ELINCO for dependable precision and performance

AC GENERATORS

DC GENERATORS

COMMUTATOR MOTORS

INDUCTION MOTORS

TORQUE MOTORS

SYNCHRONOUS MOTORS

SELF-SYNCHRONOUS MOTORS

LOW INERTIA AC INDUCTION SERVO MOTORS

AC INDUCTION GENERATORS

AC MOTOR DRIVEN INDUCTION GENERATORS

AC MOTOR GENERATOR SETS

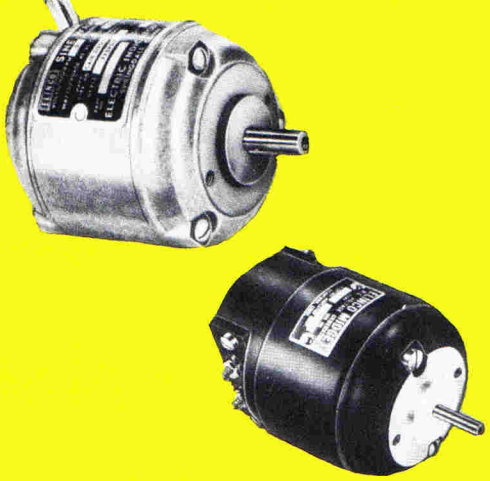
DC MOTOR GENERATOR SETS

STEPPING MOTORS

GEAR MOTORS

ELINCO

ELECTRIC INDICATOR CO. INC.
272 MAIN AVENUE, NORWALK, CONN. 06851
PHONE (203) 847-5861

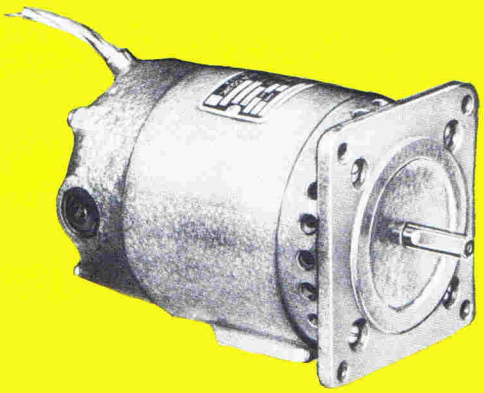


AC AND DC GENERATORS

D.C. PERMANENT MAGNET GENERATORS have an output voltage proportional to speed and are used extensively as tachometer generators. These generators are available with ratings from .25 to 170 volts per 1000 RPM and power outputs of .5 to 10 watts per 1000 RPM. The linearity of these units is guaranteed to be better than 1%. Operating speeds up to 10,000 RPM or 300 volts maximum which ever occurs first. Five frame sizes are available.

D.C. WOUND FIELD GENERATORS deliver an output voltage proportional to both speed and field excitation within the operating range. They are used where a D.C. voltage source is required or where power amplification is desired by use of field control.

A.C. PERMANENT MAGNET GENERATORS AND SINE WAVE GENERATORS which have a voltage and frequency output proportional to speed can be supplied 2-4-6-8-12-16-24 poles single phase; 2-4-6-8-12 poles two phase and for 2-4-8 poles three phase. These units have an output rating from 1 to 200 volts and ½ to 40 watts per 1000 RPM. The harmonic content of these units depends on the number of poles in the unit, the larger number of poles having the greater harmonic content. For applications where a pure sine wave is desired special sine wave units are available with less than ½ of 1% harmonic content, however these units are designed primarily as voltage source and they cannot deliver any power output. A.C. permanent magnet generators can be used as a source of sinusoidal waveform or in speed control systems where frequency is the criteria.



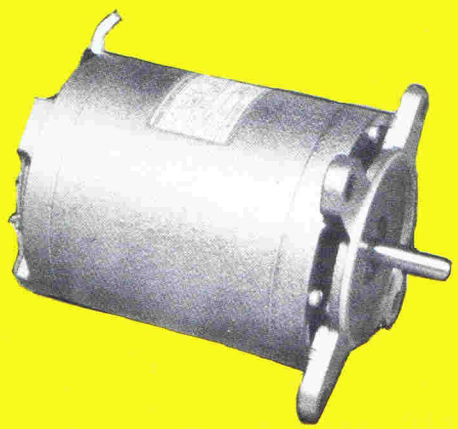
COMMUTATOR MOTORS

PERMANENT MAGNET MOTORS have shunt motor characteristics, they are often used where it is desired to have armature speed control and it is not desirable to have another constant D.C. voltage source to supply excitation. For a constant torque load on these motors, the motor speed will vary proportionally to the armature voltage. These motors should not be used for reversing applications where the plugging operations might tend to weaken the magnetic field and finally demagnetize the magnet.

D.C. SHUNT MOTORS maintain a speed that is quite constant over a wide range of load variations, they have high starting torque; lend themselves to speed control either through use of a rheostat for field or armature control, or if desired by separately exciting the field and using variations in armature voltage for speed control.

SERIES MOTORS can be used on both A.C. and D.C. The speed of a series motor varies inversely with load. Motors classified as Universal will operate successfully on both D.C. and A.C. up to the frequency at which they are rated, but they will be universal only over a limited speed and torque range. Some D.C. split field series are used as servo and torque motors where it is desired to have simple switching for reversible motors.

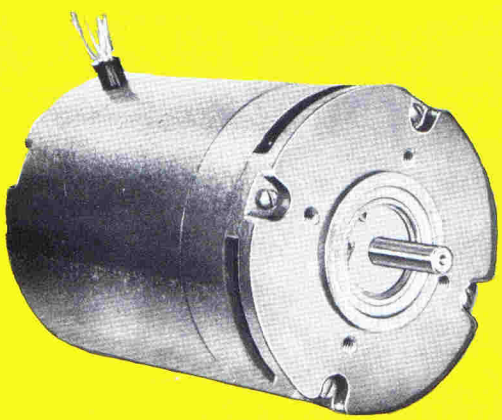
GOVERNOR MOTORS are made as shunt D.C. or series A.C. and D.C. motors. This limits the no load speed, enables motors to operate at the same speed on both D.C. and A.C., and maintains constant speed over a wide range of load and voltage variations.



INDUCTION MOTORS

"ELINCO" Induction Motors are custom engineered to provide high output at high efficiency for a given frame size, and are available in six different sizes. They have been designed for operating frequencies of 60 and 400 cycles as well as frequencies above and below these values. They can be wound with 1, 2 and 3 phases, for capacitor, split field, dual voltage and dual speed operation and can deliver outputs from 1/1000 to 1/6 HP. The larger sizes contain a fan mounted on the rotor for forced ventilation with a resulting increased rating.

Flexibility of designs permits meeting unusual performance requirements as well as variations in shaft and mounting features. Motors can be wound to develop a wide range of speed torque characteristics. For example, when high starting torque is not required the motor can be optimized for high running efficiency. When motors are required for reversing duty under running conditions the speed torque curve can be modified to give required torque to reverse motor in desired time interval.



TORQUE MOTORS

Torque Motors are induction motors designed to operate under stall conditions or at some speed in reverse direction of normal motor rotation to maintain tension, these are used in recording devices, machine tools, valve or switch operations, etc. Such motors are built in frames from 2¼ inches in diameter by 2½ inches long up to 4⅜ inches in diameter by 8½ inches long. Voltages up to 440 volts, 1, 2 or 3 phase, torques up to 200 oz. in. Mountings can be face, flange or base and shafts can be practically as desired. Some units have provisions for pipe connections to provide forced air cooling.

D.C. SERVO MOTORS AND AMPLIFIERS

INERTIAL MOTORS manufactures a quality line of **D.C. SERVO MOTORS** ranging in frame size from 3.0 thru 6.2 inches in diameter with a power range of 1/10 thru 10 horsepower.

MOTORS: Our motors contain a permanent magnet field utilizing Neodymium materials in optimum configurations. We do not experience demagnetization problems.

Our motor brush life is designed for 2 to 20 billion revolutions which does not require brush replacement.

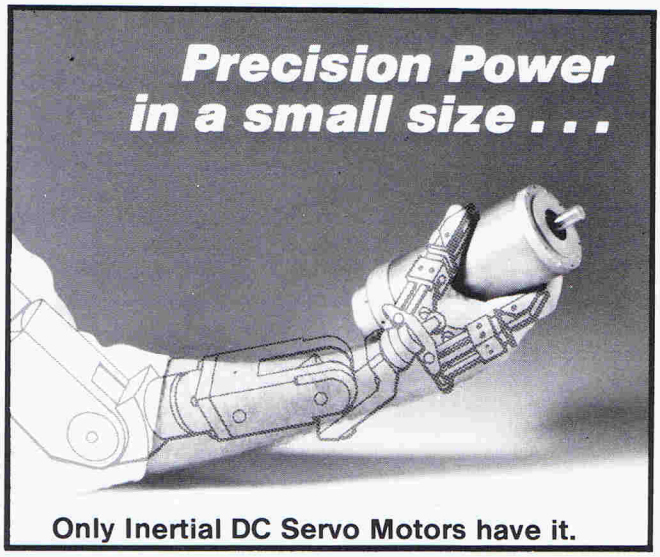
There are two design concepts behind our servo motors. Our "A" Series was designed to optimize on low inertia and fast acceleration, where the "D" Series delivers high torque in relation to the motor weight and size. This combination provides very efficient motors for all applications. Many of our motors offer the best torque to weight ratio in the motion industry, and in large sizes provide at least 3 times faster response.

Please refer to the Motor Spectrum on the following page for electrical specifications. The mechanical specifications can be found on page 3 of this four page catalog.

TACHOMETERS: Analog tachometers for velocity feedback integrally mounted to the motor shaft are readily available. Specifications are listed on the pages following.

ENCODERS: Incremental encoders for angular shaft position integrally mounted to the motor shaft are readily available. Specifications are listed on the pages following.

BRAKES: Fail Safe Brakes can be supplied also integrally mounted to motor shaft. Please consult our engineering department for detailed information.



MOUNTING: Shafts - Standard keyways, flats, grooves or holes or combinations thereof can be provided.

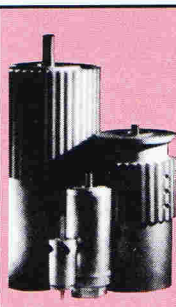
Flanges - Mounting flanges to meet your requirements including NEMA mounting configurations on most motors can be provided.

MODIFICATIONS: If you do not find the motor you require, we will work with you to tailor a standard motor to meet your specifications.

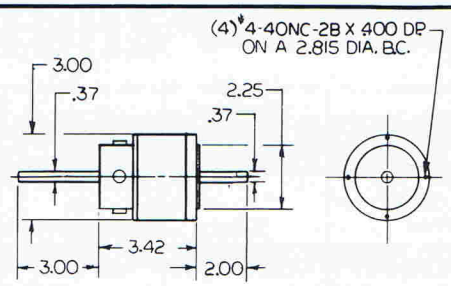
CALL OUR SALES OR ENGINEERING DEPARTMENT FOR ASSISTANCE

INERTIAL MOTORS
... a division of the Electric Indicator Company, Inc.
272 MAIN AVENUE - NORWALK - CONNECTICUT 06851
TELEPHONE: (203) 847-5861 FAX: (203) 846-3933

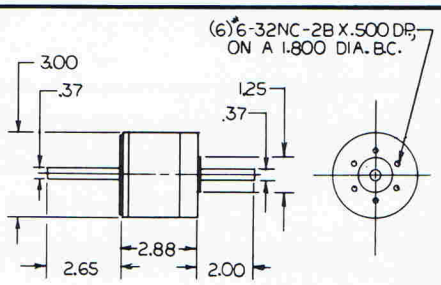
MOTOR SPECIFICATIONS

MOTOR FRAME	MAXIMUM D.C. VOLTS	MAXIMUM CONTINUOUS CURRENT	POWER RATE	ROTOR INERTIA		K_T RANGE		PEAK TORQUE		MAXIMUM CONTINUOUS TORQUE		THERMAL RESISTANCE	ROTOR THERMAL TIME CONSTANT		
	VOLT	AMP	KW/SEC	Oz-In-S^2 10^{-3}	(Kg-m^2) 10^{-6}	OZ-IN /AMP	N•m/A = V•S/RAD	OZ-IN	N•m	OZ-IN	N•m	°C/W	SEC.	P MECH CONTINUOUS W	HP
A3ØB	60	7	4	1.2	8.5	3 12	0.02 0.09	130	0.9	25	0.18	3.25	310	60	0.08
D3ØS	80	10	3	10.0	70	4 30	0.03 0.22	300	2.1	65	0.45	1.86	560	230	0.30
D3ØL	80	10	11	20.0	140	12 45	0.09 0.34	480	3.4	180	1.3	1.30	440	450	0.60
D3ØE	80	25	30	25.0	177	12 90	0.09 0.68	1200	8.5	320	2.3	0.74	770	750	1.00
A35Ø	80	10	100	1.8	12.7	7 28	0.05 0.21	500	3.5	160	1.1	1.10	780	600	0.80
A4ØS	80	10	15	1.2	8.5	3 12	0.02 0.09	240	1.7	60	0.42	3.25	310	260	0.35
A4ØL	80	10	47	1.8	12.7	6 24	0.04 0.18	400	2.8	110	0.78	1.30	780	540	0.72
D4ØØ	130	45	35	120.0	850	25 100	0.19 0.76	2400	17	700	4.9	0.52	600	900	1.21
D44Ø	130	45	30	135.0	950	30 240	0.21 1.83	5000	35	1000	7	0.43	980	2700	3.62
A5ØØ	80	10	113	1.8	12.7	7 28	0.05 0.21	600	4.2	170	1.2	1.04	780	880	1.18
A6ØS	80	30	81	7.0	50	8 32	0.06 0.24	1200	8.5	285	2	0.74	900	1060	1.42
A6ØL	80	30	136	10.0	70	10 60	0.07 0.45	1600	11	440	3.1	0.65	1050	1600	2.14
D62S	160	60	39	800.0	5650	50 200	0.38 1.40	8000	56	2100	14.8	0.22	1000	3300	4.42
D62Ø	160	60	70	1200.0	8475	60 400	0.42 2.82	12000	85	3700	26	0.13	1160	5500	7.37
D62X	160	60	110	1270.0	9180	80 500	0.56 3.53	16000	105	4500	32	0.1	1100	7000	9.40

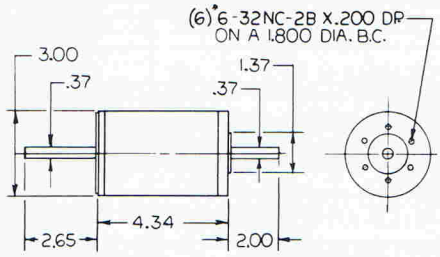
ASK FOR DETAILED PRINTS



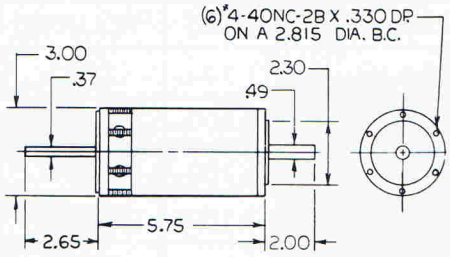
A3ØB — WEIGHT: 3 LBS.



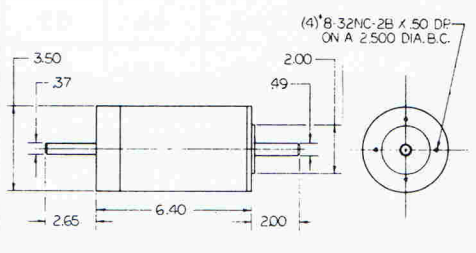
D3ØS — WEIGHT: 3 LBS.



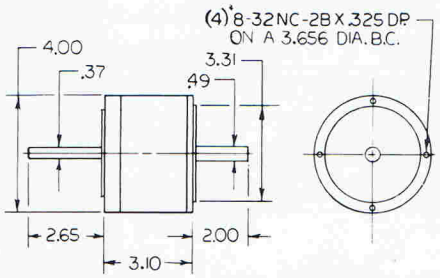
D3ØL — WEIGHT: 6 LBS.



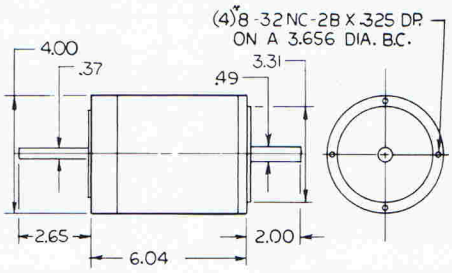
D3ØE — WEIGHT: 6.8 LBS.



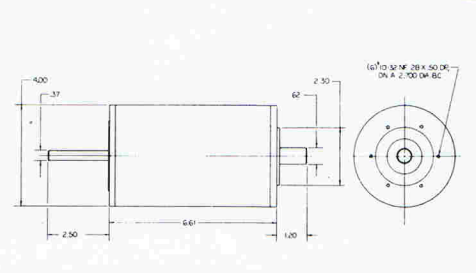
A35Ø — WEIGHT: 11 LBS.



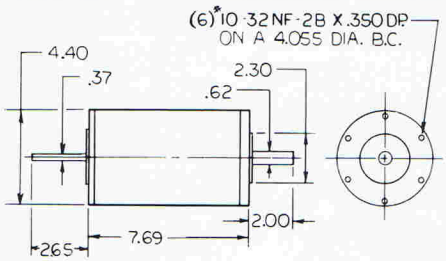
A4ØS — WEIGHT: 5.5 LBS.



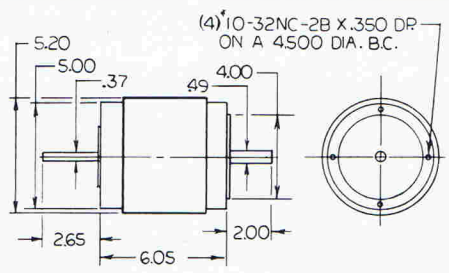
A4ØL — WEIGHT: 12 LBS.



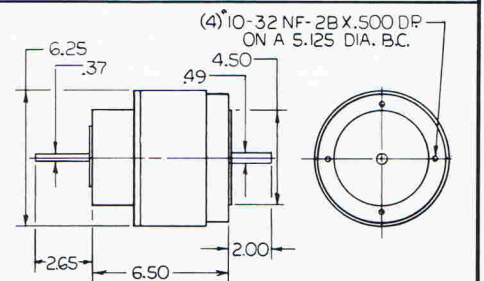
D4ØØ — WEIGHT: 13 LBS.



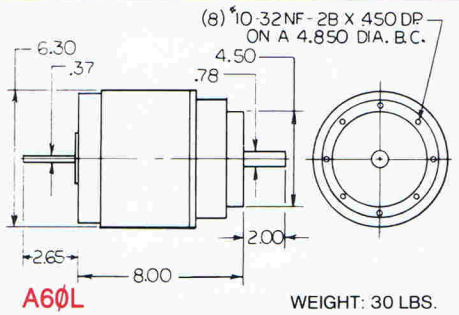
D44Ø — WEIGHT: 22 LBS.



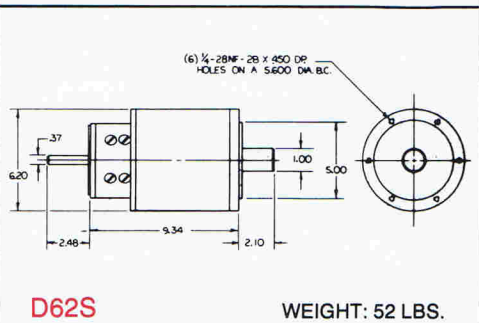
A5ØØ — WEIGHT: 20 LBS.



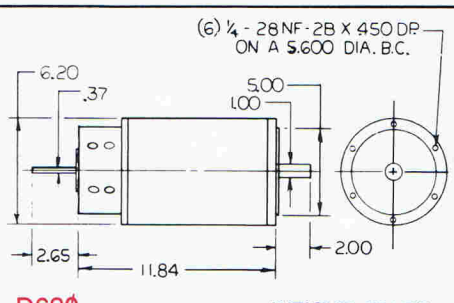
A6ØS — WEIGHT: 18 LBS.



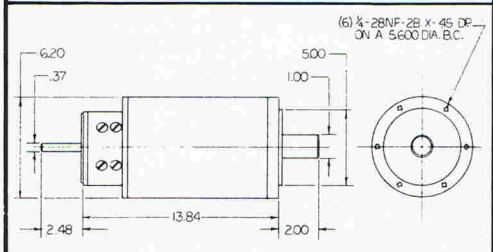
A6ØL — WEIGHT: 30 LBS.



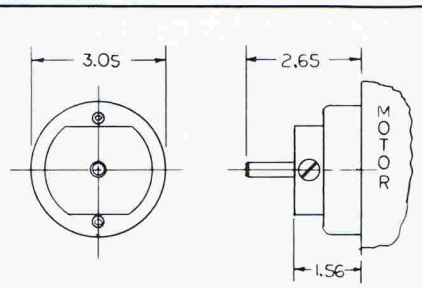
D62S — WEIGHT: 52 LBS.



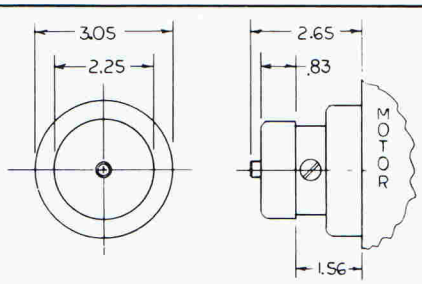
D62Ø — WEIGHT: 62 LBS.



D62X — WEIGHT: 72 LBS.



TACHOMETER



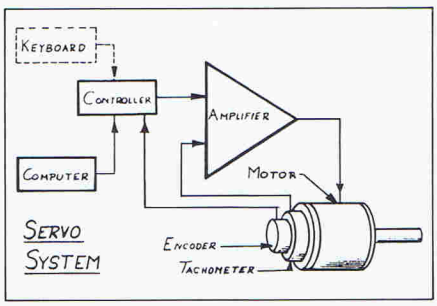
TACHOMETER & ENCODER

AMPLIFERS

MODEL	OUTPUT TO MOTOR			TYPE	CURRENT LIMIT ADJUSTMENT	POWER IN	AMPLIFIER DIMENSIONS (SINGLE AXIS)			AXES
	Irms AMPS	Ipk AMPS	VMAX ± VDC	LINEAR OR PWM	% Ipk	POWER SUPPLY OR TRANSFORMER	BASE IN. X IN.	HEIGHT INCHES	WEIGHT POUNDS	
4552-12	3	10	32	LINEAR	30 - 100	GP500	10.25 x 5.5	4.5	4	1
4552-4	6	15	62	LINEAR	30 - 100	GP600	11 x 5.5	7.0	8	1
4552-1	10	18	62	LINEAR	30 - 100	INCLUDED	12.75 x 9.5	7.25	27	1
4552-14	10	18	62	LINEAR	30 - 100	T320	13.25 x 8.5	7.25	9	1
4553-1	15	25	62	LINEAR	30 - 100	T320	15.25 x 9.25	7.0	10	1
4555	3	12	40	LINEAR	50 - 100	T320	12 x 6	7.1	6	4
369	6	12	70	PWM	50 - 100	NOTE 6	6.25 x 19	6.25	10	8
4567P	10	20	90	PWM	50 - 100	T298	10.5 x 13	8	16	1
4568P	15	35	90	PWM	50 - 100	T452	12.25 x 13	9	22	4
4569	25	50	150	PWM	50 - 100	T378	13.5 x 14	8	12	4
4571P	35	70	150	PWM	50 - 100	T345	17.5 x 6.5	9	22	1
4576P	50	100	160	PWM	50 - 100	T345	17.5 x 10.5	9	28	1
4581P	100	170	160	PWM	50 - 100	T345	17.5 x 10.5	9	28	1

NOTES:

1. ALL MODELS ACCEPT ±VDC INPUT SIGNAL.
2. ALL MODELS ACCEPT TACHOMETER INPUTS (±90 VDC MAX.).
3. ALL MODELS HAVE 3 AUXILIARY INPUTS TO INHIBIT MOTION IN C.W., C.C.W., OR BOTH DIRECTIONS.
4. IN ADDITION ALL MODELS REQUIRE 115 VAC, 50/60 H_Z, 1ϕ, 1 AMP FOR FAN POWER.
5. SOME MODELS ARE AVAILABLE WITH MULTI-AXIS PACKAGING (THIS COLUMN INDICATES THE MAXIMUM NUMBER OF DRIVES THAT CAN BE MOUNTED ON A SINGLE CHASSIS).
6. **CALL INERTIAL MOTORS CORP. FOR ADDITIONAL INFORMATION.**



TACHOMETERS & ENCODERS

TACHOMETERS:

TACHOMETER DATA:	A	B	
VOLTAGE OUTPUT / 1000 R.P.M.	$3^{\pm 10\%}$	$5^{\pm 10\%}$	VOLTS
RIPPLE VOLTAGE, AVERAGE TO PEAK	2.0	1.0	%
RIPPLE CYCLES / REVOLUTION	21	21	C.P.R.
ROTOR (J_M)	$.75x10^{-3}$	$1.5X10^{-3}$	OZ-IN-SEC^3
ROTOR RESISTANCE	45	50	OHMS
MIN. LOAD RESISTANCE	10	10	K OHMS

ENCODERS:

RESOLUTION: Line count 500 Std. (others available)

FREQUENCY RESPONSE: Channels A&B 100KHZ
Index pulse 50KHZ

QUADRATURE PHASING: 90° ± 30°

INPUT POWER: +5V DC, 100 MA

OUTPUT: Square Wave, TTL Compatible (1C 7404)

MOMENT OF INERTIA: 2.5 x 10 −4 oz.-in-sec²

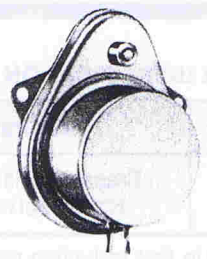
OPERATING TEMPERATURES: 0° to 70°C

(CALL INERTIAL FOR OTHER SPECIFICATIONS)

INERTIAL MOTORS CORP. • 280 NORTH BROAD STREET, DOYLESTOWN, PA 18901 U.S.A.
(215) 345-1010 800 446-7903 FAX 215-345-0111

Synchronous Motors
Series 81300 Electrically Reversible

Gear Box Rating - **5-20 oz-in** Rotor Speed - **300 rpm** Rotor Torque - **0.75 oz-in**



This compact reversible motor satisfies a wide range of constant speed applications. Long life and quiet operation are achieved by coupling a 100% hobbed gear train to a slow speed (300 RPM) rotor shaft.

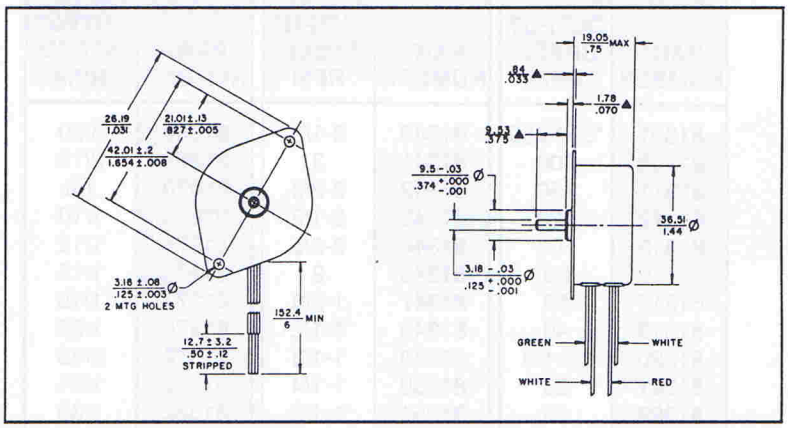
High torque is generated by a barium ferrite rotor and an electrically phase shifted stator. The rotor is enclosed by the stator poles, in the center of the coils, thus resulting in low extraneous stray field.

Two standard gear trains are offered. Brass gears with steel pinions are rated at 20 oz-in intermittent or 5 oz-in continuous. Hard steel gears will carry up to three times these loads. Other important features include permanent lubrication, low temperature rise (30°C) and virtually instant start/stop capability.

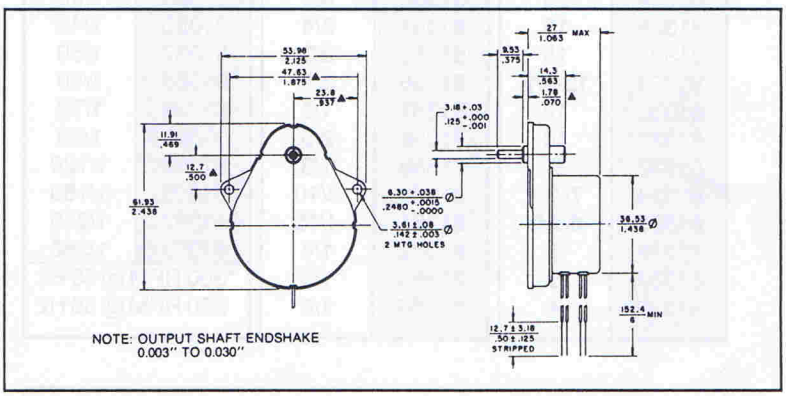
SPECIFICATIONS

Performance Nominal @ 25°C	
Operating Voltage	24, 115 or 230 Vac
Frequency	50 or 60 Hz
Power Input - Watts	1.5
Temperature Range	−23°C to +82°C (−10°F to +180°F)
Rotor Speed at 60 Hz	300 RPM
at 50 Hz	250 RPM
Rotor Torque - Nominal	0.75 oz-in
Moment of Inertia of Rotor	2 gcm²
Rotation	Reversible
Weight	5 oz.
Power Factor	0.95 Typical
Temperature Rise	30°C max.
Dielectric	1,000 VRMS, 60 HZ for 1 second
Bearings	Permanently lubricated rotor bearings, bronze output shaft bearings
Lead Wires	#26 A.W.G., Stranded, tinned copper, 105°C, 600 volts, polyvinyl chloride insulation

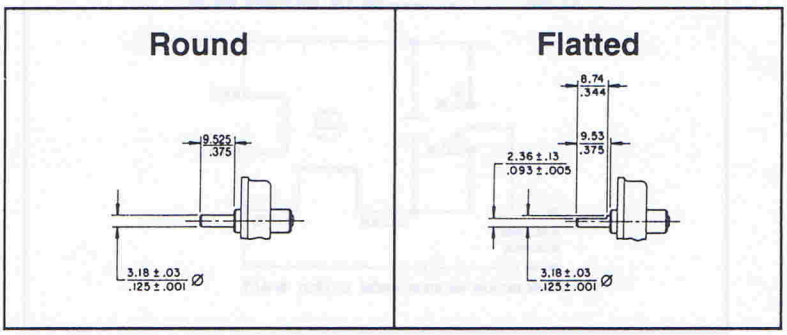
OUTLINE AND MOUNTING DIMENSIONS: MM/INCHES
Symbol ▲ ±.127/±.005 Unspecified ±.78/±.031
Basic Catalog Motor - Part No. 81301



With Gear Box - Part Nos. 81308 to 81399



Available Shaft Configurations



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Synchronous Motors
Series 81300
Electrically Reversible

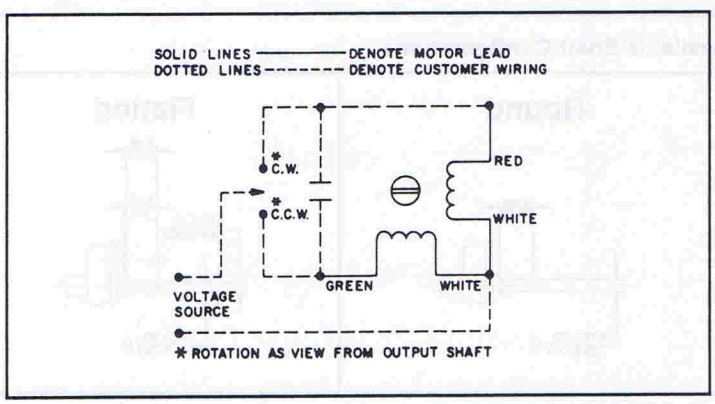
PREFIX IDENTIFICATION

Prefix	Gear Train Material*	Rotation
K	Brass wheels and steel pinions	Reversible
L	Hard steel wheels & pinions	Reversible

*Wheel in first reduction may be nonmetallic mat

81300 MOTOR PART NUMBER IDENTIFICATION

PART NUMBER	OUTPUT SPEED RPM	PART NUMBER	OUTPUT SPEED RPM	PART NUMBER	OUTPUT SPEED RPM
81301	*300/250	81340	3-1/3	81368	3/20
81308	300	81341	3	81369	2/15
81311	150	81342	2-2/3	81370	1/8
81312	120	81343	2-1/2	81373	1/10
81313	100	81344	2-2/5	81374	1/12
81316	60	81345	2	81376	1/15
81317	50	81347	1-2/3	81377	1/18
81319	40	81348	1-1/2	81378	1/20
81320	33-1/3	81349	1-1/3	81379	2/45
81321	30	81350	1-1/4	81380	1/24
81322	25	81351	1-1/5	81382	1/30
81323	24	81352	1	81384	1/36
81324	20	81353	4/5	81385	1/40
81326	16	81354	3/4	81386	1/45
81327	15	81355	2/3	81387	1/50
81329	12-1/2	81356	3/5	81388	1/60
81330	12	81357	1/2	81389	1/72
81331	10	81358	2/5	81390	1/90
81333	8	81359	1/3	81392	1/120
81334	7-1/4	81360	3/10	81395	1/180
81335	6-2/3	81361	4/15	81397	1/240
81336	6	81362	1/4	81399	1/360
81337	5	81365	1/5	*300 RPM @ 60 Hz 250 RPM @ 50 Hz	
81339	4	81366	1/6		



SUFFIX IDENTIFICATION (for voltage and frequency)

Suffix	Nominal AC Voltage ±10%	Frequency ±5%	*Phase Shift Capacitor ±10%
P3	24	60 Hz	2.0 μf
P4	115		0.1 μf
P5	230		0.025 μf
P8	24	50 Hz	2.0 μf
P9	115		0.18 μf
P10	130		0.025 μf

*Capacitor not supplied with motor. Use an A.C. Capacitor with a minimum value of two times the operating voltage of the motor.

SUFFIX IDENTIFICATION (for output shaft)

Suffix	Shaft Dimensions
None	.125 dia. x .375" long
S5	.125 dia. x .375" flatted

HOW TO ORDER

From the tables shown select:
1. Prefix for gear train (brass or hard steel)
2. Part number for output speed
3. Suffix for operating voltage
4. Suffix for shaft other than standard .125 dia. x .375" long.

EXAMPLES OF PART NUMBERS

K - 81352 - P4 --
- -- Standard .125 dia x .375" long round shaft
- P4 — 120 V 60 Hz
- 81352 — 1 RPM
- K — Brass Gear Train

L - 81331 - P10 - S5 -
- S5 — .125 dia. x .375" flatted shaft
- P10 — 240 V 50 Hz
- 81331 — 10 RPM
- L — Hard Steel Gear Train

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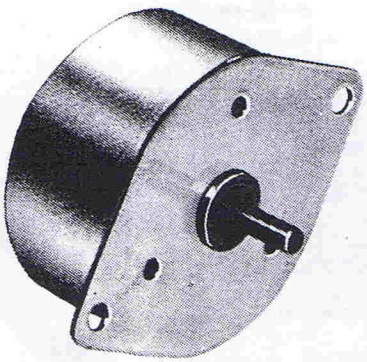
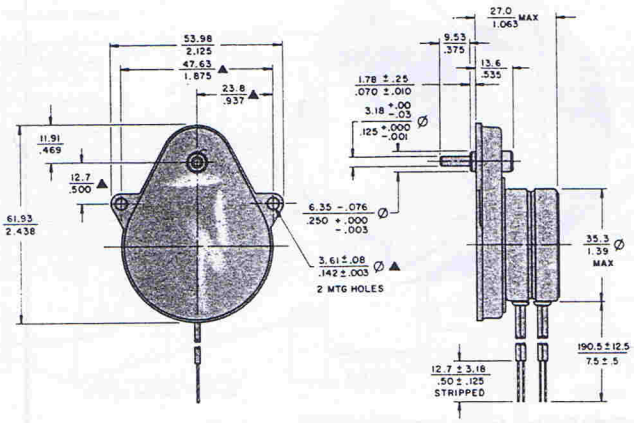
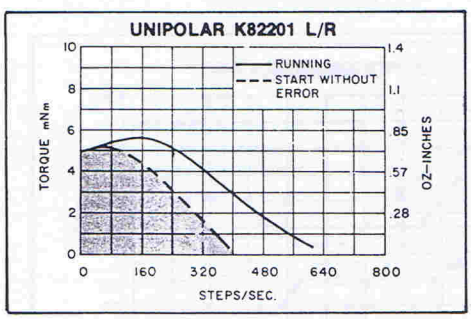
Series K82200
Stepper Motors With Gear Trains

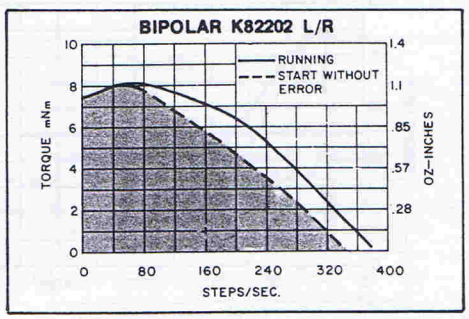


(SHOWN WITHOUT GEARBOX)
SEE BACK PAGE PAGE FOR DETAILED DRAWING OF MOTOR ONLY



SEE BACK PAGE FOR MOTOR WITHOUT GEARBOX





SPECIFICATIONS	BIPOLAR		UNIPOLAR	
ORDERING PART NO.	K82202-P1	K82202-P2	K82201-P1	K82201-P2
DC Operating Voltage	5	12	5	12
Res. per Winding Ω	27	154	26	147
Ind. per Winding mH	30	150	10	80
Holding Torque mNm/oz-in	11.3/1.6		9.9/1.4	
Step Angle	7.5°			
Step Angle Tolerance	±1.0°			
Steps per Rev.	48			
Rotor Moment of Inertia g.m²	$2x10^{-4}$			
Max. Operating Temp.	100°C			
Ambient Temp. Range Operating Storage	 —20°C to 70°C —40°C to 85°C			
Insulation Res. @ 500Vdc	100 mΩ			
Bearings	Bronze Sleeve			
Weight	85g/3oz			
Lead Wires	No. 26 AWG			

PART NUMBER	GEAR RATIO
K82201	1:1 DIRECT DRIVE
K82211	2:1
K82212	2-1/2:1
K82213	3:1
K82215	4-1/6:1
K82216	5:1
K82217	6:1
K82219	7-1/2:1
K82221	10:1
K82224	15:1
K82227	20:1
K82230	25:1
K82231	30:1
K82236	50:1
K82237	60:1
K82239	75:1
K82245	150:1
K82264	1350:1

*When ordering fill in correct series digit - Example: 82200 Series Stepper with 5:1 gear ratio K82216. Add suffix P1 or P2 as required. Standard gear reductions are available as shown above. For ratios not listed or for series not marked with "X" - consult factory for availability. Gear trains as listed have efficiencies of 90% or less depending on the number of gear meshes in the train. Gear reductions shown are typical and are available on request from the factory.

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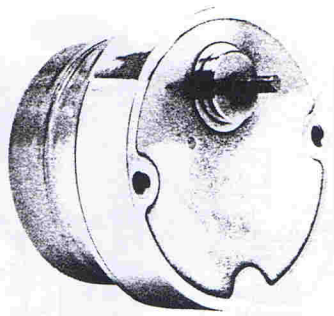
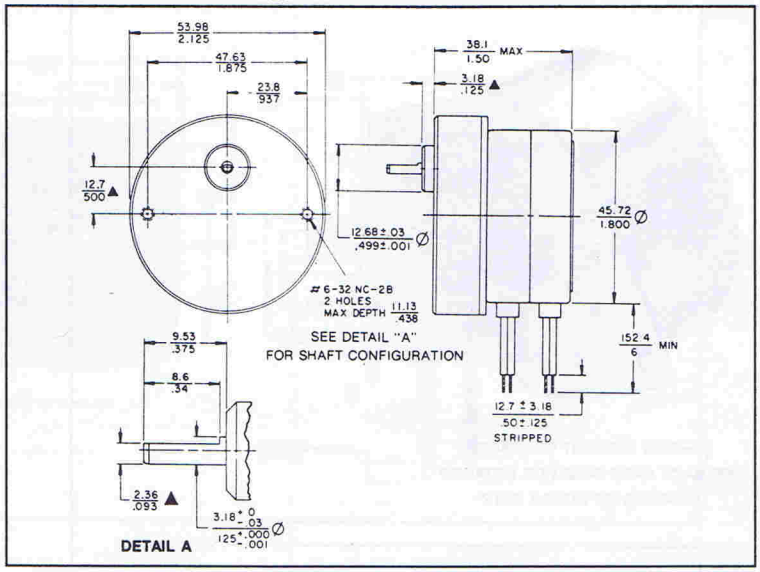
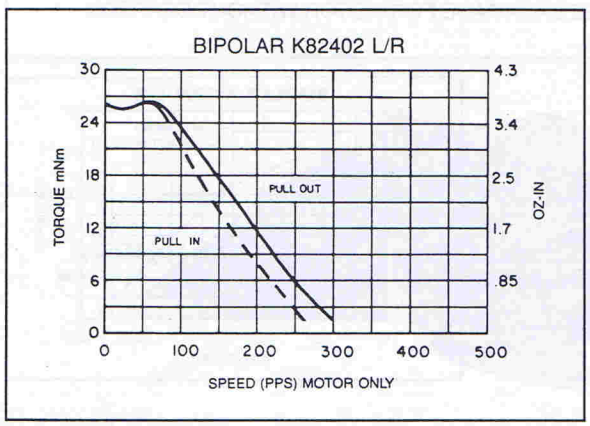
Series K82400
Stepper Motors With Gear Trains



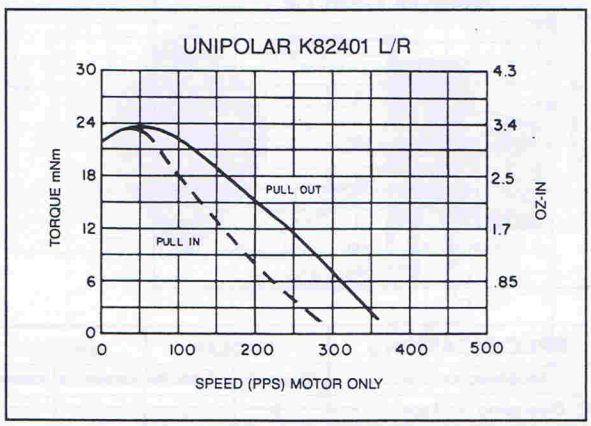
Gear Train Rating: 150 oz. in. static
100 oz. in. running

DIMENSIONS: MM/INCHES — SYMBOL ▲ ±.127/±.005 UNSPECIFIED ±.78/±.031





SEE BACK PAGE FOR MOTOR WITHOUT GEARBOX



Specifications (Motor only)

	BIPOLAR		UNIPOLAR	
PART NUMBER	K82402-P1	K82402-P2	K82401-P1	K82401-P2
DC Operating Voltage	5	12	5	12
Res. per Winding Ω	17.4	109	15.5	91
Ind. per Winding mH	32	188	13.5	86
Holding Torque mNm/oz-in	36/5.1		34/4.7	
Step Angle	7.5°			
Step Angle Tolerance	±0.5°			
Steps per Rev.	48			
Rotor Moment of Inertia g·m²	1.2×10^{-3}			
Max. Operating Temp.	100°C			
Ambient Temp. Range Operating Storage	–20°C to 70°C –40°C to 85°C			
Insulation Res. at 500Vdc	100 megohms			
Bearings	Bronze Sleeve			
Weight g/oz	244/8.6			
Lead Wires	No. 26 AWG			

Available Gear Train Reductions

PART NUMBER*	GEAR RATIO	SERIES 82400	OUTPUT STEP ANGLE
K82412	2-1/2:1	X	3.00°
K82416	5:1	X	1.50°
K82421	10:1	X	.75°
K82424	15:1	X	.50°
K82427	20:1	X	.375°
K82431	30:1	X	.25°
K82436	50:1	X	.15°
K82439	75:1	X	.10°

*When ordering fill in correct series digit – Example: 82400 Series Stepper with 5:1 gear ratio K82416. Add suffix P1 or P2 as required. Standard gear reductions are available as shown above. For ratios not listed or for series not marked with "X" – consult factory for availability. Gear trains as listed have efficiencies of 90% or less depending on the number of gear meshes in the train. Gear reductions shown are typical and are available on request from the factory.

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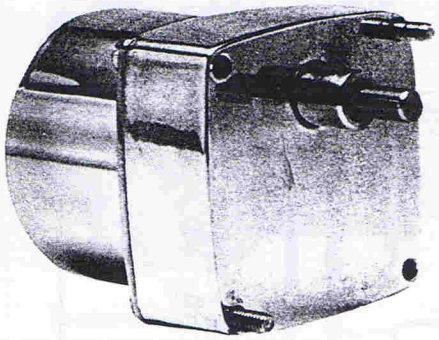
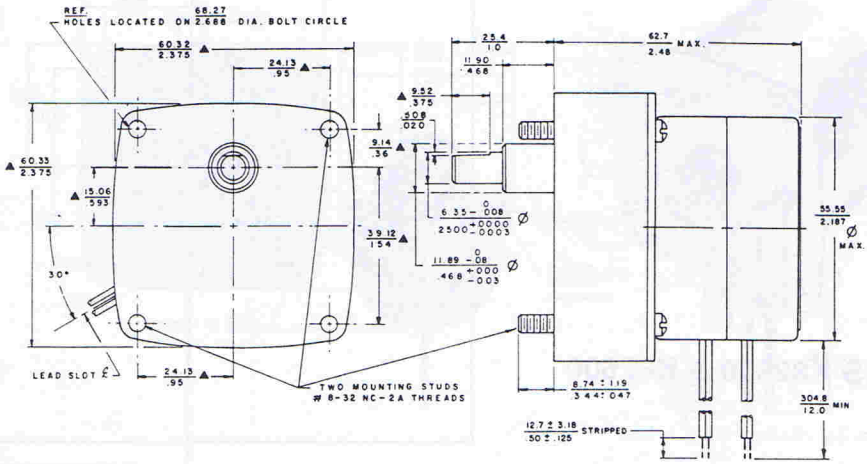
Series K82800 & K82600
Stepper Motors With Gear Trains



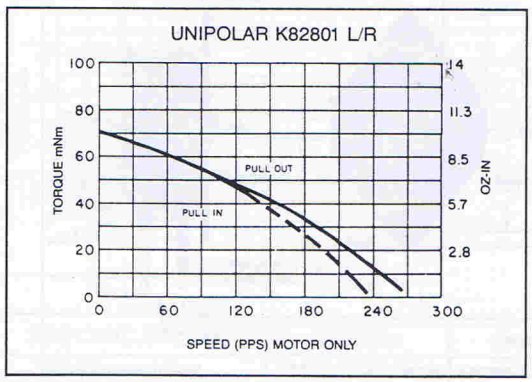
DIMENSIONS: MM/INCHES — SYMBOL ▲ ±.127/±.005 UNSPECIFIED ±.78/±.031

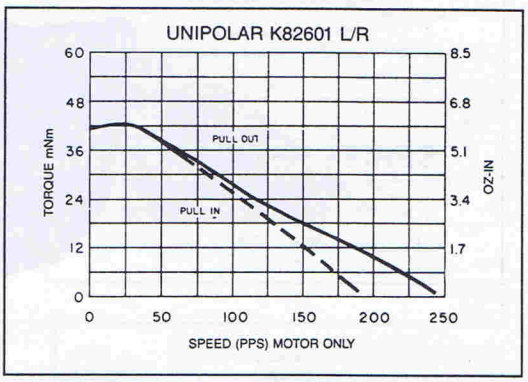


NEMA STYLE 2-11

SEE BACK PAGE FOR MOTOR WITHOUT GEARBOX

Gear Train Rating: 300 oz. in. static
200 oz. in. running





Specifications (Motor only)

ORDERING PART NUMBER (Add Suffix)	K82801		K82601	
Suffix Designation	– P1	– P2	– P1	– P2
DC Operating Voltage	5	12	5	12
Res. per Winding Ω	7.5	42	7.6	45
Ind. per Winding mH	7	32	8.5	44
Holding Torque mNm/oz-in*	92/13		71/10	
Rotor Moment of Inertia g • m²	6.0×10^{-3}		3.4×10^{-3}	
Step Angle	7.5°		15°	
Step Angle Tolerance*	± .5°		± 1.0°	
Steps per Rev.	48		24	
Max. Operating Temp.	100°C			
Ambient Temp. Range Operating Storage	– 20°C to 70°C – 40°C to 85°C			
Bearing Type**	Bronze sleeve			
Insulation Res. at 500Vdc	100 megohms			
Dielectric Withstanding Voltage	650 VRMS 60 Hz for 2 seconds			
Weight g/oz	564/19.9			
Lead Wires	26 AWG			

Available Gear Train Reductions

PART NUMBER**	GEAR RATIO	SERIES 82800	OUTPUT STEP ANGLE	SERIES 82600	OUTPUT STEP ANGLE
82-11	2:1	X	3.75°	X	7.5°
82-16	5:1	X	1.50°	X	3°
82-21	10:1	X	.75°	X	1.5°
82-24	15:1	X	.50°	X	1°
82-27	20:1	X	.375°	X	.75°
82-30	25:1	X	.30°	X	.6°
82-31	30:1	X	.25°	X	.5°
82-36	50:1	X	.15°	X	.30°
82-37	60:1	X	.125°	X	.25°
82-39	75:1	X	.10°	X	.2°
82-45	150:1	X	.05°	X	.1°

*Measured with 2 phases energized.
**When ordering fill in correct series digit – Example: 82800 Series Stepper with 2:1 gear ratio K82811. Standard gear reductions are available as shown above. For ratios not listed or for series not marked with "X" – consult factory for availability. Gear trains as listed have efficiencies of 90% or less depending on the number of gear meshes in the train. Gear reductions shown are typical and are available on request from the factory.

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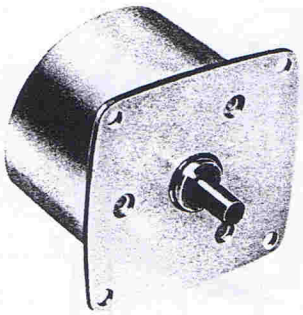
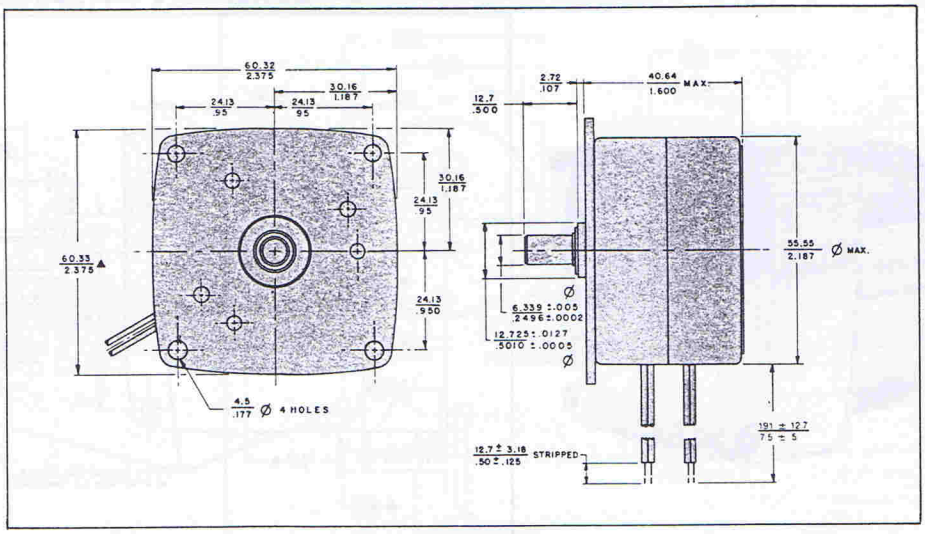
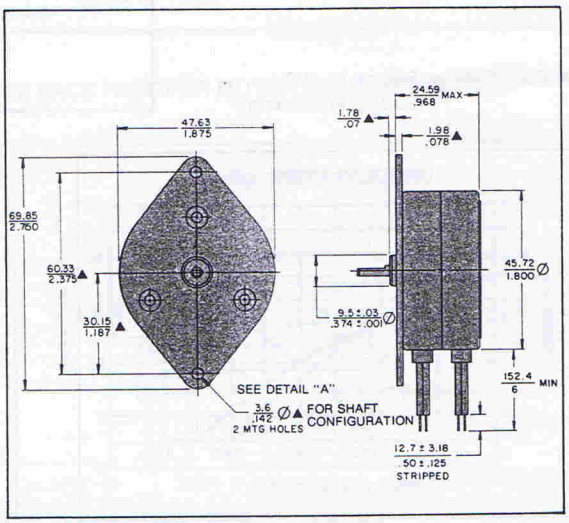
Stepper Motors Only



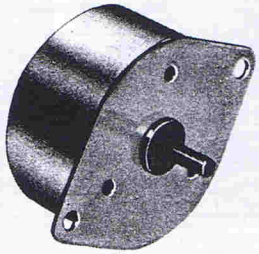
SERIES K82800 & K82600

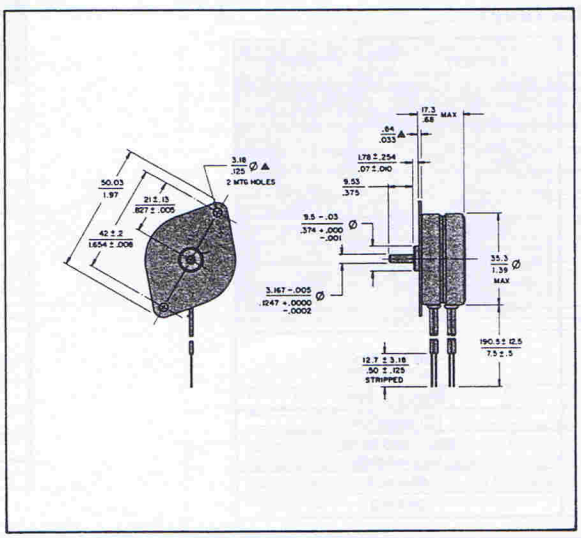


SERIES K82400



SERIES 82200





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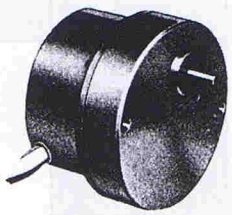
Synchronous Motors
Series 81400 - U/L recognized
Electrically Reversible

Gear Box Rating **100 oz-in** Rotor Speed **300 rpm** Rotor Torque **2 oz-in**

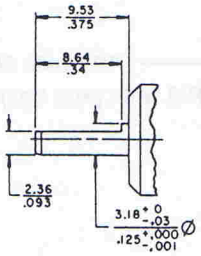
This low cost compact motor includes unique design features that assure high torque and low power consumption. The output torque is rated 2 oz-in at the rotor (300 RPM) and input power is only 3 watts. All pinions and gears are hardened steel. This motor is ideally suited for a wide range of instrumentation applications such as chart drives, card readers, computer terminal and peripheral equipment and medical instrumentation.

The 81400 series motor design incorporates a permanent magnet rotor and an electromagnetic stator with two coils. It is electrically reversible. Other important features include permanent lubrication, low temperature rise and virtually instant start/stop capabilities. Also, motor speed is synchronous and independent of variations in load, temperature or voltage.



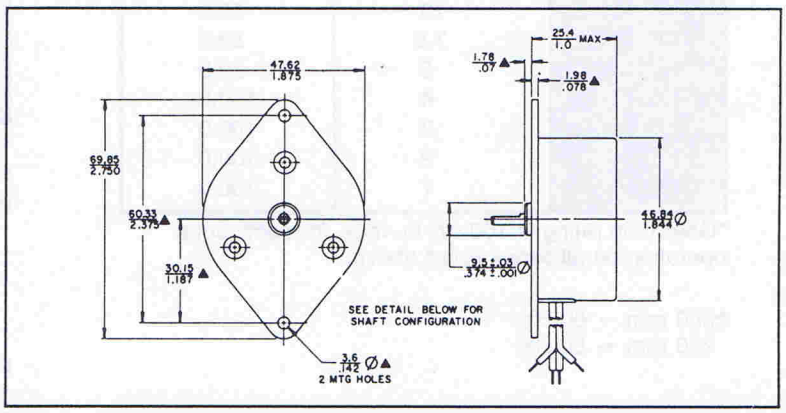
SPECIFICATIONS

Performance Nominal @ 25°C	
Operating Voltage	24, 120 or 240 Vac
Frequency	50 or 60 Hz
Power Input - Watts	3
Temperature Range	– 23°C to 65°C (– 10°F to + 150°F)
Rotor Speed @ 60 Hz @ 50 Hz	300 RPM 250 RPM
Rotor Torque - Nominal	2 oz-in
Moment of Inertia of Rotor	12 gcm²
Rotation	Reversible
Weight with gear box without gear box	10 ozs. 6.5 ozs.
U/L Recognized	YES
Power Factor	0.98
Temperature Rise	40°C max.
Dielectric Test:	900 ± 50 VRMS. 60 HZ for 1 second
Bearings	Permanently lubricated rotor bearings, bronze output shaft bearings
Lead Wires	#24 A.W.G., Stranded, tinned copper, 105°C, 600 volts, polyvinyl chloride insulation

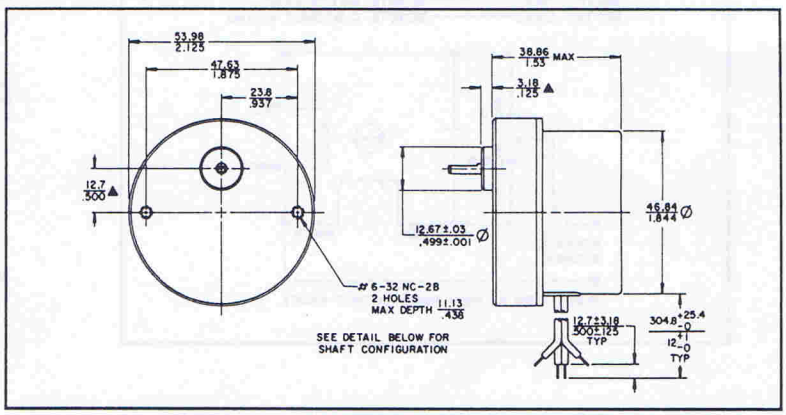


The output shaft dimensions apply to motor with or without a gear box.

OUTLINE AND MOUNTING DIMENSIONS: MM/INCHES
Symbol ▲ ± .127/ ± .005 Unspecified ± .78/ ± .031
Basic Catalog Motor - Part No. 81401



With round gear box - Part Nos. K81411 to K81452



Elinco

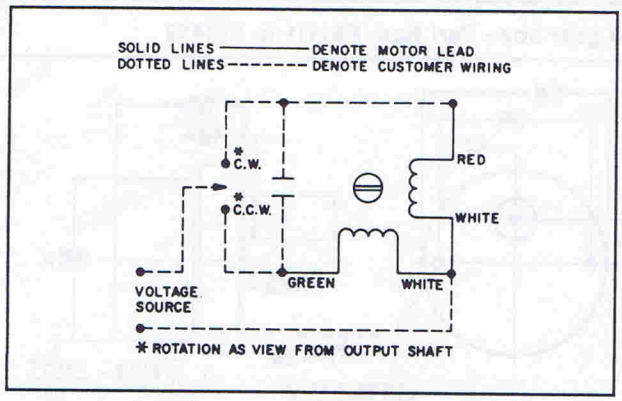
Synchronous Motors
Series 81400 - U/L recognized
Electrically Reversible

81400 MOTOR PART NUMBER IDENTIFICATION

Part Number	Output Speed (RPM)	*Synchronous Torque (oz.-in.)
K81401	†300	2.0
K81411	150	2.6
K81412	120	3.3
K81413	100	4.0
K81415	72	5.5
K81416	60	6.6
K81417	50	8.0
K81421	30	13.3
K81423	24	16.6
K81424	20	20.0
K81427	15	26.6
K81430	12	33.3
K81431	10	40.0
K81434	7.5	53.3
K81437	5	80.0
K81439	4	100.0
K81441	3	100.0
K81445	2	100.0
K81452	1	100.0

*Gear train rating is 100 oz.-in. max. for continuous operation on all series listed above.

†300 rpm – 60 Hz.
250 rpm – 50 Hz.



SUFFIX IDENTIFICATION

Suffix	Nominal A.C. Voltage ±10%	Frequency ±5%	†Phase Shift ±5%
U3	24 Vac	60 Hz	6.0 μf
U4	120 Vac	60 Hz	.22 μf
U5	240 Vac	60 Hz	.056 μf
U8	24 Vac	50 Hz	6.0 μf
U9	120 Vac	50 Hz	.22 μf
U10	240 Vac	50 Hz	.056 μf

†Capacitor not supplied with motor. Use an A.C. capacitor with a minimum value of two times the operating voltage of the motor.

HOW TO ORDER

From the tables shown select:
1. Part number for output speed & model.
2. Suffix for operating voltage.

Examples of completed part numbers are given below:

K81401 **U3**
- U3 — 24 volts 60 Hz
- K81401 — Reversible 300 RPM (without gear box)

K81411 **U4**
- U4 — 120 volts 60 Hz
- K81411 — Reversible 150 RPM (with gear box)

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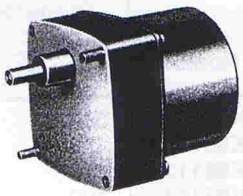
Synchronous Motors
Series 86000 - U/L Recognized

Gear Box Rating - **200 oz-in** Rotor Speed - **300 & 600 rpm** Rotor Torque - **6 oz-in**

These high torque instrument drive motors are ideally suited for use in a wide variety of medical and scientific instruments, computer peripherals and environmental control equipment.

In additional to high torque, the motors are compact, light in weight and extremely reliable and efficient. Fast start/stop characteristics eliminate the need for prestarts or clutching. Permanently lubricated rotor bearings and output shaft bearings prolong motor life and eliminate maintenance problems.

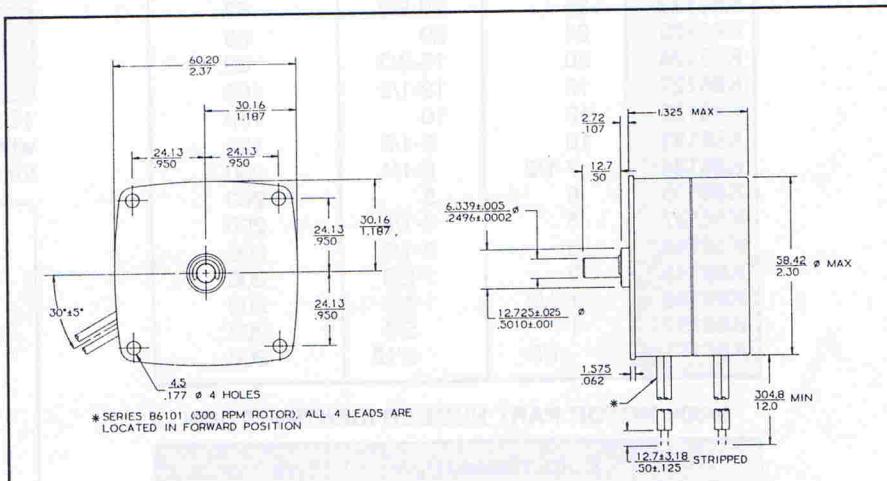


SPECIFICATIONS

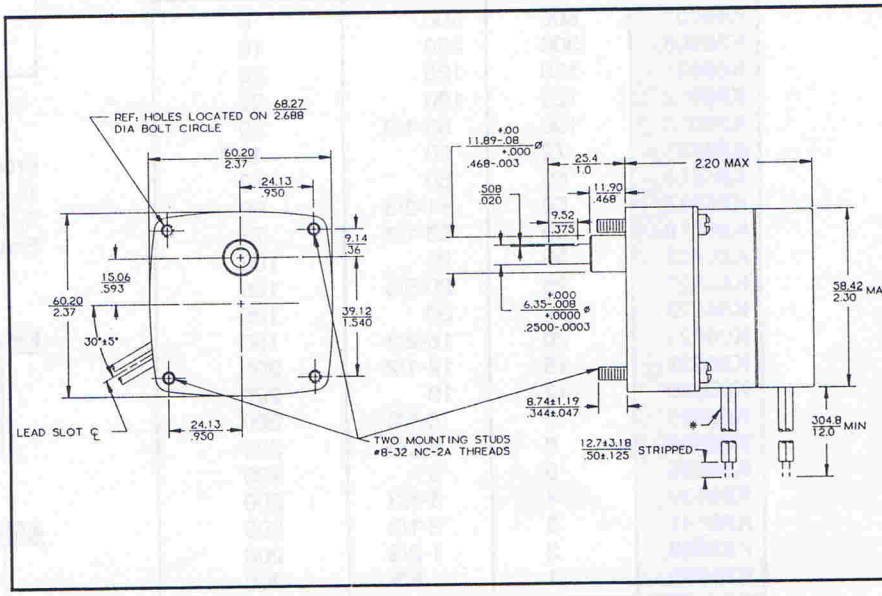
Performance Nominal @ 25°C	Motor Series	
	86100	86600
Operating Voltage	120 VAC (Available in 24 or 240)	
Frequencies	50 or 60 Hz	
Current Drain - amps	.065	.100
Power Input - watts	7	10
Temperature Range	0°C to 60°C (+32°F to +140°F)	
Rotor Speed @ 60 Hz	300 RPM	600 rpm
@ 50 Hz	250 rpm	500 rpm
Rotor Torque	6 oz-in	
Moment of Inertia of Rotor	51 gr cm²	34 gr cm²
Rotation	Reversible or dual speed unidirectional	
Weight with gear box	30 ozs.	
without gear box	16 ozs.	
U/L Listed	YES	

OUTLINE AND MOUNTING DIMENSIONS: MM/INCHES
Symbol ▲ ±.127/±.005 Unspecified ±.78/±.031

Basic Catalog Motor (Series 86101 and 86601)



With NEMA 2-11 Gear Box (Series 86100 and 86600)



Elinco

Series 86100 (300 rpm) and 86600 (600 rpm) NEMA Type 2-11 Gear Box

86100 MOTOR PART NUMBER IDENTIFICATION

Part Number	Output Speed (rpm) @ 60 Hz	Output Speed (rpm) @ 50 Hz	*Synchronous Torque (oz-in)
K86101	300	250	6
K86111	150	125	12
K86112	120	100	15
K86113	100	88-1/3	17
K86115	72	60	22
K86116	60	50	27
K86190	45	37-1/2	35
K86119	40	33-1/3	45
K86121	30	25	60
K86122	25	20-5/6	63
K86123	24	20	63
K86124	20	16-2/3	90
K86127	15	12-1/2	100
K86130	12	10	150
K86131	10	8-1/3	154
K86134	7-1/2	6-1/4	200
K86136	6	5	200
K86137	5	4-1/6	200
K86141	3	2-1/2	200
K86145	2	1-2/3	200
K86148	1-1/2	1-1/4	200
K86152	1	5/6	200
K86157	1/2	5/12	200

86600 MOTOR PART NUMBER IDENTIFICATION

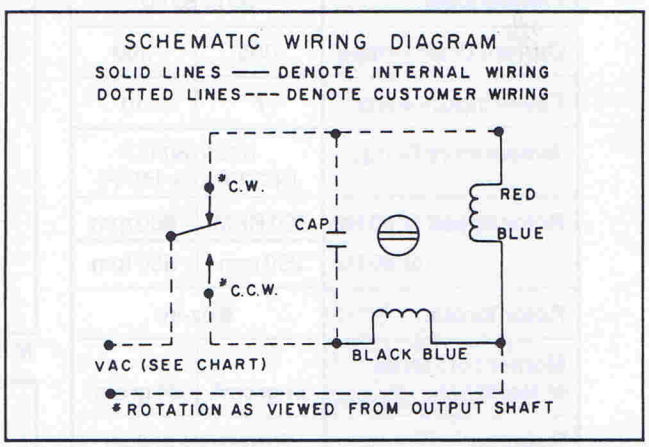
Part Number	Output Speed (rpm) @ 60 Hz	Output Speed (rpm) @ 50 Hz	*Synchronous Torque (oz-in)
K86601	600	500	6
K86608	300	250	10
K86611	150	125	20
K86612	120	100	25
K86613	100	83-1/3	30
K86615	72	60	41.7
K86616	60	50	50
K86617	50	41-2/3	60
K86619	40	33-1/3	75
K86621	30	25	100
K86622	25	20-5/6	120
K86623	24	20	125
K86624	20	16-2/3	150
K86627	15	12-1/2	200
K86630	12	10	200
K86631	10	8-1/3	200
K86633	8	6-2/3	200
K86636	6	5	200
K86639	4	3-1/3	200
K86641	3	2-1/2	200
K86645	2	1-2/3	200
K86652	1	5/6	200

*Gear Train is 200 oz-in for continuous operation on all series listed above.

SUFFIX IDENTIFICATION

Suffix	Nominal Voltage ±10%	†Series 86100 Phase Shift Capacitor mfd ±5% 60 Hz	†Series 86100 Phase Shift Capacitor mfd ±5% 50 Hz	†Series 86600 Phase Shift Capacitor mfd ±5% 60 Hz	†Series 86600 Phase Shift Capacitor mfd ±5% 50 Hz
U3	24 Vac	12	15	18	22
U4	120 Vac	.56	.68	.82	1
U5	240 Vac	.15	.18	.22	.25

†Capacitor not supplied with motor. Use an A.C. capacitor with a minimum value of two times the operating voltage of the motor.



HOW TO ORDER

From the tables shown select:
1. Part number for output speed & model.
2. Suffix for operating voltage.

Examples of completed part numbers are given below:

K86619 **U3**
- U3 — 24 volts 60 Hz / 50 Hz
- K86619 — Single Speed Reversible 40 rpm / 33-1/3 rpm

K86112 **U4**
- U4 — 120 volts 60 Hz / 50 Hz
- K86112 — Single Speed Reversible 120 rpm / 100 rpm

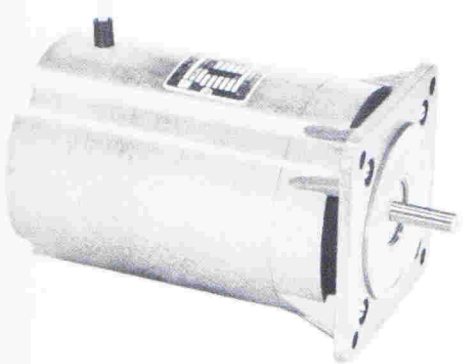
Elinco

Elinco Waterbury
a division of Electric Indicator Company Inc.
567-1 S. Leonard Street, Waterbury, CT 06708
(203) 591-1156 Fax (203)591-1159

ELINCO

Specific Technical Data Available On Over 950 Standard Units. Special Units Designed To Meet Your Requirements.

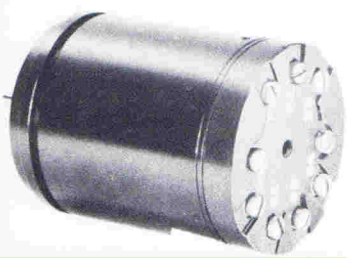
FRACTIONAL HORSEPOWER



SYNCHRONOUS MOTORS

"ELINCO" manufactures a wide variety of synchronous motors, both in the hysteresis and salient pole induction type.

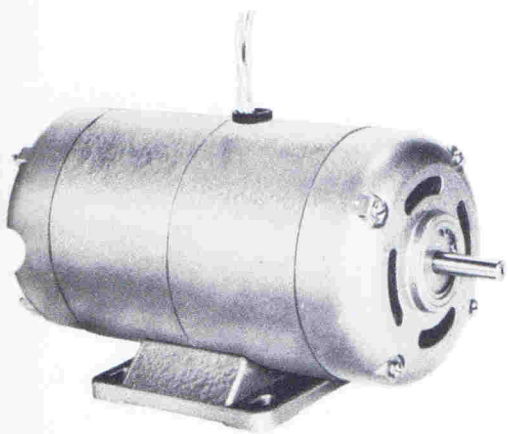
Whenever possible it is recommended that hysteresis type synchronous motors be used, since they are much quieter and are capable of pulling high intertia loads into synchronism. Their only disadvantage is that they will pull into synchronism in any position with respect to the line voltage phasing. Salient pole synchronous motors are inherently noisy, they cannot pull high inertia loads into synchronism and their only advantage is that they will lock in at some definite position, number of lock in positions being the same as the number of poles in the motor. Ratings are from 1/750 to ¼ HP at speeds from 300 to 12,000 RPM, frequencies from 30 to 400 cycles. Voltages up to 440 volts 1, 2 or 3 phase. Frame sizes are available from 2-1/4" diameter by 2-1/2" long, to 4-3/8" diameter by 8-1/2" long. Face, flange or base mounting can be supplied. All types are supplied with ball bearings.



SELF-SYNCHRONOUS MOTORS

"ELINCO" has been manufacturing commercial type synchros for 25 years. Self-synchronous synchros in midget "B" or "F" frame have an accuracy of 3° and a maximum torque of 2.5 oz. in.; in the "FB" frame the accuracy of 2° and maximum torque of 3.5 oz. in.; in the "A" frame the accuracy of 1° and a maximum torque of 50 oz. in. The midget frame is either 2¼ or 2½ inches in diameter by 3 inches long. "FB" frame 2½ inches in diameter by 4 inches long, and the "A" frame 3⅜" diameter by 6⅜" long. Mounting can be face, flange or base. These units have 115 volts 60 cycles primary and 34 volts secondary. Units for other frequencies and voltages are available. The "A" frame motor may be used as a master transmitter to several midget receivers.

In addition "ELINCO" manufactures rotating self-synchronous units, differential units, single phase rotating transformers and 3 phase, phase shifting rotary transformers. Elinco also manufactures military synchros in size 15 and 23 frames.



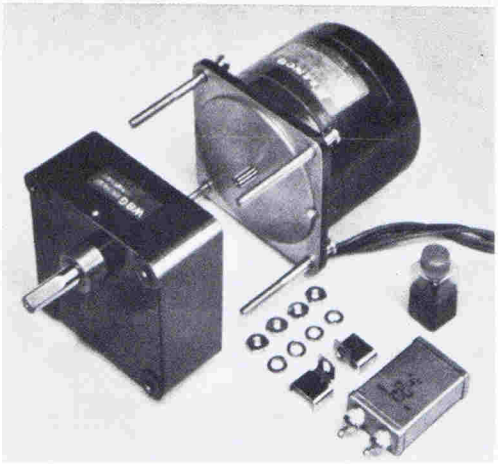
AC MOTOR AND GENERATOR SETS

A.C. MOTOR AND GENERATOR SETS are available with A.C. synchronous motors combined with an A.C. permanent magnet generator. These units can provide a source of odd frequency from standard frequency lines, such as 15-30-90-180 cycles, etc. The synchronous motor is supplied with shaft extension and can be used to drive a load, with the A.C. permanent magnet generator then used as a reference to indicate the position of the load at any instant. Another use is where these generators are provided with a rotating housing so that any phase shift from 0 to 360° can be simulated either with respect to another generator on the same unit; or to some external source. Horsepower rating of motor can be furnished to ⅛ HP with generators with an output voltage to 200 volts per 1000 RPM.

NEW ELINCO D.C. MOTOR AND GENERATOR SET combinations are available and consist of a D.C. motor to drive a load with D.C. tachometer generator to indicate speed, combined in one frame.

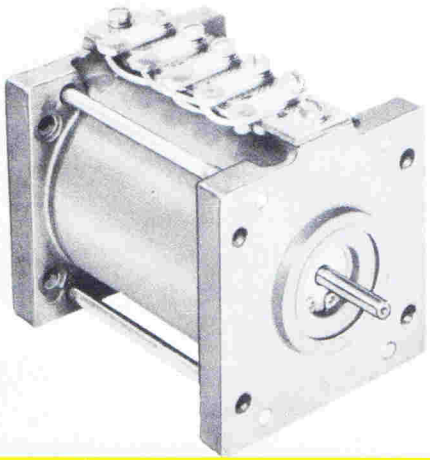
INSTRUMENT MOTORS

Elinco's line of "WM" instrument motors are designed to operate on 115 volt A.C. single phase power, either 50 or 60 Hz. Four types of motors are available; induction, hysteresis synchronous, reluctance synchronous and rapid reversing.



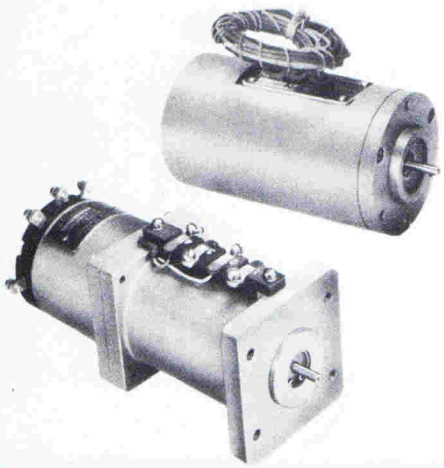
GEAR MOTORS

The "WM" line of motors can also be furnished as gear-motors with interchangeable gear heads available in a wide variety of gear reduction ratios. All "WM" motors are sold complete with the proper size capacitor for each unit.



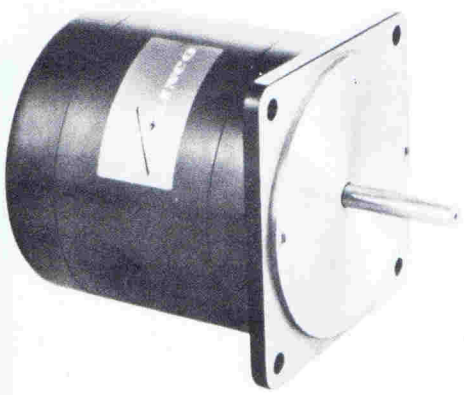
LOW INERTIA SERVO MOTORS

"ELINCO" Low Inertia A.C. Servo Motors are available in the new DP and M7 frames. These two-phase induction motors have low inertia squirrel cage rotors designed to eliminate cogging at low speeds, provide high torque to inertia ratios, linear torque speed characteristics with maximum torque at stall, and low starting voltage. They can be wound with 2 or 4 poles, for 60 or 400 cycle operations and provide a maximum stall torque of 6.5 oz. in. at 60 cycles. Three standard types of windings can be supplied: 1). For balance two phase operation. 2). For use with high voltage A.C. vacuum tube amplifiers with D.C. cancellation built into the winding, to null out D.C. current effects. 3). For use with transistor amplifiers.



AC MOTOR DRIVEN INDUCTION GENERATORS

"ELINCO" A.C. Motor Driven Induction Generators combine, in one frame, an induction motor having a high torque to inertia ratio with a linear drag cup generator. This simplifies the coupling problem by providing positive alignment in one housing having accurately machined dimensions. These motor generators are available in the new ELINCO MG8 and MG10 frames. For example, stall torques to 0.8 and 6.7 oz. in. and output volts per 1000 RPM to 3.5 and 7.0 respectively are available at 60 cycles. At 400 cycles, stall torques to 0.8 and 2.5 oz. in. and output voltages to 3.5 and 7.0 volts, 1000 RPM respectively can be obtained.



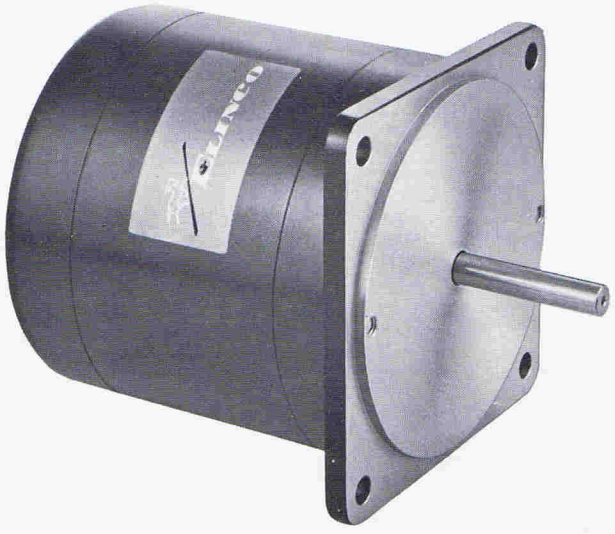
STEPPING MOTORS

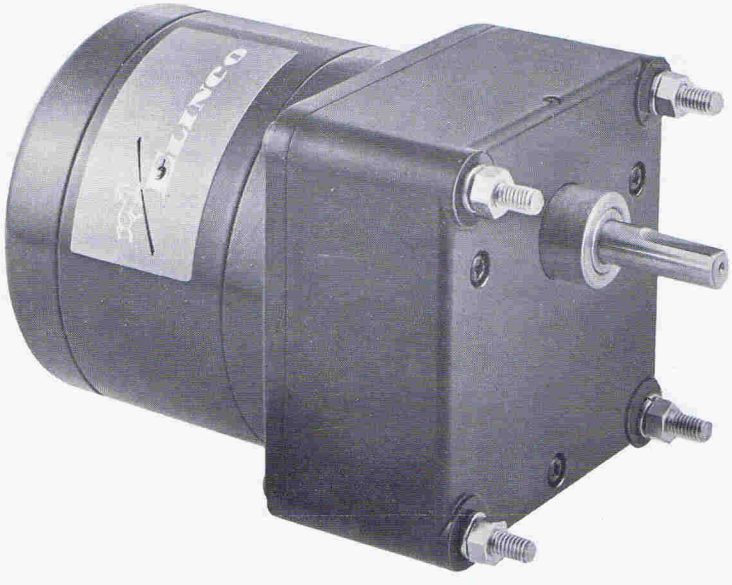
Stepping Motors are available in both Variable Reluctance and Permanent Magnet models. Stepping Motors are ideally suited for accurate positioning and control of digital programmed devices. Motors with frame diameters from 1.06" to 4.65". Stepping angles of 1.8, 4.5, 7.5, 9, 11.25, 12, 15, 22.5, 45, and 90 degrees are available in both face mounting and servo mounting configurations. Rotor torque ratings from 0.14 oz. in. to 25 oz. in. combined with 25 different interchangeable gearhead ratios provide broad applicability to diverse OEM applications.

Electric Indicator Company, Inc. 272 Main Ave. Norwalk, Conn. 06851 Phone (203) 847-5961

AC INSTRUMENT MOTORS
"WM" FRAME

INDUCTION
RAPID REVERSING
HYSTERESIS SYNCHRONOUS
RELUCTANCE SYNCHRONOUS



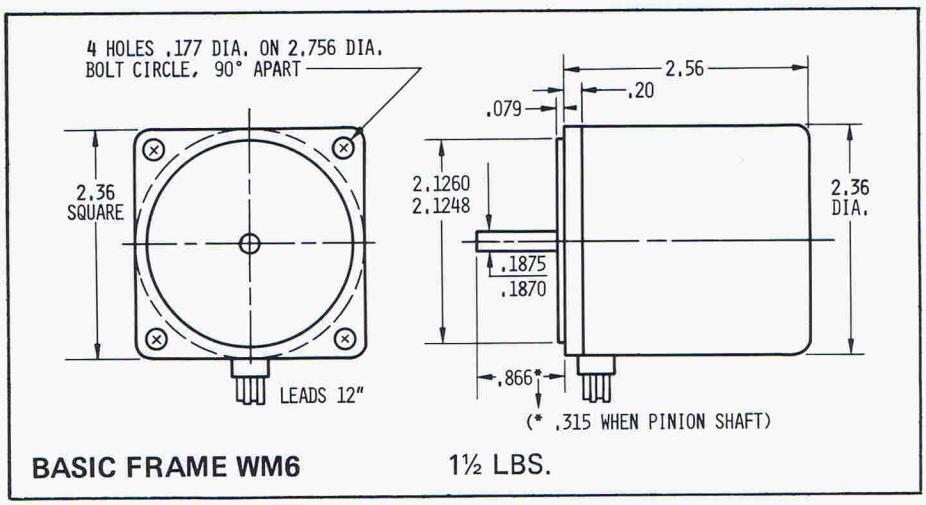


- 115 Volts, Single Phase, 60 And 50 Hertz
- Continuous Duty
- Reversible
- High Power Output
- Gear Ratios Available For 60 Or 50 Hertz
- Rugged Die Cast Construction
- Precision Ball Bearings
- Permanently Lubricated
- Metal Encased Oil-Filled Capacitor

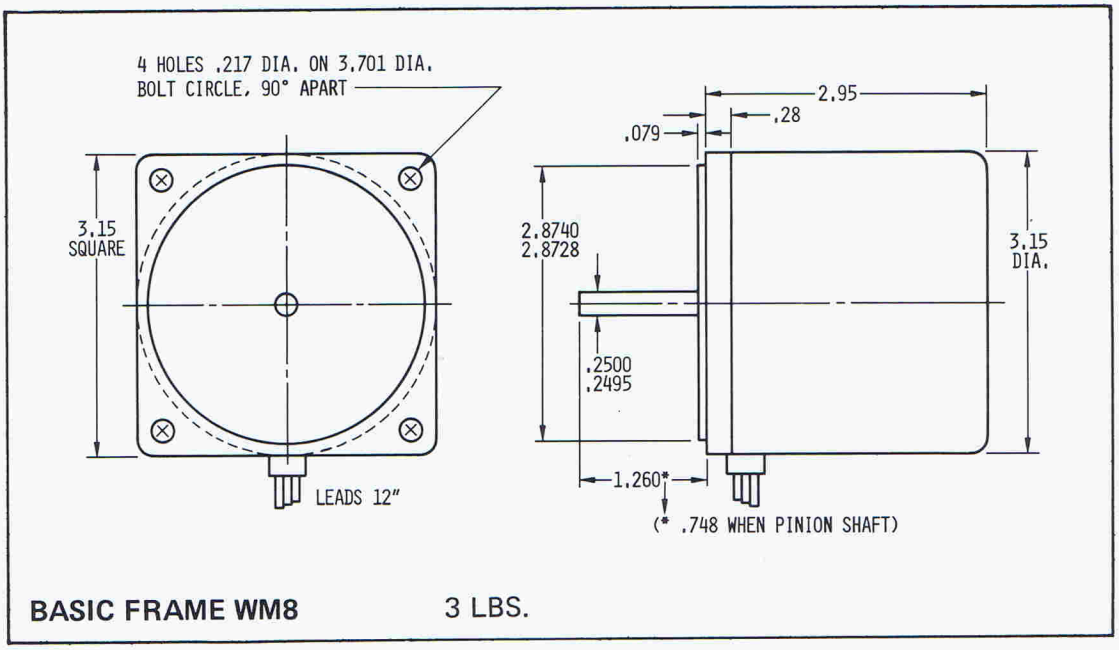
ELINCO

Electric Indicator Company, Inc., 272 Main Ave., Norwalk, Conn. 06851, Phone (203) 847-5861

"WM" INSTRUMENT MOTORS



BASIC FRAME WM6 1½ LBS.



BASIC FRAME WM8 3 LBS.

· NOTES ·

DIMENSIONS SHOWN ARE IN INCHES.

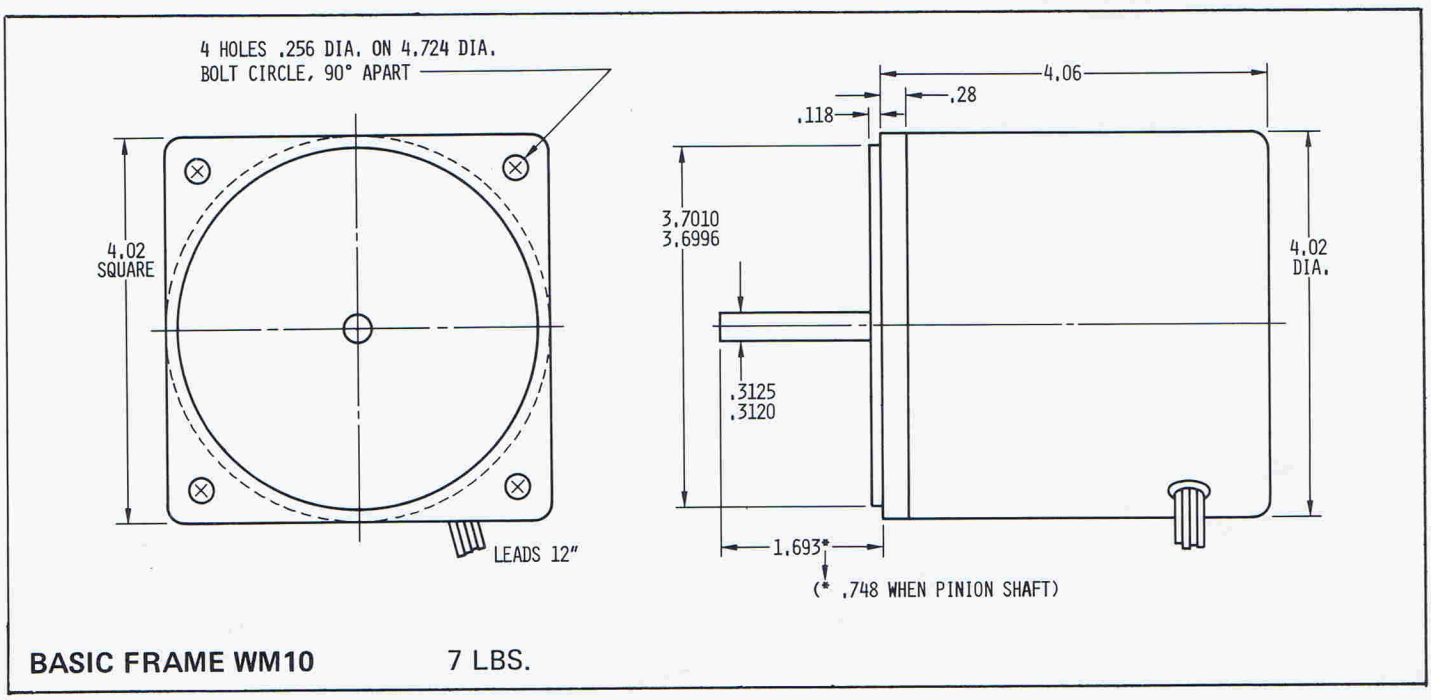
PRECISION MACHINED DIE CAST FRAMES.

TOTALLY ENCLOSED FRAMES.

ROTOR MOUNTED ON PERMANENTLY LUBRICATED, PRECISION BALL BEARINGS.

*PINION SHAFTS FOR USE WITH GEARHEADS.

GEARHEAD DIMENSIONS SHOWN ON PAGE 6.



BASIC FRAME WM10 7 LBS.

Elinco's new line of "WM" instrument motors are designed to operate on 115 volt AC single-phase power, either 50 or 60 Hz. The nominal performance data shown below is based on 60 Hz operation. The running capacitor of proper size is furnished with each unit. Four types of motors are available:

Induction Motor
Hysteresis Synchronous Motor
Reluctance Synchronous Motor
Rapid Reversing Motor

The first three types are all rated for continuous duty operation. The Rapid Reversing Motor is furnished with an internal mechanical brake and is rated for intermittent duty with a maximum duty cycle of 30 minutes. This type of motor is ideal for Induction Motor applications where coasting must be eliminated.

The "WM" instrument motors tabulated below are normally furnished with plain round shafts and in accordance with the dimensions shown on the opposite page. The plain shaft is designated in the Model Number by the letter "S", following motor type and size codes.

The "WM" line of motors can also be furnished as gearmotors (see pages 4, 5 and 6) with matching gearheads in a wide variety of gear reduction ratios. In such combination, the motor is furnished with a spline (pinion) shaft to fit the gearhead. The pinion shaft is designated in the Model Number by the letter "P" following motor type and size codes.

Before ordering either motors with plain shafts or gearmotor combinations, the designer should refer to the Model Number Nomenclature at the top of page 7 to insure correct specification.

INDUCTION MOTORS – WI

115 VOLTS, 60 HERTZ, 1 PHASE

Model	HP	Speed rpm	Poles	RATED			STARTING			Capacitor Mfd.	Basic Frame	Wiring Code (page 7)
				Torque oz-in.	Input Watts	Current MA	Torque oz-in.	Input Watts	Current MA			
WIM6S3	1/250	1500	4	3.2	12.5	110	3.2	12.5	155	1	WM6	A
WIM8S7	1/110	1600	4	6.0	20.0	165	5.7	25.0	235	1.2	WM8	A
WIM8S15	1/50	1600	4	13.0	33.0	280	8.8	48.0	485	2	WM8	A
WIM10S30	1/25	1600	4	24.3	57.0	570	19.2	115.0	1200	3	WM10	A
DUAL SPEEDS												
WIM6S3D1	1/200	3000	2	2.0	13	115	1.0	18	165	1.2	WM6	C
	1/400	1500	4	2.0	13	110	1.9	15	120	1.2		
WIM8S12D6	1/60	3200	2	5.2	31	260	10.9	48	405	3	WM8	C
	1/120	1600	4	5.2	25	205	9.9	33	280	3		
WIM10S30D15	1/25	3200	2	11.5	55	495	12.5	120	1150	4	WM10	C
	1/50	1600	4	13.7	40	350	12.0	75	685	4		

RAPID REVERSING MOTORS – WR (Intermittent Duty)

115 VOLTS, 60 HERTZ, 1 PHASE

Model	HP	Speed rpm	Poles	RATED			STARTING			Capacitor Mfd.	Basic Frame	Wiring Code (page 7)
				Torque oz-in.	Input Watts	Current MA	Torque oz-in.	Input Watts	Current MA			
WRM6S2	1/500	1450	4	2.8	15	135	2.6	22	190	1.5	WM6	B
WRM6S4	1/200	1450	4	4.2	19	165	6.8	26	225	2	WM6	B
WRM8S7	1/100	1600	4	8.8	27	220	5.6	37	315	3	WM8	B
WRM8S20	1/40	1600	4	22.4	60	480	18.4	85	780	6	WM8	B
WRM10S40	1/20	1550	4	30.0	104	950	46.0	184	1650	12	WM10	B

HYSTERESIS SYNCHRONOUS MOTORS – WH

115 VOLTS, 60 HERTZ, 1 PHASE

Model	HP	Speed rpm	Poles	RATED			STARTING			Capacitor Mfd.	Basic Frame	Wiring Code (page 7)
				Torque oz-in.	Input Watts	Current MA	Torque oz-in.	Input Watts	Current MA			
WHM6S1	1/750	1800	4	.76	8.5	103	1.5	11.5	125	0.5	WM6	A
WHM6S2	1/375	3600	2	.75	15		1.0			1.2	WM6	A
WHM8S5	1/150	1800	4	3.0	16	185	7.1	23	240	1.2	WM8	A
WHM10S15	1/50	1800	4	11.2	45					3	WM10	A
DUAL SPEEDS												
WHM6S2D1	1/375	3600	2	.76	12	110	.9	15	154	1.2	WM6	C
	1/750	1800	4	.76	12.5	112	.8	13	117	1.2		
WHM8S5D2	1/150	3600	2	1.8	18	155	2.3	21	185	2	WM8	C
	1/375	1800	4	1.8	19	165	3.3	21	175	2		
WHM10S15D7	1/50	3600	2	5.6	42					5	WM10	C
	1/110	1800	4	5.6	42					5		

RELUCTANCE SYNCHRONOUS MOTORS – WS

115 VOLTS, 60 HERTZ, 1 PHASE

Model	HP	Speed rpm	Poles	RATED			STARTING			Capacitor Mfd.	Basic Frame	Wiring Code (page 7)
				Torque oz-in.	Input Watts	Current MA	Torque oz-in.	Input Watts	Current MA			
WSM6S2	1/375	1800	4	1.5	12.3	110	1.9	18	160	1.2	WM6	A
WSM8S5	1/150	1800	4	3.5	19.5	194	4.7	44	425	1	WM8	A
WSM8S10	1/75	1800	4	5.0	30	370	5.8	72	715	2	WM8	A
WSM10S15	1/50	1800	4	11.1	42.5	440	12.8	146	1540	2.5	WM10	A
WSM10S20	1/40	1800	4	14.0	50	560	13.6	165	1800	3	WM10	A

NON-SYNCHRONOUS GEARMOTORS SPEED-TORQUE SELECTION CHART

SPEED		TORQUE – WM6 TYPE NON-SYNCHRONOUS GEARMOTORS				SELECTION	TORQUE – WM8 TYPE NON-SYNCHRONOUS GEARMOTORS					SELECTION	
60 Hz rpm	50 Hz rpm	WIM6P3D1 oz-in.	WRM6P2 oz-in.	WIM6P3 oz-in.	WRM6P4 oz-in.	Gearhead Model No. *	WIM8P12D6 oz-in.	WIM8P7 oz-in.	WRM8P7 oz-in.	WIM8P15 oz-in.	WRM8P20 oz-in.	Gearhead Model No.	Gearhead Length inch
.86	.7	140	140	140	140	W6G1800	600	600	600	600	600	W8G1800	
1.0	.8	140	140	140	140	W6G1500	600	600	600	600	600	W8G1500	
1.7	1.4	140	140	140	140	W6G900	600	600	600	600	600	W8G900	
2.1	1.7	140	140	140	140	W6G750	600	600	600	600	600	W8G750	
2.6	2.2	140	140	140	140	W6G600	600	600	600	600	600	W8G600	1.89
3.1	2.6	140	140	140	140	W6G500	600	600	600	600	600	W8G500	
3.4	2.8	140	140	140	140	W6G450	600	600	600	600	600	W8G450	
4.1	3.4	140	140	140	140	W6G375	600	600	600	600	600	W8G375	
4.3	3.6	140	140	140	140	W6G360	600	600	600	600	600	W8G360	
5.2	4.3	140	140	140	140	W6G300	600	600	600	600	600	W8G300	
6.2	5.2	140	140	140	140	W6G250	600	600	600	600	600	W8G250	
6.9	5.7	140	140	140	140	W6G225	600	600	600	600	600	W8G225	
8.3	6.9	140	140	140	140	W6G187.5	600	600	600	600	600	W8G187.5	1.54
8.6	7.2	140	140	140	140	W6G180	600	600	600	600	600	W8G180	
10.3	8.6	140	140	140	140	W6G150	520	600	600	600	600	W8G150	
13	10.8	140	140	140	140	W6G120	418	585	600	600	600	W8G120	
15.5	13.0	140	140	140	140	W6G100	402	563	600	600	600	W8G100	
17.2	14.3	134	140	140	140	W6G90	362	507	600	600	600	W8G90	
21	17	112	140	140	140	W6G75	302	422	600	600	600	W8G75	
26	22	90	126	140	140	W6G60	241	337	429	600	600	W8G60	
31	26	75	105	131	140	W6G50	201	281	358	543	600	W8G50	
43	36	54	75	94	108	W6G36	145	202	257	390	590	W8G36	
52	43	45	63	78	90	W6G30	121	169	214	325	492	W8G30	
62	51	43	60	76	86	W6G25	101	141	179	271	410	W8G25	
86	71	31	44	55	62	W6G18	73	102	129	196	296	W8G18	1.30
103	86	26	36	46	52	W6G15	61	85	108	163	247	W8G15	
124	103	22	30	38	43	W6G12.5	51	71	90	136	206	W8G12.5	
155	129	17	24	31	35	W6G10	40	56	71	108	163	W8G10	
258	215	10	15	18	21	W6G6	24	34	43	65	98	W8G6	
310	258	8.6	12	15	17	W6G5	20	28	36	54	82	W8G5	

*All W6G Gearheads have 1.06" length.

SPEED		TORQUE – WM10 SIZE NON-SYNCHRONOUS GEARMOTORS			SELECTION	
60 Hz rpm	50 Hz rpm	WIM10P30D15 oz-in.	WIM10P30 oz-in.	WRM10P40 oz-in.	Gearhead Model No.	Gearhead Length inch
8.6	7.2	1500	1500	1500	W10G180	
10.3	8.6	1500	1500	1500	W10G150	
13	10.8	1312	1500	1500	W10G120	
15.5	13.0	1093	1500	1500	W10G100	1.97
17.2	14.3	985	1500	1500	W10G90	
21	17	820	1500	1500	W10G75	
26	22	656	1340	1500	W10G60	
31	26	589	1204	1500	W10G50	
43	36	423	750	750	W10G36	
52	43	354	723	750	W10G30	
62	51	294	600	750	W10G25	1.62
86	71	212	434	618	W10G18	
103	86	177	359	515	W10G15	
124	103	147	300	428	W10G12.5	
155	129	118	242	345	W10G10	
258	215	71	145	206	W10G6	
310	258	58	120	170	W10G5	

GEARMOTOR SELECTION FROM CHARTS

To select the proper combination of motor and gearhead, enter the speed columns for either 60 Hz or 50 Hz at the desired output speed. Read to right, on the same line as desired output speed, to find the lowest torque value *equal* to or greater than required. The Model Number of the motor required will be found at the top of the column which lists the selected torque value. Also on the same line, and in the last column of the chart for each basic motor type, will be found the proper Gearhead Model Number.

Example: An induction gearmotor is to operate on 60 Hz at 103 rpm, and deliver 85 inch-ounces of torque. The complete gearmotor number (Motor No. plus Gearhead No.) is designated as WIMSP7-W8G15. The digit or digits following the gearhead number (W8G in this case) represent the reduction ratio (15:1 in this case).

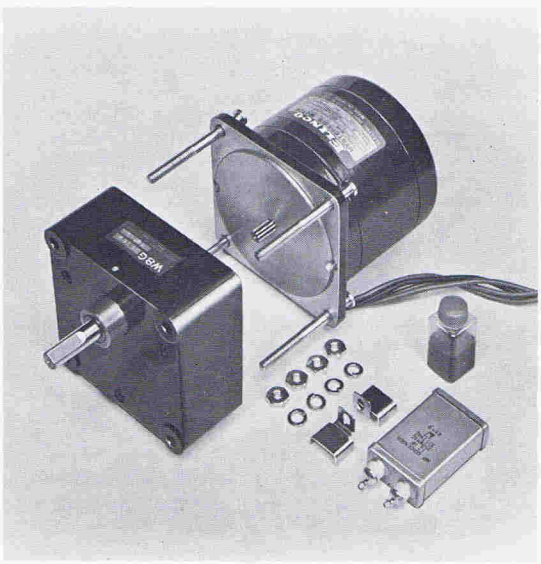
The actual output of a non-synchronous gearmotor combination may vary with the load, within ±10% of the motor's rotor speed which averages 1550 rpm at rated load. The dual-speed motors have a two-pole output speed twice that of the four-pole value on which the selection charts are based, with the same output torque at either speed.

SYNCHRONOUS GEARMOTORS
SPEED-TORQUE SELECTION CHART

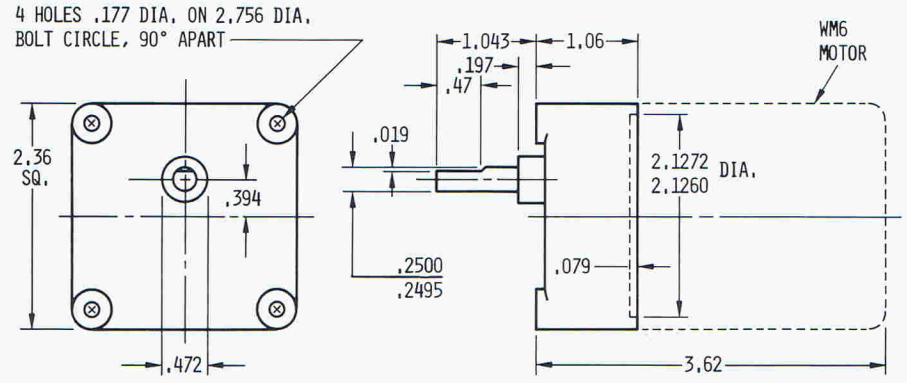
SPEED		TORQUE – WM6 TYPE SYNCHRONOUS GEARMOTORS		SELECTION	TORQUE – WM8 TYPE SYNCHRONOUS GEARMOTORS			SELECTION	
60 Hz	50 Hz	WHM6P1 WHM6P2D1	WSM6P2	Gearhead Model No. *	WHM8P5D2	WHM8P5 WSM8P5	WSM8P10	Gearhead Model No.	Gearhead Length
rpm	rpm	oz-in.	oz-in.		oz-in.	oz-in.	oz-in.		inch
1	.8	140	140	W6G1800	600	600	600	W8G1800	
1.2	1	140	140	W6G1500	600	600	600	W8G1500	
2	1.6	140	140	W6G900	600	600	600	W8G900	
2.4	2	140	140	W6G750	600	600	600	W8G750	
3	2.5	140	140	W6G600	600	600	600	W8G600	1.89
3.6	3	140	140	W6G500	600	600	600	W8G500	
4	3.3	140	140	W6G450	563	600	600	W8G450	
4.8	4	140	140	W6G375	470	600	600	W8G375	
5	4.2	140	140	W6G360	452	600	600	W8G360	
6	5	140	140	W6G300	376	600	600	W8G300	
7.2	6	131	140	W6G250	313	600	600	W8G250	
8	6.6	118	140	W6G225	283	581	600	W8G225	
9.6	8	98	140	W6G187.5	236	485	600	W8G187.5	1.54
10	8.3	94	140	W6G180	225	463	600	W8G180	
12	10	84	140	W6G150	187	385	600	W8G150	
15	12.5	67	135	W6G120	150	309	600	W8G120	
18	15	56	112	W6G100	145	297	600	W8G100	
20	16.6	51	100	W6G90	130	268	543	W8G90	
24	20	42	84	W6G75	109	223	452	W8G75	
30	25	34	67	W6G60	87	178	362	W8G60	
36	30	28	56	W6G50	72	149	302	W8G50	
50	41.6	20	40	W6G36	52	107	217	W8G36	
60	50	17	34	W6G30	43	89	181	W8G30	
72	60	16	32	W6G25	36	74	151	W8G25	1.30
100	83.3	12	23	W6G18	26	54	109	W8G18	
120	100	9.8	20	W6G15	22	45	91	W8G15	
144	120	8.1	16	W6G12.5	18	37	76	W8G12.5	
180	150	6.5	13	W6G10	14	30	60	W8G10	
300	250	3.9	7.8	W6G6	9	18	36	W8G6	
360	300	3.2	6.4	W6G5	7.2	15	30	W8G5	

*All W6G Gearheads have 1.06" length.

SPEED		TORQUE – WM10 TYPE SYNCHRONOUS GEARMOTORS			SELECTION	
60 Hz	50 Hz	WHM10P15D7	WHM10P15 WSM10P15	WSM10P20	Gearhead Model No.	Gearhead Length
rpm	rpm	oz-in.	oz-in.	oz-in.		inch
10	8.3	812	1500	1500	W10G180	
12	10	678	1355	1500	W10G150	
15	12.5	540	1081	1476	W10G120	
18	15	450	900	1230	W10G100	
20	16.6	405	811	1108	W10G90	
24	20	338	675	923	W10G75	1.97
30	25	270	540	737	W10G60	
36	30	242	485	662	W10G50	
50	41.6	174	348	476	W10G36	
60	50	146	291	398	W10G30	
72	60	121	242	330	W10G25	
100	83.3	87	175	239	W10G18	
120	100	73	146	199	W10G15	1.62
144	120	60	121	165	W10G12.5	
180	150	49	97	133	W10G10	
300	250	29	58	80	W10G6	
360	300	24	48	66	W10G5	



INTERCHANGEABLE GEARHEADS

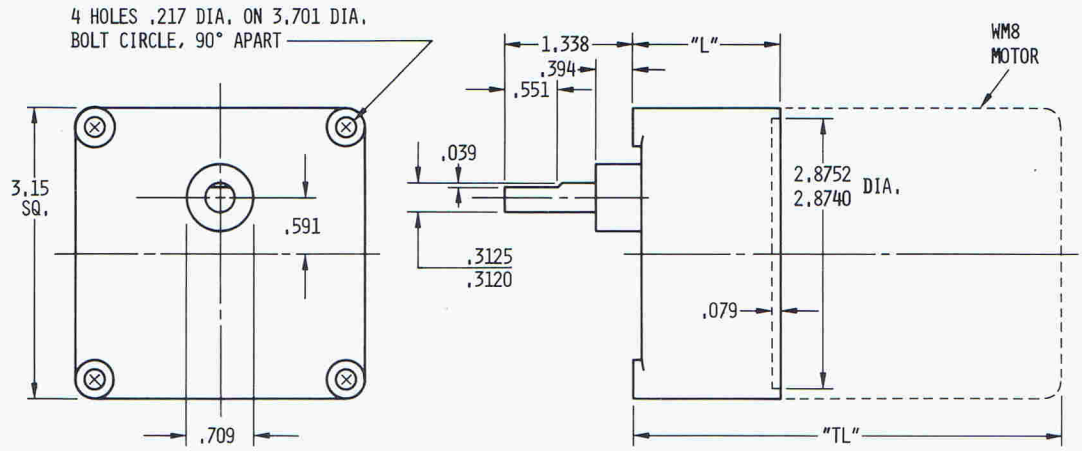


GEARHEAD W6G ¾ LBS.

Elinco Type "W-G" gearheads are constructed with precision gears, rigid housing and permanently lubricated ball bearings. *They are designed to fit all Elinco Type "WM" motors of the same basic frame.* The first step gear is made of tough phenolic resin material for quieter operation. In general, all gearheads should be used with a torque same as or less than specified in the tables on pages 4 and 5. Heavy-duty gearheads are available on request.

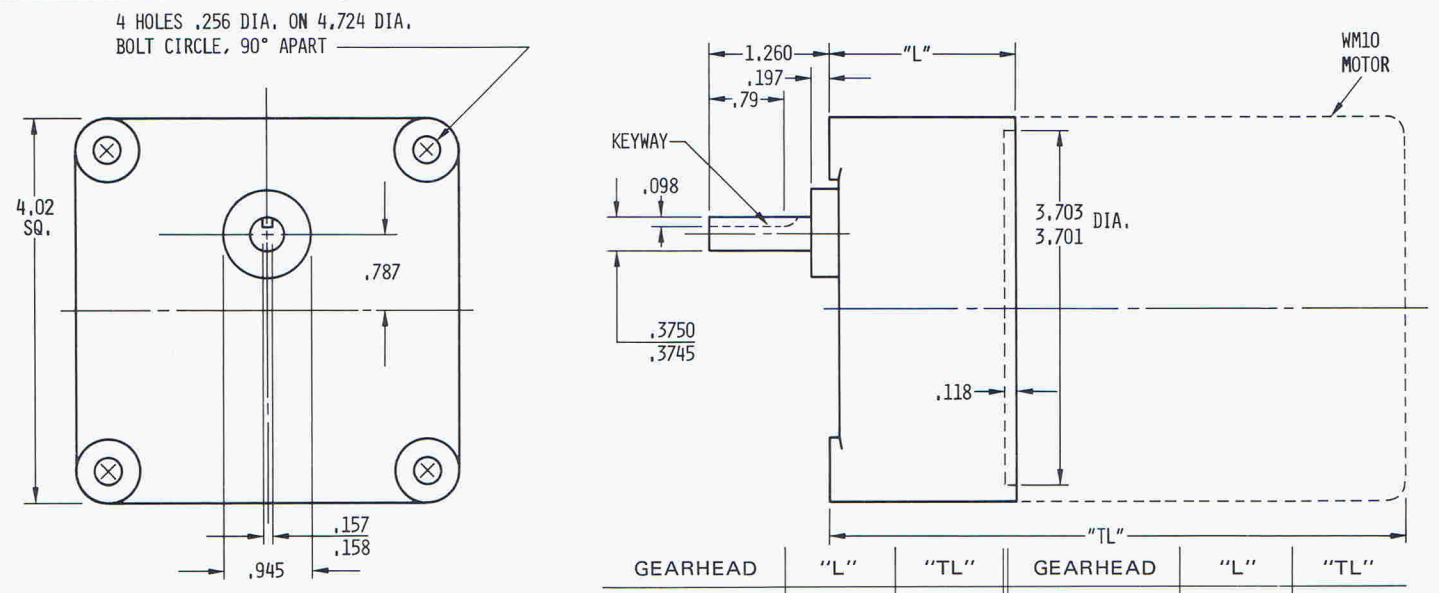
MOUNTING HARDWARE IS SUPPLIED WITH EACH UNIT.

(see photo on page 5)



GEARHEAD	"L"	"TL"
W8G5 W8G60	1.30	4.25
W8G75 W8G360	1.54	4.49
W8G375 W8G1800	1.89	4.84

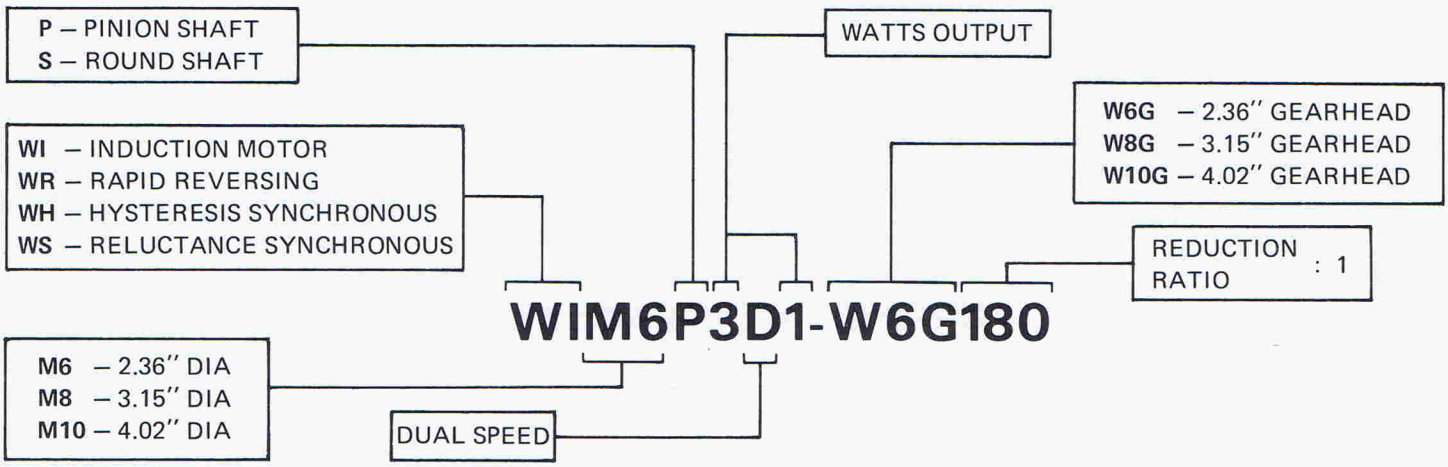
GEARHEAD W8G 1¼ LBS.



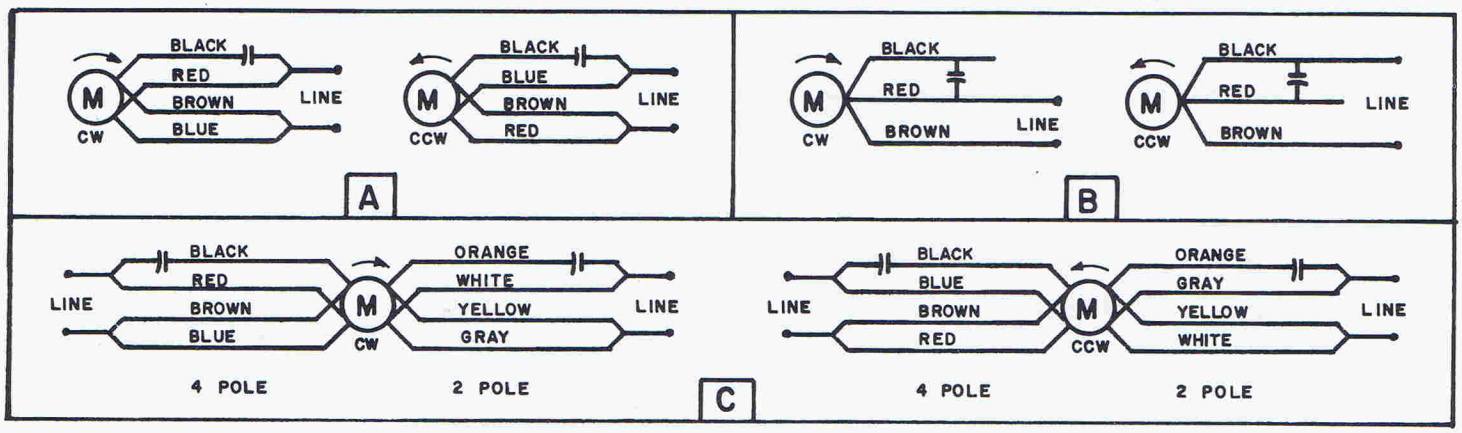
GEARHEAD	"L"	"TL"	GEARHEAD	"L"	"TL"
W10G5 W10G36	1.62	5.68	W10G50 W10G180	1.97	6.03

GEARHEAD W10G 2¼ LBS.

NOMENCLATURE



WIRING CODE (Rotation facing shaft end)



TORQUE CONVERSION TABLES

oz-in.	*	kg-cm	oz-in.	*	kg-cm	oz-in.	*	kg-cm	oz-in.	*	kg-cm	oz-in.	*	kg-cm
13.89	**1**	.07	291.63	**21**	1.51	569.38	**41**	2.95	847.13	**61**	4.39	1124.88	**81**	5.83
27.77	**2**	.14	305.52	**22**	1.58	583.27	**42**	3.02	861.02	**62**	4.46	1138.76	**82**	5.90
41.66	**3**	.22	319.41	**23**	1.66	597.16	**43**	3.10	874.90	**63**	4.54	1152.65	**83**	5.98
55.55	**4**	.29	333.30	**24**	1.73	611.04	**44**	3.17	888.79	**64**	4.61	1166.54	**84**	6.05
69.44	**5**	.36	347.18	**25**	1.80	624.93	**45**	3.24	902.68	**65**	4.68	1180.43	**85**	6.12
83.32	**6**	.43	361.07	**26**	1.87	638.82	**46**	3.31	916.57	**66**	4.75	1194.31	**86**	6.19
97.21	**7**	.50	374.96	**27**	1.94	652.71	**47**	3.38	930.45	**67**	4.82	1208.20	**87**	6.26
111.10	**8**	.58	388.85	**28**	2.02	666.59	**48**	3.46	944.34	**68**	4.90	1222.09	**88**	6.34
124.99	**9**	.65	402.73	**29**	2.09	680.48	**49**	3.53	958.23	**69**	4.97	1235.98	**89**	6.41
138.87	**10**	.72	416.62	**30**	2.16	694.37	**50**	3.60	972.12	**70**	5.04	1249.86	**90**	6.48
152.76	**11**	.79	430.51	**31**	2.23	708.26	**51**	3.67	986.00	**71**	5.11	1263.75	**91**	6.55
166.65	**12**	.86	444.40	**32**	2.30	722.14	**52**	3.74	999.89	**72**	5.18	1277.64	**92**	6.62
180.54	**13**	.94	458.28	**33**	2.38	736.03	**53**	3.82	1013.78	**73**	5.26	1291.53	**93**	6.70
194.42	**14**	1.01	472.17	**34**	2.45	749.92	**54**	3.89	1027.67	**74**	5.33	1305.41	**94**	6.77
208.31	**15**	1.08	486.06	**35**	2.52	763.81	**55**	3.96	1041.55	**75**	5.40	1319.30	**95**	6.84
222.20	**16**	1.15	499.95	**36**	2.59	777.69	**56**	4.03	1055.44	**76**	5.47	1333.19	**96**	6.91
236.09	**17**	1.22	513.83	**37**	2.66	791.58	**57**	4.10	1069.33	**77**	5.54	1347.07	**97**	6.98
249.97	**18**	1.30	527.72	**38**	2.74	805.47	**58**	4.18	1083.21	**78**	5.62	1360.96	**98**	7.06
263.86	**19**	1.37	541.61	**39**	2.81	819.35	**59**	4.25	1097.10	**79**	5.69	1374.85	**99**	7.13
277.75	**20**	1.44	555.49	**40**	2.88	833.24	**60**	4.32	1110.99	**80**	5.76	1388.74	**100**	7.20

*Enter the table in this column, whose bold face numbers are torque values in *either* ounce-inches *or* kilogram centimeters. To convert oz-in to kg-cm, simply read kg-cm value at right. To convert kg-cm to oz-in, simply read oz-in value to left.

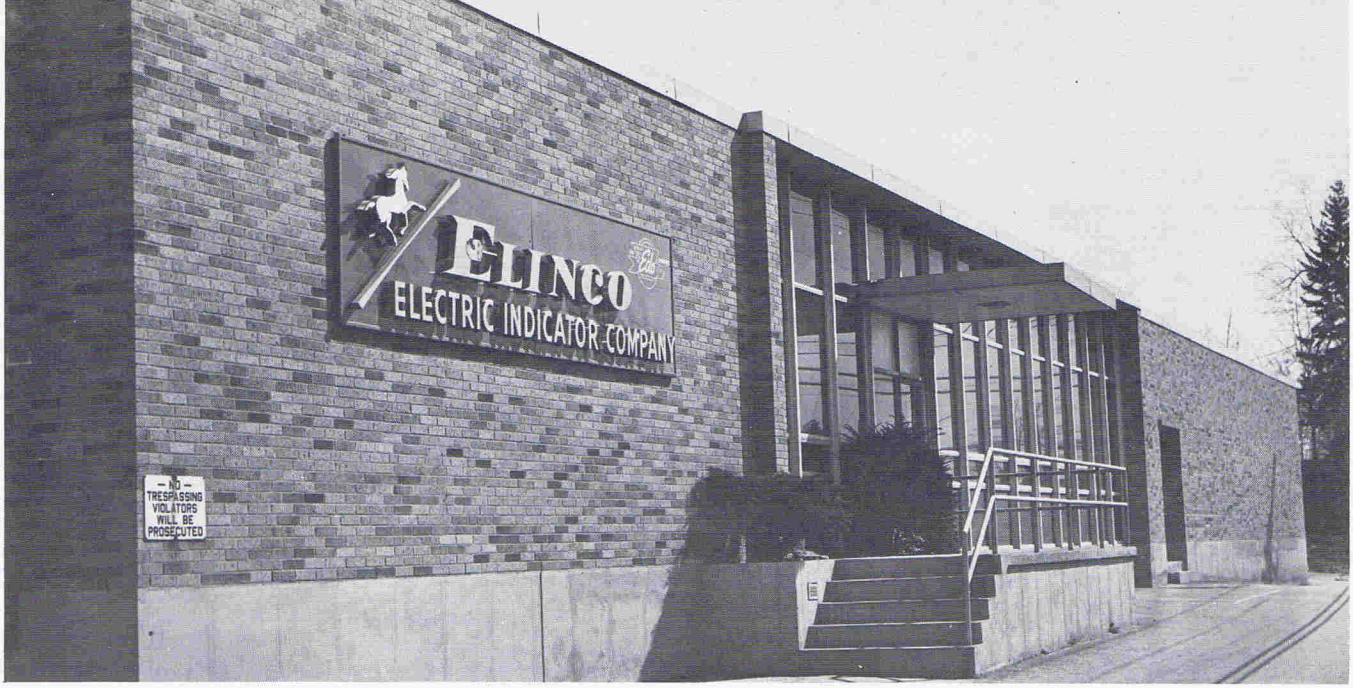
Examples: 3 oz-in = .22 kg-cm. 3 kg-cm = 41.66 oz-in.

Simple Metric Conversion:

kg-cm *to* kg-mm — move decimal one place to right (e.g. 1.8 kg-cm = 18 kg-mm)

kg-cm *to* gm-cm — move decimal 3 places to right (e.g. 1.8 kg-cm = 1800 gm-cm)

kg-cm *to* gm-mm — move decimal 4 places to right (e.g. 1.8 kg-cm = 18000 gm-mm)



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