eatec

we control
your comfort

general catalogue
2023

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)

Index

page

redline
thermostats

violetline
flow switches

blueline
pressure switches

orangeline
damper actuators

greenline
motorized valves

grayline
humidistats

yellowline
transmitters

cyanline
sensors

References

Discover some of the most important projects that **Eatec** has carried out together with its customers in Italy and around the world.

Cast Alimenti
BRESCIA

Centrali Telecom
ITALIA

Centro Snam
RAGUSA

Old Wild West
ITALIA

Palazzo Hyundai
MILANO

Linklaters
LONDON

LSG Skychefs, Lavaggio e Plonge
FIUMICINO

Università degli Studi
PESCARA

Hellenic Coast Guard
PIRAEUS

Sun City Resort
SOUTH AFRICA

Ipermercato Conad
FRASCATI

STMicroelectronics
AGRATE

Università Nicolò Cusano
ROMA

Centre Hospitalier du Sud Seine et Marne a Fontainebleau
FRANCE

Medical diagnostic Center
KRASNODAR

Hospital South Gai Gon
VIETNAM

Türkan Villa Project
BAKU AZERBAIJAN

Regional Children's Clinical Hospital
TAMBOV

Agenzia delle Entrate
ROMA

SmartRoad 2021
ALEMAGNA “BELLUNO-CORTINA”

Kernkraftwerk Biblis
WORMS

Ospedale S. Andrea
ROMA

Amazon Logistics
VARESE, CATANIA, TORINO, PESCARA

Royal Caribbean International Fleet
MIAMI

Witor’s Spa
GORIZIA

Kaufl and Stores
ROMANIA

Holiday Inn
MESTRE

Jebel Ali
DUBAI

ATG Hand Care
SRI LANKA

Studentato Stonehill
BOLOGNA

Carrefour
VARSAVIA

Cigar Access
GREECE

Ipermercato Conad
VELLETRI

Carrefour
CRACOVIA

Presidio Ospedaliero Pini
MILANO

Quellenhof Luxury Resort
LAZISE

redline

thermostats

Frost protection thermostat

TD

Description

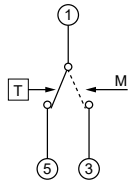
The frost protection thermostat serie TD is suitable for the protection of hot-water heating registers, downstream air heaters in ventilation and climate control systems as well as heat exchangers in cooling systems. The thermostats can also be used to control electrical heating systems and to switch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

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 mm² 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	5...95% 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

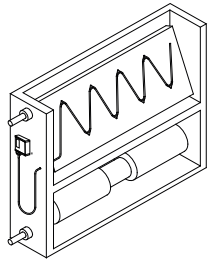


1 Common
1-3 Close on temperature rise
1-5 Close on temperature drop
M Manual reset

Function

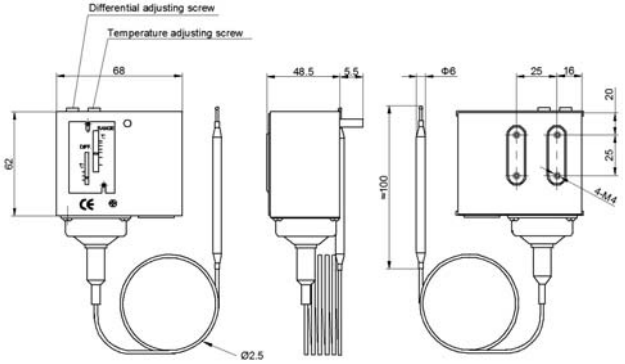
The frost protection thermostat switches when the temperature sensed by capillary for a minimum length of 30 cm drops below the temperature set on the knob. When temperature increases, the contact returns automatically to the initial position. For TDR versions it is necessary a manual reset from user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

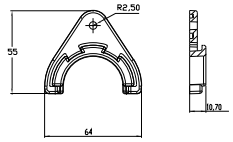


The thermostat is available with 3 different sensible elements that allow the use in different applications.
The version with 1,8 m capillary lenght has a bulb that allows the use of a pocket.
The versions with 3 and 6 m can be used in air ducts or battery exchanger.
The capillary must be applied uniformly 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

TAM

Description

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

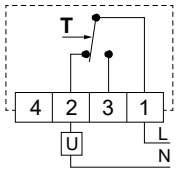
Technical specifications

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

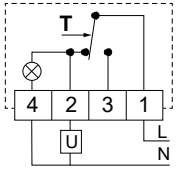
Models	Power supply	Features
TAM31	230 Vac / 24 Vac	Basic version, changeover contact
TAM32	230 Vac	with LED for closed contact
TAM33	230 Vac	with LED for closed contact and on/off switch
TAM34	230 Vac	with LED for closed contact and summer/winter switch
TAM42	24 Vac	with LED for closed contact
TAM43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

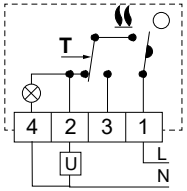
TAM31



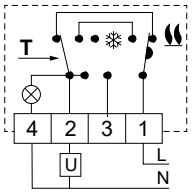
TAM32 - TAM42



TAM33 - TAM43



TAM34 - TAM44



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.

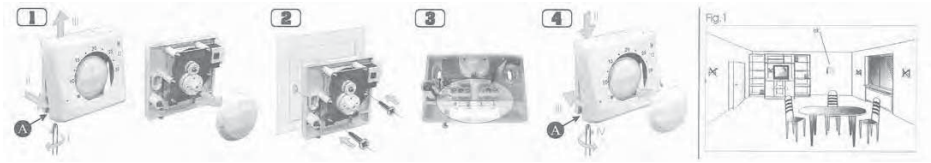
1 . Loosen the screw on the lid, then remove the cover and knob .

DO NOT EVER TURN THE SHAFT OF THE KNOB: THE THERMOSTAT CAN LOOSE THE SETTING.

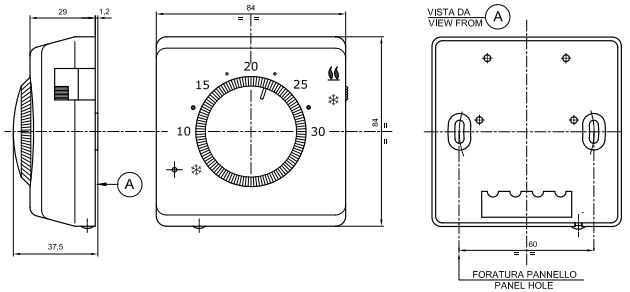
2 . Secure the device to the wall using screws

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

TA

Description

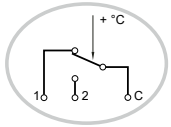
The industrial room thermostat TA is suitable for temperature control in industrial rooms such as greenhouses, industrial buildings, warehouses etc.

Technical specifications

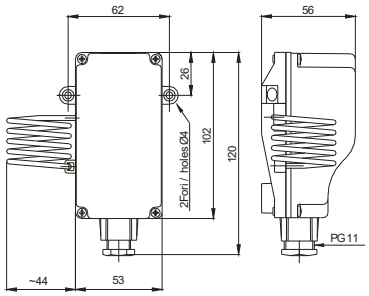
Measurement range	see schedule
Tolerance	±3° C
Differential	2 ±1°C
Electrical rating	16 (4) A, 250 V AC
Max. temperature	+70°C
Protection	IP55
Isolation class	I
Overvoltage category	II
Nominal impulse voltage	4 kV
Bulb	Spiral capillary in stainless steel
Dimensions	97 x 120 x 56 mm
Standards	CE-conformity

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

TK

Description

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.

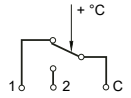
Technical specifications

Measurement range	see schedule
Differential	see schedule
Tolerance	Min. temp. ±5°C, min. temp. ±3°C
Electrical rating	16 (4) A, 250 V AC - 6 (1) A, 400 V AC
Max. housing temperature	T 85
Max. bulb temperature	T 120
Temperature gradient	1 °C/min
Isolation class	I
Overvoltage category	II
Nominal impulse voltage	4 kV
Dimensions	84 x 84 x 36 mm
Standards	CE-conformity

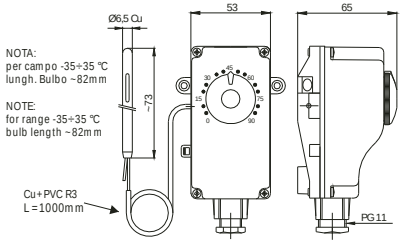
Models	Range °C	Protection (*)	Differential	Internal knob	External knob	Reset	Capillary length mm
TK1	0...+60	IP43	3±1°C		•		1000
TK1S	0...+60	IP55	3±1°C	•			1000
TK2	0...+90	IP43	4±2°C		•		1000
TK2S	0...+90	IP55	4±2°C	•			1000
TK3	-35...+35	IP43	2±1°C		•		1500
TKL100	fissa 100°C	IP55				manual	1000
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

TI

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.

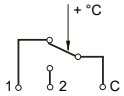
Technical specifications

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	T 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

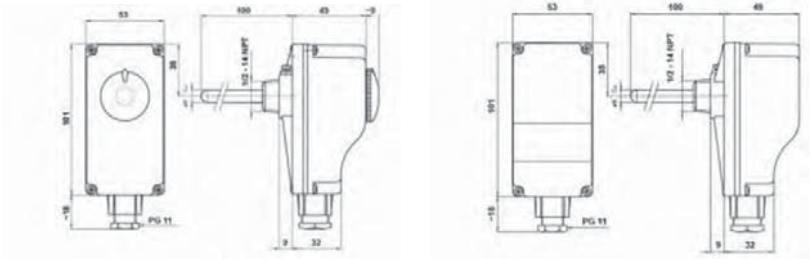
(*)The degree of protection is ensured by placing the unit horizontally or vertically with the cable entry facing down.

Models	Range °C	Internal knob	External knob	Reset
TI1	0...+60		•	
TI1S	0...+60	•		
TI2	0...+90		•	
TI2S	0...+90	•		
TI3	+30...+70		•	
TIL100	Fix 100°C			manual
TIL1	+90...+100	•		manual

Electrical wirings



Dimensions (mm)



Electromechanical strap-on pipe thermostat

TC

Description

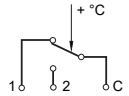
The electromechanical strap-on pipe thermostat TC with liquid expansion sensor, two available ranges, is suitable for most of temperature control requirements for heating and cooling applications. The thermostats are available with external, internal range knob and as safety limiter. The thermostat comes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

Technical specifications

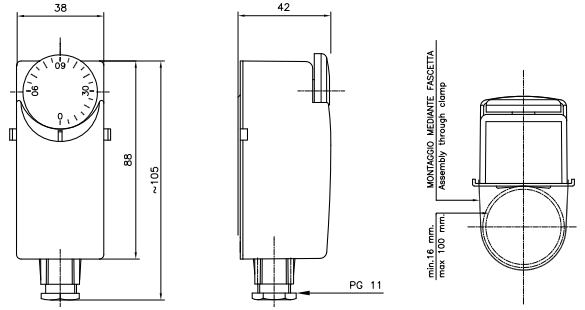
Measurement range	see schedule
Tolerance	see schedule
Differential	see schedule
Electrical rating	16 (4) A, 250 V AC - 6 (1) A, 400 V AC
Max. temperature	T 85
Protection	IP40
Isolation class	I
Overvoltage category	II
Nominal impulse voltage	4 kV
Dimensions	105 x 42 x 38 mm
Accessory	Spring band and thermal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

RTA02

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

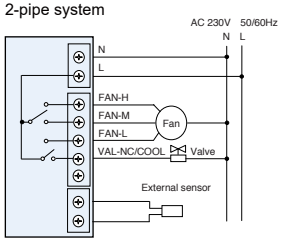
- 2 and 4 pipes selectable fan coil applications
- Fan control with manual 3-speeds setting
- ON-OFF control action for actuators
- Analog input for water temperature sensor
- Output voltage for valves 230 V AC, fan motor 230 V AC
- Power supply: 230 Vac, 50/60 Hz
- Frost protection function
- Display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

Technical features

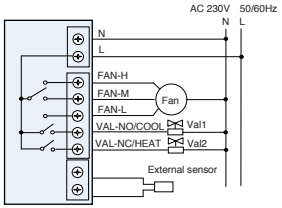
Control range	5…35 °C	
Power supply	230 V AC, 50/60 Hz	
Outputs	On-Off (valves)	
	3 speed output, 230 V AC. max 2 A resistive, 1 A inductive	
Knob and selectors		
Fan	OFF - LOW - MED - HIGH	Power on, fan speed
Set point	Push bottom ▲ ▼	Set point setting
Operating mode	Push bottom **M**	Heat, cool, auto or fan
Analogue Inputs		
Water temperature	Strap-on	
Accuracy	±1 K	
Application	2- or 4-pipe-fan coil	
Housing	Single housing 86 x 86 x 23,5 mm	
Protection class	IP30	
Working temperature	0...45° C	
Storage temperature	-10...+50° C	
Working humidity	5...95% RH non condensing	

Electrical wiring

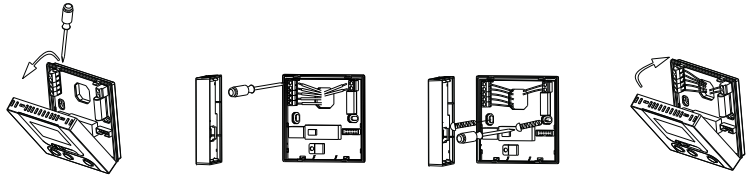
2-pipe system



4-pipe system



Mounting



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

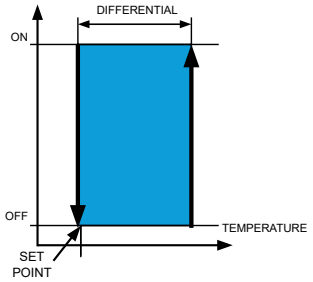
Power supply	230 VAC, 50/60 Hz
Relay output with switch contact	max 3 A, 230 VAC
Adjusting action	ON-OFF
Adjustable differential	1-8 K
Control output	ON-OFF
Temperature probe connection	NTC10K
Screw clamps for cables with maximum cross-sectional area	2,5 mm²
Working temperature °C	0...50°C
Working range 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 knob on the front of the controller.

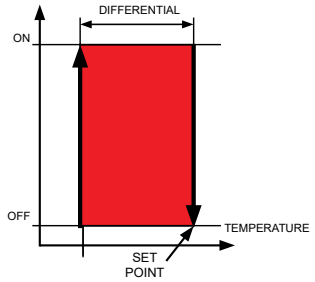
Cooling action

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.



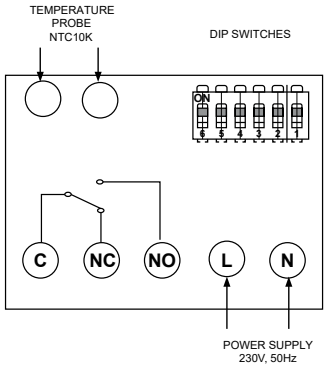
Heating action

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 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.



Electrical wirings

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



Setting DIP switches

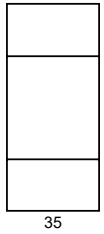
RANGE | DIFFERENTIAL | ACTION

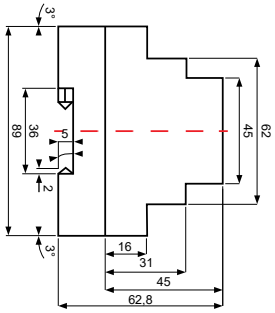
	S1	S2
+5...+35°C	ON	ON
-35...+5°C	ON	OFF
+35...+65°C	OFF	ON
-10...+20°C	OFF	OFF

DIFFERENTIAL °C	S3	S4	S5
1	ON	ON	ON
2	OFF	ON	ON
3	ON	OFF	ON
4	OFF	OFF	ON
5	ON	ON	OFF
6	OFF	ON	OFF
7	ON	OFF	OFF
8	OFF	OFF	OFF

	S6
HEATING	OFF
COOLING	ON

Dimensions (mm)





violetline

flow switches

Liquid flow switch

FS

Description

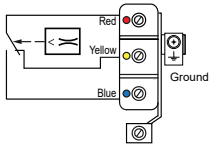
The flow switch serie FS is designed for controlling flow rates in pipes and ducts employed in HVAC applications from 1” up to 8”. In particular for monitoring flow in water, for pumps in oil circulation, cooling and lubrication systems, heat exchangers, compressors and is used as flow control device 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 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 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
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	10...95% 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

Electrical wirings

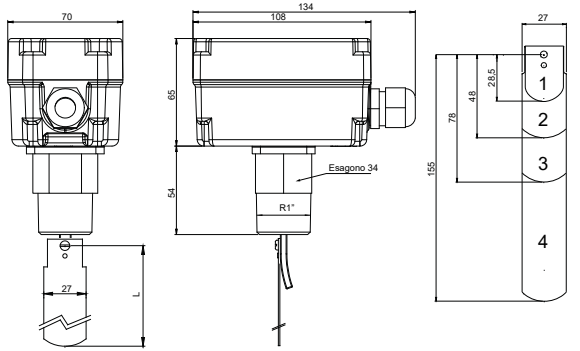


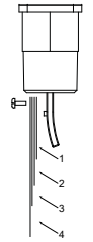
Flow rates in m³/h

Line pipe size	Paddle size	Flow m³/h				
		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
6”	1, 2, 3, 4	12.4	29,0	20,0	33,7	120
	1, 2, 3	24,0	72,0	32,7	90,0	120
8”	1, 2, 3, 4	23,9	83,4	34,6	96,0	240
	1, 2, 3	48,4	174	66,8	200	240

The values of minimum and maximum flow rate can be changed during installation shortening the paddles.

Dimensions (mm)





The paddles must be installed starting from the shortest.

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.

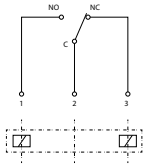
Technical specifications

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	10...95% RH, non-condensing
Working temperature	-40 …+90°C
Storage temperature	-40 …+90°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

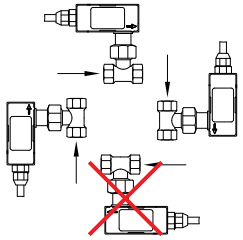
Models	Connection	Flow rate l/min H_2O	Max. recommended flow rate l/min H_2O
FL10	G 3/8	4.4 (3.7) - 5.9 (5.1)	10
FL15	G 1/2	4.4 (3.7) - 5.9 (5.1)	20
FL20	G 3/4	9.4 (8.0) - 12.8 (10.8)	40
FL25	G 1	14.7 (12.5) - 19.9 (16.9)	60
FL32	G 1 1/4	24.1 (20.5) - 32.7(27.8)	80
FL40	G 1 1/2	37.7 (32.1) - 51.0 (43.4)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

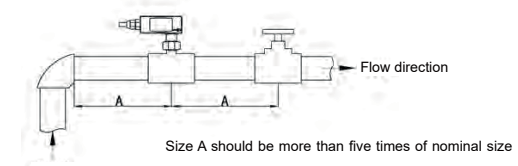
Note: The flow rate values indicate operating point. The values between the brackets indicate reset point.

Electrical wirings



Installation



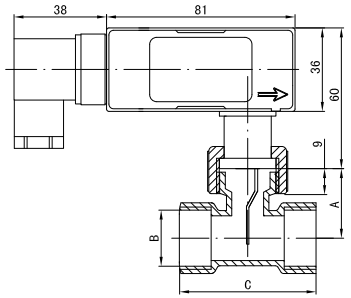


Size A should be more than five times of nominal size

Flow direction

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

Liquid flow switch

FL200

Description

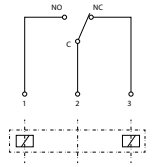
The flow switch serie FL200 is designed for controlling flow rates in pipes and ducts employed in HVAC applications from DN32 up to DN200. In particular for monitoring flow in water, for pumps in oil circulation, cooling and lubrication systems, heat exchangers, compressors and is used as flow control 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“
Body and lever material	Nickel plated brass
Paddles material	Beryllium copper alloy
Dimensions	See drawing
Protection type	IP65
Protection class	II
Max. pipe temperature	-25 …+110°C
Working humidity	10...95% 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

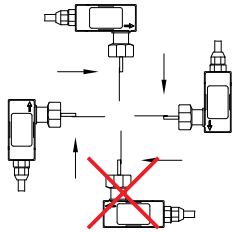
Electrical wirings

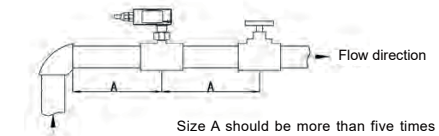


Pipe DN	Flow m³/h				
	Paddle 1	Paddles 1, 2	Paddles 1, 2, 3	Paddles 1, 2, 3, 4	Max. recommended flow m³/h
32	1,7 (1,4)...1,8 (1,5)	-	-	-	6
40	1,7 (2,4)...1,8 (2,0)	-	-	-	9
50	4,5 (3,8)...4,9 (4,2)	1,2 (1,0)...1,4 (1,2)	-	-	15
65	9,5 (8,1)...11,2 (9,5)	3,2 (2,7)...3,6 (3,1)	-	-	24
80	13,5 (11,5)...14,8 (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

Values with increasing flow, in brackets values with decreasing flow.

Installation



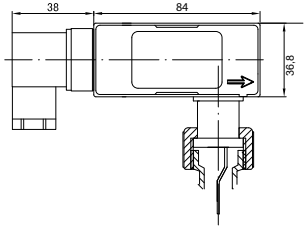


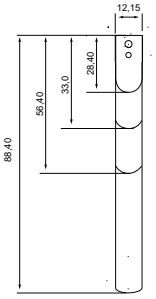
Size A should be more than five times of nominal size

Flow direction

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

Dimensioni (mm)





Liquid flow switch

FLUS001

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.

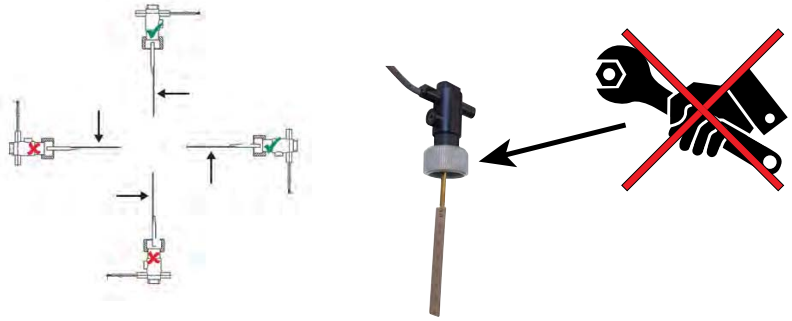
Technical specifications

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 mm², 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

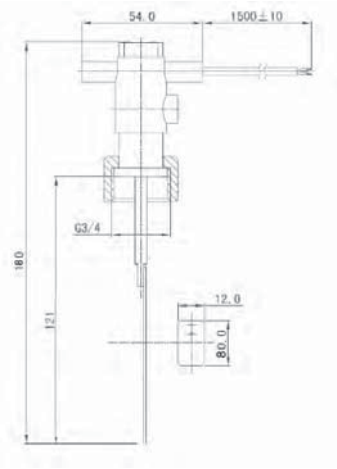
Pipe	Length of paddle cut (mm)	Flow rate m³/h H_2O		Max. recommended flow rate m³/h H_2O
		Increasing flow ON	Decreasing flow OFF	
DN20	9	1,08	0,9	4
DN25	15	1,32	1,08	5
DN32	20	1,92	1,62	8
DN40	30	2,1	1,8	10
DN50	40	2,7	2,4	14
DN80	60	5,1	4,68	30
DN100	80 (do not cut)	6,36	5,82	40
DN150	80 (do not cut)	15,48	14,22	100
DN200	80 (do not cut)	30	28,98	180

Electrical wirings

Installation



Dimensions (mm)



Liquid flow switch

FLUS

Description

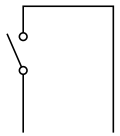
The flow switch serie FLUS is designed for controlling flow rates in pipes and ducts employed in HVAC applications from 1" up to 2". The reed contact guarantees a complete isolation between the electrical and the mechanical part.

Technical specifications

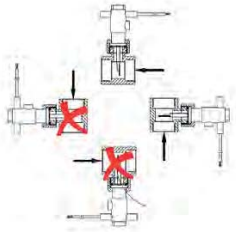
Flow rate	See schedule
Switching output	Reed SPST, max. 26 VA, 20 W
Electrial rating	1 A, 230 VAC, 48 VDC
Electical connection	RVV cable 2x0,5 mm², 300/500V UV and weather resistant
Max pressure	10 bar
Average pressure loss	0,01 bar at Q max
Hysteresis	min. 0,7 l/min.
Housing	PPE, black
Connection	Female 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 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

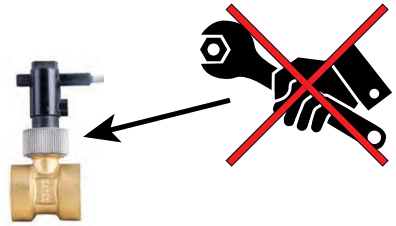
Models	Connection	Cable m	Setting m³/h	Flow rate m³/h H_2O		Max. recommended flow rate m³/h H_2O
				Increasing flow ON	Decreasing flow OFF	
FLUS002AW	G 3/4	2	0,3	0,5	0,3	4,8
FLUS006AW	G 1	2	0,4	0,6	0,4	7,8
FLUS007AW	G 1	1	0,95	0,78 - 0,99	0,74 - 0,95	7,8
FLUS011AW	G 1 1/4	4	1,92	-	-	10,8
FLUS010AW	G 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

Electrical wirings

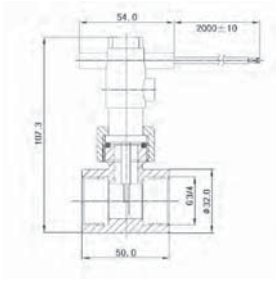


Installation

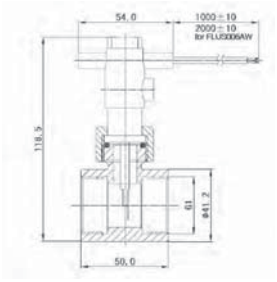




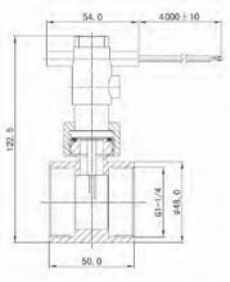
Dimensions (mm)



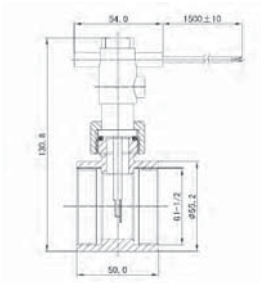
FLUS002AW



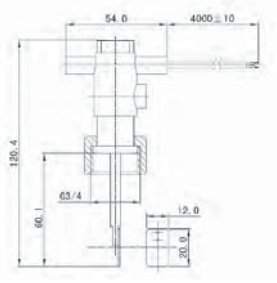
FLUS006AW / FLUS007AW



FLUS011AW



FLUS010AW



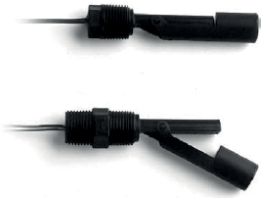
FLUS009AW

Level switch

FG

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°.

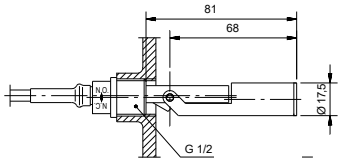


Technical specifications

Connector	Male thread G 1/2
Max. pressure	10 bar
Contact	N/O or N/C depending on the installation
Electrical rating	Reed, max 240 V AC DC, max 40 W, max 2 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^3
Installation	Horizontal ±30°
Protection type	IP68
Standards	CE conformity, RoHS

Model	Fluid	Temperature	Body material
FG1	not aggressive	-10...+80° C	Polypropylene

Dimensions (mm)



Air flow switch

FSA

Description

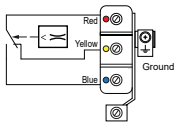
The air flow switch serie FSA is designed for controlling flow rates od air and non aggressive gases in pipes and ducts employed in HVAC applications.

Technical specifications

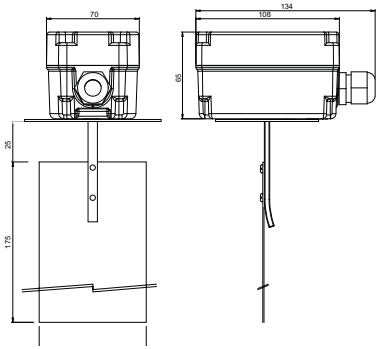
Switching output	Dustproof microswitch as potential-free SPDT contact
Electrical rating	16 (8) A, 24 - 250 V AC, at 24 V AC min. 150 mA
Lifetime	100.000 cycles at nominal load
Electrical connection	Screw terminal, wire up to 1,5 mm^2, cable Ø 6…9 mm
Housing	ABS, white
Cable conduit	M20 x 1,5 mm
Lever 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	10...95% RH, non-condensing
Working temperature °C	-40 …+85°C
Storage temperature	-40 …+85°C
Standards	CE conformity, RoHS

Model	Min. cut-out value m/sec.	Min. cut-in value m/sec.	Max cut-out value m/sec.	Max cut-in value 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

PA

Description

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	20...300 Pa (0,2...3 mbar), 30...400 Pa (0,3...4 mbar), 50...500 Pa (0,5...5 mbar), 50...700 PA (0,5...7 mbar), 200...1000 Pa (2...10 mbar), 500...2500 Pa (5...25 mbar), 1000...5000 Pa (10...50 mbar), 100...1000 Pa (1...10 mbar)
Accuracy	±15%
Mechanical working life	Over 10^6 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 **G**)
Working humidity	0...95% 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	suffix **M** for multiply packing (45 pcs/cardboard) suffix **B** for models with range in mbar suffix **UL** for UL approval (not available for IP65 models) suffix **G** for IP65 protection suffix **X** for ATEX directive suffix **LC** for low voltage version max. 0,1 A, 24 V DC suffix **NBR** for NBR diaphragm

Models	Measuring range	Tolerance	Differential
PA1	20...300 Pa (0,2...3 mbar)	±15%	10 Pa (0,1 mbar)
PA2	30...400 Pa (0,3...4 mbar)	±15%	15 Pa (0,15 mbar)
PA3	50...500 Pa (0,5...5 mbar)	±15%	20 Pa (0,2 mbar)
PA4	200...1000 Pa (2...10 mbar)	±15%	100 Pa (1 mbar)
PA5	500...2500 Pa (5...25 mbar)	±15%	150 Pa (1,5 mbar)
PA6	1000...5000 Pa (10...50 mbar)	±15%	250 Pa (2,5mbar)
PA7	100...1000 Pa (1...10 mbar)	±15%	50 Pa (0,5 mbar)
PA8	50...700 Pa (0,5...7 mbar)	±15%	20 Pa (0,2 mbar)

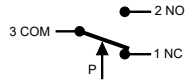
Accessories:
APA1 Snap-on plastic bracket, L-shaped
APA2 Snap-on plastic bracket, S-shaped
APA3 PVC-hose 2 m Ø 6 with 2 ABS nippels and 4 screws

Order matrix

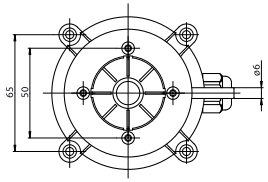
Configurable pressure ranges	20...300 Pa	(0,2…3 mbar)	PA	**1**						
	30...400 Pa	(0,3…4 mbar)		**2**						
	50...500 Pa	(0,5…5,0 mbar)		**3**						
	200...1000 Pa	(2…10 mbar)		**4**						
	500...2,5 kPa	(5...25 mbar)		**5**						
	1...5 kPa	(10…50 mbar)		**6**						
	0,1... 1 kPa	(1…10 mbar)		**7**						
	50...700 Pa	(0,5…7,0 mbar)		**8**						
Unit of measure	Pascal									
	Millibar				**B**					
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)*								**X**	
Packaging	Unit									
	45 pcs packaging									**M**

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

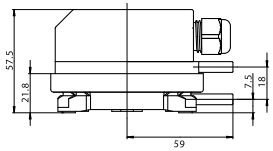
Electrical wirings



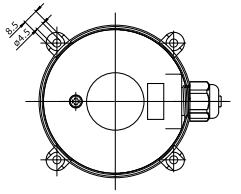
Dimensions (mm)



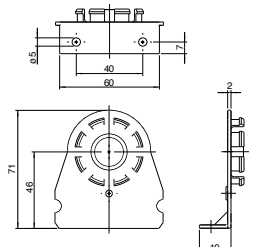
APA1 Snap-on plastic bracket, L-shaped

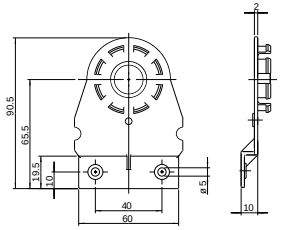


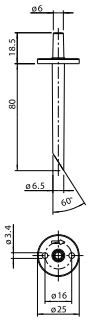
APA2 Snap-on plastic bracket, S-shaped



ABS nippel (part of APA3)







Liquid column manometer

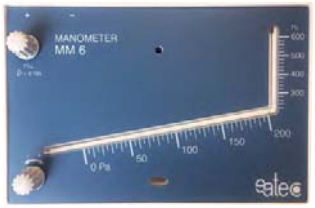
MM

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.

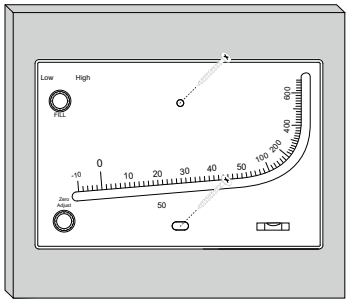
Technical specifications

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



Model	Range	Accuracy	Liquid
MM6	0...200...600 Pa	0...200 Pa ±5%, 200...600 Pa ±25%	Red
MM15	0...500...1500 Pa	0...500 Pa ±5%, 500...1500 Pa ±25%	Purple

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

Description

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

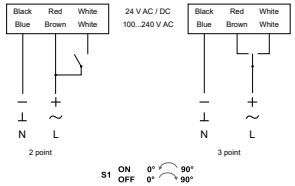
- For air dampers up to approx. 0.5 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 6 to 15,5 mm round / □ 5 to 12 mm square, minimum shaft length 35 mm, anti-rotation bracket provided for stability, adjustable angle of rotation, 0,9 m cable connection.

Technical features

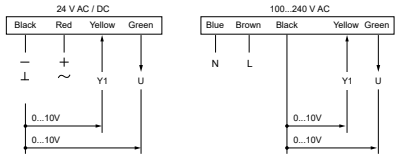
Actuator model		S2A	S2B	S2AM	S2BM
Damper area	m²	0.5			
Nominal torque	Nm	2			
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz	50/60			
Power consumption					
- in operation	W	2,0	2,8	2,0	2,8
- at rest	W	0,5	0,7	0,5	0,7
- for wire sizing	VA	4,5			
Running time	s	20...45			
Sound power level	max. db (A)	45			
Control signal		2-3 point	2-3 point	0...10 V DC	0...10 V DC
Auxiliary switch rating		5 (2,5) A, 250 V AC			
Life Cycle	cycles	60.000			
Rotation angle		max.95°			
Rotation way		L/R switch			
Protection class		II			
Protection degree		IP54			
Working range °C		-20...+70° C			
Working range % RH		5...95% RH, non-condensating			
Storage temperature		-40...+70° C			
Maintenance		free			
Weight	g	600			
Standards		CE-conformity, RoHs			
Option		suffix S for models with 1 SPDT auxiliary switch			

Electrical wirings

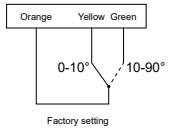
Wiring diagram



Wiring diagram
proportional



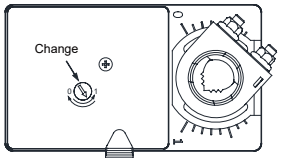
Auxiliary switch



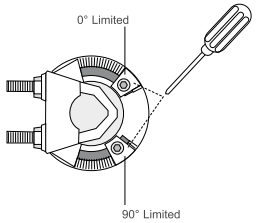
3 (1,5) A 230 V

Setting

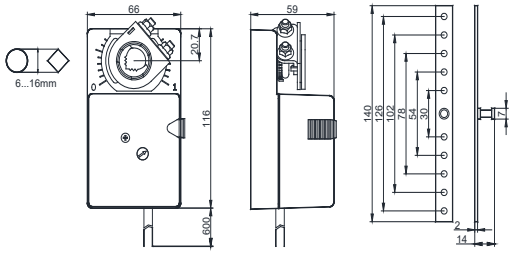
Change of rotation way



Angle of rotation limiting



Dimensions (mm)



Description

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

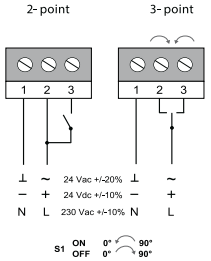
- For air dampers up to approx. 1 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 16 mm round / □ 10 to 12 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation.

Technical features

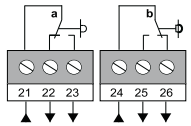
Actuator model		S4A	S4B	S4AM	S4BM
Damper area	m²		1		
Nominal torque	Nm		4		
Power supply	V	24 AC/DC	230 AC	24 AC/DC	230 AC
Frequency	Hz		50/60		
Power consumption					
- in operation	W	2.2	3.2	2.2	3.2
- at rest	W	0.5	0.7	0.5	0.7
- for wire sizing	VA	4.4	6.4	4.4	6.4
Running time	s		45		
Sound power level	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, 250 V AC		
Life Cycle	cycles		60.000		
Rotation angle					
- operating			0-90°		
- limitation			5-85° (steps of 5°)		
Protection class			II		
Protection degree			IP54		
Working range °C			-20...+70° C		
Working range RH			5...95% RH, non-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		

Electrical wirings for models at 2 / 3 point

Wiring diagram



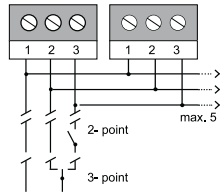
Auxiliary switches



3 (1,5) A 230 V

actuator in position 0°

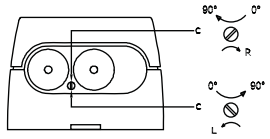
Parallel connections



Max 5 actuators

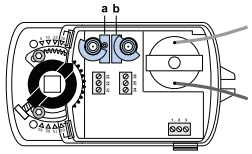
Settings

Changing direction of rotation



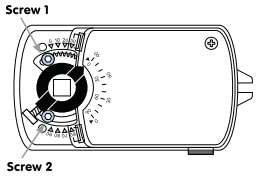
Auxiliary switch adjustment

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



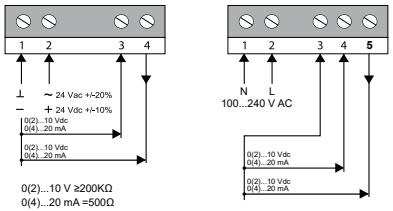
Angle of rotation limiting

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

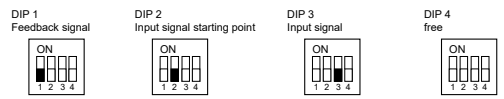


Electrical wirings for proportional models

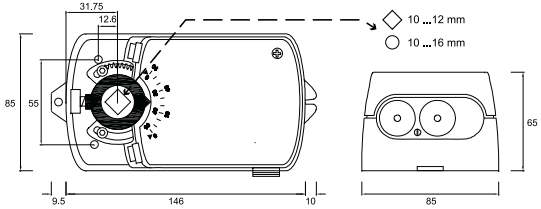
Wiring diagram



DIP settings



Dimensions (mm)



S8

Description

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

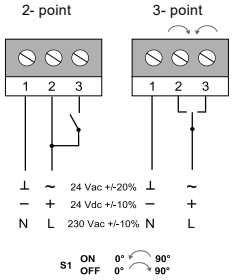
- For air dampers up to approx. 1,5 m²
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / □ 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation 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

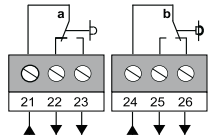
Actuator model		S8A	S8B	S8AM	S8BM
Damper area	m²		1,5		
Nominal torque	Nm		8		
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz		50/60		
Power consumption					
- in operation	W		4.5		
- at rest	W	0.5	0.7	0.5	0.7
- for wire sizing	VA		7.0		
Running time	s		30...60		
Sound power 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, 230 V AC		
Life Cycle	cicli		60.000		
Rotation angle					
- operating			0-90°		
- limitation			5-85° (steps of 5°)		
Protection class		III	II	III	II
Protection degree			IP54		
Working range °C			-20...+70° C		
Working range RH			5...95% 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		

Electrical wirings for models at 2 / 3 points

Wiring diagram

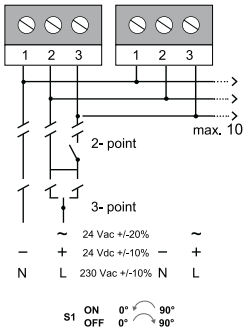


Auxiliary switches



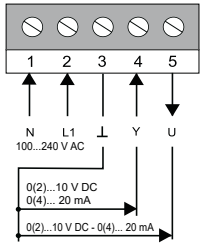
3 (1,5) A 230 Vac
actuator in position 0°

Parallel connections

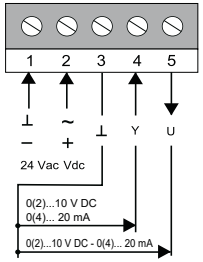


Electrical wirings for proportional models

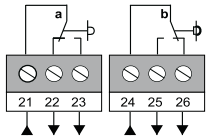
Wiring diagram 230 V AC



Wiring diagram 24 V AC



Auxiliary switches



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

Settings DIP 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

DIP 3
Input signal

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

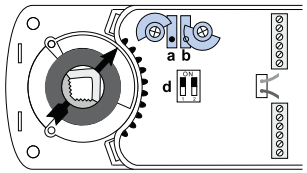
DIP 4
Rotation direction

option

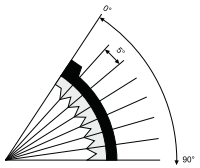
S2
Rotation direction

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

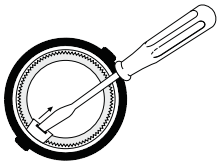
Auxiliary switch adjustment
Factory setting:
switch a at 10°
switch b at 80°
The switching position can be changed manually.



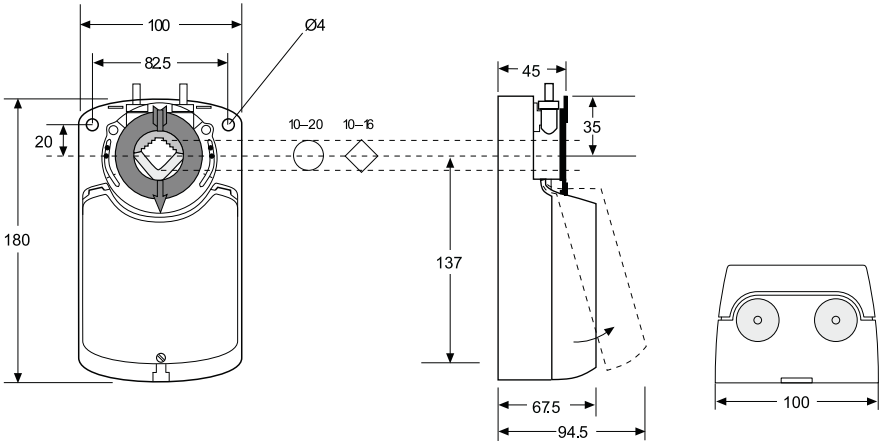
Angle of rotation limiting



Adapter release



Dimensions (mm)



Description

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

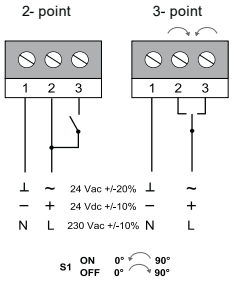
- For air dampers up to approx. 3 m²
- Nominal voltage 24 Vac/dc and 100...230 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / □ 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation bracket provided for stability, manual over ride by push button, selectable direction of rotation, adjustable angle of rotation, parallel connection up to 10 actuators.

Technical features

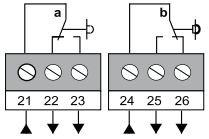
Actuator model		S16A	S16B	S16AM	S16BM
Damper area	m²	3			
Nominal torque	Nm	16			
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz	50/60			
Power consumption					
- in operation	W	4.5			
- at rest	W	0.5	0.7	0.5	0.7
- for wire sizing	VA	7.0			
Running time	s	70...100			
Sound power 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, 230 V AC			
Life Cycle	cycles	60.000			
Rotation angle					
- operating		0-90°			
- limitation		5-85° (steps of 5°)			
Protection class		III	II	III	II
Protection degree		IP54			
Working range °C		-20...+70° C			
Working range RH		5...95% 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			

Electrical wirings for models at 2 / 3 points

Wiring diagram



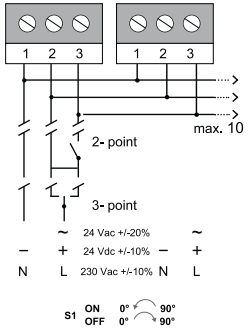
Auxiliary switches



3 (1,5) A 230 Vac

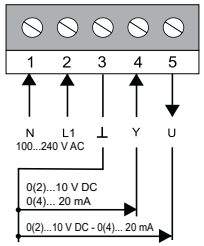
actuator in position 0°

Parallel connections

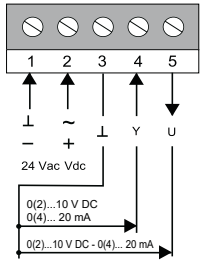


Electrical wirings for proportional models

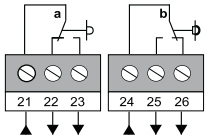
Wiring diagram 230 V AC



Wiring diagram 24 V AC



Auxiliary switches



3 (1,5) A 230 Vac

actuator in position 0°

Settings DIP 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

DIP 3
Input signal

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

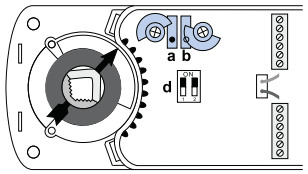
DIP 4
Rotation direction

option

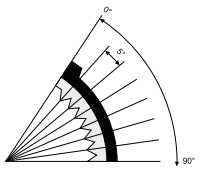
S2
Rotation direction

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

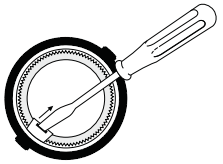
Auxiliary switch adjustment
Factory setting:
switch a at 10°
switch b at 80°
The switching position can be changed manually.



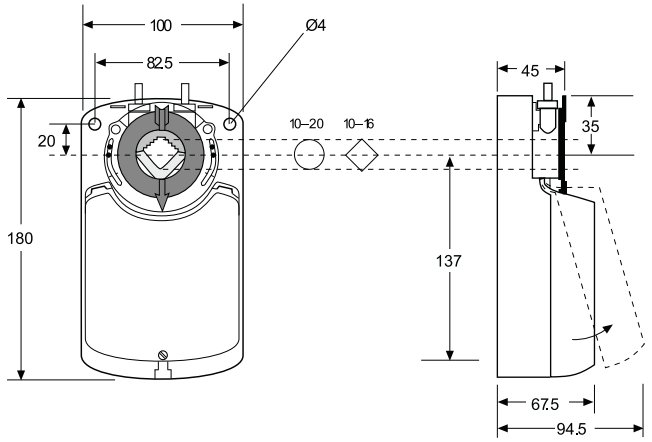
Angle of rotation limiting

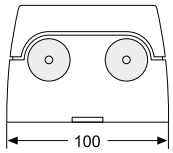


Adapter release



Dimensions (mm)





S24

Description

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

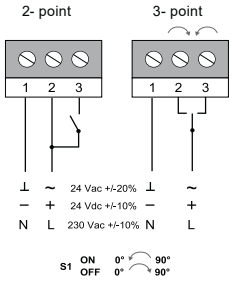
- For air dampers up to approx. 4.5 m²
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / □ 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation 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

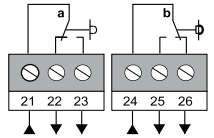
Actuator model		S24A	S24B	S24AM	S24BM
Damper area	m²	4.5			
Nominal torque	Nm	24			
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz	50/60			
Power consumption					
- in operation	W	4,5			
- at rest	W	0,5	0,7	0,5	0,7
- for wire sizing	VA	7,0			
Running time	s	130...160			
Sound 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, 230 V AC			
Life Cycle	cycles	60.000			
Rotation angle					
- operating		0-90°			
- limitation		5-85° (steps of 5°)			
Protection class		III	II	III	II
Protection degree		IP54			
Working range °C		-20...+70° C			
Working range RH		5...95% 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			

Electrical wirings for models at 2 / 3 points

Wiring diagram

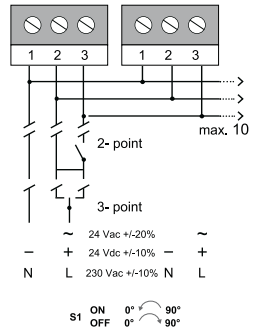


Auxiliary switches



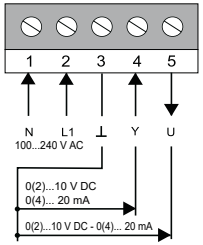
3 (1,5) A 230 Vac
actuator in position 0°

Parallel connections

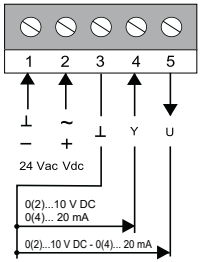


Electrical wirings for proportional models

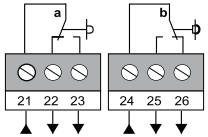
Wiring diagram 230 V AC



Wiring diagram 24 V AC



Auxiliary switches



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

Settings DIP 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

DIP 3
Input signal

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

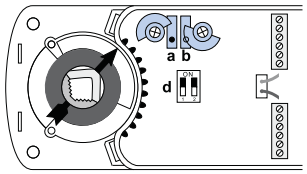
DIP 4
Rotation direction

option

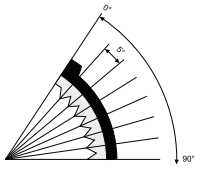
S2
Rotation direction

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

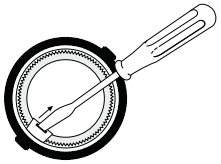
Auxiliary switch adjustment
Factory setting:
switch a at 10°
switch b at 80°
The switching position can be changed manually.



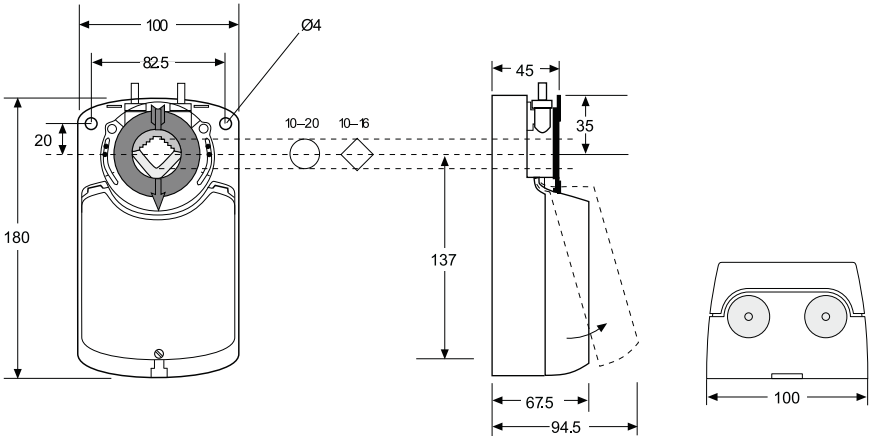
Angle of rotation limiting



Adapter release



Dimensions (mm)



Description

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

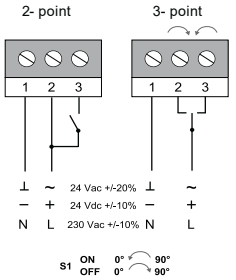
- For air dampers up to approx. 6 m²
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / □ 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation 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

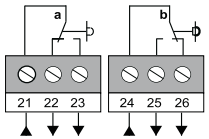
Actuator model		S32A	S32B	S32AM	S32BM
Damper area	m²	6			
Nominal torque	Nm	32			
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz	50/60			
Power consumption					
- in operation	W	4,5			
- at rest	W	0,5	0,7	0,5	0,7
- for wire sizing	VA	7,0			
Running time	s	180			
Sound power level	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, 230 V AC			
Life Cycle	cycles	60.000			
Rotation angle					
- operating		0-90°			
- limitation		5-85° (steps of 5°)			
Protection class		III	II	III	II
Protection degree		IP54			
Working range °C		-20...+70° C			
Working range RH		5...95% 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			

Electrical wirings for models at 2 / 3 points

Wiring diagram

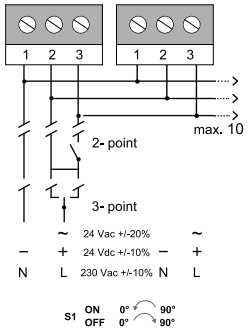


Auxiliary switches



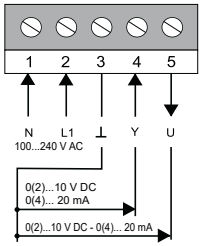
3 (1,5) A 230 Vac
actuator in position 0°

Parallel connections

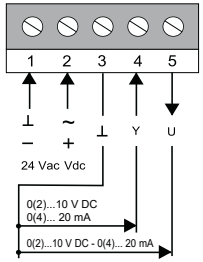


Electrical wirings for proportional models

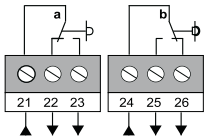
Wiring diagram 230 V AC



Wiring diagram 24 V AC



Auxiliary switches



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

Settings DIP 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

DIP 3
Input signal

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

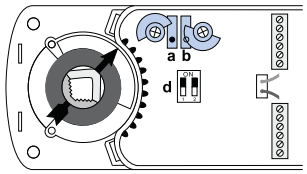
DIP 4
Rotation direction

option

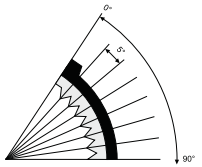
S2
Rotation direction

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

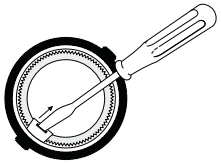
Auxiliary switch adjustment
Factory setting:
switch a at 10°
switch b at 80°
The switching position can be changed manually.



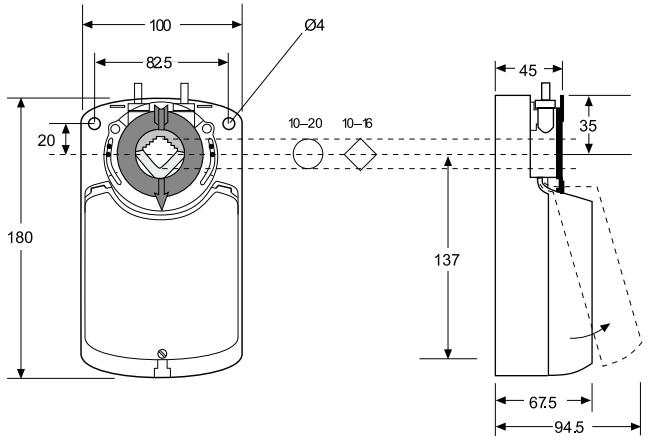
Angle of rotation limiting

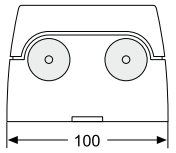


Adapter release



Dimensions (mm)





Damper actuators fast running, 8 Nm

S8F

Description

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

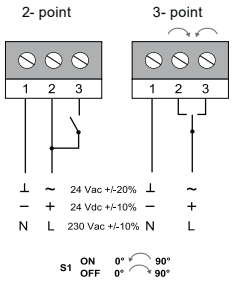
- For air dampers up to approx. 1,5 m²
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / □ 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation 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

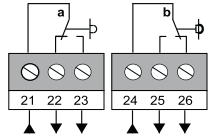
Actuator model		S8AF	S8BF	S8AMF	S8BMF
Damper area	m²		1,5		
Nominal torque	Nm		8		
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz		50/60		
Power consumption					
- in operation	W		12		
- at rest	W	0.5	0.7	0.5	0.7
- for wire sizing	VA		7.0		
Running time	s		8		
Sound power level	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, 230 V AC		
Life Cycle	cicli		60.000		
Rotation angle					
- operating			0-90°		
- limitation			5-85° (steps of 5°)		
Protection class		III	II	III	II
Protection degree			IP54		
Working range °C			-20...+70° C		
Working range RH			5...95% 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		

Electrical wirings for models at 2 / 3 points

Wiring diagram

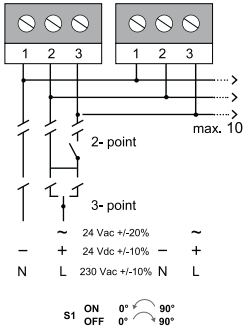


Auxiliary switches



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

Parallel connections

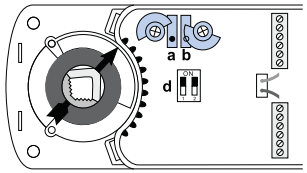


Settings

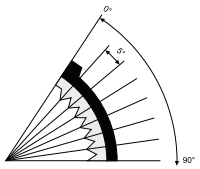
Changing the rotation direction

DIP 1

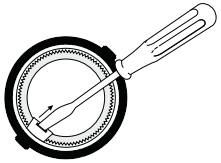
Auxiliary switch adjustment
Factory setting:
switch a at 10°
switch b at 80°
The switching position can be changed manually.



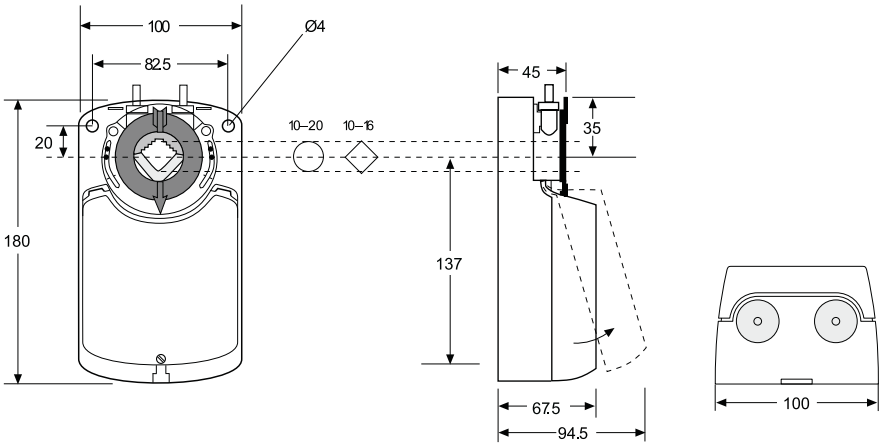
Angle of rotation limiting



Adapter release



Dimensions (mm)



S16F

Description

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

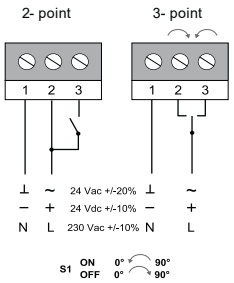
- For air dampers up to approx. 3 m²
- Nominal voltage 24 Vac/dc and 100...240 Vac
- Control: Open-close or 3-point and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 20 mm round / □ 10 to 16 mm square, minimum shaft length 50 mm, anti-rotation 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

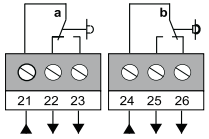
Actuator model		S16A	S16B	S16AM	S16BM
Damper area	m²	3			
Nominal torque	Nm	16			
Power supply	V	24 AC/DC	100...240 AC	24 AC/DC	100...240 AC
Frequency	Hz	50/60			
Power consumption					
- in operation	W	12			
- at rest	W	0.5	0.7	0.5	0.7
- for wire sizing	VA	7.0			
Running time	s	16			
Sound power level	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, 230 V AC			
Life Cycle	cycles	60.000			
Rotation angle					
- operating		0-90°			
- limitation		5-85° (steps of 5°)			
Protection class		III	II	III	II
Protection degree		IP54			
Working range °C		-20...+70° C			
Working range RH		5...95% 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			

Electrical wirings for models at 2 / 3 points

Wiring diagram

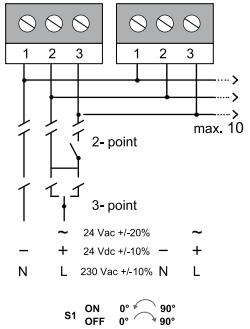


Auxiliary switches



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

Parallel connections

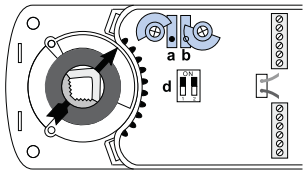


Settings

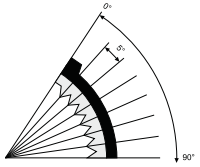
Changing the rotation direction

DIP 1

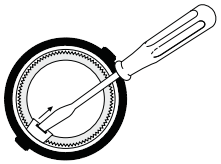
Auxiliary switch adjustment
Factory setting:
switch a at 10°
switch b at 80°
The switching position can be changed manually.



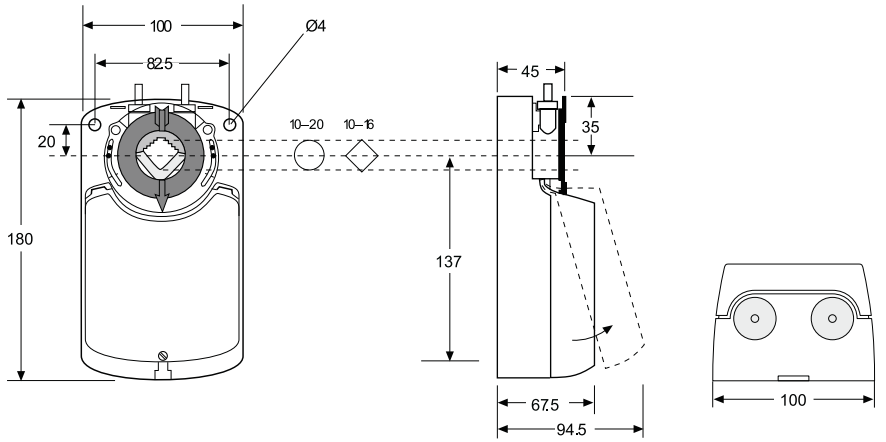
Angle of rotation limiting



Adapter release



Dimensions (mm)



Spring-return damper actuator, 2,5 Nm

SR2

Description

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

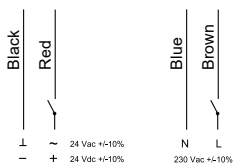
- For air dampers up to approx. 0,5 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions max Ø 12 mm, □ 8x8mm minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

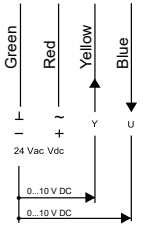
Actuator model		SR2A	SR2AM	SR2B
Damper area	m²		0,5	
Nominal torque	Nm		2,5	
Power supply	V	24 AC/DC	24 AC/DC	230 AC
Frequency	Hz		50/60	
Power consumption				
- in operation	W	2,5	2,5	2,5
- at rest	W		1,6	
Running time for motor	s		60 / 70	
Running time for spring	s		25 / 30	
Sound power level	db (A)		circa 50	
Control signal		2 point, on-off	0...10 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			5...95% 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	

Electrical wirings

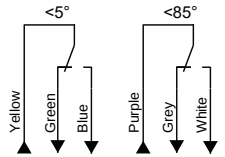
Wiring diagram On/Off



Wiring diagram proportional



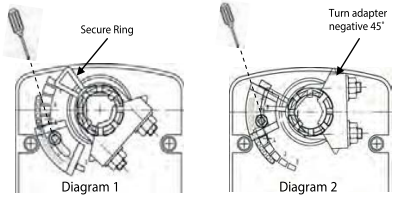
Auxiliary switches



3 (1,5) A, 250 V AC

Settings

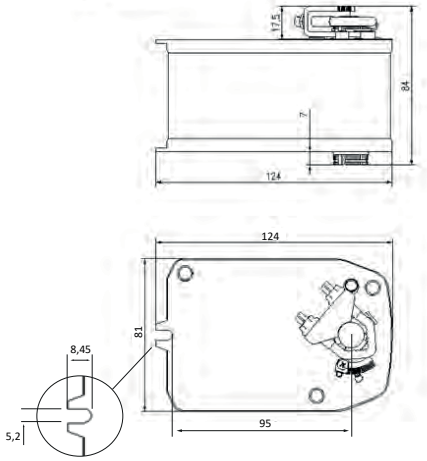
Limitation of rotation angle from 5° to 85°

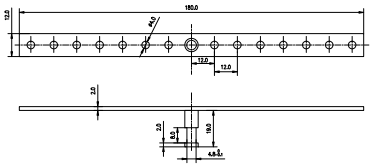


For 5° to 45° (diagram 1)
1. Loosen screw of the mechanical limiter plate.
2. Move the limiter plate to the appropriate position.
3. Tighten the screw.

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.

Dimensions (mm)





Spring-return damper actuator, 5 Nm

SR5

Description

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

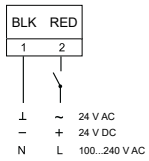
- For air dampers up to approx. 1 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 16 mm round / □ 7 to 11 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

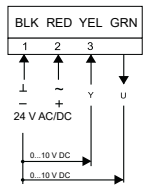
Actuator model		SR5A	SR5AM	SR5B
Damper area	m²		1	
Nominal torque	Nm		5	
Power supply	V	24 AC/DC	24 AC/DC	100...240 AC
Frequency	Hz		50/60	
Power consumption				
- in operation	W	5.0	5.0	6.0
- at rest	W		2.5	
- for wire sizing	VA		7.0	
Running time for motor	s		50...70	
Running time for spring	s		<20	
Sound power level	db (A)		< 45	
Control signal		2 point, on-off	0...10 V DC	2 point, on-off
Auxilary switch rating			3 (1.5) A, AC 250 V	
Life Cycle	cycles		60.000	
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			5...95% RH, non-condensating	
Storage temperature			-30...+80° C	
Manual override			by means of hand crank and locking switch	
Maintenance			free	
Weight	g	1800	1800	1900
Standards			CE-conformity, RoHs	
Option			suffix S for models with 2 SPDT auxiliary switches	

Electrical wirings

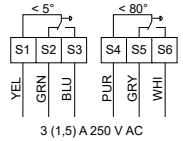
Wiring diagram On/Off



Wiring diagram proportional

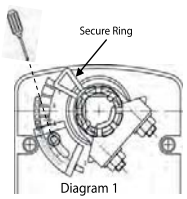


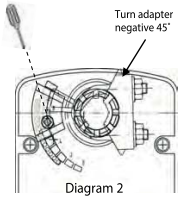
Auxiliary switches



Settings

Limitation of rotation angle from 5° to 85°



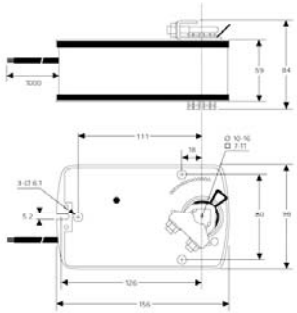


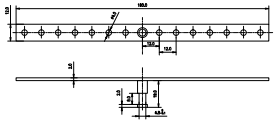
For 5° to 45° (diagram 1)
1. Loosen screw of the mechanical limiter plate.
2. Move the limiter plate to the appropriate position.
3. Tighten the screw.

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.

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.

Dimensions (mm)





Spring-return damper actuator, 10 Nm

SR10

Description

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

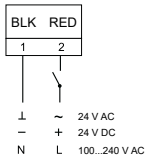
- For air dampers up to approx. 2 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 21 mm round / □ 6 to 15 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

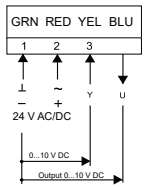
Actuator model		SR10A	SR10AM	SR10B
Damper area	m²		2	
Nominal torque	Nm		10	
Power supply	V	24 AC/DC	24 AC/DC	100...240 AC
Frequency	Hz		50/60	
Power consumption				
- in operation	W	5.0	5.0	6.5
- at rest	W		2.5	
- for wire sizing	VA		10.0	
Running time for motor	s		60...100	
Running time for spring	s		25	
Sound power level	db (A)		50 (motor), 62 (spring)	
Control signal		2 point, on-off	0...10 V DC	2 point, on-off
Auxilary switch rating			3 (1,5) A, AC 250 V	
Life Cycle	cycles		60.000	
Rotation angle				
- operating			0-90°	
- limitation			5-85° (steps of 5°)	
Protection class		III	III	II
Protection degree			IP54	
Working range °C			-20...+50° C	
Working range RH			5...95% RH, non-condensating	
Storage temperature			-30...+80° C	
Manual override			by means of hand crank and locking switch (only ON-OFF models)	
Maintenance			free	
Weight	g		2300	
Standards			CE-conformity, RoHs	
Option			suffix S for models with 2 SPDT auxiliary switches	

Electrical wirings

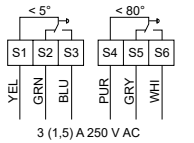
Wiring diagram, On-Off



Wiring diagram, Proportional



Auxiliary switches



3 (1,5) A 250 V AC

Settings

Limitation of rotation angle from 5° to 85°

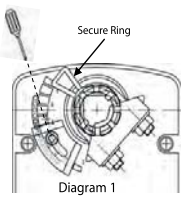


Diagram 1
5° to 45° Adjustment

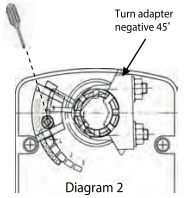


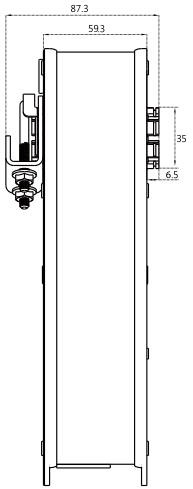
Diagram 2
45° to 85° Adjustment

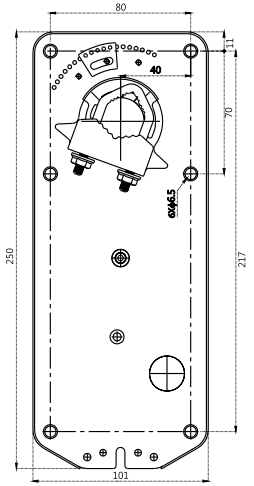
For 5° to 45° (diagram 1)
1. Loosen screw of the mechanical limiter plate.
2. Move the limiter plate to the appropriate position.
3. Tighten the screw.

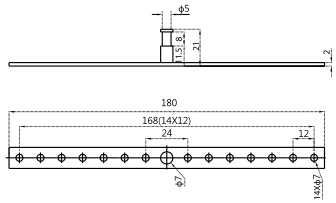
For 45° to 85° (diagram 2)
1. Release the secure ring of the adapter.
2. Remove the adapter and turn negative 45° as shown.
3. Insert adapter and secure the adapter ring.
4. Loosen screw of the mechanical limiter plate.
5. Move the limiter plate to the appropriate position.
6. Tighten the screw.

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.

Dimensions (mm)







Spring-return damper actuator, 15 Nm

SR15

Description

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

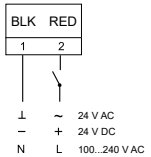
- For air dampers up to approx. 3 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 19 mm round / □ 10 to 16 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

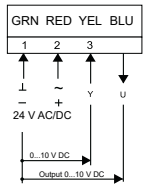
Actuator model		SR15A	SR15AM	SR15B
Damper area	m²		3	
Nominal torque	Nm		15	
Power supply	V	24 AC/DC	24 AC/DC	240 AC
Frequency	Hz		50/60	
Power consumption				
- in operation	W	6,5	6,5	7,0
- at rest	W		3,0	
- for wire sizing	VA		10,0	
Running time for motor	s		110...130	
Running time for spring	s		25	
Sound power level	db (A)		50 (motor), 62 (spring)	
Control signal		2 point, on-off	0...10 V DC	2 point, on-off
Auxilary switch rating			3 (1,5) A, AC 250 V	
Life Cycle	cicli		60.000	
Rotation angle				
- operating			0-90°	
- limitation			5-85° (steps of 5°)	
Protection class		III	III	II
Protection degree			IP54	
Working range °C			-20...+50° C	
Working range RH			5...95% RH, non-condensating	
Storage temperature			-30...+80° C	
Manual override			by means of hand crank and locking switch (only ON-OFF models)	
Maintenance			free	
Weight	g		2700	
Standards			CE-conformity, RoHs	
Option			suffix S for models with 2 SPDT auxiliary switches	

Electrical wirings

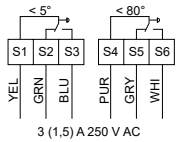
Wiring diagram, On-Off



Wiring diagram, Proportional

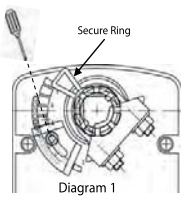


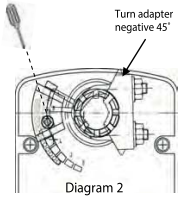
Auxiliary switches



Settings

Limitation of rotation angle from 5° to 85°



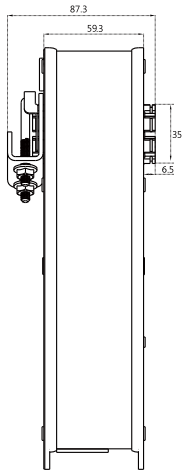


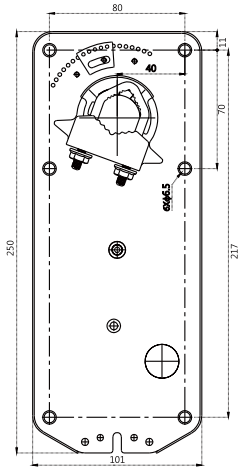
For 5° to 45° (diagram 1)
1. Loosen screw of the mechanical limiter plate.
2. Move the limiter plate to the appropriate position.
3. Tighten the screw.

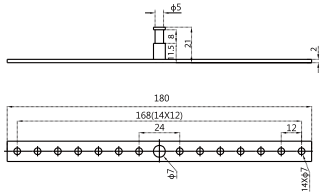
For 45° to 85° (diagram 2)
1. Release the secure ring of the adapter.
2. Remove the adapter and turn negative 45° as shown.
3. Insert adapter and secure the adapter ring.
4. Loosen screw of the mechanical limiter plate.
5. Move the limiter plate to the appropriate position.
6. Tighten the screw.

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.

Dimensions (mm)







Spring-return damper actuator, 20 Nm

SR20

Description

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

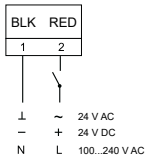
- For air dampers up to approx. 4 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point, on-off and proportional
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10 to 19 mm round / □ 10 to 16 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

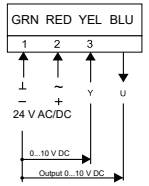
Actuator model		SR20A	SR20AM	SR20B
Damper area	m²		4	
Nominal torque	Nm		20	
Power supply	V	24 AC/DC	24 AC/DC	240 AC
Frequency	Hz		50/60	
Power consumption				
- in operation	W	6,5	6,5	7,0
- at rest	W		3,0	
- for wire sizing	VA		10,0	
Running time for motor	s		<180	
Running time for spring	s		<30	
Sound power level	db (A)		50 (motor), 62 (spring)	
Control signal		2 point, on-off	0...10 V DC	2 point, on-off
Auxilary switch rating			3 (1,5) A, AC 250 V	
Life Cycle	cicli		60.000	
Rotation angle				
- operating			0-90°	
- limitation			5-85° (steps of 5°)	
Protection class		III	III	II
Protection degree			IP54	
Working range °C			-20...+50° C	
Working range RH			5...95% RH, non-condensating	
Storage temperature			-30...+80° C	
Manual override			by means of hand crank and locking switch (only ON-OFF models)	
Maintenance			free	
Weight	g		2700	
Standards			CE-conformity, RoHs	
Option			suffix S for models with 2 SPDT auxiliary switches	

Electrical wirings

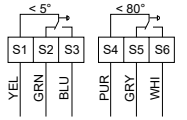
Wiring diagram, On-Off



Wiring diagram, Proportional



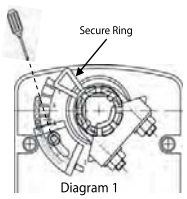
Auxiliary switches

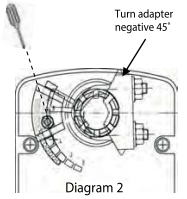


3 (1,5) A 250 V AC

Settings

Limitation of rotation angle from 5° to 85°



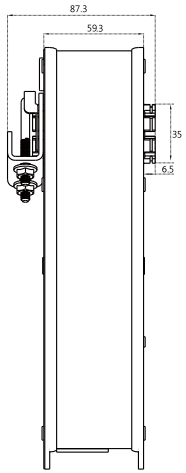


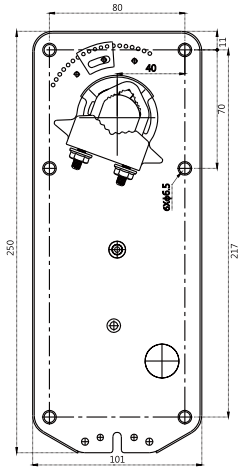
For 5° to 45° (diagram 1)
1. Loosen screw of the mechanical limiter plate.
2. Move the limiter plate to the appropriate position.
3. Tighten the screw.

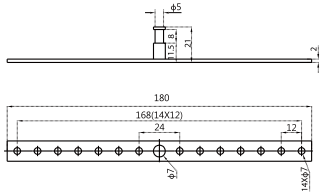
For 45° to 85° (diagram 2)
1. Release the secure ring of the adapter.
2. Remove the adapter and turn negative 45° as shown.
3. Insert adapter and secure the adapter ring.
4. Loosen screw of the mechanical limiter plate.
5. Move the limiter plate to the appropriate position.
6. Tighten the screw.

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.

Dimensions (mm)







Fire and smoke spring return damper actuator, 3 Nm

ST3

Description

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

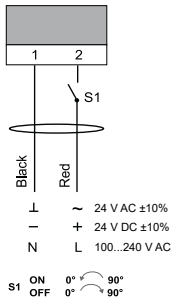
- For air dampers up to approx. 0,6 m²
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions standard □12/12 mm square, minimum shaft length 90 mm, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

Technical features

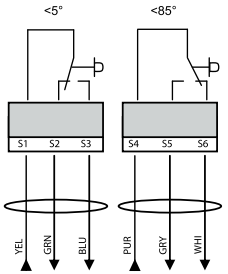
Actuator model		ST3AT	ST3BT
Damper area	m²	0,6	
Nominal torque	Nm	3	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	5	
- at rest	W	3	
- for wire sizing	VA	7,0	
Running time for motor	s	<75	
Running time for spring	s	< 25	
Sound power level	db (A)	45	
Control signal		2 point, on-off	
Auxiliary switch rating		3 (1,5) A, AC 230 V	
Life cycle	cycles	60.000	
Rotation angle			
- operating		90° (95° mechanical)	
- 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		5...95% RH, non-condensating	
Storage temperature		-30...+80° C	
Maintenance		free	
Weight	g	<1300	
Standards		CE-conformity, RoHs	

Electrical wirings

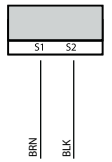
Wiring diagram



Auxiliary switches

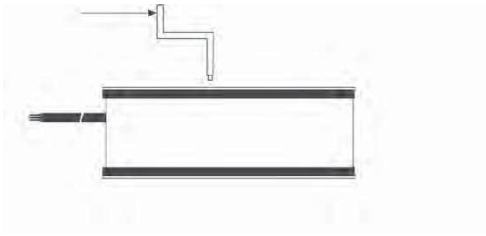


Thermal sensor

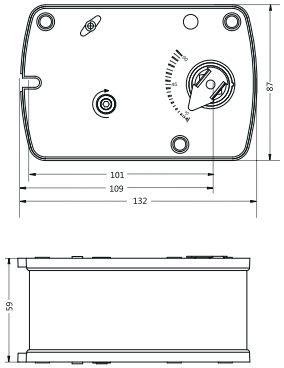


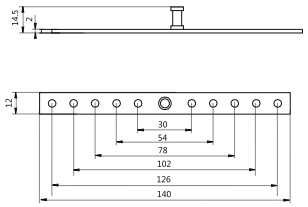
Setting

Manual override

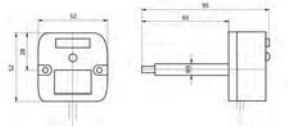


Dimensions (mm)





Thermal sensor



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

Fire and smoke spring return damper actuator, 5 Nm

ST5

Description

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

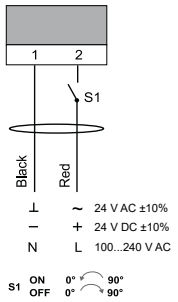
- For air dampers up to approx. 1 m²
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions standard □12/12 mm square, minimum shaft length 90 mm, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

Technical features

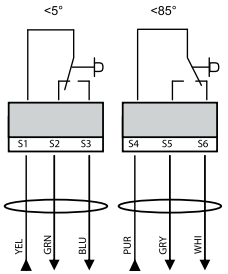
Actuator model		ST5AT	ST5BT
Damper area	m²	1	
Nominal torque	Nm	5	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	5	
- at rest	W	3	
- for wire sizing	VA	7,0	
Running time for motor	s	<70	
Running time for spring	s	< 20	
Sound power level	db (A)	45	
Control 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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature		-30...+80° C	
Maintenance		free	
Weight	g	<2000	
Standards		CE-conformity, RoHs	

Electrical wirings

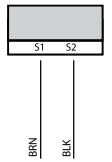
Wiring diagram



Auxiliary switches

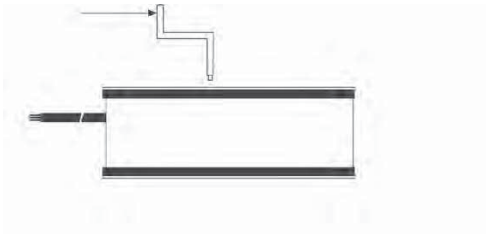


Thermal sensor

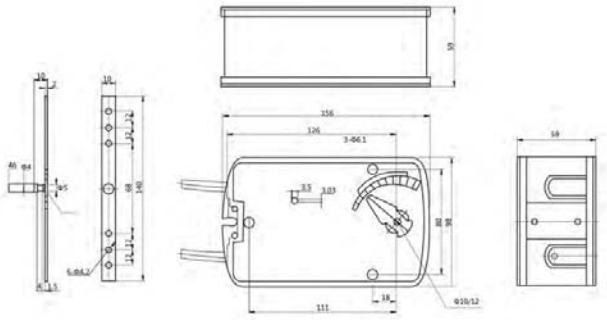


Setting

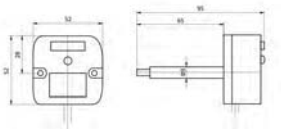
Manual override



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°C in one of the two zones. There is a test button on the sensor.

Fire and smoke spring return damper actuator, 10 Nm

ST10

Description

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

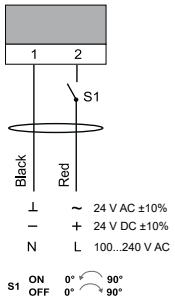
- For air dampers up to approx. 1,5 m²
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions □12/12 mm square, minimum shaft length 90 mm, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

Technical features

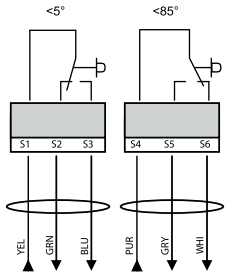
Actuator model		ST10AT	ST10BT
Damper area	m²	1,5	
Nominal torque	Nm	10	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	5	
- at rest	W	3	
- for wire sizing	VA	7,0	
Running time for motor	s	<100	75...95
Running time for spring	s	< 25	
Sound power level	db (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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature range		-30...+80° C	
Maintenance		free	
Weight	g	<2300	
Standards		CE-conformity, RoHs	

Electrical wirings

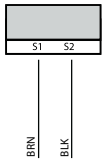
Wiring diagram



Auxiliary switches

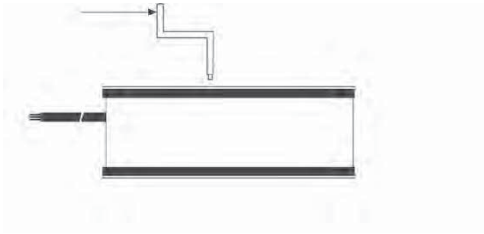


Thermal sensor

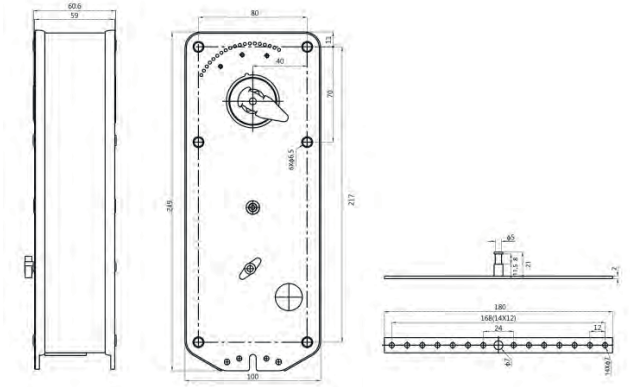


Setting

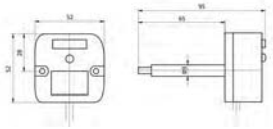
Manual override



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°C in one of the two zones. There is a test button on the sensor.

Fire and smoke spring return damper actuator, 15 Nm

ST15

Description

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

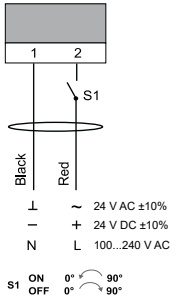
- For air dampers up to approx. 3 m²
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions □12/12 mm square, minimum shaft length 90 mm, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

Technical features

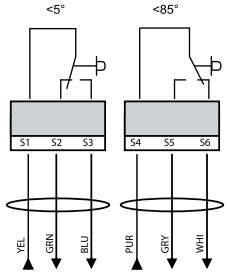
Actuator model		ST15AT	ST15BT
Damper area	m²	3	
Nominal torque	Nm	15	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	8	
- at rest	W	2,5	
- for wire sizing	VA	7,0	
Running time for motor	s	<150	
Running time for spring	s	< 25	
Sound power level	db (A)	45	
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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature range		-30...+80° C	
Maintenance		free	
Weight	g	<2600	
Standards		CE-conformity, RoHs	

Electrical wirings

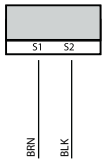
Wiring diagram



Auxiliary switches

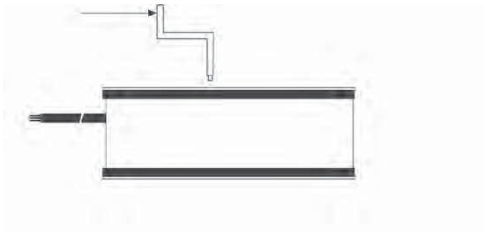


Thermal sensor

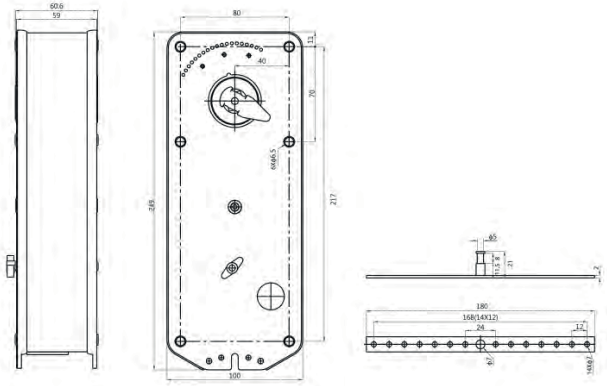


Setting

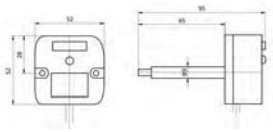
Manual override



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°C in one of the two zones. There is a test button on the sensor.

Fire and smoke spring return damper actuator, 20 Nm

ST20

Description

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

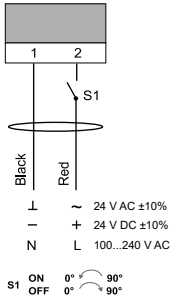
- For air dampers up to approx. 4 m²
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2-point, on-off
- Caracteristics: shaft dimensions □12/12 mm square, minimum shaft length 90 mm, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection, thermal duct sensor included.

Technical features

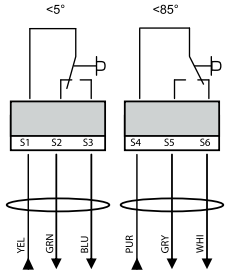
Actuator model		ST20AT	ST20BT
Damper area	m²	4	
Nominal torque	Nm	20	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	8	
- at rest	W	2,5	
- for wire sizing	VA	7,0	
Running time for motor	s	<180	
Running time for spring	s	< 30	
Sound power level	db (A)	<45	
Control signal		2 point, on-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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature range		-30...+80° C	
Maintenance		free	
Weight	g	<2600	
Standards		CE-conformity, RoHs	

Electrical wirings

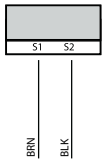
Wiring diagram



Auxiliary switches

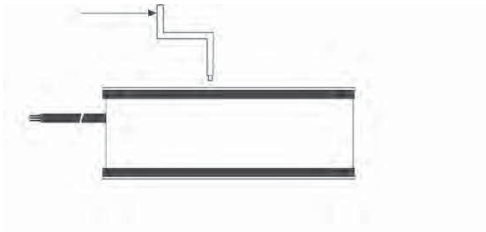


Thermal sensor

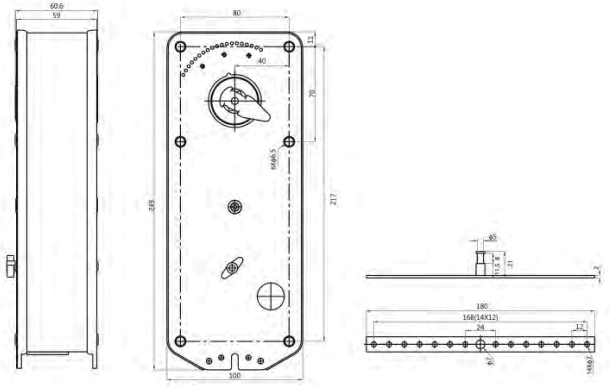


Setting

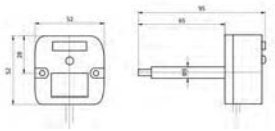
Manual override



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°C in one of the two zones. There is a test button on the sensor.

Smoke control damper actuator, 10 Nm

SF10

Description

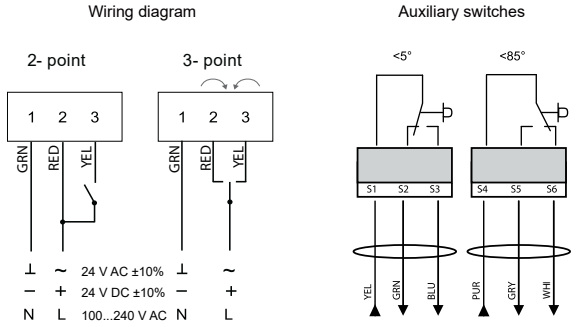
Damper actuator serie SF10 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 1,5 m²
- 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, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection.

Technical features

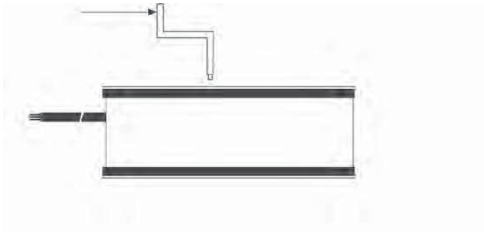
Actuator model		SF10A	SF10B
Damper area	m²	1,5	
Nominal torque	Nm	10	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	5	
- at rest	W	0,5	
- for wire sizing	VA	7,0	
Running time	s	<45	
Sound power level	db (A)	45	
Control signal		2 and 3 point	
Auxiliary 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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature		-30...+80° C	
Maintenance		free	
Weight	g	<1800	
Standards		CE-conformity, RoHs	

Electrical wirings

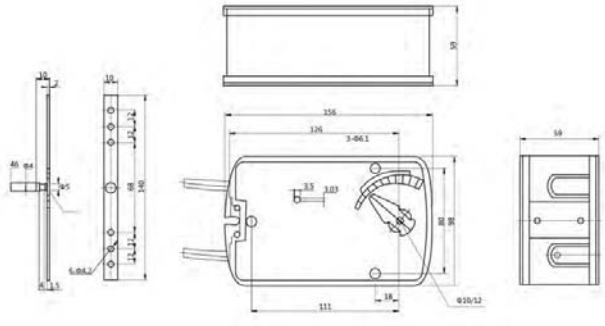


Setting

Manual override



Dimensions (mm)



Smoke control damper actuator, 15 Nm

SF15

Description

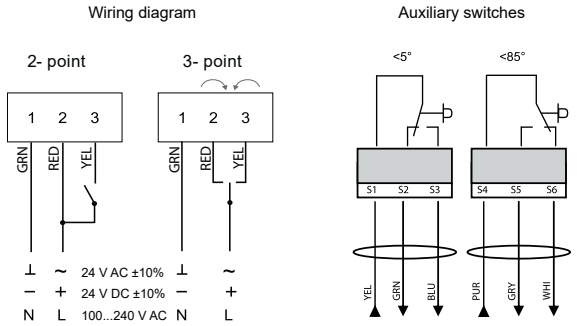
Damper actuator serie SF15 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 2 m²
- 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, anti-rotation bracket provided for stability, selectable direction of rotation, 2 not adjustable SPDT auxiliary switches, 1 m cable connection.

Technical features

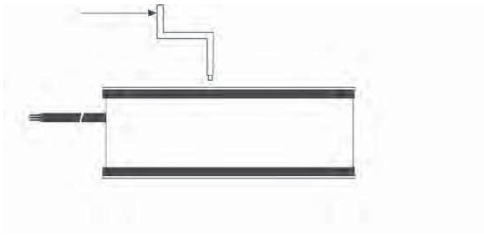
Actuator model		SF15A	SF15B
Damper area	m²	2	
Nominal torque	Nm	15	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	5	
- at rest	W	0,5	
- for wire sizing	VA	7,0	
Running time	s	<30	
Sound power level	db (A)	45	
Control signal		2 and 3 point	
Auxiliary switch 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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature		-30...+80° C	
Maintenance		free	
Weight	g	<1800	
Standards		CE-conformity, RoHs	

Electrical wirings

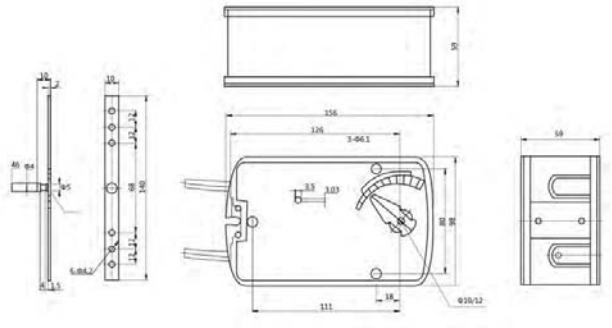


Setting

Manual override



Dimensions (mm)



Smoke control damper actuator, 30 Nm

SF30

Description

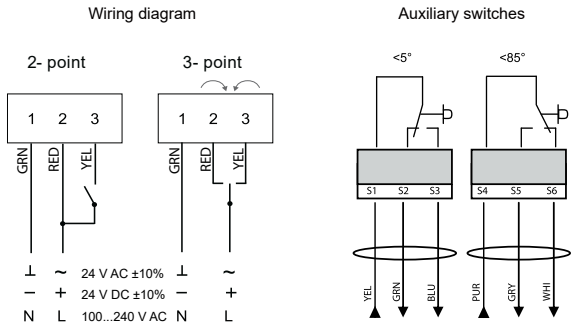
Damper actuator serie SF30 to operate and position air dampers in HVAC systems.

- For air dampers up to approx. 4 m^2
- Nominal voltage 24 V AC/DC and 100...240 V AC
- Control: 2 and 3-point
- Caracteristics: shaft dimensions standard □12/12 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.

Technical features

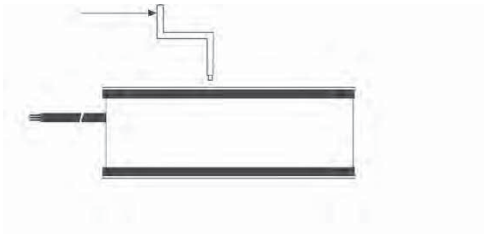
Actuator model		SF30A	SF30B
Damper area	m^2	4	
Nominal torque	Nm	30	
Power supply	V	24 AC/DC	100...240 AC
Frequency	Hz	50/60	
Power consumption			
- in operation	W	7	8
- at rest	W	2.0	2.5
- for wire sizing	VA	8.0	
Running time	s	115	
Sound power level	db (A)	<45	
Control signal		2 and 3 point	
Auxiliary 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	II
Protection degree		IP54	
Working temperature °C		-20...+50° C	
Working humidity RH		5...95% RH, non-condensating	
Storage temperature		-30...+80° C	
Maintenance		free	
Weight	g	<2200	
Standards		CE-conformity, RoHs	

Electrical wirings

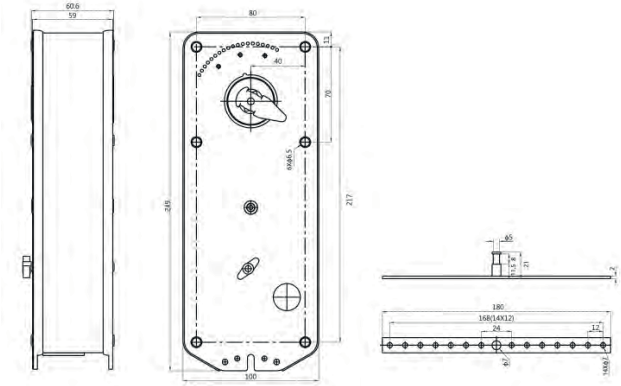


Setting

Manual override



Dimensions (mm)



Description

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

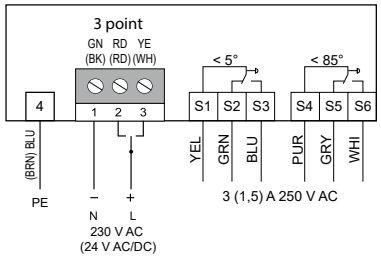
- For air dampers up to approx. 3 m² up to 9 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 3-point
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10...16 mm / 7...11 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

Actuator model		SX10A	SX10B	SX20A	SX20B	SX30A	SX30B
Damper area	m²	3		6		9	
Nominal torque	Nm	10		20		30	
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		10		12	
- at rest	W	3					
Running time	s	< 150					
Sound power level	db (A)	50					
Control signal		3 points, on-off					
Auxilary switch rating		3 (1,5) A, AC 250 V					
Life Cycle	cycles	> 70.000					
Rotation angle		Max 93°					
Protection class		III	II	III	II	III	II
Protection degree		IP66					
Working range °C		-20...+60° C					
Working range RH		5...95% RH, non-condensating					
Storage temperature		-40...+70° C					
Maintenance		free					
Standards		Conformità CE, RoHs, ATEX 2014/34/UE					
ATEX		Ex d II B T6 Gb Ex IIIC T85°C Db					
Application		Zone 1 and zone 2, zone 21 and zone 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 ".

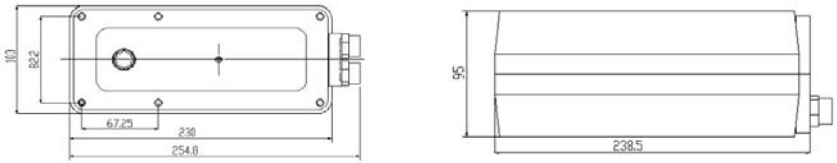
Electrical wirings



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 mm² 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.

Dimensions (mm)



Spring-return damper actuator, ATEX version

SRX

Description

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

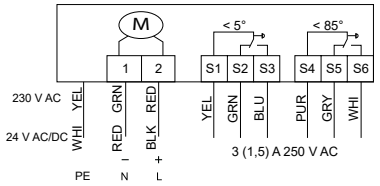
- For air dampers up to approx. 1 m² up to 4,5 m²
- Nominal voltage 24 Vac/dc and 230 Vac
- Control: 2-point with spring return
- Caracteristics: universal spindle clamp fo easy direct mounting, shaft dimensions Ø 10...16 mm / 7...11 mm square, minimum shaft length 80 mm, anti-rotation bracket provided for stability, selectable direction of rotation, adjustable angle of rotation, 1 m cable connection.

Technical features

Actuator model		SRX5A	SRX5B	SRX10A	SRX10B	SRX15A	SRX15B
Damper area	m²	1		3		4,5	
Nominal torque	Nm	5		10		15	
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					
- at rest	W	3					
Running time for motor	s	< 150					
Running time for spring	s	< 30					
Sound power level	db (A)	50...62					
Control signal		2 points, on-off					
Auxilary switch rating		3 (1,5) A, AC 250 V					
Life Cycle	cycles	> 70.000					
Rotation angle		Max 93°					
Protection class		III	II	III	II	III	II
Protection degree		IP66					
Working range °C		-20...+60° C					
Working range RH		5...95% RH, non-condensating					
Storage temperature		-40...+70° C					
Maintenance		free					
Standards		Conformità CE, RoHs, ATEX 2014/34/UE					
ATEX		Ex d II B T6 Gb Ex IIIC T85°C Db					
Application		Zone 1 and zone 2, zone 21 and zone 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 ".

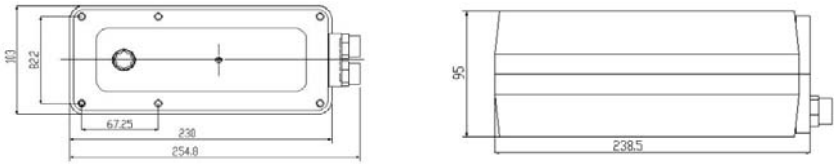
Electrical wirings



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 mm² 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.

Dimensions (mm)



greenline

motorized valves

Motorized valve with electrothermal actuator

VB, SVB

Description

The motorized valve serie VB are used in heating and air-conditioning systems for the flow control of heated or chilled water and are motorized by the electrothermal actuator serie 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
Nominal pressure	16 bar
Stroke	3 mm
Leakage	Perfect sealing
Connection type	Male thread
Installation position	See drawing
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

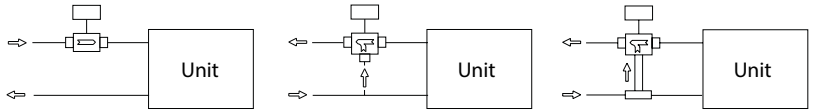
Technical specifications actuator SVB

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^2
Protection degree	IP54
Protection class	II
Working range RH	0...95% RH, non-condensing
Working range °C	-5...+50°C
Storage temperature	-25...+60°C
Standards	CE-conformity, RoHS

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

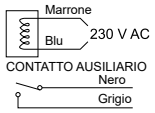
Before mounting the valve body be sure that the pipes are clean, free of soldering scraps and that the plug can glide freely. Note direction of flow reported on the valve body. 3-way-valves should be preferably used as mixing valves.
The mounting diagrams are as following:



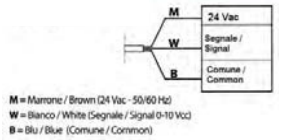
2-way valve | 3-way valve | 3-way valve with 4 ports

Wiring

2 points / on/off



Proportional

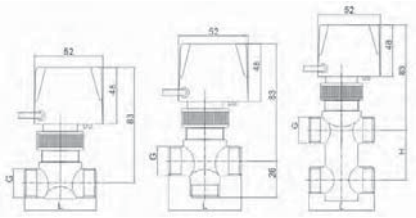


Indication

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

Dimensions (mm)

Models	Way	L	G	H
VB215	2	52	G 1/2	
VB220	2	56,5	G 3/4	
VB225	2	65	G 1	
VB315	3	52	G 1/2	
VB320	3	56,5	G 3/4	
VB325	3	65	G 1	
VB415	3 (4 port)	52	G 1/2	40
VB420	3 (4 port)	56,5	G 3/4	50
VB425	3 (4 port)	65	G 1	50



Description

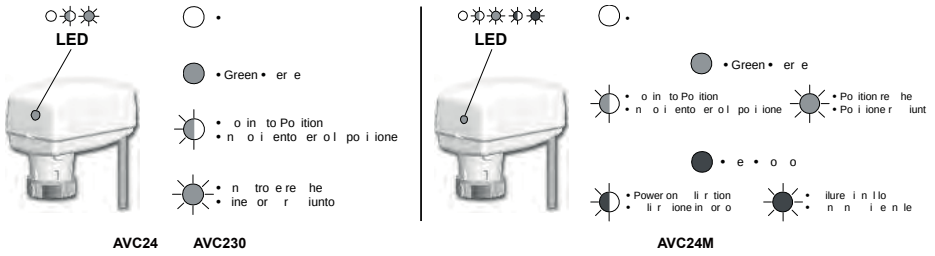
The AVC series provides floating or proportional control in HVAC applications. The compact design of this actuator makes it suitable for installation in confined spaces, such as fan coil, chilled ceiling, manifolds, etc.
The AVC series actuator is designed for field mounting onto VB terminal unit valves.
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	8 sec/mm
Connection	Metal ring M30 x 1.5
Cable	1,5 m cable lenght 3 x 0,35 mm²
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

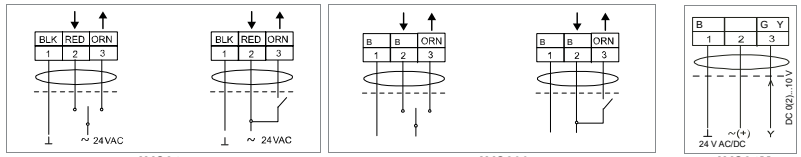
Models	Power supply	Action
AVC230	230 V AC	floating
AVC24	24 V AC	floating
AVC24M	24 V AC/DC	proportional

LED indicator



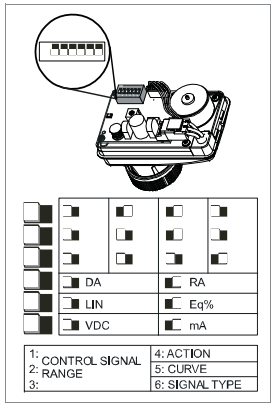
AVC24 **AVC230** **AVC24M**

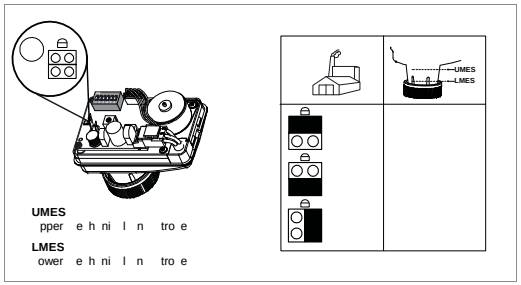
Electrical wiring



AVC24 **AVC230** **AVC24M**

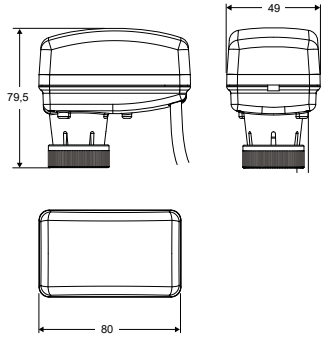
Settings for proportional version





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.

Dimensions (mm)



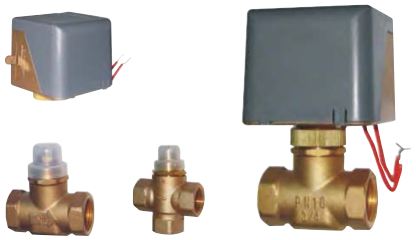
VZ, SVZ

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.

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
Valve stem	Stainless steel 302
Sealing	NBR
Dimensions and weights	See schedule



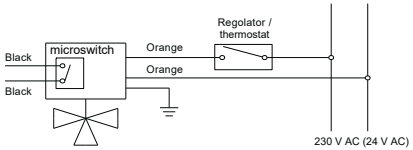
Models	Thread	Ways	KVs	Max. differential pressure (bar)
VZ215	G 1/2	2	2,5	2,5
VZ220	G 3/4	2	3,5	1,0
VZ225	G 1	2	4,0	0,6
VZ315	G 1/2	3	2,5	2,5
VZ320	G 3/4	3	3,5	1,0
VZ325	G 1	3	4,0	0,6

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 ≤ 10 s, closing ≤ 5 s
Materials	Aluminium base. Cover: ABS self-extinguishing
Protection degree	IP20
Protection class	II
Working range °C	0...+60°C
Working range RH	5...95% 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%	•

Electrical wirings



Installation

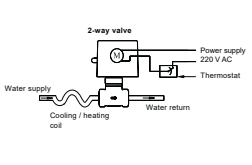


fig. 1

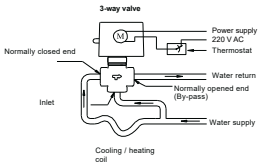


fig. 2

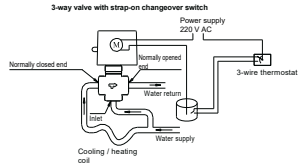
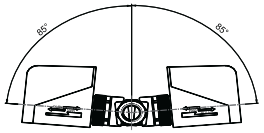


fig. 3

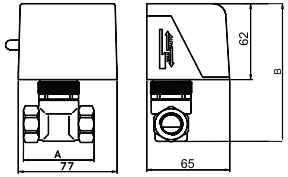
2-way valves normally closed: the flow direction is shown in the figure (the valve closes against the water flow, fig.1).

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)

Important notes for fan-coil installations:
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.



Dimensions (mm)



Models	Dimensions in mm		Weight
	A	B	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
Stem	Brass
Seat	EPDM
Seal	HNVR double O-ring
Standards	CE-conformity, RoHS

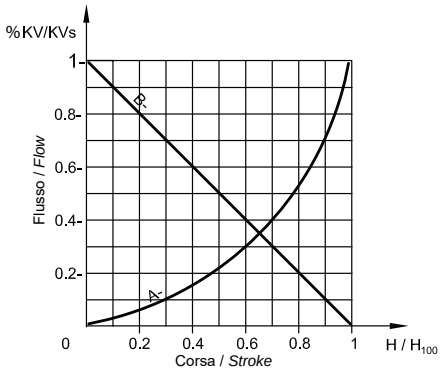
Models 2-way	Models 3-way	DN	KVs	Actuator type(*)	Actuator type	Actuator type with spring return(**)
VS215	**VS315**	15	4.0	S4..	S5..V	SR5..
VS220	**VS320**	20	6.3	S4..	S5..V	SR5..
VS225	**VS325**	25	10	S4..	S5..V	SR5..
VS232	**VS332**	32	16	S8..	S5..V	SR10..
VS240	**VS340**	40	25	S8..	S10..V	SR10..
VS250	**VS350**	50	40	S16..	S10..V	SR15..
VS250B	**VS350B**	50	63	S16..	S10..V	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

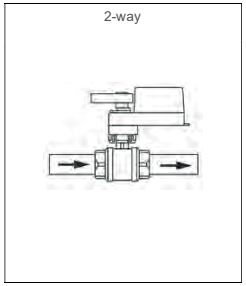
Control flow characteristics

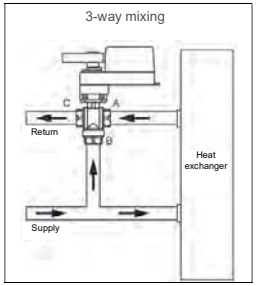


A-C equal-percentage way
B-C bypass lineare way
3-way used as mixing inlet in A and B, outlet C
3-way used as diverting inlet in C, outlet from A and B

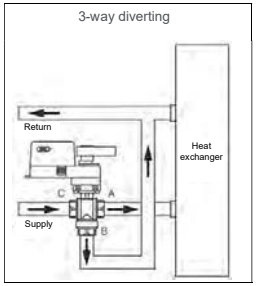
C way	constant flow
A way	variable flow
B (bypass) way	variable flow

Installation



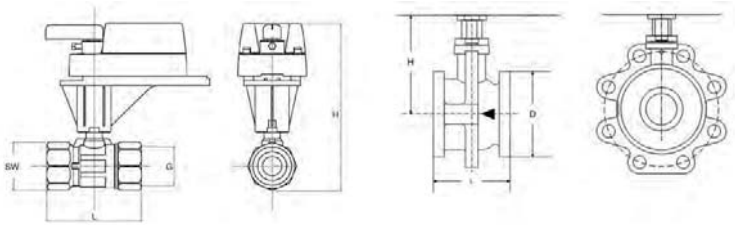


Mixing application:
Fluid enters through two inlets (A & B) and exits through one outlet (C).



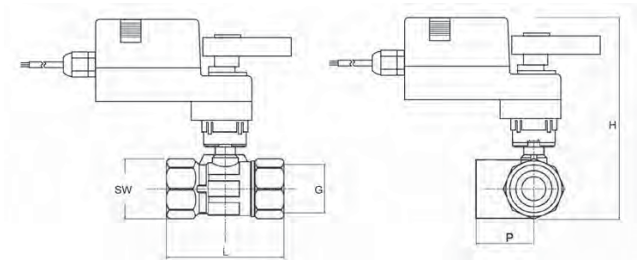
Diverting application:
Fluid enters through one inlet (C) and exits through two outlets (A & C).

Dimensions with actuator S4...S32 (mm)



DN mm	G	L	H	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	H	SW	P	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	-

Description

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

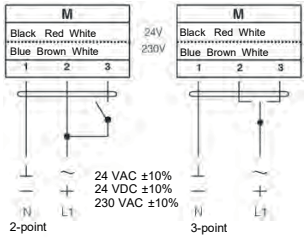
- For valves from DN15 to DN32
- Power supply 24 VAC / DC and 230 VAC
- Function: open / closed or 3 point and proportional action
- Shaft dimension □ 9 mm square (fixed)
- Direction of rotation selectable by switch
- Actuator with 1 m connection cable
- Optional 1 adjustable SPDT auxiliary switch

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		60...80	
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)				0...10 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			5...95% 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	

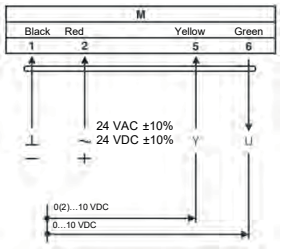
Electrical wirings

Wiring diagram S5AV / S5BV

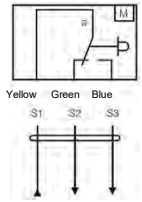


Connect via safety isolating transformer!

Wiring diagram S5AMV

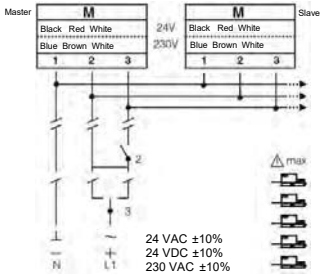


Wiring diagram S5AV / S5BV
Auxiliary switch



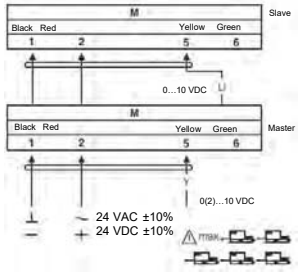
3 (1.5) A / 250 VAC
Actuator at 0° position

Wiring diagram S5AV / S5BV
Parallel connection



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

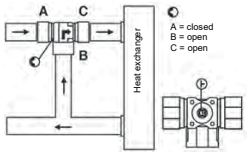
Wiring diagram S5AMV
Parallel connection



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.

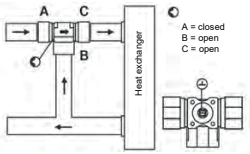
Installation

Mixing closed

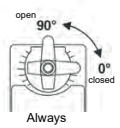


Ball valve actuators must operate CCW!

Mixing open

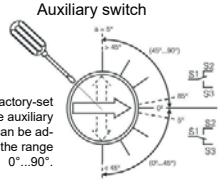


Actuator position

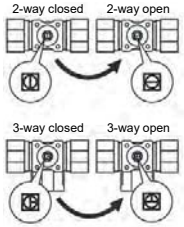


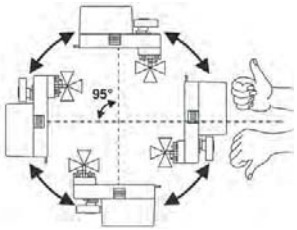
Always counter-clockwise rotation (CCW)!

Auxiliary switch

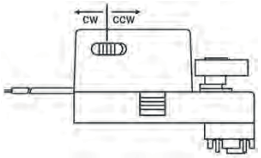


Switch a factory-set at 5°. The auxiliary switch can be adjusted in the range 0°...90°.



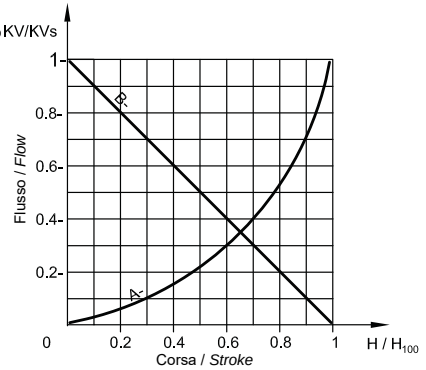


Change of rotation direction



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

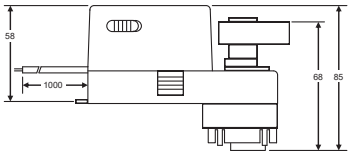
Control flow characteristics

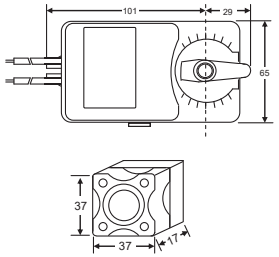


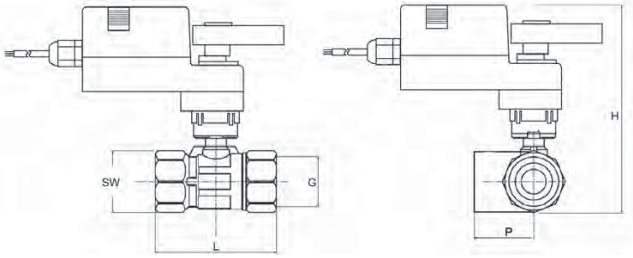
A-C equal-percentage way
B-C bypass lineare way
3-way used as mixing inlet in A and B, outlet C
3-way used as diverting inlet in C, outlet from A and B

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

Dimensions (mm)







DN mm	G	L	H	SW	P	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

Actuator for ball valves, 10 Nm

S10..V

Description

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

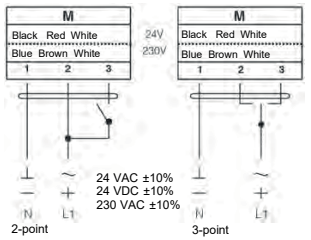
- For valves from DN40 to DN50
- Power supply 24 VAC / DC and 230 VAC
- Function: open / closed or 3 point and proportional action
- Shaft dimension □ 9 mm square (fixed)
- Direction of rotation selectable by switch
- Actuator with 1 m connection cable
- Optional 1 adjustable SPDT auxiliary switch

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		70...90	
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)				0...10 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			5...95% 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	

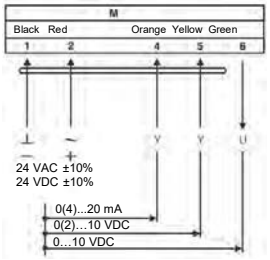
Electrical wirings

Wiring diagram S10AV / S10BV

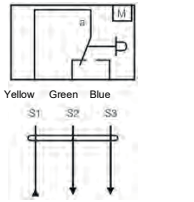


Connect via safety isolating transformer!

Wiring diagram S10AMV

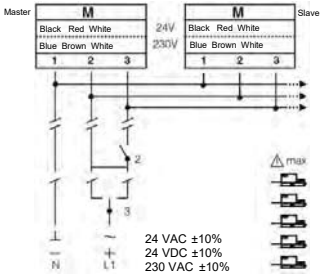


Wiring diagram S10AV / S10BV
Auxiliary switch



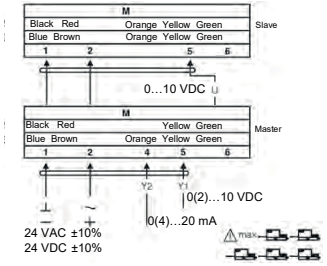
3 (1.5) A / 250 VAC
Actuator at 0° position

Wiring diagram S10AV / S10BV
Parallel connection



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

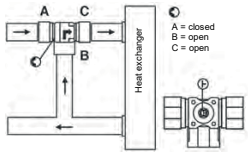
Wiring diagram S10AMV
Parallel connection



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.

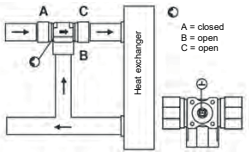
Installation

Mixing closed

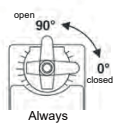


Ball valve actuators must operate CCW!

Mixing open

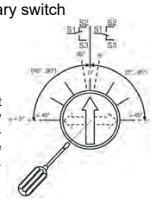


Actuator position

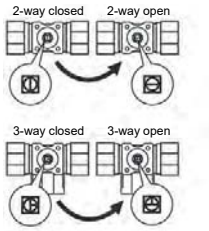


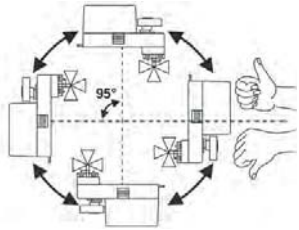
Always counter-clockwise rotation (CCW)!

Auxiliary switch

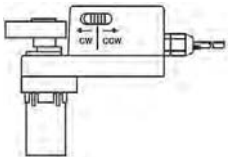


Switch a factory-set at 5°. The auxiliary switch can be adjusted in the range 0°...90°.



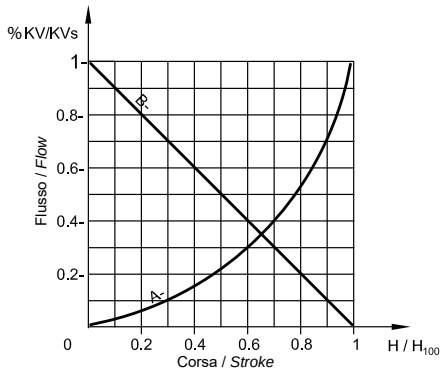


Change of rotation direction



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

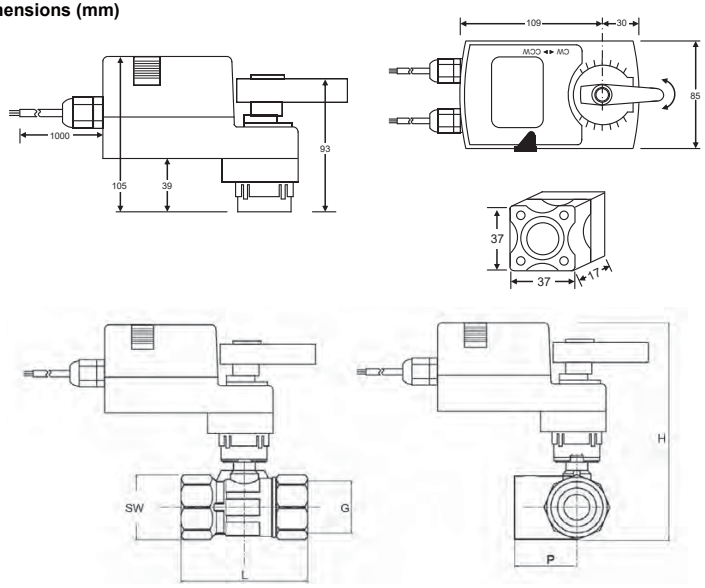
Control flow characteristics



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)



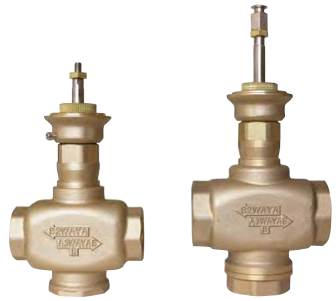
DN mm	G	L	H	SW	P	weight 2 way (kg)	weight 3 way (kg)
40	G 1" 1/2	106	181,60	56	52	1,2	1,4
50	G 2"	128	192.70	70	69	1,95	2,2
65	Flange 145	97	136	-		4,5	-
80	Flange 160	108	140	-		6,8	-
100	Flange 180	120	202	-		8,6	-

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%)
Fluid temperature	-10...100°C
Nominal pressure	1600 kPa max (16 bar)
Control flow characteristics	Equal-percentage (linear on angle way)
Rangeability	50 : 1
Leakage	< 0,05% of KVs
Connections	BSP female thread
Stroke	See schedule
Installation position	Horizontal or vertical
Maintenance	Free
Body	Brass
Plug	Ottone
Valve stem	Stainless steel 302
Stem packing	PTFE
Dimensions and weight	See schedule



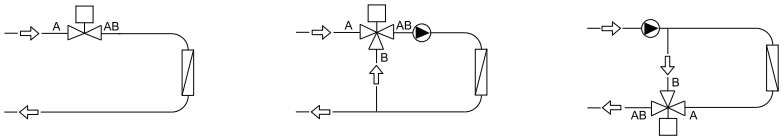
Models 2 ways	Models 3 ways	DN	KVs	Max differential pressure (bar) (*)	Stroke	Actuator
VG215	**VG315**	15	4.0	2.5 (6)	15	AVG6(M)
VG220	**VG320**	20	6.3	2.5 (6)	15	AVG6(M)
VG225	**VG325**	25	8	2.5 (6)	20	AVG6(M)
VG232	**VG332**	32	16	2.5 (5.5)	20	AVG6(M)
VG240	**VG340**	40	25	2.5 (4.5)	20	AVG6(M)
VG250	**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.

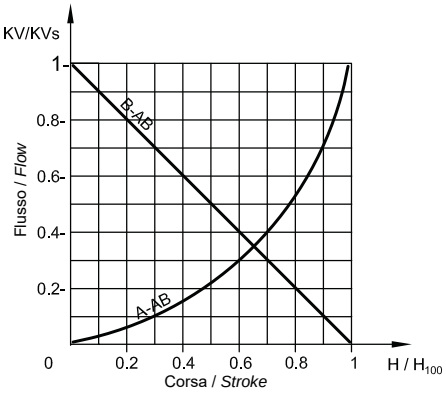
Caution

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.

Installation



Control flow characteristics

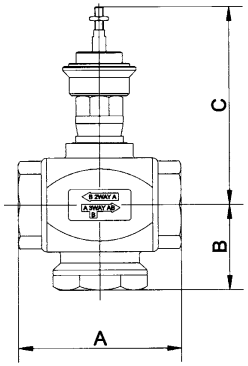


A-AB equal-percentage way
B-AB bypass lineare way
3-way used as mixing inlet in A and B, outlet AB
3-way used as diverting inlet in AB, outlet from A and B

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

Dimensions and weights

Models	Thread	Dimensions (mm)			Weight
		A	B	C	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



AVG6

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.

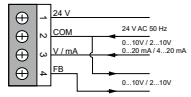
Technical specifications

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, 1...95% RH, non-condensing
Fluid temperature	< 150°C
Maintenance	Free

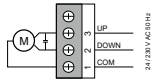
Models	Supply	Action	Consumption	Running time
AVG6	24 V AC, 50/60 Hz	on-off, floating	5,5 VA	70 sec. w/stroke 15 mm 92 sec. w/stroke 20 mm
AVG6B	230 V AC, 50/60 Hz	on-off, floating	5,5 VA	70 sec. w/stroke 15 mm 92 sec. w/stroke 20 mm
AVG6M	24 V AC, 50/60 Hz	proportional	5,5 VA	70 sec. w/stroke 15 mm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

Electrical wiring

AVG6M (proportional)
Terminal **J1**:
1: 24 V AC
2: Common
3: Input signal. 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). W1 e W2 must be set according to the input signal.
4: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC depending on the setting of W2.

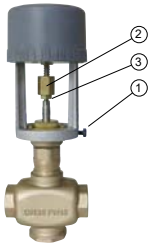


AVG6, AVG6B (on-off, floating)
1: Common
2: Stem down (direct way open)
3: Stem up (direct way close)



AVG6

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.

Setting AVG6M

W1: mA / V DC. 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 V DC) / 0...20 mA (0...10 V DC). This jumper must be set with W1 to select the input signal to J1.

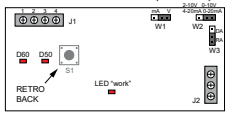
W3: Reverse operation. Moving the jumper inverts the logic of operation compared to the input signal.

LED Status indicator (work):

Normal operating status: flashes slowly (1 sec on, one sec off). During the self-adjustment of the actuator on the valve (after pressing S1 for at least 3 sec): flashing quickly (for 0.25 sec on, off 0.25 sec)

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)

Printed circuit board (AVG6M)



LED indication of the rotation direction of the motor:

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

When the LED **D50** lights up, the valve shaft moves upward. When the valve shaft reaches the top and hold the position for 25 sec, 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.

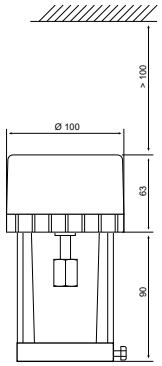
To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1" 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)



Actuator for screwed globe valve

AVG10

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

Power supply	See schedule
Electrical connection	Screw terminal
Torque	1000 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, 1...95% RH, non-condensing
Fluid temperature	< 150°C
Maintenance	Free

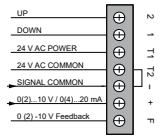
Models	Supply	Action	Consumption	Running time
AVG10	24 V AC, 50/60 Hz	on-off, floating	12 VA	105 sec.
AVG10B	230 V AC, 50/60 Hz	on-off, floating	12 VA	105 sec.
AVG10M	24 V AC, 50/60 Hz	proportional	12 VA	105 sec.

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.



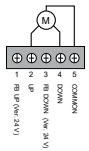
T1 T2: input terminal at 24 V AC. T2 is common terminal (T2 is connected with -).

- +: 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, AVG10B (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)
1: Feedback with stem up (24 V AC Ver.)



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 **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.

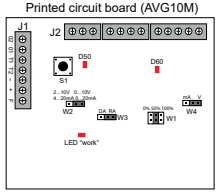
To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1" 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 problems of self-adjustment:

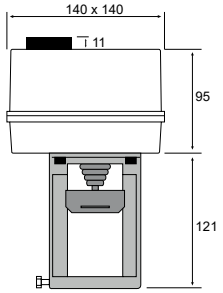
1: It occurs in the case where the stroke is reached less than half the nominal stroke.

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.

Printed circuit board (AVG10M)



Dimensions (mm)



Flanged globe valve

VF

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	-10...120°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

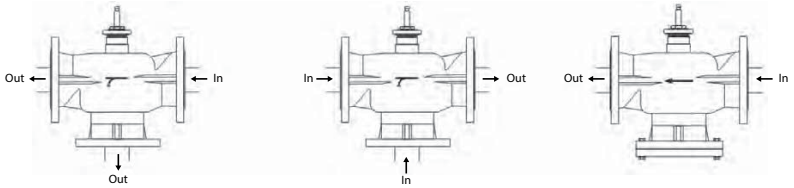
Models 2 ways	Models 3 ways	DN	KVs	Max differential pressure (bar) (*)	Stroke	Actuator
VF250	**VF350**	50	50	2,5 (6)	20	AVF12(M)
VF265	**VF365**	65	75	2,0 (6)	20	AVF12(M)
VF280	**VF380**	80	100	1,5 (6)	20	AVF12(M)
VF2100	**VF3100**	100	125	1,5 (6)	38	AVF18(M)
VF2125	**VF3125**	125	200	2 (5)	38	AVF30(M)
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

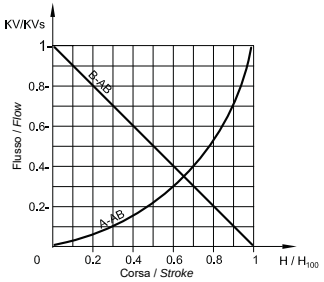
Before valves are mounted, make sure that pipes are clean, free from welding slags, that are perfectly lined up with valve body and not subjected to vibrations. The valve can be mounted in any position except upside-down. While assembling, respect the flow directions indicated by the arrows located on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

Installation



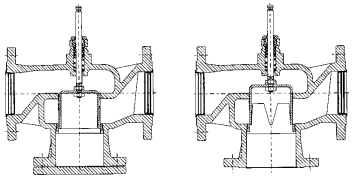
Diverting 3-way-valve | Mixing 3-way-valve | 2-way-valve

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

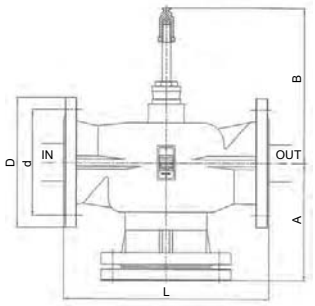
AB way	constant flow
A way	variable flow
B (bypass) way	variable flow



2 ways | 3 ways

Dimensions and weights

Models	Thread	Dimensions (mm)					Weight
	DN	D	d	L	A	B	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



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, 1...95% RH, non-condensing
Fluid temperature	< 150°C
Maintenance	Free

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**:

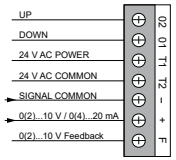
02: When short-circuiting with T2 (o -), then the stem goes completely up (direct way close).
The position of W3 has no effect.

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 -).

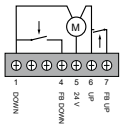
- +: Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC). W2 and W4 must be set according to the input signal.

F: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC depending on the setting of W2.

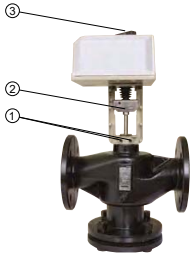


AVF.. (on-off, floating)

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)



Installation

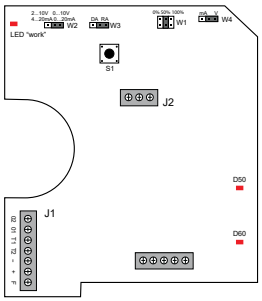


Place motor on the valve and, having placed in seat, tighten the 4 locking screw (1).

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.

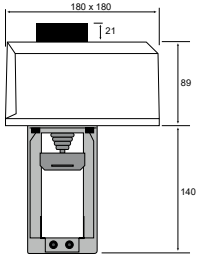
To self-adaptation occurred (the previous data is overwritten), the actuator returns to normal operation. Otherwise (the previous data is not overwritten), will be reported the failure of the state of self-adjustment (on 0.25 sec., off 0.25 sec., twice, then off by 1.25 sec.). You can hold down the "S1"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

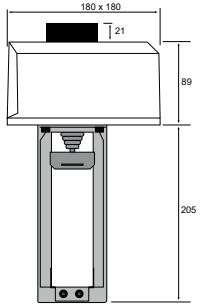
Possible errors of self-adjustment:

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)





AVF30

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
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, 1...95% RH, non-condensing
Fluid temperature	< 150°C
Maintenance	Free

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

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.

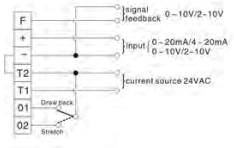
01: When short-circuiting with T2 (o -), then the stem goes completely down (direct way open).
The position of W3 has no effect.

T1 T2: input terminal at 24 V AC. T2 is common terminal (T2 is connected with -).

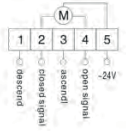
- +: Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC).

F: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC

AVF30M



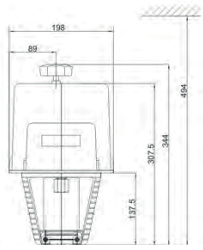
AVF30

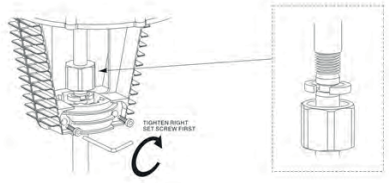


AVF30 (on-off, floating)

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

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

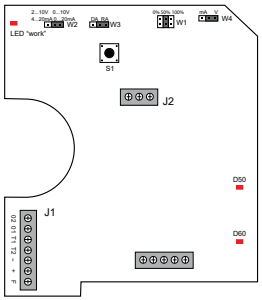
Moving the jumper W3, the situation is reversed.

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

W2: 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.

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
Electrical connection	Screw terminal
Torque	7000 N
Max. stroke	38 mm
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, 1...95% 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 175 sec: with 60 Hz
AVF70M	proportional		

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 -).

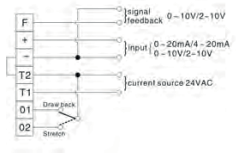
- +: Input signal 4...20 mA (2...10 V DC) / 0...20 mA (0...10 V DC).

F: Feedback signal. There is a signal 0...10 V DC or 2...10 V DC

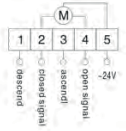
AVF70 (on-off, floating)

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

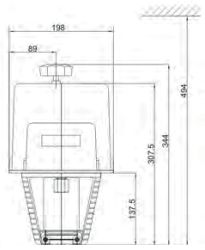
AVF70M

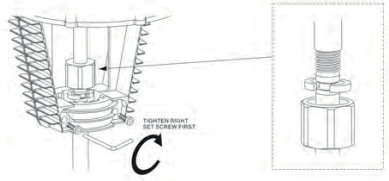


AVF70



Dimensions (mm)





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

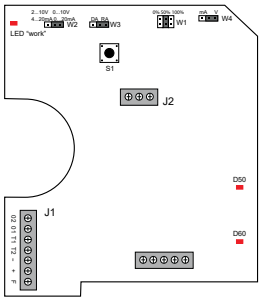
Moving the jumper W3, the situation is reversed.

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

W2: 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.

Description

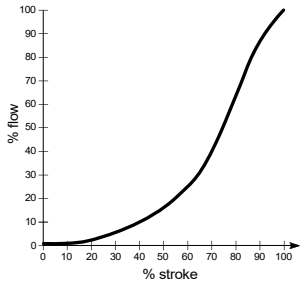
The VM series of butterfly valves (Wafer) are used in heating, refrigeration and air-conditioning systems for the flow control of heated or chilled water for domestic and industrial applications. The valves can be coupled with our 24 or 230 Vac modulating or 2-3 points actuators with or without auxiliary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

Technical specifications

Fluid	Hot and cold water (with glycole max. 50%)
Valve size	DN40 - DN150
Fluid speed	max. 4 m/s
Control flow characteristics	Equal-percentage
Body	Aluminium ADC12
Seat	EPDM
Shaft	X30Cr13 (AISI 420)
Disk	Cast iron EN-JS1030
Max working pressure	PN10
Maintenance	free
Working temperature	-30...+120°C
Storage temperature	+20...+80°C, dry and dust-free, far from direct sunlight
Standards	CE-conformity, RoHS

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

Flow control characteristic



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

Dimensions (mm)

DN	ISO	A	B	C	D	E
40	F05	139,5	194,5	76	262,5	33
50	F05	144,5	207,5	94	275,5	43
65	F05	159,5	231	111	299	46
80	F05	169,5	260,5	127	328,5	46
100	F05	189,5	295,5	151	363,5	52
125	F05	205,5	326,5	180	394,5	56
150	F07	219,5	352,5	206	420,5	56

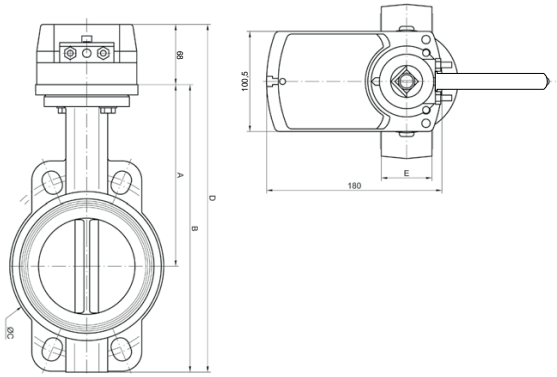
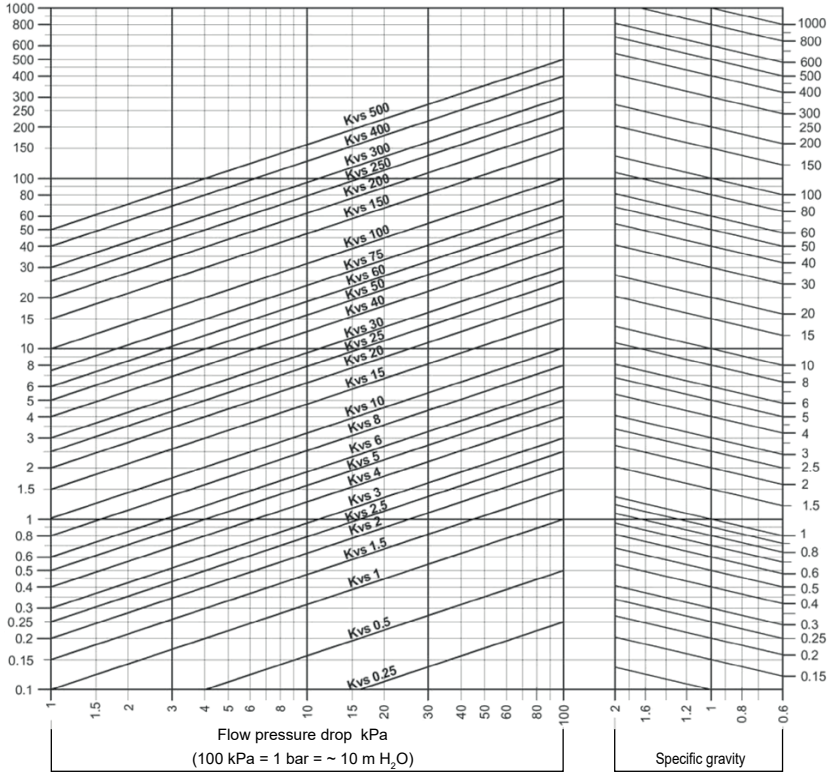


Diagram of pressure losses for liquids



Example for fluids with specific gravity 1 kg/dm³ (water)
Flow: 7.5 m³/h water
Pressure drop: 55 kPa
Locate the crossing point between the line with starting point at flow value 7.5 m³/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/dm³
Flow: 30 m³/h fluid with specific gravity 0.9 kg/dm³
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/dm³ and the sloping line at flow value 30 m³/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

HR1

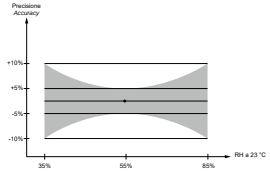
Description

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

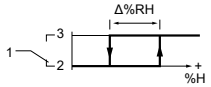
Sensible element	Stabilised synthetic textile tape
Wiring terminals	Screw terminals for wires up to 1,5 mm²
Electrical rating	max 5 (3) A, 250 VAC min 100 mA, 24 VAC
Working range	30...90% RH
Differential	6% RH
Accuracy	±5% RH*
Humidity calibration	55% RH at 23°C
Long term stability	approx. -1,5% RH/year
Time constand in moving air (0.2 m/s)	approx. 5 minutes
Working temperature	0...50°C
Storage temperature	-25...70°C no condense
Admissible ambient humidity	10...95% RH no condense
Materials	Housing of flame-retardant thermoplastic
Protection type	IP30
Protection class	II
Standards	CE-conformity, RoHS

(*) 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.

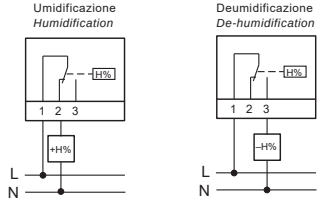


Operation

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 (Δ) of 6% RH.



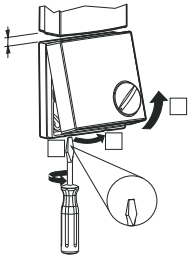
Electrical wirings

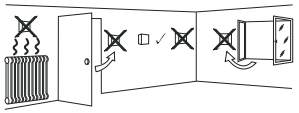


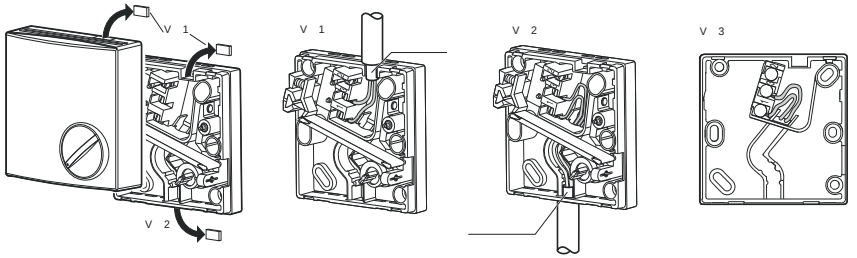
Installation

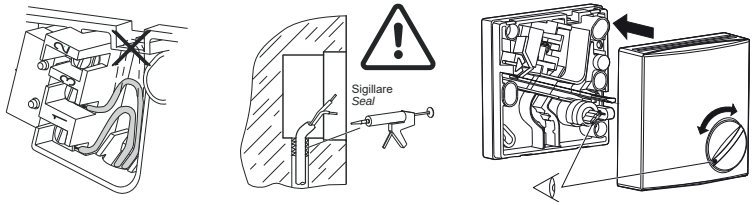
⚠ DANGER

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.

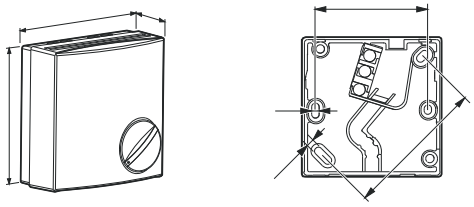








Dimensions (mm)



HD1

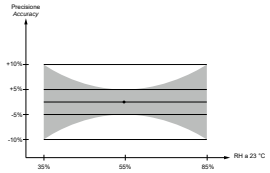
Description

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

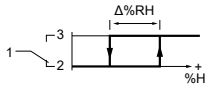
Sensible element	Stabilised synthetic textile tape, temperature-compensated
Wiring terminals	Screw terminals for wires up to 1,5 mm²
Electrical rating	Max 5 (3) A, 250 VAC Min 100 mA, 24 V
Setting range	15...95% RH
Working range	30...90% RH no condense
Differential	4% RH (after umidity calibration)
Accuracy	±5% RH*
Humidity calibration	55% RH at 23°C
Max. air speed	10 m/sec.
Long term stability	approx. -1,5% RH/year
Time constand in moving air (0.2 m/s)	approx. 3 minutes
Working temperature	0...70°C
Storage temperature	-20...70°C no condense
Admissible ambient humidity	10...95% RH no condense
Materials	Housing of flame-retardant thermoplastic
Protection type	IP30
Protection class	II
Standards	CE-conformity, RoHS

(*) 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.

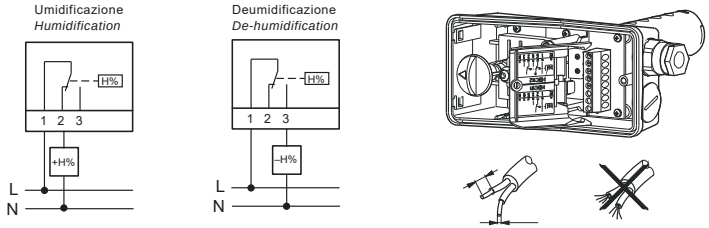


Operation

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 (Δ) of 4% RH.



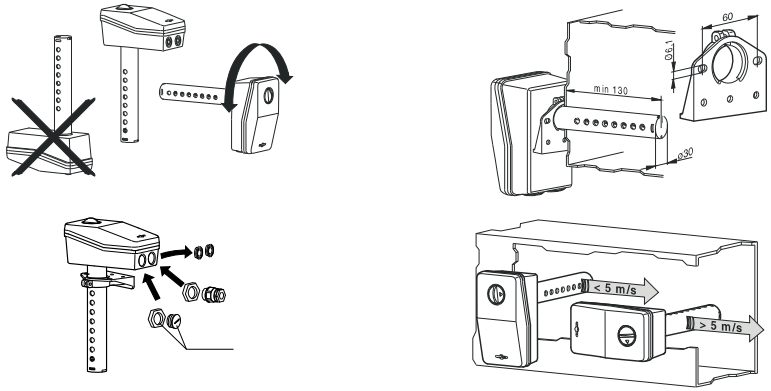
Electrical wirings



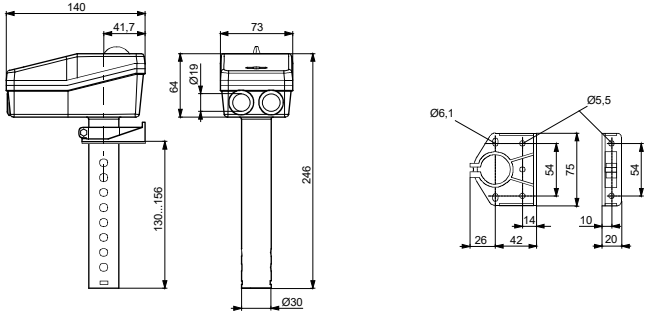
Installation

⚠ 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)



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	0...100 % RH
Accuracy RH	3% RH standard, 2% RH optional
Measurement range °C	0…50°C, 0…100°C, -30…+70°C, -40…+60°C
Accuracy °C	0,5°C
Power supply	24 VAC (±5%) 50-60 Hz / 15...35 VDC
Power consumption	< 2,5 W
Working resistance at 0...10 VDC	min. 1 kOhm
Working resistance at 4...20 mA	max 500 Ohm
Electrical connection	Screw terminals max. 1,5 mm²
Housing	ABS
Dimensions	See drawing
Protection type	IP41
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30…+80°C
Standards	CE conformity, RoHS

Order matrix

Model	Accuracy	Output 1 - Humidity	Output 2 - Temp.	Option
KTI	**3** %RH	**0** no output	**0** no output	**M** Modbus
	2 %RH	**1** 0...10 V	**1** 0...10 V	**D** Display
		2 2...10 V	**2** 2...10 V	**R** Relay*
		3 0...5 V	**3** 0...5 V	
		4 1...5 V	**4** 1...5 V	
		5 4...20 mA	**5** 4...20 mA	

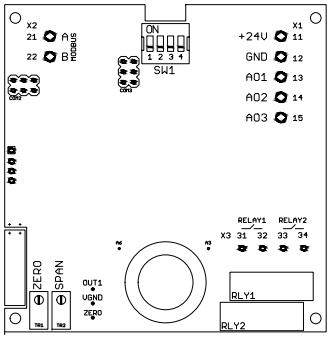
*It is recommandable to order the relay version with display option.

DIP Switch

DIP	Temp. Ranges
	0…50°C
	0…100°C
	-30…+70°C
	-40…+60°C

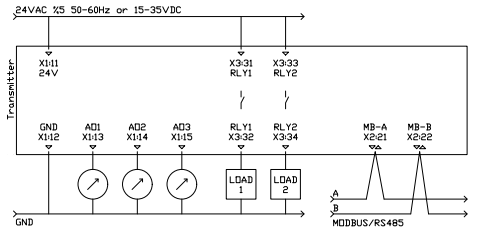
DIP	Response
	1 sec.
	5 sec.
	10 sec.
	30 sec.

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
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	not used	
TR2	not used	
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 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

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

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

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open	Open	Open
1 : 0.I.0	Open	Closed	Open
2 : I.0.I	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

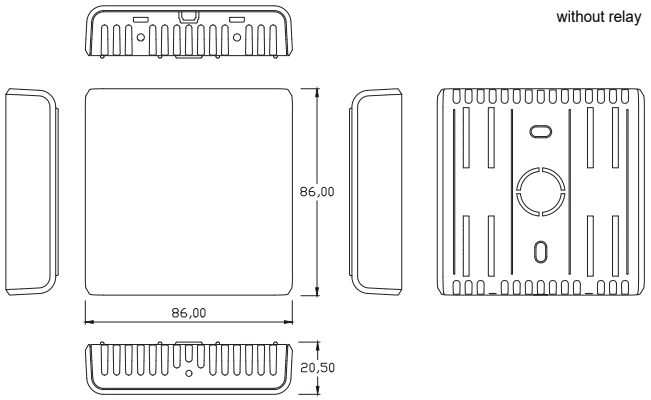
Modbus RS485 protocol

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 3seconds, Modbus is reconfigured according your parameter settings.
Unlisted registers are for analog output calibrations and some system parameters. Please do not change unlisted registers.

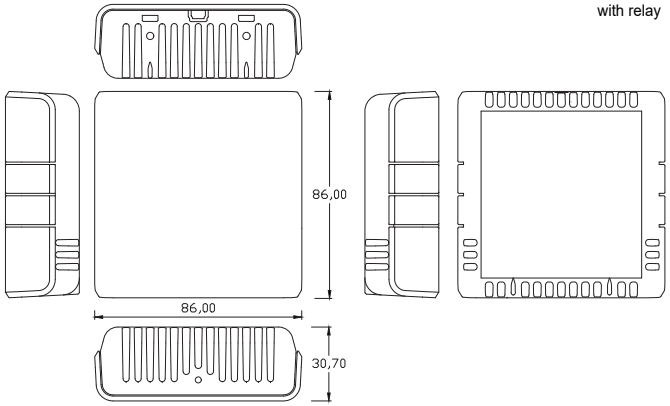
Register	R/W	Range	Description
1	R & W	1…254	Modbus Address
2	R & W	0…4	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
3	R & W	0…3	Bit_Parity_Stop, 0: 8bit_None_1, 1: 8bit_None_2, 2: 8bit_Even_1, 3: 8bit_Odd_1
4	R		Humidity as %RH x10, divide by 10 for exact value
5	R		Temperature as 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	0…1.000	Relay 1, LOW point
8	R	0…1.000	Relay 1, HIGH point
9	R	0…4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0…1.000	Relay 2, LOW point
12	R	0…1.000	Relay 2, HIGH point
13	R	0…4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0…1.000	Buzzer, LOW point
16	R	0…1.000	Buzzer, HIGH point
17	R	0…4	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)

without relay



with relay



Description

The temperature/humidity transmitter serie KTO measures the air duct 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	0...100 % RH
Accuracy RH	3% RH standard, 2% RH optional
Measurement range °C	0…50°C, 0…100°C, -30…+70°C, -40…+60°C
Accuracy °C	0,5°C
Power supply	24 VAC (±5%) 50-60 Hz / 15...35 VDC
Power consumption	< 2,5 W
Working resistance at 0...10 VDC	min. 1 kOhm
Working resistance at 4...20 mA	max 500 Ohm
Electrical connection	Screw terminals max. 1,5 mm²
Housing	ABS
Dimensions	See drawing
Protection type	IP41
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30…+80°C
Standards	CE conformity, RoHS

Order matrix

Model	Accuracy	Output 1 - Humidity	Output 2 - Temp.	Option
KTO	**3** %RH	**0** no output	**0** no output	**M** Modbus
	2 %RH	**1** 0...10 V	**1** 0...10 V	**D** Display
		2 2...10 V	**2** 2...10 V	**R** Relay*
		3 0...5 V	**3** 0...5 V	
		4 1...5 V	**4** 1...5 V	
		5 4...20 mA	**5** 4...20 mA	

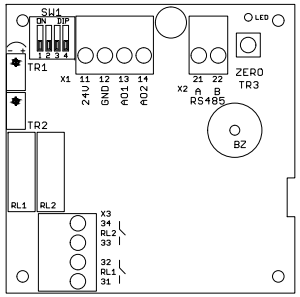
*It is recommandable to order the relay version with display option.

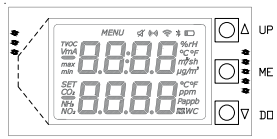
DIP Switch

DIP	Temp. Ranges
	0…50°C
	0…100°C
	-30…+70°C
	-40…+60°C

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

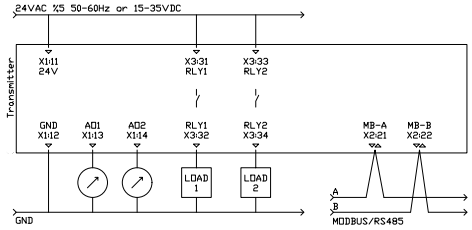
Transmitter hardware





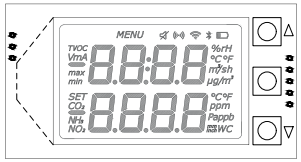
SW1	DIP Switch for configuration range and response time	
X1 TERMINAL		
11	24V	15...35 VDC or 24 VAC (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
X2 TERMINAL		
21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication 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 & 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



UP	press for increasing the value or choosing the next parameter
MENU	press and wait to enter MENU, click to navigate between sub menus one by one
DOWN	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

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

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

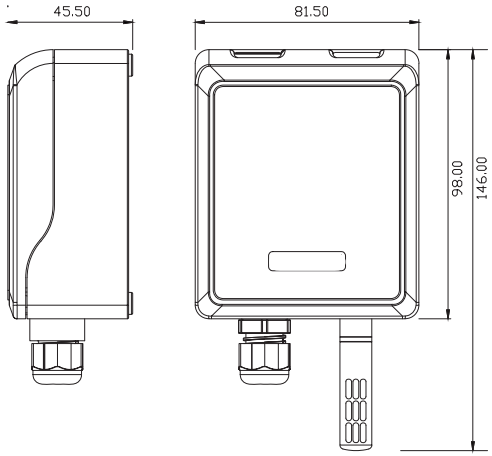
0 : Relay Contact is OPEN, Buzzer is in Silent mode
I : Relay Contact is CLOSED, Buzzer is in Warning mode
X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

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 3seconds, 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	1…254	Modbus Address
2	R & W	0…4	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
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		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	0…1.000	Relay 1, LOW point
8	R	0…1.000	Relay 1, HIGH point
9	R	0…4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0…1.000	Relay 2, LOW point
12	R	0…1.000	Relay 2, HIGH point
13	R	0…4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0…1.000	Buzzer, LOW point
16	R	0…1.000	Buzzer, HIGH point
17	R	0…4	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)



Description

The temperature/humidity transmitter serie KTD measures the air duct 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	0...100 % RH
Accuracy RH	3% RH standard, 2% RH optional
Measurement range °C	0…50°C, 0…100°C, -30…+70°C, -40…+60°C
Accuracy °C	0,5°C
Power supply	24 VAC (±5%) 50-60 Hz / 15...35 VDC
Power consumption	< 2,5 W
Working resistance at 0...10 VDC	min. 1 kOhm
Working resistance at 4...20 mA	max 500 Ohm
Electrical connection	Screw terminals max. 1,5 mm²
Housing	ABS
Dimensions	See drawing
Protection type	IP41
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30…+80°C
Standards	CE conformity, RoHS

Order matrix

Model	Accuracy	Output 1 - Humidity	Output 2 - Temp.	Option
KTD	**3** %RH	**0** no output	**0** no output	**M** Modbus
	2 %RH	**1** 0...10 V	**1** 0...10 V	**D** Display
		2 2...10 V	**2** 2...10 V	**R** Relay*
		3 0...5 V	**3** 0...5 V	
		4 1...5 V	**4** 1...5 V	
		5 4...20 mA	**5** 4...20 mA	

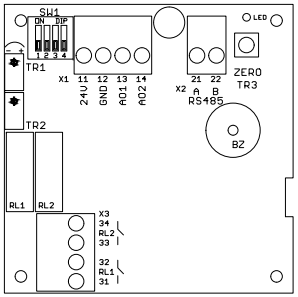
*It is recommandable to order the relay version with display option.

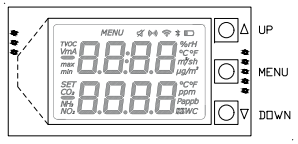
DIP Switch

DIP	Temp. Ranges
	0…50°C
	0…100°C
	-30…+70°C
	-40…+60°C

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

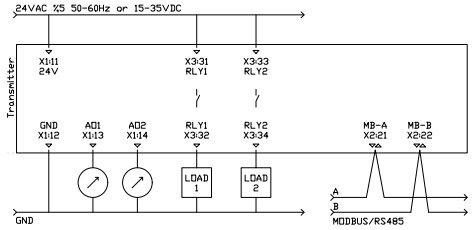
Transmitter hardware





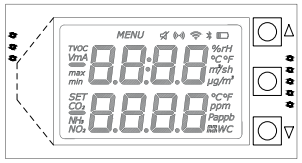
SW1	DIP Switch for configuration range and response time	
X1 TERMINAL		
11	24V	15...35 VDC or 24 VAC (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
X2 TERMINAL		
21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication 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	
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



UP — press for increasing the value or choosing the next parameter

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

DOWN — 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

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

ACTIONS	under LOW	between LOW & HIGH	over HIGH
0 : 0.0.0	Open	Open	Open
1 : 0.I.0	Open	Closed	Open
2 : I.0.I	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

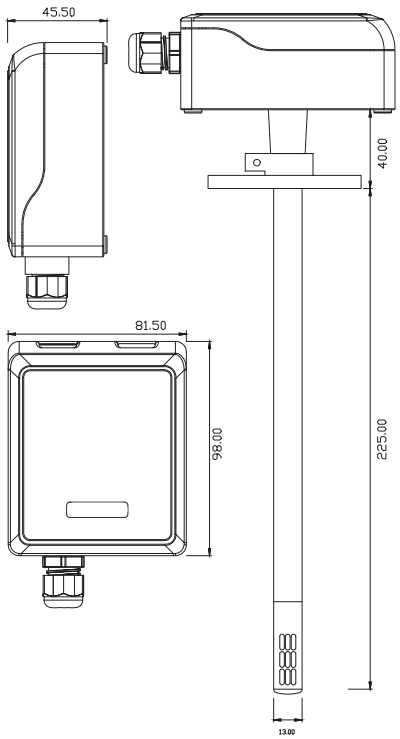
Modbus RS485 protocol

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 3seconds, 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	1…254	Modbus Address
2	R & W	0…4	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
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		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	0…1.000	Relay 1, LOW point
8	R	0…1.000	Relay 1, HIGH point
9	R	0…4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0…1.000	Relay 2, LOW point
12	R	0…1.000	Relay 2, HIGH point
13	R	0…4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0…1.000	Buzzer, LOW point
16	R	0…1.000	Buzzer, HIGH point
17	R	0…4	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)



KSIC

CO_2 room sensor

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_2	400...2000, 0...2k, 0...5k, 0...10k ppm selectable
Accuracy CO_2	± 70 ppm +3% reading
Accuracy temperature (*)	±0,3°C (5...60°C) + 1% FS
Accuracy humidity (*)	±2% RH (20...80%RH) + 2% FS
Power supply	24 VAC (±5%), 15...35 VDC
Consumption	< 2,5 W
Sensible element	NDIR self adjusting
Output	0...5 VDC, 0...10 VDC, 4...20 mA, Modbus 485
Electrical connection	Pluggable screw terminal for cables 1,5 mm²
Protection type	IP41
Working range RH	10...95% 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		Output 2		Option	
KSIC	**0**	no output	**0**	no output	**M**	Modbus
	1	0...10 V	**1**	0...10 V	**D**	Display
	2	2...10 V	**2**	2...10 V	**R**	Relay*
	3	0...5 V	**3**	0...5 V		
	4	1...5 V	**4**	1...5 V		
	5	4...20 mA	**5**	4...20 mA		

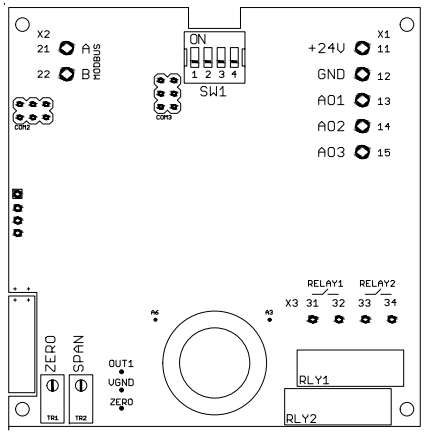
*It is recommandable to order the relay version with display option.

DIP Switch

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

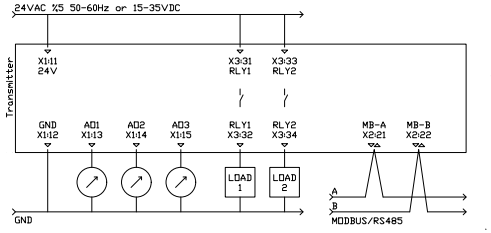
DIP 4	Response
	60 sec.
	20 sec.

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
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

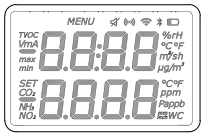


Relay contact rating is max. 1A at 230 VAC
We kindly advise using 24V for avoiding high voltage harmonics and external power relay for bigger loads
Please use shielded and twisted paired cables for Modbus connections

Display & Buttons

keep pressing until entering MENU, click for next parameter

press for EXIT



press for increasing the value or choosing the next parameter

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 1

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

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

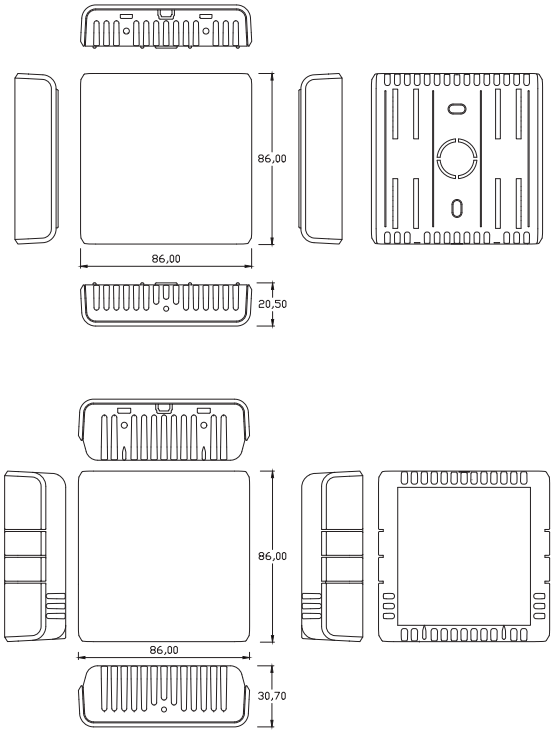
0 : Relay Contact is OPEN, Buzzer is in Silent mode
I : Relay Contact is CLOSED, Buzzer is in Warning mode
X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

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	1…254	Modbus Address
2	R & W	0…4	Baudrate, 0: 9.600, 1: 19.200, 2: 38.400, 3: 57.600, 4: 115.200
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		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	0…1.000	Relay 1, LOW point
8	R	0…1.000	Relay 1, HIGH point
9	R	0…4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0…1.000	Relay 2, LOW point
12	R	0…1.000	Relay 2, HIGH point
13	R	0…4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0…1.000	Buzzer, LOW point
16	R	0…1.000	Buzzer, HIGH point
17	R	0…4	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)



KSDC

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_2	400...2000, 0...2k, 0...5k, 0...10k ppm selectable
Accuracy CO_2	± 70 ppm +3% reading
Accuracy temperature (*)	±0,3°C (5...60°C) + 1% FS
Accuracy humidity (*)	±2% RH (20...80%RH) + 2% FS
Power supply	24 VAC (±5%), 15...35 VDC
Consumption	< 2,5 W
Sensible element	NDIR self adjusting
Output	0...5 VDC, 0...10 VDC, 4...20 mA, Modbus 485
Electrical connection	Pluggable screw terminal for cables 1,5 mm²
Protection type	IP41
Working range RH	10...95% 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		Output 2		Option	
KSDC	**0**	no output	**0**	no output	**M**	Modbus
	1	0...10 V	**1**	0...10 V	**D**	Display
	2	2...10 V	**2**	2...10 V	**R**	Relay*
	3	0...5 V	**3**	0...5 V		
	4	1...5 V	**4**	1...5 V		
	5	4...20 mA	**5**	4...20 mA		

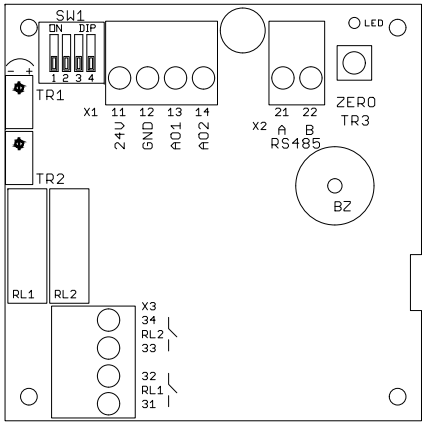
*It is recommandable to order the relay version with display option.

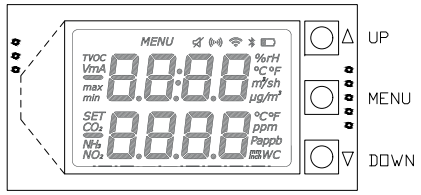
DIP Switch

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

DIP 4	Response
	60 sec.
	20 sec.

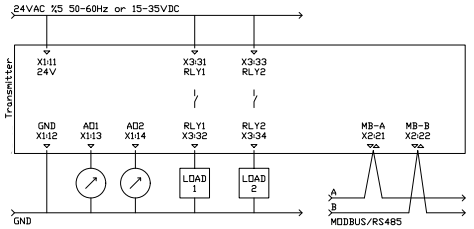
Transmitter hardware





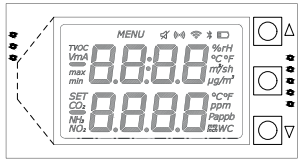
SW1	DIP Switch for configuration range and response time	
X1 TERMINAL		
11	24V	15...35 VDC or 24 VAC (± %5, 50-60 Hz)
12	GND	ground for power and reference for outputs
13	AO1	analog output 1
14	AO2	analog output 2
X2 TERMINAL		
21	A / RS485	modbus communication positive pair
22	B / RS485	modbus communication 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	
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 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



UP — press for increasing the value or choosing the next parameter

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

DOWN — 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

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

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

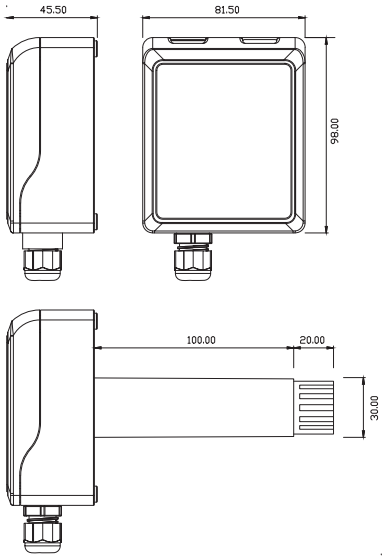
0 : Relay Contact is OPEN, Buzzer is in Silent mode
I : Relay Contact is CLOSED, Buzzer is in Warning mode
X : Relay Contact is at HYSTERESIS position, OPEN if previous position open, CLOSED if previous position closed

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	1…254	Modbus Address
2	R & W	0…2	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		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	0…1.000	Relay 1, LOW point
8	R	0…1.000	Relay 1, HIGH point
9	R	0…4	Relay 1, ACTION
10	R	0 or 1	Relay 2, contact position, 0: OFF - Contact is Open, 1: ON - Contact is Closed
11	R	0…1.000	Relay 2, LOW point
12	R	0…1.000	Relay 2, HIGH point
13	R	0…4	Relay 2, ACTION
14	R	0 or 1	Buzzer, 0: OK-Silence, 1: PreAlarm - warning intermittently, 2: WARNING continuously
15	R	0…1.000	Buzzer, LOW point
16	R	0…1.000	Buzzer, HIGH point
17	R	0…4	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

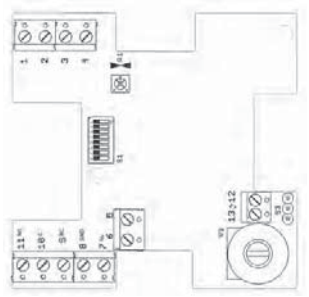
The temperature transmitter serie TTI measures the room temperature by a sensor and converts the value into a linear output signal 0...10 VDC o 4...20 mA.

Technical specifications

Measurement range	See configurator
Accuracy	±0,2°C + max 3% FS
Sensor	PT1000 Class B (2-wire)
Power supply	12...34 VAC/DC
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Current consumption	24...44 mA
Electrical connection	Screw terminals max. 1,5 mm²
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

Model	Output	Version
TTIC	4...20 mA	
TTICD	4...20 mA	with display
TTIV	0...10 V DC	
TTIVD	0...10 V DC	with display

Electrical wirings



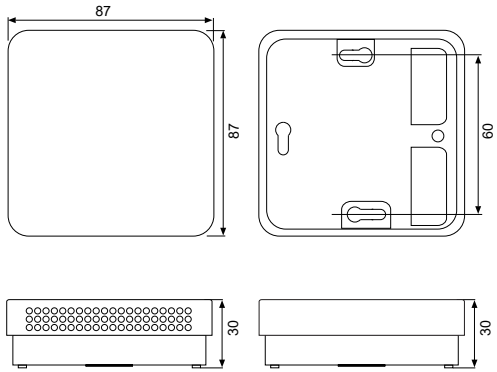
Output 0...10 V		Output 4...20 mA	
PIN	Assignment	PIN	Assignment
1	Temp.	1	-
2	-	2	-
3	-	3	Temp.
4	-	4	-
7	+	7	+
8	GND	8	GND

Settings

Temperature range selection	Range	1	2	3	4	5	6	7	8
	-100...+50°C	OFF	OFF	OFF	OFF	OFF	-	-	-
	-50...0°C	ON	OFF	OFF	OFF	OFF	-	-	-
	-50...50°C	OFF	ON	OFF	OFF	OFF	-	-	-
	-50...+150°C	ON	ON	OFF	OFF	OFF	-	-	-
	-30...+20°C	OFF	OFF	ON	OFF	OFF	-	-	-
	-30...+60°C	ON	OFF	ON	OFF	OFF	-	-	-
	-30...+70°C	OFF	ON	ON	OFF	OFF	-	-	-
	-20...+50°C	ON	ON	ON	OFF	OFF	-	-	-
	-20...+80°C	OFF	OFF	OFF	ON	OFF	-	-	-
	-20...+120°C	ON	OFF	OFF	ON	OFF	-	-	-
	-20...+150°C	OFF	ON	OFF	ON	OFF	-	-	-
	-10...+15°C	ON	ON	OFF	ON	OFF	-	-	-

Temperature range selection	Range	1	2	3	4	5	6	7	8
	-10...+120°C	OFF	OFF	ON	ON	OFF	-	-	-
	0...+40°C	ON	OFF	ON	ON	OFF	-	-	-
	0...+50°C	OFF	ON	ON	ON	OFF	-	-	-
	0...+70°C	ON	ON	ON	ON	OFF	-	-	-
	0...+100°C	OFF	OFF	OFF	OFF	ON	-	-	-
	0...+150°C	ON	OFF	OFF	OFF	ON	-	-	-
	0...+160°C	OFF	ON	OFF	OFF	ON	-	-	-
	0...+200°C	ON	ON	OFF	OFF	ON	-	-	-
	0...+250°C	OFF	OFF	ON	OFF	ON	-	-	-
	0...+400°C	ON	OFF	ON	OFF	ON	-	-	-
	0...+600°C	OFF	ON	ON	OFF	ON	-	-	-
	+10...+35°C	ON	ON	ON	OFF	ON	-	-	-

Dimensions (mm)



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.

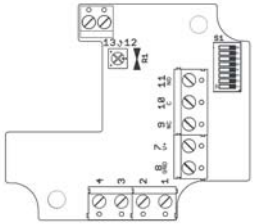
Technical specifications

Measurement range °C	See configurator
Accuracy °C	±0,2°C + max 3% of FS
Power supply	12…34 VAC/DC
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Consumption	24...44 mA
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	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30...+70°C
Standards	CE conformity, RoHS

Models	Temp. output	Version
TTOC*	4...20 mA	
TTOCD	4...20 mA	with display
TTOV	0...10 V DC	
TTOVD	0...10 V DC	with display

* available 2-wire version

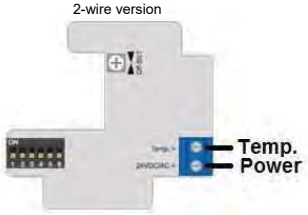
Electrical wirings



Output 0...10 V		Output 4...20 mA	
PIN	Assignment	PIN	Assignment
1	Temp.	1	-
2	-	2	-
3	-	3	Temp.
4	-	4	-
7	+	7	+
8	GND	8	GND

TTO

2-wire version



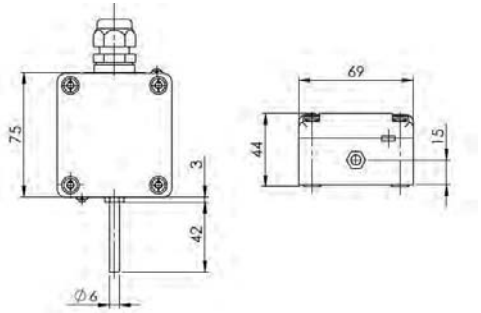
Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

Setting

Temperature range selection	Range	1	2	3	4	5	6	7	8
	-100...+50°C	OFF	OFF	OFF	OFF	OFF	-	-	-
	-50...0°C	ON	OFF	OFF	OFF	OFF	-	-	-
	-50...50°C	OFF	ON	OFF	OFF	OFF	-	-	-
	-50...+150°C	ON	ON	OFF	OFF	OFF	-	-	-
	-30...+20°C	OFF	OFF	ON	OFF	OFF	-	-	-
	-30...+60°C	ON	OFF	ON	OFF	OFF	-	-	-
	-30...+70°C	OFF	ON	ON	OFF	OFF	-	-	-
	-20...+50°C	ON	ON	ON	OFF	OFF	-	-	-
	-20...+80°C	OFF	OFF	OFF	ON	OFF	-	-	-
	-20...+120°C	ON	OFF	OFF	ON	OFF	-	-	-
	-20...+150°C	OFF	ON	OFF	ON	OFF	-	-	-
	-10...+15°C	ON	ON	OFF	ON	OFF	-	-	-

Temperature range selection	Range	1	2	3	4	5	6	7	8
	-10...+120°C	OFF	OFF	ON	ON	OFF	-	-	-
	0...+40°C	ON	OFF	ON	ON	OFF	-	-	-
	0...+50°C	OFF	ON	ON	ON	OFF	-	-	-
	0...+70°C	ON	ON	ON	ON	OFF	-	-	-
	0...+100°C	OFF	OFF	OFF	OFF	ON	-	-	-
	0...+150°C	ON	OFF	OFF	OFF	ON	-	-	-
	0...+160°C	OFF	ON	OFF	OFF	ON	-	-	-
	0...+200°C	ON	ON	OFF	OFF	ON	-	-	-
	0...+250°C	OFF	OFF	ON	OFF	ON	-	-	-
	0...+400°C	ON	OFF	ON	OFF	ON	-	-	-
	0...+600°C	OFF	ON	ON	OFF	ON	-	-	-
	+10...+35°C	ON	ON	ON	OFF	ON	-	-	-

Dimensions (mm)



TTOM

Outdoor temperature transmitter with ModBus output

Description

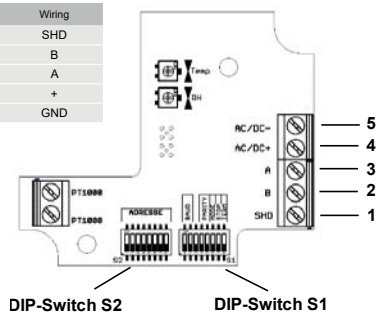
The temperature transmitter serie TTOM measures the outdoor temperature by sensor and converts the value into a Modbus output signal.

Technical specifications

Accuracy °C	±0,2°K ±1% of FS
Power supply	12…34 V AC/DC
Consumption	10...20 mA
Electrical connection	Screw terminals max. 1,5 mm²
Housing	PA6 15% GF, RAL9010
Dimensions	See drawing
Protection type	IP65
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30...+70°C
Standards	CE conformity, RoHS

Electrical wirings

PIN	Wiring
1	SHD
2	B
3	A
4	+
5	GND



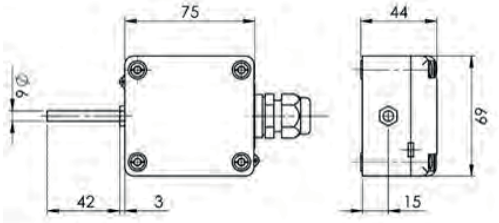
Measurement source

Unit	ModBus source	Gain
Temperature °C	20	10

DIP Switch 1

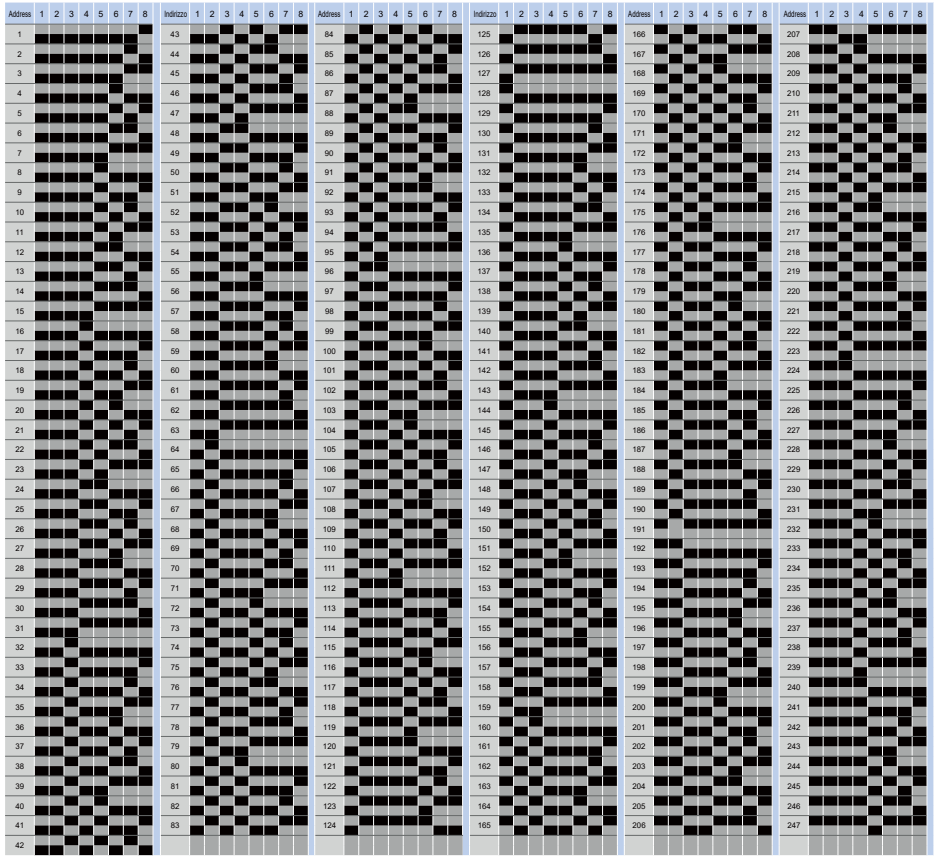
Setting	1	2	3	4	5	6	7	8
Baudrate								
9600	OFF	OFF						
19200	OFF	ON						
38400	ON	OFF						
57600	ON	ON						
Termination								
nessuna								OFF
120 Ω								ON
Parity								
Even				OFF	OFF			
Odd				OFF	ON			
No parità				ON	OFF			
No parità				ON	ON			
Modality								
RTU						OFF		
ASCII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

Dimension (mm)



TTOM

DIP-switch 2



ON	■	Switch at: ON
OFF		

TTD / TTS

Duct and screw-in temperature transmitter

Description

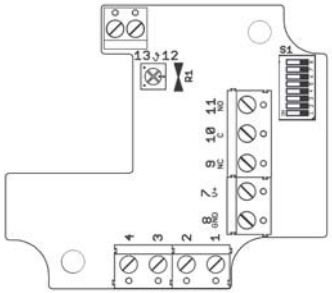
The temperature transmitter serie TTD/TTS measures the duct or screw-in temperature by sensor and converts the value into a linear output signal 0...10 V DC o 4...20 mA.

Technical specifications

Measurement range °C	See configurator
Accuracy °C	±0,2°C + max 3% of FS
Power supply	12…34 V AC/DC
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Consumption	24...44 mA
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	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30...+70°C
Standards	CE conformity, RoHS

Models	Temp. output	Version	Display
TTDC	4...20 mA	Duct	
TTDCD	4...20 mA	Duct	with display
TTDV	0...10 V DC	Duct	
TTDVD	0...10 V DC	Duct	with display
TTSC	4...20 mA	Screw-in	
TTSCD	4...20 mA	Screw-in	with display
TTSV	0...10 V DC	Screw-in	
TTSVD	0...10 V DC	Screw-in	with display

Electrical wirings



Output 0...10 V		Output 4...20 mA	
PIN	Assignment	PIN	Assignment
1	Temp.	1	-
2	-	2	-
3	-	3	Temp.
4	-	4	-
7	+	7	+
8	GND	8	GND

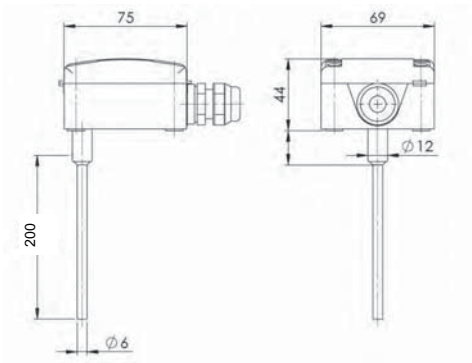
Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.

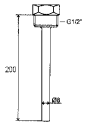
Setting

Temperature range selection	Range	1	2	3	4	5	6	7	8
	-100...+50°C	OFF	OFF	OFF	OFF	OFF	-	-	-
	-50...0°C	ON	OFF	OFF	OFF	OFF	-	-	-
	-50...50°C	OFF	ON	OFF	OFF	OFF	-	-	-
	-50...+150°C	ON	ON	OFF	OFF	OFF	-	-	-
	-30...+20°C	OFF	OFF	ON	OFF	OFF	-	-	-
	-30...+60°C	ON	OFF	ON	OFF	OFF	-	-	-
	-30...+70°C	OFF	ON	ON	OFF	OFF	-	-	-
	-20...+50°C	ON	ON	ON	OFF	OFF	-	-	-
	-20...+80°C	OFF	OFF	OFF	ON	OFF	-	-	-
	-20...+120°C	ON	OFF	OFF	ON	OFF	-	-	-
	-20...+150°C	OFF	ON	OFF	ON	OFF	-	-	-
	-10...+15°C	ON	ON	OFF	ON	OFF	-	-	-

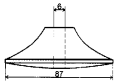
Temperature range selection	Range	1	2	3	4	5	6	7	8
	-10...+120°C	OFF	OFF	ON	ON	OFF	-	-	-
	0...+40°C	ON	OFF	ON	ON	OFF	-	-	-
	0...+50°C	OFF	ON	ON	ON	OFF	-	-	-
	0...+70°C	ON	ON	ON	ON	OFF	-	-	-
	0...+100°C	OFF	OFF	OFF	OFF	ON	-	-	-
	0...+150°C	ON	OFF	OFF	OFF	ON	-	-	-
	0...+160°C	OFF	ON	OFF	OFF	ON	-	-	-
	0...+200°C	ON	ON	OFF	OFF	ON	-	-	-
	0...+250°C	OFF	OFF	ON	OFF	ON	-	-	-
	0...+400°C	ON	OFF	ON	OFF	ON	-	-	-
	0...+600°C	OFF	ON	ON	OFF	ON	-	-	-
	+10...+35°C	ON	ON	ON	OFF	ON	-	-	-

Dimensions (mm)





Included in TTS versions



Included in TTD versions

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.

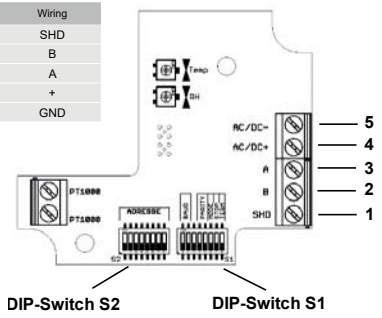
Technical specifications

Accuracy °C	±0,2°C + max 3% of FS
Power supply	12…34 V AC/DC
Consumption	10...20 mA
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	0...98% 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

PIN	Wiring
1	SHD
2	B
3	A
4	+
5	GND



Measurement source

Unit	ModBus source	Gain
Temperature °C	20	10

DIP Switch 1

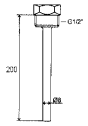
Setting	1	2	3	4	5	6	7	8
Baudrate								
9600	OFF	OFF						
19200	OFF	ON						
38400	ON	OFF						
57600	ON	ON						
Termination								
nessuna								OFF
120 Ω								ON
Parity								
Even				OFF	OFF			
Odd				OFF	ON			
No parità				ON	OFF			
No parità				ON	ON			
Modality								
RTU						OFF		
ASCII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

DIP-switch 2

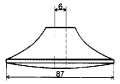
Indirizzo	1	2	3	4	5	6	7	8
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								
84								
85								
86								
87								
88								
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
121								
122								
123								
124								
125								
126								
127								
128								
129								
130								
131								
132								
133								
134								
135								
136								
137								
138								
139								
140								
141								
142								
143								
144								
145								
146								
147								
148								
149								
150								
151								
152								
153								
154								
155								
156								
157								
158								
159								
160								
161								
162								
163								
164								
165								
166								
167								
168								
169								
170								
171								
172								
173								
174								
175								
176								
177								
178								
179								
180								
181								
182								
183								
184								
185								
186								
187								
188								
189								
190								
191								
192								
193								
194								
195								
196								
197								
198								
199								
200								
201								
202								
203								
204								
205								
206								
207								
208								
209								
210								
211								
212								
213								
214								
215								
216								
217								
218								
219								
220								
221								
222								
223								
224								
225								
226								
227								
228								
229								
230								
231								
232								
233								
234								
235								
236								
237								
238								
239								
240								
241								
242								
243								
244								
245								
246								
247								

ON		Switch at: ON
OFF		

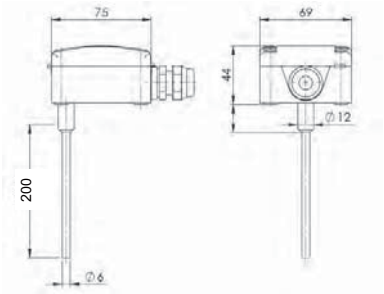
Dimension (mm)



Included in TTS versions



Included in TTD versions



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 (20...80%RH) + 2% FS
Measurement range °C	4 different scale selectable by dip-switch
Accuracy °C	±0,3°C (5...60°C) + 1% FS
Power supply	12...34 V AC/DC
Power consumption	24...44 mA
Working resistance at 0...10 V	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Speed of responce RH	8 sec.
Electrical connection	Screw terminals max. 1,5 mm²
Housing	ABS, RAL 9010
Dimensions	See drawing
Protection type	IP30
Protection class	III
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	0...+50°C
Installation	Screw fastening
Standards	CE conformity, RoHS

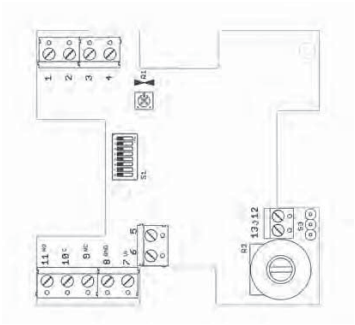
Models	Temp. output	Humidity output	Version
TTHIV	0...10 V DC	0...10 V DC	
TTHIxV	Passive sensor (*)	0...10 V DC	
TTHIVD	0...10 V DC	0...10 V DC	with display
TTHIxVD	Passive sensor (*)	0...10 V DC	with display
TTHIC	4...20 mA	4...20 mA	
TTHIxC	Passive sensor (*)	4...20 mA	
TTHICD	4...20 mA	4...20 mA	with display
TTHIxCD	Passive sensor (*)	4...20 mA	con display

(*) Replace “x” with the number of desired passive sensor:

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

TTHI

Electrical wirings



Output 0...10 V		Output 4...20 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

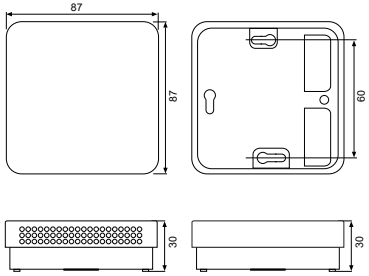
Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.
Note: The sensor is designed for a normal environment condition, other aggressive gases can ruin it.

Setting

Temperature ranges	Range	1	2
	0...+50°C	OFF	OFF
	0...+100°C	ON	OFF
	-20...+80°C	OFF	ON
	-30...+70°C	ON	ON

Humidity ranges	Range	3	4	5	6
	Relative humidity				
	0...100%	OFF	OFF	OFF	OFF
	Absolute humidity				
	0 g/m³...30g/m³	ON	OFF	OFF	OFF
	0 g/m³...50g/m³	ON	ON	OFF	OFF
	0 g/m³...80g/m³	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	ON	ON	OFF
	-50...+100°C	ON	OFF	OFF	ON
	-20...+80°C	OFF	ON	OFF	ON
	Enthalpy				
	0 kj/kg...85kj/kg	ON	ON	ON	ON

Dimensions (mm)



TTHO

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 (20...80% RH) + 2% FS
Measurement range °C	4 different scale selectable by dip-switch
Accuracy °C	±0,3°C (5...60°C) + 1,5% FS
Power supply	12...34 V AC/DC
Power consumption	24...44 mA
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 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	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30...+70°C
Standards	CE conformity, RoHS

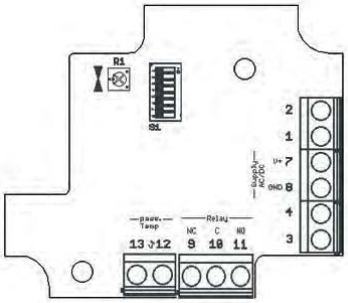
Models	Temp. output	Humidity output	Version
TTHOC	4...20 mA	4...20 mA	
TTHOxC	Passive sensor (*)	4...20 mA	
TTHOCD	4...20 mA	4...20 mA	with display
TTHOxCD	Passive sensor (*)	4...20 mA	with display
TTHOV	0...10 V DC	0...10 V DC	
TTHOxV	Passive sensor (*)	0...10 V DC	
TTHOVD	0...10 V DC	0...10 V DC	with display
TTHOxVD	Passive sensor (*)	0...10 V DC	with display

(*) Replace “x” with the number of desired passive sensor:

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

TTHO

Electrical wirings



Output 0...10 V		Output 4...20 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

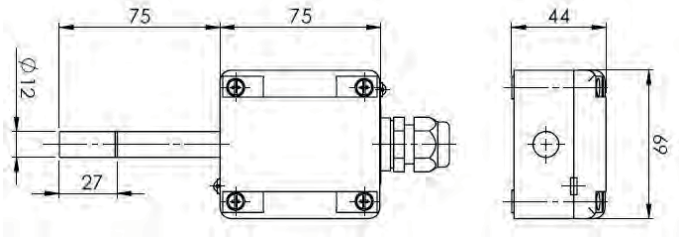
Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.
Note: The sensor is designed for a normal environment condition, other aggressive gases can ruin it.

Setting

Temperature ranges	Range	1	2
	-30...+70°C	OFF	OFF
	-20...+80°C	ON	OFF
	0...+100°C	OFF	ON
	0...+50°C	ON	ON

Humidity ranges	Range	3	4	5	6
	Relative humidity				
	0...100%	OFF	OFF	OFF	OFF
	Absolute humidity				
	0 g/m³...30g/m³	ON	OFF	OFF	OFF
	0 g/m³...50g/m³	ON	ON	OFF	OFF
	0 g/m³...80g/m³	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	ON	ON	OFF
	-50...+100°C	ON	OFF	OFF	ON
	-20...+80°C	OFF	ON	OFF	ON
	Enthalpy				
	0 kj/kg...85kj/kg	ON	ON	ON	ON

Dimensions (mm)



TTHOM

Outdoor humidity and temperature transmitter with ModBus

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	0...100% RH
Accuracy RH	±2% RH (20...80%RH) +2% FS a 25°C
Accurracy °C	±0,3°C (5...60°C) + 1,5% FS
Power supply	12…34 V AC/DC
Power consumption	10...20 mA
Electrical connection	Screw terminals max. 1,5 mm²
Housing	PA6 15% GF, RAL 9010
Dimensions	See drawing
Protection type	IP65
Protection class	III
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30...+70°C
Standards	CE conformity, RoHS

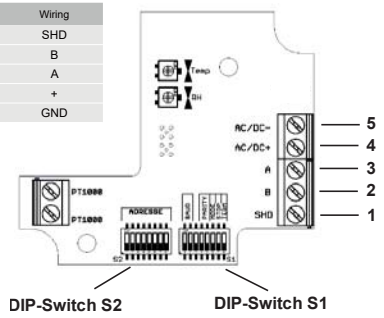
Models	Version
TTHOM	
TTHOMD	with display

Measurement source

Unit	ModBus source	Gain
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m³	22	10
Dewpoint °C	23	10
Enthalpy J	24	10

Electrical wirings

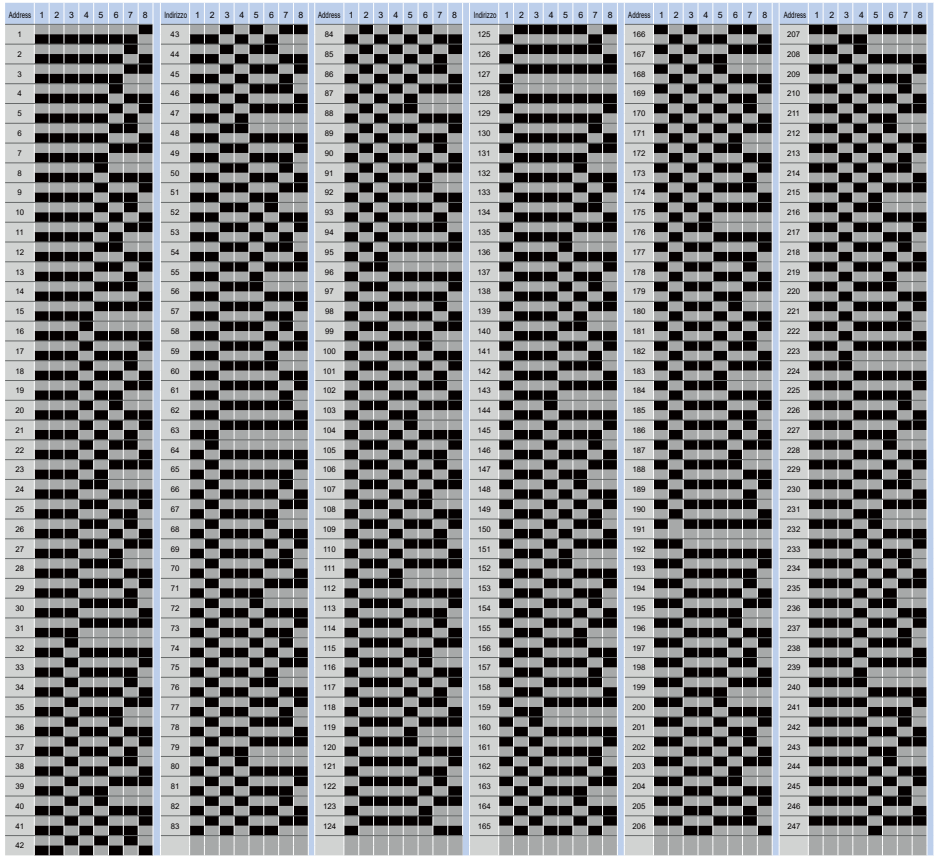
PIN	Wiring
1	SHD
2	B
3	A
4	+
5	GND



DIP Switch 1

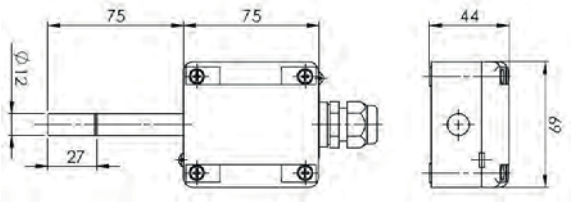
Setting	1	2	3	4	5	6	7	8
Baudrate								
9600	OFF	OFF						
19200	OFF	ON						
38400	ON	OFF						
57600	ON	ON						
Termination								
nessuna								OFF
120 Ω								ON
Parity								
Even				OFF	OFF			
Odd				OFF	ON			
No parità				ON	OFF			
No parità				ON	ON			
Modality								
RTU						OFF		
ASCII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

DIP-switch 2



ON		Switch at: ON
OFF		

Dimensions (mm)



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

Measurement range RH	Selectable by dip-switch
Accuracy RH	±2% RH (20...80%RH) + 2% FS
Measurement range °C	4 different scale selectable by dip-switch
Accurracy °C	±0,3°C (5...60°C)
Speed of responce	8 sec.
Power supply	12…34 V AC/DC
Power consumption	24...44 mA
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Electrical connection	Screw terminals max. 1,5 mm²
Housing	PA6 15% GF, RAL 9010
Dimensions	See drawing
Protection type	IP65
Protection class	II
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	-30...+70°C
Installation	Mounting flange (included)
Standards	CE conformity, RoHS

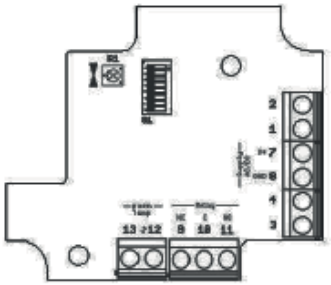
Models	Temp. output	Humidity output	Version
TTHDV	0...10 V DC	0...10 V DC	
TTHDVD	0...10 V DC	0...10 V DC	with display
TTHDxV	Passive sensor (*)	0...10 V DC	
TTHDxVD	Passive sensor (*)	0...10 V DC	with display
TTHDC	4...20 mA	4...20 mA	
TTHDCD	4...20 mA	4...20 mA	with display
TTHDxC	Passive sensor (*)	4...20 mA	
TTHDxCD	Passive sensor (*)	4...20 mA	with display

(*) Replace “x” with the number of desired passive sensor:

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

TTHD

Electrical wirings



Output 0...10 V		Output 4...20 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

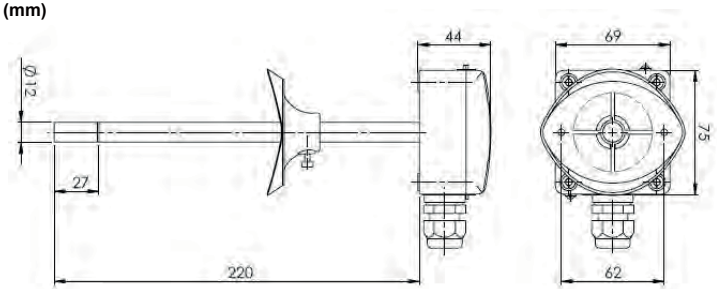
Important: connections in parallel with 24 VAC to consider the phase to prevent short circuits. The device is designed to operate in a low voltage condition.
Note: The sensor is designed for a normal environment condition, other aggressive gases can ruin it.

Setting

Temperature ranges	Range	1	2
	-30...+70°C	OFF	OFF
	-20...+80°C	ON	OFF
	0...+100°C	OFF	ON
	0...+50°C	ON	ON

Humidity ranges	Range	3	4	5	6
	Relative humidity				
	0...100%	OFF	OFF	OFF	OFF
	Absolute humidity				
	0 g/m³...30g/m³	ON	OFF	OFF	OFF
	0 g/m³...50g/m³	ON	ON	OFF	OFF
	0 g/m³...80g/m³	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	ON	ON	OFF
	-50...+100°C	ON	OFF	OFF	ON
	-20...+80°C	OFF	ON	OFF	ON
	Enthalpy				
	0 kj/kg...85kj/kg	ON	ON	ON	ON

Dimensions (mm)



TTHDM

Duct humidity and temperature transmitter with ModBus

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.

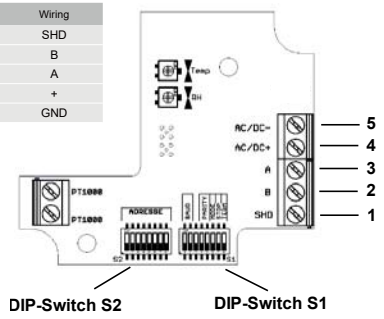
Technical specifications

Measurement range RH	0...100% RH
Accuracy RH	±2% RH (20...80%RH) +2% FS a 25°C
Accurracy °C	±0,3°C (5...60°C) + 1,5% FS
Power supply	12…34 V AC/DC
Power consumption	10...20 mA
Electrical connection	Screw terminals max. 1,5 mm²
Housing	PA6, RAL 9010
Dimensions	See drawing
Protection type	IP65
Protection class	III
Working range RH	0...98% 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

Electrical wirings

PIN	Wiring
1	SHD
2	B
3	A
4	+
5	GND



Measurement source

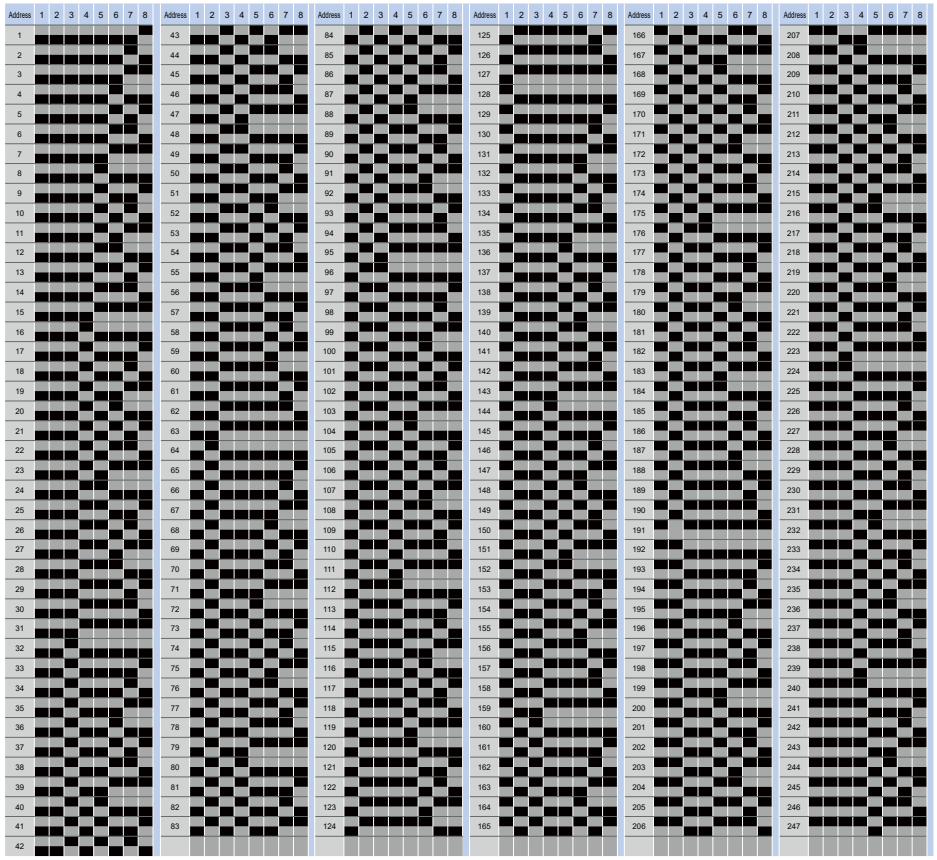
Unit	ModBus source	Gain
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m³	22	10
Dewpoint °C	23	10
Enthalpy J	24	10

DIP Switch 1

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

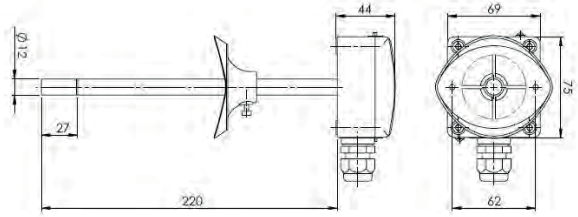
TTHDM

DIP-switch 2



ON		Switch at: ON
OFF		

Dimensions (mm)



CO_2 room sensor

SAC

Description

The SAC CO_2 sensor measures air quality through the presence of carbon dioxide in air ducts 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_2	0...2000 / 0...5000 ppm
Accuracy CO_2	±60 ppm (0...2000 ppm) ±2% FS
	±150 ppm (0...5000 ppm) ±2% FS
Accuracy temperature (*)	± 0,3K (5...60°C) + 1% FS
Accuracy humidity (*)	25°C ± 2% RH (20...80%RH) + 2% FS
Power supply	12(20)...34 V AC/DC
Power consumption	40...100 mA
Sensor setting up time	60 min.
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
CO2 sensitive element	NDIR self adjusting
Sensible element	Self-calibrating NDIR
Electrical connection	Screw terminal for cables 1,5 mm^2
Protection type	IP 30
Housing	ABS RAL9010
Working range RH	0...98% RH in aria pulita e non condensata
Working temperature °C	0...+50°C
Standards	Conformità CE, RoHs

(*) See models hereafter.

Model	Temperature	Humidity	Output
SACV	-	-	0...10 V DC
SACTV	•	-	0...10 V DC
SACTHV	•	•	0...10 V DC
SACC	-	-	4...20 mA
SACTC	•	-	4...20 mA
SACHC	-	•	4...20 mA

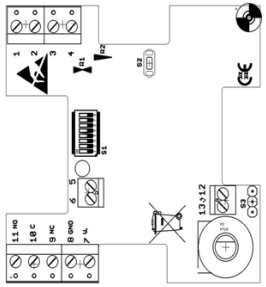
Optional: Suffix D version with display

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

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

SAC

Electrical wirings



Output 0...10 V				Output 4...20 mA			
PIN	CO_2	CO_2/T	CO_2/T/H	PIN	CO_2	CO_2/T	CO_2/H
1	ppm	temp	temp	1	-	-	-
2	-	ppm	humidity	2	-	-	-
3	-	-	ppm	3	ppm	temp	humidity
4	-	-	-	4		ppm	ppm
5	(passive poti)						
6	(passive poti)						
7	V+						
8	GND						
9	(relay NC)						
10	(relay C)						
11	(relay NO)						
12	(passive sensor)						
13	(passive sensor)						
S3	polarity R3						
S2	CO_2 Manual adjustment to 400 ppm						

Dip-switch setting

Temperature range selection

Range	1	2
-30...+70°C	OFF	OFF
-20...+80°C	ON	OFF
0...+50°C	ON	ON
0...+100°C	OFF	ON

Humidity range selection

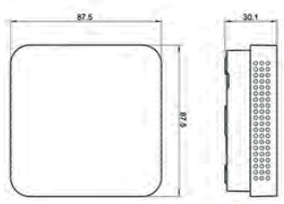
Range	3	4	5	6
Relative humidity				
0...100%	OFF	OFF	OFF	OFF
Absolute humidity				
0 g/m³...30g/m³	ON	OFF	OFF	OFF
0 g/m³...50g/m³	ON	ON	OFF	OFF
0 g/m³...80g/m³	ON	ON	ON	OFF
Mix ratio				
0 g/kg...30g/kg	OFF	OFF	OFF	ON
0 g/kg...50g/kg	OFF	OFF	ON	ON
0 g/kg...80g/kg	OFF	ON	ON	ON
Dew point				
0...+50°C	OFF	ON	ON	OFF
-50...+100°C	ON	OFF	OFF	ON
-20...+80°C	OFF	ON	OFF	ON
Enthalpy				
0 kj/kg...85kj/kg	ON	ON	ON	ON

CO_2 range selection / setting

Range	7	8
CO_2		
0...2000 ppm	OFF	
0...5000 ppm	ON	
Self adjusting		
Not activated		ON
Activated		OFF

Autocalibration CO_2 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.

Dimension (mm)



Room air quality sensor

SAV

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.

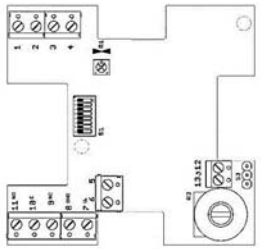
Technical specifications

Measurement range VOC	0...2000 ppm
Tolerance	±2% FS
Measurement range °C (optional)	see configuration
Accuracy °C	±0,3°C (5...60°C) + 2,5% FS
Measurement range RH (optional)	0...100% RH
Accuracy RH	±2% RH (20...80%RH) + 2% FS
Power supply	12...34 V AC/DC (20...34 V AC/DC with relay)
Calibration (corresponds)	Good air approx 1 Vdc … 4 mA = 250 ppm CO_2 equivalent 5 Vdc … 12 mA = 1175 ppm CO_2 equivalent 10 Vdc … 20 mA = 2000 ppm CO_2 equivalent
Power consumption	40...100 mA
Sensor setting up time	60 min
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Relay	SPTD potential free. Changing at 800 ppm
Relay contact	Max 24 V, 1 A
Electrical connection	Screw terminal for cables 1,5 mm²
Housing	ABS (plastic) colour white RAL9010
Weight	approx. 70 g
Protection type	IP30
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature	0...+50°C
Standards	CE conformity, RoHS

Models(*)	Temperature	Humidity	Output
SAVV	-	-	0...10 V DC
SAVTV	•	-	0...10 V DC
SAVTHV	•	•	0...10 V DC
SAVC	-	-	4...20 mA
SAVTC	•	-	4...20 mA
SAVHC	-	•	4...20 mA

(*) Add „R“ suffix for Relay version.

Electrical wirings



Output 0...10 Vdc				Output 4...20 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	Relay NC						
10	Relay COM						
11	Relay NO						
12	(passive sensor)						
13	(passive sensor)						
S3	polarity R3						

Dip-switch setting

Temperature range selection

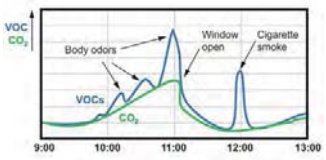
Range	1	2
0...+50°C	OFF	OFF
0...+100°C	ON	OFF
-20...+80°C	OFF	ON
-30...+70°C	ON	ON

Humidity range selection

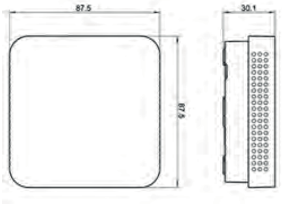
Range	3	4	5	6	7	8
Relative humidity						
0...100%	OFF	OFF	OFF	OFF	-	-
Absolute humidity						
0 g/m³...30g/m³	ON	OFF	OFF	OFF	-	-
0 g/m³...50g/m³	ON	ON	OFF	OFF	-	-
0 g/m³...80g/m³	ON	ON	ON	OFF	-	-
Mix ratio						
0 g/kg...30g/kg	OFF	OFF	OFF	ON	-	-
0 g/kg...50g/kg	OFF	OFF	ON	ON	-	-
0 g/kg...80g/kg	OFF	ON	ON	ON	-	-
Dew point						
0...+50°C	OFF	ON	ON	OFF	-	-
-50...+100°C	ON	OFF	OFF	ON	-	-
-20...+80°C	OFF	ON	OFF	ON	-	-
Enthalpy						
0 kj/kg...85kj/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 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

CO2 measuring range	0 ... 2000 ppm / 0 ... 5000 ppm
Accuracy	± 60 ppm (0 ... 2000 ppm) ± 2% FS / ± 150 ppm (0 ... 5000 ppm) ± 2% FS
Measuring range ° C (optional)	See configuration
Accuracy ° C	± 0.3 ° C (5 ... 60 ° C) + 1% FS
Measurement range RH (optional)	See configuration
RH accuracy	25°C ±2% RH (20...80% RH) + 2% FS
Supply voltage	12 ... 34 V AC / DC
Power consumption	40 ... 100 mA
Resistive load at 0 ... 10 V DC	10 ... 100 kOhm
Resistive load at 4 ... 20 mA	50 ... 500 Ohm
CO2 sensitive element	Self-calibrating NDIR
Electrical connections	Screw terminals for cables max. 1.5 mm²
Sensor setting up time	60 min.
Cable gland	M16 x 1.5 for cables ø 4 ... 10 mm
Protection	IP65
Material	PA6
Working range RH	0 ... 98% RH in clean, non-condensed air
Working range ° C	0 ... + 50 ° C
Installation	PVC mounting flange (included)
Standards	CE, RoHs compliance

Models	Temperature	Humidity	Output
SDCV	-	-	0...10 V DC
SDCT(x)V*	•	-	0...10 V DC
SDCTH(x)V*	•	•	0...10 V DC
SDCC	-	-	4...20 mA
SDCTC	•	-	4...20 mA
SDCHC	-	•	4...20 mA

Optional: Suffix D version with display

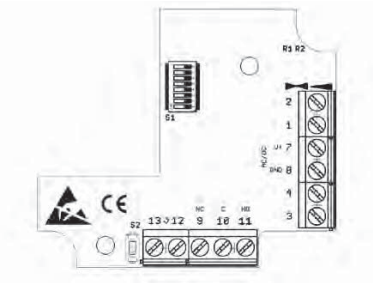
(*) Replace "**X**" with the number of selected passive sensor:

"X"	Type of passive sensor
1	Pt100 (DIN EN 60751 Cl. 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



Output 0...10 Vdc				Output 4...20 mA			
PIN	CO_2	CO_2/T	CO_2/T/H	PIN	CO_2	CO_2/T	CO_2/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	CO_2 Manual adjustment to 400 ppm						

Dip-switch setting

Temperature range selection

Range	1	2
-30...+70°C	OFF	OFF
-20...+80°C	ON	OFF
0...+50°C	ON	ON
0...+100°C	OFF	ON

Humidity range selection

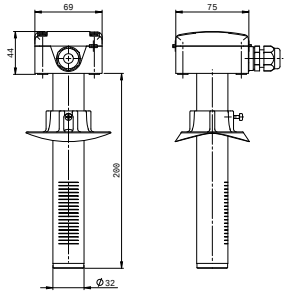
Range	3	4	5	6
Relative humidity				
0...100%	OFF	OFF	OFF	OFF
Absolute humidity				
0 g/m³...30g/m³	ON	OFF	OFF	OFF
0 g/m³...50g/m³	ON	ON	OFF	OFF
0 g/m³...80g/m³	ON	ON	ON	OFF
Mix ratio				
0 g/kg...30g/kg	OFF	OFF	OFF	ON
0 g/kg...50g/kg	OFF	OFF	ON	ON
0 g/kg...80g/kg	OFF	ON	ON	ON
Dew point				
0...+50°C	OFF	ON	ON	OFF
-50...+100°C	ON	OFF	OFF	ON
-20...+80°C	OFF	ON	OFF	ON
Enthalpy				
0 kj/kg...85kj/kg	ON	ON	ON	ON

CO_2 range settings

Range	7	8
CO_2 ranges		
0...2000 ppm	OFF	
0...5000 ppm	ON	
Auto-calibration		
Not activated		ON
Activated		OFF

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

CO_2 duct sensor with ModBus output

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_2	0...2000 ppm
Accuracy CO_2	< ± 60 ppm +2% FS (at 25°C and 1013 mbar)
Accuracy temperature (*)	±0,3°C (5...60°C) + 1% FS
Accuracy humidity (*)	±2% RH (20...80%RH) + 2% FS
Power supply	12...24 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 mm²
Protection type	IP65
Working range RH	10...95% 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

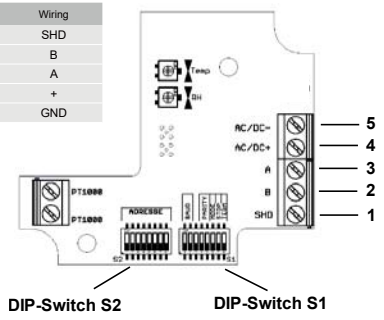
Model	Temperature	Humidity
SDCM	-	-
SDCTM	•	-
SDCTHM	•	•

Measurement source

Unit	ModBus source	Gain
ppm CO_2	10	10
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m³	22	10
Dewpoint °C	23	10
Enthalpy J	24	10

Electrical wirings

PIN	Wiring
1	SHD
2	B
3	A
4	+
5	GND

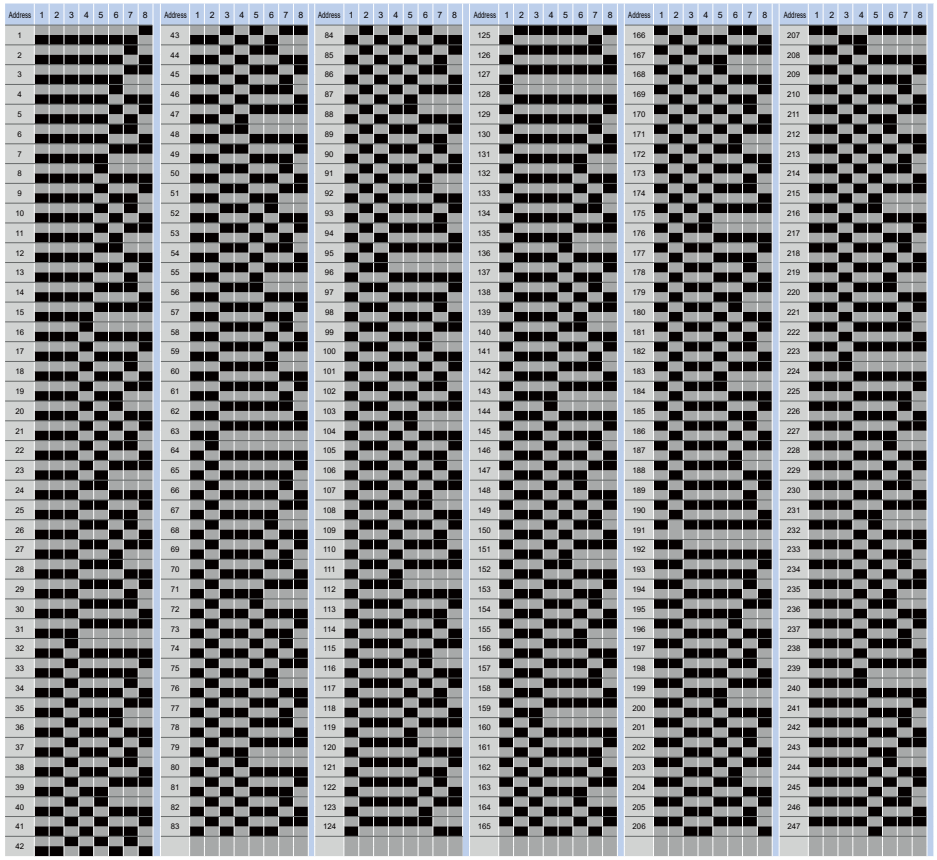


DIP Switch 1

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

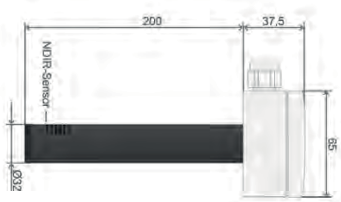
SDCM

DIP-switch 2



ON		Switch at: ON
OFF		

Dimensions (mm)



Installation

SDV

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.

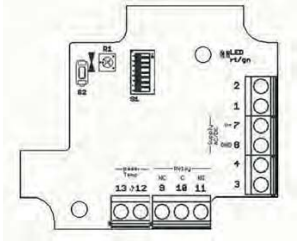
Technical specifications

Measurement range VOC	0...2000 ppm
Measurement range °C (optional)	see configuration
Accuracy temperature (*)	±0,3°C (5...60°C) + 1% FS
Measurement range RH (optional)	see configuration
Accuracy humidity (*)	±2% RH (20...80%RH) + 2% FS
Power supply	12...34 V AC/DC
Power consumption	40...100 mA
Working resistance at 0...10 V DC	10...100 kOhm
Working resistance at 4...20 mA	50...500 Ohm
Calibration (corresponds)	Good air approx 1 Vdc … 4 mA = 250 ppm CO_2 equivalent 5 Vdc … 12 mA = 1175 ppm CO_2 equivalent 10 Vdc … 20 mA = 2000 ppm CO_2 equivalent
Electrical connection	Screw terminal for cables 1,5 mm^2
Protection type	IP65
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	0...+50°C
Installation	Mounting flange (included)
Standards	CE conformity, RoHS

(*) See models hereafter.

Models	Temperature	Humidity	Output
SDVV	-	-	0...10 V DC
SDVTV	•	-	0...10 V DC
SDVTHV	•	•	0...10 V DC
SDVC	-	-	4...20 mA
SDVTC	•	-	4...20 mA
SDVHC	-	•	4...20 mA

Electrical wirings



	Output 0...10 Vdc				Output 4...20 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 potentiometer						
6	passive potentiometer						
7	V+						
8	GND						
9	relay NC						
10	relay C						
11	relay NO						
12	passive sensor						
13	passive sensor						
R1	temp. adjustment						

Dip-switch setting

Temperature range selection

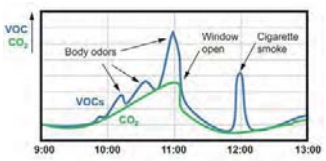
Range	1	2
-30...+70°C	OFF	OFF
-20...+80°C	ON	OFF
0...+100°C	OFF	ON
0...+50°C	ON	ON

Humidity range selection

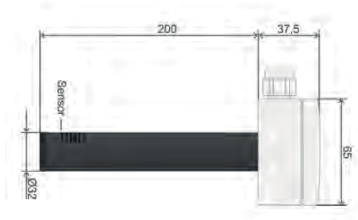
Range	3	4	5	6	7	8
Relative humidity						
0...100%	OFF	OFF	OFF	OFF	-	-
Absolute humidity						
0 g/m³...30g/m³	ON	OFF	OFF	OFF	-	-
0 g/m³...50g/m³	ON	ON	OFF	OFF	-	-
0 g/m³...80g/m³	ON	ON	ON	OFF	-	-
Mix ratio						
0 g/kg...30g/kg	OFF	OFF	OFF	ON	-	-
0 g/kg...50g/kg	OFF	OFF	ON	ON	-	-
0 g/kg...80g/kg	OFF	ON	ON	ON	-	-
Dew point						
0...+50°C	OFF	ON	ON	OFF	-	-
-50...+100°C	ON	OFF	OFF	ON	-	-
-20...+80°C	OFF	ON	OFF	ON	-	-
Enthalpy						
0 kj/kg...85kj/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



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	450...2000 ppm
Accuracy temperature	±0,3°C (5...60°C) + 1% FS
Accuracy humidity	±2% RH (20...80%RH) + 2% FS
Power supply	12...34 V AC/DC
Power consumption	40...100 mA
Electrical connection	Screw terminal for cables 1,5 mm²
Protection type	IP65
Working range RH	0...98% RH in contaminant-free, non-condensing air
Working temperature °C	0...+50°C
Installation	Mounting flange (included)
Standards	CE conformity, RoHS

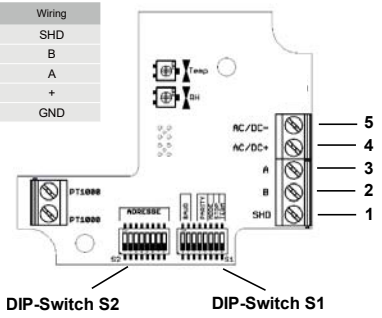
Models	Temperature	Humidity
SDVM	-	-
SDVTM	•	-
SDVTHM	•	•

Measurement source

Unit	ModBus source	Gain
Temperature °C	20	10
Relative humidity %u.r.	21	10
Absolute humidity g/m³	22	10
Dewpoint °C	23	10
Enthalpy J	24	10
ppm VOC	30	10

Electrical wirings

PIN	Wiring
1	SHD
2	B
3	A
4	+
5	GND



DIP Switch 1

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

DIP-switch 2

Address	1	2	3	4	5	6	7	8
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								

Address	1	2	3	4	5	6	7	8
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								
65								
66								
67								
68								
69								
70								
71								
72								
73								
74								
75								
76								
77								
78								
79								
80								
81								
82								
83								

Address	1	2	3	4	5	6	7	8
84								
85								
86								
87								
88								
89								
90								
91								
92								
93								
94								
95								
96								
97								
98								
99								
100								
101								
102								
103								
104								
105								
106								
107								
108								
109								
110								
111								
112								
113								
114								
115								
116								
117								
118								
119								
120								
121								
122								
123								
124								

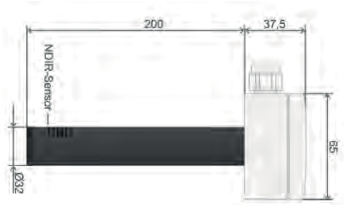
Address	1	2	3	4	5	6	7	8
125								
126								
127								
128								
129								
130								
131								
132								
133								
134								
135								
136								
137								
138								
139								
140								
141								
142								
143								
144								
145								
146								
147								
148								
149								
150								
151								
152								
153								
154								
155								
156								
157								
158								
159								
160								
161								
162								
163								
164								
165								

Address	1	2	3	4	5	6	7	8
166								
167								
168								
169								
170								
171								
172								
173								
174								
175								
176								
177								
178								
179								
180								
181								
182								
183								
184								
185								
186								
187								
188								
189								
190								
191								
192								
193								
194								
195								
196								
197								
198								
199								
200								
201								
202								
203								
204								
205								
206								

Address	1	2	3	4	5	6	7	8
207								
208								
209								
210								
211								
212								
213								
214								
215								
216								
217								
218								
219								
220								
221								
222								
223								
224								
225								
226								
227								
228								
229								
230								
231								
232								
233								
234								
235								
236								
237								
238								
239								
240								
241								
242								
243								
244								
245								
246								
247								

ON		Switch at: ON
OFF		

Dimensions (mm)



Installation

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

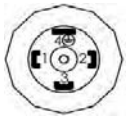
Power supply	Output 4...20 mA: 24 V DC / Ourtput 0...10 V 24 V AC/DC
Output signal	0 ... 10 V DC or 4 ... 20 mA
Berst pressure	x 2,5 FS
Linearity	≤ 1% of FS
Hysteresis	≤ 0,5% of FS
Working temperature	0 ... 85°C
Thread	G 1/2", G 1/4"
Electrical connection	Connector DIN EN 175301-803-A
Housing	Stainless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

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**		
	-0... -0,1 MPa	(-0… -1 bar)		**17**		
Thread	G1/4"				**1**	
	G1/2"				**2**	
Output signal	0...10 V DC, 3 wire, linear					**V**
	4...20 mA, 2 wire, linear					**C**

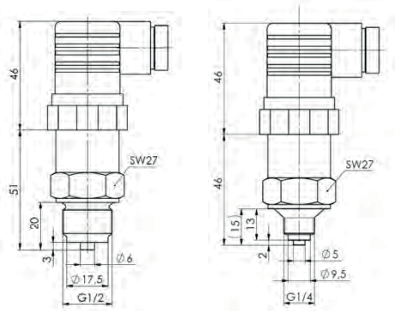
Electrical wirings

DIN EN 175301-803-A



Output 4...20 mA		Output 0...10 V	
Pin	Connection	**Pin**	Connection
1	+IN	1	+IN
2	OUT	2	GND
3		3	+OUT
4		4	

Dimensions (mm)



Differential pressure transmitter

OEM

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	≤ ± 0,5 % of ± 2,5 % of FS/year, depending on pressure range
Repetition accuracy	≤ ± 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^2
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)

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

PTR

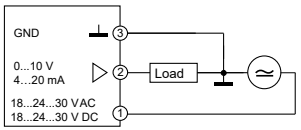
Adjustable pressure range: The end of the pressure range can be reduced to 50% of its factory set full scale value simply by the use of a push-button.
Output signal: 0 ... 10 V or 4 ... 20 mA. Other signals on request.
Configurable response time: The response time of the output signal can be configured 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

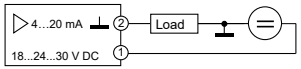
Configurable pressure ranges	0... 100 Pa	(0… 1,0 mbar)	**2**	
	0... 250 Pa	(0… 2,5 mbar)	**3**	
	0... 500 Pa	(0… 5,0 mbar)	**4**	
	0... 1000 Pa	(0… 10 mbar)	**5**	
	0... 1,6 kPa	(0... 16 mbar)	**M**	
	0... 2,5 kPa	(0… 25 mbar)	**6**	
	0... 5 kPa	(0… 50 mbar)	**7**	
	0... 10 kPa	(0… 100 mbar)	**8**	
	0... 25 kPa	(0… 250 mbar)	**9**	
	0... 50 kPa	(0… 500 mbar)	**A**	
	0... 100 kPa	(0… 1,0 bar)	**B**	
	0... 250 kPa	(0… 2,5 bar)	**F**	
Output signal	0...10 V, 3-wire, linear			**7**
	4...20 mA, 3-wire, linear			**D**
	0...10 V, 3-wire, square rooted			**L**
	4...20 mA, 3-wire, square rooted			**P**
	4...20 mA, 2-wire, linear			**2**
	4...20 mA, 2-wire, square rooted			**U**

Electrical wiring

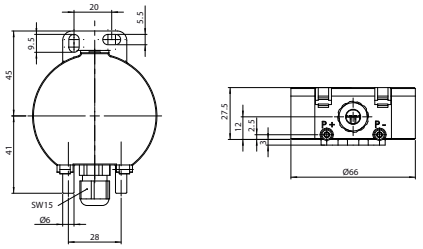
3-wire version



2-wire version



Dimensions (mm)



Differential pressure transmitter, single and dual

PTS

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 15...35 VDC
Power consumption	< 1,5 W
Output signal	0...10 VDC, 2...10 VDC, 0...5 VDC, 1...5 VDC, 4...20 mA
Current output	4...20 mA, maximum 500 Ohm
Voltage output	0...10 VDC or 0...5 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 mm²
Mounting	Screw mounting with serrated screws
Housing dimensions	151x85x50 mm
Weight	168...205 g
Cable conduit for protection cap	M16
Protection class EN 60529	IP54
Standards	CE conformity, RoHS

Order matrix

	Range 1		Range 2		Output 1		Output 2		Option	
	0	no	**0**	no	**0**	no	**0**	no	**M**	Modbus
	1	±250 Pa	**1**	±250 Pa	**1**	0...10 VDC	**1**	0...10 VDC	**D**	Display
	2	1.000 Pa	**2**	1.000 Pa	**2**	2...10 VDC	**2**	2...10 VDC	**R**	Relay*
	3	±1.000 Pa	**3**	±1.000 Pa	**3**	0...5 VDC	**3**	0...5 VDC		
	4	2.500 Pa	**4**	2.500 Pa	**4**	1...5 VDC	**4**	1...5 VDC		
	5	10.000 Pa	**5**	10.000 Pa	**5**	4...20 mA	**5**	4...20 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.

Range - Pa	sub-ranges - Pa
0 no	no
1 ±250	-25…+25, -50…+50, -100…+100, -250…+250, 0…25, 0…50, 0…100, 0…250
2 1.000	0…100, 0…200, 0…300, 0…400, 0…500, 0…600, 0…750, 0…1.000
3 ±1.000	-250…+250, -500…+500, -750…+750, -1.000…+1.000, 0…250, 0…500, 0…750, 0…1.000
4 2.500	0…100, 0…250, 0…500, 0…750, 0…1.000, 0…1.500, 0…2.000, 0…2.500
5 10.000	0…1k, 0…2k, 0…3k, 0…4k, 0…5k, 0…6k, 0…7,5k, 0…10k
6 6.000	0…500, 0…750, 0…1.000, 0…2.000, 0…3.000, 0…4.000, 0…5.000, 0…6.000
7 ±6.000	-1k…+1k, -2k…+2k, -3k…+3k, -6k…+6k, 0…1k, 0…2k, 0…3k, 0…6k

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
	-25…25	0…100	-250…250	0…100	0…500	-1.000…1.000	0…1 KPa
	-50…50	0…200	-500…500	0…250	0…750	-2.000…2.000	0…2 KPa
	-100…100	0…300	-750…750	0…500	0…1.000	-3.000…3.000	0…3 KPa
	-250…250	0…400	-1.000…1.000	0…750	0…2.000	-6.000…6.000	0…4 KPa
	0…25	0…500	0…250	0…1.000	0…3.000	0…1.000	0…5 KPa
	0…50	0…600	0…500	0…1.500	0…4.000	0…2.000	0…6 KPa
	0…100	0…750	0…750	0…2.000	0…5.000	0…3.000	0…7.5 KPa
	0…250	0…1.000	0…1.000	0…2.500	0…6.000	0…6.000	0…10 KPa

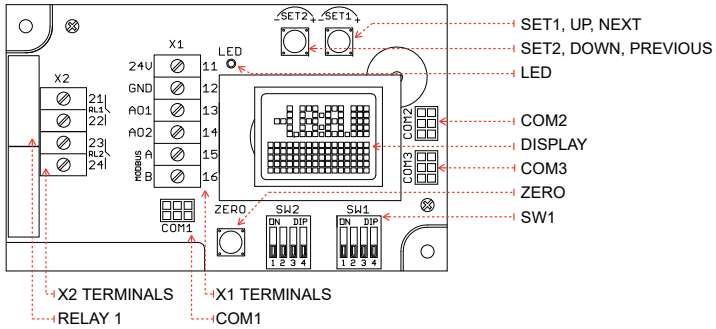
Response time

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

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

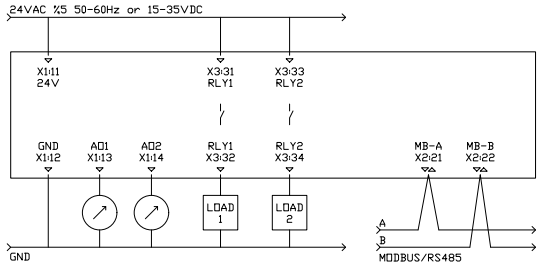
Output is updated:
- every 0.1 second in FAST mode
- every 0.4 second in SLOW mode

Transmitter hardware



SET1	Main Screen Menu Mode	press min. 5 sec. for entering MENU increase the parameter or next selection
SET2	Menu Mode	decrease the parameter or previous selection
ZERO	Main Screen Menu Mode	press min. 5 sec. for setting ZERO next parameter and finally exit
LED	Working Modbus	blinks periodically blinks for each Modbus transmitting
DISPLAY		custom dot matrix display, please check page 6 for more information
COM	COM 1 COM 2 COM 3	service port service port service port
SW 1	# 1-2-3 # 4	sub-range selection for DP 1, see page 3 response time selection, see page 3
X1 Terminals	11 24V 12 GND 13 AO1 14 AO2 15 modbus-A 16 modbus-B	14…35 VDC or 24 VAC (± %5, 50-60 Hz) ground for power and reference for outputs analog output 1 analog output 2 modbus communication positive pair modbus communication negative pair
X2	21-22	relay 1, dry contact, max. rating 1A @ 220 VAC
Relay 1	normally open	acts always for DP1

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
for Single DP version


zeroing
counts down for 5 sec.
keep pressing ZERO button


entering MENU
counts down for 5 sec.
keep pressing SET1 button


zeroing is OK


entered to MENU


min. point, scale for DP


max. point, scale for DP


response time


FAST response, 1 sec.


SLOW response, 4 sec.


Relay, LOW point

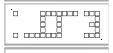

Relay, HIGH point


Relay, ACTION


action 0,
always OFF


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


bit settings


9.600


databits: 8, parity: even, stopbit: 1


19.200


databits: 8, parity: none, stopbit: 1


38.400


databits: 8, parity: none, stopbit: 2


57.600


databits: 8, parity: odd, stopbit: 1


115.200

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

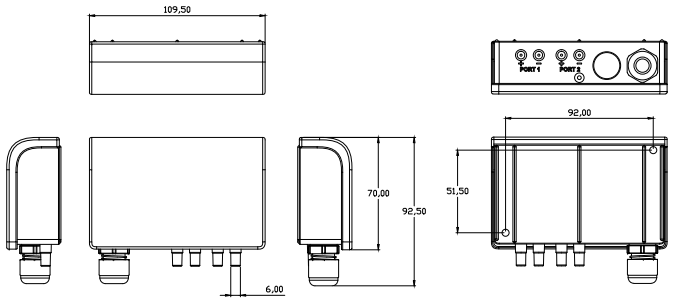
Action	under LOW	between LOW - HIGH	over HIGH
0	Open	Open	Open
1	Open	Closed	Open
2	Closed	Open	Closed
3	Open	hysterisis	Closed
4	Closed	hysterisis	Open

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)



Air differential pressure transmitter IP65

PTG

Description

The differential pressure transmitter serie PTG is used to measure differential pressure, overpressure and vacuum of gaseous, non-aggressive 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.

Technical specifications

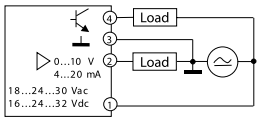
Medium	Air, non-combustible and non-aggressive gases
Measurement range	See schedule
Linearity and hysteresis error	≤ ±1% of FS
Repetition accuracy	≤ ±0.2 % of FS
Response time	0,1 s or 1 s, selectable by jumper
Position dependence	≤ ±0,02% of FS/g
Long term stability	< ±0,5% final value/year
Offset calibration	The output signal can be calibrated to zero by pressing the M key.
Supply voltage	18…30 V AC / DC
Output signal	3-wire connection, with switching output. The factory setting is 0...10 V DC, but can be changed to 4-20 mA by removing the jumper. 2-wire connection 4...20 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 mm²
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	0...95% 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) **included**
Installation	Screw fastening
Installation position	any
Standards	CE-conformity, RoHS

Models	Measuring range	Max pressure
PTG1	-50...0...+50 Pa	60 kPa
PTG2	0...100 Pa, 0...250 Pa	60 kPa
PTG3	0...500 Pa, 0...1000 Pa	75 kPa
PTG4	0...1 kPa, 0...2,5 kPa	85 kPa
PTG5	0...5 kPa, 0...10 kPa	85 kPa
PTG6	0...25 kPa, 0...50 kPa	200 kPa
PTG9	-100...0...+100 Pa	60 kPa

Suffix D for models with display

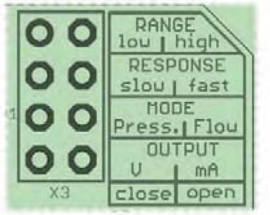
Electrical wirings

3-wire



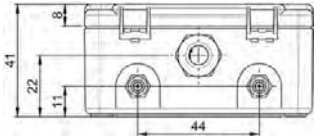
4	SA	Switching output, npn
3	GO	Ground G N D
2	Y	Output signal 0 . . . 10V / 4 . . . 20 mA
1	G	Supply voltage 24 VAC / VDC

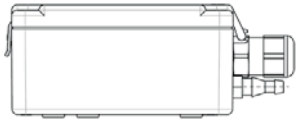
Settings

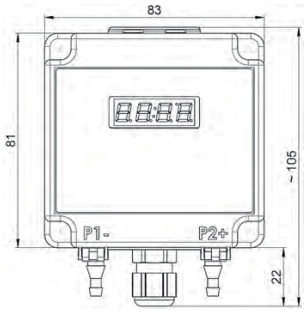


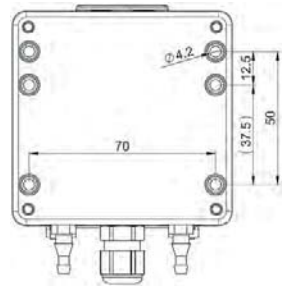
	Jumper (switched) ■	Aperto (open) ■ ■
Range pressione (Pressure range)	Bassa (low)	Alta (high)
Risposta (Response)	Lenta (slow)	Veloce (fast)
Funzionamento (Mode)	Lineare (linear)	Quadratico (square root)
Segnale di uscita (Output signal)	0…10 V	4…20 mA

Dimensions (mm)

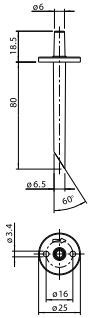








ABS nippel
(part of connection set APA3)

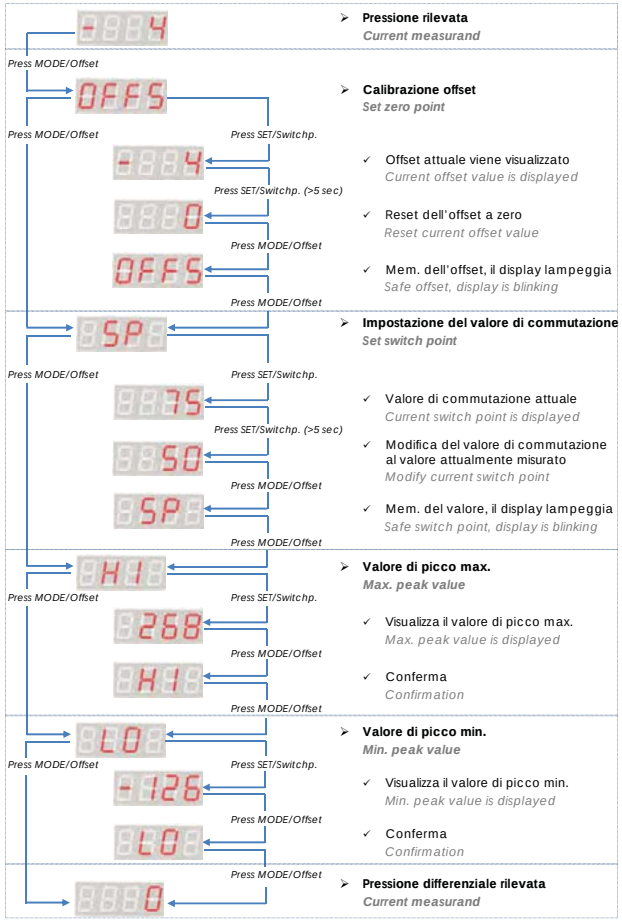


Programming version without display

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 replase the pressure tube.

Programming display version



* 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

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 long-term and temperature effect)	±1 % of FS, min ±1 Pa
Response time	0,2...10 s
Long term stability PTGM, VTGM	< ±1% of FS
Long term stability PTGA, VTGA	n.r.
Supply voltage	18…30 V AC / DC
Output signal	Digital
Protocol	ModBus RS-485, RTU
Type, Address	Slave, 1...247
Baud rate	9600...115200 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 mm²
Display	LED, 4 digits
Housing material	ABS
Housing dimensions	Approx. 81x83x41 mm
Weight	Approx. 140 g
Protection class	IP65
Working humidity	0...95% 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) **included**
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.

Models

Pressure ranges for air differential pressure versions

Model	Pressure range	Overload capacity	Bursting pressure	Additional uncertainty with temperature (% FS/10K) PTGM	PTGA
PTGAE	-25...0...+25 Pa	60 kPa	100 kPa	-	± 0,7
PTGxX	-50...0...+50 Pa	60 kPa	100 kPa	± 1,0	± 0,5
PTGxW	-100...0...+100 Pa	60 kPa	100 kPa	± 0,7	± 0,3
PTGA1	0...50 Pa	60 kPa	100 kPa	-	± 0,7
PTGx2	0...100 Pa	60 kPa	100 kPa	± 0,7	± 0,5
PTGx3	0...250 Pa	60 kPa	100 kPa	± 0,5	± 0,3
PTGx4	0...500 Pa	75 kPa	125 kPa	± 0,3	n.r.
PTGx5	0...1000 Pa	75 kPa	135 kPa	± 0,3	n.r.
PTGx7	0...5000 Pa	85 kPa	135 kPa	± 0,3	n.r.
PTGx8	0...10 kPa	85 kPa	135 kPa	± 0,3	n.r.
PTGx9	0...25 kPa	200 kPa	400 kPa	± 0,3	n.r.
PTGxA	0...50 kPa	200 kPa	400 kPa	± 0,3	n.r.
PTGxB	0...100 kPa	200 kPa	400 kPa	± 0,3	n.r.

Order matrix

			M	
Offset calibration		manual automatic	M	
Configurable pressure ranges	-25...0...+25 Pa	only available as PTGA		**E**
	-50...0...+50 Pa			**X**
	-100...0...+100 Pa			**W**
	0...50 Pa	only available as PTGA		**1**
	0...100 Pa			**2**
	0...250 Pa			**3**
	0...500 Pa			**4**
	0...1000 Pa			**5**
	0...5000 Pa			**7**
	0...10 kPa			**8**
	0...25 kPa			**9**
	0...50 kPa			**A**
	0...100 kPa			**B**

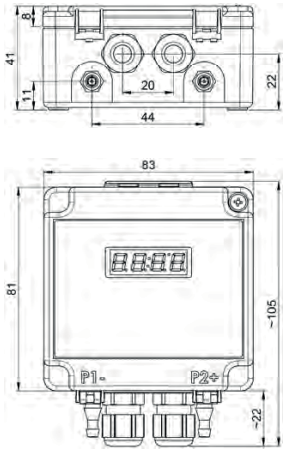
Pressure ranges for air flow volume or air flow speed versions

Model	Pressure range	Overload capacity	Bursting pressure	Additional uncertainty with temperature (% FS/10K) VTGM	VTGA
VTGA1	0...50 Pa	60 kPa	100 kPa	-	± 0,7
VTGx2	0...100 Pa	60 kPa	100 kPa	± 1,0	± 0,5
VTGx3	0...250 Pa	60 kPa	100 kPa	± 0,7	± 0,3
VTGx4	0...500 Pa	75 kPa	125 kPa	± 0,5	n.r.
VTGx5	0...1000 Pa	75 kPa	135 kPa	± 0,3	n.r.
VTGx7	0...5000 Pa	85 kPa	135 kPa	± 0,3	n.r.
VTGx8	0...10 kPa	85 kPa	135 kPa	± 0,3	n.r.

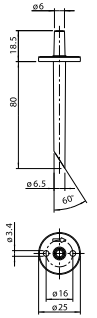
Order matrix

			M		
Offset calibration		manual automatic	M		
Configurable pressure ranges	0...50 Pa	only available as VTGA		**1**	
	0...100 Pa			**2**	
	0...250 Pa			**3**	
	0...500 Pa			**4**	
	0...1000 Pa			**5**	
	0...5000 Pa			**7**	
	0...10 kPa			**8**	
Unit of display	Air flow volume	m³/h; m³/s; cfm; l/s			**A**
	Air flow speed	m/s; ft/min			**B**

Dimensions (mm)



ABS nippel
(part of connection set APA3)



Terminal assignments

Plug-in terminals 2 x 5-pole			1 2 3 4 5	1 2 3 4 5
1	in	Supply voltage (18...30 VAC / VDC)		
2	in	Ground (GND) Common		
3	in	A / Data + (D0)		
4	in	B / Data - (D1)		
5	in	Shield		
1	out	Supply voltage (18...30 VAC / VDC)		
2	out	Ground (GND) Common		
3	out	A / Data + (D0)		
4	out	B / Data - (D1)		
5	out	Shield		

Air differential pressure transmitter

PTM

Description

The differential pressure transmitter serie PTM is used to measure differential pressure, overpressure and vacuum of gaseous, non-aggressive 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.

Technical specifications

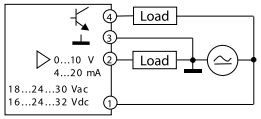
Medium	Air, non-combustible and non-aggressive gases
Measurement range	See schedule
Linearity and hysteresis error	≤ ±1% of FS
Repetition accuracy	≤ ±0.2 % of FS
Response time	0.1 s or 1 s, selectable by jumper
Position dependence	≤ ±0,02% of FS/g
Long term stability	< ±0,5% final value/year
Offset calibration	The output signal can be calibrated to zero by pressing the M key.
Supply voltage	18…30 V AC / 16…32 V DC
Output signal	3-wire connection, with switching output. The factory setting is 0-10 V DC, but can be changed to 4-20 mA by removing the jumper. 2-wire connection 4-20 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 mm²
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. Ø 85 x 58 mm
Weight	approx. 150 g
Protection class	IP54
Working humidity	0...95% RH, non-condensing
Working temperature	0...+50°C
Storage temperature	-40...+70°C
Accessories	Connection set (PVC-hose 2 m Ø 6 with 2 ABS nippels and 4 screws) **included** and snap-on plastic brackets optionally
Installation	Screw fastening
Installation position	any
Standards	CE-conformity, RoHS

Models	Measuring range	Max pressure
PTM1	-50...0...+50 Pa	20 kPa
PTM2	0...100 Pa, 0...250 Pa	20 kPa
PTM3	0...500 Pa, 0...1000 Pa	20 kPa
PTM4	0…1 kPa, 0...2,5 kPa	40 kPa
PTM5	0...5 kPa, 0...10 kPa	60 kPa
PTM6	0...25 kPa, 0...50 kPa	300 kPa
PTM9	-100...0...+100 Pa	20 kPa

Suffix D for models with display

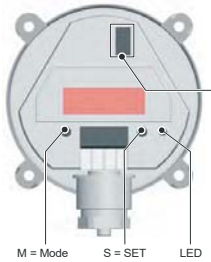
Electrical wirings

3-wires



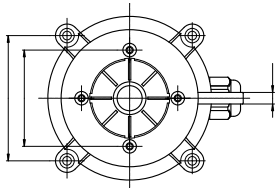
4	SA	Switching output, npn
3	GO	Ground G N D
2	Y	Output signal 0 . . . 10V / 4 . . . 20 mA
1	G	Supply voltage 24 VAC / VDC

Setting

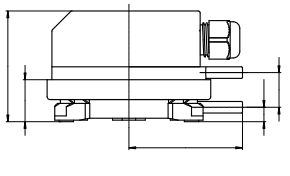


	Jumper (switched) ■	Aperto (open) ■ ■
Range pressione (Pressure range)	Bassa (low)	Alta (high)
Risposta (Response)	Lenta (slow)	Veloce (fast)
Funzionamento (Mode)	Lineare (linear)	Quadratico (square root)
Segnale di uscita (Output signal)	0…10 V	4…20 mA

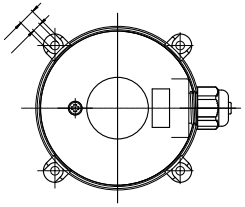
Dimensions (mm)



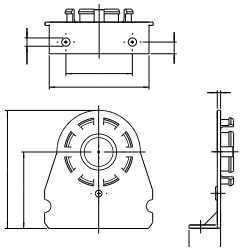
APA1 Snap-on plastic bracket, L-shaped

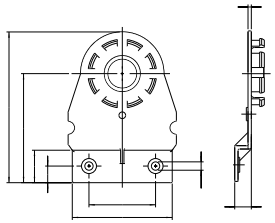


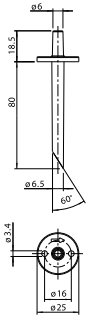
APA2 Snap-on plastic bracket, S-shaped



ABS nippel
(part of connection set APA3)



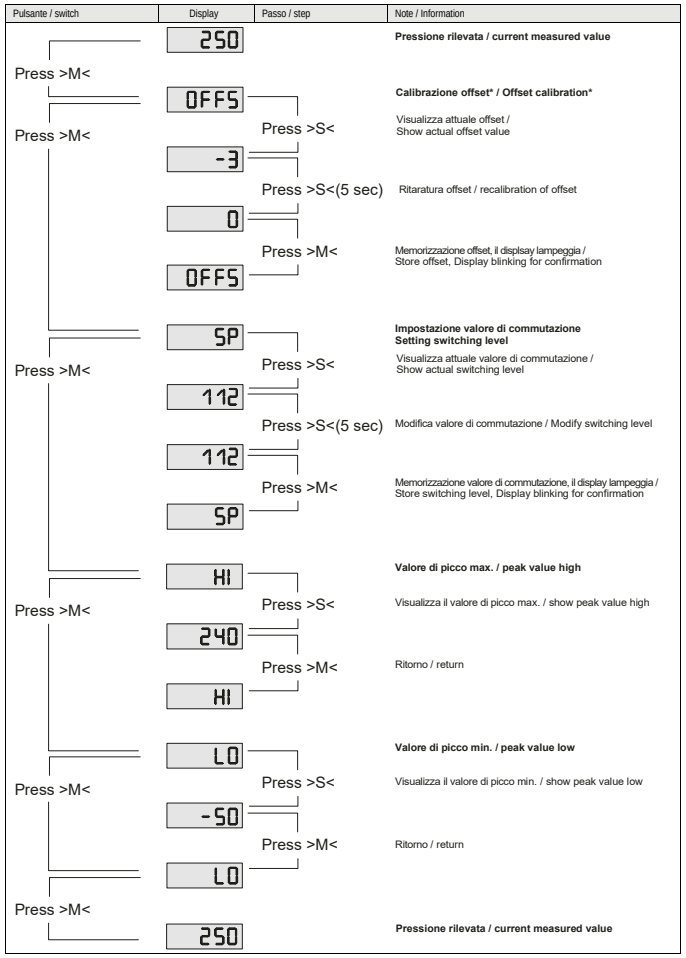




Programming version without display

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.

Description

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
Output signal	0 ... 10 V or 4 ... 20 mA
Load for 4 ... 20 mA output	20...500 Ω
Load for 0 … 10 V output	≥ 1k Ω (≥10mA)
Units, selectable	m^3/h; m^3/s; cfm; l/s
K factor	0,001...9,9 x 10^5
Switching output	Transistor, maximum switching capacity of 30 VDC / 100 mA
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^2 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	Range		Overload capacity	Bursting pressure	Temperature error
PTV1..	0... 50 Pa	(0… 0,5 mbar)	60 kPa	100 kPa	≤ ± 3,0 % of full range
PTV2..	0... 100 Pa	(0… 1,0 mbar)	60 kPa	100 kPa	≤ ± 2,0 % of full range
PTV3..	0... 250 Pa	(0… 2,5 mbar)	60 kPa	100 kPa	≤ ± 2,5 % of full range
PTV4..	0... 500 Pa	(0… 5,0 mbar)	75 kPa	125 kPa	≤ ± 2,5 % of full range
PTV5..	0... 1000 Pa	(0… 10 mbar)	85 kPa	135 kPa	≤ ± 1,5 % of full range
PTV7..	0... 5 kPa	(0… 50 mbar)	85 kPa	135 kPa	≤ ± 1,0 % of full range
PTV8..	0... 10 kPa	(0… 100 mbar)	85 kPa	135 kPa	≤ ± 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 pressure range	0... 50 Pa	(0… 0,5 mbar)	PT	1	
	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				A

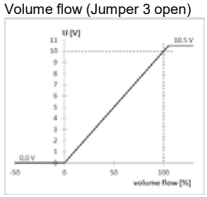
Formula configuration

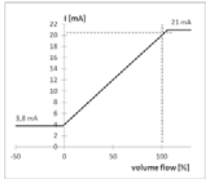
1) Select a calculation formula and enter the k-factor (jumper 1 open): This procedure is used when the k-factor is known. The k-factor can be found, for example, in documentation provided by the manufacturer of the ventilator or the probe. Use the menu guide on the device for configuration.
2) Creating reference volume flow (jumper 1 plugged in): Create a reference volume flow to configure the device. Use **FL□** 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	$q = \frac{1}{k} \cdot \sqrt{\Delta p}$

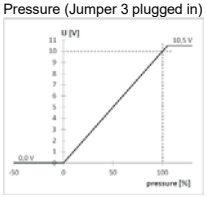
Diagramm

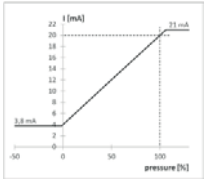
Volume flow (Jumper 3 open)





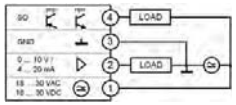
Pressure (Jumper 3 plugged in)





Terminal assignments

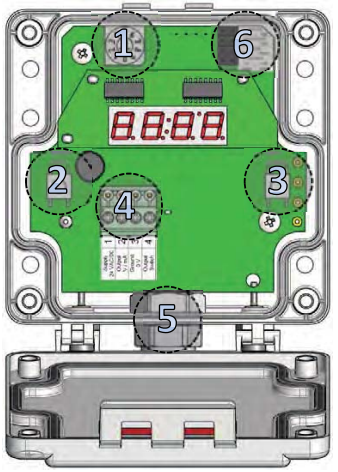
3-wire with switching output



Plug-in terminals, 4-pole	

4	Switching output (SO)
3	Ground (GND)
2	Output signal (0…10 V / 4…20 mA)
1	Supply voltage (18...30 VAC / VDC)

Jumper assignments

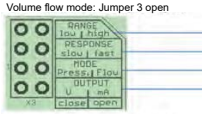


1. Rotary coding switch
2. Button MODE/Offset
3. Button SET/Switchp.
4. Plug-in terminals
5. Cap nut conduit
6. Jumper

Jumper assignments

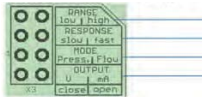
The function settings of differential pressure transducer are achieved by inserting jumpers appropriately within the transducer.

Volume flow mode: Jumper 3 open



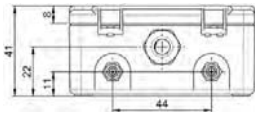
Function	Switched	Open
Entry	ref. Volume flow	K-factor
Responce time	Slow	Fast
Operation mode		Volume flow
Output signal	0...10 V DC	4...20 mA

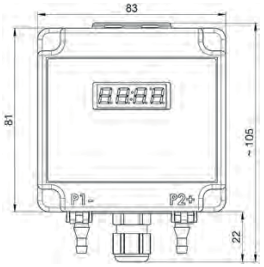
Volume flow mode: Jumper 3 plugged in

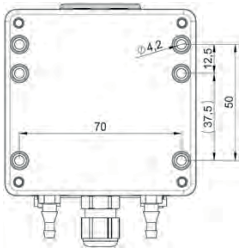


Function	Switched	Open
Setting	Zero- point	Analog end point
Responce time	Slow	Fast
Operation mode	Pressure	Volume flow
Output signal	0...10 V DC	4...20 mA

Dimensions (mm)







Description

The differential pressure transmitters serie PTQ is used to measure differential pressure, overpressure and vacuum of gaseous, non-aggressive 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.

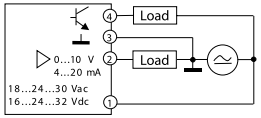
Technical specifications

Medium	Air, non-combustible and non-aggressive gases
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	≤ ±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	It performs an automated zero offset compensation. No re-calibaration needed.
Max pressure	20 kPa
Supply voltage	18…30 V AC / 16…32 V DC
Output signal	3-wire connection, with switching output. The factory setting is 0-10 V DC, but can be changed to 4-20 mA by removing the jumper.
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 mm²
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	0...95% RH, non-condensing
Working temperature	0...+50°C
Storage temperature	-40...+70°C
Accessories	Connection set (PVC-hose 2 m Ø 6 with 2 ABS nippels and 4 screws) **included** and snap-on plastic brackets optionally
Installation	Screw fastening
Installation position	any
Standards	CE-conformity, RoHS

Models	Measuring range	Version
PTQ1	-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	
PTQ1D	-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	with display
Accessories:	**APA1** Snap-on plastic bracket, L-shaped **APA2** Snap-on plastic bracket, S-shaped	

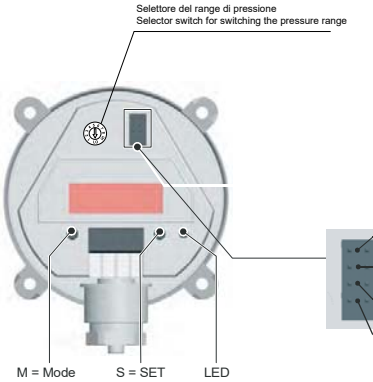
Electrical wirings

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

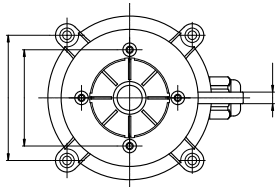
Setting



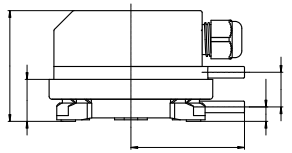
Selettore Selector	Scala Range
1	0...100 Pa
2	0...250 Pa
3	0...500 Pa
4	0...1000 Pa
5	-50...0...+50 Pa
6	-100...0...+100 Pa
7	-250...0...+250 Pa
8	-500...0...+500 Pa
0	Test output (0 V / 4 mA)
9	Test output (10 V / 20 mA)

	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)	0…10 V	4…20 mA

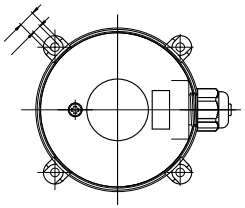
Dimensions (mm)



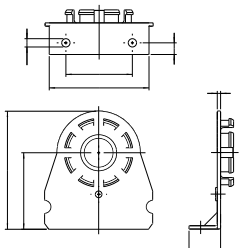
APA1 Snap-on plastic bracket, L-shaped

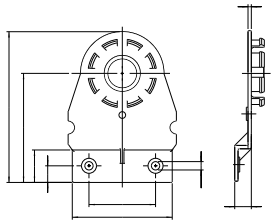


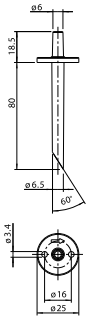
APA2 Snap-on plastic bracket, S-shaped



ABS nippel
(part of connection set APA3)



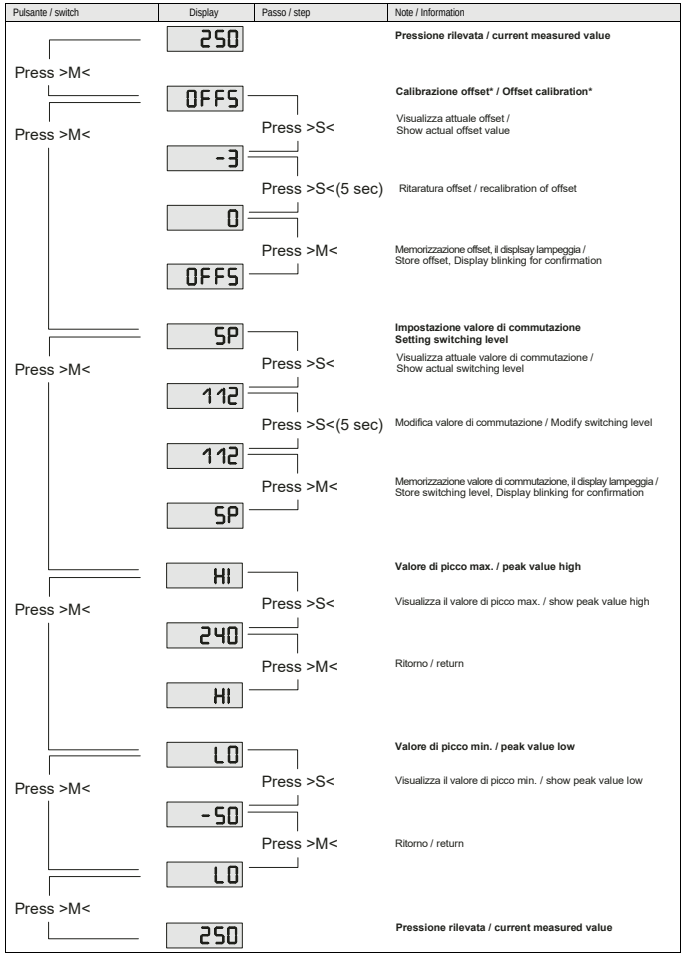




Programming version without display

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.

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

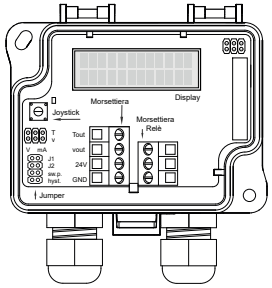
Measurement ranges	
Velocity	Range 2: 0...400 FPM (0...2 m/s) Range 10: 0...2000 FPM (0...10 m/s) Range 20: 0 - 4000 FPM (0...20 m/s)
Temperature	0...50°C
Accuracy velocity	Range 2: 0...400 FPM <20 FPM +5% from reading Range 10: 0...2000 FPM <100 FPM +5% from reading Range 20: 0...4000 FPM <200 FPM +5% from reading
Temperature	<0,55° C for v > 100 FPM

Accuracy specications include: general 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) 0...10 VDC (linear to temperature) 0...50°C L min 1K VDC Output = 32°F + (9 degrees F * volts) 4 - 20 mA (linear to temperature) 0...50°C L max 400 mA Output = 32°F + [5.625 degrees F * (mA – 4)]
Output signal 2	(vout) 0...10 VDC (linear to FPM), L min 1K, 4...20mA (linear to FPM), L max 400
Relay out	3 screw terminal block 0,2...1,5 mm², 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 (0,2...1,5 mm²)
Relay Out	3 screw terminal block 16-24AWG (0.2 – 1.5 mm²)
Cable inlet	2 x M16
Working temperature	0...50°C
Storage temperature	-20...70°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 50...180 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	-

Electrical connections



Installation

1) Mount the device in desired location, see Step 1.
2) 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.

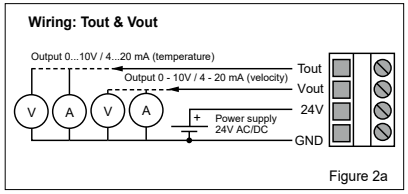


Figure 2a

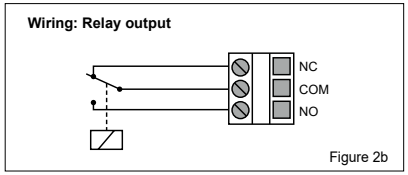


Figure 2b

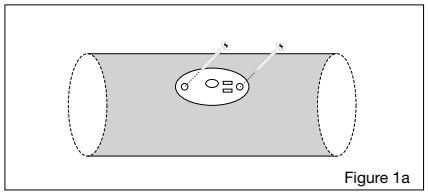


Figure 1a

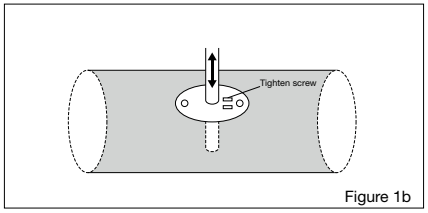


Figure 1b

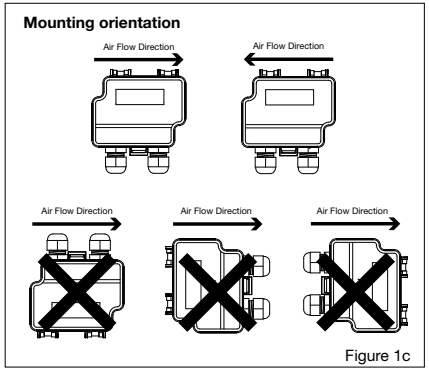


Figure 1c

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.

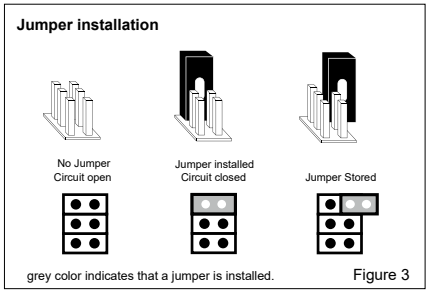


Figure 3

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.

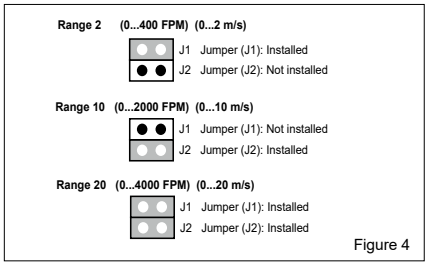


Figure 4

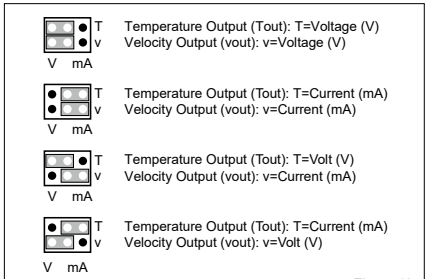


Figure 3b

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.

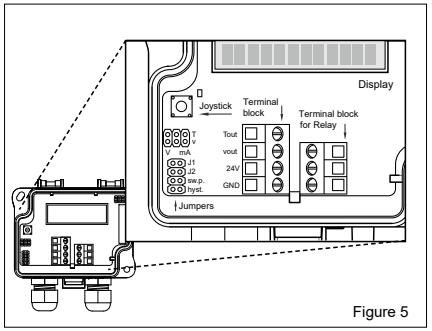
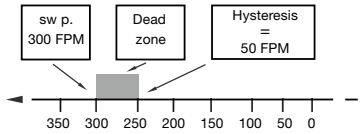


Figure 5

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.

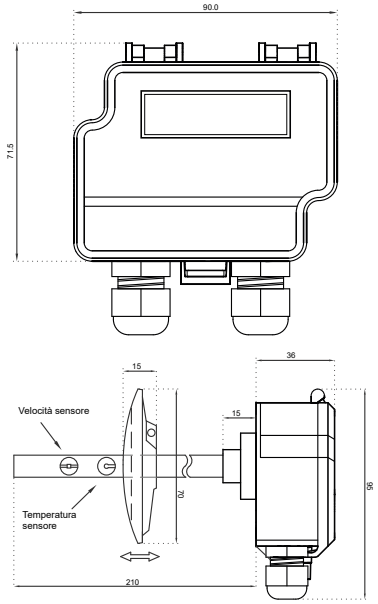


In above example Switch Point is set at 300 FPM, and hysteresis is set at 50 FPM. As the velocity increases over 300 FPM, the relay will open/close. As velocity reduces, the relay will not close/open until the velocity passes 250 FPM, thus preventing rapid cycling.

Range		Maximun Hysteresis	
m/s	FPM	m/s	FPM
0...2	0...400	0,4	80
0...10	0...2.000	2	400
0...20	0...4.000	4	800

The Hysteresis Maximum setting is based on the Range Selected.

Dimensions (mm)



cyanline

sensors

Cable temperature sensor

SC

Description

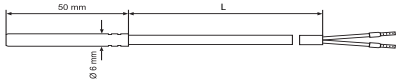
The temperature sensor serie SC measures the temperature from -35 up to +105°C of gaseous and liquid media. The range is available with all type of current sensor elements. The stainless steel sleeve protects the sensor e.g. against mechanical impacts. It is sealed by the PVC cable against humidity and can be mounted in an immersion pocket, with a spring or bracket for pipe contact.

Technical specifications

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 mm², 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 Cl. B)	1 m PVC (2x0,25 mm²)
SC1-2	Pt100 (DIN EN 60751 Cl. B)	2 m PVC (2x0,25 mm²)
SC1-5	Pt100 (DIN EN 60751 Cl. B)	5 m PVC (2x0,25 mm²)
SC2-1	Pt1000 (DIN EN 60751 Cl. B)	1 m PVC (2x0,25 mm²)
SC2-2	Pt1000 (DIN EN 60751 Cl. B)	2 m PVC (2x0,25 mm²)
SC2-5	Pt1000 (DIN EN 60751 Cl. B)	5 m PVC (2x0,25 mm²)
SC3-2	Ni1000 (TK6180)	2 m PVC (2x0,25 mm²)
SC3-5	Ni1000 (TK6180)	5 m PVC (2x0,25 mm²)
SC4-2	Ni1000 (TK5000)	2 m PVC (2x0,25 mm²)
SC4-5	Ni1000 (TK5000)	5 m PVC (2x0,25 mm²)
SC5-2	NTC20k (±1%)	2 m PVC (2x0,25 mm²)
SC5-5	NTC20k (±1%)	5 m PVC (2x0,25 mm²)
SC6-2	NTC10k (±1%) BETA 3435K	2 m PVC (2x0,25 mm²)
SC6-5	NTC10k (±1%) BETA 3435K	5 m PVC (2x0,25 mm²)
SC7-2	KTY 81-110 (±1%)	2 m PVC (2x0,25 mm²)
SC7-5	KTY 81-110 (±1%)	5 m PVC (2x0,25 mm²)
SC8-2	KTY 81-121 (±1%)	2 m PVC (2x0,25 mm²)
SC8-5	KTY 81-121 (±1%)	5 m PVC (2x0,25 mm²)

Dimensions (mm)



Strap-on temperature sensor

SCT

Description

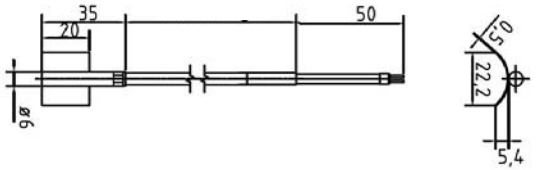
The temperature sensor serie SCT measures the temperature from -50 up to +100°C strap-on mounting on pipes and arched surfaces. The range is available with all type of current sensor elements.

Technical specifications

Measurement range	-50...+100°C
Sensor	Pt100, Pt1000, Ni1000, NTC
Type of connection	2-wires
Measured current	approx. 1 mA
Electrical connection	2 m PVC cable (2 x 0,25 mm², max. +100°C) with core cable ends
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Protection sleeve	Brass
Protection type	IP54
Storage temperature	-20...+70°C
Accessory	Spring band (included) for pipes from 25 to 110 mm
Standards	CE conformity, RoHS

Models	Type of sensor
SCT1-2	Pt100 (DIN EN 60751 Cl. 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)



Strap-on temperature sensor

SCK

Description

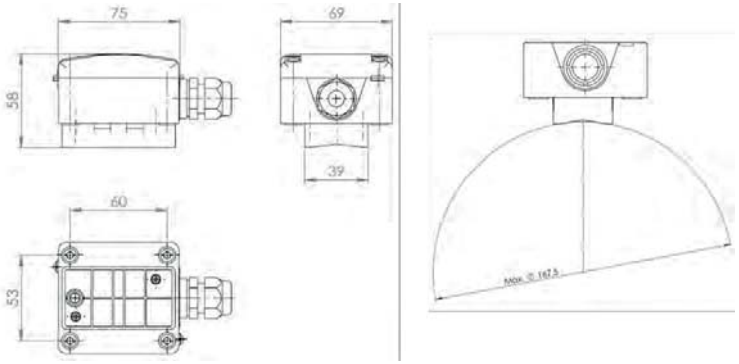
The temperature sensor serie SCK measures the temperature from -50 up to +100°C on pipes or round surfaces. The range is available with all type of current sensor elements.

Technical specifications

Measurement range	-50...+100°C
Sensor	Pt100, Pt1000, Ni1000, NTC, KTY.
Type of connection	2 fili
Measured current	approx. 1 mA
Electrical connection	Screw terminal block for wires up to 1,5 mm²
Housing	PA6, RAL9010
Cable entry	M16 high-strength cable gland with strain relief
Protection type	IP65
Storage temperature	-20...+70°C
Installation	Mounting flange (included)
Standards	CE conformity, RoHS

Models	Type of sensor
SCK1	Pt100 (DIN EN 60751 Cl. B)
SCK2	Pt1000 (DIN EN 60751 Cl. 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)



Radiation temperature sensor

STR

Description

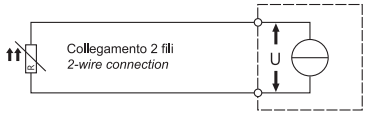
The radiation sensor serie STR designed in a modern housing measures the temperature from -30 up to +75°C of gaseous media. The range is available with all type of current sensor elements and can be mounted directly on-wall with 2 fixing screws.

Technical specifications

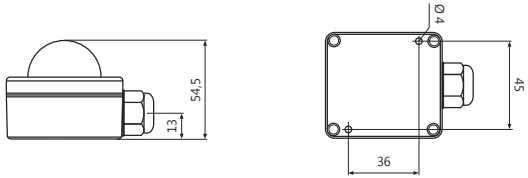
Measurement range	-30...+75°C
Sensor	Pt100, Pt1000, Ni1000, KTY, NTC
Type of connection	2-wires
Measured current	approx.1 mA
Electrical connection	Screw terminal block for wires up to 1,5 mm²
Cable entry	M16 high-strength cable gland with strain relief
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Housing	polyamide (synthetic) colour white
Dimensions	58x64x53 mm
Protection type	IP65
Storage temperature	-20...+70°C
Installation	Screw fastening
Standards	CE-conformity, RoHS

Models	Type of sensor
STR1	Pt100 (DIN EN 60751 Cl. B)
STR2	Pt1000 (DIN EN 60751 Cl. 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%)

Electrical wirings



Dimensions (mm)



Room temperature sensor

SA

Description

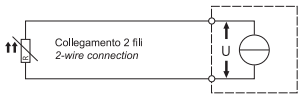
The temperature sensor serie SA designed in a modern housing measures the temperature from -30 up to +60°C of gaseous media. The range is available with all type of current sensor elements and can be mounted directly on-wall by an adapter or 2 fixing screws. The extra wide ventilation slots ensures a good air circulation for a high accuracy of measurement.

Technical specifications

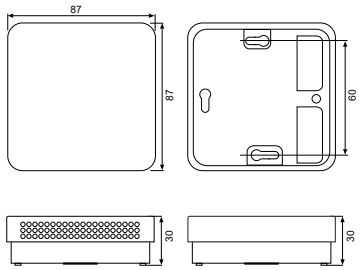
Measurement range	-30...+60°C
Sensor	Pt100, Pt1000, Ni1000, KTY, NTC
Type of connection	2-wires
Measured current	approx.1 mA
Electrical connection	Screw terminal block for wires up to 1,5 mm²
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Housing	polyamide (synthetic) colour white
Dimensions	87x87x30 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 Cl. B)
SA2	Pt1000 (DIN EN 60751 Cl. 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



Dimensions (mm)



Outdoor temperature sensor

SO

Description

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.

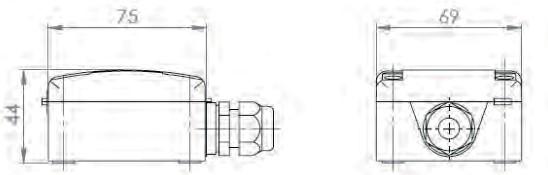
Technical specifications

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 mm²
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 Cl. B)
SO2	Pt1000 (DIN EN 60751 Cl. B)
SO3	Ni1000 (TK6180)
SO4	Ni1000 (TK5000)
SO5	NTC20k (±1%)
SO6	NTC10k (±1%) BETA 3435K
SO7	KTY 81-110 (±1%)
SO8	KTY 81-121 (±1%)

Electrical wirings

Dimensions (mm)



Duct temperature sensor

SD

Description

The temperature sensor serie SD measures the duct temperature from -30 up to +150°C of gaseous and liquid media. The range is available with all type of current sensor elements. The temperature sensor can be mounted directly on ducts or pipes by the included mounting flanged and can be easily and quickly be replaced in case of maintenance.

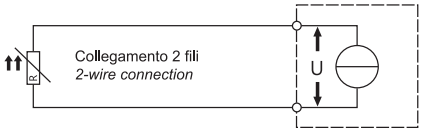
Technical specifications

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 mm²
Leakage resistance	> 100 MOhm, at +20°C (500 V DC)
Housing	Polyamide (synthetic) with snap closing screws, colour RAL 9010
Cable entry	M16 high-strength cable gland with strain relief
Installation length	from 100 to 400 mm
Material	Protection tube: stainless steel AISI 316Ti
Protection type	IP65
Storage temperature	-20...+70°C
Installation	Mounting flange (included)
Standards	CE conformity, RoHS

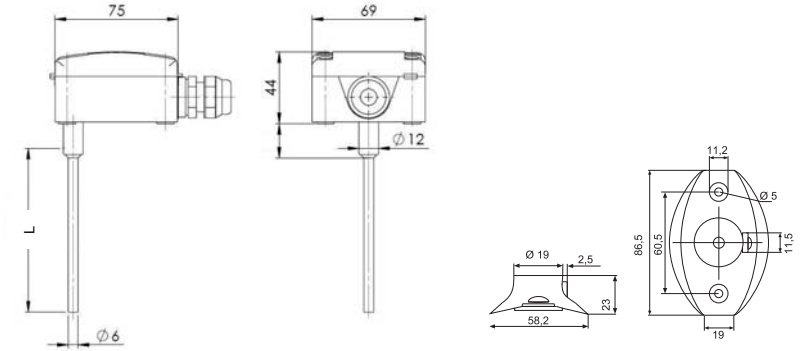
Models	Type of sensor	Tube length (L)
SD1-100	Pt100 (DIN EN 60751 Cl. B)	100 mm
SD1-150	Pt100 (DIN EN 60751 Cl. B)	150 mm
SD1-200	Pt100 (DIN EN 60751 Cl. B)	200 mm
SD1-400	Pt100 (DIN EN 60751 Cl. B)	400 mm
SD2-100	Pt1000 (DIN EN 60751 Cl. B)	100 mm
SD2-150	Pt1000 (DIN EN 60751 Cl. B)	150 mm
SD2-200	Pt1000 (DIN EN 60751 Cl. B)	200 mm
SD2-400	Pt1000 (DIN EN 60751 Cl. B)	400 mm
SD3-100	Ni1000 (TK6180)	100 mm
SD3-150	Ni1000 (TK6180)	150 mm
SD3-200	Ni1000 (TK6180)	200 mm
SD3-400	Ni1000 (TK6180)	400 mm

Models	Type of sensor	Tube length (L)
SD4-100	Ni1000 (TK5000)	100 mm
SD4-150	Ni1000 (TK5000)	150 mm
SD4-200	Ni1000 (TK5000)	200 mm
SD4-400	Ni1000 (TK5000)	400 mm
SD5-100	NTC20k (±1%)	100 mm
SD5-150	NTC20k (±1%)	150 mm
SD5-200	NTC20k (±1%)	200 mm
SD5-400	NTC20k (±1%)	400 mm
SD6-100	NTC10k (±1%) BETA 3435K	100 mm
SD6-150	NTC10k (±1%) BETA 3435K	150 mm
SD6-200	NTC10k (±1%) BETA 3435K	200 mm
SD6-400	NTC10k (±1%) BETA 3435K	400 mm

Electrical wirings



Dimensions (mm)



Screw-in temperature sensor

SI

Description

The temperature sensor serie SI measures the temperature from -30 up to +90°C at a max. pressure of 16 bar of gaseous and liquid media. The range is available with all type of current sensor elements. Brass immersion pockets are included and can be screw-in directly into tanks or pipes and can be easily and quickly be replaced in case of maintenance.

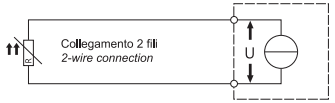
Technical specifications

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 mm²
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
Immersion pocket	brass, nickel-plated, Ø ext. 8 mm / Ø int. 6,5 mm, R 1/2" straight pipe thread
Max. pressure of pocket	16 bar
Installation length	from 100 to 400 mm
Protection type	IP65
Storage temperature	-20...+70°C
Installation	Immersion pocket
Standards	CE conformity, RoHS

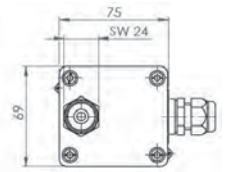
Models	Type of sensor	Tube length (L)
SI1-100	Pt100 (DIN EN 60751 Cl. B)	100 mm
SI1-150	Pt100 (DIN EN 60751 Cl. B)	150 mm
SI1-200	Pt100 (DIN EN 60751 Cl. B)	200 mm
SI1-400	Pt100 (DIN EN 60751 Cl. B)	400 mm
SI2-100	Pt1000 (DIN EN 60751 Cl. B)	100 mm
SI2-150	Pt1000 (DIN EN 60751 Cl. B)	150 mm
SI2-200	Pt1000 (DIN EN 60751 Cl. B)	200 mm
SI2-400	Pt1000 (DIN EN 60751 Cl. B)	400 mm
SI3-100	Ni1000 (TK6180)	100 mm
SI3-150	Ni1000 (TK6180)	150 mm
SI3-200	Ni1000 (TK6180)	200 mm
SI3-400	Ni1000 (TK6180)	400 mm

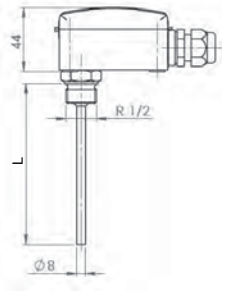
Model	Type of sensor	Tube length (L)
SI4-100	Ni1000 (TK5000)	100 mm
SI4-150	Ni1000 (TK5000)	150 mm
SI4-200	Ni1000 (TK5000)	200 mm
SI4-400	Ni1000 (TK5000)	400 mm
SI5-100	NTC20k (±1%)	100 mm
SI5-150	NTC20k (±1%)	150 mm
SI5-200	NTC20k (±1%)	200 mm
SI5-400	NTC20k (±1%)	400 mm
SI6-100	NTC10k (±1%) BETA 3435K	100 mm
SI6-150	NTC10k (±1%) BETA 3435K	150 mm
SI6-200	NTC10k (±1%) BETA 3435K	200 mm
SI6-400	NTC10k (±1%) BETA 3435K	400 mm

Electrical wirings



Dimensions (mm)





Room temperature control unit

SM

Description

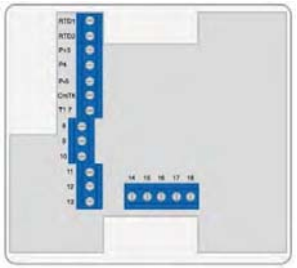
The room control unit SM has a temperature sensor for the remote measurement in domestic environments, offices, reception etc. and a setpoint control that limits the setting range to a predetermined value by the controller. It is available with occupancy button, LED and switch for fan speed.

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 mm²
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

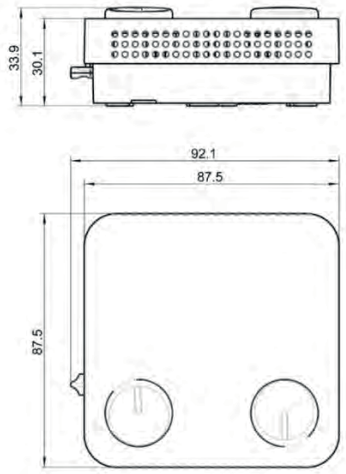
Model	Occupancy button	Green LED	Speed switch
SM5			
SM5T	•		
SM5TL	•	•	
SM5TLS	•	•	•

Electrical wirings



Terminal	Connection
RTD1, RTD2	Passive sensor
P+3, P4, P-5	Potentiometer
CMT6, T1 7	Occupancy button
8, 9, 10	

Dimensions (mm)



Resistance characteristics of temperature sensors

Temp. °C	PT100 Ohm	PT1000 Ohm	**Ni1000** TK6180 Ohm	**Ni1000** TK5000 Ohm	NTC 10K Ohm BETA 3435K K Ohm	NTC 20K Ohm K Ohm	KTY81-110 Ohm	KTY81-121 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 (€) 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 „Il 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: € 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 € 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 € 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.

Eatec srl a Socio Unico - Loc. Förche 20 - I-39040 Sciaves BZ
Tel. +39 0472 055617 - Fax +39 0472 089807 - info@eatec.it - www.eatec.it

Rev.1/2023