



# Controlled Environment & Cleanroom Equipment

Air Filtration Equipment  
1-888-211-0171  
[www.industryairsales.com](http://www.industryairsales.com)



## Terminal Filter Modules (Pharma & Life Science, GMP Design)

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Industry Air Sales Ltd.

[info@industryairsales.com](mailto:info@industryairsales.com)



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Sales Submittal lists the many options available for the RTM Module:

1. Aluminum or Stainless-steel hood construction
2. Various module depths and arrangements
3. Butterfly, Guillotine & LPD damper types
4. Aerosol Injection Manifold & Test Ports
5. Grill & Trim options
6. Top & Side Inlets, mixing-boxes & plenums

	UNITS WITH 5/8" TRIM		UNITS WITH 1-1/2" TRIM	
	2X2	2X4	2X2	2X4
TRIM LENGTH (TL)	23-5/8"	47-5/8"	25-3/8"	49-3/8"
TRIM WIDTH (TW)	23-5/8"	23-5/8"	25-3/8"	25-3/8"
BODY LENGTH (BL)	22-5/8"	46-5/8"	22-5/8"	46-5/8"
BODY WIDTH (BW)	22-5/8"	22-5/8"	22-5/8"	22-5/8"

CONFIGURATION	DEPTH 'D'
2" MEDIA PACK	9"
2" OR 4" MEDIA PACK	12"
2", 4", OR 6" MEDIA PACK	14"

EACE GUARD / GRILLE OPTIONS

FLUSH WITH 4 ACORN NUTS

2" EXTENDED WITH 4 ACORN NUTS

FLUSH LIFT-OFF HINGES WITH 1/4-TURN FASTENERS

PERFORATED 40% OPEN STAINLESS STEEL MATERIAL

FOUR (4) HANGING TABS IF OPTION IS REQUIRED.

INLET TYPE

RIBBED

DAMPER STYLE

BUTTERFLY

STANDARD (ALUMINUM)

HEAVY DUTY (STAINLESS)

GUILLOTINE

LPD DIFFUSER

TRIM OPTIONS

(OPTION A) 5/8" TRIM FOR T-BAR GRID

(OPTION B) 5/8" REMOVEABLE TRIM (RIVETED BY INSTALLER)

(OPTION C) 5/8" PERMANENT SST TRIM (BOLTED BY MANUFACTURER)

(OPTION D) 1 1/2" REMOVEABLE TRIM (RIVETED BY INSTALLER)

(OPTION E) 1 1/2" PERMANENT SST TRIM (BOLTED BY MANUFACTURER)

ORDER DETAILS

ITEM#	QTY.	REQ.
1		
2		
3		
E.X.	4	

STANDARD OPTIONS (CHECK IF APPLICABLE)

MATERIAL

.063" ALUMINUM

T-304L STAINLESS

T-316L STAINLESS

FILTER SIZE (FLUID SEAL)

2 X 2 (FILTER DIM. 21- 5/8" X 19-7/8" OD)

2 X 4 (FILTER DIM. 21- 5/8" X 43-7/8" OD)

DEPTH

9" (2" MEDIA PACK)

12" (2" OR 4" MEDIA PACK)

14" (2", 4" OR 6" MEDIA PACK)

INSULATION

NONE

2" FOIL BACKED

TOP ONLY

TOP AND SIDES

DAMPER / INLET SIZE

8"  12"

10"  14"

HANGING TABS

YES

AEROSOL INJECTION PIPE (DIP)

NOT REQUIRED

REQUIRED

PLUG TYPE:

ZINC (STD.)  BRASS  QUICK DISCONNECT

RTM

**P&G MANUFACTURING**

WASHINGTON N.C. 27889  
PHONE NO.: 252-946-9110  
FAX NO.: 252-946-4823

CUSTOMER INFORMATION

IF YOU DO NOT SEE THE OPTIONS YOU REQUIRE, THE MANUFACTURER CAN CUSTOM DESIGN YOUR HOOD TO NEARLY ANY SIZE AND SPECIFICATION.

SALES DRAWING

REV.	DRAWN BY	DATE	DESCRIPTION	APPR. BY	DATE
	WMA	5/11/10			
	JWW	6/29/10			

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES. TOLERANCES: FRACTION: ±.005" DECIMAL: ±.001" ANGULAR: ±.1°

DWG SCALE: NTS

SHEET 1 OF 1 REV. B



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Outlet (room-side) view of the standard **RTM module** showing hemmed perforated type 304SS grille and four corner acorn nuts that secure the grille to the module/hood. Optional grille fastener is removable-hinge on one side with two quarter-turn fasteners on the other side of the grille. Also visible is the standard 1.5"x1.5" removable L-trim. Typically, the module is ceiling-hung via the four corner tabs, or it's secured to a frame that's cut-out in the ceiling. The outlet edge of the module/hood is set flush with the hard-ceiling and then the trim is set in place to cover the cut-out gap.





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Inlet View (*pic at left*) of **RTM module** showing ribbed duct-collar and the standard damper, a room-side accessible cable-operated butterfly damper. The continuous welded-seam is clearly visible along the top side of the module. The standard module is .063" (16-gage) mill-aluminum, with 304SS as an available option. Also visible are the four corner-mounted hanging tabs and the ribbed collar.



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### ***RTM – Features and Options:***

**Room-side accessible challenge aerosol injection port with manifold** (*see pic below*) is one of the most popular options. This manifold permits injection of cold-generated aerosol from within the room, and then filter-face scan testing of individual filters, with the entire process conducted by a single technician.



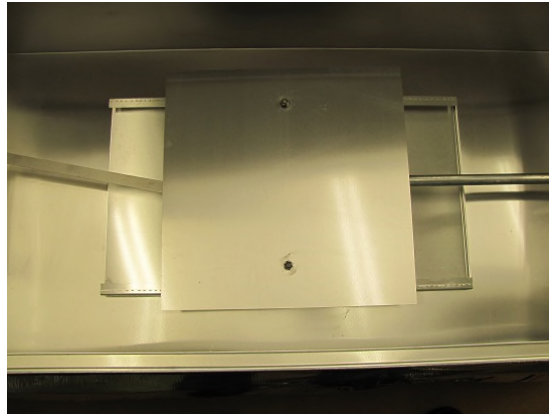
**Room-side Injection Port** comes standard with a plug, but a **quick-disconnect** (*above right*) is a real time-saving option. Quick-disconnects are available for any of the ports on the RTM, this can result in considerable savings on technician expenses, especially in a large facility with numerous ceiling filters that require regular testing.



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Regardless of damper type, **all damper operators are room-side accessible** (see pic below). As a matter of fact, all ports: Differential-Pressure, Aerosol Injection & any other type are fully accessible from the room-side, beneath the grille.



**DAMPER** options include **butterfly type**, **Low Pressure Drop (LPD) damper** and **guillotine damper** (see above, *guillotine damper is above the diffuser plate*).

**KNIFE-EDGE** is carefully welded at all four corners to permit clean gel insertion. The filter and grille retainer rod is visible (pic below). After welding, every module is leak-tested at the knife-edge.





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**RTM module** as viewed from above the hard ceiling (*pic left*). In this install the modules are supported by threaded rod mounted on unistrut. Typically, modules and duct work are insulated to minimize heat transfer and condensation.

In this install (*pic right*) the modules are supported by wire hung from the deck above. The wire is brought to the four seismic tabs and then adjusted later to bring the module flush with the finished ceiling.





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**RTM module** with trim kits being installed into framed cut-outs in a hard ceiling (*pic right*). In this installation the framing contractor has put steel studs into a rectangular frame and supported these frames with wire and threaded rod from the deck above. The modules are then lifted flush with the finished ceiling and then fastened to these frames with self-tapping screws placed just above the knife-edge of the module. Then the removable SS trim is lifted flush with the ceiling and rivetted to the module. The edge between the trim and the finished ceiling is then caulked.







## Cleanroom Filter Panels

IAS Recommends: **Type-C** Acceptance Criteria as a minimum - 99% Efficiency at 0.3 micron particles. This Performance Level includes a Filter Full-Face Scan at 0.3 microns at the factory, and it meets all GMP guidelines.

Performance Levels of HEPA and ULPA Filters per IEST-RP-CC001.5

Performance Level	Efficiency (%)	Penetration (%)	Particle Size	Leak Scant Penetration (%)
Type A	≥ 99.97	≤ 0.03	0.3 μm	No Leak Test
Type B	≥ 99.97	≤ 0.03	0.3 μm	100% & 20% Flow
Type C	≥ 99.99	≤ 0.01	0.3 μm	0.01
Type D	≥ 99.999	≤ 0.001	0.3 μm	0.005
Type E	≥ 99.97	≤ 0.03	0.3 μm	ASME AG1 Sec. FC
Type F	≥ 99.9995	≤ 0.0005	0.1-0.2 & 0.2-0.3 μm	0.0025
Type G	≥ 99.9999	≤ 0.0001	MPPS	0.001
Type H	≥ 99.97	≤ 0.03	0.1-0.2 & 0.2-0.3 μm	No Leak Test
Type I	≥ 99.97	≤ 0.03	0.1-0.2 & 0.2-0.3 μm	100% & 20% Flow
Type J	≥ 99.99	≤ 0.01	0.1-0.2 & 0.2-0.3 μm	0.01
Type K	≥ 99.995	≤ 0.005	0.1-0.2 & 0.2-0.3 μm	0.008



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The **RTM** has a fully-welded knife-edge that runs along the perimeter of the module, about 1.5" inches from the module face. The standard 9" deep module accepts a 2.88" deep reverse-gel filter panel with a 2" (50mm) deep Filter Pack (see submittal right for standard 99.99% HEPA filter panel with factory scan test)

Customer Approval: \_\_\_\_\_

FGI Part No. 42945  
Customer Information: REP: INDUSTRY AIR SALES  
Approved By TEL: 905-458-8900

2.88" DEEP, CP-32 2.0" PACK  
GEL  
SCREEN OPTIONAL  
SECTION A-A  
0.62  
HEIGHT  
LENGTH

**Filter Characteristics**

- Media Separators: Hot Melt Separators
- Frame material: Extruded Anodized Aluminum Frame
- Sealant: 2-part Polyurethane
- Filter Tolerances are +0.00/-0.13 from listed dimensions.
- Filters will be square to within 1/8" for diagonals under 30" and Filters will be square to within 1/4" for diagonals over 30".
- UL Rating: UL 900 Class 2.
- Gasket 2-part Polyurethane GEL in sealed GEL track.
- No Screen on downstream side.
- IEST C-99.99% @0.3micron efficiency.
- No Divider.
- 0.52-inches W.G. +/-0.15 @ 550 CFM, based on open filter face velocity.
- Custom dP Requirement NA-inches W.G. +/-NA @ NA CFM.
- Custom products: n/a, Other extrusion depth:

Pack Depth	Resistance Inches W.G.
2.0"	0.52
2.5"	0.45
4.0"	0.36

Filtration Group 971A Industrial Drive Aurora IL, 60506	
Filter Height	Filter Length
21.62"	43.88"

Drawing: SD-CR-REVERSE\_GEL  
 Revision: 00 Drawn By: BAP  
 Date Rev: 7/24/06 Check By:  
 All dimensions are in inches, unless otherwise noted.

YOUR APPROVAL OF THIS PRINT AUTHORIZES FILTRATION GROUP, INC TO PROCEED WITH MATERIAL PROCUREMENT, TOOLING AND PRODUCT FABRICATION. ANY CHANGES MADE AFTER APPROVAL MAY INCUR FURTHER EXPENSES TO THE CUSTOMER.



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Customer Approval: \_\_\_\_\_

FGI Part No. 43745  
 Customer Information:  
 Approved By \_\_\_\_\_

4.88" DEEP, CP-34 4.0" PACK

GEL

SCREEN OPTIONAL

SECTION A-A

0.62

HEIGHT

LENGTH

**Filter Characteristics**

- Media Separators: Hot Melt Separators
- Frame material: Extruded Anodized Aluminum Frame
- Sealant: 2-part Polyurethane
- Filter Tolerances are +0.00/-0.13 from listed dimensions.
- Filters will be square to within 1/8" for diagonals under 30" and Filters will be square to within 1/4" for diagonals over 30".
- UL Rating: UL 900 Class 2.
- Gasket 2-part Polyurethane GEL in sealed GEL track.
- No Screen on downstream side.
- IEST C-99.99% @0.3micron efficiency.
- No Divider.
- 0.36-inches W.G. +/-0.15 @ 560 CFM, based on open filter face velocity.
- Custom dP Requirement NA-inches W.G. +/-NA @ NA CFM.
- Custom products: CP-34, 4.0" Pack, Other extrusion depth:

Pack Depth	Resistance Inches W.G.
2.0"	0.52
2.5"	0.45
4.0"	0.36

	<b>Filtration Group</b> 971A Industrial Drive Aurora IL, 60506	
	Filter Height	Filter Length
	21-5/8"	43-7/8"

Drawing: SD-CR-REVERSE\_GEL  
 Revision: 00 Drawn By: BAP  
 Date Rev: 7/24/06 Check By:  
 All dimensions are in inches, unless otherwise noted.

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The optional **12" deep module** can accept a 4.88" deep filter extrusion with a **4" (100mm) Deep Filter Pack**. The 4" filter pack provides for significantly lower operating pressure drop and extended service life from the filter.



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**HEPA FILTER DIFFUSER (PHARMA TYPE) - OEM FILTER COMPARISON TABLE**

MANUFACTURER	DIFFUSER MODEL (PHARMA STYLE)	DIFFUSER SIZE (NOMINAL)	FILTER SIZE (ACTUAL)	OEM HEPA FILTER PART NO.	NOTES
P&G Mfg.	RTM 2x4, 9" Deep Module (Pharma)	24" X 48" (2 X 4)	21.62" X 43.88" X 2.88"	42945 (CP32 Reverse Gel)	99.99%, 550CFM @ 0.52"WG
	RTM 2x2, 9" Deep Module (Pharma)	24 "X 24" (2 X 2)	21.62" X 19.88" X 2.88"	42867 (CP32 Reverse Gel)	99.99%, 233CFM @ 0.52"WG
P&G Mfg.	RTM 2x4, 12" Deep Module (Pharma)	24" X 48" (2 X 4)	21.62" X 43.88" X 4.88"	41657 (CP34 Reverse Gel)	99.99%, 550CFM @ 0.35"WG
	RTM 2x2, 12" Deep Module (Pharma)	24 "X 24" (2 X 2)	21.62" X 19.88" X 4.88"	42868 (CP34 Reverse Gel)	99.99%, 233CFM @ 0.35"WG
FLANDERS	CHANNEL HOOD, MODEL 22	24" X 48" (2 X 4)	21.75" X 44.00" X 2.88" (1)	F0304094 (Reverse Gel)	99.99%, 560CFM @ 0.52"WG
	CHANNEL HOOD, MODEL 22	24 "X 24" (2 X 2)	21.75" X 22.00" X 2.88" (1)	F0304150 (Reverse Gel)	99.99% 235CFM @ 0.52"WG
AAF	PHARMAGEL24	24" X 48" (2 X 4)	21.62" X 43.88" X 2.88"	577-850-028 (Reverse Gel)	99.99%, 550CFM @ 0.52"WG
	PHARMAGEL22	24 "X 24" (2 X 2)	21.62" X 19.88" X 2.88"	577-850-027 (Reverse Gel)	99.99%, 233CFM @ 0.52"WG
CAMFIL-FARR	RFM22	24" X 48" (2 X 4)	21.75" X 44.00" O.D.	QX-21.75-44.00-5-41-FU-00-00-0	99.99%, 554CFM @ 0.52"WG
	RFM22	24 "X 24" (2 X 2)	21.75" X 20.00" O.D.	QX-21.75-20.00-5-41-FU-00-00-0	99.99%, 233CFM @ 0.52"WG
CAMFIL-FARR	PHARMA-SEAL (STANDARD)	24" X 48" (2 X 4)	21.75" X 44.00" O.D.	QX-21.75-44.00-5-41-VU-00-00-0	99.99%, 554CFM @ 0.52"WG
	PHARMA-SEAL (STANDARD)	24 "X 24" (2 X 2)	21.75" X 20.00" O.D.	QX-21.75-20.00-5-41-VU-00-00-0	99.99%, 233CFM @ 0.52"WG
CAMFIL-FARR	PHARMA-SEAL (WITH QUICK-DISCONNECT)	24" X 48" (2 X 4)	21.75" X 42.75" O.D.	QC-21.75-42.75-5-41-VU-00-00-0	99.99%, 538CFM @ 0.52"WG
	PHARMA-SEAL (WITH QUICK-DISCONNECT)	24 "X 24" (2 X 2)	21.75" X 18.75" O.D.	QC-21.75-18.75-5-41-VU-00-00-0	99.99%, 217CFM @ 0.52"WG
NOTES:	(1) Filter size is slightly larger than Pharma-RTM (P-RTM) filter but they are definitely interchangeable.				

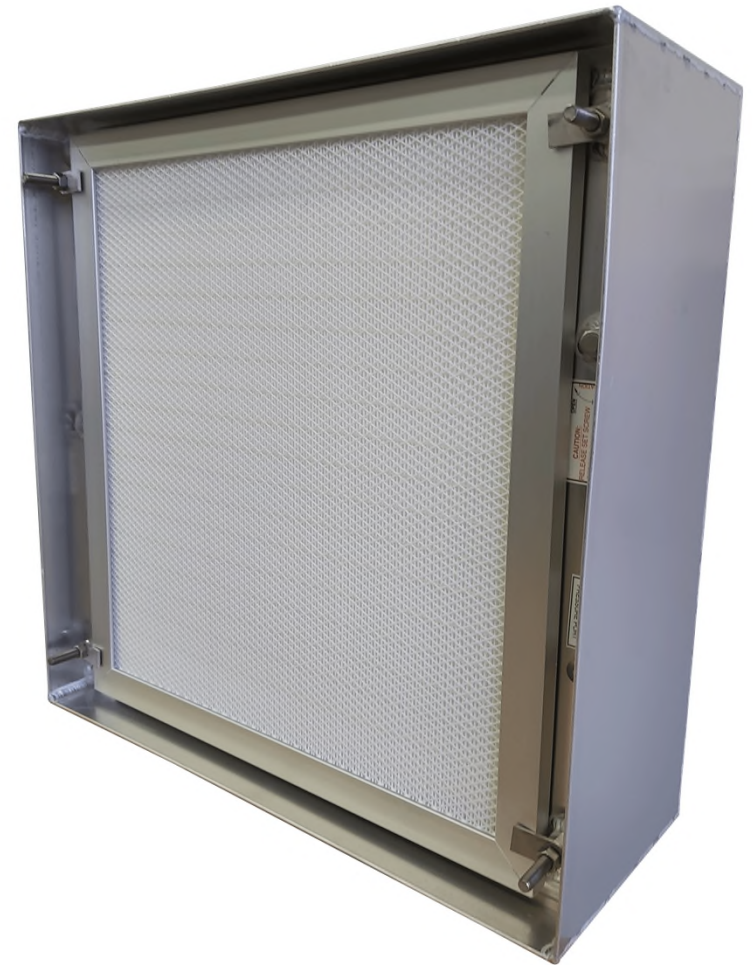


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While every manufacturer offers a similar GMP module with comparable features and options, there is often a slight difference in filter size, due to subtle differences in module design. It is very important to know the exact filter specifications in order to replace the module with the correct fit filter.

Apart from the size and efficiency, it is important to note any protective screen or center-board port requirement for the replacement reverse-gel filter element. *(Filter at right has a diamond-pattern painted screen.)*





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	UNITS WITH 5/8" TRIM		UNITS WITH 1-1/2" TRIM	
	2X2	2X4	2X2	2X4
TRIM LENGTH (TL)	23-5/8"	47-5/8"	25-3/8"	49-3/8"
TRIM WIDTH (TW)	23-5/8"	23-5/8"	25-3/8"	25-3/8"
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2" MEDIA PACK	9"
2" OR 4" MEDIA PACK	12"
2", 4", OR 6" MEDIA PACK	14"

**FACE GUARD / GRILLE OPTIONS**

FLUSH WITH 4 ACORN NUTS

2" EXTENDED WITH 4 ACORN NUTS

FLUSH LIFT-OFF HINGES WITH 1/4-TURN FASTENERS

**INLET TYPE**

RIBBED

**DAMPER STYLE**

BUTTERFLY

STANDARD (ALUMINUM)

HEAVY DUTY (STAINLESS)

GUILLOTINE

LPD DIFFUSER

**TRIM OPTIONS**

(OPTION A) 5/8" TRIM FOR T-BAR GRID

(OPTION B) 5/8" REMOVEABLE TRIM (RIVETED BY INSTALLER)

(OPTION C) 5/8" PERMANENT SST TRIM (BOLTED BY MANUFACTURER)

(OPTION D) 1 1/2" REMOVEABLE TRIM (RIVETED BY INSTALLER)

(OPTION E) 1 1/2" PERMANENT SST TRIM (BOLTED BY MANUFACTURER)

**STANDARD SPECS:**  
THE HOOD BODY SHALL BE SEAL WELDED AND CAULKED. THE INLET SHALL BE INTERMITTENTLY WELDED AND CAULKED. THE FINAL ASSEMBLY SHALL BE TESTED PER INTERNAL MANUFACTURER PROCEDURE PGM-502 TYPICAL, ASSURING THE UNIT ASSEMBLY TO BE FREE OF ANY LEAKS. FILTER FIT SHALL BE CHECKED BEFORE THE UNIT LEAVES THE FACTORY.

**CUSTOMER INFORMATION**

\*\*\*\* SUGGESTED HEPA RTM FEATURES \*\*\*\*

Industry Air Sales (Guelph) - 519-823-8900

IF YOU DO NOT SEE THE OPTIONS YOU REQUIRE, THE MANUFACTURER CAN CUSTOM DESIGN YOUR HOOD TO NEARLY ANY SIZE AND SPECIFICATION.

REV.	DATE	DESCRIPTION	APPR. BY	DATE

UNLESS OTHERWISE SPECIFIED  
+ ALL DIMENSIONS ARE IN INCHES  
\* TOLERANCES FRACTION - 1/16"  
ARE: DECIMAL - 0.005"  
ANGULAR - 0.1°

**ORDER DETAILS**

ITEM#	QTY.	REQ.
1		
2		
3		
EX.	4	

**STANDARD OPTIONS (CHECK IF APPLICABLE)**

**MATERIAL**

.063" ALUMINUM

T-304L STAINLESS

T-316L STAINLESS

**FILTER SIZE (FLUID SEAL)**

2 X 2 (FILTER DIM. 21-5/8" X 19-7/8" OD)

2 X 4 (FILTER DIM. 21-5/8" X 43-7/8" OD)

**DEPTH**

9" (2" MEDIA PACK)

12" (2" OR 4" MEDIA PACK)

14" (2", 4" OR 6" MEDIA PACK)

**INSULATION**

NONE

2" FOIL BACKED

TOP ONLY

TOP AND SIDES

**DAMPER / INLET SIZE**

8"  12"

10"  14"

**HANGING TABS**

YES

**AEROSOL INJECTION PIPE (AIP)**

NOT REQUIRED

REQUIRED

**PLUG TYPE:**

ZINC (STD.)  BRASS  QUICK DISCONNECT

**RTM**

**P&G MANUFACTURING**  
WASHINGTON N.C. 27889  
PHONE NO.: 252-946-9110  
FAX NO.: 252-946-4823

**SALES DRAWING**

DRAWN BY	DATE	DRAWING NO.	SHEET	OF	REV.
VJMA	5/11/10	CSD-010	1	1	B

## RTM CUT SHEET –

### IAS Recommended Options:

- 12" Deep Module (where space permits)
- 4" Deep Filter Pack (lower P.D.)
- Butterfly or Guillotine Damper
- Aerosol Injection Manifold with Plug or Quick Disconnect
- Welded Hanging Tabs
- Static Pressure Port with Plug or Quick Disconnect
- Foil-back Insulation, Top & Sides
- SS Grille with chain, (4) Acorn nut fasteners
- 1-1/2" Removable SS Trim with Radial Corners