

INSTALLATION INSTRUCTIONS for HEALY SYSTEMS, INC. CLEAN AIR SEPARATOR

The Model 9961 or 9961H, Healy Systems Clean Air Separator (CAS) consists of a 400 gallon steel vapor processor vessel that contains a fuel resistant bladder to hold excess gasoline vapors that may develop in gasoline storage tanks during idle periods of gasoline dispensing facility operation. Models and Drawings with a "H" suffix apply to horizontal CAS installations and those without a "H" suffix apply to vertical CAS installations. The CAS assembly weighs approximately 800 pounds which makes it necessary to have a power assisted lifting device available at the installation site to remove the CAS from the transportation vehicle and place it on the required concrete pad (see drawing 9900-9945 or 9900-9945H). The pad (level within 1/8"/foot) is located within 100 feet to the gasoline storage tank vent lines. The pad is a requirement of this installation. **DO NOT PLACE THE CLEAN AIR SEPARATOR DIRECTLY ON THE GROUND OR ASPHALT SURFACE.** NOTICE: The installer is responsible to ensure that the installation meets the latest edition requirements of NFPA 30A, Chapter 10. No electrical connections are required. The CAS securement method shown in drawing 9900-9945 or 9900-9945H shall be approved by the local authority having jurisdiction with respect to wind and seismic loading. Installer shall not loosen, rotate or remove factory installed fittings or flange as this may damage factory seals and void warranty.

In addition to the vapor processor vessel, there is a hardware kit that contains the following:

- 4 Locking 1" NPT Ball Valves
- 4 Pad locks (keyed alike)
- 1 Breather Assembly, Healy Model 9948
- 1 Float Check Valve Assembly, Model 9466G

Reference the appropriate Healy Systems installation drawing (9900-9942, 9900-9942H, 9900-9971, 9900-9971H, 9900-9972, 9900-9972H, 9900-9973 or 9900-9973H of this manual) for placement of the above parts for the vent stack configuration required by the local Authority Having Jurisdiction (AHJ) for the Underground Storage Tank (UST) system. **A flexible connection between the Clean Air Separator and the vent line(s) is allowable if required by the local Authority Having Jurisdiction (AHJ) to meet seismic requirements. Should the flex connection be installed such that it is not supported, the slope of the flex connection shall be greater than the 1/8"/foot slope required for the rest of the one inch galvanized piping.** The local contractor is responsible to provide all necessary, galvanized piping, non-hardening, UL classified pipe joint compound and plumbing fittings. Additional Pressure/Vacuum (P/V) vent valves to complete installation are not included in the hardware kit. Healy is not responsible for the warranty of any other P/V vent valve purchased to complete installation.

The CAS arrives at the site assembled and tested. All plumbing shall be done using 1" galvanized steel pipe (Schedule 40) and approved nipples, as called out in the installation drawing appropriate for the site installation. Mounting hardware shall be galvanized or stainless steel. Careful attention must be paid to the installation drawing appropriate for the site installation to assure proper operation of the bladder system. Do not inflate the bladder assembly after installation.

It is important that the CAS be secured to the concrete pad as shown in drawing 9900-9945 or 9900-9945H of this manual to prevent any unintentional repositioning of the CAS as the connecting plumbing to the vent system is accomplished.

OPERATION AND PURGING

NORMAL OPERATION:

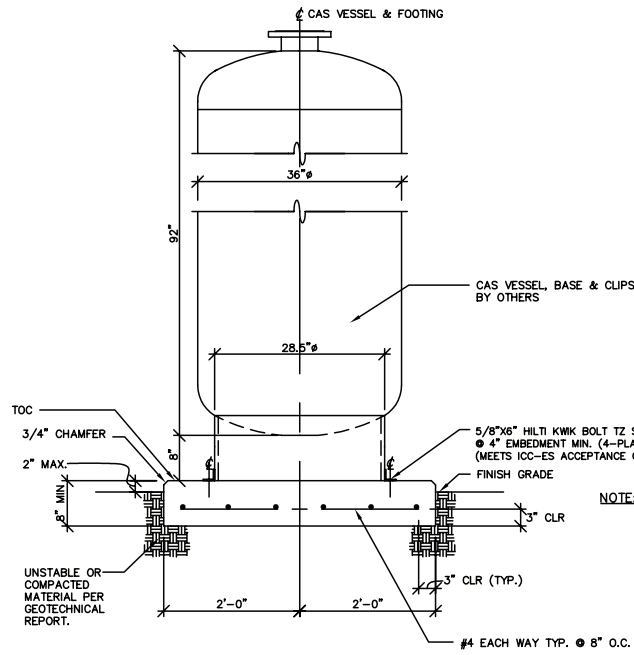
- There are four ball valves on the CAS. Each ball valve is to be installed so as to allow opening and closing with nothing obstructing the full range (90°) of movement. In normal operation, only the valve (A) at the top of the CAS shall be open – the other three valves (B, C and D) shall be closed. All four valves shall be locked in the above positions. The two plugs (E and F) should be installed using a non-hardening, UL classified pipe joint compound and tightened to 60 ft-lbs.

DRAINING THE BLADDER:

- Any liquid coming over from the vent system would have collected above the valve (A) in the riser pipe before going into the bladder. An inspection of the need to drain the bladder is easily made by removing the plug (E) at the tee on the bottom plumbing of the CAS. Before removing this plug, open the valve (B) above the tee to release any liquid into the piping below. Wait approximately 30 seconds and then close the valve (B). Now, remove the plug (E) at the tee on the bottom plumbing of the CAS – be sure to have a container suitable for gasoline available to catch fluid. If liquid in excess of 16 ounces (473 ml) drains out, the bladder should also be drained.
- Should it be necessary to drain the bladder:
 1. Close the upper ball valve (A) (usually open) leading to the gasoline storage tank vent lines.
 2. Open the valve (C) that goes to the internal syphon tube. Be sure the other three ball valves (A, B and D) that connect to the vent lines and CAS are closed.
 3. Remove the plug (E) from the bottom tee and connect an explosion proof evacuation pump capable of handling liquid. Have a liquid tight, container suitable for gasoline positioned to receive any fluid that may exit the system and start the pump. If no liquid returns within 30 seconds, the bladder is dry – discontinue pumping, remove the pump, replace the plug (E) and return the ball valves to their normal, locked, positions.

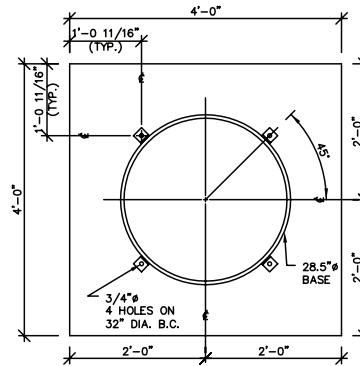
DRAINING THE CAS:

- Should it be necessary to drain the CAS (between the bladder and steel wall):
 1. Close the ball valve at the top (A) of the CAS and also the two valves (B and C) on the vertical risers.
 2. Remove the plug (E) in the bottom tee and place a metal container below the pipe opening.
 3. Carefully open the ball valve (D) at the bottom of the CAS – observe that the container that is being drained into does not overflow – empty container as required until fluid no longer comes from the pipe when the valve is open.
 4. Close the ball valve (D) and replace the plug (E) into the tee.
 5. Return all ball valves to their normal locked positions.



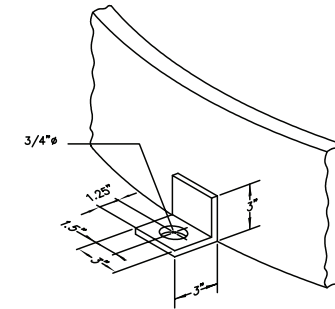
SECTION @ CAS SLAB
SCALE = 3/4" = 1'-0"

CRITERIA
 SOIL BEARING 1000 psf
 BASIC WIND SPEED 100mph
 SEISMIC $S_s = 2g$
 $S_n = 1g$
 MIN. CONCRETE COMP STRENGTH, $f'_c = 2500$ psi
 MIN. REINF. YIELD STRENGTH, $f_y = 40000$ psi



BASE PLAN
SCALE = 3/4" = 1'-0"


NOTE: Δ WHERE ICC-ES ACCEPTANCE CRITERIA IS NOT REQUIRED,
 5/8" X 6" HILTI KWIK BOLT 3 @ 4" EMBEDMENT MIN.
 CAN BE USED (PER ESR-1385 REPORT, ISSUED 09/01/04).



TYPICAL HOLD DOWN CLIP
SCALE = NONE

7	ADDED CAS DIMENSIONS, REVISED CRITERIA LIST	-	TF/MB	01/02/08
6	KB-TZ SS WAS KB3, ESR-1917 WAS ESR-1385, ADDED NOTE 1	-	TF/MB	12/21/07
REV	DESCRIPTION	ECN NO	BY	DATE

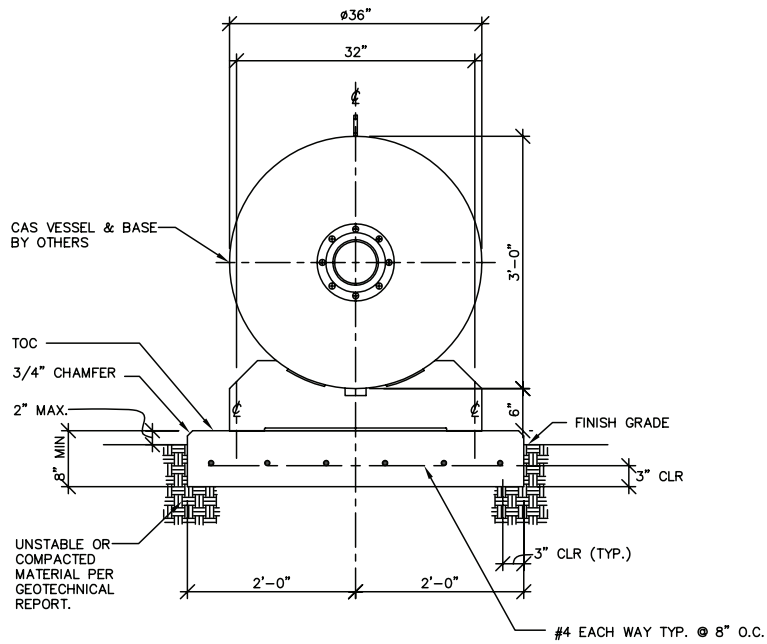
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	DO NOT SCALE DRAWING	.XX ± .02
	STANDARD INCH TOLERANCES (UNLESS OTHERWISE SPECIFIED)	.XXX ± .005 ANGULAR ± 1/2°
	SPECIAL DIST:	


Franklin Fueling Systems
Madison, WI 53718

TITLE: CLEAN AIR SEPARATOR MOUNTING SLAB DETAILS

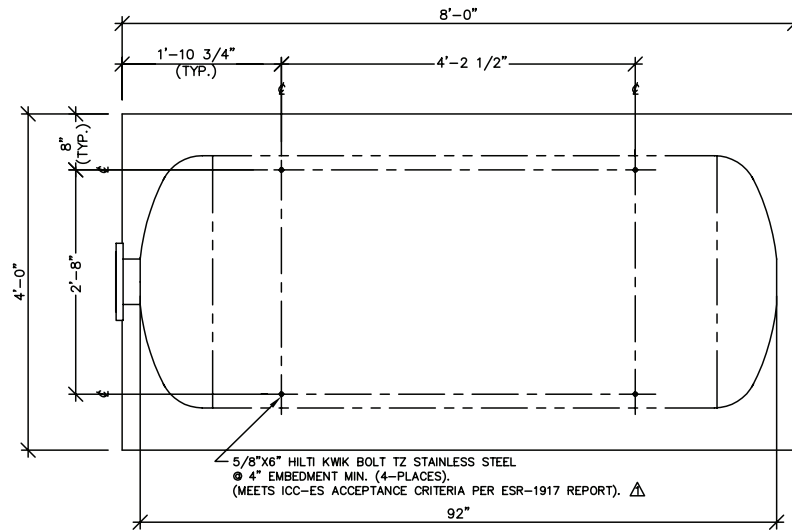
DRAWN: JWH	DATE: 07/31/02	DRW NO: 9900-9945	SUFFIX:
APPRVL:	DATE:	SCALE: 1/8	SHEET 1 OF 1

DRW NO: 9900-9945H



SECTION @ CAS SLAB

CRITERIA
 SOIL BEARING 1000 psf
 BASIC WIND SPEED 100mph
 SEISMIC $S_s=2g$
 $S_{si}=1g$
 MIN. CONCRETE COMP STRENGTH, $f'_c = 2500$ psi
 MIN. REINF. YIELD STRENGTH, $f_y = 40000$ psi



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REV	DESCRIPTION	ECN NO	BY	DATE
5	ADDED CAS DIMENSIONS, REVISED CRITERIA LIST	-	TF MB	01/02/08
4	KB-TZ SS WAS KB3, ESR-1917 WAS ESR-1385, ADDED NOTE 1	-	TF MB	12/21/07

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SPECIAL DIST:

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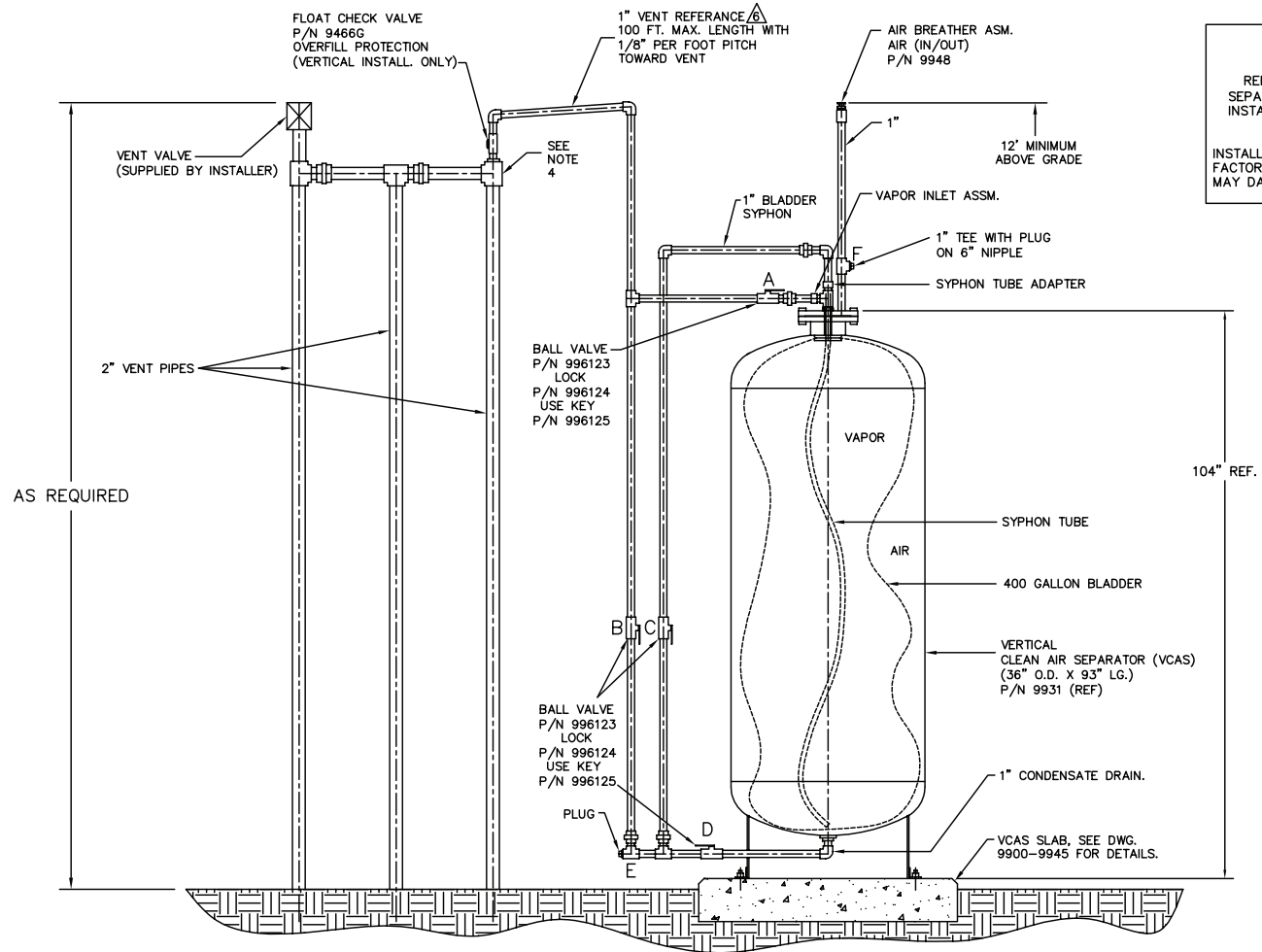


Franklin Fueling Systems

Madison, WI 53718

TITLE:
 CLEAN AIR SEPARATOR HORIZONTAL MOUNTING SLAB DETAILS

DRAWN: TF	DATE: 05/22/07	DRW NO: 9900-9945	SUFFIX: H
APPRVL: MDB	DATE: 06/05/07	SCALE: 3/4"=1'	SHEET 1 OF 1



NOTICE

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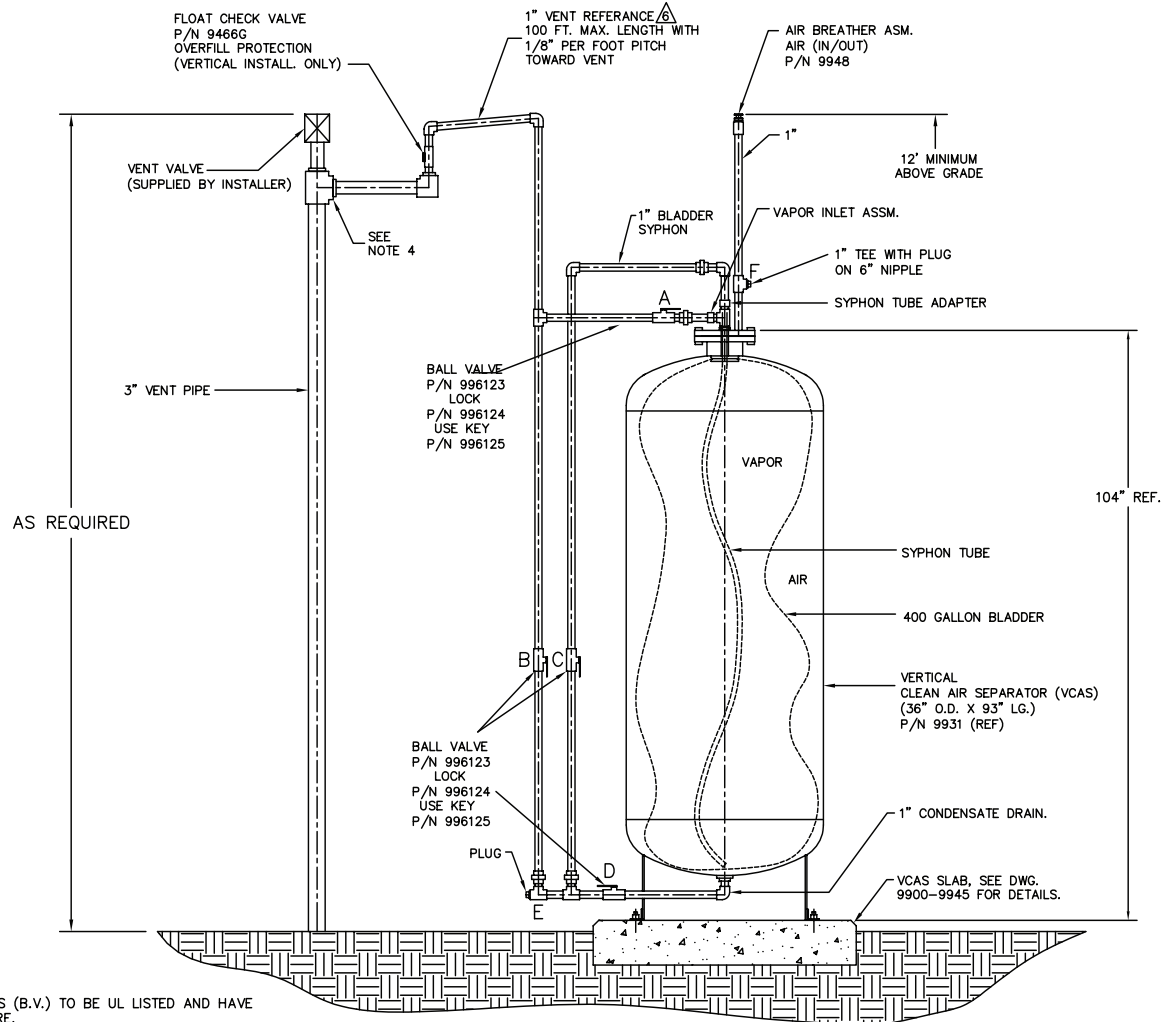
INSTALLER SHALL NOT LOOSEN, ROTATE OR REMOVE FACTORY INSTALLED FITTINGS OR FLANGE AS THIS MAY DAMAGE FACTORY SEALS AND VOID WARRANTY.

- NOTE:**
- 1 - ALL BALL VALVES (B.V.) TO BE UL LISTED AND HAVE PADLOCK FEATURE.
 - 2 - PASSIVE PRESSURE CONTROL-NO ELECTRICAL POWER REQUIRED.
 - 3 - AIR BREATHER MUST BE INSTALLED AT A MINIMUM HEIGHT OF 12' ABOVE GRADE.
 - 4 - VENT LINE TIE IN CAN BE INSTALLED ANYWHERE ALONG THE VENT STACK LINE PROVIDED THAT PIPE SLOPE IS MAINTAINED AND THE CHECK VALVE IS IN THE CORRECT VERTICAL INSTALLATION.
 - 5 - ONLY GALVANIZED PIPE IS TO BE USED FOR PIPING CONNECTIONS
- △** - A FLEXIBLE CONNECTION BETWEEN THE CLEAN AIR SEPARATOR AND THE VENT LINE(S) IS ALLOWABLE IF REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) TO MEET SEISMIC REQUIREMENTS. SHOULD THE FLEX CONNECTION BE INSTALLED SUCH THAT IT IS NOT SUPPORTED, THE SLOPE OF THE FLEX CONNECTION SHALL BE GREATER THAN THE 1/8" PER FOOT SLOPE REQUIRED FOR THE REST OF THE ONE INCH GALVANIZED PIPING.

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	ANGULAR ± 1/2°
SPECIAL DIST:	

15	ADDED NOTE 6	401666	TF	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE
Franklin Fueling Systems Madison, WI 53718				
TITLE: CLEAN AIR SEPARATOR VERTICAL INSTALLATION				
DRW NO:	DATE:	DATE:	DATE:	SUFFIX:
9900-9942	05/14/02	06/05/07	06/05/07	
ACAD HLY	SCALE:	N.T.S.	SHEET 1	OF 1



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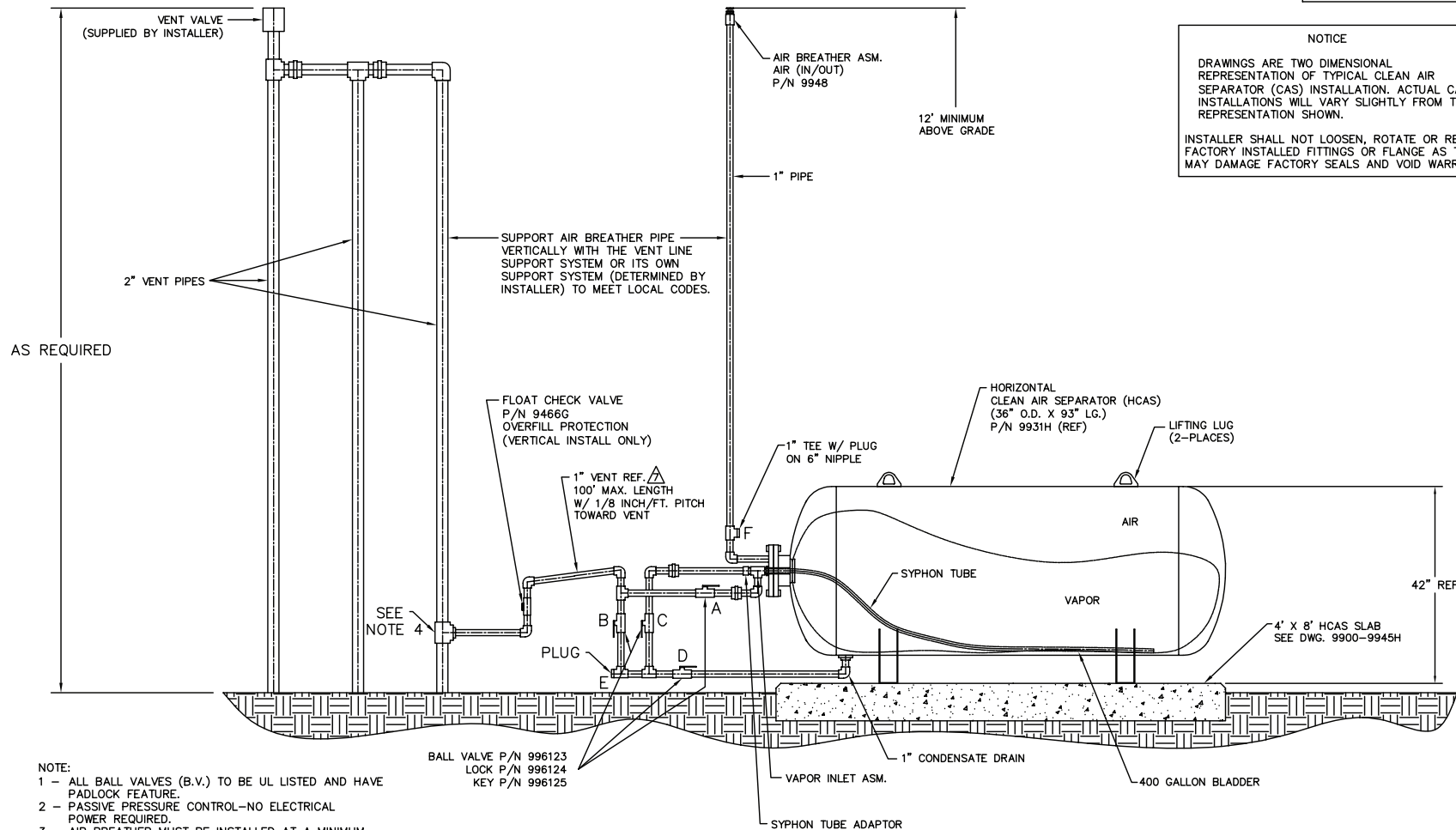
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ANGULAR	± 1/2°

SPECIAL DIST:

8	ADDED NOTE 6	401666	TF	03/20/08
REV	DESCRIPTION	EON NO	BY	DATE
Franklin Fueling Systems Madison, WI 53718				
TITLE: CLEAN AIR SEPARATOR VERTICAL INSTALLATION (1 VENT)				
DRAWN: JWH	DATE: 05/14/02	DRW NO: 9900-9971	SUFFIX:	
APPRVL: MDB	DATE: 06/05/07	ACAD HLY	SCALE: N.T.S.	SHEET 1 OF 1



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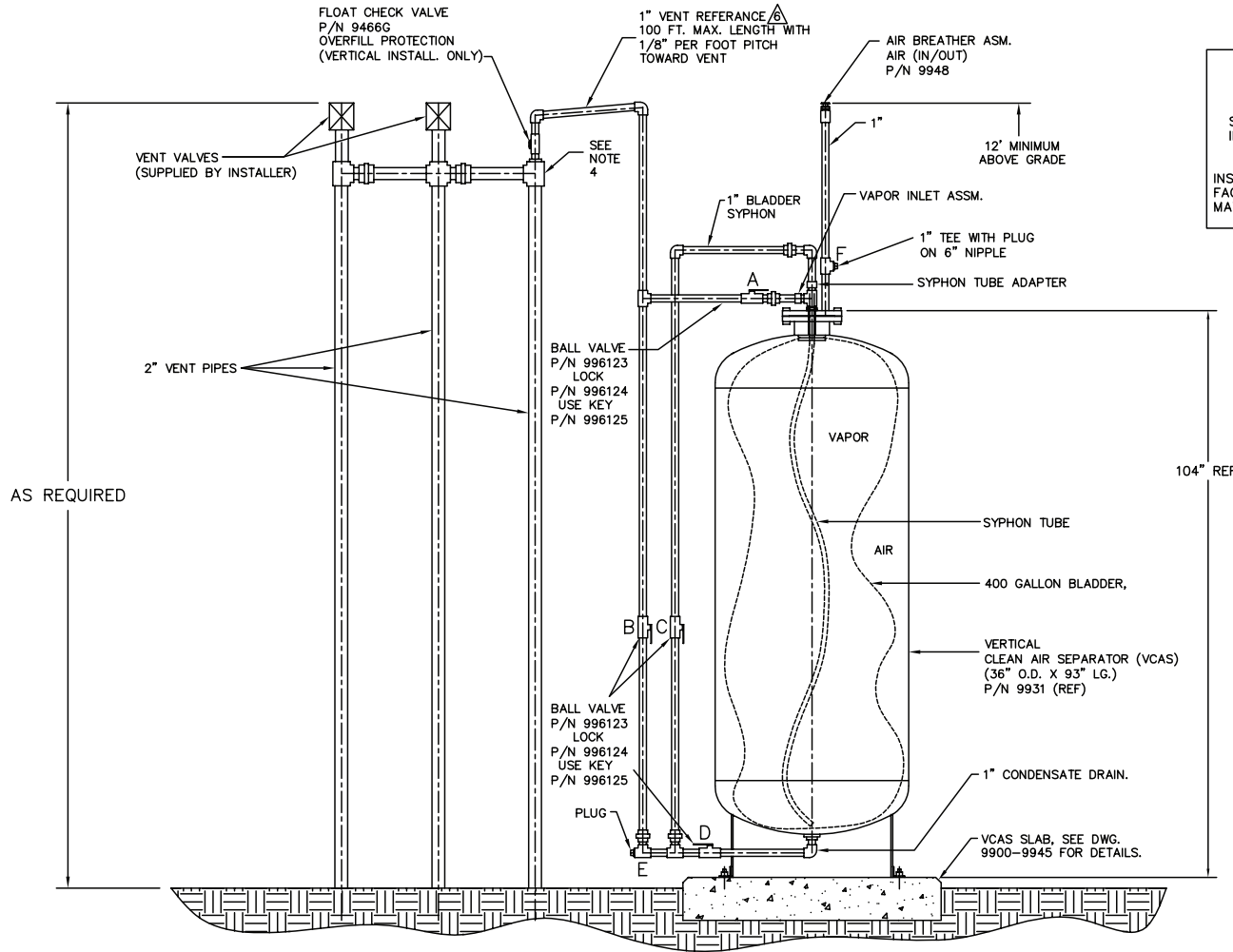
BALL VALVE P/N 996123
 LOCK P/N 996124
 KEY P/N 996125

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	ANGULAR ± 1/2°
SPECIAL DIST:	

7	ADDED NOTE ?	401666	TF	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE
Franklin Fueling Systems Madison, WI 53718				
TITLE: CLEAN AIR SEPARATOR HORIZONTAL INSTALLATION				
DRAWN:	DATE:	DRW NO:	SUFFIX:	
TF	05/23/07	9900-9942	H	
APPRVL:	DATE:	SCALE:	N.T.S.	SHEET 1 OF 1
MDB	06/05/07			



NOTICE

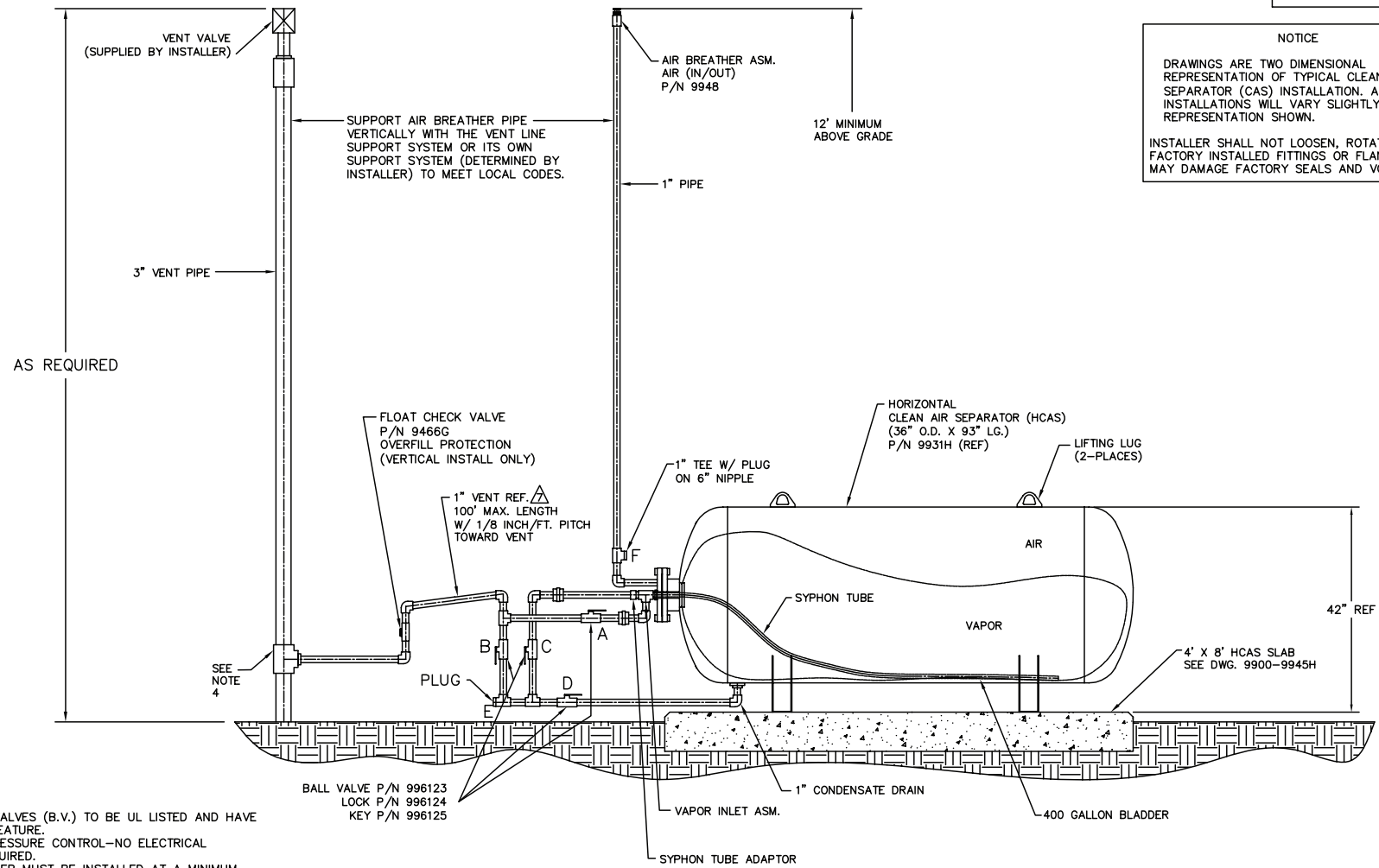
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8	ADDED NOTE 6	401666	TF	MDB	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE	
Franklin Fueling Systems <small>Madison, WI 53718</small>					
TITLE: CLEAN AIR SEPARATOR VERTICAL INSTALLATION (2 VENT)					
DRAWN:	DATE:	DRW NO:	SUFFIX:		
JWH	05/14/02	9900-9972			
APPRVL:	DATE:	ACAD HLY	SCALE:	N.T.S. SHEET 1 OF 1	
MDB	06/05/07				

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	SPECIAL DIST:	



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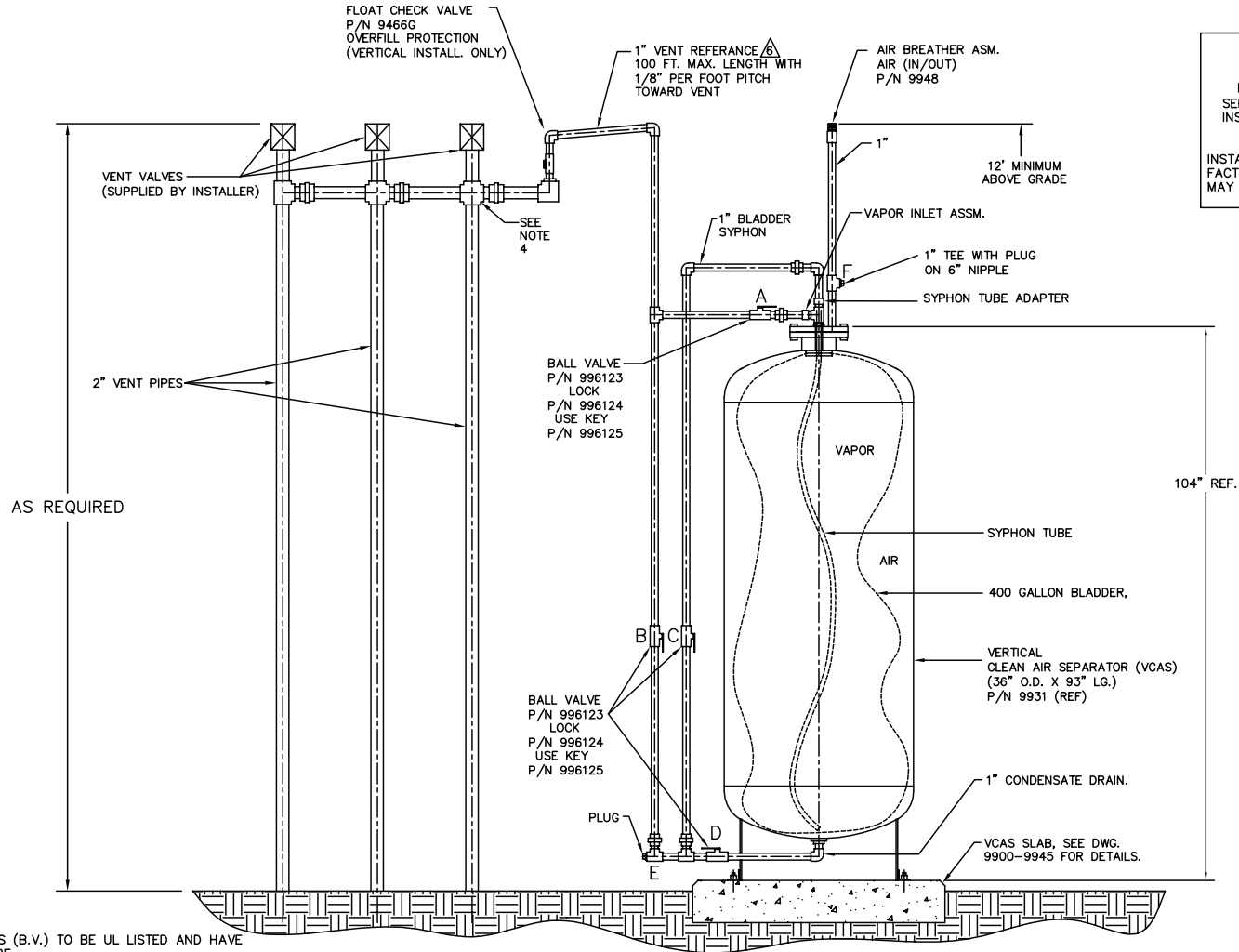
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BALL VALVE P/N 996123
 LOCK P/N 996124
 KEY P/N 996125

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MATERIAL:	
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STANDARD INCH TOLERANCES (UNLESS OTHERWISE SPECIFIED)	.XXX ± .005
SPECIAL DIST:	ANGULAR ± 1/2"

7	ADDED NOTE 7	401666	TF	MDB	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE	
Franklin Fueling Systems <small>Madison, WI 53718</small>					
TITLE: CLEAN AIR SEPARATOR HORIZONTAL INSTALLATION (1 VENT VALVE)					
DRAWN: TF	DATE: 05/22/07	DRW NO: 9900-9971	SUFFIX: H		
APPRVL: MDB	DATE: 06/05/07	SCALE: N.T.S.	SHEET 1	OF 1	



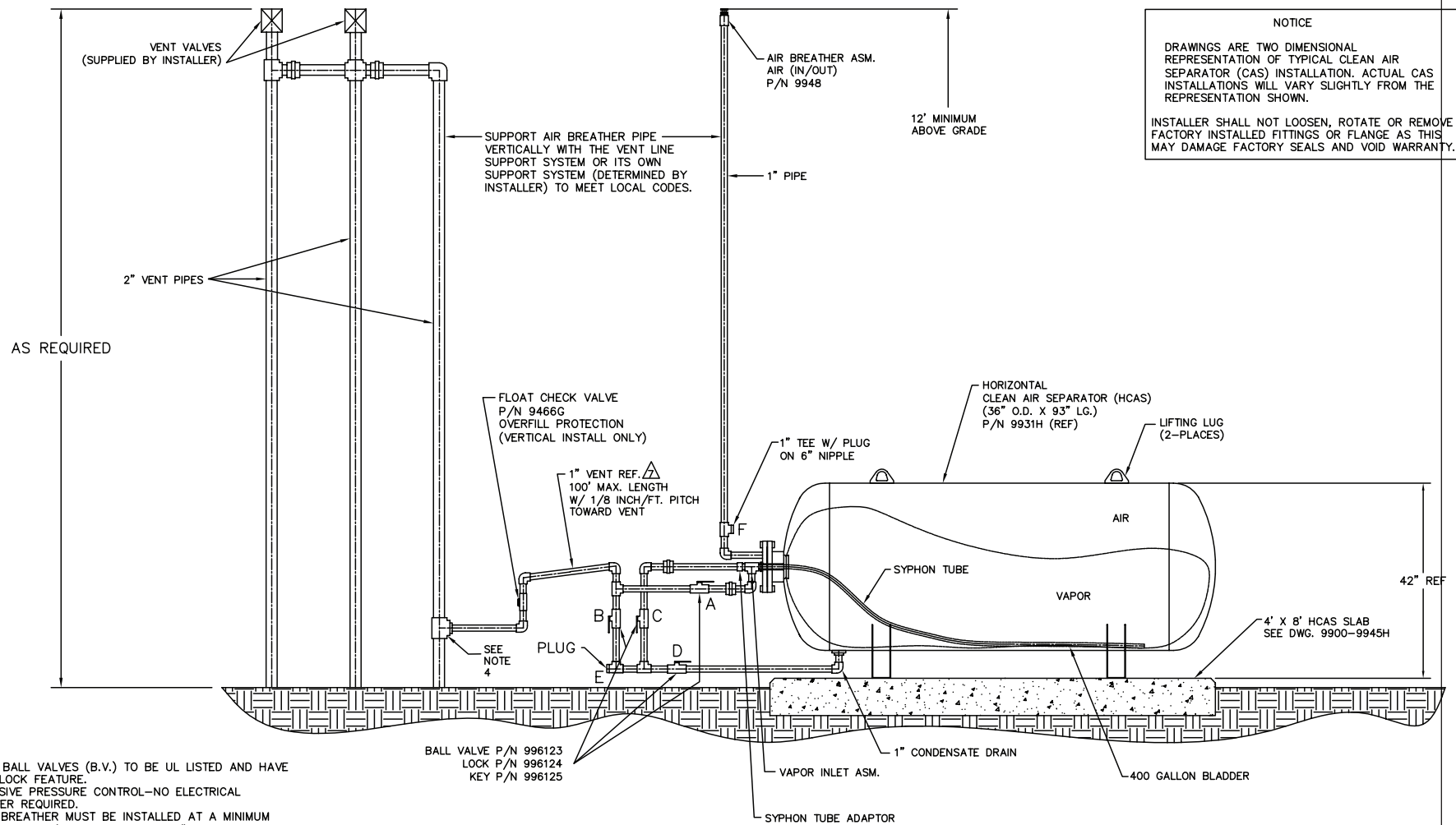
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8	ADDED NOTE 6	401666	TF	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE
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MATERIAL: DO NOT SCALE DRAWING STANDARD INCH TOLERANCES (UNLESS OTHERWISE SPECIFIED) SPECIAL DIST:		.XX ± .02 .XXX ± .005 ANGULAR ± 1/2°	TITLE: CLEAN AIR SEPARATOR VERTICAL INSTALLATION (3 VENT)	
DRAWN: JWH DATE: 05/14/02 APPRVL: MDB DATE: 06/05/07		DRW NO: 9900-9973	SUFFIX: ACAD HLY SCALE: N.T.S. SHEET 1 OF 1	



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NOTE:

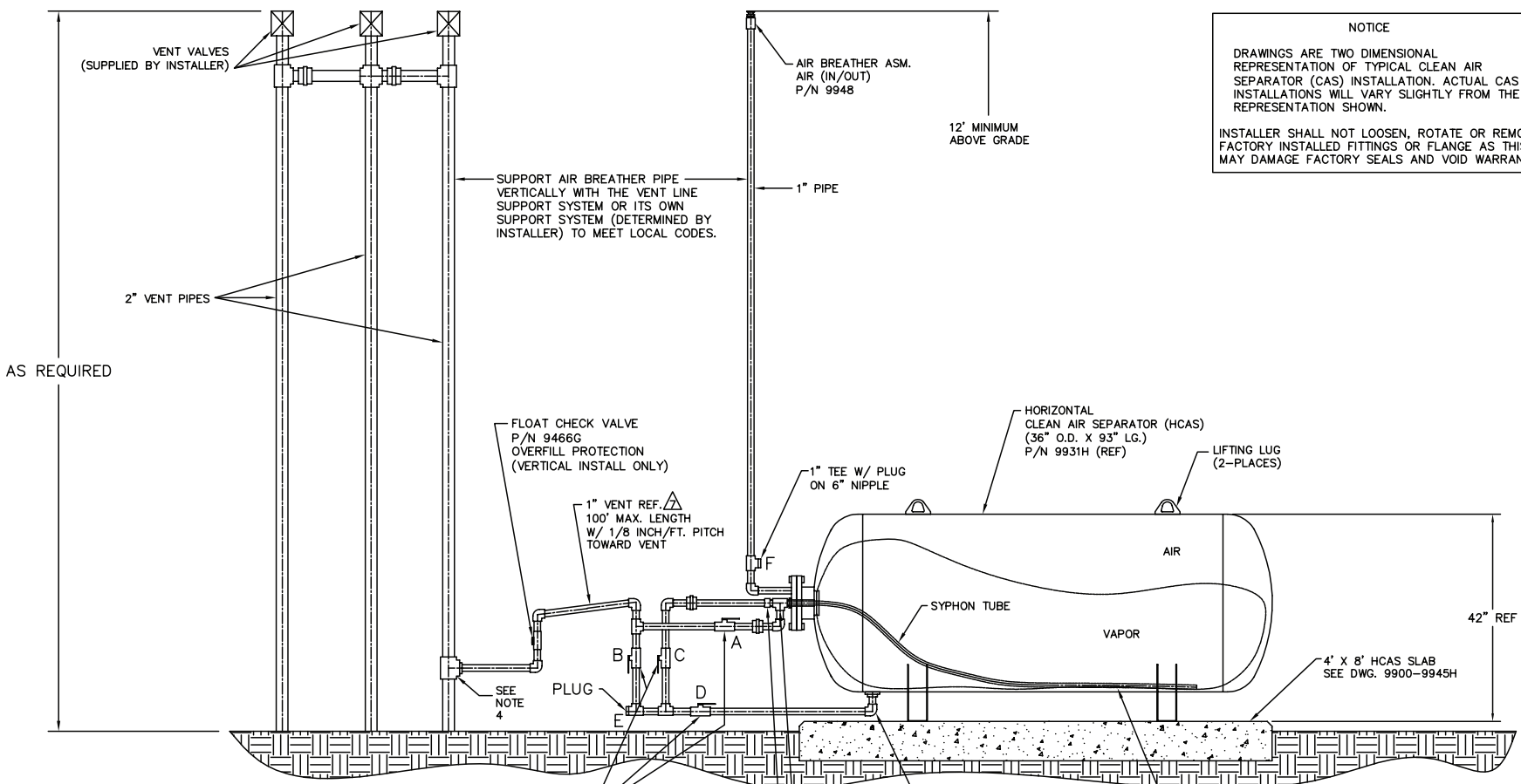
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 - 4 - VENT LINE TIE IN CAN BE INSTALLED ANYWHERE ALONG THE VENT STACK LINE PROVIDED THAT PIPE SLOPE IS MAINTAINED AND THE CHECK VALVE IS IN THE CORRECT VERTICAL INSTALLATION.
 - 5 - ONLY GALVANIZED PIPE IS TO BE USED FOR PIPING CONNECTIONS.
 - 6 - HCAS TO SLOPE SLIGHTLY TOWARD CONDENSATE DRAIN. PITCH SLAB WITHIN 1/8 INCH/FOOT TOWARD CONDENSATE DRAIN END OR SHIM HCAS FOR PROPER VESSEL DRAINAGE.
- △** - A FLEXIBLE CONNECTION BETWEEN THE CLEAN AIR SEPARATOR AND THE VENT LINE(S) IS ALLOWABLE IF REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) TO MEET SEISMIC REQUIREMENTS. SHOULD THE FLEX CONNECTION BE INSTALLED SUCH THAT IT IS NOT SUPPORTED, THE SLOPE OF THE FLEX CONNECTION SHALL BE GREATER THAN THE 1/8" PER FOOT SLOPE REQUIRED FOR THE REST OF THE ONE INCH GALVANIZED PIPING.

BALL VALVE P/N 996123
LOCK P/N 996124
KEY P/N 996125

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MATERIAL:	
DO NOT SCALE DRAWING	.XX ± .02
STANDARD INCH TOLERANCES (UNLESS OTHERWISE SPECIFIED)	.XXX ± .005
SPECIAL DIST:	ANGULAR ± 1/2°

7	ADDED NOTE 7	401666	TF	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE
		TITLE: CLEAN AIR SEPARATOR HORIZONTAL INSTALLATION (2 VENT VALVE)		
		DRAWN: TF DATE: 05/22/07	DRW NO: 9900-9972	SUFFIX: H
APPRVL: MDB DATE: 06/05/07	SCALE: N.T.S.	SHEET 1	OF 1	



NOTICE

DRAWINGS ARE TWO DIMENSIONAL REPRESENTATION OF TYPICAL CLEAN AIR SEPARATOR (CAS) INSTALLATION. ACTUAL CAS INSTALLATIONS WILL VARY SLIGHTLY FROM THE REPRESENTATION SHOWN.

INSTALLER SHALL NOT LOOSEN, ROTATE OR REMOVE FACTORY INSTALLED FITTINGS OR FLANGE AS THIS MAY DAMAGE FACTORY SEALS AND VOID WARRANTY.

- NOTE:**
- 1 - ALL BALL VALVES (B.V.) TO BE UL LISTED AND HAVE PADLOCK FEATURE.
 - 2 - PASSIVE PRESSURE CONTROL-NO ELECTRICAL POWER REQUIRED.
 - 3 - AIR BREATHER MUST BE INSTALLED AT A MINIMUM HEIGHT OF 12' ABOVE GRADE ON 1" PIPE.
 - 4 - VENT LINE TIE IN CAN BE INSTALLED ANYWHERE ALONG THE VENT STACK LINE PROVIDED THAT PIPE SLOPE IS MAINTAINED AND THE CHECK VALVE IS IN THE CORRECT VERTICAL INSTALLATION.
 - 5 - ONLY GALVANIZED PIPE IS TO BE USED FOR PIPING CONNECTIONS
 - 6 - HCAS TO SLOPE SLIGHTLY TOWARD CONDENSATE DRAIN. PITCH SLAB WITHIN 1/8 INCH/FOOT TOWARD CONDENSATE DRAIN END OR SHIM HCAS FOR PROPER VESSEL DRAINAGE.
- △ - A FLEXIBLE CONNECTION BETWEEN THE CLEAN AIR SEPARATOR AND THE VENT LINE(S) IS ALLOWABLE IF REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) TO MEET SEISMIC REQUIREMENTS. SHOULD THE FLEX CONNECTION BE INSTALLED SUCH THAT IT IS NOT SUPPORTED, THE SLOPE OF THE FLEX CONNECTION SHALL BE GREATER THAN THE 1/8" PER FOOT SLOPE REQUIRED FOR THE REST OF THE ONE INCH GALVANIZED PIPING.

BALL VALVE P/N 996123
 LOCK P/N 996124
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MATERIAL:

DO NOT SCALE DRAWING	.XX ± .02
STANDARD INCH TOLERANCES (UNLESS OTHERWISE SPECIFIED)	.XXX ± .005
	ANGULAR ± 1/2°
SPECIAL DIST:	

7	ADDED NOTE 7	401666	TF	03/20/08
REV	DESCRIPTION	ECN NO	BY	DATE
Franklin Fueling Systems Madison, WI 53718				
TITLE: CLEAN AIR SEPARATOR HORIZONTAL INSTALLATION (3 VENT VALVE)				
DRAWN:	DATE: 05/22/07	DRW NO: 9900-9973	SUFFIX: H	
APPRVL:	DATE: 06/05/07	SCALE: N.T.S.	SHEET 1 OF 1	

Clean Air Separator


Bladder Field Replacement





Important Safety Messages


Franklin Fueling Systems (FFS) equipment is designed to be installed in association with volatile hydrocarbon liquids such as gasoline. Installing or working on this equipment means working in an environment in which these highly flammable liquids may be present. Working in such a hazardous environment presents a risk of severe injury or death if these instructions and standard industry practices are not followed. Read and follow all instructions thoroughly before installing or working on this, or any other related, equipment.


As you read this guide, please be aware of the following symbols and their meanings:

Warning  This symbol identifies a warning. A warning sign will appear in the text of this document when a potentially hazardous situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous situation may involve the possibility of severe bodily harm or even death.

Caution  This is a caution symbol. A caution sign will appear in the text of this document when a potentially hazardous environmental situation may arise if the instructions that follow are not adhered to closely. A potentially hazardous environmental situation may involve the leakage of fuel from equipment that could severely harm the environment.

Warning  **Follow all applicable codes governing the installation and servicing of this product and the entire system. Always lock out and tag electrical circuit breakers while installing or servicing this equipment and any related equipment. A potentially lethal electrical shock hazard and the possibility of an explosion or fire from a spark can result if the electrical circuit breakers are accidentally turned on during installation or servicing. Please refer to the Installation and Owner's Manual for this equipment, and the appropriate documentation for any other related equipment, for complete installation and safety information.**

Warning  **Follow all federal, state and local laws governing the installation of this product and its associated systems. When no other regulations apply, follow NFPA codes 30A and 70 from the National Fire Protection Association. Failure to follow these codes could result in severe injury, death, serious property damage and/or environmental contamination.**

Warning  **Always secure the work area from moving vehicles. The equipment in this manual is usually mounted underground, so reduced visibility puts service personnel working on this equipment in danger from moving vehicles entering the work area. To help eliminate these unsafe conditions, secure the area by using a service truck to block access to the work environment, or by using any other reasonable means available to ensure the safety of service personnel.**

Warning  **Use circuit breakers for multiple disconnect to turn off power and prevent feedback from other dispensers.**

Note: Persons doing this bladder replacement must be trained by a FFS Field service engineer before attempting this procedure.

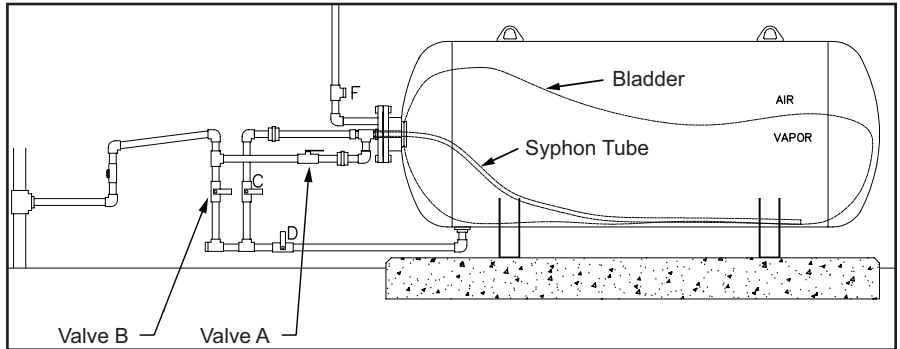
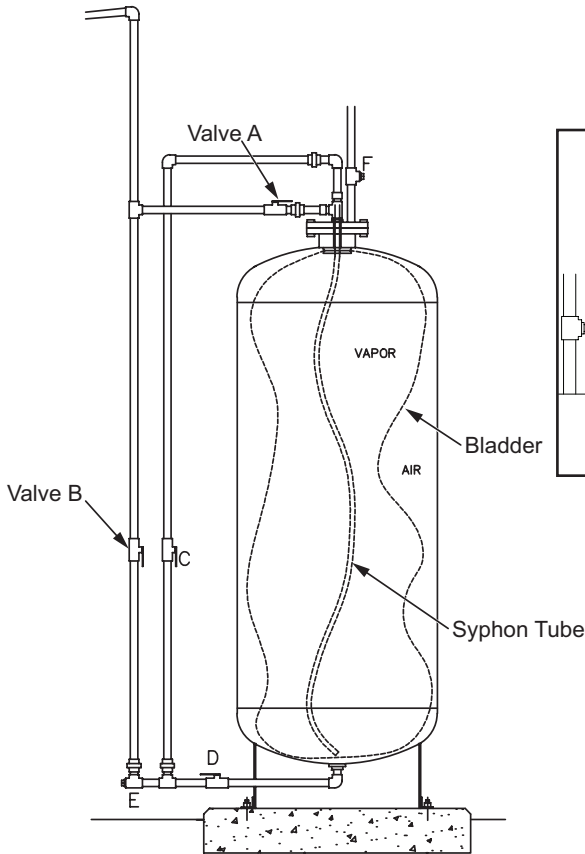



Figure 1: Clean Air Separators: Component Locations

Replacement Bladder Part# 9943

1. Close valves A & B, then disconnect piping from the Clean air Separator (CAS).
2. **It is highly recommended that Vertical Clean Air Separators be placed horizontally prior to repair.** (A powered lifting device will be needed).

Note: Lower the vertical CAS slowly and place cushioning (i.e. cardboard) under it to prevent scarring the surface.

3. Remove the syphon tube.
4. Deflate the bladder to ease its removal and to prevent damage during removal.

Warning  **Explosion potential. Assume gasoline vapors are present. Use an intrinsically safe or explosion-proof vacuum source to deflate the bladder.**

5. Remove the (8) 3/4" bolts securing the flange. Be aware that a thread-locking compound was used on the threads, and more force will be required to remove them.

Note: Account for all parts removed and reinstall in the same order.

6. Carefully remove bladder from the Clean Air Separator.

7. Remove the (6) 1/4-20 bolts from the bladder flange (9940).
8. Inspect bladder flange and nipple to ensure there are no sharp edges that could create a hole in the bladder.
9. Replace bladder by fitting the new bladder's end opening around the flange (Figure 2).



Figure 2: Place Bladder on Flange

10. Lower the Clamp Ring with lubricated O-ring to hold the bladder in position.
11. Install the (6) 1/4-20 bolts securing the clamp ring and bladder to the bladder flange.

Note: Using a couple 1" 1/4-20 bolts can help hold the flange components in position while the other bolts are secured.

12. Tighten all (6) screws to 65-88 in-lbs using torque wrench set to break at 80 in-lbs

13. Inflate bladder to 2" of water column and check for leaks in accordance with CARB exhibit 4.
14. Deflate bladder and fold into thirds lengthwise.
15. Feed bladder into the Clean Air Separator. Take care not to damage bladder as you feed it into CAS. Support the flange end so no additional stress is put on the bladder as you feed the bladder into the CAS. Best to use 2 people during this step
16. Align marks and secure the flange using the (8) ¾" bolts. Apply Loctite* to bolts.



Figure 3: Align Marks

17. Torque bolts to 80 ft/pounds.

18. Inflate bladder to 2" of water column and install syphon tube (Figure 4).



Figure 4: Install Syphon Tube

19. Reinstall the Clean Air Separator per ARB Approved IOM - EO VR-203 and VR-204. Test the Clean Air Separator in accordance with Exhibit 14.

* Loctite is a registered trademark of Henkel Corporation



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