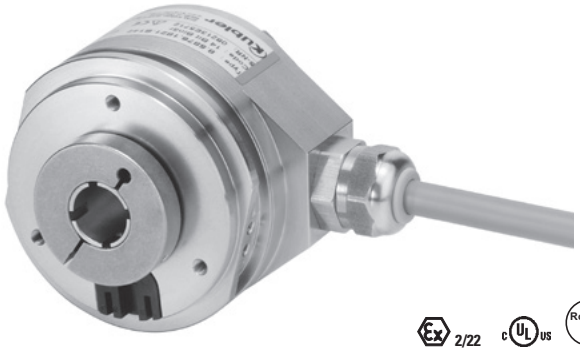
Stainless steel encoder, optical | **5876 (Hollow shaft)** | **SSI, Parallel**



The singleturn encoder 5876 with SSI or parallel interface and optical sensor technology boasts a hollow shaft of up to 12 mm.

It offers a maximum resolution of 14 bits, divided over 360°.

Safe

- A protection level of IP67 as well as the wide temperature range of -20°C to +80°C allow error-free operation even under the toughest working conditions
- The stainless-steel (1.4305) housing withstands even the most extreme external influences.

Adaptable

- Available with a choice of M12 connector or as cable version
- Gray, Binary or BCD code for parallel interface
- Wide range of possible applications thanks to numerous input options

Order code Shaft / Hollow shaft

8.5876	.	X	X	X	X	.	XXX	X
Type		a	b	c	d		e	f

a *Flange*
1 = flange with through hollow shaft
2 = flange with blind hollow shaft

b *Hollow shaft*
6 = ø 10 mm
8 = ø 12 mm

c *Output circuit / Power supply*
1 = SSI / 5 V DC
2 = SSI / 10 ... 30 V DC
3 = Parallel / 5 V DC
4 = Parallel / 10 ... 30 V DC

d *Type of connection*
1 = radial cable (1 m PVC cable) [1]
2 = M12 connector radial, without mating connector [2]

e *Code type and Division*
see table 1 (at interface 3 and 4, Parallel)
see table 2 (at interface 1 and 2, SSI)

f *Options*
2 = SET and V/R
3 [3] = SET and Latch
4 [3] = V/R and Latch

Table 1: Code type and divisions for encoders with parallel output

Interface and Supply Voltage, version 3 or 4 (Parallel)

Division	250	360	500	720	900	1000	1024 10 bit	1250	1440	1800	2000	2500	2880	3600	4000	4096 12 bit	5000	7200	8192 13 bit	16384 14 bit
Order code Gray / Gray-Excess	E02	E03	E05	E07	E09	E01	G10	E12	E14	E18	E20	E25	E28	E36	E40	G12	E50	E72	G13	G14
Order code Binary	B02	B03	B05	B07	B09	B01	B10	BA2	BA1	B18	B20	B25	B28	B36	B40	B12	B50	B72	B13	B14
Order code BCD	D02	D03	D05	D07	D09	D01	D10	DA2	DA1	D18	D20									

Table 2: Code type and SSI output

Interface / Supply Voltage, version 1 or 2

Division	1024 10 bit	4096 12 bit	8192 13 bit	16384 14 bit
Order code Gray	G10	G12	G13	G14
Order code Binary	B10	B12	B13	B14

1) In conjunction with parallel or SSI output
2) Only in conjunction with SSI output
3) Not with SSI interface

Absolute Encoders - Singleturn

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Mechanical characteristics

Speed [1]	max. 6000 min^{-1}		**Protection** acc. to EN 60 529	IP67
Rotor moment of inertia	approx. 6 x 10^{-6} kgm^2		**Working temperature range**	-20°C ... +80°C [2]
Starting torque	< 0.05 Nm		**Material** shaft / housing	stainless steel
Weight	approx. 0.6 kg		**Shock resistance** acc. EN 60068-2-27	2500 m/s^2, 6 ms
EX approval for hazardous areas	optional Zone 2 and 22		**Vibration resistance** acc. EN 60068-2-6	100 m/s^2, 10...2000 Hz

Electrical characteristics

Interface type		**Synchronous serial** (SSI)	**Synchronous serial** (SSI)	**Parallel**	**Parallel**
Power supply (U_B)		5 V DC (± 5 %)	10 ... 30 V DC	5 V DC (± 5%)	10 ... 30 V DC
Output driver		RS485	RS485	Push-Pull	Push-Pull
Power consumption (no load)	typ.	89 mA	89 mA	109 mA	109 mA
	max.	138 mA	138 mA	169 mA	169 mA
Permissible load / channel		max. +/- 20 mA	max. +/- 20 mA	max. +/- 10 mA	max. +/-10 mA
Update rate		max. 15.000/s	max.15.000/s	40.000/s	40.000/s
SSI clock rate min./max.		100 kHz / 500 kHz	100 kHz / 500 kHz	–	–
Signal level high		typ. 3.8 V	typ. 3.8 V	min. 3.4 V	min. U_B - 2.8 V
Signal level low	(I_{Load} = 20 mA)	typ. 1.3 V	typ. 1.3 V	–	–
	(I_{Load} = 10 mA)	–	–	max. 1.5 V	max. 1.8 V
	(I_{Load} = 1 mA)	–	–	max. 0.3 V	–
Rising edge time t_r (without cable)		max. 100 ns	max. 100 ns	max. 0.2 µs	max. 1 µs
Falling edge time t_f (without cable)		max. 100 ns	max. 100 ns	max. 0.2 µs	max. 1 µs
Short circuit proof outputs [3]		yes	yes [4]	yes	yes
Reverse connection of the supply voltage		no	yes	no	yes
UL-certified		File 224618			
CE compliant acc. to		EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3			
RoHS compliant acc. to		EU guideline 2002/95/EG			

1) For continuous operation max. 1500 min-1
2) 70°C cable version
3) If supply voltage U_B correctly applied
4) Only one channel allowed to be shorted-out:
   at U_B = 5 V short circuit to channel, 0 V, or +U_B is permitted.
   at U_B = 5 ... 30 V short circuit to channel or 0 V is permitted.

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Control inputs

Switching levels of the control inputs

Supply voltage		5 V DC	10 ... 30 V DC
Switching level	low	≤ 1.7 V	≤ 4.5 V
	high	≥ 3.4 V	≥ 8.7 V

Up/Down input to switch the counting direction

As a standard, absolute encoders deliver increasing code values when the shaft rotates clockwise (cw), when looking from the shaft side. When the shaft rotates counter-clockwise (ccw), the output delivers accordingly decreasing code values. The same applies to models with current interfaces. When the shaft rotates clockwise, the output delivers increasing current values, and decreasing values when it rotates counter-clockwise.

As long as the Up/Down input receives the corresponding signal (high), this feature is reversed. Clockwise rotation will deliver decreasing code/current values while counter-clockwise rotation will deliver increasing code/current values.

The response time is :

for 5 V DC supply voltage 0.4 ms
for 10 ... 30 V DC supply voltage 2 ms

SET input

This input is used to reset (zero) the encoder. A control pulse (high) sent to this input allows the current position value to be saved as the new zero position in the encoder.
For models equipped with a current interface, the analogue output (4..20 mA) will be set accordingly to the value 4 mA.

Note : After applying power to the encoder and before activating the SET input, a count direction (cw or ccw) must be clearly defined on the Up/Down input!

The response time is :

for 5 V DC supply voltage 0.4 ms
for 10 ... 30 V DC supply voltage 2 ms

LATCH input

This input is used to "freeze" the current position value. The position value will be statically available on the parallel output as long as this input remains active (high).

The response time is :

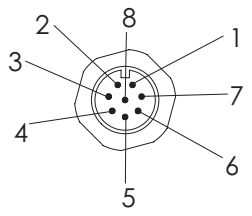
for 5 V DC supply voltage 140 µs
for 10 ... 30 V DC supply voltage 200 µs

Terminal assignment SSI with M12 connector (8-pin) or cable version

Signal	0V	$+U_B$	+T	-T	+D	-D	ST	VR
Pin	1	2	3	4	5	6	7	8
Cable colour	WH	BN	GN	YE	GY	PK	BU	RD

Top view of mating side, male contact base

M12 connector, 8 pin



Terminal assignment cable version Parallel interface up to max. 14 bit and max. 2 options:

Signal	0V	$+U_B$	1	2	3	4	5	6	7	8	9	10	11	12	13	ST/ VR	VR/ LH	14	⏚
Cable colour	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY PK	RD BU	WH GN	BN GN	WH YE	YE BN	WH GY	GY BN	PH

T: Clock signal

D: Data signal

ST: Set input. The current position is set to zero

VR: Up/down input. As long as this input is active, decreasing code values are transmitted when shaft turning clockwise.

Isolate unused outputs before initial start-up.

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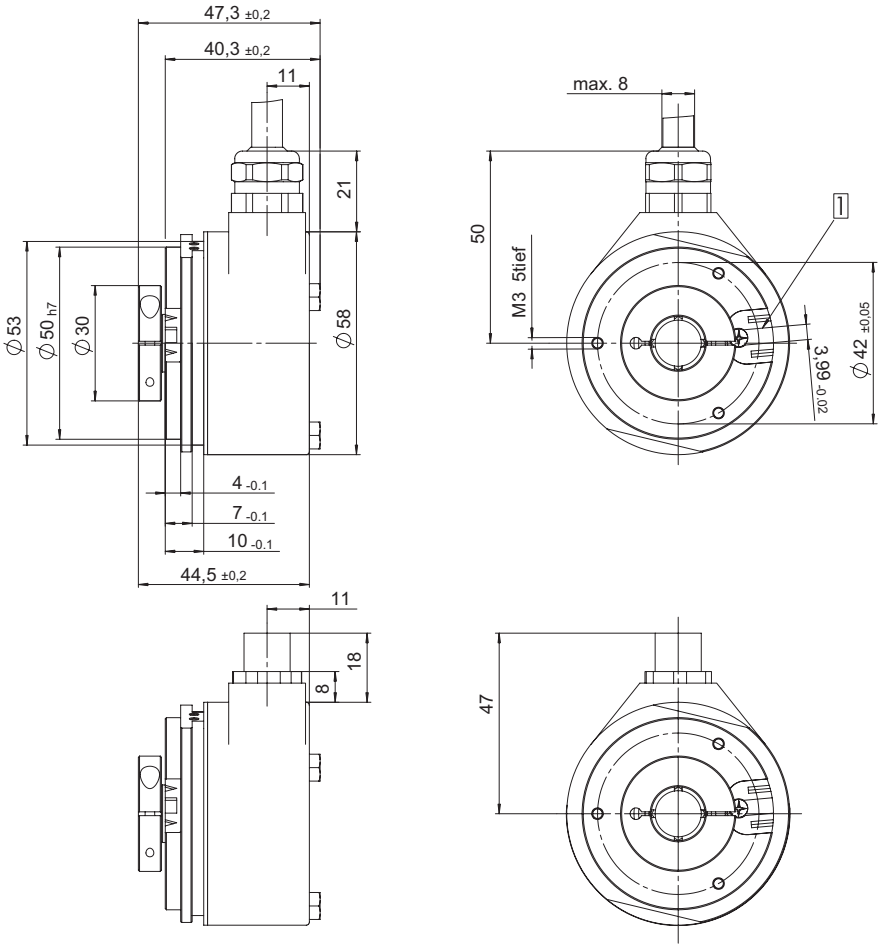
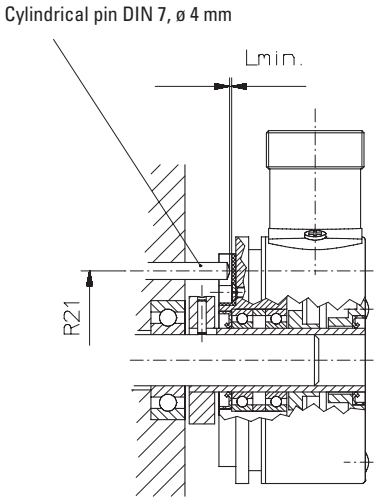
Dimensions





1 Torque stop slot,
Recommendation: Cylindrical pin DIN7, ø 4 mm

Mounting advice

1) When mounting a hollow shaft encoder, we recommend using the torque stop pin or a stator coupling.
2) When mounting the encoder ensure that the dimension Lmin. is larger than the maximum axial play of the drive.
Otherwise there is a danger that the device could mechanically seize up.