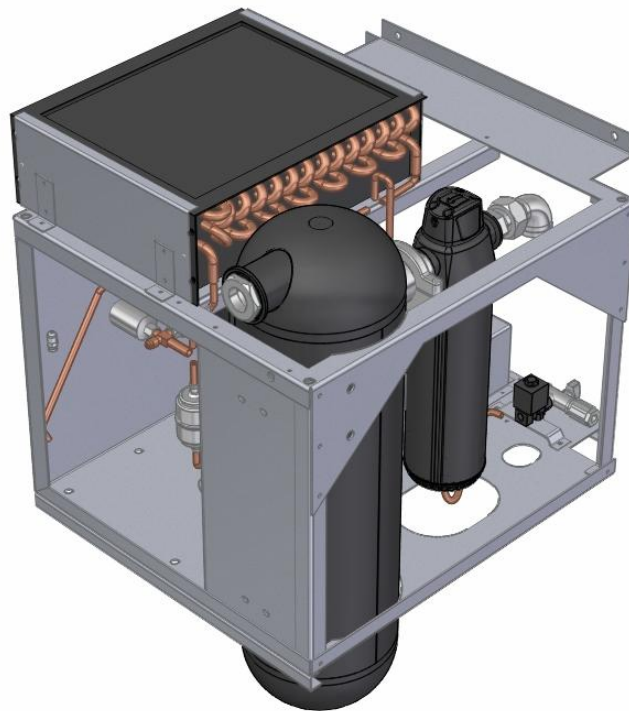


# Nx Series

INTEGRATED DRYER FOR SCREW COMPRESSORS

## OPERATOR MANUAL

18 – 22 kW (25 – 30 HP)



## EC DECLARATION

### EC DECLARATION OF CONFORMITY

In accordance with EC Machinery directives  
2006/95/EEC (LVD), 2004/108/EEC (EMC)

We,

**FS-Curtis**  
**1905 Kienlen Avenue**  
**St. Louis, MO 63133**

declare that, under our sole responsibility for manufacture  
and supply, the products;

**The Product:   Integrated Air Dryer**  
**Type:            ALM-I-222 US to ALM-I-390 US**

**Serial No:       0113MA00001 to 5214MA99999**

Which this declaration relates, are in conformity with the  
provisions of the above directives using the following  
principal standards,

EN12100-1:2011, EN12100-2:2011, EN1050, EN13857:2010,  
EN378-1+A2:2012, EN60204-1:2010, EN60529:2003,  
NEN-EN-IEC61000-6-1:2008,  
NEN-EN-IEC61000-6-2:2008,  
NEN-EN-IEC61000-6-3:2008/A1:2011,  
NEN-EN-IEC61000-6-4:2008,  
EN61000-3-2,  
DIN EN 13445-1:2009,  
DIN EN 13445-3:2009,  
ISO 15609-2:2005,  
ISO 15613-2006,  
ISO 15614-6:2008

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# SAFETY

## 1. Safety

A) When operating the air dryer the operator must apply safe working methods and observe all local safety instructions and relevant regulations.

B) Prior to installation, the dryer and the compressed air system are to be depressurized and disconnected from the electrical main supply.

C) The user is responsible for safe operating conditions. Parts and accessories must be replaced if inspection shows that safe operation cannot be assured.

D) Installation, operation, maintenance and repair are only to be authorized, trained and skilled engineers.

E) The minimum and maximum values stated must be observed, as well as all of the safety precautions described in this manual.

F) If any statement in this manual does not comply with the local legislation, the strongest standard is to be applied.

### 1.1. Transportation

A) Use care and caution when transporting the dryer. Avoid dropping and other physical abuse.

B) A forklift can be used to transport the dryers provided the forks are long enough to support its full width or length and caution is used throughout the move

### 1.2. Installation

A) In addition to the general mechanical construction procedures and local regulations, the following instructions need to be emphasized:

1) Only authorized, trained and skilled engineers should install the compressed air dryer.

2) Safety devices, protecting covers or insulation in the dryers never to be dismantled or modified.

Each pressure vessel or accessory installed outside the dryer with air above atmospheric pressure must be fitted with the required pressure relief safety valves.

### 1.3. Before Operating

A) Review all safety precautions.

B) The piping must have the correct diameter and be adapted to the operating pressure (see technical specification).

C) Never operate the dryer at pressure above the maximum specified on the dryer label (check the technical specs too).

### 1.4. Maintenance by an Engineer

A) Maintenance and repairs should only be performed when the air dryer is shut down and depressurized and when the main power switch is turned off.

B) Use only the appropriate tools for maintenance and repair.

C) Before dismantling a part under pressure, disconnect the pressure sources and depressurize the system.

D) Proceed carefully during maintenance and repair. Prevent



**PLEASE READ SAFETY NOTES  
CAREFULLY**



**BEFORE MAINTENANCE AND REPAIRS,  
MAIN POWER SWITCH MUST BE  
TURNED OFF**



**BEFORE MAINTENANCE AND REPAIRS,  
DEPRESSURIZE THE SYSTEM**

## INTRODUCTION TO DRYER

### A) Purpose of this dryer

- 1) This air dryer has been designed to remove water vapor from industrial compressed air.
- 2) This dryer has been designed for indoor operation
- 3) The minimum and maximum values stated must be observed, as well as the safety precautions described in this manual.

### B) Dryer label

The following label is affixed on the air dryer.

REFRIGERANT AIR DRYER	
Model No:	MODEL NO
Serial No:	
Max. Pressure	Refrigerant
Max. Amp.	Ref.Quantity
Fuse Amp.	Voltage
	Power
Address:	

### C) Working details

#### 1) Refrigerant circuit:

The refrigerant circuit can be divided in 3 parts:

- a) Low pressure section with an evaporator (heat exchanger)
- b) High-pressure section including: Condenser, liquid receiver, (if installed) and the filter dryer.
- c) Control circuit including: Compressor, Expansion valve, by-pass valve (if installed), Fan pressure switch (if installed)

#### 2) The Refrigerant circuit operates as follows:

- a) The compressor compresses gaseous refrigerant to a high temperature.
- b) The hot refrigerant condenses in the condenser. Being liquefied it is stored in the liquid receiver (if installed).
- c) The liquid is taken out the storage vessel and injected in the evaporator (heat exchanger) by an expansion valve.

This expansion valve is protected by a filter, which removes particles and humidity that could be in the circuit.

- d) The injected liquid fills in the refrigerant section of the air / refrigerant heat exchanger and evaporates by taking

out the calories from the compressed air. The gaseous refrigerant is sucked in the compressor and the cycle carries on.

- e) In order to keep the evaporation pressure steady, and thus the refrigerant temperature in the heat exchanger,

a by-pass valve is injecting hot gaseous refrigerant in the circuit. On certain dryers, an automatic expansion valve regulates this.

#### 3) Compressed air circuit

- a) The saturated hot compressed air flows into the Economiser where it is pre-cooled by the out flowing dry chilled air. In the cold zone of the air refrigerant section it continues to cool down to dew point and enters the separator where condensates are collected. The outgoing chilled air is then warmed up in the economizer by the hot incoming air.

- b) The condensates are collected after centrifugal separation and drained out through the automatic trap.

- c) As long as the compressed air temperature does not drop below dew point, there will be no condensation in the air circuit

#### 4) Refrigerant compressor

Being of the hermetic type, it requires no servicing.

#### 5) Condenser

a) The air condensers are equipped with a helicoidal at the condenser refrigerant level.

#### 6) Refrigerant circuit protection

a) Klixon: The single phase compressors are equipped with a klixon which is a thermal sensitive switch controlling the temperature of the compressor and possible overintensity.

In case of malfunction, the klixon trips but switches on again automatically as soon as the compressor has cooled down.

b) High Pressure Security Switch: Refrigerant line is considered as a pressure vessel. That is why it is protected against bursts by the help of manually reset switch. It is set to 25 bars for dryers working with R134a

c) Filter dryer: A refrigerant circuit is a closed circuit and total water removal in the refrigerant circuit is paramount in order to obtain a correct functioning.

d) To avoid problems, the refrigerant circuit must be vacuumed before loading the refrigerant.

It is equipped with a filter dryer, which also traps any solid particles, which may have migrated into the circuit during assembly. When the safety switch has tripped out, it has to be manually resettled before switching on the dryer.

#### 7) Refrigerant circuit controls

a) Liquid refrigerant injection: The liquid refrigerant is into the evaporator by a control valve. This valve is a thermostatic or pressostatic one maintaining a constant overheats of the refrigerant in the evaporator(s).

b) Constant evaporating pressure: In the dryers equipped with a by-pass valve, the evaporating pressure is kept constant by a controlled injection of hot gas from the high-pressure side into the low-pressure section of the circuit.

#### 8) Condensate drain - trap assembly

Dismantling the drain is easy because it can be isolated from the air circuit under pressure with a ball valve. The drain has to be depressurized before being dismantled.

#### 9) Heat Exchanger Modular design

a) The dryers are equipped with a compact Mono Block Heat Exchanger module.

This assembly has been specially designed to dry compressed air and is made of:

- 1) An Economiser which pre-cools the entering hot air with the out flowing cold air.
- 2) An air/refrigerant exchanger cooling down the compressed air.
- 3) A unique design separator concentrating all condensates and requiring no maintenance.

#### 10) Accessories

Filter change alarm on the front panel, The elements of the prefilters need to be replaced when the alarm is turned on. In any case replace the element of the filter once a year at least.

This will protect the heat exchangers and improve the quality of your compressed air.

#### E) Start up and shut-down

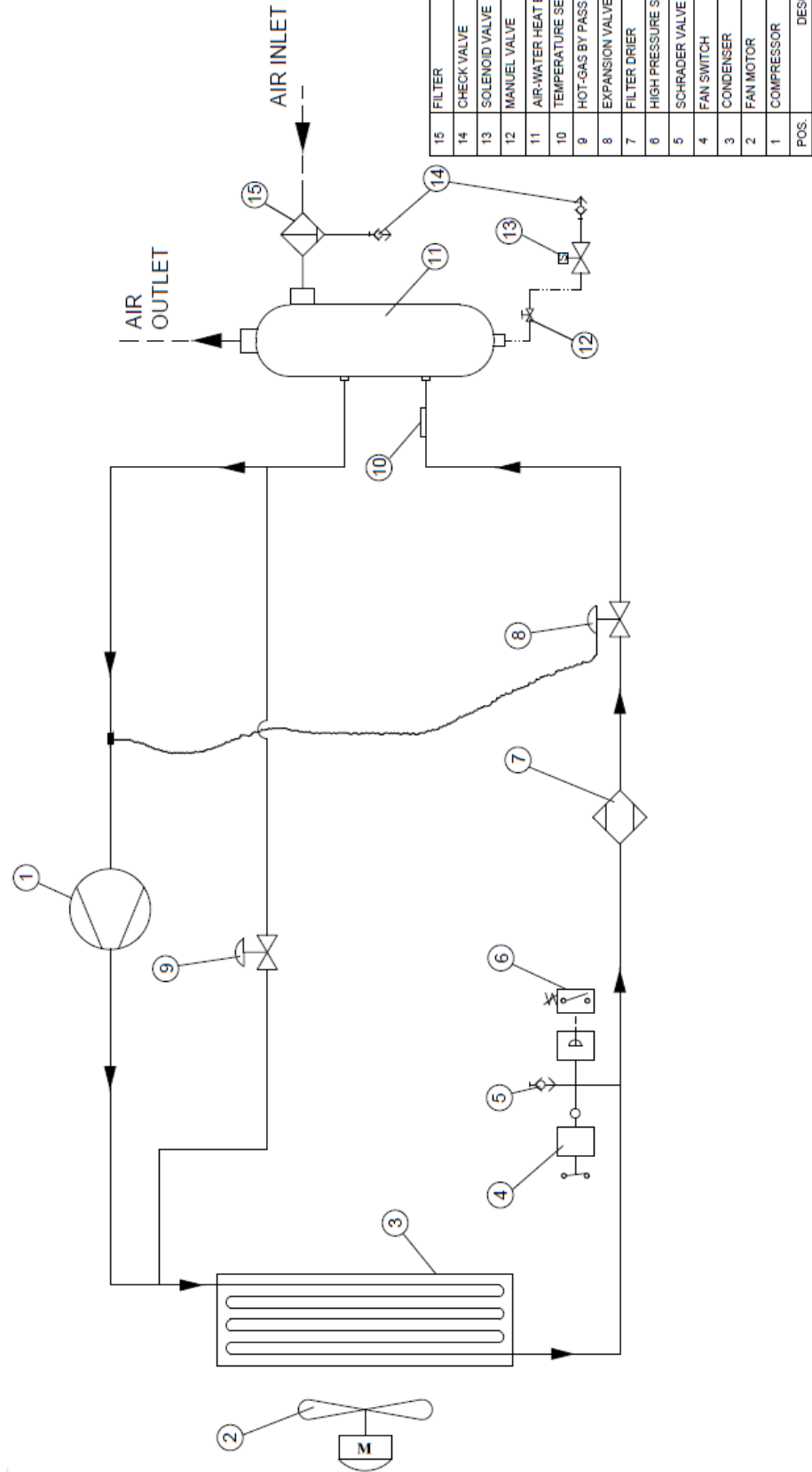
Warning: Avoid leaving the dryer off when compressed air is still flowing through it.



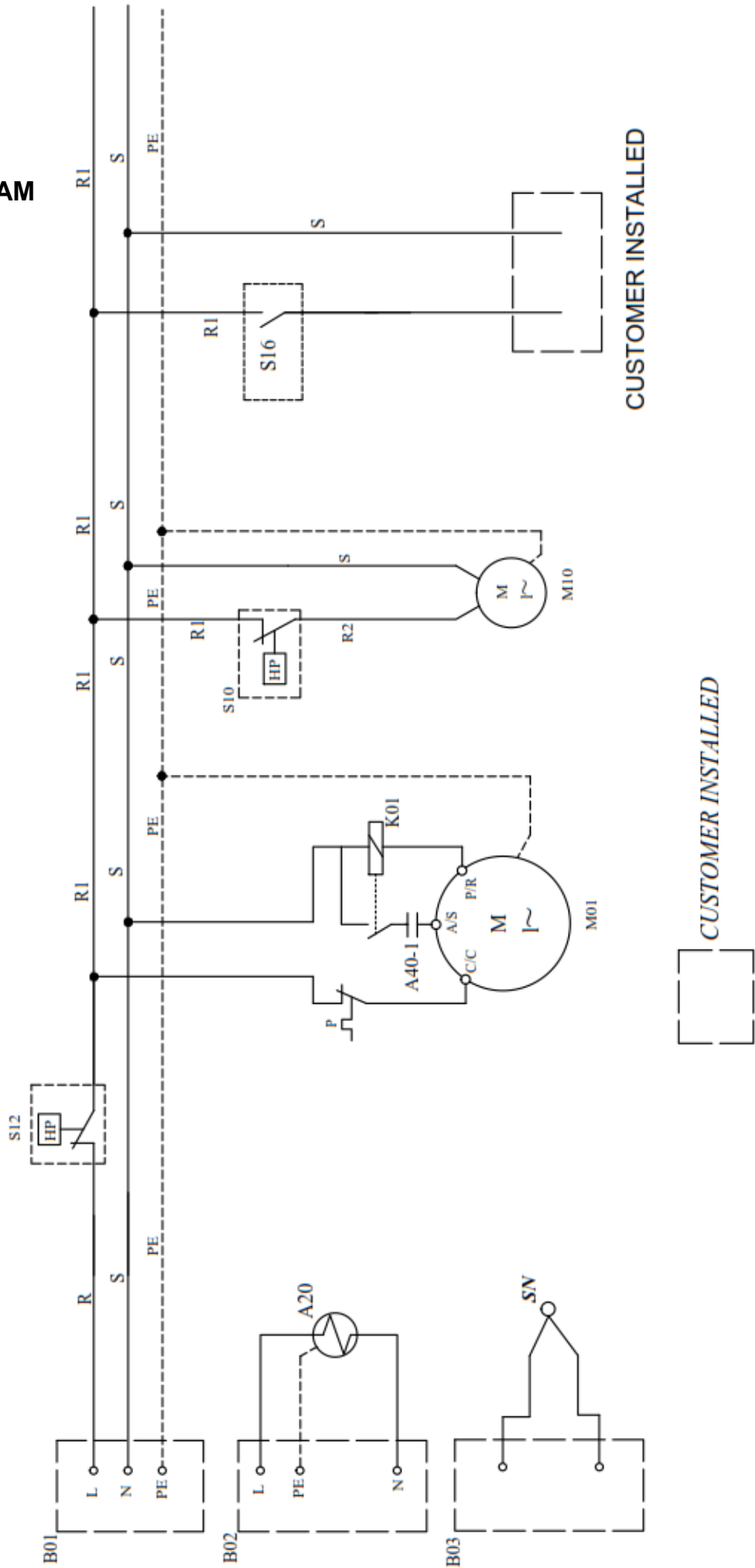
**AVOID LEAVING THE DRYER STOPPED  
WHEN COMPRESSED AIR IS FLOWING  
THROUGH IT**

# DIAGRAMS

## P&I DIAGRAM

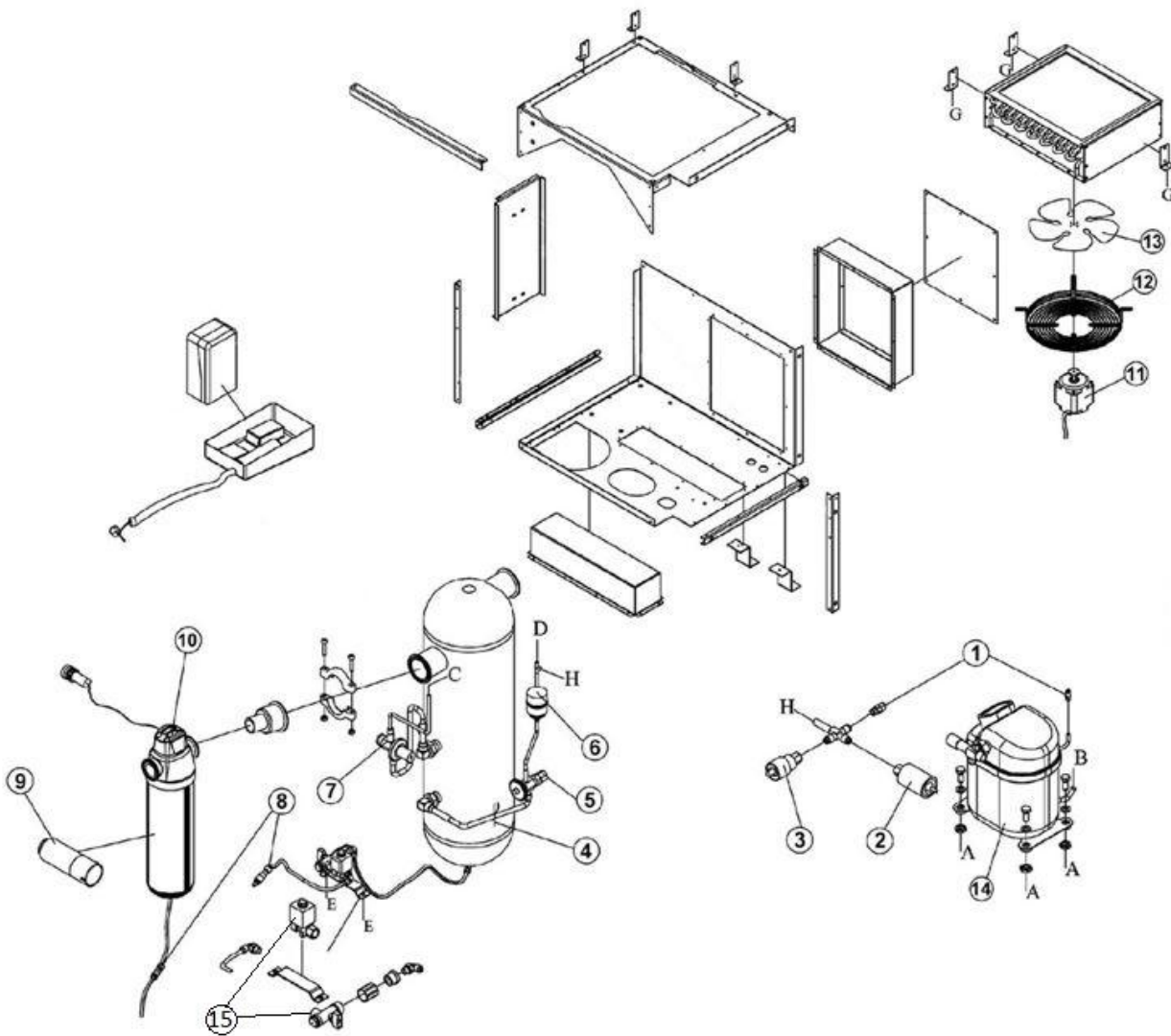


# W&D DIAGRAM





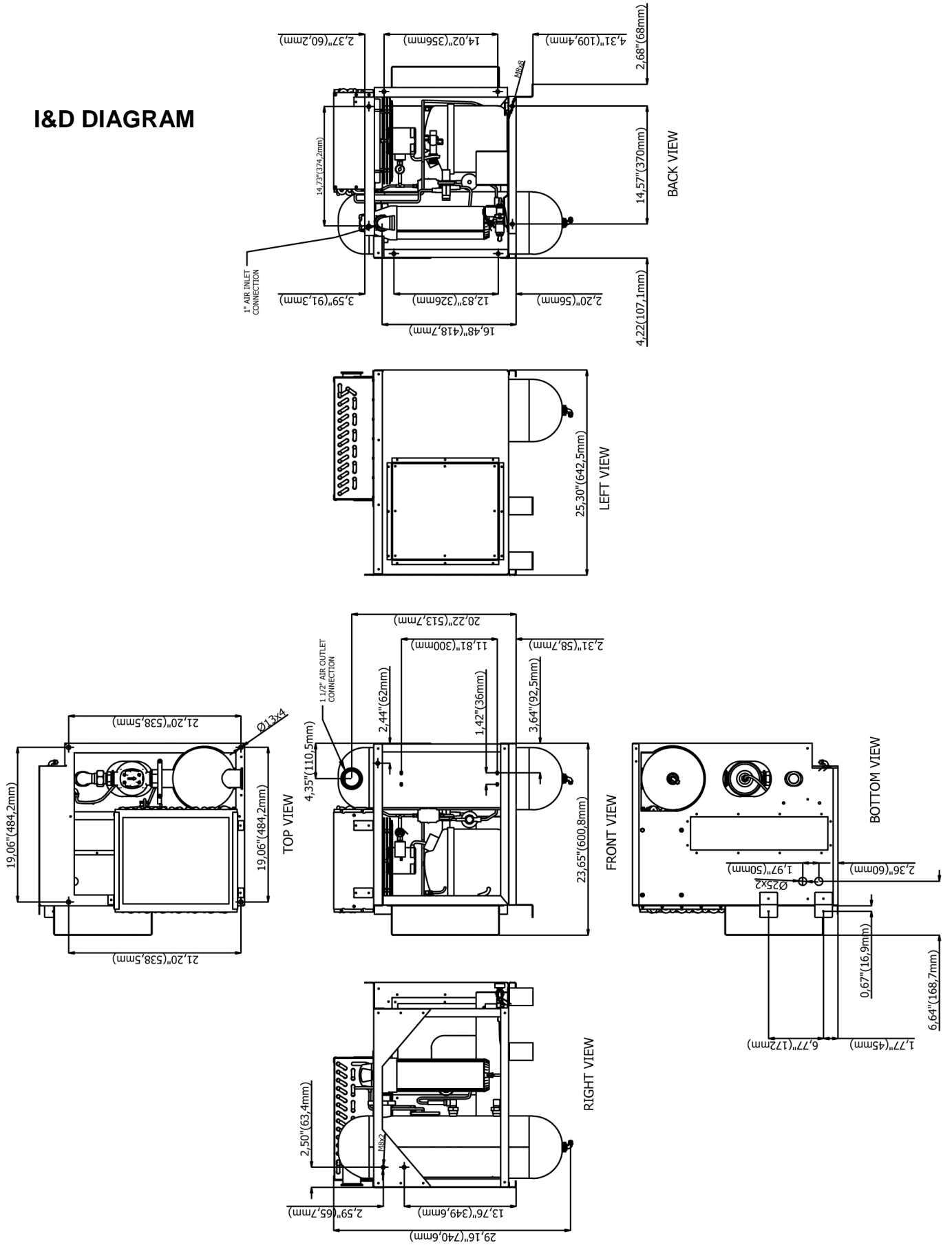
## E&D DIAGRAM



### PARTS LIST - NX 18-22 DRYER

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	FNX1822-ID-SCV	NX18-22 SCHRADER VALVE-ID	2
2	FNX1822-ID-FSW	NX18-22 FAN PRESS. SWITCH-ID	1
3	FNX1822-ID-HPS	NX18-22 H.P. SAFTEY SWITCH-ID	1
4	FNX1822-ID-TMP	NX18-22 TEMP. SENSOR PT1000-ID	2
5	FNX1822-ID-EXP	NX18-22 EXPANSION VALVE-ID	1
6	FNX1822-ID-DRI	NX18-22 DEHYDRATOR-ID	1
7	FNX1822-ID-BYP	NX18-22 BY-PASS VALVE-ID	1
8	FNX1822-ID-CHV	NX18-22 CHECK VALVE-ID	2
9	FNX1822-ID-ELM	NX18-22 REPLACEMENT ELEMENT-ID	1
10	FNX1822-ID-HOU	NX18-22 FILTER HOUSING-ID	1
11	FNX1822-ID-FAN	NX18-22 FAN MOTOR-ID	1
12	FNX1822-ID-FGR	NX18-22 FAN GRILL-ID	1
13	FNX1822-ID-FBL	NX18-22 FAN BLADE-ID	1
14	FNX1822-ID-CMP	NX18-22 COMPRESSOR-ID	1
15	FNX437-ID-DRS	NX18-22 DRAIN SET-ID	1
16	FSK-NXCD-1	NX18-22 KIT, NX DRAIN TUBE 10' EXT W. FITTING (NOT SHOWN)	1
17	FMDV-400	NX18-22 INLINF FILTER DRAIN FLOAT (NOT SHOWN)	1

# I&D DIAGRAM



## GENERAL ARRANGEMENTS & SETTINGS

### GENERAL ARRANGEMENTS

MODELS	Filter quantity and Type	Length (inch)	Width (inch)	Height (inch)	Weight (lbs)	Refrigerant Type	Refrigerant Gas (lbs)
ALM-I-222 US	G0200MX * 1	25,3	23,6	29,16	132	R134a	1,98

### SETTINGS

MODELS	Superheat of Thermostatic Expansion Valve (°F)	Evaporating Pressure (psi)	Fan pressure switch (psi)	Security High Pressure Switch (psi)	Drain Timer (min-sec)	Suction Line Temperature Switch (°F)	Condensing Pressure (if water cooled condenser is used) (psi)
ALM-I-222 US	41-50	29,7	130,5-174	362,6	1min. - 4sec.	113	160

### ELECTRICAL VALUES

MODELS	Voltage (V)	Frequency (Hz)	Nominal Power Consumption (W)	Full Load Power Consumption (W)	Nominal Current (A)	Max Current (A)	Locked Rotor Current (A)
ALM-I-222 US	115	60	840	960	10,38	14,5	50



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