

# TX 401M-NDIR POINT GAS DETECTOR

## for Hydrocarbons and CO<sub>2</sub> - ATEX II 2GD – EEx d IIC

**3-wire 4-20mA + RS485 Modbus + 3 alarm relays + 18-bit microprocessor**  
**Real non intrusive + one man local calibration and configuration**



### Measuring Principle

Detection principle based on measuring the absorption of infrared radiation passing through a volume of gas using a single beam dual detector method.

Dual pyroelectric detector with each individual detector (reference an active) optically filtered by integral windows to respond to specific bands of infrared radiation.

The optical filter associated with the active detector transmits radiation within a band of infrared wavelengths (1 to 5 μ) that are absorbed by the target gases.

The optical filter associated with the reference detector transmits radiation within a neutral band of infrared wavelengths unaffected by target gases. The reference detector therefore acts to monitor the throughput of infrared radiation and compensates for any changes in incident radiation that are not caused by absorption due to the target gases. The reference detector also provides a first means of temperature compensation.

### TX401M-NDIR Advantages

- Extremely robust IP66 flameproof aluminium dye casting junction box with yellow chromatic epoxy painting RAL 1007. Optional AISI 316L stainless steel execution.
- 3-pieces removable AISI 316L sensor enclosure for easy replacement of the sensor
- "All weather" IP65 sensor protection with integrated calibration adapter.
- Ideal for harsh environment as chemical and petrochemical industry, offshore oil and gas platforms, onshore oil and gas terminals, refineries, LNG/LPG storage and bottling plants, bio-ethanol plants, solvent and painting industry, Industrial hygiene & safety monitoring, Soil contamination and remediation, Landfill, Biogas and Biomass applications, Hazmat sites and spills, waste water, paper and pulp, ...
- All-in-one detector: 5 digit display, 4 LED status alarm, 4-20mA output, RS485 half/full duplex Modbus RTU, 3 freely programmable alarm relays, automatic temperature compensation, non-intrusive one man local calibration
- Heated optics avoiding condensation
- Continuous monitoring of detector failure en sensor operation en life time.

### Infrared Advantages

Safe operation - Immune to catalytic poisoning - Good response time - Extremely long operating life - Works in inert atmospheres - High reliability, no moving parts - High stability - Low long term drift

## TECHNICAL SPECIFICATIONS

### Mechanical

Safety Approval	<b>ATEX II 2G - EEx d IIC T6</b> (CESI 03 ATEX 283 and 282U)
Electronics enclosure	Anodised aluminium dye casting with marine grade epoxy finish (stainless steel AISI 316L in option) with windowed cover
Dimensions	Ø 95 mm x depth 85 mm (aluminium dye casting) / Ø 90 mm x depth 85 mm (stainless steel)
Weight	± 0,9 kg (1,6 kg for stainless steel)
Sensor enclosure	3-pieces removable AISI 316L sensor enclosure with "all weather" sensor protection and integrated calibration adapter
Ingress protection	Electronics enclosure : IP66 / Sensor enclosure : IP65
Supply voltage	Nominal 24 VDC (operates from 10 to 32 VDC)
Cable entry	2x side 3/4" NPT entry, one with cable gland one with closing nipple.
Wiring	SWA type 3-wire 1,5 mm <sup>2</sup> max. cable for supply voltage and 4-20mA signal SWA type 6-wire 1,5 mm <sup>2</sup> max. cable for gas alarm A1, A2 and fault relay contacts. 4-wire + hearth cable for serial RS485 half/full duplex.

Gas Detection and Analysis  
 Industrial Processes Gas Monitoring  
 Landfill & Environmental Gas Monitoring



## Electronics

Electronics	18-bit microprocessor-based electronics
Operating temperature range	- 40°C to + 85°C
Display	5 digits 7 segments LED display
Supervision and fault codes	- Gas sensor and its average lifetime - Temperature transducer - Negative drift and over-range - EEPROM communication failure
Analogue Output	0-22mA, source type, continuously controlled by the microprocessor
Digital output	Current loop test function (4 and 20mA) for detector operation control without gas
Output contacts	Full duplex RS485 Modbus RTU communication bus, up to 256 addressable detectors @ 9200 bauds on the same bus reducing field wiring requirements; up to 1200m bus loop without repeater.
Configuration et calibration	3 built-in voltage free relays for gas alarm A1 & A2 and fault alarm, manually configurable by software as NO/NC, excited, latching, memorized and delayed.
Electromagnetic conformance	Safe non-intrusive one-man local calibration & configuration via magnetic key interface; no need of special certified handheld interrogator unit ! EMC complies with EN 50081-1 and EN 50082-1



## Sensor

Sensor	Non Dispersive Infrared absorption technique
Optics	Single light source, dual wavelength temperature compensated infrared detector Heated optics to typically 7°C to 10°C above ambient temperature when running, avoiding condensation issues under high humidity conditions.
Safe Operation	High efficient sensor protection against sand, wind, rain and water jet, by the removable "all weather" sensor protection with integrated sinter filter and calibration adapter.
MTBF	> 5 years
Operating RH range	0 - 95% RH non condensing.
Operating temperature range	- 40°C to + 50°C
Temperature compensation	Automatic temperature compensation over the full operating range in standard execution
Warm-up time	< 20 sec to final zero +/- 2% FS; < 30 minutes to specification
Resolution	1% of measuring range
Repeatability zero/span @ 20°C	range 0-100% LEL , 0-5% vol, 0-100% vol : ± 1% FS/month / ± 2% FS/m range 0-1000 ppm to 0-1% Vol : ± 50 ppm/month / ± 50 ppm/month
Long term zero drift	± 1% FS/month
Response time T90	< 30 seconds

## Gases and ranges

general hydrocarbons	0-100% LEL or 0-100%
methane	0-5% or 0-100%
propane	0-2% or 0-100%
propylene	0-2%
pentane	0-2%
butane	0-2%
ETO	0-3%
ethane	0-3%
hexane	0-1%
ethanol	0-5%
ethylene	0-3%
isopropanol	0-2%
acetic acid	0-4%
methanol	0-5,5%
toluene	0-1,1%
CO <sub>2</sub>	from 0-500 ppm to 0-100%

## Standard accessories

Wall mounting shaft  
Nickel plated Brass ATEX cable gland  
Magnetic key interface

## Options

Stainless steel ATEX AISI 316L electronics enclosure and cable gland  
Flow chamber in stainless steel AISI 316L, for gas sampling applications  
Duct mounting plate with calibration connection

Non contractual pictures and specifications - subject to change without prior notification - issue EN09v1

## Distributed by:



**Special Hazard Fire Detection & Suppression**

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