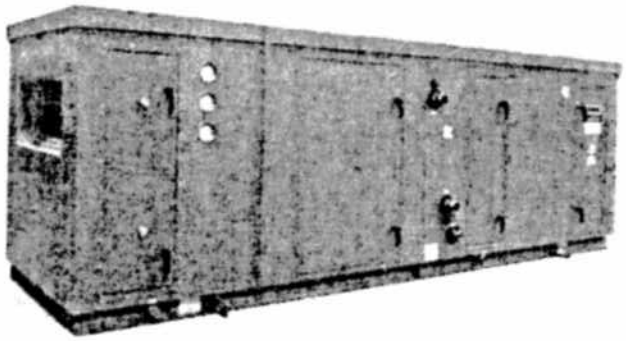
Johnson Controls

EQUIPMENT SUBMITTAL FOR APPROVAL

VA MATHER BLDG 650 REPLACE AHUs SACRAMENTO, CA



YORK CUSTOM OUTDOOR AIR HANDLING UNIT

EQUIPMENT:	YORK CUSTOM OUTDOOR AHU
UNIT TAGS:	AHU-1
QUANTITY:	1

SOLD TO:
Certified Air Conditioning, Inc.
San Diego, CA

PREPARED BY:
Taylor Stumpp
YORK, a Johnson Controls, Inc. Company
3526 Breakwater Ct.
Hayward, CA 94545
Cell: 925.989.7225
Fax: 510.785.3170

October 16, 2009
Revision #1

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SUBMITTAL NOTES

The following table must be completed prior to releasing the equipment for fabrication. Please initial the column indicating the information contained in this submittal has been verified, or indicate to refer to a marked-up page.

SUBMITTAL VERIFICATION	
	Purchaser Initials
Access door locations shown in this submittal are correct Pipe connections shown in this submittal are correct Duct connections shown in this submittal are correct	
Unit tag designations are correct	
Equipment dimensions and weights have been verified to comply with jobsite conditions and rigging requirements	

Please fill out the following table and refer to the receiving/rigging instructions in this submittal to help ensure a smooth delivery and installation of the equipment.

DELIVERY INFORMATION	
	Please fill out information below
Contact name for coordinating delivery of equipment with transportation company	
Contact phone number	
Advance notice required from transportation company prior to delivering equipment (typically 48 hours)	
Ship to address:	
Other special shipping instructions or requirements	

GENERAL DESCRIPTION

PART 1 GENERAL

1.01 WORK INCLUDED

A. York Solution outdoor air handling units and components, as shown on product drawings and described in performance specifications.

B. Motors, starters, and variable frequency drives, as shown on product drawings and described in performance specifications.

C. Factory packaged controls, as shown on product drawings and described in performance specifications.

D. Product drawings, performance specifications, and other submittal documents show segments, components, options, and features furnished by York. Options listed in this specification will not necessarily be included.

1.02 QUALITY ASSURANCE

A. York has more than 40 years of experience designing, manufacturing, and servicing air-handling units.

B. Solution units are designed and will be built to meet performance criteria of this specification.

1.03 COORDINATION

A. Installing contractor shall coordinate the following items with applicable trades:
   1. Structural supports, curbs, and/or housekeeping pads for unit.
   2. Piping size and connection/header locations including space for steam and condensate traps. Final coordination shall be done on site.
   3. Ductwork connection sizes and locations. Final coordination shall be done on site.
   4. Electrical power requirements and wire/conduit and over-current protection sizes. Final coordination shall be done on site.

1.04 RATINGS AND CERTIFICATIONS

A. Unit will conform to AMCA 210 for fan performance ratings.

B. Unit will conform to E.T.L. standards.

C. Unit sound ratings will be reported in accordance with ARI 260 for inlet and discharge sound power levels.

D. Unit casing radiated sound ratings will be reported in accordance with ISO 9614 parts 1&2 and ANSI S12.12.

E. Unit will conform to ARI 410 for capacities, pressure drops, and selection procedures of air coils.

F. Unit will conform to ARI 430 for all fabrication procedures of air handling units.

G. Motors covered by the Federal Energy Policy Act (EPACT) will meet EPACT requirements.

H. Damper performance will comply with AMCA 500.

I. Airflow Monitoring Stations will be rated in accordance with AMCA 611-95 and bear a Certified Ratings Seal for Airflow Measurement Performance.

J. Air-handling units will be ISO9001 certified.

1.05 DELIVERY

A. Unpainted units will be wrapped prior to shipment.

B. Openings will be protected against damage from shipping

C. Loose-shipped items will be packed, protected and secured with units.

D. Pipe chases will ship attached to units as indicated on drawings, unless total unit width including pipe chase exceeds 102", in which case pipe chase will ship loose.

E. Rain hoods will ship loose.

1.06 WARRANTY

A. York will warranty unit and factory packaged controls for eighteen (18) months from date of shipment. Warranty will be limited to manufacturer's defects on parts. Warranty does not include parts associated with routine maintenance, such as belts, air filters, etc. Warranty does not extend to alterations, modifications, or external components installed after unit is shipped.

PART 2 PRODUCTS

2.01 GENERAL DESCRIPTION

A. York factory manufactured Solution air-handling units designed and built to meet performance detailed in this submittal.

B. Unit will be complete with fans, motors, motor controls, coils, dampers, controls, access doors and other components/options, as shown on product drawings, wiring diagrams, and as described in performance specifications.

C. Fans and drives will be balanced to limit vibration at operating speeds.

D. Unit will ship in one (1) piece whenever possible. Shipping splits will be provided when necessary. Lifting lugs will be provided where required for proper lifting.

E. Unit casing and frame will be factory insulated.

F. Units will be ETL labeled.

2.02 UNIT CASING

A. Solution unit is specifically designed for outdoor applications.

B. Casing leakage will not exceed 1% of design CFM at ±8" static pressure differential across casing.

C. Panel deflection will not exceed L/240 at ±8" static pressure differential across casing.

D. Unit casing will consist of a structural frame with insulated roof, wall, and floor panels.

E. Removal of wall panels will not affect structural integrity of units.

F. Unit will have double wall, 2" insulated panels for walls, roof, and floor. Exterior skin will be galvanized and painted sheet steel. Individual segments will have galvanized sheet steel, stainless sheet steel, or perforated galvanized interior liner, as described in performance specifications.

1. Provide panels with optional perforated liner in the fan section and other sections as shown on the drawings. Interior liner will be perforated galvanized. Minimum perforated panel thermal resistance (R-Value) will be R11 hr-ft^2-°F/BTU.

G. Unit roof will be double-sloped with a longitudinal peak and a minimum pitch of 1/4" per foot.
1. Roof snow-loads capacity will be at least 50 lb/ft^2.
2. Roof overhangs unit perimeter by 1-1/2".

H. Floor panels will be double wall construction, designed to provide at most L/240 deflection when subjected to a 300 lb. load at mid-span.

I. Unit casing will be insulated with spray injected foam to achieve thermal resistance of R13 hr-ft2-°F/BTU.
1. Insulation application meets the requirements of NFPA 90A.
2. Drain pans will be insulated with spray injected foam.

J. Double wall access doors will be provided on sections as shown on product drawings.
1. Stainless steel hinges permit a 180° door swing.
2. Access door will be of the same material type as exterior/interior casing.
3. Access door latches will use a roller cam latching mechanism.

K. View ports will be double-pane tempered glass.

L. Primary drain pans will comply with the guidelines of ASHRAE 62.
1. Drain pans will be double sloped at least 1/8" per foot, and have no horizontal surfaces.
2. Drain connection material will be the same as drain pan.
3. Drain pans will drain to one point.
4. Drain connections will be welded to drain pans
5. Drain pans will have at least 1" clearance between pan and coil supports.

M. Auxiliary drain pans will comply with the guidelines of ASHRAE 62, and will be supplied in segments as shown in performance specifications.
1. Drain pans will be double sloped at least 1/8" per foot, and have no horizontal surfaces.
2. Drain connection material will be the same as drain pan.
3. Drain pans will drain to one point.
4. Drain connections will be welded to drain pans.
5. Drain pans will have at least 1" clearance between pan and coil supports.

N. Optional pipe chases will be furnished, as shown on drawings.

1. Pipe chases will be constructed in the same manner as units.
2. Pipe chase doors will be provided, as shown on drawings.
3. Pipe chases will have the same base rail options as units.

2.03 FANS

A. Fans will provide CFM and static pressure, as shown in performance specifications.

B. Fans will be Class I, II, or III, as required to meet selected RPM and horsepower shown in performance specifications.

C. Fans will be DWDI (housed) or SWSI (plenum), as shown on product drawings.

D. Fans will have forward curved or airfoil blades, as shown in performance specifications.

E. Airfoil fans will bear the AMCA Seal. Airfoil fan performance will be based on tests in accordance with AMCA standard 210 and will comply with the requirements of AMCA certified ratings programs for air and sound. Airfoil wheels will comply with AMCA standards 99-2408-69 and 99-2401-82.

F. Fans shafts will be polished steel and sized such that the first critical speed will be at least 125% of the maximum operating speed for the fan pressure class. Shaft will be coated with an anti-corrosion coating.

G. Fan and motor assembly will be internally mounted on a common base. Fan and motor base will be spring isolated on a full width isolator support channel.
1. Fan motor will be on an adjustable base.
2. Fan discharge will be connected to cabinet via a flexible connection.
3. Access doors will be provided as shown on product drawing.

2.04 BEARINGS AND DRIVES

A. Fan bearings will have average life (L50) of at least 200,000 hours. Bearing fatigue life ratings will comply with ANSI/AFBMA 9.

B. DWDI fans will be belt-driven. SWSI fans will be belt driven or direct driven, as shown on product drawings.

C. Forward curved fans smaller than 18" will have permanently lubricated bearings. Re-greaseable fan bearings will be factory lubricated and equipped with standard hydraulic grease fittings.

D. Fan drives will be selected for a 1.5 service factor and will be furnished with anti-static belts.
1. Drives 15 hp or smaller on constant volume fans will be adjustable pitch.
2. Drives 20 hp or larger or drives on fans with VFDs will be fixed pitch.
3. Sheaves will be machined from close grain cast iron and statically balanced.
4. Drive belts will be V type, precision molded, raw edge construction, anti-static, oil and heat resistant.

2.05 ELECTRICAL MOTORS

A. Fan motors will be built in accordance with the latest NEMA and IEEE standards.

B. Fan motors comply with ASHRAE Standard 90.1.

C. Fan motors will be furnished in sizes, electrical power and starting characteristics as shown in performance specifications.
   1. Fan motors will be rated for continuous, full load duty at 104°F (40°C) ambient temperature and 1.15 service factor.
      a. Exception: 1.5 hp and 3 hp, dual voltage (230/460V), 900 RPM, TEFC motors will have a 1.0 service factor.
   2. Fan motors will be NEMA design ball bearing type.
      a. Direct drive plenum fans will be coupled with motors that closely match required fan RPM.
   3. Fan motors will meet, at a minimum, NEMA high efficiency standards.
   4. Motors will be suitable for use with variable frequency drives, per NEMA MG-1 Part 30.

2.06 FAN MOTOR DISCONNECTS

A. Fan motor disconnects will be provided with unit, as shown in performance specifications.

B. Disconnect will be housed in a NEMA 3R enclosure, and will be mounted on the primary access side of segment.

C. Disconnect will be suitable for use as an OSHA lockout/tagout disconnect when applied in accordance with part IV, Department of Labor OSHA 29 CFR Part 1910, Control of Hazardous Energy Source (lockout/tagout): final rule.

D. Disconnect handles can be padlocked in the "off" position with up to three padlocks. Switch mechanism can be directly padlocked in the "off" position when door is open.

E. Disconnects will be provided with an integral ground lug.
   1. 16A to 100A disconnects will have two (2) #14 ground wires.
   2. 200A to 400A disconnects will have one (1) #6-250 ground wire.

2.07 FAN MOTOR STARTERS

A. Constant speed motor starters will be furnished (shipped loose) or provided (factory mounted and wired to motor) with units, as shown in submittal documents.

B. Motor starters will be housed in a dedicated, weather resistant compartment.
   1. Shipped loose starters and starters provided on units without single point power will be housed in a NEMA 3R enclosure.
   2. Weatherproof compartments will be provided on units with single point power.

C. Motor starter panels will include:
   1. Main power block
   2. Motor contactor(s)
   3. Individual short circuit and overload protection
   4. 120 volt control power transformer with primary and secondary protection
   5. 5 point terminal strip for field connections
   6. Main power disconnect
   7. Hand-Off-Auto switch

2.08 FAN VARIABLE FREQUENCY DRIVES

A. Variable frequency drives will be furnished (shipped loose) or provided (factory mounted and wired to motor) with units, as shown in submittal documents.

B. VFDs will be UL or ETL listed and comply with applicable provisions of the National Electric Code.

C. VFDs will be housed in a dedicated, weather resistant compartment.
   1. Shipped loose VFDs and VFDs provided on units without single point power will be housed in a NEMA 3R enclosure.
   2. Weatherproof compartments will be provided on units with single point power.

D. VFDs furnished or provided with units will be programmed and started by a York trained and employed technician.

E. VFD will include harmonic distortion feedback protection:
   1. Swinging DC Line Choke (equivalent to 5% input line reactor)
   2. Integral RFI/EMI filtering to meet EMC EN61800-3 for First Environment

F. User interface will include:
   1. 30 Character multi-lingual alphanumeric display
   2. Parameter set-up and operating data
   3. Display data includes:
      a. output frequency (Hz)
      b. speed (RPM)
      c. motor current
      d. calculated % motor torque
      e. calculated motor power (kW)
      f. DC bus voltage
      g. output voltage
      h. heat sink temperature
      i. elapsed time meter (re-settable)
      j. kWh (re-settable)
      k. input / output terminal monitor
      l. PID actual value (feedback) & error
      m. fault text
      n. warning text
      o. scalable process variable display

G. VFD protection circuits will include:
   1. over current
   2. ground fault
   3. over voltage
   4. under voltage
   5. over temperature
   6. input power loss of phase
   7. loss of reference/feedback
   8. adjustable current limit regulator

H. VFD will be UL 508C approved for electronic motor overload (12t).

I. VFD will include high input transient protection and surge suppression:
   1. 4 MOVs ahead of diode bridge
   2. 120 Joule rated 1600V diode module
   3. Compliant with UL 1449 / ANSI 61.4

J. VFD communication features include:
   1. Two programmable analog inputs
   2. Six programmable digital inputs
   3. Two programmable analog outputs
   4. Three programmable digital relay outputs
   5. Modbus RTU Communications protocol
   6. Adjustable filters on analog inputs and outputs
   7. Input speed signals, including 4-20 mA and 0-10 VDC
   8. Acceleration/Deceleration contacts (floating point control)
   9. Auto restart (customer selectable and adjustable)
   10. Start/Stop options will include 2 wire (dry contact closure), 3 wire (momentary contacts), application of input power, and application of reference signal (PID sleep/wake-up)
   11. Integrated control interface for Siemens FLN, Johnson N2, Modbus RTU, and BACnet MS/TP
       a. Optional LONworks over RS-485.

K. VFD will have the following functions:
   1. Premagnetization on start
   2. DC braking/hold at stop
   3. Ramp or coast to stop
   4. Seven preset speeds
   5. Three critical frequency lockout bands
   6. Start function will include ramp, flying start, automatic torque boost, and automatic torque boost with flying start

2.09 YORK MANUFACTURED HEATING AND COOLING COILS

A. York manufactured coils described in this specification will not include:
   1. Electric Heat coils
   2. Integral face and bypass coils
   3. Heat pipe coils

B. Water, direct expansion (DX), and steam coil capacity and pressure drop performance will be certified in accordance with ARI Standard 410, when selected within fluid velocity, inlet fluid temperature, and entering air temperature ranges specified by ARI 410.

C. Cooling coil segments will have a full-width IAQ drain pan that extends at least 6" downstream of the last coil in the section.

D. Coils will be removable from the side of unit, via removable AHU panels. No more than one panel must be removed to remove a coil.

E. Coils will have frames constructed of galvanized steel. Casing channels will be free-draining and do not block fin area.

F. Cooling coils with finned height greater than 48" will have an intermediate drain pan with downspout to drain condensate to main drain pan. Intermediate drain pan material will match coil frame material.

G. Coil segment door clearances will allow for at least 2-inches of field installed piping insulation.

H. Coil bulkheads and blank-offs will prevent air from bypassing coils.

I. Coil connections will be extended through unit casing.

J. Water and glycol coils will have a 1/4" FPT plugged vent or drain tap on each connection that is accessible from outside the unit.

K. Spool shaped coil grommets will be provided to insulate and seal coil penetrations.

L. Water and glycol coils will be designed to operate at 250 psig and up to 300° F and will be factory tested with 325 psig compressed air under water.

M. Direct expansion (DX) coils will conform to ANSI B9.1 (Safety Code for Mechanical Refrigeration) when operating with a refrigerant pressure not exceeding 250 psig. Coils will be factory tested with 325 psig compressed air under water. DX coils will be dehydrated and sealed prior to installation.

N. Steam distributing coils will be designed for operation at 50 psig pressure, and a corresponding saturated steam temperature of 298° F. Coils will be factory tested with 315 psig compressed air under water.

O. DX coils will have brass distributor with solder-type connections. Suction and discharge connections will be on the same end. DX liquid lines will extend outside the unit.

P. Water, glycol and DX coils tubes will be mandrel expanded to form fin bond and burnished, work-hardened interior surface.

Q. Steam coil tubes will have outer tube outside diameter of 1" and inner distribution tube outside diameter of 5/8". Circuiting will be non-trapping, drainable, suitable for a gravity drain. Steam will discharge in direction of condensate flow to ensure even distribution and heat transfer across each tube.

R. Coil fins will be die-formed, continuous, and have fully drawn collars to accurately space fins, and form a protective sheath for tubes.

2.10 FILTERS

A. Filter segments will be provided, as shown on product drawings. Filter tracks/frames will be an integral part of the unit.

B. Filter media for Solution units delivered in the continental United States will not be shipped with units. Filters will be shipped to a customer defined location. Coordinate filter delivery with York sales representatives.

C. Filter types, nominal sizes, efficiencies, and performance characteristics will be as shown in performance specifications.

D. Filter access will be provided via access doors on filter segments or adjacent segments as required by filter loading scheme. See product drawings for details.

E. Performance of installed HEPA filtration systems is certified via a DOP test and classified as UL Class 1 when tested in accordance with UL Standard 586.

2.11 DAMPERS

A. Dampers will be factory installed.

B. Dampers will have airfoil blades with extruded vinyl edge seals and flexible metal compressible jamb seals.

C. Dampers will have a maximum leakage rate of 4 CFM/square foot at 1" w.g. and comply with ASHRAE 90.1.

D. Maximum damper torque requirement will be 7 in. lbs./ft^2.

E. Damper blades will be parallel acting unless submitted otherwise.

2.12 UVC FIXTURES

A. Fixtures have been tested, listed and labeled as UL/C-UL under Category Code ABQK (Accessories, Air Duct Mounted), UL Standards: 153, 1598 & 1995 respectively.

B. Fixtures meet the "UL" drip proof design and each fixture is equipped with an electrical interlock.

C. Each lamp contains no more than 5.5 milligrams of mercury consistent with current environmental practices while producing the specified output at 500 fpm in temperatures of 55-135° F.

D. Useful lamp life will be 9000 hours with no more than a 20% output loss at the end of one year of continuous use. They are constructed with UVC proof metal bases and will not produce ozone.

2.13 AIR FLOW MONITORING STATIONS

A. Optional airflow monitoring stations will be provided on air inlets, as shown in performance specifications.

B. Airflow monitoring stations will bear the AMCA Certified Ratings Seal for Airflow Measurement Performance.

C. Airflow monitoring station dampers will comply with leakage rates per ASHRAE 90.1.

D. Airflow monitoring stations will be accurate within 5% of actual airflow between 350 FPM and 4000 FPM free area velocity.

E. Outdoor air intake openings with air flow monitoring stations will have rain louver.
   1. Louver will be a wind-driven rain penetration class A louver.
   2. Louver effectiveness ratio will be 100% at the following conditions:
      a. Wind velocity, 29 mph into louver.
      b. Rain fall rate, 3 in./hr.
      c. Free area air velocity, 1500 FPM.

2.14 DIFFUSERS

A. Diffuser segments will be provided, as shown on product drawings.

B. Perforated steel diffuser plates will be installed between fans and downstream components when required to ensure proper velocity profiles across downstream components.

2.15 ROOF CURBS

A. Roof curbs will be furnished, as shown on product drawings.

B. Roof curbs will be galvanized steel and support the perimeter of units, including pipe chases.

C. Roof curbs will have a wood nailing strip.

D. Roof curbs will be shipped loose for installation prior to unit installation.

2.16 APPURTENANCES

A. Safety grates capable of supporting a 300 lb. load will be provided over bottom openings, as shown in performance specifications.

B. Base rails suitable for rigging and lifting will be provided, as shown on product drawings.

C. Lifting lugs will be provided where required for proper lifting.

2.17 FINISHES

A. External unit surfaces will be factory cleaned prior to finishing or shipping.

B. Unit will be painted, as shown in performance specifications.
   1. Painted units will be prime-coated prior to painting.
   2. Paint will be acrylic polyurethane.
   3. Painted unit will exceed 500-hour salt spray test, with (5%) solution, without any sign of red rust when tested in accordance with ASTM B-117.

C. Unpainted air-handling units constructed of galvanized steel will pass the ASTM B-117 test for 220-hour salt spray solution (5%) without any sign of red rust.

2.18 TESTS AND INSPECTIONS

A. Fan skid will be run-balanced at specified speed to insure smooth, operation.
   1. Constant volume fan assemblies will be balanced at design RPM.
   2. Variable volume fan assemblies will be balanced from 10% to 100% of design RPM.
   3. Filter-in measurements will be taken in horizontal and vertical axes on drive and opposite-drive sides of fan shafts.
   4. Constant speed fan vibration limits: filter-in measurements will not exceed 4 mils.
   5. Variable speed fan vibration limits: filter -in measurements will not exceed 7 mils.

B. Unit wiring with voltage greater than 30Vac will be hipot tested prior to shipping.

PERFORMANCE DATA

SPECIAL NOTES: YORK air handler fan and coil performance data is measured in accordance with ARI Standard 430. Most air handler manufacturers do not comply with ARI 430. Therefore, factory performance testing may be valuable for AHU manufacturers that don't comply with ARI 430. YORK guarantees the fan and coil performance data that we submit and therefore do not offer fan & coil performance testing on individual air handlers for specific orders.

AHU-1

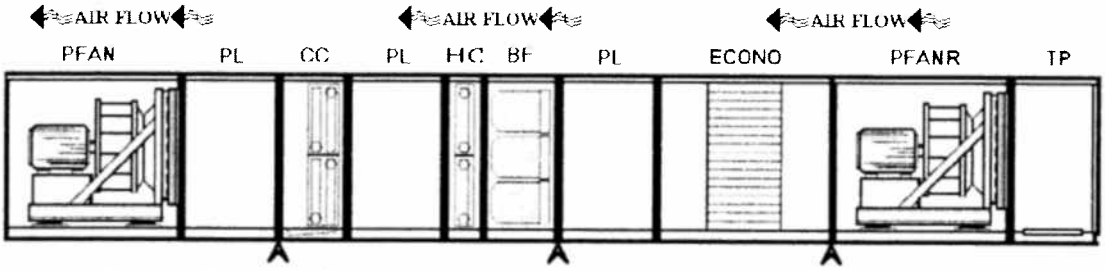
Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Unit Dimension (H* x W x L): 87" x 139" x 466" **Unit Weight:** 24252 lb.

* Height includes 6" base rail



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LEGEND: ( ) = Length in inch [ ] = Weight in lb. ^ = Split

Shipping Split Summary

Group	Length (in.)	Weight (lbs.)	Type Split
PFANR-IP	125	6439	
PL7-ECO	93	3495	Factory Split
CC-PL24-HC-BF	137	6944	Factory Split
PFAN-PL41	111	7374	Factory Split

Shipping Requires Wide Load Permit.

Project Name: VA Mather B650	Sold To:
Location:	Cust. Purch. Order No.:
Engineer:	YORK Contract No.:
Contractor:	Date: Revision Date:

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Unit Options:

Unit Construction:	Weather Proof Curb Mounted
Base:	6" Structural Steel Base Rail, Painted w/ 6 to 8 mil DFT Champagne Epoxy
Floor Material:	12 Ga. HR Steel Diamond Plate, Painted w/ 6 to 8 mil DFT Champagne Epoxy, Full Seam Weld, Thermal Break
Floor Insulation:	2" Polyurethane Foam
SubFloor Material:	None
Wall Thickness:	2"
Exterior Material:	16 Ga. G-90 Galvanized
Wall Insulation:	2" Foam
Interior Material:	20 Ga. Galvanized, Washdown, Thermal Break
Roof Exterior:	16 Ga. G-90 Galvanized
Roof Curb:	12" (Drop Ship) Insulated with 1.5" - 3# Fiberglass
Option(s):	6 to 8 mil DFT Champagne Epoxy Painted Exterior White Elastomeric Roof Coating Standard Foil Unit Nameplate YORK Custom Brand Shipping Protection: Shipping Covers

Note: Construction Overrides exist, see individual segments below.

Special Quotes

SQ#	Description	Weight (lb)	ISP (in. w.g.)
SQ	Exterior material in SF and RF Intake plenum to be 12ga	0	0.00

Electrical Options:

ETL Listed
(1) On/Off Toggle Switch for All Service Lights
Incandescent Vapor Resistant Pendant
GFI Outlet(s)

Special Quotes

SQ#	Description	Weight (lb)	ISP (in. w.g.)
SQ	SPPP with 40hp(2*20) SF VFD, 15(2*7.5) RF VFD, XFMR	0	0.00

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Factory and Field Testing:

Leak Test:	Yes
Test SP:	Non-Default Test SP (+10.00", -10.00")
Leakage:	1%
Deflection Test:	No
Airflow Test:	Yes
Fan Vibration Test:	None
Customer Witness:	No
Test Covers:	Opening covers for field/factory leak testing

IP - Inlet Plenum Segment

Segment Details

Inlet Opening:	Floor (40"L x 108"W, Offset Upstream in L, Centered in W)*
Opening Area:	30.0 sq. ft.
Damper Type:	None
Option(s):	Inlet Baffle
	* Adjusted Opening Size
	Galvanized Safety Screen
	Left Door: 2" T-B Door 24"W x 72.00"H, Out-Swing, Upstream Hinge, w/ 12" x 12" Thermal Pane Window, Stainless Fasteners.
	(1) Service Light

Construction Overrides

Interior Material:	20 Ga. Galvanized, Thermal Break

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

MULTIPLE PFANR - Multiple Plenum Return Fan Segment

Segment Details

Airflow:	20700 CFM	
ESP/TSP:	1.50 in. w.g. / 2.01 in. w.g.	
Fan Mfg/Type/Diameter:	YORK (Twin City) EPQN-270/103 (Class I)	
Multiple Config:	1H X 2W, Standard Redundancy	
Fan RPM:	1164	
Fan BHP:	9.85 BHP	
Fan BHP w/o VFD:	9.99 BHP	
Motor Type:	ODP Premium Effic.7.5HP 1200RPM 254T[1] 460-3-60 FLA: 11.00	
Motor Location:	Direct	
Drive Type:	Direct	
Isolation:	2" Seismic	
Internal Wall:	Galvanized	
Option(s):	19" Extra Section Length	Select Near Synchronous
	Aluminum Wheel	Thrust Restraints
	Inlet Screen	Fan Screen
	(2) P-Ring with Gage	
	Left Door: 2" T-B Door 23"W x 72.00"H, Out-Swing, Upstream Hinge, Stainless Fasteners.	
	Right Door: 2" T-B Door 23"W x 72.00"H, Out-Swing, Upstream Hinge, Stainless Fasteners.	
	(2) Service Lights and (1) Convenience Outlet	

Program Advisories

1. When using motor frame sizes 254T and above, motor j-box must be removed to fit through minimum size access door.

Construction Overrides

Interior Material:	20 Ga. Galvanized, Thermal Break

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

ECO - Outdoor Economizer Segment

Segment Details

EA Opening:	Left (73"H x 46"L, Offset Low in H, Upstream in L) with Drainable Blade Louver
EA Airflow/Area:	20700 CFM / 23.3 sq. ft.
EA Damper Type:	Aluminum - Ultra Low Leak (Parallel Blade)
EA Damper Qty/Size:	(1) 68"H x 43"L
EA Actuator Type:	None
OA Opening:	Right (70"H x 58"L, Offset Centered in H, Upstream in L) with 70"H x 58"L Weatherhood
OA Airflow/Area:	28000 CFM / 28.2 sq. ft.
OA Damper Type:	Aluminum - Ultra Low Leak (Parallel Blade)
OA Damper Qty/Size:	(1) 70"H x 58"L
OA Actuator Type:	None
RA Opening:	Internal (48"H x 56"W)*
RA Airflow/Area:	20700 CFM / 18.7 sq. ft.
RA Damper Type:	Aluminum - Ultra Low Leak (Parallel Blade)
RA Damper Qty/Size:	(1) 48"H x 56"W
RA Actuator Type:	None
Internal Wall:	Galvanized
Option(s):	* Adjusted Opening Size Downstream Left Door: 2" T-B Door 24"W x 72.00"H, Out-Swing, Upstream Hinge, w/ 12" x 12" Thermal Pane Window, Stainless Fasteners. (2) Service Lights Floor Drain with Black Steel Piping, Outlet Left Side

Construction Overrides

Interior Material:	20 Ga. Galvanized, Thermal Break

PL7 - Plenum Segment

Segment Details

Plenum Length:	7"

Construction Overrides

Interior Material:	20 Ga. Galvanized, Thermal Break

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

BF - Bag Filter Segment

Segment Details

Filter Depth:	22" with 2" prefilters
Filter Frame:	Galvanized
Blankoff Material:	Galvanized
Filter Area:	66.0 sq. ft.
Filter Qty/Size:	(9) 24"H X 24"W, (9) 20"H X 24"W
Prefilter Media:	Pleated - 30% Efficient (Class II) (By Factory) (MERV 7)
Filter Media:	90 - 95% Efficient (Class II) (By Factory) (MERV 15)
Load Option:	Upstream Load
Option(s):	0 -- 2" Magnehelic Filter Gauge On Left Side

Construction Overrides

Interior Material:	20 Ga. Galvanized, Thermal Break

HC - Heating Coil Segment

Segment Details

Coil Space Used:	32.0"
Drain Connection:	Left Hand, SS MNPT
Drain Pan (Upstream Coil):	304 Stainless Steel, 12" Length
Drain Pan (Downstream Coil):	304 Stainless Steel, 12" Length
Blankoff Material:	Galvanized
Coil Pull:	Both Left
Option(s):	Floor Drain with Black Steel Piping, Outlet Left Side

PL24 - Plenum Segment

Segment Details

Plenum Length:	24"
Option(s):	Left Door: 2" T-B Door 18"W x 72.00"H, Out-Swing, Upstream Hinge, w/ 8" x 8" Thermal Pane Window, Stainless Fasteners. (1) Service Light Corrosion Resistant Pendant Light Fixtures Floor Drain with Black Steel Piping, Outlet Left Side

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

CC - Cooling Coil Segment

Segment Details

Coil Space Used:	50.0"
Drain Connection:	Left Hand, SS MNPT
Drain Pan (Upstream Coil):	304 Stainless Steel, 18" Length
Drain Pan (Downstream Coil):	304 Stainless Steel, 24" Length
Intermediate Pan:	304 Stainless Steel
Blankoff Material:	304 Stainless Steel
Coil Pull:	Both Left

Construction Overrides

Interior Material:	20 Ga. Stainless Steel, Washdown, Thermal Break

Special Quotes

SQ#	Description	Weight (lb)	ISP (in. w.g.)
SQ	Piping vest	0	0.00

PL41 - Plenum Segment

Segment Details

Plenum Length:	41"
Option(s):	Left Door: 2" T-B Door 23"W x 72.00"H, Out-Swing, Upstream Hinge, w/ 12" x 12" Thermal Pane Window, Stainless Fasteners.
	Right Door: 2" T-B Door 23"W x 72.00"H, Out-Swing, Upstream Hinge, w/ 12" x 12" Thermal Pane Window, Stainless Fasteners.
	(1) Service Light
	Corrosion Resistant Pendant Light Fixtures
	Floor Drain with Black Steel Piping, Outlet Left Side

Construction Overrides

Interior Material:	20 Ga. Stainless Steel, Washdown, Thermal Break

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

MULTIPLE PFAN - Multiple Plenum Supply Fan Segment

Segment Details

Airflow:	28000 CFM
ESP/TSP:	2.50 in. w.g. / 4.49 in. w.g.
Fan Mfg/Type/Diameter:	YORK (Twin City) EPFN-270/100 (Class II)
Multiple Config:	1H X 2W, Standard Redundancy
Fan RPM:	1669
Fan BHP:	27.57 BHP
Fan BHP w/o VFD:	9.49 BHP
Motor Type:	ODP Premium Effic.15HP 1200RPM 284T 460-3-60 FLA: 19.80
Motor Location:	Direct
Drive Type:	Direct
Isolation:	2" Seismic
Discharge Opening:	Floor (60"L x 100"W, Offset Downstream in L, Centered in W)*
Opening Area:	41.7 sq. ft.
Damper Type:	None
Internal Wall:	Galvanized
Option(s):	* Adjusted Opening Size — Select 100% Width
	Aluminum Wheel — Thrust Restraints
	Inlet Screen — Fan Screen
	(2) P-Ring with Gage
	Discharge Floor Opening Galvanized Safety Screen
	Left Door: 2" T-B Door 23"W x 72.00"H, In-Swing, Downstream Hinge, w/ 12" x 12" Thermal Pane Window, Stainless Fasteners.
	Right Door: 2" T-B Door 23"W x 72.00"H, In-Swing, Downstream Hinge, w/ 12" x 12" Thermal Pane Window, Stainless Fasteners.
	(2) Service Lights and (1) Convenience Outlet
	Floor Drain with Black Steel Piping, Outlet Downstream End

Program Advisories

1. When using motor frame sizes 254T and above, motor j-box must be removed to fit through minimum size access door.

Construction Overrides

Interior Material:	20 Ga. Stainless Steel, Washdown, Thermal Break

Special Quotes

SQ#	Description	Weight (lb)	ISP (in. w.g.)
SQ	Add for extended SF section width	1500	0.00

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Coils Listed Starting At Air Inlet

HC Coil

See Pricing Form or Order Form for coil nomenclature.

Coil General / Physical Details				Air Side Performance		Fluid Side Performance	
Location:	HC-01	No. of Coils:	4	Air Flow:	1825*	EWT (°F):	180.0
Tag:		Rows:	1	Altitude (ft):	0	LWT (°F):	150.0
Application:	Heating	Fins Per Inch:	8	EAT-DB (°F):	29.0	GPM:	9.4*
Coil Type:	CDW	Tubes Per Circuit:	4	LAT-DB (°F):	98.5	WPD:	1.0
Face Type:	Full	Finned Height:	36.25*	FV (ft/min):	115	FPS:	1.8
Tube Diameter:	5/8"	Finned Length:	63*	TMBH:	137.2*	Fluid Type:	Water
Tube Material:	Copper	Coil Face Area:	15.86*	APD (in. w.g.):	0.01	Fluid Vol. (ft³):	0.4*
Tube Wall Thickness:	.020"	Conn. Loc.:	Ext. Left			Fluid Wt. (lbs):	21.9*
Fin Material:	Aluminum	Supp Conn Size:	1-1/2				
Fin Thickness:	.006"	Rtn Conn Size:	1-1/2				
Casing Material:	Stainless	No. Of Conn. Sets (per coil):	1*				
Header Material:	Copper	Conn. Mat'l:	Steel MPT				
Dry Weight (lbs.):	88.6*						

Program Advisories

* Note: Data shown per-coil.
All water, R-22 DX and steam coils are certified in accordance to ARI Standard 410.
York suggests the use of red brass or copper connectors when coils are to be attached to a copper or brass piping system.

CC Coil

See Pricing Form or Order Form for coil nomenclature.

Coil General / Physical Details				Air Side Performance		Fluid Side Performance	
Location:	CC-01	No. of Coils:	4	Air Flow:	7000*	EWT (°F):	45.0
Tag:		Rows:	8	Altitude (ft):	0	LWT (°F):	55.0
Application:	Cooling	Fins Per Inch:	12	EAT-DB (°F):	110.0	GPM:	96.8*
Coil Type:	CDW	Tubes Per Circuit:	8	EAT-WB (°F):	70.0	WPD:	11.3
Face Type:	Full	Finned Height:	36.25*	LAT-DB (°F):	46.4	FPS:	4.5
Tube Diameter:	5/8"	Finned Length:	63*	LAT-WB (°F):	46.2	Fluid Type:	Water
Tube Material:	Copper	Coil Face Area:	15.86*	FV (ft/min):	441	Fluid Vol. (ft³):	2.5*
Tube Wall Thickness:	.020"	Conn. Loc.:	Ext. Left	SMBH:	486.9*	Fluid Wt. (lbs)	155.6*
Fin Material:	Aluminum	Supp Conn Size:	3	TMBH:	487.9*		
Fin Thickness:	.006"	Rtn Conn Size:	3	APD (in. w.g.):	0.83		
Casing Material:	Stainless	No. Of Conn. Sets (per coil):	1*				
Header Material:	Copper	Conn. Mat'l:	Steel MPT				
Dry Weight (lbs.):	422.6*						

Program Advisories

* Note: Data shown per-coil.
All water, R-22 DX and steam coils are certified in accordance to ARI Standard 410.
York suggests the use of red brass or copper connectors when coils are to be attached to a copper or brass piping system.

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Static Pressure Summary

Type SP/ Segment	Component	Area (ft^2)	Velocity (ft/min)	Supply Fan (in. w.g.)	Return Fan (in. w.g.)
Specified External:				2.50	1.50
Internal:					
(IP) Inlet Plenum	Transition Loss	30.0	690		
	Galvanized Safety Screen	30.0	690		0.04
(ECO) Outdoor Economizer	EA Transition Loss	23.3	888		0.13
	EA Damper	20.3	1019		0.04
	EA Louver	23.3	888		0.30
	OA Transition Loss	28.2	993	0.17	
	OA Damper	28.2	993	0.04	
	OA Weatherhood	28.2	993	0.08	
	RA Transition Loss	18.7	1109	0.21*	
	RA Damper	18.7	1109	0.05*	
(BF) Bag Filter	Pre-filter: Pleated - 30% Efficient (MERV 7)	66.0	424	0.23	
	High Eff.: 90 - 95% Efficient (MERV 15)	66.0	424	0.55	
(HC) Heating Coil	1 row, 8 fin Heating Coil	63.4	115	0.01	
(CC) Cooling Coil	8 row, 12 fin Cooling Coil	63.4	441	0.83	
(PFAN) SWSI Supply Fan	Discharge Transition Loss	41.7	672	0.04	
	Discharge Galvanized Safety Screen	41.7	672	0.04	
Dirty Filter Allowance:					
Total:				**4.49**	**2.01**

* NOTE: For internal pressure drop totals, the smaller of the RA and OA pressure drops will be ignored.

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Dimensions & Weights Summary

Section	Length** (in.)	Width*+ (in.)	Height+ (in.)	Weight (lbs.)
IP - Inlet Plenum Segment	50	139	81	1951
MULTIPLE PFANR - Multiple Plenum Return Fan SWSI Segment	75	139	81	4488
ECO - Outdoor Economizer Segment	86	139	81	3259
PL7 - Plenum Segment	7	139	81	236
BF Segment - 22" Bag Filter Segment	31	139	81	1327
HC Segment - Heating Coil Segment	32	139	81	1541
PL24 - Plenum Segment	24	139	81	747
CC - Cooling Coil Segment	50	139	81	3329
PL41 - Plenum Segment	41	139	81	1368
MULTIPLE PFAN - Multiple Plenum Supply Fan SWSI Segment	70	139	81	6006
Overall:	**466**	**139**	**87**	**24252**

* The width does not include coil connection extensions or door latches that extend beyond the unit casing.
** The length does not include zone dampers that extend beyond the unit casing.
+ Weatherproof Units: The unit height & width indicated does not include roof panel overhang. Width increases by 2.00" & length increases by 2.00" from dimensions shown.
+ Weatherproof Units: The unit height indicated does not include the roof pitch. The unit roof is pitched up as shown on drawing at 0.25" per foot.

Johnson Controls

YORK CUSTOM AIR HANDLER PERFORMANCE SPECIFICATION

Unit Tag	Qty.	Model No.	Air Flow (CFM)
AHU-1	1	YC-87X139	28000

Sound Summary

Sound Power Leaving Each Opening In The Unit

(dBs re 1.0 pico-Watts)

Opening	63	125	250	500	1K	2K	4K	8K	LW/LWA
IP Segment Inlet	80	86	91	82	74	73	67	62	93/85
Economizer EXH	78	85	94	82	77	73	70	65	95/87
Economizer OSA	78	86	95	82	78	74	71	66	96/87
PFAN Discharge	92	96	101	98	93	86	82	77	104/99

Bare Fan Sound Power

(dBs re 1.0 pico-Watts)

Fan	63	125	250	500	1K	2K	4K	8K	LW/LWA
Return Fan Inlet	81	87	92	83	75	74	68	63	94/86
Return Fan Outlet	84	86	92	88	82	78	74	67	95/89
Supply Fan Inlet	84	95	104	88	85	80	77	74	105/96
Supply Fan Outlet	92	96	101	98	93	86	82	77	104/99

Casing Radiation

(dBs re 1.0 pico-Watts)

Fan	63	125	250	500	1K	2K	4K	8K	LW/LWA
Return Fan	68	66	68	59	59	42	34	24	73/63
Supply Fan	76	76	77	69	70	50	42	34	82/74
Combined	76	76	77	69	70	50	42	34	82/74

Sound power levels are derived from data collected on representative fans in accordance with AMCA Standard No. 300 and sound intensity methods. For draw through and blow through configurations, the reported sound power levels include corrections for plenum attenuation. The corrections are based on the physical size of the plenum, locations of openings, and insulation package. Openings upstream of the return fan are based on return fan data. Openings downstream of the supply fan are based on supply fan data. Openings between the supply fan and return fan are based on both supply and return fan data. "Bare fan" levels are as measured in the laboratory with no plenum correction.

DRAWINGS

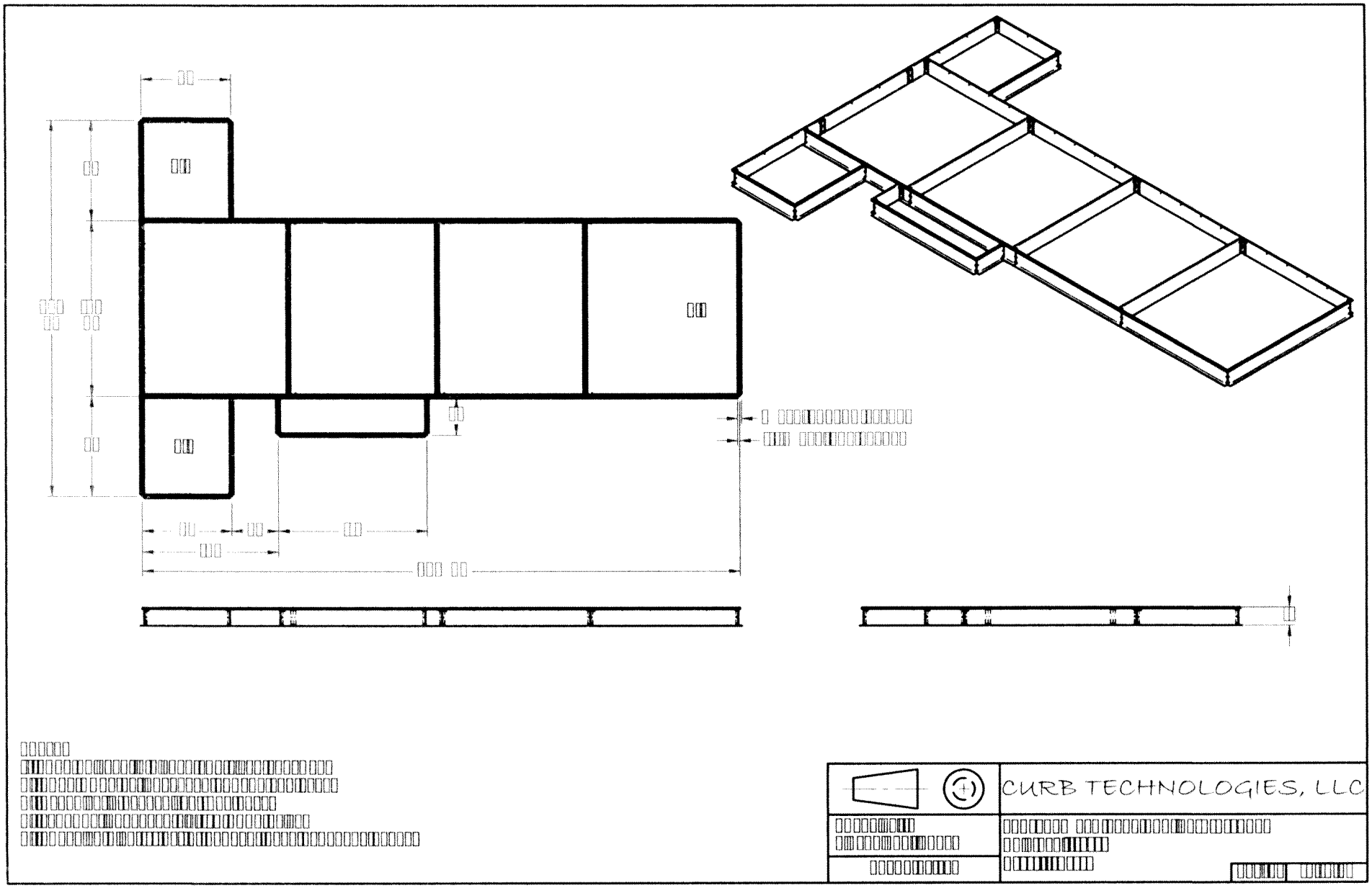
AHU-1:

- Unit Drawing
- Roof Curb Detail

YORK INTERNATIONAL

VAM BLDG 650

Tag: AHU-1



CURB TECHNOLOGIES, LLC

FAN CURVES

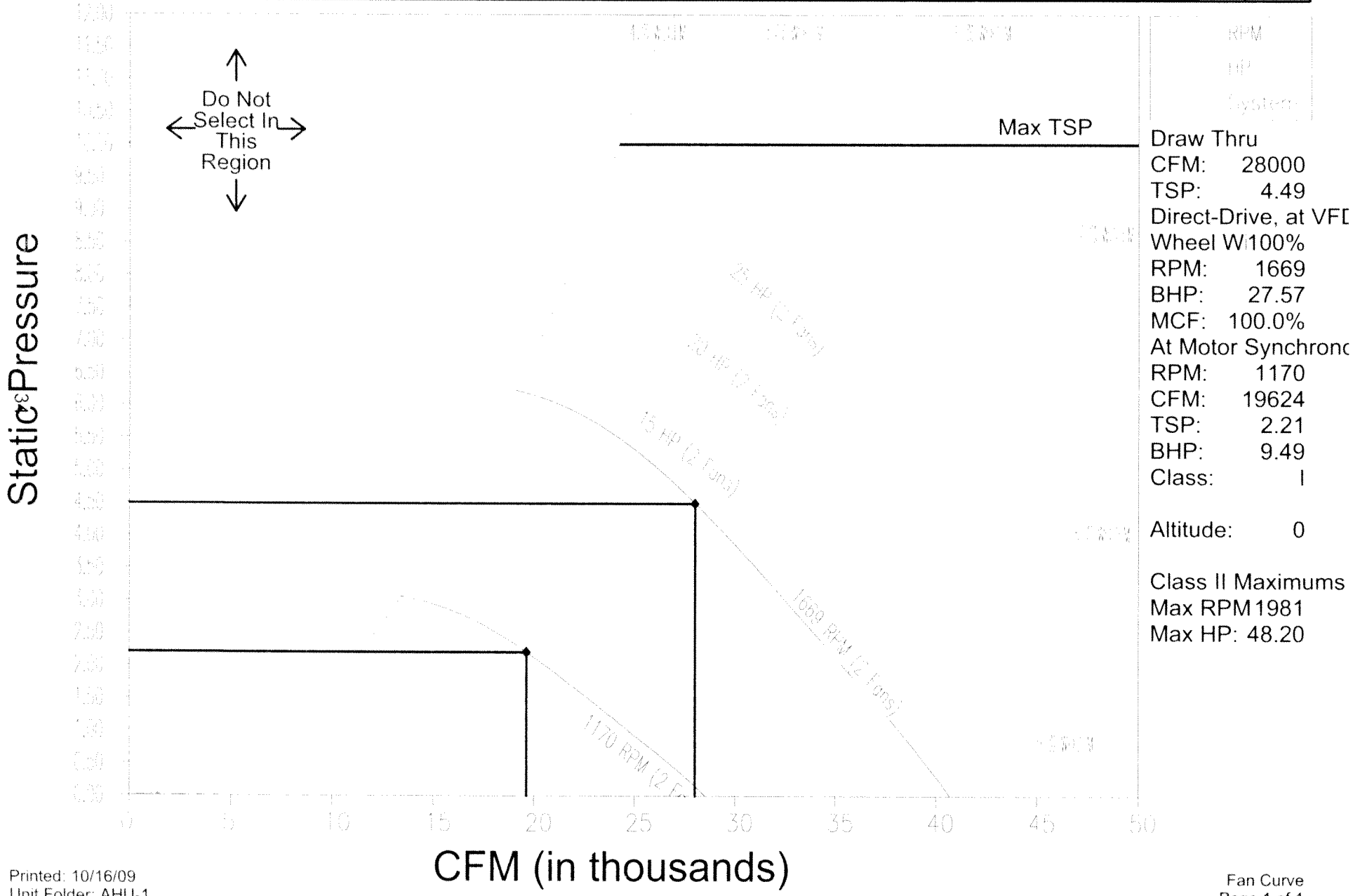
- **Plenum Supply Fans:**
  - AHU-1

- **Plenum Return Fans:**
  - AHU-1

Johnson Controls

YORK CUSTOM AIR HANDLER FAN CURVE

Project Name	Unit Tag	Qty	Model	Section	CFM	Fan Type	Class	Fan Size	VIV
VA Mather B650	AHU-1	1	TC	(2) FP	28000	EPFN	II	270/100	No

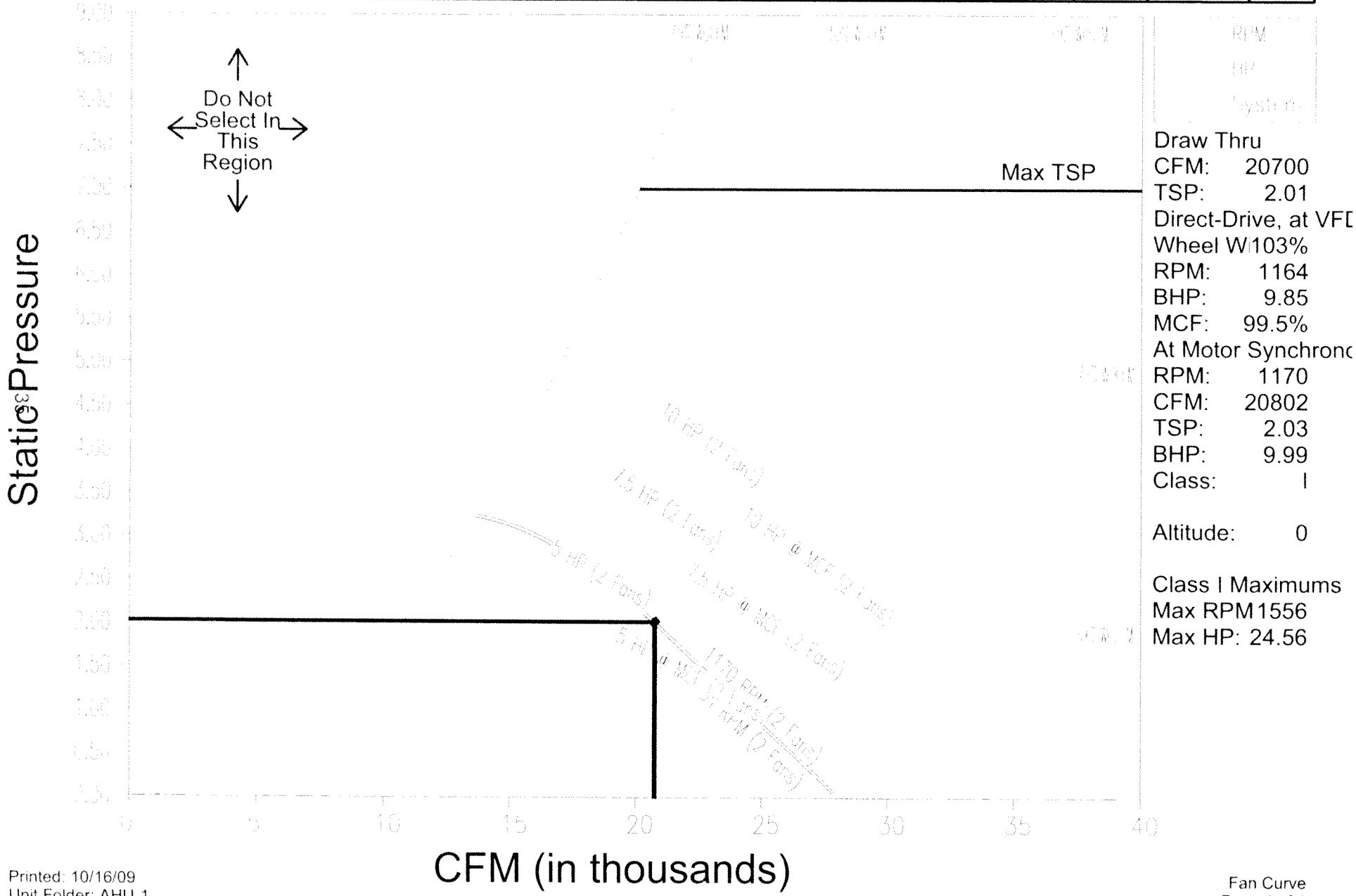


Printed: 10/16/09
Unit Folder: AHU-1

Johnson Controls

YORK CUSTOM AIR HANDLER FAN CURVE

Project Name	Unit Tag	Qty	Model	Section	CFM	Fan Type	Class	Fan Size	VIV
VA Mather B650	AHU-1	1	TC	(2) FR2	20700	EPQN	I	270/103	No



Draw Thru
CFM: 20700
TSP: 2.01
Direct-Drive, at VFI
Wheel W103%
RPM: 1164
BHP: 9.85
MCF: 99.5%
At Motor Synchronc
RPM: 1170
CFM: 20802
TSP: 2.03
BHP: 9.99
Class: I

Altitude: 0

Class I Maximums
Max RPM 1556
Max HP: 24.56

Printed: 10/16/09
Unit Folder: AHU-1

FILTER GAUGE CUT SHEETS

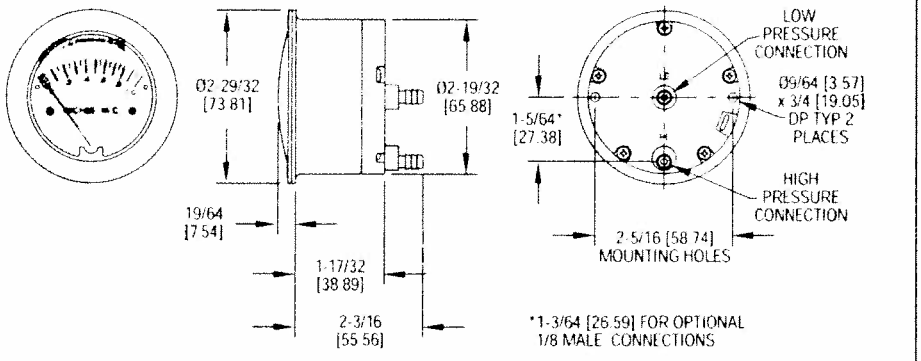
Series 2-5000

Minihelic® II Differential Pressure Gages

Combining High Accuracy, Compactness, Dependability, and Low Cost

Patent No. 4,347,744

The Series 2-5000 Minihelic® II low differential pressure gage provides excellent readability in a compact size.



Dimensions, Series 2-5000 Minihelic® II Gage.

Combining clean design, small size and low cost with enough accuracy for all but the most demanding applications our Minihelic® II gage offers the latest in design features for a dial type differential pressure gage. It is our most compact gage but is easy to read and can safely operate at total pressures up to 30 psig. The Minihelic® II is designed for panel mounting in a single 2⅛" diameter hole. Standard pressure connections are barbed fittings for ⅛" I.D. tubing; optional ¼" male NPT connections are also available. Over-pressure protection is built into the Minihelic II® gage by means of a blow-out membrane molded in conjunction with the diaphragm. Accidental over-ranging up to the rated total pressure will not damage the gage. With removable lens and rear housing, the gage may be easily serviced at minimum cost.

With the housing molded from mineral and glass filled nylon and the lens molded from polycarbonate, the gage will withstand rough use and exposure as well as high total pressure. The 5% accuracy and low cost of the Minihelic® II gage make it well-suited for a wide variety of OEM and user applications. OEM applications include cabinet air purging, medical respiratory therapy equipment, air samplers, laminar flow hoods, and electronic air cooling systems. As an air filter gage, the Minihelic® II gage finds many end use applications on large stationary engines, compressors, ventilators, and air handling units.

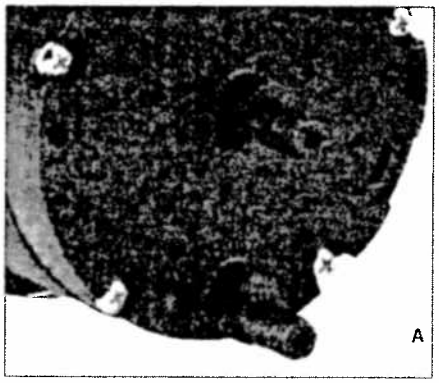
The Minihelic® II gage is suitable for many of the same applications as the Magnehelic® gage where the greater accuracy, sensitivity, and higher and lower differential pressure ranges of the Magnehelic® gage are not required.

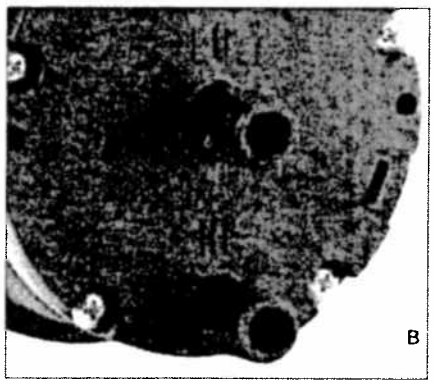
SPECIFICATIONS

Service: Air and compatible gases
Wetted Materials: Consult factory
Housing: Glass filled nylon, polycarbonate lens
Accuracy: ±5% of full scale at 70°F (21.1°C)
Pressure Limits: 30 psig (2.067 bar) continuous to either pressure connection
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C)
Size: 2 1/16" (52.39 mm) diameter dial face
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations
Process Connections: Barbed, for 3/16" I.D. tubing (standard). 1/8" male NPT (optional)
Weight: 6 oz (170.1 g)

CAUTION: FOR USE ONLY WITH AIR OR COMPATIBLE GASES.

PRESSURE CONNECTIONS





A The standard Minihelic® II gage is supplied with two barbed pressure taps molded into the rear housing of the gage. These connections allow easy, fast connection to the gage using ⅛" I.D. rubber or plastic tubing.

B For applications in systems having higher total operating pressures, optional male ¼" NPT pressure connections can be supplied.

Note the oblong over pressure vent hole on the back of the gage at the right of the connections. This vent is sealed by a membrane molded in conjunction with the diaphragm and will blow out at approximately 75 psi.

Simplicity of Design Ensures Reliable Operation

Housing is molded from strong mineral and glass filled nylon.

Pointer stops of molded rubber prevent pointer over-travel without damage.

Full vie lens is removable and molded of tough polycarbonate.

Aluminum scale litho-printed black on white enhances readability.

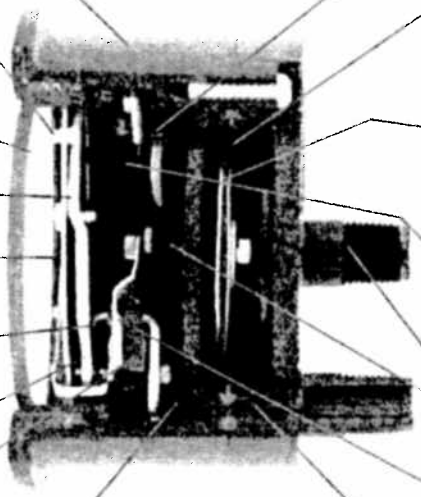
Red tipped aluminum pointer rigidly mounted to helix is easy to see.

Wishbone assembly provides mounting for helix, helix bearings, and pointer shaft.

e el bearings provide virtually friction free helix motion.

Heli is free to rotate in jewel bearings. It aligns with magnetic field of magnet to transmit pressure indications to pointer.

ero ad ustment scre located behind the removable lens, eliminates tampering.



Range spring calibration clamp fixes live length of spring for proper gage calibration and is factory set and sealed.

Silicone rubber diaphragm allows accurate response to a broad range of temperatures and at extremely low pressure. Incorporates blow out area for overpressure protection.

iaphragm support plates of lightweight aluminum on each side of the diaphragm minimize position or attitude sensitivity and help define pressure area.

Flat lea range spring reacts to pressure on the diaphragm. Live length is adjustable for calibration. Small amplitude of motion minimizes inaccuracies and assures long life.

Lo pressure tap connects to rear chamber.

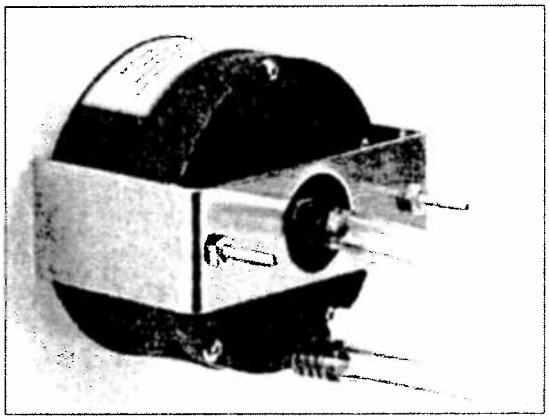
Coil spring lin provides a resilient connection between the diaphragm and the range spring.

Ceramic magnet mounted on a molded bracket at the end of the range spring rotates the helix without direct mechanical linkage.

High pressure tap connects with the front chamber through passageway in the plastic case and a sealing ring molded into the edge of the diaphragm.

Patent No. 4,347,744

PANEL MOUNTING



Mounting hardware is supplied with the Minihelic® II gage for panel mounting through a single hole, 2-5/8" (67 mm) in diameter. Panel thickness up to 1/2" (13 mm) can be accommodated with the hardware supplied. If necessary, surface mounting of the gage can be accomplished by means of two 4-40 screws into the tapped mounting bracket stud holes in the rear of the gage. Surface mounting requires clearance holes in the panel for the two pressure taps.

MO ELS

e er	e es er	e er	e S	e er	e er
2-5000-0	0-0.5	2-5205	0-5	2-5000-25	0-25
2-500	0-1.0	2-52 0	0-10	2-5000-50	0-50
2-5002	0-2.0	2-52 5	0-15	2-5000- 00	0-100
2-500	0-3.0	2-52 0	0-30	e er	e s s
2-5005	0-5.0				
2-50 0	0-10			2-5000- 25	0-125
2-5020	0-20			2-5000-250	0-250
2-50 0	0-40			2-5000-500	0-500
2-50 0	0-60			e er	e
2-5 00	0-100			2-5000-	0-1
				2-5000-	0-3

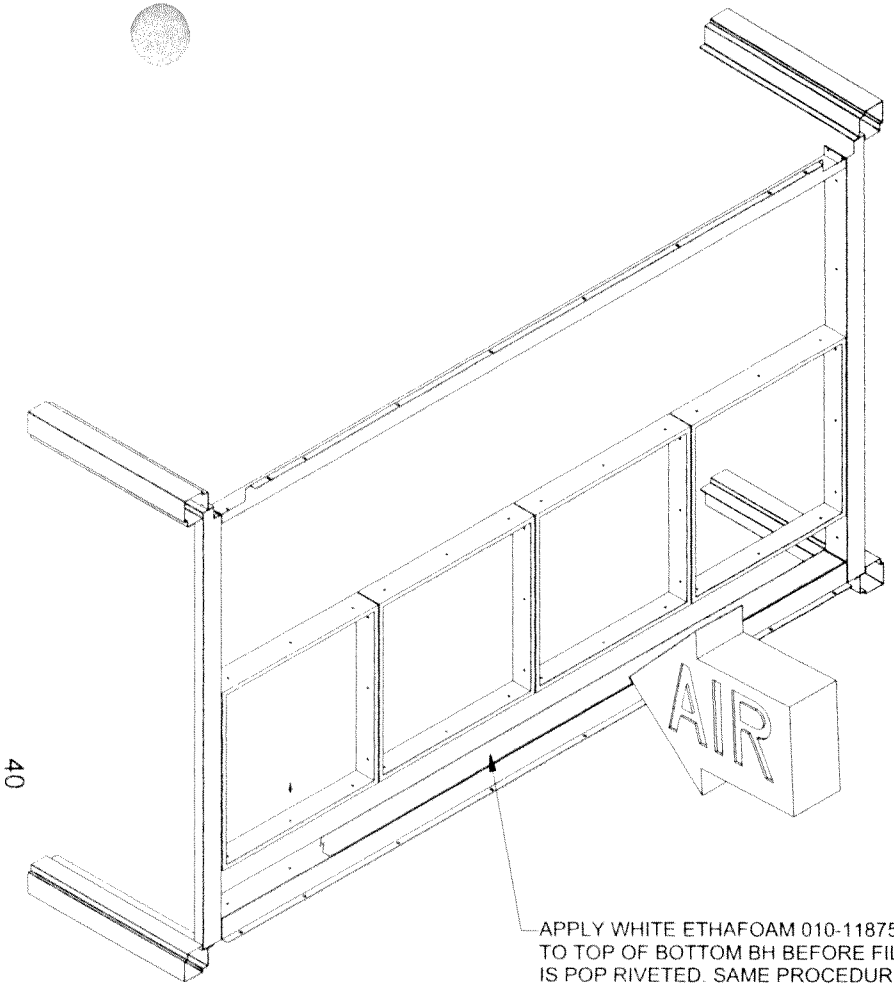
ess ries
- Porta e it
- Sur ace Mt Brkt
- 0 Air Filter it

*THIS RANGE EMPLOYS SPIRALLY WOUND BERYLLIUM COPPER BOURDON TUBE POINTER DRIVE MECHANISM.

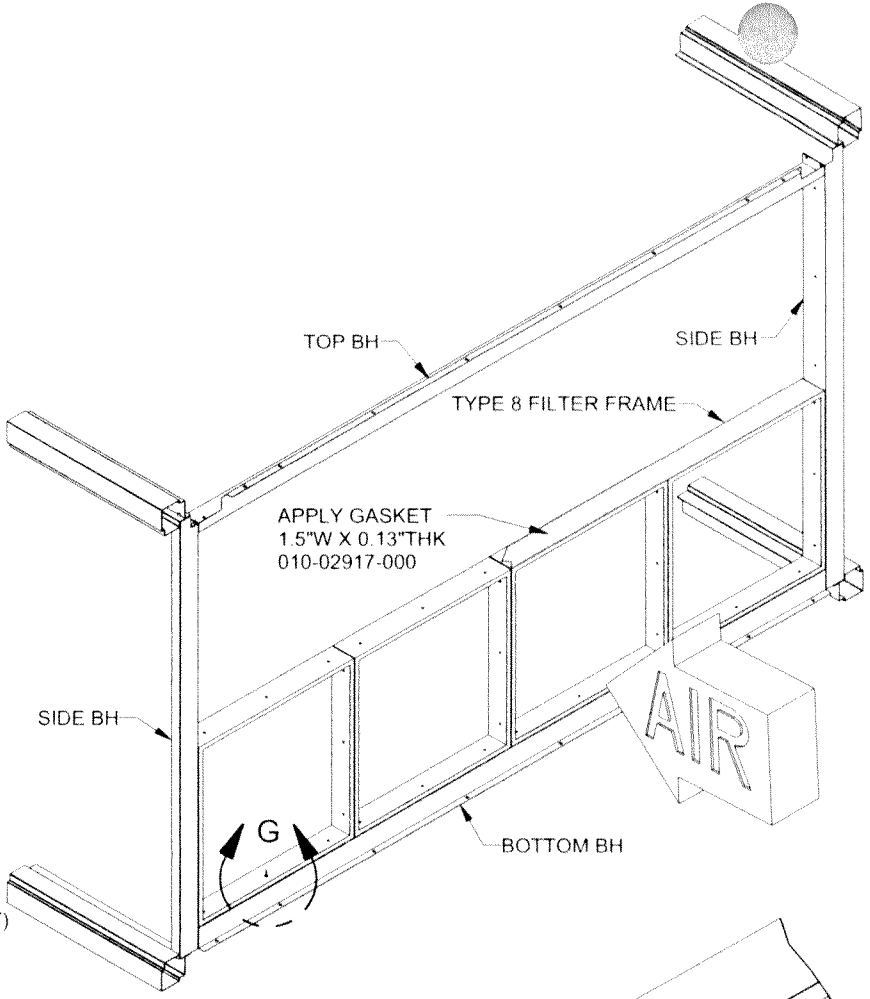
NOTE: CONSULT FACTORY REGARDING AVAILABILITY OF ADDITIONAL RANGES.

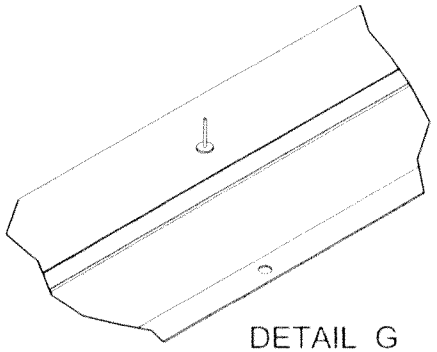
or optional male NPT connections, add suffix -NPT to model numbers listed above. xample: 2-500 -NPT. No extra charge.

FILTER FRAME CUT SHEETS



APPLY WHITE ETHAFOAM 010-11875-010 (GASKET) TO TOP OF BOTTOM BH BEFORE FILTER TRACK IS POP RIVETED. SAME PROCEDURE ON TOP BH





DETAIL G

APPLY GASKET 1.5"W X 0.13"THK 028-11875-010 BETWEEN FILTER FRAMES.

SECURE FILTER TRACK USING 3/16" X 3/8" POP RIVETS 021-19587-000 IN ALL HOLES ALONG FILTER TRACK.

THIS ASSEMBLY SHOWS THE FILTER IN THE REAR LOAD ARRANGEMENT. FOR A FRONT LOAD ARRANGEMENT FILTER FRAMES WILL BE TURNED OPPOSITE SHOWN.

STEP 4

YORK INTERNATIONAL

AIRSIDE PRODUCTS GROUP

REV LEV	DATE	REVISION RECORD	DR	CHG. NO.
	4/30/03	NEW	SBP	0703-0148
A	04/05/04	UPDATED ASSEMBLY MODEL	DKH	04-121
B	12/15/04	UPDATED ASSEMBLY MODEL	DKH	04-453

DIMENSIONS ARE IN INCHES

TOLERANCES PER ENG SPEC M-287

WELDING PER ENG SPEC M-36

TYPE 8 RIGID FILTER TRACK ASSEMBLY

MATERIAL TYP.

THICKNESS

MASTER MODEL

SIZE A

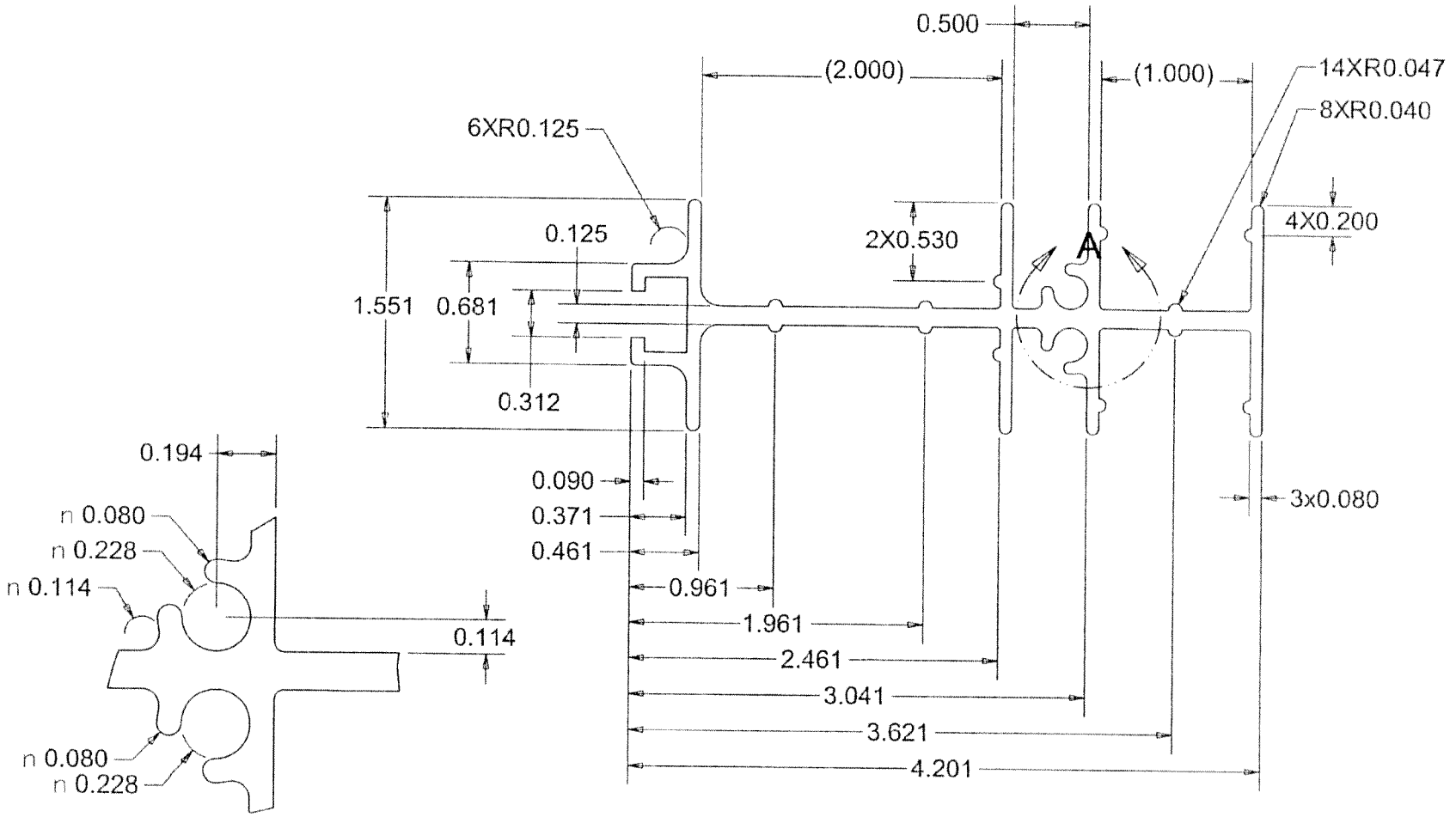
DRAWING NUMBER 386-02019-004

SHEET 1 OF 1

C:\SOLUTION\ECN 04-453(ASSY MANU)\386-02019-000\386-00005-004.iam

Notes

1. ALUMINUM ALLOY 6063-T5
2. BLEMISHES AND OR SANDING FOR OUTER SURFACES IS NOT PERMITTED.
3. ALL RADII 0.030 UNLESS OTHERWISE SPECIFIED.



DETAIL A

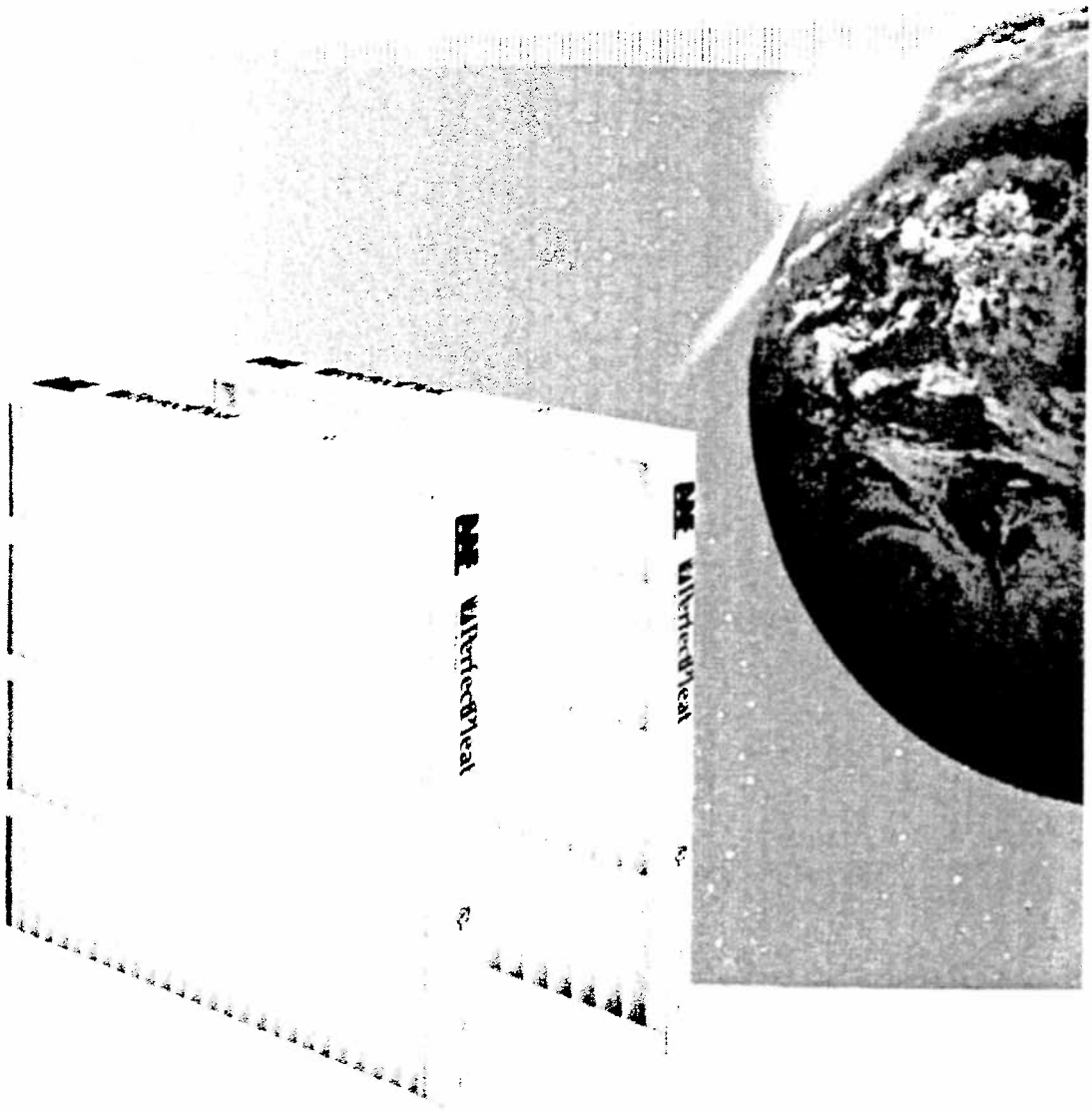
YORK INTERNATIONAL	REV LEV	DATE	REVISION RECORD	DR.	CHG. NO.	TRACK EXTRUDED, M, BAG/RIGID,W/ 2" PF	MATERIAL TYPE: STL GALV	ENG. STD. R259
AIRSIDE PRODUCTS GROUP							CUT SIZE:	
							SIZE: A	DRAWING NUMBER: 004-006-002
	-	04-01-03	NEW	hjd	0703-0128		SCALE: NTS	SHT 1 OF 1

ITEMS SHIPPING SEPARATELY

Detailed information on the following components is included in this section:

American Air Filters:

- 2", 30% efficient (MERV 7) pleated pre-filters
- 21", 90-95% efficient (MERV 15) bag final-filters



AmericanAirFilter

PerfectPleat®
PerfectPleat® HC

1" and 2" Extended Surface, Pleated Filter with Process-Controlled Quality

With DuraFlex® Media

Better Air is Our Business

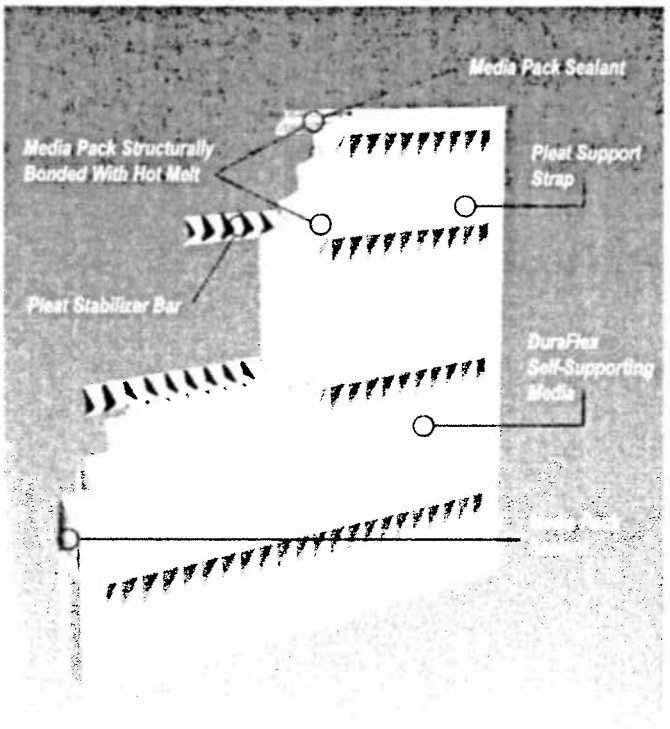
AmericanAirFilter

PerfectPleat®
PerfectPleat® HC

Extended Surface, Pleated Filter with Process-Controlled Quality

MERV 7

- ***Patented media, filter design, and manufacturing process. Patents covered under one or more of the following US 6398839 B2; US 6254653 B1; US 6159318; US 6165242; US 6387140 B1 (1" model only)***
- ***Form and fit unlike any other pleat available today***
- ***Self-supporting DuraFlex® media made from virgin fiber; no wire support needed***
- ***Consistent media with controlled fiber size and blend***
- ***HC (High Capacity) model available for applications where airflow and longer life are issues***
- ***Available in 1", 2" and *4" models***



PerfectPleat 2" Construction

The Air Filtration Leader

AAF International, one of the world's largest manufacturers of air filtration products, is known for technical innovation and excellence. Designed, developed, and patented by AAF, the PerfectPleat is a product with form and fit unlike any other pleated filter in the marketplace today. In addition, the PerfectPleat has the filtering efficiency you need and expect.

Superior Design and Construction

Drawing on years of experience in manufacturing quality air filters, AAF has created a state-of-the-art process for producing pleated filters. The extremely high quality of these filters is a result of three unique innovations: a new automated manufacturing process; a unique, self-supporting media; and a filter construction that provides incredible strength without wire support.

Since their introduction, pleated filters have become a larger and more important segment of the filtration marketplace. However, current design and process are not conducive to the manufacture of consistently pleated media packs or finished filters. Inconsistency in pleat arrangement, variations in media, improper bonding of media to frame, along with antiquated manufacturing techniques, have a negative impact on efficiency, resistance, durability, and strength.

The automated and controlled process AAF has developed for the PerfectPleat eliminates these inconsistencies and irregularities. Our automated manufacturing process offers consistency our competitors cannot match in the everyday manufacture of pleated filters.

** See brochure AFP-1-206 for 4" model*

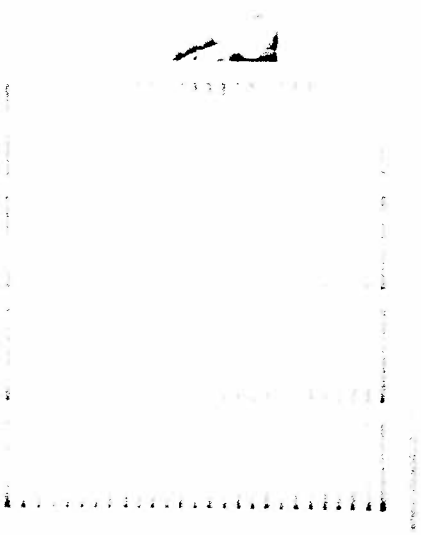
Pleat Stabilizer Adhesive Detail

DuraFlex® Media - Patented Media Design

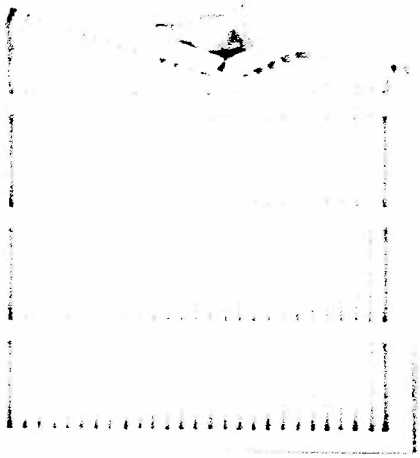
Uniform size virgin fibers are assembled in closely controlled blends to create a media that is both self-supporting and remarkably consistent in performance. The self-supporting characteristics allow a pleating pattern that promotes excellent dust holding and low resistance to airflow. The PerfectPleat also meets or exceeds all current expectations for service life. PerfectPleat HC and PerfectPleat are classified MERV 7.

DuraFlex® Media is Self-Supporting

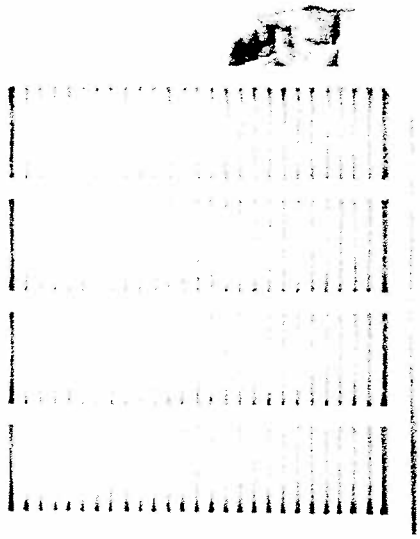
DuraFlex media's unique construction makes it self-supporting. When pleated, DuraFlex will hold its shape without the wire support characteristic of conventional pleated filters. That means no potential for the formation of rust and safer handling - no nicks or cuts for the installer. With the superior resiliency of DuraFlex media and no need for wire support, the PerfectPleat can sustain significant abuse and maintain its shape and pleat spacing. The absence of the wire also makes the filter totally incinerable, which simplifies disposal.



PerfectPleat with DuraFlex media produces a filter with excellent form and fit.



As a result of its unique design, PerfectPleat can withstand significant damage.



DuraFlex media has "memory" which allows PerfectPleat to remain functional, even when the frame has been compromised.

2" PerfectPleat — Heavy Duty Frame

The perimeter frame of the PerfectPleat HC and PerfectPleat is constructed from the highest wet-strength 28 pt. beverage carrier board available, securely bonded to the media pack. The 28 pt. thickness improves filter strength and helps resist damage.

Uniquely designed pleat stabilizers are bonded to the media on the air leaving side to ensure uniform pleat spacing and provide additional strength. On the air-entering side, support straps add to the PerfectPleat's rigidity. The support straps and pleat stabilizers ensure integrity against turbulent airflow and provide excellent lateral stability for installation in side-access systems.

Applications

The PerfectPleat HC is ideal for applications where pleated filters are currently in use and higher efficiencies are required or desired.

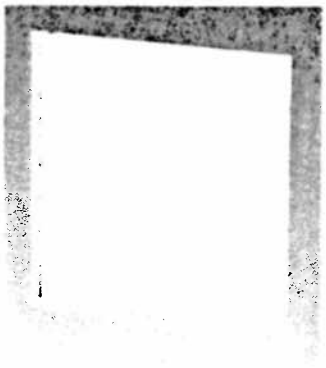
The PerfectPleat is identical to the PerfectPleat HC but with approximately 25% less media. It is best suited for standard capacity pleated filter applications.

Every PerfectPleat offers superior durability and performance when properly installed and maintained.

A Heavy Duty (HD) PerfectPleat is available for applications where extremely low temperature and high airflow are present. See Brochure AFP-1-201.

1" PerfectPleat - Strength and Durability

The 1" PerfectPleat HC and PerfectPleat have the same durability and performance as the 2" models. Both are made using DuraFlex media encased in a 28 pt. beverage carrier board frame. PerfectPleat 1" models feature a perimeter frame, with three supporting straps on the air entering and air leaving sides of the filter. Both models resist crushing and abuse and can be used in any application where 1" filters are currently in place. PerfectPleat HC and PerfectPleat are rated MERV 7.



PerfectPleat HC 1" air entering side

AmericanAirFilter

PerfectPleat®
PerfectPleat® HC

Product Information Standard Sizes

Nominal Sizes (Inches) (W x H x D)	Actual Sizes (Inches) (W x H x D)	Rated Airflow Capacity (SCFM) 300 FPM	500 FPM	625 FPM	Pleats Per Filter PerfectPleat HC 1"	PerfectPleat 1"	PerfectPleat HC 2"	PerfectPleat 2"
10 x 10 x 1	9 ½ x 9 ½ x ¾	200	**350**		11	10		
10 x 20 x 1	9 ½ x 19 ½ x ¾	400	**700**		11	10		
12 x 12 x 1	11 ½ x 11 ½ x ¾	300	**500**		14	12		
12 x 20 x 1	11 ½ x 19 ½ x ¾	500	**850**		14	12		
12 x 24 x 1	11 ½ x 23 ½ x ¾	600	**1000**		14	12		
14 x 20 x 1	13 ½ x 19 ½ x ¾	600	**1000**		16	14		
14 x 25 x 1	13 ½ x 24 ½ x ¾	750	**1200**		16	14		
15 x 20 x 1	14 ½ x 19 ½ x ¾	650	**1050**		17	15		
16 x 16 x 1	15 ½ x 15 ½ x ¾	550	**900**		19	16		
16 x 20 x 1	15 ½ x 19 ½ x ¾	650	**1100**		19	16		
16 x 25 x 1	15 ½ x 24 ½ x ¾	850	**1400**		19	16		
18 x 20 x 1	17 ½ x 19 ½ x ¾	750	**1250**		21	18		
18 x 24 x 1	17 ½ x 23 ½ x ¾	900	**1500**		21	18		
18 x 25 x 1	17 ½ x 24 ½ x ¾	950	**1550**		21	18		
20 x 20 x 1	19 ½ x 19 ½ x ¾	850	**1400**		24	20		
20 x 25 x 1	19 ½ x 24 ½ x ¾	1050	**1750**		24	20		
24 x 24 x 1	23 ½ x 23 ½ x ¾	1200	**2000**		29	24		
25 x 25 x 1	24 ½ x 24 ½ x ¾	1300	**2200**		30	25		
10 x 20 x 2	9 ½ x 19 ½ x 1 ¾	400	**700**	850			11	8
12 x 20 x 2	11 ½ x 19 ½ x 1 ¾	500	**850**	1050			14	10
12 x 24 x 2	11 ½ x 23 ½ x 1 ¾	600	**1000**	1250			14	10
14 x 25 x 2	13 ½ x 24 ½ x 1 ¾	750	**1200**	1500			16	11
15 x 20 x 2	14 ½ x 19 ½ x 1 ¾	650	**1050**	1300			17	12
15 x 25 x 2	14 ½ x 24 ½ x 1 ¾	800	**1300**	1650			17	12
16 x 16 x 2	15 ½ x 15 ½ x 1 ¾	550	**900**	1100			19	13
16 x 20 x 2	15 ½ x 19 ½ x 1 ¾	650	**1100**	1400			19	13
16 x 24 x 2	15 ½ x 23 ½ x 1 ¾	800	**1350**	1650			19	13
16 x 25 x 2	15 ½ x 24 ½ x 1 ¾	850	**1400**	1750			19	13
18 x 25 x 2	17 ½ x 24 ½ x 1 ¾	950	**1550**	1950			21	15
18 x 24 x 2	17 ½ x 23 ½ x 1 ¾	900	**1500**	1900			21	15
20 x 20 x 2	19 ½ x 19 ½ x 1 ¾	850	**1400**	1750			24	17
20 x 24 x 2	19 ½ x 23 ½ x 1 ¾	1000	**1650**	2100			24	17
20 x 25 x 2	19 ½ x 24 ½ x 1 ¾	1050	**1750**	2150			24	17
24 x 24 x 2	23 ½ x 23 ½ x 1 ¾	1200	**2000**	2500			29	20
25 x 25 x 2	24 ½ x 24 ½ x 1 ¾	1300	**2150**	2700			30	21

PerfectPleat and PerfectPleat HC filters are classified UL Class 2. Testing was performed according to UL Standard 900 and CAN 4-S111.

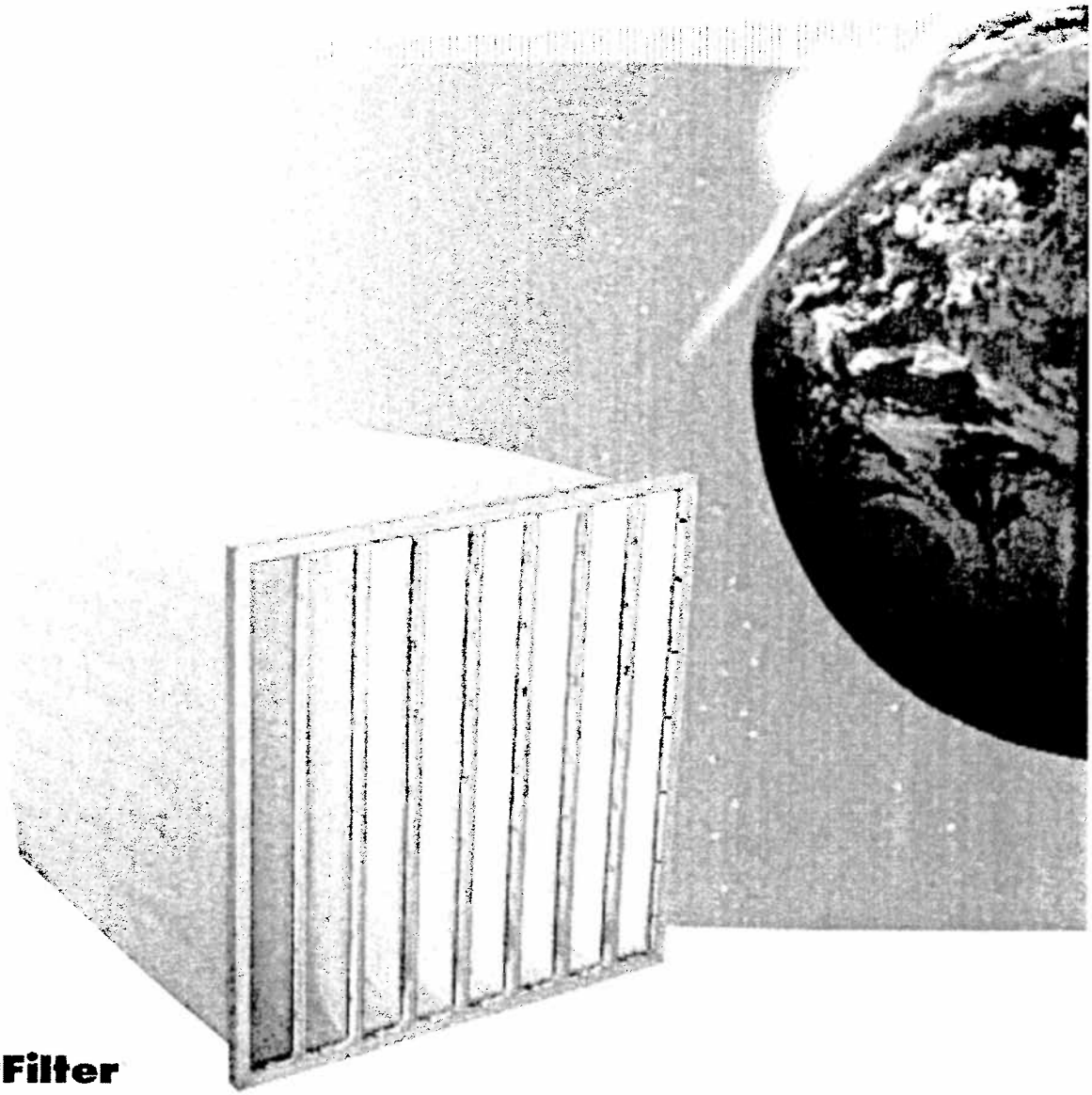
Performance Data

Filter	Pleats Per Lineal Foot	Rated Initial Resistance (in. w.g.) 300 FPM	500 FPM	625 FPM	Recommended Final Resistance (in. w.g.)	ASHRAE 52.2 MERV	Continuous Operating Temperature Limits °F	°C
PerfectPleat HC 2"	15.0	.12	**.28**	.43	1.0	7	170°	77°
PerfectPleat 2"	10.0	.14	**.30**	.45	1.0	7	170°	77°
PerfectPleat HC 1"	15.0	.23	**.48**	----	1.0	7	170°	77°
PerfectPleat 1"	12.0	.27	**.56**	----	1.0	7	170°	77°

AAF Better Air is Our Business®

10300 Ormsby Park Place Suite 600
Louisville, Kentucky 40223-6169
www.aafintl.com

Customer Service 888 AAF 2003
Fax 888 223 6500



AmericanAirFilter

DriPak® 2000

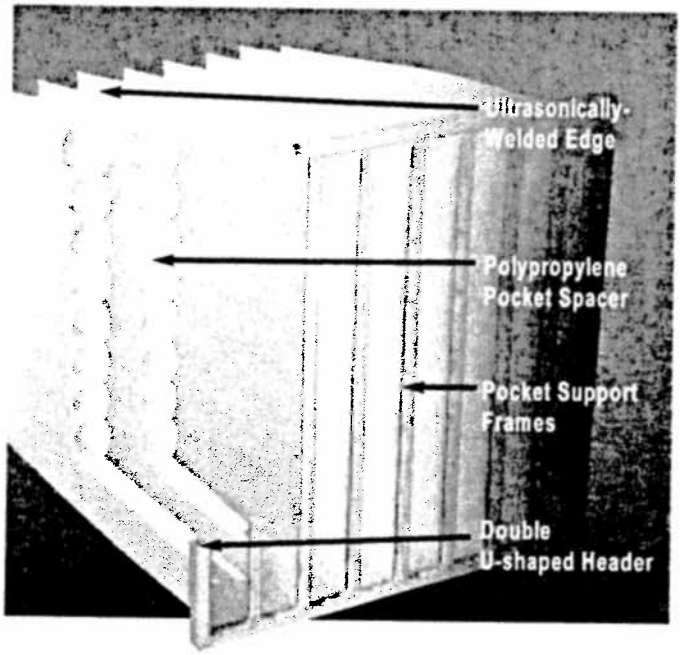
Synthetic Extended Surface Pocket Filters

Available with Antimicrobial

Better Air is Our Business

AmericanAirFilter
DriPak 2000

Extended Surface Pocket Filters with Layered, Meltblown Synthetic Media



- *High-loft, layered, meltblown synthetic media improves performance*
- *Ultrasonically-welded pocket spacers and edges*
- *Available in four efficiencies: MERV 15 (90-95%*), MERV 14 (80-85%*), MERV 12 (60-65%*) and MERV 8 (40-45%*)*
- *Available with antimicrobial*

DriPak 2000

Designed for high performance in demanding operating conditions, ultrasonically-welded DriPak 2000 extended surface pocket filters can function as prefilters or final filters where clean air is a necessity.

DriPak 2000 filters are ideal for healthcare facilities, automotive paint booths, commercial buildings, and a variety of industrial applications. Designed and manufactured by AAF International, pioneers in extended surface pocket filters, the ultrasonically-welded DriPak 2000 raises the industry standard for value and performance.

Now Better Than Ever
Today's DriPak 2000 features a unique, ultrasonically-welded pocket configuration that guarantees complete pocket inflation and eliminates crowding or leakage. Reinforced pocket support frames eliminate flexing or buckling, even in a turbulent operating environment.

The DriPak 2000 is available in four efficiencies, MERV 15, MERV 14, MERV 12, and MERV 8 to meet the requirements of your HVAC system.

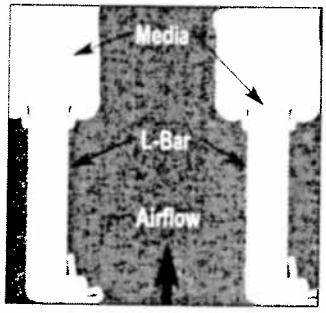
DriPak 2000 with antimicrobial is designed specifically to improve Indoor Air Quality (IAQ). Air filters trap and concentrate particulate air contaminants including viable fungal and bacterial spores. The presence of the antimicrobial preservative in the filter media is intended to preserve the integrity of the media throughout the useful life of the filter. Antimicrobial preservatives are not meant to increase the efficiency of the filter, nor to kill microorganisms "on the fly" as they pass through a filter.

IAQ Engineered

The DriPak 2000 is made from layered, meltblown synthetic media protected by a scrim on the air leaving side. Layering the media provides both a high efficiency final filter layer that effectively filters fine particulate and an integral lofted prefilter layer that captures larger particulate. Meltblown synthetic media is stronger than fiberglass, non-shedding, and is water resistant.

Designed for Performance

DriPak 2000 employs a sturdy pocket design that includes ultrasonic welding to ensure leak-free pockets. Interlocked support frames attached to the pockets prevent flexing and buckling during full inflation. The double U-shaped, reinforced header forms a solid container for the pocket support frames.

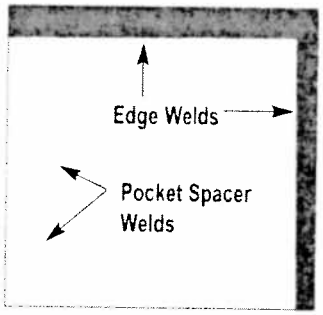


Interlocked Pocket Support Frames

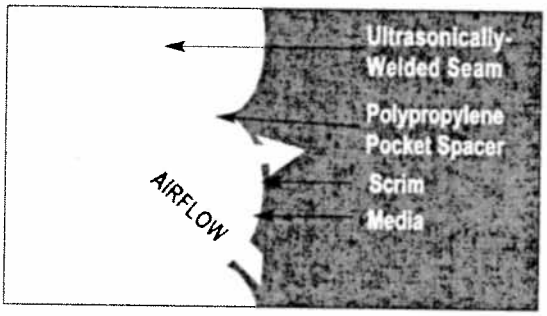
Ultrasonically-Welded Pocket Construction

The DriPak 2000 ultrasonically-welded pocket construction features ribbons of fabric sealed inside the pockets to create aerodynamic channels.This eliminates the needle holes associated with span stitching.

The contoured shape of the pocket allows full inflation without crowding or restricting airflow to ensure full media utilization and long service life.



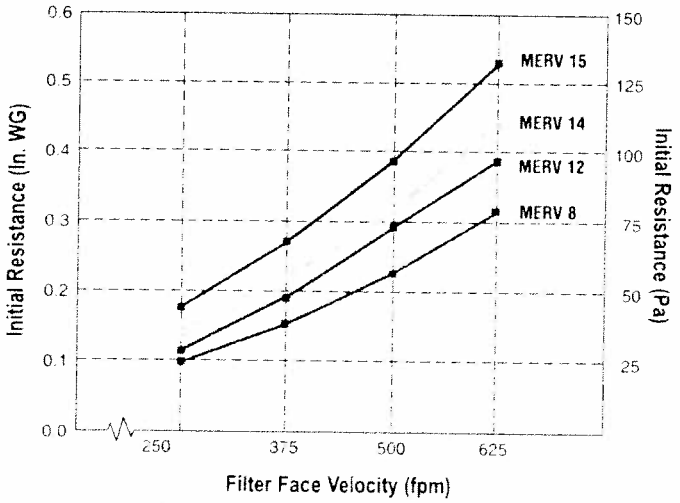
Ultrasonic Welds



Leak-Free Welded Pocket Spacer

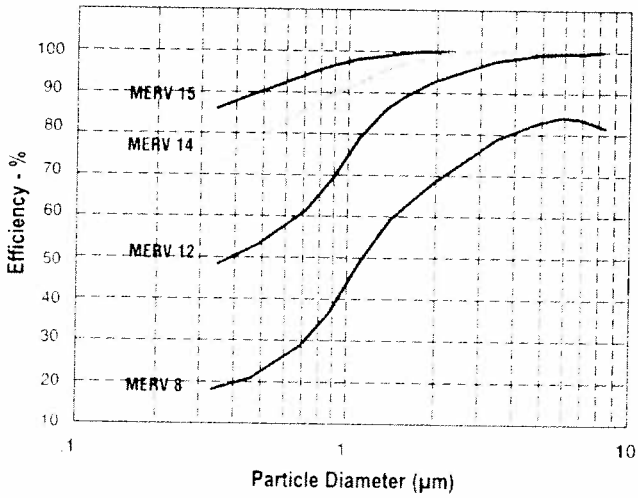
Operating Data

Initial Resistance vs. Airflow



MERV 15, 14 & 12 based on 24"x24"x30" - 8 pocket filter.
MERV 8 based on 24" x24" x19" - 6 pocket filter.

Minimum Composite Efficiency
Efficiency vs. Particle Size



Tested in accordance with ASHRAE Test Standard 52.2.
This chart shows the minimum efficiency the filter will provide throughout its service life.

- *MERV 15 (90-95%)*
- *MERV 14 (80-85%)*
- *MERV 12 (60-65%)*
- *MERV 8 (40-45%)*

AmericanAirFilter

DriPak® 2000

Nominal Size (Inches) (W x H x D)	Pockets Per Filter	Rated Airflow Capacity (CFM) By *Rated Filter Face Velocity: 375 FPM	500 FPM	625 FPM	Gross Media Area (Sq. Ft.)	*Rated Initial Resistance (In. W.G.) Average Efficiency: MERV 15 90-95%	MERV 14 80-85%	MERV 12 60-65%	MERV 8 40-45%
						Recommended final resistance is 1.0" w.g. for all models.			
24 x 24 x 36	9			2500	117	.53	.48	.44	--
24 x 24 x 36	8		2000		104	.31	.29	.27	--
24 x 24 x 36	7		2000		91	.34	.30	.29	--
24 x 24 x 36	6		2000		78	.35	.31	.29	--
24 x 20 x 36	6		1675		66	.37	.31	.31	--
20 x 24 x 36	6			2075	78	.44	.41	.35	--
20 x 24 x 36	5		1675		65	.37	.31	.31	--
20 x 20 x 36	5		1400		56	.37	.31	.31	--
12 x 24 x 36	4		1000	1250	52	.41	.37	.35	--
12 x 24 x 36	3		1000		39	.35	.31	.29	--
24 x 24 x 30	10		2000		107	.42	.34	.34	--
24 x 24 x 30	8		2000		85	.38	.32	.29	--
24 x 24 x 30	6		2000		64	.43	.36	.31	--
24 x 20 x 30	6		1675		54	.46	.37	.31	--
20 x 24 x 30	6		1675		64	.40	.36	.30	--
20 x 24 x 30	5		1675		53	.46	.37	.34	--
20 x 20 x 30	6		1400		57	.41	.32	.29	--
12 x 24 x 30	5		1000		53	.42	.34	.34	--
12 x 24 x 30	4		1000		43	.38	.32	.29	--
12 x 24 x 30	3		1000		32	.43	.36	.31	--
24 x 24 x 21	10		2000		75	.55	.41	.38	--
24 x 24 x 21	8		2000		60	.54	.42	.33	--
24 x 24 x 21	6	1500			45	.48	.37	.27	--
24 x 20 x 21	8		1675		53	.50	.37	.34	--
24 x 20 x 21	6	1250			40	.38	.28	.21	--
20 x 24 x 21	6		1675		45	.58	.47	.35	--
20 x 24 x 21	5	1250			37	.49	.38	.31	--
20 x 20 x 21	6		1400		38	.52	.35	.30	--
20 x 20 x 21	5	1050			33	.43	.26	.22	--
12 x 24 x 21	5		1000		37	.55	.41	.38	--
12 x 24 x 21	4		1000		30	.54	.42	.33	--
12 x 24 x 21	3	750			22	.48	.37	.27	--
24 x 24 x 19	6			2500	42				.32
24 x 20 x 19	6			2075	37	--	--	--	.32
20 x 24 x 19	5			2075	35	--	--	--	.32
20 x 20 x 19	5			1750	30	--	--	--	.32
12 x 24 x 19	3			1250	21	--	--	--	.32
24 x 24 x 15	10	1500			53	.49	.37	.31	--
24 x 24 x 15	8		2000		43	--	--	--	.25
24 x 24 x 15	6	1500			32	.68	.50	.34	--
24 x 20 x 15	6		1675		29	--	--	--	.25
20 x 24 x 15	5		1675		28	--	--	--	.25
20 x 20 x 15	5		1400		24	--	--	--	.25
12 x 24 x 15	5	750			27	.49	.37	.31	--
12 x 24 x 15	3	750			16	.68	.50	.34	--
12 x 24 x 15	3		1000		17	--	--	--	.25
24 x 24 x 12	6		2000		27	--	--	--	.27
24 x 20 x 12	6		1675		24	--	--	--	.27
20 x 25 x 12	6		1750		27	--	--	--	.27
20 x 24 x 12	5		1675		22	--	--	--	.27
20 x 20 x 12	5		1400		19	--	--	--	.27
16 x 25 x 12	5		1400		23	--	--	--	.27
16 x 20 x 12	4		1100		15	--	--	--	.27
12 x 24 x 12	3		1000		13	--	--	--	.27

*All performance data is based on the ASHRAE 52.2 and ASHRAE 52.1 test methods. Performance tolerances conform to Section 7.4 of ARI Standard 850-93.

Gaskets and Loops — Gaskets, for side access systems or other applications which require gaskets, and pocket support loops are available on all DriPak 2000 filters.

Classifications — DriPak 2000 filters are classified U.L. Class 1 and Class 2. Testing was performed according to U.L. Standard 900 and CAN 4-S111.

Temperature Limits — DriPak 2000 filters, operating with fan on, are designed for a continuous operating temperature of 200° F or 93° C.

AAF

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