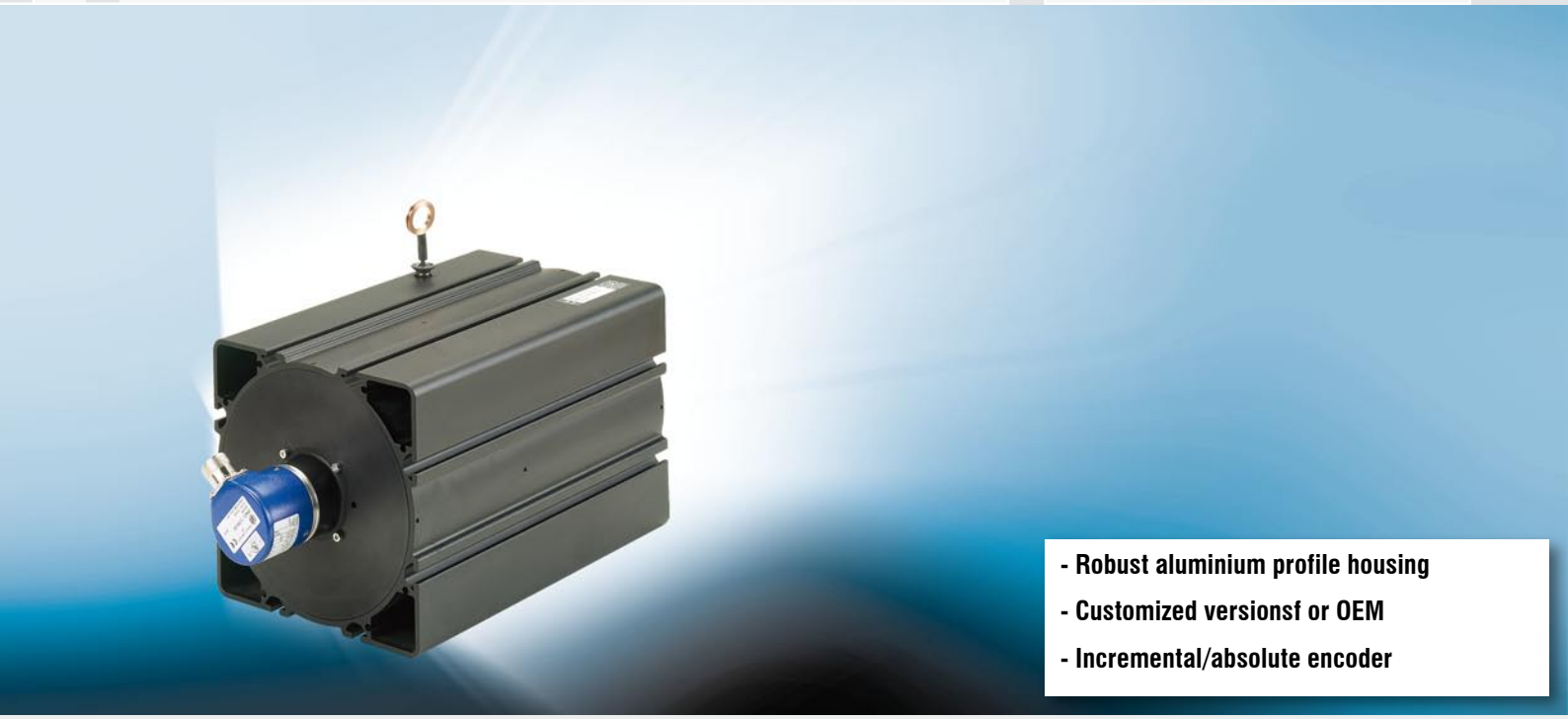
MICRO-EPSILON

More Precision.

wireSENSOR

Draw-wire displacement sensors

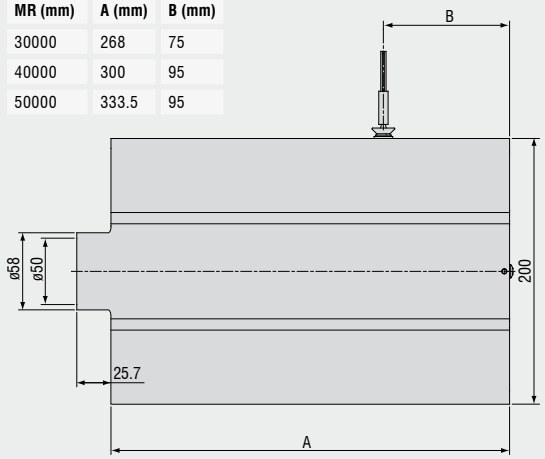
P200 digital

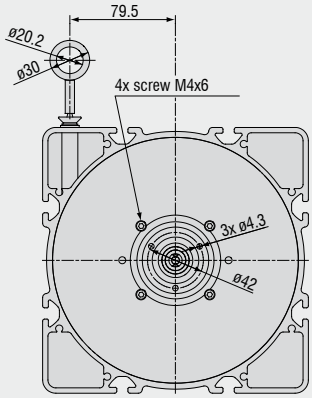


- Robust aluminium profile housing
- Customized versionsf or OEM
- Incremental/absolute encoder

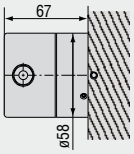
Model P200

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

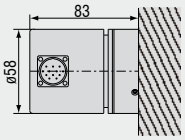




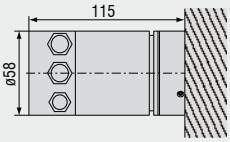
Output P200-HTL/TTL



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.

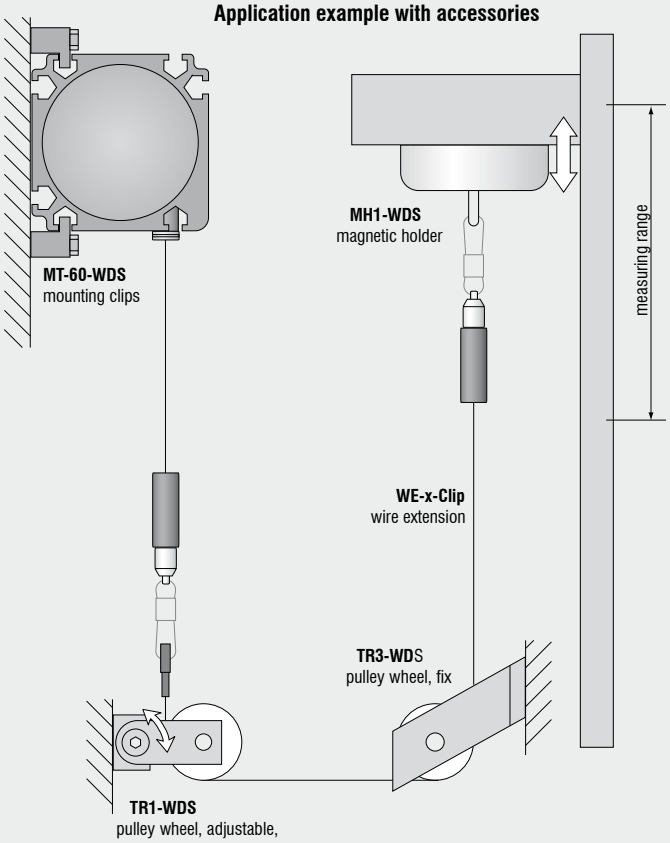
Article description

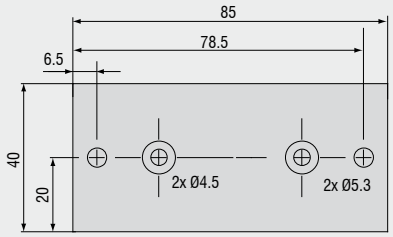
WDS - 30000 - P200 - CR - TTL

- TTL — Output options: HTL, TTL, CO: CANopen, PB: Profibus DP, SSI
- CR — Connection: SR (Output SSI): radial plug; CR (Output HTL, TTL): integrated cable, radial, 1m; BH (Output CO, PB): bus cover
- P200 — Model P200
- 30000 — Measuring range in mm

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, lenght 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

Application example with accessories

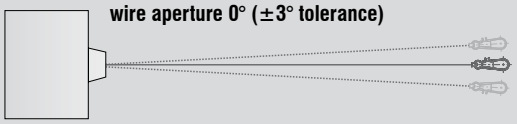




Mounting plate WDS-MP60

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 (±3° 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.



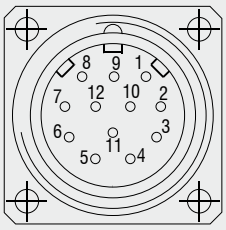
Output specifications SSI

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 $\overline{\text{DATAVALID}}$ $\overline{\text{DATAVALID}}$ $\overline{\text{MT}}$	Diagnosis outputs $\overline{\text{DV}}$ and $\overline{\text{DV}}$ $\overline{\text{MT}}$ 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 $\overline{\text{DV}}$ $\overline{\text{MT}}$ 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/ DOWN
10	black/yellow	$\overline{\text{DATAVALID}}$ $\overline{\text{MT}}$
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

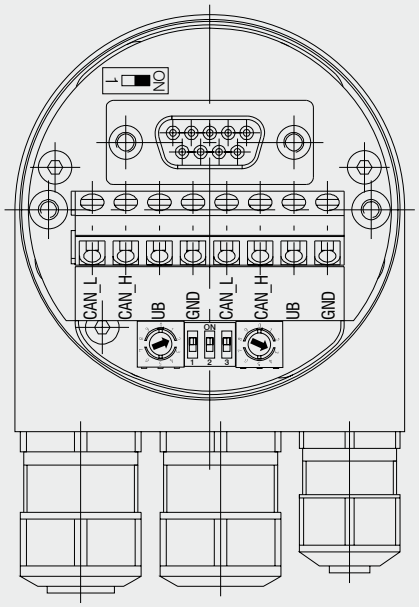
Outputs

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

Output specifications CANopen

CANopen features

Bus protocol	CANopen
Device profile	CANopen - CiA DSP 406, V 3.0
CANopen Features	Device Class 2, CAN 2.0B
Operating modes	Polling Mode (asynch, via SDO)
(with SDO progr.)	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. Acyclic Mode (synch-acyclic)
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	The encoder supports the following error messages: - 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

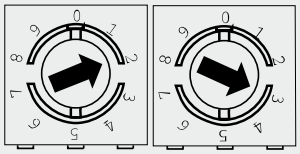
Baud rate	Setting Dip Switch		
	1	2	3
10kBit/s	OFF	OFF	OFF
20kBit/s	OFF	OFF	ON
50kBit/s	OFF	ON	OFF
125kBit/s	OFF	ON	ON
250kBit/s	ON	OFF	OFF
500kBit/s	ON	OFF	ON
800kBit/s	ON	ON	OFF
1MBit/s	ON	ON	ON

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

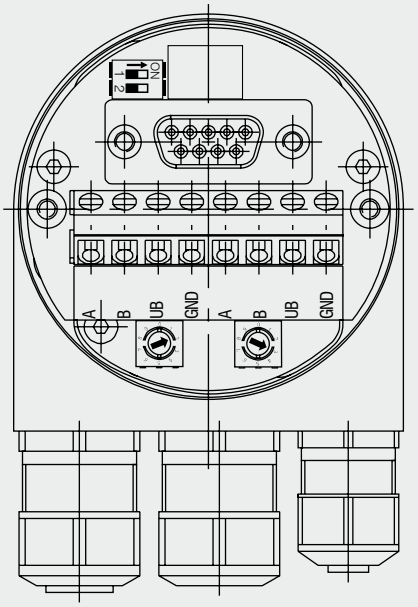
Address can be set with rotary switch. Example: User address 23



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

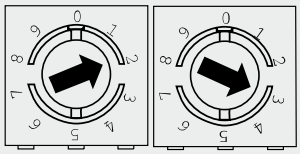


Settings of terminating resistors for Profibus-DP

ON = last user
OFF = user X

Settings of user address for Profibus-DP

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



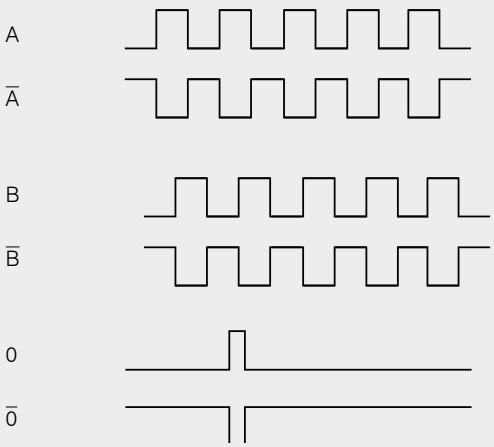
Contact description Profibus-DP

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)

Output specifications Incremental encoder

Signal output



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

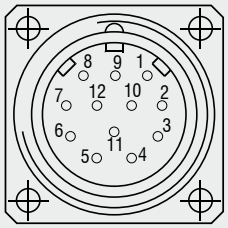
Output HTL	Push-pull (10 ... 30VDC)	
Level High	≥ UB -3V	(with I = -20mA)
Level Low	≤ 1.5V	(with I = 20mA)
Load High	≤ 40mA	
Output	A, $\overline{A}$, B, $\overline{B}$, O	

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

Output E830	Push-pull (8 ... 30VDC)
Level High	UB -3V
Level Low	≤ 2.5V
Load High	≤ 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.

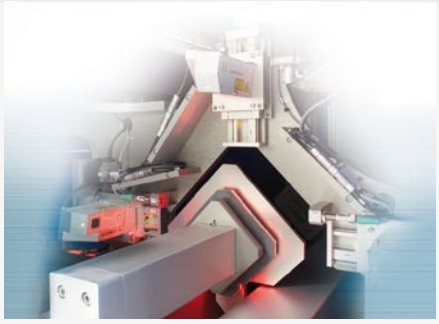
Connection assignment E, E830

Pin	Cable color	Assignment
-	white	0V
-	brown	+UB
-	green	A
-	-	$\overline{A}$
-	yellow	B
-	-	$\overline{B}$
-	grey	0

High performance sensors made by Micro-Epsilon

Sensors and systems for displacement, position and dimension
Eddy current displacement sensors
Optical and laser sensors
Capactive sensors
Linear inductive sensors
Draw wire displacement sensors
Laser micrometer
2D/3D profile sensors (laser scanner)
Image processing

Sensors and systems for non-contact temperature measurement
IR handheld
Stationary IR sensors
Thermal imager



Turn key systems for quality inspection
of plastics and film
of tires and rubber
of endless band material
of automotive components
of glass

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