

Product Handbook

COMPLETE OVERVIEW

JANUARY 2016

USED IN:

- - - - -
NANOTECHNOLOGY
- - - - -
MICROELECTRONICS
- - - - -
MEDICAL DEVICES
- - - - -
SEMICONDUCTORS
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DISK DRIVES
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LABORATORIES
- - - - -
PHARMACEUTICAL MARKETS
- - - - -
COMPOUNDING PHARMACIES
- - - - -
HOSPITALS
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CLEANROOMS



ENVIRCO®
Innovators in clean air technology

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■ About ENVIRCO®

ENVIRCO® is a recognized worldwide leader in clean air products for the semi-conductor, microelectronics, medical device, pharmaceutical, biotechnology, hospital and laboratory markets. For more than 50 years, ENVIRCO® has been an innovator in clean air technology, enjoying a history of developing cutting-edge product breakthroughs that continues through today. Its reputation for product innovation and high quality has positioned ENVIRCO® to be at the forefront of many industry firsts, including the first low-power Fan Filter Unit (FFU) and the first commercial cleanroom. Whether an organization's needs involves the production of medical devices, pharmaceuticals, university research, nanotechnology science, semiconductors or other advanced technologies, ENVIRCO® products provide clean air environment that ensures the integrity of a sample or material. Within a medical and/or operating room setting, ENVIRCO® continues to build upon its reputation as the industry's first manufacturer of a laminar flow surgical suite, providing infection control to hospital rooms and staff and preventing the spread of airborne contaminants.

ENVIRCO's complete product line is rigorously tested and is renowned for providing an economical and energy efficient method for implementing a cleanroom environment, boasting ease of installation, operation and maintenance. Above all, ENVIRCO® products deliver high performance.

■ Service & Support

The ENVIRCO® combination of innovation and high quality clean air products is surpassed only by the company's superior service it offers customers to ensure the ENVIRCO® product/system they purchase meets their needs. Highly trained and experienced engineers provide superior life cycle support, from system design and installation to final performance testing and follow up.

Learn how ENVIRCO® cleanroom products and air filtration systems can help companies improve their bottom line by maximizing product yield, improving patient care and hospital staff safety and ensuring the integrity of laboratory research. Call 1.800.884.0002, email info@envirco.com, or visit www.envirco.com for more information.

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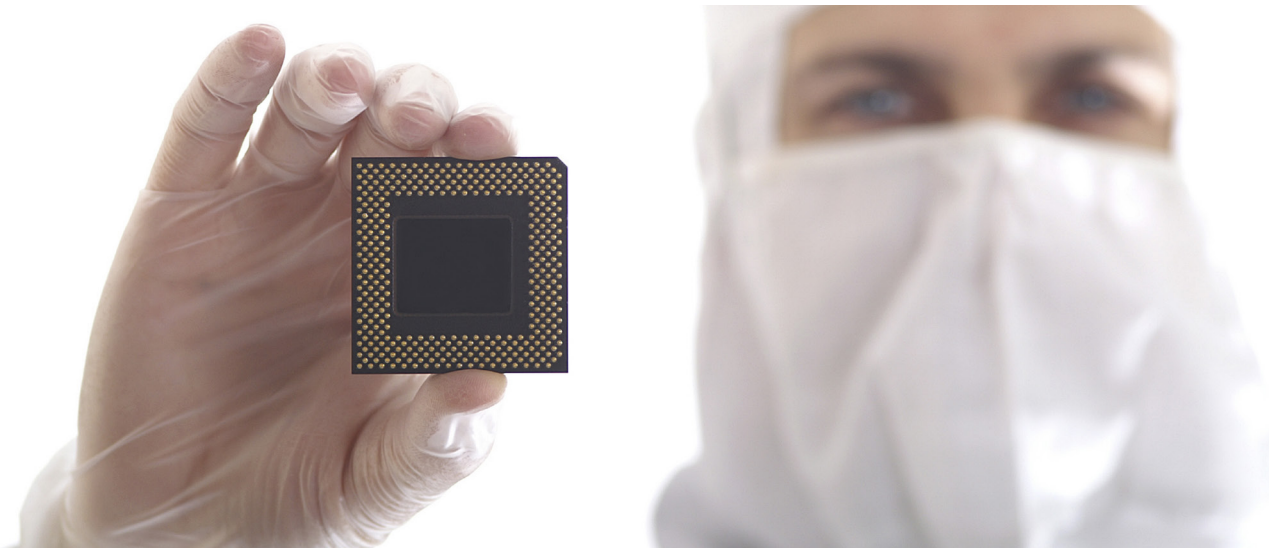


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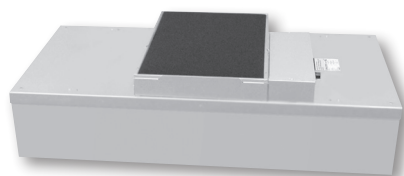
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Cleanroom Products

ENVIRCO® industrial cleanroom products satisfy the basic principle of a manufacturing business. In microelectronics market segments, a single submicron-sized particle can render thousands of microprocessors, transistors or other highly sensitive technologies useless. Cleanroom technologies are a critical component to maximizing production yields. While used for a variety of critical clean air applications, the MAC 10® line of fan filter units (FFUs) are ideal cleanroom solutions for the worldwide industrial market. The FFU design (a fan, motor and filtration system all in a single unit) draws air in from a motor assembly and through the filtration system, then exhausts it across the filter face, supplying particle- free, unidirectional airflow to the room. Renowned for their ease of installation and operation, the MAC 10® line of FFUs offer low energy consumption, low sound levels and a low profile.



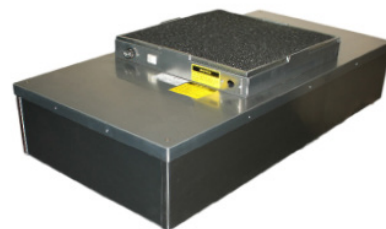
Available Models:
Standard, RSR, RSRE

■ MAC 10® Original

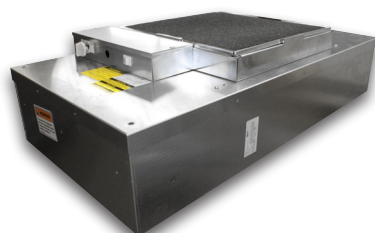
The ENVIRCO® MAC 10® fan filter unit was the first (FFU) to combine low sound, low watts and a low profile. Measuring only 51 dBA, the MAC 10® Original Standard 2 x 4 ft. (600 x 1,210 mm) provides one of the lowest sound levels of any FFU in the industry. Running at only 310 watts at 90 fpm, the unit uses less energy than traditional FFUs, while lowering total operating costs. The MAC 10® Original maintains a low profile and comes standard with the filter integral with the unit housing, requiring the unit to be removed from the ceiling grid to replace the filter. The RSR unit has the filter sealed to the unit using the knife edge/gel seal construction, allowing the filter to be replaced from the room side. The RSRE unit has the added feature of allowing the motor/blower and filter to be replaced from the room side.

■ MAC 10® LEAC2™

The ENVIRCO® LEAC2 fan filter unit (FFU) has low watts, a low profile, and a high airflow. The MAC 10® LEAC2 2x4 ft (600x1210 mm) provides one of the lowest power consumption levels of any FFU in the industry. Running at only 208 watts @ 90 fpm, the unit uses less energy than traditional FFUs and reduces operating costs. The MAC 10® LEAC2 standard model maintains a low profile, measuring less than 13" (318 mm) tall. The MAC 10® LEAC2 comes standard with the filter integral with the unit housing. Room-side replaceable filters and motor blower removable from room side are available.



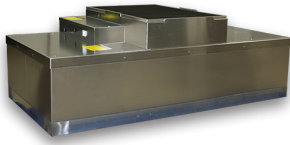
Available Models:
Standard and RSRE
(Stainless Steel Construction)



Available Models:
Standard, RSR, RSRE
(Stainless Steel Construction)

■ MAC 10® LEAC™

The ENVIRCO® LEAC fan filter unit (FFU) is the first FFU with low watts, low profile, and high airflow. The MAC 10® LEAC 2 x 4 ft. (600 x 1210 mm) provides one of the lowest levels of any FFU in the industry. Running at only 185 watts at 90 fpm, the unit uses less energy than traditional FFUs, lowering operating costs. The MAC 10® LEAC maintains a low profile, measuring less than 13" (330 mm). The MAC 10® LEAC comes standard with the filter integral with the unit housing, requiring the unit to be removed from the ceiling grid to replace the filter.



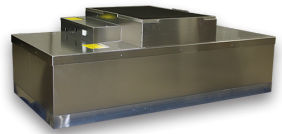
Available Models:
 Standard, RSR, RSRE
 (Stainless Steel Construction)

■ MAC 10[®] IQ™

The MAC 10 IQ[®] is the world's first smart fan filter unit. With its microcomputer-controlled EC motor, the MAC 10[®] IQ dynamically adjusts itself to maintain the set airflow, compensating for changes in static pressure, filter loading or other local conditions. Unlike conventional induction motors, the EC motor regulates itself, automatically adjusting its torque and speed to provide a constant air volume of 250-660 CFM over a wide range of static pressure. The MAC 10[®] IQ maintains airflow at such a constant rate that the need for future balancing is greatly reduced. A Universal Control Card with three different control modes, provides installation versatility by allowing the FFU to be controlled via a MODBUS RTU network, an analog 0-10 VDC control signal, or by adjusting the onboard potentiometer. The novel MAC 10[®] IQ FFU uses a combination of EC motor technology with ENVIRCO's unique baffling system and forward curve fan to make it intelligent and energy-efficient. The electronically commutative (EC) motor with internal micro-computer provides low energy consumption (235 watts at 90 fpm (0.45 m/s)), high performance and long motor life. The IQ utilizes ENVIRCO's VE5 baffling technology, offering low sound levels that are a MAC 10[®] family benchmark.

■ MAC 10[®] IQ™ LAF

Programmed for Low Flow and Low Sound applications, the MAC 10[®] IQ LAF is the world's first smart fan filter unit to take advantage of torque programming to achieve low airflow set-points using a microcomputer-controlled ECM motor. This was previously not possible with units programmed for constant airflow. With the advancement in ECM motor technology, we are able to provide a fan filter unit that delivers low airflow and maintains airflow within 10% for up to .2" WC changes in static pressure. The ability to adjust to limited changes in static pressure gives the fan the ability to supply reduced airflow for critical applications requiring low flow and low sound. A Universal Control Card with three different control modes, provides installation versatility by allowing the FFU to be controlled via a MODBUS RTU network, an analog 0-10 VDC control signal, or by adjusting the onboard potentiometer. The MAC 10[®] LAF FFU uses a combination of ECM motor technology with Envirco's unique baffling system and forward curve fan to make it intelligent and energy-efficient.



Available Models:
 Standard, RSR, RSRE
 (Stainless Steel Construction)



Available Models:
 Standard, RSR, RSRE
 (Stainless Steel Construction)

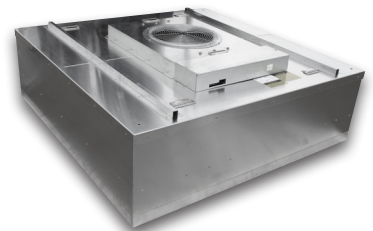
■ MAC 10[®] LEDC™

The MAC 10[®] LEDC, ENVIRCO's[®] second generation EC FFU, features the most control options and the most versatile control system available on the market today. By taking advantage of a unique combination of Electronically Commutative (EC) motor technology with ENVIRCO's proprietary baffling system and backward inclined fan, the LEDC tops the industry in energy-efficiency. The MAC 10[®] LEDC FFU can help provide opportunities to earn LEED* points with its many energy-saving features. Its EC motor with internal micro-computer provides energy consumption rates as low as 90W at 90 fpm, offers high performance, and delivers a long motor life. Utilizing ENVIRCO's experience in FFU development, the LEDC also features low sound levels of 52.3 dBA, which are a MAC

10[®] family benchmark. A Universal Control Card with three different control modes, provides installation versatility by allowing the FFU to be controlled via a MODBUS RTU network, an analog 0-10 VDC control signal, or by adjusting the onboard potentiometer.
Note: LEED (Leadership in Energy and Environmental Design) is the rating system of US Green Building Council by which building designs are certified.

■ MAC 10[®] LEDC™ 4x4

Optimize clean room operations with ENVIRCO's controlled environment solution, the new MAC 10[®] LEDC 4 x 4 ft unit. It is ENVIRCO's latest design for today's most challenging clean room applications. This low energy unit offers significant cost savings and electrical efficiencies for large clean rooms by using a backward inclined wheel, which provides 90 FPM airflow at a static pressure level of 1.0" wg., yielding a lower sound level than most competitive 2 x 4 ft units. Fewer components mean lower installed costs. With use of the MAC 10[®] LEDC 4 x 4 ft unit, additional savings are captured in the ceiling plenum because less grid is required and fewer electrical connections are needed. A Universal Control Card with three different control modes, provides installation versatility by allowing the FFU to be controlled via a MODBUS RTU network, an analog 0-10 VDC control signal, or by adjusting the onboard potentiometer.

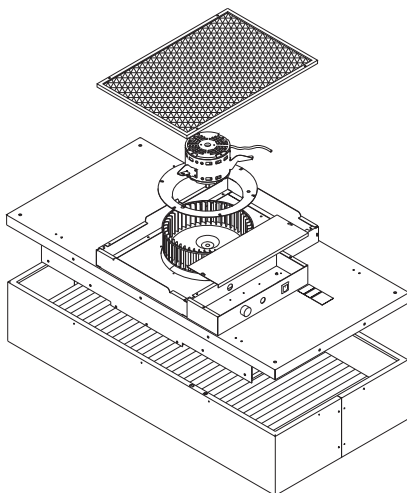


Available Models:
 Standard, RSR, RSRE

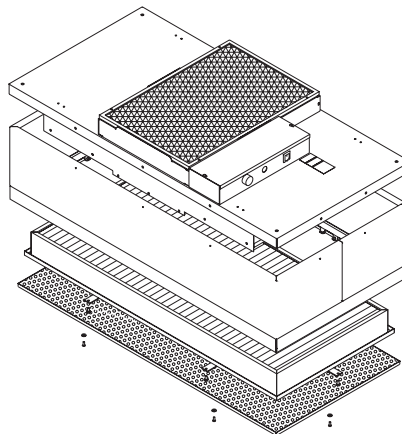
■ MAC 10® Model Comparison

Model	Original AC	LEAC2	LEAC	IQ	IQ LAF	LEDC	LEDC 4x4
Size	2x4, 2x3, 2x3.5, 2x2	2x4, 2x3, 2x2	2x4	2x4, 2x3, 2x3.5, 2x2	2x4, 2x3, 2x3.5, 2x2	2x4, 2x3, 2x3.5, 2x2	4x4
Motor Type	AC	AC	AC	ECM	ECM	ECM	ECM
Voltage	115/60Hz, 208-240/50-60Hz, 277/60Hz	115/60Hz, 208-240/50-60Hz, 277/60Hz	115/60Hz, 208-240/50-60Hz, 277/60Hz	115/60Hz, 208-240/50-60Hz, 277/60Hz	115/60Hz, 208-240/50-60Hz, 277/60Hz	115/60Hz, 208-240/50-60Hz, 277/60Hz	115/60Hz, 208-240/50-60Hz, 277/60Hz
Motor Feature	Standard Airflow	Standard Airflow	High Airflow	Constant CFM / RPM Feedback	Torque Programming / RPM Feedback	High Airflow / RPM Feedback	High Airflow / RPM Feedback
Blower Type	Forward Curve	Backward Curve	Backward Curve	Forward Curve	Forward Curve	Backward Curve	Backward Curve
Sound	Dependent on Airflow / External Static Pressure	Dependent on Airflow / External Static Pressure	Dependent on Airflow / External Static Pressure	Dependent on Airflow / External Static Pressure	Low	Dependent on Airflow / External Static Pressure	Dependent on Airflow / External Static Pressure
Velocity	90 FPM	90 FPM	90 FPM or Higher	90 FPM	90 FPM	90 FPM or Higher	90 FPM or Higher
Power Consumption	Highest	Low	Low	Low	Low	Lowest	Lowest
VAV Box Design	Recommended	Recommended	Recommended	Not Recommended	Recommended	Recommended	Recommended
BMS Communications	Yes	Yes	No	Yes	Yes	Yes	Yes
Standard Control Option (* See Notes)	3 Speed Switch, SSSC*, Modbus (ENAC)	Variable Speed Switch	3 Speed Switch	UCC, IR*	UCC, IR*	UCC, IR*	UCC*
Cabinet Styles (* See Notes)	Standard/RSR/RSRE	Standard, RSRE-All*	Standard/RSR/RSRE	Standard/RSR/RSRE	Standard/RSR/RSRE	Standard/RSR/RSRE	Standard/RSR/RSRE
Diffuser Options	Aluminum/SST	Aluminum/SST	Aluminum/SST	Aluminum/SST	Aluminum/SST	Aluminum/SST	Aluminum/SST
Painted Option	British White	British White	British White	British White	British White	British White	British White
Sheet Rock Adapters	Stainless Steel/White Painted Steel	White Painted Steel	Stainless Steel/White Painted Steel	Stainless Steel/White Painted Steel	Stainless Steel/White Painted Steel	Stainless Steel/White Painted Steel	N/A
Grid Size	1 ½" or 2" Standard as required	1 ½" or 2" Standard as required	1 ½" or 2" Standard as required	1 ½" or 2" Standard as required	1 ½" or 2" Standard as required	1 ½" or 2" Standard as required	1 ½" or 2" Standard as required
Duct Collars	10" and 12"	10", 12", 14"	10", 12", 14"	10" and 12"	10" and 12"	10", 12", 14"	N/A
Pre-Filter	Standard Foam	Standard Foam/ Optional 2" Pleated	Standard Foam/ 2" Pleated	Standard Foam	Standard Foam	Standard Foam/ Optional 2" Pleated	Finger Guard
Filter	HEPA/ULPA/Other	HEPA/ULPA/Other	HEPA/ULPA/Other	HEPA/ULPA/Other	HEPA/ULPA/Other	HEPA/ULPA/Other	HEPA/ULPA/Other

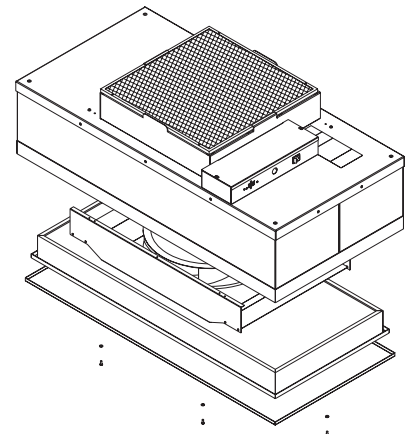
* Notes: 1. SSSC refers to Solid State Speed Control. 2. UCC refers to Universal Control Card for MODBUS RTU network, 0-10VDC analog signal, or manual potentiometer. 3. Modbus RTU (ENAC) Control Card. 4. IR refers to Infrared Control. 5. ECM refers to Electrically Commutated Motor. 6. All Roomside Removable (RSR) units have the RSRE feature of Filter and Motor Blower Removable from Rooms.



MAC 10® Standard Exploded View



MAC 10® RSR Exploded View



MAC 10® RSRE Exploded View

■ Introduction

ENVIRCO® offers a complete family of control solutions providing machine intelligence to monitor and control clean room environments of all sizes - from small to very large.

■ Features

Various fan filter unit control options

- » Single FFUs
- » Multiple FFUs organized in a zone
- » Multiple zones, each independently managed
- » Animated ceiling grids with touchscreen displays

Simplified setup and more flexible cleanroom operation

- » Automated room-side fan speed setup and control
- » EC motor control with RPM monitoring
- » Automatic controls with integrated clock/calendar
- » Closed-loop runtime fan speed monitoring and control
- » Remote control from outside cleanroom or off-site

Lowers clean room energy cost and operating expense

- » Clock/calendar sequenced FFU power ON/OFF
- » Monitor and adjust airflow as needed
- » Asset life extension from smarter FFU use
- » Central monitor of particle counters, pressure transducers

Expanded and extended cleanroom control

- » Door interlocking
- » Event logging and reporting
- » Automatic occupancy sensing
- » Automatic alarms from multiple causes and fault sensors
- » Performance logging supports as-needed maintenance
- » Connectable to overall building management systems

■ Advanced Controls

ACC7152 Touchscreen

- » 12.1" touchscreen display
- » Controls up to 400 FFUs
- » Ethernet option available
- » Animated ceiling grid
- » Closed Loop available
- » Facility Optimization included
- » Up to 24 PID loops



ACC7050/52 Touchscreen

- » 5.7" touchscreen display
- » Controls up to 400 FFUs
- » Ethernet option available
- » Animated ceiling grid
- » Closed Loop available
- » Facility Optimization included
- » Up to 24 PID loops



■ Extended Controls

ACC7020/22 Console

- » 2.4" monochrome display
- » Keypad entry
- » Supports 25 groups
- » Controls up to 200 FFUs
- » Ethernet option available
- » Facility Optimization included



■ Small Auto Controllers

ACC7015/7016

- » 2.4" LED display
- » Keypad entry
- » Supports five groups
- » Controls up to 50 FFUs
- » Designed for small systems
- » Facility Optimization included



■ Small Manual Controllers

ACC1 Small System Series

- » Seven-segment LED display
- » Designed for small systems
 - » ACC1-25 controls up to 25 FFUs
 - » ACC1-125 controls up to 125 FFUs
- » Menu-driven configuration options
- » Communication, unit control, and system monitoring in one easy-to-use package



MDR16 Remote Mount

- » Controls up to 16 FFUs
- » Manual/automatic control input
- » LED provides visual feedback of FFU indexing as percentage of speed
- » Internal jumper configurable control options
- » Exclusively compatible with MAC10 IQ & LEDC FFUs



■ Single FFU Controllers

IR Remote

- » Handheld controller for point and control - one FFU at a time
- » Remotely adjusts outputs of ECM motor
- » Maintains a constant airflow
- » Flow index lamp flashes motor output
- » Red status lamp motor power indicator
- » Lamps/sensors may be mounted or removed



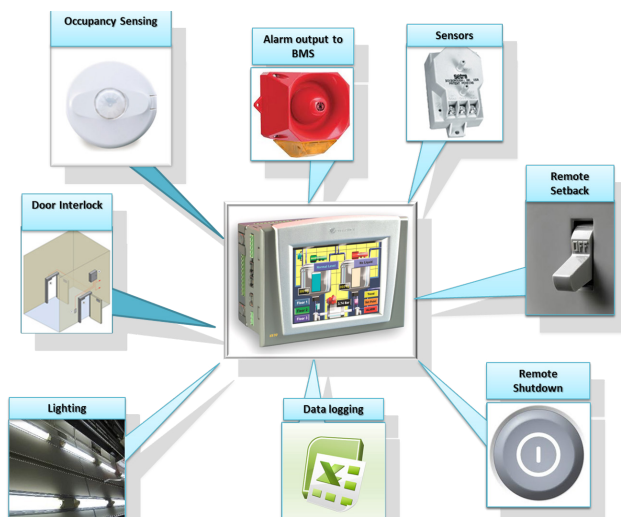
Capabilities

ENVIRCO Controls Functional Matrix		Interfaces and FFU Capability				Most Popular Features					Remote & Auto Control			Extended Features							Advanced Features		
		Serial Interfaces MODBUS-RTU	Max # of FFUs	Max # of Groups	Ethernet	Alarm Outputs	Set Speed Unit/Global	Communication Alarm	ECM RPM Monitoring	Fan Performance Alarm	Remote Shutdown	Remote Setback	Clock Calendar Control	Door Interlocking	Animated Ceiling Grid	Occupancy Sensor	Pressure, Temp Humidity	Particle Counters	Lighting Control	Exhaust Air Control	Data Logging	Building Management I/O	Closed Loop Auto Controls
Advanced Controllers	ACC7152 12.1" Touchscreen	2	400	50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ACC7052 5.7" Touchscreen	2	400	50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ACC7050 5.7" Touchscreen	2	400	50			✓	✓	✓	✓			✓	✓	✓						✓		
Extended Controllers	ACC7022 2.4" Mono Display	1	200	25	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓			
	ACC7020 2.4" Mono Display	1	200	25		✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓				
Small Auto Controllers	ACC7016 2.4" LED Display	1	50	5		✓	✓	✓	✓	✓	✓	✓	✓										
	ACC7015 2.4" LED Display	1	50	5			✓	✓	✓	✓		✓	✓										
Small Manual Controllers	ACC1-125	1	125	1		✓	✓	Compatible with control card equipped FFUs															
	ACC1-25	1	25	1		✓	✓	Compatible with control card equipped FFUs															
	MDR16	0	16	1		✓	✓	J-Box sized controller exclusively compatible with MAC 10 IQ & LEDC FFUs															
Single FFU Controllers	IR Remote	0	0	N/A		✓	Handheld remote controller compatible with MAC 10 IQ & LEDC FFUs, one at a time																
	Remote DC CB	1	1	N/A		✓	Standalone control board and electrical control box for MAC10 IQ & LEDC FFUs																
	Remote AC CB	1	1	N/A		✓	Standalone control board and electrical control box for MAC10 Original only FFUs																

I/O Options

ENVIRCO Consoles have multiple input and output options available for a cleanroom builder to implement at a low cost. The actual sensors are supplied by the customer.

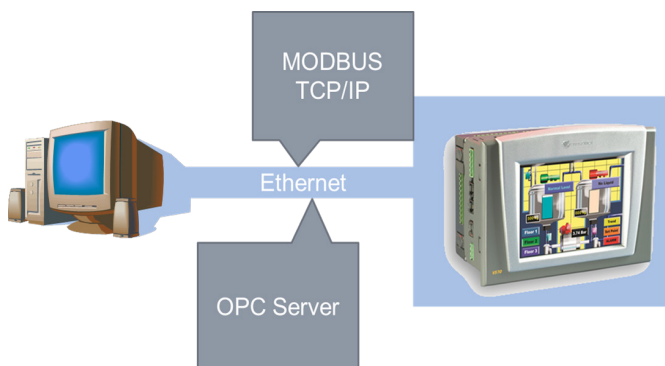
- » Room control
- » Occupancy sensing
- » Remote setback
- » Remote shutdown
- » Alarm output to BMS
- » Door interlock
- » Analog sensors
- » 0-10VDC
- » 4-20mA
- » Lighting control
- » Data logging
- » Clock calendar



Ethernet Options

ENVIRCO Consoles allow several Ethernet options to integrate with building management systems.

- » Modbus TCP/IP
- » OPC Server
- » Remote Operator
- » BACnet I/P (requires ACGW003)



Closed Loop Control Options

ENVIRCO touchscreen consoles **ACC7050/2** and **ACC7152** can provide the following:

- » Up to 24 Loops
- » Input from either:
 - » Analog sensor directly into the Console
 - » 0-10VDC
 - » 4-20mA
 - » 0-20mA
- » Connected to AirCare Motor controller
 - » 0-5VDC

Typical sensors include but not limited to:

- » Pressure
- » Temperature
- » Humidity
- » Particle count
- » CLIMET CI-3100
- » TSI 7301 and 7501
- » LIGHTHOUSE 3104

Particle counters can also be tied using MODBUS RTU or MODBUS TCP (sensors supplied by others).

Panel Box Options

Material	Item No.	Size	For Units
Polycarbonate Wall Mount	ACP NL01	10x8x2	ACC7020/22
	ACP NL02	12x10x4	ACC7050/52
	ACP NL04	14x12x6	ACC7152
Steel Flush Mount	ACP NL03	16x12x4	ACC7050/52
	ACP NL05	24x20x4	ACC7152
Stainless Steel Wall Mount (Pharma)	ACP NL06	14x12x6	All Consoles
Stainless Steel Flush Mount (Pharma)	ACP NL07	20x14x4	All Consoles



■ Ducted Ceiling Module (DCM)

The Ducted Ceiling Module from ENVIRCO is a terminal filter for use in standard T-bar drop ceiling systems, used in cleanrooms with centralized air. It is lightweight and easy to install.

Designed as a fully disposable unit, the Ducted Ceiling Module is inexpensive and easily replaceable. The Ducted Ceiling Module offers a modular design to provide filtered air from ISO 4 to ISO 5. The standard size fits into 1-1/2" (38.1 mm) T-bar grid systems. Its low weight, less than 35 lbs. (15.876 kg) makes it easy to lift into place.

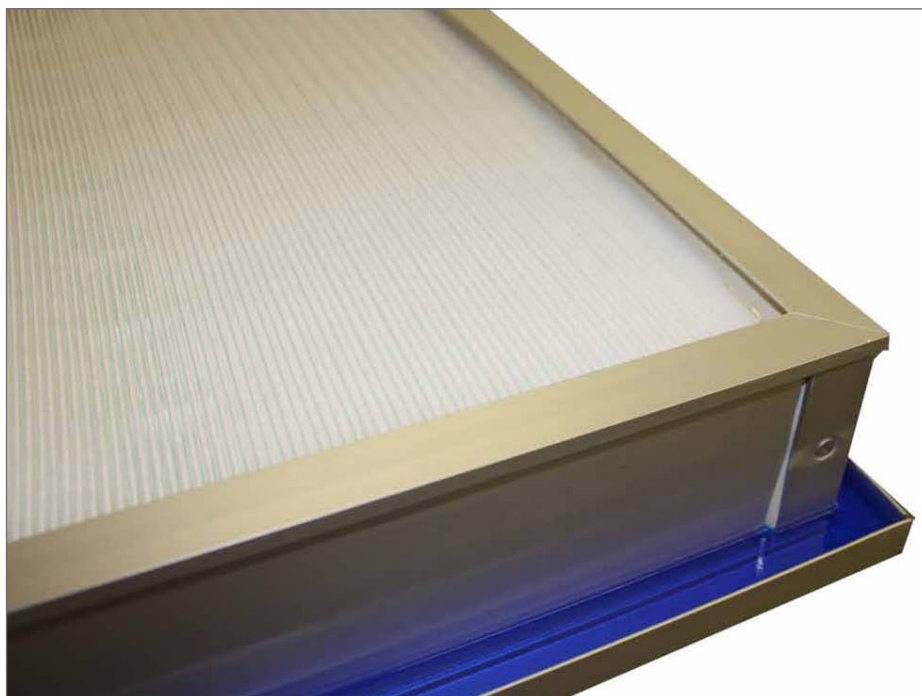
The Ducted Ceiling Modules are used in a variety of cleanroom applications including Semiconductor fabrication, disc drive manufacturing, pharmaceutical production, biotechnology, aerospace, and food processing.



■ Ducted Ceiling Module - RSR (DCM-RSR)

The RSR Ducted Ceiling Module is a lightweight, low profile, terminal filter with room side replaceable, gel seal, HEPA or ULPA filters. The filters are designed to provide unidirectional airflow for the most challenging 'Life Sciences' applications. The removable gel seal filter enables end users to replace or change HEPA or ULPA filters without removing the entire filter from the drywall or T-bar ceiling grid.

The ENVIRCO® RSR Ducted Ceiling Module is available in two sizes: nominal 24" x 48" and 24" x 24" with a 10" or 12" inlet collar. The gel seal filter element is available in HEPA and ULPA efficiencies. The dimple pleat filter pack is sealed in an anodized aluminum frame that contains penetrations for in-room damper adjustments, as well as the measurement of challenged aerosol.



UL 900 INTEGRITY & PROTECTION

OUR GEL SEAL FILTER
DESIGN ASSURES THE
INTEGRITY OF THE FILTER
SEAL.

THE GEL SEAL OFFERS
SUPERIOR **PROTECTION**
AGAINST BYPASS LEAKAGE.

■ MAC-T Ceiling Grid System

ENVIRCO's cleanroom ceiling solution, a 2" Gasket Seal Grid Cleanroom Ceiling System is fabricated using superior materials to provide both a structural grid system and zinc alloy die-castings.

The building block of a cleanroom ceiling grid system is the connection and suspension system. ENVIRCO offers a true, extruded aluminum 2" cleanroom ceiling system. It is the most cost efficient system for cleanroom classes for ISO 8 (Class 100,000) to ISO 5 (Class 100), or any full HEPA coverage application.

ENVIRCO's rod suspended cleanroom ceiling systems share attributes that in combination create a common design platform. Customizing this system to meet your specific needs is easy and worry-free. Call one of our engineers today to discuss options and find the system that best meets your needs.

■ Standard Features

ENVIRCO's gasket seal grid ceiling system has a continuous 1/4-20 thread for connection and suspension at any point. It also has lightweight multi-purpose connectors that join the grid members, providing a suspension point for the threaded rods or wire-hung eye bolts.

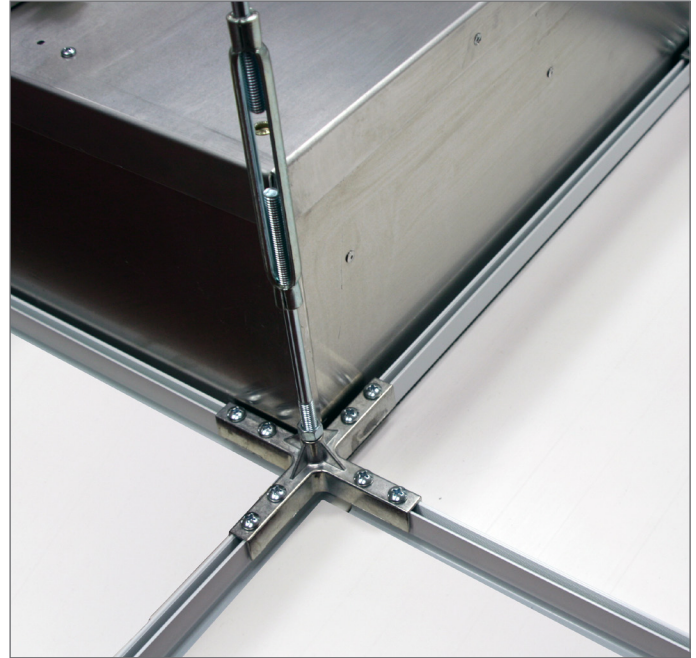
- » 2" wide extruded aluminum flange for HEPA filter, ceiling tile, and light fixture mounting.
- » 3/8" thread rod and turnbuckle adjustable or 3/8" eye bolt and 12 ga. ceiling wire.
- » Full 2" face.
- » Painted white polyester finish, more durable than powder coating.
- » Gasketed (closed cell white).
- » Can be used with 100% HEPA coverage.
- » Can be used with cleanroom lights made for 2" grid or teardrop light fixtures.
- » Easy assembly.
- » Zinc alloy castings.
- » Center Line of Grid - 24 1/2" x 48 1/2"
- » Module, Fixture, and Ceiling Tile Size - 23 5/8" x 47 5/8"

■ Optional Feature

- » Clear anodized aluminum finish.

■ Warranty

- » Limited 1-year warranty.



■ ENVIRCO MAC-T Grid Load Table

Deflection Formula	L/360	L/180	L/360
Hanger Spacing (Span)	48"	48"	24"
Main Tee Spacing	48"	48"	48"
Maximum Point Load (Lbs)	133	133	238
Maximum Uniform Load (Lbs/LF)	96	96	48
Applied Load (Lbs/SF) (Dead+Live with Filter)	24	24	24
Deflection at Mid-Span	1/8"	1/4"	1/16"



Pharmaceutical & Medical Device

Within the pharmaceutical and medical device production environments, particles containing living microorganisms can adversely affect the sterility of products both in manufacturing and storage. Preventing lapses in product sterility will save a company considerable time and money. Innovative cleanroom technologies from ENVIRCO® address the stringent contamination control needs of pharmaceutical and medical device production settings. The entire line of MAC 10® and clean bench/workstation products feature the following.

- » Room-side replaceable (RSR), gel-seal HEPA filters that protect the integrity of grid seals and change out much more easily.
- » ISO Class 5 (Class 100) cleanliness levels; allows compounding pharmacies to meet USP 797 requirements.



■ Unimodule M2 Vertical Laminar Flow Workstation

The self-contained, product-protection unit provides HEPA-filtered air to critical work areas in a positive-pressure laminar flow pattern.

- » ISO Class 5 (Class 100) clean air work zone.
- » Vertical, freestanding, positive-pressure workstation.
- » Modular design with an isolated work table.
- » Range of sizes: 3' to 8'.
- » Quiet operation.
- » Isolated work surface, no vibration.



■ METD 100% Exhausted Vertical Flow Workstation

Designed for operations involving toxic or noxious fumes that can be potentially harmful to workers; a rear plenum and workstation exhaust slots remove exhaust fumes from within the cabinet. The open front features vertical airflow for personnel protection; the HEPA filter ensures product protection.

- » ISO Class 5 (Class 100) clean air work zone.
- » 100% exhausted air used for application with toxic or noxious fumes.
- » Provides personnel and product protection.
- » Sizes: 4, 6 and 8 ft.
- » Removable stainless steel work deck for easy cleaning.



■ Laminar Downflow Module

Portable, self-contained and modular units provide ultra-clean airflow and contamination control for specific zones within a larger, ballroom environment. Ceiling-suspended or free-standing with optional support legs; modules provide easy access to filter, mowers and blowers.

- » ISO Class 5 (Class 100) clean air work zone.
- » Vertical laminar flow.
- » ENVIRALOK® Filter Framing System prevents filter leaks.
- » Nine sizes from which to choose or custom sizes are available.
- » Quiet operation.
- » Corrosion resistant.
- » Uniform airflow.





Hospital & Healthcare

By their very nature, cleanroom and air filtration products for hospital and healthcare facilities are critical to the well being of the people that pass through their doors. Hospital isolation rooms must provide infection control, protecting hospital staff from patients with airborne pathogens such as tuberculosis. The threat of potential biohazards has also become increasingly important for hospitals to address in terms of clean air solution capabilities and preparedness.

In the operating room (OR), removing airborne contaminants can decrease the likelihood of surgical-site infections (SSI), especially in procedures such as orthopedic transplants, where deep wounds are open and exposed to contaminants for several hours.

ENVIRCO® has designed and manufactured cutting-edge air filtration and surgical suite products that address the needs of hospitals and healthcare facilities.

Hospi-Gard® Products

ENVIRCO's Hospi-Gard® line offers a variety of airborne infection control products for patient rooms and clinics. The IsoClean® and AirCeil® air filtration systems create low-cost, negative pressure isolation rooms to help contain and minimize the spread of airborne viruses and disease. These same systems can also be used as recirculating air systems.



1 Injuries in Hospitals Pose a Significant Threat to Patients and a Substantial Increase in Health Care Costs. Press Release, October 7, 2003. Agency for Healthcare Research and Quality, Rockville, MD. Available at <http://www.ahrq.gov/news/press/pr2003/injurypr.htm>

■ Hospi-Gard® IsoClean® and IsoClean with UV Light

These self-contained, portable laminar flow HEPA air filtration systems are ideal for use in hospitals, clinics, nursing homes, addiction recovery centers and the like. The IsoClean® UV model contains an ultraviolet lamp that helps maximize air purification.

- » Portable for emergency response.
- » Provides up to 27 room air changes per hour in an 18 x 12 x 8 ft room.
- » Easy to maintain.
- » Quiet operation.
- » Three speed adjustable airflow control.
- » Available with UV.



■ Hospi-Gard® AirCeil®

The versatile and flexible HEPA filtration system provides a high-velocity airflow pattern to maximize particle and contaminant removal in both negative or, when combined with the optional ceiling air diffuser, positive air pressure environments.

- » Ceiling mounted with side exhaust duct.
- » Infrared control.
- » Provides up to 22 room air changes per hour in an 18 x 12 x 8 ft room.
- » Modular design for easy installation.
- » Quiet operation.
- » Helps protect patient and hospital staff.
- » Available with UV.



■ Hospi-Gard® Room Pressure Monitor & Remote Annunciator

Easily installed on any wall, the Setra Monitor is required for all Hospi-Gard® units to ensure the room maintains negative pressure, which is required for all isolation rooms.

The SRPM room pressure monitor is designed for critical care low differential pressure applications that require stringent pressure monitoring and alarming. True differential pressure is measured and displayed with a resolution of 0.0001" W.C. The SRPM is a complete system that includes a convenient backlit RGB LCD display with an intuitive graphic user interface for pressure, security, calibration, and alarm setup.

Our Remote Annunciator (SRAN) allows remote indication of room pressure status at monitoring/nurses station. A Green LED indicates Normal room condition, a Red LED and Audible Alarm, signaling a breach in room pressure status.

The SRAN is the same size as a standard electrical wall plate (2.75"W x 4.5"H) and fits flush to the wall. It can be mounted to the wall using a standard electrical box.



■ Enviramedic Products

Enviramedic Surgical Suites from ENVIRCO® offer both horizontal and vertical laminar flow air systems for hospital ORs to help reduce SSIs. Whether built into new or retrofitted into existing facilities, all surgical suite products meet the American Institute of Architects (AIA) recommended parameters for operating room ventilation, in terms of maintaining optimal temperature and humidity levels and ensuring the minimum number of air changes (including fresh air changes) per hour.

All Enviramedic laminar clean air systems are ISO Class 5 (Class 100) surgical systems and provide ultra-clean air over the critical operating field with uniform velocity to remove airborne particles and contaminants.

■ Horizontal Flow Enclosure (HOR)

The modular and re-locatable system requires minimal site preparation by using the existing OR for a return air path to create a room-within-a-room with an independent cross-flow air supply. The system contains two sets of portable air supply modules, filter modules and sliding wall panel assemblies. It also uses the existing ceiling and lights from the top of the cleanroom envelope, which makes the Enviramedic HOR an ideal retrofit solution.



■ Horizontal Flow Surgery Room (HCF)

The modular and re-locatable Enviramedic HCF uses the OR's existing HVAC system for temperature control to form an independent cross-flow air supply and ceiling return system. The floor-mounted units are ideal for applications where overhead space is limited or obstructed, such as retrofit installations.



■ Vertical Flow Surgery Isolator (VOR)

The modular and space-saving Enviramedic VOR is an independent, ceiling-suspended air supply and return system that uses the OR's existing HVAC system for temperature control. An economical and energy-efficient ECM motor dynamically adjusts the air velocity without compromising the integrity of the critical surgical zone.



Laboratory & Research

■ Table Top Horizontal Flow Clean Bench (TT)

The bench or table-mountable TT Table Top provides an ISO Class 5 product-protection environment using an aerosol-challenged HEPA filter.

- » ISO Class 5 (Class 100) clean air work zone.
- » Positive-pressure horizontal airflow.
- » Sizes: 3 to 6 ft.
- » Lighted work surface.
- » Non-glare work surface.



■ EnviraLab Sterility Module (ESM)

The self-contained, clean bench features a modular design and unique vertical and horizontal airflow pattern that sweeps around obstructions, minimizes reverse turbulence and maximizes cleansing within the critical work area. The ESM workstation provides an ISO Class 5 product-protection environment using an aerosol-challenged HEPA filter.

- » ISO Class 5 (Class 100) clean air in a stainless-steel work zone.
- » Positive-pressure vertical airflow.
- » USP 797 IV application.
- » Sizes: 3, 4 and 6 ft.
- » Shielded UV lamp for enhanced sterilization.
- » Perforated, anodized, aluminum diffuser screen protects the HEPA filter and maintains a uniform airflow velocity within the work area.



■ Laminar Flow Horizontal Flow Bench (LF)

The freestanding unit features a unique separate plenum and table design. Positive pressure laminar airflow provides product protection within the work area.

- » ISO Class 5 (Class 100) clean air work zone.
- » Two piece design allows unit to move through laboratory doors with ease.
- » Provides a lighted surface for easy location within a laboratory.
- » Two-piece construction allows easy passage through a standard doorway
- » Non-glare plastic laminated work surface for easy cleaning.
- » Solid state speed control with RFI suppression.





Clean air solutions built for you.

MORE INFORMATION AVAILABLE AT WWW.ENVIRCO.COM

■ Industrial

Cleanroom Products

- » MAC 10® Original
- » MAC 10® IQ™
- » MAC 10® IQ™ LAF
- » MAC 10® LEAC™
- » MAC 10® LEAC2™
- » MAC 10® LEDC™
- » Ducted Ceiling Module:
DCM & DCM-RSR
- » AC or DC Control Systems
- » MAC-T Ceiling
Grid System

■ Hospital & Healthcare

Hospital & Healthcare

- » IsoClean® and IsoClean
with Ultraviolet Light
- » Hospi-Gard AirCeil®
- » Hospi-Gard® Room
Pressure Monitor

Enviramedic Products

- » Horizontal Flow Enclosure
(HOR)
- » Horizontal Flow Surgery
Room (HCF)
- » Vertical Flow Surgery
Isolator (VOR)

■ Pharmaceutical

Pharmaceutical & Medical Device

- » MAC 10® products are
available in stainless
steel diffuser screens or
complete stainless steel
construction
- » Unimodule M2 Vertical
Unidirectional Flow
Workstation
- » METD 100% Exhausted
Vertical Flow Workstation
- » Unidirectional Downflow
Module

■ Laboratory & Research

Laboratory & Research

- » Unidirectional Flow
Horizontal Flow Bench (LF)
- » Table Top Horizontal Flow
Clean Bench (TT)
- » EnviraLab Sterility Module
(ESM)

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