

Aerospace | Medical | Industrial | Scientific | Microelectronics



ABSOLUTE ROTARY ENCODERS

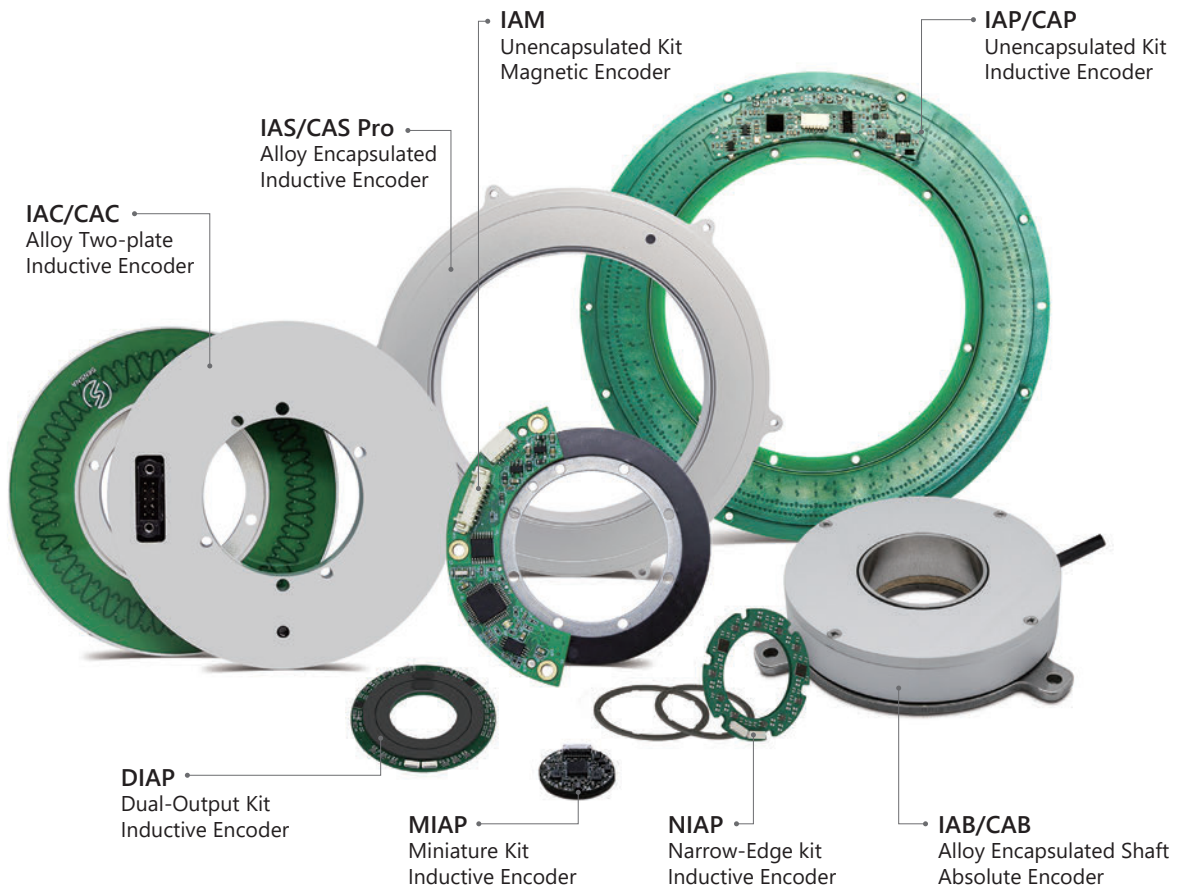
Absolute Feedback for Robotics, Industrial Automation, and Harsh Environments

High Accuracy | Hollow Shaft | Low Profile | Non-contact

Designed to meet the most demanding requirements

Absolute rotary encoder utilizes techniques of inductive and magnetic, having hollow shaft, high precision, high reliability, and non-contact features. The ultra-high precision and high-end functions of the electric encoder makes it integrated with modern motion control applications, meeting the strict requirements.

Absolute rotary encoder offers a variety of diameters, models, communication interfaces, and connection options. All models are compatible with a wide range of controllers and drives, covering all fields of precision motion control from aerospace and defense, harsh environment, to industrial, medical and automotive applications.



Typical applications

- Rotary joints & gimbals
- Actuator servos & motor encoders
- Electro-optical & infra-red camera systems
- Heliostats & solar equipment
- Robotic arms & CNC machine tools
- Test & calibration equipment
- Light & heavy calibre weapons systems
- Targeting systems & range finders
- Antenna pointing devices & telescopes
- Packaging & laboratory automation
- Medical scanners & surgical equipment
- Cranes & telescopic manipulators

Inductive Rotary Encoders

Inductive rotary encoder adopts an inductance technique to measure precise angle. They have two main parts, each shaped like a flat ring, a stator and a rotor. The stator is powered and the rotor is passive. The stator contains the electronics to receive power and generates an output signal. The output signal from the stator shows the true absolute angular position of the rotor relative to the stator without the need of any motion at power up.

Non-contact makes it easy to achieve high precision, high reliability angle measurement in harsh environments. The hollow shaft and low profile allow easy integration with through-shafts, slip-rings, direct drive motors, optical-fibres, pipes or cables. Installation does not require precisely machined mounting components or couplings.

The encoders are equipped with BiSS, Asynchronous serial (UART), SSI communication interfaces and offer a range of binary resolutions up to 22 bits per revolution. Providing customized extension options when there are more special requirements to meet.

Inductive rotary encoder can be widely used in intelligent robots, medical equipment, mechanical automation, aerospace and other fields, providing innovative product combinations and solutions for customers in various industries such as environmental detection, emergency safety, life sciences, semiconductors, chemicals, energy, etc.



Low Profile



Hollow Shaft



High Precision



Durability



**Immunity to
Magnetic Fields**

Features and benefits

- Pre-calibrated to reduce non-linearity
- Low-profile form factor and large bore
- Rugged and insensitive to foreign matter
- Multiple sizing and mounting formats
- Duplex mechanical format
- Higher system pointing accuracies
- More compact and lightweight systems
- Systems can operate in extreme environments
- Optimized system design
- Enables systems to meet higher safety levels



Defense



Aerospace



Medical



Semiconductor



Collaborative Robots

IAS/CAS Pro- Alloy Encapsulated Series



High-Precision Performance in Harsh Environments

The IAS/CAS Pro series rotary encoder features a non-contact, high-precision, large-bore absolute design. Its robust suspended-rotor core eliminates mechanical wear, meeting stringent application demands. The encoder offers easy installation and enhanced reliability by minimizing failure modes.

The CAS Pro series encoders comply with rigorous environmental standards including moisture/salt/fungus resistance, aging, thermal shock, and vibration tests. Customizable options include an extended operating temperature range of -55°C to +125°C.

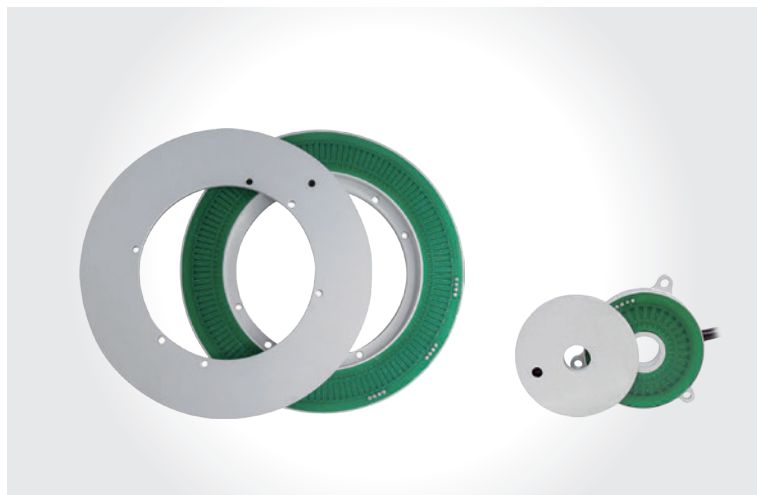
Application Areas

- Turntables & Gimbals
- Defense Systems
- Robotics
- Industrial Automation
- Custom Applications

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
IAC/CAS-25-Pro	25/6/7 mm	8 g	17-19 bit	±0.015°	6000 rpm	0.042 kg·mm ²
IAC/CAS-37-Pro	37/10/8 mm	13 g	17-19 bit	±0.01°	6000 rpm	0.236 kg·mm ²
IAC/CAS-58-Pro	58/20/10 mm	40 g	18-20 bit	±0.008°	8000 rpm	0.684 kg·mm ²
IAC/CAS-70-Pro	70/30/10 mm	55 g	18-20 bit	±0.008°	8000 rpm	3.338 kg·mm ²
IAC/CAS-90-Pro	90/50/10 mm	70 g	19-21 bit	±0.006°	6000 rpm	8.723 kg·mm ²
IAC/CAS-130-Pro	130/90/10 mm	120 g	19-21 bit	±0.006°	6000 rpm	39.669 kg·mm ²

Supply voltage	Electrical interface	Communication	Operating temp.	Protection
5-30V	RS-422 Shielded cable	SSi, BiSS-C, RS-422	-30°C - +100°C	IP 67

IAC/CAC- Alloy Two-plate Series



Reliable Angle Measurement in Extreme Environments

The IAC/CAC series rotary encoder consists of separate rotor and stator rings, both featuring a thin, annular, hollow-shaft design. Combining high precision, absolute output, and non-contact technology with a compact form factor, it delivers exceptional performance. Rugged and easy to install, it ensures precise and reliable measurement even in extreme conditions.

The CAC series encoders meet strict environmental benchmarks for moisture/salt/fungus resistance, aging, thermal cycling, and vibration. It supports custom configurations and offers a wide temperature range of -55°C to +125°C.

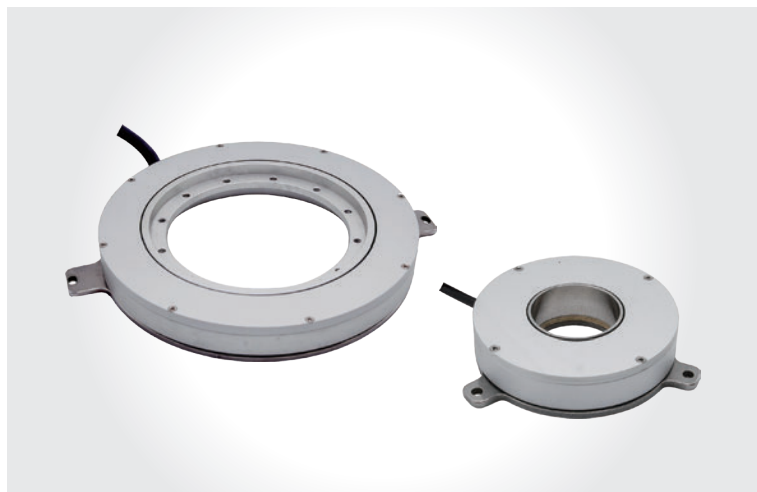
Application Areas

- UAV (Drones)
- Radar
- New Energy Equipment
- Industrial Automation
- Custom Applications

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
IAC/CAC-37	37/8/11.35 mm	20/6 g	17-19 bit	±0.025°	4000 rpm	1.185 kg·mm ²
IAC/CAC-58	58/12/16.4 mm	80/45 g	17-19 bit	±0.015°	3000 rpm	12.972 kg·mm ²
IAC/CAC-75	75/25/16.4 mm	82/50 g	17-19 bit	±0.015°	3000 rpm	39.203 kg·mm ²
IAC/CAC-90	90/40/16.4 mm	105/60 g	18-20 bit	±0.01°	1500 rpm	78.262 kg·mm ²
IAC/CAC-100	100/50/16.4 mm	115/70 g	18-20 bit	±0.01°	1500 rpm	115.612 kg·mm ²
IAC/CAC-125	125/75/16.4 mm	140/90 g	18-20 bit	±0.01°	1500 rpm	258.795 kg·mm ²
IAC/CAC-150	150/100/16.4 mm	170/110 g	18-20 bit	±0.01°	1500 rpm	490.238 kg·mm ²
IAC/CAC-175	175/125/16.4 mm	220/140 g	18-20 bit	±0.01°	1500 rpm	831.821 kg·mm ²
IAC/CAC-200	200/150/16.4 mm	260/160 g	18-20 bit	±0.01°	1500 rpm	1302.948 kg·mm ²
IAC/CAC-250	250/200/16.4 mm	300/181 g	18-20 bit	±0.01°	1500 rpm	2930.37 kg·mm ²

Supply voltage	Electrical interface	Communication	Operating temp.	Protection
5-30V	RS-422 Shielded cable	SSi, BiSS-C, RS-422	-30°C - +100°C	IP 67

IAB/CAB- Alloy Encapsulated Shaft Series



Inductive, Absolute, Robust & Easy to Install

The IAB/CAB series rotary encoder integrates the stator, rotor, housing, and bearing into a single, robust, annular hollow-shaft unit. Designed for easy installation, it provides high-precision absolute feedback and supports multiple communication interfaces. Highly resistant to shock and vibration, it is suitable for complex and demanding applications.

The CAB series encoders conform to rigorous standards for moisture/salt/fungus resistance, aging, high/low-temperature exposure, and vibration. Custom options are available, including a -55°C to +125°C operating range.

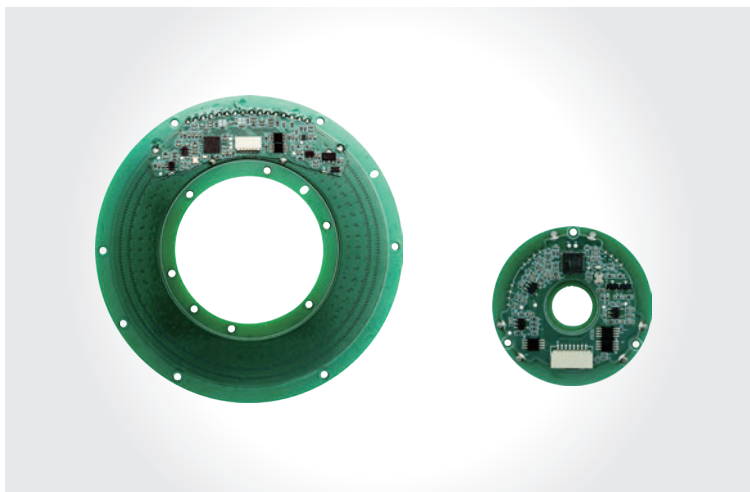
Application Areas

- Defense Systems
- Radar
- Automation Equipment
- DD Motors
- Custom Applications

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
IAB/CAB-16	15.4/1.8/21 mm	11 g	15-17 bit	±0.015°	4000 rpm	0.028 kg·mm ²
IAB/CAB-18	18/3/28.7 mm	16 g	15-17 bit	±0.015°	4000 rpm	0.037 kg·mm ²
IAB/CAB-38	38/10/10 mm	30 g	16-18 bit	±0.02°	4000 rpm	0.197 kg·mm ²
IAB/CAB-65	65/28/16.2 mm	160 g	17-19 bit	±0.015°	3000 rpm	11.067 kg·mm ²
IAB/CAB-70	70/22/20 mm	190 g	17-19 bit	±0.015°	3000 rpm	12.428 kg·mm ²
IAB/CAB-85	85/25/35 mm	220 g	17-19 bit	±0.015°	3000 rpm	12.314 kg·mm ²
IAB/CAB-90	90/36/27 mm	295 g	18-20 bit	±0.015°	3000 rpm	36.617 kg·mm ²
IAB/CAB-112	112/50/39 mm	530 g	18-20 bit	±0.01°	1500 rpm	109.754 kg·mm ²
IAB/CAB-123	123/71.5/16 mm	350 g	18-20 bit	±0.01°	1500 rpm	117.192 kg·mm ²

Supply voltage	Electrical interface	Communication	Operating temp.	Protection
5-24V	RS-422 Shielded cable	SSi, BiSS-C, RS-422	-30°C - +100°C	IP 67

IAP/CAP- Unencapsulated Kit Series



High Precision, Thin Profile, Easy Integration

The IAP/CAP series rotary encoder features an ultra-thin, lightweight design with a large through-bore and frictionless non-contact operation. Optimized for space-constrained applications, its slim profile allows seamless integration into robotic joints and multi-axis automation equipment. Ideal for position feedback and commutation optimization in frameless motor systems.

The CAP series encoders meet stringent environmental requirements for moisture/salt/ fungus resistance, aging, thermal extremes, and vibration. Customizable with options including a -55°C to +125°C operating range.

Application Areas

- Gimbals & Turntables
- UAV (Drones)
- Robotics
- Medical Devices
- Custom Applications

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
IAP/CAP-20	20/4/6.5 mm	4 g	15-17 bit	±0.05°	4000 rpm	0.01 kg·mm ²
IAP/CAP-40	40/10/7.8 mm	10 g	17-18 bit	±0.015°	6000 rpm	0.40 kg·mm ²
IAPCAP-52	52/17/7.6 mm	13 g	18-20 bit	±0.01°	8000 rpm	1.18 kg·mm ²
IAP/CAP-60	60/25/7.6 mm	18 g	18-20 bit	±0.008°	8000 rpm	2.43 kg·mm ²
IAP/CAP-80	80/35/8 mm	30 g	18-20 bit	±0.008°	8000 rpm	8.6 kg·mm ²
IAP/CAP-100	100/48/8 mm	40 g	19-21 bit	±0.006°	6000 rpm	19.7 kg·mm ²
IAP/CAP-120	120/70/8 mm	50 g	19-21 bit	±0.006°	6000 rpm	40 kg·mm ²
IAP/CAP-140	140/90/8 mm	75 g	19-21 bit	±0.006°	6000 rpm	99 kg·mm ²
IAP/CAP-180	180/120/8 mm	120 g	20-22 bit	±0.006°	4000 rpm	239.2 kg·mm ²
IAP/CAP-247	247/172/8 mm	180 g	20-22 bit	±0.006°	4000 rpm	795.6 kg·mm ²

Supply voltage	Electrical interface	Communication	Operating temp.	Protection
5-24V	Shielded cable, Connector	SSi, BiSS-C, RS-422, ABZ	-30°C - +100°C	IP 40

DIAP- Dual-Output Kit Single-Sided Series



Single-Sided, Dual-Output, Ultra-Thin Design

The DIAP series rotary encoder comprises one stator and inner/outer rotors. Utilizing electromagnetic field stacking and identification technology, it achieves dual-output encoding on a single side within an ultra-thin, narrow profile. Featuring high precision, low power consumption, and a compact structure, it is ideal for space-limited applications such as robotic joints and multi-axis automation.

Note: This series incorporates two independent position sensing and signal output channels

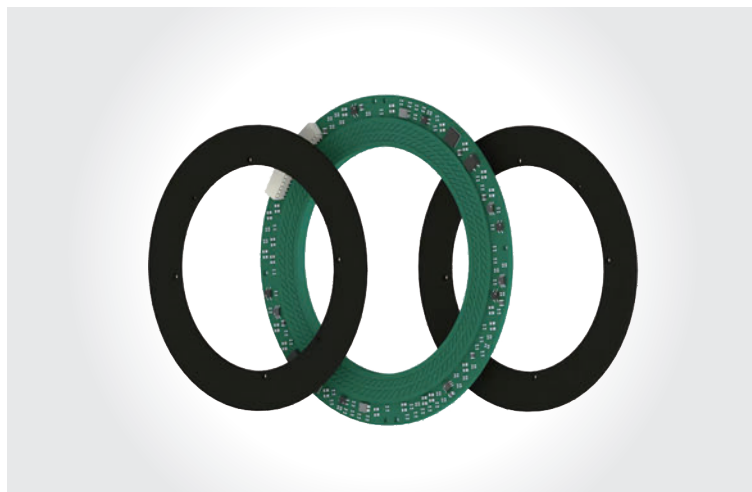
Application Areas

- Humanoid Robots
- Intelligent Logistics
- Actuators
- Industrial Automation

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
DIAP-38	38/10/3.6 mm	10 g	17-19 bit	±0.015°	6000 rpm	0.05/0.16 kg·mm ²
DIAP-46	46/16/3.6 mm	12 g	17-19 bit	±0.015°	6000 rpm	0.17/0.4 kg·mm ²
DIAP-55	55/20/3.6 mm	16 g	17-19 bit	±0.015°	6000 rpm	0.36/1.0 kg·mm ²
DIAP-65	65/30/3.6 mm	20 g	18-20 bit	±0.01°	6000 rpm	0.88/2.06 kg·mm ²
DIAP-75	75/35/3.6 mm	25 g	18-20 bit	±0.01°	6000 rpm	1.84/3.95 kg·mm ²
DIAP-85	85/45/3.6 mm	30 g	18-20 bit	±0.01°	6000 rpm	3.4/6.33 kg·mm ²
DIAP-100	100/55/4 mm	45 g	19-21 bit	±0.01°	6000 rpm	6.54/13.5 kg·mm ²
DIAP-130	130/85/4 mm	65 g	19-21 bit	±0.01°	6000 rpm	20.62/34.34 kg·mm ²

Supply voltage	Electric current	Communication	Operating temp.	Protection
5V	<80 mA	SSi, BiSS-C, RS-422, RS-485	-30°C - +100°C	IP 40

DIAP- Dual-Output Kit Dual-Sided Series



Dual-Sided, Dual-Output, Compact Design

The DIAP series rotary encoder consists of a stator and two rotors mounted on opposite sides. Offering high precision and a large through-bore, it allows for quick and secure mounting via screw fixation. With two independent sensing channels, it enables simultaneous high/low-speed measurement or redundant operation, significantly enhancing system reliability.

Note: This series incorporates two independent position sensing and signal output channels.

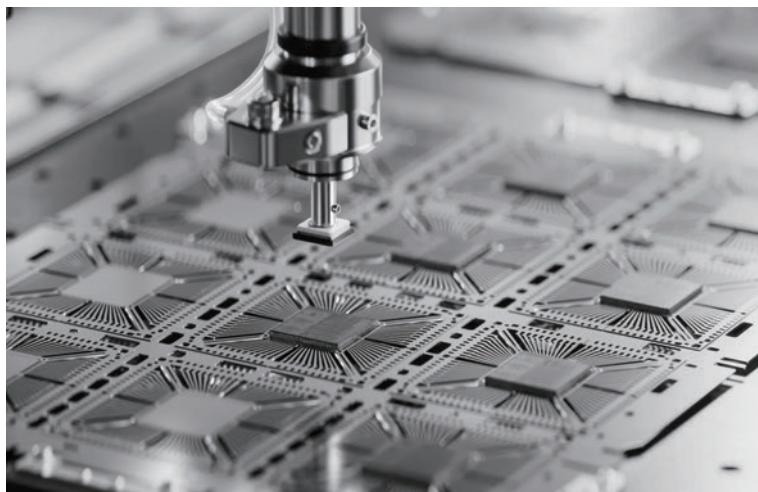
Application Areas

- Humanoid Robots
- Intelligent Logistics
- Actuators
- Industrial Automation

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
DIAP-34	34/10/7.6 mm	10 g	17-19 bit	±0.015°	6000 rpm	0.11 kg·mm ²
DIAP-50	50/20/7.6 mm	20 g	17-19 bit	±0.015°	6000 rpm	0.7 kg·mm ²
DIAP-58	58/18-21/7.6 mm	30 g	18-20 bit	±0.01°	6000 rpm	1.66 kg·mm ²
DIAP-70	70/36/7.6 mm	35 g	18-20 bit	±0.01°	6000 rpm	3.4 kg·mm ²
DIAP-78	78/31-35/7.6 mm	40 g	18-20 bit	±0.01°	6000 rpm	4.5 kg·mm ²
DIAP-90	90/56/7.6 mm	50 g	19-21 bit	±0.01°	6000 rpm	9.8 kg·mm ²
DIAP-110	110/76/7.6 mm	65 g	19-21 bit	±0.01°	6000 rpm	21.2 kg·mm ²

Supply voltage	Electric current	Communication	Operating temp.	Protection
5V	<240 mA	SSI, BiSS-C, RS-422, RS-485, ABZ	-30°C - +100°C	IP 40

NIAP- Narrow-Edge Kit Single-Sided Series



Ultra-Narrow Profile for Space-Optimized Precision Equipment

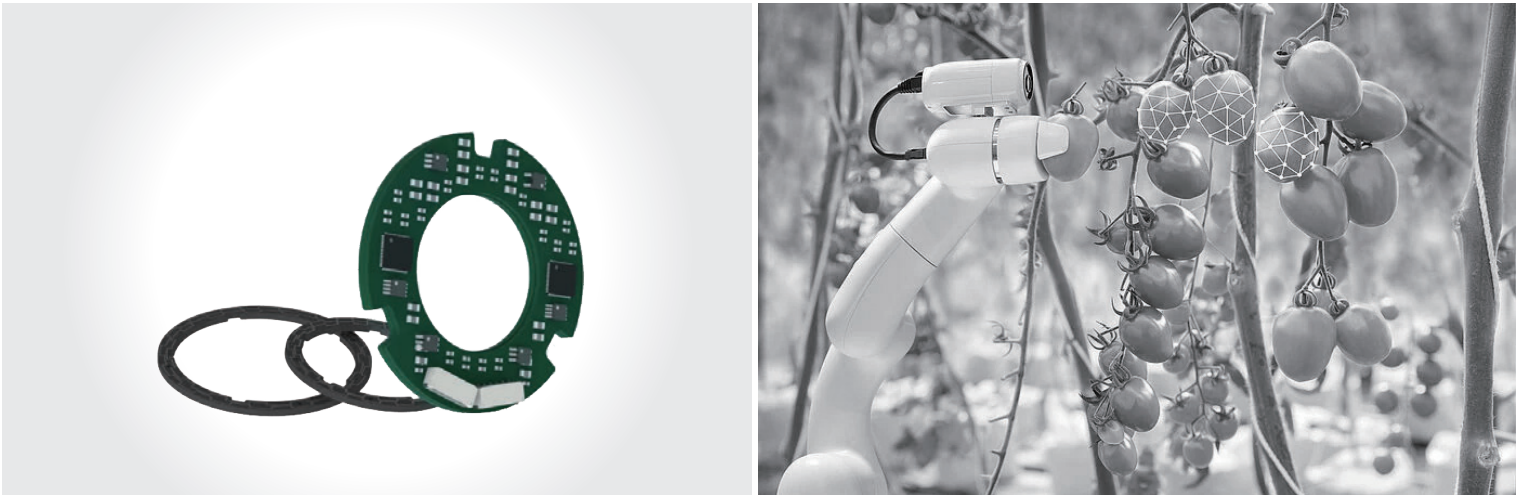
The NIAP series rotary encoder employs a highly integrated design, embedding functional coils and signal processing circuits within an ultra-thin frame just 5 mm wide. It delivers stable and reliable angular position detection within minimal physical space. Featuring non-contact operation, magnet-free design, and low power consumption, it is tailored for compact electromechanical systems, including robotic joints, precision rotary tables, and medical devices.

Application Areas

- Humanoid Robots
- Logistics Automation
- Precision Rotary Tables
- Medical Devices

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
NIAP10-20	19.9/9.4/4.9 mm	1 g	17 bit	±0.03°	6000 rpm	0.006 kg·mm ²
NIAP15-25	24.9/14.4/4.9 mm	1 g	17 bit	±0.03°	6000 rpm	0.018 kg·mm ²
NIAP20-30	29.9/19.4/4.9 mm	2 g	17 bit	±0.03°	6000 rpm	0.039 kg·mm ²
NIAP25-35	34.9/24.4/4.9 mm	2 g	17 bit	±0.03°	6000 rpm	0.073 kg·mm ²
NIAP30-40	39.9/29.9/4.9 mm	3 g	17 bit	±0.03°	6000 rpm	0.122 kg·mm ²
NIAP35-45	44.9/34.4/4.9 mm	3 g	17 bit	±0.03°	6000 rpm	0.189 kg·mm ²

Supply voltage	Electric current	Communication	Operating temp.	Protection
5V±5%	<80 mA	SSi, BiSS-C, RS-422, RS-485	-30°C - +100°C	IP 40



Ultra-Narrow Dual-Output Design for Versatile Compact Applications

The NIAP series rotary encoder utilizes proprietary multi-dimensional electromagnetic stacking technology to achieve an ultra-narrow dual-rotor design—with rotors processed down to millimeter-scale widths. Featuring energy-efficient transceivers, it achieves ultra-low power consumption (as low as 70 mA). Operating reliably from -30°C to +105°C, its magnet-free design ensures immunity to EMI and stable performance in strong magnetic fields. Standardized mounting kits simplify installation.

Application Areas

- Humanoid Robots
- Logistics Automation
- Precision Rotary Tables
- Medical Devices

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
NIAP25-15-10	24.9/9.8/5 mm	2 g	17 bit	±0.03°	6000 rpm	0.006/0.017 kg·mm ²
NIAP30-20-15	29.9/14.4/5 mm	3 g	17 bit	±0.03°	6000 rpm	0.018/0.039 kg·mm ²
NIAP35-25-20	34.9/19.4/4.9 mm	3 g	17 bit	±0.03°	6000 rpm	0.039/0.073 kg·mm ²
NIAP40-30-25	39.9/24.4/4.9 mm	4 g	17 bit	±0.03°	6000 rpm	0.073/0.122 kg·mm ²
NIAP45-35-30	44.9/29.4/4.9 mm	5 g	17 bit	±0.03°	6000 rpm	0.122/0.189 kg·mm ²

Supply voltage	Electric current	Communication	Operating temp.	Protection
5V±5%	<80 mA	SSi, BiSS-C, RS-422, RS-485	-30°C - +100°C	IP 40

MIAP- Miniature Kit Series



Small Diameter, Low Profile: Engineered for Robotic Dexterous Hands

The MIAP series rotary encoder combines a small outer diameter, ultra-thin profile, high precision, and reliability—specifically engineered for robotic dexterous hands. Leveraging proprietary electromagnetic field confinement technology, it delivers robust signal transmission within a diameter of just over 10 mm and a height of 2 mm. This breakthrough overcomes miniaturization barriers for inductive encoders, providing unparalleled precision for humanoid robot hands.

Application Areas

- Robotic Finger Joints
- Surgical Robots
- Micro Motors
- Ball Screws

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
MIAP-14	14.8/2/3.6 mm	2 g	15-17 bit	±0.03°	6000 rpm	0.006 kg·mm ²
MIAP-16	16.8/2/3.6 mm	2.5 g	15-17 bit	±0.025°	6000 rpm	0.008 kg·mm ²
MIAP-18	18.8/2/3.6 mm	3 g	15-17 bit	±0.02°	6000 rpm	1.01 kg·mm ²

Supply voltage	Electric current	Communication	Operating temp.	Protection
5V	<80 mA	SSi, BiSS-C, RS-422, RS-485	-30°C - +100°C	IP 40

IAM- Unencapsulated Kit Magnetic Series



Magnetic Ring Rotary Encoders

This IAM series rotary encoder employs Hall-effect sensors paired with a magnetic ring for angle detection. Featuring a large through-bore, absolute output, and high-speed capability, it suits diverse applications. Its non-contact, thin, and compact design facilitates integration into space-constrained devices. Offering hysteresis-free operation, high dynamics, up to 20-bit resolution, and multiple interface options, the IAM Series encoders include advanced self-monitoring and single/multi-turn variants.

Application Areas

- Robotic Joints
- Universal Joints
- AGVs
- Automated Machinery

Product	OD / ID / Height	Weight	Resolution	Accuracy	Max. operational speed	Rotor inertia
IAM-22	A: 28.5/6/7.6 mm B: 32/6/7.6 mm	8 g	17-18 bit	±0.1°	24000 rpm	0.29 kg·mm ²
IAM-29	A: 38/10/8 mm B: 38/15/8 mm	11 g	17-18 bit	±0.1°	12000 rpm	0.69 kg·mm ²
IAM-39	54/20/8 mm	15 g	17-19 bit	±0.1°	12000 rpm	2.58 kg·mm ²
IAM-49	59/25/8 mm	18 g	17-19 bit	±0.1°	12000 rpm	5.45 kg·mm ²
IAM-55	67/35/8.6 mm	22 g	17-20 bit	±0.1°	6000 rpm	11.39 kg·mm ²
IAM-64	75/45/8.6 mm	25 g	17-20 bit	±0.1°	6000 rpm	18.88 kg·mm ²
IAM-84	96/65/8.6 mm	30 g	17-20 bit	±0.1°	6000 rpm	46.48 kg·mm ²

Supply voltage	Electrical interface	Communication	Operating temperature
5-24V	RS-422 Shielded cable	SSi, BiSS-C, RS-485, ABZ	-30°C - +100°C



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