



Spring Air

Solutions for Energy Savings

**Water Wash Hood,
Dry Grease Extractor
Maintenance
Manual 2002**

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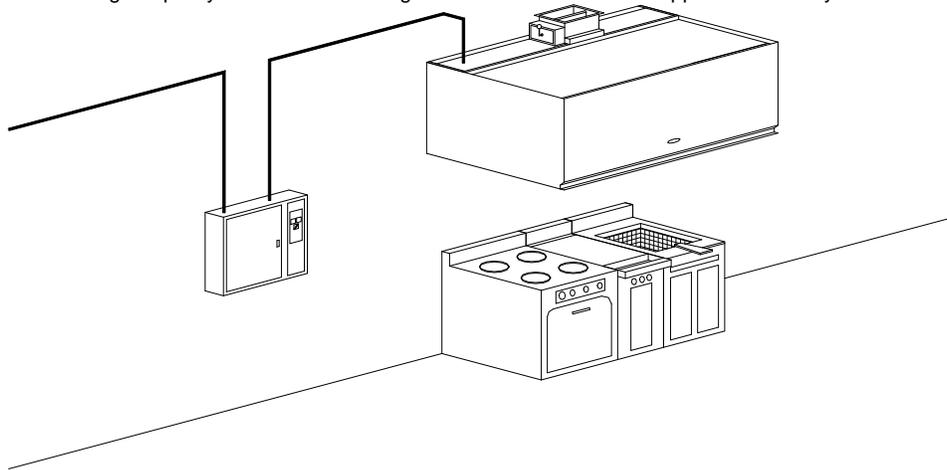
Water Wash Hood Dry Extractor OPERATING AND MAINTENANCE MANUAL

INTRODUCTION

Thank you for selecting a SPRING AIR SYSTEMS INC. commercial exhaust water wash grease extractor. Your system consists of a water wash hood, a water wash control panel and plumbing box, an exhaust fan and make air unit. Others may have supplied the exhaust fan and make up air unit.

SPRING AIR commercial kitchen hoods have been designed and constructed in accordance with the National Building Code, the National Fire Protection Association (NFPA-96), and listed by Underwriters Laboratories of Canada and Underwriters Laboratories Inc. In addition the SPRING AIR SYSTEMS hood will meet all municipal code requirements.

Each SPRING AIR hood is individually constructed to suit the space limitations of your commercial kitchen. The SPRING AIR hoods are fabricated from No. 4 finish stainless steel with all the edges ground and polished. All hoods are manufactured to stringent quality standards and are guaranteed to enhance the appearance of any commercial kitchen.



*Model HT-B Water wash Hood and model MP10H-19 Control Panel
Figure 1*

The exhaust fan operation is controlled by a selector switch on the control panel or automatically by an electronic microprocessor based, 24-hour timer. Each time the exhaust fan is turned off the internal grease extractor portion of the hood is washed with a detergent and hot water mixture.

The SPRING AIR water wash grease extractor was designed to best meet the needs of your commercial kitchen. The SPRING AIR hood (hood) provides the following important benefits:

1. Maximum Grease Extraction.
2. Automatic Daily Wash.
3. Second Line Fire Protection.
4. Minimum Exhaust Requirements.

Please read the manual carefully to familiarize yourself with your water wash hood. A factory trained service technician will complete a startup of your system. A copy of the start up report is available upon request.

Each hood and control panel is described in detail. Refer to the UL/ ULC plate on your hood and water wash control panel for your model numbers before proceeding.

MODEL NUMBER DESIGNATIONS - HOODS

A well-designed commercial kitchen ventilation system must consider proper ventilation, superior grease collection, and daily cleaning and second line fire protection.

There exist numerous types, styles and arrangements of SPRING AIR SYSTEMS hoods that meet these design requirements. Refer to the ULC label for the complete model number of your hood. The ULC label is located on the underside of the grease trough on the right hand side of the hood.

SPRING AIR SYSTEMS HOOD MODEL NUMBER DESIGNATIONS

		H	T	B	MP	10	4
C	Cold water spray/hot water wash						
H	Hot water wash						
D	Dry Grease Extractor						
T	Thermostatic Fire Damper						
F	Fusible link, spring loaded fire damper						
D	Fusible link, dead weight fire damper						
S	Shelf type hood						
B	Box type hood						
BS	Box shelf type hood						
DB	Double box type hood						
MG	Make up air through front grilles						
MP	Make up air through perforated panels						
MI	Make up air internally						
F	Single row canopy finished on all sides, Rev-Low type						
10	The length of the hood in feet						
4	The width of the hood in feet						

Model Number Designation - Hoods
Chart No1

MODEL NUMBER DESIGNATIONS - CONTROL PANELS

		A	P	10	C	19
A	Automatic stop/start with time clock					
M	Manual stop/start					
S	Single sequence small panel					
P	Large size plumbing box					
B	Small size plumbing box					
BA	Small size plumbing box with time clock					
10	One sequence					
20	Two sequence					
30	Three sequence					
40	Four sequence					
50	Five sequence					
C	Cold water spray/hot water wash					
H	Hot water wash					
19	Diameter of inlet to panel in mm					

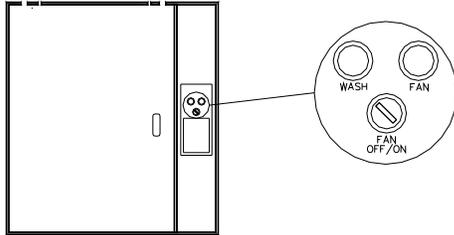
Model Number Designation - Control Panels
Chart No.2

An integral part of any SPRING AIR SYSTEMS water wash hood is the water wash control panel. The water wash control panel controls the exhaust fan operation the daily wash and second line fire protection system.

CONTROL PANEL OPERATION

Sequence of Operation: All panels

Exhaust fan: To start the exhaust fan rotate the fan selector switch to the "ON" position. The green "FAN ON" pilot and exhaust fan will turn on. The exhaust fan starter coil is energized through terminals 3 and 4 in the water wash control panel.



Supply fan: Power is provided for a fresh air motorized shut off damper through terminals 4, 8, & 9. The damper motor is energized through terminals 4, & 8. Once an end switch closes 120V/1/60 power is supplied back to the control panel through terminal 9. The supply fan motor starter is then energized through terminals 4 & 9.

When a motorized damper with end switch is not used in the installation the field electrician must jumper terminals 8 & 9 in the water wash panel to provide 120V/1/60 power to the supply fan motor starter.

MP10C & MP10H Wash Panel
Figure 2

Cold Water Spray Panels (SB10C/MPx0C/APx0C)

When the fan selector switch is rotated to the "ON" position the cold water spray solenoid valve is energized. The cold-water spray operates while the exhaust fan is operating. The cold-water spray can be observed by looking into the inlet slot of the grease extractor. All nozzles should be spraying to form a uniformed water pattern along the length of the hood.

To stop the exhaust and supply fan rotate the selector switch to the "OFF" position. The green fan "ON" pilot and the exhaust fan will turn off.

Cold Water Spray Panels (SB10C/MPx0C/APx0C).

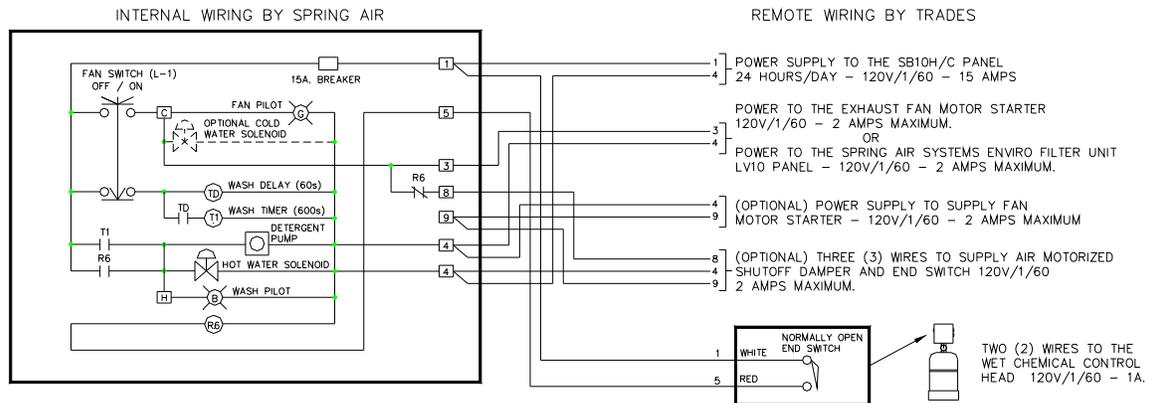
In addition the cold-water spray solenoid valve will close.

SINGLE SEQUENCE WASH

MODEL: SB10C, SB10H

CAPACITY:

One 3/4" (19 mm) to 1.25" (32 mm) hot water inlet and one 3/4" (19 mm) to 1.25" (32 mm) hot water outlet connections for washing p to 46 ft. (14 m) of hood.



Model SB10C and SB10H control panel internal wiring
Figure 3

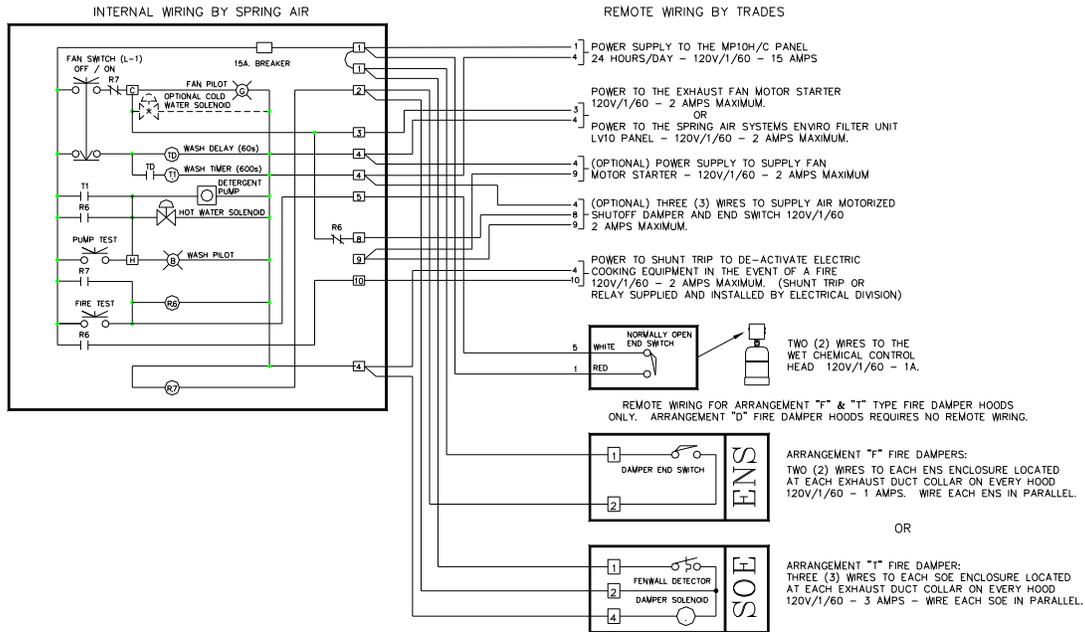
MODELS: MP10C, MP10H

CAPACITY:

One 3/4" (19 mm) to 1.5" (38 mm) hot water inlet and one 3/4" (19 mm) to 1.5" (38 mm) hot water outlet connections for washing up to 50 ft. (15 m) of hood.

When the selector switch has been rotated to the "OFF" position, after a 60 second time delay, the blue "WASH" pilot the detergent pump and hot water solenoid valve are energized. The hot water and detergent mixture flow to the hood and enter the grease extractor through an inlet pipe connected to the spray manifold. The detergent water mixture is sprayed from nozzles spaced uniformly along the length of the wash manifold washing the grease dirt and lint from the grease extractor baffle and into the drain.

The wash continues for the period of time set on the wash timer adjustable from 0 to 600 seconds. At the end of the wash cycle the blue "WASH" pilot, the detergent pump and the hot water solenoid valve shut off. The system remains idle until the next time the fan selector switch is turned to the "ON" position.

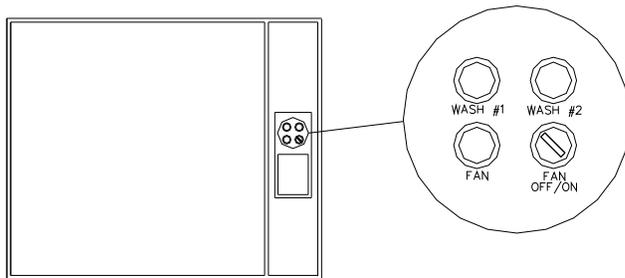


Single Sequence Wash MP10C & MP10H Electrical Wiring
Figure 4

TWO SEQUENCE WASH

MODELS: MP20C, MP20H

CAPACITY: One 3/4" (19 mm to 1.5" (38 mm) hot water inlet and two 3/4" (19 mm) to 1.5" (38 mm) hot water outlet connections for washing up to 100 ft. (30 m) of hood.

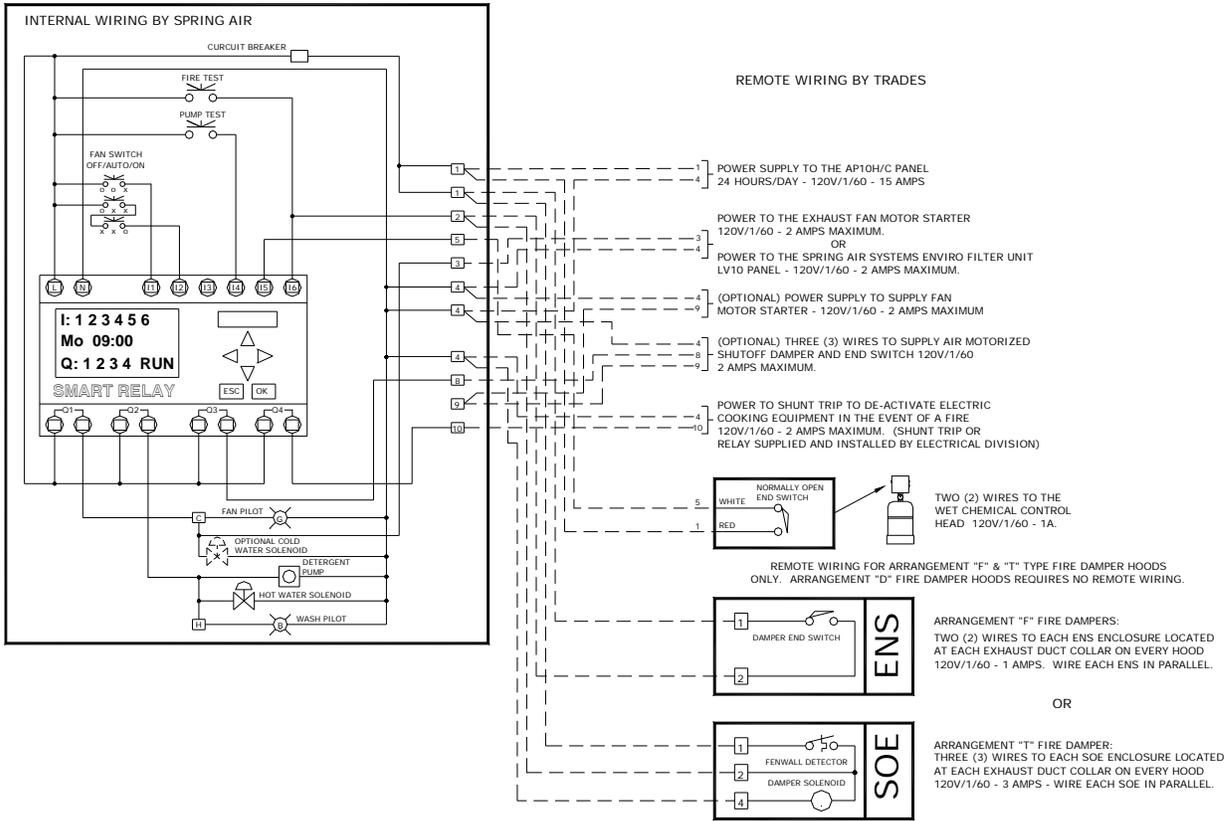


MP20C & MP20H water wash panel
Figure 5

When the fan selector switch has been rotated to the "OFF" position, after a 60 second delay, the blue "WASH #1" pilot, the detergent pump, and the hot water solenoid #1 are energized.

The detergent and water mixture washes the first group of hoods (up to 50-ft. (15 m)). The wash cycle remains on for the length of time set on wash timer #1 (T1) adjustable from 0 to 600 seconds. At the end of wash cycle #1 the "WASH #1" pilot and the hot water solenoid #1 shut off and the blue "WASH #2"

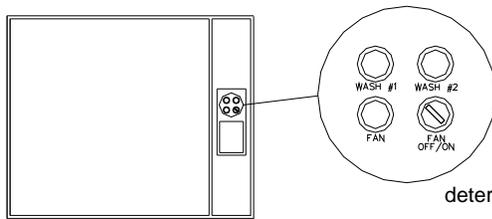
pilot and hot water solenoid valve #2 is energized. The detergent and water mixture washes the second group of hoods (up to 50 ft. (15 m)). The wash cycle continues for the length of time set on wash timer #2 (T2) adjustable from 0 to 600 seconds. At the end of wash cycle #2 the "WASH #2" pilot detergent pump and hot water solenoid valve #2 shut off. The system remains idle until the next time the fan selector switch is turned to the "ON" position.



Two Sequence Wash Panel Model AP10C & AP10H Electrical Wiring
Figure 6

THREE SEQUENCE WASH

MODELS: MP30C, MP30H
CAPACITY



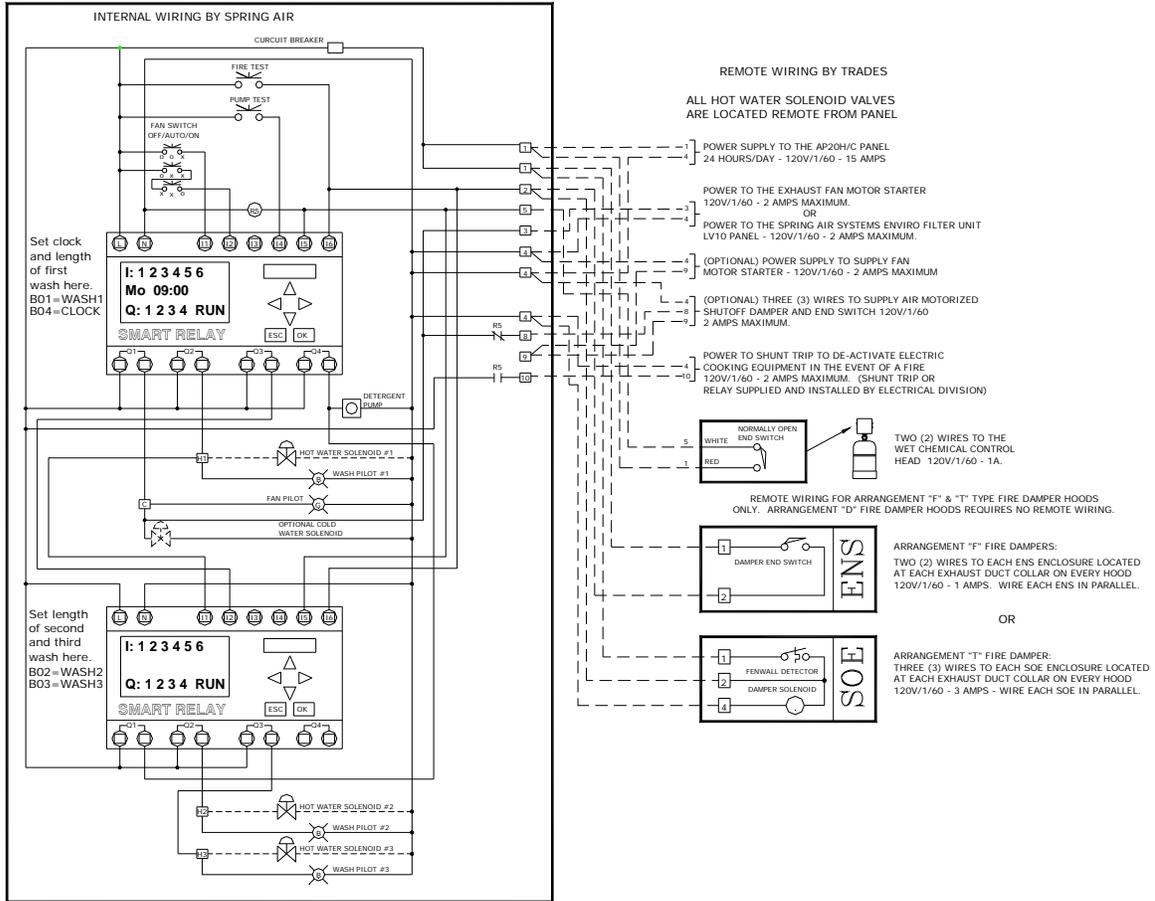
MP10C & MP10H Water Wash Panel
Figure 7

One 3/4" (19 mm) to 1.5" (38 mm) hot water inlet and one 3/4" (19 mm) to 1.5" (38 mm) hot water outlet connection piped to three 3/4" (19 mm) to 1.5" (38 mm) hot water connections to three groups of hoods for washing up to 150 ft. (45 m) of hoods.

When the fan selector switch has been rotated to the "OFF" position, after a 60 second time delay, the blue "WASH #1" pilot, the detergent pump, and the hot water solenoid #1 are energized.

Three sequence control panels have remote hot water solenoid valves. A 120V/60 signal is supplied to each hot water solenoid valve through terminals H1, H2, H3, and 4 in the control panel.

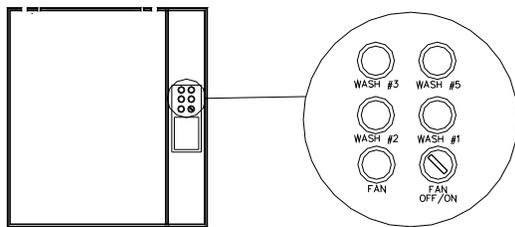
Terminals	Component
H1 & 4	Hot water solenoid valve #1
H2 & 4	Hot water solenoid valve #2
H3 & 4	Hot water solenoid valve #3



Three Sequence Wash Panel Models AP30C and AP30H Electrical Figure 8

The detergent water mixture washes the first group of hoods (up to 50-ft. (15m)). The wash cycle continues for the length of time set on wash timer #1 (T1), adjustable from 0 to 600 seconds. At the end of wash cycle #1 the blue WASH #1” pilot and the hot water solenoid valve #1 shut off and the blue “WASH #2” pilot and hot water solenoid valve #2 energize. The detergent and water mixture washes the second group of hoods (up to 50 ft. (15m)). The wash cycle continues for the length of time set on wash timer #2, adjustable from 0 to 600 seconds. At the end of wash cycle #2 the blue “WASH #2” pilot and the hot water solenoid valve #2 shut off and the blue “WASH #3” pilot and the hot water solenoid valve #3 energize. The detergent water mixture washes the third group of hoods (also up to 50 ft. (15 m)). At the end of wash cycle #3 the blue “WASH #3” pilot the hot water solenoid valve #3 and the detergent pump shut off. The system remains idle until the next time the fan selector switch is rotated to “ON” position.

FOUR AND FIVE SEQUENCE WASH SYSTEMS

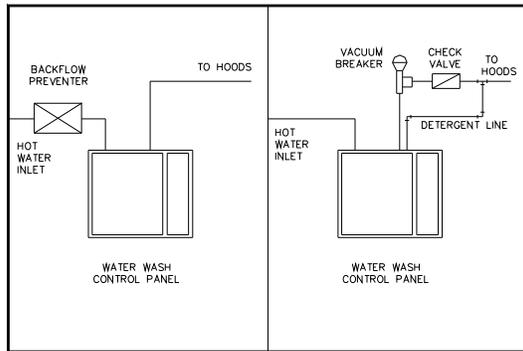


MP40C & MP40H Water Wash Panel Figure 9

Four and five sequence wash control panels operate similarly to the three-sequence wash. After the third wash cycle is complete the system proceeds to the fourth and fifth wash cycles.

Due to space limitations within the kitchen the four and five sequence wash system also have remote solenoid valves. The detergent pump and tank are still located in the wash control panel. See wiring and piping diagrams in the back of the manual for the four and five sequence wash systems.

REMOTE PIPING



Backflow Preventor Vacuum Breaker
Figure 10

All remote piping must meet applicable local plumbing codes. The panel must be installed with adequate protection to stop the flow of detergent back into the potable water supply. This may be accomplished, depending on the municipality, with a vacuum breaker and check valve assembly or a back flow preventor. SPRING AIR SYSTEMS will always prepipe the detergent line into the main hot water outlet pipe in the plumbing cabinet unless advised to do otherwise prior to shipment.

IT IS IMPORTANT TO CHECK WITH LOCAL PLUMBING INSPECTORS TO DETERMINE WHAT IS ACCEPTABLE PRACTICE IN YOUR JURISDICTION.

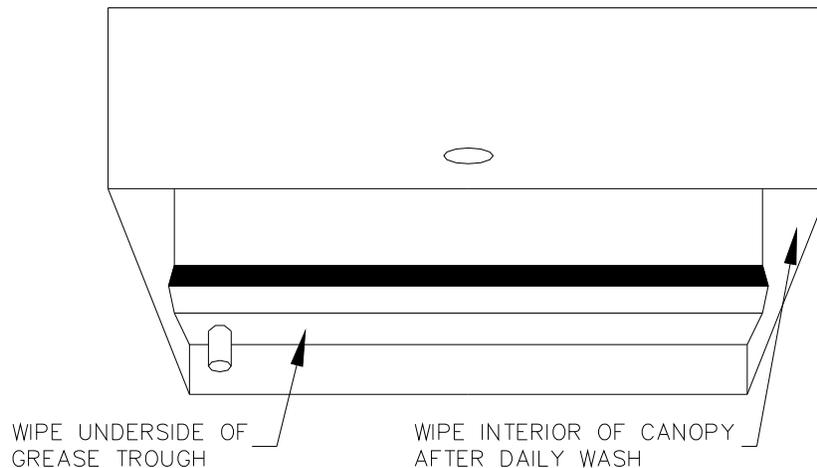
CLEANING THE EXTERIOR

Normal soil can be removed with a mild detergent water mixture applied to a cloth.

To remove baked on grease, apply a cleanser to a damp cloth or sponge and rub on the metal in the direction of the polishing lines. **DO NOT RUB IN A CIRCULAR MOTION.** Burnt deposits, which do not respond, can usually be removed by rubbing the surface with SCOTCH-BRITE scouring pads or STAINLESS scouring pads. Do not use ordinary steel wool. Heat tint can be removed by a vigorous scouring in the direction of the polish lines using SCOTCH-BRITE or STAINLESS scouring pads in conjunction with powdered cleanser.

Once the wash cycle(s) are complete wipe of the interior surface of the hood canopy and the underside of the grease trough and skirt.

During the wash cycle(s) condensation may form on these surfaces. The condensation will assist in cleaning off any grease, dirt or lint, which may have built up during the daily operation.



Cleaning the Hood Exterior
Figure 11

WASH TIMER SETTINGS

All SB10C, MP10C, MP20C, MP30C, MP40C, & MP50C wash control panel timers are factory set at two minutes.
 All SB10H, MP10H, MP20H, MP30H, MP40H, & MP50H wash control panel timers are factory set at three minutes.

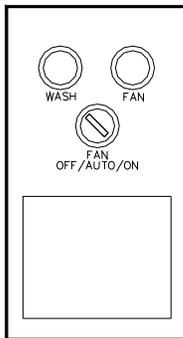
After the first four days of operation open the front access door on the grease extractor. Visually check if the baffle and interior surfaces are clean. If there are grease deposits check that the hot water pressure is between 40 psi (2.8 kg/cm²) and 70 psi (4.2 kg/cm²) and the hot water temperature is between 120 F (49 C) and 180 F (82 C). If there is adequate temperature and pressure either use a higher detergent concentration or increase the wash time.

- The detergent concentration can be adjusted by increasing the cam setting on the side of the detergent pump. Loosen the wing nut on the side of the detergent pump and rotate the cam to the next setting. The cam is adjustable from 0 to 6, 6 being the highest detergent concentration. Only increase one setting at a time. Inspect the interior each day and adjust until all surfaces are clean.
- Only increase the wash time in 30-second intervals until all baffles and exposed interior grease extractor surfaces are clean.

For type "C" water wash hoods check that the cold water pressure is at least 10 psi 1.4 kg/cm²).

AUTOMATIC WASH SYSTEMS:

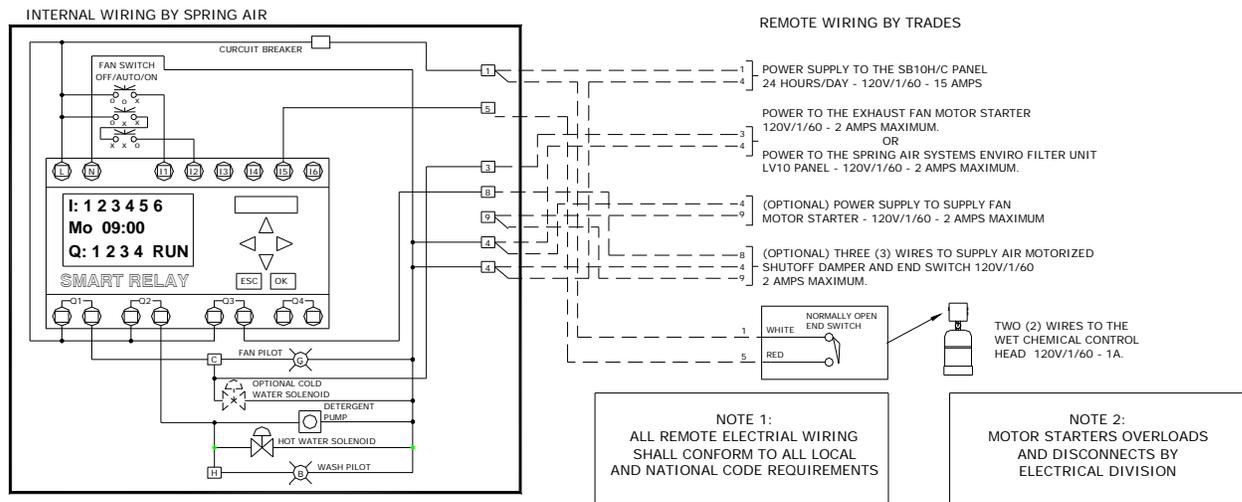
SBA10H, SBA10C, AP10H, AP10C, AP20H, AP20C, AP30H, AP30C, AP40H, AP40C, AP50H, & AP50C



The automatic wash control panels are equipped with a solid-state microprocessor. The fan selector switch is replaced with a three-position "OFF/AUTO/ON" switch. In the "OFF" and "ON" positions the control panel operates identical to the standard SB, & MP manual wash panels. When the fan switch is rotated to the "AUTO" position the solid-state time clock controls the OFF/ON operation of the exhaust fan, supply fan and wash cycle.

Setting the clock (T6) is as simple as setting a digital watch.

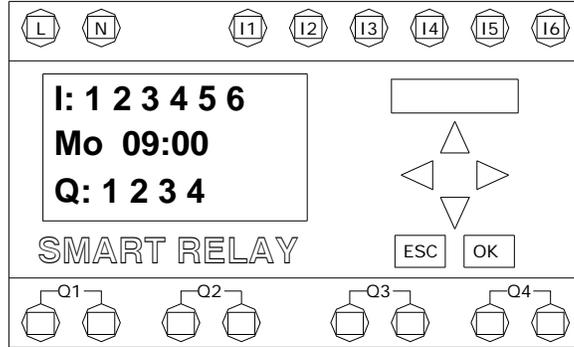
Automatic Wash Panel
 Figure 12a



SBA10C and SBA10H Automatic Wash Panel Wiring Schematic
 Figure 12b

Programming the SMARTRELAY Time Clock

Setting the Clock Time and Day



I: 1 2 3 4 5 6
Mo 09:00
Q: 1 2 3 4

1. Press these two buttons together



>Set Clock
Set Param

2. Press



Set Clock
Mo 09:00
MM. DD. YY
11. 13. 01

3. To change the day of week press or until the correct day appears.

Set Clock
Su 09:00
MM. DD. YY
11. 13. 01

4. To change the time press once. The hour will be highlighted. Press or until the correct hour appears. Press to move to minutes. Adjust the minutes by pressing or until correct minutes appears.

Set Clock
Su 11:25
MM. DD. YY
11. 13. 01

5. To change the date press again. The month will be highlighted. Press or until the correct month appears. Press to move to day. Adjust the day by pressing or until correct day appear. Press to move to year. Adjust the year by pressing or until correct year appear.

Set Clock
Su 11:25
MM. DD. YY
11. 11. 01

6. You have finished setting the clock.

I: 1 2 3 4 5 6
Su 11:25
Q: 1 2 3 4

7. Press and to return to the operating screen.

Setting the Weekly Fan “ON” and “OFF” Times

I: 1 2 3 4 5 6
Mo 09:00
Q: 1 2 3 4

1. Press these two buttons together



>Set Clock
Set Param

2. Press ▾

Set Clock
>Set Param

3. Press



B04: No1
D = MTWTFSS
On = 06:00
Off = 23:00

4. The clock has been factory set to turn the fan on at 6:00 a.m. and off at 23:00 hours or 11:00 p.m. When the fan shuts off the wash activates.

B04: No1
D = ■TWTFSS
On = 06:00
Off = 23:00

5. To change the above settings press The cursor will move to M = Monday.

B04: No1
D = MTWTF-S
On = 06:00
Off = 23:00

6. Press to remove Monday from the weekly schedule. The - dash indicates the fan will not start automatically any given day.

B04: No1
D = - TWTF- -
On = 06:00
Off = 23:00

7. Press to move to the next day of the week. Press each time the fan is not required to operate on that given day. The screen on the left indicates the fan will not automatically operate on Saturday or Sunday.

B04: No1
D = - TWTF- -
On = ■6:00
Off = 23:00

8. Press to move to the hour that the fan will start in the morning. Press to change the hour you want the fan to start in each morning. Press to move to the minute the the fan will start in the morning. Press to change the minutes.

B04: No1
D = - TWTF- -
On = 06:30
Off = ■3:00

9. Press to move to the hour that the fan will stop in the evening. Press to change the hour you want the fan to stop each evening. Press to move to the minute the fan stop in the evening. Press to change the minutes.

B04: No1
D = MTWTF- -
On = 06:30
Off = 22:30

10. Press



B04: No1
D = MTWTF- -
On = 06:30
Off = 22:30

11. If your selection is complete press and to return the the operating screen.

I: 1 2 3 4 5 6
Mo 09:14
Q: 1 2 3 4

12. You have completed programming one weekly fan "On" and "Off" cycling. If you wish to program a second (Weekend Operation) or third weekly setting go the the section "Setting Weekend Operation"

Setting Weekend Operation

I: 1 2 3 4 5 6
Mo 09:14
Q: 1 2 3 4

1. Press these two buttons together



>Set Clock
Set Param

2. Press ▾

Set Clock
>Set Param

3. Press



B04: No1
D = MTWTF--
On = 06:30
Off = 22:30

4. The clock has been set to turn the fan on at 6:30 a.m. and off at 22:30 hours or 10:30 p.m. When the fan shuts off the wash activates.

B04: No1
D = ■TWTFSS
On = 06:00
Off = 23:00

5. To set Weekend Operation press ▾

B04: No2
D = - - - - -
On = - - : - -
Off = - - : - -

6. Press to program the weekend operation.

B04: No2
D = - - - - - SS
On = - - : - -
Off = - - : - -

7. Press five times to move to Saturday. Press to turn fan on Saturday. Press once to move to Sunday. Press to turn fan on Sunday.

B04: No2
D = - - - - - SS
On = ■ - : - -
Off = - - : - -

8. Press to move to the hour that the fan will start in the morning. Press to change the hour you want the fan to start in each morning. Press to move to the minute the the fan will start in the morning. Press to change the minute

B04: No2
D = - - - - - SS
On = 10:00
Off = ■ - : - -

9. Press to move to the hour that the fan will stop in the evening. Press to change the hour you want the fan to stop each evening. Press to move to the minute the fan stop in the evening. Press to change the minutes.

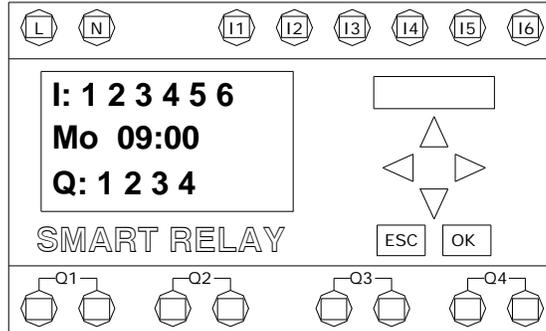
B04: No2
D = - - - - - SS
On = 10:00
Off = 23:30

10. Press If your selection is complete press and to return the operating screen.

I: 1 2 3 4 5 6
Mo 10:24
Q: 1 2 3 4

11. You have completed programming weekend fan "On" and "Off" cycling.

Setting the Wash Cycle Length



I: 1 2 3 4 5 6
Mo 09:00
Q: 1 2 3 4

1. Press these two buttons together



>Set Clock
Set Param

2. Press

Set Clock
>Set Param

3. Press



B04: No1
D = MTWTFSS
On = 06:00
Off = 23:00

4. The clock has been factory set to turn the fan on at 6:00 a.m. and off at 23:00 hours or 11:00 p.m. When the fan shuts off the wash activates. To change these times see section "Programming the SMARTRELAY time clock."

B01: T
T = 02:00m
Ta = 02:00m

5. Press The wash time has been factory pre-set at 2 minutes.

B01: T
T = 02:00m
Ta = 02:00m

6. To change the wash time press

B01: T
T = 02:30m
Ta = 02:00m

7. Press to change the length the wash in minutes. Press to move to the the length of wash in seconds. Press to change the seconds.

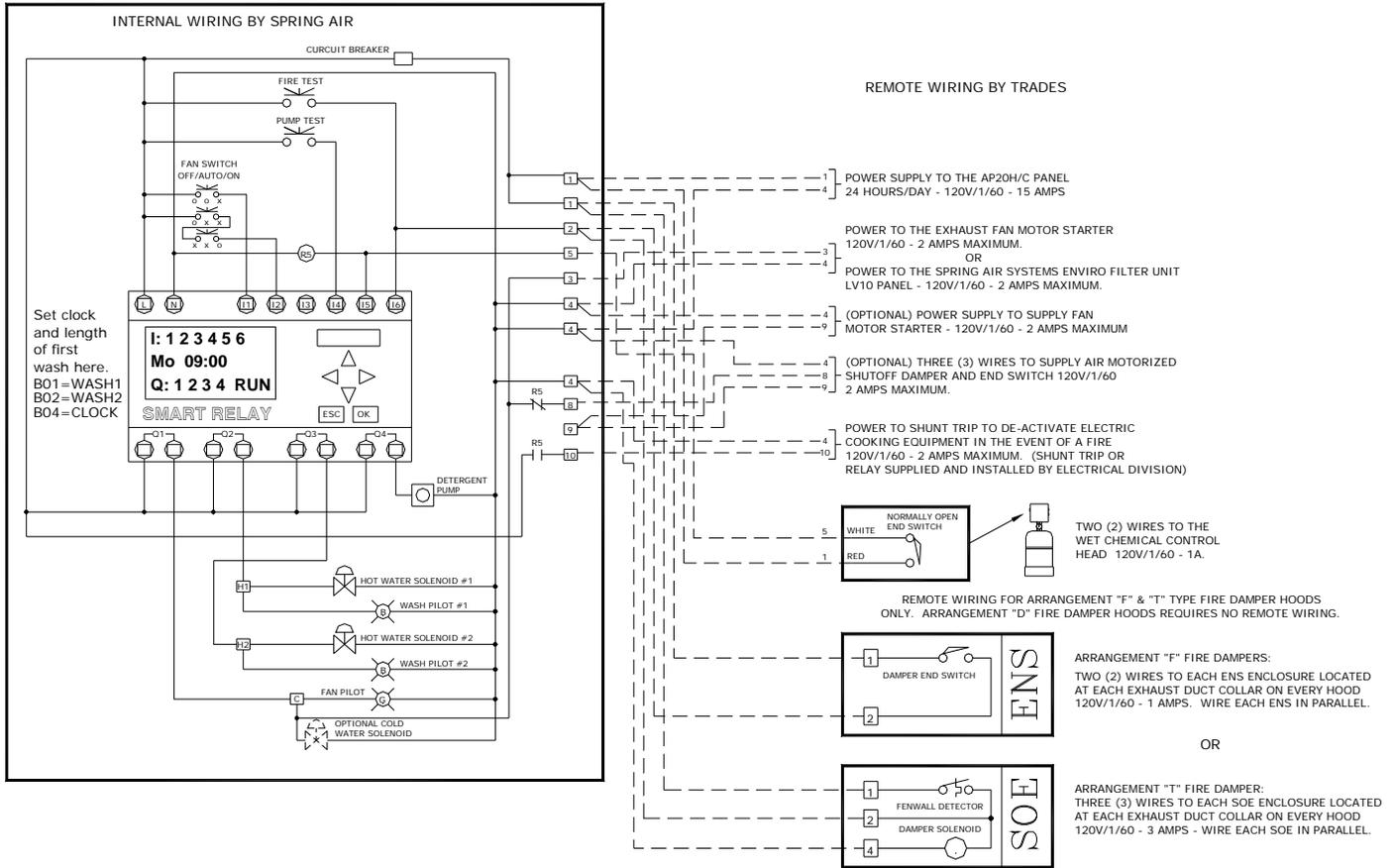
B01: T
T = 02:30m
Ta = 02:00m

8. Press if the wash time is correct.

I: 1 2 3 4 5 6
Mo 09:12
Q: 1 2 3 4

9. Press and to return to the operating screen.

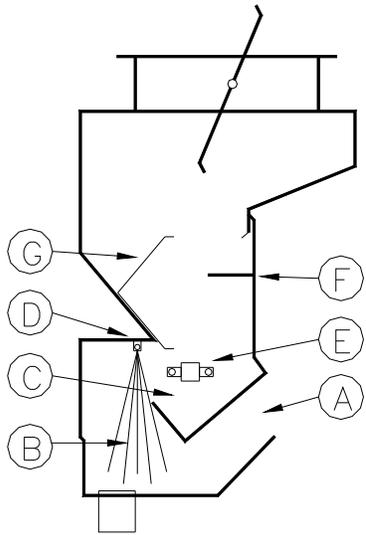
AUTOMATIC WASH SYSTEMS: AP20H, AP20C



AP20C & AP20H Wash Panel Wiring Schematic
Figure 12c

GREASE EXTRACTOR OPERATION

TYPE "C" GREASE EXTRACTOR



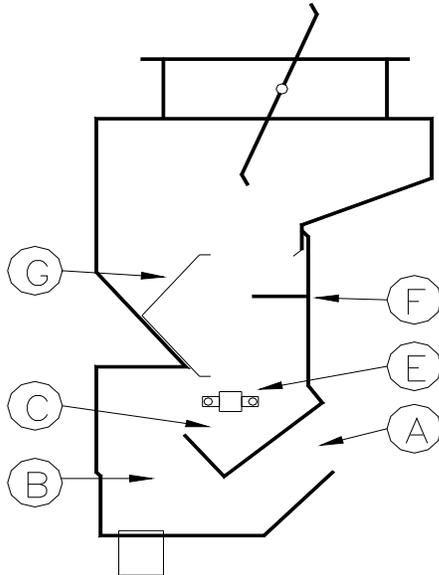
The SPRING AIR SYSTEMS type "C" grease extractor has the highest grease extraction efficiency available in a water wash hood.

The contaminated exhaust air enters the high velocity inlet slot A and flows through a transition zone to the VORTEX CHAMBER B. The cold-water spray manifold D sprays a fine cold-water mist into the path of the exhaust air. The cold-water spray causes the grease particles to cool, congeal and coagulate forming larger grease globules. The larger heavier globules are more readily removed through centrifugal force as the exhaust air accelerates through a complete 270-degree turn around the VORTEX BAFFLE C. The grease, dirt and lint are deposited on the PRIMARY VARIABLE FLOW BAFFLE G and the VORTEX BAFFLE C. The PRIMARY VARIABLE FLOW BAFFLE G is also adjustable along the length of the grease extractor to provide varying exhaust airflow. The sloping VORTEX BAFFLE C drains the collected grease to the end of the hood into a grease trough.

Type "C" Extractor
Figure 13

The cold-water spray extends from the entrance to the exit of the VORTEX CHAMBER B, which provides a secondary coverage as the exhaust air enters the secondary grease extraction chamber. The exhaust air continues into the secondary extraction chamber, which contains an additional baffle, F. Residual grease is deposited on the secondary baffle as the exhaust air gyrates through the secondary chamber. After leaving the secondary chamber the exhaust air enters the hood fire damper and duct collar and discharges into the ductwork.

TYPE "H" GREASE EXTRACTOR



Type "H" Extractor
Figure 14

The SPRING AIR SYSTEMS type "H" grease extractor is a high efficiency water wash grease extractor.

The contaminated air enters the high velocity inlet slot A and flows through the transition zone to the VORTEX CHAMBER B. The exhaust air accelerates through a complete 270-degree turn around the VORTEX BAFFLE C. Centrifugal force causes the grease, dirt and lint particles to deposit on the PRIMARY VARIABLE FLOW BAFFLE G and the VORTEX BAFFLE C. The PRIMARY VARIABLE FLOW BAFFLE G is also adjustable for varying exhaust flows along the length of the extractor. The sloping VORTEX BAFFLE C drains the collected liquid grease to the end of the hood and into the grease trough.

The exhaust air continues into the secondary extraction chamber, which contains an additional baffle, F. Residual grease is deposited on the secondary baffle as the exhaust air gyrates through the secondary chamber. After leaving the secondary chamber the exhaust air enters the hood fire damper and duct collar and discharges into the exhaust ductwork.

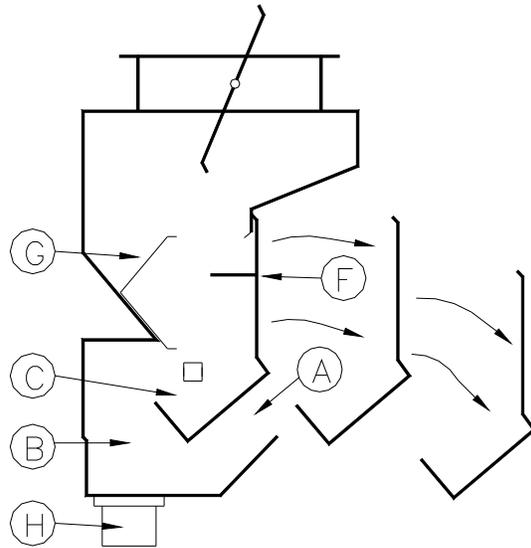
TYPE “D” GREASE EXTRACTOR

The SPRING AIR SYSTEMS type “D” grease extractor is a high efficiency dry grease extractor. The type “D” grease extractor removes grease, dirt and lint through centrifugal force. Removing the front access door and wipe the interior with a damp cloth to manually clean the grease extractor chamber

Principle of Operation

The contaminated exhaust air enters the high velocity inlet slot A and flows through the transition zone to the VORTEX CHAMBER B. The exhaust air accelerates through a complete 270-degree turn around the VORTEX BAFFLE C. Centrifugal force causes the grease, dirt and lint particles to deposit on the PRIMARY VARIABLE FLOW BAFFLE G and VORTEX BAFFLE C. The sloping VORTEX BAFFLE C drains collected grease to the end of the hood into the grease cup H.

The exhaust air continues into the secondary extraction chamber, which contains an additional baffle, F. Residual grease is deposited on the secondary baffle as the exhaust air gyrates through the secondary chamber.



Type “D” Extractor
Figure 15

GREASE EXTRACTOR TYPE	RECOMMENDED COOKING USE
Type “C”	Medium/heavy and heavy duty. Mesquites, live charcoal, Gas charbroilers, heavy frying
Type “H”	Medium and medium/heavy duty. Gas charbroilers, Fryers, Ranges, Griddles. Most commercial cooking applications
Type “D”	Light and medium duty. Electric fryers, Ranges, Ovens, Kettles and Steamers

HOOD GREASE EXTRACTOR SYSTEMS : TYPE “C”, “H” & “D”

SPRING AIR SYSTEMS hoods are available with either automatic or manual wash systems. All water wash hoods must be interconnected with a water wash control panel.

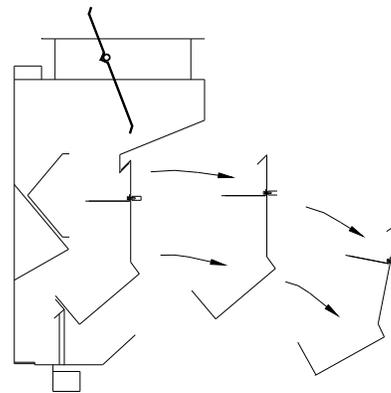
Manual: Type “D” Hood

The type “D” incorporates a grease extractor similar to type “H” but without the wash manifolds. The type “D” is recommended for light to medium cooking applications where grease is minimal.

The liquefied grease collects on internal baffles as described in the “Grease Extractor” section of the manual. The baffles are designed to drain the liquefied grease to the end of the hood and into the grease trough and grease cup.

To clean the grease extractor, the front access door and grease cup are removed and manually washed in a kitchen sink.

The two interior baffles and grease trough should be wiped down with a damp cloth soaked in a water and mild detergent mixture. If the cooking application generates high temperatures, the grease trough may require additional cleaning and/or scraping to remove baked-on solidified grease.

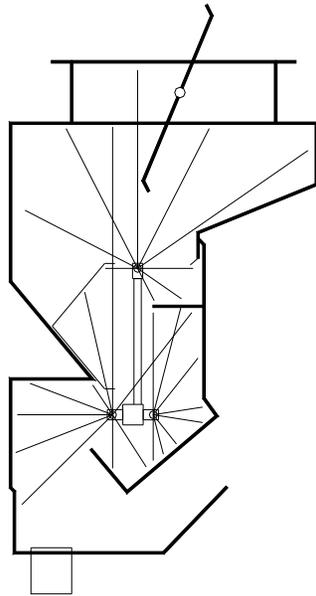


Type “D” Grease Extractor
Figure 16

Automatic Wash: Type “C” and “H:” Hoods

The “C” and “H” hoods have incorporated water wash manifold into the high efficiency grease extractor. The PRIMARY BAFFLE C and SECONDARY BAFFLE F are both water wash manifolds.

Spray nozzles are spaced evenly along baffle/manifolds. The hot detergent water mixture enters the hot water inlet pipe, and travels into the interconnecting pipe to the PRIMARY BAFFLE/MANIFOLD D and the SECONDARY BAFFLE/MANIFOLD F. The water detergent mixture is sprayed uniformly within the interior of the grease extractor.



The water/detergent mixture washes the grease, lint and dirt into the sloping VORTEX BAFFLE , which carries the mixture to the end of the hood, and into the grease trough. The mixture travels along the grease trough to the drain. The drain may be located at either end of the hood. Multiple hoods may have individual drains factory manifold to one common drain.

The wash time is adjustable from 0 to 10 minutes. The type “C” is normally set at 2 minutes while the type “H” is set at 3 minutes. Depending on the type of cooking equipment the type “C” usually requires less hot water wash time because of the continuous cold-water spray. During fan and cooking operation, the spray continuously carries grease, dirt and lint down the drain, which reduces the daily grease build-up.

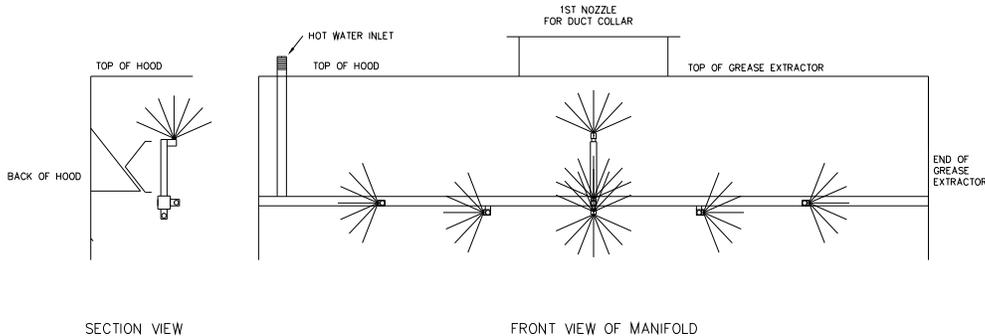
The hot water required is approximately 1 gpm/ft. of hood at 40 psi (see Chart No.1 and No. 3)

The cold-water continuous spray requires approximately 1.0 gph/ft. of hood at 15 psi (see Chart No.2 and No. 4)

See figure 19 for electrical and plumbing requirements for type “H” grease extractors.

Type “C” and “H” Wash
Figure 17

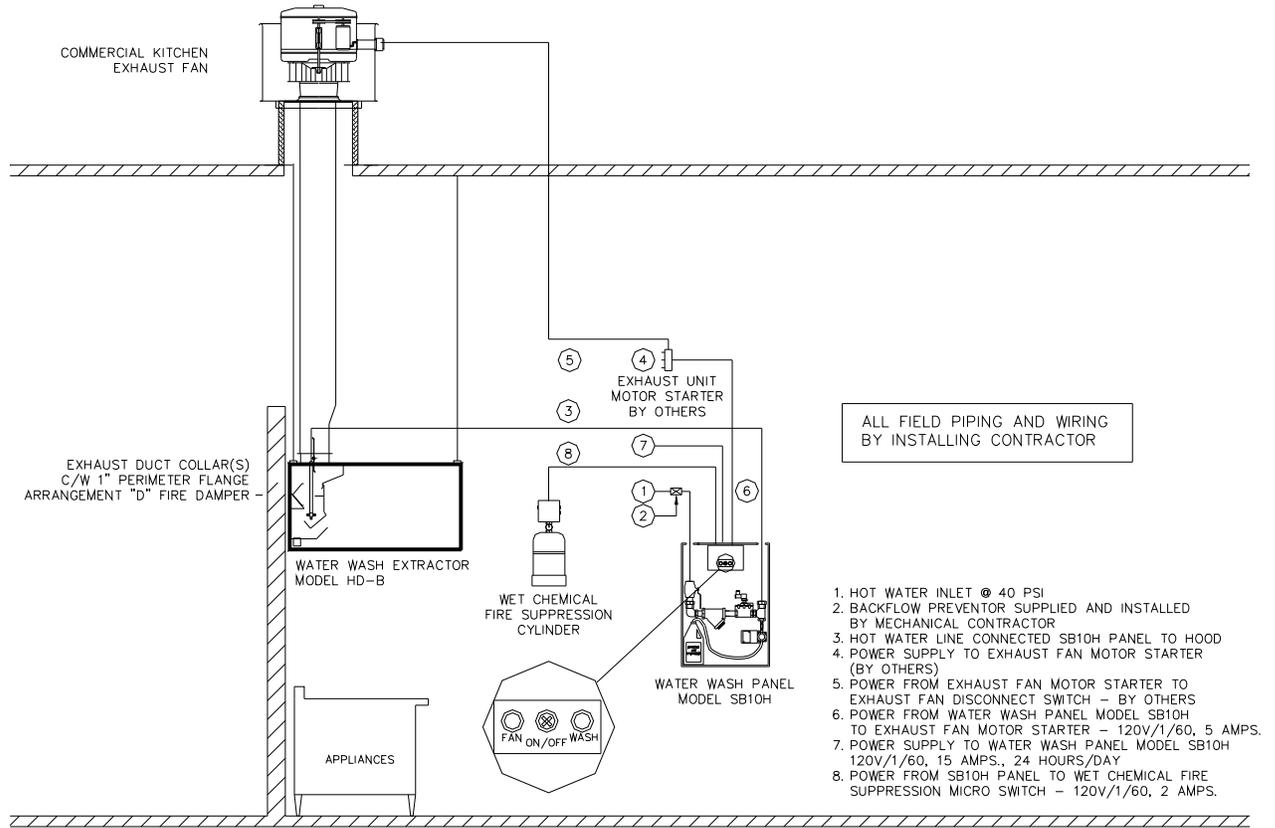
The hot water wash manifold can be viewed by removing the front access doors on the water wash grease extractor. Make sure the fan has been switched off and the wash is complete before opening these doors. All wash nozzles are directed from the middle of the water wash grease extractor towards the two ends. One wash nozzle is located on a manifold extending up towards the exhaust duct collar. This nozzle washes the exhaust fire damper and fusible link. Wash water is therefore directed straight out the duct collar into the exhaust duct. If water is found on top of the hood check for leaks in the exhaust ductwork connected to the hood. If the wash water pressure is over 70 psi over spray many occur at the ends of the grease extractor. Open the access door and rotate the wash nozzles counter clockwise 45 degrees starting with the nozzle closest the end of the grease extractor. Continue until over spray stops.



Water wash Manifold Type B, S, & B-S Extractor
Figure 18

The schematic shown in Figure 19 is typical of a standard water wash installation. Remote wiring and plumbing are shown for an exhaust fan, wet chemical systems, a Spring Air Systems water wash hood and a SB10H water wash panel.

In addition to the wiring indicated below power must be supplied to a shunt trip if electrical appliances are present under the hood and under some circumstances a signal is required to the building fire alarm both from the wet chemical system.



Field Piping and Wiring
Figure 19

Hot Water Required Model S, B, & B-S

Hood Length		Hot Water Flow USGPM	Hot Water Flow USGPM	Hot Water Flow l/m	Hot Water Flow l/s
feet	meter	@ 40 psi	@ 60 psi	@ 2.8 kg/cm2	@ 4.2 kg/cm2
3.0	914	2.4	2.8	13.2	16.2
3.5	1067	3.1	3.8	17.3	21.2
4.0	1279	3.1	3.8	17.3	21.2
4.5	1372	3.1	3.8	17.3	21.2
5.0	1524	3.1	3.8	17.3	21.2
5.5	1676	3.7	4.5	20.5	25.1
6.0	1829	3.7	4.5	20.5	25.1
6.5	1981	4.3	5.3	24.1	29.5
7.0	2131	4.3	5.3	24.1	29.5
7.5	2286	4.9	6.0	27.3	33.4
8.0	2438	4.9	6.0	27.3	33.4
8.5	2591	5.5	6.7	30.5	37.3
9.0	2743	5.5	6.7	30.5	37.3
9.5	2896	6.7	8.2	37.3	45.7
10.0	3048	6.7	8.2	37.3	45.7
10.5	3200	7.3	8.9	40.5	50.0
11.0	3353	7.3	8.9	40.5	50.0
11.5	3505	7.9	9.7	44.2	54.0
12.0	3658	7.9	9.7	44.2	54.0
12.5	3810	8.5	10.4	47.4	57.9
13.0	3962	8.5	10.4	47.4	57.9
13.5	4115	9.2	11.3	51.4	63.0
14.0	4207	9.2	11.3	51.4	63.0
14.5	4420	9.8	12.0	54.6	66.8
15.0	4772	9.8	12.0	54.6	66.8

Chart No.1

Cold Water Required Model S, B, & B-S

Hood Length		Cold Water Flow USGPM	Cold Water Flow l/s	Hood Length		Cold Water Flow USGPM	Cold Water Flow l/s
feet	meter	@ 10 psi	@ 0.7 kg/cm2	feet	meter	@ 10 psi	@ 0.7 kg/cm2
3.0	914	0.35	1.32	9.5	2896	0.91	3.44
3.5	1067	0.35	1.32	10.0	3048	0.98	3.71
4.0	1279	0.42	1.59	10.5	3200	1.05	3.97
4.5	1372	0.49	1.85	11.0	3353	1.05	3.97
5.0	1524	0.49	1.85	11.5	3505	1.12	4.24
5.5	1676	0.56	2.12	12.0	3658	1.19	4.50
6.0	1829	0.63	2.38	12.5	3810	1.19	4.50
6.5	1981	0.63	2.38	13.0	3962	1.26	4.77
7.0	2131	0.70	2.65	13.5	4115	1.33	5.03
7.5	2286	0.77	2.65	14.0	4207	1.33	5.03
8.0	2438	0.77	2.91	14.5	4420	1.40	5.30
8.5	2591	0.84	2.91	15.0	4772	1.47	5.56
9.0	2743	0.91	3.44				

Chart No.2

Hot Water Required Model DB

Hood Length		Hot Water Flow USGPM	Hot Water Flow USGPM	Hot Water Flow l/m	Hot Water Flow l/s
feet	meter	@ 40 psi	@ 60 psi	@ 2.8 kg/cm2	@ 4.2 kg/cm2
3.0	914	4.9	6.0	18.5	22.7
3.5	1067	5.9	7.2	22.3	27.2
4.0	1279	5.9	7.2	22.3	27.2
4.5	1372	6.9	8.4	26.1	31.8
5.0	1524	6.9	8.4	26.1	31.8
5.5	1676	7.8	9.5	29.5	35.9
6.0	1829	7.8	9.5	29.5	35.9
6.5	1981	8.8	10.8	33.3	40.8
7.0	2131	8.8	10.8	33.3	40.8
7.5	2286	9.8	12.0	37.1	45.4
8.0	2438	9.8	12.0	37.1	45.4
8.5	2591	10.8	13.2	40.9	50.0
9.0	2743	10.8	13.2	40.9	50.0
9.5	2896	12.7	15.5	48.0	58.6
10.0	3048	12.7	15.5	48.0	58.6
10.5	3200	13.7	16.8	51.8	63.5
11.0	3353	13.7	16.8	51.8	63.5
11.5	3505	14.7	18.0	55.6	68.1
12.0	3658	14.7	18.0	55.6	68.1
12.5	3810	15.7	19.2	59.4	72.06
13.0	3962	15.7	19.2	59.4	72.06
13.5	4115	16.7	20.4	63.2	77.1
14.0	4207	16.7	20.4	63.2	77.1
14.5	4420	17.6	21.5	66.6	81.3
15.0	4772	17.6	21.5	66.6	81.3

Chart No.3

Cold Water Required Model DB

Hood Length		Cold Water Flow USGPM	Cold Water Flow l/s	Hood Length		Cold Water Flow USGPM	Cold Water Flow l/s
feet	meter	@ 10 psi	@ 0.7 kg/cm2	feet	meter	@ 10 psi	@ 0.7 kg/cm2
3.0	914	0.21	0.79	9.5	2896	0.70	2.65
3.5	1067	0.28	1.06	10.0	3048	0.70	2.65
4.0	1279	0.28	1.06	10.5	3200	0.77	2.91
4.5	1372	0.35	1.32	11.0	3353	0.77	2.91
5.0	1524	0.35	1.32	11.5	3505	0.84	3.18
5.5	1676	0.42	1.59	12.0	3658	0.84	3.18
6.0	1829	0.42	1.59	12.5	3810	0.91	3.44
6.5	1981	0.49	1.85	13.0	3962	0.91	3.44
7.0	2131	0.49	1.85	13.5	4115	0.98	3.71
7.5	2286	0.56	2.12	14.0	4207	0.98	3.71
8.0	2438	0.56	2.12	14.5	4420	1.05	3.97
8.5	2591	0.63	2.38	15.0	4772	1.05	3.97
9.0	2743	0.63	2.38				

Chart No.4

NOTES:

- All types "C" and "H" water wash hoods have 3/4" (25 mm) hot water connections except model "DB" island type, which have 1" connections.
- Hot water pressure required is 40 to 70 psi (2.8 to 4.9 kg/cm2).
- Hot water temperature required is 120F to 180F (49 to 81C).
- All type "C" hoods have 1/2" (13 mm) cold water inlet connection.
- All drain connections are 2" diameter and recommended piped to an open hub drain.

Hood and Damper Assembly

THE SURFACE FIRE SUPPRESSION SYSTEM is always installed in am commercial kitchen. They are required by national and local code. The surface fire suppression system is a wet chemical or a water sprinkler system. In the event of a fire on the cooking surface electric thermostat or fusible links activates the systems. These systems must be UL/ULC listed.

NOTE: The exhaust fan should remain on after a surface fire suppression system has activated.

A properly designed hood and damper assembly is UL/ULC listed to impede the spread of fire from the kitchen hood into the exhaust duct. The UL/ULC listed hood and damper assembly is an important part of the kitchen ventilation system.

SPRING AIR SYSTEMS has three (3) arrangements of hood and damper assemblies available, arrangement "T", "F", and "D", thermostatic or fusible link activated systems respectively.

All SB & SBA Panels - Arrangement "D" Hoods

The wet chemical surface fire suppression system is connected to the water wash panel. Terminals 5 & 1 are connected to the normally open micro switch located in the control head of the wet chemical cylinder.

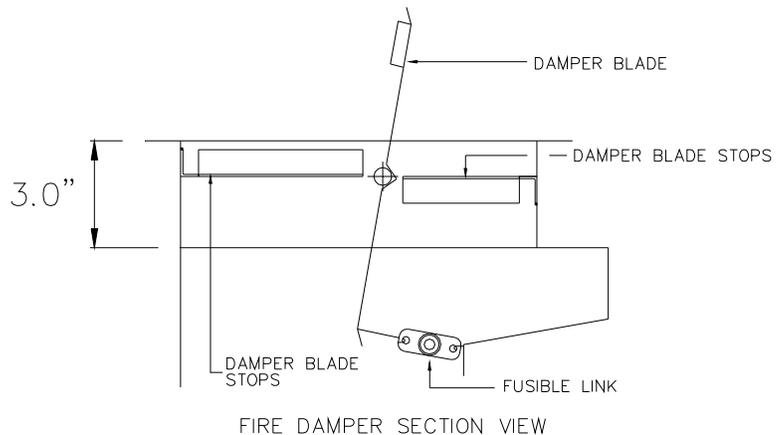
When the wet chemical fire suppression system activates the micro switch closes sending 120V/1/60 power back to the control panel. Fire relay R6 is activated, the hot water solenoid valve is energized releasing water into the interior of the grease extractor, and power to the motorized fresh air damper and supply fan motor starter is shut off.

NOTE: The exhaust fan remains on after a primary surface fire suppression system has activated.

Arrangement "D": Fusible Link Activated, Dead Weight.

The arrangement "D" hood and damper assembly consists of a fusible link damper mounted in the exhaust duct collar.

In the event of a fire within the grease extractor the fusible link melts closing the fire damper against the force of a dead weight mounted on the damper blade. The closed damper impedes the spread of fire into the exhaust ductwork. After the fire has been extinguished the fire damper must be reset. To reset the fire damper the fusible link is replaced. Open the access door on the front of the hood. Pull the fire damper open and replace the fusible link to secure the damper in place. The fusible link should be examined periodically in accordance with the NFPA-96 (SPRING AIR SYSTEMS recommends inspection every six months.)



Arrangement "D" Fire Damper
Figure 20

NOTE: The style "D" fire damper has no end switch and uses a dead weight for closure.

All MP, & AP Panels - Arrangement "F" & "T" Hoods

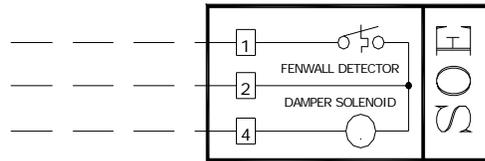
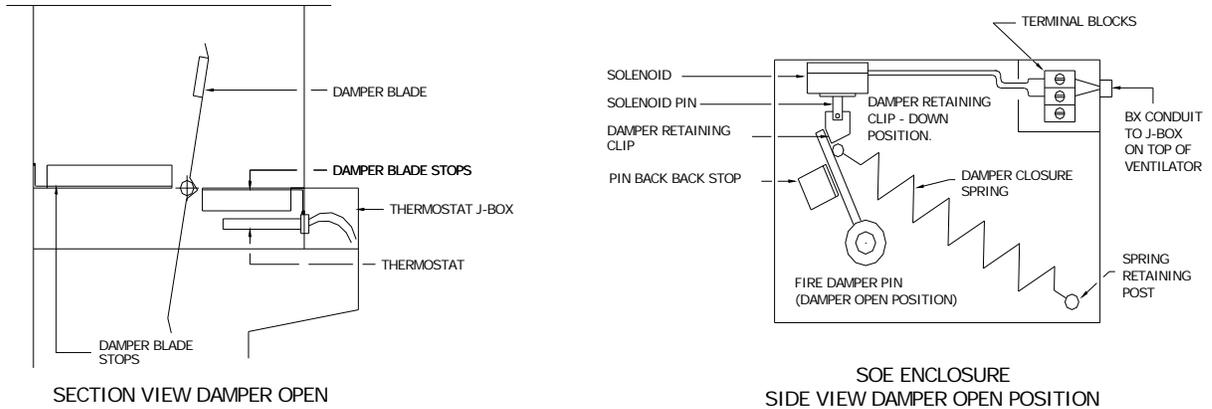
The wet chemical surface fire suppression system is connected to the water wash panel. Terminals 5 & 1 are connected to the normally open micro switch located in the control head of the wet chemical cylinder.

When the wet chemical fire suppression system activates the micro switch closes sending 120V/1/60 power back to the control panel. Fire relay R6 is activated, the hot water solenoid valve is energized releasing water into the interior of the grease extractor, and power is shut off to the motorized fresh air damper and supply fan motor starter. In addition power is supplied for an electrical shunt trip through terminals 10 & 4.

NOTE: The exhaust fan remains on after surface fire suppression system has activated.

Arrangement "T": Thermostat Activated

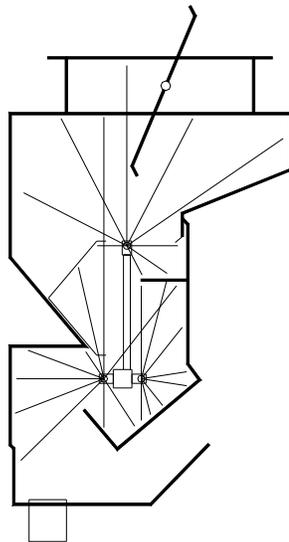
The arrangement "T" hood and damper assembly consists of a thermostatically activated spring loaded fire damper electrically connected to the water wash control panel by three wires.



ARRANGEMENT "T" FIRE DAMPER:
THREE (3) WIRES TO EACH SOE ENCLOSURE LOCATED
AT EACH EXHAUST DUCT COLLAR ON EVERY HOOD
120V/1/60 - 3 AMPS - WIRE EACH SOE IN PARALLEL.

ELECTRICAL WIRING TO SOE ENCLOSURE

Arrangement "T" Fire Damper
Figure 21



Arrangement "T" & "F" Activated
Figure 22

In addition the surface fire suppression system connect to terminals 5 & 1 the Arrangement "T" fire damper SOE enclosure is connected to terminals 1, 2, & 4.

In the event of a fire in the grease extractor the thermostat mounted in the duct collar is set to activate at 350 F. The thermostat energizes a solenoid, which pulls a pin within the Fire Damper Solenoid Enclosure (SOE) releasing the fire damper. The spring-loaded fire damper closes tight against a 40 lb. spring force. The thermostat also activates the wash control panel through terminal 2.

Within the water wash control panel the fire relay R5 is energized activating the water wash control panel hood and damper assembly.

1. The exhaust fan is shut off.
2. The hot water solenoid valve is energized releasing water into the interior of the grease extractor.

After the fire has been extinguished, rotating a lever on the outside of the FIRE DAMPER JUNCTION BOX - SOE, manually resets the fire damper.

The arrangement "T" has three advantages:

1. The damper is spring loaded to provide a positive closure and seal when closed.
2. The thermostat set at 350F (177C) responds quickly to activate the spring in the event of a fire.
3. The fire damper can be periodically tested by putting a jumper across terminals 1 & 2 in the water wash panel or heating the thermostat to 350F (177C). The damper will simulate a fire condition and then must be manually reset.

After the fire has been completely extinguished the fire damper must be reset. To reset the fire damper rotate the stainless steel handle located on the side of the Fire Damper Solenoid Enclosure 90 degrees clockwise. When access is restricted on model B and DB hoods an optional factory installed access door can be located in the roof of the hood in the vicinity of the duct collar.

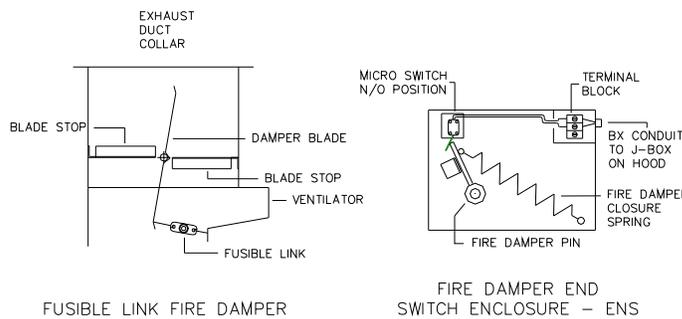
The fire damper can be tested periodically (SPRING AIR SYSTEMS recommends testing the fire damper every six months). Putting a jumper across terminals 1 & 2 located in the water wash control panel tests the damper.

NOTES:

1. **AT THE FIRST SIGN OF A KITCHEN FIRE NOTIFY THE FIRE DEPARTMENT IMMEDIATELY.**
2. **THE HOOD AND DAMPER ASSEMBLY IS NOT A SUBSTITUTE FOR THE SURFACE FIRE SUPPRESSION SYSTEM. (WET CHEMICAL, SPRINKLER, ETC.) A SURFACE FIRE PROTECTION MUST BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES.**

Arrangement "F": Fusible Link Activated, Spring Loaded.

The arrangement "F" hood and damper assembly consists of a fusible link fire damper and a damper end switch interlocked electrically to the water wash control panel with two wires.



Arrangement "F" Fire Damper

Figure 23

In addition the surface fire suppression system connects to terminals 5 & 1 the Arrangement "F" fire damper ENS enclosure is connected to terminals 1, & 2. In the event of a fire the fusible link melts closing the fire damper against the force of a 40-lb. spring. When the fire damper shuts a normally open-end switch closes sending an electrical signal to the water wash control panel through terminal 2. Within the water wash control panel the fire relay R5 is energized activating the hood and damper assembly.

1. The exhaust fan is shut off.
2. The hot water solenoid valve is energized releasing water into the interior of the grease extractor.

After the fire has been completely extinguished the fire damper must be reset. To reset the fire damper the fusible link must be replaced. Open the access door on the front of the grease extractor. Pull the fire damper open and replace the fusible link to secure the fire damper in place. The fusible link should be examined periodically in accordance with the NFPA-96 code. (SPRING AIR SYSTEMS recommends inspection every six months.)

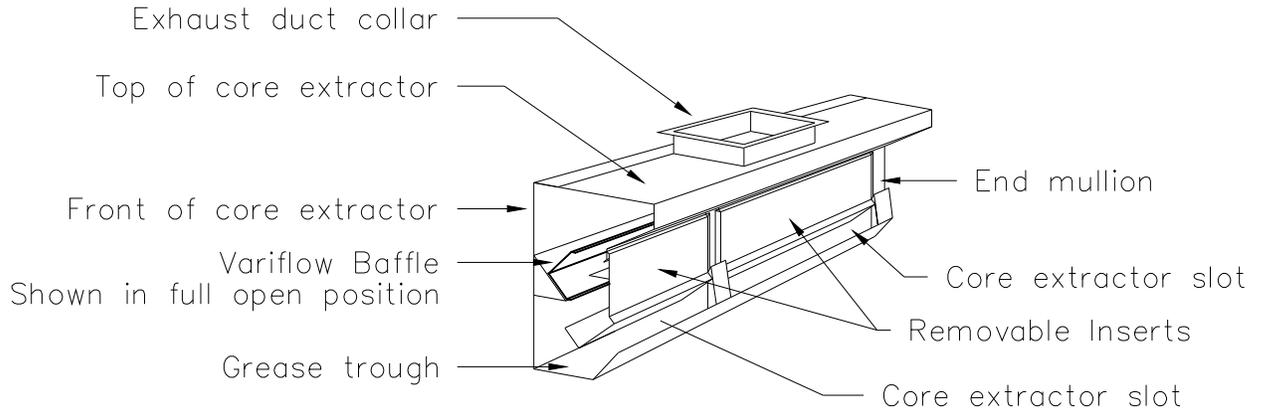


Arrangement "F" Fire Damper ENS Enclosure

Figure 24

Variflow Baffles

Optimizing the amount of exhaust air enters the core extractor slot is the key to the Spring AIR Systems system..

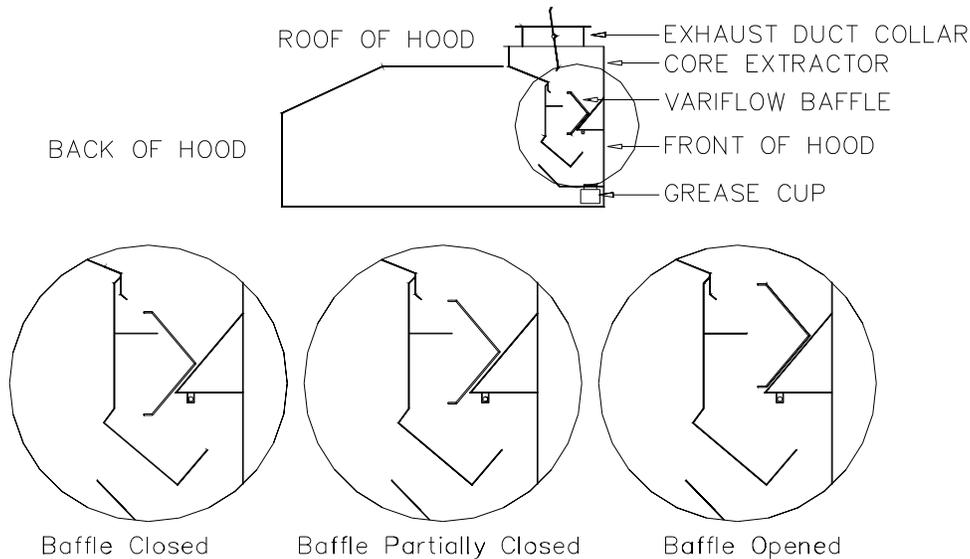


Section View of Core Extractor for DD-B-F REV LOW Hood

Figure 25

Spring Air accomplishes this complicated process with a unique core extractor profile that contains a series of specially designed *VARIFLOW* baffles located along length of the core extractor. See Figure 25 above. The *VARIFLOW* baffles are adjusted prior to shipment to allow the optimum amount of the air mixture to enter the core extractor slot. For instance the *VARIFLOW* baffles located above a charbroiler are opened to the maximum 450 CFM/ft position and the *VARIFLOW* baffles located above ovens or steamers are closed to the minimum 90 CFM/ft position. This variable adjustment along the length of each hood provides an exhaust system that truly minimizes the amount of exhaust air to properly ventilate any kitchen line up.

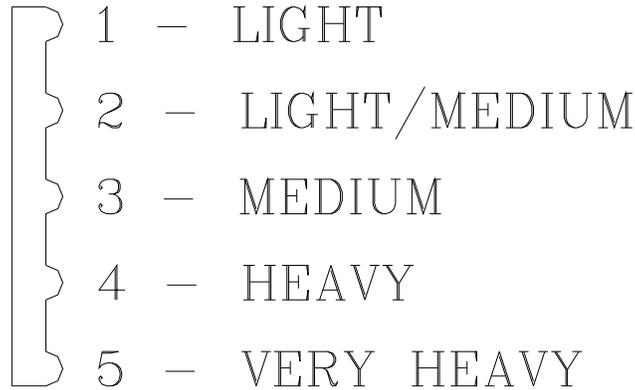
The *VARIFLOW* baffles are adjustable to provide between a 90 CFM/ft to 450 CFM/ft flow rate into the core extractor slot. The *VARIFLOW* baffles are adjustable without any special tools by lifting off the core extractor removable insert one DD type hoods (or removing the access door on water wash hoods) and hand adjusting the position of the baffle. Just set the position of the *VARIFLOW* baffle to match the appliance located below. See Figure 25 for isometric view of *VARIFLOW* baffles.



Section View of REV LOW Extractor with Detail of Variflow Baffle

Figure 26

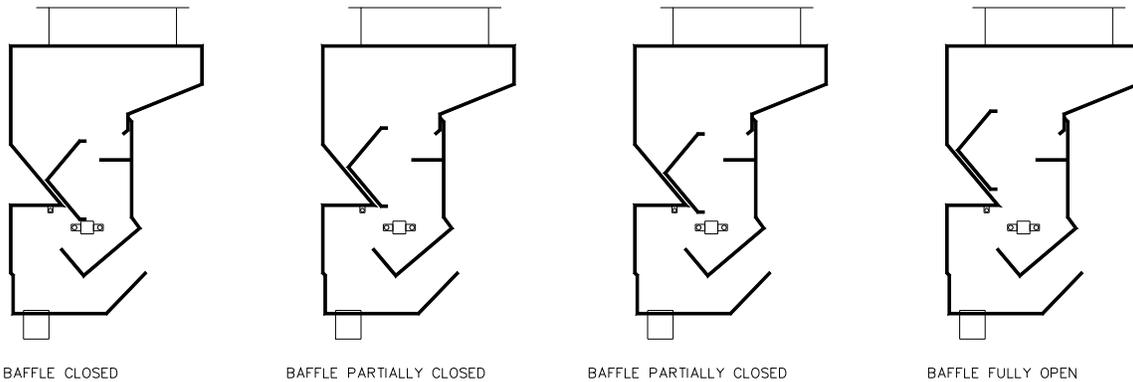
Baffle Settings



*Variflow Baffle labeling
 Figure 27a*

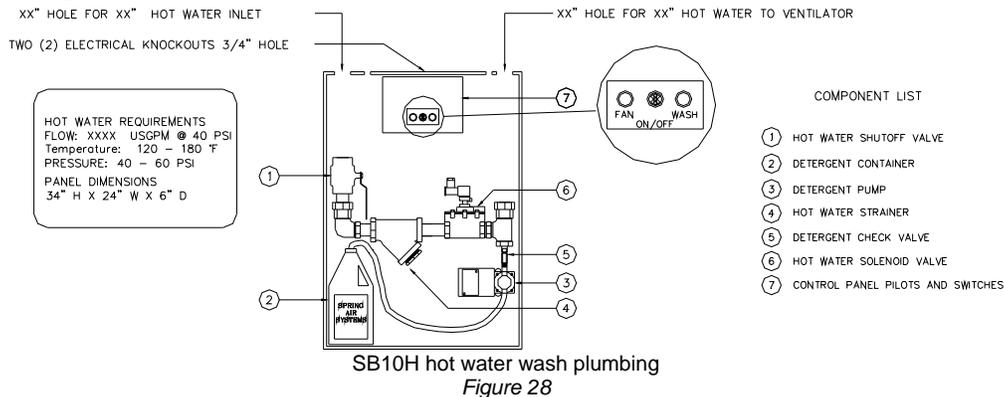
Each baffle is approximately 18" to 23" long. The "Variflow Baffles" are factory set in the middle position at about 300 CFM/ft. The baffles are connected to the Primary baffle on studs fastened by wing nuts.

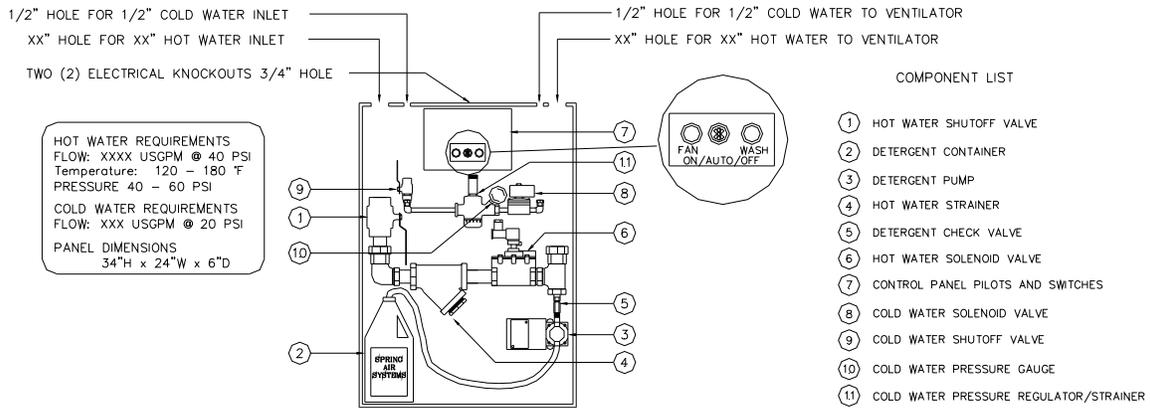
There are a total of five (5) adjustment positions on each baffle. After the water wash hood is installed the baffles can be adjusted on site to provide the exhaust air according to the appliances under the hood. For example a charbroiler would require a high exhaust flow rate and the baffle should be in the open No. 5 position.



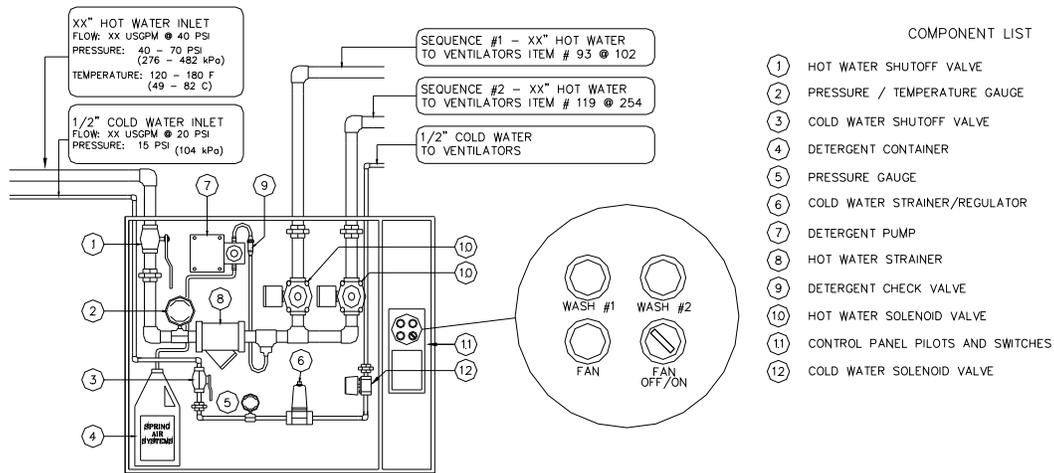
*"VARIFLOW" Adjustable Baffle
 Figure 27b*

Plumbing Panels

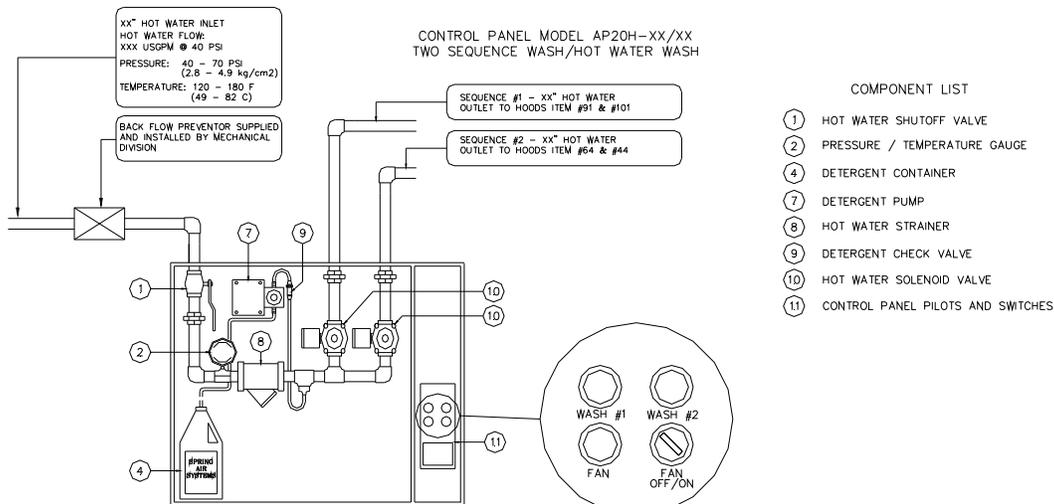




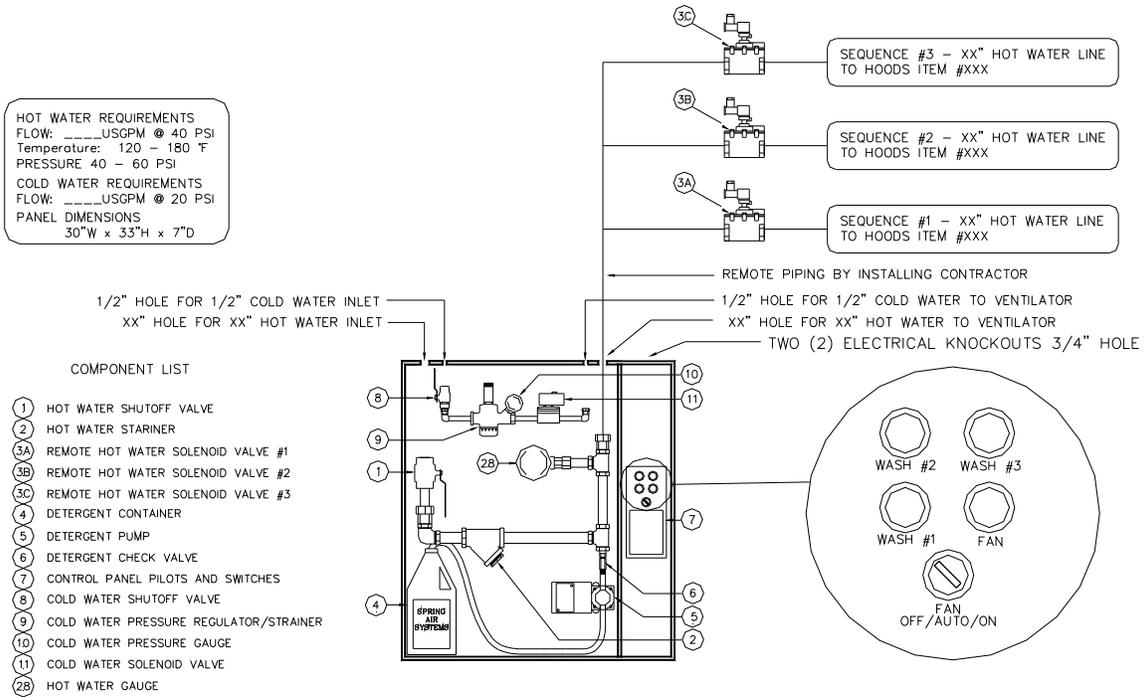
SBA10C hot water wash/cold water spray plumbing
Figure 29



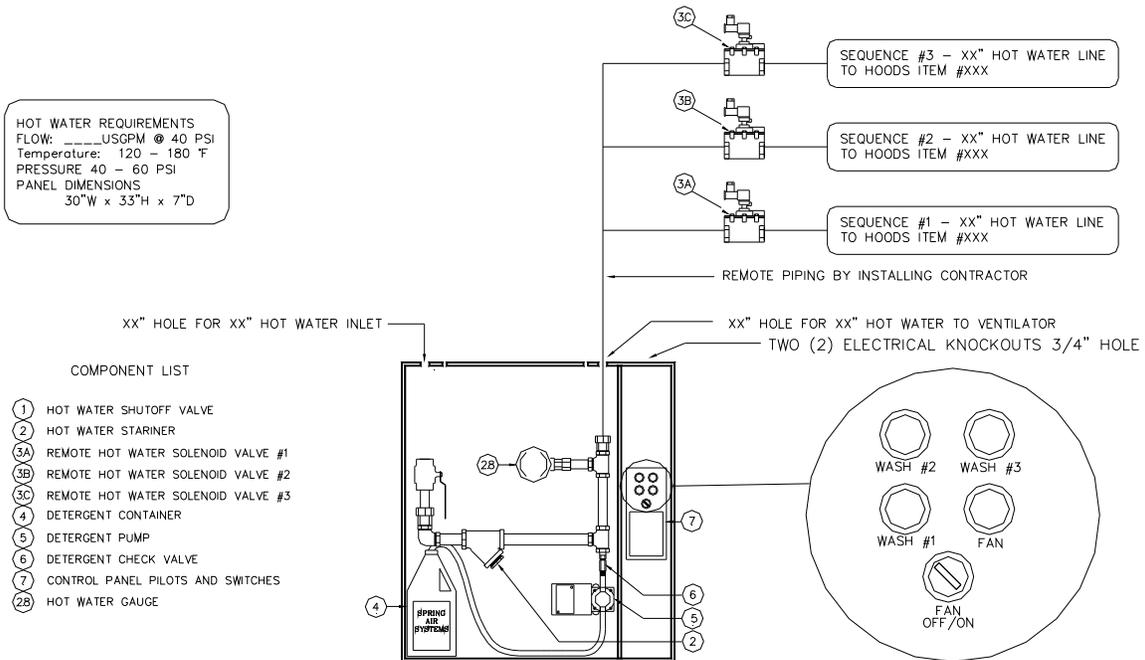
MP20C two sequence hot water wash/cold water spray plumbing
Figure 30



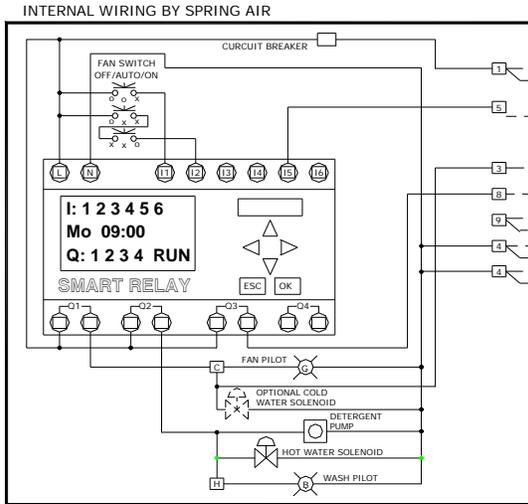
MP20H two sequence hot water wash plumbing
Figure 31



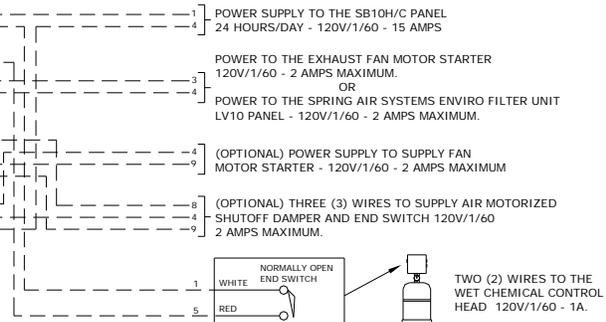
AP30C three sequence hot water wash plumbing
 Figure 32



MP30H three sequence hot water wash plumbing
 Figure 33



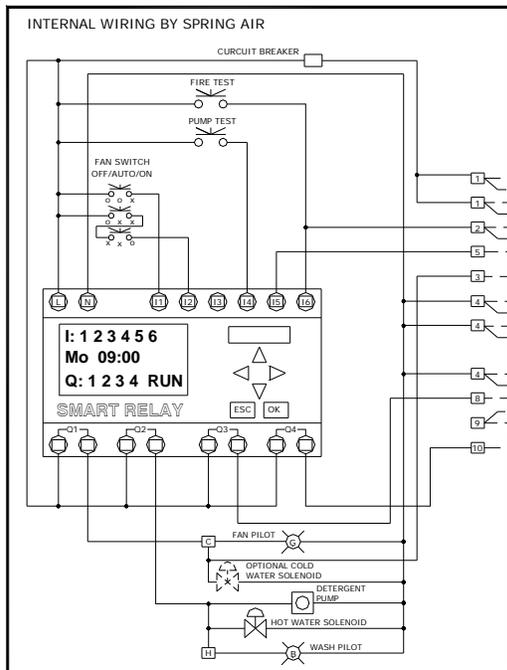
REMOTE WIRING BY TRADES



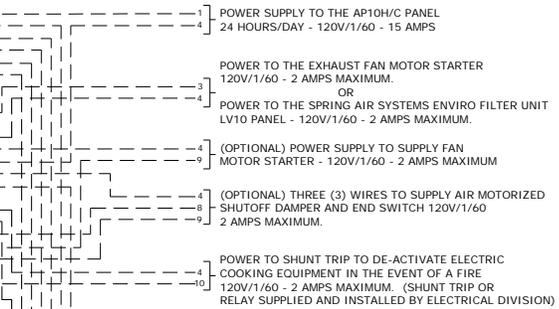
NOTE 1:
ALL REMOTE ELECTRICAL WIRING SHALL CONFORM TO ALL LOCAL AND NATIONAL CODE REQUIREMENTS

NOTE 2:
MOTOR STARTERS OVERLOADS AND DISCONNECTS BY ELECTRICAL DIVISION

*SBA10C & SBA10H single sequence electrical wiring
Figure 34*

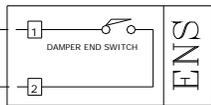


REMOTE WIRING BY TRADES



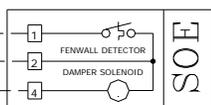
TWO (2) WIRES TO THE WET CHEMICAL CONTROL HEAD 120V/1/60 - 1A.

REMOTE WIRING FOR ARRANGEMENT "F" & "T" TYPE FIRE DAMPER HOODS ONLY. ARRANGEMENT "D" FIRE DAMPER HOODS REQUIRES NO REMOTE WIRING.



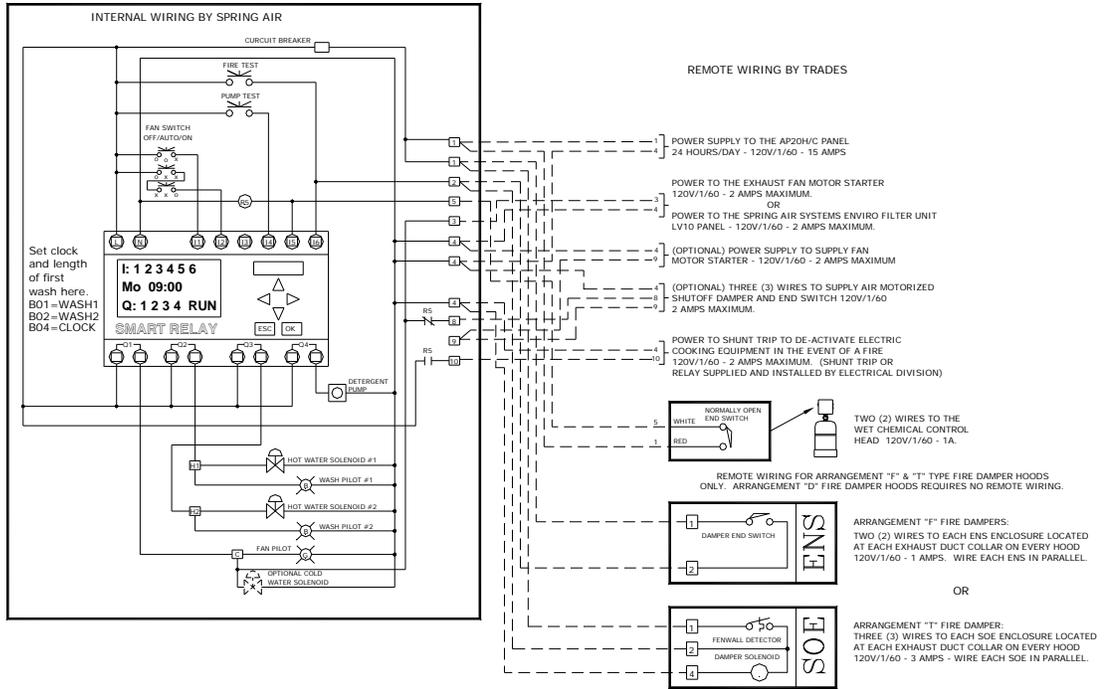
ARRANGEMENT "F" FIRE DAMPERS:
TWO (2) WIRES TO EACH ENS ENCLOSURE LOCATED AT EACH EXHAUST DUCT COLLAR ON EVERY HOOD 120V/1/60 - 1 AMPS. WIRE EACH ENS IN PARALLEL.

OR

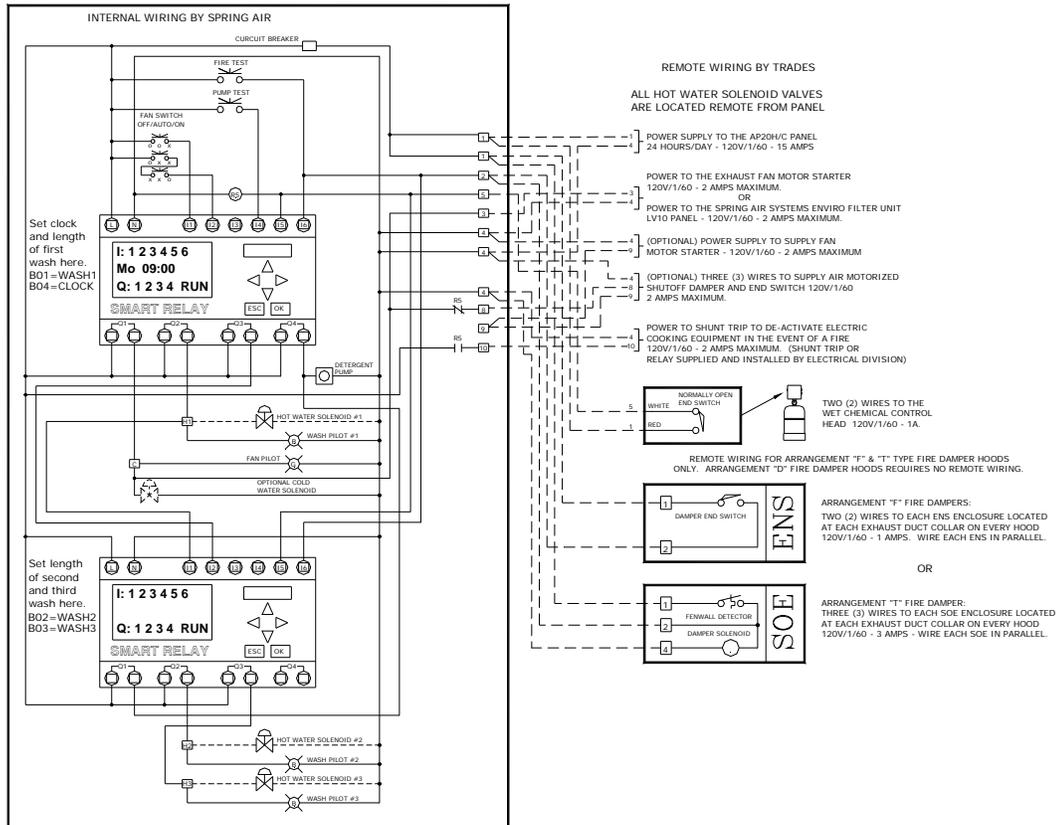


ARRANGEMENT "T" FIRE DAMPER:
THREE (3) WIRES TO EACH SOE ENCLOSURE LOCATED AT EACH EXHAUST DUCT COLLAR ON EVERY HOOD 120V/1/60 - 3 AMPS - WIRE EACH SOE IN PARALLEL.

*AP10C & AP10H single sequence electrical wiring
Figure 35*



AP20C & AP20H two sequence electrical wiring
Figure 36



AP30C & AP30H three sequence electrical wiring
Figure 37

MAINTENANCE SCHEDULE

DAILY:

1. After the manual or automatic wash wipe down the interior and exterior surfaces of the hood canopy and the underside of the grease trough. Use a damp cloth and avoid abrasive cleansers.

WEEKLY:

1. Check the level of detergent in the control panel. (Panels with low detergent alarm will automatically signal when a refill is necessary).
2. During the normal fan operation visually inspect the cold-water spray nozzles. The nozzles can be observed by looking directly into the hood inlet slot. If a nozzle is not spraying remove/clean and or replace. (Type "C" extractors only.)
3. After the daily wash inspect the hot water wash manifold and nozzles. Open the front access door to view the wash manifold. If grease or dirt is still visible remove/clean and or replace the hot water nozzle. Prior to replacement check that hot water pressure and temperature are within design ranges.

MONTHLY:

1. Check operation of detergent pump. Inspect for leaks and broken fittings.
2. After the daily wash inspect the complete interior of the grease extractor. Open the front access door and check the VORTEX BAFFLE and grease trough for any debris. Check that the drain is free and clear.

SIX MONTHS:

1. Clean all line strainers located in the control panel (hot water and cold water).
2. Check exhaust fan belts for alignment, tightness, and wear. Adjust and/or replace.
3. Measure the exhaust volume. Design exhaust volume is stamped on the ULC plate. Refer to the Exhaust Air Measurement section of this manual for detailed instructions.
4. Check the Second Line Fire Protection System.

Arrangement "T": Manually activate system by placing a jumper across terminals 1 & 2 in the control panel. The following sequence should occur:

- (i) Fire damper closes.
- (ii) Exhaust fan shuts off.
- (iii) Hot water solenoid is energized spraying water into the interior of the grease extractor. Reset the fire damper by rotating the reset handle 90 degrees clockwise. (The handle is located on the side of the fire solenoid enclosure ENS.)

Arrangement "F": Visually inspect the fusible link, which holds the fire damper open. Clean and/or replace. Manually activate the Second Line Fire Protection System placing a jumper across terminals 1 & 2 in the control panel. The following sequence should occur:

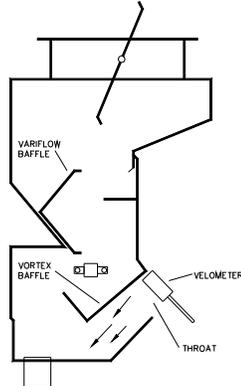
- (i) Exhaust fan shuts off.
- (ii) Hot water solenoid is engaged spraying water into the interior of the grease extractor.

CAUTION: PRIOR TO ACTIVATING THE HOOD AND DAMPER ASSEMBLY CHECK IF THE PRIMARY FIRE PROTECTION SYSTEM OR BUILDING FIRE ALARM IS ELECTRICALLY CONNECTED TO THE WATER WASH CONTROL PANEL.

Measuring the Exhaust Air

The exhaust air is measured along the inlet slot of the hood. To ensure accurate results take a reading every one-foot along the length of the hood is recommended.

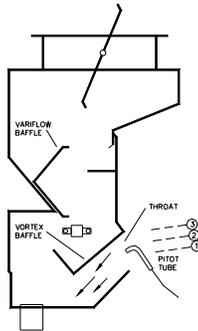
VANAXIAL VELOMETER



Hold the instrument perpendicular to the VORTEX BAFFLE and parallel to the throat (inlet slot) of the hood. Velometer should not exceed three inches in diameter.

Measuring Exhaust Air
Figure 38

PITOT TUBE OR ANEMOMETER



Hold the instrument perpendicular to the VORTEX BAFFLE and parallel to the throat (inlet slot) of the hood. Take three readings across the throat and average the results.

Measuring Exhaust Air
Figure 39

Calculate the average velocity across the inlet slot and refer to the chart below for the corresponding CFM/ft (l/s/m).

Velocity		Exhaust Air Volume	
fpm	m/s	CFM/ft	l/s/m
450	2.3	100	300
675	3.5	150	300
900	4.6	200	300
1125	5.7	250	350
1350	7.0	300	400
1575	8.0	350	500
1800	9.0	400	550
2000	10.0	450	550

START UP PROCEDURE

To properly carry out a start up the following is required.

1. Shop drawings.
2. Air flow meter.
3. Red robertson screwdriver.
4. Watch for timing wash.
5. SPRING AIR SYSTEMS start up report.

FOLLOW THE PROCEDURES CAREFULLY

A. Inspection

1. Check that all plumbing lines are the correct size and installed properly.
2. Check drain for correct size and type of floor connection.
3. Check if back flow preventor or vacuum breaker has been installed.
4. Check that detergent line has been connected (if not previously done in plant).
5. Check wiring from control panel to field connections as per drawings.
6. Check that all electrical connections are tight and secure.
7. Check exhaust duct connections.
8. Check that fire damper is open.
9. Open hood access door and check drain and grease trough for construction debris, paper or rags.

B. STARTUP

REFER TO THE START UP SHEET AT THE END OF THE MANUAL TO PROCEED.

TROUBLE SHOOTING

PROBLEM CHECK

Exhaust fan:

Low air

- (i) Improper exhaust fan rotation.
- (ii) Broken belt or slipping belt.
- (iii) Exhaust ductwork access door left open.
- (v) Obstruction in ductwork.

No air

- A. "FAN ON" pilot is off.
 - (i) Main power supply to water wash control panel is off.
 - (ii) Water wash control panel fuse has blown.
 - (iii) Fire damper is closed. (If this is the case the "WASH" pilot should have been on.)
- B. "FAN ON" pilot is on.
 - (i) Broken exhaust fan belt.
 - (ii) Exhaust fan overload has tripped.
 - (iii) Exhaust fan main disconnect is open.
 - (iv) Exhaust fan fuse has blown.

Cold-water spray continues to operate with exhaust fan off.

- (i) Cold water solenoid is faulty

WASH SYSTEM

Poor cleaning

- (i) Spray nozzles are plugged.
- (ii) Low water pressure: 40 - 70 psi (2.8 - 4.9 kg/cm²) required.
- (iii) Low water temperature: 140 - 180 F (49 - 82 C) required.
- (iv) Low detergent concentration.
- (v) Improper detergent.
- (vi) Detergent pump not operating.
- (vii) Hot water solenoid not operating during wash.
- (viii) Insufficient wash time.

No wash water

- A. Blue "WASH ON" pilot is on during wash cycle.
 - (i) Water is turned off to water wash panel.
 - (ii) Hot water solenoid valve is faulty.
- B. Blue "WASH ON" pilot is off during wash cycle.
 - (i) Faulty contact on FAN SELECTOR SWITCH.
 - (ii) Faulty wash timer (T1) contact or coil. (AP10 & SBA10 type only)

Wash water runs continuously.

- A. Blue "WASH ON" pilot is on
 - (i) Wash timer (T1) is defective (AP10 & SBA10 type only)
- A. Blue "WASH ON" pilot is on and fan is off.
 - (i) Fire damper is closed. (Arrangement "F" & "T" dampers only)
 - (ii) Faulty thermostat in exhaust duct collar. (Arrangement "T" damper only)
 - (iii) Faulty end switch in Fire Damper End Switch Enclosure (ENS) (Arrangement "F" dampers only)
 - (iv) Fire relay (R6) is faulty. . (AP10 & SBA10 type only)
- B. Blue "WASH ON" pilot is off.
 - (i) Hot water solenoid valve is stuck open. Clean or replace.

Drain plugged

- (i) Foreign material has clogged drain. Open access door of hood and inspect drain.
- (ii) Grease trap has plugged.

SECOND LINE FIRE PROTECTION

Push the FIRE TEST button in the water wash control panel. The hot water solenoid should activate and there should be 120V across terminals 10 & 4.

Fire Protection Arrangement "T" & "F".

To test jumper terminals 1 & 2 in the water wash panel.

Fire damper will not close on test (Arrangement "T" only)

- (i) Solenoid pinned in Fire Damper
- (ii) Solenoid Enclosure SOE is faulty.
- (iii) The fire damper is pinned open by foreign object in the exhaust duct collar.
- (iv) Faulty wiring from water wash control panel to hood junction box.

Exhaust fan stays on

- (i) Fire relay (R7) is faulty. (AP10 & SBA10 type only)

Wash water does not turn on.

- A. Blue "WASH ON" pilot is on.
 - (i) The hot water solenoid valve is faulty.
 - (ii) Water is shut off to the water wash control panel.
- B. Blue "WASH ON" pilot is off.
 - (i) The Fire relay (R6) or (R7) are faulty. . (AP10 & SBA10 type only)
 - (ii) The hot water solenoid valve is faulty.

Water Wash Hood Start-up Report

General Information

Job Name				
Date				
Customer				
Location				
Spring Air Service				
Exhaust Fan Model No.				
Manufacturer				
Upblast Discharge		yes		no
Exhaust Fan HP				
Exhaust Air Design (CFM)				
Supply Air Design (CFM)				
Hood mounting Height from finished floor to front of hood				
Make Up Air Systems		Good	Fair	Poor
None				

Hood Item			
Model		Length	
Width		No. of Baffles	
Baffle Size *		Design CFM	
Baffle No. Left to Right	<i>Baffle Setting</i>	Velocity Reading (fpm)	Calculated Exhaust Volume per Baffle (CFM) **
1			
2			
3			
4			
5			
6			
Total Exhaust Measured CFM			
Design Exhaust CFM			

Hood Item			
Model		Length	
Width		No. of Baffles	
Baffle Size *		Design CFM	
Baffle No. Left to Right	<i>Baffle Setting</i>	Velocity Reading (fpm)	Calculated Exhaust Volume per Baffle (CFM) **
1			
2			
3			
4			
5			
6			
Total Exhaust Measured CFM			
Design Exhaust CFM			

Item	Description	Y / N
1	Control Panel Model Number	
2	Rotate the fan selector switch to the "ON" position to start	
3	The green "FAN ON" pilot energizes	
4	The exhaust fan turns on	
5	The cold water spray energizes: C type wash panels only	
6	Rotate the fan selector switch to the "OFF" position to start wash	
7	The green fan pilot turns off	
8	The blue wash pilot turns on	
9	The exhaust fan turns off	
10	The detergent pump turns on	
11	The cold water spray turns off: C type wash panels only	
12	Hot water solenoid turns on	
13	Water leaks in remote hot water piping	
14	Water Pressure (psi)	
15	Water temperature (F)	
16	Length of wash (minutes)	
17	Water leaks in hood	
18	Drain runs clear	
19	At the end of the wash	
20	Hot water solenoid off	
21	Detergent pump off	
22	Blue wash pilot off	

Fire Dampers Arrangement "T"

23	Place a jumper across terminals 1 & 2 in control panel "MP" or "AP" only	
24	Fire damper closes	
25	Hot water solenoid on	
26	Exhaust fan off	
26	Power is supplied to the shunt trip through terminals 10 & 4	

Fire Dampers Arrangement "F"

27	Place a jumper across terminals 1 & 2 in control panel "MP" or "AP" only	
28	Hot water solenoid on	
29	Exhaust fan off	
30	Power is supplied to the shunt trip through terminals 10 & 4	

Fire Dampers Arrangement "D"

31	No interconnect to control panel required	
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Comments

Yes I have received a set of Spring Air Systems maintenance manuals.
 Signature _____ Print Name _____

Detergent Pump

Replacement Parts

Sub Assemblies

1. Motor Cover

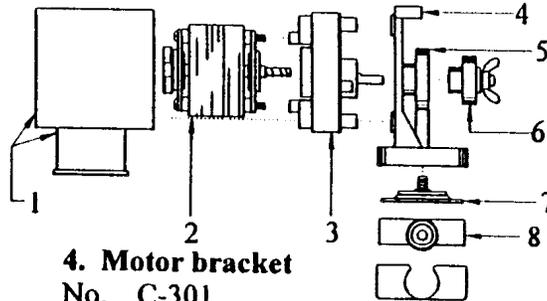
No. C-610P

2. Motor

No. A-309-1-24V 60HZ
 A-309-2-115V 60HZ
 A-309-3-230V 60HZ
 A-309-4-220V 50HZ
 A-309-5-24V 50HZ

3. Gear box

No. C-618P-14 RPM
 C-618P-30 RPM
 C-618P-45 RPM
 C-618P-60 RPM
 C-618P-125 RPM



4. Motor bracket

No. C-301

5. Yoke

No. C-304

6. Knob Assembly

No. C-325

7. Diaphragm

No. C-406T

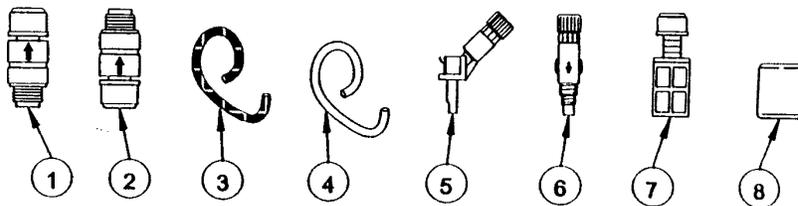
8. Pump head / with both valves

No. C-535K6-6

Replacing the diaphragm

1. Remove cover from pump head, exposing four screws.
2. Unscrew all four screws from pump head.
3. Be sure the drive assembly is in full stroke, rotate knob assembly until yoke is in a forward position. This will take pressure off diaphragm.
4. Using your fingers, unscrew the diaphragm counter clockwise.
5. When replacing old diaphragm with new, check to make sure the size of the spacers is the same (located under the nut on the diaphragm).
6. When reattaching the pump head, tighten the four screws a little at a time. Do not over squeeze the diaphragm.

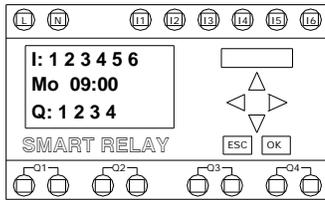
Parts Replacement



See next page for parts description and part number.

NO	Description:	Part Number
1	Top valve fitting.	C-537-6V
2	Bottom valve fitting.	C-538-6V
3	Poly tubing/opaque 5'.	C-335-6-5
4	PVC tubing/clear 5'.	C-334-6
5	T.I. Anti siphon valve fitting (optional)	T140-6V
6	Threaded Anti siphon valve, ¼ & ½" NPT	C-395HD-6V
	Threaded Anti siphon valve, ¼" NPT	C-395-6V
7	Food valve/screen.	C-340N-6V
8	Ceramic Weight	C-346

Setting the Clock Time and Day



- Press these two buttons together .
- Press .
- To change the day of week press or until the correct day appears.
- To change the time press once. The hour will be highlighted. Press or until the correct hour appears. Press to move to minutes. Adjust the minutes by pressing or until correct minutes appears.
- To change the date press again. The month will be highlighted. Press or until the correct month appears. Press to move to day. Adjust the day by pressing or until correct day appear. Press to move to year. Adjust the year by pressing or until correct year appears.
- You have finished setting the clock.
- Press and to return to the operating screen.

Setting the Length of Wash

- Press these two buttons together .
- Press .
- Press .
- The clock has been factory set to turn the fan on at 6:00 a.m. and off at 23:00 hours or 11:00 p.m. When the fan shuts off the wash activates. To change these times see section "Programming the SMARTRELAY time clock."
- Press The wash time has been factory pre-set at 2 minutes.
- To change the wash time press .
- Press to change the length the wash in minutes. Press to move to the length of wash in seconds. Press to change the seconds.
- Press if the wash time is correct.
- Press and to return to the operating screen.

Setting Weekly Fan "ON" and "OFF" times

- Press these two buttons together .
- Press .
- Press .
- The clock has been factory set to turn the fan on at 6:00 a.m. and off at 23:00 hours or 11:00 p.m. When the fan shuts off the wash activates.
- To change the above settings press . The cursor will move to M = Monday.
- Press to remove Monday from the weekly schedule. The - dash indicates the fan will not start automatically any given day.
- Press to move to the next day of the week. Press each time the fan is not required to operate on that given day. The screen on the left indicates the fan will not automatically operate on Saturday or Sunday.
- Press to move to the hour that the fan will start in the morning. Press to change the hour you want the fan to start in each morning. Press to move to the minute the fan will start in the morning. Press to change the minutes.
- Press to move to the hour that the fan will stop in the evening. Press to change the hour you want the fan to stop each evening. Press to move to the minute the fan stop in the evening. Press to change the minutes.
- Press .
- If your selection is complete press and to return the operating screen.
- You have completed programming one weekly fan "On" and "Off" cycling. If you wish to program a second (Weekend Operation) or third weekly setting go the the section "Setting Weekend Operation"

Setting Weekend Operation

- Press these two buttons together .
- Press .
- Press .
- The clock has been set to turn the fan on at 6:30 a.m. and off at 22:30 hours or 10:30 p.m. When the fan shuts off the wash activates.
- To set Weekend Operation press .
- Press to program the weekend operation.
- Press five times to move to Saturday. Press to turn fan on Saturday. Press once to move to Sunday. Press to turn fan on Sunday.
- Press to move to the hour that the fan will start in the morning. Press to change the hour you want the fan to start in each morning. Press to move to the minute the fan will start in the morning. Press to change the minute.
- Press to move to the hour that the fan will stop in the evening. Press to change the hour you want the fan to stop each evening. Press to move to the minute the fan stop in the evening. Press to change the minutes.
- Press . If your selection is complete press and to return the operating screen.
- You have completed programming weekend fan "On" and "Off" cycling.

**Other Fine Products From
SPRING AIR SYSTEMS...**

- Water Wash Ventilators
 - ◆ Hot Water Wash
 - ◆ Cold Water Spray/Hot Water Wash
 - ◆ Water Wash Control Panels
- Dry Extractor Hoods
- **RevLow** Hoods
- **Dynaflow** Hoods
- Cartridge Hoods
- Filter Hoods
- Surface Fire Suppression
- Commercial Kitchen Exhaust Fans
- Kitchen Enviro Systems
 - ◆ KES - 100% Exhaust
 - ◆ KRS - 80% Recirculation in Canada
- Commercial Kitchen Supply Units
- Compensating Hoods
- Exhaust Fans
- **Zoneflow** Kitchen Exhaust Balancing Dampers
- Supply Fans
- Commercial Kitchen Control Panels
- Truflow Demand Ventilation Controls
- Capture-i
- Captur-r
- Utility Distributions Systems