Encoders without bearing

Sine encoder with magnetic sensing, integrated pre-amplifier possible

Hollow shaft ø20 to ø60 mm, resolution 128 pulses

HMC 16

HMC 16 M

Features

- **Incremental encoder without bearings**
- **Magnetic sensing**
- **Robust and free from wear, high maximum speed**
- **Sine/cos output with 128 pulses**
- **Integrated pre-amplifier possible (version V)**
- **Redundant sensing for compensating radial runout possible (version M)**

Optional

- **In connection with an external signal processing (HEAG 158, HEAG 159, HEAG 160) random output signals and nearly unbounded pulses are possible.**

Technical data - electrical ratings

Resolution (steps/turn)	128
Sensing method	Magnetic
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
HMC 16 V, HMC 16 MV	
Voltage supply	5 VDC ±5 %
Consumption w/o load	≤90 mA
Phase shift	90° ±10°
Reference signal	Zero pulse, width 90°
Output signals	A+, B+, R+, A-, B-, R-
Output circuit	Sine/cos 1 Vpp differential
Harmonics share approx.	-50 dB
Offset sine/cosine amplitude	≤20 mV
Spectrum	250 kHz (-3 dB)
Overlaying constant share	≤20 mV
HMC 16, HMC 16 M	
Output signals	A+, B+, A-, B- (unreinforced)
Output circuit	Sine/cos (unreinforced)

Technical data - mechanical design

Dimensions (flange)	ø158 mm
Shaft	ø20...60 mm hollow shaft
Protection DIN EN 60529	IP 68
Operating speed	≤12000 rpm (mechanical)
Starting torque	1 Nm
Rotor moment of inertia	7.5 kgcm² (ø45)
Material	Housing: aluminium
Operating temperature	-30...+100 °C
Resistance	DIN EN 60068-2-6 Vibration 25 g, 10-2000 Hz DIN EN 60068-2-27 Shock 300 g, 12 ms
Axial tolerance	±2 mm
Radial tolerance	±0.2 mm
Weight approx.	2.4 kg
Connection	Mating connector

HMC 16

Part number

Version V (with integrated sine pre-amplifier)

HMC 16		V S		128

Pulses
128

Zero pulse
- Without zero pulse
N With zero pulse

Redundant sensing
- Without redundant sensing
M with redundant sensing

Standard version

HMC 16		S	128

Pulses
128

Redundant sensing
- Without redundant sensing
M with redundant sensing

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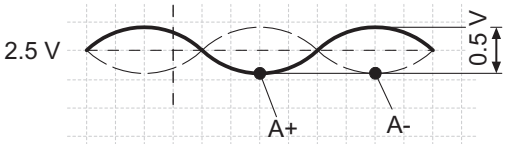
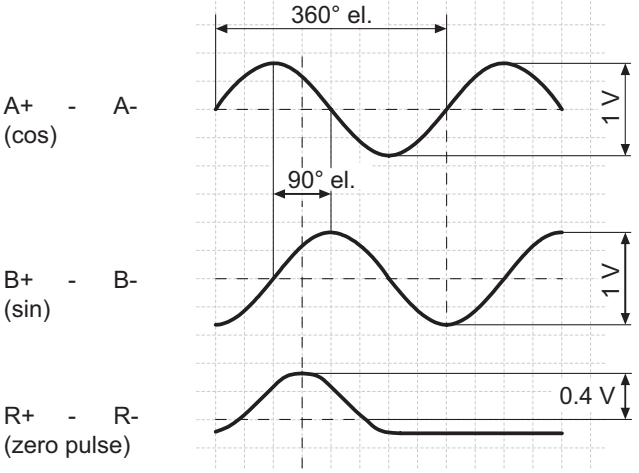
Output signals



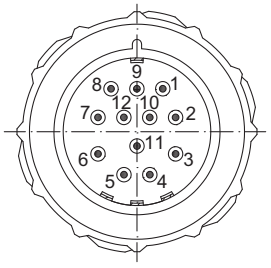
With integrated pre-amplifier at positive direction of rotation



Terminal assignment

Standard version	
Male	Assignment
Pin 1	B- (B+ inv.)
Pin 2	do not use
Pin 3	Bridge+
Pin 4	Bridge-
Pin 5	A+
Pin 6	A- (A+ inv.)
Pin 7	do not use
Pin 8	B+
Pin 9	do not use
Pin 10	do not use
Pin 11	do not use
Pin 12	do not use
Version V (with integrated pre-amplifier)	
Male	Assignment
Pin 1	B- (B+ inv.)
Pin 2	do not use
Pin 3	R+ (zero pulse)
Pin 4	R- (zero pulse inv.)
Pin 5	A+
Pin 6	A- (A+ inv.)
Pin 7	do not use
Pin 8	B+
Pin 9	do not use
Pin 10	0 V
Pin 11	do not use
Pin 12	+UB

View A

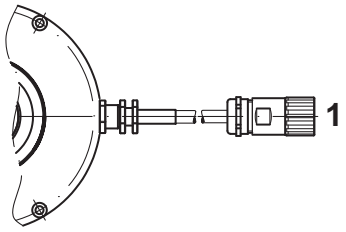


Mating connector M23 with coupling nut
Male contacts, clockwise

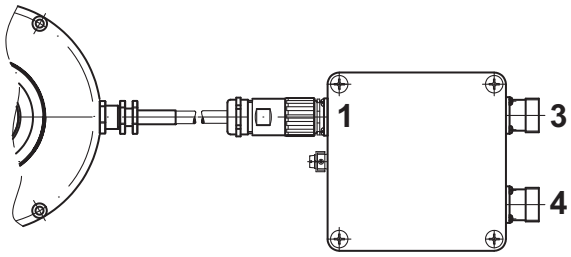
HMC 16

Connection examples

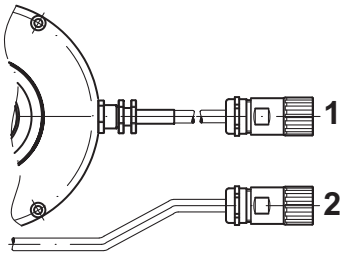
HMC 16 V



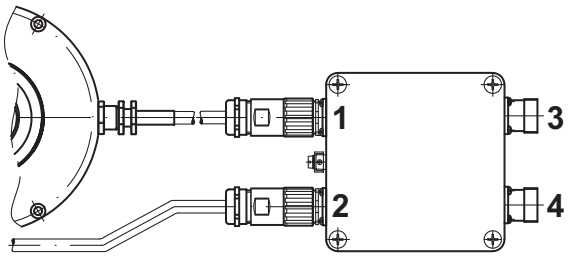
HMC 16 → HEAG 158 V, HEAG 160 V
HMC 16 V → HEAG 158, HEAG 160



HMC 16 MV



HMC 16 M → HEAG 158 VD, HEAG 160 VD
HMC 16 MV → HEAG 158 D, HEAG 160 D



Output 1 and 2

HMC 16, HMC 16 M (External signal processing with pre-amplifier required, no zero pulse)	
Output signals	A+, B+, A-, B-
Output circuit	Sine/cos unreinforced
Resolution (steps/turn)	128
HMC 16 V, HMC 16 MV (External signal processing without pre-amplifier if required)	
Output signals	A+, B+, R+, A-, B-, R-
Output circuit	Sine/cos 1 Vpp differential
Resolution (steps/turn)	128

Input 1 and 2 - External signal processing

HEAG 158, HEAG 158 D, HEAG 158 V, HEAG 158 VD HEAG 160, HEAG 160 D, HEAG 160 V, HEAG 160 VD	
Input signals	A+, B+, R+, A-, B-, R-
Input circuit	Sine/cos
Input frequency	400 kHz

Output 3 - External signal processing

HEAG 158, HEAG 158 D, HEAG 158 V, HEAG 158 VD	
Output signals	A+, B+, R+, A-, B-, R- [1] Option: Error-
Output circuit	HTL
Interpolation factor for input resolution	1...16384 (multiplying) or 1/2...1/2048 (dividing)
HEAG 160, HEAG 160 D, HEAG 160 V, HEAG 160 VD	
Output signals	A+, B+, R+, A-, B-, R- [1] Option: Error-
Output circuit	Sine/cos 1 Vpp differential
Interpolation factor for input resolution	1...128 (multiplying)

Output 4 - External signal processing

HEAG 158, HEAG 158 D, HEAG 158 V, HEAG 158 VD	
Output signals	A+, B+, R+, A-, B-, R- [1]
Output circuit	TTL
Interpolation factor for input resolution	1...16384 (multiplying) or 1/2...1/2048 (dividing)
HEAG 160, HEAG 160 D, HEAG 160 V, HEAG 160 VD	
Output signals	A+, B+, R+, A-, B-, R- [1]
Output circuits	HTL or TTL
Interpolation factor for input resolution	1...16384 (multiplying) or 1/2...1/2048 (dividing)

[1] depending on the input signals

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Dimensions

HMC 16 (HMC 16 M)