# Encoders without bearing

## Sine encoder with magnetic sensing, integrated pre-amplifier possible

## Hollow shaft ø50 to ø85 mm, resolution 200 pulses

### HMC 18

**Features**

- **Incremental encoder without bearings**
- **Magnetic sensing**
- **Robust and free from wear, high maximum speed**
- **Sine/cos output with 200 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) | 200 |
| Sensing method | Magnetic |
| Interference immunity | DIN EN 61000-6-2 |
| Emitted interference | DIN EN 61000-6-4 |
| **HMC 18 V, HMC 18 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 18, HMC 18 M** | |
| Output signals | A+, B+, A-, B- (unreinforced) |
| Output circuit | Sine/cos (unreinforced) |

| Technical data - mechanical design | |
|---|---|
| Dimensions (flange) | ø199,5 mm |
| Shaft | ø50...85 mm hollow shaft |
| Protection DIN EN 60529 | IP 68 |
| Operating speed | ≤8000 rpm (mechanical) |
| Starting torque | 1 Nm |
| Rotor moment of inertia | 40 kgcm² (ø80) |
| Material | Housing: aluminium |
| Operating temperature | -30...+100 °C |
| Resistance | DIN EN 60068-2-6<br>Vibration 25 g, 10-2000 Hz<br>DIN EN 60068-2-27<br>Shock 300 g, 12 ms |
| Axial tolerance | ±2 mm |
| Radial tolerance | ±0.2 mm |
| Weight approx. | 2.8 kg |
| Connection | Mating connector |

## HMC 18

### Part number

**Version V (with integrated sine pre-amplifier)**

| HMC 18 | | V S | | 200 |
|---|---|---|---|---|

Pulses
200

Zero pulse
- Without zero pulse
N With zero pulse

Redundant sensing
- Without redundant sensing
M with redundant sensing

**Standard version**

| HMC 18 | | S | 200 |
|---|---|---|---|

Pulses
200

Redundant sensing
- Without redundant sensing
M with redundant sensing

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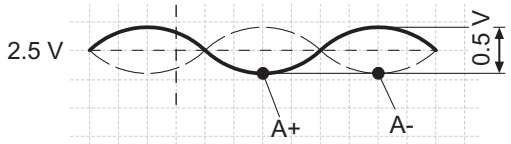
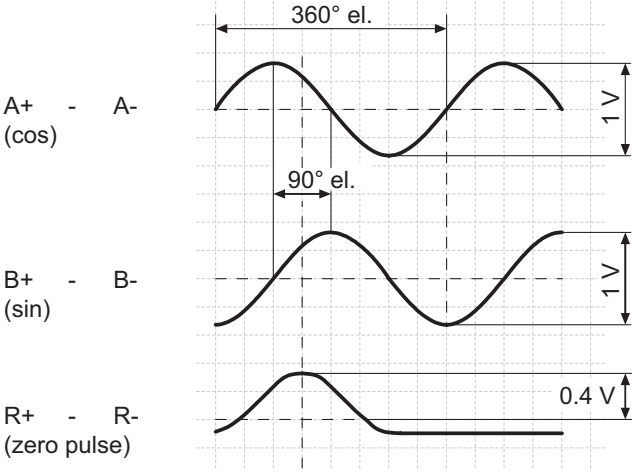
**Output signals**




With integrated pre-amplifier at positive direction of rotation




**Terminal assignment**

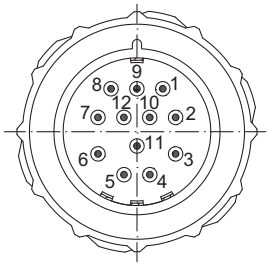
**Standard version**

| 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**

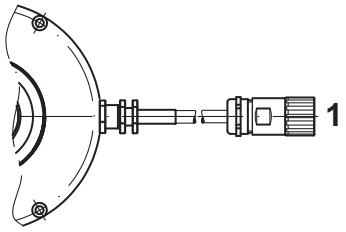



Mating connector M23 with coupling nut
Male contacts, clockwise

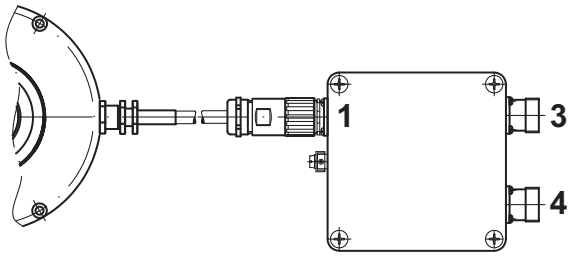
## HMC 18

### Connection examples

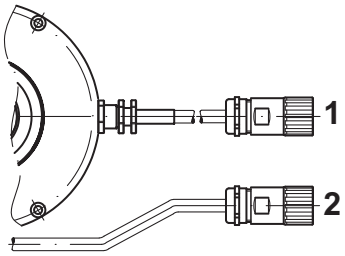
HMC 18 V



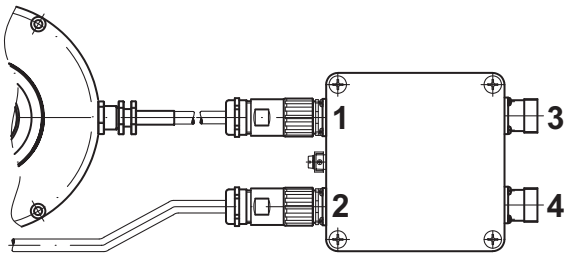

HMC 18 → HEAG 158 V, HEAG 160 V
HMC 18 V → HEAG 158, HEAG 160




HMC 18 MV




HMC 18 M → HEAG 158 VD, HEAG 160 VD
HMC 18 MV → HEAG 158 D, HEAG 160 D




### Output 1 and 2

| **HMC 18, HMC 18 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) | 200 |
| **HMC 18 V, HMC 18 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) | 200 |

### Input 1 and 2 - External signal processing

| **HEAG 158, HEAG 158 D, HEAG 158 V, HEAG 158 VD<br>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]<br>Option: Error- |
| Output circuit | HTL |
| Interpolation factor for input resolution | 1...16384 (multiplying)<br>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]<br>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)<br>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)<br>or 1/2...1/2048 (dividing) |

[1] depending on the input signals

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### Dimensions

**HMC 18 (HMC 18 M)**