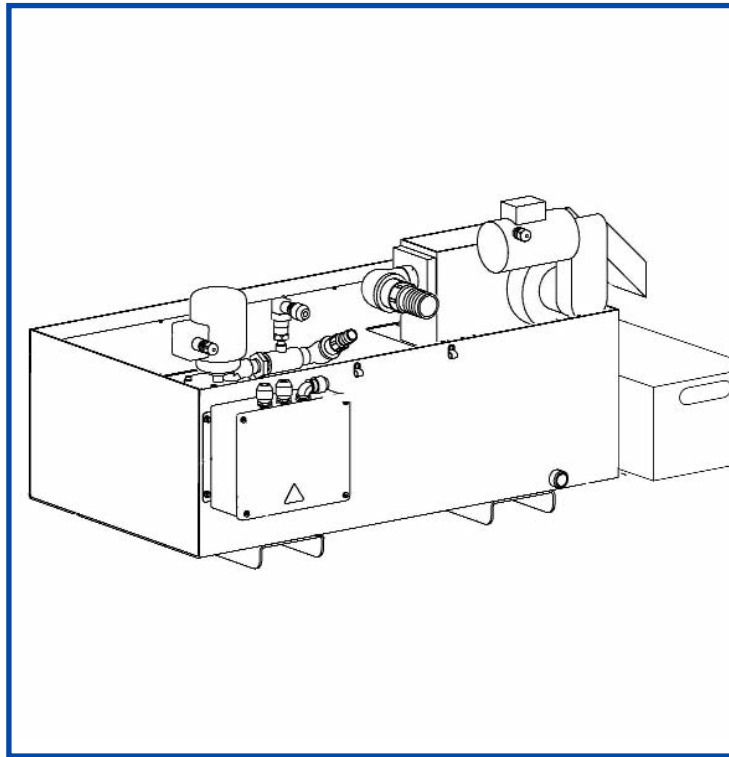




# Installation, Setup and Operation

# INSTRUCTIONS

(Includes Repair Parts List)



for

**SUNNEN® VSS™ SETTLEMENT TANK**  
(FOR USE WITH SUNNEN® VERTICAL SINGLE STROKE HONING® MACHINES)



**Model: VSS™-7000 Series**

READ THE FOLLOWING INSTRUCTIONS THOROUGHLY AND CAREFULLY BEFORE UNPACKING,  
INSPECTING, OR INSTALLING THE SUNNEN® VSS™ SETTLEMENT TANK.

\*SUNNEN®, VSS™ AND SINGLE STROKE HONING® ARE REGISTERED TRADEMARKS OF SUNNEN PRODUCTS COMPANY.\*

## GENERAL INFORMATION

The Sunnen® equipment has been designed and engineered for a wide variety of parts within the capacity and limitation of the equipment. With proper care and maintenance this equipment will give years of service.

**READ THE FOLLOWING INSTRUCTIONS CAREFULLY AND THOROUGHLY BEFORE UNPACKING, INSPECTING, OR INSTALLING THIS EQUIPMENT.**

**IMPORTANT:** Read any supplemental instructions BEFORE installing this equipment. These supplemental instructions give you important information to assist you with the planning and installation of your Sunnen equipment.

Sunnen Technical Service Department is available to provide telephone assistance for installation, programming, & troubleshooting of your Sunnen equipment. All support is available during normal business hours, 8:00 AM to 4:30 PM Central Time.

Review all literature provided with your Sunnen equipment. This literature provides valuable information for proper installation, operation, and maintenance of your equipment. Troubleshooting information can also be found within the Instructions. If you cannot find what you need, call for technical support.

Where applicable, programming information for your Sunnen equipment is also included. Most answers can be found in the literature packaged with your equipment.

**Help us help you. When ordering parts, requesting information, or technical assistance about your equipment, please have the following information available:**

- Have ALL MANUALS on hand. The Customer Services Representative or Technician will refer to it.
- Have Model Number and Serial Number printed on your equipment Specification Nameplate.
- Where Applicable: Have Drive model and all nameplate data. Motor type, brand, and all nameplate data.

**For Troubleshooting, additional information may be required:**

- Power distribution information (type - delta, wye, power factor correction; other major switching devices used, voltage fluctuations)
- Installation Wiring (separation of power & control wire; wire type/class used, distance between drive and motor, grounding).
- Use of any optional devices/equipment between the Drive & motor (output chokes, etc.).

**For fast service on your orders call:**

Sunnen Automotive Customer Service toll free at: 1-800-772-2878

Sunnen Industrial Customer Service toll free at: 1-800-325-3670

Customers outside the USA, contact your local authorized Sunnen Distributor.

Additional information available at: <http://www.sunnen.com> or e-mail: [sunnen@sunnen.com](mailto:sunnen@sunnen.com)

**NOTE:** Sunnen reserves the right to change or revise specifications and product design in connection with any feature of our products contained herein. Such changes do not entitle the buyer to corresponding changes, improvements, additions, or replacements for equipment, supplies or accessories previously sold. Information contained herein is considered to be accurate based on available information at the time of printing. Should any discrepancy of information arise, Sunnen recommends that user verify the discrepancy with Sunnen before proceeding.

---

## ESD PREVENTION REVIEW

Let's review the basics of a sound static control system and its effective implementation. First, in the three step plan:

1. Always ground yourself when handling sensitive components or assemblies.
2. Always use a conductive or shielded container during storage or transportation. These materials create a Faraday cage which will isolate the contents from static charges.
3. Open ESD safe containers only at a static safe work station.

At the static safe work station, follow these procedures before beginning any work:

- A. Put on your wrist strap or foot grounding devices.
- B. Check all grounding cords to make sure they are properly connected to ground, ensuring the effective dissipation of static charges.
- C. Make sure that your work surface is clean and clear of unnecessary materials, particularly common plastics.
- D. Anti-static bubble wrap has been included for use at the machine when an ESD safe workstation is not available.

You are now properly grounded and ready to begin work. Following these few simple rules and using a little common sense will go a long way toward helping you and your company in the battle against the hazards of static electricity. When you are working with ESD sensitive devices, make sure you:

**GROUND**  
**ISOLATE**  
**NEUTRALIZE**

## SUNNEN® LIMITED PRODUCT WARRANTY

Sunnen® Products Company and its subsidiaries (SPC) warrant that all new SPC honing machines, gaging equipment, tooling, and related equipment will be free of defects in material and/or workmanship for a period of one year from the date of original shipment from SPC.

Upon prompt notification of a defect during the one-year period, SPC will repair, replace, or refund the purchase price, with respect to parts that prove to be defective (as defined above). Any equipment or tooling which is found to be defective from improper use will be returned at the customer's cost or repaired (if possible) at customer's request. Customer shall be charged current rates for all such repair.

Prior to returning any SPC product, an authorization (RMA#) and shipping instructions must be obtained from the Customer Service Department or items sent to SPC will be returned to the customer.

**Warranty Limitations and Exclusions** This Warranty does not apply to the following:

- Normal maintenance items subject to wear and tear: (belts, fuses, filters, etc).
- Damages resulting from but not limited to:
  - › Shipment to the customer (for items delivered to customer or customer's agent F.O.B., Shipping Point)
  - › Incorrect installation including improper lifting, dropping and/or placement
  - › Incorrect electric power (beyond +/- 10% of rated voltage) including intermittent or random voltage spikes or drops
  - › Incorrect air supply volume and/or pressure and/or contaminated air supply
  - › Electromagnetic or radio frequency interference from surrounding equipment (EMI, RFI)
  - › Storm, lightning, flood or fire damage
  - › Failure to perform regular maintenance as outlined in SPC manuals
  - › Improper machine setup or operation causing a crash to occur
  - › Misapplication of the equipment
  - › Use of non-SPC machines, tooling, abrasive, fixturing, coolant, repair parts, or filtration
  - › Incorrect software installation and/or misuse
  - › Non-authorized customer installed electronics and/or software
  - › Customer modifications to SPC software

**THE LIMITED WARRANTY DESCRIBED HEREIN IS EXPRESSLY IN LIEU OF ALL ANY OTHER WARRANTIES. SPC MAKES NO REPRESENTATION OR WARRANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER MATTER. SPC IS NOT RESPONSIBLE FOR THE IMPROPER USE OF ANY OF ITS PRODUCTS. SPC SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO: LOSS OF USE, REVENUE, OR PROFIT. SPC ASSUMES NO LIABILITY FOR PURCHASED ITEMS PRODUCED BY OTHER MANUFACTURERS WHO EXTEND SEPARATE WARRANTIES, REGARDLESS OF ANY RIGHTS AFFORDED BY LAW TO BUYER, SPC'S LIABILITY, IF ANY, FOR ANY AND ALL CLAIMS FOR LOSS OR DAMAGES WITH RESPECT TO THE PRODUCTS, AND BUYER'S SOLE AND EXCLUSIVE REMEDY THEREFORE, SHALL IN ALL EVENTS BE LIMITED IN AMOUNT TO THE PURCHASE PRICE OF THAT PORTION OF THE PRODUCTS WITH RESPECT TO WHICH A VALID CLAIM IS MADE.**

### Shipping Damages

Except in the case of F.O.B., Buyer's destination shipments, SPC will not be liable for any settlement claims for obvious and/or concealed shipping damages. The customer bears the responsibility to unpack all shipments immediately and inspect for damage. When obvious and/or concealed damage is found, the customer must immediately notify the carrier's agent to make an inspection and file a claim. The customer should retain the shipping container and packing material.

---

## SUNNEN® SOFTWARE LICENSE AGREEMENT

This document is a Legal Agreement between you, as user and licensee (Licensee), and Sunnen® Products Company (SPC) with respect to preprogrammed software (Software) provided by SPC for use on SPC Equipment. By using the Software, you, as Licensee, agree to become bound by the terms of this Agreement.

In consideration of payment of the license fee (License Fee) which is part of the price evidenced by your receipt (Receipt), SPC grants to you as Licensee a non-exclusive right, without right to sub-license, to use the particular copy of the SPC Software licensed hereunder only on the particular equipment sold with the Software. SPC reserves all rights including rights not otherwise expressly granted, and retain title and ownership to the Software including all subsequent copies or updates in any media. The Software and all accompanying written materials are covered by copyrights owned by SPC. If supplied on removable media (floppy disk), you, as Licensee, may copy the Software only for back up purposes; or you may request that SPC copy the Software for you for the same purposes. All other copying of the Software or of the accompanying written materials is expressly forbidden and is in violation of the Agreement.

The Software and accompanying written materials (including the user's manual, if any) are provided in an "as is" condition without warranty of any kind including the implied warranties of merchantability and fitness for a particular purpose, even if SPC has been advised of this purpose. SPC specifically does not warrant that it will be liable as a result of the operation of the Software for any direct, indirect, consequential or accidental damages arising out of the use of or inability to use such product even if SPC has been advised of the possibility of such use. It is recognized that some states do not allow the exclusion or limitation of liability for consequential or accidental damages and to the extent this is true, the above limitations may not apply.

Any alteration or reverse engineering of the software is expressly forbidden and is in violation of this agreement.

SPC reserves the right to update the software covered by this agreement at any time without prior notice and any such updates are covered by this agreement.

# GENERAL INFORMATION & SPECIFICATIONS

## Sunnen® VSS™ Settlement Tank

The VSS-7000 series settlement tank is a stand-alone filtration unit used to supply coolant to a machine tool not equipped with a coolant system. The basic unit comes with a 40-gallon heavy gauge steel reservoir, centrifugal coolant pump, and pressure switch. The tank is baffled to allow particulate to settle out of incoming solution before being recirculated through the pump back to a machine tool. Flow regulation from the pump may be accomplished by cycling the pump on and off or by throttling partially or completely. Tanks come standard with a pressure switch that can be wired to the control voltage of a machine tool to safeguard against the machine tool operating without coolant. The settlement tank is also available with an optional magnetic separator for higher filtration of magnetic contaminates.

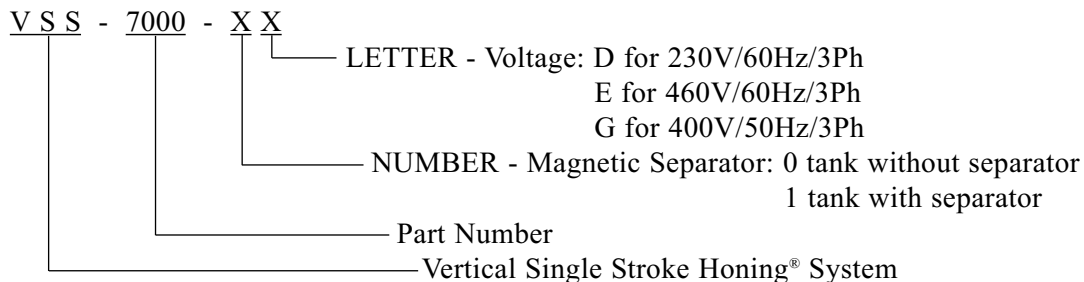
---

<b>Floor Space:</b>	1000 W x 645 D X 514mm H (39 x 25.5 x 20in)
<b>Pump Rating:</b>	80 LPM @ 4 Meter Head (20 GPM @ 15 Ft. Hd.)
<b>Pump Motor:</b>	230V/60Hz/3Ph; 1,26A/0,27kW (0.36hp) 460V/60Hz/3Ph; 0,63A/0,27kW (0.36hp) 400V/50Hz/3Ph; 0,72A/0,23kW (0.30hp)
<b>Magnetic Separator Motor:</b>	230V/60Hz/3Ph; 0,37A/0,21kW (0.28hp) 460V/60Hz/3Ph; 0,73A/0,21kW (0.28hp) 400V/50Hz/3Ph; 0,72A/0,18kW (0.24hp)
<b>Pressure Switch:</b>	5A; 12/24VDC; 125/250VAC
<b>Reservoir Capacity:</b>	188 Liters (50 Gallons)
<b>Supply Port:</b>	Hose Barb for 25mm (1in.) ID Hose
<b>Return Port:</b>	Hose Barb for 51mm (2in.) ID Hose
<b>Electrical Requirement:</b>	Be sure voltage of Settlement Tank matches supply voltage of your machine.
<b>Color:</b>	Pearl Gray / Pewter Gray / Burgundy Trim

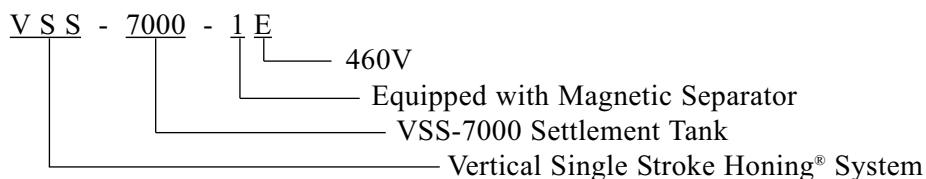
See manual packaged with your machine for directions on how to electrically connect the settlement tank to your machine tool.

---

## NUMBERING



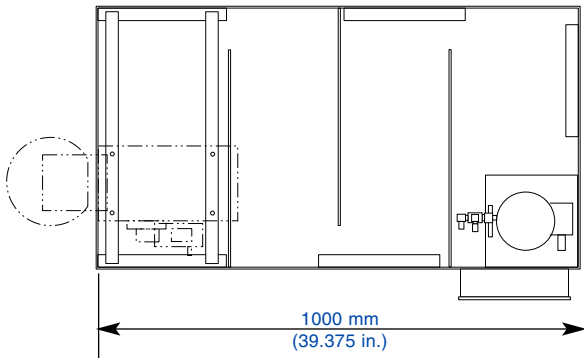
### EXAMPLE



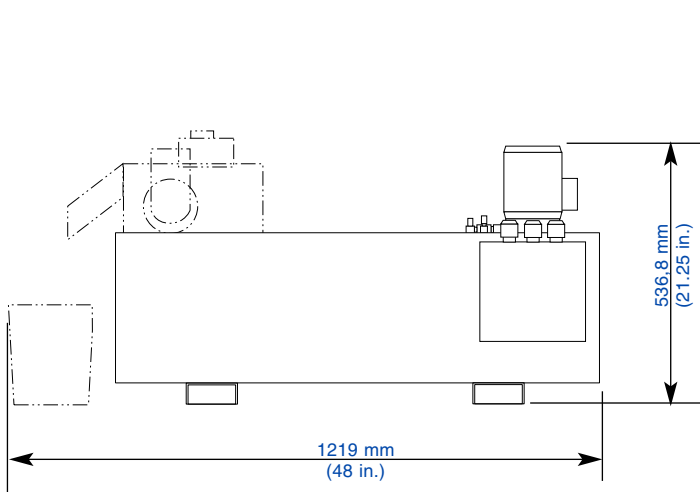
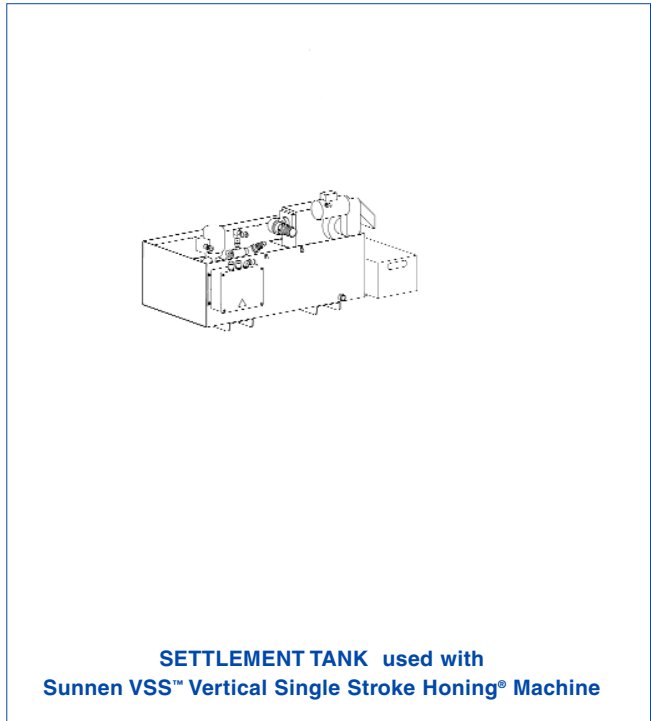
# TABLE OF CONTENTS

	Page
<b>GENERAL INFORMATION</b> .....	ii
<b>ESD PREVENTION REVIEW</b> .....	ii
<b>LIMITED PRODUCT WARRANTY</b> .....	iii
<b>SUNNEN SOFTWARE LICENSE AGREEMENT</b> .....	iii
<b>GENERAL INFORMATION &amp; SPECIFICATIONS</b> .....	iv
<b>NUMBERING</b> .....	iv
<b>TABLE OF CONTENTS</b> .....	v
<b>FLOOR PLAN LAYOUT (Typical)</b> .....	vi
<b>INSTALLATION</b>	
General .....	1
Tools & Materials .....	1
Installation .....	1
Electrical .....	2
Operational Check .....	2
<b>SETUP &amp; OPERATION</b>	
General .....	3
Major Components .....	3
Operator Controls .....	3
Safety Precautions .....	3
<b>ROUTINE MAINTENANCE</b>	
General .....	5
Coolant Line Check .....	5
Reservoir Cleaning .....	5
Settlement Tank .....	5
Magnetic Separator (Opt) .....	5
<b>REPAIR PARTS LIST</b>	
A Settlement Tank w/Magnetic Separator .....	6
B Settlement Tank .....	8

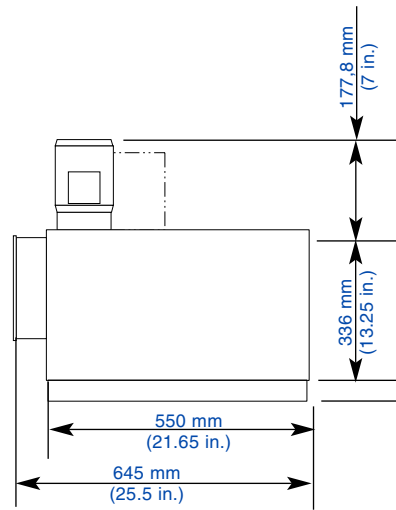
Like any machinery, this equipment may be dangerous if used improperly. Be sure to read and follow instructions for operation of equipment.



**TOP VIEW**



**SIDE VIEW**



**FRONT VIEW**

**FIGURE 1-A, Floor Plan Layout (System Configuration)**

# SECTION 1 INSTALLATION

## GENERAL

Consult this section when unpacking, inspecting, and installing Sunnen® VSS™-7000 Settlement Tank. Hereafter referred to as the Unit.

## TOOLS & MATERIALS

The following tools and materials are required for unpacking and installation of your Unit:

Knife	Hex Wrenches
Hammer	Open End Wrenches
Crow Bar	Cleaning Solvent
Tin Snips	Slip Joint Pliers
Forklift	Screwdriver (Std)

## INSTALLATION

Read the following instructions carefully and thoroughly before unpacking, inspecting and installing your Unit. All references to right and left in these instructions are, unless otherwise noted, as seen by operator as one looks at Unit or assembly being described (see Figure 1-1).

**NOTE:** When ordering parts for, or requesting information about your Unit, include Model and Serial Numbers printed on Nameplate.

1. Move Unit to staging/unpacking area.

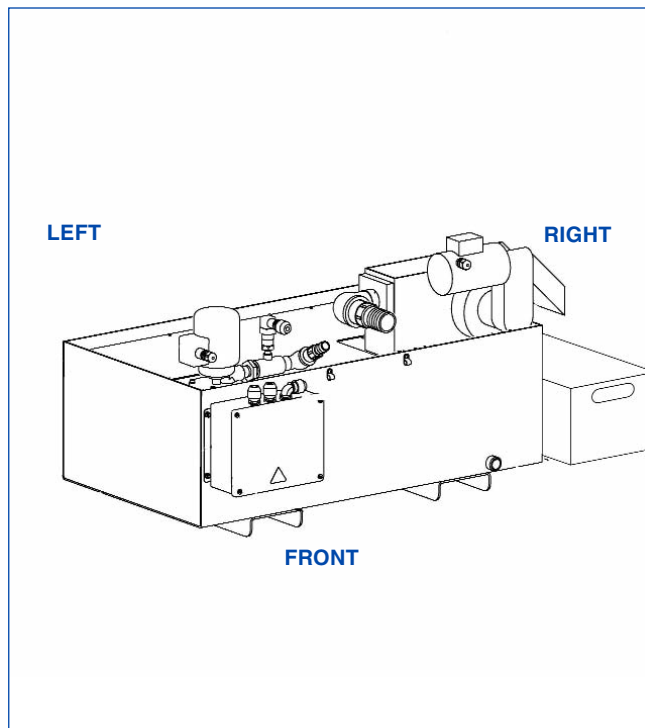


FIGURE 1-1, Settlement Tank

2. Remove plastic wrap.
3. Remove top and sides from packing crate.
4. Remove all loose components from crate.
5. Check all components against packing list.
6. Inspect Unit and components for dents, scratches, or damage resulting from improper handling, by carrier. If damage is evident, immediately file a claim with carrier.
7. Move Unit to desired location.

**NOTE:** Unit should be located close to machine to which it is to be connected. Refer to Floor Plan Layout (see Figure 1-A).

8. Wipe all protective shipping oil and grease from Unit.

## COOLANT LINES CONNECTIONS

Unit is designed to be connected to a machine tool via a Supply and Return Hose (see Figure 1-2).

- Supply Port is equipped with a 25mm (1in.) Hose Barb and Return Port is equipped with a 51mm (2in.) Hose Barb.
- Hoses and hose clamps for connection with a machine tool are not supplied with Unit.

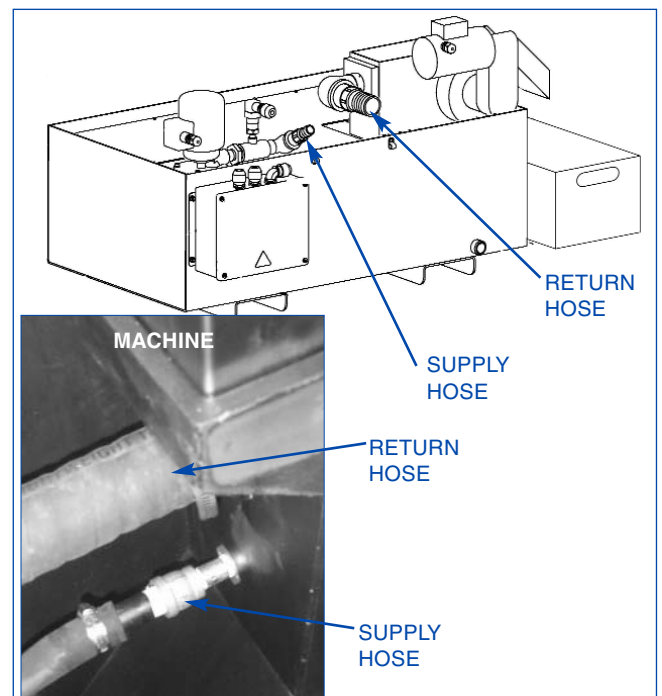


FIGURE 1-2, Coolant Lines

---

**NOTE:** Two Hoses (Supply and Return) are provided with Sunnen Vertical Single Stroke Honing® Machines for attaching machine to Unit's supply and return ports. For other machines a VSS-2070 Hose Module can be ordered for connecting the Unit to your machine.

---

1. Route and connect coolant Supply and Return Hoses to corresponding supply and return connections on your coolant system and machine (refer to Figure 1-2).

2. Fill Coolant Reservoir with either Sunnen Industrial Honing Oil or Sunnen Water-Based Coolant. Refer to Section 3.

---

**NOTE:** Reservoir Capacity is 150 Liters (40 gallons).

---

3. Route and connect coolant system Electrical Supply Cord to your machine.

### **ELECTRICAL CONNECTIONS**

Refer to manual packaged with your machine for directions on how to electrically connect Unit to your machine tool.

---

**NOTE:** All wiring is to be performed by a competent, Licensed Electrician in accordance with all local, state, and federal codes and regulations.

---

### **CAUTION**

Be sure voltage of Settlement Tank matches supply voltage of your machine.

---

### **WARNING**

**Electrical Equipment, service should be performed by authorized personnel ONLY.**

---

### **OPERATIONAL CHECK**

Read Sections 2 and 3 thoroughly and carefully before performing the Operational Check.

1. Power up Machine and check that Pump and Magnetic Separator Motors are operating properly.
3. Turn OFF power to Machine.
4. After unpacking and installing Unit, clean and lubricate as required. Refer to Section 3.



# SECTION 2

## SETUP & OPERATION

### GENERAL

Consult this section when preparing the Unit for operation.

### MAJOR COMPONENTS

The Settlement Tank is normally mounted along side or to the rear of your Machine. The Basic Unit consists of the following items (see Figure 2-1):

*Coolant Reservoir* which is the storage unit for the coolant fluid.

*Immersion Pump & Motor* circulates coolant from the reservoir, through system, and delivers it to your Machine.

*Low Pressure Switch* is used to detect low pressure in coolant supply line of settlement tank. It should be wired into machine control system and serves as a confirmation that coolant is being pumped to machine tool.

An optional *Magnetic Separator* can be incorporated into the Unit to filter out metal particles from the coolant as it is returned to the reservoir.

#### Coolant Maintenance Kit (optional)

It is recommended that Sunnen Water-Based Coolant Concentrate be used in these Machine, if a water-based coolant is used. Sunnen has available the optional SCC-900 Coolant Maintenance Kit for checking and maintaining water-based coolant.

---

**NOTE:** Maintaining proper pH levels is important when using water-based coolants, both for fluid life and cutting performance.

---

### OPERATOR CONTROLS

The Settlement Tank has no Operator Controls; the Unit is designed to be wired into & controlled by your machine.

### SAFETY PRECAUTIONS

The following precautions should be observed to ensure maximum safety while working on or around your Unit.

- Keep Unit and area around Unit cleaned of coolant spills.
- Turn OFF electrical power when performing service on your Unit, which does not require power.
- Disconnect Unit from main power supply and allow drives to drain before any work is performed inside of Electrical Enclosure.
- Ensure all Guards are in place and are in proper working order.
- Use ONLY factory authorized or recommended parts or replacement accessories. Using parts or accessories other than those approved by Sunnen could result in damage to unit and loss of warranty.

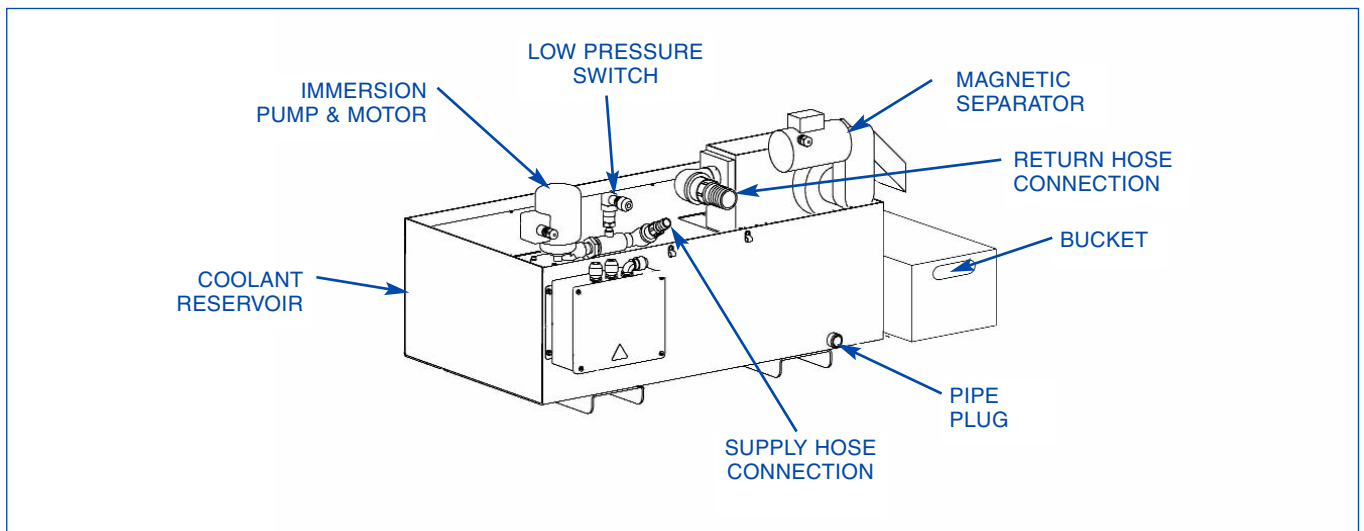


FIGURE 2-1, Settlement Tank



# SECTION 3

## ROUTINE MAINTENANCE

### GENERAL

The following routine maintenance procedures and suggested service periods are provided as a guide and are not to be construed as absolute or invariable. Local conditions must always be considered. Each Unit must be maintained individually according to its particular requirements.

### COOLANT LINES CHECK

Inspect Coolant Lines and Fittings monthly for leaks or damaged parts. Replace parts as required.

### COOLANT LEVEL CHECK

Daily, check level of Coolant in Coolant Reservoir; do not allow Coolant to drop below minimum recommended level (approx. a 19 L/5 Gal drop in level). Fill as required (see Figure 4-1).

### CAUTION

For instructions on inspecting and servicing water-based coolant, refer to Instructions packaged with Sunnen SCC-900 Coolant Maintenance Kit. (The SCC-900 Coolant Kit IS REQUIRED, when servicing a Machine which is using a water-based coolant. Use only approved Sunnen Water-Based Coolant Concentrate.)

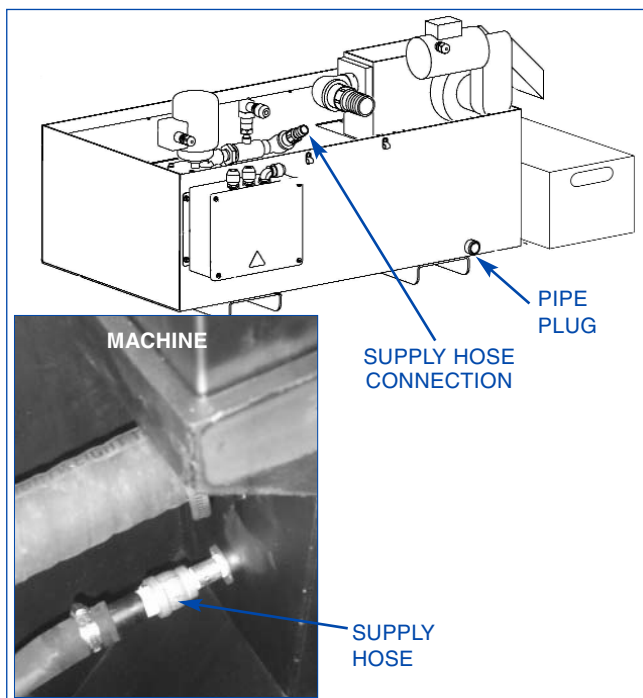


FIGURE 4-1, Settlement Tank

### RESERVOIR CLEANING

1. Turn OFF all power to Machine at Master ON/OFF Switch.
2. Pump coolant from reservoir into an approved waste container. Or disconnect supply hose at machine and use settlement tank pump to pump reservoir empty.
3. Dip or siphon out any remaining coolant from the reservoir. Or drain remaining coolant by removing pipe plug in side of reservoir.
- 4 Clean Sludge from Reservoir and wipe clean.
4. Fill Reservoir by pumping or pouring ONLY approved Sunnen Industrial Honing Oil (or Sunnen Water-Based Coolant) into Coolant Reservoir.

### MAGNETIC SEPARATOR (Optional)

The magnetic separator should be checked, cleaned, and adjusted as follows (see Figure 4-2):

**NOTE:** For complete maintenance instructions, refer to instructions packaged with Magnetic Separator.

- Water-Based Coolant: Clean discharge chute daily. When using water-based coolant, the sludge that builds up in the chute often hardens if the machine is turned off for 8 hours or more. Therefore, the sludge should be cleaned off the chute at the start of each shift. When using honing oil as a coolant, the sludge rarely if ever hardens in the chute and will not have to be checked as often.

**NOTE:** A certain amount of coolant will be carried into the sludge bucket along with the sludge. After gravity separates the coolant from the sludge, there is normally an inch or more of coolant that collects in the bucket. This coolant can be dipped out and returned to the reservoir.

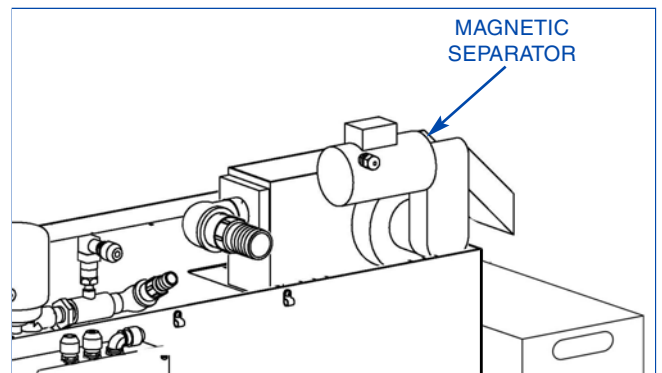
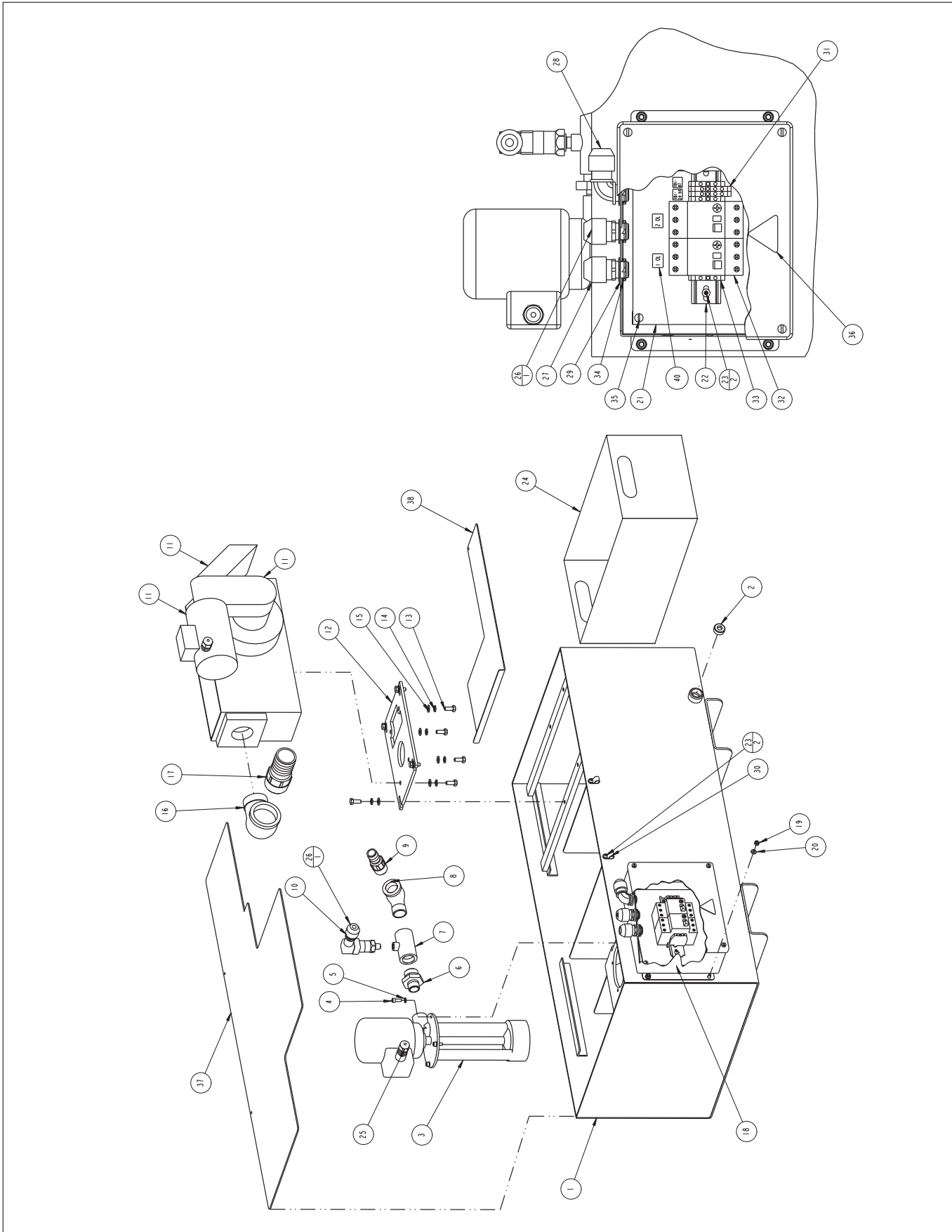


FIGURE 4-2, Magnetic Separator

**FIGURE A**  
**SETTLEMENT TANK W/MAGNETIC SEPARATOR**



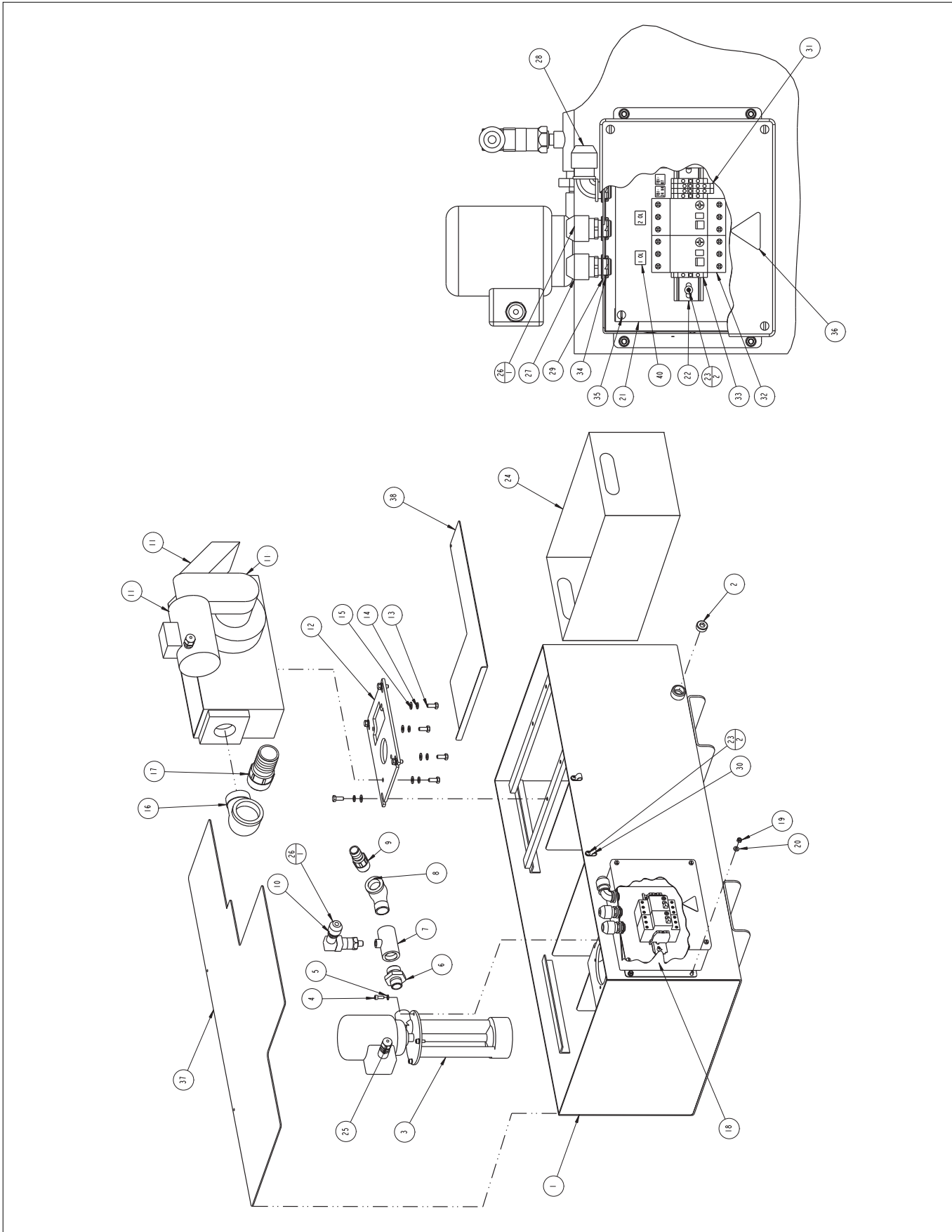
**FIGURE A •--• SETTLEMENT TANK W/MAGNETIC SEPARATOR**

**PARTS LIST COVERING FIGURE "A"**

ITEM NO.	ORDER BY PART NUMBER	QTY.	DESCRIPTION
--	<b>VSS7000-1D</b>	<b>Ref.</b>	<b>....Settlement Tank</b> w/Magnetic Separator (230V/60Hz/3Ph) <i>includes</i>
--	<b>VSS7000-1E</b>	<b>Ref.</b>	<b>....Settlement Tank</b> w/Magnetic Separator (460V/60Hz/3Ph) <i>includes</i>
--	<b>VSS7000-1G</b>	<b>Ref.</b>	<b>....Settlement Tank</b> w/Magnetic Separator (400V/50Hz/3Ph) <i>includes</i>
1	VSS7010	1	.....Coolant Tank
2	PPPM473	1	.....Pipe Plug
3	PMO216	1	.....Immersion Pump w/Mtr
4	PHSM405	4	.....Screw (M6 X 1.0 X 16mm SHCS)
5	PHWM509	4	.....Lockwasher (M6)
6	PPPM574	1	.....Pipe Hex Nipple, Reducing
7	PPPM573	1	.....Pipe Tee, Reducing
8	PPPM491	1	.....Pipe Street Elbow
9	PPP523	1	.....Hose Barb
10	PES707	1	.....Low Pressure Switch
11	KGM7095	1	.....Magnetic Separator
11a	KGM8351	1	.....Motor
11b	KGM8352	1	.....Gearbox
12	VSS7031	1	.....Magnetic Separator Base Plate
13	PHSM495	8	.....Screw (M8 X 1.25 X 20mm HHCS)
14	PHWM407	8	.....Lockwasher (M8)
15	PHWM501	8	.....Flatwasher (M8)
16	PPP317	1	.....Pipe Street Elbow
17	PPP568	1	.....Hose Barb
18	VSS7051	1	.....Junction Box
19	PHNM407	4	.....Nut (M6 Hex)
20	PHWM518	4	.....Flatwasher (M6)
21	PEM661	1	.....Panel
22	DRB0175	1	.....Din Rail (175mm)
23	PHSM438	4	.....Screw (M5 X 0.8 X 12mm PPHTC)
24	KGM3303	1	.....Swarf Bucket
25	PEC79	2	.....Cord Grip
26	PEC179	2	.....Strain Relief Connector
27	PEC180	1	.....Strain Relief Connector
28	PEC220	1	.....Strain Relief Connector
29	PEM252	3	.....O' Ring w/Retainer
30	PEM463	2	.....Cable Clamp (3/8")
31	PEM709	2	.....Terminal Block
32	PES525	2	.....Manual Motor Starter Protector (400/460V Only)
33	PET554	3	.....Ground Terminal Block
32	PES526	2	.....Manual Motor Starter Protector (230V Only)
34	PHN125	3	.....Locknut (1/2" NPT)
35	PHS1058	4	.....Screw (#10-24 x 1/2in. SHMS)
36	PNP299	1	.....Electrical Decal
37	VSS7026	1	.....Tank Cover Plate
38	VSS7027	1	.....Access Plate
39	---	--	..... <i>Not Used</i>
40	PEM152	4	.....Label

*N/S indicates Not Shown*

**FIGURE B**  
**SETTLEMENT TANK**



**FIGURE A •--• SETTLEMENT TANK**

**PARTS LIST COVERING FIGURE "B"**

ITEM NO.	ORDER BY PART NUMBER	QTY.	DESCRIPTION
--	<b>VSS7000-0D</b>	<b>Ref.</b>	<b>....Settlement Tank (230V/60Hz/3Ph) includes</b>
--	<b>VSS7000-0E</b>	<b>Ref.</b>	<b>....Settlement Tank (460V/60Hz/3Ph) includes</b>
--	<b>VSS7000-0G</b>	<b>Ref.</b>	<b>....Settlement Tank (400V/50Hz/3Ph) includes</b>
1	VSS7010	1	.....Coolant Tank
2	PPPM473	1	.....Pipe Plug
3	PMO216	1	.....Immersion Pump w/Mtr
4	PHSM405	4	.....Screw (M6 X 1.0 X 16mm SHCS)
5	PHWM509	4	.....Lockwasher (M6)
6	PPPM574	1	.....Pipe Hex Nipple, Reducing
7	PPPM573	1	.....Pipe Tee, Reducing
8	PPPM491	1	.....Pipe Street Elbow
9	PPP523	1	.....Hose Barb
10	PES707	1	.....Low Pressure Switch
11	---	--	..... <i>Not Used</i>
12	VSS7031	1	.....Magnetic Separator Base Plate
13	PHSM495	8	.....Screw (M8 X 1.25 X 20mm HHCS)
14	PHWM407	8	.....Lockwasher (M8)
15	PHWM501	8	.....Flatwasher (M8)
16	PPP317	1	.....Pipe Street Elbow
17	PPP568	1	.....Hose Barb
18	VSS7051	1	.....Junction Box
19	PHNM407	4	.....Nut (M6 Hex)
20	PHWM518	4	.....Flatwasher (M6)
21	PEM661	1	.....Panel
22	DRB0175	1	.....Din Rail (175mm)
23	PHSM438	2	.....Screw (M5 X 0.8 X 12mm PHTC)
24	PEC79	1	.....Cord Grip
25	PEC179	2	.....Strain Relief Connector
26	PEC180	1	.....Strain Relief Connector
27	PEM252	3	.....O' Ring w/Retainer
28	PEM324	2	.....Locknut
29	PEM709	2	.....Terminal Block
30	PEM823	1	.....Knockout Plug
31	PES525	1	.....Manual Motor Starter Protector (400/460V Only)
31	PES526	2	.....Manual Motor Starter Protector (230V Only)
32	PET554	2	.....Ground Terminal Block
33	PHN125	3	.....Locknut (1/2" NPT)
34	PHS1058	4	.....Screw (#10-24 x 1/2in. SHMS)
35	PNP299	1	.....Electrical Decal
36	VSS7026	1	.....Tank Cover Plate
37	VSS7027	1	.....Access Plate

*N/S indicates Not Shown*

Like any machinery, this equipment may be dangerous if used improperly. Be sure to read and follow instructions for operation of equipment.

## FRACTION / DECIMAL / MILLIMETER EQUIVALENTS CHART

INCH			INCH			INCH		
FRACTION	DECIMAL	MILLIMETER	FRACTION	DECIMAL	MILLIMETER	FRACTION	DECIMAL	MILLIMETER
....	.003937	0,1000	9/32	.281250	7,1438	21/32	.656250	16,6688
....	.007874	0,2000	19/64	.296875	7,5406	....	.669291	17,0000
....	.011811	0,3000	5/16	.312500	7,9375	43/64	.671875	17,0656
1/64	.015625	0,3969	....	.314961	8,0000	11/16	.687500	17,4625
....	.015748	0,4000	21/64	.328125	8,3344	45/64	.703125	17,8594
....	.019685	0,5000	11/32	.343750	8,7313	....	.708661	18,0000
....	.023622	0,6000	....	.354331	9,0000	23/32	.718750	18,2563
....	.027559	0,7000	23/64	.359375	9,1281	47/64	.734375	18,6531
1/32	.031250	0,7938	3/8	.375000	9,5250	....	.748031	19,0000
....	.031496	0,8000	25/64	.390625	9,9219	3/4	.750000	19,0500
....	.035433	0,9000	....	.393701	10,0000	49/64	.765625	19,4469
....	.039370	1,0000	13/32	.406250	10,3188	25/32	.781250	19,8438
3/64	.046875	1,1906	27/64	.421875	10,7156	....	.787402	20,0000
1/16	.062500	1,5875	....	.433071	11,0000	51/64	.796875	20,2406
5/64	.078125	1,9844	7/16	.437500	11,1125	13/16	.812500	20,6375
....	.078740	2,0000	29/64	.453125	11,5094	....	.826772	21,0000
3/32	.093750	2,3813	15/32	.468750	11,9063	53/64	.828125	21,0344
7/64	.109375	2,7781	....	.472441	12,0000	27/32	.843750	21,4313
....	.118110	3,0000	31/64	.484375	12,3031	55/64	.859375	21,8281
1/8	.125000	3,1750	1/2	.500000	12,7000	....	.866142	22,0000
9/64	.140625	3,5719	....	.511811	13,0000	7/8	.875000	22,2250
5/32	.156250	3,9688	33/64	.515625	13,0969	57/64	.890625	22,6219
....	.157480	4,0000	17/32	.531250	13,4938	....	.905512	23,0000
11/64	.171875	4,3656	35/64	.546875	13,8906	29/32	.906250	23,0188
3/16	.187500	4,7625	....	.551181	14,0000	59/64	.921875	23,4156
....	.196850	5,0000	9/16	.562500	14,2875	15/16	.937500	23,8125
13/64	.203125	5,1594	37/64	.578125	14,6844	....	.944882	24,0000
7/32	.218750	5,5563	....	.590551	15,0000	61/64	.953125	24,2094
15/64	.234375	5,9531	19/32	.593750	15,0813	31/32	.968750	24,6063
....	.236220	6,0000	39/64	.609375	15,4781	....	.984252	25,0000
1/4	.250000	6,3500	5/8	.625000	15,8750	63/64	.984375	25,0031
17/64	.265625	6,7469	....	.629921	16,0000	1	1.000000	25,4000
....	.275591	7,0000	41/64	.640625	16,2719	1-1/16	1.062500	26,9880

### FORMULAS:

<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">MULTIPLY</td> <td></td> <td style="text-align: center;">BY</td> <td></td> <td style="text-align: center;">TO GET</td> </tr> <tr> <td style="text-align: center;">INCHES (in)</td> <td style="text-align: center;">x</td> <td style="text-align: center;">25.4</td> <td style="text-align: center;">=</td> <td style="text-align: center;">MILLIMETERS (mm)</td> </tr> <tr> <td style="text-align: center;">FEET (ft)</td> <td style="text-align: center;">x</td> <td style="text-align: center;">0.3048</td> <td style="text-align: center;">=</td> <td style="text-align: center;">METERS (m)</td> </tr> </table>	MULTIPLY		BY		TO GET	INCHES (in)	x	25.4	=	MILLIMETERS (mm)	FEET (ft)	x	0.3048	=	METERS (m)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">MULTIPLY</td> <td></td> <td style="text-align: center;">BY</td> <td></td> <td style="text-align: center;">TO GET</td> </tr> <tr> <td style="text-align: center;">MILLIMETERS (mm)</td> <td style="text-align: center;">x</td> <td style="text-align: center;">0.03937</td> <td style="text-align: center;">=</td> <td style="text-align: center;">INCHES (in)</td> </tr> <tr> <td style="text-align: center;">METERS (m)</td> <td style="text-align: center;">x</td> <td style="text-align: center;">3.281</td> <td style="text-align: center;">=</td> <td style="text-align: center;">FEET (ft)</td> </tr> </table>	MULTIPLY		BY		TO GET	MILLIMETERS (mm)	x	0.03937	=	INCHES (in)	METERS (m)	x	3.281	=	FEET (ft)
MULTIPLY		BY		TO GET																											
INCHES (in)	x	25.4	=	MILLIMETERS (mm)																											
FEET (ft)	x	0.3048	=	METERS (m)																											
MULTIPLY		BY		TO GET																											
MILLIMETERS (mm)	x	0.03937	=	INCHES (in)																											
METERS (m)	x	3.281	=	FEET (ft)																											

"SUNNEN" AND THE SUNNEN LOGO ARE REGISTERED TRADEMARKS OF SUNNEN PRODUCTS COMPANY."

Sunnen® reserves the right to change or revise specifications and product design in connection with any feature of our products contained herein. Such changes do not entitle the buyer to corresponding changes, improvements, additions, or replacements for equipment, supplies or accessories previously sold. Information contained herein is considered to be accurate based on available information at the time of printing. Should any discrepancy of information arise, Sunnen recommends that user verify discrepancy with Sunnen before proceeding.



**SUNNEN PRODUCTS COMPANY**  
 7910 Manchester Road, St. Louis, MO 63143 U.S.A.  
 Phone: 314-781-2100 Fax: 314-781-2268  
 U.S.A. Toll-Free Sales and Service: 1-800-325-3670  
 International Division Fax: 314-781-6128

<http://www.sunnen.com>  
 e-mail: sunnen@sunnen.com

**SWITZERLAND – SUNNEN AG**  
 Phone: ++ 41 71 649 33 33 Fax: ++ 41 71 649 34 34  
[www.sunnen.ch](http://www.sunnen.ch) e-mail: info@sunnen.ch

**ITALY – SUNNEN ITALIA S.R.L.**  
 Phone: 39 02 383 417 1 Fax: 39 02 383 417 50  
[www.sunnenitalia.com](http://www.sunnenitalia.com) e-mail: sunnen@sunnenitalia.com

**FRANCE – SUNNEN SAS**  
 Phone: +33 01 69 30 0000 Fax: +33 01 69 30 1111  
[www.sunnen.fr](http://www.sunnen.fr) e-mail: info@sunnen.fr

**BELGIUM – SUNNEN BENELUX BVBA**  
 Phone: +32 38 80 28 00 Fax: +32 38 44 39 01  
[www.sunnen.be](http://www.sunnen.be) e-mail: info@sunnen.be

**UK – SUNNEN PRODUCTS LTD.**  
 Phone: ++ 44 1442 39 39 39 Fax: ++ 44 1442 39 12 12  
[www.sunnen.co.uk](http://www.sunnen.co.uk) e-mail: hemel@sunnen.co.uk

**POLAND – SUNNEN POLSKA SP. Z O.O.**  
 Phone: +48 22 814 34 29 Fax: +48 22 814 34 28  
[www.sunnen.pl](http://www.sunnen.pl) e-mail: sunnen@sunnen.pl

**RUSSIA – SUNNEN RUS**  
 Phone: +7 495 258 43 43 Fax: +7 495 258 91 75  
[www.sunnen.ru](http://www.sunnen.ru) e-mail: sunnen@sunnen-russia.ru

**CZECH REPUBLIC – SUNNEN S.R.O.**  
 Phone: +420 383 376 317 Fax: +420 383 376 316  
[www.sunnen.cz](http://www.sunnen.cz) e-mail: sunnen@sunnen.cz

**CHINA – SHANGHAI SUNNEN MECHANICAL CO., LTD.**  
 Phone: 86 21 5813 3322 Fax: 86 21 5813 2299  
[www.sunnensh.com](http://www.sunnensh.com) e-mail: shsunnen@sunnensh.com