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www.universalanalyzers.com

273SF SERIES

HEATED STACK FILTER
STAINLESS NEMA 4X



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e-mail address: sales@universalanalyzers.com
MAN273SF Rev C



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LIMITED WARRANTY

ALL PRODUCTS MANUFACTURED BY UNIVERSAL ANALYZERS INC. ARE WARRANTED TO BE FREE OF MANUFACTURING DEFECTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF RECEIPT AT THE CUSTOMER'S RECEIVING AREA AND FOR AN ADDITIONAL PERIOD OF UP TO 90 DAYS IF THE PRODUCT IS PLACED IN SERVICE AFTER BEING IN STORAGE. THIS WARRANTY COVERS MATERIALS AND LABOR TO RESTORE ANY PRODUCTS TO ORIGINAL FACTORY SPECIFICATIONS IF A DEFECT IS FOUND WITHIN THE WARRANTY PERIOD.

THE DEFECTIVE PRODUCT SHOULD BE SENT, FREIGHT PREPAID, TO THE FACTORY IN CARSON CITY, NEVADA. REPAIRS WILL BE PERFORMED AT THE FACTORY AND RETURNED, PREPAID, BY THE SAME SHIPPING METHOD USED TO SEND THE PRODUCT TO THE FACTORY.

THIS WARRANTY DOES NOT APPLY WHERE THE EQUIPMENT HAS SUSTAINED DAMAGE DUE TO NEGLIGENCE, MODIFICATION, CORROSION, OR OTHER REASON BEYOND THE SCOPE OF THE NORMAL DEFINITION OF "MANUFACTURING DEFECT".

FURTHER, THIS WARRANTY IS LIMITED TO REPLACING THE DEFECTIVE COMPONENTS AND RETURNING THE EQUIPMENT MANUFACTURED BY UNIVERSAL ANALYZERS INC. TO THE CUSTOMER IN WORKING CONDITION. ANY OTHER CLAIMS ARE OUTSIDE THE SCOPE OF THIS WARRANTY. NO WARRANTIES ARE MADE AS TO THE SUITABILITY OF THE USE OF THE EQUIPMENT IN ANY PARTICULAR APPLICATION OR LOCATION. THE SUITABILITY OF THE USE OF THE EQUIPMENT IS THE RESPONSIBILITY OF THE CUSTOMER AND THE INSTALLING CONTRACTOR.

UNIVERSAL ANALYZERS 273SF SERIES HEATED STACK FILTER**OPERATING SPECIFICATIONS**

SAMPLE FLOW RATE:	0 TO 20 LPM
CALIBRATION GAS REQUIREMENT:	SAMPLE FLOW RATE PLUS 10%
OPERATING PRESSURE DROP AT 10 LPM:	12" WATER COLUMN
MAXIMUM GAS TEMPERATURE AT INLET:	700° FAHRENHEIT
OVEN TEMPERATURE:	350° FAHRENHEIT
DIMENSIONS:	14" x 14" x 14"
WEIGHT (VERIES W/ OPTIONS):	35 LBS. (MINUS PROBE)
INPUT POWER REQUIREMENT:	300 TO 550 WATTS
INPUT VOLTAGE REQUIREMENT:	115V OR 230VAC @ 50/60 HZ
BLOWBACK TANK VOLUME:	0.7 SCF @ 100 PSIG
BLOWBACK DURATION:	TWO SECONDS
BLOWBACK TIMER PERIOD:	W/O TIMER CARD - EXT. CONTROL W/ TIMER CARD - 15 MIN. TO 24 HR.
BLOWBACK SOLENOID VALVE VOLTAGE:	W/O TIMER CARD - 12,24V OR 115,230V W/ TIMER CARD - 115,230V

MATERIAL SPECIFICATIONS

ENCLOSURE:	NEMA 4X, STAINLESS STEEL
SAMPLE LINE CONNECTION:	3 INCH HEAT SHRINK BOOT (UNLESS OTHERWISE SPECIFIED)
FILTER CHAMBER HEATER TYPE:	ROD HEATERS IN ALUMINUM TUBES, CONTROLLED W/ THERMAL SWITCH
FILTER CHAMBER MATERIAL:	316 STAINLESS STEEL (HASTELLOY C-276 AVAILABLE)
FILTER ELEMENT TYPES:	CERAMIC 2-MIC (STANDARD) CERAMIC w/ 0.1-MIC COATING INSIDE 316SS SINTERED 2-MIC

APPLICATION

The Universal Analyzers 273SF Series Heated Stack Filter Assembly is designed to be used on stacks where the filter needs to be changed on a regular basis. Filter changes can be made in less than one minute.

The filter will mount onto a 2", 3" or 4" flange connection to the stack as specified. The stinger or probe screws into filter chamber. Stack temperatures and the corrosive gasses which may be present will determine the material and design of the probe to be used. A variety of materials are available for stacks having temperatures as high as 3000° F. (1650° C.).

Sample flow rates of up to 20 liters per minute can be extracted and filtered through the 273SF with a minimal amount of pressure drop.

GENERAL DESCRIPTION

The 273SF is a Heated Stack Filter Assembly consisting of the filter body mounted in a NEMA 4X Fiberglass Enclosure or Stainless Steel Enclosure. An optional blowback system may be provided to allow the blowback to occur on command from a computer, data logger, PLC, or external switch mounted in a safe area.

The NEMA 4X enclosure is fastened directly to the mounting flange which is sized to match the mating sample flange on the stack. There is a heat shrink boot on the bottom of the enclosure to accept a Heated Sample Line (HSL). When the HSL is properly supported, the flange mounting of the 273SF is sufficient to support the entire assembly.

Two, 125 watt heater tubes are mounted on the outside of the filter chamber. The heater holds the temperature of the filter at 350° F. A bi-metallic thermal switch mounted on the heater keeps the temperature from exceeding 350° F by opening the circuit at that temperature. An optional independent thermocouple/RTD can be provided as a means to measure and transmit or record the temperature of the filter. A second thermal switch, set at 225° F. (105° C.) is provided to be used as an alarm contact if the temperature drops below the switch temperature.

Several types of filter elements can be supplied with the 273SF. The 2 micron ceramic filter is supplied as an economical general purpose filter. A similar ceramic filter with an internal 0.1 micron coating is available for finer filtration or to provide a surface to enhance the blowback capability where the fines have a tendency to fill the pores of the 2 micron element. A 2 micron, 316 stainless steel filter can be inserted for those applications where the ceramic filter is determined to be unsuitable. Additional filtration materials and pore sizes are available on request.

The blowback accumulator, a 7" diameter stainless steel sphere, is designed to be pressurized to a maximum pressure of 125 psig compressed air. At that pressure there is ½ cubic foot of air stored to flush the particulate matter out of the filter and through the probe into the stack.

Compressed air is used to clean the filter element. This air supplied to the blowback assembly needs to be clean and dry. Instrument quality air is preferred. The pressure should be as high as possible, up to 125 psig. High pressure air fills the accumulator and provides a substantial blast when the solenoid valve opens. This loosens the particles on the filter surface and forces them back through the sample probe into the stack. The period of time between blowback cycles should occur before the pressure drop across the filter begins to increase. This should be selected to be as often as every fifteen minutes but no less frequently than once per day. The time period between blowback cycles can be based on a calculation to estimate the amount of sample required to deposit from three to five grams of solids in the filter element.

Instrument air usage is minimal and smoothed by the fact that the air accumulator is charged over a period of time through a 1/4" instrument air line. The recharge time could be extended with a restriction in the air line if it were desired to reduce the pressure pulses on the instrument air supply and to consume instrument air more slowly.

The calibration gas is injected into the chamber ahead of the filter. This is close to the sample source as is required by many EPA officers. A back pressure check valve (set at 3 to 5 psig) is provided in the cal gas injection path to insure that calibration gas does not leak into the sample while the sample is being drawn through the filter.

INSTALLATION INSTRUCTIONS

Each stack where the 273SF is to be mounted should have a flanged sample nozzle installed. The sample probe (stinger) is screwed into the 1/2" NPT on the filter chamber thru the probe support collar on the sub-flange. The probe, when installed, should have the interior end level or pointing slightly downward to allow any entrained liquid to drain back into the stack. The length of the probe should be selected to extend into the center of the stack; or if the stack diameter is greater than 12', at least 6' into that stack.

A HSL should be supported close to the 273SF. The HSL should be fed through the heat shrink boot on the bottom of the NEMA 4X enclosure. Connect the sample tube to the center tube fitting on the filter chamber. The unheated portion of the sample line should be kept short and insulated to avoid condensation. Connect the cal gas line through the back pressure check valve to the 1/4" tubing fitting. If the compressed air line is part of the HSL, it can be connected to the 1/4" fitting directly next to the accumulator. If an external air line is to be used for BLOWBACK, bring the air into the enclosure through a bulkhead fitting to be installed in the wall of the enclosure and connect the air to the same 1/4" fitting next to the accumulator.

Provide power to the terminal blocks within the electrical box on the 273SF. See the drawings in this manual for the wiring schematic that supports the model being wired. Insure the power supplied to the heated stack filter matches the voltage requirement shown on the serial number tag. The voltage requirement can be changed by changing the jumpers on the terminal strip. The four jumpers labeled "115" are in place for 115 VAC operation. The two jumpers labeled "230" would be in place for 230VAC operation (with the 115 VAC jumpers removed). They can be changed in the field, however, **the solenoid valve must be rated for the voltage provided to the 273SF**. An independent ground wire should be run to the grounding terminal on the terminal strip.

The terminals labeled “LOW TEMP” are connected to a dry circuit thermal switch mounted on the heater tube, next to the heater control switch. This may be connected to an external alarm to indicate a low temperature condition within the filter. The switch will “open” above 105° C.

If an independent measurement and display of the oven temperature is desired, an optional thermocouple or RTD can be slipped into a 1/8” diameter thermal well supplied within the heater tube.

The final installation step is to insure that the sample line is insulated completely. Close the cover of the enclosure and latch the door shut. The goal is to keep the temperature of the gas sample at a temperature above the dew point of the gas all the way from the stack to the sample cooler/dehydrator.

SMART BLOW BACK MODULE (OPTIONAL)

The “smart” blowback module includes a timer circuit which will initiate the blowback cycle based on an regular, adjustable time period. The timer can be turned off by adding an external jumper. An external contact closure will initiate a blowback cycle whether the timer is active or not.

The schematic and board layout for the automatic timer for the automatic blowback circuit are shown on drawing number E0046 & E0042. The potentiometer, R14, is the time cycle control. At the full counter clockwise position, the period of time between blowback cycles is about 15 minutes and full clockwise position, the period of time between blowback cycles is about 24 hours.

A jumper placed between terminals labeled as “AUTO-OFF” and “COM” will disarm the timer. A contact closure between terminals labeled as “MANUAL B.B.” and “COM” will initiate a blowback cycle. These terminal labels may be found on the circuit board itself, or in the case where the board is mounted within a large enclosure, the connections are brought out to an external terminal strip which is also labeled as described.

The blowback solenoid valve will be opened for 2 seconds when the blowback cycle is started by either the internal timer or an external contact closure.

Power is provided to the timer circuit when power is applied to the 273SF.

START-UP PROCEDURE

Apply power to the 273SF. Allow five minutes for the filter to come to temperature. This warm-up period is extremely important to avoid the condensation within the 273SF filter which would cement the particulates to the filter surface.

Start the gas sample pump and determine that the proper amount of sample is being supplied to the instrumentation.

Run a calibration cycle to insure that the calibration lines are properly installed and sealed. A flow meter should be installed in the calibration gas supply line to insure that there is at least 10 percent more calibration gas being supplied to the 273SF than is being withdrawn as sample. That will insure that the filter and probe are being properly flooded with calibration gas. The excess calibration gas will be discharged through the probe.

Open the instrument air valve to charge the blowback accumulator. Exercise the blowback solenoid valve to insure it is properly wired. After a blowback cycle, the presence of a slight pulse on the sample tubing in the analyzer house and the momentary dilution of the sample with instrument air is normal and signifies that a blowback cycle has occurred.

The optimum time between blowback cycles is to be determined by experience. Once a day is sufficient in relatively clean applications. The requirement could be as frequent as every fifteen minutes where the dust and soot levels are severe. It is better to blowback too often than not enough. A vacuum gage in the sample line can be helpful to indicate if the particulate loading of the filter has started to restrict the flow of sample. That condition should not be allowed to occur. The blowback should be initiated before observing a change in pressure drop.

CHANGING THE FILTER

CAUTION: THIS PROCEDURE CAN CAUSE SEVERE BURNS. USE PROPER PROTECTION.

Changing the filter in the 273SF Series Heated Filter Assembly is extremely easy. Open the door to the filter enclosure. Using gloves to protect the hand, grasp the cap on the end of the filter body opposite the probe and turn it counter clockwise. **The cover may be hot to the touch and may cause burns to the hand if not protected.** Removing the cover exposes the filter. Reach into the heated oven with pliers to pull out the old filter.

Inspect the o-rings which are at each end of the filter to insure they are still elastic and will seal the filter. Replace them if they are charred or deformed.

Replace the filter with an new one, again handling it with pliers. Insure it is pushed in the center of the oven so that it is in contact with the o-ring at the inside end of the filter.

Screw the cap back on the filter body. Close the door and latch shut. The filter replacement procedure is complete.

**ACCESSORIES AND SPARE PARTS
FOR 273SF SERIES HEATED STACK FILTER in NEMA 4X ENCLOSURE**

<u>Level A, Consumable Supplies:</u>			Life Expectancy, Years
2 ea.	4980-0034	2 Micron Filter, Ceramic	1/2
2 ea.	4904-0015	Filter o-ring seal, Viton, #2-208	1/2
1 ea.	4904-0016	Plug o-ring seal, Viton, #2-216	1/2
<u>Level B, Basic Spare Parts:</u>			
4 ea.	3014-0046	Heater Rod, 3/8" Dia. x 1.5" Lg. 63Watt	5
	3103-0014	Switch, Chamber Heater Temp. (NC Below 350°F)	5
1 ea.	3103-0012	Switch, Low Temp. (Blue Leads)	5
<i>or</i>			
1 ea.	3103-0013	Switch, Low Temp. (Yellow Leads)	5
1 ea.	4955-0010	Solenoid Blow-back Valve, 24 VDC	10
<i>or</i>			
1 ea.	4955-0002	Solenoid Blow-back Valve, 115 VAC	10
<i>or</i>			
1 ea.	4955-0005	Solenoid Blow-back Valve, 230 VAC	10
	4956-0001	Accumulator Sphere, Blow-back, Unheated	10
	5110-0015	Acid Blocker Assembly	10
1 ea.	3600-0019	Blowback Timer Card, 115 VAC	
<i>or</i>			
1 ea.	3600-0054	Blowback Timer Card, 230 VAC	
	3014-0033	Heater Enclosure, 115 VAC 250 Watt	5
	3103-0013	Switch, Temp - Enclosure Heater (NC Below 225°F)	5
	5150-0014	Cal Gas Check Valve, Adjustable Pressure	10
	5209-0083	Knob Assembly for 273SF Series	

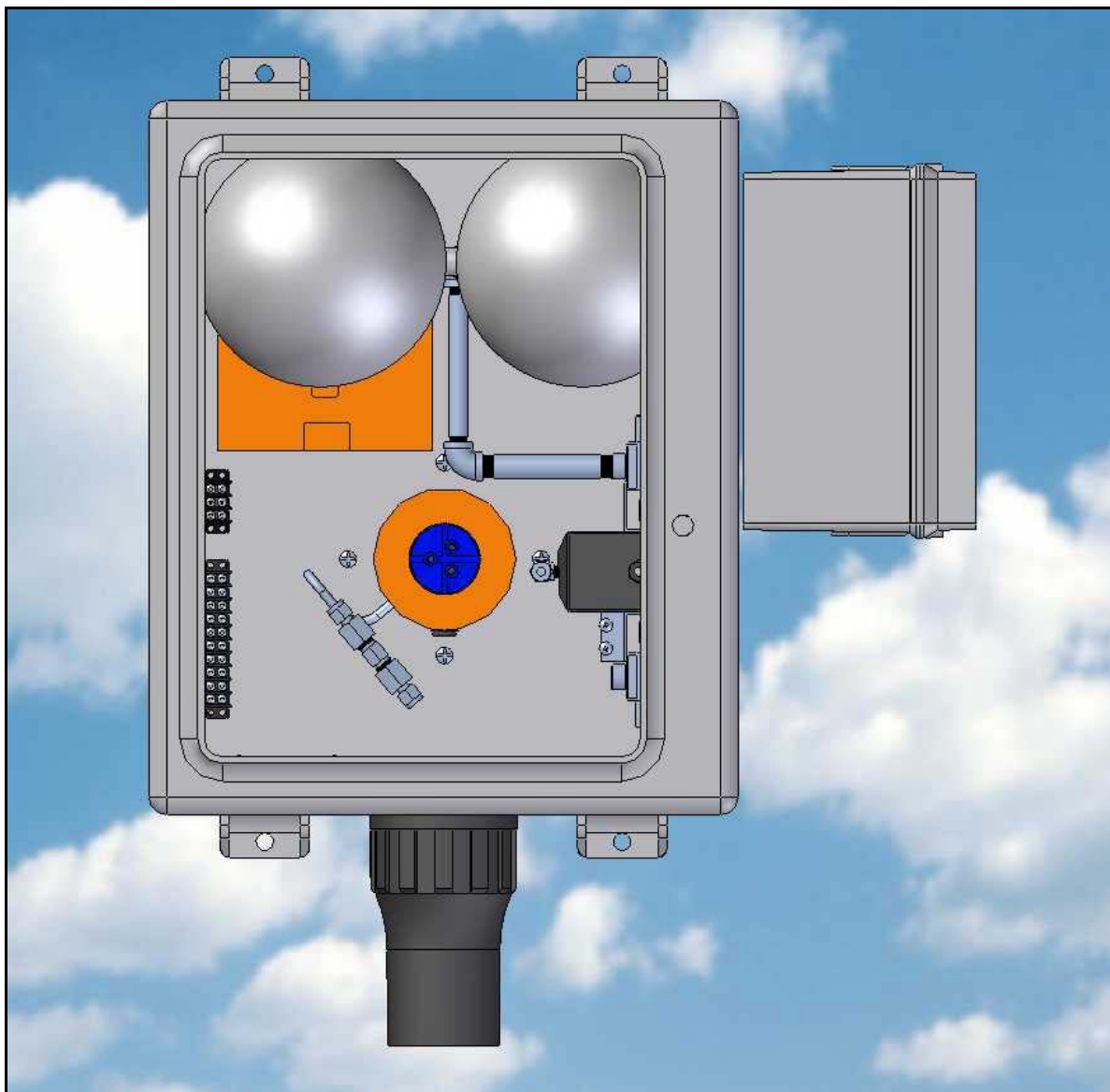


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MODEL 273SF

HEATED STACK FILTER

NEMA 4X



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MAN273SFDBBFGI Rev D



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UNIVERSAL ANALYZERS MODEL 273SF-DBB-FGI HEATED STACK FILTER**OPERATING SPECIFICATIONS**

SAMPLE FLOW RATE:	0 TO 20 LPM
CALIBRATION GAS REQUIREMENT:	SAMPLE FLOW RATE PLUS 10%
OPERATING PRESSURE DROP AT 10 LPM:	12" WATER COLUMN
MAXIMUM GAS TEMPERATURE AT INLET:	700° FAHRENHEIT
OVEN TEMPERATURE:	350° FAHRENHEIT
DIMENSIONS:	20" x 23" x 16" HWD
WEIGHT:	30 POUNDS (PLUS PROBE)
INPUT POWER REQUIREMENT:	450 WATTS
INPUT VOLTAGE REQUIREMENT:	115V @ 50/60 HZ
BLOWBACK TANK VOLUME:	1.4 SCF @ 100 PSIG
BLOWBACK DURATION:	TWO SECONDS
BLOWBACK TIMER PERIOD:	EXTERNAL CONTROL
BLOWBACK SOLENOID VALVE VOLTAGE:	24VDC

MATERIAL SPECIFICATIONS

ENCLOSURE TYPE:	NEMA 4X, FIBERGLASS
SAMPLE LINE CONNECTION:	3 INCH HEAT SHRINK BOOT
ENCLOSURE HEATER:	PAD HEATER w/ 225° F THERMAL SW.
FILTER CHAMBER HEATER TYPE:	(2) BAND HEATERS w/ THERMAL SW.
OVEN INSULATION MATERIAL:	FIBERGLASS INSULATION TUBE
FILTER CHAMBER MATERIAL:	316 STAINLESS STEEL (HASTELLOY C-276 AVAILABLE)
FILTER ELEMENT TYPES:	CERAMIC 1-MIC (STANDARD) CERAMIC w/ 0.1-MIC COATING INSIDE 316SS SINTERED 2-MIC

APPLICATION

The Universal Analyzers Model 273SF Heated Stack Filter Assembly is designed to be used on stacks where the filter needs to be changed on a regular basis. Filter changes can be made in less than one minute.

The filter will mount onto a 2", 3" or 4" flange connection to the stack as specified. The stinger or probe screws into filter chamber. Stack temperatures and the corrosive gasses which may be present will determine the material and design of the probe to be used. A variety of materials are available for stacks having temperatures as high as 3000° F. (1650° C.).

Sample flow rates of up to 20 liters per minute can be extracted and filtered through the Model 273SF with a minimal amount of pressure drop.

GENERAL DESCRIPTION

The Model 273SF is a Heated Stack Filter Assembly consisting of the 273 filter mounted in a NEMA 4X enclosure along with a blowback/sample select air operated valve to be activated by external means thru a solenoid valve.

The NEMA 4X enclosure is fastened directly to the mounting flange which is sized to match the mating sample flange on the stack. There is a heat shrink boot on the bottom of the enclosure to accept a Heated Sample Line (HSL). When the HSL is properly supported, the flange mounting of the 273SF is sufficient to support the entire assembly.

Two, 120 watt heater bands are mounted on the outside of the filter chamber. The temperature of the filter is held at 350° F. A bi-metallic thermal switch fused to the heater keeps the temperature from exceeding 350° F by opening the circuit at that temperature. An optional independent thermocouple/RTD can be provided as a means to measure and transmit the temperature of the filter. A second thermal switch, set at 225° F. (105° C.) is provided to be used as an alarm contact if the temperature drops below the switch temperature.

Several types of filter elements can be supplied with the Model 273SF. The 2 micron ceramic filter is supplied as an economical general purpose filter. A similar ceramic filter with an internal 0.1 micron coating is available for finer filtration or to provide a surface to enhance the blowback capability where the fines have a tendency to fill the pores of the 2 micron element. A 2 micron, 316 stainless steel filter can be inserted for those applications where the ceramic filter is determined to be unsuitable. Additional filtration materials and pore sizes are available on request.

The dual blowback accumulators are 7" diameter stainless steel spheres. It is designed to be pressurized to a maximum pressure of 125 psig compressed air. At that pressure there is 1 cubic foot of air stored to flush the particulate matter out of the filter and through the probe into the stack.

Compressed air is used to clean the filter element. This air supplied to the blowback assembly needs to be clean and dry. Instrument quality air is preferred. High pressure air fills the accumulators and provides a substantial blast when the valve toggles open. This loosens the particles on the filter surface and forces them back through the sample probe into the stack. The period of time between blowback cycles should occur before the pressure drop across the filter begins to increase. This should be selected to be as often as every fifteen minutes but no less frequently than once per day. The time period between blowback cycles can be based on a calculation to estimate the amount of sample required to deposit from three to five grams of solids in the filter element.

Instrument air usage is minimal and smoothed by the fact that the air accumulator is charged over a period of time through a 1/4" instrument air line. The recharge time could be extended with a restriction in the air line if it were desired to reduce the pressure pulses on the instrument air supply and to consume instrument air more slowly.

The calibration gas is injected into the chamber ahead of the filter. This is close to the sample source as is required by many EPA officers. A back pressure check valve (set at 3 to 5 psig) is provided in the cal gas injection path to insure that calibration gas does not leak into the sample while the sample is being drawn through the filter.

INSTALLATION INSTRUCTIONS

Each stack where the Model 273SF is to be mounted should have a flanged sample nozzle installed. The sample probe (stinger) is screwed into the 1/2" NPT on the filter chamber thru the Probe Support Collar on the supplied flange. Tighten the collar set screw. The probe, when installed, should have the interior end level or pointing slightly downward to allow any entrained liquid to drain back into the stack. The length of the probe should be selected to extend into the center of the stack; or if the stack diameter is greater than 12', at least 6' into that stack.

A HSL should be supported close to the Model 273SF. The HSL should be fed through the heat shrink boot on the bottom of the NEMA 4X enclosure. Connect the sample tube to the center tube fitting on the filter chamber. The unheated portion of the sample line should be kept short and insulated to avoid condensation. Connect the cal gas line through the back pressure check valve to the 1/4" tubing fitting. If the compressed air line is part of the HSL, it can be connected to the Instrument Air 1/4" fitting. If an external air line is to be used for blow back, bring the air into the enclosure through a bulkhead fitting to be installed in the wall of the enclosure and connect the air to the same 1/4" fitting.

Provide power to the terminal blocks within the electrical box on the Model 273SF. 450 watts of power, at 115VAC is required. A thermal switch on the heater band will control the temperature at 350° F. (180° C.). Insure the power supplied to the heater matches the heater voltage requirement shown on the serial number tag. An independent ground wire should be run to the grounding terminal on the terminal strip.

If an independent measurement and display of the oven temperature is desired, a thermocouple/RTD can be slipped into a 1/8" diameter thermal well supplied within the heater band.

The final installation step is to insure that the sample line is insulated completely. Close the cover of the enclosure and latch the door shut. The goal is to keep the temperature of the gas sample at a temperature above the dew point of the gas all the way from the stack to the sample cooler/dehydrator.

START-UP PROCEDURE

Apply power to the Model 273SF. Allow five minutes for the filter to come to temperature. This warm-up period is extremely important to avoid the condensation within the Model 273SF filter which would cement the particulates to the filter surface.

Start the gas sample pump and determine that the proper amount of sample is being supplied to the instrumentation.

Run a calibration cycle to insure that the calibration lines are properly installed and sealed. A flow meter should be installed in the calibration gas supply line to insure that there is at least 10 percent more calibration gas being supplied to the Model 273SF than is being withdrawn as sample. That will insure that the filter and probe are being properly flooded with calibration gas. The excess calibration gas will be discharged through the probe.

Open the instrument air valve to charge the blowback accumulators. Toggle the solenoid valve to insure it is properly wired. After a blowback cycle, the presence of a slight pulse on the sample tubing in the analyzer house and the momentary dilution of the sample with instrument air is normal and signifies that a blowback cycle has occurred.

The optimum time between blowback cycles is to be determined by experience. Once a day is sufficient in relatively clean applications. The requirement could be as frequent as every fifteen minutes where the dust and soot levels are severe. It is better to blowback too often than not enough. A vacuum gage in the sample line can be helpful to indicate if the particulate loading of the filter has started to restrict the flow of sample. That condition should not be allowed to occur. The blowback should be initiated before observing a change in pressure drop.

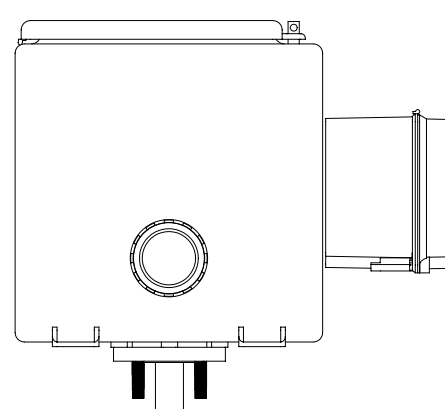
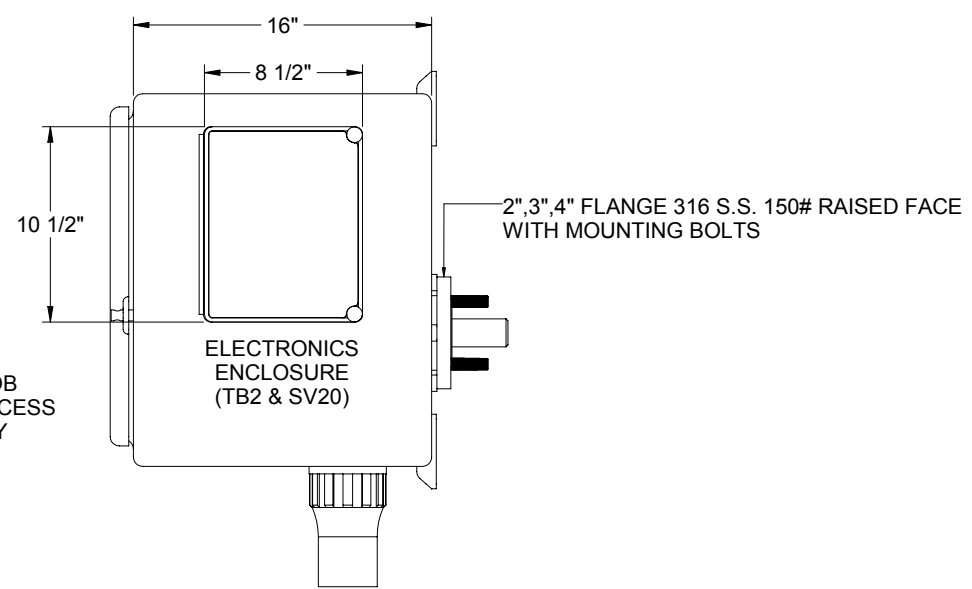
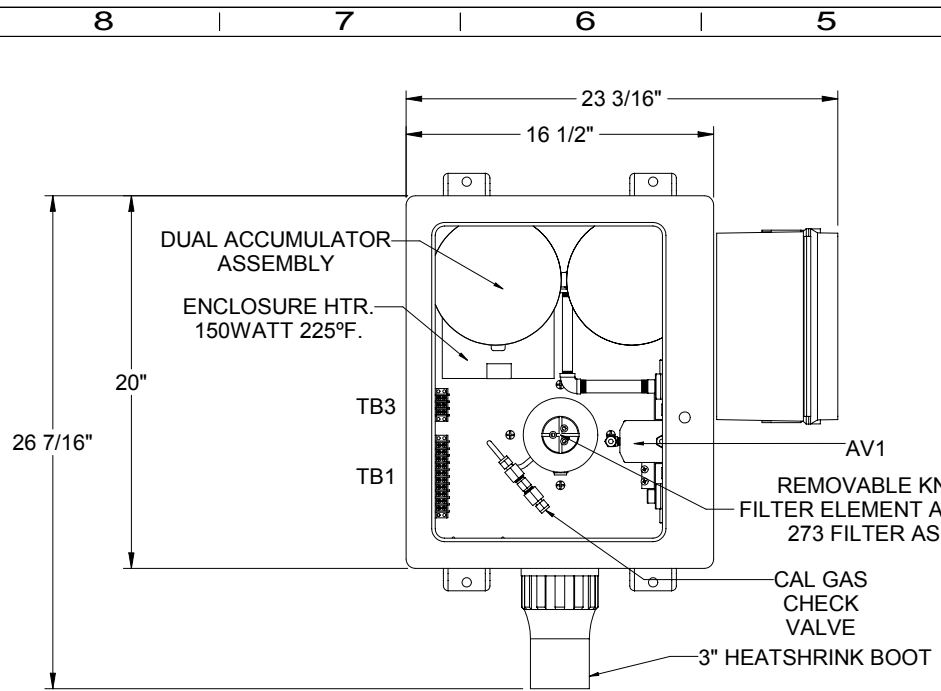
CHANGING THE FILTER

Changing the filter in the Model 273SF Heated Filter Assembly is extremely easy. Open the door to the filter enclosure. Using gloves to protect the hand, grasp the cap on the end of the filter body opposite the probe and turn it counter clockwise. **The cover may be hot to the touch and may cause burns to the hand if not protected.** Removing the cover exposes the filter. Reach into the heated oven with pliers to pull out the old filter.

Inspect the o-rings which are at each end of the filter to insure they are still elastic and will seal the filter. Replace them if they are charred or deformed.

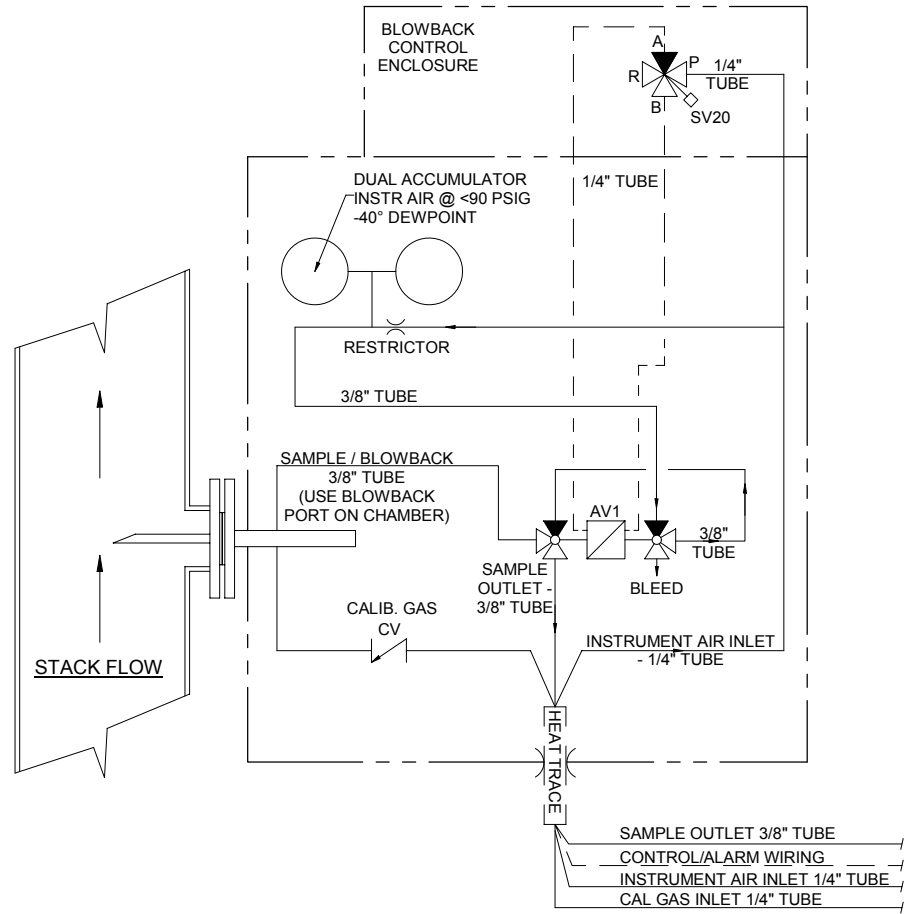
Replace the filter with a new one, again handling it with pliers. Insure it is pushed in the center of the oven so that it is in contact with the o-ring at the inside end of the filter.

Screw the cap back on the filter body. Close the door and latch shut. The filter replacement procedure is complete.

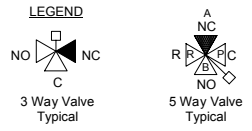


- NOTES:
- 1). ARRANGEMENT MAY VARY ACCORDING TO GOOD ENGINEERING AND ASSEMBLY PRACTICES.
 - 2). SEE SHEET 2 FOR P&ID.
 - 3). SEE SHEET 3 FOR WIRING SCHEMATIC.

UNIVERSAL ANALYZERS INC.		D	04/08/04	REVISION PER SHEET 3	RPH	JK
1701 South Sutor Terrace Carson City, Nevada 89706 USA		REV	DATE	DESCRIPTION	DWN	APVD
MODEL 273SF-DBB-FG-F2/3/4 ARRANGEMENT		REVISIONS				
	DATE	SCALE	NTS	SIZE	D	SHEET
	02/23/2004					1 OF 3
PART NO.	FOR	DRAWN BY	E. Muselman	DRAWING NO.		
NOT ISSUED	INSTRUMENT	APVD BY	R. Daniel	P0810		



NOTES:
 1) ALL COMPONENTS WETTED BY SAMPLE AND CALIBRATION GASES SHALL BE:
 STAINLESS STEEL
 BOROSILICATE GLASS
 TEFLON
 VITON



2) SV20 VOLTAGE OPTIONS ARE CUSTOMER SPECIFIED.

SV20 VOLTAGE OPTIONS		
VOLTAGE	DESCRIPTION	UAI P/N
24VDC	SYJ5120-5M0Z-M5	4955-0105
120VAC	SYJ5120-3LZ-M5	4955-0114

Item	Qty	Description	UAI Part No.
AV1	1	Valve - Air Op. Dual 3 Way 1 Actuator #SS-62XTF4-51DDM-HT	4955-0104
SV20	1	Solenoid Valve 5 Way SMC	0000-0000
RESTRICTOR	1	Restrictor - 40 Micron 316 Sintered S.S.	4991-0203

UNIVERSAL ANALYZERS INC. 1701 South Sutrro Terrace Carson City, Nevada 89706 USA		D 04/08/04	REVISION PER SHEET 3	RPH JK
MODEL 273SF-DBB-FG-F2/3/4 P&ID		REV	DATE	DESCRIPTION
PART NO. NOT ISSUED		FOR INSTRUMENT	DATE 02/23/2004	REVISIONS
DRAWN BY E. Muselman		SCALE NTS	SIZE D	SHEET 2 OF 3
APVD BY R. Daniel		DRAWING NO. P0810		

Universal Analyzers Inc.1701 SOUTH SUTRO TERRACE
TELEPHONE (800) 993-9309
(775) 883-2500CARSON CITY, NV 89706
FAX 775-883-6388**ACCESSORIES AND SPARE PARTS
FOR MODEL 273SF-DBB-FGI HEATED STACK FILTER in NEMA 4X ENCLOSURE**

4980-0128	1 Micron Filter, Ceramic 9" Length	\$ 98.00
4904-0015	Filter o-ring seal, Viton, #2-208	\$ 2.00
4904-0016	Plug o-ring seal, Viton, #2-216	\$ 2.00
5150-0037	Plug, Cap - Teflon	\$ 29.00
3014-0020	Heater Band Assembly (Heater Bands & Switches)	\$ 416.50
3014-0040	Heater Band, 115/230VAC 120 Watt	\$ 210.00
3014-0034	Heater Pad, Enclosure - 120VAC 150 Watt 225°F	\$ 210.00
3103-0014	Thermal Switch, Open @ 340°F Selco (Heater Band Cntrl.)	\$ 35.00
3103-0012	Thermal Switch, Close @ 225°F Selco (Low Temp)	\$ 35.00
5150-0014	Calib. Gas Check Valve Assembly (Check Valve & Fittings)	\$ 106.00
4955-0003	Calib. Gas Check Valve, Adjustable Pressure	\$ 75.00
4955-0105	Solenoid Valve, SMC #SYJ5120-5M0Z-M5	\$ 150.00
4955-0104	Air Op. Valve, Swagelok #SS-62XTF4-51DDM-HT	\$1200.00
4956-0001	Accumulator Sphere, Blowback, Unheated	\$ 115.00
4907-0004	Boot, Heat Shrinkable Aperseal 3"	\$ 96.00