

# LAMBDA SENSOR

## FOR BIOMASS HEATING





Dieses Prinzip der Restsauerstoffmessung im Abgas macht man sich auch bei der Verbrennung von Biomasse (Stückholz, Hackschnitzel, Pellets) zu Nutze. Um die derzeit geforderten und ständig steigenden Schadstoffemissionsgrenzwerte zu erreichen, ist eine Regelung mittels Lambdasonde Stand der Technik.



Ce principe de mesure de l'oxygène dans les gaz d'échappement est également utile dans la combustion de la biomasse (bûchettes, copeaux, pellets). Afin d'atteindre les valeurs limites exigées actuellement, toujours plus sévères, une régulation par sonde lambda répond à l'état de la technique.



di efficienza in presenza di emissioni ridotte al minimo. Questo principio della misurazione dell'ossigeno residuale nei gas di scarico viene utilizzato anche nella combustione della biomassa (pezzi di legno, legno tritato, pellet). Al fine di raggiungere i valori limite delle emissioni di sostanze nocive la regolazione per mezzo di un sensore Lambda costituisce lo stato attuale dell'arte.



This principle of residual oxygen measurement in the exhaust gas is also used as regards to the combustion of biomass (logs, wood chips, pellets). In order to achieve the pollutant emission threshold currently required and constantly becoming more stringent, control by means of the lambda sensor is state-of-the-art.

Figure 10 is a line graph showing the Output Voltage (mV) on the Y-axis (ranging from -10 to 70) versus O<sub>2</sub>(%) on the X-axis (ranging from 0 to 25). The graph displays the relationship between Output Voltage and O<sub>2</sub> concentration for three different temperatures (200degC, 100degC, 30degC) and three different S/N ratios (11, 12, 13). The legend indicates the following data series:

- 200degC\_13V\_S/N:11 (Red circles)
- 200degC\_13V\_S/N:12 (Red triangles)
- 200degC\_13V\_S/N:13 (Red squares)
- 100degC\_13V\_S/N:11 (Green circles)
- 100degC\_13V\_S/N:12 (Green triangles)
- 100degC\_13V\_S/N:13 (Green squares)
- 30degC\_13V\_S/N:11 (Blue circles)
- 30degC\_13V\_S/N:12 (Blue triangles)
- 30degC\_13V\_S/N:13 (Blue squares)

The graph shows that the output voltage decreases as the O<sub>2</sub> concentration increases. The decrease is more pronounced at higher temperatures and lower S/N ratios. The 200degC series shows the steepest decline, while the 30degC series shows the least decline. The S/N ratio also affects the output voltage, with S/N:11 generally showing the highest output voltage and S/N:13 showing the lowest output voltage for a given temperature and O<sub>2</sub> concentration.



|                |                                                              |                                                                 |                                                                                   |                                                           |
|----------------|--------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------|
| <b>1</b>       | Schutzrohr                                                   | Tube de protection                                              | Tubo di protezione                                                                | Protective tube                                           |
| <b>2</b>       | Fettfreies Gewinde M18x1,5<br>(Anzugsdrehmoment: 45Nm)       | Filetage sans graisse M18x1,5 (couple de serrage 45 Nm)         | Filettatura priva di grassi M18x1,5 (giri di tenuta: 45Nm)                        | Grease-free thread M18x1.5 (tightening torque: 45Nm)      |
| <b>3</b>       | Dichtring                                                    | Bague d'étanchéité                                              | Anello di guarnizione                                                             | Sealing ring                                              |
| <b>4</b>       | Sechskant 22mm                                               | Ecrou six pans                                                  | Vite esagonale da 22 mm                                                           | Hexagonal head 22mm                                       |
| <b>5</b>       | Kabelabdichtung                                              | Joint d'étanchéité câble                                        | Guarnizione del cavo                                                              | Cable seal                                                |
| <b>6</b>       | Glasseidenschlauch 150mm                                     | Tube verre flexible 150 mm                                      | Tubo flessibile in vetro di seta da 150 mm                                        | Fibre glass hose 150mm                                    |
| <b>7</b>       | Masse Kabel grau<br>AWG20 (0,50mm <sup>2</sup> ) 230mm       | Câble de masse gris AWG20 (0,50mm <sup>2</sup> ) 230mm          | Massa del cavo grigia<br>AWG20 (0, 50 mm <sup>2</sup> ) 230 mm                    | Earthing cable grey AWG20 (0.50mm <sup>2</sup> ) 230mm    |
| <b>8</b>       | 2 x Heizer Kabel weiss AWG20<br>(0,50mm <sup>2</sup> ) 230mm | 2 câbles de chauffage blancs AWG20 (0,50mm <sup>2</sup> ) 230mm | 2 x dispositivo di riscaldamento cavo bianco AWG20 (0,50 mm <sup>2</sup> ) 230 mm | 2 x heater cable white AWG20 (0.50mm <sup>2</sup> ) 230mm |
| <b>9</b>       | Sonden Signal schwarz AWG20<br>(0,50mm <sup>2</sup> ) 230mm  | Signal de sonde noir AWG20 (0,50mm <sup>2</sup> ) 230mm         | Sonde segnale nero<br>AWG20 (0,50 mm <sup>2</sup> ) 230 mm                        | Sensors signal black AWG20 (0.50mm <sup>2</sup> ) 230mm   |
| <b>10</b>      | Stecker max. Temp. 130°C                                     | Connecteur temp max. 130°C                                      | Presa temperatura massima di 130° C                                               | Plug, max temperature 130°C                               |
| <b>-6,1mV</b>  | Spannung bei 13V an Luft                                     | Tension à 13 V à l'air                                          | Tensione con 13V all'aria                                                         | Voltage at 13V at air                                     |
| <b>80 Ohm</b>  | Innenwiderstand                                              | Résistance intérieure                                           | Resistenza interna                                                                | Internal resistance                                       |
| <b>16V</b>     | Max. zulässige Heizerspannung                                | Température de chauffage maxi. autorisée                        | Tensione massima ammessa per il dispositivo di riscaldamento                      | Max admissible heater voltage                             |
| <b>6,1 Ohm</b> | Heizerwiderstand<br>(23 +/- 5°C)                             | Résistance chauffage<br>(23 +/- 5°C)                            | Opvarmningsmodstand<br>(23 +/- 5°C)                                               | Heater resistance<br>(23 +/- 5°C)                         |
|                | Gemeinsame Entwicklung mit Niterra an einer Biomassesonde    | Développement collectif avec Niterra sur une sonde à biomasse   | Sviluppo comune con Niterra di un sensore per biomassa                            | Joint development with Niterra regarding a biomass sensor |
|                | Spezielle Niedertemperatur Keramik für Holzverbrennung       | Céramique basse température spéciale pour combustion de bois    | Temperatura bassa specifica Ceramica per la combustione del legno                 | Special low-temperature ceramics for wood combustion      |
|                | 10-jährige Versorgungsgarantie                               | 10 ans de garantie fournisseur                                  | Garanzia di approvvigionamento di 10 anni                                         | 10-year supply guarantee                                  |
|                | Langjährige Preisgarantie                                    | Prix garantis pendant de longues années                         | Garanzia di prezzo per diversi anni                                               | 5-year price guarantee                                    |
|                | Schnelle Verfügbarkeit                                       | Disponibilità rapide                                            | Disponibilità rapida                                                              | Quick availability                                        |
|                | Problemlose Verwendung mit Originalstecker                   | Utilisation rapide avec le connecteur d'origine                 | Uso senza problemi in combinazione con una presa originale                        | Trouble-free use with genuine plug                        |

# We create your solution

## Possible connecting cables



### Everything is possible

Standard lengths:

- 2,20 m
- 5,00 m
- 10,00 m



**118.02-7120** Standard 2,20m  
inkl. Aderendhülsen

Diverse Stecker  
auf Anfrage



Standard 2,20m  
embouts compris

Divers connecteurs  
sur demande



Standard da 2,20m  
inclusi gli involucri delle  
estremità delle venature

Diverse prese  
su richiesta

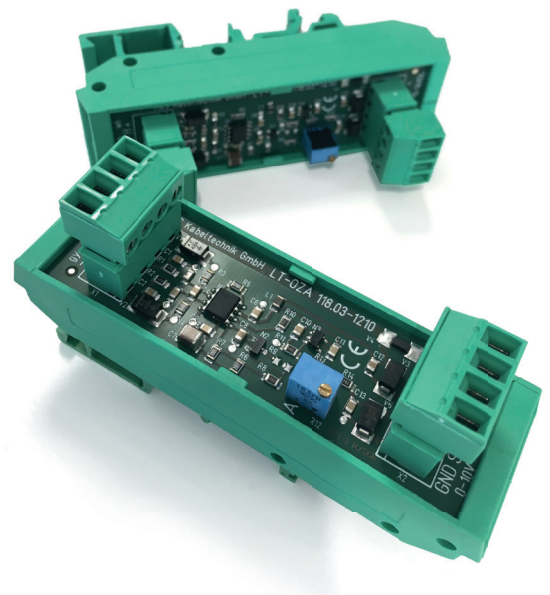


Standard 2.20m  
incl. ferrules

Diverse plugs  
upon request

## Lambda Electronic Transmitter

| Order No.          | Input voltage | Output signal |
|--------------------|---------------|---------------|
| <b>118.03-1211</b> | 12 voltage    | 0-10 voltage  |
| <b>118.03-2411</b> | 24 voltage    | 0-10 voltage  |



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Niterra