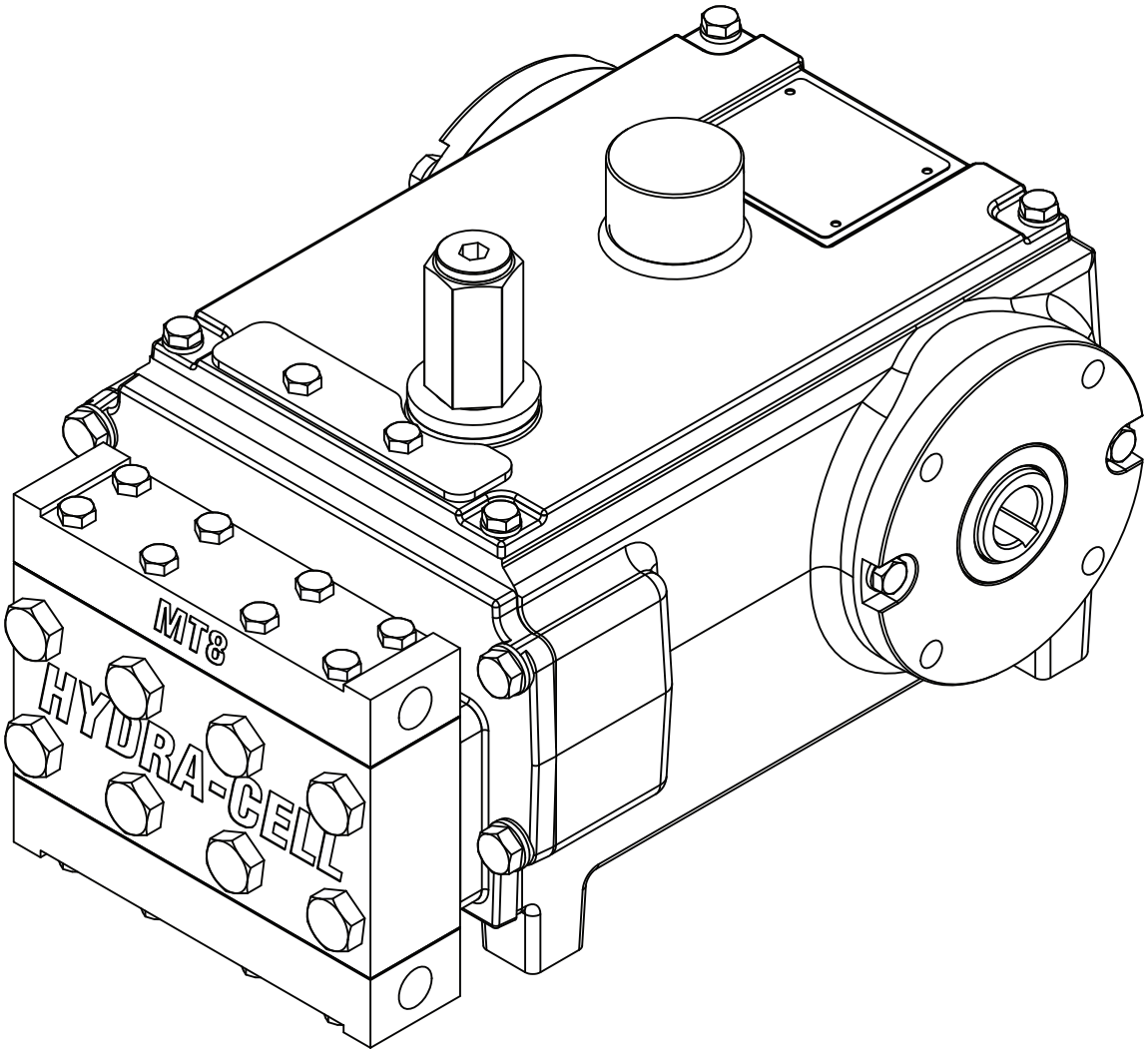
Hydra-Cell®
METERING SOLUTIONS™

MT8 Metering Pump

Installation, Operation & Maintenance

190-999C



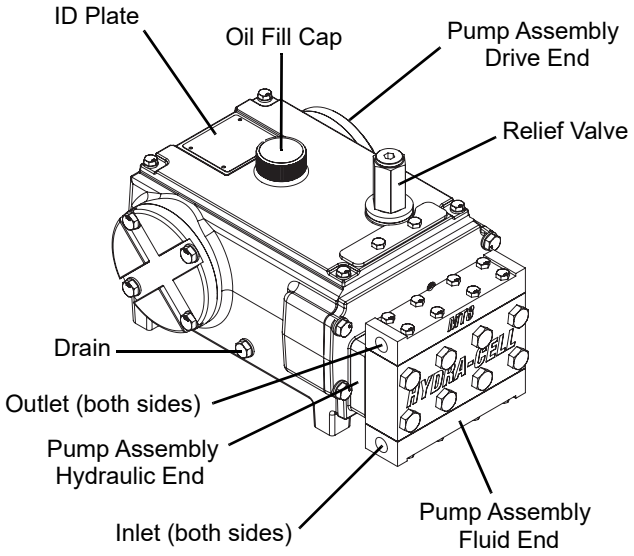
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CE

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Component Identification



MT8 Operation

Hydra-Cell Metering Solutions Pumps are hydraulically-actuated, hydraulically-balanced diaphragm metering pumps that exceed API 675 performance standards of ±1% steady state accuracy, ±3% linearity and ±3% repeatability.

Due to their multiple diaphragm design, the MT Series metering pumps provide virtually “pulse-free” linear flow. Unlike conventional single diaphragm metering pumps, this linear flow reduces the need for pulsation dampeners and increases the reliability, performance, and safety of the metering pump system.

Pump operation and plunger activation are accomplished through a crankshaft.

MT Series pumps offer either mechanical flow adjustment or flow adjustment through a variable-frequency drive (VFD).

MT8 Specifications

Steady State Accuracy	±1%
Linearity	±3%
Repeatability	±3%
Maximum Discharge Pressure	
Metallic Heads:	3500 psi (241 bar)
Non-Metallic Heads:	350 psi (24 bar)
Maximum Inlet Pressure	
Metallic Heads:	500 psi (34 bar)
Non-Metallic Heads:	300 psi (21 bar)
Maximum Temperatures*	
Metallic Heads:	250°F (121°C)
Non-Metallic Heads:	140°F (60°C)
* Consult factory for correct component selection for temperatures from 160°F (71°C) to 250°F (121°C).	
Inlet Port	1/4 inch NPT or BSPT
Discharge Port	1/4 inch NPT or BSPT
Maximum Solids	200 microns
Suction Lift Capability	20 feet (6.1 meters)
Shaft Rotation	Bi-directional
Oil Capacity	1-3/4 US quarts (1.7 liters)
Weight (less motor)	
Metallic Heads:	100 lbs (45.4 kg)
Non-Metallic Heads:	75 lbs (34 kg)
Flow Rate	0.06 - 8.0 GPH

MT8 Specifications (Cont'd)

Performance Maximum Flow at Designated Pressure for Pumps with Electronic Gearbox Reducers - Imperial

Gearbox Part Number	All Pumps (gph)				Pump rpm	Gear Ratio	Motor rpm
	500 psi	1500 psi	2500 psi	3500 psi			
112-400	0.473	0.429	0.387	0.349	18	100:1	1800
112-401	0.587	0.532	0.479	0.428	22.5	80:1	
112-402	0.776	0.703	0.635	0.567	30	60:1	
112-403	0.961	0.872	0.795	0.714	36	50:1	
112-404	1.177	1.089	0.985	0.888	45	40:1	
112-405	1.593	1.437	1.309	1.176	60	30:1	
112-407	2.312	2.105	1.924	1.727	90	20:1	
112-409	4.657	4.257	3.839	3.430	180	10:1	
112-410	6.156	5.556	5.064	4.464	240	7.5:1	
112-411	8.000*	8.000*	7.320*	6.530*	360	5:1	

Required Motor hp: 1/2

* Flow rates above 8 gph not guaranteed to meet API 675 Performance Standards; therefore, pump rpm should be limited to 317 at 500 psi and 352 at 1500 psi when using a 5:1 gear reducer and 1800 rpm motor. To reach 8 gph at pressures above 1700 psi with the same reducer and motor, the VFD will need to be programmed for operation above 60 Hz.

Performance Maximum Flow at Designated Pressure for Pumps with Electronic Gearbox Reducers - Metric

Gearbox Part Number	All Pumps (lph)				Pump rpm	Gear Ratio	Motor rpm
	34 bar	103 bar	172 bar	241 bar			
112-400	1.492	1.353	1.221	1.101	15	100:1	1500
112-401	1.852	1.678	1.511	1.350	18.75	80:1	
112-402	2.448	2.218	2.003	1.789	25	60:1	
112-403	3.031	2.751	2.508	2.252	30	50:1	
112-404	3.713	3.435	3.107	2.801	37.5	40:1	
112-405	5.025	4.533	4.129	3.710	50	30:1	
112-407	7.293	6.640	6.069	5.448	75	20:1	
112-409	14.691	13.429	12.110	10.820	150	10:1	
112-410	19.419	17.526	15.974	14.082	200	7.5:1	
112-411	28.659*	25.810*	23.091*	20.598*	300	5:1	

Required Motor kW: 0.37

* Flow rates above 30.28 lph are not guaranteed to meet API 675 Performance Standards. To reach a flow rate of 30.28 lph with a 5:1 gear box and 1500 rpm motor, the VFD will need to be programmed for operation above 50 Hz.

Note: Systems vary. The MT8 pump must be calibrated once installed to ensure optimum performance. The API 675 Performance Standard is achievable for flow rates as low as 0.06 gph (or 0.2271 lph). Please contact the factory for assistance.

MT8 Specifications (Cont'd)

Performance Maximum Flow at Designated Pressure for Pumps with Manual Variable Speed Gearbox

Flow Rates in Gallons Per Hour (gph)

Manual Dial Setting	All Pumps				Metalic Pump Heads Only						Motor rpm
	350 psi		500 psi		1500 psi		2500 psi		3500 psi		
	Flow Rate	rpm	Flow Rate	rpm	Flow Rate	rpm	Flow Rate	rpm	Flow Rate	rpm	
1	1.85	70	1.85	71	1.62	70	1.44	70	1.28	70	1800
2	3.67	144	3.64	144	3.26	143	2.92	143	2.62	143	
3	5.56	213	5.51	214	4.90	213	4.40	212	3.93	211	
4	7.26	280	7.16	281	6.36	278	5.70	278	5.09	277	
5					7.75	343	6.94	342	6.17	341	
6									7.08	405	
Manual Dial Setting to achieve Maximum Flow Rate at pressures shown above											
	4.45		4.50		5.17		5.87		6.90		Motor rpm
	8.00	310	8.00	315	8.00	354	8.00	399	8.00	462	1800

Required Motor hp: 1/2

- Minimum flow rate of 0.06 gph can be achieved at a Manual Dial setting of 0.1.
- Flow rates above 8 gph are not guaranteed to meet API 675 Performance Standards.
- Only use motors 1/2 hp with turndown ratios to match the appropriate range of application.

Flow Rates in Liters Per Hour (lph)

Manual Dial Setting	All Pumps				Metalic Pump Heads Only						Motor rpm
	24 bar		34 bar		103 bar		172 bar		241 bar		
	Flow Rate	rpm	Flow Rate	rpm	Flow Rate	rpm	Flow Rate	rpm	Flow Rate	rpm	
1	5.99	60	5.98	61	5.24	60	4.63	59	4.04	59	1500
2	11.53	121	11.39	121	10.21	120	9.24	120	8.11	120	
3	17.62	179	17.21	179	15.46	178	13.94	178	12.27	177	
4	23.04	234	22.64	235	20.31	233	18.28	232	16.12	231	
5	28.22	288	27.86	289	24.97	286	22.36	286	19.73	285	
6							26.09	339	23.23	338	
7							29.95	392	26.24	391	
8									29.59	444	
Manual Dial Setting to achieve Maximum Flow Rate at pressures shown above											
	5.42		5.50		7.00		7.10		8.10		Motor rpm
	30.28	310	30.28	315	30.28	355	30.28	397	30.28	448	1500

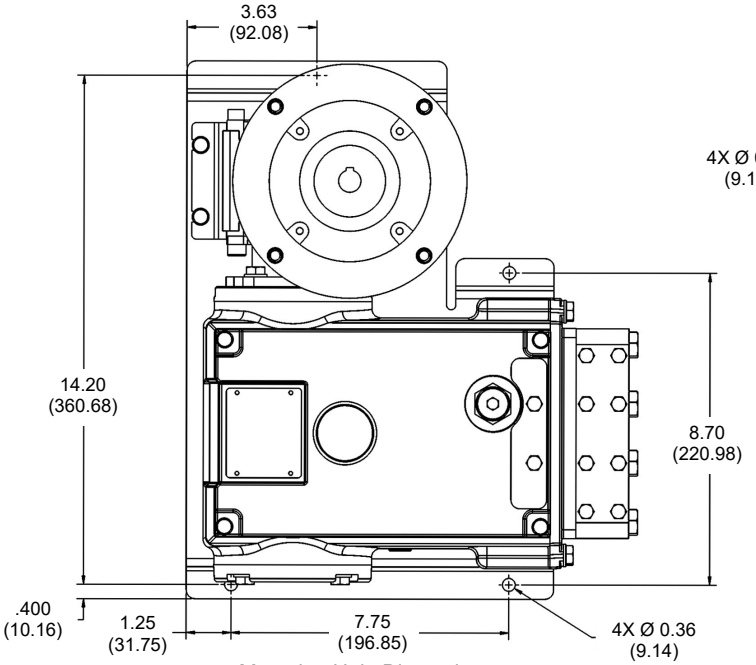
Required Motor kW: 0.37

- Minimum flow rate of 0.227 lph can be achieved at a Manual Dial setting of 0.1.
- Flow rates above 30.28 lph are not guaranteed to meet API 675 Performance Standards.
- Only use motors 0.37 kW with turndown ratios to match the appropriate range of application.

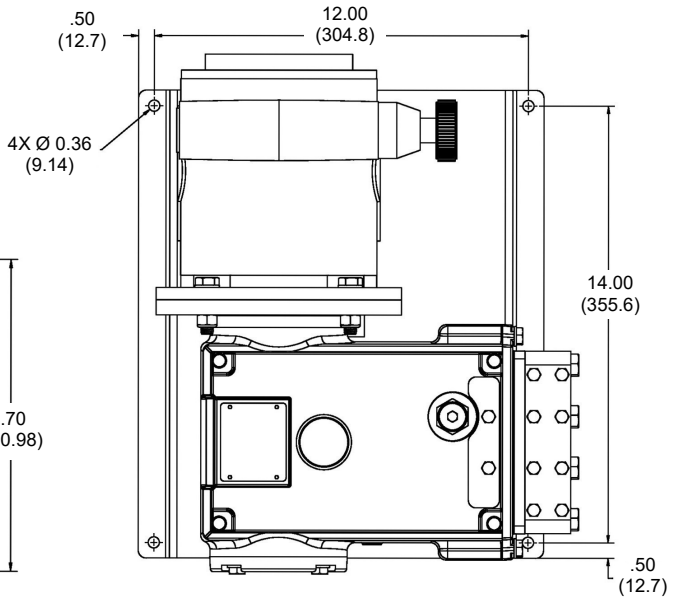
MT8 Dimensions

Representative Drawings: Inches (mm)

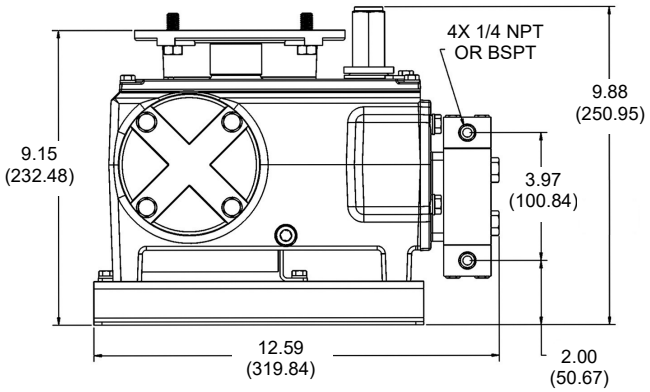
Metallic Pump Heads

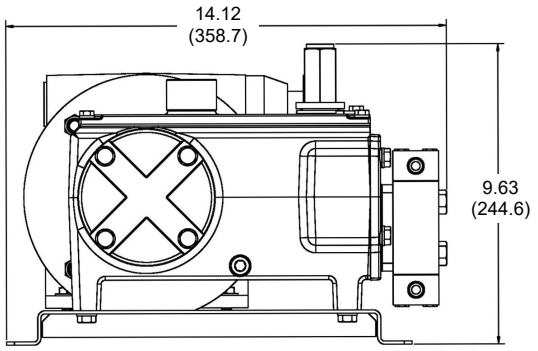


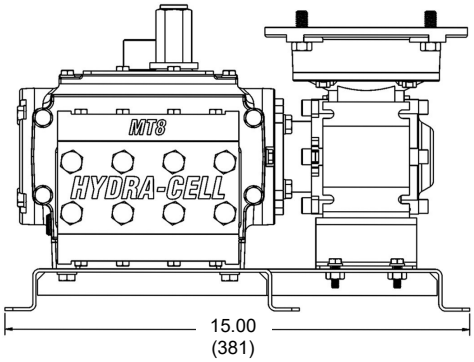
Metallic Heads with Manual Adjustment

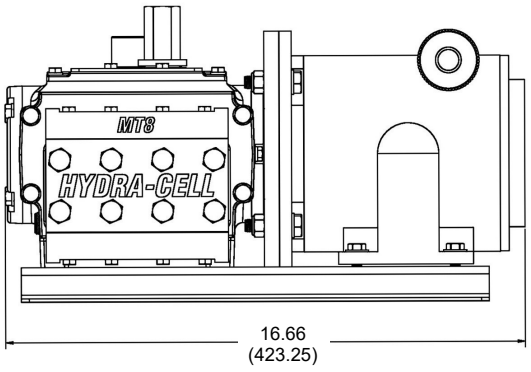


Mounting Hole Dimensions









Note: These drawings are to be used for reference only. All dimensions are reference.
Contact factory for additional drawings of specific models and configurations.

Safety Precautions

General Remarks

These safety / installation instructions contain fundamental information and precautionary notes and must be kept available to all associated with the operation of the pump. Please read them thoroughly prior to installation, electrical connection and commissioning of the unit. It is imperative that all other operating instructions relating to the components of individual units are followed.

These safety / installation instructions do not take local regulations into account. The operator must ensure that such regulations are observed by all, including the personnel carrying out the installation.

Each pump must be labeled by the end user to warn of any hazards that the system process may produce; e.g. corrosive chemicals or hot process etc.

All personnel involved in the operation, maintenance, inspection and installation of the pump must be fully qualified to carry out the work. The personnel's responsibilities, competence and supervision must be clearly defined by the operator. To the extent that if the personnel in question is not already in possession of the requisite know how, appropriate training and instruction must be provided. In addition, the operator is responsible for ensuring that the contents of the operating instructions are fully understood by all the responsible personnel.

When installing a Hydra-Cell pump in conjunction with a motor or motor and frequency controller the relevant manuals must be referred to for electromagnetic compatibility. The installation should conform to EN 61800 and EN 60204 as applicable.

All safety instructions in this manual and all relevant local health and safety regulations must be followed.

Attention must be paid to the weight of the pump before attempting to lift either manually or selecting appropriate lifting equipment.

Inlet Piping

Provide for permanent or temporary installation of a compound pressure gauge to monitor the inlet pressure. To maintain maximum flow, the pump inlet should be under flooded suction conditions at all times. **Do not supply more than one pump from the same inlet line.**

Supply Tank

Use a supply tank that is large enough to provide time for any trapped air in the fluid to escape. The tank size should be at least twice the maximum pump flow rate.

Install a separate inlet line from the supply tank to each pump.

Place a cover over the supply tank, to prevent foreign objects from falling into it.

Hose Sizing and Routing

To minimize acceleration head and frictional losses, size the suction line at least one size larger than the pump inlet, and keep the suction line as short and direct as possible.

Recommendations:

- Keep inlet lines less than 3 ft. (1 m) long
- Use at least 3/8" (9 mm) I.D. inlet hose
- Minimize fittings (elbows, valves, tees, etc.)

Support the pump and piping independently.

Inlet Piping (Pressure Feed)

Provide for permanent or temporary installation of a compound pressure gauge to monitor the inlet pressure. To maintain maximum flow, the pump inlet should be under flooded suction conditions at all times. **Do not supply more than one pump from the same inlet line.**

Note: System back pressure must exceed the pump inlet pressure by at least 15 psi (1 bar) in order to prevent flow thru.

Discharge Piping

Hose and Routing

Use the shortest, most-direct route for the discharge line.

Select pipe or hose with a working pressure rating of at least 1.5 times the maximum system pressure. Example: Select a 1500 psi (103 bar) W.P. rated hose for a system to be operated at 1000 psi (69 bar) gauge pressure.

Support the pump and piping independently.

Pressure Regulation

Install a pressure relief valve in the discharge line. Bypass pressure must not exceed the pressure limit of the pump.

Size the valve so that, when fully open, it will be large enough to relieve the full capacity of the pump without over pressurizing the system.

Locate the valve as close to the pump as possible and ahead of any other valves. Adjust the pressure relief valve to no more than 10% over the maximum working pressure of the system. Do not exceed the manufacturer's pressure rating for the pump or valve.

Route the bypass line to the supply tank.

CAUTION: Never install shutoff valves in the bypass line or between the pump and pressure regulator or relief valve.

Provide for permanent or temporary installation of a pressure gauge to monitor the discharge pressure at the pump.

Minimum Discharge Pressure

To ensure proper capacity control, a minimum discharge pressure of 50 psi (3.5 bar) is required.

MT8 Installation

Location

Locate the pump as close to the supply source as possible.

Install the pump system in a lighted clean space where it will be easy to inspect and maintain.

Motor and Controller

The MT Series pump shaft can rotate in either direction, therefore direction of motor shaft rotation is not critical.

When flow rate is determined by motor speed, it is controlled using an inverter duty constant torque motor and VFD. Flow rate functions can also be easily controlled using the Hydra-Cell Control Freak and appropriate motor or by selecting the manual adjust option.

Accessories

Consult installation drawing below for typical metering fluid system components. Contact Wanner Engineering or the distributor in your area for more details.

Important Precautions

Adequate Fluid Supply. To avoid cavitation and premature pump failure, be sure that the pump will have an adequate fluid supply and that the inlet line will not be obstructed.

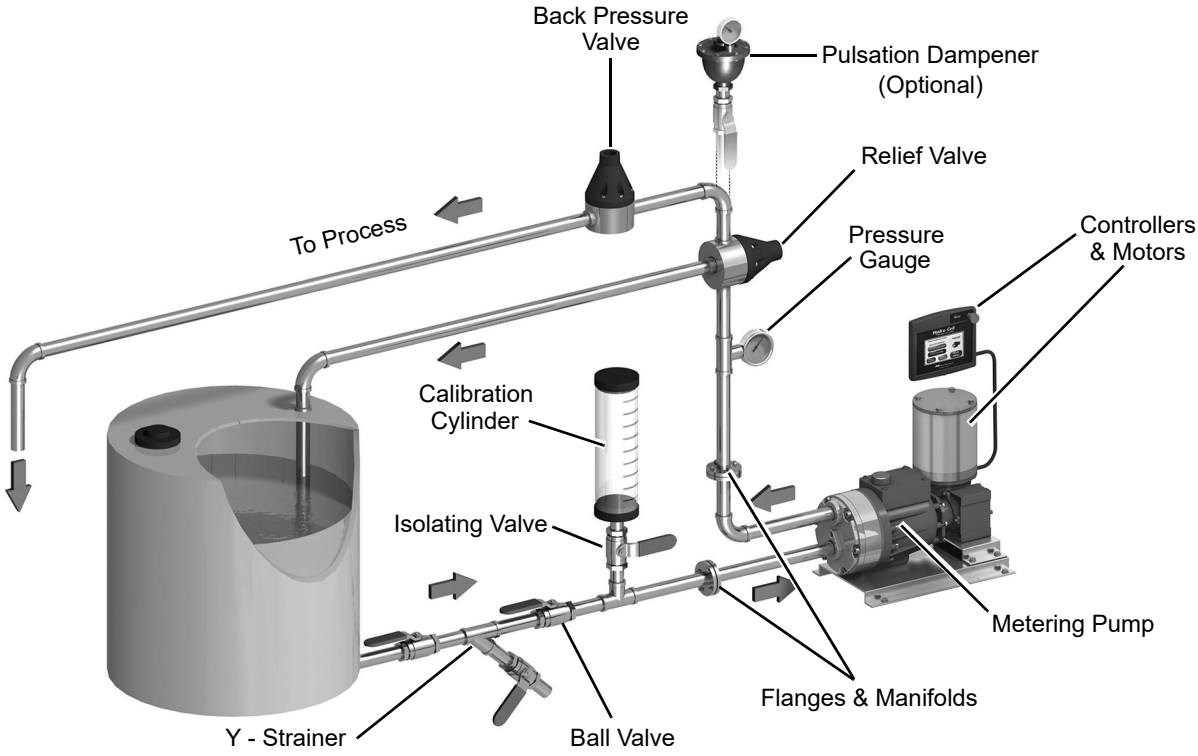
Positive Displacement. This is a positive-displacement pump. Although the MT Series pump is equipped with the patented Kel-Cell Diaphragm Position Control and internal relief system, it is recommended that an external pressure relief valve be installed downstream of the pump to avoid severe system damage if the discharge line ever becomes blocked.

Safety Guards. Follow all codes and regulations regarding installation and operation of the pumping system.

Shut-Off Valves. Never install shut-off valves between the pump and discharge pressure regulator or in the regulator bypass line.

Consult the Factory in the following situations:

- Extreme temperature applications (above 160°F or below 40°F)
- Ambient temperatures (above 110°F)
- Pressure feeding of pumps
- Viscous or abrasive fluid applications
- Chemical compatibility problems



MT8 Installation (Cont'd)

Initial Start-Up Procedure

Before you start the pump, be sure that:

1. All shut-off valves are open, and pump has adequate supply of fluid.
2. All connections are tight.
3. The oil level is 1 in. (25 mm) from the top of the crankcase.
4. Open priming valve on system back pressure valve so pump starts under minimum pressure. See Typical Metering Installation drawing.

Turn on power to pump motor and:

1. Check inlet pressure. To maintain maximum flow, pump inlet should be under flooded suction conditions at all times. Inlet pressure must not exceed 250 psi (17.3 bar).
2. Observe any erratic noise or flow.
3. Jog pump on and off until fluid coming from priming valve is air-free.
4. Close priming valve.
5. Perform pump calibration. See Calibration Procedure.

Calibration

Note: Each metering pump or pump system must be calibrated to determine the pump speed required for the desired flow rate.

Accurate calibration depends on pump discharge pressure and system conditions. When calibrating the pump or system, it is useful to plot capacity curves for future reference. Observe on the curve, that pump capacity decreases slightly as discharge pressure increases.

In order to achieve the best possible results, perform calibration under actual process conditions. Follow these steps:

1. Run pump for 20 minutes at actual process conditions. If process system cannot be used, circulate back to supply tank through pressure relief valve (see Typical Metering Installation drawing). If required system pressure is less than 50 psi (3.5 bar), a back pressure valve must be installed and set to produce minimum of 50 psi (3.5 bar) pressure at pump head.
2. Determine maximum pump speed required for all system conditions that need to be satisfied. Measure pump delivery at this maximum speed using system calibration cylinder, flow meter, or similar container. This is the "rated capacity" for pump.
3. Measure pump delivery at 100%, 75%, 50%, 25%, and 10% of maximum speed just determined. Let pump run for 5 minutes at each speed setting or manual adjust setting before taking capacity measurement.

MT8 Maintenance

Periodically

CAUTION: Do not turn the drive shaft while the oil reservoir is empty.

CAUTION: Do not leave contaminated oil in the pump housing or leave the housing empty. Remove contaminated oil as soon as discovered and replace with clean oil.

1. Check inlet pressure periodically with gauge.
2. Change oil annually.
3. Change oil as follows:
   a. Remove drain plug (60), and allow oil and contaminants to drain completely. Catch oil and dispose of properly. Reinstall drain plug.
   b. Add suitable oil for the application and pump components.
   c. Ensure oil level is 1 in. (25 mm) from the top crankcase.
4. Oil Capacity 1-3/4 US quarts (1.7 liters)

Change Oil Annually

Note: Minimum oil viscosity for proper hydraulic end lubrication is 16-20 CST (80-100 SSU). MT Series replacement parts kits (complete kits and diaphragm kits) include suitable oil for each MT Series pump configuration.

CAUTION: If you are losing oil but don't see any external leakage, or if the oil becomes discolored and contaminated, the diaphragm (17) may be damaged. Refer to the Fluid End Service and Troubleshooting Sections. Do not operate the pump with a damaged diaphragm.

MT8 Maintenace (Cont'd)

This section explains how to disassemble and inspect all easily serviceable parts of the pump.

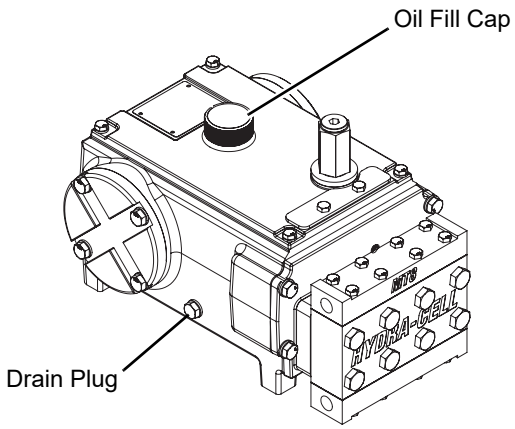
CAUTION: Disassembly of the hydraulic end of the pump should be performed only by a qualified technician. For assistance, contact Wanner Engineering (612-332-5681) or the distributor in your area.

When flow rate is determined by motor speed, it is controlled using an inverter duty constant torque motor and VFD. Flow rate functions can also be easily controlled using the Hydra-Cell Control Freak and appropriate motor or by selecting the manual adjust option.

CAUTION: If the pump is losing oil and no external leakage is visible, or if the oil becomes discolored and contaminated, the single diaphragm may be damaged.

IMPORTANT: Fluid such as engine oil, hydraulic fluid, coolants, grease, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the ground must be cleaned in a specific manner. See local, state and federal regulations for the correct disposal method.

1. Changing Hydraulic End Oil



a. If necessary, with the pump horizontal, remove drain plug and oil fill cap (56) (D03-039-1250). Allow all oil and contaminant to drain out.

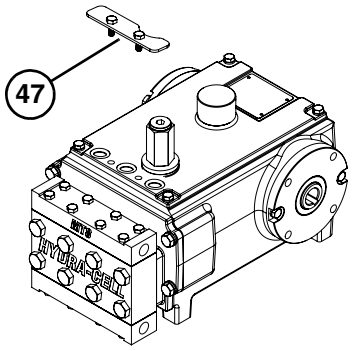
   Note: MT Series replacement parts kits (complete kits and diaphragm kits) include the correct oil for each specific MT Series pump configuration.

b. Install drain plug.

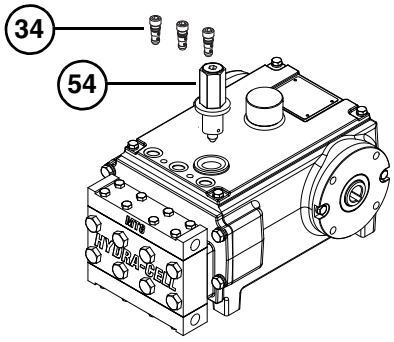
CAUTION: Do not leave contaminated oil in the pump housing or leave the housing empty.

c. Fill the reservoir to the required level. Contact Wanner Engineering (612-332-5681) for more details.

2. Hydraulic End Priming



a. Remove PRV port plate (Item 47) (190-047) exposing the three air bleed valve assemblies (Item 34) (190-901).



b. Remove all three air bleed valve assemblies (Item 34) (190-901) and main PRV relief assembly (Item 54) (190-058).

c. Using a pipette, drizzle oil from crankcase into all three air bleed valve assembly ports until full.

d. Set motor control or manual adjust gearbox to no more than 50 pump RPM.

e. Turn on motor.

f. Bubbles will be observed coming from all three air bleed valve ports. Allow pump to run until no more bubbles are observed coming from ports. Oil may need to be added to one or more of the air bleed valve ports during this phase.

NOTE: DO NOT re-install main relief valve assembly.

g. Once all three air bleed valve assemblies have been reinstalled, re-start pump. Bubbles will be observed coming from main relief valve port.

IMPORTANT: Run pump for a minimum of 10 minutes, or until no more bubbles can be seen escaping from main relief valve assembly port (this may take much longer than 10 minutes, but this step is crucial to making sure all the air is removed from hydraulic end of pump).

h. Stop the pump.

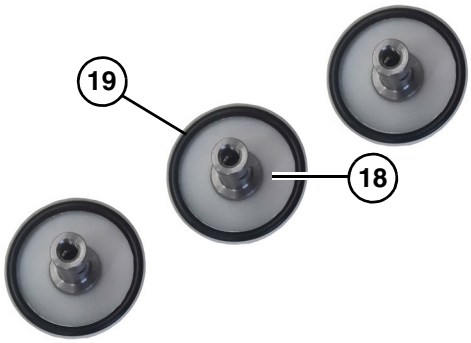
i. Re-install the main PRV assembly.

MT8 Maintenance (Cont'd)

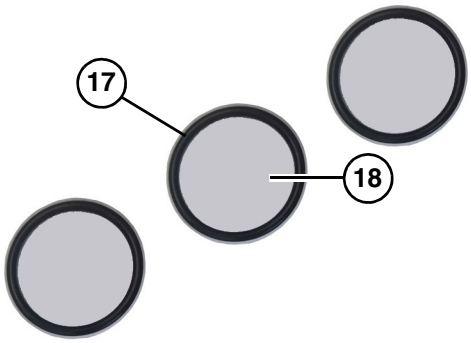
3. Diaphragm Installation



a. Assemble diaphragm followers (21) (190-072) onto the diaphragms (18) (190-018-07) hand tight.



b. Install one o-ring (19) (190-050-10) onto back side of diaphragms (18) (190-018-07).



c. Install one o-ring (17) (190-050-11) onto front of each diaphragm (18) (190-018-07).



d. Seat each of the three diaphragm / O-ring assemblies into the diaphragm backer plate (20) (190- 421) as shown.

MT8 Reference Videos

Videos for Priming, Diaphragm Replacement and Check Valve Replacement.

https://www.youtube.com/watch?v=Hgz-qhOcSVw

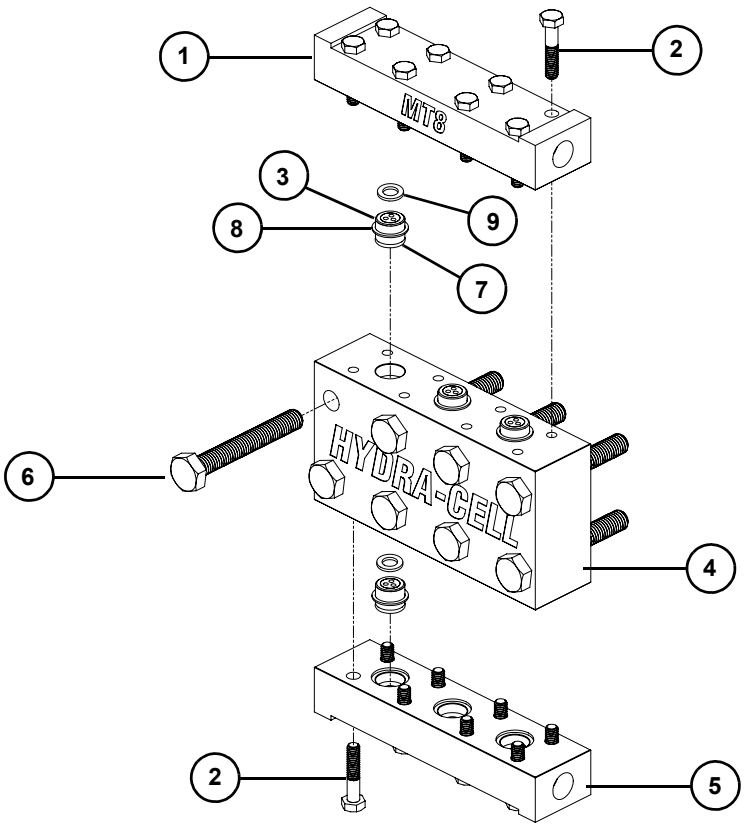
https://www.youtube.com/watch?v=UbChCrUkb7U

https://www.youtube.com/watch?v=Uh30nwD0KC8

MT8 Fluid End Parts List

Ref No.	Part Number	Description	Quantity/ Pump
1	190-260-01	Manifold Top, 316 SST, NPT	1
	190-260-02	Manifold Top, Hastelloy, NPT	1
	190-260-03	Manifold Top, Alloy 20, NPT	1
	190-260-06	Manifold Top, 316 SST, BSPT	1
	190-260-07	Manifold Top, Hastelloy, BSPT	1
	190-260-08	Manifold Top, Alloy 20, BSPT	1
2	190-300	Hex Head Bolt, M6 x 1.0 x 3.0	16
3	190-905-01	Check Valve Assembly, 316 SS	6
	190-905-02	Check Valve Assembly, Hastelloy C	6
	190-905-03	Check Valve Assembly, Alloy 20	6
4	190-258-01	Manifold Body, 316 SST	1
	190-258-02	Manifold Body, Hastelloy	1
	190-258-03	Manifold Body, Alloy 20	1

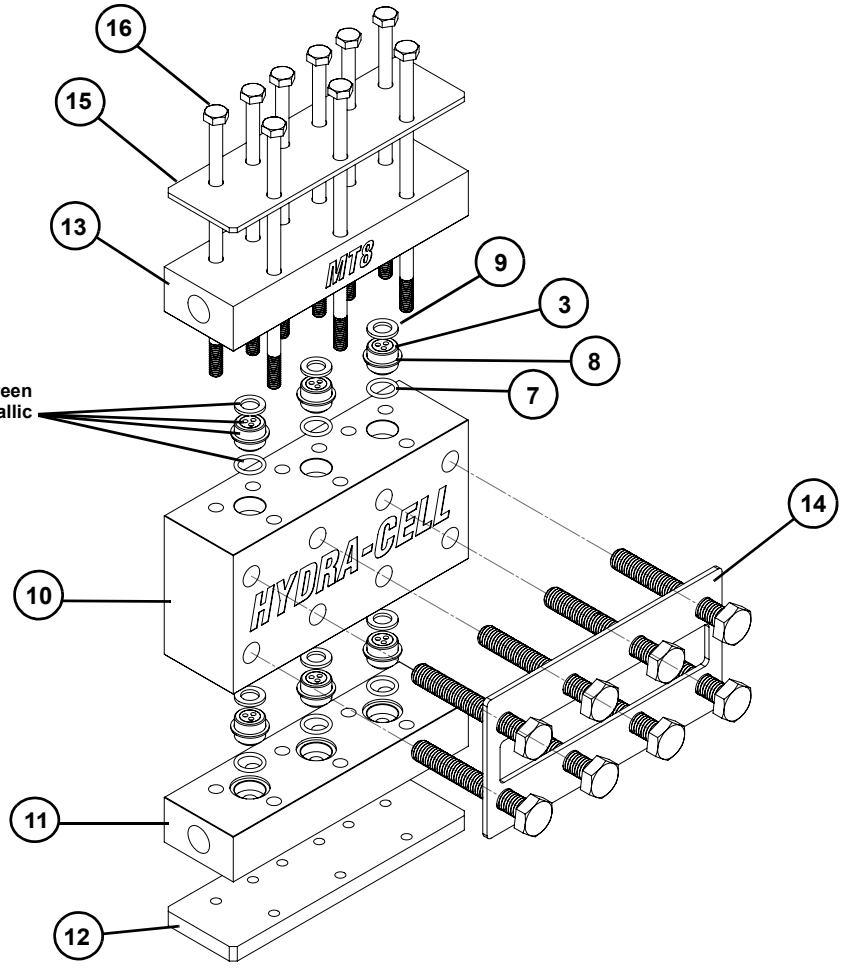
Ref No.	Part Number	Description	Quantity/ Pump
5	190-259-01	Manifold Bottom, 316 SST, NPT	1
	190-259-02	Manifold Bottom, Hastelloy, NPT	1
	190-259-03	Manifold Bottom, Alloy 20, NPT	1
	190-259-06	Manifold Bottom, 316 SST, BSPT	1
	190-259-07	Manifold Bottom, Hastelloy, BSPT	1
	190-259-08	Manifold Bottom, Alloy 20, BSPT	1
6	190-302	Hex Head Bolt, M10 x 1.5 x 70 mm	8
7	190-301	O-ring, PTFE	6
8	D40-047-2114	O-ring, PTFE Encapsulated	6
9	190-261	Crush Ring, PTFE.	6



MT8 Fluid End Parts List (Cont'd)

Ref No.	Part Number	Description	Quantity/ Pump
10	190-110-01	Manifold, Main Body, PVC, ASTM D6263	1
	190-110-02	Manifold, Main Body, PVDF, ASTM D6713	1
11	190-111-01	Bottom, Manifold, PVC, ASTM D6263, 1/4" NPT	1
	190-111-02	Bottom, Manifold, PVDF, ASTM D6713, 1/4" NPT	1
	190-111-03	Bottom, Manifold, PVC, ASTM D6263, 1/4" BSPT	1
	190-111-04	Bottom, Manifold, PVDF, ASTM D6713, 1/4" BSPT	1
12	190-117	Plate, Manifold Bottom	1
13	190-112-01	Top, Manifold, PVC, ASTM D6263, 1/4" NPT	1
	190-112-02	Top, Manifold, PVDF, ASTM D6713, 1/4" NPT	1
	190-112-03	Top, Manifold PVC, ASTM D6263, 1/4" BSPT	1
	190-112-04	Top, Manifold, PVDF, ASTM D6713, 1/4" BSPT	1
14	190-113	Plate, Front Manifold	1
15	190-114	Plate, Manifold Top	1
16	190-115	Bolt, HHCS, M6 x 1 x 140 mm, 18-8 SS	9

NOTE: This table contains parts specific to and included in the non metallic pump heads.



NOTE: Items shared between metallic and non metallic manifold.

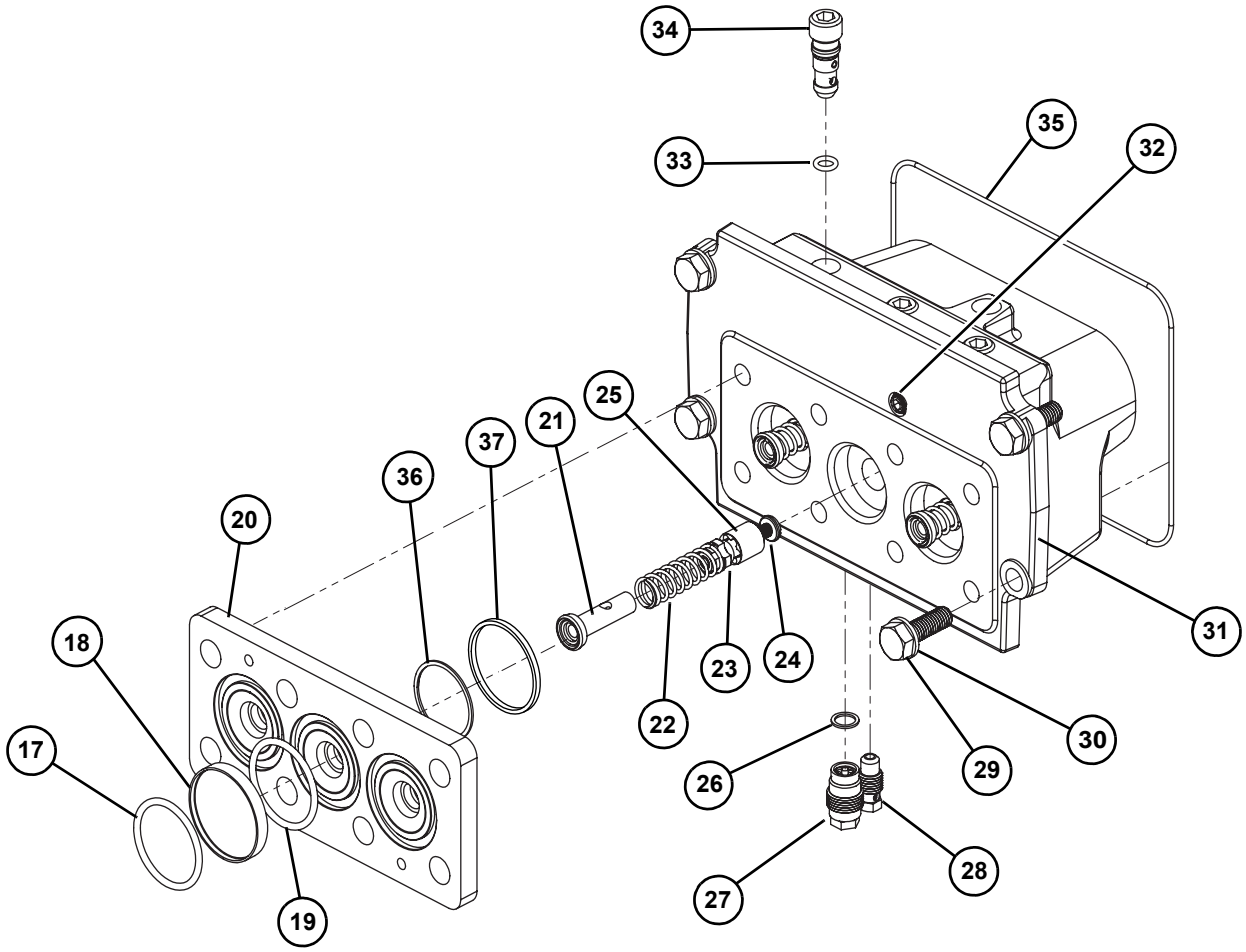
MT8 Hydraulic End Parts List

Ref No.	Part Number	Description	Quantity/ Pump
17	190-050-11	O-ring, PTFE	3
18	190-018-07	MT8, Single Diaphragm	3
19	190-050-10	O-ring, BUNA	3
20	190-421	Diaphragm Backer Plate	1
21	190-072	Diaphragm Follower	3
22	190-028	Spring	3
23	190-022	Washer Guide	3
24	190-032	Screw, PHMS, M5 x 0.8 x 35 mm	3
25	190-009	Spool Valve	3
26	190-904	Underfill Valve Washer	3
27	177-904	Underfill Valve Assembly	3
28	177-905	Overfill Valve Assembly	3
29	190-096	Bolt, Hex Head, M8 x 1.25 x 25 mm	4
30	190-093	Washer, M8	4

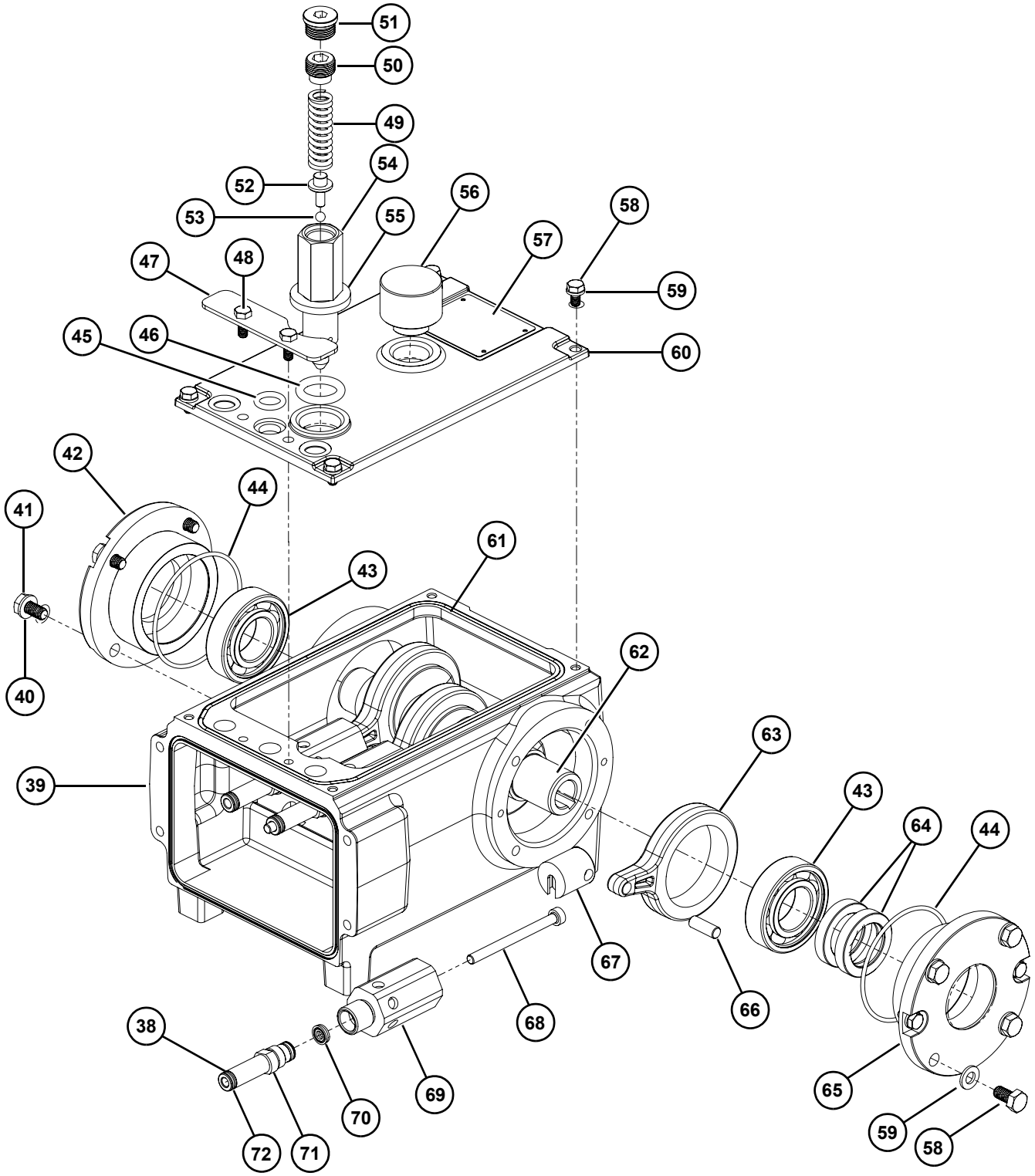
Ref No.	Part Number	Description	Quantity/ Pump
31	190-003-02	Machined Hydraulic Plate	1
32	190-099	Plug, 1/16-27 NPT	2
33	D25-047-2118	O-ring, FKM	3
34	190-901	Air Bleed Valve Assembly	3
35	190-038	O-ring, FKM	3
36	D40-047-2111	O-ring, FKM	1
37	190-108	Backup Ring	1

Hydraulic End Service

CAUTION: Disassembly of the hydraulic end of the pump should be performed only by a qualified technician. For assistance, contact Wanner Engineering (612-332-5681) or the distributor in your area.



MT8 Drive End Parts List



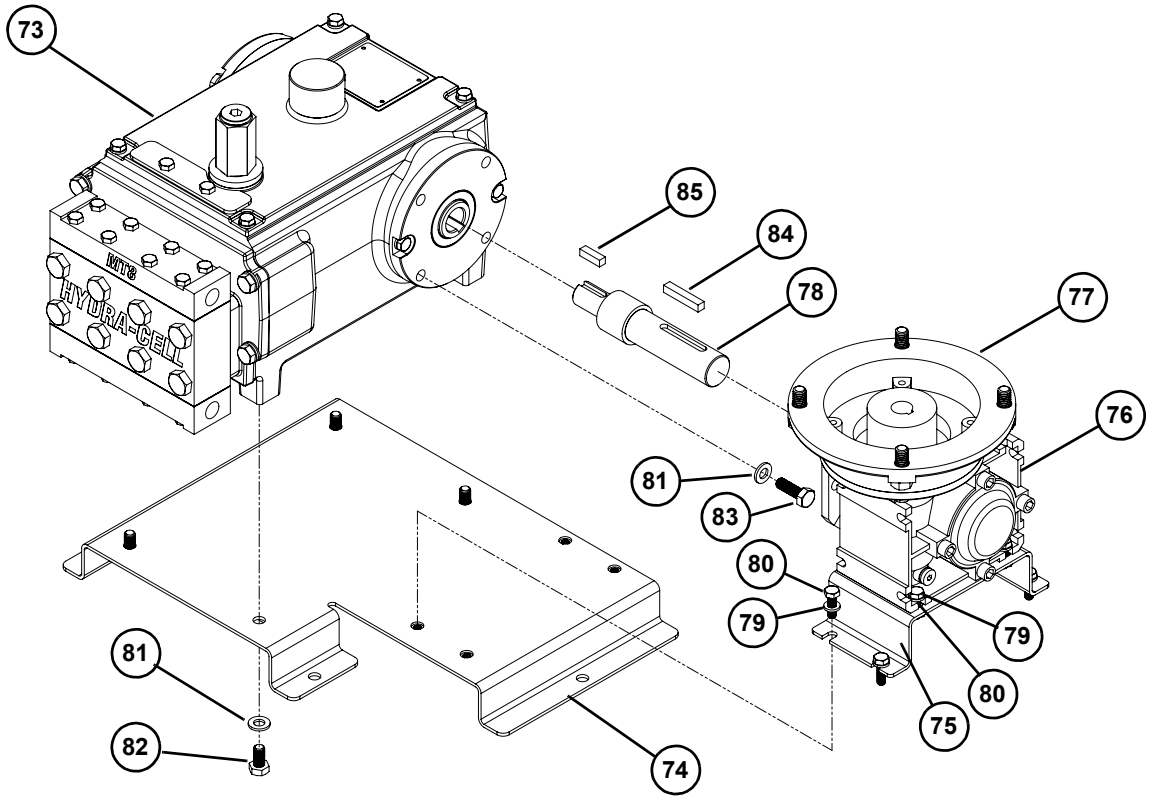
MT8 Drive End Parts List (Cont'd)

Ref No.	Part Number	Description	Quantity/ Pump
38	190-223	Backup Ring, PTFE	6
39	190-001-02	Machined Crankcase Housing	1
40	190-093	Washer, M8	4
41	190-095	Bolt, HHCS, M8 x 1.25 x 16 mm	4
42	190-090-03	Closed End Bearing Cover	1
43	D03-010-2910	Front Bearing	2
44	190-043	O-ring, NBR	2
45	190-305	O-ring, FKM	3
46	190-083	O-ring, FKM	1
47	190-047	Plate, PRV Ports	1
48	190-014	Bolt, Hex Head, M6 x 1.0 x 16 mm	2
49	190-061	Spring	1
50	190-304	Set-Screw, Half Dog	1
51	190-077	Plug, SAE 1/2 Tube	1
52	190-059	Valve Rod	1
53	D25-015-3010	Ball, 1/4" Diameter	1
54	190-058	Relief Valve Body	1
55	190-037	PRV Valve Shim	1
56	D03-039-1250	Metal Sealing Oil Cap Assembly	1
57	190-013	Data Label	1
58	190-094	Bolt, HHCS, M6 x 1 x 12 mm	6
59	190-092	Washer, M6	6
60	190-024-02	Machined Crankcase Cover	1
61	190-306	Formed O-ring, FKM	1
62	190-002-05	Machined Crankshaft	1
63	190-005-02	Machined Connecting Rod	3
64	F20-031-2110	Seal, CR 11615	2
65	190-090-02	Shaft End Bearing Cover	1
66	190-029	Wrist Pin	3
67	190-008	Crosshead	3
68	190-006	Plunger	3
69	190-019	Cylinder Gland	3
70	190-020	Seal, Polypak	3
71	190-007	Cylinder	3
72	190-220	O-ring, NBR	6

MT8 Gearbox and Baseplate Parts List

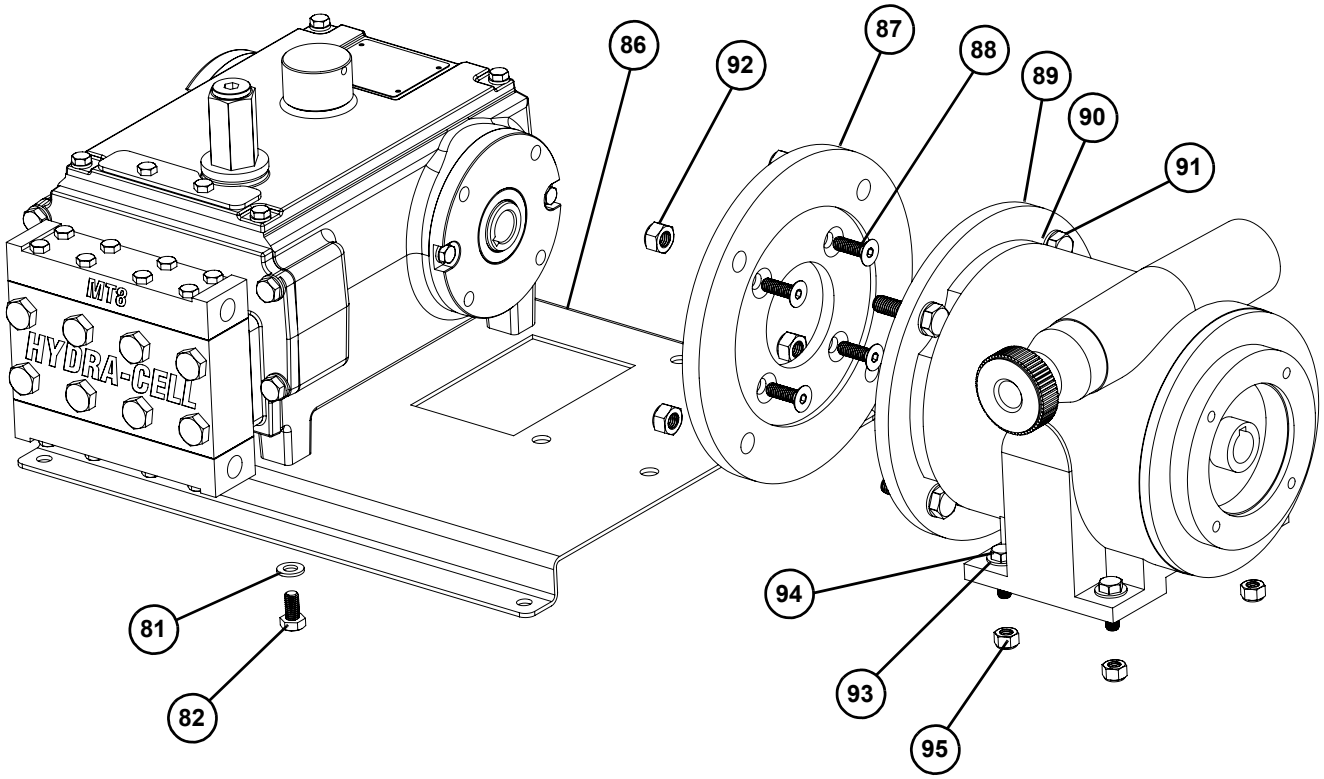
Ref No.	Part Number	Description	Quantity/ Pump
73	190-900-N	Pump Assembly	1
	190-900-M	Pump Assembly	1
74	190-105	Weldment, Base Plate, MT8	1
	190-236	Weldment, Base Plate, MT8, SST	1
75	190-106	Weldment, Gearbox Support	1
	190-237	Weldment, Gearbox Support, SST	1
76	112-400	Gearbox / Ratio 100:1	1
	112-401	Gearbox / Ratio 80:1	1
	112-402	Gearbox / Ratio 60:1	1
	112-403	Gearbox / Ratio 50:1	1
	112-404	Gearbox / Ratio 40:1	1
	112-405	Gearbox / Ratio 30:1	1
	112-407	Gearbox / Ratio 20:1	1
	112-409	Gearbox / Ratio 10:1	1
	112-410	Gearbox / Ratio 7.5:1	1
	112-411	Gearbox / Ratio 5:1	1

Ref No.	Part Number	Description	Quantity/ Pump
77	112-555	Input Flange Kit, NEMA 56C Adapter	1
	112-556	Input Flange Kit, 143/145 TC Adapter	1
	112-558	Input Flange Kit, IEC 63 Adapter	1
	112-559	Input Flange Kit, IEC 71 Adapter	1
	112-560	Input Flange Kit, IEC 80 Adapter	1
78	190-040	Shaft, MT8 Gearbox	1
79	190-092	Washer, M6	6
80	190-097	Screw, HHCS, M6 x 1 x 20 mm	6
81	190-093	Washer, M8	8
82	190-095	Bolt, HHCS, M8 x 1.25 X 16	4
83	190-096	Bolt, Hex Head x 1.25 X 25 mm	4
84	D25-085-2210	Key, 1/4 Sq x 1.40 LG	1
85	112-151	6 x 6 x 20 mm Key	1



MT8 Manual Adjust Gearbox Parts List

Ref No.	Part Number	Description	Quantity/ Pump
86	190-251	WE - Start Assembly Template	1
87	190-045	Adapter, Manual Adjust Gearbox	1
88	190-252	Bolt, Flat Head, M8 x 1.25 x 25mm	4
89	112-852	IEC 80 B5 - IEC 80 B14	1
	112-853	IEC 80 B5 - IEC 90 B14	1
	112-854	IEC 80 B5 - NEMA	1
90	112-526	Flat Washer, M10 SST	1
91	112-527	Screw, M10 x 1.5 x 40mm, HHCS	4
92	112-032	Locknut, M10 x 1.5 SST	4
93	100-915	Washer, 5/16 Flat Special.	4
94	100-948	Screw, 5/16-18 x 1.00, HHCS	4
95	100-938	Locknut, 5/16-18	4



MT8 Troubleshooting

Problem	Probable Cause	Solution
Motor / Pump Does Not Operate	No power.	Supply correct power according to motor requirements.
	Blown fuse/tripped circuit breaker.	Replace / reset, eliminate circuit overload.
	Shaft coupling to pump not in place.	Install proper coupling hardware (see parts list).
	Current overload - motor.	Motor not rated for pump operating conditions - install proper motor.
	Thermal overload - motor.	Motor not rated for pump and / or ambient operating conditions - supply cooling system or install proper motor.
	Faulty motor drive/controller.	Repair / replace.
	Faulty motor.	Repair / replace.
	Low liquid level in supply tank (if low-level shut-off is used).	Fill tank.
No Delivery	Supply tank empty.	Fill tank.
	Loss of prime.	Re-prime using Initial Start-Up Procedure
	Inlet line or strainer clogged.	Increase supply pressure by raising fluid level in tank, raising tank, or pressurizing suction tank.
	Inlet line too restrictive.	Increase inlet line diameter and/or decrease inlet line length.
	Fluid viscosity too high.	Reduce viscosity if possible (by heat or some other means). Increase inlet line diameter and/or decrease inlet line length. Increase supply pressure.
	Vapor lock / cavitation.	Increase inlet pressure. Decrease fluid temperature.
	Pump valves held open or worn out.	Clear debris and flush, or replace (see Fluid End Service)
	System relief valve actuating.	Adjust relief valve, or repair, clean, or replace with new relief valve.
Delivery Too Low and / or Erratic	Review all Probable Causes and Solutions in No Delivery section on previous page.	
	Air leak(s) in inlet line.	Locate all leaks and repair.
	System back pressure too low.	Adjust back pressure valve to higher setting. Install back pressure valve if none in system.
	Pumped fluid characteristics changed.	Monitor supply tank temperature to determine if fluid is too hot (leading to cavitation) or too cold (increasing fluid viscosity). Stabilize temperature at suitable level to resolve problem. Check for entrapped air in fluid supply system.
	Inlet supply pressure changed.	Monitor inlet supply pressure (at the pump) to determine if it is too low, causing a starved condition / cavitation. Stabilize pressure at suitable level to resolve problem.
	Pump OK - Calibration system or flow meter error.	Evaluate components and repair/correct problem(s).
	Oil condition in pump hydraulic end changed.	Check oil level - if low evaluate for source of leakage. Consult factory for hydraulic end service.
		Change oil per recommended guidelines in maintenance section.
Delivery Too High and / or Erratic	System back pressure too low.	Adjust back pressure valve to higher setting. Install back pressure valve if none in system.
	Inlet supply pressure changed.	Monitor inlet supply pressure (at the pump) to determine if it is too high, causing a “flow-through” condition. Stabilize pressure at suitable level to resolve problem.
	Pump OK - Calibration system or flow meter error.	Evaluate components and repair / correct problem(s).

MT8 Pump Series Replacement Parts Kit

TO ORDER REPLACEMENT PARTS KIT: A Replacement Parts Kit contains 11 digits corresponding to customer-specified design options.

1	2	3	4	5	6	7	8	9	10	11

Digit (s)	Order Code	Description
1-4		**Pump Configuration**
	MT08	For all MT8 pumps
5		**Kit Designation**
	K	Complete Fluid End Kit
	D	Diaphragm Kit
	V	Valve Kit*
6 - 7		**Pump Head Version**
	51	Standard
8		**Diaphragm & O-ring Material**
	J	PTFE - No Leak Detection
9 - 10		**Check Valve Material**
	SS	316 SST
	TT	Hastelloy C
	AA	Alloy 20
11		**Hydraulic Oil End**
	G	5W30 (Synthetic oil)
	K	Food contact oil

** K & D kits include diaphragms and oil; V kits do not*

MT8 Replacement Parts Kits Contents

Kit Designation	Part Number	Description	QTY Per kit
K (Complete Fluid End Kit)	190-905-XX	Check Valve Assembly	6
	190-301	PTFE O-Ring	6
	D40-047-2114	PTFE Encapsulated O-Ring	6
	190-261	Crush Ring	6
	190-050-10	O-Ring (NBR)	6
	190-050-11	O-Ring (PTFE Encapsulated)	6
	190-018-07	Diaphragm	6
D (Diaphragm Kit)	190-050-10	O-Ring (NBR)	6
	190-050-11	O-Ring (PTFE Encapsulated)	6
	190-018-07	Diaphragm	6
V (Valve Kit)	190-905-XX	Check Valve Assembly	6
	190-301	PTFE O-Ring	6
	D40-047-2114	PTFE Encapsulated O-Ring	6
	190-261	Crush Ring	6

Limited Warranty

Wanner Engineering, Inc. (“Wanner”) extends to the original purchaser of equipment supplied or manufactured by Wanner and bearing its name, a limited one-year warranty from the date of purchase against defects in material or workmanship, under normal use and service, and provided the equipment is installed, operated and maintained in accordance with instructions supplied by Wanner will repair or replace, at its option, defective parts without charge if: (a) you provide written notice of any defect within thirty (30) days from the discovery of the defect; (b) the claim is received by Wanner before the expiration of the warranty period; and (c) such parts are returned with transportation charges prepaid to Wanner Engineering, Inc., 1204 Chestnut Avenue, Minneapolis, Minnesota 55403. A return goods authorization must be received prior to the return of the defective part. No allowance will be made for repairs undertaken without Wanner’s written consent or approval.

Not withstanding anything to the contrary, this warranty does not cover:

1. Electric motors (if applicable) not manufactured by Wanner. The warranties, if any, on such equipment are assigned to you by Wanner (without recourse) at the time of purchase.
2. Normal wear and/or damage caused by or related to abrasion, corrosion, abuse, negligence, accident, faulty installation or tampering which impairs normal operation.
3. Transportation costs.

This limited warranty is exclusive, and is in lieu of any other warranties (oral, express, implied or statutory) including, but not limited to, implied warranties of merchantability and fitness for a particular purpose; warranties of non-infringement; warranties arising from course of dealing or usage of trade or any other matter. Any descriptions of the equipment, drawings, specifications, and any samples, models, bulletins, or similar material used in connection with the sale of equipment are for the sole purpose of identifying the equipment and are not to be construed as an express warranty that the equipment will conform to such description. Any field advisory or installation support is advisory only. Every form of liability for direct, special, incidental or consequential damages or loss is expressly excluded and denied. All liability of Wanner shall terminate one (1) year from the date of purchase of the equipment.

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