Absolute encoders 5

Single-turn encoders

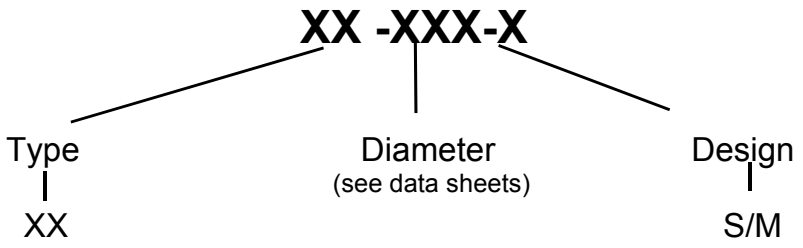
Multi-turn encoders

5 Absolute encoders

5.1 Explanatory notes

The various models of the absolute encoder series described in this section all comply with the mechanical, electrical and connection specifications of the TR standard.
The TR encoders also offer a variety of customization options, however (please consult the sales department regarding versions differing from the data sheets). Possible adaptation options are shown in subsection "Alternative ", page 5-10.

Series definition



Type

HE: Hardware encoder (non-programmable)
The measured value of the HE-series absolute encoder is directly available at the output of the interface module. In contrast to the programmable encoders of series CE and CH, the positions of the code disks are pre-processed in a hardware logic circuit and output via the interface module.

CE: Compact encoder (programmable)
The TR absolute encoder with integrated processor offers numerous possibilities for free programming of the encoder parameters in order to ensure flexible adjustment to the machine.

CH: Hollow-shaft compact encoder (programmable)
See CE for description

ZE: High resolution encoder (programmable)
The line encoder is compatible with the CE encoder, but is able to achieve very high resolutions of up to 131.072 (17-bit) increments per revolution thanks to its new internal structure. The quality and durability of the encoder have undergone further improvement in order to obtain a consistent level of accuracy.

XK: Encoder with integrated coupling
Available as HE technology (HK), CE technology (CK) or ZE technology (ZK).

ZH: High resolution hollow shaft encoder (programmable)
ZE technology, however as hollow shaft type

Design

S: Single-turn encoder

M: Multi-turn encoder

5.2 Functional description

In contrast to incremental measuring systems, the absolute encoder provides the current position value instantaneously. If this measuring system is moved mechanically in the deactivated state, the current position can be read out directly as soon as the voltage supply is switched on again.
The TR absolute encoders can be supplied in single-turn or multi-turn versions depending on the type required.

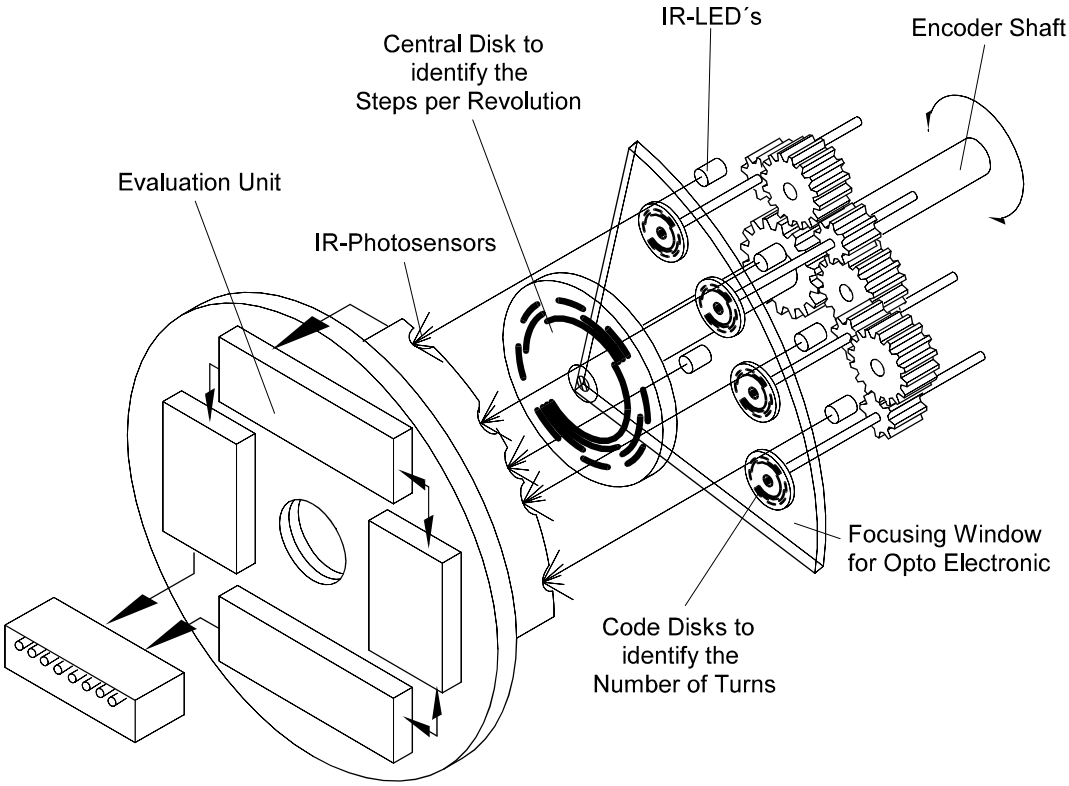
Single-turn

This encoder resolves **a single revolution or turn** of the drive shaft into measuring increments (e.g. 8192). The number of measuring increments per revolution is recorded and balanced via a code disk. This measured value is output via different interface modules depending on the type of interface used, and is repeated after each revolution.

Multi-turn

Besides the angular positions per revolution, multi-turn encoders also record **multiple rotations or turns.** The drive shaft is connected to an internal reduction gear via which the number of revolutions is recorded.
In the case of the multi-turn encoder, the measured value is thus composed of the **angular position** and the **number of revolutions**. The measured value is also balanced and output via different interface modules depending on the type of interface used.

Sketch:



5.3 Applications

The measurement and conversion of the rotary or angular movement with a total resolution of up to 33 bits allows positioning to values with higher resolutions in the series-connected control unit.

If encoder types with additional incremental signals are used, it is possible to use 2 channels with a 90° phase offset for speed evaluation or monitoring functions.

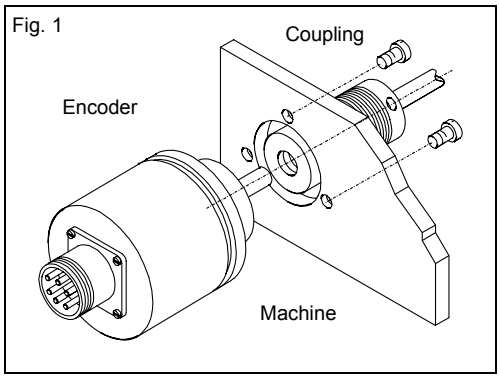
For paint shops or other applications in potentially explosive atmospheres, the encoder can be mounted in an explosion-proof housing conforming to safety class EX-90.C.1006.

For customization purposes, TR absolute encoders with integrated processors (CE series) offer a wide range of possibilities for free programming of the encoder parameters (see section "EPROG parameterization software").

Examples of typical applications of absolute encoders:

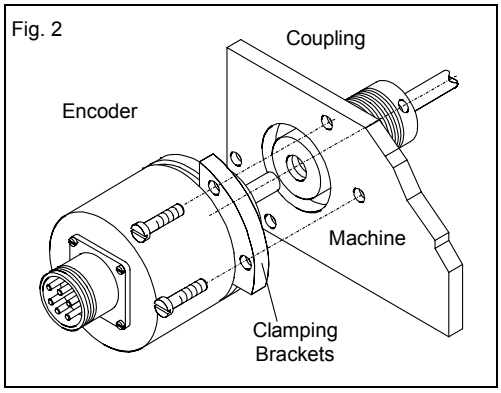
- Transfer machines
- Machine tools
- Flexible production plants
- Gantry robots
- Buckling arm robots
- Assembly lines
- Foundries
- Woodworking machines
- Roll stands and straightening plants
- Printing industry
- Packaging equipment
- Power plants
- Research
- Observatories
- Civil engineering
- Ship propulsion
- Locks/sluices
- X-ray tables
- Cutting machines
- etc.

5.4 Assembly instructions



Encoder shaft drive

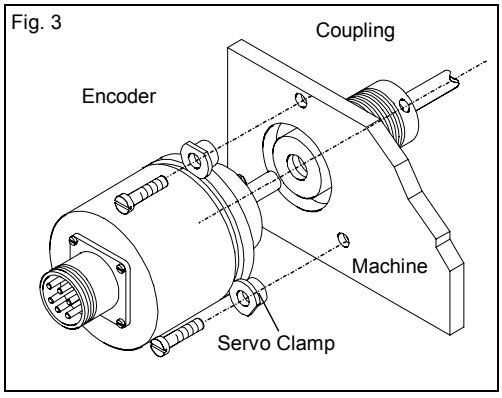
The absolute encoders are connected to the drive shaft via an elastic coupling, which compensates for any deviations in the axial and radial direction between the encoder and drive shaft. This avoids excessive strain on the bearings.



Types of mounting

Flange mounting

The centering collar with fit f7 centers the encoder in relation to the shaft. It is fixed to the machine by means of three screws in the flange (Fig. 1)



Clamping bracket mounting

The centering collar with fit f7 centers the encoder in relation to the shaft. The encoder is fixed by means of 2 clamping brackets or 3 servo clamps (Fig. 2 and 3)

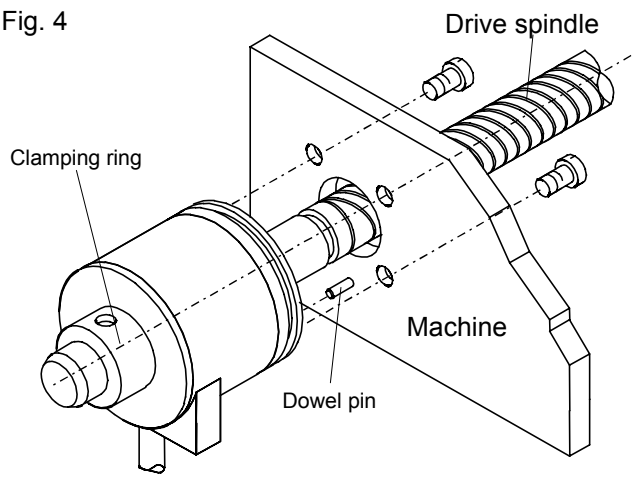
Assembly instructions for CH/ZH series

The CH/ZH encoder has an integrated coupling. Mechanical deviations from the drive shaft are compensated for by the "overhung" arrangement of the encoder shaft.

Mounting of CH/ZH hollow-shaft encoder

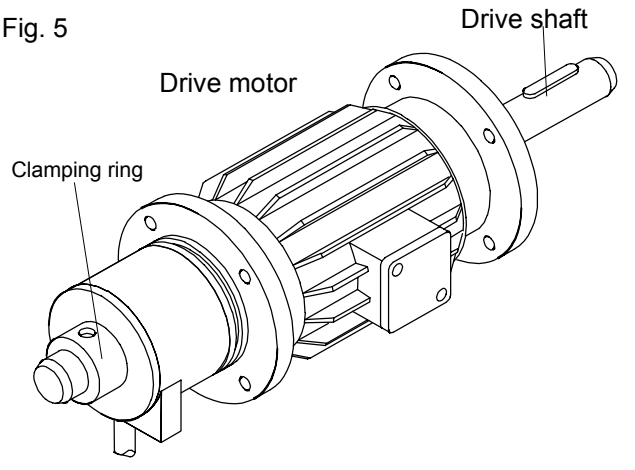
The encoder can be centered either via a centering collar with fit h7 or by a dowel pin corresponding to a bore-hole in the encoder housing.
* Centering collar version with 4 screws on flange (Fig. 4) or with servo clamps.
* Dowel pin version, centered directly with clamping ring of hollow shaft (Fig. 4).
Fig. 5 shows how to mount the encoder on a motor. This is done by means of the clamping ring and dowel pin.

Fig. 4



Absolute encoder CH / ZH

Fig. 5



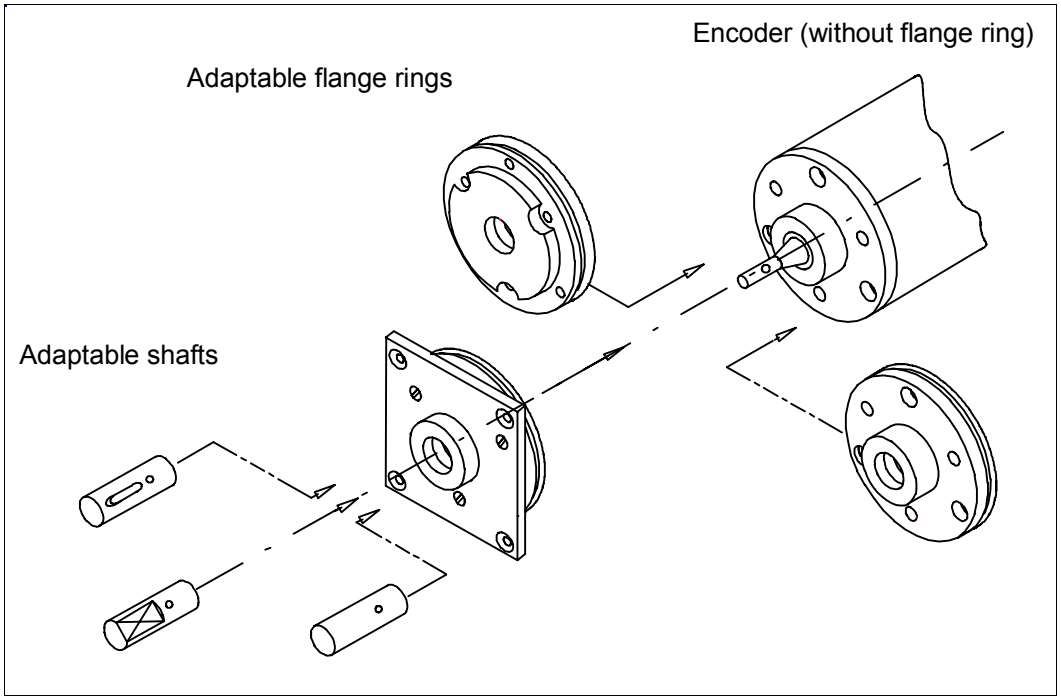
Absolute encoder CH / ZH

5.5 Alternative designs

Mechanical

There are a number of adaptable flange ring designs available for adjusting to existing constructions or ensuring uniform mounting of the encoder. The wide range of shaft designs allows easy attachment to measuring gears and couplings.

Sketch



5.5.1 Encoder with integrated coupling

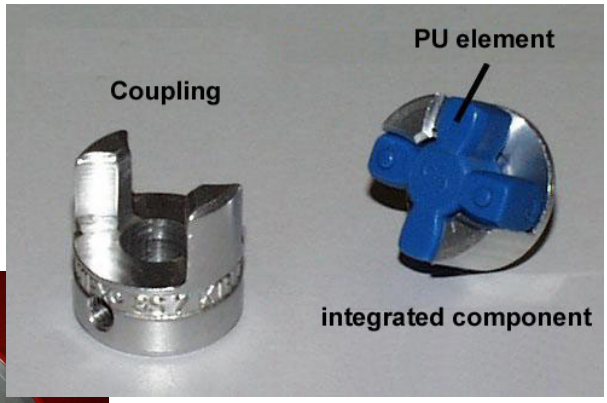
Note:
Encoders with integrated coupling are standalone devices and cannot be produced by remodelling of a standard device with shaft.

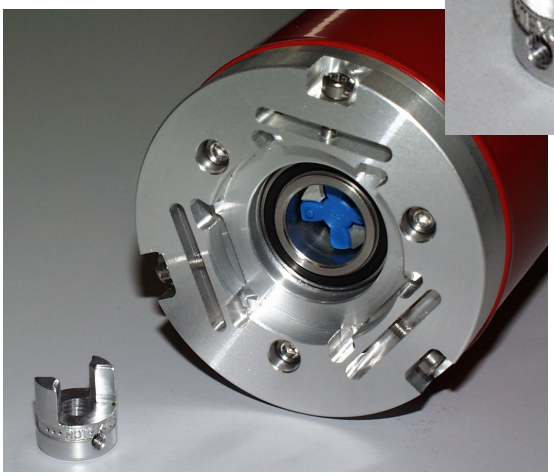
The following encoder types can be offered with integrated coupling:

HK-, CK- and ZK

That means:

- Deliverable in all types of the HE-65, CE-65 and ZE-65 series as single-turn or multi-turn
- With integrated claw-coupling in the encoder

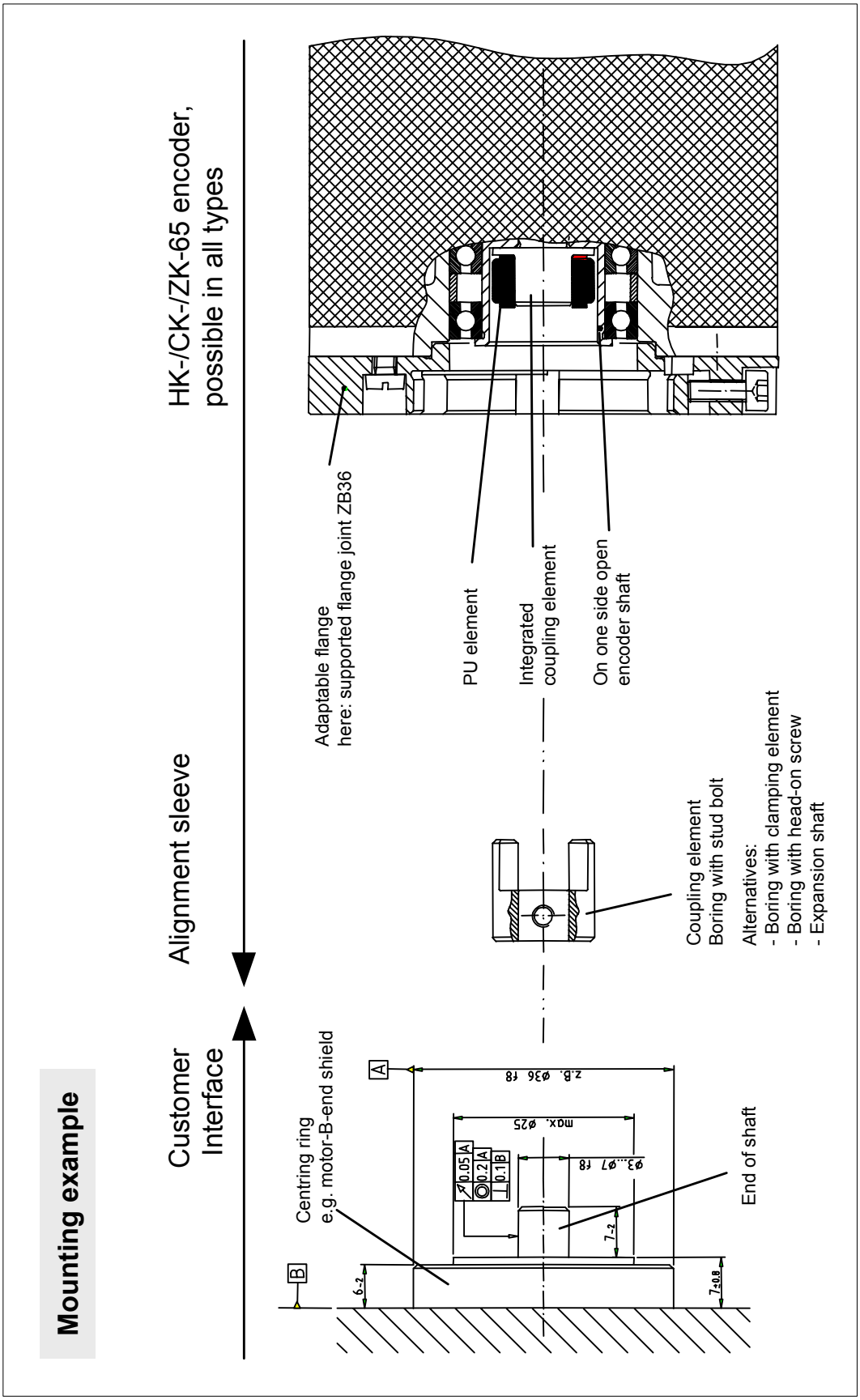




Features

- Short construction length (integrated coupling in the encoder shaft)
- Simple and fast mounting / dismounting
- Radial and axial tolerance to the customer shaft
- Only few components necessary

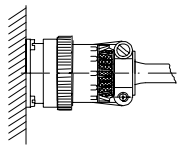
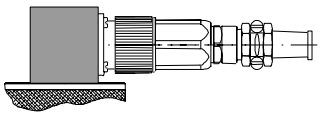
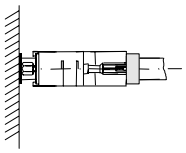
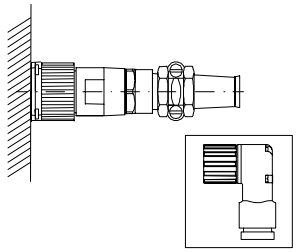
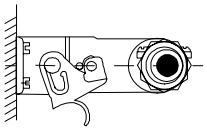
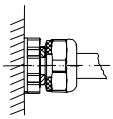
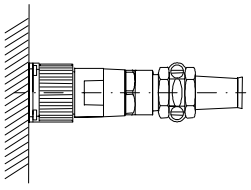
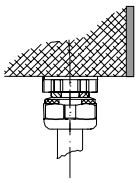
Mounting example



Connecting equipment

The TR encoders can be supplied with various plug or cable outlets. It is advisable to use a plug if the wiring and encoder assembly are to be performed at different times or if an encoder has to be replaced quickly and easily. On the encoder side, you will normally find a flanged plug (pins); to connect this, you will need a coupling or cable socket into which to plug the cable or control unit. Specifications and details of plug types are available on request.

Examples

Connection	Series				Connections
	CE/HE 65	**CE/HE 100**	**CE/HE 65**	**CE/HE 100**	
39 Pin Teldix, Round 	-P -CAM	-P -CAM	-SSI -ASI -ISI	-SSI -ASI -ISI	12 Pin Round, 90° 
25/37 Pin SUB-D 	-P -CAM	-P -CAM	-SSI -ASI -ISI	-SSI -ASI -ISI	12 Pin Round, axial 
25/50 Pin Harting 		-P -CAM	-SSI -ASI -ISI -P -CAM	-SSI -ASI -ISI -P -CAM	Cable Gland, axial 
26 Pin Round Connector 	-P -CAM	-P -CAM	-SSI -ASI -ISI -P -CAM	-SSI -ASI -ISI -P -CAM	Cable Gland, radial 

Electrical

The encoder types can be supplied with different electrical properties in order to adapt them to the servo electronics.

Note

The adaptation options listed below must be checked and coordinated with the sales department to make sure they are suitable for your specific encoder type.

Supply voltage

- +(11-27) V DC
- +5V DC

Output circuits

- Push-pull
- Push-pull with tristate
- Open collector
- Open emitter
- TTL
- Cable driver

Incremental signals

- K0, K0 negated, K1, K1 negated, K2, K2 negated (pulse count on request)

Encoder with integrated heating and thermostat

- Extended temperature range

Special I/Os

- On request

Special designs

- On request

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Absolute-Encoder CE-65-S P

- **Small and Compact**
- **Single-Turn**
- **Parallel Output**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter (Max 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Preset 2	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < + 2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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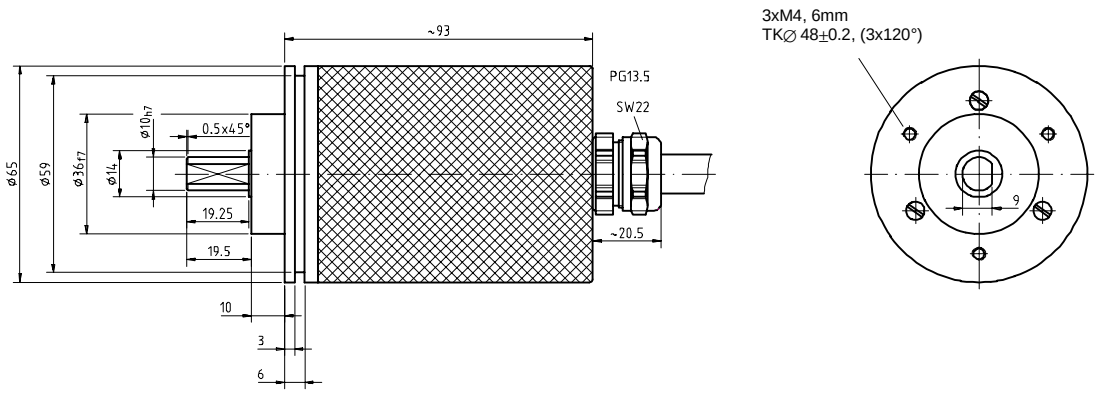
Absolute-Encoder CE-65-S P

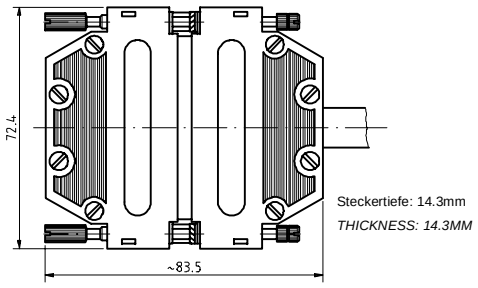
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Connector	PG Axial with 0.5 m cable with 37 pin SUB-D Connector

Dimensional Drawing



37pol. Sub.D.-Buchse + Stecker
37 PIN. SUB.D.-SOCKET + CONNECTOR



Steckertiefe: 14.3mm
THICKNESS: 14.3MM

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Absolute-Encoder CE-65-S CAM

- **Small and Compact**
- **Single-Turn**
- **Discrete CAM Outputs (32 Outputs)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code	CAMS (Dynamic Anticipation)
* Number of Discrete Outputs	Maximum 32
* Number of CAMS per Discrete Output	Maximum 4
Output Options	Push-Pull, Open Collector, Open Emitter (Max. 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < + 2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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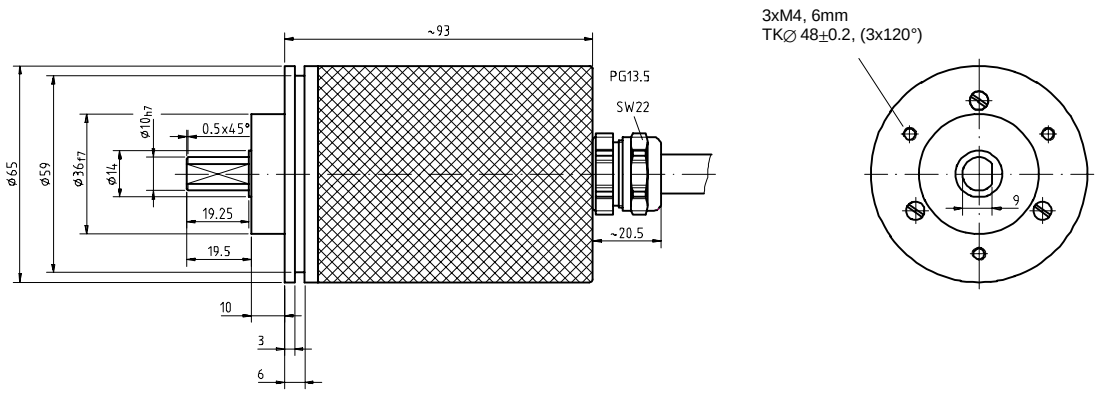
Absolute-Encoder CE-65-S CAM

Mechanical Data

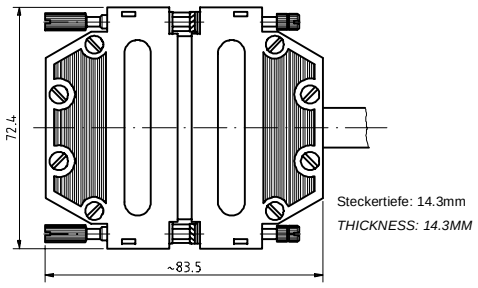
Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	PG Axial with 0.5 m cable and 37 pin SUB-D Connector

* Other connector types available upon request.

Dimensional Drawing



37pol. Sub.D.-Buchse + Stecker
37 PIN. SUB.D.-SOCKET + CONNECTOR



Steckertiefe: 14.3mm
THICKNESS: 14.3MM

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Absolute-Encoder CE-65-S SSI

- **Small and Compact**
- **Single-Turn**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < + 2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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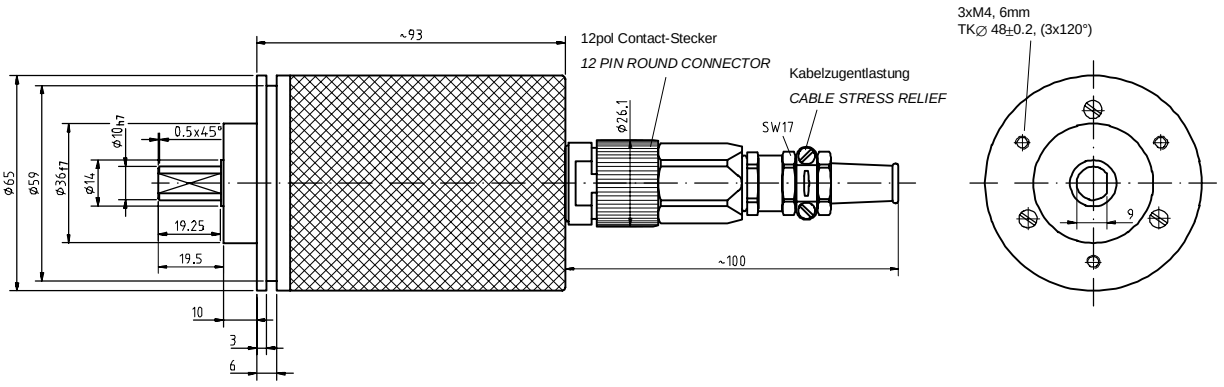
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



Absolute-Encoder CE-65-S ASI

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- **Small and Compact**
- **Single-Turn**
- **ASI (Asynchronous Serial Interface)**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray
Baud Rate	4800 Baud, Other Baud Rates by Request
Data Output	RS422 (2 wire) Short Circuit and Reverse Polarity Protected
Communication Format	1 Start Bit, 7 Data Bits, 1 Parity Bit, 2 Stop Bits
Data Format	ASCII
Standard Communication	ASCII, 6 Character + CR
Baud Rate	4800 Baud
Other Communication Formats	Upon Request

Input Options

Forward / Reverse	Change direction of count
Preset 1	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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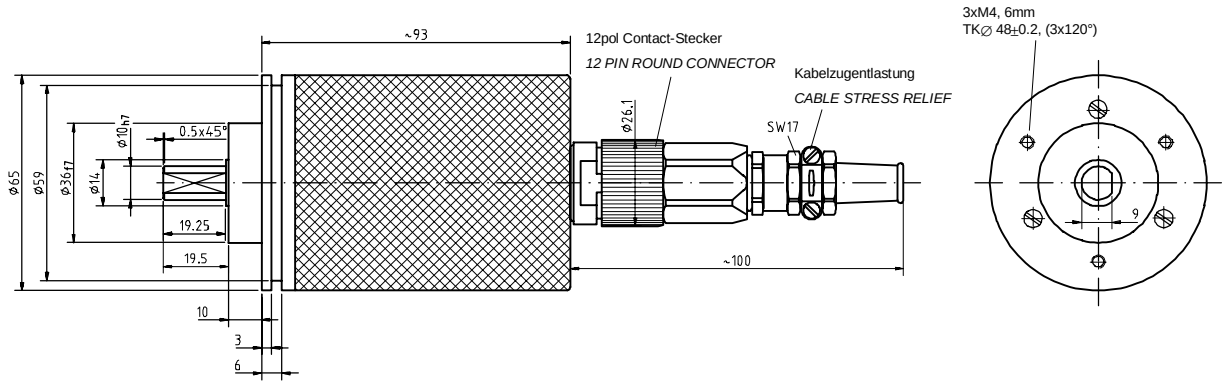
Absolute-Encoder CE-65-S ASI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder CE-65-S ISI

- **Small and Compact**
- **Single-Turn**
- **ISI (Incremental Serial Interface)**
- **Absolute Incremental Encoder**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to 115 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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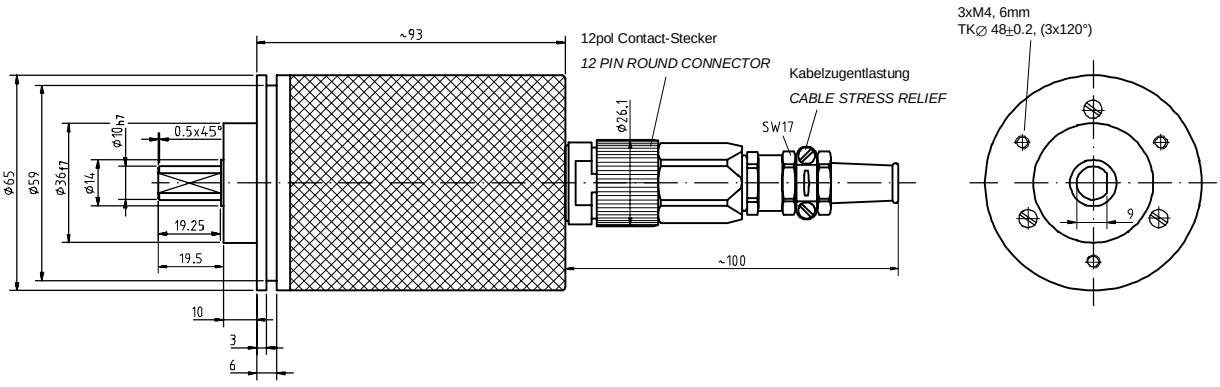
Absolute-Encoder CE-65-S ISI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder CE-65-S A

- **Small and Compact**
- **Single Turn**
- **Analog Output with 14 Bit D/A Converter 0-20mA or -10 to +10V**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps per Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programmable via RS485	PC IBM compatible EPROG Software
* Analog Voltage Output (14 Bit D to A Converter)	-10 to +10V, 0 - 10V
Impedance	min. 500 Ω
* Analog Current Output (14 Bit D to A Converter)	0 - 20 mA
Impedance	max. 500 Ω
SSI Interface	
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format (programmable)	Standard, Tree Format, with Repetition
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Input Options	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Latch	Freezes the analog output data
* Polarity	Changes polarity of analog voltage value
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request
* Programmable Parameters	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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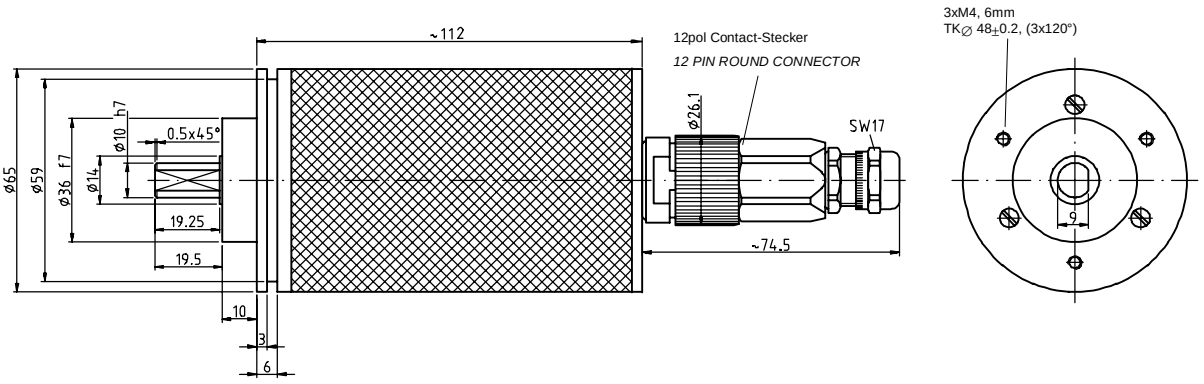
Absolute-Encoder CE-65-S A

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



Absolute-Encoder CE-65-S A

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- **Small and Compact**
- **Single Turn**
- **Analog Output with 14 Bit D/A Converter 0-20mA or -10 to +10V**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**

5

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps per Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programmable via RS485	PC IBM compatible EPROG Software
* Analog Voltage Output (14 Bit D to A Converter)	-10 to +10V, 0 - 10V
Impedance	min. 500 Ω
* Analog Current Output (14 Bit D to A Converter)	0 - 20 mA
Impedance	max. 500 Ω
SSI Interface	
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format (programmable)	Standard, Tree Format, with Repetition
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Input Options	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Latch	Freezes the analog output data
* Polarity	Changes polarity of analog voltage value
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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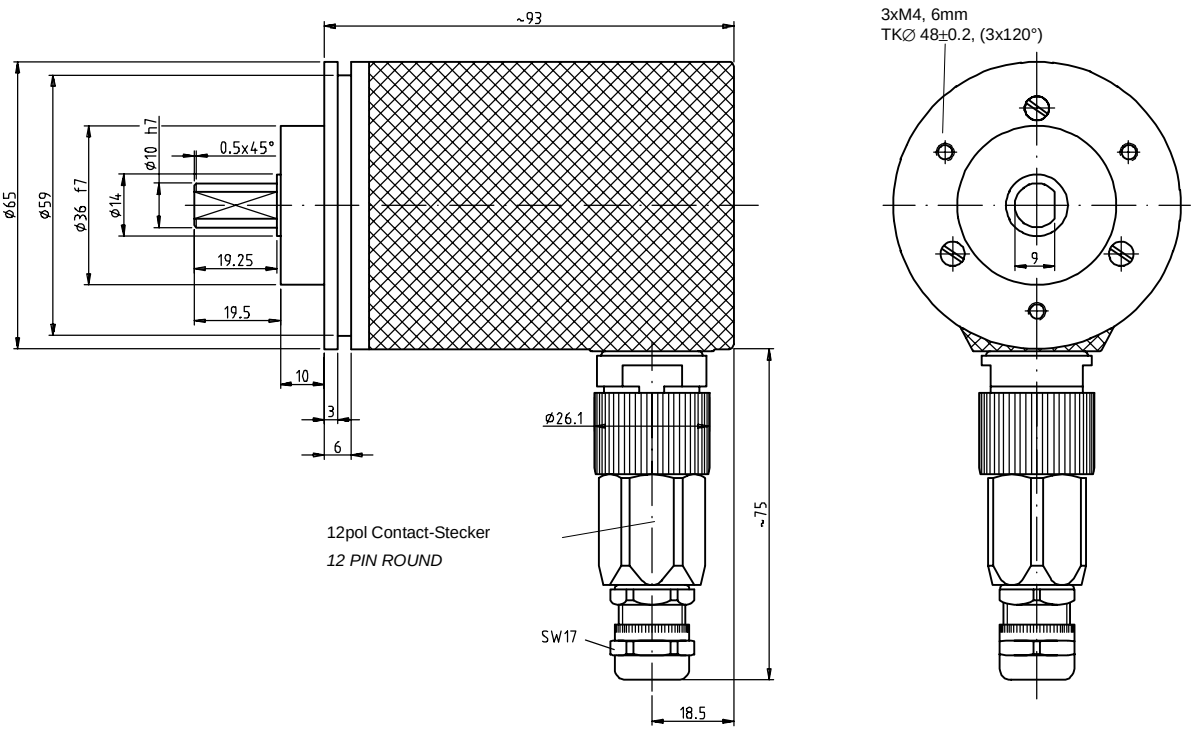
Absolute-Encoder CE-65-S A

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Radial

Dimensional Drawing



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Absolute-Encoder CE-65-S IBS

- **Small and Compact**
- **Single-Turn**
- **Interbus-S**
- **Programmable Over The Interbus-S**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable Over Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes (programmable)	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Programmable Parameters (via IBS bus)	
Direction of Count	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Output Code	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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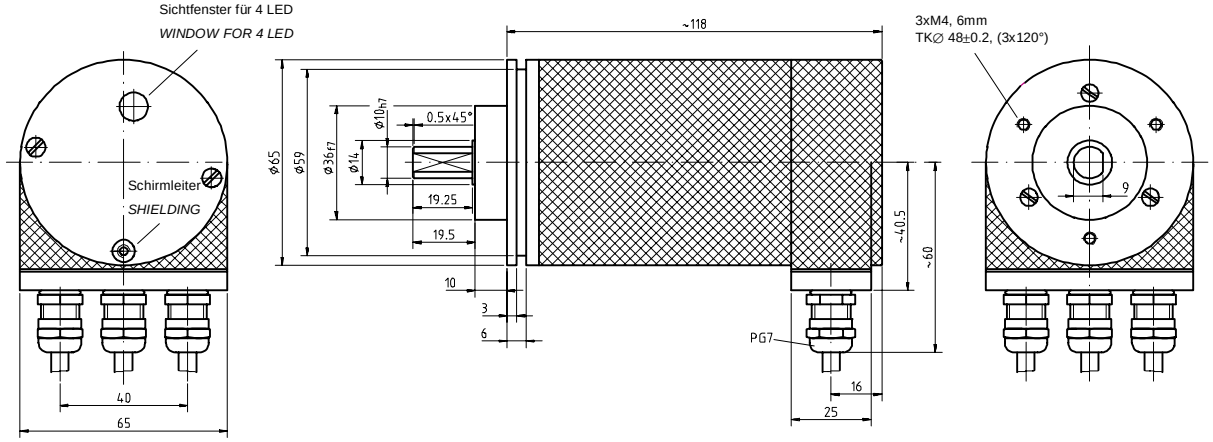
Absolute-Encoder CE-65-S IBS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3XPG7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder CE-65-S PROFIBUS

- **Small and Compact**
- **Single-Turn**
- **Profibus-DP**
- **Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via RS485	PC IBM Compatible EPROG Software
* Output Codes (programmable)	Binary, Gray, BCD, Shifted Gray, Excess3, Shifted Excess3
Data Protocol	Profibus-DP (Din E 19 245 T.3) Same as SINEC-L2-DP
Standard Baud Rate	9.6 kbaud to 12 Mbaud
Option	3 to 12 Mbaud
* Station Address	3 - 99
Inputs	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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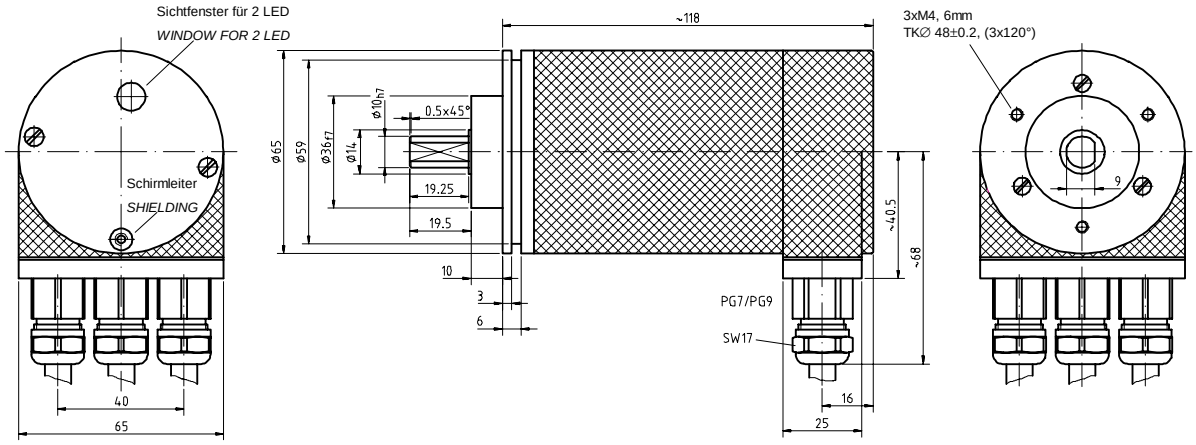
Absolute-Encoder CE-65-S PROFIBUS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

Absolute-Encoder CE-65-S LWL

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VIA BUS

- **Small and Compact**
- **Single-Turn**
- **LWL Interface**
- **Programmable via Fiber Optic Ring**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via LWL-Ring	in connection with • PC Compatible Central-Module • SIMATIC-S5 Compatible Central-Module • VMEbus • SMP-Bus
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary / Gray
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Stations	max. 254
Programmable Parameters via IBS bus	Count Direction Number of Counts per Length Preset Value 1,2 Adjust Absolute Value

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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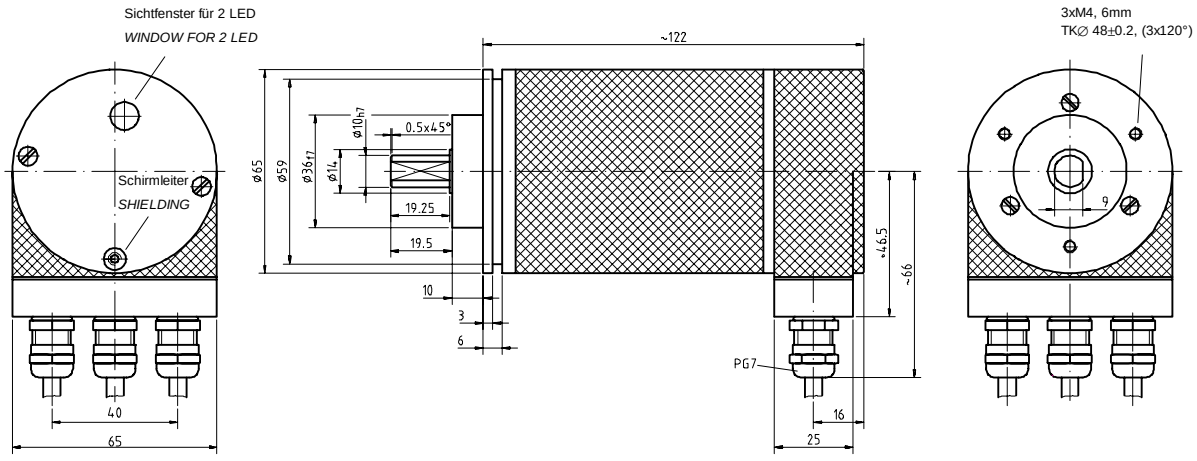
Absolute-Encoder CE-65-S LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

Absolute-Encoder CE-65-S SUCONET K1

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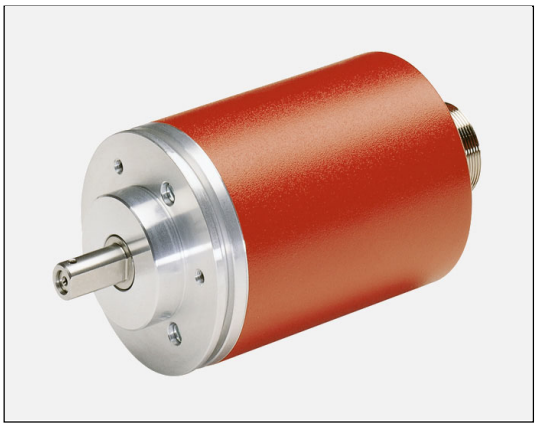

- **Small and Compact**
- **Single-Turn**
- **SUCONET-Fieldbus-Interface**
- **Programmable via SUCONET-Bus**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programming via Bus	Fieldbus Connection Suconet K1
Output Code	Binary
Data Protocol	2-wire, RS485 (Master-Slave)
Baud Rate	187,5 kBaud
Maximum Stations	max. 31, adjustable by DIP-switches
User Modules	PS 3, PS 306, PS 316, *PS 4-100, *PS 4-200, *PS 416
Programmable Parameters	
Count Direction	
Steps (Measuring Length)	
Scale Factor	
Preset Value (Adjust absolute position to a given set value (i.e. zero set)	
Pin Configuration	Upon Request

* only if compatible to PS 3

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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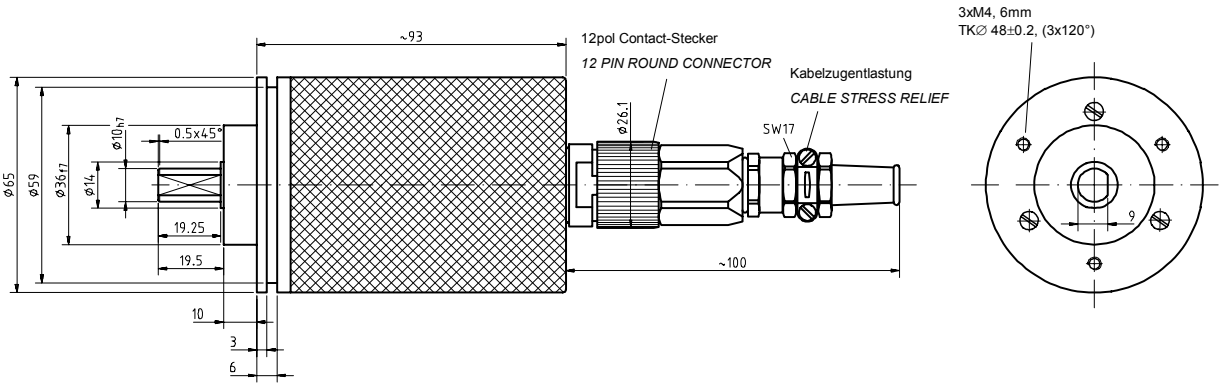
Absolute-Encoder CE-65-S SUCONET K1

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	approx. 0,7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	$2{,}5 \times 10^{-6}$ kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin. Contact-Connector - Axial

Dimensional Drawing



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Absolute-Encoder LC-65-S P

- **Low Cost Single-Turn Encoder**
- **Small and Compact**
- **Single-Turn**
- **Parallel Output**
- **Programmable by the Factory**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	2 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
* Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter (Max 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1 / 2	Adjust absolute position to a given set value
Latch	Freezes data lines
Bus	For multiplexing many encoders.
Logic Levels	"0" < +2 VDC, "1" > 8 VDC, max. 30 VDC
Pin Configuration for 25 pin. SUB-D Connector	
PIN 1- 16	Data 2^0 - 2^{15}
PIN 17	Forward / Reverse
PIN 18	Preset 1
PIN 19	Preset 2
PIN 20	Latch
PIN 21	BUS
PIN 22/23	Not Connected
PIN 24	11-27 V (US)
PIN 25	0 V

* Programmable Parameters Done by the Factory

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* With Rubber Protective Housing IP67 is possible.

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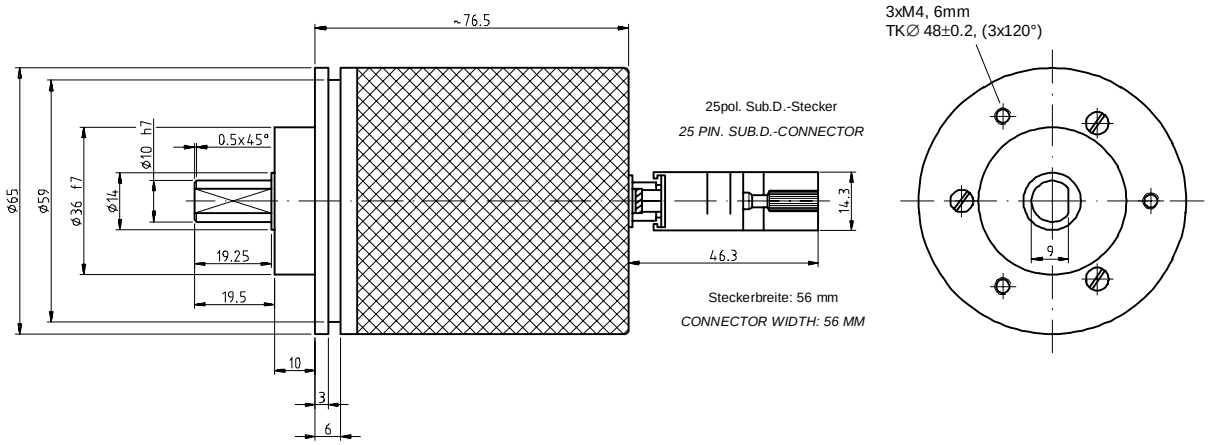
Absolute-Encoder LC-65-S P

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.5 kg (1.1 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	25 pin SUB-D connector, axial

Maßzeichnung



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Absolute-Encoder LC-65-S SSI

- **Low Cost Single-Turn Encoder**
- **Small and Compact**
- **Single-Turn**
- **SSI (Synchronous Serial Interface)**
- **Programmable by the Factory**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity ..... max. 13 Bit
* Steps / Revolution ..... 2 to 8192 Steps / Rev
Number of Revolutions ..... 1 Revolution
Supply Voltage ..... 11-27 VDC
Power Dissipation (No Load) ..... < 4 Watt
* Output Code ..... Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input ..... Opto Coupler Isolated
Clock Frequency ..... 95 kHz - 1 MHz
Transmission Cable Length ..... Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output ..... RS422 (2 wire)
Output Format ..... Most significant bit is left justified
Input Options
* Forward / Reverse ..... Change direction of count
* Preset 1 / 2 ..... Adjust absolute position to a given set value (i.e. zero set)
Logic Levels ..... "0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration (12 pin Contact Connector)

PIN 1	Clock -	PIN 10	Preset 2
PIN 2	Clock +	PIN 11	11-27 V (US)
PIN 3	Data +	PIN 12	0 V
PIN 4	Data -		
PIN 5/6/7	Not connected		
PIN 8	Forward / Reverse		
PIN 9	Preset 1		

* Programmable Parameters Done by the Factory

Environmental Data

Electromagnetic compatibility (EMC) ..... EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature ..... 0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional) ..... -30° to +80°C (-22° to 176°F)
Relative Humidity ..... 98 % (non condensing)
* Protection Class ..... IP 65 (DIN 40 050)
* The protection class of the encoder can be effected by the type of connector used.

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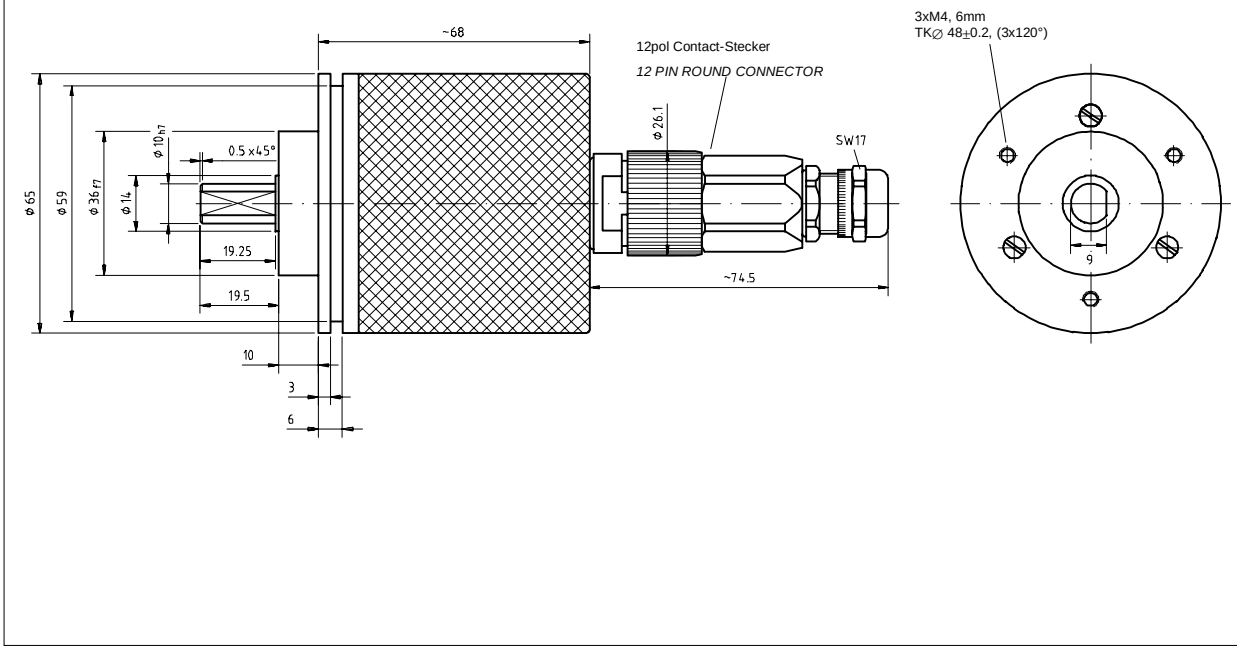
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



Absolute-Encoder CE-100-S P

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- **Robust**
- **Single-Turn**
- **Parallel Output**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Preset 2	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 54 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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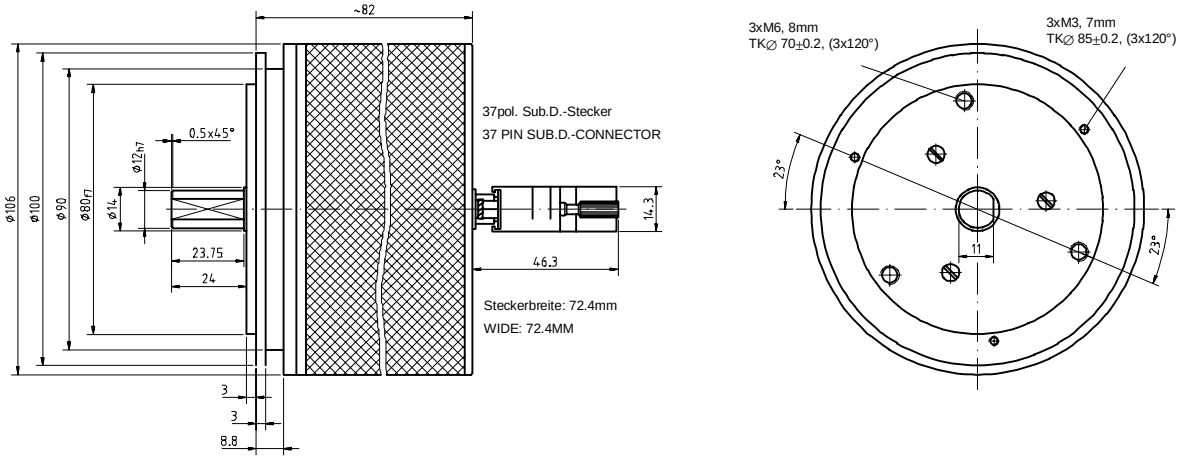
Absolute-Encoder CE-100-S P

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	37 pin SUB-D Connector

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder CE-100-S CAM

- **Robust**
- **Single-Turn**
- **Discrete CAM Outputs (32 Outputs)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code	CAMS (Dynamic CAM Anticipation)
* Number of Discrete Outputs	Maximum 32
* Number of CAMS per Discrete Output	Maximum 4
Output Options	Push-Pull, Open Collector, Open Emitter
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Ermitter Output drivers
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 54 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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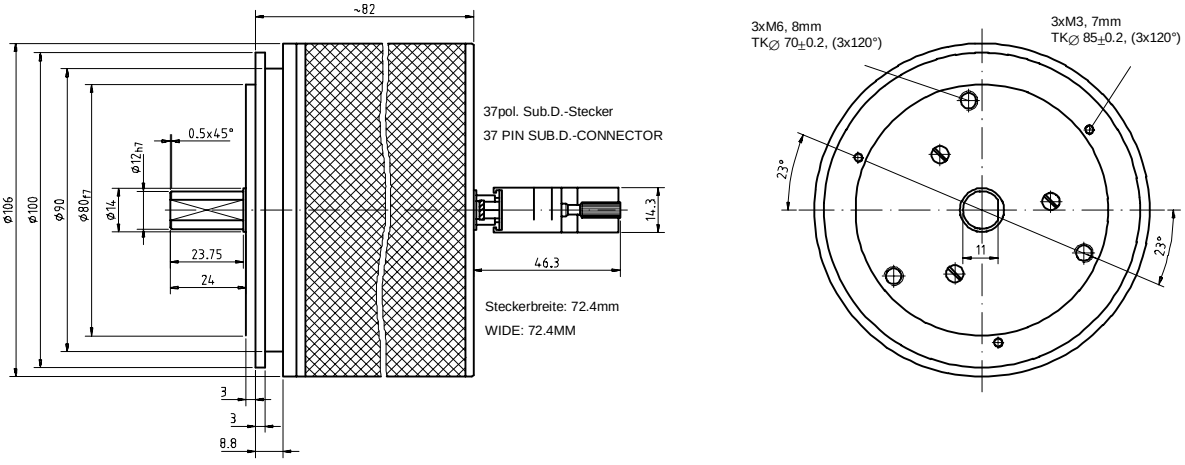
Absolute-Encoder CE-100-S CAM

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	37 pin SUB-D Connector

* Other connector types available upon request.

Dimensional Drawing



Absolute-Encoder CE-100-S SSI

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- **Robust**
- **Single-Turn**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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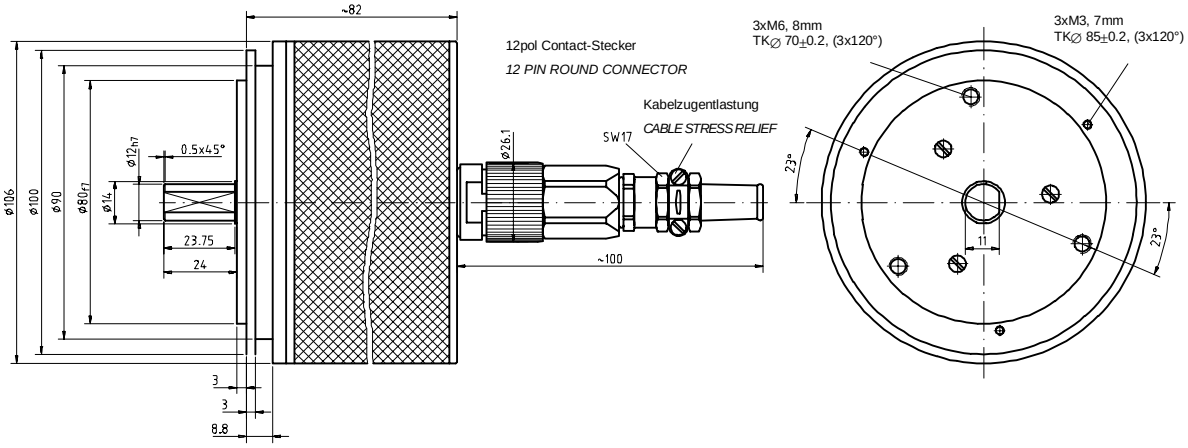
Absolute-Encoder CE-100-S SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder CE-100-S ASI

- **Robust**
- **Single-Turn**
- **Not Programmable**
- **ASI (Asynchronous Serial Interface)**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Output Code	Binary, BCD, Gray
Baud Rate	4800 Baud, Other Baud Rates by Request
Data Output	RS422 (2 wire) Short Circuit and Reverse Polarity Protected
Communication Format	1 Start Bit, 7 Data Bits, 1 Parity Bit, 2 Stop Bits
Data Format	ASCII
Standard Communication	ASCII, 6 Character + CR
Baud Rate	4800 Baud
Other Communication Formats	Upon Request
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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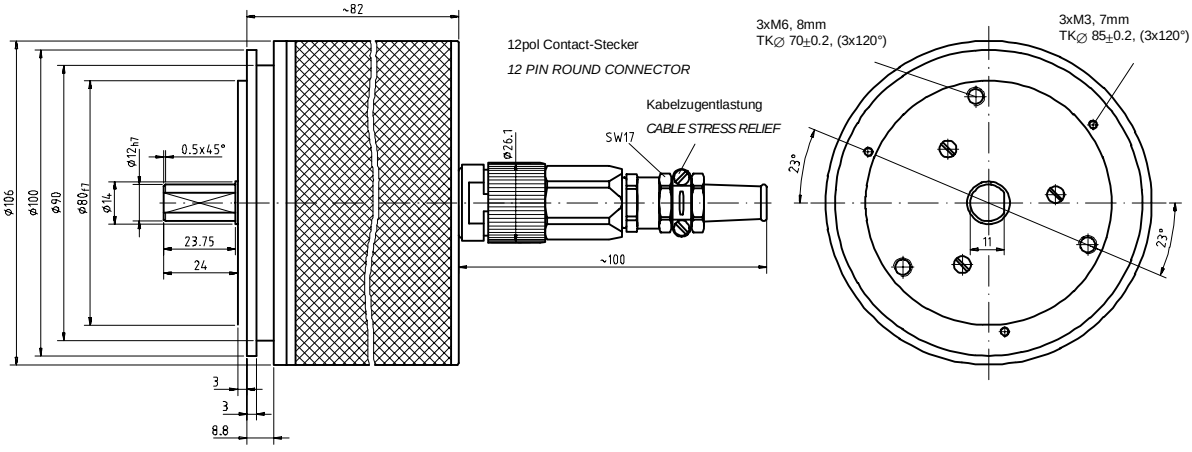
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder CE-100-S ISI

- **Robust**
- **Single-Turn**
- **ISI (Incremental Serial Interface)**
- **Absolute Incremental Encoder**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
* Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to 124 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used

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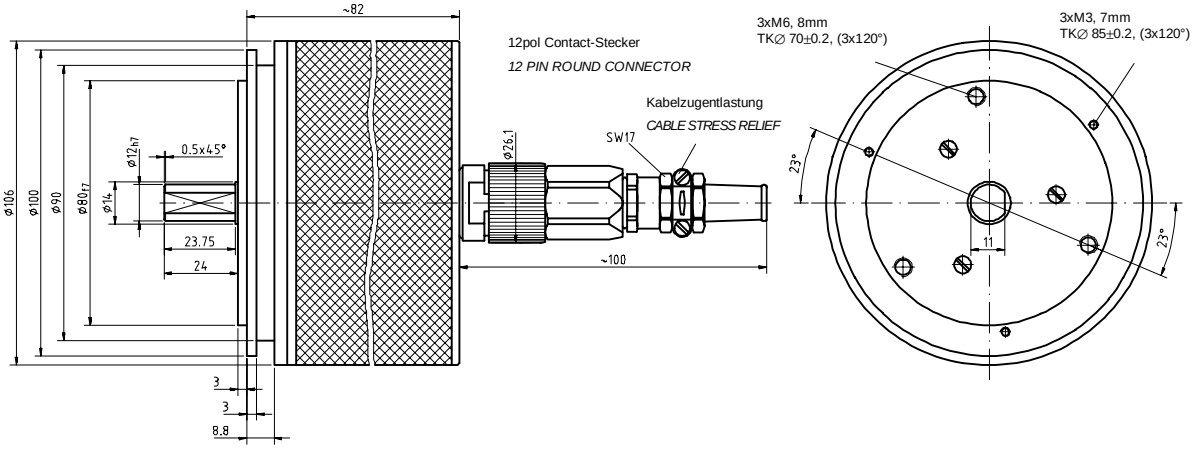
Absolute-Encoder CE-100-S ISI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



Absolute-Encoder CE-100-S IBS

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- **Robust**
- **Single-Turn**
- **Interbus-S**
- **Programmable via the Interbus-S**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes (programmable)	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Programmable Parameters (via IBS bus)	
Direction of Count	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Output Code	
Inputs	
Preset 1	Adjust absolute position to a given set value (i.e. zero set)
Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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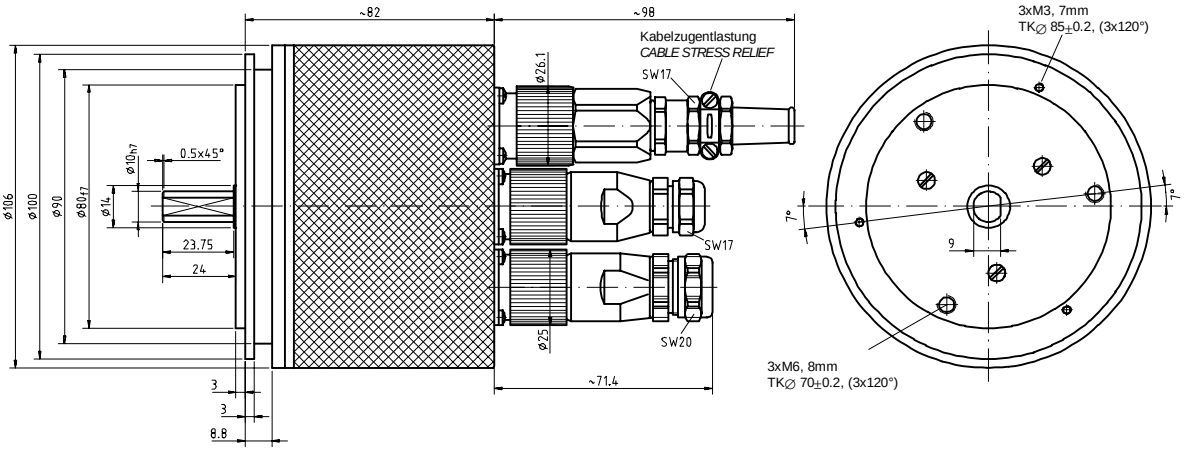
Absolute-Encoder CE-100-S IBS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X 9 Pin Contact Connector - Axial
	1 X 12 Pin Contact Connector - Axial

Other Connector Types Available on Request

Dimensional Drawing



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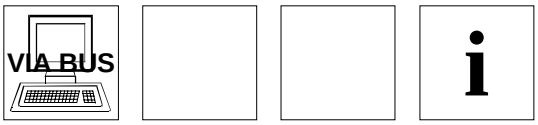
Absolute-Encoder CE-100-S LWL



- **Robust**
- **Single-Turn**
- **LWL Interface**
- **Programmable via Fiber Optic Ring**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via LWL-Ring	in connection with • PC Compatible Central-Module • SIMATIC-S5 Compatible Central-Module • VMEbus • SMP-Bus
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary / Gray
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Stations	max. 254
Programmable Parameters via IBS bus	
Count Direction	
Number of Counts per Length	
Preset Value 1,2	
Adjust Absolute Value	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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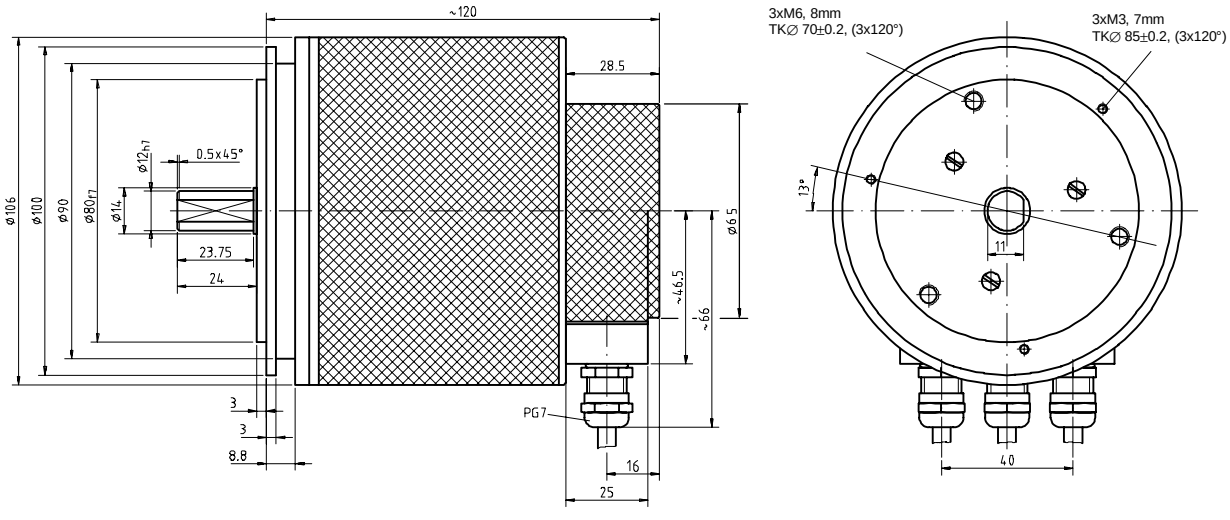
Absolute-Encoder CE-100-S LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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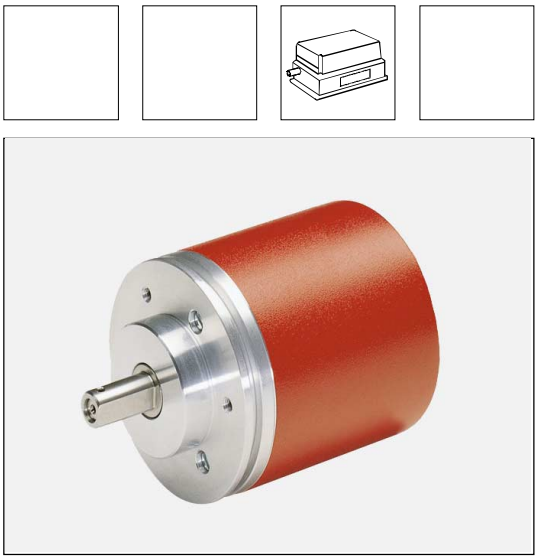
Absolute-Encoder HE-58-S P



- **Small and Compact**
- **Single-Turn**
- **Parallel Output**
- **Not Programmable**

5

Electrical Data

Encoder Capacity	max. 9 Bit
Steps / Revolution	1 to 512 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 3 Watt
Output Code	Binary, BCD, Gray, Shifted Gray
Output Options	Push-Pull, Open Collector, Open Emitter, TTL
Maximum Current	15 mA / Short Circuit Protected (not with TTL output)
Input Options	
Forward / Reverse	Change direction of count
Latch	Freezes data lines
Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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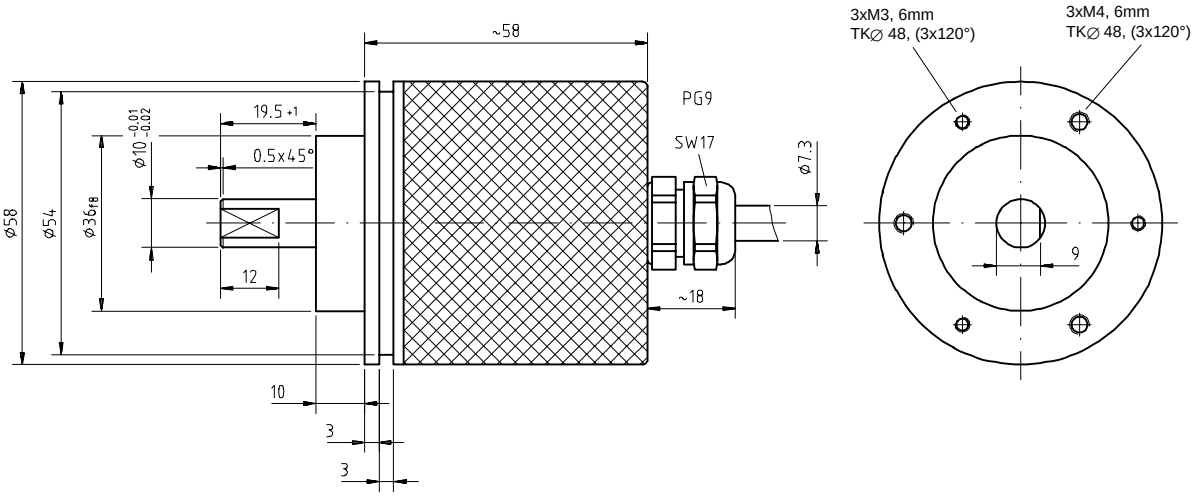
Absolute-Encoder HE-58-S P

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.3 kg (0.7 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	PG 9 Axial with 0.5 m cable

Dimensional Drawing



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Absolute-Encoder HE-65-S P

- **Small and Compact**
- **Single-Turn**
- **Parallel Output**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter (Max. 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
Forward / Reverse	Change direction of count
Latch	Freezes data lines
Bus	For multiplexing many encoders. Only to be used with Open Collector Drivers
Logic Levels	“0“ < +2 VDC, “1“ > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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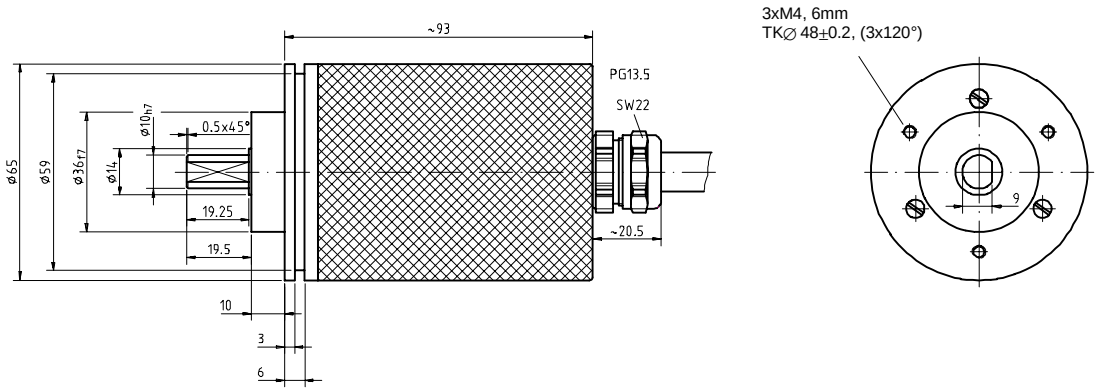
Absolute-Encoder HE-65-S P

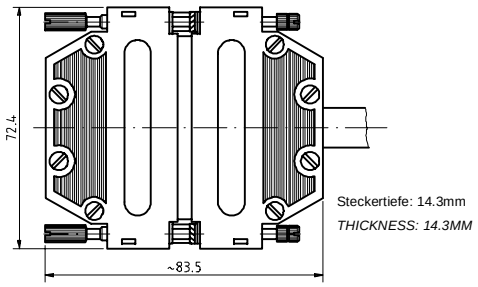
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	PG Axial with 0.5 m cable with 37 pin SUB-D Connector

Dimensional Drawing



37pol. Sub.D.-Buchse + Stecker
37 PIN. SUB.D.-SOCKET + CONNECTOR



Steckertiefe: 14.3mm
THICKNESS: 14.3MM

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Absolute-Encoder HE-65-S SSI

- **Small and Compact**
- **Single-Turn**
- **SSI (Synchronous Serial Interface)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
Output Format	Standard, Tree Format, with Repetition
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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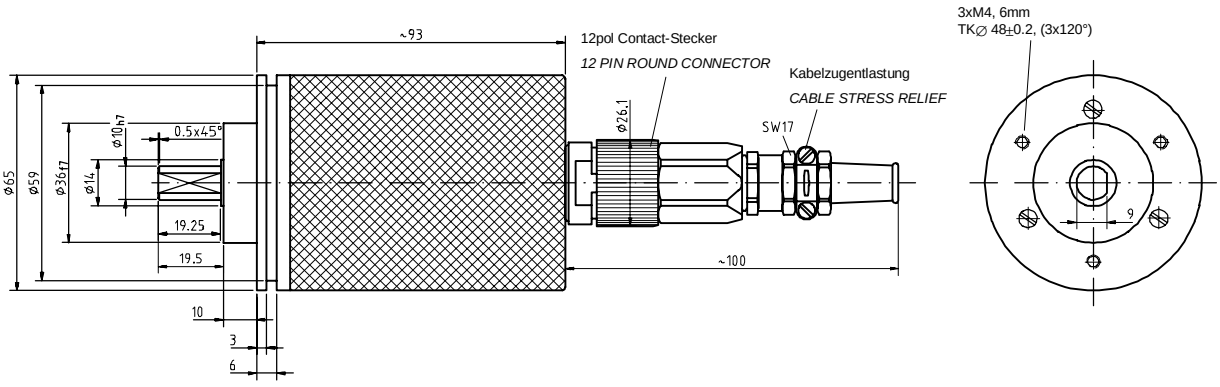
Absolute-Encoder HE-65-S SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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Absolute-Encoder HE-65-S IBS

- **Small and Compact**
- **Single-Turn**
- **Interbus-S**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used

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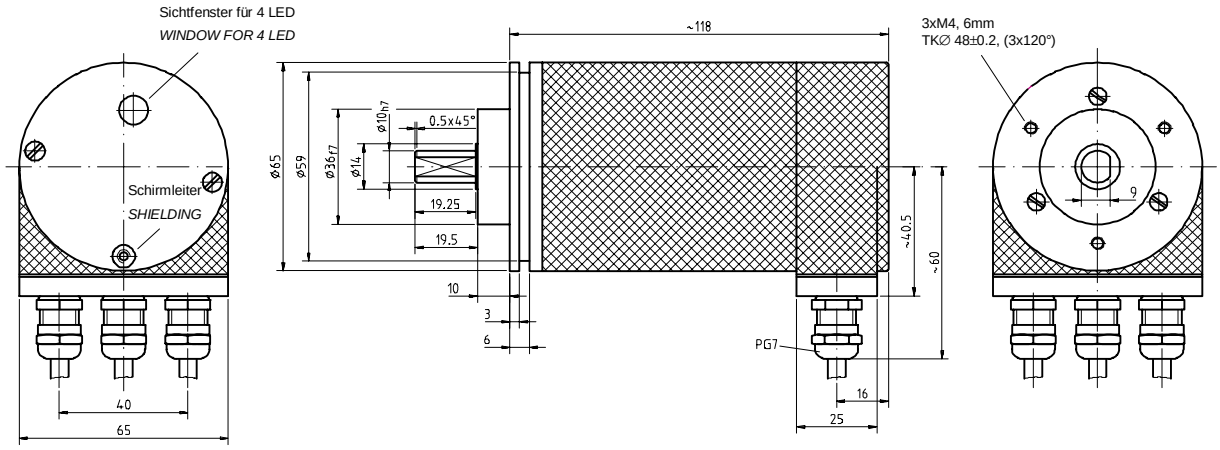
Absolute-Encoder HE-65-S IBS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 X PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder HE-65-S CAN

- **Small and Compact**
- **Single-Turn**
- **CAN-Bus Interface Device-Net-Profile**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898)
Other Interfaces	On Request
Output Code	Binary (standard), * Gray (programmable)
Baud Rate (adjustable by switch)	125 kbaud, 250 kbaud, 500 kbaud
Count Direction	Increase CW (Standard), * Decrease CW (programmable)
Pin Configuration	Upon Request

* If power is lost, these parameters will reset to their default settings.

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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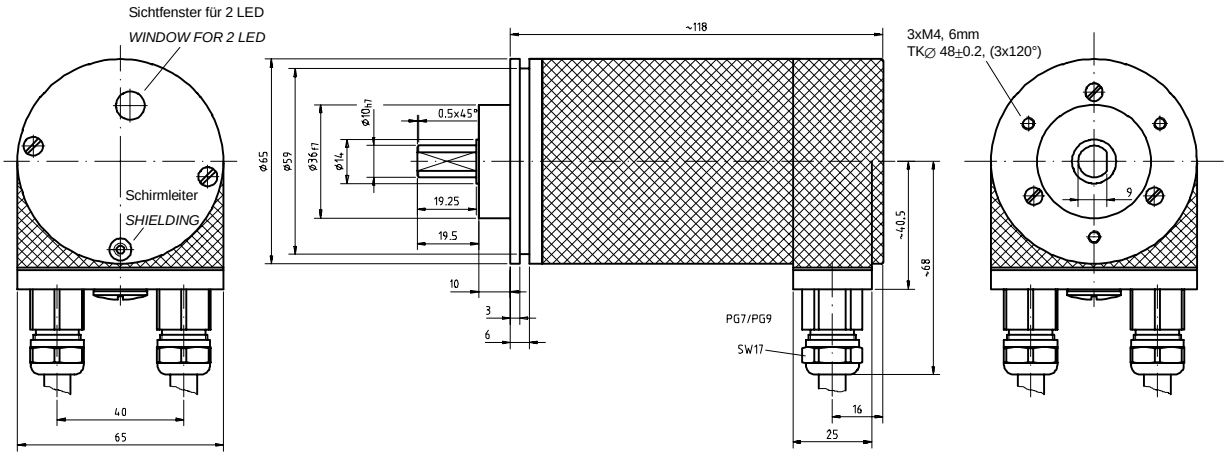
Absolute-Encoder HE-65-S CAN

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 x PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder HE-65-S LWL

- **Small and Compact**
- **Single-Turn**
- **LWL Interface**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary / Gray
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Points	max. 254
Inputs	
Forward / Reverse	Change count direction
Logic Levels	“0“ < + 2 VDC, “1“ > + 8 V DC, max. 30 VDC
Pin Configuration	On Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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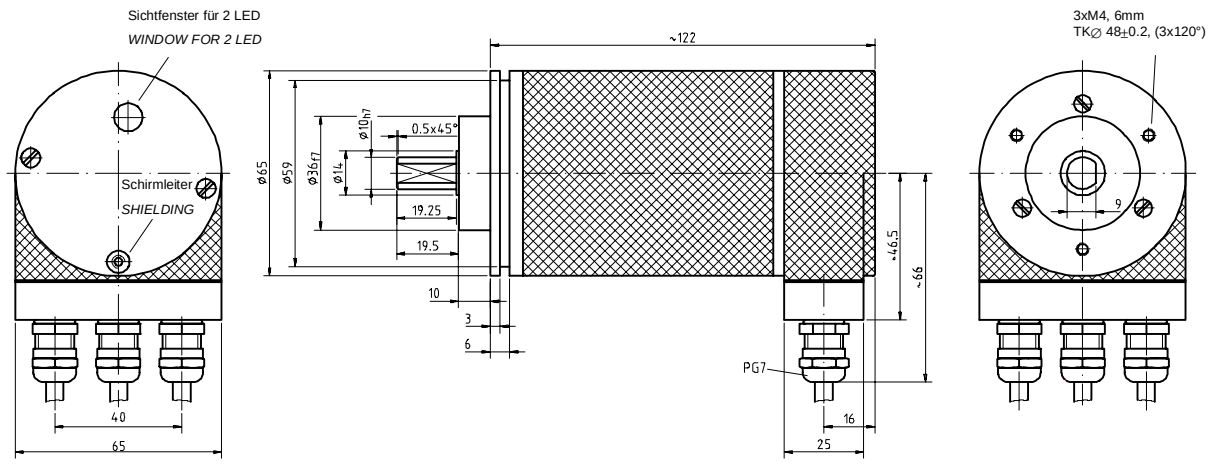
Absolute-Encoder HE-65-S LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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Absolute-Encoder HE-100-S P

- **Robust**
- **Single-Turn**
- **Parallel Output**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter (max. 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
Forward / Reverse	Change direction of count
Latch	Freezes data lines
Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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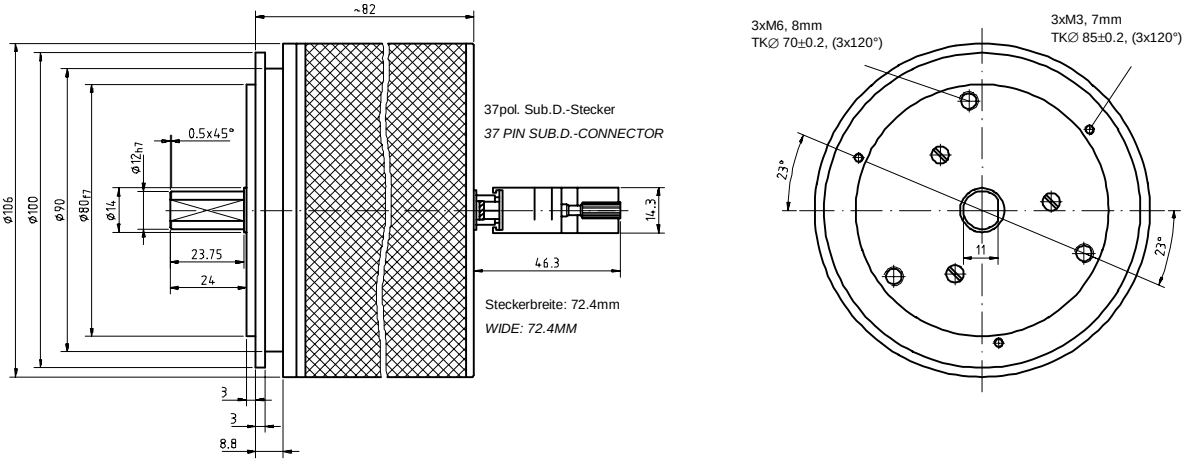
Absolute-Encoder HE-100-S P

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	37 pin SUB-D Connector

* Other connector types available upon request.

Dimensional Drawing



Absolute-Encoder HE-100-S SSI

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- **Robust**
- **Single-Turn**
- **SSI (Synchronous Serial Interface)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
Output Format	Most Significant Bit - Left Justified, Multiple Transmission
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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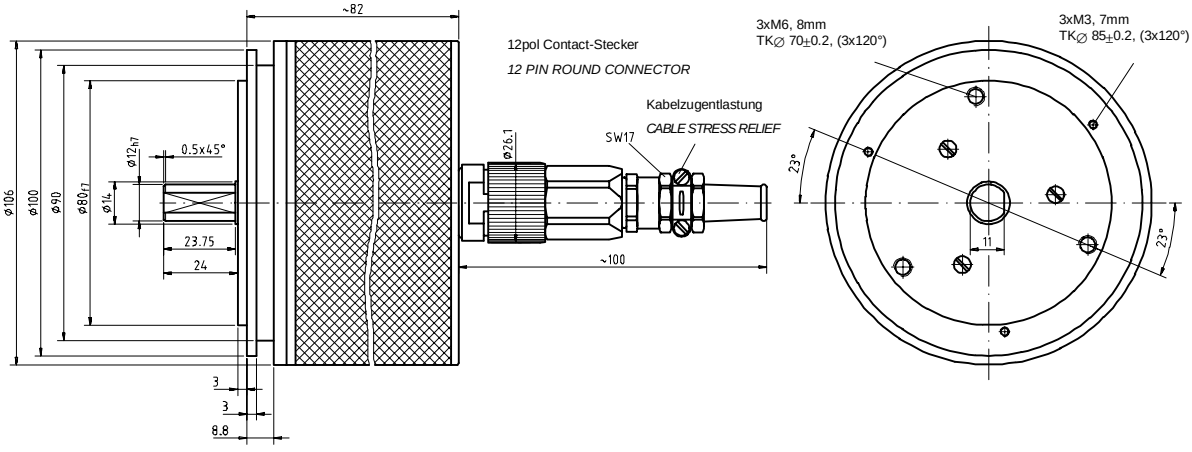
Absolute-Encoder HE-100-S SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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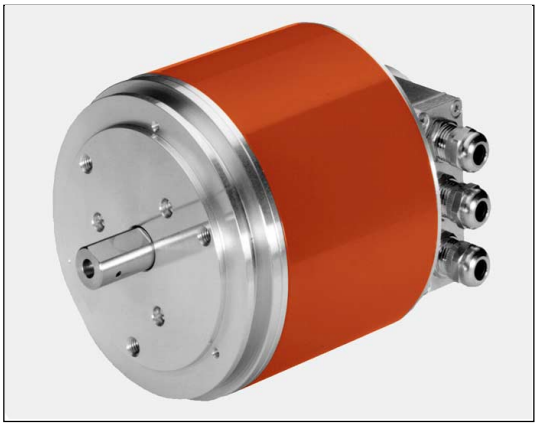
Absolute-Encoder HE-100-S LWL



- **Robust**
- **Single-Turn**
- **LWL Interface**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 13 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary / Gray
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Stations	max. 254
Inputs	
Forward / Reverse	Change count direction
Logic Levels	“0“ < + 2 VDC, “1“ > + 8 V DC, max. 30 VDC
Pin Configuration	On Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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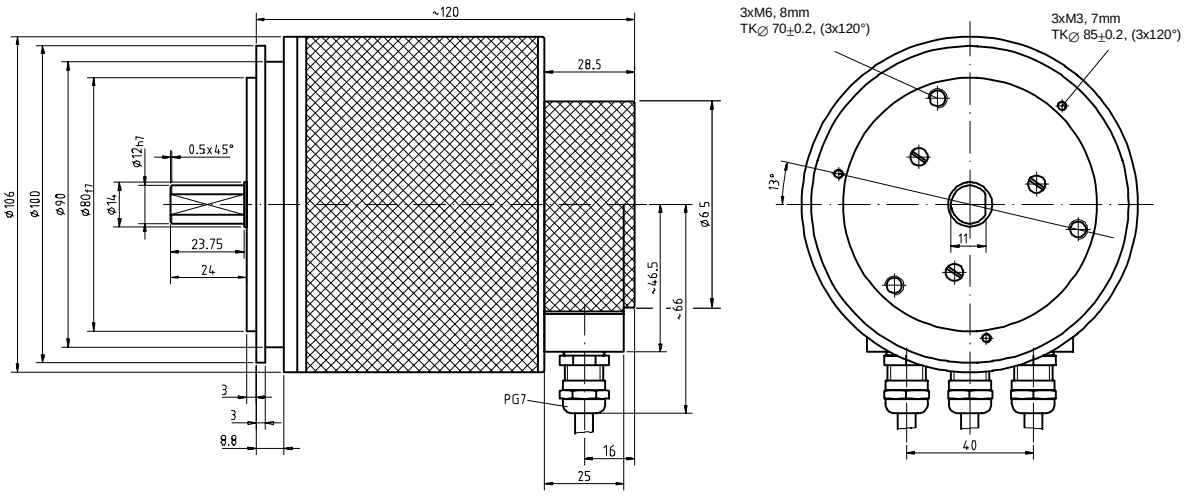
Absolute-Encoder HE-100-S LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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Absolute-Encoder ZE-65-S P - 16 Bit

- **High Resolution ZE-65 Single-Turn, Resolution max. 16 Bit**
- **Small and Compact**
- **Parallel-Interface**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 16 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 65536
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC, (5 VDC)
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Special Codes	Upon Request
Output Options	Push-Pull, Open Collector, Open Emitter (Max 35 V)
Number of Outputs	max. 16 (by decimal Codes max. 10 000 Steps / Revolution
Maximum Current	40 mA / Output, Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Preset 2	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < + 2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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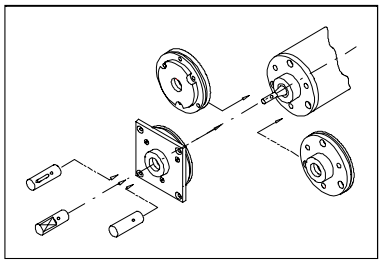
Absolute-Encoder ZE-65-S P - 16 Bit

Mechanical Data

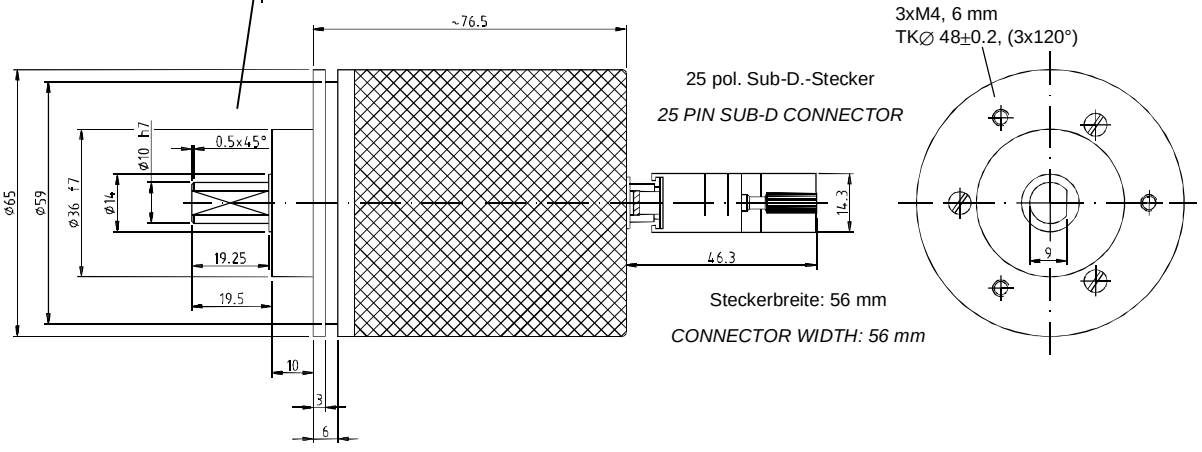
Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Connector	25 pin SUB-D Connector
Other connector types available	Upon Request

Dimensional Drawing



siehe auch Kapitel Zubehör

SEE ALSO CHAPTER ACCESSORIES



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Absolute-Encoder ZE-65-S CAM 16 Bit

- **High Resolution ZE-65 Single-Turn, Resolution max. 16 Bit**
- **Small and Compact**
- **Discrete CAM Outputs (max. 16 Outputs)**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 16 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 65536
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC, (5 VDC)
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code	CAMS (Dynamic CAM Anticipation)
* Number of Discrete Outputs	Maximum 16
* Number of CAMS per Discrete Output	Maximum 4
Output Options	Push-Pull, Open Collector, Open Ermitter
Maximum Current	40 mA / Output, Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < + 2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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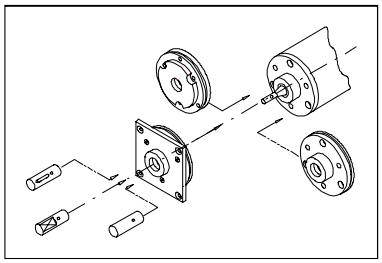
Absolute-Encoder ZE-65-S CAM 16 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Connector	25 pin SUB-D Connector
Other connector types available	Upon Request

Dimensional Drawing



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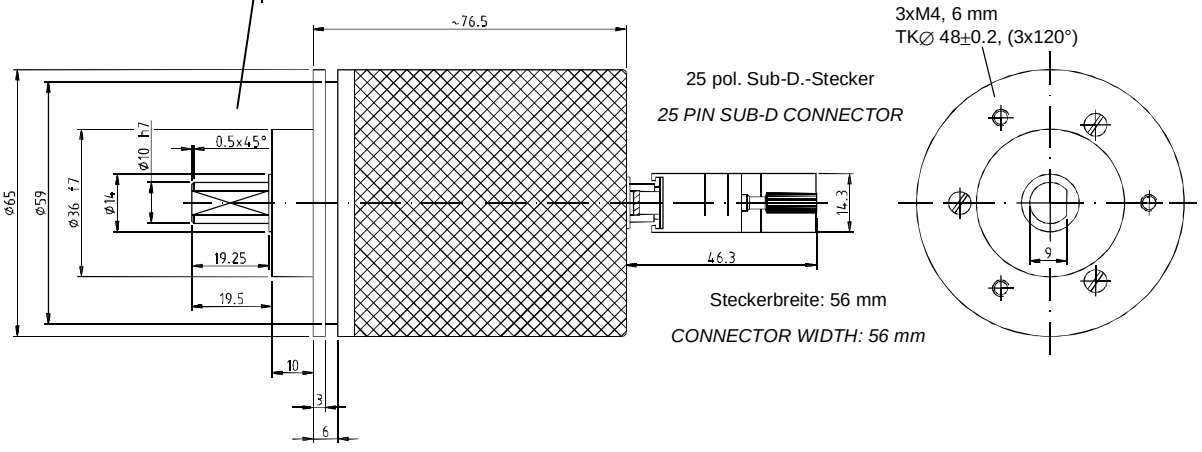
SEE ALSO CHAPTER ACCESSORIES



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Absolute-Encoder ZE-65-S SSI 17 Bit

- **High Resolution ZE-65 Single-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **SSI (Synchronous Serial Interface)**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-Ø 100 mm**

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	80 kHz – 820 kHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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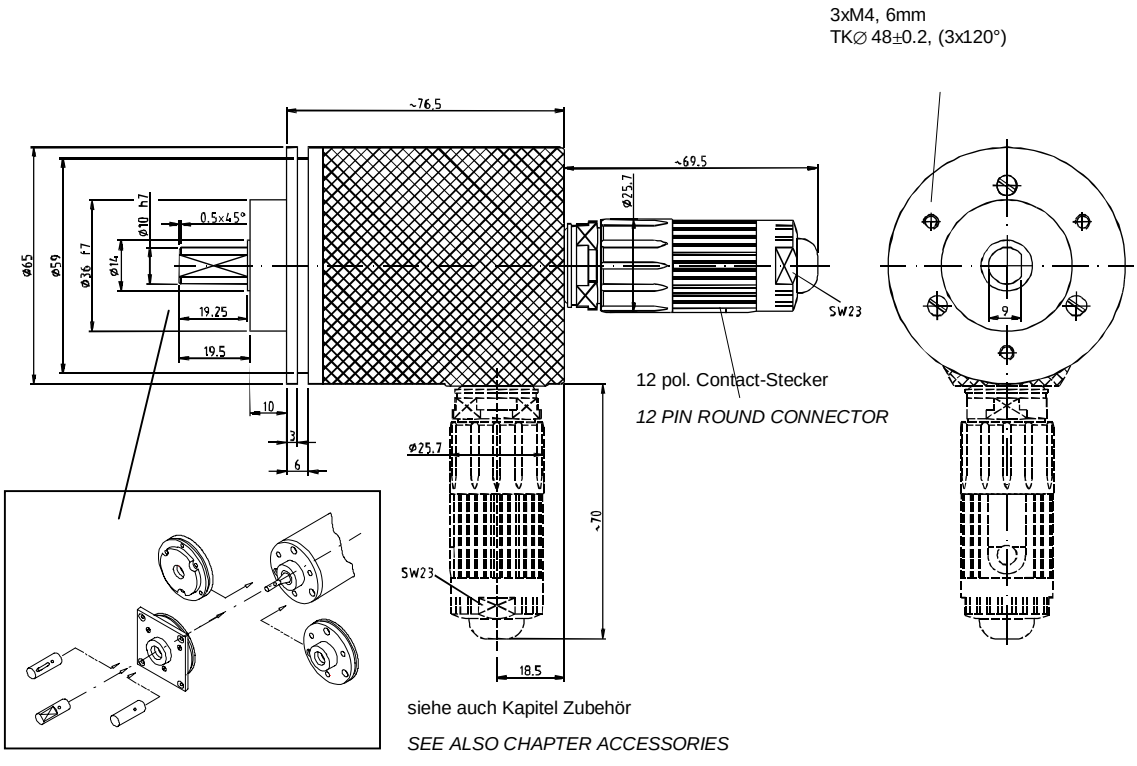
Absolute-Encoder ZE-65-S SSI 17 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector
Other connector types available	Upon Request

Dimensional Drawing



Absolute-Encoder ZE-65-S ASI - 17 Bit

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- **High Resolution ZE-65 Single-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **ASI (Asynchronous Serial Interface)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Output Code	Binary, BCD, Gray
Baud Rate	4800 Baud, Other Baud Rates by Request
Data Output	RS422 (2 wire) Short Circuit and Reverse Polarity Protected
Communication Format	1 Start Bit, 7 Data Bits, 1 Parity Bit, 2 Stop Bits
Data Format	ASCII
Standard Communication	ASCII, 6 Character + CR
Baud Rate	4800 Baud
Other Communication Formats	Upon Request

Input Options

Forward / Reverse	Change direction of count
Preset 1	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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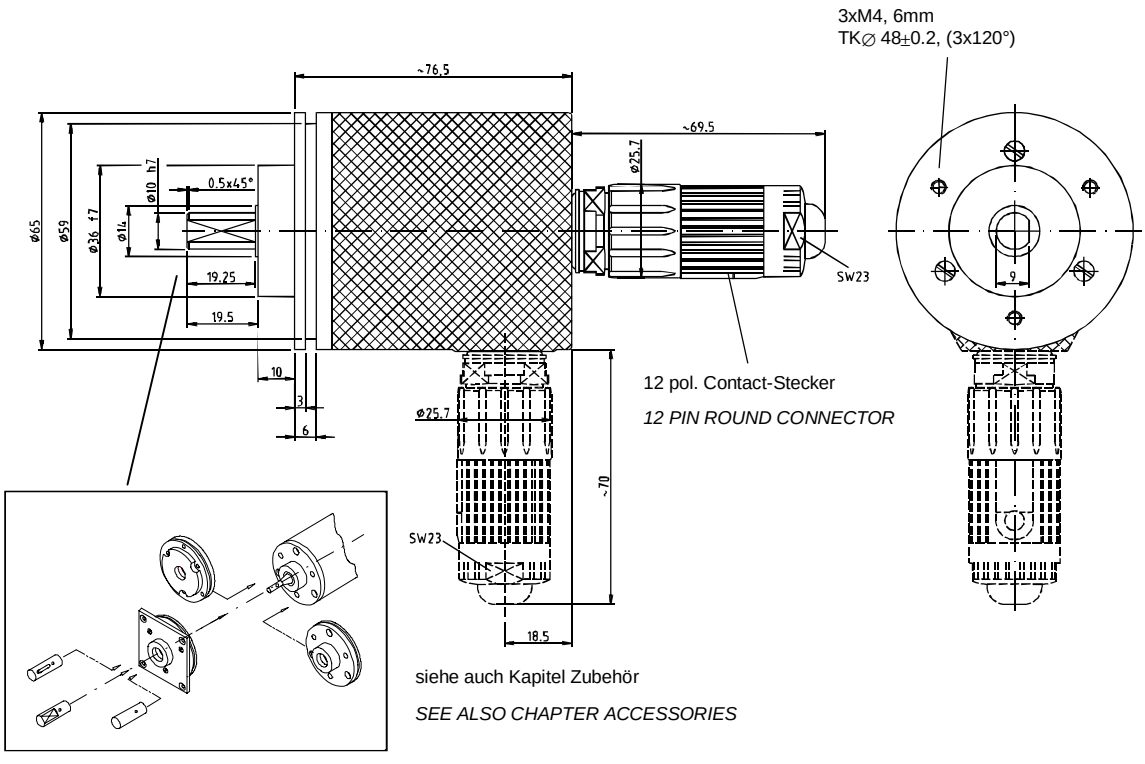
Absolute-Encoder ZE-65-S ASI - 17 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector
Other connector types available	Upon Request

Dimensional Drawing



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SEE ALSO CHAPTER ACCESSORIES

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Absolute-Encoder ZE-65-S ISI 17 Bit

- **High Resolution ZE-65 Single-Turn**
  Resolution max. 17 Bit
- **Small and Compact**
- **ISI (Incremental Serial Interface)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to 115 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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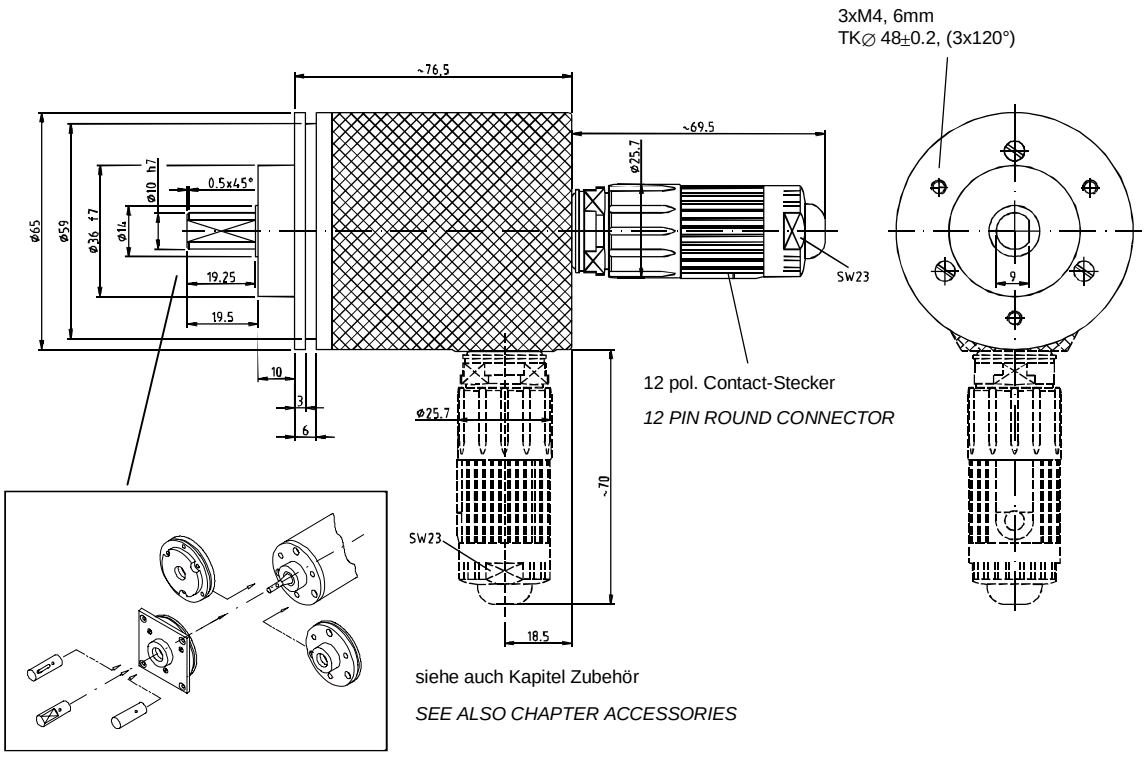
Absolute-Encoder ZE-65-S ISI 17 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



siehe auch Kapitel Zubehör

SEE ALSO CHAPTER ACCESSORIES

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Absolute-Encoder ZE-65-S A - 17 Bit

- **High Resolution ZE-65 Single-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **Analog Output with 14 Bit D/A Converter 0-20mA or -10 to +10V**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**
- **Also available with housing-Ø 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programmable via RS485	PC IBM compatible EPROG Software
* Analog Voltage Output (14 Bit D to A Converter)	-10 to +10V, 0 - 10V
Impedance	min. 500 Ω
* Analog Current Output (14 Bit D to A Converter)	0 - 20 mA
Impedance	max. 500 Ω
SSI Interface	
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Input Options	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Latch	Freezes the analog output data
*Polarity	Changes polarity of analog voltage value
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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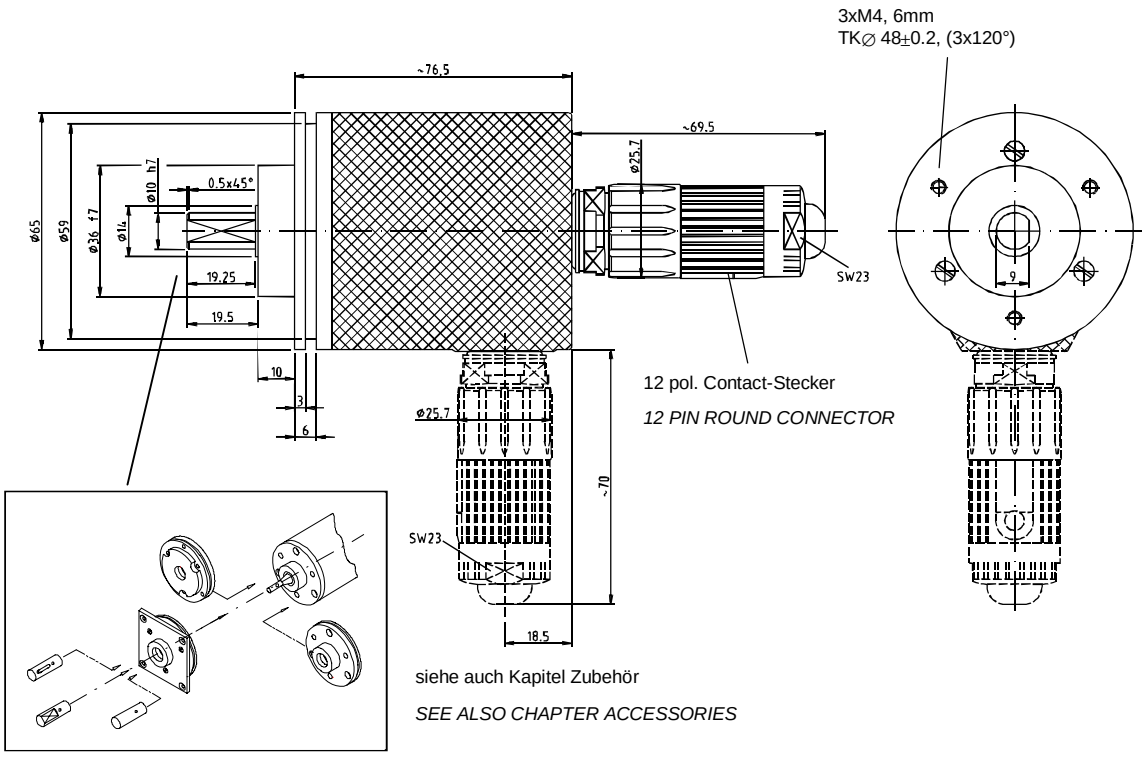
Absolute-Encoder ZE-65-S A - 17 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector
Other connector types available	Upon Request

Dimensional Drawing



siehe auch Kapitel Zubehör

SEE ALSO CHAPTER ACCESSORIES

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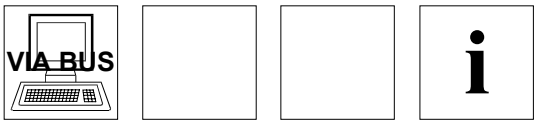
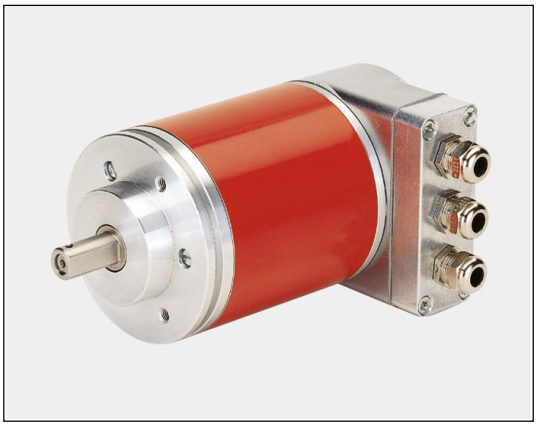
Absolute-Encoder ZE-65-S IBS 17 Bit





- **High Resolution ZE-65 Single-Turn, Resolution max 17 Bit**
- **Small and Compact**
- **Interbus-S**
- **Programmable Over The Interbus-S**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programmable Over Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes (programmable)	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Programmable Parameters (via IBS bus)	
Direction of Count	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Output Code	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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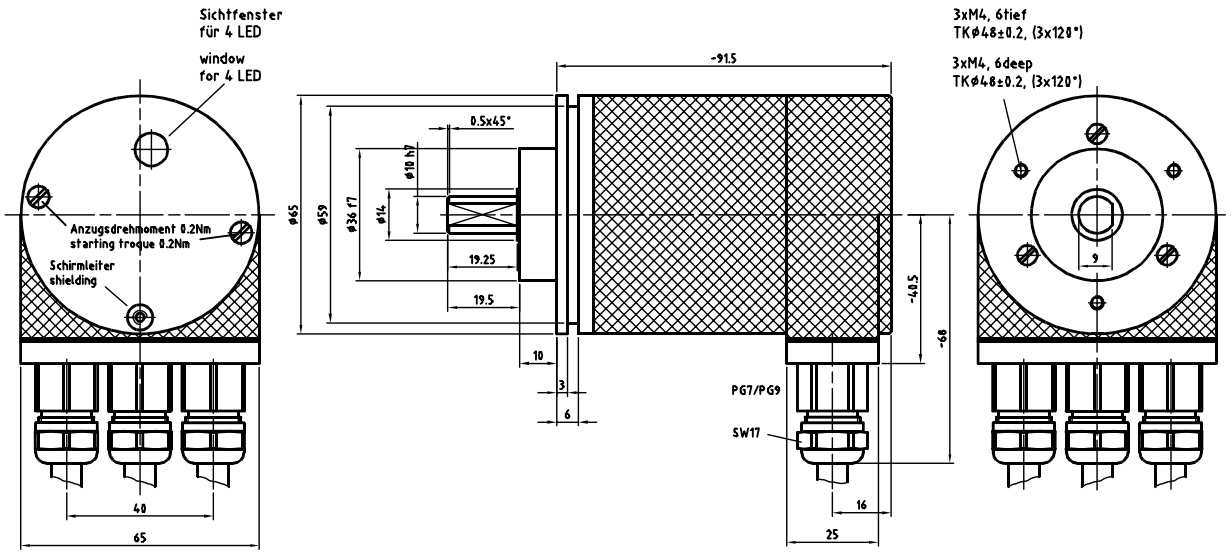
Absolute-Encoder ZE-65-S IBS 17 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3XPG7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4,3-Fst.

Absolute-Encoder ZE-65-S DeviceNet 17 Bit

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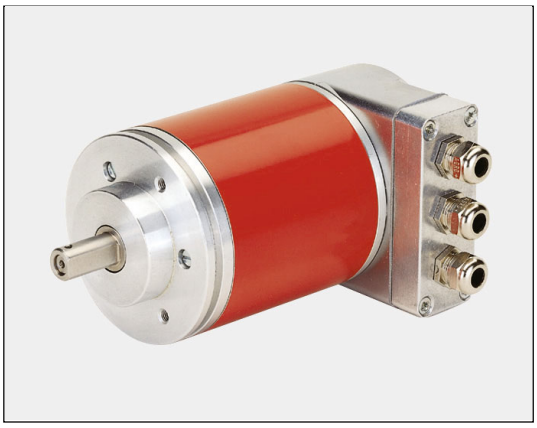
VIA BUS



- **High Resolution ZE-65 Single-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **Interface : DeviceNet**
- **Programmable via CAN-Bus**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programming via CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898) PCA 82 C250 / C251
Output Code (programmable)	Binary, Gray
Baud Rate (adjustable by switch)	125 kbaud, line length up to 500 m 250 kbaud, line length up to 250 m 500 kbaud, line length up to 100 m
Size of encoder addresses	0 to 63, adjustable by DIP-switches)
Terminating resistor	123Ω, switchable
Programmable Parameters	
Count Direction	
Output Code	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Special Outputs	
- Error	
- Operating Range	
- Safe Region	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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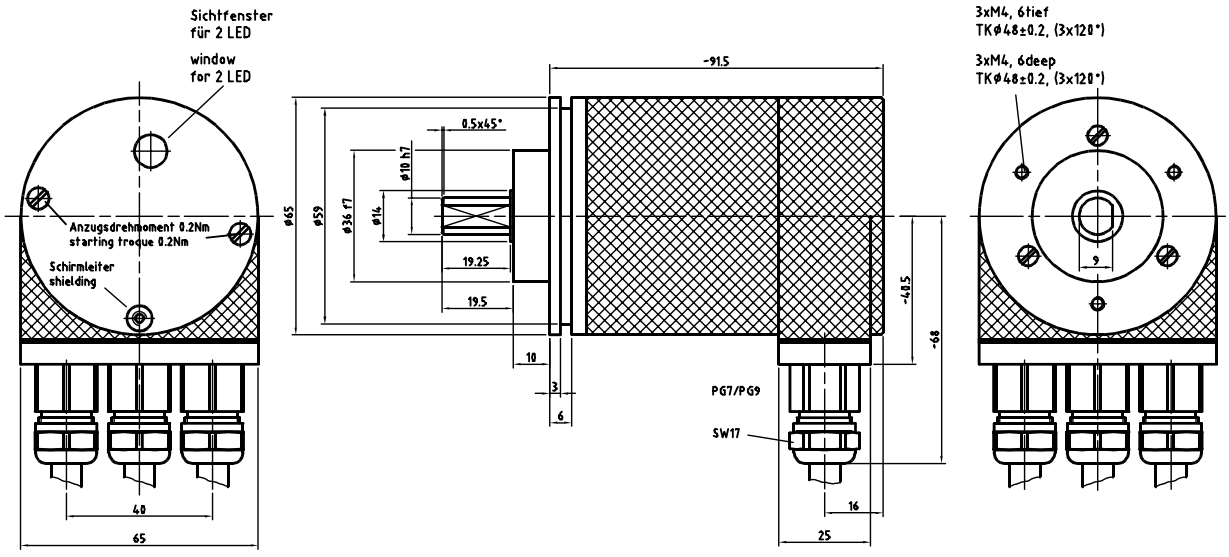
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

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Absolute-Encoder ZE-65-S CANopen 17 Bit

- **High Resolution ZE-65 Single-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **Interface : CANopen**
- **Programmable via CAN-Bus**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programming via CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898)
Data Protocol	CAN 2.0 A, CANopen Device Profil for Encoder CIA DS-406 V2.0 / PCA 82 C250 / C251
Output Code	Binär
Baud Rate (adjustable by switch)	20 kbaud, line length up to 2500 m 125 kbaud, line length up to 500 m 500 kbaud, line length up to 100 m 1 Mbaud, line length up to 25 m
Size of encoder addresses	1 to 64, adjustable by DIP-switches)
Terminating resistor	123Ω, switchable
Programmable Parameters	
Count Direction	
Number of Counts per Length	
Number of Revolutions	
Adjust Absolute Value	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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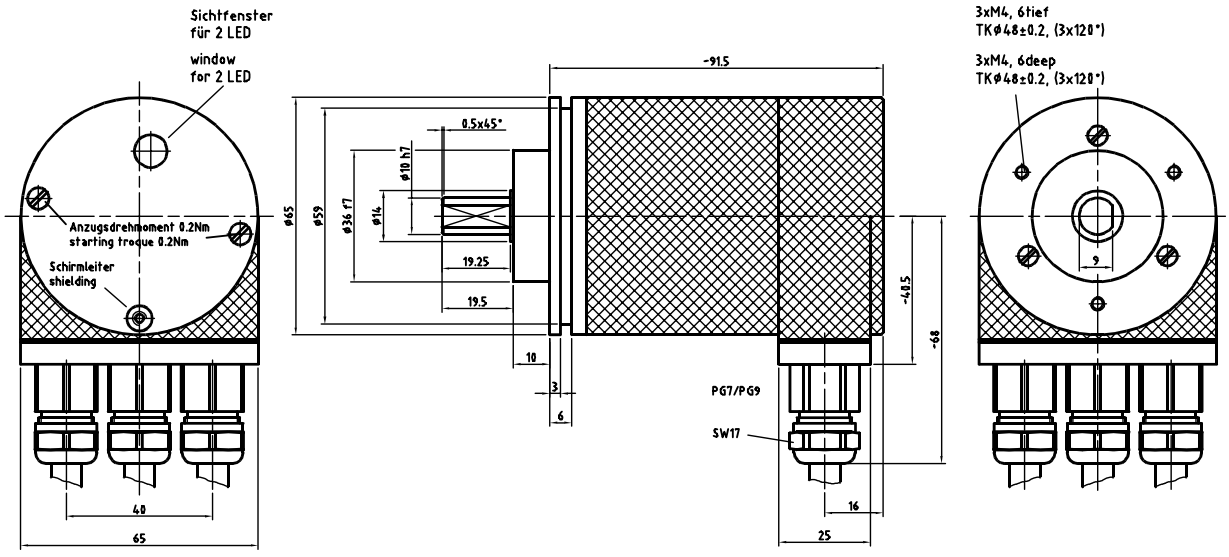
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

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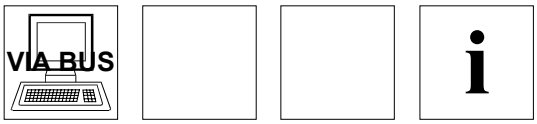
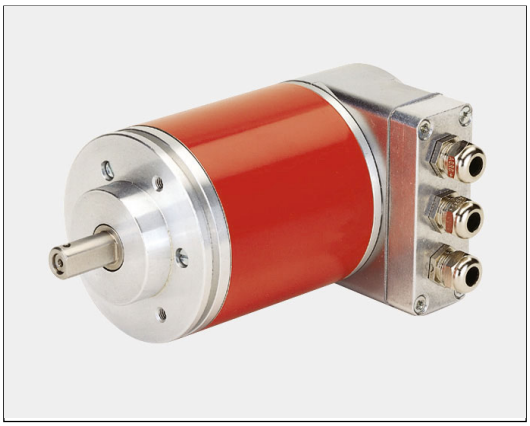
Absolute-Encoder ZE-65-S PROFIBUS (PNO) 17 Bit





- **High Resolution ZE-65 Single-Turn Resolution max. 17 Bit**
- **Small and Compact**
- **Interface: PROFIBUS-DP**
- **Parametrizable via PROFIBUS, according to PNO-profile CLASS2**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Output Code	Binary
Data Protocol	PROFIBUS-DP Protocol DIN E 19 245 T.3
Standard Baud Rate	9.6 kbaud to 12 Mbaud
Option	3 to 12 Mbaud
* Station Address	3 - 99
Inputs	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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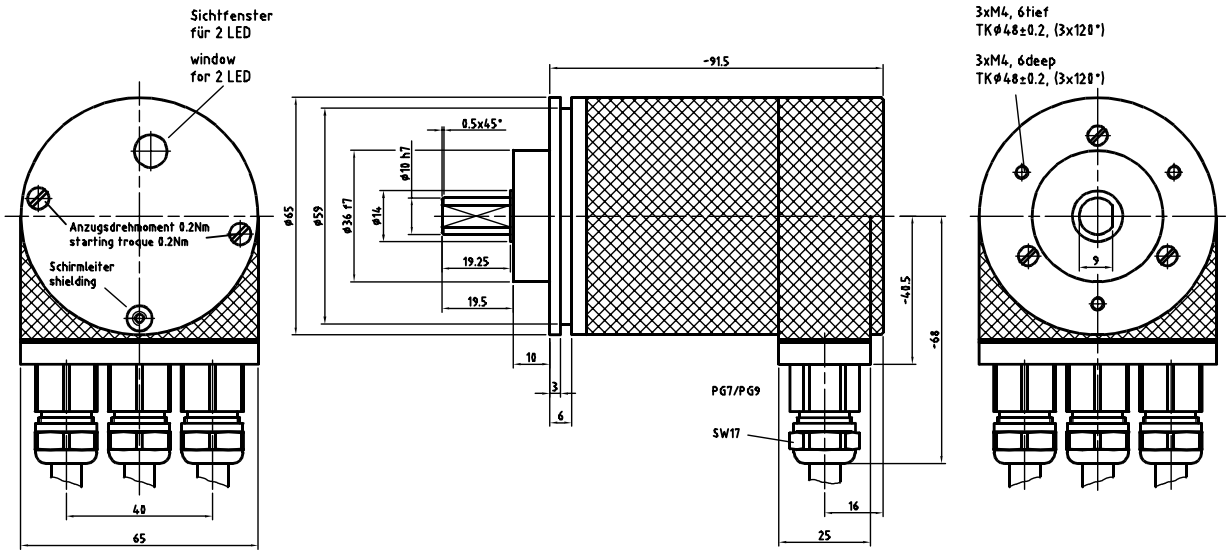
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	End Cap with 3 X PG 9 Radial

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

Absolute-Encoder ZE-65-S LWL 17 Bit

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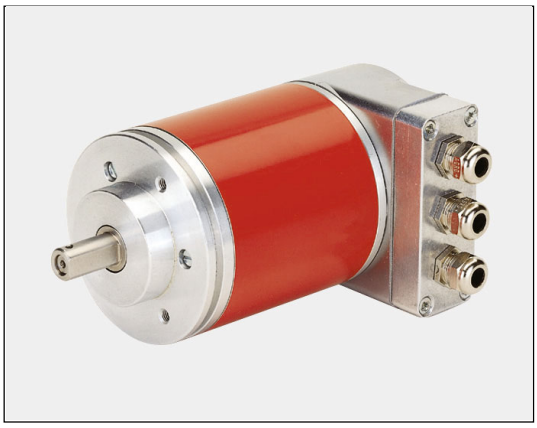
VIA BUS



- **High Resolution ZE-65 Single-Turn**
  Resolution max. 17 Bit
- **Small and Compact**
- **LWL-Interface**
- **Programmable via LWL-Ring**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programmable via LWL-Ring	in connection with • PC Compatible Central-Module • SIMATIC-S5 Compatible Central-Module • VMEbus • SMP-Bus
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with Plastic Cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Points	max. 254
Programmable Parameters	
Count Direction	
Number of Counts per Length	
Number of Revolutions	
Preset Value 1,2	
Adjust Absolute Value	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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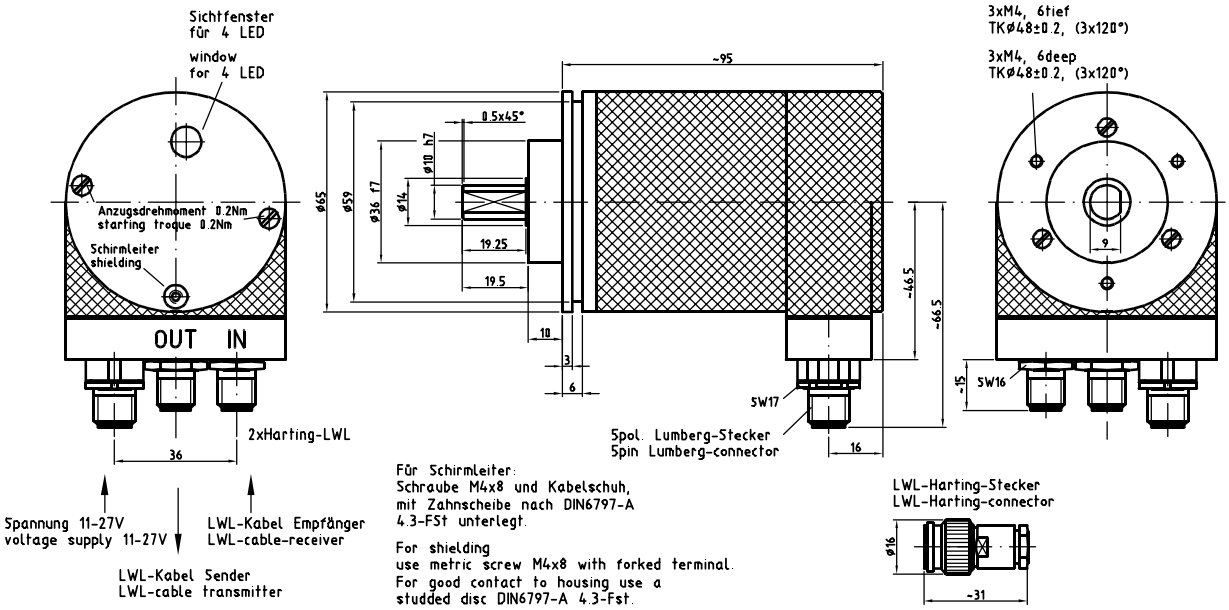
Absolute-Encoder ZE-65-S LWL 17 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



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Absolute-Encoder ZE-65-S SUCONET K1 17 Bit

- **High Resolution ZE-65 Single-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **SUCONET-Fieldbus-Interface**
- **Programmable via SUCONET-Bus**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 13 Bit, [2] max. 15 Bit, [3] max. 17 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	1 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programming via Bus	Fieldbus Connection Suconet K1
Output Code	Binary
Data Protocol	2-wire, RS485 (Master-Slave)
Baud Rate	187,5 kbaud
Maximum Stations	max. 31, adjustable by DIP-switches
User Modules	PS 3, PS 306, PS 316, *PS 4-100, *PS 4-200, *PS 416
Programmable Parameters	
	Count Direction
	Steps (Measuring Length)
	Scale Factor
	Preset Value (Adjust absolute position to a given set value (i.e. zero set)
Pin Configuration	Upon Request

* only if compatible to PS 3

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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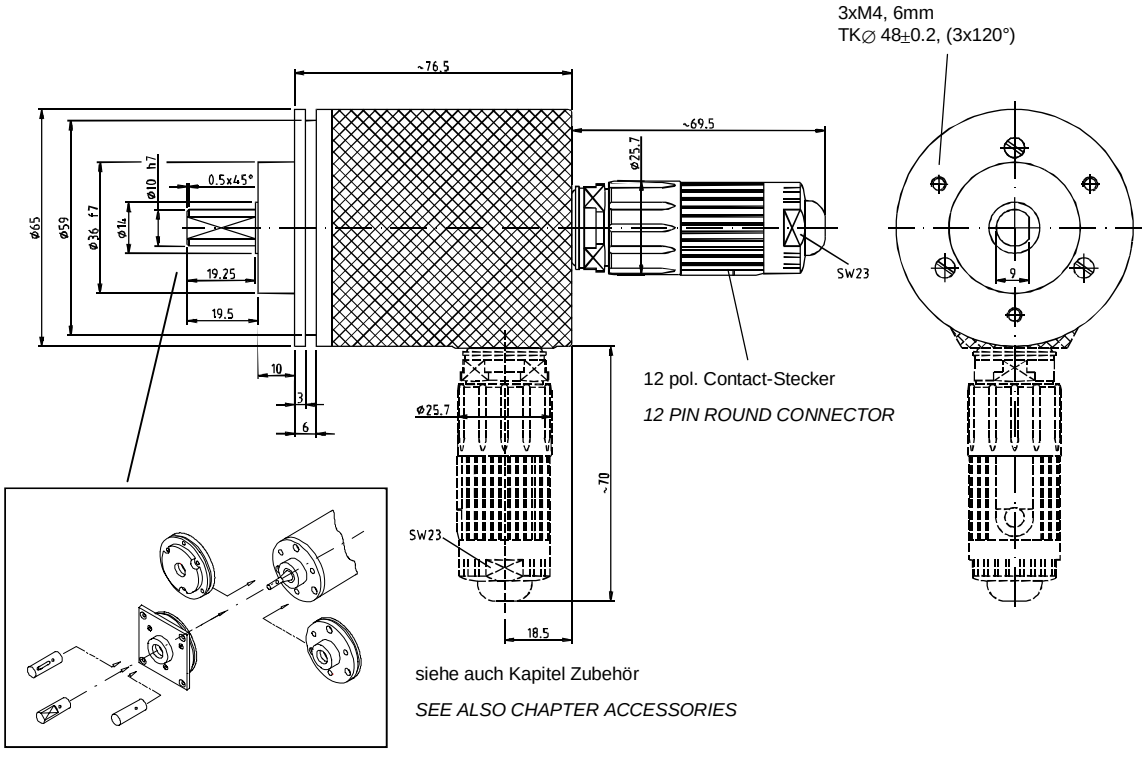
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector

Dimensional Drawing



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Absolute-Encoder CE-65-M P

- **Small and Compact**
- **Multi-Turn**
- **Parallel Output**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter (Max 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Preset 2	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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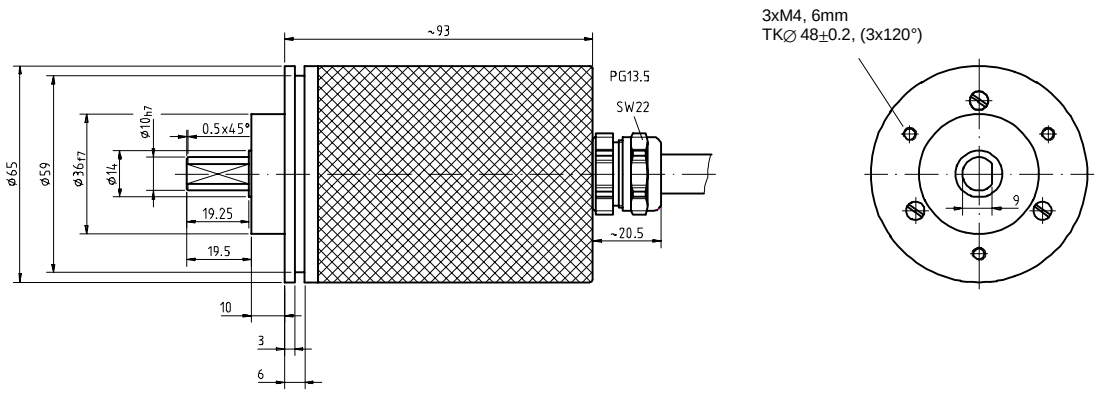
Absolute-Encoder CE-65-M P

Mechanical Data

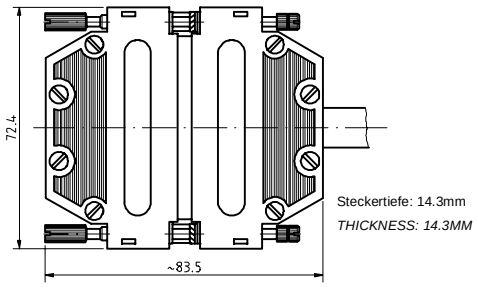
Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	PG Axial with 0.5 m cable with 37 pin SUB-D Connector

* Other connector types available upon request.

Dimensional Drawing



37pol. Sub.D.-Buchse + Stecker
37 PIN. SUB.D.-SOCKET + CONNECTOR



Steckertiefe: 14.3mm
THICKNESS: 14.3MM

Absolute-Encoder CE-65-M CAM

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- **Small and Compact**
- **Multi Turn**
- **Discrete CAM Outputs (32 Outputs)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code	CAMS (Dynamic Anticipation)
* Number of Discrete Outputs	Maximum 32
* Number of CAMS per Discrete Output	Maximum 4
Output Options	Push-Pull, Open Collector, Open Emitter (Max. 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Note
Cam Programming is Only Possible to 16 Bit

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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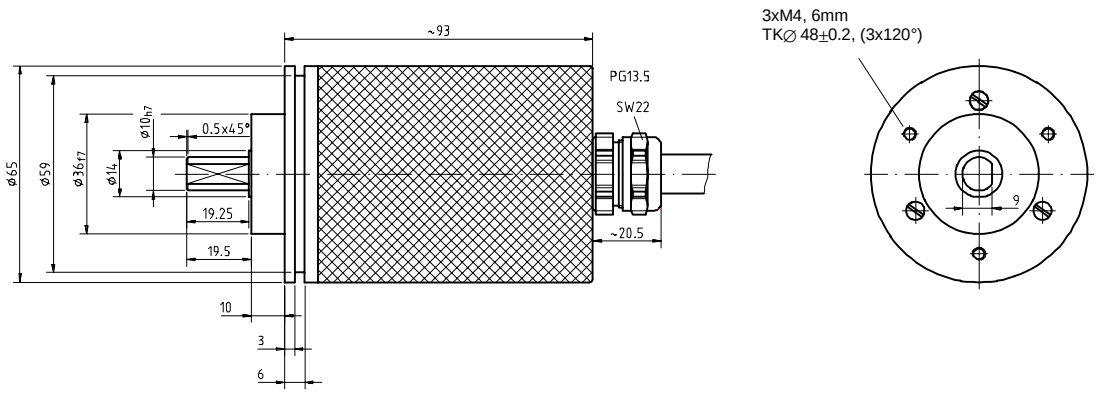
Absolute-Encoder CE-65-M CAM

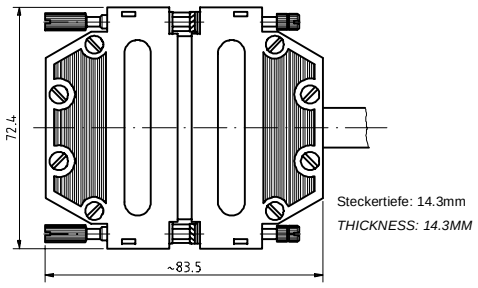
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	PG Axial with 0.5 m cable and 37 pin SUB-D Connector

Dimensional Drawing



37pol. Sub.D.-Buchse + Stecker
37 PIN. SUB.D.-SOCKET + CONNECTOR



Steckertiefe: 14.3mm
THICKNESS: 14.3MM

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Absolute-Encoder CE-65-M SSI

- **Small and Compact**
- **Multi-Turn**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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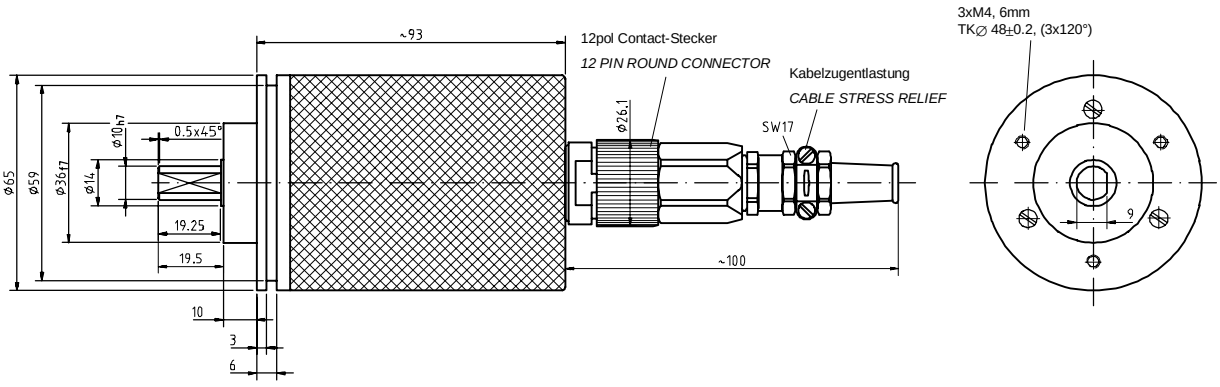
Absolute-Encoder CE-65-M SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



Absolute-Encoder CE-65-M ASI

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- **Small and Compact**
- **Multi-Turn**
- **ASI (Asynchronous Serial Interface)**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray
Baud Rate	4800 Baud, Other Baud Rates by Request
Data Output	RS422 (2 wire) Short Circuit and Reverse Polarity Protected
Communication Format	1 Start Bit, 7 Data Bits, 1 Parity Bit, 2 Stop Bits
Data Format	ASCII
Standard Communication	ASCII, 6 Character + CR
Baud Rate	4800 Baud
Other Communication Formats	Upon Request

Input Options

Forward / Reverse	Change direction of count
Preset 1	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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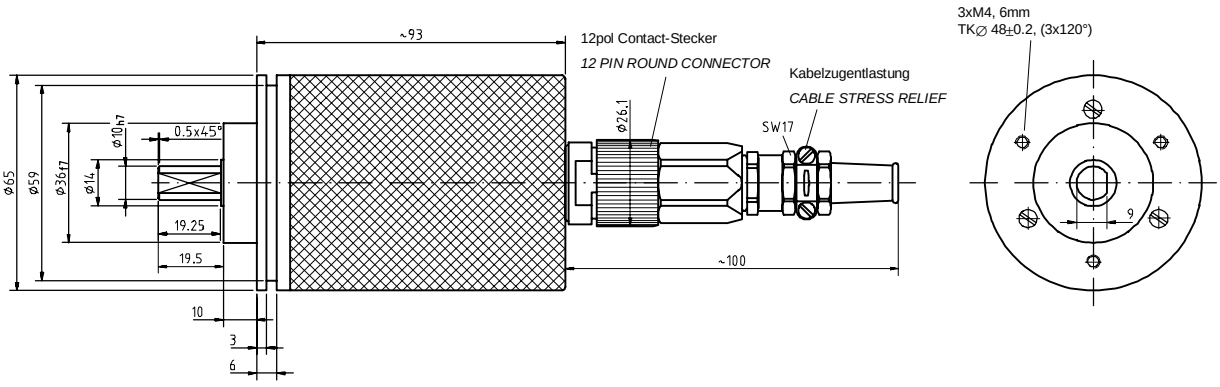
Absolute-Encoder CE-65-M ASI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder CE-65-M ISI

- **Small and Compact**
- **Multi-Turn**
- **ISI (Incremental Serial Interface)**
- **Absolute Incremental Encoder**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to 115 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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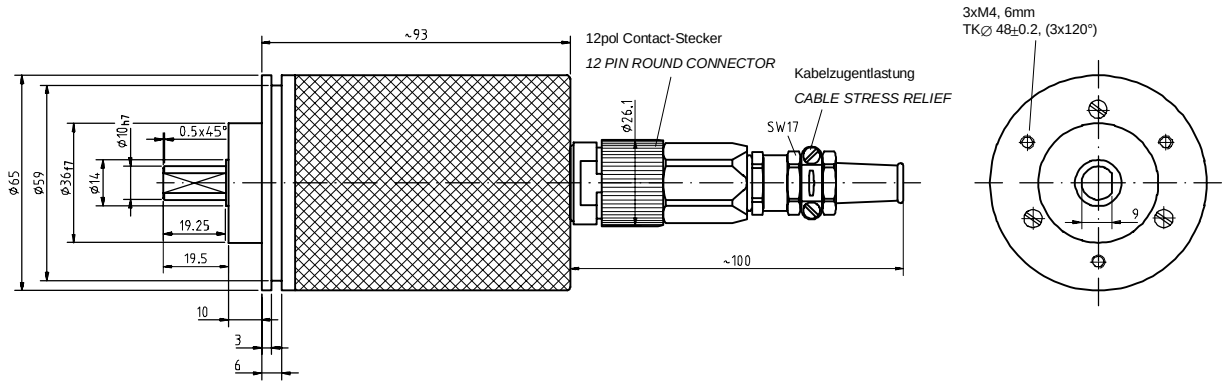
Absolute-Encoder CE-65-M ISI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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Absolute-Encoder CE-65-M A

- **Small and Compact**
- **Multi-Turn**
- **Analog Output with 14 Bit D/A Converter**
  0-20mA or -10 to +10V or 0 to +10V
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps per Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programmable via RS485	PC IBM compatible EPROG Software
* Analog Voltage Output (14 Bit D to A Converter)	-10 to +10V, 0 - 10V
Impedance	min. 500 Ω
* Analog Current Output (14 Bit D to A Converter)	0 - 20 mA
Impedance	max. 500 Ω
SSI Interface	
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Input Options	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Latch	Freezes the analog output value
* Polarity	Changes polarity of analog voltage value
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request
* Programmable Parameters	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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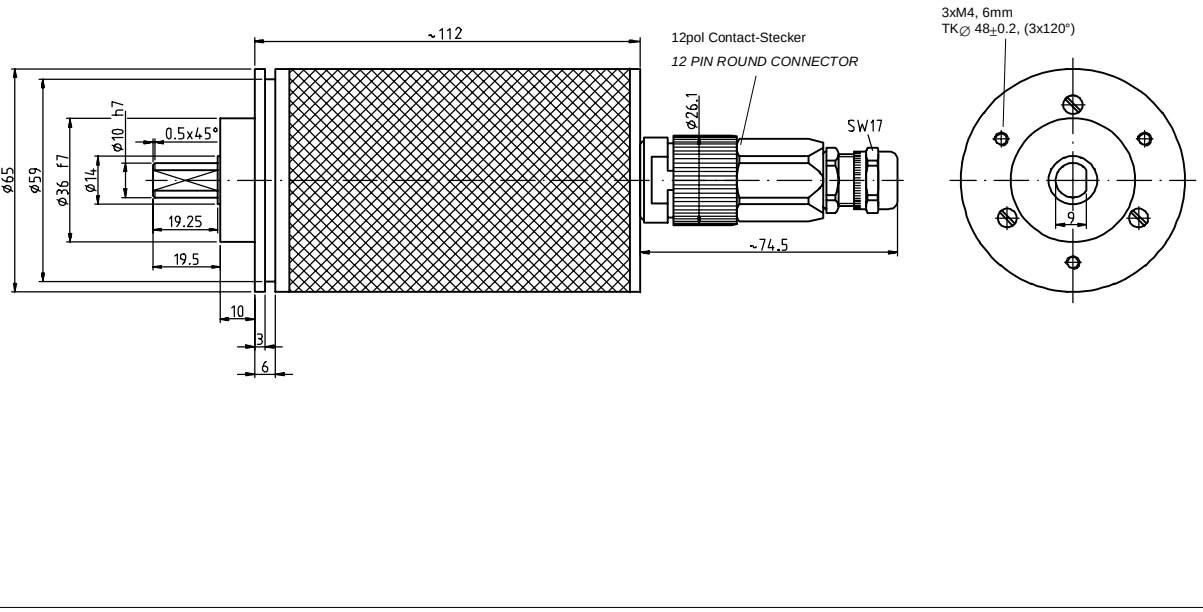
Absolute-Encoder CE-65-M A

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



Absolute-Encoder CE-65-M A

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- **Small and Compact**
- **Multi Turn**
- **Analog Output with 14 Bit D/A Converter 0-20mA or -10 to +10V**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**

5

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps per Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programmable via RS485	PC IBM compatible EPROG Software
* Analog Voltage Output (14 Bit D to A Converter)	-10 to +10V, 0 - 10V
Impedance	min. 500 Ω
* Analog Current Output (14 Bit D to A Converter)	0 - 20 mA
Impedance	max. 500 Ω
SSI Interface	
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Input Options	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Latch	Freezes the analog output data
* Polarity	Changes polarity of analog voltage value
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request
* Programmable Parameters	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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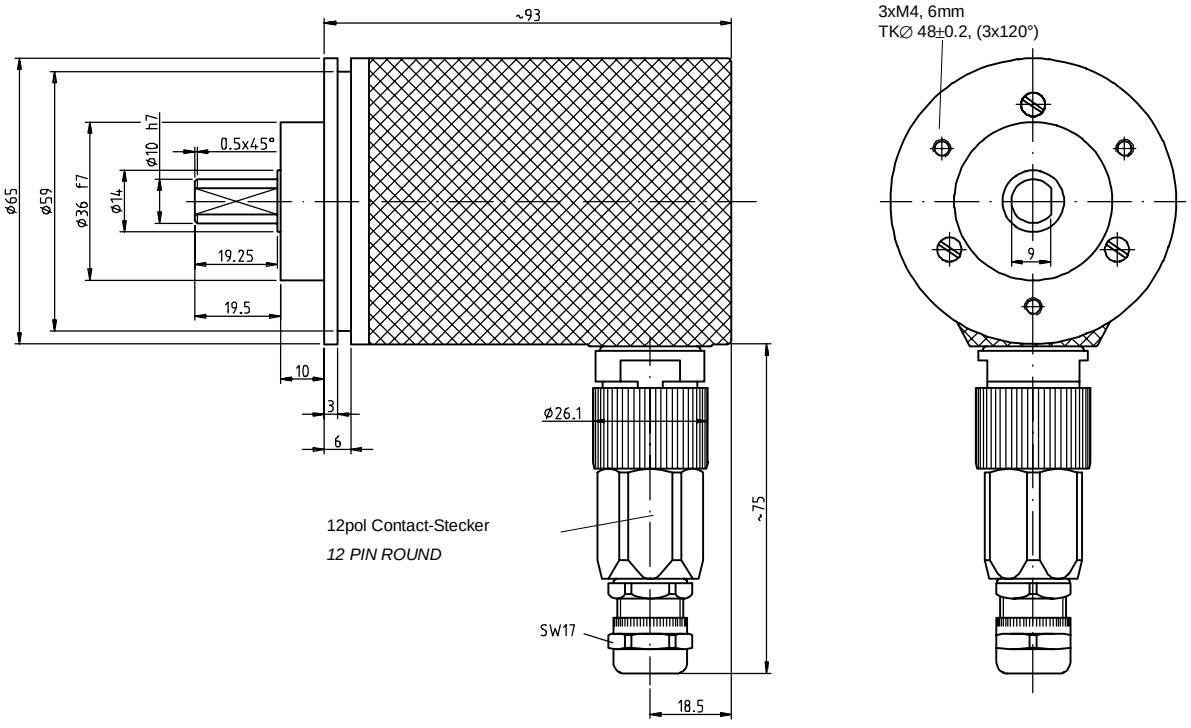
Absolute-Encoder CE-65-M A

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Radial

Dimensional Drawing



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Absolute-Encoder CE-65-M IBS

- **Small and Compact**
- **Multi-Turn**
- **Interbus-S**
- **Programmable via Interbus-S**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes (programmable)	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Programmable Parameters (via IBS bus)	
Direction of Count	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Output Code	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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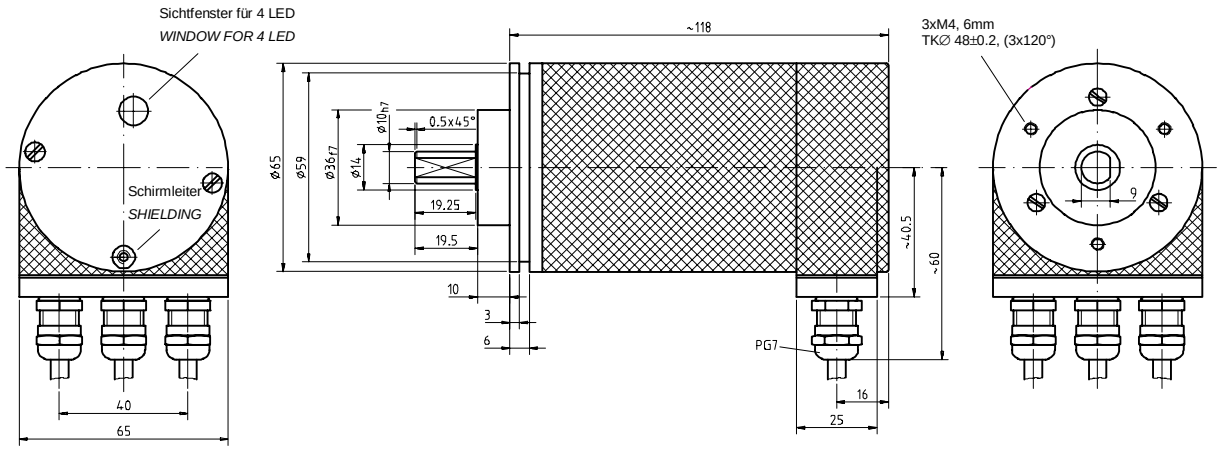
Absolute-Encoder CE-65-M IBS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 X PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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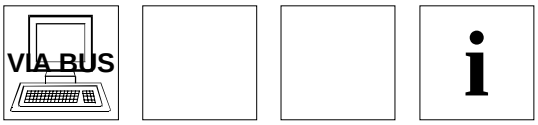
Absolute-Encoder CE-65-M CAN



- **Small and Compact**
- **Multi-Turn**
- **CAN-Bus-Interface Device-Net-Profil**
- **Programmable via CAN-Bus**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programming via CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898)
Output Code (programmable)	Binary, Gray
Baud Rate (adjustable by switch)	125 kbaud, line length up to 500 m
	250 kbaud, line length up to 250 m
	500 kbaud, line length up to 100 m
Size of encoder addresses	0 to 63, adjustable by DIP-switches)
Terminating resistor	123Ω, switchable
Programmable Parameters	
Count Direction	
Output Code	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Special Outputs	
- Error	
- Operating Range	
- Safe Region	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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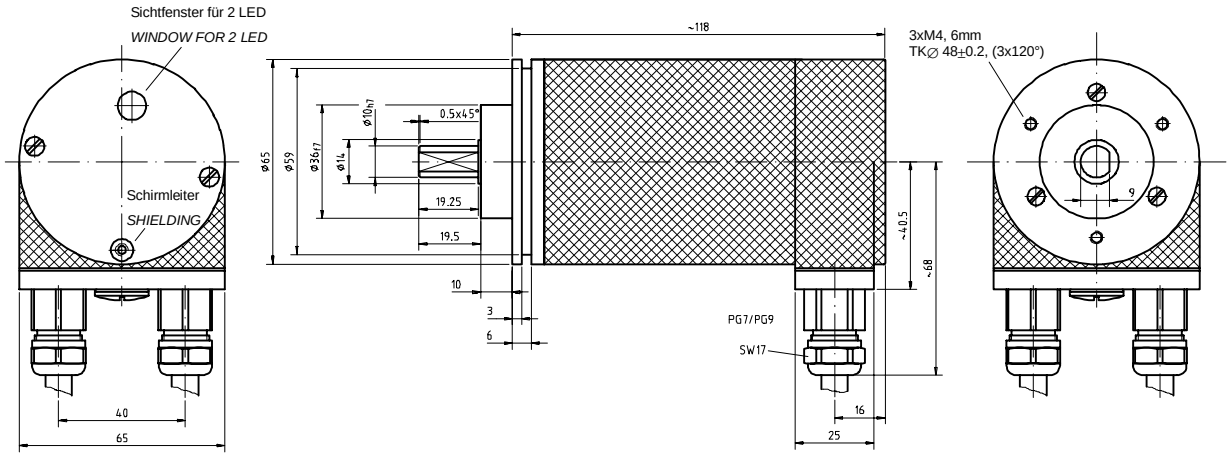
Absolute-Encoder CE-65-M CAN

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder CE-65-M PROFIBUS

- **Small and Compact**
- **Multi -Turn**
- **Profibus-DP**
- **Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via RS485	PC IBM Compatible EPROG Software
* Output Codes (programmable)	Binary, Gray, BCD, Shifted Gray, Excess3, Shifted Excess3
Data Protocol	Profibus-DP (Din E 19 245 T.3) Same as SINEC-L2-DP
Standard Baud Rate	9.6 kbaud to 12 Mbaud
Option	3 to 12 Mbaud
* Station Address	3 - 99
Inputs	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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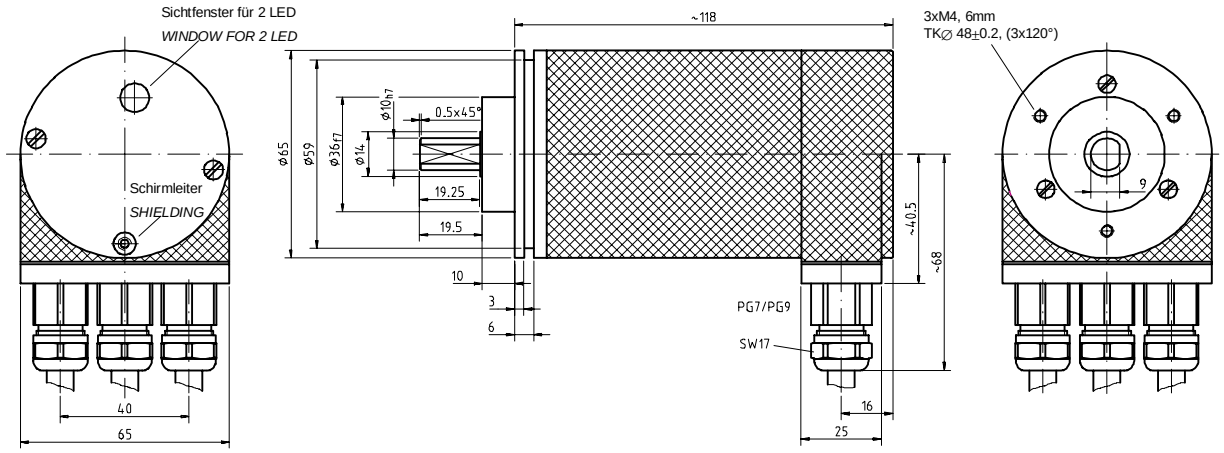
Absolute-Encoder CE-65-M PROFIBUS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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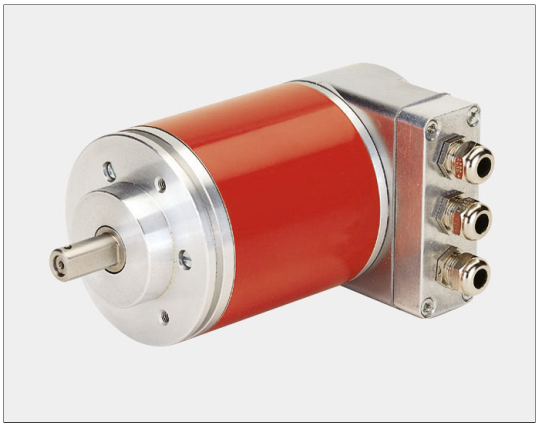
Absolute-Encoder CE-65-M PROFIBUS (PNO)



- **Small and Compact**
- **Multi -Turn**
- **Profibus-DP**
- **Programmable via Bus**
- **PROFIBUS - PNO-Profile CLASS2**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	25 Bit
* Steps / Revolution	8192 Steps / Rev
* Measurement Range	16777216 Steps
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary
Data Protocol	PROFIBUS-DP Protocol DIN E 19 245 T.3
Standard Baud Rate	9.6 kbaud to 12 Mbaud
Option	3 to 12 Mbaud
* Station Address	3 - 99
Inputs	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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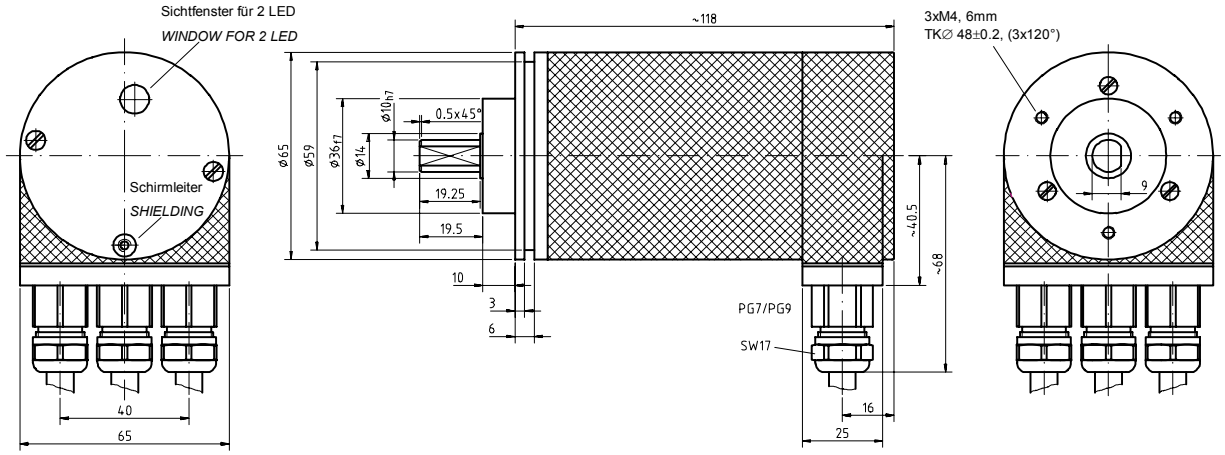
Absolute-Encoder CE-65-M PROFIBUS (PNO)

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	End Cap with 3 X PG 9 Radial

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
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Absolute-Encoder CE-65-M FIPIO

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VIA BUS

- **Small and Compact**
- **Multi -Turn**
- **FIPIO Interface**
- **Programmable via FIPIO**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	25 Bit
* Steps / Revolution	8192 Steps / Rev
* Revolutions	4096 Steps
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary
Data Protocol	FIPIO /FSD C8
Standard Baud Rate	following FIPIO standards
* Station Address	1 - 127
Programmable Parameters	
* Preset	Adjust absolute position to a given set value (i.e. zero set)
* V/R	Count Direction
* Overspeed	Speed limit
* UP/DOWN	
* Limit Switches	
* Cams	electronic Cams
* Tool Changer	
* Measuring length in steps	
* Measuring length in revolutions	
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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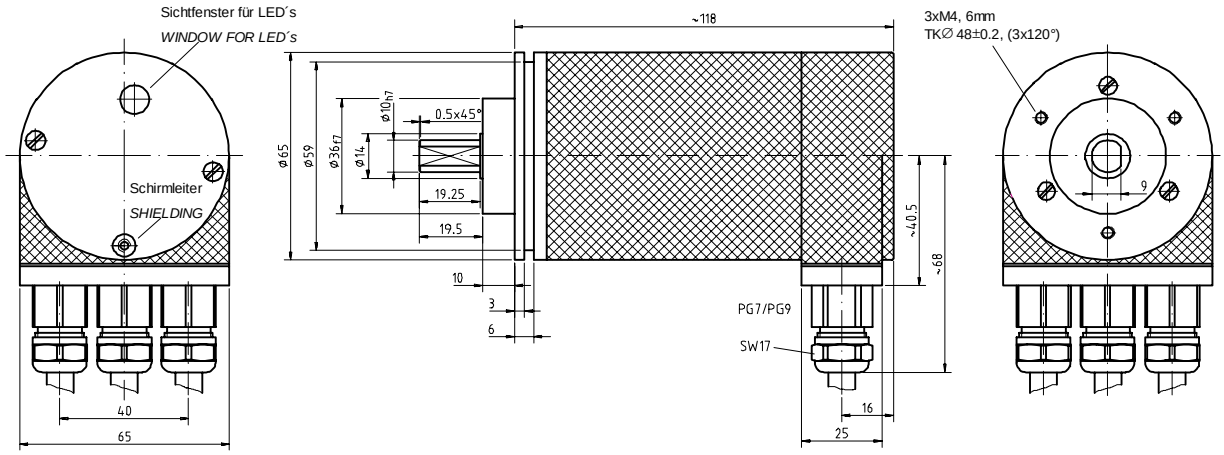
Absolute-Encoder CE-65-M FIPIO

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	End Cap with 3 X PG 9 Radial

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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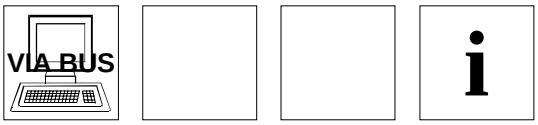
Absolute-Encoder CE-65-M LWL



- **Small and Compact**
- **Multi - Turn**
- **LWL Interface**
- **Programmable via LWL Ring**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via LWL-Ring	in connection with • PC Compatible Central-Module • SIMATIC-S5 Compatible Central-Module • VMEbus • SMP-Bus
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with Plastic Cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Points	max. 254
Programmable Parameters via IBS bus	
Count Direction	
Number of Counts per Length	
Preset Value 1,2	
Adjust Absolute Value	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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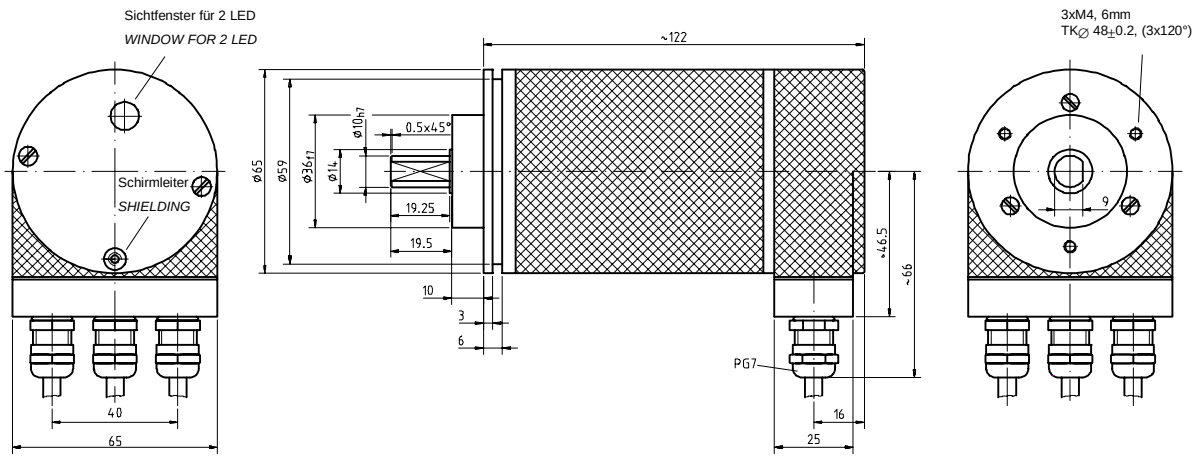
Absolute-Encoder CE-65-M LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED DISK DIN 6797-A 4.3-FST.

Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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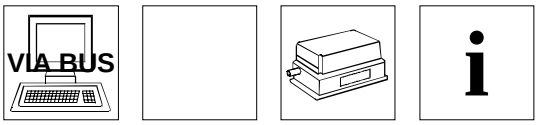
Absolute-Encoder CE-65-M SUCONET K1



- **Small and Compact**
- **Multi-Turn**
- **SUCONET-Fieldbus-Interface**
- **Programmable via SUCONET-Bus**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programming via Bus	Fieldbus Connection Suconet K1
Output Code	Binary
Data Protocol	2-wire, RS485 (Master-Slave)
Baud Rate	187,5 kbaud
Maximum Stations	max. 31, adjustable by DIP-switches
User Modules	PS 3, PS 306, PS 316, *PS 4-100, *PS 4-200, *PS 416
Programmable Parameters	
Count Direction	
Steps (Measuring Length)	
Scale Factor	
Preset Value (Adjust absolute position to a given set value (i.e. zero set)	
Pin Configuration	Upon Request

* only if compatible to PS 3

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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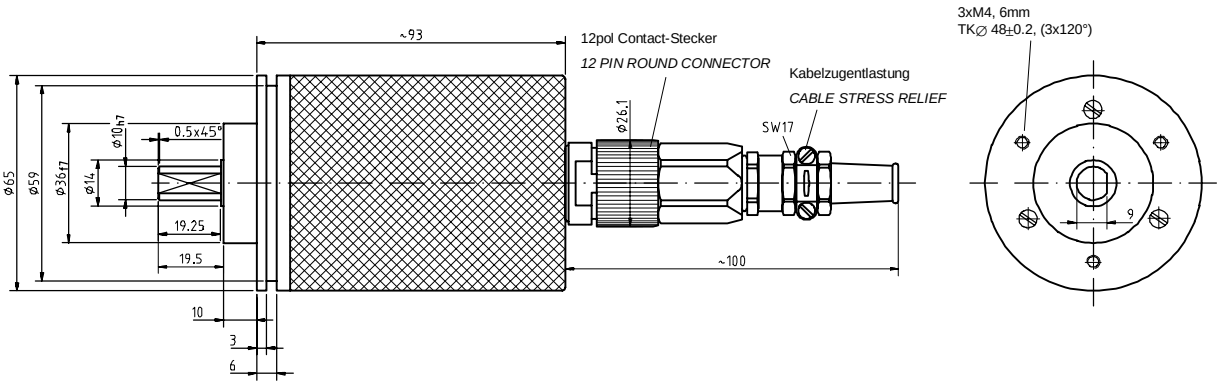
Absolute-Encoder CE-65-M SUCONET K1

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector

Dimensional Drawing



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Absolute-Encoder CE-100-M P

- **Robust**
- **Multi -Turn**
- **Parallel Output**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Preset 2	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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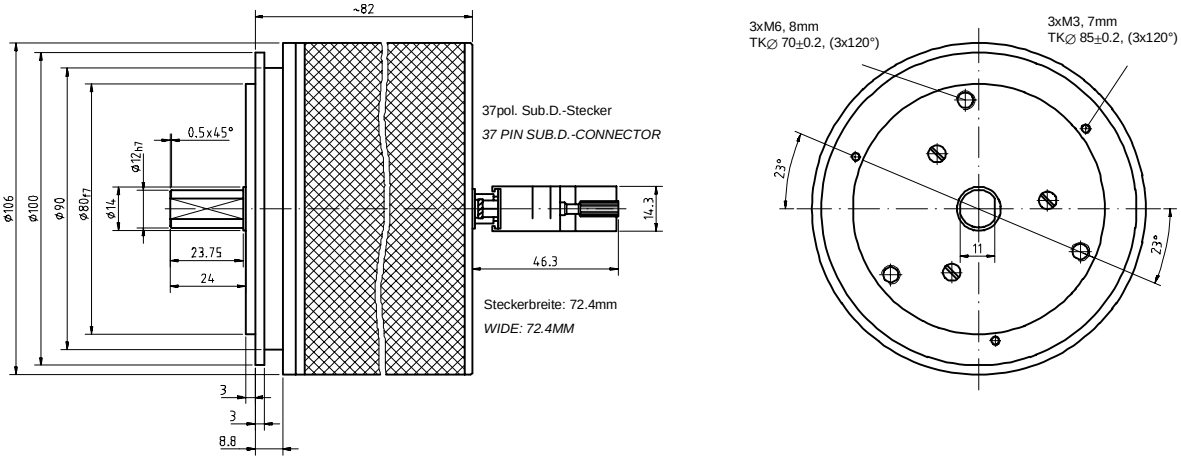
Absolute-Encoder CE-100-M P

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	37 pin SUB-D Connector

Dimensional Drawing



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Absolute-Encoder CE-100-M CAM

- **Robust**
- **Multi -Turn**
- **Discrete CAM Outputs (32 Outputs)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code	CAMS (Dynamic CAM Anticipation)
* Number of Discrete Outputs	Maximum 32
* Number of CAMS per Discrete Output	Maximum 4
Output Options	Push-Pull, Open Collector, Open Emitter
Maximum Current	100 mA / Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters ..... **Note**
Cam Programming is Only Possible to 16 Bit

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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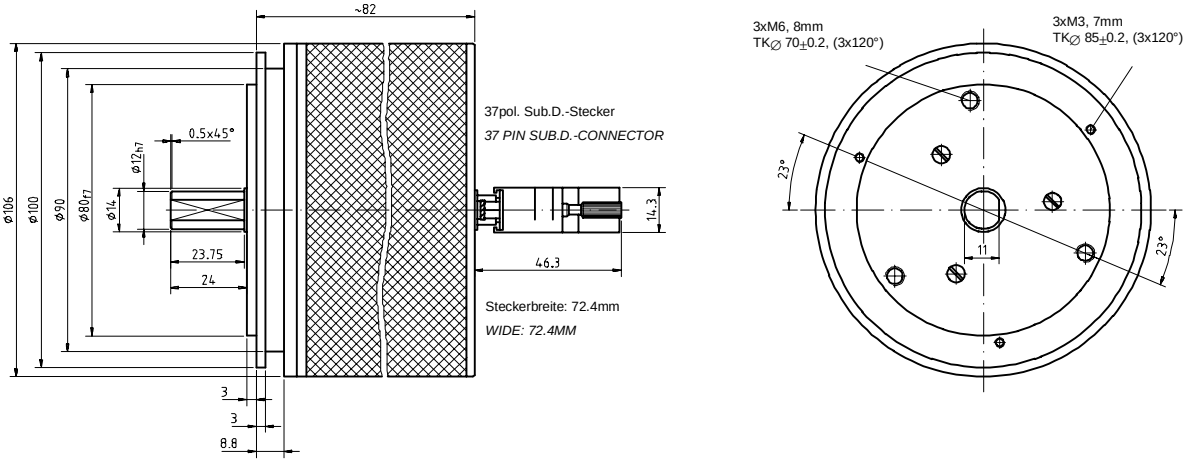
Absolute-Encoder CE-100-M CAM

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	37 pin SUB-D Connector

Dimensional Drawing



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Absolute-Encoder CE-100-M SSI

- **Robust**
- **Multi -Turn**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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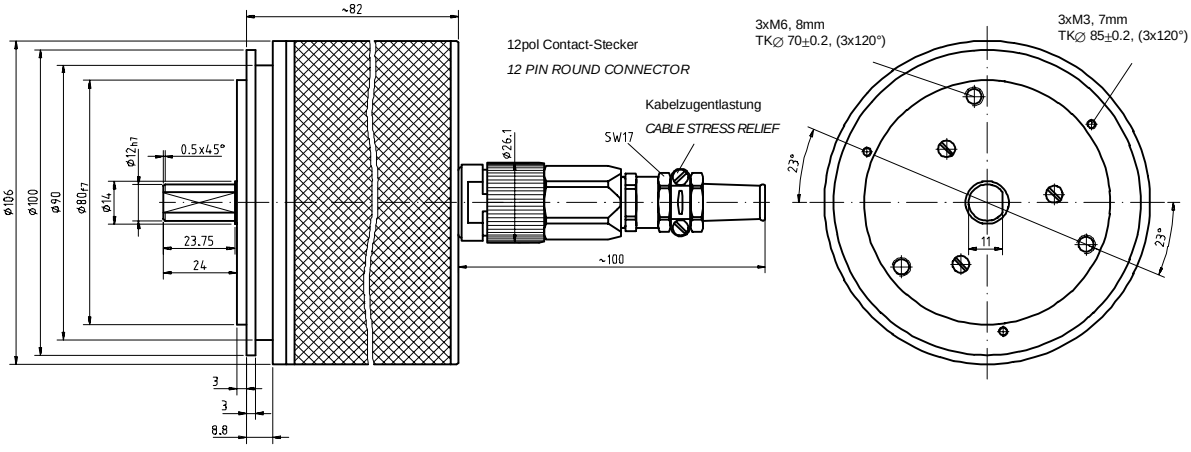
Absolute-Encoder CE-100-M SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



Absolute-Encoder CE-100-M ASI

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- **Robust**
- **Multi -Turn**
- **Not Programmable**
- **ASI (Asynchronous Serial Interface)**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray
Baud Rate	4800 Baud, Other Baud Rates by Request
Data Output	RS422 (2 wire) Short Circuit and Reverse Polarity Protected
Communication Format	1 Start Bit, 7 Data Bits, 1 Parity Bit, 2 Stop Bits
Data Format	ASCII
Standard Communication	ASCII, 6 Character + CR
Baud Rate	4800 Baud
Other Communication Formats	Upon Request

Input Options

Forward / Reverse	Change direction of count
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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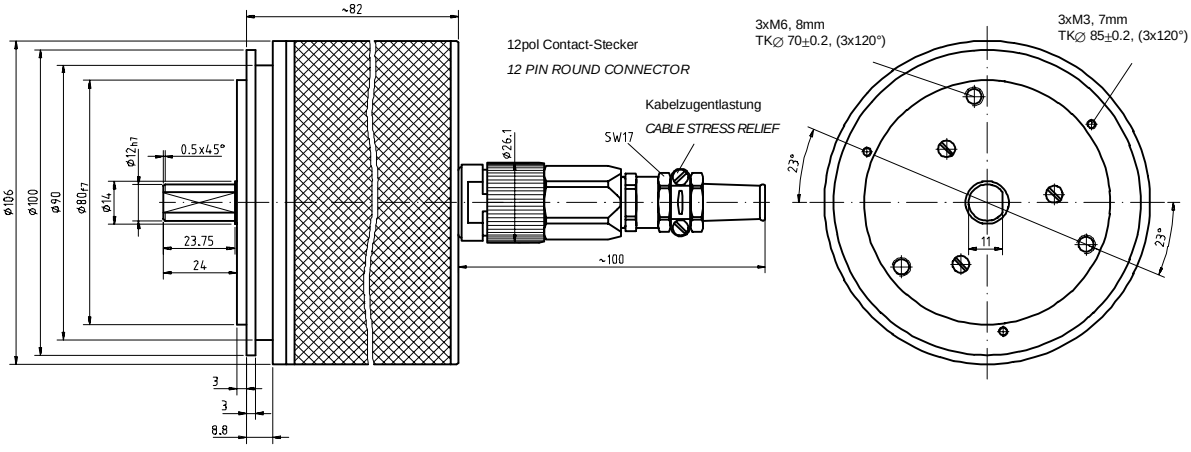
Absolute-Encoder CE-100-M ASI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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Absolute-Encoder CE-100-M ISI

- **Robust**
- **Multi -Turn**
- **ISI (Incremental Serial Interface)**
- **Absolute Incremental Encoder**
- **Programmable Encoder Parameters**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
* Steps / Revolution	8192 Steps / Rev
* Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to 124 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used

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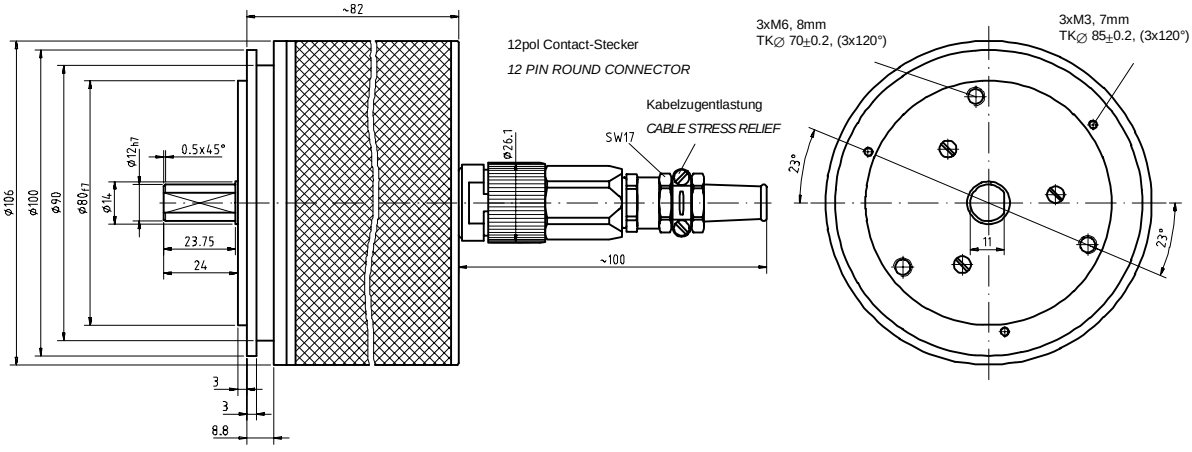
Absolute-Encoder CE-100-M ISI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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Absolute-Encoder CE-100-M IBS

- **Robust**
- **Multi -Turn**
- **Interbus-S**
- **Programmable via Interbus-S**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable Over Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes (programmable)	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Programmable Parameters (via IBS bus)	
Direction of Count	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Output Code	
Inputs	
Preset 1	Adjust absolute position to a given set value (i.e. zero set)
Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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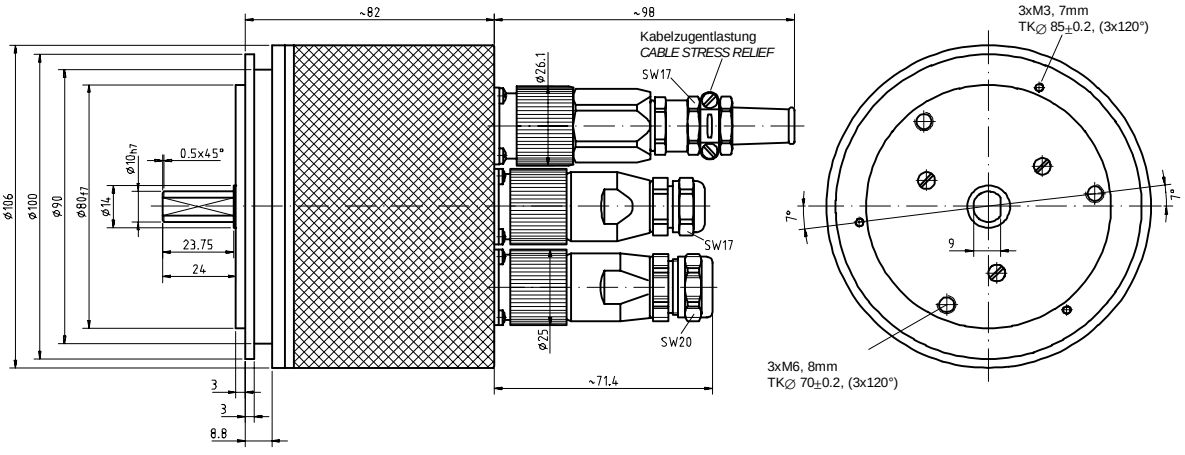
Absolute-Encoder CE-100-M IBS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X 9 Pin Contact Connector - Axial
	1 X 12 Pin Contact Connector - Axial

Dimensional Drawing



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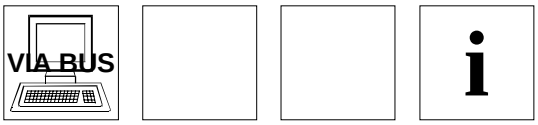
Absolute-Encoder CE-100-M LWL



- **Robust**
- **Multi - Turn**
- **LWL Interface**
- **Programmable via LWL Ring**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Programmable via LWL-Ring	in connection with
	PC Compatible Central-Module
	SIMATIC-S5 Compatible Central-Module
	VMEbus
	SMP-Bus
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Stations	254
Programmable Parameters via IBS bus	
Count Direction	
Number of Counts per Length	
Preset Value 1,2	
Adjust Absolute Value	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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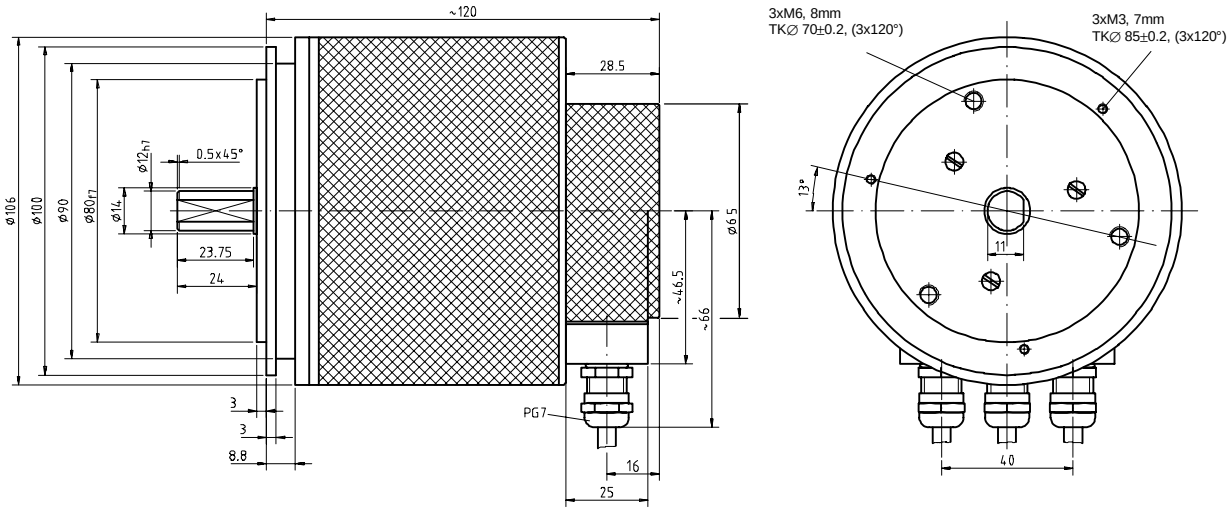
Absolute-Encoder CE-100-M LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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Absolute-Encoder ZE-115-M PROFIBUS (PNO)

- **Sturdy Design**
- **For Use in Heavy Machine Industries**
- **Profibus-DP / SSI - Interface**
- **Parametrizable via PROFIBUS, according to PNO-profile CLASS2**
- **Integrated in Special TR Aluminium-Profile Housing**

5

Electrical Data

Max. Encoder Capacity	24 bit
* Steps / Revolution	1 - 4096
* Number of Revolutions	max. 4096 revolutions
Supply Voltage	11-27 VDC
Max. Current Consumption	< 350 mA at 11 V DC, < 150 mA at 27 V DC
PROFIBUS-DP Data Interface	
Output Code	Binary
Data Transmission	PROFIBUS-DP protocol according to DIN E 19 245 T.3
Standard Baud Rates	9.6 kbaud – 12 Mbaud
* Station Addresses	3 - 99, adjustable via rotary switches
Special Features	Parameter programming according to PNO Profile Class 2
SSI Data Interface	
Structure	Data: 2-wire acc. to EIA RS422, Pulses: Opto-coupler input
Cable Type	Twisted-pair, well screened with wave impedance of 100 Ω to 130 Ω. Min. cross section 0.25mm² with a capacity of approx. 60 pF/m.
Length of cable	up to 250 m at 125 kHz, up to 50 m at 1 MHz
Transmission rate	80 kHz - 1MHz
Transmission procedure	synchronous-serial, 24 bit left-justified
Output code	programmable (Binary, Gray)
Inputs	
* Preset 1 and 2	Electronic adjustment
Switching level	1-level > +8V, 0-level > +2V, up to ±35V, 5kΩ
Pin Configuration	Upon request
* Programmable Parameter	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +70°C (-4° to 158° F)
Storage Temperature	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class (TR Double Housing)	IP 67 (DIN 40 050)
* Protection class of housing is dependent proper cable size and installation.	

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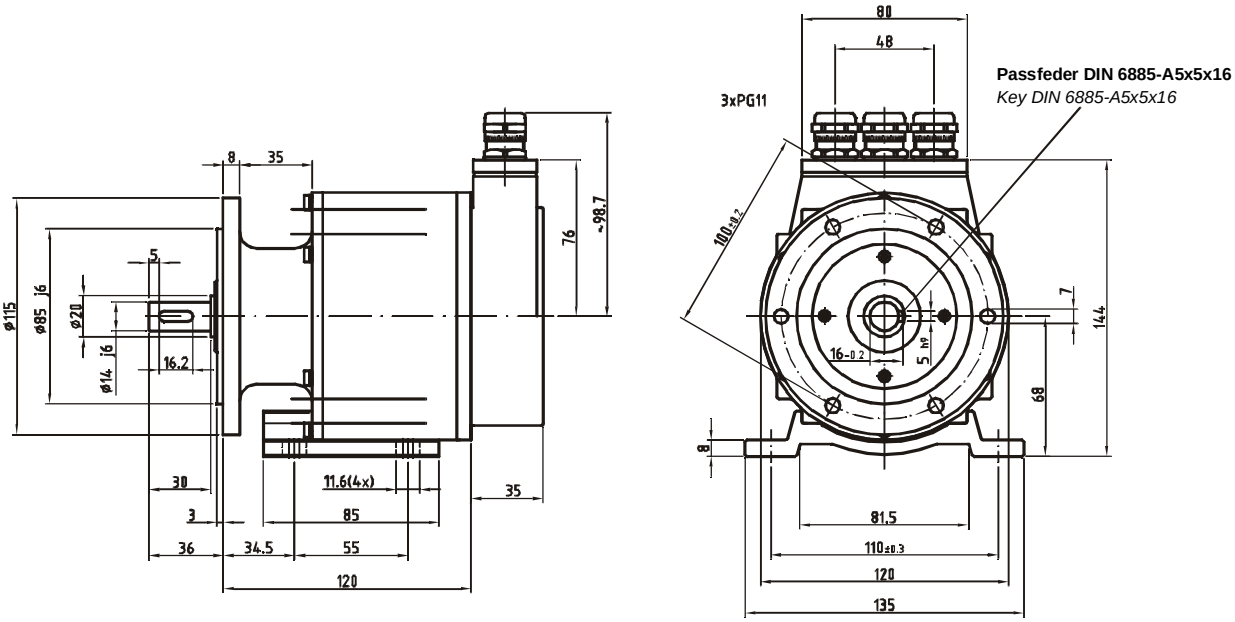
Absolute-Encoder ZE-115-M PROFIBUS (PNO)

Mechanical Data

Maximum Rotational Speed	3600 RPM
Maximum Load on Shaft	100 N Axial, 150 N Radial (at end of shaft)
Lifetime on Bearings	2.8 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	60 N Axial, 90 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	6.0 kg (13.2 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Vibration	According to DIN 40 046, Part 8
Form of vibration	Sine
Frequency range	50 Hz to 2000 Hz
Acceleration	≤ 245 m/s² (25g) peak
Axes	X, Y and Z axis
Duration	2 Hours / Axis

Dimensional Drawing



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Absolute-Encoder ZE-115-M ISI

- **Sturdy Design**
- **For Use in Heavy Machine Industries**
- **ISI - Interface (incremental serial)**
- **Programmable Encoder Parameters**
- **Integrated in Special**
  TR Aluminium-Profile Housing

5

Electrical Data

Max. Encoder Capacity	24 bit
* Steps / Revolution	1 - 4096
* Number of Revolutions	max. 4096 revolutions
Supply Voltage	11-27 VDC
Max. Current Consumption	< 350 mA at 11 V DC, < 150 mA at 27 V DC
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	1-level > +8V, 0-level > +2V, up to ±35V, 5 kOhm
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to approx. 115 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +70°C (-4° to 158° F)
Storage Temperature	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class (TR Double Housing)	IP 67 (DIN 40 050)

* Protection class of housing is dependent proper cable size and installation.

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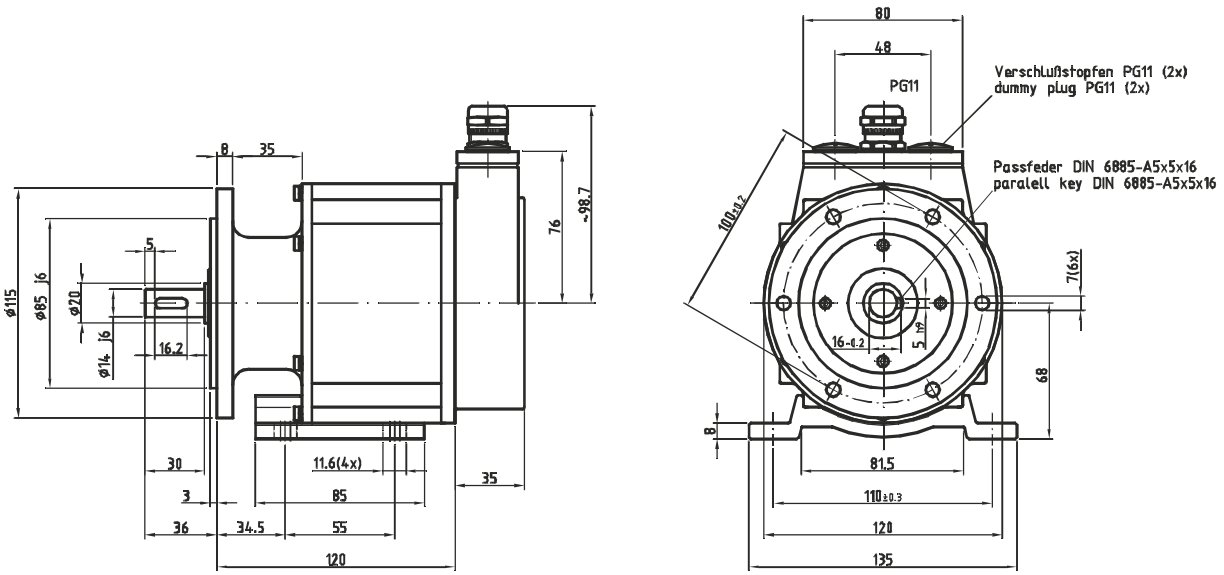
Mechanical Data

Mechanically permissible speed:	3600 RPM
Permissible shaft loading:	100 N axial, 150 N radial (at end of shaft)
Minimum bearing lifetime:	2,8 x 10^{10} revolutions at:
- Operating speed:	3000 RPM
- Shaft loading:	60 N axial, 90 N radial (at end of shaft)
- Operating temperature:	60°C
Weight	approx. 6.0 kg (13.2 lb.)
Max. angular acceleration:	≤ 10^4 rad/s²
Vibration	According to DIN IEC 68-2, Part 6
Form of vibration	sine
Frequency range	50 Hz to 2000 Hz
Acceleration	≤ 245 m/s² (25g) peak
Axes	X-, Y- and Z-axis
Duration	2 h/axis

Dimensional Drawing



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Absolute-Encoder ZE-115-M SSI

- **Sturdy Design**
- **For Use in Heavy Machine Industries**
- **SSI - Interface (synchronous serial)**
- **Programmable Encoder Parameters**
- **Integrated in Special**
  TR Aluminium-Profile Housing

Electrical Data

Max. Encoder Capacity	24 bit
* Steps / Revolution	1 - 4096
* Number of Revolutions	max. 4096 revolutions
Supply Voltage	11-27 VDC
Max. Current Consumption	< 350 mA at 11 V DC, < 150 mA at 27 V DC
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	80 kHz – 820 kHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.
Data Output	RS422 (2 wire)
* Output Format	Tree Format, with Repetition, manual
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	1-level > +8V, 0-level > +2V, up to ±35V, 5 kOhm

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +70°C (-4° to 158° F)
Storage Temperature	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class (TR Double Housing)	IP 67 (DIN 40 050)

* Protection class of housing is dependent proper cable size and installation.

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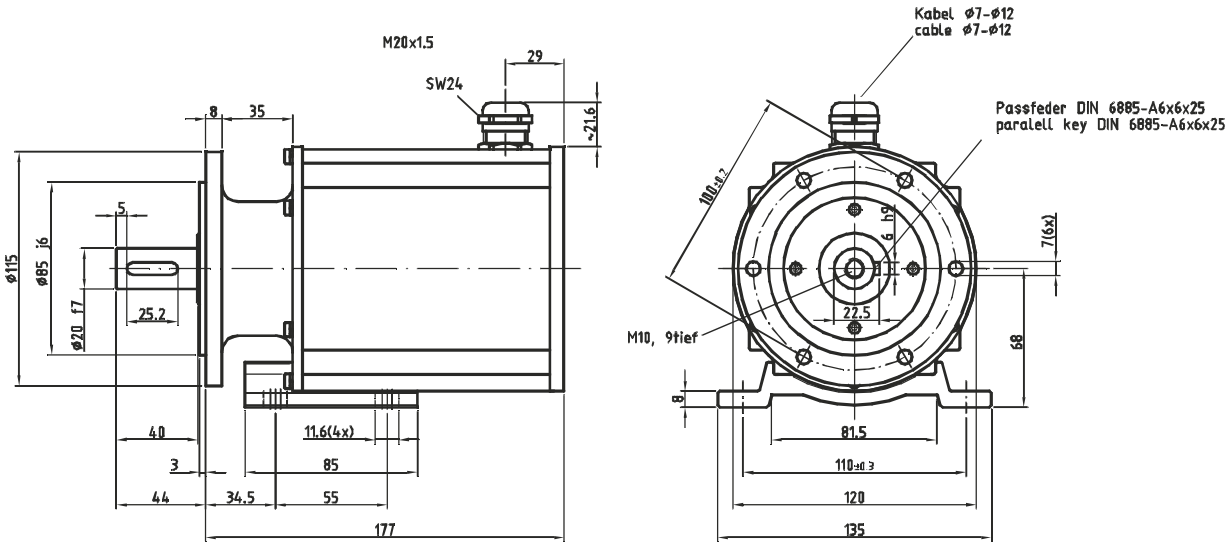
Mechanical Data

Mechanically permissible speed:	3600 RPM
Permissible shaft loading:	100 N axial, 150 N radial (at end of shaft)
Minimum bearing lifetime:	2,8 x 10^{10} revolutions at:
- Operating speed:	3000 RPM
- Shaft loading:	60 N axial, 90 N radial (at end of shaft)
- Operating temperature:	60°C
Weight	approx. 6.0 kg (13.2 lb.)
Max. angular acceleration:	≤ 10^4 rad/s²
Vibration	According to DIN IEC 68-2, Part 6
Form of vibration	sine
Frequency range	50 Hz to 2000 Hz
Acceleration	≤ 245 m/s² (25g) peak
Axes	X-, Y- and Z-axis
Duration	2 h/axis

Dimensional Drawing



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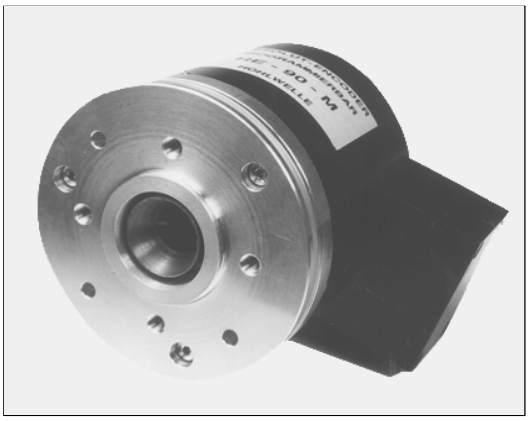
Absolute-Encoder CH-90-M SSI



- **Robust Hollow Shaft Encoder**
- **Multi-Turn**
- **SSI (Synchronous Serial Interface)**
- **Programmable Encoder Parameters**
- **Directly Couples to Shaft**
- **No Coupler Required**

Electrical Data

Encoder Capacity	max. 22 Bit
* Steps / Revolution	1024 Steps / Rev.
* Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Programming via RS485	PT-100N Programming Terminal
* Output Code (programmable)	Binary, Gray
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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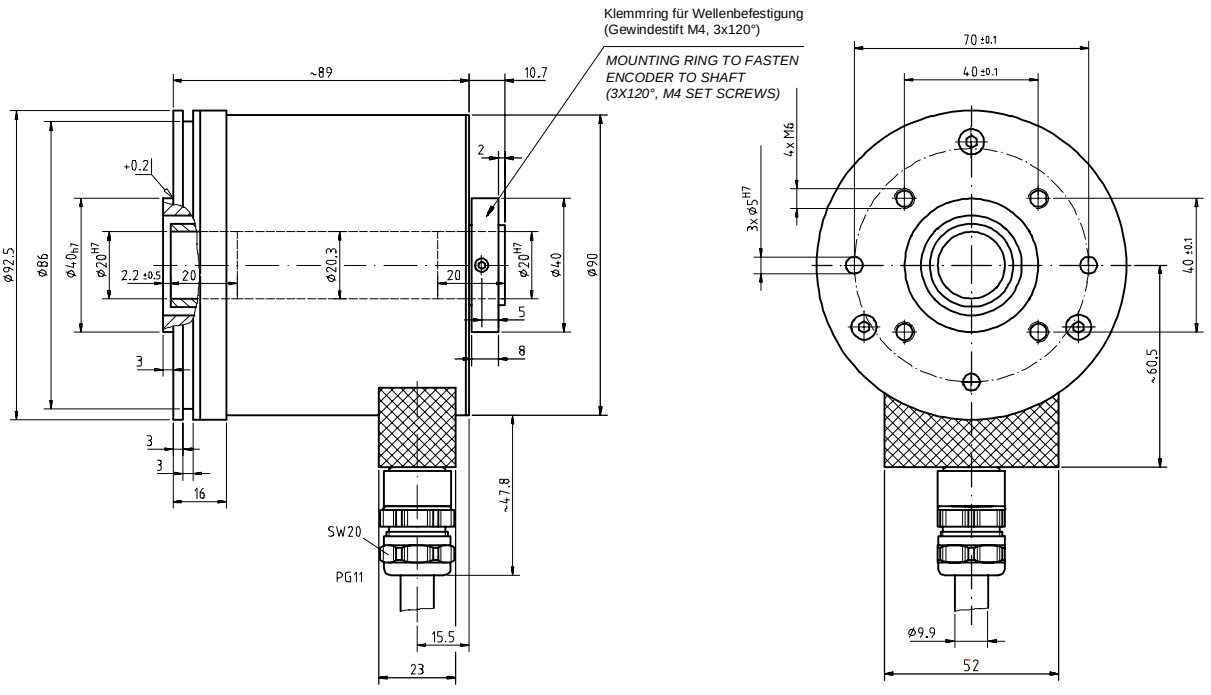
Absolute-Encoder CH-90-M SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Operational Speed	3000 RPM
Maximum Load on Shaft	40 N axial
Weight	2.0 kg (4.4 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Startup Momentum at 20°C (68°F)	< 10 Ncm
Maximum Parallel Offset (Shaft/Flange)	< 1 mm
Vibration (Sinus 50-2000 Hz)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
* Standard Connector	PG 11 radial

Dimensional Drawing



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Absolute-Encoder HE-65-M P

- **Small and Compact**
- **Multi -Turn**
- **Parallel Output**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, Gray
Output Options	Push-Pull, Open Collector, Open Emitter (Max. 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
Forward / Reverse	Change direction of count
Latch	Freezes data lines
Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Ermitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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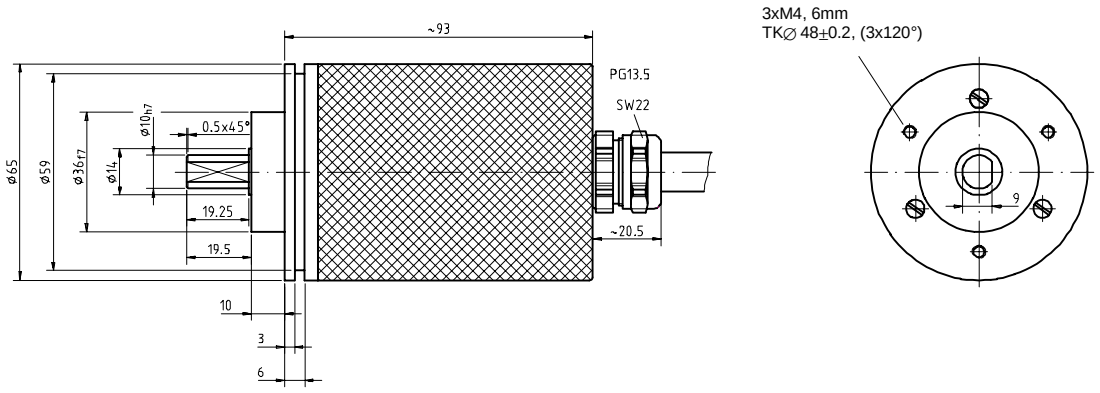
Absolute-Encoder HE-65-M P

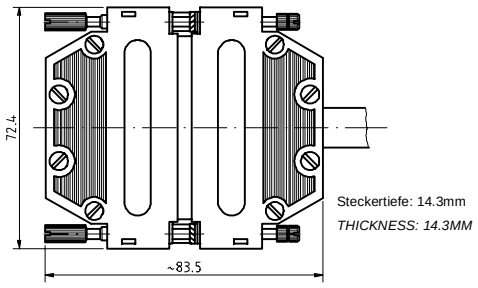
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	PG Axial with 0.5 m cable with 37 pin SUB-D Connector

Dimensional Drawing



37pol. Sub.D.-Buchse + Stecker
37 PIN. SUB.D.-SOCKET + CONNECTOR



Steckertiefe: 14.3mm
THICKNESS: 14.3MM

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Absolute-Encoder HE-65-M SSI

- **Small and Compact**
- **Multi -Turn**
- **SSI (Synchronous Serial Interface)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
Output Format	Standard, Tree Format, with Repetition
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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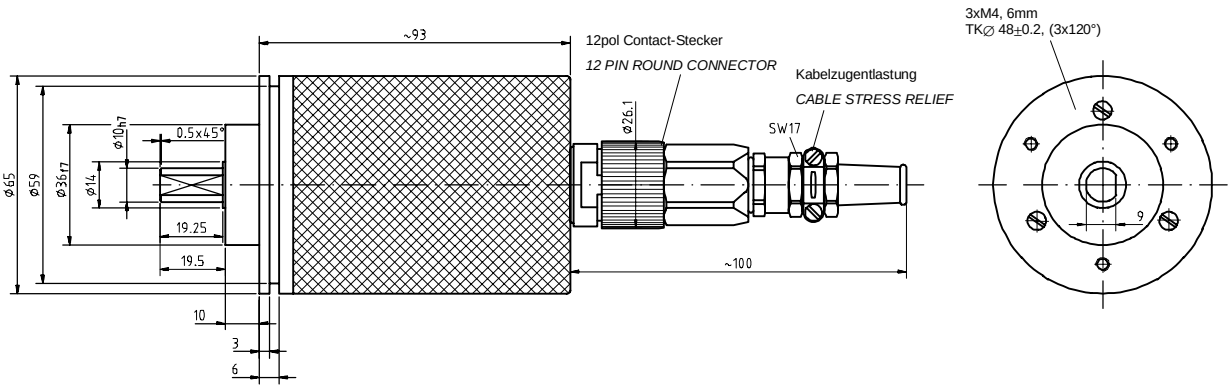
Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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Absolute-Encoder HE-65-M IBS

- **Small and Compact**
- **Multi -Turn**
- **Interbus-S**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used

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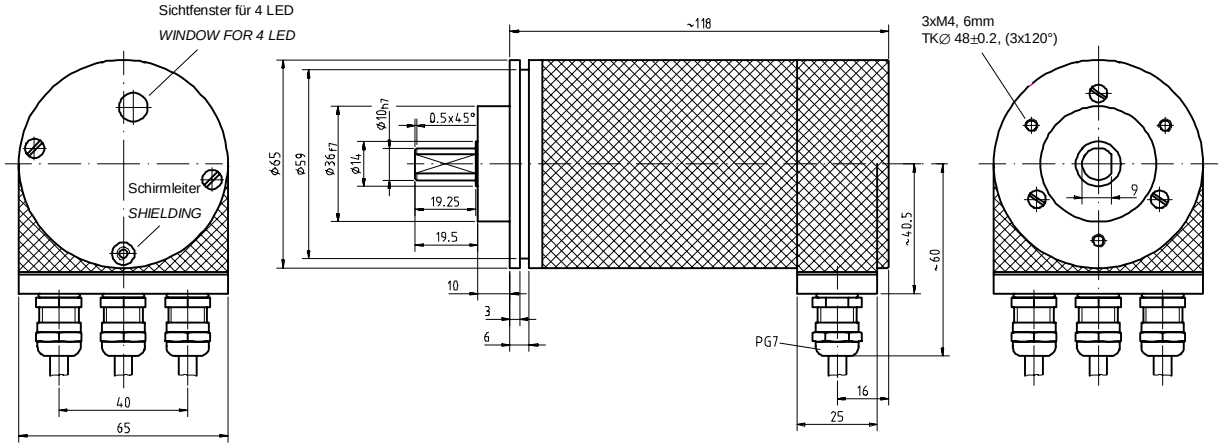
Absolute-Encoder HE-65-M IBS

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 X PG 7 Radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder HE-65-M CAN

- **Small and Compact**
- **Multi - Turn**
- **CAN-Bus Interface Device-Net-Profile**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898)
Other Interfaces	On Request
Output Code	Binary (standard), * Gray (programmable)
Baud Rate (adjustable by switch)	125 kbaud, 250 kbaud, 500 kbaud
Count Direction	Increase CW (Standard), * Decrease CW (programmable)
Pin Configuration	Upon Request

* If power is lost, these parameters will reset to their default settings.

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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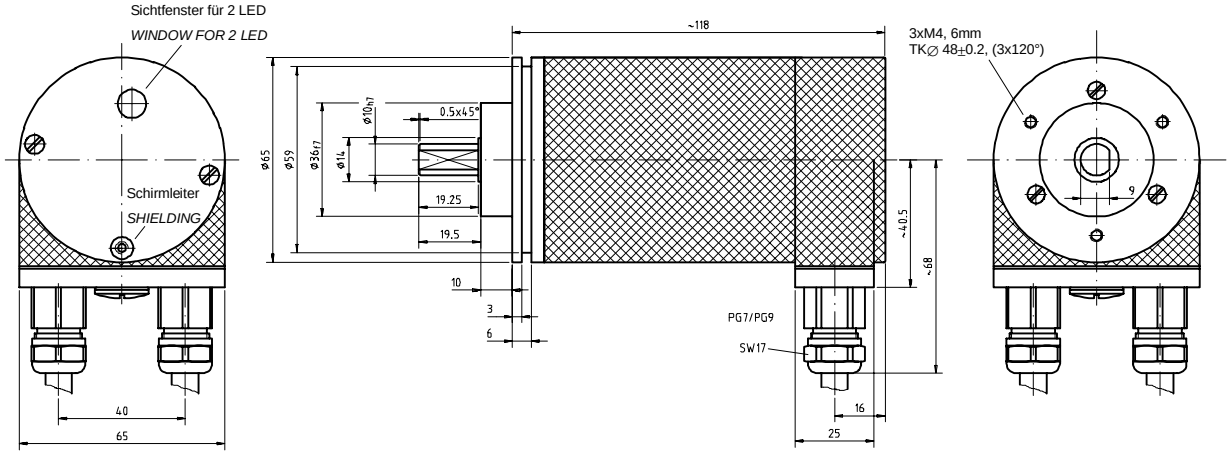
Absolute-Encoder HE-65-M CAN

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 x PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder HE-65-M CANopen

- **Small and Compact**
- **Multi-Turn**
- **CAN-Bus-Interface (CANopen-Profil)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 24 Bit
Steps / Revolution	4096 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898)
Data Protocol	CAN 2.0 A, CANopen Device Profil for Encoder CID DS-406 V1.0
Output Code	Binary
Baud Rate (adjustable by switch)	20 kbaud, line length up to 2500 m 125 kbaud, line length up to 500 m 500 kbaud, line length up to 100 m 1 Mbaud, line length up to 25 m
Size of encoder addresses	0 to 64, adjustable by DIP-switches)
Terminating resistor	123Ω, switchable
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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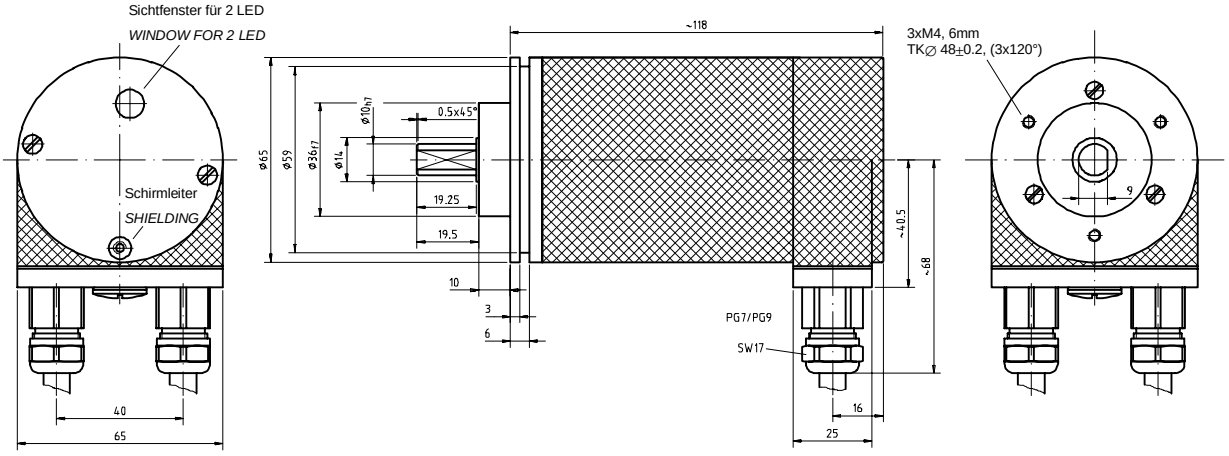
Absolute-Encoder HE-65-M CANopen

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED
DISK DIN 6797-A 4.3-FST.

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Absolute-Encoder HE-65-M LWL

- **Small and Compact**
- **Multi - Turn**
- **LWL Interface**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary / Gray
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Stations	max. 254
Inputs	
Forward / Reverse	Change count direction
Logic Levels	“0“ < + 2 VDC, “1“ > + 8 V DC, max. 30 VDC
Pin Configuration	On Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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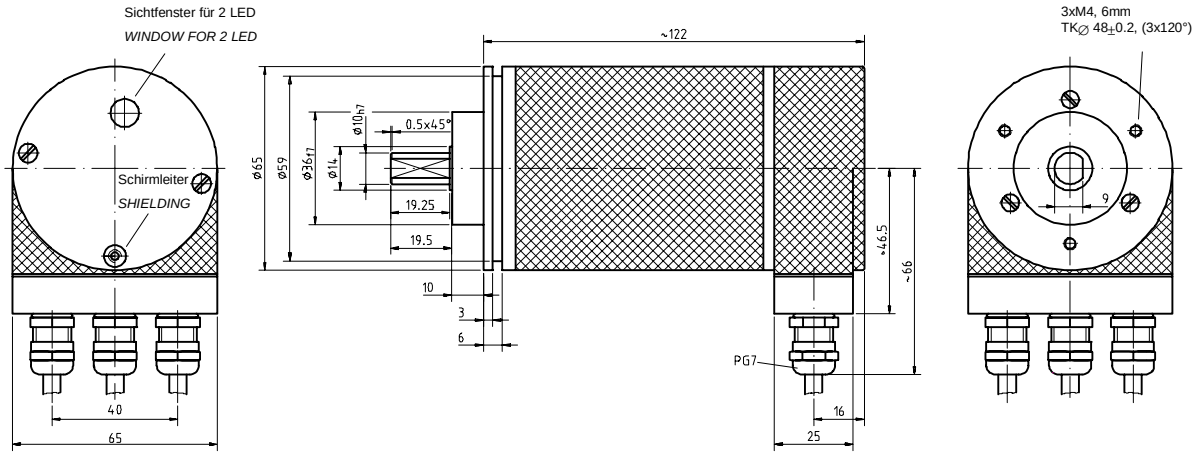
Absolute-Encoder HE-65-M LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN 6797-A
4.3-FSt unterlegt.

FOR SHIELDING:
USE METRIC SCREW M4X8 WITH FORKED TERMINAL.
FOR GOOD CONTACT TO HOUSING USE A STUDDED DISK DIN 6797-A 4.3-FST.

Biegeradius LWL-Kabel > 30mm

BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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Absolute-Encoder HE-65-M SLIN

- **Small and Compact**
- **Multi-Turn**
- **SLIN-Bus-Interface**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 24 Bit
Steps / Revolution	4096 Steps / Rev
Number of Revolutions	4096 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	< 4 Watt
Data Protocol	
Bus Structure	linear, RS485 (2-wire), galvanically isolated
Communication Format	1 Startbit, 7 Datenbit, 1 Controlbit, 1 Paritybit, 1 Stopbit
Transmission Rate	115,2 kBaud
Transmission Method	asynchronous and half duplex, according to SLIN-Protocol
Stations	max. 8, Encoder addressing via jumper at the connector
Saving	Parity, Checksum
Bus Access	Master/Slave principle
Inputs	
Ident 0	Encoder address 2^0, jumper to GND
Ident 1	Encoder address 2^1, jumper to GND
Ident 2	Encoder address 2^2, jumper to GND
Bus (+5V)	Pull-Up-Ressistor of Bus (+5V) to RS485+
Bus (GND)	Pull-Down-Ressistor of Bus (GND) to RS485-
Bustermination	occurred by the connection of an external resistor Approx.120 Ω between RS485+ and -
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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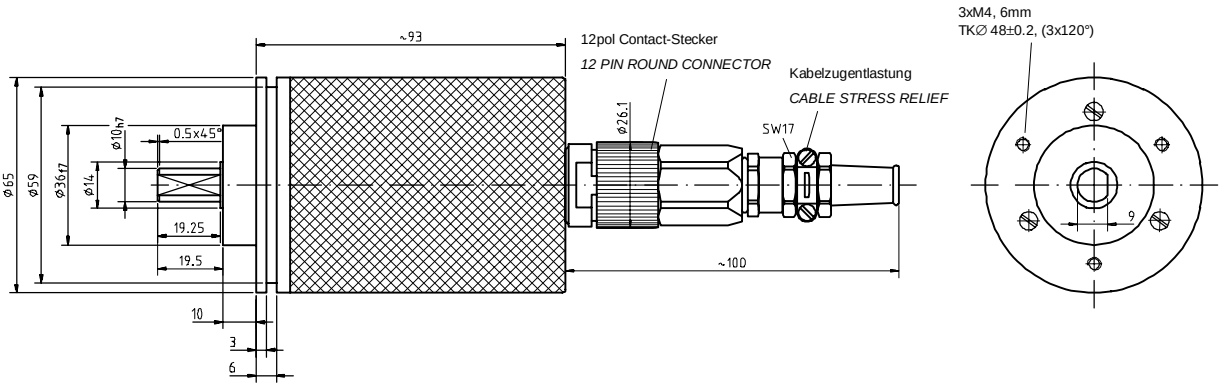
Absolute-Encoder HE-65-M SLIN

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N. Axial, 30 N. Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-2	≤ 1000 m/s^2 (100g)
Standard Connector	12pin Contact Connector

Dimensional Drawing



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Absolute-Encoder HE-100-M P

- **Robust**
- **Multi -Turn**
- **Parallel Output**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	1 to 8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Output Options	Push-Pull, Open Collector, Open Emitter (max. 35 V)
Maximum Current	100 mA / Short Circuit Protected
Input Options	
Forward / Reverse	Change direction of count
Latch	Freezes data lines
Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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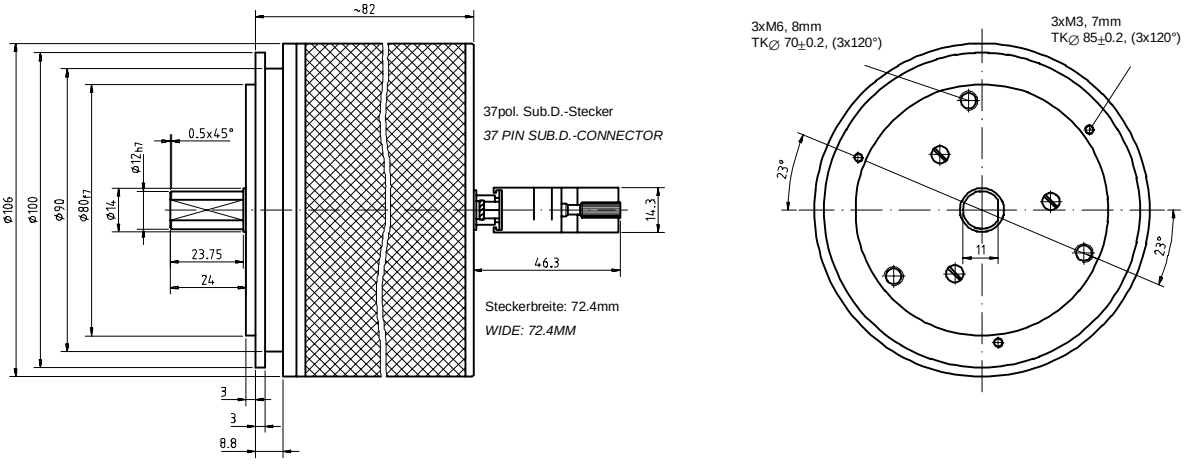
Absolute-Encoder HE-100-M P

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	37 pin SUB-D Connector

Dimensional Drawing



Absolute-Encoder HE-100-M SSI

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- **Robust**
- **Multi -Turn**
- **SSI (Synchronous Serial Interface)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

5

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	95 kHz - 1 MHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
Output Format	Most Significant Bit - Left Justified, Multiple Transmission
Input Options	
Forward / Reverse	Change direction of count
Logic Levels	“0“ < +2 VDC, “1“ > + 8 VDC, max. 30 VDC
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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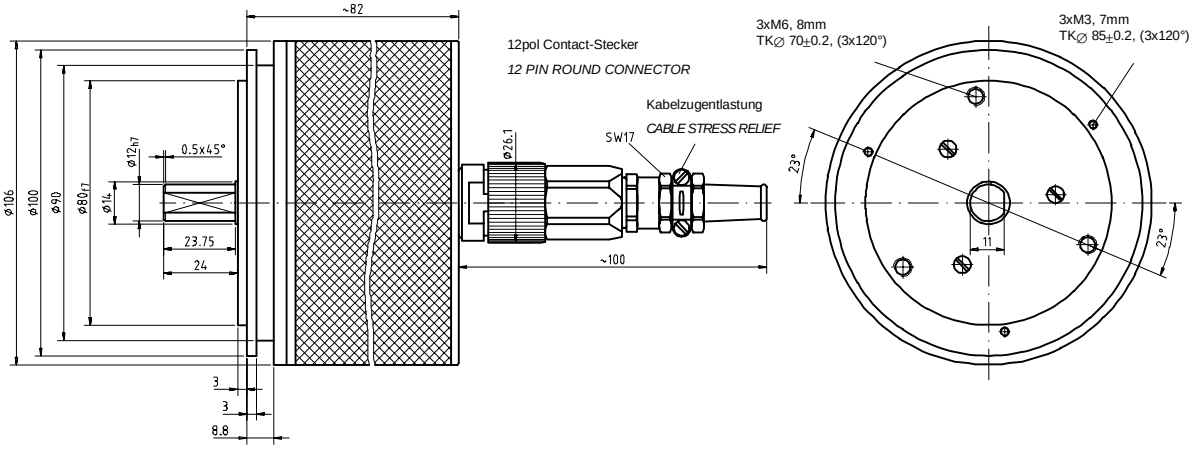
Absolute-Encoder HE-100-M SSI

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

Dimensional Drawing



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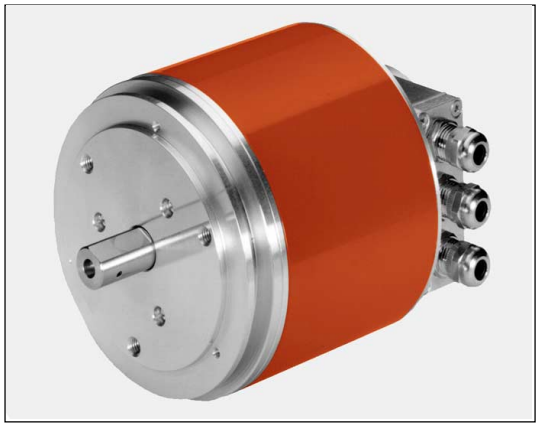
Absolute-Encoder HE-100-M LWL



- **Robust**
- **Multi - Turn**
- **LWL Interface**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**

Electrical Data

Encoder Capacity	max. 25 Bit
Steps / Revolution	8192 Steps / Rev
Number of Revolutions	4096 Revolution
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	< 4 Watt
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with plastic cable (Radius ≥ 30 mm)
Output Code	4 Byte Binary / Gray
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Stations	max. 254
Inputs	
Forward / Reverse	Change count direction
Logic Levels	“0“ < + 2 VDC, “1“ > + 8 V DC, max. 30 VDC
Pin Configuration	On Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0°-60°C (32° to 140° F) / (Optional -20° to +70°C) (-4° to 158° F)
Extended Temperature (Optional)	-30° to +80°C (-22° to 176°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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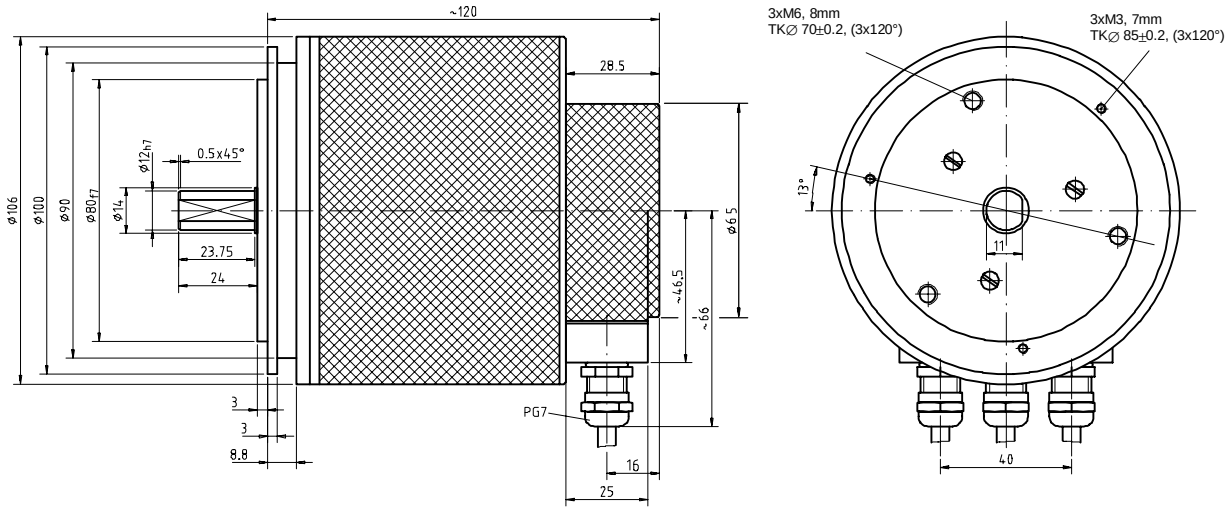
Absolute-Encoder HE-100-M LWL

Mechanical Data

Maximum Rotational Speed	6000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	1.3 kg (2.9 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



Biegeradius LWL-Kabel > 30mm
BENDING RADIUS OF FIBRE-OPTIC CABLE > 30MM

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Absolute-Encoder ZE-65-M P 32 Bit

- **High Resolution ZE-65 Multi-Turn, Resolution max. 16 Bit**
- **Small and Compact**
- **Parallel-Interface**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 32 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 65536
* Number of Revolutions	max.65536 Revolutions
Supply Voltage	11-27 VDC, (5 VDC)
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Special Codes	Upon Request
Output Options	Push-Pull, Open Collector, Open Emitter (Max 35 V)
Number of Outputs	max. 16
Maximum Current	40 mA / Output, Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Preset 2	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < + 2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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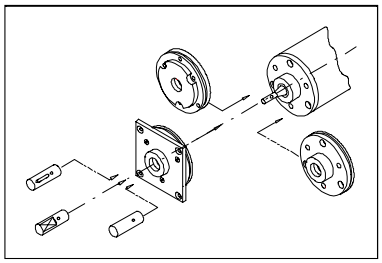
Absolute-Encoder ZE-65-M P 32 Bit

Mechanical Data

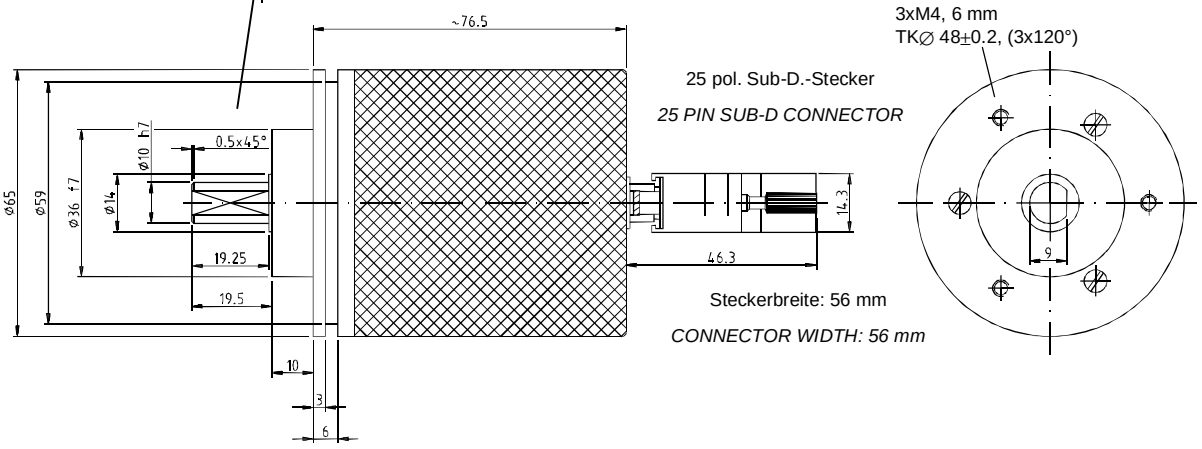
Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Connector	25 pin SUB-D Connector
Other connector types available	Upon Request

Dimensional Drawing



siehe auch Kapitel Zubehör

SEE ALSO CHAPTER ACCESSORIES



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Absolute-Encoder ZE-65-M CAM 32 Bit

- **High Resolution ZE-65 Multi-Turn, Resolution max. 16 Bit**
- **Small and Compact**
- **Discrete CAM Outputs (max. 16 Outputs)**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 32 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 65536
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 VDC, (5 VDC)
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code	CAMS (Dynamic CAM Anticipation)
* Number of Discrete Outputs	Maximum 16
* Number of CAMS per Discrete Output	Maximum 4
Output Options	Push-Pull, Open Collector, Open Ermitter (max.35 VDC)
Maximum Current	40 mA / Output, Short Circuit Protected
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value
* Latch	Freezes data lines
* Bus	For multiplexing many encoders. Only to be used with Open Collector or Open Emitter Output drivers.
Logic Levels	"0" < + 2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 50 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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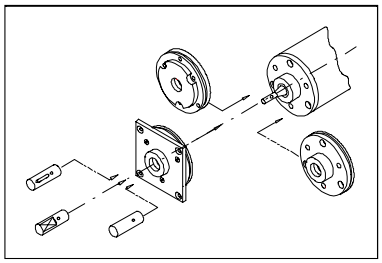
Absolute-Encoder ZE-65-M CAM 32 Bit

Mechanical Data

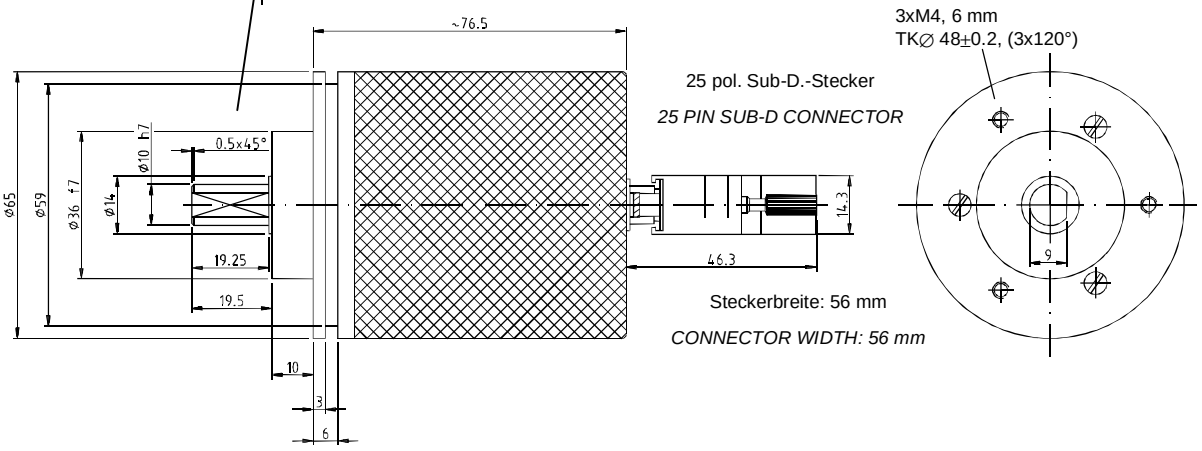
Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Connector	25 pin SUB-D Connector
Other connector types available	Upon Request

Dimensional Drawing



siehe auch Kapitel Zubehör

SEE ALSO CHAPTER ACCESSORIES



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Absolute-Encoder ZE-65-M SSI 33 Bit

- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **SSI (Synchronous Serial Interface)**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	80 kHz – 820 kHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.…
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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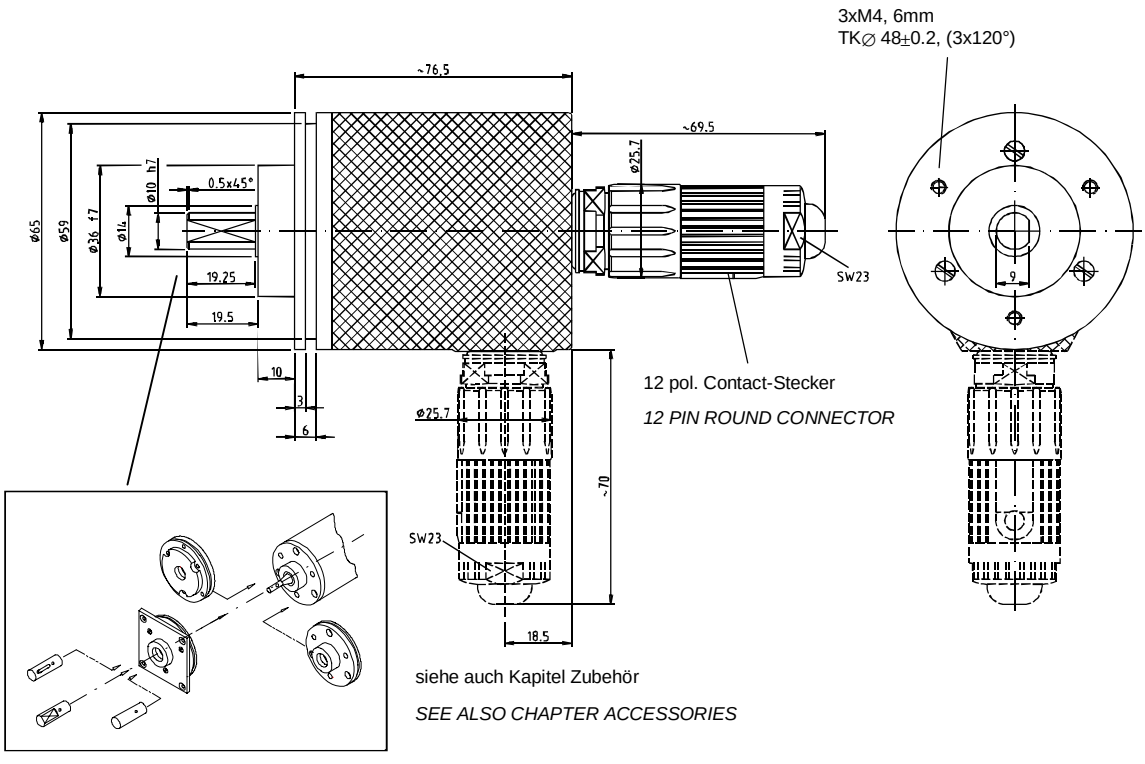
Absolute-Encoder ZE-65-M SSI 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector
Other connector types available	Upon Request

Dimensional Drawing



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SEE ALSO CHAPTER ACCESSORIES

Absolute-Encoder ZE-65-M ASI - 33 Bit

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- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **ASI (Asynchronous Serial Interface)**
- **Not Programmable**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Output Code	Binary, BCD, Gray
Baud Rate	4800 Baud, Other Baud Rates by Request
Data Output	RS422 (2 wire) Short Circuit and Reverse Polarity Protected
Communication Format	1 Start Bit, 7 Data Bits, 1 Parity Bit, 2 Stop Bits
Data Format	ASCII
Standard Communication	ASCII, 6 Character + CR
Baud Rate	4800 Baud
Other Communication Formats	Upon Request

Input Options

Forward / Reverse	Change direction of count
Preset 1	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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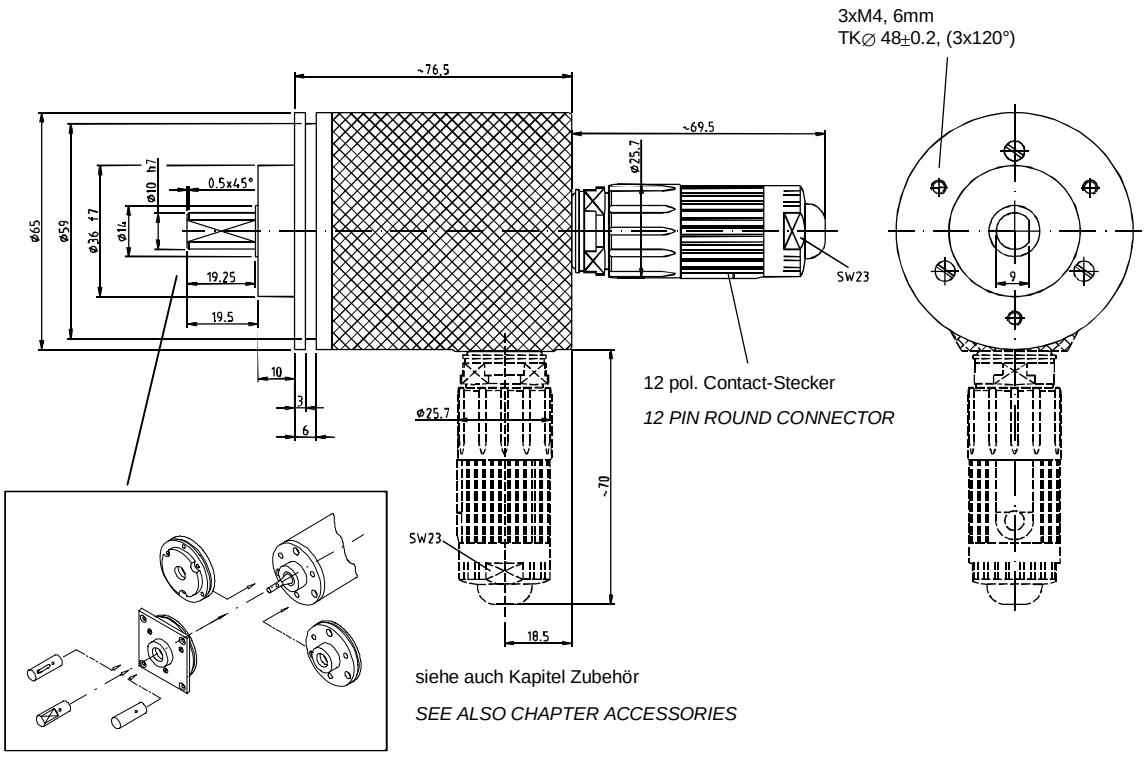
Absolute-Encoder ZE-65-M ASI - 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector
Other connector types available	Upon Request

Dimensional Drawing



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Absolute-Encoder ZE-65-M ISI 33 Bit

- **High Resolution ZE-65 Multi-Turn**
  Resolution max. 17 Bit
- **Small and Compact**
- **ISI (Incremental Serial Interface**
- **Free programmable Encoder-Parameters**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programming via RS485	IBM Compatible EPROG Software, PT100 Programming Terminal
Inputs	
* Load Input	Request for Encoder Position
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC
Output Options	Push-Pull (100 mA), RS422
* Load Output	Verification of Load Request
Channel 1	A
Channel 1 neg.	A neg.
Channel 2	B
Channel 2 neg.	B neg.
* Load Frequency	Programmable (2 kHz to 115 kHz)
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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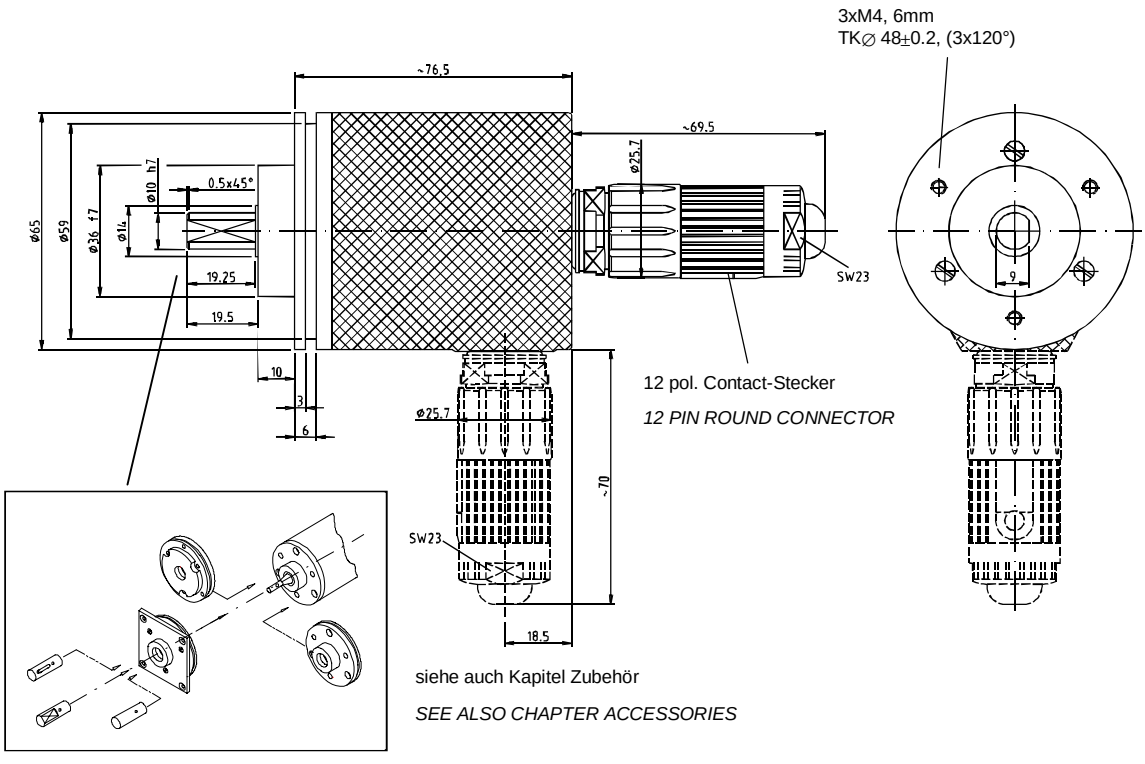
Absolute-Encoder ZE-65-M ISI 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector - Axial

* Other connector types available upon request.

Dimensional Drawing



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Absolute-Encoder ZE-65-M A - 33 Bit

- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **Analog Output with 14 Bit D/A Converter 0-20mA or -10 - to +10V**
- **SSI (synchronous Serial Interface**
- **Free programmable Encoder-Parameters**

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programmable via RS485	PC IBM compatible EPROG Software
* Analog Voltage Output (14 Bit D to A Converter)	-10 to +10V, 0 - 10V
Impedance	min. 500 Ω
* Analog Current Output (14 Bit D to A Converter)	0 - 20 mA
Impedance	max. 500 Ω
SSI Interface	
Clock Input	Opto Coupler Isolated
Clock Frequency	80 kHz - 820 kHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.
Data Output	RS422 (2 wire)
* Output Format	Standard, Tree Format, with Repetition
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Input Options	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Latch	Freezes the analog output data
* Polarity	Changes polarity of analog voltage value
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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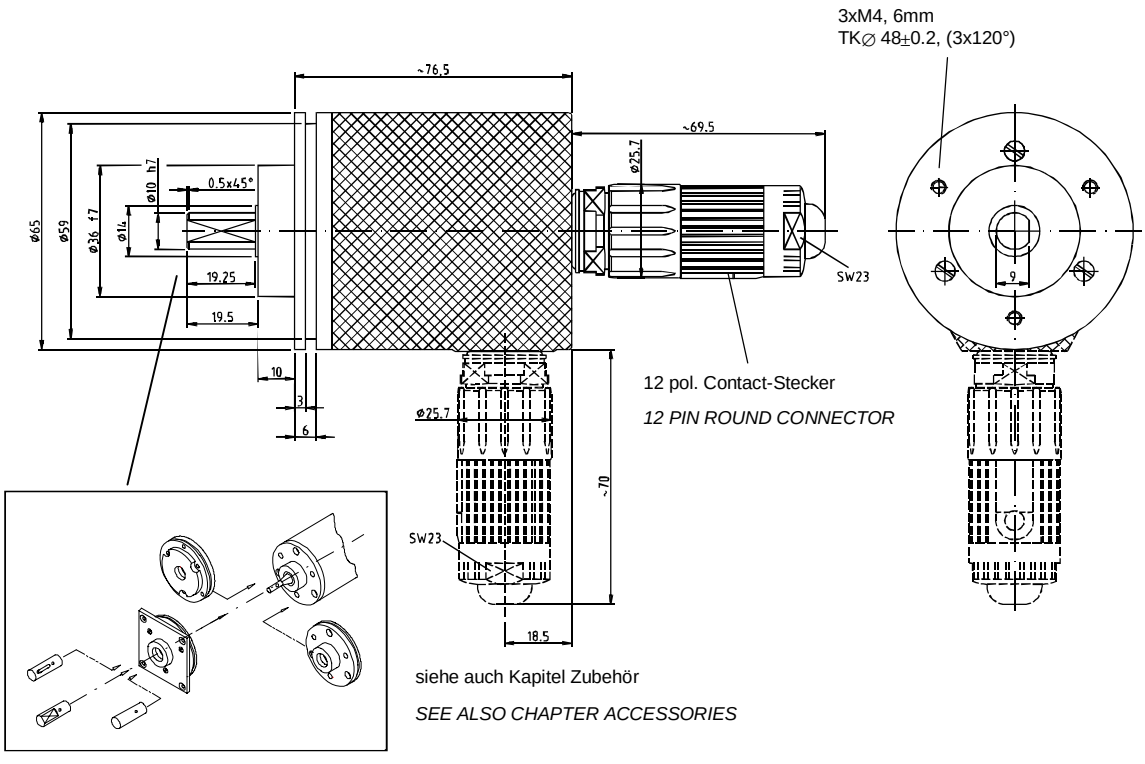
Absolute-Encoder ZE-65-M A - 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9×10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	$\leq 10^4$ rad/s^2
Momentum of Inertia	2.5×10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	$\leq$ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	$\leq$ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector
Other connector types available	Upon Request

Dimensional Drawing



Absolute-Encoder ZE-65-M IBS 33 Bit

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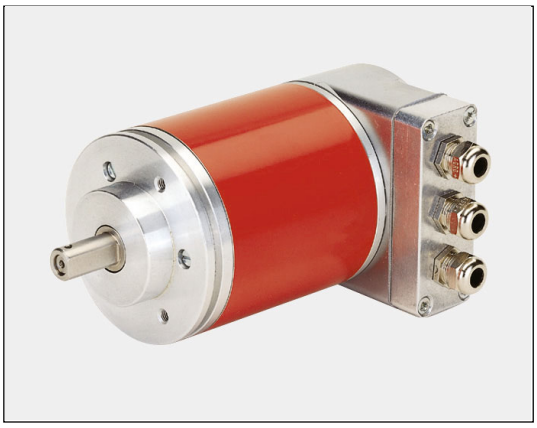
VIA BUS



- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **INTERBUS-S**
- **Programmable via INTERBUS-S**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programmable via Interbus-S	2 Wire Long Distance Field Bus, RS422, Electrically Isolated
Output Codes (programmable)	Binary, Gray
Baud Rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0.5 ms
Identification Number	51 Decimal
Programmable Parameters (via IBS bus)	
Direction of Count	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Output Code	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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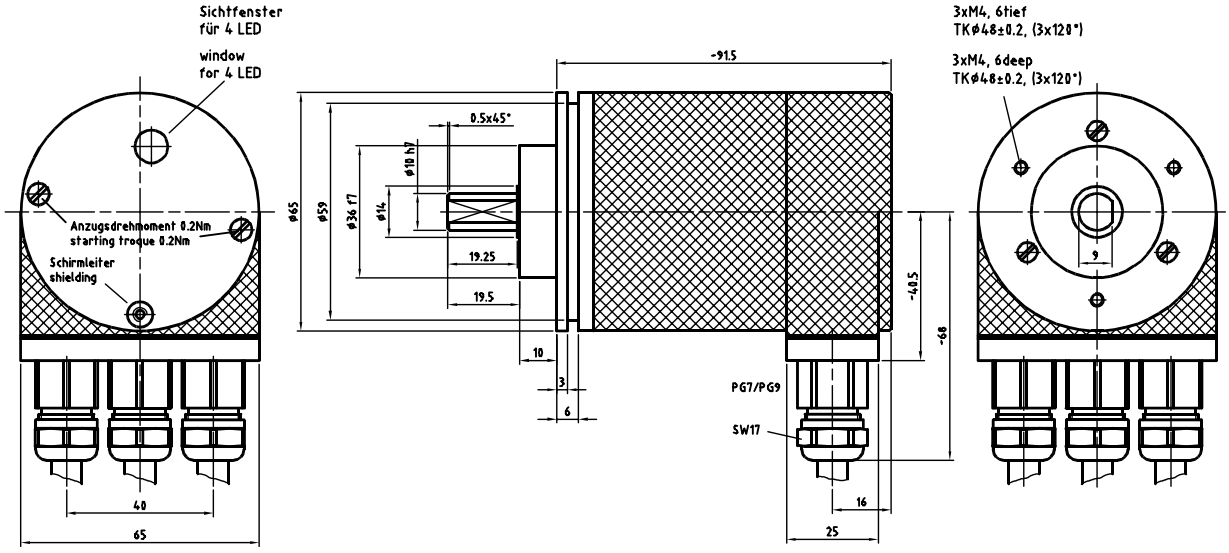
Absolute-Encoder ZE-65-M IBS 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 X PG 7 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

Absolute-Encoder ZE-65-M DeviceNet 33 Bit

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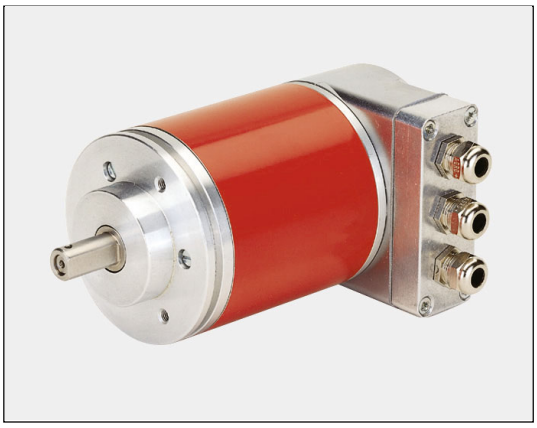
VIA BUS



- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **Interface : DeviceNet**
- **Programmable via CAN-Bus**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programming via CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898) PCA 82 C250 / C251
Output Code (programmable)	Binary, Gray
Baud Rate (adjustable by switch)	125 kbaud, line length up to 500 m 250 kbaud, line length up to 250 m 500 kbaud, line length up to 100 m
Size of encoder addresses	0 to 63, adjustable by DIP-switches)
Terminating resistor	123Ω, switchable
Programmable Parameters	
Count Direction	
Output Code	
Number of Steps per Revolution	
Number of Revolutions	
Preset Value	
Special Outputs	
- Error	
- Operating Range	
- Safe Region	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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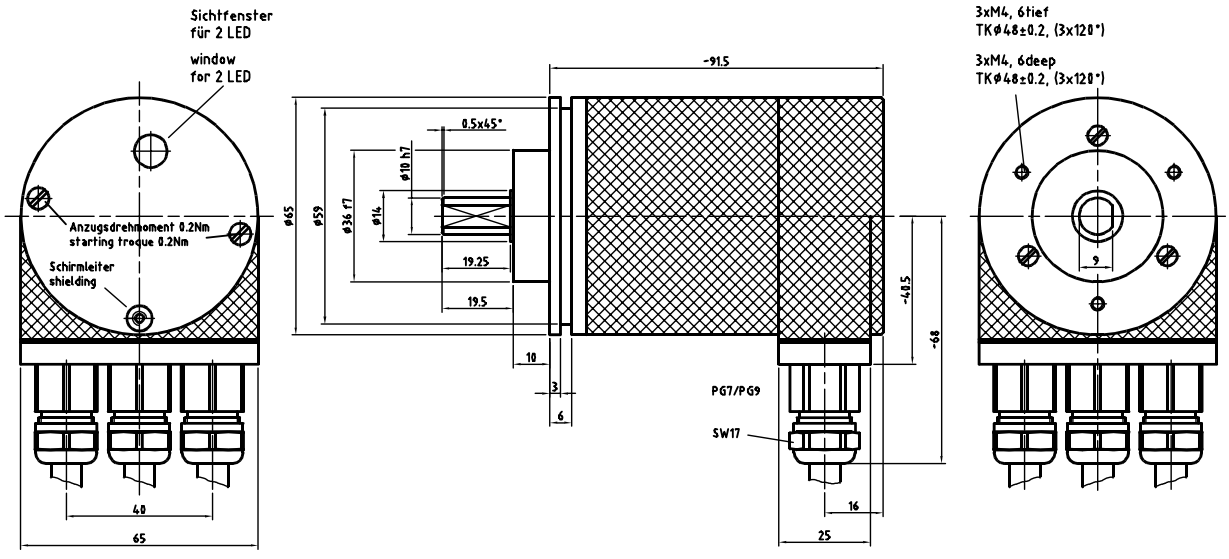
Absolute-Encoder ZE-65-M DeviceNet 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

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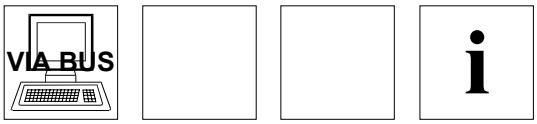
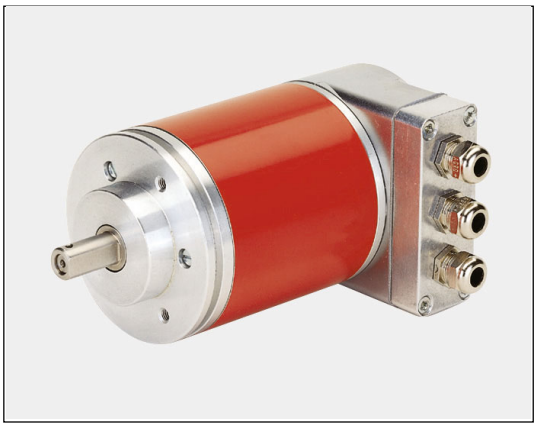
Absolute-Encoder ZE-65-M CANopen 33 Bit





- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **Interface : CANopen**
- **Programmable via CAN-Bus**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Programming via CAN-Bus	CAN-Bus-Interface (ISO/DIS 11898)
Data Protocol	CAN 2.0 A, CANopen Device Profil for Encoder CIA DS-406 V2.0 / PCA 82 C250 / C251
Output Code	Binär
Baud Rate (adjustable by switch)	20 kbaud, line length up to 2500 m 125 kbaud, line length up to 500 m 500 kbaud, line length up to 100 m 1 Mbaud, line length up to 25 m
Size of encoder addresses	1 to 64, adjustable by DIP-switches
Terminating resistor	123Ω, switchable
Programmable Parameters	
Count Direction	
Number of Counts per Length	
Number of Revolutions	
Adjust Absolute Value	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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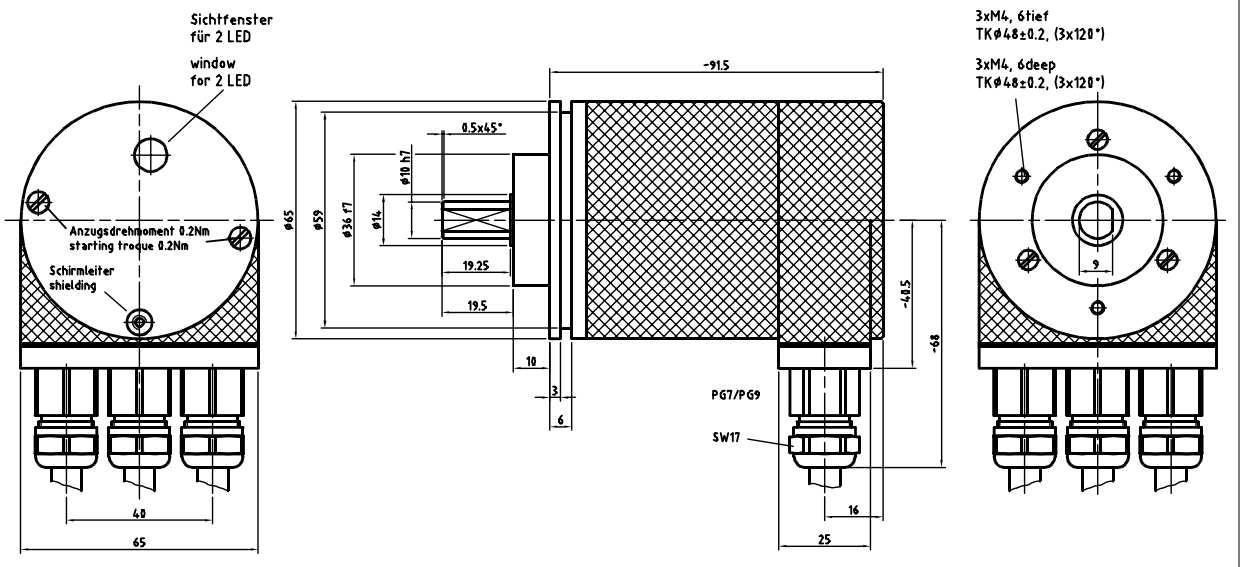
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	2 X PG 9 radial mount

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

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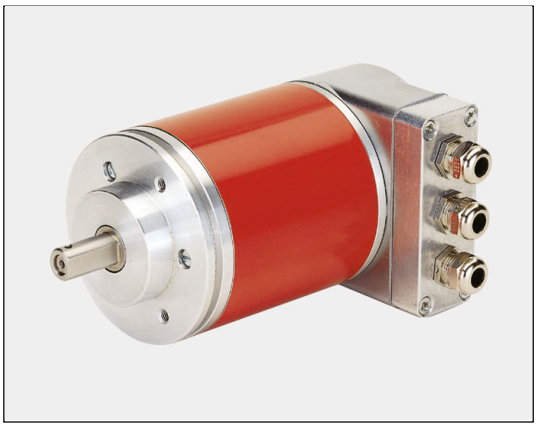
Absolute-Encoder ZE-65-M PROFIBUS (PNO) 33 Bit

VIA BUS



- **High Rsolution ZE-65 Multi-Turn Resolution max. 17 Bit**
- **Small and Compact**
- **Interface: PROFIBUS-DP**
- **Parametrizable via PROFIBUS, according to PNO-profile CLASS2**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
* Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
Output Code	Binary
Data Protocol	PROFIBUS-DP Protocol DIN E 19 245 T.3
Standard Baud Rate	9.6 kbaud to 12 Mbaud
Option	3 to 12 Mbaud
* Station Address	3 - 99
Inputs	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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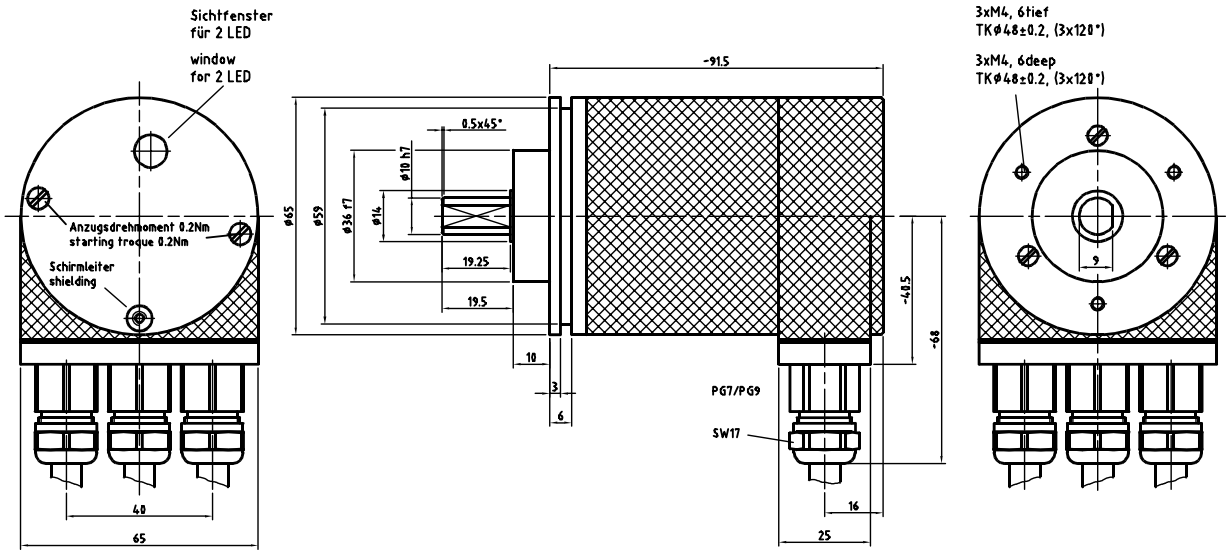
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	End Cap with 3 X PG 9 Radial

Dimensional Drawing



Für Schirmleiter:
Schraube M4x8 und Kabelschuh,
mit Zahnscheibe nach DIN6797-A
4.3-FSt unterlegt.

For shielding
use metric screw M4x8 with forked terminal.
For good contact to housing use a
studded disc DIN6797-A 4.3-Fst.

Absolute-Encoder ZE-65-M LWL 33 Bit

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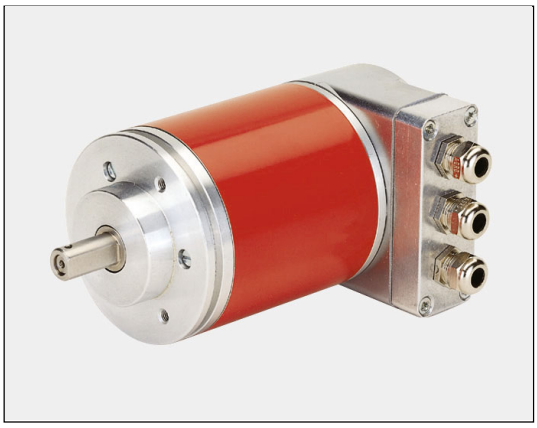
VIA BUS



- **High Resolution ZE-65 Multi-Turn**
  Resolution max. 17 Bit
- **Small and Compact**
- **LWL-Interface**
- **Programmable via LWL-Ring**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 VDC
Power Dissipation (No Load)	≤ 3 Watt
Programmable via LWL-Ring	in connection with • PC Compatible Central-Module • SIMATIC-S5 Compatible Central-Module • VMEbus • SMP-Bus
Transmission Media LWL	Plastic (“APF”- All Plastic Fiber) or Glass (“PCS”- Plastic Coated Silicon)
Maximum Cable Length between two points	600 m with Glass Cable, 45 m with Plastic Cable (Radius □ 30 mm)
Output Code	4 Byte Binary
Baud Rate	2,5 Mbaud in fiber optic ring
Maximum Points	max. 254
Programmable Parameters	
Count Direction	
Number of Counts per Length	
Number of Revolutions	
Preset Value 1,2	
Adjust Absolute Value	

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of cable used.

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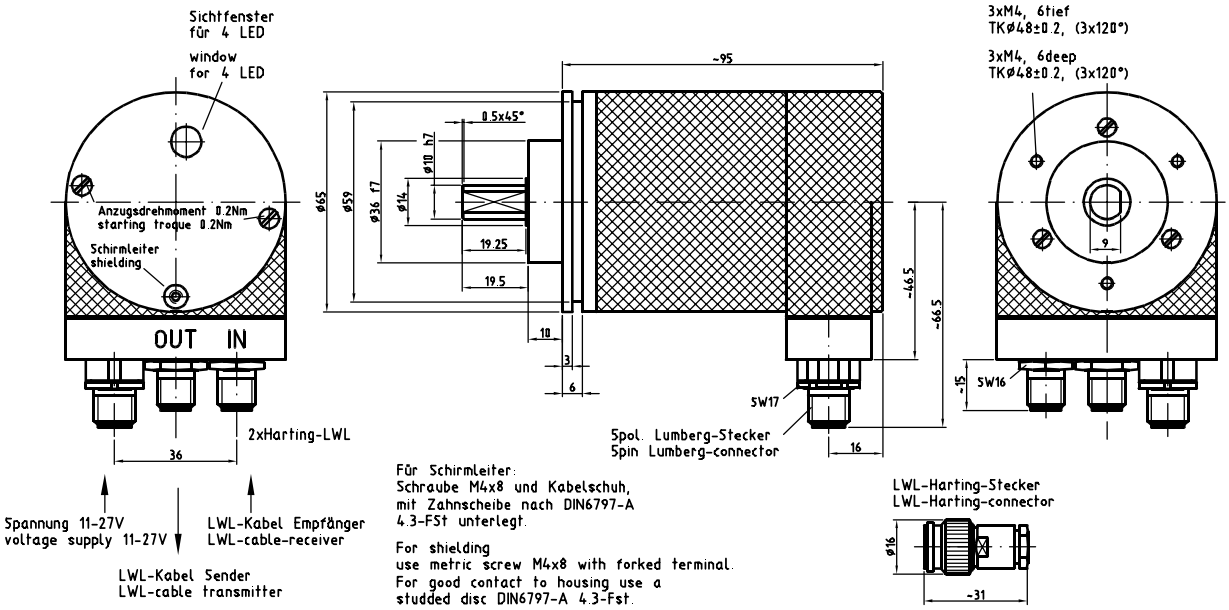
Absolute-Encoder ZE-65-M LWL 33 Bit

Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	3 x PG 7 radial mount

Dimensional Drawing



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Absolute-Encoder ZE-65-M SUCONET K1 33 Bit

- **High Resolution ZE-65 Multi-Turn, Resolution max. 17 Bit**
- **Small and Compact**
- **SUCONET-Fieldbus-Interface**
- **Programmable via SUCONET-Bus**
- **Standard Interchangeable Mounting Flanges**
- **Also available with housing-∅ 100 mm**

5

Electrical Data

Encoder Capacity	[1] max. 29 Bit, [2] max. 31 Bit, [3] max. 33 Bit
Steps / Revolution	[1] 1 - 8192, [2] 1 - 32768, [3] 1 - 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤3 Watt
Programming via Bus	Fieldbus Connection Suconet K1
Output Code	Binary
Data Protocol	2-wire, RS485 (Master-Slave)
Baud Rate	187,5 kbaud
Maximum Stations	max. 31, adjustable by DIP-switches
User Modules	PS 3, PS 306, PS 316, *PS 4-100, *PS 4-200, *PS 416
Programmable Parameters	
Count Direction	
Steps (Measuring Length)	
Scale Factor	
Preset Value (Adjust absolute position to a given set value (i.e. zero set)	
Pin Configuration	Upon Request

* only if compatible to PS 3

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to +80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Extended Temperature (Optional)	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	IP 65 (DIN 40 050)

* The protection class of the encoder can be effected by the type of connector used.

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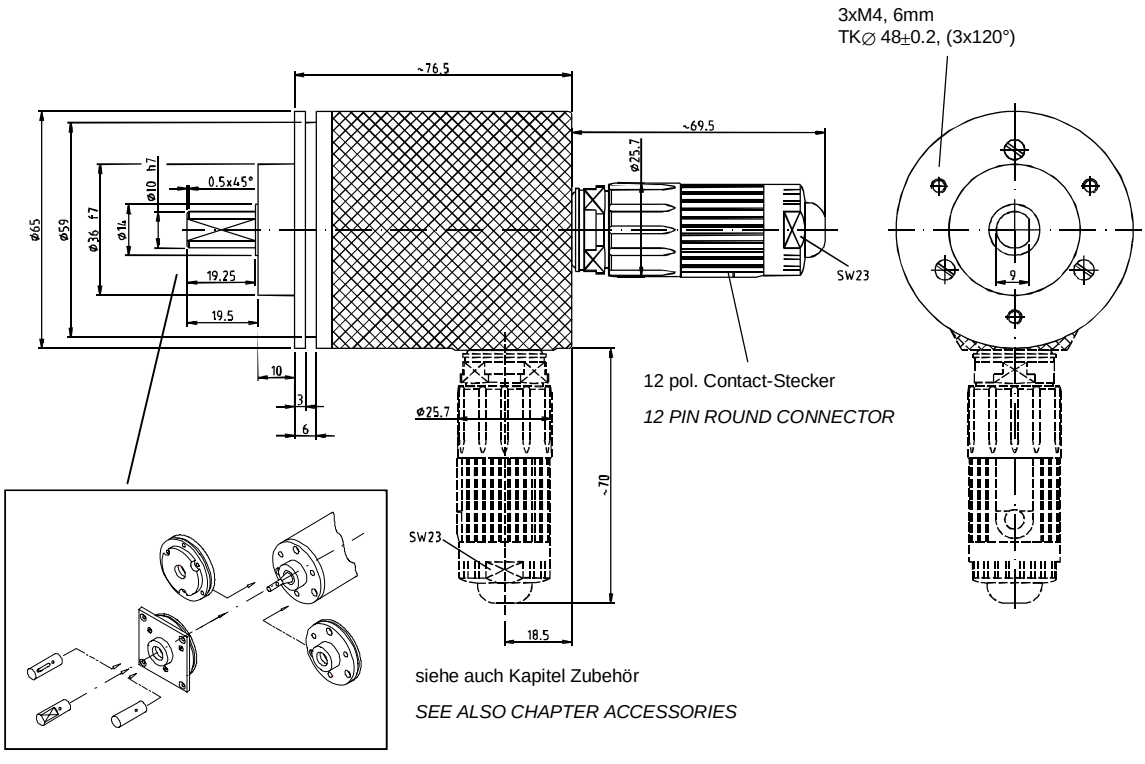
Mechanical Data

Maximum Rotational Speed	12000 RPM
Maximum Load on Shaft	40 N Axial, 60 N Radial (at end of shaft)
Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	6000 RPM
-Load on Shaft	20 N Axial, 30 N Radial (at end of shaft)
-Operating Temperature	60°C (140°F)
Weight	0.7 kg (1.5 lb.)
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	2.5 x 10^{-6} kg m^2
Startup Momentum at 20°C (68°F)	2 Ncm
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 1000 m/s^2 (100g)
Standard Connector	12 pin Contact Connector

Dimensional Drawing



siehe auch Kapitel Zubehör

SEE ALSO CHAPTER ACCESSORIES

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Absolute-Encoder ZH-80-M SSI 32 Bit

- **High Resolution ZH-80 Multi-Turn, Resolution max. 17 Bit**
- **Hollow Shaft Encoder for Direct Coupling to any Drive Shaft (Shaft diameter to max. 20 mm)**
- **No coupling necessary**
- **Fast mounting by collet fastening**

Electrical Data

Encoder Capacity	max. 32 Bit
* Steps / Revolution	1 – 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 4 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	80 kHz - 820 kHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.
Data Output	RS422 (2-wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Note for the programming:
Steps/Revolution x Number of Revolutions ≤ 32 bit

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Storage Temperature	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	Up to IP 65 (DIN 40 050)

* This protection class applies to the encoder with the cable screwed together and wired correctly.

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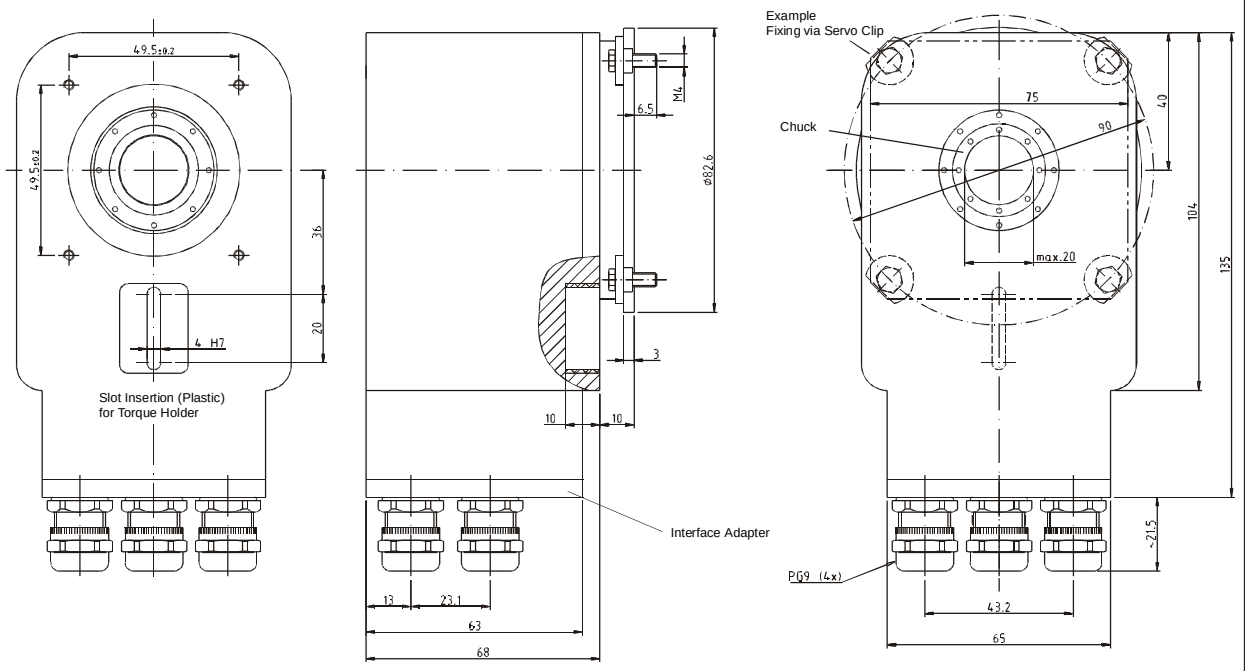
Mechanical Data

Maximum Rotational Speed	3000 min^{-1}
Maximum Load on Shaft	Self-Mass
Parallel Offset of the Customer Shaft	± 0,2 mm
Min. Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Operating Temperature	60°C (140°F)
Weight	approx. 1,3 kg
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	57,2 x 10^{-6} kg m^2
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 500 m/s^2 (50g)
Connection	Screw terminal, 4 x PG 9 radial
Type of Connections / Connector types	Upon Request

Dimensional Drawing



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Absolute-Encoder ZH-81-M SSI/ISI

- **High Resolution ZH-81 Multi-Turn, Resolution max. 17 Bit**
- **Hollow Shaft Encoder for Direct Coupling to any Drive Shaft (Shaft diameter 25 mm)**
- **No coupling necessary**
- **Fast mounting by collet fastening**

Electrical Data

Encoder Capacity	max. 32 Bit
Steps / Revolution	1 – 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 4 Watt
Programming via RS485	IBM Compatible EPROG Software
SSI Interface:	Clock Input: Opto Coupler Isolated / Clock Frequency: 80 kHz - 820 kHz
* Output Code	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.
Data Output / * Output Format	RS422 (2-wire) / Standard, Tree Format, with Repetition
ISI Interface (**optional**)	
* Load Output	Verification of Load Request
Channel 1 / Channel 1 neg.	A / A neg. (Push-Pull / 100 mA or TTL)
Channel 2 / Channel 2 neg.	B / B neg. (Push-Pull / 100 mA or TTL)
* Load Frequency	2 kHz up to approx. 115 kHz
Input Options	
* Forward / Reverse	Change direction of count
* Preset	Adjust absolute position to a given set value (i.e. zero set)
* Load Input (ISI Interface)	Request for Encoder Position
Logic Levels	"0" < + 2 V DC, "1" > + 8 V DC, max. 30 V DC
Pin Configuration	Upon Request
	Note for the programming:
* Programmable Parameters	Steps/Revolution x Number of Revolutions ≤ 32 bit

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0 to +60°C (Optional -20 to +70°C)
Storage Temperature	-30 to +120°C
Relative Humidity	98 % (non condensing)
* Protection Class	up to IP 54 (DIN 40 050)

* This protection class applies to the encoder with the cable screwed together and wired correctly.

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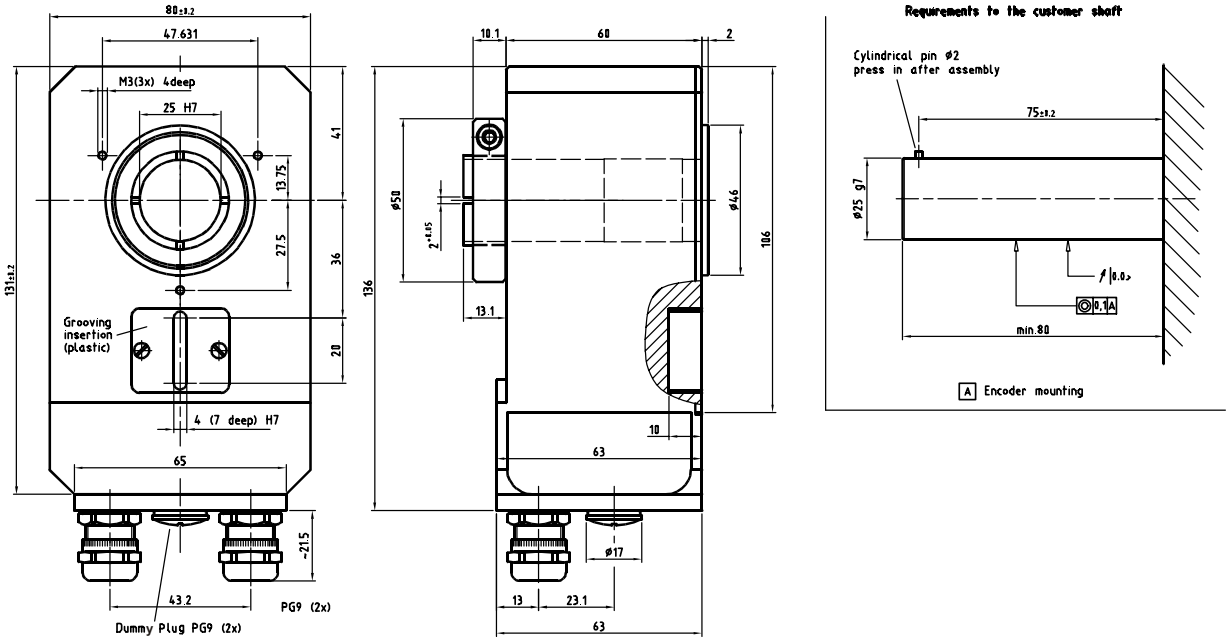
Mechanical Data

Maximum Rotational Speed	3000 min^{-1}
Maximum Load on Shaft	Self-Mass
Min. Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Operating Temperature	60°C (140°F)
Weight	approx. 1,3 kg
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	57,2 x 10^{-6} kg m^2
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 500 m/s^2 (50g)
Connection	Screw terminal, 2 x PG 9 radial
Type of Connections / Connector types	Upon Request

Dimensional Drawing



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Absolute-Encoder ZH-81-M IBS 31 Bit

- **High Resolution ZH-81 Multi-Turn, Resolution max. 17 Bit**
- **Hollow Shaft Encoder for Direct Coupling to any Drive Shaft (Shaft diameter 20 mm)**
- **No coupling necessary**
- **Fast mounting by collet fastening**

Electrical Data

Encoder Capacity	max. 31 Bit
Steps / Revolution	1 – 131072
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 4 Watt
Programming via	
RS485	IBM Compatible EPROG Software or
INTERBUS-S	2 Wire, Long Distance Field Bus, RS422, Electrically Isolated
Output code, programmable via K3	Binary, Gray
Baud rate	300 kbaud min., 500 kbaud max. Including Control and Status Bytes
Refresh Rate	0,5 ms
Identification Number	51 Decimal
Programmable Parameters	
Direction of Count	
Number of Steps per Revolution	(5 to 2^{31} – 1)
Number of Revolutions	(1 to 2^{31} – 1)
Preset Value	
Code	
Profile selection according to K1, K2 or K3	
Pin Configuration	Upon Request

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0 to +60°C (Optional -20 to +70°C)
Storage Temperature	-30 to +120°C
Relative Humidity	98 % (non condensing)
* Protection Class	up to IP 54 (DIN 40 050)

* This protection class applies to the encoder with the cable screwed together and wired correctly.

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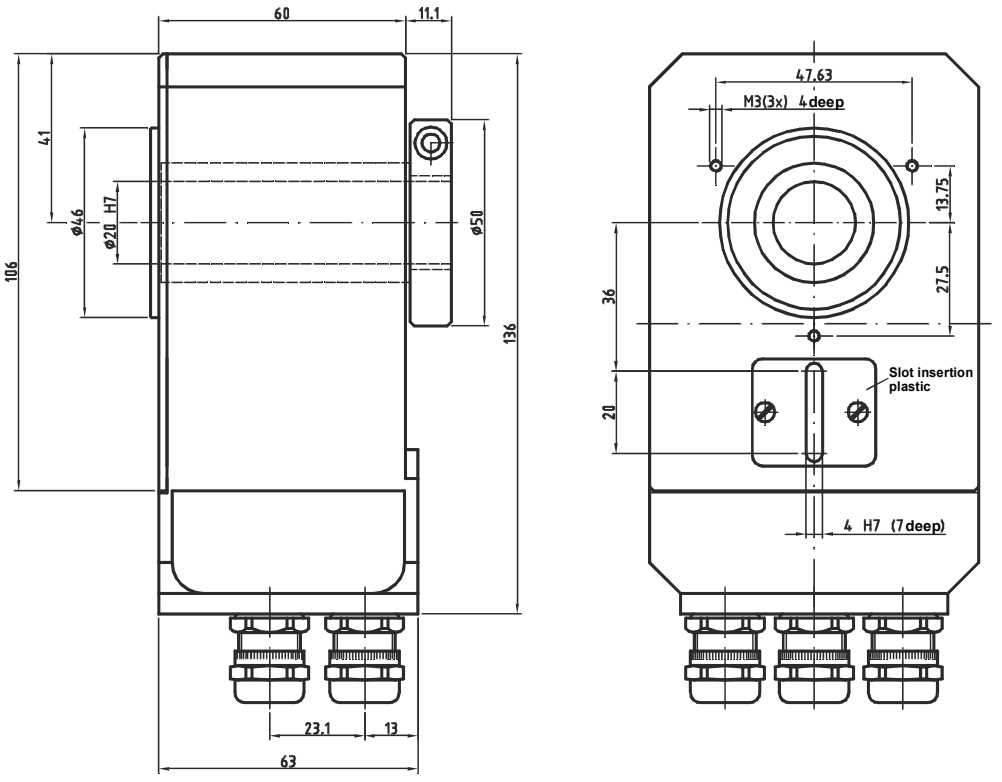
Mechanical Data

Maximum Rotational Speed	3000 min^{-1}
Maximum Load on Shaft	Self-Mass
Min. Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Operating Temperature	60°C (140°F)
Weight	approx. 1,3 kg
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	57,2 x 10^{-6} kg m^2
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 500 m/s^2 (50g)
Connection	Screw terminal, 4 x PG 9 radial
Type of Connections / Connector types	Upon Request

Dimensional Drawing



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Absolute-Encoder ZH-81-M PROFIBUS (PNO) 31 Bit

VIA BUS

- **High Resolution ZH-81 Multi-Turn, Resolution max. 17 Bit**
- **Hollow Shaft Encoder for Direct Coupling to any Drive Shaft (Shaft diameter 20 mm)**
- **No coupling necessary**
- **Fast mounting by collet fastening**

5

Electrical Data

Encoder Capacity	max. 31 Bit
* Steps / Revolution	1 – 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 3 Watt
* Output Code	Binary, Gray, Shifted Gray
Data Protocol	PROFIBUS-DP Protocol DIN E 19 245 T.3
Standard Baud Rate	9.6 kbaud to 12 Mbaud
Option	3 to 12 Mbaud
* Station Addresses	3 - 99
Inputs	
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > +8 VDC, max. 30 VDC
Pin Configuration	Upon Request

* Programmable Parameters

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0 to +60°C (Optional -20 to +70°C)
Storage Temperature	-30 to +120°C
Relative Humidity	98 % (non condensing)
* Protection Class	up to IP 54 (DIN 40 050)

* This protection class applies to the encoder with the cable screwed together and wired correctly.

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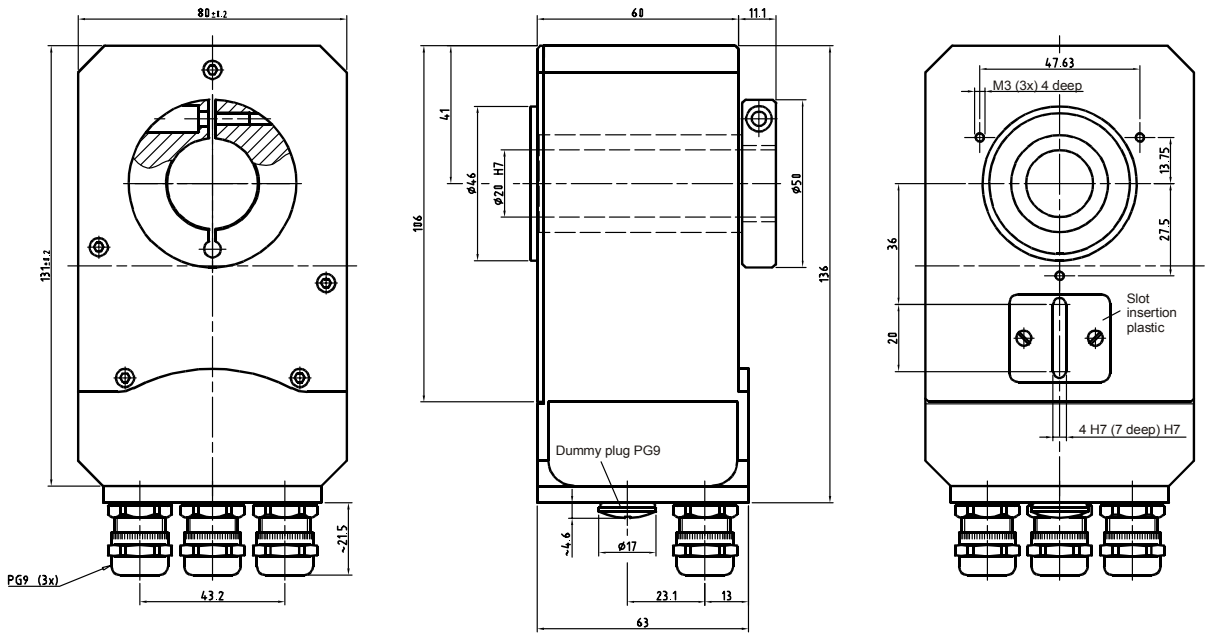
Mechanical Data

Hollow Shaft	∅ 20 H7
Maximum Rotational Speed	3000 min^{-1}
Maximum Load on Shaft	Self-Mass
Permissible parallel disalignment of the customer shaft	± 0,2 mm
Min. Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Operating Temperature	60°C (140°F)
Weight	approx. 1,3 kg
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	57,2 x 10^{-6} kg m^2
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 500 m/s^2 (50g)
Connection	Screw terminal, 3 x PG 9 radial
Type of Connections / Connector types	Upon Request

Dimensional Drawing



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Absolute-Encoder ZH-90-M SSI 32 Bit

- **High Resolution ZH-90 Multi-Turn, Resolution max. 17 Bit**
- **Hollow Shaft Encoder for Direct Coupling to any Drive Shaft (Shaft diameter to max. 25 mm)**
- **No coupling necessary**

Electrical Data

Encoder Capacity	max. 32 Bit
* Steps / Revolution	1 – 131072
* Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 4 Watt
Programming via RS485	IBM Compatible EPROG Software
* Output Code (programmable)	Binary, BCD, Gray, Shifted Gray, Excess3, Shifted Excess3
Clock Input	Opto Coupler Isolated
Clock Frequency	80 kHz - 820 kHz
Transmission Cable Length	Dependent on Cable Cross Section, Shielding, Clock Frequency etc.
Data Output	RS422 (2-wire)
* Output Format	Standard, Tree Format, with Repetition
Input Options	
* Forward / Reverse	Change direction of count
* Preset 1	Adjust absolute position to a given set value (i.e. zero set)
* Preset 2	Adjust absolute position to a given set value (i.e. zero set)
Logic Levels	"0" < +2 VDC, "1" > + 8 VDC, max. 30 VDC

* Programmable Parameters

Note for the programming:
Steps/Revolution x Number of Revolutions ≤ 32 bit

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	-20° to -+80°C (-4° to 176° F) / (Optional -30° to +100°C) (-22° to 212° F)
Storage Temperature	-30° to +120°C (-22° to 248°F)
Relative Humidity	98 % (non condensing)
* Protection Class	Up to IP 65 (DIN 40 050)

* This protection class applies to the encoder with the cable screwed together and wired correctly.

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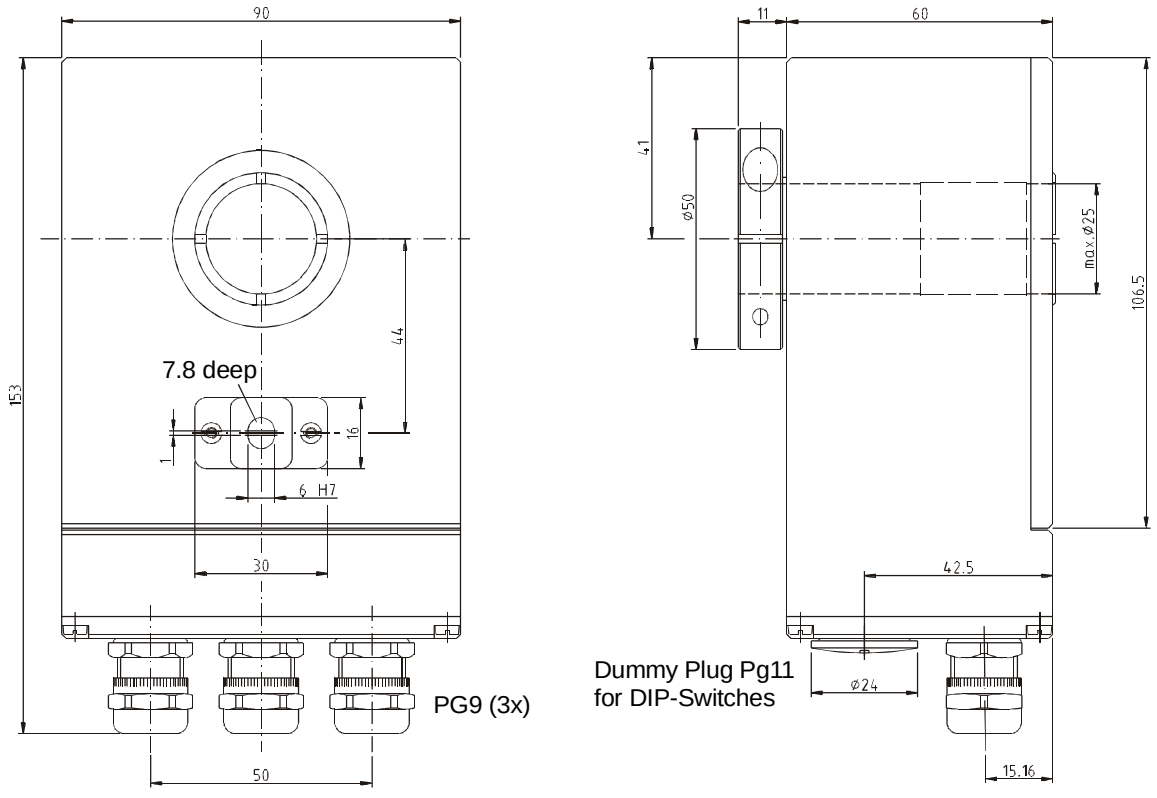
Mechanical Data

Maximum Rotational Speed	6000 min^{-1}
Maximum Load on Shaft	Self-Mass
Min. Lifetime on Bearings	3.9 x 10^{10} Revolutions at:
-Operational Speed	3000 RPM
-Operating Temperature	60°C
Weight	approx. 1,3 kg
Maximum Angular Acceleration	≤ 10^4 rad/s^2
Momentum of Inertia	57,2 x 10^{-6} kg m^2
Vibration (50-2000 Hz Sinusoidal)	
DIN IEC 68-2-6	≤ 100 m/s^2 (10g)
Shock (11ms) DIN IEC 68-2-27	≤ 500 m/s^2 (50g)
Connection	Screw terminal, 3 x PG 9 radial
Type of Connections / Connector types	Upon Request

Dimensional Drawing



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Absolute-Encoder MG-75-M ASI

- **MG-75 Multi-Turn, Resolution 6 Bit**
- **Hollow Shaft Encoder for Direct Coupling to any Drive Shaft (Shaft diameter 20 mm)**
- **No coupling necessary**
- **6- or 8-digit LED Display**
- **ASI (Asynchronous Serial Interface)**
- **Bus capable, max. 31 Subscribers**

Electrical Data

Encoder Capacity	max. 22 Bit
Steps / Revolution	64
Number of Revolutions	max. 65536 Revolutions
Supply Voltage	11-27 V DC
Power Dissipation (No Load)	≤ 4 Watt
Programming	optional
Output Code	Binary
Standard Baud Rates	9600, 19200, 38400, other Baud Rates Upon Request
Data Output	RS422 / RS485
Communication Format	1 Start Bit, 8 Data Bits, 1 Parity Bit (even), 1 Stop Bit
Other Communication Formats	Upon Request
Station Addresses	1 - 31, adjustable via HEX-Rotary-Switches
Bus Termination	Switching-On via DIP-Switches

Environmental Data

Electromagnetic compatibility (EMC)	EN 61000-4-2 (IEC-801-2) / EN 61000-4-4 (IEC-801-4)
Operating Temperature	0 - +60°C
Storage Temperature	-30 - +120°C
Relative Humidity	98 % (non condensing)
Protection Class	IP 50 (DIN 40 050)