

Lambda Sensor Mini-LSU 4.9



- ▶ Application: lambda 0.65 to ∞
- ▶ Exhaust gas temperature: 930°C (1,030 for a short time)
- ▶ Hexagon temperature: 700°C
- ▶ Thread: M16x1.5
- ▶ Weight w/o wire: 34 g

This sensor is designed to measure the proportion of oxygen in exhaust gases of automotive engines (gasoline or Diesel).

The wide band lambda sensor Mini-LSU 4.9 is a planar ZrO₂ dual cell limiting current sensor with integrated heater. Its monotonic output signal in the range of lambda = 0.65 to air makes the LSU capable of being used as a universal sensor for lambda = 1 measurement as well as for lean and rich ranges. The connector housing contains a trimming resistor, which defines the characteristic of the sensor. The main benefit of the Mini-LSU 4.9 is its very compact design in combination with the high Bosch production quality standard. The Mini-LSU is produced and tested in a handmade process.

The complete light weight housing is made of Inconel which makes it resistant against high temperatures. The sensor element is more than 50 % smaller than it is in the production lambda sensor. It is connected over silver coated steel cables to make it more reliable against vibrations.

This lambda sensor operates only in combination with a special LSU-IC, used in most Bosch Motorsport ECUs and lambda control units like LT4. You'll find this unit and more on our homepage at Electronics/Sensor Interfaces.

Application

Application	lambda 0.65 to ∞
Fuel compatibility	gasoline/Diesel/E85
Exhaust gas pressure	≤ 2.5 bar (higher with decrease accuracy)
Exhaust gas temperature range (operating)	< 930°C

Exhaust gas temperature range (max.) for short time	< 1,030°C
Hexagon temperature	$\leq 700^\circ\text{C}$
Wire and protective sleeve temperature	< 250°C
Connector temperature	< 150°C
Storage temperature range	-40 to 100°C
Max. vibration (stochastic peak level)	300 m/s ² (see Installation Notes)

Technical Specifications

Variations

Mini-LSU 4.9 with automotive connector	
Connector	1928.404.682 (Series production type, not available from Bosch Motorsport)
Mating connector	D261.205.356-01
Wire length L	950 mm
Mini-LSU 4.9 with motorsport connector	
Connector	AS607-35PN
Mating connector	AS007-35SN
Wire length L	200 to 1,400 mm

Mechanical Data

Weight w/o wire	34 g
Thread	M16x1.5
Wrench size	17 mm
Tightening torque	60 Nm

Electrical Data

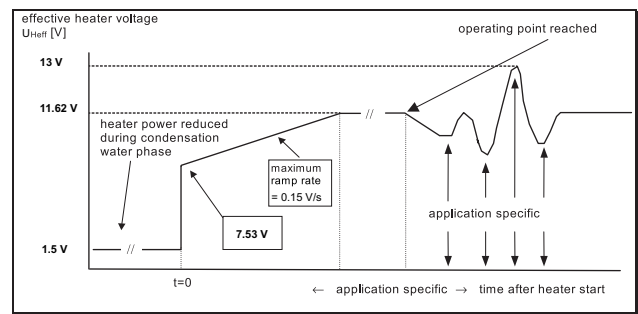
Power supply H+ nominal	7.5 V
System supply voltage H+ (min)	10.8 V
Heater power steady state	7.5 W
Heater control frequency	100 Hz
Nominal resistance of Nernst cell	300 Ohm
Max. current load for Nernst cell	250 μ A

Characteristic

Signal output	I_p meas		
Accuracy at lambda 0.8	0.80 \pm 0.01		
Accuracy at lambda 1	1.016 \pm 0.007		
Accuracy at lambda 1.7	1.70 \pm 0.05		
I_p [mA]	lambda	U_A [V], v=17	U_A [V], v=8
-2.000	0.650	-	0.510
-1.602	0.700	-	0.707
-1.243	0.750	0.192	0.884
-0.927	0.800	0.525	1.041
-0.800	0.822	0.658	1.104
-0.652	0.850	0.814	1.177
-0.405	0.900	1.074	1.299
-0.183	0.950	1.307	1.409
-0.106	0.970	1.388	1.448
-0.040	0.990	1.458	1.480
0	1.003	1.500	1.500
0.015	1.010	1.515	1.507
0.097	1.050	1.602	1.548
0.193	1.100	1.703	1.596
0.250	1.132	1.763	1.624
0.329	1.179	1.846	1.663
0.671	1.429	2.206	1.832
0.938	1.701	2.487	1.964
1.150	1.990	2.710	2.069
1.385	2.434	2.958	2.186
1.700	3.413	3.289	2.342
2.000	5.391	3.605	2.490
2.150	7.506	3.762	2.565
2.250	10.119	3.868	2.614

Please note: U_A is not an output signal of the lambda sensor, but the output of the evaluation circuit. Only I_p 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



Resistance/LSU Temperature

R (Ohm)	Temp (°C)
80	1030
150	888
200	840
250	806
300 [operating point]	780
350	761
400	744
450	729
550	703
650	686
800	665
1000	642
1200	628
2500	567

Connectors and Wires

Connector	Please see variations
Mating connector	Please see variations
Sleeve	fiber glass / silicone coated
Pin 1	Pump current APE / IP
Pin 2	Virtual ground IPN / VM
Pin 3	Heater voltage H- / Uh-
Pin 4	Heater voltage H+ / Uh+
Pin 5	Trim resistor RT / IA
Pin 6	Nernst voltage UN / RE
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 LSU-IC, used in most Bosch Motorsport ECUs and lambda control units like LT4. 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 and 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.
- Sensors should be installed as close to vertical as possible (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 system up stand and surrounding the sensor must be sealed in order to avoid the effects of leakage 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.
- A higher maximum vibration profile is possible and should be determined by the customer's individual application.

Safety Note

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

Legal Restrictions

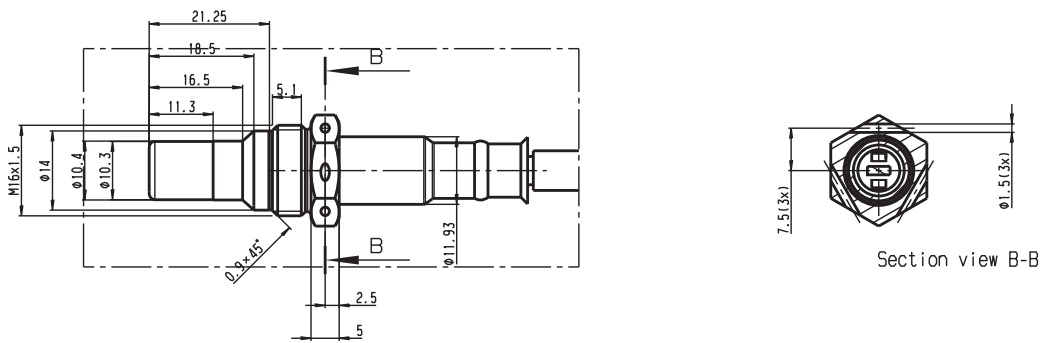
Due to embargo restrictions, sale of this product in Russia, Belarus, Iran, Syria, and North Korea is prohibited.

Ordering Information

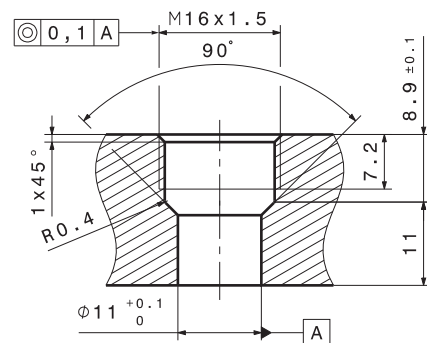
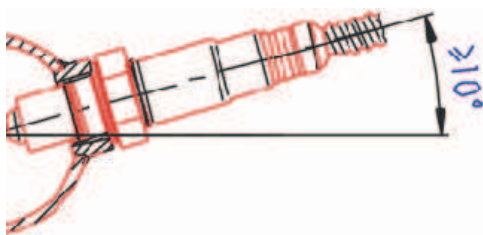
Lambda Sensor Mini-LSU 4.9
 With automotive connector
 Order number **B258.490.103-30**

Lambda Sensor Mini-LSU 4.9
 With motorsport connector
 Order number **F02U.V02.227-02**

Dimensions



Mounting recommendation



Represented by:

Europe:

Bosch Engineering GmbH
Motorsport
Robert-Bosch-Allee 1
74232 Abstatt
Germany
Tel.: +49 7062 911 9101
Fax: +49 7062 911 79104
motorsport@bosch.com
www.bosch-motorsport.de

North America:

Bosch Engineering North America
Motorsport
38000 Hills Tech Drive
Farmington Hills, MI 48331-3417
United States of America
Tel.: +1 248 876 2977
Fax: +1 248 876 7373
motorsport@bosch.com
www.bosch-motorsport.com

Asia-Pacific:

Bosch Engineering Japan K.K.
Motorsports Department
1-9-32 Nakagawa Chuo, Tsuzuki-ku
Yokohama City
Kanagawa Prefecture 224-8601
Japan
Tel.: +81 45 605 3032
Fax: +81 45 605 3059
www.bosch-motorsport.jp

Australia, New Zealand and South

Africa:
Robert Bosch Pty. Ltd
Motorsport
1555 Centre Road
Clayton, Victoria, 3168
Australia
Tel.: +61 (3) 9541 3901
motor.sport@au.bosch.com