UR20S Series

Gas detectors

Technical Data Sheet

WATTS®

Description

UR20S Series gas detectors are used for detecting inflammable or toxic gases in classified areas in industrial environments and boiler rooms. All models can be used with **CIVIC1 Series** control units (one sensor) and **CIVIC4 Series** control units (up to 4 sensors) or with other control units set up to receive a 4-20 mA signal (generally combined fire/intrusion detection systems).

UR20S

Gas detector in metal housing (Group II protection mode, category 3G, Ex nA IIC T6) with operating status indicator light, for indicating gas alarms by means of a 4-20 mA analogue output or a trip threshold (pre-alarm, level 1 and 2 alarm, fault) that can be freely set with DIP switches. Power supply: 11-28 VDC. Signal output: 4-20 mA. An explosion-proof version is available to order, marked with the ATEX hexagon symbol and designation II 2G, Ex d IIC T6.
Compliant with Directives EMC 2014/30/EU and ATEX 2014/34/EU.
CE ⟨Ex⟩ II 3G, Ex nA IIC T6.

Type	Part No.	DN	Protection	Weight (Kg)
UR20S	0940571	NATURAL GAS	IP55	0.65
UR20S	0940572	LPG	IP55	0.65
UR20S	0940573	CO	IP55	0.65

Technical features	Natural gas and LPG	Carbon monoxide
Sensor type	Standard catalytic, pellistor or semiconductor	Electrochemical cell or semiconductor
Power supply	11-28VDC	11-28VDC
Maximum power consumption	3.2 W	1.5 W
Measuring range	0-100% LEL	0-500 ppm
Precision (excluding semiconductor)	+ 5% of full scale, + 10% of reading	
Precision (semiconductor)	+ 10% full scale (at setpoint)	
Measurement resolution	1% LEL	5 ppm
Microprocessor resolution	1024 pixels (10 bit)	1024 pixels (10 bit)
Safety circuit	Internal watchdog	
Warm-up time	< 2 mins.	< 2 mins.
Stabilisation time	< 2 mins.	< 2 mins.
Maximum response time	< 20s (T50), < 60s (T90)	
Average service life of sensor in air	255 weeks	255 weeks
4-20 mA output signal:		
Proportional output signal	4mA = 0% LEL	4mA = 0 ppm
(default)	20mA = 100% LEL	20mA = 500 ppm
Threshold-based output signal	0mA = no alarm	0mA = no alarm
(applications with 1 or 2 thresholds)	10mA = 1st threshold = 20% LEL	10mA = 1st threshold = 100 ppm
	20mA = 2nd threshold = 40% LEL	20mA = 2nd threshold = 200 ppm
4-20mA output reference selection	jumpers with ref. to power supply negative or positive	
Fault sensor	22 mA	22 mA
4-20mA output load resistor	< 200Ω at 12VDC power supply	< 200Ω at 12VDC power supply
	200Ω-700Ω at 24VDC power supply	200Ω-700Ω at 24VDC power supply
Ambient temperature (°C):		
Operation	-20÷50°C	-20÷50°C
Storage	-20÷70°C	-20÷70°C
Ambient relative humidity:		
Operation	15%-90% non-condensing	15%-90% non-condensing
Storage	45%-75% non-condensing	45%-75% non-condensing
Operating pressure	80-110 kPa	80-110 kPa
Ambient air speed	< 6 m/s	< 6 m/s

Operation

UR20S Series gas detectors are equipped with an internal sensor that is sensitive to the different gases to be monitored. After a warm-up and stabilisation period, in which the sensing element comes up to optimum operating temperature, the gas detectors continuously measure the concentration of gas (CH_4, LPG, CO depending on model) and generate a proportional or threshold-based output signal.
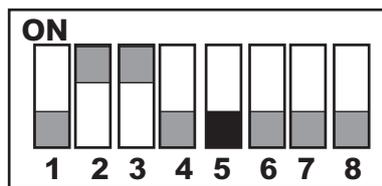
Proportional output signal: the electrical output signal is proportional to the gas concentration, expressed as a percentage of LEL (Lower Explosion Limit) for flammable gases, and in parts per million for toxic gases.

Threshold-based output signal: when the concentration of gas in the room reaches certain threshold values, the detector generates electrical output signals. The gas concentration thresholds are expressed as a percentage of LEL (Lower Explosion Limit) for flammable gases, and in parts per million for toxic gases.

The signal generated must then be managed by the CIVIC Series (or similar compatible) gas detector control units, which indicate the alarm state by means of a visual or audible alarm.

Installation

The **UR20S Series** gas detector consists of an electronic board, which processes the signal from the sensor and generates an output signal to send to the gas detector control units on the basis of the concentrations detected. The board is mounted in a hermetic aluminium housing, which also contains the sensor, fixed at the bottom of it. Change the position of DIP switch 5 to select the detector's operating logic.

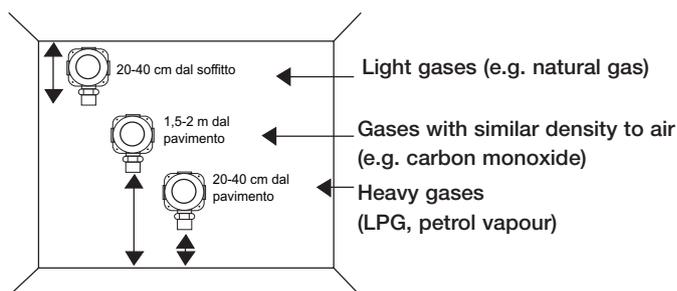

Proportional output signal (default)
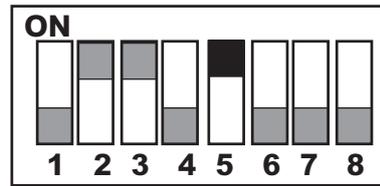
Threshold-based output signal
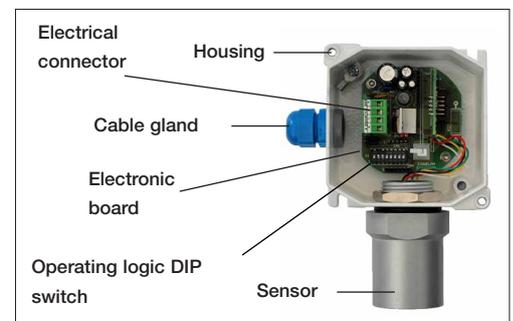
When installing the gas detector, adhere to the following rules:
- fit approximately 20/40cm from the floor for gases heavier than air (LPG);
- fit approximately 20/40cm from the ceiling for gases lighter than air (natural gas);
- fit approximately 150/200cm from the floor for gases with similar density to air (CO). Since CO is a toxic gas, the gas detector must always be fitted at the breathing height of the room's occupants.

20-40 cm dal soffitto — Light gases (e.g. natural gas)

1,5-2 m dal pavimento — Gases with similar density to air (e.g. carbon monoxide)

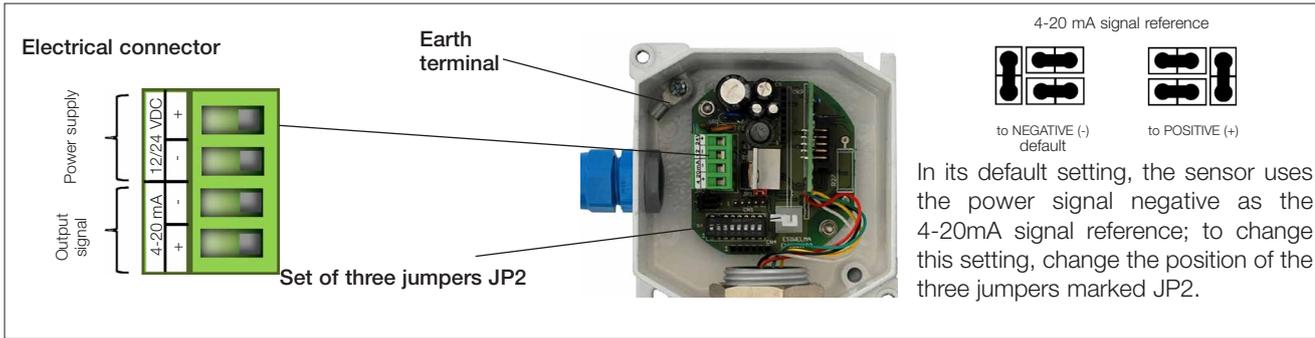20-40 cm dal pavimento — Heavy gases (LPG, petrol vapour)

In addition to general considerations, also take account of the following when selecting the installation position of the gas detector: proximity of possible gas escape points; distance of at least 1.5 m from heat sources and ventilation apertures; never fit in poorly ventilated areas where gas pockets may occur; keep away from objects that might obstruct the natural movement of the gas; do not fit in the immediate vicinity of machines that routinely emit gas in the course of operation; the installation environment must have a temperature of between -20°C and 50°C and relative humidity of less than 90% non-condensing. The device must be powered off before fitting or removal. The number of gas detectors to install in an environment is proportional to its height and surface area.

Electrical connections

The sensor must be installed in accordance with EN 60079-14. Use cables with the following minimum sections in relation to their length:

| Cable length	Minimum section of cable
< 100 m	0.75 mm²
< 200 m	1 mm²
< 500 m	1.5 mm²

In environments exposed to electromagnetic interference, use shielded cable. The sensor must be earthed using the system provided.

Electrical connector

Power supply

12/24 VDC
+
−

Output signal

4-20 mA
−
+

Earth terminal

Set of three jumpers JP2

4-20 mA signal reference

to NEGATIVE (-) default   to POSITIVE (+)

In its default setting, the sensor uses the power signal negative as the 4-20mA signal reference; to change this setting, change the position of the three jumpers marked JP2.

Post-installation checks

UR20S Series gas detectors are factory-set. No on-site setting is required. After installation, run the following functional test: power up the detector; wait for at least 2 minutes for the sensing element to warm up; check correct operation of the sensor using a mixture with a concentration of 50% of the LEL of the gas to be detected (CH_4 and LPG), or of 500 ppm for CO; check the operation of the sensor status LED; check that the output signal is as follows:

Proportional output signal: 10.5-13.5 mA
Threshold-based output: 18.5-21 mA
CO detector: 18.5-21 mA

LED
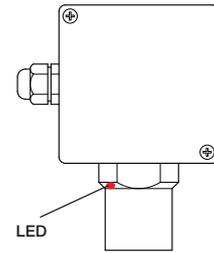
Posizione LED di stato sensore

UR20S gas detector status	LED status
Warm-up	2 flashes/sec.
Fully operational	1 flash every 10 sec.
Pre-alarm	2 flashes every 5 sec.
1st threshold alarm	3 flashes every 5 sec.
2nd threshold alarm	4 flashes every 5 sec.
Fault	Steadily lit

UR20S Series gas detectors require regular testing as laid down in the installation manual.
Average service life of sensors: 5 years.

Overall dimensions (mm)

UR20S

26 100

100

155

55

60

CH 22

Ø 43
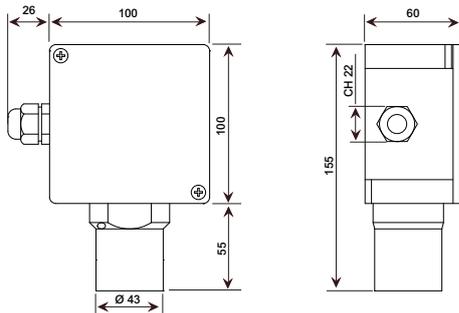
Specification text

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Gas detector sensor **UR20S Series** – WATTS brand – in metal housing (Group II protection mode, category 3G, Ex nA IIC T6) with operating status indicator LED, for indicating gas alarms by means of a 4-20mA analogue output or a trip threshold (pre-alarm, level 1 and 2 alarm, fault) that can be freely set with DIP switches. Available in three versions, for detecting natural gas, LPG and carbon monoxide (CO). Compliant with Directives EMC 2014/30/EU and ATEX 2014/34/EU. II 3G, Ex nA IIC T6.