



More Precision.

wire**SENSOR**

Draw-wire displacement sensors



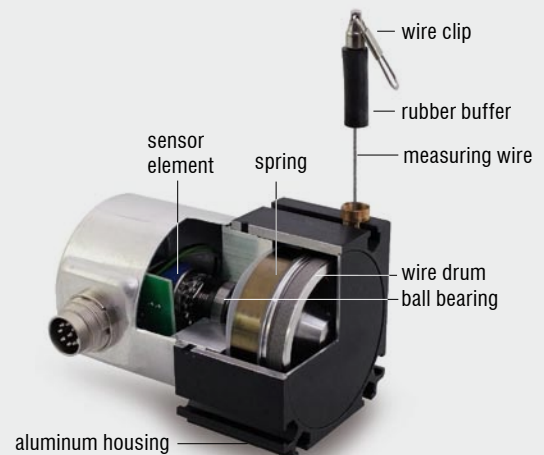


- Measuring ranges to 50,000mm
- Resolution quasi infinite
- Compact overall design
- Easy mounting for any application
- High reliability and long life cycle
- Analog and digital outputs

Principle

Draw-wire displacement sensors measure linear movements using a highly flexible steel cable. The cable drum is attached to a sensor element which provides a proportional output signal. Measurements are performed with high accuracy and high dynamic response. The use of high quality components guarantees a long life cycle and high operational reliability. MICRO-EPSILON offers a wide selection of draw-wire displacement sensors with numerous types of output signal. This means that each customer has the opportunity of selecting

the best sensor for his application. Choose between analog and digital outputs to optimize your individual measurement task. OEM-solutions for customized integration possible. wireSENSORS are application friendly due to the excellent measurement range to size ratio and the fact that they are easy to mount and use. The rugged sensor construction ensures reliable operation even under difficult ambient conditions.



Sensor design WDS-P60

| Model | Measuring range (mm) | | | | | | | | | | | | | | | | | | | page | | | | |
|---------------|----------------------|-------------|-------------|-----|-------------|-------------|-------------|-------------|------|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------|------|--------|--------|--------|-------|
| | 50 | 100 | 150 | 250 | 300 | 500 | 750 | 1000 | 1250 | 1500 | 2000 | 2500 | 3000 | 4000 | 5000 | 7500 | 10.000 | 15.000 | 30.000 | | 40.000 | 50.000 | | |
| MK30 analog | P | | P | P | | P | P | | | | | | | | | | | | | | | | 6-7 | |
| MK30 digital | | | | | | E | E | | | | | | | | | | | | | | | | 8-9 | |
| MK46 analog | | | | | | | | P | P | | | | | | | | | | | | | | 10-11 | |
| MK46 digital | | | | | | | | | E | | | | | | | | | | | | | | 12-13 | |
| MK 77 analog | | | | | | | | | | | P | | | | | | | | | | | | 14-15 | |
| MK 77 digital | | | | | | | | | | | | E | | | | | | | | | | | 16-17 | |
| MK 120 analog | | | | | | | | | | | | | P U I | | P U I | P U I | | | | | | | 18-19 | |
| MPM analog | P | | P | P | | | | | | | | | | | | | | | | | | | 20-21 | |
| MP/MPW analog | | P | | | P | P | | P | | | | | | | | | | | | | | | 22-23 | |
| P60 analog | | P U I | P U I | | P U I | P U I | P U I | P U I | | | P U I | | | | | | | | | | | | 24-25 | |
| P60 digital | | | | | | | | E A | | E A | | | | | | | | | | | | | 26-27 | |
| P96 analog | | | | | | | | | | | P U I | P U I | | | | | | | | | | | 28-29 | |
| P96 digital | | | | | | | | | | | | | E A | | | | | | | | | | 30-31 | |
| P115 analog | | | | | | | | | | | | | P U I | P U I | P U I | P U I | P U I | P U I | | | | | 32-33 | |
| P115 digital | | | | | | | | | | | | | | | E A | E A | E A | E A | | | | | 34-35 | |
| P200 digital | | | | | | | | | | | | | | | | | | | | | E A | E A | E A | 36-37 |
| mechanics | | | | | | | | | | M | | | M | | M | M | M | M | M | M | M | M | M | 38-39 |

P potentiometer U voltage I current E incremental encoder A absolute encoder M mechanics

Available sensor series

wireSENSOR MK30/MK77/MK120



wireSENSOR MPM/MPW



wireSENSOR P60/P96



wireSENSOR P115

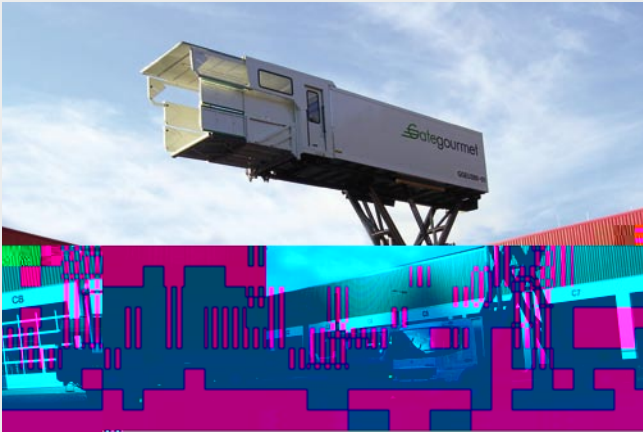


wireSENSOR P200



wireSENSOR mechanics





Positioning of catering trucks at Airbus A380



Positioning of operating tables



Variable support for mobile cranes and cherry picker platforms



Release of satellites into space



Displacement measurement on slag transporter



Position measurement on X-ray machines



Lift-height measurement in fork-lift trucks

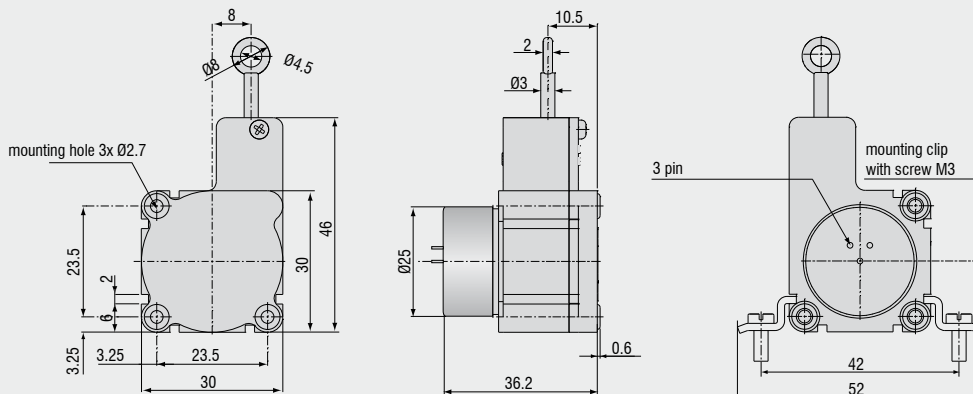


Height of lifting platforms on automobile production lines

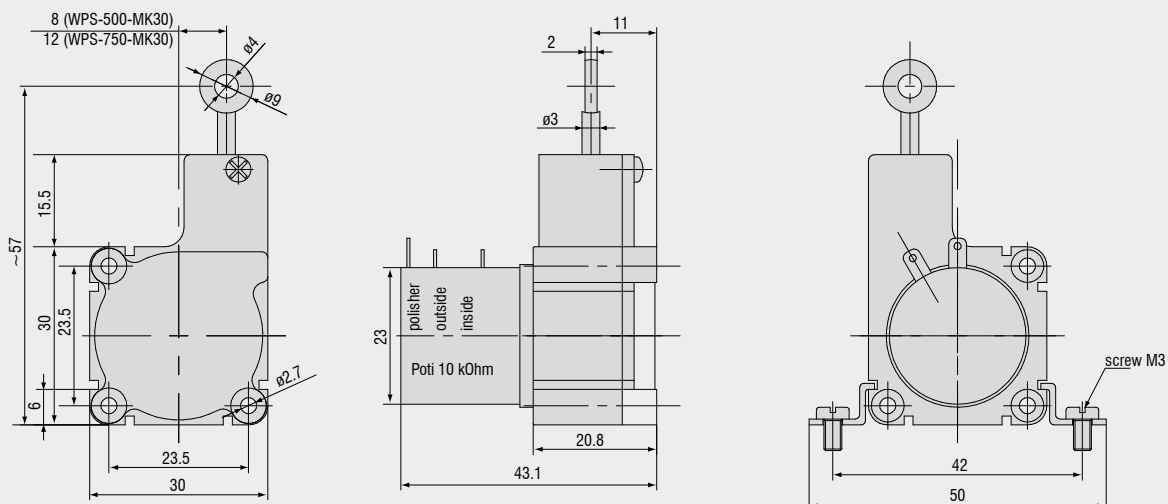


- Robust plastic housing
- Customized versions for OEM
- Conductive plastic/wire/hybrid potentiometer
- Smallest design in its class

Model MK30-P (Measuring range 50mm)



Model MK30-P (Measuring range 150/250/500/750/1000/1250mm)



| Model | | WPS-50-MK30 | WPS-150-MK30 | WPS-250-MK30 | WPS-500-MK30 | WPS-750-MK30 |
|-------------------------------------|-----------------------------|--|----------------|--------------|--------------|--------------|
| Output | | P | | | | |
| Measuring range | | 50mm | 150mm | 250mm | 500mm | 750mm |
| Linearity | conductive plastic pot. P50 | ±0.5% FSO | 0.25mm | - | - | - |
| | wire pot. P25 | ±0.25% FSO | - | - | 0.625mm | 1.25mm |
| | hybrid pot. P25 | ±0.25% FSO | - | 0.375mm | - | - |
| | hybrid pot. P10 | ±0.1% FSO | - | - | 0.25mm | 0.5mm |
| Resolution | conductive plastic pot. | | quasi infinite | | | |
| | wire pot. | | - | 0.1mm | 0.1mm | 0.15mm |
| conductive plastic pot./hybrid pot. | | | quasi infinite | | | |
| Sensor element | | conductive plastic/wire/hybrid potentiometer | | | | |
| Temperature range | | -20 ... +80°C | | | | |
| Material | housing | plastic | | | | |
| | draw wire | coated polyamid stainless steel (ø 0.36mm) | | | | |
| Wire mounting | | eyelet | | | | |
| Sensor mounting | | mounting holes / mounting grooves | | | | |
| Wire acceleration | | appr. 5g | | | | |
| Wire retraction force (min) | | appr. 1N | | | | |
| Wire extension force (max) | | appr. 2.5N | | | | |
| Protection class | | IP 20 | | | | |
| Electrical connection | | soldering tag | | | | |
| Weight | | appr. 45g | | | | |

FSO = Full Scale Output

Specifications for analog outputs on page 43.

Article description

WPS - 50 - MK30 - P25

Output option:
 potentiometer P50 (linearity ±0.5 % FSO)
 potentiometer P25 (linearity ±0.25 % FSO)
 potentiometer P10 (linearity ±0.1 % FSO)

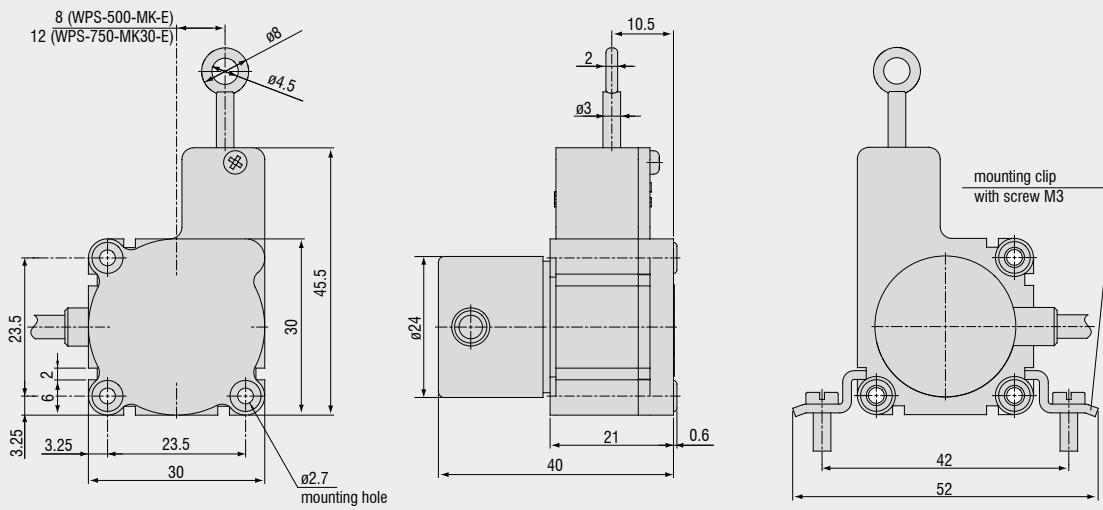
Model MK30

Measuring range in mm



- Robust plastic housing
- Customized versions for OEM
- Smallest design in its class
- Incremental encoder

Model MK30



| Model | | WPS-500-MK30 | WPS-750-MK30 |
|-----------------------------|------------|--|---------------|
| Output | | E/E830 | E/E830 |
| Measuring range | | 500mm | 750mm |
| Linearity E | ±0.05% FSO | 0.25mm | 0.375mm |
| Resolution | | 10 Pulses/mm | 6.7 Pulses/mm |
| | | 0.1mm | 0.15mm |
| Sensor element | | Incremental encoder | |
| Temperature range | | -20 ... +80°C | |
| Material | housing | plastic | |
| | draw wire | coated polyamid stainless steel (ø 0.36mm) | |
| Wire mounting | | eyelet | |
| Sensor mounting | | mounting holes / mounting grooves | |
| Wire acceleration | | appr. 5g | |
| Wire retraction force (min) | | appr. 1N | |
| Wire extension force (max) | | appr. 2.5N | |
| Protection class | | IP54 | |
| Electrical connection | | cable radial, 1m | |
| Weight | | ca. 80g | |

FSO = Full Scale Output
 Specifications for digital outputs on page 47.

Article description

WPS - 500 - MK30 - E830

Output option:
 encoder E (5 ... 24VDC)
 encoder E830 (8 ... 30VDC)

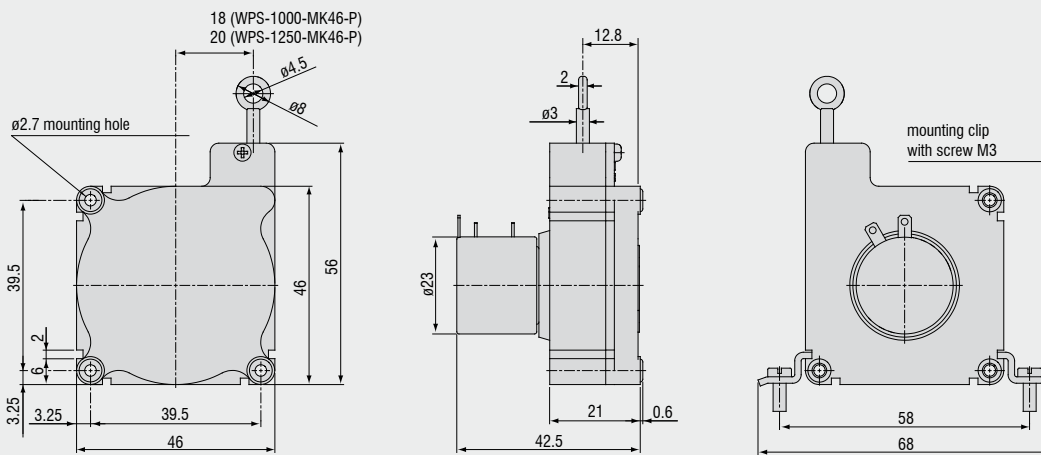
Model MK30

Measuring range in mm

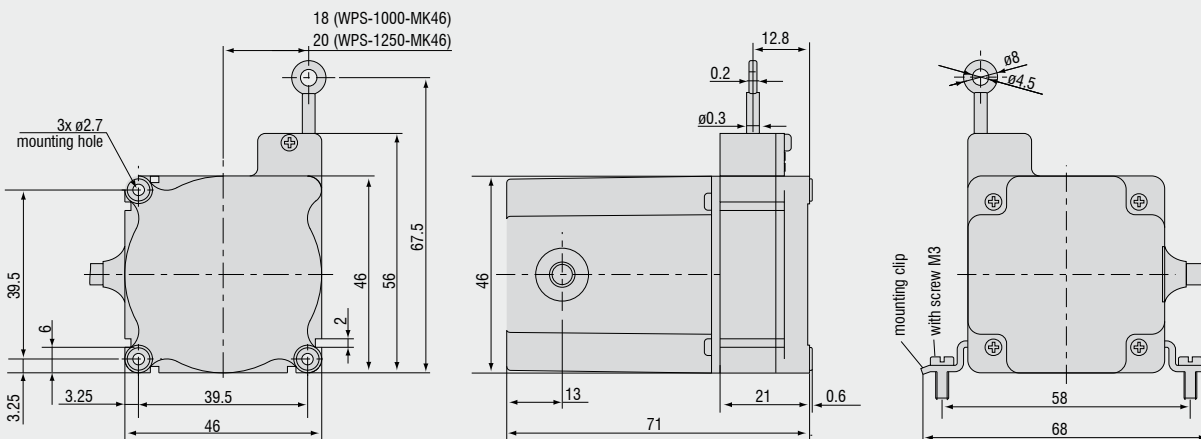


- Robust plastic housing
- Customized versions for OEM
- Wire/hybrid potentiometer

Model MK46 Output P10/P25



Model MK46 Output CR-P25



| Model | | | WPS-1000-MK46 | WPS-1250-MK46 |
|-----------------------------|-----------------|------------------|--|---------------|
| Output | | | P | |
| Measuring range | | | 1000mm | 1250mm |
| Linearity | wire pot. P25 | $\pm 0.25\%$ FSO | 2.5mm | 3.12mm |
| | hybrid pot. P10 | $\pm 0.1\%$ FSO | 1mm | 1.2mm |
| Resolution | wire pot. P25 | | 0.3mm | 0.4mm |
| | hybrid pot. P10 | | quasi infinite | |
| Sensor element | | | wire/hybrid potentiometer | |
| Temperature range | | | -20 ... +80°C | |
| Material | housing | | plastic | |
| | draw wire | | coated polyamid stainless steel (\varnothing 0.36 mm) | |
| Wire mounting | | | eyelet | |
| Sensor mounting | | | mounting holes / mounting grooves | |
| Wire acceleration | | | appr. 5g | |
| Wire retraction force (min) | | | appr. 1N | |
| Wire extension force (max) | | | 1.6N | 1.5N |
| Protection class | | | IP 20 | |
| Electrical connection | P10, P25 | | soldering tag | |
| | CR-P25 | | integrated cable, radial, 1m | |
| Weight | | | appr. 80g | |

FSO = Full Scale Output
 Specifications for analog outputs on page 43.

Article description

WPS - 1000 - MK46 - P25

Output option:
 potentiometer P25 (linearity $\pm 0.25\%$ FSO)
 potentiometer P10 (linearity $\pm 0.1\%$ FSO)
 potentiometer CR-P25, integrated cable, radial, 1m

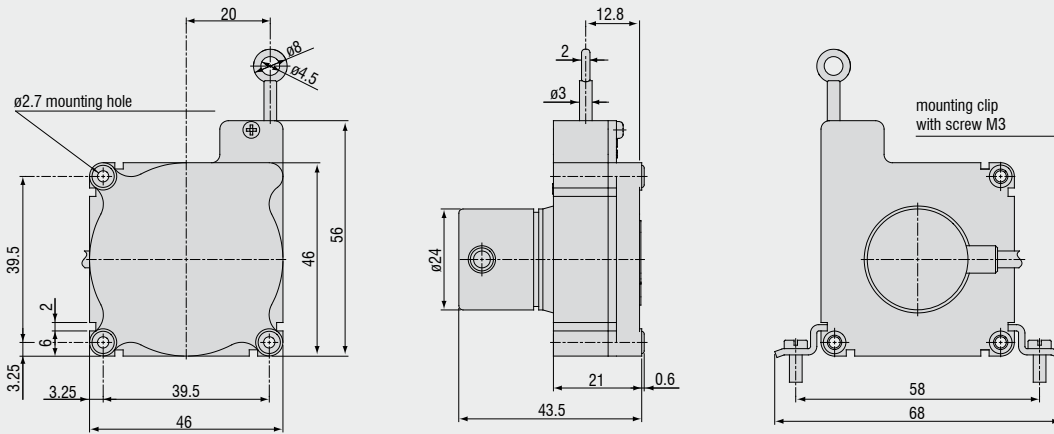
Model MK46

Measuring range in mm



- Robust plastic housing
- Customized versions for OEM
- Incremental encoder

Model MK46



| Model | | WPS-1250-MK46 | |
|-----------------------------|-----------|---------------|--|
| Output | | | E/E830 |
| Measuring range | | | 1250mm |
| Linearity | encoder | ±0.05% FSO | 0.625mm |
| Resolution | | | 4 Pulses/mm |
| | | | 0.25mm |
| Sensor element | | | incremental encoder |
| Temperature range | | | -20 ... +80°C |
| Material | housing | | plastic |
| | draw wire | | coated polyamid stainless steel (ø 0.36mm) |
| Wire mounting | | | eyelet |
| Sensor mounting | | | mounting holes / mounting grooves |
| Wire acceleration | | | appr. 5g |
| Wire retraction force (min) | | | appr. 1N |
| Wire extension force (max) | | | 1.5N |
| Protection class | | | IP54 |
| Electrical connection | | | cable radial, 1m |
| Weight | | | appr. 120g |

FSO = Full Scale Output
 Specifications for digital outputs on page 47.

Article description

WPS - 1250 - MK46 - E

Output option:
 encoder E (5 ... 24VDC)
 encoder E830 (8 ... 30VDC)

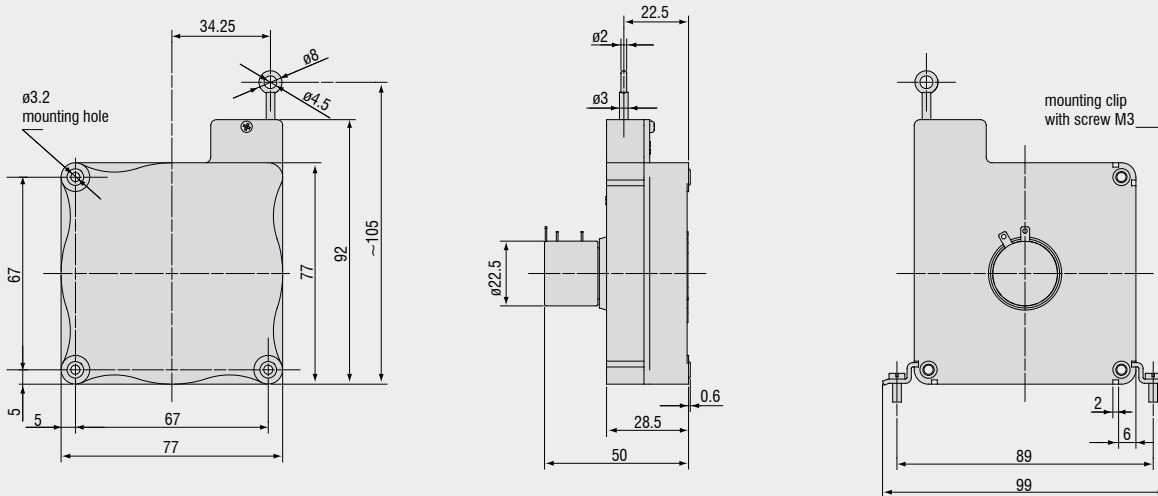
Model MK46

Measuring range in mm

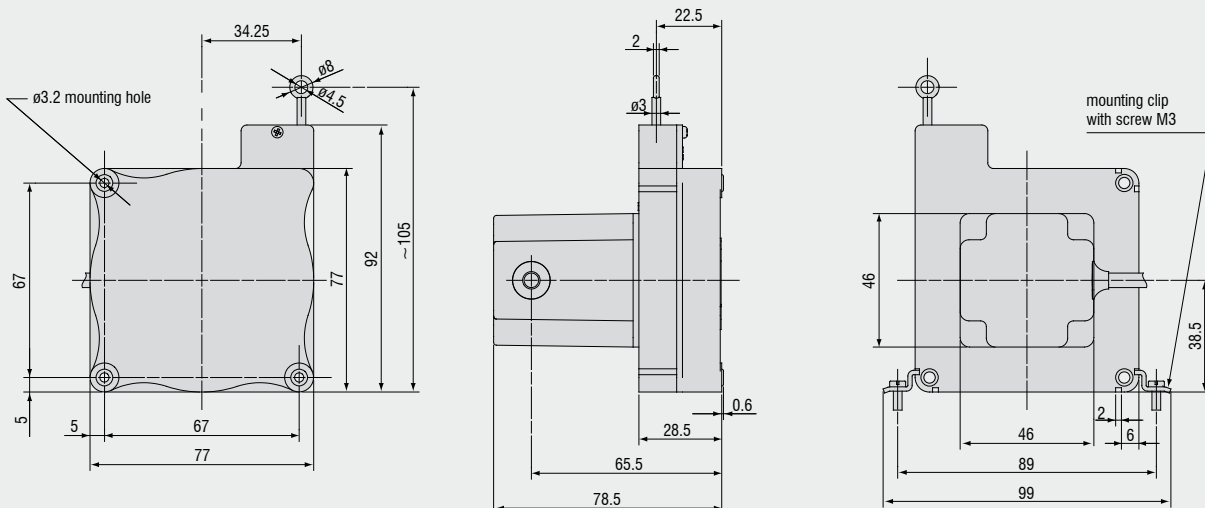


- Robust plastic housing
- Customized versions for OEM
- Wire potentiometer

Model MK77 Output P25



Model MK77 Output CR-P25



| Model | | WPS-2100-MK77 | |
|-----------------------------|-----------|------------------|-----------------------------------|
| Output | | | P25 |
| Measuring range | | | 2100mm |
| Linearity | wire pot. | $\pm 0.25\%$ FSO | 5.25mm |
| Resolution | wire pot. | | 0.55mm |
| Sensor element | | | wire potentiometer |
| Temperature range | | | -20 to 80°C |
| Material | housing | | plastic |
| | draw wire | | coated polyamid stainless steel |
| Wire mounting | | | eyelet |
| Sensor mounting | | | mounting holes / mounting grooves |
| Cable diameter | | | 0.45mm |
| Wire retraction force (min) | | | 3.5N |
| Wire extension force (max) | | | 5N |
| Wire acceleration | | | 5g |
| Protection class | | | IP 20 |
| Electrical connection | P25 | | soldering tag |
| | CR-P25 | | integrated cable radial, 1m |
| Weight | P25 | | ca. 0.2kg |
| | CR-P25 | | ca. 0.25kg |

FSO = Full Scale Output
 Specifications for analog outputs on page 43.

Article description

WPS - 2100 - MK77 - P25

Output option:
 potentiometer P25 (linearity $\pm 0.25\%$ FSO)
 potentiometer CR-P25, integrated cable, radial, 1m

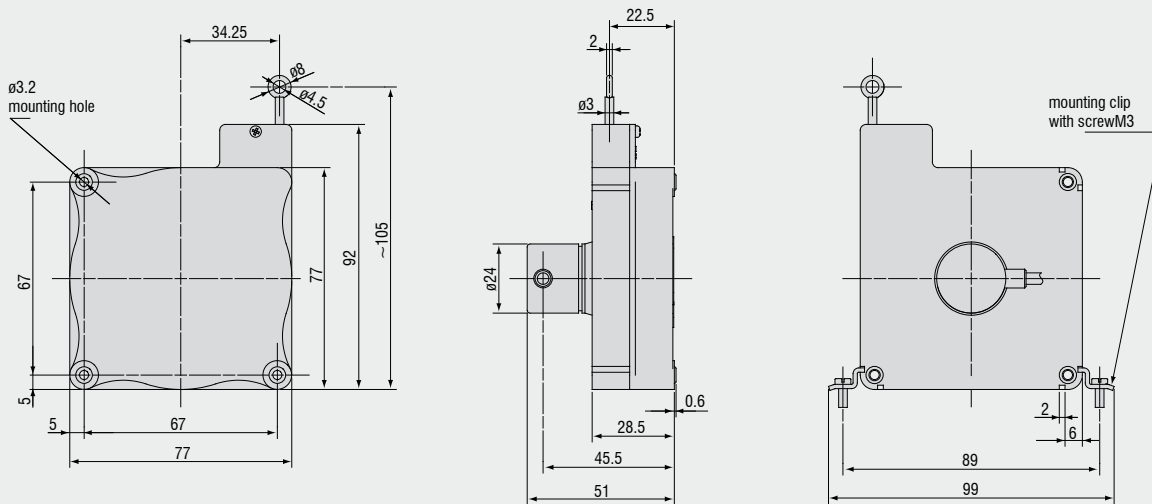
Model MK77

Measuring range in mm



- Robust plastic housing
- Customized versions for OEM
- Incremental/absolute encoder

Model MK77



| Model | WPS-2100-MK77 | |
|-----------------------------|-----------------------------------|--|
| Output | E/E830 | |
| Measuring range | 2100mm | |
| Linearity | 1.05mm | |
| | ±0.05% FSO | |
| Resolution | 0.43mm | |
| Sensor element | incremental encoder | |
| Temperature range | -20 to 80°C | |
| Material | housing | Plastic |
| | draw wire | coated polyamid stainless steel (ø 0.45mm) |
| Wire mounting | Eyelet | |
| Cable diameter | 0.45mm | |
| Sensor mounting | mounting holes / mounting grooves | |
| Wire retraction force (min) | 3.5N | |
| Wire extension force (max) | 5N | |
| Wire acceleration | 5g | |
| Protection class | IP 54 | |
| Electrical connection | cable radial, 2m | |
| Weight | appr. 0.27kg | |

FSO = Full Scale Output
 Specifications for digital outputs on page 47.

Article description

WPS - 2100 - MK77 - E

Output option:
 encoder E (5 ... 24VDC)
 encoder E830 (8 ... 30VDC)

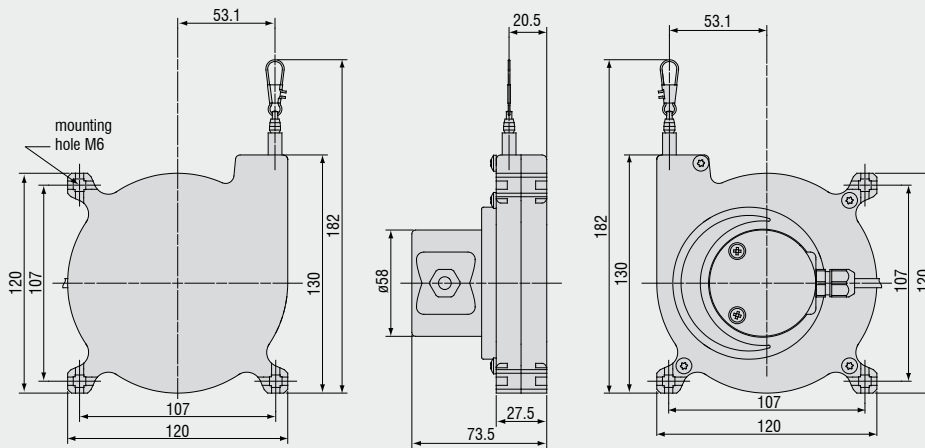
Model MK77

Measuring range in mm

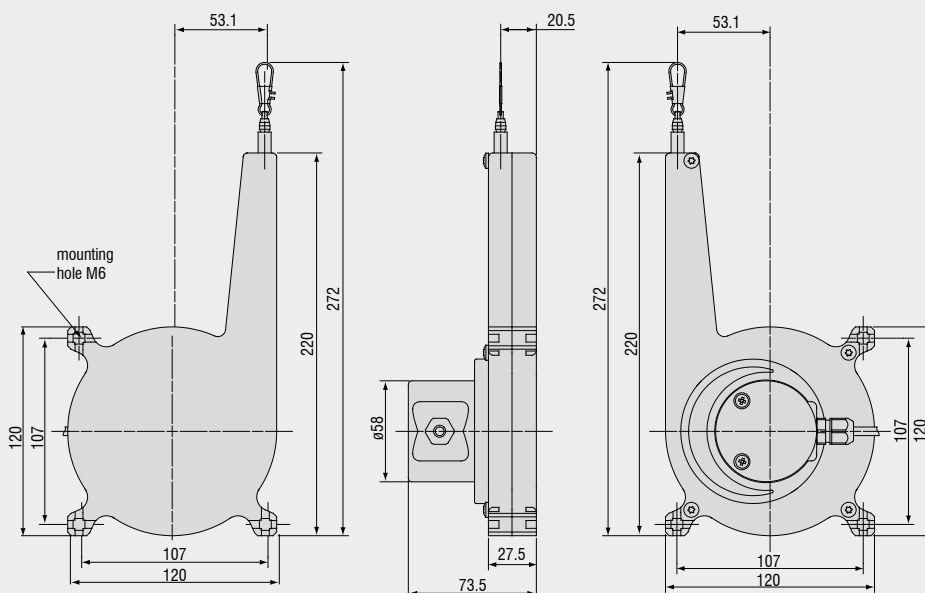


- Robust plastic housing
- Customized versions for OEM
- Potentiometer, current and voltage output

Model MK120 (Measuring range 3000, 5000mm)



Model MK120 (Measuring range 7500mm)



| Model | WPS-3000-MK120 | WPS-5000-MK120 | WPS-7500-MK120 |
|-----------------------------|-------------------------------------|----------------|----------------|
| Output | P/U/I | | |
| Measuring range | 3000mm | 5000mm | 7500mm |
| Linearity | ±0.15% FSO | ±4.5mm | ±7.5mm |
| Resolution | quasi infinite | | |
| Temperature range | -20 to 80°C | | |
| Material | housing | plastic PA6 | |
| | draw wire | 0.45mm coated | |
| Wire mounting | wire clip | | |
| Wire acceleration | | 2.5g | 1.5g |
| Wire retraction force (min) | 5.5N | 5N | 7N |
| Wire retraction force (max) | | 8N | 13N |
| Electrical connection | integrated cable, radial, 1m length | | |
| Protection class | IP 65 | | |
| Weight | | 0.75kg | 0.9kg |

FSO = Full Scale Output
 Specifications for analog outputs on page 43.

Article description

WPS - 3000 - MK120 - CR - P

Output option:
 P: potentiometer
 U: voltage
 I: current

Connection CR: integrated cable, radial, 1m

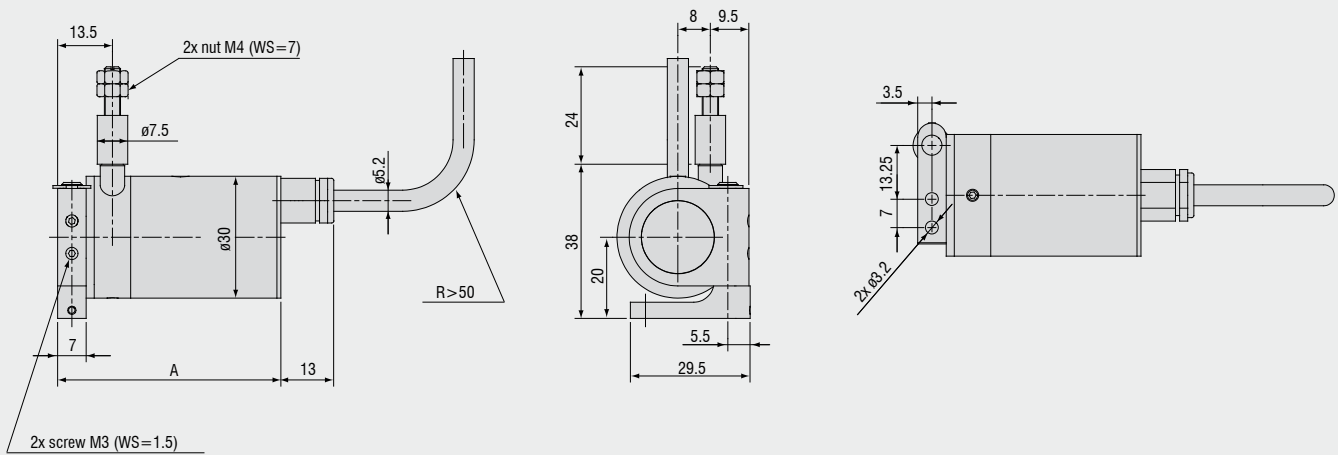
Model MK120

Measuring range in mm



- Extreme compact miniature sensor
- Flexible mounting via swivel flange
- High speed measurement, wire acceleration up to 100g

Model MPM



| Measuring range (mm) | A (mm) |
|----------------------|--------|
| 50 | 55 |
| 150 / 250 | 64 |
| 50-HG | 61 |
| 150 / 250-HG | 70 |

| Model | | WDS-50 MPM | WDS-150 MPM | WDS-250 MPM |
|-----------------------------|------------|---|----------------------|-------------|
| Output | | | P | |
| Measuring range | | 50mm | 150mm | 250mm |
| Linearity | ±0.2% FSO | - | ±0.3mm | ±0.5mm |
| | ±0.25% FSO | ±0.125mm | - | - |
| Resolution | | quasi infinite | | |
| Sensor element | | conductive plastic potentiometer | hybrid potentiometer | |
| Temperature range | | -20 ... +80°C | | |
| Material | housing | aluminium | | |
| | draw wire | stainless steel (ø 0.45mm) | | |
| Sensor mounting | | swivel flange in two axes 180° / 360° | | |
| Wire mounting | | thread M4 | | |
| Wire acceleration | | appr. 25g (Option HG: 100g) | | |
| Wire retraction force (min) | | 1.5N (Option HG: 10N) | | |
| Wire extension force (max) | | 3.5N (Option HG: 17N) | | |
| Protection class | | IP 65 | | |
| Vibration | | 20g, 20Hz - 2kHz | | |
| Mechanical shock | | 50g, 20ms | | |
| Electrical connection | | integrated cable, axial, 3-leads, 1m long | | |
| Weight | | appr. 150g | | |

FSO = Full Scale Output
 Specifications for digital outputs on page 43.

Article description

WDS - 50 - MPM - C - P - HG

Option HG: Wire acceleration up to 100g

Output option:
 P: potentiometer

Connection:
 C: integrated cable, axial, 1m

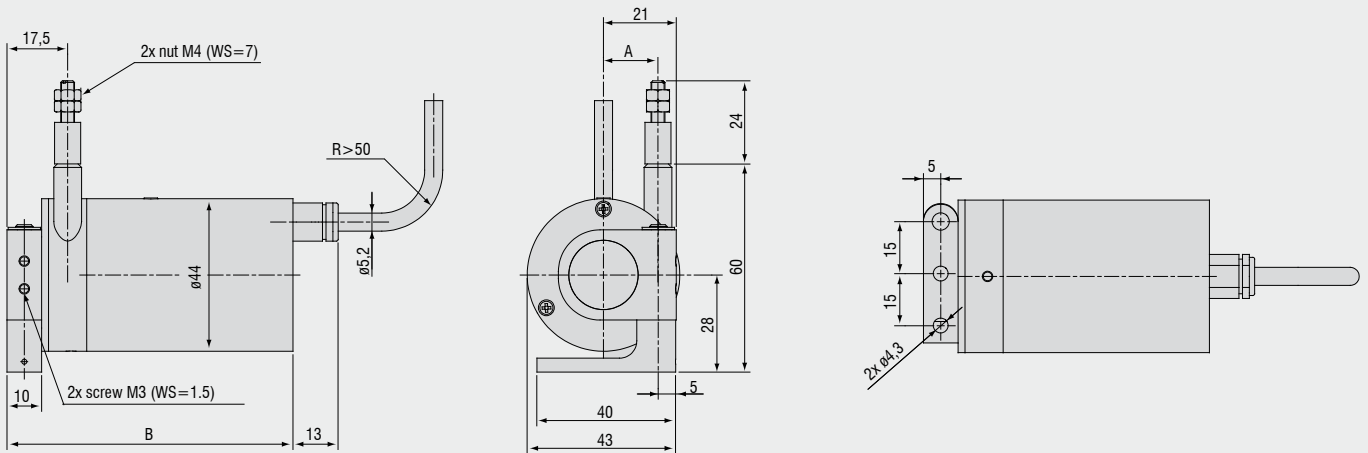
Model MPM

Measuring range in mm



- Miniature design
- Optional IP 67 (MPW)
- For fast measurement and harsh environments

Model MP / MPW



| Measuring range (mm) | A (mm) | B (mm) |
|----------------------------|--------|--------|
| 100 / 300 / 500 / 1000-MP | 15.7 | 82.5 |
| 100 / 300 / 500 / 1000-MPW | 15.7 | 86.5 |

| Model | | WDS-100 MP(W) | WDS-300 MP(W) | WDS-500 MP(W) | WDS-1000 MP(W) |
|-----------------------------|------------|---|---------------|----------------------|----------------|
| Output | | P | | | |
| Measuring range | | 100mm | 300mm | 500mm | 1000mm |
| Linearity | ±0.1% FSO | - | - | 0.5mm | 1mm |
| | ±0.25% FSO | - | 0.75mm | - | - |
| | ±0.5% FSO | 0.5mm | - | - | - |
| Resolution | | 0.15mm | 0.2mm | quasi infinite | |
| Sensor element | | wire potentiometer | | hybrid potentiometer | |
| Temperature range | | -20 ... +80°C | | | |
| Material | housing | aluminium | | | |
| | draw wire | stainless steel (ø 0.45mm) | | | |
| Wire mounting | | thread M4 | | | |
| Sensor mounting | | swivel flange in two axes 180° / 360° | | | |
| Wire acceleration | | appr. 30g | | | |
| Wire retraction force (min) | | 7N | 7N | 6.5N | 5N |
| Wire extension force (max) | | 8.5N | 8.5N | 8.5N | 8N |
| Protection class | series MP | IP 65 | | | |
| | series MPW | IP 67 | | | |
| Vibration | | 20g, 20Hz - 2kHz | | | |
| Mechanical shock | | 50g, 10ms | | | |
| Electrical connection | | integrated cable, axial, 3-leads, 1m long | | | |
| Weight | | appr. 270g | | | |

FSO = Full Scale Output

Specifications for analog outputs on page 43.

Article description

WDS - 100 - MP - C - P

Output option:
P: potentiometer

Connection:
C: integrated cable, axial, 1m

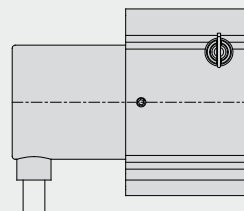
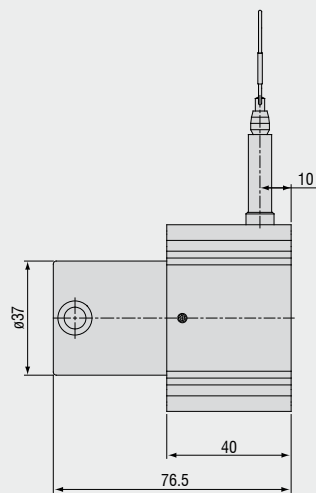
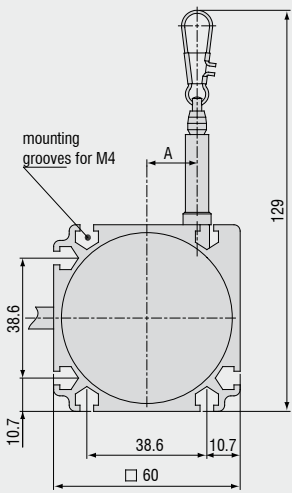
Model MP / MPW (IP67)

Measuring range in mm



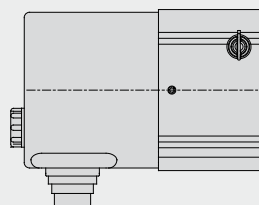
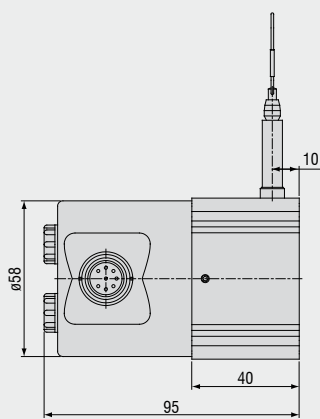
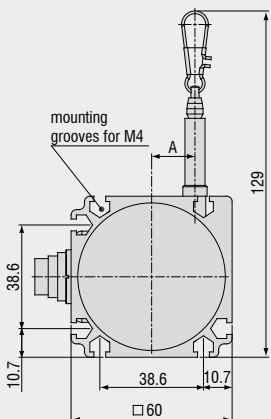
- Robust aluminium profile housing
- Customized versions for OEM
- Potentiometer, current and voltage output

Model P60 Output P



| Measuring range (mm) | A (mm) |
|------------------------|--------|
| 100 / 300 / 500 / 1000 | 16.15 |
| 150 / 750 / 1500 | 24.2 |

Model P60 Output U/I



| Measuring range (mm) | A (mm) |
|------------------------|--------|
| 100 / 300 / 500 / 1000 | 16.15 |
| 150 / 750 / 1500 | 24.2 |

| Model | | WDS-100- P60 | WDS-150- P60 | WDS-300- P60 | WDS-500- P60 | WDS-750- P60 | WDS-1000- P60 | WDS-1500- P60 | |
|-----------------------------|------------|---|-----------------|-----------------|-----------------|----------------------|------------------|------------------|-----|
| Output | | P/U/I | | | | | | | |
| Measuring range | mm | 100 | 150 | 300 | 500 | 750 | 1000 | 1500 | |
| Linearity | ±0.1% FSO | ±mm | - | - | - | 0.5 | 0.75 | 1 | 1.5 |
| | ±0.25% FSO | ±mm | - | - | 0.75 | - | - | - | - |
| | ±0.5% FSO | ±mm | 0.5 | 0.75 | - | - | - | - | - |
| Resolution | | quasi infinite | | | | | | | |
| Sensor element | | conductive plastic/wire potentiometer | | | | hybrid potentiometer | | | |
| Temperature range | | -20 ... +80°C | | | | | | | |
| Material | housing | aluminium | | | | | | | |
| | draw wire | coated polyamid stainless steel (ø 0.45mm) | | | | | | | |
| Sensor mounting | | mounting grooves in the housing | | | | | | | |
| Wire mounting | | wire clip | | | | | | | |
| Wire acceleration | | appr. 10 - 15g (dependent upon measuring range) | | | | | | | |
| Wire retraction force (min) | N | 6.5 | 4.5 | 6 | 6 | 4 | 5 | 3.5 | |
| Wire extension force (max) | N | 7.5 | 5.5 | 7.5 | 7.5 | 5.5 | 7.5 | 5.5 | |
| Protection class | | IP 65 (only if connected) | | | | | | | |
| Vibration | | 20g, 20Hz - 2kHz | | | | | | | |
| Mechanical shock | | 50g, 10ms | | | | | | | |
| Electrical connection | P | integrated cable, radial, 1m long | | | | | | | |
| | U/I | flange connector, radial, 8-pin, DIN45326 | | | | | | | |
| Weight | | appr. 370g | | | | | | | |

FSO = Full Scale Output
Specifications for analog outputs on page 43.

Article description

WDS - 100 - P60 - CR - P

Output option:
P = potentiometer (with connection CR)
U = voltage (with connection SR)
I = current (with connection SR)

Connection:
SR: radial plug
CR: integrated cable, radial, 1m

Model P60

Measuring range in mm



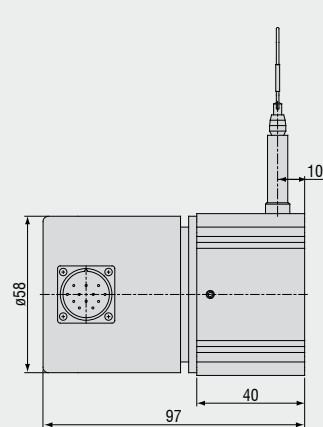
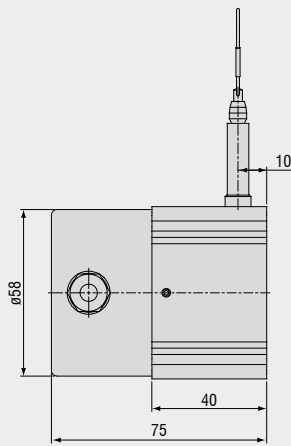
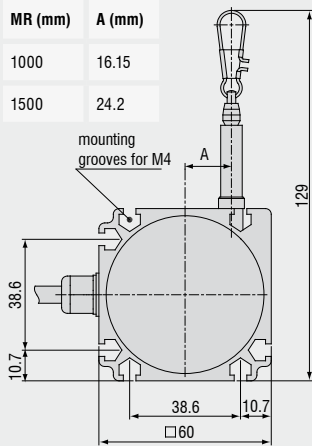
- Robust aluminium profile housing
- Customized versions for OEM
- Incremental/absolute encoder

Model P60

Output HTL/TTL

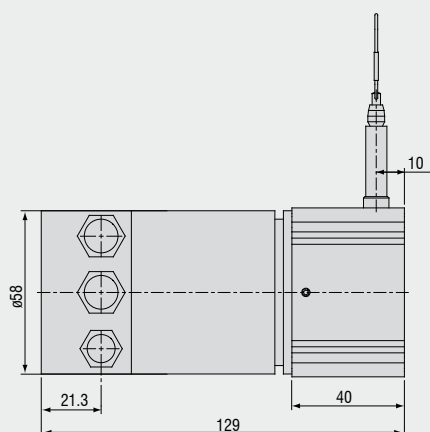
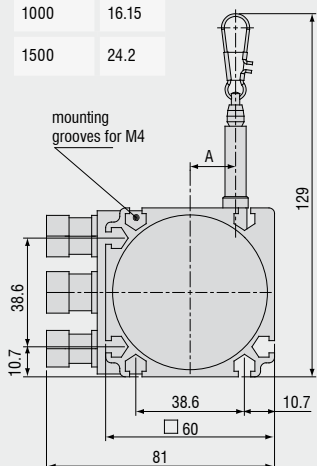
Output SSI

| MR (mm) | A (mm) |
|---------|--------|
| 1000 | 16.15 |
| 1500 | 24.2 |



Model P60 Output CO/PB

| MR (mm) | A (mm) |
|---------|--------|
| 1000 | 16.15 |
| 1500 | 24.2 |



| Model | | WDS-1000-P60 | WDS-1500-P60 |
|-----------------------------|-------------|--|----------------------|
| Output | | HTL/ TTL/ PB/ CO/ SSI | |
| Measuring range | | 1000mm | 1500mm |
| Linearity | ±0.02% FSO | ±0.2mm | ±0.3mm |
| Resolution | HTL, TTL | 0.067mm (15 Pulses/mm) | 0.1mm (10 Pulses/mm) |
| | SSI, PB, CO | 0.024mm | 0.03mm |
| Sensor element | | incremental encoder | |
| Temperature range | | -20 ... +80°C | |
| Material | housing | aluminium | |
| | draw wire | coated polyamid stainless steel (ø 0.45mm) | |
| Sensormontage | | mounting grooves in the housing | |
| Wire mounting | | wire clip | |
| Wire acceleration | | 10g | 15g |
| Wire retraction force (min) | | 5N | 3.5N |
| Wire extension force (max) | | 7.5N | 5.5N |
| Protection class | | IP 65 (only if connected) | |
| Vibration | | 20g, 20Hz - 2kHz | |
| Mechanical shock | | 50g, 10ms | |
| Electrical connection | HTL/TTL | integrated cable, radial, 1m long | |
| | SSI | flange connector, radial, 12-pin | |
| | PB/CO | bus cover | |
| Weight | | appr. 1kg | |

FSO = Full Scale Output

Specifications for digital outputs on page 44.

Article description

WDS - 1000 - P60 - CR - TTL

Output option:

HTL

TTL

CO: CANopen

PB: Profibus DP

SSI

Connection:

SR (Output SSI): radial plug

CR (Output HTL, TTL): integrated cable, radial, 1m

BH (Output CO, PB): bus cover

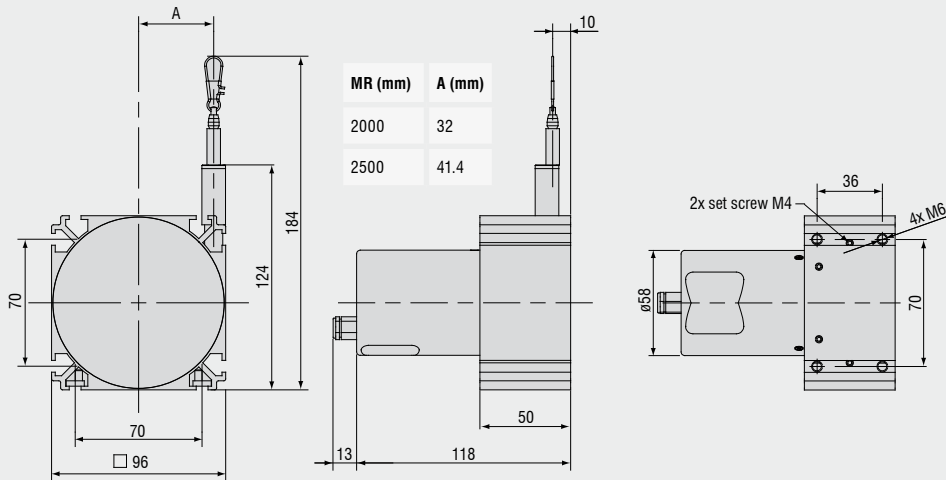
Model P60

Measuring range in mm

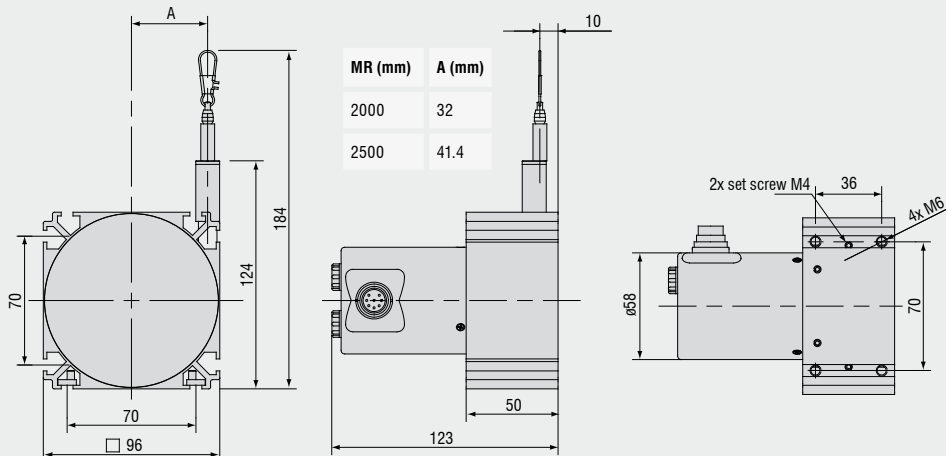


- Robust aluminium profile housing
- Customized versions for OEM
- Potentiometer, current and voltage output

Model P96 Output P



Model P96 Output U/I



| Model | | | WDS-2000-P96 | WDS-2500-P96 |
|-----------------------------|-----------|-----|---|--------------|
| Output | | | P/U/I | |
| Measuring range | mm | | 2000 | 2500 |
| Linearity | ±0.1% FSO | ±mm | 2.0 | 2.5 |
| Resolution | | | quasi infinite | |
| Sensor element | | | hybrid potentiometer | |
| Temperature range | | | -20 ... +80°C | |
| Material | housing | | aluminium | |
| | draw wire | | ø 0.8mm | |
| Sensor mounting | | | slot nuts | |
| Wire mounting | | | wire clip | |
| Wire acceleration | | | 8g | |
| Wire retraction force (min) | | | 7.5N | 5.5N |
| Wire extension force (max) | | | 11N | 9N |
| Protection class | | | IP 65 (only if connected) | |
| Vibration | | | 20g, 20Hz - 2kHz | |
| Mechanical shock | | | 50g, 10ms | |
| Electrical connection | P | | integrated cable, radial, 1m long | |
| | U/I | | flange connector, axial, 8-pin DIN45326 | |
| Weight | | | appr. 1.1kg | |

FSO = Full Scale Output
 Specifications for analog outputs on page 43.

Article description

WDS - 2000 - P96 - CA - P

Output option:
 P = potentiometer (with connection CA)
 U = voltage (with connection SR)
 I = current (with connection SR)

Connection:
 SR: radial plug
 CA: integrated cable, axial, 1m

Model P96

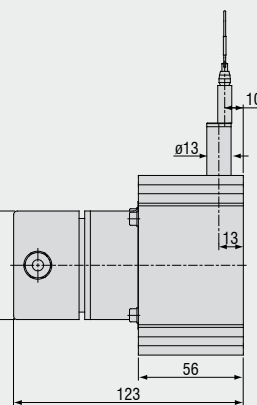
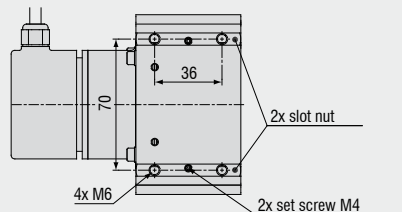
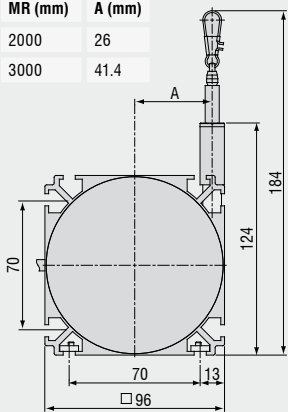
Measuring range in mm



- Robust aluminium profile housing
- Incremental/absolute encoder

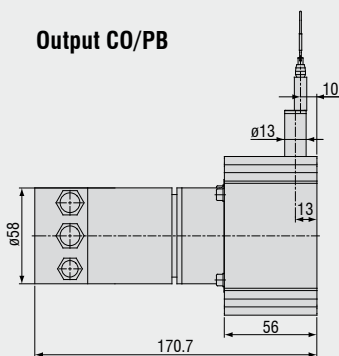
Model P96

| MR (mm) | A (mm) |
|---------|--------|
| 2000 | 26 |
| 3000 | 41.4 |

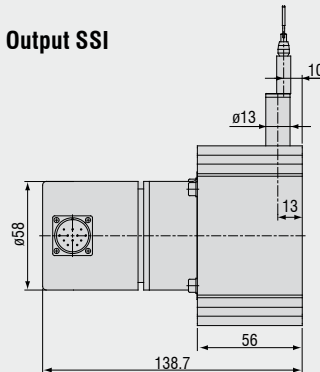


Output HTL/TTL

Output CO/PB



Output SSI



| Model | WDS-3000-P96 | |
|-----------------------------|------------------------------|---|
| Output | HTL/ TTL/ SSI/ PB/ CO | |
| Measuring range | 3000mm | |
| Linearity | ±0.02% FSO | ±0.6mm |
| Resolution | HTL, TTL | 0.087mm (11.53 pulses/mm) |
| Resolution | SSI, PB, CO | 0.032mm |
| Sensor element | Incremental/absolute encoder | |
| Temperature range | -20 ... +80°C | |
| Material | housing | aluminium |
| | draw wire | coated polyamid stainless steel (ø 0.8mm) |
| Sensor mounting | slot nuts | |
| Wire mounting | wire clip | |
| Wire acceleration | 7g | |
| Wire retraction force (min) | 5.5N | |
| Wire extension force (max) | 9N | |
| Protection class | IP 65 (only if connected) | |
| Vibration | 20g, 20Hz - 2kHz | |
| Mechanical shock | 50g, 10ms | |
| Electrical connection | HTL, TTL | integrated cable, radial, 1m long |
| | SSI | flange connector, radial, 12-pin |
| | PB, CO | bus cover |
| Weight | appr. 1.7kg | |

FSO = Full Scale Output

Specifications for digital outputs on page 44.

Article description

WDS - 3000 - P96 - CR - TTL

Output option:

HTL

TTL

CO: CANopen

PB: Profibus DP

SSI

Connection:

SR (Output SSI): radial plug

CR (Output HTL, TTL): integrated cable, radial, 1m

BH (Output CO, PB): bus cover

Model P96

Measuring range in mm

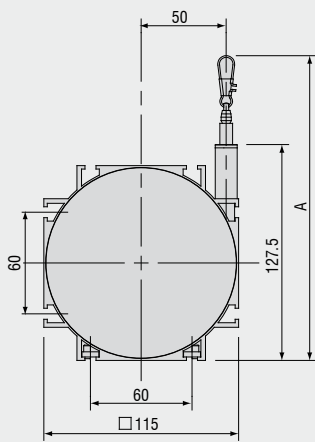


- Robust aluminium profile housing
- Customized versions for OEM
- Potentiometer, current and voltage output

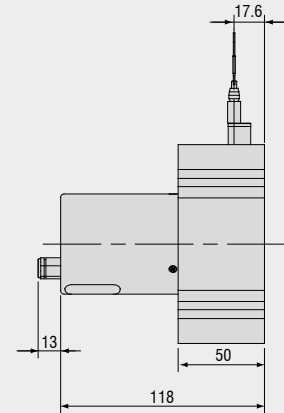
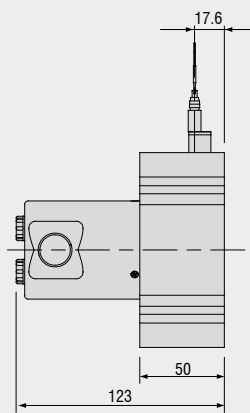
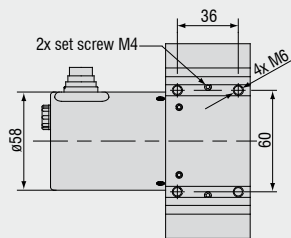
Model P115 (Measuring range 3000/4000/5000mm)

Output UI

Output P

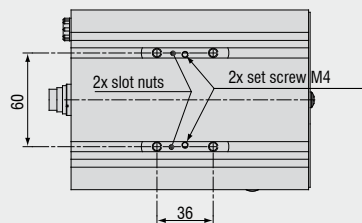
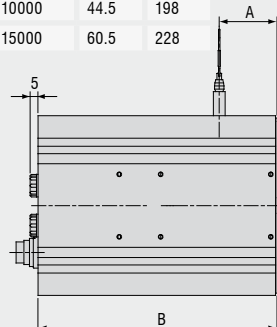
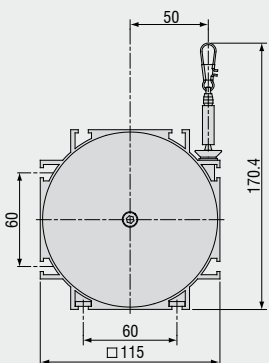


| MR (mm) | A (mm) |
|-------------|--------|
| 3000 | 186 |
| 4000 / 5000 | 180 |



Model P115 (Measuring ranges 7500/10000/15000mm)

| MR (mm) | A (mm) | B (mm) |
|---------|--------|--------|
| 7500 | 37 | 153 |
| 10000 | 44.5 | 198 |
| 15000 | 60.5 | 228 |



| Model | | WDS-3000-P115 | WDS-4000-P115 | WDS-5000-P115 | WDS-7500-P115 | WDS-10000-P115 | WDS-15000-P115 |
|-----------------------------|------------|--|---------------|---------------|---|----------------|----------------|
| Measuring range | | 3000mm | 4000mm | 5000mm | 7500mm | 10000mm | 15000mm |
| Output | | P/U/I | | | | | |
| Linearity | ±0.1% FSO | ±3mm | - | - | - | - | - |
| | ±0.15% FSO | - | ±6mm | ±7.5mm | ±11.3mm | ±15mm | ±22.5mm |
| Resolution | | quasi infinite | | | | | |
| Sensor element | | hybrid potentiometer | | | | | |
| Temperature range | | -20 ... +80°C | | | | | |
| Material | housing | aluminium | | | | | |
| | draw wire | coated polyamid stainless steel (ø 0.45mm) | | | coated polyamid stainless steel (ø 1.0mm) | | |
| Sensor mounting | | slot nut | | | | | |
| Wire mounting | | wire clip | | | | | |
| Wire acceleration | | appr. 6g | | | | | |
| Wire retraction force (min) | | 4.5N | 4N | 4N | 8N | 8N | 8N |
| Wire extension force (max) | | 8N | 8.5N | 9N | 24N | 21N | 25N |
| Protection class | | IP 65 (only if connected) | | | | | |
| Vibration | | 20g, 20Hz - 2kHz | | | | | |
| Mechanical shock | | 50g, 20ms | | | | | |
| Electrical connection | P | integrated cable, axial, 1m long | | | | | |
| | U/I | flange connector, radial, 8-pin, DIN45326 | | | | | |
| Weight | | appr. 1.1kg | | | 2.2kg | 3.2kg | 3.5kg |

FSO = Full Scale Output
Specification for analog outputs on page 43.

Article description

WDS - 3000 - P115 - CA - P

P: potentiometer Connection CA: P115-3000/4000/5000
Connection SA: P115-7500/10000/15000

U: voltage Connection SR: P115-3000/4000/5000
Connection SA: P115-7500/10000/15000

I: current Connection SR: P115-3000/4000/5000
Connection SA: P115-7500/10000/15000

Connection:
SR: radial plug
SA: axial plug
CA: integrated cable, axial, 1m

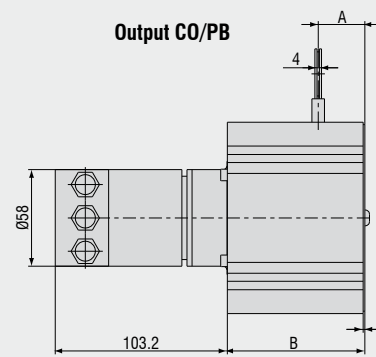
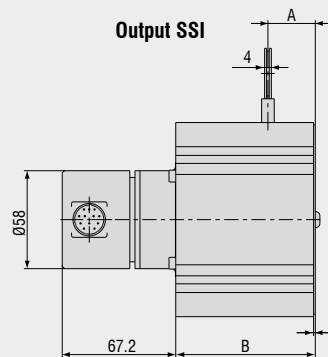
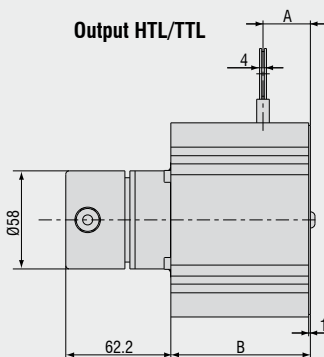
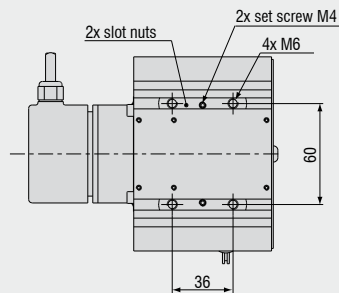
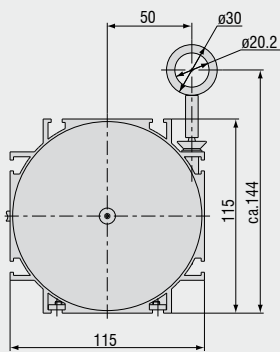
Model P115

Measuring range in mm



- Robust aluminium profile housing
- Customized versions for OEM
- Incremental/absolute encoder

Model P115



| MR (mm) | A (mm) | B (mm) |
|---------|--------|--------|
| 5000 | 28 | 82.5 |
| 7500 | 37 | 105.5 |
| 10000 | 44.5 | 148.5 |
| 15000 | 61 | 180.5 |

| Model | | WDS-5000-P115 | WDS-7500-P115 | WDS-10000-P115 | WDS-15000-P115 |
|-----------------------------|-------------|---|---------------|----------------|----------------|
| Measuring range | | 5000mm | 7500mm | 10000mm | 15000mm |
| Output | | HTL/ TTL/ SSI/ PB/ CO | | | |
| Linearity | ±0.01% FSO | - | - | ±1mm | ±1.5mm |
| | ±0.02% FSO | ±1mm | ±1.5mm | - | - |
| Resolution | HTL,TTL | 0.105mm (9.52 Pulses/mm) | | | |
| | SSI, PB, CO | 0.038mm | | | |
| Sensor element | | incremental/absolute encoder | | | |
| Temperature range | | -20 ... +80°C | | | |
| Material | housing | aluminium | | | |
| | draw wire | coated polyamid stainless steel (ø 1.0mm) | | | |
| Sensor mounting | | slot nuts | | | |
| Wire mounting | | eyelet | | | |
| Wire acceleration | | 5g | 6g | 3g | 3g |
| Wire retraction force (min) | | 4N | 8N | 8N | 8N |
| Wire extension force (max) | | 16N | 24N | 21N | 25N |
| Protection class | | IP 65 (only if connected) | | | |
| Vibration | | 20g, 20Hz - 2kHz | | | |
| Mechanical shock | | 50g, 10ms | | | |
| Electrical connection | HTL/ TTL | integrated cable, radial, 1m long | | | |
| | SSI | flange connector, radial, 12-pin | | | |
| | PB/ CO | bus cover | | | |
| Weight | | appr. 2kg | appr. 2.5kg | appr. 3.5kg | appr. 4.5kg |

FSO = Full Scale Output
Specifications for digital outputs on page 44.

Article description

WDS - 5000 - P115 - CR - TTL

Output options:

HTL

TTL

CO: CANopen

PB: Profibus DP

SSI

Connection:

SR (Output SSI): radial plug

CR (Output HTL, TTL): integrated cable, radial, 1m

BH (Output CO, PB): bus cover

Model P115

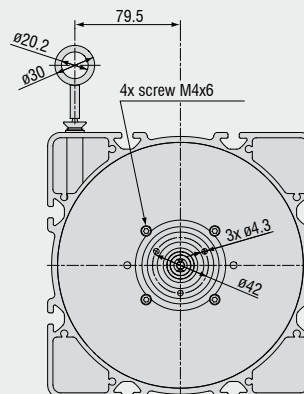
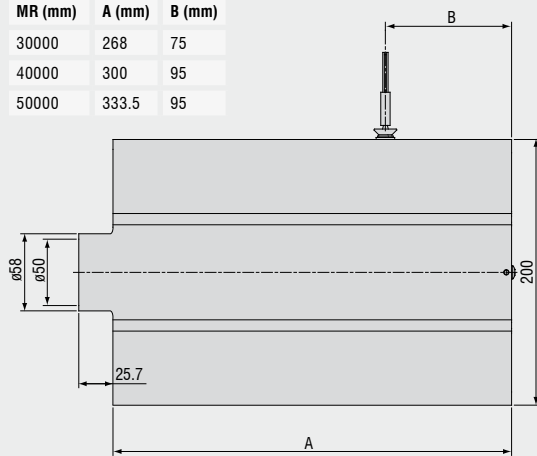
Measuring range in mm



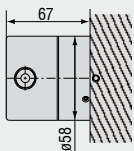
- Robust aluminium profile housing
- Customized versions for OEM
- Incremental/absolute encoder

Model P200

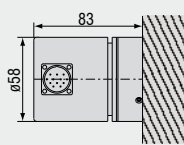
| MR (mm) | A (mm) | B (mm) |
|---------|--------|--------|
| 30000 | 268 | 75 |
| 40000 | 300 | 95 |
| 50000 | 333.5 | 95 |



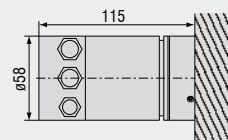
Output P200-HTL/TTL



Output P200-SSI



Output P200-CO/PB



| Model | | WDS-30000-P200 | WDS-40000-P200 | WDS-50000-P200 |
|-------------------------------|-------------|---|----------------|----------------|
| Measuring range | | 30000mm | 40000mm | 50000mm |
| Output | | HTL/ TTL/ SSI/ PB/ CO | | |
| Travel per encoder revolution | | 500mm | | |
| Linearity | ± 0.01% FSO | 3mm | 4mm | 5mm |
| Resolution | HTL, TTL | 0.167mm (6 pulses/mm) | | |
| | SSI, PB, CO | 0.061mm | | |
| Temperature range | | -20 ... +80°C | | |
| Sensor element | | incremental/absolute encoder | | |
| Material | housing | aluminium | | |
| | draw wire | coated polyamid stainless steel (ø 0.8mm) | | |
| Wire mounting | | eyelet | | |
| Sensor mounting | | slot nuts | | |
| Wire acceleration | | 2g | | |
| Wire retraction force (min) | | 12N | 11N | 11N |
| Wire extension force (max) | | 22N | 22N | 24N |
| Protection class | | IP 65 | | |
| Electrical connection | HTL, TTL | integrated cable, radial, 1m long | | |
| | SSI | flange connector, radial, 12-pin | | |
| | PB/ CO | bus cover | | |
| Weight | | appr. 10kg | appr. 11kg | appr. 12kg |

FSO = Full Scale Output
Specifications for digital outputs on page 44.

Article description

WDS - 30000 - P200 - CR - TTL

Output options:

HTL

TTL

CO: CANopen

PB: Profibus DP

SSI

Connection:

SR (Output SSI): radial plug

CR (Output HTL, TTL): integrated cable, radial, 1m

BH (Output CO, PB): bus cover

Model P200

Measuring range in mm



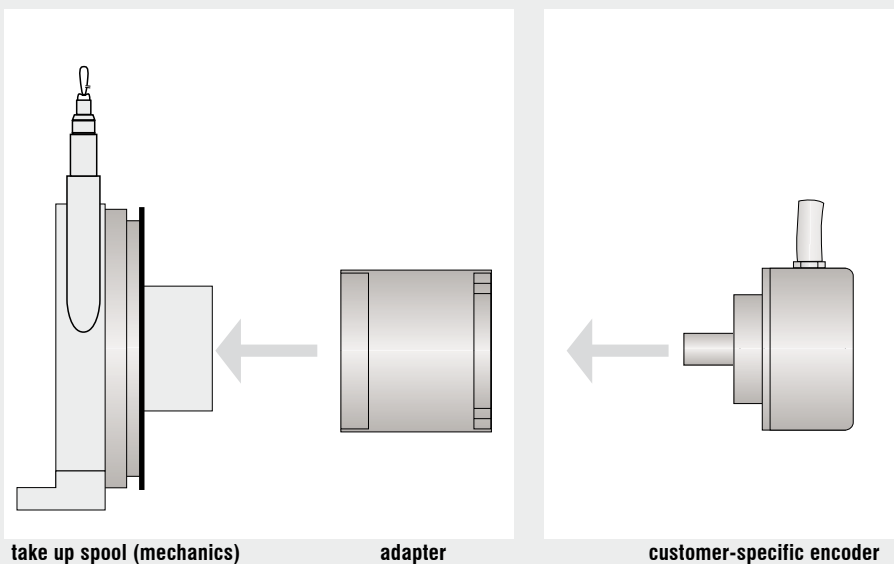
- Use almost any encoder
- Robust aluminium profile housing
- High quality sensor components

Rugged draw-wire mechanics forencoder mounting

The wireSENSOR mechanics of the Z60, P96, P115 and P200 series are designed for easy mounting of an incremental or absolute encoder. The selection of the interface, resolution and type of connection can therefore be individually configured. Optimum matching to the signal conditioning system is ensured. High precision components and a rugged housing offer high operational reliability and a long life time even under harsh industrial conditions.

A complete measurement unit always consists of the basic draw-wire mechanism and the adapter for the customer-specific encoder.

The adapter contains all the necessary mounting accessories for fitting the encoder and is included in delivery of the P96, P115 and P200 series.



For the customer-specific encoder or potentiometer various draw-wire mechanics are available with measuring range up to 50m.

| Model | WDS-1500 Z60-M | WDS-3000 P96-M | WDS-5000 P115-M | WDS-7500 P115-M | WDS-10000 P115-M | WDS-15000 P115-M | WDS-30000 P200-M | WDS-40000 P200-M | WDS-50000 P200-M | |
|-------------------------------------|------------------------|---------------------------------|--------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----|
| Measuring range | 1500mm | 3000mm | 5000mm | 7500mm | 10000mm | 15000mm | 30000mm | 40000mm | 50000mm | |
| Output | dependent upon encoder | | | | | | | | | |
| Linearity | ±0.01% FSO | - | - | - | - | 1mm | 1.5mm | 3mm | 4mm | 5mm |
| | ±0.02% FSO | 0.3mm | 0.6mm | 1mm | 1.5mm | - | - | - | - | - |
| Resolution | dependent upon encoder | | | | | | | | | |
| Travel per encoder revolution | 150mm | 260.09mm | 315.07mm | | | | 500mm | | | |
| Suitable encoder- adapter-flange | WDS-EAC 1 | not available | | | | | | | | |
| | | for clamping flange | | | | | | | | |
| | WDS-EAS 1 | included in delivery | | | | | | | | |
| | | for synchro flange | | | | | | | | |
| Temperature range | operation | -20...+80°C | | | | | | | | |
| | storage | -40...+80°C | | | | | | | | |
| Material | housing | aluminium | | | | | | | | |
| Material | wire | coated polyamid stainless steel | | | | | | | | |
| | | ø 0.45mm | ø 0.8mm | ø 1.0mm | | | 0.8mm | | | |
| Wire mounting | wire clip | thread M4 | eyelet | | | | | | | |
| Sensor mounting | 2 mounting holes | slot nuts | | | | | | | | |
| Wire acceleration | 10g | 7g | 5g | 6g | 3g | 3g | | | | |
| Wire retraction force (min) | 3.5N | 5N | 4N | 8N | 8N | 8N | 12N | 11N | 11N | |
| Wire extension force (max) | 5.5N | 10N | 16N | 24N | 21N | 25N | 22N | 22N | 24N | |
| Protection class | dependent upon encoder | | | | | | | | | |
| Vibration | 20g, 20Hz...2 kHz | | | | | | | | | |
| Mechanical shock | 50g, 10ms | | | | | | | | | |
| Weight | 0.3kg | 1.1kg | 1.4kg | 1.9kg | 2.8kg | 3.2kg | 9.5kg | 10kg | 11kg | |

FSO = Full Scale Output
Specifications for digital outputs on page 44.

Article description

WDS - 5000 - P115 - M - SO

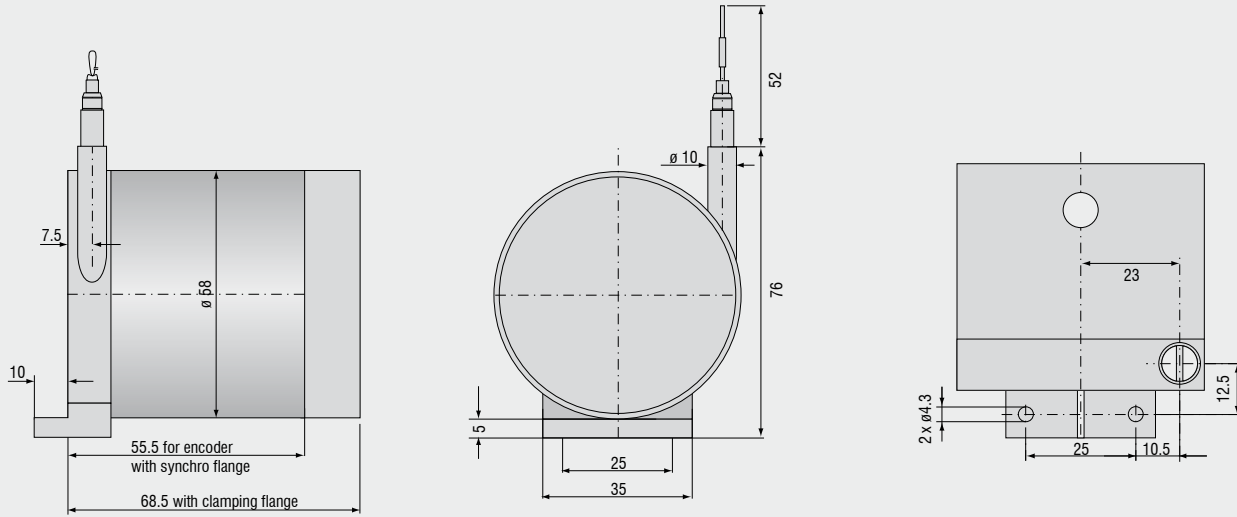
Wire stripper (only P115/P200)

Mechanic

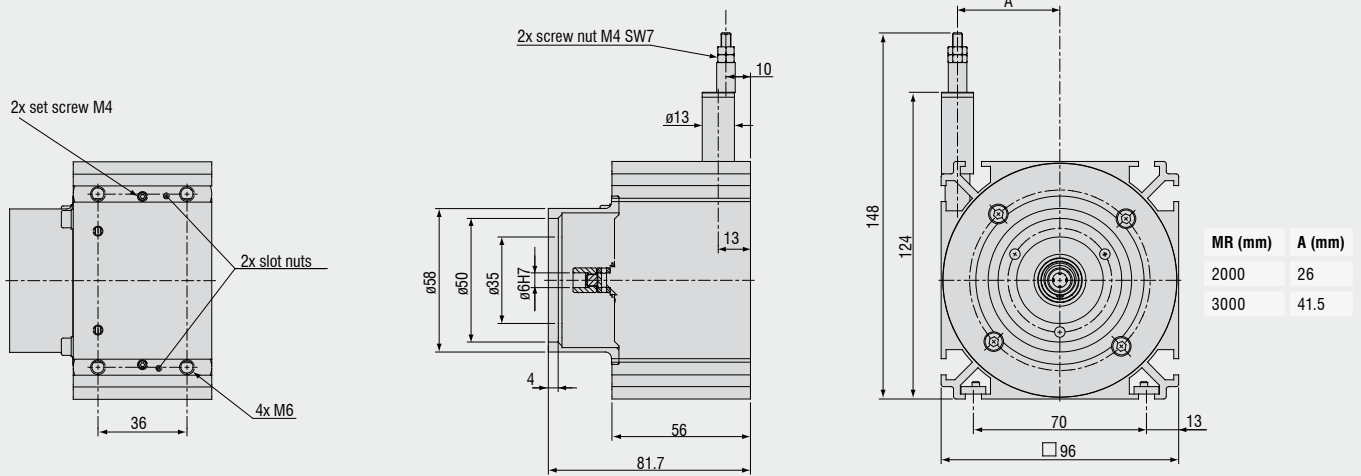
Model Z60/P96/P115/P200

Measuring range in mm

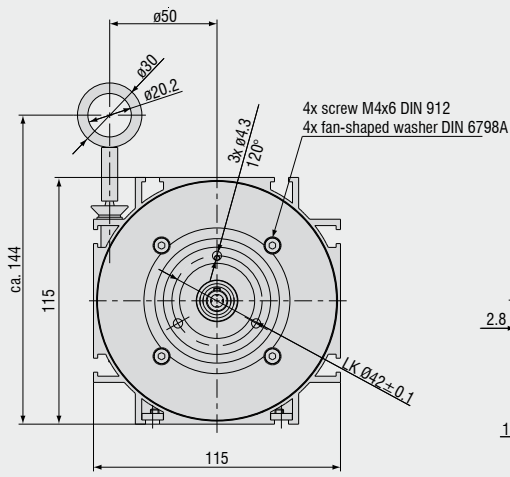
Model Z60



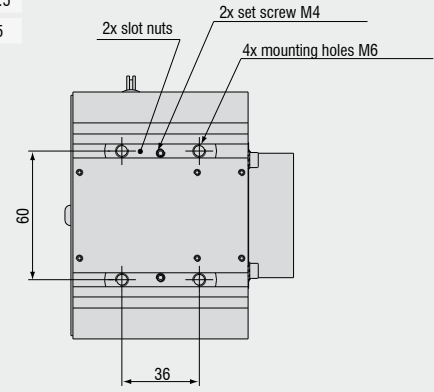
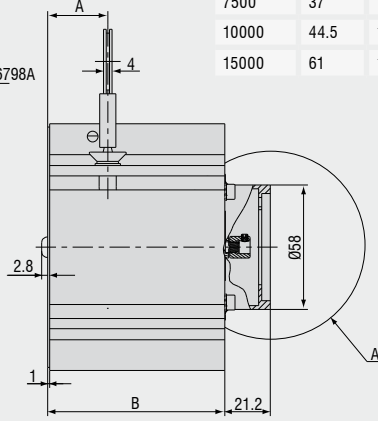
Model P96



Model P115

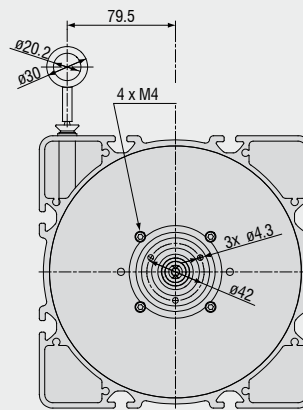
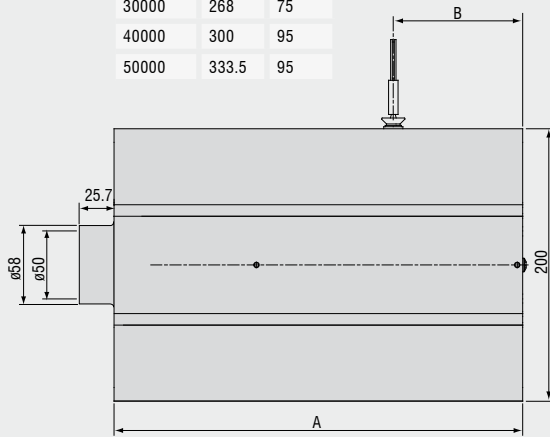


| MR (mm) | A (mm) | B (mm) |
|---------|--------|--------|
| 5000 | 28 | 82.5 |
| 7500 | 37 | 105.5 |
| 10000 | 44.5 | 1148.5 |
| 15000 | 61 | 180.5 |

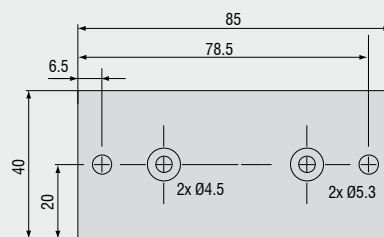
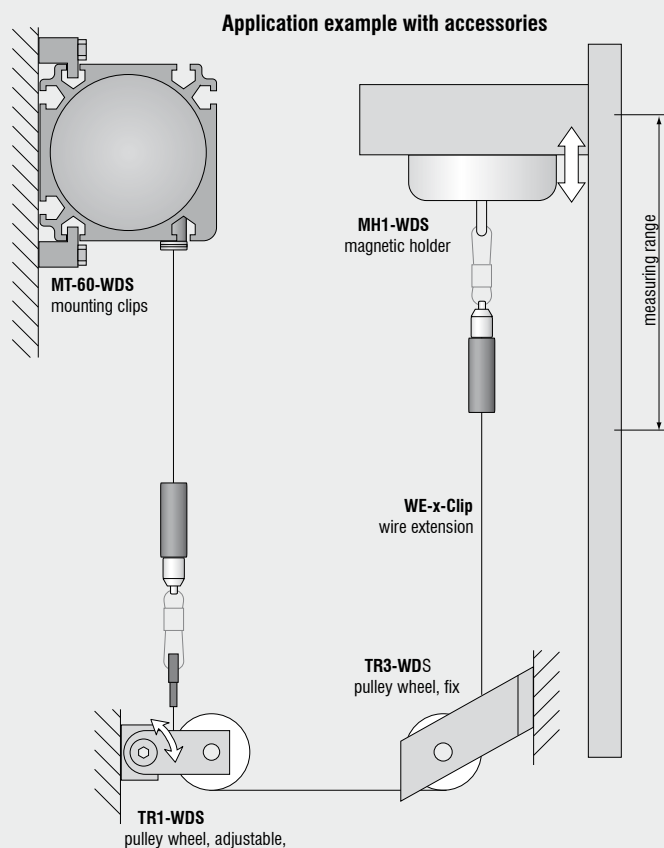


Model P200

| MR (mm) | A (mm) | B (mm) |
|---------|--------|--------|
| 30000 | 268 | 75 |
| 40000 | 300 | 95 |
| 50000 | 333.5 | 95 |



| | |
|---------------------------|---|
| WE-x-M4, WE-x-Clip | Wire extension x=length |
| TR1-WDS | Pulley wheel, adjustable |
| TR3-WDS | Pulley wheel, fixed |
| GK1-WDS | Attachment head for M4 |
| MH1-WDS | Magnetic holder for wire mounting |
| MH2-WDS | Magnetic holder for sensor mounting |
| MT-60-WDS | Mounting clamp for WDS-P60 |
| FC8 | Female connector for WDS, 8-pin |
| FC8/90 | Female connector 90° for WDS |
| PC 3/8 | Sensor cable, length 3 m |
| PS 2010 | Power supply (chassis mounting 35 x 7.5 mm); input 120/230 VAC; output 24 VDC/2.5 A; L/B/H 120 x 20 x 40 mm |
| WDS-MP60 | Mounting plate for P60 sensors |



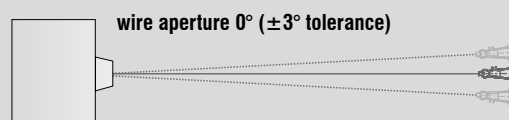
Mounting plate WDS-MP60

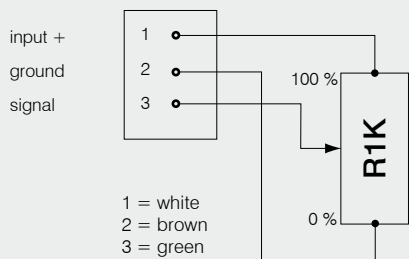
Installation information:

Wire attachment: The free return of the measurement wire is not permissible and it is essential that this is avoided during installation.

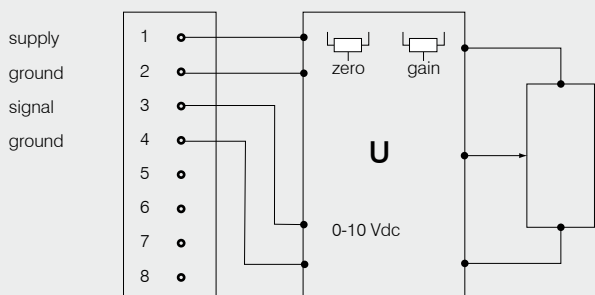
Wire exit angle:

When mounting a draw-wire displacement sensor, a straight wire exit ($\pm 3^\circ$ tolerance) must be taken into account. If this tolerance is exceeded, increased material wear on the wire and at the wire aperture must be expected.

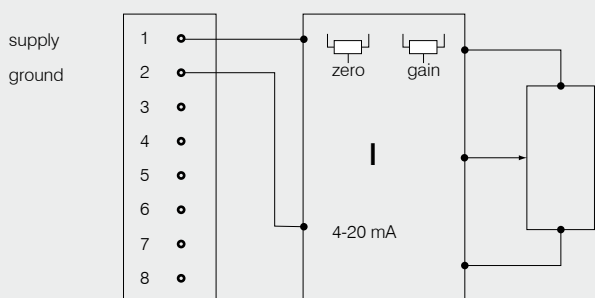




| Potentiometric output (P) | |
|---------------------------|---|
| Supply voltage | max. 32VDC at 1kOhm / 1 Wmax |
| Resistance | 1kOhm ±10% (potentiometer) |
| Temperature coefficient | ±0.0025% FSO/°C |
| Sensitivity | depends on measuring range individually shown on test report |



| Voltage output (U) | |
|-------------------------------------|-------------------------------------|
| Supply voltage | 14 ... 27VDC (non stabilized) |
| Current consumption | 30mA max |
| Output voltage | 0 ... 10VDC Option 0 ... 5 / ±5V |
| Load impedance | >5kOhm |
| Signal noise | 0.5mV _{eff} |
| Temperature coefficient | ±0.005% FSO/°C |
| Electromagnetic compatibility (EMC) | EN 50081-2 EN 50082-2 |
| Adjustment ranges | |
| Zero | ±20 %FSO |
| Sensitivity | ±20 % |



| Current Output (I) | |
|-------------------------------------|-------------------------------|
| Supply voltage | 14 ... 27VDC (non stabilized) |
| Current consumption | 35mA max |
| Output current | 4 ... 20mA |
| Load | <600Ohm |
| Signal noise | <1.6µA _{eff} |
| Temperature coefficient | ±0.01% FSO/°C |
| Electromagnetic compatibility (EMC) | EN 50081-2 EN 50082-2 |
| Adjustment ranges | |
| Zero | ±18% FSO |
| Sensitivity | ±15% |

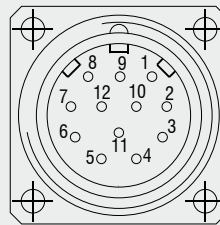
Output specifications SSI

Contact description

| | |
|---|---|
| 1 UB | Encoder power supply connection. |
| 2 GND | Encoder ground connection. The voltage drawn to GND is UB. |
| 3 Pulses + | Positive SSI pulse input. Pulse + forms a current loop with pulse -. A current of approx. 7 mA in direction of pulse + input generates a logical 1 in positive logic. |
| 4 Data + | Positive, serial data output of the differential line driver. A High level at the output corresponds to logical 1 in positive logic. |
| 5 ZERO | Zero setting input for setting a zero point at any desired point within the entire resolution. The zeroing process is triggered by a High pulse (pulse duration ≥ 100 ms) and must take place after the rotating direction selection (UP/DOWN). For maximum interference immunity, the input must be connected to GND after zeroing. |
| 6 Data - | Negative, serial data output of the differential line driver. A High level at the output corresponds to logical 0 in positive logic. |
| 7 Pulses - | Negative SSI pulse input. Pulse - forms a current loop with pulse +. A current of approx. 7 mA in direction of pulse - input generates a logical 0 in positive logic. |
| 8 / 10 $\overline{\text{DATAVALID}}$ $\overline{\text{DATAVALID MT}}$ | Diagnosis outputs $\overline{\text{DV}}$ and $\overline{\text{DV MT}}$ Jumps in data word, e.g. due to defective LED or photoreceiver, are displayed via the $\overline{\text{DV}}$ output. In addition, the power supply of the multiturn sensor unit is monitored and the $\overline{\text{DV MT}}$ output is set when a specified voltage level is dropped below. Both outputs are Low-active, i.e. are switched through to GND in the case of an error. |
| 9 UP/DOWN | UP/DOWN counting direction input. When not connected, this input is on High. UP/ $\overline{\text{DOWN}}$ -High means increasing output data with a clockwise shaft rotating direction when looking at the flange. UP/ $\overline{\text{DOWN}}$ -Low means increasing values with a counter-clockwise shaft rotating direction when looking at the flange. |
| 11 / 12 | Not in use |

Anschlussbelegung

| Pin | Cable color | Assignment |
|-----|--------------|----------------------------------|
| 1 | brown | UB |
| 2 | black | GND |
| 3 | blue | Pulses + |
| 4 | beige | Data + |
| 5 | green | ZERO |
| 6 | yellow | Data - |
| 7 | violet | Pulses - |
| 8 | brown/yellow | $\overline{\text{DATAVALID}}$ |
| 9 | pink | UP/ $\overline{\text{DOWN}}$ |
| 10 | black/yellow | $\overline{\text{DATAVALID MT}}$ |
| 11 | - | - |
| 12 | - | - |



Please use leads twisted in pairs for extension cables.

Inputs

Control signals UP/DOWN and Zero

| | |
|------------|---------|
| Level High | > 0.7UB |
| Level Low | < 0.3UB |

Connection: UP/DOWN input with 10kohms to UB, zeroing input with 10kohms to GND.

SSI pulse

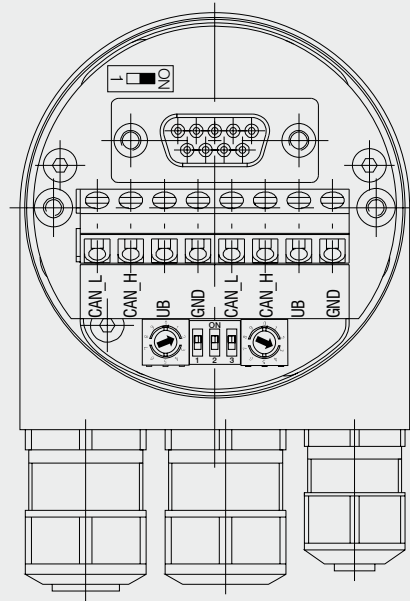
Optocoupler inputs for electrical isolation

Outputs

| | |
|---|-----------------------------|
| SSI data | RS485 driver |
| Diagnostic outputs | |
| Push-pull outputs are short-circuit-proof | |
| Level High | > UB -3.5V (with I = -20mA) |
| Level Low | $\leq 0.5V$ (with I = 20mA) |

CANopen features

| | |
|-----------------------------------|--|
| Bus protocol | CANopen |
| Device profile | CANopen - CiA DSP 406, V 3.0 |
| CANopen Features | Device Class 2, CAN 2.0B |
| Operating modes (with SDO progr.) | <p>Polling Mode (asynch, via SDO)</p> <p>Cyclic Mode (asynch-cyclic) The encoder cyclically sends the current process actual value without a request by a master. The cycle time can be parameterized for values between 1 and 65535 ms. Synch Mode (synch-cyclic) The encoder sends the current actual process value after receiving a synch telegram sent by a master. The synch counter in the encoder can be parameterized so that the position value is not sent until after a defined number of synch telegrams.</p> <p>Acyclic Mode (synch-acyclic)</p> |
| Preset value | With the "Preset" parameter the encoder can be set to a desired actual process value that corresponds to the defined axis position of the system. The offset value between the encoder zero point and the mechanical zero point of the system is saved in the encoder. |
| Rotating direction | With the operating parameter the rotating direction in which the output code is to increase or decrease can be parameterized. Scaling The steps per revolution and the total revolution can be parameterized. |
| Scaling: | The steps per revolution and the total revolution can be parameterized. |
| Diagnose | <p>The encoder supports the following error messages:</p> <ul style="list-style-type: none"> - Position and parameter error - Lithium cell voltage at lower limit (Multiturn) |
| Default setting | 50kbit/s, node number 1 |



Setting of terminating Resistor for CANopen



ON = Last user
OFF = User X

Setting CANopen baud rate

| Baud rate | Setting Dip Switch | | |
|-----------|--------------------|-----|-----|
| | 1 | 2 | 3 |
| 10kBit/s | OFF | OFF | OFF |
| 20kBit/s | OFF | OFF | ON |
| 50kBit/s | OFF | ON | OFF |
| 125kBit/s | OFF | ON | ON |
| 250kBit/s | ON | OFF | OFF |
| 500kBit/s | ON | OFF | ON |
| 800kBit/s | ON | ON | OFF |
| 1MBit/s | ON | ON | ON |

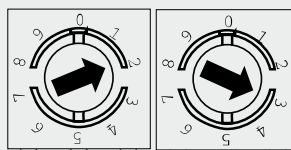
Contact description CANopen

| | |
|-------|--------------------------------|
| CAN_L | CAN Bus Signal (dominant Low) |
| CAN_H | CAN Bus Signal (dominant High) |
| UB | Versorgungsspannung 10...30VDC |
| GND | Ground contact for UB |

(Terminals with the same designation are internally interconnected)

Settings of user address for CANopen

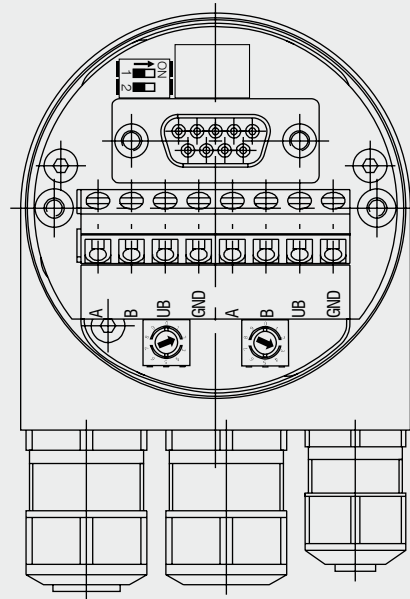
Address can be set with rotary switch. Example: User address 23



Output specifications Profibus

Profibus-DP features

| | |
|----------------------|--|
| Bus protocol | Profibus-DP |
| Profibus features | Device Class 1 and 2 |
| Data exch. functions | Input: Position value Additional parameterized speed signal (readout of the current rotary speed) Output: Preset value |
| Preset value | With the "Preset" parameter the encoder can be set to a desired actual value that corresponds to the defined axis position of the system. |
| Parameter functions | Rotating direction: With the operating parameter the rotating direction for which the output code is to increase or decrease can be parameterized. |
| Diagnose | The encoder supports the following error messages: - Position error - Lithium cell voltage at lower limit (Multiturn) |
| Default setting | User address 00 |



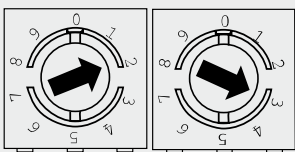
Settings of terminating resistors for Profibus-DP



ON = last user
OFF = user X

Settings of user address for Profibus-DP

Address can be set with rotary switch. Example: User address 23

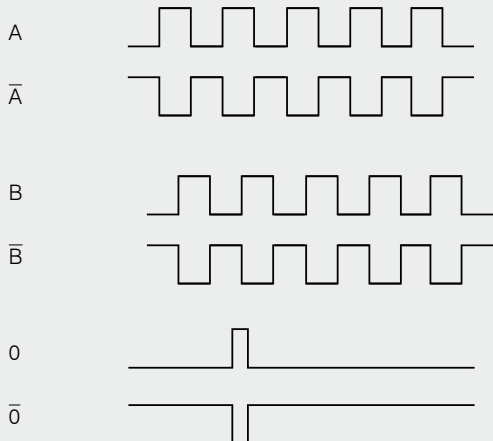


Contact description Profibus-DP

| | |
|-----|-----------------------------|
| A | A negative serial data line |
| B | Positive serial data line |
| UB | Supply voltage 10...30VDC |
| GND | Ground contact for UB |

(Terminals with the same designation are internally interconnected)

Signal output



| Output TTL | Linedriver (5VDC) |
|------------|---------------------------------|
| Level High | $\geq 2.5V$ (with $I = -20mA$) |
| Level Low | $\leq 0.5V$ (with $I = 20mA$) |
| Load High | $\leq 20mA$ |
| Output | A, \bar{A} , B, \bar{B} , O |

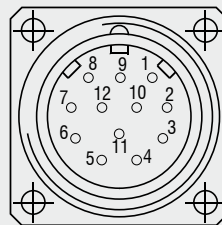
| Output HTL | Push-pull (10 ... 30VDC) |
|------------|-----------------------------------|
| Level High | $\geq UB -3V$ (with $I = -20mA$) |
| Level Low | $\leq 1.5V$ (with $I = 20mA$) |
| Load High | $\leq 40mA$ |
| Output | A, \bar{A} , B, \bar{B} , O |

| Output E | Push-pull (5VDC) |
|------------|------------------|
| Level High | UB -2.5V |
| Level Low | $\leq 0.5V$ |
| Load High | $\leq 50mA$ |
| Output | A, B, O |

| Output E830 | Push-pull (8 ... 30VDC) |
|-------------|-------------------------|
| Level High | UB -3V |
| Level Low | $\leq 2.5V$ |
| Load High | $\leq 50mA$ |
| Output | A, B, O |

Pin assignment TTL, HTL

| Pin | Cable color | Assignment |
|-----|-------------|----------------------------|
| 1 | pink | B inv. |
| 2 | blue | UB Sense |
| 3 | red | N (Nullimpulses) |
| 4 | black | N inv. (Nullimpulses inv.) |
| 5 | brown | A |
| 6 | green | A inv. |
| 7 | - | - |
| 8 | grey | B |
| 9 | - | - |
| 10 | white/green | GND |
| 11 | white | GND Sense |
| 12 | brown/green | UB |



Pin 2 and Pin 12 are internally connected as well as Pin 11 and 10.
For cable length >10m twisted pair wires are required.

Connection assignment E, E830

| Pin | Cable color | Assignment |
|-----|-------------|------------|
| - | white | 0V |
| - | brown | +UB |
| - | green | A |
| - | - | \bar{A} |
| - | yellow | B |
| - | - | \bar{B} |
| - | grey | O |

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of automotive components
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