smart **GasDetection** Technologies **GfG**

D-ReX

State-of-the-art monitoring of gases in the semiconductor industry

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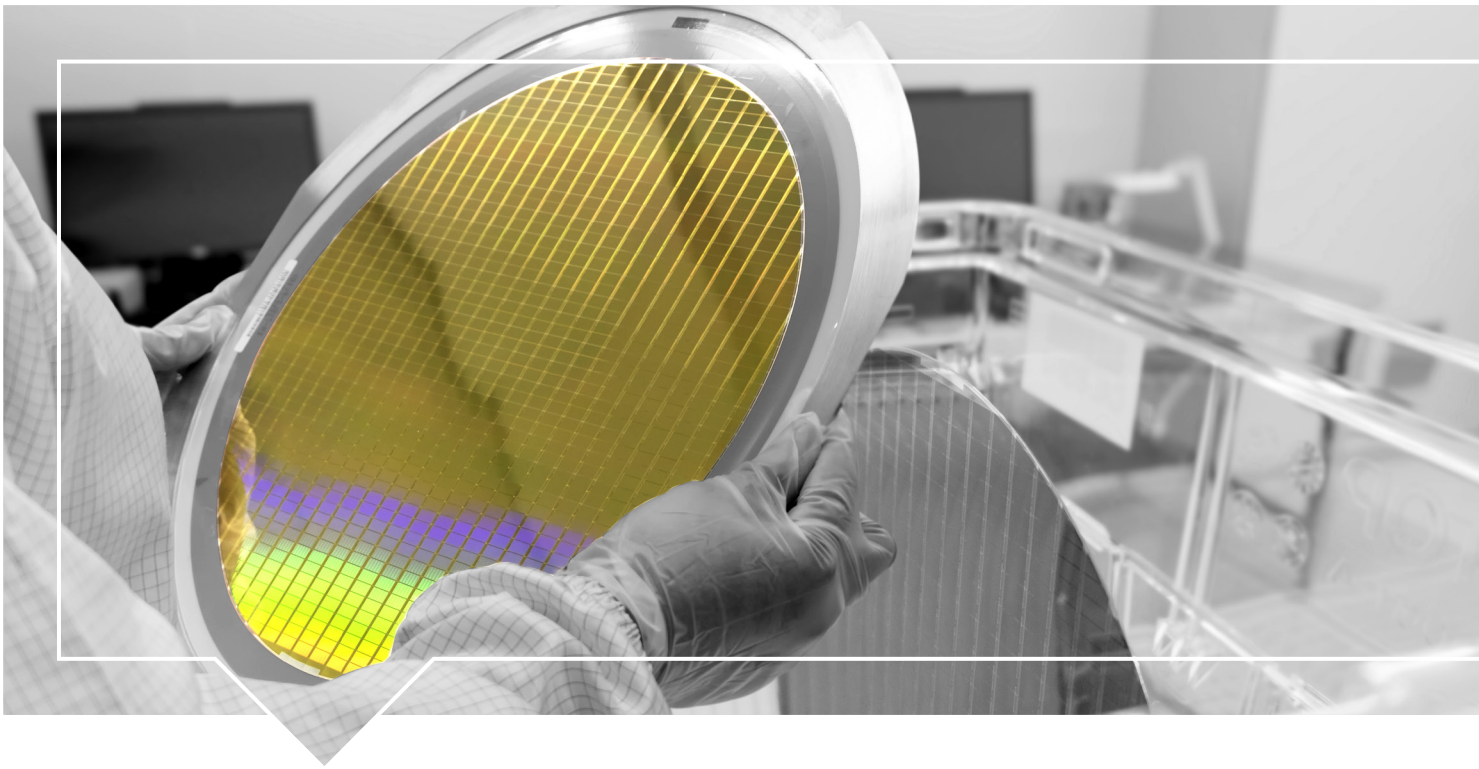
D-ReX Designed for Versatility

Gases are used in many areas of application and process steps of the semiconductor industry. This results in a wide variety of associated requirements for measuring methods, sensors, measuring ranges and communication.

The D-ReX allows you to select the ideal combination of measurement method and sensor for every requirement. Benefit from the DIN-rail mounted gas detector's easy-to-understand user interface, its modern, future-proof technology, and simple and cost-effective maintenance.

Versatility in measurement methods
The D-ReX gas detector series lets you choose between different measuring methods to ensure you are using the ideal solution for every requirement.

» **D-ReX PoU (Point of Use)**
Monitoring of gases at the point of use using the diffusion method.

» **D-ReX PoI (Point of Installation)**
Monitoring of gases by diffusion method using a remote sensor cartridge. Distance between the D-ReX and the cartridge can be up to 30 meters.

» **D-ReX PoS (Point of Sampling)**
Monitoring of gases via extraction using a built-in pump (suction distance up to 30 meters). The sensor is situated within the D-ReX. Furthermore, the D-ReX PoS is the only gas detector in the world that offers optional monitoring of the hose line for leaks. The Line Integrity Monitoring (LIM) technology continuously works to prevent unnoticed absorption of secondary air.

» **D-ReX PoS with pyrolyzer**
The Py-ReX is the matching pyrolyzer for the D-ReX PoS to monitor gases that are either too toxic or chemically inactive to be measured directly. The Py-ReX is simply mounted between the suction hose and the D-ReX and breaks the monitored gas down into harmless, easy-to-detect components.

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

Versatility in gases and measuring ranges

A wide range of durable smart sensors, covering all important gases of the semiconductor industry as well as the relevant measuring ranges, is available for the D-ReX. The following list is merely a selection of these. Please note that a pyrolyzer is needed for the detection of some gases (*).

List of Detectable Gases using an EC Sensor

Formula	Gas	Nominal Range	Formula	Gas	Nominal Range
AsH_3	Arsine	0-1 ppm	N_2H_4	Hydrazine	0-1 ppm
AsH_3	Arsine / no H_2 (no cross-sensitivity to H2)	0-1 ppm	NH_3	Ammonia	0-100 ppm
B_2H_6	Diborane	0-1 ppm	NH_3	Ammonia	0-1000 ppm
Br_2	Bromine	0-5 ppm	NH_3	Ammonia	0-5000 ppm
Cl_2	Chlorine	0-10 ppm	NO	Nitrogen monoxide	0-100 ppm
ClF_3	Chlorine trifluoride	0-1 ppm	NO_2	Nitrogen dioxide	0-30 ppm
ClO_2	Chlorine dioxide	0-2 ppm	O_2	Oxygen (5-year sensor, lead-free)	0-25 Vol.-%
CO	Carbon monoxide	0-500 ppm	O_3	Ozone	0-5 ppm
$COCl_2$	Phosgene	0-2 ppm	PH_3	Phosphine	0-1 ppm
DCS	Dichlorosilane	0-30 ppm	SiH_4	Silane	0-50 ppm
ETO	Ethylene oxide	0-20 ppm	SO_2	Sulfur dioxide	0-10 ppm
F_2	Fluorine	0-5 ppm	TEOS	Tetraethyl orthosilicate	0-100 ppm
GeH_4	Germanium hydrogen	0-5 ppm	TMB	Trimethyl borate	0-500 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.-%			

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

Versatility in communication

A simple, straightforward visual display of readings, alarms and error messages as well as the capability to be easily integrated into alarm and monitoring systems are what make good gas detectors.

The D-ReX offers:

» A high-resolution color display
» Plain text information instead of cryptic codes
» Bluetooth® for easy maintenance and access to all relevant information via app
» Power-over-Ethernet communication (Modbus/TCP)
» LonWorks® (optional)
» RS-485 (Modbus/RTU)
» Analog: 4–20 mA signal
» 5x internal programmable relays (optional)

1 **D-ReX**

2 **Py-ReX**

3 **Ethernet cable with PoE**

4 **IP Code sticker**

5 **Sensor cartridge with detachable pipe flange adapter** (up to 30 meters / 100 feet)

6 **Connector cartridge for remote sensors (M12)**

7 **Sensor cartridge with detachable diffusion mode adapter**

8 **Integrated pump** (up to 30 meters / 100 feet)

9 **Mounting bracket**

10 **Pipe flange saddle**

11 **Lower housing covers**

Gases:	See gas list
Measuring Principle:	Sensor dependent; available options: EC = electrochemical | CC = catalytic combustion | IR = infrared
Sampling Method: PoU PoI PoS	Depending on configuration » Diffusion » Remote sensor » Extraction with pump (if applicable, in combination with Py-ReX)
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 (D-ReX PoS only)
	» 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: **Operating Humidity:** **Operating Pressure:**	-10 to +40 °C 14 to 104 °F 5 to 90 % RH 70 to 130 kPa
Power Supply:	12 to 30 V DC SELV/PELV PoE = 48 V DC
Housing: **Protection Class:**	Plastic PoS-Version: base unit IP30 (optionally IP64) / gas sensor IP64 PoU-Version: base unit IP30 (optionally IP64) / gas sensor IP43 PoI-Version: base unit IP30 (optionally IP64) / gas sensor IP40–IP64, depending on installation situation
Mounting: **Weight:** **Dimensions:** **(W x H x D)**	(DIN) rail IEC/EN 650 g up to 850 g 145 x 105 x 78 mm 5.7 x 4.1 x 3.0 in
Labelling:	CE and UL certification