TM & TMG Series Mixers

OWNERS MANUAL

Warranty

Our products are guaranteed against defective materials and workmanship, we will repair or replace such items as may prove defective at our option. Warranty period is one year on items manufactured by INDCO. On items not manufactured by INDCO, the manufactures warranty applies. All component parts of our products are covered by this warranty, except for normal wear items such as belts or impellers. We cannot be responsible for damage or abuse to equipment caused by improper installation or operation. Warranties can also be voided by unauthorized disassembly of equipment. For warranty repairs, equipment is returned to INDCO at the customer's expense; we will repair and return to customer at our expense. Under no circumstances will we allow labor charges or other expense to repair defective merchandise. This warranty is exclusive and is in lieu of all other warranties, whether express or implied. INDCO shall not be liable for any other damages, whether consequential, indirect, or incidental, arising from the sale or use of its products.

TM(G) SERIES
TOP ENTRY MIXERS

Contents **Page**

INDCO, Inc.
4040 Earnings Way
New Albany, IN 47150
phone: 812-941-5954
fax: 812-944-9742
web: www.indco.com

INDCO
your direct source for superior mixing equipment

TM & TMG Series Top Entry Mount Mixers

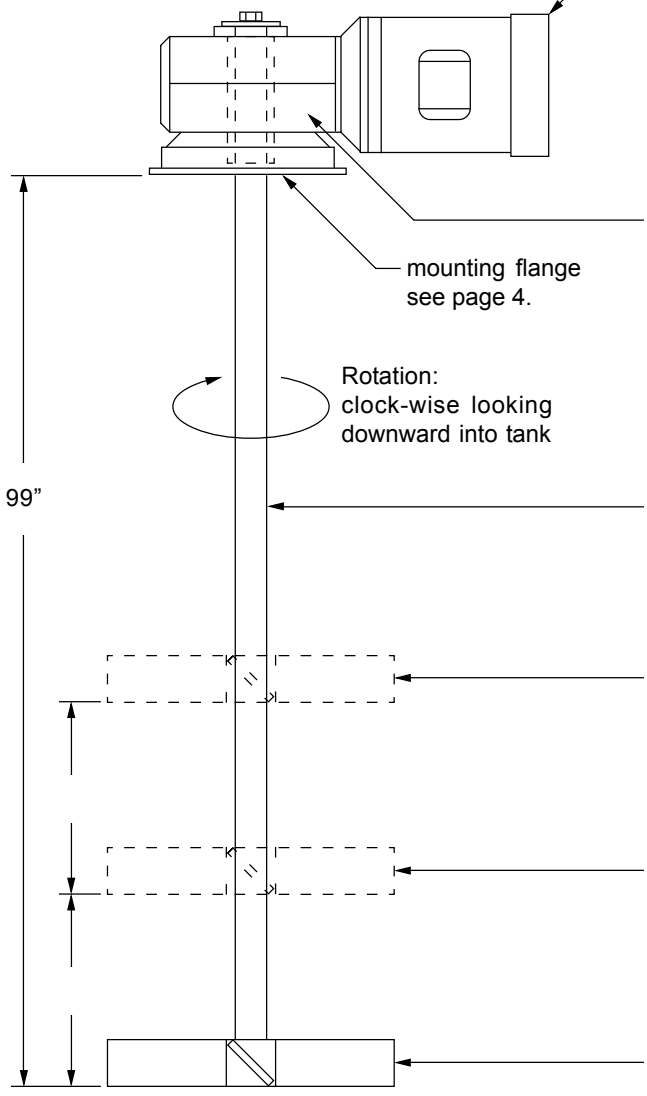
- SPECIFICATION SHEET -

Model: _____

Serial No.: _____

Date: _____

Order No.: _____



100 - Motor:

Part no.:_____

HP:_____ RPM:_____

volts:_____ cycles:_____ phase:_____

frame:_____ enclosure:_____

200 - Gear Reducer:

Part no.:_____

Model No.: _____

Ratio: _____

RPM output: _____

300 - Shaft:

Diameter _____

402 - Impeller, upper:

Diameter _____

Type _____

401 - Impeller, center:

Diameter _____

Type _____

402 - Impeller, lower:

Diameter _____

Type _____

Safety

Please read this complete manual before trying to install or operate your mixer.

- High voltage and rotating equipment can cause serious or fatal injury.
- Never move the unit without a suitable lifting device and do not lift mixer by shaft.
- Have a qualified individual operate and service this equipment.
- Never run the unit in open air.
- Always lockout the power when working on the unit.

Electric Motor Safety:
Motors should be installed, protected and fused in accordance with latest issue of National Electrical Code, NEMA Standard Publication No. MG 2 and local codes.
Frames and accessories of motors should be grounded in accordance with National Electrical Code (NEC) Article 430. For general information on grounding refer to NEC Article 250.
Not all rotating parts are guarded. Keep hands and clothing away from moving parts.
Trained, qualified personnel should make electrical repairs and non-standard connections.
If environment has hazardous combustible fumes present, use only explosion-proof electric motors.

Air Motor Safety:
The air motor is designed to be driven by compressed air and under no circumstances be driven with any other gases. Fluids, particles, solids or any substance mixed with air, particularly combustible substances likely to cause explosions, must not drive air motor.

- Do not drive with flammable or explosive gases or operate unit in an atmosphere containing them.
- Air motor is designed for air only. Do not allow corrosive gases or particulate material to enter motor. Water vapor, oil-based contaminants, or other liquids must be filtered out.
- Do not use a hammer or force coupling or drive pulley onto shaft when installing drive onto air motor. This causes end thrust that could damage air motor.
- Ambient temperature should not exceed 250°F.
- Beware of any exposed and/or movable parts. Proper guards should be in place to prevent personal and/or property damage.
- Solid or liquid material exiting unit can cause eye or skin damage. Keep away from air stream.
- Always disconnect air supply before servicing.
- Do not allow air motor to “run free” at high speeds with no loads. Excessive internal heat build-up, loss of internal clearances and rapid motor damage will result.
- Some models may exceed 85dB(A) sound level. Hearing protection should be worn when in close proximity to these models.

General

INDCO’s TM series - top mounted heavy duty gear drive mixers are designed for handling large volumes and are the most common and most efficient mixer used in the process industry.

INDCO’s TMG series - top mounted heavy duty gear drive mixers are designed for handling low viscosity materials in large batches or small batches of heavy material that are beyond the range of direct drive mixers.

Both the above mixers feature axial flow impellers that generate downward flow for optimum circulation and mixing.

Receiving

Before removing any packing, visually inspect the exterior of the shipment for any sign of damage. Should there be any damage, bring it to the attention of the delivering UPS or truck line and note the same on the receiving ticket. Should there be damage you must place a claim with the truck line. *They are the only ones who will pay for the damage done and you are the only one who can place that claim.*

Operation

Electric Power: Once the electric motor has been wired, check rotation to be sure the mixer shaft is rotating in a clock-wise direction, looking downward into the container.

Air Power: Check to ensure the air valve is in the closed position, then connect air supply. Check rotation to be sure the mixer shaft is rotating in a clock-wise direction, looking downward into the container.

Once the mixer is in the container, it is now safe to operate. Always start and stop mixer in slowest speed.

CAUTION:

- ✓ ***Never run mixer without an impeller.***
- ✓ ***Never run the impeller in open air.***

Installation

Mounting Flange Details
- Gear Reducer

Mixer Mounting Surface

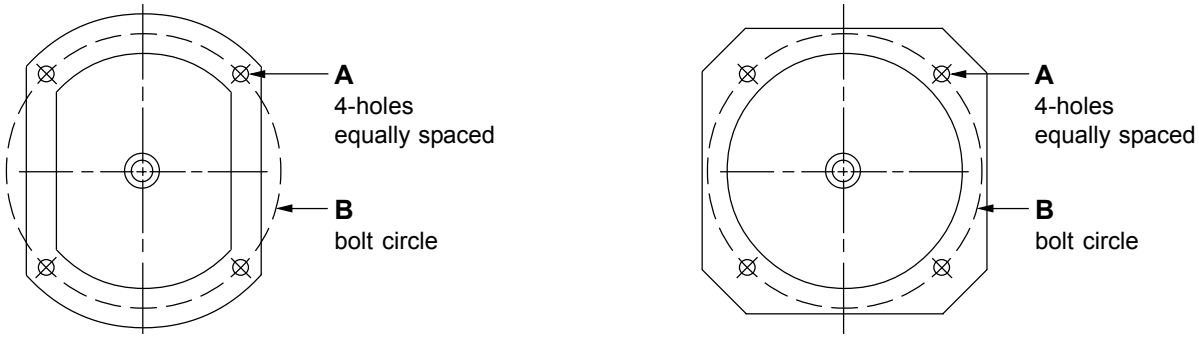
The following tables and flange details correspond with the Gear Reducer model number for your mixer listed on the Specification Sheet, page 2. Gear reducers are listed by manufacture and model series number.

DIMENSIONS (in inches)

	Winsmith							IPTS	
model	**917**	**920**	**924**	**926**	**930**	**935**	**943**	**50**	**100**
A	0.344	0.406	0.406	0.406	0.563	0.563	0.688	0.41	0.41
B	5.88	6.5	7.5	8	9.25	10	11.5	7.0	9.0

	Electra-Gear							
model	**21**	**26**	**30**	**35**	**400**	**500**	**600**	**H600**
A	0.44	0.50	0.56	0.56	0.69	0.81	0.81	0.81
B	6.88	7.38	9.12	10.75	11.5	12.75	15.25	15.25

MOUNTING FLANGE DETAILS



Motor to Gear Reducer Mounting Procedures

Motor to C-Flange:

• Check motor and reducer mounting registers for nicks that would interfere with assembly. Remove if necessary.

• Remove protective plastic plug from reducer input shaft. The bore has been coated with an anti-seize compound.

• Align the motor shaft and key with keyway in bore and slide up to flange.

• Position the motor conduit box as desired.

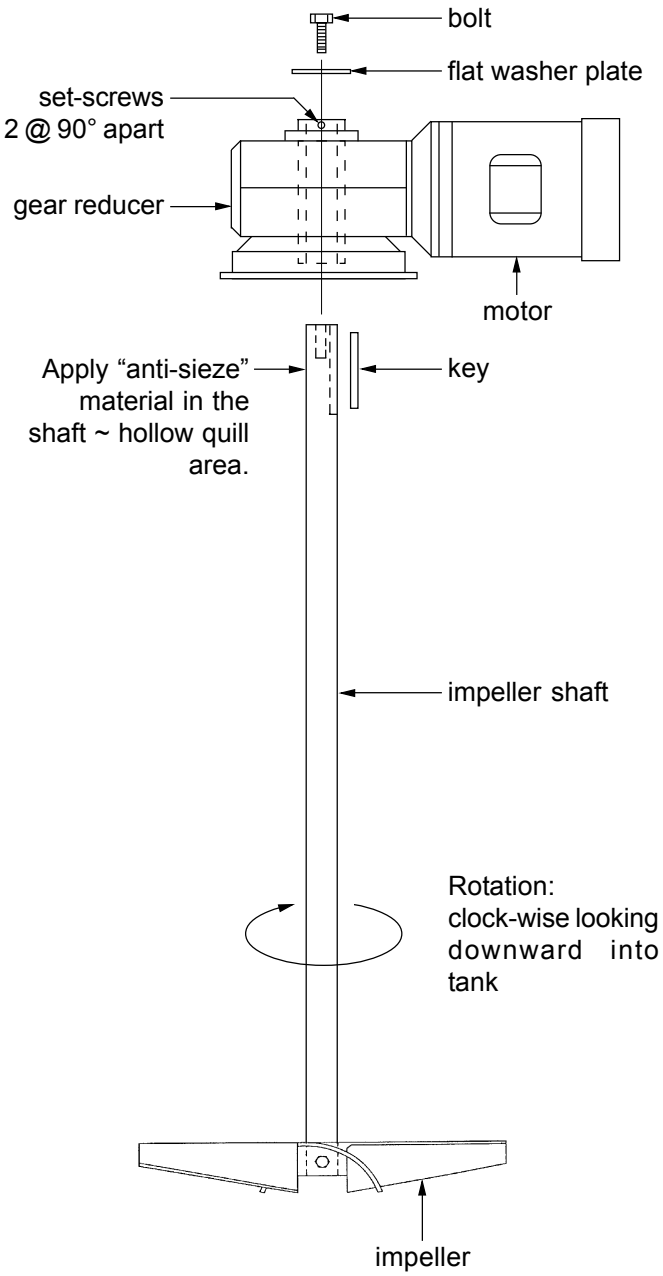
• Using the fasteners supplied, secure the motor to the reducer. Draw down evenly so as not to bend the motor shaft. Tighten fasteners to 200 inch pounds.

Motor to C-Flange with Coupling:

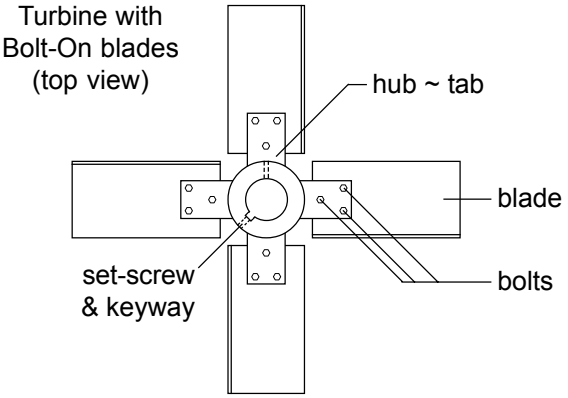
• Check motor and reducer mounting registers for nicks that would interfere with assembly. Remove if necessary.

• When assembling the motor and coupling, the coupling halves should be equally spaced on each shaft to insure adequate engagement. The following describes a method for doing this.
First determine the assembled shaft clearance by measuring the distance from the C-Flange face to the reducer shaft end and subtracting the motor shaft length. Mount and secure the motor shaft coupling half with the spider end extending one half the clearance distance beyond the motor shaft. Mount the reducer coupling half and coupling spider on reducer shaft in its approximate position but do not secure.
Locate the motor conduit box in the desired position and secure the motor to the reducer flange using the fasteners provided. Tighten to about 200 inch pounds.
Using the access hole in the flange, slide the coupling together and tighten the set screw.

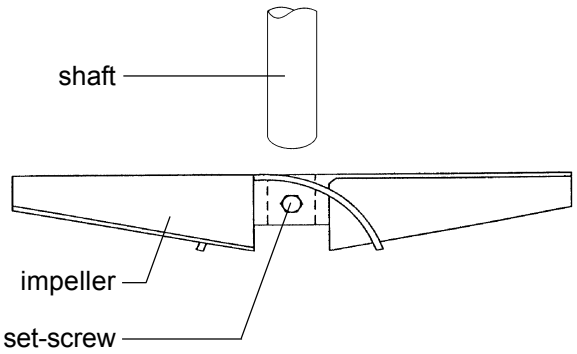
Impeller Shaft
The impeller shaft mounts through the hollow gearbox shaft. Apply an “anti-sieze” material in the hollow gearbox quill area. Align key with keyways in gearbox and impeller shaft. Downward load is supported by a bolt and washer plate that thread into the end of impeller shaft. Tighten securely.



Impellers
If your unit has impellers with bolt-on blades, it will be up to the installer wheather the blades are mounted to the hub (tabs) before mounting hub to the shaft. Your application may require the blades to be mounted to hub inside the tank, after hub is mounted to shaft.



To install the impeller, back off the set screws as far as possible without removing them. Insert mixing shaft into the bore and tighten the set screws firmly to secure the impeller to the shaft. If your unit is supplied with a shaft key, align and install. Most keyways should align with one set-screw.



Impeller Placement
Mixers with ONE impeller, mount it 1 to 2 impeller diameters distance off the bottom of mixing container.

Mixers with TWO or more impellers, mount the lowest impeller 1 to 2 impeller diameters distance off the bottom of mixing container. Mount the other impellers 1 to 2 impeller diameters apart. The uppermost impeller should be positioned approximately 1 impeller diameter under the surface of the liquid.

The above guide-lines are “rules of thumb” and may not be the best for your situation. Experimenting with impeller placement may provide your best results.

Maintenance - Gear Reducer

Winsmith - 900 Series

Factory Filled:
Your new speed reducer is filled to the proper level for standard mounting position with the appropriate grade of oil for operation in a 51°F to 110°F temperature environment. The oil level should be checked and adjusted (if necessary) prior to operation, using the oil plug provided and while the unit is oriented in its operating position.
If operating ambient temperature is outside the range specified above, then refer to the lubrication chart and refill the unit with the correct grade based on actual ambient temperatures.

Oil Changing:
When changing oil for any reason, it should be remembered that oils of various types may not be compatible. Therefore, when changing to a different oil, it is recommended that the housing be completely drained and thoroughly flushed with a light flushing oil prior to refilling with the appropriate lubricant. The oil level should be rechecked after a short period of operation and adjusted if necessary.

Initial Oil Change:
The oil in a new speed reducer should be changed at the end of 250 hour of operation.

Subsequent Oil Changes:
Under normal conditions, after the initial oil change, the oil should be changed after every 2,500 hours of operation, or every six months, whichever occurs first. Under severe conditions (rapid temperature changes, moist, dirty or corrosive environment) it may be necessary to change oil at intervals of one to three months. Periodic examination of oil samples taken from the unit will help establish the appropriate interval.

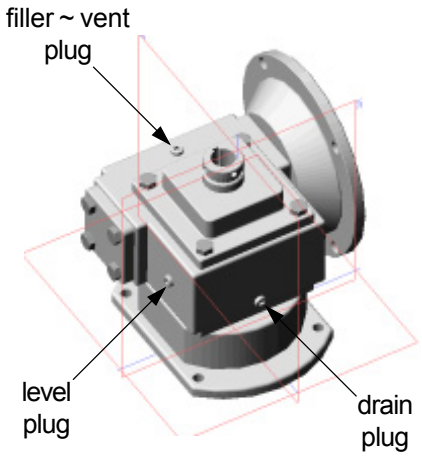
Synthetic Oils:
Synthetic lubricants can be advantageous over mineral oils in that they generally are more stable, have longer life, and operate over a wider temperature range. These oils are appropriate for any application but are especially useful when units are subjected to low start-up temperatures or high operating temperatures. However, continuous operation above 225°F may cause damage to the seals or other components. It is recommended that the initial oil be changed or filtered after the first 1500 hours of operation to remove metal particles that accumulate during break-in. Subsequent oil changes should be made after 5000 hours operation if units are operating in a clean environment.

Oil Temperature:
Speed reducers in normal operation can generate temperature up to 200°F depending on the type of reducer and the severity of the application (loading, duration of service, ambient temp.). Excessive temperature can result from overloading due to original unit selection being too small for the application or increased load after original load size was selected. Overfilling and Under filling the oil level of a speed reducer will cause overheating. Ensure oil is at the proper level.

Lubricants:
Below is just a few of the recommended lubricants that should be used in your speed reducer.

Ambient Temp.	16 to 50°F	51 to 110°F	111 to 165°F
Max.Op.Temp.	185°F	200°F	200°F
ISO Visc.Grade	460	680	1000
AGMA Lub.No.	#7 Comp.	#8 Comp.	#8A Comp.
Mobil Oil	600W	600W Super	Extra Hecla
Shell Oil	Omala 460	Omala 680	Omala 800
Sun Oil	Sunep 1110	Sunep 1150	Oil 8 AC

Gear Reducer



Electra-Gear Series

Run In Period:
The maximum efficiency of the gear reducer is obtained after a "run-in" period. The length of time required will depend on the load applied and will be 8 to 12 hours at rated load, and considerably longer at light loads.
During "run-in", higher than normal motor currents, lower efficiency, and lower output torque can be expected. Overloading will not decrease "run-in" time, but may cause severe wear.

Oil Change Time Table:
Standard Mobil 600W Lubricant (factory fill)
Drain and refill oil after first 100 hours of operation. Under normal conditions, change oil every 2000 hours of operation or 6 months, whichever occurs first. Check ambient temperature limits of your oil to ensure it matches ambient conditions.
SEGL Lubricant (special high performance)
Under normal conditions, change oil every 8000 hours of operation or every three years, whichever occurs first.

Lubrication:
The speed reduce is filled to the proper level with lubricant, Mobil 600W lube is the factory standard with SEGL being the preferred option.

Recommended Lubricants:

Manufacture	- Name	Ambient Temp. Range, deg.F
• *Standard Factory Fill Lubricant:*		
Mobil	- Mobil Cylinder 600W	+32 to +100
• *Special High Performance Lubricants:*		
Chem Age Ind.	- SEGL Gear Lube	-50 to +425
Mobil	- Mobil SHC 634	0 to +100
Mobil	- Mobil SHC 629	-25 to +100
Mobil	- Mobil SHC 626	-40 to +40

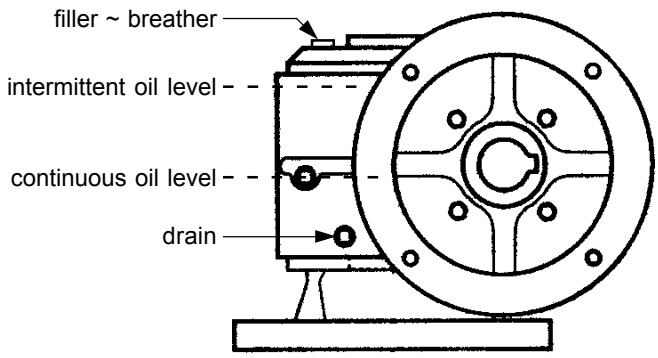
The SEGL lubricants are available from:
New Age Chemical
3765 Kettle Court E.
Delafield, WI 53018

Oil Fill Capacities in U.S. Pints

Frame Size	Cont. Duty	Int. Duty
21	1.1	2.0
26	1.8	3.4
30	2.8	5.0
35	3.5	7.0
400	4.0	9.25
500	8.0	17.0
600	11.0	26.5

Continuous Duty is defined as running more than 30 minutes in an hour. If the unit is going to be run on a continuous basis (more than half the time), it should be filled to the continuous duty (low) level.
Intermittent Duty is defined as running less than 30 minutes in an hour, or with an input speed of 800rpm or less. However, use of the optional SEGL High Performance Oil requires the continuous oil level be used in all cases, regardless of running time or RPM.

Gear Reducer



Maintenance - Gear Reducer (continued)

IPTS - ICSF Series

Factory Filled:
Reducers are shipped filled with oil. Before operating, the breather plug must be installed in the top of the reducer. When the reducer is mounted so that the output shaft is vertical, the breather should be placed in the uppermost side.

Oil Changing:
The oil in a new unit should be drained at the end of two weeks operation or 100 hours, whichever comes first, and the case thoroughly flushed with a light flushing oil. The original oil can be used for refilling if it has been filtered; otherwise new oil must be used. After this, a change of oil every 2500 hours of operation or every six months, whichever comes first, is recommended for units operating under normal conditions. If the unit is operating in extremely dirty or high temperature environments the oil should be changed more often.

The unit should be filled when not running to the center of the oil sight gauge or the oil level plug with Mobil 600W cylinder oil or equivalent AGMA 7 or 7EP lubricant when the ambient temperature does not exceed 90°F. For units operating in ambient temperatures normally between 80°F to 125°F, Mobil 600W super cylinder oil or equivalent AGMA 8 or 8EP lubricant is recommended.

Oil Fill Capacities in Fluid Ounces

Frame Size, Vertical Output	Cont. Duty
34	4
40	6
45	12
50	10
60	14
70	25
80	36
100	72

Preventive Maintenance:
Shafts and vent plugs should be kept clean to prevent foreign particles from entering seals or gear case. Inspect periodically for proper oil level and replenish when necessary.