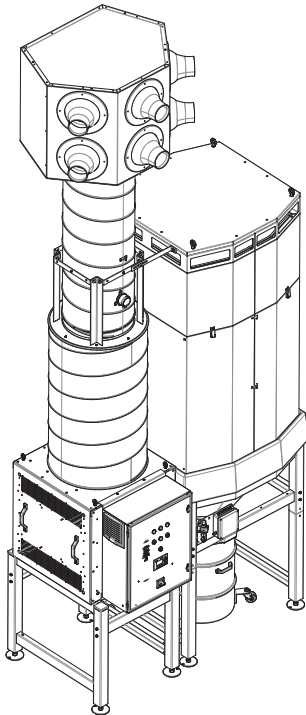




Operator's Manual

Circulator®



For use with machines having Code Numbers:
AD1326-10



Register your machine:
www.lincolnelectric.com/register
Authorized Service and Distributor Locator:
www.lincolnelectric.com/locator

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.



KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

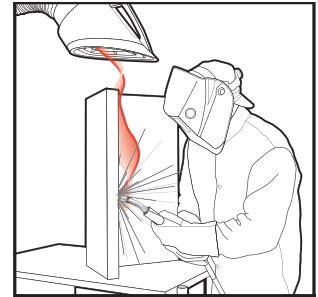
READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.



WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**



SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.



SECTION A: WARNINGS



CALIFORNIA PROPOSITION 65 WARNINGS



WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to
www.P65warnings.ca.gov/diesel

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code § 25249.5 *et seq.*)



WARNING: Cancer and Reproductive Harm
www.P65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



FOR ENGINE POWERED EQUIPMENT.

- 1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
- 1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- 1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact



with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

- 1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
- 1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
- 1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
- 1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- 1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- 2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- 2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- 2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
- 2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
 - 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
 - 2.d.2. Never coil the electrode lead around your body.
 - 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
 - 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
 - 2.d.5. Do not work next to welding power source.



ELECTRIC SHOCK CAN KILL.



- 3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
 - DC Manual (Stick) Welder.
 - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
 - 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
 - 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
 - 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
 - 3.g. Never dip the electrode in water for cooling.
 - 3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
 - 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
 - 3.j. Also see Items 6.c. and 8.



ARC RAYS CAN BURN.



- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



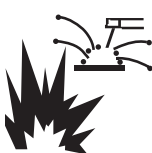
FUMES AND GASES CAN BE DANGEROUS.



- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. 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.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer's safety practices. SDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.



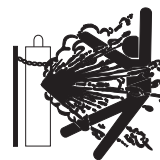
WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



- 6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 02269-9101.
- 6.j. Do not use a welding power source for pipe thawing.



CYLINDER MAY EXPLODE IF DAMAGED.



- 7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.



FOR ELECTRICALLY POWERED EQUIPMENT.



- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Refer to
<http://www.lincolnelectric.com/safety>
for additional safety information.

Table of Contents

Installation.....	Section A
Technical Specifications.....	A-1
Select Suitable Location.....	A-2
Environmental Area.....	A-2
Stacking	A-2
Tilting	A-2
Lifting	A-2
General Description.....	A-2
Uncrating.....	A-2
Hardware Overview.....	A-3
Tools Needed.....	A-3
Hardware Uncrating.....	A-3
Connecting Air Inlet To Filter Base.....	A-3
Connection Of Filter Base To Frame.....	A-4
Fan Base Assembly.....	A-4
Connection Of Fan Unit To The Leg Base.....	A-4
Connection Of Fan Assembly To Filter Unit.....	A-4
Connecting Outlet Unit.....	A-5
Connecting L Bracket.....	A-5
Install Pressure Sensor And Pitot Tube.....	A-6
Particulate Collection Drum.....	A-6
Compressed Air Connection.....	A-6
Operation.....	Section B
Graphic Symbols used in manual.....	B-1
Control	B-2
Controls / Indicator Lights.....	B-2
Time Controlled Operation.....	B-2
Automatic System Start-Up.....	B-5
Overtime System Start-Up.....	B-5
PLC Start-Up Process.....	B-5
Set Weekly Timer.....	B-5
Outlet Nozzles.....	B-7
Maintenance.....	Section C
Automatic Filter Cleaning.....	C-1
Periodic Maintenance.....	C-1
Maintenance Schedule.....	C-1
Motor/Fan Housing.....	C-2
Replacing The Filters.....	C-3
Troubleshooting	Section D
Diagrams	Section E
Block Logic Diagram.....	E-1
Field Connection Diagram.....	E-2
Parts List.....	parts.lincolnelectric.com

Content/details may be changed or updated without notice. For most current Instruction Manuals, go to parts.lincolnelectric.com.

TECHNICAL SPECIFICATIONS CIRCULATOR

INPUT			
MAKE/MODEL	DESCRIPTION	INPUT VOLTAGE +/- 10%	NOMINAL CURRENT (MAX.)
AD1326-10	Circulator	380-480V/3~/50-60Hz	13.9A

PHYSICAL DIMENSIONS			
HEIGHT	WIDTH	DEPTH	WEIGHT
213.6 in. 5425 mm	92.1 in. 2340 mm	53.2 in. 1350 mm	1764 lbs. 800 kg.

TEMPERATURE RANGE	RELATIVE HUMIDITY
41°F (5°C) to 113°F (45°C)	MAX. 80%

FILTER MATERIAL	FILTER SURFACE AREA
Cellulose fibers provided with precoat	2 x 807 ft² (2 x 75 m²)

FILTER CLASS L
According to DIN EN 60335-2-69

COMPRESSED AIR QUALITY	REQUIRED PRESSURE
Dry and Oil Free (ISO 8573-3 class 6)	5 - 6 BAR (75 - 90 PSI)

COMPRESSED AIR CONNECTION	COMPRESSED AIR CONSUMPTION
Quick Coupling ISO 6150 B	Max: 5.3 ft³/min. (87 lbs./in²) Depending on the degree of filter saturation

OFFLINE CLEANING CYCLE DURATION
1hr 30 min

INSULATION CLASS FAN MOTOR	PROTECTION CLASS FAN MOTOR
F	IP54

INSTALLATION

Safety Precautions

Read entire installation section before starting installation.

WARNING

ELECTRIC SHOCK can kill.

- Only qualified personnel should perform this installation.
- Turn the input power OFF and unplug the machine from the receptacle before working on this equipment.
- Insulate yourself from the work and ground.
- Always connect the CIRCULATOR to a power supply grounded according to the National Electrical Code and local codes.



SELECT SUITABLE LOCATION

This product is for INDOOR USE ONLY.

- Do not place equipment near radiant heat sources.
- Do not place in a confined space. Allow a minimum of 3 feet of clearance around machine at all times for maintenance requirements.
- The circuit breaker switch on the rear panel is the input power disconnect device. Do not position the equipment so that it is difficult to operate the circuit breaker.

ENVIRONMENTAL AREA

Keep the machine inside and dry at all times. Do not place it on wet ground or in puddles. Never place liquids on top of the machine.

STACKING

The Circulator cannot be stacked.

TILTING

Place the Circulator directly on a secure, level surface.

LIFTING

Lifting this machine is NOT recommended without disassembly. If lifting or moving is necessary, follow the Installation Procedure detailed in this manual.

GENERAL DESCRIPTION

The CIRCULATOR is a free-standing general filtration system that prevents accumulation of welding fume by continuous filtration of polluted air. It consists of a central filter unit, a fan in a sound absorbing case, an outlet unit with adjustable outlet nozzles, a silencer and a control panel with variable frequency drive and PLC.

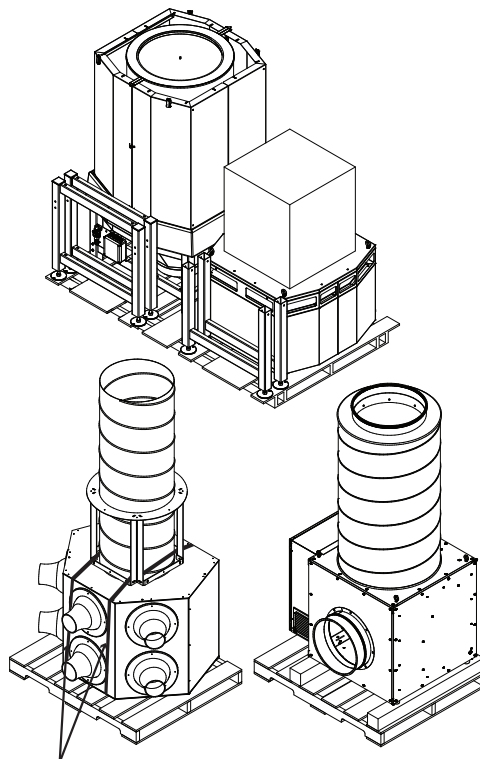
The air containing welding fumes is extracted through the air inlet module on top of the filter unit. The larger particles and any sparks are separated by a labyrinth-shaped spark arrester. Subsequently, the air is cleaned by the main filter cartridges. The air is then passed through the extraction fan and a duct silencer. The clean air is blown back into the workshop by the outlet unit with adjustable nozzles. The unit contains an automatic pulse cleaning system that cleans the filter cartridges using compressed air. The dust and dirt particles are collected in the drum that is located underneath the filter unit.

The CIRCULATOR compliments the natural and forced ventilation system(s) to reduce welding fume in the general workshop area.

UNCRATING

1. Position the filter leg base in the desired location and raise it in to position.
2. Locate the mounting hardware box and verify all necessary mounting hardware is present.
3. Using an appropriate hoist and rigging attached to the eye bolts, remove the unit from the pallets and position the unit in the desired location. See Figure A.2

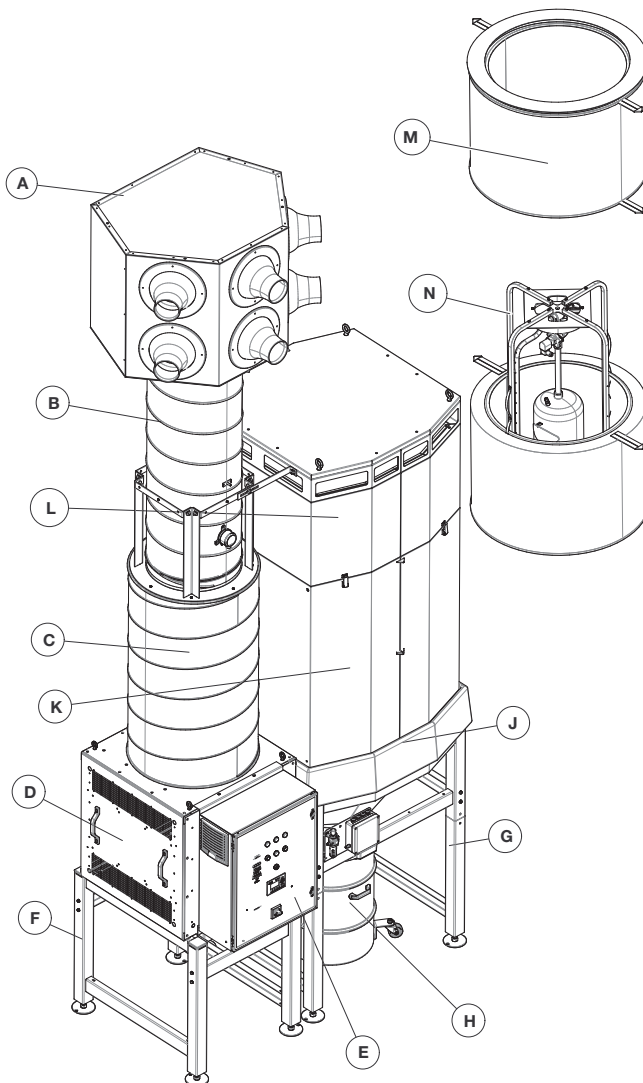
FIGURE A.1



These straps should be removed after connecting outlet unit. See fig A.8

HARDWARE OVERVIEW:

- A. Outlet unit with 6 adjustable nozzles
- B. Duct 20 inches (508mm diameter)
- C. Silencer
- D. Fan
- E. System Control Panel
- F. Fan Base
- G. Filter Base
- H. Filter Control Box
- I. Particulate Collection Drum
- J. Base
- K. Filter Housing
- L. Air Inlet Module
- M. Filter Cartridges
- N. Automatic Filter Cleaning System

FIGURE A.2 – CIRCULATOR HARDWARE OVERVIEW**TOOLS NEEDED**

- 9/16" SOCKET WRENCH
- 9/16" OPEN END WRENCH
- #5/16 SOCKET WRENCH
- Miscellaneous Hand Tools
- Ladder/Lift

HARDWARE UNCRATING:

1. Carefully remove shrink wrap and protective packaging from all components.
2. Obtain mounting hardware box located on skid with duct work.

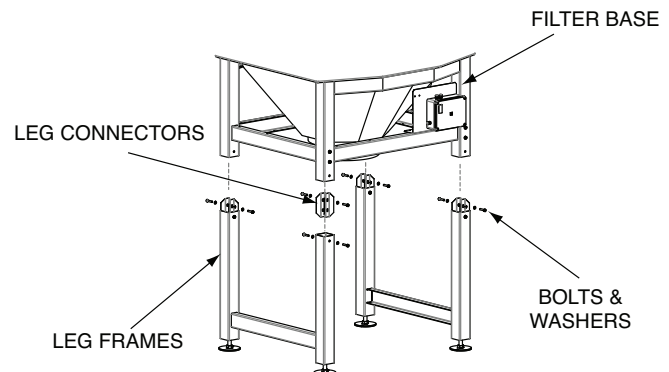
⚠ WARNING

FALLING EQUIPMENT can cause injury.

- Lift only with equipment of adequate lifting capacity.
- Be sure machine is stable when lifting.
- Do not operate machine while suspended or when lifting.

**CONNECTION OF FILTER BASE TO FRAME**

1. Locate the thick set of legs and prepare for installation on air inlet module. See Figure A.3.

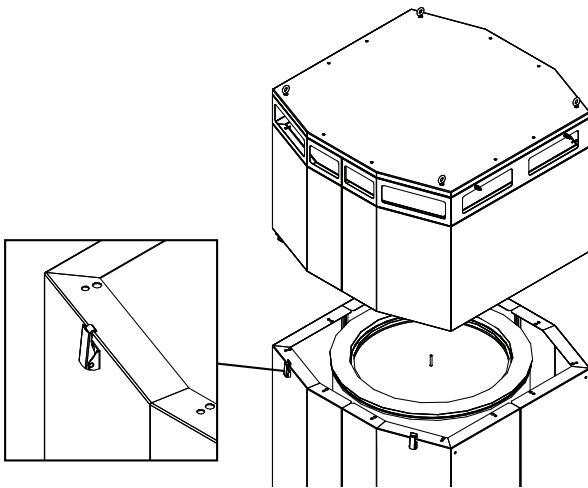
FIGURE A.3

2. Insert leg connectors half way into leg frames. See Figure A.5.
3. Insert bolts and washers into lower holes and hand tighten. See Figure A.5.
4. Using a lift or hoist, position the assembled air inlet module onto the leg assembly.
5. Insert bolts and washers into upper holes of the leg connectors. Using a 13mm nutdriver, tighten all nuts and bolts securely.

CONNECTING AIR INLET TO FILTER BASE

1. Lift the air inlet module with the eye bolts using a crane, align & place it above the filter housing. Secure it using four latches. See Figure A.4.

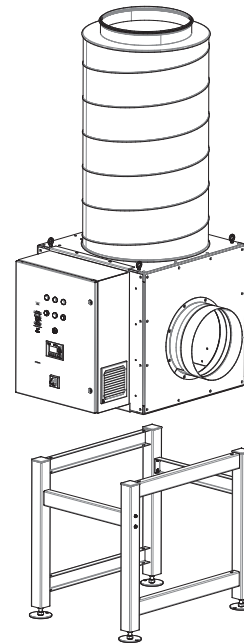
FIGURE A.4



CONNECTION OF FAN UNIT TO THE LEG BASE.

Carefully move the fan assembly including Silencer & Control Panel from the skid using tow motor. Place it above the leg assembly. Secure it using 3/8" bolts at 4 places. Figure A.6

FIGURE A.6

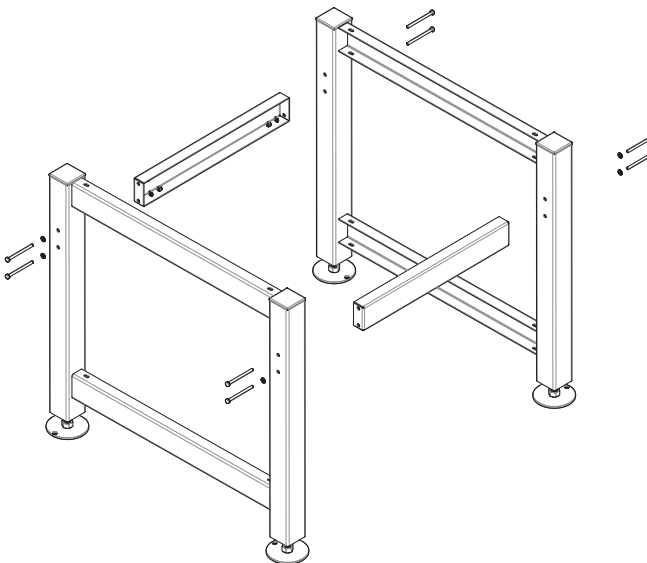


Note orientation

FAN BASE ASSEMBLY

1. Carefully remove the two (2) leg frames & connecting frames from skid. Assemble the fan base using long M8 bolts provided in the hardware kit as shown in the Fig A.5

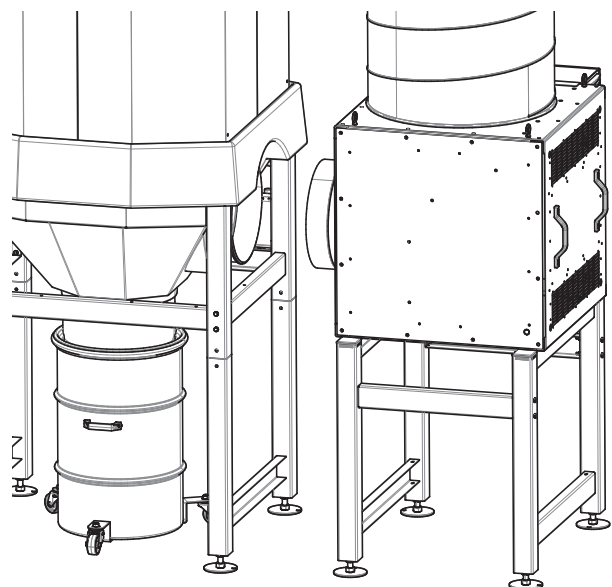
FIGURE A.5



CONNECTION OF FAN ASSEMBLY TO FILTER UNIT:

- 1) Carefully align the fan inlet hole to the Filter Housing outlet hole.
- 2) Height can be adjusted by rotating the adjustable feet.
- 3) Push the Fan unit towards the Circulator until the Filter housing outlet is inserted inside the fan box inlet.
- 4) Secure it using sheet metal screws (not shown)

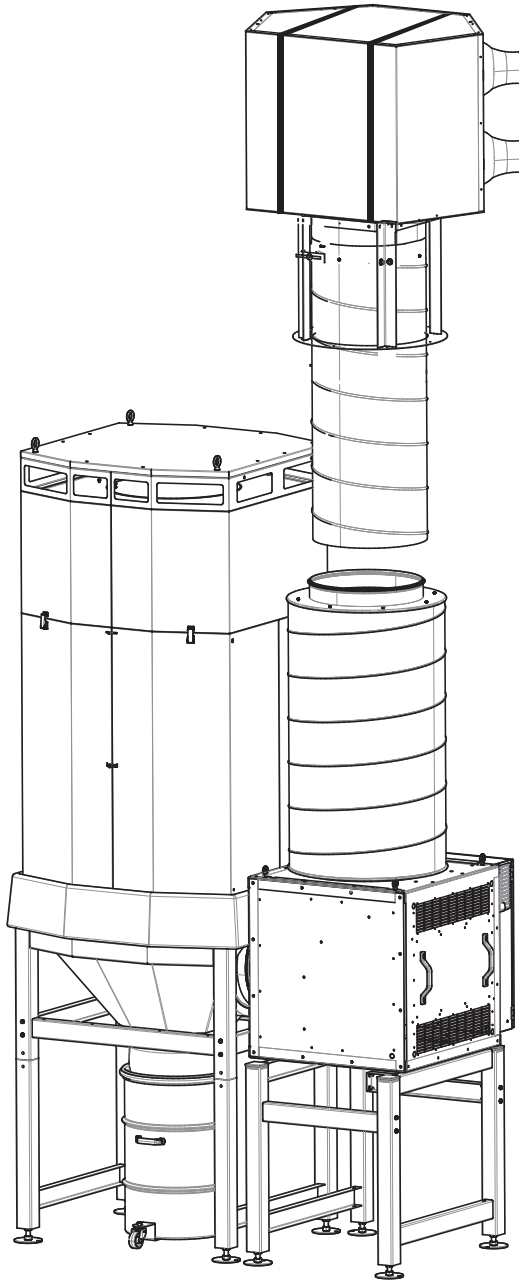
FIGURE A.7



CONNECTING OUTLET UNIT

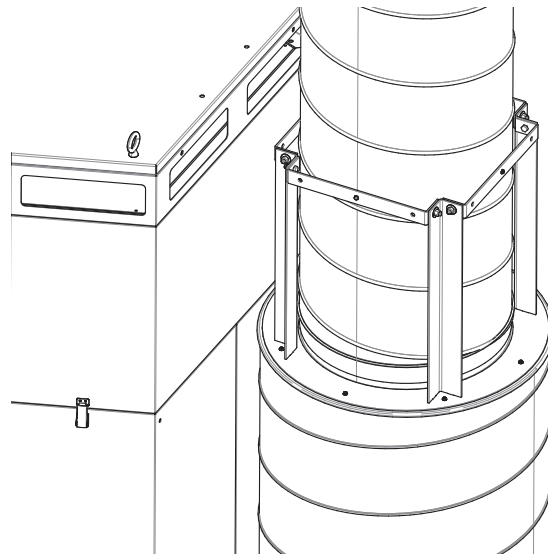
- 1) Carefully lift the assembled Outlet without cutting the Straps on the Holding bracket. Tilt it keeping duct pipe down. Insert duct pipe over the Flange connection of the Silencer. Orient the Nozzle head. See Figure A.8.

FIGURE A.8



- 2) Remove the straps & slowly drag down the bracket assembly, place the round piece sitting flush with Silencer top surface. See Figure A.9

FIGURE A.9

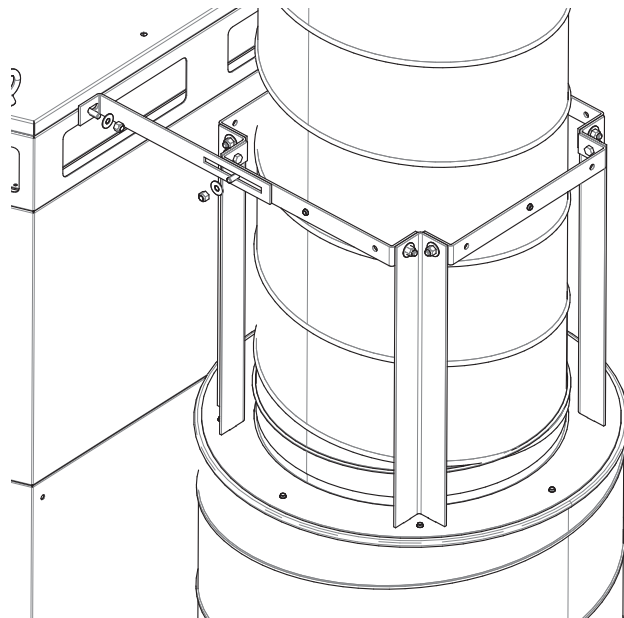


- 3) Secure the duct pipe to the Silencer using 6 #10 sheet metal screws provided (not shown).

CONNECTING L BRACKET

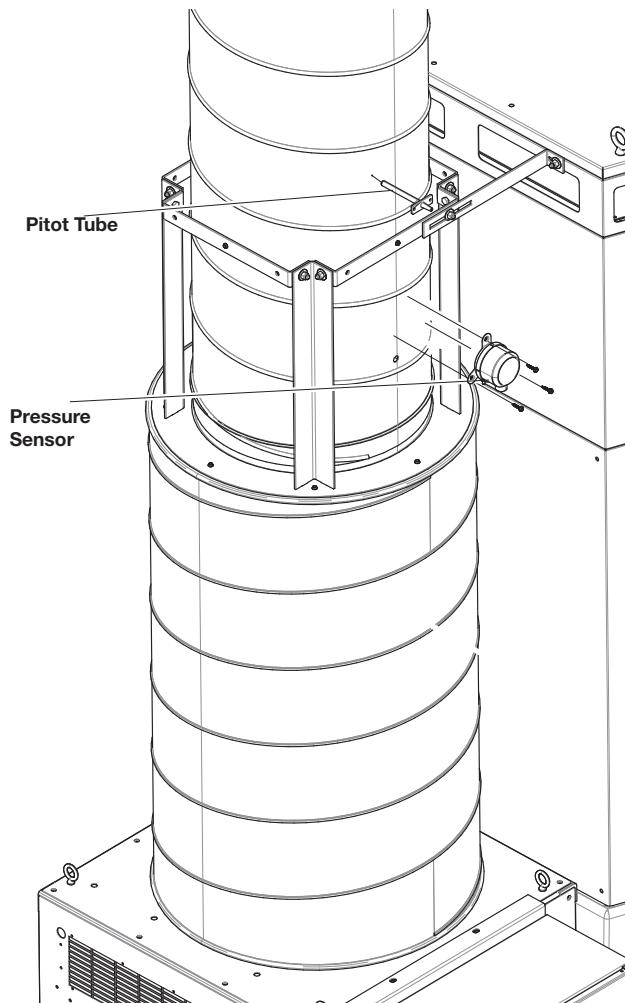
- 1) Align the Holding bracket & make it parallel to the filtration unit.
- 2) Install the connecting L brackets between Air inlet & Holding bracket using 3/8" Hardware.
- 3) Secure the Holding bracket with #10 sheet metal screws from hardware kit as mentioned below:
 - a) Round piece with the Silencer 8 No's
 - b) C Brackets with the Duct Pipe 4 No's at the middle.
 See Figure A.10

FIGURE A.10

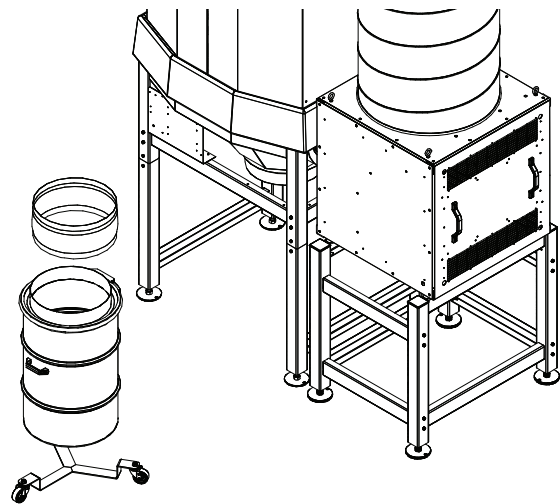


INSTALL PRESSURE SENSOR AND PITOT TUBE

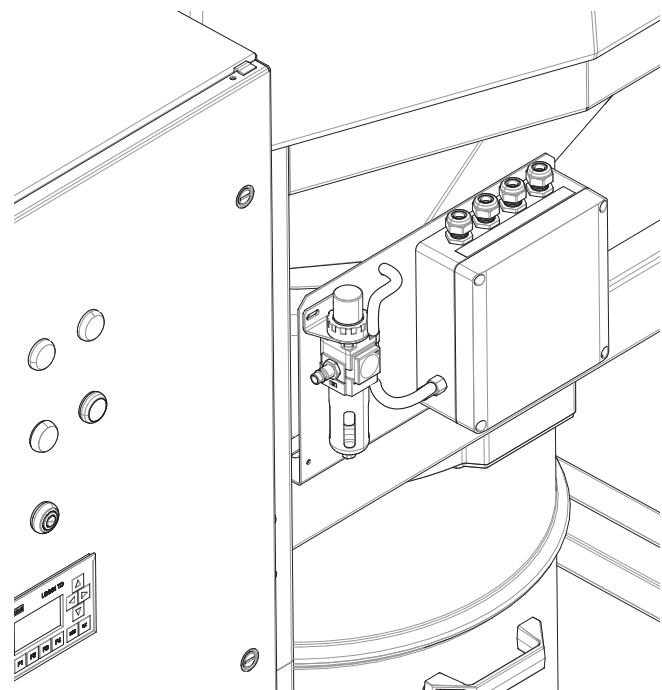
- 1) Drill 1/4" inch hole in the duct pipe 2 - 3" above the Duct Bracket.
- 2) Insert Pitot tube & secure it with sheet metal screws (not shown)
- 3) Install Differential Pressure Sensor 5 - 10" below the duct bracket. See Figure A.11
- 4) Secure Pressure Sensor using 3 Sheet metal screws.
- 5) Connect the clear tube from Pitot tube to the +ve connection nipple (left side) of the sensor.
- 6) Connect other end of the wire terminal from Pressure Sensor to the Control Panel. Refer Wiring Diagram for Connection details.

FIGURE A.11**PARTICULATE COLLECTION DRUM**

1. Mount the flexible duct connector onto the drum flange and tighten the adjustable clamps using a slot head screwdriver. See Figure A.12.
2. Remove shrink wrap from the bottom of the hopper.
3. Position the particulate collection drum directly below the hopper.
4. Connect the other end of the flexible duct connector to the bottom of the hopper.

FIGURE A.12**COMPRESSED AIR CONNECTION**

1. Connect compressed air line to pressure Regulator. Air supply must be in a range between 5 to 6 Bar. See Figure A.13.

FIGURE A.13

When Making Electrical Connections

Make all electrical connections compatible to your local city / state code.



WARNING








ELECTRIC SHOCK can kill.

- Only qualified personnel should perform this installation.
- Turn the input power OFF and unplug the machine from the receptacle before working on this equipment.
- Insulate yourself from the work and ground.
- Always connect the CIRCULATOR to a power supply grounded according to the National Electrical Code and local codes.



OPERATION


GRAPHIC SYMBOLS THAT APPEAR ON THIS MACHINE OR IN THIS MANUAL

-  INPUT POWER
-  ON
-  OFF
-  CIRCUIT BREAKER
-  INPUT POWER
-  SINGLE PHASE
ALTERNATING CURRENT
-  READ THIS OPERATORS
MANUAL COMPLETELY

U_1 INPUT VOLTAGE

I_1 INPUT CURRENT


 PROTECTIVE
GROUND

 **WARNING or CAUTION**
Documentation must be con-
sulted in all cases where this
symbol is displayed.

 Explosion

 Dangerous Voltage

 Shock Hazard

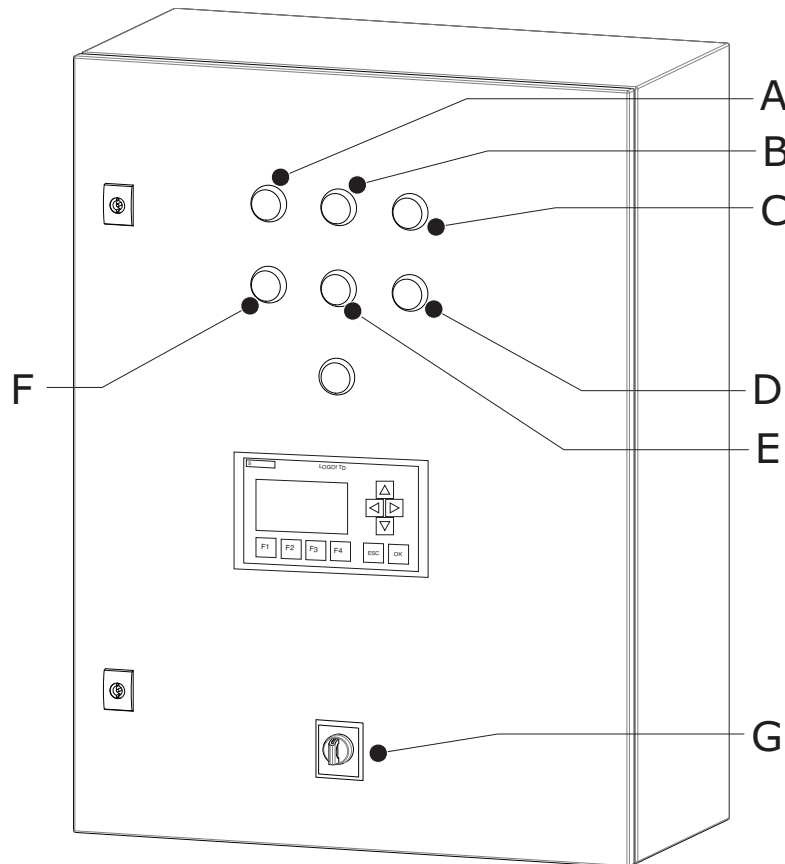
 Shock Hazard

CONTROL

The system is designed to run in automatic mode. In this time-controlled operation, the system will start and stop automatically at the preset days and times. Manual mode is only used for incidental use, e.g. outside regular working hours.

CONTROLS / INDICATOR LIGHTS

FIGURE B.1



TIME CONTROLLED OPERATION

1. Turn on the main switch. **See Figure B.1.**
2. Wait approx. 10 seconds for the system to initialize.
3. Press AUTO (automatic). **See Figure B.1.**

In AUTO mode, the system runs automatically, according to the preset timer settings.

- A. Power On
- B. System Failure (Light)
- C. Fan Running (Light)
- D. Manual Start
- E. Stop
- F. Auto Start
- G. Main Switch - Input Power

1 SAFETY

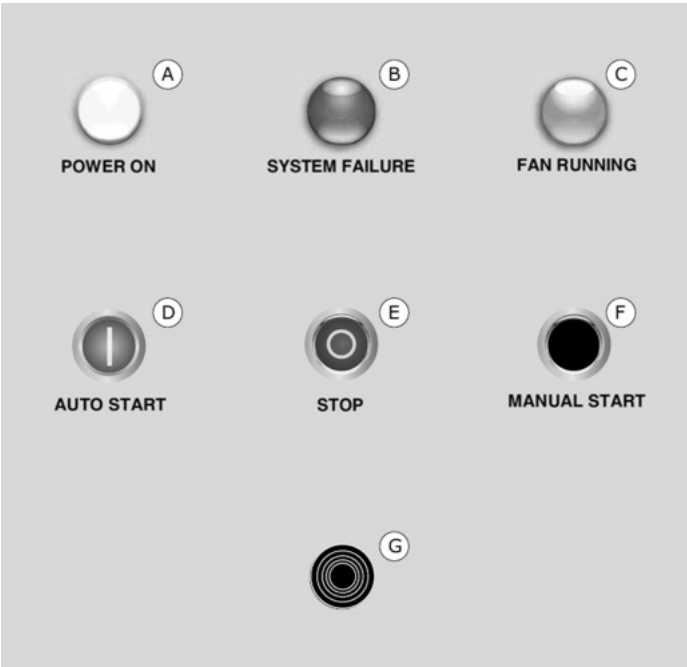


WARNING
Prevent exposure of system control panel to welding or grinding sparks.

2 DISPLAY SYSTEM CONTROL PANEL

2.1 Display

The display of the system control panel looks as follows.



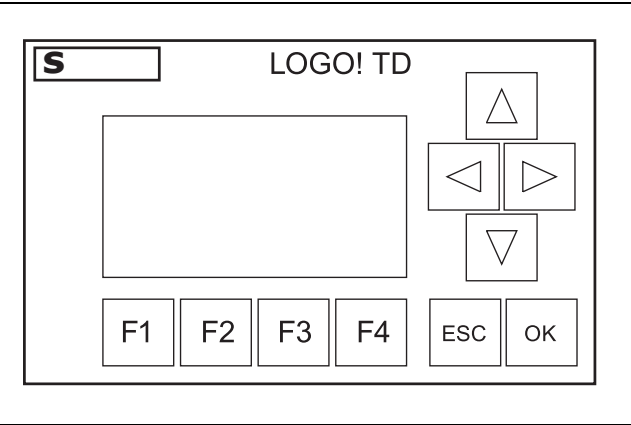
2.2 Functions

- A **Control light POWER ON:**
Indicates the presence of electrical voltage on the system control panel.
- B **Control light SYSTEM FAILURE:**
System failure; check display of PLC and frequency drive for further action.
- C **Control light FAN RUNNING:**
Fan is running or running out.
- D **AUTO START:**
Switch on the system to run in accordance with the timer setting (default setting: on 08:00 h, off 17:00 h).
- E **STOP:**
Switch off the system manually, overruling timer setting.
- F **MANUAL START:**
Manual start of the system outside programmed working hours. System subsequently runtime can be programmed
- G **BUZZER:**
In case of a system failure indicated by the control light (B), the buzzer emits an acoustic signal simultaneously.
- H **MAIN SWITCH** (not shown).

3 DISPLAY PLC

3.1 Display

The PLC display looks as follows.



PLC (Siemens LOGO! TD)

3.2 Function keys

The text display of the PLC contains the following function keys:

F1	Shows status counters: <ul style="list-style-type: none">- total pulses- filter hours- total hours- motor failure for 20 seconds.
F1	Reset filter alarm.
F2	Shows counters: <ul style="list-style-type: none">- online cleaning- filter failure for 20 seconds.
F3	Push once to start "test cleaning cycle" (3 min). Online/Offline cleaning mode.
F3	Push 5 sec. to start "Manual cleaning cycle" (1 hour 30 min). Online cleaning mode only.
F1&F4	Press F1 & F4 together to reset hour counters (except total hours) after filter exchange.

4 LANGUAGE SETTING

4.1 Available languages

The language of the LOGO! menus can be set in one of the ten predefined languages:

- CN (Chinese)
- DE (German)
- EN (English)
- ES (Spanish)
- FR (French)
- IT (Italian)
- NL (Dutch)
- RU (Russian)
- TR (Turkish)
- JP (Japanese)

4.2 Language setting

Default language of the menu is English.

To change the menu language, proceed as follows.

- 1 Press ▼ to show time + date.
- 2 Press **ESC**.
- 3 Select 'Set..': Press ▼ or ▲.

The display shows:

```
Stop
Set Param
>Set..
Prg Name
```

- 4 Press **OK**.
- 5 On the Set menu, select '**Menu Lang**': Press ▼ or ▲.
- 6 Press **OK**.
- 7 Press ▼ or ▲ to select the language of your choice.
- 8 Confirm language selection. Press **OK**.
- 9 Press **ESC** (2x).

5 CLOCK SETTINGS

5.1 Set time and date

To set the time and date, proceed as follows.

- 1 Press ▼ to show time + date.
- 2 Press **ESC**.
- 3 Select '**Set..**': Press ▼ or ▲.
- 4 Press **OK**.
- 5 Move the '>' cursor to '**Clock**': Press ▼ or ▲.
- 6 Press **OK**.
- 7 Move the '>' cursor to '**Set Clock**': Press ▼ or ▲.
- 8 Apply 'Set Clock': Press **OK**.

The display shows (example):

```
Set Clock
Mo 15:30
YYYY-MM-DD
2008-05-26
```

- 9 Select the day of the week: Press ▼ or ▲.
- 10 Move the '>' cursor to the next position: Press ◀ or ▶.
- 11 To change the time: Press ▼ or ▲.
- 12 To set the correct time of day, repeat steps 10 and 11.
- 13 To set the correct date, repeat steps 10 and 11.
- 14 To confirm the entries: Press **OK**.
- 15 Press **ESC** (2x).

5.2 Set summertime/wintertime

To set summertime/wintertime, proceed as follows.

- 1 Press ▼ to show time + date.
- 2 Press **ESC**.
- 3 Select '**Set..**': Press ▼ or ▲.
- 4 Press **OK**.
- 5 Move the '>' cursor to '**Clock**': Press ▼ or ▲.
- 6 Press **OK**.
- 7 Move the '>' cursor to '**S/W Time**': Press ▼ or ▲.
- 8 Press **OK**.

The display shows:

```
>On
Off
S/W Time:
Off
```

- 9 Move the '>' cursor to '**On**': Press ▼ or ▲.
- 10 Confirm 'On': Press **OK**.

The display shows:

```
EU
```

- 11 Press ▶ to select the applicable time zone. Press **OK**.

The display shows (assuming you have set European time):

```
>On
Off
S/W Time:
On → EU
```

Europe/UK/US/Australia/Tasmania/New Zealand/Freely adjustable: customized switchover dates and times.

6 WEEKLY TIMER SETTINGS

6.1 Set weekly timer

Default weekly time settings are Mo-Fr 07:00-17:00 h.

There are four week timers (Timer 1 to 4) installed in the program, each consisting of three screens.

To change the timer settings, proceed as follows.

- 1 Press ▼ to show time + date.
- 2 Press **ESC**.
- 3 Select '**Set Param**': Press ▼ or ▲.
- 4 Press **OK**.

<pre>Timer 1 1 D=MTWTF-- On =07:00 Off =17:00</pre>	<p>Timer 1, screen 1</p> <p>← Weekdays (daily)</p> <p>← On-time (07:00 h)</p> <p>← Off-time (17:00 h)</p>
--	---

- 5 Press ◀ or ▶ to change cursor position. Press ▼ or ▲ to change value.
- 6 Press **OK**.

Note: Timer 1 - screen 4: make sure setting Pulse = **Off**.

If desired, Timers 2 to 4 can be used to set additional on/off moments of the fan, resulting in a start up of the filter cleaning process.

- 7 Press ▲ several times until Timer 2 shows up. Set additional time settings, e.g.:
On = 12:30
Off = 12:00

AUTOMATIC SYSTEM START-UP

1. Follow Set Weekly Timer procedure.



ATTENTION

- Do NOT turn off the main switch.
- Make sure power supply and compressed air are available after working hours.



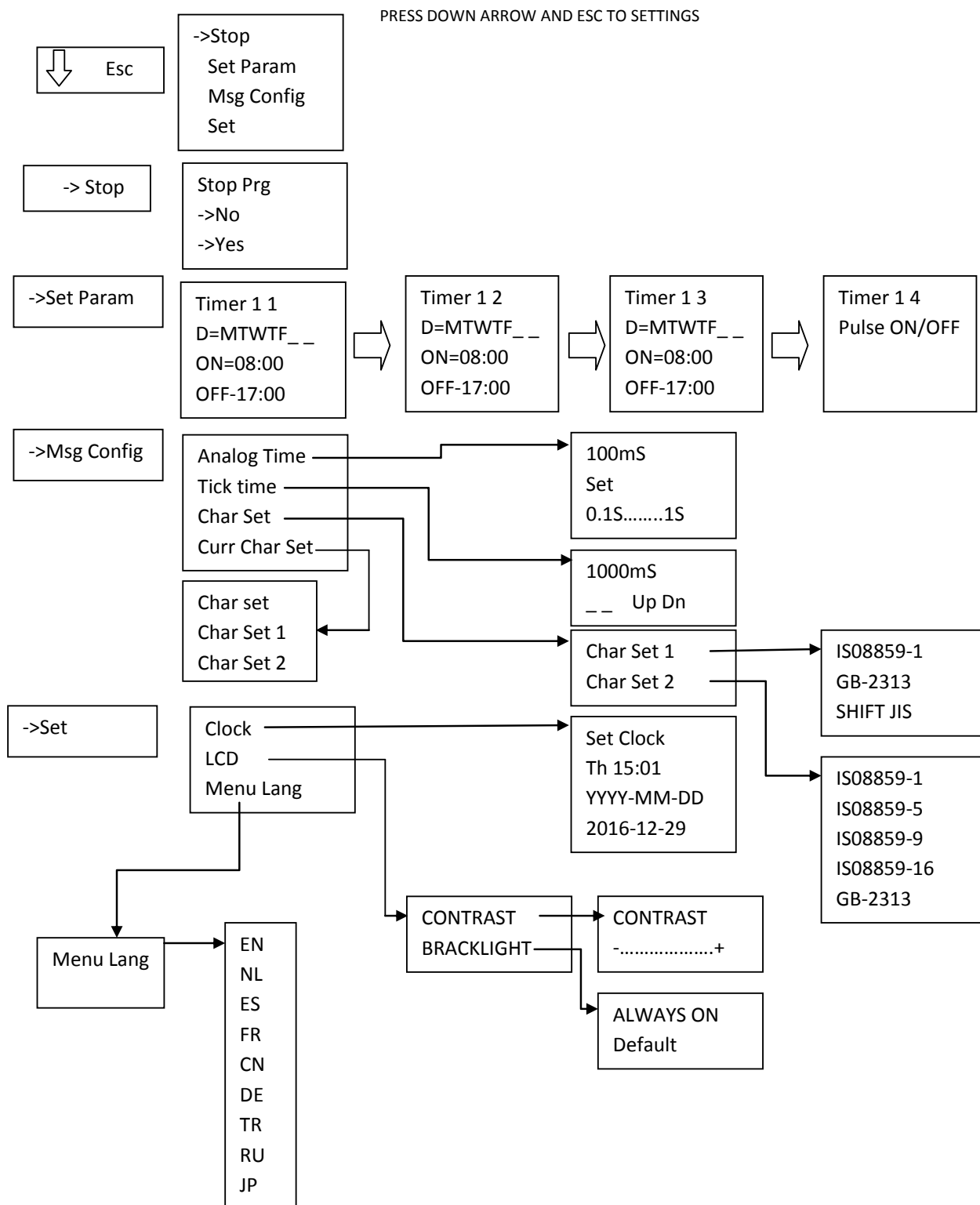
OVERTIME SYSTEM START-UP

1. Press MANUAL START.
 - a. Pressing button will override system to run an additional 2 hours.

PLC START-UP PROCESS

1. Press **q** to show time and date.
2. Press ESC.
3. Select 'Start'...: Press **q** or **p**.
 - a. If "Stop" is the first item displayed, system is already in START mode.
 - b. Press ESC.
4. Confirm "Start": Press OK.
5. Press ESC.

MENU NAVIGATION



Analog Time: refresh rate in milliseconds that specifies how frequently analog inputs in message texts are updated

Tick time: frequency at which message texts scroll on and off the display There are two ways that a message text can tick on and off the screen: line by line, or character by character

OUTLET NOZZLES

To optimize system performance of the CIRCULATOR, position the nozzles and regulate the air flow as follows:

- Direct the nozzles at the welding fume layer without obstruction.
- Direct the nozzles to the section of the facility where the highest concentration of welding fume occurs.
- Set the correct throw by regulating the airflow.
(Throw is the distance that pressurized air travels.)

The airflow volume can be regulated by adjusting as follows.

1. Fan speed is automatically regulated by a delta P sensor. Set point can be change to control Speed.
2. Outlet nozzle damper (nozzles are adjustable)

See Figure B.2 and B.3 for more guidelines to achieve a proper air circulation.

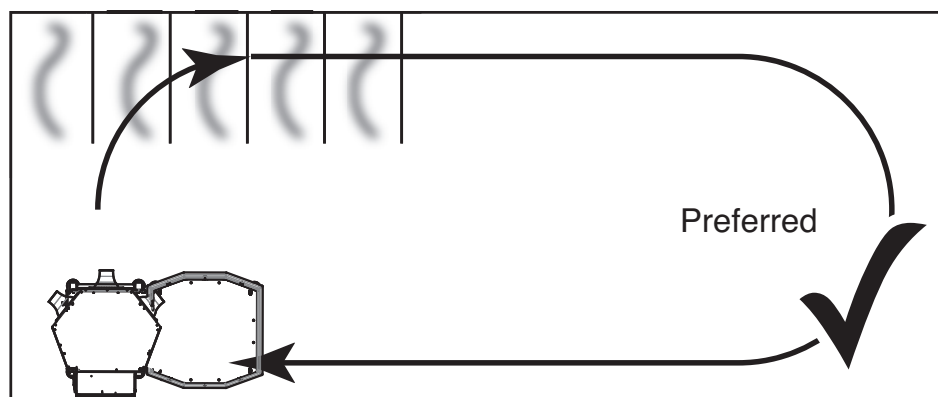
The throw can be adjusted by the potentiometer FAN SPEED 0-100%. The fan speed ranges between 30Hz and 50Hz. The maximum throw is 130 ft. (40m) at an air velocity of 1 to 1.6 ft/s (0.3 to 0.5m/s).

It is recommended to not over-dimension the capacity, but to strive for a proper air circulation at the lowest possible fan speed.

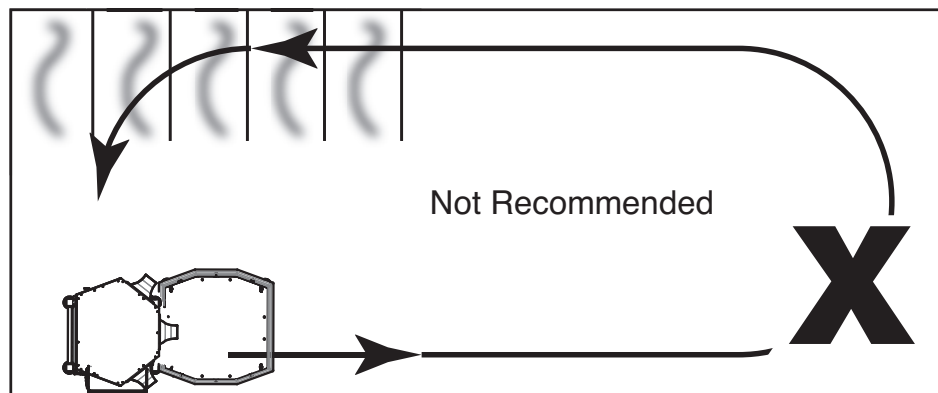
- Adjust the nozzles to the best position. See Figure B.2.
- Regulate the correct throw by adjusting the Pressure (Pa) value in VFD parameter 2021 Set point1. See Figure B.3

Throw	Airflow/Nozzle	Total Airflow	Fan Speed	Frequency
43 ft. (13.1m)	393 CFM (667 m ³ /h)	2000 CFM (3400 m ³ /h)	1200 RPM	20Hz
130 ft. (40m)	885 CFM (1500 m ³ /h)	6000 CFM (10200 m ³ /h)	3000 RPM	50Hz

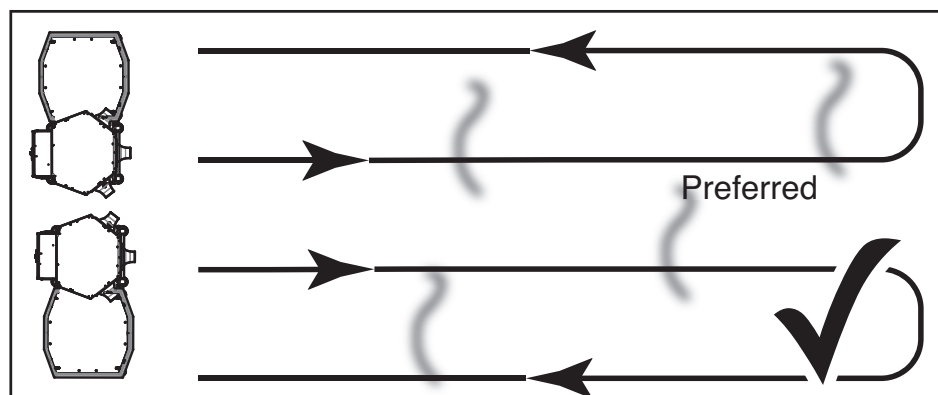
FIGURE B.2 - ADJUSTABLE NOZZLE POSITIONING



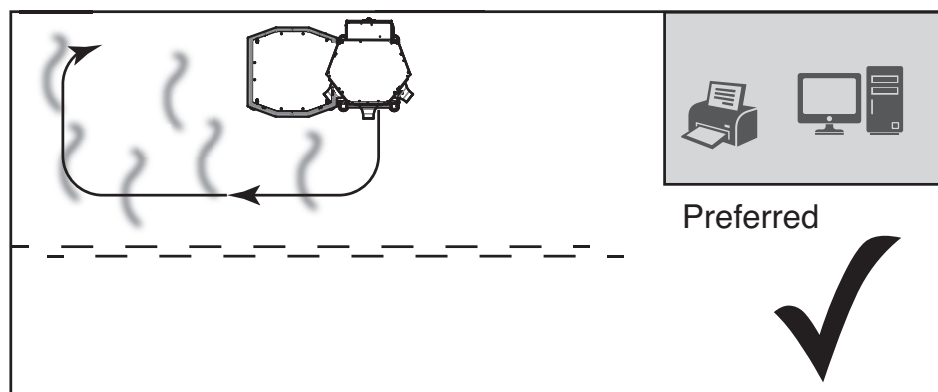
Welding fume is mixed
at source, optimum dilution



Concentration of welding
fume instead of dilution

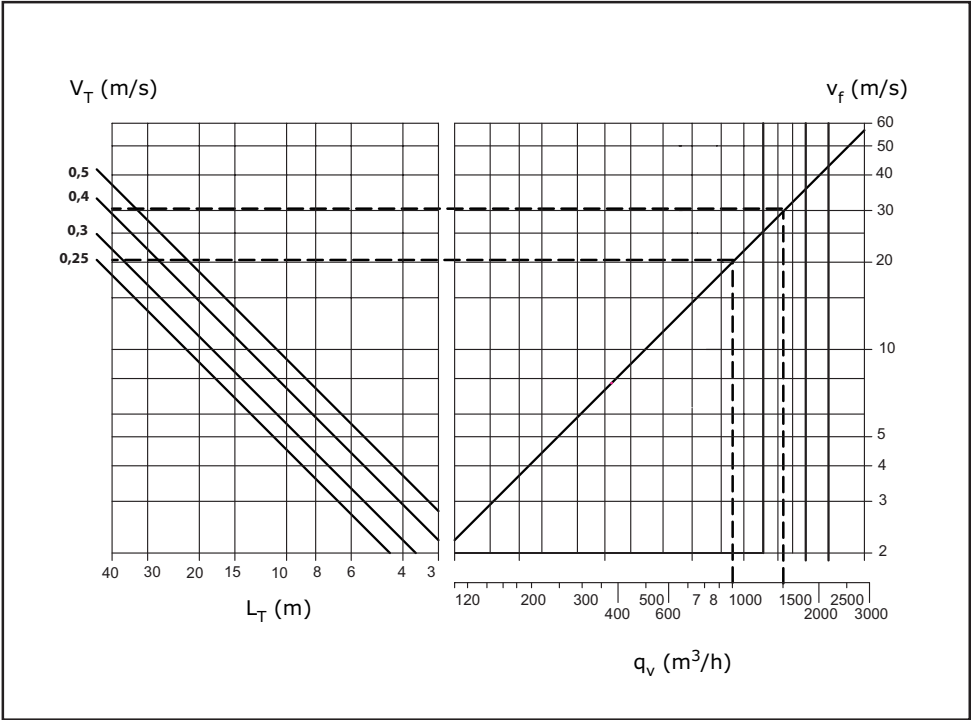


Example position of
two systems

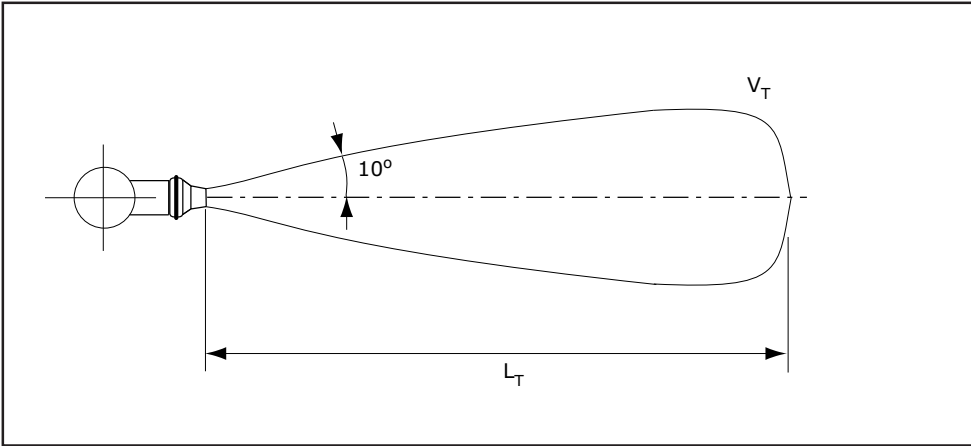


Dilution/filtration of a
specific section of the facility

FIGURE B.3 - VELOCITY GRAPH



V_T = final velocity of throw
 V_F = velocity of outlet nozzle
 L_T = throw at V_T
 q_v = air volume per nozzle



Horizontal Throw
(isotherm)

MAINTENANCE

AUTOMATIC FILTER CLEANING

Each time the system is switched off after having been run for at least 1 hr 30 min, an automatic cleaning cycle will take place. During this cycle, both filter cartridges are cleaned by compressed air jets from the SELF CLEANING UNIT SYSTEM. The dust and dirt particles end up in the drum underneath. The filter cleaning procedure takes approx. 1 hr 30 min.

The automatic filter online cleaning system will also be activated as soon as the pressure rises above 2000 Pa (8 in. WG) during use. Off-line cleaning will start once the pressure rises above 1200 Pa (4.8 in WG) (5.2 in. WG) for 1 hr 30 min.

Buzzer beeps, if the pressure does not drop below 1800 Pa (7.2 in WG) after 2 Hours of cleaning,

To ensure initial operating efficiency of the filter cartridges, they should not be cleaned during the first 40 hours after filter replacement. This is achieved by resetting the hour counter.

PERIODIC MAINTENANCE

The product has been designed to function without problems for many hours with minimal maintenance. In order to guarantee this, some simple, regular maintenance and cleaning activities are required which are described below. If you observe the necessary caution and carry out the maintenance at regular intervals, any problems that occur will be detected and corrected before they lead to a total breakdown.

The indicated maintenance intervals can vary depending on the specific working and ambient conditions. Therefore it is recommended to thoroughly inspect the complete product once every year other than the indicated periodic maintenance.

MAINTENANCE SCHEDULE

NOTE: * *REQUIRES Lincoln Electric factory authorized service technician.*

AS NEEDED

- Replace filters (See filter replacement instructions).
- Inspect and test functionality of the filter media cleaning system.*
- Program and verify system auto on/off timer (PLC). *
- Clean spiral ducting. *

MONTHLY

- Check particulate collection barrels and dispose of particulate if necessary.
- Check and log filter pressure.

EVERY 6 MONTHS

- Ensure that the Cubic Feet per Minute (CFM) is operating to the engineered specifications based on the individual system *

FILTER HOUSINGS

- Check the integrity of the filter housing and tighten all bolts and screws as needed.
- Clean housing with a non-aggressive detergent.
- Check the connections to the duct work, seal if necessary.
- Check incoming air pressure.
- Inspect and clean (with a non-aggressive detergent) the filter control box.

YEARLY

- Change membrane S31228-359*
- Change O-Ring S23281-68. *

MAINTENANCE TABLE

Component	Action	Frequency		
		Every Month	Every 3 Months	Every 6 Months
Control Panel	Check filters for damage. Take them out of the door of the control panel and clean them with compressed air.	X		
	Clean inside using an industrial vacuum cleaner.		X	
Drum	Check levels of dust and dirt particulate. Empty if necessary.	X ¹	X ¹	X ¹

¹ Frequency depends on welding process.

MOTOR/FAN HOUSING**(Sound Absorbing Enclosure)**

- Check the integrity of the fan housing (sound absorbing box) and tighten all bolts and screws if necessary.
- Verify unit is level and adjust if necessary.
- Clean housing (sound absorbing enclosure) with a non-aggressive detergent.
- Check connection of silencer to fan housing and seal if necessary.
- Check connection of ductwork to silencer and seal if necessary.
- Check fan motor blades for encrusted particles and clean if necessary.
- Inspect and clean control panel with a non-aggressive detergent.
- Inspect inside fan housing (sound absorbing enclosure).
- Check inlets and outlets for tears or wear.

CONTROL PANEL

- Check for functionality of control panel fan.
- Inspect and clean any buildup or dirt on fan blade impellers in control panel.
- Inspect and replace control panel filters if necessary.

REPLACING THE FILTERS

WARNING

- Saturated filters and/or full drums often contain dust and dirt particles which can be inhaled and cause harm.
- When replacing filters always wear a high-quality and approved respirator.
- Wrap everything in a properly closed plastic bag and dispose of in compliance with the local regulations.
- Always replace both filters at the same time.



When To Replace the Filters

- When damaged.
- When the extraction capacity is significantly reduced.
- In cases of a continuous alarm situation while the cleaning mechanism is running.

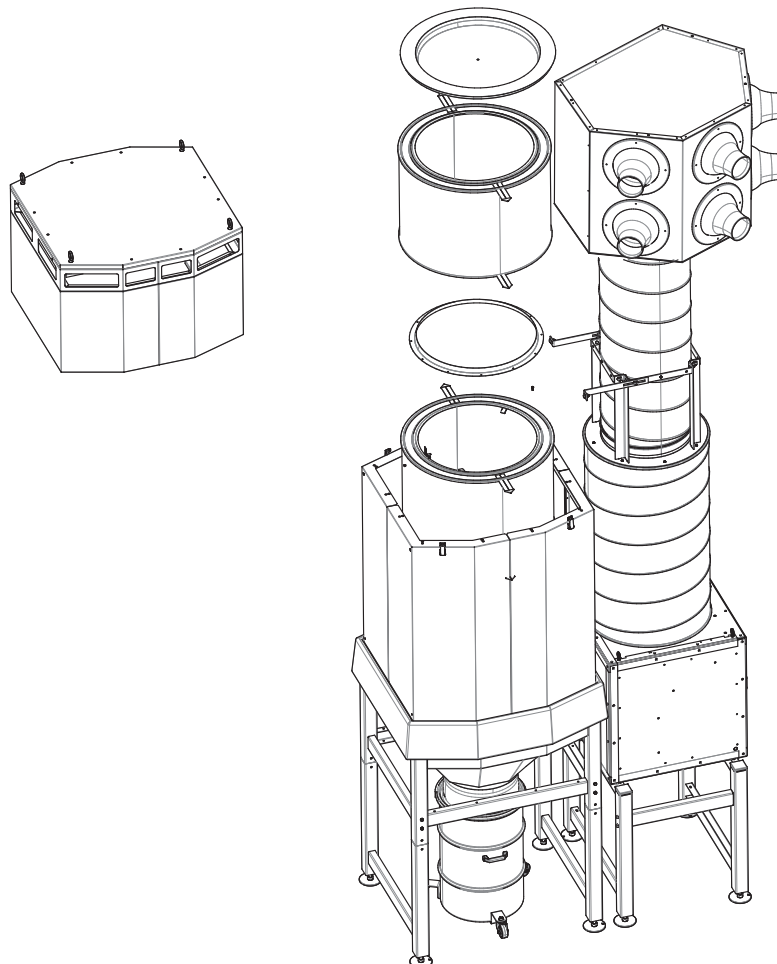
NOTE: You must learn from experience when to replace the filters. The life span of the filters strongly depends on the composition of the welding fumes, humidity, etc.

How To Replace Filters

1. Disconnect input power and the compressed air connection.
2. Using 9/16" nut driver remove the nuts securing the connecting Brackets
3. Using 9/16" nut driver Loosen the nuts at holding bracket side.
4. Slide & open the Brackets, unlatch the 4 latches to release Air Inlet.
5. Lift the Air Inlet using eye bolts.
6. Using a 13mm wrench, remove the nuts and associated washers securing the filter lid. See Figure A.2.
7. Remove the upper filter. The filter has been fitted with special straps for this purpose. See Figure A.2.
8. Remove the filter ring.
9. Remove the lower filter.
10. Clean the Lower filter Ring.
11. Position the new filters, filter ring and filter lid in reverse order and mount the lid housing.

NOTE: For all other technical issues, please contact The Lincoln Electric Automation Division Environmental Solutions Hotline at 1-888-935-3878 option 4.

FIGURE C.1 – CIRCULATOR FILTERS & COMPONENTS



TROUBLESHOOTING

HOW TO USE TROUBLESHOOTING GUIDE

 **WARNING**

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labeled "PROBLEM (SYMPTOMS)." This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the Possible Cause, generally it states to contact you local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact the Lincoln Electric Automation Division: 22221 St. Clair Ave. Cleveland, Ohio 44117-1199 U.S.A.

Phone: 1-888-935-3878 option 4

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

PROBLEM (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
When the "Start Button" is pressed the system will not start.	1. Make sure the correct input power is being	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility. 1-888-935-3878.
	2. Check if power light is ON (White Light).	
	3. Check clock set up (Time / Date).	
	4. System may be trying to start during	
	5. Check the "AUTO" button on VFD is pressed	
	6. Check for VFD or PLC faults	
When the "Start Button" is pressed the system starts and then stops. NOTE: Manual start does not make the fan turn on.	1. Check for fault / alarm on display.	
	2. Machine may be shutting down on scheduled down time.	
The clock reads the wrong time/date.	1. See Operation Section of this manual.	
Number of run cycles changed.	1. See Operation Section of this manual.	
The cooling fan inside the control panel does not function.	1. Check thermostat setting (inside panel).	
	2. Have an electrician check the electrical connections.	
	3. Verify cooling fan pilot fuse	
The airflow is diminished.	1. Filter clogged (check display).	
	2. Check Pitot tube and plastic tube. Clean / replace as needed.	
The alarm buzzer is activated.	1. Check fault / alarm read out on display.	
	2. Check compressed air connection.	
	3. Check filter pressure on display.	
	4. If a Variable Frequency Drive (VFD) fault occurs, call authorized electrician.	
Particulate is emitting from the collection drum.	1. Empty collection drum.	
	2. Check seals and clamp on collection drum.	
There is an abnormal amount of weld fume in work zone.	1. Check to make sure the machine is powered on.	
	2. Check nozzle position.	
	3. Have an electrician check fan speed on VFD.	

FIGURE F.1 BLOCK LOGIC DIAGRAM

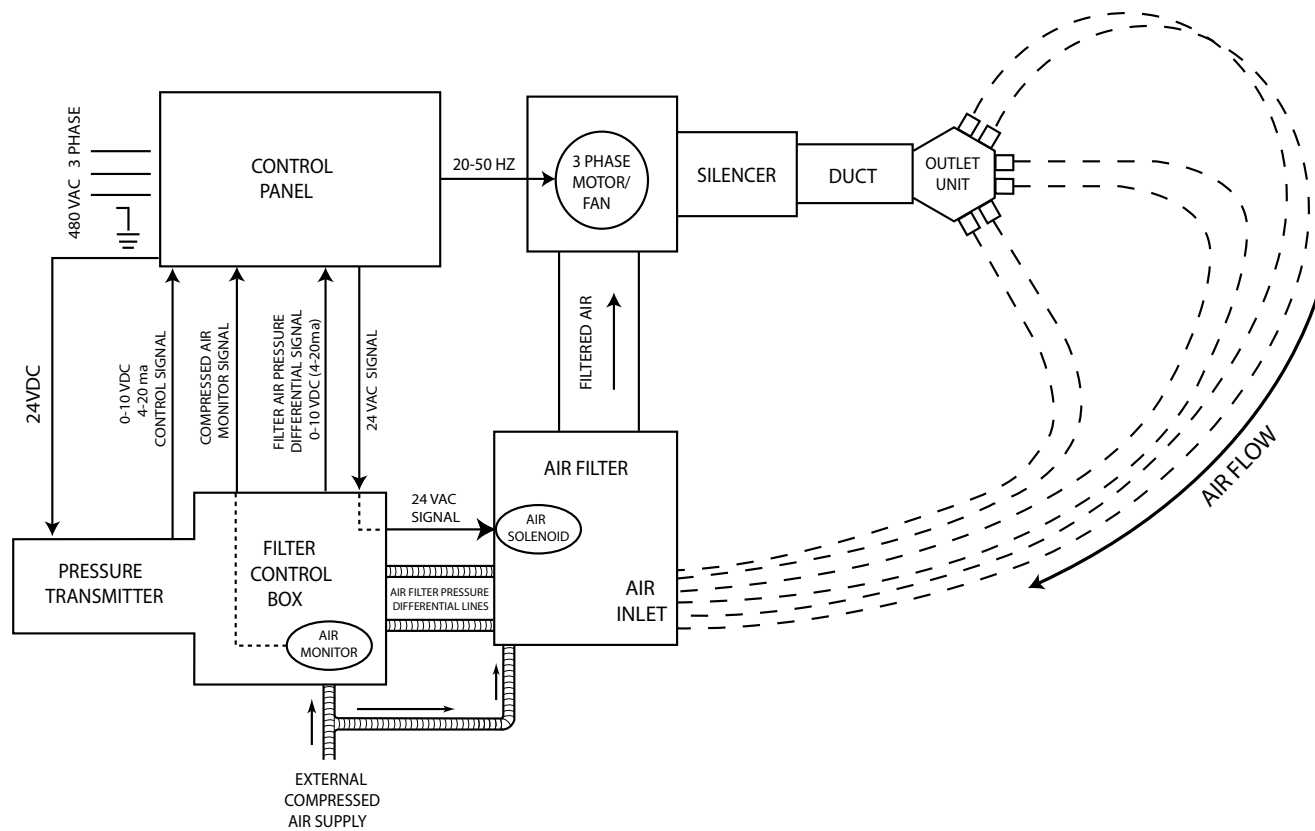
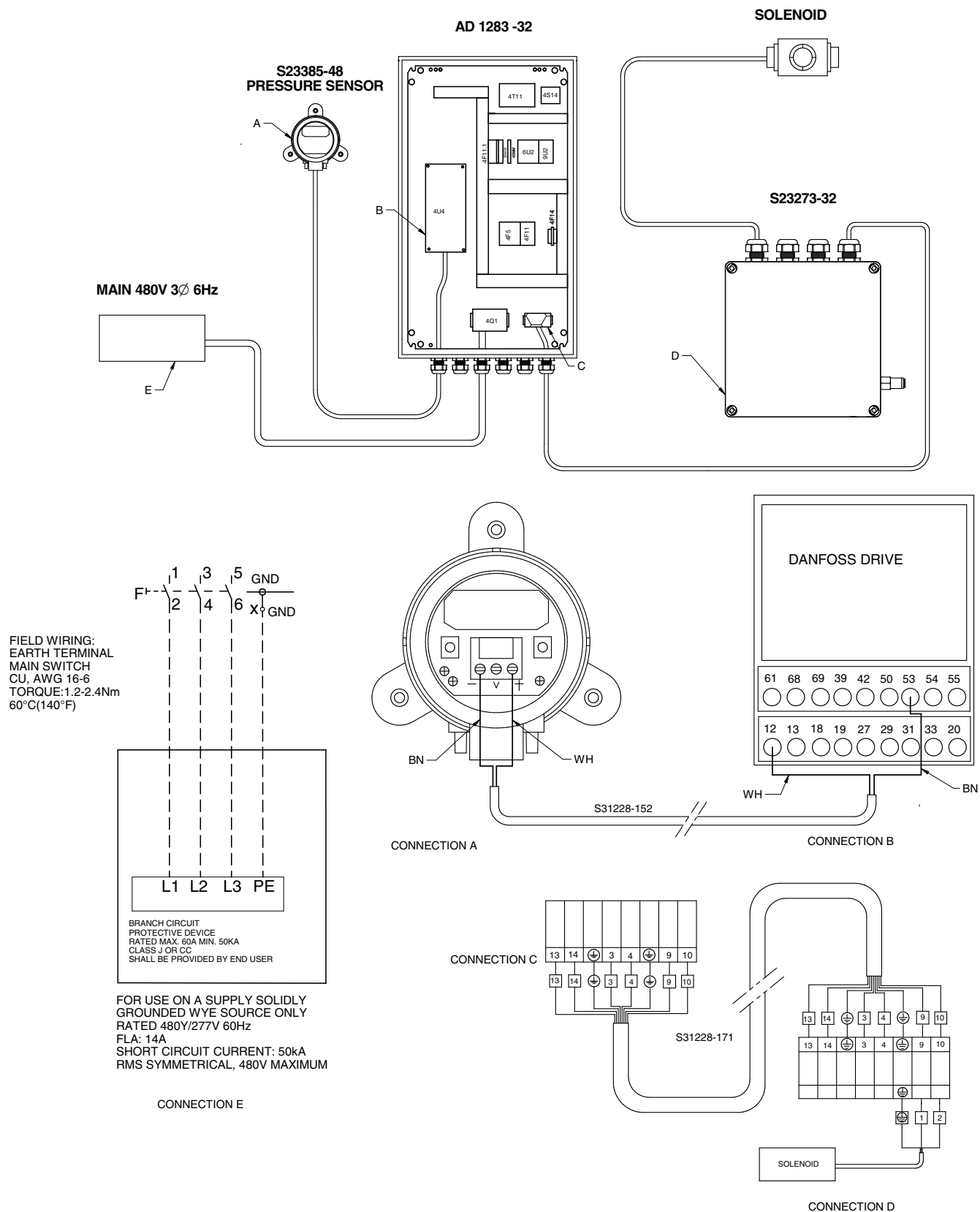
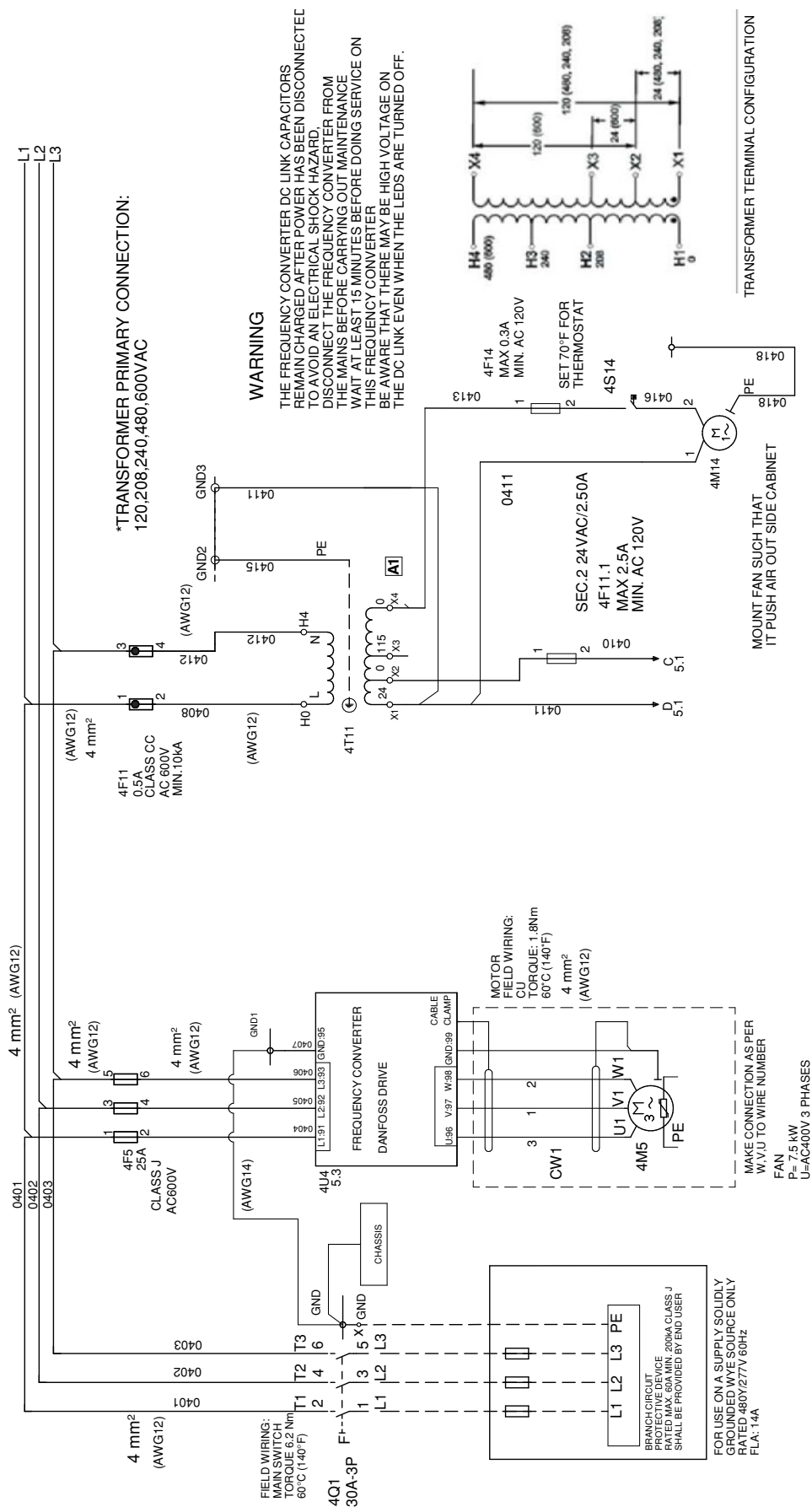
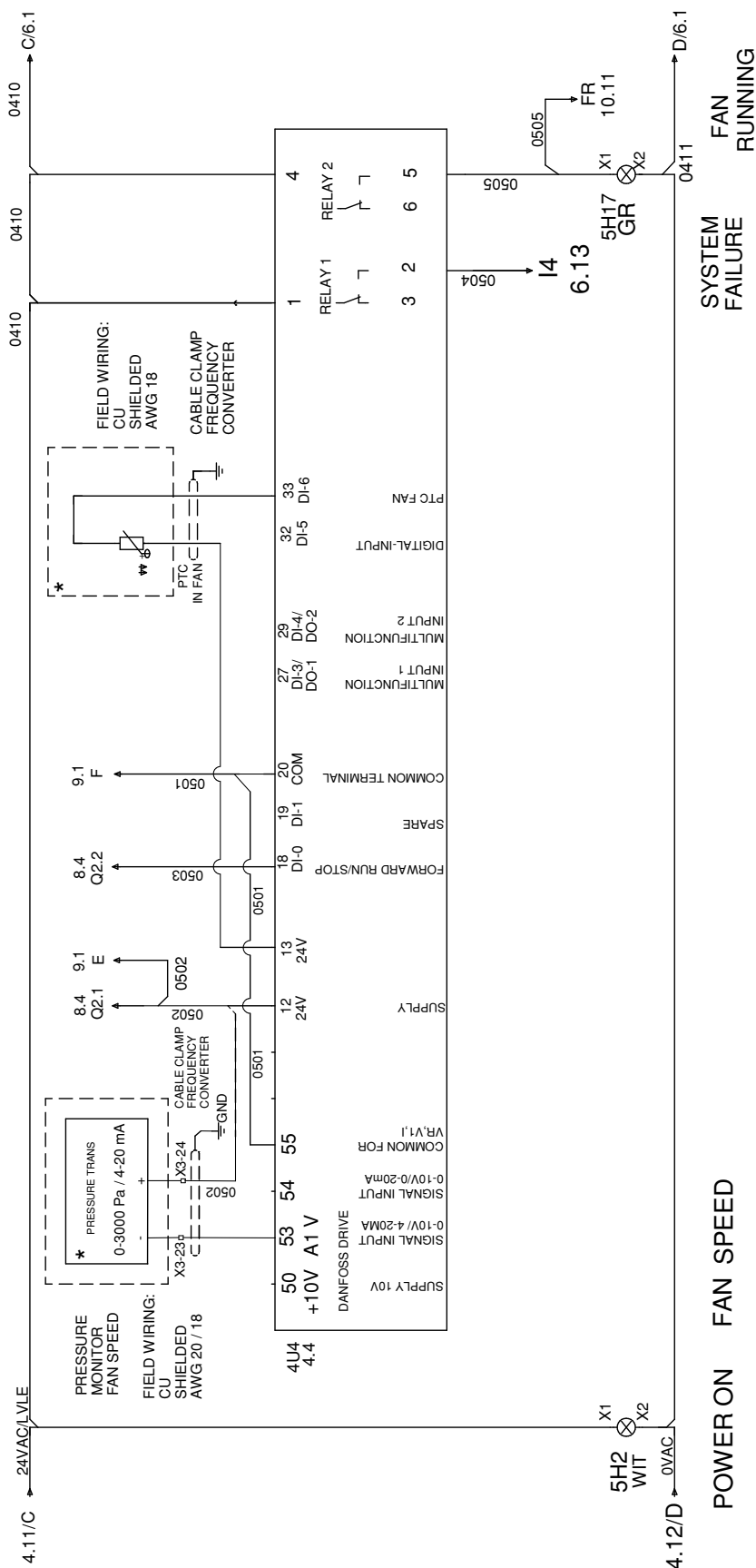


FIGURE F.2 Field Connection Diagram







NOTES:

NOTES:
N.A. DO NOT CONNECT PTC IF THE OPTION UNAVAILABLE IN MOTOR.
UPDATE DRIVE CONFIGURATION ACCORDINGLY
N.B. CLASS 1 CONTROL CIRCUIT: USE CLASS 1 CONDUCTORS FOR
CONNECTING TO REMOTE CONTROL CIRCUIT

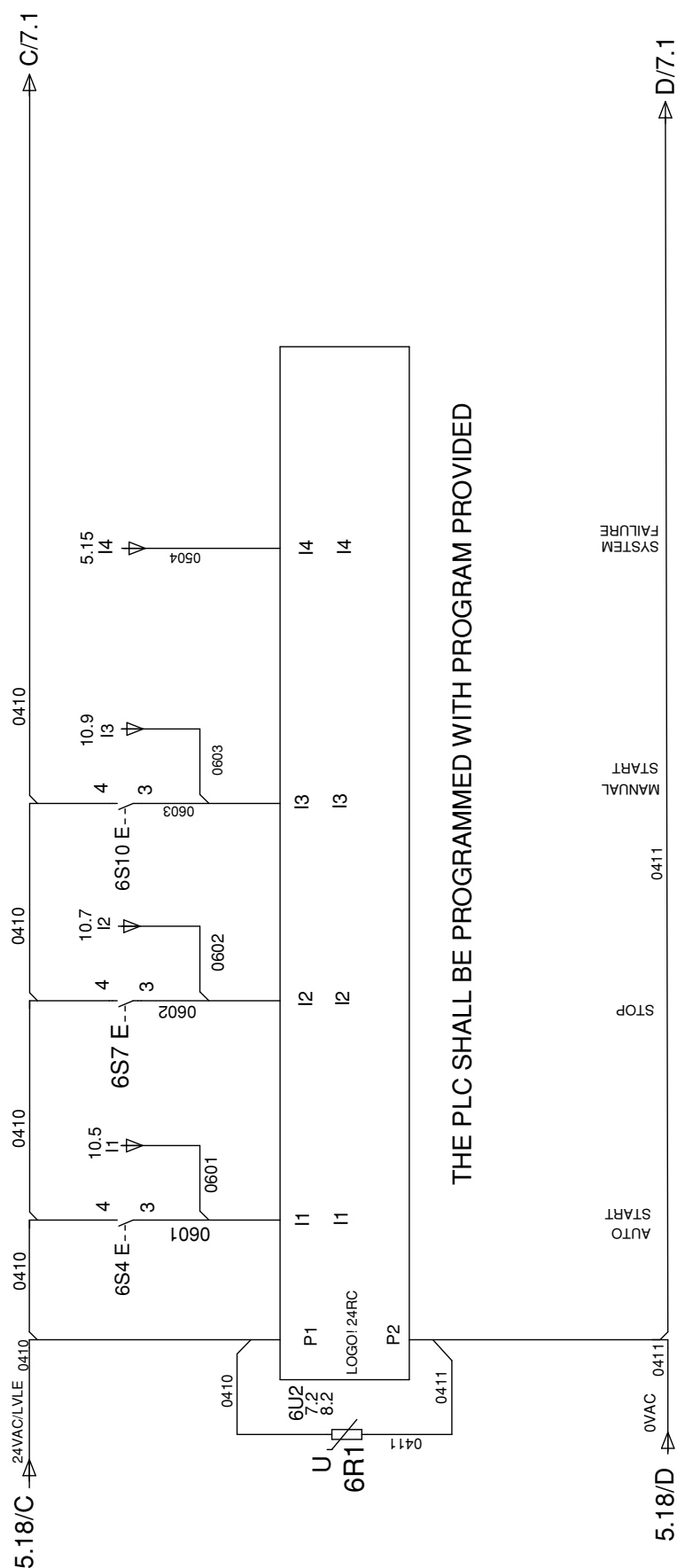
**** : FIELD INSTALLATION COMPONENT**



THE LINCOLN ELECTRIC COMPANY

World's Leader in Welding and Cutting Products
Sales and Service through Subsidiaries and Distributors Worldwide
Cleveland, Ohio 44117-1199 U.S.A.

A.10
S31228-357PRINT



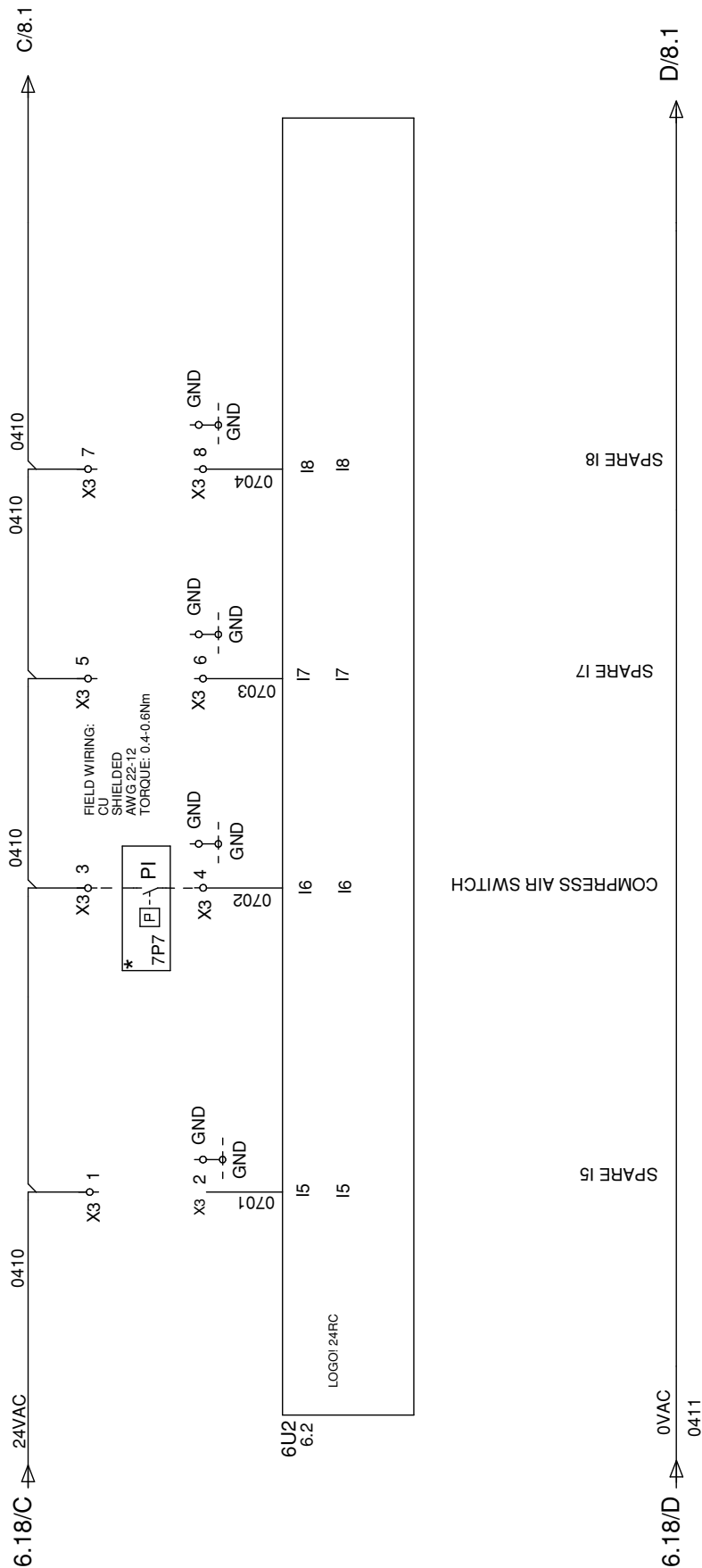
CLASS 1 CONTROL CIRCUIT: USE CLASS 1 CONDUCTORS FOR CONNECTING TO REMOTE CONTROL CIRCUIT

LINCOLN
ELECTRIC

THE LINCOLN ELECTRIC COMPANY

World's Leader in Welding and Cutting Products
Sales and Service through Subsidiaries and Distributors Worldwide
Cleveland, Ohio 44117-1199 U.S.A.

A10
S31228-357PRINT



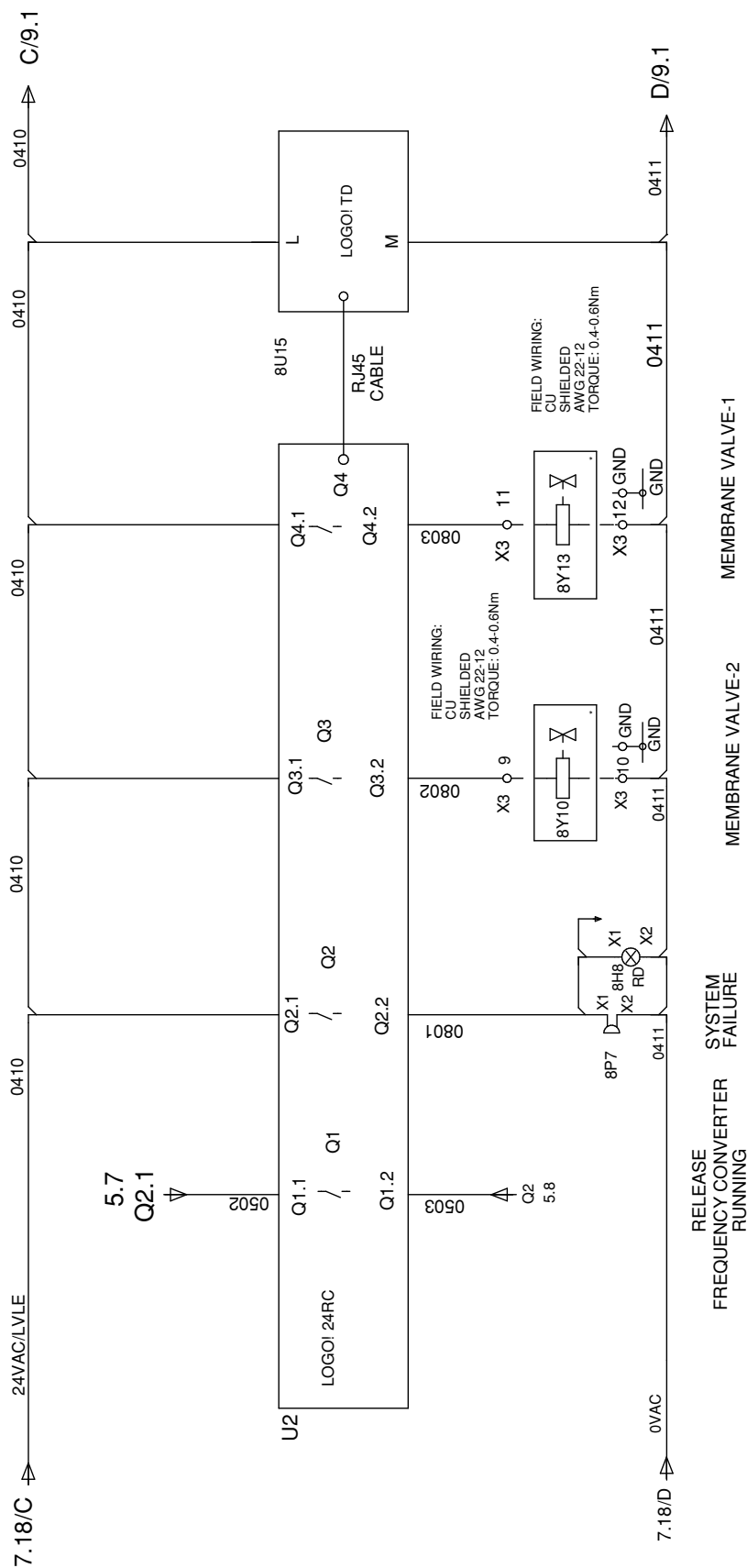
CLASS 1 CONTROL CIRCUIT: USE CLASS 1 CONDUCTORS FOR
CONNECTING TO REMOTE CONTROL CIRCUIT

* :FIELD INSTALLATION COMPONENT



THE LINCOLN ELECTRIC COMPANY
World's Leader in Welding and Cutting Products
Sales and Service Worldwide
Cleveland, Ohio 44117-1199 U.S.A.

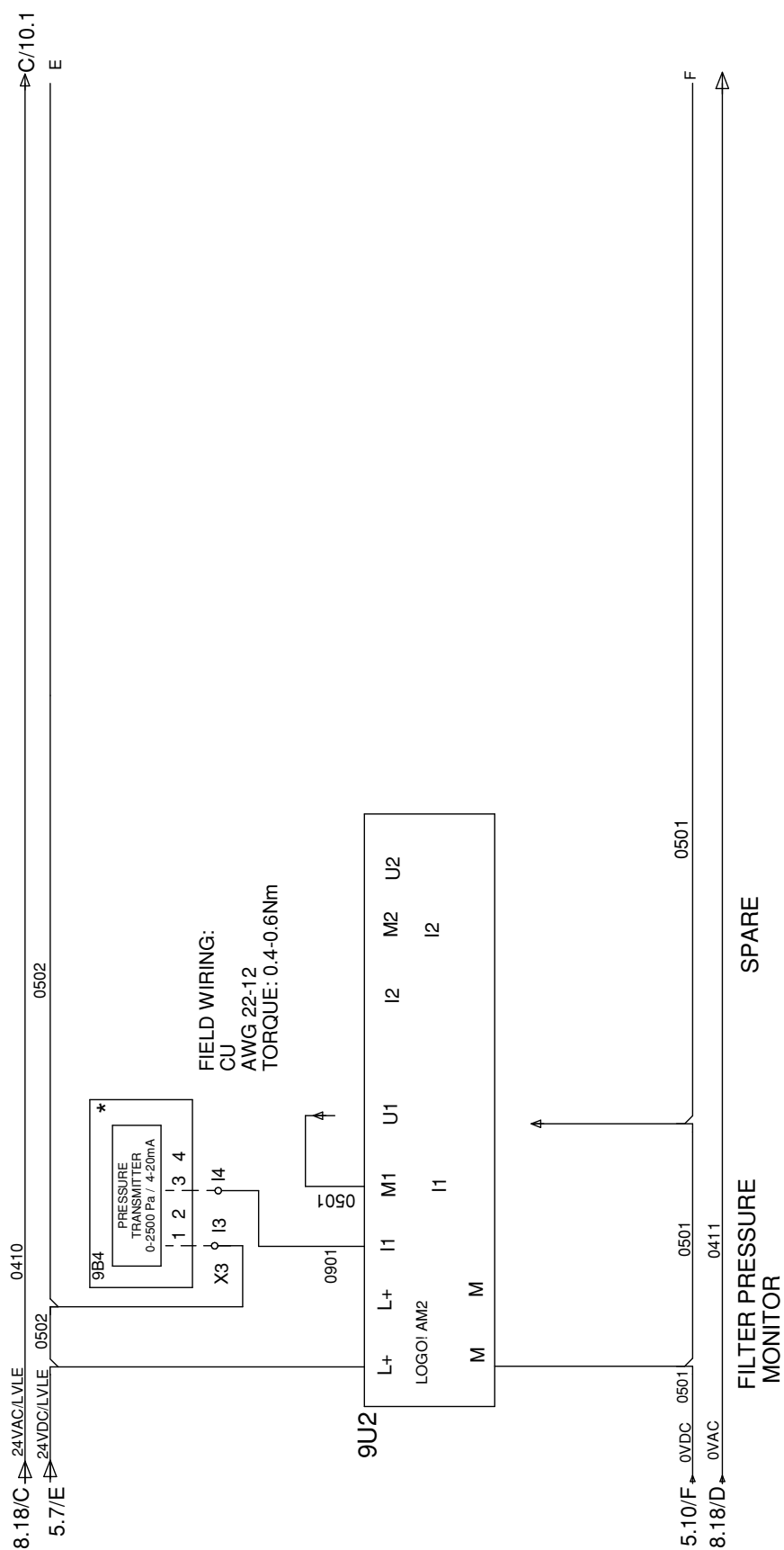
A10
S31228-357/PRINT



CLASS 1 CONTROL CIRCUIT: USE CLASS 1 CONDUCTORS FOR CONNECTING TO REMOTE CONTROL CIRCUIT

THE LINCOLN ELECTRIC COMPANY
World's Leader in Welding and Cutting Products
Sales and Service through Subsidiaries and Distributors Worldwide
Cleveland, Ohio 44117 • 199 U.S.A.

A10
S31228-357PRINT

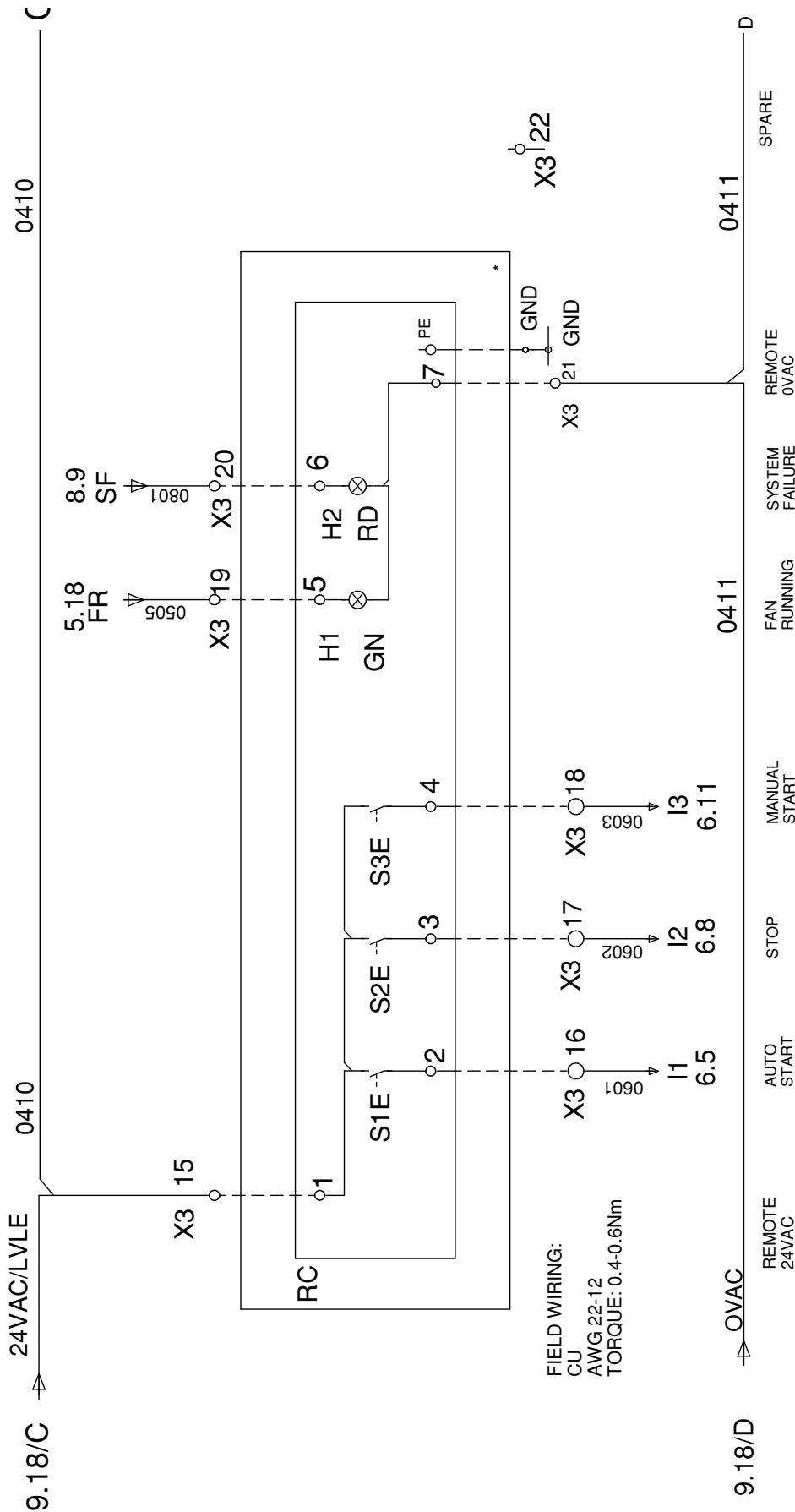


*FIELD INSTALLATION COMPONENT

CLASS 1 CONTROL CIRCUIT: USE CLASS 1 CONDUCTORS FOR CONNECTING TO REMOTE CONTROL CIRCUIT

THE LINCOLN ELECTRIC COMPANY
World's Leader in Welding and Cutting Products
Sales and Service through Subsidiaries and Distributors Worldwide
Cleveland, Ohio 44117-1199 U.S.A.

A10
S31228-357PRINT



CLASS 1 CONTROL CIRCUIT: USE CLASS 1 CONDUCTORS FOR CONNECTING TO REMOTE CONTROL CIRCUIT

LINCOLN ELECTRIC THE LINCOLN ELECTRIC COMPANY
World's Leader in Welding and Cutting Products
Sales and Service Through Subsidiaries and Distributors Worldwide
Cleveland, Ohio 44117-1199 U.S.A.

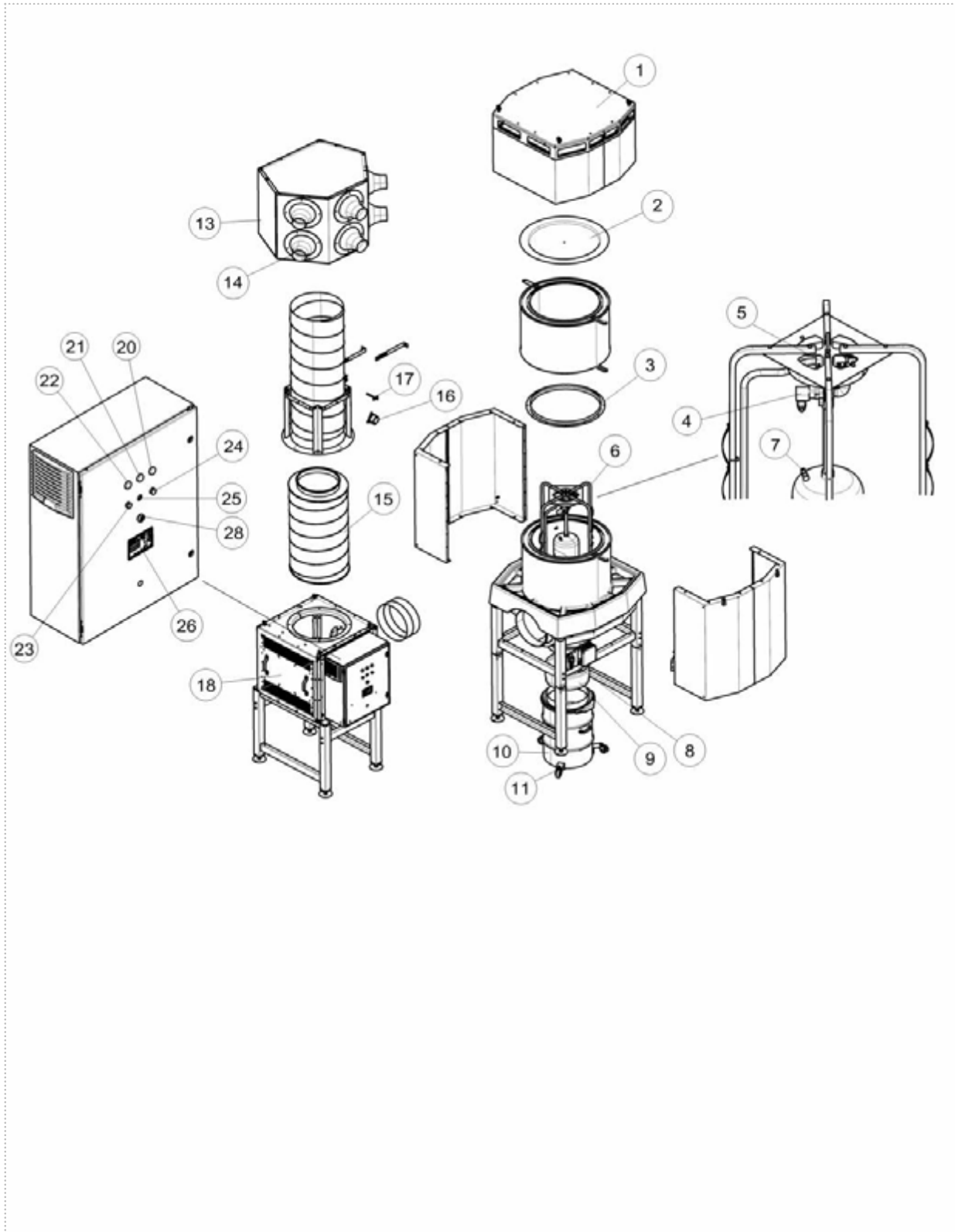
A.10
S31228-357PRINT

Circulator - AD1326-10

General Assembly

KEY	PART NUMBER	DESCRIPTION	QTY
1	9SFC0202951050	LID FRAME HOUSING	1
2	9SFC0719020040	FILTER COVER SCS	1
3	9SFC0719020060	INTERMEDIATE RING	1
4	9SFC0042000040	PULSE VALVE 3/4 INCH INTEGRAL	1
5	9SS31228-68	PISTON HOUSE ASSEMBLY	1
6	9SS23281-67	COMPLETE CLEANING SYSTEM	1
7	9SS23888-1	PRESSURE RELIEF VALVE	1
8	9SS23385-108	ENV.COMPRESSED AIR REGULATOR W/DRYER	1
9	9SS23385-11	BUSHING DRUM	1
10	9SS31228-170	DRUM ASSEMBLY	1
11	9SFC0000100869	DRUM TROLLEY; CASTOR	1
	9SS31228-274	DUSTBIN; DRUM LID; LEVER LOCK; BUSHING	1
13	9SFC0202958050	DILUTER UNIT	1
14	9SS29456-1	NOZZLE DILUTER SCS	1
15	9SS23281-97	20"-STRAIGHT SILENCER	1
16	9SS23385-48	DIFFERENTIAL PRESSURE TRANSMITTER	1
17	9SS23316-79	PITOT TUBE	1
18	9SM18464-58	FAN 10HP 5500CFM	1
	AD1283-32	ENVSYSTEM CONTROL PANELSCP 7.5KW	1
	9SS31228-255	THERMOSTAT	1
20	9SFC0000100664	PILOT LIGHT WHITE (12-30V)	1
21	9SFC0000100663	PILOT LIGHT GREEN (12-30V)	1
22	9SFC0000100665	PILOT LIGHT RED (12-30V)	1
23	9SFC0328050300	PUSH BUTTON GREEN (600V10A)	1
24	9SFC0328050320	PUSH BUTTON BLACK (600V10A)	1
25	9SFC0328050310	PUSH BUTTON RED (600V10A)	1
26	9SS31228-243	GRAPHICAL DISPLAY	1
	9SS31228-251	TRANSFORMER 600V	1
28	9SFC0000100039	BUZZER	1
	9SS23273-17	VARISTOR	1
	9SS31228-230	PLC LOGO	1

General Assembly



P-1140-C.jpg

			
WARNING	<ul style="list-style-type: none"> Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground. 	<ul style="list-style-type: none"> Keep flammable materials away. 	<ul style="list-style-type: none"> Wear eye, ear and body protection.
Spanish AVISO DE PRECAUCION	<ul style="list-style-type: none"> No toque las partes o los electrodos bajo carga con la piel o ropa mojada. Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> Protéjase los ojos, los oídos y el cuerpo.
French ATTENTION	<ul style="list-style-type: none"> Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> Protégez vos yeux, vos oreilles et votre corps.
German WARNUNG	<ul style="list-style-type: none"> Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese ATENÇÃO	<ul style="list-style-type: none"> Não toque partes elétricas e electrodos com a pele ou roupa molhada. Isole-se da peça e terra. 	<ul style="list-style-type: none"> Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> Use proteção para a vista, ouvido e corpo.
Japanese 注意事項	<ul style="list-style-type: none"> 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> 燃えやすいものの側での溶接作業は絶対にしてはなりません。 	<ul style="list-style-type: none"> 目、耳及び身体に保護具をして下さい。
Chinese 警告	<ul style="list-style-type: none"> 皮肤或湿衣物切勿接触带电部件及焊缝。 使你自己与地面和工件绝缘。 	<ul style="list-style-type: none"> 把一切易燃物品移离工作场所。 	<ul style="list-style-type: none"> 佩戴眼、耳及身体劳动保护用具。
Korean 위험	<ul style="list-style-type: none"> 전도체나 용접봉을 젖은 행갑 또는 피부로 절대 접촉치 마십시오. 모재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> 인화성 물질을 접근시키지 마십시오. 	<ul style="list-style-type: none"> 눈, 귀와 몸에 보호장구를 착용하십시오.
Arabic تحذير	<ul style="list-style-type: none"> لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الألكترود بجند الجسم أو بالملابس المبللة بالماء. ضع عازلًا على جسمك خلال العمل. 	<ul style="list-style-type: none"> ضع المواد القابلة للاشتعال في مكان بعيد. 	<ul style="list-style-type: none"> ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	WARNING
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	Spanish AVISO DE PRECAUCION
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	French ATTENTION
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	German WARNUNG
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	Portuguese ATENÇÃO
<ul style="list-style-type: none"> ● ヒュームから顔を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> ● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切して下さい。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	Japanese 注意事項
<ul style="list-style-type: none"> ● 顔部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表板打開或沒有安全罩時不準作業。 	Chinese 警告
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동치 마십시오. 	Korean 위험
<ul style="list-style-type: none"> ● ابتعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● القطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغيل هذا الجهاز إذا كانت الاغطية الحديدية الواقية ليست عليه. 	Arabic تحذير

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀焊材料，並請遵守貴方的有閱勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

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 advice or information about their use of our products. We respond to our customers based on the best information in our possession at that time. Lincoln Electric is not in a position to warrant or guarantee such advice, and assumes no liability, with respect to such information or advice. We expressly disclaim any warranty of any kind, including any warranty of fitness for any customer's particular purpose, with respect to such information or advice. As a matter of practical consideration, we also cannot assume any responsibility for updating or correcting any such information or advice once it has been given, nor does the provision of information or advice create, expand or alter any warranty with respect to the sale of our products.

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.



THE LINCOLN ELECTRIC COMPANY

22801 St. Clair Avenue • Cleveland, OH • 44117-1199 • U.S.A.
Phone: +1.216.481.8100 • www.lincolnelectric.com