

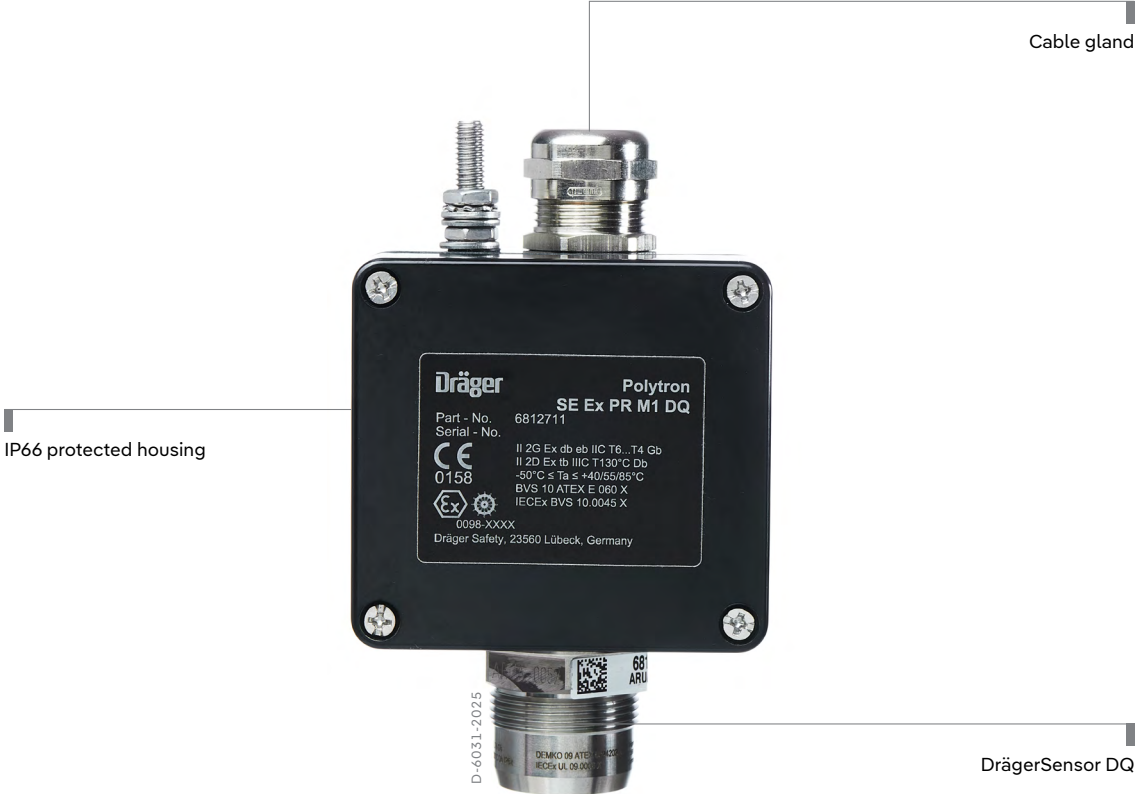


# Dräger Polytron SE Ex Detector for flammable gases and vapours

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The Dräger Polytron SE Ex ... DQ sensing heads are gas detectors for the continuous monitoring of flammable gases and vapours in the ambient air. Measurement is based on the heat of reaction principle where a chemical reaction takes place in a catalytic bead (also known as a pellistor) inside the sensor.

# Dräger Polytron SE Ex



# Benefits

## Heat of reaction principle

By the heat of reaction principle, concentrations of flammable gases can be detected long before they tend to be ignitable, in other words: before they reach the lower explosive limit (LEL). The sensing heads are intended to be used in the harsh industrial environment and connected to a suitable central controller by means of a 3-core cable. Based on different sensor types Dräger offers three versions for different applications: On the one hand for the detection of up to 100 % LEL (where a special HT-version can be used at ambient temperatures up to 150 °C), on the other hand for the detection of very low concentrations in the range 0 ... 10 % LEL (leak detection).

## Six housing variants

The sensing heads Dräger Polytron SE Ex PR ... DQ and SE Ex LC ... DD are available as four variants each, which differ by their junction boxes, specified by the following code:

M1 - small standard housing

M2 - midsize standard housing

Besides these junction boxes made of glass fiber reinforced Polyester (GRP) with type of protection "e" (increased safety) housing a sensor with metric ("M") thread, a further variant with type of protection "d" (flameproof enclosure) is available, coded as:

Remote Sensor DQ NPT aluminum / stainless steel - flameproof metal housing

A sensor with an NPT thread is screwed into these two variants. It is intended for conduit installation. The two housings differ in their respective material.

## Comprehensive explosion protection

The sensing heads Polytron SE Ex ... DQ are labeled according to the Directive 2014/34/EU as II 2G/ II 2D and thus are suitable for operation in areas with potentially explosive atmospheres of zone 1 and 2 as well as zone 21 and 22. In the same way, for world-wide applications, an IECEx-approval allows to operate these sensing heads in hazardous areas.

## mV measuring signal

The flame-proof encapsulated gas sensor produces a mV-signal which is proportional to the gas concentration and can be evaluated by a suitable central controller (e.g. Dräger REGARD or Polytron SE Ex). Connected to the sensing head via a shielded 3-core cable of several hundreds of meters length, the central controller is intended to activate alarms if dangerous gas concentrations occur.

## Pellistor sensors type DQ

Since they are operated as precisely measuring temperature dependent resistors, the measuring beads housed in the sensor are called pellistors (from engl. pellet and resistor). A pellistor is a small bead made of very porous ceramic material which is impregnated by a special catalyst and embedding a small platinum filament. By means of an electrical current of approx. 255 mA on the one hand the platinum filament heats up the ceramic bead to roughly 450 °C, on the other hand this platinum wire acts as a measuring resistor dependent on the bead's temperature. When molecules of a flammable gas penetrate into the catalytic bead they react with the activated airborne oxygen which is adsorbed in the porous ceramic and release heat of reaction causing the pellistor's temperature rising. The resulting resistance increase of some milli-Ohms is proportional to the gas concentration.

# Benefits

## Compensation of environmental conditions

By means of a second, entirely uniform pellistor, which is especially encapsulated, any parameter affecting precise measurement is optimally compensated. This is particularly true in respect to humidity and ambient temperature. During manufacturing these pellistors are matched in respect to optimum compensation characteristics. Since both these pellistors are catalytic the sensor is called type DQ (double detector) with a resulting long-term stable sensor signal being nearly unaffected by ambient temperature changes.

## Poison resistance

The pellistors which are manufactured since decades are of type PR, which means poison resistant. Based on their special construction these sensors have a longer lifetime compared to conventional sensors when being exposed to industrial atmospheres containing catalyst poisons such as sulfur-, phosphor-, lead- or silicon compounds.

## Very short response times

To achieve short response times the gas entrance of the DQ-sensor is not a conventional sinter disc but a thin wire mesh disc so that the gas to be detected can very quickly enter the pellistors by way of diffusion.

## Measuring function for explosion protection

In conjunction with some Dräger central controller units the Dräger sensing heads Polytron SE Ex PR ... DQ and HT M DQ are type-approved to be used in preventive explosion protection applications acc. to EN 1127-1. This is a customer's benefit since in case of a dangerous gas concentration a performance approved gas detection system will automatically activate countermeasures so that explosive concentrations cannot form and the extension of hazardous areas thus decrease. By this, electrical installations can be designed more simply and in some cases even no further explosion protection measures are necessary. This is because potentially explosive atmospheres occur seldom or even not at all when having a gas detection system like this.

# Details

D-6031-2025



Dräger Polytron SE Ex M1

D-6059-2025



Dräger Polytron SE Ex M2

D-15033-2010



Dräger Remote Sensor DQ NPT

# System Components

D-10088-2018



## Catalytic Bead DrägerSensor

The DrägerSensor ... DQ detects flammable gases and vapours such as hydrogen. Due to the double-detector compensation method, the catalytic sensor is particularly long-term stable. The wire mesh at the gas inlet serves as a flame barrier. So it ensures explosion protection at the same time short response time.

D-6806-2016



## Dräger REGARD 7000

The Dräger REGARD 7000 is a modular and therefore highly expandable control system for monitoring various gases and vapours. Suitable for gas warning systems with various levels of complexity and numbers of transmitters, the Dräger REGARD 7000 also features exceptional reliability and efficiency. An additional benefit is the backward compatibility with the REGARD.

# Related Products

D-6044-2025



## Dräger PEX 3000

The Dräger PEX 3000 transmitter detects flammable gases and vapours in concentrations below their lower explosive limit (100 % LEL). It helps you to increase the explosion protection of your plant. Its heat-tone sensor reacts to gas within just a few seconds, and the measurement signal remains particularly stable over the long term.

# Technical Data

## SENSING HEADS

All sensing heads Polytron SE Ex ... DQ and Remote Sensor DQ NPT

Type	Sensing head with catalytic bead sensor	
Gases and Vapors	Flammable gases and vapors in the ambient air such as methane, propane, acetone, acetylene, ammonia, petrol 065/095, benzene, 1.3-butadiene, n-butane, n-butyl acetate, diethyl ether, dimethyl ether, ethanol, ethylene (ethene), ethyl acetate, ethylene oxide, n-hexane, hydrogen, methanol, methyl ethyl ketone (MEK), methyl methacrylate, n-nonane, n-octane, n-pentane, i-propanol, propylene (propene), propylene oxide, toluene and o-xylene.	
Maximum cable length	Between sensing head and controller Polytron SE Ex	3 x 1.5 mm <sup>2</sup> : 1450 m
		3 x 1.0 mm <sup>2</sup> : 950 m
		3 x 0.75 mm <sup>2</sup> : 700 m
	Between measuring head Remote Sensor DQ NPT and central unit Polytron 5200 or Polytron 8200	1,0mm <sup>2</sup> : 30 m
		1,5 mm <sup>2</sup> : 50 m
		2,5 mm <sup>2</sup> : 75 m
Between sensing head and controller REGARD	3 x 1.5 mm <sup>2</sup> : 700 m	
	3 x 1.0 mm <sup>2</sup> : 450 m	
	3 x 0.75 mm <sup>2</sup> : 350 m	
Ambient conditions	Atmospheric pressure: 800 ... 1100 hPa	
	Relative humidity: 5 ... 95 %, non-condensing	
Expected sensor lifetime	> 3 years	

## Polytron SE Ex PR ... DQ

Full scale deflection	Combined with a suitable controller - 100 % of the Lower Explosion Limit (LEL)	
Sensor current	240 ... 270 mA (preferably 255 mA) constant current produced by a suitable controller, approx. 1 W	
Response time (25 °C)	t <sub>50</sub> ≤ 7 s, t <sub>90</sub> ≤ 13 s (methane)	
	t <sub>50</sub> ≤ 8 s, t <sub>90</sub> ≤ 14 s (propane)	
Measuring function acc. to 2014/34/EU	Measuring function for explosion protection acc. to EN 60079-29-1 for the a.m. gases and vapors	
Measuring cable	screened 3-core cable, core cross sections 0.5 ... 1.5 mm <sup>2</sup>	
	For remote sensor DQ NPT: 3- or 5-wire, shielded, conductor cross-section 0.2 to 2.5 mm <sup>2</sup>	
	Outer diameter 7 to 12 mm - exception Remote Sensor DQ NPT	
Cable gland	M 20 x 1.5- exception: Sensing head Polytron SE Ex PR NPT1 DQ (comes without cable gland)	
Ambient temperature	SE Ex PR M1/2 DQ	minimum temperature: -50 °C
		maximum temperature: T4: 85 °C, T5: 55 °C, T6: 40 °C
Housings	SE Ex PR M1/2 DQ	IP 66, glass fiber reinforced Polyester (GRP)
	Remote Sensor DQ NPT	IP 65, 66, 67, aluminum or stainless steel
Dimensions (w x h x d) and weight	SE Ex PR M1 DQ	small standard housing 80 x 130 x 56 mm incl. sensor and cable gland, 0.5 kg
	SE Ex PR M2 DQ	midsize standard housing 136 x 107 x 56 mm incl. sensor and cable gland, 0.6 kg
	Remote Sensor DQ NPT	150 x 180 x 130 mm incl. sensor, weight aluminum: 2,2 kg stainless steel: 4,0 kg

# Technical Data

Explosion protection acc. to EU-directive2014/34/EU	SE Ex PR M1/2 DQ	Ex II 2 G D Ex db eb IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6x Tamb (-50 °C bis + 40 °C/+55 °C/+85 °
	EC-Type examination certificate BVS 10 ATEX E 060 X	
	Remote Sensor DQ NPT	Ex db IIC T6/T4 Gb Ex tb IIIC T80/130°C Db -40°C < Ta < +40/+80°C
Explosion protection acc. to IECEx	EU-Baumusterprüfbescheinigung PTB 11 ATEX 1005 X	
	SE Ex PR M1/2 DQ	Ex db eb IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6
	IECEx Certificate of Conformity BVS 10.0045X	

## Polytron SE Ex HT M DQ

Full scale deflection	Combined with a suitable controller - 100 % of the Lower Explosion Limit (LEL)	
Sensor current	240 ... 270 mA (preferably 255 mA) constant current produced by a suitable controller, approx. 1 W	
Response time (25 °C)	t50 ≤ 7 s, t90 ≤ 13 s (methane)	
	t50 ≤ 8 s, t90 ≤ 14 s (propane)	
Measuring function acc. to 2014/34/EU	Measuring function for explosion protection acc. to EN 60079-29-1 for the a.m. gases and vapors	
Measuring cable	screened 3-core cable, core cross sections 0.5 ... 1.5 mm <sup>2</sup>	
	outer diameter 7 ... 12 mm, sufficiently temperature resistant	
Cable gland	M 20 x 1.5	
Ambient temperature	minimum temperature: -50 °C, maximum temperature: T3: 150 °C T4: 85 °C, T5: 55 °C, T6: 40 °C	
Housing	IP 66, galvanized cast iron housing	
Dimensions (w x h x d) and weight	150 x 152 x 85 mm incl. sensor and cable gland, 2.6 kg	
Explosion protection acc. to EU-directive2014/34/EU	DrägerSensor HT M DQ	Ex II 2 G D Ex db IIC T6 / T5 / T4 / T3 Gb Ex tb IIIC T130/T195 °C Db IP6x Tamb (-50 °C bis + 40 °C/+55 °C/+85 °C/+150 °C) DEMKO 09 ATEX 0924202 X / IECEx UL 09.0006X
	Housing	Flameproof Enclosure Typ Range 2000 Ex II 2 G D Ex e IIC T3 Gb Ex tb IIIC T200 °C Db IP66 Tamb (-50°C bis + 40 °C/+55 °C/+85 °C/+150 °C) CML 14 ATEX 3040

# Technical Data

## Polytron SE Ex LC ... DD

Full scale deflection	Combined with a suitable controller - 10 % of the Lower Explosion Limit (LEL)		
Sensor current	276 mA constant current produced by a suitable controller, approx. 1 W		
Response time (25 °C)	t50 < 6 s, t90 < 20 s (methane)		
Measuring cable	screened 3-core cable, core cross sections 0.5 ... 1.5 mm <sup>2</sup> outer diameter 7 ... 12 mm - exception: Sensing head Polytron SE Ex LC NPT1 DD (Conduit thread)		
Cable gland	M 20 x 1.5		
Ambient condition	maximum temperature	SE Ex LC M1/2 DD	T4: 85 °C, T5: 50 °C, T6: 40 °C
	minimum temperature	-40 °C	
	atmospheric pressure	800 ... 1100 mbar	
	relative humidity	5 ... 95 %, non-condensing	
Housings	SE Ex LC M1/2 DD	IP 66, glass fiber reinforced Polyester (GRP)	
Dimensions (w x h x d) and weight	SE Ex LC M1 DD	small standard housing 80 x 130 x 56 mm incl. sensor and cable gland, 0.6 kg	
	SE Ex LC M2 DD	midsize standard housing 136 x 107 x 56 mm incl. sensor and cable gland, 0.7 kg	
Explosion protection acc. to EU-directive 2014/34/EU	SE Ex LC M1/2 DD	SE Ex LC M1/2 DD Ex II 2 G D Ex db eb IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6x Tamb (-40 °C bis + 40 °C/+50 °C/+85 °C)  EC-Type examination certificate BVS 10 ATEX E 060 X	
Explosion protection acc. to IECEx	SE Ex LC M1/2 DD		
IECEx Certificate of Conformity	BVS 10.0045X		

## SENSORS

Type	Catalytic bead sensor for range 0 ... 100 % LEL		
Explosion protection acc. to EU-directive 2014/34/EU	DrägerSensor PR M DQ	Ex II 2 G D Ex db IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6x Tamb (-50 °C bis + 40 °C/+55 °C/+85 °C)	
	DrägerSensor PR NPT DQ (S)	Ex II 2 G D Ex db IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6x Tamb (-50 °C bis + 40 °C/+55 °C/+85 °C)	
	DrägerSensor HT M DQ	Ex II 2 G D Ex db IIC T6 / T5 / T4 / T3 Gb Ex tb IIIC T130/T195 °C Db IP6x Tamb (-50 °C bis + 40 °C/+55 °C/+85 °C/+150 °C)	
	EC-Type examination certificate DEMKO 09 ATEX 0924202X		

# Technical Data

Explosion protection acc. to IECEx	DrägerSensor PR M DQ	Ex db IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6x Tamb (-50 °C bis +40 °C/+55 °C/+85 °C)
	DrägerSensor PR NPT DQ (S)	Ex db IIC T6 / T5 / T4 Gb Ex tb IIIC T130 °C Db IP6x Tamb (-50 °C bis +40 °C/+55 °C/+85 °C)
	DrägerSensor HT M DQ	Ex db IIC T6 / T5 / T4 / T3 Gb Ex tb IIIC T130/T195 °C Db IP6x Tamb (-50 °C bis +40 °C/+55 °C/+85 °C/ +150 °C)
IECEx Certificate of Conformity UL 09.0006X		
Type	Catalytic bead sensor for range 0 ... 10 % LEL	
Explosion protection acc. to EU-directive 2014/34/EU	Ex-Sensor LC M	Ex II 2 G D Ex db eb IIC T6 / T5 / T4 Gb Ex tb IIIC T80/T95/130 °C Db IP6x Tamb (-40 °C bis +40 °C/+50 °C/+85 °C)
	Ex-Sensor LC NPT	Ex II 2 G D Ex db IIC T6 / T5 / T4 Gb Ex tb IIIC T80/T95/130 °C Db IP6x Tamb (-40 °C bis +40 °C/+50 °C/+85 °C)
EC-Type examination certificate DMT 02 ATEX E 188 X		
Explosion protection acc. to IECEx	Ex-Sensor LC M	Ex db eb IIC T6 / T5 / T4 Gb Ex tb IIIC T80/T95/130 °C Db IP6x Tamb (-40 °C bis +40 °C/+50 °C/+85 °C)
	Ex-Sensor LC NPT	Ex db IIC T6 / T5 / T4 Gb Ex tb IIIC T80/T95/130 °C Db IP6x Tamb (-40 °C bis +40 °C/+50 °C/+85 °C)
IECEx Certificate of Conformity BVS 10.0012X		

# Ordering Information

## Dräger Polytron SE Ex

Dräger Polytron SE Ex PR M1 DQ, small standard housing, 0 ... 100 %LEL	6812711
Dräger Polytron SE Ex PR M2 DQ, midsize standard housing, 0 ... 100 %LEL	6812710
Dräger Polytron SE Ex LC M1 DD, small standard housing, 0 ... 10 %LEL	6812722
Dräger Polytron SE Ex LC M2 DD, midsize standard housing, 0 ... 10 %LEL	6812721
Dräger Polytron SE Ex HT M DQ, high temperature version, 0 ... 100 %LEL	6812720
DrägerSensor PR M DQ	6812220
DrägerSensor PR NPT DQ	6812380
DrägerSensor HT M DQ	6812390
DrägerSensor PR NPT DQ S	3701800
Ex-Sensor LC M	6810350
Ex-Sensor LC NPT	6810675
Dust filter for DrägerSensor PR M DQ and PR NPT DQ (PE-discs, 10 pcs.)	6810537
Calibration adapter (PE, max. operation temperature 70 °C)	6806978
Process adapter (stainless steel, with locking nut M30 x 1,5) for DrägerSensor PR M DQ, PR NPT DQ and HT M DQ	6812470
Process adapter (stainless steel, with locking nut M36 x 1,5) for Ex-Sensor LC M and LC NPT	6812465

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