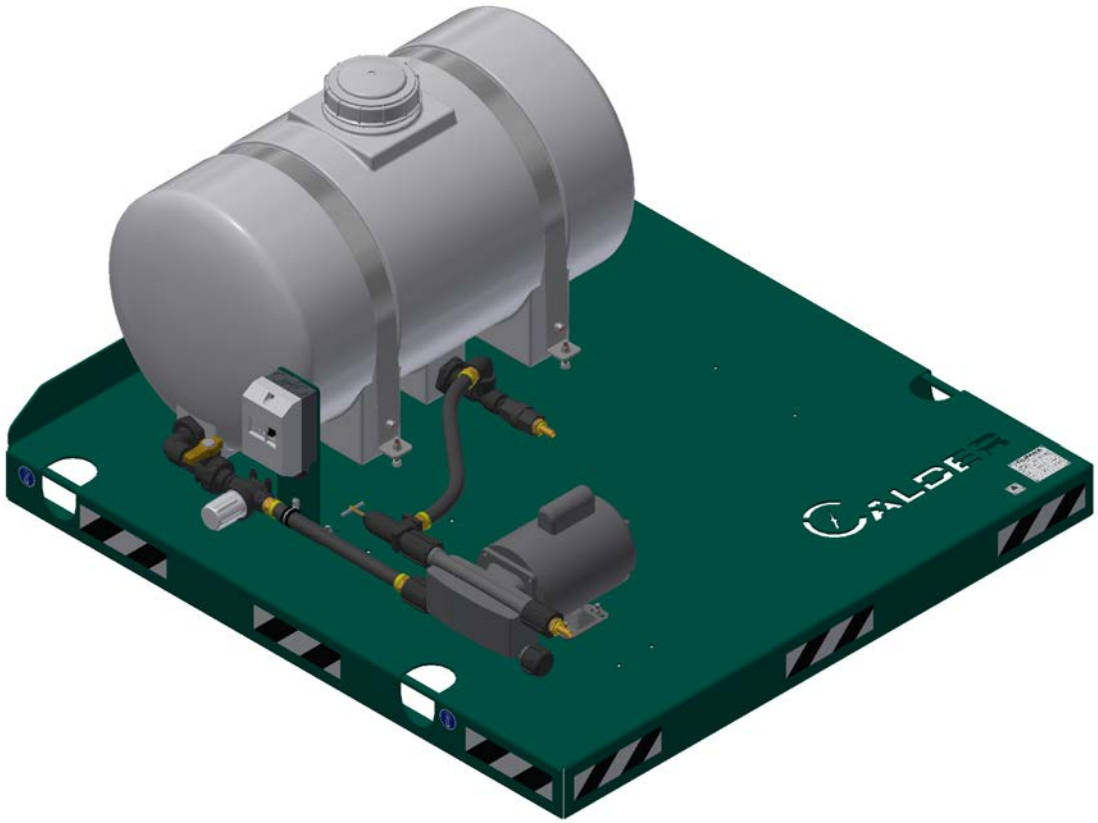
RECIRCULATION TANK

OPERATING MANUAL

ORIGINAL INSTRUCTIONS



VALVE TESTING & REPAIR SYSTEMS BY CLIMAX

P/N 90637
September 2021
Revision 2

CLIMAX | BORTECH CALDER H&S TOOL

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- Your name
- Shipping address
- Telephone number
- Machine model
- Serial number (if applicable)
- Date of purchase

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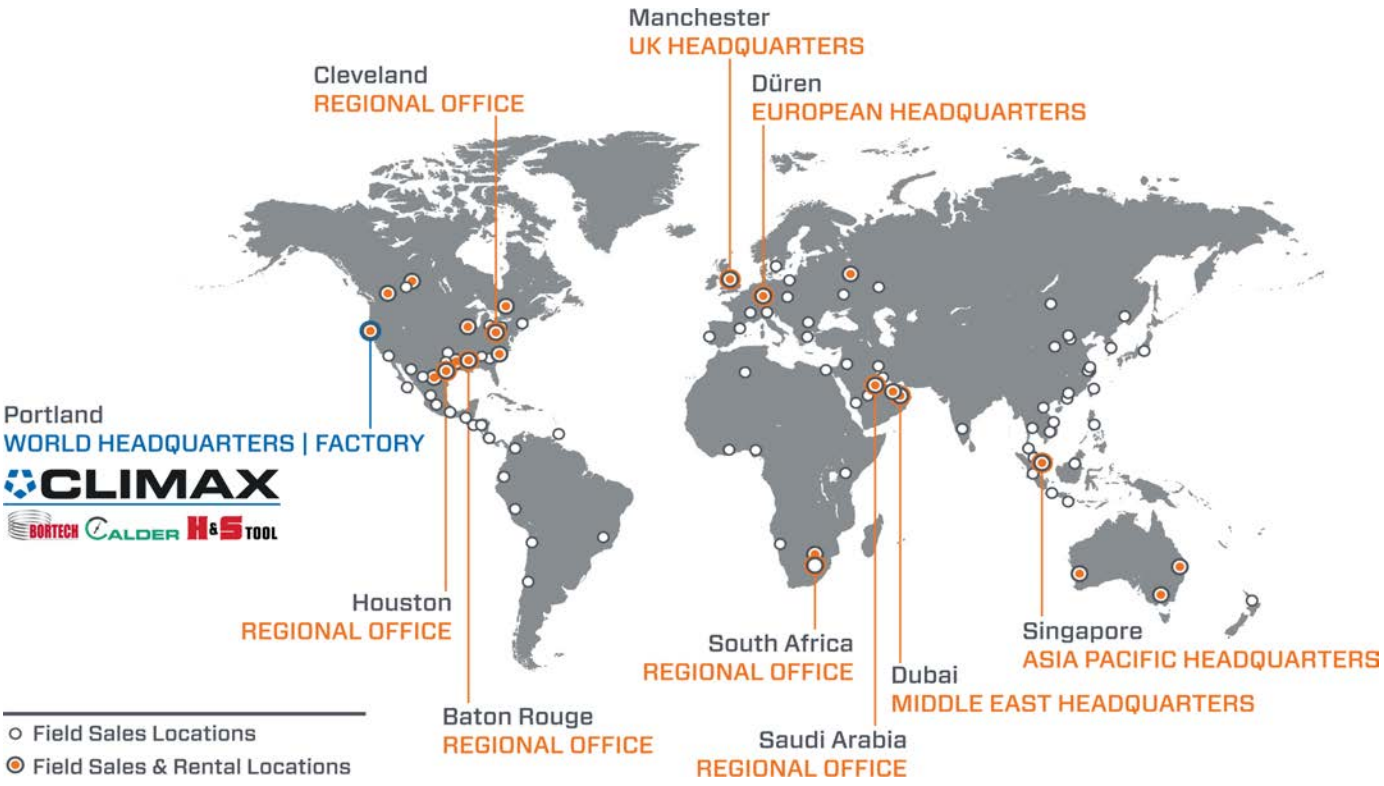
CLIMAX GLOBAL LOCATIONS



CE DOCUMENTATION

DECLARATION OF CONFORMITY

2006/42/EC Machinery Directive

Name of manufacturer or supplier
Climax Portable Machining and Welding Systems

Full postal address including country of origin
2712 E. Second St., Newberg, OR 97132, USA

Description of product
RECIRCULATION TANK

Name, type or model, batch or serial number
90544; 90545; 90546

Standards used, including number, title, issue date and other relative documents
EN 349, EN 3744, EN 11201, EN 12100-1, EN 13849-1, EN 14121-1

Full postal address if different from manufacturers
Climax GmbH
Am Langen Graben 8
52353 Duren, Germany

Declaration

I declare that as the Manufacturer, the above information in relation to the supply / manufacture of this product, is in conformity with the stated standards and other related documents following the provisions of the above Directives and their amendments.

Signature of Manufacturer: _____

Position Held: VP of Engineering; Research & Development

Date: _____

CE

LIMITED WARRANTY

CLIMAX Portable Machine Tools, Inc. (hereafter referred to as “CLIMAX”) warrants that all new machines are free from defects in materials and workmanship. This warranty is available to the original purchaser for a period of two years after delivery. If the original purchaser finds any defect in materials or workmanship within the warranty period, the original purchaser should contact its factory representative and return the entire machine, shipping prepaid, to the factory. CLIMAX will, at its option, either repair or replace the defective machine at no charge and will return the machine with shipping prepaid.

CLIMAX warrants that all parts are free from defects in materials and workmanship, and that all labor has been performed properly. This warranty is available to the customer purchasing parts or labor for a period of 90 days after delivery of the part or repaired machine or 180 days on used machines and components. If the customer purchasing parts or labor finds any defect in materials or workmanship within the warranty period, the purchaser should contact its factory representative and return the part or repaired machine, shipping pre-paid, to the factory. CLIMAX will, at its option, either repair or replace the defective part and/ or correct any defect in the labor performed, both at no charge, and return the part or repaired machine shipping prepaid.

These warranties do not apply to the following:

- Damage after the date of shipment not caused by defects in materials or workmanship
- Damage caused by improper or inadequate machine maintenance
- Damage caused by unauthorized machine modification or repair
- Damage caused by machine abuse
- Damage caused by using the machine beyond its rated capacity

All other warranties, express or implied, including without limitation the warranties of merchantability and fitness for a particular purpose are disclaimed and excluded.

Terms of sale

Be sure to review the terms of sale which appear on the reverse side of your invoice. These terms control and limit your rights with respect to the goods purchased from CLIMAX.

About this manual

CLIMAX provides the contents of this manual in good faith as a guideline to the operator. CLIMAX cannot guarantee that the information contained in this manual is correct for applications other than the application described in this manual. Product specifications are subject to change without notice.

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1 INTRODUCTION

IN THIS CHAPTER:

1.1 HOW TO USE THIS MANUAL

This manual describes information necessary for the setup, operation, maintenance, storage, shipping, and decommissioning of the Recirculation Tank.

The first page of each chapter includes a summary of the chapter contents to help you locate specific information. The appendices contain supplemental product information to aid in setup, operation, and maintenance tasks.

Read this entire manual to familiarize yourself with the Recirculation Tank before attempting to set it up or operate it.

1.2 SAFETY ALERTS

Pay careful attention to the safety alerts printed throughout this manual. Safety alerts will call your attention to specific hazardous situations that may be encountered when operating this machine.

Examples of safety alerts used in this manual are defined here[1]:

DANGER

indicates a hazardous situation which, if not avoided, ***WILL*** result in death or severe injury.

WARNING

indicates a hazardous situation which, if not avoided, ***COULD*** result in death or severe injury.

1. For more information on safety alerts, refer to *ANSI/NEMA Z535.6-2011, Product safety Information in Product Manuals, Instructions, and Other Collateral Materials*.

⚠ CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

indicates a hazardous situation which, if not avoided, could result in property damage, equipment failure, or undesired work results.

1.3 GENERAL SAFETY PRECAUTIONS

CLIMAX leads the way in promoting the safe use of portable machine tools and valve testers. Safety is a joint effort. You, the end user, must do your part by being aware of your work environment and closely following the operating procedures and safety precautions contained in this manual, as well as your employer's safety guidelines.

Observe the following safety precautions when operating or working around the machine.

Training – Before operating this or any machine tool, you should receive instruction from a qualified trainer. Contact CLIMAX for machine-specific training information.

Risk assessment – Working with and around this machine poses risks to your safety. You, the end user, are responsible for conducting a risk assessment of each job site before setting up and operating this machine.

Intended use – Use this machine in accordance with the instructions and precautions in this manual. Do not use this machine for any purpose other than its intended use as described in this manual.

Personal protective equipment – Always wear appropriate personal protective gear when operating this or any other machine tool.

Work area – Keep the work area around the machine clear of clutter. Restrain cords and hoses connected to the machine. Keep other cords and hoses away from the work area.

Lifting – Many CLIMAX machine components are very heavy. Whenever possible, lift the machine or its components using proper hoisting equipment and rigging. Always use designated lifting points on the machine.

Lock-out/tag-out – Lock-out and tag-out the machine before performing maintenance.

Moving parts – CLIMAX machines have numerous exposed moving parts and interfaces that can cause severe impact, pinching, cutting, and other injuries. Except for stationary operating controls, avoid contact with mov-

ing parts by hands or tools during machine operation. Remove gloves and secure hair, clothing, jewelry, and pocket items to prevent them from becoming entangled in moving parts.

1.4 MACHINE-SPECIFIC SAFETY PRECAUTIONS

Eye hazard – Always wear eye protection when operating the machine.

Sound level – This machine produces potentially harmful sound levels. Hearing protection is required when operating this machine or working around it.

Hazardous environments – Do not operate the machine in environments where potentially explosive materials, toxic chemicals, or radiation may be present.

Pressurization – Do not over-pressurize the valve test system beyond the limits described in this manual and on machine labels. Do not pressurize the system while the side panels are removed from the test console.

Test gauges – Do not use any gauge above its rating. Do not remove test gauges while the system is pressurized.

Utility service requirements – Do not exceed the pressure ratings stated in this manual and on the machine labels.

1.5 RISK ASSESSMENT AND HAZARD MITIGATION

To achieve the intended results and to promote safety, the operator must understand and follow the design intent, set-up, and operation practices that are unique to valve testers.

The operator must perform an overall review and on-site risk assessment of the intended application. Due to the unique nature of high-pressure hydrostatic testing, identifying one or more hazards that must be addressed is typical.

When performing the on-site risk assessment, it is important to consider the valve tester and the workpiece as a whole.

⚠ WARNING

High-pressure valve testing may result in the sudden, unexpected release of stored energy with the potential to cause property damage or personnel injury. Potential hazards may include the possibility of high-velocity fluid escaping and high-energy projectile impact. The end-user must assess the application and install protective barrier devices, as appropriate.

1.6 RISK ASSESSMENT CHECKLIST

The following checklist is not intended to be an all inclusive list of things to watch out for when setting up and operating this valve testing machine. However, these checklists are typical of the types of risks the assembler and operator should consider. Use these checklists as part of your risk assessment:

TABLE 1-1. RISK ASSESSMENT CHECKLIST BEFORE SET-UP

	Before set-up
☐	I took note of all the warning labels on the machine.
☐	I removed or mitigated all identified risks (such as tripping, cutting, crushing, entanglement, shearing, or falling objects).
☐	I considered the need for personnel safety guarding and installed any necessary guards.
☐	I considered the potential hazards that are inherent in high-pressure valve testing, including the possibility of high velocity fluid escape or workpiece fragmentation, and have installed appropriate protective barriers.
☐	I read the machine assembly instructions (Section 3).
☐	I considered how this machine operates and identified the best placement for the controls, cabling, and the operator.
☐	I evaluated and mitigated any other potential risks specific to my work area.

TABLE 1-2. RISK ASSESSMENT CHECKLIST AFTER SET-UP

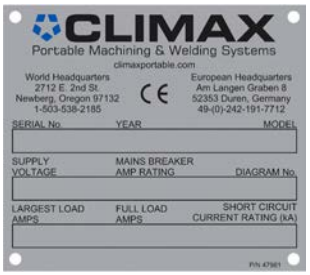
	After set-up
☐	I checked that the machine is safely installed (according to Section 3).
☐	I identified all possible pinch points, such as those caused by rotating parts, and informed the affected personnel.
☐	I followed the required maintenance checklist (Section 5).
☐	I checked that all affected personnel have the recommended personal protective equipment, as well as any site-required or regulatory equipment.
☐	I checked that all affected personnel understand and are clear of the danger zone.
☐	I evaluated and mitigated any other potential risks specific to my work area.

1.7 LABELS

1.7.1 Label identification

The following warning and identification labels should be on your machine. If any are defaced or missing, contact CLIMAX immediately for replacements.

TABLE 1-3. LABELS

	P/N 29152 Mass plate		P/N 47981 Serial, year, model plate
	P/N 590359 Warning label: wear eye protection		

1.7.2 Label location

The following figures display the location of the labels on each of the components of the Recirculation Tank. For further identification of location placement, refer to the exploded views in Appendix A.

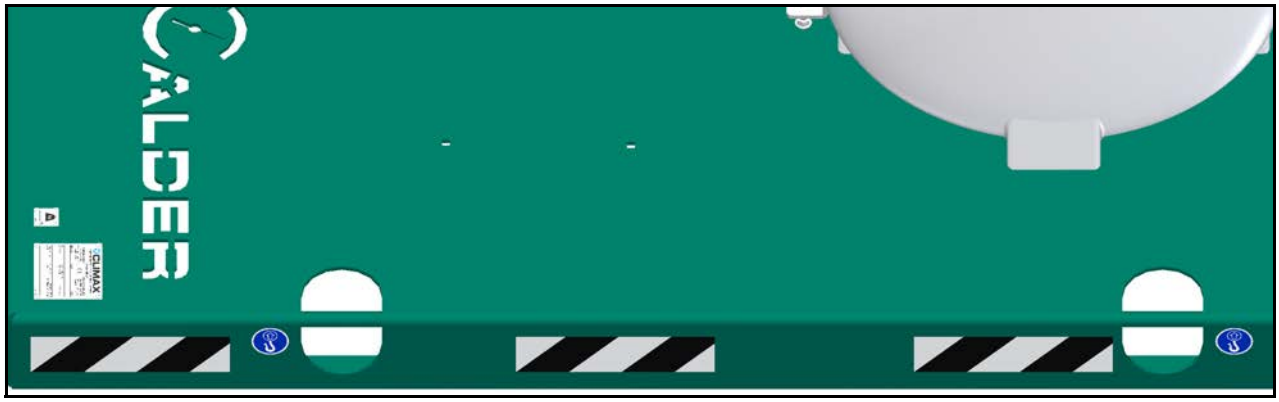


FIGURE 1-1. RIGHT LABEL LOCATION

Label P/N: 29152, 47981, 590359

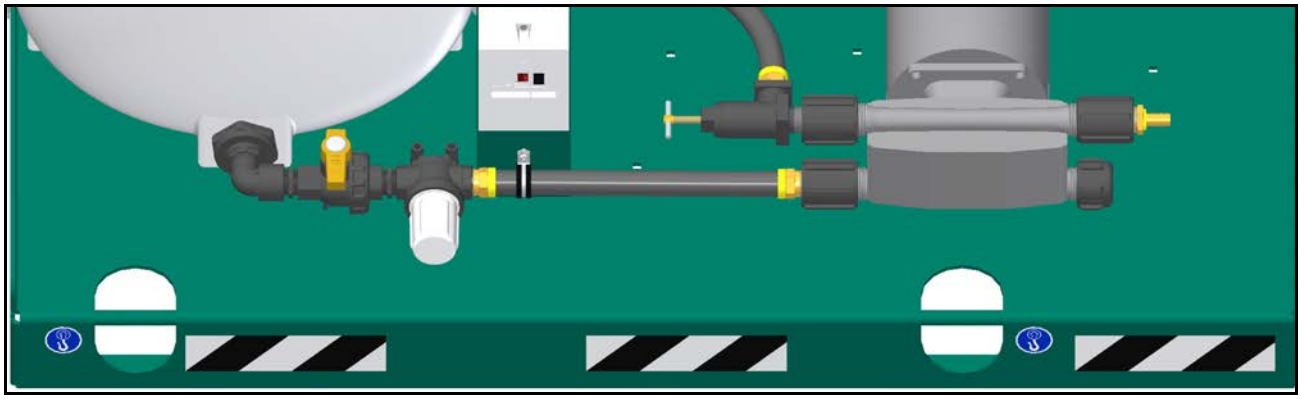


FIGURE 1-2. LEFT LABEL LOCATION

Label P/N: 590359

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2 OVERVIEW

IN THIS CHAPTER:

2.1 Features and components

The recirculation tank and pump is used to store the test fluid for the entire Calder line of valve testing equipment. The on-board positive displacement pump supplies up to 3.9 gpm (14.8 lpm).

A control panel on the skid operates the pump to turn it off and on. The relief valve protects the pump from over-pressurization by returning the excess flow to the return port of the tank. The tank screen keeps large debris out of the pump. A shut-off valve allows service of the suction screen without draining the tank. Maximum pressure is 70 psi (4.8 bar).

Principle components include:

- 35, 65, 125 gallon (132, 246, 473 liters) tanks with vented lid
- 120/240 volt alternating current (VAC) compatible motor
- 1/2" (13 mm) supply and return barbs
- Support skid that may be moved by fork lift, pallet jack, or crane
- Check valve on return prevents the tank draining into the testing device or onto the floor in the event of hose failure
- Components are compatible with an ethylene glycol water mixture (that is, antifreeze)

Principle components are shown in Figure 2-1.

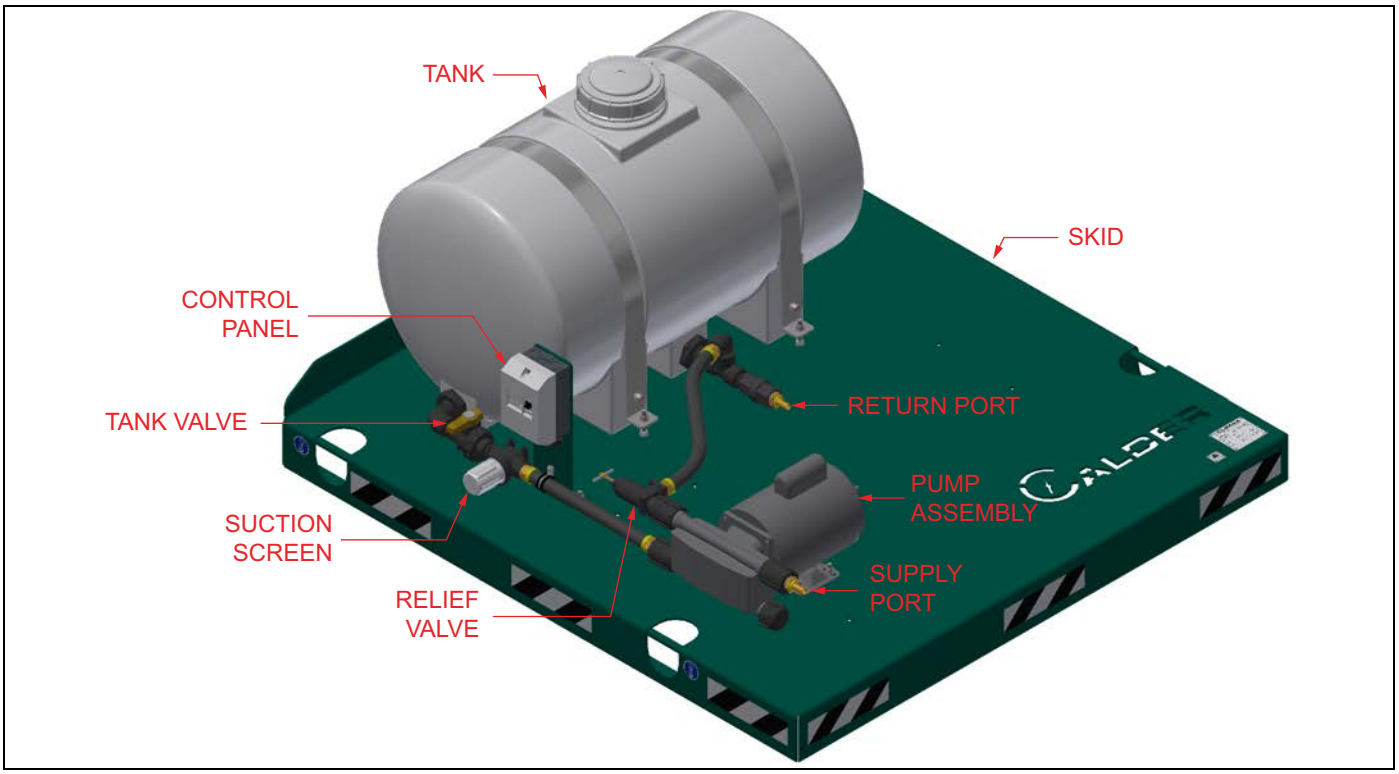

FIGURE 2-1. COMPONENTS

2.2 CONTROLS

The Recirculation Tank controls are located by the motor on the skid (shown in Figure 2-2).

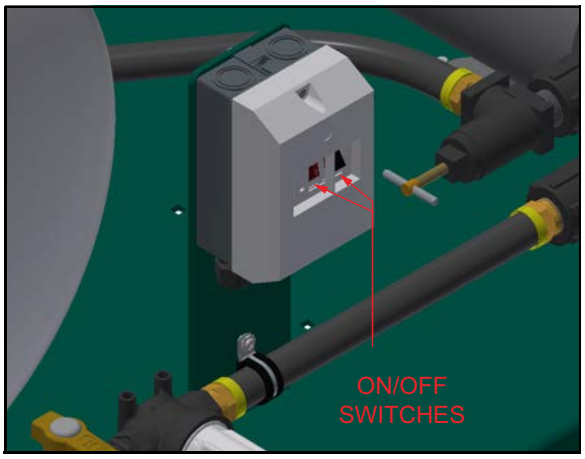

FIGURE 2-2. CONTROL PANEL

2.3 DIMENSIONS

The following figures show the machine and operating dimensions.

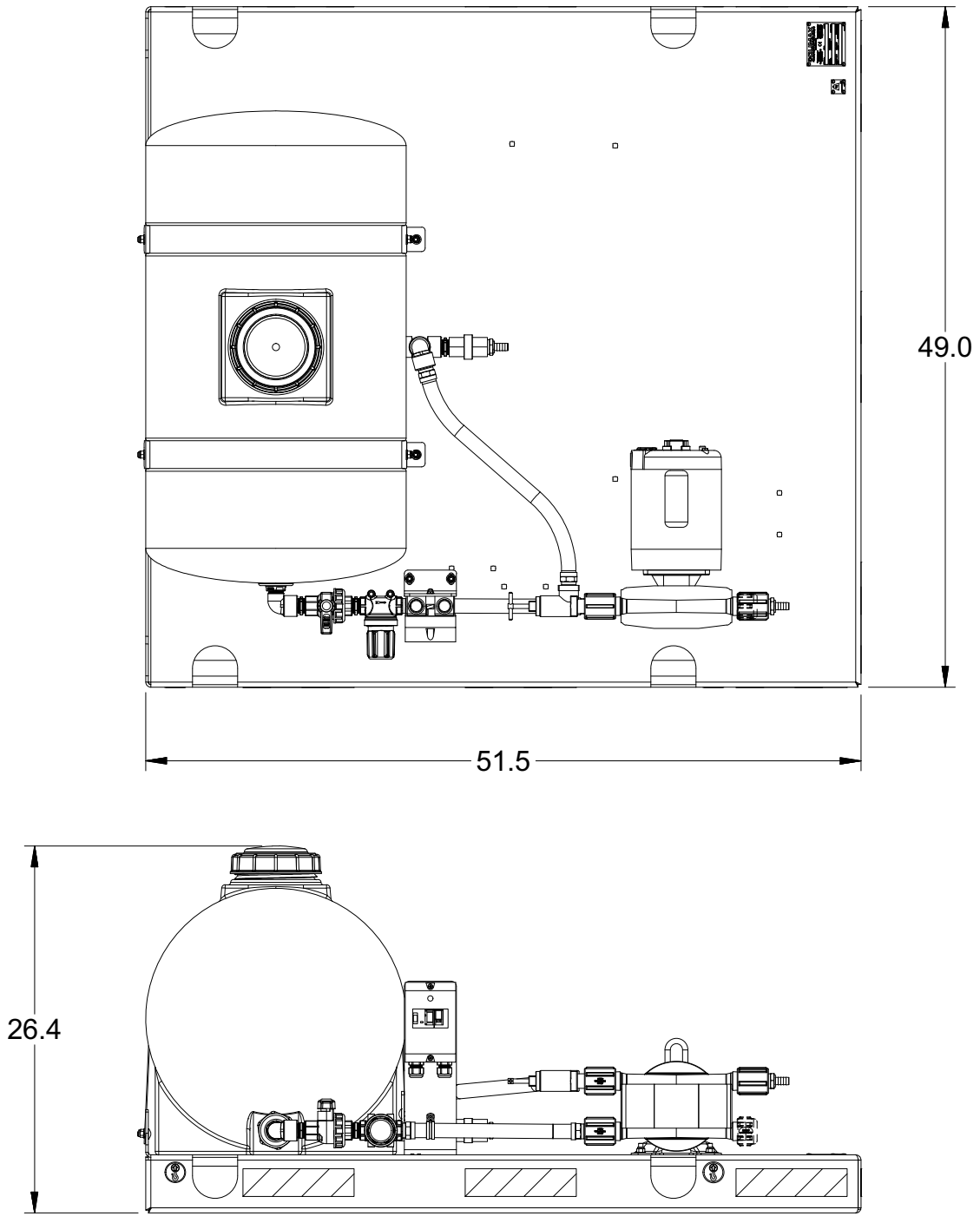

FIGURE 2-3. 35-GALLON (132-LITER) RECIRCULATION TANK DIMENSIONS

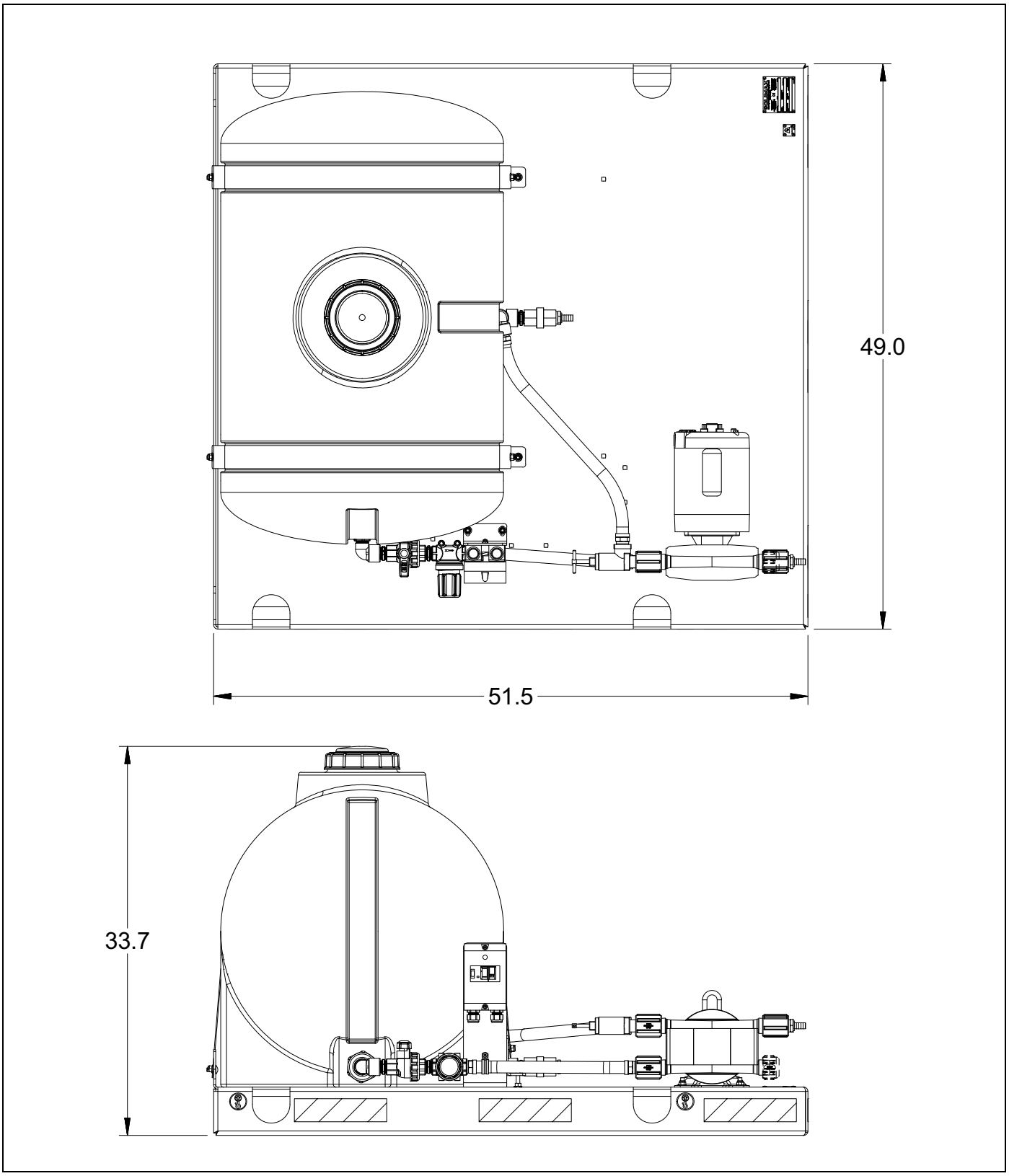

FIGURE 2-4. 65-GALLON (246-LITER) RECIRCULATION TANK DIMENSIONS

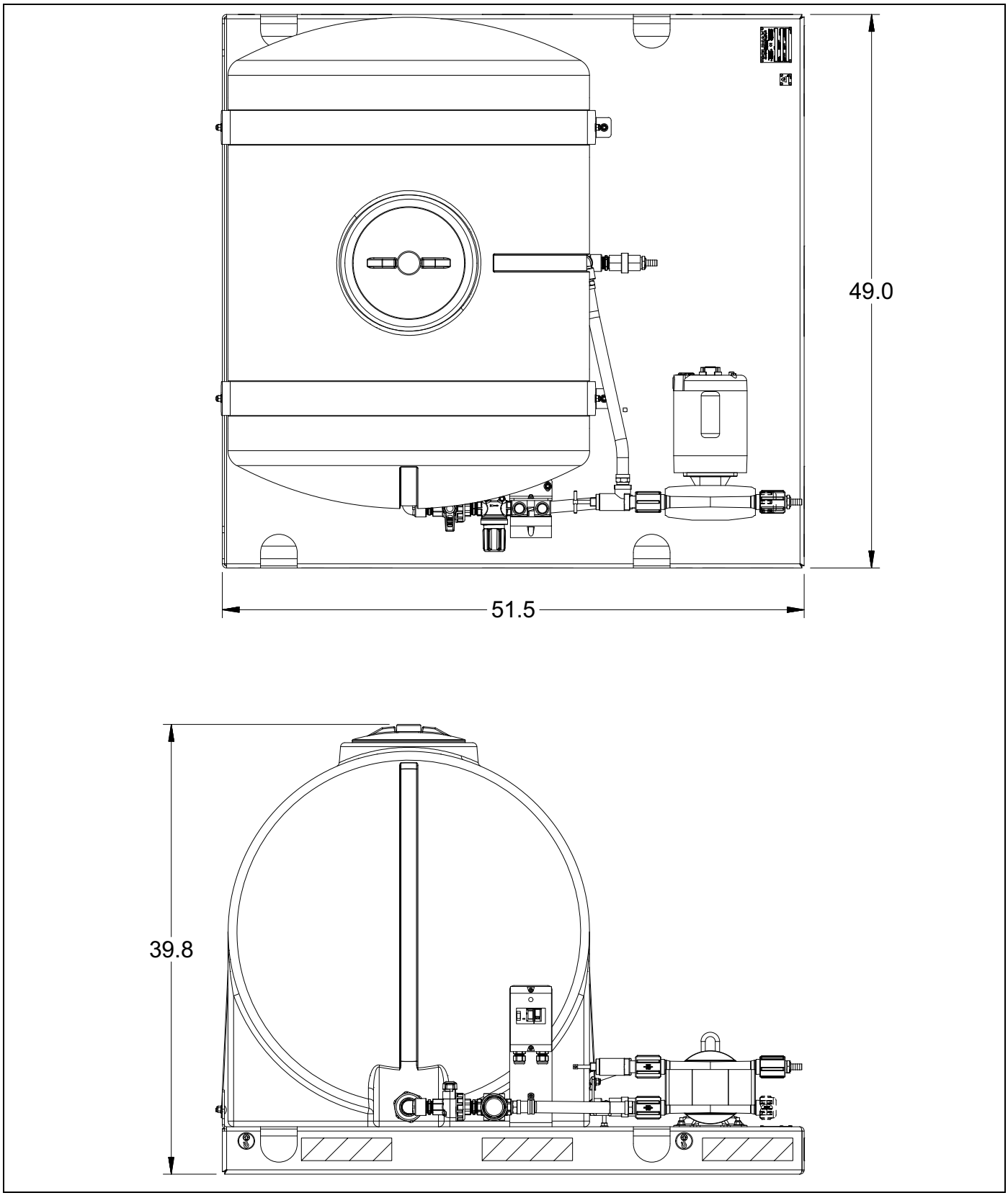

FIGURE 2-5. 125-GALLON (473-LITER) RECIRCULATION TANK DIMENSIONS

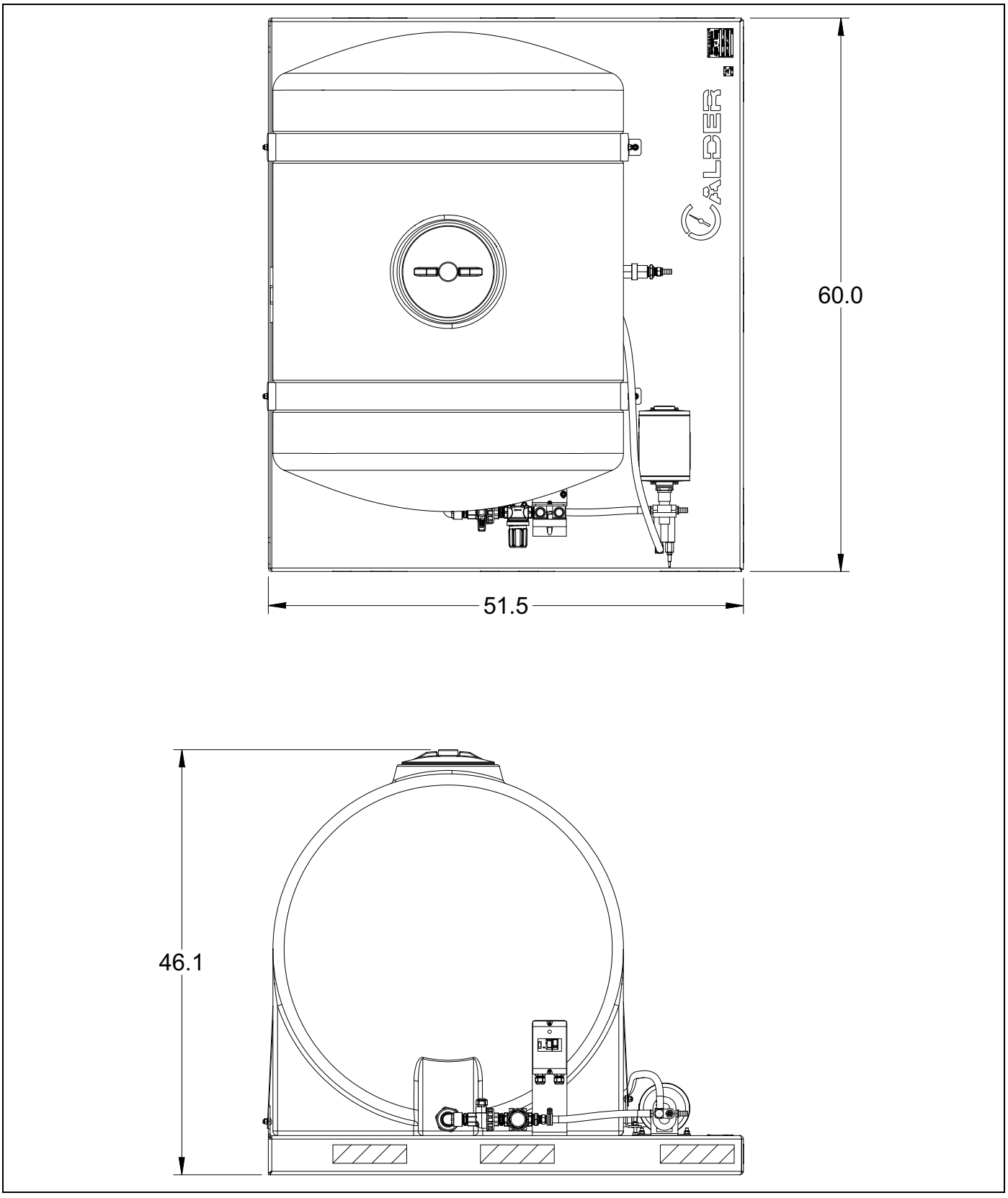

FIGURE 2-6. 225-GALLON (852-LITER) RECIRCULATION TANK DIMENSIONS

2.4 SPECIFICATIONS

The relief valve is set at 70 psi (4.8 bar).

TABLE 2-1. WEIGHTS

Recirculation tank size	Weight without water	Total machine weight
35 gallon (132 liter)	253 lbs (115 kg)	555 lbs (252 kg)
65 gallon (246 liter)	273 lbs (124 kg)	860 lbs (390 kg)
125 gallon (473 liter)	281 lbs (127 kg)	1,398 lbs (634 kg)
225-gallon (852-liter)	389 lbs (177 kg)	2,265 lbs (1,030 kg)

⚠ WARNING

Do not use the machine in any application that exceeds these operating specifications. Failure to follow these guidelines could result in personnel injury and property damage, and will void the warranty.

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3 SETUP

IN THIS CHAPTER:

This section describes the setup and assembly procedures for the recirculation tank and pump.

3.1 RECEIPT AND INSPECTION

Your CLIMAX product was inspected and tested prior to shipment, and packaged for normal shipment conditions. CLIMAX does not guarantee the condition of your machine upon delivery.

When you receive your CLIMAX product, perform the following receipt checks:

1. Inspect the shipping containers for damage.
2. Check the contents of the shipping containers against the included invoice to make sure that all components have been shipped.
3. Inspect all components for damage.

Contact CLIMAX immediately to report damaged or missing components.

NOTICE

Keep the shipping container and all packing materials for future storage and shipping of the machine.

3.2 LIFTING AND RIGGING

WARNING

The recirculation tank and pump can weigh between 600–1,400 lbs (272–635 kg) when filled with water. To prevent serious injury to yourself and others, always follow the operating procedures outlined in this manual, your own company rules, and local regulations for heavy lifting. Serious injury or fatalities can result from improper lifting methods.

When moving the tank with test liquid inside, the center of gravity will change with the liquid's momentum, causing the tank to shift suddenly. It is highly recommended to remove the test fluid before moving the tank. Extreme care needs to be exercised when moving the tank with fluid in the tank.

Four lifting points (identified by the label seen in Figure 3-1) are built into the skid that are intended for straps or hooks to be attached to lift and move the skid. It can also be moved with a pallet jack or a forklift.

Attach separate hoist shackles to each hoist ring.

FIGURE 3-1. LIFTING POINT LABEL

WARNING

Falling or uncontrolled swinging of machinery can cause serious injury or be fatal to the operator and bystanders. Only lift the machine by the hoist rings marked by Figure 3-1.

CAUTION

Make sure the rigging is correctly attached before lifting the machine. Lift the machine slowly, making sure that no components will be crushed or bent if the machine is lifted in the vertical orientation. If the rigging causes the tank assembly to swing or become unstable, lower it and adjust the rigging.

3.3 PREPARING THE TANKS FOR TESTING

Do the following to prepare the tanks for testing:

1. Connect the supply and return hoses to the ports on the Hydro Pro Console or valve testing device.
2. Connect the tank skid and fill the tank with testing fluid.

3. Open the fill valve on testing device and turn on the pump to prime the pump.

TIP:

It may be necessary to bleed the air out of the suction line by cracking the hose barb seal on the pump.

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4 OPERATION

Do the following checks before operating the machine:

1. Complete the risk assessment checklist in Table 1-3 on page 5.
2. Check that the work area is clear of non-essential personnel and equipment.
3. Check fluid level sufficient for filling test body.
4. Check condition of fluid meets the required cleanliness.
5. Check that the tank valve is open.

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5 MAINTENANCE

The pump is lubricated by the manufacturer before shipping.

Table 5-1 lists maintenance intervals and tasks

TABLE 5-1. MAINTENANCE INTERVALS AND TASKS

Interval	Task
Before each use	Check the power cord for any damage.
	Clean the filters.
	Check for water leaks.
Weekly	Check the plumbing.
Every 500 hours	Check the cam and bearing and the motor.
Every 1,000 hours	Check the pump seals, valves, and body.
As needed	Clean the tank suction screen.

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6 STORAGE AND SHIPPING

IN THIS CHAPTER:

6.1 Storage

Proper storage of the recirculation tank and pump will extend its usefulness and prevent undue damage.

Before storing, do the following:

1. Clean and dry the machine.
2. Drain all liquids.

CAUTION

If the skid is exposed to an environment allowing freezing, failure of the pump, fitting, and tank will occur. In the event that the skid is exposed to temperatures lower than the test media's freezing point, the entire system should be drained of test fluid and the pump filled with the appropriate mixture of antifreeze to protect it from freezing and corrosion.

6.1.1 Short-term storage

Do the following for short-term storage (three months or less):

1. Remove hoses.
2. Cap the ports.

6.1.2 Long-term storage

Do the following for long-term storage (longer than three months):

1. After draining the pump, fill it with the appropriate mixture of antifreeze to protect the pump from freezing and corrosion.
2. Store in an enclosed container.
3. Add a desiccant pouch to the container. Replace according to manufacturer instructions.
4. Store the container in an environment out of direct sunlight with temperature < 70ºF (21ºC) and humidity < 50%.

6.2 SHIPPING

The Recirculation Tank can be shipped in its original shipping container.

6.3 DECOMMISSIONING

To decommission the recirculation tank and pump before disposal, remove all fluids from the pump. Dispose of all fluids in a manner that complies with local and national regulations. Never dump the fluids onto the ground.

Refer to Appendix A for component assembly information.

APPENDIX A ASSEMBLY DRAWINGS

Drawing list

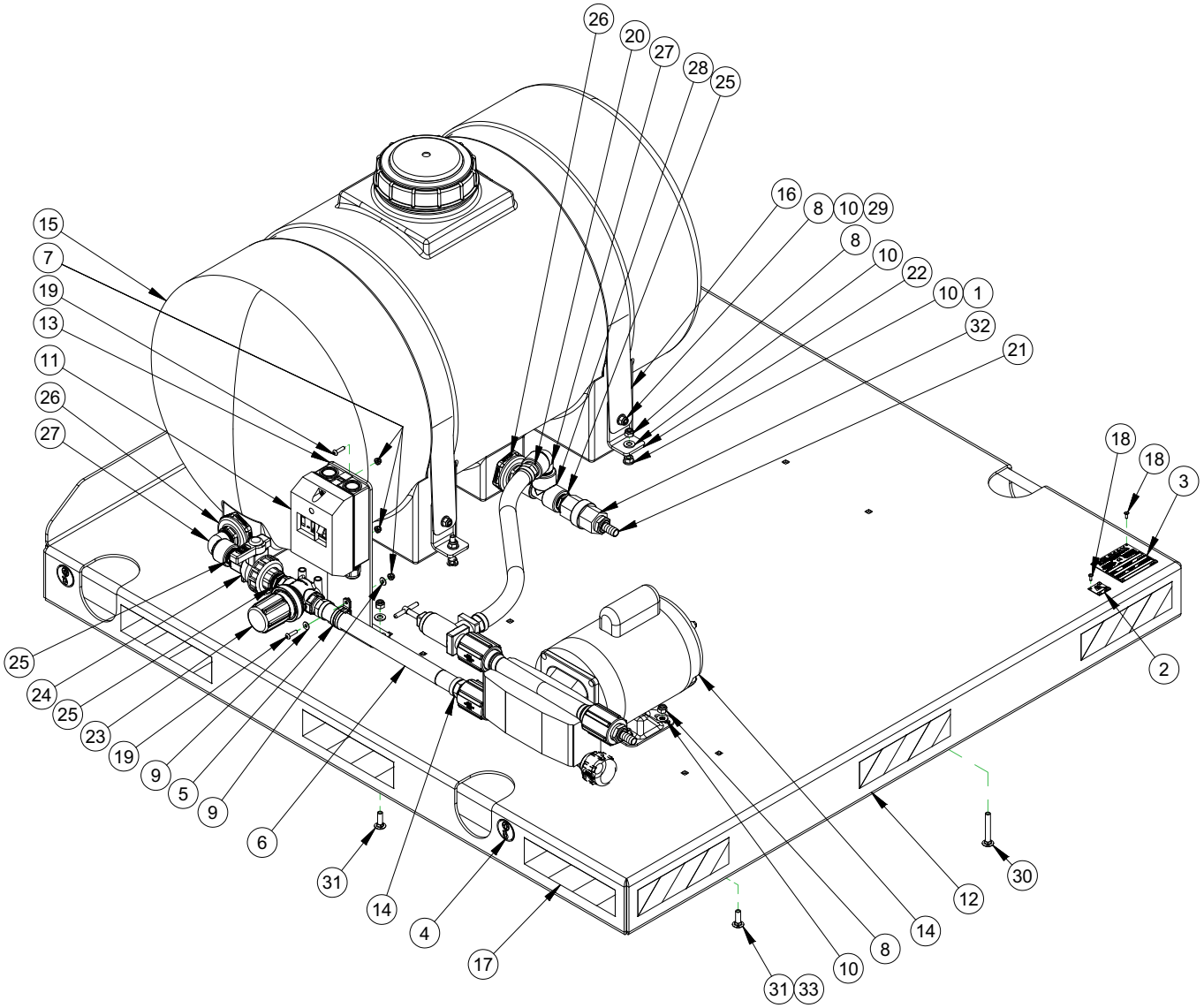


FIGURE A-1. 35-GALLON (132-LITER) RECIRCULATION TANK ASSEMBLY (P/N 90544)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	13904	NUT 5/16-18 STDN STAINLESS STEEL
2	1	29152	PLATE MASS CE
3	1	47981	NAMEPLATE ELECTRICAL CONTROL PANELS CE
4	4	59039	LABEL WARNING LIFT POINT ROUND 1.5"
5	1	78100	P-CLAMP 1" OD ALUM
6	30 in	81894	HOSE LOW PRESSURE PUSH-LOK 3/4 ID
7	3	82628	NUT LOCK #10-24 SS
8	12	82634	NUT NYLOCK 5/16 SS
9	2	82685	WASHER #10 FLTW SS
10	13	82687	WASHER 5/16 FLTW SS
11	1	90508	MOTOR STARTER INLINE MANUAL 120V, 14AMP CALDER RECIRC
12	1	90542	CALDER RECIRCULATION TANK SKID
13	1	90543	CONTROL PANEL MOUNT
14	1	90547	RECIRCULATION PUMP ASSY
15	1	90548	TANK HORIZONTAL 35 GALLON
16	1	90554	TANK STRAPS HORIZONTAL 35 GALLON
17	9	90564	STICKER EDGE MARKING
18	8	90566	RIVET SS BLIND 1/8 DIA .197-.255 GRIP
19	3	90567	SCREW 10-24 X 3/4 BHCS SS
20	2	90568	FTG PUSH-ON HOSE BARB BRASS 3/4 HOSE X 3/4 MALE NPT
21	1	90569	FTG PUSH-ON HOSE BARB BRASS 1/2 HOSE X 3/4 MALE NPT
22	2	90574	TANK STRAP ANCHOR
23	1	90575	STRAINER T POLY 3/4 NPT 80 MESH CLEAR BOWL
24	1	90576	FTG POLY VALVE 3/4 NPT
25	4	90577	FTG POLY SHORT NIPPLE 3/4
26	2	90579	FTG POLY TANK FLANGE 3/4 NPT
27	2	90580	FTG POLY STREET ELBOW 90 DEG 3/4 NPT
28	1	90581	FTG POLY TEE 3/4 NPT
29	4	90582	SCREW 5/16-18 X 3/4 SQ NECK CARRIAGE SS
30	2	90583	SCREW 5/16-18 X 2-1/4 SQ NECK CARRIAGE SS
31	6	90653	SCREW 5/16-18 X 1 SQ NECK CARRIAGE SS
32	1	90654	VALVE CHECK 3/4 FNPT POLY
33	6	90655	RETAINER BOLT 5/16

FIGURE A-2. 35-GALLON (132-LITER) RECIRCULATION TANK ASSEMBLY PARTS LIST (P/N 90544)

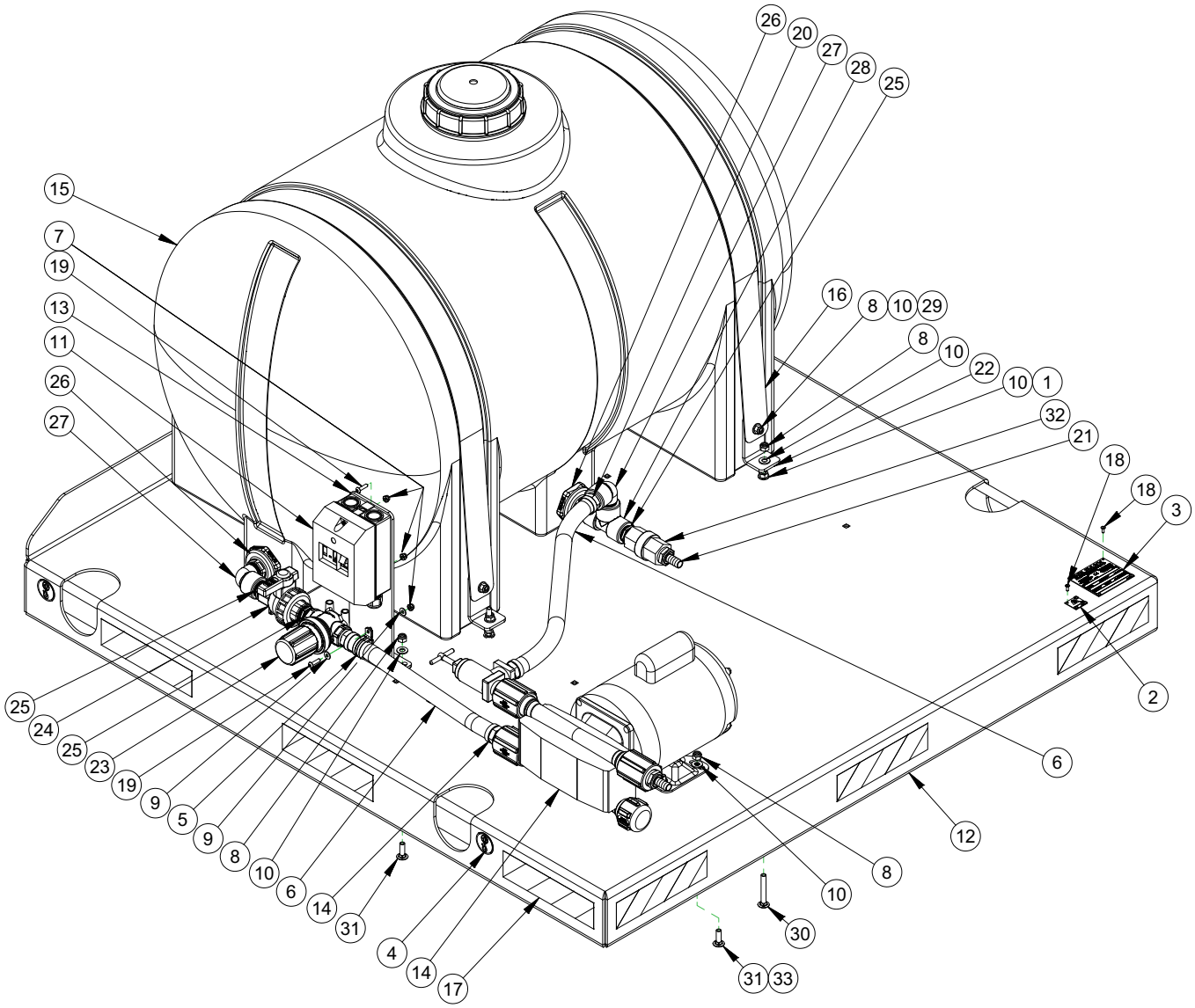


FIGURE A-3. 65-GALLON (246-LITER) RECIRCULATION TANK ASSEMBLY (P/N 90545)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	13904	NUT 5/16-18 STDN STAINLESS STEEL
2	1	29152	PLATE MASS CE
3	1	47981	NAMEPLATE ELECTRICAL CONTROL PANELS CE
4	4	59039	LABEL WARNING LIFT POINT ROUND 1.5"
5	1	78100	P-CLAMP 1" OD ALUM
6	35 in	81894	HOSE LOW PRESSURE PUSH-LOK 3/4 ID
7	3	82628	NUT LOCK #10-24 SS
8	12	82634	NUT NYLOCK 5/16 SS
9	2	82685	WASHER #10 FLTW SS
10	13	82687	WASHER 5/16 FLTW SS
11	1	90508	MOTOR STARTER INLINE MANUAL 120V, 14AMP CALDER RECIRC
12	1	90542	CALDER RECIRCULATION TANK SKID
13	1	90543	CONTROL PANEL MOUNT
14	1	90547	RECIRCULATION PUMP ASSY
15	1	90549	TANK HORIZONTAL 65 GALLON
16	1	90555	TANK STRAPS HORIZONTAL 65 GALLON
17	9	90564	STICKER EDGE MARKING
18	8	90566	RIVET SS BLIND 1/8 DIA .197-.255 GRIP
19	3	90567	SCREW 10-24 X 3/4 BHCS SS
20	2	90568	FTG PUSH-ON HOSE BARB BRASS 3/4 HOSE X 3/4 MALE NPT
21	1	90569	FTG PUSH-ON HOSE BARB BRASS 1/2 HOSE X 3/4 MALE NPT
22	2	90574	TANK STRAP ANCHOR
23	1	90575	STRAINER T POLY 3/4 NPT 80 MESH CLEAR BOWL
24	1	90576	FTG POLY VALVE 3/4 NPT
25	4	90577	FTG POLY SHORT NIPPLE 3/4
26	2	90579	FTG POLY TANK FLANGE 3/4 NPT
27	2	90580	FTG POLY STREET ELBOW 90 DEG 3/4 NPT
28	1	90581	FTG POLY TEE 3/4 NPT
29	4	90582	SCREW 5/16-18 X 3/4 SQ NECK CARRIAGE SS
30	2	90583	SCREW 5/16-18 X 2-1/4 SQ NECK CARRIAGE SS
31	6	90653	SCREW 5/16-18 X 1 SQ NECK CARRIAGE SS
32	1	90654	VALVE CHECK 3/4 FNPT POLY
33	6	90655	RETAINER BOLT 5/16

FIGURE A-4. 65-GALLON (246-LITER) RECIRCULATION TANK ASSEMBLY PARTS LIST (P/N 90545)

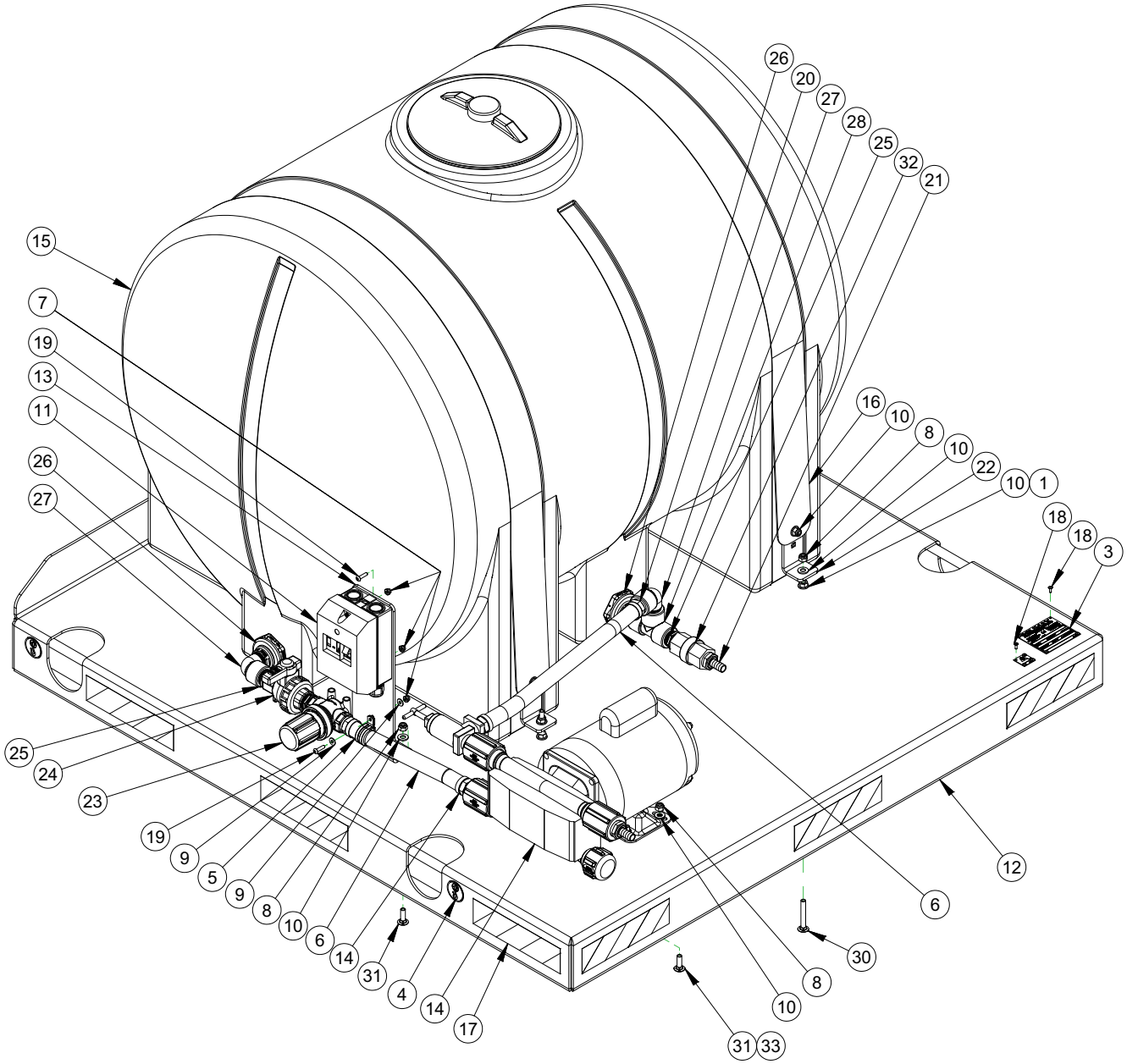


FIGURE A-5. 125-GALLON (473-LITER) RECIRCULATION TANK ASSEMBLY (P/N 90546)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	13904	NUT 5/16-18 STDN STAINLESS STEEL
2	1	29152	PLATE MASS CE
3	1	47981	NAMEPLATE ELECTRICAL CONTROL PANELS CE
4	4	59039	LABEL WARNING LIFT POINT ROUND 1.5"
5	1	78100	P-CLAMP 1" OD ALUM
6	28 in	81894	HOSE LOW PRESSURE PUSH-LOK 3/4 ID
7	3	82628	NUT LOCK #10-24 SS
8	12	82634	NUT NYLOCK 5/16 SS
9	2	82685	WASHER #10 FLTW SS
10	14	82687	WASHER 5/16 FLTW SS
11	1	90508	MOTOR STARTER INLINE MANUAL 120V, 14AMP CALDER RECIRC
12	1	90542	CALDER RECIRCULATION TANK SKID
13	1	90543	CONTROL PANEL MOUNT
14	1	90547	RECIRCULATION PUMP ASSY
15	1	90550	TANK HORIZONTAL 125 GALLON
16	1	90556	TANK STRAPS HORIZONTAL 125 GALLON
17	9	90564	STICKER EDGE MARKING
18	8	90566	RIVET SS BLIND 1/8 DIA .197-.255 GRIP
19	3	90567	SCREW 10-24 X 3/4 BHCS SS
20	2	90568	FTG PUSH-ON HOSE BARB BRASS 3/4 HOSE X 3/4 MALE NPT
21	1	90569	FTG PUSH-ON HOSE BARB BRASS 1/2 HOSE X 3/4 MALE NPT
22	2	90574	TANK STRAP ANCHOR
23	1	90575	STRAINER T POLY 3/4 NPT 80 MESH CLEAR BOWL
24	1	90576	FTG POLY VALVE 3/4 NPT
25	4	90577	FTG POLY SHORT NIPPLE 3/4
26	2	90579	FTG POLY TANK FLANGE 3/4 NPT
27	2	90580	FTG POLY STREET ELBOW 90 DEG 3/4 NPT
28	1	90581	FTG POLY TEE 3/4 NPT
29	4	90582	SCREW 5/16-18 X 3/4 SQ NECK CARRIAGE SS
30	2	90583	SCREW 5/16-18 X 2-1/4 SQ NECK CARRIAGE SS
31	6	90653	SCREW 5/16-18 X 1 SQ NECK CARRIAGE SS
32	1	90654	VALVE CHECK 3/4 FNPT POLY
33	6	90655	RETAINER BOLT 5/16

FIGURE A-6. 125-GALLON (473-LITER) RECIRCULATION TANK ASSEMBLY PARTS LIST (P/N 90546)

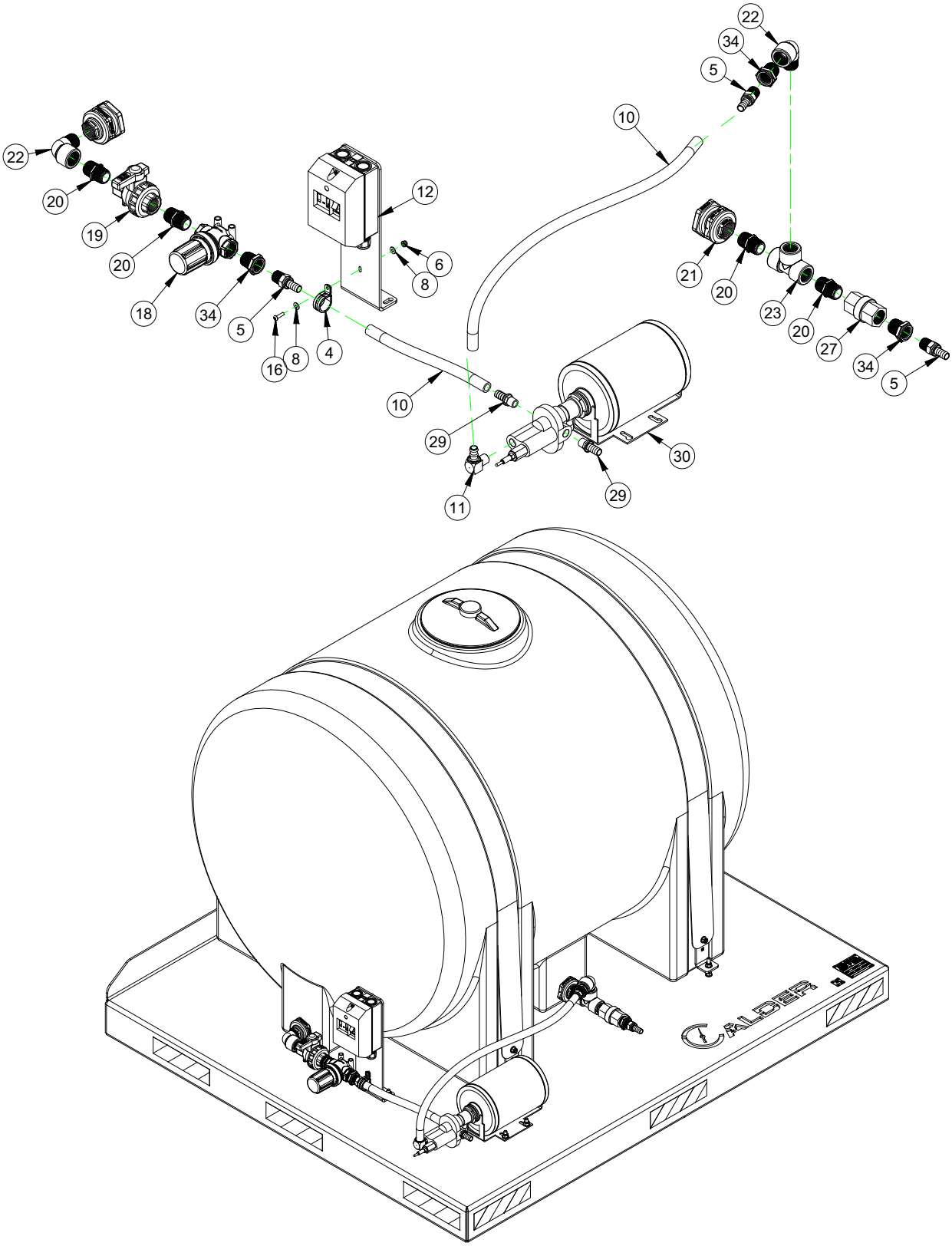


FIGURE A-7. 225-GALLON (852-LITER) RECIRCULATION TANK ASSEMBLY (P/N 91823)

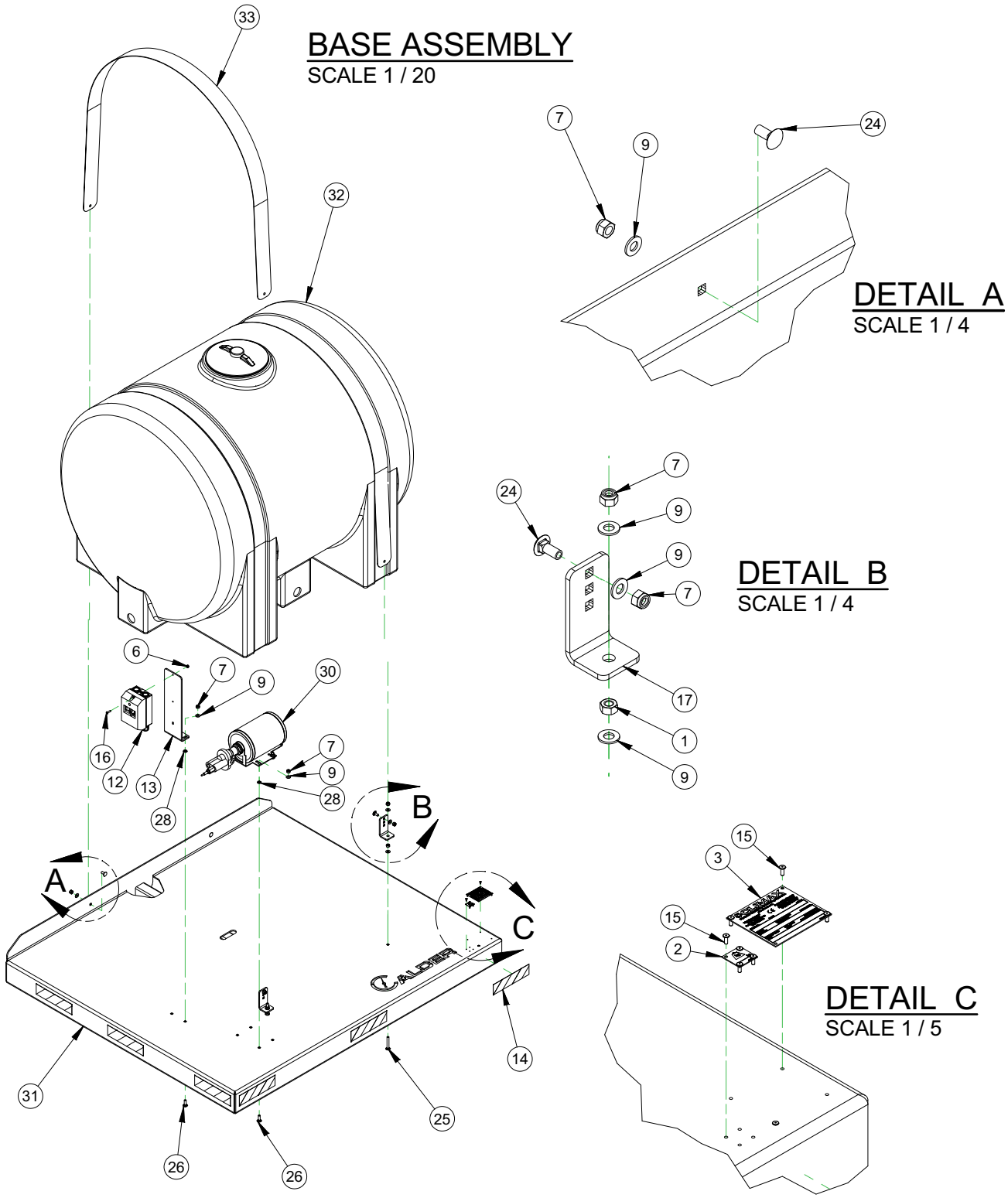
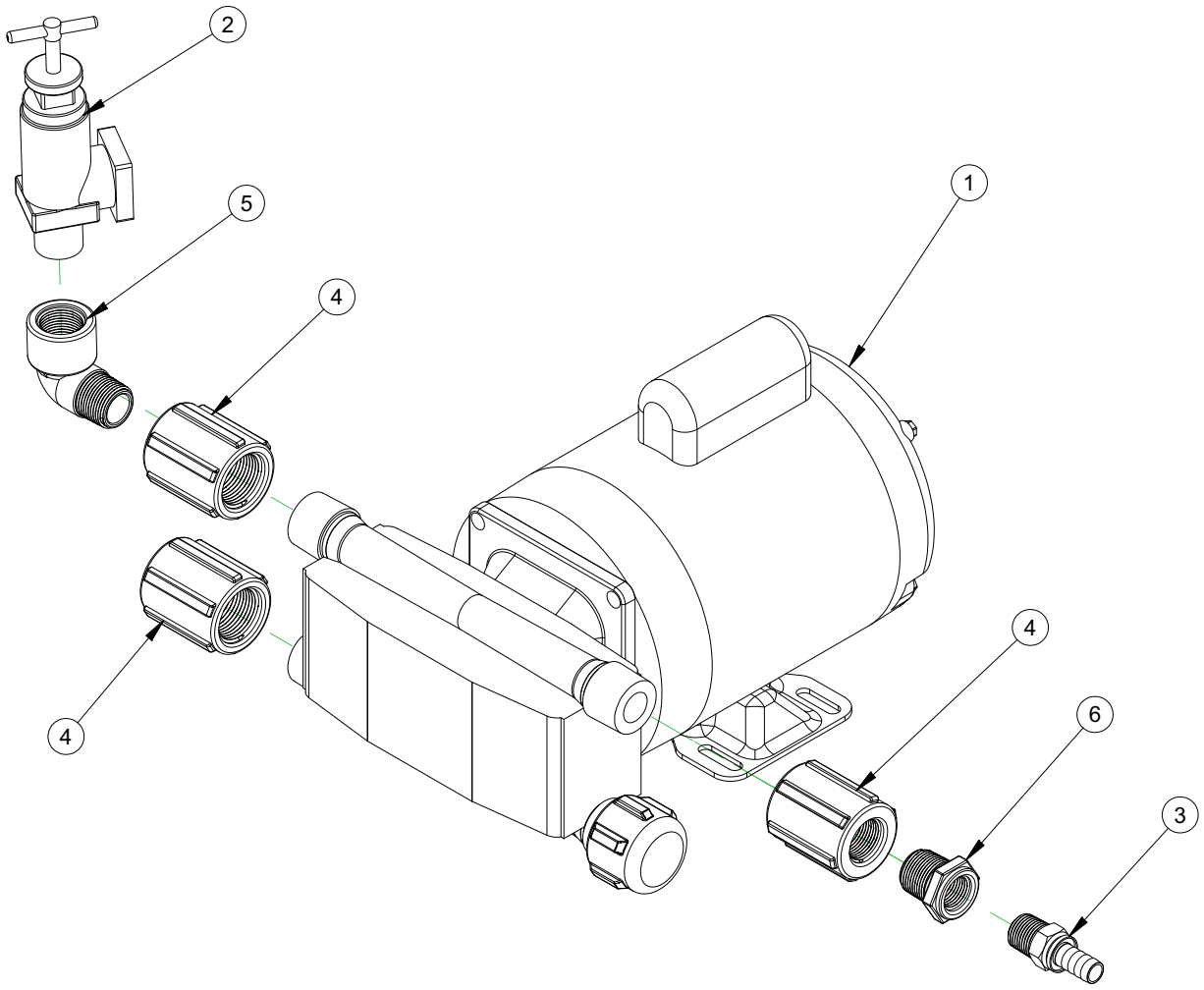


FIGURE A-8. 225-GALLON (852-LITER) RECIRCULATION TANK ASSEMBLY DETAIL (P/N 91823)

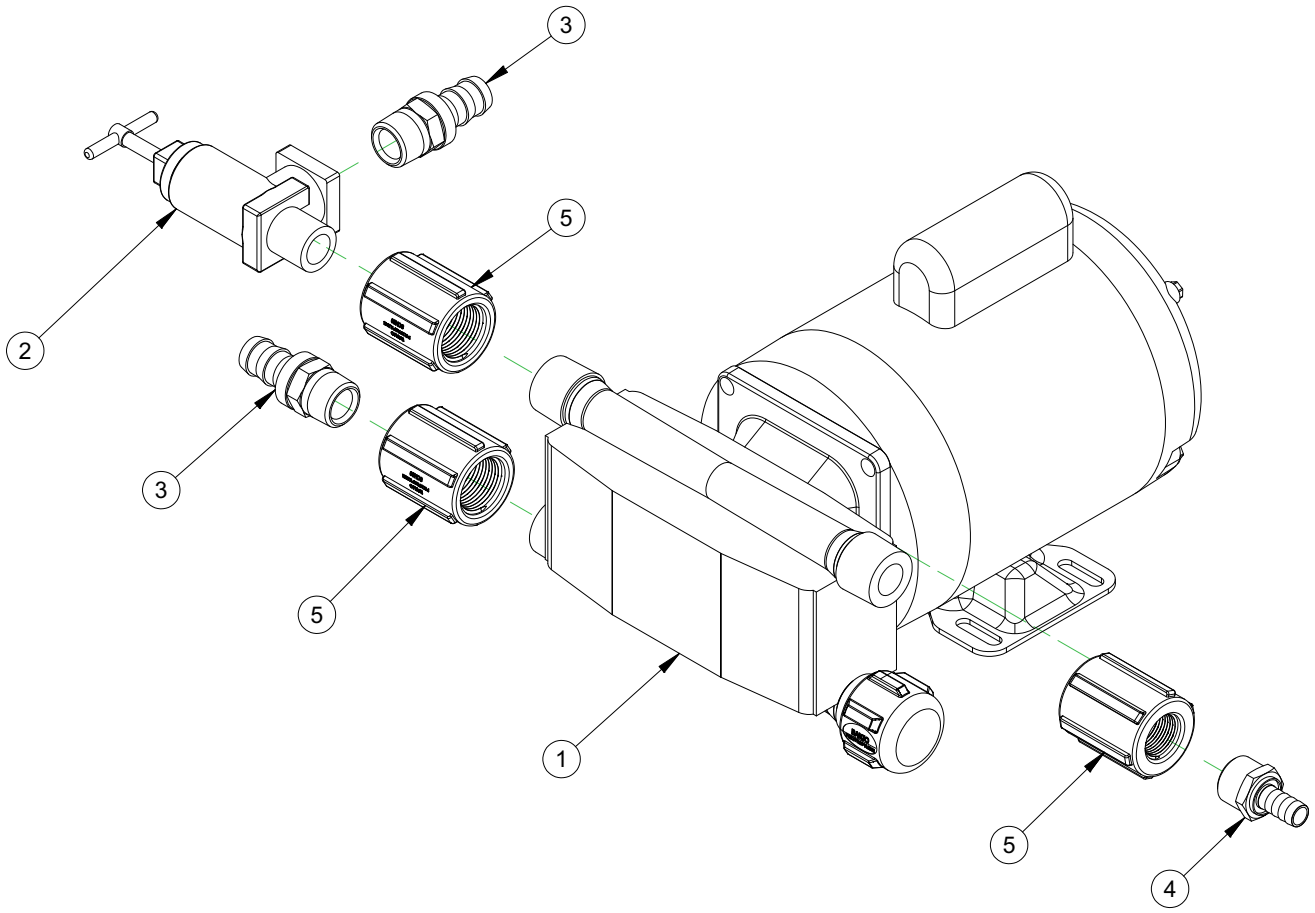
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	13904	NUT 5/16-18 STDN STAINLESS STEEL
2	1	29152	PLATE MASS CE
3	1	47981	NAMEPLATE ELECTRICAL CONTROL PANELS CE
4	1	78100	P-CLAMP 1" OD ALUM
5	3	81917	FTG PUSH-ON BARB 1/2 NPTM X 1/2 HOSE SWIVEL BRASS
6	3	82628	NUT LOCK #10-24 SS
7	12	82634	NUT NYLOCK 5/16 SS
8	2	82685	WASHER #10 FLTW SS
9	14	82687	WASHER 5/16 FLTW SS
10	42	82847	HOSE LOW PRESSURE PUSH LOK 1/2 ID
11	1	88039	FTG ELBOW 90° 3/8 NPTM X 1/2 BARB BRASS
12	1	91256	MOTOR STARTER INLINE MANUAL
13	1	90543	CONTROL PANEL MOUNT
14	72 IN	90564	STICKER EDGE MARKING
15	8	90566	RIVET SS BLIND 1/8 DIA .197-.255 GRIP
16	3	90567	SCREW 10-24 X 3/4 BHCS SS
17	2	90574	TANK STRAP ANCHOR
18	1	90575	STRAINER T POLY 3/4 NPT 80 MESH CLEAR BOWL
19	1	90576	FTG POLY VALVE 3/4 NPT
20	4	90577	FTG POLY SHORT NIPPLE 3/4
21	2	90579	FTG POLY TANK FLANGE 3/4 NPT
22	2	90580	FTG POLY STREET ELBOW 90 DEG 3/4 NPT
23	1	90581	FTG POLY TEE 3/4 NPT
24	4	90582	SCREW 5/16-18 X 3/4 SQ NECK CARRIAGE SS
25	2	90583	SCREW 5/16-18 X 2-1/4 SQ NECK CARRIAGE SS
26	6	90653	SCREW 5/16-18 X 1 SQ NECK CARRIAGE SS
27	1	90654	VALVE CHECK 3/4 FNPT POLY
28	6	90655	RETAINER BOLT 5/16
29	2	91045	FTG PUSH-ON HOSE BARB BRASS 1/2 HOSE X 3/8 MALE NPT
30	1	91257	PUMP GEAR BRONZE 4.4 GPM 1/2HP
31	1	91817	CALDER RECIRCULATION TANK SKID 225 GALLON
32	1	92038	TANK HORIZONTAL 225 GALLON MODIFIED
33	1	92050	TANK STRAPS HORIZONTAL 225 GALLON
34	3	94749	FTG POLY REDUCER BUSHING 3/4 NPTM X 1/2 NPTF

FIGURE A-9. 225-GALLON (852-LITER) RECIRCULATION TANK ASSEMBLY PARTS LIST (P/N 91823)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	90557	PUMP TWIN PLUNGER HYPRO 3.9GPM OPEN
2	1	90558	RELIEF SPRAY PUMP 3/4" NPT
3	1	81917	FTG PUSH-ON BARB 1/2 NPTM X 1/2 HOSE SWIVEL BRASS
4	3	90571	FTG POLY REDUCER COUPLER 1 X 3/4 NPT
5	1	90580	FTG POLY STREET ELBOW 90 DEG 3/4 NPT
6	1	94749	FTG POLY REDUCER BUSHING 3/4 NPTM X 1/2 NPTF

FIGURE A-10. 225-GALLON (852-LITER) RECIRCULATION PUMP ASSEMBLY (P/N 92037)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	90557	PUMP TWIN PLUNGER HYPRO 3.9GPM OPEN
2	1	90558	RELIEF SPRAY PUMP 3/4" NPT
3	2	90568	FTG PUSH-ON HOSE BARB BRASS 3/4 HOSE X 3/4 MALE NPT
4	1	90569	FTG PUSH-ON HOSE BARB BRASS 1/2 HOSE X 3/4 MALE NPT
5	3	90571	FTG POLY REDUCER COUPLER 1 X 3/4 NPT

FIGURE A-11. RECIRCULATION PUMP ASSEMBLY (P/N 90547)

APPENDIX B SCHEMATICS

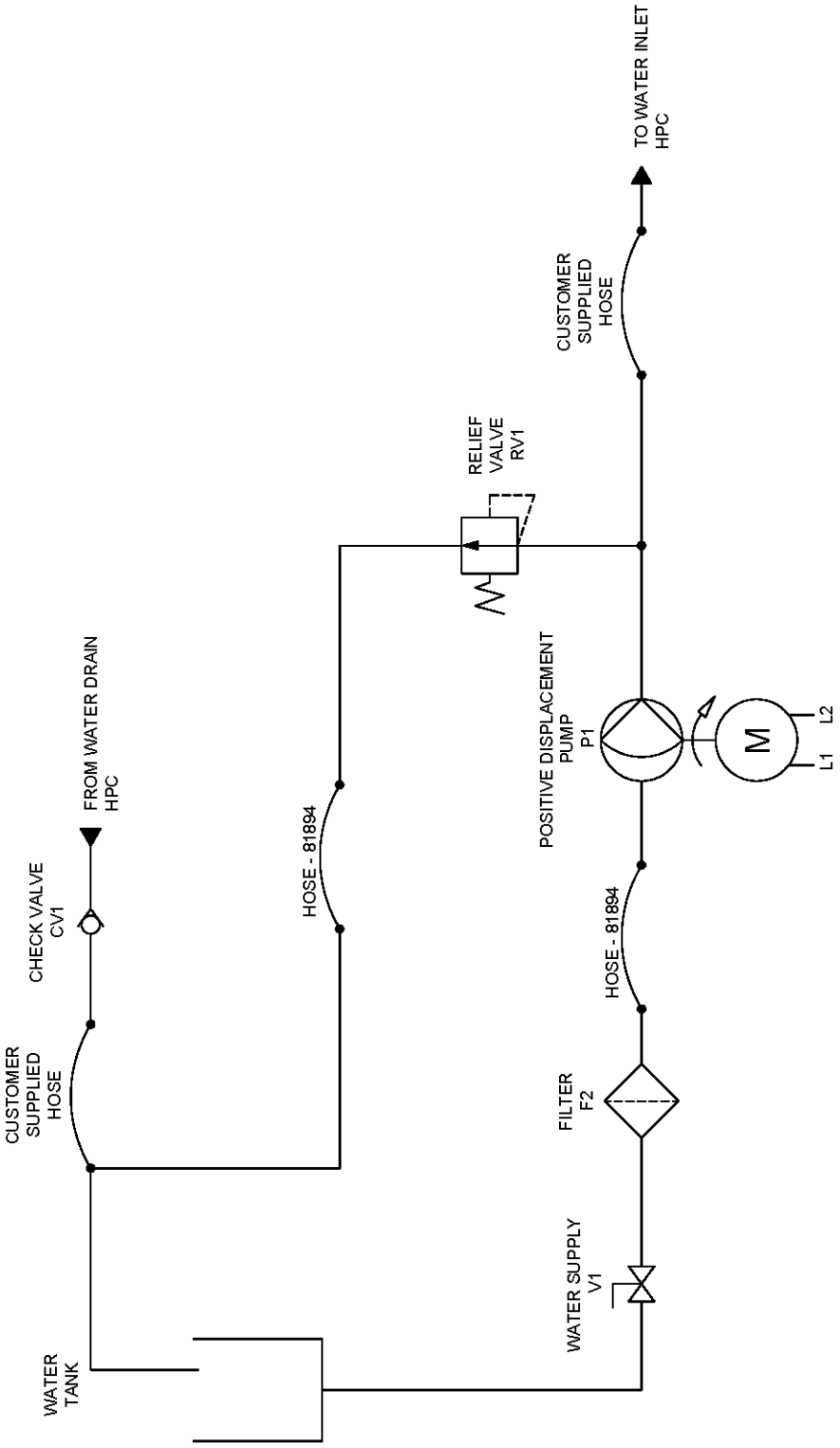


FIGURE B-1. SCHEMATIC (P/N 89791)

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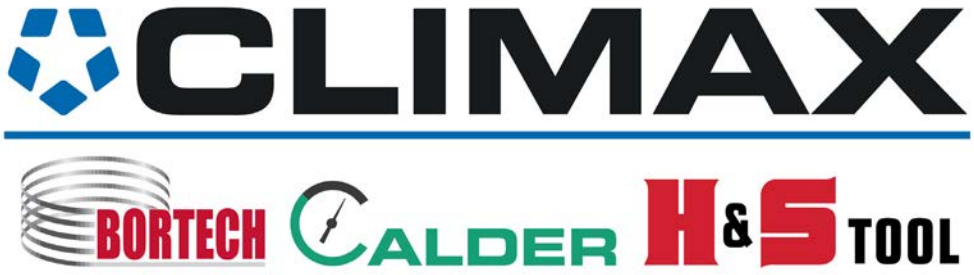
CLIMAX
BORTECH
CALDER
H&S TOOL