"ELINCO" HYSTERESIS MOTORS

10-A-1094

Bulletin 48-C

February 15, 1949

ELECTRIC INDICATOR COMPANY, STAMFORD, CONNECTICUT

"ELINCO" Hysteresis Synchronous Motors are made in "BS" and "FS" frames, as dimensioned on Print A-930; in "A" frame, as dimensioned on Print C-1037; and in "G" frame, as dimensioned on Print A-1094. Single phase motors are permanent split capacitor type. Polyphase motors can be furnished in all types. These motors are so constructed that special features, such as double end shafts, face mounting (Prints A-1284 and A-1340 dimension standard face mounted motors which can be furnished with the same ratings, provided provision is made in mounting to allow free passage of air to ventilation slots in front and rear end bells), or other changes can usually be made without large additional cost. Totally enclosed motors, of the same dimensions, can be furnished with reduced ratings. An automatic thermal overload protector can be furnished in the "G" frame without change in dimensions. The "A" frame motor, with automatic thermal overload protector, is dimensioned as shown on Print A-1188. At present, we cannot provide a thermal overload protector in the "BS" or "FS" frames.

Hysteresis Synchronous Motors differ from the more common reluctance type in the following particulars:

a) There is no variation in torque throughout the 360° of angular rotation. Hence, no torque pulsation under condition of constant load.

b) The damping factor is great, relative to the magnetic coupling so, that for sudden changes in load, the rotor assumes its new load angle without hunting or oscillation.

c) They will start and pull into synchronism with high inertia loads and do not require a size or rating beyond that of the pure power component of load.

The frames and end bells of these motors are aluminum. All parts are accurately machined to close tolerances to provide concentric air gap at assembly. The armature rotates on super precision ball bearings which have been selected for smoothness and quietness. The ball bearings are factory lubricated with extremely wide temperature range grease, and in most cases lubrication is sufficient for at least a year. The motors, except mounting surfaces, are finished with light blue mottletone, baked synthetic which harmonizes with most colors. Special colors or other finishes can be furnished.

The stator consists of thin, high quality, silicon steel laminations, riveted under pressure and accurately machined for concentric assembly in frame. The windings are of formex type wire and, after assembly, are double impregnated and baked using a clear phenolic type varnish. Lead wires may be cotton covered asbestos, rayon covered synthetic rubber or nylon coated extruded plastic.

The special magnetic steel alloy rotor is machined all over to provide constant wall thickness (this being very important) and hardened. Two mounting spiders are pressed into tube and permanently fixed by riveting. The sub-assembly is pressed on carbon steel shaft and the outside diameter ground concentric to bearing seats. The rotor and shaft assemblies of the "A" and "G" frame units include fan to cool windings. As the "BS" and "FS" units are totally enclosed, no internal fan is provided for cooling. All rotor assemblies are dynamically balanced to very precise limits and finished with baked, corrosion resistant enamel.

The base of the "G" frame is stamped from heavy gauge steel. The bases of the "BS" and "A" frame are cast integral with frames.

All parts subject to corrosion are plated, painted or otherwise protected.

Capacitors for 115 volt single phase motors should be oil filled units for 220 volt A.C. operation.

Characteristics of some of the present 115 volt, single phase, 60 cycle, single speed motors are:

Type	Speed	Nominal H.P. Rating	Starting Torque In.Lbs.	Pull-In Torque In.Lbs.	Pull-Out Torque In.Lbs.	Cap. Value Mfd.
*BSH-369	1800	1/750	.085	.050	.052	1.25
*BSH-389	3600	1/350	.080	.050	.055	1.25
ASH-309	1800	1/125	.36	.36	.40	2.75
/ALH-349	900	1/150	.69	.56	.58	None
ALH-310	1800	1/60	.75	.70	.80	4.0
ALH-346	3600	1/50	.50	.40	.41	2.5
GH-377	1200	1/30	2.15	1.85	2.0	8.0
GH-368	1800	1/16	2.55	2.40	2.50	5.0
GH-374	3600	1/20	1.0	.95	1.20	7.0

*Motors with identical characteristics can be furnished in FSH frame as shown on lower half of Print A-930.

/This unit is for 220 volt 2 phase operation.

Other windings for operation on different voltages, different speeds or other variations can be developed within limits of machine. Full information on such variations for required characteristics should be forwarded for comments by our engineers.

Similar type units to operate as induction motors (sub-synchronous speed) can also be furnished. These units are ideally suited where smooth, rapid braking is desired without the use of auxiliary controls, or heavy power demands. These units have good efficiency and weight to power ratio.

Characteristics of two such units are shown below:

Type	Speed	Nominal H.P. Rating	Full-Load Torque In.Lbs.	Starting Torque In.Lbs.	Duty	Cap. Value Mfd.
ALH-350	1750	1/40	.9	.95	Cont.	4.5
GH-351	1750	1/20	2.0	2.1	Cont.	4.0

Characteristics of some of the present 115 volt, single phase, 60 cycle, dual speed motors are:

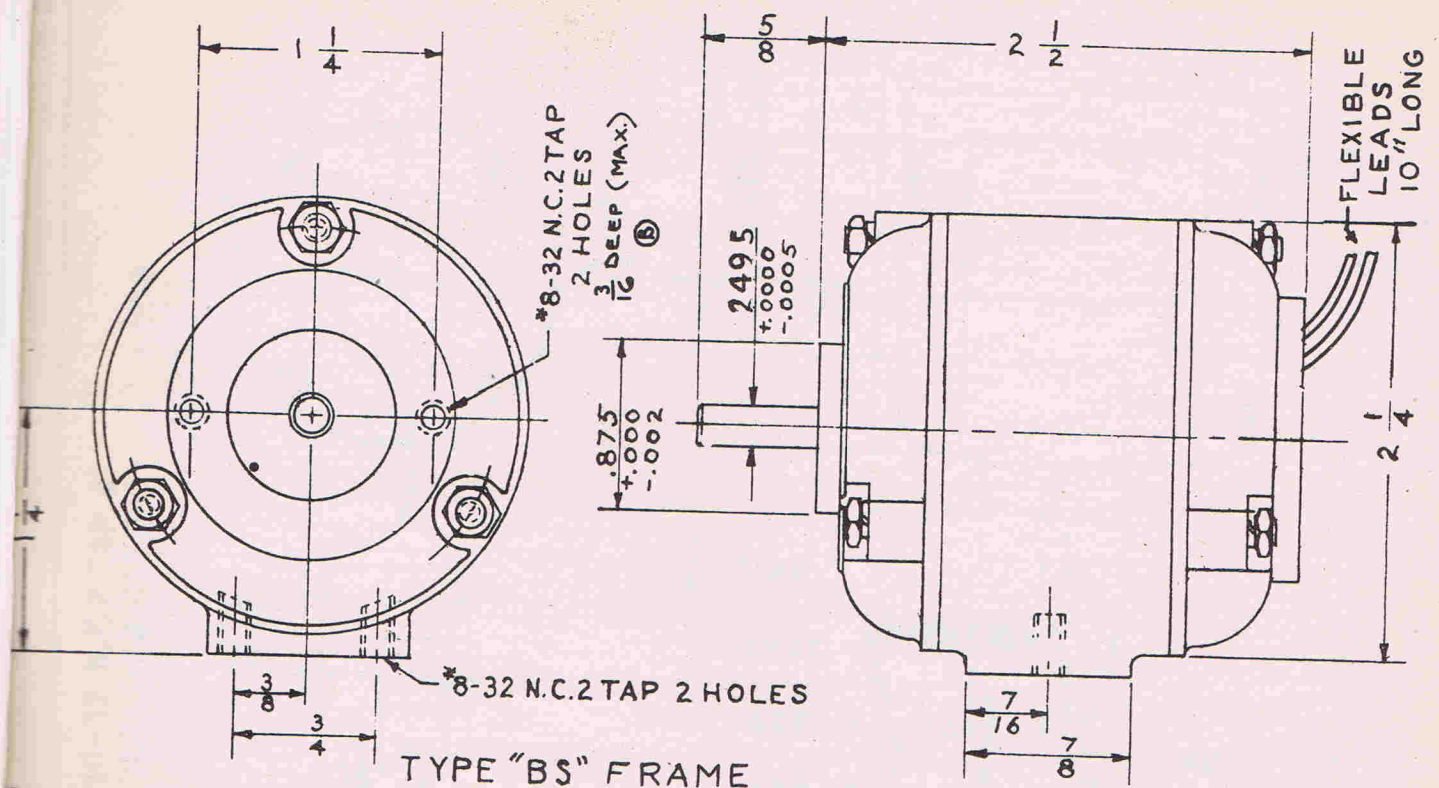
Type	Speed Ranges	Nominal H.P.Rating	Starting Torque In.Lbs.	Pull-In Torque In.Lbs.	Pull-Out Torque In.Lbs.	Cap. Value Mfd.
*BSH-388	1800	1/1200	.050	.032	.032	1.5
	3600	1/600	.035	.030	.030	1.5
ALH-287	900	1/150	.21	.45	.48	4.0
	1800	1/75	.37	.61	.70	4.0
GH-366	600	1/200	.45	.55	.88	5.0
	1200	1/75	.82	.70	.92	6.0
GH-325	900	1/100	.80	.82	.90	5.0
	1800	1/40	1.20	1.40	1.70	5.0
GH-355	1200	1/60 1/52	1.1	1.0	1.2	4.25
	3600	1/60 1/37	.42	.55	.60	8.0
GH-394	1800	1/25 1/22	1.6	1.6	1.8	6.0
	3600	1/20 1/16	1.0	1.1	1.2	10.0

*Motor with identical characteristics can be furnished in "FSH" frame as shown on lower half of Print A-930.

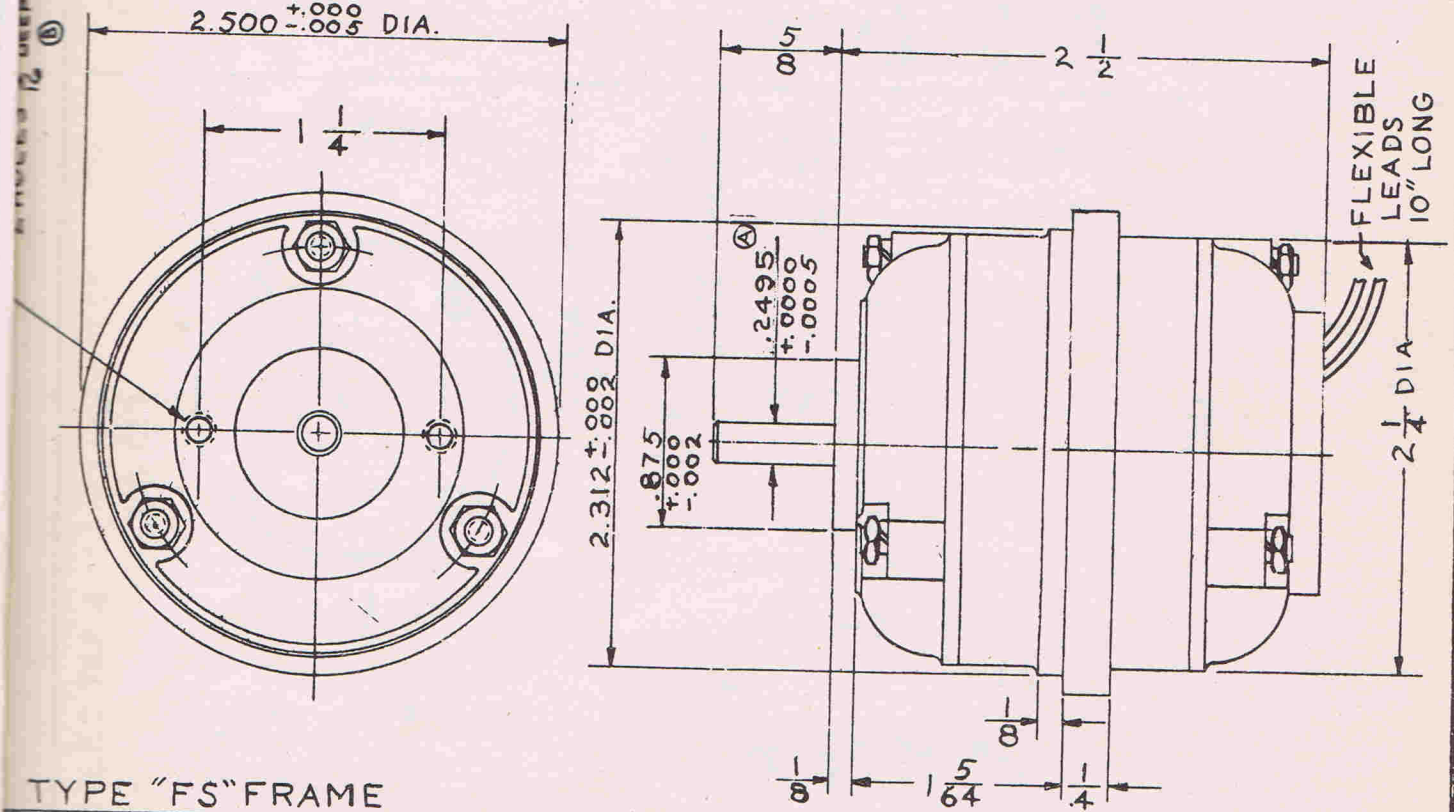
Different windings can be developed to obtain dual speed in other ranges or for operation from other voltages or frequencies.

Development of a triple speed synchronous motor in "GH" frame is now being completed. The motor, Type GH-371, operates on 115 volts, single phase, 60 cycle, at 900, 1800 or 3600 RPM, and will be rated approximately ~~1/100, 1/75 and 1/60~~ HP respectively. For laboratory use, this tri-speed motor will also be furnished completely wired, with capacitors and switches for reversing and speed changing mounted in enclosed case on top of motor. A 6 foot long rubber covered plug-in cord will be included.

GH-371
900 — 1/100 — 5 mfd
1800 — 1/60 — 5 mfd } Use 1-5 mfd capacitor
3600 — 1/40 — 8 mfd } & 1-3 " "



TYPE "BS" FRAME



TYPE "FS" FRAME

ELECTRIC INDICATOR COMPANY - STAMFORD, CONN.

"ELINCO" TYPES "BS & "FS" FRAMES

ISED	DATE	APPROVED
2188	1-21-46	R.O.H
NOTE	8-23-46	R.J.H.

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNTIL DATED AND SIGNED AS CHECKED AND APPROVED

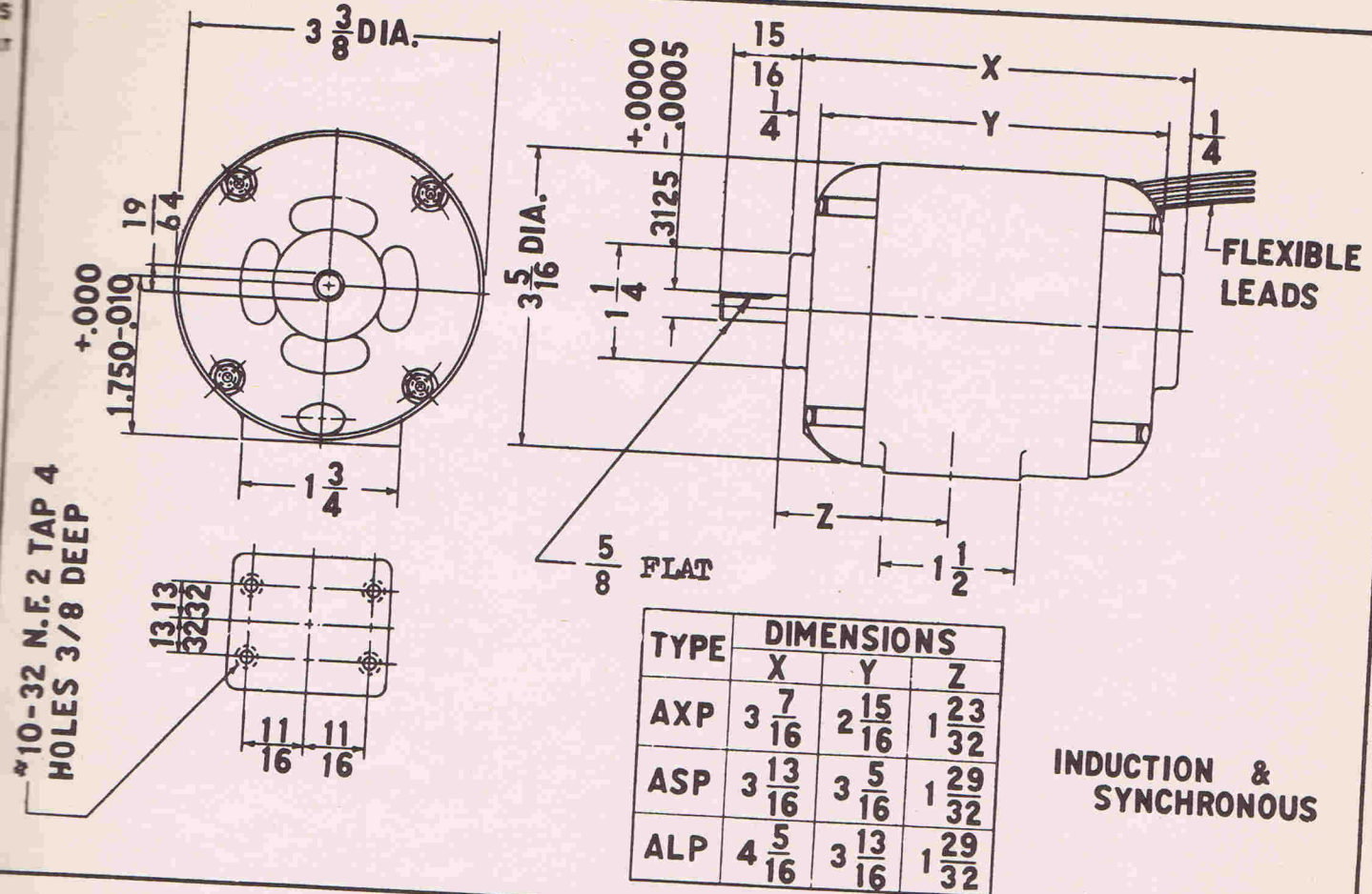
DESTROY ALL PRINTS MADE PREVIOUS TO DATE OF LAST REVISION

MADE: F.S.P. DATE: 9-4-45

CHECKED: APPROVED R.J.H

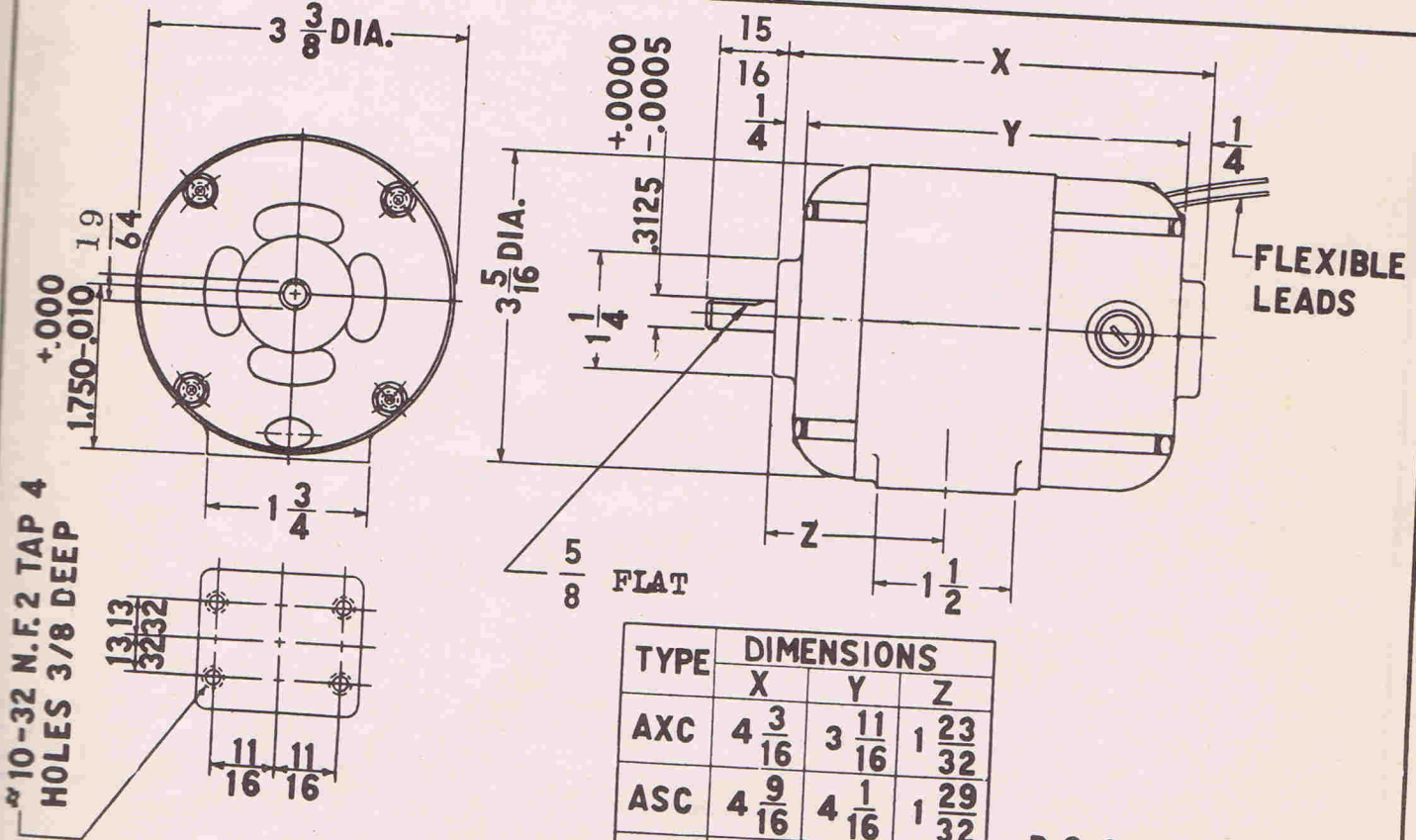
SCALE = 1:1

No. A-930



TYPE	DIMENSIONS		
	X	Y	Z
AXP	3 7/16	2 15/16	1 23/32
ASP	3 13/16	3 5/16	1 29/32
ALP	4 5/16	3 13/16	1 29/32

INDUCTION & SYNCHRONOUS



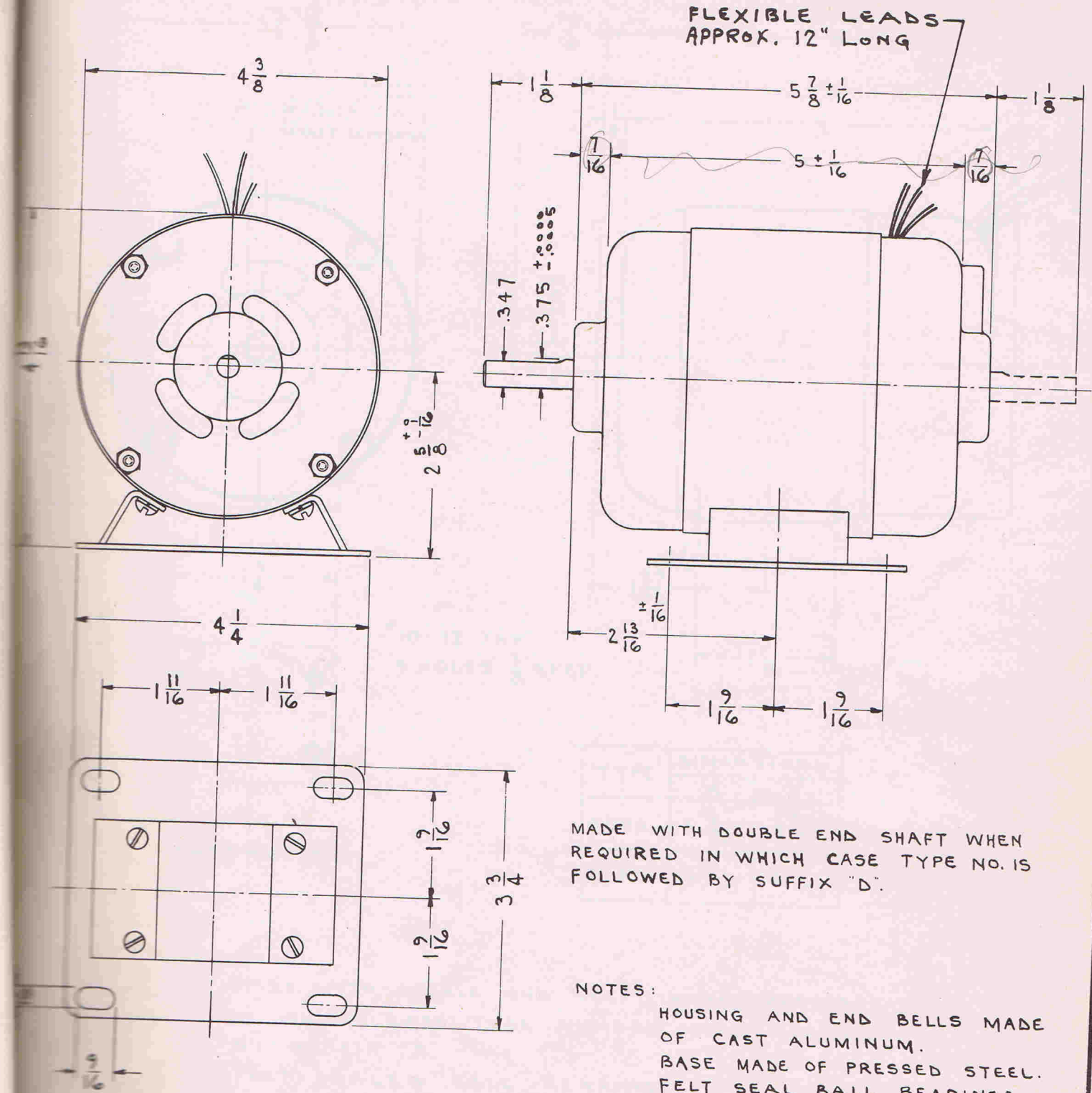
TYPE	DIMENSIONS		
	X	Y	Z
AXC	4 3/16	3 11/16	1 23/32
ASC	4 9/16	4 1/16	1 29/32
ALC	5 1/16	4 9/16	1 29/32

D.C. & UNIVERSAL

TYPE 'A' MOTOR

MADE	APP'D	DATE	SCALE	NO.
J.M.R.	R.K.	6-22-46	NONE	

ELECTRIC INDICATOR COMPANY



MADE WITH DOUBLE END SHAFT WHEN REQUIRED IN WHICH CASE TYPE NO. IS FOLLOWED BY SUFFIX "D".

NOTES:

HOUSING AND END BELLS MADE OF CAST ALUMINUM.
BASE MADE OF PRESSED STEEL.
FELT SEAL BALL BEARINGS.

LECTRIC INDICATOR CO. STAMFORD, CONN.

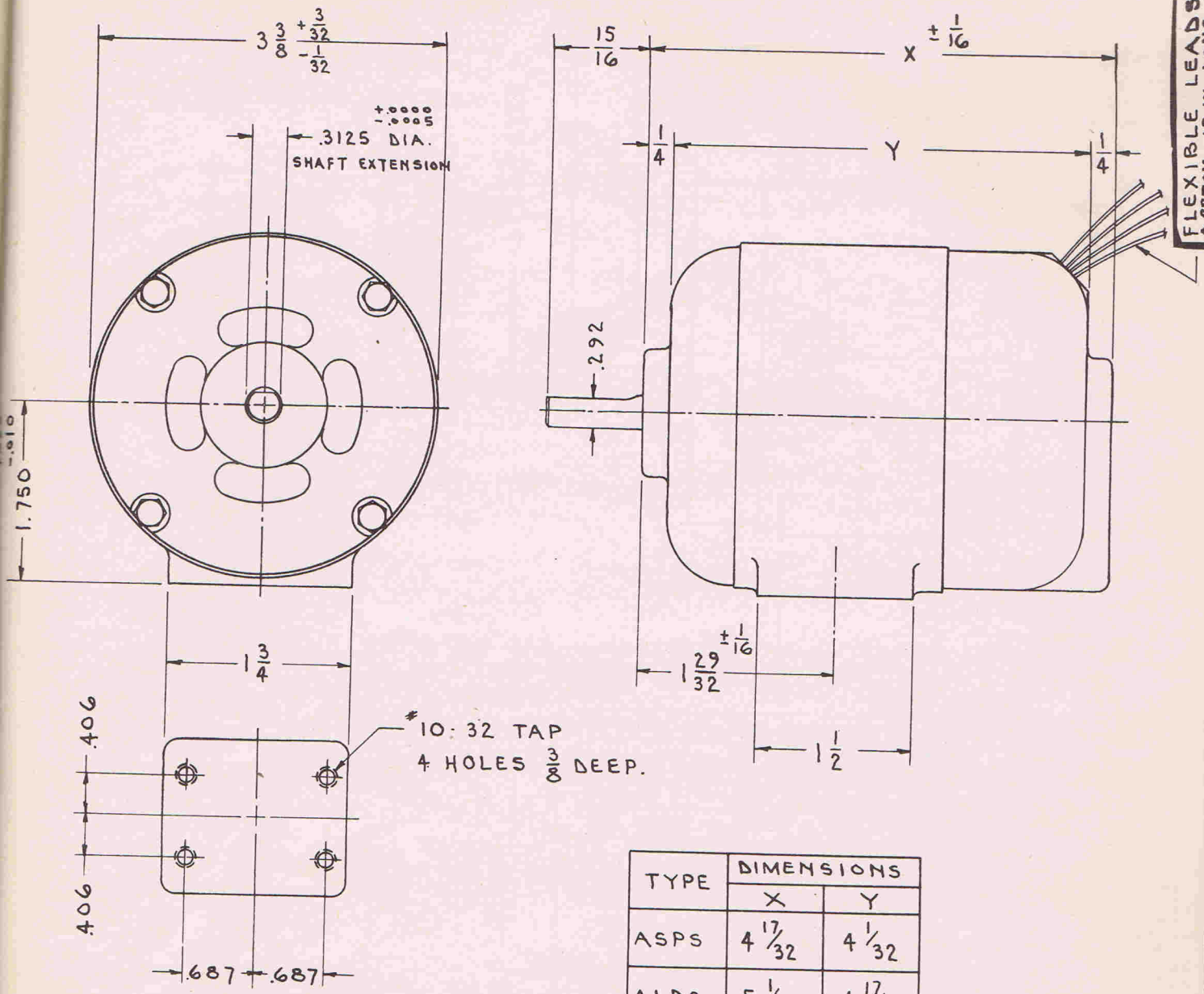
OUTLINE OF TYPE "G", "GS," & "GH" FRAME

	DATE	APPROVED
	1-31-47	
	2-1-48	

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNTIL DATED AND SIGNED AS CHECKED AND APPROVED

DESTROY ALL PRINTS MADE PREVIOUS TO DATE OF LAST REVISION

MADE: J. M. R. DATE: 12-11-46
CHECKED: R. K. APPROVED
SCALE = HALF SIZE
No. A-1094 D



TYPE	DIMENSIONS	
	X	Y
ASPS	4 17/32	4 1/32
ALPS	5 1/32	4 17/32

NOTES -

MADE WITH DOUBLE END SHAFT WHEN REQUIRED IN WHICH CASE TYPE NUMBER IS FOLLOWED BY SUFFIX "D".

FELT SEALED BALL BEARINGS.

STANDARD FINISH - BLACK WRINKLE

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACT. DIMENSIONS + 1/32 DEC. DIMENSIONS ± .005

OUTLINE OF TYPE "A" FRAME SPLIT PHASE MOTOR

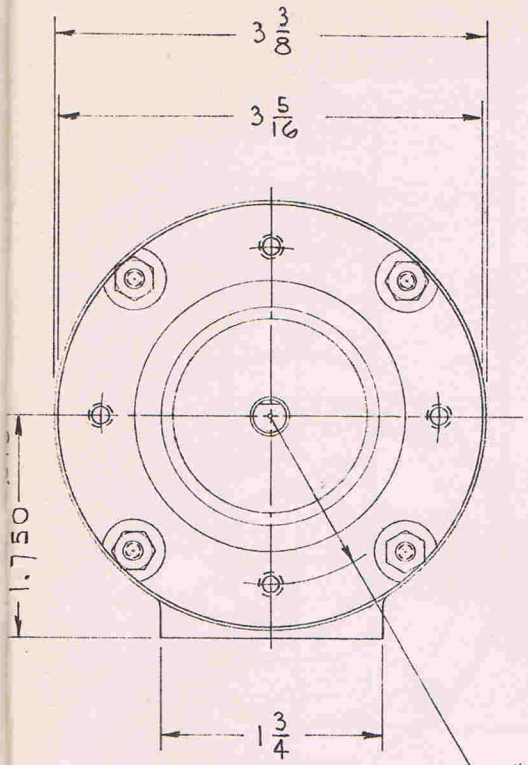
DRAWN BY	DATE	APP'D.	SCALE
J.M.R.	2-17-47		NONE

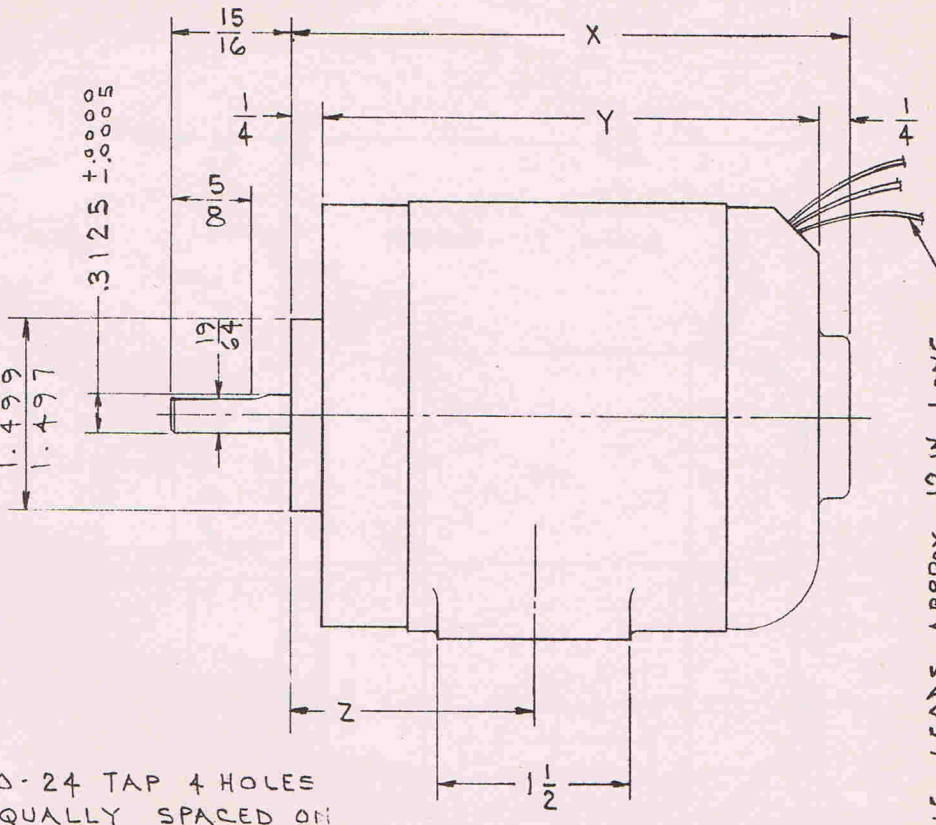
REVISIONS

ELECTRIC INDICATOR COMPANY
STAMFORD, CONN.

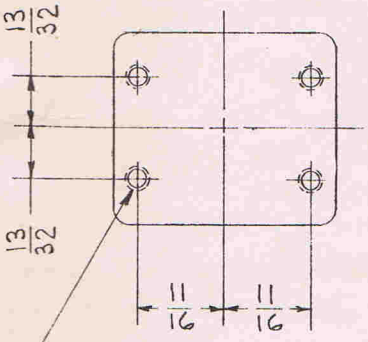
No. A-1188

B



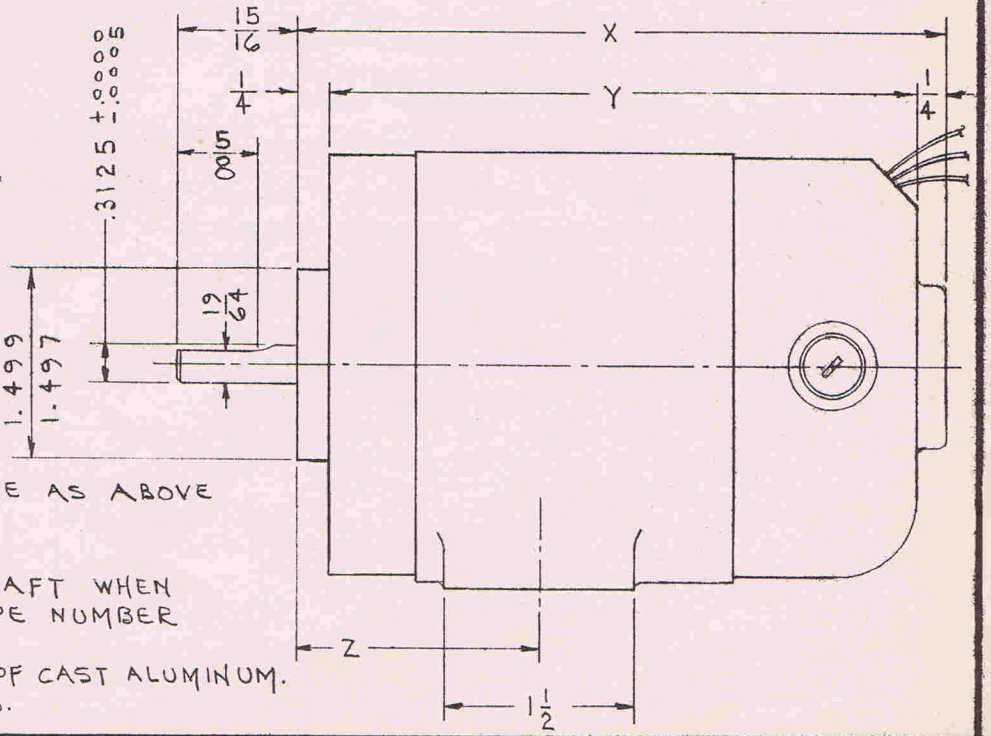


#10-24 TAP 4 HOLES EQUALLY SPACED ON A 1.312 R.



#10-32 TAP 4 HOLES 3/8 DEEP, SUPPLIED ONLY WHEN SPECIFIED BY CUSTOMER.

INDUCTION, RELUCTANCE & HYSTERESIS (B)				
TYPE		DIMENSIONS		
		X	Y	Z
ASHF	ASPF	3 13/16	3 5/16	1 29/32
ALHF	ALPF	4 5/16	3 13/16	1 29/32



D.C. & UNIVERSAL			
TYPE	DIMENSIONS		
	X	Y	Z
ASCF	4 9/16	4 1/16	1 29/32
ALCF	5 1/16	4 9/16	1 29/32

ALL OTHER DIMENSIONS SAME AS ABOVE

OTES-

MADE WITH DOUBLE END SHAFT WHEN REQUIRED IN WHICH CASE TYPE NUMBER IS FOLLOWED BY SUFFIX "D"
HOUSING AND END BELLS MADE OF CAST ALUMINUM.
FELT SEAL BALL BEARINGS.

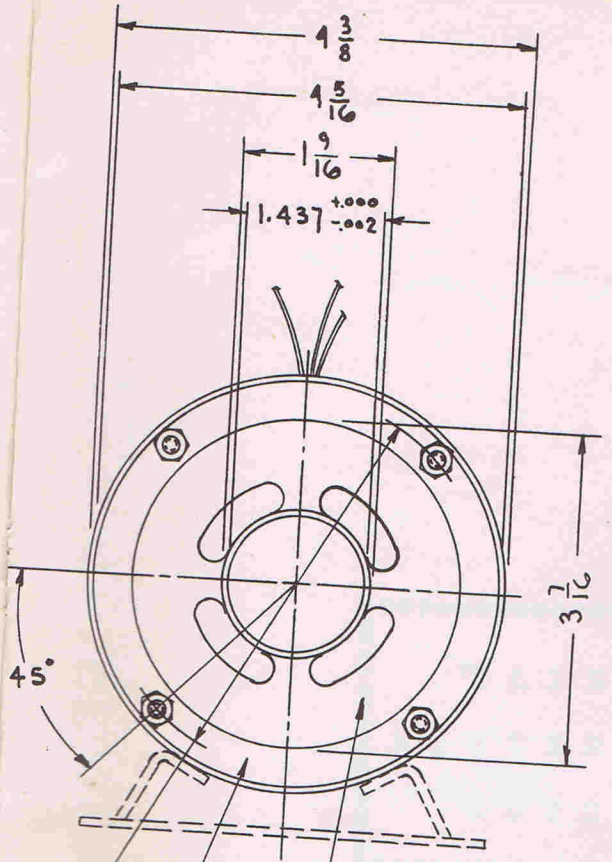
OUTLINE OF TYPE "A" FRAME WITH FINISHED FACE END BRACKET

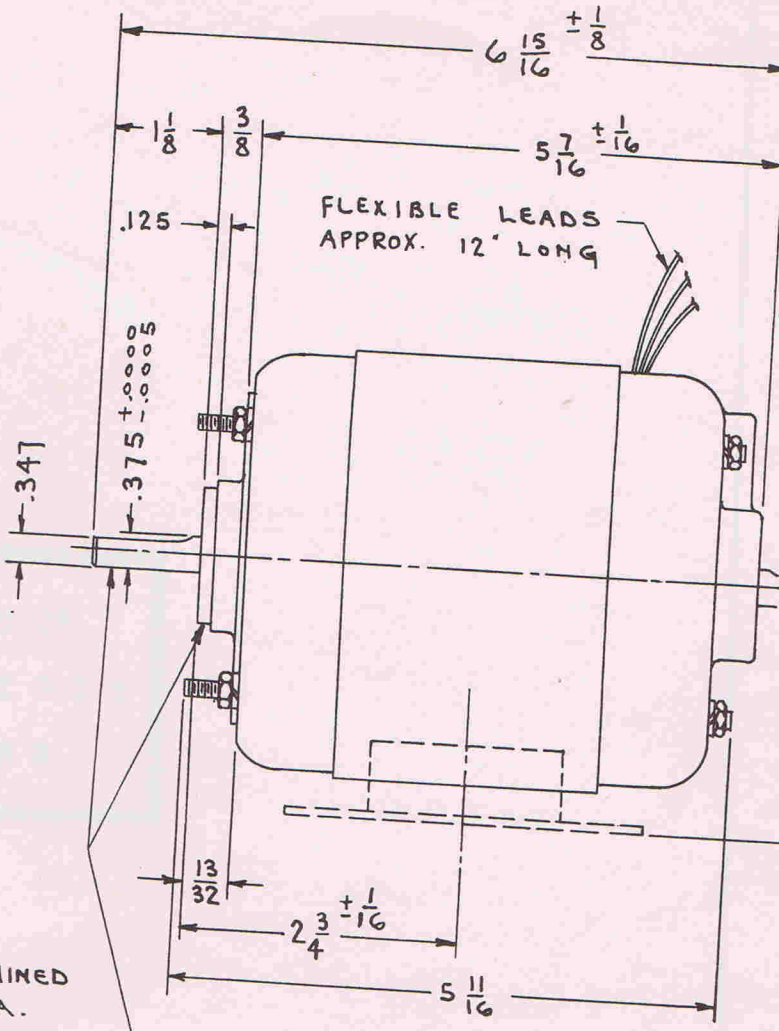
DRAWN BY	DATE	APP'D.	SCALE
J.M.R.	7-9-47	B.K.	NONE

REVISIONS	
5-5-48	ADDED HYSTERESIS

ELECTRIC INDICATOR COMPANY
STAMFORD, CONN.

No. A-1284 B



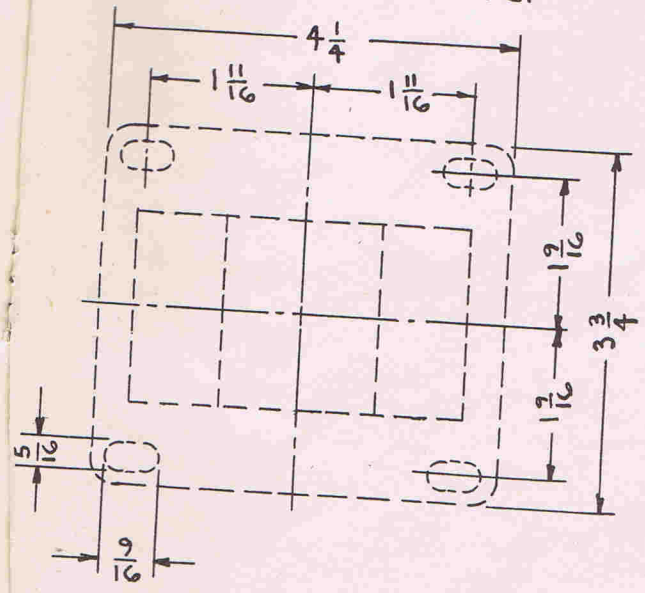


THIS SURFACE ROUGH CAST.

THIS SURFACE TO BE MACHINED FROM 3 7/16 DIA. TO 4 5/16 DIA.

FOUR #8-32 STUDS EQUALLY SPACED ON A 3.906 DIA. B.C.

.004 MAX. ECCENTRICITY TOTAL INDICATOR READING ON THESE TWO SURFACES.



NOTES-

MADE WITH DOUBLE END SHAFT WHEN REQUIRED IN WHICH CASE TYPE NO. FOLLOWED BY SUFFIX "D".
MOUNTING BASE FURNISHED ONLY WHEN SPECIFIED ON ORDER.
HOUSING AND END BELLS MADE OF CAST ALUMINUM.
BASE MADE OF PRESSED STEEL.
FELT SEAL BALL BEARINGS.

REVISIONS		OUTLINE OF TYPE "GF", "GSF", & "GHF" FINISHED FACE MOTOR			
6-1-48	ADDED GSF & GHF TO TITLE	DRAWN BY J. M. R.	DATE 11-7-47	APP'D.	SCALE NONE

ELECTRIC INDICATOR COMPANY