

**ROD 4x9 Series**

Specifications

Dimensions

Electrical Connection

**Incremental Rotary Encoder**




**Successor Series to the ROD 1400**



<b>Mechanical design</b>		<b>Special housing</b> Shaft diameter 10 mm
<b>Output signals</b>	ROD 429 ROD 439 ROD 459	□ TTL □ HTL ~ 11 µApp
<b>Special feature</b>		<b>Designed specifically for mounting to Indramat motors</b>
<b>Successor units to</b>	ROD 1423 ROD 1424 ROD 1430 ROD 1451	<b>The ROD 4x9 series will replace the rotary encoders of the previous ROD 1400 series.</b> ROD 429 without polarizing key ROD 429 with polarizing key ROD 439 ROD 459

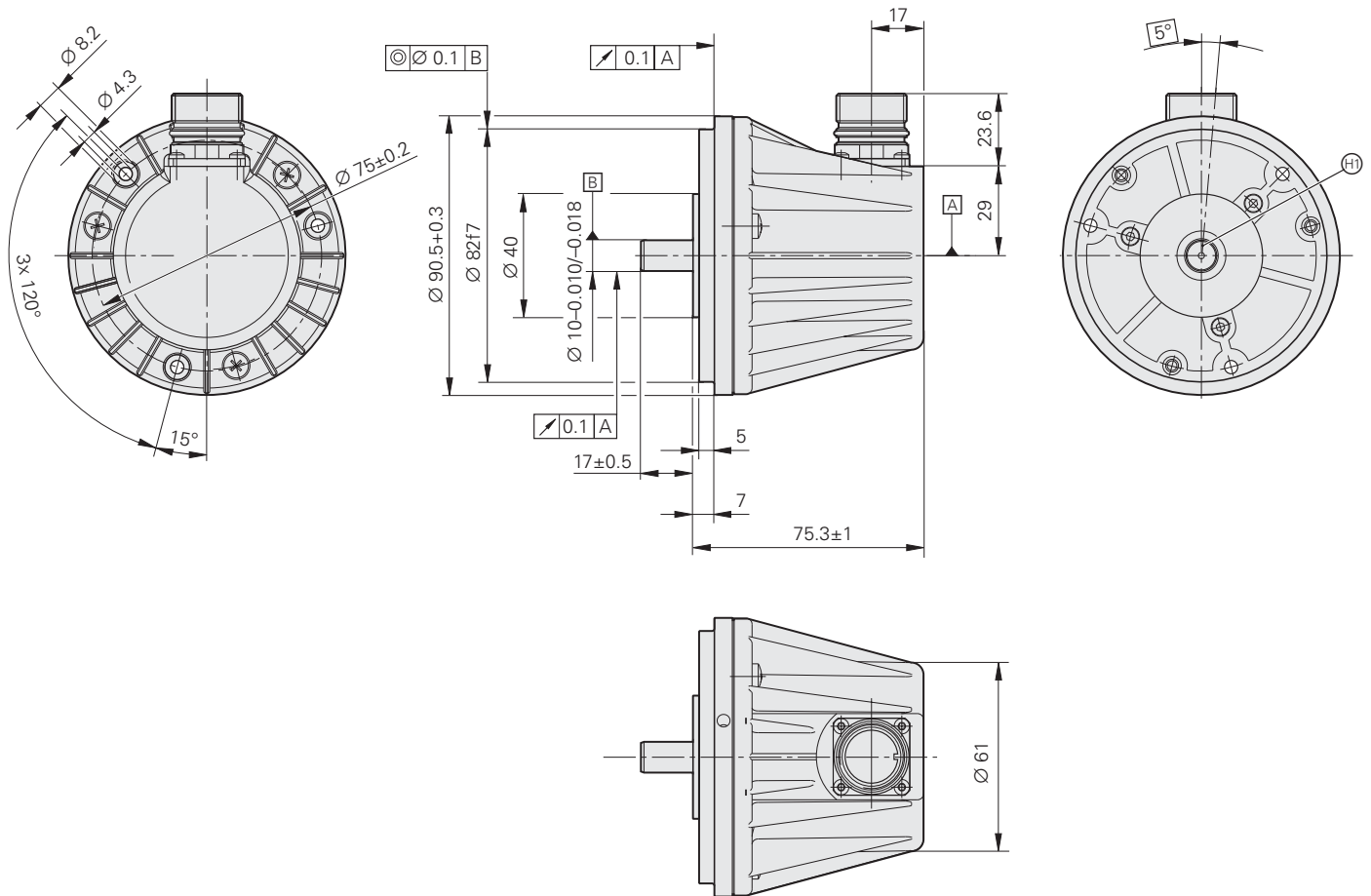


## Specifications

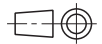
	ROD 429	ROD 439	ROD 459
<b>Incremental signals</b>	 TTL; 2 square-wave pulse trains $U_{a1}$ , $U_{a2}$	 HTL; 2 square-wave pulse trains $U_{a1}$ , $U_{a2}$	 11 $\mu$ A <sub>pp</sub> ; non-floating; 2 sinusoidal signals $I_{a1}$ , $I_{a2}$
Line counts	Max. 5000		
Scanning frequency	≤ 300 kHz		–
Cutoff frequency	–3 dB	–	180 kHz
<b>Reference mark signal</b>	1 TTL square-wave pulse per revolution	1 HTL square-wave pulse per revolution	1 signal peak per revolution
<b>Power supply</b> without load	5 V ± 10% max. 120 mA	10 to 30 V, max. 150 mA	5 V ± 10% max. 90 mA
<b>Electrical connection*</b>	Radial flange socket, with or without polarizing key	Radial flange socket, with polarizing key	
<b>Shaft</b>	Solid shaft Ø 10 mm		
<b>Mech. permissible speed n</b>	Max. 12000 rpm		
<b>Starting torque</b> at 20 °C (68 °F)	≤ 0.01 Nm		
<b>Moment of inertia of rotor</b>	2.1 · 10 <sup>-6</sup> kgm <sup>2</sup>		
<b>Vibration</b> 55 to 2000 Hz <b>Shock</b> 6 ms	≤ 100 m/s <sup>2</sup> (IEC 60068-2-6) ≤ 1000 m/s <sup>2</sup> (EN 60068-2-27)		
<b>Max. operating temperature</b>	100 °C (212 °F)		+85 °C (185 °F)
<b>Min. operating temperature</b>	–30 °C (–22 °F)		–10 °C (14 °F)
<b>Protection</b> IEC 60529	IP 67 at housing; IP 64 at shaft inlet		
<b>Weight</b>	Approx. 0.4 kg		

\* Please indicate when ordering

**Dimensions**



Dimensions in mm



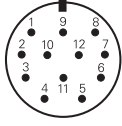



Tolerancing ISO 8015  
 ISO 2768 - m H

- ▣ = Ball bearing
- ⊕ = Reference mark position, shaft – flange  $\pm 15^\circ$



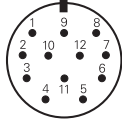

**Electrical Connection**

**ROD 429, ROD 439 Pin Layout**

<b>12-pin HEIDENHAIN flange socket</b>   												
	Power supply					Incremental signals						
	<b>12</b>	<b>2</b>	<b>10</b>	<b>11</b>	<b>7</b>	<b>9</b>	<b>5</b>	<b>6</b>	<b>8</b>	<b>1</b>	<b>3</b>	<b>4</b>
	<b>U<sub>P</sub></b>	<b>Sensor</b> U <sub>P</sub>	<b>0V</b>	<b>Sensor</b> 0V	<b>Polarizing key</b> <sup>1)</sup>	<b>Shield</b>	<b>U<sub>a1</sub></b>	<b><math>\overline{U}_{a1}</math></b>	<b>U<sub>a2</sub></b>	<b><math>\overline{U}_{a2}</math></b>	<b>U<sub>a0</sub></b>	<b><math>\overline{U}_{a0}</math></b>

**Shield** on housing. The shield is connected to pin 9; **U<sub>P</sub>** = Power supply  
**Sensor:** The sensor line is connected internally with the corresponding power line.  
<sup>1)</sup> polarizing key optional for ROD 429

**ROD 459 Pin Layout**

<b>12-pin HEIDENHAIN flange socket</b>   											
	Power supply					Incremental signals					
	<b>3</b>	<b>4</b>	<b>9</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>6</b>	<b>10</b>	<b>8</b>	
	<b>U<sub>P</sub></b>	<b>0V</b>	<b>Shield</b>	<b>Polarizing key</b>	<b>I<sub>1+</sub></b> (0°+)	<b>I<sub>1-</sub></b> (0°-)	<b>I<sub>2+</sub></b> (90°+)	<b>I<sub>2-</sub></b> (90°-)	<b>I<sub>0+</sub></b> (RI+)	<b>I<sub>0-</sub></b> (RI-)	

**Shield** on housing. The shield is connected to pin 9; **U<sub>P</sub>** = Power supply

**HEIDENHAIN**

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**For more information**

- Brochure: *Rotary Encoders*