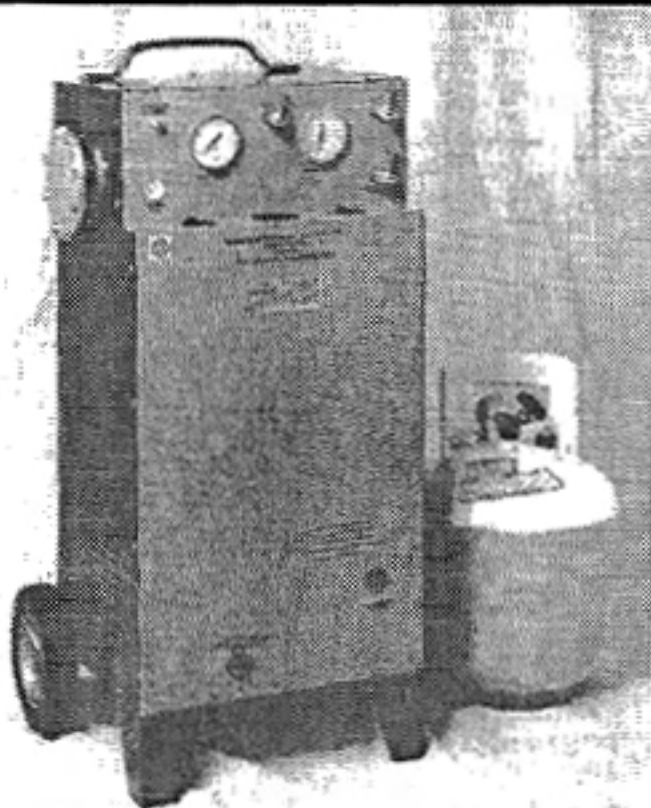


OPERATING INSTRUCTIONS



MODEL RLV-700

**REFRIGERANT RECOVERY / RECYCLING UNIT
(PATENTED)**

**NATIONAL REFRIGERATION PRODUCTS
985 WHEELER WAY • LANGHORNE, PA 19047
(215) 638-8909 FAX (215) 638-9270**

REVISED 6-22-99

MODEL RLV700

The RLV700 unit can recover/recycle liquid and vapor refrigerant. It has only one inlet for refrigerant and automatically adjust itself for proper mode when liquid or vapor enters the unit. For safety reasons this unit is equipped with an automatic recovery cylinder shut off. This shut off maintains a maximum 80% fill of the recovery cylinder by volume. The unit has an hourmeter to indicate when to change filter drier cores. Filter cores must be changed every 4 hours or 135 lbs processed!

ALWAYS USE CYLINDERS APPROVED FOR RECOVERY (NRP model NC50U or equivalent).

DO NOT MIX DIFFERENT REFRIGERANTS IN A CYLINDER. Mixtures cannot be separated.

ALWAYS WEAR RUBBER GLOVES AND GOGGLES WHEN TRANSFERRING REFRIGERANT.

BEFORE FILLING AN EMPTY CYLINDER ALWAYS EVACUATE THE CYLINDER FOR 15 MINUTES OR TO AT LEAST 1000 MICRONS TO REMOVE AIR AND NONCONDENSABLES. NONCONDENSABLES WILL INCREASE DISCHARGE PRESSURE DRAMATICALLY.

ALWAYS USE A PREFILTER (ALCO #ALF-053, PARKER #PF053-MF, OR FILTER DRIER SPORLAN #C-053) AT THE INLET OF THE UNIT. FAILURE TO DO THAT MAY RESULT IN MALFUNCTIONING OF PRESSURE REGULATOR, LIQUID/VAPOR SWITCH, AND SOLENOID VALVES.

NOTE:

1. All valves on the RLV700 must be in the closed position except when the unit is in use. The RLV700 is like a refrigeration unit and must not be open to the air.
2. Connect the RLV700 to a properly grounded 115 Volt 1 phase 60 Hz outlet. Do not use an extension cord longer than 25 ft. Voltage drop will damage the compressor.
3. Refrigeration hoses should not exceed eight feet in length.
4. USE A PREFILTER (ALCO #ALF-053, PARKER #PF053-MF, OR FILTER DRIER SPORLAN #C-053) TO PREVENT PARTICLES TO INTERFERE WITH PROPER OPERATION OF PRESSURE REGULATOR, LIQUID/VAPOR SWITCH, AND SOLENOID VALVES. PREFILTER MUST BE CHANGED AFTER RECOVERY FROM A BURNOUT SYSTEM, BEFORE PROCESSING ANOTHER REFRIGERANT, AFTER PROCESSING 135 POUNDS OF REFRIGERANT.
5. RLV700 unit is suitable for R12, R22, R134a, R502, and Blends.
6. Always remove Schrader cores from access fitting when process refrigerant from disabled unit. This type of restriction reduces flow rate drastically.

7. Evacuate the RLV700 by hooking a vacuum pump up to the outlet port. Evacuate for 15 minutes or 1000 microns. Turn the RLV700 on without the float cord connected. This energizes the solenoids allowing access to all the piping.

COMPRESSOR OIL SIGHT GLASS

During normal operation a very small amount of compressor oil will be carried out of the RLV700 unit. The compressor oil level should be at 1/2 sight glass (located on the front side of the unit). When oil level decreases, oil needs to be added to the compressor. Use 150 or 300 viscosity refrigeration oil. Before adding oil ensure that any pressure in the unit has been properly relieved and the inlet valve is closed. To add oil, attach a hose to "Oil charging port". Transfer oil from a container by turning RLV700 on until the sight glass is 1/2 full. **DO NOT OVERFILL.** Turn unit off, close oil port cap. Normal oil charge is approximately 14-16 ounces.

COMPRESSOR OIL DRAIN

The compressor oil drain is located on the bottom of the unit. Before draining oil ensure that pressure has been properly relieved in the unit. Remove fitting cap and Schrader valve, tilt the unit. Oil will drain into container by gravity. Drain oil into a container for proper disposal. **WARNING: Oil in the compressor can be under pressure and hot if unit has been running. Serious burns could occur. Use caution!**

WARNING

1. Avoid the use of an extension cord because the cord may overheat. However, if you must use one, the cord must be a minimum number 14/3, oil resistant, meet N.E.C., and be 25 ft long maximum.
2. THE FOLLOWING DAMAGES TO RLV700 ARE NOT COVERED BY THE WARRANTY:
 - A. Damage to the compressor due to the compressor being run without oil.
 - B. Damage to the pressure regulator, liquid/vapor switch, level switch, or solenoid valves due to particles introduced into unit because prefilter was not used or changed.

WARRANTY

NRP Recovery/Recycling Equipment is warranted to be free of manufacturing defects. NRP will repair or give credit for repair at NRP's choice if any NRP Recovery/Recycling unit or accessories have manufacturing defects. Any warranty claim must be submitted in writing within one year of purchase with a copy of the original invoice. Under no circumstances shall NRP be liable for the cost of labor charges, lost profits, injury to good will or any other special or consequential damages for defective goods, late delivery or non-delivery. There are no warranties which extend beyond the description of the face hereof, and NRP makes no warranty of merchantability or fitness for a specific purpose. This warranty does not cover damage by improper operation or abuse.

RECOVERY/RECYCLING PROCEDURE

The RLV700 can recover/recycle liquid and vapor refrigerant. It has only one inlet for refrigerant. When liquid or vapor enters the unit it automatically switches itself to the proper mode of operation.

IMPORTANT: Pump-out switch must be in "OFF" position during recovery/recycling.

VERY IMPORTANT: Always use a prefilter (Alco #ALF-053, PARKER #PF053-MF, or filter drier SPORLAN #C-053) at the inlet of the unit. Failure to do that may result in malfunctioning of pressure regulator, liquid/vapor switch, and solenoid valves.
Prefilter must be changed after processing refrigerant from a burnout system, when transferring another refrigerant, after processing 500 lb of refrigerant.

1. Connect the inlet of the RLV700 unit to the liquid port of the source of contaminated refrigerant (recovery cylinder, disabled unit, etc).
2. Connect the outlet of the RLV700 unit to the liquid port of the cylinder designated for recycled refrigerant.
3. Open inlet and outlet valves on the RLV700 unit, liquid valve on recycled refrigerant cylinder, and liquid valve on contaminated refrigerant source (if it has one).
4. Turn on the RLV700 unit.
The unit will recover/recycle refrigerant. Switching from liquid to vapor mode and from vapor to liquid mode is automatic.

VERY IMPORTANT: During recovery/recycling pay attention to contaminant accumulator sight glass. Since all contaminants (oil, acid, particulates) are separated in the accumulator it is imperative to drain them out (see Contaminants draining procedure) when:

- A. Contaminants are level with the sight glass.
 - B. Recovery/recycling is complete.
 - C. Replacing a full cylinder with recycled refrigerant with an empty one.
 - D. Changing filter drier cores.
5. When recovery/recycling is complete, close all the valves and drain the accumulator (see Contaminants draining procedure).

CONTAMINANTS DRAINING PROCEDURE

Contaminants accumulator must be drained when:

- A. Contaminants are level with the sight glass.
- B. Recovery/recycling is complete.
- C. Replacing a full cylinder with recycled refrigerant with an empty one.
- D. Changing filter drier cores.

To drain accumulator:

1. Connect a hose to "ACCUMULATOR DRAIN" valve. Another end of the hose put into a container.
2. Close the inlet valve.
3. Turn on the RLV700 unit.
4. Evacuate low pressure side of the RLV700 unit to 10"-15" of vacuum. (R22 - 10") all others 15"
5. Turn off the unit.
If pressure on inlet gauge is rising above 0 psi repeat steps 2 and 3.
6. Connect a hose to a vapor valve of the cylinder you currently discharge refrigerant into, purge the hose, and connect the hose (house fitting to be with a depressor) to the "Compressor oil charge" port.
7. Slowly open the vapor valve of the cylinder to increase pressure on the low side of the RLV700 to 3-5 psig (never increase pressure above 5 psig).

8. Slightly open the "ACCUMULATOR DRAIN" valve and drain all contaminants into a container for proper disposal.
Drain contaminants until gas starts coming out of the drain hose. If necessary repeat step 7.

CLEARING TRAPPED REFRIGERANT

Since the RLV700 is designed to be used with different refrigerants clearing procedure which removes residual refrigerant out of the unit to be followed before transferring a different refrigerant.

To clear refrigerant out of the unit:

1. Connect outlet of the unit to the vapor side of empty (or almost empty) cylinder.
2. Open outlet valve of the unit and vapor valve of the cylinder.
3. Keep closed the inlet valve of the unit.
4. Turn the unit "ON".
5. When the inlet gauge indicates vacuum, turn the pump out switch "ON" (the pressure on the inlet gauge will go up).
6. When the inlet gauge is down to 10" of vacuum, pump out is complete.
7. After completing pump out, turn "OFF" the power switch and then pump out switch.
8. A total evacuation of the unit can be obtained by using a vacuum pump.

IMPORTANT: The composition of oil in recycled refrigerant is slightly higher during pump out procedure.

It will be still lower than requirements of the INDUSTRY RECYCLING GUIDELINE (IRG-2) but if user is attempting to clean refrigerant to requirements of ARI Standard 700, the pump out should be discharged into separate cylinder (this refrigerant can be recycled later).

Purging Non-Condensables - Method (1)

Allow the cylinder, into which you have recycled the refrigerant, to sit for as long as possible. This helps separate the refrigerant gas from the non-condensable. ARI allows 15 minutes to complete the purge cycle. Slowly open the vapor valve on your recovery tank. Evacuate air from the tank for no more than 8-10 seconds.

Purging Non-Condensables - Method (2)

As in method (1) it is good to let the cylinder sit for as long as possible. Minimum ambient should be 65 degrees F.

- * Install a pressure gauge calibrated with 1 PSIG divisions to the vapor port of your recovery/recycling tank.
- * Measure the cylinder pressure.
- * Measure the temperature of the cylinder midway on the top domed radius.
- * From the chart find the tank pressure from the measured temperature.
- * Compare the measured tank pressure and converted pressure from dome temperature to the chart provided.
- * If the measured values are within 8 PSI of each other, the recycled refrigerant is within specification.
- * If it is not, follow the purging procedure used in method (1) to remove the non-condensables until an 8 PSI differential is obtained.

PSIG	Temperature, °F						
	Yellow	Green	Green	Blue	Purple	Teal	White
	REFRIGERANT - (Sporlan Code)						
	12 (F)	22 (V)	124 (U)	134a (J)	502 (R)	AZ50 or 507 (P)	717 (A)
5*	-29	-48	3	-22	-57	-59	-34
4*	-28	-47	4	-21	-55	-57	-33
3*	-28	-45	4	-19	-54	-55	-32
2*	-25	-44	7	-18	-52	-55	-30
1*	-14	-34	9	-18	-51	-53	-29
0	-22	-41	10	-15	-50	-52	-28
1	-19	-39	13	-12	-47	-50	-26
2	-18	-37	16	-10	-45	-47	-23
3	-14	-34	18	-8	-42	-45	-21
4	-11	-32	21	-5	-40	-43	-19
5	-9	-30	23	-3	-38	-41	-17
6	-7	-28	26	1	-36	-39	-15
7	-4	-26	28	1	-34	-37	-13
8	-2	-24	30	3	-32	-35	-12
9	0	-22	32	5	-30	-34	-10
10	2	-20	34	7	-29	-32	-8
11	4	-19	36	8	-27	-30	-7
12	5	-17	38	10	-26	-29	-5
13	7	-15	40	12	-24	-27	-4
14	9	-14	41	13	-22	-25	-2
15	11	-12	43	15	-20	-24	-1
16	12	-11	45	16	-19	-23	2
17	14	-9	48	18	-18	-21	3
18	15	-8	48	19	-18	-20	3
19	17	-7	49	21	-15	-18	4
20	18	-5	51	22	-13	-17	6
21	20	-4	52	24	-12	-16	7
22	21	-3	54	25	-11	-15	8
23	23	-1	55	26	-9	-13	9
24	24	0	57	27	-8	-12	11
25	25	1	58	29	-7	-11	12
26	27	2	59	30	-6	-10	13
27	28	4	61	31	-5	-9	14
28	29	5	62	32	-4	-8	15
29	31	6	63	33	-3	-6	16
30	32	7	65	35	-1	-5	17
31	33	8	66	36	0	-4	18
32	34	9	67	37	1	-3	19
33	35	10	68	38	2	-2	19
34	37	11	69	39	3	-1	20
35	38	12	71	40	4	0	21
36	39	13	72	41	5	1	22
37	40	14	73	42	6	2	23
38	41	15	74	43	7	3	24
39	42	16	75	44	8	4	25
40	43	17	76	45	9	5	26

PRESSURE-TEMPERATURE RELATIONSHIP CHART

50	53	26	86	54	18	13	34
52	55	28	88	56	20	15	35
54	57	29	90	57	21	16	37
56	58	31	91	59	23	18	38
58	60	32	93	60	24	19	40
60	62	34	95	62	26	21	41
62	64	35	97	64	27	22	42
64	65	37	98	65	29	24	44
66	67	38	100	66	30	25	45
68	68	40	101	68	32	27	46
70	70	41	103	69	33	28	47
72	71	42	104	71	34	29	49
74	73	44	106	72	35	30	50
76	74	45	107	73	37	32	51
78	76	46	109	75	38	33	52
80	77	48	110	76	40	34	53
82	78	49	111	77	41	35	54
84	80	51	112	79	43	37	56
86	81	52	113	80	44	38	57
88	82	53	114	81	45	39	58
90	84	54	115	82	46	40	59
92	85	55	116	83	47	41	60
94	86	56	117	84	48	42	61
96	87	57	118	85	49	43	62
98	88	58	119	86	50	44	63
100	89	59	120	87	51	45	64
102	90	60	121	88	52	46	65
104	91	61	122	89	53	47	66
106	92	62	123	90	54	48	67
108	93	63	124	91	55	49	68
110	94	64	125	92	56	50	69
112	95	65	126	93	57	51	70
114	96	66	127	94	58	52	71
116	97	67	128	95	59	53	72
118	98	68	129	96	60	54	73
120	100	69	130	97	61	55	74
122	101	70	131	98	62	56	75
124	102	71	132	99	63	57	76
126	103	72	133	100	64	58	77
128	104	73	134	101	65	59	78
130	105	74	135	102	66	60	79
132	106	75	136	103	67	61	80
134	107	76	137	104	68	62	81
136	108	77	138	105	69	63	82
138	109	78	139	106	70	64	83
140	110	79	140	107	71	65	84
142	111	80	141	108	72	66	85
144	112	81	142	109	73	67	86
146	113	82	143	110	74	68	87
148	114	83	144	111	75	69	88
150	115	84	145	112	76	70	89
152	116	85	146	113	77	71	90
154	117	86	147	114	78	72	91
156	118	87	148	115	79	73	92
158	119	88	149	116	80	74	93
160	120	89	150	117	81	75	94
162	121	90	151	118	82	76	95
164	122	91	152	119	83	77	96
166	123	92	153	120	84	78	97
168	124	93	154	121	85	79	98
170	125	94	155	122	86	80	99
172	126	95	156	123	87	81	100
174	127	96	157	124	88	82	101
176	128	97	158	125	89	83	102
178	129	98	159	126	90	84	103
180	130	99	160	127	91	85	104
182	131	100	161	128	92	86	105
184	132	101	162	129	93	87	106
186	133	102	163	130	94	88	107
188	134	103	164	131	95	89	108
190	135	104	165	132	96	90	109
192	136	105	166	133	97	91	110
194	137	106	167	134	98	92	111
196	138	107	168	135	99	93	112
198	139	108	169	136	100	94	113
200	140	109	170	137	101	95	114
202	141	110	171	138	102	96	115
204	142	111	172	139	103	97	116
206	143	112	173	140	104	98	117
208	144	113	174	141	105	99	118
210	145	114	175	142	106	100	119
212	146	115	176	143	107	101	120
214	147	116	177	144	108	102	121
216	148	117	178	145	109	103	122
218	149	118	179	146	110	104	123
220	150	119	180	147	111	105	124
222	151	120	181	148	112	106	125
224	152	121	182	149	113	107	126
226	153	122	183	150	114	108	127
228	154	123	184	151	115	109	128
230	155	124	185	152	116	110	129
232	156	125	186	153	117	111	130
234	157	126	187	154	118	112	131
236	158	127	188	155	119	113	132
238	159	128	189	156	120	114	133
240	160	129	190	157	121	115	134
242	161	130	191	158	122	116	135
244	162	131	192	159	123	117	136
246	163	132	193	160	124	118	137
248	164	133	194	161	125	119	138
250	165	134	195	162	126	120	139
252	166	135	196	163	127	121	140
254	167	136	197	164	128	122	141
256	168	137	198	165	129	123	142
258	169	138	199	166	130	124	143
260	170	139	200	167	131	125	144
262	171	140	201	168	132	126	145
264	172	141	202	169	133	127	146
266	173	142	203	170	134	128	147
268	174	143	204	171	135	129	148
270	175	144	205	172	136	130	149
272	176	145	206	173	137	131	150
274	177	146	207	174	138	132	151
276	178	147	208	175	139	133	152
278	179	148	209	176	140	134	153
280	180	149	210	177	141	135	154
282	181	150	211	178	142	136	155
284	182	151	212	179	143	137	156
286	183	152	213	180	144	138	157
288	184	153	214	181	145	139	158
290	185	154	215	182	146	140	159
292	186	155	216	183	147	141	160
294	187	156	217	184	148	142	161
296	188	157	218	185	149	143	162
298	189	158	219	186	150	144	163
300	190	159	220	187	151	145	164

FILTER DRIER CORES CHANGE

Filter drier cores must be changed when transferring another refrigerant or every 4 hours of recovery/recycling. The RLV700 has an hourmeter which is energized when the compressor is on. Filter drier core change has to be made as fast as possible to avoid adsorption of moisture from the air.

IMPORTANT: After filter drier change the RLV700 must be evacuated.

To change filter cores:

1. Properly relieve pressure from the RLV700 unit.
2. Unscrew bolts on filter drier shells and take cartridges with filter cores out of the shells.
3. Examine gaskets on the filter caps and on the end of the cartridges. If necessary replace them.
4. Properly wipe internal surface of the shells with clean rag.
5. Replace the cores and install cartridges with the new cores into the shells. **REPLACE AND INSTALL ONE CORE AT THE TIME. DO NOT FORGET TO INSTALL FINAL FILTER PADS (final filter pads are supplied with filter cores).**
6. Evacuate the unit.

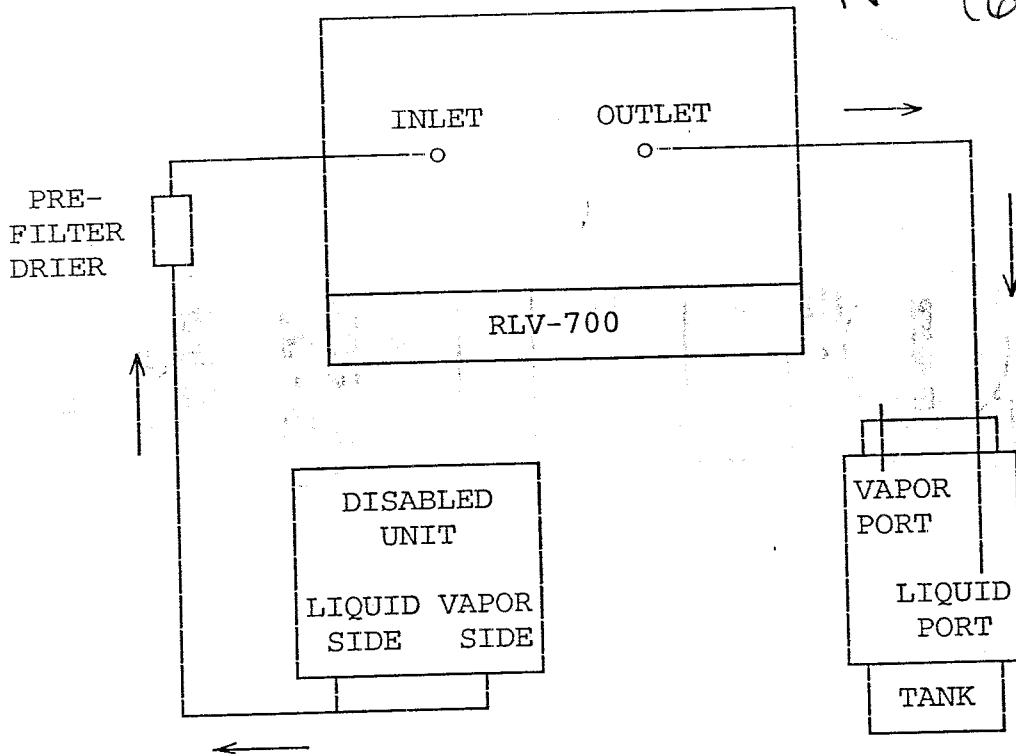
IMPORTANT RECOMMENDATION

The RLV700 unit was tested to ARI Standard 740 and if properly maintained and operated will clean refrigerants to requirements of ARI Standard 700-95 concerning WATER, CHLORIDE ION, ACIDITY, NON BOILING RESIDUES AND PARTICULATES/SOLIDS.

The RLV700 unit (as any other recycling unit) cannot separate mixtures of refrigerants and thus satisfy requirements ARI Standard 700 concerning "OTHER REFRIGERANTS" if refrigerant designated for recycling contains other refrigerant(s). In this case refrigerant must be sent for reclamation.

DIAGRAM: RLV700 LIQUID RECOVERY AND VAPOR RECYCLING

*N6ØHDSBV
(60" HOSE ASS'Y)*



RLV700 RECOVERY/RECYCLING:

- * THE CONTAMINATED REFRIGERANT IS RECOVERED OR PUMPED AUTOMATICALLY, FROM A DISABLED UNIT OR A REFRIGERANT CYLINDER, BY THE RLV700
- * THE RLV700 RECYCLES AUTOMATICALLY THIS REFRIGERANT IN ONE PASS AND TRANSFERS THE RECYCLED REFRIGERANT INTO A RECOVERY TANK
- * THE RLV700 CAN PROCESS REFRIGERANT IN VAPOR FORM OR/AND IN LIQUID FORM