



MX3 - MX5 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.



**MX3 & MX5 SERIES
MIXERS**

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Safety

Please read this complete manual before trying to operate your mixer. Failure to follow these instructions could result in serious bodily injury or death.

- Never move the unit without a suitable lifting device.
- Have a qualified individual bring power to your unit.
- Never run the unit in open air.
- Never adjust the speed without the unit running.
- Always lockout the power when working on the unit.
- Always use the container holder to restrain the container during operation.

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. Eyebolts or lifting lugs are intended for lifting the motor only. These lifting provisions should never be used when lifting or handling the motor with other equipment (i.e. pumps, gearboxes, or other driven equipment) as a single unit. Be sure eyebolt is fully threaded and tight in its mounting hole.

Frames and accessories of motors should be grounded in accordance with National Electrical Code (NEC) Article 430. Rotating parts such as pulleys, couplings, external fans, unusual shaft extensions should be permanently guarded. Keep hands and clothing away from moving parts. Trained, qualified personnel should make electrical repairs only.

Mechanical Variable Speed Drive Safety:

When maintenance is required in the area of the equipment necessitating removal of the guarding, the prime mover should be turned off and "locked out".

The user of variable speed belt drives should be aware of the hazards through misuse of the product or failure to protect against contact with moving parts.

Spring-loaded pulleys should never be disassembled without first receiving instruction from factory.

Rapid acceleration or braking, or shock loading may cause a shaft to fracture due to torsional twist beyond its capacity. All mounting screws on the pulleys must be kept tight.

Even though each pulley is individually balanced at the factory the system in which the pulleys operate may resonate, particularly at high RPM's over 1800. Sometimes a new belt will reduce vibration levels in a system.

General

A container holder designed to hold anything up to a 55-gallon drum is supplied, but the unit can handle batches in the 250-300 gallon range, based on viscosity.

Standard Features:

- MX3 - 3 HP motors
- TEFC or Explosion-Proof, 3-phase, 230/460-volt, 60Hz.
- Shaft: 1.5" diameter - 316 stainless steel.
- ONE, 15" diameter, 3-blade Turbine Impellers - 316SS.
- Fixed speed electric models - 175rpm.
- Mechanical variable speed electric models - 30 to 200rpm.
- Electrical variable speed electric models - 0 to 175rpm.

- MX5 - 5 HP motors
- TEFC or Explosion-Proof, 3-phase, 230/460-volt, 60Hz.
- Shaft: 2" diameter - 316 stainless steel.
- TWO, 15" diameter, 3-blade Turbine Impellers - 316SS.
- Fixed speed electric models - 175rpm.
- Mechanical variable speed electric models - 30 to 200rpm.
- Electrical variable speed electric models - 0 to 175rpm.

Installation

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.

Mounting:

Ensure the unit is securely bolted to your floor and is level, square, and plumb. Leave space around the unit for cleaning, inspection and maintenance.

Pre-Start Up Check List:

1. Are all mounting bolts tight?
2. Bump motor and check rotation, looking down into the container, shaft should rotate clock-wise. If direction is incorrect reverse motor.

Operation

Speed Adjustment:

Listed below are the various mixer models and how the variable-speed adjustments are made.

- **Models:** **MX3-TV1**
 MX3-TV2 **MX5-TV2**
 MX3-TV2 **MX5-TV4**

Electronic Variable Speed Drive:

- Speed range of 0 to 175-RPM.
- Controlled by the Control Box or Inverter Keypad.
- Either DC or AC-VFD drive.

- **Models:** **MX3-EV** **MX5-EV**

Mechanical Variable Speed Drive:

- Speed range of 30 to 200-RPM.
- Turning the hand-wheel at the rear of the mixer varies the speed.
- Always stop and start the mixer in the lowest hand-wheel setting.

*DO NOT TURN THE HAND-WHEEL
WHEN THE MIXER IS NOT RUNNING !*

- **Models:** **MX3-T** **MX5-T**
 MX3-E **MX5-E**

Fixed Speed:

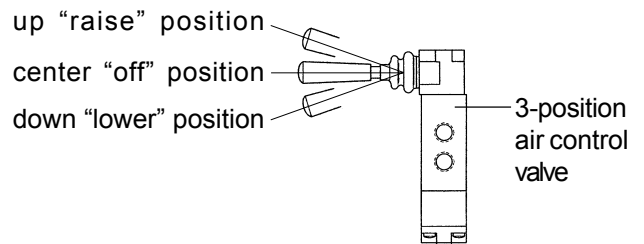
- speed 175-RPM.

Air Cylinder Lift Operation:

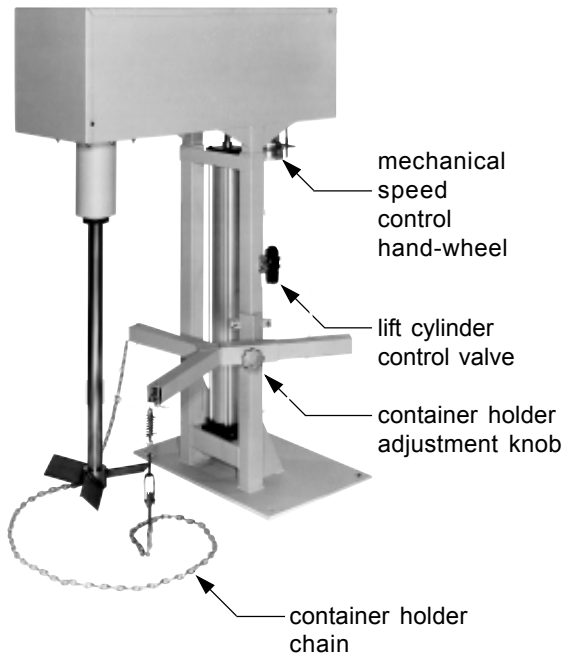
Before connecting your air supply ensure the lift control valve is in the center (off) position. Connect your air supply to the quick connector on the 3-position air valve. Maximum air pressure is 100-PSI. Note that air pressure is used to both raise and lower the cylinder. The following will enable you to adjust the height of the impeller or to install and remove your batch container:

CAUTION: After the air line is installed and before operating the machine for the first time, move the lift control valve to the downward position. This will charge the air cylinder and prevent surging when the lift control valve is moved to the upward position.

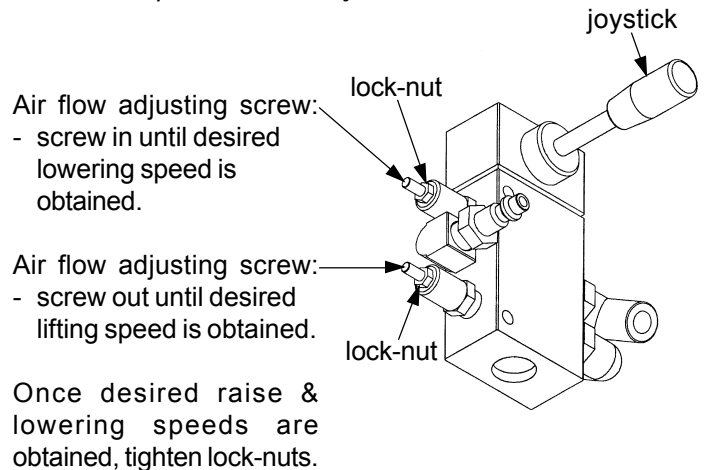
- Lifting:
Move the lift control valve to the upper most position. To stop upward motion, move valve to center (off) position.
- Hold:
To hold the impeller at any height, move the lift control valve to the center (off) position.
- Lowering:
Move the lift control valve to the lower most position. To stop downward motion, move valve to center (off) position.



Mechanical Variable Speed Drive Model



Air Valve Speed Control Adjustment:



Once desired raise & lowering speeds are obtained, tighten lock-nuts.

Maintenance

General

Maintaining your mixer is not difficult if you follow these guidelines:

- Keep the mixer clean.
- Ensure all bolts, nuts and set-screws are tight.
- Check all wiring on a regular basis and repair as needed.
- Unit fails to start: Check power source to unit, check -and/or- reset breaker. If problem continues, disconnect power and have a qualified person make proper repairs.

Mechanical Variable Speed Drive

- Avoid using automotive chassis and other non-interchangeable lubricants. Lubricated pulleys will stick or freeze if not lubricated properly. The most frequent cause is failure to run the drive through part of its range at the time it is lubricated. The pulley must be lubricated periodically and pulley adjustment opened and closed to distribute the grease inside. Small amounts of grease will do. Wipe excess off of belt faces.
- Check belt alignment. Misalignment will cause the belt to overheat and wear rapidly.
- Watch for overload conditions. If the belt loops out or squeals the drive is overloaded. This condition will frequently exist during start-up but should not continue for more than a few seconds. When starting up, particularly if starting several times a day, try to start up slowly by jogging the machine to bring the speed up gradually.
- Excessive vibration will cause damage to all of the equipment in the drive system. If any doubt exists as to the safe levels of vibration a qualified person should be called in to examine the drive.
- Use Loctite on set screws where necessary to prevent screws from backing out due to vibration in machine.

Maintenance, continued

Gear Reducers

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.

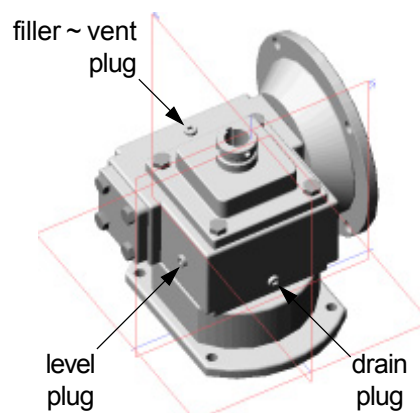
Oil Temperature:

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:

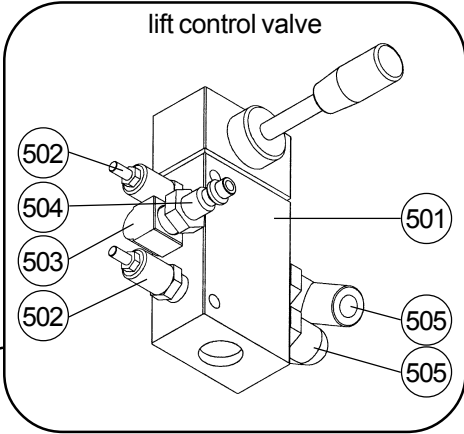
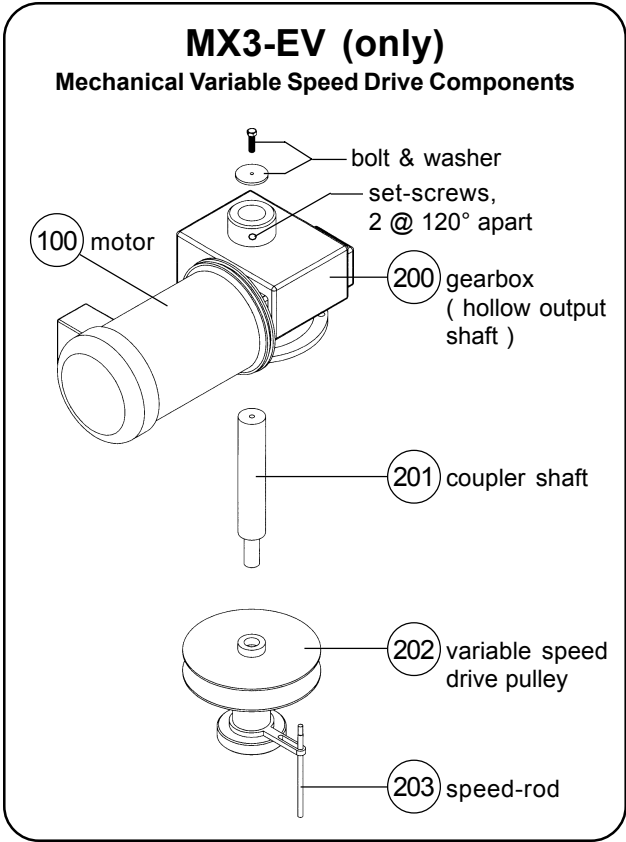
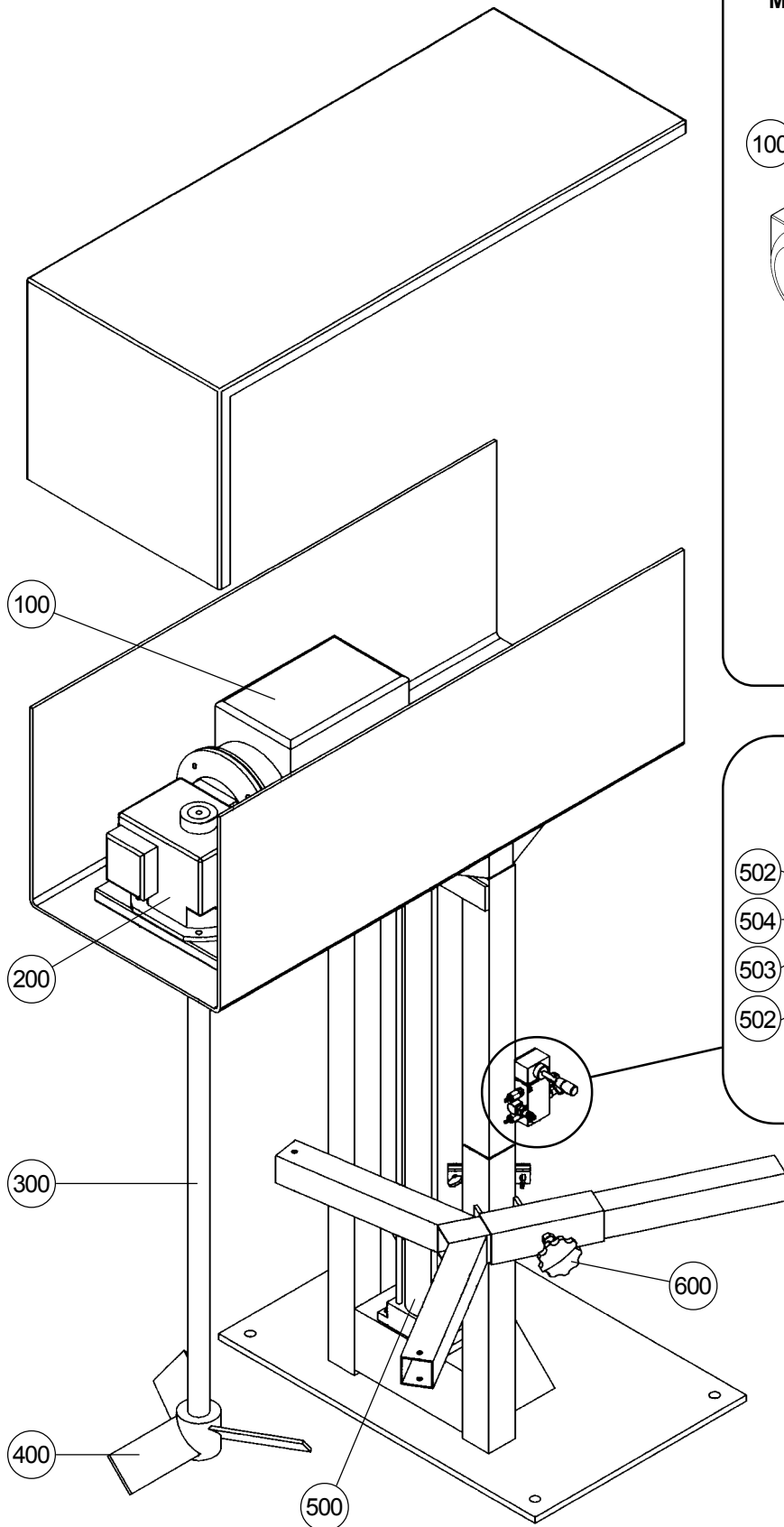
Below is just a few of the recommended lubricants that should be used in your speed reducer.

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



Oil Fill Capacities

Model	Frame Size	U.S. Pints
MX3-T	926	1.2
MX3-E	926	1.2
MX3-TV1	926	1.2
MX3-TV2	926	1.2
MX3-TV4	926	1.2
MX3-EV	935	2.1
MX5-T	935	2.1
MX5-E	935	2.1
MX5-TV2	935	2.1
MX5-TV4	935	2.1
MX5-EV	935	2.1



Parts List

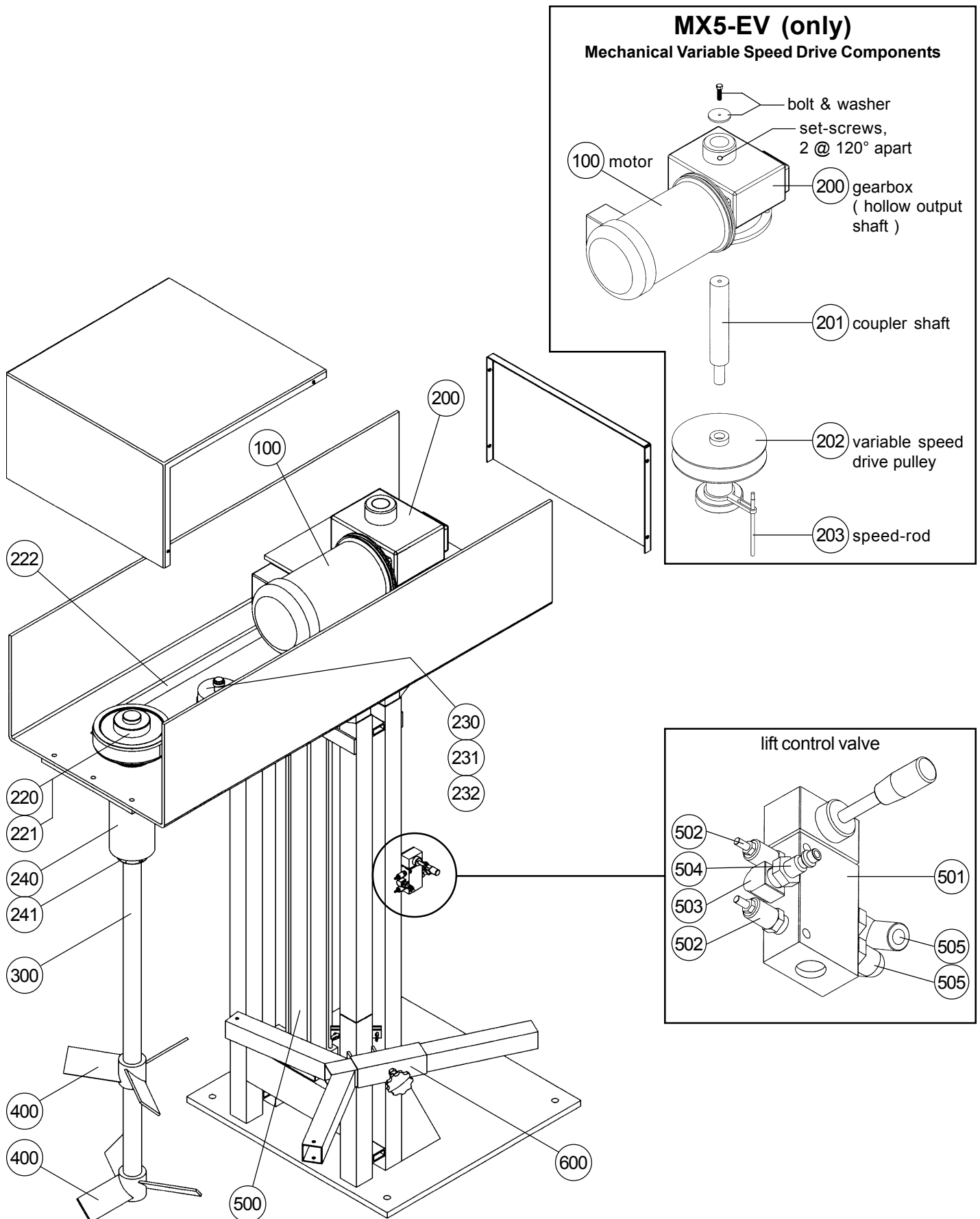
**models: MX3-T, MX3-E
MX3-TV1, MX3-TV2, MX3-TV4**

Item	Description	Part No.	Qty.
100.	3-HP motor, 56C Mount, T.E.F.C., 230/460 VAC, 3-phase	MTR-3-56C-3-TEFC	1
100.	3-HP motor, 140TC Mount, Explosion-Proof, 230/460 VAC, 3-phase	MTR-3-140TC-3-EP	1
100.	3-HP motor, 145TC Mount, T.E.F.C., 180-VDC	MTR-108502	1
101.	3-HP DC Motor Controller	MTR-DC-CONTROL-3HP	1
102.	Power cord, 12/3 (no plug)	CRD-CORD	1
100.	3-HP motor, 182TC Mount, T.E.F.C., Variable-Speed Inverter-Duty, 230-Volt	MTR-SM-3-230	1
100.	3-HP motor, 182TC Mount, T.E.F.C., Variable-Speed Inverter-Duty, 460-Volt	MTR-SM-3-460	1
101.	Motor Controller Keypad with 60" cable, for Inverter-Duty motors	MTR-AC-CONTROL	1
200.	Gear box, right angle, 10:1 ratio - 56C input, 1.5" hollow quill output	HDW-GB-926MDSF-10:1	1
200.	Gear box, right angle, 10:1 ratio - 140TC input, 1.5" hollow quill output	HDW-GB-140TC-10/1	1
200.	Gear box, right angle, 10:1 ratio - 182TC input, 1.5" hollow quill output	HDW-GB-182TC-10/1	1
300.	Shaft, 1.5" diameter - 316 stainless steel, machined	SHF-1-1/2	52"
400.	Impeller, Turbine, 15" dia., 3-blade, 1.5" bore - 316 stainless steel	C-STI-15	1
500.	Air Cylinder, 4" dia. - 36" travel	HDW-4X36	1
501.	3-Position spool valve	HDW-E2181-1000	1
502.	Brass muffler for spool valve	HDW-SPCMUF	2
503.	Elbow, street, brass - 1/4"NPT	HDW-2202P-4-4	1
504.	Quick release coupler - 1/4" MNPT	HDW-1/4-M-QCPLUG	1
505.	Push connect, 90° elbow - 3/8" tube x 1/4"MNPT	HDW-W369ML-6-4	2
506.	Push connect, 90° elbow - 3/8" tube x 1/2"MNPT (not shown)	HDW-W369ML-6-8	2
507.	Air line tube - 3/8" (not shown)	HDW-EB-64-0500	60"
600.	Container Holder Ass'y Complete	N-CH5-A	1

model: MX3-EV (only)

Mechanical Variable Speed Drive

100.	3-HP, 140TC Mount, Explosion-Proof, 230/460 VAC, 3-phase	MTR-3-140TC-3-EP	1
200.	Gear box, right angle, 15:1 ratio - 140TC input, 2.0" hollow quill output	HDW-GB-140TC-15/1	1
201.	Coupler shaft, 2" dia. x 1.125" dia. x 13" long	CPL-MX5V	1
202.	Drive pulley - variable speed head with handwheel	HDW-HM7-PULLEY	1
203.	Torque arm shaft, threaded, 3/8" x 8" - stainless	MET-HS5-SPEEDROD	1
204.	Drive Belt, V-type (not shown)	HDW-BELT-HS5	1
205.	DriveN pulley - spring loaded (not shown)	HDW-12905X1-1/8	1
206.	Bearing housing (not shown)	HDW-MX5V-BRGHSG	1
207.	Sealmaster bearing (not shown)	HDW-ER32T	2
300.	Shaft, machined - 2" dia. (not shown)	SHF-MX5V	1
400.	Impeller, Turbine, 15" dia., 3-blade, 2" bore - 316 stainless steel	C-STI-15	1



Parts List

models: **MX5-T, MX5-E**
MX5-TV2, MX5-TV4

Item	Description	Part No.	Qty.
100.	5-HP motor, 184TC Mount, T.E.F.C., 230/460 VAC, 3-phase	MTR-5-BIGC-3-TEFC	1
100.	5-HP motor, 184TC Mount, Explosion-Proof, 230/460 VAC, 3-phase	MTR-5-BIGC-3-EP	1
100.	5-HP motor, 184TC Mount, T.E.F.C., Inverter-Duty, 230/460 VAC, 3-phase	MTR-5-184TC-TEFC	1
101.	5-HP Inverter, 15J series, 230-Volt, 3-phase input (not shown)	INV-5-230-3-NEMASM	1
102.	5-HP Inverter, 15J series, 460-Volt, 3-phase input (not shown)	INV-5-460-3-NEMASM	1
200.	Gear box, right angle, 10:1 ratio - 184TC input, 2" hollow quill output	HDW-GB-184TC-10/1	1
210.	Coupler shaft, 2" dia. x 13" long, 316ss, machined	SHF-2	13"
220.	HTD belt drive pulley/sprocket	HDW-MX5-HTD-SPROCKET	2
221.	HTD belt drive bushing, E x 2"	HDW-MX5-HTD-BUSHING	2
222.	HTD belt, 2590-14M-40 (38.9" C.D.)	HDW-MX5-HTD-BELT	1
230.	Belt tensioner	HDW-MX5-BELT-TENS	1
231.	Belt tensioner idler shaft	HDW-MX5-IDLERSHFT	1
232.	Belt tensioner idler pulley	HDW-MX5-IDLER-PULLEY	1
240.	Bearing housing	HDW-MX5V-BRGHSG	1
241.	Sealmaster bearing	HDW-ER32T	2
300.	Shaft, 2" diameter - 316 stainless steel, machined	SHF-2	64"
400.	Impeller, Turbine, 15" dia., 3-blade, 1.5" bore - 316 stainless steel	C-STI-15	1
500.	Air Cylinder, 4" dia. - 48" travel	HDW-4X48	1
501.	3-Position spool valve	HDW-E2181-1000	1
502.	Brass muffler for spool valve	HDW-SPCMUF	2
503.	Elbow, street, brass - 1/4"NPT	HDW-2202P-4-4	1
504.	Quick release coupler - 1/4" MNPT	HDW-1/4-M-QCPLUG	1
505.	Push connect, 90° elbow - 3/8" tube x 1/4"MNPT	HDW-W369ML-6-4	2
506.	Push connect, 90° elbow - 3/8" tube x 1/2"MNPT (not shown)	HDW-W369ML-6-8	2
507.	Air line tube - 3/8" (not shown)	HDW-EB-64-0500	72"
600.	Container Holder Ass'y Complete	N-CH5-A	1

model: **MX5-EV (only)**

Mechanical Variable Speed Drive

100.	5-HP, 184TC Mount, Explosion-Proof, 230/460 VAC, 3-phase	MTR-5-BIGC-3-EP	1
200.	Gear box, right angle, 15:1 ratio - 184TC input, 2.0" hollow quill output	HDW-GB-184TC-10/1	1
201.	Coupler shaft, 2" dia. x 1.125" dia. x 13" long	CPL-MX5V	1
202.	Drive pulley - variable speed head with handwheel	HDW-HM7-PULLEY	1
203.	Torque arm shaft, threaded, 3/8" x 8" - stainless	MET-HS5-SPEEDROD	1
204.	Drive Belt, V-type (not shown)	HDW-BELT-MXT5V	1
205.	DriveN pulley - spring loaded (not shown)	HDW-12905X1-1/8	1
206.	Bearing housing	HDW-MX5V-BRGHSG	1
207.	Sealmaster bearing	HDW-ER32T	2
300.	Shaft, machined - 2" dia.	SHF-MXT5V	1
400.	Impeller, Turbine, 15" dia., 3-blade, 2" bore - 316 stainless steel	C-STI-15	2