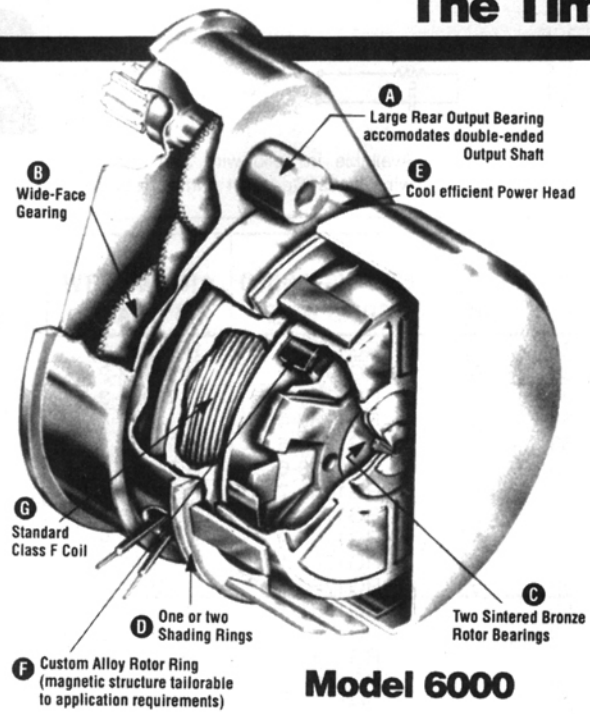
The Time and Motion Experts:



Model 6000

The story behind the development of Model 6000 . . . the ultimate in hysteresis motor design.

Hysteresis motors vs permanent magnet motors?

Well, PM motors are great. That's why we make them. They are, in many cases, by far the most cost-effective motor for the job.

But. There are *also* applications that cry out for the inherent advantages of hysteresis design — (1) quiet smooth operation, (2) insensitivity to high inertia loads, (3) back driving capability and, above all (4) the flexibility and design advantages of "stallability-without-damage"* performance.

These advantages are the reason *why* we make *hysteresis* motors *as well as* PM motors . . . and have done so for the past 30 years . . . and why we *continue* to add refinements to this familiar motor.

Cramer Model 6000 is the most effective hysteresis motor ever conceived . . . one that establishes new performance levels. The *standard* Model 6000, for example, is a Class F (155°C) motor, formerly available throughout the industry only as a *"special"*. It also has UL recognition and CSA approval for up to 6 watts of input power.

(continued at top of next page)

AC Hysteresis Synchronous Motors: Standard Models.

These unidirectional models offer smooth starting, smooth running, quiet operation, stallability-without-damage and remarkable flexibility of design.

- Low reset torques.
- High starting torques.
- Shaded pole construction.
- Wide range of output speeds.
- Rugged construction.
- Lifetime lubrication.

PERFORMANCE DATA

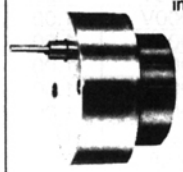
Torque (oz. in.)	247	447	357	420
Rated Start	16	40	22	N/A
Start (typical)	22	45	25	20
Run (typical)	67	81	60	20
Synchronous (typical)	37	37	20	20

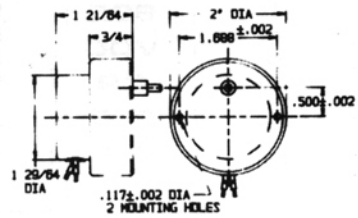
Model 357: Shift/clutch design. Rotor disengages from gear train to permit output shaft to be turned by external reset mechanisms.

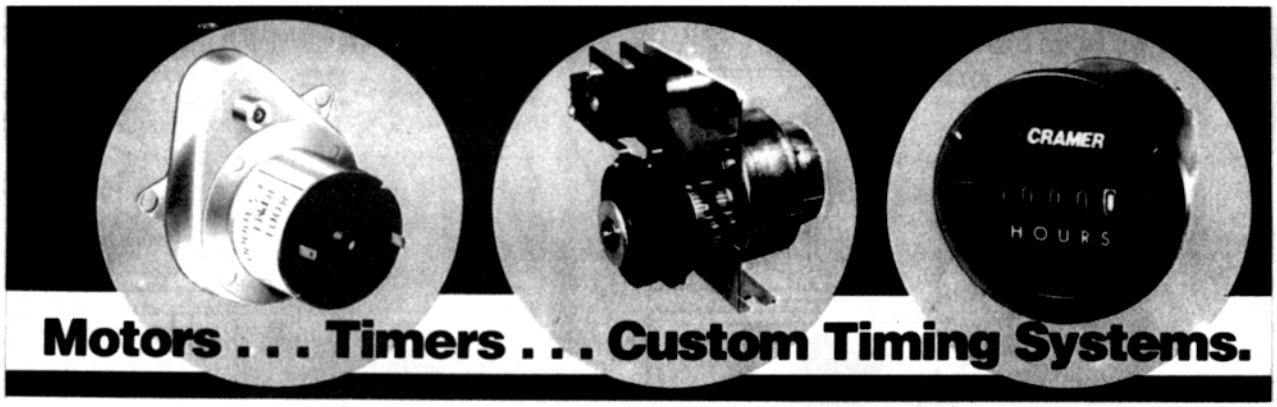
Model 420: This is Model 447 with second gear train to produce very slow speeds. Usable torque is limited by gear train rating.

Models 247 & 447

Both models designed for continuous duty applications. Use Model 247 in applications involving lower torques, lower motor temps.







21 MOTORS

A Cramer 6000 does the job of a competitive unit at a much lower temperature rise.

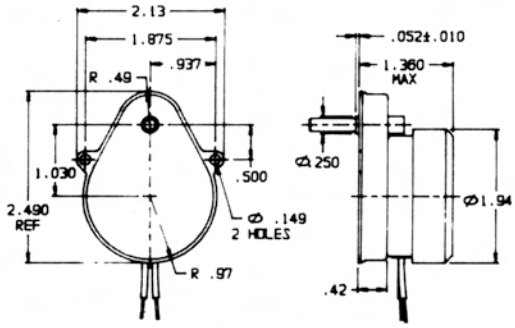
Check these exclusive design advantages in drawing at left:

Gear cup incorporates larger rear output bearing (A) allowing for enhanced sideload capacity and double-ended output shaft. Brass spur gears themselves (B) have wider face. Rotor bearing (C) is permanently lubricated, sintered bronze rather than lead babbitt. Shading ring (D) offers a new level of design flexibility; variations in shading rings, rotor and coil serve to modify start, stall and reset torques and control a wide range of performance characteristics.

Product description:

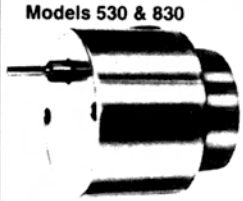
Shaded pole, single phase, synchronous-type hysteresis motor that provides smooth quiet performance and allows operation to a stall condition without damage* or increase in temperature rise. Pear-shaped gear box is designed to contain a wide range of gear ratios along with one-way and two-way frictions. Output shaft can be configured with pinions, levers, flats, knurls, etc. Outboard rear bearing provides stability and strength and allows for a double-ended output shaft. Wide selection of output speeds is offered with high starting torques and low reset torques. Custom designs available.

PERFORMANCE DATA	Model 6000
Operating Voltages (AC)	24, 115, 220, 240; 50 or 60 Hz
Input Power:	6 Watts Max
Maximum Coil Operating Temp.:	155°C
Rotor Speed:	600 RPM
Stall Torque @ 5 Watts 60 Hz:	80 oz. in. @ 1 RPM 15 oz. in. @ 6 RPM
Operating Temperature Range:	-40° to +100°C



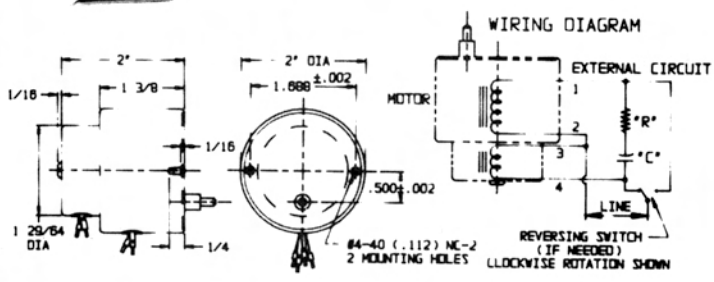
AC Hysteresis: Reversible Models.

Models 530 & 830



Advantages of standard hysteresis motors *plus reversibility*. Use these capacitor phase shift units when *electrical* reset rather than "spring reset reversibility" is required.

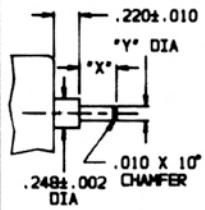
PERFORMANCE		
Torque (oz. in.)	530	830
Rated start	45	100
Start (typical)	52	125
Run (typical)	102	150
Synchronous (typ.)	35	28



Shafts & Bearings

Standard shafts are steel, machined from centerless ground stock and case hardened for longer life. Bearings are machined from commercial bronze. Other shaft and bearing configurations and materials available on special order.

Round



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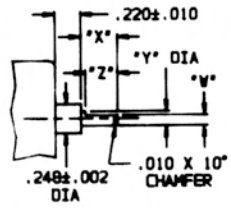
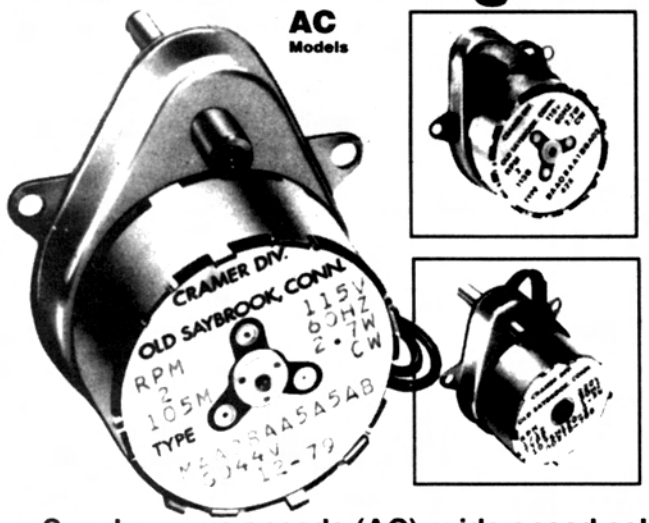
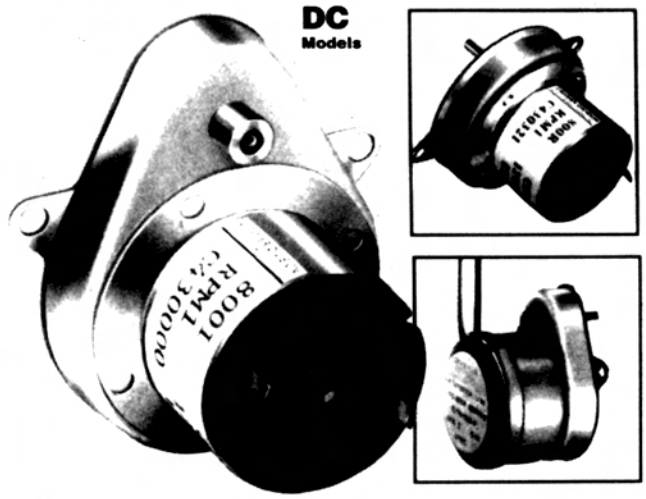


CODE	X	Y
26	5/16	.125
41D	13/16	.125
75D	1/2	.125
82D	3/8	.125

CODE	W	X	Y	Z
27D	.093	5/16	.125	1/4
511D	.093	1/2	.125	7/16
93D	.093	3/8	.125	1/4

Permanent Magnet AC & DC Gearmotors





• Synchronous speeds (AC), wide speed selection.
• UL Listed & CSA Approved • Custom designs

These remarkably efficient power heads are all permanent magnet inductor types and are designed for use in applications where fast starts and stops are a consideration. When "PM" motors are operated within their starting torque ratings, they typically reach synchronous speed during the first two cycles of applied voltage . . . and stop with far less coast than comparable hysteresis motors. Maximum running torques greater than those developed by hysteresis units of the same size are customary. Speed is as accurate as line frequency.

Cramer DC Permanent Magnet Motors are available for applications demanding the use of DC power. It should be noted that with DC units it is essential that we know torque requirements at specific speeds in order to be able to determine correct motor/gear combinations.

High torque applications

- Cassette lift: copiers
- Valve drives: water softeners
- Chart recorders: heavy duty paper drive
- Automatic teller machines: paper drive
- Automatic tollgates: ticket dispenser

Medium to light torque applications

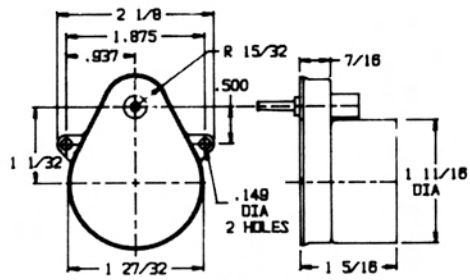
- Chart recorders: paper drive
- Irrigation control: timing
- Displays: point-of-purchase
- Telescope drives
- Pill dispensers: belt drives
- Emergency lighting: rotating beacon drives

PERFORMANCE DATA

	105	107	113	800I/800R	800P
Rotor Speed (RPM)	600	450	240	2400-4800	1200-3600
Starting Torque (oz. in. @ 1 RPM)	300	30	60	60	30
Running Torque (oz. in. @ 1 RPM)	300	60	60	60	30
Power Input (watts)	2.7	2.3	2.7	2.0	2.0
Operating Temp. Range (°C)	← -20° to +55° →			← -20° to +85° →	
Temp. Rise (nom. °C)	54°	34°	46°	—	—
Voltages Offered (VAC)	← 24, 115, 220; 50 or 60 Hz →			← 6, 12, 24 VDC →	

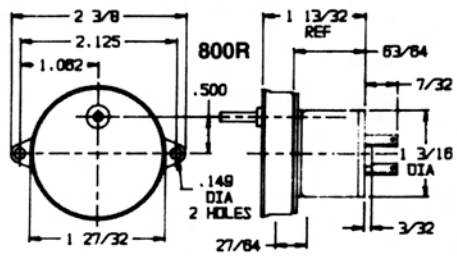
MECHANICAL DATA

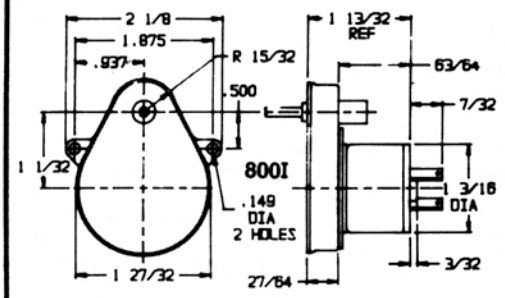
AC Models (107 below)



Available with Round Gearcase

DC Models





GEAR TRAIN SELECTOR: ALL AC AND DC PM MOTORS

Basic gear train construction: Polished steel pins (gear shafts). Output shaft steel or stainless steel with brass gear pressed into shaft. Permanent lubrication.

Gear Train	Dynamic* Torque	Static** Torque	Frictions†	Individual construction features
Light Duty	20 oz. in.	60 oz. in.	Currently N/A.	Pinions and gears molded as single piece of specially formulated plastics.
Standard Duty	30 oz. in.	90 oz. in.	One way, two way or without friction.	Separate hobbed or shaved brass gears and bronze pinions as sub-assemblies.
Heavy Duty	150 oz. in.	150 oz. in.	One way clutch nest. (N/A for DC motors.)	Molded sintered steel gear and pinion assemblies.

* **Dynamic torque rating** is the maximum load the gear train can drive continuously without undue wear.

** **Static torque rating** is the maximum static torque load that can be sustained without substantial risk of damage to the gear train. (E.g.: As when attempting to turn a de-energized motor from its output shaft.)

† **Frictions** are slip clutch devices that are built into a gear train to permit manual rotation of the output shaft.

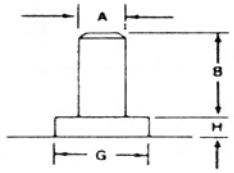
One-way friction permits manual advance in the direction of powered shaft rotation only.

Two-way friction permits *manual* turning in either direction, but is not designed for continuous slippage and should not be relied upon to protect a gear train against excessive torque loads.

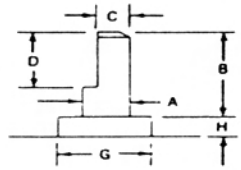
AVAILABLE SHAFTS: ALL PM MOTORS

Selection Data								Reference Data			
Dwg. No.	Shaft Dia. (A)	Shaft Ordering Code — Free Shaft Lgth (B) .375	.500	.750	1.000	Shaft Width At Flat (C)	Flat Lgth (D)	Knurl Lgth (E)	Knurl Set-back (F)	Brg O.D (G)	Brg O.D (H)
LIGHT AND STANDARD DUTY GEAR TRAINS											
1	.125	02	03	05	06	—	—	—	—	.250	.070
	.187	66	71	72	88						
2	.125	T1	T2	T3	T4	.078	.375	—	—		
	.187	67	T5	T6	T7	.162					
3	.125	V1	V2	V3	V4	—	—	.250	.062		
HEAVY DUTY GEAR TRAINS											
1	.1875	AA	AB	AC	AD	—	—	—	—	.375	.218
2		BD	BE	BF	BG	.162	.375	—	—		
3	.125	CC	CD	CE	CF	—	—	.250	.062		

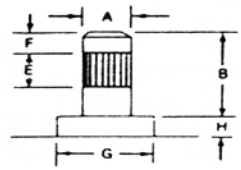
Dwg. No. 1
ROUND SHAFT



Dwg. No. 2
FLATTED ROUND SHAFT



Dwg. No. 3
KNURLED ROUND SHAFT



Note: Custom Shaft and Bearing Configurations Available.

Toll Free 1-800-526-5376 • 201-337-1000 • Fax 201-337-1862