

# Lambda Sensor LSU ADV/ADV pre Turbo

www.bosch-motorsport.com



- ▶ Application: lambda 0.65 to  $\infty$
- ▶ Wide band
- ▶ Max. exhaust gas temperature range 1,030°C for a short time
- ▶ Max. Hexagon temperature 700°C for a short time
- ▶ Without trim resistance in connector

This sensor is designed to measure the proportion of oxygen in exhaust gases of automotive engines (gasoline or Diesel). A version with a protection tube of Inconel for pre-turbo-(supercharger) mounting is available.

The wide band lambda sensor LSU ADV is a planar  $ZrO_2$  dual cell limiting current sensor with integrated heater. Its monotonic output signal in the range of lambda 0.65 to air makes the LSU ADV capable of being used as a universal sensor for lambda 1 measurement as well as for other lambda ranges.

The LSU ADV has no trimming resistor inside the connector what results in just 5 connector pins. Compared to LSU 4.9, the LSU ADV has a wider working temperature range.

LSU ADV operates only in combination with a special evaluation unit used in lambda control unit LT4 ADV. You'll find this unit and more on our homepage at Electronics/Sensor Interfaces.

## Application

Application	lambda 0.65 to $\infty$
Fuel compatibility	gasoline/Diesel/E85
Exhaust gas pressure	$\leq 2.5$ bar (higher with decrease accuracy)

Exhaust gas temperature (operating)	$\leq 930^\circ\text{C}$ ( $\leq 980^\circ\text{C}$ pre Turbo Version)
Max. exhaust gas temperature for short time	$\leq 1,030^\circ\text{C}$
Hexagon temperature (operating)	$\leq 650^\circ\text{C}$
Max. hexagon temperature for short time	$\leq 700^\circ\text{C}$
Max. temperature at welding seam	$\leq 820^\circ\text{C}$ (pre Turbo Version)
Max. temperature difference between hexagon and welding seam	$\leq 330^\circ\text{C}$
Wire and protective sleeve temperature	$\leq 250^\circ\text{C}$
Connector temperature	$\leq 140^\circ\text{C}$
Storage temperature range	-40 to $100^\circ\text{C}$
Max. vibration (stochastic peak level)	300 m/s <sup>2</sup>

**Technical Specifications****Variations****1.) LSU ADV with automotive connector**

Connector	1 928 404 669
Mating connector	F 02U B00 725-01
Pin 1	APE
Pin 2	IPN
Pin 3	H-
Pin 4	Uh+ / H+
Pin 5	RE
Pin 6	nc
Wire length L	95.0 cm

**2.) LSU ADV pre Turbo with automotive connector**

Connector	1 254 488 136
Mating connector	on request
Pin 1	IP/APE
Pin 2	VM/IPN
Pin 3	Uh- / H-
Pin 4	Uh+ / H+
Pin 5	UN / RE
Pin 6	nc

**3.) LSU ADV (pre Turbo) with motorsport connector**

Connector	AS 6-07-35PA
Mating connector	AS 0-07-35SA
Pin 1	Uh+ / H
Pin 2	Uh- / H-
Pin 3	IP / APE
Pin 4	VM / IPN
Pin 5	UN / RE
Pin 6	nc

Please specify the required wire length with your order (ADV pre Turbo max. 33 cm/ADV max. 90 cm).

**Mechanical Data**

Weight w/o wire	120 g
Thread	M18x1.5
Wrench size	22 mm
Tightening torque	40 to 60 Nm

**Electrical Data**

Power supply H+ nominal	7.5 V
System supply voltage	10.8 V to 16.5 V
Heater power steady state	8.7 W
Heater control frequency	≥ 100 Hz
Nominal resistance of Nernst cell	300 Ω
Max current load for Nernst cell	≤ 80 μA
Switch-on time	≤ 5 s

**Characteristic**

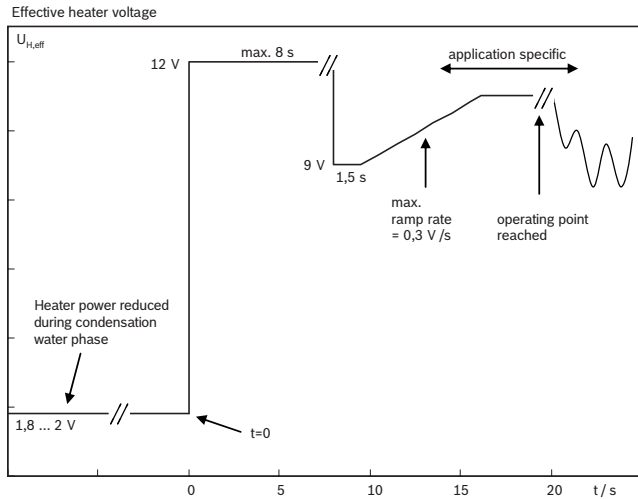
Signal output	$I_p$ meas
Accuracy at lambda 0.8	-0.652 ± 0.032 mA
Accuracy at lambda 1	-0.018 ± 0.008 mA
Accuracy at lambda 1.7	0.515 ± 0.022 mA

$I_p$ [mA]	lambda	$U_A$ [V], v=17	$U_A$ [V], v=8
-1,38000	0,650	0,048	0,817
-1,11000	0,700	0,332	0,950
-0,88000	0,750	0,574	1,064
-0,65000	0,800	0,816	1,178
-0,47500	0,850	1,000	1,265
-0,37000	0,880	1,111	1,317
-0,30000	0,900	1,184	1,351
-0,16000	0,950	1,332	1,421
-0,07600	0,980	1,420	1,462
-0,04800	0,990	1,449	1,476
-0,02000	1,000	1,479	1,490
0,01167	1,030	1,512	1,506
0,03278	1,050	1,534	1,516
0,06444	1,080	1,568	1,532
0,08556	1,100	1,590	1,542
0,17000	1,180	1,679	1,584
0,23080	1,260	1,743	1,614
0,36000	1,430	1,879	1,678
0,40148	1,500	1,922	1,699
0,52000	1,700	2,047	1,758
0,54740	1,780	2,076	1,771
0,77000	2,430	2,310	1,881

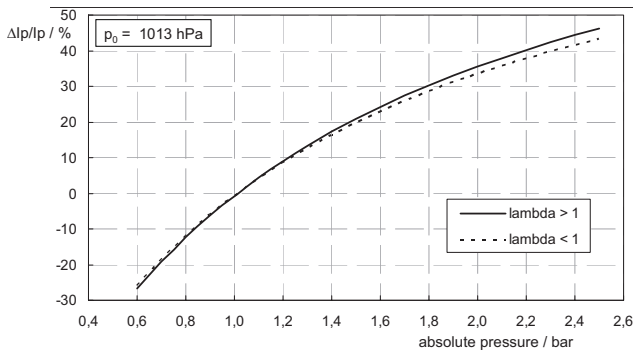
1,40000      5,000      2,973      2,193

**Please note:** UA is not an output signal of the lambda sensor, but the output of the evaluation circuit. Only IP correlates with the oxygen content of the exhaust gas. Amplification factor  $v=17$  is typically used for lean applications ( $\lambda > 1$ ), amplification factor  $v=8$  is typically used for rich applications ( $\lambda < 1$ ).

### Heater Strategy



### Pressure Compensation



### Connectors and Wires

Connector	Please see variations
Mating connector	Please see variations
Sleeve	fiber glass / silicone coated
Wire length	Please see variations

Various motorsport and automotive connectors are available on request.

### Installation Notes

This lambda sensor operates only in combination with a special evaluation unit used in lambda control unit LT4 ADV. You'll find this unit and more on our homepage at Accessories/Expansion Modules.

The lambda sensor should be installed at point which permits the measurement of a representative exhaust-gas mixture, which does not exceed the maximum permissible temperature.

Install at a point where the gas is as hot as possible.

Observe the maximum permissible temperature.

As far as possible install the sensor vertically (wire upwards).

The sensor is not to be fitted near to the exhaust pipe outlet, so that the influence of the outside air can be ruled out.

The exhaust-gas passage opposite the sensor must be free of leaks in order to avoid the effects of leak-air.

Protect the sensor against condensation water.

The sensor is not to be painted, nor is wax to be applied or any other forms of treatment. Use only the recommended grease for lubricating the thread.

Please find further application hints in the offer drawing at our homepage.

### Safety Note

The Sensor is not intended to be used for safety related applications without appropriate measures for signal validation in the application system.

### Ordering Information

#### Lambda Sensor LSU ADV

Automotive connector, wire length 95 cm  
Order number **0 258 027 010**

#### Lambda Sensor LSU ADV

Motorsport connector, wire length customer specific (max. 90 cm)  
Order number **F 02U V01 861-01**

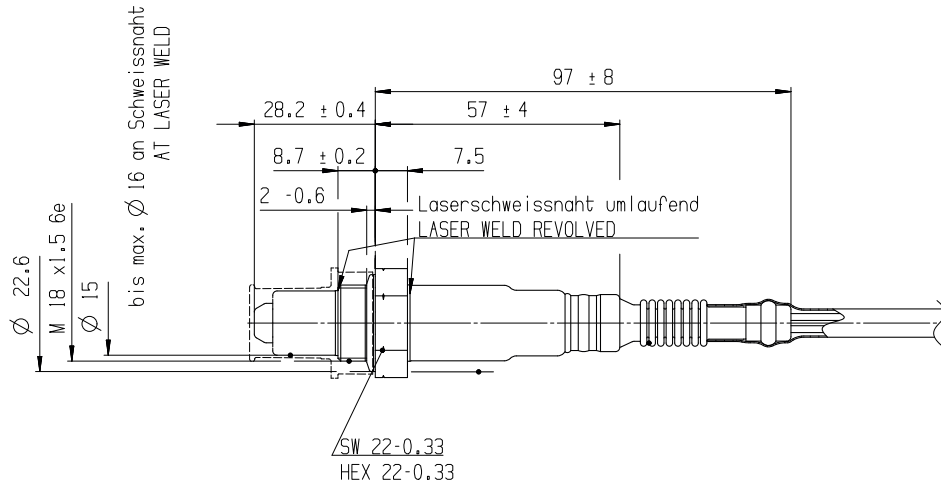
#### Lambda Sensor LSU ADV pre Turbo

Automotive connector, wire length 37 cm  
Order number **0 258 027 052**

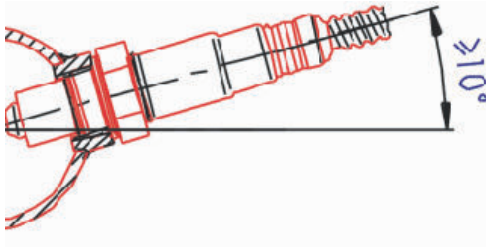
#### Lambda Sensor LSU ADV pre Turbo

Motorsport connector, wire length 33 cm  
Order number **F 02U V02 066-01**

Dimensions

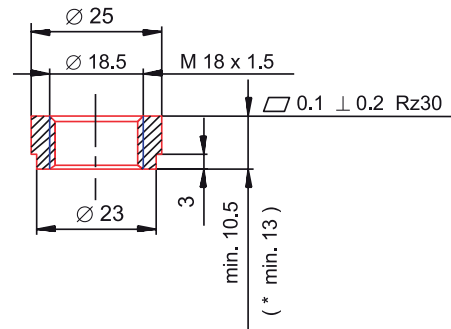


Mounting recommendation



Recommended design of the mating thread in the exhaust pipe

\*: THexagon > 600°C or  
TGas > 930°C



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