smart GasDetection Technologies GfG

D-ReX® PoS
Gas detection using extraction mode

Gas No. 1   Gas No. 2

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D-ReX

MC1: 2.0.0
MC2: 2.0.0
MC3: 2.0.0
HTML 2.0.0

21010601

RESET
MENU

SRV FLT FLT
SRQ CTRL SEN

ON AL1 AL2 AL3 AL4

Part: D-ReX-SC1E
S/N: 22082590

ppm AsH$_3$

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LAN LAN
10/100 ACT

MADE IN GERMANY

GfGsafety.com

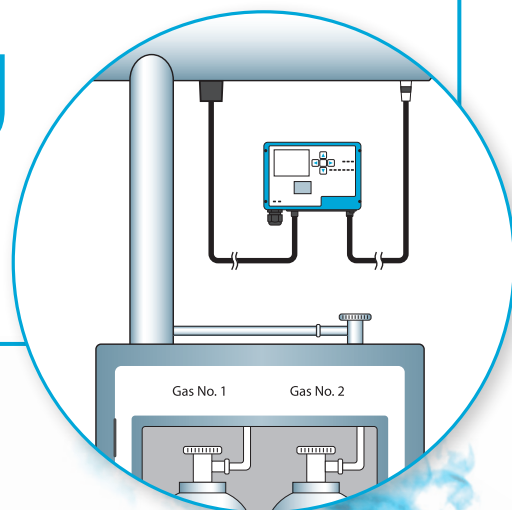# D-ReX PoS

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

Option: » Line Integrity
           Monitoring
        » Pyrolyzer Py-ReX

Gas No. 1   Gas No. 2
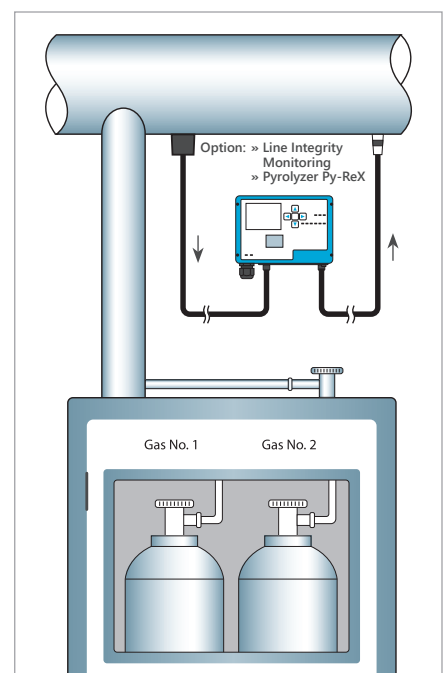
Easy to use and maintain

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.
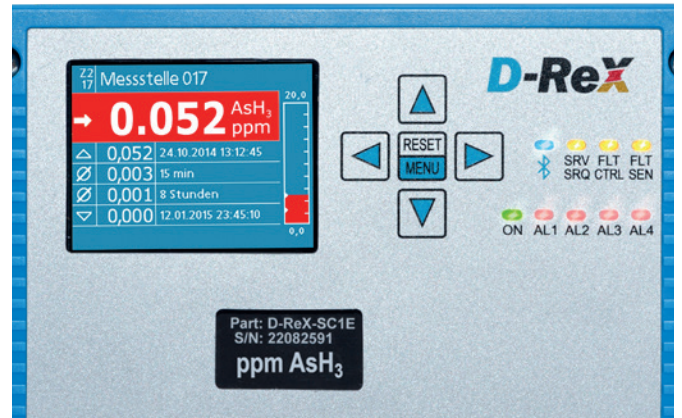
User interface with display, control keys and status LEDs

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.
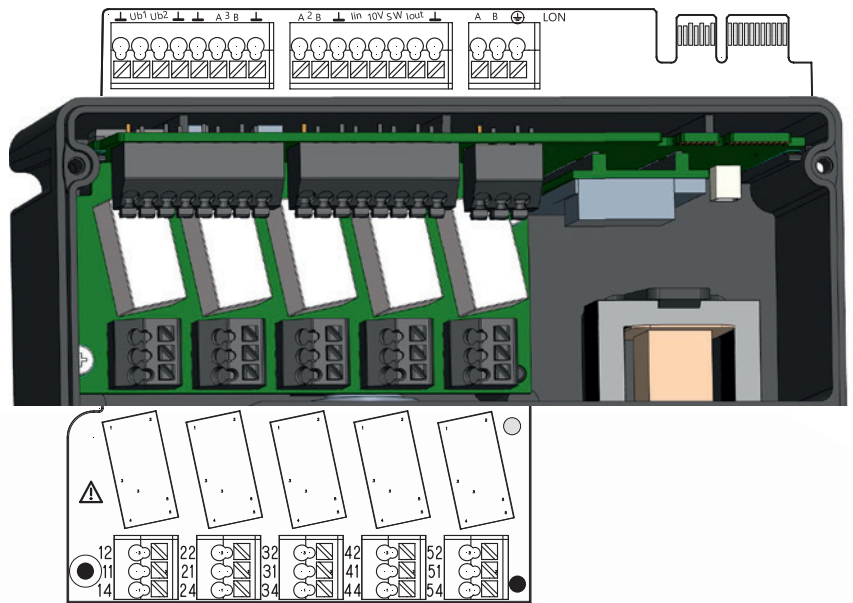
LonWorks®

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® For dissolving electrochemically inactive gases

In combination with a D-ReX® 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.

Connection to D-ReX

| 1 | Filament | 3 | Target gas in |
| 2 | Quartz gas tube | 4 | Sample gas out |
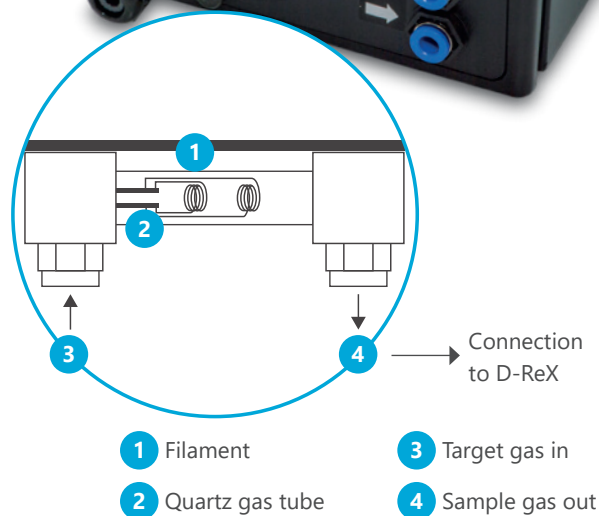
List of Detectable Gases using an EC Sensor

Formula	Gas	Nominal Range
AsH_3	Arsine	0-1 ppm
AsH_3	Arsine / no H_2 (no cross-sensitivity to H2)	0-1 ppm
B_2H_6	Diborane	0-1 ppm
Br_2	Bromine	0-5 ppm
Cl_2	Chlorine	0-10 ppm
ClF_3	Chlorine trifluoride	0-1 ppm
ClO_2	Chlorine dioxide	0-2 ppm
CO	Carbon monoxide	0-500 ppm
$COCl_2$	Phosgene	0-2 ppm
DCS	Dichlorosilane	0-30 ppm
ETO	Ethylene oxide	0-20 ppm
F_2	Fluorine	0-5 ppm
GeH_4	Germanium hydrogen	0-5 ppm
H_2	Hydrogen	0-2000 ppm
H_2	Hydrogen	0-1 Vol.-%
H_2	Hydrogen	0-4 Vol.-%
H_2S	Hydrogen sulfide	0-100 ppm
H_2SE	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.-%

Formula	Gas	Nominal Range
N_2H_4	Hydrazine	0-1 ppm
NH_3	Ammonia	0-100 ppm
NH_3	Ammonia	0-1000 ppm
NH_3	Ammonia	0-5000 ppm
NO	Nitrogen monoxide	0-100 ppm
NO_2	Nitrogen dioxide	0-30 ppm
O_2	Oxygen (5-year sensor, lead-free)	0-25 Vol.-%
O_3	Ozone	0-5 ppm
PH_3	Phosphine	0-1 ppm
SiH_4	Silane	0-50 ppm
SO_2	Sulfur dioxide	0-10 ppm
TEOS	Tetraethyl orthosilicate	0-100 ppm
TMB	Trimethyl borate	0-500 ppm

List of detectable gases which require a pyrolyzer

Formula	Gas	Nominal Range
$C_2H_2Cl_2$	Trans-1,2 dichloroethylene (DCE)	tbd
C_4F_6	Hexafluorobutadiene	tbd
C_5F_8	Octafluorcyclopenten	tbd
CH_3F	Methyl fluoride	tbd
NF_3	Nitrogen trifluoride	0-50 ppm
SF_6	Sulfur hexafluoride	tbd

List of Detectable Gases using an IR Sensor

Formula	Gas	Nominal Range
C_3H_8	Propane	0-2 Vol.-%
CH_4	Methane	0-5 Vol.-%
CO_2	Carbon dioxide	0-5 Vol.-%
CO_2	Carbon dioxide	0-1 Vol.-%
N_2O	Nitrous oxide	0-1000 ppm
N_2O	Nitrous oxide	0-1 Vol.-%

List of Detectable Gases using a CC Sensor

Formula	Gas	Nominal Range
C_2H_2	Acetylene	0-100 % UEG
C_2H_4	Ethylene	0-100 % UEG
C_2H_6	Ethane	0-100 % UEG
C_3H_8	Propane	0-100 % UEG
C_4H_{10}	Butane	0-100 % UEG
C_5H_{12}	Pentane	0-100 % UEG
C_6H_{14}	Hexane	0-100 % UEG
CH_4	Methane	0-100 % UEG
H_2	Hydrogen	0-100 % UEG

Other gases on request.

Gases::	See gas list
Detection Principle:	Sensor dependent; Available options: EC = electrochemical CC = catalytic combustion IR = infrared
Sampling Method:	Extraction with pump
Display and Interface:	Display: 2.4" full color TFT (320 x 240 pixels) Interface: 5 push buttons
Selectable languages:	German, English (more languages coming soon)
Communication:	» 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 optinally be upgraded with an external relaymodule with up to 16 relays each
Response Time:	Varies by sensor (see sensor data sheet)
Expected Average Life of the Sensor:	Varies by sensor (see sensor data sheet)
Operating Temperature:	-10 to +40 °C 14 to 104 °F
Operating Humidity:	5 to 90 % RH
Operating Pressure:	70 to 130 kPa
Power Supply:	12 to 30 V DC SELV/PELV PoE = 48 V DC
Housing:	Plastic
Protection Class:	Base unit IP30 (optionally IP64) Sensor cartridge IP64
Mounting:	(DIN) rail IEC/EN
Weight:	650 g up to 850 g
Dimensions: (W x H x D)	145 x 105 x 78 mm 5.7 x 4.1 x 3.0 in
Labelling:	CE and UL certification

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Technologies