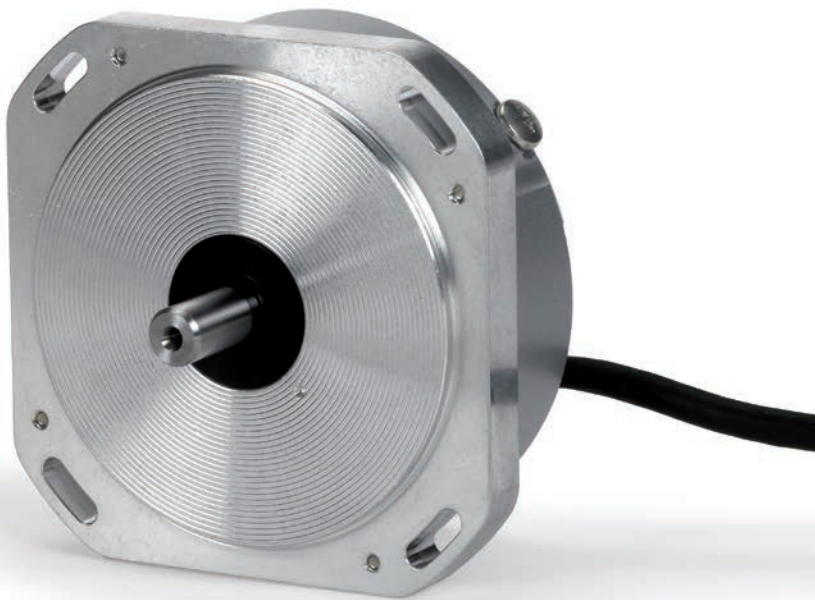




HEIDENHAIN



Product Information

ROD 200

ROD 700

ROD 800

Incremental Angle Encoders
with Integral Bearing for
Separate Shaft Coupling

07/2022



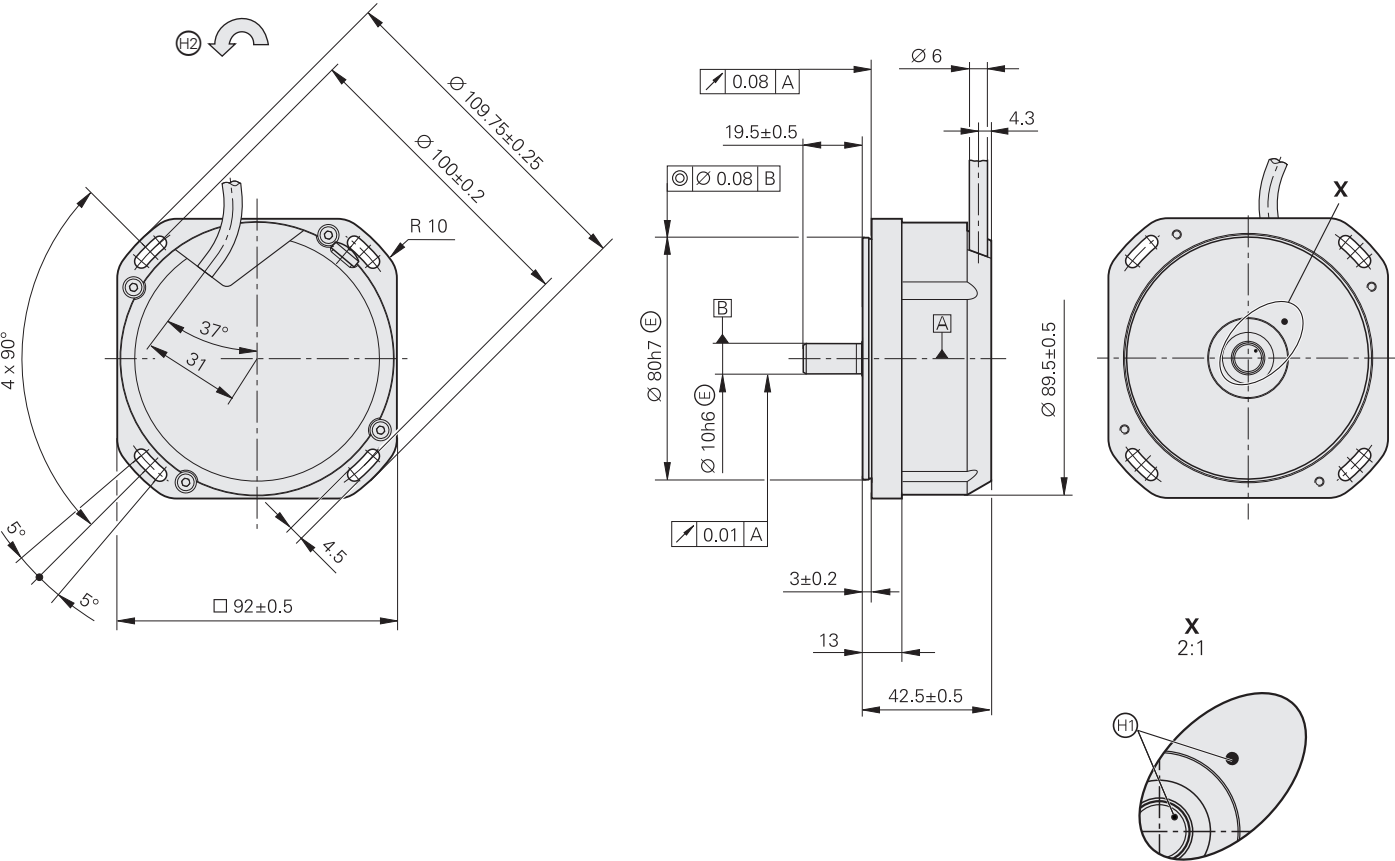
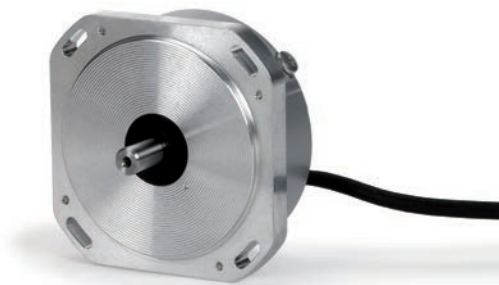
Automation and Metrology
8808 Tyler Blvd, Mentor, OH 44060

1-888-354-2525 | sales@auto-met.com

Request a quote: auto-met.com

ROD 200 series

- For a separate shaft coupling
- System accuracy: ±5"



mm
Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

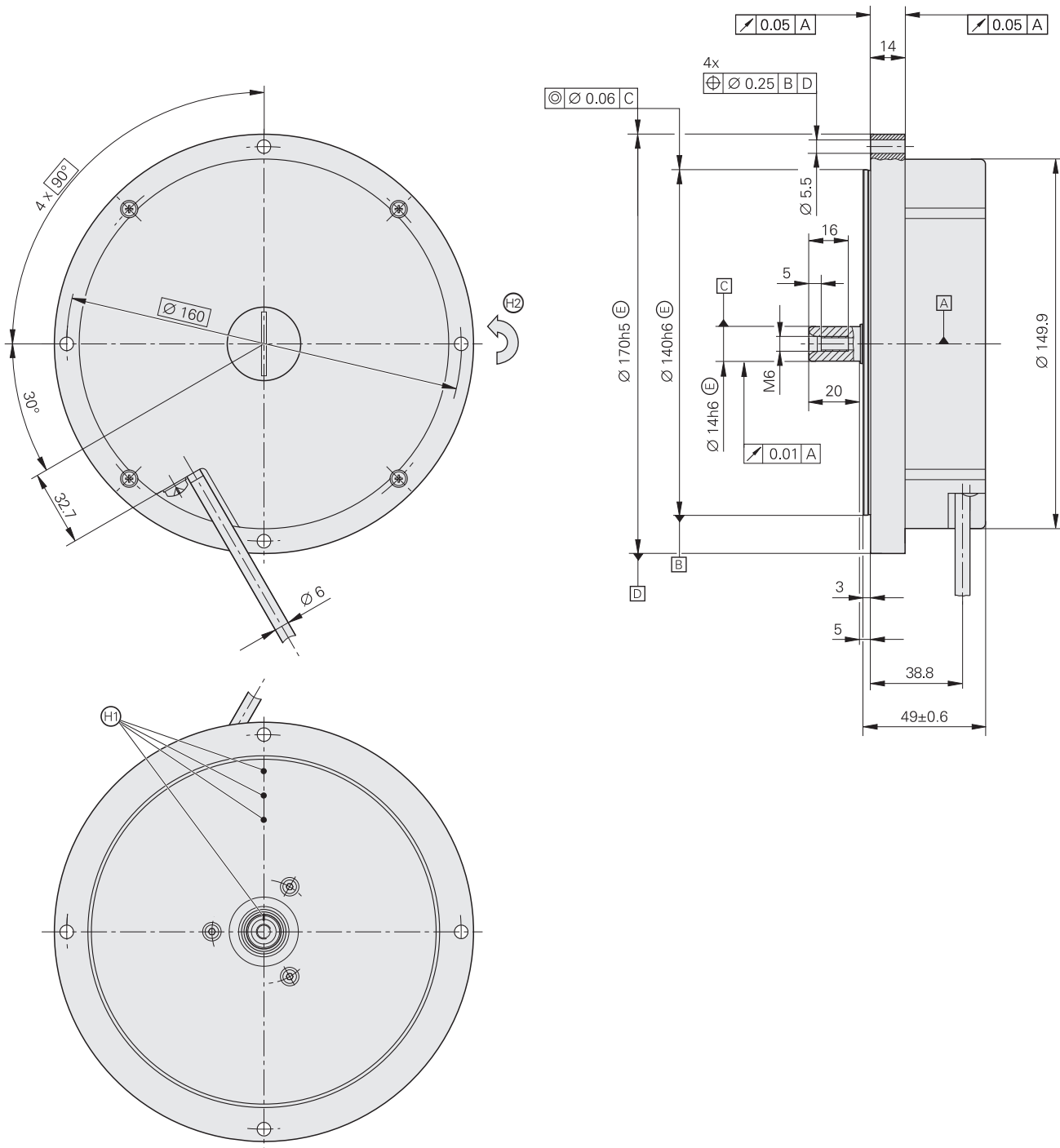
Radial cable (can also be used axially)
[A] = Bearing
[H1] = Position of the reference mark signal ±5°
[H2] = Direction of shaft rotation for output signals as per the interface description

	Incremental ROD 270	ROD 280
Measuring standard	DIADUR circular scale with incremental track	
Line count	18000	18000
System accuracy	±5"	
Position error per signal period	≤ ±0.7"	
Interface	TTL	1 V _{PP}
Integrated interpolation Output signals/rev	10-fold 180000	– 18000
Reference mark*	One	ROD 280: One ROD 280 C: Distance-coded
Cutoff frequency –3 dB Output frequency Edge separation a	– ≤ 1 MHz ≥ 0.22 μs	≥ 180 kHz – –
Elec. permiss. shaft speed	≤ 333 rpm	–
Electrical connection*	Cable (1 m), with or without a 12-pin M23 coupling (male)	
Cable length ¹⁾	≤ 100 m	≤ 150 m
Supply voltage	DC 5 V ±0.5 V/≤ 150 mA (without load)	
Shaft	Solid shaft D = 10 mm	
Mech. permissible speed	≤ 10000 rpm	
Starting torque	≤ 0.01 Nm at 20 °C	
Moment of inertia of rotor	20 · 10 ^{–6} kgm ²	
Shaft load	Axial: 10 N Radial: 10 N at shaft end	
Vibration 55 Hz to 2000 Hz Shock 6 ms	≤ 100 m/s ² (EN 60068-2-6) ≤ 200 m/s ² (EN 60068-2-27)	
Operating temperature	Frequent flexing: –10 °C to 70 °C Stationary cable: –20 °C to 70 °C	
Protection EN 60529	IP64	
Mass	≈ 0.7 kg	

* Please select when ordering
¹⁾ With HEIDENHAIN cable

ROD 780/ROD 880

- For a separate shaft coupling
- System accuracy: ±1" or ±2"



mm
Tolerancing ISO 8015
ISO 2768 - m H
< 6 mm: ±0.2 mm

Radial cable (can also be used axially)
A = Bearing
1 = Position of the reference mark signal ±5°
2 = Direction of shaft rotation for ascending position values

	Incremental ROD 780	ROD 880
Measuring standard	DIADUR circular scale with incremental track	
Line count*	18000 36000	36000
System accuracy	±2"	±1"
Position error per signal period	18000 lines: ≤ ±0.7" 36000 lines: ≤ ±0.35"	≤ ±0.35"
Interface	~ 1 V _{PP}	
Reference mark*	ROD x80: One ROD x80 C: Distance-coded	
Cutoff frequency -3 dB	≥ 180 kHz	
Electrical connection*	Cable (1 m), with or without a 12-pin M23 coupling (male)	
Cable length ¹⁾	≤ 150 m	
Supply voltage	DC 5 V ±0.5 V/≤ 150 mA (without load)	
Shaft	Solid shaft D = 14 mm	
Mech. permissible speed	≤ 1000 rpm	
Starting torque	≤ 0.012 Nm at 20 °C	
Moment of inertia of rotor	0.36 · 10 ⁻³ kgm ²	
Shaft load	Axial: 30 N Radial: 30 N at shaft end	
Vibration 55 Hz to 2000 Hz Shock 6 ms	≤ 100 m/s ² (EN 60068-2-6) ≤ 200 m/s ² (EN 60068-2-27)	
Operating temperature	0 °C to 50 °C	
Protection EN 60529	IP64	
Mass	≈ 2.4 kg	

* Please select when ordering
¹⁾ With HEIDENHAIN cable

Mounting

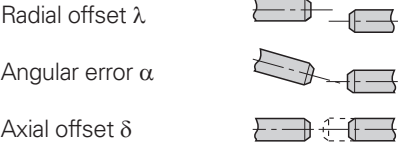
Angle encoders of the **ROD** product family require a separate coupling for connection to the drive shaft. The shaft coupling compensates for axial movement and misalignment between the shafts, thereby preventing excessive encoder bearing loads. For realizing high accuracies, it is necessary that the shaft of the angle encoder be optimally aligned with the shaft of the machine. The HEIDENHAIN product portfolio includes diaphragm couplings and flat couplings designed for connecting the shaft of the ROD angle encoder to the drive shaft.

Mounting

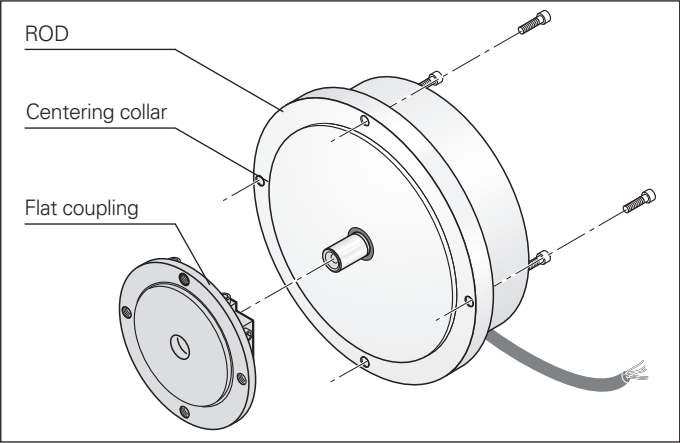
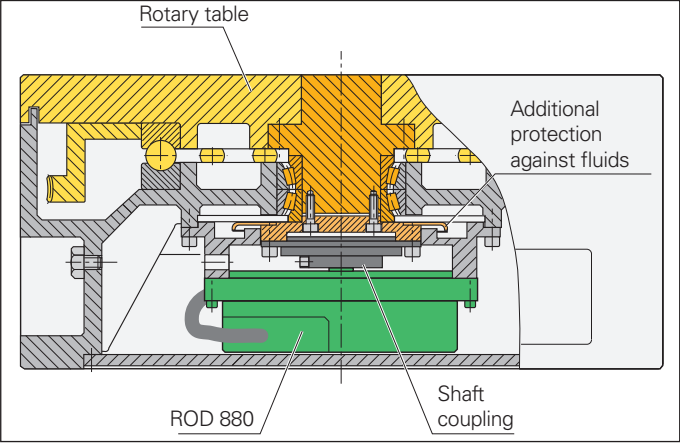
ROD angle encoders have an integral mounting flange with a centering collar. The encoder shaft is connected to the machine shaft by means of a diaphragm coupling or flat coupling.

Shaft couplings

The shaft coupling compensates for axial movement and misalignment between the encoder shaft and the drive shaft, thereby preventing excessive encoder bearing loads.

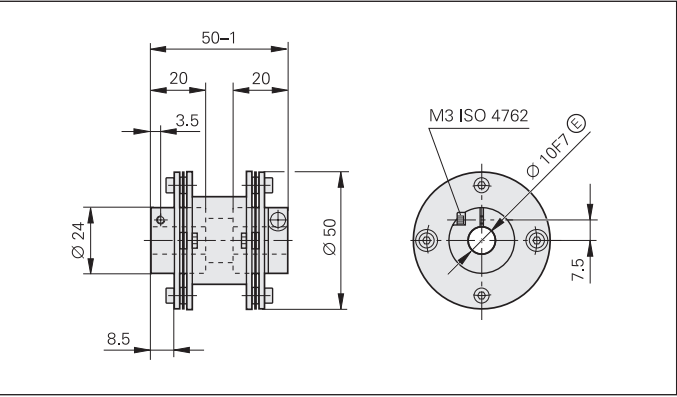


Mounting example for the ROD 880

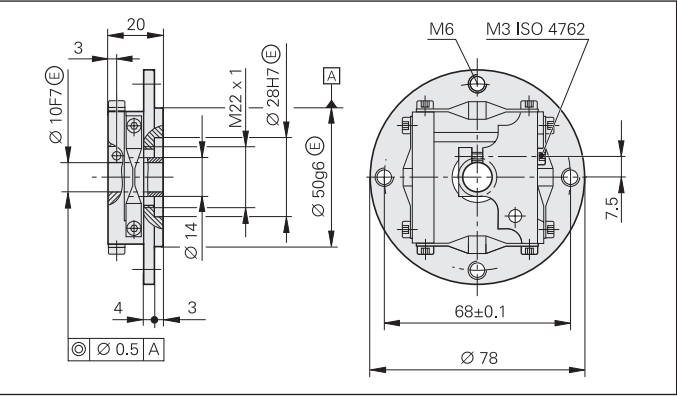


Shaft coupling	ROD 200 series		ROD 700 series, ROD 800 series		
	K 03 Diaphragm coupling	K 18 Flat coupling	K 01 Diaphragm coupling	K 15 Flat coupling	K 16 Flat coupling
Hub bore	10 mm		14 mm		
Kinematic transfer error	±2″ At λ ≤ 0.1 mm and α ≤ 0.09°		±1″	±0.5″ At λ ≤ 0.05 mm and α ≤ 0.03°	
Torsional rigidity	1500 Nm/rad	1200 Nm/rad	4000 Nm/rad	6000 Nm/rad	4000 Nm/rad
Permissible torque	0.2 Nm	0.5 Nm			
Perm. radial offset λ	≤ 0.3 mm				
Perm. angular error α	≤ 0.5°			≤ 0.2°	≤ 0.5°
Perm. axial offset δ	≤ 0.2 mm			≤ 0.1 mm	≤ 1 mm
Moment of inertia (approx.)	20 · 10 ⁻⁶ kgm ²	75 · 10 ⁻⁶ kgm ²	200 · 10 ⁻⁶ kgm ²		400 · 10 ⁻⁶ kgm ²
Permissible shaft speed	10000 rpm	1000 rpm	3000 rpm	1000 rpm	
Tightening torque of clamping screws (approx.)	1.2 Nm		2.5 Nm	1.2 Nm	
Mass	100 g	117 g	180 g	250 g	410 g

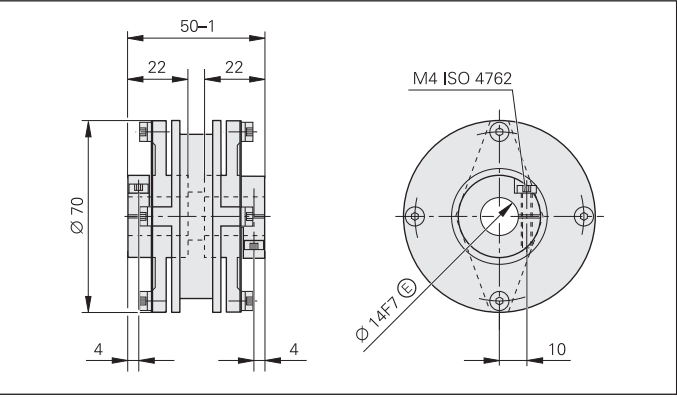
K 03 diaphragm coupling
ID 200313-04



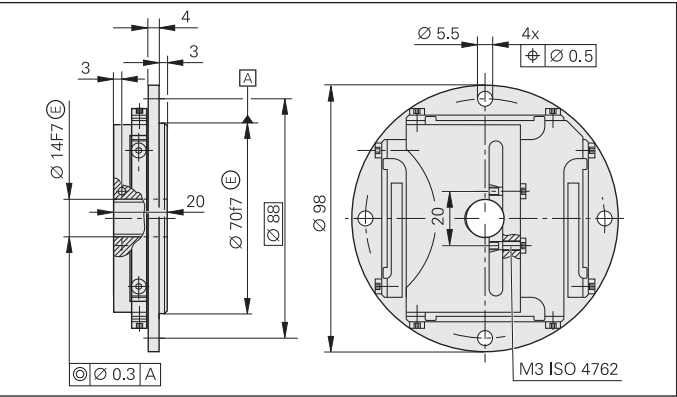
K 18 flat coupling
ID 202227-01



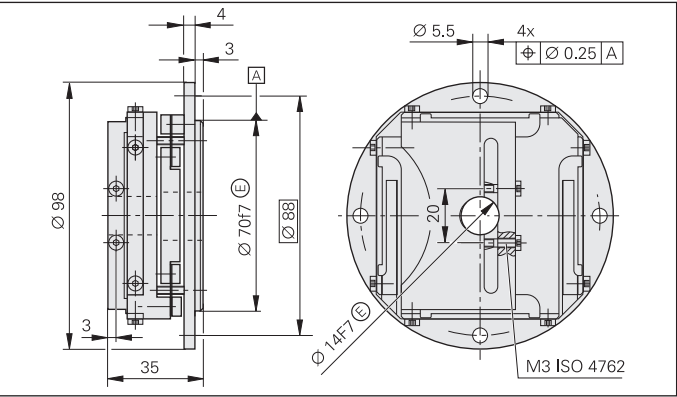
K 01 diaphragm coupling
ID 200301-02



K 15 flat coupling
ID 255797-01



K 16 flat coupling
ID 258878-01

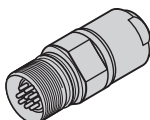
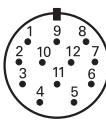
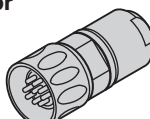
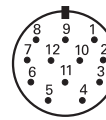
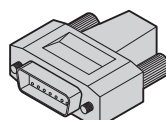
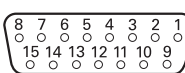
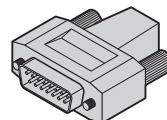
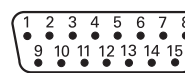


mm
Tolerancing ISO 8015
ISO 2768:1989-mH
≤ 6 mm: ±0.2 mm
Product Information ROC 200/700/800

Interfaces

~ 1 V_{PP} incremental signals

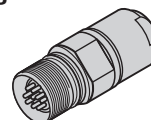
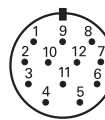
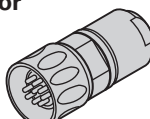
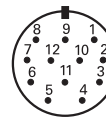
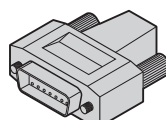
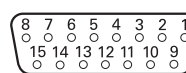
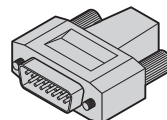
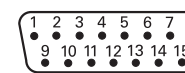
Pin layout

12-pin M23 coupling					12-pin M23 connector															
  					  															
15-pin D-sub connector for HEIDENHAIN controls and the IK 220														15-pin D-sub connector at the encoder or for the PWM						
  														  						
	Power supply				Incremental signals						Other signals									
	12	2	10	11	5	6	8	1	3	4	9	7	/							
	1	9	2	11	3	4	6	7	10	12	5/8/13/15	14	/							
	4	12	2	10	1	9	3	11	14	7	5/6/8/15	13	/							
	U _P	Sensor ¹⁾ U _P	0V	Sensor ¹⁾ 0V	A+	A–	B+	B–	R+	R–	Vacant	Vacant	Vacant							
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	/	Violet	Yellow							

Cable shield connected to housing; **U_P** = Power supply voltage
Sensor: The sense line is connected in the encoder with the corresponding power line.
Vacant pins or wires must not be used!
¹⁾ **LIDA 2xx:** Vacant

TTL incremental signals

Pin layout

12-pin M23 coupling					12-pin M23 connector									
  					  									
15-pin D-sub connector for HEIDENHAIN controls and the IK 220					15-pin D-sub connector at the encoder or for the PWM									
  					  									
	Power supply				Incremental signals						Other signals			
	12	2	10	11	5	6	8	1	3	4	7	/	9 ³⁾	
	1	9	2	11	3	4	6	7	10	12	14	8/13/15	5	
	4	12	2	10	1	9	3	11	14	7	13	5/6/8	15 ³⁾	
	U _P	Sensor ¹⁾ U _P	0V	Sensor ¹⁾ 0V	U _{a1}	U _{a1}	U _{a2}	U _{a2}	U _{a0}	U _{a0}	U _{aS} ²⁾	Vacant	Vacant	
	Brown/ Green	Blue	White/ Green	White	Brown	Green	Gray	Pink	Red	Black	Violet	/	Yellow	

Cable shield connected to housing; **U_P** = Power supply voltage
Sensor: The sense line is connected in the encoder with the corresponding power line.
Vacant pins or wires must not be used!
¹⁾ **LIDA 2xx:** Vacant / ²⁾ **ERO 14xx:** Vacant
³⁾ **Exposed linear encoders:** Conversion from TTL to 11 μA_{PP} for the PWT, otherwise unassigned

HEIDENHAIN

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This Product Information document supersedes all previous editions, which thereby become invalid. The basis for ordering from HEIDENHAIN is always the Product Information document edition valid when the order is placed.

More information:

- Comply with the requirements described in the following documents to ensure correct and intended operation:
- Brochure: *Angle Encoders with Integral Bearing* 591109-xx
 - Brochure: *Interfaces of HEIDENHAIN Encoders* 1078628-xx
 - Brochure: *Cables and Connectors* 1206103-12
- For brochures and Product Information documents, visit www.heidenhain.com.