintenance free NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product is provided different outputs.

## Technical specifications

Measurement range CO <sub>2</sub>	4002000, 02k, 05k, 010k ppm selectable
Accuracy CO <sub>2</sub>	± 70 ppm +3% reading
Accuracy temperature (*)	±0,3°C (560°C) + 1% FS
Accuracy humidity (*)	±2% RH (2080%RH) + 2% FS
Power supply	24 VAC (±5%), 1535 VDC
Consumption	< 2,5 W
Sensible element	NDIR self adjusting
Output	05 VDC, 010 VDC, 420 mA, Modbus 485
Electrical connection	Pluggable screw terminal for cables 1,5 mm <sup>2</sup>
Protection type	IP41
Working range RH	1095%~RH in contaminant-free, non-condensing air
Working temperature °C	-30+70°C
Storage temperature	-20+50°C
Standards	CE conformity, RoHS



## Order matrix

Model		Output 1 CO <sub>2</sub>	Те	Output 2 mperature		Output 3 Humidity	Option			
KSDC	0	no output	0	no output	0	no output	М	Modbus		
	1	010 V	1	010 V	1	010 V	D	Display		
	2	210 V	2	210 V	2	210 V	R	Relay*		
	3	05 V	3	05 V	3	05 V				
	4	15 V	4	15 V	4	15 V				
	5	420 mA	5	420 mA	5	420 mA				

\*It is recommandable to order the relay version with display option.

## DIP Switch

DIP 1-2	CO2 Ranges
DN DIP 1 2 3 4	400-2.000 ppm
DN DIP 1 2 3 4	0-2.000 ppm
DN DIP 1 2 3 4	0-5.000 ppm
DN DIP 1 2 3 4	0-10.000 ppm
-	

DIP 4	Response
	60 sec.
	20 sec.

## KSDC

<sup>162</sup>966°

**KSDC** 

#### Transmitter hardware



SW1	DIP Switch for configuration range and response time							
X1 TERMINAL 11 12 13 14	24V GND AO1 AO2	1535 VDC or 24 VAC (± %5, 50-60 Hz) ground for power and reference for outputs analog output 1 analog output 2						
X2 TERMINAL 21 22	A / RS485 B / RS485	modbus communication positive pair modbus communication negative pair						
LED	bead LED, period modbus commun	lically lights ON and OFF ication, blinks when there is a communication						
TR1 TR2 ZERO / TR3 RL1 BZ	not used not used relay 1 buzzer							
X3 TERMINAL 31 32	NO - RL1 NO - RL1	relay 1 dry contact max. rating 1A @ 230 VAC relay 1 dry contact max. rating 1A @ 230 VAC						

## Electrical wirings



Relay contact rating is max. 1A at 230 VAC We kindly advise using 24V for avoiding high voltage harmonics and external power relay for bigger loads Please use shielded and twisted paired cables for Modbus connections





## Display & Buttons



press for increasing the value or choosing the next parameter

press and wait to enter MENU, click to navigate between sub menus one by one

 ${\tt D}{\tt \Box}{\tt W}{\tt N}~$  press for decreasing the value or choosing the previous parameter





main screen transmitter is working

keep pressing MENU button until seeing 0 transmitter is not working in MENU mode

## Parameters for Relay & Buzzer

Main Screen >>>> r1 L > r1 H > r1 A > Main Screen



LOW set point for Relay



HIGH set point for Relay



ACTION selection for Relay

### Actions for Relay & Buzzer

U.	action 0, relay contact is always OPEN
	action 1, relay contact is CLOSED between points, OPEN under LOWpoint and OPEN over HIGHpoint
	action 2, relay contact is OPEN between points, CLOSED under LOWpoint and OPEN over HIGHpoint
	action 3, relay contact is CLOSED over HIGHpoint, OPEN under LOWpoint, hysterisis between points
	action 4, relay contact is OPEN over HIGHpoint, CLOSED under LOWpoint, hysterisis between points



## KSDC

## 

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0:0.0.0	Open	Open	Open
1 : 0.1.0	Open	Closed	Open
2 : 1.0.1	Closed	Open	Closed
3 : 0.X.I	Open	Hysteresis	Closed
4 : I.X.0	Closed	Hysteresis	Open

0 : Relay Contact is OPEN, Buzzer is in Silent mode

I : Relay Contact is CLOSED, Buzzer is in Warning mode

X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

## Modbus RS485 protocol

Default Settings: Modbus ID:1, 9600, 8bit, None, 1. Register Table starts from Base 1.

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Whenever writing to any Modbus Parameter, the new parameter is activated instantly and you should have to configure the master device according to new parameters. For every reboot/initializing, Modbus is activated with default parameters for 3 seconds. After 3 seconds, Modbus is reconfigured according to your parameter settings. Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

Register	R/W	Range	Description
1	R & W	1254	Modbus Address
2	R & W	02	Baudrate, 0: 9.600, 1: 19.200
3	R & W	03	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R		CO2 level as ppm
5	R		Temperature as C x100, divide by 100 for exact value
6	R	0 or 1	Relay 1, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
7	R	01.000	Relay 1, LOW point
8	R	01.000	Relay 1, HIGH point
9	R	04	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	01.000	Relay 2, LOW point
12	R	01.000	Relay 2, HIGH point
13	R	04	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	01.000	Buzzer, LOW point
16	R	01.000	Buzzer, HIGH point
17	R	04	Buzzer, ACTION
18-29	R		Only for service needs
30	R		CO2 level as ppm
31	R		Temperature as C x100, divide by 100 for exact value
32	R		Temperature as C
33	R		Temperature as F x100, divide by 100 for exact value
34	R		Temperature as F
35	R		Humidity as %rH x100, divide by 100 for exact value
36	R		Humidity as %rH

KSDC

## 



<sup>166</sup> 9 tec°

## Room temperature transmitter

## Description

The temperature transmitter serie TTI measures the room temperature by a sensor and converts the value into a linear output signal 0...10 VDC o 4...20 mA.

## Technical specifications

Measurement range	See configurator
Accuracy	±0,2°C + max 3% FS
Sensor	PT1000 Class B (2-wire)
Power supply	1234 VAC/DC
Working resistance at 010 V DC	10100 kOhm
Working resistance at 420 mA	50500 Ohm
Current consumption	2444 mA
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Display	Optional, display the actual temperature
Dimensions	See drawing
Housing	ABS, RAL 9010
Protection type	IP20
Protection class	III
Installation	Screw fastening
Standards	CE conformity, RoHS

_		/

TTI

Model	Output	Version
TTIC	420 mA	
TTICD	420 mA	with display
ΤΤΙν	010 V DC	
TTIVD	010 V DC	with display

## Electrical wirings



Ou	tput 010 V	Output 420 mA					
PIN	Assignment	PIN	Assignment				
1	Temp.	1	-				
2	-	2	-				
3	-	3	Temp.				
4	-	4	-				
7	+	7	+				
8	GND	8	GND				



# TTI

## Settings

Range 1 2 3 4 5 6 7		8		Range	1	2	3	4	5	6	7	8							
u	-100+50°C	OFF	OFF	OFF	OFF	OFF	-	-	-		-10+120°C	OFF	OFF	ON	ON	OFF	-	-	-
	-500°C	ON	OFF	OFF	OFF	OFF	-	-	-	u	0+40°C	ON	OFF	ON	ON	OFF	-	-	-
ectic	-5050°C	OFF	ON	OFF	OFF	OFF	-	-	-	ectio	0+50°C	OFF	ON	ON	ON	OFF	-	-	-
sele	-50+150°C	ON	ON	OFF	OFF	OFF	-	-	-	sele	0+70°C	ON	ON	ON	ON	OFF	-		-
Jge	-30+20°C	OFF	OFF	ON	OFF	OFF	-	-	-	Jge	0+100°C	OFF	OFF	OFF	OFF	ON	-	-	-
e rar	-30+60°C	ON	OFF	ON	OFF	OFF	-	-	-	e rar	0+150°C	ON	OFF	OFF	OFF	ON	-	-	
ture	-30+70°C	OFF	ON	ON	OFF	OFF	-	-	-	ture	0+160°C	OFF	ON	OFF	OFF	ON	-	-	-
bera	-20+50°C	ON	ON	ON	OFF	OFF	-	-	-	oera	0+200°C	ON	ON	OFF	OFF	ON	-	-	-
dme	-20+80°C	OFF	OFF	OFF	ON	OFF	-	-	-	dme	0+250°C	OFF	OFF	ON	OFF	ON	-	-	-
P	-20+120°C	ON	OFF	OFF	ON	OFF	-	-	-	4	0+400°C	ON	OFF	ON	OFF	ON	-	-	-
	-20+150°C	OFF	ON	OFF	ON	OFF	-	-	-		0+600°C	OFF	ON	ON	OFF	ON	-	-	-
	-10+15°C	ON	ON	OFF	ON	OFF	-	-	-		+10+35°C	ON	ON	ON	OFF	ON	-	-	-

## Dimensions (mm)





## Outdoor temperature transmitter

## Description

The temperature transmitter serie TTO measures the outdoor temperature by sensor and converts the value into a linear output signal 0...10 VDC o 4...20 mA.

## Technical specifications

Measurement range °C	See configurator
Accuracy °C	±0,2°C + max 3% of FS
Power supply	1234 VAC/DC
Working resistance at 010 V DC	10100 kOhm
Working resistance at 420 mA	50500 Ohm
Consumption	2444 mA
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Housing	PA6 15% GF, RAL9010
Dimensions	See drawing
Protection type	IP65
Protection class	III
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	-30+70°C
Standards	CE conformity, RoHS

Models	Temp. output	Version
TTOC*	420 mA	
TTOCD	420 mA	with display
ττον	010 V DC	
TTOVD	010 V DC	with display

\* available 2-wire version

## Electrical wirings



Οι	ıtput 010 V	Output 420 mA								
PIN	Assignment	PIN	Assignment							
1	Temp.	1	-							
2	-	2	-							
3	-	3	Temp.							
4	-	4	-							
7	+	7	+							
8	GND	8	GND							



ΤΤΟ

TTO



Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

## Setting

	Range	1	2	3	4	5	6	7	8		Range	1	2	3	4	5	6	7	8
	-100+50°C	OFF	OFF	OFF	OFF	OFF	-	-	-		-10+120°C	OFF	OFF	ON	ON	OFF	-	-	-
L	-500°C	ON	OFF	OFF	OFF	OFF	-	-	-	Ц	0+40°C	ON	OFF	ON	ON	OFF	-	-	-
ectic	-5050°C	OFF	ON	OFF	OFF	OFF	-	-	-	ectic	0+50°C	OFF	ON	ON	ON	OFF	-	-	-
sele	-50+150°C	ON	ON	OFF	OFF	OFF	-	-	-	sele	0+70°C	ON	ON	ON	ON	OFF	-	-	-
Jge	-30+20°C	OFF	OFF	ON	OFF	OFF	-	-	-	Jge	0+100°C	OFF	OFF	OFF	OFF	ON	-	-	-
e rar	-30+60°C	ON	OFF	ON	OFF	OFF	-	-	-	e rar	0+150°C	ON	OFF	OFF	OFF	ON	-	-	-
ture	-30+70°C	OFF	ON	ON	OFF	OFF	-	-	-	ture	0+160°C	OFF	ON	OFF	OFF	ON	-	-	-
era	-20+50°C	ON	ON	ON	OFF	OFF	-	-	-	era	0+200°C	ON	ON	OFF	OFF	ON	-	-	-
dme	-20+80°C	OFF	OFF	OFF	ON	OFF	-	-	-	dme	0+250°C	OFF	OFF	ON	OFF	ON	-	-	-
P	-20+120°C	ON	OFF	OFF	ON	OFF	-	-	-	4	0+400°C	ON	OFF	ON	OFF	ON	-	-	-
	-20+150°C	OFF	ON	OFF	ON	OFF	-	-	-		0+600°C	OFF	ON	ON	OFF	ON	-	-	-
	-10+15°C	ON	ON	OFF	ON	OFF	-	-	-		+10+35°C	ON	ON	ON	OFF	ON		-	-

## Dimensions (mm)





Outdoor temperature transmitter with ModBus output

## Description

The temperature transmitter serie TTOM measures the outdoor temperature by sensor and converts the value into a Modbus output signal.

## Technical specifications

Accuracy °C	±0,2°K ±1% of FS					
Power supply	1234 V AC/DC		-		-	
Consumption	1020 mA	2		-		-
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>				-	
Housing	PA6 15% GF, RAL9010		/			
Dimensions	See drawing					/
Protection type	IP65					
Working range RH	098% RH in contaminant-free, n	non-condensing air				
Working temperature °C	-30+70°C					
Standards	CE conformity, RoHS					

## Electrical wirings



Dimension (mm)



## **Measurement source**

Unit	ModBus source	Gain
Temperature °C	20	10

**TTOM** 

Setting	1	2	3	4	5	6	7	8
	Baudra	ate						
9600	OFF	OFF						
19200	OFF	ON						
38400	ON	OFF						
57600	ON	ON						
							Termi	nation
nessuna								OFF
120 Ω								ON
				Parity				
Even				OFF	OFF			
Odd				OFF	ON			
No parità				ON	OFF			
No parità				ON	ON			
	_		_	_	_	Modal	ity	
RTU						OFF		
ASCII						ON		
							Bit stop	
1							OFF	
2							ON	
	Setting 9600 19200 38400 57600 120 Ω Ressuna 120 Ω Even Odd No parità No parità No parità RTU ASCII	Setting 1   9600 OFF   19200 OFF   19200 OFF   38400 ON   38400 ON   57600 ON   120 Ω F   120 Ω F   Odd A   No parità A   ASCII A   1 Q   1 A   2 1	Setting 1 2   9600 OFF OFF   19200 OFF ON   38400 ON OFF   38400 ON OFF   57600 ON ON   7 T T   Nessuna T T   120 Ω T T   Kron T T   No parità T T   RTU T T   ASCII T T   1 T T   1 T T   2 T T	Setting 1 2 3   9600 OFF OFF I   9600 OFF ON I   19200 OFF ON I   38400 ON OFF I   38400 ON OFF I   38400 ON OFF I   7600 ON ON I   I20 Ω I I I   Pessuna I I I   120 Ω I I I   Peven I I I   No parità I I I   No parità I I I   ASCII I I I   1 I I I   2 I I I	Setting 1 2 3 4   9600 OFF OFF OFF 1 1   9600 OFF ONF ON 1 1   19200 OFF ON I 1 <	Setting 1 2 3 4 5   9600 OFF OFF OFF I I I   9600 OFF OFF ON I I I   19200 OFF ON I I I I I   19200 OFF ON OFF ON I	Setting123456Baucererererererererererererererererererer	Setting12345679600OFFOFFIIIII9600OFFOFFIIIII19200OFFONIIIII19200OFFONIIIII38400ONOFFIIIII38400ONOFFIIIII57600ONONIIIII120 ΩIIIIIIII120 ΩIIIIIIII120 ΩIII </th



## TTOM

## 

#### DIP-switch 2

Address	1	2 3	4 5	6	78	Indirizzo	1 2	3 4	4 5	6 7	8	Address	1 2	3	4 8	56	78	Indirizzo 1	12	3 4	56	78	Address	1 2	3 4	56	7	8	Address	1 2	3 4	56	378
1						43						84	_		-	_		125					166	_			-		207		_		
2						44						85						126					167						208				
3						45						86			-			127					168						209				
4						46						87						128					169						210				
5						47						88						129					170					_	211				
						47					-		-					120					170					-	211		۳.,		
6						48						89						130					1/1						212				
7						49						90						131					172						213				
8						50						91						132					173						214				
9						51						92						133					174						215				
10						52						93						134					175						216				
11						53						94					_	135					176	_					217				
12						54						95						136					177						218				
13						55						96		I D				137					178				Ξ.		219				
14						56						97						138					179						220			ک ک	
15						57						98						139					180						221			ه کا	
16						58						99						140					181						222			ه ک	£ _
17						59						100						141					182						223				<u>د م</u>
10						60					-	100						142					102						220				
10				_		00						101					_	142					103						224				
19						61						102						143					184						225				
20						62						103						144					185						226				
21						63						104						145					186						227				
22						64						105						146					187						228				
23						65						106						147					188						229				
24						66						107						148					189						230				
25						67						108						149					190						231				
26						68						109						150					191	_					232				
27						69						110					-	151					192						233		-	-	
28						70						111						152					193						234				
29						71						112						153					194						235				
30						72						113						154					195						236				i
31						73						114						155					196						237				
32						74						115			-			156					197						238				_ که
33						75						116						157					198				٢,		239				که:
34						76						117						158					199						240		ک ک		
35						77						118						159					200						241				
26						79						110						160					201						242		ه ه		
27						70						120						161					201						242		-		
20						- 19						120						160					202						243		-		
38						80						121						162					203						244				
39						81						122						163					204						245				
40						82						123						164					205						246				
41						83						124						165					206						247				
42																																	

ON	Switch at: ON
OFF	



## Duct and screw-in temperature transmitter

## TTD / TTS

## Description

The temperature transmitter serie TTD/TTS measures the duct or screw-in temperature by sensor and converts the value into a linear output signal 0...10 V DC o 4...20 mA.

## Technical specifications

Measurement range °C	See configurator
Accuracy °C	±0,2°C + max 3% of FS
Power supply	1234 V AC/DC
Working resistance at 010 V DC	10100 kOhm
Working resistance at 420 mA	50500 Ohm
Consumption	2444 mA
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Housing	PA6 15% GF, RAL9010
Dimensions	See drawing
Protection type	IP65
Protection class	III
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	-30+70°C
Standards	CE conformity, RoHS



Models	Temp. output	Version	Display
TTDC	420 mA	Duct	
TTDCD	420 mA	Duct	with display
TTDV	010 V DC	Duct	
TTDVD	010 V DC	Duct	with display
TTSC	420 mA	Screw-in	
TTSCD	420 mA	Screw-in	with display
TTSV	010 V DC	Screw-in	
TTSVD	010 V DC	Screw-in	with display



## TTD / TTS

## Electrical wirings



Ou	tput 010 V	Output 420 mA							
PIN	Assignment	PIN	Assignment						
1	Temp.	1	-						
2	-	2	-						
3	-	3	Temp.						
4	-	4	-						
7	+	7	+						
8	GND	8	GND						

Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

## Setting

	Range	1	2	3	4	5	6	7	8		Range	1	2	3	4	5	6	7	8
uc	-100+50°C	OFF	OFF	OFF	OFF	OFF	-	-	-		-10+120°C	OFF	OFF	ON	ON	OFF	-	-	-
	-500°C	ON	OFF	OFF	OFF	OFF	-		-	Ы	0+40°C	ON	OFF	ON	ON	OFF	-		-
ectio	-5050°C	OFF	ON	OFF	OFF	OFF	-		-	ectio	0+50°C	OFF	ON	ON	ON	OFF	-		-
sel	-50+150°C	ON	ON	OFF	OFF	OFF	-	-	-	sel	0+70°C	ON	ON	ON	ON	OFF	-	-	-
nge	-30+20°C	OFF	OFF	ON	OFF	OFF	-	-	-	nge	0+100°C	OFF	OFF	OFF	OFF	ON	-	-	-
iture rai	-30+60°C	ON	OFF	ON	OFF	OFF	-		-	e rai	0+150°C	ON	OFF	OFF	OFF	ON	-	-	-
	-30+70°C	OFF	ON	ON	OFF	OFF	-	-	-	iture	0+160°C	OFF	ON	OFF	OFF	ON	-	-	-
oera	-20+50°C	ON	ON	ON	OFF	OFF	-	-	-	Dera	0+200°C	ON	ON	OFF	OFF	ON	-	-	-
emp	-20+80°C	OFF	OFF	OFF	ON	OFF	-	-	-	emp	0+250°C	OFF	OFF	ON	OFF	ON	-	-	-
-	-20+120°C	ON	OFF	OFF	ON	OFF	-	-	-	-	0+400°C	ON	OFF	ON	OFF	ON	-	-	-
	-20+150°C	OFF	ON	OFF	ON	OFF	-	-	-		0+600°C	OFF	ON	ON	OFF	ON	-	-	-
	-10+15°C	ON	ON	OFF	ON	OFF	-		-		+10+35°C	ON	ON	ON	OFF	ON	-	-	-

## Dimensions (mm)



## Duct and screw-in temperature transmitter

## TTDM / TTSM

## Description

The temperature transmitter serie TTDM/TTSM measures the duct or screw-in temperature by sensor and converts the value into a Modbus 485 signal.

## Technical specifications

Accuracy °C	±0,2°C + max 3% of FS
Power supply	1234 V AC/DC
Consumption	1020 mA
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Housing	PA6 15% GF, RAL9010
Dimensions	See drawing
Protection type	IP65
Protection class	III
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	-30+70°C
Standards	CE conformity, RoHS



Models	Version
TTDM	Duct
TTSM	Screw-in

## Electrical wirings



### **Measurement source**

Unit	ModBus source	Gain
Temperature °C	20	10

	Setting	1	2	3	4	5	6	7	8	
	9600	OFF	OFF							
	19200	OFF	ON							
	38400	ON	OFF							
	57600	ON	ON							
								Termi	nation	
-	nessuna								OFF	
tc	120 Ω								ON	
Ň		Parity								
0	Even				OFF	OFF				
	Odd				OFF	ON				
	No parità				ON	OFF				
	No parità				ON	ON				
			_	_			Modal	ity		
	RTU						OFF			
	ASCII						ON			
								Bit stop		
	1							OFF		
	2							ON		

## TTDM / TTSM

### DIP-switch 2









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Included in TTS versions



Included in TTD versions

## Room humidity and temperature transmitter

## Description

The temperature/humidity transmitter serie TTHI measures the room temperature and humidity by capacitive sensors and converts the value into a linear output signal 0...10 V DC or 4...20 mA.

## Technical specifications

Measurement range RH	Selectable by dip-switch
Accuracy RH	±2% RH (2080%RH) + 2% FS
Measurement range °C	4 different scale selectable by dip-switch
Accuracy °C	±0,3°C (560°C) + 1% FS
Power supply	1234 V AC/DC
Power consumption	2444 mA
Working resistance at 010 V	10100 kOhm
Working resistance at 420 mA	50500 Ohm
Speed of responce RH	8 sec.
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>
Housing	
	ABS, RAL 9010
Dimensions	ABS, RAL 9010 See drawing
Dimensions Protection type	ABS, RAL 9010 See drawing IP30
Dimensions Protection type Protection class	ABS, RAL 9010 See drawing IP30 III
Dimensions Protection type Protection class Working range RH	ABS, RAL 9010 See drawing IP30 III 098% RH in contaminant-free, non-condensing air
Dimensions Protection type Protection class Working range RH Working temperature °C	ABS, RAL 9010 See drawing IP30 III 098% RH in contaminant-free, non-condensing air 0+50°C
Dimensions Protection type Protection class Working range RH Working temperature °C Installation	ABS, RAL 9010 See drawing IP30 III 098% RH in contaminant-free, non-condensing air 0+50°C Screw fastening



TTHI

Models	Temp. output	Humidity output	Version
TTHIV	010 V DC	010 V DC	
TTHIxV	Passive sensor (*)	010 V DC	
TTHIVD	010 V DC	010 V DC	with display
TTHIxVD	Passive sensor (*)	010 V DC	with display
TTHIC	420 mA	420 mA	
TTHIxC	Passive sensor (*)	420 mA	
TTHICD	420 mA	420 mA	with display
TTHIxCD	Passive sensor (*)	420 mA	con display

(\*) Replace "x" with the number of desired passive sensor:

X	Type of passive sensor
1	Pt100 (DIN EN 60751 CI. B)
2	Pt1000 (DIN EN 60751 CI. B)
3	Ni1000 (TK6180)
5	NTC20k (±1%)
6	NTC10k (±1%) BETA 3435K



## тні

### Electrical wirings



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mp.
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nsor
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6

Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

Note: The sensor is designed for a normal environment condition, other aggressive gases can ruin it.

#### Range 1 2 Range 3 4 5 0...+50°C OFF OFF Relative humidity 0...+100°C 0...100% ON OFF OFF OFF OFF OFF -20...+80°C OFF ON Absolute humidity -30...+70°C ON ON 0 g/m<sup>3</sup>...30g/m<sup>3</sup> OFF ON OFF OFF 0 g/m<sup>3</sup>...50g/m<sup>3</sup> OFF ON ON OFF Temperature ranges Humidity ranges 0 g/m<sup>3</sup>...80g/m<sup>3</sup> ON ON ON OFF Mix ratio 0 g/kg...30g/kg OFF OFF OFF ON 0 g/kg...50g/kg OFF OFF ON ON 0 g/kg...80g/kg OFF ON ON ON Dew point 0...+50°C OFF OFF ON ON -50...+100°C ON ON OFF OFF -20...+80°C OFF ON ON OFF Enthalpy 0 kj/kg...85kj/kg ON ON ON ON 87 87 8 ſ 0

Dimensions (mm)

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178





#### Setting

## Outdoor humidity and temperature transmitter

## Description

The temperature/humidity transmitter serie TTHO measures the outdoor temperature and humidity by a capacitive humidity sensor and converts the value into a linear output signal 0...10 V DC o 4...20 mA. The humidity and temperature sensor is protected against contamination by a screw sinter filter.

## Technical specifications

Measurement range RH	Selectable
Accuracy RH	±2% RH (2080% RH) + 2% FS
Measurement range °C	4 different scale selectable by dip-switch
Accuracy °C	±0,3°C (560°C) + 1,5% FS
Power supply	1234 V AC/DC
Power consumption	2444 mA
Working resistance at 010 V DC	10100 kOhm
Working resistance at 420 mA	50500 Ohm
Electrical connection	Screw terminals max. 1,5 mm²
Housing	PA6 15% GF, RAL9010
Dimensions	See drawing
Protection type	IP65
Protection class	III
Working range RH	098% RH in contaminant-free, non-condensing ai
Working temperature °C	-30+70°C
Standards	CE conformity, RoHS



**TTHO** 

Models	Temp. output	Humidity output	Version
ттнос	420 mA	420 mA	
TTHOxC	Passive sensor (*)	420 mA	
TTHOCD	420 mA	420 mA	with display
TTHOxCD	Passive sensor (*)	420 mA	with display
ттноу	010 V DC	010 V DC	
TTHOxV	Passive sensor (*)	010 V DC	
TTHOVD	010 V DC	010 V DC	with display
TTHOxVD	Passive sensor (*)	010 V DC	with display

 ${}^{(\star)}$  Replace "x" with the number of desired passive sensor:

Х	Type of passive sensor
1	Pt100 (DIN EN 60751 Cl. B)
2	Pt1000 (DIN EN 60751 CI. B)
3	Ni1000 (TK6180)
5	NTC20k (±1%)
6	NTC10k (±1%) BETA 3435K



# TTHO

Electrical wirings



0	utput 010 V	Output 420 mA				
PIN	Assignment	PIN	Assignment			
1	Output temp.	1	-			
2	Output humid.	2	-			
3	-	3	Output temp.			
4	-	4	Output humid.			
7	+	7	+			
8	GND	8	GND			
12	passive sensor	12	passive sensor			
13	passive sensor	13	passive sensor			

Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

Note: The sensor is designed for a normal environment condition, other aggressive gases can ruin it.

## Setting

	Range	1	2		Range	3	4	5	6
Temperature ranges	-30+70°C	OFF	OFF		Relative humidity				
	-20+80°C	ON	OFF		0100%	OFF	OFF	OFF	OFF
	0+100°C	OFF	ON		Absolute humidity				
	0+50°C	ON	ON		0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF
		0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF			
				ges	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF
	tit Literan	ran	Mix ratio						
		dity	0 g/kg30g/kg	OFF	OFF	OFF	ON		
		i i i i i i i i i i i i i i i i i i i	0 g/kg50g/kg	OFF	OFF	ON	ON		
		лана страна с		0 g/kg80g/kg	OFF	ON	ON	ON	
					Dew point				
			0+50°C	OFF	ON	ON	OFF		
				-50+100°C	ON	OFF	OFF	ON	
				-20+80°C	OFF	ON	OFF	ON	
					Enthalpy				
		,		0 kj/kg85kj/kg	ON	ON	ON	ON	

## Dimensions (mm)

180


### Description

The temperature/humidity transmitter serie TTHDM measures the outdoor temperature and humidity by a capacitive humidity sensor and converts the value into an RS485 output signal with ModBus RTU/ASCII protocol. The sensor is protected by a sintered filter.

### Technical specifications

Measurement range RH	0100% RH	
Accuracy RH	±2% RH (2080%RH) +2% FS a 25°C	×C.
Accurracy °C	±0,3°C (560°C) + 1,5% FS	2 Cit &
Power supply	1234 V AC/DC	•
Power consumption	1020 mA	1
Electrical connection	Screw terminals max. 1,5 mm²	
Housing	PA6 15% GF, RAL 9010	1
Dimensions	See drawing	
Protection type	IP65	
Protection class	III	
Working range RH	098% RH in contaminant-free, non-condensing air	
Working temperature °C	-30+70°C	
Standards	CE conformity. RoHS	

Models	Version
TTHOM	
TTHOMD	with display

**Electrical wirings** 

### **Measurement source**

Unit	ModBus source	Gain
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m <sup>3</sup>	22	10
Dewpoint °C	23	10
Enthalpy J	24	10

#### Setting 2 3 4 5 6 7 8 1 Baudrate 9600 OFF OFF ON 19200 OFF 38400 ON OFF 57600 ON ON ermination OFF nessuna **DIP Switch 1** ON 120 Ω Parity Even OFF OFF OFF ON Odd No parità ON OFF No parità ON ON Modality RTU OFF ASCII ON Bit stop OFF 1 2 ON





## TTHOM

### TTHOM

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### DIP-switch 2

Address	1	2 3 4	4 5 6	78	Indirizzo	1 2	3 4	56	78	Address	1 2	3 4	4 5	6 7	8	Indirizzo	1 2	3 4	56	578	Address	1 2	34	45	6 7 8	Address	1 2	3 4	56	78
1					43					84						125					166					207				
2					44					85						126					167					208				
3					45					86						127					168					209				
-					40					07						100					160					210				
4					40					0/						120					109					210				
5					47					88						129					170					211				
6					48					89						130					171					212				
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12					54					95						136			=_		177					218				
13					55					96						137					178					219				
14					56					97						138					170					220				
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19					61					102						143					184					225				
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21					63					104						145					186					227				
22					64					105						146					187					228				
23					65					106						147					188					229				
24					66					107						148					189					230				
25					67					108				<b>.</b>		149					190				▝▔	231				
26					68					109						150					191					232				
27					69	_				110						151					192					233				
28					70					111						152			۲_		193					234				
29					71					112						153					194					235				
30				<b>.</b>	72					113						154					195					236				
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33					75					110						157					190					239				
34					/6					117						158					199					240				
35										118						159					200					241				
36					78					119						160					201					242				
37					79					120						161					202					243				
38					80					121						162					203					244				
39					81					122						163					204					245				
40					82					123						164					205					246				
41					83					124						165					206					247				
42																														

ON	Switch at: ON
OFF	

### Dimensions (mm)



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69

<sup>182</sup>9 tec°

### Duct humidity and temperature transmitter

### Description

The temperature/humidity transmitter serie TTHD measures the duct temperature and humidity by a capacitive sensor and converts the value into a linear output signal 0...10 V DC or 4...20 mA.

### Technical specifications

Technical specifications		
Measurement range RH	Selectable by dip-switch	
Accuracy RH	±2% RH (2080%RH) + 2% FS	
Measurement range °C	4 different scale selectable by dip-switch	
Accurracy °C	±0,3°C (560°C)	58
Speed of responce	8 sec.	
Power supply	1234 V AC/DC	
Power consumption	2444 mA	
Working resistance at 010 V DC	10100 kOhm	
Working resistance at 420 mA	50500 Ohm	
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>	
Housing	PA6 15% GF, RAL 9010	
Dimensions	See drawing	
Protection type	IP65	
Protection class	II	
Working range RH	098% RH in contaminant-free, non-condensing air	
Working temperature °C	-30+70°C	
Installation	Mounting flange (included)	
Standards	CE conformity, RoHS	

Models	Temp. output	Humidity output	Version
TTHDV	010 V DC	010 V DC	
TTHDVD	010 V DC	010 V DC	with display
TTHDxV	Passive sensor (*)	010 V DC	
TTHDxVD	Passive sensor (*)	010 V DC	with display
TTHDC	420 mA	420 mA	
TTHDCD	420 mA	420 mA	with display
TTHDxC	Passive sensor (*)	420 mA	
TTHDxCD	Passive sensor (*)	420 mA	with display

(\*) Replace "x" with the number of desired passive sensor:

Type of passive sensor
Pt100 (DIN EN 60751 CI. B)
Pt1000 (DIN EN 60751 Cl. B)
Ni1000 (TK6180)
NTC20k (±1%)
NTC10k (±1%) BETA 3435K



TTHD

# TTHD

### Electrical wirings



utput 010 V	Output 420 mA				
Assignment	PIN	Assignment			
Output temp.	1	-			
Output humid.	2	-			
-	3	Output temp.			
-	4	Output humid.			
+	7	+			
GND	8	GND			
passive sensor	12	passive sensor			
passive sensor	13	passive sensor			
	Assignment Output temp. Output humid. - - + GND passive sensor passive sensor	Assignment PIN Output temp. 1 Output humid. 2 - 3 - 4 + 7 GND 8 passive sensor 12 passive sensor 13			

Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

Note: The sensor is designed for a normal environment condition, other aggressive gases can ruin it.

### Setting

	Range	1	2		Range	3	4	5	6
	-30+70°C	OFF	OFF		Relative humidity				
	-20+80°C	ON	OFF		0100%	OFF	OFF	OFF	OFF
	0+100°C	OFF	ON		Absolute humidity				
	0+50°C	ON	ON		0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF
es					0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF
ang				ges	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF
e 19				ran	Mix ratio				
atur				lity	0 g/kg30g/kg	OFF	OFF	OFF	ON
Dera				mic	0 g/kg50g/kg	OFF	OFF	ON	ON
eml				문	0 g/kg80g/kg	OFF	ON	ON	ON
F					Dew point				
					0+50°C	OFF	ON	ON	OFF
					-50+100°C	ON	OFF	OFF	ON
					-20+80°C	OFF	ON	OFF	ON
					Enthalpy				
					0 kj/kg85kj/kg	ON	ON	ON	ON

### Dimensions (mm)

184

Δ

**lec**°



### Duct humidity and temperature transmitter with ModBus

### TTHDM

### Description

The temperature/humidity transmitter serie TTHDM measures the duct temperature and humidity by a capacitive humidity sensor and converts the value into an RS485 output signal with ModBus RTU/ASCII protocol. The sensor is protected by a sintered filter.

### Technical specifications

		No. of Concession, Name
Measurement range RH	0100% RH	
Accuracy RH	±2% RH (2080%RH) +2% FS a 25°C	
Accurracy °C	±0,3°C (560°C) + 1,5% FS	
Power supply	1234 V AC/DC	
Power consumption	1020 mA	
Electrical connection	Screw terminals max. 1,5 mm <sup>2</sup>	
Housing	PA6, RAL 9010	
Dimensions	See drawing	
Protection type	IP65	
Protection class	III	
Working range RH	098% RH in contaminant-free, non-condensing air	
Working temperature °C	-30+70°C	
Installation	Mounting flange (included)	
Standards	CE conformity, RoHS	

Models	Version
TTHDM	
TTHDMD	with display

### **Measurement source**

Unit	ModBus source	Gain
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m <sup>3</sup>	22	10
Dewpoint °C	23	10
Enthalpy J	24	10

5

OFF ON OFF ON 6

Modality OFF ON

9

Bit stop OFF ON

7

8

Termination OFF ON

		Setting	1	2	3	4
			Baudr	ate		
		9600	OFF	OFF		
		19200	OFF	ON		
		38400	ON	OFF		
		57600	ON	ON		
<sup>/DC+</sup> <b>4</b>	-	nessuna				
^   <mark>⊗ </mark> —— 3	tc	120 Ω				
ı 🔊 — 2	Ň					Parit
SHD 1	S O	Even				OFF
		Odd				OFF
		No parità				ON
		No parità				ON
Switch S1		RTU				
		ASCII				
		1				
		2				

### Electrical wirings

F

PIN	Wiring	
1	SHD	
2	В	
3	A	
4	+	<b>⊕</b> <sup>E</sup> V <sub>RH</sub>
5	GND	
		AC/DC- S
		୍ଚ୍ଚ AC/DC+ 🚫 🦳 <b>4</b>
		A 🚫 🗌 —— 3
	PT1000	₽ 🚫 <b></b> 2
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	PT1000	
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	/	
	<b>DIP-Switch S</b>	52 DIP-Switch S1

### **TTHDM**

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### DIP-switch 2

Address	s 1	23	4 5 6	5 7 8	Address	1 2	3 4	5	6 7	8	Address	1 2	3 4	5	6 7	8	Address	1 2	3 4	5	678	Address	1 2	3 4	56	678	Address	1 2	3 4	5 6	78
1					43						84						125					166					207				
2					44						85						126					167					208				
3					45						86						127					168					209				
4					46						97						129					160					210				
4					40						0/						120					109					210				
5					47						88						129					170					211				
6					48						89						130					171					212				
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8			_		50						91						132	-				173					214				
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12					66						06						127					179					210				
13					55			-	_	_	90						137					170					215				
14					56						97						138					1/9					220				
15					57						98						139					180					221				
16					58						99						140					181					222				
17					59						100						141					182					223				
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19					61						102						143					184					225				
20					62						103						144					185					226				
21					63						104						145					186					227				
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23					65						106						147					188					220				
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33					75						116						157					198				• E _	239				
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37					79						120						161					202					243				
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39					81						122						163					204					245				
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### Dimensions (mm)





186 **lec**° 9



### Description

The SAC  $CO_2$  sensor measures air quality through the presence of carbon dioxide in the room in the range between 0...2000 or 0...5000 ppm. The measurement of  $CO_2$  concentration happens through a NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product can be provided with humidity or humidity/temperature sensor. Output 0 ... 10 V DC or 4 ... 20 mA outputs.

### Technical specifications

Measurement range CO <sub>2</sub>	02000 / 05000 ppm
Accuracy CO <sub>2</sub>	±60 ppm (02000 ppm) ±2% FS
	±150 ppm (05000 ppm) ±2% FS
Accuracy temperature	± 0,3K (560°C) + 1% FS
Accuracy humidity	25°C ± 2% RH (2080%RH) + 2% FS
Power supply	1234 V AC/DC (2034 V AC/DC with relay)
Power consumption	40100 mA
Sensor setting up time	60 min.
Working resistance at 010 V DC	10100 kOhm
Working resistance at 420 mA	50500 Ohm
CO2 sensitive element	NDIR self adjusting
Sensible element	Self-calibrating NDIR
Electrical connection	Screw terminal for cables 1,5 mm <sup>2</sup>
Protection type	IP 30
Housing	ABS RAL9010
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	0+50°C
Standards	CE, RoHs compliance



SAC

Temperature	Humidity	Output
-	-	010 V DC
•	-	010 V DC
•	•	010 V DC
-	-	420 mA
•	-	420 mA
-	•	420 mA
	Temperature - • • - - • •	TemperatureHumidity•-•••••-•-••••••

Optional: suffix "D" version with display and/or suffix "R" relay version

 $^{(\star)}$  Replace "X" with the number of selected passive sensor:

"X"	Type of passive sensor
1	Pt100 (DIN EN 60751 CI. B)
3	Ni1000 (TK6180)
5	NTC20k (±1%)
6	NTC10k (±1%) BETA 3435K



## SAC

### Electrical wirings



	Outp	ut 010 V		Output 420 mA							
PIN	CO2	CO <sub>2</sub> /T	CO <sub>2</sub> /T/H	PIN	CO <sub>2</sub>	CO <sub>2</sub> /T	CO <sub>2</sub> /H				
1	ppm	temp	temp	1	-	-	-				
2	-	ppm	humidity	2	-	-	-				
3	-	-	ppm	3	ppm	temp	humidity				
4	-	-	-	4		ppm	ppm				
5			(pa	ssive p	oti)						
6	(passive poti)										
7				V+							
8				GND							
9			(r	elay NC	;)						
10			(	relay C	)						
11			(r	elay NC	))						
12			(pas	sive ser	nsor)						
13			(pase	sive ser	nsor)						
S3			рс	plarity R	3						
S2		С	$O_2$ Manual a	djustme	nt to 400 pp	m					

### Dip-switch setting

	Range	1	2		Range	3	4	5	6		Range	7	8
	-30+70°C	OFF	OFF		Relative humidity						CO <sub>2</sub>		
	-20+80°C	ON	OFF		0100%	OFF	OFF	OFF	OFF	bu	02000 ppm	OFF	
	0+50°C	ON	ON		Absolute humidity					setti	05000 ppm	ON	
ч	0+100°C	OFF	ON	_	0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF	n/s	Self adjusting		
ecti				tior	0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF	ctio	Not activated		ON
sel				elec	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF	ele	Activated		OFF
nge				je s	Mix ratio					ge s			
e rai				้ลทด	0 g/kg30g/kg	OFF	OFF	OFF	ON	rang			
ature				lity r	0 g/kg50g/kg	OFF	OFF	ON	ON	°20			
pera				mid	0 g/kg80g/kg	OFF	ON	ON	ON	0			
emi				모	Dew point								
F					0+50°C	OFF	ON	ON	OFF				
					-50+100°C	ON	OFF	OFF	ON				
					-20+80°C	OFF	ON	OFF	ON				
					Enthalpy								
					0 kj/kg85kj/kg	ON	ON	ON	ON				

Autocalibration CO<sub>2</sub> sensor: The sensor must be mounted with the ventilation slots against the flow direction. The screw connector shall be installed in the direction of the ventilation slots. The sensor shall be exposed to fresh air at least once a day, otherwise it will give incorrect readings on long term. The sensor requires 15 days of calibration to be adapted to the real values.



188 **Tec** 

### Description

The air quality sensor serie SAV for mixed gases (VOC) measures the air quality from 0...2000 ppm referring to the calibration gas. The sensors with provided by linear output signal 0...10 V DC or 4...20 mA. Optional a relay SPTD.

### Technical specifications

Measurement range VOC	02000 ppm	
Tolerance	±2% FS	
Measurement range °C (optional)	see configuration	
Accuracy °C	±0,3°C (560°C) + 2,5% FS	
Measurement range RH (optional)	0100% RH	
Accuracy RH	±2% RH (2080%RH) + 2% FS	
Power supply	1234 V AC/DC (2034 V AC/DC with relay)	_
Calibration (corresponds)	Good air approx 1 Vdc 4 mA = 250 ppm CO <sub>2</sub> equivale	nt
	5 Vdc … 12 mA = 1175 ppm CO <sub>2</sub> equivalent	
	10 Vdc 20 mA = 2000 ppm CO <sub>2</sub> equivalent	
Power consumption	40100 mA	
Sensor setting up time	60 min	
Working resistance at 010 V DC	10100 kOhm	
Working resistance at 420 mA	50500 Ohm	
Relay	SPTD potential free. Changing at 800 ppm	
Relay contact	Max 24 V, 1 A	
Electrical connection	Screw terminal for cables 1,5 mm <sup>2</sup>	
Housing	ABS (plastic) colour white RAL9010	
Weight	approx. 70 g	
Protection type	IP30	
Working range RH	098% RH in contaminant-free, non-condensing air	
Working temperature	0+50°C	
Standards	CE conformity, RoHS	

Models	Temperature	Humidity	Output
SAVV	-	-	010 V DC
SAVTV	•	-	010 V DC
SAVTHV	•	•	010 V DC
SAVC	-	-	420 mA
SAVTC	•	-	420 mA
SAVHC	-	•	420 mA

Optional: suffix "R" relay version

### Electrical wirings



	Outpu	t 010 Vdo	;		Outpu	t 420 mA	
PIN	VOC	VOC/T	VOC/T/H	PIN	VOC	VOC/T	VOC/H
1	VOC	temp	temp	1	-	-	-
2	-	VOC	humidity	2	-	-	-
3	-	-	VOC	3	VOC	temp	humidity
4	-	-	-	4	-	VOC	VOC
7				+			
8				GND			
9			R	lelay NC	2		
10			Re	elay CO	М		
11			R	elay NC	)		
12			(pas	sive sen	isor)		
13			(pas	sive sen	isor)		
S3			ро	plarity R	3		



SAV



### Dip-switch setting

	Range	1	2		Range	3	4	5	6	7	8
	0+50°C	OFF	OFF		Relative humidity						
	0+100°C	ON	OFF		0100%	OFF	OFF	OFF	OFF	-	-
	-20+80°C	OFF	ON		Absolute humidity						
ы	-30+70°C	ON	ON	_	0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF	-	-
ectio	selection		tion	0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF	-	-	
sel			elec	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF	-	-	
nge				je s	Mix ratio						
e rai				้ลกดู	0 g/kg30g/kg	OFF	OFF	OFF	ON	-	-
atur				lity I	0 g/kg50g/kg	OFF	OFF	ON	ON	-	-
pera				mid	0 g/kg80g/kg	OFF	ON	ON	ON	-	-
eml				문	Dew point						
F					0+50°C	OFF	ON	ON	OFF	-	-
					-50+100°C	ON	OFF	OFF	ON	-	-
					-20+80°C	OFF	ON	OFF	ON	-	-
					Enthalpy						
					0 kj/kg85kj/kg	ON	ON	ON	ON	-	-

WARNING: At the sensor is needed warming up at powering, therefore it takes about 60 minutes before having a signal. In this phase, the sensor must be placed in the fresh air to take it as a reference. If you remove the power supply voltage it is necessary to wait 60 minutes. Generally the sensor should be placed into fresh air at least once a day. This procedure prevents a long-term drift.

### Measuring behaviour



### Dimensions (mm)





### Description

The SACV CO<sub>2</sub> and VOC sensor measures the presence of carbon dioxide and mixed gases in the room in the range between 0...2000 or 0...5000 ppm. The measurement of CO<sub>2</sub> concentration happens through a NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product can be provided with humidity or humidity/temperature sensor. Output 0 ... 10 V DC or 4 ... 20 mA outputs.

### Technical specifications

Measurement range	02000 / 05000 ppm
Accuracy CO <sub>2</sub>	±60 ppm (02000 ppm) ±2% FS
	±150 ppm (05000 ppm) ±2% FS
Accuracy temperature	± 0,3K (560°C) + 1% FS
Accuracy humidity	25°C ± 2% RH (2080%RH) + 2% FS
Power supply	1234 V AC/DC (2034 V AC/DC with relay)
Power consumption	40100 mA
Sensor setting up time	60 min.
Working resistance at 010 V DC	10100 kOhm
Working resistance at 420 mA	50500 Ohm
CO2 sensitive element	NDIR self adjusting
Sensible element	Self-calibrating NDIR
Electrical connection	Screw terminal for cables 1,5 mm <sup>2</sup>
Housing	ABS RAL9010
Weight	са. 70 g
Protection type	IP 30
Working range RH	098% RH in contaminant-free, non-condensing air
Working temperature °C	0+50°C
Standards	CE, RoHs compliance



Model	Temperature	Humidity	Output
SACVV	-	-	010 V DC
SACVxV	Passive sensor (*)	-	010 V DC
SACVTV	•	-	010 V DC
SACVTHV	•	•	010 V DC
SACVC	-	-	420 mA
SACVxC	Passive sensor (*)	-	420 mA
SACVTC	•	-	420 mA
SACVHC	-	•	420 mA

Optional: suffix "D" version with display and/or suffix "R" relay version

 $^{(\star)}$  Replace " $\boldsymbol{x}$  " with the number of selected passive sensor:

" <b>x</b> "	Type of passive sensor
1	Pt100 (DIN EN 60751 CI. B)
3	Ni1000 (TK6180)
5	NTC20k (±1%)
6	NTC10k (±1%) BETA 3435K



SACV

### SACV

### Electrical wirings



	Out	Out	put 420 mA					
PIN	VOC/CO <sub>2</sub>	VOC/CO <sub>2</sub> /T	VOC/CO <sub>2</sub> /T/H	PIN	VOC/CO <sub>2</sub>			
1	(VOC)	temp	temp	1				
2	ppm	(VOC)	humidity	2				
3	-	ppm	(VOC)	3	(VOC)			
4	-	-	ppm	4	ppm			
5	(passive poti)							
6	(passive poti)							
7	V+							
8	GND							
9			(relay NC)					
10			(relay C)					
11			(relay NO)					
12		(p	assive sensor)					
13		(p	assive sensor)					
S3			polarity R3					
S2		CO <sub>2</sub> Manua	I adjustment to 4	l00 ppm				

### Dip-switch setting

	Range	1	2		Range	3	4	5	6		Range	7	8
	-30+70°C	OFF	OFF		Relative humidity						CO <sub>2</sub>		
	-20+80°C	OFF	ON		0100%	OFF	OFF	OFF	OFF	ng	02000 ppm	OFF	OFF
	0+50°C	ON	OFF		Absolute humidity					setti	05000 ppm	ON	OFF
ы	0+100°C	ON	ON	_	0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF	u / 8	010000 ppm	OFF	ON
ecti				tior	0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF	ctio			
sel				elec	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF	selec			
nge				je si	Mix ratio					ge s			
e rai				ang	0 g/kg30g/kg	OFF	OFF	OFF	ON	ranç			
ature				lity r	0 g/kg50g/kg	OFF	OFF	ON	ON	°0			
oera				mid	0 g/kg80g/kg	OFF	ON	ON	ON	0			
emi				문	Dew point								
F					0+50°C	OFF	ON	ON	OFF				
					-50+100°C	ON	OFF	OFF	ON				
					-20+80°C	OFF	ON	OFF	ON				
					Enthalpy								
					0 kj/kg85kj/kg	ON	ON	ON	ON				

Autocalibration CO<sub>2</sub> sensor: The sensor must be mounted with the ventilation slots against the flow direction. The screw connector shall be installed in the direction of the ventilation slots. The sensor shall be exposed to fresh air at least once a day, otherwise it will give incorrect readings on long term. The sensor requires 15 days of calibration to be adapted to the real values.



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### Description

The SDC CO2 sensor measures air quality through the presence of carbon dioxide in air ducts in the range between 0...2000 ppm / 0...5000 ppm. The measurement of CO2 concentration happens through a NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product can be provided with humidity or humidity/temperature sensor. Output 0 ... 10 Vdc or 4 ... 20 mA outputs.

### Technical specifications

Measurement range CO2
Accuracy CO2

Accuracy temperature Accuracy humidity Power supply Power consumption Sensor setting up time Working resistance at 0...10 V DC Working resistance at 4...20 mA CO2 sensitive element Sensible element Electrical connection Cable gland **Protection type** Housing Working range RH Working temperature °C Installation Standards

0...2000 / 0...5000 ppm ±60 ppm (0...2000 ppm) ±2% FS ±150 ppm (0...5000 ppm) ±2% FS ± 0,3K (5...60°C) + 1% FS 25°C ± 2% RH (20...80%RH) + 2% FS 12...34 V AC/DC (20...34 V AC/DC with relay) 40...100 mA 60 min. 10...100 kOhm 50...500 Ohm NDIR self adjusting Self-calibrating NDIR Screw terminal for cables 1,5 mm<sup>2</sup> M16 x 1.5 for cables ø 4 ... 10 mm IP65 PA6 0 ... 98% RH in clean, non-condensed air 0 ... + 50 ° C PVC mounting flange (included) CE, RoHs compliance



SDC

Models	Temperature	Humidity	Output
SDCV	-	-	010 V DC
SDCT(x)V*	•	-	010 V DC
SDCTH(x)V*	•	•	010 V DC
SDCC	-	-	420 mA
SDCTC	•	-	420 mA
SDCHC	-	•	420 mA

Optional: suffix "D" version with display and/or suffix "R" relay version

(\*) Replace "X" with the number of selected passive sensor:

"X"	Type of passive sensor
1	Pt100 (DIN EN 60751 CI. B)
3	Ni1000 (TK6180)
5	NTC20k (±1%)
6	NTC10k (±1%) BETA 3435K

The sensor must comply with the ventilation slots against the flow direction the measured medium are attached. An external indication of the location of ventilation slits offers inappropriate gland, which always towards the vents shows.

Generally the sensor should be supplied at least once per day with fresh air, as he regularly calibrates itself to this. This procedure prevents a long-term drift whereby the sensor is very stable.

The sensor requires 15 days of calibration time, during which time it adapts to the real values.



### **SDC**

### Electrical wirings



	Outpu	t 010 Vdo	;	Output 420 mA					
PIN	CO <sub>2</sub>	CO <sub>2</sub> /T	CO <sub>2</sub> /T/H	PIN	CO <sub>2</sub>	CO <sub>2</sub> /T	CO <sub>2</sub> /H		
1	ppm	temp	temp	1	-	-	-		
2	-	ppm	humidity	2	-	-	-		
3	-	-	ppm	3	ppm	temp	humidity		
4	-	-	-	4		ppm	ppm		
7				V+					
8				GND					
12	passive sensor								
13	passive sensor								
S2		С	O, Manual a	djustme	nt to 400 pp	m			

### Dip-switch setting

	Range	1	2		Range	3	4	5	6		Range	7	8
ection	-30+70°C	OFF	OFF		Relative humidity						CO <sub>2</sub> ranges		
	-20+80°C	ON	OFF		0100%	OFF	OFF	OFF	OFF		02000 ppm	OFF	
	0+50°C	ON	ON		Absolute humidity						05000 ppm	ON	
	0+100°C	OFF	ON	_	0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF	ings	Auto-calibration		
				tion	0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF	sett	Not activated		ON
sel			le selec	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF	nge	Activated		OFF	
nge				Mix ratio					) <sub>2</sub> ra				
e rai				ity rang	0 g/kg30g/kg	OFF	OFF	OFF	ON	8			
ature					0 g/kg50g/kg	OFF	OFF	ON	ON				
oera				mid	0 g/kg80g/kg	OFF	ON	ON	ON				
emi				문	Dew point								
F					0+50°C	OFF	ON	ON	OFF				
					-50+100°C	ON	OFF	OFF	ON				
					-20+80°C	OFF	ON	OFF	ON				
					Enthalpy								
					0 kj/kg85kj/kg	ON	ON	ON	ON				

The automatic self-calibration (ASC) algorithm independently generates a reference value by analyzing the measured  $CO_2$  concentration over a certain period of time (approx. 7 days). This reference value is used to update the calibration curve. For correct use, it is necessary that the  $CO_2$  sensor is regulary exposed to fresh air = 400 ppm at least 1 time per day for at least 30 minutes. The  $CO_2$  sensor must be operated in continuous measurement mode during (ASC), switching it off will delay (ASC). To exclude gross calibration errors, the reference value is only accepted when the values are found to be plausible by the internal plausibility check of the sensor.

### Dimensions (mm) and installation





### SDCM

### Description

The SDCM  $CO_2$  sensor measures air quality through the presence of carbon dioxide in air ducts in the range between 0 and 2000 ppm. The measurement of  $CO_2$  concentration happens through a NDIR sensor that operates on an infrared basis and which compensates the presence of any impurity. The product is provided with ModBus 485 output.

### Technical specifications

Measurement range CO <sub>2</sub>	02000 ppm
Accuracy CO <sub>2</sub>	< ± 60 ppm +2% FS (at 25°C and 1013 mbar)
Accuracy temperature (*)	±0,3°C (560°C) + 1% FS
Accuracy humidity (*)	±2% RH (2080%RH) + 2% FS
Power supply	1224 V AC/DC
Consumption	max. 9 mA
Sensible element	NDIR self adjusting
Output	ModBus RS485 (ASCII/RTU)
Electrical connection	Screw terminal for cables 1,5 mm <sup>2</sup>
Protection type	IP65
Working range RH	1095% RH in contaminant-free, non-condensing air
Working temperature °C	-20+50°C
Storage temperature	-20+50°C
Installation	Mounting flange (included)
Standards	CE conformity, RoHS

Model	Temperature	Humidity
SDCM	-	-
SDCTM	•	-
SDCTHM	•	•

### **Measurement source**

Unit	ModBus source	Gain
ppm CO <sub>2</sub>	10	10
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m <sup>3</sup>	22	10
Dewpoint °C	23	10
Enthalpy J	24	10



### Electrical wirings



### **SDCM**

### DIP-switch 2

### 





### Dimensions (mm)



### Installation



<sup>196</sup>9 tec°



### Air quality duct sensor

### Description

The SDV sensor measures air quality in air ducts in the range between 0...2000 ppm. The product can be provided with humidity or humidity/temperature sensor. Output 0 ... 10 V DC or 4 ... 20 mA outputs.

### Technical specifications

Measurement range VOC Measurement range °C (optional) Accuracy temperature (*) Measurement range RH (optional) Accuracy humidity (*) Power supply Power consumption Working resistance at 010 V DC Working resistance at 420 mA Calibration (corresponds)	02000 ppm see configuration $\pm 0,3^{\circ}C$ (560°C) + 1% FS see configuration $\pm 2\%$ RH (2080%RH) + 2% FS 1234 V AC/DC (2034 V AC/DC with relay) 40100 mA 10100 kOhm 50500 Ohm Good air approx 1 Vdc 4 mA = 250 ppm CO <sub>2</sub> equivalent 5 Vdc 12 mA = 1175 ppm CO <sub>2</sub> equivalent 10 Vdc 20 mA = 2000 ppm CO <sub>2</sub> equivalent
Electrical connection Protection type Working range RH Working temperature °C Installation Standards	Screw terminal for cables 1,5 mm <sup>2</sup> IP65 098% RH in contaminant-free, non-condensing air 0+50°C Mounting flange (included) CE conformity, RoHS
Standards	CE conformity, RoHS

Models	Temperature	Humidity	Output
SDVV	-	-	010 V DC
SDVTV	•	-	010 V DC
SDVTHV	•	•	010 V DC
SDVC	-	-	420 mA
SDVTC	•	-	420 mA
SDVHC	-	•	420 mA

Optional: suffix "R" relay version

### Electrical wirings



	Output	t 010 Vdo	;		Outpu	t 420 mA			
PIN	VOC	VOC/T	VOC/T/H	PIN	VOC	VOC/T	VOC/H		
1	ppm	temp	temp	1	-	-	-		
2	(VOC)	ppm	humidity	2	-	-	-		
3	-	(VOC)	ppm	3	ppm	temp	humidity		
4	-	-	(VOC)	4	(VOC)	ppm	ppm		
5			passive	e potentio	ometer				
6			passive	e potentio	ometer				
7				V+					
8				GND					
9				relay NC					
10	relay C								
11	relay NO								
12	passive sensor								
13			pas	sive sen	sor				
R1	temp. adjustment								



**SDV** 

### Dip-switch setting

	Range	1	2		Range	3	4	5	6	7	8
	-30+70°C	OFF	OFF		Relative humidity						
	-20+80°C	ON	OFF		0100%	OFF	OFF	OFF	OFF	-	-
	0+100°C	OFF	ON		Absolute humidity						
u	0+50°C	ON	ON	_	0 g/m <sup>3</sup> 30g/m <sup>3</sup>	ON	OFF	OFF	OFF	-	-
ecti				tior	0 g/m <sup>3</sup> 50g/m <sup>3</sup>	ON	ON	OFF	OFF	-	-
sel				elec	0 g/m <sup>3</sup> 80g/m <sup>3</sup>	ON	ON	ON	OFF	-	-
nge				je s	Mix ratio						
e rai				้ลทด	0 g/kg30g/kg	OFF	OFF	OFF	ON	-	-
ature				ity r	0 g/kg50g/kg	OFF	OFF	ON	ON	-	-
pera				mid	0 g/kg80g/kg	OFF	ON	ON	ON	-	-
emi				면	Dew point						
-					0+50°C	OFF	ON	ON	OFF	-	-
					-50+100°C	ON	OFF	OFF	ON	-	-
					-20+80°C	OFF	ON	OFF	ON	-	-
					Enthalpy						
					0 kj/kg85kj/kg	ON	ON	ON	ON	-	-

Through the necessary heating-up phase it will take about 60 minutes until the sensor emits a signal. In this phase, the sensor should be exposed to the fresh air, since it takes this as a reference. If you take away the supply voltage short he needed again for 60 minutes. Generally the sensor should at least once per day to be supplied with fresh air, as he regularly calibrates itself to this. This procedure prevents a long-term drift whereby the sensor is very stable.

### Measuring behaviour



### Dimensions (mm) and installation







### Air quality duct sensor with ModBus output

### Description

The SDVM sensor measures air quality in air ducts in the range between 450...2000 ppm. The product can be provided with humidity or humidity/temperature sensor. ModBus 485 output.

### Technical specifications

Measurement range VOC Accuracy temperature Accuracy humidity **Power supply Power consumption Electrical connection Protection type** Working range RH Working temperature °C Installation Standards

450...2000 ppm ±0,3°C (5...60°C) + 1% FS ±2% RH (20...80%RH) + 2% FS 12...34 V AC/DC 40...100 mA Screw terminal for cables 1,5 mm<sup>2</sup> IP65 0...98% RH in contaminant-free, non-condensing a 0...+50°C Mounting flange (included) CE conformity, RoHS

Models	Temperature	Humidity
SDVM	-	-
SDVTM	•	-
SDVTHM	•	•

### **Measurement source**

Unit	ModBus source	Gain
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m <sup>3</sup>	22	10
Dewpoint °C	23	10
Enthalpy J	24	10
ppm VOC	30	10

#### Wiring PIN SHD 1 2 В 3 А 4 **₽** 5 GND AC/DC-AC/DC+ Ø A PT1000 в Ď Ì ADRESSE SHD PT1000 .....

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**DIP-Switch S2** 

Electrical wirings



3

2

1

	Setting	1	2	3	4	5	6	7	8
	Baudrate								
	9600	OFF	OFF						
	19200	OFF	ON						
	38400	ON	OFF						
	57600	ON	ON						
								Termi	nation
Ξ	nessuna								OFF
tc	120 Ω								ON
Ň		_	_	_	Parity		_	_	_
0) L	Even				OFF	OFF			
B	Odd				OFF	ON			
	No parità				ON	OFF			
	No parità				ON	ON			
					_	_	Modal	ity	
	RTU						OFF		
	ASCII						ON		
								Bit stop	
	1							OFF	
	2							ON	

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### **SDVM**

### DIP-switch 2

### 





### Dimensions (mm)



### Installation



### Relative pressure transmitter

### Description

The relative pressure transmitter PTD series with ceramic measuring cell is used to measure relative pressures of non-aggressive media.

Possible fields of application are building automation, industrial, pneumatic and hydraulic sectors. The standard series covers various measurement ranges (see schedule) with linear output signals 4 ... 20 mA or 0 ... 10 V DC. The resistant stainless steel case is available with two connectors and has an IP65 protection class.

### Technical specifications

Power supply	Output 420 mA: 24 V DC / Ourtput 010 V 24 V AC/E
Output signal	0 10 V DC or 4 20 mA
Berst pressure	x 2,5 FS
Linearity	≤ 1% of FS
Hysteresis	≤ 0,5% of FS
Working temperature	0 85°C
Thread	G 1/2", G 1/4"
Electrical connection	Connector DIN EN 175301-803-A
Housing	Stainless steel Aisi 303
Protection class EN 60529	IP65
Standards	CE, 2011/65/EU (RoHS II)



PTD

#### Code matrix

Configurable pressure range	0 0,16 MPa	(0… 1,6 bar)	PTD	01		
	0 0,25 MPa	(0… 2,5 bar)		02		
	0 0,4 MPa	(0 4 bar)		03		
	0 0,6 MPa	(0 6 bar)		04		
	0 1 MPa	(0 10 bar)		05		
	0 1,6 MPa	(0… 16 bar)		06		
	0 2,5 MPa	(0… 25 bar)		07		
	0 4 MPa	(0… 40 bar)		08		
	0 6 MPa	(0… 60 bar)		09		
	-0,1 0 MPa	(-1 0 bar)		10		
	-0,1 0,06 MPa	(-1 0,6 bar)		11		
	-0,1 0,15 MPa	(-1 1,5 bar)		12		
	-0,1 0,3 MPa	(-1 3 bar)		13		
	-0,1 0,5 MPa	(-1 5 bar)		14		
	-0,1 0,9 MPa	(-1 9 bar)		15		
	-0,1 1,5 MPa	(-1 15 bar)		16		
	-00,1 MPa	(-01 bar)		17		
Thread	G1/4"				1	
	G1/2"				2	
Output signal	010 V DC, 3 wire, line	ear				V
	420 mA, 2 wire, linear	r				С



# PTD

### Electrical wirings

DIN EN 175301-803-A



0	utput 420 mA	Output 010 V			
Pin	Connection	Pin	Connection		
1	+IN	1	+IN		
2	OUT	2	GND		
3		3	+OUT		
4		4			

### Dimensions (mm)





### Differential pressure transmitter



### Description

The differential pressure transmitters of the PTR series are used to measure differential pressure, overpressure and vacuum. They provide one adjustable pressure range and one output signal.

Monitoring of gaseous, non-aggressive media. Possible usage areas are: Building automation, air conditioning systems and clean room monitoring, valve and flap control, filter, ventilator and blower monitoring, control of air flows.

### Technical data

Supply voltage	18 30 V AC/DC (only DC for 2-wire version)
Output signal	0 10 V or 4 20 mA
Load for 4 20mA output	20 500 Ohm
Max. current draw	< 40 mA (<21 mA for 2-wire version)
Pressure medium	Air and non-aggressive gases
Linearity and hysteresis error	≤ ± 1% of FS
Working temperature	-40 50°C
Storage temperature	-40 70°C
Typical long-term stability	$\leq$ ± 0,5 % of ± 2,5 % of FS/year, depending on pressure range
Repetition accuracy	$\leq \pm 0.2$ % of FS
Position dependence	≤ ± 0,02 % of FS/g
Humidity	0 95 % RH, non-condensing
Response time, selectable	0,1 - 1,0s
Process connection	6 mm hose connection
Electrical connection	Spring terminals for wires and leads up to 1,5 mm <sup>2</sup>
Mounting	Screw mounting with serrated screws
Housing material	ABS
Housing dimensions	ca. Ø 66 x 28 mm
Weight	50 g
Cable conduit for protection cap	M12x1,5 threaded connection, made of polyamide
Protection class EN 60529	IP54
Conformity	EN 60770, EN 61326, 2011/65/EU (RoHS II)
Optional	UL, conforms to UL Std. 61010-1, conforms to CSA Std. C22.2 No. 61010-1

Model	Range		Overload capacity	Bursting pressure	Temperature error
PTR2	0 100 Pa	(0 1,0 mbar)	60 kPa	100 kPa	$\leq$ ± 2,5 % of full range
PTR3	0 250 Pa	(0… 2,5 mbar)	60 kPa	100 kPa	$\leq$ ± 2,5 % of full range
PTR4	0 500 Pa	(0… 5,0 mbar)	60 kPa	100 kPa	$\leq$ ± 2,5 % of full range
PTR5	0 1000 Pa	(0 10 mbar)	75 kPa	125 kPa	$\leq$ ± 1,0 % of full range
PTRM	0 1,6 kPa	(0 16 mbar)	85 kPa	135 kPa	$\leq$ ± 1,0 % of full range
PTR6	0 2,5 kPa	(0 25 mbar)	85 kPa	135 kPa	$\leq$ ± 1,0 % of full range
PTR7	0 5 kPa	(0 50 mbar)	85 kPa	135 kPa	$\leq$ ± 1,0 % of full range
PTR8	0 10 kPa	(0 100 mbar)	85 kPa	135 kPa	$\leq$ ± 1,0 % of full range
PTR9	0 25 kPa	(0 250 mbar)	135 kPa	275 kPa	$\leq$ ± 1,0 % of full range
PTRA	0 50 kPa	(0 500 mbar)	200 kPa	400 kPa	$\leq$ ± 1,0 % of full range
PTRB	0 100 kPa	(0 1,0 bar)	200 kPa	400 kPa	$\leq$ ± 1,0 % of full range
PTRF	0 250 kPa	(0 2,5 bar)	400 kPa	800 kPa	$\leq$ ± 1,0 % of full range





**Adjustable pressure range:** The end of the pressure range can be reduced to 50% of its factory set full scale value simply by the use of a push-button.

**Output signal:** 0 ... 10 V or 4 ... 20 mA. Other signals on request.

**Configurable response time:** The response time of the output signal can be configured using a jumper. If the jumper is in place the response time is slow (factory setting), which is useful for suppressing brief pressure peaks. If the application requires a fast response time the jumper must be removed.

Easy offset calibration: The output signal can be calibrated to zero by pressing the push-button (pressure transmitter must be depressurised).

Volume flow measurement (optional): The shape of the output signal can be switched from linear to square root using a jumper in order to measure the volume flow via a differential pressure.

Reset: The transmitter can be reset to its factory setting, just by pressing the push-button for 10sec.

Measuring method: Piezoresistive pressure transducer

**Mounting position:** Can be mounted in any position. The self-compensating piezoresistive pressure transducer eliminates any possible mounting error.

### Order matrix

Configurable pressure	0 100 Pa	(0… 1,0 mbar)	PTR	2	
ranges	0 250 Pa	(0… 2,5 mbar)		3	
	0 500 Pa	(0… 5,0 mbar)		4	
	0 1000 Pa	(0… 10 mbar)		5	
	0 1,6 kPa	(0 16 mbar)		м	
	0 2,5 kPa	(0… 25 mbar)		6	
	0 5 kPa	(0… 50 mbar)		7	
	0 10 kPa	(0… 100 mbar)		8	
	0 25 kPa	(0… 250 mbar)		9	
	0 50 kPa	(0… 500 mbar)		Α	
	0 100 kPa	(0… 1,0 bar)		в	
	0 250 kPa	(0… 2,5 bar)		F	
Output signal	010 V, 3-wire, line	ar			7
	420 mA, 3-wire, linear				
	010 V, 3-wire, square rooted				
	420 mA, 3-wire, square rooted				
	420 mA, 2-wire, linear				
	420 mA, 2-wire, se	quare rooted			U
Optional	Suffix UL for models	s UL / CSA approval			

### **Electrical wiring**









### Description

Single and dual differential pressure transmitters of the PTS series are used to measure differential pressure, overpressure and vacuum. They provide eight adjustable pressure ranges, two output signals, Modbus and calibrated and temperature compensated measurements. Monitoring of gaseous, non-aggressive media. Possible usage areas are: Building automation, air conditioning systems and clean room monitoring, valve and flap control, filter, ventilator and blower monitoring, control of air flows.

### Technical data

Supply voltage	24 VAC or 1535 VDC
Power consumption	< 1,5 W
Output signal	010 VDC, 210 VDC, 05 VDC, 15 VDC, 420 mA
Current output	420 mA, maximum 500 Ohm
Voltage output	010 VDC or 05 VDC, minimum 1000 Ohm
Relay output	Max. rating 1A at 230 VAC
Sensing element	Piezoresistive silicon ceramic sensor
Pressure medium	Air and non-aggressive gases
Temperature compensation	-40 110°C
Accuracy	± 0,25% of FS
Working temperature	-25 70°C
Storage temperature	-30 85°C
Pressure connection	6 mm hose connection
Electrical connection	Spring terminals for wires and leads up to 1,5 mm <sup>2</sup>
Mounting	Screw mounting with serrated screws
Housing dimensions	151x85x50 mm
Weight	168205 g
Cable conduit for protection cap	M16
Protection class EN 60529	IP54
Standards	CE conformity, RoHS

### Order matrix

model	Range 1		Range 2 Ou		Output 1	Output 2		Option		
PTS	0	no	0	no	0	no	0	no	М	Modbus
	1	±250 Pa	1	±250 Pa	1	010 VDC	1	010 VDC	D	Display
	2	1.000 Pa	2	1.000 Pa	2	210 VDC	2	210 VDC	R	Relay*
	3	±1.000 Pa	3	±1.000 Pa	3	05 VDC	3	05 VDC		
	4	2.500 Pa	4	2.500 Pa	4	15 VDC	4	15 VDC		
	5	10.000 Pa	5	10.000 Pa	5	420 mA	5	420 mA		
	6	6.000 Pa	6	6.000 Pa						
	7	±6.000 Pa	7	±6.000 Pa						

\*It is recommandable to order the relay version with display option.

Each range has its own 8 sub-ranges that can be selected by DIP switch, see schedule hereafter.



PTS

# PTS

Ran	ge - Pa	sub-ranges - Pa
0	no	no
1	±250	-25+25, -50+50, -100+100, -250+250, 025, 050, 0100, 0250
2	1.000	0100, 0200, 0300, 0400, 0500, 0600, 0750, 01000
3	±1.000	-250+250, -500+500, -750+750, -1.000+1.000, 0250, 0500, 0750, 01.000
4	2.500	0100, 0250, 0500, 0750, 01.000, 01.500, 02.000, 02.500
5	10.000	01k, 02k, 03k, 04k, 05k, 06k, 07,5k, 010k
6	6.000	0500, 0750, 01.000, 02.000, 03.000, 04.000, 05.000, 06.000
7	±6.000	-1k+1k, -2k+2k, -3k+3k, -6k+6k, 01k, 02k, 03k, 06k

### DIP Switch

1. SW1, channel #1,2,3 selects port 1 sub-ranges

2. SW1, channel #4 selects reponse time

### Sub-ranges

DIP switch 1 and DIP switch 2 have the same subscales selectable from the table.

SW1/2	±250 Pa	1.000 Pa	±1.000 Pa	2.500 Pa	6.000 Pa	±6.000 Pa	10 KPa
	-2525	0100	-250250	0100	0500	-1.0001.000	01 KPa
	-5050	0200	-500500	0250	0750	-2.0002.000	02 KPa
	-100100	0300	-750750	0500	01.000	-3.0003.000	03 KPa
	-250250	0400	-1.0001.000	0750	02.000	-6.0006.000	04 KPa
	025	0500	0250	01.000	03.000	01.000	05 KPa
	050	0600	0500	01.500	04.000	02.000	06 KPa
	0100	0750	0750	02.000	05.000	03.000	07.5 KPa
	0250	01.000	01.000	02.500	06.000	06.000	010 KPa

### Response time

SW1	Response
	FAST / 1 sec.
	SLOW / 4 sec.

In both cases, FAST or SLOW, - output is mean of latest 10 measurements.

Output is updated:

- every 0.1 second in FAST mode - every 0.4 second in SLOW mode



### Transmitter hardware



### Electrical wiring



Relay contact rating is max. 1A at 230 VAC We kindly advise using 24V for avoiding high voltage harmonics and external power relay for bigger loads Please use shielded and twisted paired cables for Modbus connections



### Display

main screen

zeroing is OK

response time

Relay, LOW point

Relay, HIGH point

zeroing

### for Single DP version entering MENU counts down for 5 sec. counts down for 5 sec. keep pressing ZERO button keep pressing SET1 button entered to MENU min. point, scale for DP max. point, scale for DP FAST response, 1 sec. SLOW response, 4 sec.

Relay, ACTION .0 action 0, always OFF 0 action 1, ON between LOW and HIGH points action 2, OFF between LOW and HIGH points action 3, ON over HIGH action 4, ON under LOW EXIT modbus address

baudrate 9.600 19.200 38.400 57.600 

115.200

### bit settings

databits: 8, parity: even, stopbit: 1

databits: 8, parity: none, stopbit: 1

databits: 8, parity: none, stopbit: 2

databits: 8, parity: odd, stopbit: 1

### Menu

- 1. For entering MENU press SET1 button min. 5 sec.
- 2. ZERO button calls the next parameter
- 3. SET1 button increases the value or choses the next selection
- 4. SET2 button decreases the value or choses the previous selection
- 5. All parameters are listed below, due to options you may not see some of them
- 6. Any changed parameter or value is set while exiting Menu

Main Screen >> r1L >> r1H >> r1A >> EXIT

### Actions for Relay and Buzzer

Action	under LOW	between LOW - HIGH	over HIGH
0	Open	Open	Open
1	Open	Closed	Open
2	Closed	Open	Closed
3	Open	hysterisis	Closed
4	Closed	hysterisis	Open

### Modbus 485 protocol

Use Function 3 for Reading and Function 6 for Writing Holding Registers. Register Table starts from Base 1. Default Settings: Modbus ID:1, 9600, 8bit, None, 1.

Register	R/W	min.	max.	Description
1	R & W	1	254	Modbus Address
2	R & W	0	4	Baudrate, 0: 9.600, 1: 19.200
3	R & W	0	3	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R	min. Pa	max. Pa	DP measurement as PASCAL
5	R			Blank
6	R	0	1	Relay, contact position, 0: OFF/Open, 1: ON/Closed
7	R & W	min. Pa	max. Pa	Relay, LOW Point
8	R & W	min. Pa	max. Pa	Relay, HIGH Point
9	R & W	0	4	Relay, Actions
10-20	R & W			Blank

### Dimensions (mm)





PTS

### Air differential pressure transmitter IP65

### Description

The differential pressure transmitter serie PTG is used to measure differential pressure, overpressure and vacuum of gaseous, nonaggressive media. It provides 2 pressure ranges and 2 output signals, which are selectable by jumper.

PTG

Possible fields of application are building automation and air conditioning systems, overpressure measurement in clean rooms and laboratories, measurement of constant pressure in VAV applications, dynamic filter and ventilator monitoring.

### Technical specifications

Technical specifications	O management
Medium	Air, non-combustible and non-aggressive gases
Measurement range	See schedule
Linearity and hysteresis error	≤±1% of FS
Repetition accuracy	≤ ±0.2 % of FS
Response time	0,1 s or 1 s, selectable by jumper
Position dependence	≤ ±0,02% of FS/g
Long term stability	< ±0,5% final value/year
Offset calibration	The output signal can be calibrated to zero by pressing the M key.
Supply voltage	1830 V AC / DC
Output signal	3-wire connection, with switching output. The factory setting is 010 V DC, but can be changed to 4-20 mA by removing the jumper. 2-wire connection 420 mA version is available upon request.
Switching output	npn transistor output for max. 30 V DC/100 mA
Electrical connection	Screw terminal block for wires and strands up to 1,5 mm <sup>2</sup>
Display, optional	LED, 4 digits
Housing material	Housing with process connection P2 (-)
	Base part with process connection P1 (+)
Cable conduit	M16x1,5 connection made of polyamide
Housing dimensions	approx. 81x83x41 mm
Weight	approx. 125 g
Protection class	IP65
Working humidity	095% RH, non-condensing
Working temperature	0+50°C
Storage temperature	-10+70°C
Accessories	Connection set (PVC-hose 2 m Ø 6 with 2 ABS nippels and 4 screws) <b>included</b>
Installation	Screw fastening
Installation position	any
Standards	CE-conformity, RoHS
Optional	UL, conforms to UL Std. 61010-1, conforms to CSA Std. C22.2 No. 61010-1

Models	Measuring range	Max pressure
PTG1	-500+50 Pa	60 kPa
PTG2	0100 Pa, 0250 Pa	60 kPa
PTG3	0500 Pa, 01000 Pa	75 kPa
PTG4	01 kPa, 02,5 kPa	85 kPa
PTG5	05 kPa, 010 kPa	85 kPa
PTG6	025 kPa, 050 kPa	200 kPa
PTG9	-1000+100 Pa	60 kPa

Suffix A offset autocalibration Suffix D for models with display Suffix UL for models UL / CSA approval





### Electrical wirings

3-wire



### Settings

_						Jumper (switched)	Aperto (open)
	0	0	RANGE low high	$\langle \longrightarrow$	Range pressione (Pressure range)	Bassa (low)	Alta (high)
	0	0	RESPONSE slow   fast	$  \longrightarrow$	Risposta (Response)	Lenta (slow)	Veloce (fast)
31	0	0	MODE Press. Flow	$\longrightarrow$	Funzionamento (Mode)	Lineare (linear)	Quadratico (square root)
	0	0	OUTPUT V mA	$  \longrightarrow$	Segnale di uscita (Output signal)	010 V	420 mA
	X	3	close open				

### Dimensions (mm)





ABS nippel (part of connection set APA3)









### Programming version without display

In the version without display, you can program the switching value by acting in this way:

1 Apply the pressure or differential pressure at which you want the system switches

2 Press the "S" button for 5 seconds until the LED flashes quickly.

At this point the switching value is saved and the LED will light while reaching the set pressure.

For recalibration remove both pressure tube, press the button "MODE/Offset" for 5 seconds and than replace the pressure tube.

#### Programming display version

212



\* Free from pipes or remove the cap from the two nozzles before proceeding with the offset re-calibration.

Air differential pressure and air flow volume and speed transmitter, IP65 with ModBus

PTG / VTG

### Description

The air differential pressure transmitter serie PTG and the velocity transmitter serie VTG are used to measure differential pressure, air flow volume and air flow speed.

The measured value can be the output and the parameterization on the device can be done via Modbus RTU data interface. Possible fields of application are building automation and air conditioning systems, overpressure measurement in clean rooms and laboratories, measurement of constant pressure in VAV applications, dynamic filter and fan monitoring.

### Technical specifications

Medium	Air, non-combustible and non-aggressive gases
Measurement range	See schedule
Linearity and hysteresis error	≤ ±0,5% of FS, min ±1 Pa
Uncertainty (total error band w/o	±1 % of FS, min ±1 Pa
long-term and temperature effect)	
Response time	0,210 s
Long term stability PTGM, VTGM	< ±1% of FS
Long term stability PTGA, VTGA	n.r.
Supply voltage	1830 V AC / DC
Output signal	Digital
Protocol	ModBus RS-485, RTU
Type, Address	Slave, 1247
Baud rate	9600115200 bd
Data bit, Stop bit	8, 1
Maximum current draw	< 230 mA
Electrical connection	Screw terminal block for wires and strands up to 1,5 mm <sup>2</sup>
Display	LED, 4 digits
Housing material	ABS
Housing dimensions	Approx. 81x83x41 mm
Weight	Approx. 140 g
Protection class	IP65
Working humidity	095% RH, non-condensing
Working and storage temperature	
PTGM, VTGM	-20+70°C
PTGA, VTGA	-10+50°C
Accessories	Connection set (PVC-hose 2 m Ø 6 with 2 ABS nippels and 4 screws) <b>included</b>
Installation	Screw fastening
Installation position	Any
Standards	CE-conformity, RoHS

#### Setup

Configuration of air flow volume or air flow speed measurement

1. Select a calculation formula and enter a k-factor. Both dependents on the type of fan or measuring sensor.

2. Or create a reference air flow volume or air flow speed, which is entered directly.

The modbus is used to set the device. Please read the exact procedure in the installation manual.

#### Adjustable response time

The response time of the output signal can be variably set via Modbus.

#### Easy offset calibration

For PTGM and VTGM press the MODE/offset button or set via Modbus in an unpressurized state to adjust the offset to zero. The versions PTGA and VTGA perform an automated zero offset compensation.

### Display

A red LED display shows the pressure value, air flow volume or air flow speed.

#### Mounting position

Can be mounted in any position. The zero offset calibration eliminates any possible position error.



### PTG / VTG

### Models

### Pressure ranges for air differential pressure versions

Model	Pressure range	Overload capacity	Bursting pressure	Additional uncertain (% FS PTGM	ty with temperature /10K) PTGA
PTGAE	-250+25 Pa	60 kPa	100 kPa	-	± 0,7
PTGxX	-500+50 Pa	60 kPa	100 kPa	± 1,0	± 0,5
PTGxW	-1000+100 Pa	60 kPa	100 kPa	± 0,7	± 0,3
PTGA1	050 Pa	60 kPa	100 kPa	-	± 0,7
PTGx2	0100 Pa	60 kPa	100 kPa	± 0,7	± 0,5
PTGx3	0250 Pa	60 kPa	100 kPa	± 0,5	± 0,3
PTGx4	0500 Pa	75 kPa	125 kPa	± 0,3	n.r.
PTGx5	01000 Pa	75 kPa	135 kPa	± 0,3	n.r.
PTGx7	05000 Pa	85 kPa	135 kPa	± 0,3	n.r.
PTGx8	010 kPa	85 kPa	135 kPa	± 0,3	n.r.
PTGx9	025 kPa	200 kPa	400 kPa	± 0,3	n.r.
PTGxA	050 kPa	200 kPa	400 kPa	± 0,3	n.r.
PTGxB	0100 kPa	200 kPa	400 kPa	± 0,3	n.r.

### Order matrix

Offset calibration		manual	PTGM	
		automatic	PTGA	
Configurable pressure ranges	-250+25 Pa	only available as PTGA		Е
	-500+50 Pa			X
	-1000+100 Pa			w
	050 Pa	only available as PTGA		1
	0100 Pa			2
	0250 Pa			3
	0500 Pa			4
	01000 Pa			5
	05000 Pa			7
	010 kPa			8
	025 kPa			9
	050 kPa			Α
	0100 kPa			В

### Pressure ranges for air flow volume or air flow speed versions

Model	Pressure range	Overload capacity	Bursting pressure	Additional uncertain (% FS VTGM	ty with temperature /10K) VTGA
VTGA1	050 Pa	60 kPa	100 kPa	-	± 0,7
VTGx2	0100 Pa	60 kPa	100 kPa	± 1,0	± 0,5
VTGx3	0250 Pa	60 kPa	100 kPa	± 0,7	± 0,3
VTGx4	0500 Pa	75 kPa	125 kPa	± 0,5	n.r.
VTGx5	01000 Pa	75 kPa	135 kPa	± 0,3	n.r.
VTGx7	05000 Pa	85 kPa	135 kPa	± 0,3	n.r.
VTGx8	010 kPa	85 kPa	135 kPa	± 0,3	n.r.

### Order matrix

Offset calibration		manual automatic	VTGM VTGA		
Configurable pressure ranges	050 Pa	only available as VTGA		1	
	0100 Pa			2	
	0250 Pa			3	
	0500 Pa			4	
	01000 Pa			5	
	05000 Pa			7	
	010 kPa			8	
Unit of display	Air flow volume	m³/h; m³/s; cfm; l/s			Α
	Air flow speed	m/s; ft/min			в

<sup>214</sup>9 lec°



### Dimensions (mm)











### Terminal assignments

Pli tei 2 x	ug-i rmir x 5-j	n nals pole	<b>000000</b> <b>1</b> 2 3 4 5	<b>CCCCC</b> <b>CCCCC</b> 1 2 3 4 5
1	in	Supply voltage	(1830 VAC / VDC	)
2	in	Ground (GND) Common		
3	in	A / Data + (D0)		
4	in	B / Data - (D1)		
5 in Shield		Shield		
1	out	Supply voltage	(1830 VAC / VDC	)
2	out	Ground (GND) Common		
3	out	A / Data + (D0)		
4	out	B / Data - (D1)		
5	out	Shield		



### Air differential pressure transmitter

### Description

The differential pressure transmitter serie PTM is used to measure differential pressure, overpressure and vacuum of gaseous, nonaggressive media. It provides 2 pressure ranges and 2 output signals, which are selectable by jumper. Possible fields of application are building automation and air conditioning systems, overpressure measurement in clean rooms and laboratories, measurement of constant pressure in VAV applications, dynamic filter and ventilator monitoring.

ΡΤΜ

### Technical specifications



Models	Measuring range	Max pressure
PTM1	-500+50 Pa	20 kPa
PTM2	0100 Pa, 0250 Pa	20 kPa
PTM3	0500 Pa, 01000 Pa	20 kPa
PTM4	01 kPa, 02,5 kPa	40 kPa
PTM5	05 kPa, 010 kPa	60 kPa
PTM6	025 kPa, 050 kPa	300 kPa
PTM9	-1000+100 Pa	20 kPa

Suffix D for models with display


#### Electrical wirings

3-wires



Setting



	Jumper (switched)	Aperto (open)
Range pressione	Bassa	Alta
(Pressure range)	(low)	(high)
Risposta	Lenta	Veloce
(Response)	(slow)	(fast)
Funzionamento	Lineare	Quadratico
(Mode)	(linear)	(square root)
Segnale di uscita (Output signal)	010 V	



57.5 21.8 ◪ È 59



APA2 Snap-on plastic bracket, S-shaped

















#### Programming version without display

In the version without display, you can program the switching value by acting in this way: 1 Apply the pressure or differential pressure at which you want the system switches 2 Press the "S" button for 5 seconds until the LED flashes quickly. At this point the switching value is saved and the LED will light while reaching the set pressure.

#### Programming display version



\* Free from pipes or remove the cap from the two nozzles before proceeding with the offset re-calibration.





The transmitters of the PTV series are used to measure volume flow, differential pressure, overpressure and vacuum. A jumper enables switching between volume flow and pressure measurement. Monitoring of gaseous, non-combustible and non-aggressive media. Possible usage areas are: Building automation and air conditioning systems, overpressure measurement in clean rooms and laboratories, measurement of constant pressure in VAV applications, dynamic filter and ventilator monitoring

#### Technical specification

Power supply	18 30 VAC/DC	1
Output signal	0 10 V or 4 20 mA	Volume Flor
Load for 4 20 mA output	20500 Ω	1
Load for 0 10 V output	≥ 1k Ω (≥10mA)	Soft and a state
Units, selectable	m³/h; m³/s; cfm; l/s	Determined interested in the second s
K factor	0,0019,9 x 10⁵	Dates () Balance () In a rest rol approximation The present
Switching output	Transistor, maximum switching capacity of 30 VDC / 100 mA	and in Colonary
Working temperature	0 50°C	
Storage temperature	-10 70°C	
Typical long-term stability (Pressure range)	≤± 1,0 % from end value / year	
Linearity error incl. hysteresis and repetition accuracy (Pressure range)	≤±1 % del FS, min ±1 Pa	
Humidity	0 95 % RH, non-condensing	
2 response times, selectable between 0.1 s and 20 s	0,1 - 1,0s	
Process connection P1 and P2	Ø 6 mm	
Electrical connection	Plug-in terminals for wires and strands up to 1.5 mm <sup>2</sup> with Cap	nut
Housing material	ABS	
Housing dimensions	ca. 81 x 43 x 41 mm	
Weight	125 g	
Protection class acc. to EN 60529	IP 65	
Standards	EN 60770, EN 61326, 2014/30/EU, 2011/65/EU (RoHS II)	

Models	F	Range	Overload capacity	Bursting pressure	Temperature error
PTV1	0 50 Pa	(0… 0,5 mbar)	60 kPa	100 kPa	$\leq$ ± 3,0 % of full range
PTV2	0 100 Pa	(0… 1,0 mbar)	60 kPa	100 kPa	$\leq$ ± 2,0 % of full range
PTV3	0 250 Pa	(0… 2,5 mbar)	60 kPa	100 kPa	$\leq$ ± 2,5 % of full range
PTV4	0 500 Pa	(0… 5,0 mbar)	75 kPa	125 kPa	$\leq$ ± 2,5 % of full range
PTV5	0 1000 Pa	(0… 10 mbar)	85 kPa	135 kPa	$\leq$ ± 1,5 % of full range
PTV7	0 5 kPa	(0… 50 mbar)	85 kPa	135 kPa	$\leq$ ± 1,0 % of full range
PTV8	0 10 kPa	(0… 100 mbar)	85 kPa	135 kPa	$\leq$ ± 1,0 % of full range

#### Characteristics and settings

- Select a calculation formula and enter the k-factor. The k-factor can be found, for example, in documentation provided by the manufacturer of the ventilator or the probe.
- The output signal can be changed between 0...10 Volt and 4 ... 20 mA by removing a jumper.
- To give a switch signal at an user defined pressure level the transmitter has an adjustable transistor switching output (npn NO) with a maximum switching capacity of 30 Vdc/100 mA.
- The response time of the output signal can be configured using a jumper. If the jumper is in place the response time is slow (factory setting), which is useful for suppressing brief pressure peaks. If the application requires a fast response time the jumper must be removed.
- If there are any drifts on output, the transmitter can be adjusted by pressing the Offset-button to zero.
- The differential pressure transducer can be mounted in any position.







#### Order matrix

Configurable	0 50 Pa	(0 0,5 mbar)	PTV	1	
pressure range	0 100 Pa	(0 1,0 mbar)		2	
	0 250 Pa	(0 2,5 mbar)		3	
	0 500 Pa	(0 5,0 mbar)		4	
	0 1000 Pa	(0 10 mbar)		5	
	0 5 kPa	(0 50 mbar)		7	
	0 10 kPa	(0 100 mbar)		8	
Volume flow unit	m³/h; m³/s; cfm; l/s				Α

#### Formula configuration

- 1) Select a calculation formula and enter the k-factor (jumper 1 open): This procedure is used when the k-factor is known. The k-factor can be found, for example, in documentation provided by the manufacturer of the ventilator or the probe. Use the menu guide on the device for configuration.
- 2) Creating reference volume flow (jumper 1 plugged in): Create a reference volume flow to configure the device. Use FLD in the menu guide for entry - see description in the operating instructions.

Selection on device	Manufacturer, e.g.	Formula in data sheet of manufactuter
F 1	Ebm-Papst, Ziehl- Abegg	$q = k \cdot \sqrt{\Delta p}$
F 2	Ziehl-Abegg	$q = \sqrt{\frac{\rho_{20}}{\rho}} \cdot k \cdot \sqrt{\Delta p}$
F 3	Nicotra-Gebhardt, Rosenberg	$q = k \cdot \sqrt{\frac{2}{\rho} \cdot \Delta p}$
F 4	Fläkt Woods	$q = \frac{1}{k} \cdot \sqrt{\Delta p}$

### Diagramm



#### Terminal assignments

ate<u>c</u>











- 2 Output signal (0...10 V / 4...20 mA) 1 Supply voltage (18...30 VAC / VDC)



#### Jumper assignments



- 1. Rotary coding switch
- 2. Button MODE/Offset
- 3. Button SET/Switchp.
- 4. Plug-in terminals
- 5. Cap nut conduit
- 6. Jumper

#### Jumper assignments

The function settings of differential pressure transducer are achieved by inserting jumpers appropriately within the transducer.

Volume flow mode: Jun	nper 3 open	Function	Switched	Open 🗖 🗖
OO RANGE	<u>/</u>	Entry	ref. Volume flow	K-factor
OO RESPONSE slow   fast	]→	Responce time	Slow	Fast
100 MODE Press,   Flor	>	Operation mode		Volume flow
	<u> </u>	Output signal	010 V DC	420 mA
X3 close oper				

Volume flow mode: Jumper 3 plugged in	Function	Switched	Open 🗖 🗖
OO RANGE low   high	Setting	Zero- point	Analog end point
O O RESPONSE slou   fast	Responce time	Slow	Fast
	Operation mode	Pressure	Volume flow
X3 close open	Output signal	010 V DC	420 mA











The differential pressure transmitters serie PTQ is used to measure differential pressure, overpressure and vacuum of gaseous, nonaggressive media. It provides 8 pressure ranges and 2 output signals, which are easily selectable by jumper or rotary selector switch. Possible fields of application are building automation and air conditioning systems, overpressure measurement in clean rooms and laboratories, measurement of constant pressure in VAV applications, dynamic filter and ventilator monitoring.

**PTQ** 

	<b>Technical specifications</b>		
	Medium	Air, non-combustible and non-aggressive gases	Transition Tarantia
	Measurement range	-50…0…+50 Pa, -100…0…+100 Pa, -250…0…+250 Pa, -500…0…500 Pa, 0…100 Pa, 0…250 Pa, 0…500 Pa, 0…1000 Pa	
	Linearity and hysteresis error	$\leq \pm 1\%$ of FS	
	Repetition accuracy	≤ ±0.2 % of FS	. 18
	Response time	0.1 s or 1 s, selectable by jumper	
	Position dependence	$\leq \pm 0.02\%$ of FS/g	
	Long term stability	< ±0,5% final value/year	
	Offset calibration	It performs an automated zero offset compensation. No re-calib	paration needed.
	Max pressure	20 kPa	
	Supply voltage	1830 V AC / 1632 V DC	
	Output signal	3-wire connection, with switching output. The factory setting is 0 4-20 mA by removing the jumper.	0-10 V DC, but can be changed to
	Switching output	npn transistor output for max. 30 V DC/100 mA	
	Electrical connection	screw terminal block for wires and strands up to 1,5 mm <sup>2</sup>	
	Display, optional	LED, 4 digits	
	Housing	Housing with process connection P2 (-) Base part with process connection P1 (+)	
	Cable conduit	M16x1,5 connection made of polyamide	
	Dimensions	approx. Ø 85 x 58 mm	
	Weight	approx. 150 g	
	Protection type	IP54	
	Working humidity	095% RH, non-condensing	
	Working temperature	0+50°C	
	Storage temperature	-40+70°C	
	Accessories	Connection set (PVC-hose 2 m $\emptyset$ 6 with 2 ABS nippels ar plastic brackets optionally	nd 4 screws) included and snap-on
	Installation	Screw fastening	
	Installation position	any	
	Standards	CE-conformity, RoHS	
	Models	Measuring range	Version
	PTQ1	-500+50 Pa, -1000+100 Pa, -2500+250 Pa, -5000500 Pa, 0100 Pa, 0250 Pa, 0500 Pa, 01000 Pa	
	PTQ1D	-500+50 Pa, -1000+100 Pa, -2500+250 Pa, -5000500 Pa, 0100 Pa, 0250 Pa, 0500 Pa, 01000 Pa	with display
	Accessories:	<ul><li>APA1 Snap-on plastic bracket, L-shaped</li><li>APA2 Snap-on plastic bracket, S-shaped</li></ul>	
222	9 tec		

# PTQ

#### 

### Electrical wirings

3-wires



4	SA	Switching output, npn
3	GO	Ground G N D
2	Y	Output signal 0 10V / 4 20 mA
1	G	Supply voltage 24 VAC / VDC

### Setting



Selettore	Scala
Selector	Range
1	0100 Pa
2	0250 Pa
3	0500 Pa
4	01000 Pa
5	-500+50 Pa
6	-1000+100 Pa
7	-2500+250 Pa
8	-5000+500 Pa
0	Test output (0 V / 4 mA)
9	Test output (10 V / 20 mA)

		Jumper (switched)	Aperto (open)
	Range pressione (Pressure range)	Bassa (low)	Alta (high)
	Risposta (Response)	Lenta (slow)	Veloce (fast)
	Funzionamento (Mode)	Lineare (linear)	Quadratico (square root)
	Segnale di uscita (Output signal)	010 V	420 mA



APA1 Snap-on plastic bracket, L-shaped







APA2 Snap-on plastic bracket, S-shaped

ABS nippel (part of connection set APA3)









#### Programming version without display

In the version without display, you can program the switching value by acting in this way: 1 Apply the pressure or differential pressure at which you want the system switches 2 Press the "S" button for 5 seconds until the LED flashes quickly. At this point the switching value is saved and the LED will light while reaching the set pressure.

#### Programming display version



\* Free from pipes or remove the cap from the two nozzles before proceeding with the offset re-calibration.



# Airflow and velocity transducer

# Description

The airflow and velocity transmitter series FSE is design to control the air flow into air duct in HVAC systems and in VAV applications.

Technical specifications	
Measurement ranges	
Velocity	Range 2: 0400 FPM (02 m/s) Range 10: 02000 FPM (010 m/s) Range 20: 0 - 4000 FPM (020 m/s)
Temperature	050°C
Accuracy velocity	Range 2: 0400 FPM <20 FPM +5% from reading Range 10: 02000 FPM <100 FPM +5% from reading Range 20: 04000 FPM <200 FPM +5% from reading
Temperature	<0,55° C for v > 100 FPM
Accuracy specications include: ge	neral accuracy, temperature drift, linearity, hysteresis, long term stability, and repetition error.
Media compatibility	Dry air or non-aggressive gases
Measuring units	FPM and °F
Measuring element	temperature: NTC10K, velocity: Pt1000
Electrical	Input 24 VAC/DC ± 10%, current consumption 35 mA (50 mA with relay) + 40 mA with current output
Output signal 1	(Tout) 010 VDC (linear to temperature) 050°C L min 1K VDC Output = $32°F + (9 \text{ degrees } F * \text{ volts})$ 4 - 20 mA (linear to temperature) 050°C L max 400 mA Output = $32°F + [5.625 \text{ degrees } F * (mA - 4)]$
Output signal 2	(vout) 010 VDC (linear to FPM), L min 1K, 420mA (linear to FPM), L max 400
Relay out	3 screw terminal block 0,21,5 mm <sup>2</sup> , potential free SPDT, 250 VAC, 6A / 30 VDC, 6 A adjustable switching point and hysteresis
Display	3 1/2 Digit LCD display
Size	45,7 x 12,7 mm
Electrical connections	2 each
Power supply & Signal out	4 screw terminal block 16-24 AWG (0,21,5 mm <sup>2</sup> )
Relay Out	3 screw terminal block 16-24AWG (0.2 – 1.5 mm <sup>2</sup> )
Cable inlet	2 x M16
Working temperature	050°C
Storage temperature	-2070°C
Working humidity	0 to 95% RH, non condensing
Protection type	IP54
Dimensions housing	90 x 95 x 36 mm
Dimensions probe	Ø: 10 mm
Length	210 mm
Immersion length with flange	Adjustable 50180 mm
Mounting	2 screw holes, 4 mm
Materials	Case ABS (UL 94 V-0 approved), cover PC (UL 94 V-0 approved), pocket stainless steel
Standards	CE-conformity, RoHS, LVD, WEEE

Models	Display + relay
FSE1	•
FSE2	-



FSE

# FSE

#### 

#### Electrical connections



#### Installation

- 1) Mount the device in desired location, see Step 1.
- Open the lid and route cable through strain relief and connect the wires to terminal block, see Step 2. Use separate strain relief for each cable.
- 3) The device is now ready for conguration.
- WARNING! Apply power after the device is properly wired.

#### STEP 1 (mounting device)

- 1) Select mounting location (in a duct).
- 2) Use the mounting ange of the device as a template and mark the screw holes.
- 3) Mount the ange on the duct with screws (not included), Figure 1a.
- 4) Adjust the probe to desired depth. Ensuring the end of the probe reaches the middle of the duct, Figure 1b.
- 5) Tighten the screw on the ange, to hold the probe in position.

#### STEP 2 (Wiring diagrams)

For CE compliance, a properly grounded shielding cable is required.

1) Unscrew strain relief and route cable(s). Use the strain relief on left for power in and signal out (Tout/vout) and the strain relief on right for relay.

- 2) Connect the wires as shown in Figures 2a and 2b.
- 3) Tighten the strain relief.











Conguration requires:

1) Select the desired measurement mode, Step 3.

2) Select the desired measurement range, Step 4.

3) Congure the relay (optional), Steps 5 and 6.

Selection convention used to input configuration information into FSE Transducer

Entering conguration information into the FSE Air Velocity and Temperature transducer is accomplished with the Joystick, see Figure 5, the Display, and Jumpers installed and removed from the set of three (3) or four (4) jumper pins, see Figure 5.

Joystick Pressing down or tilting (Tilt Up/Down or SidetoSide) will cycle the display though the available menu choices. The Joystick will only cycle the choices up, if you accidently pass your preferred selection continue to activate the Joystick until your selection reappears.

Jumpers Jumpers are used in two (2) different ways:

- 1) Jumpers are installed, and remain installed, to select the required choice, see Steps 3 and 4.
- 2) Jumpers are installed, a choice is made, and the jumper is removed, see Steps 5 and 6.

STEP 3 (select measurement mode)

Congure the outputs:

1) Select the output mode, Current (4-20 mA) or Voltage (0-10V), by installing jumpers as shown in Figure 3b. Both outputs, Temperature (T) and Velocity (v), are congured separately.

#### STEP 4 (select measurement range)

Select the measurement range by installing jumpers as shown in Figure 4. Note: Figure 3, Jumper Installation.



## STEP 5 (configure relay) (jumper sw.p)

Note: display is required.

- 1) Install jumper to pins labeled sw.p. (Switching Point), see Figure 5.
- 2) Press down/tilt the push-button (joystick). The values (FPM) for the Switching Point (relay on/off) will cycle up. Continue until the required value (FPM) is shown on the display.
- 3) Remove and store jumper after conguration is completed.

#### STEP 6 (configure relay) (jumper hyst.)

- 1) Install jumper to pins labeled hyst. (hysteresis), see Figure 5.
- 2) Press down/tilt the push-button (joystick). The values (FPM) for the hysteresis of the relay switching point will cycle up to the maximum value. Continue until the required value (FPM) is shown on the display.
- 3) Remove and store jumper after conguration is completed.











#### About hysteresis

Hysteresis represents a dead-zone less than or equal to 20% of the Range Selected. The hysteresis is anchored at the Switching Point (sw p.), extending to the hysteresis range selected.



In above example Switch Point is set at 300 FPM, and hysteresis is set at 50 FPM. As the velocity increases over 300 FPM, the relay will open/close. As velocity reduces, the relay will not close/open until the velocity passes 250 FPM, thus preventing rapid cycling.

Ra	nge	Maximun	Hysteresis
m/s	FPM	m/s	FPM
02	0400	0,4	80
010	02.000	2	400
020	04.000	4	800

The Hysteresis Maximum setting is based on the Range Selected.







# cyanline

# sensors

The temperature sensor serie SC measures the temperature from -35 up to +105°C of gaseous and liquid media. The range is available with all type of current sensor elements. The stainless steel sleeve protects the sensor e.g. against mechanical impacts. It is sealed by the PVC cable against humidity and can be mounted in an immersion pocket, with a spring or bracket for pipe contact.

#### Technical specifications

Technical specifications	
Measurement range	-35+105°C
Sensor	Pt100, Pt1000, Ni1000, KTY, NTC
Type of connection	2-wires
Measured current	approx. 1 mA
Electrical connection	PVC cable from 2 m up to 5 m (2 x 0,25 mm <sup>2</sup> , max. +105°C) with core cable ends
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Protection sleeve	Stainless steel V4A
Sleeve dimension	Ø 6x50 mm
Protection type	IP67 (moisture sealed rolled)
Storage temperature	-20+70°C
Installation	screw-in pocket, mounting flange, compression fitting (not in scope of delivery)
Standards	CE conformity, RoHS

Models	Type of sensor	Cable length (L)
SC1-1	Pt100 (DIN EN 60751 CI. B)	1 m PVC (2x0,25 mm <sup>2</sup> )
SC1-2	Pt100 (DIN EN 60751 CI. B)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC1-5	Pt100 (DIN EN 60751 CI. B)	5 m PVC (2x0,25 mm <sup>2</sup> )
SC2-1	Pt1000 (DIN EN 60751 CI. B)	1 m PVC (2x0,25 mm <sup>2</sup> )
SC2-2	Pt1000 (DIN EN 60751 CI. B)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC2-5	Pt1000 (DIN EN 60751 CI. B)	5 m PVC (2x0,25 mm <sup>2</sup> )
SC3-2	Ni1000 (TK6180)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC3-5	Ni1000 (TK6180)	5 m PVC (2x0,25 mm <sup>2</sup> )
SC4-2	Ni1000 (TK5000)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC4-5	Ni1000 (TK5000)	5 m PVC (2x0,25 mm <sup>2</sup> )
SC5-2	NTC20k (±1%)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC5-5	NTC20k (±1%)	5 m PVC (2x0,25 mm <sup>2</sup> )
SC6-2	NTC10k (±1%) BETA 3435K	2 m PVC (2x0,25 mm <sup>2</sup> )
SC6-5	NTC10k (±1%) BETA 3435K	5 m PVC (2x0,25 mm <sup>2</sup> )
SC7-2	KTY 81-110 (±1%)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC7-5	KTY 81-110 (±1%)	5 m PVC (2x0,25 mm <sup>2</sup> )
SC8-2	KTY 81-121 (±1%)	2 m PVC (2x0,25 mm <sup>2</sup> )
SC8-5	KTY 81-121 (±1%)	5 m PVC (2x0,25 mm <sup>2</sup> )

Dimensions (mm)

**Iec** 

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SC

The temperature sensor serie SCT measures the temperature from -50 up to +100°C strap-on mounting on pipes and arched surfaces. The range is available with all type of current sensor elements.

#### Technical specifications

Measurement range Sensor Type of connection Measured current Electrical connection Leakage resistance Protection sleeve

Protection type Storage temperature Accessory Standards -50...+100°C Pt100, Pt1000, Ni1000, NTC 2-wires approx. 1 mA 2 m PVC cable (2 x 0,25 mm², max. +100°C) with core cable ends > 100 MOhm, at +20°C (500 V DC) Brass IP54 -20...+70°C Spring band (included) for pipes from 25 to 110 mm CE conformity, RoHS



Models	Type of sensor
SCT1-2	Pt100 (DIN EN 60751 CI. B)
SCT2-2	Pt1000 (DIN EN 60751 Cl. B)
SCT3-2	Ni1000 (TK6180)
SCT4-2	Ni1000 (TK5000)
SCT5-2	NTC20k (±1%)
SCT6-2	NTC10k (±1%) BETA 3435K

Dimensions (mm)







SCT



The temperature sensor serie SCK measures the temperature from -50 up to +100°C on pipes or round surfaces. The range is available with all type of current sensor elements.

### Technical specifications

-50+100°C
Pt100, Pt1000, Ni1000, NTC, KTY.
2 fili
approx. 1 mA
Screw terminal block for wires up to 1,5 mm <sup>2</sup>
PA6, RAL9010
M16 high-strength cable gland with strain relief
IP65
-20+70°C
Mounting flange (included)
CE conformity, RoHS



SCK

Models	Type of sensor
SCK1	Pt100 (DIN EN 60751 CI. B)
SCK2	Pt1000 (DIN EN 60751 CI. B)
SCK3	Ni1000 (TK6180)
SCK4	Ni1000 (TK5000)
SCK5	NTC20k (±1%)
SCK6	NTC10k (±1%) BETA 3435K
SCK7	KTY 81-110 (±1%)
SCK8	KTY 81-121 (±1%)

#### **Dimensions (mm)**









ta

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# Radiation temperature sensor

#### Description

The radiation sensor serie STR designed in a modern housing measures the temperature from -30 up to +75°C of gaseous media. The range is available with all type of current sensor elements and can be mounted directly on-wall with 2 fixing screws.

#### Technical specifications

Measurement range	-30+75°C
Sensor	Pt100, Pt1000, Ni1000, KTY, NTC
Type of connection	2-wires
Measured current	approx.1 mA
Electrical connection	Screw terminal block for wires up to 1,5 $\mbox{mm}^2$
Cable entry	M16 high-strength cable gland with strain relief
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Housing	polyamide (synthetic) colour white
Dimensions	58x64x53 mm
Protection type	IP65
Storage temperature	-20+70°C
Installation	Screw fastening
Standards	CE-conformity, RoHS



**STR** 

Models	Type of sensor
STR1	Pt100 (DIN EN 60751 CI. B)
STR2	Pt1000 (DIN EN 60751 CI. B)
STR3	Ni1000 (TK6180)
STR4	NTC1,8k (±1%)
STR5	NTC20k (±1%)
STR6	NTC10k (±1%) BETA 3435K
STR7	KTY 81-110 (±1%)
STR8	KTY 81-121 (±1%)



Dimensions (mm)



The temperature sensor serie SA designed in a modern housing measures the temperature from -30 up to +60°C of gaseous media. The range is available with all type of current sensor elements and can be mounted directly on-wall by an adapter or 2 fixing screws. The extra wide ventilation slots ensures a good air circulation for a high accuracy of measurement.

SA

#### Technical specifications

Measurement range	-30+60°C Pt100 Pt1000 Ni1000 KTY NTC	
Type of connection	2 wires	
Measured current	approx.1 mA	
Electrical connection	Screw terminal block for wires up to 1,5 mm <sup>2</sup>	
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)	
Housing	polyamide (synthetic) colour white	
Dimensions	87x87x30 mm	
Protection type	IP30	
Protection class	III	
Storage temperature	-20+70°C	
Installation	Screw fastening on-wall, on in-wall junction box with optional adapter frame (optional)	
Standards	CE-conformity, RoHS	

Models	Type of sensor
SA1	Pt100 (DIN EN 60751 CI. B)
SA2	Pt1000 (DIN EN 60751 CI. B)
SA3	Ni1000 (TK6180)
SA4	Ni1000 (TK5000)
SA5	NTC20k (±1%)
SA6	NTC10k (±1%) BETA 3435K
SA7	KTY 81-110 (±1%)
SA8	KTY 81-121 (±1%)

#### Electrical wirings









The temperature sensor serie SO measures the outdoor temperature from -50 up to 90°C by a sensor built-in a robust plastic housing and is humidity and temperature resistant. The range is available with all type of current sensor elements. The temperature sensor can be mounted in climate-sensitive areas e.g. on outside walls by avoiding a direct solar radiation.

#### Technical specifications

Measurement range	-50+90°C
Sensor	Pt100, Pt1000, Ni1000, KTY, NTC
Type of connection	2-wires
Measured current	approx. 1 mA
Electrical connection	Screw terminal block for wires up to 1,5 mm <sup>2</sup>
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Housing	Polyamide (synthetic) with snap closing screws, colour white like RAL 9010
Cable entry	M16 high-strength cable gland with strain relief
Dimensions	64x58x34,5 mm
Protection type	IP65
Storage temperature	-20+70°C
Installation	Screw fastening
Standards	CE conformity, RoHS



Models	Type of sensor
SO1	Pt100 (DIN EN 60751 CI. B)
SO2	Pt1000 (DIN EN 60751 CI. B)
SO3	Ni1000 (TK6180)
SO4	Ni1000 (TK5000)
SO5	NTC20k (±1%)
SO6	NTC10k (±1%) BETA 3435K
S07	KTY 81-110 (±1%)
SO8	KTY 81-121 (±1%)

## Electrical wirings



#### Dimensions (mm)





The temperature sensor serie SZ measures the temperature from -30 up to +90°C of gaseous and liquid media. The range is available with all type of current sensor elements. Pockets or flange are available and can be installed directly into tanks, pipes or air ducts and can be easily and quickly be replaced in case of maintenance.

SZ

#### Technical specifications

Measurement range	-30+150°C	
Sensor	Pt100, Pt1000, Ni1000, NTC	
Type of connection	2-wires	
Measured current	approx. 1 mA	
Electrical connection	Screw terminal block for wires up to 1,5 mm <sup>2</sup>	
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)	
Housing	Polyamide (synthetic) with snap closing screws, RAL 9010	
Cable entry	M16 high-strength cable gland with strain relief	
Installation length	from 100 to 400 mm	
Material	Protection tube: stainless steel V4A	
Protection type	IP65	
Storage temperature	-20+70°C	
Installation	Pockets CuZn / stainless steel V4A, series PZ, or plastic flange, FZ1 (see next page)	
Standards	CE conformity, RoHS	

	Models	Type of sensor	Tube length (L)
	SZ1-100	Pt100 (DIN EN 60751 CI. B)	100 mm
	SZ1-150	Pt100 (DIN EN 60751 CI. B)	150 mm
	SZ1-200	Pt100 (DIN EN 60751 CI. B)	200 mm
	SZ1-400	Pt100 (DIN EN 60751 CI. B)	400 mm
	SZ2-100	Pt1000 (DIN EN 60751 CI. B)	100 mm
	SZ2-150	Pt1000 (DIN EN 60751 CI. B)	150 mm
	SZ2-200	Pt1000 (DIN EN 60751 CI. B)	200 mm
	SZ2-400	Pt1000 (DIN EN 60751 CI. B)	400 mm
	SZ3-100	Ni1000 (TK6180)	100 mm
	SZ3-150	Ni1000 (TK6180)	150 mm
	SZ3-200	Ni1000 (TK6180)	200 mm
	SZ3-400	Ni1000 (TK6180)	400 mm
	SZ4-100	Ni1000 (TK5000)	100 mm
	SZ4-150	Ni1000 (TK5000)	150 mm
	SZ4-200	Ni1000 (TK5000)	200 mm
	SZ4-400	Ni1000 (TK5000)	400 mm
	SZ5-100	NTC20k (±1%)	100 mm
	SZ5-150	NTC20k (±1%)	150 mm
	SZ5-200	NTC20k (±1%)	200 mm
	SZ5-400	NTC20k (±1%)	400 mm
238	9 tec		

# SZ

## 

Models	Type of sensor	Tube length (L)
SZ6-100	NTC10k (±1%) BETA 3435K	100 mm
SZ6-150	NTC10k (±1%) BETA 3435K	150 mm
SZ6-200	NTC10k (±1%) BETA 3435K	200 mm
SZ6-400	NTC10k (±1%) BETA 3435K	400 mm

# Electrical wirings







Pocket OT Ni	Length (L)	Tmax	Max static pressure
PZ100	100 mm	160°C	16 bar
PZ150	150 mm	160°C	16 bar
PZ200	200 mm	160°C	16 bar
PZ400	400 mm	160°C	16 bar



Serie PZ

Pocket SS 316Ti	Length (L)	Tmax	Max static pressure
PZ100X	100 mm	400°C	40 bar
PZ150X	150 mm	400°C	40 bar
PZ200X	200 mm	400°C	40 bar
PZ400X	400 mm	400°C	40 bar



Serie PZ...X



# Room temperature control unit

#### Description

The room control unit SM has a temperature sensor for the remote measurement in domestic environments, offices, reception etc. and a setpoint control that limits the setting range to a predetermined value by the controller. It is available with occupancy button, LED and switch for fan speed.

#### Technical specifications

Sensor	NTC 10 kOhm
Power supply	24 V AC/DC
Potentiometer	5 kOhm
Occupancy button	10mA, 35 V DC
Fan speed	5 selectable with slide switch
Electrical connection	screw terminals max. 1,5 mm <sup>2</sup>
Housing	ABS, colour white RAL 9010
Dimensions	87,5 x 87,5 x 30 mm
Weight	82 g
Protection type	IP20
Working temperature	0+50°C
Storage temperature	-30+60°C
Standards	CE-conformity, RoHS



SM

Model	Occupancy button	Green LED	Speed switch
SM5			
SM5T	•		
SM5TL	•	•	
SM5TLS	•	•	•





### Electrical wirings









# Resistance characteristics of temperature sensors

Temp.	PT100	PT1000	Ni1000 TK6180	Ni1000 TK5000	NTC 10K Ohm	NTC 20K Ohm	KTY81-110	KTY81-121
°C	Ohm	Ohm	Ohm	Ohm	BETA 3435K K Ohm	K Ohm	Ohm	Ohm
-50,00	80,31	803,10	743	791	330,92	1667,57	515,00	510,00
-40,00	84,27	842,70	791	831	189,67	813,44	567,00	562,00
-30,00	88,22	882,20	842	872	112,06	415,48	624,00	617,00
-20,00	92,16	921,60	893	914	68,16	221,30	684,00	677,00
-10,00	96,09	960,90	946	956	42,62	122,47	747,00	740,00
0,00	100,00	1000,00	1000	1000	27,35	70,20	815,00	807,00
10,00	103,90	1039,00	1056	1045	17,98	41,56	886,00	877,00
20,00	107,79	1077,90	1112	1091	12,09	25,35	961,00	951,00
25,00	109,74	1097,40	1141	1114	10,00	20,00	1000,00	990,00
30,00	111,67	1116,70	1171	1138	8,31	15,89	1040,00	1029,00
40,00	115,54	1155,40	1230	1186	5,82	10,21	1122,00	1111,00
50,00	119,40	1194,00	1291	1235	4,15	6,72	1209,00	1196,00
60,00	123,24	1232,40	1353	1285	3,01	4,52	1299,00	1286,00
70,00	127,07	1270,00	1417	1337	2,22	3,10	1392,00	1378,00
80,00	130,89	1308,90	1483	1390	1,66	2,12	1490,00	1475,00
90,00	134,70	1347,00	1549	1444	1,26	1,54	1591,00	1575,00
100,00	138,50	1385,00	1618	1500	0,97	1,12	1696,00	1679,00
110,00	142,29	1422,00	1688	1557	0,76	0,82	1805,00	1786,00
120,00	146,06	1460,60	1760	1615	0,59	0,61	1915,00	1896,00
130,00	149,82	1498,20	1883	1675		0,46	2023,00	2003,00
140,00	153,58	1535,80	1909	1737		0,35	2124,00	2103,00
150,00	157,31	1573,10	1987	1799		0,27	2211,00	2189,00



# general sales conditions

#### PRICES

The prices mentioned in our current price list are in Euro ( $\in$ ) do not include VAT and, even if confirmed, can be subject to variations due to increases in raw materials and labour costs. If the price is tied to parity between the Euro and a foreign currency, the rate of exchange value is specified by publication by the Banca d'Italia, as indicated in the "II Sole 24 Ore" daily newspaper. If the rate of exchange varies by more than 5%, we reserve the right to modify at any time our prices and the discounts applied to current orders. In such a case the buyer is entitled to withdraw immediately from the order.

The said prices do not include transport and insurance costs, im-port license expenses, customs charges, etc., and are considered chargeable to the Buyer.

Our quotations are not binding for the order; the Buyer accepts our delivery terms. After issuing our order acknowledgement, the order is confirmed.

Minimum ordering amount:  $\in$  250,00 net (under this amount the price in force is not confirmed). Neutral products are supplied without a surcharge but minimum 50 pieces/part number.

Certificates of origin issued by Chamber of Commerce € 50,00. Certificates legalized by foreign embassy min. € 250,00.

#### PACKING

Packing is included in the sale price. Packing different from standard will be invoiced at cost (standard plastic pallets at  $\in$  20,00 net each).

#### DOCUMENTS

We reserve rights on all documents referring to the products and/or made available with quotations, acknowledgements or on delivery. Such documents may neither be copied nor made available to third parties without our written agreement. They must be returned to us on request.

#### SHIPMENT

Shipment is ex our works, unless otherwise agreed.

As soon as the goods are handed over to the forwarder, all our obligations are considered fulfilled.

Therefore, all expenses and risks will be the Buyer's responsibility without any exceptions, even if the shipping charges are prepaid by us.

It is the Buyer's responsibility to insure the goods against damage and/or loss. We therefore cannot be held liable for damage and/or loss.

The shipping rates for Italy are at cost price, and we reserve the right to select the most suitable means of transport.

In case of payment by cash on delivery, the fees are always in-curried by us and debited to the Buyer.

#### DELIVERY TERMS

Delivery terms are indicative and are not binding. We cannot be held liable for any production or shipment delay, if such a delay is caused by one of the following reasons: a commercial blockade, difficulties in obtaining raw materials and/or other circumstances beyond our control. In that case we do not accept any penalties and the Buyer renounces any claims for indemnity and/or reimbursement of damages.

We reserve the right to delivery the goods before the agreed date.

#### CLAIMS

Clams have to be brought to our attention within 8 days after the receipt of the goods, otherwise we will not accept the said claims. Claims do not authorise delays in payment or further price reductions. In case of packing received damaged, the Buyer must inform the forwarder immediately, and send a copy to us for information.

#### PAYMENT TERMS

Invoices are payable in the currency specified in the invoice.

Payments must be remitted within the agreed expiry data. We reserve ownership of the goods until the invoice and any accessory expenses have been fully paid. Failure by the Buyer to pay by the due date automatically gives rise to interest, giving us the right to deem the contract cancelled because of such failure, unless we prefer to ask for settlement of the amount due, by recourse to law if necessary, with bank interest and damages added. If the Buyer stops a payment, the outstanding amount becomes immediately due and we will file a petition for bankruptcy.

Interest on arrears: in the case of delayed payments, interest on arrears will be calculated at the rate of 7 (seven) points above the official rate of discount of the Banca d'Italia in force at the time such interest was applied.

#### WARRANTY

All the products supplied by us are guaranteed against construction faults or defects of material for 24 months from the date of delivery, the term by which we shall repair the faulty parts in order to restore correct operation of the appliances. We do not accept any responsibility for direct or indirect damage caused by the use of the said appliances. Any return of material must be requested from us in writing, must reach us free our works and will be re-turned ex our works.

The guarantee is restricted exclusively to the repair at our plant, of appliances acknowledged to be defective, whereas all other costs of transport or labor for technical operations on the appliances are charged to the Buyer. The guarantee is voided if the appliances are found to have been tampered with or dismantled.

If interventions on appliances not considered to be under guarantee are requested, we reserve the right to debit the Buyer for management of the return  $\notin$  40,00 spare parts, manpower etc. not included.

In the event of a dispute, the Buyer accepts that the Bolzano Court of Law is competent and accepts the laws in force in Italy.





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