## CHEMICAL INJECTION PUMP

# MOTOR DRIVEN

TWO HEADS



The model MT chemical injection pumps are designed to be driven by an electric motor. These positive displacement pumps have removable fluid ends with interchangeable check valves, and a removable stainless steel cover for easy maintenance on the drivetrain.

The pumps are available in various materials and piston sizes to meet your specific chemical injection requirements. They can also be equipped with chemical tanks and index wheels to provide simple flow rate control.

For decades, Western Chemical Pumps model MT pump has demonstrated reliable engineering and design, earning the trust of its users through rigorous testing and proven performance.

#### **FEATURES**

- ♦ Two fluid end pump
- Index wheel allows easy flow rate control by skipping strokes to inject the precise amount desired
- ♦ Adjustable stroke length to fine tune injection flow rates
- Double piston seals with vented isolation to prevent chemical blow-by into pump box
- ♦ Capable of injecting up to 5,000 psi
- Stainless steel piston and check valves come standard for better reliability







#### MT PUMP CONFIGURATIONS

MT	3/8	#2	Υ	PART NUMBER		
1	<b>↑</b>	<b>↑</b>	1	Model		
MT				Electric Motor, Dual Head		
				Piston Diameter		
	1/4			1/4" (Includes Index Wheels)		
	3/8			3/8" (Includes Index Wheels)		
	5/8		5/8" (No Index Wheels)			
	1		1" (No Index Wheels)			
				Attachments		
		#2		No Tanks		
		#3		Two Tanks		
				Fluid End Material		
			Steel (standard)			
			Υ	303 Stainless Steel		
			Q	316 Stainless Steel		

MTS	-A	#2	Υ	PART NUMBER		
<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	Model		
MTS				Electric Motor, Dual Head		
				Piston Diameter		
	-A			1/4" or 3/8" (Index Wheel) and 5/8" (No Index Wheel)		
	-B			1/4" or 3/8" (Index Wheel) and 5/8" (Index Wheel)		
	-C			5/8" (Index Wheel) and 5/8" (Index Wheel)		
				Attachments		
		#2		No Tanks		
		#3		Two Tanks		
				Fluid End Material		
			Υ	Stainless Steel		
			Q	316 Stainless Steel		

### **OPTIONS & UPGRADES**

Material: Upgrade to Y or Q models for enhanced corrosion resistance

**Piston Size**: Multiple sizes available to fit your required injection flow rates and pressures

**Resilient Seat Check Valves**: Added O-ring provides better sealing capability, which is ideal for low viscosity fluids, such as methanol

Packing Seals: Buna-N, EPDM, Neoprene, PTFE (Teflon™), FKM (Viton™)

**Rope Packing**: Graphite impregnated or PTFE (Teflon™) rope

Prime Ball: Ceramic or tungsten

Tank: Optional two 5 gallon stainless steel tanks

**Index Wheel**: MT 1/4" and 3/8" pumps come standard with index wheels. MT 5/8" pump requires an upgrade to the MTS model to include an index wheel. The index wheel has 10 easily adjustable pins allowing flow rate control by skipping strokes.

Motors: Multiple motor models available to fit your power supply

**Pulley Driven**: Option to replace the motor for a pulley, if an existing power drivetrain is available

Coupler: Option available that is ideal for cold weather environments

Other unique or special order materials are available to fit your needs. Please inquire with your Western Chemical Pumps, Inc. distributor. Specify desired options when placing order.

	PER HEAD	
PISTON DIA (IN)	MAX DISCHARGE PRESSURE (PSI)	FLOW RATE MIN - MAX (QTS / DAY)
1/4	6,750	0.3 - 42.2
3/8	3,000	0.6 - 95.0
5/8	1,250	1.6 - 263.9
1	400	42.2 - 675.6

PER HEAD - FLOW RATE (QTS / DAY)							
PISTON DIA	INDEX PINS		STROKE	LENGTH			
(IN)	"IN"	1	11/16	5/16	1/16		
	0	42.2	29.0	13.2	2.6		
	1	38.0	26.1	11.9	2.4		
	2	33.8	23.2	10.6	2.1		
	3	29.6	20.3	9.2	1.8		
1/4	4	25.3	17.4	7.9	1.6		
1/4	5	21.1	14.5	6.6	1.3		
	6	16.9	11.6	5.3	1.1		
	7	12.7	8.7	4.0	0.8		
	8	8.4	5.8	2.6	0.5		
	9	4.2	2.9	1.3	0.3		
	0	95.0	65.3	29.7	5.9		
	1	85.5	58.8	26.7	5.3		
	2	76.0	52.3	23.8	4.8		
	3	66.5	45.7	20.8	4.2		
3/8	4	57.0	39.2	17.8	3.6		
3/0	5	47.5	32.7	14.8	3.0		
	6	38.0	26.1	11.9	2.4		
	7	28.5	19.6	8.9	1.8		
	8	19.0	13.1	5.9	1.2		
	9	9.5	6.5	3.0	0.6		
	0	263.9	181.4	82.5	16.5		
	1	237.5	163.3	74.2	14.8		
	2	211.1	145.2	66.0	13.2		
	3	184.7	127.0	57.7	11.5		
5/8	4	158.4	108.9	49.5	9.9		
3/6	5	132.0	90.7	41.2	8.2		
	6	105.6	72.6	33.0	6.6		
	7	79.2	54.4	24.7	4.9		
	8	52.8	36.3	16.5	3.3		
	9	26.4	18.1	8.2	1.6		
1	0	675.6	464.5	211.1	42.2		



#### **CAUTION**

3 PHASE MOTORS REVERSE DIRECTION WHEN POWER WIRES ARE INTERCHANGED. CHECK ROTATION OF MOTOR IMMEDIATELY AFTER ANY ELECTRICAL MODIFICATIONS.

ENSURE PUMP IS ELECTRICALLY ISOLATED WITH PROPER LOCKOUT / TAGOUT PROCEDURES PRIOR TO PERFORMING WORK.

ENSURE CHECK VALVE FLOW IS IN THE DIRECTION OF THE ARROW. INCORRECT DIRECTION COULD CAUSE PUMP TO OVER PRESSURE.

#### **INSTALLATION & OPERATION**

Securely mount base (M1) to concrete pad or platform. Ensure motor and pump shaft remain in alignment during installation. Misalignment could cause premature wear on coupler and bearings.

Fill the pump box with 3-1/2 quarts SAE 20 or SAE 30. The oil level should partially submerge the piston.

Connect the motor to power following the wiring instructions printed on the motor. Ensure motor turns pump shaft in the direction of arrows indicated on the pump (clockwise looking from motor towards pump).

Connect the suction and discharge lines to the fluid end. Open the prime valve (D16-2Y) and run the pump until gas is purged from the system. Bubbles and chemical may flow out of the prime valve opening. If trouble is experienced during priming, use a trigger type oil can to force oil through the bleed hole into the fluid end. This may speed up the priming process. Close the prime valve after priming is complete.

#### FLOW RATE CONTROL

Choose the preferred flow rate from the provided flow rate table. Opting for the maximum stroke length with 5 index pins "IN" is generally advisable. This approach enables future adjustments for higher or lower flow rates by repositioning the index pins as needed.

To position the index pins (M11-3), use the pin hook (M11-4) to hook the pin and slide it either "IN" or "OUT" of the index wheel. "IN", will skip a stroke and is positioned with the grooved pin head closest to the index wheel. "OUT", will allow the piston to stroke and is positioned with the grooved pin head away from the index wheel. Do not pull the pin completely out of the index wheel. Index pins (MT11-3) are threaded and can be screwed "IN" or "OUT".

To modify the stroke length, first, loosen the two cap screws (M13-1). Then, align the pull bar (M13S) with your chosen stroke length as printed on the pull bar. Finally, tighten the two cap screws to secure the assembly in place.

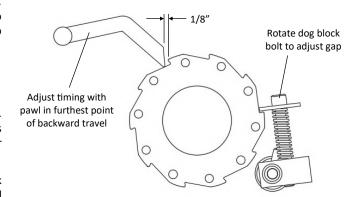
Pumps with 5/8" and 1" pistons that are not equipped with an index wheel control flow rate by modifying the stroke length. Adjust the stroke length by positioning the pull bar (M131) to the desired setting indicated on the flow rate table from the rows indicating "0" in the index pins column. Loosen screw (DFF44-2), then slide the pull bar to the desired position. Tighten the screw (DFF44-2) to secure the assembly.

#### **MAINTENANCE & TROUBLESHOOTING**

Chemical Leakage: This can be detected by chemical leaking around the fluid end nut (LD12-4B). To correct this issue, tighten the V-ring packing (D12B). First, loosen the setscrew (LD12-2) and nut (D47-1A) on top of the fluid end. Using the supplied packing wrench (D44-3), insert in holes of fluid end nut and rotate. Hold fluid end upright while rotating the fluid end nut. The rotation will compress the V-ring packing around the piston. Tighten the setscrew and nut on top of the fluid end. Overtightening the V-ring packing can prevent the piston from completing a full stroke.

Preventing Pump Box Oil Leakage Into Fluid End: This can be detected by oil leaking around the fluid end nut (LD12-4B). To correct this issue, tighten the rope packing (LD15-1). First, remove the cover (MT-23A) of the pump. Remove the hold pins (M15H, MT15H) from the packing nut (LD15Y) inside the pump box. Using the packing wrench (D44-3), insert in holes of packing nut and rotate. Do not overtighten rope packing.

Dog Block Timing Adjustment: Manually rotate the drive shaft (M7-2A) clockwise until the pawl (M25) is in the farthest back point of its travel. The pawl should drop and be set to catch the next tooth on the index wheel with the next forward movement. In this back position, there should be a 1/8" gap between the pawl and index wheel. The dog tooth bolt (M20-8) should be set against the index wheel preventing reverse rotation. If the gap is not 1/8", turn the dog tooth bolt to adjust the gap. Rotate the drive shaft clockwise to observe the proper action on each of the 10 teeth on the index wheel.

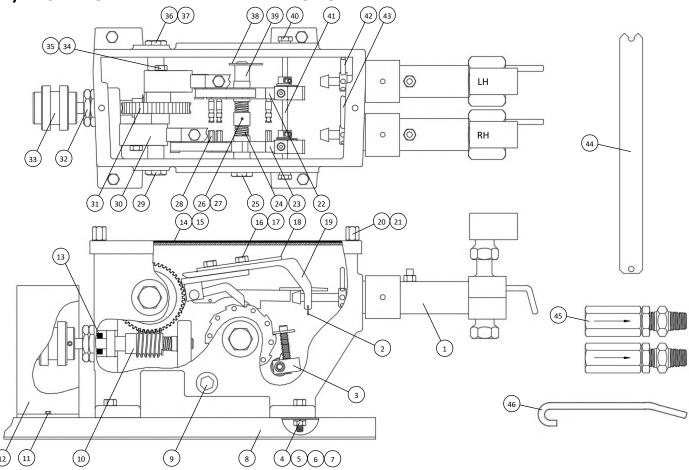


#### **TIPS FOR BEST OPERATION**

- Plan ahead for proper pump mounting location
- Short flooded suction lines and clean chemicals with no debris perform best
- Chemical lines should be rigid and have no abrupt change in elevation to prevent trapping gas bubbles
- Fluid end must be vertical for ball check valves to operate properly
- Keep pump and motor shaft properly aligned
- Install motor cutoff switch within easy reach of pump
- Ensure correct rotation of motor
- Keep oil clean and at the recommended fill level to partially submerge piston



## MT/MTS #2 PUMP - INDEX WHEEL: PARTS LIST



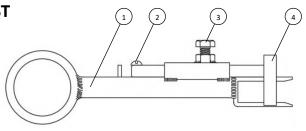
	MT/MTS #2 - INDEX WHEEL								
1	FLUID END	***	15 GASKET	MT23-1	29 PLUG BEARING, LH	M6-3	42 HOLD PIN	M15H	
2	COTTER PIN	M13P	16 CAP SCREW	M13-1	30 FOLLOWER ASSY	M5-4Z	43 HOLD PIN	MT15H	
3	DOG BLOCK ASSY	M20-1Z	17 LOCK WASHER	M13-1W	31 WORMGEAR ASSY	MT6Z	44 PIN HOOK	M11-4	
4	CAP SCREW	LD8-3	18 CLAMP BAR	M13-2	32 RETAINER	M9B	45 LINE CHECK VALVE	D461	
5	WASHER	D21-2	19 RETURN BAR	M13S	33 COUPLING ASSY	M10SF	46 PACKING WRENCH	D44-3	
6	LOCK WASHER	M4L	20 THUMB SCREW	LD23-2	33 COUPLING ASSY	M10*			
7	NUT	D1-2A	21 GASKET	LD23-2A	34 CAP SCREW	LD10-2			
8	BASE	M1	22 INDEX WHEEL ASSY	M11Z	35 WASHER	M5-3			
9	DRAIN PLUG	M2-2	23 INDEX WHEEL	MT11	36 PLUG BEARING, RH	M6-2	NOT PICTURED		
10	WORMSHAFT ASSY	M7AZ	24 SPRING	D7	37 SHIM WASHER	M6-2W	MOTOR	***	
11	SCREW	M10-2B	25 SHAFT	MT11D	38 CLIP	M20D3	CAP SCREW	D23-2**	
12	COUPLING GUARD	M10-2A	26 SPACER	MT20-6	39 SPACER	M20-6	WASHER	M56**	
13	OIL SEAL	M9-2B	27 SETSCREW	M20-5	40 PLUG	M20-2L	LOCK WASHER	D47-1L**	
14	COVER	MT23A	28 INDEX PIN	MT11-3	41 SHAFT	MT20-2S	NUT	D47-1A**	

Subassembly detail shown in following drawings

## MT/MTS #2 PUMP - NO INDEX WHEEL: PARTS LIST

Includes all parts from MT/MTS #2

	MT/MTS #2 - NO INDEX WHEEL						
	PLUG D24-1 Not pictured, replaces M11						
	PUSH BAR ASSY	M501-4Z	Replaces M5-4Z				
1	PUSH BAR	M501-4					
2	SCREW	M131-2					
3	CAP SCREW	DFF44-2					
4	PULL BAR	M131					



All images are for illustrative purposes. Actual product may differ.

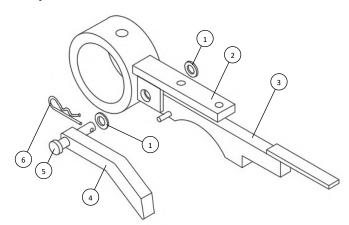
<sup>\*\*\*</sup> See subassembly drawing for part number

<sup>\*\*</sup>Location: Mount motor to base

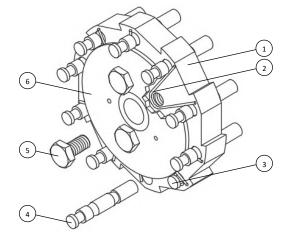
<sup>\*</sup> Optional equipment



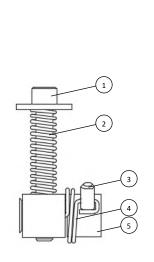
## MT/MTS #2 PUMP: SUBASSEMBLIES



	FOLLOWER ASSY	M5-4Z		
1	SPACER	M25-1B	4 PAWL	M25
2	FOLLOWER	M5-4	5 PIN	M25-1
3	PUSH BAR	M24	6 COTTER PIN	LD13-2



	INDEX WHEEL ASSY M11Z							
1	INDEX WHEEL	M11	4	INDEX PIN	M11-3			
2	SPRING	M11-5	5	BOLT	LD10-2			
3	INDEX PIN, SHORT	M11-3S	6	PLATE	M11-6			



DOG BLOCK ASSY

1 DOG TOOTH BOLT

4 TORSION SPRING

5 BLOCK AND PIVOT M20-1

2 SPRING

3 SET SCREW

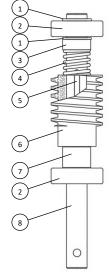
M20-1Z

M20-8

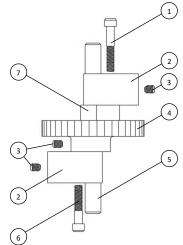
M20-9

M20-10

M20-7







	WORMGEAR ASSY	MT6Z
1	BOLT	MT5-1
2	CAM	M5
3	SETSCREW	LD7-1A
4	GEAR	MT6
5	SHAFT	MT6-4
6	BOLT	M5-1
7	SPACER	MT6-6

7	D461: 1/4 MNPT D462Q: 1/4 FNPT
6 MANAMAN	
4	
2	
	D461: 1/4 FNPT D462Q: 1/4 FNPT

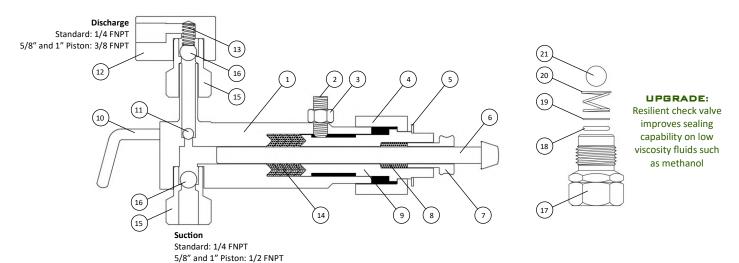
	LINE CHECK VALVE	D461	D462Q
1	BODY / CAGE	D461B	D176BQ
2	O-RING, TEFLON™	M170-55T*	D170-5T*
3	RING	D461R	D177
4	BALL, CERAMIC	D17-5C	D17-6C
5	SPRING	D461S	D178
6	SPRING	D18-1Y	D462SQ
7	NIPPLE / BODY	D461A	D462BFQ

\*Alternate materials: Buna-N, Viton™, Neoprene, EPDM

MOTOR	HP	HZ	VOLTAGE	PHASE	ENCLOSURE	HAZARD CLASS	TEMP CODE
MR-T13B	1/3	60	115/208-230V AC	1	TEFC	-	-
MR-T33B	1/3	60	208/230-460V AC	3	TEFC	-	-
MR-E13B	1/3	60	115/208-230V AC	1	XPFC	CL 1 GR C,D / CL 2 GR E,F,G	T3B
MR-E33B	1/3	60	208/230-460V AC	3	XPFC	CL 1 GR D / CL 2 GR F,G	T3C



## MT/MTS #2 PUMP: SUBASSEMBLIES CONTINUED



PISTON DIA (IN)	1/4			3/8			5/8		1	
MATERIAL	Standard	Υ	Q	Standard	Υ	Q	Υ	Q	Υ	Q
MT FLUID END ASSY	M164Z1	M164Z1Y	M164Z1Q	M160Z1	M160Z1Y	M160Z1Q	M161Z1Y	M161Z1Q	M161-8Z1Y	M161-8Z1Q
1 FLUID END BODY	LD164	LD164Y	LD164Q	LD160	LD160Y	LD160Q	M161Y	M161Q	M161-8Y	M161-8Q
2 SETSCREW	LD12-2	LD12-2Q	LD12-2Q	LD12-2	LD12-2Q	LD12-2Q	LD12-2Q	LD12-2Q	LD12-2Q	LD12-2Q
3 NUT	D47-1A	D47-1AQ	D47-1AQ	D47-1A	D47-1AQ	D47-1AQ	D47-1AQ	D47-1AQ	D47-1AQ	D47-1AQ
4 FLUID END NUT	LD12-4B	LD12-4BY	LD12-4BQ	LD12-4B	LD12-4BY	LD12-4BQ	M121-4BY	M121-4BQ	M121-48BY	M121-48BQ
5 GASKET	LD12-1	LD12-1	LD12-1	LD12-1	LD12-1	LD12-1	M121-1	M121-1	M121-18	M121-18
6 PISTON	M144Y	M144Y	M144Q	M14Y	M14Y	M14Q	M141Y	M141Q	M141-8Y	M141-8Q
7 ROPE PACKING NUT	LD15Y	LD15Y	LD15Q	LD15Y	LD15Y	LD15Q	M151Y	M151Q	M151-8Y	M151-8Q
8 ROPE PACKING, GRAPHITE	LD15-1	LD15-1	LD15-1*	LD15-1	LD15-1	LD15-1*	M151-1	M151-1*	M151-18	M151-18*
8 ROPE PACKING, TEFLON™	LD15-1T*	LD15-1T*	LD15-1T	LD15-1T*	LD15-1T*	LD15-1T	M151-1T*	M151-1T	M151-18T*	M151-18T
9 CYLINDER	LD124-4AY	LD124-4AY	LD124-4AQ	LD12-4AY	LD12-4AY	LD12-4AQ	M121-4AY	M121-4AQ	M121-48AY	M121-48AQ
10 PRIME VALVE	D16-2Y	D16-2Y	D16-2Q	D16-2Y	D16-2Y	D16-2Q	D16-2Y	D16-2Q	D16-2Y	D16-2Q
11 PRIME BALL, CERAMIC	D17-4C	D17-4C	D17-4C	D17-4C	D17-4C	D17-4C	D17-6C	D17-6C	D17-6C	D17-6C
11 PRIME BALL, TUNGSTEN	D17-4T*	D17-4T*	D17-4T*	D17-4T*	D17-4T*	D17-4T*	D17-6T*	D17-6T*	D17-6T*	D17-6T*
12 SQUARE ELL	D170-4	D170-4Y	D170-4Q	D170-4	D170-4Y	D170-4Q	M171-4Y	M171-4Q	M171-4Y	M171-4Q
13 SPRING	D18-1Y	D18-1Y	D18-1Y	D18-1Y	D18-1Y	D18-1Y	M181-1Y	M181-1Y	M181-1Y	M181-1Y
14 V-RING PACKING	ннннн	втвтв	VTVTV	ннннн	ВТВТВ	VTVTV	ВТВТВ	VTVTV	втвтв	VTVTV
PACKING, EPDM (B)	D124B*	D124B (3)	D124B*	D12B*	D12B (3)	D12B*	D121B (3)	D121B*	M121-8B (2)	M121-8B*
PACKING, BUNA-N (H)	D124H (5)	D124H*	D124H*	D12H (5)	D12H*	D12H*	D121H*	D121H*	M121-8H*	M121-8H*
PACKING, NEOPRENE (N)	D124N*	D124N*	D124N*	D12N*	D12N*	D12N*	D121N*	D121N*	M121-8N*	M121-8N*
PACKING, TEFLON™ (T)	D124T*	D124T (2)	D124T (2)	D12T*	D12T (2)	D12T (2)	D121T (2)	D121T (2)	M121-8T (1)	M121-8T (1)
PACKING, VITON™ (V)	D124V*	D124V*	D124V (3)	D12V*	D12V*	D12V (3)	D121V*	D121V (3)	M121-8V*	M121-8V (2)
CHECK VALVE	D17Y	D17Y	D17Q	D17Y	D17Y	D17Q	D172Y	D172Q	D172Y	D172Q
15 CAGE	D17BY	D17BY	D17BQ	D17BY	D17BY	D17BQ	D172B	D172BQ	D172B	D172BQ
16 CHECK BALL, CERAMIC	D17-6C	D17-6C	D17-6C	D17-6C	D17-6C	D17-6C	D171-2C	D171-2C	D171-2C	D171-2C
16 CHECK BALL, TUNGSTEN	D17-6T*	D17-6T*	D17-6T*	D17-6T*	D17-6T*	D17-6T*	D171-2T*	D171-2T*	D171-2T*	D171-2T*
RESILIENT CHECK VALVE	D176ZYT*	D176ZYT*	D176ZQT*	D176ZYT*	D176ZYT*	D176ZQT*	D172ZYT*	D172ZQT*	D172ZYT*	D172ZQT*
17 CAGE	D176B	D176B	D176BQ	D176B	D176B	D176BQ	D172B	D172BQ	D172B	D172BQ
18 O-RING, TEFLON™	D170-5T**	D170-5T**	D170-5T**	D170-5T**	D170-5T**	D170-5T**	D171-8T**	D171-8T**	D171-8T**	D171-8T**
19 RING	D177	D177	D177	D177	D177	D177	D173	D173	D173	D173
20 SPRING	D178	D178	D178	D178	D178	D178	D174	D174	D174	D174
21 CHECK BALL, CERAMIC	D17-6C	D17-6C	D17-6C	D17-6C	D17-6C	D17-6C	D171-2C	D171-2C	D171-2C	D171-2C
21 CHECK BALL, TUNGSTEN	D17-6T*	D17-6T*	D17-6T*	D17-6T*	D17-6T*	D17-6T*	D171-2T*	D171-2T*	D171-2T*	D171-2T*
MTS FLUID END ASSY  MTS fluid end BOM same as above, except replace piston with the following							M161Z1RY	M161Z1RQ	M161-8Z1RY	M161-8Z1RQ
6 PISTON							M141RY	M141RQ	M141-8RY	M141-8RQ

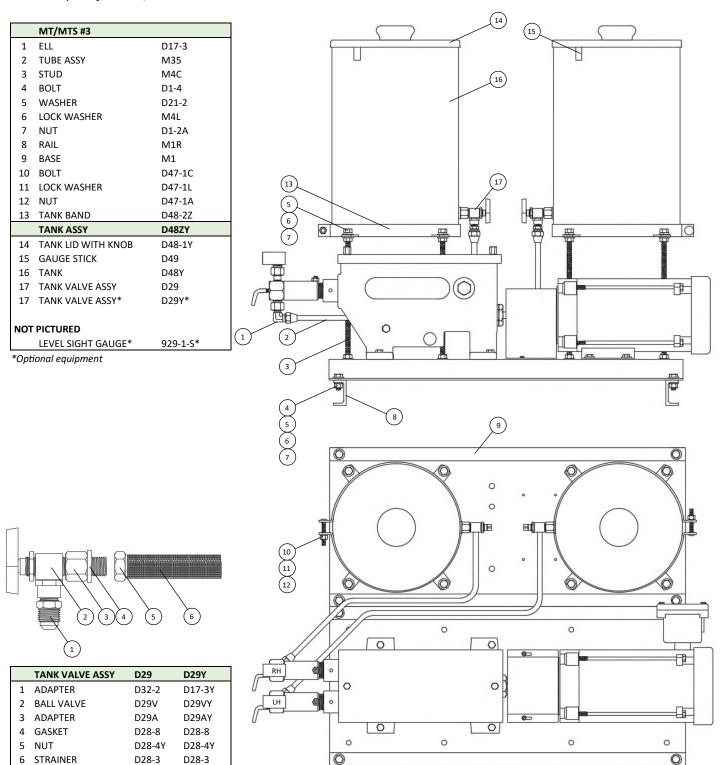
<sup>\*\*</sup>Alternate materials: Buna-N, Viton™, Neoprene, EPDM \*Optional equipment, please specify when ordering

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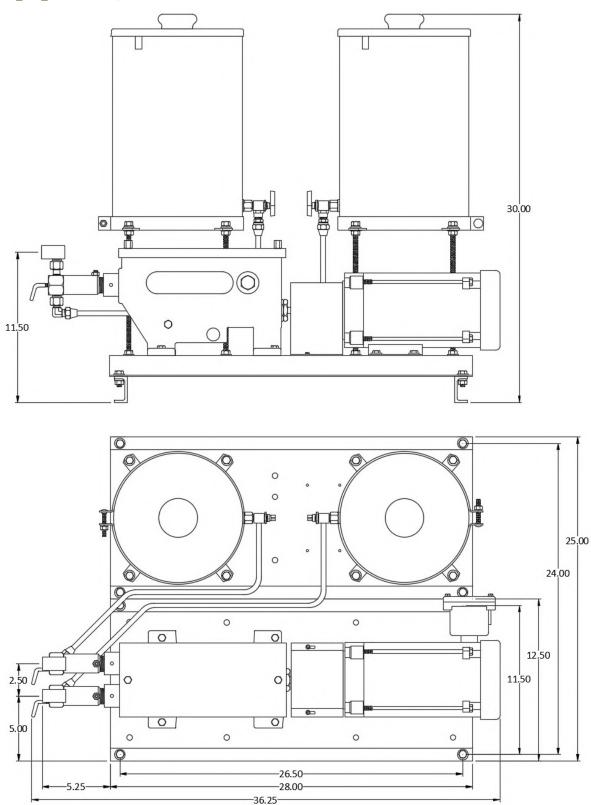


## MT/MTS #3 PUMP: PARTS LIST

Includes all parts from MT/MTS #2







Western Chemical Pumps, Inc. 603 South Kansas Avenue, Olathe, KS 66061 913 - 829 - 1888 | sales@westernchemicalpumps.com

Dimensions are in inches. Actual product may have variance in measurements.

All images are for illustrative purposes. Actual product may differ.

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