



Central System Weld Fume Control Solutions

*IDEAL FOR SCHOOLS, FABRICATION SHOPS,
AND MANUFACTURING / PRODUCTION FACILITIES*

**LINCOLN[®]
ELECTRIC**

 **WELD FUME CONTROL**

Lincoln Electric's Central System Weld Fume Control Solutions

IDEAL FOR SCHOOLS, FABRICATION SHOPS,
AND MANUFACTURING / PRODUCTION FACILITIES



Low vacuum system shown above

Regardless of the extraction system needed for your facility, our team at Lincoln Electric will provide engineering, commissioning, training, and service for your system which allows for a simple and easy solution.

Central Systems can be used for the following welding processes and metalworking operations:

- ▶ Stick (SMAW)
- ▶ TIG (GTAW)
- ▶ Flux-Cored (FCAW)
- ▶ MIG (GMAW)
- ▶ Plasma Cutting
- ▶ Grinding⁽¹⁾

Lincoln Electric's Central Systems feature:

- ▶ Flexibility
- ▶ Low energy consumption
- ▶ Support, Service and Knowledge from the Lincoln Electric team

⁽¹⁾ Not suitable for use when grinding aluminum, magnesium or other explosive materials.

With a Central System, welding fume is removed and extracted at the point of welding, typically referred to as the source, and is transported via ductwork to a central location for filtration. This type of extraction system helps to keep welding fume away from the operator's breathing zone and also reduces the accumulation of welding fume in the workplace.

WELD FUME EXTRACTION SYSTEMS GENERALLY FALL INTO ONE OF TWO CATEGORIES: LOW VACUUM OR HIGH VACUUM.

Low Vacuum Central Systems

Low vacuum systems can be source extraction at the arc or general ventilation. Low vacuum source extraction systems draw air at close proximity (6 - 15 inches) to the welding arc. The extraction equipment is designed such that it removes a large volume of air at low transport velocity and low system pressure. The air volume is directly related to the type of capture device used with the low volume system.

Low vacuum central systems are typically installed in:

Schools with individual welding booths, training facilities and facilities with fabrication of large parts.

High Vacuum Systems

High vacuum systems are source extraction systems that draw the welding fume at very close proximity (2 - 6 inches) to the welding arc. The extraction equipment is designed such that it draws the air at a very high air transport velocity and high pressure, but at a low air volume.

High vacuum systems are typically installed in:

Schools, job shop part fabrication, facilities with fabrication of smaller parts that are not moved around, and low ceiling facilities.

High vacuum system shown below

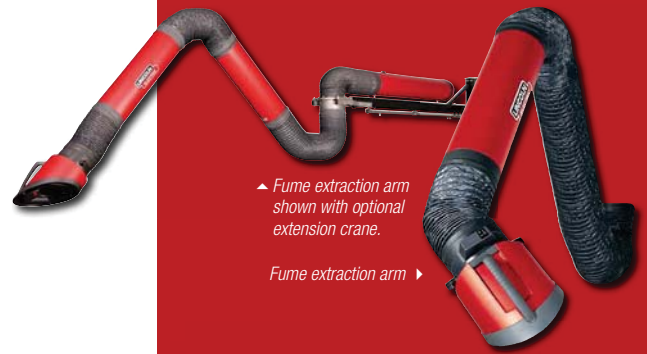


A LOW VACUUM CENTRAL SYSTEM IS COMPRISED OF THE FOLLOWING COMPONENTS:

- 1. Extraction Arms** - Extraction arms for low vacuum systems are constructed of a hood and hose or hose and tube combination. The arm's diameter is typically 8 inches; lengths are usually 6, 10 or 13 feet (2, 3 or 4 meters) with boom extensions available. When correctly positioned, the capture capability of adjustable fume extraction arms is suitable for all position welding and cutting. A lamp with arc sensor kit is available for most arms.
- 2. Ducting** - Enclosed pathway for moving welding fume from capture device to filtration unit.
- 3. Filter Unit** - Lincoln Electric filter units have self-cleaning capability and filter media designed for welding fume. Filters with a Minimum Efficiency Reporting Value (MERV) rating of 16 are available. (Filter efficiency is dependent on process and particulate type and size). A collection bin located under the filter unit provides a convenient means to handle collected particulate. (Particulate should be disposed of according to Federal, State and local regulations). Some filter units may include a pre-separator to protect filter cartridges from mechanical damage due to larger particles.
- 4. Fan Motor** - When reviewing fan specifications, Lincoln Electric looks closely at:
 - Motor power consumption
 - Free blowing capacity
 - Weight
 - Motor speed
 - Maximum noise level
 - Operating Elevation

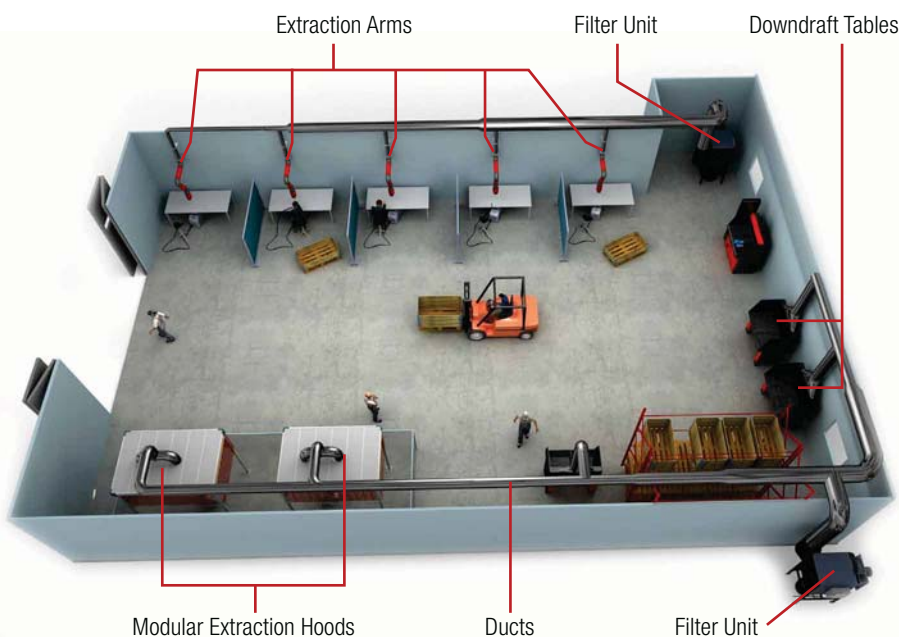
Correctly sizing the fan motor will minimize operating energy costs while providing the correct amount of CFM to meet the system and customer needs.
- 5. Controls** - Two control options are available on low vacuum central systems – manual or automatic. Either control system can be used with or without filtration.
 - a. Manual On/Off Control** - Manual control results in the fan running at full speed and 100% capacity regardless of demand when the system is turned on. Manual control has the least expensive installation costs, but high energy usage when compared to automatic control.
 - b. Automatic Control** - A central system with automatic control uses a variable frequency (or inverter) drive to adjust the fan speed based on extraction need. As the control system senses more welding arcs, the fan speed increases to handle the additional demand. As demand lessens, the fan slows down. Energy savings can be realized with automatic controls; however, the installation cost is higher than manual controls.

Note: Individual welder exposure level should be checked to confirm it is within OSHA PEL and ACGIH TLV limits for the manual or automatic setting used.



BENEFITS OF A LOW VACUUM CENTRAL SYSTEM INCLUDE:

- Easy positioning of extraction arm
- Minimal maintenance
- Automatic filter cleaning
- Custom engineered to meet facility and application requirements
- Larger amount of air removed from operator's breathing zone
- Lower noise level
- Energy efficient - automatic controls and recirculation



BENEFITS OF A HIGH VACUUM CENTRAL SYSTEM:

- Automatic filter cleaning
- Low maintenance
- Economical to operate



EN 20 Extraction Nozzle



SHM-400 Suction Head



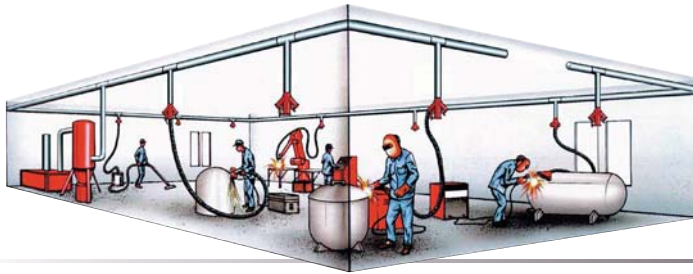
Magnum[®] PRO Fume Extraction Welding Gun



SHFA Flat Suction Nozzle with Flexible Arm

HIGH VACUUM CENTRAL SYSTEMS:

High vacuum systems are source extraction systems that draw the welding fume at very close proximity (2 - 6 inches) to the welding arc. The extraction equipment is designed such that it draws the air at a very high air transport velocity and high pressure, but at a low air volume, typically 50 - 160 CFM when using 1.5 - 3 inch diameter hose or duct. These systems require very large extraction fans to create the high operating pressure. Types of extraction devices include suction nozzles, flex hoses and welding guns with integrated fume extraction. The extraction system hoses and duct sizes are usually very small and can be easily moved about the work area or used in confined spaces. Also, due to the low volume of air movement, make-up air or outside air introduced back into a space that a ventilation system has exhausted outside is kept at a minimum.



Eastern Wyoming College utilizes a high vacuum central system for fume extraction.

The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.

CUSTOMER ASSISTANCE POLICY

The business of The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to www.lincolnelectric.com for any updated information.

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WELD FUME CONTROL

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