BelAir

COMPRESSED AIR TREATMENT

AHT Series Refrigerated Dryers

Installation & Operation Maintenance Manual

AHT20 - AHT350

(-1) 115/1/60 (-2) 230/1/60

MODEL:

_____

SERIAL NUMBER:

_____

FRIULAIR Dryers

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7425MUM022 Rev00

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 ACT 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 IF YOU HAVE A WARRANTY CLAIM:

BelAir Technologies, LLC	Phone	(302) 894-1191	Delaware
		(303) 287-6666	Colorado
	Fax	(302) 894-1193	Delaware
		(720) 554-7758	Colorado

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 USED

Before attempting any intervention on the dryer, read carefully the instructions reported in this use and maintenance manual.

General warning sign. Risk of danger or possibility of damage to the machine. Read carefully the text related to this sign.

Electrical hazard. The relevant text outlines conditions which could result fatal. The related instructions must be strictly respected.

Danger hazard. Part or system under pressure.

Danger hazard. Component or system which during the operation can reach high temperature.

Danger hazard. It's absolutely forbidden to breathe the air treated with this apparatus.

Danger hazard. It's absolutely forbidden to use water to extinguish fire on the dryer or in the surrounding area.

Danger hazard. It's absolutely forbidden to operate the machine when the panels are not in place.

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

Compressed air inlet connection point.

Compressed air outlet connection point.

Condensate drain connection point.

Operations which can be worked out by the operator of the machine, if qualified **1**.

NOTE : Text to be taken into account, but not involving safety precautions.

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

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

Not to spoil our commitment, the user should follow the few ecological suggestions marked with this sign.

1 Experienced and trained personnel acquainted with the relevant rules and laws, capable to perform the needed activities and to identify and avoid possible dangerous situations while handling, installing, using and servicing the machine.

1.2 WARNINGS

Compressed air is a highly hazardous energy source. Never work on the dryer with parts under pressure. Never point the compressed air or the condensate drain jet towards anybody. The user is responsible for the installation of the dryer, which has to be executed on the basis of the instructions given in the “Installation” chapter. Otherwise, the warranty will be voided and dangerous situations for the personnel and/or damages to the machine could occur.

Only qualified personnel can use and service electrically powered devices. Before attempting any maintenance action, the following conditions must be satisfied:

- Ensure that any part of the machine is under voltage and that it cannot be connected to the mains.
- Ensure that any part of the dryer is under pressure and that it cannot be connected to the compressed air system.

These refrigeration air dryers contain R134a or R404A HFC type refrigerant fluid. Refer to the specific paragraph - maintenance operation on the refrigeration circuit.

Any change to the machine or to the relevant operating parameters, if not previously verified and authorised by the Manufacturer, in addition to create the possibility of dangerous conditions will void the warranty.

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

1.3 PROPER USE OF THE DRYER

This dryer has been designed, manufactured and tested only to be used to separate 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 be in any case responsible for any resulting damage. Moreover, the correct use requires the compliance with the installation conditions, in particular :

- Voltage and frequency of the mains.
- Pressure, temperature and flow-rate of the incoming air.
- 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 separation of water and eventual oil particles present in compressed air. The dried air cannot be used for breathing purposes or for operations leading to direct contact with foodstuff.

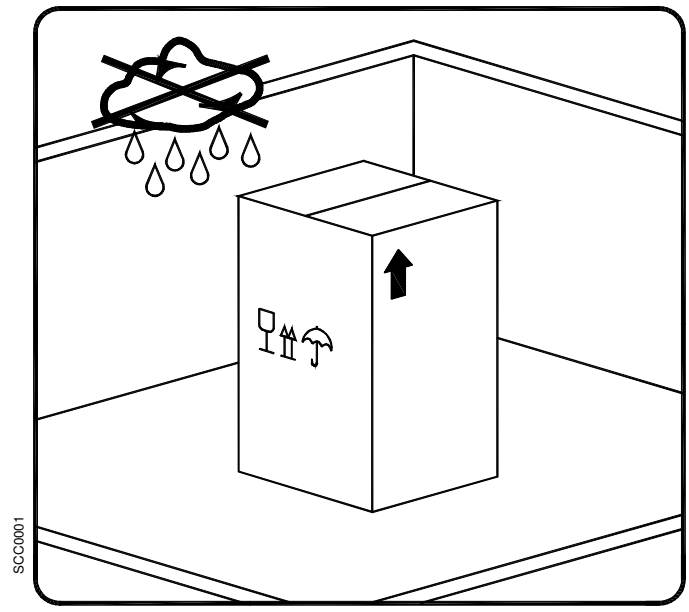
This dryer is not suitable for the treatment of dirty air or of air containing solid particles.

2.1 TRANSPORT

Once verified the integrity of the packaging, place the unit near the installation point and unpack the contents.

- To move the packaged unit we suggest to use a suitable trolley or forklift. Transportation by hands is discouraged.
- Keep the dryer always in vertical position. Turning it upside down some parts could be irreparably damaged.
- Handle with care. Heavy blows could cause irreparable damage.

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 90%. Should the stocking time exceed 12 months, please contact the manufacturer.

The packaging materials are recyclable.
Each single material must be properly disposed in a manner complying with the rules in force in the destination country.

2.3 INSTALLATION SITE

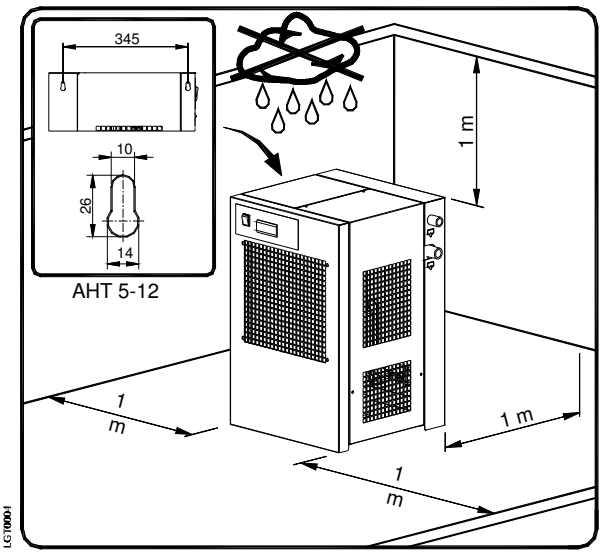
Particular care is required in selecting the installation site, as an improper location could jeopardise the proper operation of the dryer.
This unit is not suitable to be used in explosive atmosphere, where risk of fire could exist, or in presence of gaseous or solid polluting material.

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

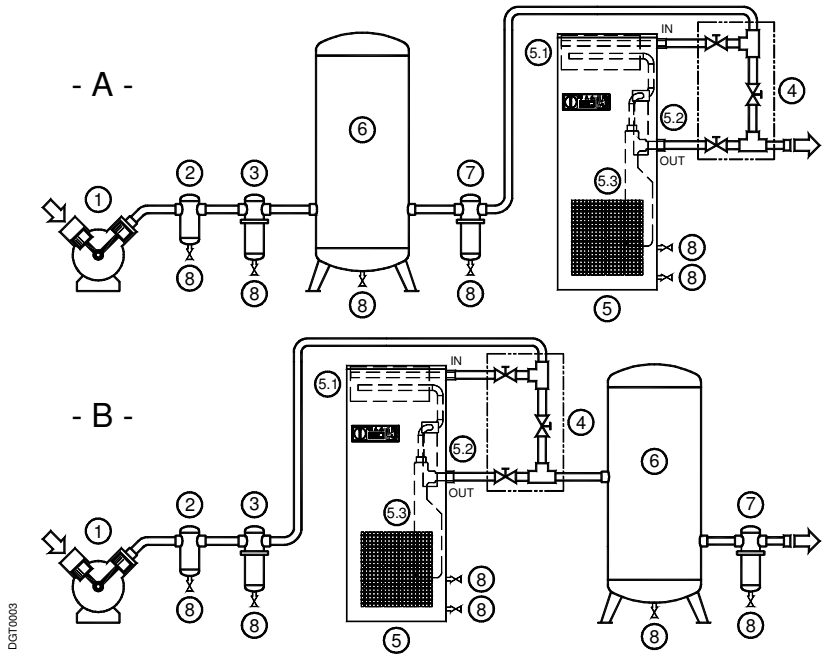
Minimal installation requirements :

- 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 +35°F (+1.5 °C).
- Maximum ambient temperature +115°F (+46 °C).
- Leave at least 40in (1 meter) of free space on every side of the drier for ventilation purposes and maintenance operations.

The dryer doesn't require to be fixed to the supporting surface. The dryer needs to be fixed to the supporting surface only with particular installation procedures (dryer on brackets, hanging units, etc.)



2.4 INSTALLATION LAYOUT



1. Air compressor
2. Condensate separator
3. Line filter (min. 20 micron)
4. By-pass group
5. AHT Dryer
5.1 Aftercooler
5.2 Pre-Filter (FTP Series - 3 micron)
5.3 Alu-Dry Module
6. Compressed air tank
7. Final filter
8. Condensate drain

In case of heavily polluted inlet air (ISO 8573.1 class 3.-.3 or worse quality), we recommend the additional installation of a pre-filter (5 micron minimum) to prevent a clogging of the heat exchanger.

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	psig	60	80	100	120	140	160	180	200
	barg	4	5.5	7	8	10	11	12.5	14
Factor		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	ºF	80	90	100	105	110	115
	ºC	27	32	38	40	43	46
Factor		1.22	1.11	1.00	0.94	0.89	0.83

Correction factor for inlet air temperature changes:							
Air temperature	ºF	140	160	175	180	195	210
	ºC	60	70	80	82	90	100
Factor		1.25	1.14	1.02	1.00	0.91	0.80

Correction factor for DewPoint changes:					
DewPoint	ºF	35-40	41-45	46-50	51-54
	ºC	1.5-4.9	5-7	7.1-10	10.1-12
Factor		0.80	1.00	1.08	1.12

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 **AHT 150** has a nominal duty of **150 scfm (255 Nm^3/h)**. What is the maximum allowable flow through the dryer under the following operating conditions:

- Inlet air pressure = 120 psig (8 barg)
- Ambient temperature = 105ºF (40ºC)
- Inlet air temperature = 195ºF (90ºC)
- Pressure DewPoint = 45ºF (7ºC)

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

Air flow capacity = 150 x 1.07 x 0.94 x 0.91 x 1.00

= **137 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 = 95 (161 Nm^3/h)
- Inlet air pressure = 120 psig (8 barg)
- Ambient temperature = 105ºF (40ºC)
- Inlet air temperature = 195ºF (90ºC)
- Pressure DewPoint = 45ºF (7ºC)

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 = 95 ÷ 1.07 ÷ 0.94 ÷ 0.91 ÷ 1.00

= **104 scfm** → Therefore the model suitable for the conditions above is **AHT 150** (**150 scfm** or **255 Nm^3/h** - nominal duty).

2.6 CONNECTION TO THE COMPRESSED AIR SYSTEM

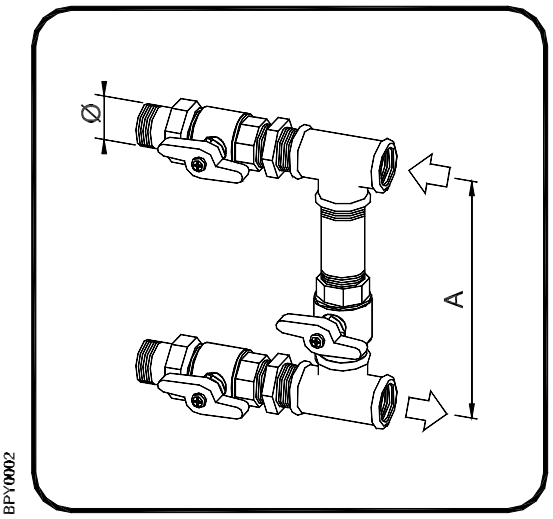
Operations to be performed by qualified personnel.

Never operate with plants under pressure.

The user is responsible to ensure that the dryer will never be operated with pressure exceeding the nominal values.
Eventual over-pressure could be dangerous both for the operator and the machine.

The temperature and the amount of air entering the dryer must comply with the limits reported on the data plate. In case of treatment of air at particularly high temperatures, the installation of an aftercooler could result necessary. The cross section of the connecting piping, which must be free from dust, rust, chips and other impurities, must be consistent with the flow-rate of the dryer.

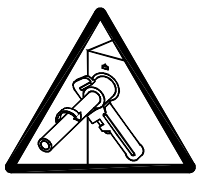
In order to facilitate the maintenance operations, we suggest installing a by-pass group, as shown in the following illustration.



Dryer	Ø [NPT-F]	A [in - mm]
AHT 5-12	1/2”	3.1/2” - 90
AHT 18-23	1”	16.3/8” - 415
AHT 30-40	1.1/4”	20.5/8” - 525
AHT 55-60	1.1/2”	26” - 660
AHT 80-100	2"	25” - 635

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:

PIPING THE DRYER, INLET/OUTLET CONNECTIONS MUST BE SUPPORTED AS SHOW IN THE DIAGRAM.
FAILING WILL RESULT IN DAMAGE

2.7 CONNECTION TO THE MAINS

The connection to the mains, to be carried out by qualified personnel, and the safety systems must comply with local rules and laws.

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.

Dryer supplied at 115/1/60 voltage comes with a mains connecting cable already installed and ending with a North-American standard plug 2 poles + ground. Dryer supplied at 230/1/60 voltage comes with a box for the connection to the mains.
The mains socket must be provided with a **mains magneto-thermal differential breaker** (I□n=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.

It is mandatory to ensure the connection to the ground terminal.
Don't use adapters on the mains socket.
If necessary, have the plug replaced by qualified personnel.

2.8 CONDENSATE DRAIN

The condensate is discharged at the same pressure of the air entering the dryer.
Never point the condensate drain jet towards anybody.

The dryer comes already fitted with tubing in flexible plastics (1/4" - 6 mm or 3/8" - 10 mm diameter and 60in - 1500 mm long) for the connection to the collection plant.
The condensate drain occurs through two solenoid valves protected with a mechanical strainer. The condensate coming from the separator is previously filtered, then discharged. The solenoid valve coils are operated by the electronic control instrument.
If an electric strainer is installed, the intervention times are determined by the internal capacitive sensor (see specific paragraph).
Connect and properly fasten the condensate drain to a collecting plant or container.
The drain cannot be connected to pressurised systems.

Don't dispose the condensate in the environment.
The condensate collected in the dryer contains oil particles released in the air by the compressor.
Dispose the condensate in compliance with the local rules.
We suggest to install a water-oil separator where to convey all the condensate drain coming from compressors, dryers, tanks, filters, etc.

3.1 PRELIMINARY OPERATION

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

Before delivery, each dryer is submitted to accurate tests and controlled simulating real operating conditions. Nevertheless, the unit could be damaged during transportation. We therefore suggest to check the integrity of the dryer upon arrival and to keep it under control during the first hours of operation.

The start-up must be performed by qualified personnel.
It's mandatory that the engineer in charge 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 the panels are not in place.

3.2 FIRST START-UP

At the first start-up, or in case of start-up after a long inactivity period or following to maintenance operations, follow the instructions given below. The start-up must be performed by qualified personnel.

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 closed.
- 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 DMC14 electronic instrument is ON.
- Ensure the consumption matches with the values of the data plate.
- **Ensure the fan works 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 OPERATION AND SWITCHING OFF

Operation (refer to paragraph 5.1 Control Panel) :

- Verify the condenser for cleanliness.
- Verify that the system is powered.
- Turn on the main switch - pos. 1 on the control panel.
- Ensure that DMC14 electronic instrument is ON.
- Wait a few minutes; verify that the operating temperature displayed on electronic instrument DMC14 is correct and that the condensate is regularly drained.
- Switch on the air compressor.

Switching OFF (refer to paragraph 5.1 Control Panel) :

- Check that the temperature indicated on the DMC14 is within range.
- Switch OFF the air compressor.
- After a few minutes, switch OFF the main switch - pos. 1 of the control panel of the dryer.

NOTE : A DewPoint within 32°F (0°C) and 60°F (+15°C) displayed on 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.

AHT MODEL		/ AC Air-Cooled						
		20	**30**	**40**	**50**	**75**	**100**	**150**
Air flow rate at nominal condition [1]	[scfm]	20	30	40	50	75	100	150
	[Nm³/h]	34	51	68	85	127	170	255
	[Nl/min]	566	850	1132	1416	2124	2832	4248
Pressure DewPoint at nominal condition [1]	[°F – °C]	<45 – <7						
Nominal (max.) ambient temperature	[°F – °C]	100 (115) – 38 (46)						
Min. ambient temperature	[°F – °C]	35 – 1.5						
Nominal (max.) inlet air temperature	[°F – °C]	180 (210) – 82 (100)						
Nominal inlet air pressure	[psig – barg]	100 – 7						
Max. inlet air pressure	[psig – barg]	200 – 14						
Air pressure drop - Δp	[psi]	1.5	2.8	2,6	4.1	3.8	3.9	5.0
	[bar]	0.10	0.19	0,18	0.28	0.26	0.27	0.35
Inlet - Outlet connections	[NPT-F]	1/2”	1/2”	1/2”	1/2”	1”	1.1/4”	1.1/4”
Refrigerant type		R134.a						R404A
Refrigerant quantity [3]	[oz]	7	8	8	10.1/4	14	16	20.1/2
	[kg]	0.20	0.22	0.22	0.29	0.40	0.45	0.58
Cooling air flow	[cfm]	290	290	290	290	530	590	880
	[m³/h]	500	500	500	500	900	1000	1500
Pre-Filter (3 micron) [2]	[model]	FTP 30	FTP 30	FTP 45	FTP 65	FTP 125	FTP 125	FTP 200
Heat load	[Btu/h]	1650	2100	2100	3500	4500	5800	8500
Nominal refrigeration compressor power	[HP]	1/8	1/6	1/6	1/4	1/4+	1/3+	1/2
Standard Power Supply [3]	[Ph/V/Hz]	115/1/60						
Nominal electric absorption	[W]	210	280	310	460	770	880	1100
	[A]	2.3	2.5	3.1	4.7	8.3	8.7	10.1
Max. electric absorption	[W]	240	320	360	530	890	1000	1300
	[A]	2.4	2.8	3.9	5.2	8.9	11.2	12.1
Max. level noise at 40in (1m)	[dbA]	< 70						
Weight	[lbs]	66	68	71	73	112	134	146
	[kg]	30	31	32	33	51	61	66

[1] The nominal condition refers to an ambient temperature of 100°F (38°C) with inlet air at 100psig (7barg) and 180°F (82°C).

[2] Dryer is delivered with a.m. filter already installed, fitted with automatic timed condensate drain.

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

AHT MODEL		/ AC Air-Cooled										
		20	**30**	**40**	**50**	**75**	**100**	**150**	**200**	**250**	**300**	**350**
Air flow rate at nominal	[scfm]	20	30	40	50	75	100	150	200	250	300	350
	[Nm^3/h]	34	51	68	85	127	170	255	340	425	510	595
	[Nl/min]	566	850	1132	1416	2124	2832	4248	5663	7080	8495	9910
Pressure DewPoint at nominal	[°F – °C]	<45 – <7										
Nominal (max.) ambient	[°F – °C]	100 (115) – 38 (46)										
Min. ambient temperature	[°F – °C]	35 – 1.5										
Nominal (max.) inlet air	[°F – °C]	180 (210) – 82 (100)										
Nominal inlet air pressure	[psig – barg]	100 – 7										
Max. inlet air pressure	[psig – barg]	200 – 14										
Air pressure drop - Δp	[psi]	1.5	2.8	2.6	4.1	3.8	3.9	5.0	4.4	4.9	4.5	4.2
	[bar]	0.10	0.19	0.18	0.28	0.26	0.27	0.35	0.30	0.34	0.31	0.29
Inlet - Outlet connections	[NPT-F]	1/2”	1/2”	1/2”	1/2”	1”	1.1/4”	1.1/4”	1.1/2”	1.1/2”	2”	2”
Refrigerant type		R134.a						R404A				
Refrigerant quantity [3]	[oz]	7	8	8	10.1/4	14	16	20.1/2	30.1/2	33.1/2	35	42
	[kg]	0.20	0.22	0.22	0.29	0.40	0.45	0.58	0.87	0.95	1.00	1.20
Cooling air flow	[cfm]	290	290	290	290	530	590	880	2060	2900	3600	3700
	[m^3/h]	500	500	500	500	900	1000	1500	3500	5000	6150	6350
Pre-Filter (3 micron) [2]	[model]	FTP 30	FTP 30	FTP 45	FTP 65	FTP 125	FTP 125	FTP 200	FTP 200	FTP 300	FTP 300	FTP 450
Heat load	[Btu/h]	1450	2100	2100	4000	4500	5800	8500	11900	17500	20400	20400
Nominal refrigeration	[HP]	1/8	1/6	1/6	1/4	1/4+	1/3+	1/2	5/8	1.1/8	1.1/4	1.1/4
Standard Power Supply [3]	[Ph/V/Hz]	230/1/60										
Nominal electric absorption	[W]	210	280	310	460	770	880	1100	1350	1750	2200	2300
	[A]	1.1	1.3	1.6	2.4	4.2	4.3	5.1	6.3	8.4	10.5	11.1
Max. electric absorption	[W]	240	320	360	530	890	1000	1300	1560	2100	2580	2690
	[A]	1.2	1.4	2.0	2.6	45	5.6	6.1	7.4	10.1	12.3	12.8
Max. level noise at 40in (1m)	[dbA]	< 70										
Weight	[lbs]	66	68	71	73	112	134	146	165	185	291	304
	[kg]	30	31	32	33	51	61	66	75	84	132	138

[1] The nominal condition refers to an ambient temperature of 100°F (38°C) with inlet air at 100psig (7barg) and 180°F (82°C).

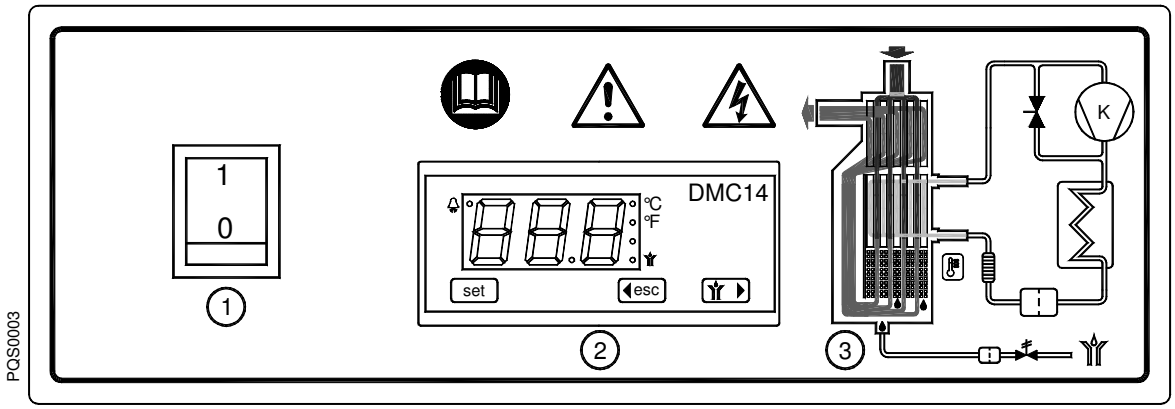
[2] Dryer is delivered with a.m. filter already installed, fitted with automatic timed condensate drain.

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

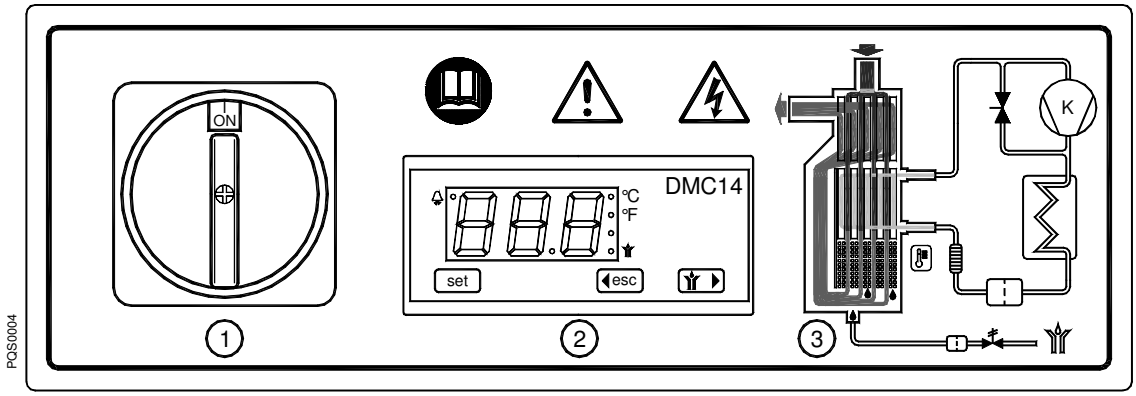
5.1 CONTROL PANEL

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

AHT 20 - 75



AHT 100 - 350



(1) Main switch

(2) Electronic control instrument DMC14

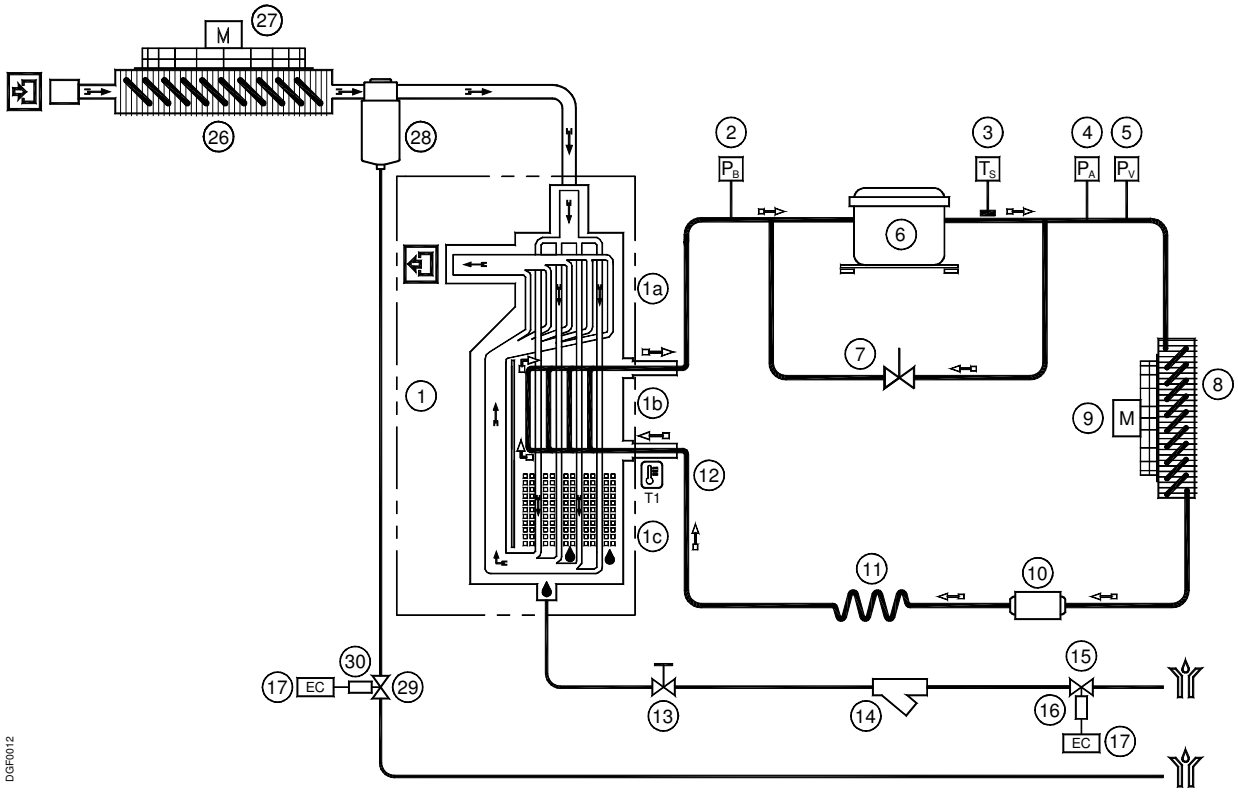
(3) Air and refrigerating gas flow diagram

5.2 OPERATION

Operating principal – The dryer models described in this manual all operate on the same principal. First the very hot moisture laden air directly from the compressor enters the aftercooler (copper tube / aluminum fin cooling surface) where it is cooled to within 12 to 15 degrees F of the ambient air temperature. It leaves the aftercooler with entrained condensed water droplets which are separated by the 3 to 5 micron bulk liquid filter separator element and drained away by the systems first timed electronic solenoid drain. The partially cooled moisture laden air next enters an air to air heat exchanger to pre-cool it. The compressed air next goes through the evaporator, also known as the air to refrigerant heat exchanger. The compressed air temperature is reduced to approximately 36 degrees F causing additional water vapor to condense to liquid. The liquid is continuously coalesced and collected in the dryer separator for automatic removal by the second condensate drain. The cool moisture free compressed air then passes back through the air to air heat exchanger to be reheated to within 10 to 15 degrees F of the incoming compressed air temperature as it exits the dryer.

Refrigerant circuit - Refrigerant gas is cycled through the compressor and exits at high pressure to a condenser where heat is removed causing the refrigerant to condense to a high-pressure liquid state. The liquid is forced through a capillary tube 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.

5.3 FLOW DIAGRAM



1. Alu-Dry Module
   - a - Air-to-air heat exchanger
   - b - Air-to-refrigerant exchanger
   - c - Condensate separator
2. Refrigerant pressure-switch P_B (AHT 300-350)
3. T_S safety thermo-switch (AHT 100-350)
4. Refrigerant pressure-switch P_A (AHT 300-350)
5. Refrigerant pressure-switch (fan) P_V
6. Refrigerating compressor
7. Hot gas by-pass valve
8. Condenser Unit
9. Condenser fan
10. Dehydration filter
11. Capillary tube
12. T1 Temperature probe (DewPoint)
13. Condensate drain service valve
14. Y-shaped condensate drain strainer
15. Condensate drain solenoid valve
16. Coil for cond. drain solenoid valve
17. EC = Electronic control instrument

...

26. Aftercooler
27. Aftercooler fan (AHT 75-350)
28. Pre-Filter (FTP Series - 3 micron)
29. Pre-Filter condensate drain solenoid valve
30. Pre-Filter coil for condensate drain solenoid valve

→ Compressed air flow direction

⇨ Refrigerating gas flow direction

5.4 REFRIGERATING COMPRESSOR

The refrigerating compressor is the pump of the system where the gas coming from the evaporator (low pressure side) is compressed up to the condensation pressure (high pressure side). All the compressors used are manufactured by primary companies and are designed for applications where high compression ratios and wide temperature changes are present.

The fully sealed construction is perfectly gas tight, so ensuring high-energy efficiency and long useful life. The pumping unit is supported by dumping springs, in order to consistently reduce the acoustic emission and the vibration diffusion. The electric motor is cooled down by the aspirated refrigerating gas, which goes through the coils before reaching the compression cylinders. The internal thermal protection protects the compressor from overheating and overcurrents. The protection is automatically restored as soon as the nominal temperature conditions are reached.

5.5 CONDENSER

The condenser is the element in which the gas coming from the compressor is cooled down and condensed becoming a liquid. Mechanically, it is formed by a copper tubing circuit (with the gas flowing inside) immersed in an aluminium blades package.
The cooling operation occurs via a high efficiency axial ventilator which, in applying pressure on the air contained within the dryer, forces it into the blades package.
It is mandatory that the temperature of the ambient air will not exceed the nominal values. It is important **TO KEEP THE UNIT FREE FROM DUST AND OTHER IMPURITIES**.

5.6 AFTERCOOLER

The aftercooler is the element where the incoming hot air undergoes the cooling stage. Mechanically, it is formed by a copper tubing circuit (with the compressed air flowing inside) immersed in an aluminium blades package. The cooling operation occurs via a high efficiency axial ventilator which, in applying pressure on the air contained within the dryer, forces it into the blades package. In models AHT 20-50 the aftercooler is combined with the dryer's condenser, thus forming just one heat exchanger battery, cooled by just one high efficiency axial fan.
It is mandatory that the temperature of the ambient air will not exceed the nominal values of the dryer. It is important **TO KEEP THE UNIT FREE FROM DUST AND OTHER IMPURITIES** taken in by the fan.

5.7 PRE-FILTER (FTP Series - 3 micron)

Positioned at the outlet of the aftercooler, it assures a good air cleanliness level, in addition to the complete removal of the water condensed in the aftercooler. **REPLACE THE FILTERING ELEMENT (CARTRIDGE) AT LEAST EVERY 12 MONTHS.**

5.8 DEHYDRATION FILTER

Traces of humidity and slag which could accumulate inside the chilling plant, or smudge which could occur after a long use of the dryer, could limit the lubrication of the compressor and clog the capillary tube. The function of the dehydration filter, located before the capillary tubing, is to stop the impurities, so avoiding their circulation within the system.

5.9 CAPILLARY TUBE

It consists of a piece of reduced cross section copper tubing located between the condenser and the evaporator to form a throttling against the flow of the refrigerating fluid. This throttling creates a pressure drop, which is a function of the temperature to be reached within the evaporator: the lower the capillary tube outlet pressure, the lower the evaporation temperature. The length and the diameter of the capillary tubing are accurately sized with the performance to be reached by the dryer; no maintenance/adjustment operations are necessary.

5.10 ALU-DRY MODULE

The air-to-air and the air-to-refrigerant heat exchangers plus the demister type condensate separator are housed in a unique module.

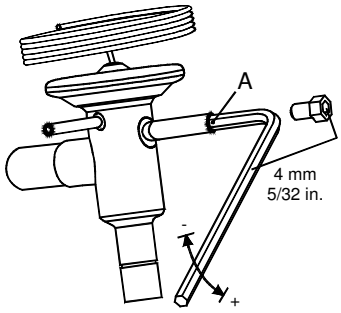
The counter-flows of compressed air in the air-to-air heat exchanger ensure maximum heat transfer. The large cross section of flow channels within the heat exchanger module leads to low velocities and reduced power requirements. The air-to-refrigerant exchanger, with counter-current flows, assure excellent performances. The generous dimensions of the exchange surface determines the correct and complete evaporation of the refrigerant (preventing liquid returning to the compressor). The high efficiency condensate separator is located within the drying module. No maintenance is required and it offers the additional advantage of creating a cold coalescing effect for excellent air drying results. The generous collection volume assures the correct operation of the dryer even with extremely damp inlet air.

5.11 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)
Hot gas setting (R404A) :	temperature 33°F (+0.5 / -0 °K) pressure 75.4 psig (+1.45 / -0 psi) temperature 0.5 °C (+0.5 / -0 °K) pressure 5.2 barg (+0.1 / -0 bar)

5.12 REFRIGERANT PRESSURE SWITCH PA - PB - PV

As operation safety and protection of the dryer a series of pressure switches are installed in gas circuit.

PB : Low-pressure controller device on the pushing side (carter) of the compressor, is enabled only if the pressure drops below the pre-set value. The values are automatically reset when the nominal conditions are restored.

Calibrated pressure : R 404 A Stop 14.5 psig - Restart 72.5 psig
R 404 A Stop 1.0 barg - Restart 5.0 barg

PA : This high-pressure controller device, located on the pushing side on the compressor, is activated when the pressure exceeds the pre-set value. It features a manual-resetting button mounted on the controller itself.

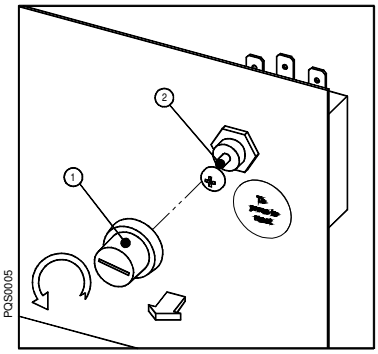
Calibrated pressure : R 404 A Stop 464 psig - Manual reset
R 404 A Stop 32 barg - Manual reset

PV : Fan control pressure switch is placed at the discharge side of refrigeration compressor. It keeps the condensation temperature/pressure constant within preset limits (Air-Cooled).

Calibrated pressure : R 134.a Start 160 psig (117°F) - Stop 116 psig (97°F) - Tolerance ± 14.5 psi
R 134.a Start 11 barg (47°C) - Stop 8 barg (36°C) - Tolerance ± 1 bar

R 404 A Start 290 psig (113°F) - Stop 232 psig (97°F) - Tolerance ± 14.5 psi
R 404 A Start 20 barg (45°C) - Stop 16 barg (36°C) - Tolerance ± 1 bar

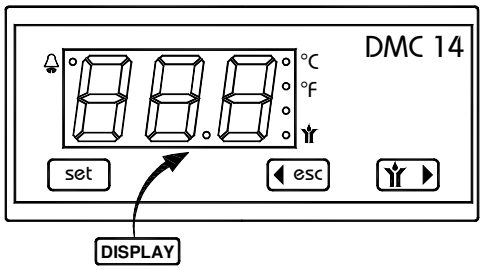
5.13 SAFETY THERMO-SWITCH T_S



To protect the operating safety and the integrity of the dryer, a thermo-switch (T_S) is installed on the refrigerant gas circuit. The thermo-switch sensor, in case of unusual supply temperatures, stops the cooling compressor before it is permanently damaged.

T_S : Manually reset the thermo-switch only after the nominal operating conditions have been restored. Unscrew the relative cap (see pos.1 in the figure) and press the reset button (see pos.2 in the figure).

5.14 DMC14 ELECTRONIC INSTRUMENT (AIR DRYER CONTROLLER)



set Button - access to set-up.
esc Button - exit to set-up / value dencrement.
Button - condensate drain test / value increment.
LED - dryer in alarm condition.
● °C LED - it shows the current temperature scale (°C).
● °F LED - it shows the current temperature scale (°F).
● LED - condensate drain solenoid valve activated.

The DMC14 controller performs a double function : it shows the current operating DewPoint temperature through the alphanumeric display, that is measured by a probe located at the end of the evaporator; it also controls the functioning of condensate drain solenoid valve through the cyclic electronic timer.

The ● LED shows any alarm condition, it can happen when :
- pressure DewPoint is too high;
- pressure DewPoint is too low;
- the probe is faulty.

If the probe is faulty, the instrument also shows “PF” message (Probe Failure), and alarm activation is immediate. In case of “DewPoint too low” condition (ASL parameter, that is fix and equal to 28.5°F or -2°C), the alarm signal is delayed of a fix time (AdL parameter) equal to 30 sec, while for “DewPoint too high” condition the value (ASH parameter) is set by the user and the signal is activated with AdH delay time, that can be also set up by the operator (the instrument is already adjusted during final test of the dryer, please see following values). When DewPoint returns into operating temperature (set range), the alarm condition is deactivated.

DMC14 allows also remote annunciation of the alarm condition of the dryer; this through a volt free contact on terminals 8 & 9 - please also see electric drawings into the attachments (max 250V 1A, min 5VDC 10mA)
- with dryer off or in alarm conditions contact is open
- with dryer on and correct operating DewPoint, contact is closed.

OPERATION - After dryer starting, the electronic controller displays current operating DewPoint : it shows the measured temperature in Celsius degrees (● °C) with a 0.5°C resolution, or in Fahrenheit degrees (● °F) with a 1°F resolution.

The condensate drain solenoid valve is activated for 2 seconds (Ton) - LED (●) on - each minute (ToF), if standard setting. To perform the manual test for the condensate drain, press the button.

SET-UP (PROGRAMMING)

To access the set-up, keep pressed simultaneously both set and button for at least 5 seconds. In this way **programming operation will be activated** and the controller display shows the first parameter that can be set (Ton). After that, by pressing set buttom the display shows the value set for that parameter. If the value is correct press set button to conferm it and to give access on following parameters. To change the value of selected parameter, must be used esc and button, respectively to decrease or increase the value. All parameters that can be modified are indicated in following table :

Display	Description	Value range	Set value	Equal to
Ton	Activation time of the condensate drain solenoid valve.	01 … 20	02	2 sec
ToF	Pause time of the condensate drain solenoid valve.	01 … 20	01	1 min
ASH	Alarm threshold for a high DewPoint .	0.0 … 68.0	60	60°F
AdH	ASH alarm time before signal	00 … 20	20	20 min
SCL	Temperature scale	°C … °F	°F	° Fahrenheit
Fixed parameters :	ASL (low DewPoint alarm) = -2°C or 28.5°F	AdL (signal delay) = 30 sec		

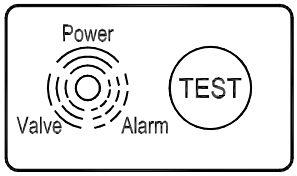
It is possibile to exit from set-up conditon in any moment, by pressing simultaneously both esc and button. If any operations are not made during 30 seconds, the controller exits automatically from programming operation.

5.15 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 checks the level of the liquid: 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 to avoid wasting air. No Y-shaped strainer is installed and no adjusting is required. A service valve is installed before the electronic drain in order to make check and maintenance operation easy.

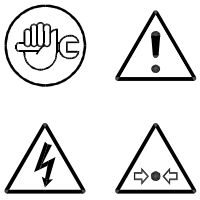
AT DRYER START-UP VERIFY THAT THIS VALVE IS OPEN.

CONTROL PANEL



The control panel here illustrated allows checking of drain working.
Power : LED ON - drain ready to work / supplied
Valve : SLOW BLINKING LED - membrane solenoid valve open / discharging
Alarm : FAST BLINKING LED - drain in alarm condition
Test : button - discharge test (keep pushed for 2 seconds)

TROUBLESHOOTING



Only qualified personnel should perform troubleshooting and or maintenance operations.
Prior to performing any maintenance or service, be sure 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.**
- **Maintenance personnel have read and understand the safety and operation instructions in this manual.**

SYMPTOM	POSSIBLE CAUSE - SUGGESTED ACTION
◆ No led lighting up.	⇨ Verify that the system is powered. ⇨ Verify the electric wiring (internal and/or external). ⇨ 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. ⇨ The dryer is not under pressure - restore nominal condition. ⇨ Solenoid valve defective - replace the drain. ⇨ 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. ⇨ 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. ⇨ The service valve located before the drain is closed - open it. ⇨ The dryer is not under pressure - restore nominal condition. ⇨ 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 SCHEDULE


Only qualified personnel should perform troubleshooting and or maintenance operations.
Prior to performing any maintenance or service, be sure 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.**
- **Maintenance personnel have read and understand the safety and operation instructions in this manual.**


Before attempting any maintenance operation on the dryer, shut it down and wait at least 30 minutes.

Some components can reach high temperature during operation. Avoid contact until system or component has dissipated heat.

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. 2 bar / 30 psig) blowing from inside towards outside clean the condenser; repeat this operation blowing in the opposite way; be careful not to damage the aluminium fins of the cooling package.

- Close the isolation valve for the condensate drain, remove the mechanical filter and clean it with compressed air and a brush. Reinstall the filter, make sure it is secure, and open the isolation 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, inspect unit for broken, cracked or bare wires.
- Inspect refrigerating circuit for signs of oil and refrigerant leakage.
- Measure and record amperage. Verify that readings are within acceptable parameters as listed in specification table.
- Inspect condensate drain flexible hoses, and replace if necessary.
- At the end, check the operation of the machine.

6.2 TROUBLESHOOTING


Only qualified personnel should perform troubleshooting and or maintenance operations.
Prior to performing any maintenance or service, be sure 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.**
- **Maintenance personnel have read and understand the safety and operation instructions in this manual.**

Before attempting any maintenance operation on the dryer, shut it down and wait at least 30 minutes.
Some components can reach high temperature during operation. Avoid contact until system or component has dissipated heat.

SYMPTOM	POSSIBLE CAUSE - SUGGESTED ACTION
◆ The dryer doesn't start.	⇨ Verify that the system is powered. ⇨ Verify the electric wiring.
◆ The compressor doesn't work.	⇨ Activation of the compressor internal thermal protection - wait for 30 minutes, then retry. ⇨ Verify the electric wiring. ⇨ **Where installed**- Replace the internal thermal protection and/or the start-up relay and/or the start-up capacitor and/or the working capacitor. ⇨ **Where installed-** The P_A pressure switch has been activated - see specific point. ⇨ **Where installed-** The P_B pressure switch has been activated - see specific point. ⇨ **Where installed-** The T_S safety thermo-switch has been activated - see specific point. ⇨ If the compressor still doesn't work, replace it.
◆ The condenser fan doesn't work .	⇨ Verify the electric wiring. ⇨ P_V pressure switch is faulty - replace it. ⇨ If the fan still doesn't work, replace it.
◆ **AHT 75-350-** The Aftercooler fan doesn't work.	⇨ Verify the electric wiring. ⇨ If the fan still doesn't work, replace it.
◆ DewPoint too high.	⇨ The dryer doesn't start - see specific point. ⇨ The T1 DewPoint probe doesn't correctly detect the temperature - ensure the sensor is pushed into the bottom of copper tube immersion well. ⇨ The refrigerating compressor doesn't work - see specific point. ⇨ The ambient temperature is too high or the room aeration is insufficient - provide proper ventilation. ⇨ The inlet air is too hot - restore the nominal conditions. ⇨ The inlet air pressure is too low - restore the nominal conditions. ⇨ The inlet air flow rate is higher than the rate of the dryer - reduce the flow rate - restore the normal conditions. ⇨ The condenser unit is dirty - clean it. ⇨ The aftercooler is dirty - clean it. ⇨ The condenser fan doesn't work - see specific point. ⇨ The aftercooler fan doesn't work - see specific point. ⇨ The dryer doesn't drain the condensate - see specific point. ⇨ The hot gas by-pass valve is out of setting - contact a refrigeration engineer to restore the nominal setting. ⇨ There is a leak in the refrigerating fluid circuit - contact a refrigeration engineer.
◆ DewPoint too low.	⇨ The condenser fan is always ON - P_V pressure switch is faulty. ⇨ The hot gas by-pass valve is out of setting - contact a refrigeration engineer to restore the nominal setting.

◆ Excessive pressure drop within the dryer.	⇨ The Pre-Filter (FTP Series - 3 micron) is clogged - replace the filter element (cartridge) - Refer to the instructions in the user's and maintenance manual of the filter. ⇨ The dryer doesn't drain the condensate - see specific point. ⇨ The DewPoint is too low - the condensate is frost and blocks the air - see specific point. ⇨ Check for throttling the flexible connection hoses.
◆ The dryer doesn't drain the condensate.	⇨ The condensate drain service valve is closed - open it. ⇨ The condensate drain strainer is clogged - remove and clean it. ⇨ The drain solenoid valve is jammed - remove and clean it. ⇨ Verify the electric wiring. ⇨ The coil of the condensate drain solenoid valve burned out - replace it. ⇨ 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. ⇨ 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. ⇨ **Where installed-** Untreated air flows through the by-pass unit - close the by-pass. ⇨ The dryer doesn't drain the condensate - see specific point. ⇨ DewPoint too high - see specific point.
◆ **Where installed-** The P_A high-pressure switch has been activated.	⇨ Check which of the following has caused the activation : 1. The ambient temperature is too high or the room aeration is insufficient - provide proper ventilation. 2. The condenser unit is dirty - clean it. 3. The aftercooler is dirty - clean it. 4. The condenser fan doesn't work - see specific point. 5. The aftercooler fan doesn't work - see specific point. ⇨ Reset the pressure-switch pressing the button on the controller itself - verify the dryer for correct operation. ⇨ The P_A pressure switch is faulty - contact a refrigeration engineer to replace it.
◆ **Where installed-** The P_B low-pressure switch has been activated.	⇨ There is a leak in the refrigerating fluid circuit - contact a refrigeration engineer. ⇨ The pressure switch restores automatically when normal conditions are restored - check the proper operation of the dryer.
◆ **Where installed -** The T_S safety thermo-switch has been activated.	⇨ Check which of the following has caused the activation : 1. Excessive thermal load - restore the standard operating conditions. 2. The inlet air is too hot - restore the nominal conditions. 3. The ambient temperature is too high or the room aeration is insufficient - provide proper ventilation. 4. The condenser unit is dirty - clean it. 5. The aftercooler is dirty - clean it. 6. The condenser fan doesn't work - see specific point. 7. The aftercooler fan doesn't work - see specific point. 8. There is a leak in the refrigerating fluid circuit - contact a refrigeration engineer. ⇨ Reset the thermo-switch by pressing the button on the thermo-switch itself - verify the correct operation of the dryer (also see par. 5.14). ⇨ The T_S thermo-switch is faulty - replace it.
◆ **DMC14-** The LED 🔔 ● of the instrument is on or flashes to indicate alarm situations.	⇨ The LED 🔔 ● flashes because the DewPoint is too high - see specific point. ⇨ The LED 🔔 ● flashes because the DewPoint is too low - see specific point. ⇨ The LED 🔔 ● flashes because the probe is faulty or interrupted, the instrument displays the message "PF" (Probe Failure) - replace the probe.

6.3 SUGGESTED SPARE 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 be worked out by a refrigerating systems specialist or in our factory.

			AHT 115/1/60						
No.	**DESCRIPTION OF THE SPARE PARTS**	**CODE**	**20**	**30**	**40**	**50**	**75**	**100**	**150**
3	T_S safety thermo-switch	56141NN005							1
4	Refrigerant gas pressure switch P_V	5655NNN160	1	1	1	1	1	1	1
6	Refrigerating compressor (-1) 115/1/60	5015135101	1						
6	Refrigerating compressor (-1) 115/1/60	5015135103		1					
6	Refrigerating compressor (-1) 115/1/60	5015135105			1				
6	Refrigerating compressor (-1) 115/1/60	5015135007				1			
6	Refrigerating compressor (-1) 115/1/60	5015135011					1	1	
6	Refrigerating compressor (-1) 115/1/60	5030135005							1
8	Hot gas by-pass valve	64140SS150	1	1	1	1	1	1	
8	Hot gas by-pass valve	64140SS155							1
9.01	Fan motor (-1) 115/1/60	5210135010					1		
9.01	Fan motor (-1) 115/1/60	5210135015	1	1	1	1			
9.02	Fan blade	5210135020						1	1
9.02	Fan blade	5215000022	1	1	1	1			
9.02	Fan blade	5215000019					1		
9.02	Fan blade	5215000025						1	1
9.03	Fan grid	5225000015	1	1	1	1			
9.03	Fan grid	5225000010					1		
9.03	Fan grid	5225000027						1	1
10	Dehydration filter	6650SSS007	1	1	1	1	1	1	
10	Dehydration filter	6650SSN150							1
12	Temp. probe DMC14 (T1)	5625NNN035	1♦	1♦	1♦	1♦	1♦	1♦	1♦
13+14	Condensate drain valve/strainer	64355MN012	1	1	1	1	1		
14	Y-type condensate drain strainer	64355FF011						1	1
15	Condensate drain solenoid valve	64320FF081	1♦	1♦	1♦	1♦	1♦	1♦	1♦
16	Coil for cond. drain solenoid valve 115V	64N22MM002	1♦	1♦	1♦	1♦	1♦	1♦	1♦
17	DMC14 Electronic Instrument 115V	5620130103	1♦	1♦	1♦	1♦	1♦	1♦	1♦
21	Electronic drain (-1) 115/1/60	2210BEK001P	1	1	1	1	1	1	
21	Electronic drain (-1) 115/1/60	2210BEK002P							1
22	Main switch 2P 0/1	5450SZN010	1	1	1	1	1	1	
22	Main switch 2P 0/1 Cover	5450SZN015	1	1	1	1	1	1	
22	Main switch 2P 0/1 Cover	5450SZN117							1
27.01.00	Fan motor - Aftercooler (-1) 115/1/60	5210135020					1	1	
27.01.00	Fan motor - Aftercooler (-1) 115/1/60	5210135021							1
27.02.00	Fan blade - Aftercooler	5215000022					1		
27.02.00	Fan blade - Aftercooler	5215000025						1	
27.03.00	Fan blade - Aftercooler	5215000032							1
27.03.00	Fan grid - Aftercooler	5225000015					1		
27.03.00	Fan grid - Aftercooler	5225000025						1	1
28.01.00	Cartridge for FTP 30 Pre-Filter	TP30	1	1					
28.01.00	Cartridge for FTP 45 Pre-Filter	TP45			1	1			
28.01.00	Cartridge for FTP 125 Pre-Filter	TP125					1	1	
28.01.00	Cartridge for FTP 200 Pre-Filter	TP200							1
29	Pre-Filter condensate drain solenoid valve	64320FF081	1	1	1	1	1	1	1
30	Pre-Filter coil x cond. drain solenoid valve 115V	64N22MM002	1	1	1	1	1	1	1

			AHT 230/1/60						
No.	**DESCRIPTION OF THE SPARE PARTS**	**CODE**	**20**	**30**	**40**	**50**	**75**	**100**	**150**
3	T_S safety thermo-switch	56141NN005							1
4	Refrigerant gas pressure switch P_V	5655NNN160	1	1	1	1	1	1	1
6	Refrigerating compressor (-2)	5015110101	1						
6	Refrigerating compressor (-2)	5015110104		1					
6	Refrigerating compressor (-2)	5015110107			1				
6	Refrigerating compressor (-2)	5015110113				1			
6	Refrigerating compressor (-2)	5015115011					1	1	
6	Refrigerating compressor (-2)	5030115005							1
8	Hot gas by-pass valve	64140SS150	1	1	1	1	1	1	
8	Hot gas by-pass valve	64140SS155							1
9.01	Fan motor (-2)	5210110012					1		
9.01	Fan motor (-2)	5210110018	1	1	1	1		1	1
9.02	Fan blade	5215000022	1	1	1	1			
9.02	Fan blade	5215000019					1		
9.02	Fan blade	5215000025						1	1
9.03	Fan grid	5225000010					1		
9.03	Fan grid	5225000015	1	1	1	1			
9.03	Fan grid	5225000027						1	1
10	Dehydration filter	6650SSS007	1	1	1	1	1	1	
10	Dehydration filter	6650SSN150							1
12	Temp. probe DMC14 (T1)	5625NNN035	1♦	1♦	1♦	1♦	1♦	1♦	1♦
13+14	Condensate drain valve/strainer	64355MN012	1	1	1	1	1		
14	Y-type condensate drain strainer	64355FF011						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	DMC14 Electronic Instrument	5620110103	1♦	1♦	1♦	1♦	1♦	1♦	1♦
21	Electronic drain (-1)	2210BEK001A	1	1	1	1	1	1	
21	Electronic drain (-1)	2210BEK002A							1
22	Main switch 2P 0/1	5450SZN010	1	1	1	1	1	1	1
22	Main switch 2P 0/1 Cover	5450SZN015	1	1	1	1	1	1	1
22	Main switch 2P 0/1 Cover	5450SZN117							1
27.01.00	Fan motor - Aftercooler (-2)	5210110018					1	1	
27.01.00	Fan motor - Aftercooler (-2)	5210110022							1
27.02.00	Fan blade - Aftercooler	5215000022					1		
27.02.00	Fan blade - Aftercooler	5215000025						1	
27.03.00	Fan blade - Aftercooler	5215000032							1
27.03.00	Fan grid - Aftercooler	5225000015					1		
27.03.00	Fan grid - Aftercooler	5225000025						1	1
28.01.00	Cartridge for FTP 30 Pre-Filter	TP30	1	1					
28.01.00	Cartridge for FTP 65 Pre-Filter	TP45			1	1			
28.01.00	Cartridge for FTP 125 Pre-Filter	TP125					1	1	
28.01.00	Cartridge for FTP 200 Pre-Filter	TP200							1
29	Pre-Filter condensate drain solenoid valve	64320FF080	1	1	1	1	1	1	1
30	Pre-Filter coil x cond. drain solenoid valve	64N22MM002	1	1	1	1	1	1	1

			AHT 230/1/60			
No.	***DESCRIPTION OF THE SPARE PARTS***	**CODE**	**200**	**250**	**300**	**350**
2	Refrigerant gas pressure switch P_B	5655NNN085			1	1
3	T_S safety thermo-switch	56141NN005	1	1	1	1
4	Refrigerant gas pressure switch P_A	5655NNN087			1	1
5	Refrigerant gas pressure switch P_V	5655NNN160	1	1		
5	Refrigerant gas pressure switch P_V	5655NNN170			1	1
6	Refrigerating compressor	5030115015	1			
6	Refrigerating compressor	5030115020		1		
6	Refrigerating compressor	5030115025			1	1
7	Hot gas by-pass valve	64140SS155	1	1	1	1
9.1	Fan motor (Condenser)	5210110022	1			
9.2	Fan blade (Condenser)	5215000035	1			
9.3	Fan grid (Condenser)	5225000030	1			
9	Complete fan	5250110100		1	1	
9	Complete fan	5250115005				1
10	Dehydration filter	6650SSN160	1	1	1	1
12	Temp. probe DMC14 (T1)	5625NNN035	1♦	1♦	1♦	1♦
14	Y-type condensate drain strainer	64355FF011	1	1	1	1
15	Condensate drain solenoid valve	64320FF082	1♦	1♦	1♦	1♦
16	Coil for cond. drain solenoid valve	64N22MM003	1♦	1♦	1♦	1♦
17	DMC14 Electronic Instrument	5620110103	1♦	1♦	1♦	1♦
21	Electronic drain	2210BEK002P	1	1	1	1
22	Main switch	5450SZN117	1	1	1	1
27	Complete fan (Aftercooler)	5250115005	1	1		
27	Complete fan (Aftercooler)	5250110110			1	1
28.1	Cartridge for FTP 200 Pre-Filter	TP200	1			
28.1	Cartridge for FTP 300 Pre-Filter	TP300		1	1	
28.1	Cartridge for FTP 450 Pre-Filter	TP450				1
29	Pre-Filter condensate drain solenoid valve	64320FF082	1	1	1	1
30	Pre-Filter coil x condensate drain solenoid valve	64N22MM003	1	1	1	1

♦ Suggested spare part.

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

6.4 MAINTENANCE OPERATION ON THE REFRIGERATING CIRCUIT

Maintenance and service on refrigerating systems must be carried out only by certified refrigerating 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 refrigerating engineers. Room is to be aired before any intervention.
If is required to re-fill the refrigerating circuit, contact a certified refrigerating 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, R134.a, Oil
Canopy and Supports	Carbon steel, Epoxy paint
Refrigerating compressor	Steel, Copper, Aluminium, Oil
Alu-Dry Module	Aluminium
Condenser Unit	Aluminium, Copper, Carbon steel
Aftercooler	Aluminium, Copper, Carbon steel
Pipe	Copper
Fan	Aluminium, Copper, Steel
Valve	Brass, Steel
Electronic Level Drain (optional)	PVC, Aluminium, Steel
Insulation Material	Synthetic rubber without CFC, Polystyrene, Polyurethane
Electric cables	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 AHT 20-50 Dryers Dimensions
7.1.2 AHT 75 Dryers Dimensions
7.1.3 AHT 100 Dryers Dimensions
7.1.4 AHT 150 Dryers Dimensions
7.1.5 AHT 200-250 Dryers Dimensions
7.1.6 AHT 300-350 Dryers Dimensions

7.2 EXPLODED VIEW

7.2.1 Exploded view of Dryers AHT 20-50
7.2.2 Exploded view of Dryers AHT 75
7.2.3 Exploded view of Dryers AHT 100
7.2.4 Exploded view of Dryers AHT 150
7.2.5 Exploded view of Dryers AHT 200-250
7.2.6 Exploded view of Dryers AHT 300-350

Exploded view table of components - Dryers AHT 20-350

(1) Alu-Dry Module
1.1 Insulation Material
(2) Refrigerant pressure-switch P_B (AHT 300-350)
(3) T_S safety thermo-switch (AHT 100-350)
(4) Refrigerant pressure-switch P_A (AHT 300-350)
(5) Refrigerant pressure-switch (fan) P_V
(6) Refrigerating compressor
(7) Hot gas by-pass valve
(8) Condenser Unit
(9) Condenser fan
9.1 Motor
9.2 Blade
9.3 Grid
(10) Dehydration filter
(11) Capillary tube
(12) T1 Temperature probe (DewPoint)
(13) Condensate drain service valve
(14) Y-shaped condensate drain strainer
(15) Condensate drain solenoid valve
(16) Coil for cond. drain solenoid valve
(17) Electronic control instrument
...
(21) Electronic level drain
(22) Main switch
...
(26) Aftercooler
(27) Aftercooler fan (AHT 75-350)
27.1 Motor
27.2 Blade
27.3 Grid
(28) Pre-Filter (FTP Series - 3 micron)
(29) Pre-Filter condensate drain solenoid valve
(30) Pre-Filter coil for cond. drain solenoid valve
...
(51) Front panel
(52) Back panel
(53) Right lateral panel
(54) Left lateral panel
(55) Cover
(56) Base plate
(57) Upper plate
(58) Support beam
(59) Support bracket
(60) Control panel
(61) Electric connector
(62) Electric box

7.3 ELECTRIC DIAGRAMS

Electrical Diagram table of components - Dryers AHT 20-350

: Main switch
IG

: Refrigerating compressor
K

: Compressor thermal protection
KT

KR : Compressor starting relay (if installed)
CS : Compressor starting capacitor (if installed)
CR : Compressor operating capacitor (if installed)

Va : Aftercooler fan (Aftercooler - AHT 75-350)
CVA : Aftercooler fan starting capacitor (if installed)

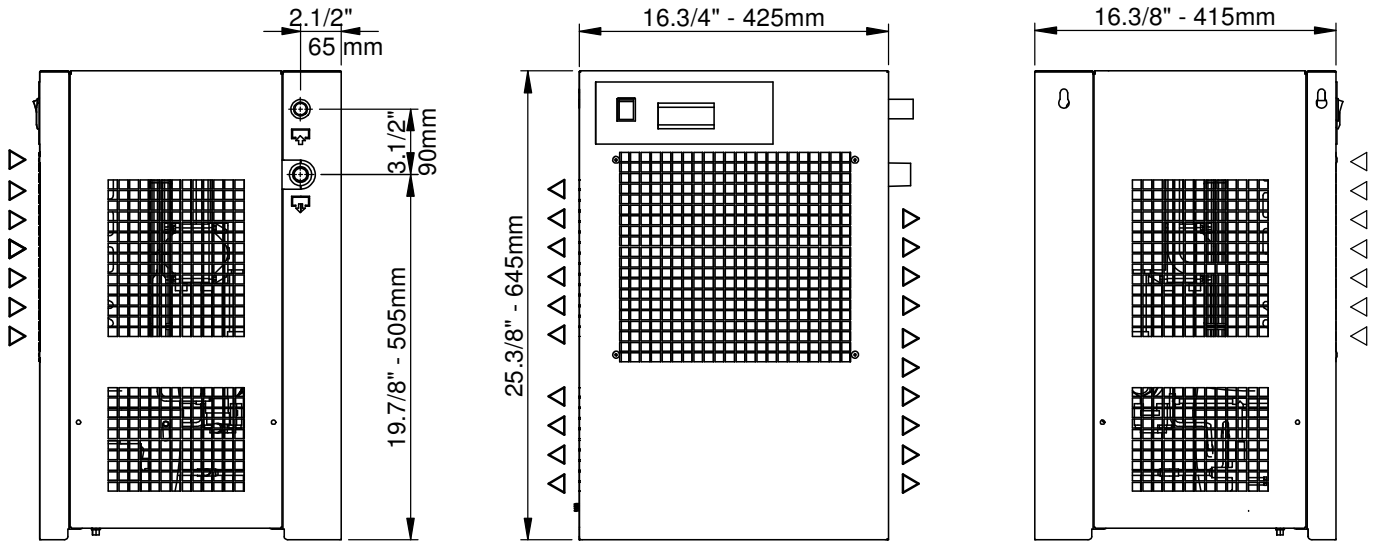
Vc : Condenser fan
CVC : Fan starting capacitor (if installed)

DMC14 : DMC14 Electronic Instrument - Air Dryer Controller
PR : T1 Temperature probe (DewPoint)
PV : Pressure switch - Fan control
PA : Pressure switch - Compressor discharge side - high-pressure (AHT 300-350)
PB : Pressure switch - Compressor suction side - low-pressure (AHT 300-350)
TS : Safety thermo-switch (AHT 100-350)
BOX : Electric box
EVD : Condensate drain solenoid valve
ELD : Electronic level drain

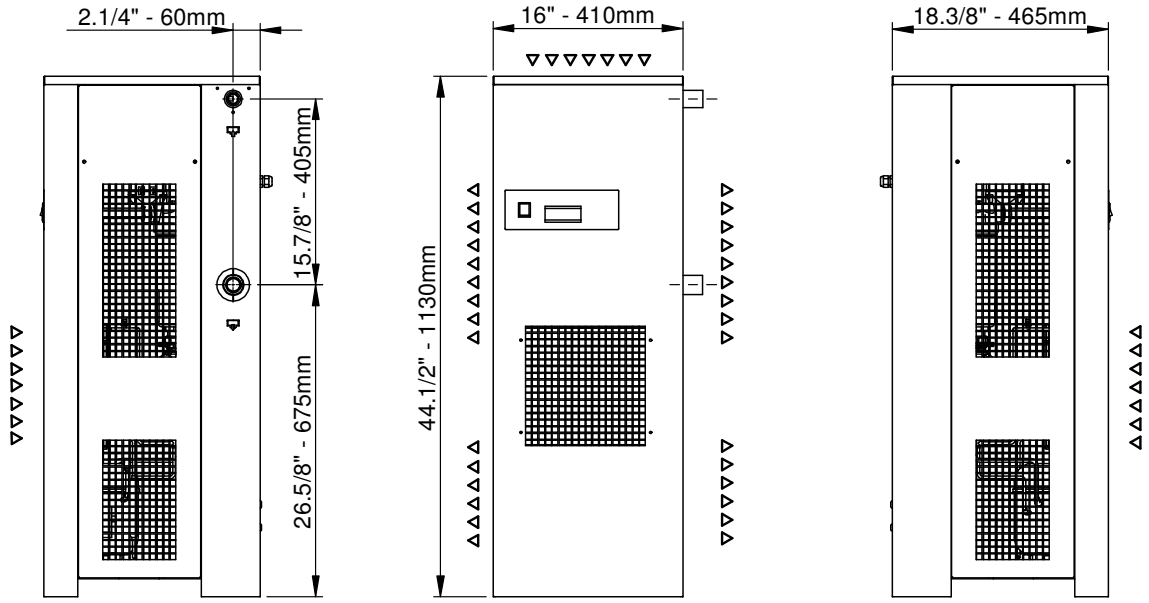
BN = BROWN
BU = BLUE
BK = BLACK
YG = YELLOW/GREEN

GB ATTACHMENTS GB

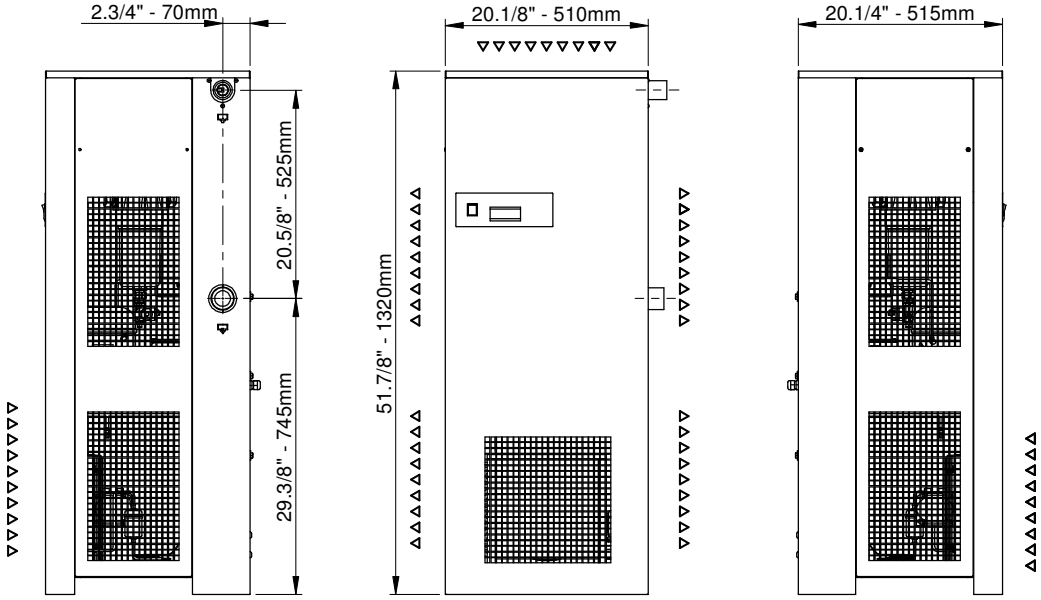
7.1.1 AHT 20-50



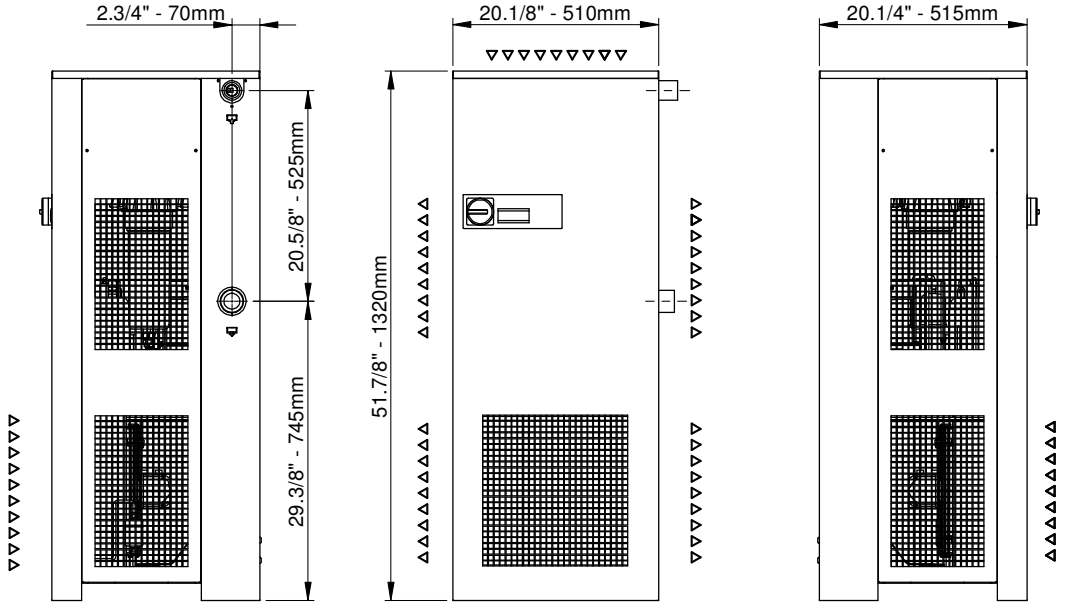
7.1.2 AHT 75



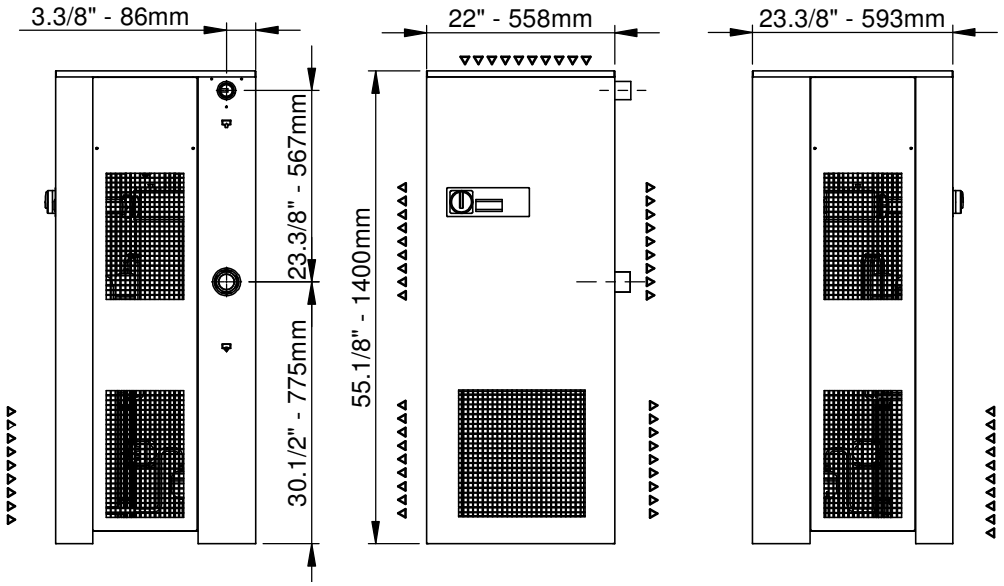
7.1.3 AHT 100



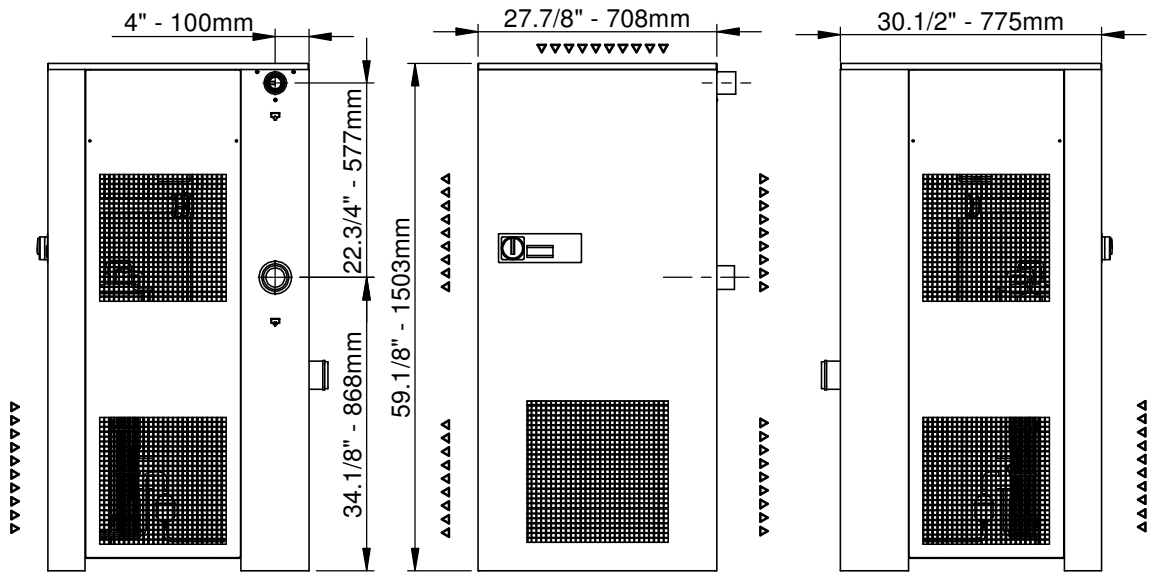
7.1.4 AHT 150



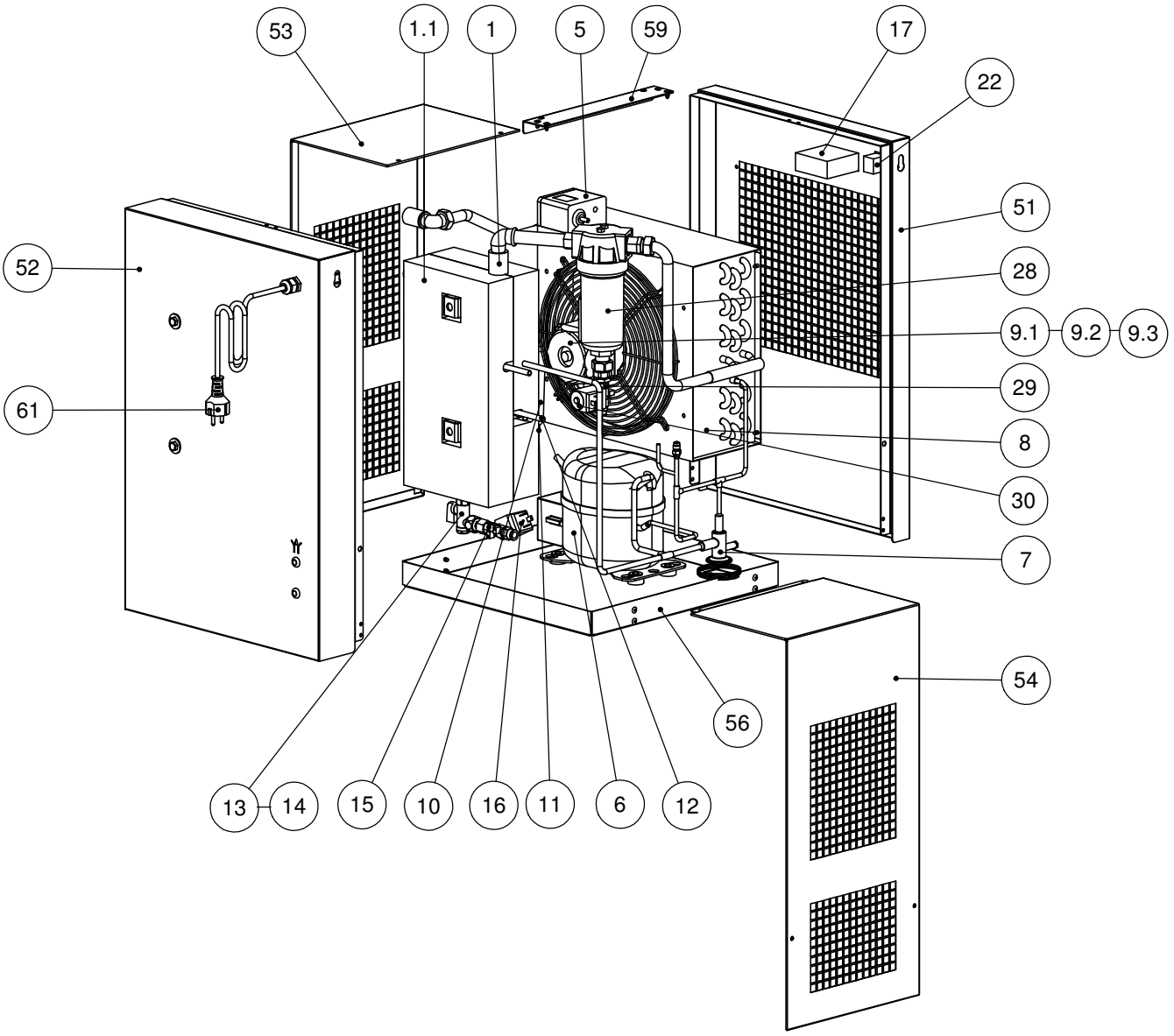
7.1.5 AHT 200-250



7.1.6 AHT 300-350



7.2.1 AHT 20-50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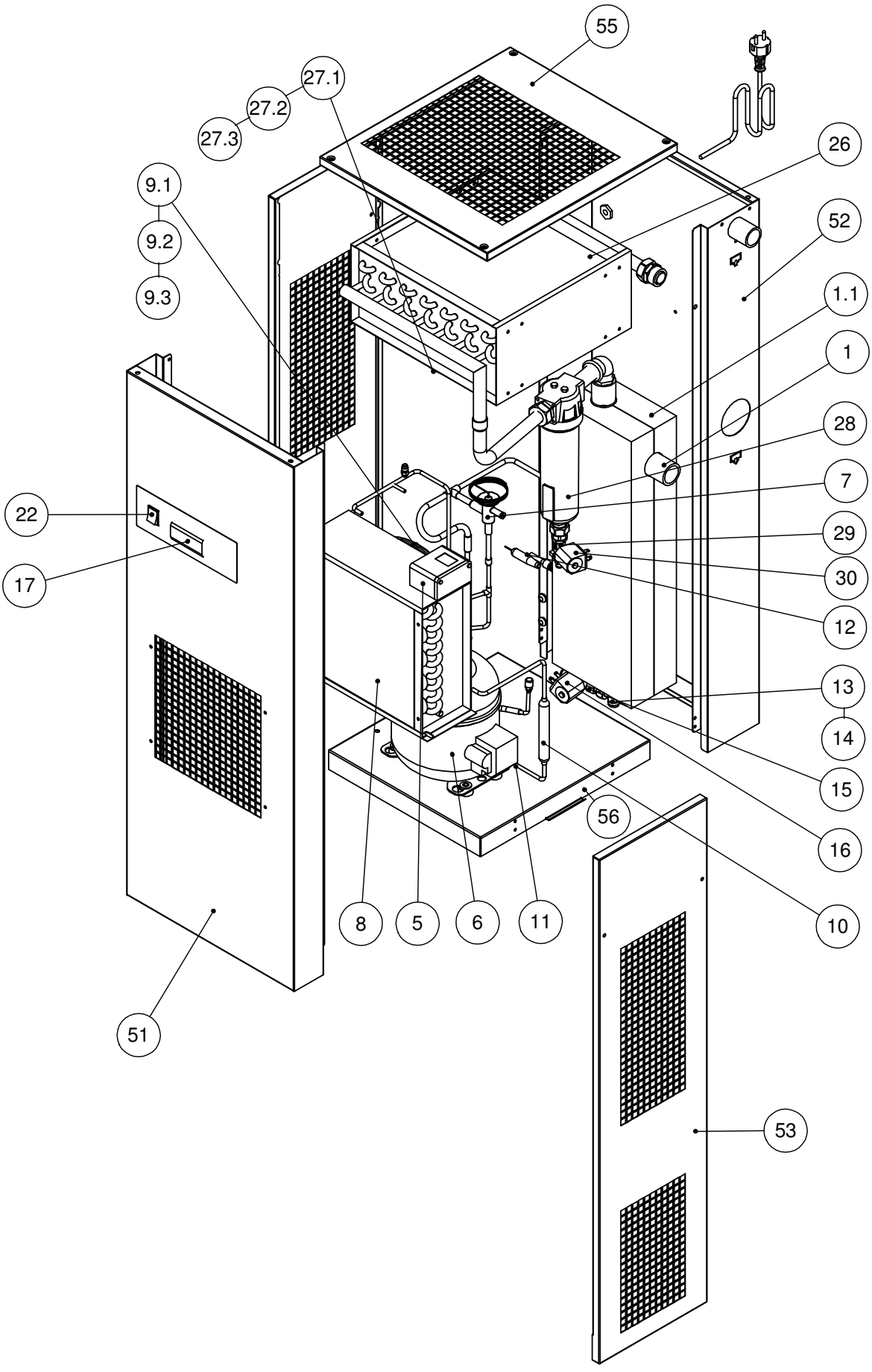
7.2.2 AHT 75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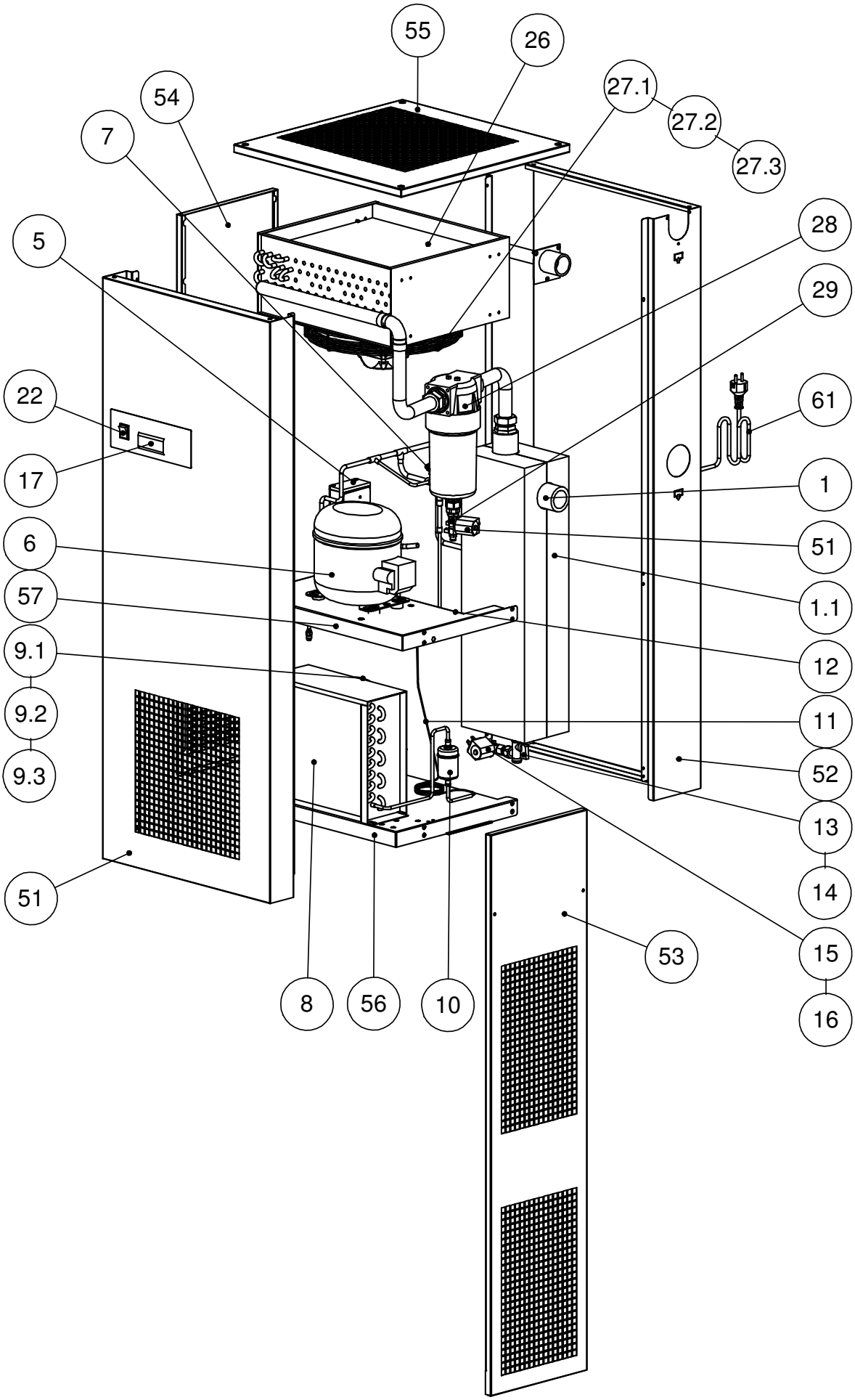
7.2.3 AHT 100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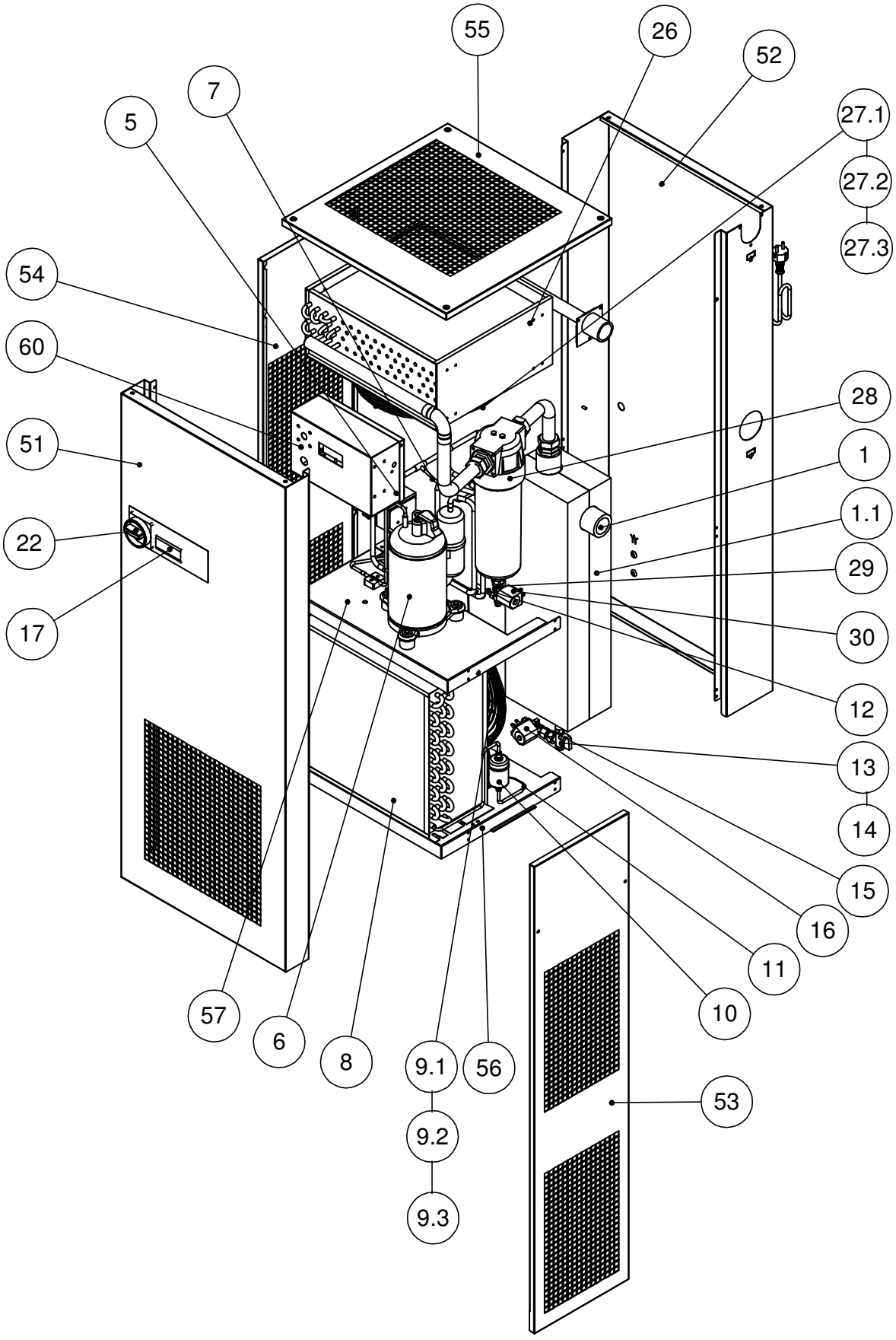
7.2.4 AHT 150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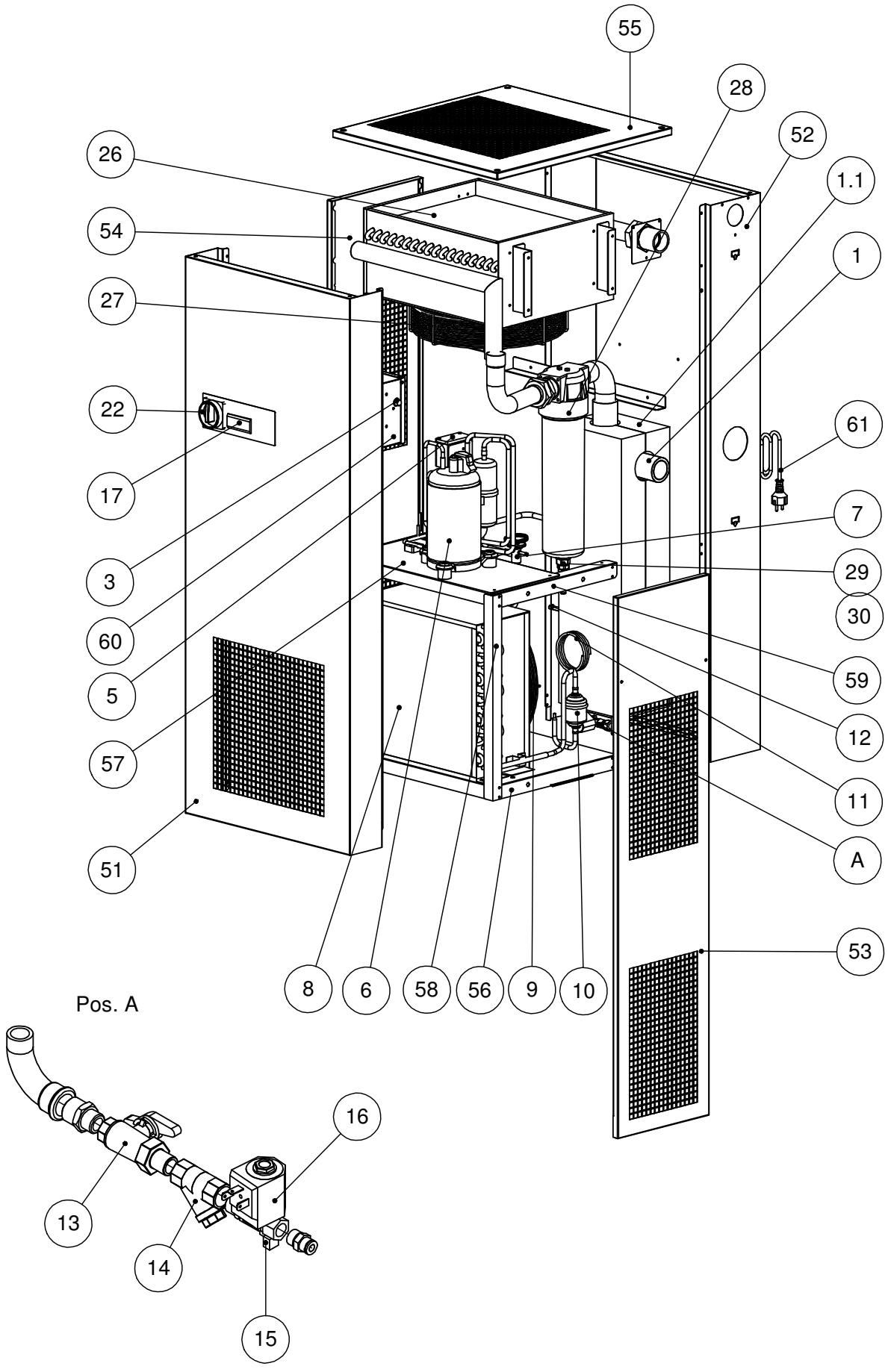
9.2
9.3

7.2.5 AHT 200-250



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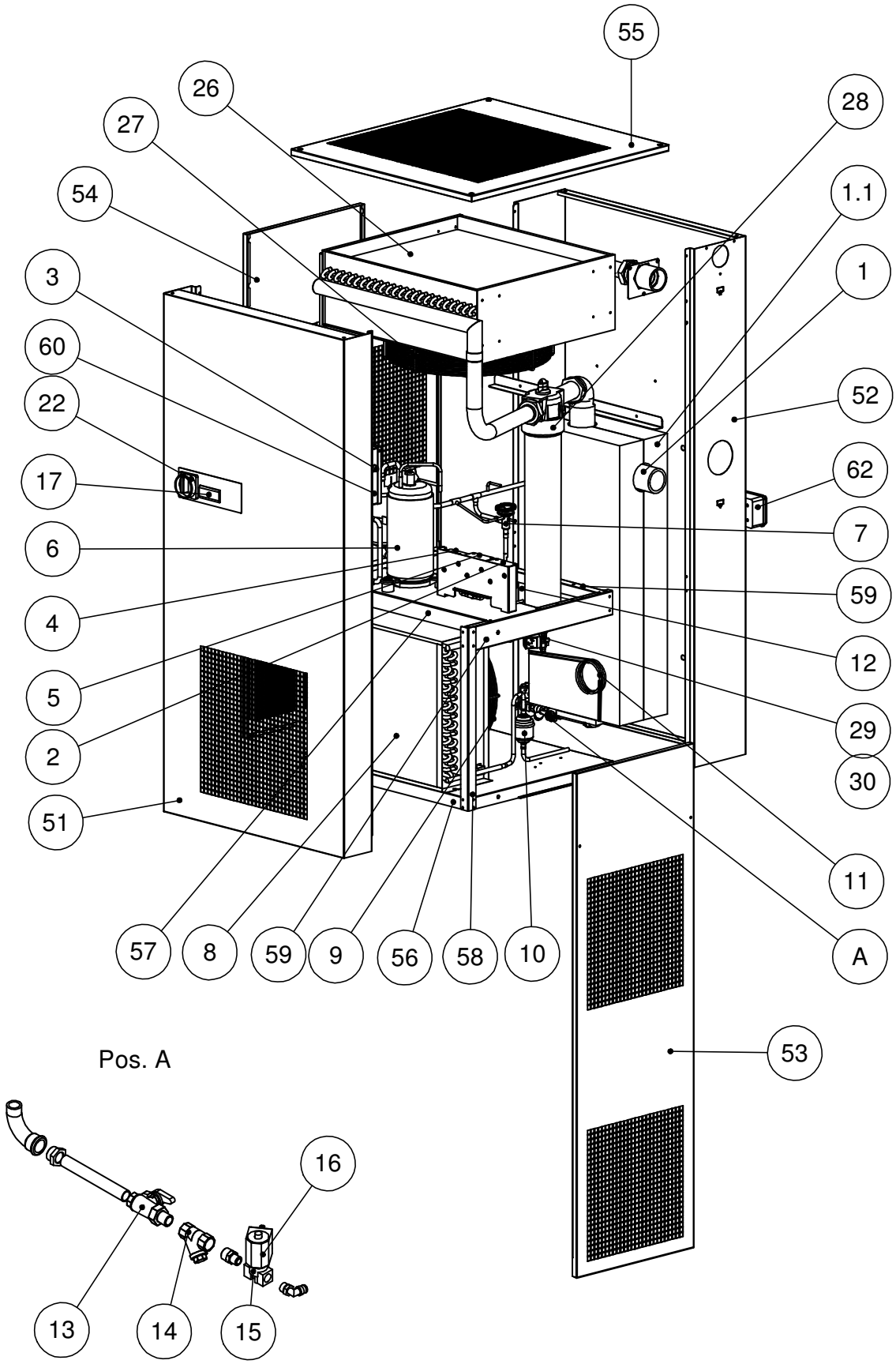
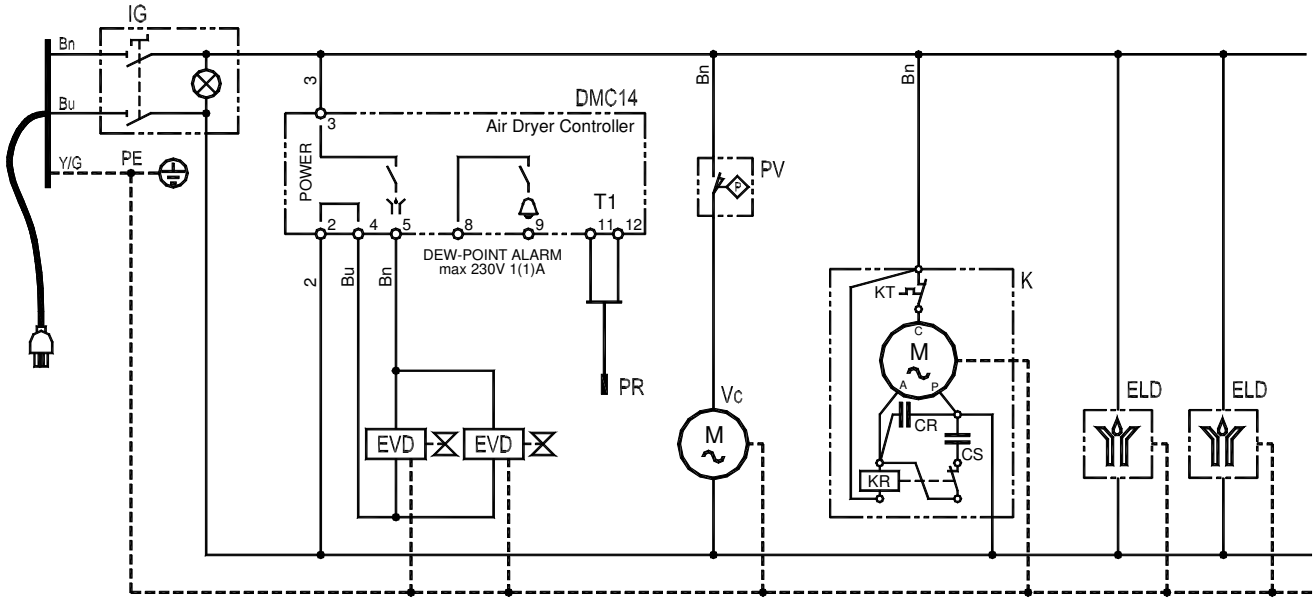
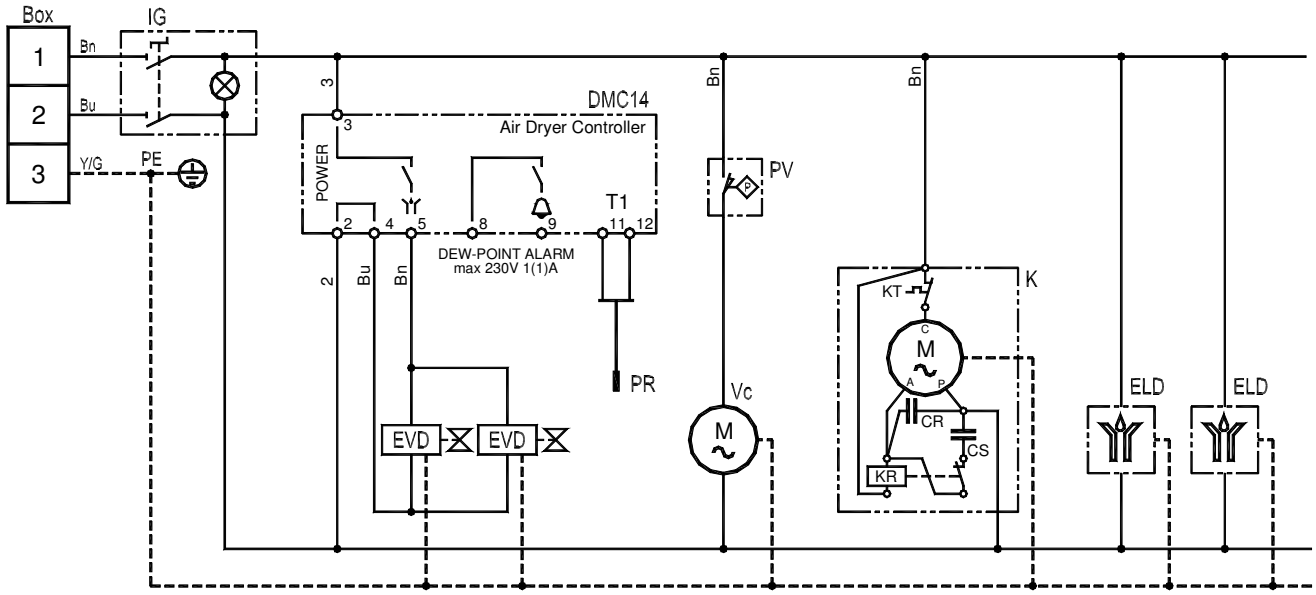


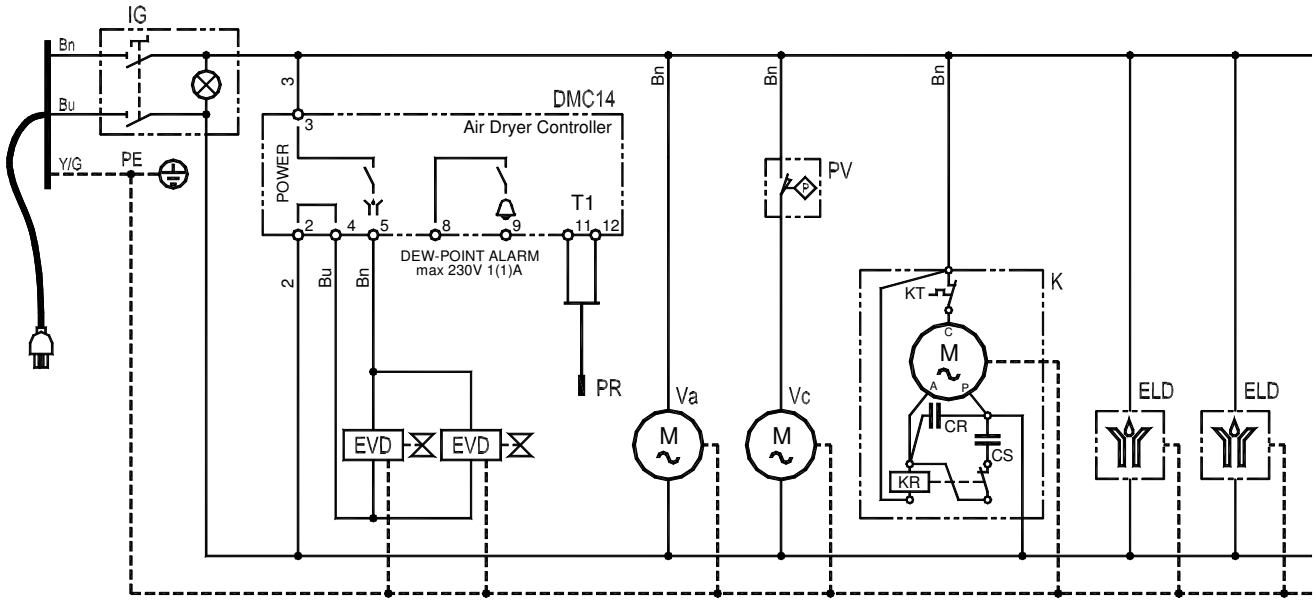
7.3.1 AHT 20-50 (-1) 115/1/60



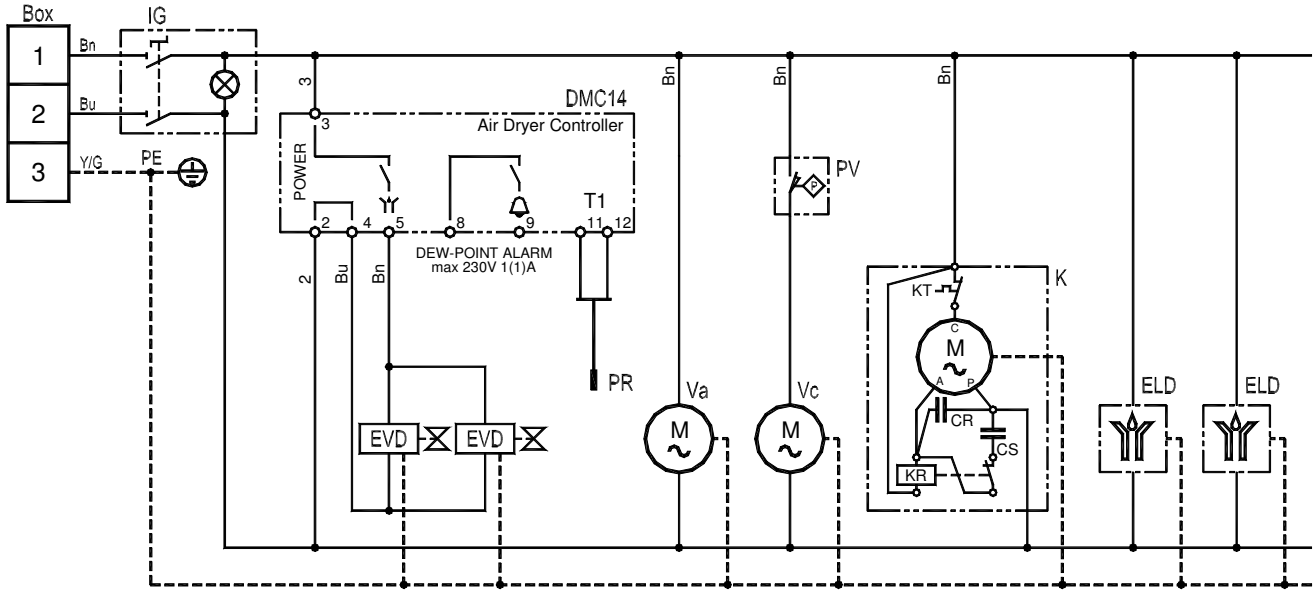
7.3.2 AHT 20-50 (-2) 230/1/60



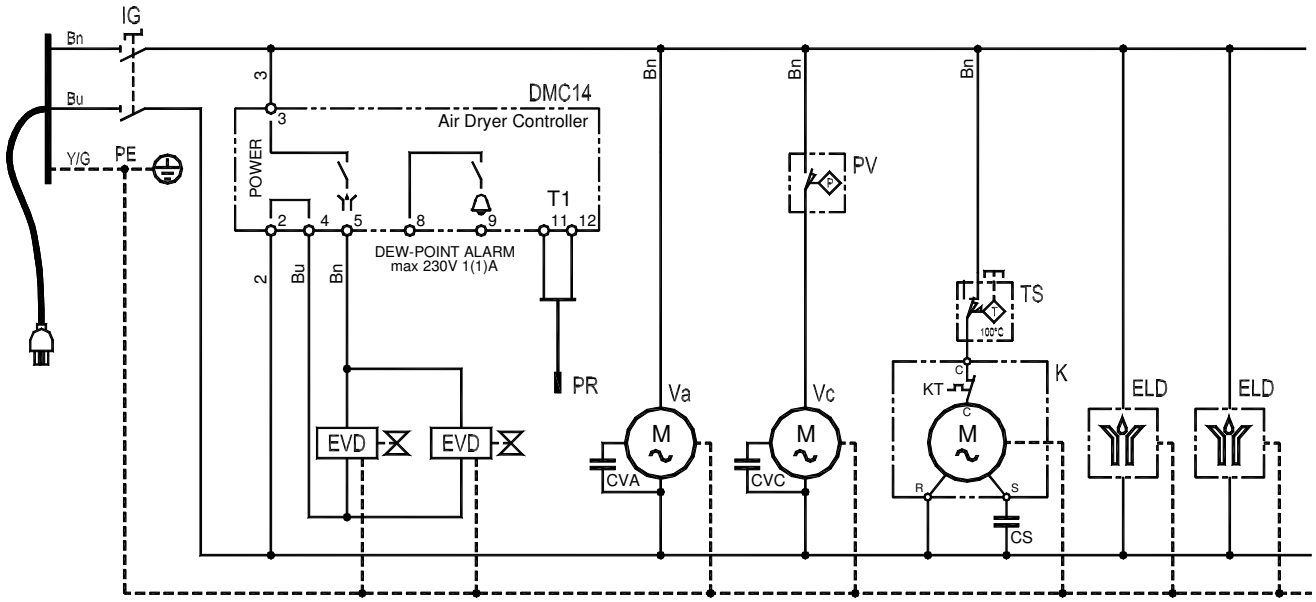
7.3.3 AHT 75-100 (-1) 115/1/60



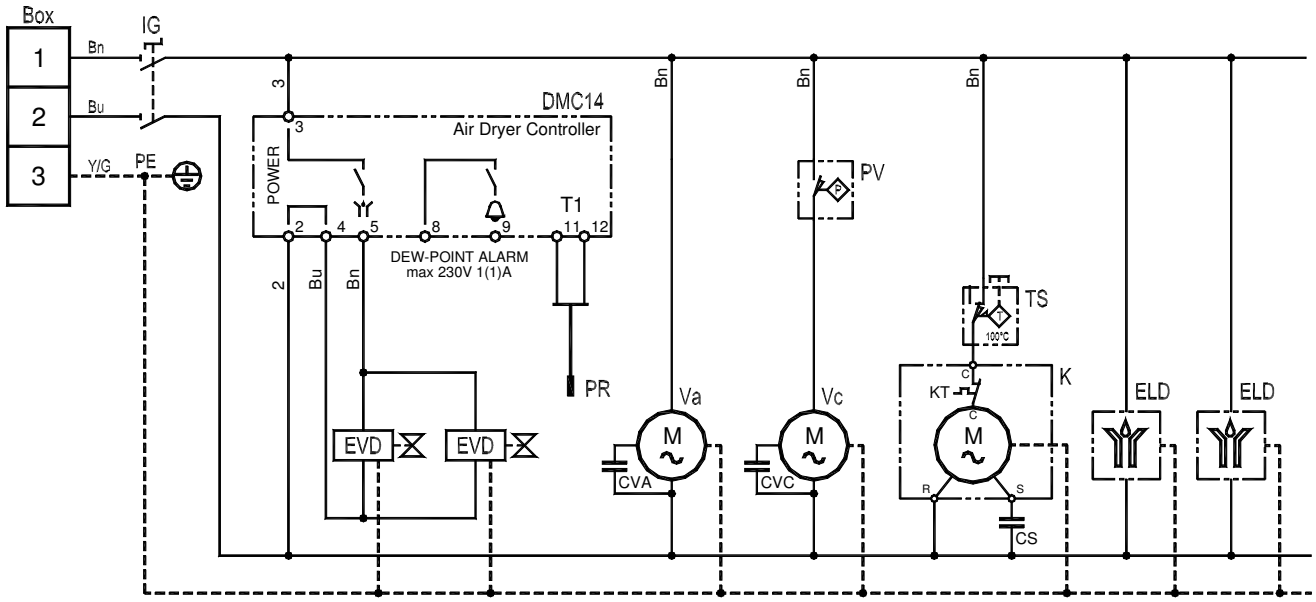
7.3.4 AHT 75-100 (-2) 230/1/60



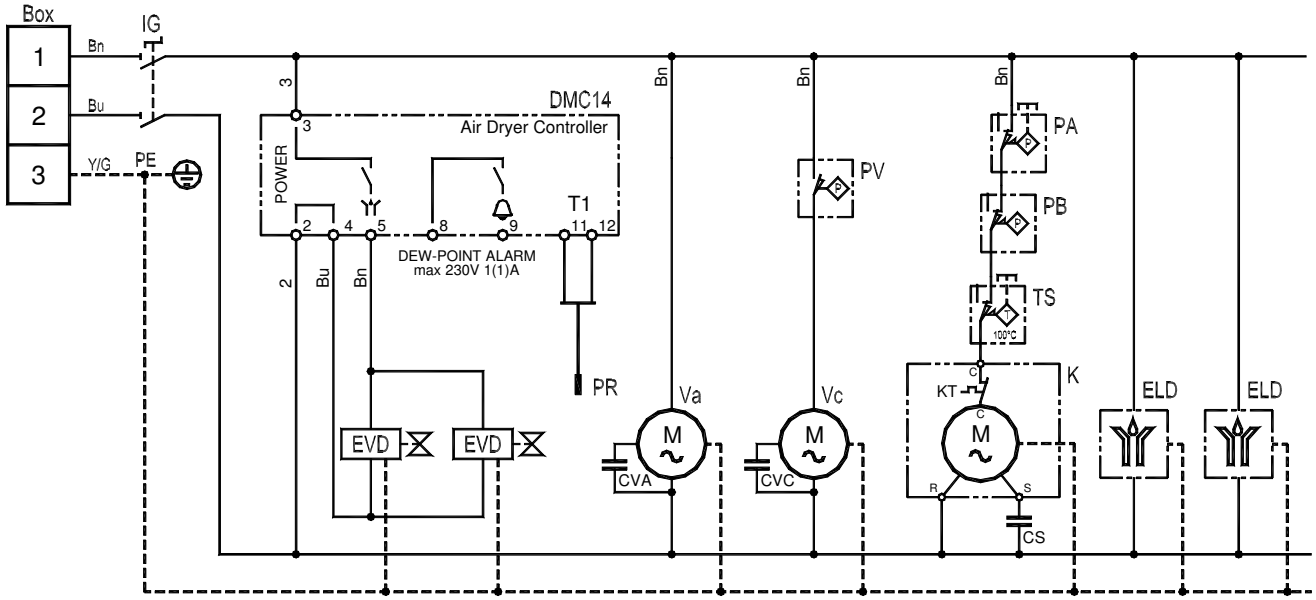
7.3.5 AHT 150 (-1) 115/1/60



7.3.6 AHT 150-250 (-2) 230/1/60



7.3.7 AHT 300-350 (-2) 230/1/60



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