



IMPORTANT: Read Manual BEFORE installing, operating or maintaining the Sentinel Model 100, Model 350 and the Model 500.

VACUUM CONTROLLER PARTS AND MAINTENANCE MANUAL Model 100 • Model 350 • Model 500

GENERAL INFORMATION

The SENTINEL VACUUM CONTROLLER is a diaphragm operated pneumatic valve. With proper installation, it is capable of maintaining a stable vacuum with $\pm .2$ " Hg over an adjustable range of 10" - 15" Hg at the regulator.

The SENTINEL VACUUM CONTROLLER has been designed to correct several serious faults inherent in other types of regulators.

1. The SENTINEL is not load sensitive. It may be adjusted to a desired vacuum level with or without the milking units on the line. This is particularly valuable to the dairyman who milks with a varying number of units. As each unit is removed or added to the system, the Sentinel will automatically compensate for the changing load. In areas where testing devices are used, no readjustment is necessary to correct for the additional load of the units on the pipeline. However, it cannot offset the pressure drop which occurs in the claw due to the weigh device being in series with the milk hose on each unit.

2. The SENTINEL has a fully open to a fully closed span of .2" Hg. This means that when the vacuum rises or falls more than .2" Hg the regulator will open to maximum or close.

3. The SENTINEL will return to its set-point within .1" Hg after a drop in vacuum level caused by a leak into the system.

4. The SENTINEL is easy to adjust. It may be set within .1" Hg of the desired level with a special wrench supplied with each regulator. This key is designed to prevent unauthorized personnel from changing the vacuum level, without the owner's consent.

5. SENTINEL VACUUM CONTROLLERS never completely shut off, therefore, a small amount of air is always passing through the unit, even when the poppet is in the closed position. The reason for this air pass-by is because of the .003" clearance between the poppet and the body of the unit. This clearance is necessary to minimize friction, thereby allowing instantaneous reaction to changes in vacuum levels.

6. Filter gauges (standard with models 500, 350 and 100) indicate the condition of the vacuum controller filter. When the button on the filter gauge pulls in flush with the face, the filter should be changed for dependable operation.

OPERATING PRINCIPLE

(Refer to Figure #1)

As vacuum is applied on first system start up, a vacuum is drawn on the bottom side of the diaphragm (348-09), through the main sensing port located in the bottom of the shaft. The regulator is biased at approximately 3.0" Hg via the spring (348-03). The vacuum is drawn into the dome (348-11) through the hole in the diaphragm. Once the desired set point is reached, the bellows assembly (348-35) admits air into the dome through the dome filter assembly (348-36) and felt filter (348-15), passing through the regulating seat in the bellows assembly into the dome (348-11) thus maintaining a constant vacuum in the dome. This vacuum is 3.0" Hg below the regulating point of the controller. EXAMPLE: Controller set at 10" Hg, thus giving 13.0" Hg regulating point. At this point the diaphragm is in a balanced condition. Any rise in vacuum will move the diaphragm (348-09) in a downward direction thus opening the valve wider. Any drop will move the diaphragm toward the dome, causing the valve to close. Since the resistance of the moving assembly is very low, a fully open to fully closed range of $\pm .2$ " Hg may be obtained.

MOUNTING INSTRUCTIONS

1. The SENTINEL VACUUM CONTROLLER should be mounted at approximately eye level for maximum ease of periodic servicing (changing filters when required). Avoid, whenever possible, mounting close to hot water heaters and vacuum pumps, especially in small engine rooms or confined areas with poor ventilation.

2. Install as close to the sanitary trap as possible if maximum control is desired. A tee with an automatic drain on the bottom should be provided to insure drainage after wash-up.

3. Avoid mounting on reserve tanks or headers whenever possible. In some cases this can result in a pipe-organ effect and cause an oscillation or pulsing problem. If this is encountered, a double elbow or offset may be necessary to break up direct airflow beneath the regulator. In some cases placement in a different location may be required.

4. It is not necessary to use a pipe wrench to tighten the regulator to the line. A small amount of pipe dope or Teflon tape should be used before installation to provide a seal and prevent galling.

DISASSEMBLY PROCEDURE

(MODEL 350)

(Refer to Figure # 1)

The MODEL 350 SENTINEL may be disassembled in the field for inspection or repairs in the following manner:

1. Remove the controller from the line by unsnapping the quick disconnect clamp (348-07).
2. Remove the filter retaining ring (348-19).
3. Remove and set aside top dome filter (348-36).
4. Place the controller on the table, using soft clean cloths as a cushion, with the dome down and with guide (348-04) facing up. Grasp the body (348-01) with your fingers and apply pressure to guide with your thumbs in a downward direction. This will force the guide away from the snap ring (348-05). Remove the snap ring while holding the guide down with one hand, being careful not to let spring tension force the guide out too quickly. Allow the guide to come out. This is a precision fit and a slight rocking or shifting motion may be necessary should it become bound. Under no circumstances should anything be used to pry it out.
5. Remove the damper ring assembly (348-26; 348-24; 348-25) noting position.
6. Remove the spring (348-03).
7. Remove spring guide (348-23) noting position.
8. With a screwdriver of the proper blade width, remove the 8-32 X 5/8 stainless steel screws holding the dome (348-11) to the flange (348-08).
9. Inspect the dome (348-11) for dirt or small foreign particles. If any are found, clean out with a clean lint-free cloth.
10. Set the dome aside, open side down, to prevent dust or other contaminants from collecting in it while removed.
11. Remove diaphragm securing bolt (348-30) and set aside. (The poppet must be held by hand to prevent turning.)
12. Remove diaphragm retainer (348-10).
13. Remove diaphragm by lifting outer edge, where fitted into the flange, with fingernail or soft pointed object. Do not use a screwdriver or other sharp metallic object. Remove from shaft.
14. Inspect silicon-rubber diaphragm for holes or tears. If even the smallest puncture is noted, diaphragm must be replaced.
15. The poppet and shaft (348-02) may now be removed from the body (348-01). These are a unit and no attempt should be made to remove the poppet from the shaft. Often there is sufficient dirt and build up to retard removal of poppet from the body. If severe resistance is encountered, soak the body and poppet in warm water and a mild liquid detergent solution to remove buildup.

5. Do not reduce the pipe-size the regulator is mounted on to a size less than the diameter of the regulator base, unless the entire system's pipe size is smaller in diameter than the diameter of the regulator base. EXAMPLE: With the model 100, do not reduce below 1 1/2" NPT.

6. At no time should any type lubricant be applied to the regulator (especially WD40). Such lubrication will only cause a collection of foreign particles, restricting movement and eventually destroying the silicone rubber diaphragm.

7. At the time of installation, the customer should be instructed in the adjustment and filter replacement procedures. If the customer is not under a regular service program with his dealer, he should be shown the procedures for cleaning and routine care.

8. Adjustment of desired vacuum level is simply made with the special wrench provided with each regulator. Follow these steps: (A) Remove the snap-on top dome filter. (B) Looking down from the top, insert the adjusting wrench in the center of the piece on the top of the dome. (C) Clockwise rotation of the adjusting screw will raise the level, counter clockwise will lower the setting.

9. Upon initial starting of the vacuum pump, the regulator will open fully and then gradually begin to close until its set-point is reached. It is recommended that all drains and valves be closed before system start-up. If too many leaks into the system are permitted and the pump cannot pull at least 8" Hg, the controller may remain open. The filter gauge provided on Models 500, 350 and 100 has a black button on its face. This button will pull in flush when it is time to change filters. The regulator will automatically correct for filter restrictions of up to 30" H₂O. But beyond this point sufficient air cannot be taken in to keep vacuum levels down to the desired point.

10. The filter retaining ring must be checked periodically to insure a firm seal. New filters tend to take a cold set and become loose. If this occurs, dirt and foreign particles will by-pass it, and become lodged on the moving parts. This may cause sluggish or erratic regulation. It is recommended that each time the filter is changed that the bottom half of the barrel be washed out with a warm water solution of mild liquid household detergent. (DO NOT USE PIPELINE SOAP OR OTHER POWDERS HAVING CAUSTIC COMPOUNDS IN THEM.)

11. If frequent filter change is encountered, large filter adapter kits are available from L. J. Engineering, Inc.

12. A relief valve (348-17) is available as an option and is mounted between the pump and the controller. It is factory set at 16" Hg. This setting can be adjusted to a higher vacuum by turning the screw clockwise. (The adjustment screw can be seen in the center of the threaded end.) The relief valve cannot be set lower than 15" Hg.

(15. Continued) Do not use powdered pipeline cleaners or other soaps which may contain caustic compounds. Tapping lightly with a rubber handle may be necessary.

16. Inspect the poppet for nicks and abrasions. If any are found on the face, the poppet must be replaced. Any attempt to file the poppet should be avoided. Doing so will void the warranty.

17. All of the various parts may now be washed in a mild soap solution and may be scrubbed with a non-abrasive brush. Do not use steel wool or scouring pads as this will mar the anodized plating.

18. If it is necessary to remove the bellows assembly (348-35), a special tool is required. Removal should not be attempted without it. A set of aneroid tools is available from L. J. Engineering, Inc.

19. Remove the aneroid by holding the top ring with wrench supplied with the aneroid tools and inserting bellows wrench in bottom side and unscrew.

20. Remove all traces of silicone sealing compound from threads and any adhered to dome.

21. Inspect rubber seat for damage or foreign particles in small center hole.

22. Inspect stainless steel seat for dirt build up and remove by washing. Do not scrape with a sharp object.

REASSEMBLY (MODEL 350) (Refer to Figure #1)

Care must be taken to keep all foreign particles and dirt out of the work area when assembling the controller. A clean, smooth table or bench should be used.

1. After carefully cleaning all parts, the controller may be reassembled, making sure there are no dust or lint particles in the dome (348-11). The aneroid assembly is replaced by applying a small amount of silicone sealing compound on the male threads. During insertion into the dome, some silicone will come off on the dome. Rotate after it makes contact with the dome to give an even seal. Then from the bottom, thread the bottom half of the aneroid onto the projecting piece. Being careful not to cross-thread or bind it, tighten down with the aneroid wrenches only. Do not attempt to use any other type of tool, since damage is sure to result.

2. Wipe away any excess silicone sealant from the top of the dome and aneroid.

3. Inspect the inside of the dome for any loose or foreign particles and remove with clean lint-free cloth.

4. Place dome, large flanged end down, on clean surface until ready for re-assembly.

5. After making certain that the body (348-01) is clean and free from scores, insert the poppet into the barrel. This is a precision fit and must not be forced. If resistance

is met, apply a slight side-to-side motion to the stem, working the poppet into the barrel.

6. Replace the spring guide (348-23).

7. Replace the spring (348-03).

8. Replace the damping collar assembly (348-24, 348-25 and 348-26).

9. Replace guide (348-04).

10. Push the guide into the barrel far enough to allow placement of snap-ring (348-05) into the inner groove in the barrel.

11. Slide diaphragm onto stem protruding from top side of the flange (348-08).

12. Insert the lip of the diaphragm into groove. Work the edges of diaphragm around evenly with fingers to insure there are no wrinkles or uneven areas.

13. Place stainless steel back-up plate (348-16) on top of the diaphragm. NOTE: Some early models will not have this plate; but all replacement diaphragms should be installed with it.

14. Replace diaphragm retainer (348-10) first placing a small amount of silicone sealant to the bottom edge of retainer where it contacts the diaphragm plate.

15. Place small amount of silicone sealant on the threads of the diaphragm bolt (348-30) and screw into top of shaft. Place fingers in poppet to retard rotation and snug down bolt. Do not over tighten.

16. Place dome open side up and carefully set flange down over screw holes. These are not keyed, but it is preferred that the port for the filter gauge is located towards the front in line with the label on the dome.

17. Replace the eight 8-32 x 5/8 screws (Flange screws - 348-28) carefully, making sure that each is aligned and not cross-threaded. Tighten down evenly to a snug fit, making sure that the flange and dome are securely in place. Insert filter pressure gauge if it was removed. Put small amount of grease on threads and hand tighten only.

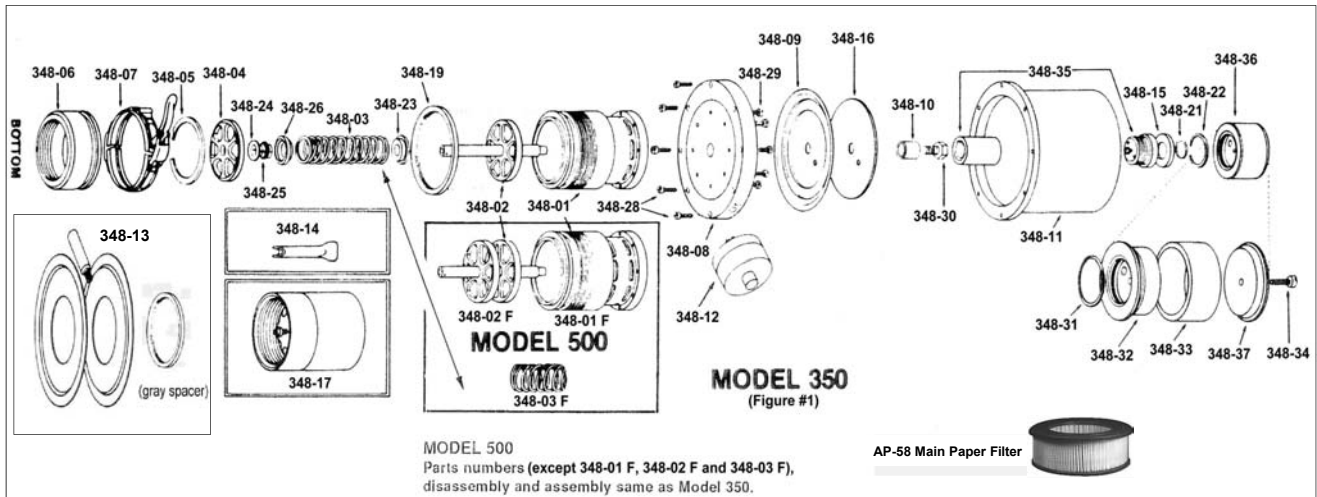
18. Install on vacuum system and adjust to desired level.

19. Place top dome filter in place and re-check vacuum level with it in place. It may cause a slight elevation in level in some instances. If this is encountered, simply adjust regulator to a slightly lower setting, then install top dome filter to bring back up. If a rise of more than .5" Hg occurs, replace the dome filter.

MODEL 500

Part numbers, disassembly and assembly are the same as the Model 350, except for the poppet, the body and the spring.

Exploded view of Sentinel Model 350 and Model 500 - Figure #1



Part#	Part Description
348-01	Body
348-01 F	Body Model 500
348-02	Poppet Assembly
348-02 F	Poppet Assembly Model 500
348-03	Spring Model 350
348-03 F	Spring Model 500
348-04	Poppet Guide
348-05	Large Bottom Snap Ring
348-06	Inlet Adapter
348-07	Quick Disconnect Clamp
348-08	Flange
348-09	Diaphragm Assembly
348-10	Diaphragm Retainer
348-11	Dome
348-12	Air Filter Gauge
348-13	Large Filter Adapter Kit
348-14	Adjusting Wrench
348-15	Top Felt Filter
348-16	S.S. Back-Up Plate
348-17	Relief Valve (3" NPT fitting)

Part#	Part Description
348-19	Filter Retaining Ring
348-21	Small Top Snap Ring
348-22	Large Top Snap Ring
348-23	Spring Guide
348-24	Damping Collar Complete
348-25	Damping Collar Spring Only
348-26	Damping Collar Retainer
348-28	Dome Screws (8-32 x 5/8)
348-29	Flange Screws (10-32 x 3/4)
348-30	Diaphragm Bolt
348-31	Top Dome Filter O-Ring
348-32	Filter Cart. Holder-Bottom
348-33	Filter Replacement Cartridge
348-34	Top Filter Holding Screw (10-32 x 3/4)
348-35	Aneroid Assembly Complete
348-35 C	Aneroid Cap Only
348-35 B	Aneroid Bellows Assembly Only
348-36	Top Dome Filter Complete
348-37	Filter Cartridge Holder-Top
V-348-51	Poppet Window Band M-500
AP-58	Main Paper Filter
P350-MAN	Parts & Maintenance Manual Model 100/350/500 Vacuum Controllers



Model 350 Sentinel Vacuum Controller

DISASSEMBLY PROCEDURE
(MODEL 100)
(Refer to Figure #2)

The MODEL 100 SENTINEL is basically the same as the Model 350 in construction and operation. Disassembly and cleaning differ only in the following steps.

Step #1 - The Model 100 must be unscrewed from the line, as it has no quick disconnect clamp.

Step #2 - The poppet (353-04) can not be removed from the bottom of the barrel as with the Model 350. In order to remove it, the flange screws (353-12) must be removed allowing the body (353-01) to be separated from the flange (353-02), thus allowing the poppet to be removed from the top of the body.

The aneroid assembly and top dome filter are interchangeable between the Model 100 and the Model 350.

The diaphragm assembly and dome are the same design and differ only in physical size.

Insert a wooden pencil or soft object into one of the intake ports to hold poppet open while replacing diaphragm. Otherwise the diaphragm will appear to be too small and not fit into outer groove. Once dome has been replaced, the pencil may be removed. **DO NOT USE A SCREW DRIVER.**

Reassemble in reverse order. Please note the following:

NOTE 1: The screw which holds the backup plate and diaphragm assembly must be sealed with silicone sealant. Very little sealant is required. Just enough to seal shoulder of screw to backup plate. If excess is allowed to extrude down into the poppet stem it can seal off the sensing hole in the side of the shaft and the controller will not regulate properly.

NOTE 2: The diaphragm lip must be worked into the recess in the flange so there are no wrinkles or bulges prior to dome installation.

NOTE 3: To aid reassembly of dome to flange, a small scribe mark may be made, before disassembly, to align screw holes.

SPECIFIC INSTRUCTIONS
TO THE CUSTOMER

1. Complete cleaning and performance instructions should be given to the customer upon installation to insure maximum performance and unnecessary call backs.
2. Emphasize the importance of routine cleaning of the lower body.
3. Daily check of the air filter gauge.
4. Check weekly to insure air filter retaining ring is tight.
5. **Before each milking, check line vacuum as a routine check of normal operation.**
6. When each main filter is removed or changed, the

lower half of the body should be flushed out with a warm mild soapy solution of household detergent, being careful not to submerge more than just the lower half. The usual build-up of carbon and fine dust particles are usually quite water soluble.

7. A weekly check of the controller is a must to insure maximum performance and proper operation.

8. Even though every effort has been made to insure trouble free performance and maximum life, daily check of the vacuum level should be made as routine procedure.

9. VISUAL QUICK CHECK

To make certain your SENTINEL VACUUM CONTROLLER is in balance with your system, take the following steps:

A. Before turning your system on, remove the main filter from the vacuum controller.

B. With the system operating, look through the windows in the body of the unit. You should see the poppet moving up and down. At no time, if operating properly, should the poppet be more than half open.

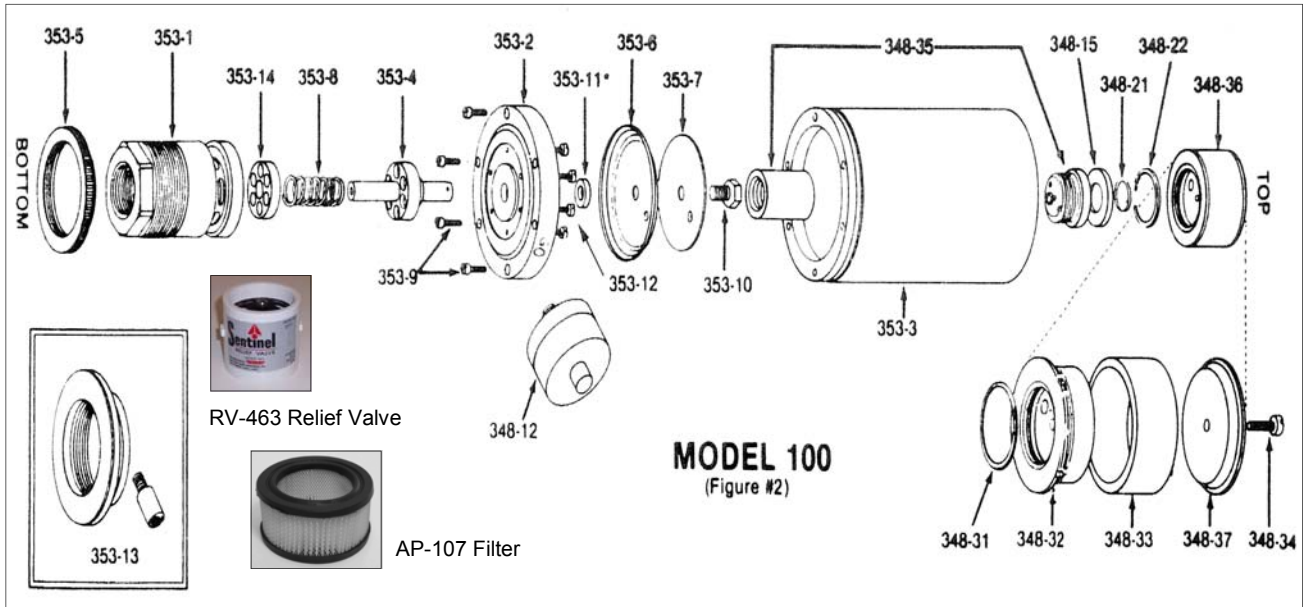
C. Be sure to replace the filter after this checking procedure. You should not operate your system for an extended period without the filter in place.

MAINTENANCE INSTRUCTIONS

1. **DO NOT OPERATE** without top **AND** bottom filters in place. **Replace bottom filter** when button on filter gauge pulls in flush. **Replace top dome filter** when the vacuum gauge indicates over 1/2" difference when top dome filter is momentarily removed during operation.
2. When main filter is changed the lower half of the controller should be immersed in a warm mild soapy solution of household detergent being careful not to submerge more than just the lower half. Agitate several minutes and rinse. The usual build-up of carbon and fine dust particles are usually quite water soluble and can be removed in this manner.
3. **NEVER ALLOW LIQUIDS** to enter top dome opening.
4. **NEVER USE** pipeline wash solutions in the controller. General pipeline cleaners are corrosive and will dissolve aluminum.
5. **NEVER USE** lubricants on the controller.
6. Check the line vacuum gauge and air flow gauge regularly to insure maximum performance.

NOTE: Under no circumstances do we feel this controller will eliminate the need for proper vacuum capacity and a good vacuum system in regard to line size and method of installation.

Exploded view of Sentinel Model 100 - Figure #2



Part#	Part Description
353-01	Body
353-02	Flange
353-03	Dome
353-04	Poppet Assembly
353-05	Filter Retaining Ring
353-06	Diaphragm
353-07	Diaphragm Back-up Plate
353-08	Spring
353-09	Dome Screws (10-32 x 3/4)
353-11*	Bottom diaphragm washer (obsolete after serial # 1200)
353-12	Flange Screws (10-32 x 3/4)
353-13	Large Filter Adapter
353-14	Poppet Guide
RV-463	Small Relief Valve (2" NPT fitting)
AP-107	Main Paper Filter
P350-MAN	Parts & Maintenance Manual Model 100/350/500

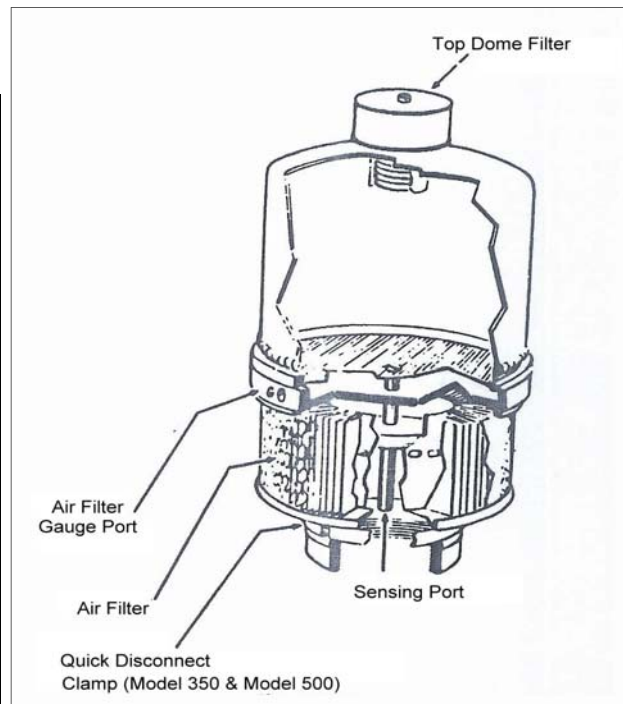
Part#	Part Description
348-12	Air Filter Gauge
348-15	Top Felt Filter
348-21	Small Top Snap Ring
348-22	Large Top Snap Ring
348-31	Top Dome Filter O-Ring
348-32	Filter Cart. Holder-Bottom
348-33	Filter Replacement Cartridge
348-34	Top Filter Holding Screw (10-32 x 3/4)
348-35	Aneroid Complete
348-35 C	Aneroid Cap Only
348-35 B	Aneroid Bellows Assembly Only
348-36	Top Dome Filter Complete
348-37	Filter Cart. Holder-Top

Model 100 Sentinel Vacuum Controller



TROUBLE SHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE	CURE
Sudden rise in vacuum	Ruptured main diaphragm	Replace main diaphragm
"	Foreign material in body	Wash with mild soap and water
"	Wet dome filter	Replace dome filter
Slow rise in vacuum	Dome filter plugged or dirty	Replace dome filter
"	Dirty top felt filter	Replace
"	Foreign particles in top regulator seat	Remove and clean
Vacuum too low	Dirty barrel and poppet	Clean
"	Diaphragm pulled away from support plate but not ruptured	Replace
"	Leak around dome flange	Tighten
"	Leak around aneroid	Reseal
Vacuum unstable	Unsuitable location for mounting	Move to another location
"	Pulsator line tied too close to the controller	Move controller to another location
"	Dirty poppet or body	Clean controller
"	Inadequate controller capacity	Use proper size controller



PAPER FILTER GUIDE

AP-107 Air Filter for Model 100 fits:

- Tecumseh 31925
- Fram CA-76
- WIX 42374
- Baldwin PA1712

AP-58 Air Filter (standard for Model 350 and for Model 100 with adapter kit) fits:

- Fram CA-102PL
- WIX 42112
- Baldwin PA1648

Filters for Model 350 with adapter kit:

- WIX 42020
- Fram CA-160

Procedure for using the large filter adapter kits for the Model 100 and Model 350/500.

1. Remove the filter gauge.
2. Screw brass adapter on the gauge and reinstall hand tight.
3. Remove filter retaining ring and old filter.
4. (Model 350/500 only) Place gray spacer around body up flush with bottom of the flange.
5. (Model 350/500 only) Place one of the thin adapter plates up against the gray spacer.
6. Install new filter.
7. (Model 350/500 only) Put on bottom adapter plate.
8. (Model 100 only) Put on new retaining ring.
9. (Model 350/500 only) Screw on filter retaining ring up against the bottom adapter plate.
10. Check for filter tightness every day for the first few days, as the rubber on the filter has a tendency to take a cold set and become loose with time.

Sentinel Model 100 Vacuum Controller

- Sensitive to 0.1" Hg change
- Adjustment range 8" – 15" Hg
- Reaction time to change: 50 milliseconds or less
- Finish: Hard anodized aluminum for maximum durability and corrosion resistance
- Adjustment screw (with special wrench to restrict unauthorized tampering).
- 1½" female NPT mounting
- Size: 5" diameter x 12¾" high
- Filters: a. Top dome filter, submicron (LJE Part# 348-33) b. Main filter, standard paper cartridge type (LJE Part# AP-107)
- Maximum capacity: 150 CFM ASME at 15" Hg
- Direct Sensing
- Weight: 4 lbs.
- Nominal Air Pass-by: 10 CFM ASME
- PEACEKEEPER 462-100: Available noise suppressor with added filtration

Sentinel Model 350 Vacuum Controller

- Sensitive to 0.1" Hg change
- Adjustment range 8" - 15" Hg
- Reaction time to change: 50 milliseconds or less
- Hard anodized aluminum for maximum durability and corrosion resistance.
- Adjustment screw (with special wrench to restrict unauthorized tampering).
- 3" female NPT mounting
- Size: 7" diameter x 13¼" high
- Filters: a. Top dome filter, submicron (LJE Part# 348-33) b. Main filter, standard paper cartridge type (LJE Part# AP-58)
- Mounting: Quick-disconnect stainless steel clamp
- Maximum capacity: 350 CFM ASME at 15" Hg
- Direct Sensing
- Weight: 10 lbs.
- Nominal Air Pass-by: 15 CFM ASME
- PEACEKEEPER 462-350: Available noise suppressor with added filtration

Sentinel Model 500 Vacuum Controller

- Sensitive to 0.1" Hg change
- Adjustment range 8" - 15" Hg
- Reaction time to change: 50 milliseconds or less
- Hard anodized aluminum for maximum durability and corrosion resistance.

Sentinel Model 500 Vacuum Controller (cont.)

- Adjustment screw (with special wrench to restrict unauthorized tampering).
- 3" female NPT mounting
- Size: 7" diameter x 13¼" high
- Filters: a. Top dome filter, submicron (LJE Part# 348-33) b. Main filter, standard paper cartridge type (LJE Part# AP-58)
- Mounting: Quick-disconnect stainless steel clamp
- Maximum capacity: 500 CFM ASME at 15" Hg
- Direct Sensing
- Weight: 10 lbs.
- Nominal Air Pass-by: 25 CFM ASME
- PEACEKEEPER 462-350: Available noise suppressor with added filtration

1. LIMITED WARRANTY: Seller warrants that the goods delivered shall be free from defects in material and workmanship for a period of one (1) year from the date of Seller's shipment. Seller's sole obligation and Buyer's exclusive remedy for defects in the goods shall be limited, at Seller's option, to either repair or replacement of goods determined to be defective. Transportation and any other delivery costs to return defective goods to Seller for repair or replacement shall be the responsibility of Buyer. Any claim by Buyer must be made by Buyer to Seller in writing within five (5) days of the discovery of the claimed defect but in no event after the expiration of one (1) year from the date of Seller's shipment, whichever is less. Buyer's failure to so notify Seller of such defects within the above time periods shall bar Buyer from any remedy under this Warranty, or for recovery of damages or losses due to defects in the goods. Any return of goods shall be subject to the prior written approval of Seller.

THIS WARRANTY IS THE SOLE WARRANTY COVERING THE GOODS AND SELLER MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED OR STATUTORY, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS WARRANTY. IN NO EVENT SHALL SELLER BE LIABLE FOR CONSEQUENTIAL, COMPENSATORY, PUNITIVE OR INCIDENTAL DAMAGES HOWSOEVER ARISING FROM SELLER'S PERFORMANCE OF THIS CONTRACT OR THE PERFORMANCE OF THE GOODS.

This Warranty shall not apply to goods which have been repaired or altered by other than authorized representatives of Seller or to damage or defects caused by accident, vandalism, Acts of God, erosion, normal wear and tear, improper selection by Buyer or others, and other causes beyond Seller's control. This Warranty shall not apply to the misapplication, improper installation, or misuse of the goods caused by variations in environment, the inappropriate extrapolation of data provided, the failure of Buyer or others to adhere to pertinent specifications or industry practices, or otherwise.

2. LIMITATION OF SELLER'S LIABILITY: Seller's liability on any claim of any kind, including claims based upon Seller's negligence, breach of contract, or strict liability in tort, for any loss or damage arising out of, connected with, or resulting from the use of the goods furnished hereunder or Seller's performance of this contract, shall in no case exceed the purchase price allocable to the goods or part thereof which give rise to the claim. **IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES HOWSOEVER ARISING OUT OF SELLER'S PERFORMANCE OF THIS CONTRACT AND NOTWITHSTANDING WHETHER SELLER MAY HAVE BEEN ADVISED OR IS ADVISED OF THE POSSIBILITY OF SPECIAL (OR LIQUIDATED) DAMAGES.**



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