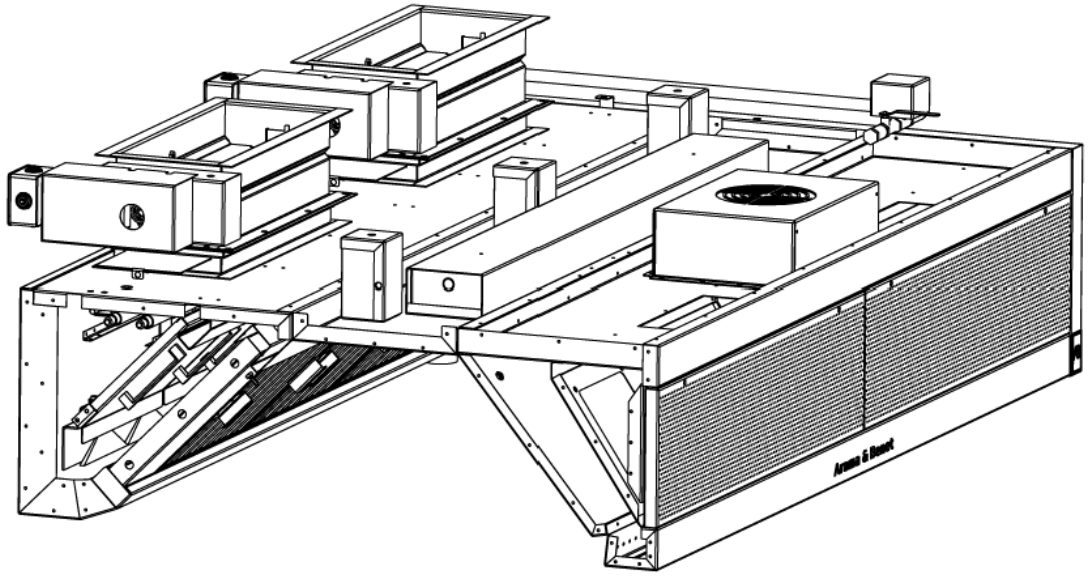
Arama & Benet

Energy-Saving Commercial Kitchen Exhaust and Supply Air Hood with Integrated **Water Mist Safety System | UVGuard-Pro Air Filtration System | MAGIC" On-Demand Control System** [ABFJ-ULA-WM-UVC-VD]



Energy efficiency tested and verified in accordance ASTM 1704-19 standard by third party independent laboratory. For test report result visit: www.arama-benet.com

In today's fast-paced commercial kitchen environments, safety, efficiency, and aesthetics are paramount. Our Energy-Saving Commercial Kitchen Exhaust and Supply Air Hood with Integrated Water Mist System is a revolutionary solution that addresses these critical needs. This cutting-edge hood system combines advanced technology with sleek design to provide a comprehensive solution for commercial kitchens seeking to enhance safety, save energy, and elevate their kitchen spaces.

Key Features:

1. **Fire Prevention and Safety:** The integrated water mist on-demand system is the cornerstone of our hood's safety features. It effectively removes grease and sparks from the exhaust ducts, significantly reducing the risk of fire accidents. This proactive approach to safety ensures a secure cooking environment for both staff and patrons.
2. **Energy Efficiency:** Our hood boasts exceptionally high energy efficiency, achieving impressive performance levels even at low air exhaust and supply flow volumes. This means substantial electricity savings while maintaining optimal kitchen conditions.
3. **Versatile Design:** With a wide range of hood types available, our product can be customized to fit any kitchen room, making it an adaptable choice for various culinary establishments. Whether it's a compact cafe or a bustling restaurant, our hoods blend seamlessly with any kitchen layout.
4. **Aesthetic Appeal:** The satin-polished stainless-steel finish adds a touch of sophistication to your kitchen space. This high-quality finish not only complements any design but also ensures durability and easy maintenance, keeping your kitchen looking pristine.

5. **“MAGIC” On-Demand Control System:** Our advanced control system allows you to optimize performance while saving electricity. It ensures that the hood operates at maximum efficiency only when needed, reducing energy consumption during downtime.
6. **UVGuard-Pro Air Filtration:** Integrated UVC air filtration not only purifies the air but also keeps your ducts clean and safe. This eliminates the need for costly annual cleaning and maintenance, reducing long-term operating expenses.
7. **“COOKING LUME” Illuminating Ambiance:** The hood comes equipped with liquid-tight protected linear LED light fixtures that provide soft, even lighting above the work and cooking spaces. This creates a welcoming atmosphere for both your kitchen staff and customers.

Benefits:

- **Enhanced Safety:** The water mist system prevents fire accidents by effectively removing grease and sparks from exhaust ducts, offering peace of mind for kitchen operators.
- **Cost Savings:** High energy efficiency and reduced maintenance costs translate into significant long-term savings for your establishment.
- **Versatility:** Our hood can be tailored to fit any kitchen layout, ensuring that it seamlessly integrates into your space.
- **Aesthetics:** The sleek stainless-steel finish adds a touch of elegance to your kitchen, elevating the overall dining experience.
- **Environmental Responsibility:** Our energy-saving design not only reduces costs but also lowers your carbon footprint, contributing to a more sustainable future.

Water Mist On-Demand control System

The Water Mist technology developed by "Arama and Benet" Engineering enables water dispersion through unique nozzles. The nozzles are installed in the inner part of the hood with grease filter reservoirs along its length, creating a "water mist" in the airflow path entering the hood space. The nozzles are designed for installation with a 10% overlap to fully cover the airflow path and prevent the penetration of particles and oils, as demonstrated in Figure 1.

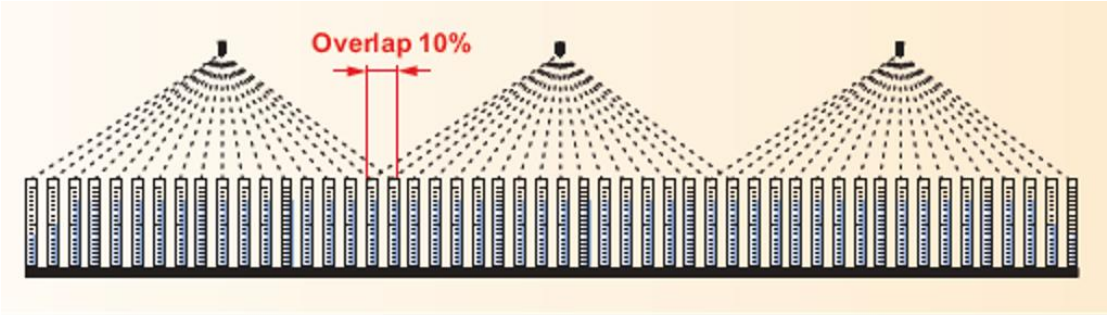


Figure 1

The nozzles are designed for installation with a 10% overlap to fully cover the airflow path and prevent the penetration of particles and oils. There are several models of nozzles with different spray angles tailored to the spraying activity and water mist dispersion according to the hood model and size. Our company calculates and installs the appropriate type of nozzles for each hood, as illustrated in Figure 2.

Water Mist On-Demand control System

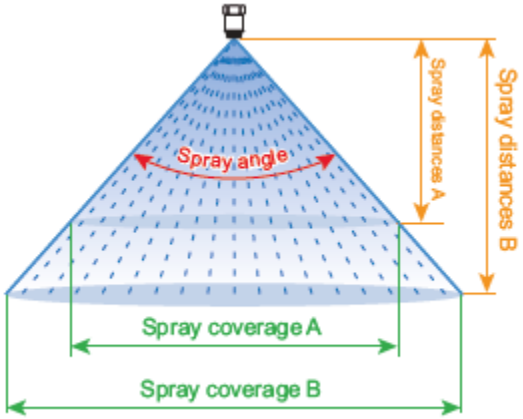


Figure 2

The space in the hood where the nozzles are installed is narrow and elongated, similar to the length of the hood itself. Therefore, we have customized the shape of the water mist dispersion manifold to a flat shape with uniform distribution of water mist to ensure equal coverage along the length of the hood, as illustrated in Figure 3.

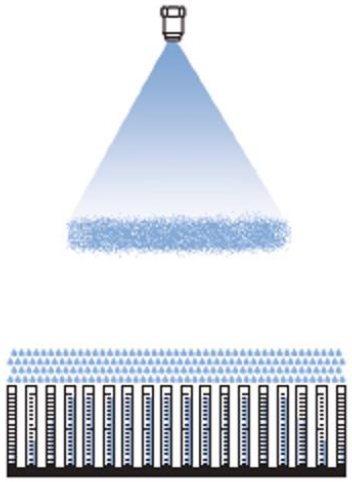


Figure 3

Water Mist On-Demand control System

The engineering department of "Arma et Bnet" had an additional goal, which was to adapt nozzles with minimal water consumption and maximum operational efficiency. After significant investment in laboratory testing, we acquired nozzles with low water consumption and highly efficient spraying performance. The nozzles operate within a water pressure range in the supply line with a diameter of 1/2", between 0.5 Bar to 20 Bar. The recommended water pressure in the supply line is 1 Bar.

Our company recommends installing a particle filter in the water supply line of the misting system to prevent clogging and pressure drop in the supply pipe and within the nozzles. The material from which the nozzles are made is AISI 316 stainless steel, ensuring an unlimited lifespan of the nozzles.

The activation of the nozzles is carried out by an electronically controlled water valve, controlled by a controller when the hood extraction fan starts at the beginning of the cooking process. A water pressure sensor installed in the control system will alert in case the water pressure falls below 1.0 Bar, and a warning message will appear on the system display accompanied by an audible alert on the control panel.

A cabinet with a controller and a colorful touchscreen display sized at 7.5" in the case of a control system and energy-saving "MAGIC" system is illustrated in Figure 4, or a controller and a colorful touchscreen display sized at 4.5" in the case of a "WATER MIST" control system is depicted in Figure 5.

Water Mist On-Demand control System

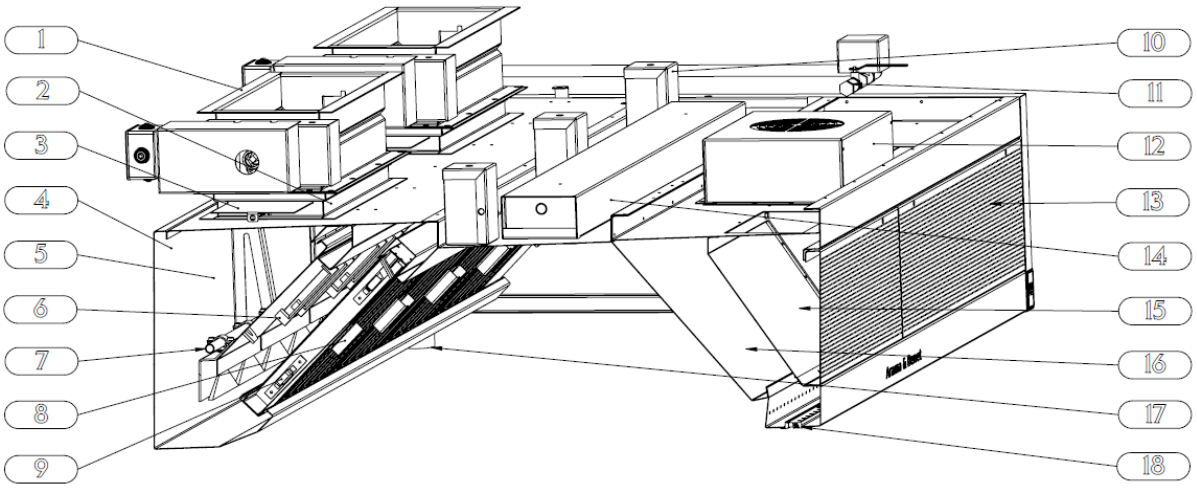
Figure 4

Figure 5

Water drainage is facilitated through a 2" diameter pipe connected to a connector with internal threading at the bottom of the hood. The side for installing the water drainage connection can be predetermined prior to hood manufacturing. Please note that it is mandatory to install a water trap at the connection to the hood to prevent odors from entering the misting system through the water supply pipe.

Additional fire protection [option]

The hoods will be equipped with fire dampers installed on each air exhaust collar. Fire dampers contain a fusible link and a spring to prevent fire from penetrating into the ductwork and to prevent ignitions as an additional protective measure in the event of a fire in the cooking equipment. The fire damper is mechanical and closes upon the melting of the fusible link at a temperature exceeding 102°C. After a fire event, it is required to return the fire shelf to the open position and install a new fusible link. All of this is carried out by a technician from the manufacturer or supplier of the hoods.



1	Motorized Flow Volume Damper (MFVD)
2	Hood connection collar
3	Fire Damper with Fusible link (option)
4	Air extraction plenum
5	UVGuard-Pro Air Filtration System module (UVGI)
6	Removable protection plates
7	Water Mist On-Demand System components
8	First stage grease filters
9	Safety switches

10	Infrared temperature sensors
11	Water line connection
12	Jet Fan
13	Perforated air diffuser front panel
14	"Kitchen Lume" LED light fixture
15	Air supply plenum
16	Jet supply plenum
17	Water drains connection
18	Flat Jet modules

About "Flat Jet" Technology: Revolutionizing Kitchen Ventilation

The culinary world is an ever-evolving landscape of innovation and precision. As kitchens become more advanced, so do the technologies that support them. One such breakthrough in the realm of commercial kitchen ventilation systems is the "Flat Jet" technology, a pioneering development by Arama & Benet Engineering Company. To truly grasp the significance of this advancement, it's essential to understand its predecessor, "Super Jet" technology.

Super Jet Technology: "Super Jet" technology laid the foundation for the remarkable "Flat Jet" innovation. Developed by Arama & Benet Engineering Company, "Super Jet" technology was designed to provide exceptional extraction capabilities within commercial kitchens. It addressed the challenge of efficiently removing steam, smoke, and heat generated by cooking appliances during the cooking process. The technology was known for its powerful air extraction capabilities, ensuring that kitchen spaces remained comfortable and free from the adverse effects of excess heat and smoke.

Flat Jet Technology: Building upon the success of "Super Jet," Arama & Benet Engineering Company introduced "Flat Jet" technology, a cutting-edge solution that takes kitchen ventilation to a whole new level. This innovation was engineered with the specific aim of minimizing convective heat emission into the kitchen area, particularly when the air extraction flow is reduced to a minimum. How does "Flat Jet" technology achieve this remarkable feat? At its core, it leverages the principles of airflow and precision engineering.

About "Flat Jet" Technology: Revolutionizing Kitchen Ventilation

The technology features a flat, streamlined design that effectively separates the hot area above kitchen appliances from the rest of the kitchen space. By doing so, it prevents the spread of heat and smoke, creating a more comfortable and safer environment for kitchen staff and diners alike.

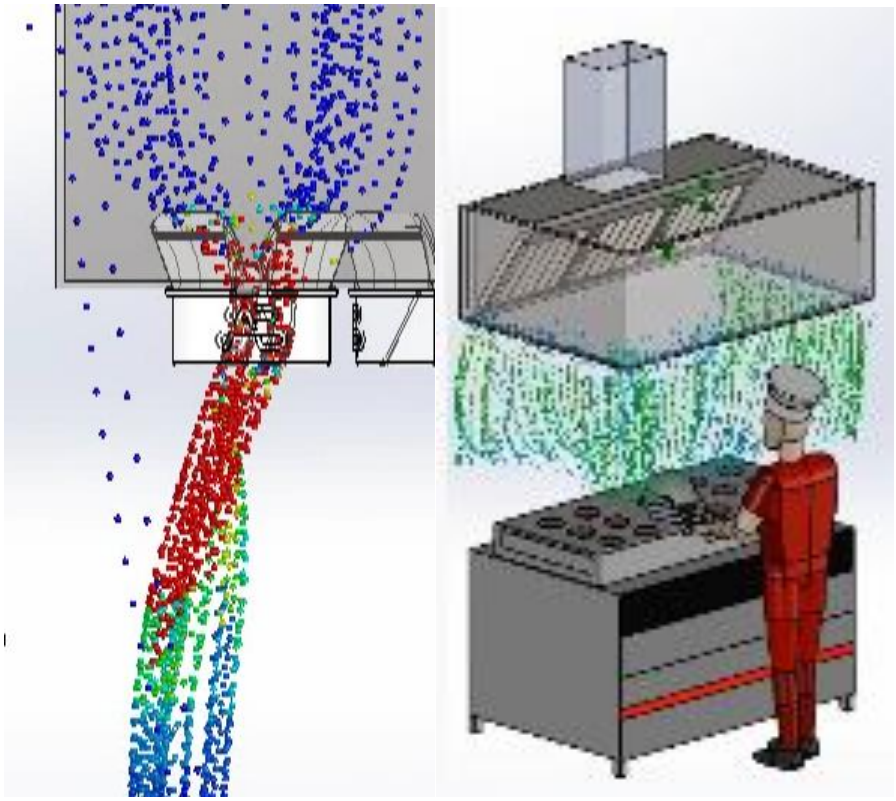
Key Benefits of "Flat Jet" Technology:

1. **Accurate Extraction:** "Flat Jet" technology maintains precise and effective extraction of steam, smoke, and heat, even when the extraction flow is reduced to a minimum. This ensures that the kitchen environment remains comfortable and safe, regardless of cooking activity.
2. **Enhanced Kitchen Comfort:** By minimizing the convective heat emitted into the kitchen area, "Flat Jet" technology contributes to a more pleasant and comfortable working environment for kitchen staff. It also enhances the dining experience for restaurant patrons by preventing the intrusion of excess heat and odours.
3. **Energy Efficiency:** This technology not only enhances kitchen comfort but also promotes energy efficiency. By reducing the need for excessive ventilation and air conditioning, it helps establishments reduce their energy consumption and operational costs.

In conclusion, "Flat Jet" technology is a remarkable advancement in the world of commercial kitchen ventilation systems. Born from the

About "Flat Jet" Technology: Revolutionizing Kitchen Ventilation

foundation laid by "Super Jet" technology, it excels in creating a safe, comfortable, and energy-efficient kitchen environment. As culinary standards continue to rise, innovations like "Flat Jet" play a pivotal role in supporting the modern kitchen's demands for precision, efficiency, and a superior dining experience.



Cost Saving with Energy Savings “Flat JET” Energy-Saving Hoods

Investing in kitchen ventilation systems is not just about ensuring a comfortable working environment; it's also about making smart financial decisions that contribute to long-term cost savings. With Flat Jet energy-saving hoods from Arama and Benet Engineering Company, businesses can significantly reduce both their capital investment and ongoing operational costs, all while maintaining optimal ventilation efficiency.

Example 1: Medium Duty Cooking Setup

Consider a kitchen cooking block with a length of 250 cm and a width of 70 cm, equipped with cooking appliances such as a 2-Vat Fryer, Broiler, and Oven. Traditionally, a regular hood measuring 300 cm in length and 100 cm in width would be installed to ensure proper extraction of heat, vapor, and smoke, requiring an exhaust flow rate of 6480 m3/h (3810 CFM) for medium duty cooking.

Now, by opting for a Flat Jet hood sized 300x120 cm, the required exhaust flow rate drops significantly to just 2550 m3/h (1500 CFM). This reduction in airflow translates to substantial savings in both capital investment and ongoing operational costs.

A Make-Up Air (MUA) unit with a capacity of 3810 CFM would typically cost approximately $19,000 in capital investment and $5,000 annually in operational costs. However, with the reduced airflow requirement of 1500 CFM, the corresponding MUA unit's capital investment drops to around $7,500, with annual operational costs decreasing to approximately $1,600.

Cost Saving with Energy Savings "Flat JET" Energy-Saving Hoods

Cost Savings Calculation:

- Capital Investment: $5,000 per 1000 CFM in MUA unit.
- Annual Operational Cost: $1,050 per 1000 CFM in MUA unit.

By utilizing Flat Jet series energy-saving hoods, businesses can realize significant savings of $11,500 in capital investment and $3,400 annually for each hood installed.

Example 2: Heavy Duty Cooking Setup with MAGIC On-Demand Control System

In a scenario where heavy-duty cooking appliances like Underfired Gas Broilers, Wok Stations, and Vat Fryers are employed, the ventilation requirements are higher. A comparison between a regular extract hood sized 600x110 cm and a Flat Jet series hood sized 600x140 cm equipped with the **"Magic-Pro"** On-Demand Control energy-saving system reveals substantial cost savings potential.

The regular hood would require an exhaust flow rate of 12500 CFM, leading to a capital investment of approximately $62,500 and annual operational costs of $13,125 for the MUA unit. However, with the Flat Jet series hood combined with the **"Magic-Pro"** system, the exhaust flow rate reduces to 5740 CFM, resulting in significant cost savings.

Cost Savings Calculation:

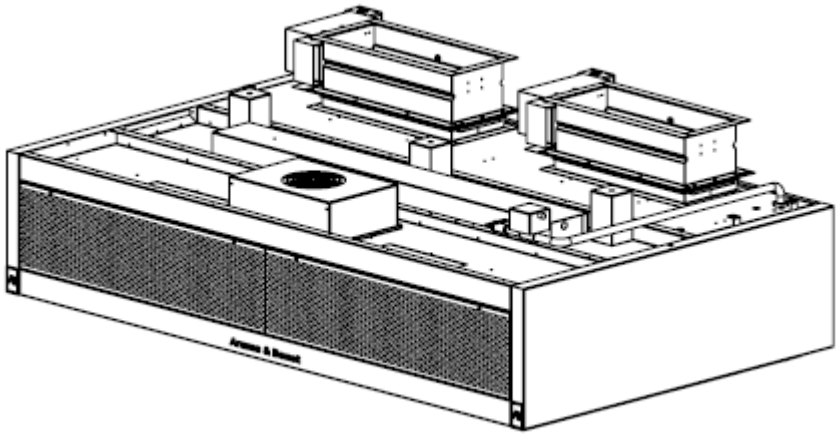
- Capital Investment: $5,000 per 1000 CFM in MUA unit.
- Annual Operational Cost: $1,050 per 1000 CFM in MUA unit.

Cost Saving with Energy Savings “Flat JET” Energy-Saving Hoods

Businesses can save a remarkable $40,100 in capital investment and $7,750 annually by implementing the Flat Jet series hood with the "MAGIC" system.

Additional Considerations:

- Reduced size of hood exhaust ducts, air supply ducts, and insulation
- Decreased size of Ecology Unit and associated maintenance costs
- Lower electricity wiring and circuits expenses



"UVGuard-Pro: Harnessing the Power of Ultraviolet Germicidal Irradiation (UVGI) for Pure Air"

UVGuard-Pro leverages the science of Ultraviolet Germicidal Irradiation (UVGI) to create an unrivalled air purification system. Here's a closer look at how it operates:

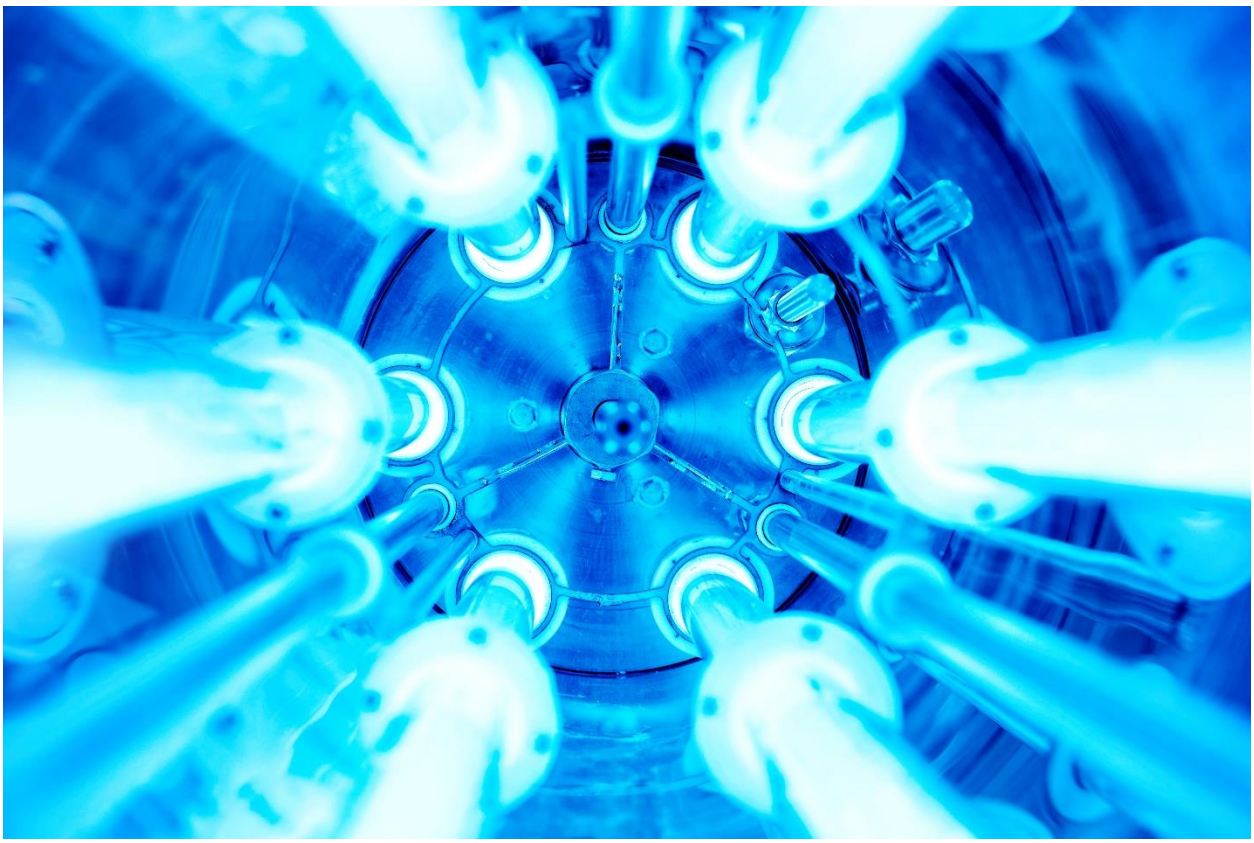
1. **UV-C Cross-Linking:** UV wavelengths are employed to inactivate microorganisms by inducing cross-links between the constituent nucleic acids within their structure. This disruption prevents these microorganisms from reproducing and renders them harmless.
2. **Ozone Generation:** UV lamps in UVGuard-Pro are specifically designed to generate ozone. The bulb's glass is crafted from high-purity fused quartz, which allows the transmission of ozone-producing wavelengths. This ozone aids in the purification process, further enhancing air quality.
3. **Maintenance and Inspection:** To ensure optimal performance, in-duct UV lamps are equipped with protective measures against dust accumulation, such as upstream filters. Regular inspection and cleaning of these lamps are recommended, using a cloth dampened with water or suitable cleaning agents, while avoiding oils or waxes on the wiping cloth.
4. **Safety and Training:** Proper care and maintenance of UV systems require trained personnel. UVGuard-Pro prioritizes safety and encourages all maintenance personnel to undergo training in both UV system maintenance and UV safety protocols.

"UVGuard-Pro: Harnessing the Power of Ultraviolet Germicidal Irradiation (UVGI) for Pure Air"

5. **Light Baffles:** Light baffles play a crucial role in UVGI systems. They can either contain UV light within a fixture or enhance the UV irradiance field. These baffles prevent UV light from escaping and often consist of blinds or materials with low UV reflectivity, ensuring uninterrupted airflow.
6. **Optimizing Performance:** UVGI systems can be fine-tuned for maximum inactivation rates while minimizing energy consumption. Design factors like reflectivity and duct length can reduce the required UV lamp power. Reflective surfaces increase average irradiance, while longer ducts increase UV dose by extending exposure time.
7. **Calculating Required UV Wattage:** Determining the necessary UV wattage is essential for effective UVGI system design. For example, to achieve a URV 13 rating in a 1.5 m stainless steel duct with a 500 FPM operating velocity and 25% reflectivity, a minimum of 68.5 W of UV power is required. Considering a typical 31% efficiency, this equates to a total lamp power of approximately 221W.

UVGuard-Pro - Setting the Standard in UVGI Air Purification. Superior Performance, Safety, and Efficiency for Your Peace of Mind.

"UVGuard-Pro: Harnessing the Power of Ultraviolet Germicidal Irradiation (UVGI) for Pure Air"



In conclusion, smart business owners leverage Arama and Benet Energy-Saving Technologies, such as Flat Jet hoods and the "MAGIC" system, to achieve substantial cost savings in both capital investment during setup and ongoing operational expenses. By embracing these innovative solutions, businesses not only ensure a comfortable kitchen environment but also make sound financial decisions that contribute to long-term success and profitability.

“Magic-Pro” Demand Control Kitchen Ventilation by Arama & Benet

Magic-Pro is an innovative and highly efficient On-Demand Control System developed and manufactured by Arama & Benet Engineering Company. This revolutionary product is designed to optimize and control airflow in commercial kitchens, significantly reducing electricity consumption related to exhaust fans and air conditioning makeup air units. **Magic-Pro** achieves these remarkable energy savings by dynamically adjusting air exhaust and supply flow rates in real-time based on cooking load, thanks to its cutting-edge technology and robust sensor integration.

Key Features:

1. **Advanced Control System: Magic-Pro** is equipped with a state-of-the-art Programmable Logic Controller (PLC) featuring a user-friendly 7" full-colour touch screen. This intuitive interface allows for easy monitoring and precise control of the system.
2. **Sensor Integration: Magic-Pro** incorporates an array of sensors to ensure accurate and responsive performance:
    - **Infra-Red Temperature Sensors (IRT):** These sensors monitor cooking appliance temperatures, providing real-time data for precise control.
    - **Smoke Detection Sensor (SDS):** Ensures rapid response to smoke levels, enhancing safety and efficiency.
    - **Room Temperature Sensor (RTS):** Monitors room temperature, contributing to overall comfort and energy optimization.

“Magic-Pro” Demand Control Kitchen Ventilation by Arama & Benet

3. **Motorized Flow Volume Dampers (MFVD): Magic-Pro** includes motorized dampers installed on each exhaust collar of the "Super Jet" Series commercial kitchen exhaust hood. These dampers allow for precise control of airflow rates, ensuring that ventilation is adjusted to meet specific cooking requirements.
4. **Variable Frequency Drives (VFD):** The system employs VFDs to control the power consumption of exhaust fan motors. This adjustable power management ensures efficient operation and substantial energy savings.
5. **PLC-Based Control: Magic-Pro** is built upon the renowned "Unitronics" PLC technology, which is known for its reliability and efficiency. PLCs are programmed with original high-efficiency energy-saving algorithms.
6. **Building Management System Integration:** Each **Magic-Pro** system can control and operate up to 26 exhaust fans. PLCs are fully applicable to communicate with Building Management Systems via Modbus TCP or BACnet over Ethernet (CAT 5), and VPN (Virtual Private Network) connectivity is possible when connected via Ethernet.
7. **ABTF Sensor® - Arama and Benet True Flow Sensor:** Developed to measure induct air velocity, the ABTF Sensor transmits measured data to calculate air flow volume accurately. This unique sensor construction is suitable for use in grease and vapor air streams.

“Magic-Pro” Demand Control Kitchen Ventilation by Arama & Benet

8. **High-Performance Infrared Temperature Sensors:** Installed in exhaust hoods above specified cooking equipment, these sensors monitor cooking appliance surface temperatures, with a temperature range from 20°C up to 326°C.

System Components:

- Programmable Logic Control (PLC) with a 7" full-color touch screen
- ABTF Sensor® - Patented Arama and Benet True Flow Sensor
- InfraRed Temperature Sensors (IRT)
- Room Temperature Sensor (RTS)
- Smoke Detection Sensor (SDS)
- Motorized Flow Volume Dampers (MFVD)
- Variable Frequency Drives (VFD)
- I/O Module

Operation:

Magic-Pro's comprehensive sensor suite transmits real-time data, including cooking equipment surface temperature, room temperature, smoke, and vapor levels, as well as exhaust and supply flow rates via I/O Modules to the system's PLC. Customized energy-saving algorithms calculate real-time exhaust and supply flow volume rates based on various parameters, including the type of exhaust hood (Typical or Jet type), minimum heat load emission

“Magic-Pro” Demand Control Kitchen Ventilation by Arama & Benet

standards (in accordance with VDI 2052, ASTM 1704-2016, and ANSI/ASHRAE/IES 90.1 Standards). The calculated air flow rates are then provided to Motorized Flow Volume Dampers (MFVD) and fans' Variable Frequency Drives (VFD), reducing energy consumption.

Benefits:

- **Energy Efficiency: Magic-Pro** significantly reduces electricity costs by optimizing exhaust fan operation and makeup air unit supply to match cooking load. This leads to substantial savings, often amounting to thousands of dollars annually.
- **Enhanced Safety:** The system's smoke detection sensors ensure a rapid response to potential fire hazards, contributing to a safer kitchen environment.
- **Operational Cost Efficiency:** By fine-tuning ventilation according to cooking load, **Magic-Pro** enhances the overall operational cost efficiency of both air exhaust and air supply systems.

Market Impact:

Magic-Pro has been developed based on four years of intensive research and development, resulting in patented technology such as the "ABTF Sensor®" (Arama and Benet True Flow Sensor). It has been designed to address the needs of a wide range of commercial kitchen operators, including those in hotels, hospitals, military bases, restaurants, catering services, bakeries, and corporate kitchens. The system has gained widespread recognition for its ability to achieve

“Magic-Pro” Demand Control Kitchen Ventilation by Arama & Benet

energy savings and improve operational efficiency in the commercial kitchen ventilation market.

DCKV Custom Design:

To ensure optimal energy savings, Arama & Benet Engineering Company provides customized MAGIC™® Energy Analysis Reports (EAR) and Estimated Financial Reports (EFR) for each potential customer. The EAR calculates energy consumption and environmental impact, while the EFR provides profit margin and estimated profit based on project cost, payback period, and other financial factors.

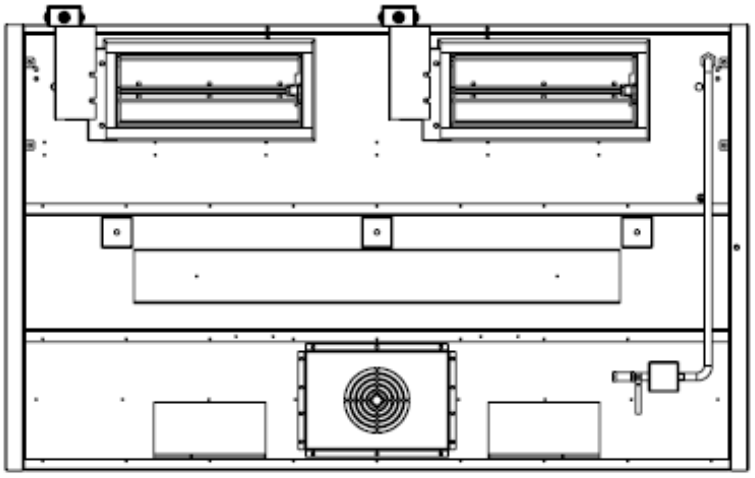
Worldwide Virtual System Follow Up:

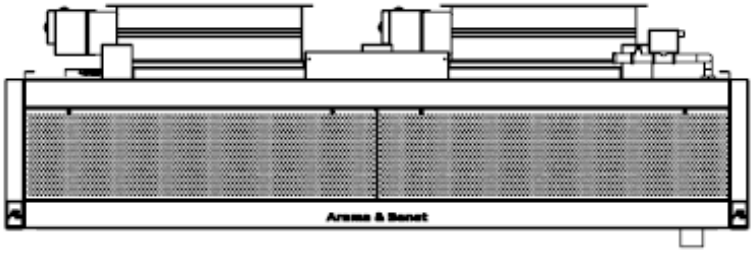
Arama & Benet Engineering Company offers Worldwide Virtual System Follow-Up services, allowing clients to stay connected via VPN for regular monitoring and system updates.

In summary, **Magic-Pro** is a groundbreaking Energy Saving Demand Control Kitchen Ventilation (DCKV) System that offers a highly efficient and cost-effective solution for commercial kitchen ventilation. With its innovative technology and sensor integration, it optimizes airflow in

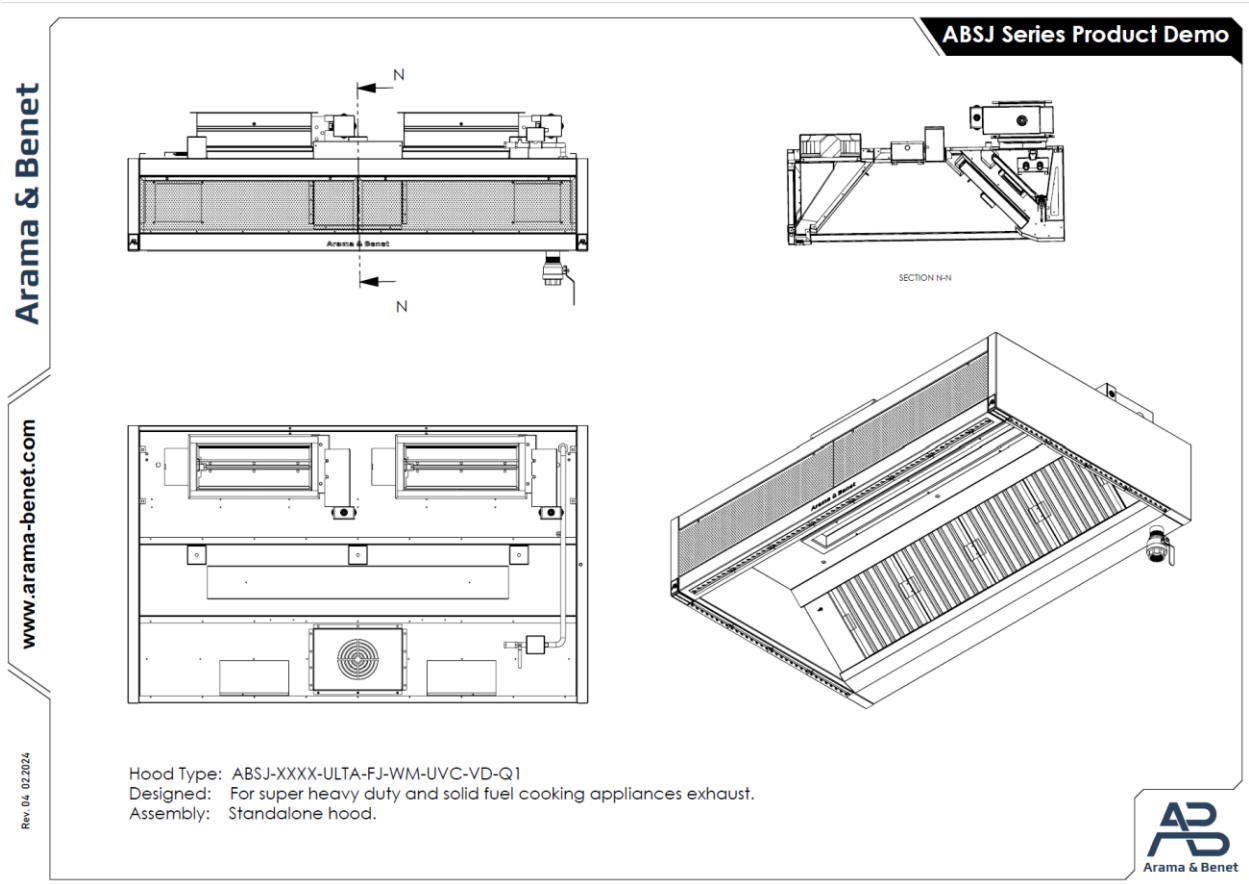
“Magic-Pro” Demand Control Kitchen Ventilation by Arama & Benet

real-time to save energy and improve operational efficiency, making it an invaluable asset for kitchen operators in various sectors.





ABFJ Series Hood Product Demo:

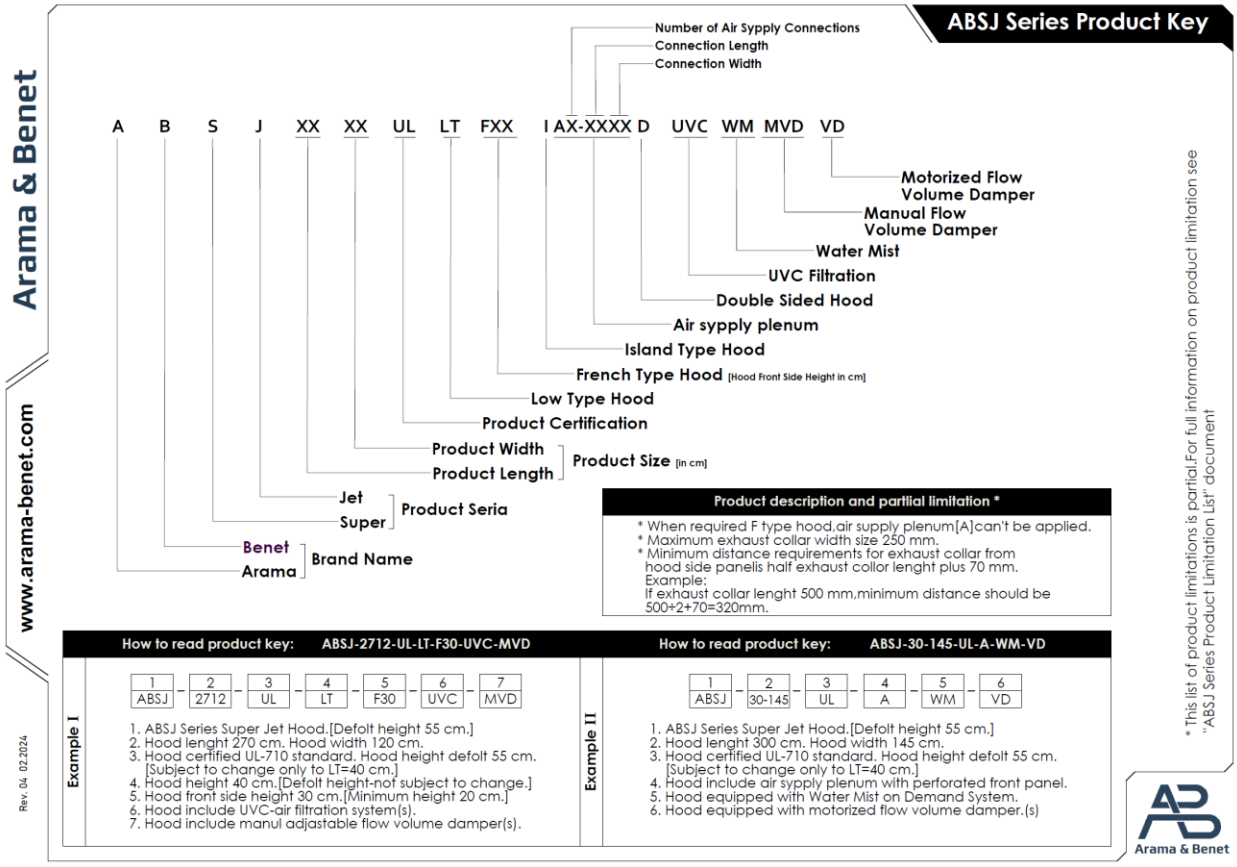


Hood type: ABFJ-XXXX-ULTA-WM-UVC-VD-Q1

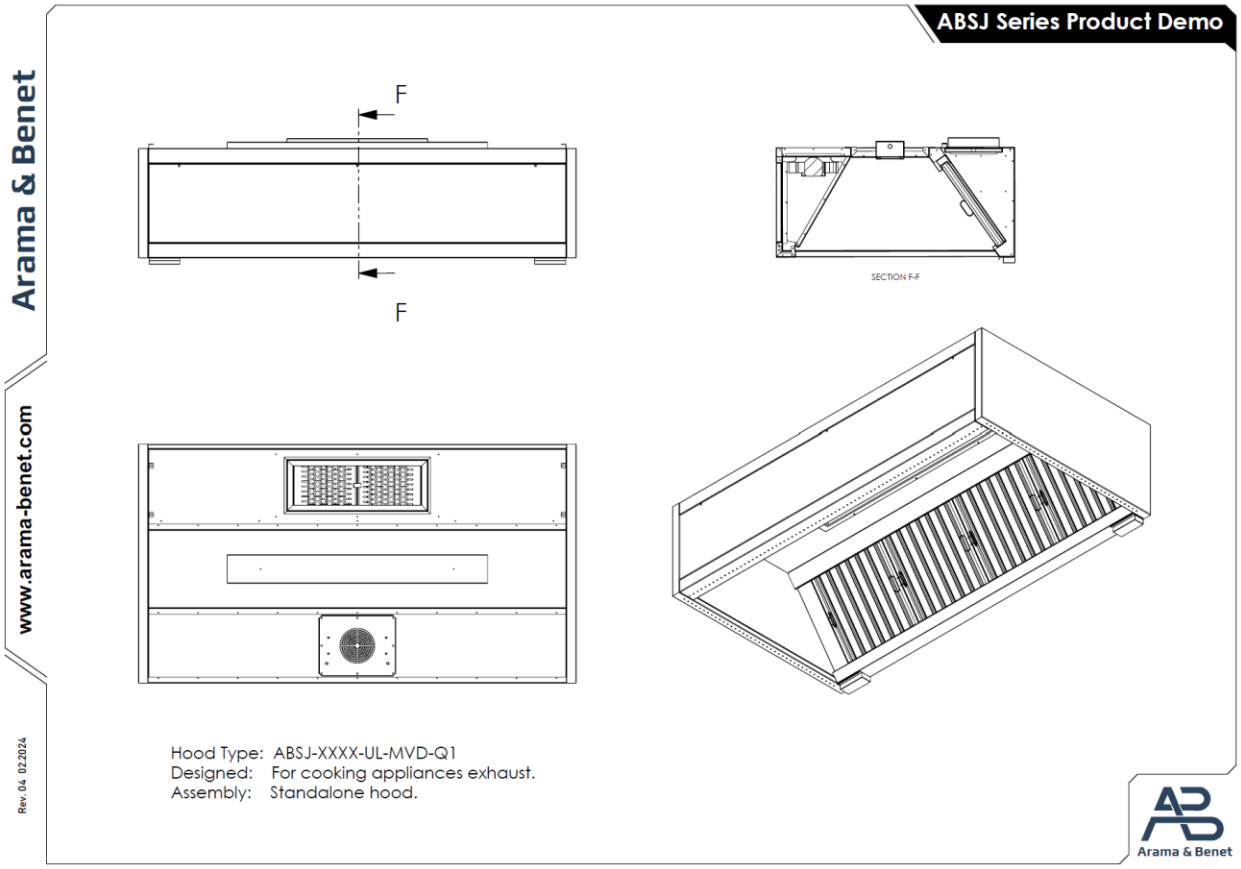
"Flat Jet" Series Energy saving air exhaust and air supply hood for solid fuel operated heavy-duty and super heavy-duty cooking appliances. For wall type installation. Single section. Including

- **"Water Mist" On-Demand control System**
- **"UVGuard-Pro" Ultraviolet Germicidal Irradiation (UVGI) system**
- **"Magic-Pro" Demand Control Kitchen Ventilation Energy Saving System**

ABSJ Series Hoods. How to read key product:



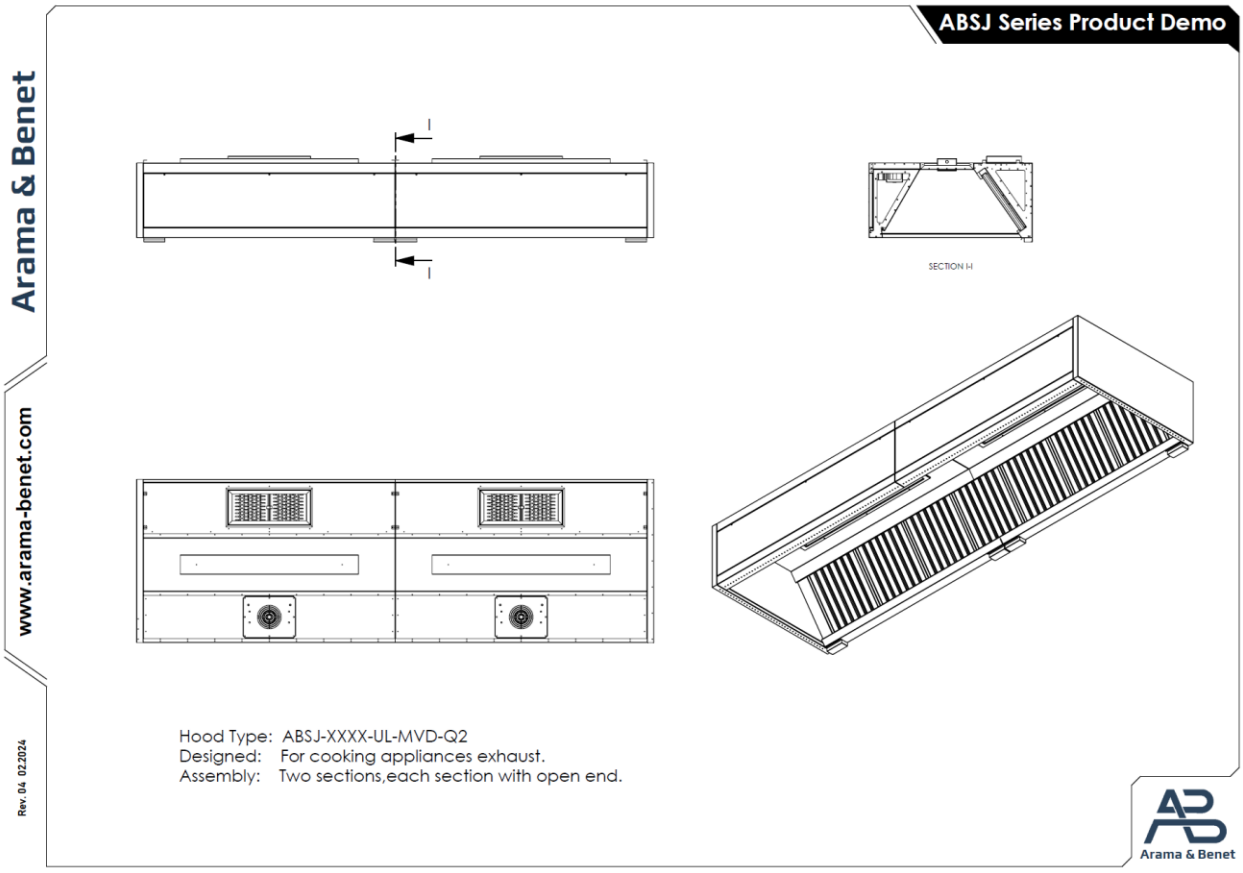
ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-UL-MVD-Q1

Energy saving hood for cooking appliances exhaust. For wall type installation. Single section. UL-710 Listed. ASTM-1704-19 verified.

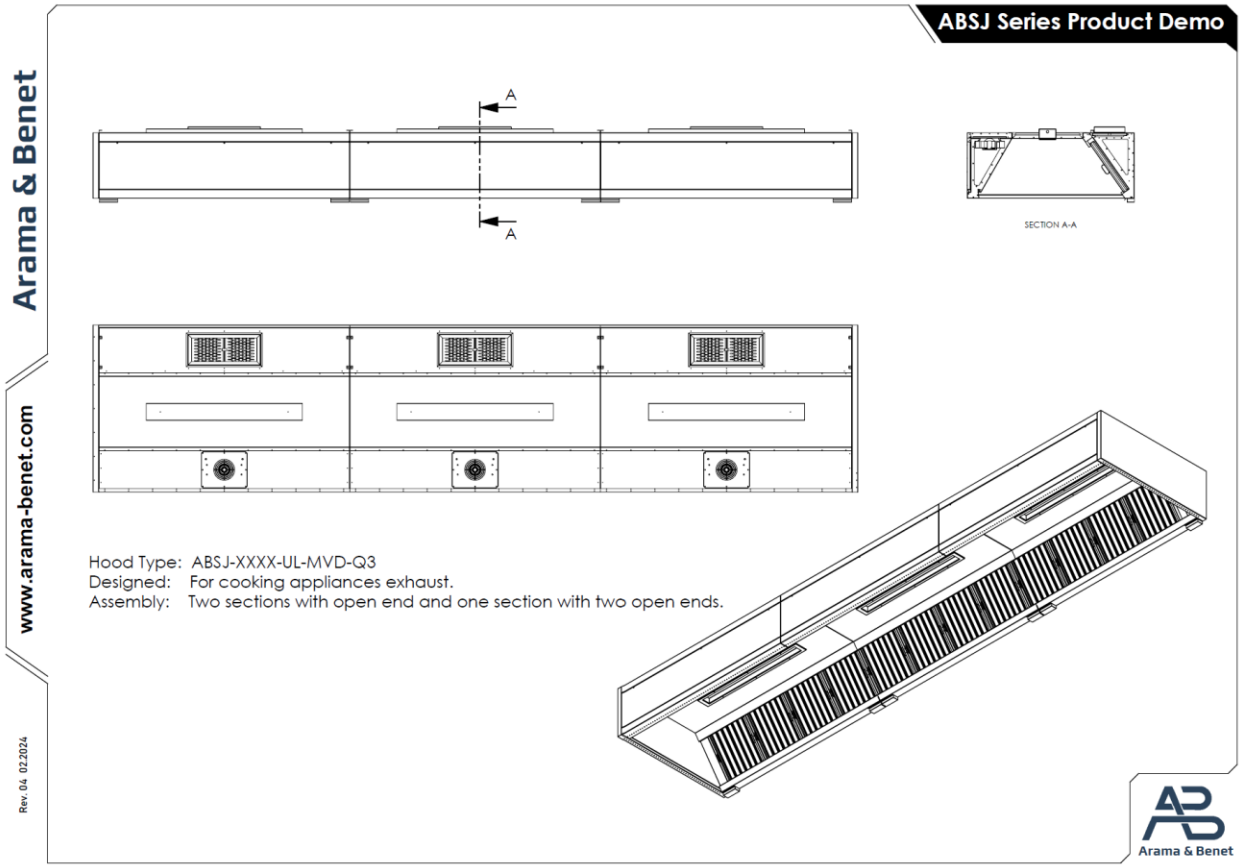
ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-UL-MVD-Q2

Energy saving hood for cooking appliances exhaust. For wall type installation. Double section. UL-710 Listed. ASTM-1704-19 verified.

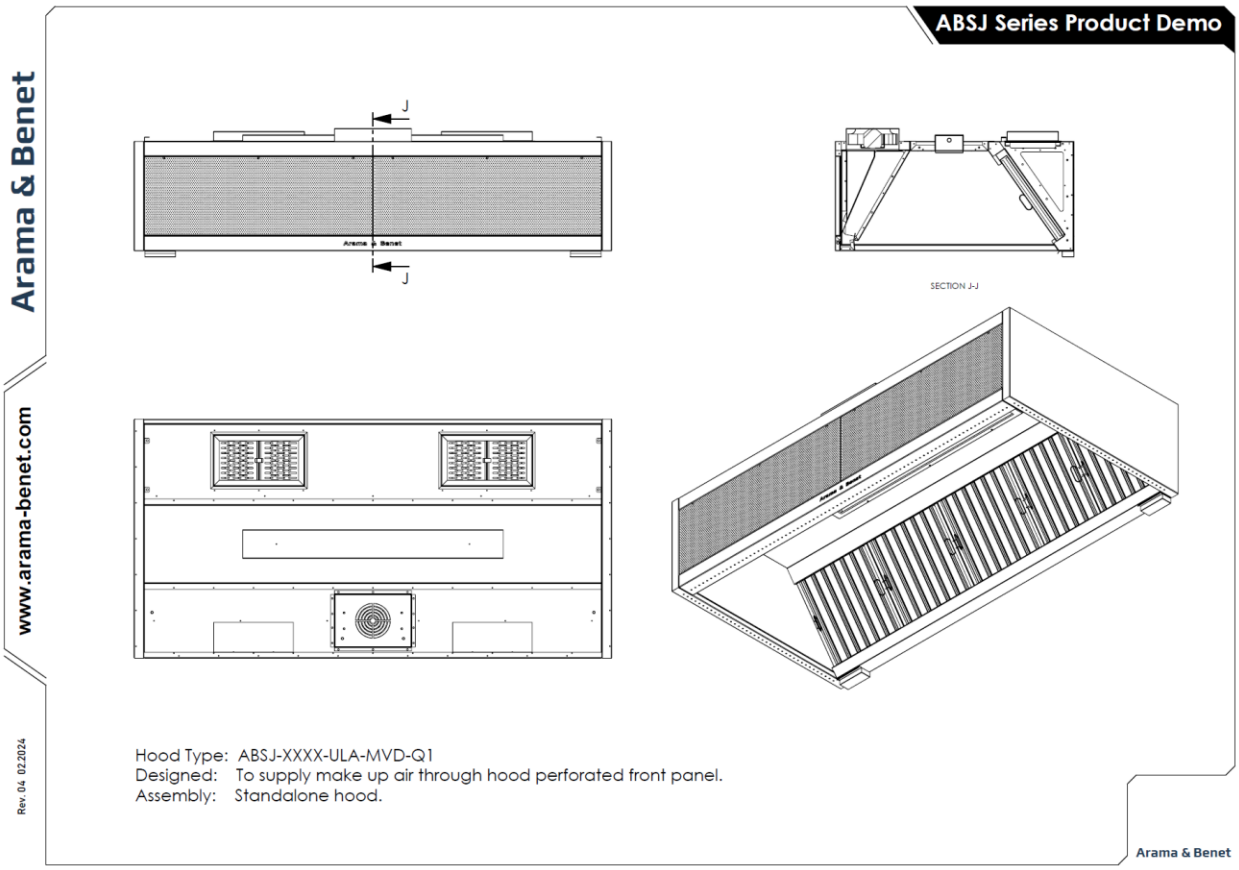
ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-UL-MVD-Q3

Energy saving hood for cooking appliances exhaust. For wall type installation. Tripple section. UL-710 Listed. ASTM-1704-19 verified.

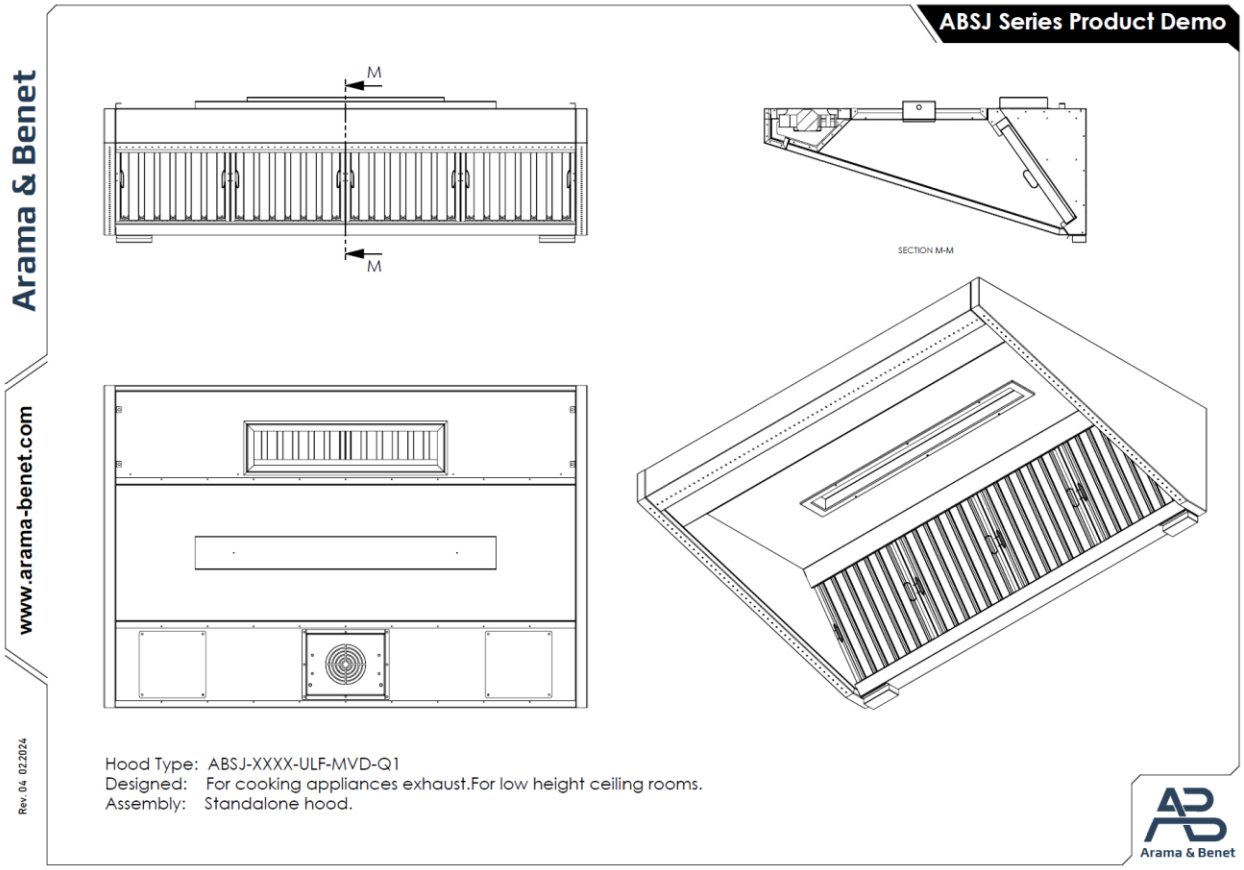
ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-ULA-MVD-Q1

Energy saving hood for cooking appliances exhaust and make-up air supply. For wall type installation. Single section. UL-710 Listed. ASTM-1704-19 verified.

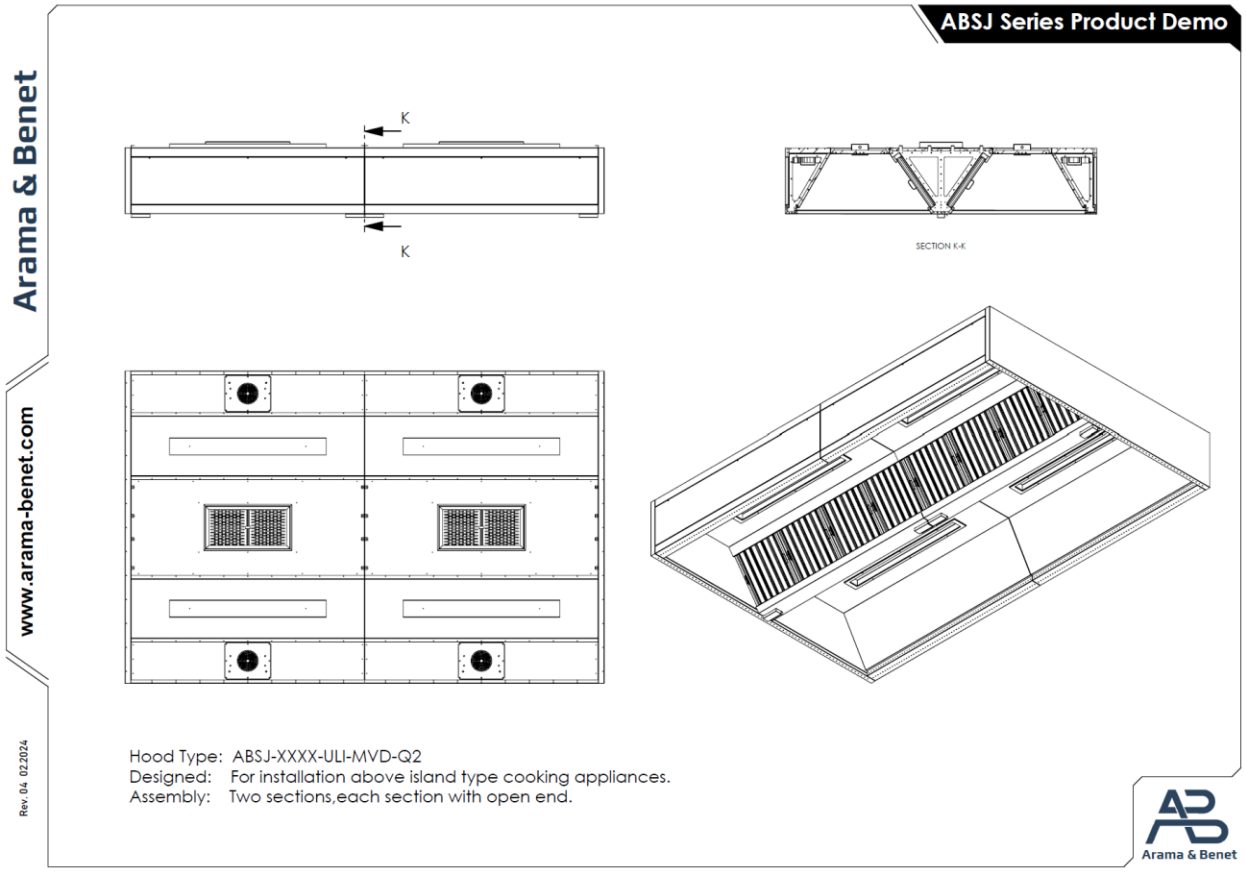
ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-ULF-MVD-Q1

Energy saving hood for cooking appliances exhaust. For wall type installation. Single section. Designed for installation in low-ceiling rooms. UL-710 Listed. ASTM-1704-19 verified.

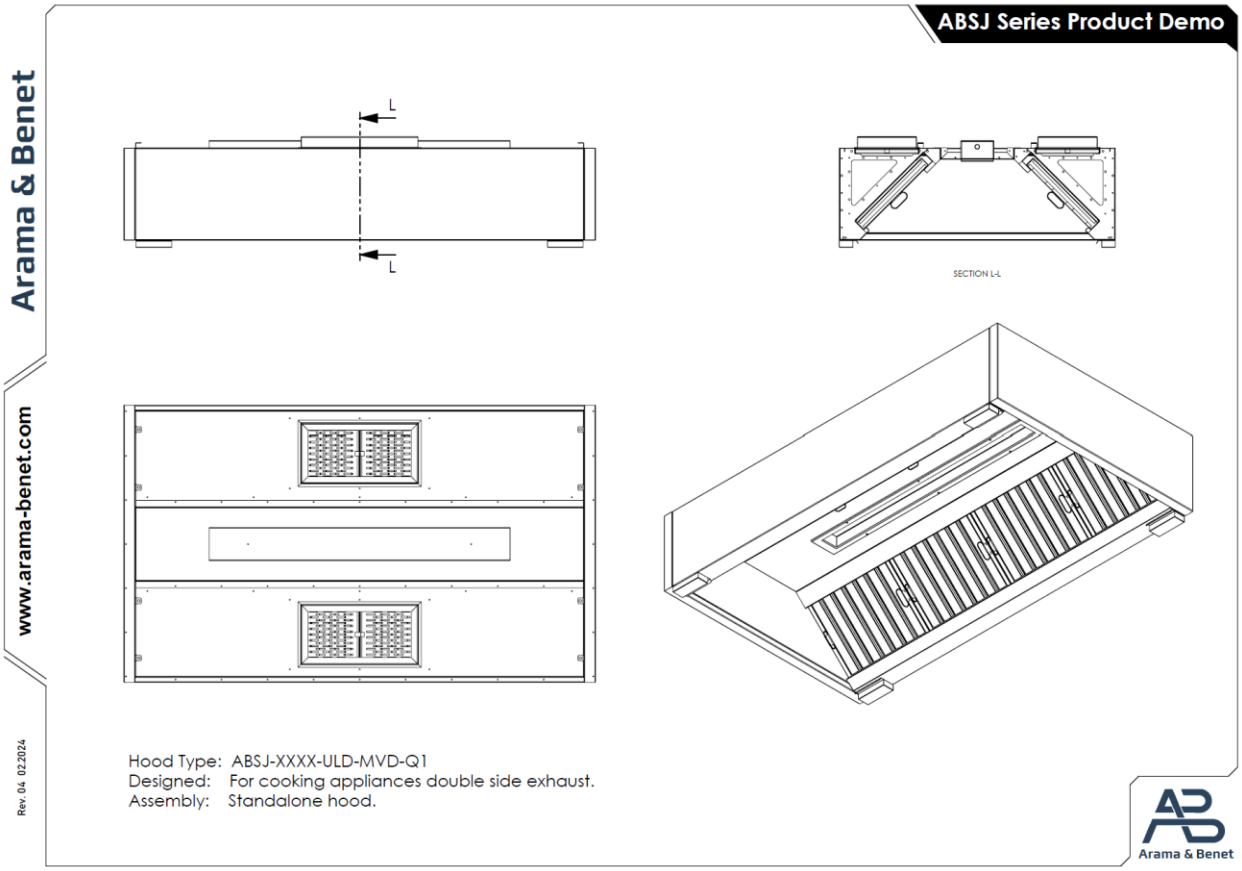
ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-ULI-MVD-Q2

Standalone type energy saving hood for cooking appliances exhaust. For island type installation. Double section. UL-710 Listed. ASTM-1704-19 verified.

ABSJ Series Hoods Product Line:



Hood type: ABSJ-XXXX-ULD-MVD-Q1

Energy saving hood for cooking appliances exhaust. Designed for both island and wall type installations. Single section. UL-710 Listed. ASTM-1704-19 verified.