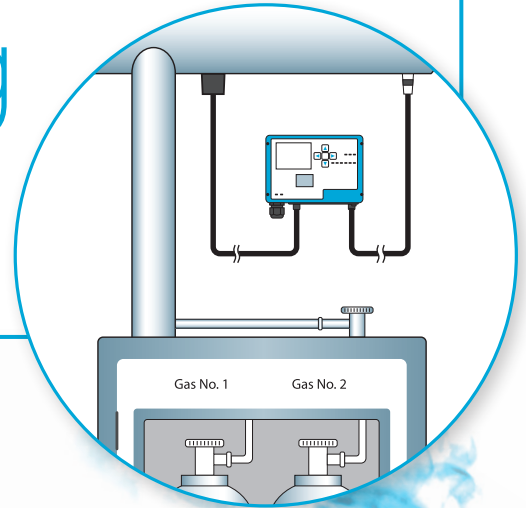




# D-ReX<sup>®</sup> PoS

## Gas detection using extraction mode





# eXtraction Mode Gas Detection at the Point of Sampling (PoS)

Not all gases can be monitored directly at the measuring point. This may be because the maintenance of a remote sensor would be too complicated or because the target gas has to be broken down into detectable components first. This can be done using a pyrolyzer.

In these cases, the D-ReX PoS with its integrated pump is an ideal solution. The point of sampling (PoS) can be up to 30 meters away from the D-ReX. This also applies to the length of the recirculation hose. The optionally available Line Integrity Monitoring (LIM) ensures that no secondary air is drawn on the suction path.

### For specific gases

In combination with the Py-ReX® pyrolyzer, the D-ReX PoS thus also enables monitoring of gases that are either too toxic or chemically inactive to be measured directly. The Py-ReX is simply mounted between the intake hose and the D-ReX and breaks the monitored gas down into non-hazardous, easy-to-detect components.



### USPs:

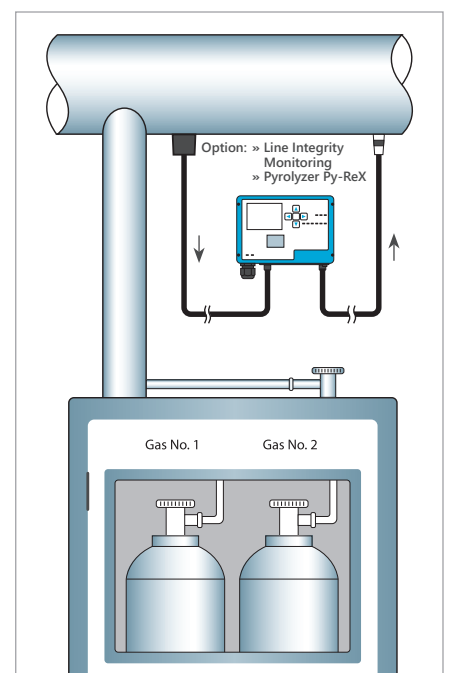
- » Tube length up to 30 m / 100 ft.
- » Easy to replace mechanical component of internal pump
- » Bluetooth®

### Options:

- » 5x internal relays (form C, programmable)
- » 16x external relays (GMA200-RT/D)
- » LonWorks®
- » Line Integrity Monitoring
- » Py-Rex pyrolyzer

### Features:

- » Sensors for more than 30 gases
- » Hot-swappable smart sensor cartridge
- » High-resolution, full-color 2.4" TFT display
- » Plain text information
- » Tool-free maintenance
- » Power-over-Ethernet (PoE) communication
- » Can be addresses via web portal
- » Password-protected menu
- » Interface:
  - Analog: 4–20 mA output
  - Digital: RS-485 (Modbus/RTU)
  - 10/100 Mbit Ethernet (Modbus/TCP)
- » Bright status and alarm LEDs
- » Data logger to review sensor and alarm history
- » CE marked and UL certified



### Easy to use and maintain

The D-ReX is a very user-friendly, easy-to-maintain gas detector.

### High-resolution, full-color display

The 2.4", 320 x 240 pixel full-color TFT display sets new standards for gas detectors. It provides clear and precise information about the current measured values, the short-term and long-term exposure, as well as any malfunctions that may have occurred. Information can be displayed in a variety of languages and scripts, including English, German and Simplified Chinese.

### Clear Information

No longer will you have to decipher cryptic error codes – information on any issue is instead displayed in plain text. Status LEDs provide an additional instant overview of vital components of the system.

### Intuitive device management

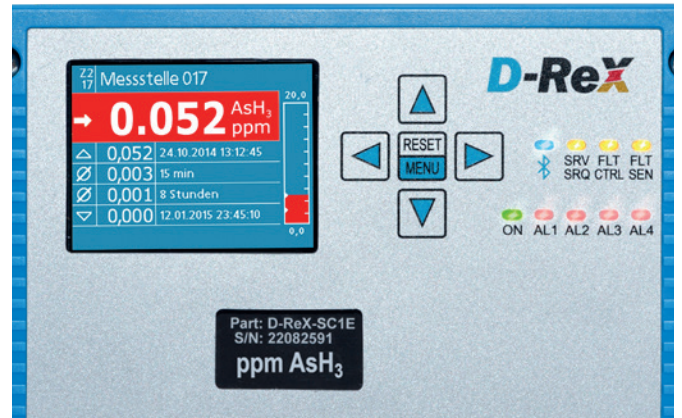
Settings on the D-ReX can easily be managed using the configuration program or the GfG app (Android). They can be connected to the device either via RJ45 an interface or Bluetooth. This will give you access to all settings and configuration options. After entering the password, changes can also be made using the control keys in the D-ReX's service menu.

### Advanced connectivity

The D-ReX comes with a wide variety of communication interfaces: Choose between analog, industry standard 4-20 mA, digital RS-485 interface (Modbus/RTU), Ethernet (Modbus/TCP) and LonWorks (optional) for signal transmission. The Bluetooth option enables wireless connectivity. In addition to the five internal, programmable changeover contact relays (optional), 16 additional relays can be addressed by connecting the D-ReX to a GMA200-RT/D relay module.

### Periodic sensor self-tests

The plug-and-play smart sensor cartridges are pre-configured and pre-calibrated for easy installation or replacement. Automatic sensor self-tests increase safety while reducing maintenance costs even further.



User interface with display, control keys and status LEDs

### The new Standard for Versatility: D-ReX

All the advantages mentioned perfectly qualify the D-ReX for numerous applications in virtually all industries. Some of its unique features make it particularly suitable for use in the semiconductor industry, photovoltaic industry and industrial manufacturing as well as in laboratories. If you are looking for the gas detector that best suits your needs, the D-ReX will be your first choice for many applications.

### Possible areas of application:

- » Distribution boxes
- » Process tools
- » Vacuum pumps
- » Scrubbers
- » Gas cabinets
- » Ambient breathing zones
- » Storage areas
- » Cleanroom environments
- » Sub fab systems
- and many more.





# Versatility means having options

No two facilities are the same and even within a facility, the requirements for a gas detector can vary from department to department or from one gas being monitored to another. It is therefore an immense help to have a gas detector that can be configured and adapted accordingly.



### LonWorks®

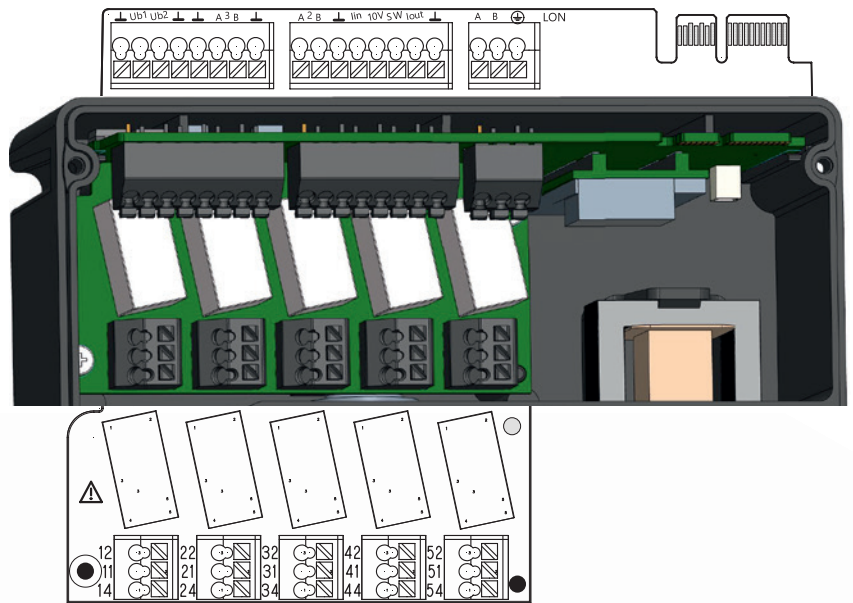
LonWorks is an open and interoperable system for building automation and is characterized by its flexible topology and cross trade functions.

If your previous gas detection system was integrated into your infrastructure via LonWorks or you want your new system to be integrated using the LonTalk® protocol, the D-ReX can be incorporated seamlessly, as all D-ReX versions are available with an optional LonWorks module. Keep the advantages of LonWorks, while benefitting from a state-of-the-art gas detection solution at the same time.

### Internal Relays

Depending on the application, it may be beneficial for the gas detector to have its own relays. All versions of the D-ReX are optionally available with 5 internal, freely programmable form C relays. The terminal allocation can be seen here:

Alternatively, you can also connect an external GMA200-RT/D relay module to add a further 16 relays to the D-ReX.



### D-ReX versions and options

D-ReX Version	Internal Sensor (Diffusion)	External Sensor (Diffusion)	Pump module (eXtraction Module)	Py-ReX	Internal Relays	LonWorks
Point of Use (PoU)	✓				5 (option)	(option)
Point of Installation (PoI)		✓			5 (option)	(option)
Point of Sampling (PoS)	✓		✓	✓*	5 (option)	(option)

\* Required for certain gases

# Py-ReX<sup>®</sup> For dissolving electrochemically inactive gases

In combination with a D-ReX<sup>®</sup> PoS, the Py-ReX enables the detection of electrochemically inactive gases, such as fluorides commonly used in the semiconductor industry.

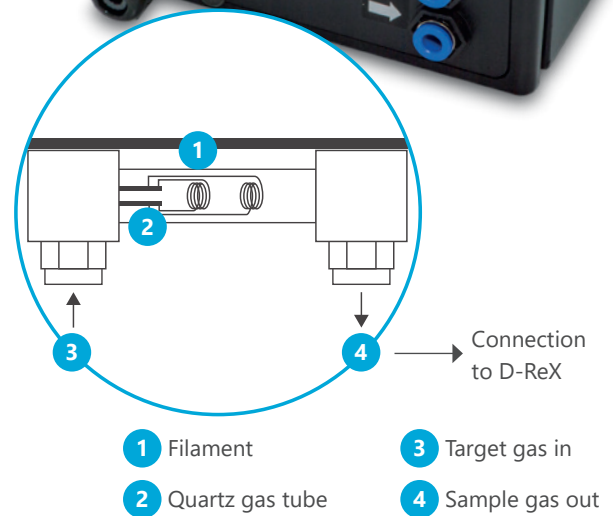
## How does pyrolysis work?

Pyrolyzers, sometimes also called decomposers, are used in many analytical instruments. In each case, the goal is to convert the original gas (target gas) into another gas (sample gas) that is easier to detect.

The Py-ReX is a filament pyrolyzer. It contains a filament in a quartz glass tube, which is heated to a certain temperature depending on the gas you need to detect. On contact with the filament, the target gas decomposes into the sample gas and possibly other components. The sample gas is then measured by an electrochemical smart sensor. The original concentration of the target gas can then be calculated from the concentration of the sample gas.

## For which gases do you need a pyrolyzer?

Most of the inert gases used in the semiconductor industry and in industrial processes are fluorine-based. However, there are also inert, fluorine-free gases, such as 1,2-dichloroethene, that need to be monitored.



- 1 Filament
- 2 Quartz gas tube
- 3 Target gas in
- 4 Sample gas out

## List of Detectable Gases using an EC Sensor

Formula Gas	Nominal Range	Formula Gas	Nominal Range
AsH <sub>3</sub> Arsine	0-1 ppm	N <sub>2</sub> H <sub>4</sub> Hydrazine	0-1 ppm
AsH <sub>3</sub> Arsine / no H <sub>2</sub> (no cross-sensitivity to H <sub>2</sub> )	0-1 ppm	NH <sub>3</sub> Ammonia	0-100 ppm
B <sub>2</sub> H <sub>6</sub> Diborane	0-1 ppm	NH <sub>3</sub> Ammonia	0-1000 ppm
Br <sub>2</sub> Bromine	0-5 ppm	NH <sub>3</sub> Ammonia	0-5000 ppm
Cl <sub>2</sub> Chlorine	0-10 ppm	NO Nitrogen monoxide	0-100 ppm
ClF <sub>3</sub> Chlorine trifluoride	0-1 ppm	NO <sub>2</sub> Nitrogen dioxide	0-30 ppm
ClO <sub>2</sub> Chlorine dioxide	0-2 ppm	O <sub>2</sub> Oxygen (5-year sensor, lead-free)	0-25 Vol.-%
CO Carbon monoxide	0-500 ppm	O <sub>3</sub> Ozone	0-5 ppm
COCl <sub>2</sub> Phosgene	0-2 ppm	PH <sub>3</sub> Phosphine	0-1 ppm
DCS Dichlorosilane	0-30 ppm	SiH <sub>4</sub> Silane	0-50 ppm
ETO Ethylene oxide	0-20 ppm	SO <sub>2</sub> Sulfur dioxide	0-10 ppm
F <sub>2</sub> Fluorine	0-5 ppm	TEOS Tetraethyl orthosilicate	0-100 ppm
GeH <sub>4</sub> Germanium hydrogen	0-5 ppm	TMB Trimethyl borate	0-500 ppm
H <sub>2</sub> Hydrogen	0-2000 ppm		
H <sub>2</sub> Hydrogen	0-1 Vol.-%		
H <sub>2</sub> Hydrogen	0-4 Vol.-%		
H <sub>2</sub> S Hydrogen sulfide	0-100 ppm		
H <sub>2</sub> SE Hydrogen selenide	0-5 ppm		
HBr Hydrogen bromide	0-30 ppm		
HCl Hydrogen chloride	0-30 ppm		
HCN Hydrogen cyanide	0-30 ppm		
HF Hydrogen fluoride	0-10 ppm		
HMDS Hexamethyl disilazane	0-0.5 Vol.-%		

## List of detectable gases which require a pyrolyzer

Formula Gas	Nominal Range
C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> Trans-1,2 dichloroethylene (DCE)	tbd
C <sub>4</sub> F <sub>6</sub> Hexafluorobutadiene	tbd
C <sub>5</sub> F <sub>8</sub> Octafluorocyclopenten	tbd
CH <sub>3</sub> F Methyl fluoride	tbd
NF <sub>3</sub> Nitrogen trifluoride	0-50 ppm
SF <sub>6</sub> Sulfur hexafluoride	tbd

## List of Detectable Gases using an IR Sensor

Formula Gas	Nominal Range
C <sub>3</sub> H <sub>8</sub> Propane	0-2 Vol.-%
CH <sub>4</sub> Methane	0-5 Vol.-%
CO <sub>2</sub> Carbon dioxide	0-5 Vol.-%
CO <sub>2</sub> Carbon dioxide	0-1 Vol.-%
N <sub>2</sub> O Nitrous oxide	0-1000 ppm
N <sub>2</sub> O Nitrous oxide	0-1 Vol.-%

## List of Detectable Gases using a CC Sensor

Formula Gas	Nominal Range
C <sub>2</sub> H <sub>2</sub> Acetylene	0-100 % UEG
C <sub>2</sub> H <sub>4</sub> Ethylene	0-100 % UEG
C <sub>2</sub> H <sub>6</sub> Ethane	0-100 % UEG
C <sub>3</sub> H <sub>8</sub> Propane	0-100 % UEG
C <sub>4</sub> H <sub>10</sub> Butane	0-100 % UEG
C <sub>5</sub> H <sub>12</sub> Pentane	0-100 % UEG
C <sub>6</sub> H <sub>14</sub> Hexane	0-100 % UEG
CH <sub>4</sub> Methane	0-100 % UEG
H <sub>2</sub> Hydrogen	0-100 % UEG

# Technical Specification: D-ReX (PoS)

<b>Gases:</b>	See gas list
<b>Detection Principle:</b>	Sensor dependent; Available options: EC = electrochemical CC = catalytic combustion IR = infrared
<b>Sampling Method:</b>	Extraction with pump
<b>Display and Interface:</b>	Display: 2.4" full color TFT (320 x 240 pixels) Interface: 5 push buttons
<b>Selectable languages:</b>	German, English (more languages coming soon)
<b>Communication:</b>	» Analog: 4–20 mA output » Digital: RS-485 (Modbus/RTU) » 10/100 Mbit Ethernet (Modbus/TCP) » Bluetooth » Interface for Py-ReX » LonWorks (option)  Relays: 5x internal (programmable) form C relays (option) Max. 2 A / 30 V DC Min. 10 mA / 5 V can optionally be upgraded with an external relay module with up to 16 relays each
<b>Response Time:</b>	Varies by sensor (see sensor data sheet)
<b>Expected Average Life of the Sensor:</b>	Varies by sensor (see sensor data sheet)
<b>Operating Temperature:</b>	-10 to +40 °C 14 to 104 °F
<b>Operating Humidity:</b>	5 to 90 % RH
<b>Operating Pressure:</b>	70 to 130 kPa
<b>Power Supply:</b>	12 to 30 V DC SELV/PELV PoE = 48 V DC
<b>Housing:</b>	Plastic
<b>Protection Class:</b>	Base unit IP30 (optionally IP64) Sensor cartridge IP64
<b>Mounting:</b>	(DIN) rail IEC/EN
<b>Weight:</b>	650 g up to 850 g
<b>Dimensions:</b>	145 x 105 x 78 mm (W x H x D)
<b>Labelling:</b>	CE and UL certification

Headquarters

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