Encoders

Optical Encoders

Features:
96 to 1024 Lines 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	
Lines per revolution	N	96 - 512	100 - 512	1,000 -1,024	
Signal output, square wave		2	2+1 index	2	channels
Supply voltage	V_{CC}	4.5 ... 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	$8 \cdot 10^{-6}$			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 5500	number of channels 5540	lines per revolution	For combination with DC-Micromotors, brushless DC-Servomotors and DC-Motor-Tachos
HEDS 5500 K		2	–	96	
HEDS 5500 C	HEDS 5540 C	2	2+1	100	
HEDS 5500 D		2	–	192	**Series**
HEDS 5500 E	HEDS 5540 E	2	2+1	200	2036, 2444, 3056, 3564
HEDS 5500 F	HEDS 5540 F	2	2+1	256	2230, 2233, 2251
HEDS 5500 G	HEDS 5540 G	2	2+1	360	2338, 2342, 2356
HEDS 5500 H	HEDS 5540 H	2	2+1	400	2842, 3042
HEDS 5500 A	HEDS 5540 A	2	2+1	500	3557, 3863
HEDS 5500 I	HEDS 5540 I	2	2+1	512	
HEDM 5500 B		2	–	1,000	
HEDM 5500 J		2	–	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.

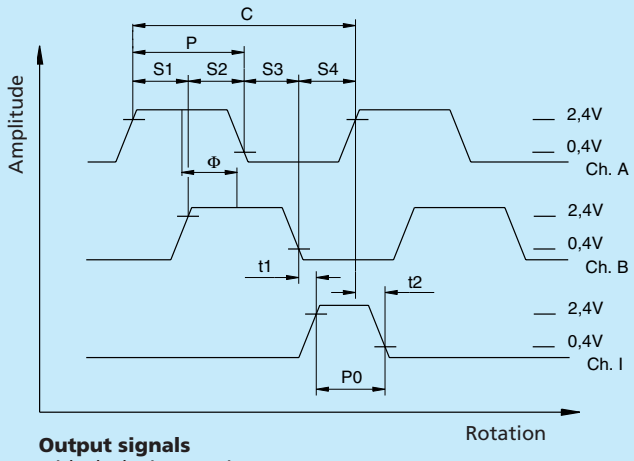
A LED source and lens system transmits collimated light through a low inertia metal disc to give two channels with 90° phase shift.

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

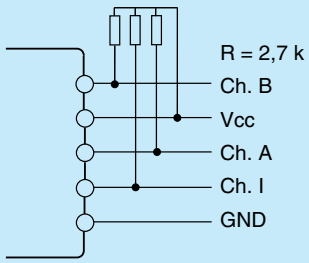
Ball bearings are recommended for continuous operation at low and high speeds and for elevated radial shaft load.

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

Output signals / Circuit diagram / Connector information

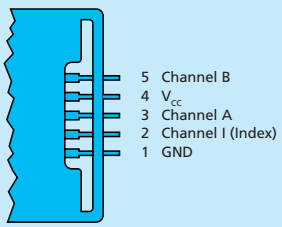


Output signals
with clockwise rotation as seen from the shaft end



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 Lines per revolution
3 Channels + complementary outputs
Digital output
Line driver

Series 5540

See beginning of the Encoder Section for Ordering Information

HEDL 5540			
Lines per revolution	N	500	
Signal output, square wave		2+1 index and complementary outputs	channels
Supply voltage	V_{CC}	4.5 ... 5.5	V DC
Current consumption, typical (V_{CC} = 5 V DC)	I_{CC}	57	mA
Pulse width	P	180 ± 35	°e
Index pulse width	Po	90 ± 35	°e
Phase shift, channel A to B	Φ	90 ± 15	°e
Logic state width	S	90 ± 35	°e
Cycle	C	360 ± 5.5	°e
Signal rise/fall time, typical	tr/tf	0.25 / 0.25	µs
Frequency range [1]	f	up to 100	kHz
Inertia of code disc	J	$8 \cdot 10^{-6}$	oz-in-sec²
Operating temperature range		0 to 70 (32 to 158)	°C (°F)

[1] Velocity (rpm) = f (Hz) x 60/N

Ordering information

Encoder type	number of channels	lines 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: AM26L32, SN75175, MC3486

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.

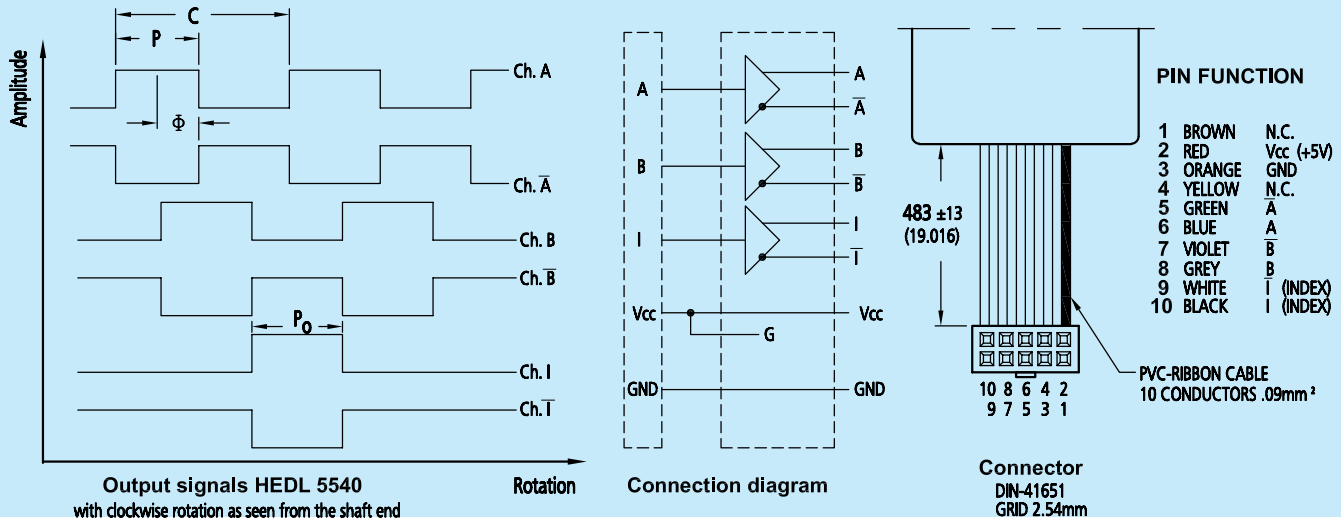
The single 5 volt supply and the digital output signals are interfaced with a connector.

The line driver offers enchanced 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



Output signals HEDL 5540
with clockwise rotation as seen from the shaft end

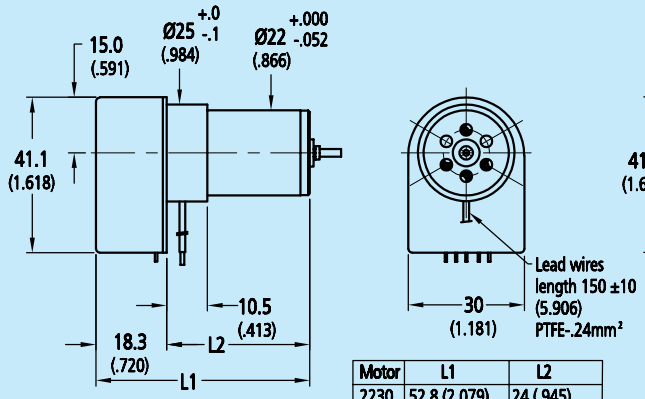
Connection diagram

Connector
DIN-41651
GRID 2.54mm

For notes on technical data refer to "Technical Information". Specifications subject to change without notice. MME0701

Series 5500, 5540

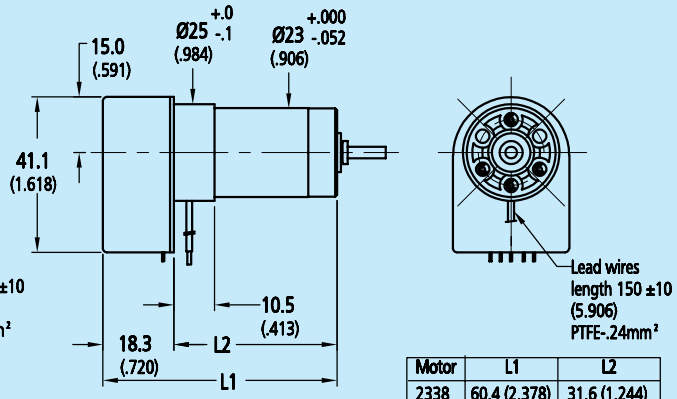
HEDS 5500, 5540 with motors 2230, 2233



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

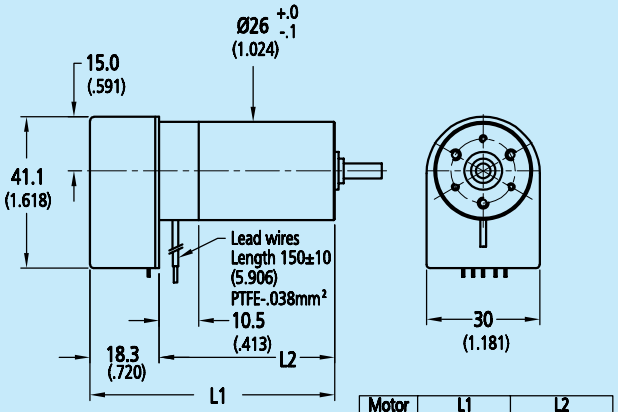
HEDS 5500, 5540 with motors 2338, 2342



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

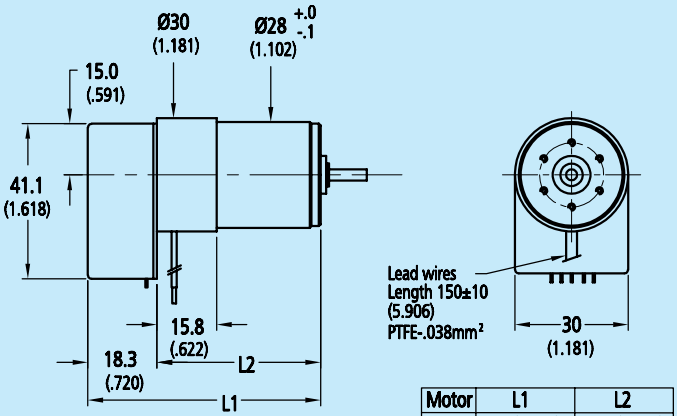
HEDS 5500, 5540 with motors 2642, 2657



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

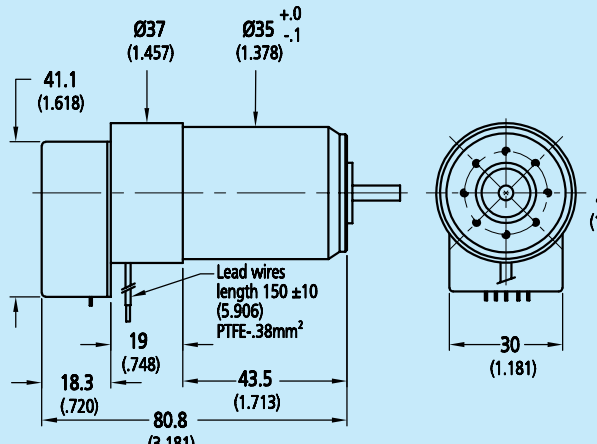
HEDS 5500, 5540 with motors 2842, 3042



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

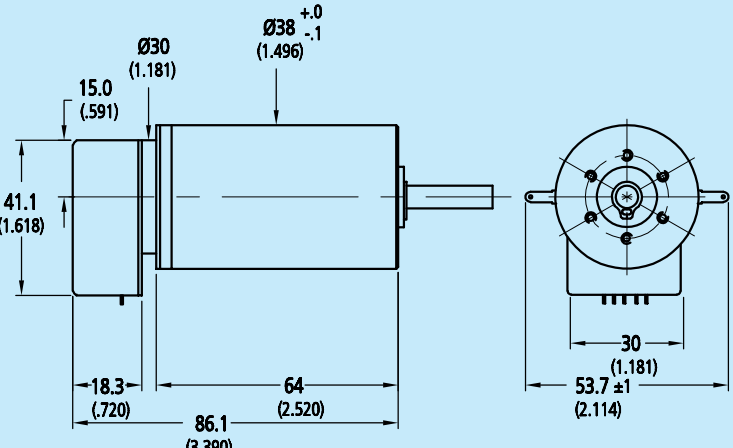
Encoders HEDS 5500, 5540
with DC-Micromotor 2842, 3042

HEDS 5500, 5540 with motor 3557



Encoders HEDS 5500, 5540
with DC-Micromotor 3557

HEDS 5500, 5540 with motor 3863

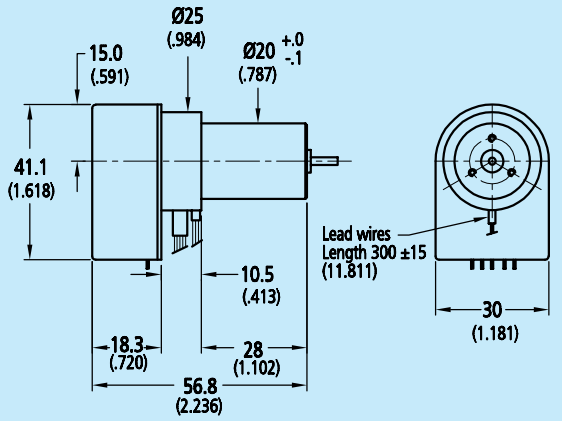


Encoders HEDS 5500, 5540
with DC-Micromotor 3863

For notes on technical data refer to "Technical Information". Specifications subject to change without notice. MME0701

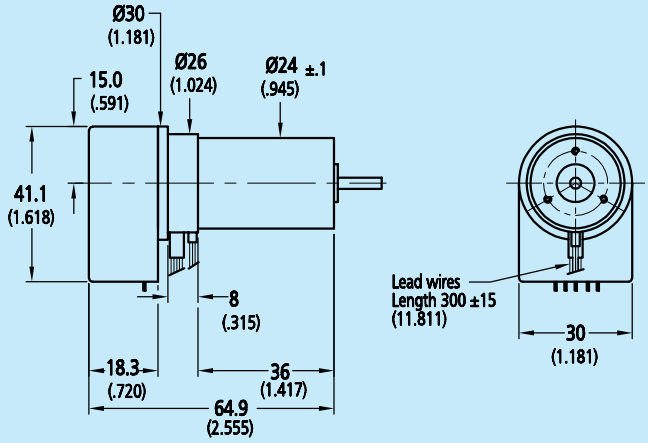
Series 5500, 5540

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



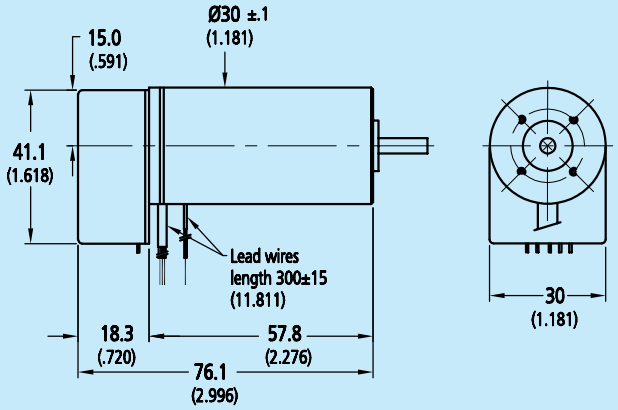
Encoders HEDS 5500, 5540
with Brushless DCServomotor- 2036 U ... B K312

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



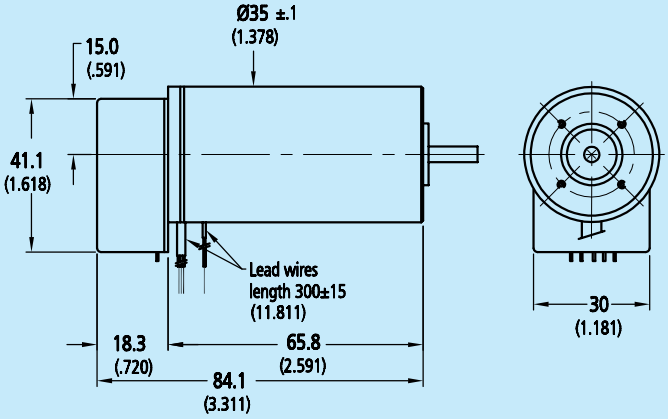
Encoders HEDS 5500, 5540
with Brushless DC-Servomotor 2444 S ... B K312

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



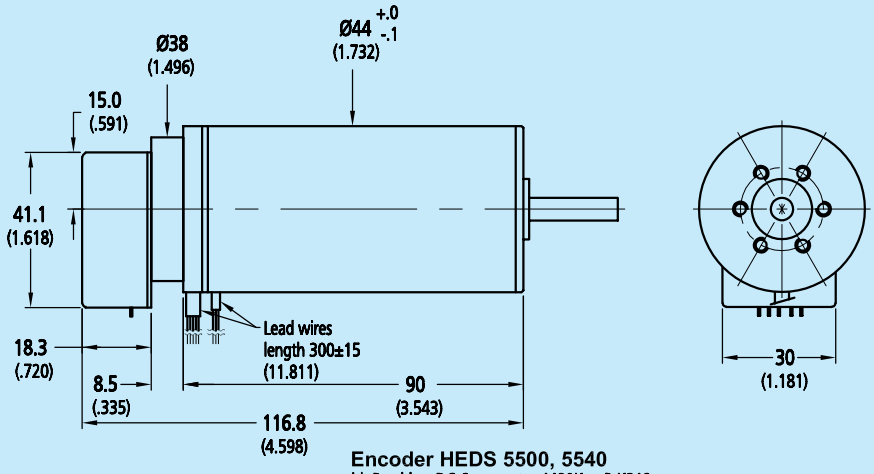
Encoders HEDS 5500, 5540
with Brushless DC-Servomotor 3056 K ... B K312

HEDS 5500, 5540 with Brushless Servomotor 3564 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

For notes on technical data refer to "Technical Information". Specifications subject to change without notice. MME0701