Encoders

magnetic multi-turn absolute Encoder,
SSI Interface with BISS-C Protocol,
4096 steps per revolution, Line Driver

For combination with
Brushless DC-Motors

Series AEMT-12/16 L

		AEMT-12/16 L	
Steps per revolution		4 096	
Single-turn resolution		12 Bit	
Multi-turn resolution		16 Bit	
Signal output		SSI Interface with BISS-C Protocol	
Supply voltage	U_{DD}	4,5 ... 5,5	V
Current consumption, typical[1]	I_{DD}	typ. 25, max. 35	mA
Battery voltage[2]		3 ... 5,5	V
Clock Frequency, max. (CLK and $\overline{CLK}$)		2	MHz
Input low level (CLK and $\overline{CLK}$)		0 ... 0,8	V
Input high level (CLK and $\overline{CLK}$)		2 ... 5	V
Setup time after power on, max.	t_{setup}	20	ms
Timeout, typ.	$t_{timeout}$	20	µs
Inertia of sensor magnet	J	0,08	gcm²
Operating temperature range		-40 ... +100	°C
Hysteresis		0,17	°m
Mass, typ.		13,5	g

[1] U_{DD} = 5 V: with unloaded outputs
[2] Battery adapter available as accessory (article no. 6501.00368)

Note: The output signals are TIA-422 compatible.
Examples of Line Driver Receivers: iC-HF, SN65LBC179, SN75179B

For combination with Motor

Dimensional drawing A	**<L1 [mm]**
2444 ... B - K3051	55,3
3056 ... B - K3051	67,3
3564 ... B - K3051	75,3
4490 ... B - K3051	100,3
4490 ... BS - K3051	100,3

Dimensional drawing B	**<L1 [mm]**
2232 ... BX4	50,2
2250 ... BX4	68,2

Dimensional drawing C	**<L1 [mm]**
3242 ... BX4	60,0
3268 ... BX4	86,0

Dimensional drawing D	**<L1 [mm]**
2264 ... BP4 - 6356	79,1
3274 ... BP4 - 6356	90,8

Characteristics

The multi-turn absolute encoder with Line Driver in combination with the FAULHABER brushless DC-Servomotors is ideal for commutation, speed and position control. It can also be used to create a sinusoidal commutation signal.

The encoder provides absolute angle information with a Single-turn resolution of 12 bits and a multi-turn resolution of 16 bits.
The position data can be communicated via an SSI interface with BiSS-C Protocol.
Besides the standard configuration as detailed here different alternative resolutions are available on request as a special programming.

Additional advantages are a higher efficiency of the motor and a reduced torque ripple.
The encoder has differential input and output signals (TIA-422). Differential signals reduce ambient interference and are suitable for applications with high ambient interference.
The Line Driver amplifies the encoder signal which means that long cables can be used without signal degradation.

Differential signal outputs must be decoded by the appropriate receiver module. In the encoder a 120 ohm line termination resistor is integrated between the CLK and $\overline{CLK}$ inputs. A corresponding resistor is recommended for the DATA and $\overline{DATA}$ output signals on the controller. Special number 6419 is recommended for operation with FAULHABER Motion Controllers of generation V3.0. With this variant, the resistor for the DATA and $\overline{DATA}$ output signals is already integrated in the controller.

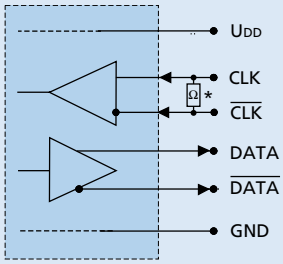
The supply voltage as well as the output signals for the encoder are interfaced through a ribbon cable, optionally with connector. Through the pin U_{BAT} the supply with an optional backup battery is possible (Article number 6501.00368).

For the brushless DC servomotors series BX4, the motor and encoder are connected via two ribbon cables.
In the series B and BP4 the motors are connected via single wires and the encoders via ribbon cable.

To view our large range of accessory parts, please refer to the "Accessories" chapter.

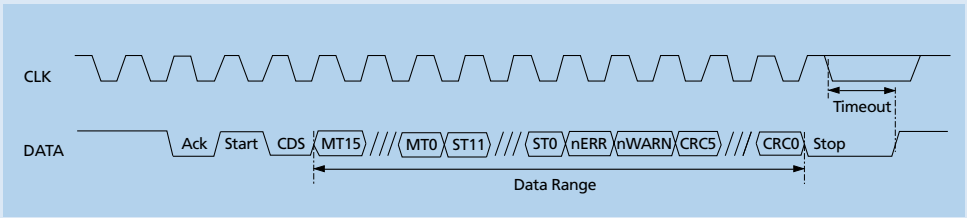
Circuit diagram / Output signals

Output circuit



Interface Protocol BISS-C

Angle position values are ascending for clockwise rotation.
Clockwise rotation as seen from the shaft end.

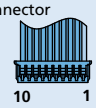


*Terminating resistor 120 Ω

Note: Data and Clock run inverted to the displayed signals Data and Clock.

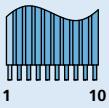
Connector information / Variants

Example product designation: **3242G024BX4 AEMT-12/16 L**

Option	Type	Description
5418	Connector 	for combination with Brushless DC-Motor series B(S) BP4, and BXT H. Connector variants AWG 28 / PVC ribbon cable with connector Molex Picoblade, 51021-1000, recommended mating connector Picoblade 53047-1010.
5419	Connector 	for combination with Brushless DC-Motors series BX4. Connector variants AWG 28 / PVC ribbon cable with connector Molex Picoblade, 51021-1000, recommended mating connector Picoblade 53047-1010.  Inclusive motor connector 3830

Connection standard

No.	Function
1	Preset
2	UDD
3	GND
4	UBAT
5	Reserved
6	Reserved
7	DATA
8	DATA
9	CLK
10	CLK

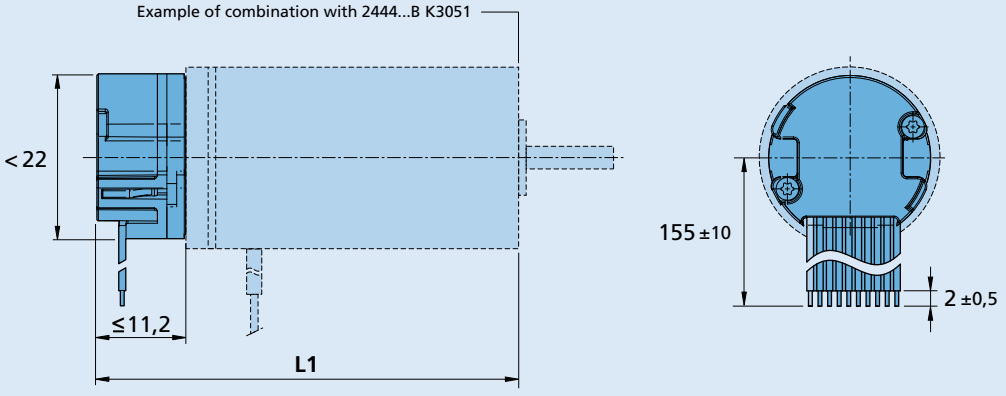


Standard cable
PVC-ribbon cable, 10-AWG 28, 1,27 mm.

Note:
Motors with AEMT-12/16 L are commutated via the encoder and, by default, do not have any Hall sensors.

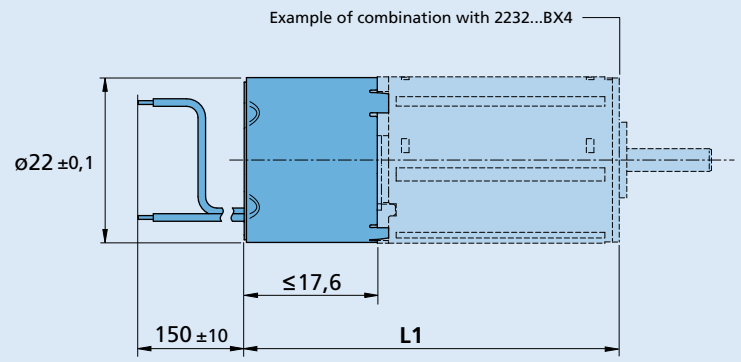
Caution:
incorrect lead connection will damage the motor electronics!

Dimensional drawing A

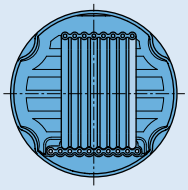


AEMT-12/16 L

Dimensional drawing B



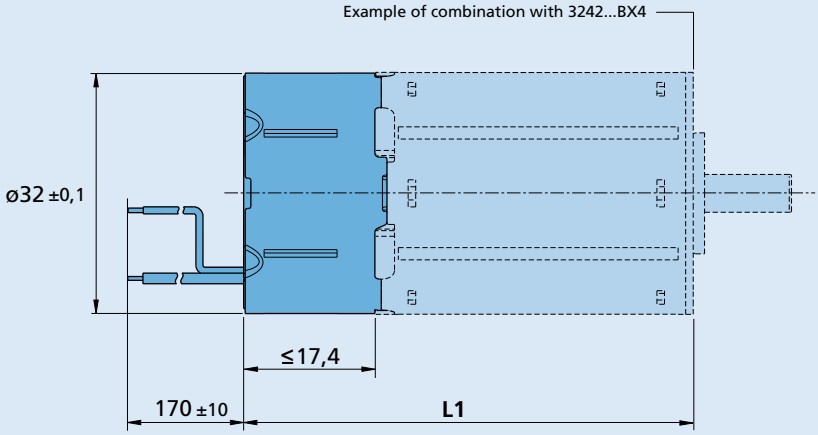
Connection Motor



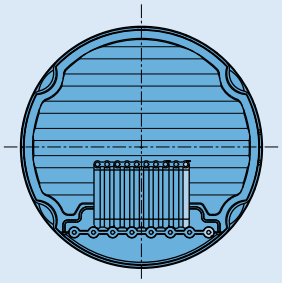
Connection Encoder

AEMT-12/16 L

Dimensional drawing C



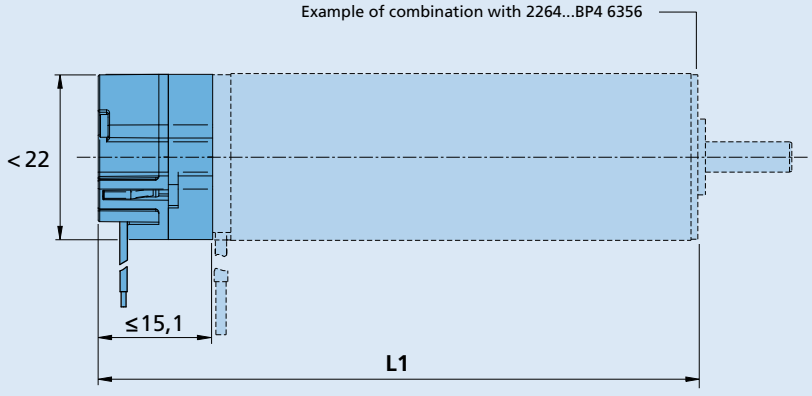
Connection Encoder

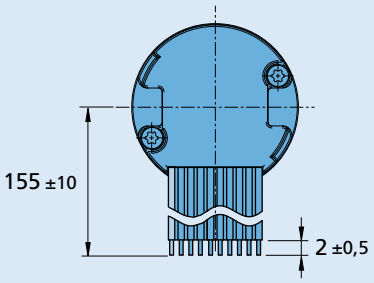


Connection Motor

AEMT-12/16 L

Dimensional drawing D





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