



UNIT VENTILATOR AIR COOLED

AIR COOLED UNIT VENTILATOR (UV-AAC/AHP) SERIES



PROVIDING A HEALTHY, COMFORTABLE,
LEARNING ENVIRONMENT FOR
OUR LEADERS OF TOMORROW

SCHOOL AIR



2 THRU 4 TONS

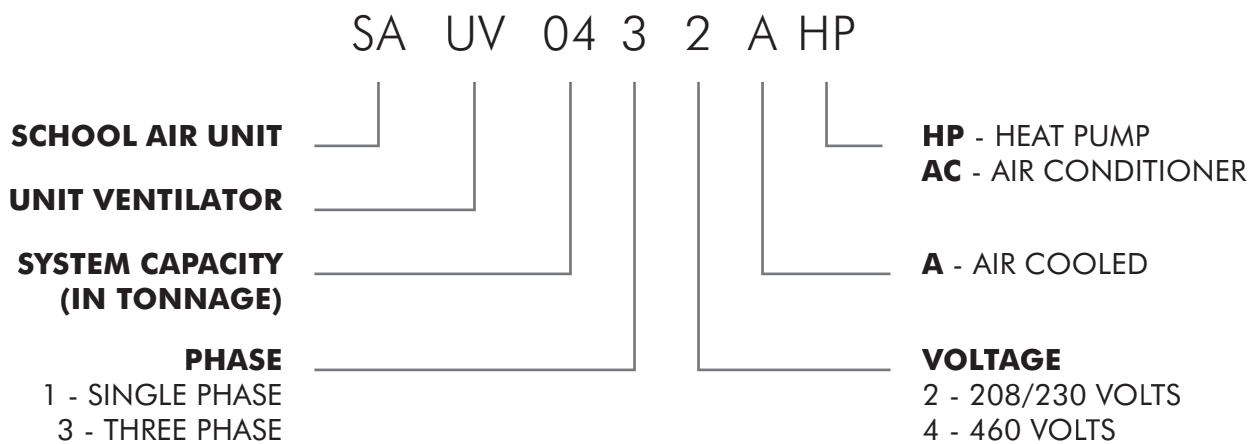


MADE IN AMERICA

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MODEL DESIGNATIONS



UNIT LAYOUT



FRONT VIEW



REAR VIEW

FEATURES & SPECIFICATIONS

GENERAL SPECIFICATIONS

The supplied product shall be a self-contained air conditioning unit as manufactured by School Air, Inc., available as a DX cooling only or a heat pump unit ventilator with options for electric heating or hydronic heating. The unit shall be floor-mounted and vertically sized to allow the supply air to be ducted or supplied through a high level plenum. All access and maintenance shall be through the front of the unit. The unit shall be engineered to provide one stage of free cooling and one stage of mechanical cooling. Heat pump units shall also offer one stage of mechanical heating with automatic defrost control.

The unit shall be constructed in accordance with ETL & CSA standards, and a label shall be affixed to the unit listing the product code under which it is registered.

The unit shall be a product of a recognized quantity control program and be fully assembled and tested prior to shipment.

The unit shall not exceed 48dBA when measured 6 feet from the unit and 5 feet off the deck. On a weighted "A" scale

CABINET

The cabinet shall be constructed from galvanized sheet steel. After assembly the cabinet shall be degreased and coated with a Polyurethane paint. Standard color shall be cloud white (Code #005). The finish shall be easily cleanable and hard wearing to give maximum protection. The cabinet shall be insulated with acoustic foam insulation and sandwiched between two layers of soundboard, containing no fibrous materials. The foam insulation shall have a fire rating of UL94HF-1. Units utilizing fibrous insulation shall not be acceptable.

The front of the unit shall contain a low-level return air grille integral to the front of the door(s) and a sound attenuating inlet plenum. The door(s) shall be hinged with a spring-loaded pin to allow for easy removal if required. Doors shall be secured with a key lock.

COMPRESSOR

The refrigeration system shall consist of a hermetic scroll compressor equipped with crankcase heater to guard against liquid flood back conditions and the elimination of oil foaming upon start up. The compressor shall be mounted on vibration absorbers for quiet operation. An internal overload protector shall protect the compressor against excessive motor temperatures and currents.

REFRIGERATION – COOLING ONLY

With cooling only units, the refrigeration system shall contain a factory fitted expansion device(s) and filter drier. Factory set high and low-pressure switches shall be fitted; manual reset high-pressure cutout and automatic reset low-pressure cutout.

COILS

The evaporator and condenser coils shall be constructed of aluminum fins mechanically bonded to 3/8" copper tubes. Both coils shall be fitted to non-corrosive drain trays.

REFRIGERATION- HEAT PUMP

Heat pump systems shall be fitted with two expansion devices, each with a check valve assembly to prevent short cycling of refrigerant during the heat pump operation and a reversing valve to enable the unit to operate in both cooling and heat pump mode. A factory set defrost switch shall be fitted to allow defrosting of the outside coil when in heat pump mode. Factory set high and low-pressure switches shall be fitted; manual reset high pressure cutout and automatic reset low-pressure cutout.

FANS & FAN MOTOR

The condenser and evaporator fans shall be statically and dynamically balanced for quiet operation. Each fan assembly shall be double inlet forward curved centrifugal type with integral direct drive motor.,

FILTER

Each unit shall be fitted with 1" thick pleated disposable synthetic filters designed to meet ASHRAE standard 52-76, 80% arrestance. The filter shall be treated with a durable, low toxicity, broad-spectrum antimicrobial that inhibits the growth of bacteria and fungi on the filter surfaces.

ECONOMIZER

Each unit shall be fitted with a spring return modulating damper that acts to mix the outdoor air with the return air. The damper shall have the capability of permitting only the outside air into the space, or recycling the return air and allowing only a minimum of outside air to enter the space. Full modulation allowing any mixture of outside air and return air shall be possible. A minimum damper position setting shall also be possible to continuously maintain outside air ventilation requirements dependent on control via the unit's microprocessor controller.

POWERED EXHAUST

Powered Exhaust shall be provided to prevent over pressurization of the space with the exhaust fan capable of exhausting 100% of room air.

CONTROL PANEL

Located at the top of the unit behind the front door(s), the control panel shall contain a 24-volt control circuit transformer and all necessary contactors, relays and circuit breakers to provide the necessary control. All components located in the panel shall be clearly marked for easy identification. All terminal blocks and wires shall be individually numbered. Wiring outside the control panel shall be run in protective sleeving.

MICROPROCESSOR CONTROLS - STANDARD

The unit shall be fitted with a Johnson Controls Metasys UNT111-1 programmable microprocessor controller mounted outside the air stream and specifically designed to operate the unit in an energy efficient manner using pre-engineered control strategies. The microprocessor shall determine the mode of operation based on the return air, supply air, and ambient air temperatures.

SOUND DATA

Units shall not exceed 48 dBA on a weighted "A" scale when measured 6' (six) feet from the unit at 5" (five) off the deck.

DISCONNECT SWITCH

The unit shall be fitted with a power disconnect switch located on the control panel, sized for the full load amperage of the unit to enable the unit to be disconnect from the power supply prior to any maintenance. In the off position the switch can be locked out.

3 SPEED SWITCH

A 3 speed selector switch shall be mounted internally enabling adjustment of the supply air volume.

OPTIONAL FEATURES

MICROPROCESSOR CONTROLS – NON STANDARD

For customers specified controls, the microprocessor controller and associated control hardware shall be supplied to School Air, Inc. for factory installation and testing. Strategy, wiring diagrams, microprocessor and sensors shall be supplied free of charge to School Air, Inc.

DISPLAY MODULE-ZONE TERMINAL

For units fitted with the Johnson Metasys microprocessor controller a hand-held zone terminal shall be supplied for set point changes, control adjustments, and unit interrogation.

SUPPLY AIR BOX

A 24" high factory supplied supply air box painted to match the unit shall be mounted on top of the unit. The supply air box shall be cut in the field by the installing contractor where as duct work may be attached (duct work to be field supplied by others). The supply air box shall be lined with acoustic foam to minimize noise levels. The supply air box shall be shipped separately for field mounting, hardware provided.

OUTSIDE AIR REAR EXTENSION

Where site conditions do not permit the use of the standard locations for outside air intake and exhaust air discharge, an outside air rear extension shall be supplied for site installation by the mechanical contractor. The outside air rear extension shall be available in the following sizes and configurations.

* Contact School Air, Inc. regarding height requirements.

DISCHARGE DUCT FLANGE

The one inch factory fitted discharge duct flange shall be supplied to allow for easy installation of a discharge duct to the unit.

DUCT SHROUD

The 36" or 18" three sided duct shroud shall be painted to match the unit and shall extend from the top of the unit through the ceiling. The shroud shall be trimmed in the field by the mechanical contractor to suit the ceiling height.

HOT GAS BYPASS

For precise capacity control and to protect against coil freeze up during low load conditions, hot gas bypass shall be factory installed. The action of the hot gas bypass valve shall be controlled based on system operating pressures.

ELECTRIC HEATING

The unit shall be fitted with electric resistance heating elements downstream of the DX coil. The elements shall be controlled by the unit's operating system. Both a manual thermal protection switch and an automatic thermal protection switch shall be installed.

HOT WATER HEATING COIL, CONTROL VALVE, AND VALVE PACKAGES

A hot water heating coil shall be mounted in the plenum box on top of the unit. The coil shall be constructed of copper tubes with aluminum fins. Capacity control shall be achieved by either a two or three way modulating valve or a two position valve. The coil shall include factory piped circuit setter, manual shut off valves, strainer and drain with hose bib.

FREEZE PROTECTION

The unit shall be fitted with a freeze protection sensor to prevent any freezing of the hot water coil assembly. When the sensor detects a freeze up condition it shall shut the damper and force the flow control valve open and prevent the unit supply fan from running.

ACOUSTIC PLENUM/BOX

A plenum/box with top discharge shall be mounted on top of the unit. The plenum shall be lined with acoustic foam to minimize noise levels. The plenum is available in heights from 24" to 48" in 2" increments. The plenum shall be shipped separately for field mounting, hardware provided.

TIME CLOCK

Time clock shall be provided for "stand-alone" units where time functions, night and weekend setback, etc. are not transmitted from a building management system, door mounted twist timer, or remote central time clock.

FIRE DETECTION

The unit shall be fitted with a fire detector mounted in the return air stream to prevent the unit from operating if the return air temperature should rise above the setting on the element. The temperature setting on the fire detector element shall be adjustable.

SMOKE DETECTOR

The unit shall be fitted with a smoke detector mounted in the return air stream. If smoke is present the detector will sense it, and the unit will be shut down automatically.

CONDENSER COIL FILTER

A wire framed synthetic filter shall be fitted across the inlet of the outdoor coils. This shall be reusable and may be vacuum cleaned.

WALL SLEEVE

The wall sleeve shall be constructed from galvanized steel. An interior separator plate running the entire length of the sleeve shall separate the fresh air inlet from the exhaust air. The sleeve shall be provided by School Air, Inc. and insulated by the installing contractor with foil back insulation. Alternatively two separate sleeves shall be supplied, one for condenser supply air, the other for exhaust

ALTERNATE REFRIGERANTS

Systems are factory charged with R-22 refrigerant. R-407C and R134A are available as an alternate.

COMPRESSOR WARRANTY

Every compressor shall carry a 4 (four) extended warranty, which shall warrant the compressor a total of five years.

UV LIGHTS

UV lights shall be factory installed inside the unit. The light bank(s) shall be located upstream of the airflow, and be easily accessible behind the flip down control panel.

OUTDOOR LOUVER

An outdoor louver shall be furnished by School Air, Inc. and be suitable for masonry, glass, or panel wall construction. The louvers shall be available in the following materials and may be flanged or recessed style:

1. Aluminum with clear anodized finish
2. Aluminum with bronze anodized finish
3. Aluminum with baked enamel finish, customer selected color
4. Unpainted galvanized steel

Either a single louver (combined air intake and exhaust), or two separate louvers shall be supplied.

All louvers may be provided with a bird screen.

FACTORY START-UP & TRAINING

School Air, Inc. shall provide start-up and customer training for the supplied equipment. Start-up will be coordinated with the local representative.

UNIT OPERATION SAUV-AC

SAUV-COOLING ONLY

The SAUV-AC cooling only unit is designed to maintain the desired setpoint temperature within a conditioned space by switching and modulating via the programmable microprocessor, controlling the unit in one of four occupied modes:

1. Free cooling – using outside air
2. Free cooling & DX cooling – using outside air and DX cooling
3. DX cooling – mechanical cooling with room return air and minimum fresh air
4. Heating (optional) - room return air and minimum fresh air

These modes are switched based on the following parameters: return air temperature, supply air temperature and the ambient air temperature.

FREE COOLING

If the return air temperature is higher than the occupied setpoint and if the ambient air temperature is low enough to satisfy the cooling load in the occupied space, the microprocessor controller will signal the fresh air economizer damper. This will automatically modulate between 0-100% and the conditioned space temperature will be maintained by full fresh air or “free cooling”. This mode of operation leads to much reduced running time for the compressor leading to cost and machinery savings.

FREE COOLING & DX COOLING

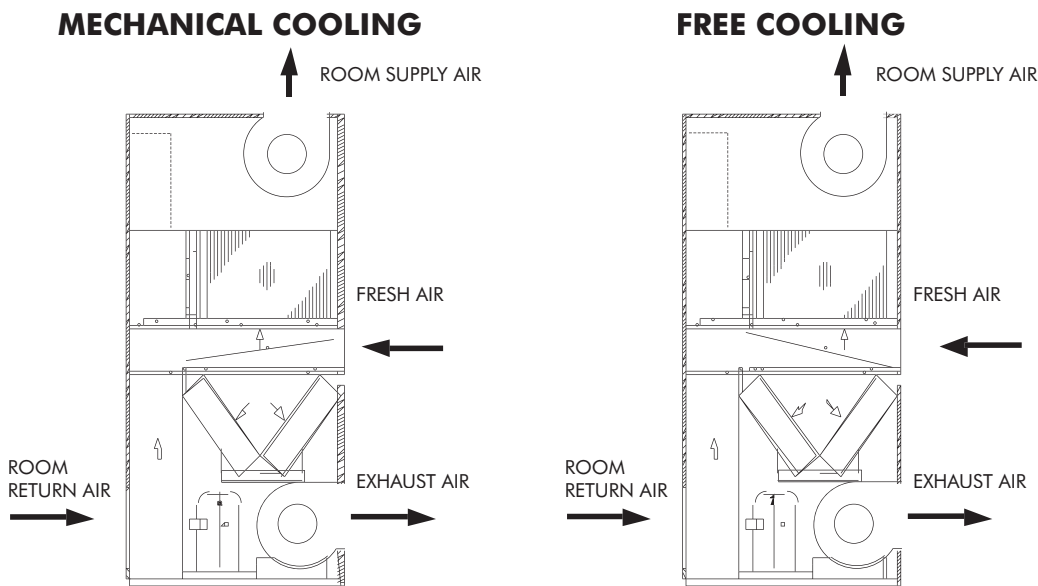
The return air temperature sensor will call for free cooling when the ambient air temperature is low enough to satisfy the cooling load in the occupied space, the controller will signal the fresh air economizer damper to open and modulate to satisfy the cooling load in the occupied space. Until the ambient air temperature drops low enough, the fresh air may not be capable of satisfying the cooling requirements. The Controller will energize the compressor and DX cooling may also be required on an intermittent basis.

MECHANICAL DX COOLING

If the ambient air temperature is equal or higher than the occupied setpoint the unit will call for mechanical DX cooling. The controller will send a signal to energize the compressor. The outdoor air damper may be set to a minimum position to allow the necessary amount of outside air to be introduced prior to being conditioned, thus satisfying minimum ventilation code requirements.

HEATING (OPTIONAL)

As standard this unit is not fitted with any heating capability, however optional electric or low pressure hot water heating may be fitted and will be energized if the return air temperature falls below the occupied setpoint. As with the cooling mode the outdoor air damper can be set to a minimum position for the introduction of outside air.



UNIT OPERATION SAUV-HP

SAUV-HEAT PUMP

The SAUV heat pump is designed to maintain the desired set-point temperature within a conditioned space by switching and modulation via the programmable microprocessor, controlling the unit in one of four occupied modes:

1. Free cooling – using outside air
2. Free cooling & DX cooling – using outside air and DX cooling
3. DX cooling – mechanical cooling with room return air and minimum fresh air
4. DX heating – reverse cycle, room return air and minimum fresh air

FREE COOLING

If the return air temperature is higher than the occupied set-point and if ambient air temperature is low enough to satisfy the cooling load in the occupied space, the microprocessor controller will signal the fresh air economizer damper. This will automatically modulate between 0-100% and the conditioned space temperature will be maintained by full fresh air or “free cooling”. This mode of operation leads to much reduced running time for the compressor leading to cost and machinery savings.

FREE COOLING & DX COOLING

The return air temperature sensor will call for free cooling when the ambient air temperature is low enough to satisfy the cooling load in the occupied space, the controller will signal the fresh air economizer damper to open and modulate to satisfy the cooling load in the occupied space. Until the ambient air temperature drops low enough, the fresh air may not be capable of satisfying the cooling requirements. The controller will energize the reversing valve and the compressor and DX cooling may also be required on an intermittent basis.

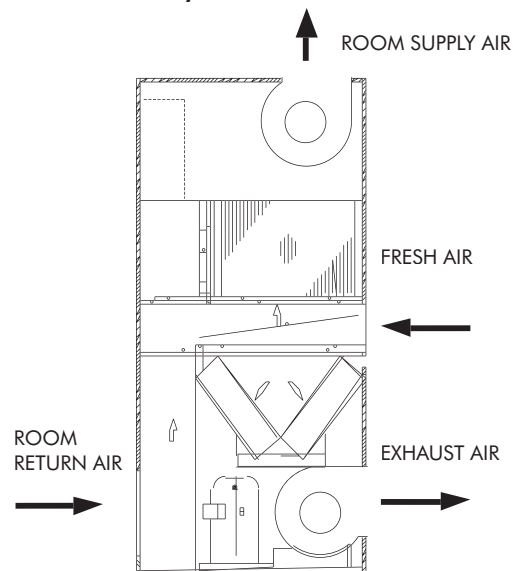
MECHANICAL DX COOLING

If the ambient air temperature is equal or higher than the occupied setpoint the unit will call for mechanical DX cooling. The controller will send a signal to energize the reversing valve and the compressor. The outdoor air damper may be set to a minimum position to allow the necessary amount of outside air to be introduced prior to being conditioned, thus satisfying minimum ventilation code requirements.

HEATING

If the return air temperature is below the setpoint the controller will de-energize the reversing valve allowing the unit to operate in the reverse cycle DX heating mode. As with the cooling mode the outdoor air damper can be set to a minimum position for the introduction of outside air. During periods of operation in low ambient temperature the unit will periodically enter into a defrost mode to remove the frost build up on the coil acting as an evaporator. The controller will energize the reversing valve allowing the unit to operate in the cooling mode using hot refrigerant to melt the frost build up. An alternate heating source e.g. optional electric or hot water heating should be fitted to the unit and will be energized to offset the cooling effect of the defrost cycle.

MECHANICAL HEATING HEAT PUMP/ELECTRIC HEATING



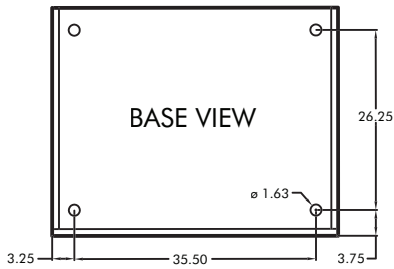
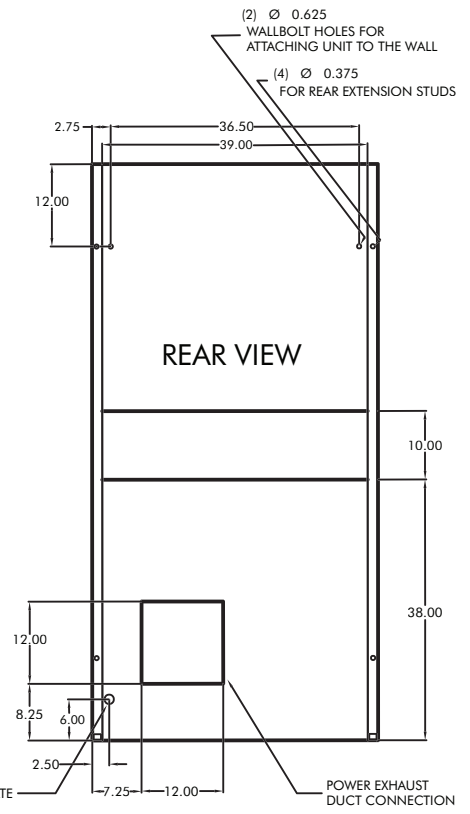
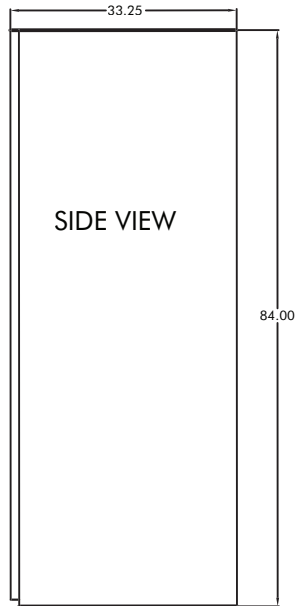
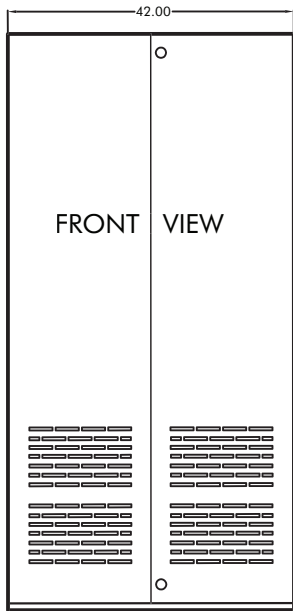
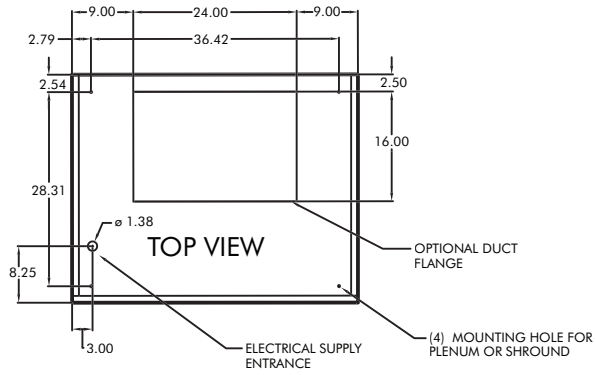
TECHNICAL DATA

HEAT PUMP	SAUV-02-HP	SAUV-03-HP	SAUV-04-HP
AIR CONDITIONER	SAUV-02-AC	SAUV-03-AC	SAUV-04-AC
NOMINAL TONNAGE	2	3	4
Cooling Capacity Based On 95°F (35°C) Ambient @ 80°F DB/67°F WB (26.7°C DB, 19.4°C WB) Entering Air			
Total BTU/HR	23,900	35,900	47,000
Sensible BTU/HR	18,000	25,900	36,300
EER/SEER	10.0/10.8	10.0/10.8	10.1/10.2
Heating Capacity @ 70°F DB/47°F WB (21.1°C DB, 8.3°C WB) Entering Air			
BTU/HR	22,750	34,200	46,610
C.O.P	3.1	3.2	3
Evaporator Section			
CFM (L/S) @ 0.3" ESP	800	1200	1600
Fan Motor HP	0.25	0.5	0.75
Coil Face Area ft.2	5.25	5.25	5.25
Rows/FPI	2 (12)	3 (12)	4 (12)
Filter Data			
Size/Quantity	16x25x1(2)	16x25x1(2)	16x25x1(2)
Compressor Section – Hermetic Heat Pump Duty R-22			
Condenser Section – Direct Drive			
CFM (L/S) @ 0.2" ESP	1600	2400	3200
Fan Motor HP	0.5	0.75	0.75
Coil Face Area ft.2	6	6	6
Rows/FPI	3 (12)	4 (12)	4 (12)
Electrical Heat (optional)			
Kw	5	7.5	7.5
BTU/HR	17,200	25,800	25,800
Stages	1	1	1
Hot Water Heat (optional)			
Heating Capacity @ 180°F Entering Water			
BTU/HR	34,500	40,000	50,000
GPM	3.5	4	5
Pressure Drop PSIG	15	19	22
Unit Weight (Lbs.)	675	730	730

ELECTRICAL DATA

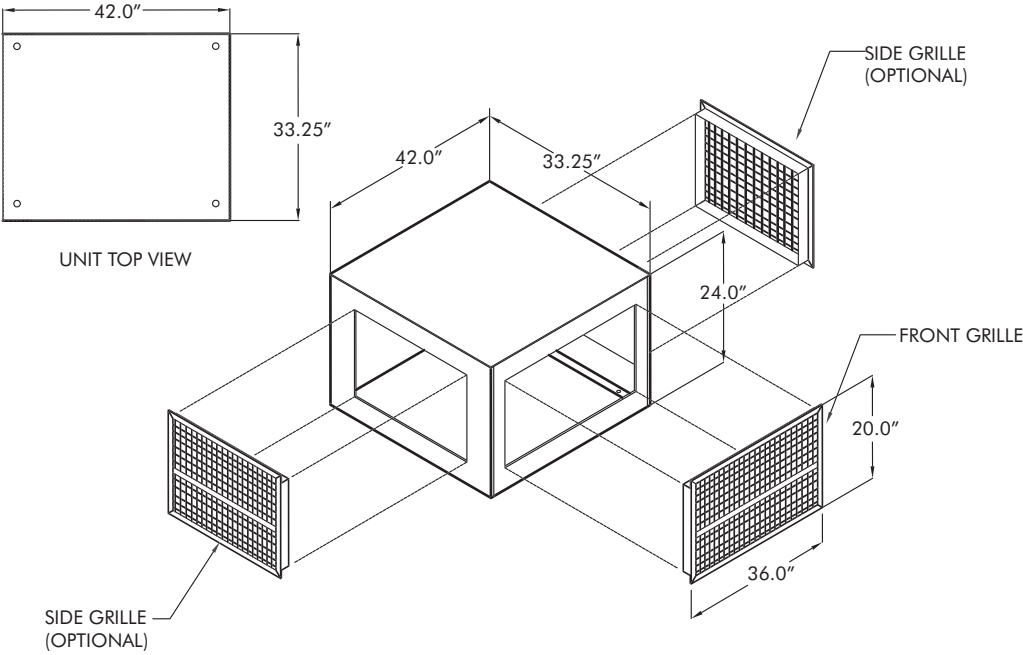
ELECTRICAL DATA: AIR CONDITIONER / HEAT PUMP				
208V / 1 PH / 60 HZ	FLA	14	18.1	26.2
	MCA	17.9	23.2	30.2
	MFS	30A	35A	50A
208V / 3 PH / 60 HZ	FLA	10.5	14.2	18.9
	MCA	12.8	17.5	23.4
	MFS	20	30A	35A
460V / 3 PH / 60 HZ	FLA	4.9	7.8	10.2
	MCA	6	9.5	12.5
	MFS	15A	20A	25A
Electrical Data: Air Conditioner / Heat Pump With Electric Heat				
208V / 1 PH / 60 HZ	FLA	39.6	54.8	61.2
	MCA	48.2	67.5	74.3
	MFS	60	80A	100A
208V / 3 PH / 60 HZ	FLA	25	35	40
	MCA	30.6	43	48.4
	MFS	35A	50A	60A
460V / 3 PH / 60 HZ	FLA	12	16.2	19.6
	MCA	15	20	24
	MFS	20A	25A	30A

DIMENSIONAL DATA (2 THRU 4 TONS)

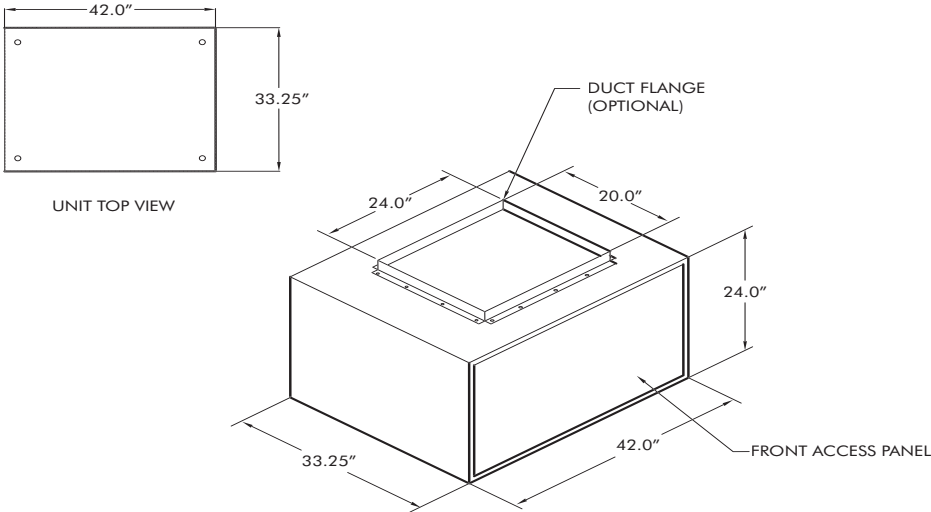


NOTE:
ALL DIMENSIONS ARE IN INCHES

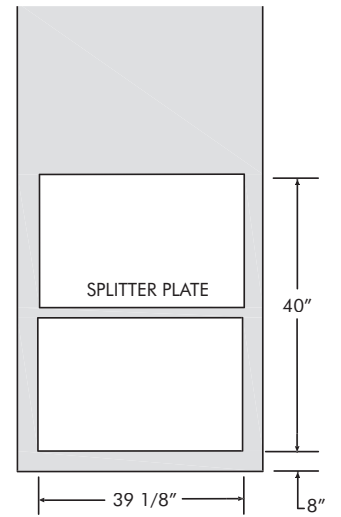
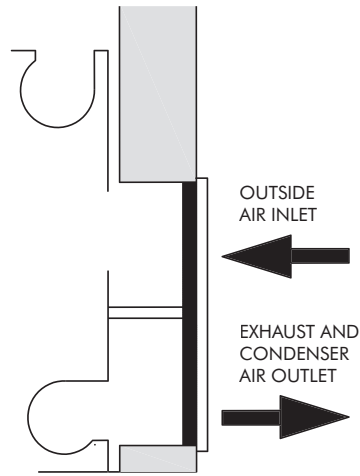
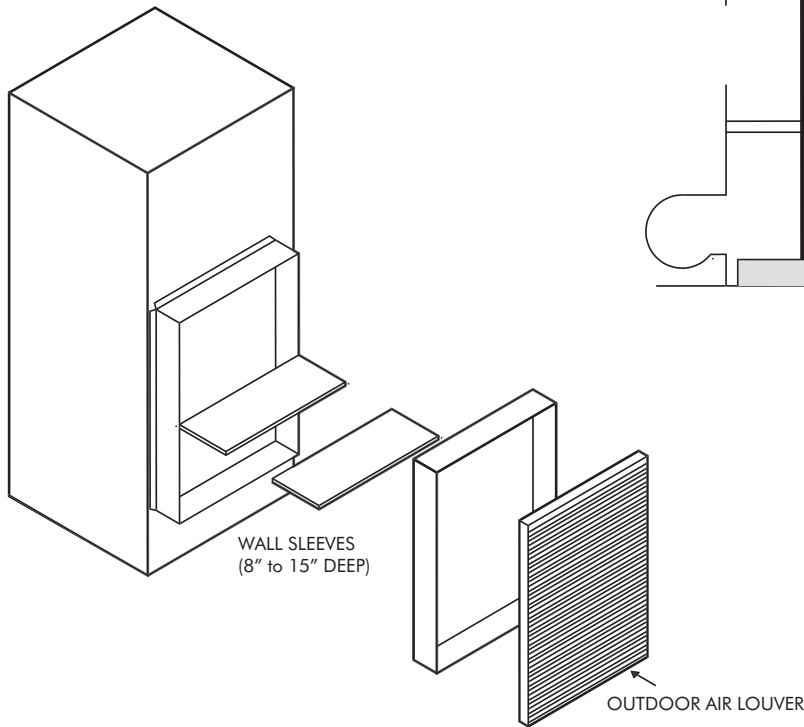
PLENUM



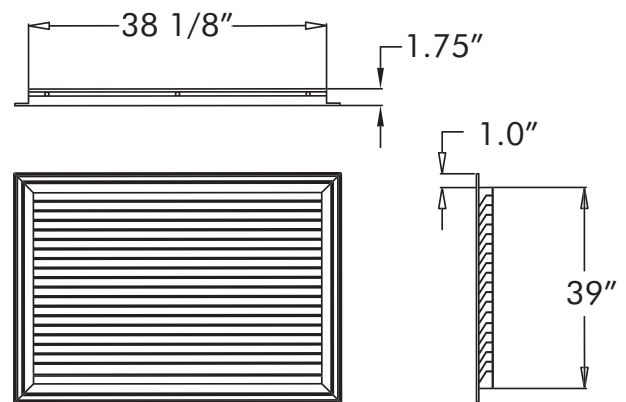
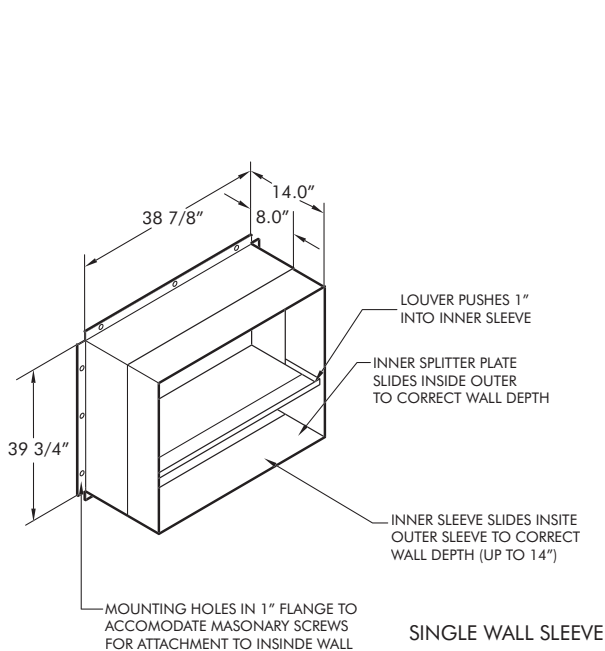
TOP DISCHARGE PLENUM



SINGLE WALL SLEEVE & LOUVER

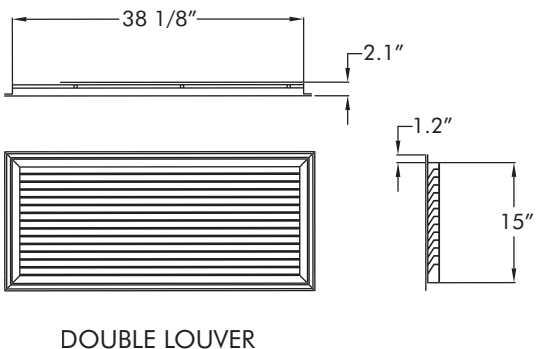
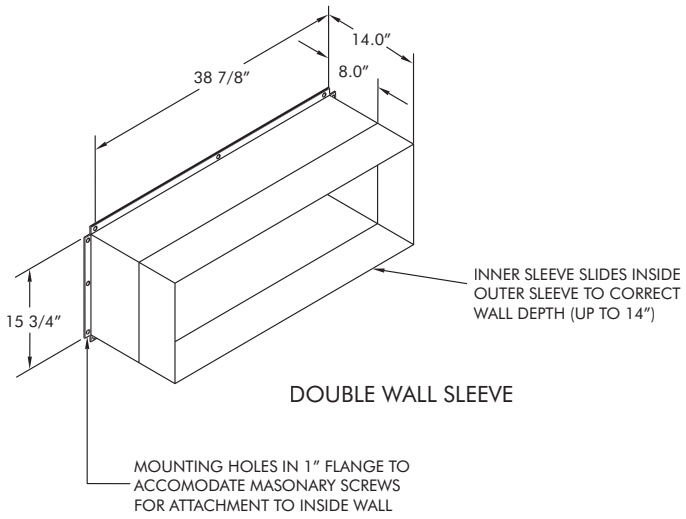
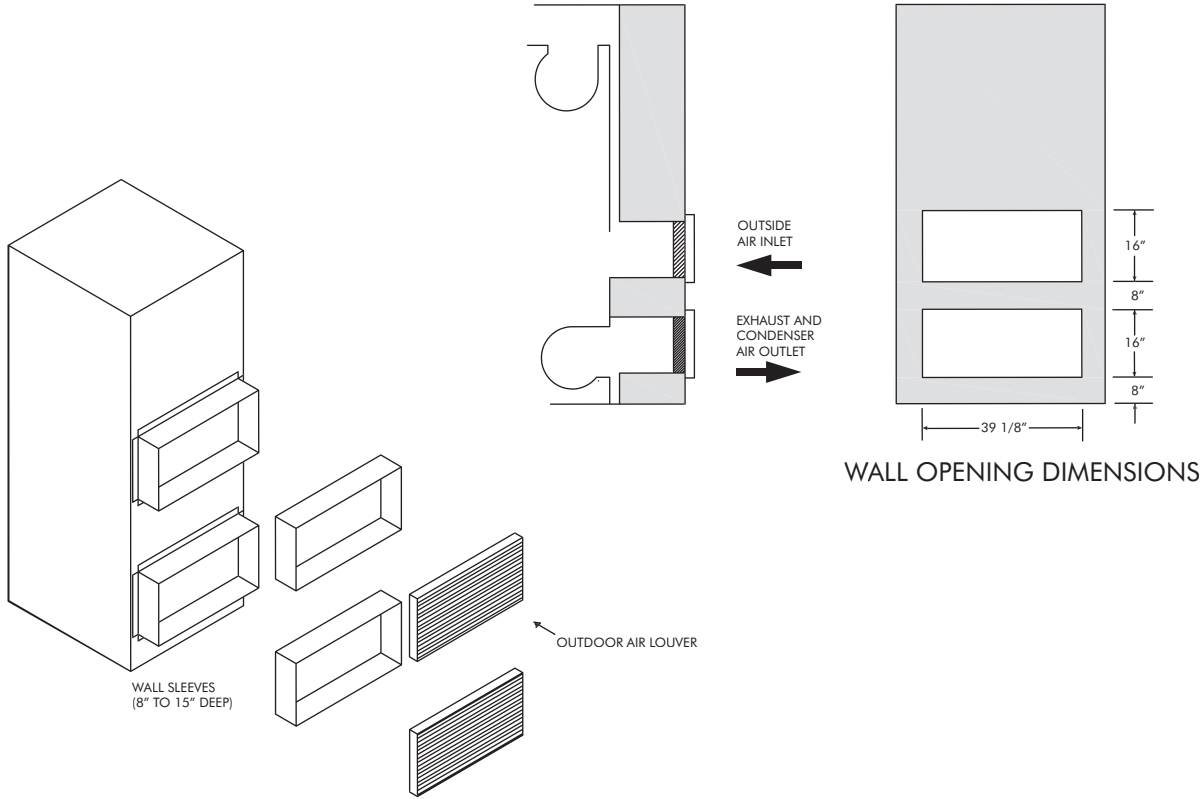


WALL OPENING DIMENSION

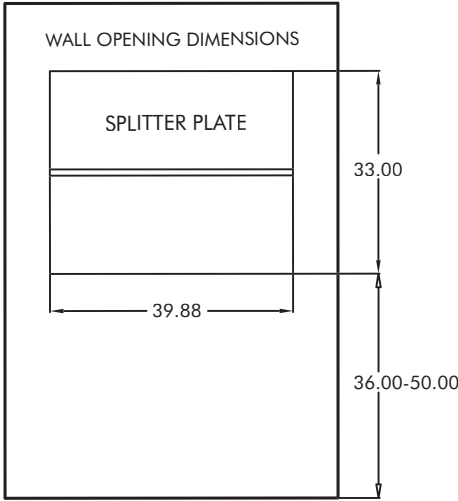
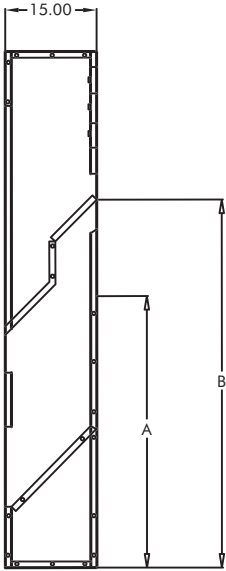
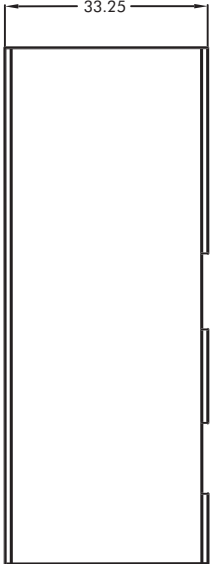
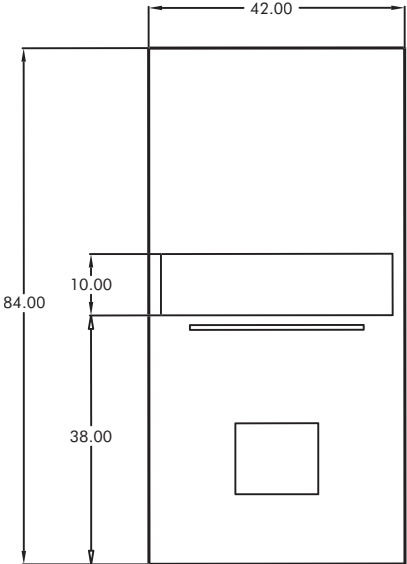


SINGLE LOUVER

DOUBLE WALL SLEEVE & DOUBLE LOUVER

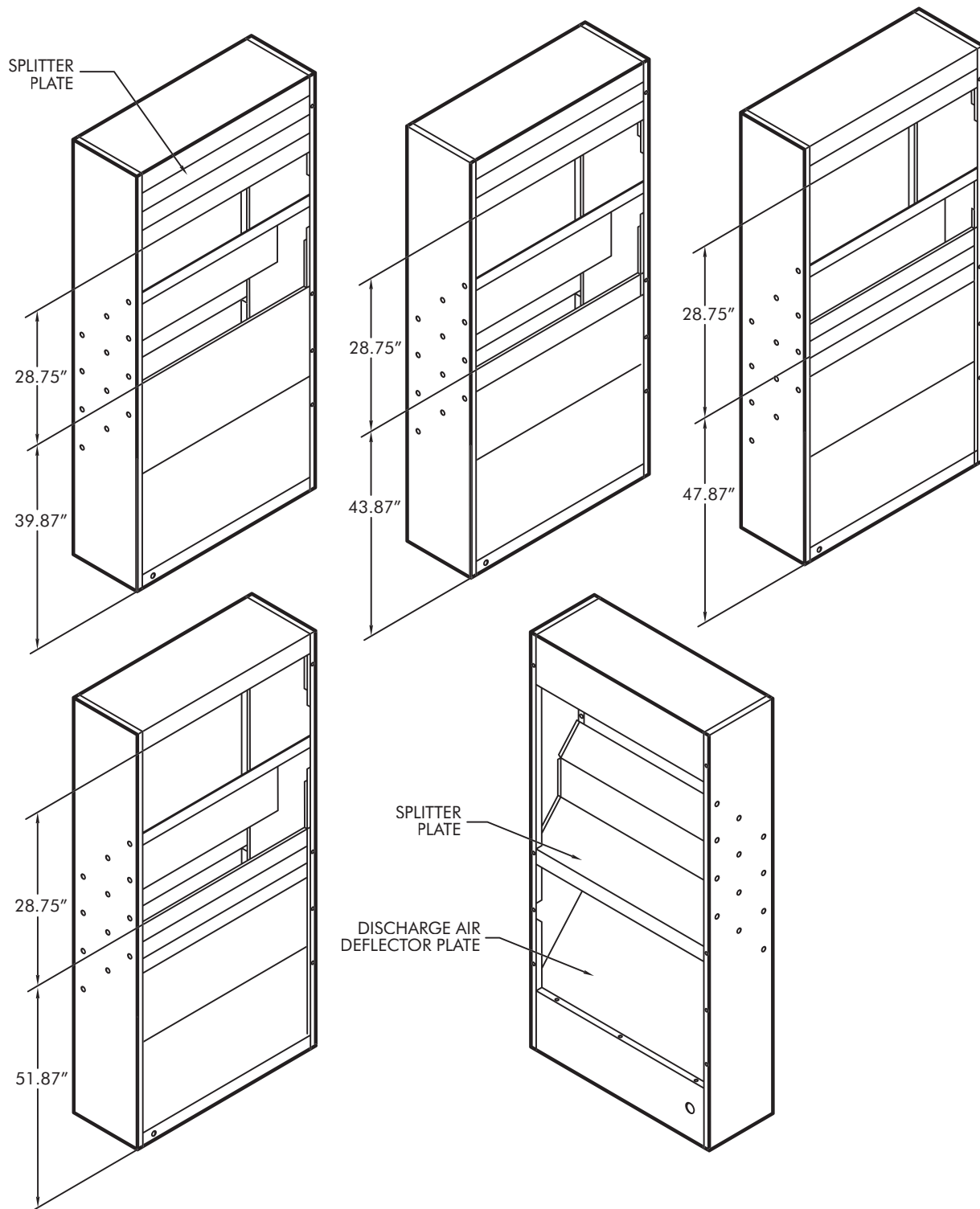


REAR EXTENSIONS

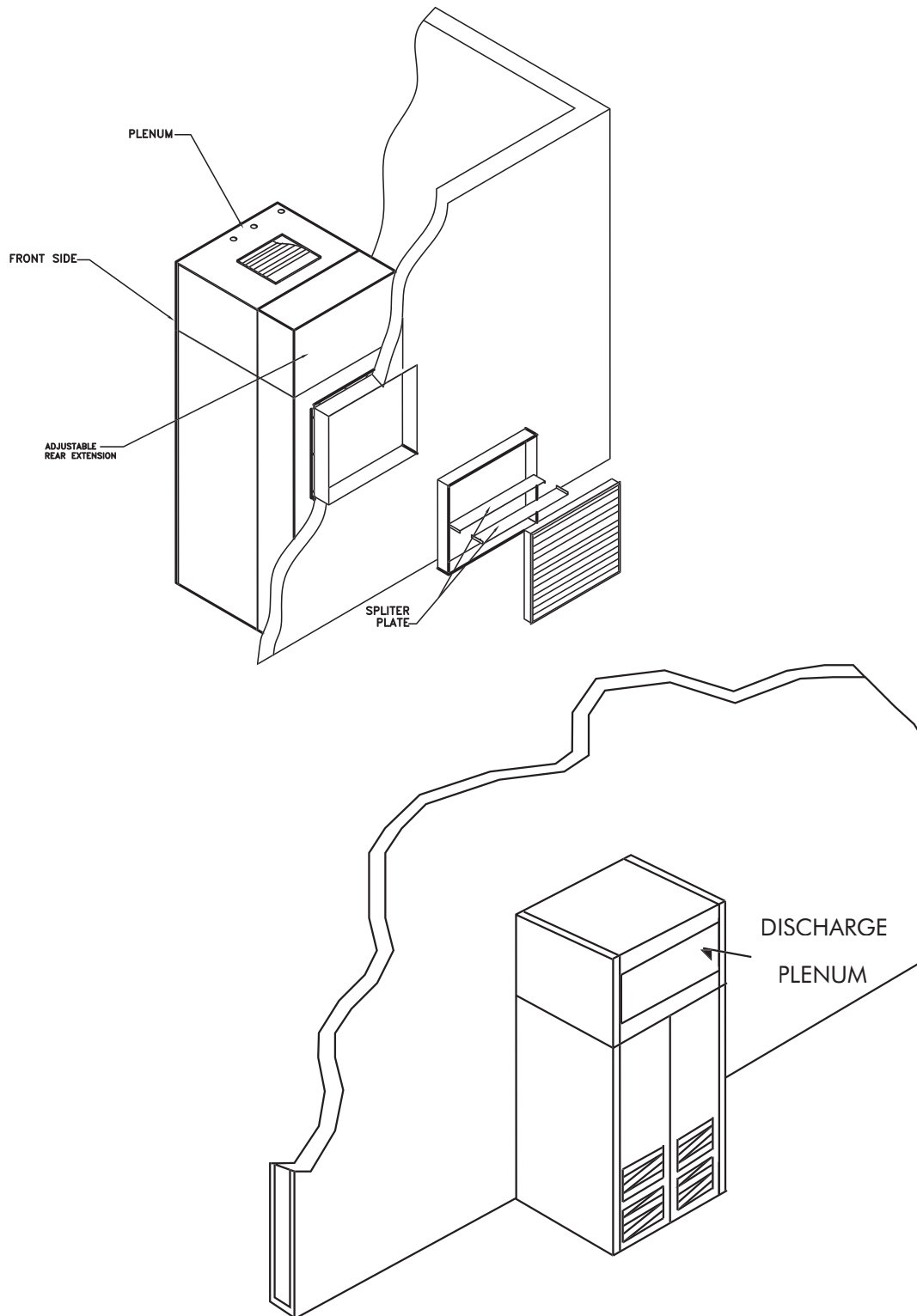


WALL OPENING HEIGHT	A	B
36" TO 39"	39.87	59.87
40" TO 43"	43.87	59.87
44" TO 47"	47.87	59.87
48" TO 50"	51.87	63.50

OPTIONAL REAR EXTENSIONS

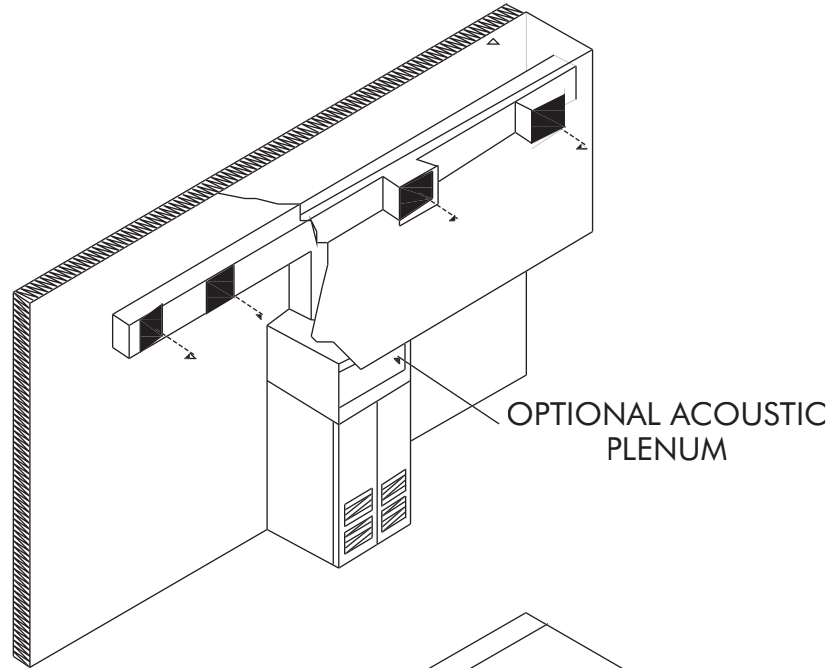


TYPICAL AIR DISTRIBUTION METHODS



TYPICAL AIR DISTRIBUTION METHODS

DUCTED HIGH WALL SUPPLY (EXPOSED DUCT OR CONCEALED IN SOFFET)



OPTIONAL
DUCT SHROUD

30" OPTIONAL
HOT WATER PLENUM

