belparts®

BUILDING HVAC COMPONENTS

Update 09/2016
Sensors

Building HVAC components

Belparts is specialized in the development, production and marketing of components for the automation of HVAC-systems in buildings. We design field components that exactly match market needs. Throughout the development process, we ensure functionality, quality en reliability.

Belparts produces field components for all areas of HVAC, whether production, distribution, or terminal control of heating and cooling, as well as ventilation. Whatever the HVAC-application, we have it covered.

Our field components are designed to be smoothly integrated with any Building Management System (BMS), Direct Digital Controller (DDC), Programmable Logic Controller (PLC), and Supervisory Control and Data Acquisition (SCADA) system.

A leading player for more than two decades

Belparts was established in 1987 by professionals from the HVAC-industry. Since then, we have developed a reputation for intelligent product design and reliable solutions. Our company has enjoyed a healthy success ever since its foundation.

Market driven innovation

We constantly strive for product and system optimizations. Our engineers incorporate the latest proven technological developments into the design of new HVAC-components and understand how to combine high quality with product affordability.

Shared competency and values

The Belparts staff shares a common passion for technology, product design, quality, and HVAC-applications. Each of our team members is both customer and results-oriented, and is trained to think 'innovation'. Integrity and responsibility are prerequisites for every employee.

BRUSSELS ENVIRONMENT

6B524
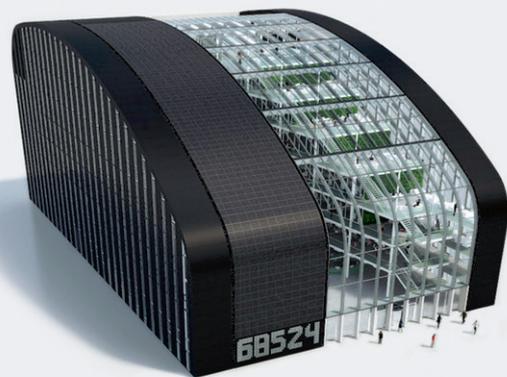
energetx

Belparts produces a broad range of components that save costs at every single point in your HVAC-system. By selecting the optimal component for each individual situation, considerable amounts of energy can be saved. Our *energetx*-range of products includes control valves, rotating valves, valve and air damper actuators, terminal control valves, and sensors.

dynamx

Based on our revolutionary Dynamic Flow Networking (DFN) concept, our *dynamx*-valves adjust the flow of energy exactly to the desired conditions. This ensures that only the exact amount of energy is delivered at the right place and at the right time. The result is optimal comfort and reduced energy costs.

energetx

8. Sensors

Product key

The product identification key contains all essential data defining the unique features or the sensor.

Example: type ST-G-20

S	T		G	20		
Measurement			**Execution**			

Sensor								

						T	temperature (T°)
						H	relative humidity (rH)
						HT	relative humidity (rH) + temperature (T°)
						P	pressure or pressure difference
						R	smoke
						Q	air quality
						L	light intensity
						V	air speed (v)
						VT	air speed (v) + temperature (T°)
						O	presence
						CO	CO sensor (ppm)
						CO_2	CO2 sensor (ppm)
						M	motion

Measuring element

-	Pt 1000
100	Pt 100
C10	NTC 10kΩ
C20	NTC 20kΩ
P	NTC 10kΩ
N	Ni 1000/Tk 5000 (L&G)
ND	Ni 1000 (DIN)

Version temperature sensor

A	sensor for room measurements
E	sensor for outside mounting
F	sensor for measuring combustion gases
G	sensor for measurements inside ducts
T	sensor for measurements inside pipes

Length or the measuring or immersion probe

05	5cm
10	10cm
15	15cm
20	20cm

Type or output signal

U	0..10Vdc
i	4..20mA

Specific characteristics

T_0	-20°..+80°C
LCD	with LCD display

Sensors with calibration certificate available on request (contact us for more information).

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BUILDING HVAC COMPONENTS

Overview

8

SERIES	Version	Ω	0..10Vdc	4..20mA	LCD	Page
Wireless						
ST.W..	Sensors 868.3 MHz					7
MODBUS						
ST..-M	MODBUS sensors					9
Temperature T°						
ST.AP..	Clamp-on sensors	●	●	●	●	16
ST.E..	Outside sensors	●	●	●	●	14
ST.T..	Immersion sensors	●	●	●	●	12
ST.C..	Cable sensors	●	●	●	●	17
ST.G..	Duct sensors	●	●	●	●	11
ST.A..	Room sensors	●	●	●	●	15
ST.F..	Combustion gas temperature sensors	●	●	●		18
Air speed						
SVT..	Air speed sensors (+ temperature)		●	●	●	19
Relative humidity rH						
SH-TPS..	Condensation sensors	●				20
SHT-E..	Relative humidity sensors outside		●	●	●	21
SHT-G..	Relative humidity sensors duct		●	●	●	21
SHT-A..	Relative humidity sensors room		●		●	21
Air quality						
SCO_2..	CO_2 (ppm)		●		●	23
SCO..	CO (ppm)		●	●		23
Pressure difference Δp (air)						
SP.A94..	min. -100..+100Pa, max. 0..2.500Pa	adjustable	●		●	27
SP.A95..	min. -50..+50Pa, max. 0..1.000Pa	adjustable	●	●	●	27
SP.A96..	min. 0..2.000 Pa, max. 0..20.000Pa	adjustable	●	●	●	27
Pressure (water)						
SP.W91..	min. 0..2,5bar, max. 0..60bar	adjustable	●	●	●	26
Pressure difference Δp (air + water)						
SP.W92..	min. 0..1bar, max. 0..6bar	adjustable	●	●	●	29
Other						
SR.K..	Smoke detector					22
SL..	Light sensor		●	●		24
SO.. (PIR)	Presence detection - movement detection					25
SO-C..	Overwork timer					25

Network diagram

Ao$_1$: 0..10Vdc
Ao$_2$: 0..10Vdc
Ao$_8$: 0..10Vdc

Ao$_1$: 0..10Vdc
Ao$_2$: 0..10Vdc
Ao$_8$: 0..10Vdc

Ao$_1$: 0..10Vdc
Ao$_2$: 0..10Vdc
Ao$_8$: 0..10Vdc

MODBUS
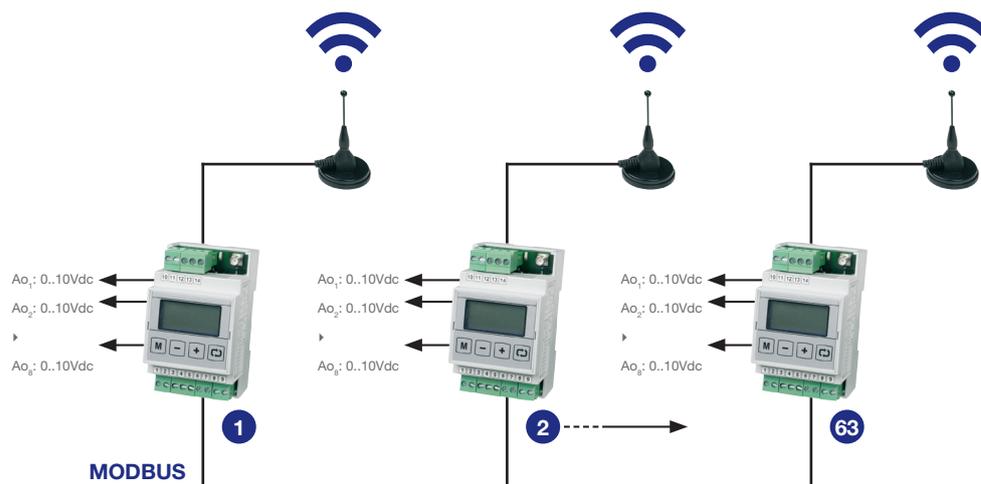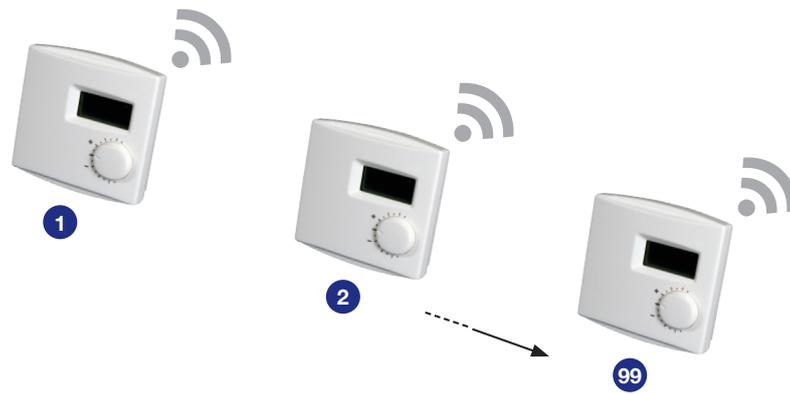
transmitter
receiver

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Wireless sensors   ST-W..

- Measurement temperature and/or relative humidity
- Power supply: battery AA Li [3]
- Housing neutral

- Wireless communication 868.3 MHz (FSK)
- Maximum 6237 sensors in one domain
- Bi-directional communication 20..100m (500m)

TYPE	AC/DC 24 Volt	T°	rH	CO_2	PIR	Setpoint	LCD	Switch	Price €/pc
ST-A1-W		●							177,-
ST-A1-W-LCD		●					●		250,-
ST-A3-W		●				●			196,-
ST-A3-W-LCD		●				●	●		269,-
SHT-A1-W		●	●						247,-
SHT-A1-W-LCD		●	●				●		320,-
SHT-A3-W		●	●			●			267,-
SHT-A3-W-LCD		●	●			●	●		340,-
ST-A4-W		●						●	[1]
ST-A4-W-LCD		●					●	●	[1]
ST-A5-W		●				●		●	[1]
ST-A5-W-LCD		●				●	●	●	[1]
ST-E2-W		●							267,-
ST-E2-W-24 [3]	●	●							267,-
ST-E2-DI-W		●							290,-
ST-E2-DI-W-24 [3]	●	●							290,-
SHT-E2-W		●	●						341,-
SO-PIR-W					●				318,-
SOL-PIR-W [2]					●				349,-
SCO2T-A1-W [3]	●	●	●	●					674,-
SCO2T-A1-W-LCD [3]	●	●	●	●			●		729,-
SCO2HT-A1-W [3]	●	●	●	●					869,-
SCO2HT-A1-W-LCD [3]	●	●	●	●			●		924,-

Accessories	TYPE	Description	Price €/pc
	ST-W-BS-BSA	Base station U_V: AC/DC 24 Volt for maximum 99 wireless sensors ST..-W.. with MODBUS RTU interface (RS485) Maximum number or base stations in one domain: 63 Delivery includes antenna, type ST-W-BSA	408,-
	ST-W-REP-E2	Repeater for wireless sensor network, U_V: AC/DC 24 Volt, with antenna	306,-
	ST-W-TOOL	PC-Tool for analysis or the wireless sensor netwerk	979,-
	ST-W-BSPS	Base station power supply	[1]
	ST-W-SER	Configuration tool for wireless sensor network (handy)	314,-
	ST-W-BAT	AA Li battery (A04491) life time up to 6 years	[1]

[1] on request

[2] with integrated light sensor

[3] note! wireless CO_2 sensors require an external power supply AC/DC 24 Volt

▲ standard

MODBUS I/O modules

- Universal I/O modules
- MODBUS RTU/RS485
- DIN-rail mounting
- Power supply U$_v$: AC 24 Volt
- With LCD display

I/O	TYPE	Inputs	Outputs	LCD	MODBUS	Price €/pc
	UM12-01-MB	4x Pt1000/DI	4x 0..10Vdc, 4x DO of 2x 3P	●	●	**300,-**
	UM12-02-MB	4x 0..10Vdc	4x 0..10Vdc, 4x DO of 2x 3P	●	●	**300,-**

Controller	TYPE	Inputs	Outputs	LCD	MODBUS	Price €/pc
	UC-01-MB	3x Pt1000 of 2x Pt1000 + 1x pot 1x 0..10Vdc/DI	3 of 4x 0..10Vdc, 2mA 4x 24Vac, 1A (triac)	●	●	**274,-**
	UC-02-MB	2x 0..10Vdc	1x 0..10Vdc, 2mA 2x 24Vac, 1A	●	●	**274,-**

▲ standard

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MODBUS sensors and terminal controls   MB..

- Measurement of different units
- MODBUS RTU/RS485
- Optional with LCD display

- Power supply U_V: AC 24 Volt

TYPE	T°	rH	CO₂	LCD	MODBUS	Price €/pc
ST-A1-MB	●				●	149,-
ST-A1-MB-LCD	●			●	●	204,-
SHT-A1-MB	●	●			●	220,-
SHT-A1-MB-LCD	●	●		●	●	274,-
SCO2T-A1-MB	●		●		●	568,-
SCO2T-A1-MB-LCD	●		●	●	●	624,-
SCO2HT-A1-MB	●	●	●		●	725,-
SCO2HT-A1-MB-LCD	●	●	●	●	●	764,-

Accessories	TYPE	Description	Price €/pc
	S.MB.SER	Servicetool MODBUS	[1]

TYPE	AC 24 Volt	AC 230 Volt	Heating					Cooling					LCD	Buttons	Price €/pc
			On/Off	PWM	3-point	0..10Vdc	4..20mA	On/Off	PWM	3-point	0..10Vdc	4..20mA			

MODBUS terminal controls with outputs heating/cooling

TYPE	AC 24 Volt	AC 230 Volt	On/Off	PWM	3-point	0..10Vdc	4..20mA	On/Off	PWM	3-point	0..10Vdc	4..20mA	LCD	Buttons	Price €/pc
DTM-RUM-LCD	●			●	●	●			●	●	●		●	4	188,-
DTM-RUM-LCD-2B	●			●	●	●			●	●	●		●	2	188,-
DTM-RUM-LCD-3B	●			●	●	●			●	●	●		●	3	188,-
DTM-RUM-LCD-FH [2]	●			●	●	●			●	●	●		●	3	[1]
DTM-R4M-LCD	●			●		●			●		●		●	4	212,-
DTM-R4M-LCD-2B	●			●		●			●		●		●	2	212,-
DTM-R4M-LCD-3B	●			●		●			●		●		●	3	212,-
DTM-R4M-LCD-L [3]	●			●					●				●	4	[1]

[1] on request

[2] with change-over input

[3] lighting control through PIR

▲ standard

Resistance tables

The Belparts product range offers a complete range or sensors suitable for comfort applications in buildings like heating, ventilation and air-conditioning installations.

All standard passive sensors are provided with a platina Pt1000 sensing element. At the same time other sensing elements can be delivered depending on your choice: Pt 100, NTC 10kΩ, NTC 20kΩ, Ni 1000 DIN, Ni 1000Tk5000, NTC 10kΩ, etc.

	Pt 100	Pt 1000	Ni 1000 DIN	Ni 1000/Tk5000	NTC 10kΩ	NTC 10kΩ Precon	NTC 20kΩ
SERIES	ST100..	ST..	STND..	STN..	STC10..	STP..	STC20..
Temperature	[Ω]	[Ω]	[Ω]	[Ω]	[kΩ]	[kΩ]	[kΩ]
- 50 °C	80,30	803,1	742,55	790,88	667,83	441,30	1662,49
- 40 °C	84,30	842,7	791,31	830,84	335,67	239,80	811,97
- 30 °C	88,20	882,2	841,46	871,69	176,68	135,20	415,06
- 20 °C	92,20	921,6	892,96	913,48	96,79	78,91	221,19
- 10 °C	96,10	960,9	945,82	956,24	55,30	47,54	122,45
0 °C ▶	100	1000	1000	1000	32,65	29,49	70,20
+10 °C	103,90	1039,0	1055,52	1044,79	19,89	18,79	41,56
+20 °C	107,80	1077,9	1112,36	1090,65	12,49	12,26	25,35
+25 °C ▶	109,70	1097,4	1141,29	1113,99	10	10	20
+30 °C	111,70	1116,7	1170,56	1137,62	8,06	8,19	15,88
+40 °C	115,50	1155,4	1230,11	1185,71	5,32	5,59	10,21
+50 °C	119,40	1194,0	1291,05	1234,98	3,60	3,89	6,72
+60 °C	123,20	1232,4	1353,40	1285,45	2,49	2,76	4,52
+70 °C	127,10	1270,7	1417,21	1337,15	1,75	1,99	3,10
+80 °C	130,90	1308,9	1482,50	1390,12	1,26	1,46	2,17
+90 °C	134,70	1347,0	1549,34	1444,39	0,92	1,08	1,54
+100 °C	138,50	1385,0	1617,79	1500,00	0,68	0,82	1,12
+110 °C	142,30	1422,9	1687,89	1556,98	0,51	0,62	0,82
+120 °C	146,10	1460,6	1759,72	1615,37	0,39	0,48	0,61
+130 °C	149,80	1498,2	1833,35	1675,19	0,30	0,38	0,46
+140 °C	153,60	1535,8	1908,87	1736,48	0,23	0,30	0,35
+150 °C	157,30	1573,1	1986,35	1799,27	0,18	0,24	0,27

Integration in every BMS system

	0..10Vdc	4..20mA	PTC1000	NTC 1,8 kOhm	NTC 2,2 kOhm	NTC 10 kOhm Precon	NTC 10 kOhm	NTC 10 KB	NTC 20 kOhm	Pt100	Pt1000	Ni1000 DIN	Ni1000/Tk5000
kΩ			1	2,252	2,252	10	10	10	20	0,109	1,097	1,141	1,114
T°			+25°C	+25°C	+25°C	+25°C	+25°C	+25°C	+25°C	0°C	0°C	0°C	0°C
Δ			±1,3°C	±0,3°C	±0,25°C	±0,25°C	±0,25°C		±0,25°C	±0,3°C	±0,3°C	±0,4°C	±0,4°C
Andover	●					●							
Webeasy	●	●				●					●	●	●
HC System	●												
Honeywell	●								●		●		
Johnson Controls	●				●		●				●		
Kieback&Peter	●												
Landis&Gyr	●												●
Priva	●	●	●	●	●	●	●	●	●	●	●	●	●
Saia	●	●					●				●		
Satchwell	●							●					
Sauter	●											●	
Siemens	●												●
Staefa Control	●												
Schneider/TAC	●	●		●									
Trend	●	●					●						

Duct temperature sensor

ST-G..

- Duct temperature measurement
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Measuring probe 20cm stainless steel Ø 6mm
- Active sensors U$_v$: AC/DC 24 Volt [2]
- Active sensors optional with LCD display
- Housing IP54

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Passive	TYPE	Measuring element [1]	Ω	0..10Vdc	4..20mA	LCD	Brass probe	Probe 2S	ST.MF.06	[cm]	Price €/pc
	ST-X-20	Pt1000	●					●		20	47,-
◄	ST-G-20	Pt1000	●					●	●	20	52,-
	STN-X-20	Ni1000/Tk5000	●					●		20	47,-
	STN-G-20	Ni1000/Tk5000	●					●	●	20	52,-
	STC10-X-20	NTC 10kΩ	●					●		20	47,-
	STC10-G-20	NTC 10kΩ	●					●	●	20	52,-
	STC20-X-20	NTC 20kΩ	●					●		20	47,-
	STC20-G-20	NTC 20kΩ	●					●	●	20	52,-

Active	TYPE	Measuring range [3]		0..10Vdc	4..20mA			Probe 2S	ST.MF.06	[cm]	Price €/pc
	ST-X-20-U	0..10Vdc @ 0..+100°C		●				●		20	137,-
	ST-X-20-U-LCD	0..10Vdc @ 0..+100°C		●	●			●		20	214,-
◄	ST-G-20-U	0..10Vdc @ 0..+100°C		●				●	●	20	142,-
	ST-G-20-U-LCD	0..10Vdc @ 0..+100°C		●	●			●	●	20	219,-
	ST-X-20-I	4..20mA @ 0..+100°C			●			●		20	137,-
	ST-X-20-I-LCD	4..20mA @ 0..+100°C			●	●		●		20	214,-
	ST-G-20-I	4..20mA @ 0..+100°C			●			●	●	20	142,-
	ST-G-20-I-LCD	4..20mA @ 0..+100°C			●	●		●	●	20	219,-

Accessories	TYPE	Description	Price €/pc
	ST.MF.06	Mounting flange Ø 6mm for duct temperature sensors ST-X..	5,-

[1] alternatively other measuring elements can be supplied (list on request)

[2] also available for power supply DC 15 Volt

[3] measuring range adjustable:

0°C	..	+50°C	
0°C	**..**	**+100°C**	standard setting
-50°C	..	+50°C	
-50°C	..	+150°C	

▲ standard

2S: stainless steel

Immersion sensors for quick measurement • water

ST-T-10-F

- Immersion sensor for quick measurement (2.5s)
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Measuring probe 8cm stainless steel Ø 4mm
- Active sensors U_V: AC/DC 24 Volt [2]
- Threaded connection R ½"
- Active sensors optional with LCD display

Passive	TYPE	Measuring element [1]	Ω	0..10Vdc	4..20mA	LCD	Brass probe	Probe 2S	[cm]	Price €/pc
	ST-T-10-F	Pt1000	●					●	10	**77,-**
	STN-T-10-F	Ni1000/Tk5000	●					●	10	**77,-**
	STC10-T-10-F	NTC 10kΩ	●					●	10	**77,-**
	STC20-T-10-F	NTC 20kΩ	●					●	10	**77,-**

Active	TYPE	Measuring range [3]							[cm]	Price €/pc
	ST-T-10-F-U	0..10Vdc @ 0..+100°C		●				●	10	**128,-**
	ST-T-10-F-U-LCD	0..10Vdc @ 0..+100°C		●		●		●	10	**205,-**
	ST-T-10-F-I	4..20mA @ 0..+100°C			●			●	10	**128,-**
	ST-T-10-F- I -LCD	4..20mA @ 0..+100°C			●	●		●	10	**205,-**

[1] alternatively other measuring elements can be supplied (list on request)

[2] also available for power supply DC 15 Volt

[3] measuring range adjustable:

0°C	..	+50°C	
0°C	**..**	**+100°C**	standard setting
-50°C	..	+50°C	
-50°C	..	+150°C	

▲ standard

2S: stainless steel

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Immersion sensors • water

ST-T..

- Immersion sensor with immersion pocket
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Measuring probe 10cm stainless steel Ø 6mm

- Active sensors U$_v$: AC/DC 24 Volt [2]
- Immersion probe Ø 8mm x 10cm (brass or 2S)
- Active sensors optional with LCD display

Passive	TYPE	Measuring element [1]	Ω	0..10Vdc	4..20mA	LCD	Brass pocket	2S pocket	[cm]	Price €/pc
	ST-X-10	Pt1000	●						10	43,-
	STN-X-10	Ni1000/Tk5000	●						10	43,-
	STC10-X-10	NTC 10kΩ	●						10	43,-
	STC20-X-10	NTC 20kΩ	●						10	43,-
	ST-T-M-10	Pt1000	●				●		10	60,-
	STN-T-M-10	Ni1000/Tk5000	●				●		10	60,-
	STC10-T-M-10	NTC 10kΩ	●				●		10	60,-
	STC20-T-M-10	NTC 20kΩ	●				●		10	60,-
	ST-T-S-10	Pt1000	●					●	10	73,-
	STN-T-S-10	Ni1000/Tk5000	●					●	10	73,-
	STC10-T-S-10	NTC 10kΩ	●					●	10	73,-
	STC20-T-S-10	NTC 20kΩ	●					●	10	73,-

Active	TYPE	Measuring range [3]	Ω	0..10Vdc	4..20mA	LCD	Brass pocket	2S pocket	[cm]	Price €/pc
	ST-X-10-U	0..10Vdc @ 0..+100°C		●					10	122,-
	ST-X-10-U-LCD	0..10Vdc @ 0..+100°C		●		●			10	199,-
	ST-X-10-I	4..20mA @ 0..+100°C			●				10	122,-
	ST-X-10-I-LCD	4..20mA @ 0..+100°C			●	●			10	199,-
	ST-T-M-10-U	0..10Vdc @ 0..+100°C		●			●		10	139,-
	ST-T-M-10-U-LCD	0..10Vdc @ 0..+100°C		●		●	●		10	216,-
	ST-T-M-10-I	4..20mA @ 0..+100°C			●		●		10	139,-
	ST-T-M-10-I-LCD	4..20mA @ 0..+100°C			●	●	●		10	216,-
	ST-T-S-10-U	0..10Vdc @ 0..+100°C		●				●	10	152,-
	ST-T-S-10-U-LCD	0..10Vdc @ 0..+100°C		●		●		●	10	229,-
	ST-T-S-10-I	4..20mA @ 0..+100°C			●			●	10	152,-
	ST-T-S-10-I-LCD	4..20mA @ 0..+100°C			●	●		●	10	229,-

Accessories	TYPE	Description	Price €/pc
	ST.IPB.10	Immersion pocket Ø 8mm x 10cm *brass* MS362 for ST-X..	17,-
	ST.IPS.10	Immersion pocket Ø 8mm x 10cm *stainless steel (2S)* AISI303 for ST-X..	30,-

[1] alternatively other measuring elements can be supplied (list on request)

[2] also available for power supply DC 15 Volt

[3] measuring range adjustable

2S: stainless steel

Outside sensors

- Temperature measurement outside
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Housing IP54

- Active sensors U$_v$: AC/DC 24 Volt
- Active sensors optional with LCD display

Passive	TYPE	Measuring element [1]	Ω	0..10Vdc	4..20mA	LCD		Price €/pc
	ST-E1	Pt1000	●					24,-
	STN-E1	Ni1000/Tk5000	●					24,-
	STC10-E1	NTC 10kΩ	●					24,-
	STC20-E1	NTC 20kΩ	●					24,-

Active	TYPE	Measuring range [2]		0..10Vdc	4..20mA	LCD		Price €/pc
	ST-E2-U	0..10Vdc @ -50..+50°C		●				137,-
	ST-E2-U-LCD			●		●		237,-
	ST-E2-I	4..20mA @ -50..+50°C			●			137,-
	ST-E2-I-LCD				●	●		237,-

[1] alternatively other measuring elements can be supplied (list on request)

[2] measuring range adjustable:

0°C	..	+50°C	
0°C	..	+100°C	
-50°C	**..**	**+50°C**	standard setting
-50°C	..	+150°C	

▲ standard

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Room temperature sensors

- Room temperature measurement
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Housing neutral white [1], IP20

- Active sensors U_v: AC/DC 24 Volt
- Active sensors optional with LCD display
- Customized version available on request

Passive	TYPE	Measuring element [2]	Ω	0..10Vdc	4..20mA	Potentiometer setpoint ±3K	5 position switch	LCD	Price €/pc
	ST-A1	Pt1000	●						30,-
	STN-A1	Ni1000/Tk5000	●						30,-
	STC10-A1	NTC 10kΩ	●						30,-
	STC20-A1	NTC 20kΩ	●						30,-
	ST-A3	Pt1000	●			10kΩ			62,-
	STN-A3	Ni1000/Tk5000	●			10kΩ			62,-
	STC10-A3	NTC 10kΩ	●			10kΩ			62,-
	STC20-A3	NTC 20kΩ	●			10kΩ			62,-
	ST-A5	Pt1000	●			10kΩ	●		82,-
	STN-A5	Ni1000/Tk5000	●			10kΩ	●		82,-
	STC10-A5	NTC 10kΩ	●			10kΩ	●		82,-
	STC20-A5	NTC 20kΩ	●			10kΩ	●		82,-

Active	TYPE	Measuring range [3]		0..10Vdc	4..20mA	Potentiometer setpoint ±3K	5 position switch	LCD	Price €/pc
	ST-A1-U	0..10Vdc @ 0..+50°C		●					103,-
	ST-A1-U-LCD	0..10Vdc @ 0..+50°C		●				●	180,-
	ST-A1-i	4..20mA @ 0..+50°C			●				103,-
	ST-A1-i-LCD	4..20mA @ 0..+50°C			●			●	180,-
	ST-A3-U	0..10Vdc @ 0..+50°C		●		10kΩ			159,-
	ST-A3-U-LCD	0..10Vdc @ 0..+50°C		●		10kΩ		●	236,-
	ST-A3-i	4..20mA @ 0..+50°C			●	10kΩ			159,-
	ST-A3-i-LCD	4..20mA @ 0..+50°C			●	10kΩ		●	236,-
	ST-A3-UU	0..10Vdc @ 0..+50°C		●		0..10Vdc			169,-
	ST-A3-UU-LCD	0..10Vdc @ 0..+50°C		●		0..10Vdc		●	246,-
	ST-A3-ii	4..20mA @ 0..+50°C			●	4..20mA			169,-
	ST-A3-ii-LCD	4..20mA @ 0..+50°C			●	4..20mA		●	246,-

[1] alternatively these room sensors can be supplied in a light grey (RAL7040) or dark grey (RAL7012) version (price on request)

[2] alternatively other measuring elements can be supplied (list on request)

[3] measuring range adjustable:

0°C	..	+50°C	standard setting
0°C	..	+100°C	
-50°C	..	+50°C	
-50°C	..	+150°C	

▲ standard

Clamp-on sensors

ST-AP..

- Temperature measurement on pipework
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Housing IP54 [1]

- Active sensors U_v: AC/DC 24 Volt [3]
- ST-AP1, incl. metal strap Ø 32..80mm
- Active sensors optional with LCD display

Passive	TYPE	Measuring element [2]	Ω	0..10Vdc	4..20mA	LCD		Price €/pc
	ST-AP1	Pt1000	●					56,-
	STN-AP1	Ni1000/Tk5000	●					56,-
	STC10-AP1	NTC 10kΩ	●					56,-
	STC20-AP1	NTC 20kΩ	●					56,-
	ST-AP2	Pt1000	●					29,-
	STN-AP2	Ni1000/Tk5000	●					29,-
	STC10-AP2	NTC 10kΩ	●					29,-
	STC20-AP2	NTC 20kΩ	●					29,-

Active	TYPE	Measuring range		0..10Vdc	4..20mA	LCD		Price €/pc
	ST-AP1-U	0..10Vdc @ 0..+100°C [4]		●				124,-
	ST-AP1-U-LCD			●		●		201,-
	ST-AP1-I	4..20mA @ 0..+100°C [4]			●			124,-
	ST-AP1-I-LCD				●	●		201,-

[1] alternatively a low-cost version can be supplied, type ST-AP2: this type or sensor is delivered with 2m cable (without housing)

[2] alternatively other measuring elements can be supplied (list on request)

[3] also available for power supply DC 15 Volt

[4] measuring range adjustable:

0°C	..	+50°C	
0°C	**..**	**+100°C**	standard setting
-50°C	..	+50°C	
-50°C	..	+150°C	

▲ standard

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Cable sensors

- Temperature measurement
- Pt1000, NTC10kΩ, NTC20kΩ, Ni1000 Tk5000
- Cable length standard 2m [1]
- Stainless steel probe

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Passive	TYPE	Measuring element [2]	Ω	0..10Vdc	4..20mA	LCD	Probe Ø 4mm x 30mm	Price €/pc
	ST-C1-02	Pt1000	●				●	**24,-**
	STN-C1-02	Ni1000/Tk5000	●				●	**24,-**
	STC10-C1-02	NTC 10kΩ	●				●	**24,-**
	STC20-C1-02	NTC 20kΩ	●				●	**24,-**

Passive	TYPE	Measuring element [2]					Probe Ø 6mm x 45mm	Price €/pc
IP67	**ST-C1-02B**	Pt1000	●				●	**25,-**
	STN-C1-02B	Ni1000/Tk5000	●				●	**25,-**
	STC10-C1-02B	NTC 10kΩ	●				●	**25,-**
	STC20-C1-02B	NTC 20kΩ	●				●	**25,-**

Active	TYPE	Measuring range		0..10Vdc	4..20mA	LCD	Probe Ø 6mm x 115mm	Price €/pc
	ST-C1-02-U	0..10Vdc @ 0..+100°C		●			●	**205,-**
	ST-C1-02-U-LCD	0..10Vdc @ 0..+100°C		●		●	●	**282,-**
	ST-C1-02-I	4..20mA @ 0..+100°C			●		●	**205,-**
	ST-C1-02-I-LCD	4..20mA @ 0..+100°C			●	●	●	**282,-**

Passive	TYPE	Measuring element [2]	Ω				Probe Ø 6mm x 115mm	Price €/pc
	ST-C2-02	Pt1000	●				●	**42,-**
	STN-C2-02	Ni1000/Tk5000	●				●	**42,-**
	STC10-C2-02	NTC 10kΩ	●				●	**42,-**
	STC20-C2-02	NTC 20kΩ	●				●	**42,-**

Passive	TYPE	Measuring element [2]	Ω				Probe Ø 4mm x 95mm	Price €/pc
	ST-C3-095-02	Pt1000	●				●	**50,-**

[1] Other cable lengths: on request

[2] Other measuring element: on request

▲ standard

Customized versions on request.

Combustion gas temperature sensors

ST-F..

- Temperature measurement
- Pt1000 or Pt100
- Stainless steel measuring probe 20cm

- Active sensors U_v: AC 24 Volt
- Temperature range: 0°C..+400°C
- Housing IP54

Passive	TYPE	Measuring element	Ω	0..10Vdc	4..20mA	LCD		Price €/pc
	ST-F-20	Pt1000	●					216,-
	ST100-F-20	Pt100	●				[1]	216,-

Active	TYPE	Measuring range		0..10Vdc	4..20mA			Price €/pc
	ST-F-20-U	0..10Vdc @ 0..+400°C		●				374,-
	ST-F-20-i	4..20mA @ 0..+400°C			●			374,-

[1] alternatively a 0..10Vdc (or 4..20mA) convertor can be supplied (price on request)

▲ standard

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Air speed sensors

SVT..

- Measurement of air speed and temperature in ducts
- Direct measurement in the air flow (2, 10 or 20 m/s)
- Stainless steel probe Ø 10mm x 10, 20 or 40cm [1]
- Active sensors U_v: AC/DC 24 Volt
- Output 2x 0..10Vdc or 4..20mA (adjustable) [2]
- Optional with LCD display

Active	TYPE	Outputs [2]	T° range	AC/DC 24 Volt	0..10Vdc	4..20mA	ST.MF.10	Range v	[cm]	Price €/pc
	SVT-02-10	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..2m/s	10	139,-
	SVT-02-10-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..2m/s	10	188,-
	SVT-02-20	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..2m/s	20	149,-
	SVT-02-20-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..2m/s	20	198,-
	SVT-02-40	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..2m/s	40	159,-
	SVT-02-40-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..2m/s	40	208,-
	SVT-10-10	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..10m/s	10	182,-
	SVT-10-10-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..10m/s	10	231,-
	SVT-10-20	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..10m/s	20	149,-
	SVT-10-20-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..10m/s	20	198,-
	SVT-10-40	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..10m/s	40	159,-
	SVT-10-40-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..10m/s	40	208,-
	SVT-20-10	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..20m/s	10	191,-
	SVT-20-10-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..20m/s	10	240,-
	SVT-20-20	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..20m/s	20	191,-
	SVT-20-20-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..20m/s	20	240,-
	SVT-20-40	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..20m/s	40	201,-
	SVT-20-40-LCD	2x 0..10Vdc	0..+50°C	●	●	[2]	●	0..20m/s	40	250,-

Accessories	TYPE	Description	Price €/pc
	ST.MF.10	Mounting flange Ø 10mm for air speed sensors SVT..	5,-

[1] mounting flange included in delivery (ST-MF-10)

[2] these sensors come standard as a 0..10Vdc sensor. The output signal can be converted on site into 4..20mA output (adjusting through jumper).

▲ standard

Condensation sensors and leakage detection

SH..

- Condensation and leakage detection
- Sensors with high resistance
- Room, ceiling or pipe
- Optional with detection module

Condensation detection

TYPE		Ω	Relay NO/NC		Price €/pc
SH-TPS-1	Ceiling sensors	●			**85,-**
SH-TPS-3	Pipe sensors	●			**76,-**
	When relative humidity is high (80..85% rH) the conductivity of the sensor increases. When condensation is detected, the resistance decreases to ± 8 MΩ.				

Condensation module AC/DC 24 Volt

SH-NEHR	Condensation module, for DIN-rail mounting		●	to combine with max. 5 condensation sensors SH-TPS..	**114,-**

Leakage detection

TYPE					Price €/pc
SH-CS1	Leakage detection sensor for SH-WLR(-A1)	●		floor mounting with connection housing	**75,-**
SH-CS2	Leakage detection sensor for SH-WLR(-A1)	●		mounting on pipes [1] length: 2m	**75,-**
SH-CS3	Leakage detection sensor for SH-WLR(-A1)	●		floor mounting with 2meter cable	**75-**
T-SH-CS3-C01	Protection hood for SH-CS3				**100,-**

Leakage detection module AC/DC 24 Volt

SH-WLR-A1	Leakage detection module, for room mounting		●	to combine with SH-CS1, SH-CS2 or SH-CS3	**130,-**
SH-WLR	Leakage detection module, for DIN-rail mounting		●	to combine with SH-CS1, SH-CS2 or SH-CS3	**147,-**

[1] can also be mounted on cooling pipes in order to detect condensation

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8

Combined sensors for temperature (T°) and relative humidity (rH)   SHT..

- Measurement temperature (T°) and relative humidity (rH)
- Room, outside or duct
- Different measuring ranges for T°, rH

- Active sensors U_v: AC/DC 24 Volt
- Analoge output: 2x 0..10Vdc (or 4..20mA: see table)
- Optional with LCD display

Room	TYPE	Ao$_1$: 0..10Vdc rH	Ao$_2$: 0..10Vdc T°	Ω	0..10Vdc	4..20mA	LCD	Price €/pc
◄	SHT-A1-UU	0..100%	0..+50°C		●			237,-
	SHT-A1-UU-LCD	0..100%	0..+50°C		●		●	293,-

Outside	TYPE	Ao$_1$: 0..10Vdc rH	Ao$_2$: 0..10Vdc T°					Price €/pc
◄	SHT-E2-UU	0..100%	-50..+50°C		●	[1]		322,-
	SHT-E2-UU-LCD	0..100%	-50..+50°C		●	[1]	●	396,-

Duct [2]	TYPE	Ao$_1$: 0..10Vdc rH	Ao$_2$: 0..10Vdc T°					Price €/pc
◄	SHT-G-UU	0..100%	-50..+50°C		●	[1]		244,-
	SHT-G-UU-LCD	0..100%	-50..+50°C		●	[1]	●	308,-
	SHT-G-UU-T0	0..100%	-20..+80°C		●	[1]		244,-

[1] analog output signal adjustable (via jumper): 0..10Vdc or 4..20mA

[2] length of the measuring probe: 20cm, mounting flange included in the delivery (ST-MF-10)

▲ standard

These sensors are also available for a power supply DC 15 Volt

Smoke detectors

SR..

- Smoke detection in duct systems
- 1 contact free of potential (8A): smoke detection
- 1 contact free of potential (6A): dirt
- Power supply U_v: AC 230 Volt or AC 24 Volt
- Verification of the operation through LCD
- Optional with MODBUS connection

TYPE	Power supply U_v	Contact NC/NO	Contact NO	MODBUS	Manual reset	Price €/pc
SR-K-01	AC 24 Volt	●	●		●	537,-
SR-K-01-M	AC 24 Volt	●	●	●	●	609,-
SR-K-01-230	AC 230 Volt	●	●		●	574,-

▲ standard

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CO$_2$ and CO Sensors

SCO..

- Measurement ppm CO$_2$: 0..2.000ppm, CO: 0..300ppm
- Analoge output CO$_2$: 0..10Vdc, CO: 0..10Vdc/4..20mA
- Room, outside or duct

- Active sensors U$_v$: AC/DC 24 Volt
- Met ABC-Logic (Automatic Background Calibration)
- Optional with LCD display

Room	TYPE	Range CO$_2$	Range T°	Range rH	0..10Vdc	4..20mA	LCD	Price €/pc
	SCO2T-A1	0..2.000ppm	0..+50°C		●			505,-
	SCO2T-A1-LCD	0..2.000ppm	0..+50°C		●		●	577,-
	SCO2HT-A1	0..2.000ppm	0..+50°C	0..100%	●			699,-
	SCO2T-A1-LED [1]	0..2.000ppm	0..+50°C		●			552,-

TYPE	Accessories				Price €/pc
S.MB.SER	Calibration tool for SCO$_2$..-A1				[2]

Duct	TYPE	Range CO$_2$	Range T°		0..10Vdc	4..20mA	LCD	Price €/pc
	SCO2T-G	0..2.000ppm	0..+50°C		●			649,-
	SCO2T-G-LCD	0..2.000ppm	0..+50°C		●		●	721,-

TYPE	Accessories				Price €/pc
SCO2-SER-G	Calibration tool for SCO$_2$..-G				210,-

Room/Outside	TYPE	Range CO			0..10Vdc	4..20mA		Price €/pc
	SCO-E2-I	0..100ppm of 0..300ppm			●	●		552,-

[1] with 3 LED's for CO$_2$ alarm

[2] on request

▲ standard

Light intensity sensors

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SL..

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- Measurement of light intensity (Lux)
- Ranges: 0..0,8/1/2/10 kLux
- Optional with extra temperature measurement (T°)

- Active sensors U$_v$: AC 24 Volt

Room	TYPE	Measuring range light	AC 24 Volt	Lux: 0..10Vdc	Lux: 4..20mA	T°: 0..10Vdc	Measuring range T°	Price €/pc
	SL-A	0..2.000 Lux	●	●	●	-	-	**246,-**

Outside	TYPE	Measuring range light					Measuring range T°	Price €/pc
	SLT-E1	0..1 kLux / 10 kLux [1]	●	●	-	●	0..10Vdc @ -50..+50°C	**270,-**
	SLTC20-E1	0..800 Lux [2]	-	-	-	[3]	-50..+80°C	**197,-**
	SLTC10-E1	0..800 Lux [2]	-	-	-	[4]	-50..+80°C	**197,-**

[1] measuring range adjustable:

0..1000 Lux	standard setting
0..10000 Lux	

[2] light sensor based on a photo-resistor cell (no external power supply required): 0..800 Lux = 30kΩ..3 kΩ, combined with a NTC 20kΩ temperature measurement

[3] NTC 20kΩ

[4] NTC 10kΩ

▲ standard

PIR presence sensors and overwork timers   SO..

- PIR presence detection (NC/NO)
- Room mounting
- Output: potential free contact

- Active sensors U_v: AC/DC 24 Volt
- Delay 1..20min (adjustable)

Presence	TYPE	Range	Contact	Contact NC/NO	0..10Vdc	4..20mA		Price €/pc
	SO-PIR-2	max. 3,7m	<60Vdc 0,1A	●				97,-

Movement	TYPE	Range	Contact					Price €/pc
	SM-PIR-12	max. 12m	<50mA 24Vac	●				100,-

Overwork timer [1]	TYPE	Time setting						Price €/pc
	SO-C0105	1..5 hour		●				113,-
	SO-C0210	2..10 hour		●				120,-
	SO-DOT-U1	0..24 hour		●				270,-

[1] power supply U_v: AC 24 Volt or AC 230 Volt

▲ standard

Pressure sensors for air, water, glycol-water, oil

SP-W91

- Active pressure sensors
- Analoge output: 0..10Vdc or 4..20mA
- Mounting G½"

- Active sensors U_v: AC/DC 24 Volt
- Measuring range adjustable
- Optional with LCD display

Air/Water	TYPE	0..10Vdc	4..20mA	LCD	Range p [2]	Overpressure	M	Price €/pc
	SP-W91-016	●	[1]		0..2,5bar	50bar	G½"	238,-
	SP-W91-016-LCD	●	[1]	●	0..6,0bar	50bar	G½"	296,-
					0..10,0bar			
					0..16,0bar			

Air/Water	TYPE				Range p [2]	Overpressure	M	Price €/pc
	SP-W91-060	●	[1]		0..16,0bar	120bar	G½"	391,-
	SP-W91-060-LCD	●	[1]	●	0..25,0bar	120bar	G½"	449,-
					0..40,0bar			
					0..60,0bar			

[1] output signal 0..10Vdc or 4..20mA: adjustable via jumper

[2] adjustable

▲ standard

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Differential pressure sensors for air   SP-A..

- Active differential pressure sensors
- Analog output: 0..10Vdc or 4..20mA
- Connection kit included in delivery

- Active sensors U$_V$: AC/DC 24 Volt
- Measuring range adjustable
- Optional with LCD display

Air [1]	TYPE	0..10Vdc	4..20mA	LCD		Range Δp [4]	0-point calibration	Price €/pc
	SP-A94	●				±100Pa	automatic	**209,-**
	SP-A94-LCD	●		●		0..100Pa	automatic	**267,-**
						0..200Pa		
						0..500Pa		
						0..1.000Pa		
						0..1.500Pa		
						0..2.000Pa		
						0..2.500Pa		

Air [2]	TYPE	0..10Vdc	4..20mA	LCD		Range Δp [4]	0-point calibration	Price €/pc
	SP-A95	●	●		[3]	-50..+50 Pa	automatic	**307,-**
	SP-A95-LCD	●	●	●	[3]	-100..+100 Pa	automatic	**365,-**
						-250..+250 Pa		
						-500..+500 Pa		
						0..100 Pa		
						0..200 Pa		
						0..500 Pa		
						0..1.000 Pa		

Air	TYPE	0..10Vdc	4..20mA	LCD		Range Δp [4]	0-point calibration	Price €/pc
	SP-A96	●	●		[3]	0..2.000 Pa	automatic	**366,-**
	SP-A96-LCD	●	●	●	[3]	0..4.000 Pa	automatic	**424,-**
						0..5.000 Pa		
						0..7.000 Pa		
						0..10.000 Pa		
						0..15.000 Pa		
						0..20.000 Pa		
						0..25.000 Pa		

[1] the analog output can be set either as linear to the differential pressure or flow proportional

[2] for example for cleanroom applications

[3] output signal 0..10Vdc or 4..20mA: adjustable via jumper

[4] adjustable

▲ standard
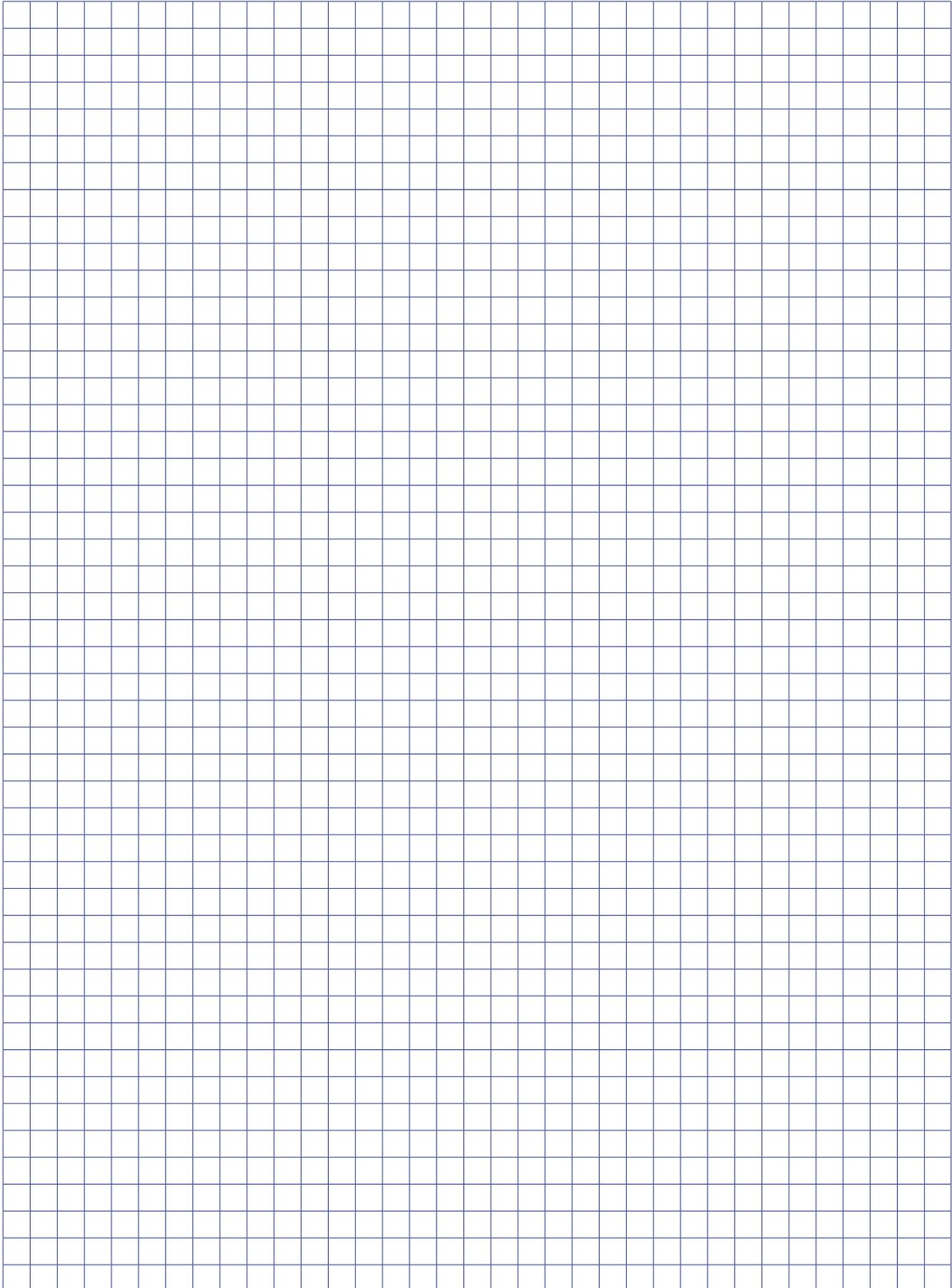
Differential pressure sensors for water

SP-W92

- Active differential pressure sensors
- Analog output: 0..10Vdc or 4..20mA
- Process connection: 8mm cupper pipe
- Active sensors U_v: AC/DC 24 Volt
- Measuring range adjustable
- Optional with LCD display

Water	TYPE	0..10Vdc	4..20mA	LCD		Range Δp [2]	Static pressure	Price €/st
	SP-W92-002	●	●		[1]	0..1,0bar or	16bar	**497,-**
	SP-W92-002-LCD	●	●	●	[1]	0..2,5bar	16bar	**555,-**

Water	TYPE					Range Δp [2]	Static pressure	Price €/st
	SP-W92-006	●	●		[1]	0..4,0bar or	16bar	**497,-**
	SP-W92-006-LCD	●	●	●	[1]	0..6,0bar	16bar	**555,-**

[1] output signal 0..10Vdc or 4..20mA: adjustable via jumper

[2] adjustable

▲ standard

1bar ≈ 100 kPa