

OPERATING INSTRUCTION MANUAL

MD70-15 Liquid Transfer Station



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Statement of Warranty and Liability

All equipment manufactured by HRC is guaranteed against defects in materials and workmanship for a period of six months from the date of shipment from our factory. Any claimed defects must be reported, and the materials and/or equipment must be returned freight prepaid, to our plant within the guarantee period. Our liability for defects in material and/or workmanship shall be limited to the replacing or repairing, at our option, such defective materials and/or equipment at no cost to the purchaser. Any damages or loss occurring during shipment are not covered by this warranty but are the responsibility of the carrier(s). Please report all shipping damage to the carrier(s) immediately.

All materials and/or equipment furnished by other suppliers carry no warranty except said supplier's warranty as to materials and workmanship. Transportation, handling damage, wear and tear, and other causes of damage outside the control of the manufacturer are not covered by this warranty. Under no circumstances will HRC be responsible for any damage, loss or liability of any nature arising out of the installation and/or use of the materials and or use of equipment furnished.

There are no other warranties, expressed or implied, except as stated above. The warranty becomes null and void if any devices or accessories other than those distributed or officially recommended by HRC, are installed, or attached to this equipment.

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Overview of the MD70-15 Liquid Transfer Station

HRC pump stations are designed to resist leakage and corrosion from all photo processing chemicals. Magnetic Drive Pumps do not use seals, eliminating leakage through the pump assembly. They are thermally protected and within reasonable limits can be run dry without pump damage. They are CPVC constructed with the motor totally enclosed and fan cooled.

The MD70-15 pump station is equipped with an in-line filter screen. The trouble free operation of this pump station is critically dependent on the proper maintenance of its in-line filter screen system (Y-Strainer). The pump station **must be installed so that the screen is easily accessible**. This manual's page on pump station maintenance further elaborates on the details of cleaning the Y-Strainer screen. The procedure is quite simple and **absolutely essential**.

In most instances, this pump station will arrive configured with a sealed lid. The lid is attached to the tank with stainless steel bolts and nuts and functions as a barrier against gases, which may be present in your drain system. **The sealed lid is not intended as a barrier against solution overflow**. The pump is also equipped with a high liquid level alarm system; should the incoming solution reach the level of this alarm switch, an audible buzzer will sound. **Do not disable this switch**. If an audible alarm is experienced regularly, the pump station is not working properly. The filter may be blocked or the pump station may be unable to keep up with the incoming flow of solution. Consult the troubleshooting guide for further information.

This system has been designed to function as an under-the-sink transfer station. It is therefore frequently "hard" plumbed making it very difficult to perform service work at a later time. In order to service the in-line filter screen, as well as perform any other needed repairs, **it is recommended that this station be installed with either quick disconnect fittings or short sections of reinforced tubing**.

A receptacle outlet should be installed near the equipment and should be easily accessible. **Avoid the use of long extension cords**.

Installation of the MD70-15 Liquid Transfer Station

When installing the MD70-15 Liquid Transfer Station, several things should be taken into consideration.

1. The MD70-15 Liquid Transfer Station **must** be “soft plumbed”. Quick disconnects **must** be installed on all PVC inlet fittings so the unit can be removed for routine maintenance procedures.
2. The discharge pipes on the unit must be the proper diameter for the unit to function properly. Refer to *Illustration 1* for further information. The chart indicates the amount of head pressure the pump can accommodate at various pipe diameters. **Do not exceed these specifications!!**
3. The unit must be installed near an electrical outlet, use of extension cords is not recommended. As the unit is normally under a sink, a GFI outlet is preferred.
4. The red handled ball valves and filter screen assembly must be accessible. The Y-strainer on the MD70-15 Liquid Transfer Station should be cleaned daily for the proper trouble free operation of this unit.
5. The discharge pipes from the unit should not contain more than two elbows; one of which is included with the unit following the check valve. Additional fittings significantly reduce the ability of the pump to perform its job properly. **Approximately two feet of head can be subtracted for each additional fitting.**
6. Hallmark Refining Corporation recommends that all pipe entering or exiting the MD70-15 Liquid Transfer Station be Schedule 80 or higher.

Product	1" Exit Pipe	1 1/2" Exit Pipe	2" Exit Pipe
MD70RLT	26 Feet 15 GPM	22 Feet 15 GPM	21 Feet 15 GPM
MD70RLZT	26 Feet 10 GPM	25 Feet 10 GPM	24 Feet 10 GPM
MD100RLT	29 Feet 18 GPM	22 Feet 23 GPM	21 Feet 24 GPM

Illustration 1: Specifications for Installing the Liquid Transfer Station

Operation of the MD70-15 Liquid Transfer Station

The MD70-15 Liquid Transfer Station is a pump station used to move liquid from one place to another. In the most common case scenario, liquid enters the holding tank of the liquid transfer station from a pipe at the sink.

The holding tank contains three float switches. The bottom float switch turns the system off. The middle float switch turns the system on and the top float switch activates an alarm that sounds when there is too much liquid in the holding tank.

When there is enough liquid in the holding tank to cover both the bottom and the middle float switch, the pump is activated. The pump will continue to run until the liquid level drops below the bottom float switch. The pump will then stop running until it is activated again by the addition of fluid to the holding tank.

As mentioned in the overview of this manual, there are certain maintenance procedures that **must** be followed for the optimal performance of the liquid transfer station. More detail of these maintenance procedures can be found immediately following the troubleshooting section in this manual. In an effort to simplify the troubleshooting process, there are lights on the control box of the MD70-15 that indicate certain conditions are present.

Green LED

A solid green LED indicates that the unit has AC electrical power. Under normal operating conditions, the green LED will flicker continuously when the circuit board is ready to run.

Yellow LED

The yellow LED indicates that the pump has been activated. If this light is blinking, the pump was activated in an abnormal sequence and a system error condition exists. Refer to the troubleshooting guide for additional information.

Red LED

The blinking red LED indicates a fault has occurred in the operation of the unit. Usually, this is an indicator that the high level alarm has been activated. In this case, an alarm will sound to inform the user that the holding tank contains too much liquid. As a safety precaution, the top float switch will activate the pump to run if the middle or bottom float switch did not activate to turn on the pump. After 2 minutes of the pump operating while the unit contains too much liquid, the pump will turn off. This is intended to reduce the likelihood of the pump motor burning out from running continuously for extended periods of time. The high level alarm can be silenced, but the station will continue to turn on the pump and alarm every thirty minutes for two minute intervals until the situation is resolved and the float switch has been released. Refer to the troubleshooting guide and the interpretation guide of the LED's for additional information.

Parts List for the MD70-15 Liquid Transfer Station

Reference Number	Part Number	Part Description	Quantity
1	905-170	Holding Tank Assembly Complete with base plate, rubber feet, pick up tube assembly and gasket	1
	914-500	Tank Cover Small (8 ¼" x 5 ½")	1
	914-502	Tank Cover Large (8 ¼" x 8 ½")	1
3	200-014	Holding Tank Gasket	1
	915-120	Control Box Assembly	1
	915-049	MD70-15 Drop in Assembly	1
	436-020	Male Adapter for Sink and Vent	2
	741-005	5 Amp Circuit Breaker	1
	728-018	Power Cord	1
	740-006	Circuit Board	1
	502-010	Check Valve 1"	1
14	730-003	Alarm Buzzer	1
	808-010	PVC Elbow FPT x FPT	1
	505-010	Ball Valve 1"	2
19	836-010	Male Adapter 1"	1
	336-010	Hose Fitting 1"	2
	522-012	Hose Clamp	2
	540-008	Complete Y-Strainer Assembly	1
23	540-012	Y-Strainer Screen (Orange)	
	540-014	Y-Strainer Retainer Clip	
	519-010	Tank Adapter 1"	1
25	918-003	Pick Up Tube Assembly	1
	915-017	Float Switch Assembly	1
	524-001	Liquid Level Switch	3
28	702-285	MD70RLT Pump	1
	702-046	MD70 Impeller Assembly	1
	884-005	PVC Nipple 1"	4
	210-002	SS Hex Nut	10
	211-002	SS Hex HD Cap Screw	10
32	807-010	Elbow 1" Slip x FPT	2

MD70-15 Liquid Transfer Station

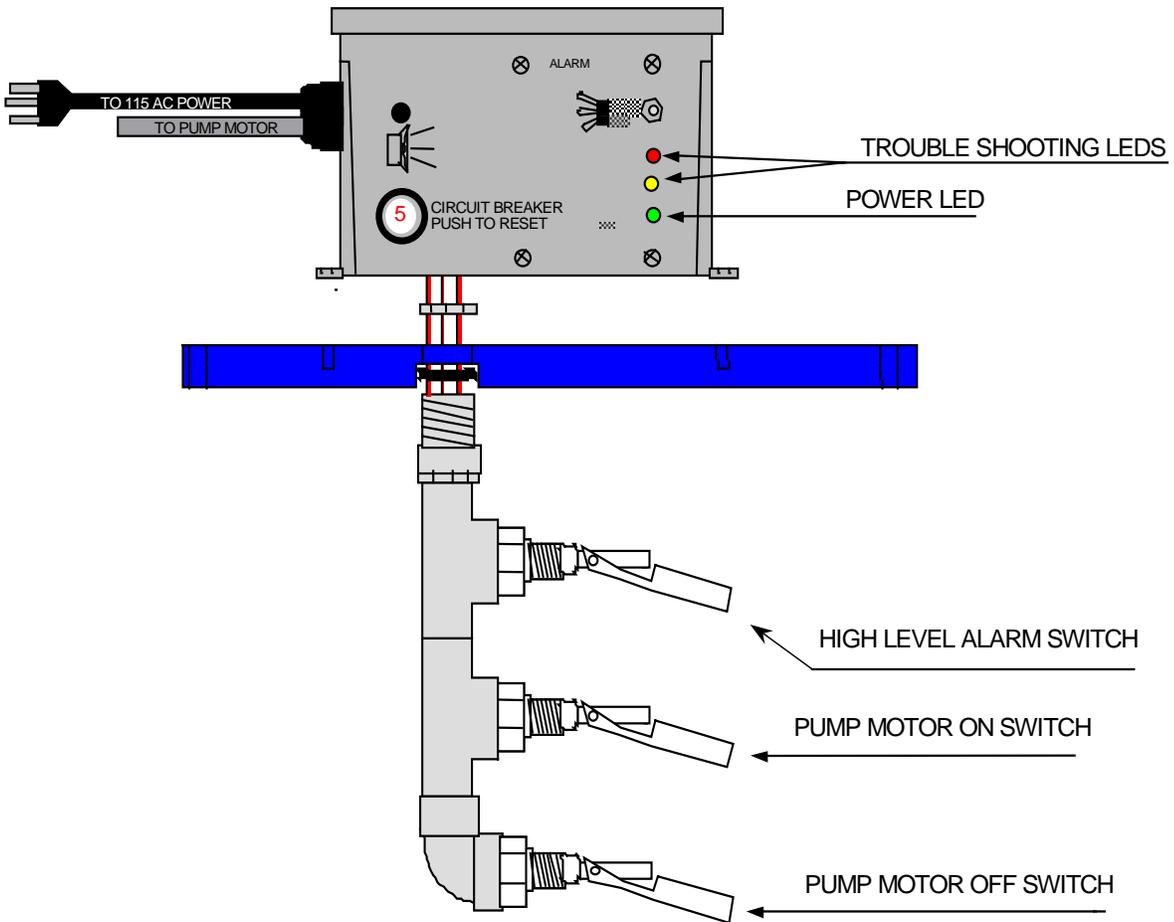


Illustration 3: Operational Schematic of the MD70-15

Parts List for the MD70-15 Y-Strainer Assembly

Reference Number	Part Number	Part Description	Quantity
1	NA*	Y-Strainer Housing	1
2	540-014	Retainer Clip	1
3	540-012	Filter Screen	1
4	NA*	Filter Body	1
5	540-013	O Ring	1
6	NA*	Cap	1
7	NA*	Support Ring	1
	540-008	Complete Y-Strainer Assembly (Includes 2 preassembled elbows and tubing)	

* The entire assembly must be purchased. These parts are not available separately.

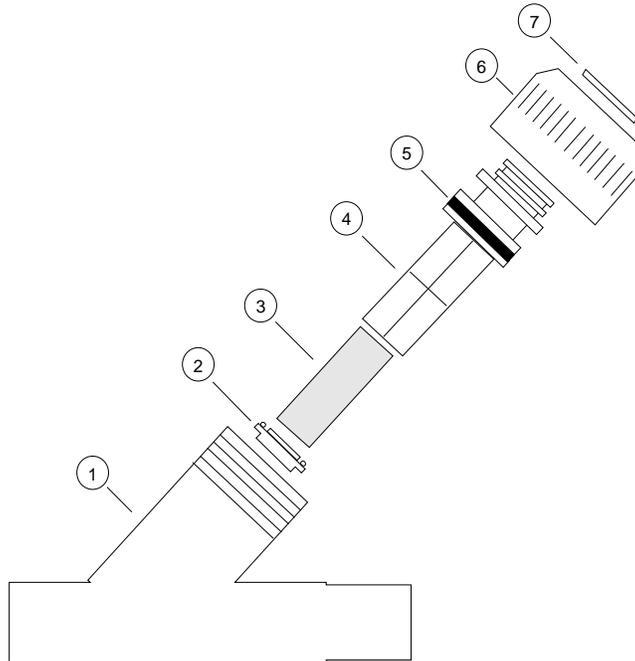


Illustration 4: Exploded View of the Y-Strainer Assembly

Parts List for the MD70RLT Iwaki Walchem Pump

Item	Description	Quantity	Part Number
1	Bolts and Washers	6 Sets	210-075
2	Front Casing	1	702-094
3	O-Ring	1	702-069
4	Impeller with Spindle	1	702-073
5	Rear Casing	1	702-074
6	Magnetic Drive Assembly	1	702-075

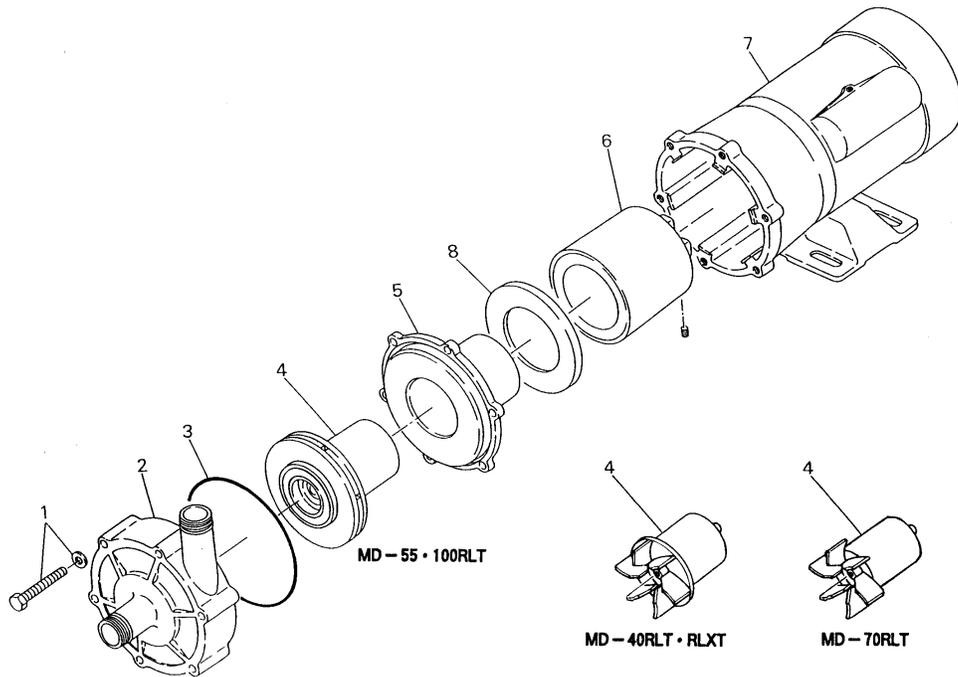


Illustration 5: Exploded View of the MD70RLT Iwaki Walchem Pump

Instructions for Using Iron Out in Photo Lab Applications

Iron Out should be used as a preventative measure to reduce iron build up in photo labs that use steel wool type silver recovery units. Photo labs that operate a liquid transfer station are at the most risk of damage from iron build up. Excessive iron buildup will cause liquid transfer station malfunction and clogged pipes. **It is recommended that Iron Out be used weekly for best results.**

Items needed:

Warm water

1 cup of Iron Out

2.5 Gallon Container

1. Slowly mix 1 cup of Iron Out with 1 gallon warm water in a container. **Be sure the Iron Out dissolves completely.**
2. Pour the dissolved solution down the drain, preferably after the lab has closed. This allows the Iron Out sufficient time to sit in the liquid transfer station's holding tank or pipes and dissolve iron buildup.

DO NOT pour the powdered Iron Out down the drain first, then flush the sink with water. Undissolved Iron Out tends to crystallize and contributes to the buildup problem.

Iron Out will not solve current drainage problems. It is intended as a preventative measure only. Current problems need to be addressed and resolved before Iron Out can be effective.

Troubleshooting Guide for the MD70-15 Liquid Transfer Station

PROBLEM	POSSIBLE SOLUTION
<p>The pump is running, but is moving little or no solution. The red LED is blinking and the alarm is sounding.</p>	<p>Y-Strainer screen could be plugged. See Filter Maintenance.</p> <p>Pick up tube inside the tank could be clogged.</p> <p>Ball valves (see diagram) may have been left closed after last maintenance procedure. See Holding Tank Maintenance.</p> <p>The impeller assembly may be worn or damaged. See Pump Head Maintenance.</p> <p>The pump may have lost it's prime. With the system on, twist the Y-Strainer screen cap off until a drip of liquid comes out. This should remove any air locks. Tighten the cap immediately.</p> <p>How many elbows are on the discharge side of the MD70-15 motor? No more than two are recommended. Refer to the installation guide in this manual for further information.</p> <p>The discharge pipe should be no smaller than 1" and no larger than 2". If the pipe is smaller than 1", a plumber cannot snake the line. If the pipe is larger than 2", too much head pressure is created on the system. Refer to the installation chart in this manual for further information.</p>
<p>The float switches need to be checked, but the holding tank is not accessible.</p>	<p>The system is probably "hard plumbed". It is recommended that a plumber install flexible plumbing or a quick disconnect. As a temporary solution, try jiggling the holding tank to dislodge debris.</p>
<p>The 9-volt battery needs replacing, but the control box lid cannot be removed.</p>	<p>The system is probably "hard plumbed". It is recommended that a plumber install flexible plumbing or a quick disconnect.</p>
<p>The pump station does not have a green power light.</p>	<p>Has the breaker at the main power panel been thrown? Check and reset if necessary.</p> <p>Has the breaker at the pump station been thrown? Reset the circuit breaker on the control box and check for the reason it blew. The four most common reasons are the red handled ball valves are closed, the check valve is not operating/installed properly, the impeller is damaged or the pipes after the liquid transfer station are blocked.</p> <p>Is there a switch in the lab that controls power to the electrical outlet?</p> <p>Has the GFI circuit breaker at the outlet been checked?</p>

PROBLEM	POSSIBLE SOLUTION
<p>The pump station is overfilling, or appears to be leaking. The red LED is blinking and the alarm is sounding.</p>	<p>The pump may have lost it's prime. With the system on, twist the Y-Strainer filter cap off until a drip of liquid comes out. This should remove any air locks. Tighten the cap immediately. Airlocks occur because of the introduction of too much liquid at one time. If this is a continuous problem, the drain hole of the sink may need to be shrunk. Hire a plumber to restrict the size of the drain hole in the sink so that too much liquid cannot be introduced into the pump station at one time.</p> <p>Y-Strainer filter could be plugged. See Filter Maintenance.</p> <p>The pick up tube inside the tank could be plugged. There is an 8" piece of 1" diameter tubing on the elbow inside the holding tank. This tubing is cut on the bias so it can lie on the floor of the tank and prevent debris from being sucked into the pump inlet line. If this tubing is removed for cleaning, it MUST be replaced and angled toward the bottom of the tank.</p> <p>Is <i>Iron Out</i> being used on a regular basis? It is recommended that one cup of <i>Iron Out</i> be pre-mixed with one gallon of water and poured down the sink. This should be done weekly. Refer to the Instructions for Using Iron Out in Photo Lab Applications in this user manual for further instructions.</p> <p>The float switches may be dirty, blocked or detached. See Holding Tank Maintenance.</p> <p>The red handled ball valves may have been left closed after last maintenance procedure. Make sure they are open.</p> <p>Power to the pump station may be connected to a switch and the switch is turned off.</p> <p>Breaker at control box or main circuit breaker may be thrown. Reset breaker and investigate the cause.</p> <p>The discharge pipe should be no smaller than 1 ½" and no larger than 2". If the pipe is smaller than 1 ½", a plumber cannot snake the line. If the pipe is larger than 2", too much head pressure is created on the system.</p>
<p>The pump is making a loud noise and/or is pumping very slowly.</p>	<p>The impeller assembly on the pump may be worn and in need of replacement. See Pump Head Maintenance.</p>

Interpretation of the LED's on the Control Box

As stated in the Operations section of this manual, the MD70-15 Liquid Transfer Station has a series of LED's on the face of the control box that indicate certain conditions are present during operation of the system.

The following table explains these LED indicators in greater detail.

	Appearance	Condition Present
Green LED	Solid Light	Electrical current is present at the system. The unit has power. <ul style="list-style-type: none"> If the system is completely full of liquid and the light is still solid green and no other lights are present, the circuit board is inoperable.
	Blinking Light	The unit is operating normally. The circuit board in the system is performing as programmed.
Yellow LED	Solid Light	The pump has been activated to run. <ul style="list-style-type: none"> If the pump is not running, the pump motor may be burnt out.
	Blinking Light	The top float switch has been activated and a time out sequence has occurred. <ul style="list-style-type: none"> If the top float switch is activated for more than five minutes, the pump will shut off to avoid burning out the pump motor. An alarm will sound. The red LED will be blinking. The alarm can be cancelled. The system will turn on and repeat this cycle every thirty minutes for five minutes at a time until the problem is cleared. Refer to the troubleshooting guide for possible solutions.
Red LED	Blinking Light no Alarm	A fault has occurred in the operation of the unit. <ul style="list-style-type: none"> The middle float switch has activated the pump to run without the bottom float switch being activated. Refer to Holding Tank Maintenance.
	Blinking Light with Alarm	A fault has occurred in the operation of the unit. The top float switch has been activated. <ul style="list-style-type: none"> There are many reasons that the top float switch could be activated. Refer to the troubleshooting guide for possibilities. The most common problem is that the Y-Strainer filter needs to be cleaned. Under normal operating conditions, the unit should turn on and off without activating the high level alarm.

Maintenance Procedures for the MD70-15 Liquid Transfer Station

Filter Maintenance

The Y-Strainer screen should be cleaned daily. Heavy algae or other particulate build-up will necessitate more frequent cleaning. Failure to service this screen will result in a reduced pumping rate and could damage the pump head assembly. Service this assembly using the following procedure:

- 1) Disconnect the pump station from the power supply.
- 2) Close the 1" valve from the holding tank to the Y-Strainer (see diagram) and the 1" valve to the drain.
- 3) Unscrew the filter assembly from its housing.
- 4) Remove the retaining cap at the bottom of the filter assembly (it snaps off) and slide the screen out of the filter assembly. The screen can then be cleaned by rinsing it in a stream of tap water and manually removing any sediment build-up. **DO NOT CLEAN THE SCREEN IN THE SINK WITH THE MD70-15!!**
- 5) Replace the screen in the assembly and snap the retaining cap in place. This retaining cap **MUST** be present or the screen is useless.
- 6) Screw the filter assembly into the Y-Strainer housing.
- 7) Reconnect the pump station to the power supply.
- 8) Open the valves that were closed prior to the maintenance procedure and inspect for leaks.

Holding Tank Maintenance

Under certain conditions and particularly after extended use, it will be necessary to clean the holding tank. Service this using the following procedure:

- 1) Disconnect the pump station from the power supply.
- 2) Close the 1" valve from the holding tank to the Y-Strainer (see diagram) and the 1" valve to the drain.
- 3) Disconnect the pump station from inlet and vent plumbing. This will require the help of a plumber if these connections have been "hard plumbed". The plumber should install flexible tubing or a quick disconnect.
- 4) Remove wing nuts holding the lid to the holding tank and lift the entire lid assembly from the tank. The assembly will still be attached to the pump station via the power cord to the pump. Use care not to damage the exposed float switches.
- 5) Check the operation of the float switches. Clean the switches and the inside of the holding tank. An old toothbrush works well.
- 6) Rinse the holding tank of any accumulated sludge-like material. Use a Wet/Dry Vacuum if necessary to remove sludge.
- 7) Reattach the lid assembly to the holding tank with the wing nuts.
- 8) Reconnect the pump station to the power supply.
- 9) Open the valves that were closed prior to the maintenance procedure and check for leaks.

NOTE: When reassembling the lid, be certain that the float switches are not obstructed by the pick up tube assembly at the bottom of the holding tank. **The float switches must operate freely!**

Pump Head Maintenance

On certain occasions, it may be necessary to change the liquid end of the MD70-15RLT pump. Follow this procedure to minimize the difficulty in accessing the liquid end of the pump. If components are being replaced, it is highly advisable to replace the complete liquid end (LMD70RT) to prolong the life of the other components.

- 1) Disconnect the pump station from the power supply.
- 2) Close the 1" valve from the holding tank to the Y-Strainer (see diagram) and the 1" valve to the drain.
- 3) Unscrew and remove check valve from the pump.
- 4) Remove screws holding the front casing of the pump.
- 5) Carefully pull the front case away from the pump motor. There is a certain amount of flex in the tubing to the holding tank, which will allow the pump head to be pulled away from the pump motor.
- 6) The impeller, rear case, and O-Ring can now be removed and the front case unscrewed from its connection point.
- 7) Replace worn parts and reassemble, making certain to wrap the threaded fitting which attaches to the front case with teflon tape.

MD70-15 Liquid Transfer Station

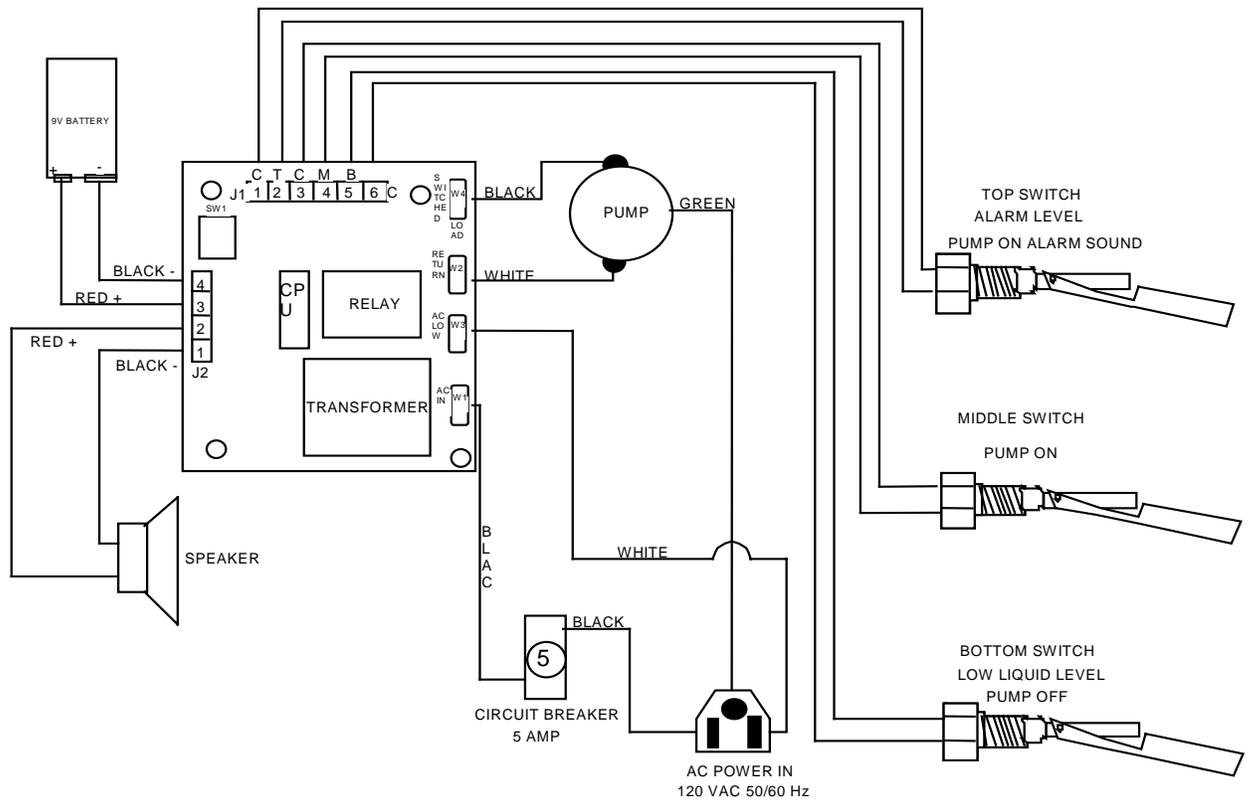


Illustration 6: Wiring Schematic for the MD70-15 Control Box

Specifications for the MD70-15 Liquid Transfer Station

Pump Station Size	20"L x 14"W x 20"H
Holding Tank Capacity	3½ Gallons
Shipping Weight	39 lbs.
Maximum Output	25.6 Gallons
Maximum Head	31.8 ft.
Sample Output on Performance Curve	12 GPM @ 25 ft.
Power Requirements	115 VAC 60Hz
Connections	1" NPTM
Motor UL File Number	E89768
Pump Station UL File Number	E159207