

# Sensigas®

## Gas Detectors

IP65 Protection Degree  
MED/3.54 (IEC 60092-504) certified

### UR.41.I



Power supply 10-28Vdc. Sensitive elements:

- Catalytic (S and P), Infrared (I) or Semiconductor (T) for flammable gases,
- Electrochemical cell (S or P), Infrared (I) or Semiconductor (T) for toxic and refrigerant gases.

Up to three intervention thresholds. Automatic counting of the lifetime of the sensors.  
LED on the sensor body to indicate the operating status and display option.

**Use**

UR.41.I detectors are used to detect, by diffusion, the presence of:  
*Methane Gas, LPG, Carbon Monoxide (CO), Petrol Vapours, Acetylene, Hydrogen, Ammonia (LIE and Toxicity), Propane, Octane, Ethyl Alcohol (Ethanol), Oxygen, Carbon Dioxide, Xylene, Acetone, Hexane, Cycle- Hexane, Toluene, Pentane, Butane, Heptane, Ethane, Methanol, Benzene, Ethyl Acetate, Cyanuric Acid, Sulphuric Acid (Hydrogen Sulphate), Hydrochloric Acid, Chlorine, Nitrogen Monoxide, Nitrogen Dioxide, Nitrous Oxide, Ethylene Oxide, Biogas and, more generally, Hydrocarbons, as well as flammable and non-flammable Refrigerants, in not classified areas in industrial environments, thermal power stations or similar places.*

The UR.41.I detectors are designed for local BUS operation for interfacing with Sensigas® UCE40MPA, Central Unit that, together with the MDD40 Display Module, perform monitoring tasks of the Gas Detection System.  
The activation of the gas alarms takes place through the MAR40 Relay Modules.

**Operation**

In case of a gas leak the sensor compares the measured concentration value with the intervention thresholds set by activating the associated relays. The eventual alarm information is transmitted to the Central Unit and Remote Relay and Display Modules according to the foreseen associations.

**Ordering** Simply indicate product code: please, refer to “available models”.

Available models:

**Code:** \* UR xx yy z I \*\*

- I = IP65 Protection Degree
- Sensing Element type:  
S = Standard; P = Professional; I = Infrared; T = Standard with Threshold operation.
- “21” for Stand Alone detectors with 4...20 mA output  
“41” for Bus Based System EW40
- G = Methane; P = LPG; O = Carbon Monoxide; B = Gasoline Vapours; L = Acetylene;  
I = Hydrogen; M = Ammonia (LIE); C = Propane; T = Octane; E = Ethyl Alcohol;  
S = Oxygen; D = Carbon Dioxide; X = Xylene; A = Acetone; H = Hexane;  
Q = Cycle-Hexane; T = Toluene; N = Pentane; U = Butane; F = Heptane; K = Ethane;  
J = Ammonia (Toxicity); V = Methanol; Z = Benzene; Y = Ethyl Acetate;  
W = Hydrocyanic Acid; HS = Sulphuric Acid; HC = Hydrochloric Acid; CL = Chlorine;  
N1 = Nitrogen Monoxide; N2 = Nitrogen Dioxide; N3 = Nitrous Oxide,  
EO = Ethylene Oxide; GD = Biogas; HY = Hydrocarbons; R = Refrigerants.

\* Prefix to the name of the Detector: DR = Display with Relays; DN = Display without Relays;  
\*\* Suffix to the name of the Detector: EXR = Extended temperature range -40... + 70°C.

## Technical Characteristics

Note (1): Detectors using Catalytic Sensing Elements are sensitive to all Flammable Gases, with different sensitivities and responses related to Methane (see Tables contained in the Display Board and Service Terminal Manuals), through which these relative answers can be inserted in the Detector.

Note (2): When detector detects a very high gradient of increasing concentration, and the full-scale value of 20% is exceeded, power is removed from the sensing element and the out-of-range (fault condition for overrange) is declared respectively with:

- 4÷20mA output set at 22mA;
- the output of the fault relay activated (relay energized or not depending on the selection made);
- the status LED visible from outside fixed on with an OFF flash of 0,5s every 5s;
- the display (if present) explicitly declares the need for a recalibration.



After such a condition occurs:

- make sure the area is free of explosive mixtures;
- power off and re-power the detector to allow the sensing element to be powered and wait at least an hour to allow thermal stabilization.

Only entering the calibration procedure can bring the detector out of this state.

As with all other operational contexts:

- if the recalibration procedure is successful, it can bring the detector into normal operating status;
- if the recalibration procedure is not successful the detector is definitively declared faulty.

Sensor type	Catalytic, Infrared, or Semiconductor	Electrochemical Cell or Semiconductor
Detectable Gas (see available models)	Explosive Gases (1)	Toxic Gases (e.g.: CO)
Power Supply	10÷28Vdc	10÷28Vdc
Maximum Power Consumption (@ 28Vdc)	1,7W	0,5W
Measuring range	0÷100% LEL (2)	0÷500 ppm
Precision (Catalytic, E.C., NDIR)	± 5% of Full Scale,	± 10% readout
Precision (Semiconductor)	± 10% of Full Scale	(on calibration point)
Repeatability	± 5% of Full Scale,	± 10% readout
Measurement Resolution (Sensitivity)	1% LEL	5 ppm
Microprocessor Resolution	4096 points (12 bit A/D Converter)	
Digital Filter system	Kalman Filter and zero drift compensation	
Watch dog	External, acting on the whole Safety Chain	
Warm-up Time	< 2 minutes after every power on	
Stabilization Time	2 hours from first power on	
Response Time (Max)	< 20s (T50), < 60s (T90)	
Average Sensor Life (in Air)	255 weeks	255 weeks
Settable threshold limit values, default settings:		
(Editable from UCE40MPA or Service Terminal or Display Card)	Pre-alarm:	10% LEL
	1 <sup>st</sup> threshold alarm:	20% LEL
	2 <sup>nd</sup> threshold alarm:	40% LEL
Operation and storage conditions:		
Environment Temperature (°C)		
- Operating	-20 ÷ 50 or -40 ÷ 70 (Extended Range)	
- Storage	-20 ÷ 70	
Relative Umidity (%UR) without condens.		
- Operating	15 ÷ 90	
- Storage	45 ÷ 75	
Operating Pressure (KPa)	80 ÷ 120	
Air Speed (m/s)	≤ 6	
Optical Signalling	Red LED visible on the sensor body	
Dimensions and Weight	See dedicated paragraph	
	 0474 / xxxx (manufacturing year)	CERTIFICATE n. MED327120CS
MED Directive / Standards	MED 2014/90/EU / IEC 60092-504	
EMC Directives / Standards	EMC 2014/30/EU / EN50270 / EN 61326-1	
LVD Directives / Standards	Not applicable	
<u>Product Standard</u>	EN60079-29-1	

### Options, Accessories and Spare Parts:

#### Display Options

Display Board without **DN-** Relay (Detector Name)

Display Board with Relay **DR-** (Detector Name)

Display Board are in fact the Operator Interface on board the Detector for control, monitoring, calibration and calibration operations. They manage:

- N. 4 Sensors for Magnetic Actuator used to give the operator commands;
- N. 4 SPDT Relay (only for DR- Board).

each Relay is associated with a Led for local Alarm or Sensor Fault signaling the state of the LEDs is directly associated to the status of the relative Relay: Relay X "On" => Led X "On"  
N. 6 Heating resistors for Extended Range Detectors (**EXR** suffix)

#### TUL40.. Test Kit

The kit consists of at least one cylinder of calibrated gas, the dispensing valve, a precision flow meter and the flow chamber to put the detector under flow.

Kit components can be sold separately.

#### TUS40..Service Terminal Kit

Terminal necessary for the calibration of detectors not equipped with Display Board.

#### NRXX-Y-ZZZ replacement sensor body

Sensor body complete with relative signal conditioning board.

## Sensor Lifetime

Sensor average lifetime (see technical characteristics) is referred to a typical usage in a pollution-free environment. Presence of a high concentration of pollutants can shorten the lifetime of the sensing element.

*The Catalytic Sensor only works in the presence of Oxygen. Do not use pure gas or the lighter directly on the Sensor which could be irreparably damaged.*

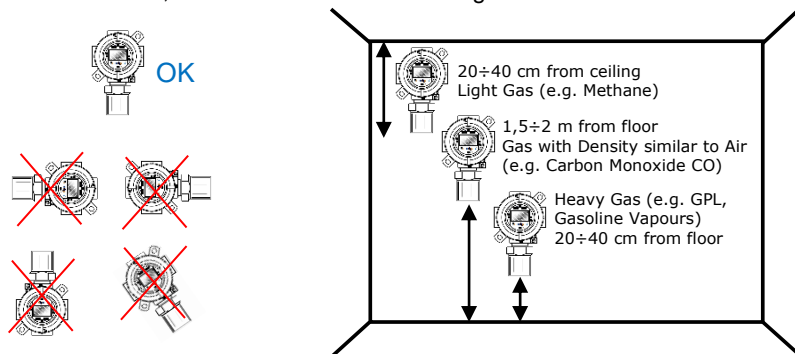
**CAUTION:** consider that in particularly polluted environments or with vapours of flammable substances (in particular solvents), the useful life of the sensor can be considerably reduced. Some Substances cause a permanent reduction in sensitivity, preventing the Sensor from coming into contact with Silicone Vapours (present in Paints and Sealants), Lead Tetraethyl or Esters Phosphates. Other substances cause a temporary loss of Sensitivity, these "Inhibitors" are Halogens, Hydrogen Sulfate, Chlorine, Chlorinated Hydrocarbons. In the latter case, after a short time in Clean Air, the Sensor resumes its normal operation.

Once the detection system starts up, it has to be supplied with energy during all the lifetime of its sensors.

Seasonal use is not recommended.

## Mechanical Installation

For Sensors installation, follow the rules as in the diagram:



The positioning of the sensors must take into account not only the aforementioned general rules, but also the following installation rules; in particular the sensors must be installed:

- Near possible gas leak points;
- At least 1.5m from heat sources and ventilation openings;
- Never in poorly ventilated areas where gas pockets may occur and, more generally, away from obstacles to the natural movement of the gas;
- Far from appliances that throughout their normal working can have functional gas leakage (unless this is the purpose of the detection);
- In environments where atmospheric conditions are not included in the technical characteristics.
- The assembly and disassembly of the sensors must be carried out when the appliance is not live.

The number of sensors to be installed in an environment is proportional to its surface, its height and conformation, as well as the relative density of the gas.

The installation must also take into account:

- The geometry of the structures (beams, false ceilings, wells, etc.)
- Mechanical and liquid protection
- Poisoning protection
- Accessibility for appliance maintenance.

The installation of the detectors must take place as late as possible to avoid damage, but in time to adequately protect the environment for which they are intended.

## Environmental compatibility and disposal



This product has been designed and constructed using materials and processes that take into account the environmental issue. Refer to the following notes for disposal of the product at the end of its working life, or when it is replaced:

- for disposal purposes, this product is classified as an electric and electronic device: do not dispose of it with normal household waste, in particular as regards the printed circuit
- comply with all local laws in force
- as far as possible reuse basic materials to keep environmental impact to a minimum
- use local depots and waste recycling companies, or contact the supplier or manufacturer to return used products or to ask for information on environmental compatibility and waste disposal
- the product packaging can be reused. Keep it for future use or to return the product to the supplier.

## Electrical Installation and Configuration

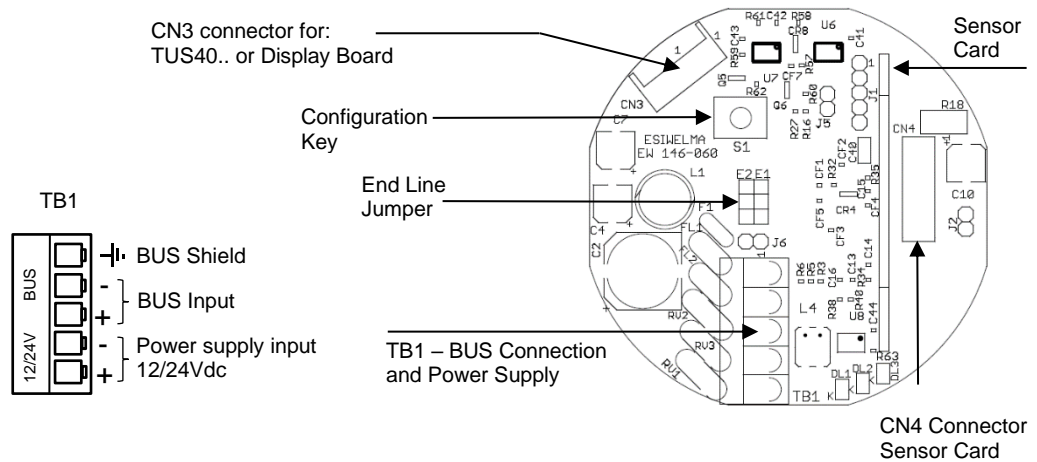
**CAUTION:** Make the area safe and ensure that the device power supply is off before cabling and configuration operations.

Install the sensor in compliance with local Standards.

To enter cables, uses the 1" NPT cable gland provided for the housing.

Ground the sensor using the internal grounding system.

Refer to the Control Unit manual for all cabling information (cable type and specifications, bus topology, length of connections etc.) and configuration.



## Checklist after mechanical and electrical installation

Before using the sensor, it must be recognised by the Control Unit through an assignment operation (refer to the manual of the aforesaid Control Unit for correct execution).

Sensors are factory calibrated so they normally do not require any other calibration once installed. Still, after installation, an operational check of the sensors is recommended.

## Troubleshooting

For troubleshooting, having only one LED identifying the functional states described in the table opposite, in the event of a fault or malfunctions, in addition to the usual checks on correct power supply and wiring, it is necessary to use the TUS40 service terminal .. (or use the Display Board, if present) and refer to the relevant product documentation. See also Notes 1 and 2 in the technical specifications for the OVER-RANGE FAILURE

The status led has the following meaning:

Sensor Status	LED Status on Sensor Body
PREHEATING	Flashing with 2 Hz Frequency
WORKING	1 pulse "ON" every about 10s
PRE-ALARM	2 pulse "ON" every about 5s
1 <sup>st</sup> THRESHOLD ALARM	3 pulse "ON" every about 5s
2 <sup>nd</sup> THRESHOLD ALARM	4 pulse "ON" every about 5s
FAILED SENSOR	Steady ON
OVER-RANGE FAILURE	Steady ON, 1 pulse "OFF" every about 5s

## Periodic Maintenance

Every three to six months a functional check of the sensors should be provided:

- in free air, the measurement value shown on the Control Unit is lower than 1...2% of the LEL for explosive gases or at 10 ppm e.g. for CO;
- after applying appropriate gas mixture via the **TUL40..** test kit, the measurement value shown on the Control Unit is between 45% and 55% of Methane LEL for explosive gases or between 450 and 550 ppm for CO and the status LED is according to the above table.

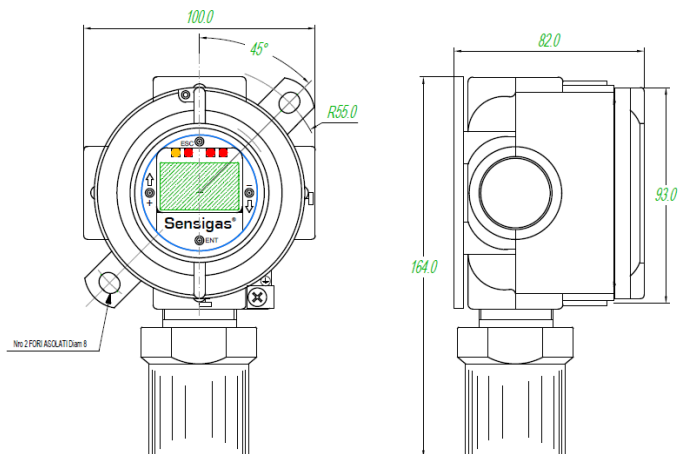
Any functional anomalies found during the periodic checks of the sensors can be identified and corrected with the **TUS40..** service terminal or with the display card, if present; in the absence of these devices, send the detector to your Supplier / Installer, who will send it to EsiWelma.

## Dimensions and Weight

Dimensions (HxWxD):

164x100x82mm

Weight: 0,8Kg



Due to our policy of continuous product improvement, specifications are subject to change without notice.