# Specification Smart NOx Sensor "CLY-NOx-24"

1. General description

This technical specification describes the smart NOx sensor (SNS) used for catalyst management in vehicles with gasoline or diesel engines. The smart NOx sensor consists of a ceramic sensor element and an electronic control unit.

The smart NOx sensor measures the NOx concentration, air/fuel ratio (A/F ratio) and equilibrium oxygen partial pressure in the exhaust gas of combustion engines (gasoline and diesel) and can be used for

- Lean burn engines (NOx trap)
- Diesel engines (SCR catalysts, NOx trap, closed-loop NOx control)
- On board diagnostics, OBD (gasoline and diesel engine)
- Test and control system of desulfurization and denitrification in power plant
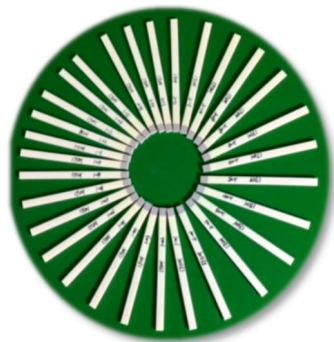
Smart NOx Sensor Ceramic Chips   Smart NOx Sensor Physical Chart

2. Product benefits

- Modular »Stand-Alone« NOx Sensor

- Standardized electronic interface with CAN-Bus
- Independent of catalyst supplier, ECU supplier and engine management system
- All Electronics including heater control and drivers integrated in the sensor
- Self diagnosis capability regarding shortcut and open wire
- Calibrated High Accuracy Smart NOx Sensor

3. Technical Index of control signals

Nr	Name	Symbol	Min	Max	Dim	Remarks
1	Operating temperature ranges	T_W	-40	105	℃	
2	Supply voltage	U_{bat}	16	36	V	
3	O₂ concentration	O_2	0	21	%	
4	NOₓ concentration	NO_X	0	1500	ppm	NO& NO₂
			0	2000		
			0	3000		
5	NOₓ accuracy	C_{NOx}		10%	ppm	>100ppm
6	Response time NOx	$\tau_{33<-->66\%} NO_X$		1300	ms	
7	Response time O₂	$\tau_{33<-->66\%} O_2$		1000	ms	

4. Transfer Protocol "SAEJ1939"

Data format:

Transfer rate   250 kBaud

Repetition   50 msec

Data format   Intel

Identifier   extended

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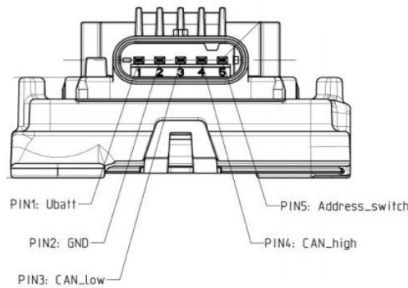
Transmit signals：

Standard transmit address (Pin5 open):

18F00F52h (PGN = 61455, in HEX: F00F; After Treatment outlet - position, bank 1)

Alternative transmit address (Pin5 to GND):

18F00E51h (PGN = 61454, in HEX: F00E; After Treatment intake - position, bank 1)

5. Connection instructions

Smart NOx Sensor Interface Diagram

Connector assignment:
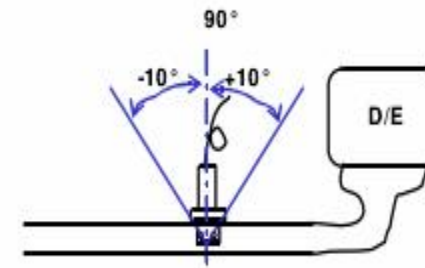
Pin1: Ubatt

Pin2: Gnd

Pin3: CAN low

Pin4: CAN high

Pin5: Ident (open => standard address; GND => alternative address)

6. Installation instructions

Recommended mounting position of the NOx Sensor is downstream of NOx trap or SCR catalyst.

Tilt angle in gas flow direction

The recommended tilt angle is 90°±10°. Other angles are possible (as long as other specifications are fulfilled; e.g. maximum temperature hexagon, grommet) but may be linked with

- a decrease in response time.
- a need of delayed dew point sending due to an increased amount of condensed humidity and less heating up of the sensor assembly by the exhaust gas in sloped bosses.
- a different gas sensitivity due to the changing gas concentration profiles versus the exhaust pipe diameter.