ELINCO

designers and
manufacturers of

GOVERNOR-CONTROLLED
SELF-SYNCHRONOUS
DRAG CUP
VELOCITY & ACCELERATION
DC & AC TACHOMETER
SHUNT
SERIES
COMPOUND
PERMANENT-MAGNET
SPLIT-FIELD
SEPARATELY EXCITED
UNIVERSAL
INDUCTION
RELUCTANCE
HYSTERESIS
ONE, TWO & THREE PHASE
DC & AC SERVO
TOTALLY-ENCLOSED
AC DYNAMICALLY BRAKED
REELMOTORS

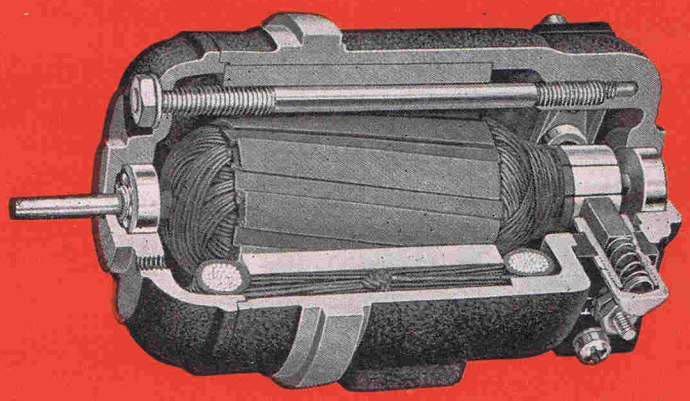
fractional horse-power
motors and generators

ELINCO does not manufacture, or carry in stock, low-cost, mass-production motors. Every order is special, engineered and produced to the customer's own exact specifications . . . or by variation of one of our hundreds of different basic types of units. We produce only special, high-precision instruments, demanding the highest engineering ability, and manufactured with the skill and care that the name ELINCO has meant for years.

ELINCO

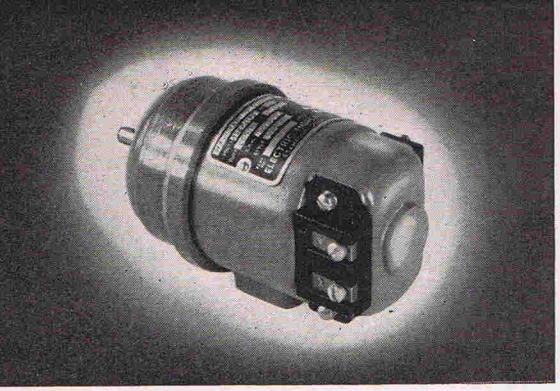
TYPE "FB"

MOTORS GENERATORS

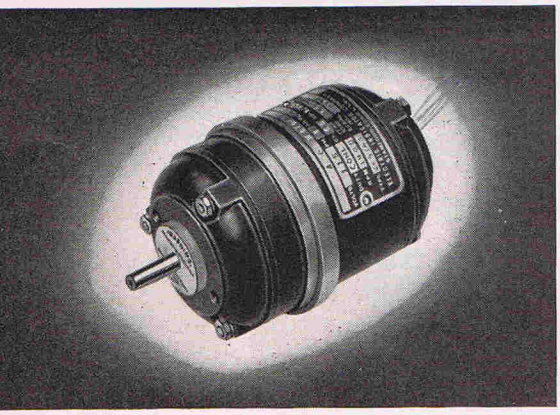


ELECTRIC INDICATOR CO. STAMFORD, CONN.

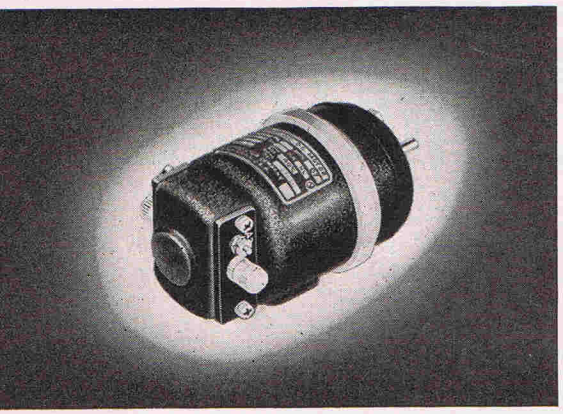
PRINTED IN U.S.A.



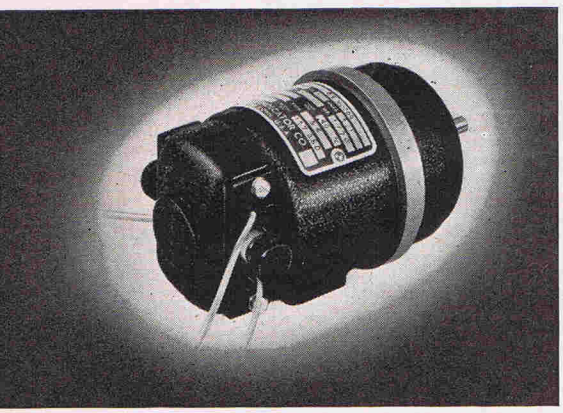
FB PERMANENT-MAGNET DC GENERATOR



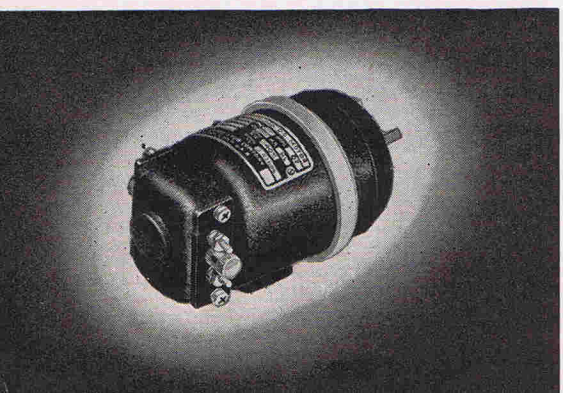
FBS PERMANENT-MAGNET AC-GENERATOR



FB PERMANENT-MAGNET DC MOTOR



FB SERIES AND UNIVERSAL MOTORS



FB SHUNT-WOUND DC MOTOR

FB Permanent-Magnet D.C. GENERATORS

CONSTRUCTION

The field of these generators is made of Alnico No. 2 magnet steel which is stabilized after magnetization. Armature laminations are of high-grade silicon steel and have 9 slots, skewed at assembly to minimize "slot-lock." Coils are machine-wound and connected to a 9- or 18-bar sturdy built-up copper commutator, with amber mica insulation. For special applications a solid palladium-silver commutator can be supplied.

Square brush rigging consists of 3/16" square silver graphite brush, and heat-treated beryllium-copper spring, mounted in machined brass cartridge-type holder. The brush holder is mounted in the bakelite terminal block and accurately aligned with commutator axis.

Finger-type brushes consist of silver-graphite tips bonded to beryllium-copper leaf springs. The leaf springs are mounted on bakelite terminal block and tension adjusted with gramgage to close limits. Accurate spring pre-forming and tempering insure proper alignment with commutator.

Square brush rigging is recommended for applications where speeds exceed 2000 r.p.m. For low-speed applications, and those requiring low driving torque, finger-type brushes are recommended. The finger brush structure provides more uniform voltages for rotation in two directions.

CHARACTERISTICS

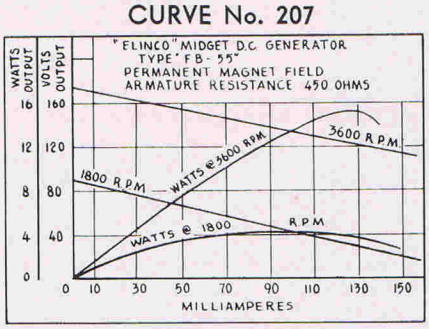
Output voltage is linear with speed within ±1% in either direction.

NOTE: Units can be driven at speeds to 10,000 r.p.m., or 180 volts, whichever represents the smaller output.

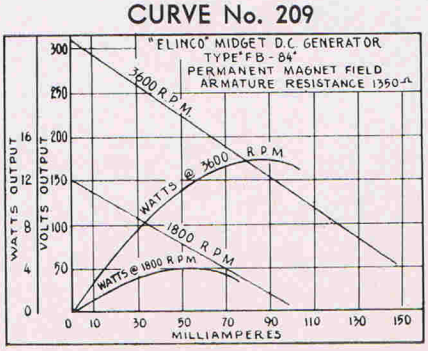
PERFORMANCE

The performance of two standard units is shown on Curves Nos. 207 and 209. FB generators can be wound to meet a wide variety of other specifications.

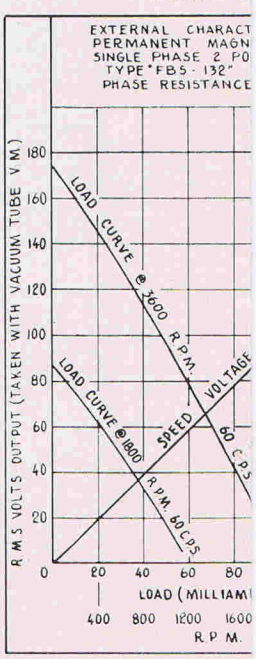
CURVE No. 207



CURVE No. 209



CURVE N



FBS Permanent-Magnet A.C. GENERATORS

CONSTRUCTION

These generators are wound two-pole, for one-, two-, or three-phase output. No brushes or slip rings are required and there are no rotating windings. The permanent-magnet rotor is made of Alnico No. 2 magnet steel and is cast about a soft steel insert, which is pinned to the non-magnetic shaft rotating on lubricated, shielded, precision ball bearings. After mounting, the outside diameter of the magnet-steel pole is finish-ground to close tolerance.

The rotor assembly is then dynamically balanced and protected with red insulating varnish, except for bearing seats and shaft extension. The stator is made up of laminations with 12 slots. Coils are form-wound and assembled into position. The assembly is then impregnated with clear insulating varnish, baked, and finished with protective covering to specification.

CHARACTERISTICS

The wave form of standard units contains approximately 5% harmonics. Two-phase sine-wave signal voltage generators are available with total harmonic content of less than 1%.

Standard units are designed for speeds up to 5,000 r.p.m., but can be furnished to operate up to 10,000 r.p.m. with special design. Care must be exercised not to exceed the wattage ratings. If desired, multi-pole machines can be wound for one-, two-, or three-phase output.

PERFORMANCE

Typical performance of standard units is shown on Curves Nos. 221, 267 and 223. Type FBS-132 (Curve 221) is a two-pole single-phase generator rated at approximately 5 volts per 100 r.p.m. Type FBS-258 (Curve 267) is a two-pole, two-phase generator whose output is approximately 3 volts per 100 r.p.m. per phase. Type FBS-114 (Curve 223) is a two-pole, three-phase generator rated at approximately 2½ volts per 100 r.p.m. per phase.

The output of all units is linear with speed.

FB Permanent-Magnet D.C. MOTORS

CONSTRUCTION

The field of these motors is made from Alnico No. 2 magnet steel which is stabilized after magnetization. Armature laminations are of high-grade silicon steel and contain 9 slots, skewed to minimize "slot-lock." Coils are wound with formvar-type magnet wire and soldered to 9- or 18-bar sturdy built-up copper commutator. For special applications a solid palladium-silver commutator can be supplied. Brush boxes are machined from bar brass, and extend through molded bakelite terminal strips very close to commutator; thus the square brushes are strongly supported and held tightly throughout entire length. Brush springs are of heat-treated beryllium-copper; brushes are 3/16 in. sq., and made of material suitable for required service.

CHARACTERISTICS

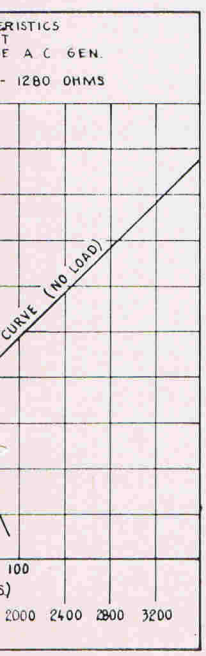
These motors have very high efficiency, as shown by their curves; even though higher efficiency is to be expected when no current is required for the field, they are exceptional. Units can be furnished to operate on any voltage from 6 to 115 v. D.C.

NOTE: Permanent-magnet motors are generally not recommended for duty which will require plugging reversing, due to possible demagnetization of the field. For such application consult our engineering department.

PERFORMANCE

Type FB-139 (Curve 219) is wound to operate on 115 volts D.C. For continuous duty it is rated at 1/50 h.p. at 3500 r.p.m. Ratings given are the highest for continuous duty; they could be considerably higher for intermittent duty.

o. 221



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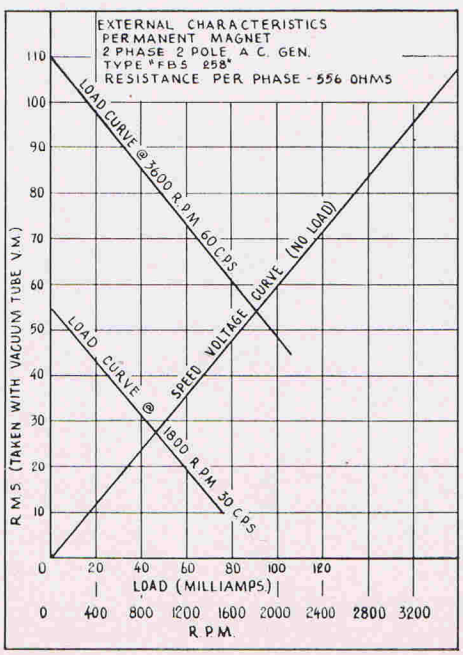

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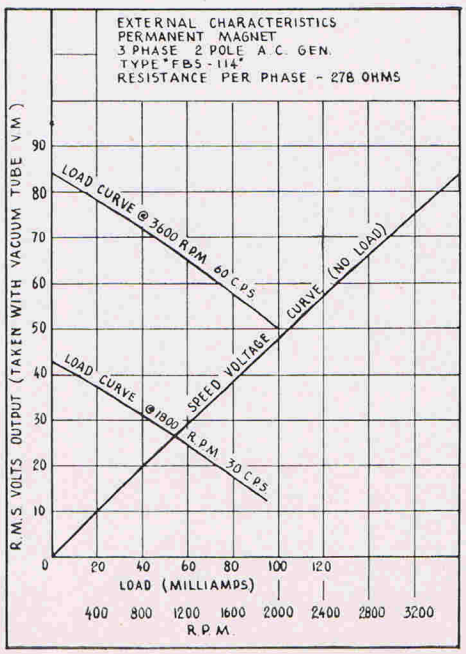
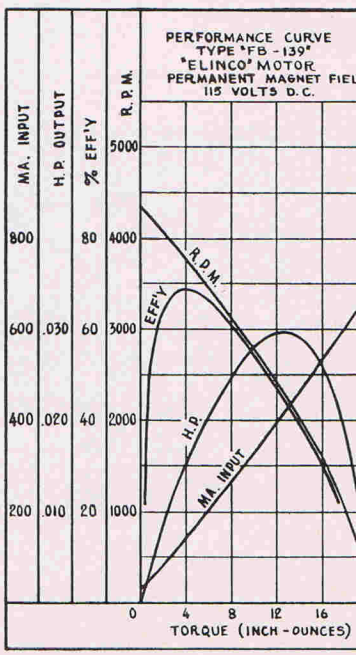


CURVE No. 219



FB SERIES & UNIVERSAL MOTORS

CONSTRUCTION

The field is two-pole, of high-grade silicon steel. Coils are form-wound, bound with insulating tape, and fitted to the lamination stack. Connection to motor is made through flexible leads brought through terminal block. Armatures are of high-grade silicon-steel laminations with 9 slots, skewed to minimize "slot-lock." Armature coils are machine-wound and connected to a 9- or 18-bar built-up copper commutator. For special applications a solid palladium-silver commutator can be supplied.

Brush boxes, machined from bar brass, extend through molded bakelite terminal strips very close to commutator; thus the square brushes are strongly supported, held tightly through full length. Brush springs are of heat treated beryllium-copper; brushes are 3/16 in. sq., and of material suitable for required service.

CHARACTERISTICS

These motors can be furnished wound for operation from 6 to 115 volts, D.C. or A.C., as well as for a wide variety of speeds, loads, or duty. Efficiency is very high.

PERFORMANCE

Model FB-57 (Curve 224) operates on 115 v. D.C., or 115 v. 60 cy. single-phase A.C. with a continuous-duty rating of 1/65 to 1/75 h.p. at 5500 to 7000 r.p.m. Model FB-56 (Curve 225) is for operation at 24 volts D.C. and has a continuous-duty rating of 1/60 h.p. at 5000 r.p.m.

FB SPLIT-FIELD D.C. MOTORS

No characteristics are shown for Split-Field D.C. Motors. Generally these units operate from vacuum-tube circuits with windings to meet specific requirements such as definite resistance value across brushes, specified resistance value of field, etc. The construction is usually the same as in Elinco Shunt-Wound or Series Motors; all styles can be uni-directional or reversible. Before assembly, and upon completion, all split-field motors are given a high potential insulation test between windings and from windings to ground.

FB SHUNT-WOUND D.C. MOTORS

CONSTRUCTION

The field is two-pole, of high-grade silicon steel. Coils are form-wound, bound with insulating tape, and fitted to the lamination stack. Field leads are securely fastened to separate terminals on a bakelite terminal strip. The armature is of high-grade silicon-steel laminations with 9 slots, skewed to minimize "slot-lock." Armature coils are machine-wound and connected to a 9- or 18-bar built-up copper commutator. For special applications a solid palladium-silver commutator can be supplied.

Brush boxes are machined from bar brass and extend through molded bakelite terminal strips very close to commutator; thus the square brushes are strongly supported and held tightly through entire length. Brush springs are made of heat-treated beryllium-copper; brushes are 3/16 in. sq. and are of material suitable for required service.

CHARACTERISTICS

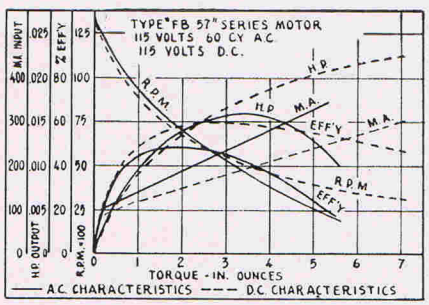
These motors can be furnished for operation on any voltage from 6 to 115 volts. Efficiency is exceptional.

Shunt-wound motors can be furnished for servo systems or other special applications with fields wound to operate from one voltage source, and armature wound to operate from another different voltage source.

PERFORMANCE

A typical unit, Model FB-127 (Curve 217) operates on 115 v. D.C. input, with a continuous-duty rating of 1/75 h.p. at 3300 r.p.m. For low voltage operation, Model FB-150 (Curve 220) is designed for 6 volts D.C. input, and rated for continuous-duty at 1/100 h.p. at 3500 r.p.m.

CURVE No. 224



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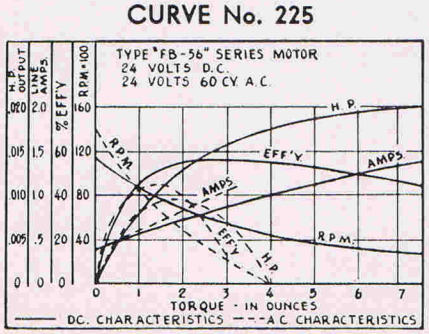
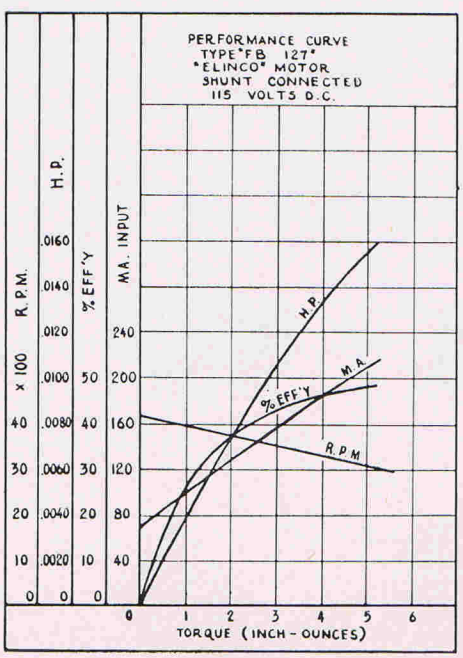


CURVE No. 217



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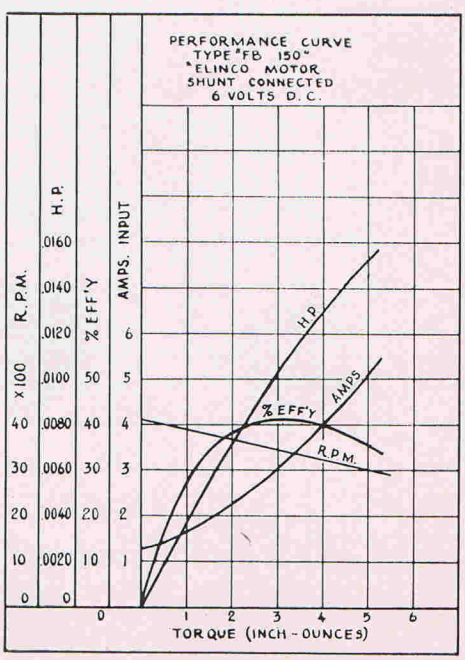
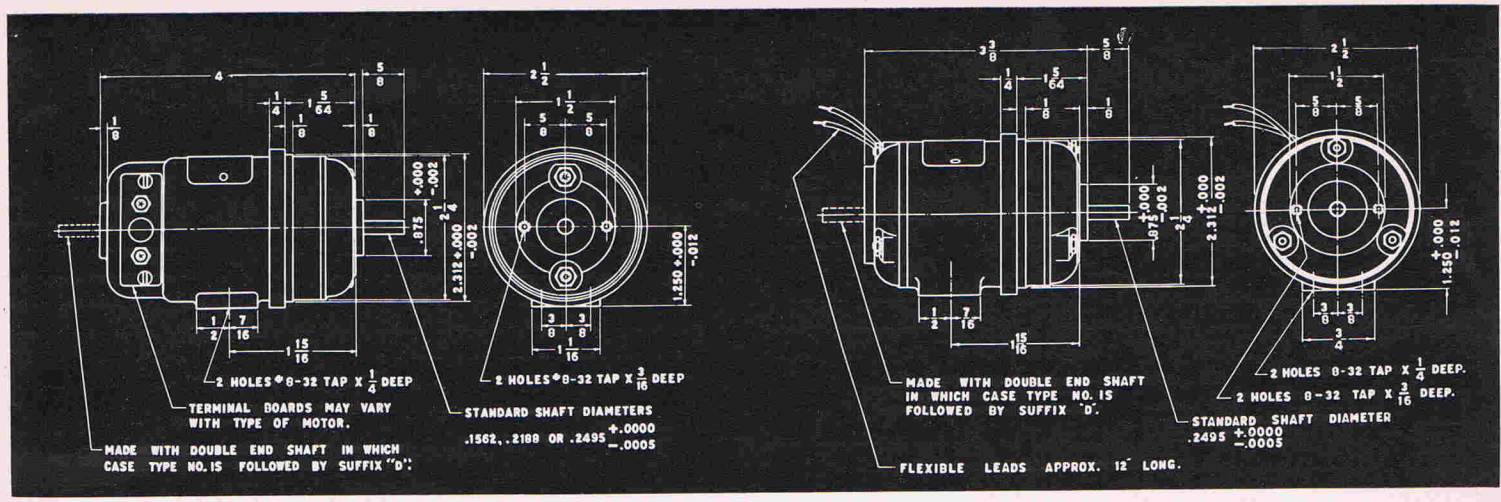




FB FRAME

FBS FRAME

GENERAL SPECIFICATIONS

TYPES AVAILABLE

Elinco FB units are available in the types illustrated in this bulletin, as well as self-synchronous transmitters, receivers, and other specially-designed units. The performance curves shown are for a limited number of models in each classification, and were selected to give the broadest over-all picture of what may be expected from Elinco units.

CONSTRUCTION

The materials and methods used in the construction have been selected only after careful experimentation and exhaustive testing. Uniformity is assured by the close supervision and careful inspection of every unit produced.

SHAFTS: Standard shafts are of piston-finish cold rolled steel; stainless steel may be provided on order. There are three standard sizes of diameters: 0.1562", 0.2188" and 0.2495"; single-extension shafts are standard, though all units can be furnished with shaft extensions on both ends.

HOUSINGS: All housings and end bells are of cast aluminum anodized in accordance with standard specifications.

ARMATURES: Armatures are dynamically balanced by means of the latest type dynamic-balancing machines; armature or fields, or both, of any unit can be wound with fine wire to very high resistance to match plate resistances in electronic applications. All rotating parts are equipped with instrument-type ball bearings.

TERMINALS AND MOUNTINGS: Standard units are provided with terminal screws for external connections; however, all terminal leads can be brought out separately if required. Mounting can be made either by the base or the strong, large concentric flange. Units are provided with a machined rabbet on face for centering.

WEIGHT: Depending on type units weigh between 26 and 32 ounces.

FINISHES

Standard finish is black wrinkle in FB units, blue mottletone on FBS units. All ferrous parts are coated with a base of zinc chromate primer. Wound stators and rotors are impregnated with high-grade approved insulating varnish and furnished with a protective coating of an oil-, water-, acid-, and fungus-resisting material, or material to meet your specifications. Special finishes externally or internally can be provided to meet varying conditions of climate or usage, or to match the finish of other units in your own product for uniformity of style.

SPECIAL DESIGN

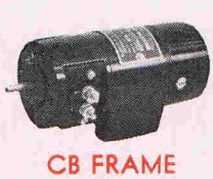
The specifications included in the description of the models illustrated apply to the standard models as shown; there is no hard and fast rule — just as special finishes are available, you may obtain different shaft diameters, length, or changes in dimensions or frames, as well as alteration in the actual electrical characteristics. Engineers will readily recognize which standard models fit their needs, or can be adapted to meet special requirements.

OTHER ELINCO FRAME TYPES AND SPECIAL FEATURES

The variety of units Elinco can supply is almost limitless; there are over 400 basic models, all of which can be varied both electrically and physically. Certain others of these models and frame types are illustrated below. For specific information write for other literature.

BSH FRAME

TYPE MI



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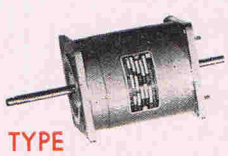
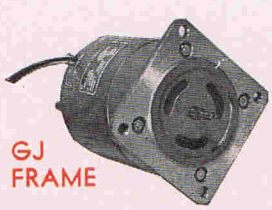


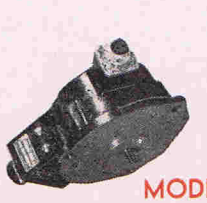
TYPE ALPJJDZ

FSH FRAME



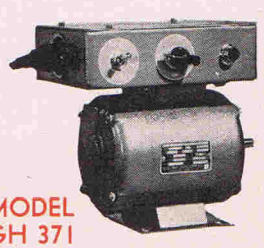
GJ FRAME

DRAG CUP

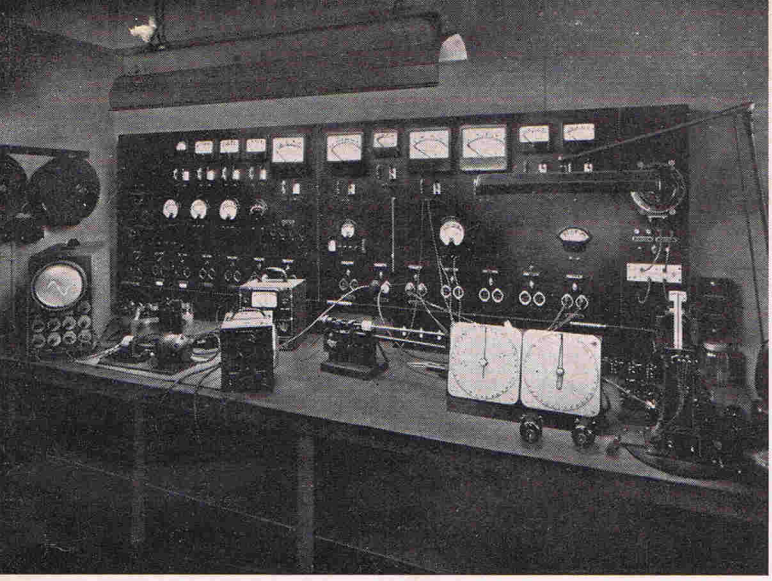


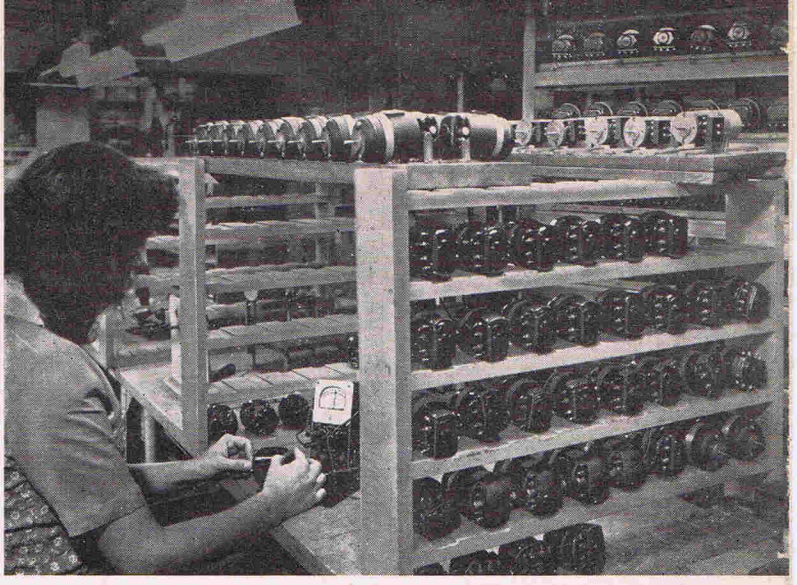
MODEL 336

T FRAME



MODEL GH 371





THE STORY OF ELINCO

The name ELINCO has been associated with the design and development of precision apparatus for almost twenty-five years. A recognized leader, first in the field of indicating devices, the skills and resources of the company were turned, finally, in 1940 to concentrate solely upon the design and production of special, high-precision instrument-type motors and generators.

In the remote indicating devices formerly manufactured, the self-synchronous motor was a vital operating part and, naturally, units of exceptional precision were necessary to provide the extreme accuracy of the Elinco Indicating Systems. To assure such precision the company soon devoted the efforts of their engineers to the design and manufacture of motor and generator units which could be relied upon to uniformly provide the precision operation needed.

The exceptional performance of these units soon led to requests from manufacturers of other equipment, and the demand had become so great by 1940 that the company reluctantly discontinued the indicating system phase of operations in order to devote its full resources to meet this new demand.

However, the years of experience in the design and production of indicating systems has proved of inestimable value in providing the company with close insight and appreciation of the needs of customers and an unsurpassed background of engineering experience in meeting exacting specifications for such high-precision motors and generators.

In contrast to the operations of many companies, Elinco does not maintain inventory of 'stock' models, or manufacture low-cost mass-production types such as for electric fans and similar appliances. Every Elinco order is special, produced to meet specific requirements. However, over many years, the company has designed hundreds of different models, and one or more of these "basic" types can usually be altered to provide the physical and electrical characteristics specified.

During the war Elinco units could be found on equipment in every part of the world, setting new standards for operating performance; and, in the post-war age of instrumentation, Elinco is continuing to be the first choice of scores of manufacturers and laboratories for the design and production of precision motors and generators.