JUNE 2000
INSTALLATION
LUBRICATION
OPERATION
MAINTENANCE INSTRUCTIONS
PRICE $2.00

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ULTRA-POWER™

INSTALLATION AND MAINTENANCE INSTRUCTIONS
GEAR REDUCERS AND GEARMOTORS

INDEX

1 – GENERAL SAFETY INSTRUCTIONS

⚠ WARNING! Gear reducers and gearmotors present dangerous parts because they may be:

- live;
- at temperature higher than 50° C;
- rotating during the operation;
- eventually noisy (sound levels > 85 dB(A)).

⚠ WARNING! Incorrect installation, an improper use, the removing or disconnection of protection devices, the lack of inspections and maintenance may cause severe personal injury or property damage.

Therefore the component must be moved, installed, commissioned, handled, controlled, serviced and repaired **exclusively by responsible qualified personnel**.

It is recommended to pay attention to all instructions of present handbook, all instructions relevant to the system, all existing laws and standard concerning correct installation.

Components in non-standard design or with special executions or with constructive variations may differ in the details from the ones described here following and may require additional information.

For any clarification and/or additional information consult Foote-Jones/Illinois Gear and specify all name plate data.

Gear reducers and gearmotors of present handbook are suitable for installations in industrial areas; **additional protection** measures, if necessary, must be adopted and assured by the person responsible for the installation.

IMPORTANT:
The components supplied by Foote-Jones/Illinois Gear must be incorporated into machinery and **should not be commissioned before the machinery in which the components have been incorporated conforms to:**

- **Machinery directive 89/392/EEC and subsequent updatings; in particular, possible safety guards for shaft ends not being used, eventually accessible fan cover passages (or other) are the Buyer's responsibility;**

- ***Electromagnetic compatibility (EMC)* directive 89/336/EEC and subsequent updatings.**

For the installation, use and maintenance of the electric motor (also brake or non-standard motor) and/or the electric supply device (frequency converter, soft-start, etc.), consult the specific documentation. If necessary, require it.

When operating on gear reducer (gearmotor) or on components connected to it **the machine must be at rest**: disconnect motor (including auxiliary equipments) from power supply, gear reducer from load, be sure that safety systems are on against any accidental starting and, if necessary, pre-arrange mechanical locking devices (to be removed before commissioning).

If deviations from normal operation occur (temperature increase, unusual noise, etc.) immediately switch off the machine.

The products relevant to this handbook correspond to the technical level reached at the moment the handbook is printed.

Foote-Jones/Illinois Gear reserves the right to introduce, without notice, the necessary changes for the increase of product performances.

⚠ WARNING! The paragraphs marked with present symbol contain dispositions to be strictly respected in order to assure personal **safety** and to avoid any **heavy damages** to the machine or to the system (e.g.: works on lives parts, on lifting machines, etc.); the responsible party for the installation or maintenance must scrupulously **follow all instructions contained in present handbook.**

2 – OPERATING CONDITIONS

Gear reducers can be used for applications according to name plate, at ambient temperature 0 to 40° C (with peaks at -10° C and +50° C), maximum altitude 1000 m.

Not allowed running conditions: application in aggressive environments having explosion danger, etc. Ambient conditions must comply with specifications stated on name plate.

3 – HOW SUPPLIED

3.1 – Receipt

At receipt verify that the unit corresponds to the one ordered and has not been damaged during the transport; in case of damages, report them immediately to the courier.

Avoid commissioning gear reducers and gearmotors that are even slightly damaged.

3.2 – Name plate

Every gear reducer presents a name plate in anodized aluminum containing main technical information relevant to operating and constructive specifications and defining, according to contractual agreements, the application limits; the name plate must be kept integral.

3.3 – Protections and Packing

Overhanging free shaft ends and hollow shafts are treated with protective anti-rust long life oil. All internal parts are protected with protective anti-rust oil.

Unless otherwise agreed in the order, products are adequately packed: on pallet, protected with a polyethylene film, wound with adhesive tape and strap (bigger sizes) ; in carton pallet, wound with adhesive tape and strap (smaller sizes); in carton boxes wound with tape (for small dimensions and quantities).

If necessary, gear reducers are conveniently separated by means of anti-shock foam cells or of fitting cardboard.

Do not stock packed products on top of each other.

4 – STORING

Surroundings should be sufficiently clean, dry and free from excessive vibrations ($v < 0.2$ mm/s) to avoid damage to bearings (excessive vibration should also be guarded during transit, even if within wider range) and ambient storage temperature should be 0 to 40° C: peaks of 10° C above and below are acceptable.

The gear reducers filled with oil must be positioned according to the mounting position mentioned on the order during transport and storage.

Every six months rotate the shafts (some revolutions are sufficient) to prevent damage to bearings and seal rings.

Assuming normal surrounding and the provision of adequate protection during transmit, the unit is protected for storage up to 1 year.

For a 2 year storing period in normal surrounding it is necessary to pay attention also to following instructions:

— generously grease the sealings, the shafts and the unpainted machined surfaces, if any, and periodically control conservation state of the protective anti-rust oil;

for gear reducers and gearmotors supplied without oil:

— insert anti-condensation material into the gear reducer to be replaced before due date and remove them before commissioning (as alternative, completely fill the gear reducer with lubrication oil and the specified level before commissioning).

For storages longer than 2 years or in aggressive surroundings or outdoors, consult Foote-Jones/Illinois Gear.

5 – INSTALLATION

5.1 – General

Be sure that the structure on which gear reducer or gearmotor is fitted is plane, levelled and sufficiently dimensioned in order to assure fitting stability and vibration absence (vibration speed V < 3.5 mm/s for PN < 15 kW and V < 4.5 mm/s for PN > 15 kW are acceptable), keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads.

For the dimensions of fixing screws of gear reducer feet and the depth of tapped holes, consult the Foote-Jones/Illinois Gear technical catalogues.

Carefully select the length of fixing screws when using tapped holes for gear reducer fitting, in order to assure a sufficient meshing thread length for the correct gear reducer fitting without breaking down the threading seat.

Before the installation, verify that:
— there were no damages during the storing or the transport;
— design is suitable to the environment (temperature, atmosphere, etc.);
— electrical connection (power supply, etc.) corresponds to motor name plate data;
— used mounting position corresponds to the one stated in name plate.

⚠ **WARNING!** When lifting and transporting the gear reducer or gearmotor use through holes or tapped holes of the gear reducer casing, be sure that load is properly balanced and provide lifting systems and cables of adequate section. If necessary, gear reducer and gearmotor masses are stated in Foote-Jones/Illinois Gear technical catalogues.

⚠ **WARNING!** Do not use motor eyebolts when lifting the gearmotors.

Position the gear reducer or gearmotor so as to allow a free passage of air for cooling both gear reducer and motor (especially at their fan side).

Avoid: any obstruction to the air flow; heat sources near the gear reducer that might affect the temperature of cooling air and of gear reducer (for radiation); applications hindering the steady dissipation of heat.

Mount the gear reducer or gearmotor so as not to receive vibration.

Mating surfaces (of gear reducer and machine) must be clean and sufficiently rough to provide a good friction coefficient; remove by a scraper or solvent the eventual paint of gear reducer coupling surfaces.

When external loads are present use pins or locking blocks, if necessary.

When fitting gear reducer and machine and/or gear reducer and eventual flange **B5** it is recommended to use **locking adhesives** such as LOCTITE on the fastening screws (also on flange mating surfaces).

Star-delta starting should be adopted for no-load starting (or with a very small load) and for smooth starts, low starting current and limited stresses, if requested.

If overloads are imposed for long periods or if shocks or danger of jamming are envisaged, then motor-protection, electronic torque limiters, fluid couplings, safety couplings, control units or other similar devices should be fitted.

Where duty cycles involve a high number of on-load starts, it is advisable to utilize **thermal probes** for motor protection (fitted on the wiring); magnetothermic breaker is unsuitable since its threshold must be set higher than the motor nominal current of rating.

Use varistors to limit voltage peaks due to contactors.

⚠ **WARNING!** When gear reducer is equipped with a backstop device, provide a protection system where a backstop device breaking could cause personal injury or property damage.

Attention! Shaft, bearing and coupling life depends on alignment precision between the shafts. Carefully align the gear reducer with the motor and the driven machine (with the aid of shims if need be; for gear reducers size ≥ 400 use level tapped holes), interposing flexible couplings wherever possible.

Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate control devices (e.g.: remote level gauge, lubricant for food industry, etc.).

In polluting surroundings, take suitable precautions against lubricant contamination.

For outdoor installation or in a hostile environment, protect the gear reducer or gearmotor with an anti-corrosion paint; added protection may be afforded by applying water-proof grease (especially around the rotary seating of sealing rings and at shaft end access points). Gear reducers and gearmotors should be protected whenever possible and by appropriate means from solar radiation and extremes of weather; weather protection **becomes essential** when high or low speed shafts are vertically disposed or when the motor is installed vertically with the fan uppermost.

For ambient temperatures greater than 40° C or less than 0° C, consult Foote-Jones/Illinois Gear.

5.2 – Fitting of components to shaft ends

Before mounting, thoroughly clean mating surfaces and lubricate against seizure and fretting corrosion.

Attention! Installing and removal operations should be carried out with the aid of a jacking screw or puller using the tapped hole at the shaft butt-end taking care to avoid impacts and shocks which may damage the bearings, the circlips or other parts.

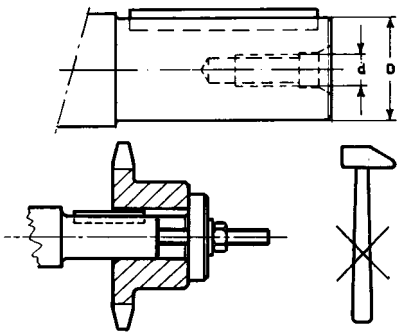
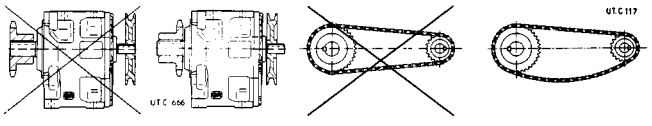


Figure 2

Couplings having a tip speed on external diameter up to 20 m/s must be statically balanced; for higher tip speeds they must be dynamically balanced.

Where the transmission link between gear reducer and machine or motor generates shaft end loads, (see fig. 3), ensure that:
– loads do not rise above catalogue values;
– transmission overhung is kept to a minimum;
– gear-type transmissions must guarantee a minimum of backlash on all mating flanks;
– drive-chains should not be tensioned (if necessary - alternate loads and/or motion - foresee suitable chain tighteners);
– drive-belts should not be over-tensioned.



Incorrect *Correct* *Incorrect* *Correct*

Figure 3

5.3 – Shaft-mounting

When shaft mounted, the gear reducer must be supported both axially and radially by the machine shaft end, as well as anchored against rotation only, by means of a reaction having **freedom of axial movement** and sufficient **clearance in its couplings** to permit minor oscillations always in evidence without provoking dangerous overloading on the gear reducer.

Follow the relevant pointers given in Foote-Jones/Illinois Gear technical catalogues in connection with the reaction arrangement type.

6 – LUBRICATION

Depending on type and size, gear reducers and gearmotors may be grease-lubricated and supplied FILLED WITH GREASE, or (synthetic or mineral) oil-lubricated and supplied FILLED WITH OIL or WITHOUT OIL, the type and size (see ch. 11.2). When supplying WITHOUT OIL, the filling up to specified level (normally stated by means of transparent level plug) is Buyer's responsibility.

Every gear reducer has a **lubrication plate**.

Concerning lubricant type and quantity, gear reducer type, how supplied, plugs, filling instructions, oil-change interval, etc. see lubrication table.

Be sure that with gear reducers and gearmotors size ≥ 100, the filler plug is provided with a valve (symbol ⊸◇⊸); otherwise, replace it with the one normally supplied.

When gear reducer or gearmotor is provided with a **spillway plug** (red color), fill after unscrewing a.m. plug in order to check the obtained level by oil outlet.

When gear reducer or gearmotor is provided with a **level plug with rod**, fill with oil up to specified level on rod.

When gear reducer or gearmotor is supplied with a level plug (size 100), necessary lubricant quantity is that which reaches a.m. level (gear reducer at rest) and not the approximate quantity given on the catalogue.

Usually bearings are automatically and continuously lubricated (bathed, splashed, through pipes or by a pump) utilizing the main gear reducer lubricant. The same applies for backstop devices, when fitted to gear reducers.

In certain gear reducers in vertical mounting positions V1, V3, V5 and V6, and right-angle shaft gear reducers in horizontal positions B3, B6 and B51 (though not gearmotors in this case, for which the above indications hold good), upper bearings are independently lubricated with a special grease *for life*, assuming pollution free surroundings. The same applies for motor bearings (except for some cases in which a relubrication device is adopted) and backstop devices when fitted to motors.

Always be sure that the gear reducer is located as per the mounting position ordered, which appears on the

name plate. When no indication is given, the gear reducer may be used in horizontal mounting position B3 or B5 (B3 or B8 worm gear reducers size ≤50), or vertical position V1 (in the case of right angle shaft gear reducers in the design incorporating flange FO1…).

Combined gear reducer units. Lubrication remains independent; thus, data relative to each single gear reducer hold good.

7 – COMMISSIONING

Carry out an overall check, making particularly sure that the gear reducer is filled with lubricant.

Where star-delta starting is being used, input voltage must match the motor lower voltage (Δ connection).

For asynchronous three-phase motor, if the direction of rotation is not as desired, invert two phases at the terminals.

Before running gear reducers fitted with a **backstop device**, make sure that the **direction of rotation in machine, gear reducer and motor all correspond correctly**.

⚠ WARNING! One or more startings in the false direction, even if short, could damage the backstop device, the coupling seats and/or the electric motor.

A **running-in** period is advisable:
– of approx. 400 to 1600 h for gear reducers with worm gear pairs in order to reach maximum efficiency;
– of approx. 200 to 400 h for gear reducers with bevel and/or cylindrical gear pairs in order to reach maximum functionality.

The temperature of both gear reducer and lubricant may well rise beyond normal values during running-in. After the running-in period it may be necessary to verify the gear reducer fixing bolt tightness.

Note: worm gear reducer efficiency is lower in the **first running hours** (about 50) and at every cold starting (efficiency will be better with oil temperature increasing).

8 – MAINTENANCE

8.1 – General

At machine rest, verify at regular intervals (more or less frequently according to use):
a) all external surfaces are clean and air passages to the gear reducer or gearmotor are free, in order that cooling remains fully effective;
b) normal running conditions.

⚠ CAUTION

– oil level and deterioration degree (check with cold gear reducer at rest);
– noise level;
– vibrations;
– sealings;
– correct fastening screws tightening;
– etc.

⚠ WARNING! After a running period, gear reducer (excluding the shaft mounted gear reducers) is subject to a light internal overpression which may cause burning liquid discharge. Therefore, before loosening whichever plug, wait until gear reducer has become cold. If not possible, take the necessary protection measures against burning due to worm oil contact. In all cases, always proceed with great care.

Maximum oil temperatures indicated in lubrication table do not represent a hindrance to the gear reducer regular running.

During the oil change, after having unscrewed also the filler plug in order to improve the discharge, it is recommended to clean the gear reducer casing internally using the same oil type suitable for the running. For the next filling use a 60 micron oil filter.

When dismounting the cap (whenever provided with gear reducers), reset the sealing with adhesive on cleaned and degreased mating surfaces.

9 – SOUND LEVELS

Most of the Foote-Jones/Illinois Gear product range is characterized by **sound pressure levels** (mean value of measurement, assuming nominal load and input speeds n_1 - 1400 min $^{-1}$, at 1 m from external profile of gear reducer standing in free field on a reflecting surface, according to draft proposal ISO/DIS 8579-1) **lower or equal to 85 dB(A)**.

The table indicates the products which **can exceed** a.m. threshold.

Machine/Train of gears		i1	size
Parallel shaft	**R 1**	≤3.15	≥160
		≥4	≥225
	R21	≤14	≥250
		≥16	≥320
	R31	all	≥400
Right angle shaft	**R C1**	≤18	≥250
		≥20	≥320
	R C21	all	≥400
	R C31	all	≥400
Right angle Shaft	**R C**	1	≥250

10 – TROUBLES: CAUSES AND CORRECTIVE ACTIONS

Troubles	Possible causes	Corrective actions
Excessive temperature (in continuous duty or of bearings	Inadequate lubrication: – excessive or insufficient oil quantity – unsuitable lubricant (different type, too viscous, exhausted, etc.) – too tightened taper roller bearings – worm gear reducer with excessive load during running-in – excessive ambient temperature	Check: – oil level – lubricant type and/or state – Consult Foote-Jones/Illinois Gear – Reduce the load – Increase the cooling or correct the ambient temperature
	Obstructed suction openings of fan cover	Clean the fan cover
	Inefficiency of eventual auxiliary bearing lubrication system	Check the pump and the pipes
	Bearing failure, defect or bad lubrication	Consult Foote-Jones/Illinois Gear
	Inefficient or out of service oil cooling system: obstructed filter, insufficient oil (exchanger) or water (coil) flow rate, pump out of service, etc.	Check the pump, the pipes, the oil filter and safety devices efficiency (manostats, thermostats, etc.)
Anomalous noise	One or more teeth with: – dents or spallings – excessive flank roughness	Consult Foote-Jones/Illinois Gear
	Bearings failure, defect or bad lubrication	Consult Foote-Jones/Illinois Gear
	Taper roller bearings with excessive clearance	Consult Foote-Jones/Illinois Gear
	Vibrations	Check the fastening
Lubricant leaking from seal rings	Seal ring with worn, bakelized, damaged or false mounted seal lip	Replace the seal ring
	Damaged rotating seating (scoring, rust, dent, etc.)	Restore the seating
	Mounting position differs from the one stated in the name plate	Correctly position the gear reducer

NOTE: When consulting Foote-Jones/Illinois Gear state:

- all data on gear reducer or gearmotor name plate;
- failure nature and duration;
- when and under what conditions the failure happened.

LUBRICATION TABLE

Direction for first fill

Before putting into service, fill to specified level with mineral oil (BP-Energol GR-XP, ESSO Spartan EP, MOBIL Mobilgear 600, SHELL Omala, TEXACO Meropa) or synthetic oil (MOBIL Glygoyle*, SHELL Tiveta Oil*, MOBIL SHC…) having the ISO viscosity-grade given in the table.
* Internally, special paint is necessary.

ISO viscosity grade [cSt]

Output Speed nx RPM		Ambient temperature 1) [°C]		
		Mineral Oil		Synthetic Oil
Right angle gear reducer RC	Others	0 to 20	10 to 40	0 to 40
Above >710 RPM	> 224	150	150	150
710 - 280 RPM	224 to 22.4	150	220	220
280 - 90 RPM	22.4 to 5.6	220	320	220, 320
Under < 90 RPM	< 5.6	320	460	460

1) Peaks of 10° C (20° C for synthetic oil) above and 10° C below the ambient temperature range are acceptable.

Oil-change interval

Oil temperature (° C)	Oil-change interval 1) [h]	
	Hours Mineral oil	Hours Synthetic oil
< 65	8,000	25,000
65 ÷ 80	4,000	18,000
80 ÷ 95	2,000	12,500
95 ÷ 110	–	9,000

1) Apart from running hours:
– replace mineral oil each 3 years;
– replace or regenerate synthetic oil each 5 to 8 years according to gear reducer size, running and environmental conditions.

MECHANICAL WARNINGS AND CAUTIONS

WARNING

IMPORTANT INFORMATION
PLEASE READ CAREFULLY

CAUTION

The following **WARNING** ***and*** **CAUTION** ***information is supplied to you for your protection and to provide you with many years of trouble free and safe operation of your Foote-Jones product:***

Read **ALL** instructions prior to operating reducer. Injury to personnel or reducer failure may be caused by improper installation, maintenance or operation.

WARNING

- Written authorization from Foote-Jones/Illinois Gear is required to operate or use reducers in man lift or people moving devices.
- Check to make certain application does not exceed the allowable load capacities published in the current catalog.
- Buyer shall be solely responsible for determining the adequacy of the product for any and all uses to which Buyer shall apply the product. The application by Buyer shall not be subject to any implied warranty of fitness for a particular purpose.
- For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.
- Hot oil and reducers can cause severe burns. Use extreme care when removing lubrication plugs and vents.
- Make certain that the power supply is disconnected before attempting to service or remove any components. Lock out the power supply and tag it to prevent unexpected application of power.
- Reducers are not to be considered fail safe or self-locking devices. If these features are required, a properly sized, independent holding device should be utilized. Reducers should not be used as a brake.
- Any brakes that are used in conjunction with a reducer must be sized or positioned in such a way so as to not subject the reducer to loads beyond the catalog rating.
- Lifting supports including eyebolts are to be used for vertically lifting the gearbox only and no other associated attachments or motors.
- Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.
- Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and/or shaft breakage from bending fatigue, if not sized properly.

CAUTION

- Test run unit to verify operation. If the unit tested is a prototype, that unit must be of current production.
- If the speed reducer cannot be located in a clear and dry area with access to adequate cooling air supply, then precautions must be taken to avoid the ingestion of contaminants such as water and the reduction in cooling ability due to exterior contaminants.
- Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

In the event of the resale of any of the goods, in whatever form, Resellers/Buyers will include the following language in a conspicuous place and in a conspicuous manner in a written agreement covering such sale:

> The manufacturer makes no warranties or representations, express or implied, by operation of law or otherwise, as to the merchantability or fitness for a particular purpose of the goods sold hereunder. Buyer acknowledges that it alone has determined that the goods purchased hereunder will suitably meet the requirements of their intended use. In no event will the manufacturer be liable for consequential, incidental or other damages. Even if the repair or replacement remedy shall be deemed to have failed of its essential purpose under Section 2-719 of the Uniform Commercial Code, the manufacturer shall have no liability to Buyer for consequential damages.

Resellers/Buyers agree to also include this entire document including the warnings and cautions above in a conspicuous place and in a conspicuous manner in writing to instruct users on the safe usage of the product.

This information should be read together with all other printed information supplied by Foote-Jones

ELECTRICAL WARNINGS AND CAUTIONS

⚠WARNING **IMPORTANT INFORMATION** **⚠CAUTION**
PLEASE READ CAREFULLY

Appropriate Foote-Jones/Illinois Gear instructions provided with the motor and precautions attached to the motor should be read carefully prior to installation, operation and/or maintenance of the equipment. Injury to personnel or motor failure may be caused by improper installation, maintenance or operation.

The following ⚠WARNING and ⚠CAUTION information is supplied to you for your protection and to provide you with many years of trouble free and safe operation of your Foote-Jones product:

⚠WARNING

- Disconnect power and lock out driven equipment before working on a motor.
- Always keep hands and clothing away from moving parts.
- The lifting support on the motor is not to be used to lift the entire machine. Only the motor attached directly to the support may be safely lifted by the support.
- Install and ground per local and national codes.
- Discharge all capacitors before servicing a single phase motor.
- Misapplication of a motor in hazardous environment can cause fire or an explosion and result in serious injury. Only the end user, local authority having jurisdiction, and/or insurance underwriter are qualified to identify the appropriate class(es), group(s), division and temperature code Foote-Jones/Illinois Gear personnel cannot evaluate or recommend what motors may be suitable for use in hazardous environments. If a motor is name plated for hazardous locations, do not operate the motor without all of the grease and drain plugs installed.
- Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, resistance, imbedded detector or thermocouple.
- Motors with automatic reset thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic reset thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
- Motors with manual reset thermal protectors may start unexpectedly after the protector trips when the surrounding air is at +20˚ Fahrenheit or lower. If the manual reset protector trips, disconnect motor from its power supply. After the protector cools (five minutes or more), it can be reset and power may be applied to the motor.
- Connect all protective device leads, marked P1, P2, etc., per instructions supplied with the motor.
- Operation of a motor at other than its nameplate rating may result in fire, damage to equipment or serious injury to personnel.
- For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.

⚠CAUTION

- Consult qualified personnel with questions and all electrical repairs must be performed by trained and qualified personnel only.
- For motors nameplated as “belted duty only”, do not operate the motor without belts properly installed.
- Motors and/or driven equipment should not be operated faster than their rated speed.
- For inverter applications, follow the inverter manufacturer’s installation guidelines.
- Make sure the motor is properly secured and aligned before operation.

In the event of the resale of any of the goods, in whatever form, Resellers/Buyers will include the following language in a conspicuous place and in a conspicuous manner in a written agreement covering such sale:

> The manufacturer makes no warranty or representations, express or implied, by operation of law or otherwise, as to the merchantability or fitness for a particular purpose of the goods sold hereunder. Buyer acknowledges that it alone has determined that the goods purchased hereunder will suitably meet the requirements of their intended use. In no event will the manufacturer be liable for consequential, incidental or other damages. Even if the repair or replacement remedy shall be deemed to have failed of its essential purpose under Section 2-719 of the Uniform Commercial Code, the manufacturer shall have no liability to Buyer for consequential damages.

Resellers/Buyers agree to also include this entire document including the warnings and cautions above in a conspicuous place and in a conspicuous manner in writing to instruct users on the safe usage of the product.

This information should be read together with all other printed information supplied by Foote-Jones.

For more information contact: **Foote-Jones**, *A REGAL-BELOIT Company*, 2914 Industrial Avenue, Aberdeen, SD 57402-1089
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