MICRO-EPSILON

# More Precision.

## POSITION MONITORING OF TELESCOPIC SUPPORTS


# Variable Support Displacement of Mobile Cranes and Lift Trucks

Maximum operational readiness is an important criterion for elevating work platforms and vehicle-mounted cranes. Load torque limiters monitor the maximum permitted load that is allowed to be moved. In the limit area, the load torque limiter must automatically recognise whether the crane must be shut down. One important factor for the maximum permissible lifting capacity is the current support displacement. Due to the individual operating environments, often the supports cannot be fully extended so that only a reduced load torque is permitted. The fully variable support now offers the possibility to determine and approve the maximum load torque for any support displacement. The support displacement is automatically measured by using suitable sensor technology.

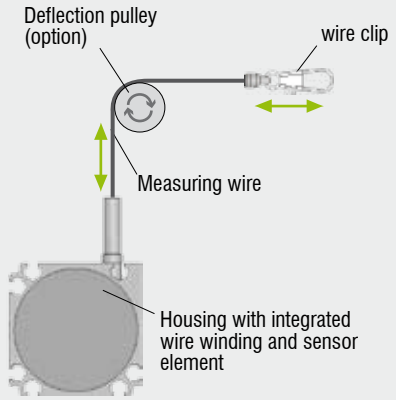
The support displacement is measured using draw-wire sensors with typical measuring ranges between 1,500mm and 4,000mm. In order to achieve maximum safety, two sensors per support are normally required for a redundant measurement. This means that connection of the sensors to the vehicle electronics can be either analogue using current, voltage or a potentiometer, or digital via field buses (CANopen, Profibus etc.). In particular, the telescopic capability and simplified (retrofit is also possible) mounting make draw-wire sensors ideal for these types of application.

**Decisive benefits:**

- **Price/performance ratio**
- **Low space requirements (telescopic)**
- **Simplified mounting (including retrofitting)**
- **Various measuring ranges and output types**
- **Measuring ranges up to 4m**
- **Ambient temperature -40° … +80°C**
- **Robust sensor design**

**The draw-wire measurement principle**

Draw-wire displacement sensors measure linear movements using a highly flexible steel wire. The wire drum is connected to a sensor element, which produces a proportional output signal. Measurements are performed to a high accuracy and dynamics. Due to their high quality components, the sensors benefit from a long service life and high operational reliability.




## § Extract from the current accident prevention regulations

BGV D6 §16

"Mobile cranes and portable cranes where the load is attached to a boom or jib must have equipment for their force-operated lifting, boom retraction and trolley running gear which prevents exceeding the permitted load torque. Work movements which cause a reduction of the load torque must still be possible after tripping the load torque limiter".

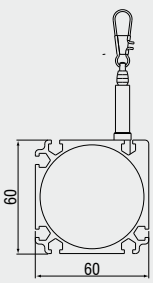
§16 (1b):
"In the case of exceeding the permitted load torque, this requirement is fulfilled if all crane work movements which cause an increase of the load torque are automatically stopped, e.g. the extension (telescoping) or lowering of the boom, the extension of the trolley.

(This extract makes no claims for completeness).

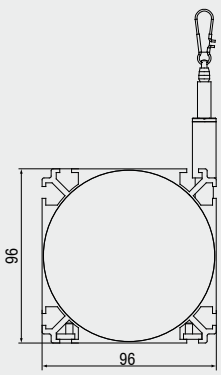
# SENSOR OVERVIEW

| | | Available measurement ranges | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Output | 100 | 150 | 300 | 500 | 750 | 1000 | 1500 | 2000 | 2300 | 2500 | 3000 | 4000 | 5000 | 7500 | 10000 | 15000 |
| P60 analogue | P - U - I | • | • | • | • | • | • | • | | | | | | | | | |
| P60 digital | HTL - TTL - PP - TTL2 - PB - CO - SSI | | | | | | • | • | | • | | | | | | | |
| P96 analogue | P - U - I | | | | | | | | • | | • | | | | | | |
| P96 digital | HTL - TTL - SSI - PB - CO | | | | | | | | | | | • | | | | | |
| P115 analogue | P - U - I | | | | | | | | | | | • | • | • | • | • | • |
| P115 digital | HTL - TTL - SSI - PB - CO | | | | | | | | | | | | | • | • | • | • |

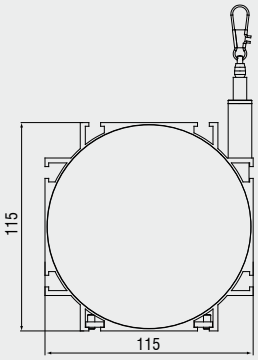
P = Potentiometer; U = Voltage; I = Current; TTL (HTL) = Incremental Encoder; SSI, PB, CO = Absolut Encoder; PP = 2 x Potentiometer; TTL2 = 2 x TTL




**WDS-P60**




**WDS-P96**




**WDS-P115**

## High performance sensors made by Micro-Epsilon

**Sensors and systems for displacement, position and dimension**
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**Micro-Epsilon Messtechnik GmbH & CO. KG**

A member of micro-epsilon group

Koenigbacher Straße 15
94496 Ortenburg / Germany

Phone +49 8542 1680
Fax +49 8542 16890

info@micro-epsilon.com
www.micro-epsilon.com



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