



# GAS DETECTOR ST450EC

PART.NO. I228000-I228010

DETECTION OF TOXIC GASES, HYDROGEN AND OXYGEN

SYSTEM CGD50, CGD500 TOUCH

## GENERAL DESCRIPTION

- Detection of toxic gases, Hydrogen and Oxygen
- All-round industrial gas detector!
- ATEX / IECEx approved
- Touch screen experience, control without additional tools
- Self-diagnostics
- Reliable sensor technology

The **ST450EC** is an all-round gas detector which functions well under the most difficult circumstances. The heart of the detector is a replaceable gas sensor, which is available for Oxygen, Toxic gases and Hydrogen. The measuring principle is based on an electrochemical sensor, which is developed to meet the highest standards. The sensor has an outstanding stability, which achieves long-term reliability. The high selectivity of the sensors minimizes "false" readings.

The **ST450EC** comes standard with a graphic display. The display shows the measured value and various status notifications locally. The capacitive key control gives you an experience similar to a touchscreen and enables easy navigation through the user/calibration menu.

The user menu is secured with a password, unauthorized users cannot access the gas detector. The control of the user/calibration menu *does not* require additional tools (for example magnets). Simple, easy and user friendly! The user menu provides different features, such as a zero and span calibration, adjusting alarm set points (local alarm indication through notifications on the display and bright colored LED), showing set points, diagnostic information and simulation of the output signal (4-20mA) for loop testing.

The **ST450EC** is **Ex d** and **Ex t** approved (ATEX / IECEx / cCSAus). This makes the sensor an all-round gas detector and useful in GAS and DUST zones. The gas detector can be used in Ex applications (zone I/2 and 21/22), without having a zener barrier. This reduces investment costs directly.

## HEIGHTS AREAS / REMOTE APPLICATIONS:

An remote version, **ST450EC Remote** available to allow the user to mount the sensor separately from the transmitter. Remote sensors are ideal for applications where the gases present ascend, i.e. gases lighter than air. High located detection areas are often difficult to reach for example during maintenance. When using a remote sensor, the sensor itself will be mounted high and the transmitter will be mounted within close reach. This makes maintenance quick and easy and therefore cost effective. Cable lengths up to 150 meters are supported between the transmitter and the remote sensor (depending on the type).

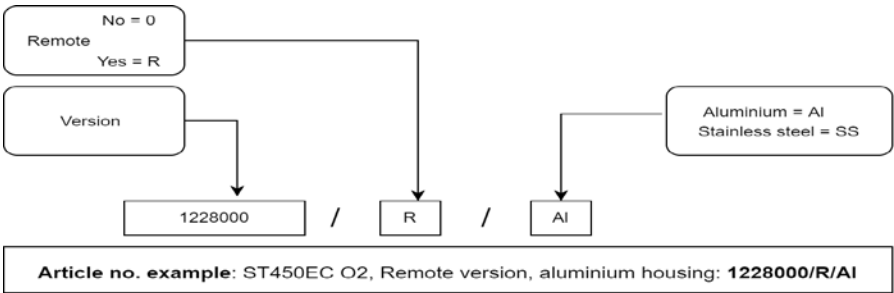
## APPLICATIONS:

- + Water Industry
- + Refineries
- + Oil & Gas Industry
- + Food Industry
- + Pharmaceutical Industry
- + Steel Industry
- + Laboratory / Universities

WORLDWIDE MODELS ORDERING INFORMATION

GAS DETECTOR						
TYPE	RANGE	PART NO.			OPERATING TEMPERATURE	RELATIVE HUMIDITY (N.C.)
		STANDARD	REMOTE	STAINLESS		
ST450EC-O <sub>2</sub>	0-25 Vol.%	I228000	+ /R	+ /SS	-30 to +55 °C*	20-90%
ST450EC-O <sub>2</sub> Longlife	0-25 Vol.%	I228000/LL3			-30 to +55 °C*	20-90%
ST450EC-H <sub>2</sub> S	0-30 ppm	I228001			-30 to +50 °C**	20-90%
ST450EC-H <sub>2</sub> S	0-50 ppm	I228002			-30 to +50 °C**	20-90%
ST450EC-H <sub>2</sub> S	0-100 ppm	I228003			-30 to +50 °C**	20-90%
ST450EC-CO	0-100 ppm	I228004/100			-30 to +50 °C	15-90%
ST450EC-CO	0-250 ppm	I228004/250			-30 to +50 °C	15-90%
ST450EC-CO	0-500 ppm	I228004/500			-30 to +50 °C	15-90%
ST450EC-CO	0-500 ppm (LHS)	I228004/500/LHS			-30 to +50 °C	15-90%
ST450EC-NO	0-100 ppm	I228007			-20 to +50 °C	15-90%
ST450EC-NO <sub>2</sub>	0-20 ppm	I228008			-20 to +50 °C	15-90%
ST450EC-H <sub>2</sub>	0-1000 ppm	I228005			-30 to +50 °C	15-95%
ST450EC-H <sub>2</sub>	0-100 %LEL	I228006			-30 to +50 °C	15-95%
ST450EC-CS <sub>2</sub>	0-50 ppm	I228009/50			-40 to +50 °C	15-90%
ST450EC-CS <sub>2</sub>	0-100 ppm	I228009/100			-40 to +50 °C	15-90%

\* Acc. EN 50104: -10 to +50°C / 20 to 90 rH.N.C  
\*\*Acc. EN IEC 62990-1: -25 to +55 °C / 20 to 90 % rH.N.C

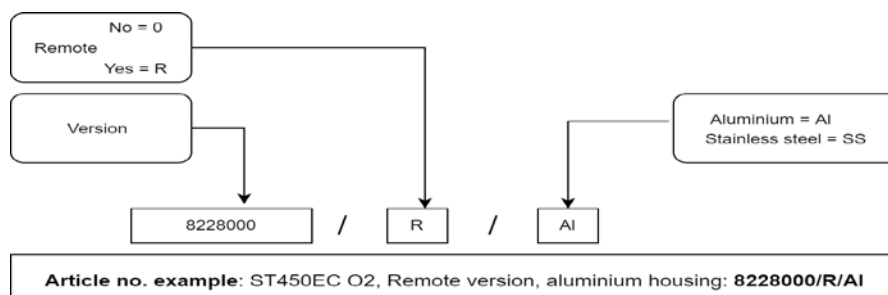


## NORTH AMERICAN MODELS ORDERING INFORMATION

GAS DETECTOR						
TYPE	RANGE	PART NO.			OPERATING TEMPERATURE	RELATIVE HUMIDITY (N.C.)
		STANDARD	REMOTE	STAINLESS		
ST450EC-O <sub>2</sub>	0-25 Vol.%	8228000	+ /R	+ /SS	-30 to +55 °C*	20-90%
ST450EC-O <sub>2</sub> Longlife	0-25 Vol.%	8228000/LL3			-30 to +55 °C*	20-90%
ST450EC-H <sub>2</sub> S	0-30 ppm	8228001			-30 to +50 °C**	20-90%
ST450EC-H <sub>2</sub> S	0-50 ppm	8228002			-30 to +50 °C**	20-90%
ST450EC-H <sub>2</sub> S	0-100 ppm	8228003			-30 to +50 °C**	20-90%
ST450EC-CO	0-100 ppm	8228004/100			-30 to +50 °C	15-90%
ST450EC-CO	0-250 ppm	8228004/250			-30 to +50 °C	15-90%
ST450EC-CO	0-500 ppm	8228004/500			-30 to +50 °C	15-90%
ST450EC-CO	0-500 ppm (LHS)	8228004/500/LHS			-30 to +50 °C	15-90%
ST450EC-NO	0-100 ppm	8228007			-20 to +50 °C	15-90%
ST450EC-NO <sub>2</sub>	0-20 ppm	8228008			-20 to +50 °C	15-90%
ST450EC-H <sub>2</sub>	0-1000 ppm	8228005			-30 to +50 °C	15-95%
ST450EC-H <sub>2</sub>	0-100 %LEL	8228006			-30 to +50 °C	15-95%
ST450EC-CS <sub>2</sub>	0-50 ppm	8228009/50			-40 to +50 °C	15-90%
ST450EC-CS <sub>2</sub>	0-100 ppm	8228009/100			-40 to +50 °C	15-90%

\* Acc. EN 50104: -10 to +50°C / 20 to 90 rH.N.C

\*\*Acc. EN IEC 62990-1: -25 to +55 °C / 20 to 90 % rH.N.C






Standard version



Remote version

## ORDERING INFORMATION

ACCESSORIES			
TYPE	IMAGE	PART NO.	DESCRIPTION
Signal cable		4002426	Mesh shielded cable, 2x0,75 mm <sup>2</sup> (flexible cores), per meter
		4002427	Mesh shielded cable, 3+1x0,75 mm <sup>2</sup> (flexible cores), per meter
		4002454	Mesh shielded cable ST-ECR, 4+1x0,75 mm <sup>2</sup> (flexible cores), per meter
Duct mounting set JIS		Duct kit for JIS ducts Stainless Steel	
		5101101-00A	100A (Ø 200mm)
		5101102-00A	125A (Ø 235mm)
		5101103-00A	150A (Ø 265mm)
		5101104-00A	200A (Ø 320mm)
		5101105-00A	250A (Ø 385mm)
Duct mounting set DIN		Duct kit for DIN ducts Stainless Steel	
		5101731-00A	DIN 100 (Ø 220mm)
		5101732-00A	DIN 125 (Ø 250mm)
		5101733-00A	DIN 150 (Ø 285mm)
		5101734-00A	DIN 200 (Ø 340mm)
		5101735-00A	DIN 250 (Ø 385mm)
Duct mounting set		4002722, 4002723	Duct mounting set for mounting in ventilation ducts. (250x200x1,5 mm). 4002722 for brass 4002723 for Stainless steel.
Splash guard		4002712	Enviromental sensor protection, incl. splash water
Inline flow adapter		4002720	Inline flow adapter for sample applications, connection 2x6mm, SS
Protective hood		4002714	Protective hood SS, for optimal protection in "wet" production areas, dim. 315x300x138 mm
Protective bracket		4002713	SS bracket, extra protection for use in e.g. warehouses
Conical collector hood		4000657	Conical hood for ascending gases

## ORDERING INFORMATION

## SPARE PARTS / CONSUMABLES

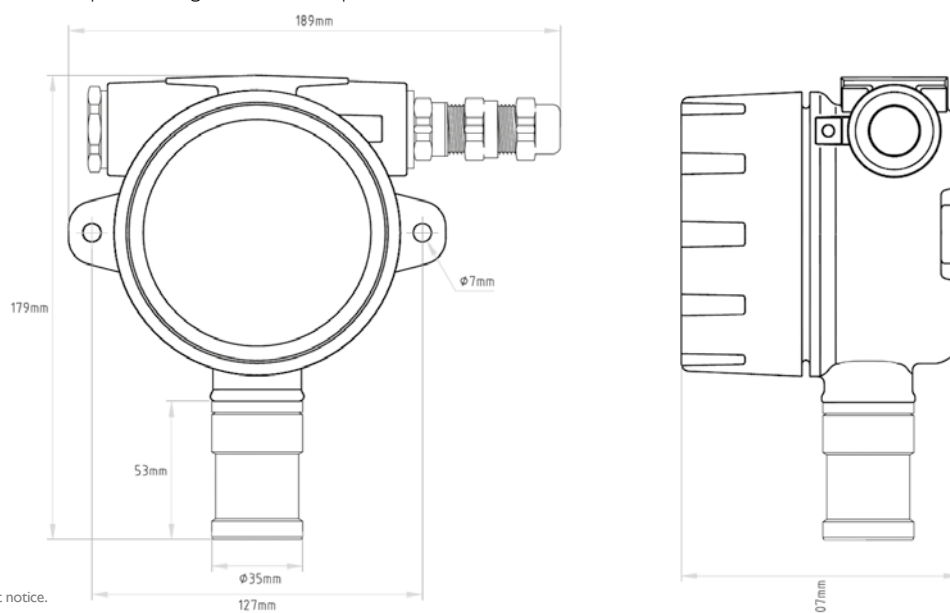
SPARE GAS SENSOR	PART NO.	RANGE	DESCRIPTION
EC Sensor O <sub>2</sub>	I228600	0-25 Vol.% O <sub>2</sub>	Oxygen sensor
EC Sensor O <sub>2</sub> LL3	I228600/LL3	0-25 Vol.% O <sub>2</sub>	Oxygen sensor Long life 3 Years
EC Sensor H <sub>2</sub> S	I228602	30 / 50 / 100 ppm H <sub>2</sub> S	Hydrogen sulfide sensor
EC Sensor CO	I228604	100/250/500 ppm CO	Carbon monoxide sensor
EC Sensor CO (LHS)	I228604/LHS	0-500 ppm CO	CO sensor with low sensitivity to H <sub>2</sub>
EC Sensor H <sub>2</sub>	I228605	0-1000 ppm H <sub>2</sub>	Hydrogen ppm sensor
EC Sensor H <sub>2</sub>	I228606	0-100 %LEL H <sub>2</sub>	Hydrogen LEL sensor
EC Sensor NO	I228607	0-100 ppm NO	Nitric oxide sensor
EC Sensor NO <sub>2</sub>	I228608	0-20 ppm NO <sub>2</sub>	Nitrogen dioxide sensor
EC Sensor CS <sub>2</sub>	I228609	0-50/100 ppm CS <sub>2</sub>	Carbon disulfide sensor

## TEST GASES AND ACCESSORIES

TYPE	PART NO.	DESCRIPTION
BUGAS, 100 Vol.% N <sub>2</sub>	9990524	Nitrogen, 100 Vol.%, 110 gas liters
BUGAS, 20,9% O <sub>2</sub> / N <sub>2</sub>	9990537	Synthetic air, 20,9% O <sub>2</sub> / 79% N <sub>2</sub> , 110 gas liters
BUGAS, 10 ppm H <sub>2</sub> S	9990540	Hydrogen sulfide, 10 ppm in air, 58 gas liters
BUGAS, 25 ppm H <sub>2</sub> S	9990507	Hydrogen sulfide, 25 ppm in air, 58 gas liters
BUGAS, 50 ppm CO	9990505	Carbon monoxide, 50 ppm in air, 110 gas liters
BUGAS, 100 ppm CO	9990522	Carbon monoxide, 100 ppm in air, 110 gas liters
BUGAS, 500 ppm CO	9990534	Carbon monoxide, 500 ppm in air, 110 gas liters
BUGAS, 200 ppm H <sub>2</sub>	9990542	Hydrogen, 200 ppm in air, 110 gas liters
BUGAS, 2 Vol.% H <sub>2</sub>	9990506	Hydrogen, 2 Vol.% in air, 110 gas liters
BUGAS, 25 ppm NO	9990511	Nitrogen Monoxide, 25 ppm in Air, 58 gas liters
BUGAS, 5 ppm NO <sub>2</sub>	9990512	Nitrogen Dioxide, 5 ppm in Air, 58 gas liters
Calibration adapter	4002715	Stainless Steel / calibration flow adapter
Gas hose	I225819	Flexible gas hose, Ø 4x6mm, suitable for non corrosive gasses 1 meter.
Gas hose	I910204	Flexible gas hose, Ø 4x6mm, suitable for corrosive gasses 1 meter.
Flow regulator brass	9990600	Flow regulator Chrome/brass, fixed flow 0,5 l/min (for non corrosive gasses)
Flow regulator SS	9990601	Flow regulator Stainless, fixed flow 0,5 l/min (for corrosive gasses)

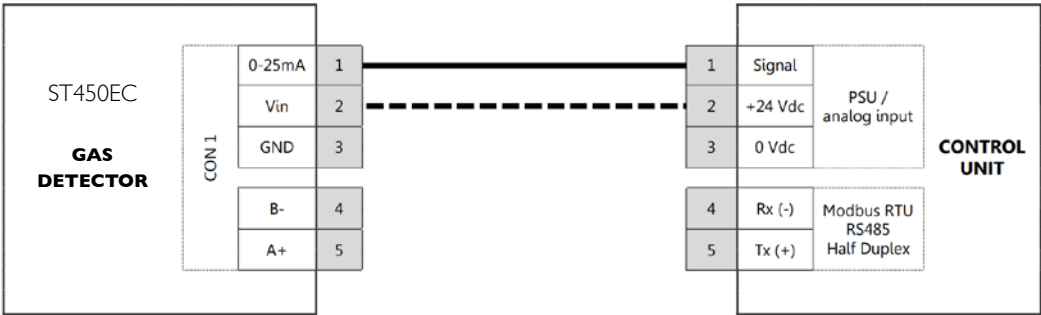
Consilium offers a wide range of test gases, if the required test gas is not listed, please contact us.

## DIMENSIONS

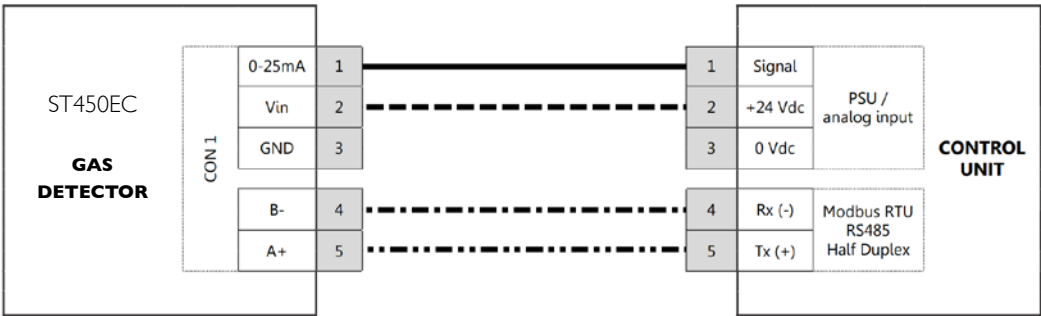


The specifications described herein are subject to change without notice.

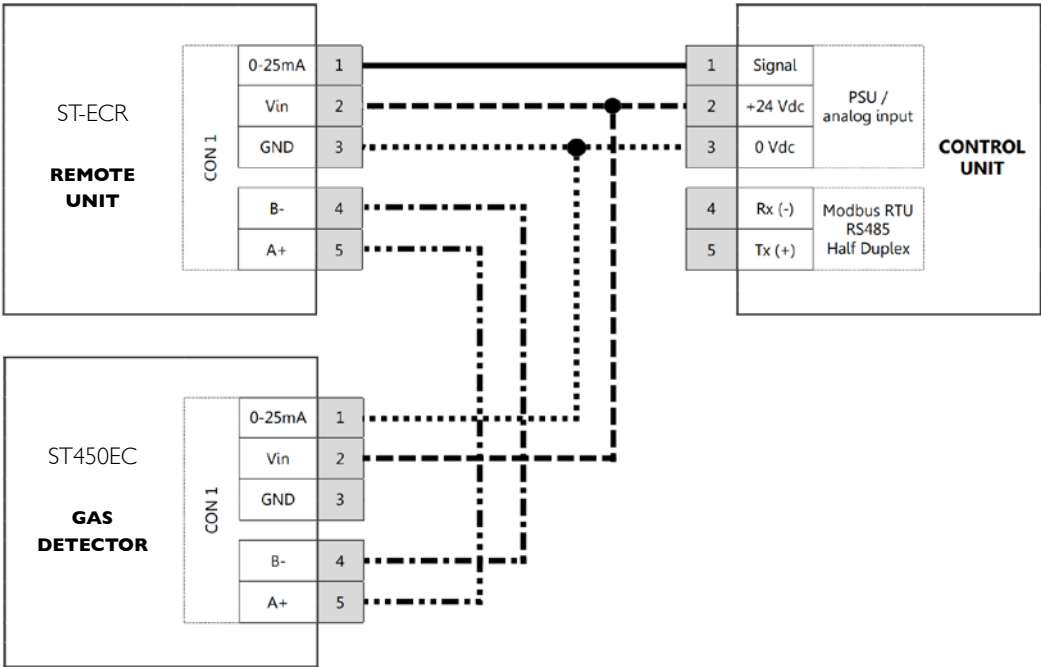
CONNECTION DIAGRAM GAS DETECTOR



ST450EC connected as 4-20 mA transmitter



ST450EC connected via modbus



ST450EC connected as Remote

## SPECIFICATIONS

PRODUCT	ST450EC
Gas type	Oxygen, Hydrogen and Toxic gases (O <sub>2</sub> , H <sub>2</sub> S, CO, H <sub>2</sub> , NO, NO <sub>2</sub> , CS <sub>2</sub> )
Sensor type	Electrochemical sensor (2 or 3 electrodes)
Display	Digital graphic display with backlight
Status LED display	Green: OK, Red: Alarm, Yellow: SF (System Failure), Blue: User menu active
Power supply	24-28 VDC (max. 40 mA)(120 mA remote)
Outputs	Analogue: 4-20 mA (<2.4 mA system failure, >20 mA overrange) Digital: RS485 Modbus RTU (half-duplex)
Signal cable (ST450EC)	2-wire shielded, 0.75 ... 2.5 mm <sup>2</sup> (excluding earth connection and Modbus)
Signal cable (ST450EC Remote)	4-wire shielded, 0.75 ... 2.5 mm <sup>2</sup> (excluding earth connection and Modbus)
Cable gland	Standard Brass, optional SS (thread M20x1.5)
Load impedance	max. 160 $\Omega$ at 24VDC
Operating temperature	See table "Order information"
Relative humidity	See table "Order information"
Pressure range	Toxic: Atmospheric $\pm$ 10%, Oxygen: 80 to 120 kPa
Enclosure	Coated aluminum or SS
Dimensions	179 x 189 x 107 mm (HxWxD)
Weight	1.8 kg (Alu), 3.15 kg (SS)
Ingress Protection	IP 66 (Sensor IP 6x)*
Enclosure gas sensor	SS 316
CE marking	ATEX (Directive 2014/34/EU) Electromagnetic Compatibility (Directive 2014/30/EU)
Approvals	<div> <div>ATEX</div> <div>           II 2G Ex db IIC T6 Gb            II 2D Ex tb IIIC T85°C Db         </div> </div> <div> <div>IECEX</div> <div>           Ex db IIC T6 Gb            Ex tb IIIC T85°C Db IECEx            (Tamb: -40°C to +65°C)         </div> </div>
Type examination	Oxygen: EN 50104:2019, EN 50271:2018 H2S: EN IEC 62990-1:2022, EN 50270:2015, EN 50271:2018
Approvals (North American models)	<div> <div>cCSAus</div> <div>           Class I, Zone I, AEx db IIC T6 Gb            Zone 2 I, AEx tb IIIC T85°C Db            Class I, Division I, GP A, B, C, D T6            Class II, Division I, GP E, F, G T85°C         </div> </div>
Compliance with: (North American models)	<div> <div>CSA</div> <div>C22.2 No. 60079-0:19, 60079-1:16, 60079-31:15, 25:17, 30:20</div> </div> <div> <div>CAN/CSA</div> <div>C22.2 No. 61010-1-12</div> </div> <div> <div>UL</div> <div>61010-1, 60079-0:19, 60079-1:15, 60079-31, 60079-29-1</div> </div> <div> <div>FM</div> <div>3600:2022, 3615:2022, 3616:2022</div> </div>
Manufacturer	Consilium Safety Netherlands B.V.

\* IP ratings do not imply that the equipment will detect gas during and after exposure to those conditions.



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DATA SHEET ST450EC\_EN\_2024\_v2.14