Zumbach

SWISS PRIME MEASURING SINCE 1957

Modular Single Axis Laser Measuring Head
for Diameter, Width, Height.
Measuring Field = 310 mm (12.2 in.).

# ODAC® 310

Modern single axis measuring head from the ODAC® laser measuring unit series. Highest accuracy, robustness, reliability and functionality distinguish all the laser heads from ZUMBACH. The ODAC® 310 is manufactured with a modular design. It is available with a support rail or as individual emitter and receiver parts when a maximum of flexibility is required to install the head in any position. The measuring head can also be installed in constricted confines or several emitter/ receiver pairs can be mounted in the same plane. ODAC® 310 models can be used in virtually every manufacturing process in the wire and cable industry,
the plastics and rubber industry as well as the steel and metal industry.
Known for precision, quality and ease of use the laser measuring heads from ZUMBACH are among the best
of their class.

The technological basis considered for these measuring heads is always of the latest cutting edge technology, with laser diodes as light sources combined with intelligent and powerful measured-value processors which facilitate a simple and flexible integration. Our long-standing experience as a pioneer of in-line measuring technology, combined with high production figures result in a product with an excellent price-performance ratio.

Amongst the outstanding features are features such as single scan calibration (CSS), single scan monitoring and high data rate output of up to 333* data packages per second. The measuring heads can be used with all line speeds. Vibrations during production have no noticeable influence on measurements.

* Depending on the measuring head model, the number of transmitted measured values as well as the baud rate of the interface.

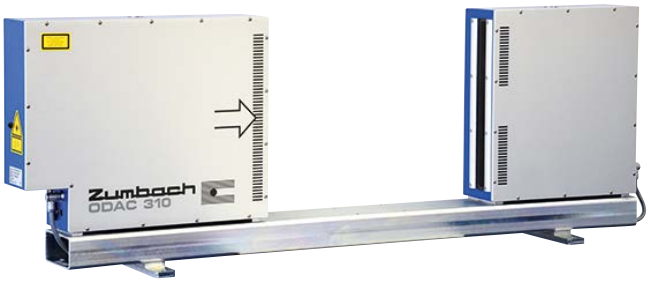
### Adaptive signal processing in the measuring units increase accuracy

All the measuring heads of the ODAC® series have adaptive signal processing (patent DE3111356), which makes subsequent regular re-calibrations superfluous. Only in instances of component exchange or compliance to calibration regulations ISO 9000/9001 etc would re-calibration be required.

All the relevant parameters for accuracy are continuously monitored by the measuring system and automatically compensated. This is valid in particular also for possible long-term changes of the behaviour of the scanner motor or the measuring electronics.

### Flexible communication integration

- RS (-232 /-422 /-485)
- EN (Ethernet TCP/IP)
- DP (Profibus DP)
- PN (Profinet IO V2.3)
- J (digital, for connection to USYS processors)




### Main Advantages

- Very high scan rate (measuring frequency)
  Standard: 1000/s, Version F: 2000/s
- High precision measurement
- High insensitivity to dirt and dust

### Flexible mounting

With or without rail, different measuring distances

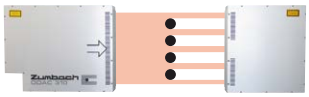
### Types of measurement

1 Diameter

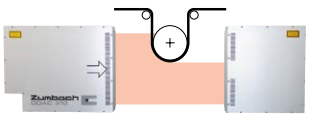
4 Height

2 Slit width

5 Multiple products



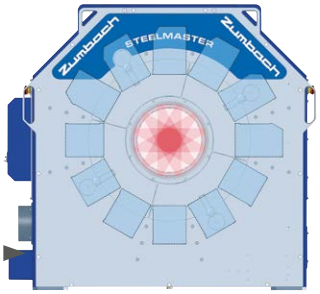
3 Penetration depth



Other types of measurement on request

### Special Applications

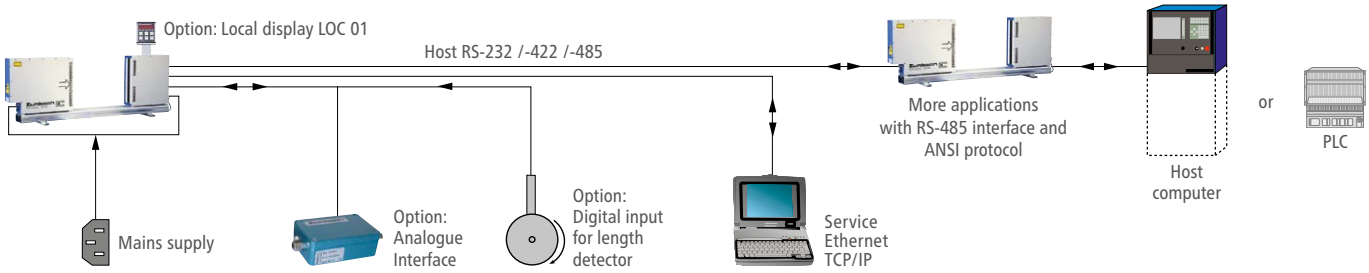
Measurement of hot steel




► Ask for special data sheets on STEELMASTER hot steel systems

# System Overviews

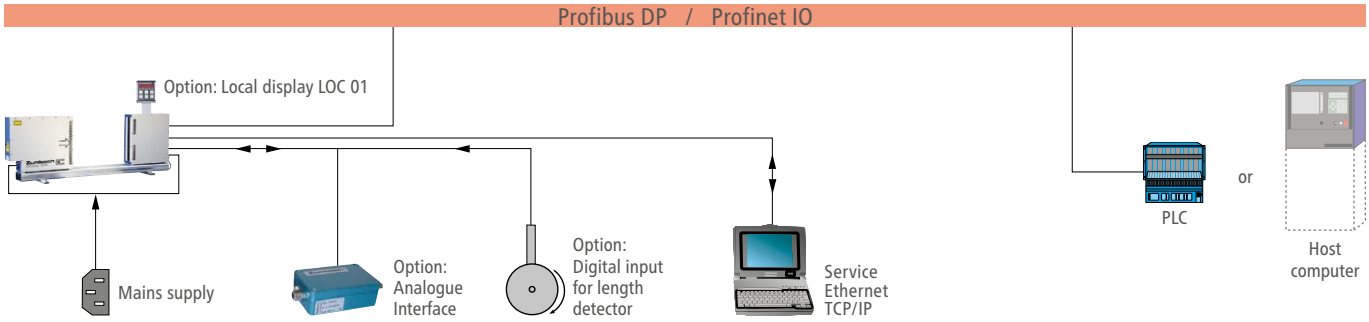
## ODAC® 310EN-RS (serial interface)




The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. The RS version communicates via the integrated RS interface with a higher level system, like USYS from ZUMBACH, host computer (or PLC). The ZUMBACH protocols ODAC, ASCII or the network capable ANSI software protocols are selectable according to choice.

## ODAC® 310EN-DP (Profibus DP) or -EN-PN (Profinet IO)

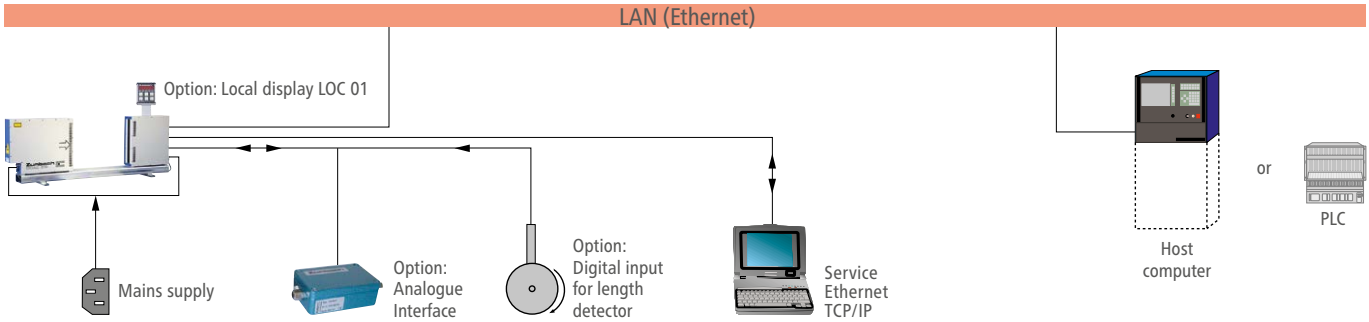
Profibus DP / Profinet IO




The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. These versions communicate via the integrated Profibus DP or Profinet IO interface with a higher level system. These interfaces are designed for high speed data transfer at the sensor actuator level. At this level, controllers such as programmable logic controllers (or PLC's) exchange data via a fast serial (Profibus DP) or Ethernet (Profinet IO) connection with their distributed peripherals such as drivers, valves or intelligent slaves like ODAC measuring heads from ZUMBACH.

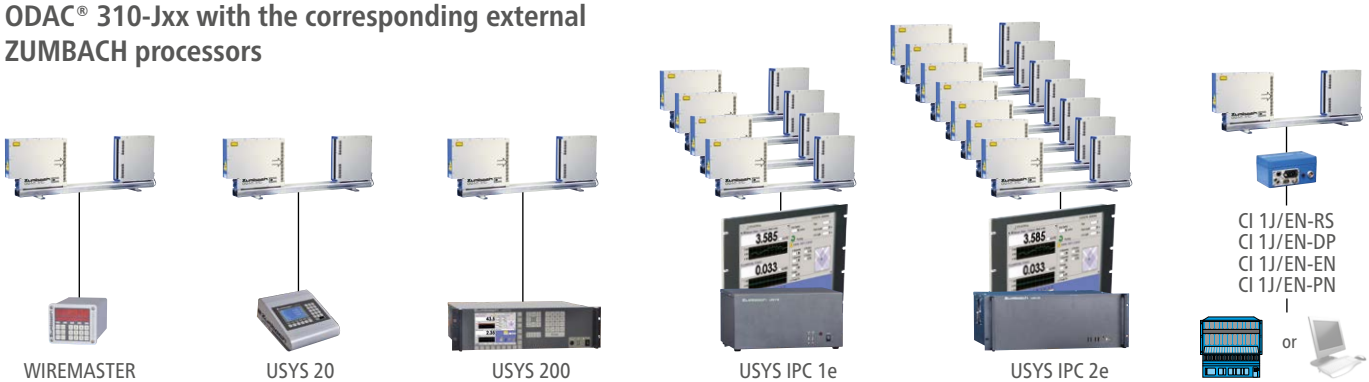
## ODAC® 310EN-EN (Ethernet)

LAN (Ethernet)




The built-in processor allows the acquisition and filtering of the measured values, as well as statistic functions, parameter selection and many other functions. The EN version communicates via the integrated EN interface with a higher level system. The selectable ZUMBACH protocols (ODAC or ASCII) are integrated and transmitted in the well known TCP/IP protocol. TCP/IP allows the data transfer through existing networks such as LANs and others.

## ODAC® 310-Jxx with the corresponding external ZUMBACH processors



# Accessories

| Description | Order Number |
|---|---|
| **Set of calibration standards** | **ODAC.9501.72000** |

Delivered in a protection box, comprising:
– Calibration standard holder
– Calibration standard ø 6 and 200 mm
– Certificate
Other calibration standards on request.

| | |
|---|---|
| **Local display LOC 01** | **LOC.011.01000** |

Is mounted directly on the measuring head.
Requires connection cable # ODAC.9167.00005 between LOC 01 and the measuring head.
Not for ODAC J versions.

| | |
|---|---|
| **Fixation plate for the emitter unit** | **B.ODAC.3101.9110** |

It simplifies the assembly and any adjustment (only for component version).
Suitable screws are included in the delivery.

| | |
|---|---|
| **Fixation plate for the receiver unit** | **B.ODAC.3101.9120** |

It simplifies the assembly and any adjustment (only for component version).
Suitable screws are included in the delivery.

| Description | Order Number |
|---|---|
| **Analogue interface AI 4-ODAC** | **ODAC.000.100** |

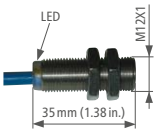
Interface with 4 analogue and 5 digital outputs. Direct connection of the digital input (proximity switch).
Not for ODAC J versions.

| | |
|---|---|
| **Connector** | **A10 125 0070** |

Counter connector for digital input "I/F". Connection of a proximity switch. It is not required, if the analogue interface AI 4-ODAC is already used. Not for ODAC J versions.

| | |
|---|---|
| **Proximity switch** | **A16 100 0110** |

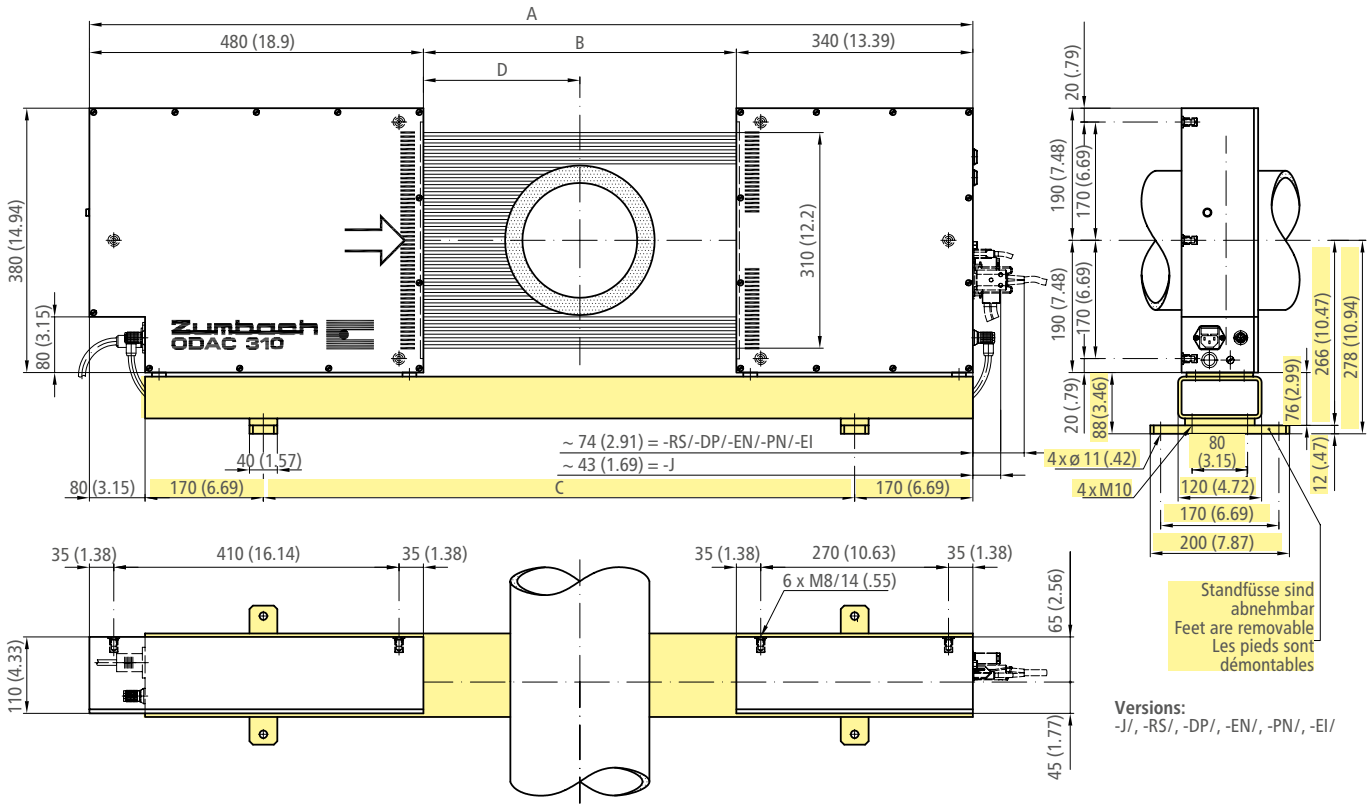
The proximity switch is used for the length detection.
Main data:
– Standard: EN 60947-5-6 (NAMUR, NC)
– Switching distance max. 2 mm (.08 in.), flush mounting
– Ambient temperature: -25...100° C (-13...212° F)
– Protection: IP 67
– Connection: PVC cable 2 m (6.5 ft.)



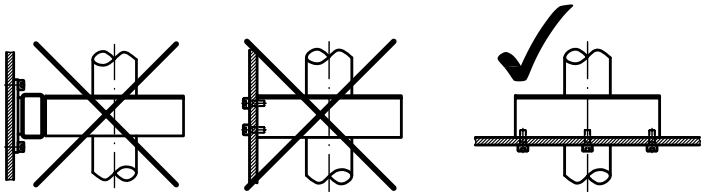

| | |
|---|---|
| **Signal cable L2 Bus 1DR22 x 02R** | **A13 252 0150** |

For the connection between the Profibus DP interface and the customer's data acquisition system. Only for ODAC DP version.

# Dimensions




**Installation in Vertical Lines**



| Model | A | B | Models with rail C | D |
|---|---|---|---|---|
| ODAC.310.DT.250 | 1320 (51.97) | 500 (19.69) | 900 (35.43) | 250 (9.84) |
| ODAC.310.DT.500 | 1820 (71.65) | 1000 (39.37) | 1400 (55.12) | 500 (19.69) |
| ODAC.310.DT.750 | 2320 (91.34) | 1500 (59.06) | 1900 (74.8) | 750 (29.53) |
| ODAC.310.DT.1000 | 2820 (111.02) | 2000 (78.74) | 2400 (94.49) | 1000 (39.37) |

Dimensions in mm (inch)

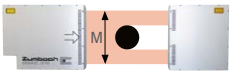
# Technical Data

| Measurement | | | | | |
|---|---|---|---|---|---|
| **Model(s)** | | **ODAC 310J**<br>**ODAC 310EN-xx** | **ODAC 310JP**<br>**ODAC 310EN-xxP** | **ODAC 310JN**<br>**ODAC 310EN-xxN** | **ODAC 310JSx** |
| Version | | Standard | Profile measurement | "Narrow Beam" [7] | Same with synchronization input |
| Measuring field M [1] | | 310 mm (12.2 in.) | | | |
| Min. object ø | | 1 mm (.04 in.) | | | |
| Scanning frequency scans/s | standard | 1000 | | 500 | |
| | option | F version: 2000 | | F version: 1000 | – |
| Scanning speed | | 606 m/s (1988 ft./s); F version: 1212 m/s (3976 ft./s) | | | |
| Width of laser beam [6] | | 8 mm (0.3 in.) | | 1.4 mm (.055 in.) | see J/JP/JN |
| Repeatability (3 σ) at measuring distance D and averaging time (s) | 250 mm ( 9.84 in.) | 2.0 µm (0.1 s)<br>(.00008 in.) | 1.0 µm (1 s)<br>(.00004 in.) | 3.0 µm (0.1 s)<br>(.00012 in.) | 1.5 µm (1 s)<br>(.00006 in.) |
| | 500 mm (19.69 in.) | 2.5 µm (0.1 s)<br>(.0001 in.) | 1.2 µm (1 s)<br>(.000047 in.) | 3.7 µm (0.1 s)<br>(.000145 in.) | 1.8 µm (1 s)<br>(.000071 in.) |
| | 750 mm (29.53 in.) | 3.0 µm (0.1 s)<br>(.00012 in.) | 1.5 µm (1 s)<br>(.00006 in.) | 4.5 µm (0.1 s)<br>(.00018 in.) | 2.2 µm (1 s)<br>(.00087 in.) |
| | 1000 mm (39.37 in.) | 3.5 µm (0.1 s)<br>(.00014 in.) | 1.7 µm (1 s)<br>(.000067 in.) | 5.0 µm (0.1 s)<br>(.0002 in.) | 2.5 µm (1 s)<br>(.0001 in.) |
| Measurement error centric at measuring distance D [2] | | 250 mm ( 9.84 in.) | ± 25 µm (.00098 in.) | | |
| | | 500 mm (19.69 in.) | ± 32 µm (.00126 in.) | | |
| | | 750 mm (29.53 in.) | ± 40 µm (.00157 in.) | | |
| | | 1000 mm (39.37 in.) | ± 45 µm (.00177 in.) | | |
| Measurement error within the measuring zone [3] | | 1.25 x value of the measurement error centric (ODAC 310xxP: 1.5 x value of the measurement error centric) | | | |
| Measuring zone (width x height) | | 200 x 300 mm (7.87 x 11.81 in.) | 400 x 300 mm (15.75 x 11.81 in.) | 200 x 300 mm (7.87 x 11.81 in.) | see J/JP/JN |
| Resolution [4] | | 1 µm (.00005 in.) | | | |
| Light source [5] | | HeNe Laser, class 2 | | | |
| Types of measurement (see page 1) | | 1, 2, 3, 4, 5 | | | 1, 6, 7 |

| Interfaces / Connections | | | | | | |
|---|---|---|---|---|---|---|
| **Model(s)** | **ODAC 310EN-RSx** | **ODAC 310EN-DPx** | **ODAC 310EN-ENx** | **ODAC 310EN-PNx** | **ODAC 310EN-EIx** | **ODAC 310Jx** |
| Interface Service | Ethernet TCP/IP, RJ45, 10/100BaseT, isolated | | | | | Only J interfaces to Zumbach processors: WIREMASTER, USYS 20, USYS 200, USYS IPC 1e, USYS IPC 2e, CI 1J/EN-RS/-DP/-EN/-PN<br><br>JSx interfaces via Synchrobox CI 2JS/1J to the ZUMBACH processors |
| Interface Host | RS-232/-422/-485 D-sub. connectors 9p./m, isolated. Data rate: up to 333/s | Profibus DP (RS-485), D-sub. connector 9p./f, isolated. Update rate: up to 62/s (fast: 125/s) | Ethernet TCP/IP, 2 x RJ45, 10/100BaseT isolated. Data rate: up to 333/s | Profinet IO, 2 x RJ45, 10/100BaseT isolated. Update rate: up to 62/s (fast: 125/s) | | |
| Interface LOC | Only for Zumbach local display LOC 01 | | | | | |
| Interface I/F | Can be used for the connection of a remote interface (e. g. AI 4-ODAC) or as digital input for the length detector (e.g. proximity switch according to EN 60947-5-6, NAMUR) | | | | | |
| LED Service interface | Indicates link and traffic | | | | | – |
| LED Host interface | Indicates traffic | Indicates traffic and error | Indicates link and traffic | Indicates link, traffic, system error and bus error | | |
| Indicator of contaminated windows | Flashing LED on the measuring head (relay output 48 V / 0.5 A as option) | | | | | |
| Power supply | 90...265 VAC, 48...62 Hz, 20 VA | | | | | supplied by the processor unit (24 V) |

| Operation conditions / Miscellaneous | |
|---|---|
| Ambient temperature | Operating: 0...45° C (32...113° F), Transport / Storage: -20...50° C (-4...122° F) |
| Max. atmospher. humidity | 95% (non condensing) |
| Altitude | 0...2500 m (0...8200 ft.) over sea level |
| Type of protection | Case IP 65, connection plate IP 40 |
| Weight | Emitter: 21.5 kg (47.4 lbs.), Receiver: 13.5 kg (29.8 lbs.), Rail short (DT250): 18 kg (39.7 lbs.) |

[1] M stands for measuring field height. In practice, the largest object diameter corresponds to Measuring Field Height minus instability of position.




[2] Valid for object diameter bigger than "Min. object ø" and smaller than 95% from "measuring field M". The centre of the object is at the "measuring distance D" as well as in the middle of the "measuring field M".

[3] The measured borders of the object must be within this measuring zone. The centre of this measuring zone is at the "measuring distance D" as well as in the middle the "measuring field M".

[4] System resolution is the smallest practical value on the last digit of the display (adjustable).

[5] Maximum power of the laser can be read on the warning label.

[6] Measured in the measuring plane, including lateral Jitter of the scans.

[7] The xx**N** versions (Narrow beam) is recommended in case of products with very uneven surfaces, for the contour measurement and detection of surface defects, such as lumps and neckdowns.

All units, which are equipped with lasers, were designed to meet the regulations CDRH (USA), BS 4803, EN 60825-1, DIN/VDE 0837. They hold the warning and explanatory labels prescribed by EN 60825-1.


## Ordering Information

**When ordering, please specify the following:**

**1** Models: **ODAC 310Jx, -JSx or ODAC 310EN-RSx, -DPx, -ENx, -PNx, -EIx**
Versions: Standard, **P** (Profile measurement), **N** (Narrow Beam), **K** (Components, without rail) specify the measuring distance **D** (see page 3), **F** (Fast, with higher scan frequency)

**2** **Connection cable**

**2a** The connection between **ODAC 310EN-RS** and the higher level system is to be provided by the customer (via serial interface).

**2b** For **ODAC 310EN-DP**, the connection to a higher level system is made with the signal cable # A13 252 0150.

**2c** For the **ODAC 310EN-EN/-PN** version, the connection from the measuring head to the customer's Ethernet port can be made with a standard RJ45 Patch cable.

**2d** **Length** of the connection cable between **ODAC 310Jx** and the processor. Available lengths: 1, 2, 3, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 m, each 10 m up to 200 m, 220 m, 240 m (3.3, 6.6, 10, 16, 33, 50, 65, 82, 98, 115, 131, 147, 164 ft., each 33 ft. up to 656 ft., 722 ft., 787 ft.). Longer cables on request.

**2e** For **"K" versions** (without rail): Length of the connection cable between emitter and receiver. Available lengths: 1.5, 2, 3, 4, 5, 6, 8 m (5, 6.5, 10, 13, 16.4, 19.7, 26.2 ft.). Minimum length = 2 x measuring distance D **+** 0.9 m (3 ft.). Order no. B.ODAC.821.32xxx.

**3** **Processor model** (Data acquisition system), only for **ODAC 310Jx**: WIREMASTER, USYS 20, USYS 200, USYS IPC 1e, USYS IPC 2e, CI 1J/EN-RS, CI 1J/EN-DP, CI 1J/EN-EN, CI 1J/EN-PN. ►Ask for corresponding data sheets.

• Technical specifications are subject to change without notice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