

Encoders

Optical Encoders

Features:
 96 to 1024 Pulses per revolution
 2 or 3 Channels
 Digital output

Series 5500, 5540

See beginning of the Encoder Section for Ordering Information

		HEDS 5500	HEDS 5540	HEDM 5500	
Pulses per revolution	N	96 - 512	100 - 512	1,000 -1,024	
Signal output (quadrature)		2	2+1 index	2	channels
Supply voltage	V_{CC}	4.5 to 5.5			V DC
Current consumption, typical ($V_{CC} = 5$ V DC)	I_{CC}	17	57	57	mA
Pulse width	P	180 ± 45	180 ± 35	180 ± 45	°e
Phase shift, channel A to B	Φ	90 ± 20	90 ± 15	90 ± 15	°e
Logic state width	S	90 ± 45	90 ± 35	90 ± 45	°e
Cycle	C	360 ± 5.5	360 ± 5.5	360 ± 7.5	°e
Signal rise/fall time, typical	tr/tf	0.25 / 0.25			µs
Frequency range ¹⁾	f	up to 100	up to 100 ²⁾	up to 100	kHz
Inertia of code disc	J	8.497 · 10 ⁻⁶			oz-in-sec ²
Operating temperature range		-40 to +100 (-40 to +212)		-40 to +70 (-40 to +158)	°C (°F)

¹⁾ Velocity (rpm) = f (Hz) x 60/N

²⁾ HEDS 5540 requires pull-up resistors of 2.7 kΩ between pins 2, 3, 5 and 4 (V_{CC})

Ordering information

Encoder type	number of channels	Pulses per revolution	For combination with DC-Micromotors, brushless DC-Servomotors and DC-Motor-Tachos
	5500	5540	
HEDS 5500 K	2	–	} Series 2036, 2444, 3056, 3564 2230, 2233, 2251 2338, 2342, 2356 2842, 3042 3557, 3863
HEDS 5500 C	2	2+1	
HEDS 5500 D	2	–	
HEDS 5500 E	2	2+1	
HEDS 5500 F	2	2+1	
HEDS 5500 G	2	2+1	
HEDS 5500 H	2	2+1	
HEDS 5500 A	2	2+1	
HEDS 5500 I	2	2+1	
HEDM 5500 B	2	–	
HEDM 5500 J	2	–	1,000 1,024

Interlocking connector options: on demand with extension cables 11.8 in length.

Line driver options: on demand for extreme conditions or long cable connections.

Features

These incremental shaft encoders in combination with the FAULHABER DC-Micromotors are designed for indication and control of both, shaft velocity and direction of rotation as well as for positioning.

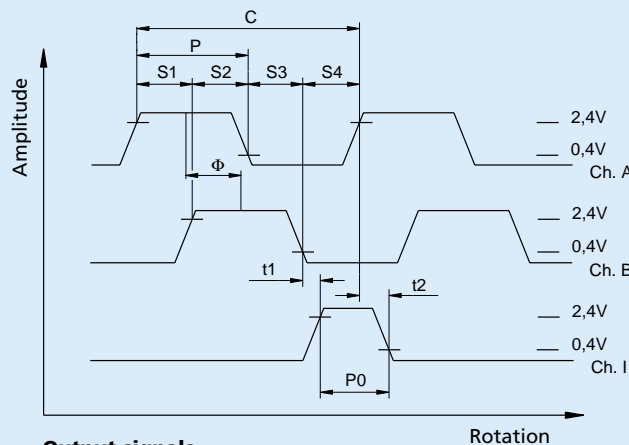
A LED source and lens system transmits collimated light through a low inertia metal disc to give two channels with 90° phase shift.

The single 5 volt supply and the two or three channel digital output signals are interfaced with a 5-pin connector.

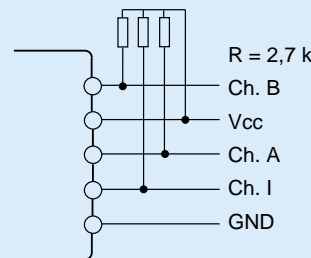
Ball bearings are recommended for continuous operation at low and high speeds and for elevated radial shaft load.

Details for the DC-Micromotors and suitable reduction gearheads are on separate catalog pages.

Output signals / Circuit diagram / Connector information

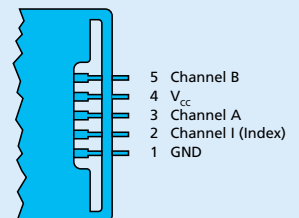


Output signals
with clockwise rotation as seen from the shaft end



Connection diagram
HEDS 5540 requires pull-up resistors

Pin Function



Connector
 suggested connectors
 AMP 103686-4/640442-5,
 Molex 2695/2759
 Berg 65039--032/4825X-000
 HEDS 8903

Encoders

Optical Encoders with Line Driver

- Features:**
 500 Pulses per revolution
 3 Channels + complementary outputs
 Digital output
 Line driver

Series 5540

See beginning of the Encoder Section for Ordering Information

		HEDL 5540	
Pulses per revolution	N	500	
Signal output, (quadrature)		2+1 index and complementary outputs	
Supply voltage	V_{CC}	4.5 to 5.5	
Current consumption, typical ($V_{CC} = 5$ V DC)	I_{CC}	57	
Pulse width	P	180 ± 35	
Index pulse width	P_o	90 ± 35	
Phase shift, channel A to B	Φ	90 ± 15	
Logic state width	S	90 ± 35	
Cycle	C	360 ± 5.5	
Signal rise/fall time, typical	tr/tf	0.25 / 0.25	
Frequency range ¹⁾	f	up to 100	
Inertia of code disc	J	$8.497 \cdot 10^{-6}$	
Operating temperature range		0 to 70 (32 to 158)	
¹⁾ Velocity (rpm) = f (Hz) x 60/N			

Ordering information

Encoder type	number of channels	pulses per revolution	For combination with:
HEDL 5540 A	2+1	500	DC-Micromotors and DC-Motor-Tachos Series 2230, 2233, 2251 2338, 2342 2642, 2657, 2842 3042, 3557, 3863 brushless DC-Servomotors Series 2036, 2444, 3564

The housing dimensions of the HEDL encoder are the same as the HEDS/HEDM encoders, but there is a ribbon cable instead of plain connector pins

Suggested Line Receivers: LT-1

Features

These incremental shaft encoders in combination with the FAULHABER DC-Micromotors and brushless DC-Servomotors are designed for indication and control of both, shaft velocity and direction of rotation as well as for positioning.

A LED source and lens system transmits collimated light through a low inertia metal disc to give two channels with 90° phase shift.

The index pulse is synchronized with the channel B. Each encoder channel provides complementary output signals.

The single 5 volt supply and the digital output signals are interfaced with a connector.

The line driver offers enhanced performance when the encoder is used in noisy environments, or when it is required to drive long distances.

Motor with ball bearings are recommended for continuous operation at low and high speeds and for elevated radial shaft load.

Details for the motors and suitable reduction gearheads are on separate catalog pages.

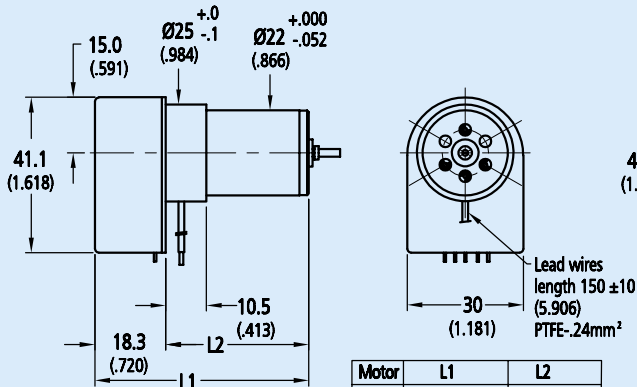
Output signals / Circuit diagram / Connector information

PIN FUNCTION	
1 BROWN	N.C.
2 RED	Vcc (+5V)
3 ORANGE	GND
4 YELLOW	N.C.
5 GREEN	A
6 BLUE	A-bar
7 VIOLET	B
8 GREY	B-bar
9 WHITE	I (INDEX)
10 BLACK	I-bar (INDEX)

Connector
 DIN-41651
 GRID 2.54mm

Series 5500, 5540

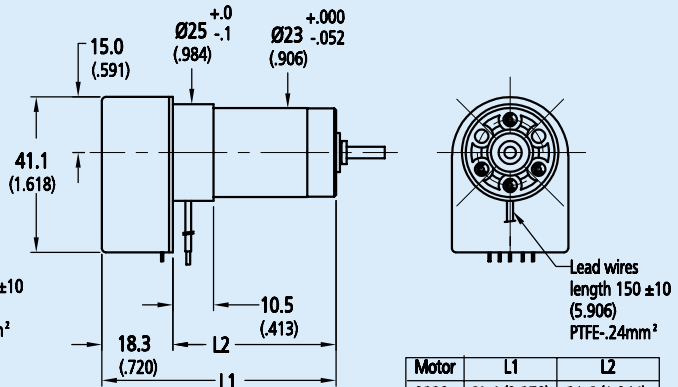
HEDS 5500, 5540 with motors 2230, 2233



Motor	L1	L2
2230	52.8 (2.079)	24 (.945)
2233	55.6 (2.189)	26.8 (1.055)

Encoders HEDS 5500, 5540
DC-MICROMOTORS 2230, 2233

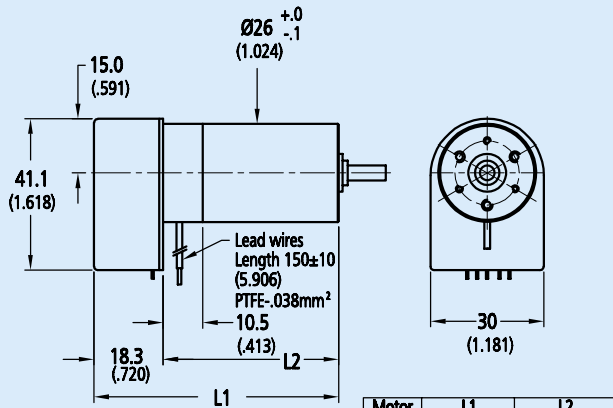
HEDS 5500, 5540 with motors 2338, 2342



Motor	L1	L2
2338	60.4 (2.378)	31.6 (1.244)
2342	64.8 (2.551)	36.0 (1.417)

Encoders HEDS 5500, 5540
DC-MICROMOTORS 2338, 2342

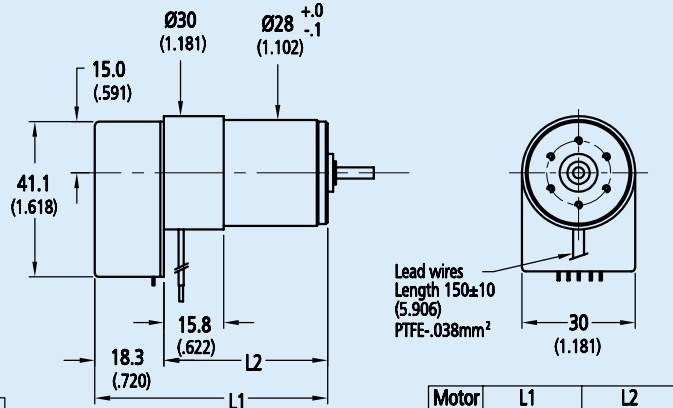
HEDS 5500, 5540 with motors 2642, 2657



Motor	L1	L2
2642	64.8 (2.551)	36 (1.417)
2657	79.6 (3.134)	51 (2.008)

Encoders HEDS 5500, 5540
with DC-Micromotor 2642, 2657

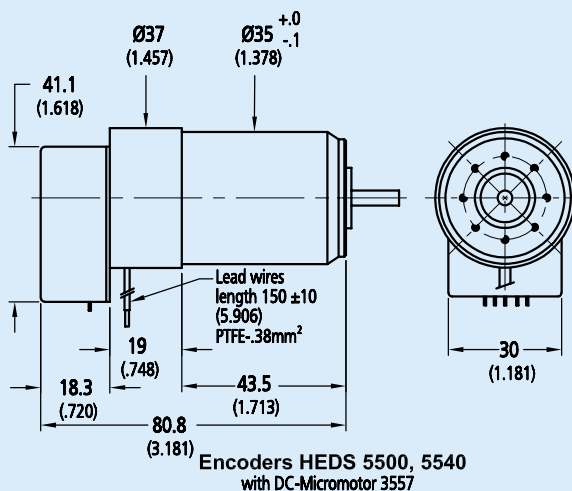
HEDS 5500, 5540 with motors 2842, 3042



Motor	L1	L2
2842	64.8 (2.551)	27.5 (1.083)
3042	64.8 (2.551)	30.7 (1.209)

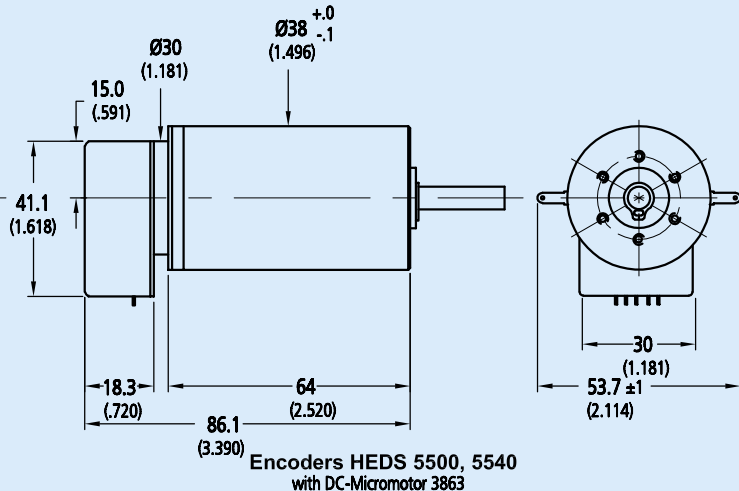
Encoders HEDS 5500, 5540
with DC-Micromotor 2842, 3042

HEDS 5500, 5540 with motor 3557



Encoders HEDS 5500, 5540
with DC-Micromotor 3557

HEDS 5500, 5540 with motor 3863



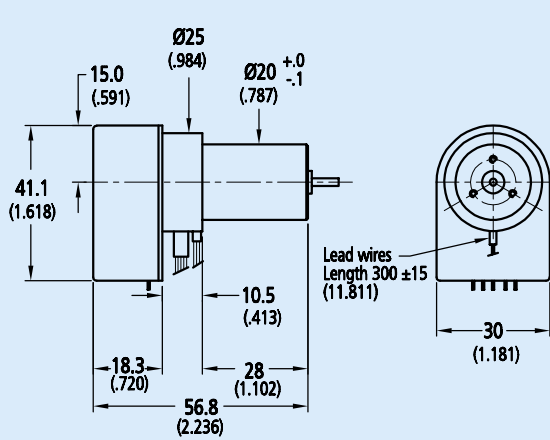
Encoders HEDS 5500, 5540
with DC-Micromotor 3863

For notes on technical data refer to "Technical Information". Specifications subject to change without notice. MMIE0402

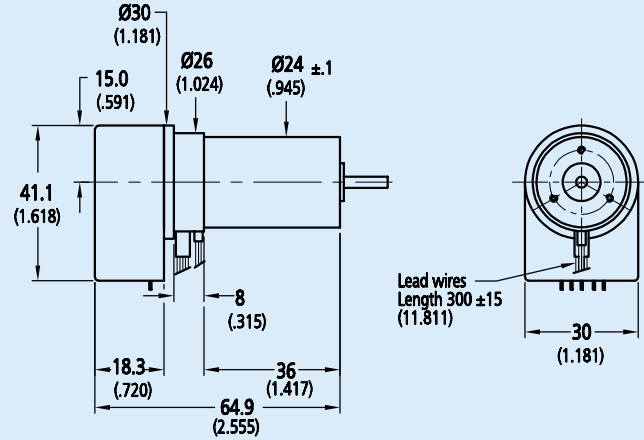
Series 5500, 5540

HEDS 5500, 5540 with Brushless Servomotor 2036 U ... B K312

HEDS 5500, 5540 with Brushless Servomotor 2444S ... B K312



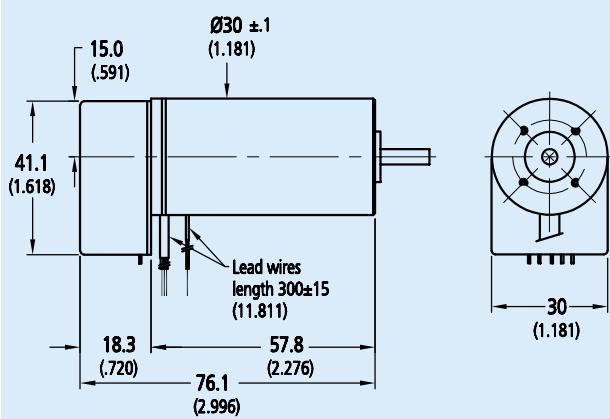
Encoders HEDS 5500, 5540
with Brushless DC-Servomotor- 2036 U ... B K312



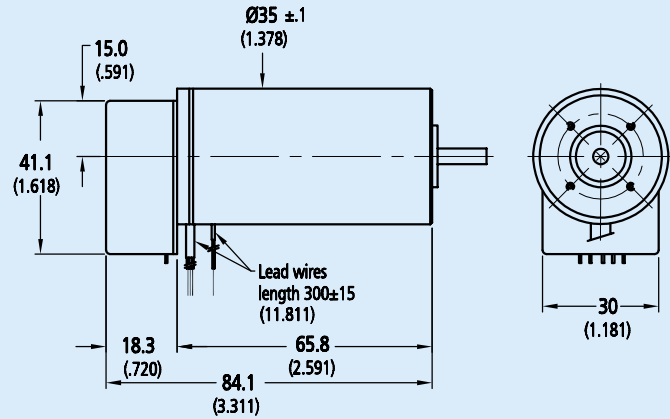
Encoders HEDS 5500, 5540
with Brushless DC-Servomotor 2444 S ... B K312

HEDS 5500, 5540 with Brushless Servomotor 3056 K ... B K312

HEDS 5500, 5540 with Brushless Servomotor 3564 K ... B K312

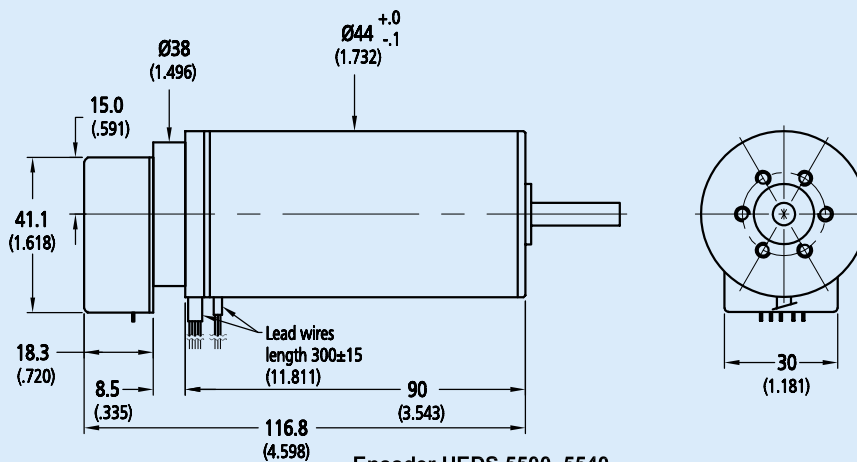


Encoders HEDS 5500, 5540
with Brushless DC-Servomotor 3056 K ... B K312



Encoders HEDS 5500, 5540
with Brushless DC-Servomotor 3564 K ... B K312

HEDS 5500, 5540 with Brushless Servomotor 4490 K ... B K312



Encoder HEDS 5500, 5540
with Brushless DC-Servomotor 4490K ... B K312