

NH1-D...



Frameless Brushless DC Motors  
pgs. 14-0A-14-0G

A 6Z10M13...



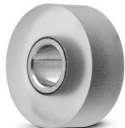
Friction Drive Wheels  
pg. 14-1

A 7T 5MUR...



Feed Rollers Without Bearing  
pg. 14-2

A 7M 5MUR...



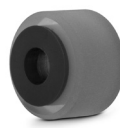
Feed Rollers Without Bearing  
pg. 14-3

A 7Z 5MUR...



Idler Rollers With Sintered Bronze  
Bearing  
pg. 14-4

A 7ZB5MURG...



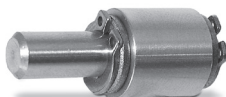
Idler Rollers With Polymer Bearing  
pg. 14-5

A 7Z 8MURBB...



Idler Rollers with Double-Shielded  
ABEC 3 Bearing  
pg. 14-6

S7AYPAM...



Low Cost Idlers with Sintered Bronze  
Bearings  
pg. 14-7

S9930AMKRV..



Stud Type Cam Followers  
pg. 14-8

A 7Y 5MCF...



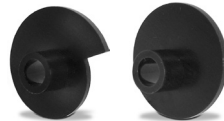
Cam Followers, Shallow Head  
pg. 14-9

A 3Y 3M.Z0.



Molded Cams with Metal Insert  
pg. 14-10

A 3Y 3M.M06



Molded Cams  
pg. 14-11

RoHS COMPLIANT  
UL AGENCY RECOGNITION  
CLASS F INSULATION

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**> OVERVIEW:**

Lightweight, frameless motors delivering low inertia, high efficiency and high torque density in compact sizes.

Frameless brushless DC motors are unique and versatile in a wide range of applications. Frameless BLDC motors fit more easily into small compact machines that require precision and higher torque density. Additionally, they can replace heavier, less efficient hydraulic components by decreasing operating and maintenance costs. These motors are also more environmentally friendly than others.



**> FEATURES:**

- High torque to inertia ratio for quick response and precision control.
- High torque density in a compact package.
- Large rotor inner diameter for easy cable routing.
- Standard 200 mm lead lengths.
- Low cogging torque for a smooth operation.
- Machine wound reliability with bondable magnet wire for a compact and reliable coil.
- Constructed with corrosion-resistant materials.
- Tested for performance and reliability.

**> APPLICATIONS:**

- Surgical Robots
- Collaborative Robots
- Packaging Equipment
- Medical Equipment
- Indexing and Positioning
- General Purpose Equipment
- Manufacturing Automation
- AGV and AMR

<b>METRIC COMPONENT</b>					
<b>Catalog Number</b>					
	<b>NH1-D35</b>	<b>NH1-D52</b>	<b>NH1-D64</b>	<b>NH1-D77</b>	<b>NH1-D100</b>
Standard bus voltage (Vdc)	48	48	48	48	48
Standard stack heights (mm)	20.5	18.5	25.5	28	32
<b>Data Below is Based on Standard Stack Height at 48V</b>					
Rated Speed (rpm)	6000	3000	3000	3000	2000
No-load Speed (rpm)	10250	4450	3450	3250	2880
Rated Torque (N • m)	0.15	0.43	1	2.12	4
Peak Torque (N • m)	0.38	1.08	2.5	5.3	10
Rated Power (W)	90	140	310	670	840
Ke (Vrms/krpm)	3.21	7.42	9.55	10.15	11.44
Kt (N • m/Arms)	0.042	0.113	0.145	0.154	0.174
Rated Current (Arms)	3.07	3.81	6.88	13.73	22.98
Peak Current (Arms)	7.68	9.52	17.20	34.32	57.45
Standard Inertia (kgcm <sup>2</sup> )	0.013	0.047	0.158	0.45	1.6
Stator Insulation Rating (°C)	155	155	155	155	155
Stator Weight (kg)	0.077	0.172	0.417	0.635	1.193
Rotor Weight (kg)	0.027	0.045	0.099	0.158	0.326
Number of Poles	6	6	8	10	10
R (ph-ph) (Ohms)	2.6	1.55	0.74	0.24	0.1
L (ph-ph) (mH)	1	1.92	1.1	0.6	0.42
Air Gap (mm)	0.50	0.50	0.50	0.50	0.76

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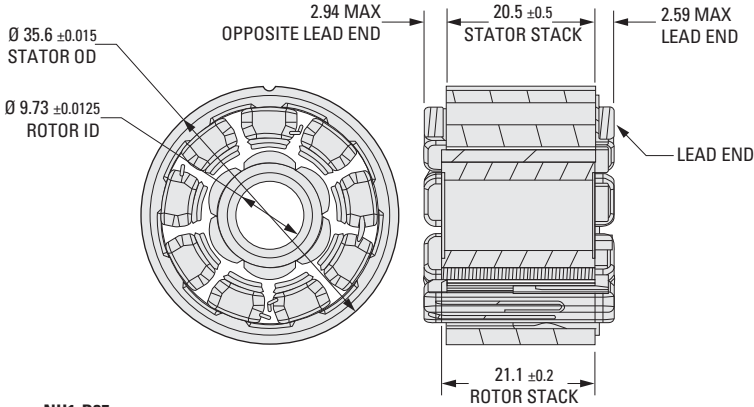
**TORQUE RANGE (CONTINUOUS):** 0.15 N • m - 4 N • m

**TORQUE RANGE (PEAK):** 10 N • m - 0.38 N • m

**RATED VOLTAGES:** 12 Vdc - 60 Vdc

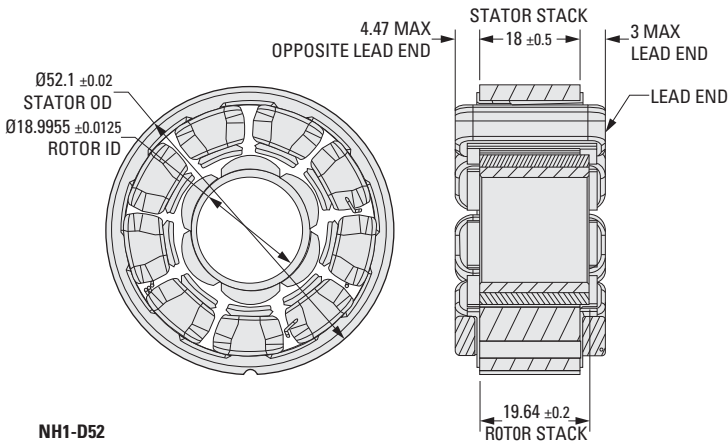
**POWER:** 75 W TO 670 W

**WARRANTY:** ONE YEAR LIMITED WARRANTY



**NH1-D35**

Lead Gauge	Lead UL Style	Phase A Color	Phase B Color	Phase C Color	Lead Length (mm)	Termination
26 AWG	UL 1180	Blue	Brown	Violet	200	None



**NH1-D52**

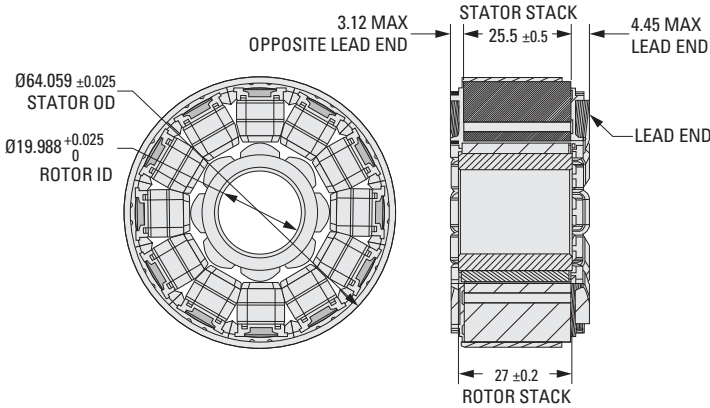
Lead Gauge	Lead UL Style	Phase A Color	Phase B Color	Phase C Color	Lead Length (mm)	Termination
22 AWG	UL 1199	Blue	Brown	Violet	200	None

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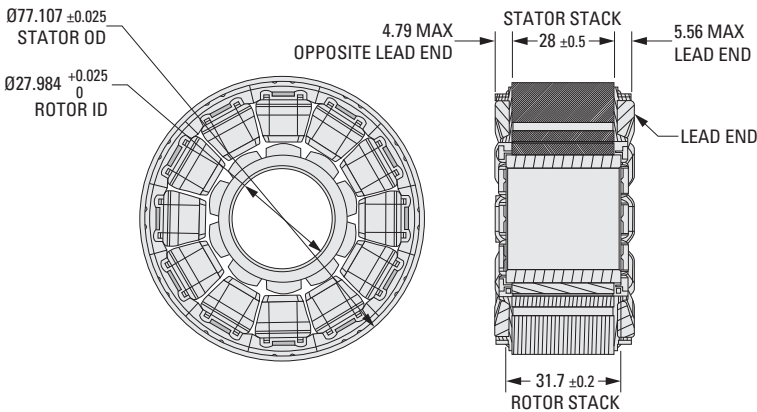


**TORQUE RANGE (CONTINUOUS):** 0.15 N • m - 4 N • m  
**TORQUE RANGE (PEAK):** 10 N • m - 0.38 N • m  
**RATED VOLTAGES:** 12 Vdc - 60 Vdc  
**POWER:** 75 W TO 670 W  
**WARRANTY:** ONE YEAR LIMITED WARRANTY



**NH1-D64**

Lead Gauge	Lead UL Style	Phase A Color	Phase B Color	Phase C Color	Lead Length (mm)	Termination
18 AWG	UL 1199	Blue	Brown	Violet	200	None



**NH1-D77**

Lead Gauge	Lead UL Style	Phase A Color	Phase B Color	Phase C Color	Lead Length (mm)	Termination
18 AWG	UL 1199	Blue	Brown	Violet	200	None

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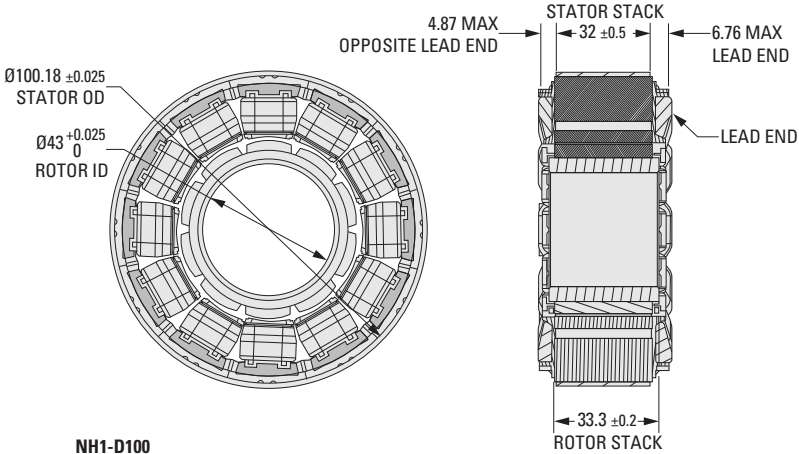
**TORQUE RANGE (CONTINUOUS):** 0.15 N • m - 4 N • m

**TORQUE RANGE (PEAK):** 10 N • m - 0.38 N • m

**RATED VOLTAGES:** 12 Vdc - 60 Vdc

**POWER:** 75 W TO 670 W

**WARRANTY:** ONE YEAR LIMITED WARRANTY

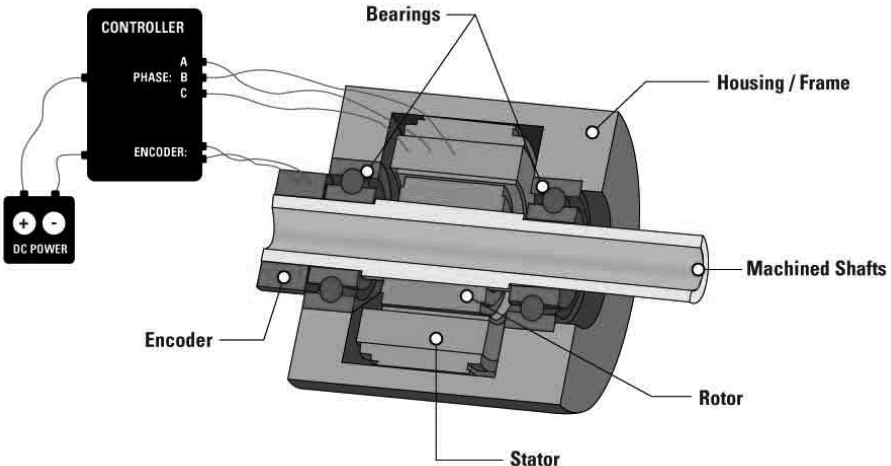


**NH1-D100**

Lead Gauge	Lead UL Style	Phase A Color	Phase B Color	Phase C Color	Lead Length (mm)	Termination
14AWG	UL 1199	Blue	Brown	Violet	200	None

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**HOW TO USE THIS MOTOR:**



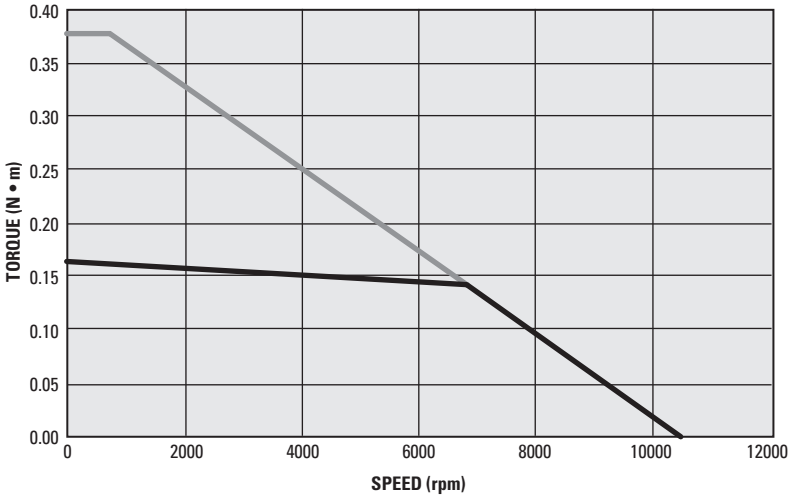
**SPEED / TORQUE CHARACTERISTIC:** for **NH1-D35** and **NH1-D52 @ 48V**



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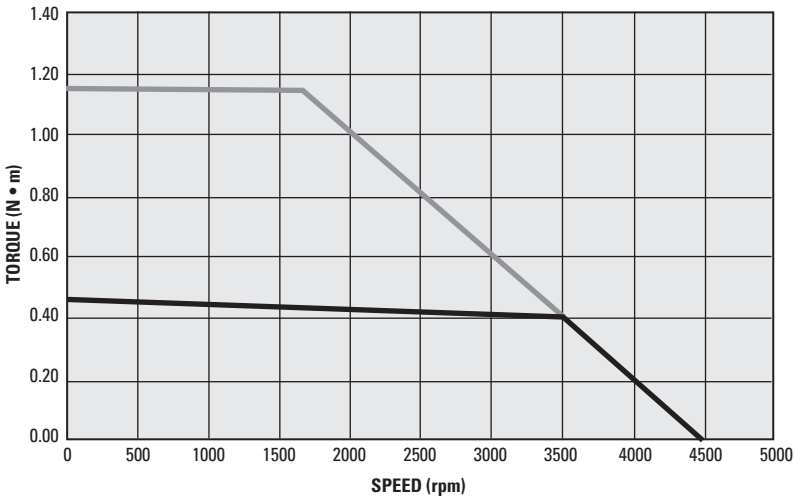
**NH1-D35 Speed / Torque Curves @ 48V**

— Continuous — Intermittent



**NH1-D52 Speed / Torque Curves @ 48V**

— Continuous — Intermittent



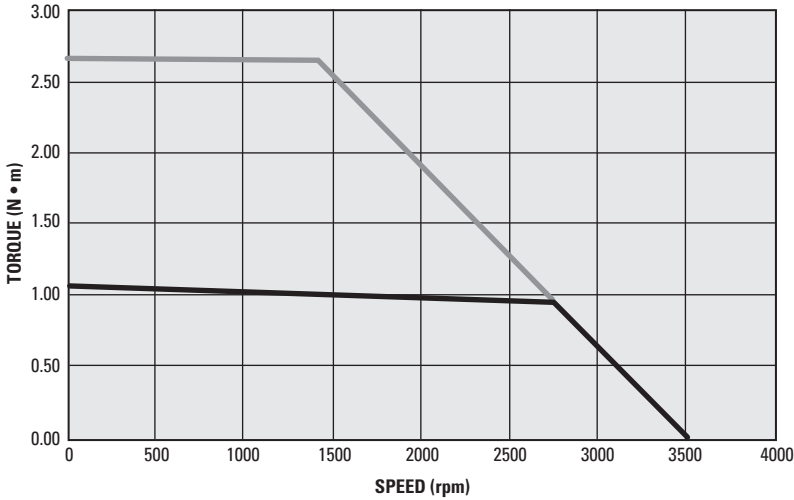
**SPEED / TORQUE CHARACTERISTIC:** for **NH1-D64** and **NH1-D77** @ 48V



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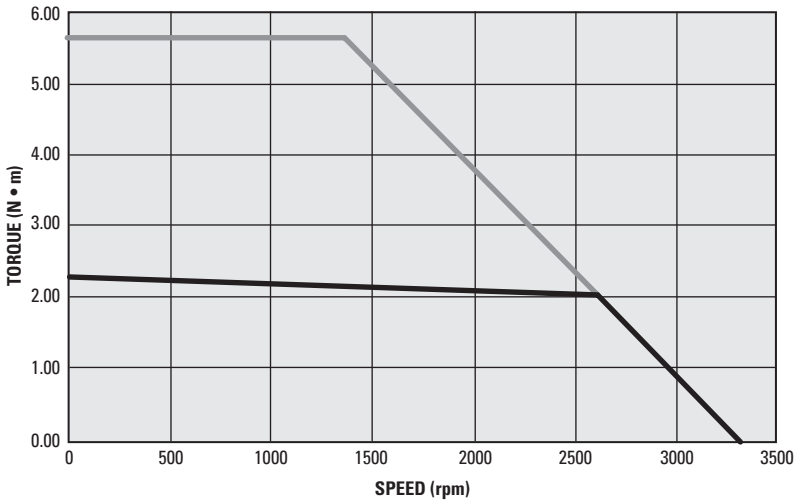
**NH1-D64 Speed / Torque Curves @ 48V**

— Continuous — Intermittent

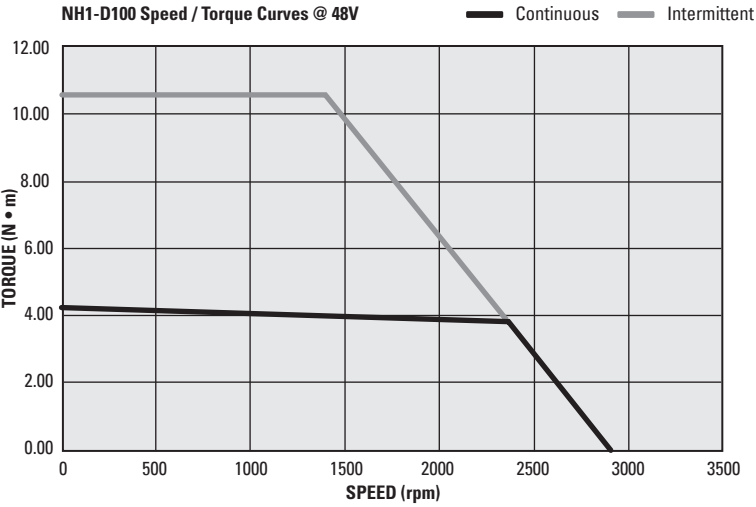


**NH1-D77 Speed / Torque Curves @ 48V**

— Continuous — Intermittent



**SPEED / TORQUE CHARACTERISTIC:** for NH1-D100 @ 48V



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4.8 mm FACE

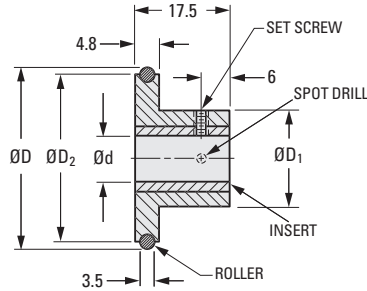
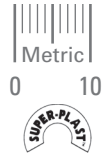
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**> MATERIAL:**

**Body** – Acetal

**Insert** – Brass

**Roller** – Buna “N”, 70 Durometer



**METRIC COMPONENT**

Catalog Number	D Dia.	d Bore +0.025 0	D <sub>1</sub> Hub Dia.	D <sub>2</sub> Dia.	Set Screw
A 6Z10M131304	15.9	4	16	12.7	M3
A 6Z10M131904	22.3			19.1	
A 6Z10M132504	28.6			25.4	
A 6Z10M133804	41.3			38.1	
A 6Z10M135104	54	25	50.8	M3	
A 6Z10M131306	15.9	6	16	12.7	M3
A 6Z10M131906	22.3			19.1	
A 6Z10M132506	28.6			25.4	
A 6Z10M133806	41.3			38.1	
A 6Z10M135106	54	25	50.8	M3	
A 6Z10M131908	22.3	8	16	19.1	M4
A 6Z10M132508	28.6			25.4	
A 6Z10M135108	54	25	50.8	M4	

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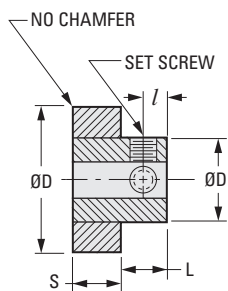
URETHANE SURFACE  
WITHOUT BEARING

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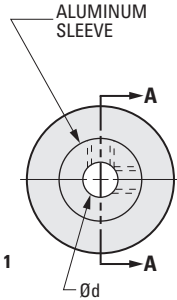
**MATERIAL:**

- Roller** - Urethane 60 Durometer  
Ground Outside Diameter
- Sleeve** - Aluminum

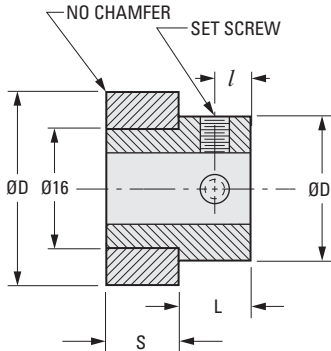
All feed rollers supplied with 2 set screws



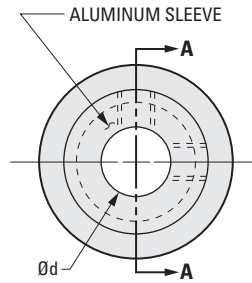
**SECTION A-A**



**Fig. 1**



**SECTION A-A**



**Fig. 2**

**METRIC COMPONENT**

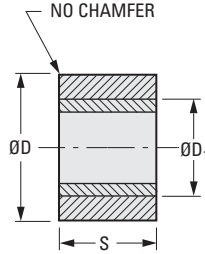
Catalog Number	Fig. No.	D Dia. ± 0.075	d Bore +0.0127 0	S Face Width ± 0.25	L Hub Proj.	I	D <sub>1</sub> Sleeve O.D.	Set Screw
A 7T 5MUR1405	1	14	5	6.35	6.35	3.17	11.1	M3
A 7T 5MUR1905		19						
A 7T 5MUR1606		16						
A 7T 5MUR1906	2	19	6	9.52	6.35	3.17	12.7	M4
A 7T 5MUR2206		22						
A 7T 5MUR2510		25						
A 7T 5MUR3210	1	32	10	9.52	9.52	4.76	19	M4
A 7T 5MUR3810		38					20.62	
A 7T 5MUR3812		38					25.4	
A 7T 5MUR4412		44					25.4	
A 7T 5MUR5012		50					31.75	
							34.9	M6

URETHANE SURFACE  
WITHOUT BEARING

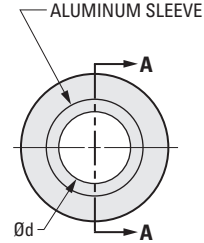
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**> MATERIAL:**

- Roller - Urethane 60 Durometer
- Ground Outside Diameter
- Sleeve - Aluminum



**SECTION A-A**



**METRIC COMPONENT**

Catalog Number	D Dia. $\pm 0.075$	d Bore $+0.013$ 0	S Face Width $\pm 0.25$	D <sub>1</sub> Sleeve O.D.	
A 7M 5MUR1206A	12	6	6.35	8.74	
A 7M 5MUR1206B			18.2		
A 7M 5MUR1206C			12.7		
A 7M 5MUR1710	17	10	6.35	12.7	
A 7M 5MUR1910	19		12.7		
A 7M 5MUR2010	20		12.7		
A 7M 5MUR2310	23		12.3		17.47
A 7M 5MUR2810A	28		11.12		12.7
A 7M 5MUR2810B			17.47		
A 7M 5MUR5010	50	17.47	34.92		
A 7M 5MUR5012A	50	12	19.05	34.92	
A 7M 5MUR5012B			25.4		

**Check out our blog, "Ideas in Motion"**  
<https://info.designatronics.com/blog>

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# IDLER ROLLERS

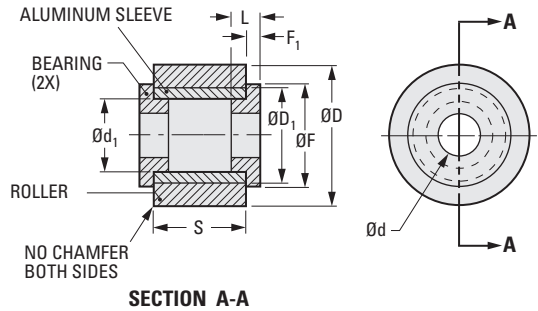
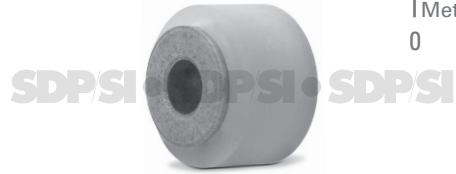


URETHANE SURFACE  
WITH SINTERED BRONZE BEARING

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**> MATERIAL:**

- Roller** - Urethane 60 Durometer  
Ground Outside Diameter
- Sleeve** - Aluminum Alloy
- Bearing** - Sintered Bronze



**METRIC COMPONENT**

Catalog Number	D Dia.	d Bore +0.038 0	S Face Width ± 0.25	L Bearing Length	F Flange Dia.	F <sub>1</sub> Flange Thickness	d <sub>1</sub> Sleeve I.D.	D <sub>1</sub> Sleeve O.D.
A 7Z 5MUR1203A	12	3	6.35	4	9	1.5	6	8.74
A 7Z 5MUR1203B			18.2					
A 7Z 5MUR1203C			12.7					
A 7Z 5MUR1706	17	6	6.35	4	14	2	10	12.7
A 7Z 5MUR1906			19					
A 7Z 5MUR2006			20					
A 7Z 5MUR2306	23	6	12.7	4	16	3	10	17.47
A 7Z 5MUR2806A			23					
A 7Z 5MUR2806B			28					
A 7Z 5MUR5006	50	6	17.47	4	16	3	10	34.92
A 7Z 5MUR5008A			19.05					
A 7Z 5MUR5008B			25.4					

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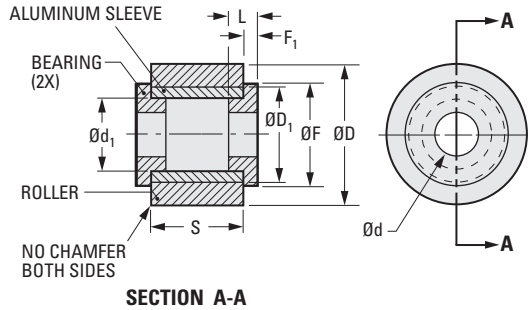
14-4  
D815

URETHANE SURFACE  
WITH POLYMER BEARING

PHONE: 516.328.3300 • FAX: 516.326.8827 • WWW.SDP-SI.COM

**> MATERIAL:**

- Roller** - Urethane 60 Durometer  
Ground Outside Diameter
- Sleeve** - Aluminum Alloy
- Bearing** - M250® Polymer

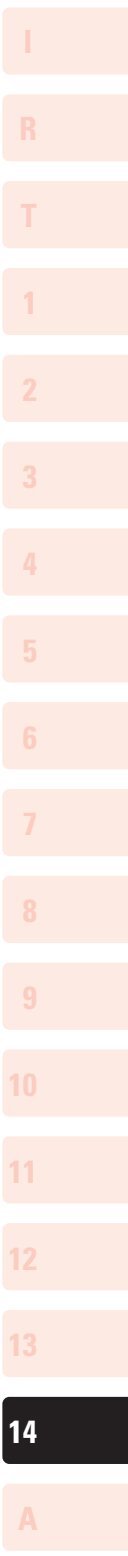


**METRIC COMPONENT**

Catalog Number	D Dia.	d Bore	S Face Width ± 0.25	L Bearing Length	F Flange Dia.	F1 Flange Thickness Ref.	d1 Sleeve I.D.	D1 Sleeve O.D.
A 7ZB5MURG1203A	12	3 <sup>+0.080</sup> +0.020	6.35	4	9	1.5	6	8.74
A 7ZB5MURG1203B			18.2					
A 7ZB5MURG1203C			12.7					
A 7ZB5MURG1706	17	6 <sup>+0.105</sup> +0.030	6.35	4	14	2	10	12.7
A 7ZB5MURG1906	19		12.7					
A 7ZB5MURG2006	20		12.7					
A 7ZB5MURG2306	23		12.3					
A 7ZB5MURG2806A	28		11.12					
A 7ZB5MURG2806B			17.47					
A 7ZB5MURG5006	50		17.47					
A 7ZB5MURG5008A	50	8 <sup>+0.120</sup> +0.040	19.05	6	16	2	12	34.92
A 7ZB5MURG5008B			25.4					

**If you're buying standard components & sending them out for secondary services - DON'T!**

**We can modify any standard part to meet your exact requirements.**



# IDLER ROLLERS



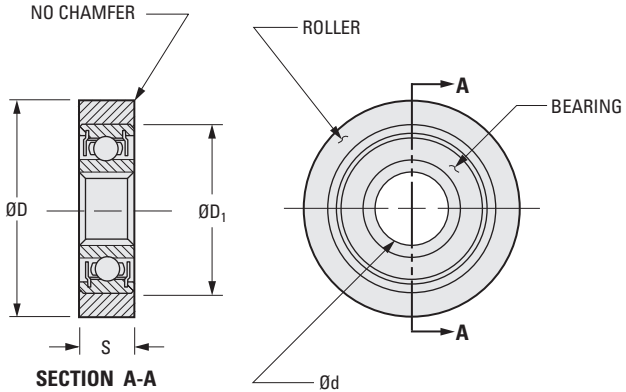
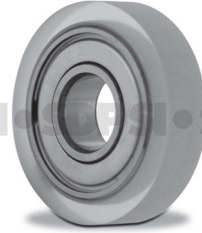
URETHANE SURFACE  
WITH DOUBLE-SHIELDED ABEC 3 BEARING

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**> MATERIAL:**

- Roller** - Urethane 60 Durometer  
Ground Outside Diameter
- Bearing, Double-Shielded** - Stainless Steel



METRIC COMPONENT				
Catalog Number	D Dia. ± 0.075	d Bore 0 -0.005	S Face Width ± 0.25	D <sub>1</sub> Dia.
A 7Z 8MURBB1205	12	5	3	9
A 7Z 8MURBB1905	19			
A 7Z 8MURBB1606	16	6	5	13
A 7Z 8MURBB1906	19			
A 7Z 8MURBB2810	28	10	7	19
A 7Z 8MURBB3810	38			
A 7Z 8MURBB3812	38	12	8	28
A 7Z 8MURBB4412	44			

## Waiting For Inspiration To Strike?

This scientific approach to creativity makes a lot more sense to us engineers, who tend to need a little more logical reasoning and a little less haphazardness.

<https://info.designatronics.com/improving-creativity-ebook>

STAINLESS STEEL  
SINTERED BRONZE BEARINGS

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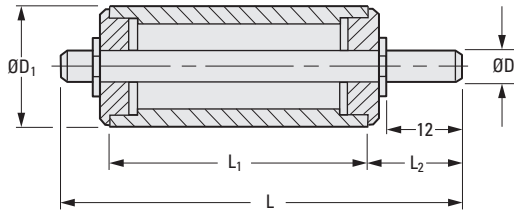
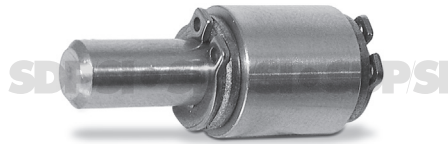


**> MATERIAL:**

- Shaft - 303 Stainless Steel
- Housing - 300 Series Stainless Steel
- Bearings - Sintered Bronze

**> SPECIFICATIONS:**

- Idlers with:
- 5 and 6 dia. shaft have a tolerance of -0.004/-0.012
- 8 dia. shaft have a tolerance of -0.005/-0.014



**METRIC COMPONENT**

Catalog Number	L	L <sub>1</sub>	L <sub>2</sub>	D Dia. g6	D <sub>1</sub> Dia.	Clearance Dia.
Δ S7AYPAM32120510	32	12	14.3	5	10	10.2
S7AYPAM32120512					12	12
Δ S7AYPAM32120612	32	12	15	6	12	14
S7AYPAM32120618					18	18
Δ S7AYPAM50250510	50	25	14.3	5	10	10.2
S7AYPAM50250512					12	12
S7AYPAM50250515					15	15
S7AYPAM50250618	50	25	15	6	18	18
S7AYPAM50250818					18	18
S7AYPAM50250820	50	25	16.2	8	20	20

Δ Retaining ring clearance diameter or bronze bearing flange diameter is larger than diameter "D<sub>1</sub>".

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# STUD TYPE CAM FOLLOWERS



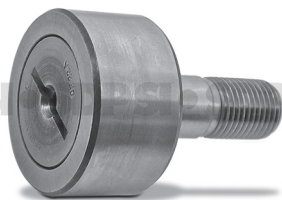
NEEDLE BEARINGS  
CAGE-GUIDED  
FULL-COMPLEMENT

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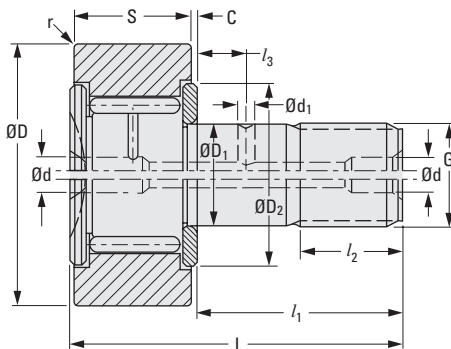
**MATERIAL:**

Roller & Needles - 52100 Steel  
Stud - 1055 Steel



Catalog Number	Load Ratings* N			
	Dyn. C	Stat. C <sub>0</sub>	Dyn. C <sub>w</sub>	Stat. C <sub>ow</sub>
S9930AMKRV16	6400	8500	4850	6500
S9930AMKRV19	7300	10800	5500	7900
S9930AMKRV22	8600	12900	6300	9100
S9930AMKRV26	8600	12900	7300	11300
S9930AMKRV30	12200	19000	9500	14600
S9930AMKRV32			10000	15800
S9930AMKRV35	18300	35000	12800	23000
S9930AMKRV40	21000	39500	14800	26500

\* The basic load ratings C and C<sub>0</sub> apply if the bearing outer ring (with cylindrical outside surface) is mounted into a housing with standard bearing fit; when used as track roller, the load rating C<sub>w</sub> and C<sub>ow</sub> apply.



## METRIC COMPONENT

Catalog Number	l <sub>1</sub> Stud Length	D Roller Dia.	D <sub>1</sub> Stud Dia. h7	S Roller Width	L Length	G Thread Size	l <sub>2</sub> Thread Length	Lubrication Holes Dia.	
								d	d <sub>1</sub>
S9930AMKRV16	16	16	6	11	28	M6 x 1	8	4 Δ	—
S9930AMKRV19	20	19	8		32	M8 x 1.25	10	4	—
S9930AMKRV22	23	22	10	12	36	M10 x 1	12	4	—
S9930AMKRV26		26							
S9930AMKRV30	25	30	12	14	40	M12 x 1.5	13	6	3
S9930AMKRV32		32							
S9930AMKRV35	32.5	35	16	18	52	M16 x 1.5	17	6	3
S9930AMKRV40	36.5	40	18	20	58	M18 x 1.5	19	6	3

Δ Relubrication via stud end face only.

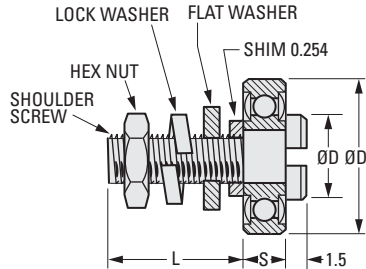
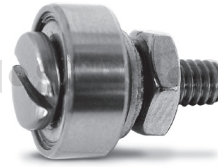
Catalog Number (Ref. Only)	l <sub>3</sub> Location	r Corner Radius Min.	C	Max. Speed** rpm	Stud Housing Dia.		D <sub>2</sub> Clamp Dia.	Max. Clamp Torque N • m
					Min.	Max.		
S9930AMKRV16	—	0.15	0.6	8500	8.964	9.000	12	3
S9930AMKRV19				7000	10.957	11.000	14	8
S9930AMKRV22	—	0.3	0.6	6000	12.957	13.000	17	15
S9930AMKRV26								
S9930AMKRV30	6	0.6	0.6	4500	14.957	15.000	23	22
S9930AMKRV32								
S9930AMKRV35	8	0.6	0.8	3400	19.948	20.000	27	58
S9930AMKRV40		1		2900	21.948	22.000	32	87

\*\* Limiting speeds shown are for grease lubrication. With oil lubrication, the speed can be increased by approximately 30% except for sealed versions (which are available on special order).

**> MATERIAL:**

**Bearing** - 440C Stainless Steel, ABEC-3, Double Shield

**Hardware** - 303 Stainless Steel



**METRIC COMPONENT**

Catalog Number	Dimension				Thread
	L	D	D <sub>1</sub>	S	
A 7Y 5MCF0803	6	5	8	4	M2 x 0.4
A 7Y 5MCF1004	8	6	10		M3 x 0.5
A 7Y 5MCF1304			13	5	M5 x 0.8
A 7Y 5MCF1306	12	8	M6 x 1.0		
A 7Y 5MCF1608	16	10	16		

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**> MATERIAL:**

Cam - Acetal, Black  
 Insert - Brass

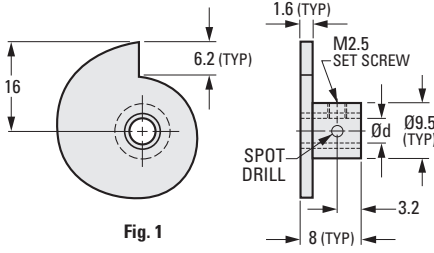
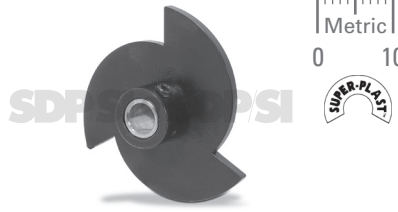


Fig. 1

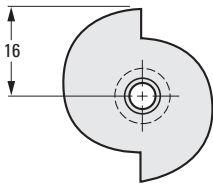


Fig. 2

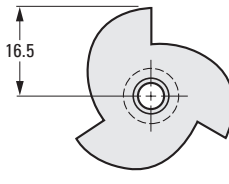


Fig. 3

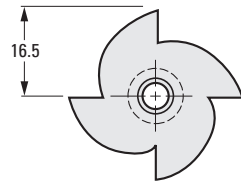


Fig. 4

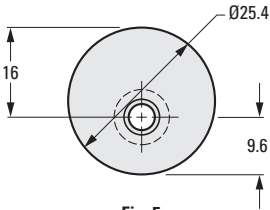


Fig. 5

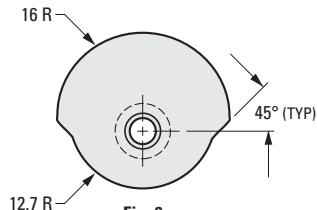


Fig. 6

**METRIC COMPONENT**

Catalog Number	Fig. No.	d Bore +0.025 0	Rise per 15°
A 3Y 3M1Z03	1	3	0.25
A 3Y 3M1Z04		4	
A 3Y 3M2Z03	2	3	0.5
A 3Y 3M2Z04		4	
A 3Y 3M3Z03	3	3	0.75
A 3Y 3M3Z04		4	
A 3Y 3M4Z03	4	3	1
A 3Y 3M4Z04		4	
A 3Y 3M5Z03	5	3	—
A 3Y 3M5Z04		4	
A 3Y 3M6Z03	6	3	—
A 3Y 3M6Z04		4	

MOLDED

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**> MATERIAL:**  
Acetal, Black

**> SPECIFICATIONS:**  
Bore is sized for press fit on standard shafting.  
Use straight knurl for maximum torques.

Other bore sizes available on special order.

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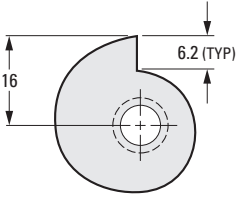
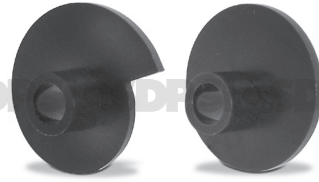


Fig. 1

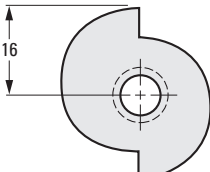
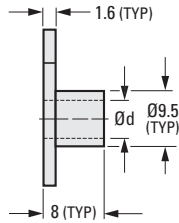


Fig. 2

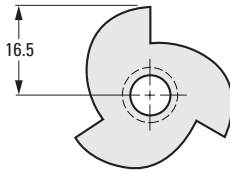


Fig. 3

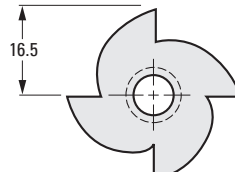


Fig. 4

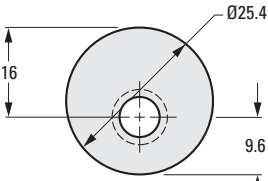


Fig. 5

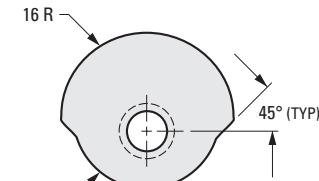


Fig. 6

**METRIC COMPONENT**

Catalog Number	Fig. No.	d Bore	Rise per 15°
A 3Y 3M1M06	1	6	0.25
A 3Y 3M2M06	2		0.5
A 3Y 3M3M06	3		0.75
A 3Y 3M4M06	4		1
A 3Y 3M5M06	5		—
A 3Y 3M6M06	6		—

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