

WS Position Sensors – the functional principle

WS position sensors capture position measurement either absolutely or incrementally, using measuring cables made from stainless steel. Using different constructions, and with measuring lengths of up to 60,000 mm, the ultra-simple, sturdy, space-saving designs make these sensors the ideal basic solution for many length and positional measuring tasks.

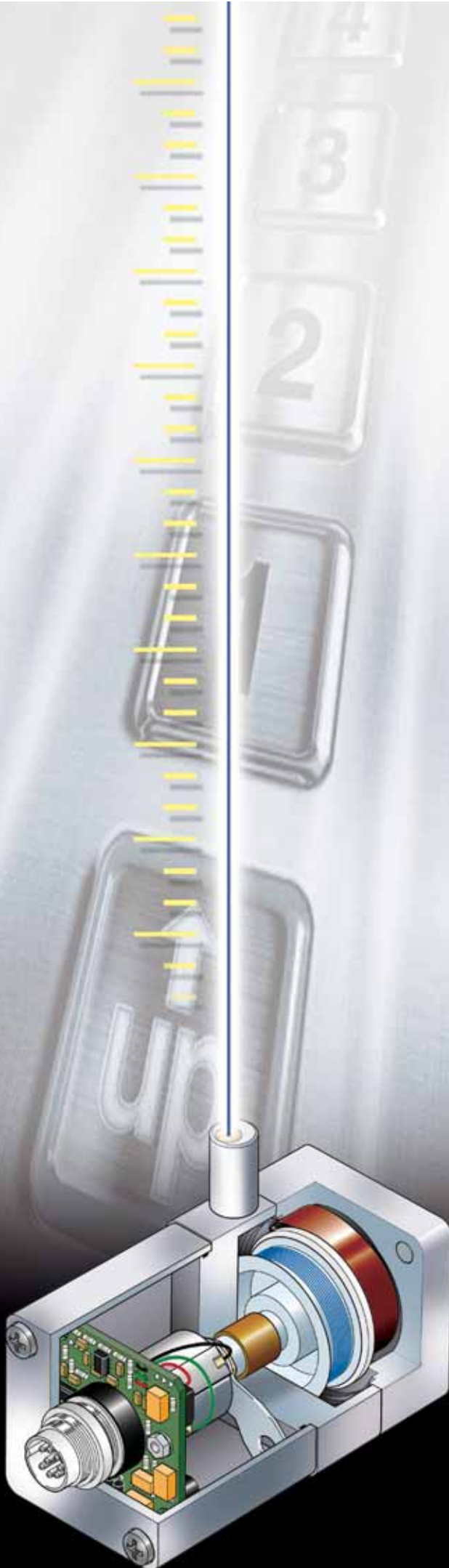
- WS position sensors comprise the following components:
- A precisely-calibrated measuring cable
- A measuring cable drum
- A measurement shaft
- A spring motor
- An angle sensor element
- Optional sensor electronics.

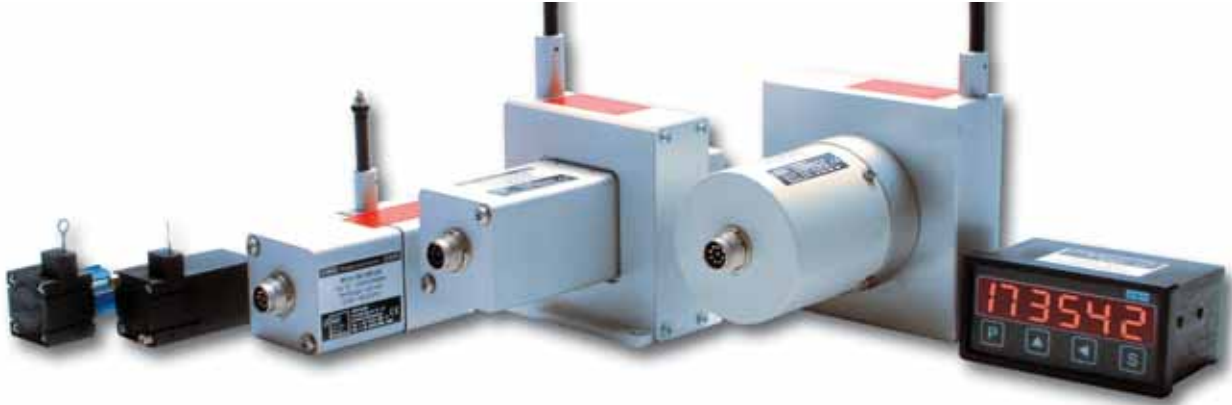
The measuring cable is first wound in tight spiral layers round the drum. To determine the position, the measuring cable is then unwound from the drum against the return force of the spring motor. The unwinding process from the drum converts the linear movement of the measuring cable into an angular movement. This angular movement is then captured using angle sensor elements (encoders or potentiometers) and converted into an electrical output signal.

Analogue output types include potentiometer, 0-10 V, 4-20 mA, analogue derived SSI or a programmable version with span and offset adjustment. Digital outputs include incremental encoder, absolute encoder, SSI, CANopen, Profibus, Interbus-S or RS-232.

Technical advantages:



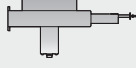
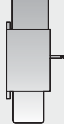






- Fast and easy to assemble
- Only minimal linear guidance required
- Compact design
- Resistant to vibration and shock
- High protection category to IP67
- Linearity of up to 0.01%
- High measuring speed up to 20 m/s
- Measuring lengths of up to 60,000 mm
- Many output types





■ Potentiometer
■ Encoder

Model Selection Guide for WS Position Sensors

Model	Measurement ranges								Outputs							Protection class	Special Characteristics		
	500	1000	1250	3000	6000	15000	60000	Potentiometer	0 ... 10 V	4 ... 20 mA	HTL/TTL inc	SSI	CANopen	DeviceNet	Profibus				
WS10 	■								●	●	●		●				IP65	<ul style="list-style-type: none"> Industrial sensor Very compact For manifold applications 	
WS17KT 	■								●	●	●		●				IP64	<ul style="list-style-type: none"> Analogue sensor for medium ranges Universal industrial sensor 	
WS19KT 	■												●	●	●	●	●	IP64	<ul style="list-style-type: none"> Robust industrial sensor With encoder output
WS60 	■												●	●	●	●	●	IP52	<ul style="list-style-type: none"> Compact sensor Especially for applications in elevators
WS12 	■								●	●	●		●				IP67	<ul style="list-style-type: none"> Very robust For applications in hostile environments 	
WS10EX 	■								●	●	●						IP65	<ul style="list-style-type: none"> Dust explosion-proof Very compact 	
WS12EX 	■								●	●	●						IP67	<ul style="list-style-type: none"> Dust explosion-proof Very robust For applications in hostile environments 	
WS100 	■								●	●	●		●	●	●	●	IP68	<ul style="list-style-type: none"> Compression-proof sealing Made of stainless steel For offshore-applications 	
WS31C/42C 	■								●	●	●						IP50	<ul style="list-style-type: none"> Miniature sensor For OEM applications and instrumentation 	
WS10SG 	■								●	●	●		●				IP64	<ul style="list-style-type: none"> In plastic housing Flexible mounting 	