BelAir
COMPRESSED AIR TREATMENT

FRIULAIR Dryers

# ACT Series Refrigerated Dryers

| | |
|---|---|
| **I**nstallation & **O**peration **M**aintenance **M**anual | **AMD10 – AMD100**<br>**(-1) 115/1/60 (-2) 230/1/60** |
| | **MODEL** |
| | **Serial Number** |



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***"…together we achieve the extraordinary…"***


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# ***STATEMENT OF WARRANTY TERMS & CONDITIONS***

BELAIR's refrigerated air dryers are warranted to be free of defects in materials and workmanship under proper use, installation, and application. Warranty covers parts and labor at fair market value and according to warranty labor replacement guidelines. This warranty shall be for a period of 15 months from date of shipment from our factory or other stocking facilities or 12 months from date of installation. Proof of installation date will be required. All dryers outside the U.S. and Canada carry a parts only warranty.

**ALL FREIGHT DAMAGE CLAIMS ARE NOT THE RESPONSIBILITY OF THE MANUFACTURER AND ARE NOT COVERED UNDER WARRANTY AS ALL PRODUCTS ARE SHIPPED F.O.B. SHIPPER.**
**PLEASE DIRECT ALL FREIGHT CLAIMS TO THE SHIPPER IN QUESTION.**

## ***EXCLUSIONS***

**ADJUSTMENTS TO THE HOT GAS AND MAINTENANCE OF FLOAT AND AUTOMATIC DRAINS AND CONDENSER COILS ARE CONSIDERED TO BE ROUTINE MAINTENANCE AND THEREFORE NON-WARRANTABLE ITEMS AND ARE THE SOLE RESPONSIBILITY OF THE END USER. CONSULT THE INSTALLATION, OPERATION AND MAINTENANCE MANUAL FOR THE ADJUSTMENT AND MAINTENANCE PROCEDURES. THE GEOMETRIC CONFIGURATION OF THE AMD HEAT EXCHANGER REQUIRES A MINIMUM 5 MICRON (I MICRON RECOMMENDED) PREFILTER TO ENSURE THE LIFE OF THE HEAT EXCHANGER, THE PREFILTER MUST ALSO BE PROPERLY MAINTAINED.**
**THIS WARRANTY DOES NOT APPLY TO ANY UNIT DAMAGED BY ACCIDENT, MODIFICATION, MISUSE, NEGLIGENCE, OR MISAPPLICATION. DAMAGE TO HEAT EXCHANGERS BY EXPOSURE TO AMMONIA, ANY OTHER CORROSIVE SUBSTANCE OR SUB-FREEZING ENVIRONMENT WILL BE CONSIDERED MISUSE.**

## ***INSPECTION***

Any refrigerated dryer part or material found defective will be repaired, replaced or refunded, at the sellers option free of charge, provided that BELAIR is notified within the above stated warranty period. **All returns of allegedly defective equipment must have prior written authorization.** Said authorization may be obtained through our refrigerated dryer service department. All refrigerated dryers, parts, materials must be returned **freight prepaid to** the Manufacturer's factory for inspection within 30 days of return authorization date. Any shipment returned to the factory collect will be refused.
After inspection, if an item is found to be warrantable, the repaired item or replacement will be returned normal ground freight prepaid within the continental United States and Canada. In the event an item is deemed non-warranty due to improper usage, maintenance, improper installation, abuse, alteration or operator error the customer is responsible for all charges (including parts, labor or replacement costs) incurred resolving the warranty claim. Expedited shipment costs are the responsibility of the requestor.

Any replacement part or material is warranted only to the extent of the remaining warranty period of the dryer or to the extent as provided by the supplier, whichever is longer.

## ***IDENTIFICATION PLATE***

The identification plate is located on the back of the dryer and shows all the primary data of the machine. Upon installation, fill in the table on the previous page with all the data shown on the identification plate. This data should always be referred to when calling the manufacturer or distributor.
The removal or alteration of the identification plate will void the warranty rights.

## ***DISCLAIMER***

The warranty does not cover any responsibility or liability for direct or indirect damages to persons, or equipment caused by improper usage or maintenance, and is limited to manufacturing defects only. Refer to BELAIR Warranty policy manual for travel, mileage and special charge considerations. The warranty will be immediately voided if there are changes or alterations to the dryer.

## ***FILTERS AND DRAINS***

Filters and drains are warranted to be free from defects in material and workmanship, under proper use, installation, application and maintenance in accordance with written specifications for a period of one year from date of purchase. Elements, o-rings and float drains are considered consumable items and are warranted at installation only.

## ***WHO TO CONTACT FOR SERVICE OR WARRANTY CLAIM***

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**All freight damage claims should be filed within 15 working days and should be directed to the carrier.**

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## *1.1 DEFINITION OF THE SAFETY SYMBOLS*

Carefully read instruction manual before attempting any service or maintenance procedures on the dryer.

Caution warning sign. Risk of danger or possibility of damage to equipment, if related text is not followed properly.

Electrical hazard. Warning message indicates practices or procedures that could result in personal injury or fatality if not followed correctly.

Danger hazard. Part or system under pressure.

Danger hazard. High temperature conditions exist during operation of system. Avoid contact until system or component has dissipated heat.

Danger hazard. Treated air is not suitable for breathing purposes; serious injury or fatality may result if precautions are not followed.

Danger hazard: In case of fire, use an approved fire extinguisher, water is not an acceptable means in cases of electrical fire.

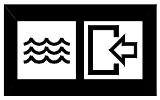
Danger hazard. Do not operate equipment with panels removed.

Maintenance or control operation to be performed by qualified personnel only **1**.

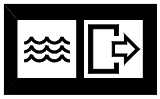

Compressed air inlet connection point.


Compressed air outlet connection point.

Condensate drains connection point.



Cooling water inlet connection point (Water-Cooled).



Cooling water outlet connection point (Water-Cooled).

Condensate drains connection point.

Operations that can be performed by the operator of the machine, if qualified **1**.

**NOTE:** Text that specifies items of note to be taken into account does not involve safety precautions.

In designing this unit a lot of care has been devoted to environmental protection:

- CFC free refrigerants
- CFC free insulation parts
- Energy saving design
- Limited acoustic emission
- Dryer and relevant packaging composed of recyclable materials

This symbol requests that the user heed environmental considerations and abide with suggestions annotated with this symbol.

**1** Experienced and trained personnel familiar with national and local codes, capable to perform the needed activities, identify and avoid possible dangerous situations while handling, installing, using and servicing the machine. Ensuring compliance to all statutory regulations.

## *1.2 WARNINGS*

Compressed air is a highly hazardous energy source.
Never work on the dryer with pressure in the system.
Never point the compressed air or the condensate drain outlet hoses towards anybody.
The user is responsible for the proper installation of the dryer. Failure to follow instructions given in the “Installation” chapter will void the warranty. Improper installation can create dangerous situations for personnel and/or damages to the machine could occur.

Only qualified personnel are authorized to service electrically powered devices. Before attempting maintenance, the following conditions must be satisfied :

- Ensure that main power is off, machine is locked out, tagged for service and power cannot be restored during service operations.
- Ensure that valves are shut and the air circuit is at atmospheric pressure. De-pressurize the dryer.

Warranty does not apply to any unit damaged by accident, modification, misuse, negligence or misapplication. Unauthorized alterations will immediately void the warranty.

In case of fire, use an approved fire extinguisher, water is not an acceptable means in cases of electrical fire.

## *1.3 PROPER USE OF THE DRYER*

This dryer has been designed, manufactured and tested for the purpose of separating the humidity normally contained in compressed air. Any other use has to be considered improper.

The Manufacturer will not be responsible for any problem arising from improper use; the user will bear responsibility for any resulting damage.

Moreover, the correct use requires the adherence to the installation instructions, specifically:

- Voltage and frequency of the main power.
- Pressure, temperature and flow-rate of the inlet air.
- Pressure, temperature and cooling water capacity (Water-Cooled).
- Ambient temperature.

This dryer is supplied tested and fully assembled. The only operation left to the user is the connection to the plant in compliance with the instructions given in the following chapters.

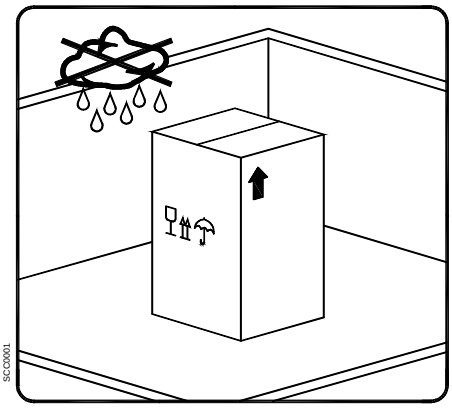
The purpose of the machine is the removal of water and residual oil vapor present in compressed air. The dried air cannot be used for respiration purposes or for operations leading to direct contact with food products.
This dryer is nor suitable for the treatment of dirty air or of air containing solid particles.

## *2.1 TRANSPORTING THE UNIT*

Check for visible loss or damage, if no visible damage is found place the unit near to the installation point and unpack the contents.

- Always keep the dryer in the upright vertical position. Damage to components could result if unit is laid on its side or if placed upside down.
- To move the packaged unit we recommend to use suitable trolley or forklift. Transportation by hands is discouraged.
- Store machine in a clean, dry environment, do not expose to severe weather environments.

## *2.2 STORAGE*




Even when packaged, keep the machine protected from severity of the weather.

Keep the dryer in vertical position, also when stored. Turning it upside down some parts could be irreparably damaged.

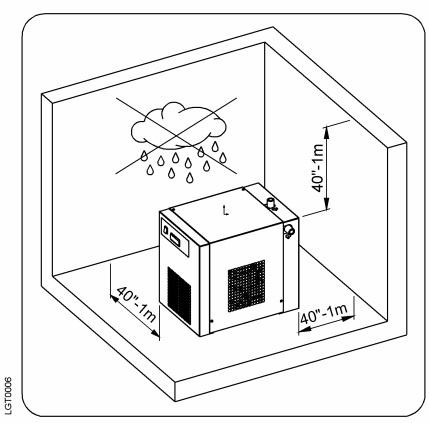
If not in use, the dryer can be stored in its packaging in a dust free and protected site at a maximum temperature of 115°F (46°C), and a specific humidity not exceeding the 90%. Should the stocking time exceed 12 month, please contact the manufacturer.

The packaging materials are recyclable. Dispose of material in compliance with the rules and regulations in force in the destination country.

## *2.3 INSTALLATION SITE*

Particular care is required in selecting the installation site. Failure to install dryer in the proper ambient conditions will affect the dryer's ability to condense refrigerant gas. This can cause higher loads on the compressor, loss of dryer efficiency and performance, overheated condenser fan motors, electrical component failure and dryer failure due to the following: compressor loss, fan motor failure and electrical component failure. Failures of this type will affect warranty considerations.
This unit is not suitable to be used in explosive atmosphere, where risk of fire could exist, or in presence of gaseous or solid polluting material or in an environment of corrosive chemicals, poisonous gasses, steam heat and areas of high ambient conditions.

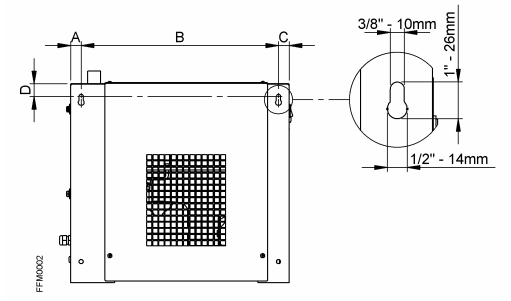
Don't use water to extinguish fire on the dryer on in the surrounding area.




Minimal installation requirements :

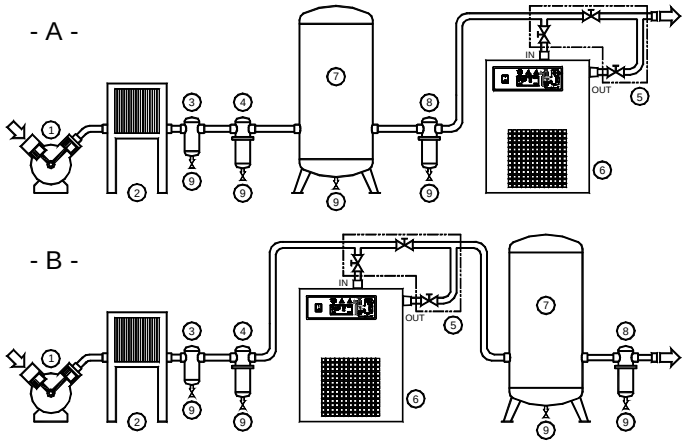
- Select a clean room dry, free from dust, and protected from atmospheric disturbances.
- The supporting area must be smooth, horizontal and able to hold the weight of the dryer.
- Minimum ambient temperature +34°F (+1°C).
- Maximum ambient temperature +115°F (+46°C).
- Allow at least 40 inches of clearance on each side of the dryer for proper ventilation and circulation through the condenser. The space is also necessary to facilitate maintenance operations. The dryer does not require attachment to the floor surface; however installations where the unit is suspended require an attachment to the hanging apparatus.

**Dryer hanging:**




| Dryer | A [in-mm] | B [in-mm] | C [in-mm] | D [in-mm] |
|---|---|---|---|---|
| AMD 10-15 | 3/4"- 20 | 12 - 305 | 3/4"- 20 | 1.1/4" - 33 |
| AMD 20-50 | 1"- 25 | 18.5/16"- 465 | 1"- 25 | 13/16" - 30 |
| AMD 75 | 1.9/16"- 40 | 14.3/16"- 360 | 3/4"- 20 | 13/16" - 30 |
| AMD 100 | 1.9/16"- 40 | 15,3/16"- 385 | 3/4"- 20 | 13/16" - 30 |

## *2.4 INSTALLATION LAYOUT*




1. Air compressor
2. Final refrigerator
3. Condensate separator
4. Pre-Filter (min. 5 micron)
5. By-pass group
6. Dryer
7. Compressed air tank
8. Final filter
9. Condensate drain

**It is mandatory to install a filter (with filtration grade at least 5 micron) on the dryer inlet side to prevent that rust, scale or other pollutants clog the Alu-Dry Module and the condensate drain.**

**Type A** installation is suggested when the compressor operates at reduced intermittence and the total consumption equals the compressor flow rate.

**Type B** installation is suggested when the air consumption can consistently change with peak values highly exceeding the flow rate of the compressors. The capacity of the tank must be sized in order to compensate eventual instantaneous demanding conditions (peak air consumption).

## *2.5 CORRECTION FACTORS*

| Inlet air pressure | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 |
|---|---|---|---|---|---|---|---|---|
| | 4,1 | 5.5 | 6,9 | 8,3 | 9,7 | 11,0 | 12,4 | 13,8 |
| Factor (F1) | 0.79 | 0.91 | 1.00 | 1.07 | 1.13 | 1.18 | 1.23 | 1.27 |

| Correction factor for ambient temperature changes (Air-Cooled): | | | | | | |
|---|---|---|---|---|---|---|
| Ambient temperature | 80 | 90 | 100 | 105 | 110 | 115 |
| | 27 | 32 | 38 | 41 | 43 | 46 |
| Factor (F2) | 1.12 | 1.09 | 1.00 | 0,93 | 0.85 | 0.75 |

| Correction factor for inlet air temperature changes: | | | | | | |
|---|---|---|---|---|---|---|
| Air temperature | 80 | 90 | 100 | 110 | 120 | 130 |
| | 27 | 32 | 38 | 43 | 49 | 54 |
| Factor (F3) | 1,24 | 1,23 | 1,00 | 0,81 | 0,66 | 0,54 |

| Correction factor for DewPoint changes: | | | | | |
|---|---|---|---|---|---|
| DewPoint | 38 | 41 | 44 | 47 | 50 |
| | 3,3 | 5,0 | 6,7 | 8,3 | 10,0 |
| Factor (F4) | 0,92 | 1,00 | 1,07 | 1,16 | 1,25 |

### How to find the air flow capacity:

Air flow capacity = Nominal duty X Factor (F1) X Factor (F2) X Factor (F3) X Factor (F4)

**Example:**

An **AMD 75** has a nominal duty of **75 scfm**. What is the maximum allowable flow through the dryer under the following operating conditions:

- Inlet air pressure = 120 psig (8,3 barg)
- Ambient temperature = 90℉ (32℃)
- Inlet air temperature = 110℉ (43℃)
- Pressure DewPoint = 41℉ (5,0℃)

Each item of data has a corresponding numerical factor as follows:

Air flow capacity = 75 x 1.07 x 1.09 x 0.81 x 1.00

= **71 scfm** → This is the maximum flow rate that the dryer can accept under these operating conditions.

### How to select a suitable dryer for a given duty:

Minimum Std. air flow rate = Design air flow ÷ Factor (F1) ÷ Factor (F2) ÷ Factor (F3) ÷ Factor (F4)

**Example:**

The procedure here is to list the operating conditions and then to locate the corresponding numerical factors:

- Design air flow = 60
- Inlet air pressure = 120 psig (8,3 barg)
- Ambient temperature = 90℉ (32℃)
- Inlet air temperature = 110℉ (43℃)
- Pressure DewPoint = 41℉ (5,0℃)

In order to select the correct dryer model the required flow rate is to be divided by the correction factors relating to above mentioned parameters:

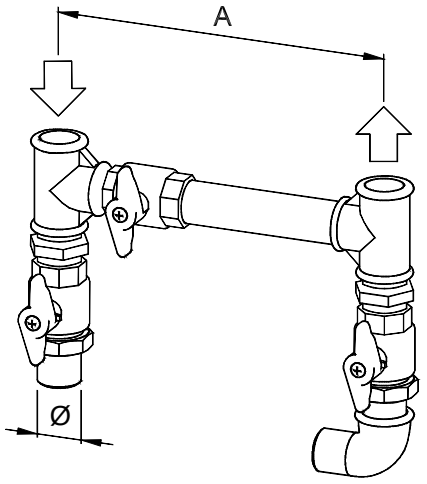
Minimum Std. air flow rate = 60 ÷ 1.07 ÷ 1.09 ÷ 0.81 ÷ 1.00

= **64 scfm** → Therefore the model suitable for the conditions above is **AMD 75** (**75 scfm**).

## *2.6 CONNECTION TO THE COMPRESSED AIR SYSTEM*

Operations to be performed by qualified personnel only. Never work on compressed air system under pressure. The user is responsible to ensure that the dryer will never be operated with pressure exceeding the maximum pressure rating on the unit data tag. Over-pressurizing the dryer could be dangerous for both the operator and the unit**.**

The air temperature and the scfm entering the dryer must comply within the limits stated on the data nameplate. The system connecting piping must be kept free from dust, rust, chips and other impurities, and must be consistent with the flow-rate of the dryer. In case of treatment of air at particularly high temperature, the installation of a final refrigerator could result necessary. In order to perform maintenance operations, it recommended that a dryer by-pass system be installed as shown in the following illustration.




In realising the dryer, particular measures have been taken in order to limit the vibration which could occur during the operation. Therefore we recommend to use connecting pipes able to insulate the dryer from possible vibrations originating from the line (flexible hoses, vibration damping fittings, etc.).

**CAUTION**
In all AMD models use a back-up wrench on the heat exchanger when tightening.

## *2.7 ELECTRICAL CONNECTIONS*

**Qualified personnel should carry out connecting unit to the main power. Be sure to check the local codes in your area.**

Before connecting the unit to the electric power, verify that the voltage and the frequency available on the mains correspond to the data reported on the data plate of the dryer. In terms of voltage, a ±5% tolerance is allowed.

115/1/60 dryers are supplied with a standard North American power cord and plug assembly (two poles and a ground). 230/1/60 dryers are supplied with a standard North American power cord.

The mains socket must be provided with a **mains magneto-thermal differential breaker** (IΔn=0.03A), adjusted on the basis of the consumption of the dryer (see the nominal values on the data plate of the dryer). The cross section of the power supply cables must comply with the consumption of the dryer, while keeping into account also the ambient temperature, the conditions of the mains installation, the length of the cables, and the requirements enforced by the local Power Provider.

Connect to a properly grounded outlet. Improper connection of the equipment-grounding conductor can result in risk of electric shock. Do not use adapters on the plug receptacle- if it does not fit the outlet, have a proper outlet installed by a qualified electrician.

## *2.8 CONDENSATE DRAIN*

**Discharge is at system pressure. Drain line should be secured.**
**Never point the condensate drain line towards anybody.**

The dryer comes with a flexible plastic drain tube (1/4in - 6 mm - 1500 mm long) for the connection to suitable drain. Removal of the condensate occurs through a solenoid valve protected with a mechanical filter. In order to avoid clogging of the solenoid valve, the condensate from the separator is previously filtered, than discharged. An adjustable electronic timer (dryer controller) operates the solenoid valve coil. The drain cannot be connected to pressurized systems.

**Condensate may contain oil. Comply with applicable laws concerning disposal. An oil-water separator should be installed before the air inlet to the dryer for the purpose of removing condensate drainage coming from compressors, dryers, tanks, filters, etc.**

## *3.1 PRELIMINARY OPERATION*

Verify that the operating parameters match with the nominal values stated on the data nameplate of the dryer (voltage, frequency, air pressure, air temperature, ambient temperature, etc.).

This dryer has been thoroughly tested, packaged and inspected prior to shipment. Nevertheless, the unit could be damaged during transportation, check the integrity of the dryer during initial start-up and monitor operation during the first hours of operation.

**Qualified personnel must perform the initial start-up.**
**When installing and operating this equipment, comply with all *National Electrical Code and any applicable federal, state and local codes*.**

**It's mandatory that the engineer in charge will adopt safety operational conditions complying with the local safety and accident prevention requirements.**
**The same engineer will be responsible for the proper and safe operation of the dryer.**
**Never operate the dryer if their panels are not in place.**

## *3.2 INITIAL START-UP*

**This procedure should be followed on initial start-up, after periods of extended shutdown or following maintenance procedures.**
**Qualified personnel must perform the start-up.**

**Sequence of operations (refer to paragraph 5.1 Control Panel) :**

- Ensure that all the steps of the "Installation" chapter have been observed.
- Ensure that the connection to the compressed air system is correct and that the piping is suitably fixed and supported.
- Ensure that the condensate drain pipe is properly fastened and connected to a collection system or container.
- Ensure that the by-pass system (if installed) is open and the dryer is isolated
- Ensure that the manual valve of the condensate drain circuit is open.
- Remove any packaging and other material which could obstruct the area around the dryer.
- Activate the mains switch.
- Turn on the main switch - pos. 1 on the control panel.
- Ensure that the DMC15 electronic instrument is ON.
- Ensure the consumption matches with the values of the data plate.
- **Ensure the fan work properly - wait for its first interventions.**
- Allow the dryer temperature to stabilise at the pre-set value.
- Slowly open the air inlet valve.
- Slowly open the air outlet valve.
- Slowly close the central by-pass valve of the system (if installed).
- Check the piping for air leakage.
- Ensure the drain is regularly cycling - wait for its first interventions.

## *3.3 START-UP AND SHUT DOWN*

### *3.3.1 OPERATION AND SWITCHING-OFF*

**Operation (refer to paragraph 5.1 Control Panel) :**

- Check the condenser for cleanliness (Air-Cooled).
- Ensure the cooling water flow and temperature is adequate (Water-Cooled).
- Verify that the system is powered.
- Activate the main switch on the control panel (pos. 1).
- Ensure that DMC15 electronic instrument is ON.
- Wait a few minutes; verify that the DewPoint temperature displayed on DMC15 electronic instrument is correct and that the condensate is regularly drained.
- Switch on the air compressor.

**Switching off (refer to paragraph 5.1 Control Panel) :**

- Verify that the DewPoint temperature displayed on DMC15 electronic instrument is correct.
- Switch off the air compressor.
- After few minutes, switch off the main switch on the control panel of the dryer (pos. 1).

**NOTE : A DewPoint included in the green operating area of the electronic controller is correct according to the possible working conditions (flow-rate, temperature of the incoming air, ambient temperature, etc.).**

During the operation, the refrigerating compressor will run continuously. The dryer must remain on during the full usage period of the compressed air, even if the air compressor works intermittently.

**The number of starts must be no more than 6 per hour. The dryer must stop running for at least 5 minutes before being started up again.**
**The user is responsible for compliance with these rules. Frequent starts may cause irreparable damage.**

| AMD MODEL | | 10-1 | 15-1 | 20-1 | 35-1 | 50-1 | 75-1 | 100-1 |
|---|---|---|---|---|---|---|---|---|
| Air flow rate at nominal condition [1] | [scfm] | 10 | 15 | 20 | 30 | 50 | 75 | 100 |
| | [$m^3$/h] | 17 | 25 | 34 | 59 | 85 | 127 | 170 |
| | [l/min] | 283 | 425 | 566 | 991 | 1415 | 2123 | 2830 |
| Pressure DewPoint at nominal condition [1] | [℉ – ℃] | 41 – 5 | | | | | | |
| Nominal (max.) ambient temperature | [℉ – ℃] | 100 (115) – 38 (46) | | | | | | |
| Min. ambient temperature | [℉ – ℃] | 34 – 1 | | | | | | |
| Nominal (max.) inlet air temperature | [℉ – ℃] | 100 (130) – 38 (55) | | | | | | |
| Nominal inlet air pressure | [psig – barg] | 100 – 7 | | | | | | |
| Max. inlet air pressure | [psig – barg] | 200 – 14 | | | | | | |
| Air pressure drop - $\Delta$p | [psi – bar] | 1,5 – 0,10 | 2,0 – 0,14 | 0,6 – 0,04 | 1,3– 0,09 | 2,2 – 0,15 | 2,6 – 0,18 | 2,2 – 0,15 |
| Inlet - Outlet connections | [NPT-F] | 3/8" | | 1/2" | | | 1" | 1.1/4" |
| Refrigerant type | | R 134.a | | | | | | |
| Refrigerant quantity [2] | [oz – kg] | 7.1/4 – 200 | 7.1/2 – 210 | 7.1/2 – 210 | 7.3/4 – 220 | 8.3/4 – 250 | 11.1/2 – 330 | 15.1/2 – 440 |
| Cooling air flow | [cfm – $m^3$/h] | 180 – 300 | 180 – 300 | 180 – 300 | 180 – 300 | 240– 400 | 240 – 400 | 300 – 500 |
| Heat load | [Btu/h] | 1690 | 1690 | 1690 | 2080 | 2560 | 4080 | 5820 |
| Standard Power Supply [2] | [Ph/V/Hz] | 115/1/60 | | | | | | |
| Nominal electric absorption | [W] | 190 | 200 | 210 | 290 | 300 | 450 | 700 |
| | [A] | 2.5 | 2.6 | 2.7 | 3.2 | 3.4 | 5.1 | 8,0 |
| Max. electric absorption | [W] | 230 | 240 | 250 | 340 | 390 | 510 | 830 |
| | [A] | 2.7 | 2.8 | 3.0 | 3.6 | 4.0 | 5.6 | 8.6 |
| Max. level noise at 401in (1m) | [dbA] | < 70 | | | | | | |
| Weight | [lbs – kg] | 46 - 21 | 48 - 22 | 55 - 25 | 62 - 28 | 70 - 32 | 75 - 34 | 86 - 39 |

[1] The nominal condition refers to an ambient temperature of 100℉ (38℃) with inlet air at 100psig (7b arg) and 100℉ (38℃).

[2] Check the data shown on the identification plate.

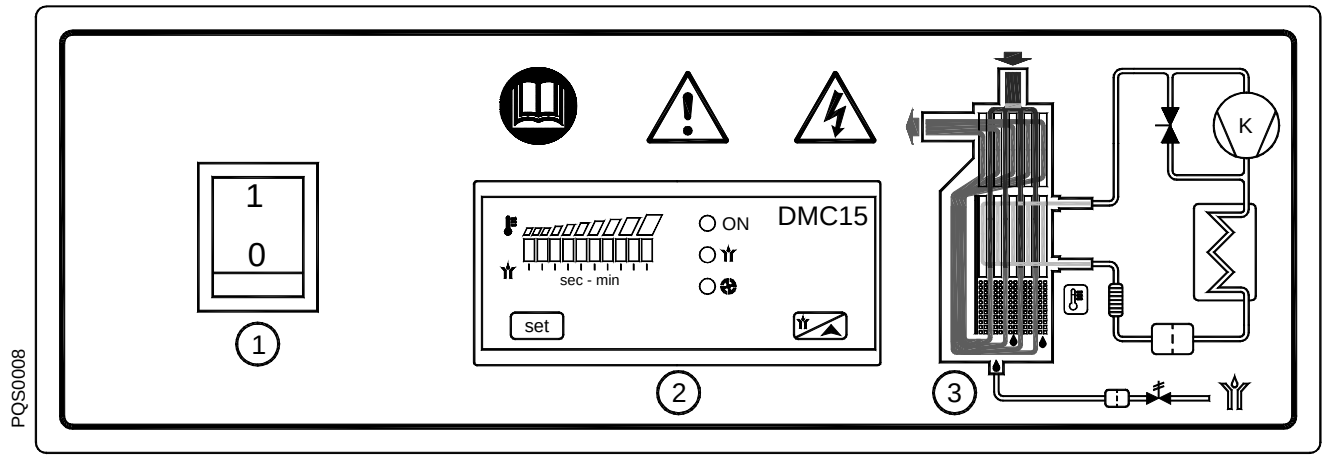
| AMD MODEL | | 10-1 | 15-1 | 20-1 | 35-1 | 50-1 | 75-1 | 100-1 |
|---|---|---|---|---|---|---|---|---|
| Air flow rate at nominal condition [1] | [scfm] | 10 | 15 | 20 | 30 | 50 | 75 | 100 |
| | [$m^3$/h] | 17 | 25 | 34 | 59 | 85 | 127 | 170 |
| | [l/min] | 283 | 425 | 566 | 991 | 1415 | 2123 | 2830 |
| Pressure DewPoint at nominal condition [1] | [°F – °C] | 41 – 5 | | | | | | |
| Nominal (max.) ambient temperature | [°F – °C] | 100 (115) – 38 (46) | | | | | | |
| Min. ambient temperature | [°F – °C] | 34 – 1 | | | | | | |
| Nominal (max.) inlet air temperature | [°F – °C] | 100 (130) – 38 (55) | | | | | | |
| Nominal inlet air pressure | [psig – barg] | 100 – 7 | | | | | | |
| Max. inlet air pressure | [psig – barg] | 200 – 14 | | | | | | |
| Air pressure drop - $\Delta$p | [psi – bar] | 1,5 – 0,10 | 2,0 – 0,14 | 0,6 – 0,04 | 1,3– 0,09 | 2,2 – 0,15 | 2,6 – 0,18 | 2,2 – 0,15 |
| Inlet - Outlet connections | [NPT-F] | 3/8" | | 1/2" | | | 1" | 1.1/4" |
| Refrigerant type | | R 134.a | | | | | | |
| Refrigerant quantity [2] | [oz – kg] | 7.1/4 – 200 | 7.1/2 – 210 | 7.1/2 – 210 | 7.3/4 – 220 | 8.3/4 – 250 | 11.1/2 – 330 | 15.1/2 – 440 |
| Cooling air flow | [cfm – $m^3$/h] | 180 – 300 | 180 – 300 | 180 – 300 | 180 – 300 | 240– 400 | 240 – 400 | 300 – 500 |
| Heat load | [Btu/h] | 1690 | 1690 | 1690 | 2080 | 2560 | 4080 | 5820 |
| Standard Power Supply [2] | [Ph/V/Hz] | 230/1/60 | | | | | | |
| Nominal electric absorption | [W] | 190 | 200 | 210 | 290 | 300 | 450 | 700 |
| | [A] | 1.1 | 1.2 | 1.2 | 1.6 | 1.7 | 2.7 | 4.0 |
| Max. electric absorption | [W] | 230 | 240 | 250 | 340 | 390 | 660 | 830 |
| | [A] | 1.2 | 1.3 | 1.4 | 1.8 | 2.0 | 3.3 | 4.3 |
| Max. level noise at 401in (1m) | [dbA] | < 70 | | | | | | |
| Weight | [lbs – kg] | 46 - 21 | 48 - 22 | 55 - 25 | 62 - 28 | 70 - 32 | 75 - 34 | 86 - 39 |

[1] The nominal condition refers to an ambient temperature of 100°F (38°C) with inlet air at 100psig (7b arg) and 100°F (38°C).

[2] Check the data shown on the identification plate.

## *5.1 CONTROL PANEL*

The control panel illustrated below is the only dryer-operator interface.



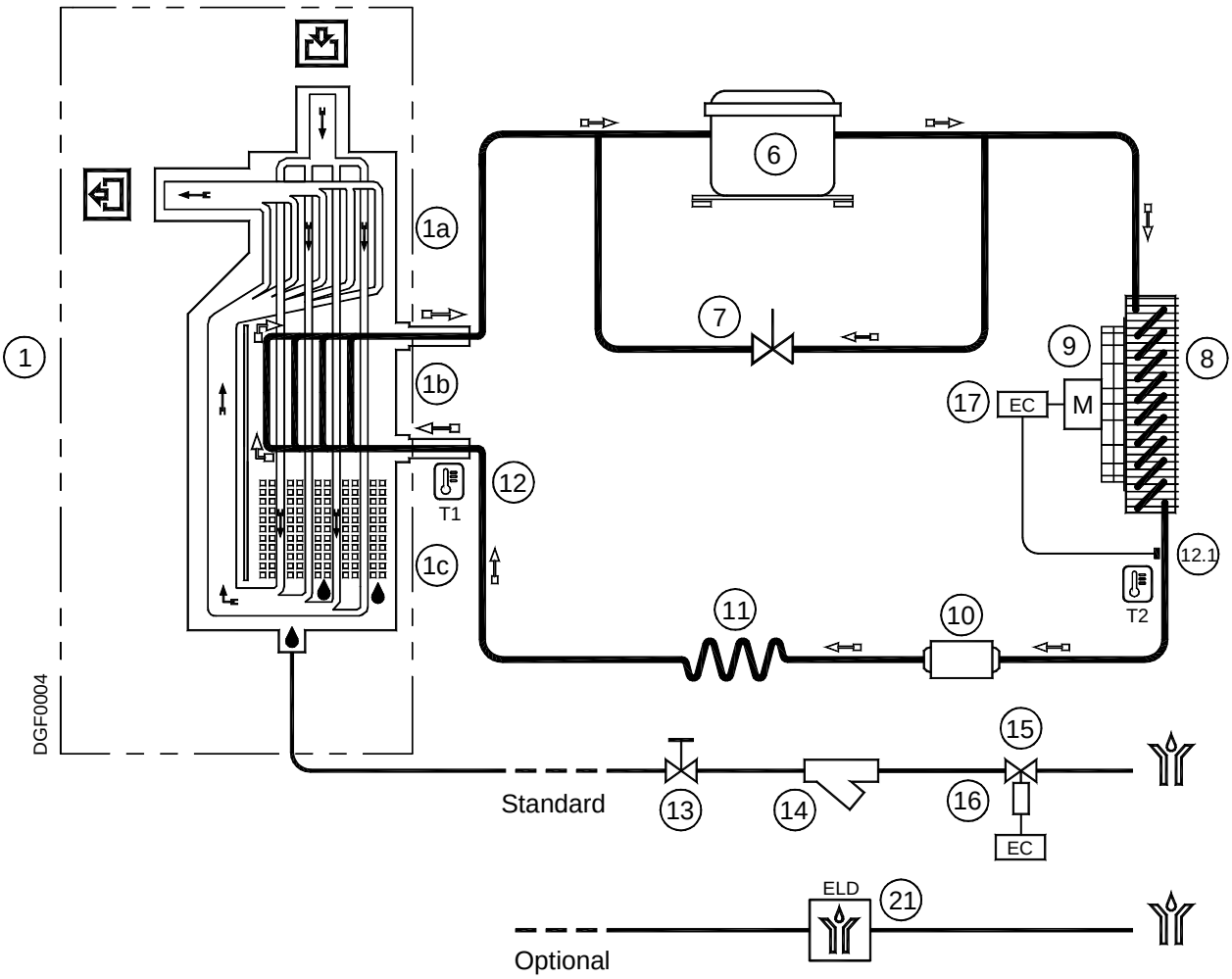

1. Main switch
2. DMC15 Electronic control instrument
3. Air and refrigerating gas flow diagram

## *5.2 OPERATION*

**Operating principal** - The dryer models described in this manual operate all on the same principal. The hot moisture laden air enters an air to air heat exchanger. The air then goes through the evaporator, also known as the air to refrigerant heat exchanger. The temperature of the air is reduced to approximately 35-39 degrees Fahrenheit, causing water vapor to condense to liquid. The liquid is continuously coalesced and collected in the separator for removal by the condensate drain. The cool moisture free air then passes back through the air to air heat exchanger to be reheated to within fifteen degrees of the incoming air temperature as it exits the dryer.

**Refrigerant circuit** - Refrigerant R134a, gas is cycled through the compressor and exits at high pressure to an air condenser where heat is removed causing the refrigerant to condense to a high-pressure liquid state. The liquid is forced through a metering device (capillary tube or thermal expansion valve) where the resulting pressure drop allows the refrigerant to boil off at a predetermined temperature. Low-pressure liquid refrigerant enters the heat exchanger where heat from the incoming air is transferred causing the refrigerant to boil; the resulting phase change produces a low pressure, low temperature gas. The low-pressure gas is returned to the compressor, where it is re-compressed and begins the cycle again. During those periods when the compressed air load is reduced the excess refrigerant is by-passed automatically back to the compressor via the hot gas by-pass valve circuit.
The refrigeration circuit needed for these operations is basically composed of a refrigeration compressor, a condenser and the evaporator, also called air-to-refrigerant exchanger.

## *5.3 FLOW DIAGRAM*




1. Alu-Dry Module
   - a - Air-to-air heat exchanger
   - b - Air-to-refrigerant exchanger
   - c - Condensate separator

...

6. Refrigerating compressor
7. Hot gas by-pass valve
8. Condenser
9. Condenser fan
10. Filter Drier
11. Capillary tube
12. T1 Temperature probe (DewPoint)
12.1. T2 Temperature probe (fan control)
13. Condensate drain service valve
14. Y-shaped condensate drain strainer
15. Condensate drain solenoid valve
16. Coil for condensate drain solenoid valve
17. EC = Electronic control instrument

...

21. Electronic level drain

Compressed air flow direction

Refrigerating gas flow direction

## *5.4 REFRIGERATION COMPRESSOR*

The refrigeration compressor is the pump in the system, gas coming from the evaporator (low pressure side) is compressed up to the condensation pressure (high pressure side). The compressors utilized are manufactured by leading manufacturers and are designed for applications where high compression ratios and wide temperature changes are present. The hermetically sealed construction is perfectly gas tight, ensuring high-energy efficiency and long, useful life. Dumping springs support the pumping unit in order to reduce the acoustic emission and the vibration diffusion. The aspirated refrigeration gas, flowing through the coils before reaching the compression cylinders cools the electric motor. The thermal protection protects the compressor from over heating and over currents. The protection is automatically restored as soon as the nominal temperature conditions are reached.

## *5.5 CONDENSER UNIT*

The condenser is the component in which the gas coming from the compressor is cooled down and condensed becoming a liquid. Mechanically, a serpentine copper tubing circuit (with the gas flowing inside) is encapsulated in an aluminum fin package. The cooling operation occurs via a high efficiency fan, creating airflow within the dryer, moving air through the fin package. It's mandatory that the ambient air temperature does not exceed the nominal values. It is also important **TO KEEP THE CONDENSER UNIT FREE FROM DUST AND OTHER IMPURITIES**.

## *5.6 FILTER DRIER*

Traces of humidity and slag can accumulate inside the refrigeration circuit. Long periods of use can also produce sludge. This can limit the lubrication efficiency of the compressor and clog the expansion valve or capillary tube. The function of the Filter Drier, located before the capillary tubing, is to eliminate any impurities from circulating through the system.

## *5.7 CAPILLARY TUBE*

It consists of a piece of reduced cross section copper tubing located between the condenser and the evaporator, acting as a metering device to reduce the pressure of the refrigerant. Reduction of pressure is a design function to achieve optimum temperature reached within the evaporator: the smaller the capillary tube outlet pressure, the lower the evaporation temperature.
The length and interior diameter of the capillary tubing is accurately sized to establish the performance of the dryer; no maintenance or adjustment is necessary.

## *5.8 AMD HEAT EXCHANGER MODULE*

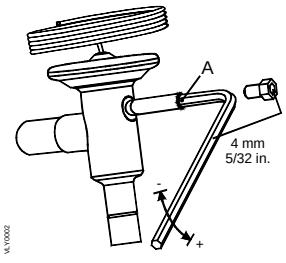
The heat exchanger module houses the air-to-air, the air-to-refrigerant heat exchangers and the demister type condensate separator. The counter flow of compressed air in the air-to-air heat exchanger ensures maximum heat transfer. The generous cross section of flow channel within the heat exchanger module leads to low velocities and reduced power requirements. The generous dimensions of the air-to-refrigerant heat exchanger plus the counter flow gas flow allows full and complete evaporation of the refrigerant (preventing liquid return to the compressor). The high efficiency condensate separator is located within the heat exchanger module. No maintenance is required and the coalescing effect results in a high degree of moisture separation.

## *5.9 HOT GAS BY-PASS VALVE*

This valve injects part of the hot gas (taken from the discharge side of the compressor) in the pipe between the evaporator and the suction side of the compressor, keeping the evaporation temperature/pressure constant at approx. 36°F (+2 °C). This injection prevents the formation of ice inside the dryer evaporator at every load condition.

**ADJUSTMENT**
The hot gas by-pass valve is adjusted during the manufacturing testing phase. As a rule no adjustment is required; anyway if it is necessary the operation must be carried out by an experienced refrigeration engineer.

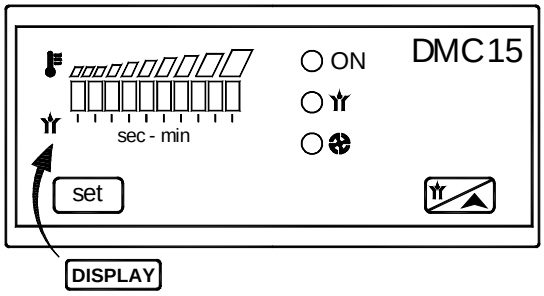
WARNING : the use of ¼" Schrader service valves must be justified by a real malfunction of the refrigeration system. Each time a pressure gauge is connected, a part of refrigerant is exhausted.




Without compressed air flow through the dryer, rotate the adjusting screw (position A on the drawing) until the following value is reached:

Hot gas setting (R134.a) : temperature 33°F (+0.5 / -0 °K)
pressure 29 psig (+1.45 / -0 psi)
temperature 0.5°C (+0.5 / -0 °K)
pressure 2.0 barg (+0.1 / -0 bar)

## *5.10 DMC15 ELECTRONIC INSTRUMENT (AIR DRYER CONTROLLER)*




set Button - access the set-up.

Button - condensate drain test / value increment.

ON Green LED - glowing = power on.

Yellow LED - glowing = condensate drain solenoid valve on.

Yellow LED - glowing = condenser fan on.

The DMC15 electronic controller performs the following functions : it shows the current operating DewPoint through the digital led display which is detected from the (T1) probe located at the end of the evaporator, while a second (T2) probe, located on the discharge side of the condenser, activates the relevant fan; eventually it controls the functioning of condensate drain solenoid valve through the cyclic electronic timer.

**OPERATION -** During the dryer operation, the LED ON is on.

**Thermometer -** The 10 LED display indicates the current operating DewPoint, shown by means of a two colours (green - red) bar over the display itself.

- Green section - operating conditions ensuring an optimal DewPoint;
- Red section - DewPoint of the dryer too high, the dryer is working with elevated thermal load (high inlet air temperature, high ambient temperature, etc.). The treatment of the compressed air may be improper.

Too high DewPoint temperature, value exceeding the upper limit of the instrument range, is indicated by the intermittent flashing of the last LED; whereas the intermittent flashing of the first LED shows too low DewPoint temperature.
A possible (T1) probe failure is indicated by the intermittent flashing of the first and last LED of the display, whereas the dryer keeps on working correctly.

**Fan Thermo-Switch -** The fan condenser is activated when the condensate temperature reaches or exceeds 95°F (35°C) ($FAN_{ON}$) - LED on - and it is deactivated when the temperature goes down to 86°F (30°C) ($FAN_{ON}$ - Hys) - LED off. In case of (T2) probe failure, the fun will run continuously and the LED will intermittent flash.

**Timer -** The condensate drain solenoid valve is activated for 2 seconds ($T_{ON}$) - LED on - each minute ($T_{OFF}$), if standard setting. To perform the manual test for the condensate drain, press the button.

**SET-UP -** The DMC15 is adjusted during the final test of the dryer. In case of particular requirements concerning the operation management, the user can change the setting of the programmed parameters.
The parameters which can be set up are the following :

- $FAN_{ON}$ - activation temperature of condenser fan. It is adjustable inside the following range of values, with step of 1.8°F (1°K); whereas the Hys hysteresis is fixed and equal to -9°F (-5°K).
- $T_{ON}$ - activation time of the condensate drain solenoid valve.
- $T_{OFF}$ - pause time between two consecutive activation of the condensate drain solenoid valve.

To access the set-up, keep the button set pressed for at least 2 seconds; ON LED flashing confirms the command. First appears the ($FAN_{ON}$) parameter; to access the other parameters, press sequentially the set button. To change the value of the selected parameter, keep the set button pressed and operate on button ; the current value is shown on the LED display. For the value range and the resolution (value of each single LED), see the following table :

| Parameter | Description | Display | Value range | Resolution | Set value |
|---|---|---|---|---|---|
| $FAN_{ON}$ | Activation temperature of condenser fan | Synchronous flashing LED ON + LED | (87.8 - 104 °F) (31 - 40 °C) | 1.8°F 1°K | 95 °F 35°C |
| $T_{ON}$ | Activation time of the condensate drain solenoid valve | Synchronous flashing LED ON + LED | 1 - 10 sec | 1 sec | 2 sec |
| $T_{OFF}$ | Pause time of the condensate drain solenoid valve | Non-Synchronous flashing LED ON + LED | 1 - 10 min | 1 min | 1 min |

To exit the set-up condition in any moment, press the button. If no operations are performed for 2 minutes, the system automatically exits the set-up condition.

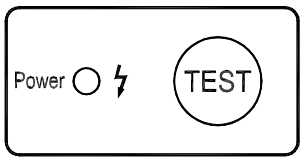
## *5.11 ELECTRONIC LEVEL DRAIN*

Instead of the usual drain system (a solenoid valve controlled by means of electronic instrument); an electronic level controlled drain can be installed as option.
This drain consists of a condensate accumulator where a capacitive sensor continuously checking liquid level is placed: as soon as the accumulator is filled, the sensor passes a signal to the electronic control and a diaphragm solenoid valve will open to discharge the condensate.

For a complete condensate discharge the valve opening time will be adjusted exactly for each single drain operation. Right in time the discharge line will be closed again without wasting compressed air.

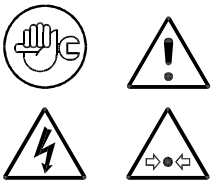
No condensate strainers are installed. No adjusting is required.
A service valve is installed before electronic drain in order to make check and maintenance easily.
**AT DRYER START-UP VERIFY THAT THIS VALVE IS OPEN.**

### CONTROL PANEL




The control panel here illustrated allows checking of drain working.
**Power** : LED - drain ready to work / supplied
**Test** : button - discharge test (keep pushed for 2 seconds)

### TROUBLE SHOOTING



The troubleshooting and resultant service work should be carried out by qualified personnel.

**Before any intervention, Ensure that:**
- **no part of the machine is powered** and that it cannot be connected to the mains supply.
- **no part of the machine is under pressure** and that it cannot be connected to the compressed air system.

| SYMPTOM | POSSIBLE CAUSE - SUGGESTED ACTION |
|---|---|
| ◆ No led lighting up. | ⇨ Check for mains failure.<br>⇨ Verify the electric wiring (internal and/or external).<br>⇨ Check internal printed circuit board for possible damage. |
| ◆ Pressing of Test button, but no condensate discharge. | ⇨ The service valve located before the drain is closed - open it.<br>⇨ The dryer is not under pressure - restore nominal condition.<br>⇨ Solenoid valve defective - replace the drain.<br>⇨ The internal printed circuit board is damaged - replace the drain. |
| ◆ Condensate discharge only when Test button is pressed. | ⇨ The capacitive sensor is too dirty - open the drain and clean the sensor plastic tube. |
| ◆ Drain keeps blowing off air. | ⇨ The diaphragm valve is dirty - open the drain and clean it.<br>⇨ The capacitive sensor is too dirty - open the drain and clean the sensor plastic tube. |
| ◆ Drain in alarm condition. | ⇨ The capacitive sensor is too dirty - open the drain and clean the sensor plastic tube.<br>⇨ The service valve located before the drain is closed - open it.<br>⇨ The dryer is not under pressure - restore nominal condition.<br>⇨ Solenoid valve defective - replace the drain. |

NOTE : When the drain is in alarm condition, the diaphragm solenoid valve will open 7.5 sec every 4 min.

## *6.1 CONTROLS AND MAINTENANCE*

The maintenance operations must be worked out by qualified personnel.
**Before any intervention, Ensure that:**

- **no part of the machine is powered** and that it cannot be connected to the mains supply.
- **no part of the machine is under pressure** and that it cannot be connected to the compressed air system.

Before attempting any maintenance operation on the dryer, switch it off and wait at least 30 minutes. During operation the copper piping connecting the compressor to the condenser can reach dangerous temperature able to burn the skin.

**DAILY**

- Verify that the DewPoint displayed on the electronic instrument is correct.
- Check the proper operation of the condensate drain systems.
- Verify the condenser for cleanliness.

**EVERY 200 HOURS OR MONTHLY**

- With an air jet (Max. 30 psig - 2 barg) blowing from inside towards outside clean the condenser; repeat this operation blowing in the opposite way; be careful not to damage the aluminium blades of the cooling package.
- Close the manual condensate drain valve, unscrew the mechanical strainer and clean it with compressed air and a brush. Reinstall the strainer properly tight, and then open the manual valve.
- At the end, check the operation of the machine.

**EVERY 1000 HOURS OR YEARLY**

- Verify for tightness all the screws of the electric system and that all the “Faston” type connections are in their proper position.
- Check the conditions of the condensate drain flexible hoses, and replace if necessary.
- At the end, check the operation of the machine.

## *6.2 TROUBLESHOOTING*

The troubleshooting and the eventual checks have to be worked out by qualified personnel.
Pay particular attention in case of interventions on the refrigerating circuit. The refrigerating fluid, if under pressure, while expanding could cause freezing burns and serious damage to the eyes, should it get in contact with them.

| SYMPTOM | POSSIBLE CAUSE - SUGGESTED ACTION |
|---|---|
| ◆ The dryer doesn't start. | ⇨ Verify that the system is powered.<br>⇨ Verify the electric wiring. |
| ◆ The compressor doesn’t work. | ⇨ Activation of the compressor internal thermal protection - wait for 30 minutes, then retry.<br>⇨ Verify the electric wiring.<br>⇨ **Where installed-** Replace the internal thermal protection and/or the start-up relay and/or the start-up capacitor and/or the working capacitor.<br>⇨ If the compressor still doesn’t work, replace it. |
| ◆ The fan of the condenser doesn’t work. | ⇨ Verify the electric wiring.<br>⇨ The DMC15 electronic controller is faulty - replace it.<br>⇨ If the fan still doesn't work, replace it. |
| ◆ DewPoint too low. | ⇨ The fan is always ON - the ○ yellow LED of DMC15 controller is glowing continuously - see specific point.<br>⇨ Ambient temperature is too low - restore de nominal condition.<br>⇨ The hot gas by-pass valve is out of setting - contact a refrigeration engineer to restore the nominal setting. |

| | |
|---|---|
| ◆ DewPoint too high. | ⇨ The dryer doesn't start - see specific point.<br>⇨ The T1 DewPoint probe doesn't correctly detect the temperature - ensure the sensor is pushed into the bottom of copper tube immersion well.<br>⇨ The refrigerating compressor doesn't work - see specific point.<br>⇨ The ambient temperature is too high or the room aeration is insufficient - provide proper ventilation.<br>⇨ The inlet air is too hot - restore the nominal conditions.<br>⇨ The inlet air pressure is too low - restore the nominal conditions.<br>⇨ The inlet air flow rate is higher than the rate of the dryer - reduce the flow rate - restore the normal conditions.<br>⇨ The condenser is dirty - clean it.<br>⇨ The condenser fan doesn't work - see specific point.<br>⇨ The dryer doesn't drain the condensate - see specific point.<br>⇨ The hot gas by-pass valve is out of setting - contact a refrigeration engineer to restore the nominal setting.<br>⇨ There is a leak in the refrigerating fluid circuit - contact a refrigeration engineer. |
| ◆ Excessive pressure drop within the dryer. | ⇨ The dryer doesn't drain the condensate - see specific point.<br>⇨ The DewPoint is too low - the condensate is frost and blocks the air - see specific point.<br>⇨ Check for throttling the flexible connection hoses. |
| ◆ The dryer doesn't drain the condensate. | ⇨ The condensate drain service valve is closed - open it.<br>⇨ The condensate drain strainer is clogged - remove and clean it.<br>⇨ The drain solenoid valve is jammed - remove and clean it.<br>⇨ Verify the electric wiring.<br>⇨ The coil of the condensate drain solenoid valve burned out - replace it.<br>⇨ The DewPoint is too low - the condensate is frozen - see specific point. |
| ◆ The dryer continuously drains condensate. | ⇨ The drain solenoid valve is jammed - remove and clean it.<br>⇨ Try to remove the electric connector on the solenoid valve - if drain stops verify the electric wiring or the electronic instrument is faulty - replace it. |
| ◆ Water within the line. | ⇨ The dryer doesn't start - see specific point.<br>⇨ **Where installed -** Untreated air flows through the by-pass unit - close the by-pass.<br>⇨ The dryer doesn't drain the condensate - see specific point.<br>⇨ DewPoint too high - see specific point. |
| ◆ **DMC15-** The first and the last LED of the display of electronic instrument blink simultaneously. | ⇨ Verify the electric wiring of (T1) DewPoint probe.<br>⇨ The (T1) DewPoint probe is faulty - replace it.<br>⇨ The DMC15 electronic controller is faulty - replace it. |
| ◆ **DMC15-** The ○ ✣ yellow LED of the electronic controller is flashing continuously. | ⇨ Verify the electric wiring of (T2) fan control probe.<br>⇨ The (T2) fan control probe is faulty - replace it.<br>⇨ The DMC15 electronic controller is faulty - replace it. |
| ◆ **DMC15-** The first LED of the display of electronic instrument is flashing continuously. | ⇨ DewPoint too low - see specific point.<br>⇨ The (T1) DewPoint probe is faulty - replace it.<br>⇨ The DMC15 electronic controller is faulty - replace it. |
| ◆ **DMC15-** The last LED of the display of electronic instrument is flashing continuously. | ⇨ DewPoint too high - see specific point.<br>⇨ The (T1) DewPoint probe is faulty - replace it.<br>⇨ The DMC15 electronic controller is faulty - replace it. |

## *6.3 REPLACEMENT PARTS*

The suggested spare parts list will enable you to promptly intervene in case of abnormal operation, so avoiding to wait for the spares delivery. In case of failure of other parts, for example inside the refrigerating circuit, the replacement must mandatory be worked out by a refrigerating systems specialist or in our factory.

**NOTE : To order the suggested spare parts or any other part, it's necessary to quote the data reported on the identification plate.**

| | | | AMD -1 (115/1/60) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***No.*** | ***DESCRIPTION OF THE SPARE PARTS*** | **CODE** | **10U** | **15U** | **20U** | **35U** | **50U** | **75U** | **100U** |
| 6 | Refrigerating compressor | 5015135101 | 1 | 1 | 1 | | | | |
| 6 | Refrigerating compressor | 5015135103 | | | | 1 | | | |
| 6 | Refrigerating compressor | 5015135105 | | | | | 1 | | |
| 6 | Refrigerating compressor | 5015135010 | | | | | | 1 | |
| 6 | Refrigerating compressor | 5015135011 | | | | | | | 1 |
| 7 | Hot gas by-pass valve | 64140SS160 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9.1 | Fan motor | 5210135005 | 1 | 1 | 1 | 1 | | | |
| 9.1 | Fan motor | 5210135010 | | | | | 1 | 1 | |
| 9.1 | Fan motor | 5210135015 | | | | | | | 1 |
| 9.2 | Fan blade | 5215000010 | 1 | 1 | 1 | 1 | | | |
| 9.2 | Fan blade | 5215000019 | | | | | 1 | 1 | |
| 9.2 | Fan blade | 5215000022 | | | | | | | 1 |
| 9.3 | Fan grid | 5225000010 | | | | | 1 | 1 | 1 |
| 10 | Dehydration filter | 6650SSS007 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | DMC15 Temperatue probe (T1) | 5625NNN033 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12.1 | DMC15 Temperatue probe (T2) | 5625NNN035 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | Condensate drain solenoid valve | 64320FF081 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 16 | Coil for cond. drain solenoid valve | 64N22MM002 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | DMC15 Controller 115V | 5620130104 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | Electronic drain | 2210BEK001P | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | Main switch | 5450SZN010 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

♦ **Suggested spare part**

| | | | AMD -2 (230/1/60) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***No.*** | ***DESCRIPTION OF THE SPARE PARTS*** | **CODE** | **10U** | **15U** | **20U** | **35U** | **50U** | **75U** | **100U** |
| 6 | Refrigerating compressor | 5015110101 | 1 | 1 | 1 | | | | |
| 6 | Refrigerating compressor | 5015110107 | | | | 1 | 1 | | |
| 6 | Refrigerating compressor | 5015110115 | | | | | | 1 | |
| 6 | Refrigerating compressor | 5015110016 | | | | | | | 1 |
| 7 | Hot gas by-pass valve | 64140SS160 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9.1 | Fan motor | 5210110005 | 1 | 1 | 1 | 1 | | | |
| 9.1 | Fan motor | 5210110011 | | | | | 1 | 1 | |
| 9.1 | Fan motor | 5210110017 | | | | | | | 1 |
| 9.2 | Fan blade | 5215000010 | 1 | 1 | 1 | 1 | | | |
| 9.2 | Fan blade | 5215000019 | | | | | 1 | 1 | |
| 9.2 | Fan blade | 5215000022 | | | | | | | 1 |
| 9.3 | Fan grid | 5225000010 | | | | | 1 | 1 | 1 |
| 10 | Dehydration filter | 6650SSS007 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | DMC15 Temperatue probe (T1) | 5625NNN033 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12.1 | DMC15 Temperatue probe (T2) | 5625NNN035 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | Condensate drain solenoid valve | 64320FF080 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 16 | Coil for cond. drain solenoid valve | 64N22MM001 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | DMC15 Controller 115V | 5620110104 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | Electronic drain | 2210BEK001A | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | Main switch 2P 0/1 | 5450SZN010 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

♦ **Suggested spare part**

## *6.4 MAINTENANCE OPERATION ON THE REFRIGERATION CIRCUIT*

Maintenance and service on refrigeration systems must be carried out only by certified refrigeration engineers only, according to local rules.

All the refrigerant of the system must be recovered for its recycling, reclamation or destruction.

DO NOT DISPOSE THE REFRIGERANT FLUID IN THE ENVIROMENT.

This dryer comes ready to operate and filled with R134a or R404A type refrigerant fluid.

In case of refrigerant leak contact a certified refrigeration engineers. Room is to be aired before any intervention.
If is required to re-fill the refrigeration circuit, contact a certified refrigeration engineers.
Refer to the dryer nameplate for refrigerant type and quantity.

Characteristics of refrigerants used:

| Refrigerant | Chemical formula | TLV | GWP |
|---|---|---|---|
| R134a - HFC | CH2FCF3 | 1000 ppm | 1300 |
| R404A - HFC | CH2FCF3/C2HF5/C2H3F3 | 1000 ppm | 3784 |

## *6.5 DISMANTLING OF THE DRYER*

If the dryer is to be dismantled, it has to be split into homogeneous groups of materials.

| Part | Material |
|---|---|
| Refrigerant fluid | R404A, R134a, Oil |
| Canopy and Supports | Carbon steel, Epoxy paint |
| Refrigeration Compressor | Steel, Copper, Aluminium, Oil |
| Alu-Dry module | Aluminium |
| Condenser Unit | Aluminium, Copper, Carbon steel |
| Pipe | Copper |
| Fan | Aluminium, Copper, Steel |
| Valve | Brass, Steel |
| Electronic Level Drain | PVC, Aluminium, Steel |
| Insulation Material | Synthetic gum without CFC, Polystyrene, Polyurethane |
| Electric cable | Copper, PVC |
| Electric Parts | PVC, Copper, Brass |

We recommend to comply with the safety rules in force for the disposal of each type of material. The chilling fluid contains droplets of lubrication oil released by the refrigerating compressor. Do not dispose this fluid in the environment. Is has to be discharged from the dryer with a suitable device and then delivered to a collection centre where it will be processed to make it reusable.

## *7.1 DRYERS DIMENSIONS*

***7.1.1 AMD 10-15 Dryers Dimensions***
***7.1.2 AMD 20-50 Dryers Dimensions***
***7.1.3 AMD 75 Dryers Dimensions***
***7.1.4 AMD 100 Dryers Dimensions***

## 7.2 EXPLODED VIEW

### 7.2.1 Exploded view of Dryers AMD 10-15
### 7.2.2 Exploded view of Dryers AMD 20-50
### 7.2.3 Exploded view of Dryers AMD 75-100

***Exploded view table of components - Dryers AMD 10-100***

| | | | |
|---|---|---|---|
| (1) | Alu-Dry Module | (16) | Coil for cond. drain solenoid valve |
| | 1.1 Insulation Material | (17) | Electronic control instrument |
| ... | | ... | |
| (6) | Refrigerating compressor | (21) | Electronic level drain |
| (7) | Hot gas by-pass valve | (22) | Main switch |
| (8) | Condenser | ... | |
| (9) | Condenser fan | (51) | Front panel |
| | 9.1 Motor | (52) | Back panel |
| | 9.2 Blade | (53) | Right lateral panel |
| | 9.3 Grid | (54) | Left lateral panel |
| (10) | Filter Drier | ... | |
| (11) | Capillary tube | (56) | Base plate |
| (12) | T1 Temperature probe (DewPoint) | ... | |
| (12.1) | T1 Temperature probe (Fan control) | (59) | Support bracket |
| (13) | Condensate drain service valve | ... | |
| (14) | Y-shaped condensate drain strainer | (61) | Electric connector |
| (15) | Condensate drain solenoid valve | | |

## 7.3 ELECTRIC DIAGRAMS

### 7.3.1 Electrical Diagram of Dryers AMD 10-100 - Electronic Instrument DMC15

***Electrical Diagram table of components - Dryers AMD 10-100***

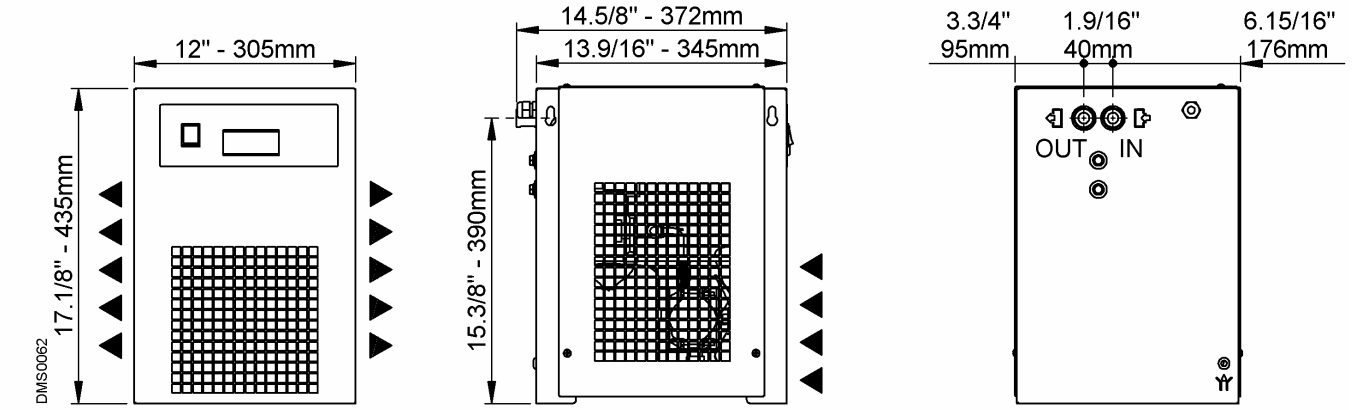
**IG** : Main switch
**K** : Refrigerating compressor
- **KT** : Compressor thermal protection
- **KR** : Compressor starting relay (if installed)
- **CS** : Compressor starting capacitor (if installed)
- **CR** : Compressor run capacitor (if installed)

**V** : Condenser fan
- **CV** : Fan starting capacitor (if installed)

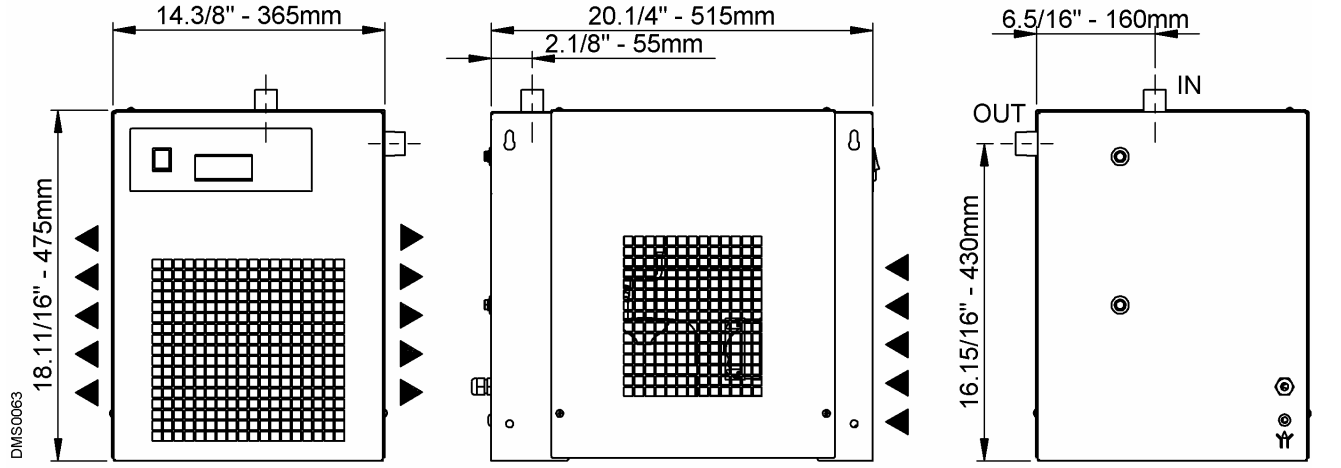
**DMC15** : DMC15 Electronic Instrument - Air Dryer Controller
**T1** : T1 Temperature probe (DewPoint)
**T2** : T2 Temperature probe (Fan control)
**EVD** : Condensate drain solenoid valve
**ELD** : Electronic level drain

BN = BROWN
BU = BLUE
BK = BLACK
YG = YELLOW/GREEN

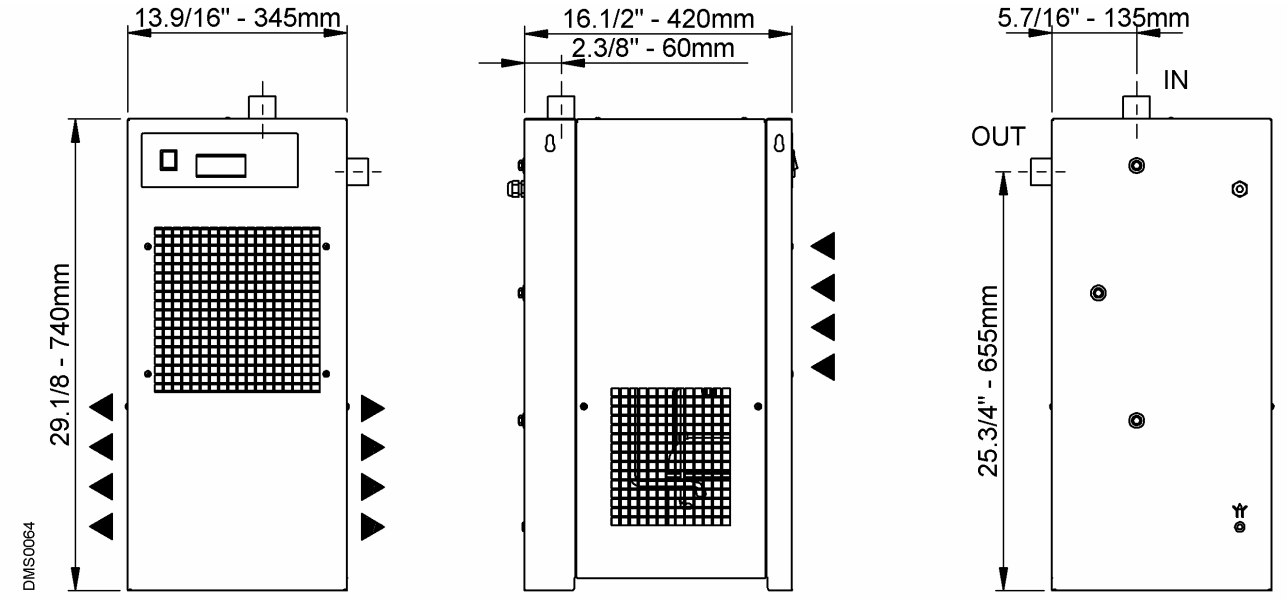
## 7.1.1 AMD 10-15




## 7.1.2 AMD 20-50




## 7.1.3 AMD 75



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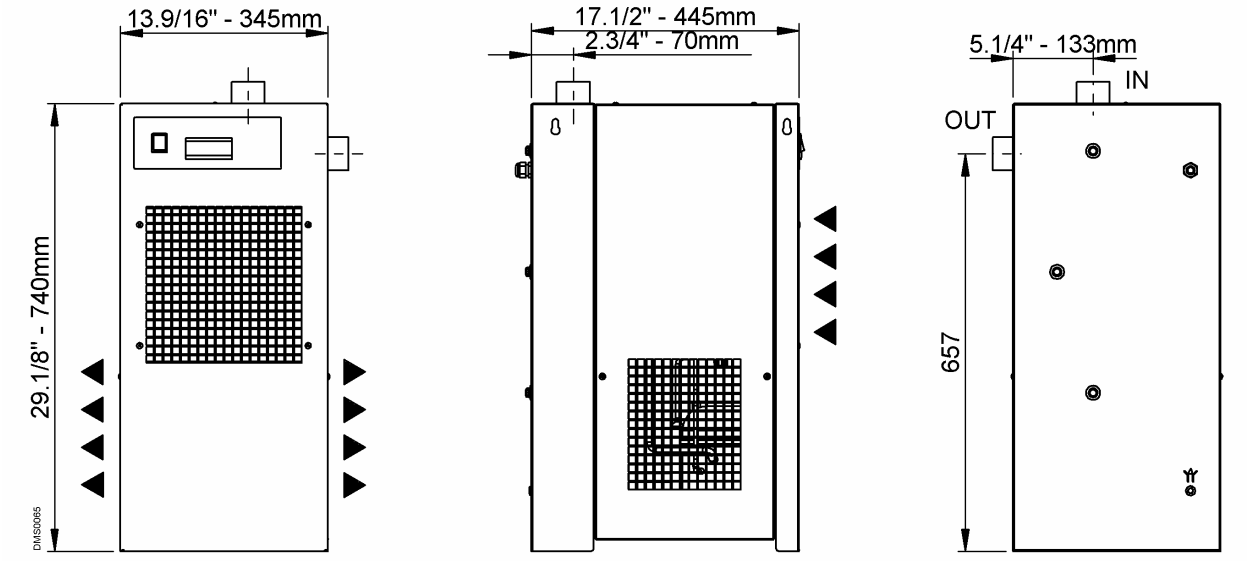
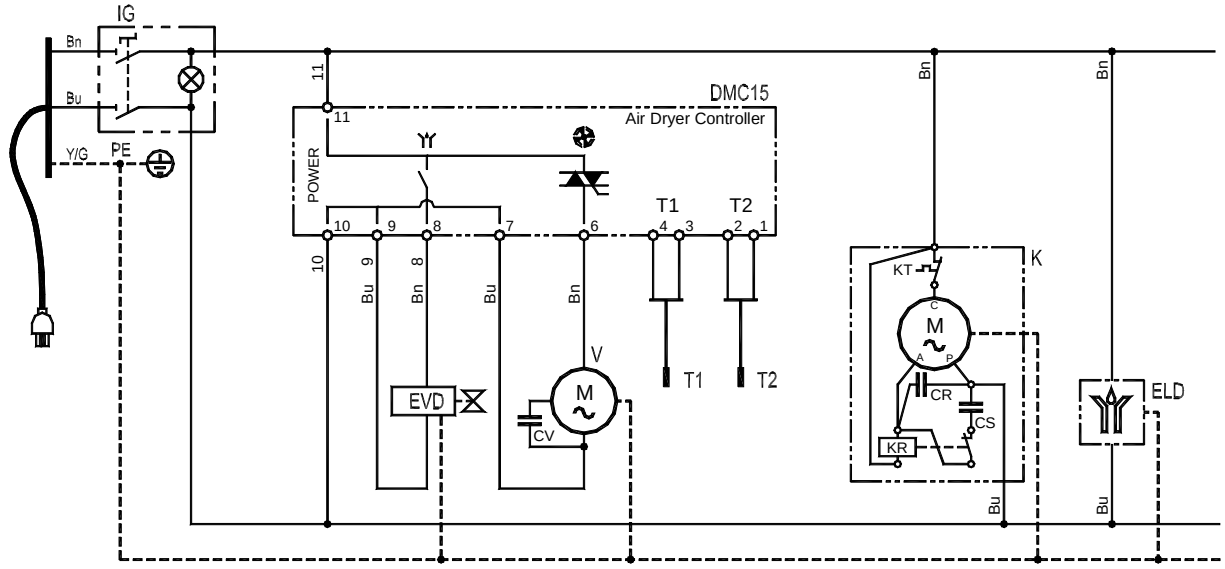
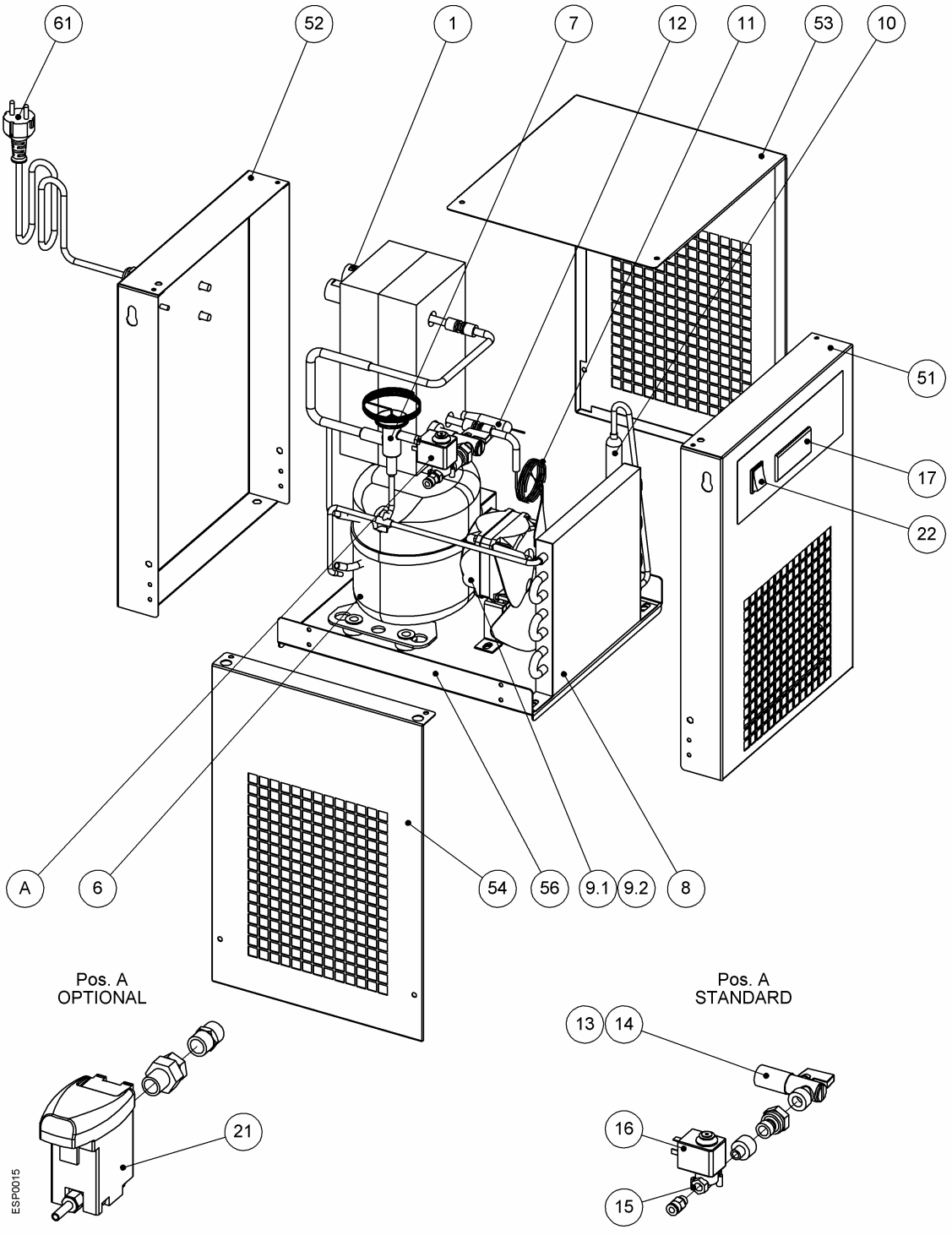



## 7.2.1 AMD 10-100 - DMC15



## *7.3.1 AMD 10-15 U*



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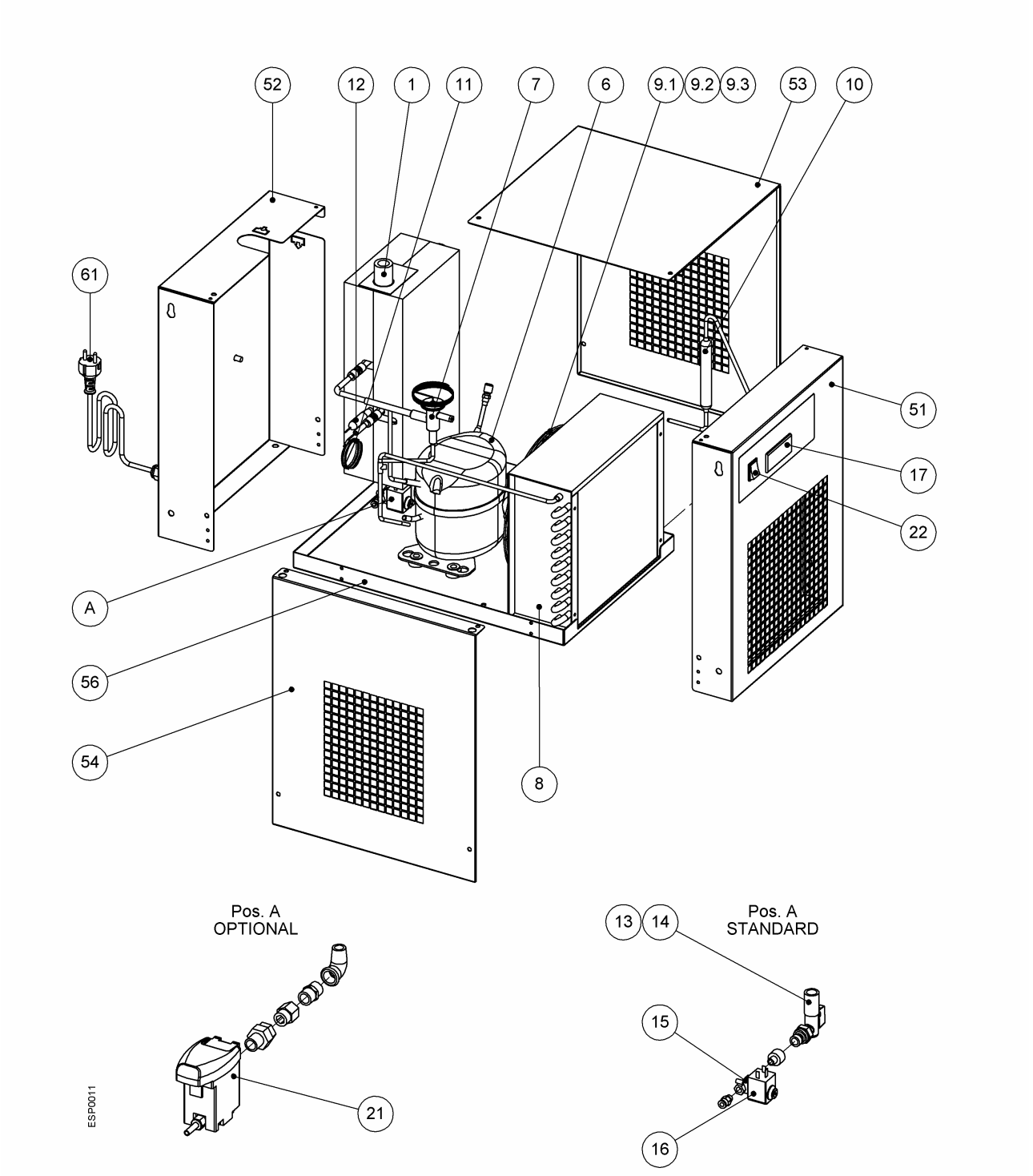
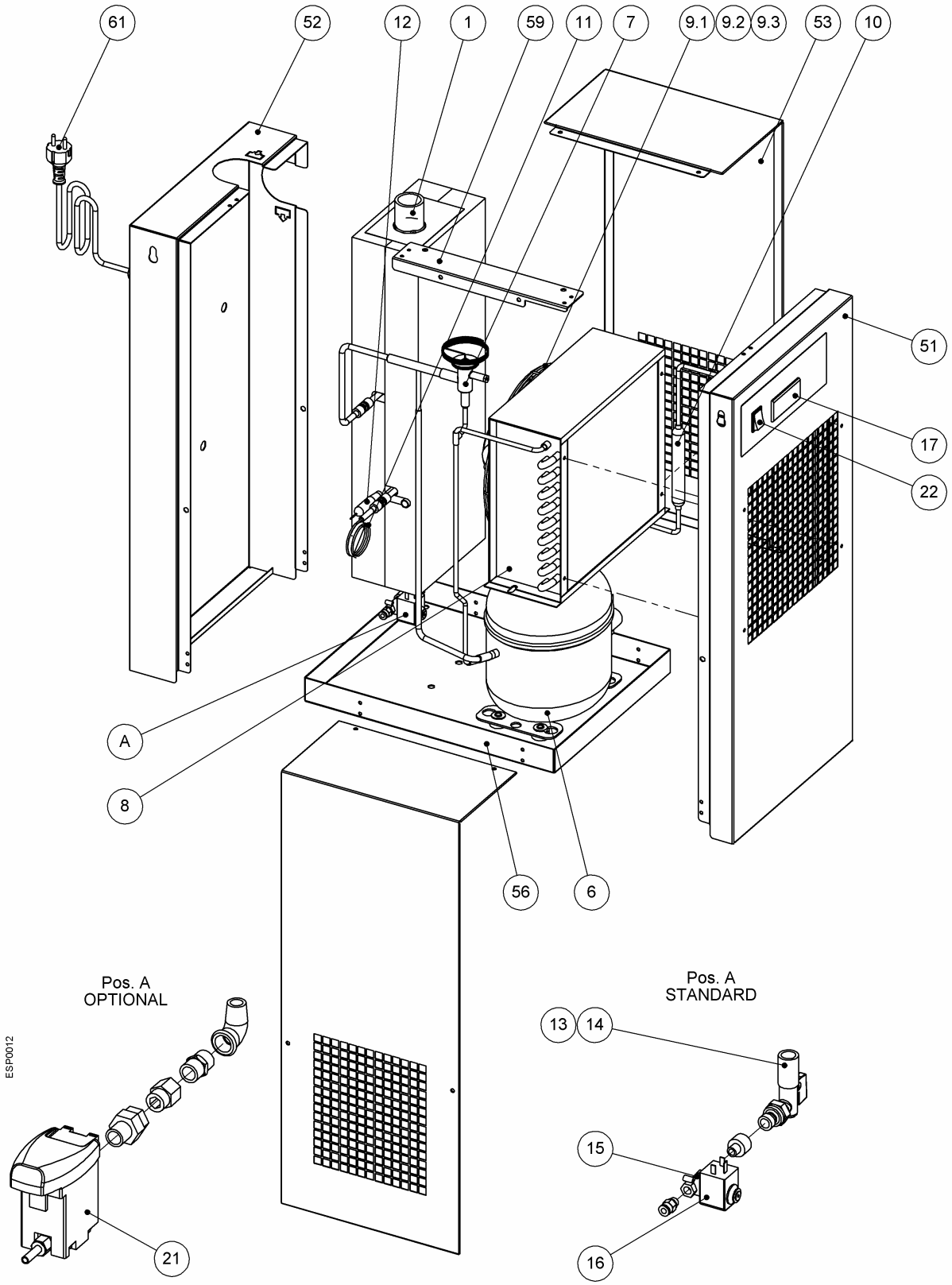


## *7.3.3 AMD 75-100 U*



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