



Counting



Controlling



## RMSN

### Rotary Magnetic Scale Nonius

- Rotary applications
- All nonius proportion
- Master and nonius tracks

#### Features

- From low to very high accuracy producible on demand
- Two track magnetization
- Several pole pitches
- Different scale geometries
- Customizable for many applications
- No wear from usage
- Resistant to dust, cooling lubricant emulsion, oil, etc.
- Wide range of selectable magnetic scale characteristics
- A variety of magnetic materials for several applications

### Indicating movements with the RMSN

**Simple – Precise – Economic**

The RMSN rotary magnetic scale can be used for continuous or discrete positioning, motion control, such as commutation, and many other solutions. BOGEN can produce rotary scales on the flange, outer or inner diameter. Production can start with prototype quantities and scale to large series production. In combination with a BOGEN encoder the highest system accuracy can be reached with especially optimized pole pitches.

## Features

| <b>Magnetic Properties (Elastomer bonded ferrite/Isotropic)</b> |            |
|---|------------|
| Residual Induction (Br) mT                                      | 240-260    |
| Coercive force (Hcb) kA/m                                       | 171-195    |
| Intrinsic coercive force (Hcj) kA/m                             | 223-279    |
| Maximum energy product (Bhmax) MGOe                             | 1.45-1.65  |
| Reversing temperature modulus % / °C                            | -0.18      |
| <b>Physical Properties</b>                                      |            |
| Tensile Strength N/mm <sup>2</sup> (MPa)                        | >2.5       |
| Hardness Shore D  | 30 -45     |
| Density g/cm <sup>3</sup>                                       | 3.55-3.7   |
| Temperature Range °C  | -40 to 100 |
| <b>Chemical Properties</b>                                      |            |
| Hydraulic Oil (23°Cx72h)  | ++         |
| Alcohol (23°Cx72h)  | +          |
| Weak Alkali (23°Cx72h)  | ++         |
| Detergent (23°Cx72h)  | ++         |
| Aromatic Solvent (23°Cx72h)                                     | -          |
| Organic, Anorganic Acid (23°Cx72h)                              | -          |
| Aliphatic Solvent (23°Cx72h)                                    | -          |
| Water (60°Cx72h)  | ++         |

- not suitable  
+ good  
++ very good

| <b>Magnetic Properties (Hard ferrite/Isotropic)</b> |  |
|---|--|
| Residual Induction (Br) mT                          | 200 -220   |
| Coercive force (Hcb) kA/m                           | 135 -140   |
| Intrinsic coercive force (Hcj) kA/m                 | 220 -230   |
| Maximum energy product (Bhmax) MGOe                 | 1.45 -1.65   |
| Reversing temperature modulus % / °C                | -0.19  |
| <b>Physical Properties</b>                          |  |
| Tensile Strength N/mm <sup>2</sup> (MPa)            | 50   |
| Hardness HV   | 500 -600   |
| Density g/cm <sup>3</sup>                           | 4.8-4.9  |
| Temperature Range °C                                | -40 to 250   |
| <b>Chemical Properties</b>                          |  |
| Hydraulic Oil (23°Cx72h)                            | ++   |
| Alcohol (23°Cx72h)                                  | +  |
| Weak Alkali (23°Cx72h)                              | ++   |
| Detergent (23°Cx72h)                                | ++   |
| Aromatic Solvent (23°Cx72h)                         | Chemical resistance depends on temperature, concentration and time of exposure to the medium |
| Organic, Anorganic Acid (23°Cx72h)                  |  |
| Aliphatic Solvent (23°Cx72h)                        |  |
| Water (60°Cx72h)                                    | ++   |

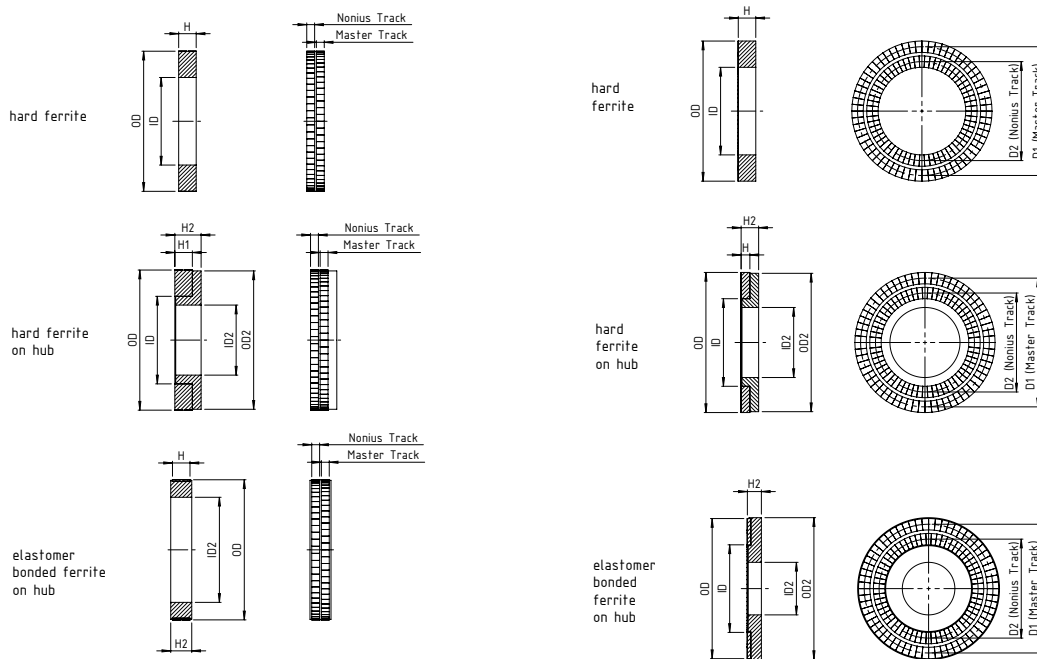
- not suitable  
+ good  
++ very good

## Customized Rotary Magnetic Scale Nonius

Customized rotary magnetic scales with different dimensions and pole numbers can be produced economically.

BOGEN scale production capabilities are designed for high flexibility at low cost. Please contact BOGEN to discuss your requirements.

Technical Drawing



Available Dimensions RMSN - Axial

| Order-No. | Order Code          | Master-Nonius Relation | Magnetic Pole Pitch | Outer Diameter (OD) | Outer Diameter (OD2) | Inner Diameter (ID) | Inner Diameter (ID2) | Height (H) | Height (H2) | Master Track Diameter (D1) | Nonius Track Diameter (D2) |
|-----------|---------------------|------------------------|---------------------|---------------------|----------------------|---------------------|----------------------|------------|-------------|----------------------------|----------------------------|
|           |                     |                        | [mm]                | [mm]                | [mm]                 | [mm]                | [mm]                 | [mm]       | [mm]        | [mm]                       | [mm]                       |
| 51558     | RMSN16-15A-1.28-E-S | 16-15                  | 1.28                | 15.50               | 17.00                | 3.00                | 5.00                 | -          | 7.00        | 13.04                      | 5.84                       |
| 51701     | RMSN16-15A-1.28-E-S | 16-15                  | 1.28                | 15.50               | 16.00                | 3.00                | 3.00                 | -          | 6.00        | 13.04                      | 5.84                       |
| 51216     | RMSN32-31A-1.28-E-S | 32-31                  | 1.28                | 29.00               | 29.80                | 15.10               | 10.00                | -          | 6.00        | 26.08                      | 18.88                      |
| 51499     | RMSN32-31A-1.28-E-S | 32-31                  | 1.28                | 29.00               | 29.00                | 15.10               | 11.00                | -          | 6.00        | 26.08                      | 18.88                      |
| 51217     | RMSN32-31A-1.28-F-A | 32-31                  | 1.28                | 30.00               | 29.80                | 11.50               | 10.00                | 2.50       | 6.00        | 26.08                      | 18.88                      |
| 51694     | RMSN32-31A-1.50-F-A | 32-31                  | 1.50                | 34.00               | 33.60                | 20.40               | 15.70                | 2.00       | 6.00        | 30.56                      | 23.36                      |
| 51352     | RMSN32-31A-1.50-E-S | 32-31                  | 1.50                | 33.50               | 34.00                | 20.00               | 19.00                | -          | 6.00        | 30.56                      | 23.36                      |
| 51353     | RMSN32-31A-1.50-E-S | 32-31                  | 1.50                | 33.50               | 34.00                | 20.00               | 16.00                | -          | 6.00        | 30.56                      | 23.36                      |
| 52066     | RMSN64-63A-1.28-F-A | 64-63                  | 1.28                |                     | 55.00                |                     | 42.00                | 2.50       |             | 52.15                      | 44.95                      |
| 52087     | RMSN64-63A-1.28-E-S | 64-63                  | 1.28                |                     | 55.00                |                     | 42.00                | -          | 1.00        | 52.15                      | 44.95                      |
| 52076     | RMSN64-63A-1.50-F-A | 64-63                  | 1.50                |                     | 64.50                |                     |                      |            |             | 61.12                      | 53.92                      |
| 52097     | RMSN64-63A-1.50-E-S | 64-63                  | 1.50                |                     | 64.00                |                     | 45.00                | -          | 2.50        | 61.12                      | 53.92                      |

Available Dimensions RMSN - Radial

| Order-No. | Order Code         | Master-Nonius Relation | Magnetic Pole Pitch | Outer Diameter (OD) | Outer Diameter (OD2) | Inner Diameter (ID) | Inner Diameter (ID2) | Height (H) | Height (H2) |
|-----------|--------------------|------------------------|---------------------|---------------------|----------------------|---------------------|----------------------|------------|-------------|
|           |                    |                        | [mm]                | [mm]                | [mm]                 | [mm]                | [mm]                 | [mm]       | [mm]        |
| 51218     | RMSN32-31-1.28-F-A | 32-32                  | 1.28                | 24.50               | 24.00                | 17.00               | 10.00                | 6.00       | 7.00        |
| 51467     | RMSN32-31-1.28-F-A | 32-31                  | 1.28                | 24.50               | 24.00                | 17.00               | 16.35                | 6.00       | 10.00       |
| 51269     | RMSN64-63-1.28-F-A | 64-63                  | 1.28                | 50.55               | 50.00                | 38.00               | 31.00                | 8.00       | 9.50        |
| 51356     | RMSN64-63-1.28-E-S | 64-63                  | 1.28                | 50.55               | -                    | 48.55               | 25.00                | 10.00      | 11.00       |
| 51521     | RMSN64-63-1.50-F-A | 64-63                  | 1.50                | 59.50               | 50.00                | 43.50               | 35.00                | 6.00       | 7.50        |
| 51529     | RMSN64-63-1.50-E-S | 64-63                  | 1.50                | 59.60               | -                    | 57.60               | 52.60                | 6.00       | 6.00        |

Order Code

Parameters

RMSN M-N S - P - M - H - G - P

|                      |            | Code                            | Explanation *   |
|----------------------|------------|---------------------------------|---|
| <b>Parameters</b>    | <b>M-N</b> | <b>Number of pole pairs</b>     | ... - ...<br>Number of pole pairs: Master-Nonius, e. g. 32-31 |
|                      | <b>S</b>   | <b>Surface of magnetization</b> | <b>Radial, on the circumference (no input required)</b>       |
|                      |            |                                 | A<br>Axial, on the end surface                                |
|                      | <b>P</b>   | <b>Pole pitch (mm)</b>          | ...<br>Pole pitch of nonius track in millimeter, e. g. 1.28   |
|                      | <b>M</b>   | <b>Magnetization material</b>   | F<br>Hard ferrite (8/22)                                      |
|                      |            |                                 | E<br>Elastomer bonded ferrite                                 |
|                      |            |                                 | V<br>Vulcanized ferrite                                       |
|                      |            |                                 | P<br>Plastoferrite  |
|                      | <b>H</b>   | <b>Hub material</b>             | A<br>Aluminum   |
|                      |            |                                 | S<br>Steel  |
|                      |            |                                 | M<br>Sheet metal  |
|                      | <b>G</b>   | <b>Accuracy Class</b>           | <b>300 Arc seconds (no input required)</b>                    |
|                      |            |                                 | G...<br>Only necessary if deviates from default               |
|                      | <b>P</b>   | <b>Protection</b>               | <b>Without protection (no input required)</b>                 |
| S<br>Stainless steel |            |                                 |   |
| F<br>Fibre           |            |                                 |   |
| P<br>Plastic         |            |                                 |   |

\* standard parameters are bold

Ordering Example

RMSN32-31-1.28-E-A-G100

Rotary Magnetic Scale Nonius, 32 master-31 nonius pole pairs radial on the circumference, pole pitch of nonius track 1.28 mm, elastomer bonded ferrite (magnetization material), aluminum hub, 100 arc seconds accuracy class, no protection

RMSN64-63A-1.50-E-S

Rotary Magnetic Scale Nonius, 64 master-63 nonius pole pairs , surface of magnetization axial, pole pitch of nonius track 1.50 mm, elastomer bonded ferrite (magnetization material), stainless steel hub, 300 arc seconds accuracy class, no protection