



ID SERIES WATER-BATH VAPORIZERS

OPERATION MANUAL

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Figure 1-1 - ID Series Vaporizer

## 1. GENERAL

**1.01** This manual provides a physical and functional description and operation theory necessary for effective use of Ransome ID Series Water Bath LP-Gas Vaporizers.

**1.02** Ransome ID Series Water Bath Vaporizers provide an economical, dependable source of Liquefied Petroleum (LP) gas vapor for a wide range of applications up to 10,000 gallons per hour. Standard units require 115 V AC, 60 Hz power. They are individually factory-tested on propane and shipped ready for use. The LP-Gas Inlet and Vapor Outlet are connected to the user's system. The Water Bath is filled with a glycol-water mix, the burner is activated, and the Ransome ID Series Vaporizer goes to work, quietly and automatically.

**1.03** LP-Gas is stored as liquid and used as vapor. To change it to a vapor, heat must be added at the following rates:

- a) From 785 BTU for each gallon of Propane at -44 degrees F to 441 BTU for each gallon at 132 degrees F.
- b) From 808 BTU for each gallon of Butane at 32 degrees F to 634 BTU for each gallon at 130 degrees F.

The liquid will then boil, change to vapor at the rate of:

- c) 36.4 ft. for each gallon of propane.
- d) 31.3 ft. for each gallon of butane.

**1.04** Ransome ID Series Vaporizers develop the heat required for vaporization through combustion of a small portion of the vapor generated. Operating on temperature control, the burner functions only as needed to maintain proper Water Bath temperature.

### How To Select A Water Bath Vaporizer

**1.05** Features of the ID Series Vaporizers include the following:

- a) Efficient propane combustion and consistent performance is maintained, since the power burner is substantially independent of weather conditions. Air is delivered to the combustion zone through the burner by a heavy-duty fan and is discharged through a diffuser specially designed to provide a firm flame anchor and stable, high-efficiency combustion. The resultant flame stability provides quiet operation, free from vibration, pulsation or flashback.
- b) A low, attractive silhouette is maintained in all sizes, since the power burner requires only a short stack and weather cap at the flue outlet. The neat, rectangular housing is covered with stainless-steel and blends well with any architectural setting.

c) A continuous supply of dry, warm vapor is assured by providing additional heat exchange area over the amount required for rated capacity. The large water bath acts as a massive heat sink, eliminating the need to shut down while servicing power burner or controls

d) All critical components are protected from outside weather conditions to assure maximum reliability. These units are completely insulated for an economical operation.

e) All models are built in accordance with Factory Mutual safety requirements.

f) All models feature safety interlocks which initiate automatic shut down sequence of power burner, de-energize liquid level controls and activate a warning light on the control panel in the event of excessive or insufficient burner gas pressure, excessive or insufficient waterbath temperature or low bath level.

g) "Blue Chip" burner control system includes automatic burner sequence, flame supervision, status indication, first out annunciation and a self diagnostic feature.

h) All units include dry alarm contacts for remote monitoring of the safety interlock and burner control status.

i) Integral liquid level control system prevents LP-Gas liquid from entering vapor line.

j) Units are shipped ready for use, requiring only electrical power supply and connection of liquid and vapor lines.

**1.06** Determine total amount of LP-Gas Vapor required. Add up the maximum inputs of all the gas using equipment in the system from manufacturers' data plates or literature, usually expressed in BTU/Hr. Be sure this is correct. If in doubt, contact the manufacturer of the equipment.

(a) Calculate required capacity as follows:

$$Q = \frac{H \times Fd}{91,690}$$

Where:

Q = Required capacity in Gallons/Hr. propane

H = Total input required, BTU/Hr.

Fd = Load Variation Factor; 1.1 for Gradual Load Changes, or 1.2 for Rapidly Fluctuating Load, 1.25 for temperatures below -20 degrees F.

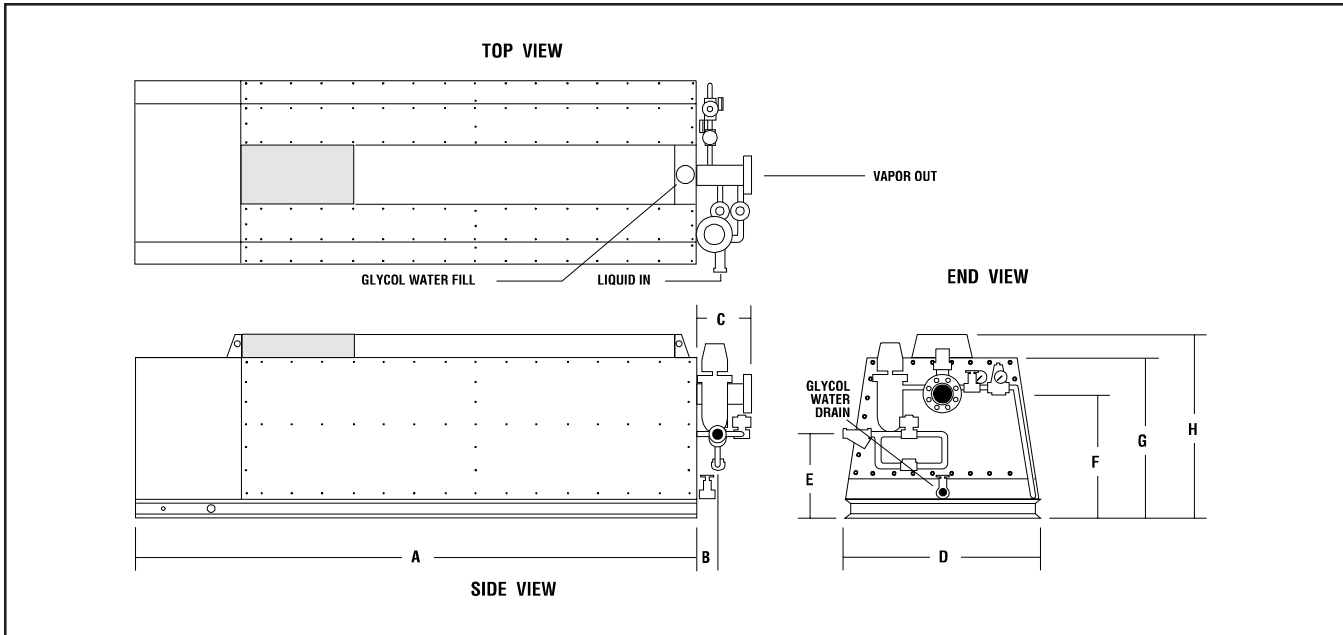
## 2. PHYSICAL DESCRIPTION

**2.01** The Ransome ID Series Vaporizers are all similar in design and construction. It should be installed on a level concrete slab designed to support the total weight of the machine filled with its water/glycol solution.

**2.02** The principle difference between models is capacity,

ranging from 500 GPH (Gallons Per Hour) to 10,000 GPH. Capacity is increased by vaporizer burner and tube size.

**2.03** Figure 2-1 illustrates a typical Vaporizer system and is provided with key letter call-outs for ID500 thru ID6000 physical dimensions.



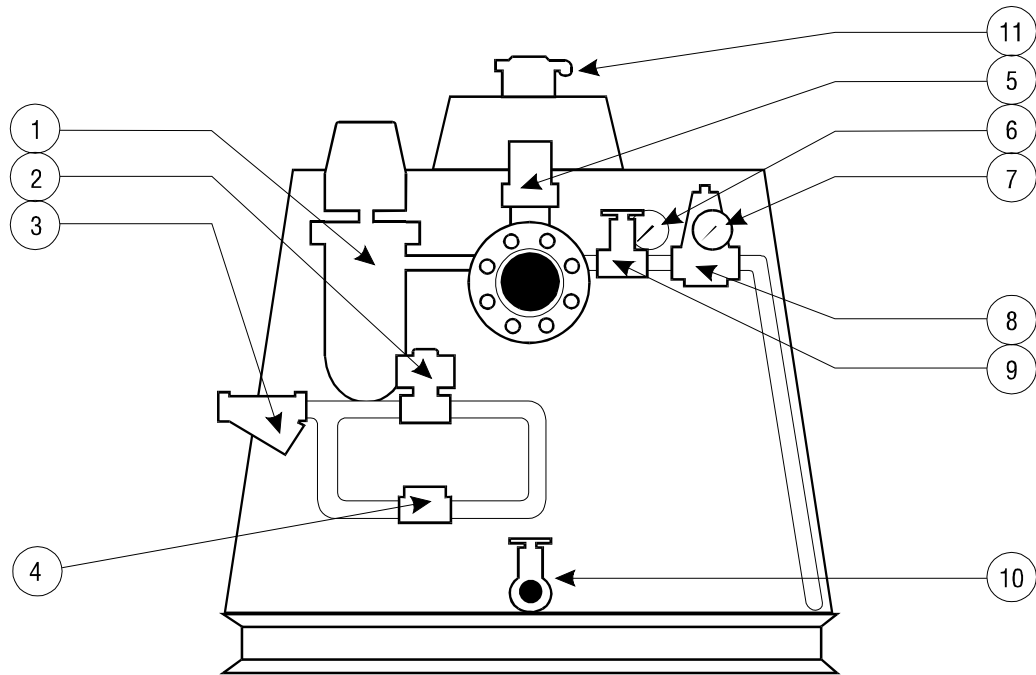
Ransome Model	DIMENSIONS, IN.								Approx. Weight LB.
	A	B	C	D	E	F	G	H	
ID 500	127.25	9	11	39	16	28	33.25	109	4,500
ID 750	165	10	12	43	20.25	31.5	39	49	5,800
ID 1000	185	10	12	60	23.75	40.75	50	60	8,200
ID 1500	200	10.5	12.5	60	23	39.75	47.25	57.25	9,200
ID 2000	220	10.5	12.5	66.75	29	46.75	54.5	64.5	15,000
ID 2500	235	11	13	79	26.5	43.5	53.25	63.25	17,000
ID 3000	276	11	13	79	32	49.75	58.25	68.25	19,500
ID 4000	292	11.5	17.5	94	34	61.75	68	78	24,000
ID 5000	330	13	20	94	35.5	64	71	81	28,000
ID 6000	384	14	22	106	37	66	74	84	32,000

Ransome Model	DIMENSIONS, CM.								Approx. Weight KG.
	A	B	C	D	E	F	G	H	
ID 500	323	23	28	99	41	71	84	109	2,041
ID 750	419	25	30	109	51	80	99	124	2,631
ID 1000	468	25	30	152	60	104	127	152	3,720
ID 1500	506	27	32	152	58	101	120	145	4,173
ID 2000	556	27	32	170	74	119	138	164	6,804
ID 2500	594	28	33	200	67	110	135	161	7,711
ID 3000	698	28	33	200	81	126	148	173	8,845
ID 4000	738	29	44	237	86	157	173	198	10,886
ID 5000	834	33	51	237	90	162	180	205	12,701
ID 6000	975	36	56	268	94	168	188	213	14,515

Figure 2-1 - ID Series Physical Specifications

**2.04** Figure 2-2 provides detail of the Burner Train Assembly. Associated Table 2-2 provides a cross reference for each

call-out, identifying the respective element as to function and/or description.



**Figure 2-2 - Typical ID Series Burner Train Assembly**

Key	Element	Function
1.	Liquid Level Float Switch Assembly	Monitors liquid level and actuates liquid inlet solenoid valve.
2.	Liquid Inlet Solenoid Valve	Blocks incoming liquid to prevent liquid spillover.
3.	"Y" Type Strainer	Prevents debris from entering vaporizer system.
4.	Check Valve	Allows liquid back flow when solenoid is closed.
5.	Relief Valve	Vents to atmosphere if vessel pressure exceeds 250 psig.
6.	Pressure Gauge	Displays vapor pressure at vaporizer outlet.
7.	Pressure Gauge	Displays first-stage gas pressure to vaporizer Burner Train.
8.	First-Stage Regulator	Provides first-stage gas pressure regulation for vaporizer Burner Train.
9.	Globe Valve	Provides manual shut-off of gas supply to vaporizer Burner Train.
10.	Gly Water Drain	Provides for draining water/glycol solution from vaporizer.
11.	Gly Water Fill	Provides for filling water/glycol solution into vaporizer.

**Table 2-2 - Typical ID Series Burner Train Assembly Cross-Reference**

## 2. PHYSICAL DESCRIPTION (Continued)

2.05 Figure 2-3 illustrates a typical ID Series Burner Control Train with key number call-outs for all the major system elements and controls.

Associated Table 2-3 provides a cross reference for each call-out, identifying the respective element as to function and/or description.

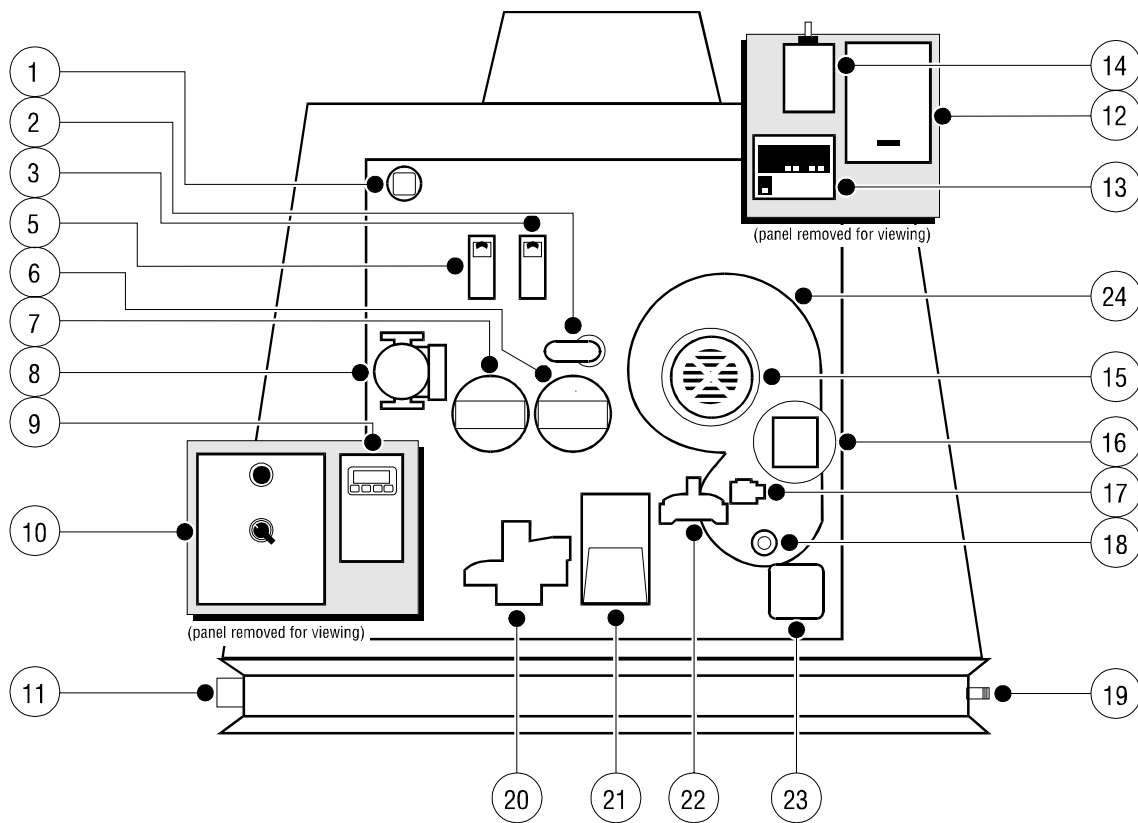


Figure 2-3 - Typical ID Series Burner Control Train Assembly

Key	Element	Function
1.	Low Water Cut-Off Switch	Safety interlock, signals low bath level.
2.	Operating Temperature Sensor	Monitors bath temperature.
3.	Low Temperature Switch	Safety interlock, signals low bath temperature.
4.	N/A	N/A
5.	High Temperature Switch	Safety interlock, signals high bath temperature.
6.	High Burner Gas Pressure Switch	Safety interlock, signals high second-stage gas pressure
7.	Low Burner Gas Pressure Switch	Safety interlock, signals low second-stage gas pressure.
8.	Recirculating Pump	Insures proper blending of water/glycol mixture.
9.	Operating Temperature Controller	Monitors bath temperature and signals burner firing.
10.	Control Box	Housing for OFF/ON/START, and READY switch.
11.	Gas Vent	Safely vents all internal controls to cabinet exterior.
12.	Motor Starter	Motor Starter for blower motor.
13.	Microcomputer	Flame safegaurd, supervises burner firing.
14.	Ignition Transformer	Provides the source of ignition required to ignite the burner.
15.	Blower Motor	Drives combustion air fan.
16.	Low Air Pressure Switch	Used by microcomputer to confirm adequate combustion air pressure to main burner.
17.	Pilot Gas Valve	Controls gas supply to pilot burner.
18.	Ultraviolet Sensor	Used by microcomputer for flame supervision.
19.	LPDrain	Provides for removal of heavy ends from Burner Train and purging air.
20.	Main Gas Regulator	Maintains proper main burner gas pressure.
21.	Main Gas Valve	Controls gas supply to main gas burner.
22.	Pilot Gas Regulator	Maintains proper pilot gas pressure.
23.	High/Low Motor	Drives burner from high to low firing rate.
24.	Blower Fan	Provides positive combustion air pressure.

**Table 2-3 - Typical ID Series Burner Control Train Assembly Cross-Reference**

### 3. FUNCTIONAL DESCRIPTION

**3.01** Figure 3-1 illustrates the general schematic for ID Vaporizers (see following page). The schematic is functionally equivalent for all sizes.

**3.02** LP-Gas is supplied to the Vaporizer Inlet from the user's Storage Tank(S) System at a pressure depending on temperature (refer to Table 3-1). The liquid passes through a solenoid valve on the liquid inlet assembly and enters the vaporizer. Once inside the vaporizer, the liquid passes through a series of heat exchange tubes that are submerged in hot water, where it changes from a liquid to a vapor and passes to the outlet.

#### Burner Train

**3.03** A small portion of the vapor supplied to the load is drawn off and used to supply the Burner Train. Vapor passes to a first-stage Gas regulator, reducing the vapor pressure to 15 psig then through a second stage gas regulator, reducing the vapor pressure to about 4" W.C. (see test report). A pressure gauge at the vaporizer outlet monitors the pressure supplied to both the load and the burner train. A second gauge located after the first stage regulator monitors the pressure supplied to the burner controls.

#### Burner Controls

**3.04** One of the purposes of the Burner Controller is to allow vapor to be supplied to Burner on demand. When the Water Bath temperature drops to less than 170 degrees F, the Operating Temperature Control Switch's contacts close and electrical energy passes to the Burner Controller. The activated controller now opens the pilot gas valve and lights the pilot by means of spark ignition. It then opens the main gas valve. The vapor passing through the main gas valve is lit as it reaches the burner causing the Water Bath temperature to increase. Subsequently, it reaches 170 degrees F causing the Operating Temperature Control Switch to signal the Burner Controller to shut down the Burner.

#### Limits and Safety Features

**3.05** The ID Series Vaporizer utilizes an external float switch to monitor liquid levels within the vaporizer. If the liquid reaches the high set-point, a solenoid valve on the liquid inlet line is closed, preventing a liquid spill over. Once the liquid level has dropped, this solenoid valve will re-open automatically.

**3.06** The ID Series Vaporizer is fitted with a series of safety interlocks which monitor all vital functions of the system. If an unsafe condition is noted, all control power is interrupted, causing the burner to initiate shutdown and the liquid level controls to close. The vaporizer will remain off until the unsafe condition is reversed and the START button is manually activated.

**3.07** The Burner controller utilizes a pressure switch to ensure that the blower is providing a positive air pressure prior to igniting the burner. The controller also utilizes an Ultraviolet Flame Detector to monitor the flame status to insure that a stable flame is maintained.

**3.08** The Vapor Outlet Line pressure is monitored by a Safety Relief Valve which opens when the line pressure exceeds 250 psig. The user should provide a Shut-Off Valve and Outlet Pressure Regulator on the Vapor Outlet Line. The Pressure Regulator should not be over 24 inches from the Vaporizer.

Temperature (F)	Approximate Pressure PSIG	
	Propane	Butane
100	220.0	46.0
100	190.0	37.0
90	165.0	29.0
80	140.0	22.0
70	120.0	16.5
60	102.0	11.5
50	86.0	6.9
40	72.0	3.0
30	58.0	
20	47.0	
10	37.0	
0	28.0	
-10	20.0	
-20	13.5	
-30	8.0	
-40	3.6	

**Table 3-1 - Storage Tank Pressure vs. Ambient Temperature Chart**



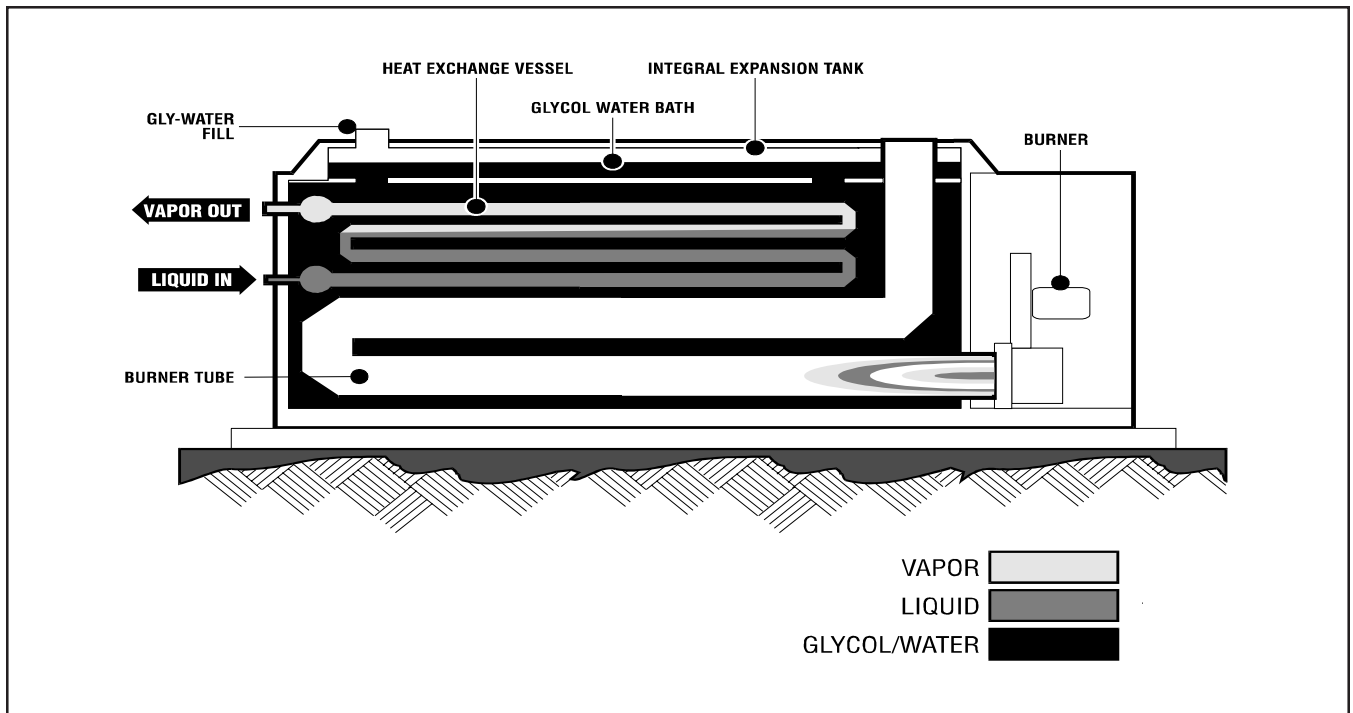


Figure 3-1 - General Schematic for ID Series Vaporizers

#### 4. SPECIFICATIONS

4.01 Table 4-1 will provide the user with tabulated performance specifications for ID Series Vaporizers. Figure 2-1 illustrates the physical specifications for ID Vaporizers. The user will find this useful when planning new installations.

#### Selection Chart

If your Peak Load Requirments are up to (1)				Approximate Water Capacity		Ransome Model
GAL/Hr Propane	KG/Hr	Thousands CF/Hr	of Millions of BTU/Hr	Gallon	Liter	
500	960	18.3	45.8	300	1,135	ID 500
750	1,440	27.5	68.8	400	1,514	ID 750
1,000	1,920	36.6	91.7	825	3,123	ID 1000
1,500	2,880	54.9	138	850	3,217	ID 1500
2,000	3,840	73.3	183	1,380	5,223	ID 2000
2,500	4,800	91.6	229	1,750	6,624	ID 2500
3,000	5,760	109.9	275	1,900	7,192	ID 3000
4,000	7,680	146.6	367	2,975	11,260	ID 4000
5,000	9,600	183.2	458	3,500	13,248	ID 5000
6,000	11,520	219.8	550	4,600	17,411	ID 6000

(1) Units may be paralleled to achieve greater capacities.

NOTE: For usage with other liquified gases, consult factory for sizing information. (i.e. C3H6, NH3, SO2, C12)

Table 4-1 - ID Series Functional Specifications

## 5. OPERATION

**5.01** The intent of Part 5 is to give the LP-Gas user general information on installation and start-up procedures for the Ransome ID Series Vaporizers. Each user's application will differ slightly, but it is hoped the user will gain from these generalized instructions.

**5.02** After consultation with Ransome Sales and Service Engineer or Distributor, the user will make a plan for the LP Gas storage and vaporizer location.

**5.03** When the Ransome equipment arrives, examine the shipping container for obvious damage and then carefully unpack it. Inspect for obvious shipping damage. All claims for shipping damage should be made to shipper, not to Ransome or distributor. Obvious workmanship problems or incomplete shipments should be immediately referred to Ransome (or distributor) following the warranty service procedures described in part 6.

### CAUTION

Do not use matches or other flames to conduct leak test.

### Start-Up and Operating Procedure

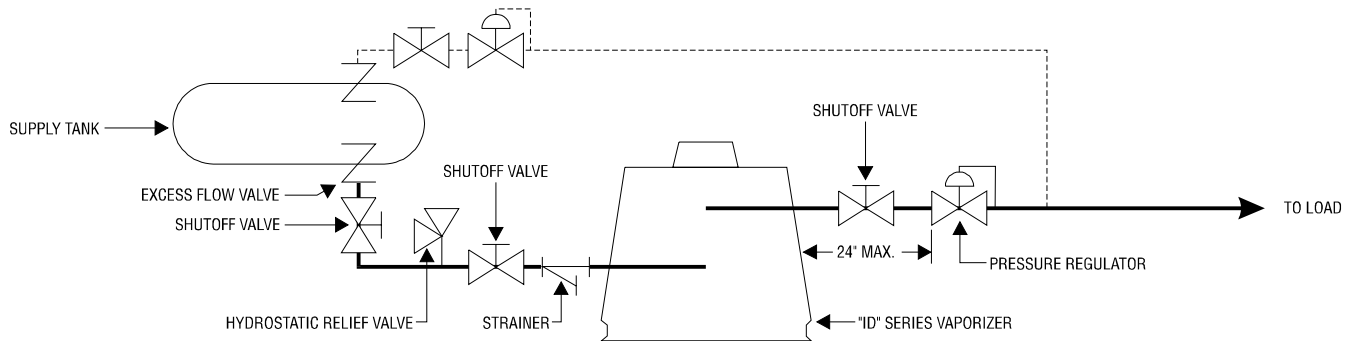
**5.04** All Ransome vaporizers are factory tested using commercial propane. Ransome equipment is thoroughly tested at the factory and proven to be free from leaks. However, vibration and jarring during subsequent handling, shipment and installation can cause leaks!

The factory recommends:

(a) Use a good quality liquid leak detecting solution, for leaks checking. This is available for subfreezing temperatures as needed. A thorough leak test using one of these solutions or equivalent leak detector must be conducted after installation and any leaks must be repaired prior to operation of the Vaporizer.

### CAUTION

Only a trained, experienced vaporizer serviceman should inspect, test, start-up or service this equipment.



### NOTES:

1. Equipment, piping and installation must be in accordance with provisions of NFPA 58, and all applicable state, provincial and local codes.
2. Liquid pump may be required to provide sufficient pressure to inlet of vaporizer during conditions of low tank pressure.
3. Outlet pressure regulator must be mounted at or above centerline of vaporizer outlet and as close as practicable to outlet.
4. Do not install dripleg or other liquid trap upstream of outlet pressure regulator.
5. Regulator outlet pressure must be adjusted to a pressure below the vapor pressure of the saturated LP-Gas at lowest operating temperature or vapor may reliquefy in downstream piping.
6. Liquid piping system must allow for occasional reverse flow toward supply tank to prevent excessive pressure during operation.

Figure 5-1 - Typical ID Series Installation

## Start Up and Operating Procedure (Continued)

Start-up instructions are based on complete proper installation of entire system, including storage tanks, valves, piping, pumps, bypass valves, etc., including required electrical power

supply. All must be in accordance with NFPA No. 58 Standards, and all state, provincial or local regulations, codes and laws. See Figure 5-1. Instructions assume use of clean, none-contaminated LP-Gas. Close all valves in system prior to start-up. Then proceed as follows:

**Step 1** - Fill machine with proper mixture of Dow Ambitol solution or equivalent and clean tap water to prevent freezing and corrosion. Use no more than 50% glycol. Pre-mix antifreeze and water before filling to insure a good mixture.

**Step 2** - Prime system by slowly opening valves in liquid line one at a time, between storage tanks and vaporizer inlet, starting at tank. If pump is incorporated, be sure to open valves on manual bypass line, to avoid excessive differential pressure and possible damage. DO NOT start pump at this time.

**Step 3** - Slowly open vaporizer's liquid inlet valve, liquid will flow up to liquid propane inlet control solenoid valve.

**Step 4** - Slowly open main burner gas valve, located at the vaporizer outlet, admitting propane to fill the first stage burner gas regulator.

**Step 5** - Slowly open pilot gas valve, located inside vaporizer cabinet.

**Step 6** - Slowly open main burner gas valve, located inside vaporizer cabinet, admitting propane vapor to the main gas valve.

**Step 7** - Reset manual lockouts on the HIGH and LOW Burner gas pressure switches.

**Step 8** - Rotate the OFF/ON/START Switch to the START position and hold for several seconds, allowing liquid inlet solenoid to open, admitting liquid propane to vaporizer heat exchanger tube.

**Step 9** - If the safety interlocks are satisfied, the green ready light will illuminate, indication that you can release the START Switch.

**Step 10** - Depress "SELECT" button on Temperature Controller or bypass 210 second countdown timer.

**Step 11** - Burner will now run through a firing sequence and fire until water bath reaches 175 degrees F.

**Step 12** - If the Burner fails to ignite, purge the vaporizer supply line to the burner of air by suitable means. Do not allow propane vapor to build up in vaporizer cabinet.

**Step 13** - When burner has shut down, the water bath has reached its operating temperature. The vaporizer is now ready to be put on line. Open vapor outlet valve (supplied by customer). Vaporizer will supply propane vapor to its capacity. Start liquid pump if required.

## Start Up and Operating Procedure (Continued)

### Temporary Shut Down

1. Close vapor outlet valve (supplied by customer). Vaporizer burner will cycle on and off to maintain heat for quick turn on. During idle periods, pump need not be used.

### Complete Shut Down

1. Shut off pump (if used).
2. Rotate vaporizer "ON/OFF/START" switch to the OFF position.
3. Shut liquid and vapor valves.
4. Close vapor outlet valve (supplied by customer).

### Safety Interlocks

(Controls that would prevent machine from starting):

1. Low Water cut-off switch
2. High Temperature Switch
3. Low Temperature Switch
4. Low Propane Vapor Switch
5. High Propane Vapor Switch

#### NOTE

A safe way to check if switch is open is to place a volt meter across each interlock to see which one is open and keeping the machine from starting.

### Factory Interlock Settings (Should not be adjusted)

1. High Temperature Switch: 200 degrees F.
2. Low Temperature Switch: 100 degrees F.
3. Operating Temperature Switch: (#1) 175° F, 10° DIFF. (#2, #3 and #4 not used)
4. Low Vapor Pressure Switch: 1 inch W.C.
5. High Propane Vapor Switch: 15 inches W.C.

## 6. MAINTENANCE

**6.01** All maintenance procedures in part 6 should be in accordance with local regulations and the user's maintenance plan.

### Safety Precautions

**6.02** The ID Series Vaporizers contain flammable gas under various pressures while in normal operation. Any gas leaks within the vaporizer system or in any part of the installation are potentially dangerous and must be eliminated immediately or a fire may occur. Any odor, gas or dark oily stains on joints or fittings indicate a possible gas leak. If such leak does exist, pilots or other sources of ignition must be immediately extinguished. Electrical power should be disconnected at a location remote from the suspected leak.

**6.03** Thorough inspections for leaks should be conducted frequently. Any leak should be repaired immediately. Since this equipment, as well as any other components in the installation use threaded joints, gaskets, and O-rings are subjected to vibration and thermal stresses, the possibility of leaks developing over a period of time is always present.

### Emergency Instructions

**6.04** If a large leak is discovered, do not attempt to repair.

- a) Evacuate all personnel from the area.
- b) Call the Fire Department.
- c) If it can be done SAFELY, shut off main gas supply valve(s) at the LP-Gas storage tank(s). The leak will stop all gas downstream from the gas supply valve(s) has been exhausted.
- d) Make certain all gas has dispersed before attempting repairs.

### Routine Inspections

**6.05** Operating Switches and Controls should be checked for correct performance at frequent intervals. Repair or replacement should be accomplished at the first indication or sticking, erratic performance or any abnormal condition.

**6.06** Safety Relief Valves should be replaced at no more than five year intervals or any time possible damage is suspected. Vent piping connected to safety relief valves must be kept open - free from condensation, ice or other foreign material that might restrict release of excessive pressure in an emergency.

**6.07** Pressure regulator Vents must be clear because erratic operation, lack of stability or loss of control may result.

**6.08** Burner Train: Burners, pilots, controls and all related components must be kept free of insects, cobwebs, debris and/or other foreign materials that might impair operation. Particular attention should be paid to the possibility of tar or other sticky or oily deposits accumulating in the gas controls. These deposits must be removed to prevent faulty operation. If these heavy ends are continually found in the fuel, the burner gas for the vaporizer may be withdrawn directly from storage tank(s). If this is to be done, a suitable regulator should be installed at the storage tank to avoid recondensation.

**6.09** Glycol-Water Mixture in the Vaporizer Water Bath must be kept at the proper operating level. This can be routinely checked through the filler coupling. Continuous loss of liquid indicates a leak or could be due to excessive Water Bath temperature. The Operating Temperature Switch may require replacement or readjustment to 170 degrees F. When vaporizer is handling a load, Water Bath temperature will increase to as high as 180 degrees F. This is a normal occurrence.

### CAUTION

NEVER operate an ID Water Bath Vaporizer on anything but a mixture of a good quality ethylene glycol base antifreeze (no more than 50%) and water. Use of straight antifreeze will severely reduce vaporizing capacity and straight water boil away as well as cause severe corrosion.

**6.10** Water Bath Mixture tests should be made periodically for antifreeze protection as well as condition of the rust inhibitors. Replace mixture or supplement glycol or rust inhibitors as indicated.

**6.11** Exterior Paint - Keep all external surfaces well painted to prevent deterioration and rust.

## Purging Gas From System

**6.12** If service requires removal of gas from the system, do not merely vent gas to the atmosphere. This could result in fire with the possibility of injury or damage.

- a) A Flare Burner should be installed at a safe distance from any gas leakage.
- b) Dispose of gas by burning.
- c) Make sure all gas is actually removed from the equipment before any connections are loosened.

**6.13** If LP-Gas liquid is present in the Ransome equipment, it will chill as the pressure is relieved, slowing the rate at which it will boil and discharge as vapor through the Flare Burner. BE CERTAIN all liquid is actually vaporized before loosening any connections. The presence of frost on the outlet of a component part is an indication of the presence of LP-Gas liquid and no connection should be loosened until it melts.

**6.14** All servicing must be done in a safe, thorough, step-by-step manner. If in doubt about what to do, the serviceman should:

- a) Consult the Operation Manual.
- b) Consult the gas system installer
- c) Contact Ransome, following the instructions under Warranty Service in this manual.

## Gas System Trouble Shooting

**6.15** The trouble shooting procedures described in TABLE 6-1 are intended to help a serviceman isolate the cause of trouble encountered during routine operation. Only the kinds of trouble most likely to be encountered in service are listed; the list is by no means comprehensive. The Probable Cause column of Table 6-1 lists in order of most likely occurrence. To make best use of these trouble shooting procedures, the serviceman should be thoroughly familiar in the physical and functional Description of the Ransome system, described in parts 2 and 3 of this manual.

**6.16** Before beginning any trouble shooting, make certain the Ransome Vaporizer has been properly installed. All system components including storage tanks, valves, piping, pumps and bypass valves must conform to NFPA No. 58 Standards and all state, provincial or local regulations, codes and laws.

## Warranty Service

**6.17** Faulty system components should be returned to Ransome Manufacturing following the conditions set out in the Warranty. Defective material or technical questions should be referred to:

**RANSOME MANUFACTURING**  
**3495 South Maple Avenue**  
**Fresno, California 93725**  
**U.S.A.**

Phone (559) 485-0979 / Fax (559) 485-8869

When the material is returned to Ransome, the following information will expedite repair or replacement and return if it is included:

- (a) Complete Material Return Authorization (MRA) form. These can be obtained from Ransome Customer Service upon request.
- (b) The name and area code - telephone number of the individual most familiar with the failure.
- (c) A brief statement of the problem with the unit.
- (d) Make(s) of other gas equipment in the user's system.
- (e) The approximate date and Purchase Order Number for the Ransome equipment (if known).
- (f) The Model and Serial Number of the Ransome equipment.

**Table 6-1 - Trouble Shooting**

<b>Symptom</b>	<b>Probable Cause</b>	<b>Remedy</b>
Flame Fail	<ol style="list-style-type: none"> <li>1. Air in lines.</li> <li>2. Spark plug failure.</li> <li>3. Open ignition wire.</li> <li>4. Pilot or main gas valve failure.</li> <li>5. Pilot or main gas regulator failure.</li> <li>6. Ignition transformer failure.</li> <li>7. Manual shut-off valve closed.</li> <li>8. Adjustable pilot orifice cock closed.</li> <li>9. UV scanner failure.</li> </ol>	<p>Purge system.</p> <p>Clean, readjust. Replace if necessary.</p> <p>Check. Replace if necessary.</p> <p>Inspect valve assembly. Clean, repair or replace.</p> <p>Inspect. Clean, repair or replace.</p> <p>Check connections. Replace if necessary.</p> <p>Open.</p> <p>Open.</p> <p>Check conns., measure output. Replace if necessary.</p>
Out Limits	<ol style="list-style-type: none"> <li>1. Low burner gas pressure.</li> <li>2. High burner gas pressure.</li> <li>3. High temperature switch.</li> </ol>	<p>Check supply pressure and adjust.</p> <p>Inspect regulator and adjust to factory specs.</p> <p>Adjust to 200° F.</p>
Liquid at Vaporizer Outlet	<ol style="list-style-type: none"> <li>1. Flame failure.</li> <li>2. Temperature control.</li> <li>3. Spillover float switch failure.</li> <li>4. ID over-capacitated</li> <li>5. Solenoid valve failure</li> </ol>	<p>See "Flame fail" above.</p> <p>Check.</p> <p>Check.</p> <p>Reduce Load.</p> <p>Inspect, repair.</p>
Pressure drop in machine with water bath at operating temperature.	<ol style="list-style-type: none"> <li>1. Liquid inlet solenoid failure.</li> <li>2. Spillover float switch failure.</li> <li>3. Manual shut-off valve closed.</li> </ol>	<p>Inspect.</p> <p>Check.</p> <p>Open.</p>
Water-Bath not reaching operating temperature.	<ol style="list-style-type: none"> <li>1. ID over-capacitated.</li> <li>2. Op. temperature controller.</li> <li>3. Flame failure.</li> </ol>	<p>Reduce load.</p> <p>Adjust to 170°.</p> <p>See "Flame fail" above.</p>

**Table 6-2 - Replaceable Parts List**

Item	Ransome Part No.	Mfg. Part No.	Description
1		700-HC24A1	Relay plug in 14 PIN 4PDT
2	01-55636-00	N/A	Fuse 5 amp ADC ceramic
3	06-57015-01	C645C1020	Switch, low press. cut-off (Low Burner Gas)
4	06-57016-00	L4006A	Switch, high temp. (High Water Temperature)
5	06-57016-50	L4006B	Switch, low temp. (Low Water Temperature)
6	06-57036-00	C437D1005	Pressure switch, (High Burner Gas)
7	06-57037-00	C437E1004	Pressure switch (Low Air Pressure)
8	06-57065-00	McDONNELL#69	Switch, low water cut-off (Low Water Level)
9	10-627/5810	627/5810	1st stage regulator, 3/4 NPT, 10-25 PSI (1st Stage Burner Gas)
10	10-R522-CFF	R522CFF	2nd stage regulator, 1/2" x 3/4" 9-1/2" -13"wc (Pilot Gas Regulator)
11	10-S302G-SMC	S302G-SMC	2nd stage regulator 2" NPT (Main Burner Gas Regulator)
12	14-58075-00	V4055A1007	Fluid actuator, Honeywell (Operator for Main Gas Valve)
13	14-58076-00	V4046C1054	Pilot gas valve, (Pilot Gas Solenoid)
14	14-58083-00	V5055B1069	Valve body, (Main Burner Gas Valve)
15	18-59000-00	Jo-Bell#CB303EP	Control, level-float assembly
16		22042	Webster Type 612-6A7H (Ignition Transformer)
17	18-59300-05	25663	Spark Ignitor
18	18-59250-05	C7027A 1023	Mini Peeper, UV flame scanner
19	18-RM7800E 1010	RM7800E 1010	Microcomputer, burner controller
20	18-ST7800A 1039	ST7800A 1039	Microcomputer, timer card
21	18-R7849A 1015	R7849A 1015	Ultraviolet amplifier
22	90-90260-00	Grundfos #2P410	Pump, water recirculating
23	00-5161-F33A55	F33A55	Liquid inlet solenoid, 1-1/4"