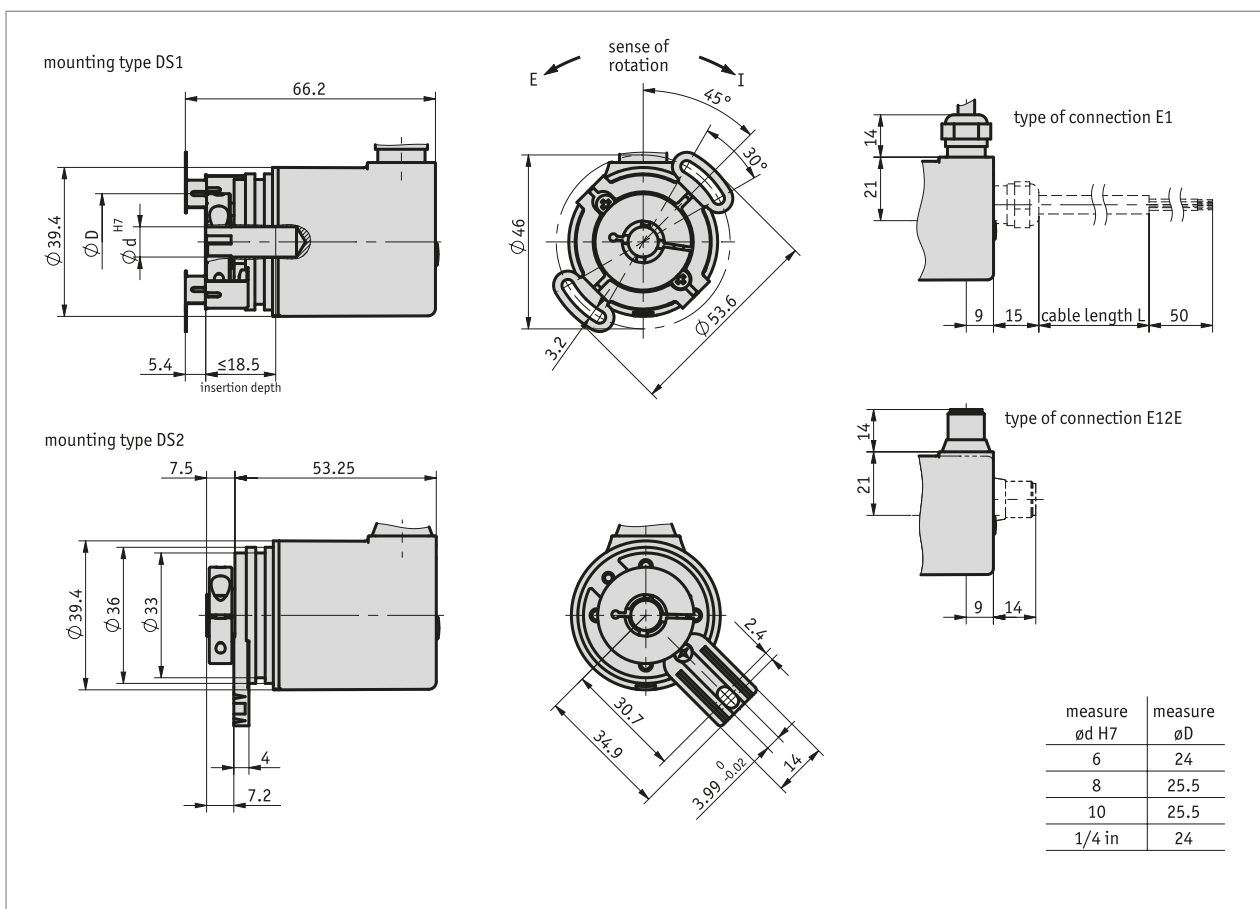


# Absolute encoder WH3650M

compact hollow shaft rotary encoder with SSI and IO-Link

## Profile

- Absolute wear-free magnetic encoder
- Multiturn without gearbox and without battery
- Interface SSI, IO-Link
- Extremely compact and very robust design
- IP67 protection class
- Extensive temperature range -40 ... 85° C
- Optimal price-performance ratio
- Industry 4.0 ready



### Mechanical data

Feature	Technical data	Additional information
shaft	rustproof stainless steel	
Flange	aluminum	
Housing	zinc die-cast	
Speed	6000 min <sup>-1</sup>	with protection class IP65, transient for ≤10 min
	3000 min <sup>-1</sup>	with protection class IP65, continuous operation
	4000 min <sup>-1</sup>	with protection class IP67, transient for ≤10 min
	2000 min <sup>-1</sup>	with protection class IP67, continuous operation
Starting torque	<0.007 Nm at 20 °C	with protection class IP65
	<0.01 Nm at 20 °C	with protection class IP67
Shaft load rating	40 N	radial
	20 N	axial
Cable sheath	PUR	∅5.5 ±0.2 mm, with SSI
Cable bending radius	45 mm	static, at SSI
	65 mm	dynamic, at SSI
Mounting type	stator coupling	mounting type DS1
	spring element	mounting type DS2
Weight	~0.2 kg	

### Electrical data

#### ■ IO-Link interface

Feature	Technical data	Additional information
Operating voltage	18 ... 30 V DC	reverse polarity protected, the power-supply unit corresponds to Class 2 (UL 1310)
Current consumption	≤40 mA	without load
Parameter storage	10 <sup>4</sup> cycles	also applies to calibration operations
Status display	two-color LED (red/green)	device status
Interface	IO-Link version 1.1	according to IEC 61131-9
Parameter	SIKO standard profile	IOL
	smart sensor profile	IOLssp
Type of connection	1x M12-plug connector (A-coded)	4-pole, 1x pin, E12E connection type

#### ■ SSI interface

Feature	Technical data	Additional information
Operating voltage	10 ... 30 V DC	reverse polarity protected, the power-supply unit corresponds to Class 2 (UL 1310)
Current consumption	≤40 mA	without load
Parameter storage	10 <sup>4</sup> cycles	also applies to calibration operations
Digital inputs	2	calibration (SET), direction of rotation (DIR). Both inputs active at high (comparator).
Input signal level high	≥60 %, from +UB	<+UB
Input signal level low	≤30 %, from +UB	
SSI clock speed input	50 kHz ... 2 MHz	
Status display	two-color LED (red/green)	device status
Monoflop time	≤15 µs	
Interface	SSI	line driver according to RS485
Cycle time	2 ms	
Type of connection	1x M12-plug connector (A-coded)	8-pole, 1x pin, E12E connection type
	open cable end	E1 connection type

### System data

Feature	Technical data	Additional information
Scanning	magnetic	
Resolution	12 bit	single-turn, 4096 steps/rotation, only at SSI
	13 bit	single-turn, 8192 steps/rotation, only at SSI
	14 bit	singleturn, 16384 steps/revolution
System accuracy	±1 °	
Repeat accuracy	±0.2 °	
Measuring range	1 rotation(s)	singelturm
	4096 rotation(s)	12 bit, only at SSI
	65536 rotation(s)	16 bit, only at SSI
	262144 rotation(s)	18 bit, only at IO-Link
	16777216 rotation(s)	24 bit, only at SSI
Approval	UL	UL 61010-1, File No. E503367

### Ambient conditions

Feature	Technical data	Additional information
Ambient temperature	-40 ... 85 °C	
Storage temperature	-40 ... 85 °C	
Relative humidity	93 %	condensation inadmissible
EMC	DIN EN 61326-1	immunity requirement of industry
	DIN EN 61000-4-2, -3, -6, -8	interference resistance / immission
	DIN EN 61000-4-4	burst
	DIN EN 61000-6-2	interference resistance / immission
	DIN EN 61000-6-4	emitted interference / emission
Safety regulations	DIN EN 55011 classes A and B	radiation emission / radio interference suppression
	UL 61010-1	indoor use, outdoor use possible, not intended for use involving direct exposure to UV light.
		Environment dry / wet.
		Protection class III as per EN 61140.
		Pollution degree 2 as per EN 61010.
		Maximum humidity 93% at 40 °C.
Protection category	IP65	EN 60529 (protection type not yet reviewed by UL)
	IP67	EN 60529 (protection type not yet reviewed by UL)
Shock resistance	2500 m/s <sup>2</sup> , 6 ms	EN 60068-2-27
Vibration resistance	300 m/s <sup>2</sup> , 10 ... 2000 Hz	EN 60068-2-6

### pin assignment

#### ■ SSI, E12E

Signal	PIN
GND	1
+UB	2
T +	3
T -	4
D +	5
D -	6
SET	7
DIR	8

#### ■ SSI, E1

Signal	Color
GND	white
+UB	brown
T +	green
T -	yellow
D +	gray
D -	pink
SET	blue
DIR	red

#### ■ IO-Link, E12E

Signal	PIN
L+ (+UB)	1
nc	2
L- (GND)	3
C/Q	4

### Industry 4.0

In most cases, data exchange with the absolute rotary encoder is limited to the exchange of process data. In addition to the process data, the rotary encoder provides additional information with an IO-Link interface that can be evaluated for condition monitoring up to predictive maintenance:

Process data	Smart Value	Smart Function
Actual position	Temperature	Condition monitoring
Speed	Limit speed	Application overload
	Operation hours counter	Operating time
	Acceleration events	Activation of PLC functions
	Speed events	Activation of PLC functions
		Asset management

### Order

#### ■ Ordering table

Feature	Ordering data	Spezifikation	Additional information
interface/protocol	A IO-Link	IO-Link SIKO standard profile	

