SZENZORTECHNIKA
Technology for safe environment!

QUALITY SYSTEM CERTIFICATION DNV·GL ISO 9001

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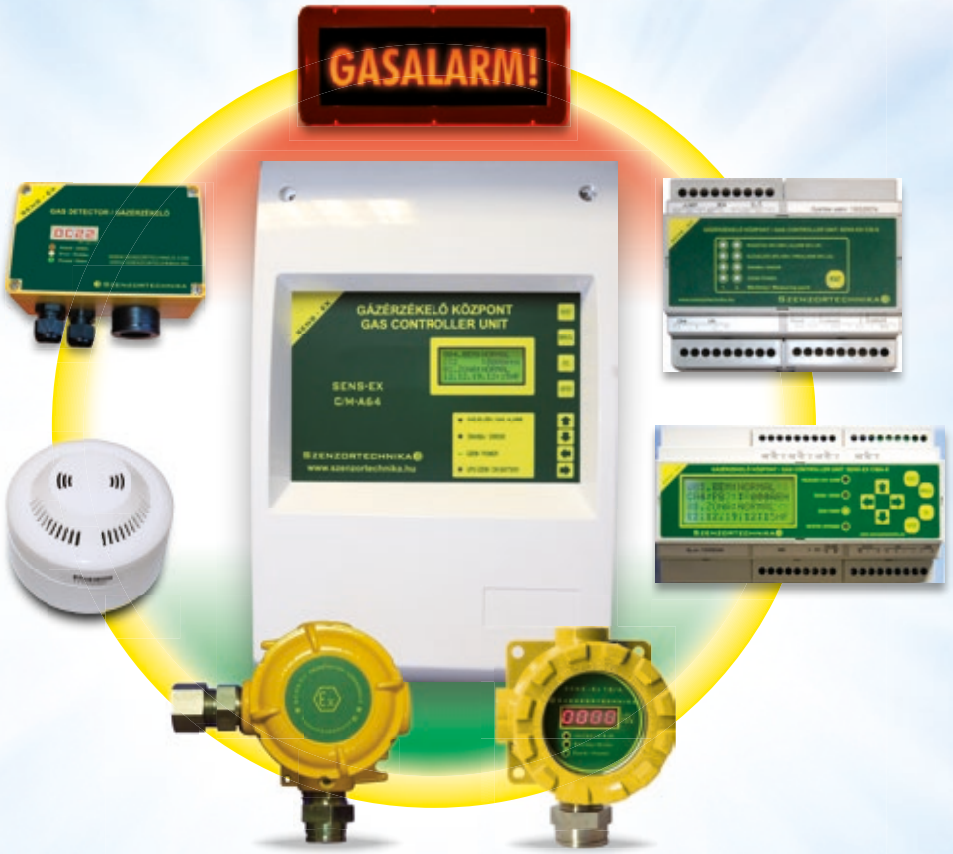



# SENS-EX gas detection devices

# 1. Gas detection systems

## Function:

The installed SENS-EX type gas detectors and gas detection systems are designed to detect explosive or toxic gases, vapours, carbon dioxide, oxygen and other gases in the air. They can measure gas concentration, indicate gas danger and control electric equipment (e.g. ventillation, signaling devices,…) by relay contacts, to prevent a possible accidents and catastrophe situations. Detectors can be used both as a transmitter with a compatible control panel or as a stand-alone gas detector. Our gas detectors and systems are used lot of different places to protect residential, commercial and industrial properties from the gas danger. The explosion proof type (x) detectors are flameproof designed to use in ZONE 1 or 2 potentially explosive environments, where the risk of explosion is due to the presence of gases, vapours and mists.

## Applications:

Gas and petrochemical industry, chemical and other kinds of industrial plants, dyeing workshops, warehouses, gas-fired boilers, gas receivers, car park buildings, garages of office buildings, tunnels, wineries, soft drink plants and breweries, sparkling plants, gas engines, industrial kitchens, repair shops for gas-driven cars, workplaces, labs and other facilities where explosive, toxic or environmentally harmful gases and vapours can be present in harmful quantities. Please, contact the manufacturer for details! www.sensortechnica.com

## The general structure of the system:

### Connectable gas detectors and control panels

| Types | SENS-EX C/D… | SENS-EX C/ MR-D | SENS-EX C/MA… directly | SENS-EX C/MA… by interface | Stand-alone detector |
|---|---|---|---|---|---|
| SENS-E(x/X) TG/A-…-…-A(D) | | | √ | | |
| SENS-E(x/X) TG/A-…-…-AC(D) | √ | | √ | √ | √ |
| SENS-E(x/X) TG/A-…-…-AR(D) | | | √ | √ | √ |
| SENS-E(x/X) TG/A-…-…-ACR(D) | √ | | √ | √ | √ |
| SENS-E(x/X) TG/A-…-…-S | √ | | | √ | |
| SENS-EX TG/A-E-CO-A-G | | | √ | | |
| SENS-EX TG/A-E-CO-C-G | √ | | | √ | √ |
| SENS-EX TG/S-D-CO | | √ | | √ | |
| SENS-EX TG/S-DR-CO | | | | | √ |
| SENS-Ex TG/S | √ | | | √ | |

# 2. Control panels for gas detection

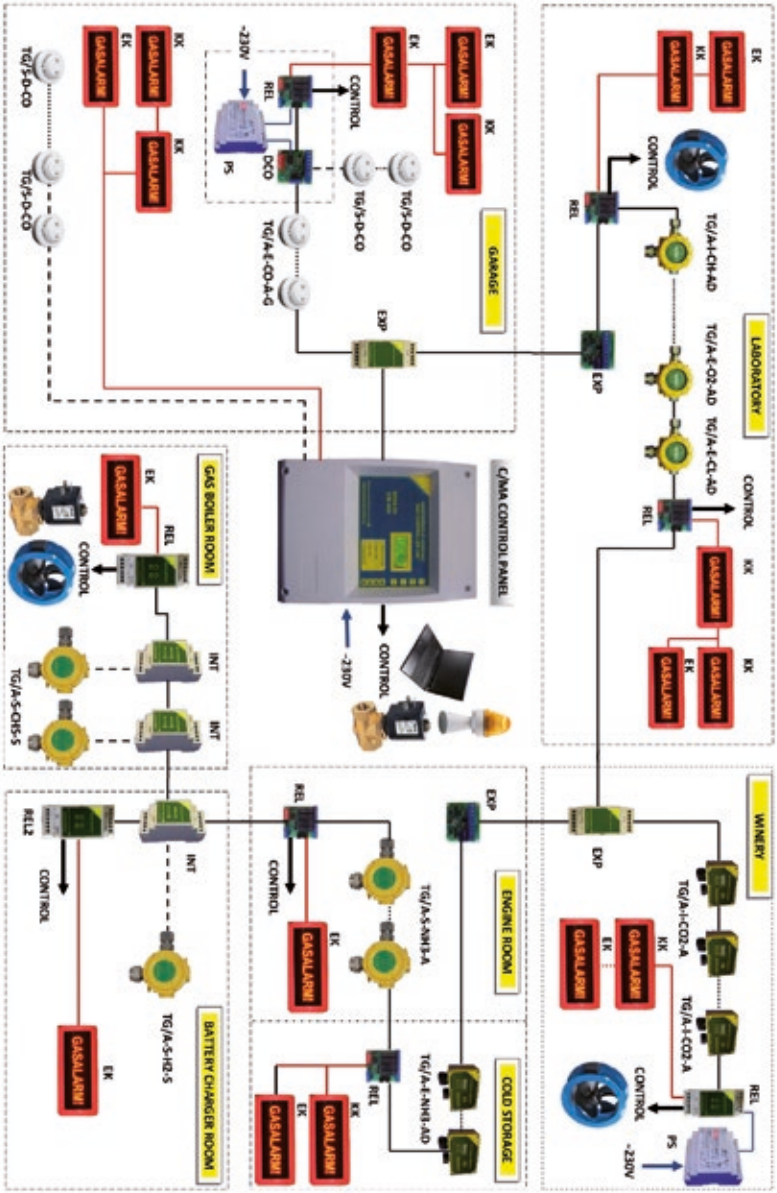
## 2.1. Addressable control panels

### 2.1.1. SENS-EX C/MA-... addressable gas detection control panel

- High quality product developed and produced in Europe
- Intelligent, programmable, microprocessor controlled devices
- Modular systems, easy to be expanded even later too
- Several hundred transmitters and modules can be connected in up to 32 zones
- Addressable (max. 255 devices) and / or conventional gas detectors
- Large digital LCD display and LED status signals
- Automated and manual ventilation control
- Programmable controls, up to four signalling levels + self error indication
- According to demand serial or star-point wiring can be used
- 24VDC or 230VAC power supply
- Optional UPS and event memory
- Wall mounted or DIN rail or Rack cabinet design
- Fault and service signal for the sake of safety
- Easy to use, long lifetime, economical operation and maintanence
- Equipment and production technology conforming to standards
- Certification: ISO, NAT, CE, ATEX, IECEx
- Warranty of 1 to 3 years when operation conforms to the requirements of manual
- Favourable price

Available programmed controller and their expansion modules

| Base model: CMA-(S; - E) | 8 addresses, 1 zone, 1 material, 2 signalling levels |
|---|---|
| CMA-M-A16 | software module with 16 addresses |
| CMA-M-A32 | software module with 32 addresses |
| CMA-M-A64 | software module with 64 addresses |
| CMA-M-A128 | software module with 128 addresses |
| CMA-M-A256 | software module with 256 addresses |
| CMA-M-Z2 | software module with 2 zones |
| CMA-M-Z4 | software module with 4 zones |
| CMA-M-Z8 | software module with 8 zones |
| CMA-M-Z16 | software module with 16 zones |
| CMA-M-Z32 | software module with 32 zones |
| CMA-M-L3 | software module with 3 signalling levels |
| CMA-M-L4 | software module with 4 signalling levels |
| CMA-M-MAT2 | software module that can be set for 2 materials |
| CMA-M-MAT10 | software module that can be set for 10 materials |
| CMA-M-MEM | Event log software module |


LABORATORY
GARAGE
GAS BOILER ROOM
BATTERY CHARGER ROOM
C/MA CONTROL PANEL
ENGINE ROOM
COLD STORAGE
WINERY
EXP
INT
REL
REL2
CONTROL
-230V
PS
DCO
EK
KK
GASALARM
TG/A-I-CH4-AD
TG/A-E-O2-AD
TG/A-E-CL-AD
TG/A-E-CO-A-G
TG/S-D-CO
TG/A-S-OHS-S
TG/A-S-NH3-A
TG/A-E-NH3-AD
TG/A-I-CO2-A
TG/A-S-H2-S

## 2.1.2. Technical specification of addressable control panels

| Type | SENS-EX C/MA | SENS-EX C/MA-S | SENS-EX C/MA-E |
|---|---|---|---|
| Operating voltage | 230V AC±5% | 24V DC±20% | 24V DC±20% |
| Current consumption | 300 mA | 60 mA | 100 mA |
| UPS | Optional | Optional | Optional |
| Detector network structure | Serial line | Serial line | Serial line |
| Detector network data transfer | RS485 | RS485 | RS485 |
| Number of addressable devices | 255 pcs | 255 pcs | 255 pcs |
| Additional detector expansion | With conventional CO detectors by an interface | With conventional CO detectors by an interface | With conventional CO detectors by an interface |
| Measuring ranges | LEL, v%, ppm | LEL, v%, ppm | LEL, v%, ppm |
| Desplay | LCD display + LED statement | LCD display + LED statement | LCD display + LED statement |
| Ingress protection | IP40 | IP21 | IP00 |
| Signal processing | Microcontroller | Microcontroller | Microcontroller |
| Audible warning | Built in buzzer | Built in buzzer | Built in buzzer |
| Management, programming | Membrane keyboard | Membrane keyboard | Membrane keyboard |
| Alarm levels | 2-4 Programmable | 2-4 Programmable | 2-4 Programmable |
| Relay output | 4 x MORSE | 4 x MORSE | 4 x MORSE |
| Relay load capacity | ~ 250V, 1A / 48VDC, 1A resistive | ~ 250V, 1A / 48VDC, 1A resistive | ~ 250V, 1A / 48VDC, 1A resistive |
| Relay expansion | 2 or 4 relay moduls | 2 or 4 relay moduls | 2 or 4 relay moduls |
| Operating temperature | -10°C… +50°C | -10°C…- +50°C | -10°C…- +50°C |
| Operating pressure | 900 -1100 mBar | 900 -1100 mBar | 900 -1100 mBar |
| Operating humidity | 10 – 90 rH% | 10 – 90 rH% | 10 – 90 rH% |
| Dimension, weight | 400 x 265 x 90mm; ≈1kg | 105x90x60mm; ≈0,3kg | 200 x 130 x 65mm; ≈1kg |
| Enclosure material | White plastic | PPO UL94VO Grey plastic | Metal |
| Cable inlet | Cable glands | - | - |
| Cable connection | Terminal block, max. 1.5mm$^2$ | Terminal block, max. 1.5mm2 | Terminal block, max. 1.5mm2 |
| Mounting | Onto wall in vertical position | to EN 60715 rail | 19" RACK box |

## 2.2. Conventional control panels

### 2.2.1. SENS-EX C/D-S-.. gas detection control panel

- Intelligent, and micro-processor controlled devices
- Equipment and production technology conforming to standards:
- DNV-ISO, NAT, BKI-ATEX, IECEx, CE
- Long lifetime, economical operation
- Control 1 or 2 conventional gas detector
- Fault and service signal for the sake of safety
- 2 alarm levels and fault signal
- Freely adjustable relay outputs
- User-friendly, easy use and maintanance
- Sound and light signals that can easily be perceived
- 24VDC or 230VAC power supply, with optional AC adapter
- Possibility of UPS function
- Wall mounted or DIN rail design
- Warranty of 3 years when operation conforms to the requirements of user manual
- Possibility of relay output expansion (SENS-EX C/D-REL: expander module. The device contains 3 adjustable Morse relays.)

#### SENS-EX C/D1(2)-S-U type controller:

it can be used only for transmitters SENS-EX(x)-TG/A-…-…-S (with output of electric resistance) type and SENS-EX(x)-TG/A-…-…-C (with 4–20 mA outputs).

#### SENS-EX C/D1(2)-S type controller:

Exclusively for use in boiler-houses, it can be applied with SENS-EX(x)-TG/A-…-…-S (resistance output) methane or propane sensor transmitters.

## 2.2.2. SENS-EX C/MR-D-S-CO control panel for CO detectors

- High quality product developed and produced in Europe
- Intelligent, and microprocessor controlled devices
- 1 zone design, up to 20 pcs SENS-EX TG/S-D-CO detectors can be connected
- Completely automated operation, automated ventilation control
- Two alarm levels and fault an service signal for the sake of safety
- Freely adjustable relay outputs, sound and light signals
- User-friendly, easy use and maintanance
- Wall or DIN rail mounted design
- Relay expansion is possible (SENS-EX C/MR-REL-S: expansion module. The device contains 2 adjustable Morse relays.)
- Serial wiring (1-loop system)
- 24VDC or 230VAC power supply, with optional AC adapter
- Optional UPS
- Equipment and production technology conforming to standards: ISO, NAT, CE
- Long lifetime, economical operation
- Warranty of 1 to 3 years when operation conforms to the requirements of manual
- Favourable price

## 2.2.3. Technical specification of conventional control panels

| Type | SENS-EX C/D-S | SENS-EX C/D-S-U | SENS-EX C/MR-D-S |
|---|---|---|---|
| Operating voltage | 24V DC±20% | 24V DC±20% | 24V DC±20% |
| Current consumption | 50mA | 50mA | 50mA |
| UPS | Optional | Optional | Optional |
| Detector network structure | Star topology | Star topology | Serial line |
| Detector network data transfer | Analog | Analog | Digital |
| Number of detectors | 1-2 pcs | 1-2 pcs | 20 pcs |
| Additional detector expansion | By an additional control panel | By an additional control panel | By an additional control panel |
| Measuring ranges | 1-100 LEL | LEL, v%, ppm | 30-1000ppm CO |
| Desplay | LED statement indicator | LED statement indicator | LED statement indicator |
| Ingress protection | IP21 | IP21 | IP21 |
| Signal processing | Microcontroller | Microcontroller | Microcontroller |
| Audible warning | Built in buzzer | Built in buzzer | Built in buzzer |
| Management | Membrane keyboard | Membrane keyboard | Membrane keyboard |
| Alarm levels | 2 | 2 | 2 |
| Relay output | 4 x MORSE | 4 x MORSE | 4 x MORSE |
| Relay load capacity | ~ 250V, 1A / 48VDC, 1A resistive | ~ 250V, 1A / 48VDC, 1A resistive | ~ 250V, 1A / 48VDC, 1A resistive |
| Relay expansion | + 3 relay modul | + 3 relay modul | + 2 relay modul |
| Operating temperature | -10°C… +50°C | -10°C…- +50°C | -10°C…- +50°C |
| Operating pressure | 900 -1100 mBar | 900 -1100 mBar | 900 -1100 mBar |
| Operating humidity | 10 – 90 rH% | 10 – 90 rH% | 10 – 90 rH% |
| Dimension, weight | 105x90x60mm; ≈0,2kg | 105x90x60mm; ≈0,2kg | 105x90x60mm; ≈0,2kg |
| Enclosure material | PPO UL94VO plastic | PPO UL94VO plastic | PPO UL94VO plastic |
| Cable inlet | - | - | - |
| Cable connection | Terminal block, max. 1.5mm$^2$ | Terminal block, max. 1.5mm$^2$ | Terminal block, max. 1.5mm$^2$ |
| Mounting | to EN 60715 rail | to EN 60715 rail | to EN 60715 rail |

# 3. Complementary modules for control panels

## SENS-EX C/MA-...

- Addressable interface module to integrate conventional detectors into the system: SENS-EX C/MA-INT(-S)
- Addressable expansion control module with 4 programmable relays: SENS-EX C/MA-REL(-S)
- Addressable expansion control module with 2 programmable relays: SENS-EX C/MA-REL2(-S)
- RS485 amplifier and line branching module for SENS-EX C/MA panels: SENS-EX C/MA-EXP(-S)
- Addressable one loop adapter module to SENS-EX C/MA controllers for connecting SENS-EX TG/S-D-CO detectors: SENS-EX C/MA-DCO(-S)
- Addressable ten loop adapter module to SENS-EX C/MA controllers for connecting SENS-EX TG/S-D-CO detectors: SENS-EX C/MA-DCO10(-S)
- Battery charger module: SENS-EX C/MA-PS(-S)
- DIN rail mounted power supply modules: SENS-EX PS1.5-S, …PS2.0-S, …PS4.2-S
- Addressable, DIN rail mounted repeater module for SENS-EX/MA controllers, display same LCD and LED information as the main panel and can be reset the sound signal, if needed.: (LCD): SENS-EX C/MA-MK-LCD-S
- Addressable, DIN rail mounted secondary display for SENS-EX/MA controllers, show status information in the form of LED signals, same as the main panel and can be reset the sound signal, if needed.: (LED): SENS-EX C/MA-MK-LED-S
- Wall mounted design enclosures in three sizes for SENS-EX panels and modules, suitable for receiving DIN rail mounted units and units without cover as well as connecting cables. Protection as needed, IP20 to IP65: SENS-EX BOX…

## SENS-EX C/D-S

- Power supply modules: SENS-EX PS1.5-S, …PS2.0-S, …PS4.2-S
- Expansion control module with 3 relays: SENS-EX C/D-REL-S
- Module for charging the battery: SENS-EX C/MA-PS-S
- Wall mounted design enclosures: SENS-EX BOX…

## SENS-EX C/MR-D-S-CO

- Power supply modules: SENS-EX PS1.5-S, …PS2.0-S, …PS4.2-S
- Expansion control module with 2 relays: SENS-EX C/MRD-REL(-S)
- Module for charging the battery: SENS-EX C/MA-PS-S
- Wall mounted design enclosures: SENS-EX BOX…

# 4. Gas detectors and transmitters

## 4.1. SENS-E(x/X) TG/A-... type intelligent gas detectors and transmitters

- Detection and measurement of different gases concentration in the air
- Completely automated device
- Intelligent signal process by microcontroller
- Stand-alone or system integrated applications
- Measuring ranges: LEL / v% / ppm
- Cathalytic / infrared / semiconductor / electrochemical type sensors
- Aesthetic, industrial design, IP54 / IP65 IP rating
- Explosion proof type (for ZONE 1 / ZONE 2 applications) or "non explosion proof" type (for other industrial applications)
- BKI ATEX, IECEx, TÜV (IP65), ISO, NAT, CE certificates
- Calibration certificates by accredited laboratory
- Output signals: RS485 / 4-20mA / mV / Ω /relay contacts
- LED status indication and optional LED digital display
- Four alarm levels, error and service indication
- Programmable relay contacts to control electric equipment
- Long life, reliable operation, easy use and maintenance
- Competitive price, long time garantee, service background

### Technical Specification

| | |
|---|---|
| Power supply voltage and current | 5 – 30V DC, max 200mA (depend on the type) |
| Type of sensor built in: | Cathalytic, IR, semiconductor and electrochemical |
| Measuring range: | LEL / v% / ppm |
| Expected life time of the sensors: | 2 – 8 year |
| Sampling method: | diffusion |
| Output signal: | RS485, 4-20mA, relay contacts, electrical resistance |
| Relay output: | 3 pcs. programmable, 48V, 1A electrical load capacity contacts |
| Response time $t_{90}$: | <30 sec. |
| Display: | LED status indication and optional LED digital display |
| Operating pressure: | 900 -1100 mBar |
| Operating humidity: | 15 – 90 rH% |
| Operating temperature: | -40°C - +55°C (+125°C) |
| Air velocity: | max. 5 m/s |
| ATEX certificate: | BKI13ATEX0005X |
| Ex protection: | Normal: II 2G Ex d IIC T6 (Ta=-40 °C…+55°C)Gb<br>HT: II 2G Ex d IIC T3 (Ta=-40°C...+125°C)Gb |
| IECEx certificate: | IECEx BKI 13.0003X |
| Ex protection: | Normal: Ex d IIC T6 (Ta=-40 °C…+55°C)Gb<br>HT: Ex d IIC T3 (Ta=-40°C...+125°C)Gb |
| Ingress protection (IEC 529): | IP65 |
| Material of eclosure: | Aluminium and stainless steel / POM |
| Dimension, weight: | (X): 125x105x60mm, 0,5 kg / (x): 150x150x90mm, 1 kg |
| Cable inlet: | (X) IP 65 plastic cable gland / (x) opcional "Exd" cable gland |
| Connectable cable: | Wire cross section of 0,5 mm2 to 1,5 mm2, number of wires (cores) depends on application, cable cross section: circle, max Ø 14 mm, screened industrial cable |

## Legend of the SENS-EX type gas detectors

e.g. SENS SENS-Ex TG/A-S-CH-ACR-HT

**HT**: For high temperature environment (up to 125°C), for normal temperature there is no sign (up to 55°C)

**H:** Heated detector for low temperature environment (below -20°C, depend on the sensor)

**S:** Simple, conventional detector, only for suitable SENS-EX type control panel

**A:** Addressable detector for SENS-EX C/MA type control panels (if there is an additional "D" sign, it means LED diplay version)

**AC:** Stand alone or Addressable detector for SENS-EX C/MA type control panels with extra 4-20mA output (if there is an additional "D" sign, it means LED diplay version)

**AR:** Stand alone or Addressable detector for SENS-EX C/MA type control panels with extra relay outputs (if there is an additional "D" sign, it means LED diplay version)

**ACR:** Stand alone or Addressable detector for SENS-EX C/MA type control panels with extra 4-20mA and relay outputs (if there is an additional "D" sign, it means LED diplay version)

**D**: Digital, conventional detector, only for suitable SENS-EX type control panel

**DR**: Digital, conventional detector for suitable SENS-EX type control panel or use as a stand alone detector with relay outputs

Gas type: e.g. **$H_2$, CO, $CO_2$, $O_2$, $H_2S$, NO, $NO_2$, $CL_2$, $NH_3$, $SO_2$, $PH_3$, HCN, HCL, ETO, $N_2O$ ...**

**CH**: Hydrocarbons gases by infrared sensor (without small molecular gases)

**CHS**: Specific hydrocarbons gases: METHANE, PROPANE, BUTANE, LPG

**CHX**: Hydrocarbons gases, vapours

**LELS**: Specific combustible gases: METHANE, PROPANE, BUTANE, LPG, HYDROGEN

**LELX**: All combustible gases (hydrocarbons, ammonia, CO, stb.)

**C:** Catalytic sensor inside

**S:** Semiconductor sensor inside

**E:** Electrochemical sensor inside

**I:** Optical sensor inside

**X:** Non explosion proof equipment

**x:** Explosion proof equipment (with ATEX, IECEx certificates)

## 4.2. SENS-EX TG/S-D(R)-CO... semiconductor type carbon monoxide detector and transmitter

- Carbon monoxide detection according to EN 50291 standard
- Completely automated device
- Intelligent signal process by microcontroller
- Special semiconductor type sensors for CO detection
- ISO, NAT, CE certificates
- Calibration certificates by accredited laboratory
- Four alarm levels, error and service indication by LED
- Relay contacts to control electric equipment (R)
- Stand-alone or system integrated applications
- Aestethic design
- Long life, reliable operation, easy use and maintenance
- Competitive price, long time garantee, service background

### Technical Specification

| | |
|---|---|
| Power supply voltage and current | 9 – 32V DC, max 50mA |
| Type of sensor built in: | Figaro TGS 2442 |
| Measuring range: | 30-1000 ppm carbon monoxide |
| Expected life time of the sensors: | 5 year |
| Sampling method: | diffusion |
| Output signal: | Special digital sign or relay contacts |
| Relay output: | 3 pcs. 48V, 1A electrical load capacity contacts |
| Response time $t_{90}$: | <3 min. |
| Display: | LED status indication |
| Operating pressure: | 900 -1100 mBar |
| Operating humidity: | 15 – 90 rH% |
| Operating temperature: | -10°C… +40°C |
| Air velocity: | max. 5 m/s |
| IP rating (IEC 529): | IP20 |
| Material of eclosure: | White plastic |
| Dimension, weight: | d=990 mm, h=480 mm; 150 gr. |
| Cable inlet: | Base |
| Connectable cable: | Wire cross section of 0,75 $mm^2$ to 1,5 $mm^2$, number of wires 3-8 depends on the application |

## 4.3. SENS-EX TG/A-E-CO-...-G addressable, electrochemical carbon monoxide detector and transmitter

- Carbon monoxide detection according to EN 50291 standard or linear 4-20 mA output
- Completely automated device
- Intelligent signal process by microcontroller
- Electrochemical sensors
- High sensitivity and good selectivity for CO gas
- ISO, NAT, CE certificates
- Calibration certificates by accredited laboratory
- Four alarm levels, error and service indication by LED
- Stand-alone or system integrated applications
- Aestethic design
- Long life, reliable operation, easy use and maintenance
- Competitive price, long time garantee, service background

### Technical Specification

| | |
|---|---|
| Power supply voltage and current TG/A-E-CO-A-G type | 9 – 32V DC, max 50mA |
| Power supply voltage and current TG/A-E-CO-C-G type | 20-28V DC, max 30mA |
| Type of sensor built in: | ECO-SURE |
| Measuring range: | 0-300 ppm carbon monoxide |
| Expected life time of the sensors: | 3-5 year |
| Sampling method: | diffusion |
| Output signal TG/A-E-CO-A-G type: | RS485 |
| Output signal TG/A-E-CO-C-G type: | 4 – 20 mA |
| Response time $t_{90}$: | <3 min. |
| Display: | LED status indication |
| Operating pressure: | 900 -1100 mBar |
| Operating humidity: | 15 – 90 rH% |
| Operating temperature: | -10°C… +40°C |
| Air velocity: | max. 5 m/s |
| Ingress protection:(IEC 529): | IP20 |
| Material of eclosure: | White plastic |
| Dimension, weight: | d=990 mm, h=480 mm; 150 gr. |
| Cable inlet: | Base |
| Connectable cable TG/A-E-CO-A-G type: | 4 x 0,75 - 1,5 mm2 twisted, shielded cable |
| Connectable cable TG/A-E-CO-C-G type: | 2 x 0,75 shielded cable |

## 4.4. Technical specification of gas detectors

| **Type series** | **SENS-Ex(X) TG/A-S-…-…*** | **SENS-Ex(X) TG/A-C-…-…*** | **SENS-Ex(X) TG/A-I-…-…*** | **SENS-Ex(X) TG/A-E…-…*** |
|---|---|---|---|---|
| Operating voltage | *-S: 5 VDC<br>*-A…: 24 VDC | *-S: 3 VDC<br>*-A…: 24 VDC | *-S: 5 VDC<br>*-A…: 24 VDC | *-C: 24 VDC<br>*-A…: 24 VDC |
| Current consumption | Max. 160mA | Max. 200mA | Max. 100mA | Max. 100mA |
| Type of sensor | Semiconductor | Catalytic bead | Infrared | Electrochemical |
| Detectable gases and measuring ranges | CH gases, vapours, $H_2$ 1-100 ARH%<br>$NH_3$, HFC, CFC, HCFC 50-10000ppm<br>CO 30-1000 ppm | Combustible gases, vapours 1-100 ARH% | CH gases, vapours 1-100 ARH%<br>$CO_2$ 0-100 tf%<br>$N_2O$ 0-1000ppm | $H_2$, $NH_3$, CO, $CO_2$, $NO_x$, $H_2S$, $N_2O$, $SO_2$, $CL_2$, $PH_3$, HCl, HCN, ETO… ppm range<br>$O_2$ 0-25 v%<br>$CO_2$ 0-100 v% |
| Life time of sensor | 5 - 6 year | 3-5 year | 5-6 year | 2-5 year |
| Sampling | diffusion | diffusion | diffusion | diffusion |
| Response time $t_{90}$ | <30 s | <30 s | <30 s | <60 s |
| Display | *-S:No<br>*-A…:LED status indication<br>*-A…D:LED digital display + LED status indication | *-S:No<br>*-A…:LED status indication<br>*-A…D:LED digital display + LED status indication | *-S:No<br>*-A…:LED status indication<br>*-A…D:LED digital display + LED status indication | *-C:No<br>*-A…:LED status indication<br>*-A…D:LED digital display + LED status indication |
| Output signal | *-S:electrical resistance<br>*-A:RS485<br>*-AC:RS485+4-20mA<br>*-ACR: RS485+4-20mA+relays | *-S:electrical resistance<br>*-A:RS485<br>*-AC:RS485+4-20mA<br>*-ACR: RS485+4-20mA+relays | *-S:0-5VDC voltage<br>*-A:RS485<br>*-AC:RS485+4-20mA<br>*-ACR: RS485+4-20mA+relays | *-C: 4-20mA current<br>*-A:RS485<br>*-AC:RS485+4-20mA<br>*-ACR: RS485+4-20mA+relays |
| Relay output | *-AR, *-ACR: 3 x MORSE | *-AR, *-ACR: 3 x MORSE | *-AR, *-ACR: 3 x MORSE | *-AR, *-ACR: 3 x MORSE |
| Relay load capacity | 48 V, 1A resistive | 48 V, 1A resistive | 48 V, 1A resistive | 48 V, 1A resistive |
| ATEX approval | (x): BKI13ATEX0005X | (x): BKI13ATEX0005X | (x): BKI13ATEX0005X | (x): BKI13ATEX0005X |
| ATEX protection sign | (x) Ex II 2G Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C)<br>(x) –HT: Ex II 2G Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) | (x) Ex II 2G Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C)<br>(x) –HT: Ex II 2G Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) | (x) Ex II 2G Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C)<br>(x) –HT: Ex II 2G Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) | (x) Ex II 2G Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C)<br>(x) –HT: Ex II 2G Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) |
| IECEx approval | (x): IECEx BKI 13.0003X | (x): IECEx BKI 13.0003X | (x): IECEx BKI 13.0003X | (x): IECEx BKI 13.0003X |

| Type series | SENS-Ex(X) TG/A-S-…-…* | SENS-Ex(X) TG/A-C-…-…* | SENS-Ex(X) TG/A-I-…-…* | SENS-Ex(X) TG/A-E…-…* |
|---|---|---|---|---|
| IECEx protection sign | (x) Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C) (x) -HT: Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) | (x) Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C) (x) -HT: Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) | (x) Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C) (x) -HT: Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) | (x) Ex d IIC T6 Gb ($T_{a=}$ -40 °C …+55 °C) (x) -HT: Ex d IIC T3 Gb ($T_{a=}$ -40 °C…+125 °C) |
| Enclosure material | (x) Stainless steel and aluminium (X) POM and aluminium | (x) Stainless steel and aluminium (X) POM and aluminium | (x) Stainless steel and aluminium (X) POM and aluminium | (x) Stainless steel and aluminium (X) POM and aluminium |
| Operating temperature | -20°C…+50°C HT: (-40°C…+125°C) H: (-40°C…+40°C) | -20°C…+70°C HT: (-40°C…+125°C) | 0°C…+50°C H: (-40°C…+40°C) | -20°C…+50°C HT: (-40°C…+125°C) |
| Operating pressure | 900 -1100 mBar | 900 -1100 mBar | 900 -1100 mBar | 900 -1100 mBar |
| Operating humidity | 15 – 90 rH% | 15 – 90 rH% | 15 – 90 rH% | 15 – 90 rH% |
| Signal processing | *-S: Analog *-A…: Mikrocontroller | *-S: Analog *-A…: Mikrocontroller | *-S: Analog *-A…: Mikrocontroller | *-C: Analog *-A…: Mikrocontroller |
| Ingress protection | (x) IP65, (X) IP54, (-G) IP20 | (x) IP65, (X) IP54 | (x) IP65, (X) IP54 | (x) IP65, (X) IP54, (-G) IP20 |
| Dimensions, weight | ≈150x150x90mm, 1 kg. | ≈150x150x90mm, 1 kg. | ≈150x150x90mm, 1 kg. | ≈150x150x90mm, 1 kg. |
| Wiring | *-S: 4 x 0,75-1.5mm² *-A:4 x 0,75-1.5mm² twisted *-AC:3-6 x 0,75mm² twisted *-ACR:3-9 x 0,75mm² twisted industrial cable | *-S: 3 x 0,75-1.5mm² *-A:4 x 0,75-1.5mm² twisted *-AC:3-6 x 0,75mm² twisted *-ACR:3-9 x 0,75mm² twisted industrial cable | *-S: 3 x 0,75-1.5mm² *-A:4 x 0,75-1.5mm² twisted *-AC:3-6 x 0,75mm² twisted *-ACR:3-9 x 0,75mm² twisted industrial cable | *-C: 2 x 0,75-1.5mm² shielded *-A:4 x 0,75-1.5mm² twisted *-AC:3-6 x 0,75mm² twisted *-ACR:3-9 x 0,75mm² twisted industrial cable |
| Cable inlet | Cable gland | Cable gland | Cable gland | Cable gland |
| Cable connection | Terminal block, max. 1.5mm² | Terminal block, max. 1.5mm² | Terminal block, max. 1.5mm² | Terminal block, max. 1.5mm² |
| Mounting | Onto wall, pillar, ceiling in vertical position | Onto wall, pillar, ceiling in vertical position | Onto wall, pillar, ceiling in vertical position | Onto wall, pillar, ceiling in vertical position |

# 5. Typical detectable gases and recommended detectors

| Substance | Chemical formula | Density (Air=1) | Exposure Limits | Explo-sion limit | Measuring range | Recommended transmit-ter/detector types |
|---|---|---|---|---|---|---|
| Acetone | $C_3H_6O$ | 2 | 500 ppm | 2,5 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X)TG/A-I-CH-… |
| Acetylene | $C_2H_2$ | 0,91 | - | 2,3 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X)TG/A-I-CH-… |
| Ammonia | $NH_3$ | 0,59 | 20 ppm | 15 v% | 1 – 100 ppm, 100 – 10000 ppm, 1 – 100 LEL | SENS-E(x/X) TG/A-S-NH3-…, SENS-E(x/X) TG/A-E-NH3-…, SENS-Ex TG/A-C-NH3-…, |
| Benzine | Mixture | 3,4 | 300 ppm (TWA value) | 1,3 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X)TG/A-I-CH-… |
| n-Butane | $C_4H_{10}$ | 2,11 | 1000 ppm | 1,4 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| CFC, HFC, HCFC | Mixture | 3 - 7 | 200 – 1000 ppm | - | 100 – 20000 ppm | SENS-E(x/X) TG/A-S-CHX-… |
| Ethyl acetate | $C_4H_8O_2$ | 3,0 | 400 ppm | 2,2 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Ethanol | $C_2H_6O$ | 1,6 | 500 ppm | 3,3 v% | 100 – 10000 ppm, 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Ethylene oxide | $C_2H_4O$ | 1,52 | 1 ppm | 2,6 v% | 0,1 – 5 ppm | SENS-E(x/X) TG/A-E-ETO-…, |
| Hydrogen | $H_2$ | 0,07 | - | 4 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-H2-…, SENS-Ex TG/A-C-LELX-… |
| i-Butane | $C_4H_{10}$ | 2,0 | 1000 ppm | 1,8 v% | 1 – 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| i-Propanol | $C_3H_8O$ | 2,1 | 200 ppm | 2,0 v% | 1 – 100 LEL | SENS-E(x/X)TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Hydrogen sulphide | $H_2S$ | 1,19 | 5 ppm | 4,3 v% | 1 – 100 ppm, 10 – 1000 ppm | SENS-E(x/X) TG/A-E-H2S-…, SENS-E(x/X) TG/A-S-H2S-… |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sulphur dioxide | $SO_2$ | 2,25 | 0,5 ppm | - | 1 - 10 ppm | SENS-E(x/X) TG/A-E-SO2-…, |
| Chlorine | $Cl_2$ | 2,5 | 0,5 ppm | - | 0,01 - 2 ppm | SENS-E(x/X) TG/A-E-CL2-…, |
| Air quality | - | - | - | - | 1 - 30 ppm | SENS-E(x/X) TG/A-S-CHX-…, |
| LPG, Propane-Butane | $C_3H_8$-$C_4H_{10}$ | 1,8-2 | 1000 ppm | 2 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Methane | $CH_4$ | 0,6 | - | 4,4 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Methanol | $CH_3OH$ | 1,1 | 200 ppm | 5,5 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Nitrogen dioxide | $NO_2$ | 1,58 | 5 ppm | - | 1 - 20 ppm | SENS-E(x/X) TG/A-E-NO2-…, |
| Nitrogen monoxide | NO | 1,04 | 25 ppm (TWA value) | - | 1 - 100 ppm | SENS-E(x/X) TG/A-E-NO-…, |
| Oxygen | $O_2$ | 1,1 | - | - | 1 - 25 v% | SENS-E(x/X) TG/A-E-O2-…, |
| Carbon dioxide | $CO_2$ | 1,5 | 5000 ppm | - | 100 - 10000 ppm, 0,1 - 5 v%, 1 - 100 v% | SENS-E(x/X) TG/A-I-CO2-… |
| Carbon monoxide | CO | 0,97 | 30 ppm | 12,5 v% | 1 - 300 ppm, 30 -1000 ppm, 1-100 LEL | SENS-E(x/X) TG/A-S-CO-…, SENS-Ex TG/A-C-LELX-…,, SENS-E(x/X) TG/A-E-CO-…, SENS-EX TG/A-E-CO-(A/C)-G, SENS-EX TG/S-D(R)-CO |
| Propane | $C_3H_8$ | 1,55 | 1000 ppm | 1,7 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Phosphine | $PH_3$ | 1,18 | 0,1 ppm | 1,6 v% | 0,01 - 1 ppm | SENS-E(x/X) TG/A-E-PH3-…, |
| Styrene | $C_8H_8$ | 3,6 | 20 ppm | 0,9 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Xilene | $C_8H_8$ | 0,59 | 20 ppm | 15 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |
| Toluene | $C_6H_5CH_3$ | 3,1 | 50 ppm | 1,1 v% | 1 - 100 LEL | SENS-E(x/X) TG/A-S-CHX-…, SENS-Ex TG/A-C-LELX-…, SENS-E(x/X) TG/A-I-CH-… |

# 6. Signaling equipment of gas detecting systems

The sound and light signaling equipment are important complementary units of the gas detecting systems. They warn people for the danger of gas controlled by gas detectors.

- LED light signaling equipment with different texts
- Type of signals: continuous or interrupted
- Power supply: 12-24 V DC
- Max. current: 50 mA - 100 mA
- Dimensions: 330x150x70 mm
- Ingress protection: IP32 or IP65
- Sound pressure: 90 dB or without
- Types:
  - SENS-EX KE outdoor one-sided light signal board
  - SENS-EX KE-H outdoor one-sided light and sound signal board
  - SENS-EX EK indoor one-sided light and sound signal board
  - SENS-EX KK indoor two-sided light and sound signal board

To our customers we provide competent support, we offer direct contact with the sales department and an opportunity to meet management. Feedback information from our customers undergoes through analysis to impinge on development and enrichment of products.

We are seeking long term co-operation with all of our respective partners, therefore we offer our products and services at competitive prices, also securing further advantages to our regular customers.

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## GAS DETECTION
## GASMESSTECHNIK

QUALITY SYSTEM CERTIFICATION
DNV·GL
ISO 9001

NAT
KALIBRÁLÓ
NAT-2-0222/2015