

RMS

Rotary Magnetic Scales

RMSI Rotary Magnetic Scale Incremental Page 1

- Incremental Measuring
- Rotary Applications
- Counting Controlling

RMSN Rotary Magnetic Scale Nonius Page 9

- Counting
- Controlling
- ALWAYS ABSOLUTE

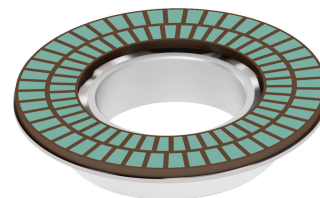
RMSI

Rotary Magnetic Scale Incremental



RMSN

Rotary Magnetic Scale Nonius



Features and Benefits

- from low to very high accuracy
- one or two track magnetization
- several pole pitches
- variety of magnetic materials for many different applications
- resistant to dust, cooling lubricant emulsion, oil, etc.

Features and Benefits

- wide range of selectable magnetic scale characteristics: low to very high accuracy, several pole pitches, different scale geometries, a variety of magnetic materials
- two track magnetization
- customizable for many applications
- no wear from usage
- resistant to dust, cooling lubricant emulsion, oil, etc.

RMSI

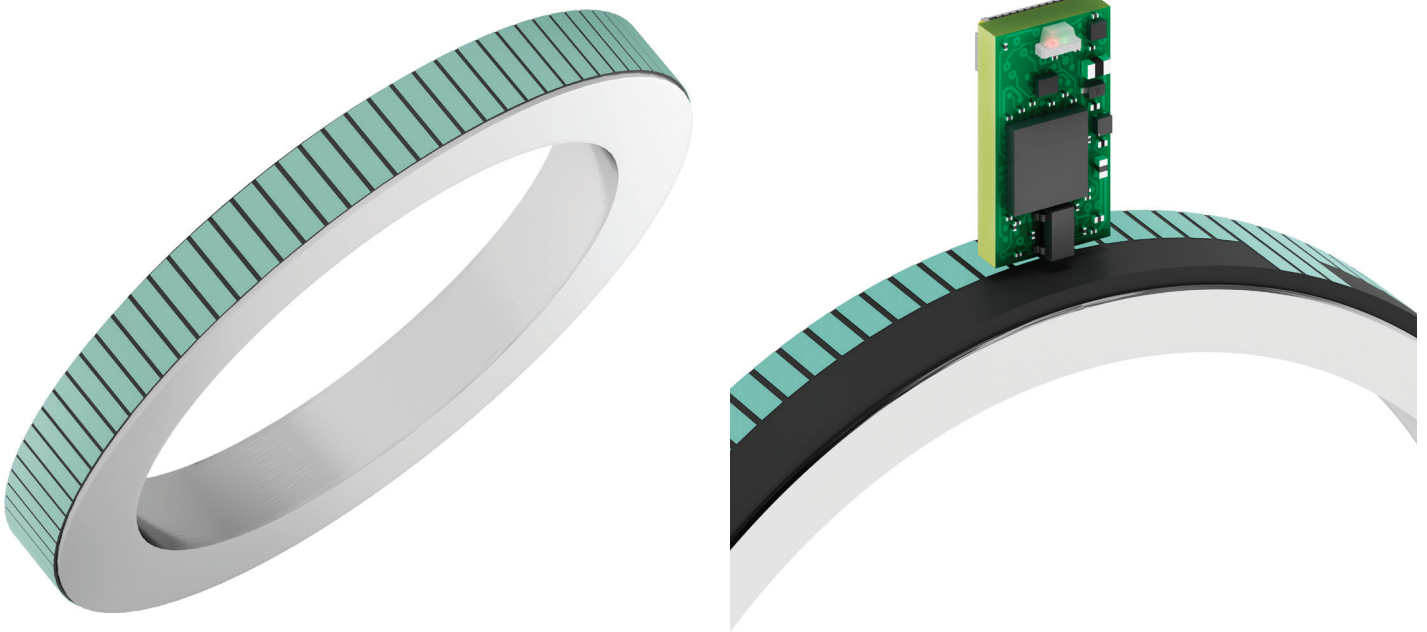
Rotary Magnetic Scale Incremental

Motion control and angle measuring have never been easier and more reliable with BOGEN's rotary magnetic scales. Different magnetic and hub materials and customizable dimensions ensure that our rotary scales suit various tasks and applications. BOGEN rotary scales can be adapted to many different requirements. Our standard program covers many applications.

Incremental
Measuring

Rotary
Applications

Counting
Controlling



Features and Benefits

- from low to very high accuracy
- one or two track magnetization
- several pole pitches
- variety of magnetic materials for many different applications
- resistant to dust, cooling lubricant emulsion, oil, etc.

Features

Elastomer-bonded Ferrite/Isotropic

Magnetic Properties

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

Physical Properties

tensile strength N/mm ² (MPa)	>2.5
hardness shore D	30-45
density g/cm ³	3.55-3.7
temperature range °C	-40 to 100

Chemical Properties

hydraulic oil (23°C×72h)	++
alcohol (23°C×72h)	+
weak alkali (23°C×72h)	++
detergent (23°C×72h)	++
aromatic solvent (23°C×72h)	-
organic, anorganic acid (23°C×72h)	-
aliphatic solvent (23°C×72h)	-
water (60°C×72h)	+

Hard Ferrite/Isotropic

Magnetic Properties

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

Physical Properties

tensile strength N/mm ² (MPa)	50
Hardness HV	500-600
density g/cm ³	4.8-4.9
temperature range °C	-40 °C to 250 °C

Chemical Properties

hydraulic oil (23°C×72h)	++
alcohol (23°C×72h)	+
weak alkali (23°C×72h)	++
detergent (23°C×72h)	++
aromatic solvent (23°C×72h)	Chemical resistance depends on temperature, concentration and time of exposure to the medium
organic, anorganic acid (23°C×72h)	
aliphatic solvent (23°C×72h)	
water (60°C×72h)	
	++

- not suitable

+ good

++ very good

Vulcanized Ferrite/Isotropic

Magnetic Properties

residual induction (Br) mT	185
coercive force (Hcb) kA/m	129
intrinsic coercive force (Hcj) kA/m	257

Physical Properties

hardness shore A	85 ± 3
density g/cm ³	4.13
temperature range °C	-40 to 160

Chemical Properties

hydraulic oil (23°C×72h)	+++
alcohol (23°C×72h)	++
weak alkali (23°C×72h)	+++
detergent (23°C×72h)	+++
aromatic solvent (23°C×72h)	-
organic, anorganic acid (23°C×72h)	-
aliphatic solvent (23°C×72h)	-
water (60°C×72h)	+++

- not suitable

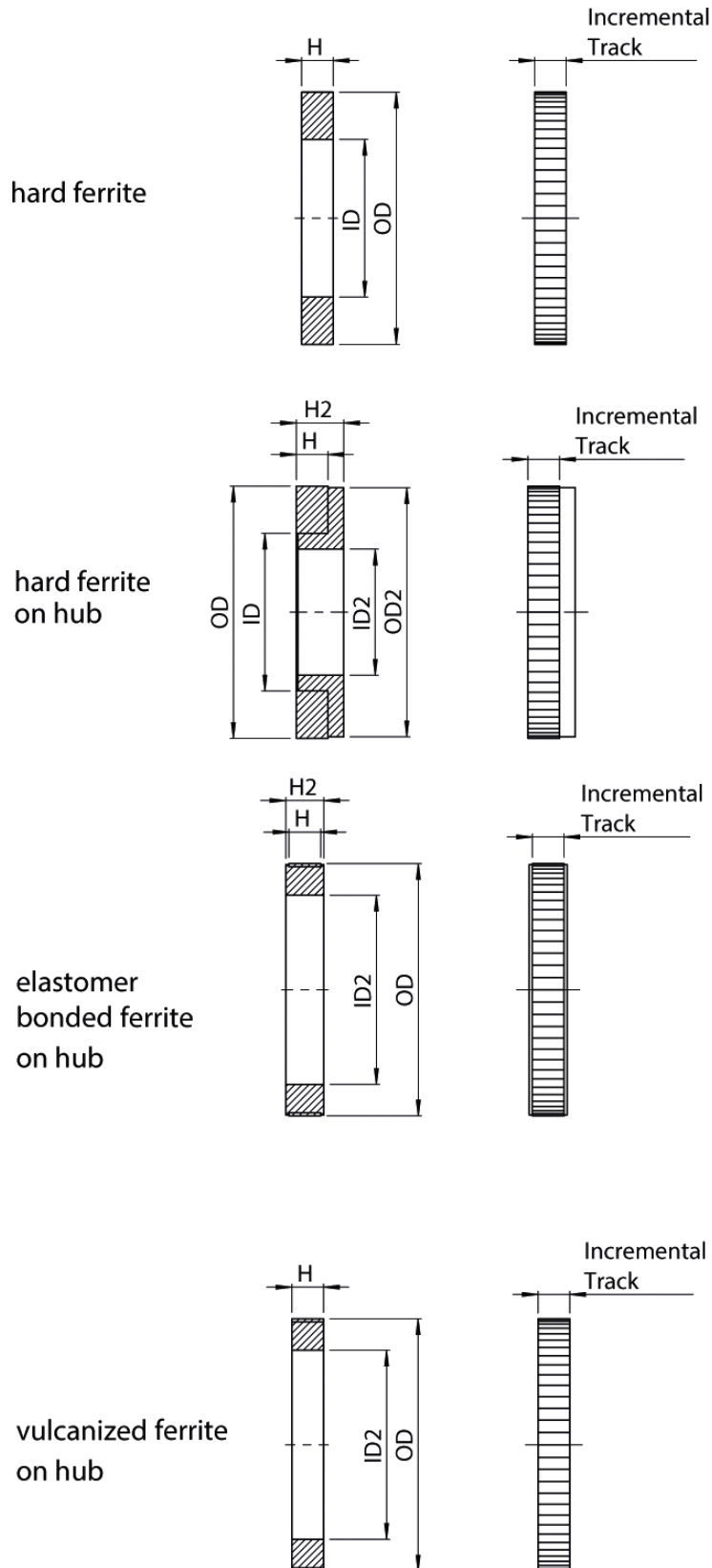
+ good

++ very good

Due to mechanical characteristics of individual parts and applied manufacturing processes, the top surface of the magnetic component may show minimal surface changes. This has no negative impact on functionality.

Technical Drawing

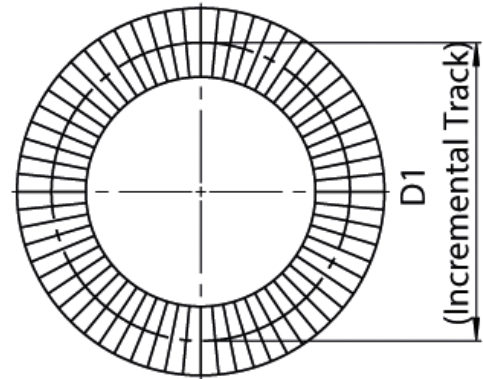
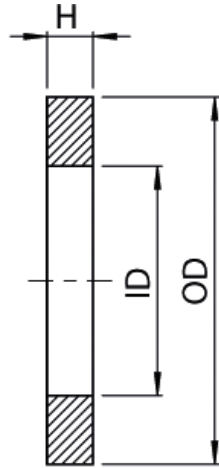
Radial



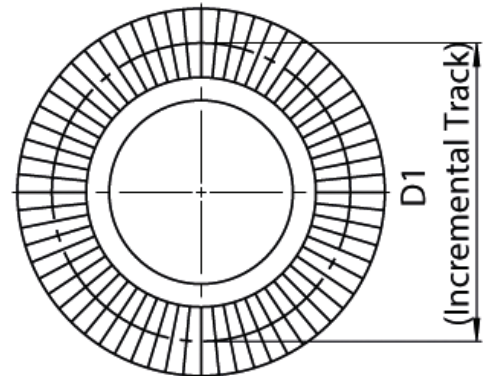
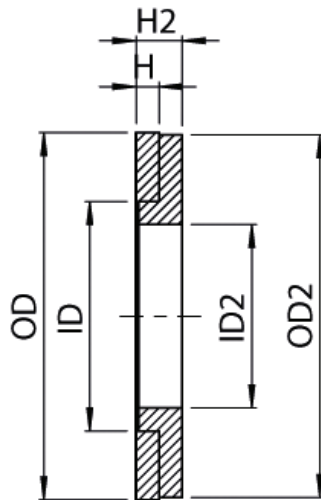
Technical Drawing

Axial

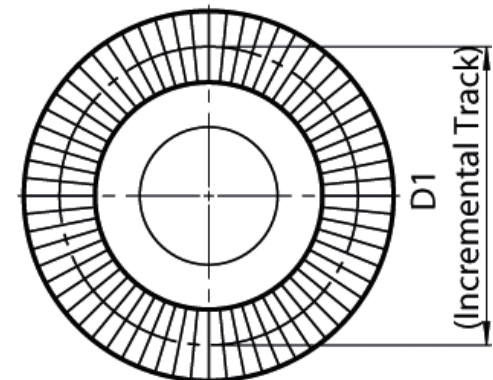
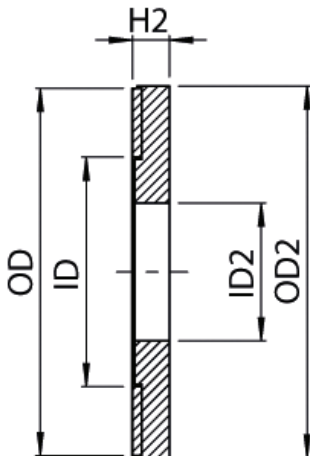
hard ferrite



hard ferrite
on hub



elastomer
bonded ferrite
on hub



Available Rotary Magnetic Scale Incremental Dimensions

	order-no.	matchcode	numbers of poles	magnetic pole pitch	outer diameter (OD)	inner diameter (ID)	height (H)
				[mm]	[mm]	[mm]	[mm]
ferrite rings (radial)	51565	RMSI19.75-64-F	64	1	19,75	14,7	4,1
	50536	RMSI19.75-32-F	32	2	19,75	14,7	4,1
	51566	RMSI19.75-26-F	26	2,5	19,75	14,7	4,1
	51560	RMSI21.3-28-F	28	2,5	21,3	14,7	4,1
	51561	RMSI21.3-16-F	16	5	21,3	14,7	4,1
	51585	RMSI24-76-F	76	1	24	5	3
	51586	RMSI24-40-F	40	2	24	5	3
	51587	RMSI24-32-F	32	2,5	24	5	3
	51588	RMSI24-16-F	16	5	24	5	3
	51578	RMSI24.3-78-F	78	1	24,3	20	4
	51579	RMSI24.3-40-F	40	2	24,3	20	4
	51108	RMSI24.3-32-F	32	2,5	24,3	20	4
	51580	RMSI24.3-16-F	16	5	24,3	20	4
	51581	RMSI24.5-80-F	80	1	24,5	17	6
	51582	RMSI24.5-40-F	40	2	24,5	17	6
	51583	RMSI24.5-32-F	32	2,5	24,5	17	6
	51584	RMSI24.5-16-F	16	5	24,5	17	6
	51589	RMSI30-96-F	96	1	30	11,5	5
	51590	RMSI30-50-F	50	2	30	11,5	5
	51591	RMSI30-40-F	40	2,5	30	11,5	5
	51592	RMSI30-20-F	20	5	30	11,5	5
	51593	RMSI30-96-F	96	1	30	11,5	2,5
	51594	RMSI30-50-F	50	2	30	11,5	2,5
	51595	RMSI30-40-F	40	2,5	30	11,5	2,5
	51596	RMSI30-20-F	20	5	30	11,5	2,5
	51559	RMSI30.9-100-F	100	1	30,9	21,3	5
	50954	RMSI30.9-50-F	50	2	30,9	21,3	5
	50357	RMSI30.9-40-F	40	2,5	30,9	21,3	5
	50182	RMSI30.9-20-F	20	5	30,9	21,3	5
	51568	RMSI31-100-F	100	1	31	24	10
	50887	RMSI31-50-F	50	2	31	24	10
	51569	RMSI31-40-F	40	2,5	31	24	10
	50466	RMSI31-20-F	20	5	31	24	10
	51562	RMSI32.21-102-F	102	1	32,21	25,5	10
	51563	RMSI32.21-22-F	22	5	32,21	25,5	10
	50365	RMSI38-120-F	120	1	38	30	6,5
	50239	RMSI38-50-F	50	2,5	38	30	6,5
	50204	RMSI38-24-F	24	5	38	30	6,5
	51567	RMSI41.2-130-F	130	1	41,2	25,05	10
	50431	RMSI41.2-64-F	64	2	41,2	25,05	10
51570	RMSI45-144-F	144	1	45	34	10	
50888	RMSI45-72-F	72	2	45	34	10	
51571	RMSI48-152-F	152	1	48	40	10	
50437	RMSI48-32-F	32	5	48	40	10	
51572	RMSI48.3-154-F	154	1	48,3	36,6	10	
51573	RMSI48.3-80-F	80	2	48,3	36,6	10	
50828	RMSI48.3-36-F	32	5	48,3	36,6	10	
51564	RMSI48.7-156-F	156	1	48,7	37,2	5	
50666	RMSI48.7-64-F	64	2,5	48,7	37,2	5	
50232	RMSI48.7-32-F	32	5	48,7	37,2	5	
51574	RMSI54.7-172-F	172	1	54,7	41,6	10	
50889	RMSI54.7-36-F	36	5	54,7	41,6	10	
51575	RMSI62.6-198-F	198	1	62,6	52,6	10	
50699	RMSI62.6-100-F	100	2	62,6	52,6	10	
51576	RMSI62.6-80-F	80	2,5	62,6	52,6	10	
51577	RMSI62.6-40-F	40	5	62,6	52,6	10	
50460	RMSI72-228-F	228	1	72	54	7	
50240	RMSI72-88-F	88	2,5	72	54	7	

	order-no.	matchcode	number of poles	magnetic pole pitch	outer diameter (OD)	inner diameter (ID)	height (H)
				[mm]	[mm]	[mm]	[mm]
ferrite rings (axial)	51598	RMSI14-20A-F	20	2	14	8	1,5
	51599	RMSI14-16A-F	16	2,5	14	8	1,5
	51600	RMSI14-10A-F	10	5	14	8	1,5
	51604	RMSI19.75-20A-F	20	2,5	19,75	14,7	4,1
	51605	RMSI19.75-10A-F	10	5	19,75	14,7	4,1
	51618	RMSI24-24A-F	24	2	24	5	3
	51619	RMSI24-20A-F	20	2,5	24	5	3
	51620	RMSI24-10A-F	10	5	24	5	3
	51616	RMSI24.3-16A-F	16	5	24,3	20	4
	51617	RMSI24.5-16A-F	16	5	24,5	17	6
	51621	RMSI30-16A-F	16	5	30	11,5	5
	51622	RMSI30-28A-F	28	1	30	11,5	2,5
	51623	RMSI30-16A-F	16	1	30	11,5	2,5
	51597	RMSI30.9-18A-F	18	5	30,9	21,3	5
	51612	RMSI31-20A-F	20	5	31	24	10
	51601	RMSI32.21-20A-F	20	5	32,21	25,5	10
	51610	RMSI38-108A-F	108	1	38	30	6,5
	50614	RMSI38-54A-F	54	2	38	30	6,5
	51611	RMSI38-44A-F	44	2,5	38	30	6,5
	51613	RMSI45-50A-F	50	2,5	45	34	10
	51614	RMSI48-30A-F	30	5	48	40	10
	51602	RMSI48.7-70A-F	70	2	48,7	37,2	5
	51603	RMSI48.7-30A-F	30	5	48,7	37,2	5
	51615	RMSI54.7-32A-F	32	5	54,7	41,6	10
	51606	RMSI72-200A-F	200	1	72	54	7
	51607	RMSI72-100A-F	100	2	72	54	7
	51608	RMSI72-80A-F	80	2,5	72	54	7
	51609	RMSI72-40A-F	40	5	72	54	7
50748	RMSI72-38A-F	38	5	72	54	7	

Customized Rotary Magnetic Scales Incremental

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.

Order Code

RMSI D - N S - M - H - G - P - I

			code	explanation *
parameters	D	outer diameter [mm]		outer diameter of ring surface in millimeter
	N	number of poles		even positive integer number
	S	surface of magnetization		radial (default)
			A	axial
	M	magnetization material	F	hard ferrite (8/22)
			E	elastomer bonded ferrite
			V	vulcanized ferrite
			P	plastroferrite
	H	hub material		without hub (only for magnetization materials hard ferrite and plastroferrite)
			A	aluminum
			S	steel
	G	accuracy class		600 arc seconds (default)
			G...	(only necessary if deviates from default)
P	protection		without protection (default)	
		S	stainless steel	
		F	fibre	
I	index		without reference mark (default)	
		Z	north-south-north reference mark	

⁽¹⁾ standard parameters are bold

Ordering Example

RMSI50-64-F-A-G100

rotary magnetic scale incremental, outer diameter 50mm, number of poles 64, surface of magnetization radial, magnetization material hard ferrite, hub material aluminum, accuracy class 100 arc seconds

RMSI50-64A-E-S-G100-F-Z

rotary magnetic scale incremental, outer diameter 50mm, number of poles 64, surface of magnetization axial, magnetization material elastomer bonded ferrite, hub material steel, accuracy class 100 arc seconds, protection fibre, index north-south-north

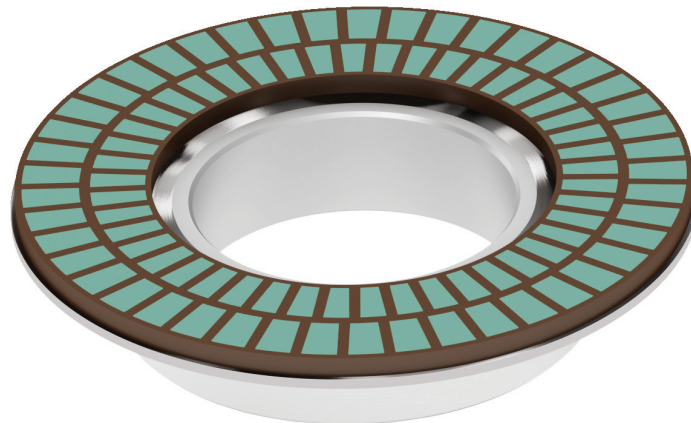
RMSN

Rotary Magnetic Scale Nonius

Indicating movements with RMSN is simple, precise and economic. RMSN rotary magnetic are used in continuous or discrete positioning, motion control, such as commutation, and many other solutions. BOGEN manufactures rotary scales on the flange, outer or inner diameter. Production processes cover both prototype quantities and large series production. The combination of BOGEN encoders and scales with optimized pole pitches ensure highest system accuracy.

Counting

Controlling

ALWAYS
ABSOLUTE 

Features and Benefits

- wide range of selectable magnetic scale characteristics: low to very high accuracy, several pole pitches, different scale geometries, a variety of magnetic materials
- two track magnetization
- customizable for many applications
- no wear from usage
- resistant to dust, cooling lubricant emulsion, oil, etc.

Features

Magnetic Properties (Elastomer-bonded ferrite/Isotropic)

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
physical properties	
tensile strength N/mm ² (MPa)	>2.5
hardness shore D	30 -45
density g/cm ³	3.55-3.7
temperature range °C	-40 to 100

Chemical Properties

hydraulic oil (23 °C × 72 h)	++
alcohol (23 °C × 72 h)	+
weak alkali (23 °C × 72 h)	++
detergent (23 °C × 72 h)	++
aromatic solvent (23 °C × 72 h)	-
organic, anorganic acid (23 °C × 72 h)	-
aliphatic solvent (23 °C × 72 h)	-
water (60 °C × 72 h)	++

Magnetic Properties (Hard ferrite/Isotropic)

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

Physical Properties

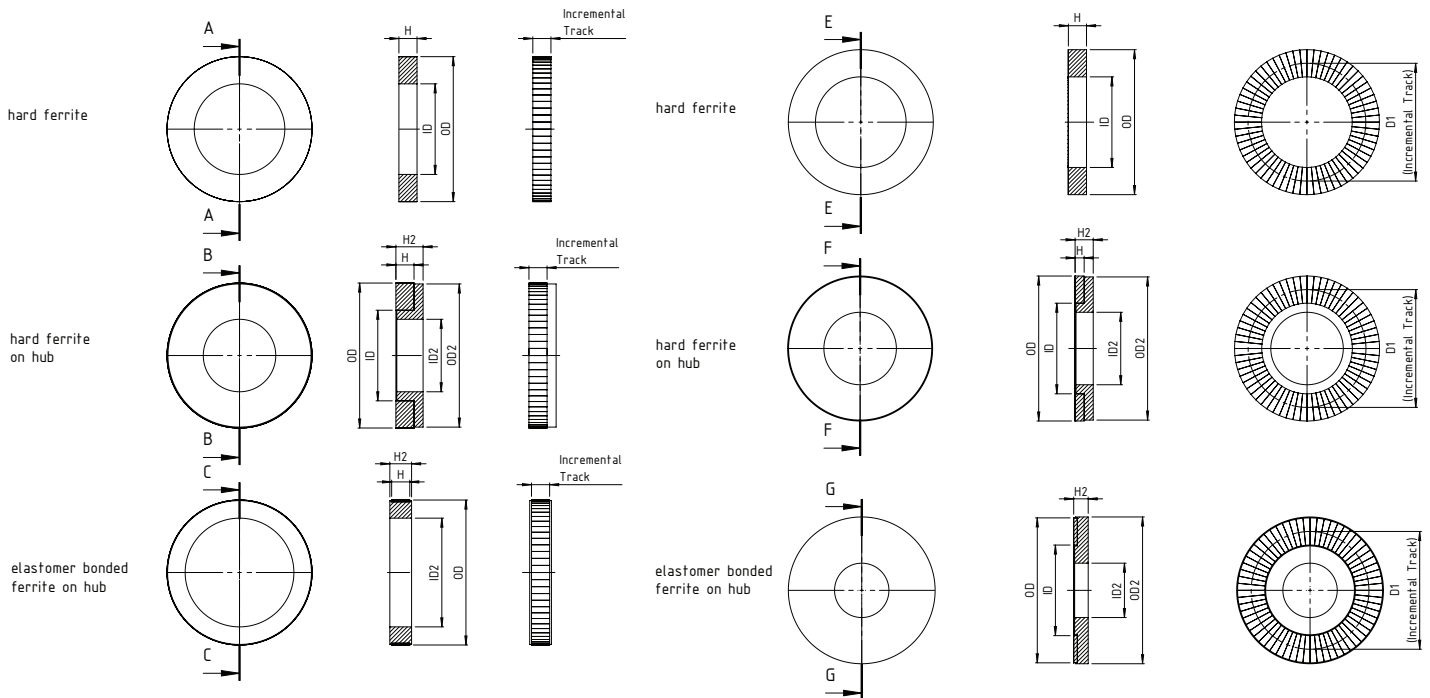
tensile strength N/mm ² (MPa)	50
hardness HV	500 -600
density g/cm ³	4.8 - 4.9
temperature range °C	- 40 to 250

Chemical Properties

hydraulic oil (23 °C × 72 h)	++
alcohol (23 °C × 72 h)	+
weak alkali (23 °C × 72 h)	++
detergent (23 °C × 72 h)	++
aromatic solvent (23 °C × 72 h)	chemical resistance depends on temperature, concentration and time of exposure to the medium
organic, anorganic acid (23 °C × 72 h)	
aliphatic solvent (23 °C × 72 h)	
water (60 °C × 72h)	++

- not suitable + good ++ very good

Due to mechanical characteristics of individual parts and the applied manufacturing processes, the top surface of the magnetic component may show minimal surface changes. This has no negative impact on functionality.



Available Dimensions RMSN Axial

order no.	order code	OD (elastomer/hard ferrite)	OD2 (hub)	ID (elastomer/hard ferrite)	ID2 (hub)	fit	H (elastomer/hard ferrite)	H2 (RMSN)	master track Ø	nonius track Ø
		[mm]					[mm]			
51558	RMSN16-15A-1.28-E-S	15.50	17.00	3.00	5.00	D9	1.00	7.00	13.04	5.84
51701	RMSN16-15A-1.28-E-S	15.50	16.00	3.00	3.00	H7	1.00	6.00	13.04	5.84
51216	RMSN32-31A-1.28-E-S	29.00	29.80	15.10	10.00	H7	1.00	6.00	26.08	18.88
51499	RMSN32-31A-1.28-E-S	29.00	29.00	15.10	11.00	H7	1.00	3.50	26.08	18.88
51217	RMSN32-31A-1.28-F-A	30.00	29.80	11.50	10.00	H7	2.50	6.00	26.08	18.88
51694	RMSN32-31A-1.50-F-A	34.00	33.60	20.40	15.70	H7	2.00	6.00	30.56	23.36
51352	RMSN32-31A-1.50-E-S	33.50	34.00	20.00	19.00	H7	1.00	6.00	30.35	23.15
51353	RMSN32-31A-1.50-E-S	33.50	34.00	20.00	16.00	H7	1.00	6.00	30.56	23.36
52066	RMSN64-63A-1.28-F-A	55.00	54.00	42.00	35.00	H7	2.50	4.00	52.15	44.95
52087	RMSN64-63A-1.28-E-S	55.00	55.00	42.00	35.00	H7	1.00	2.50	51.78	45.28
52076	RMSN64-63A-1.50-F-A	64.50	64.00	51.00	40.00	H7	3.00	4.50	61.12	53.92
52097	RMSN64-63A-1.50-E-S	64.00	64.00	51.00	45.00	H7	1.00	2.50	61.12	53.92

Available Dimensions RMSN Radial

order no.	order code	OD (elastomer/hard ferrite)	OD2 (hub)	ID (elastomer/hard ferrite)	ID2 (hub)	fit	H (elastomer/hard ferrite)	H2 (RMSN)
		[mm]					[mm]	
51218	RMSN32-31-1.28-F-A	24.50	24.00	17.00	10.00	H7	6.00	7.00
51467	RMSN32-31-1.28-F-A	24.50	24.00	17.00	16.35	H7	6.00	10.00
51269	RMSN64-63-1.28-F-A	50.55	50.00	38.00	31.00	H7	8.00	9.50
51356	RMSN64-63-1.28-E-S	50.55	49.55	48.55	25.00	H7	10.00	11.00
51521	RMSN64-63-1.50-F-A	59.50	50.00	43.50	35.00	H7	6.00	7.50
51529	RMSN64-63-1.50-E-S	59.60	57.60	57.60	52.60	H7	6.00	6.00

magnet material: E = elastomer; F = hard ferrite; hub material: S = steel; A = aluminum

Order Code Sensor

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

			code	explanation *
parameters	M-N	number of pole pairs	... - ...	number of pole pairs: Master-Nonius, e. g. 32-31
	S	surface of magnetization		radial, on the circumference (no input required)
			A	axial, on the end surface
	P	pole pitch (mm)	...	pole pitch of nonius track in millimeter, e. g. 1.28
	M	magnetization material	F	hard ferrite [8/22]
			E	elastomer bonded ferrite
			V	vulcanized ferrite
			P	plastroferrite
	H	hub material	A	aluminum
			S	steel
			M	sheet metal
	G	accuracy class		300 arc seconds (no input required)
			G...	only necessary if deviates from default
	P	protection		without protection (no input required)
S			stainless steel	
F			fibre	
P			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

Customized Rotary Magnetic Scales

Customized rotary magnetic scales with different dimensions and pole numbers can be produced economically, and BOGEN scale production capabilities are designed for high flexibility at low cost. Please contact BOGEN to discuss your requirements.



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