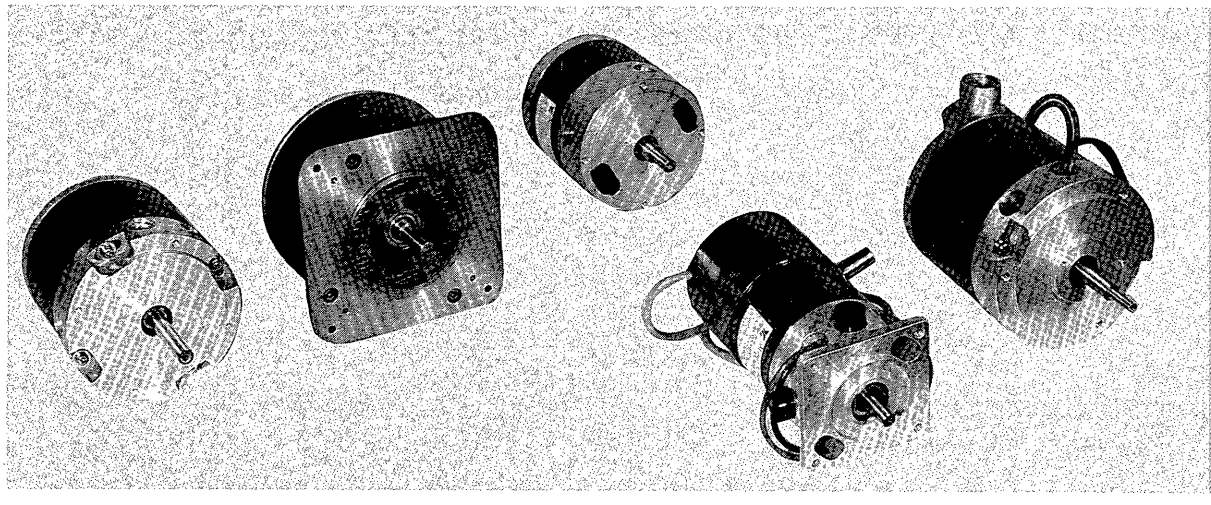
MINERTIA MOTOR S SERIES

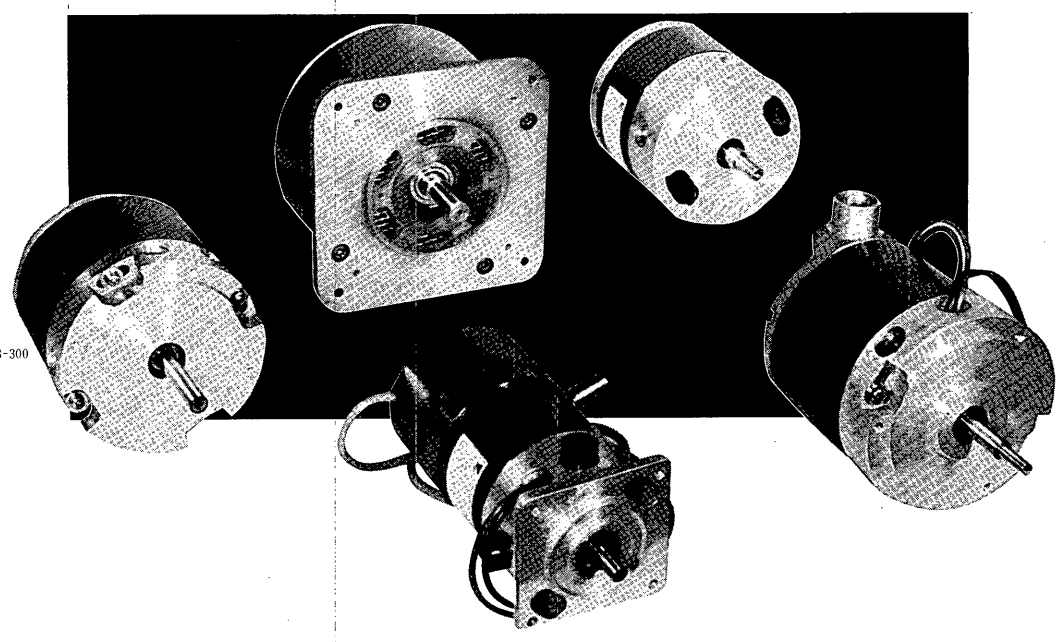
NON-FERROUS CUP-ARMATURE

FOR COMPUTER PERIPHERALS
TYPE S01A TO S22A



YASKAWA

The Minertia Motor S Series is mainly designed for computer peripherals which require the highest possible response speed due to the non-ferrous cup-armature. No rotating iron makes it possible for lower armature inertia, lower armature inductance, lower electrical and mechanical time constants and high pulse-torque capabilities. Experienced mechanical design provides the highest torsional and lateral resonant frequency. Additional features include small size, light weight, and small power consumption. Those features develop a highly-accurate positioning table drive in new applications, such as with IC bonding machines.



583-300

FEATURES

- New, high performance, cup armature, DC servomotors.
- Highest possible acceleration in low inertia load applications.
- Mechanical time constants of less than one millisecond.
- Motor inertias as low as 0.00017 oz•in•sec^2.
- Electrical time constants of 0.1 millisecond or less.
- 10 Times rated torque without field demagnetization.
- Low armature inductance—no cogging, long brush life.

RATINGS AND SPECIFICATIONS

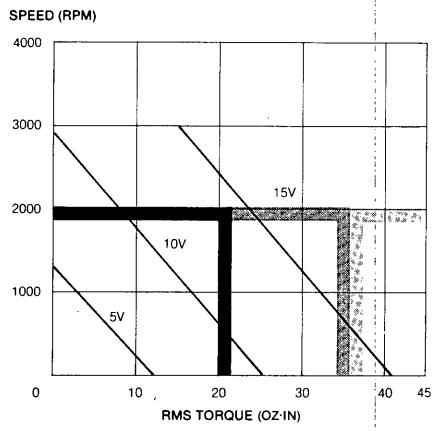
Minertia Motor S Series Type		S01A	S02A	S02B	S06A	S10A	S10B	S10C	S12A	S22A
Peak Rated Torque	oz·in	226	350	350	650	320	380	320	542	1480
Rated Torque	oz·in	21.0	33.0	33.0	76.0	28.4	33.4	28.4	56.0	193
Torque Constant	oz·in/amp±10%	3.79	5.82	11.6	10.8	5.14	6.36	5.40	9.06	18.5
Armature Winding Resistance (at 25℃)	Ω±10%	0.93	0.82	3.47	0.91	0.84	0.84	0.84	0.68	0.69
Armature Inductance	mH	0.12	0.10	0.45	0.31	0.05	0.05	0.05	0.11	0.50
Peak Current	A	60	60	30	60	60	60	60	60	80
Voltage Constant	V/1000rpm±10%	2.80	4.30	8.60	8.00	3.80	4.70	4.00	6.70	13.7
Viscous Damping Coefficient	oz·in/1000rpm	0.14	0.70	0.42	0.56	0.14	0.20	0.14	0.72	1.00
Friction Torque	oz·in	1.00	1.00	1.00	0.67	1.50	1.50	1.50	2.00	4.20
Armature Inertia	$oz \cdot in \cdot sec^2 \times 10^{-3}$	0.68	0.60	0.60	1.73	0.171	0.29	0.29	0.57	10.3
Mechanical Time Constant	ms	6.20	2.00	2.20	1.90	0.77	0.86	1.18	0.67	3.00
Electrical Time Constant	ms	0.13	0.12	0.13	0.34	0.06	0.06	0.06	0.16	0.72
Power Rate	kW/sec	4.52	12.8	12.8	23.6	33.2	27.1	19.6	39.0	25.5
Torque Inertia Ratio	rad/sec^2	30700	55000	55000	44000	163000	115000	97800	98800	18700
Thermal Resistance	deg C/watt	2.8	3.0	3.0	1.9	3.4	3.4	3.4	3.1	1.1
Thermal Time Constant	sec	18	14	14	24	13	13	13	29	25
Max Allowable Armature Temperature	℃	155	155	155	155	155	155	155	155	155
Rated Speed	rpm	2000	4000	2000	2000	4000	4000	4000	3000	2000
Max Allowable Speed (1 min.)	rpm	7000	9000	5000	4000	13000	10000	10000	9000	4000
Weight	lbs	4.2	6.6	6.6	9.0	8.0	10.0	9.0	15.4	16.0

CHARACTERISTICS

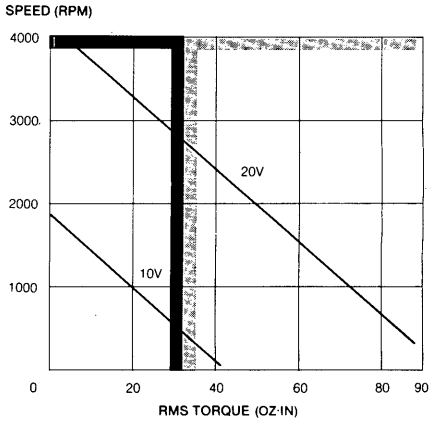
Torque-Speed Curves

Zone of safe continuous operation without air cooling.
Zone of safe continuous operation with adequate cooling.
Zone beyond capacity of motor for continuous operation.
Note: Motor is mounted on 10" × 10" × 1/4" heat sink.

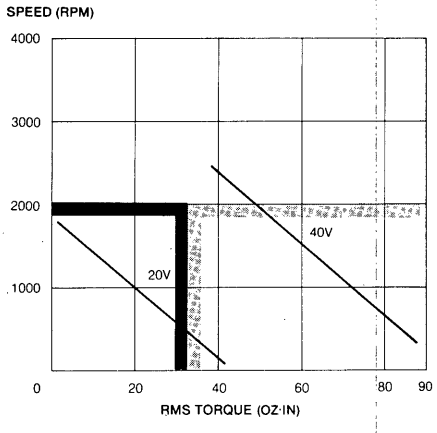
Type S01A



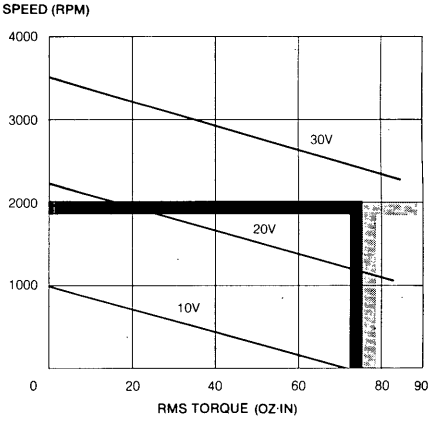
Type S02A



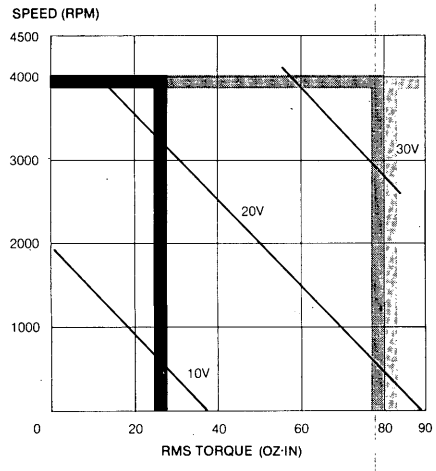
Type S02B



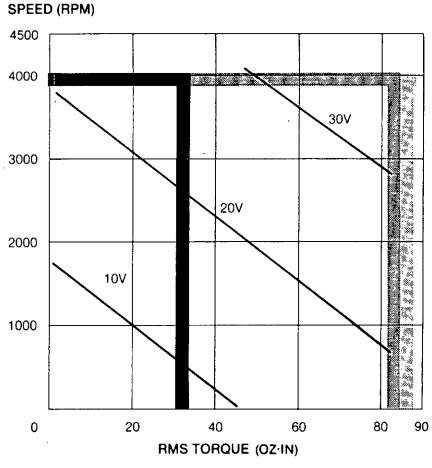
Type S06A



Type S10A



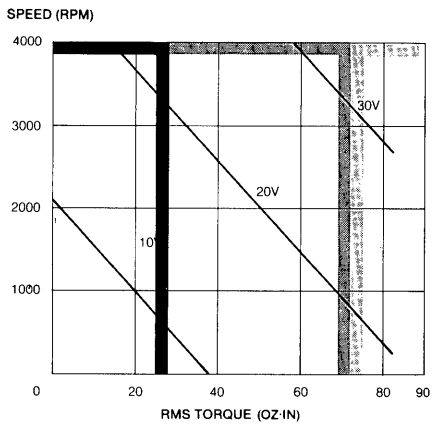
Type S10B



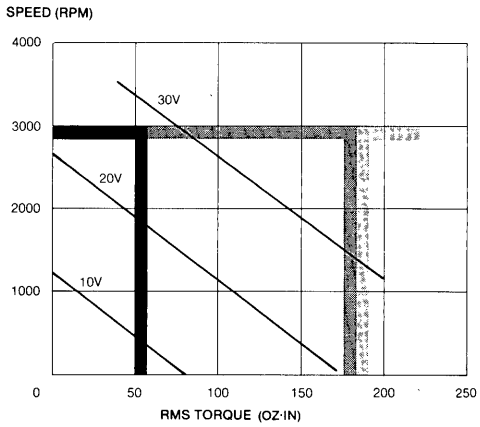
Torque-Speed Curves (Cont'd)

Zone of safe continuous operation without air cooling.
Zone of safe continuous operation with adequate cooling.
Zone beyond capacity of motor for continuous operation.
Note: Motor is mounted on 10" × 10" × 1/4" heat sink.

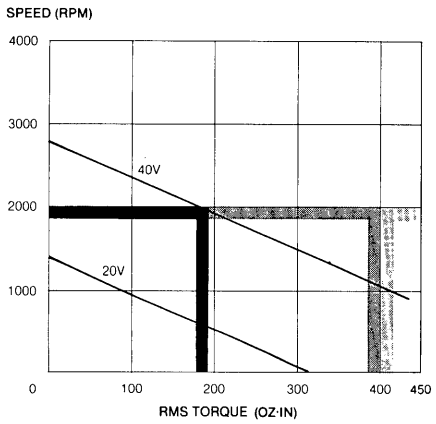
Type S10C



Type S12A



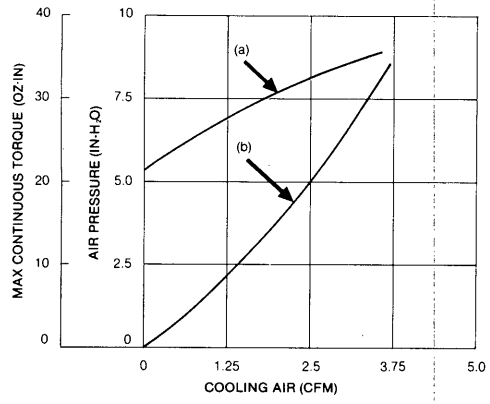
Type S22A



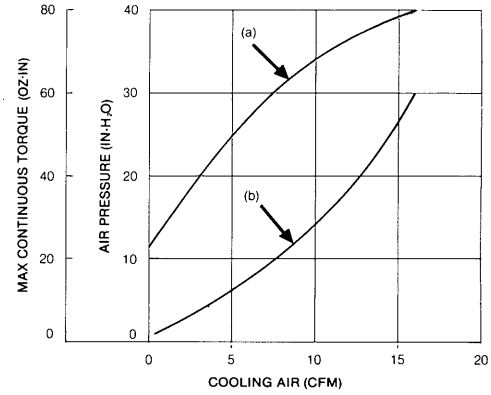
Continuous Torque-Cooling Air and Air Flow Impedance Curves
(For Types S01A, S10A, S10B, S10C, S12A and S22A)

Note: Each meaning of curves in Figures is as follows;
- *Curve (a) — Max continuous torque VS cooling air.*
- *Curve (b) — Air flow impedance.*

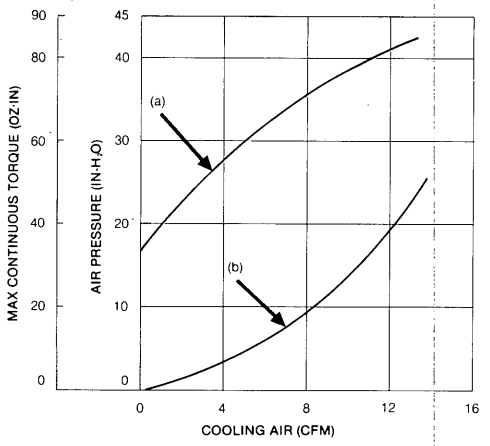
Type S01A



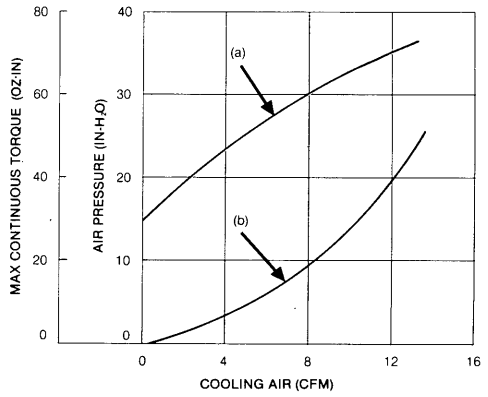
Type S10A



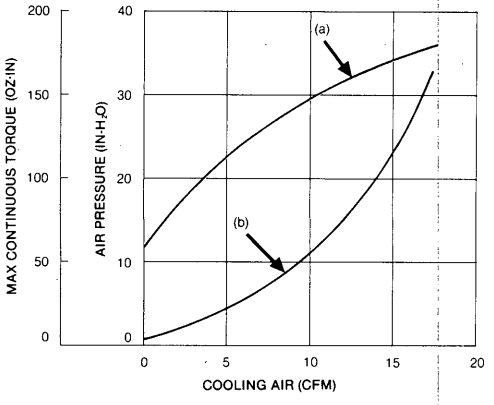
Type S10B



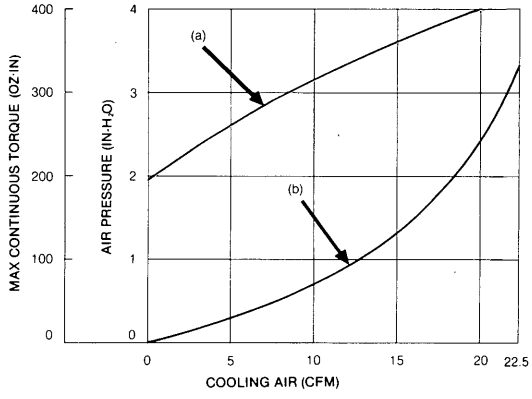
Type S10C



Type S12A



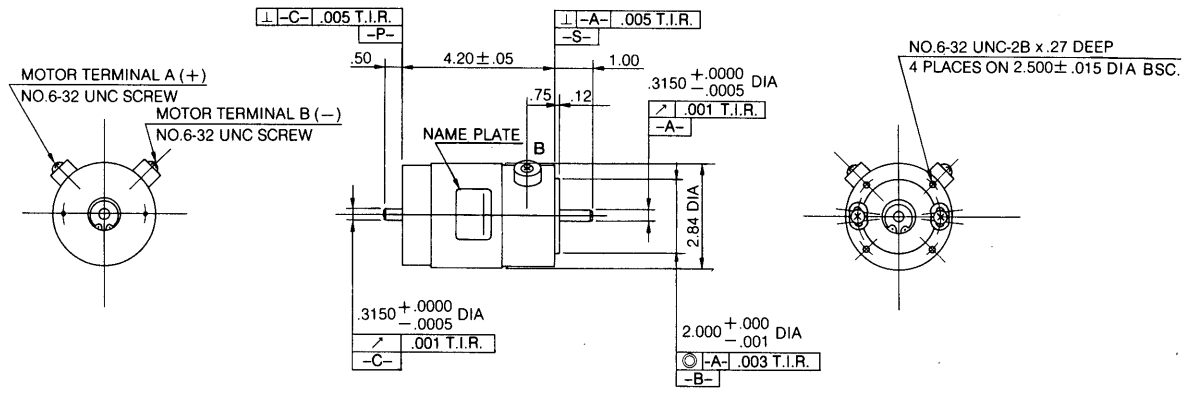
Type S22A



DIMENSIONS in inches

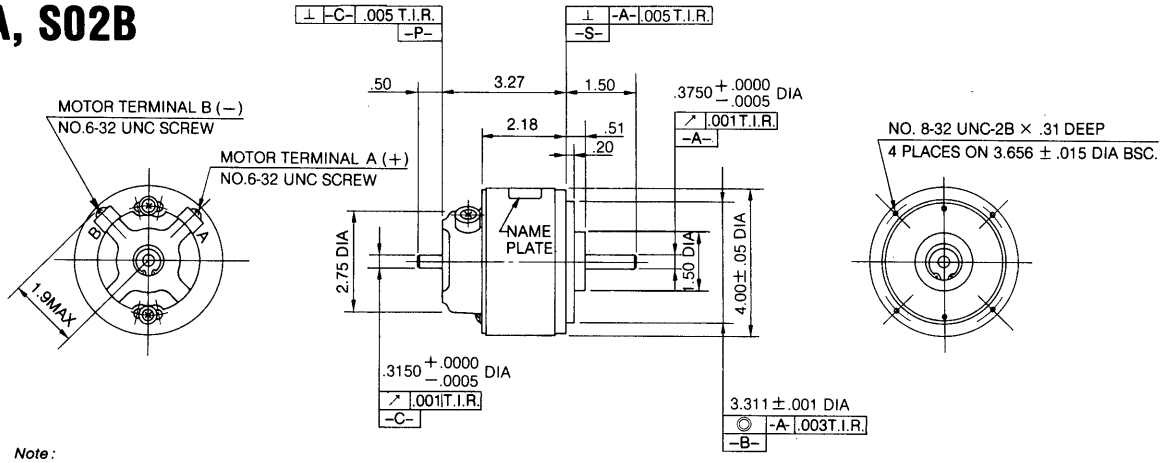
Note: Tolerances are as follows;
- *1 Decimal—Reference*
- *2 Decimals—.00 ± .02*
- *3 Decimals—.000 ± .01*

S01A



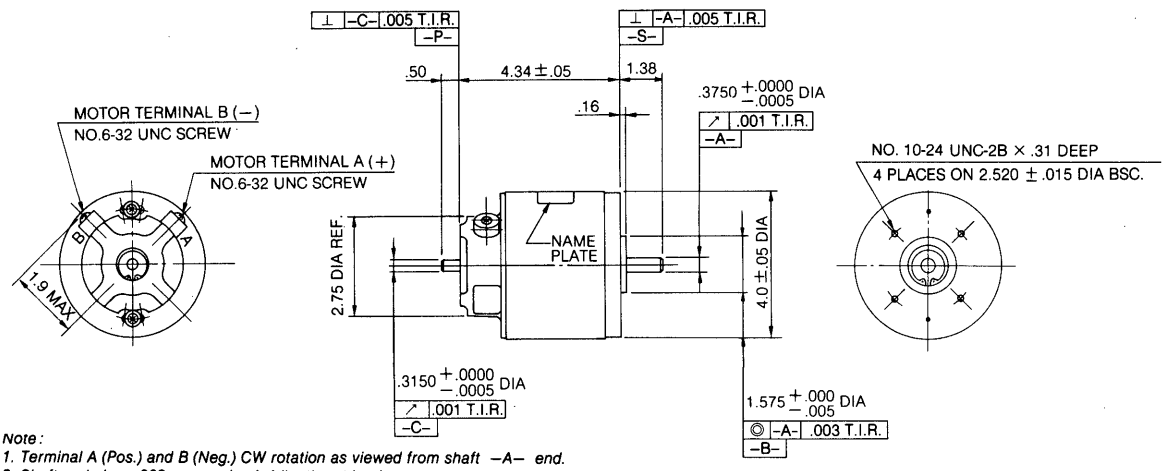
Note:
1. *Terminal A (Pos.) and B (Neg.) CW rotation as viewed from shaft —A— end.*
2. *Shaft end play: .002 max under A 4 lbs thrust load.*
3. *Shaft radial play: .002 max under A 2 lbs radial load.*
4. *Allowable thrust load: .4.5 lbs, Allowable radial load: 2.5 lbs.*

S02A, S02B



Note:
1. *Terminal A (Pos.) and B (Neg.) CW rotation as viewed from shaft —A— end.*
2. *Shaft end play: .002 max under A 4 lbs thrust load.*
3. *Shaft radial play: .002 max under A 2 lbs radial load.*
4. *Allowable thrust load: 4.5 lbs, Allowable radial load: 2.5 lbs.*

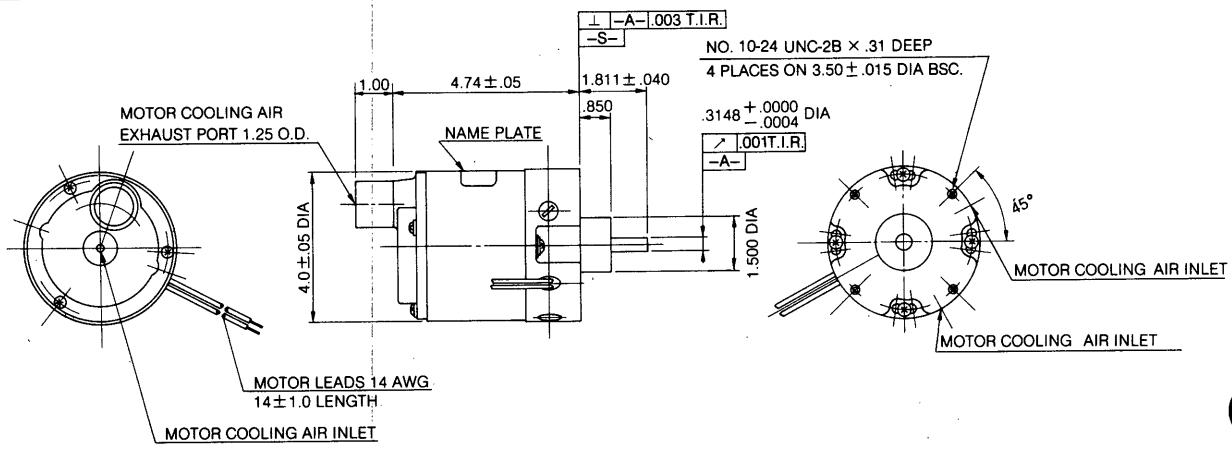
S06A



Note:
1. *Terminal A (Pos.) and B (Neg.) CW rotation as viewed from shaft —A— end.*
2. *Shaft end play: .002 max under A 4 lbs thrust load.*
3. *Shaft radial play: .002 max under A 2 lbs radial load.*
4. *Allowable thrust load: 4.5 lbs, Allowable radial load: 2.5 lbs.*

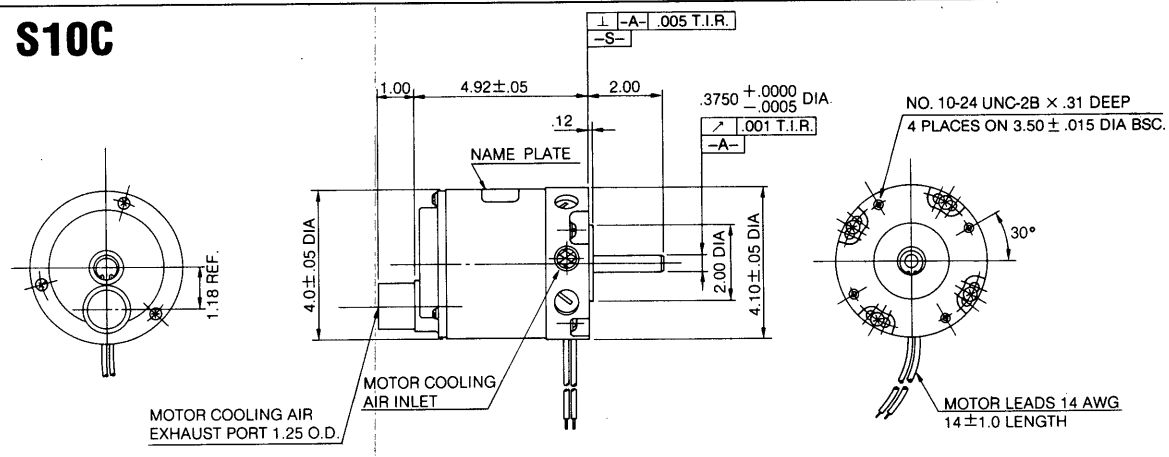
Note: Tolerances are as follows;
- *1 Decimal — Reference*
- *2 Decimals — .00 ± .02*
- *3 Decimals — .000 ± .01*

S10A



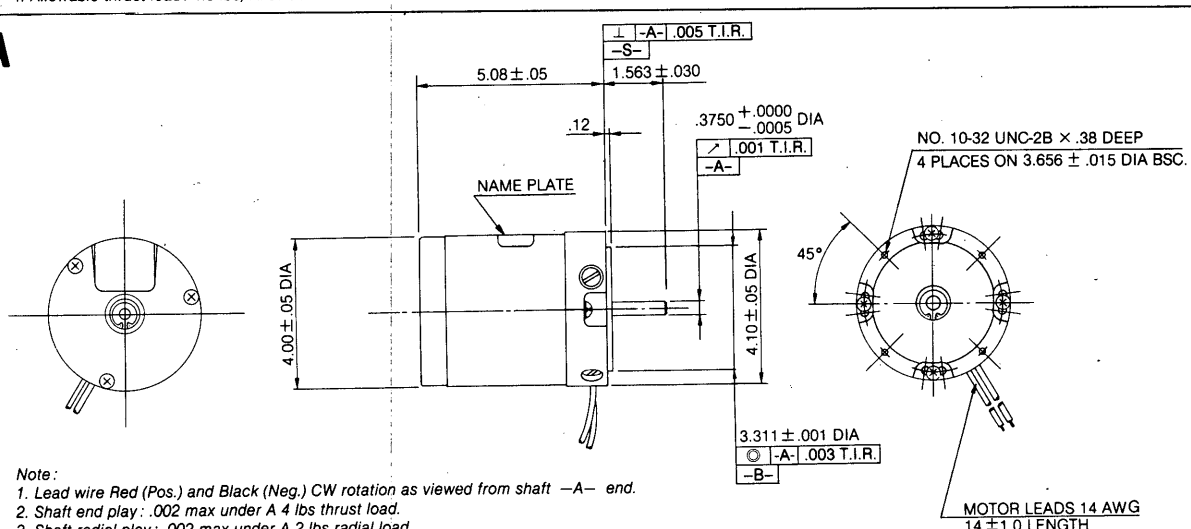
Note:
1. *Lead wire Red (Pos.) and Black (Neg.) CW rotation as viewed from capstan end.*
2. *Shaft end play: .001 max under A 4 lbs thrust load.*
3. *Shaft radial play: .0015 max under A 2 lbs radial load.*
4. *Allowable thrust load: 4.5 lbs, Allowable radial load: 2.5 lbs.*

S10B, S10C



Note:
1. *Lead wire Red (Pos.) and Black (Neg.) CW rotation as viewed from shaft -A- end.*
2. *Shaft end play: .002 max under A 4 lbs thrust load.*
3. *Shaft radial play: .002 max under A 2 lbs radial load.*
4. *Allowable thrust load: 4.5 lbs, Allowable radial load: 2.5 lbs.*

S12A

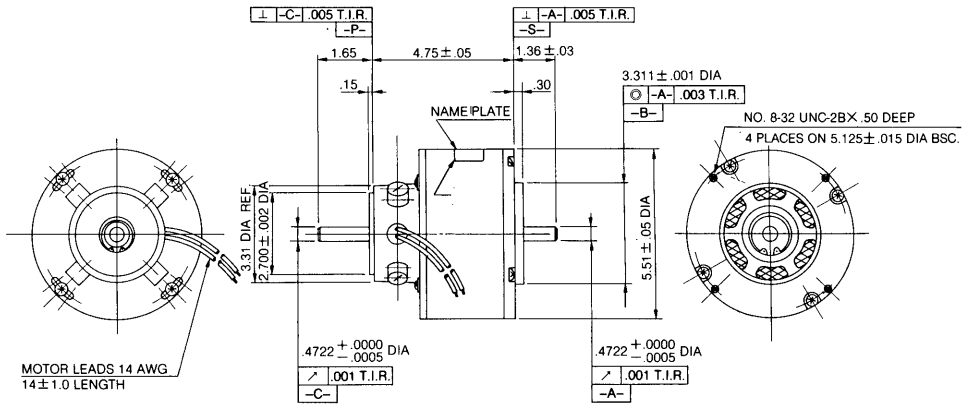


Note:
1. *Lead wire Red (Pos.) and Black (Neg.) CW rotation as viewed from shaft -A- end.*
2. *Shaft end play: .002 max under A 4 lbs thrust load.*
3. *Shaft radial play: .002 max under A 2 lbs radial load.*
4. *Allowable thrust load: 4.5 lbs, Allowable radial load: 2.5 lbs.*

DIMENSIONS(Cont'd) in inches

Note: Tolerances are as follows;
- *1 Decimal — Reference*
- *2 Decimals — .00 ± .02*
- *3 Decimals — .000 ± .01*

S22A



Note:
1. *Lead wire Red (Pos.) and Black (Neg.) CW rotation as viewed from shaft −A− end.*
2. *Shaft end play: .002 max under A 4 lbs thrust load. (Max shaft end play: .006)*
3. *Shaft radial play: .002 max under A 4 lbs radial load.*
4. *Allowable thrust load: 8 lbs, Allowable radial load: 5 lbs.*

ORDERING INFORMATION

- Application
- Type
- Ratings : output, voltage, current, torque, speed
- Environmental conditions : ambient temperature, location
- Others to be specified

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NON-FERROUS CUP-ARMATURE

FOR COMPUTER PERIPHERALS
TYPE S01A TO S22A

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YASKAWA ELECTRIC CORPORATION

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Due to ongoing product modification/improvement, data subject to change without notice.

TSE-C246-1C

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