



New Components and Solutions

- Position and Motion Sensors
- Transmission Technology
- Counting Technology
- Process Technology

Safety first



further information about Safety Solutions on page 12

Safety for harsh applications.

- SIL 3 (EN 62061) certification in preparation
- Sturdy bearing construction with Safety-Lock™ technology tolerates installation errors
- Rugged encoders for large AC vector drives with high vibration loading
- Hermetically encapsulated (IP 69K) or surface treated: Ideal for use in commercial vehicles, wind energy, dockside cranes or offshore installations.

Sendix encoders from Kübler. Technology you can trust in.



■■■ *pulses for automation*

Table of contents

General

Company profile / Product portfolio	4 - 5
Kübler News	62 - 63
Contacts Germany, Europe, Worldwide	64 - 66

New Products

Absolute Singleturn / Multiturn Encoders Sendix F36	6 - 7
Magnetic, compact Encoders	8 - 9
Incremental Encoders Series 5821	10
Encoders for Special Applications	11
Encoders for functional safety / Inclinometers	12
Encoders – Accessories	13
Connectors and Cables / Transmission Technology	14 - 15
Preset Counters Codix 907 908	16
Codix Counters and Displays	17
Preset Counter Codix 560	18
Hour Meter HR 47	19

Datasheets

Absolute Encoders	
Sendix absolut, Singleturn F3653 F3673	20 - 23
Sendix absolut, Multiturn F3663 F3683	24 - 27
Sendix absolut, Singleturn F3658 F3678 CANopen	28 - 30
Sendix absolut, Multiturn F3668 F3688 CANopen	31 - 33
Miniature series, magnetic Singleturn 2450 2470	34 - 35
Sendix absolut, Singleturn M3658 M3678 SAE J1939	36 - 38
Incremental Encoders	
Miniature series, magnetic 2430 2440	39 - 40
Large hollow shaft 5821	41 - 42
Sendix 5006 Stainless-steel	43 - 44
Transmission technology	
Slip rings IST-SR085	45 - 47
Slip rings IST-SR060	48
Optical fibre signal transmission	49 - 50
Cables, Connectors, Accessories	
8-pin M12 Cordsets with integrated control LEDs	51
M12 Connection technology	52
Robust Bearing Unit	53
Preset counters / Timers	
LCD Preset counters Codix 907 908	54 - 55
LED Preset counter Codix 560	56 - 59
Timer, round HR 47	60

New for 2009

Our pulses are our assets

Fritz Kübler GmbH is a manufacturer of counting and sensor technology that is active worldwide.



The core business of Kübler GmbH is the development, manufacture and marketing of leading-edge position and motion sensors, innovative display and counting technology as well as connection and transmission technology. Founded in the year 1960, the family business is now led by the next generation of the family, Gebhard and Lothar Kübler. It is active worldwide with the export share of its turnover exceeding 60 percent. 6 subsidiaries and 50 exclusive representatives offer product know-how, service and advice globally on-site.

We see the opportunities for our business in the field of application-oriented innovations and service-intensive achievements – always with the success of our customers in mind.

With over 225 employees, we reliably ensure the high level of flexibility of our products, superior quality management as well as exceptional delivery dependability.

Our Product Portfolio

Customer oriented solutions



Position and Motion Sensors



- Incremental Encoders
- Absolute Encoders
- Draw-wire Systems
- Linear Measuring Systems
- Inclinometers

Counters and Process Displays



- Display and Preset Counters
- Timers and Preset Hour Meters
- Frequency Meters and Tachometers
- Combination Time and Energy Meters
- Position Displays
- Process Displays and Controllers

Connector and Signal Transmission Technology



- Slip rings
- Fibre Optic Modules
- Cables, Connectors and Cable Assemblies

OEM Products and Systems (OPS)



- Customised Display, Measurement and Control Components
- Complete Systems Solutions: Sensor Technology, Electronics, Mechanics

Absolute Singleturn / Multiturn Encoders

Sendix F36: The compact revolution.

Kübler presents the first optical multiturn encoder without gears and with 100 percent magnetic insensitivity.

Kübler introduces a little technological revolution. A new encoder technology, first used in the absolute singleturn and multiturn Sendix F36 series, aims to spur on applications in the future; whilst getting rid of technological disadvantages such as wear or magnetic sensitivity. All the advantages on one chip – this is the motto.

In the new patented, optimised design there is room enough only for the essentials, such as for example the sturdy Safety Lock™ Design bearing-assembly. The bearings used are very large for an encoder of this size. This bearing assembly alone - guarantor for extreme ruggedness and long service life - takes up two-thirds of the overall depth of the compact encoder. Thanks to the non-contact optical technology, maximum service life is achieved.



An OptoASIC with the new Intelligent-Scan-Technology developed by Kübler lies at the heart of the new absolute F36 Sendix series; here the information threads come together; here lies the intelligence for singleturn and multiturn functions.



CANopen SSI BiSS INTERFACE



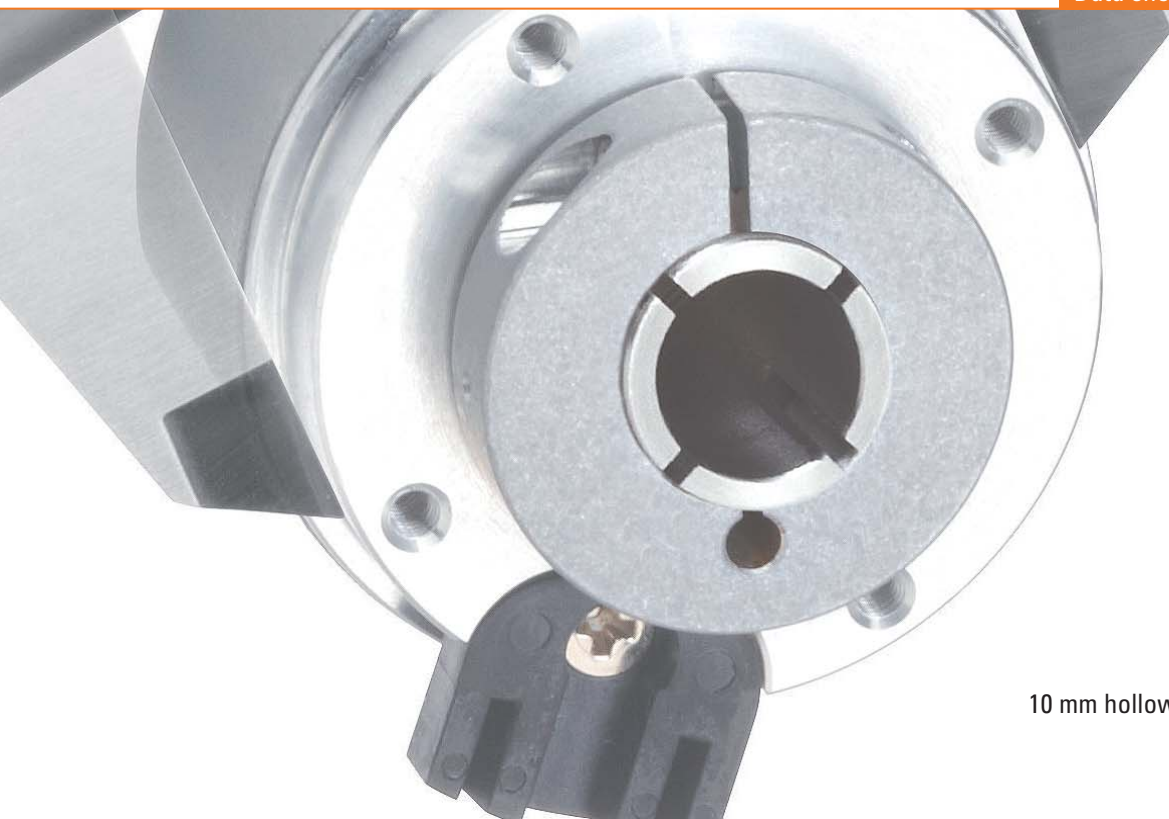
It is probably also a record that an 8 millimetre hollow-shaft or a 10 millimetre blind-hollow shaft can be offered within the flange size of just 36 millimetres. The icing on the cake is provided by the compact dimensions of the tangential cable outlet.

With a total resolution of up to 41 bits, which results from the combination of a requirement-based programmable multiturn encoder with up to 16 million revolutions and a high-precision singleturn with up to 17 bits resolution, the new F36 encoders feature a particular wide choice of options, which opens up numerous areas of application to them. The Kübler absolute Sendix F36 are initially available with SSI and BiSS interface options – CANopen in preparation.

Application areas:

- Medical equipment
- Small drives
- Pick and Place machines
- All automation equipment with limited installation room

Data sheet page 20



Particularly compact:
10 mm hollow shaft in a 36 mm flange size



New: the miniature magnetic series in 24 mm size – unbeatably small.

Safety Lock inside: compact Sendix series in 36 mm size, incl. sturdy Safety-Lock bearings. IP 69K even on the flange side.

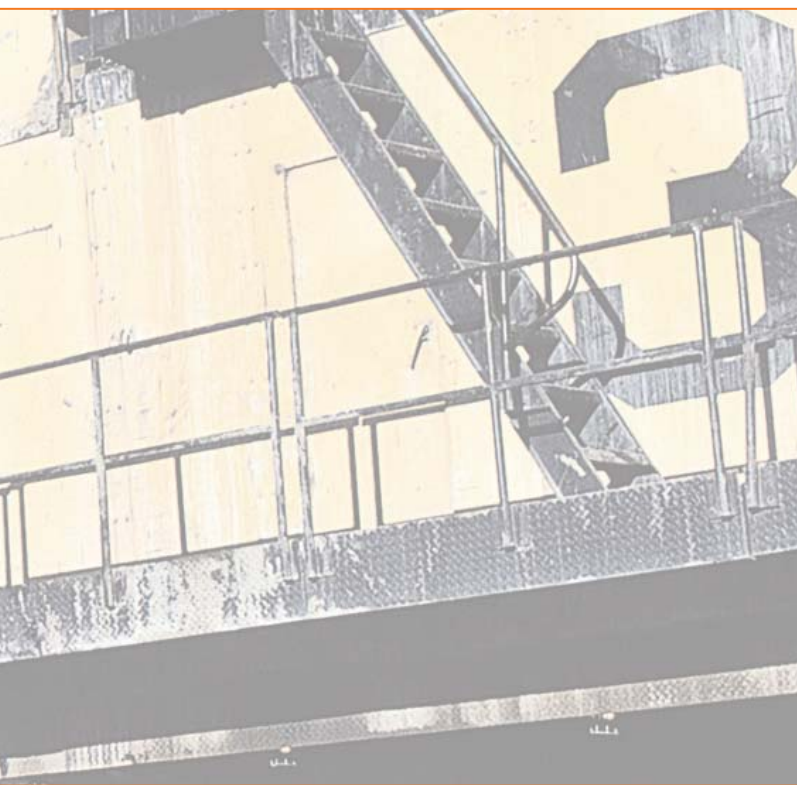
Data sheet page 34 and 39



Magnetic, Compact Encoders

Magnetic, compact and encapsulated: A new incremental series expands the Kübler magnetic encoder portfolio

Singleturn - Incremental - Fieldbus – Analogue



Wherever applications do not require peak performance values when it comes to accuracy and no significant levels of magnetic interference are present, then magnetic encoders are the compact, economical choice. The new magnetic miniature encoders have a resolution of up to 256 pulses per revolution. The models with an analogue interface are the ideal replacement for potentiometer solutions giving your application a longer lifetime. As well as the standard SSI interface, the absolute singleturn versions also come in CANopen Fieldbus variants.

With dimensions of just 24 or 36 mm the magnetic encoders from Kübler are amazingly compact and extremely rugged. At the same time the Safety-Lock *plus*TM and Sensor-ProtectTM technology allow an all-round protection level of IP 69K – even on the flange side. And last but not least, their resistance to severe cold predestines these mini devices for mobile automation. Whether in excavators or in refuse vehicles, these robust encoders stand up to the frequent use of high-pressure washers. And, even in the far north, the encoders reliably do their job at temperatures down to -40°C.



SAE J1939: the encoder series offers this standard protocol of the Society of Automotive Engineers for utility vehicles, construction and agricultural machinery, as well as in ships and railway vehicles.

Incremental Encoders

Optimised proportions: Solutions with large hollow shaft



The overall diameter of just 58 mm boasts a hollow shaft of up to 28 mm diameter.

Data sheet page 41

Incremental hollow shaft encoder 5821

Encoders with a through hollow shaft require remarkably little installation space and therefore enjoy great popularity when used with electric drives.

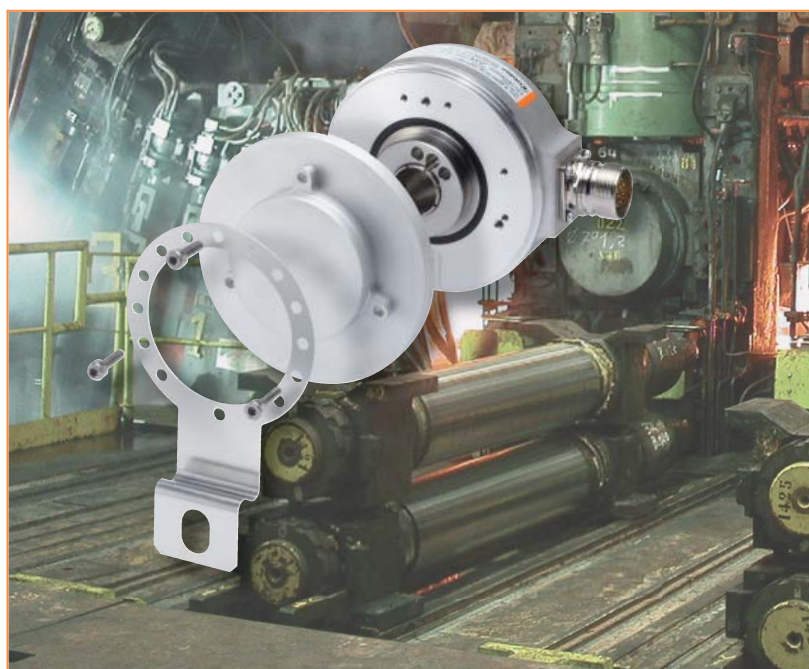
Here however the new Kübler Series 5821 offers a convenient, reasonably-priced alternative solution: wherever applications place only relatively low demands regarding speed (max. 3000 revolutions per minute) and temperature (max +85°C), then everything speaks for the use of the series 5821 with its through hollow shaft up to 28 mm.

Protection cover for hollow shaft series A02H

The Heavy Duty incremental encoders A02H, with hollow shafts up to 42 mm, are particularly tough and resistant to vibrations. They are the right choice for AC-vector drives, which are used in steel plants.

For applications with a very high degree of pollution Kübler now offers a protective cover, which ensures in the simplest manner possible that the encoder will continue to operate reliably at all times and over a very long service life.

Adds to resistance and protects against pollution: The new protection cover



Encoders for Special Applications

One Sendix encoder for every eventuality

Sea-water resistant encoders for offshore applications

The tried and tested Sendix technology can provide proof of its true qualities when working under difficult conditions. This is where the wheat is separated from the chaff. The Sendix encoders win the argument because of their particularly sturdy Safety-Lock™ Design bearings and offer maximum protection as a result of their solid die-cast housing. Moreover their trademarks also include a protection level of IP67 as well as a very wide temperature range (-40 ... +90°C), making Sendix the first choice for outdoor applications. If salt water now enters the equation, as for example in offshore applications or in outside plant near the coast, then even the high levels of protection start to reach their limits. An economical alternative to encoders manufactured from seawater-resistant stainless-steel comes in the form of coated encoders from Kübler. They brilliantly master even the tough salt-spray test IEC 68-2-11 concerning resistance to seawater. Nearly all the encoders in the Sendix series are available in a salt water resistant version. Please ask us for an appropriate quotation.

Stainless-steel encoders 5006 for the food industry.

Wherever plant and machinery is cleaned by means of aggressive chemicals or steam jets, then hard-wearing stainless-steel housings are called for. The stainless-steel family is manufactured out of a special stainless-steel (Niro – corrosion-resistant, austenitic chrome-nickel steel) that suitably meets the high requirements of the general food law regulations. The connection technology is naturally of the same level of quality: from resistant cables, through special stainless steel connectors and on down to the little but important details such as the Viton seals used in the encoders.



seawater resistant on request



Data sheet page 43

Encoders for functional safety / Inclinometers

safety@kuebler.com



safety@kuebler.com

Sendix absolute and Sendix incremental

Safety functions acc. to EN 61800-5-2, as for example

- Safely Limited Speed (SLS)
- Safely Limited Position (SLP)
- Safe Speed Range (SSR)
- Safe Direction (SD)

SIL 3 (EN 62061) or PLe (EN ISO 13849-1) – Certification for absolute multiturn encoders in preparation

Large choice of versions thanks to unique modular design.

Through hollow shaft up to 15 mm in 58 mm standard size.
Very high clock rate (up to 10 MHz), very short control times. Fast start-up, high rotational speed.



more information: www.kuebler.com

Inclinometers IS40

The inclinometer IS40 permits 2-dimensional inclinations to be measured. Versions are available for the measuring ranges $\pm 10^\circ$, $\pm 45^\circ$ or $\pm 60^\circ$.

Among their special features are their rugged and compact construction, the high shock resistance, the protection level IP67, and the wide temperature range of -30°C to $+70^\circ\text{C}$.

The rugged compact construction makes this sensor the ideal device for angle measurement in harsh environments – for vehicle technology, solar installations, cranes and hoists, and commercial vehicles.

Encoders – Accessories

Little extras for big solutions

Taper shaft - mounting kit.

The new mounting kit upgrades the large incremental hollow shaft encoder A02H for mounting onto a tapered shaft. Tapered shafts are used for high-precision direct coupling to direct drives. An isolating insert is also included in the mounting kit; this reliably protects the encoder from shaft currents.

Included in the set: Insert for cone blind hole, cone 1:10, 17 mm length, insulation insert, Allen screw for central fixing



Robust bearing unit.

The new robust bearing unit separates the bearing load from the sensor technology and can be easily retrofitted. It provides the ideal solution, where strong forces exert pressure on the shafts – for example when belts are under high tension.

The robust bearing unit is suitable for all Sendix 50xx and 58xx series encoders.



Spring tether element

Simple but clever – this new torque stop offers the maximum amount of flexibility when fixing. Spring tethers can be fixed at just about any angle, since pitch circles can be selected steplessly from 42 up to 84.5 mm.

The spring tether element is suitable for all hollow shaft encoders.



Connectors and Cables

Connectors and Cables – Solutions according to the intentions of our customers



Incremental compact encoders series 3610 and 3620 now with M12 connector

The industry standard M12 is now also available for the compact 36 mm encoders. The 8-pin connectors are available for the shaft version in both radial and axial options; for the hollow shaft version the radial option is available. These items, together with the comprehensive range of matching cordsets, ensure fast error-free connection of the encoders.



Cordsets for CANopen encoders and analogue encoders

(Sendix 3651, Draw-wires with potentiometer).

The new series of ready-to-go cordsets for CANopen Fieldbus encoders and analogue encoders rounds off the Kübler connection technology product range for Kübler encoders. Once more Kübler provides solutions and not only components.

Overview Cordsets page 52



M12 Cordsets with integrated control LEDs

The new 8-pin M12 cordset for incremental encoders ensures fast, simple connections under difficult outdoor conditions. The connection, in a transparent, right-angle housing, contains three LEDs, which display the channels A,B and Z.

This allows the smooth functioning of the encoders to be easily checked at a glance any time. This also greatly facilitates any necessary troubleshooting. It is of additional help during start-up, as the zero point can be detected when the Z-pulse LED lights up.

Data sheet page 51

Transmission Technology

For power, signals, air, hydraulics, and light

Slip ring programme with more options – including air and hydraulics

The slip ring programme for both series SR085 and SR060 has now been expanded. New order codes allow considerably more options.

Slip rings transmit power, signals or data from a stationary to a rotating platform. The modular SR085 Slip Ring series however can also be upgraded to transmit air or hydraulics.



Version with media lead-through for air or hydraulics.

Optical fibre modules now also for SSI encoders.

The tried and tested optical fibre modules for incremental encoders have now been expanded with the addition of a version for absolute encoders with standard SSI interface. It is thus possible to implement connections from standard encoders over distances of up to 1500 m and with high EMC interference.



Compact pneumatic rotatable connector

Data sheet page 45



Data sheet page 49

Codix Preset Counters

The simple, economical, high-performance Preset Counter Kübler Codix 907 | 908



Data sheet page 54

Codix 907 | 908

A high-quality preset counter for pulse, time and position inputs, Made in Germany and with a 6-digit display? As well as a 3-year warranty, relay outputs and user friendly plug-in screw terminal? With very attractive pricing?

You do not come across this every day, but it is possible: the Codix 907/908 from counter specialist Kübler is a real price-cutter in its class but is still more than able to handle control and monitoring tasks both easily and reliably. Slimmed down to essential functions, the preset counter in DIN format 48 x 48 mm is the result of the latest Kübler technologies and a strict cost/benefit calculation. Functionality and user-benefit were the focus.

The high-quality LCD display with optional backlighting offers space for a 2-line 6-digit display along with preset annunciators. The settings of the preset is very simple via the decade keypad.

Technical features:

- Plug-in screw terminal
- Menu-driven programming
- Decade keypad, for each digit one key
- Minimum installation depth
- High protection rating (IP 65)
- 2 x 6-digit with preset annunciator from -999999 up to +999999
- For pulse, time and position
- Adding and subtracting
- Codix 907 – 1 preset
Codix 908 – 2 presets
- With or without backlighting

Codix Counters and Displays

Codix family in compact DIN 24 x 48 format expanded

Codix 538 – CAN Display

The new CODIX 538 from Kübler can be integrated without difficulty into any CAN or CANopen network in order to display locally any user-defined value. Numerical values can be directly scaled using a factor or offset from the display device. The bright, 8mm high display has a floating decimal point that can be inserted in any position.



www.kuebler.com/counters

Codix 52C | 52T – Dual Counters

The Codix 52C dual counters boast separate single-channel pulse inputs – the Codix 52T versions have a common count input. For both counter contents the displayed values are scaled separately from each other and indicated via a very bright LED display. At the same time the big front keys permit operation and menu-driven programming even when wearing gloves.



www.kuebler.com/counters

Codix 140 | 141 – Standard Pulse counters / Timer

With their clear 7-digit display and 8 millimetre high figures the Codix 140 and Codix 142 pulse counters supply their information at a glance and directly display the total number of pulses. All the values are reliably stored in the EEPROM and protected against data loss.

Codix 142 | 143 – Service Pulse counters / Timer

The Service and Pre-service values of the service counters Codix 142 and Codix 143 can be requested and displayed at any time – via the display and solid-state output. The service intervals are permanently pre-programmed at the factory in line with the customer's wishes (starting from a min. order quantity of 25 pcs.). The counter can be reset by means of the reset key or by using an electrical input. For the simple monitoring of your service intervals.



www.kuebler.com/counters

New large Preset Counter Codix 560

The new generation of preset counters in DIN 96x48 format



Data sheet page 56

With the large preset counters Codix 560 Kübler is rounding off a completely new generation of preset counters. All the areas of application for preset counters – including even simple control tasks – are now comprehensively covered.

This DIN size 96x48mm device is full of power: The Codix 560 offers very bright, large LEDs that can be easily read in poor lighting conditions or from a long distance away. Great store was placed – as with all Codix units – on very simple user operation and programming structure. For this reason the Codix 560 is equipped with numerous scrolling help texts, which – thanks to the 14 segment LED – are very clearly legible, as well as with an intuitive cursor keypad.

The preset counter can be used for pulses, time, frequency and position; it can also function as an overall total counter or as a batch counter.

Technical characteristics:

- 2 (changeover) relays
- Count modes for pulse, time, frequency and position
- Scalable display
- Averaging, start delay (Tachometer)
- Step or tracking presets
- Direct preset entry via the front keys or via the Teach-In input
- Max. count frequency 60 kHz
- Status display of the presets
- 3 predefined settings for the most common parameter settings
- Tracking presets eliminate the need for reprogramming of the pre-signal
- 4-stage RESET modes
- Fast installation thanks to user-friendly plug-in screw terminal connections
- Minimum installation depth
- Suitable for installation in mosaic systems

Hour Meter HR 47

It knows when it happened!

The new electromechanical hour meter HR 47 from Kübler – with run indicator – is indispensable, wherever service intervals have to be effectively monitored and planned.

A run indicator reliably displays the status of the meter, whilst the count value can always be easily read at a glance thanks to its large figures.

As an electromechanical meter the Kübler HR 47 is virtually impossible to manipulate and is exceptionally reliable and robust. In consequence it offers a long service life, especially with regard to the 7-digit display with its wide counting range. The HR 47 is ideal for use in applications outdoors and in machines with high loads, thanks to its high IP 65 level of protection and its broad operating temperature range, not forgetting its excellent resistance to shock and vibration.

So it really is at home in tough industrial environments such as in construction machinery or industrial trucks.

The standard format housing is simple to install thanks to its flexible mounting clips and can be used in virtually any application thanks to the wide choice of power supply options on offer – these cover 10-80 Volt DC or 100-130 Volt AC at 60 Hz up to 187-264 Volt AC at 50 Hz.



Data sheet page 60

Rotary Measuring Technology

Absolute Singleturn Encoders

Sendix absolut

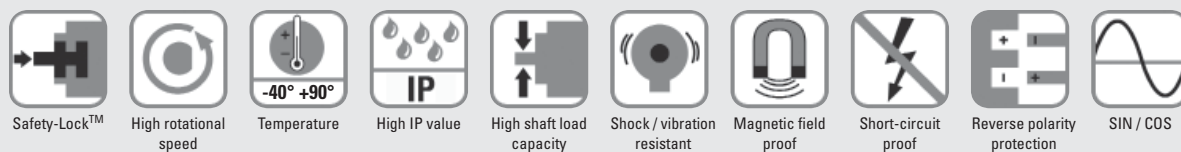
F3653 / F3673 (Shaft / Hollow shaft)

SSI / BiSS



The Sendix F36 singleturn boasts exceptional ruggedness and compact dimensions. With a size of just 36 x 42 mm it offers a through hollow shaft of up to 8 mm or a blind hollow shaft of up to 10 mm.

Its high-precision optical sensor technology can achieve a resolution of up to 17 bits.



Reliable and magnetically insensitive

- Sturdy bearing construction in Safety Lock™ Design for resistance against vibration and installation errors
- Ideal for use outdoors thanks to IP 67 protection and wide temperature range from -40°C up to +90°C

Optimised performance

- High-precision with a data refresh rate of the position value $\leq 1\mu s$
- High-resolution feedback in real-time via incremental outputs SinCos and RS422
- Short control cycles, clock rate with SSI up to 2 MHz / with BiSS up to 10 MHz

Order code Shaft version

8.F3653 . XXXX . XX 1 X
Type 1 2 3 4 5 6 7



1 Synchro flange

2 = IP67, $\varnothing$ 36 mm
4 = IP65, $\varnothing$ 36 mm

2 Shaft ($\varnothing$ x L)

1 = 6 x 12,5 mm
2 = 6,35 x 12,5 mm
3 = 8 x 15 mm
4 = 9,525 x 15,875 mm
5 = 10 x 20 mm

3 Interface / Power supply, SSI or BiSS

1 = 5 V DC
2 = 10 ... 30 V DC
3 = 5 V DC and 2048 ppr SinCos track
4 = 10 ... 30 V DC and 2048 ppr SinCos
5 = 5 V DC, with sensor output for monitoring the voltage on the encoder
6 = 5 V DC and 2048 ppr SinCos, with sensor output for monitoring the voltage on the encoder
7 = 5 V DC and 2048 ppr incremental signals RS422
8 = 10 ... 30 V DC and 2048 ppr incremental signals RS422

4 Type of connection

1 = Cable, tangential (1 m PUR)
3 = Cable, tangential (5 m PUR)
8 = 8-pin connector M12, axial
(only with output circuits 1 or 2)

5 Code

B = SSI, Binary
C = BiSS, Binary
G = SSI, Gray

6 Resolution

A = 10 bit ST
2 = 12 bit ST
3 = 13 bit ST
4 = 14 bit ST
7 = 17 bit ST

7 Inputs/Outputs

2 = SET, DIR inputs / Status output

Preferred types are underlined

Order code Hollow shaft

8.F3673 . XXXX . XX 1 X
Type 1 2 3 4 5 6 7



1 Flange

$\varnothing$ 36 mm, IP65
1 = with torque stop
2 = with stator coupling

2 Hollow shaft ($\varnothing$ x L)

1 = 6 mm
2 = 6,35 mm
3 = 8 mm
4 = 10 mm
(Blind hollow shaft)

3 Interface / Power supply, SSI or BiSS

1 = 5 V DC
2 = 10 ... 30 V DC
3 = 5 V DC and 2048 ppr SinCos track
4 = 10 ... 30 V DC and 2048 ppr SinCos
5 = 5 V DC, with sensor output for monitoring the voltage on the encoder
6 = 5 V DC and 2048 ppr SinCos, with sensor output for monitoring the voltage on the encoder
7 = 5 V DC and 2048 ppr incremental signals RS422
8 = 10 ... 30 V DC and 2048 ppr incremental signals RS422

4 Type of connection

1 = Cable, tangential (1 m PUR)
3 = Cable, tangential (5 m PUR)
8 = 8-pin connector M12, axial
(only with interface 1 or 2 and blind hollow shaft 10mm)

5 Code

B = SSI, Binary
C = BiSS, Binary
G = SSI, Gray

6 Resolution

A = 10 bit ST
2 = 12 bit ST
3 = 13 bit ST
4 = 14 bit ST
7 = 17 bit ST

7 Inputs/Outputs

2 = SET, DIR inputs / Status output

Preferred types are underlined

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

Rotary Measuring Technology

Absolute Singleturn Encoders	Sendix absolut	F3653 / F3673 (Shaft / Hollow shaft)	SSI / BiSS
------------------------------	----------------	--------------------------------------	------------

Mechanical characteristics:			
Maximum speed			
Shaft- or blind hollow shaft version without shaft seal (IP65)		12 000 min ⁻¹	10 000 min ⁻¹ (continuous op.)
Shaft version (IP 67) or hollow shaft version (IP 65) with shaft seal		10 000 min ⁻¹	8 000 min ⁻¹ (continuous op.)
Starting torque		without shaft seal < 0,007 Nm	with shaft seal (IP67) < 0,01 Nm
Shaft load capacity		radial	40 N
		axial	20 N
Weight		ca. 0,2 kg	
Protection to EN 60 529		housing side	IP 67
		shaft side	IP 65 (solid shaft version opt. IP 67)
EX approval for hazardous areas		optional Zone 2 and 22	
Working temperature range		-40°C ... +90°C	
Cable type:		fixed	-30°C
		flexible	-20°C
Materials		Shaft/Hollow shaft	stainless steel
		Flange	Aluminium
		Housing	Zinc die-cast
		Cable	PUR
Shock resistance acc. to DIN-IEC 68-2-27		>2500 m/s ² , 6 ms	
Vibration resistance acc. to DIN-IEC 68-2-6		>100 m/s ² , 55 ... 2000 Hz	

General electrical characteristics:			
Supply voltage		5 V DC + 5% od. 10 ... 30 V DC	
Current consumption (no load)		5 V DC	max. 70 mA
		24 V DC	max. 20 mA
Reverse connection of the supply voltage		yes	
CE compliant acc. to		EN 61 000-6-2, EN 61 000-6-4 and EN 61 000-6-3	
RoHS compliant acc. to		EG-guideline 2002/95/EG	

Interfaces			
General interface characteristics			
Output driver		RS 485 transceiver type	
Permissible load/channel		max. + 30 mA	
Signal level		high	typ 3,8 V
		low with I _{Last} = 20 mA	typ 1,3 V
Short-circuit proof outputs		yes ¹⁾	

SSI interface		
Resolution, singleturn	10 ... 17 bit	
Code	Binary or Gray	
SSI clock rate	< 14 bit	50 kHz ... 2 MHz
	> 15 bit	50 kHz ...125 kHz
Monoflop time	> 15 µs	
Note: If the clock cycle starts within the monoflop time a second data transfer begins with the same data. If the clock cycle starts after the monoflop time the cycle begins with the new values. The update rate is dependent on the clock speed, data length and monoflop time.		
Data refresh rate	up to 14 bit	< 1 µs
	up to 15 ... 17 bit	4 µs
Status and Parity Bit	on request	

BiSS interface

Resolution, singleturn	10 ... 17 bit
Code	Binary
BiSS Clock rate	up to 10 MHz
Max. update rate	< 10 µs, depends on the clock rate and the data length
Data refresh rate	< 1 µs
Note:	– Bidirectional, programmable parameters are: resolution, code, direction, alarms and warnings – CRC data verification

Incremental outputs (A/B), 2048 ppr

	Sine/Cosine	RS 422 TTL-compatible
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 V _{pp} (+ 20%)	high: min. 2,5 V low: max. 0,5 V
Short circuit proof	yes ¹⁾	yes ¹⁾

SET input

Input	active high	
Input type	comparator	
Signal level	high	min. 60 % of V ₊ , max: V ₊
	low	max. 30 % of V ₊
(V ₊ = supply voltage)		
Input current	< 0,5 mA	
Min. pulse duration (SET)	10 ms	
Timeout after SET signal	14 ms	

The encoder can be set to zero at any position by means of a HIGH signal on the SET input. Other preset values can be factory-programmed. The SET input has a signal processing time of approx. 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approx. 14 ms before the new position data can be read. During this time the status output is at LOW.

DIR input

A HIGH signal switches the direction of rotation from the default CW to CCW. This inverted function can also be factory-programmed. If DIR is changed when the device is already switched on, then this will be interpreted as an error. The status output will switch to LOW.

Response time (DIR input)	1 ms
----------------------------------	------

Status output

Output driver	Open collector, internal pull up resistor 22 kOhm	
Permissible load	-20 mA	
Signal level	high	+V
	low	< 1 V
Active	low	

The status output serves to display various alarm or error messages. In normal operation the status output is HIGH (open-collector with int. pull-up 22 kOhm).

An active status output (LOW) displays:

LED fault (failure or ageing) – over-temperature – undervoltage

In the SSI mode, the fault indication can only be reset by switching off the power-supply to the device.

Power-on delay

After Power-ON the device requires a time of approx. 150 ms before valid data can be read.

¹⁾ Short circuit proof to 0V or to output when supply voltage correctly applied

Rotary Measuring Technology

Absolute Singleturn Encoders	Sendix absolut	F3653 / F3673 (Shaft / Hollow shaft)	SSI / BiSS
------------------------------	----------------	--------------------------------------	------------

Terminal assignment

Interface	Type of connection	Features	Cable
1, 2	1,2	SSI or BiSS, SET, DIR, Status	Signal:
			GND
			+V
			+C
			-C
			+D
			-D
			SET
			DIR
			Stat
			PE

Interface	Type of connection	Features	M12 Connector									
1, 2	3	SSI or BiSS, SET, DIR	Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Shield/PE
			M12 connector:	1	2	3	4	5	6	7	8	PH

Interface	Type of connection	Features	Cable													
3,4	1,2	SSI or BiSS, SET, DIR, 2048 Sin/Cos	Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	A	A inv	B	B inv	PE
			M12 connector:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield

Interface	Type of connection	Features	Cable
5	1,2	SSI or BiSS, SET, DIR, Sensor outputs	Signal:
			GND
			+V
			+C
			-C
			+D
			-D
			SET
			DIR
			0 V _{sens}
			+V _{sens}
			PE

Interface	Type of connection	Features	Cable
6	1,2	SSI or BiSS, SET DIR, 2048 Sin/Cos Sensor outputs	Signal:
			GND
			+V
			+C
			-C
			+D
			-D
			0 V _{sens}
			+V _{sens}
			A
			A inv
			B
			B inv
			PE

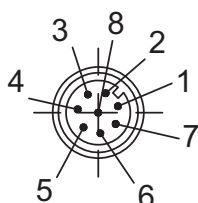
Interface	Type of connection	Features	Cable
7,8	1,2	SSI or BiSS, SET, DIR, 2048 Sin/Cos	Signal:
			GND
			+V
			+C
			-C
			+D
			-D
			A
			A inv
			B
			B inv
			PE

+V: Encoder power supply +V DC
 GND: Encoder power supply ground GND (0V)
 +C, -C: Clock signal
 +D, -D: Data signal
 SET: Set input. The current position becomes defined as position zero.

DIR: Direction input:
 If this input is active, output values are counted backwards (decrease) when the shaft is turning clockwise.
 Stat: Status output

PE: Protective earth
 PH: Plug connector housing (Shield)
 A, Ainv: Incremental output channel A
 B, Binv: Incremental output channel B

Top view of mating side, male contact base: 8-pin M12 connector



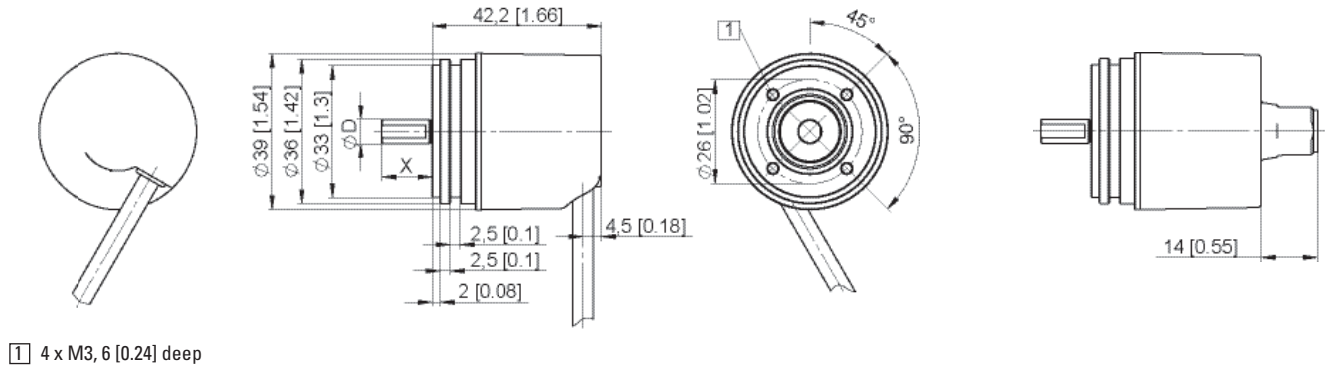
Corresponding mating connector: 05.CMB-8181-0

Rotary Measuring Technology

Absolute Singleturn Encoders	Sendix absolut	F3653 / F3673 (Shaft / Hollow shaft)	SSI / BiSS
------------------------------	----------------	--------------------------------------	------------

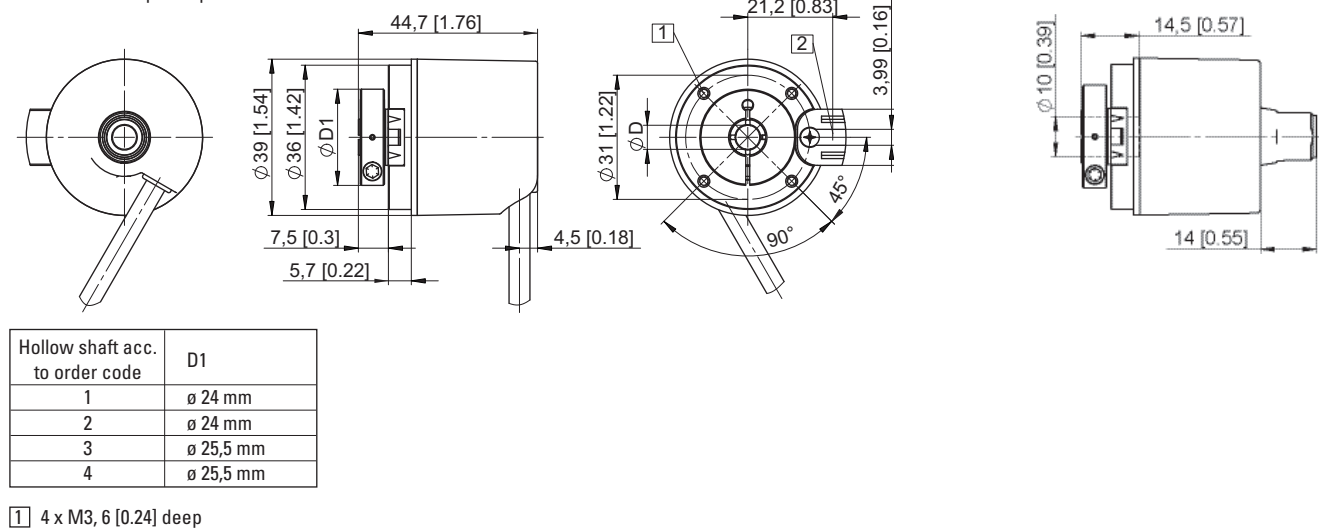
Dimensions shaft version:

Synchro flange, $\varnothing$ 36 mm, cable or connector version

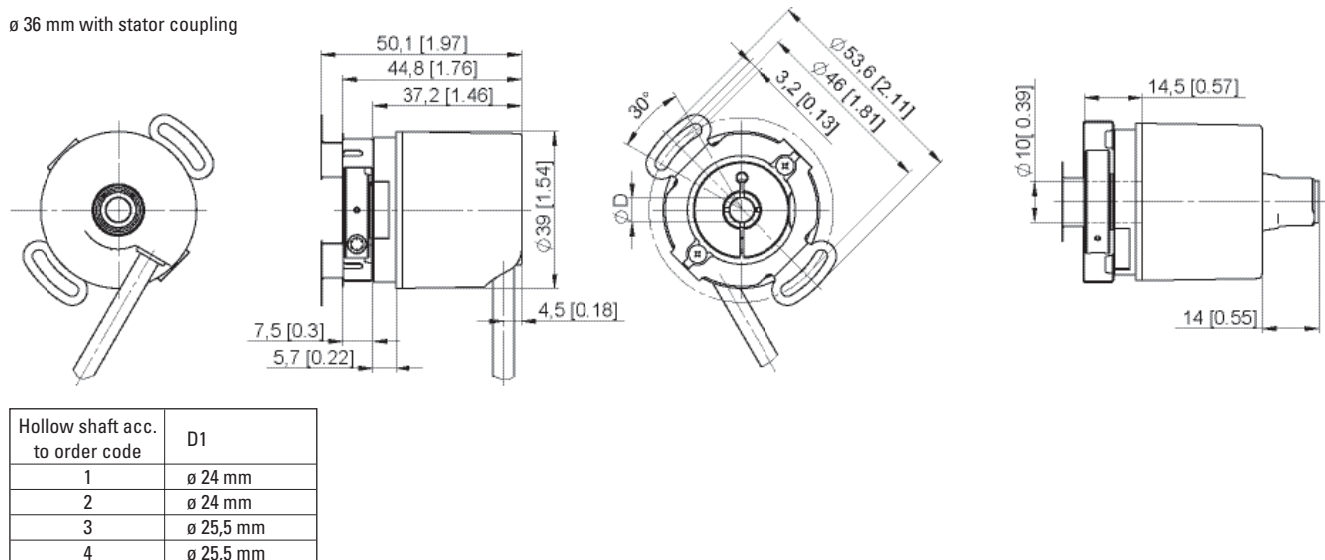


Dimensions hollow shaft version:

$\varnothing$ 36 mm with torque stop



$\varnothing$ 36 mm with stator coupling



Rotary Measuring Technology

Absolute Multiturn Encoders

Sendix absolut

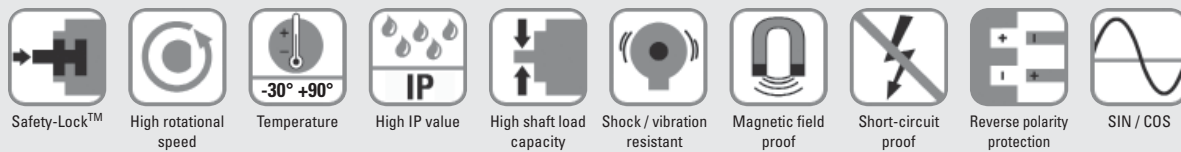
F3663 / F3683 (Shaft / Hollow shaft)

SSI / BiSS



The Sendix F36 multiturn is an optical multiturn encoder without gears, 100% insensitive to magnetic fields, in miniature format.

With a size of just 36 x 42 mm it offers a through hollow shaft of up to 8 mm or a blind hollow shaft of up to 10 mm.



Reliable and magnetically insensitive

- Electronic multiturn 100 % magnetic-field resistant
- Sturdy bearing construction in Safety Lock™ Design for resistance against vibration and installation errors
- Reduced number of components ensures magnetic insensitivity
- Ideal for use outdoors thanks to IP 67 protection and wide temperature range from -30°C up to +90°C

Optimized performance

- High-precision with a data refresh rate of the position value $\leq 1\mu s$
- High-resolution feedback in real-time via incremental outputs SinCos and RS422
- Short control cycles, clock rate with SSI up to 2 MHz / with BiSS up to 10 MHz

Order code Shaft version

8.F3663 . XXXX . XXXX
Type 1 2 3 4 5 6 7 8



1 Flange, ø 36 mm

- 1 = Clamping flange, IP67
- 2 = Synchro flange, IP67
- 3 = Clamping flange, IP65
- 4 = Synchro flange, IP65

2 Shaft (ø x L)

- 1 = 6 x 12,5 mm
- 2 = 6,35 x 12,5 mm
- 3 = 8 x 15 mm
- 4 = 9,525 x 15,875 mm
- 5 = 10 x 20 mm

3 Interface / Power supply, SSI oder BiSS

- 1 = 5 V DC
- 2 = 10 ... 30 V DC
- 3 = 5 V DC and 2048 ppr SinCos track
- 4 = 10 ... 30 V DC and 2048 ppr SinCos
- 5 = 5 V DC, with sensor output for monitoring the voltage on the encoder
- 6 = 5 V DC and 2048 ppr SinCos, with sensor output for monitoring the voltage on the encoder
- 7 = 5 V DC and 2048 ppr incremental signals RS422
- 8 = 10 ... 30 V DC and 2048 ppr incremental signals RS422

4 Type of connection

- 1 = Cable, tangential (1 m PUR)
- 3 = Cable, tangential (5 m PUR)

5 Code

- B = SSI, Binary
- C = BiSS, Binary
- G = SSI, Gray

6 Resolution

- A = 10 bit ST
- 2 = 12 bit ST
- 3 = 13 bit ST
- 4 = 14 bit ST
- 7 = 17 bit ST

7 Resolution

- (Multiturn)
- 2 = 12 Bit MT
- 6 = 16 Bit MT
- 4 = 24 Bit MT

8 Inputs/Outputs

- 2 = Input SET, DIR / Status output

Preferred types are underlined

Order code Hollow shaft

8.F3683 . XXXX . XXXX
Type 1 2 3 4 5 6 7 8



1 Flange

- ø 36 mm, IP65
- 1 = with torque stop
- 2 = with stator coupling

2 Hollow shaft (ø x L)

- 1 = 6 mm
- 2 = 6,35 mm
- 3 = 8 mm
- 4 = 10 mm (Blind hollow shaft)

3 Interface / Power supply, SSI oder BiSS

- 1 = 5 V DC
- 2 = 10 ... 30 V DC
- 3 = 5 V DC and 2048 ppr SinCos track
- 4 = 10 ... 30 V DC and 2048 ppr SinCos
- 5 = 5 V DC, with sensor output for monitoring the voltage on the encoder
- 6 = 5 V DC and 2048 ppr SinCos, with sensor output for monitoring the voltage on the encoder
- 7 = 5 V DC and 2048 ppr incremental signals RS422
- 8 = 10 ... 30 V DC and 2048 ppr incremental signals RS422

4 Type of connection

- 1 = Cable, tangential (1 m PUR)
- 3 = Cable, tangential (5 m PUR)

5 Code

- B = SSI, Binary
- C = BiSS, Binary
- G = SSI, Gray

6 Resolution

- A = 10 bit ST
- 2 = 12 bit ST
- 3 = 13 bit ST
- 4 = 14 bit ST
- 7 = 17 bit ST

7 Resolution

- (Multiturn)
- 2 = 12 Bit MT
- 6 = 16 Bit MT
- 4 = 24 Bit MT

8 Inputs/Outputs

- 2 = Input SET, DIR / Status output

Preferred types are underlined

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

Rotary Measuring Technology

Absolute Multiturn Encoders	Sendix absolut	F3663 / F3683 (Shaft / Hollow shaft)	SSI / BiSS
-----------------------------	----------------	--------------------------------------	------------

Mechanical characteristics:			
Maximum speed			
Shaft- or blind hollow shaft version without shaft seal (IP65)		12 000 min ⁻¹	10 000 min ⁻¹ (continuous op.)
Shaft version (IP 67) or hollow shaft version (IP 65) with shaft seal		10 000 min ⁻¹	8 000 min ⁻¹ (continuous op.)
Starting torque		without shaft seal	< 0,007 Nm
		with shaft seal (IP67)	< 0,01 Nm
Shaft load capacity		radial	40 N
		axial	20 N
Weight			ca. 0,2 kg
Protection to EN 60 529		housing side	IP 67
		shaft side	IP 65 (solid shaft version opt. IP 67)
EX approval for hazardous areas			optional Zone 2 und 22
Working temperature range			
Cable type:		fixed	-30°C ... +90°C
		flexible	-20°C ... +90°C
Materials		Shaft/Hollow shaft	stainless steel
		Flange	Aluminium
		Housing	Zinc die-cast
		Cable	PUR
Shock resistance acc. to DIN-IEC 68-2-27			>2500 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6			>100 m/s ² , 55 ... 2000 Hz

General electrical characteristics:			
Supply voltage			5 V DC + 5% od. 10 ... 30 V DC
Current consumption (no load)		5 V DC	max. 50 mA
		24 V DC	max. 30 mA
Reverse connection of the supply voltage			yes
CE compliant acc. to			EN 61 000-6-2, EN 61 000-6-4 and EN 61 000-6-3
RoHS compliant acc. to			EG-guideline 2002/95/EG

Interfaces			
General interface characteristics			
Output driver			RS 485 transceiver type
Permissible load/channel			max. + 30 mA
Signal level		high	typ 3,8 V
		low at I _{Last} = 20 mA	typ 1,3 V
Short-circuit proof outputs			yes ¹⁾

SSI interface			
Resolution, singleturn			10 ... 17 bit
Number of revolutions			max. 24 bit
Code			Binary or Gray
SSI clock rate		< 14 bit	50 kHz ... 2 MHz
		> 15 bit	50 kHz ... 125 kHz
Monoflop time			> 15 µs
Note: If the clock cycle starts within the monoflop time a second data transfer begins with the same data. If the clock cycle starts after the monoflop time the cycle begins with the new values. The update rate is dependent on the clock speed, data length and monoflop time.			
Data refresh rate		up to 14 bit	< 1 µs
		up to 15 ... 17 bit	4 µs
Status and Parity Bit			on request

BiSS interface

Resolution, singleturn	10 ... 17 bit
Number of revolutions	max. 24 bit
Code	Binary
BiSS clock rate	up to 10 MHz
Max. update rate	< 10 µs, depends on the clock rate and the data length
Data refresh rate	< 1 µs
Note:	– Bidirectional, programmable parameters are: resolution, code, direction, alarms and warnings – Multi-cyclic data output, e.g. for temperature – CRC data verification

Incremental outputs (A/B), 2048 ppr

	Sine/Cosine	RS 422 TTL-compatible
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 Vpp (+ 20%)	high: min. 2,5 V low: max. 0,5 V
Short circuit proof	yes ¹⁾	yes ¹⁾

SET input

Input	active high
Input type	comparator
Signal level	high min. 60 % of V+, max: V+ low max. 30 % of V+
Input current	< 0,5 mA
Min. pulse duration (SET)	10 ms
Timeout after SET signal	14 ms

The encoder can be set to zero at any position by means of a HIGH signal on the SET input. Other preset values can be factory-programmed. The SET input has a signal processing time of approx. 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approx. 14 ms before the new position data can be read. During this time the status output is at LOW.

DIR input

A HIGH signal switches the direction of rotation from the default CW to CCW. This inverted function can also be factory-programmed. If DIR is changed when the device is already switched on, then this will be interpreted as an error. The status output will switch to LOW.

Response time (DIR input)	1 ms
----------------------------------	------

Status output

Output driver	Open collector, internal pull up resistor 22 kOhm
Permissible load	-20 mA
Signal level	high +V low < 1 V
Active	low

The status output serves to display various alarm or error messages. In normal operation the status output is HIGH (open-collector with int. pull-up 22 kOhm).

An active status output (LOW) displays:
LED fault (failure or ageing) – over-temperature – undervoltage
In the SSI mode, the fault indication can only be reset by switching off the power-supply to the device.

Power-on delay

After Power-ON the device requires a time of approx. 150 ms before valid data can be read.

¹⁾ Short circuit proof to 0V or to output when supply voltage correctly applied

Rotary Measuring Technology

Absolute Multiturn Encoders	Sendix absolut	F3663 / F3683 (Shaft / Hollow shaft)	SSI / BiSS
-----------------------------	----------------	--------------------------------------	------------

Terminal assignment

Interface	Type of connection	Features	Cable										
1, 2	1,2	SSI or BiSS, SET, DIR, Status	Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	Stat	PE
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	Shield

Interface	Type of connection	Features	Cable													
3,4	1,2	SSI or BiSS, SET, DIR, 2048 Sin/Cos	Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	A	A inv	B	B inv	PE
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield

Interface	Type of connection	Features	Cable												
5	1,2	SSI or BiSS, SET, DIR, Sensor outputs	Signal:	GND	+V	+C	-C	+D	-D	SET	DIR	0 V _{sens}	+V _{sens}	PE	
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	RD-BU	VT	Shield	

Interface	Type of connection	Features	Cable													
6	1,2	SSI or BiSS, SET DIR, 2048 Sin/Cos Sensor outputs	Signal:	GND	+V	+C	-C	+D	-D	0 V _{sens}	+V _{sens}	A	A inv	B	B inv	PE
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY-PK	RD-BU	Shield

Interface	Type of connection	Features	Cable											
7,8	1,2	SSI or BiSS, SET, DIR, 2048 Sin/Cos	Signal:	GND	+V	+C	-C	+D	-D	A	A inv	B	B inv	PE
			Cable colour:	WH	BN	GN	YE	GY	PK	BU	VT	RD	RD-BU	Shield

+V: Encoder power supply +V DC
 GND: Encoder power supply ground GND (0V)
 +C, -C: Clock signal
 +D, -D: Data signal
 SET: Set input. The current position becomes defined as position zero.

DIR: Direction input:
 If this input is active, output values are counted backwards (decrease) when the shaft is turning clockwise.
 Stat: Status output

PE: Protective earth
 PH: Plug connector housing (Shield)
 A, Ainv: Incremental output channel A
 B, Binv: Incremental output channel B

Rotary Measuring Technology

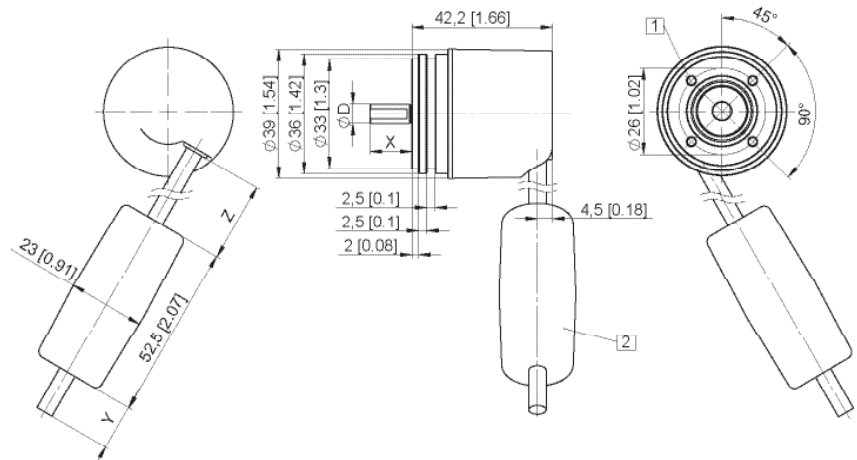
Absolute Multiturn Encoders	Sendix absolut	F3663 / F3683 (Shaft / Hollow shaft)	SSI / BiSS
-----------------------------	----------------	--------------------------------------	------------

Dimensions shaft version:

Synchro flange, $\varnothing$ 36 mm, cable version

Y	Z
1 m	150 mm
5 m	150 mm

- 1 4 x M3, 6 [0.24] deep
- 2 Battery (with cable)



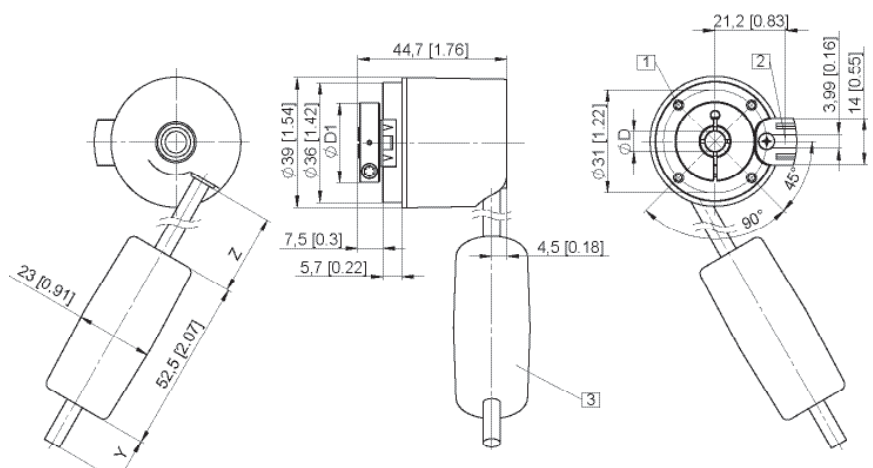
Dimensions hollow shaft version:

$\varnothing$ 36 mm with torque stop

Hollow shaft acc. to order code	D1
1	$\varnothing$ 24 mm
2	$\varnothing$ 24 mm
3	$\varnothing$ 25,5 mm
4	$\varnothing$ 25,5 mm

Y	Z
1 m	150 mm
5 m	150 mm

- 1 4 x M3, 6 [0.24] deep
- 2 Torque stop slot
Recommendation : cyl. pin acc. to DIN 7 $\varnothing$ 4
- 3 Battery (with cable)

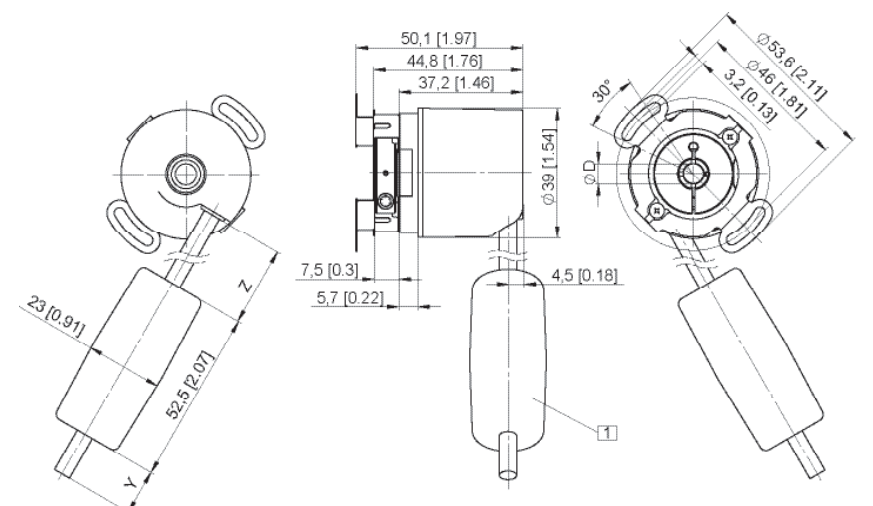


$\varnothing$ 36 mm with stator coupling

Hollow shaft acc. to order code	D1
1	$\varnothing$ 24 mm
2	$\varnothing$ 24 mm
3	$\varnothing$ 25,5 mm
4	$\varnothing$ 25,5 mm

Y	Z
1 m	150 mm
5 m	150 mm

- 1 Battery (with cable)



Rotary Measuring Technology

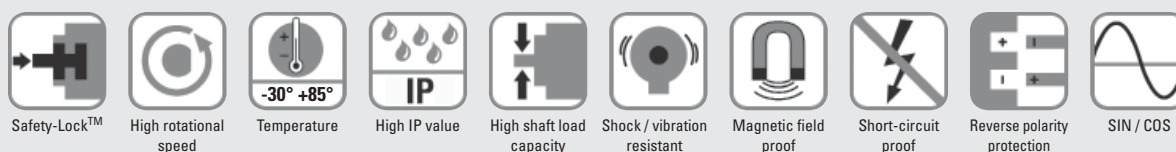
Absolute Singleturn Encoders	Sendix absolut	F3658 / F3678 (Shaft / Hollow shaft)	CANopen
------------------------------	----------------	--------------------------------------	---------



The Sendix F36 singleturn boasts exceptional ruggedness and compact dimensions. With a size of just 36 x 42 mm it offers a through hollow shaft of up to 8 mm or a blind hollow shaft of up to 10 mm.

Its high-precision optical sensor technology can achieve a resolution of up to 17 bits.

CANopen



Reliable and magnetically insensitive

- Sturdy bearing construction in Safety Lock™ Design for resistance against vibration and installation errors
- Ideal for use outdoors thanks to IP 67 protection and wide temperature range from -40°C up to +90°C

Up-to-the-minute Fieldbus performance

- CANopen with current encoder profile
- LSS services for configuration of the node address and baud rate
- Variable PDO mapping in the memory

Order code Shaft version

8.F3658 . XX2X . 21 1 2
Type 1 2 3 4 5



- 1 Flange, ø 36 mm**
 1 = Clamping flange, IP67
 2 = Synchro flange, IP67
 3 = Clamping flange, IP65
 4 = Synchro flange, IP65

- 2 Shaft (ø x L)**
 1 = 6 x 12,5 mm
 2 = 6,35 x 12,5mm
 3 = 8 x 15 mm
 4 = 9,525 x 15,875 mm
 5 = 10 x 20 mm

- 3 Interface / Power supply**
 2 = CANopen DS301 V4.0, 10 ... 30 V DC

- 4 Type of connection**
 1 = Cable, tangential (1 m PUR)
 3 = Cable, tangential (5 m PUR)

- 5 Fieldbus profile**
 21 = CANopen Encoderprofile DS406 V3.1

Preferred types are underlined

Available as of september 2009

Order code Hollow shaft

8.F3678 . XX2X . 21 1 2
Type 1 2 3 4 5



- 1 Flange ø 36 mm, IP65**
 1 = with torque stop
 2 = with stator coupling

- 2 Blind hollow shaft**
 4 = 10 mm
 5 = 6 mm
 6 = 6,35 mm
 7 = 8 mm

- 3 Interface / Power supply**
 2 = CANopen DS301 V4.0, 10 ... 30 V DC

- 4 Type of connection**
 1 = Cable, tangential (1 m PUR)
 3 = Cable, tangential (5 m PUR)

- 5 Fieldbus profile**
 21 = CANopen Encoderprofile DS406 V3.1

Preferred types are underlined

Available as of september 2009

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

Rotary Measuring Technology

Absolute Singleturn Encoders	Sendix absolut	F3658 / F3678 (Shaft / Hollow shaft)	CANopen
------------------------------	----------------	--------------------------------------	---------

Mechanical characteristics:		
Maximum speed		
Shaft- or blind hollow shaft version without shaft seal (IP65)		12 000 min ⁻¹ 10 000 min ⁻¹ (continuous op.)
Shaft version (IP 67) or hollow shaft version (IP 65) with shaft seal		10 000 min ⁻¹ 8 000 min ⁻¹ (continuous op.)
Starting torque	without shaft seal with shaft seal (IP67)	< 0,007 Nm < 0,01 Nm
Shaft load capacity	radial axial	40 N 20 N
Weight		ca. 0,2 kg
Protection to EN 60 529	housing side shaft side	IP 67 IP 65 (solid shaft version opt. IP 67)
EX approval for hazardous areas		optional Zone 2 und 22
Working temperature range (Cable type)	fixed flexible	-30°C ... +85°C -20°C ... +85°C
Materials	Shaft/Hollow shaft Flange Housing Cable	stainless steel Aluminium Zinc die-cast PUR
Shock resistance acc. to DIN-IEC 68-2-27		> 2500 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6		> 100 m/s ² , 55 ... 2000 Hz

Diagnostic LED (two-colour, red/green)		
LED ON or blinking	red	Error display
	green:	Status display

General information about CANopen

The CANopen encoders of the M3658 and M3678 series support the latest CANopen communication profile according to DS 301 V4.02. In addition, device-specific profiles like the encoder profile DS 406 V3.1 are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CAN-Bus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again.

The following output values may be combined in a freely variable way as PDO (PDO mapping): **position, speed** as well as the **status of the working area**.

The encoders are available with a connector or a cable connection. The device address and baud rate can be set/modified by means of the software. The two-colour LED located on the back indicates the operating or fault status of the CAN bus, as well as the status of the internal diagnostics. Node address, baud rate and CANbus termination are programmable.

CANopen Communication Profile DS301 V4.02

Among others, the following functionality is integrated. Class C2 functionality:

- NMT Slave
- Heartbeat Protocol
- Identity Object
- Error Behaviour Object
- Variable PDO Mapping self-start programmable (Power on to operational), 3 Sending PDO's
- Node address, baud rate and CANbus / Programmable termination

Terminal assignment

Signal:	+Ub	0 V	CAN GND	CAN High	CAN Low
Cable colour:	BN	WH	GY	GN	YE

General electrical characteristics:		
Supply voltage		10 ... 30 V DC
Current consumption (no load)		24 V DC max. 60 mA
Reverse connection of the supply voltage (U_b)		yes
RoHS compliant acc. to		EG-guideline 2002/95/EG
CE compliant acc. to		EN 61000-6-2, EN 61000-6-4, and EN 61000-6-3

Interface characteristics CANopen:		
Resolution Singleturn	1 ... 65536 (16 bit), scaleable:: 1 ... 65536	
Default value Singleturn	8192 (13 bit)	
Code	Binary	
Interface	CAN High-Speed according to ISO 11898, Basic- and Full-CAN, CAN Specification 2.0 B	
Protocol	CANopen profil DS 406 V3.1 with manufacturer-specific add-ons LSS-Service DS305 V2.0	
Baud rate	10 ... 1000 kbit/s (Software configurable)	
Node address	1 ... 127 (Software configurable)	
Termination switchable	Software configurable	
LSS Protocol	CIA LSS protocol DS305 Global command support for node address and baud rate Selective commands via attributes of the identity object	

CANopen Encoder Profile DS406 V3.1

The following parameters can be programmed:

- Event mode
- 1 work area with upper and lower limit and the corresponding output states
- Variable PDO mapping for position, speed, work area status
- Extended failure management for position sensing with integrated temperature control
- User interface with visual display of bus and failure status 1 LED two colours
- Customer-specific memory - 16 Bytes

"Watchdog controlled" device

LSS Layer Setting Services DS305 V2.0

- Global support of Node-ID and baud rate
- Selective protocol via identity object (1018h)

Rotary Measuring Technology

Absolute Singleturn Encoders

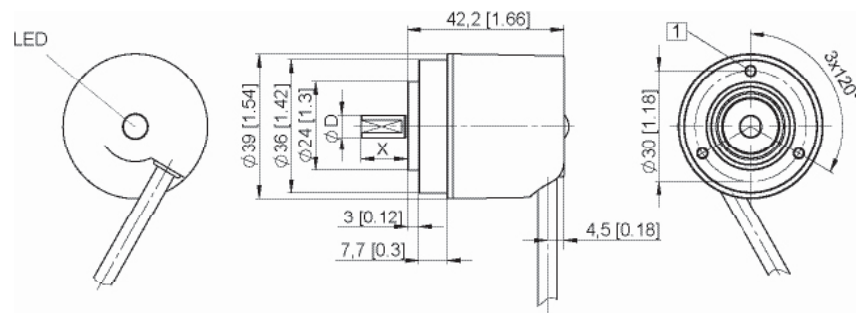
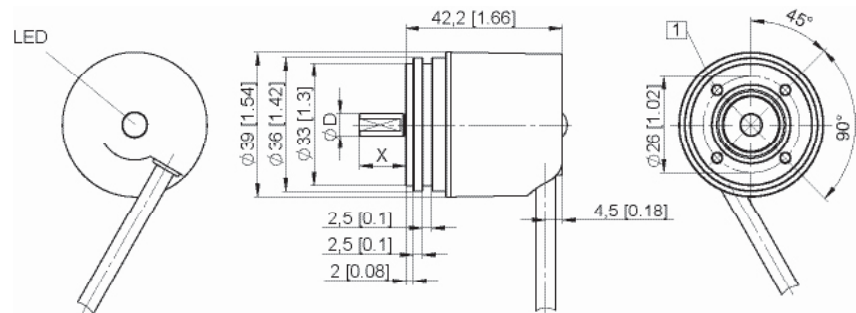
Sendix absolut

F3658 / F3678 (Shaft / Hollow shaft)

CANopen

Dimensions shaft version:

Synchro flange, $\varnothing$ 36 mm,
cable or connector version

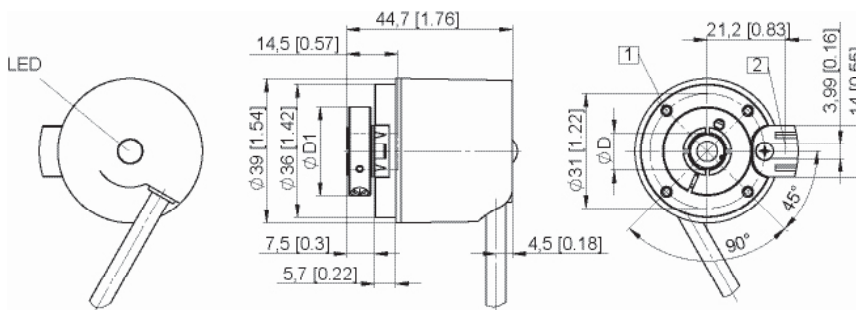


1 M3, 6 [0.24] deep

Dimensions hollow shaft version:

$\varnothing$ 36 mm with torque stop

Hollow shaft acc. to order code	D1
1	$\varnothing$ 24 mm
2	$\varnothing$ 24 mm
3	$\varnothing$ 25,5 mm
4	$\varnothing$ 25,5 mm



1 M3, 6 [0.24] deep

2 Torque stop slot
Recommendation : cyl. pin acc. to DIN 7 $\varnothing$ 4

Rotary Measuring Technology

Absolute Multiturn Encoders	Sendix absolut	F3668 / F3688 (Shaft / Hollow shaft)	CANopen
-----------------------------	----------------	--------------------------------------	---------



CANopen



The Sendix F36 multiturn is an optical multiturn encoder without gears, 100% insensitive to magnetic fields, in miniature format.

With a size of just 36 x 42 mm it offers a through hollow shaft of up to 8 mm or a blind hollow shaft of up to 10 mm.

Safety-Lock™	High rotational speed	Temperature -30° +85°	High IP value	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection	SIN / COS

Reliable and magnetically insensitive

- Electronic multiturn 100 % magnetic-field resistant
- Sturdy bearing construction in Safety Lock™ Design for resistance against vibration and installation errors
- Reduced number of components ensures magnetic insensitivity
- Ideal for use outdoors thanks to IP 67 protection and wide temperature range from -30°C up to +90°C

Up-to-the-minute Fieldbus performance

- CANopen with current encoder profile
- LSS services for configuration of the node address and baud rate
- Variable PDO mapping in the memory

Order code Shaft version

8.F3668 . XX2X . 21 1 2
Type 1 2 3 4 5



- 1 Flange, ø 36 mm**
1 = Clamping flange, IP67
2 = Synchro flange, IP67
3 = Clamping flange, IP65
4 = Synchro flange, IP65

- 2 Welle (ø x L)**
1 = 6 x 12,5 mm
2 = 6,35 x 12,5mm
3 = 8 x 15 mm
4 = 9,525 x 15,875 mm
5 = 10 x 20 mm

- 3 Interface / Power supply**
2 = CANopen DS301 V4.0, 10 ... 30 V DC

- 4 Type of connection**
1 = Cable, tangential (1 m PUR)
3 = Cable, tangential (5 m PUR)

- 5 Fieldbus profile**
21 = CANopen Encoderprofile DS406 V3.1

Preferred types are underlined

Available as of september 2009

Order code Hollow shaft

8.F3688 . XX2X . 21 1 2
Type 1 2 3 4 5



- 1 Flange
ø 36 mm, IP65**
1 = with torque stop
2 = with stator coupling

- 2 Blind hollow shaft**
4 = 10 mm
5 = 6 mm
6 = 6,35 mm
7 = 8 mm

- 3 Interface / Power supply**
2 = CANopen DS301 V4.0, 10 ... 30 V DC

- 4 Type of connection**
1 = Cable, tangential (1 m PUR)
3 = Cable, tangential (5 m PUR)

- 5 Fieldbus profile**
21 = CANopen Encoderprofile DS406 V3.1

Preferred types are underlined

Available as of september 2009

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

Rotary Measuring Technology

Absolute Multiturn Encoders	Sendix absolut	F3668 / F3688 (Shaft / Hollow shaft)	CANopen
-----------------------------	----------------	--------------------------------------	---------

Mechanical characteristics:			
Maximum speed			
Shaft- or blind hollow shaft version without shaft seal (IP65)	12 000 min ⁻¹	10 000 min ⁻¹	(continuous op.)
Shaft version (IP 67) or hollow shaft version (IP 65) with shaft seal	10 000 min ⁻¹	8 000 min ⁻¹	(continuous op.)
Starting torque		without shaft seal	< 0,007 Nm
		with shaft seal (IP67)	< 0,01 Nm
Shaft load capacity		radial	40 N
		axial	20 N
Weight		ca. 0,2 kg	
Protection to EN 60 529		housing side	IP 67
		shaft side	IP 65 (solid shaft version opt. IP 67)
EX approval for hazardous areas		optional Zone 2 und 22	
Working temperature range		fixed	-30°C ... +85°C
(Cable type)		flexible	-20°C ... +85°C
Materials		Shaft/Hollow shaft	stainless steel
		Flange	Aluminium
		Housing	Zinc die-cast
		Cable	PUR
Shock resistance acc. to DIN-IEC 68-2-27		> 2500 m/s ² , 6 ms	
Vibration resistance acc. to DIN-IEC 68-2-6		> 100 m/s ² , 55 ... 2000 Hz	

Diagnostic LED (two-colour, red/green)			
LED ON or blinking		red	Error display
		green:	Status display

General information about CANopen

The CANopen encoders of the M3658 and M3678 series support the latest CANopen communication profile according to DS 301 V4.02. In addition, device-specific profiles like the encoder profile DS 406 V3.1 are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CAN-Bus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again.

The following output values may be combined in a freely variable way as PDO (PDO mapping): **position, speed** as well as the **status of the working area**.

The encoders are available with a connector or a cable connection. The device address and baud rate can be set/modified by means of the software. The two-colour LED located on the back indicates the operating or fault status of the CAN bus, as well as the status of the internal diagnostics. Node address, baud rate and CANbus termination are programmable.

CANopen Communication Profile DS301 V4.02

Among others, the following functionality is integrated. Class C2 functionality:

- NMT Slave
- Heartbeat Protocol
- Identity Object
- Error Behaviour Object
- Variable PDO Mapping self-start programmable (Power on to operational), 3 Sending PDO's
- Node address, baud rate and CANbus / Programmable termination

Terminal assignment

Signal:	+Ub	0 V	CAN GND	CAN High	CAN Low
Cable colour:	BN	WH	GY	GN	YE

General electrical characteristics:			
Supply voltage		10 ... 30 V DC	
Current consumption (no load)		24 V DC	max. 60 mA
Reverse connection of the supply voltage (Ub)		yes	
RoHS compliant acc. to		EG-guideline 2002/95/EG	
CE compliant acc. to		EN 61000-6-2, EN 61000-6-4, and EN 61000-6-3	

Interface characteristics CANopen			
Resolution Singleturn		1 ... 65536 (16 bit), scaleable:: 1 ... 65536	
Default value Singleturn		8192 (13 bit)	
Total resolution		1 ... 4.294.967.296 (32 bit) Default: 25 bit	
Code		Binary	
Interface		CAN High-Speed according to ISO 11898, Basic- and Full-CAN, CAN Specification 2.0 B	
Protocol		CANopen profil DS 406 V3.1 with manufacturer-specific add-ons LSS-Service DS305 V2.0	
Baud rate		10 ... 1000 kbit/s (Software configurable)	
Node address		1 ... 127 (Software configurable)	
Termination switchable		Software configurable	
LSS Protocol		CIA LSS protocol DS305 Global command support for node address and baud rate. Selective commands via attributes of the identity object	

CANopen Encoder Profile DS406 V3.1

The following parameters can be programmed:

- Event mode
- 1 work area with upper and lower limit and the corresponding output states
- Variable PDO mapping for position, speed, work area status
- Extended failure management for position sensing with integrated temperature control
- User interface with visual display of bus and failure status 1 LED two colours
- Customer-specific memory - 16 Bytes

"Watchdog controlled" device

LSS Layer Setting Services DS305 V2.0

- Global support of Node-ID and baud rate
- Selective protocol via identity object (1018h)

Rotary Measuring Technology

Absolute Multiturn Encoders

Sendix absolut

F3668 / F3688 (Shaft / Hollow shaft)

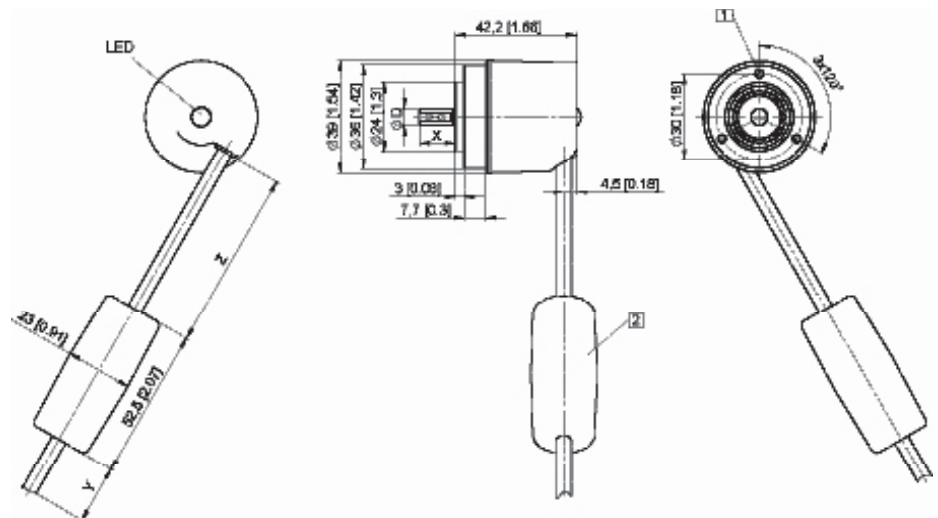
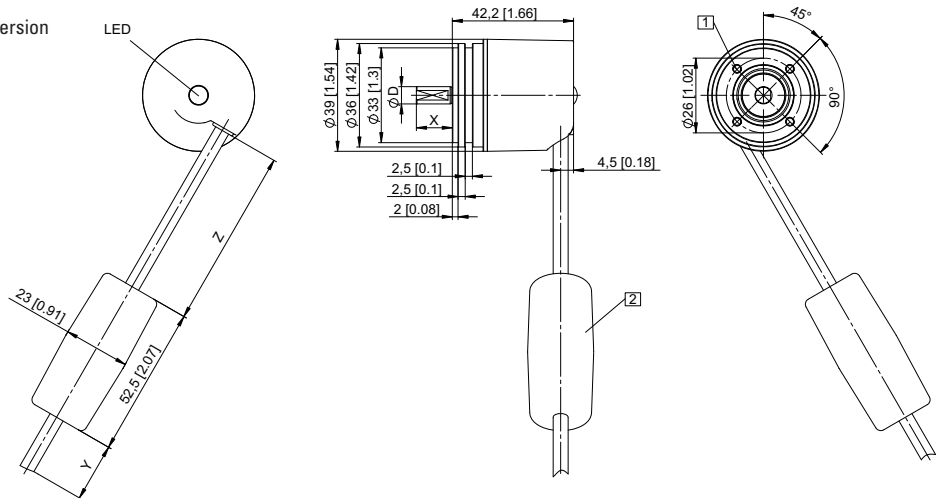
CANopen

Dimensions shaft version:

Synchro flange, ø 36 mm, cable or connector version

Y	Z
1 m	150 mm
5 m	150 mm

- 1 4 x M3, 6 [0.24] deep
- 2 Battery (with cable)



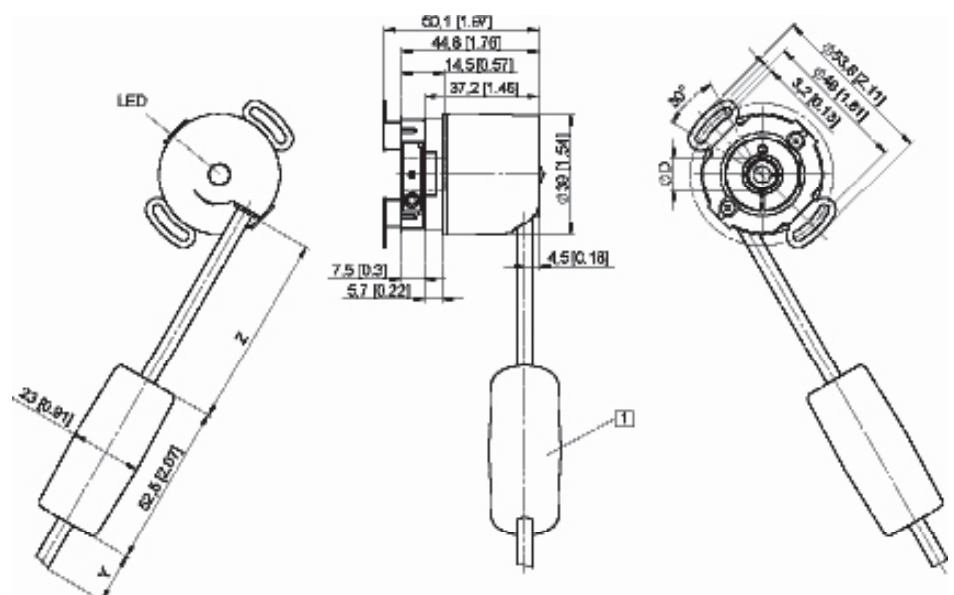
Dimensions hollow shaft version:

Ø 36 mm with torque stop

Hollow shaft acc. to order code	D1
1	ø 24 mm
2	ø 24 mm
3	ø 25,5 mm
4	ø 25,5 mm

Y	Z
1 m	150 mm
5 m	150 mm

- 1 Battery (with cable)



Rotary Measuring Technology

Absolute Singleturn Encoders

Miniature series, magnetic

2450 / 2470 (Shaft / Hollow shaft)



The absolute singleturn encoders 2450 and 2470 are the specialists when space is tight. Thanks to a new magnetic measuring principle, they require installation space of just 24 mm.

Because of their high 12 Bit resolution with 4096 different positions for 360° they offer exceptional repeat accuracy.



Safety-Lock™



High rotational speed



Temperature



Shock / vibration resistant



Short-circuit proof



Reverse polarity protection

Minimal space requirement

- The outer diameter measures 24 mm; the shaft diameter at least 4 mm
- Flexible connection with radial or axial cable outlet

Durable and accurate

- Long service life and freedom from wear due to non-contact measuring system
- Wide temperature range from -20°C up to +85°C
- High 12 Bit resolution with 4096 different positions for 360°

Order code Shaft version

8.2450 . XXXX . G121
Type 1 2 3 4 5



1 Flange

- 1 = ø 24 mm
- 2 = ø 30 mm
- 3 = ø 28 mm

3 Output circuit / Power supply

- 1 = SSI / 5 V DC
- 2 = SSI / 8 ... 30 V DC

5 Gray-Code

12 Bit resolution

2 Shaft

- 1 = ø 4 mm
- 2 = ø 6 mm
- 3 = ø 5 mm x 10 mm with flattening

4 Type of connection

- 1 = cable axial (2 m PVC cable ø 4,5 mm)
- 2 = cable radial (2 m PVC cable ø 4,5 mm)

Preferred types are underlined

Order code hollow shaft

8.2470 . XXXX . G121
Type 1 2 3 4 5



1 Flange

- 1 = ø 24 mm

3 Output circuit / Power supply

- 1 = SSI / 5 V DC
- 2 = SSI / 8 ... 30 V DC

5 Gray-Code

12 Bit resolution

2 Blind hollow shaft

- (insertion depth max. 14 mm)
- 1 = ø 4 mm
- 2 = ø 6 mm

4 Type of connection

- 1 = cable axial (2 m PVC cable ø 4,5 mm)
- 2 = cable radial (2 m PVC cable ø 4,5 mm)

Preferred types are underlined

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

Rotary Measuring Technology

Absolute Singleturn Encoders	Miniature series, magnetic	2450 / 2470 (Shaft / Hollow shaft)
-------------------------------------	-----------------------------------	---

Mechanical characteristics			
Speed		max. 12.000 min ⁻¹	
Rotor moment of inertia		approx. 0,1 x 10 ⁻⁶ kgm ²	
Starting torque		< 0,001 Nm	
Shaft load capacity	radial	10 N	
	axial	20 N	
Weight		ca. 0,06 kg	
Protection to EN 60529	housing side	IP 64 (IP 69K on request)	
	flange side	IP 50 (IP 67 on request)	
Working temperature range		-20° C ... +85 °C ¹⁾	
Materials	Shaft/Hollow shaft	stainless steel	
	Clamping ring	MS58	
Shock resistance acc. to DIN-IEC 68-2-27		1000 m/s ² , 6 ms	
Vibration resistance acc. to DIN-IEC 68-2-27		100 m/s ² , 55 ... 2000 Hz	

Terminal assignment

Signal:	0V	+Ub	+T	-T	+D	-D	
cable colour:	WH	BN	GN	YE	GY	PK	

Electrical characteristics SSI Interface	
Sensor	
Supply voltage	5 (+0,4) V DC or 8 ... 30 V DC ²⁾
Current consumption (no load)	< 40 mA
Reverse connection of the supply voltage	yes
Measuring range	360°
Resolution/Code	12 Bit/Gray
Linearity (25 °C)	< 1,5 °
Repeat accuracy	< 0,1 °
Data refresh rate	typ 100 µs
RoHS compliant acc. to	EG-guideline 2002/95/EG
CE compliant acc. to	EN 61000-6-2, EN 61000-6-4, EN 61000-6-3 and EN 61000-4-8 (behaviour under magnetic influence)

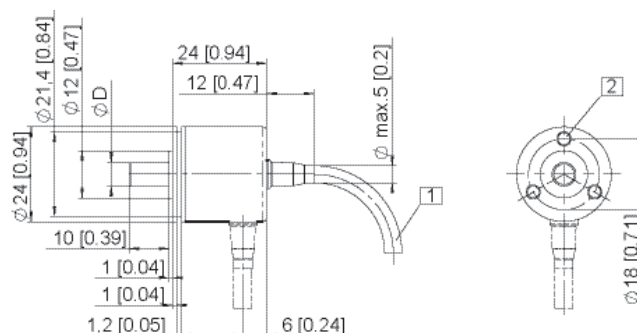
SSI interface

Clock speed:	100 kHz ... 750 kHz
Output driver	RS 485
Monoflop time typ./max.	16 µs / 20 µs
Short circuit proof outputs	yes ³⁾
Permissible load/channel	typ. 60 Ohm (acc. to RS 485)

Dimensions shaft version:

Flange Type 1 (ø 24 mm)

- 1 min. R50 [1,97] 2 3 x M3, 4 [0,16] deep

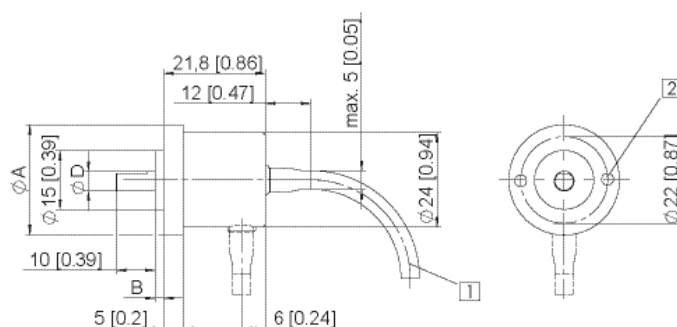


Flange Type 2 (ø 30 mm)

Flange Type 3 (ø 28 mm)

Flange Type	2	3
A	ø 30 mm	ø 28 mm
B	3 mm	2 mm

- 1 min. R50 [1,97] 2 3 x M3, 4 [0,16] tief



Mounting advice:

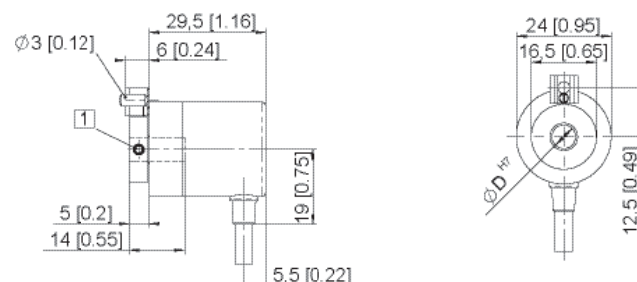
The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time! We recommend the use of suitable couplings (see Accessories section).

Dimensions hollow shaft version

- 1 4 x M3 DIN 915 - SW15

Mounting advice:

The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time! Mounting attachments and couplings can be found in the chapter Accessories



1) Non-condensing

2) The supply voltage at the encoder input must not be less than 4.75 V (5 V - 5%)

3) Short circuit to 0 V or to output, only one channel at a time, supply voltage correctly applied

Rotary Measuring Technology

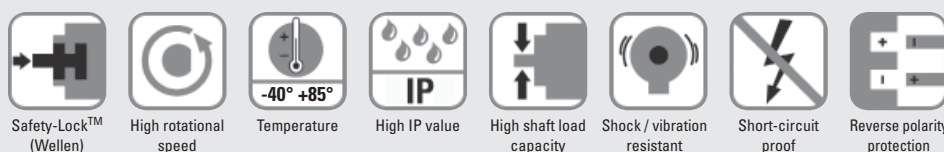
Absolute Singleturn Encoders	Sendix absolut	M3658 / M3678 (Shaft / Hollow shaft)	SAE J1939
------------------------------	----------------	--------------------------------------	-----------



SAE J1939

The absolute Sendix encoders M3658 and M3678 with SAE J1939 interface support all common requirements of the special protocol for utility vehicles and make a considerable contribution to the comprehensive system diagnostics or to fast fault localisation.

The encoders offer fast, error-free start-up with no need to set switches; the encoder address is assigned automatically via Address Claiming (ACL).



Safe Technology

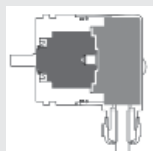
- Increased resistance against vibration and installation errors
- Sturdy bearing construction in Safety Lock™ Design
- Fewer components and connection points increase the operational reliability
- OptoASIC technology with highest integration density (Chip-on-Board)
- Resistant die cast housing and protection up to IP 69K

Versatile Applications

- Up-to-the-minute Fieldbus performance in the application: SAE J1939 with CAN-Highspeed to ISO 11898
- Suitable connection variant for every specific case
- Bus cover with M12 connector or cable connection
- Fast determination of the operating status via two-colour LED
- Fast, error-free start up with no need to set switches; with automatic Address Claiming (ACL).

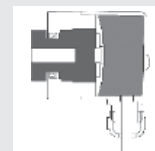
Safety-Lockplus™

IP69k protection on the flange side, robust bearing assemblies with interlocking bearings, mechanically protected shaft seal



Sensor-Protect™

Fully encapsulated electronics, separate mechanical bearing assembly



Order code Shaft version

8.M3658 . XXXX . 32 XX
Type 1 2 3 4 5 6 7



1 Flange
2 = Synchro flange

3 Output circuit / Power supply
C = CAN Highspeed 8 ... 30 V DC

5 Fieldbus profile
32 = J1939

Preferred types are underlined

2 Shaft (ø x L)
3 = ø 6 x 12,5 mm
5 = ø 6,35 (1/4") x 12,5 mm
6 = ø 8 x 12,5 mm

4 Type of connection
2 = cable radial (1 m PUR)
4 = M12 connector radial

6 Option 2
1 = Standard

7 Option 1
1 = IP67
2 = IP69k

Corresponding mating connector:
05.B-8151-0/9

Seawater resistant version on request

Order code Hollow shaft

8.M3678 . XXXX . 32 XX
Type 1 2 3 4 5 6 7



1 Flange
2 = with long torque stop
5 = with stator coupling

3 Output circuit / Power supply
C = CAN Highspeed 8 ... 30 V DC

5 Fieldbus profile
32 = J1939

Preferred types are underlined

2 Hollow shaft
2 = ø 6 mm
3 = ø 6,35 (1/4")
4 = ø 8 mm
6 = ø 10 mm

Type of connection
4 = cable radial (1 m PUR)
4 = M12 connector radial

6 Option 2
1 = Standard

7 Option 1
1 = IP67
2 = IP69k

Corresponding mating connector:
05.B-8151-0/9

Seawater resistant version on request

Accessories:

- Cables and connectors, also pre-assembled, can be found in the chapter Connection Technology
- Mounting attachments and couplings can be found in the chapter Accessories

Rotary Measuring Technology

Absolute Singleturn Encoders	Sendix absolut	M3658 / M3678 (Shaft / Hollow shaft)	SAE J1939
------------------------------	----------------	--------------------------------------	-----------

Mechanical characteristics			
Max. speed		6000 min ⁻¹	
Starting torque		< 0,06 Nm	
Shaft load capacity	radial	40 N	
	axial	20 N	
Weight		ca. 0,2 kg	
Protection to EN 60 529/DIN 40050-9		IP 67/IP 69k	
EX approval for hazardous areas		optional Zone 2 und 22	
Working temperature range		-40 °C ... +85 °C	
Materials	Shaft / Hollow shaft	stainless steel	
	Flange	Aluminium	
	Housing	Zinc die-cast	
	Cable	PUR	
Shock resistance acc. to DIN-IEC 68-2-27		5000 m/s ² , 6 ms	
Vibration resistance acc. to DIN-IEC 68-2-6		300 m/s ² , 10 ... 2000 Hz	
Permanent shock resistance acc. to DIN-IEC 68-2-29		1000 m/s ² , 2 ms	
Vibration (broad-band random) acc. to DIN-IEC 68-2-64		5 ... 2500 Hz, 100 m/s ² - rms	

Diagnostic LED (two-colour, red/green)		
LED ON or blinking	red	Error display
	green:	Status display

General electrical characteristics	
Supply voltage	8 ... 30 V DC
Current consumption, 24 V DC, (no load)	< 25 mA
Reverse connection of the supply voltage (U _b)	yes
Measurement range	360°
Linearity	< 1°
Repeat accuracy	< 0,1°
Data refresh	400 µs
RoHS compliant acc. to	EG-guideline 2002/95/EG
CE compliant acc. to	EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3

Interface characteristics CANopen	
Resolution	1 ... 16384 (14 bit), scaleable: 1 ... 16384
Default value	16384 (14 bit)
Code	Binary
Interface	CAN High-Speed according to ISO 11898, Basic- and Full-CAN, CAN Specification 2.0 B
Protocol	SAE J1939
Baud rate	250 kbit/s
Node address	1 ... 255 (via address claiming)
Termination	Software configurable

General Information concerning SAE J1939

The protocol J1939 originates from the international Society of Automotive Engineers (SAE) and operates on the physical layer with high speed CAN as per ISO11898. The application emphasis lies in the area of the power train and chassis of commercial vehicles.

It serves to transfer diagnostic data (for example, motor speed, position, temperature) and control information. Type series M3658 and M3678 encoders support the total functionality of J1939. This protocol is a multimaster system with decentralised network management that does not involve channel-based communication.

It supports up to 254 logic nodes and 30 physical control devices per segment. The information is described as Parameters (signals) and combined on 4 memory pages (Data Pages) into Parameter Groups (PGs). Each parameter group can be identified via a unique number, the Parameter Group Number (PGN). Independently of this, each signal is assigned a unique SPN (Suspect Parameter Number).

The major part of the communication occurs cyclically and can be received by all control devices without the explicit request for data (Broadcast). Furthermore the parameter groups are optimised to a length of 8 data bytes. This enables very efficient utilization of the CAN protocol.

If greater amounts of data need to be transferred, then transport protocols (TP) can be used: BAM (Broadcast Announce Message) and CDMT (Connection Mode Data Transfer). With BAM TP the transfer of data occurs as a broadcast.

Encoder Implementation SAE J1939

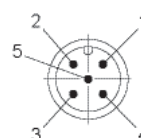
- PGNs that are adaptable to the customer's application
- Resolution of address conflicts -> Address Claiming (ACL)
- Continuous checking whether control addresses have been assigned twice within a network
- Change of control device addresses during run-time
- Unique identification of a control device with the help of a name that is unique worldwide
- This name serves to identify the functionality of a control device in the network
- Predefined PGs for Position, Speed and Alarm
- 250 kBit/s, 29-Bit Identifier
- Watchdog controlled device

A two-colour LED, located on the rear of the encoder, signals the operating and fault status of the J1939 protocol, as well as the status of the internal sensor diagnostics.



Terminal assignment

Signal:	+Ub	0 V	CAN GND	CAN High	CAN Low
M12/Pin:	2	3	1	4	5
cable colour:	BN	WH	GY	GN	YE



Rotary Measuring Technology

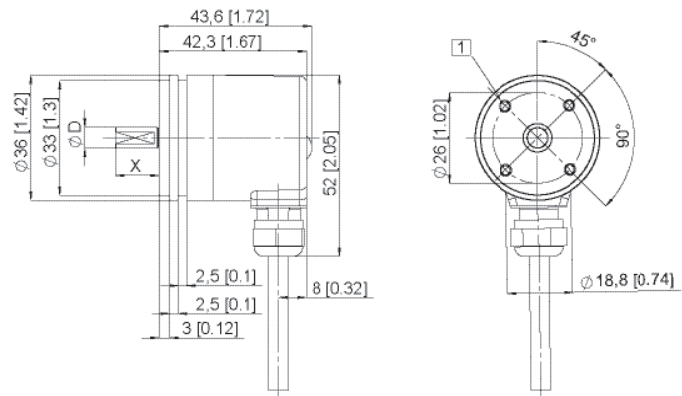
Absolute Singleturn Encoders

Sendix absolut

M3658 / M3678 (Shaft / Hollow shaft) SAE J1939

Dimensions shaft version:

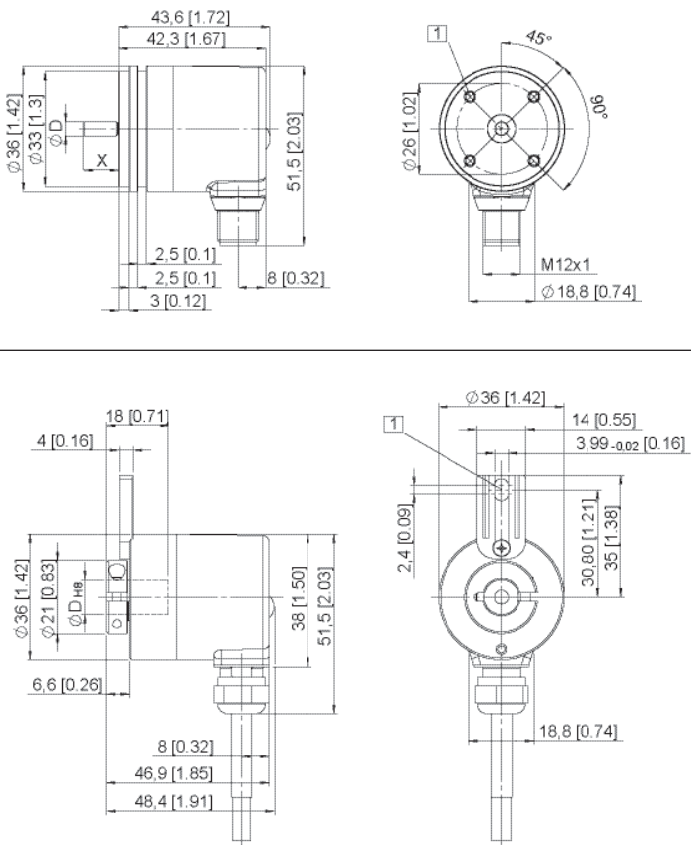
ø 36 mm, Synchro flange



1 M3, 6 [0.24] deep

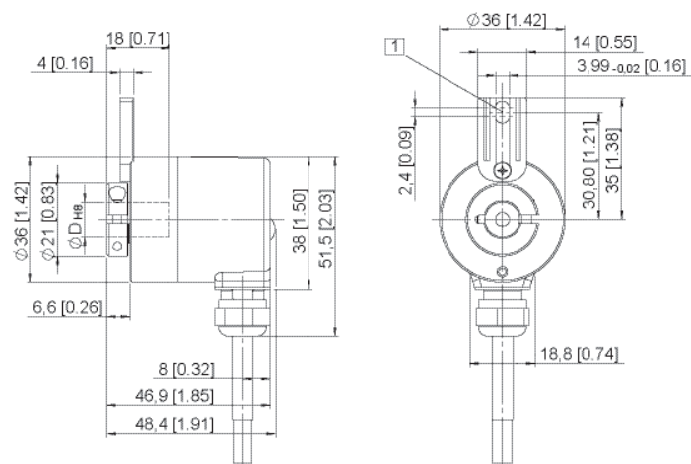
Dimensions hollow shaft version:

ø 36 mm, Flange with long torque stop



1 Torque stop slot,
Recommendation: cyl. pin. acc. DIN 7 ø4

ø 36 mm, Stator coupling



Rotary Measuring Technology

Incremental Encoder

Miniature series, magnetic

2430 / 2440 (Shaft / Hollow shaft)



Thanks to their non-contact magnetic scanning technology the miniature-format singleturn encoders 2430 and 2440 guarantee exceptional ruggedness.

As a result of their compact outer diameter, they are ideal for use where installation space is restricted.



Safety-Lock™



High rotational speed



Temperature



Shock/vibration resistant



Short-circuit proof



Reverse polarity protection

Magnetically robust

- The non-contact magnetic technology prevents wear and guarantees a long service life
- Multiple clamping affords high strain relief to the cable outlet, ensuring longer life.
- Wide temperature range from -20°C up to +85°C

Compact Power

- Wide range power supply, either 5 V DC or 8 ... 30 V DC
- Flexible connection options: can be supplied with radial or axial cable outlet

Order code Shaft version

8.2430 . XXXX . XXXX
Type 1 2 3 4 5



1 Flange

- 1 = ø 24 mm
- 2 = ø 30 mm
- 3 = ø 28 mm

2 Shaft (D)

- 1 = ø 4 mm
- 2 = ø 6 mm
- 3 = ø 5 mm x 10 mm with flattening

3 Interface / Power supply

- 5 = RS422 (with inverted signal) supply voltage 8 - 30 V
- 6 = RS422 (with inverted signal) supply voltage 5 V

4 Type of connection

- 1 = cable axial (2 m PVC cable ø 4,5 mm)
- 2 = cable radial (2 m PVC cable ø 4,5 mm)

5 Pulse rate

- 1 ... 128 (factory programmable) 256
- (e.g. 128 pulses => 0128)
- Other pulse rates on request

Preferred types are underlined

Order code Hollow shaft

8.2440 . XXXX . XXXX
Type 1 2 3 4 5



1 Flange

- 1 = ø 24 mm

2 Blind hollow shaft

- (insertion depth max. 14 mm)
- 1 = ø 4 mm
- 2 = ø 6 mm

3 Interface / Power supply

- 5 = RS422 (with inverted signal) supply voltage 8-30 V
- 6 = RS422 (with inverted signal) supply voltage 5 V

4 Type of connection

- 1 = cable axial (2 m PVC cable ø 4,5 mm)
- 2 = cable radial (2 m PVC cable ø 4,5 mm)

5 Pulse rate

- 1 ... 128 (factory programmable) 256
- (e.g. 128 pulses => 0128)
- Other pulse rates on request

Preferred types are underlined

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

Incremental Encoder	Miniature series, magnetic	2430 / 2440 (Shaft / Hollow shaft)
----------------------------	-----------------------------------	---

Mechanical characteristics		
Speed		max. 12.000 min ⁻¹
Rotor moment of inertia		approx. 0,1 x 10 ⁻⁶ kgm ²
Starting torque		< 0,001 Nm
Shaft load capacity	radial	10 N
	axial	20 N
Weight		ca. 0,06 kg
Protection acc. to EN 60529	housing side	IP 64 (IP 69K on request)
	flange side	IP 50 (IP 67 on request)
Working temperature range		-20° C ... +85 °C ¹⁾
Materials	Shaft/Hollow shaft	stainless steel
	Clamping flange	MS58
Shock resistance acc. to DIN-IEC 68-2-27		1000 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-27		100 m/s ² , 55 ... 2000 Hz

Electrical characteristics		
Output circuit	RS 422 (TTL-compatible)	RS 422 (TTL-compatible)
Supply voltage	8 ... 30 V DC	5 V ±5%
Current consumption	no load	typ. 40 mA
	with inversion	max. 90 mA
Permissible load/channel	max. ±20 mA	max. ±20 mA
Pulse frequency	max. 300 kHz	max. 300 kHz
Signal level	high	min. 2,5 V
	low	max. 0,5 V
Rise time t _r	max. 200 ns	max. 200 ns
Fall time t _f	max. 200 ns	max. 200 ns
Min. flange distance	0,5 µs ²⁾	0,5 µs ²⁾
Short circuit proof outputs ³⁾	yes ⁴⁾	yes ⁴⁾
Reverse connection of the supply voltage	yes	no
CE compliant acc. to	EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3	
RoHS compliant acc. to	EG-guideline 2002/95/EG	

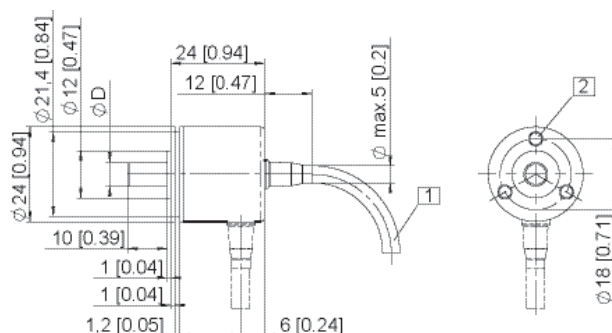
Terminal assignment

Signal:	0 V	+U _B	$\bar{A}$	A	$\bar{B}$	B	$\bar{0}$	0
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD

Dimensions shaft version:

Flange Type 1 (ø 24 mm)

- 1 min. R50 [1,97] 2 3 x M3, 4 [0,16] deep

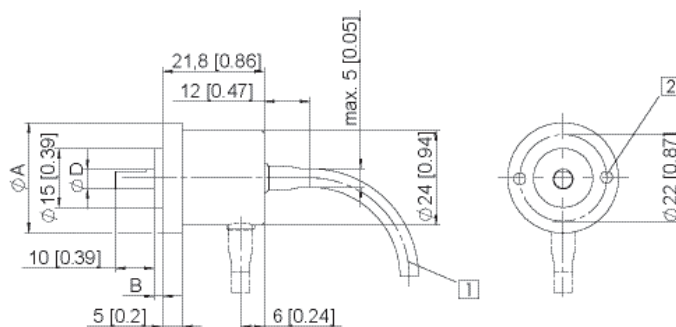


Flange Type 2 (ø 30 mm)

Flange Type 3 (ø 28 mm)

Flange Type	2	3
A	ø 30 mm	ø 28 mm
B	3 mm	2 mm

- 1 min. R50 [1,97] 2 3 x M3, 4 [0,16] deep

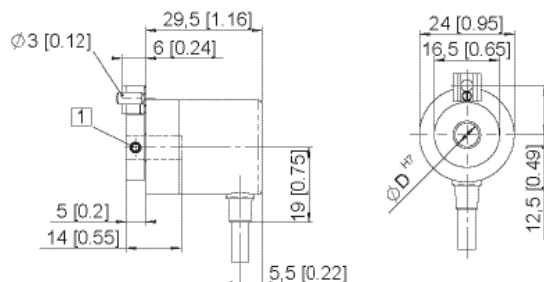


Mounting advice

The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time! We recommend the use of suitable couplings (see Accessories section).

Dimensions hollow shaft version

- 1 4 x M3 DIN 915 - SW15



Mounting advice

The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time! Cylindrical pin (ISO 2338-A-3m6 x 10) for torque stop incl. in scope of delivery.

1) Non-condensing

2) For max. speed use a counter with input frequency of min. 500 kHz.

3) If supply voltage 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.

Rotary Measuring Technology

Incremental Encoder

Large hollow shaft

5821



Optimised proportions, optimised costs:

With an overall diameter of just 58 millimetres the series 5821 boasts a hollow shaft of up to 28 millimetres diameter.



Temperature



Shock/vibration resistant



Magnetic field proof



Short-circuit proof



Reverse polarity protection

Order code Hollow shaft

8.5821 . XXXX . XXXX
Type 1 2 3 4 5



1 Flange

1 = with spring element

2 Hollow shaft

3 = $\varnothing$ 28 mm
5 = $\varnothing$ 25 mm
6 = $\varnothing$ 24 mm
C = $\varnothing$ 20 mm
K = $\varnothing$ 16 mm

3 Output circuit / Power supply

1 = RS 422 (with inverted signal) / 5 V
3 = Push-pull (with inverted signal) / 8-30 V
4 = RS 422 (with inverted signal) / 8-30 V

4 Type of connection

1 = Cable radial (1 m PVC cable)
E = 8-pin connector M12, radial

5 Pulse rate

50, 60, 100, 125, 250, 400, 500, 512, 960, 1000, 1024, 2000, 2048, 5000 (z.B. 100 pulses => 0100)

Other pulse rates on request

Preferred types are underlined

Mechanical characteristics

Speed	max. 3000 min ⁻¹
Rotor moment of inertia (shaft version)	approx. $3,5 \times 10^{-6}$ kgm ²
Starting torque	< 0,1 Nm
Weight	ca. 0,4 kg
Protection acc. to EN 60 529	IP 64
Working temperature	-20 °C ... +85 °C
Material	steel
Shock resistance acc. to DIN-IEC 68-2-27	1000 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6	100 m/s ² , 35...2000 Hz

Electrical characteristics

Output circuit	RS 422	Push-Pull (7272)
Supply voltage	5 V $\pm$ 5% / 8 ... 30 V	8 ... 30 V DC
Power consumption		
no load	typ. 40 mA	< 40 mA
with inverted signal	max. 90 mA	max. 100 mA
Permissible load/channel	max. $\pm$ 20 mA	max. $\pm$ 40 mA
Pulse frequency	max. 300 kHz	max. 200 kHz
Signal level		
high	min. 2,5 V	min UB - 3 V
low	max. 0,5 V	max. 0,5 V
Rise time tr	max. 200 ns	max. 1 s
Fall time tf	max. 200 ns	max. 1 s
Short circuit proof outputs ¹⁾	yes	yes
Reverse connection of the supply voltage	yes	yes
CE compliant acc. to	EN 61 000-6-2, EN 61 000-6-4 and EN 61 000-6-3	
RoHS compliant acc. to	EG-guideline 2002/95/EG	

1) If supply voltage correctly applied

Rotary Measuring Technology

Incremental Encoder

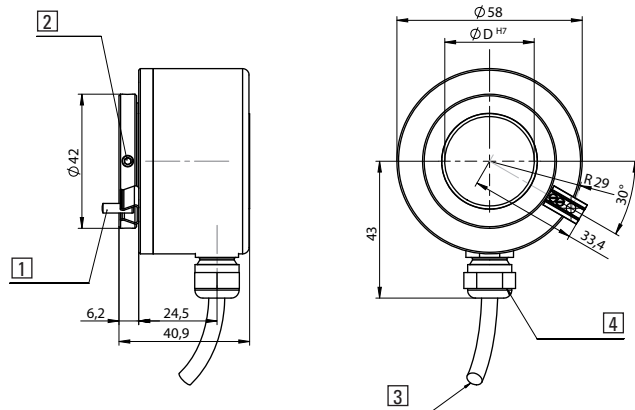
Large hollow shaft

5821

Dimensions shaft version:

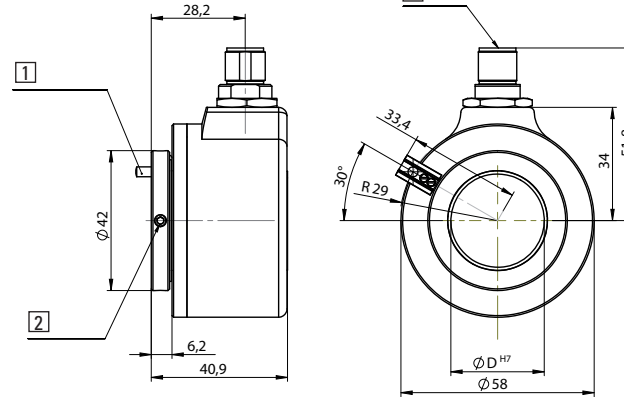
Flange with torque stop, $\varnothing$ 58 mm, spring contact

Cable version, Connection type 1



- 1 Cylindrical pin 3m6x12 DIN 6325 included
- 2 4 x socket set screw M4x6 DIN 913
- 3 Cable length 2 Meter
- 4 Cable gland PG7

M12 Plug version, Connection type E

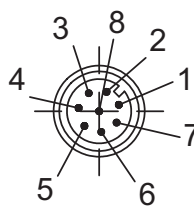


- 1 Cylindrical pin 3m6x12 DIN 6325 included
- 2 4 x socket set screw M4x6 DIN 913
- 3 Connector M12

Terminal assignment

Signal:	0 V GND	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	shield
M12 eurofast, 8-pol. connector, Pin	1	2	3	4	5	6	7	8	1)
Cable colour	WH	BN	GN	YE	GY	PK	BU	RD	shield

8-pin M12 connector



Accessories

Mounting attachments and stator couplings can be found in the Accessories section

M12 coupling

straight, 8-pin,
self-assembly, IP67

Order No.:

05.CMB8181-0



M12 connector

preassembled with cable
straight, 8-pin,
open end, PVC cable 2 -15 m

Order No.:

2 m: **05.WAKS8-2/P00**

5 m: **05.WAKS8-5/P00**

10 m: **05.WAKS8-10/P00**

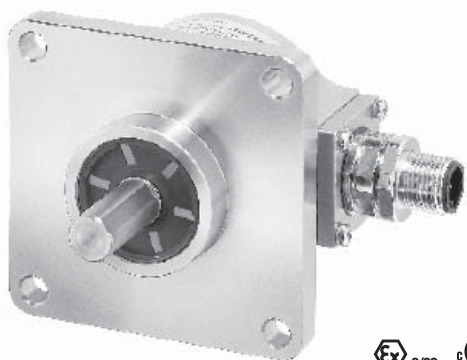
15 m: **05.WAKS8-15/P00**



1) PH = Shield is attached to connector housing.

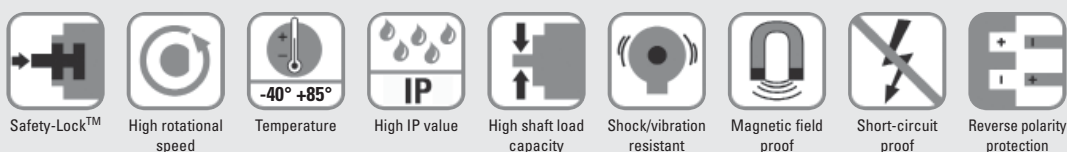
Rotary Measuring Technology

Incremental Encoder	Sendix	5006 Stainless-steel
---------------------	--------	----------------------



The Sendix incremental 5006 in stainless-steel offers optimum material resistance and thus virtually unlimited durability.

The high-grade Viton seals, the IP 67 level of protection as well as the wide temperature range additionally ensure impermeability and ruggedness.



Durable and sealed

- Protection rating IP67
- Rugged stainless-steel housing
- Viton seals
- Wide temperature range -40 ... +85°C
- Sturdy bearing construction in Safety Lock™ Design for resistance against vibration and installation errors

Flexible in use

- Compatible with all common US and European standards,
- Supply voltage 5 ... 30 V DC, various interface options, max. 5000 PPR
- Compact dimensions:
Outer diameter 50 mm, installation depth max. 47 mm

Order code

8.5006 . XXXX . XXXX
Type 1 2 3 4 5



1 Flange

7 = Clamping flange, metric $\varnothing$ 58 mm
A = Synchro flange, metric $\varnothing$ 58 mm
C = Square flange 63,5 mm [2,5 inch]

2 Shaft ($\varnothing \times L$)

1 = $\varnothing$ 6 mm x 10 mm
3 = $\varnothing$ 10 mm x 20 mm
8 = $\varnothing$ 3/8" x 7/8"

3 Output circuit / supply voltage

2 = Push-pull (7272 with inversion) / 5 ... 30 V
4 = RS 422 (with inversion) / 5 V
5 = Push-pull with inversion / 10 ... 30 V

4 Type of connection

4 = 8-pin M12 connector radial

5 Pulse rate

360, 512, 1000, 1024, 2000, 2048, 2500, 3600, 4096, 5000
(e.g. 100 pulses => 0100) Other pulse rates on request

Preferred types are underlined

Note:

Encoder will be delivered without mating connector.

Corresponding mating connector: : Type 05.CMB-8181-0

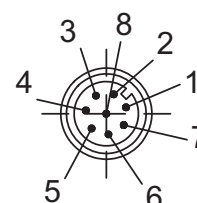
Mechanical characteristics

Speed ¹⁾	max. 6000 min ⁻¹
Rotor moment of inertia (shaft version)	ca. $1,8 \times 10^{-6}$ kgm ²
Starting torque	< 0,05 Nm
Weight	ca. 0,4 kg
Load capacity of shaft:	radial 80 N axial 40 N
Protection acc. to EN 60 529	IP 67
EX approval for hazardous areas	optional Zone 2 and 22
Working temperature	-40 °C ... +85 °C
Materials	housing, flange, shaft connector Seals stainless steel, 1.4305 stainless steel, Viton
Shock resistance acc. to DIN-IEC 68-2-27	2500 m/s ² , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6	100 m/s ² , 10...2000 Hz

Terminal assignment

Signal:	0 V GND	+U _B	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	shield
M12 eurofast, 8-pin connector, Pin	1	2	3	4	5	6	7	8	¹⁾

8-pin M12 connector



Matching mating connector: 05.CMB-8181-0

Suitable accessories:

- further cables and connectors, also pre-assembled, can be found in the Connection Technology section.
- further mounting attachments and stator couplings can be found in the Accessories section.

¹⁾ For continuous operation max. 3000 min⁻¹

Incremental Encoder	Sendix	5006 Stainless-steel
---------------------	--------	----------------------

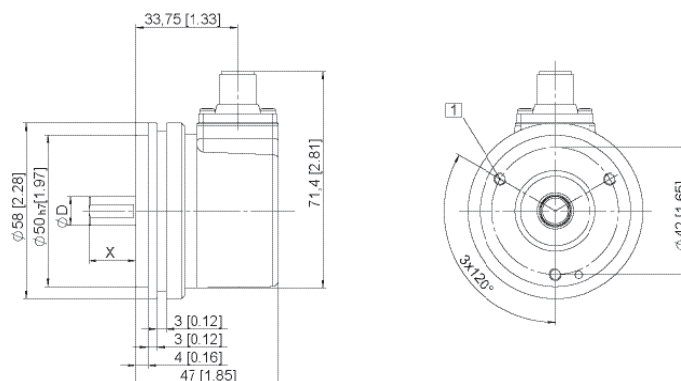
Electrical characteristics

Output circuit:		RS 422 (TTL-compatible)	Push-Pull	Push-Pull (7272)
Supply voltage		5 V ±5%	10 ... 30 V DC	5 ... 30 V DC
Current consumption	no load with inverted signal	typ. 40 mA max. 90 mA	typ. 50 mA max.100 mA	typ. 50 mA max. 100 mA
Permissible load/channel		max. ±20 mA	max. ±20 mA	max. ±20 mA
Pulse frequency		max. 300 kHz	max. 300 kHz	max. 300 kHz
Signal level	high low	min. 2,5 V max. 0,5 V	min UB - 1 V max. 0,5 V	min. UB-2,0 V max. 0,5 V
Rise time tr		max. 200 ns	max. 1 µs	max. 1 µs
Fall time tf		max. 200 ns	max. 1 µs	max. 1 µs
Short circuit proof outputs ¹⁾		yes ²⁾	yes	yes
Reverse connection of the supply voltage		no	yes	no
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		EG-guideline 2002/95/EG		

Dimensions

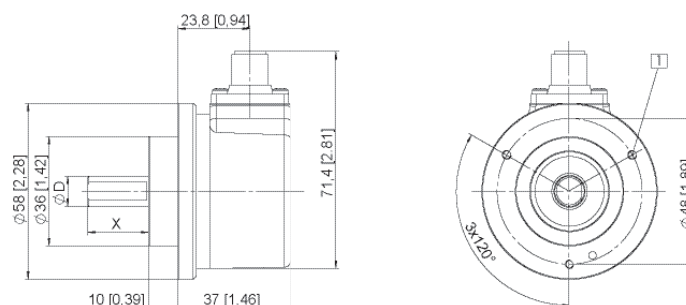
Synchro flange, $\varnothing$ 58 mm, (Flange type A)

1 3 x M3, 6 [0.24] deep

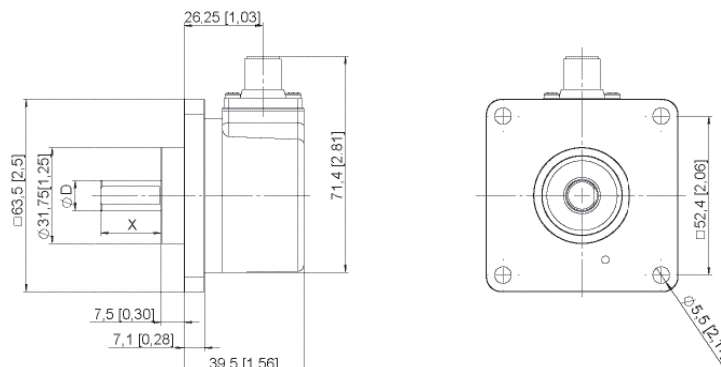


Clamping flange, $\varnothing$ 58 mm (Flange type 7)

1 M3, 5,5 [0.21] deep



Square flange, $\square$ 63,5 mm [2.5 inch] (Flange type C)



1) If supply voltage correctly applied

2) Only one channel allowed to be shorted-out:

at UB = 5 V short circuit to channel, 0 V, or +UB is permitted.
at UB = 5 ... 30 V short circuit to channel or 0 V is permitted.



In general slip rings are used to transmit power, signals or data from a stationary to a rotating platform.

The transmission between the stator and rotor takes place via sliding contacts and is extremely reliable. The construction is modular and offers the greatest flexibility in a variety of applications.

Flexible and Rugged:

- Modular construction system, load and signal/data channels can be combined as desired
- Rugged GFPC housing (glass-reinforced polycarbonate), 30% glass-fibre content for industrial usage
- Long service life and long maintenance cycles
- Individually replaceable brush rings
- Customised versions easily available

Reliable with Safety-Trans™ Design

- Two-cavity system for load and signal transmission
- Labyrinth seal
- High vibration resistance
- Fieldbus signals such as Profibus, CANopen etc. up to 12 MBit/sec

Application areas for Slip Rings:

- Packaging machines
- Textile machines
- Robots and handling equipment
- Cranes
- Pipeline inspection systems
- Video surveillance (CCTV) equipment
- Fairground rides
- Bottling plants
- Rotary tables

Order code

for standard versions

IST - SR085 - XX - XX - XX - XXXXX - VXXX

Type

1

2

3

4

5

6

7

8

9

1 Flange mounting

00 = Media lead-through

Hollow shaft mounting

20 = ø 20 mm

24 = ø 24 mm

25 = ø 25 mm

30 = ø 30 mm

IN = ø 1 Inch

other options on request

2 Number of signal/data channels ¹⁾

(only in pairs e.g. 2, 4, 6)

3 Number of power (load) channels ¹⁾

4 Max. load current

1 = 16 A, 240 V AC/DC

2 = 40 A, 240 V AC/DC

3 = 10 A, 400 V AC/DC

4 = 20 A, 400 V AC/DC

5 Mounting position

1 = Standing and horizontal (flange down)

2 = Hanging and horizontal (flange up)

6 Contact material for data channels

1 = Gold

2 = Media lead-through

7 Media lead-through

0 = none, Flange mounting

1 = Air, connection 1/4"

2 = Air, connection 1/2"

3 = Air, connection 3/8"

4 = Hydraulics, connection 1/2"

5 = Hydraulics, connection 3/8"

Hollow shaft mounting

6 = Air, rotatable connector (up to 300 min⁻¹)

8 Protection rating

1 = IP 50

2 = IP 64

9 Version number (options)

V 100 = Standard without options

Options on request:

- > 20 channels
- other fixing options
- other types of connection e.g. plug connectors

Accessories

Maintenance set

comprises brush and contact oil for signal contacts

Order No.: **IST-MS-01**

¹⁾ 20 combination max., for example 4 data channels and 16 power channels

Transmission Technology

Slip rings

IST-SR085

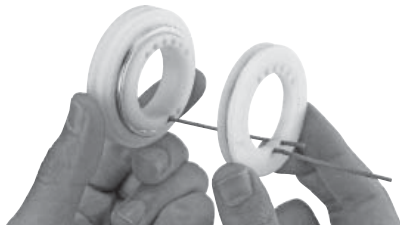
Technical Data (standard version)

Dimensions	see drawing
Overall length	dependent on the number of transmission paths
Bore diameter	up to $\varnothing 30$ mm
Voltage/current loading	max. 40 A for 240 V AC/DC
Contact resistance load channel	≤ 1 Ohm
Contact resistance Signal/Data channel	$\leq 0,1$ Ohm
Insulation resistance at 500 V DC	10^3 M Ohm
Dielectric strength	1000 V eff. (60 sec.)

Speed	max. 800 1/min
Operating temperature	$-30 \dots +80$ °C
Protection rating	max. IP 64
Service life	> 500 Mio. revolutions
Maintenance cycles	ca. 50 Mio. revolutions
Number of rings	ca. 20 (> 20 on request)
on request)	EN61010-1 2001, VDE 0110 part 1, VDE 0295/6.92, VDE 0100 part 523

Modular Construction System

Simple installation



Stator ring with copper graphite pick-off spring for load currents, for a long service life



Insulator with slip ring for load currents



Stator ring with gold or copper alloy (90% gold content) pick-off spring for signal currents



Insulator with slip ring for signal currents, separate signal channels with contact guide

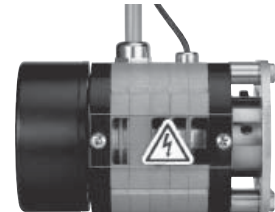


Technology in detail

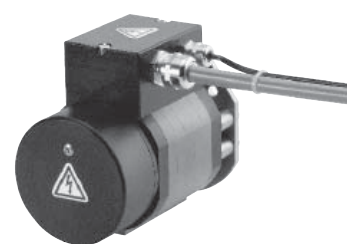
Easily accessible connections



Practical maintenance window



IP 64 version with rotor and stator protective cover



Hollow shaft mounting with pneumatic rotatable connector



Version with media leadthrough (air, hydraulics)



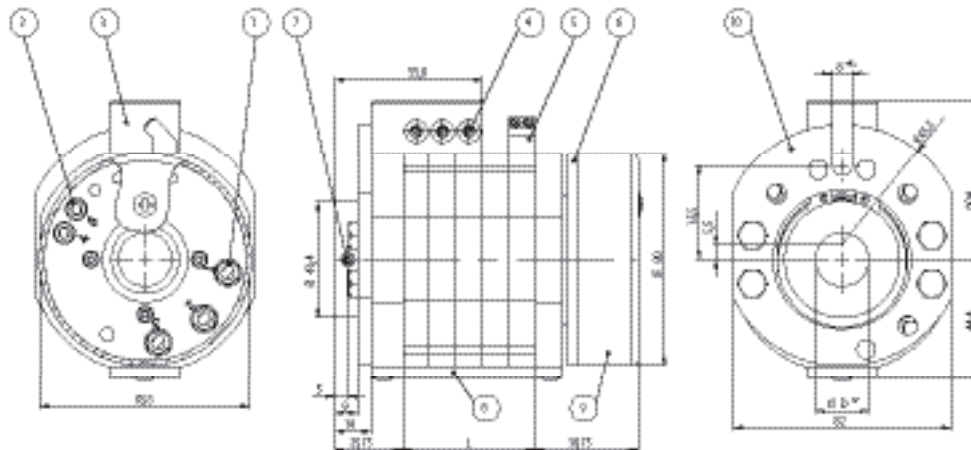
Transmission Technology

Slip rings IST-SR085

Dimensions

Air lead-through versions

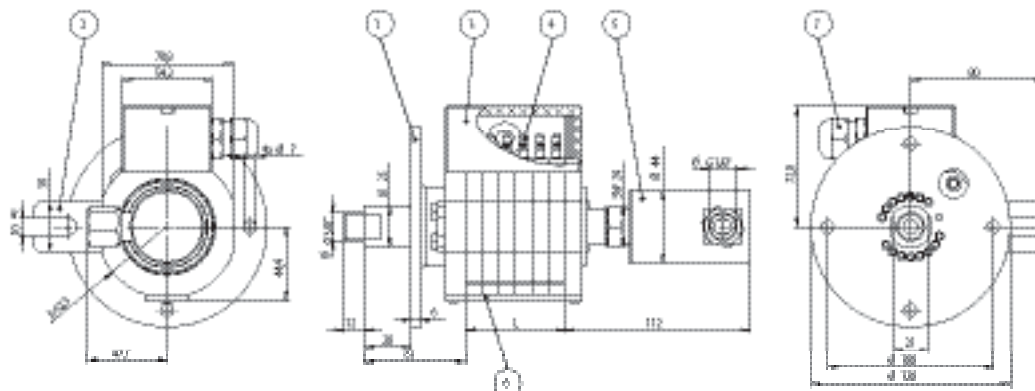
Example: Type IST-SR085-25-02-03-11101-V100
(2 data channels, 3 power channels)



- | | | |
|---|--|--------------------------------------|
| 1 – Screw terminal M5 for load transmission | 4 – Wire lead-in for load possible on both sides | 8 – Maintenance window |
| 2 – Screw terminal for signal transmission | 5 – Terminal clamp for signal transmission | 9 – Protective cover for connections |
| 3 – Terminal clamp for load without wire protection, with shock-hazard touch protection | 6 – Rotating connection ring | 10 – Torque stop |
| | 7 – 4 x socket set screw DIN 914 M6 x 10 | |

air lead-through versions

Example: Type IST-SR085-00-00-06-11131-V123



- | | | |
|---------------------|-----------------------------|------------------------|
| 1 – Mounting flange | 3 – Stator protective cover | 5 – Media lead-through |
| 2 – Torque stop | 4 – Terminal clamp | 6 – Maintenance window |
| | | 7 – Cable gland |

Calculation of the overall length

Basic dimensions	
slip ring with hollow shaft	64,5 mm
slip ring with flange mounting and media lead-through 3/8"	185 mm
slip ring with flange mounting and media lead-through 1/4"	168 mm
Additionsmaße	
+ number of signal/data channels	+ 10 mm / 2 Data channels
+ number of power channels, order variant 1 (16 A, 240 V)	+ 10 mm per power channel
+ number of power channels, order variant 2 (40 A, 240 V)	+ 10 mm per power channel + 10 mm, if only power + 20 mm
+ number of power channels, order variants 3 and 4 (10 or 20 A, 400 V)	+ 20 mm per power channel, if only power + 10 mm
+ Labyrinth isolation ring for power and signal transmission	+ 10 mm

Slip rings

IST-SR060



The SR060 is a compact, economical slip ring for up to 3 load and 2 signal transmissions from a stationary to a rotating platform.

The transmission between the stator and rotor units occurs extremely reliably via sliding contacts.

Compact

- Dimensions 60 x 98 mm
- Can be used as a pair starting from just 60 mm shaft distance of the sealing rollers
- Various component configurations for the transmission paths, max. 3 x load and 2 x signal transmission

Efficient

- Economical – thanks to minimization of individual components, favourable mounting and component part design to suit
- Fully encapsulated in high-grade glass reinforced plastic housing shells
- Ideally suited for the heating of sealing drums (rollers) in packaging machines

Application areas for Slip Rings

- Packaging machines
- Textile machines
- Robots and handling equipment
- Cranes
- Pipeline inspection
- Video surveillance equipment
- Fairground rides
- Bottling plants
- Rotary tables

Order code

IST - SR060 - XX - X - X - V01

1 Hollow shaft diameter

18 = ø 18 mm
20 = ø 20 mm
24 = ø 24 mm
25 = ø 25 mm (other diameters on request)

2 Number of signal transmission paths (max. 2)

3 Number of load transmission paths (max. 3)

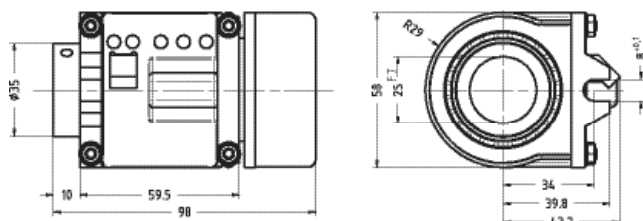
4 Version number V01 Standard

Technical Data (standard version):

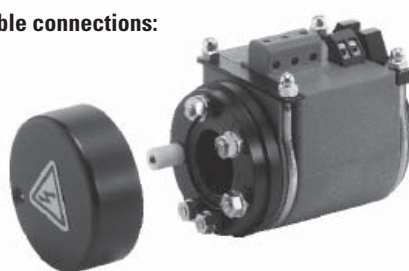
Dimensions	see drawing
Overall length	dependent on the number of transmission paths
Hollow shaft diameter	up to max. ø 25 mm
Current loading	max. 16 A (at 240 V AC)
Voltage/current loading	240 V AC (dependent on the current loading)
Contact resistance signal channel	< 0.1 Ohm

Contact resistance load channel	< 1 Ohm
Insulation resistance at 500 V DC	10 ³ MOhm
Dielectric strength	1000 V eff. (60 sec.)
Speed	max. 500
Operating temperature	0 ° ... 75 °C
Protection rating:	IP 50
Service life	> 500 Mio. revolutions
Maintenance cycles	approx. 50 Mio. revolutions

Dimensions



Easily accessible connections:



Optical fibre signal transmission

SSI



Optical fibre transmission system for SSI absolute encoders

The system is made up of an optical fibre transmitter and an optical fibre receiver.

The optical fibre transmitter converts the electrical signals of a normal absolute encoder with Synchronous Serial Interface (SSI) into a light signal for transmission by means of an optical fibre. The receiving module converts the optical signal back into electrical signals. Absolute signals can be transmitted safely through one glass fibre over distances of up to 1500 m.

The resolution of 13 bit for a singleturn encoder or 25 bit for a multi-turn encoder can be defined by means of a DIP-switch on the front side of the module.

Reliable transmission

- Safe signal transmission up to 1500 m
- Resists extremely strong electro-magnetic fields

Easy installation

- Signal transmission via a single glass fibre.
- Resolution of 13 bit or 25 bit can be set via DIP-switch
- LED for monitoring of power supply, clock and date
- DIN-rail mounting – requires min. installation space – only 22 mm wide

Application areas

- Process control technology and automation technology
- Interference-sensitive applications
- High voltage plant
- Plant with long transmission distances
- Potential separation
- Hazardous areas

Order code

Optical fibre transmitter

$U_B = 10 \dots 30 \text{ V DC}$

$U_B = 5 \text{ V DC}$

LWLS.A1

LWLS.A4

Scope of delivery:

- Optical fibre module
- Multilingual operating manual

Optical fibre receiver

$U_B = 10 \dots 30 \text{ V DC}$

$U_B = 5 \text{ V DC}$

LWLE.A1

LWLE.A4

Accessories

Simplex Patch cable ST-ST – Multimode

Connector: 2xST/PC, Optical fibre: 1x50/125

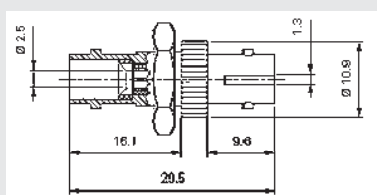
Standard lengths: 2 m, 5m, 8m, 10m, 15m, 20m, ... (in 5 m steps)

Order code:

05.B09-B09-821-L XXX

①

① Length in m

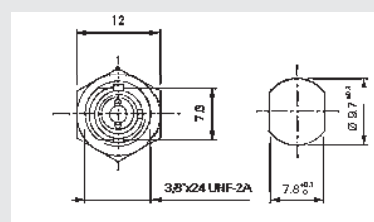


ST Multimode coupling

Barrel: ceramic, slotted

Order No.:

05.LWLK.001



Connection Technology

Optical fibre signal transmission

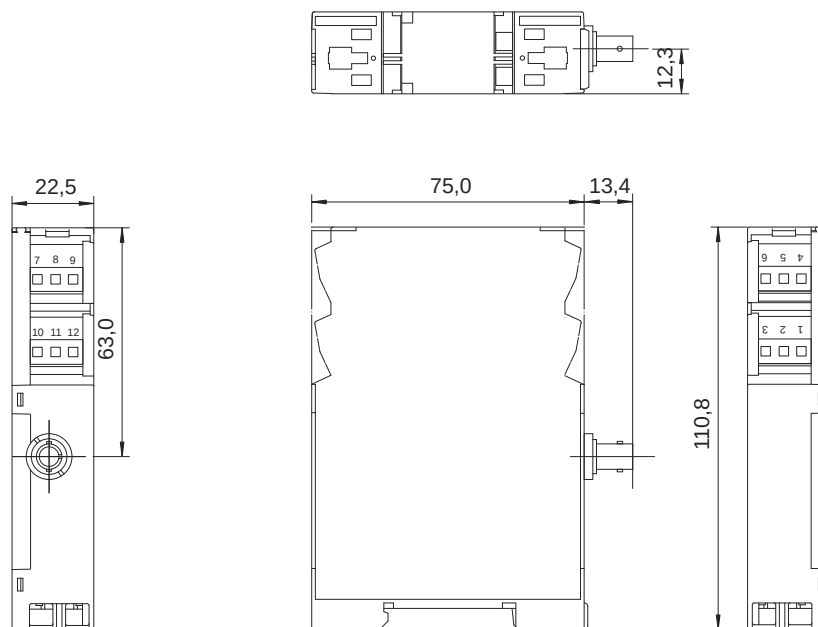
SSI

Technical data

Supply voltage	10 ... 30 V or 5 V $\pm$ 5%
Power consumption per module	U_B 10 ... 30 V DC max 1,6 W U_B 5 V DC max 0,8 W
Operating voltage reverse connection protection	available
Encoder inputs	optical fibre transmitter -T, +T and -D, +D
SSI clock rate	500 kHz fixed setting
Optical wavelength	820 nm
Optical transmission rate	120 Mbit/s
Optical fibre connection	ST connector, 13 mm, $\varnothing$ 9 mm on the bottom side of the housing

Glass fibre	multimode fibre, 50/125 μ m, 62,5/125 μ m
Max. optical fibre transmission distance	max. 1500 m
Dimensions	(W x L x H) 22,5 x 110,8 x 88,4 mm
Protection	IP 40, terminals IP 20
Terminals	protected against contact, max.conductor diameter 2,5 mm ²
Temperature range	-10 °C ... +60 °C
Weight	approx. 100 g
Standards	EN 55 011 Class B1 EN 61 000-6-2: 2006

Dimensions



Connecting diagram

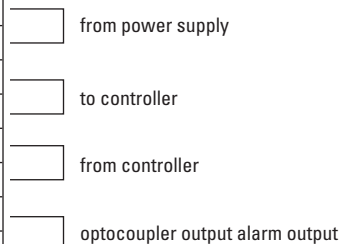
Optical fibre transmitter:

Pin	signal
1	0 V (GND)
2	+ U_B
3	+ T
4	- T
5	+ D
6	- D
7	0 V (GND)
8	+ U_B

Connecting diagram

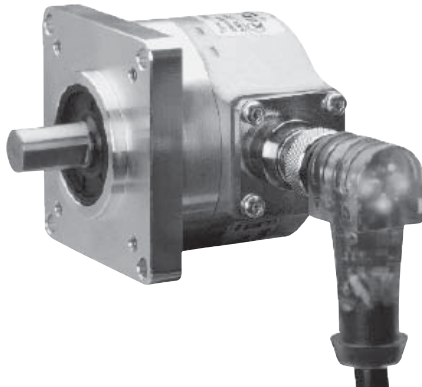
Optical fibre receiver:

Pin	signal
1	0 V (GND)
2	+ U_B
3	+ D
4	- D
5	+ T
6	- T
7	emitter (-)
8	collector (+)



Cables and Connectors

8-pin M12 Cordset with integrated control LEDs



The 8-pin M12 Cordset for incremental encoders ensures fast, simple connections under difficult outdoor conditions.

The Cordset, in a transparent, right-angle housing, contains three LEDs, which display the channels A,B and Z.

Informative

- With LEDs to display channels A, B (both green) and Z (amber)
- LEDs for start-up and to display the zero point
- Shows current status of the output channels

Versatile

- Suitable for Incremental Encoders
- Right Angle Female Connector
- 5 - 30 V DC

Order code

8-pin M12 Cordset

with integrated control LEDs

Order-No.:

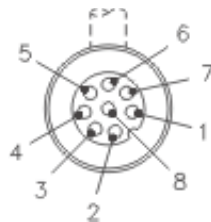
05.E-WKC 8T-PX3-930-XXXX

Cable

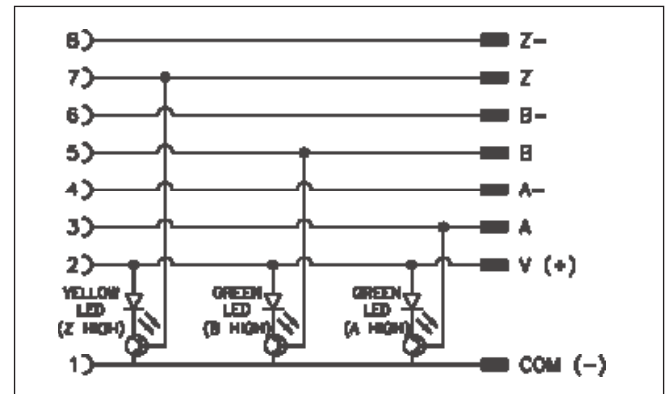
- PVC
- 8 x 24 AWG
- 7.2 mm OD
- Standard lengths: 2, 4, 6, 8, 10 m

Terminal assignment

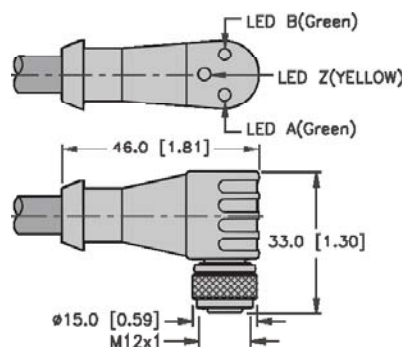
Signal:	0 V	+U _B	$\bar{A}$	A	$\bar{B}$	B	$\bar{0}$	0
Cable colour:	WH	BN	GN	YE	GY	PK	BU	RD



Wiring diagram



Dimensions



Connection Technology

M12 connectors, cordsets

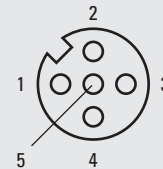
CANopen



M12 coupling – 5-pin, straight, self-assembly

CANopen Bus in

Order No.: **8.0000.5116.0000**



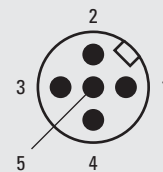
suitable for encoders:
Sendix 3658 | 3678,
Sendix 5858 | 5878,
Sendix 5868 | 5888



M12 connector – 5-pin, straight, self-assembly

CANopen Bus out

Order No.: **8.0000.5111.0000**



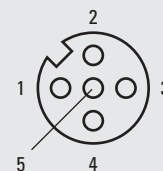
suitable for encoders:
Sendix 5858 | 5878,
Sendix 5868 | 5888



M12 coupling – 5-pin, straight, single-ended, PVC cable 2...15m

CANopen Bus in

Order No.: 2m	8.0000.6V81.0002
5m	8.0000.6V81.0005
10m	8.0000.6V81.0010
15m	8.0000.6V81.0015



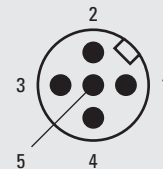
suitable for encoders:
Sendix 3658 | 3678,
Sendix 5858 | 5878,
Sendix 5868 | 5888



M12 connector – 5-pin, straight, single-ended, PVC cable 2...15m

CANopen Bus out

Order No.: 2m	8.0000.6V88.0002
5m	8.0000.6V88.0005
10m	8.0000.6V88.0010
15m	8.0000.6V88.0015



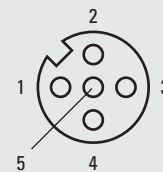
suitable for encoders:
Sendix 5858 | 5878,
Sendix 5868 | 5888

Analogue encoder



M12 coupling – 5-pin, straight, self-assembly

Order No.: **8.0000.5116.0000**

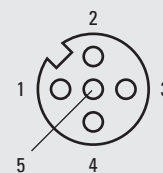


suitable for:
draw-wire,
A50, B80, C120, D135,
Inclinometer IS40,
Sendix 3658 | 3678



M12 coupling – 5-pin, straight, single-ended, PVC cable 2...15m

Order No.: 2m	05.WAKS4.5-2/P00
5m	05.WAKS4.5-5/P00
10m	05.WAKS4.5-10/P00
15m	05.WAKS4.5-15/P00



suitable for:
draw-wire,
A50, B80, C120, D135,
Inclinometer IS40,
Sendix 3658 | 3678

Rotary Measuring Technology

Accessories	Robust Bearing Unit	Suitable for 58-size with solid shaft
-------------	---------------------	---------------------------------------



Shock / vibration resistant



Temperature



High IP value



High shaft load capacity

Quick and Easy – More Protection

- The separation of bearing load and sensor technology affords the encoder greater protection in tough environments
- Retrofitting can be carried out very quickly and easily

Order code

Robust bearing unit

(matching shaft encoders with clamping flange and shaft 6 mm)

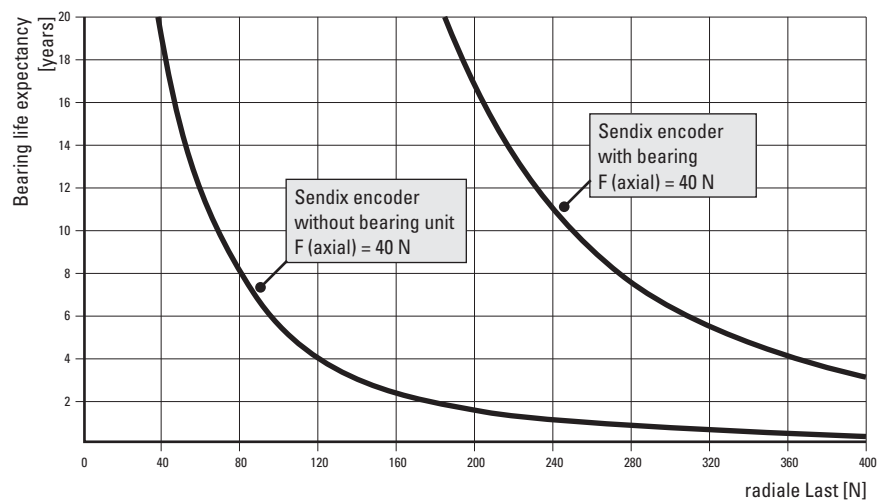
Ord.-No. **8.0010.8200.000B**

Mechanical characteristics

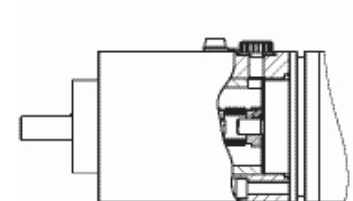
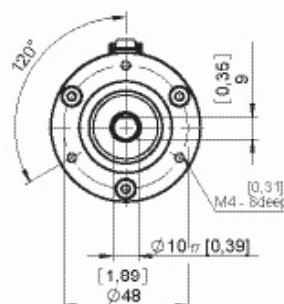
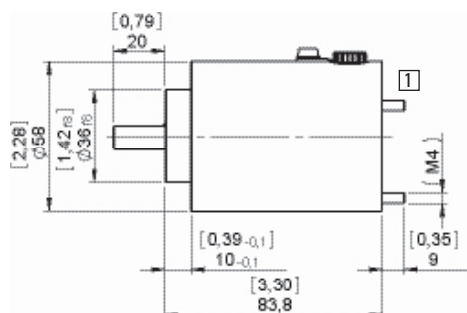
Speed	max. 6.000 min ⁻¹
Weight	ca. 560 g
Protection	IP 67
Material	housing aluminium (Seawater resistant) shaft stainless steel

Bearing life expectancy L10

at 3,000 revolutions/min with continuous operation



Dimensions



- 1 3 x Cylindrical pin M4x25 (SW3)
1 x O-Ring
included as mounting set

Preset Counters

LCD Preset Counters

1 or 2 Presets

Codix 907 / 908



The Codix 908 and 907 preset counters for pulse and time inputs offer all essential counter functions at an amazing price-performance ratio.

As a result of their minimal mounting depth and their plug-in screw terminals, the counters are simple and quick to install; as an option the two-line LCD can also be backlit. It is then even easier to read it at a glance.



DC 11 ... 30 V	AC 115 / 230 V	 -10° +50°	 DIN 48 x 48	 Menu driven programming	 IP 65	 Plug-in screw terminal	 max. 5 kHz	 1 or 2	 Multifunction	 2 x 6 LCDs
Supply voltage		Temperature	DIN front bezel	Menu driven programming	High IP value	Plug-in screw terminal	Count frequency	Presets 907: 1 / 908: 2	Multifunction	2 x 6 LCDs

Simple

- Plug-in screw terminal
- Menu driven programming
- Decade keypad, for each digit one key
- DC or AC supply voltage
- Minimum installation depth
- High protection rating (IP 65)
- With preset annunciators

Powerful

- For pulse, time and position
- Adding or subtracting
- Automatic reset, via key or electrical
- Codix 907: 1 Presets / Codix 908: 2 Presets
- 2 x 6 digit display with preset annunciators from -999999 up to +999999
- With or without backlighting

Order code

6.90 X . 0 1 0 X . X A 0
① ② ③ ④ ⑤

① Number of presets

- 7 = 1 preset
- 8 = 2 presets

② Output

- 0 = Relays

③ LCD options

- 0 = no backlighting
- 1 = green backlighting

④ Supply voltage

- 0 = 230 V AC
- 1 = 115 V AC
- 3 = 10 ... 30 V DC

⑤ Input trigger level

- A = 4 ... 30 V DC level

Delivery specification

- Preset counter
- Mounting clip
- 8 pin screw terminal
- 7 pin screw terminal
- Operating instructions

Stock models:

6.907.0100.3A0	6.907.0100.0A0
6.908.0100.3A0	6.908.0100.0A0
6.908.0101.3A0	6.908.0101.0A0

Accessories

Adapter front bezel 55 x 55 mm
for panel cut-out 50 x 50 mm

Order-No.

T00885

Gasket

N511004

Adapter bezel 60 x 75 mm
with screw fixing

Order-No.

T008860

Gasket

N511028

Replacement parts

8-pin screw terminal 1 ... 8

Order-No. **N100498**

8-pin screw terminal 9 ... 15

Order-No. **N100548u002**

Preset Counters

LCD Preset Counters	1 or 2 Presets	Codix 907 / 908
---------------------	----------------	-----------------

Technical data

Supply voltage		AC 115/230 V / 50/ 60 Hz, max. 6,5 VA
		DC 11 ... 30 V, max. 4 W
External fuse protection		230 V AC T 0,1 A
		115 V AC T 0,125 A
		11 ... 30 V DC T 0,2 A
Display		2-line 6-digits LCD display positive green, with optional backlighting
Data retention		> 10 years, EEPROM
Count inputs		pulse counter cnt.dir, up.dn, quad FrErUn, InpA.InpB., InpB.InpB.
Voltage supply for sensors		AC 24 V DC -40/+15%, 50 mA at 230 V AC, 40 mA at 115 V AC
		DC max. 50 mA, external voltage supply is connected through
Operating temperature		-10 °C ... +50 °C
Storage temperature		-25 °C ... +75 °C
Humidity		at +40 °C r.F. 93%, non condensing
Altitude		up to 2000 m
EMV		Emitted interference EN55011 Class B
		Immunity to interference EN 61000-6-2
Device safety		EN 61010 part 1; Protection 2
Application area		Soiling Level 2
Protection		IP65 (from the front)
Weight		AC version approx. 250 g
		DC version approx. 150 g

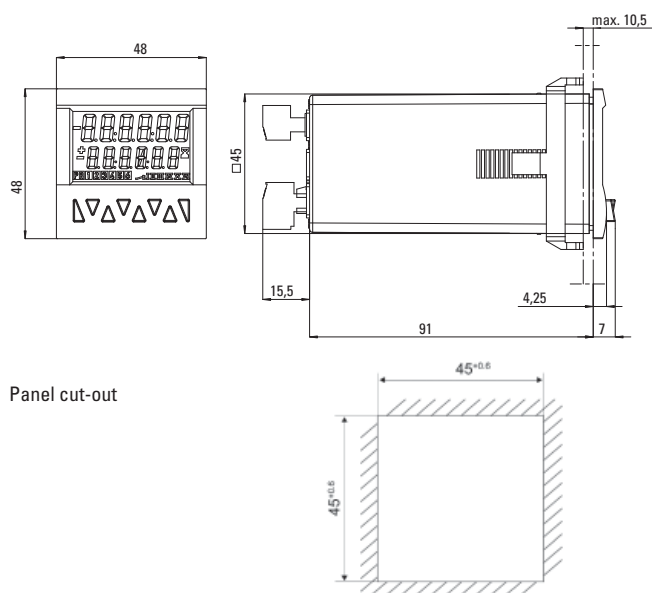
Inputs

Count inputs	A and B
Polarity of the inputs	programmable for all inputs in common NPN/PNP
Input resistance	10 kΩ
Count frequency	max. 5 kHz (details see manual) can be damped to 30 Hz (mechanical contacts)
Control / Reset input	Lock, Reset
Min pulse duration of the inputs	statical / 1 ms
Switching levels with AC/DC-supply:	4 ... 30 V DC: low 0 ... 2 V DC high 3,5 ... 30 V DC
Pulse shape	variable, Schmitt-Trigger characteristics

Outputs

Switching voltage	max. 250 V AC / 110 V DC
Switching current	max. 3 A AC/DC min. 30 mA DC
Switching capacity	max. 750 VA / 90 W
Output 1	
Mech. service life (switching cycles)	2 x 10 ⁷
N° of switching cycles at 3 A / 250 V AC	1 x 10 ⁵
N° of switching cycles at 3 A / 30 V DC	1 x 10 ⁵
Relay with closing contact, progr. normal closed or normal open.	
Output 2	
Mech. service life (switching cycles)	20 x 10 ⁶
N° of switching cycles at 3 A / 250 V AC	5 x 10 ⁴
N° of switching cycles at 3 A/30 V DC	5 x 10 ⁴
Relay with changeover contact	
Reaction time of the outputs:	
Pulse counter	< 15 ms
Timer	< 10 ms

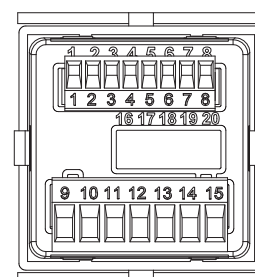
Dimensions



Connections

Signal and control inputs

- Sensor voltage supply
AC: 24 VDC/220 V, 50 mA
115 V, 40 mA
DC: UB connected through
- GND (0 VDC)
- INP A (Signal input A)
- INP B (Signal input B)
- RESET (Reset input)
- LOCK (Key locking input)
- n. c.
- n. c.



Version with relays/optocouplers

- Relay contact C./Collector
 - Relay contact N.O./Emitter
 - Relay contact C./Emitter
 - Relay contact N.O./not assigned
 - Relay contact N.C./Collector
 - AC: 115/230 VAC N~
 - DC: 11 ... 30 VDC
 - AC: 115/230 VAC L~
 - DC: GND (0 VDC)
- Output 1
- Output 2
- Supply voltage

Preset Counters

LED Preset Counters

2 Presets

Codix 560



With its automatic help texts, clearly and legibly displayed on 14 LED segments, the Codix 560 preset counter takes the user effortlessly through the programming. The large user-friendly front keys can be operated even when wearing gloves.



DC 10 ... 30 V Power supply	AC 90 ... 260 V Power supply	 -20° +65° Temperature range	 DIN 96 x 48 DIN front bezel	 Menu-driven programming	 IP 65 High IP value	 max. 60 kHz High count frequency	 t/Hz Multifunction	 t/Hz Frequency display with HRA	 POSITION Position display	 LED 1 x 6 LEDs
--	---	------------------------------------	------------------------------------	-----------------------------	----------------------------	--	---------------------------	--	----------------------------------	-----------------------

Batch Batch counter	Σ Total counter
-------------------------------	---------------------------

Multifunction

- Counter, Tachometer, Timer and Position Display in one device
- Can be used as Preset Counter, Batch Counter or Total Counter
- Many different count modes
- Scalable display
- Set value
- Multi-range power supply for AC or DC

User-friendly:

- Automatic help texts, displayed in German and English
- 14-segment LED for improved text representation
- Status display of the presets
- 3 predefined parameters
- Tracking presets eliminate the need for reprogramming of the pre-signal
- Minimum installation depth
- 4-stage RESET modes
- 3-stage keypad locking
- Suitable for installation in mosaic systems

Order code

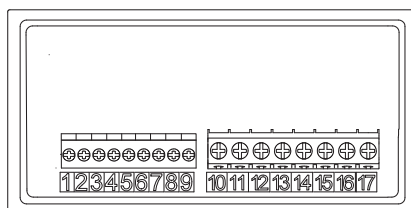
6.560 . 010 . XX0
① ②

- ① Supply voltage
0 = 90 ... 260 V AC
3 = 10 ... 30 V DC

- ② Input trigger levels
0 = Standard level (HTL)
A = 4...30 V DC level

- Delivery specification
- Preset counter
 - Mounting clip
 - Instruction manual

Connections



Signal and Control inputs

- INP A (Signal input A)
- INP B (Signal input B)
- RESET (Reset input)
- LOCK (Keypad lock)
- GATE (Gate input)
- MPI 1 (User input 1)
- MPI 2 (User input 2)
- Sensor supply voltage
AC: 24 VDC/80 mA
DC: UB connected through
- Shared connection for signal and control inputs
GND (0 VDC)

Version with relay/optocoupler

- Relay contact C.2
 - Relay contact N.O.2
 - Relay contact N.C.2
 - Relay contact C.1
 - Relay contact N.O.1
 - Relay contact N.C.1
 - AC: 90..260 VAC N~
DC: 10..30 VDC
 - AC: 90..260 VAC L~
DC: GND (0 VDC)
- Output 1
- Output 2
- Supply voltage

Preset Counters

LED Preset Counters	2 Presets	Codix 560
----------------------------	------------------	------------------

Technical data

Sensor supply voltage		AC 90 ... 260 V AC max. 11 VA, 50/60 HZ DC 10 ... 30 V, max. 5,5 W
External fuse protection		230 V AC T 0,1 A 10 ... 30 V DC T 0,25 A
Data retention		> 10 years, EEPROM
Response time of the frequency meter:		100 / 600 ms, for details, see instruction manual
Input modes	Input modes:	Count direction (cnt.dir), Difference (up.dn), Addition A+B (up.up), phase discriminator x1, x2, x4 (quad, quad x2, quad x4), Ratio (A/B), Ratio in % ((A-B)/A x 100%)
	Frequency meter:	A, A-B, A+B quad, A/B, (A-B)/A x 100%
	Timer:	4 Start modes: FrErun, Auto, InpA.InpB., InpB.InpB.
Sensor supply voltage		AC supply 24 V DC $\pm$ 15%, 80 mA DC supply max. 50 mA, external supply voltage is connected through
Operating temperature		-20 °C ... +65 °C
Storage temperature		-25 °C ... +75 °C
Relative humidity		at +40 °C r.F. 93%, non-condensing
Altitude		up to 2000 m
EMV	Emitted interference	EN55011 Class B
	Immunity to interference	EN 61000-6-2
Device safety		EN 61010 part 1; Protection 2
Application area		Soiling Level 2
Protection		IP65 (from the front)
Weight		AC version approx. 180 g

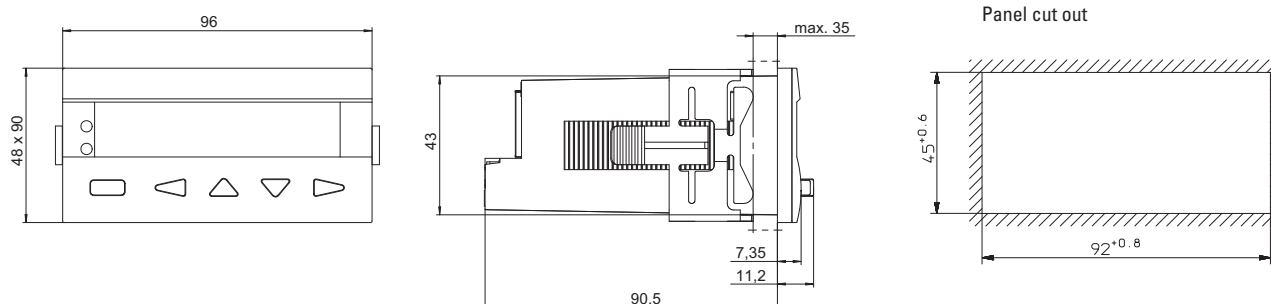
Inputs

Count inputs		A and B
Polarity of the inputs		programmable for all inputs in common NPN/PNP
Input resistance		5 k Ω
Count frequency		max. 5 kHz (details see manual) can be damped to 30 Hz (mechanical contacts)
Control / Reset input		MPI 1 and MPI 2, Lock, Gate, Reset
Min pulse duration of the inputs		10 ms / 1 ms
Switching levels with DC supply	HTL-level:	low: 0 ... 4 V DC high: 12 ... 30 V DC
	4 ... 30 V DC:	low: 0 ... 2 V DC high: 3,5 ... 30 V DC
Switching levels with AC supply	HTL-level:	low: 0 ... 0,2 x UB high: 0,6 x UB ... 30 V DC
	4 ... 30 V DC:	low: 0 ... 2 V DC high: 3,5 ... 30 V DC
Pulse shape		variable, Schmitt-Trigger characteristics

Outputs

Switching voltage		max. 250 V AC / 150 V DC
Switching current		max. 3 A AC / DC min. 30 mA DC
Switching capacity		max. 750 VA / 90 W
Output 1 + 2		
Mech. service life (switching cycles)		2 x 10 ⁷
N° of switching cycles at 3 A / 250 V AC		5 x 10 ⁴
N° of switching cycles at 3 A / 30 V DC		5 x 10 ⁴
Relay with changeover contact		
Reaction time of the outputs (pulse / time)		13 ms Details s. instruction manual

Dimensions



Preset Counters

LED Preset Counters

2 Presets

Codix 560

Pulse counter

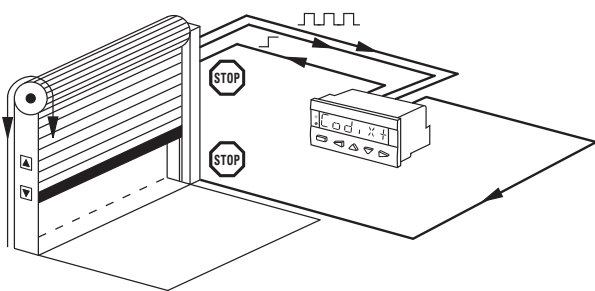
Functions / Count modes

- Count with direction mode
- Difference mode
- Quadrature mode quad / quad2 / quad4
- Add, Sub, automatic reset
- 2-input adding mode A+B
- Ratio measurement A/B
- Multi-range power supply for AC or DC
- Percentage difference measurement $(A-B)/A \times 100\%$
- Batch counting
- Totaliser (Overall total)
- Multiplication and division factor (up to 99,9999)
- Set value
- Step or tracking preset

Application examples

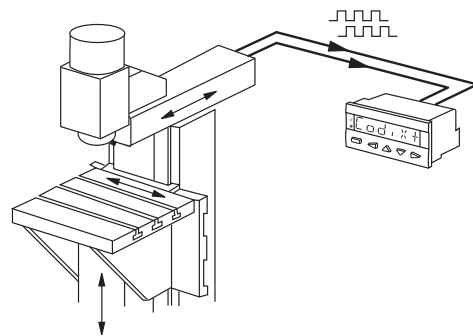
CountDir + Add

Roller shutter door with automatic shut-off



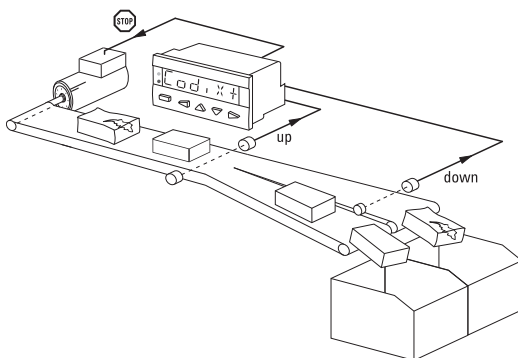
Quad + Add

Running direction and position on milling machines, Limit switch monitoring



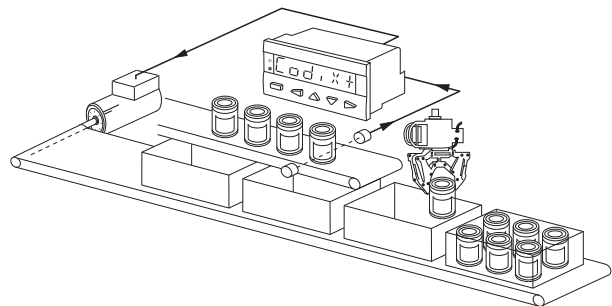
UpDown + Add

Automatic subtraction of faulty or reject parts from the total piece count



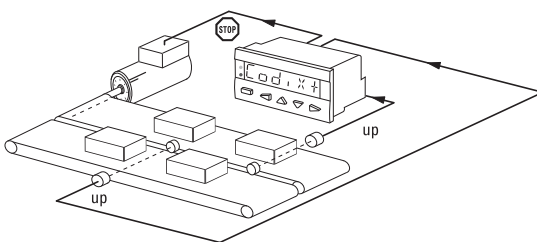
CountDir + Batch

Logging of piece numbers and packing units plus control of replenishment of packing cartons



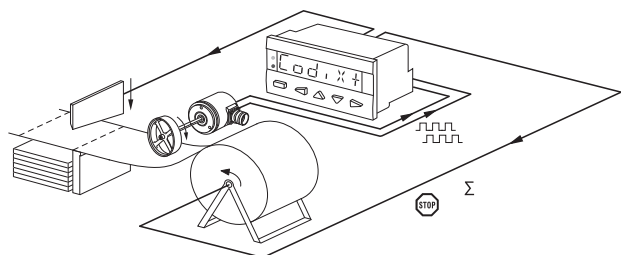
UpUp + Add

Adding up of two parallel or staggered production lines



Quad + Add tot

Cut-to-length with overall total count and control of the machine



Preset Counters

LED Preset Counters

2 Presets

Codix 560

Frequency meter (Tachometer)

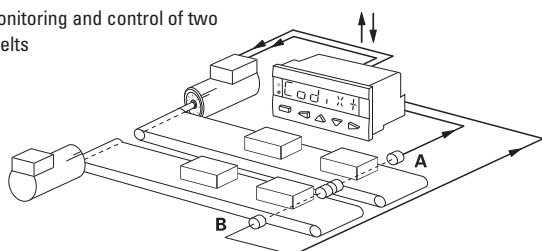
Functions / Count modes

- A
- A - B
- A + B
- A / B
- $(A - B) / A \times 100 \%$ (percentage display)
- Quad (phase discriminator with recognition of direction)
- Averaging
- Start delay
- 2nd tachometer input
- Gate input
- Multiplication and division factor (up to 99,999)

Application examples

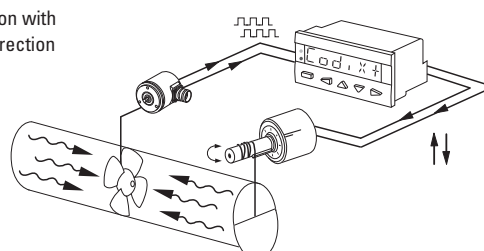
A - B

Synchro monitoring and control of two conveyor belts



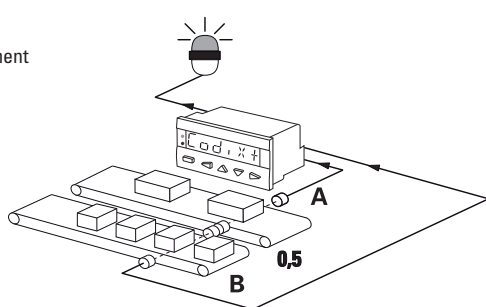
Quad

Speed regulation with indication of direction



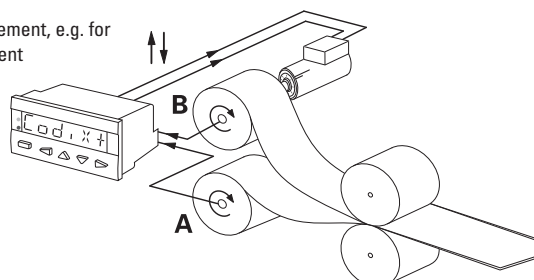
A/B

Ratio measurement



$(A-B)/A [\%]$

Ratio measurement, e.g. for speed alignment



Time and Hours-run meter (Timer)

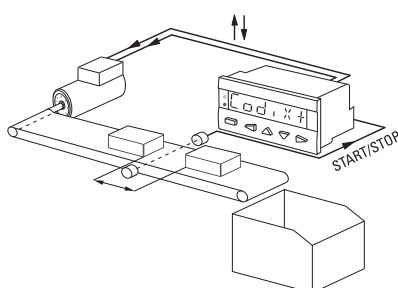
Functions / Count modes

- FrErUn (Control via gate input)
- Auto (Start via Reset, Stop at Preset)
- InpB.InpB (Start with first edge at InpB., Stop with second edge InpB.)
- InpA. InpB (Start with InpA., Stop with InpB.)
- Totaliser (Overall total)
- Batch counting
- Set value
- Step or tracking preset

Application examples

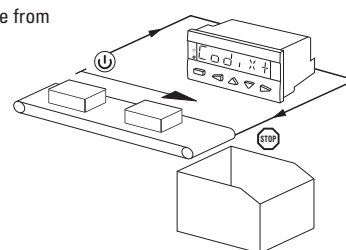
InpB. InpB

Interval measurement



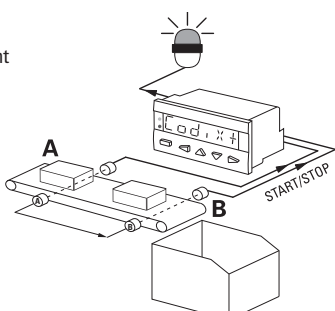
FrErUn

Measurement of overall time from switching on the conveyor belt till switching off



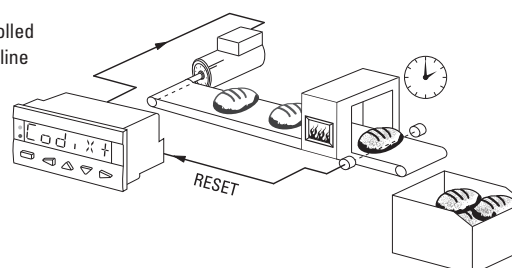
InpA. InpB

Run-time measurement



Auto

Time-controlled production line



Hour Meters / Timers, electromechanical

Timers, round	with run indicator	HR 47
---------------	--------------------	-------



The electromechanical hour meter HR 47 efficiently monitors and plans maintenance intervals.

A run indicator reliably displays the status of the meter, whilst the count value can always be easily read at a glance thanks to its large figures. With no reset the HR 47 is virtually impossible to manipulate and is exceptionally reliable and robust.

AC/DC 10 ... 264V	-25° +80°	000000		
Power supply	Temperature	High shock resistance	Timer	no reset

Safe application

- For voltage ranges 10 ... 80 V DC, 100 ... 130 V AC and 187 ... 264 V AC
- Large optical figures, 7-digit
- Suitable for any mounting position
- Without reset, therefore tamper-proof
- With run indicator for AC version – optional LED for DC version

Robust

- For panel cut-out ø 50.5 mm with frontpanel dimensions ø 58 mm
- High shock and impact resistance
- Simple, secure mounting screwed clamping clip
- Protection IP65 (front side)

Order code

voltage	with run indicator	without run indicator
10 ... 80 V DC	3.474.911.373	3.474.901.373
100 ... 130 V AC/60 Hz	3.474.901.084	—
187 ... 264 V AC/50 Hz	3.474.901.075	—

Accessories

Gasket

ø 58 x ø 50 x 1 mm

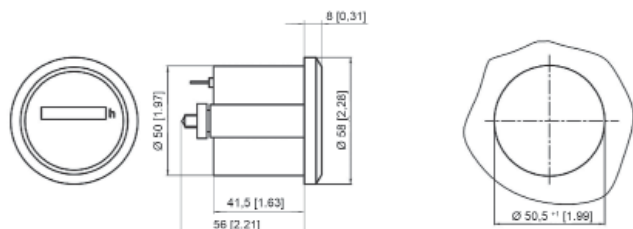
N511182

Technical data:

Electrical connection	screw terminal for flat pin connector 6,3 x 0,8 mm	
Power consumption	10 ... 80 V DC	max. 720 mW
	100 ... 130 V AC, 60 Hz	max. 1,1 VA
	187 ... 264 V AC, 50 Hz	ca. 1,2 VA
Rated voltages	100 ... 130 V AC, 60 Hz 187 ... 264 V AC, 50 Hz 10 ... 80 V DC	
On time	100 %	
Display	AC	99999,99 h
	DC	999999,9 h
Resolution	AC	0,01 h corresponds to 36 s
	DC	0,1 h corresponds to 6 min
Count mode	adding	
Height of figures	4 mm [0.158"]	
Colour of figures:	white and red on black	
Ambient temperature	AC	-25° ... +80 °C
	DC	-20° ... +70 °C non condensing)
Relative humidity	< 95% (non condensing)	
Mounting position	any	

Protection (EN 60 529)	IP 65
Housing	plastic PC (Polycarbonate)
Accuracy	AC + 0,02% DC + 0,002%
Weight	ca. 50 g
Run indicator	AC fast rotating wheel in viewing window DC optional LED
Test voltage	2000 V AC, 50 Hz for AC version

Dimensions



New CNC centre – Kübler is investing in more flexibility



Kübler customer day – Kübler offers impulses for innovations with top-flight expert forums and the inauguration of a new production facility.



Kübler Kaizen culture – Our way of breathing down the neck of wasteful habits

Kübler is setting up a Kaizen office, to implement the company philosophy both systematically and for the long term.



Professional advice

Germany

09221 Neukirchen/Chemnitz
Registriertechnik
Jörg Müller
Hauptstraße 148A
Tel. 03713-30 47 89
Fax 03713-30 47 89
Registriertechnikmueller
@t-online.de

28876 Oytten
Fritz Kübler GmbH
Zähl- und Sensortechnik

Vertriebsbüro Nord
Hermi Herrmann
Mohnblumenweg 6
Tel. 04207-6880-32
Fax: 04207-6880-34
hermi.herrmann@kuebler.com
www.kuebler.com

35759 Driedorf
Fritz Kübler GmbH
Zähl- und Sensortechnik
Vertriebsbüro Mitte
Stefan Heinigk
Gartenstraße 10
Tel. 02775-5784-27
Fax 02775-5784-28
stefan.heinigk@kuebler.com
www.kuebler.com

59757 Arnsberg
Fritz Kübler GmbH
Zähl- und Sensortechnik
Vertriebsbüro West
Torsten Czubkowski
Auf der Umcke 11 a
Tel. +49 (0) 2932 - 89 18 98
Fax: +49 (0) 2932 - 5 33 11
torsten.czubkowski
@kuebler.com
www.kuebler.com

78023 Villingen-Schwenningen
Fritz Kübler GmbH
Zähl- und Sensortechnik
Firmensitz
Postfach 34 40
Tel. 07720-39 03-0
Fax 07720-21564
info@kuebler.com
www.kuebler.com

78549 Spaichingen
Fritz Kübler GmbH
Zähl- und Sensortechnik
Vertriebsbüro Süd-West
Karl Klaritsch
Eichenweg 1
Tel. 07424 94 90 69
Fax 07424 94 90 87
Mobil: 0174 3 22 59 41
karl.klaritsch@kuebler.com
www.kuebler.com

88696 Owingen
Fritz Kübler GmbH
Zähl- und Sensortechnik
Vertriebsbüro Süd-Ost
Stefan Rost
Nikolausstrasse 21
Tel. 07551 93 63 75
Fax 07551 93 64 92
stefan.rost@kuebler.com
www.kuebler.com

Approved system partners/ distributors:

22149 Hamburg
Hermann Seidel GmbH
Techn. Vertretungen
Rahlstedter Str. 16
Tel. 040-675085-0
Fax 040-675085-85
info@seidel-gmbh.de
www.seidel-gmbh.de

42499 Hückeswagen
Fuhrmeister + Co. GmbH
Industrie-Elektronik
Stahlschmidtsbrücke 38
Tel. 02192-851122
Fax 02192-851127
info@fuhrmeister-gmbh.de
www.fuhrmeister-gmbh.de

66287 Quierschied-Göttelborn
Herbert Neundorfer
GmbH & Co. KG
Werksvertretungen
Zum Schacht 9
Tel. 0 68 25 95 45 0
Fax 0 68 25 95 45 99
info@herbert-neundorfer.de
www.herbert-neundorfer.de

82069 Hohenschäftlarn
Bachmann
Electronic GmbH
Am Wagnerfeld 4
Tel. 08178-8676-0
Fax: 08178-8676-50
info@bachmann-electronic.de
www.bachmann-electronic.de

Katalog-Distributoren (Deutschland):

28539 Bremen
Schuricht Distrelec GmbH
Lise Meitner-Str. 4
Tel. 0180-5 22 34-35
Fax 0180-5 22 34-36
scc@schuricht.de
www.schuricht.de

64546 Mörfelden-Walldorf
RS Components GmbH
Hessenring 13 b
Tel. 06105-401234
Fax 06105-401100
www.rs-components.de

82041 Oberhaching
Farnell GmbH
Keltnering 14
Tel.: 089-61 39 39 39
www.farnell.de

92240 Hirschau
Conrad Electronic GmbH
Klaus-Conrad-Straße 1
Tel. 09604-4089-88
www.conrad.com

Europe

Austria
Gebhard Balluff GmbH + Co.
Industriestraße B16
A-2345 Brunn am Gebirge
Tel. +43 0 22 36 3 25 21-0
Telefax +43 0 22 36 3 25 21 46
sensor@balluff.at
www.balluff.at

Belarus
FEK Company
ul. Engelsa, 30
BY-220030 Minsk
Tel. +375 17 210 59 57
Fax +375 17 227 53 13
turck@infonet.by
www.turck.by

Belgium
• Electromechanical counters
Crouzet S.A.
Avenue Roi Albert I, 40
B-1780 Wemmel
Tel. +32 2 462 07 30
Fax +32 2 461 00 23
awesdijk@crouzet.com
www.crouzet.com

• Electronic counters
Duranmatic B.V.
Robijn 800
NL-3316 KE Dordrecht
Tel. +31 78 631 05 99
Telefax +31 78 613 11 33
info@duramatic.nl
www.duramatic.nl

• Encoders and
process products
Multiprox N.V.
P.b. 71 Lion d'Orweg 12
B-9300 Aalst
Tel.: +32-053766 566
Fax: +32-053783 977
mail@multiprox.be
www.multiprox.be

Bulgaria
Sensomat GmbH
D-r Ivan Penakov Str 15-
W-4-11
9300 Dobritsch
Tel.: +359-58-603023
Fax: +359-58-603033
info@sensomat.info
www.sensomat.info

Czech Republic
TURCK s.r.o.
Hradecká 1151
CZ-500 03 Hradec Králové
Tel. +420 - 4 95 51 87 66
Fax +420 - 4 95 51 87 67
turck-cz@turck.com
www.turck.cz

Denmark
Hans Følsgaard A/S
Theilgaardstr. 1
DK-4600 Køge
Denmark
Tel. +45 43 20 86 25
Fax +45 43 96 88 55
psh@hf.net
www.hf.net

Estonia
Standel AS
Kiisa 8
11313 Tallinn
Estonia
Tel (+372) 6 558 180
Fax (+372) 6 558 179
standel@standel.ee
www.standel.ee

Finland
Murrelektronik OY
Koukkukatu 1
FIN-15700 Lahti
Tel. +358 3 882 4000
Telefax +358 3 882 4040
myynti@murrelektronik.fi
www.murrelektronik.fi

France
Fritz Kübler S.à.r.l.
Compteurs et codeurs
industriels
195 rue de Soutz
F-68270 Wittenheim
Tel. +33 3 89 53 45 45
Telefax +33 3 89 53 66 77
E-Mail:
info@kuebler-sarl.com
www.kuebler-sarl.com

Great Britain
• Encoders
OEM Automatic Ltd
Whiteacres, Cambridge Road
Wheatstone
Leicestershire LE8 6GZ
Tel. +44 116 284 99 00
Telefax +44 116 284 17 21
information@uk.oem.se
www.oem.co.uk

Greece
Industrial Automation Systems
L.J. Skourgialos
241, El. Venizelou Ave.
176 73 Kallithea - Athens
Greece
Tel.: +30 210 9510260
Fax: +30 210 9511048
info@ias.gr
www.ias.gr

Hungary
Kvalix Automatika Kft.
Kiss Ernő u. 1-3
H-1046 Budapest
Tel. +36 1 272 2242
Fax +36 1 272 2244
info@kvalix.hu
www.kvalix.hu

Ireland
Irish Industrial Components Ltd.
Unit 18/2, Canal Turn,
Clondalkin Industrial Estate
IRL-Clondalkin, Dublin 22
Tel. +353 1 45 70 012
Telefax +353 1 45 70 609
info@iicld.ie
www.iicld.ie

Iceland
Reykjafell Ltd.
Skipholti 35
IS-125 Reykjavik
Tel. +354 588 6010
Telefax +354 588 6088
reykjafell@reykjafell.is
www.reykjafell.is

Italy
• Encoder-Division
Kübler Italia Srl.
Viale F. Testi 287
I-20126 Milano
Tel. +39 0 26 42 33 45
Fax +39 0 26 61 13 843
alfredo.angeli@kuebler.com
www.kuebler.com

• Exclusive representative for
counters and process pro-
ducts, preferred distributor
for encoders:
MASAUTOMAZIONE S.R.L.
Via G. Galilei 20
I-20090 Segrate (MI)
Tel. +39 02 26 92 20 90
Fax +39 02 26 92 16 87
info@masautomazione.it
www.masautomazione.it

Netherlands
• Electromechanic counters
Crouzet BV
Industrieweg 17
NL-2382 NR Zoeterwoude
Tel. +31 71 541 11 21
Telefax +31 71 541 35 74
com-nl@crouzet.com
www.crouzet.com

• Electronical counters,
Process devices and
encoders:
Duranmatic B.V.
Robijn 800
NL-3316 KE Dordrecht
Tel. +31 78 631 05 99
Telefax +31 78 613 11 33
info@duramatic.nl
www.duramatic.nl

Norway
ELTECO AS
Floodmyrveien 24
N-3946 Porsgrunn
Tel. +47 35 56 20 70
Fax +47 35 56 20 99
firmapost@elteco.no
www.elteco.no

Poland
Kubler Polska Sp. z o.o.
ul. Dabrowskiego 441
60-451 Poznan
Poland
Tel.: +48 (0) 61 849 99 02
Fax: +48 (0) 61 849 99 03
sales@kubler.pl
www.kubler.pl

ASTAT sp. z o.o.
ul. Dabrowskiego 441
60-451 Poznan
Poland
Tel. +48 (0) 6 18 48 88 71
Fax +48 (0) 6 18 48 82 76
info@astat.com.pl
www.astat.com.pl

• Electronic Counters and
process devices:
IMPOL-1 Sp.j.
ul. Krakowiaków 103
02-255 Warszawa
tel. +48 22 886 56 02
fax +48 22 886 56 04
impol@impol-1.pl
www.impol-1.pl

• Encoders:
OEM AUTOMATIC Sp. z o.o.
ul. Postępu 2
02-676 Warszawa
Tel.: +48 22 863 27 22
Fax: +48 22 863 27 24
info@pl.oem.se
www.oemautomatic.com.pl

Portugal
LA2*P, Lda.
Rua Teófilo Braga, 156 A
Escrit. F - Edifício S. Domingos
Cabeço do Mouro
2785 - 122 S. Domingos de Rana
Tel. +351 21 444 70 70
Fax +351 21 444 70 75
geral@la2p.pt
www.la2p.pt

Romania
Syscom SRL
Calea Plevnei 139, Sector 6
ROM-Bucharest 77131
Tel. +040 21 310 26 78
Fax +040 21 316 91 76
vasile.enache@syscom18.com
www.syscom.ro

Russia
Servotechnica ZAO
22, Vyborgskaya str
125130 Moscow
Tel. +7 4 95 797 88 56
Fax +7 4 95 450 00 43
info@servotechnica.ru
www.servotechnica.ru

Serbia
Rapelectronics d.o.o.
Rabina Alkalaja 16
ZEMUN, Beograd
YU-11080
Tel. +381 11 3161 229
Fax +381 11 3075 035
rapelectronic@sezampro.yu
www.rapel.co.yu

Slovakia
S.D.A. s. r. o.
Jána Bottu 4
974 01 Banská Bystrica
Tel. +421 48 414 83 86/7
Fax +421 48 414 83 89
sekretariat@s-a.sk
www.kuebler.sk

Slovenia
SENZORJI SB d.o.o.
Ulica Kirbiševih 53a
2204 Miklavž na Dravskem polju
Slovenia
Tel.: +386 2 6 29 03 00
Fax: +386 2 6 29 03 02
senzorji.sb@siol.net
www.senzorji-sb.si

Spain
Elion, S.A.
Farrell, 5
E-08014 Barcelona
Tel. +34 93 298 20 00
Fax +34 93 431 18 00
elion@elion.es
www.elion.es

Sweden
• Counters and
process products
Flexitron AB
Box 7117
S-18712 Täby
Tel. +46 87 32 85 60
Telefax +46 87 569 132
sales@flexitron.se
www.flexitron.se

• Encoders:
OEM AUTOMATIC AB
Dalagatan 4, Box 1011
S-57328 Tranås
Tel.: +46 75-242 4100
Fax: +46 75-242 4119
info@aut.oem.se
www.oemautomatic.se

Switzerland
Micronor AG
Pumpwerkstrasse 32
CH 8105 Regensdorf
Tel.: +41 44 843 40 20
Fax: +41 44 843 40 39
info@micronor.ch
www.micronor.ch

Turkey
ERUZ Elektrik San. ve Tic. A.Ş.
Necatibey Caddesi
Demirbag Han Kat 1
TR-80030 Karaköy-Istanbul
Tel. +90 212 93 60 36
Fax +90 212 24 45 156
eruzelektrik@superonline.com
www.eruzelektrik.com.tr

Professional advice

Europe

European catalogue distributors

Austria

Farnell GmbH
Birkenstrasse 2
5300 Salzburg/Hallwang
Tel. +43 (0) 662 - 218 06 80
Fax +43 (0) 662 - 218 06 70
www.farnell.at
verkauf.at@farnell.com
RS Components
Albrechtstr. 11
A-3950 Gmünd
Tel. +43 28 52 505
Telefax +43 28 52 53 223
www.rs-components.at

France

Radiospares Composants
Rue Norman King BP 453
F-60031 Beauvais CEDEX
Tel. +33 3 44 10 16 48
Telefax +33 3 44 10 16 44
www.radiospares.fr

Farnell France SAS
81-83 rue Henri Depagneux
BP 60426 Limas
69654 Villefranche sur Saône
Cedex
Tel. +33 4 74 68 99 99
Fax +33 4 74 68 99 90
www.farnell.fr
ventes@farnell.com

Great Britain

RS Components Ltd.
PO Box 99, Corby
Northants NN17 9RS
Tel. +44 15 36 201 234
Telefax +44 15 36 40 56 78
www.rswwww.com

Farnell
Canal Road
Leeds, LS12 2TU
Tel. +44 87 01 200 200
Fax +44 87 01 200 201
www.farnell.co.uk
sales@farnell.co.uk

Italy

RS Components S.p.A.
Via De Vizzi 93/95
20092, Cinisello Balsamo,
Milano
Tel. +39 02 660 581
Fax +39 02 660 580 51
www.rs-components.it
www.rs.com

Distrelec Italia s.r.l.
C.P. 90
20020 Lainate (Mi)
Tel. +39 02 - 937 51 51
Fax +39 02 - 93755755
info-it@distrelec.com
www.distrelec.com

Switzerland

Distrelec AG
Grabenstrasse 6
CH-8606 Nänikon
Tel. +41 - 9 44 95 36
Fax +41 - 9 44 99 88
www.distrelec.com

Farnell AG
Brandschenkestr.178
Postfach 1703
8027 Zürich
Tel. +41 (0) 1 - 204 64 64
Fax +41 (0) 1 - 204 64 54
www.farnell.ch
verkauf.ch@farnell.com

Worldwide

Argentina

AUMECON S.A.
Acassuso 4768
1605 Munro
Prov. de Buenos Aires
Tel. +54 11 47 56 1251
Telefax +54 11 47 62 63 31
ventas@aumecon.com.ar
www.aumecon.com.ar

Australia

Balluff Leuze Pty. Ltd.
12 Burton Court
Bayswater VIC, 3179
Tel. +61 3 97 20 41 00
Fax +61 3 97 38 26 77
sales@balluff.com.au
www.balluff.com.au

Brazil

Balluff Controles Elétricos Ltda.
Rua Francisco Foga 25,
Cx. Postal 189
CEP 13280-000 Vinhedo-SP
Tel. +55 19 38 76 99 99
Fax +55 19 38 76 99 90
vendas@balluff.com.br
www.balluff.com.br

Canada

Connectric Systems Inc.
28-207 Edgeley Boulevard,
Unit 28
CDN-Concord, Ontario L4K 4B5
Tel. +1 905 669 00 80
Telefax +1 905 669 00 82
solisaac@connectric.com
www.connectric.com

Chile

Electronica industrial
El Schädler y Cia. Ltda.
Casilla 189-9
Av. Antonio Varas 1871
Providencia
Santiago
6641545
Tel. +56 2 274 74 30
Telefax +56 2 204 93 38
schadler@interactiva.cl

China

Headquarter Beijing:
Kuebler (Beijing) Automation
Trading Co. Ltd.
4404 Zhongyuan Building-2 No.
208 Lize Zhongyuan Erqu
Wangjing New Industrial Park
Chaoyang District Beijing,
100102 China
Tel.: +86 01 5134 8680
Fax: +86 01 5134 8681
kuebler.china@kuebler.com
http://www.kuebler.cn

Branch Offices
Shanghai, Tianjin, Wuhan, Chengdu
Distributors in China
Nation Wide
Hong Kong
PO KWONG ELECTRIC (HONG KONG) LIMITED
Rm. 177-180, 1/F, Blk C, Hang
Wai Ind. Ctr.,
6 Kin Tai St., Tuen Mun, N.T
Tel. +852 24 23 66 22
Fax +852 24 61 10 02
sales@pokwong.com
www.pokwong.com

Egypt

AEE Advanced Electronic
Engineering
26, Rabaa Bldgs., Nozha St.
ET-Nasr City, Cairo
Tel. +20 2 418 50 20
Fax +20 2 418 53 70
sales@aee.com.eg
www.aee.com.eg
www.kuebler.in

India

Kuebler Automation India Pvt Ltd
House No 677, S no 269/3,
Bhugaon, Near Daulat Dhaba,
Taluka: - Mulshi, Dist: - Pune,
Pin: - 412 108,
Maharashtra, India
Tel. +91 - 9819 457 872
shashank.sawant@kuebler.com

Rajdeep Automation Pvt. Ltd.
Survey 143, 3rd Floor,
Sinhaghad Road,
Vadgaon Dhayari, Pune
411041
Tel: +91 20 24 39 37 55
Fax: +91 20 24 39 37 56
info@rajdeep.in
www.rajdeep.in

Indonesia

SUPRA Engineering
Jl. Pecenongan 17 D
RI-10120 Jakarta
Tel. +62 21 345 73 55
Telefax +62 21 345 73 18
astina@centrin.net.id
www.supra.co.id

Israel

Omega Engineering
P.O.Box 109
ZRUFA 30850
Tel. +972-4-9544993
Fax. +972-4-9544992
info@omegae.net
http://www.omegae.net

Lebanon

Elias Ghali & Son's
Sabbteithe
Beirut
Tel. + 963 31 22 20 789
Fax: + 961 16 86 255
sghali1@cyberia.net.lb
www.ghali-sy.com

Malaysia

INGERMARK (M) SDN. BHD.
No.29, Jalan KPK 1/8,
Kawasan Perindustrian
Kundang,
48020 Rawang,
Selangor Darul Ehsan
Tel.: +60-3-7980 9591
Fax: +60-3-7981 7442
ingmal@tm.net.my

New Zealand

Carrel & Carrel Ltd.
3, Mc Donald St.
Morningside
NZ-Auckland 1003
Tel. +64 9 846 91 24
Telefax +64 9 846 85 55
sales@carrel.co.nz
www.carrel.co.nz

Philippines

Technorand Sales Corporation
Wilshire Annapolis Plaza,
Annapolis Street
San Juan, Metro Manila 1500
Tel. +63 716-5990
Fax +63 716-5986
techno@compass.com.ph

Singapore

Raymond International Pte. Ltd.
Blk 219 Henderson Road #07-04
Henderson Industrial Park
Singapore 159556
Tel. +65 62 76 37 38
Fax +65 62 76 37 39
raymond@raymondcom.com
www.raymondcom.com

South Africa

RET Automation Controls
130 Boeing Road East
ZA-Bedfordview 2008
Tel. +27 11 453 24 68
Telefax +27 11 453 24 06
info@retauto.co.za
www.retauto.co.za

South Korea

Kuebler Korea (by F&B)
578, Kwaebop-dong, Sasang-ku
Pusan Industrial Supplies
Market 9-116
PUSAN
Tel. +82 51 319 12 30
Fax +82 51 319 12 50
fmb@kuebler.co.kr
http://www.kuebler.co.kr

Syria

Elias Ghali & Son's
P.O.Box 64
SYR-Homs
Tel. + 963 31 24 80 780
Fax: + 963 31 2 227 638
s.ghali@scs-net.org
www.ghali-sy.com

Taiwan, R.O.C.

- Encoder, Transmission,
Electronic counters und
Process products
E-Sensors & Automation Int'l Corp.
6F-2, No.109, Chien Kuo 1st Rd.
Kaohsiung 80284
Taiwan, R.O.C.
Tel. +886-7-7220371
Fax +886-7-7718161
ez-corp@umail.hinet.net
www.e-sensors.com.tw

Canaan Electric Corp.

6F-5, No. 63, Sec. 2
Chang An East Road
Taipei
Tel. +886 225 08 23 31
Fax +886 225 08 47 44
sales@canaan-elec.com.tw
www.canaan-elec.com.tw

Thailand

Technology Instrument Co., Ltd.
208/132-137 Moo 6 Patanakarn
Rd., Pravat, Bangkok 10250
Tel. +662 3 22 22 33
Fax +662 7 22 30 47
marketing@tic.co.th
www.tic.co.th

Tunisia

H2M Technologies
13, Rue El Moutanabi
TN-2037 El Menzah 7 - Tunis
Tel. +216 71 42 76 77
Fax +216 71 42 76 88
h2m.tech@planet.tn

U.S.A.

- Counting and Process
technology
Global Industrial Products, Inc
8129 North Austin Ave
Morton Grove, IL 60053
Glenview, IL 60026
Toll-free number:
1-800-951-8774
Tel. 847 965 9808
Fax 847 965 9846
sales@globalpower.com
www.kueblerusa.com

- Rotary and linear encoders
„Kübler by Turck“
Turck Inc.
3000 Campus Drive
Minneapolis MN 55441
Tel. +1 763 553 7300
Fax +1 763 553 0708
sensors@turck.com
www.kueblerbyturck.com
www.turck.com

Partner for selected counters
and Process technology
Kessler-Ellis Products Co.
sales@kep.com
www.kep.com

Professional advice

Contact in Germany

001000 ... 09999

Registriertechnik
Jörg Müller
Hauptstraße 148A
09221 Neukirchen/Chemnitz
Tel. +49 (0) 37 13 30 47 89
Fax +49 (0) 37 13 30 47 89
registriertechnikmueller
@t-online.de

10000 ... 15899, 15940 ... 18999

Kübler Vertriebsbüro Nord
Hermi Herrmann
Mohnblumenweg 6
28876 Oyten
Tel. 04207-6880-32
Fax: 04207-6880-34
hermi.herrmann@kuebler.com

15900 ... 15939

Registriertechnik
Jörg Müller
Hauptstraße 148A
09221 Neukirchen/Chemnitz
Tel. +49 (0) 37 13 30 47 89
Fax +49 (0) 37 13 30 47 89
registriertechnikmueller
@t-online.de

19000 ... 19999

Kübler Vertriebsbüro Nord
Hermi Herrmann
Mohnblumenweg 6
28876 Oyten
Tel. 04207-6880-32
Fax: 04207-6880-34
hermi.herrmann@kuebler.com

20000 ... 29999

Kübler Vertriebsbüro Nord
Hermi Herrmann
Mohnblumenweg 6
28876 Oyten
Tel. 04207-6880-32
Fax: 04207-6880-34
hermi.herrmann@kuebler.com

30000 ... 32999, 38000 ... 39999

Kübler Vertriebsbüro Nord
Hermi Herrmann
Mohnblumenweg 6
28876 Oyten
Tel. 04207-6880-32
Fax: 04207-6880-34
hermi.herrmann@kuebler.com

33000 ... 33999

Kübler Vertriebsbüro West
Torsten Czubkowski
Auf der Ümcke 11 a
59757 Arnsberg
Tel. +49 (0) 2932 - 89 18 98
Fax: +49 (0) 2932 - 5 33 11
torsten.czubkowski@kuebler.com

34000 ... 37999

Kübler Vertriebsbüro Mitte
Stefan Heinigk
Gartenstr. 10
35759 Driedorf
Tel. +49 (0) 27 75 57 84 27
Fax +49 (0) 27 75 57 84 28
stefan.heinigk@kuebler.com

40000 ... 47999

Kübler Vertriebsbüro West
Torsten Czubkowski
Auf der Ümcke 11 a
59757 Arnsberg
Tel. +49 (0) 2932 - 89 18 98
Fax: +49 (0) 2932 - 5 33 11
torsten.czubkowski@kuebler.com

49000 ... 49999

Kübler Vertriebsbüro Nord
Hermi Herrmann
Mohnblumenweg 6
28876 Oyten
Tel. 04207-6880-32
Fax: 04207-6880-34
hermi.herrmann@kuebler.com

50000 ... 53399, 53580 ... 53999

58000 ... 59999
Kübler Vertriebsbüro West
Torsten Czubkowski
Auf der Ümcke 11 a
59757 Arnsberg
Tel. +49 (0) 2932 - 89 18 98
Fax: +49 (0) 2932 - 5 33 11
torsten.czubkowski@kuebler.com

53400 ... 53579, 54000 ... 54999

55300 ... 55999, 56500 ... 56999
Kübler Vertriebsbüro West
Torsten Czubkowski
Auf der Ümcke 11 a
59757 Arnsberg
Tel. +49 (0) 2932 - 89 18 98
Fax: +49 (0) 2932 - 5 33 11
torsten.czubkowski@kuebler.com

55000 ... 55299, 56000 ... 56499

57000 ... 57999
Kübler Vertriebsbüro Mitte
Stefan Heinigk
Gartenstr. 10
35759 Driedorf
Tel. +49 (0) 27 75 57 84 27
Fax +49 (0) 27 75 57 84 28
stefan.heinigk@kuebler.com

60000 ... 61999, 63000 ... 65999

67000 ... 67599, 68000 ... 69999
Kübler Vertriebsbüro Mitte
Stefan Heinigk
Gartenstr. 10
35759 Driedorf
Tel. +49 (0) 27 75 57 84 27
Fax +49 (0) 27 75 57 84 28
stefan.heinigk@kuebler.com

66000 ... 66999, 67600 ... 67999

Kübler Vertriebsbüro West
Torsten Czubkowski
Auf der Ümcke 11 a
59757 Arnsberg
Tel. +49 (0) 2932 - 89 18 98
Fax: +49 (0) 2932 - 5 33 11
torsten.czubkowski@kuebler.com

70000 ... 76799, 77000 ... 79999

Kübler Vertriebsbüro Süd-West
Karl Klaritsch
Eichenweg 1
78549 Spaichingen
Tel. +49 (0) 74 24 94 90 69
Fax +49 (0) 74 24 94 90 87
karl.klaritsch@kuebler.com

76800 ... 76999

Kübler Vertriebsbüro Süd-West
Karl Klaritsch
Eichenweg 1
78549 Spaichingen
Tel. +49 (0) 74 24 94 90 69
Fax +49 (0) 74 24 94 90 87
karl.klaritsch@kuebler.com

80000 ... 87999, 89200 ... 89499

Kübler Vertriebsbüro Süd-Ost
Stefan Rost
Nikolausstrasse 21
88696 Owingen
Tel. +49 (0) 7551 93 63 75
Fax +49 (0) 7551 93 64 92
stefan.rost@kuebler.com

88000 ... 89199, 89500 ... 89999

Kübler Vertriebsbüro Süd-West
Karl Klaritsch
Eichenweg 1
78549 Spaichingen
Tel. +49 (0) 74 24 94 90 69
Fax +49 (0) 74 24 94 90 87
karl.klaritsch@kuebler.com

90000 ... 95999

Kübler Vertriebsbüro Süd-Ost
Stefan Rost
Nikolausstrasse 21
88696 Owingen
Tel. +49 (0) 7551 93 63 75
Fax +49 (0) 7551 93 64 92
stefan.rost@kuebler.com

96000 ... 99999

Kübler Vertriebsbüro Mitte
Stefan Heinigk
Gartenstr. 10
35759 Driedorf
Tel. +49 (0) 27 75 57 84 27
Fax +49 (0) 27 75 57 84 28
stefan.heinigk@kuebler.com

Certified Partners/
Distributors:

22149 Hamburg

Hermann Seidel GmbH
Techn. Vertretungen
Rahlstedter Str. 16
Tel. 040-675085-0
Fax 040-675085-85
info@seidel-gmbh.de
www.seidel-gmbh.de

42499 Hückeswagen

Fuhrmeister + Co. GmbH
Industrie-Elektronik
Stahlschmidsbrücke 38
Tel. 02192-851122
Fax 02192-851127
info@fuhrmeister-gmbh.de
www.fuhrmeister-gmbh.de

66287 Quierschied-Göttelborn

Herbert Neundörfer
GmbH & Co. KG
Werksvertretungen
Zum Schacht 9
Tel. 0 68 25 95 45 0
Fax 0 68 25 95 45 99
info@herbert-neundoerfer.de
www.herbert-neundoerfer.de

82069 Hohenschäftlarn

Bachmann
Electronic GmbH
Am Wagnerfeld 4
Tel. 08178-8676-0
Fax: 08178-8676-50
info@bachmann-electronic.de
www.bachmann-electronic.de

Fritz Kübler GmbH,
Zähl- und Sensortechnik

Postfach 34 40
78023 Villingen-Schwenningen

Tel. 07720-39 03-0
Fax 07720-21564
info@kuebler.com
www.kuebler.com

The simple, economical, high-performance Preset Counter

Kübler Codix 907 | Kübler Codix 908

For Pulses, Time, and Position

Quality brand – Made in Germany

Menu-driven programming

High-quality LCD display



Plug-in screw terminals

3-year warranty

Order now for a special

Introductory price!

Save up to 35 % and order our new preset counters
Codix 907 and Codix 908.

All details are online at

www.kuebler.com/newpresetcounter

