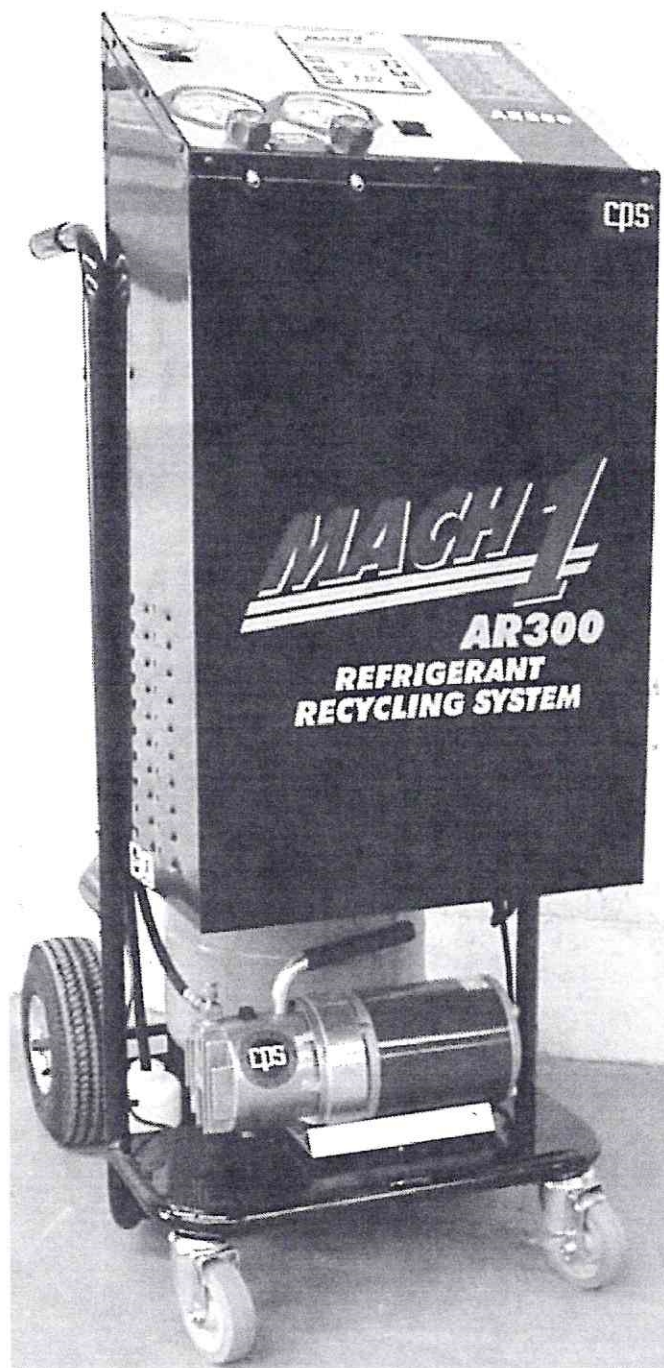


# AR300E Series Service Manual

For the following models: AR300E



73-101.1  
2-12-2001 REV A

**7. Section4:  
Reference  
Materials  
(in Englisch)**

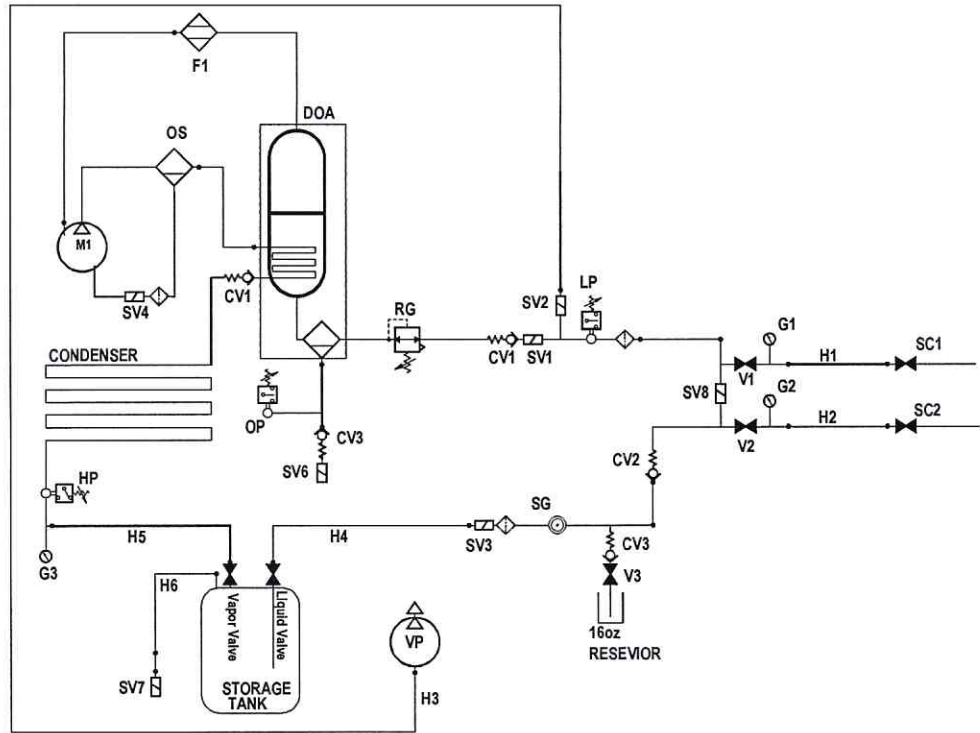
## **Section 4. Reference Materials**

- 1. AR300E Refrigeration Schematic**
- 2. AR300E Refrigeration Schematic- Mode 1**
- 3. AR300E Refrigeration Schematic- Mode 2**
- 4. AR300E Refrigeration Schematic- Mode 3**
- 5. AR300E Refrigeration Schematic- Mode 6**
- 6. AR300E Refrigeration Schematic- Mode 7**
- 7. AR300E Refrigeration Schematic- Mode 8**
- 8. AR300E Refrigeration Schematic- Mode 9A**
- 9. AR300E Refrigeration Schematic- Mode 9B**
- 10. AR300E Refrigeration Schematic- Automatic Oil Drain**
- 11. AR300E Refrigeration Schematic- Oil Injection**
- 12. AR300E Electrical Schematic**
- 13. AR300E Electrical Schematic- Mode 1**
- 14. AR300E Electrical Schematic- Mode 2**
- 15. AR300E Electrical Schematic- Mode 3**
- 16. AR300E Electrical Schematic- Mode 6**
- 17. AR300E Electrical Schematic- Mode 7**
- 18. AR300E Electrical Schematic- Mode 8**
- 19. AR300E Electrical Schematic- Mode 9A**
- 20. AR300E Electrical Schematic- Mode 9B**
- 21. AR300E Electrical Schematic- High Pressure Switch Lockout Function**
- 22. AR300E Electrical Schematic- Tank Overfill Lockout Function**
- 23. AR300E Parts List**

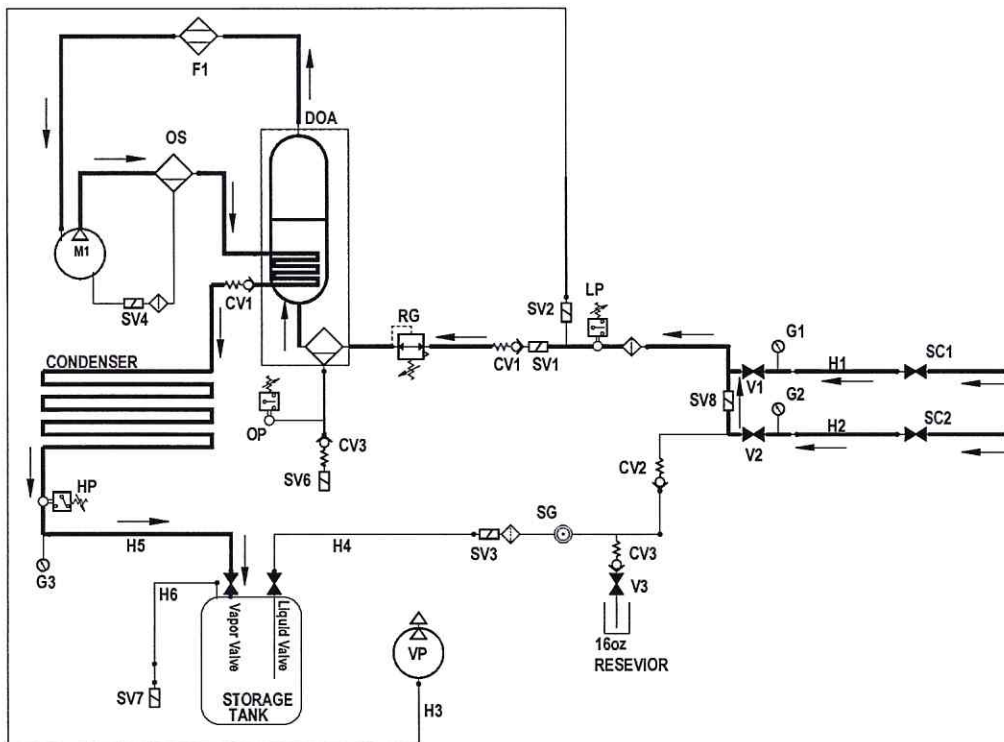
# 1. AR300 REFRIGERATION SCHEMATIC

LEGEND- AR400 REFRIGERATION SCHEMATIC

- SV1 Recovery Solenoid Valve
- SV2 Vacuum Pump Solenoid Valve
- SV3 Charging Solenoid Valve
- SV4 Comp Equalization Solenoid Valve
- SV6 Oil Drain Solenoid Valve
- SV7 Air Purge Solenoid Valve
- SV8 High/Low Solenoid Valve
- F1 Moisture Filter
- M1 Compressor
- CV1 Check Valve, 1/8MPT-1/4FL
- CV2 Check Valve, 1/4FL-1/8MPT
- CV3 R134 Check Valve, 1/8MPT-1/8MPT
- OS Oil Separator, Comp Oil Return
- HP High Pressure Switch
- LP Vacuum Pressure Switch
- OP Oil Pressure Switch
- G1 Low side pressure gauge
- G2 High side pressure gauge
- G3 Tank pressure gauge
- SG Sight Glass
- V1 Low side Manifold Valve
- V2 High Side Manifold Valve
- V3 Injection Valve
- H1 Low Side Service Hose
- H2 High Side Service Hose
- H3 Tank Liquid Hose
- H4 Tank Vapor Hose
- H5 Purge Hose
- H6 H6 Purge Hose
- DOA DOA Chamber
- SC1 Low Side Service Coupling
- SC2 High Side Service Coupling
- VP Vacuum Pump
- H3 Vacuum Pump Hose

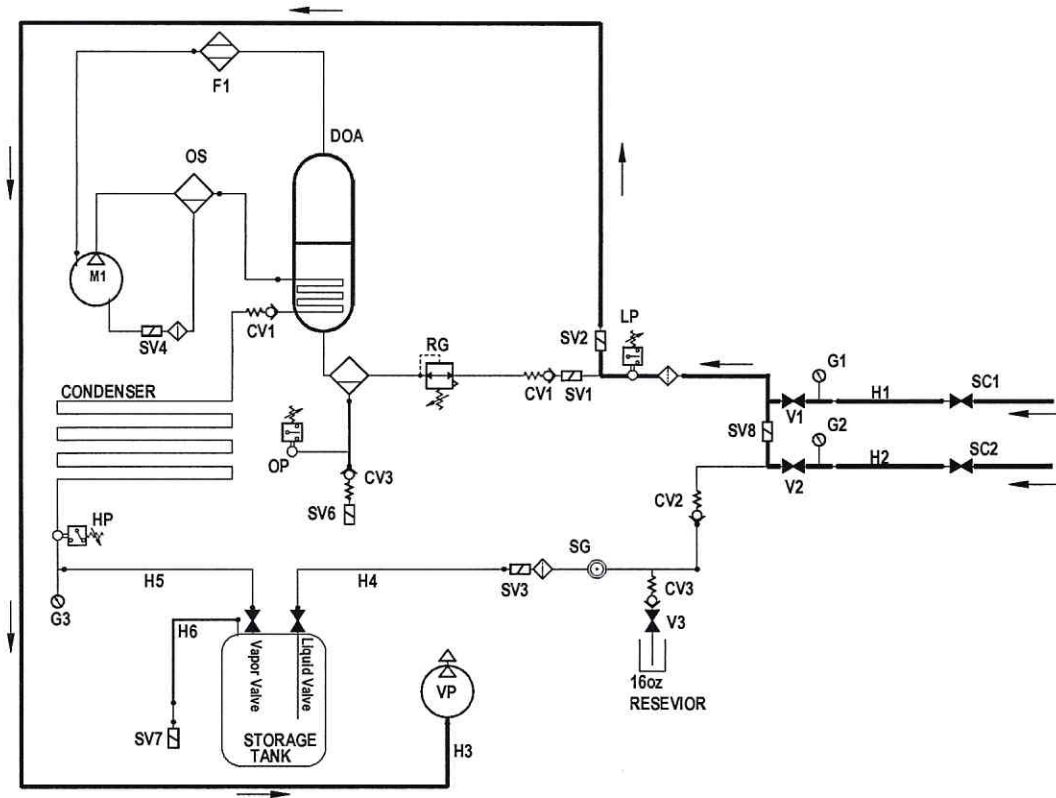


# 2. AR300 REFRIGERATION SCHEMATIC- Mode 1 (Recover)

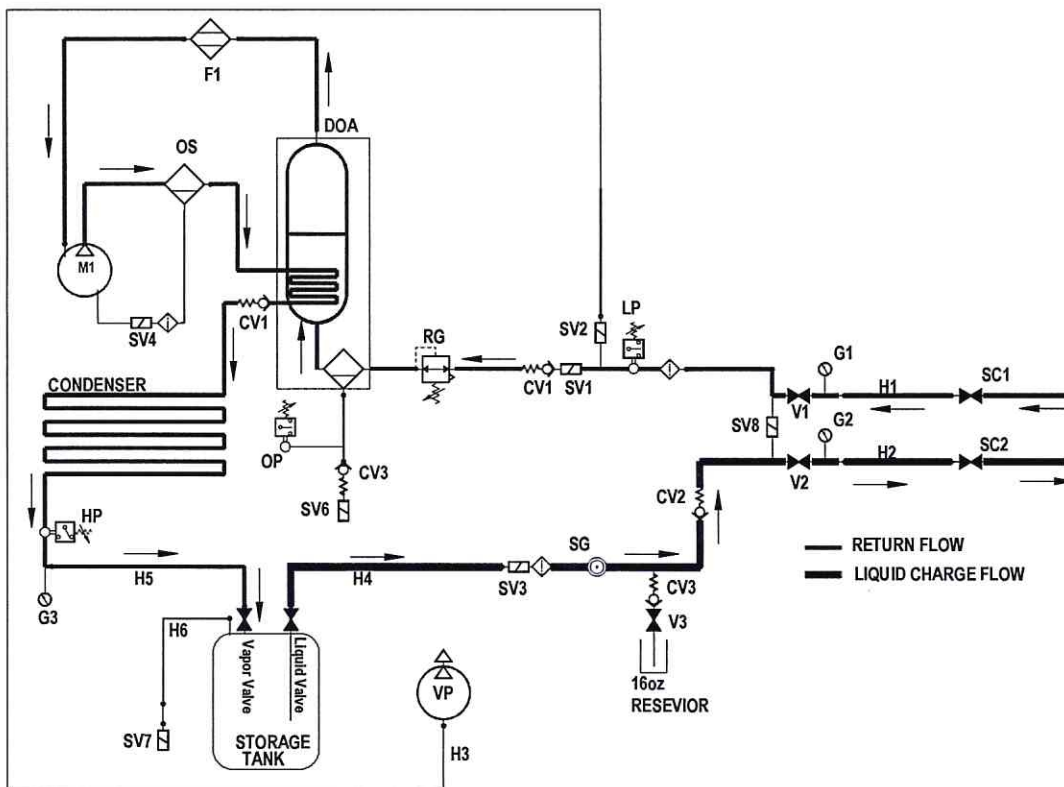




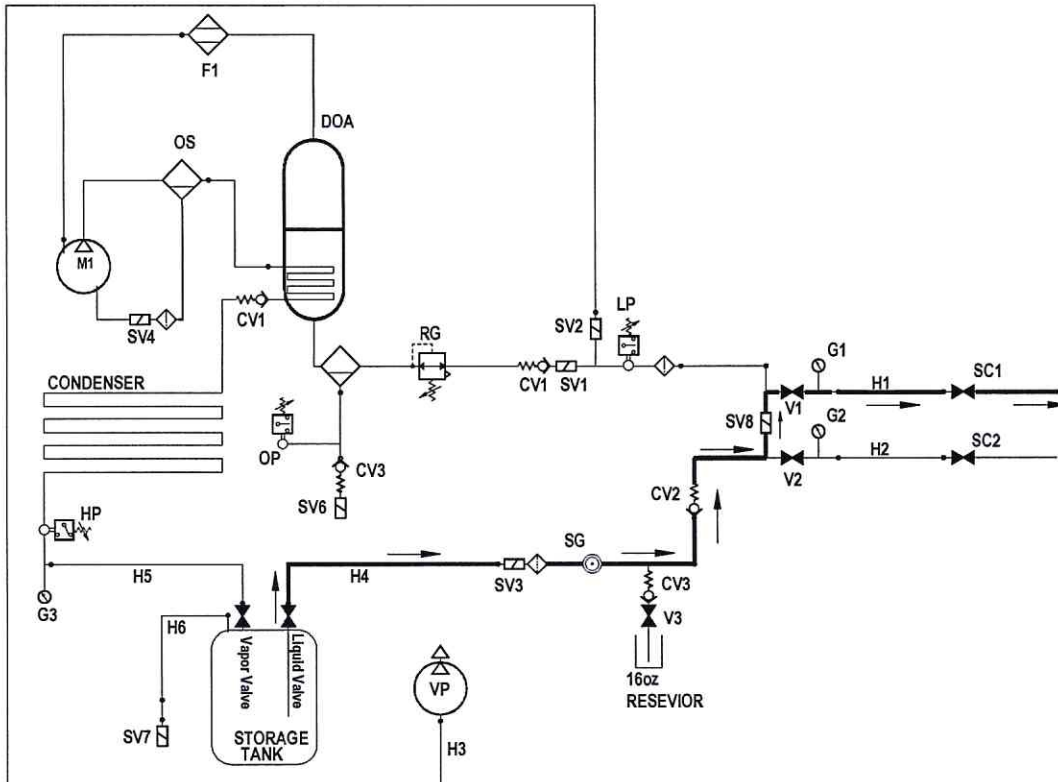
### 3. AR300 REFRIGERATION SCHEMATIC- Mode 2 (Evacuation)



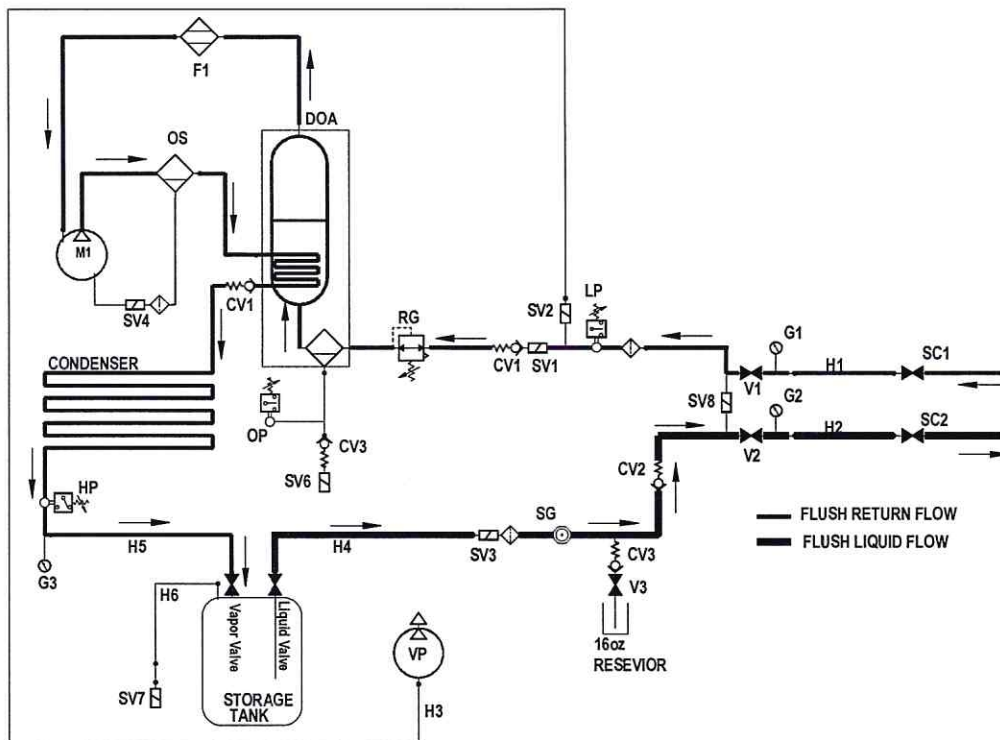
### 4. AR300 REFRIGERATION SCHEMATIC- Mode 3 (Charge)



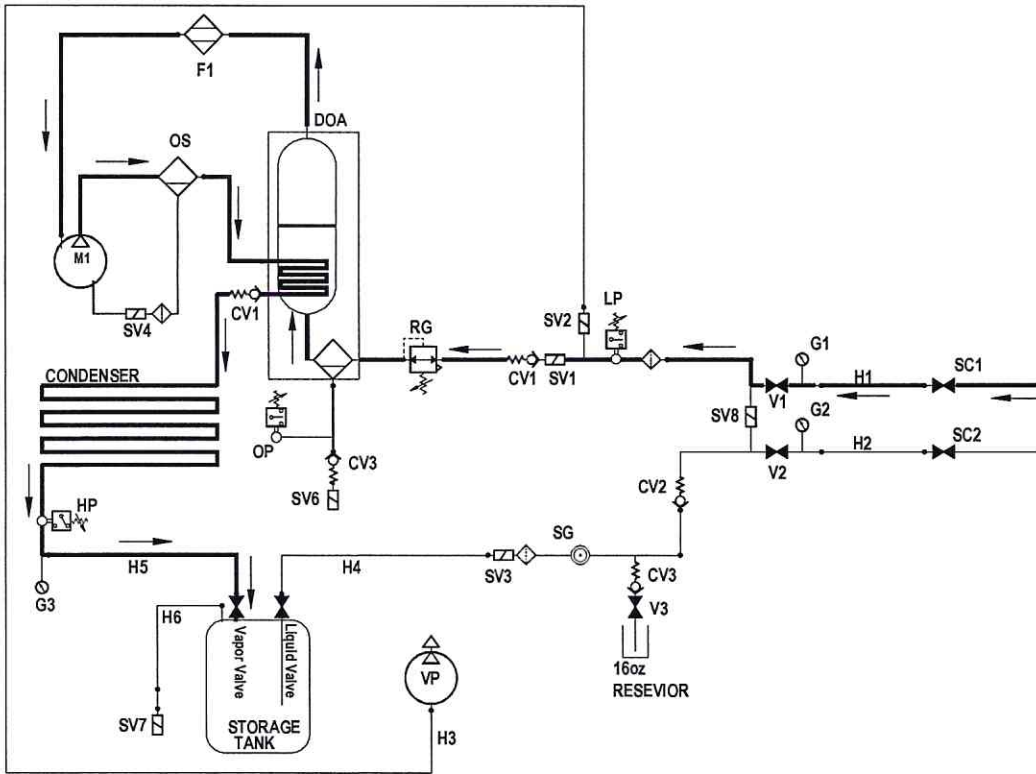
## 5. AR300 REFRIGERATION SCHEMATIC- Mode 6 (Quick Charge)



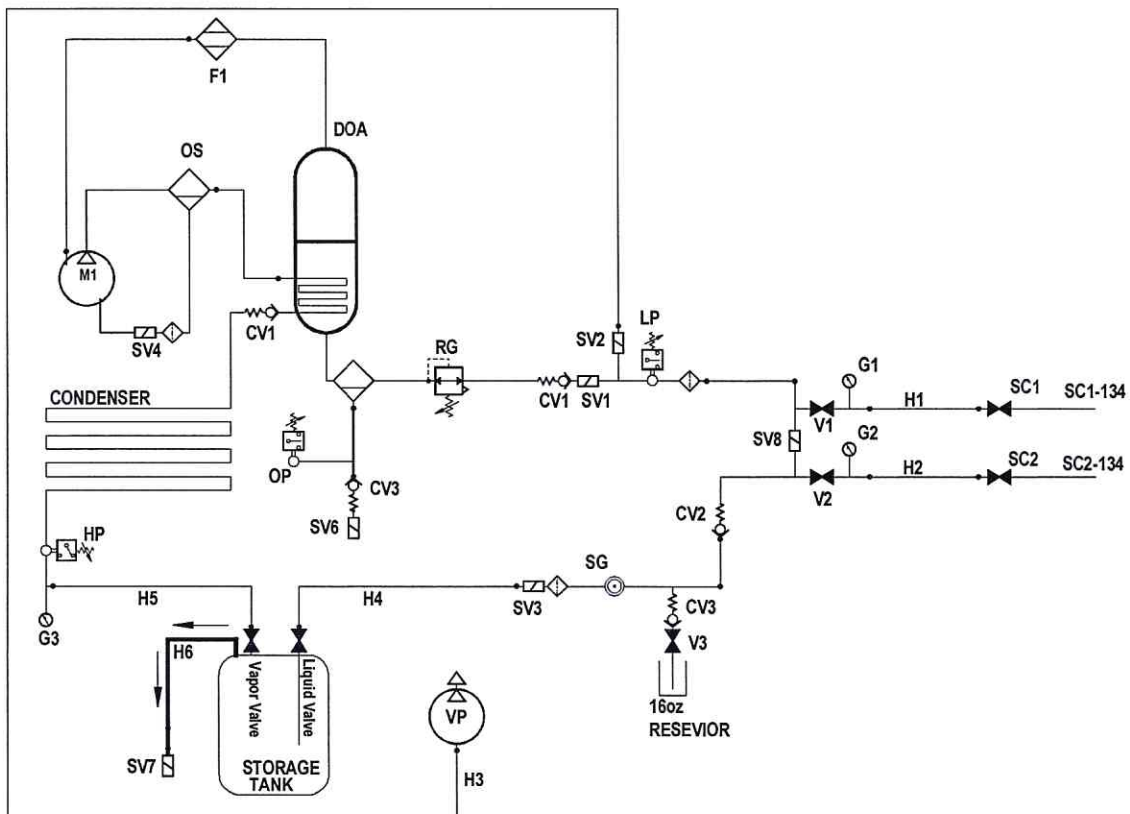
## 6. AR300 REFRIGERATION SCHEMATIC- Mode 7 (Flush)



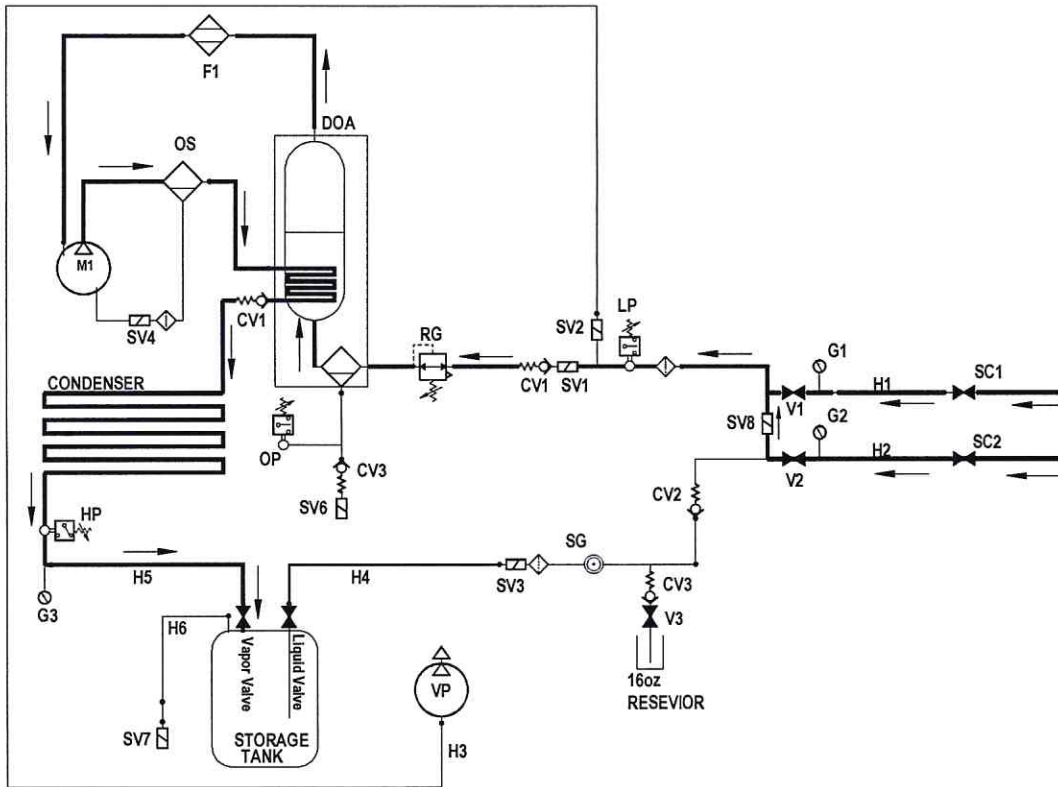
## 7. AR300 REFRIGERATION SCHEMATIC- Mode 8 (Refill)



## 8. AR300 REFRIGERATION SCHEMATIC- Mode 9A (Air Purge)

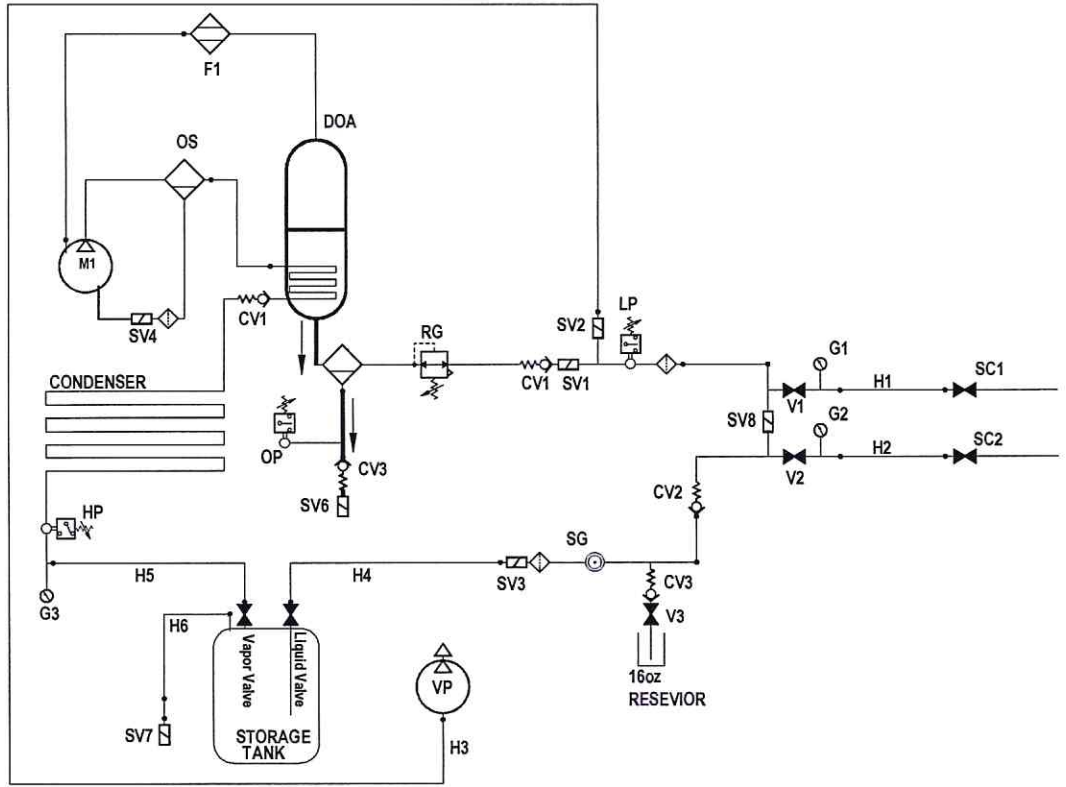


# 9. AR300 REFRIGERATION SCHEMATIC- Mode 9B (Filter Change)

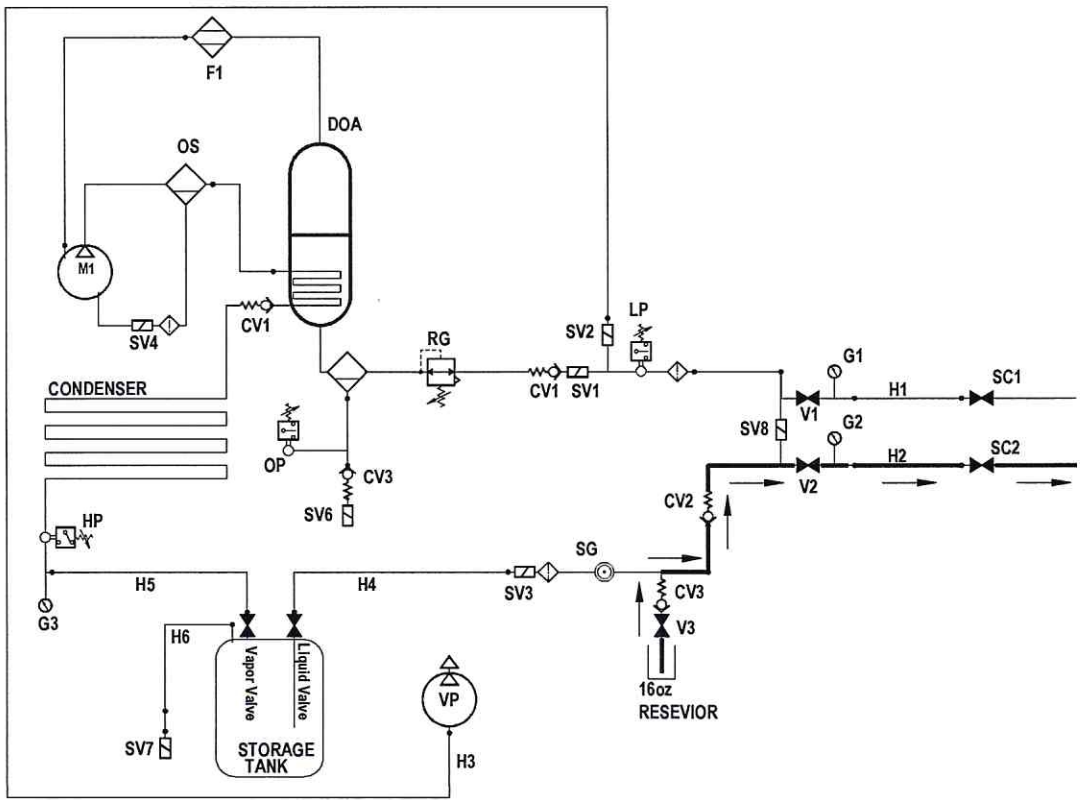




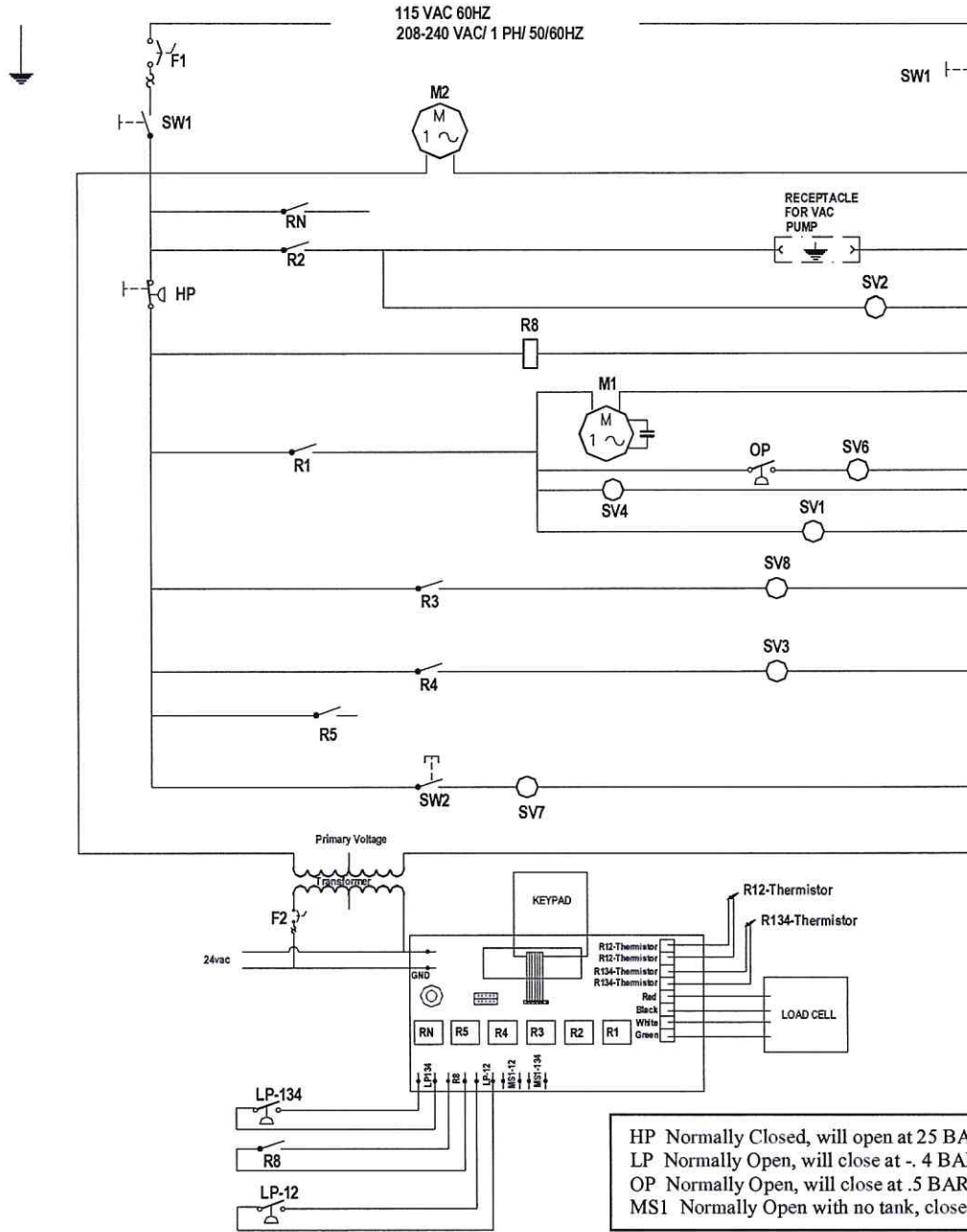
### 10. AR300 REFRIGERATION SCHEMATIC- Automatic Oil Drain



### 11. AR300 REFRIGERATION SCHEMATIC- Oil Injection



# 12. AR300 ELECTRICAL DIAGRAM

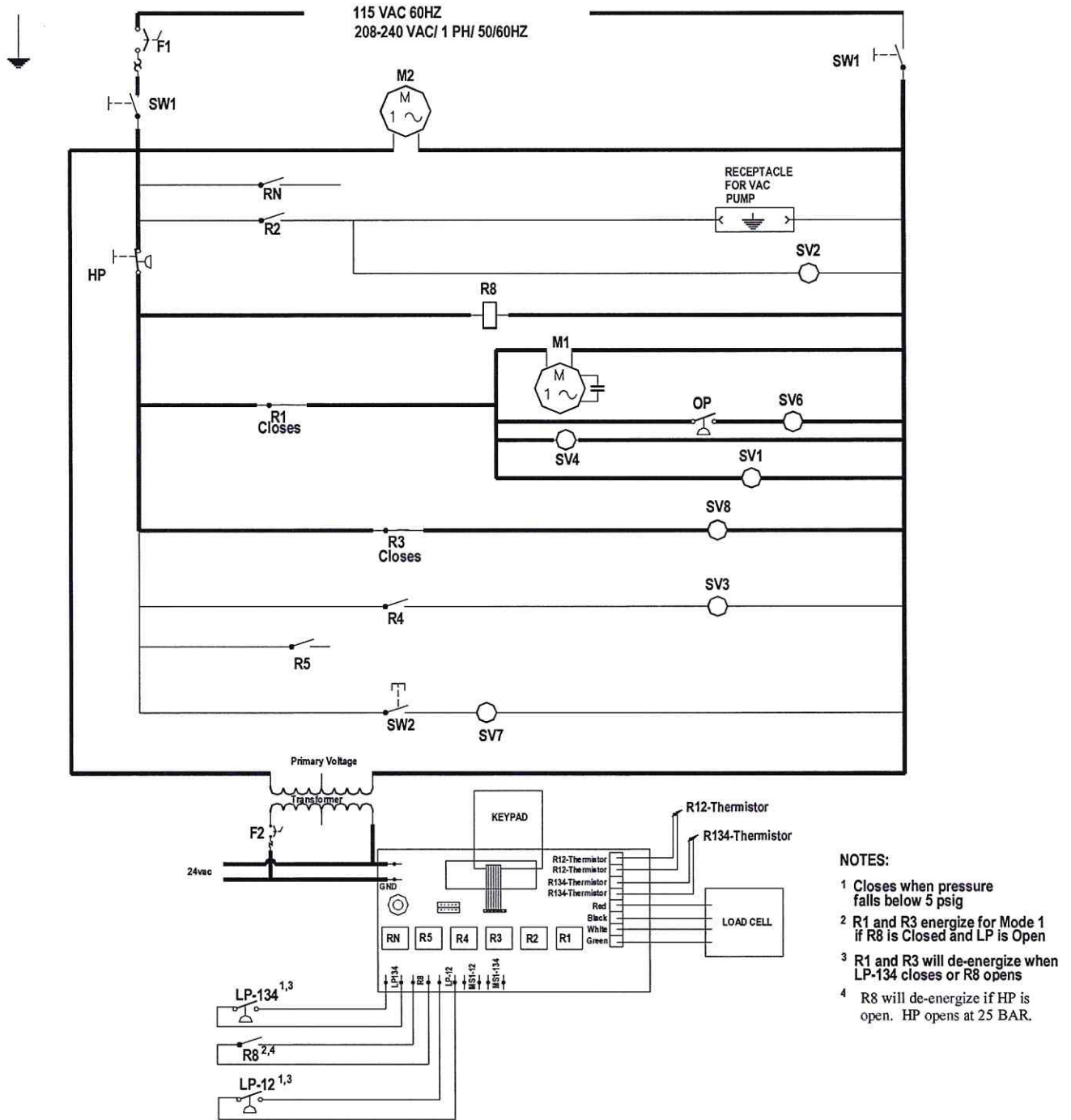


## LEGEND- AR300 ELECTRICAL SCHEMATIC

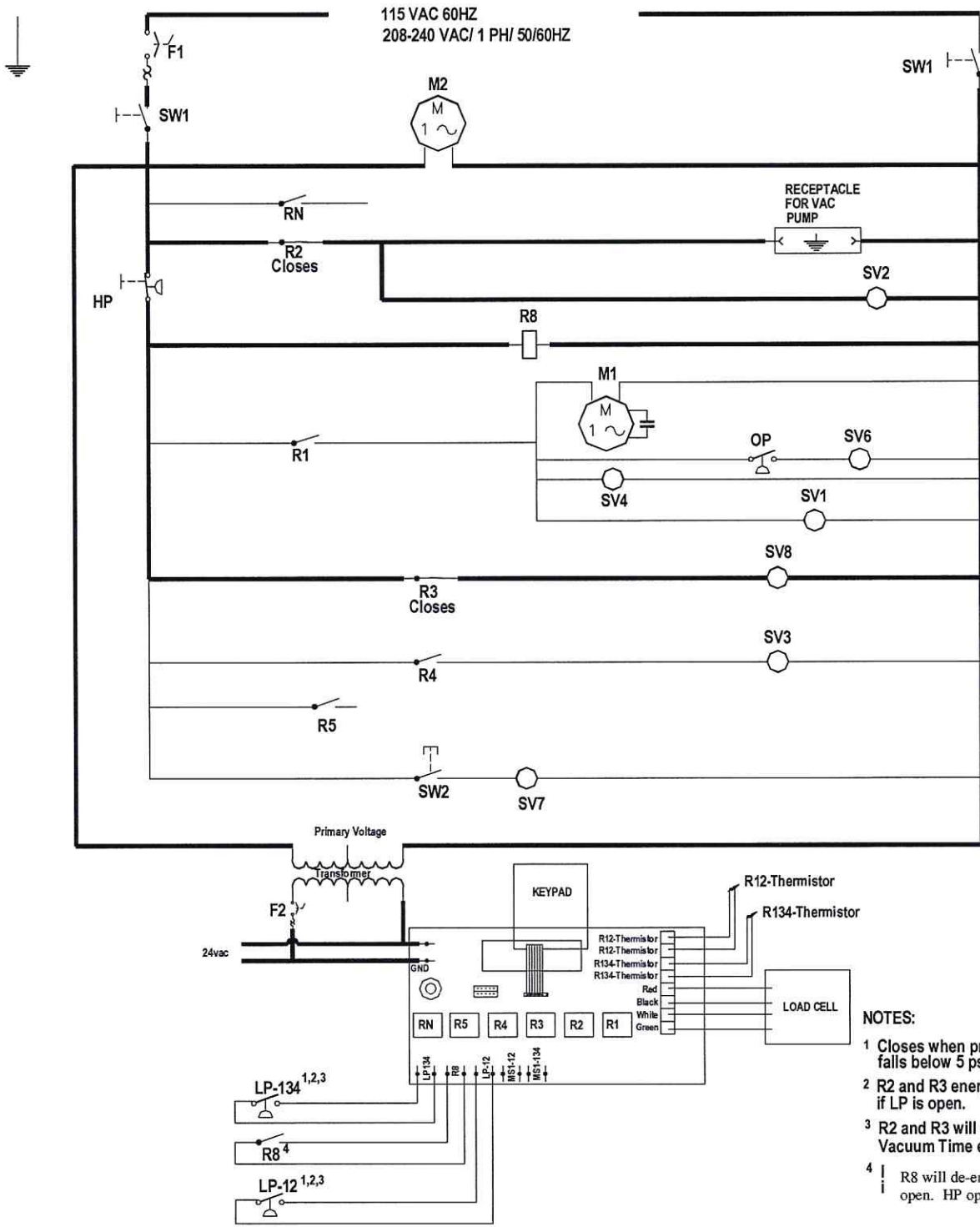
- R1- Relay, Compressor Start
- R2- Relay, Vacuum Start
- R3- Relay, SV8
- R4- Relay, Charge (SV3)
- R5- Relay, Master Refrigerant Switch Over
- RN- Relay, Options
- SV1 Recovery Solenoid Valve Coil
- SV2 Vacuum Pump Solenoid Coil
- SV3 Charging Solenoid Coil
- SV4 Comp Equalization Solenoid Coil
- SV6 Oil Drain Solenoid Coil
- SV7 Air Purge Solenoid Coil
- SV8 Manifold Solenoid Coil
- HP High Pressure Limit Switch
- LP Vacuum Pressure Switch
- OP Oil Pressure Switch
- M1 Compressor Motor
- SW1- Power Switch, 2PST
- SW2- Purge Switch, SPST
- M2- Fan Motor
- F1- Thermal Circuit Breaker TCBR
- F2- Tranformer Thermal Circuit Breaker TCBR

HP Normally Closed, will open at 25 BAR, manual reset below 19 BAR.  
 LP Normally Open, will close at - .4 BAR vacuum, auto reset above .4 BAR  
 OP Normally Open, will close at .5 BAR, auto reset above 1 BAR  
 MS1 Normally Open with no tank, closed with tank load applied

# 13. AR300 ELECTRICAL DIAGRAM- Mode 1 (Recover)



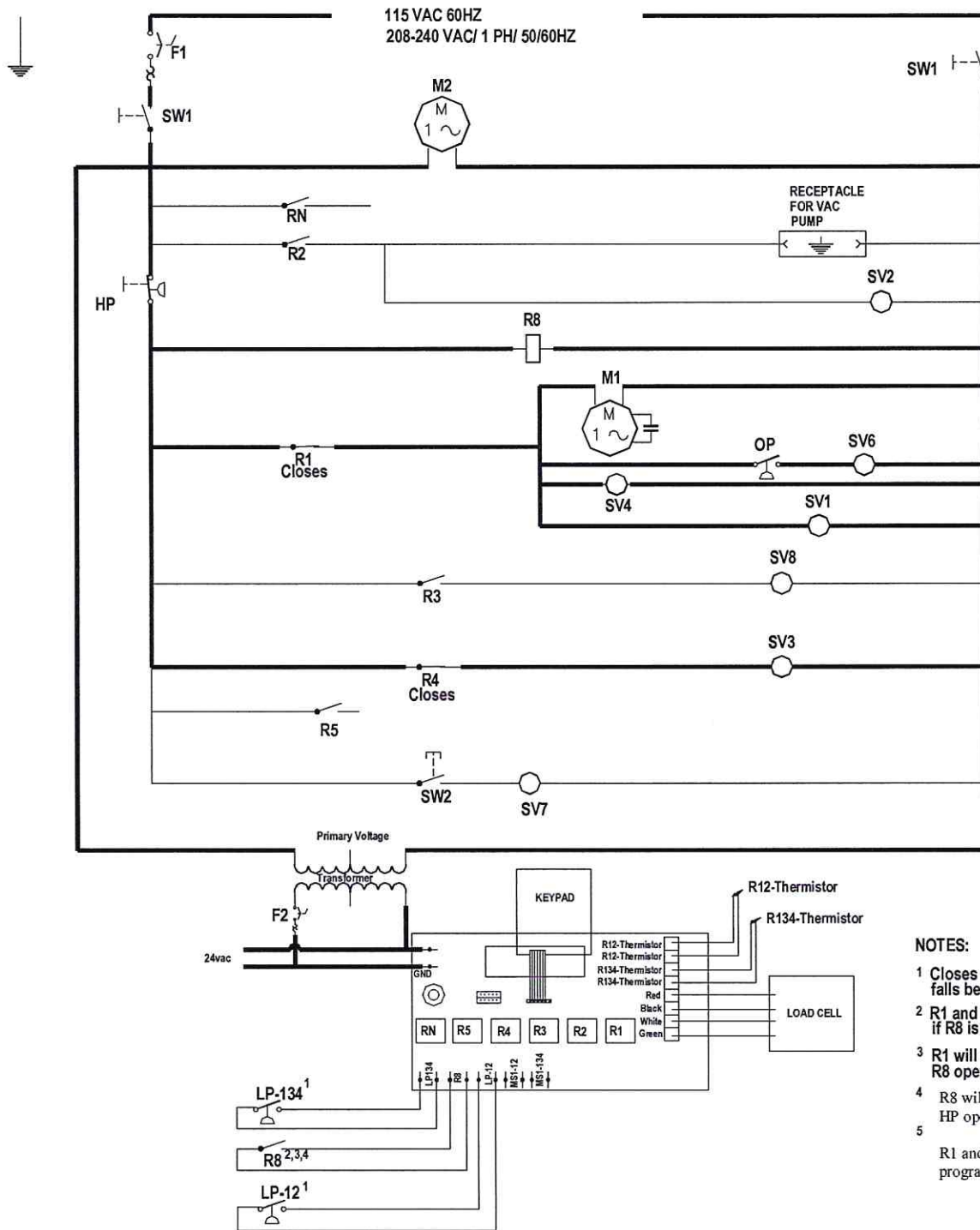
# 14. AR300 ELECTRICAL DIAGRAM- Mode 2 (Evacuate)



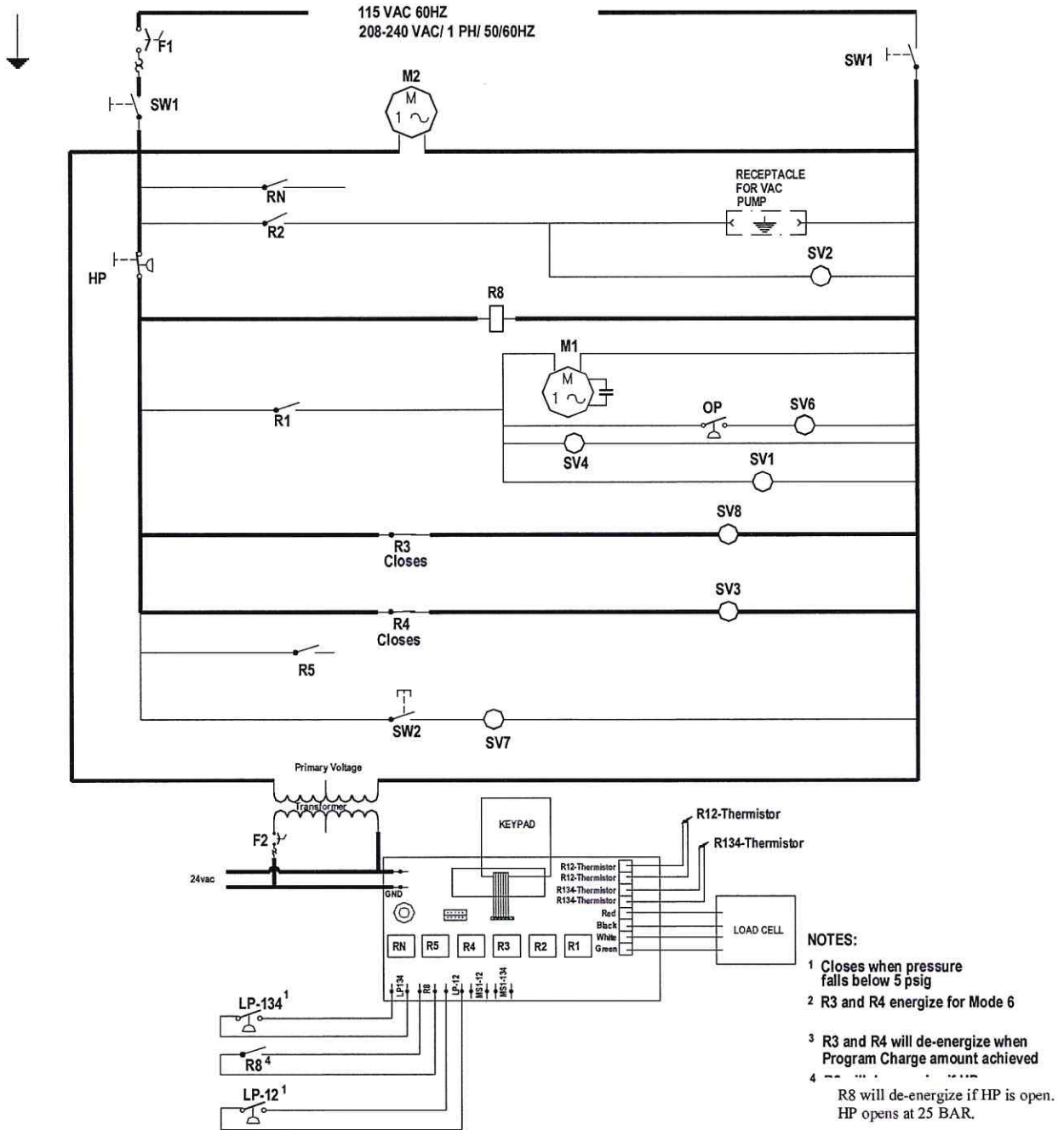
- NOTES:**
- 1 Closes when pressure falls below 5 psig
  - 2 R2 and R3 energize for Mode 2 if LP is open.
  - 3 R2 and R3 will de-energize when Vacuum Time expires
  - 4 R8 will de-energize if HP is open. HP opens at 25 BAR.



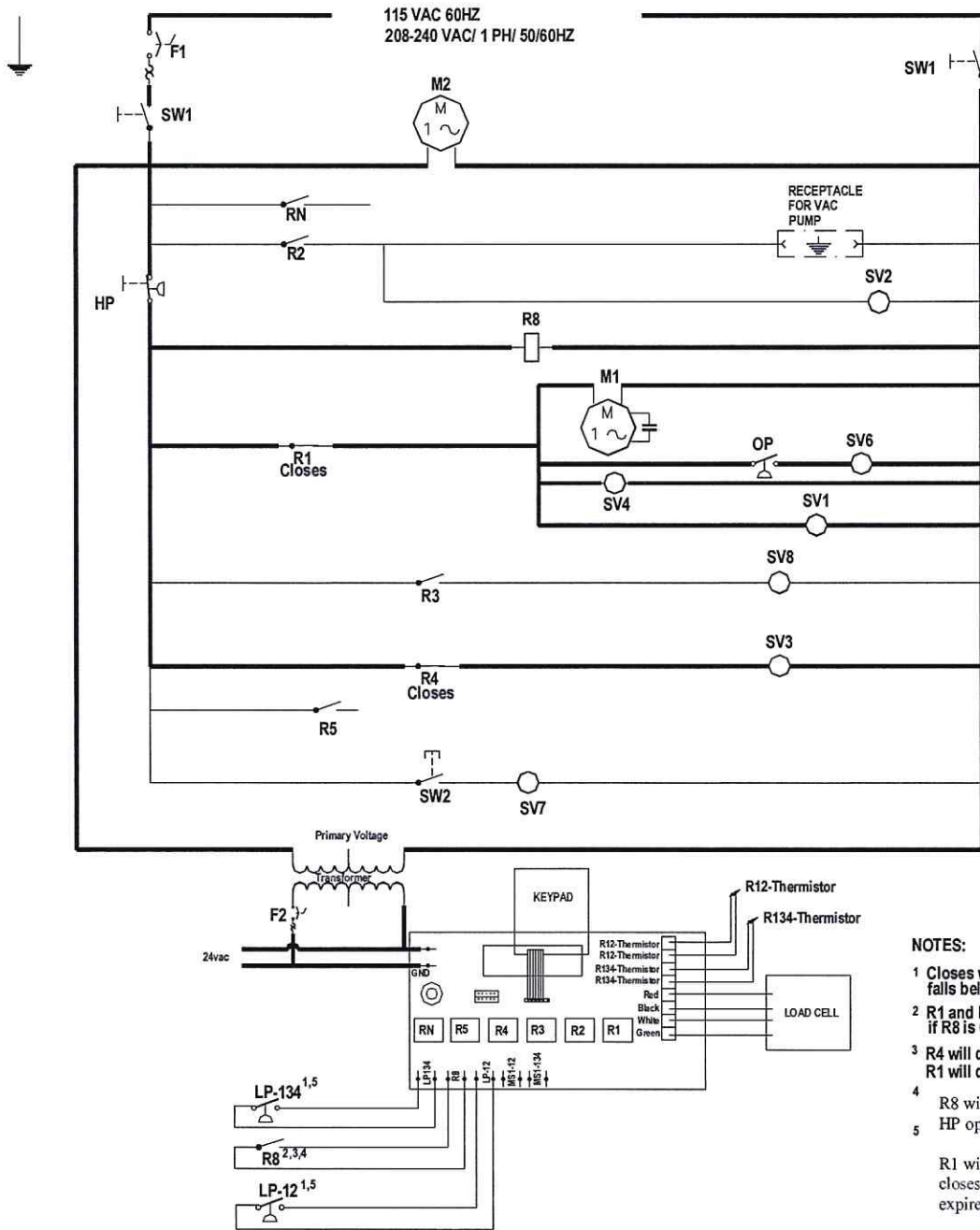
# 15. AR300 ELECTRICAL DIAGRAM- Mode 3 (Charge)



# 16. AR300 ELECTRICAL DIAGRAM- Mode 6 (Quick Charge)



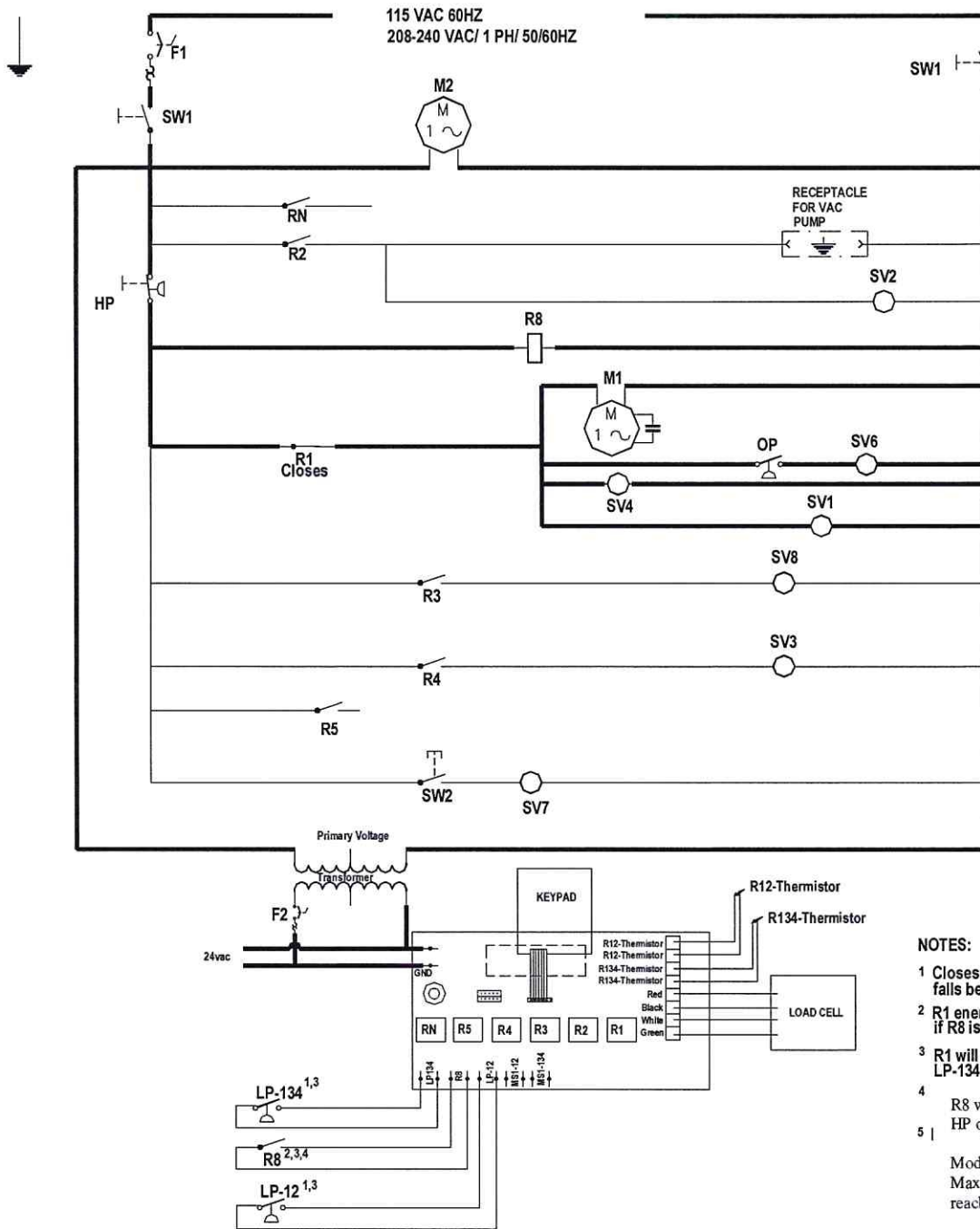
# 17. AR300 ELECTRICAL DIAGRAM- Mode 7 (Flush)



**NOTES:**

- 1 Closes when pressure falls below 5 psig
- 2 R1 and R4 energize for Mode 7 if R8 is Closed
- 3 R4 will de-energize when Flush Time Expires  
R1 will de-energize if R8 opens
- 4 R8 will de-energize if HP is open.  
HP opens at 25 BAR.
- 5 R1 will de-energize after the LP closes. (only after Flush time expires)

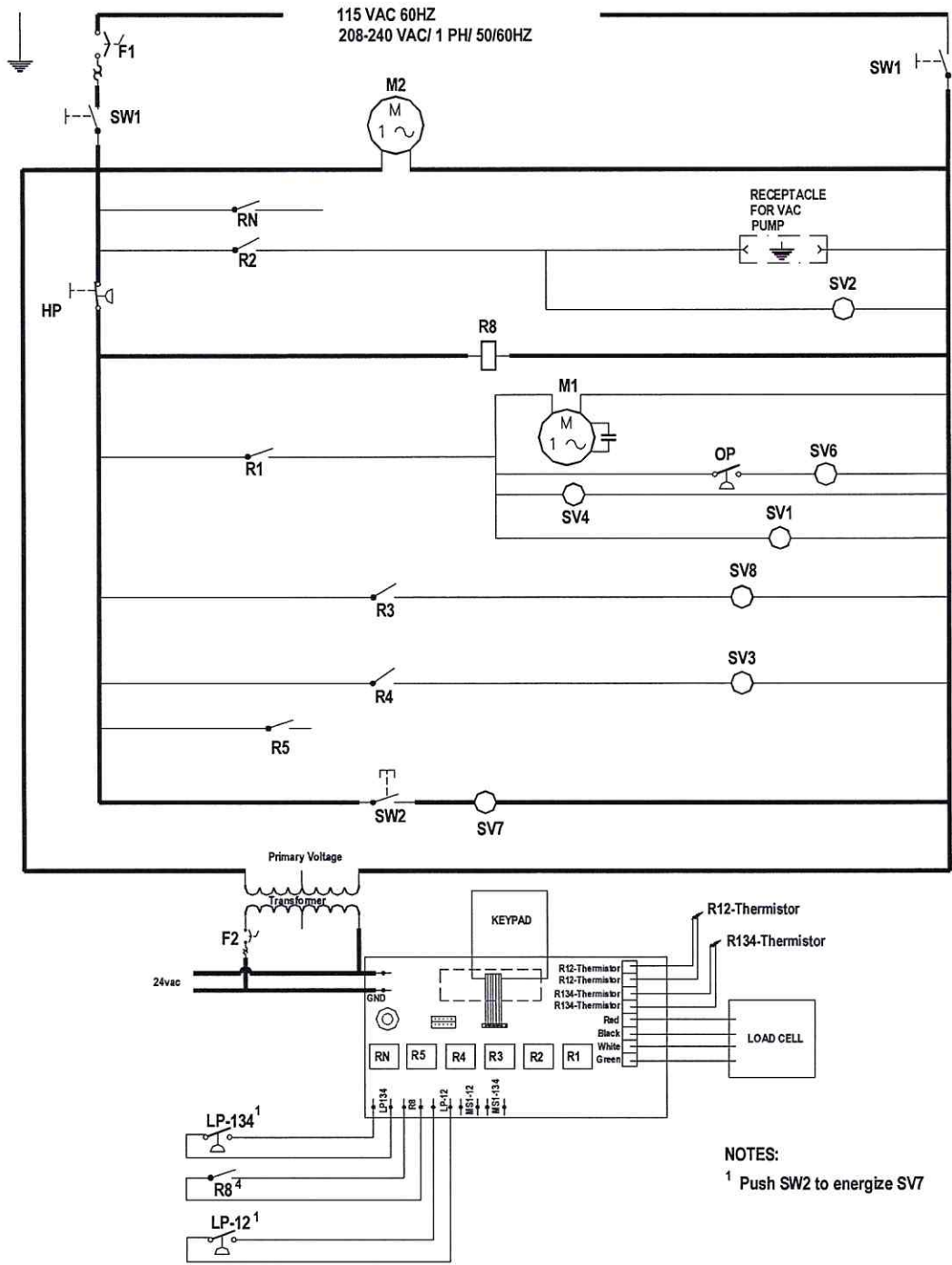
# 18. AR300 ELECTRICAL DIAGRAM- Mode 8 (Refill)



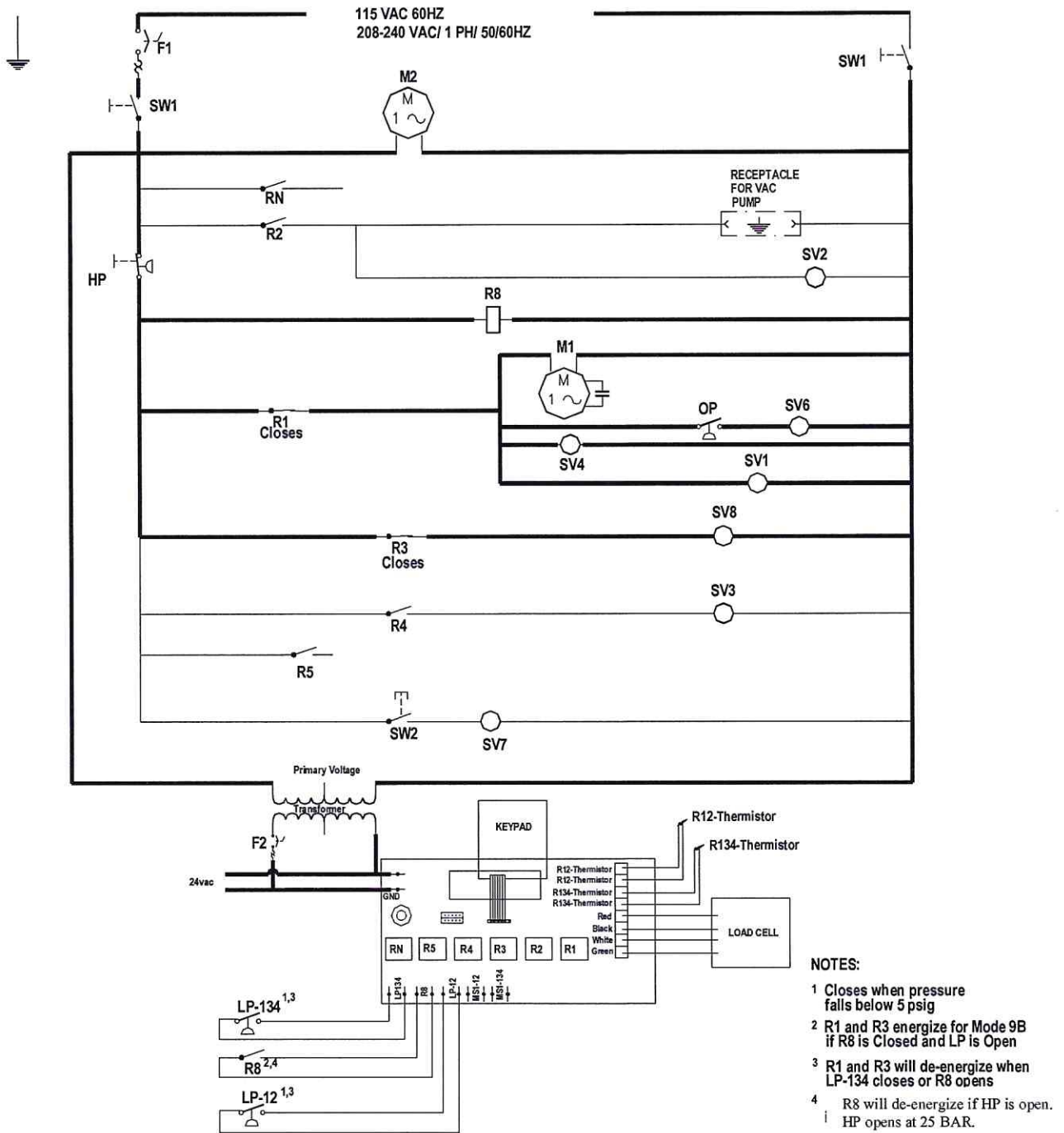
- NOTES:**
- 1 Closes when pressure falls below 5 psig
  - 2 R1 energize for Mode 8 if R8 is Closed and LP is Open
  - 3 R1 will de-energize when LP-134 closes or R8 opens
  - 4 R8 will de-energize if HP is open.
  - 5 HP opens at 25 BAR.
- Mode 8 is complete when Maximum tank refill weight is reached.



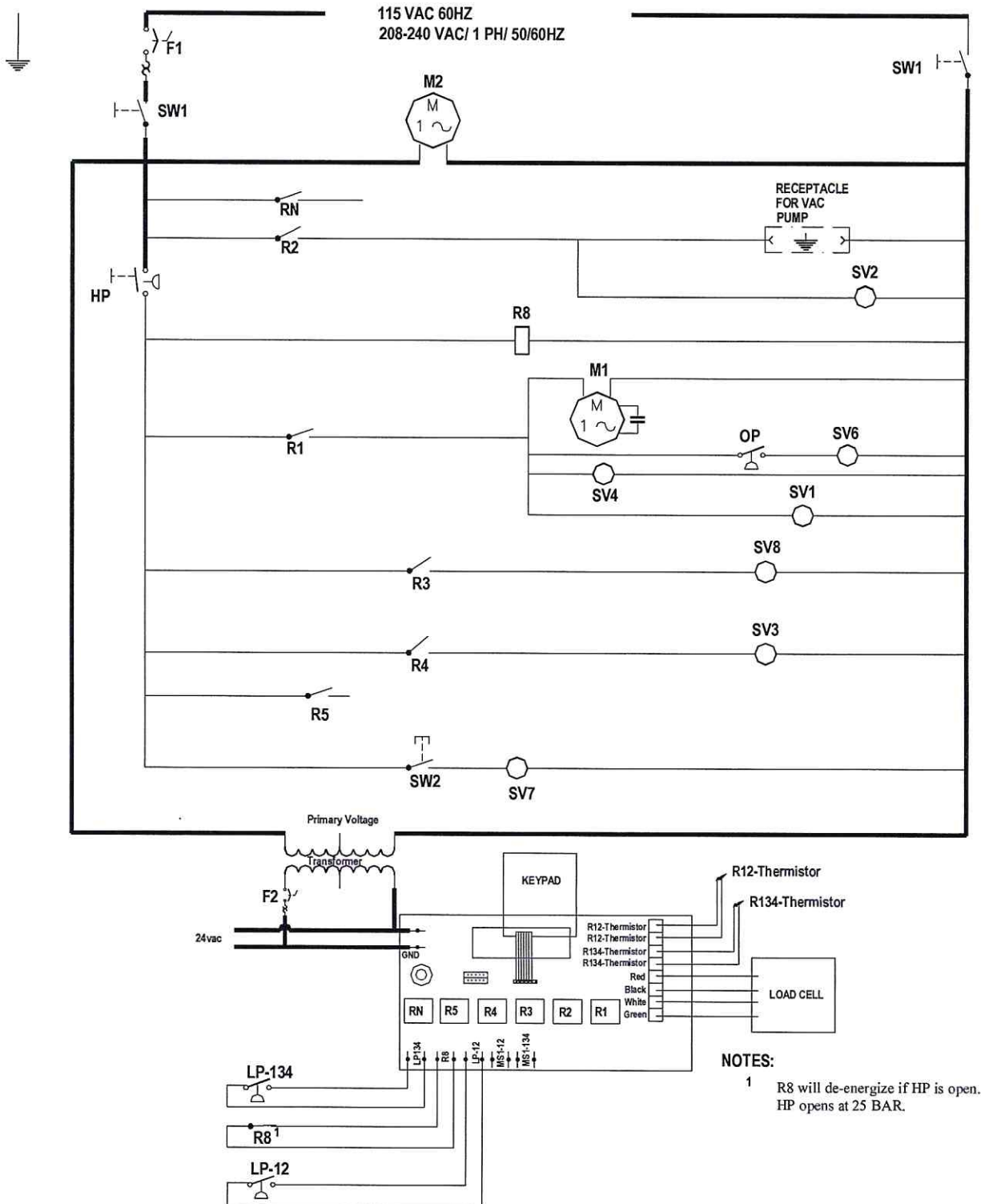
# 19. AR300 ELECTRICAL DIAGRAM- Mode 9A (Purge)



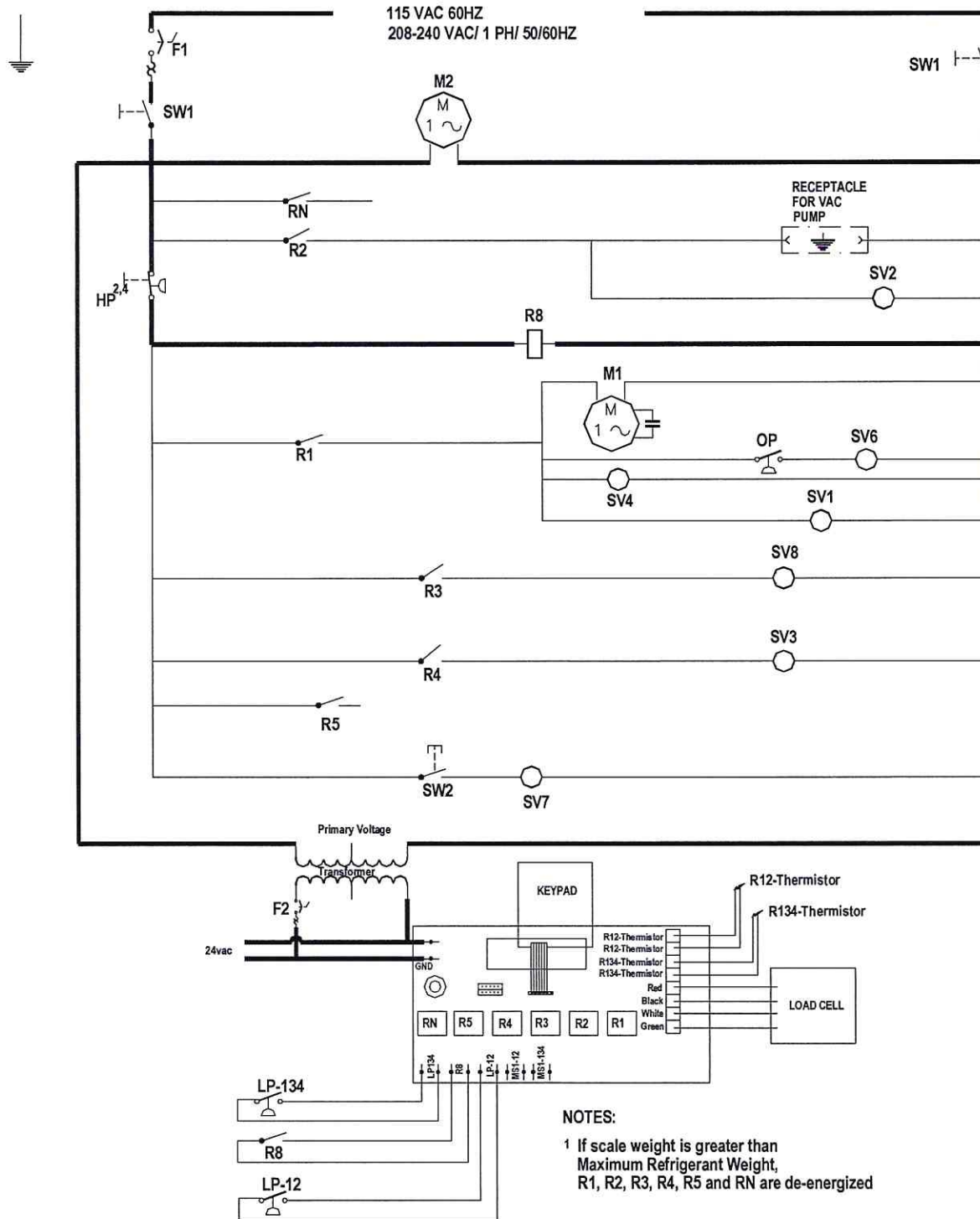
# 20. AR300 ELECTRICAL DIAGRAM- Mode 9B (Filter Change)



# 21. AR300 ELECTRICAL DIAGRAM- HP Switch Lockout



# 22. AR300 ELECTRICAL DIAGRAM- Tank Overfill lockout



## 23. AR300E SERIES PARTS LIST

AR300EE  
SERIES  
MODEL



<u>P/N</u>	<u>DESCRIPTION</u>	<u>SCHEMATIC CODE</u>			
30-736	High Side Pressure Gauge	G2	x		
30-737	Low Side Pressure Gauge	G1	x		
30-738	Tank Pressure Gauge	G3	x		
31-003	Keypad	KEYPAD	x		
33-103	Transformer	TRANSFORMER	x		
35-100	High Pressure Switch	HP	x		
35-101	Low Pressure Switch	LP	x		
35-102	Main Power Switch	SW1	x		
35-107	Purge Switch	SW2	x		
36-003	Compressor Oil Return Solenoid Valve	SV4	x		
36-004	Check Valve	CV1	x		
36-005	Solenoid Block	SV1,SV2, SV3	x		
36-006	Check Valve	CV3	x		
36-010	Check Valve	CV2	x		
36-015	Solenoid Operator	SV1,SV2,SV3, SV6,SV7,SV8	x		
36-017	Solenoid Coil-230v	SV1,SV2,SV3, SV6,SV7,SV8	x		
37-101	Relay	R8	x		
39-004	Fan	M2	x		
39-011	Circuit Breaker	F1	x		
41-611	Filter Shell	FD	x		
41-612	Fan Grill		x		
41-702	Pressure Regulator	RG	x		
41-703	Liquid Sight Glass	SG	x		
41-704	Compressor	M1	x		
41-705	Oil Separator	OS	x		
41-707	Condenser Coil	CONDENSER	x		
41-709	Cotter Pin		x		
	27 liter Recovery Tank	TANK	x		
	Vacuum Pump	VP	x		
42-245	Manifold Valve Knob		x		
44-104	Cart		x		
44-147	Cowling		x		
44-145	Control Panel		x		
52-100	10" Pneumatic Wheels		x		
52-101	4" Swivel Caster		x		
52-102	Cart Hand Grips		x		
52-106	4" Swivel Caster with Brake		x		
54-100	16 ounce Oil Bottle	RESEVIOR	x		
54-101	Metal Bottle Cap		x		
	Power Cord		x		
62-101	Power Cord		x		
71-706	DOA Chamber	DOA	x		
74-017	Label Knob ON-OFF		x		
74-101	MASTER LABEL SHEET AR300E Generic		x		

<u>P/N</u>	<u>DESCRIPTION</u>	<u>SCHEMATIC CODE</u>	<u>AR300EE</u>
81-004	Vacuum Pump Receptacle	RECEPTACLE	x
82-102	PC Board Nylon Stand Offs		x
82-105	IEC Electrical Inlet		x
84-003	Black Wire Tie		x
86-114	#8-32 Socket Head Screw		x
86-115	#6-32 nut with star washer		x
86-120	1/4-20 Lock Nut		x
86-121	1/4-20 x .5" Socket Head Screw		x

86-122	#8 x 1/2 Phillips Sheet Metal Screw		x
86-124	#10-24 x 1/2 Fan Mounting Screw		x
86-129	1/4-20 x 1.5" bolt		x
87-101	3/16 Rivet		x
AR200-A3	Scale Assembly	LOAD CELL	x
AR2MNF LD220-A1	Manifold Gauge Assembly	V1, V2, G1, G2, SV8, & CV2	x
AR300EPCB-A1	PC Board	PCB	x
AR4CMP220-A1	Compressor Assembly	M1	x
AR4DISCH220-A1	Discharge Block Assembly	SV6,SV7	x
AR4OILINJ-A1	Oil Injection Assembly	V3	x
ARDOA-A1	DOA chamber assembly	DOA	x
ARH10-A1	Manifold Internal Hose		x
ARH11-A1	Liquid and Vapor Tank Hose	H4, H5	x
ARH12-A1	Purge Tank Hose	H6	x
ARH14-A1	Purge Gauge Internal Hose		x
ARH15-A1	Compressor Suction Hose		x
ARH19-A1	Oil Drain Hose		x
ARH4-A1	Vacuum Pump Hose	H3	x
ARH6-A1	R134 Low side Service Hose	H1	x
ARH7-A1	R134 High Side Service Hose	H2	x
AROILSEP-A1	Oil Return Assembly	OS & SV4	x
ARSB220-A1	Solenoid Block Assembly	SV1,SV2, SV3	x
ARXF	Filter Drier	FD	x
M2XRK	Teflon Valve Repair Kit	V1,V2	x
QCH134	High Side 134a Service Coupling	SC2	x
QCL134	Low Side 134a Service Coupling	SC1	x
TMX2G-A1	Thermistor	T1, T2	x

## Additional Contact Information:

**CPS<sup>®</sup>**  
**CPS Products, Inc., USA**

✉ CPS Products, Inc.

1010 East 31<sup>st</sup> Street Hialeah, FL 33013, USA  
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e-mail: [cpssales@cpsproducts.com](mailto:cpssales@cpsproducts.com)

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Ruby Industrial Complex #05-09A Genting Block 80 Genting Lane,  
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e-mail: [cpsasia@signet.com.sg](mailto:cpsasia@signet.com.sg)

Website: [www.cpsproducts.com](http://www.cpsproducts.com)

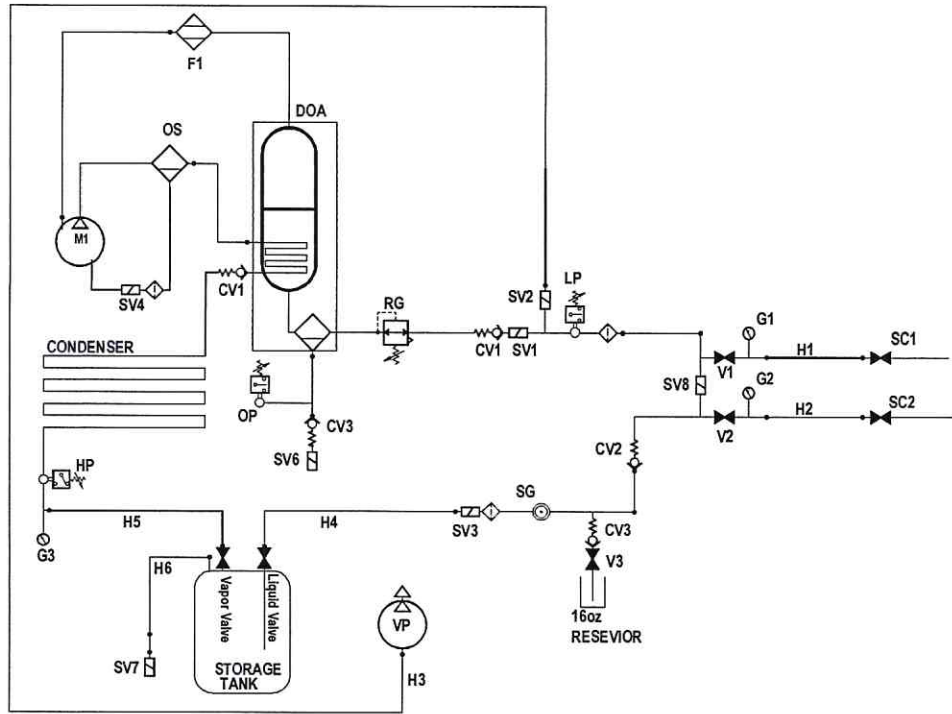
## **Section 4. Reference Materials**

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- 4. AR300E Refrigeration Schematic- Mode 3**
- 5. AR300E Refrigeration Schematic- Mode 6**
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- 23. AR300E Parts List**

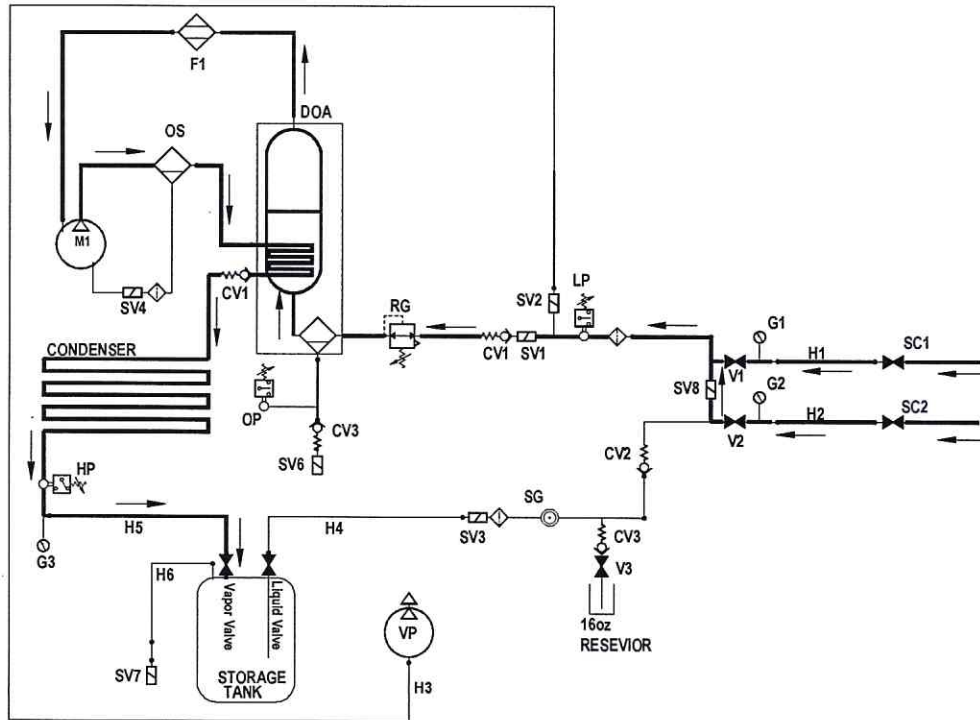
# 1. AR300 REFRIGERATION SCHEMATIC

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- SV2 Vacuum Pump Solenoid Valve
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- SV4 Comp Equalization Solenoid Valve
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- SV7 Air Purge Solenoid Valve
- SV8 High/Low Solenoid Valve
- F1 Moisture Filter
- M1 Compressor
- CV1 Check Valve, 1/8MPT-1/4FL
- CV2 Check Valve, 1/4FL-1/8MPT
- CV3 R134 Check Valve, 1/8MPT-1/8MPT
- OS Oil Separator, Comp Oil Return
- HP High Pressure Switch
- LP Vacuum Pressure Switch
- OP Oil Pressure Switch
- G1 Low side pressure gauge
- G2 High side pressure gauge
- G3 Tank pressure gauge
- SG Sight Glass
- V1 Low side Manifold Valve
- V2 High Side Manifold Valve
- V3 Oil Injection Valve
- H1 Low Side Service Hose
- H2 High Side Service Hose
- H3 Tank Vapor Hose
- H4 Tank Liquid Hose
- H5 Purge Hose
- H6 DOA Chamber
- SC1 Low Side Service Coupling
- SC2 High Side Service Coupling
- VP Vacuum Pump
- H2 Vacuum Pump Hose

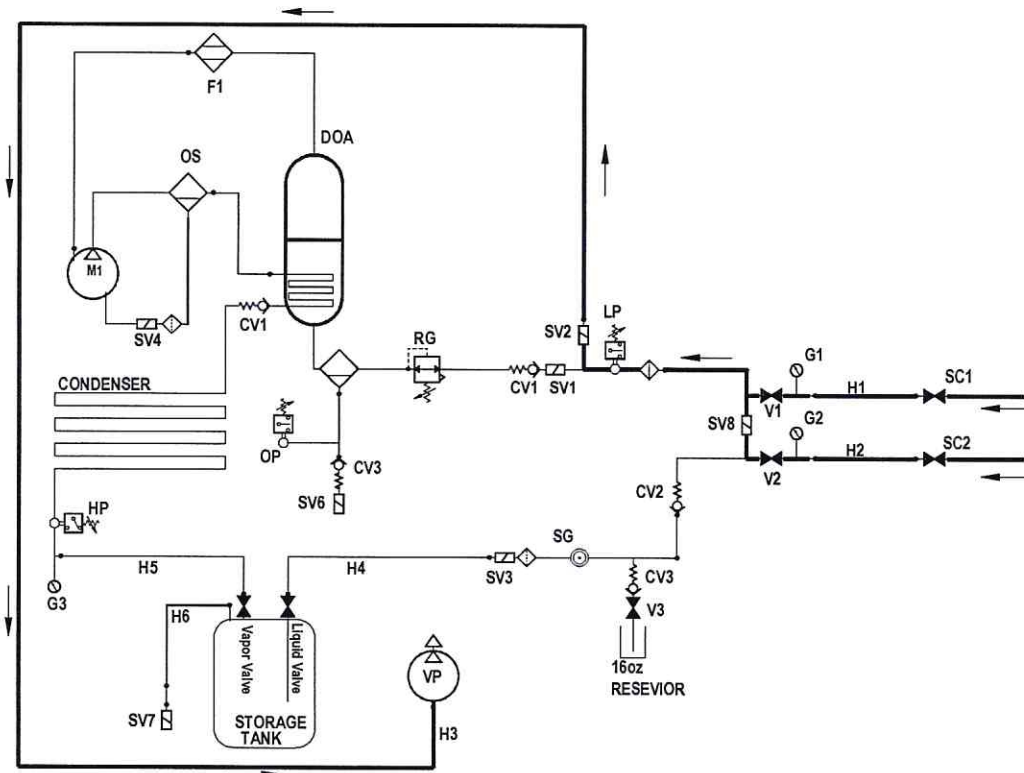


# 2. AR300 REFRIGERATION SCHEMATIC- Mode 1 (Recover)

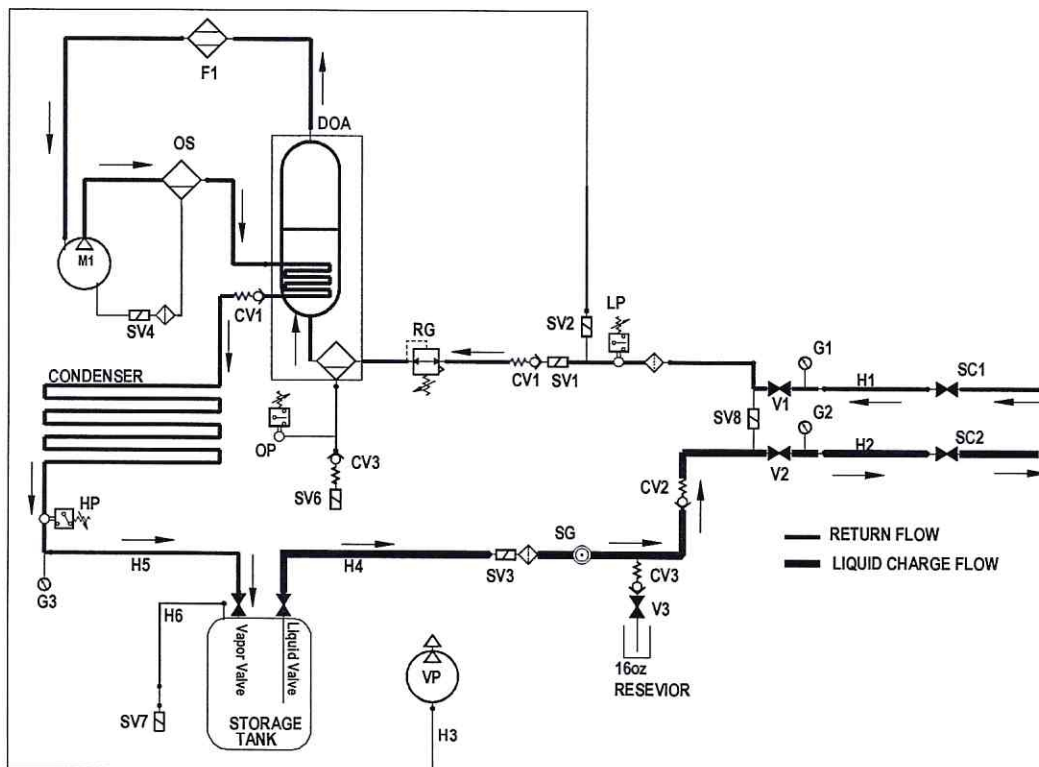




### 3. AR300 REFRIGERATION SCHEMATIC- Mode 2 (Evacuation)

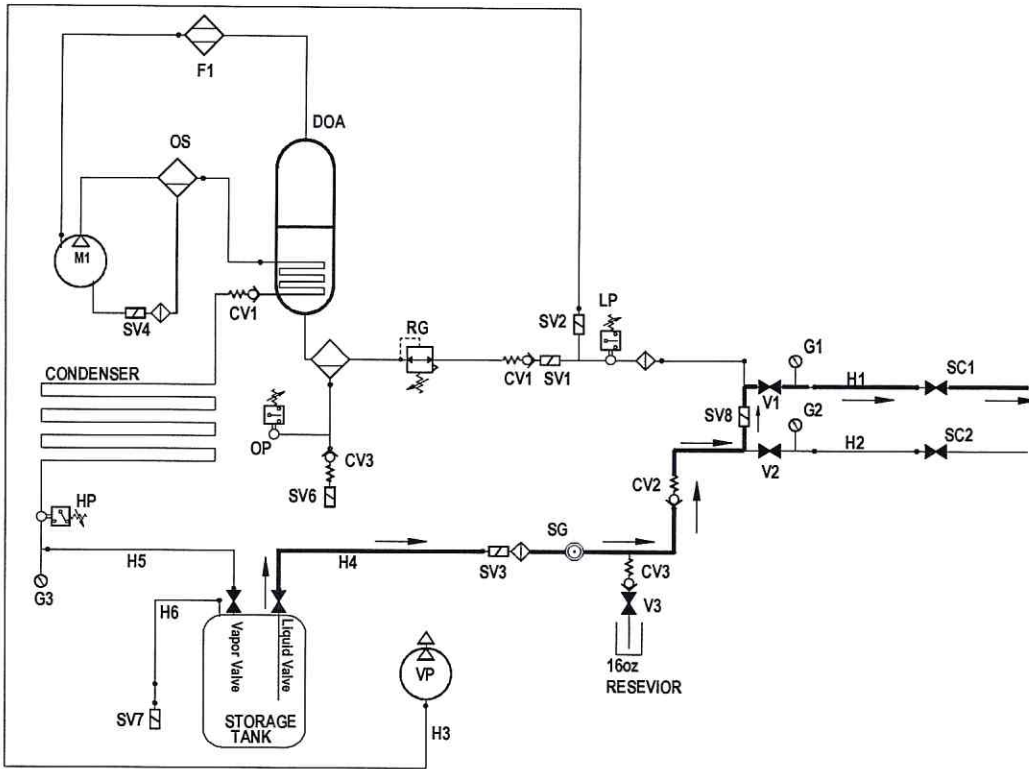


### 4. AR300 REFRIGERATION SCHEMATIC- Mode 3 (Charge)

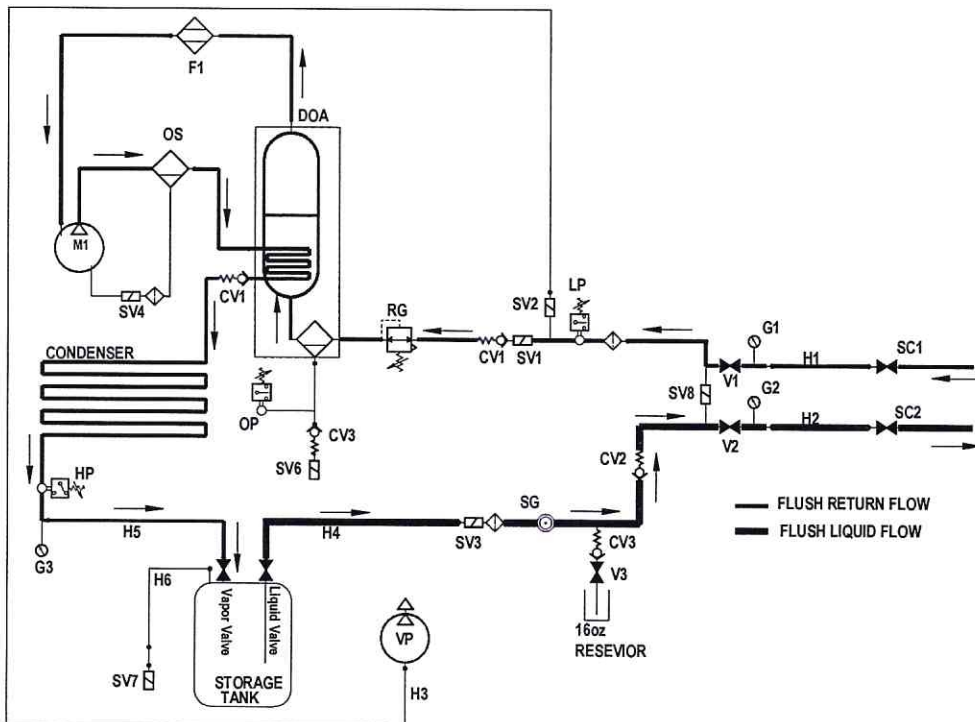




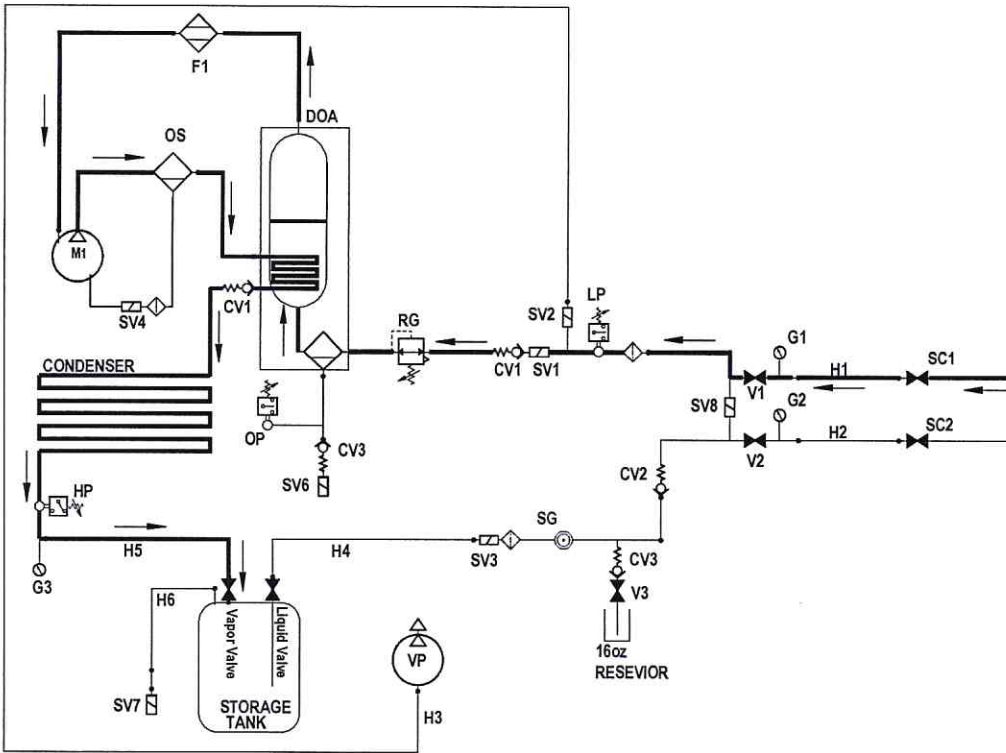
### 5. AR300 REFRIGERATION SCHEMATIC- Mode 6 (Quick Charge)



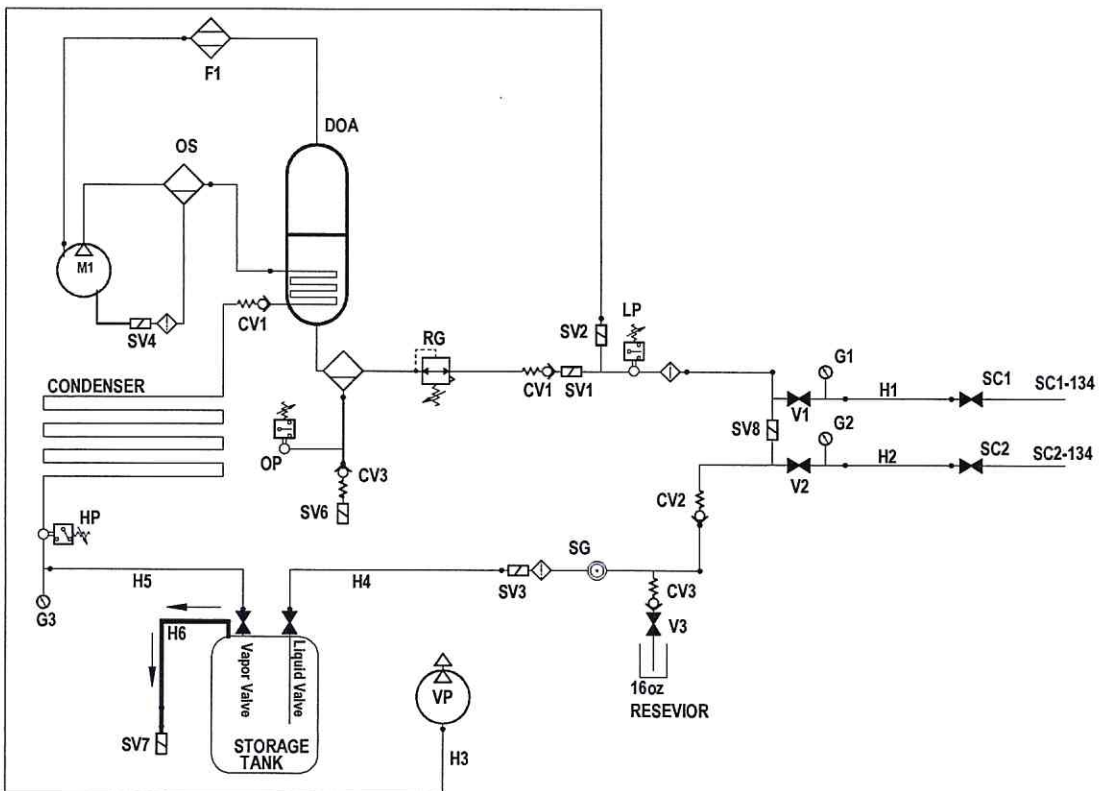
### 6. AR300 REFRIGERATION SCHEMATIC- Mode 7 (Flush)



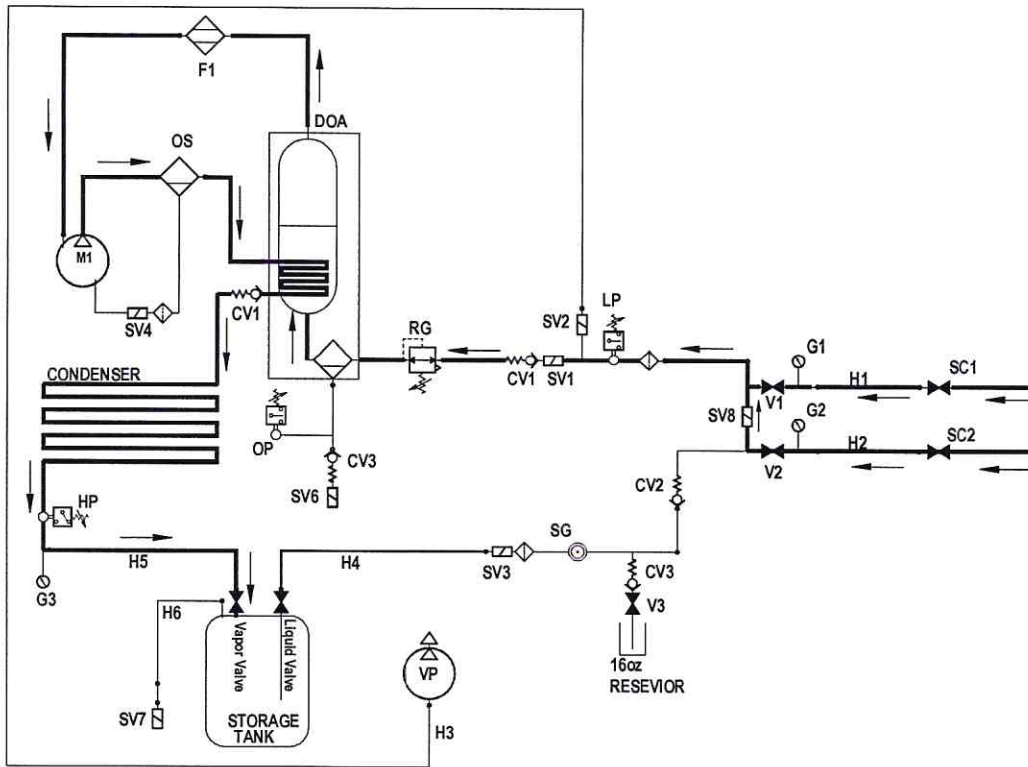
### 7. AR300 REFRIGERATION SCHEMATIC- Mode 8 (Refill)



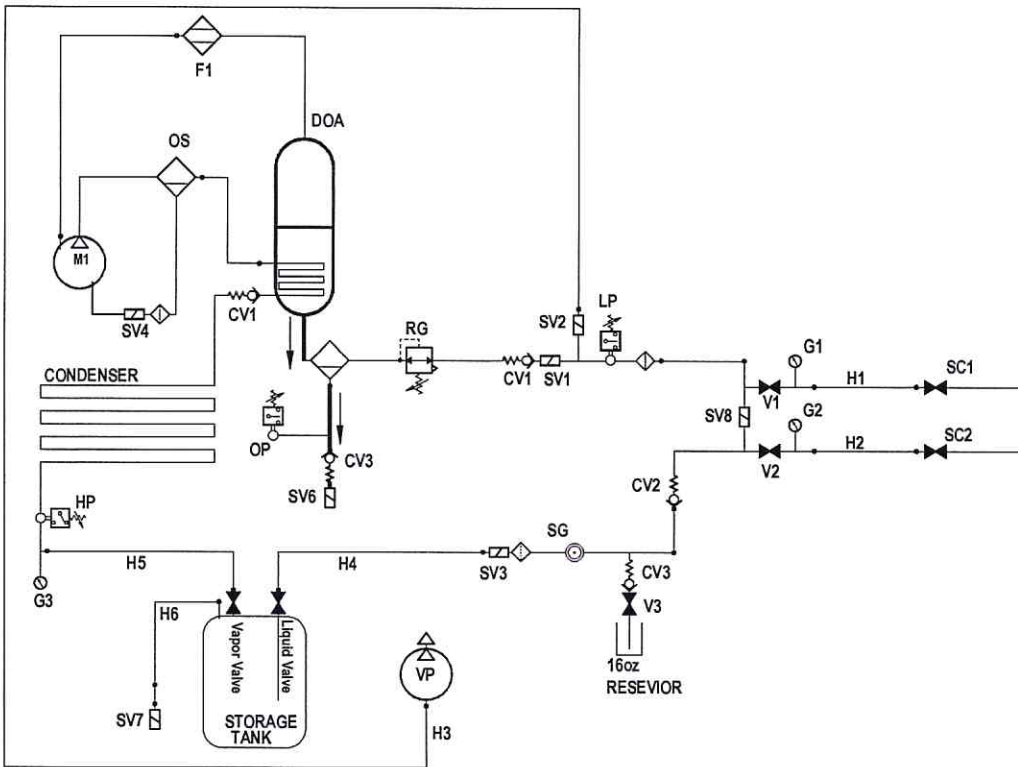
### 8. AR300 REFRIGERATION SCHEMATIC- Mode 9A (Air Purge)



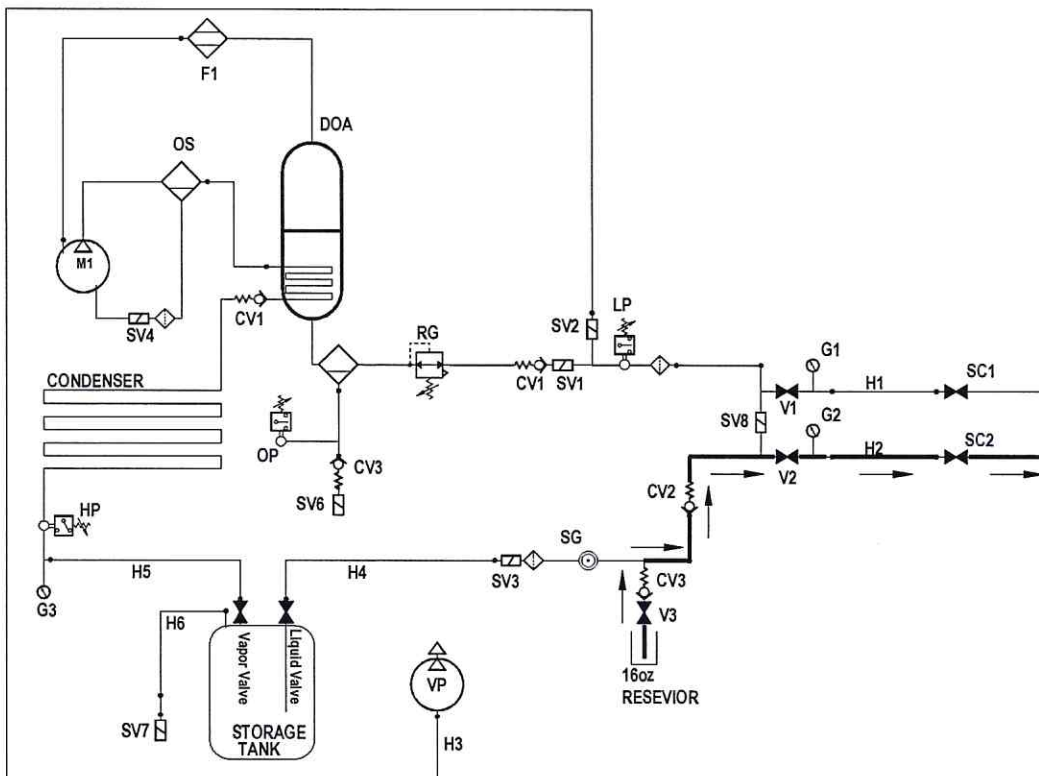
# 9. AR300 REFRIGERATION SCHEMATIC- Mode 9B (Filter Change)



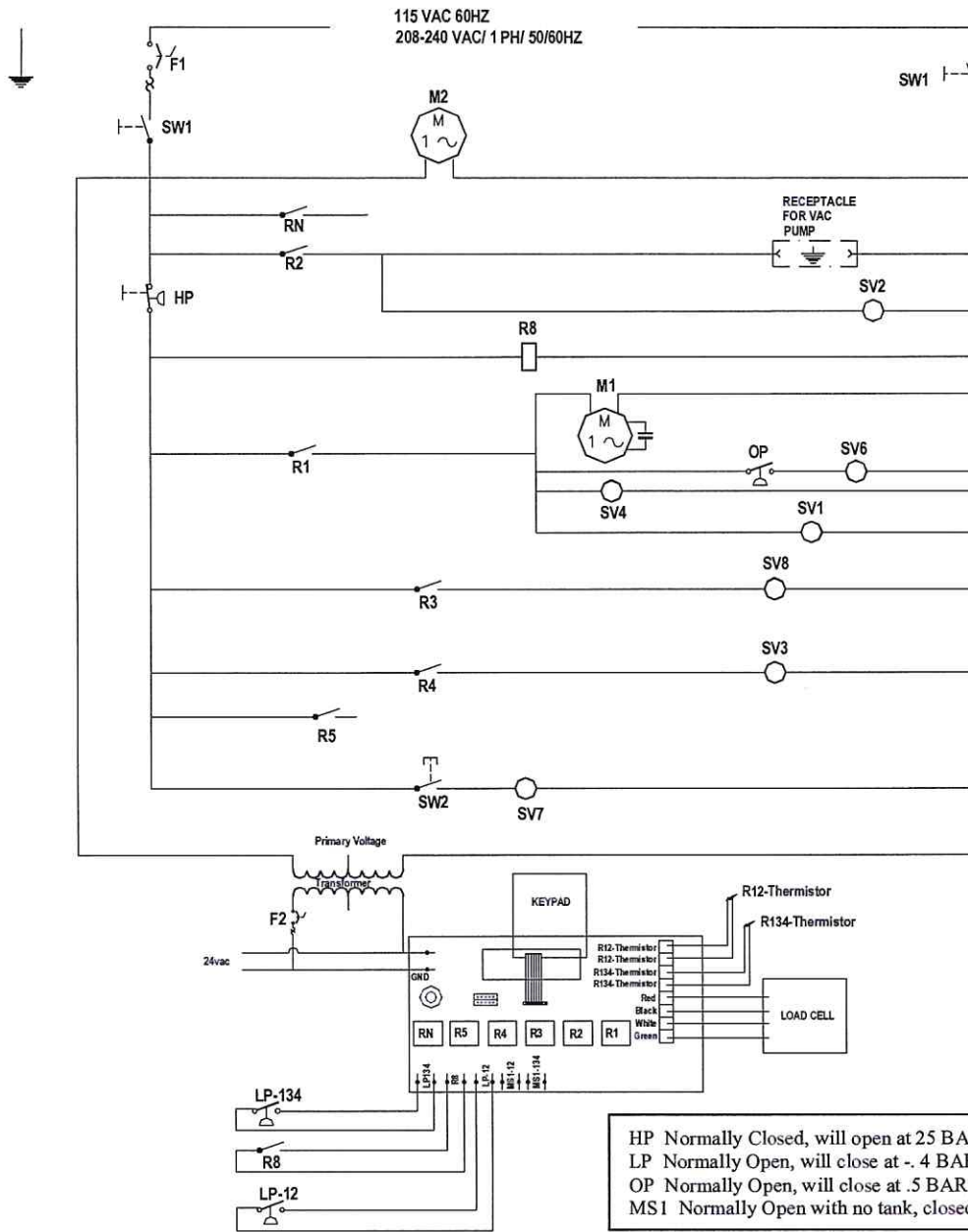
## 10. AR300 REFRIGERATION SCHEMATIC- Automatic Oil Drain



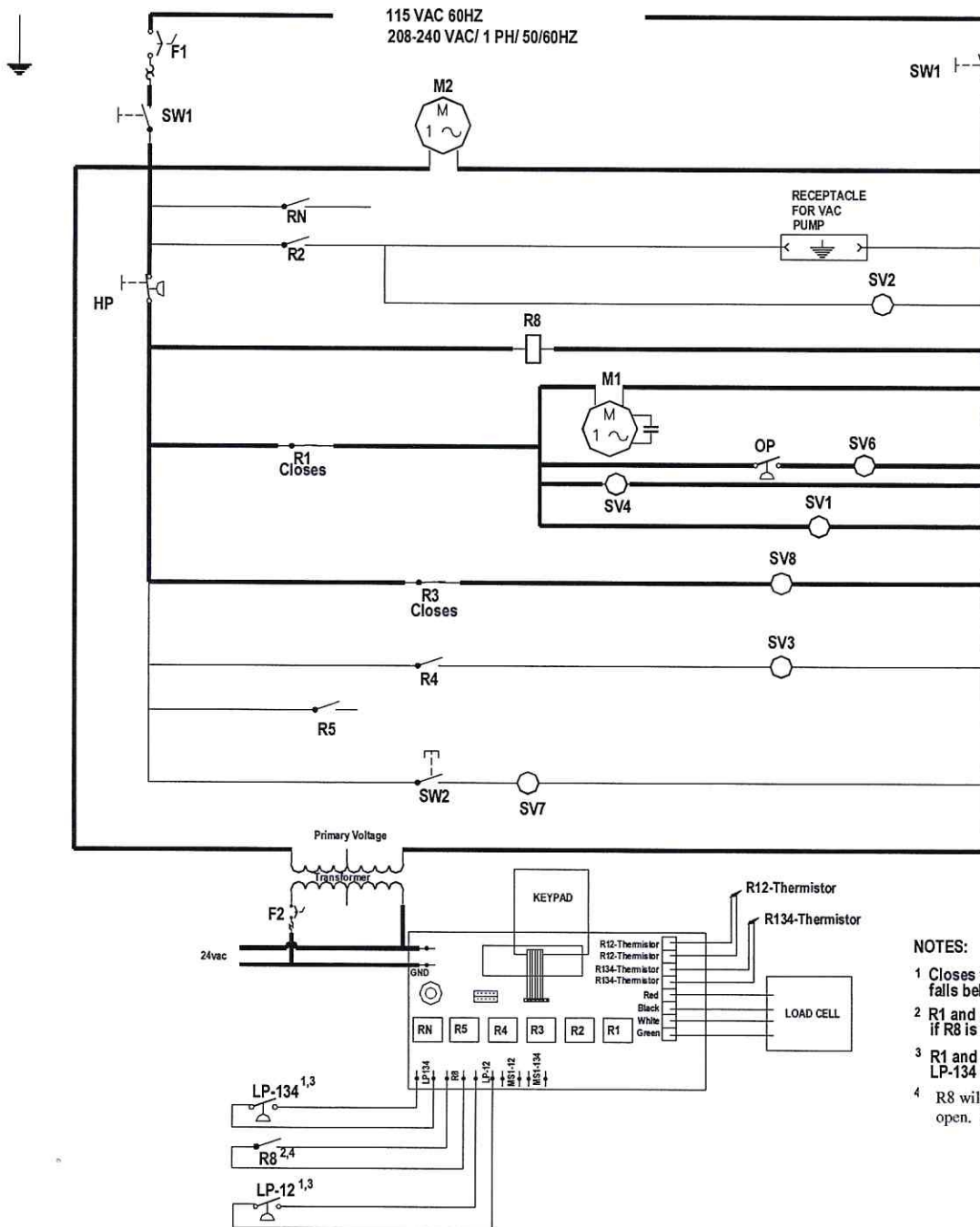
## 11. AR300 REFRIGERATION SCHEMATIC- Oil Injection



# 12. AR300 ELECTRICAL DIAGRAM

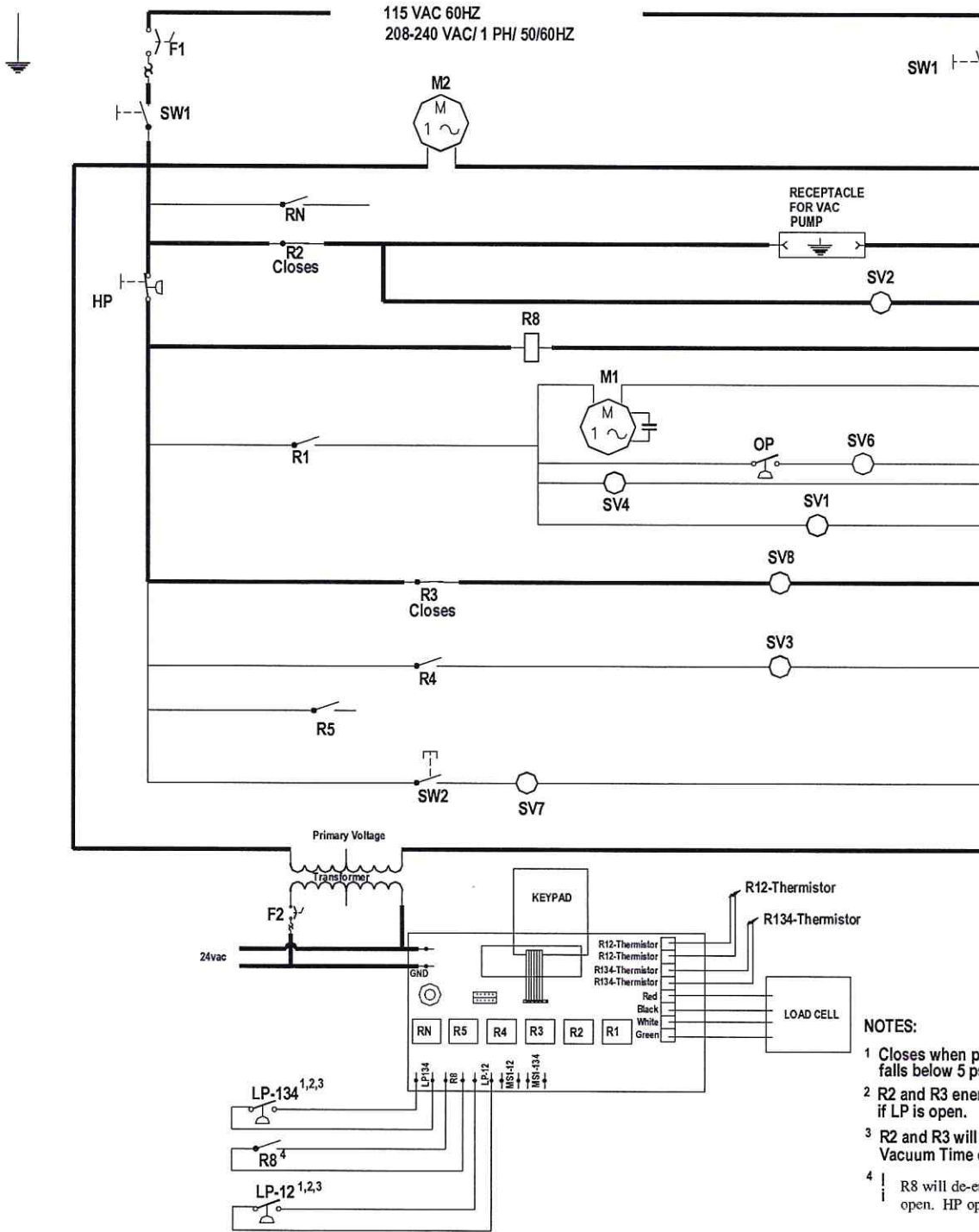


# 13. AR300 ELECTRICAL DIAGRAM- Mode 1 (Recover)

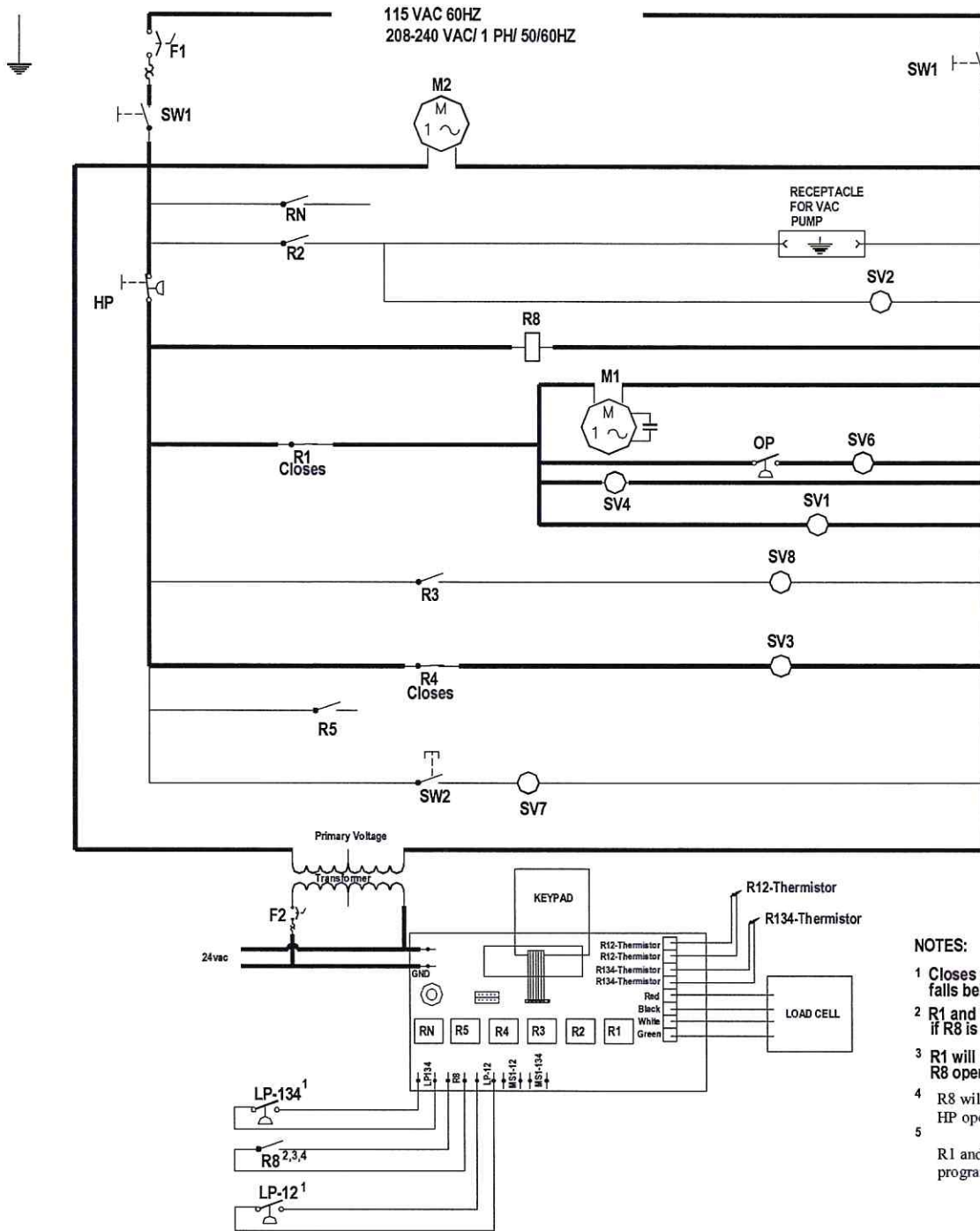




# 14. AR300 ELECTRICAL DIAGRAM- Mode 2 (Evacuate)



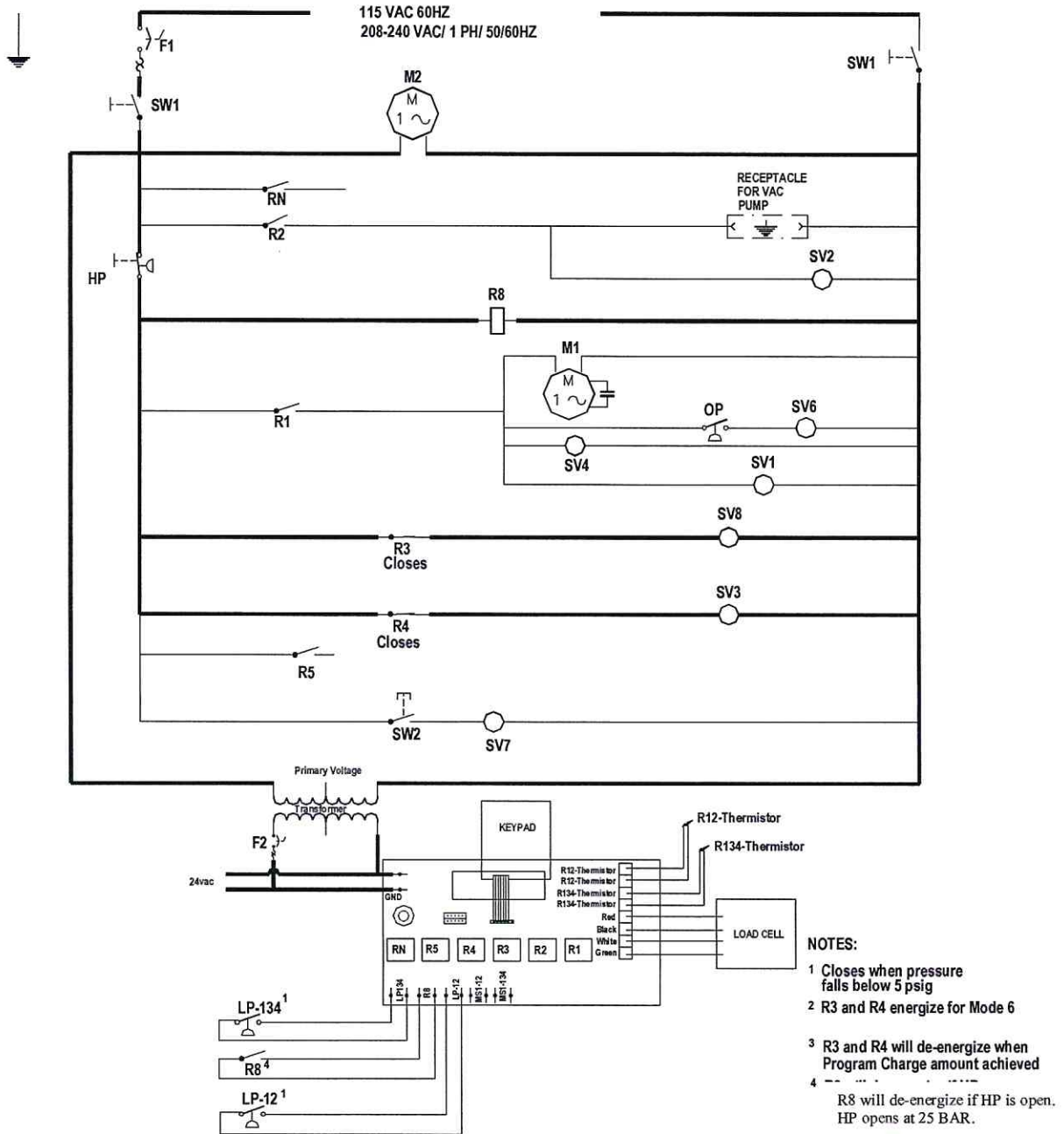
# 15. AR300 ELECTRICAL DIAGRAM- Mode 3 (Charge)



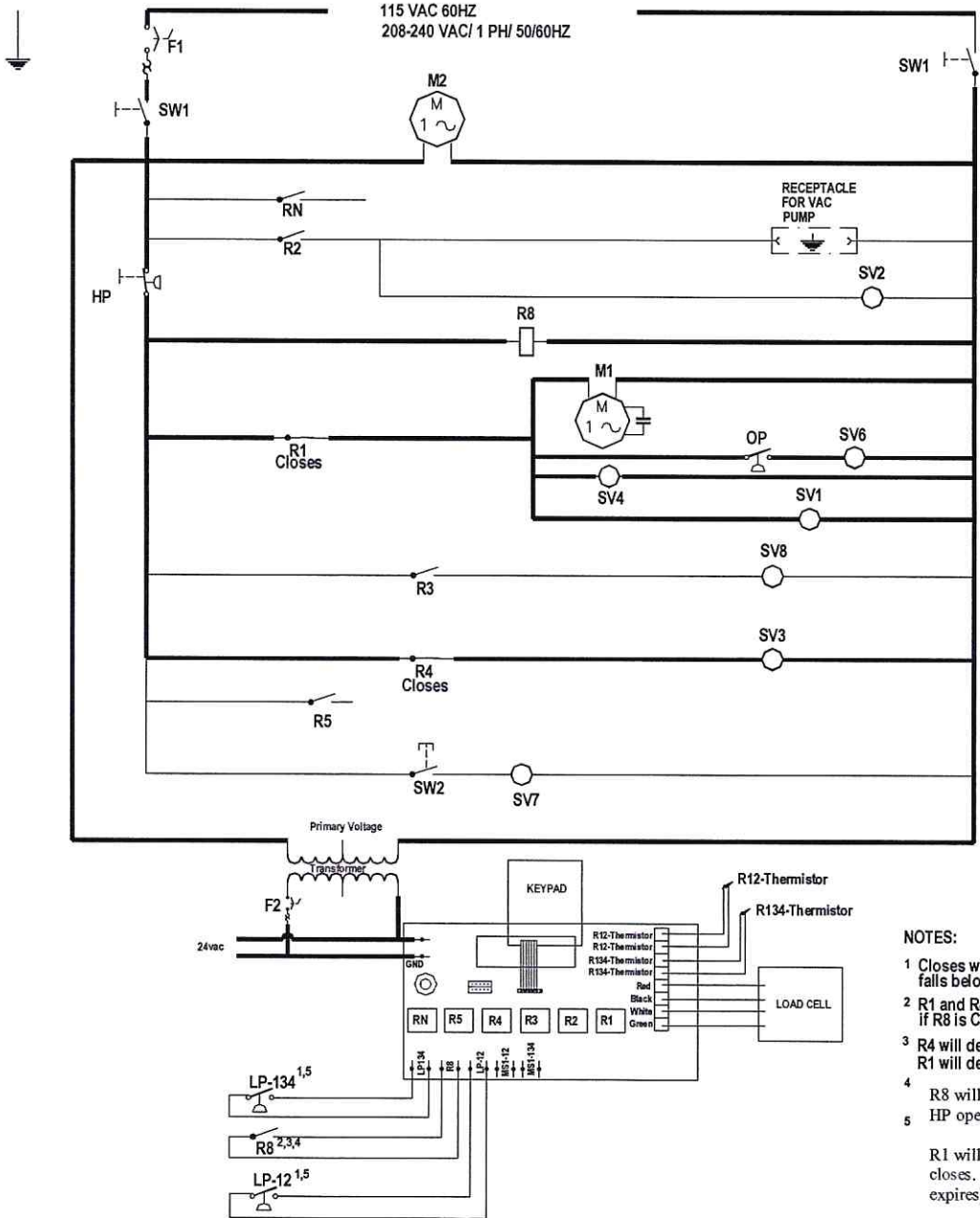
## NOTES:

- 1 Closes when pressure falls below 5 psig
- 2 R1 and R4 energize for Mode 3 if R8 is Closed
- 3 R1 will de-energize if R8 opens
- 4 R8 will de-energize if HP is open. HP opens at 25 BAR.
- 5 R1 and R4 will de-energize when programmed charge is achieved.

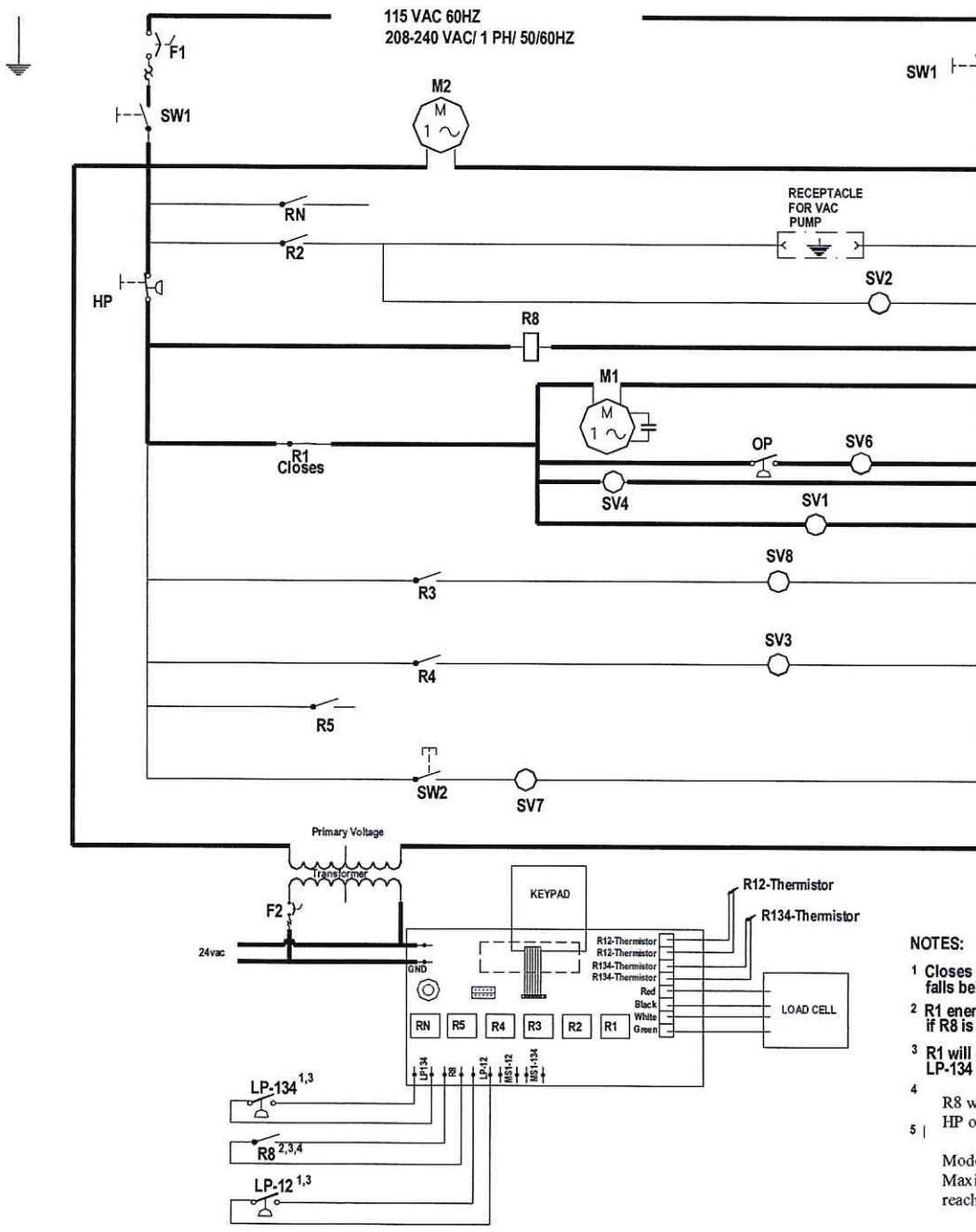
# 16. AR300 ELECTRICAL DIAGRAM- Mode 6 (Quick Charge)



# 17. AR300 ELECTRICAL DIAGRAM- Mode 7 (Flush)

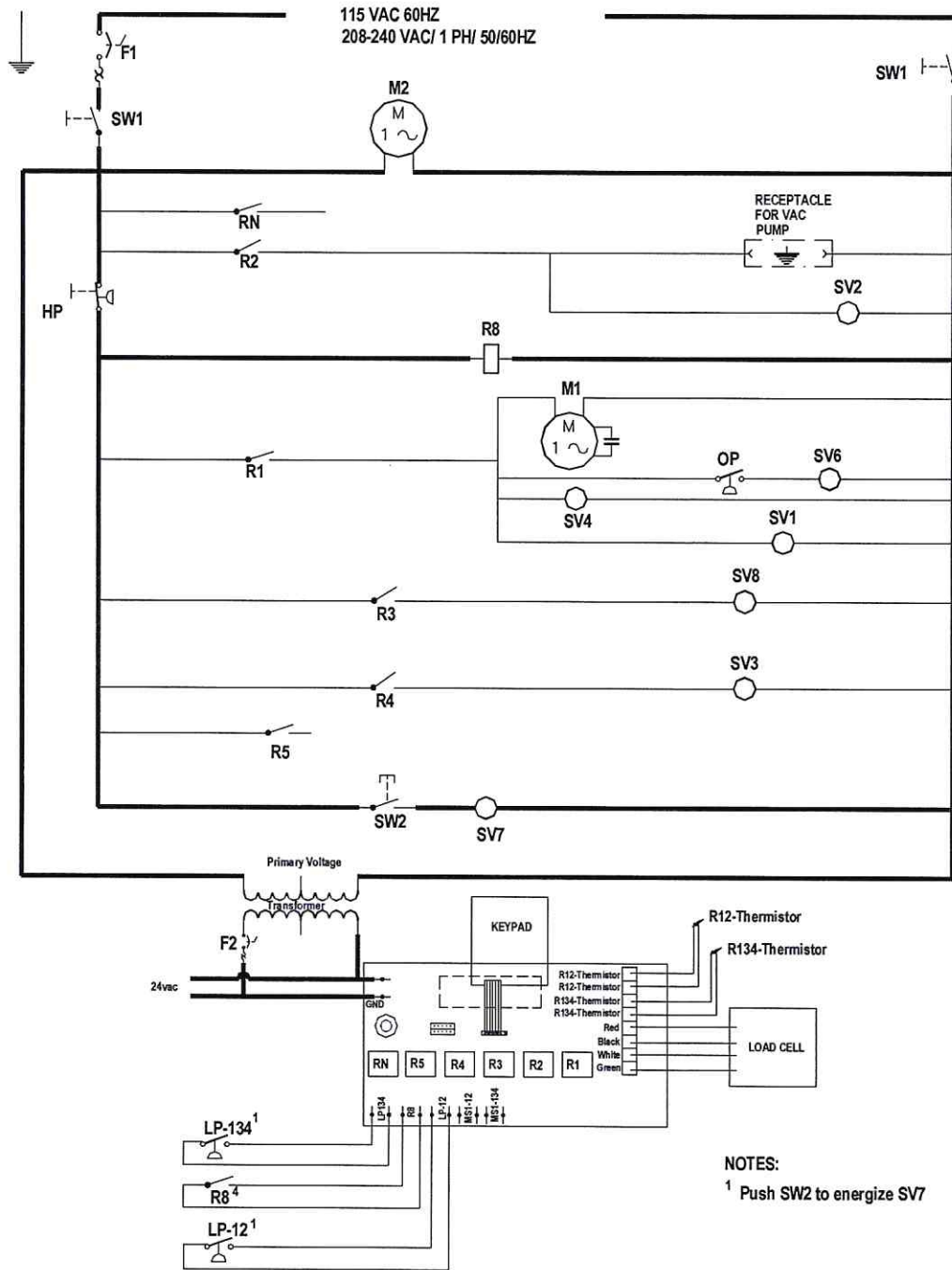


# 18. AR300 ELECTRICAL DIAGRAM- Mode 8 (Refill)



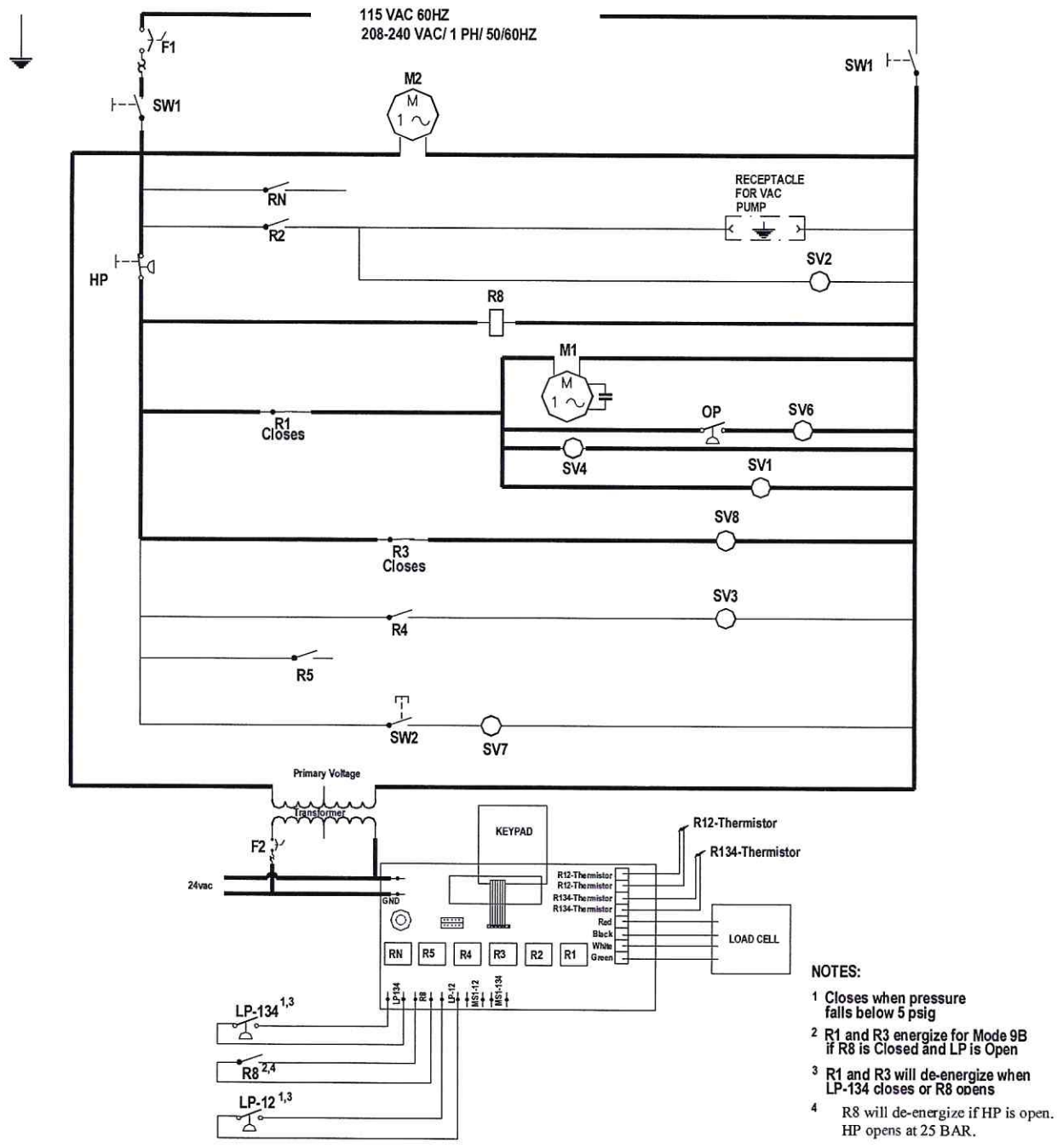
- NOTES:**
- 1 Closes when pressure falls below 5 psig
  - 2 R1 energize for Mode 8 if R8 is Closed and LP is Open
  - 3 R1 will de-energize when LP-134 closes or R8 opens
  - 4 R8 will de-energize if HP is open. HP opens at 25 BAR.
  - 5 |
- Mode 8 is complete when Maximum tank refill weight is reached.

# 19. AR300 ELECTRICAL DIAGRAM- Mode 9A (Purge)



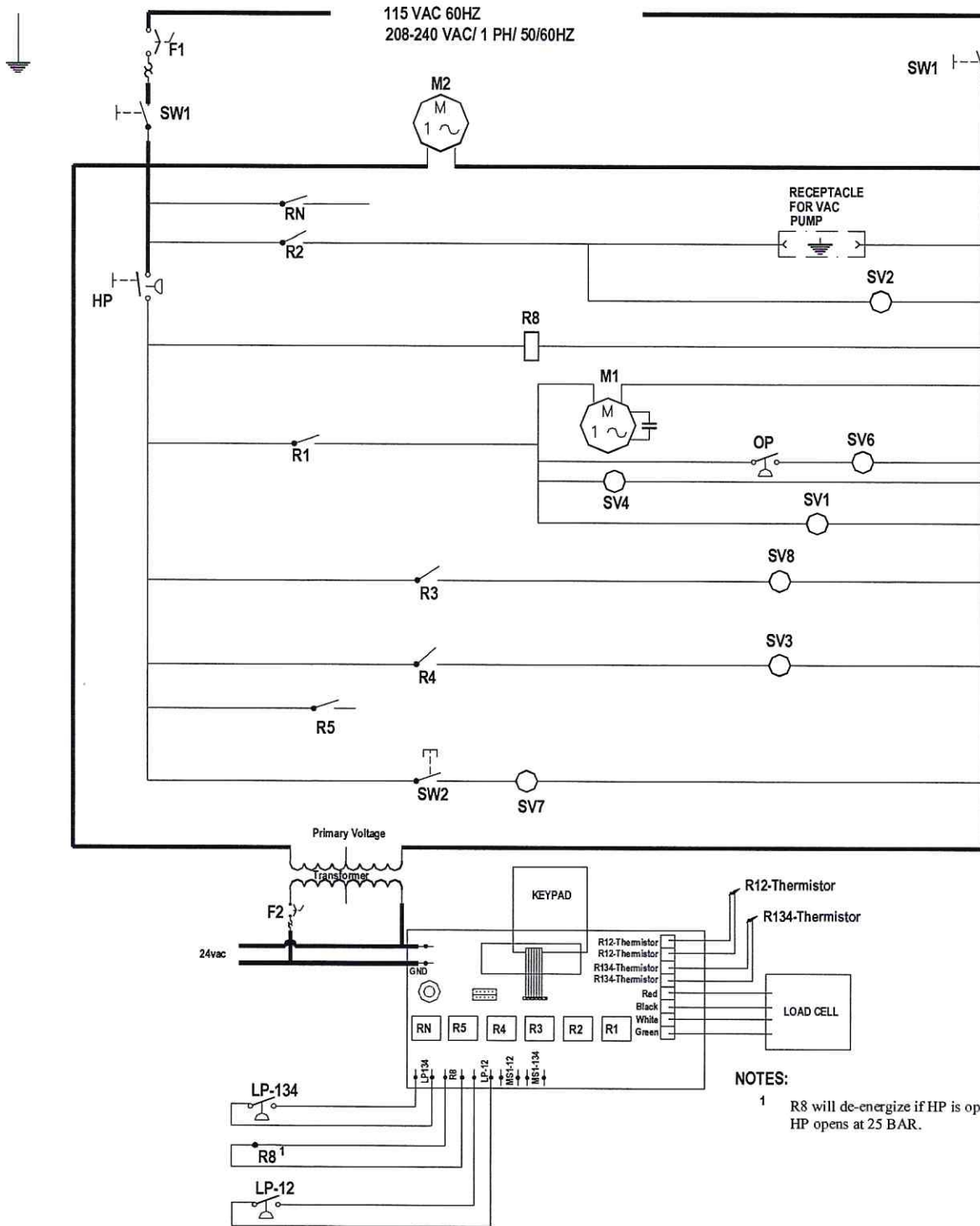


# 20. AR300 ELECTRICAL DIAGRAM- Mode 9B (Filter Change)

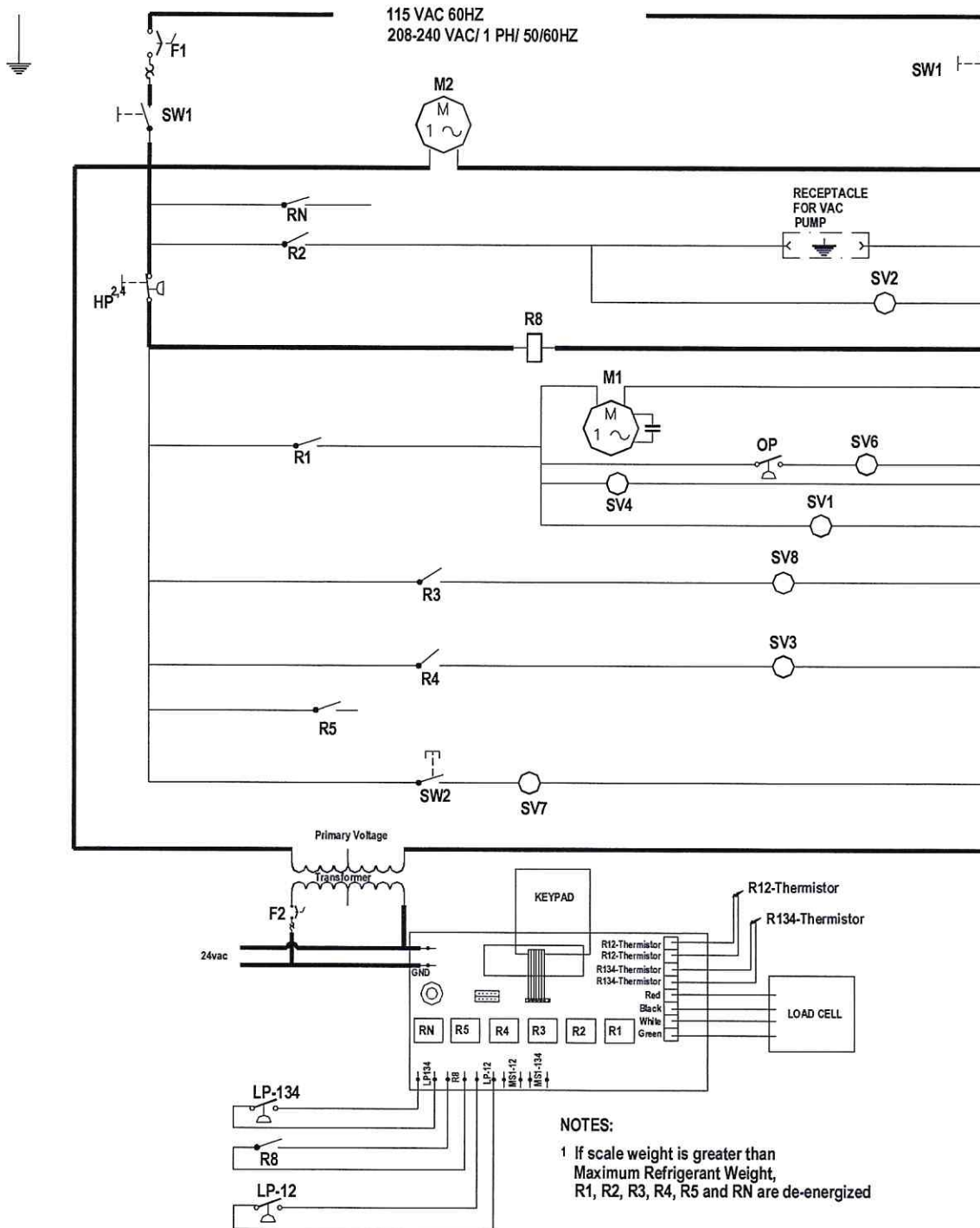


- NOTES:**
- 1 Closes when pressure falls below 5 psig
  - 2 R1 and R3 energize for Mode 9B if R8 is Closed and LP is Open
  - 3 R1 and R3 will de-energize when LP-134 closes or R8 opens
  - 4 R8 will de-energize if HP is open. HP opens at 25 BAR.

# 21. AR300 ELECTRICAL DIAGRAM- HP Switch Lockout



# 22. AR300 ELECTRICAL DIAGRAM- Tank Overfill lockout



# 23. AR300E SERIES PARTS LIST

AR300EE  
SERIES  
MODEL

<u>P/N</u>	<u>DESCRIPTION</u>	<u>SCHEMATIC CODE</u>			
30-736	High Side Pressure Gauge	G2	x		
30-737	Low Side Pressure Gauge	G1	x		
30-738	Tank Pressure Gauge	G3	x		
31-003	Keypad	KEYPAD	x		
33-103	Transformer	TRANSFORMER	x		
35-100	High Pressure Switch	HP	x		
35-101	Low Pressure Switch	LP	x		
35-102	Main Power Switch	SW1	x		
35-107	Purge Switch	SW2	x		
36-003	Compressor Oil Return Solenoid Valve	SV4	x		
36-004	Check Valve	CV1	x		
36-005	Solenoid Block	SV1,SV2,SV3	x		
36-006	Check Valve	CV3	x		
36-010	Check Valve	CV2	x		
36-015	Solenoid Operator	SV1,SV2,SV3, SV6,SV7,SV8	x		
36-017	Solenoid Coil-230v	SV1,SV2,SV3, SV6,SV7,SV8	x		
37-101	Relay	R8	x		
39-004	Fan	M2	x		
39-011	Circuit Breaker	F1	x		
41-611	Filter Shell	FD	x		
41-612	Fan Grill		x		
41-702	Pressure Regulator	RG	x		
41-703	Liquid Sight Glass	SG	x		
41-704	Compressor	M1	x		
41-705	Oil Separator	OS	x		
41-707	Condenser Coil	CONDENSER	x		
41-709	Cotter Pin		x		
	27 liter Recovery Tank	TANK	x		
	Vacuum Pump	VP	x		
42-245	Manifold Valve Knob		x		
44-104	Cart		x		
44-147	Cowling		x		
44-145	Control Panel		x		
52-100	10" Pneumatic Wheels		x		
52-101	4" Swivel Caster		x		
52-102	Cart Hand Grips		x		
52-106	4" Swivel Caster with Brake		x		
54-100	16 ounce Oil Bottle	RESEVIOR	x		
54-101	Metal Bottle Cap		x		
	Power Cord		x		
62-101	Power Cord		x		
71-706	DOA Chamber	DOA	x		
74-017	Label Knob ON-OFF		x		
74-101	MASTER LABEL SHEET AR300E Generic		x		

<u>P/N</u>	<u>DESCRIPTION</u>	<u>SCHEMATIC CODE</u>	<u>AR300EE</u>
81-004	Vacuum Pump Receptacle	RECEPTACLE	x
82-102	PC Board Nylon Stand Offs		x
82-105	IEC Electrical Inlet		x
84-003	Black Wire Tie		x
86-114	#8-32 Socket Head Screw		x
86-115	#6-32 nut with star washer		x
86-120	1/4-20 Lock Nut		x
86-121	1/4-20 x .5" Socket Head Screw		x
86-122	#8 x 1/2 Phillips Sheet Metal Screw		x
86-124	#10-24 x 1/2 Fan Mounting Screw		x
86-129	1/4-20 x 1.5" bolt		x
87-101	3/16 Rivet		x
AR200-A3	Scale Assembly	LOAD CELL	x
AR2MNFLD220-A1	Manifold Gauge Assembly	V1, V2, G1, G2, SV8, & CV2	x
AR300EPCB-A1	PC Board	PCB	x
AR4CMP220-A1	Compressor Assembly	M1	x
AR4DISCH220-A1	Discharge Block Assembly	SV6,SV7	x
AR4OILINJ-A1	Oil Injection Assembly	V3	x
ARDOA-A1	DOA chamber assembly	DOA	x
ARH10-A1	Manifold Internal Hose		x
ARH11-A1	Liquid and Vapor Tank Hose	H4, H5	x
ARH12-A1	Purge Tank Hose	H6	x
ARH14-A1	Purge Gauge Internal Hose		x
ARH15-A1	Compressor Suction Hose		x
ARH19-A1	Oil Drain Hose		x
ARH4-A1	Vacuum Pump Hose	H3	x
ARH6-A1	R134 Low side Service Hose	H1	x
ARH7-A1	R134 High Side Service Hose	H2	x
AROILSEP-A1	Oil Return Assembly	OS & SV4	x
ARSB220-A1	Solenoid Block Assembly	SV1,SV2, SV3	x
ARXF	Filter Drier	FD	x
M2XRK	Teflon Valve Repair Kit	V1,V2	x
QCH134	High Side 134a Service Coupling	SC2	x
QCL134	Low Side 134a Service Coupling	SC1	x
TMX2G-A1	Thermistor	T1, T2	x