



OTV
Precision Sensing

PRODUCT SPECIFICATION

Nonius Encoder Disc Series

Axial & Radial Dual-Track Absolute Magnetic Encoder Discs
for IC-Haus iC-MU Series Encoder ICs

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www.otvsensing.com

thomas@otvsensing.com

1 Product Overview

OTV Nonius Encoder Discs are precision dual-track magnetic targets engineered for **off-axis absolute encoder** applications. Each disc carries two concentric magnetized tracks — a Master track and a Nonius track — with different numbers of pole pairs. An IC-Haus iC-MU series Hall sensor IC reads both tracks simultaneously. The phase difference between the two tracks creates a unique code within one full mechanical revolution, delivering **true absolute angular position** immediately on power-up — no battery backup, no reference run (homing) required.

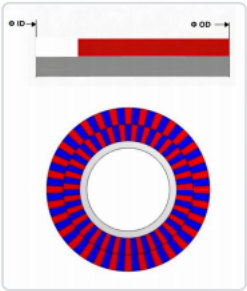
Two magnetization orientations are available to suit different mechanical layouts and sensor mounting configurations:

Axial Nonius Encoder Disc

Poles magnetized perpendicular to the disc face. The Hall sensor is positioned beside the disc, reading from the axial (face) direction. This **off-axis** geometry creates a hollow center bore — essential for routing cables, shafts, or optics through the encoder. Reference prefix: **A**.

Radial Nonius Encoder Disc

Poles magnetized on the outer circumference of the ring. The Hall sensor reads from the radial (outer edge) direction. Suitable where axial space above the disc is unavailable and the sensor must be positioned around the perimeter. Pole width is specified in degrees. Reference prefix: **R**.



2 Axial Nonius Encoder Disc

2.1 For iC-MU200

Pole width: 2.00 mm (standard). Designed for the iC-MU200 encoder IC with larger mechanical envelope and higher pole count capability.

Reference	Master Track Pole Pairs	Nonius Track Pole Pairs	ID (mm)	OD (mm)	Thickness (mm)
A2001600	16	15	8.0	24.0	1.3
A2003200	32	31	25.0	44.5	1.4
A2003201	32	31	25.0	49.0	2.0
A2003202	32	31	31.5	49.0	2.0
A2003203	32	31	29.0	42.0	1.1
A2003204	32	31	30.5	42.5	1.1
A2003205	32	31	28.9	44.5	1.4
A2006402	64	63	62.0	85.0	1.8
A2006401	64	63	65.0	84.0	2.5

2.2 For iC-MU150

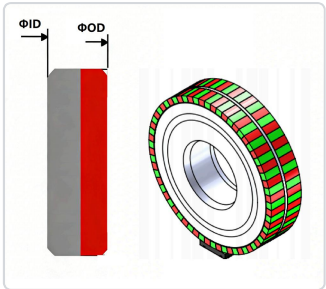
Pole width: 1.50 mm (standard). Compact mid-range encoder disc for the iC-MU150 IC, balancing size and resolution.

Reference	Master Track Pole Pairs	Nonius Track Pole Pairs	ID (mm)	OD (mm)	Thickness (mm)
A1501600	16	15	8.0	18.0	1.1
A1503200	32	31	18.0	34.5	1.1
A1503201	32	31	20.0	31.5	1.1
A1503202	32	31	20.0	33.0	1.1
A1503203	32	31	20.0	33.0	2.0
A1503204	32	31	23.0	35.0	1.1
A1503205	32	31	20.0	39.0	2.0
A1506400	64	63	47.4	65.1	1.1
A1506401	64	63	45.0	64.0	2.5
A1506402	64	63	47.4	64.5	1.1

2.3 For iC-MU

Pole width: 1.28 mm (standard). The most compact encoder disc series, optimized for the iC-MU IC in space-constrained applications.

Reference	Master Track Pole Pairs	Nonius Track Pole Pairs	ID (mm)	OD (mm)	Thickness (mm)
A1283200	32	31	15.0	29.0	1.1
A1283201	32	31	15.0	27.2	1.1
A1283202	32	31	16.5	28.5	1.1
A1286400	64	63	38.0	56.0	1.1
A1286401	64	63	38.0	52.0	1.1
A1286402	64	63	40.0	54.7	2.0
A1286403	64	63	35.0	55.0	2.5



3 Radial Nonius Encoder Disc

3.1 For iC-MU

Radial magnetization on the outer circumference. Pole width measured in degrees (angular). Designed for the iC-MU IC in applications where the sensor must read from the radial direction.

Reference	Master Track Pole Pairs	Nonius Track Pole Pairs	ID (mm)	OD (mm)	Master Pole Width (°)	Nonius Pole Width (°)
R1286000	32	31	20.0	24.5	5.625	5.806

3.2 For iC-MU150

Larger-diameter radial encoder ring with higher pole count for the iC-MU150 IC. Suitable for applications with available outer diameter space.

Reference	Master Track Pole Pairs	Nonius Track Pole Pairs	ID (mm)	OD (mm)	Master Pole Width (°)	Nonius Pole Width (°)
R1503000	64	63	53.1	59.6	2.813	2.857

4 Material & Performance Specifications

Metal Backplate Material	AL6061 Aluminum Alloy or Stainless Steel (application-dependent)
Magnetic Rubber Compound	Ferrite/NBR rubber
Remanence (Br) @ 20 °C	160 mT (typical)
Operating Temperature Range	-40 °C to +140 °C
Magnetization Orientation	Axial (perpendicular to disc face) or Radial (outer circumference)
Track Configuration	Dual-track: Master track + Nonius track (Nonius/Vernier absolute encoding)
Pole Pair Range	16/15 to 64/63 (Master/Nonius)
Absolute Accuracy	±0.1° (standard); ±0.05° achievable with system calibration
Compatible Encoder ICs	IC-Haus iC-MU, iC-MU150, iC-MU200, iC-MUE
Output Interfaces (via IC)	BiSS-C, SSI, SPI (absolute); ABZ incremental; UVW commutation

5 Reference Number System

OTV Nonius Encoder Disc reference numbers follow a structured format that encodes the magnetization type, target chip series, pole count, and variant:

Position	Example	Meaning
Char 1	A / R	A = Axial magnetization R = Radial magnetization
Chars 2 - 4	200 / 150 / 128	Target encoder IC series: 200 = iC-MU200 150 = iC-MU150 128 = iC-MU
Chars 5 - 6	16 / 32 / 64	Master track pole pair count: 16 pairs 32 pairs 64 pairs
Chars 7 - 8	00 - 05	Variant code: differentiates models with the same pole count but different ID/OD/thickness

Example:

A2003203

= Axial → iC-MU200 → 32 pole pairs → variant 03 (ID 29 mm, OD 42 mm, 1.1 mm thick)

6 Customization Capabilities

OTV offers full customization of Nonius Encoder Discs to meet specific application requirements. The following parameters can be tailored:

Inner Diameter (ID)	Custom bore size to match shaft or hub dimensions
Outer Diameter (OD)	Custom OD within manufacturing limits (up to 200 mm+)
Thickness	From 1.0 mm; custom thickness per mechanical envelope
Pole Pair Count	Custom master/nonius pole pair combinations (up to 128+ pairs)
Magnetization Pattern	Axial or radial; single-track, dual-track, or with index/reference marks
Mounting Features	Custom metal backplates, hubs, adhesive backing, press-fit, bolt patterns
Material Grade	High-temperature compounds available for >140 °C environments
Encoder IC Matching	Optimized pole widths for non-iC-Haus encoder chips available on request

8 Ordering Information & Lead Times

Standard Products

All models listed in Sections 2 and 3 are standard products. When stock is unavailable, lead time is **2 weeks** after order confirmation and deposit receipt.

Custom Design Samples

Customized Nonius Encoder Disc samples for validation: nominal fee applies to cover material and tooling setup. Lead time: **4 weeks** after design confirmation.

Volume Production

Lead times for volume orders confirmed at quotation. Flexible MOQ — we discuss volume-based pricing for prototype, pilot, and mass production stages.