C-AIRE®

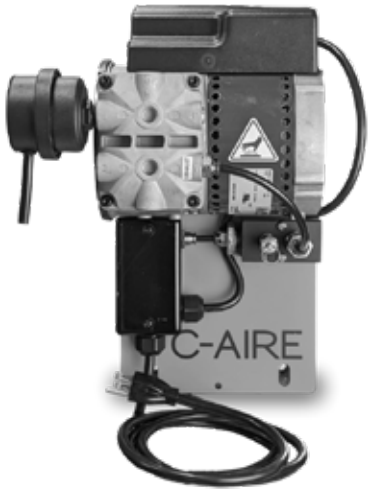
COMPRESSORS

MODELS

S280

S281

S163/S253/S418



S164

S110

Fire Protection Air Compressor Owner's Manual

REV. D
Oct/26/26

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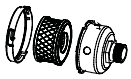
PARTS IDENTIFICATION



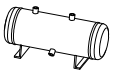
1. AIR FILTER

2. PRESSURE SWITCH

3. SAFETY VALVE

4. PRESSURE GAUGE

5. CHECK VALVE

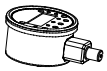


6. TANK

7. OUTLET

8. MANUAL DRAIN VALVE

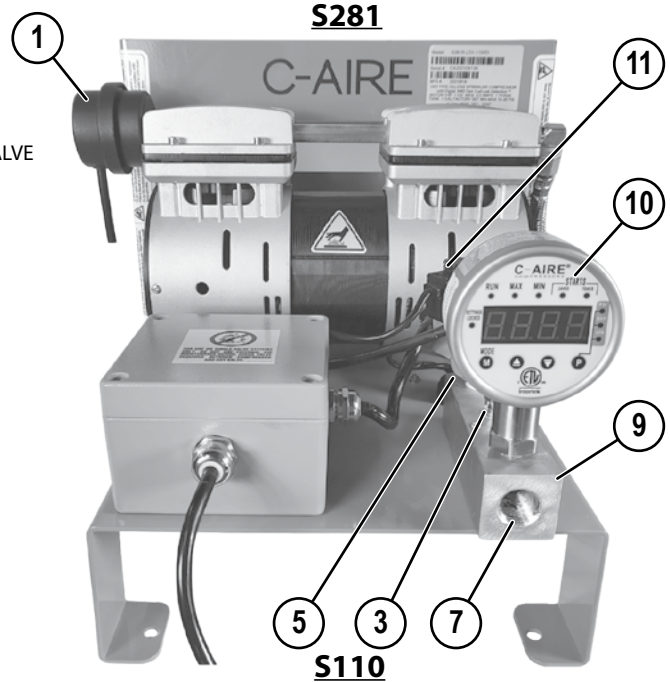
9. MANIFOLD



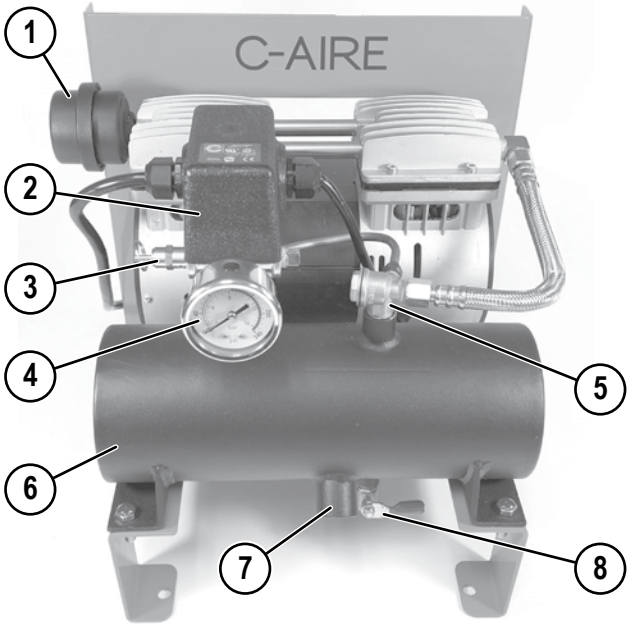
10. DIGITAL AMD

11. SOLENOID

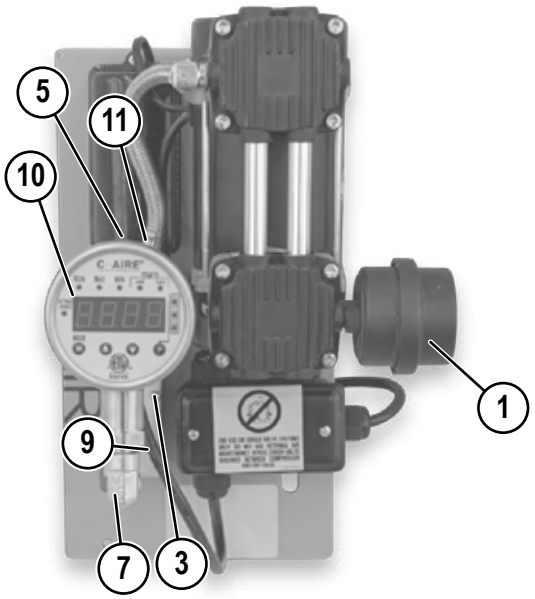
S281



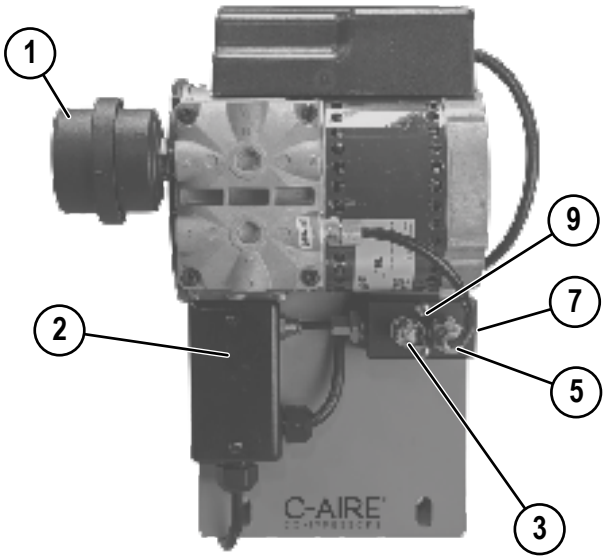
S280



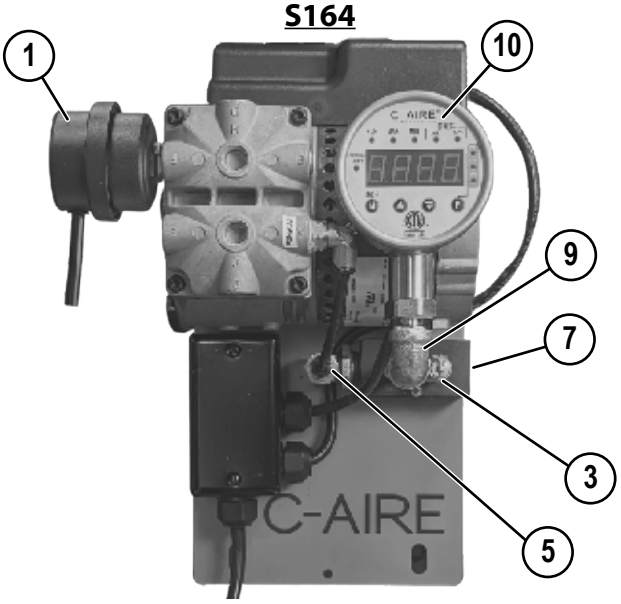
S110



S163/S253/S418



S164



INTRODUCTION

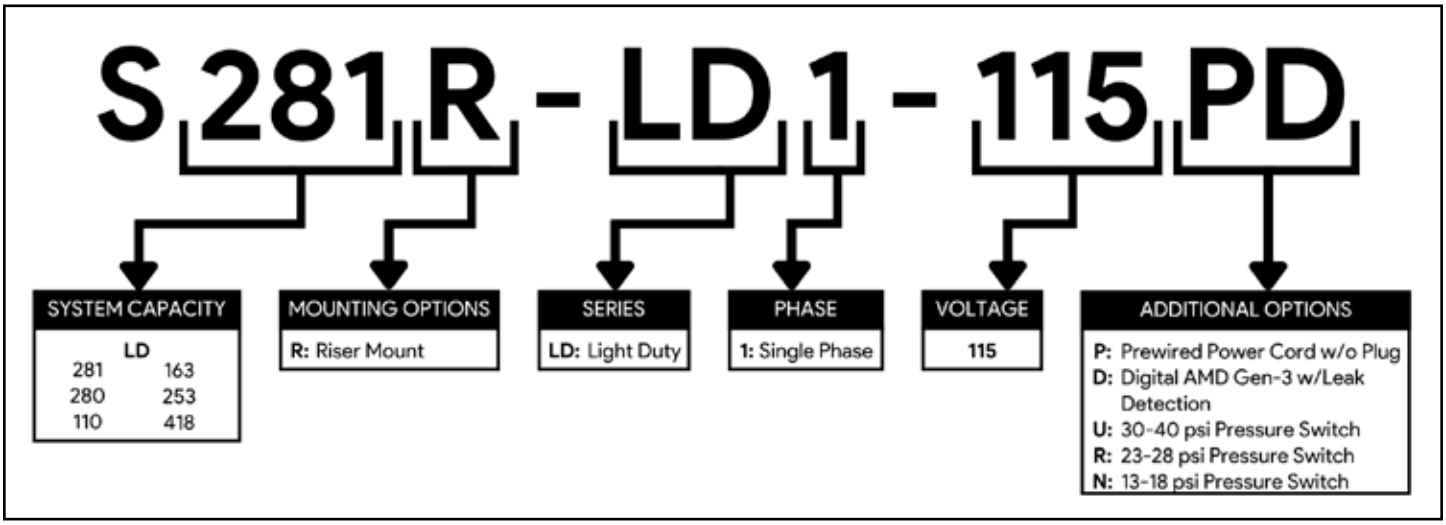
The compressor you have purchased is a combination of nearly 100 different components, all of which have been carefully designed, engineered, and assembled to ensure a long, dependable, trouble-free life. The product has been fully tested at the factory and has gone through quality-control inspection prior to shipping.

Like any mechanical piece of equipment, it is necessary to fully understand the proper use of its operation and application. Misuse of this valuable and helpful air-power source may shorten its expected life as well as void the warranty of the entire unit. We ask you take the time to read this manual to ensure the dependable service you can expect from your C-Aire compressor.

Failure to do so can cause serious injury and may void all warranties.

Please take special notice of the safety precautions and safety information contained in this manual. Compressed air, like electricity, is a very helpful and necessary tool. However, compressed air can be extremely dangerous and harmful when it is not understood or is misused.

PRODUCT NUMBERING SYSTEM



- SET PRESSURE IN SECONDS (S110/S164/S281)
- IDEAL FOR QUIET SETTINGS
  - Nursing Homes
  - Apartments
  - Churches
- INCLUDED:
  - UNIVERSAL MOUNTING BRACKET
  - RISER MOUNT HOSE CLAMPS (for 2.5" to 4" risers)
  - POWER CORD W/O PLUG (for installation and testing purposes)
  - RUBBER FLEX HOSE (1/2" x 30" hose)

WARNING: Refer to the authority having jurisdiction regarding hard wiring requirements.

- AVAILABLE ACCESSORIES

ACCESSORY	PART NUMBER
AUTOMATIC AIR MAINTENANCE DEVICE	CAMD1
FLOOR MOUNTING KIT*	INSTALL-S28
1/2" X 30" STAINLESS STEEL FLEXIBLE HOSE	DT 3005 H / PACK OF 5: DT 3005 H-5PK
1/2" X 36" FLEXIBLE HOSE	DT 3605 H / PACK OF 5: DT 3605 H-5PK
1/2" X 48" FLEXIBLE HOSE	DT 4805 H / PACK OF 5: DT 4805 H-5PK
1/2" X 72" FLEXIBLE HOSE	DT 7205 H / PACK OF 5: DT 7205 H-5PK
RISER MOUNT HOSE CLAMPS (5"- 7" RISERS)	HS HC6-8-K
RISER MOUNT HOSE CLAMPS (7"- 9" RISERS)	HS HC8-10-K

- ETL Listed for Fire Protection:
  - Digital AMD: USA: UL 508 Canada: C22.2 No. 14
  - Compressors (S281/S280/S164/S163/S253/S418):
    USA: UL 1450 – 3rd Edition
    Canada: C22.2 No. 68-92

SPECIFICATIONS	S110	S280	S281
HP	.5	1	1
SYSTEM CAPACITY	40 PSI 128 GALLONS	40 PSI 313 GALLONS	40 PSI 313 GALLONS
	18 PSI 284 GALLONS	20 PSI 696 GALLONS	18 PSI 696 GALLONS
	10 PSI 511 GALLONS	10 PSI 1,253 GALLONS	10 PSI 1,253 GALLONS
PRESSURE SWITCH	FACTORY SET AT 10-20 PSI MINIMUM DIFFERENTIAL: 5 PSI	FACTORY SET AT 50-100 PSI REQUIRES AIR MAINTENANCE DEVICE	ADJUSTABLE: 5-55 PSI FACTORY SET AT 10-20 PSI MINIMUM DIFFERENTIAL: 5 PSI
CFM	1.55 @ 10 PSI	3.80 CFM @ 10 PSI	3.80 CFM @ 10 PSI
PUMP	2 CYLINDER, OIL FREE	2 CYLINDER, OIL FREE	2 CYLINDER, OIL FREE
CYLINDERS	CERAMIC COMPOSITE	CERAMIC COMPOSITE	CERAMIC COMPOSITE
VOLTS	115	115	115
PHASE	1	1	1
RUNNING AMPS	3.2	8.5	8.5
BREAKER SIZE	15 AMP RECOMMENDED	15 AMP RECOMMENDED	15 AMP RECOMMENDED
DIMENSIONS	14.3" X 9.3" X 10"	14" X 13" X 14"	14" X 13" X 14"
WEIGHT	19 LBS	46 LBS	41 LBS

* S110/S164/S163/S253/S418 not floor mount compatible.

SPECIFICATIONS	S163	S253	S418
HP	0.5	0.5	0.5
SYSTEM CAPACITY	40 PSI 192 GALLONS		
		28 PSI 260 GALLONS	
			18 PSI 405 GALLONS
PRESSURE SWITCH	FACTORY SET AT 30-40 PSI	FACTORY SET AT 23-28 PSI	FACTORY SET AT 13-18 PSI
CFM	2.21 @ 10 PSI	2.21 @ 10 PSI	2.21 @ 10 PSI
PUMP	1 CYLINDER, OIL FREE	1 CYLINDER, OIL FREE	1 CYLINDER, OIL FREE
CYLINDERS	CERAMIC COMPOSITE	CERAMIC COMPOSITE	CERAMIC COMPOSITE
VOLTS	115	115	115
PHASE	1	1	1
RUNNING AMPS	4	4	4
BREAKER SIZE	15 AMP RECOMMENDED	15 AMP RECOMMENDED	15 AMP RECOMMENDED
DIMENSIONS	10" X 9.5" X 14"	10" X 9.5" X 14"	10" X 9.5" X 14"
WEIGHT	21 LBS	21 LBS	21 LBS

SPECIFICATIONS	S164
HP	.5
SYSTEM CAPACITY	40 PSI 192 GALLONS
	18 PSI 405 GALLONS
	10 PSI 729 GALLONS
PRESSURE SWITCH	FACTORY SET AT 10-20 PSI MINIMUM DIFFERENTIAL: 5 PSI
CFM	2.21 @ 10 PSI
PUMP	1 CYLINDER, OIL FREE
CYLINDERS	CERAMIC COMPOSITE
VOLTS	115
PHASE	1
RUNNING AMPS	4
BREAKER SIZE	15 AMP RECOMMENDED
DIMENSIONS	10" X 9.5" X 14"
WEIGHT	22 LBS

SAFETY

DEFINITIONS

⚠ **DANGER**: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

⚠ **WARNING**: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ **CAUTION**: Indicates a situation that will or could cause minor injury or property damage.

GENERAL PRECAUTIONS

Read the Owner's Manual before operating.

⚠ **DANGER**:
Do not use compressed air for breathing air applications.
Beware of high voltage: disconnect lockout/tagout electric supply before servicing.
Ground compressor per codes.

⚠ **WARNING**:
Beware of high-pressure air: do not bypass, modify, or remove safety/relief valves.
Beware of hot surfaces: allow unit to cool before servicing.
Do not operate with safety guards removed.

⚠ **CAUTION**:
Never operate the compressor near flammable liquids or vapors.
Do not direct the air stream at body.
Drain tank air weekly to decrease risk of bursting.

NOTE: Per UL 1450:46.17 C-Aire recommends a maximum of 70% duty cycle for its compressors.

INSTALLATION

SELECTING A LOCATION:

C-Aire compressors are to be installed and operated in a clean, dry, well-lighted, and well-ventilated area.

Provide at least 200 cubic feet of fresh air per 1 hp.

Ideal operating temperatures are between 32°F and 100°F.

Avoid excessively humid areas, as moisture may form in the pump, producing sludge and causing moving parts to wear prematurely.

NOTE: The dry pipe/sprinkler system compressor is to be installed in accordance with the Standard for Installation of Sprinkler Systems, NFPA 13.

⚠ **CAUTION**: If temperatures consistently drop below 32°F, install the compressor in a heated area.

⚠ **CAUTION**: Never operate the compressor in temperatures below 20°F or above 104°F.

⚠ **WARNING**: A compressor should never be used in an area where toxic, corrosive, or volatile agents may be present.

(INSTALLATION CONTINUED ON NEXT PAGE)

MOUNTING THE COMPRESSOR

⚠ **CAUTION**: Remove the compressor from the shipping packaging before mounting.

MOUNTING OPTIONS

1 Install Mounting Bracket

Riser: Mounts to 2 ½" riser or larger. Clamps for 2 ½ to 4" included. (Other kits available for larger risers.)

Drywall: Use 2x4s attached to studs in the drywall to attach the mount bracket. (2x4s not included.)

Cinder Block/Concrete Wall: Use wall anchors (not included) to attach mounting bracket.

2 Hang unit on mounting bracket

3 Bolt unit to mounting bracket

4 Install air filter assembly

FLOOR MOUNTING*

1 Mark hole locations

Place unit in chosen location, mark 3 holes and remove unit.

Floor Mount kits are ordered separately and include 3 anchor bolts, nuts, washers, and vibration absorption washers.

2 Drill holes

Drill 1.75" deep using a 3/8" masonry drill bit in the floor at indicated markings.

3 Install anchor bolts

Tap anchor bolts down to secure while protecting bolt threads. Feed vibration absorption washer onto bolt.

4 Secure Unit

Place unit on anchor bolts slide on washer and then loosely thread * nut over bolt.

* Do not tighten nut. Tightening the nut may lead to stress on the frame causing damage to the unit.

5 Install air filter assembly

*Floor mounting for S280/S281 ONLY

INLET AND DISCHARGE PIPING

⚠ **CAUTION**: Do not operate unit without inlet-air filtration.

If the air is dirty, pipe the filter to a source of clean air.

Do not install piping with a diameter lower than that of the pump intake.

⚠ **CAUTION**: Do not use PVC plastic in the discharge line.

Use hand-welded or threaded steel or copper pipes and cast-iron fittings that are safe for the discharge pressure and temperature.

ELECTRICAL

⚠ **WARNING**: Compressor installation must be performed by a qualified electrician in accordance with the National Electrical Code (NEC) or the Canadian Electrical Code (CEC), the National Electrical Safety Code (NESC) OSHA code, and/or any local or state codes having precedence.

Be sure of proper wire sizing and that the circuit breaker and the distance from the breaker is within suggested range. Confirm your electrical-supply voltage matches what is required for the motor.

⚠ **WARNING**: The compressor must be grounded. Grounding reduces the risk of electric shock. Certain C-Aire Models are equipped with a cord that has a grounding wire with a grounding plug. The plug must be plugged into an outlet that is installed and grounded in accordance with all local codes and ordinances.

⚠ **WARNING**: Improper installation of the grounding plug will result in a risk of electric shock. When repair or replacement of the cord or plug is required, do not connect the grounding wire to either flat-blade terminal. The insulated wire with a green outer surface and yellow stripes is the grounding wire.

NOTE: The installation, electric motor, wiring, and all electrical controls must be in accordance with NFPA 70-1996 National Electric Code, National Electric Safety Code, and state and local codes. Failure to abide by the national, state, and local codes may result in physical harm and/or property damage.

⚠ **DANGER**: High voltage may cause personal injury or death. Disconnect and lockout/tagout, per OSHA regulation 1910.147, all electrical power supplies before opening the electrical enclosure or servicing.

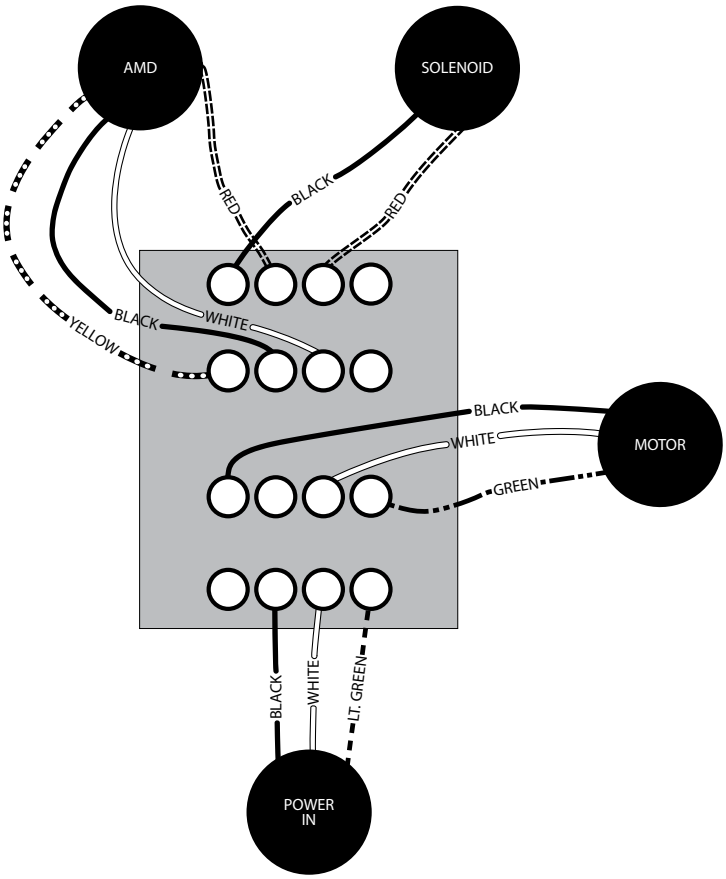
⚠ **DANGER**: Never assume a compressor is safe to work on if it is not operating. It could restart at any time. Always disconnect/ lockout/tagout before servicing.

⚠ **CAUTION**: Dry pipe sprinkler compressor must be wired to a reliable power source to be compliant with AHJ.

NOTE: Wiring diagrams for each model type are located on the following page.

(ELECTRICAL CONTINUED ON NEXT PAGE)

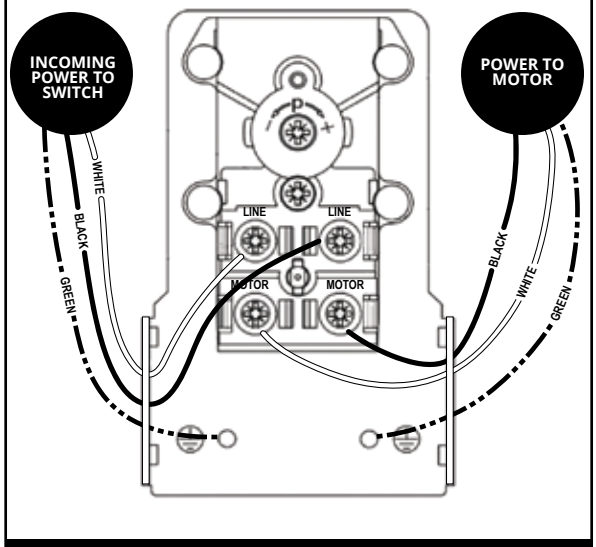
WIRING DIAGRAM



S281 DIGITAL AMD

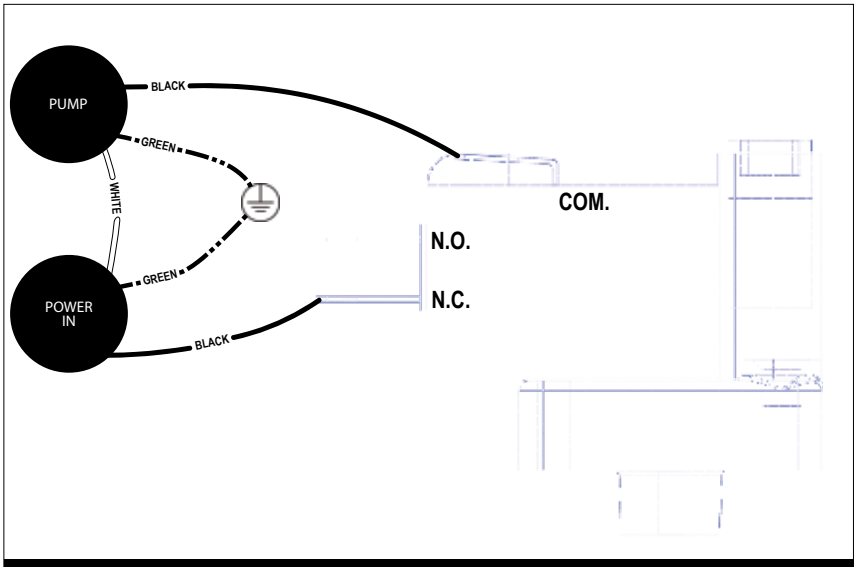
ELECTRICAL (CONTINUED

WIRING DIAGRAM



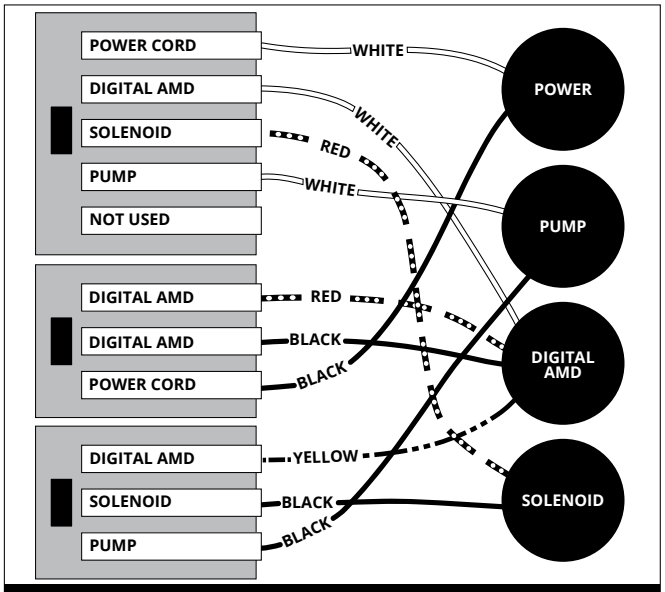
S280 PRESSURE SWITCH

WIRING DIAGRAM



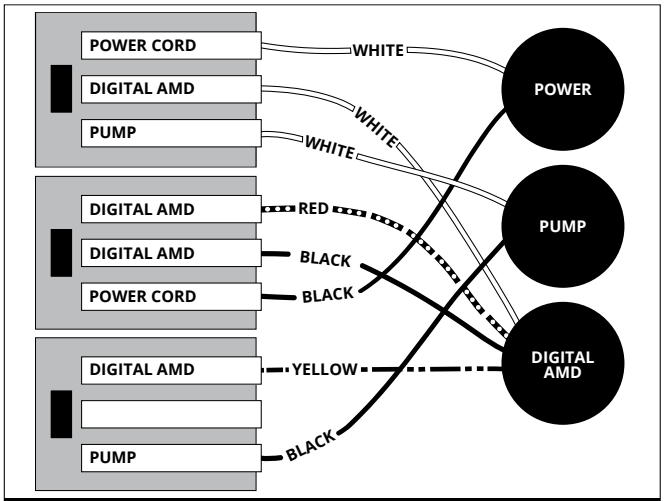
S163R/S253R/S418R PRESSURE SWITCH

WIRING DIAGRAM



S110 DIGITAL AMD

WIRING DIAGRAM



S164 DIGITAL AMD

START UP

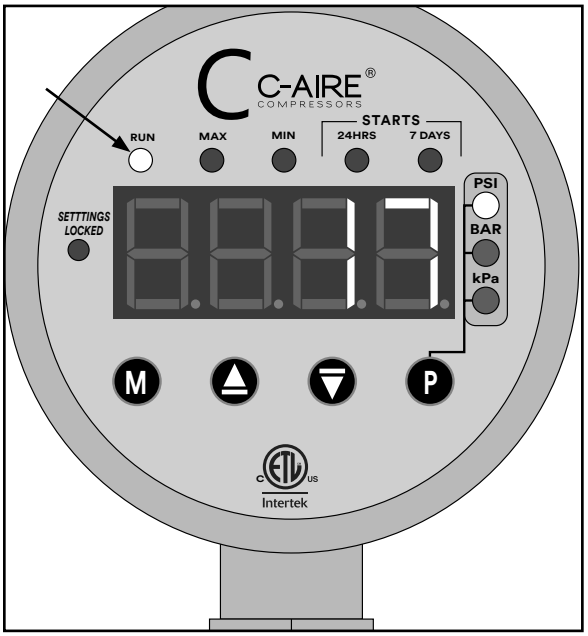
NOTE: There is no need to "break-in" your compressor. It has been tested and run at the factory by qualified personnel.
NOTE: S163/S253/S418 - Remove the air filter when filling systems near maximum capacity. The check valve unloader orifice will continuously bleed a small amount of air while the compressor is running.

When operating the compressor for the first time, do the following:

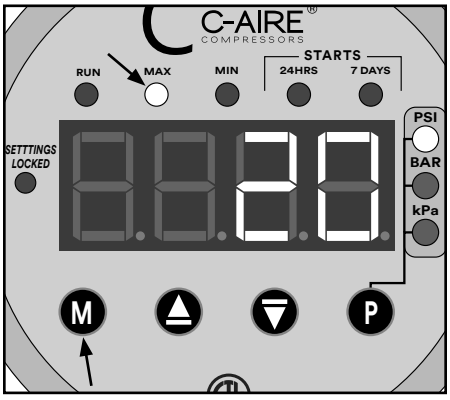
1. Perform an inspection of the compressor to ensure there are no obstructions that might interfere with moving parts.
2. Connect the compressor to the power source (the compressor will start).
3. Ensure compressor shuts off at desired pressure.

DIGITAL AMD OPERATING INSTRUCTIONS FOR S110, S164, & S281 MODELS

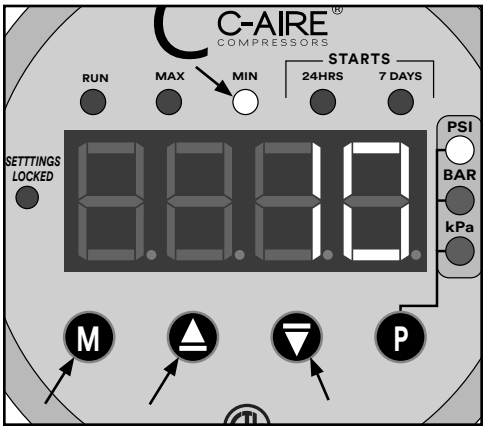
This Digital AMD has 5 different modes of operation. When it is powered on, it starts in the **RUN** mode and will display the current pressure.



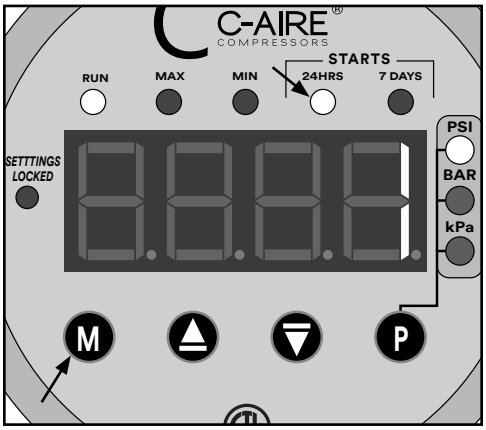
Pressing the M mode button once will switch it to the maximum pressure setting, (or the pressure at which the compressor turns off). At this point you are able to adjust the maximum/turn off pressure. When the **MAX** indicator is on, the arrow buttons ▲ ▼ can perform a +1/-1 change to the set value. The compressor will not run in this mode. If the compressor remains in this mode for 60 seconds with no adjustments, it will automatically revert back to the **RUN** mode. Range: 10-55 PSI.



Pressing the M mode button a second time will switch it to the minimum pressure mode, this is the minimum pressure the system will reach before it turns on. At this point you are able to adjust the minimum/turn on pressure. When the **MIN** indicator is on, the arrow buttons ▲ ▼ can perform a +1/-1 change to the set value. If the compressor remains in this mode for 60 seconds with no adjustments, it will automatically revert back to the **RUN** mode. Range: 5-50 PSI. **Note**: the upper and lower limits have a minimum differential of 5 PSI.



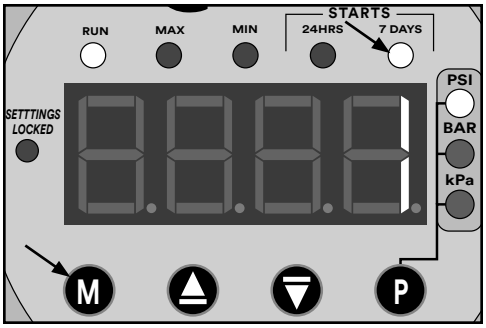
Press the M mode button a third time and the **24HRS** indicator will display the total number of starts in the last 24 hours (The counter will not measure time if the unit has no power).



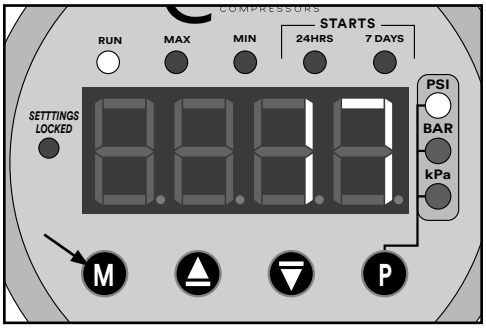
(DIGITAL AMD INSTRUCTIONS CONTINUED ON NEXT PAGE)

DIGITAL AMD OPERATING INSTRUCTIONS (CONTINUED)

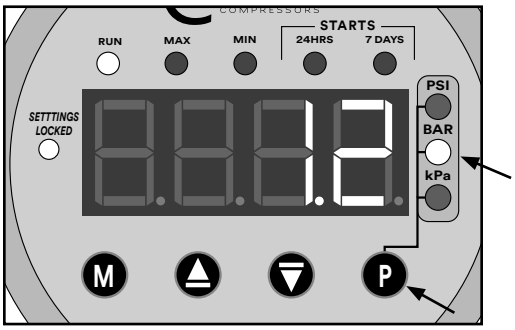
Pressing the M mode button a fourth time, the **7DAYS** indicator will display the total number of starts in the last 7 days (The counter will not measure time if the unit has no power).



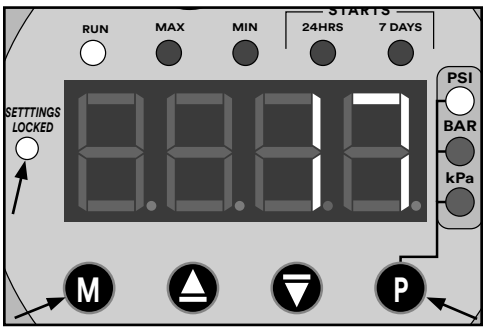
Pressing the M mode button a 5th time brings it back to the beginning.



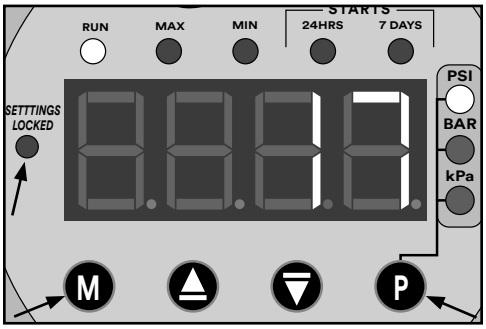
When in the **RUN** state, press the P pressure button to toggle between the pressure units of measure **PSI**, **BAR** and **kPa**.



To lock the settings, hold the M and the P simultaneously for 3 seconds until the **SETTINGS LOCKED** light is illuminated.

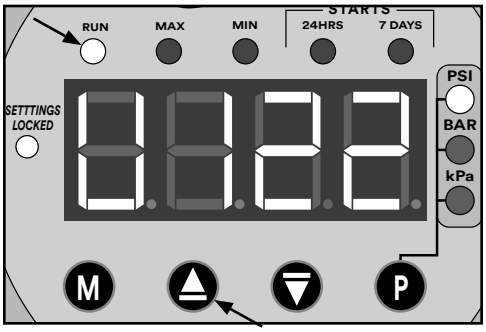


To unlock, repeat the previous process until the **SETTINGS LOCKED** light turns off.

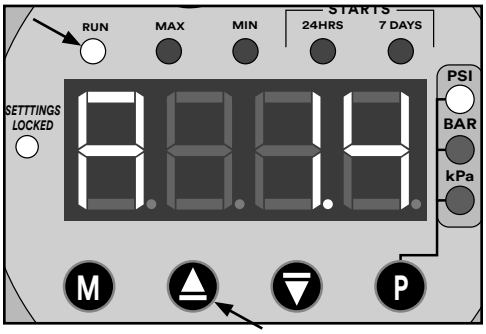


To display the **Volts** and **Amps**, when in the **RUN** mode, press the ▲ up arrow button once and it will display the Volts and press it again to display the Amps.

Volts



Amps



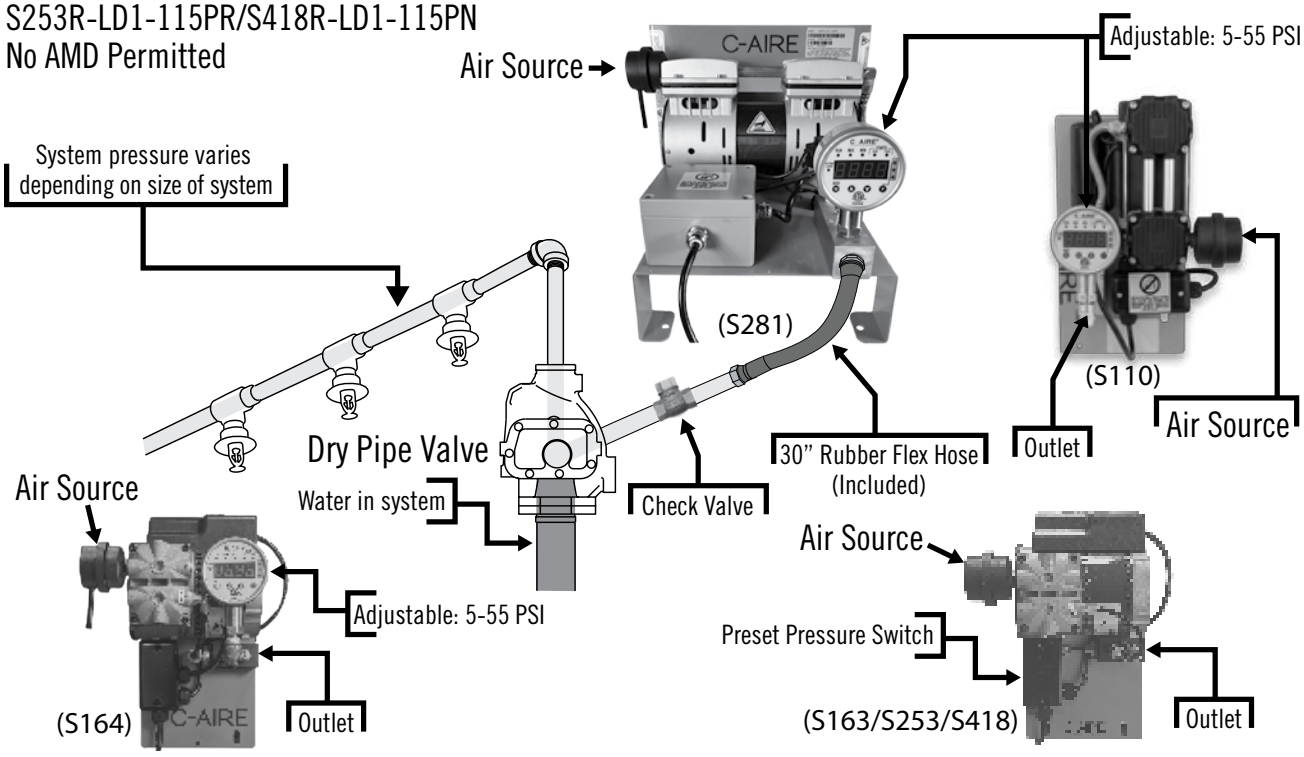
NOTE: After 60 seconds of inactivity in any mode, the unit will revert back to the **RUN** mode.

SYSTEM INSTALLATION DIAGRAMS

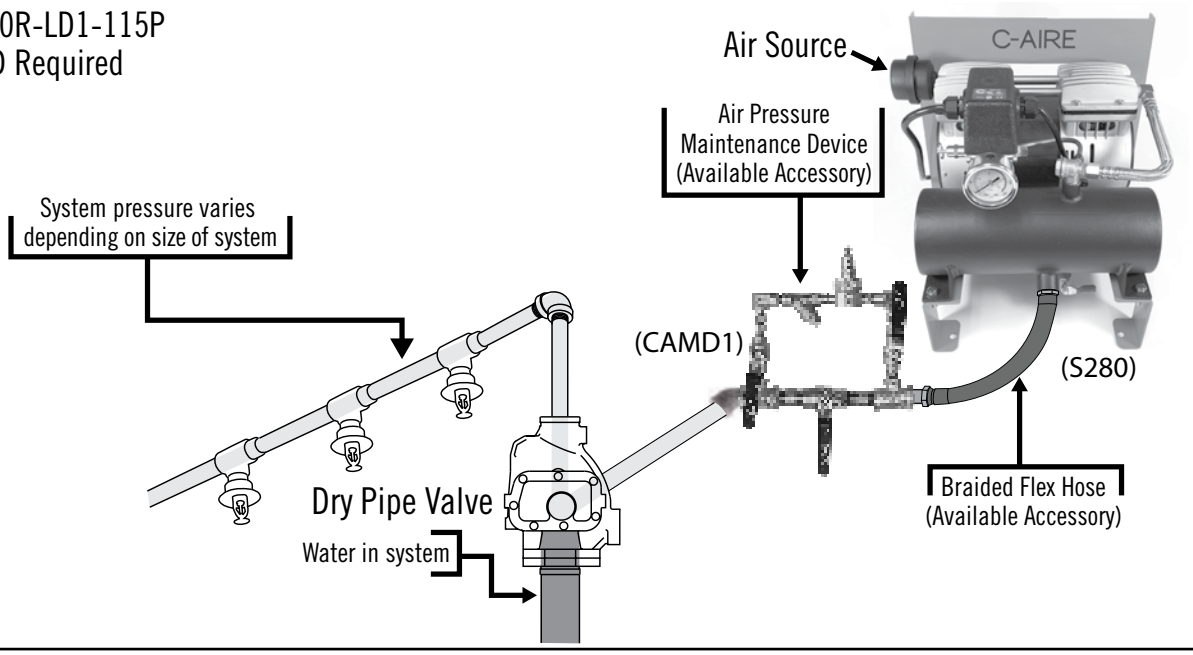
NOTE: The 280 model is factory set at 50-100 PSI. To be used in conjunction with an air maintenance device (not included).

S281R-LD1-115PD/S110R-LD1-115PD/
S164R-LD1-115PD/S163R-LD1-115PU/
S253R-LD1-115PR/S418R-LD1-115PN
No AMD Permitted

Digital AMD eliminates the need for air pressure maintenance device.



S280R-LD1-115P
AMD Required



MAINTENANCE

⚠ **WARNING**: Before performing maintenance, release air pressure from the compressor using the manual drain valve (see parts identification 8) and disconnect/lockout/tagout the main power supply.

WEEKLY MAINTENANCE

■ Drain moisture from your air compressor's tank WEEKLY!

⚠ **CAUTION**: Open the drain valve slowly to release the moisture, as pressure in the tank can cause the moisture to expel at very high velocity.

■ Check for any unusual noises, vibrations, or permanent leaks from the unloader valve.

BIANNUAL MAINTENANCE

■ TURN OFF POWER and check and tighten all electrical connections.

■ Change air-intake filter(s). The filter is located on the top of the compressor (see parts identification item 1). Twist the top cap off of the filter housing to access the filter.

■ Check to make sure all bolts are tight.

VALVES AND SWITCHES

PRESSURE RELIEF VALVE (safety valve - see parts identification 3)

Pressure-relief valves are standard on all units. Pressure-relief valves aid in preventing system failures by relieving system pressure when compressed air reaches a determined level. Pressure-relief valves are PRESET by the manufacturer: *under no circumstances should the setting be changed by anyone other than the manufacturer.*

⚠ **DANGER**: Pressure-relief valves are designed to protect compressed-air systems in accordance with ASME B19 safety standards.

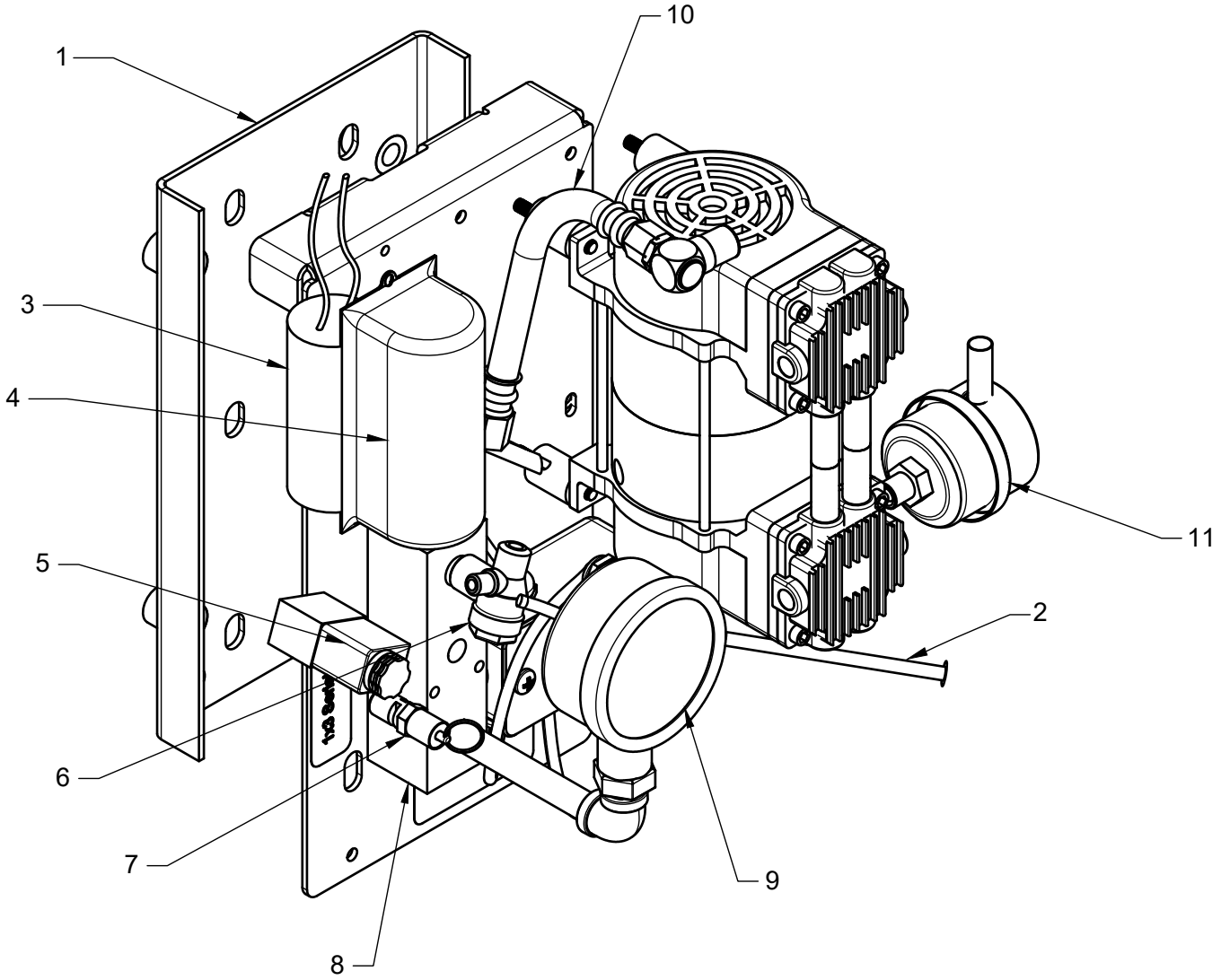
PRESSURE SWITCH (S280/S163/S253/S418) / DIGITAL AMD (S281/S164/S110) (see parts identification 2 & 10)

A pressure switch or Digital AMD are standard on all C-Aire compressors. These are used to detect the demand for compressed air and allow the motor to start. When the demand is satisfied, the motor stops. They are both preset at the factory by C-Aire and do not require adjustment. However, if you want to make adjustments to the Digital AMD, those instructions are on page 5.

⚠ **DANGER**: Electric power always exists inside the pressure switch/digital AMD whenever the compressor is connected to a power supply. Do not touch any electrical leads or electric components without locking out the power supply first.

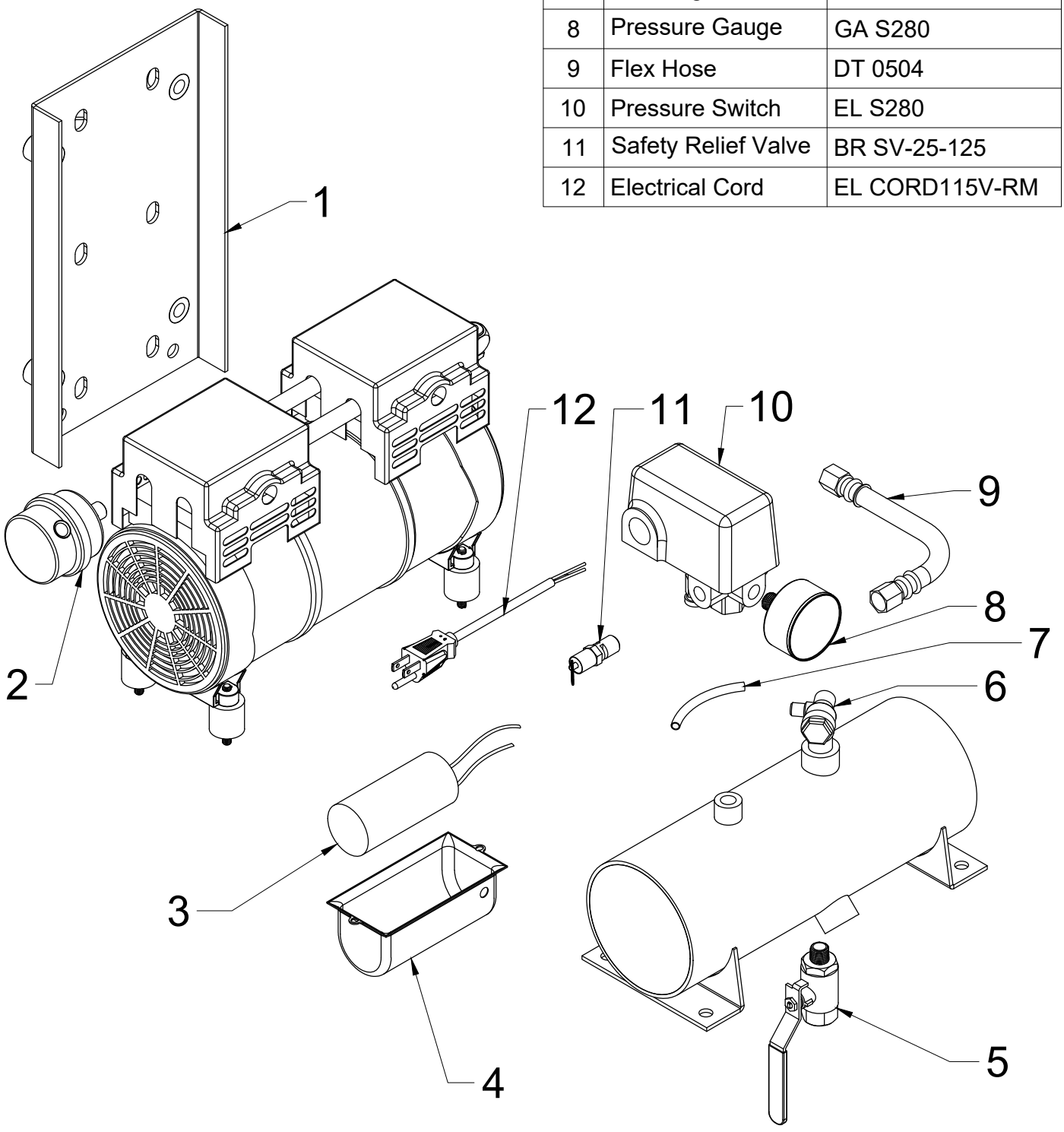
S110 PARTS DIAGRAM

1	Mounting Bracket	RM BRACKET
2	Electrical Cord	EL CORD115V-RM
3	Capacitor	EL CBB60
4	Capacitor Cover	EL CBB60-C
5	Soldenoid Valve	EL SV3V1-06
6	Check Valve	BR 37525
7	Safety Relief Valve	BR SV-25-70
8	Manifold	BP 3M
9	Digital Air Maintenance Device	EL D0911
10	Flex Hose	DT 0504
11	Filter Assembly	FA S28



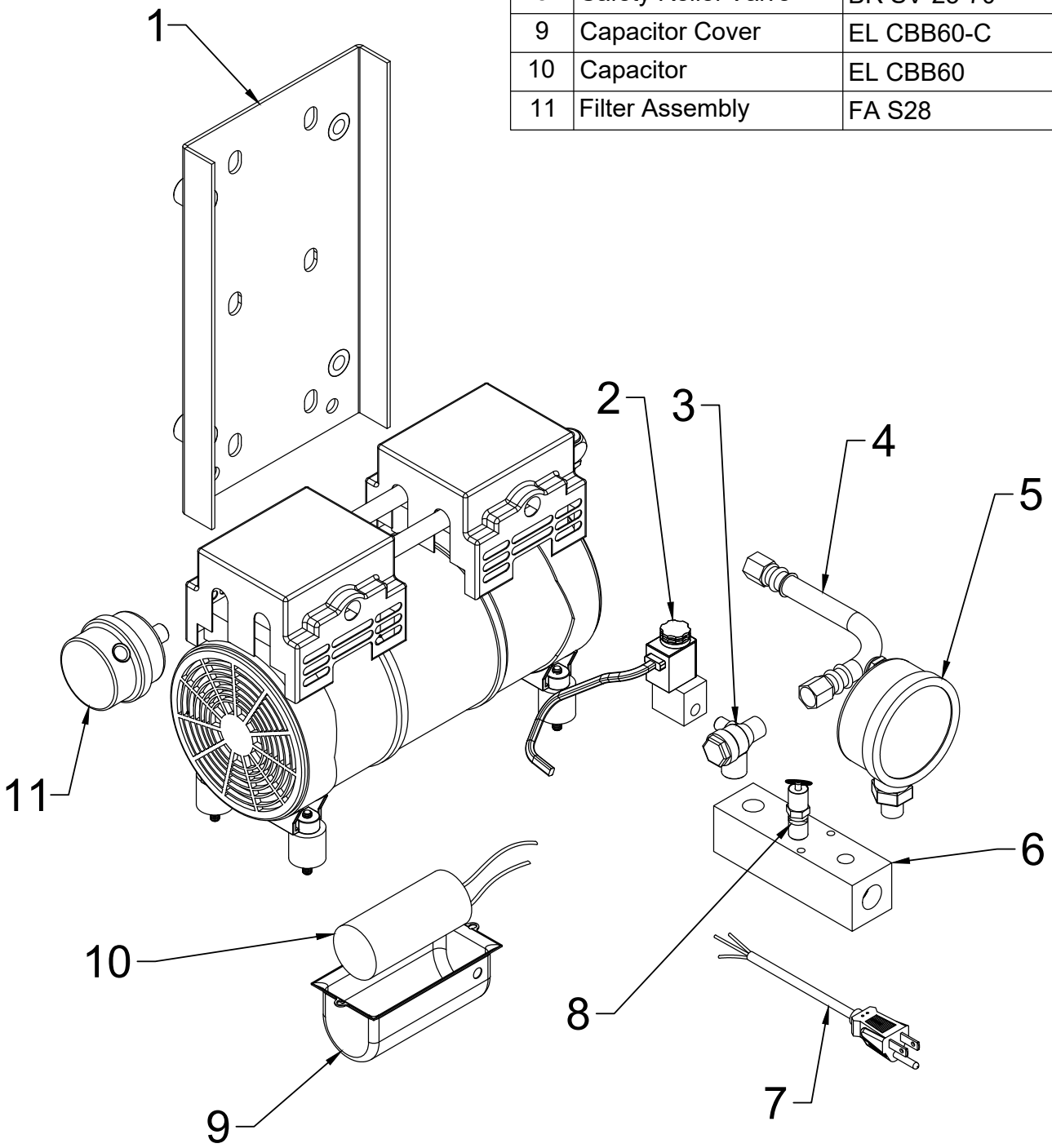
S280 PARTS DIAGRAM

1	Mounting Bracket	RM BRACKET
2	FIter Assembly	FA S28
3	Capacitor	EL CBB60
4	Capacitor Cover	EL CBB60-C
5	Drain Valve	BR S28
6	Check Valve	BR 37525
7	Discharge Tube	DT S280
8	Pressure Gauge	GA S280
9	Flex Hose	DT 0504
10	Pressure Switch	EL S280
11	Safety Relief Valve	BR SV-25-125
12	Electrical Cord	EL CORD115V-RM



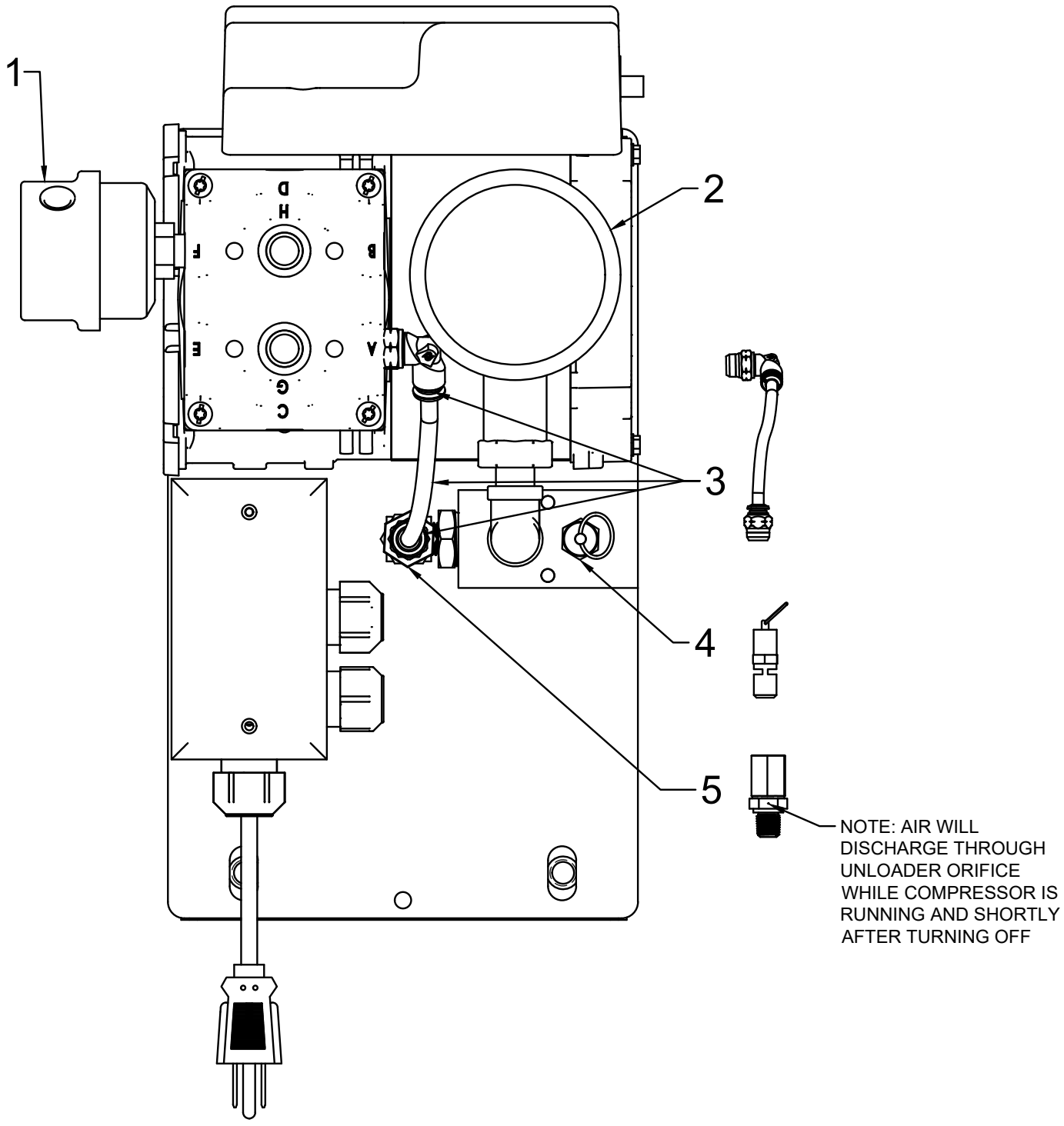
S281 PARTS DIAGRAM

1	Mounting Bracket	RM BRACKET
2	Solenoid Valve	EL SV3V1-06
3	Check Valve	BR 37525
4	Flex Hose	DT 0504
5	Digital AMD	EL D0911
6	Manifold	BP 3M
7	Power Cord	EL CORD115V-RM
8	Safety Relief Valve	BR SV-25-70
9	Capacitor Cover	EL CBB60-C
10	Capacitor	EL CBB60
11	Filter Assembly	FA S28



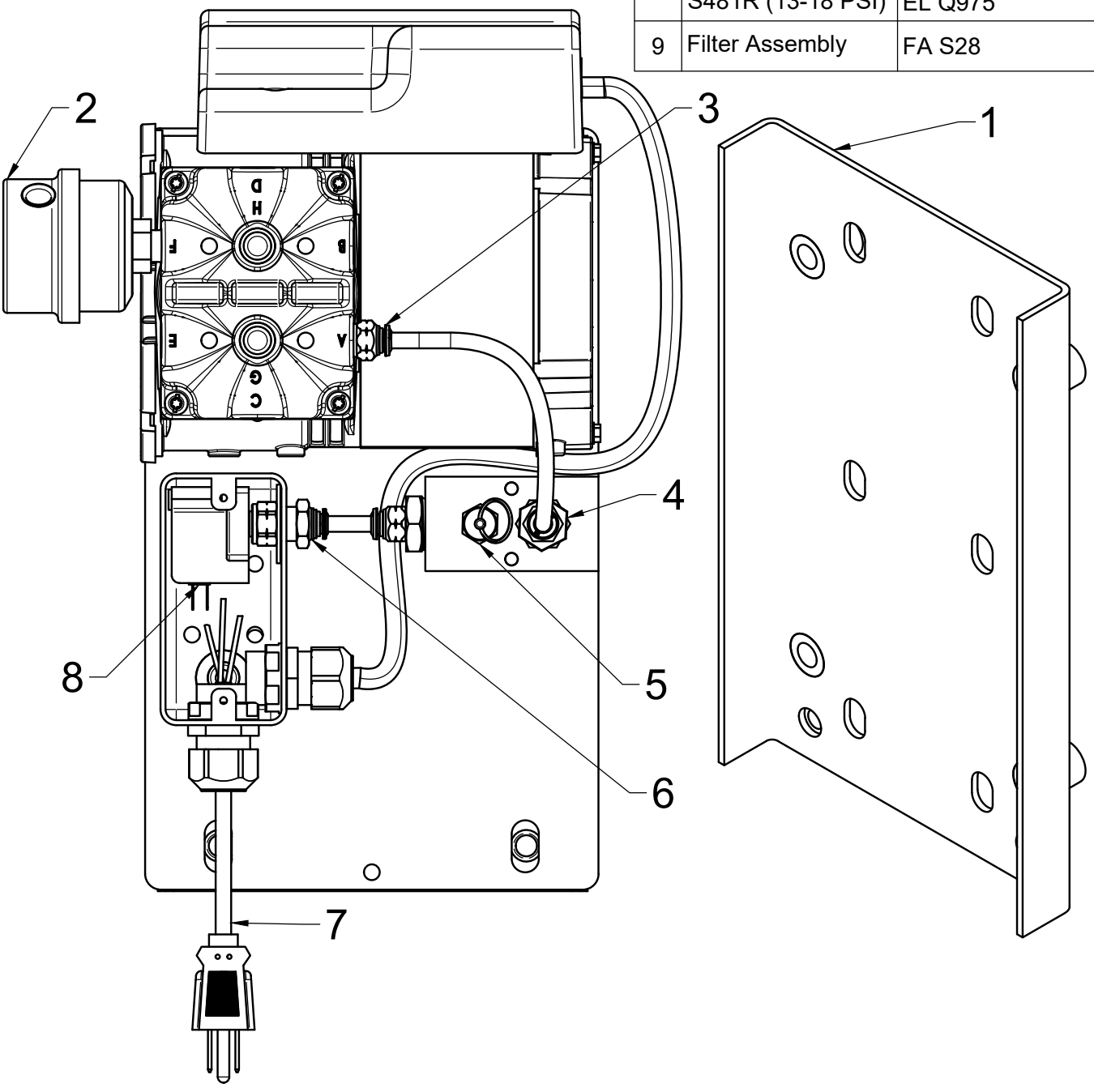
S164 PARTS DIAGRAM

1	Filter Assembly	FA S28
2	Digital AMD	EL D0911
3	Discharge Kit Hose & Push Lock Fittings	DT S164-K
4	Safety Relief 50 PSI	BR SV-25-50
5	Check Valve	BR PA6



S163/S253/S418 PARTS DIAGRAM

1	Mounting Bracket	RM BRACKET
2	Filter Assembly	FA S28
3	Push Lock Fitting	PL PLA 04
4	Check Valve	BR PA6
5	Safety Relief Valve	BR SV-25-50
6	Bulkhead	PL PLB 02X04
7	Power Cord	EL CORD115V-RM
8	Pressure Switch S163R (30-40 PSI) S253R (23-28 PSI) S481R (13-18 PSI)	 EL Q976 EL Q979 EL Q975
9	Filter Assembly	FA S28



TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SUGGESTED CORRECTION
• Compressor will not turn on	• No electrical power* • Loose wire connections • Overheating Compressor	• Turn on power • Tighten connections • See “Overheating Compressor”
• Knocking noise or internal pump issue	• Internal pump issue	• Call C-Aire for assistance
• Pump/motor hums	• Not unloading head pressure	• Clean check valve • Check Solenoid operation
	• Bad capacitor connection	• Remove wire nuts and redo connection
	• Low incoming voltage	• Check voltage • Up-size wire
• Short cycling	• Pressure differential too small	• Increase differential between Max & Min pressure
	• Leaks	• Find and repair leaks
	• Check valve not seated	• Clean/replace check valve • Stretch spring
	• Condensation built up in plumbing	• Drain condensation • Reduce humidity in compressor room • Install compressor above system valve
• Overheating Compressor	• Leaks	• Find and repair leaks
	• System too large	• Decrease system pressure • Up-size compressor
• Breaker/Fuse trips	• Wrong size fuse or breaker	• Check fuse/breaker size
	• Bad fuse or breaker	• Replace
	• Motor starting under load	• Clean/replace check valve
	• Low incoming voltage	• Check voltage • Up-size wire
• Pressure does not build or builds slowly	• Leaks	• Find and repair leaks
	• Clogged air filter	• Replace filter element
	• Internal pump issue	• Call C-Aire for assistance

MODEL #	
SERIAL #	
MFG #	
INSTALL DATE	

Make a permanent record of the Model and Serial Number of your compressor by filling in the fields above. You’ll save time and expense by including this reference identification on replacement part orders.

380 West 1st Street, Dresser, WI 54009 // 800.762.2247 // 651.462.3440 // www.cairecompressors.com

WARRANTY

OIL FREE COMPRESSOR

C-Aire Inc. warrants its compressors to be free from defects in material and workmanship subject to the following provisions:

STANDARD WARRANTY DURATION: 12 months from date of install.

WHAT THE WARRANTY COVERS DURING THE WARRANTY DURATION: All components on the compressor except for those items listed in the section titled "What is excluded from warranty coverage".

WHAT IS EXCLUDED FROM THE WARRANTY COVERAGE:

A) Air intake filters, which is a maintenance item.

B) Failure due to improper installation, insufficient power, or absence of mounting pads on floor mounted units.

C) Freight damaged items. (REJECT THE SHIPMENT or note damage on Bill of Lading)

D) Any labor, freight or transportation charges that are not pre-approved by C-Aire.

E) Labor charges incidental to the installation, electrical connections, repair, service, adjustment, removal, or replacement.

F) Misuse or abuse.

G) **C-AIRE HAS NO OBLIGATION UNDER THESE WARRANTIES OR OTHERWISE (REGARDLESS OF THE FORM OF ACTION) FOR SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF USE, LOST PROFITS, LOST INCOME, WHETHER SUFFERED BY THE BUYER OR A THIRD PARTY.**

C-AIRE'S OBLIGATIONS: C-Aire will repair or replace, at C-Aire's option, defective parts, pay reasonable labor costs of replacing or repairing the defective part, and pay ground freight for the return of defective parts and shipment of the replacement part(s). ALL LABOR AND FREIGHT MUST BE PRE-APPROVED AND ARRANGED BY C-AIRE.

PURCHASER'S OBLIGATION:

1) Properly install and start up the compressor.

2) Ensure the compressor is sized properly for the application. The compressor should run no more than 30 minutes/day on average after initial system fill.

3) Maintain proof of purchase.

WARRANTY CLAIMS: Please contact C-Aire at 1-800-762-2247 or 651-462-3440. Please have your Model and serial number available.

C-AIRE®

COMPRESSORS

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