

# Gearmotor Series ServoDisc

## INTRODUCTION



- 8 to 2604 in-lb (.9 to 294 N-M) Continuous Stall Torque
- Virtually Zero to Medium Backlash Models
- Compact, Inline Packaging
- Powered by High-Performance DC ServoDisc Motors

Kollmorgen provides an assortment of gearmotors. Characteristics of all these products include high-torque-to-weight ratios, smooth constant torque and fast acceleration.

- The Accurex™ series, with virtually zero backlash, is designed with a minimum of moving parts for extremely reliable operation
- The Revex™ series uses proven spur gear technology to produce a wide range of exact gear ratios with a maximum of 5 arc minutes of backlash
- The Indurex™ series provides fully reversible helical gearing which results in an exceptional gearmotor actuator
- The low voltage Ferrite series is the flattest design, ideal for battery-powered applications

### ACCUREX

- Virtually zero backlash for high-position accuracy
- Continuous output torque up to 500 in-lb
- Heavy duty bearing design
- Harmonic drive components for simplicity, high reliability and compact shape
- Exact reduction ratios: 60, 80, 100, 120 and 160:1
- High torque capacity in single-stage ratio
- IP55 environmental sealing and prep for resolver are available

### REVEX

- Extremely low backlash; less than 5 arc-minutes
- High-torsional stiffness to ensure high accuracy and repeatability in positioning applications

- Exact reduction ratios: 10:1 up to 100:1 (other ratios optional)
- Continuous output torque up to 2604 in-lbs
- Compact and lightweight
- Gearhead can be sold separately (consult an Kollmorgen Sales Office)
- IP55 environmental sealing and prep for resolver are available

### INDUREX

- Low backlash; less than 20 arc-minutes
- Compact ultraquiet design
- Industrial compact design
- Reduction ratios 3.67:1 up to 98.87:1
- Continuous output torque up to 2580 in-lbs
- IP55 environmental sealing and prep for resolver are available

### FERRITE

- Flat shape and lightweight for easy design intergration
- Reduction ratios from 15:1 to 150:1
- Continuous output torque up to 200 in-lbs
- Suitable for battery operation: 12 or 24 Volts
- Constant torque over the entire speed range
- Zero cogging for smooth operation
- Low inertia produces rapid, accurate response to command signals
- Options:
  - Tachometers or encoders
  - Fail-safe brakes

### Compatible Products

- KXA Plus Amplifier
- EM19 Linear Amplifier

# Accurex Gearmotor Series ServoDisc

## PERFORMANCE DATA

Gearmotor Types		Rated Speed (RPM)	Continuous Torque (in-lb/N-m)	Peak Torque (in-lb/N-m)	Gear Ratio	Motor Voltage (Volts)	Motor Current (amps)
1.0	S6M4H/H6D60	50.0	52/6	300/34	60:1	17.5	5.0
2.0	S9M4H/H9D60	50.0	274/31	570/64	60:1	35.0	7.5
3.0	S6M4H/H6D80	37.5	70/8	300/34	80:1	17.5	5.0
4.0	S9M4H/H9D80	37.5	345/39	570/64	80:1	35.0	7.5
5.0	S6M4H/H6D100	30.0	87/10	400/45	100:1	17.5	5.0
6.0	S9M4H/H9D100	30.0	431/49	770/87	100:1	35.0	7.5
7.0	S6M4H/H6D120	25.0	105/12	400/45	120:1	17.5	5.0
8.0	S6M4H/H6D160	18.8	140/16	400/45	160:1	17.5	5.0
9.0	S9M4H/H9D120	17.0	500/57	990/112	120:1	26.0	7.5

		Units	S6M4H/H6D (all ratios)	S9M4H/H9D (all ratios)
1.0	Max Inertia (2)	oz-in-sec <sup>2</sup>	0.0033	0.0125
		g-cm <sup>2</sup>	233	883
2.0	Radial Load	lbs	200	465
2.1	Distance from Mounting Surface	in	1 1/8	1 1/2
3.0	Axial Load	lbs	500	500
4.0	Basic Weight (3)	lbs	5.15	10.80
5.0	Basic Length (3)	in	5.4	6.8

Motor electrical and mechanical specifications are subject to change without notice. Please consult a Kollmorgen Sales Office.

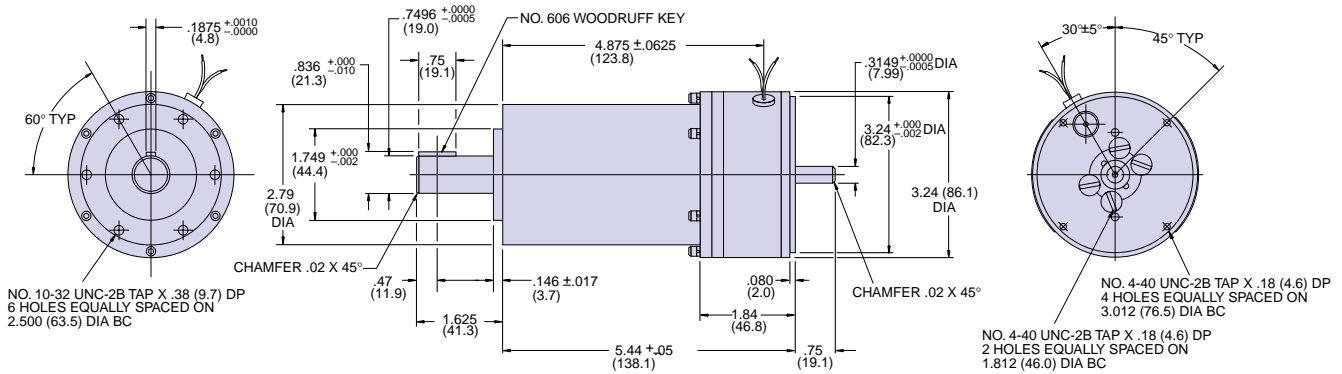
Notes:

1. Mounted on 8" x 16" x 3/8" aluminum heatsink.
2. Motor plus gearhead, measured at motor shaft.
3. Weights and lengths will vary with options.
4. For vertical orientation, a grease cartridge is recommended.
5. Gearmotors can be mounted in any position.

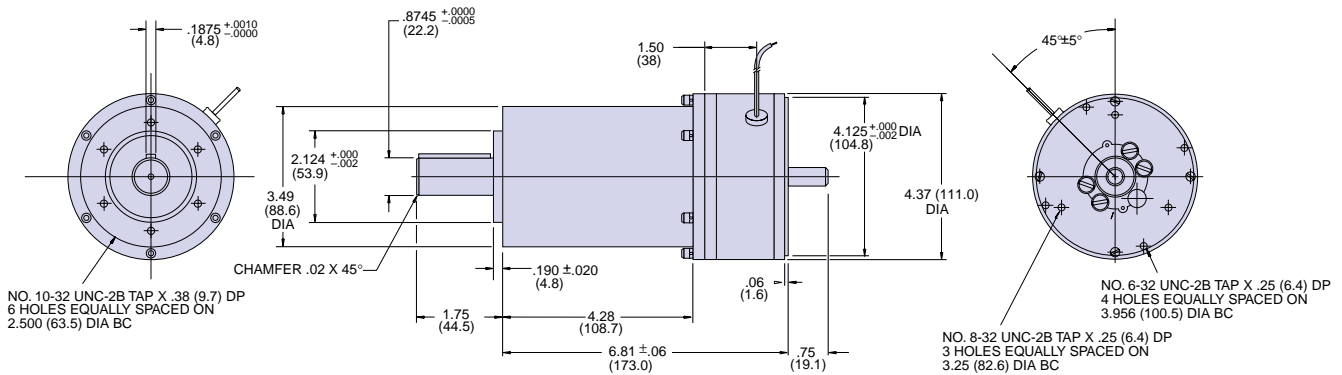
# Accurex Gearmotor Series ServoDisc

## DIMENSIONS

### S6M4H/H6D



### S9M4H/H9D



#### Notes:

1. Illustrations show basic motor lengths only. Lengths will vary with options.
2. Mating connectors are supplied with "Industrial" versions.

# Accurex Gearmotor Series ServoDisc

## OPTIONS

### TACHOMETER SPECIFICATIONS

Tachometer/Motor Types	S6T/S6M4H	S9A4T/S9M4H
1.0 Output Voltage (Volts/kRPM)	0.75	3.0
2.0 Max Ripple Peak to Peak (%)*	1.5	1.5
3.0 Linearity Referred to 3600 RPM (%)	0.05	0.06
4.0 Bi-directional Tolerance (%)	1.5	1.5
5.0 Output Impedance (ohm)	<5	<5
6.0 Moment of Inertia (oz-in-sec <sup>2</sup> )	0.00025	0.0024
7.0 Temperature Coefficient (%/°C Rise)	-0.02	-0.02
8.0 Recommended Load Resistance (ohms)	1000	1000
9.0 Friction Torque (oz-in)	0.75	1.0
10.0 Weight (lb)	1.13	2.0

\*With 500 Hz low pass filter.

### BRAKE SPECIFICATIONS

Motor Types	S6M4H	S9M4H
1.0 DC Voltage (Volts)	24	24
2.0 Input Power @ 20°C Nominal (Watts)	8	9
3.0 Holding Torque (in-lbs)	3 Min.	8 Min.
4.0 Inertia (oz-in-sec <sup>2</sup> )	0.00028	0.00096
5.0 Weight (lb)	0.65	1.0

Notes:

1. Brakes are electrically released.
2. Brakes are intended for power loss situations or to hold motor when at a standstill.

### M23 ENCODER SPECIFICATIONS

(for all motors) (See Encoder Section for more detailed information.)

1.0 Resolution	Up to 2540 Cycles Per Revolution (500 for sinewave)
2.0 Frequency Response (kHz)	100
3.0 Output Format	Quadrature Channels and Index
4.0 Phasing	90° ± 20° Max
5.0 Output Levels (5, 12 and 15 Volts)	TTL and CMOS Compatible
6.0 Input Power	5, 12 and 15 Volts 150 ma Max
7.0 Moment of Inertia (oz-in-sec <sup>2</sup> )	0.0001
8.0 Weight	2.0 oz Typical

### CONNECTION SPECIFICATIONS

(circular MS style mating connector available as industrial version)

#### Encoder M23 S6M4HI/S9M4HI

Function	Pin
Channel A	A
Channel B	B
Channel I	C
V+	D
Common	F
Case Ground	G
Channel A*	H
Channel B*	I/K (1)
Channel I*	J
+15V**	H
-15V**	I/K (1)

**Motor/Tach or  
Motor/Tach/Brake**  
(for clockwise rotation)  
**S6M4HI/S9M4HI**

Lead	Pin
(+) Motor Lead	A
(-) Motor Lead	B
(+) Tach Lead	C
(-) Tach Lead	D
(+) Brake Lead	E
(-) Brake Lead	F
Case Ground	G

Notes:

S6M4HI uses Pin K. S9M4HI uses Pin I.

\*Additional outputs for complementary models.

\*\*Split supply for amplified sinewave.

# Revex Gearmotor Series ServoDisc

## PERFORMANCE DATA

	Gearmotor Types	Rated Speed (RPM)	Continuous Torque (in-lb/N-m)	Peak Torque** (in-lb/N-m)	Gear Ratio	Motor Voltage (Volts)	Motor Current (amps)
1.0	S6M4H/GH6-10	300	12.6/1.4	50/59.6	10:1	17.8	5.2
1.1	U9M4T/GH9-10*	300	27/3.1	103/11.7	10:1	22.9	8.6
1.2	U9M4/GH9-10	300	30/3.4	115/13	10:1	24.1	8.7
1.3	N9M4/GH9-10	300	41/4.6	163/18.4	10:1	30.2	7.8
1.4	U9M4HT/GH9-10*	300	45/5.1	179/20.2	10:1	29.9	8.5
1.5	S9M4H/GH9-10	300	49.4/5.6	296/33.5	10:1	35.0	7.8
1.6	U12M4T/GH12-10*	300	64/7.3	258/29.1	10:1	40.4	8.7
1.7	U12M4/GH12-10	300	75.2/8.5	301/34	10:1	43.4	8.8
1.8	U12M4HT/GH12-10*	300	93/10.5	372/42	10:1	56.5	7.9
1.9	U12M4H/GH12-10	300	103/11.6	417/47.2	10:1	67.7	7.8
1.10	JR12M4CH/GH12-10	300	105/11.9	420/47.5	10:1	61	8.4
1.11	JR16M4CH/GH16-10	300	263/31.4	650/73.4	10:1	129	9.6
2.0	S6M4H/GH6-20	150	24.7/3.1	100/11.3	20:1	17.8	5.2
2.1	U9M4T/GH9-20*	150	52/5.8	207/23.3	20:1	22.9	8.6
2.2	U9M4/GH9-20	150	60/6.8	240/27.1	20:1	24.1	8.7
2.3	N9M4/GH9-20	150	81/9.2	325/36.7	20:1	30.2	7.8
2.4	U9M4HT/GH9-20*	150	90/10.1	358/40.4	20:1	29.9	8.5
2.5	S9M4H/GH9-20	150	99/11.2	495/56	20:1	35.0	7.8
2.6	U12M4T/GH12-20*	150	129/14.6	515/58.2	20:1	40.4	8.7
2.7	U12M4/GH12-20	150	150/17	602/68	20:1	43.4	8.8
2.8	U12M4HT/GH12-20*	150	185/20.9	740/87.6	20:1	56.5	7.9
2.9	U12M4H/GH12-20	150	205/23.2	836/94.5	20:1	62.7	7.8
2.10	JR12M4CH/GH12-20	150	211/23.8	844/95	20:1	61	8.4
2.11	JR16M4CH/GH16-20	150	545/61.5	2603/294	20:1	129	9.6
3.0	S6M4H/GH6-40	75	48.3/5.5	159/18	40:1	17.8	5.2
3.1	U9M4T/GH9-40*	75	108/12.2	413/46.7	40:1	22.9	8.6
3.2	U9M4/GH9-40	75	117/13.2	468/93	40:1	24.1	8.7
3.3	N9M4/GH9-40	75	158/18	636/71.8	40:1	30.2	7.8
3.4	U9M4HT/GH9-40*	75	165/18.6	681/77	40:1	29.9	8.5
3.5	S9M4H/GH9-40	75	194/21.9	681/77	40:1	35.0	7.8
3.6	U12M4T/GH12-40*	75	252/28.5	1030/116.4	40:1	40.4	8.7
3.7	U12M4/GH12-40	75	294/33.3	1178/133	40:1	43.4	8.8
3.8	U12M4HT/GH12-40*	75	363/41.0	1434/162	40:1	56.5	7.9
3.9	U12M4H/GH12-40	75	411/46.4	1433/162	40:1	67.7	7.8
3.10	JR12M4CH/GH12-40	75	421/47.6	1534/516.5	40:1	61	8.4
3.11	JR16M4CH/GH16-40	75	1089/123	2603/294	40:1	129	9.6
4.0	S6M4H/GH6-60	50	72.5/8.2	177/20	60:1	17.8	5.2
4.1	U9M4T/GH9-60*	50	161/18.2	620/70	60:1	22.9	8.6
4.2	U9M4/GH9-60	50	176/19.9	726/82	60:1	24.1	8.7
4.3	N9M4/GH9-60	50	239/27	726/82	60:1	30.2	7.8
4.4	U9M4HT/GH9-60*	50	248/28	725/82	60:1	29.9	8.5
4.5	S9M4H/GH9-60	50	292/33	725/82	60:1	35.0	7.8
4.6	U12M4T/GH12-60*	50	378/42.7	1548/174.6	60:1	40.4	8.7
4.7	U12M4/GH12-60	50	442/50	1548/175	60:1	43.4	8.8
4.8	U12M4HT/GH12-60*	50	544/61.5	1548/175	60:1	56.5	7.9
4.9	U12M4H/GH12-60	50	602	1548/175	60:1	62.7	7.8
4.10	JR12M4CH/GH12-60	50	632/71.4	1548/175	60:1	61	8.4
4.11	JR16M4CH/GH16-60	50	1634/185	2603/184	60:1	129	9.6
5.0	S6M4H/GH6-100	30	79/9	195/22	100:1	15.4	3.6
5.1	U9M4T/GH9-100*	30	258/29.2	796/90	100:1	22.9	8.6
5.2	U9M4/GH9-100	30	293/33.2	796/90	100:1	24.1	8.7
5.3	N9M4/GH9-100	30	318/36	796/90	100:1	29.0	5.7
5.4	U9M4HT/GH9-100*	30	318/36	796/90	100:1	27.8	7.4
5.5	S9M4H/GH9-100	30	318/36	796/90	100:1	33	5.5
5.6	U12M4T/GH12-100*	30	630/71.2	1699/192	100:1	40.4	8.7
5.7	U12M4/GH12-100	30	681/77	1699/192	100:1	42.4	8.6
5.8	U12M4HT/GH12-100*	30	681/77	1699/192	100:1	54.3	6.6
5.9	U12M4H/GH12-100	30	681/77	1699/192	100:1	60.7	5.7
5.10	JR12M4CH/GH12-100	30	681/77	1699/192	100:1	57.5	5.8
5.11	JR16M4CH/GH16-100	30	2604/294	3905/441	100:1	125	9.0

\*Smallest axial length for gearmotor with tachometer.

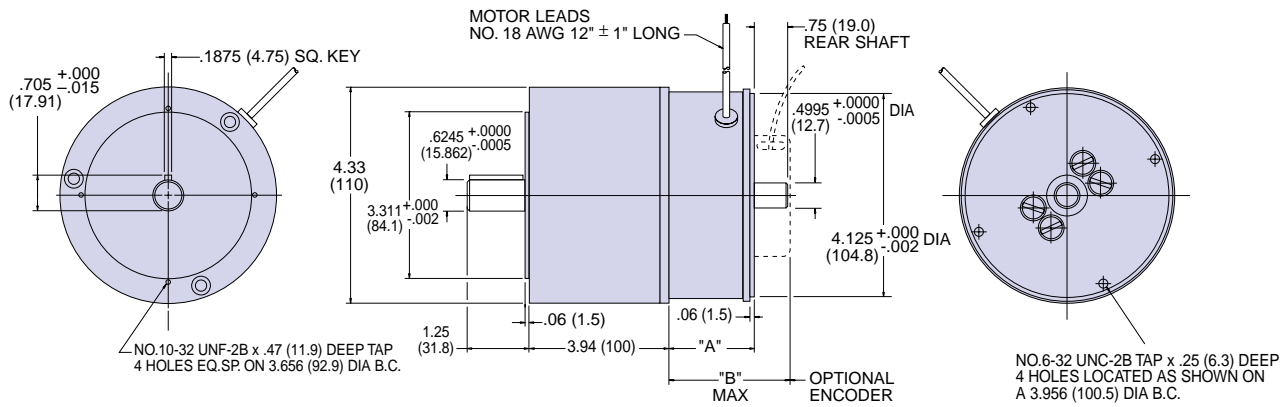
\*\*For short duration only.



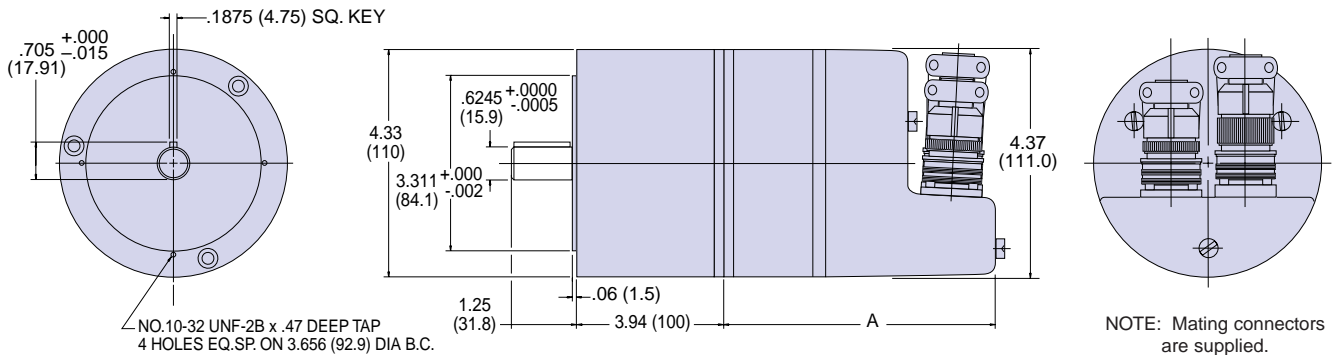
# Revex Gearmotor Series ServoDisc

## DIMENSIONS

### S-SERIES (S9)



S9M4H/GH9			Motor	Motor/Tachometer	Motor/Brake	Motor/Brake Tachometer
A	Without Encoder	in	2.28	3.25	3.70	4.66
		mm	57.9	82.6	94.0	118.4
B (max)	With Encoder	in	3.33	4.30	4.75	5.71
		mm	84.6	109.0	120.7	145.0



S9M4HI/GH9			Motor	Motor/Tachometer	Motor/Brake	Motor/Brake Tachometer
A	Without Encoder	in	5.19	6.17	6.67	7.61
		mm	131.8	157.0	169.4	193.3
A	With Encoder	in	5.19	6.17	6.67	7.61
		mm	131.8	157.0	169.4	193.3

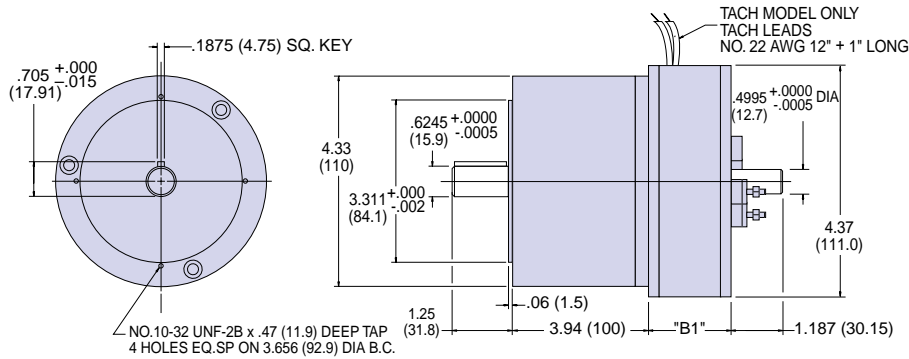
Motor Connector - MS3102A16S-IP

Encoder Connector - MS3102A18-IP

# Revex Gearmotor Series ServoDisc

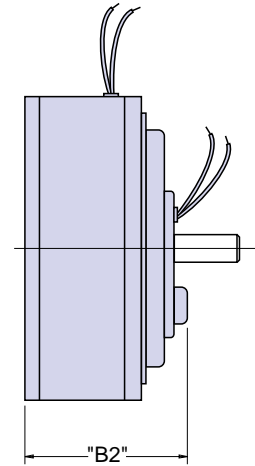
## DIMENSIONS

### U-SERIES

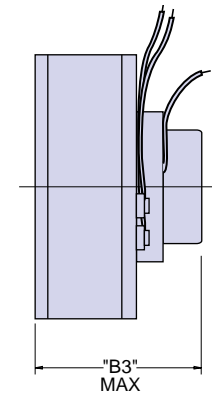


Gearmotor		B1	B2	B3	B4
U9M4/GH9	in	1.84	2.78	3.32	3.98
	mm	46.74	70.6	84.4	101.1
U9M4T/GH9	in	1.86	—	3.34	—
	mm	47.20	—	84.8	—
U9M4HT/GH9	in	2.41	—	3.89	—
	mm	61.12	—	98.8	—

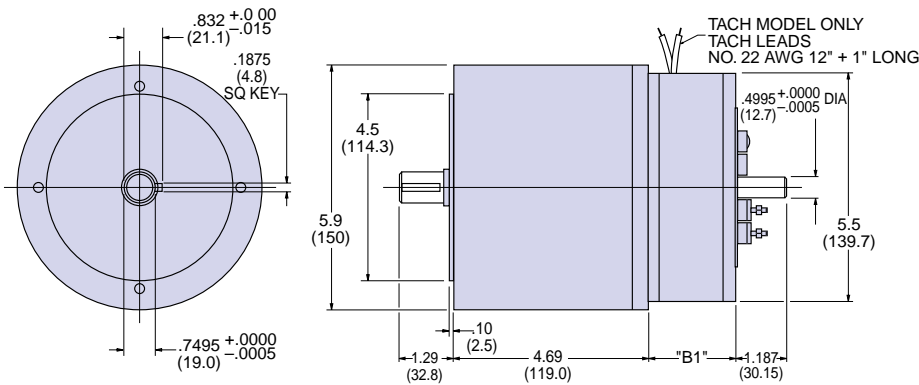
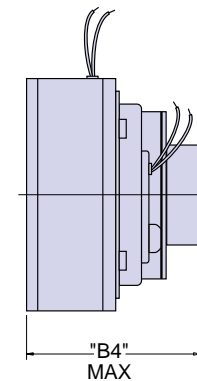
MOTOR/  
TACHOMETER



MOTOR/  
ENCODER



MOTOR/  
TACHOMETER/  
ENCODER



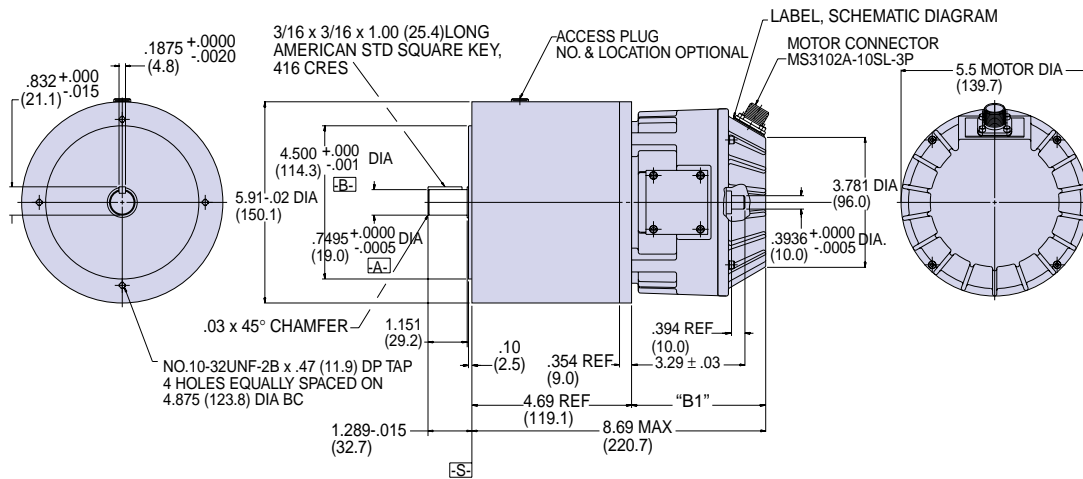
Gearmotor		B1	B2	B3	B4
U12M4/GH12	in	2.11	3.05	3.59	4.25
	mm	53.59	77.5	91.2	108
U12M4H/GH12	in	2.78	3.72	4.26	4.92
	mm	70.61	94.5	108.25	125
U12M4T/GH12	in	2.11	—	3.59	—
	mm	53.6	—	91.2	—
U12M4HT/GH12	in	2.81	—	4.28	—
	mm	71.4	—	108.7	—



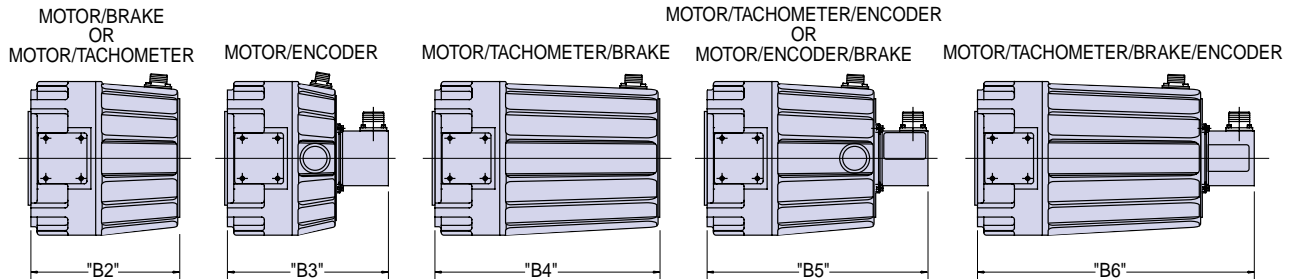
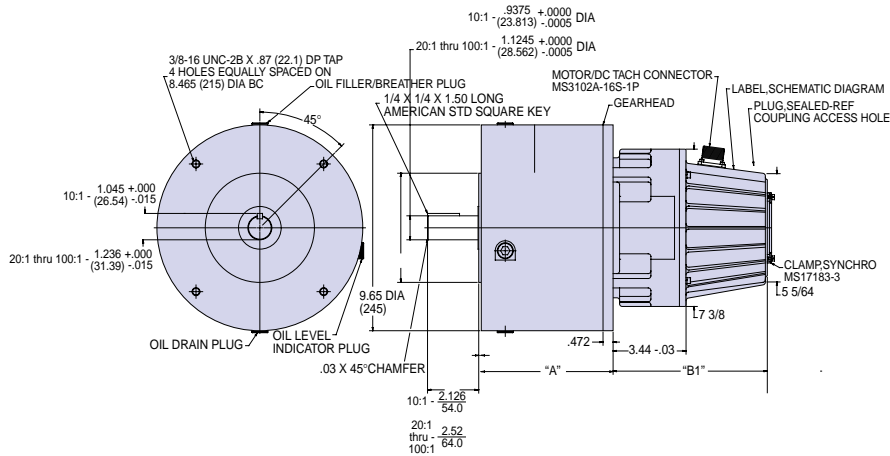
# Revex Gearmotor Series ServoDisc

## DIMENSIONS

### JR12/GH12



### JR16/GH16

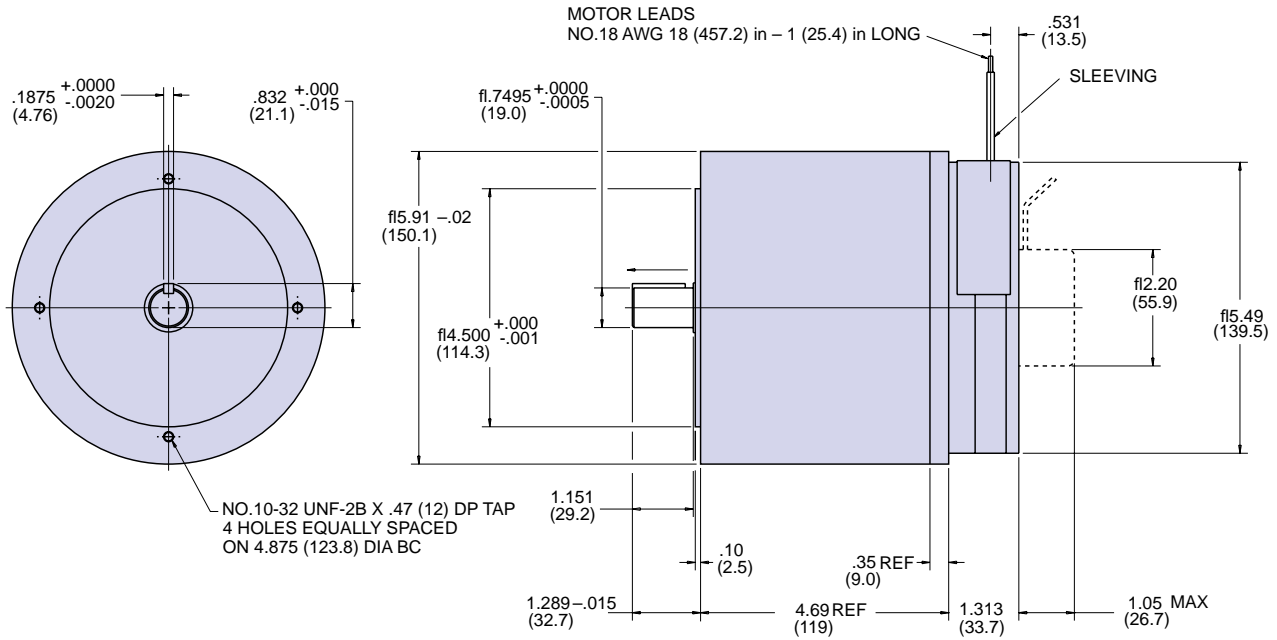


Gearmotor		A					B					
		10:1	20:1	40:1	60:1	100:1	1	2	3	4	5	6
JR12M4CH/GH12	in	4.685	4.685	4.685	4.685	4.685	3.94	5.77	7.20	8.49	9.26	11.07
	mm	119.0	119.0	119.0	119.0	119.0	100.1	146.6	182.9	215.6	235.2	281.2
JR16M4CH/GH16	in	5.20	6.20	6.20	6.20	6.20	4.50	6.34	7.77	9.06	9.81	11.62
	mm	132.1	157.5	157.5	157.5	157.5	114.3	161.0	197.4	230.1	249.1	295.1

# Revex Gearmotor Series ServoDisc

## DIMENSIONS

### N-SERIES (N9)

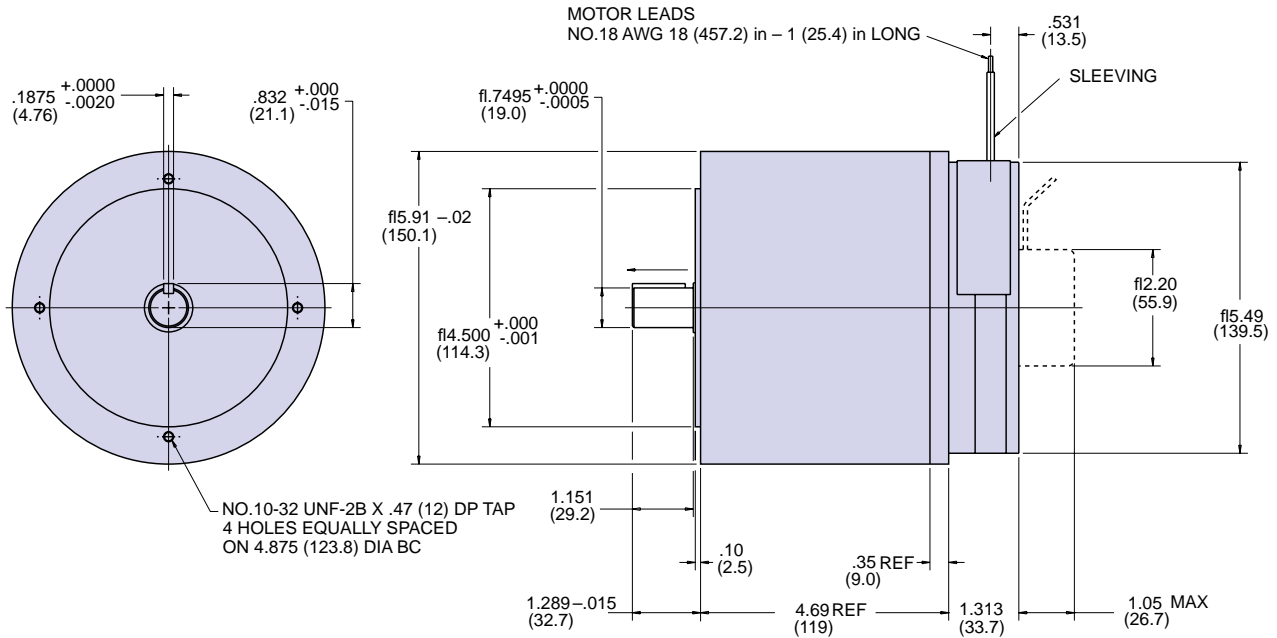


N9M4/GH9/M23			Motor	Motor/Tachometer	Motor/Brake	Motor/Brake Tachometer
A	Without Encoder	in	0.93	0.95	2.43	2.45
		mm	23.6	24.1	61.7	62.2
B (max)	With Encoder	in	1.98	2.00	3.48	3.50
		mm	50.3	50.8	88.4	88.9

# Revex Gearmotor Series ServoDisc

## DIMENSIONS

### N-SERIES (N12)



N12M4/GH12/M23			Motor	Motor/Tachometer	Motor/Brake	Motor/Brake Tachometer
A	Without Encoder	in	1.06	1.09	2.87	2.90
		mm	26.9	27.7	72.9	73.7
B (max)	With Encoder	in	2.11	2.14	3.92	3.95
		mm	53.6	54.4	99.6	100.3

		Units	GH6	GH9	GH12	GH16
1.0	Max Inertia (2)	oz-in-sec <sup>2</sup>	10.9x10 <sup>-4</sup>	5.90x10 <sup>-3</sup>	22.46x10 <sup>-3</sup>	86.5x10 <sup>-3</sup>
		g-cm <sup>2</sup>	77	417	1586	6108
2.0	Radial Load	lbs	47	135	134	430
2.1	Distance from Mounting Surface	in	.71	.69	.93	1.7
3.0	Axial Load	lbs	52	126	253	762
4.0	Basic Weight (3)	lbs	4.3-5.0	8.2-12.7	18.5-24.7	50.5-67.5
5.0	Basic Length (3)	in	2.3-2.8	3.94	4.68	5.2-6.5

#### Notes:

- Mounted on 8" x 16" x 3/8" aluminum heatsink.
- Motor plus gearhead, measured at motor shaft.
- Weights and lengths will vary with options.
- Gearmotors can be mounted in any position.

# Revex Gearmotor Series ServoDisc

## OPTIONS

### TACHOMETER SPECIFICATIONS

Tachometer/Motor Types	9FA4T/U-Series	F9T/JR-Series
1.0 Output voltage (Volts/kRPM)	2.5	3.0
2.0 Max ripple peak to peak (%)*	5.0	4.0
3.0 Linearity referred to 3600 RPM (%)	0.06	0.05
4.0 Bi-directional tolerance (%)	3.0%	1.5
5.0 Output impedance (ohm)	1.18	1.0
6.0 Moment of inertia (oz-in-sec <sup>2</sup> )	0.0024	0.005
7.0 Temperature coefficient (%/°C Rise)	-0.19	-0.02
8.0 Recommended load resistance (ohms)	2500 Min.	2000 Min.

\*With 500 Hz low pass filter.

### BRAKE SPECIFICATIONS

Brake Types/Motor Types	BRK/JR-Series
1.0 DC voltage (Volts) (90V in option)	24
2.0 Input power @ 20°C nominal (Watts)	25 Max
3.0 Holding torque (in-lb)	70.8
4.0 Additional inertia (oz-in-sec <sup>2</sup> )	0.0064

Notes:

1. Brakes are electrically released.
2. Brakes are intended for power loss situations or to hold motor when at a standstill.

### ENCODER SPECIFICATIONS

(For U-Series, use Model #M23 for JR-Series; use Model #BA251.) (See Feedback Section for more detailed information.)

1.0 Resolution	Up to 2540 cycles per revolution
2.0 Frequency response (kHz)	100
3.0 Output format	Quadrature channels and index
4.0 Phasing	90° ± 20° max
5.0 Output levels (5, 12 and 15 Volts)	TTL and CMOS compatible
6.0 Input power	5, 12, and 15 volts 150 ma max
7.0 Moment of inertia (oz-in-sec <sup>2</sup> )	
M23	0.0001
BA251	0.00045

# Indurex Gearmotor Series ServoDisc

## PERFORMANCE DATA

	Gearmotor Types	Rated Speed (RPM)	Continuous Torque (in-lb/N-m)	Peak Torque (in-lb./N-m)	Gear Ratio	Motor Voltage (Volts)	Motor Current (amps)
1.0	JR24M4CH/KR16-4	818	281/31.7	842/95	3.67:1	139.7	26.0
2.0	JR24M4CH/KR16-5	605	379/42.8	1138/128	4.96:1	139.7	26.0
3.0	JR24M4CH/KR16-6	467	491/55.4	1473/166	6.42:1	139.7	26.0
4.0	JR24M4CH/KR16-7	435	528/59.7	1583/178	6.90:1	139.7	26.0
5.0	JR16M4CH/KR16-10	301	269/30.4	806/91.1	9.96:1	127.4	9.6
6.0	JR24M4CH/KR16-10	301	762/86.1	2286/258	9.96:1	139.7	26.0
7.0	JR24M4CH/KR16-20	153	1498/169	3700/418	19.58:1	139.7	26.0
8.0	JR16M4CH/KR16-20	150	528/59.7	1614/182	19.58:1	129.4	9.6
9.0	JR16M4CH/KR16-40	77	1022	3067/346	39.17:1	129.4	9.6
10.0	JR16M4CH/KR16-60	53	1488/168	4464/504	57.01:1	129.4	9.6
11.0	JR16M4CH/KR16-80	38	2055/232	6000/678	78.76:1	129.4	9.6
12.0	JR16M4CH/KR16-100	30	2580/291	6180/698	98.87:1	129.4	9.6

		Units	JR16M4CH/KR16	JR24M4CH/KR16
1.0	Max Inertia (2)	oz-in-sec <sup>2</sup>	0.097	0.535
		kg-cm <sup>2</sup>	6.849	37.78
2.0	Radial Load	lb	500	272
2.1	Distance from Mounting Surface	in	1	1
3.0	Axial Load (5)	lb	114	71
4.0	Basic Weight (3)	lb	42	84
5.0	Basic Length (3)	in	10.7	13

### Notes:

1. Mounted on 16" x 16" x 3/8" (JR16), 21" x 21" x 1/2" (JR24) aluminum heatsink.
2. Motor plus gearhead, measured at motor shaft.
3. Weights and lengths will vary with options.
4. Gearmotors can be mounted in any position.
5. Axial Load combined with specified Radial Load.

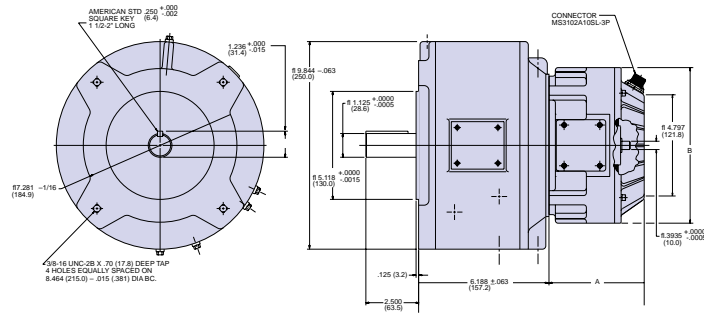
# Indurex Gearmotor Series ServoDisc

## OPTIONS

### JR16M4CH/JR24M4CH

Gearmotor		A*	B
JR16M4CH	in	5.00	7.38
	mm	127.0	187.4
JR24M4CH	in	6.78	11.09
	mm	172.2	281.7

\*Dimension will change depending on options chosen.



## TACHOMETER SPECIFICATIONS

Tachometer Types	F9T	W6T6	W6T19
1.0 Output voltage (Volts/kRPM)	3	6	19
2.0 Max ripple peak to peak (%)*	4	3	2
3.0 Linearity referred to 3600 RPM (%)	0.05	1	1
4.0 Bi-directional tolerance (%)	±1.5	±1	±1
5.0 Output impedance (ohms)	1.0	5.4	26.0
6.0 Moment of inertia (oz-in-sec <sup>2</sup> )	0.005	0.008	0.008
7.0 Temperature coefficient (%/°C Rise)	-0.020	-0.045	-0.045
8.0 Recommended load resistance (ohms)	2000 Min.	350 Min.	2600 Min.
9.0 Friction torque (oz-in)	3	3	3
10.0 Weight (lb)	2.2	1.5	1.5

\*With 500 Hz low pass filter.

## BRAKE SPECIFICATIONS

Motor Types	JR16M4CH	JR24M4CH
1.0 DC voltage (Volts) (90V in option)	24	24
2.0 Input power @ 20°C nominal (Watts)	25 Max	27 Max
3.0 Holding torque (in-lb)	70.8	180.0
4.0 Additional inertia (oz-in-sec <sup>2</sup> )	0.0064	0.0210
5.0 Disengagement time (millisec)	70	70
6.0 Engagement time (millisec)	30	30
7.0 Weight (lb)	2.5	5.0

Notes:

1. Brakes are electrically released.
2. Brakes are intended for power loss situations or to hold motor when at a standstill.

## BA251 ENCODER SPECIFICATIONS

(See Feedback Section for more detailed information.)

1.0 Resolution	Up to 2540 cycles per revolution (500 for sinewave)
2.0 Frequency response (kHz)	100
3.0 Output format	Quadrature channels and index
4.0 Phasing	90° ± 20° max
5.0 Output levels (5, 12 and 15 Volts)	TTL and CMOS compatible
6.0 Input power	5, 12, and 15 volts 150 ma max
7.0 Moment of inertia (oz-in-sec <sup>2</sup> )	
8.0 Weight	