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TFT
DRY AIR SOLUTIONS

ADSORPTION DEHUMIDIFIERS

AIRDRY

AD 100 ÷ 1250 E

ELECTRICAL REGENERATION

TECHNICAL MANUAL

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ISO 9001 BUREAU VERITAS Certification

Models	**AD100E** **AD270E** **AD420E** **AD550E** **AD700E** **AD820E** **AD1250E**
Catalogue	**MTAD012E_EN**
Emission	**06.20**

The machine instructions consist of the following documents:

- Declaration of conformity
- Technical manual
- Wiring diagrams

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1 Preliminary Information

No part of this publication may be reproduced, stored or transmitted in any form without the prior written permission of the Company.
The machine, to which these instructions refer, has been designed for the uses that will be presented in the appropriate paragraphs, compatibly with its performance characteristics. We exclude any contractual or extra-contractual liability of the Company for damages caused to persons, animals or things, by errors of installation, adjustment and maintenance or by improper use. Any use not expressly indicated in this manual is not permitted.
This documentation is for information purposes only and cannot be regarded as a contract with a third party.
The Company implements a policy of constant improvement and development of its products. It therefore reserves the right to make changes to specifications, fittings and documentation at any time, without prior notice and without any obligation to update what has already been delivered.

1.1 Purpose And Content Of The Manual

The purpose of these instructions is to provide essential information for the selection, installation, use and maintenance of the machine. They have been drawn up in conformity with the legislative provisions issued by the European Union and with the technical standards in force at the date of issue of the instructions themselves.
The instructions shall include indications to avoid reasonably foreseeable misuse.

1.2 Purpose And Content Of The Manual

The instructions must be placed in a suitable place, protected from dust and humidity and easily accessible to users and operators. The instructions must always accompany the machine throughout its entire life cycle and must therefore be transferred to any subsequent user.
We recommend that you always check that the instructions are up to date with the latest revision available.
Any updates sent to the customer must be kept in an annex to this manual.
The Company is available to provide any information regarding the use of its products.

1.3 Using the Manual

The instructions are an integral part of the machine. Users or operators must consult the instructions before each operation on the machine and at any time of uncertainty regarding the transport, handling, installation, maintenance, use and dismantling of the machine.
In order to draw the attention of operators and users to the operations to be carried out in safety, graphic symbols have been inserted in these instructions and are shown in the following paragraphs.

2 General safety information

- Anyone using the **AD** series dehumidifier must have this manual available and be aware of the safety information contained in it.
- The information contained in this manual includes suggestions for optimal operating methods and procedures, which are not intended to replace personal responsibility and/or local safety regulations.
- Only personnel with adequate knowledge of the dehumidifier should work on the dehumidifier and carry out maintenance work.
- Only personnel authorised to carry out electrical installations may carry out maintenance work on electrical components. Repairs to electrical components must be carried out by qualified personnel.
- The dehumidifier cannot be installed in areas where explosion protection devices are required.
- The unit must not be splashed or submerged in water.
- The unit must never be connected to a voltage or frequency other than that for which it was designed. Refer to the identification plate. Excessively high line voltage may result in electric shock and damage to the unit.
- Do not insert your fingers or any other object into the air vents.
- The power supply is constantly present in the unit's main switch.
- Electrically disconnect the dehumidifier from the main switch before opening each panel of the dehumidifier.
- Before performing any maintenance work, allow the dehumidifier to cool down at least 15 minutes after switching it off.
- After a power failure, the dehumidifier may restart automatically. Always turn off and lock the main power switch to the OFF position before performing any maintenance work.
- Dehumidifier panels should only be removed for maintenance purposes.
- The dehumidifier can only be installed to dehumidify air at atmospheric pressure.
- Do not leave the dehumidifier in operation without the filters on the air inlet.
- Labels and signals must not be removed from the dehumidifier
- This manual must always be close to the dehumidifier and easily accessible.
- Checking and maintenance operations must be carried out in strict compliance with the instructions.
- Always contact TFT for service and repair and use only original spare parts.
- Before carrying out any work that alters or modifies the dehumidifier, specific written authorisation must be obtained from TFT.
- During operation and other work on the equipment, it is always the responsibility of individuals to evaluate: The safety of all persons involved, the safety of the unit and other property, environmental protection.

2.1 General safety regulations

Before starting any type of operation on the units, each operator must be fully familiar with the operation of the machine and its controls and have read and understood all the information contained in this manual.

The removal and/or tampering with of any safety device is strictly prohibited.

Any ordinary or extraordinary maintenance operation must be carried out with the machine stationary, without power supply.

Do not put your hands or introduce any screwdrivers, wrenches or other tools on the moving parts.

The machine operator and the maintenance technician must receive the training and instruction appropriate to their safety tasks.

Operators must be familiar with the personal protective equipment and accident prevention rules provided for by national and international laws and standards.

2.2 Operation monitoring

The dehumidifier is controlled from the control panel located on the front of the unit, see section 17 “Instrumentation description”.

3 Warranty

- The warranty period is valid from the date on which the unit left the factory, unless otherwise specified in writing.
- The warranty is limited to the replacement, free of charge, of parts or components proven to be defective as a result of defects in materials or workmanship.
- All warranty claims must include proof that the fault has occurred within the warranty period and that the unit has been used in accordance with the specifications. All requests must specify the type of unit and the manufacturing number. This information is printed on the identification plate, see Unit marking section.
- A condition of the warranty is that the unit is serviced and maintained throughout the warranty period by a qualified TFT or TFT approved technician. Service and maintenance must be documented for the warranty to be valid.
- Always contact TFT for service and repair.
- Operational failures may occur if the unit is insufficiently serviced, inadequately serviced or incorrectly maintained.

4 Compliance with Directives

- The dehumidifier complies with the essential safety requirements of the Machinery Directive 2006/42/EC, the Electromagnetic Compatibility Directive EMC 2014/30/EU, the Directive LVD 2014/35/EU, the Directive 2014/29/EU on the approximation of the laws of the Member States relating to electrical equipment and the RoHS Directive 2011/65/EU.
- The dehumidifier is produced by an ISO 9001:2015 certified organisation.

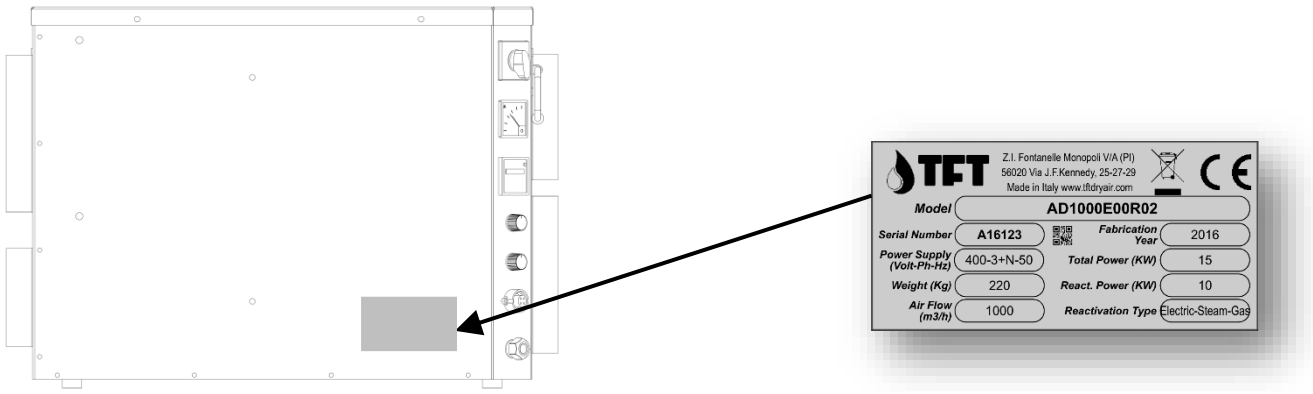
5 Copyright

- The contents of this manual are subject to change without notice.
- This manual contains information protected by copyright laws. No part of this manual may be reproduced or transmitted without the written consent of TFT.

6 Unit marking

6.1 Identification plate

The unit's CE and identification mark is located on the side of the structure, near the power supply inlet, as shown in the figure below.



7 Residual risks

The machine has been designed in such a way as to minimise risks to the safety of the persons who will interact with it. It was not technically possible to completely eliminate the causes of risk during the project. Therefore, it is absolutely necessary to refer to the following instructions and symbols.

PARTS CONSIDERED (if present)	RESIDUAL RISK	MODALITIES	WARNING
Fans and fan grilles	Injuries	Inserting sharp objects through the grids while the fans are running	Do not insert any objects into the fan grilles
Internal unit and regeneration and by-pass ducts with purging sector	Burns	Contact and contact	Avoid contact, use protective gloves
Internal unit: Electrical cables and metal parts	Electrocution of severe burns	Insulation defect of power cables, live metal parts	Adequate electrical protection of the supply lines; maximum care in making the connection to earth of the metal parts
Electrical regeneration: Heating elements	Electrocution of severe burns	Fire due to short circuit or overheating of the heating elements due to lack of regeneration air flow	Keep the regeneration air passage free and clean the filters, never disconnect the main switch from the power supply before the heating elements have been post-cooled
External unit: Area around the unit	Intoxications severe burns	Fire due to short circuit or overheating of the supply line upstream of the unit's electrical cabinet	Cable cross section and power supply line protection system conforming to current standards

8 Safety symbols used

	GENERIC DANGER Strictly observe all the instructions on the side of the pictogram. Failure to follow the instructions may lead to risk situations with possible damage to the health of the operator and the user in general.
	ELECTRICAL HAZARD Strictly observe all the instructions on the side of the pictogram. The symbol indicates machine components or, in this manual, identifies actions that could generate electrical hazards.
	MOVING PARTS The symbol indicates moving machine components that could pose a risk.
	HOT SURFACES The symbol indicates machine components with a high surface temperature that could pose a risk.
	SHARP SURFACES The symbol indicates components or parts of the machine that could cause sharp injuries when touched.
	PROHIBITION OF ACCESS TO THE ELECTRICAL SWITCHBOARD The symbol indicates that access to the electrical panel or electrical parts is prohibited to personnel not specifically qualified to operate this type of equipment.
	GROUNDING The symbol identifies the point of the machine for grounding.
	RECOVERABLE OR RECYCLABLE MATERIAL

8.1 Graphic conventions used in the manual

	Indicates operations that are hazardous to persons and/or to the proper functioning of the machine.
	Indicates operations not to be performed.
	Indicates important information that the operator must necessarily follow for the proper operation of the machine under safeguard conditions.

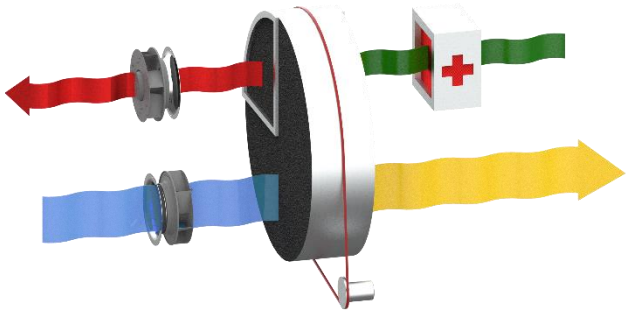
9 Applications

The **AD** dehumidifier is of the absorption type, with desiccant rotor and is designed to dehumidify air at atmospheric pressure. The dehumidifier can be used to dehumidify air at relative humidity up to 100% and temperature from -20°C to +40°C effectively in environments where low humidity is required. The units have no insulation and low temperatures can create condensation on the panels.

The applications are many and cover all the segments; some examples are listed below:

- Moisture control in production processes
- Drying of temperature-sensitive products
- Maintaining the correct level of humidity in storage warehouses
- Corrosion protection of plants and ferrous materials in general
- Humidity control in museums and libraries
- Drying of buildings after flooding and in the building industry
- Improved environmental conditions wherever there is excess moisture

10 Principle of operation



The dehumidifier works using two air flows; the main one is the air to be dehumidified, while a second flow - of lower flow rate - is used to regenerate the dehumidification rotor. Two fans inside the dehumidifier create these two air flows that cross the rotor in opposite directions. The air to be dehumidified - also called "process air" - passes through the desiccant rotor impregnated with silica gel. Silica gel is a highly hygroscopic material that absorbs water vapour from the air. As it passes through the rotor, the air transfers its moisture content to the rotor. The dehumidified air is then sent to the production room or process to be dehumidified. The dehumidification process can take place between -20°C and +40°C. During the process, the rotor rotates very slowly and is equipped with a drive system with a reduction gear and belt. The so-called "regeneration air" is used by the system to remove the absorbed moisture and take it outside: it is heated by a battery inside the dehumidifier, up to about +100°C and crosses the rotor in the opposite direction to the process air and subjects it to a reverse process, for which the rotor gives up its moisture content and is restored to its initial absorbing capacity. The regeneration air is expelled warm and humid and must be sent outside the treated environment.

11 Product description

The adsorption dehumidifier has been designed to meet the requirements of the IP54 degree of protection of the IEC standard.

11.1 Structure

The structure of the dehumidifier is made of galvanized steel painted outside (standard equipment) or stainless steel (optional equipment) with simple panels. The top panel can be removed for maintenance of electrical components and all internal mechanical parts. Connections to the dehumidifier can be made with standard spiral channels (connections for round spiral channels are optional).

11.2 Rotor

The dehumidifier has a rotor made of desiccant material. The rotor has an alveolar structure made of heat-resistant corrugated sheets containing the silica gel desiccant material, which creates a high number of axial fluid threads and at the same time a high absorption area in a small volume. The rotor is constructed to withstand saturated air without being damaged. Furthermore, the rotor is not damaged if the process or regeneration fan stops due to a fault during operation. The rotor is non-combustible and non-flammable.

11.2.1 Trasmission system

A belt drive system controls the movement of the rotor. The belt carries out its traction action on the outer edge of the rotor and is driven by a pulley on the gear motor. A special device maintains the correct tension of the belt to prevent slippage of the belt itself. The correct direction of rotation and transmission can be checked by opening the front panel.

11.2.2 Bearings

The rotor is equipped with ball bearings. The rotor shaft is made of steel.

11.3 Filters

The dehumidifier has two separate G4 filters: one on the process air inlet and the other on the regeneration air inlet.

11.4 Fans for process and regeneration air

The fans are directly coupled to a single-phase and/or three-phase motor of class IP55, ISO F, Class B. They are accessible for maintenance by removing the inspectionpanel. Fans from model 420 onwards have manual adjustment of the air flow rate by means of a potentiometer located on the front of the structure.

11.4.1 Limitations with frequency converter

The dehumidifier complies with the emission limits for residential, commercial and light industrial environments with the exception of the emission limits for harmonics (EN 61000-3-12). Since it exceeds the limits for harmonics, the equipment should not be used in residential, commercial and light industrial environments without taking appropriate measures in the electrical installation, such as supplying the equipment with a dedicated transformer connected to the high or medium voltage grid.

11.5 Batteria di riscaldamento aria di rigenerazione

The electric regeneration battery has self-adjusting PTC elements for power modulation.

11.6 Electrical panel

The electrical cabinet is located at the top of the unit structure. The control panel, selectors and alarm indicators are located on the front panel of the unit.

When the dehumidifier is turned off, allow at least 15 minutes to elapse before entering the dehumidifier.

12 Installation

GENERAL WARNINGS AND USE OF SYMBOLS

Before carrying out any type of operation, each operator must be fully familiar with the operation of the machine and its controls and have read and understood all the information contained in this manual.

All operations carried out on the machine must be carried out by qualified personnel in accordance with the national legislation in force in the country of destination.

The installation and maintenance of the machine must be carried out in accordance with the national or local regulations in force.

Do not approach or insert any objects into the moving parts.

WORKERS' GREETINGS AND SAFETY

The operator's workplace must be kept clean, tidy and free of objects that may restrict free movement. The workplace must be adequately illuminated for the planned operations. Insufficient or excessive lighting can pose risks.

Make sure that the working rooms are always well ventilated and that the extraction systems are always functional, in excellent condition and in compliance with the legal requirements.

PERSONAL PROTECTIVE EQUIPMENT

Operators who install and maintain the machine must wear the personal protective equipment required by law listed below.

Protective footwear.

Eye protection.

Protective gloves.

Respiratory protection.

Hearing protection.

12.1 Safety and security

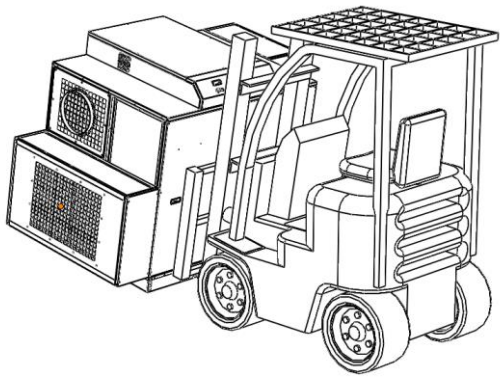
WARNING! To prevent injury or damage to the dehumidifier, always use approved lifting equipment.

WARNING! Do not climb on the dehumidifier or place objects on it.

WARNING! Installation, adjustments, maintenance and any repairs must only be carried out by qualified personnel who are informed of the risks associated with work on equipment powered by high-voltage current and at high temperatures.

12.2 Lifting and Handling

When unloading and positioning the unit, great care must be taken to avoid sudden or violent manoeuvres to protect the internal components. Units can be handled by forklift/palletizer or bridge crane, taking care not to damage the side and top panels of the unit. In the case of handling by forklift, place a safety spacer between the structure of the unit and the forks of the lift, to avoid damage to the panelling. When handling with a bridge crane, it is recommended to use a suitable harness as a precautionary measure to prevent damage to the structure and its internal components. The unit must always be kept horizontal during these operations.



WARNING! All transfers of the dehumidifier must be carried out with great caution in view of the risk of overturning the dehumidifier. All panel doors must be closed during transport.

12.3 Reception and Inspection

During installation or when working on the unit, the rules in this manual must be strictly observed, the instructions on the unit must be observed and all necessary precautions must be taken. Failure to observe the above rules can lead to dangerous situations. Upon receipt of the unit, check its integrity: the machine has left the factory in perfect condition; any damage must be immediately reported to the carrier and noted on the Delivery Sheet before finishing it. The Company must be informed, within 8 days, of the extent of the damage. The customer must complete a written report in the event of significant damage.

Before accepting the delivery, please check:

- That the machine has not been damaged during transport;
- That the material delivered corresponds to that indicated in the transport document.

In case of damage or abnormalities:

- Note the damage immediately on the Delivery Sheet;
- Inform the supplier within 8 days of receipt of the extent of the damage. Reports received after this deadline are not valid;
- In the event of significant damage, please complete a written report.

12.4 Storage

If it is necessary to store the unit, leave it packed in a closed place. If for any reason the machine has already been unpacked, follow these instructions to prevent damage, corrosion and/or deterioration:

- Reuse packaging material to ensure unit protection;
- Protect the dehumidifier from dust, frost, rain or aggressive agents;
- Make sure that all openings are well sealed or sealed;
- Never use steam or other cleaners to clean the unit that could damage it;
- Remove any keys needed to access the control panel and entrust them to the site manager;

12.5 Unpacking

The packaging may be dangerous for the operators.

It is recommended to leave the units packed during handling and to remove the packaging only at the time of installation. The packaging of the unit must be removed with care to avoid possible damage to the machine. The materials used for the packaging may be of a different nature (wood, cardboard, nylon, etc.).

Packaging materials should be stored separately and handed over for disposal or possible recycling to the appropriate companies for this purpose, thus reducing the environmental impact.

12.6 Disposal

The unit must be disposed of in accordance with the applicable standards and legal requirements. Get in touch with local authorities.
The rotor material is non-combustible and must be disposed of as a glass-fibre material. If the rotor has been exposed to chemicals that are hazardous to the environment, the associated risk must be assessed. Chemicals can accumulate in the rotor material. Take the necessary precautions in accordance with the applicable rules and regulations.

If disassembly of the rotor is required, wear a CE marked visor suitable for the purpose, selected and applied in accordance with the applicable safety standards, to protect against dust.

Respiratory protection.

12.7 Installation and location requirements

The **AD** series dehumidifier is designed to be installed in a room, must be installed in a horizontal position and preferably locked to the ground.
For maintenance, replacement of filters, etc., leave an access space of 1500mm. On the inspectable side of the dehumidifier.

It is important that the location chosen for the installation of the dehumidifier meets the requirements, in order to ensure optimal and trouble-free operation.

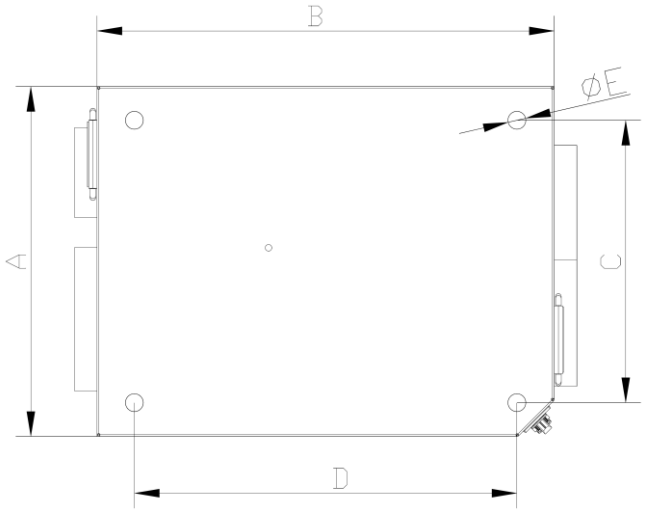
When carrying out maintenance and service work, it is important that the relevant minimum space requirements are met.

The dehumidifier is designed to be installed indoors only. Avoid installing the dehumidifier in a humid environment, where there is a risk of water entering the unit, or in a very dusty environment. If in doubt, please contact TFT.

If there is a need to reduce the dehumidifier vibration, contact TFT for instructions. Refer to EN1299+A1:2008.

12.8 Positioning on the ground

The dehumidifier must be installed on a flat surface or platform, with a nominal ground load capacity capable of supporting the weight of the machine. If the maximum ground load weight is not exceeded, no special foundation is required.



MODEL	AD	100	270	420	550	700	820	1250
A	mm	434	434	489	489	489	584	584
B	mm	499	499	639	639	639	679	679
C	mm	374	374	429	429	429	524	524
D	mm	395	395	535	535	535	575	575
E	Ø mm	25	25	25	25	25	25	25

12.9 Connecting the ducts

The dehumidifier can be installed inside or outside the room to be dehumidified. If placed internally, the regeneration air must be ducted and brought out of the room to be dehumidified, and it is also advisable to move the supply away from the process air intake.

12.9.1 General warnings

Process and regeneration air connections are designed in accordance with ISO 13351.

The dehumidifier has been designed for specific process air flows, which correspond to the dimensions of the installed fans.

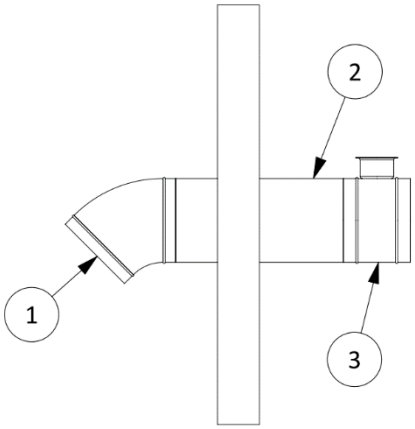
When installing the network of ducts to be connected to the dehumidifier, observe the following instructions:

- The length of the pipeline network must be kept to a minimum in order to limit pressure drops.
- Process air and dry air ducts must have the same diameter. The same applies to regeneration air and wet air ducts.

- For optimum performance, all rigid joints in process or regeneration air ducts must be air- and vapor-tight.
- The process air duct must be insulated to prevent condensation on the outside if the temperature inside the duct falls below the dew point of the ambient air.
- If there is a risk of temperatures below 0°C, the ducts must be insulated.
- The high moisture content of the exhaust air emitted by the dehumidifier may cause condensation to build up inside the ducts. By insulating the ducts, the amount of condensation is reduced.
- The horizontal humid air ducts must be installed with a slight slope (away from the dehumidifier) to facilitate the outflow of any condensation. Condensate drainage devices must be installed at the lowest points of the humid air outlet duct. The humid air duct must be made of corrosion-resistant material (e.g. stainless steel, aluminium, plastic, etc.) and must withstand temperatures of up to 100°C.
- Be sure to leave adequate space for maintenance when designing and installing the ducts.
- The ducts must be designed to prevent rain or snow from entering the dehumidifier.
- In order to reduce the transmission of vibrations and/or noise along rigid ducts, the installation of watertight flexible couplings and possible silencers is recommended.
- Ducts mounted directly on the dehumidifier must be equipped with suitable supports to reduce the load and tension due to the weight and movement of the ducts themselves.
- Manual calibration dampers must be installed on the process and regeneration air flows to maintain the unit's functional efficiency. For the unit to function efficiently, it is essential that the air flows are correct.
- The total pressure drop of the process and regeneration air ducts must not exceed the available pressure of the fans fitted to the dehumidifier.

12.9.2 Specifications for the air inlet duct

The duct connecting the outside air to the inlet of the dehumidifier must be at a sufficient height above ground level to prevent the entry of slag and dust. The duct must be designed to prevent the ingress of rain or snow. The air intake must be protected from possible pollutants such as exhaust gases, steam or harmful emissions. To prevent the entry of foreign bodies, animals, etc.. protect the channel inlet with a wire mesh of about 10mm at the outer end of the duct.
To avoid humid air blowing into the regeneration air duct, the regeneration air intake must be located at least 2 metres from the humid air outlet.
In some installations the regeneration air can be drawn in from the room where the dehumidifier is installed and in this case no duct is necessary.
It is advisable to install a damper on the regeneration circuit to allow a correct calibration of the air flow rate.

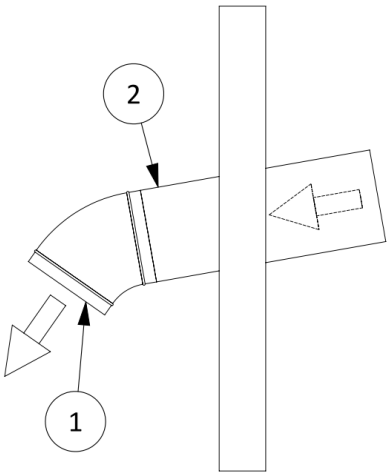


1. Wire mesh
2. Circular or rectangular duct
3. Control damper

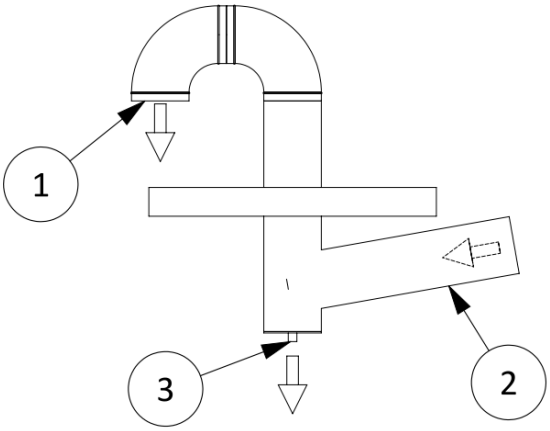
12.9.3 Specifications for the humid air outlet duct

The material for the humid air duct must resist corrosion and be able to withstand temperatures of up to 100°C. Wet air ducts must always be insulated if there is a risk of condensation. The high humidity of the air emitted by the dehumidifier may cause condensation to accumulate inside the ducts. This channel should be slightly sloped to prevent any condensation from returning to the inside of the dehumidifier. The slope of the duct must be at least 2 cm/m. In addition, it is necessary to drill 5mm drainage holes at the lowest points of the duct to avoid water accumulation inside the duct. An adjustment damper can be installed to regulate the air flow. Protect the channel outlet with a wire mesh with a mesh width of about 10mm at the outer end of the duct to prevent the entry of animals into the ducts of the dehumidifier.

Horizontal Expulsion



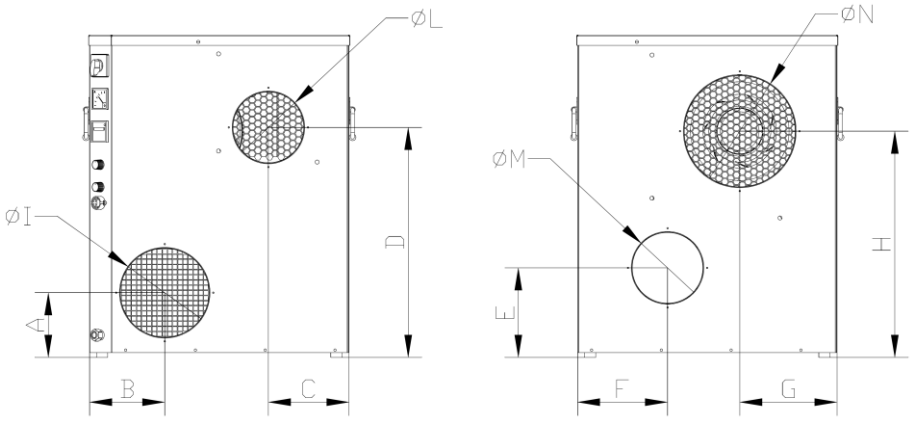
Vertical Expulsion



1. Wire mesh
2. Circular or rectangular duct with downward slope
3. Condensate drainage

12.9.4 Connection dimensions of the air intakes

Input/output connections



MODEL	AD	100	270	420	550	700	820	1250
A	mm	117	117	144	144	144	144	144
B	mm	138	138	168	168	168	168	168
C	mm	161	161	160	160	160	180	180
D	mm	295	295	345	345	345	513	513
E	mm	123	123	115	115	115	200	200
F	mm	96	96	118	118	118	201	201
G	mm	144	144	162	162	162	217	217
H	mm	274	274	324	324	324	505	505
I	Ø mm	Ø125	Ø125	Ø200	Ø200	Ø200	Ø200	Ø200
L	Ø mm	Ø125	Ø125	Ø160	Ø160	Ø160	Ø160	Ø160
M	Ø mm	Ø80	Ø80	Ø125	Ø125	Ø125	Ø160	Ø160
N	Ø mm	Ø160	Ø160	Ø200	Ø200	Ø200	Ø250	Ø250

12.10 Electrical Connections: Preliminary Safety Information

The electrical panel is located inside the unit and the control equipment is located on the front of the structure. To access the electrical panel, remove the top panel of the unit.

	The electrical connection must be made according to the electrical diagram attached to the unit and in compliance with local and international regulations.
	Make sure that the power supply line of the unit is disconnected upstream of the unit. Make sure that the disconnecting device is locked or that a warning sign is attached to the operating handle to prevent operation.
	Make sure that the power supply corresponds to the rated machine data (voltage, phases, frequency) given on the circuit diagram and on the nameplate attached to the unit.
	The power supply cables must be protected upstream against the effects of short circuit and overload by a suitable device in accordance with the standards and laws in force.
	The cable cross section must be commensurate with the calibration of the upstream protection system and must take into account all the factors that can influenzare (temperature, type of insulation, length, etc.).
	The power supply must comply with the above limits, otherwise the warranty will be immediately void.
	Make all ground connections required by applicable legislation and regulations.
	Before starting any operation, make sure that the power supply is disconnected.

12.11 Electrical Data

	The following electrical data refer to the standard unit without accessories. In all other cases, refer to the electrical data given in the attached wiring diagrams.
	The supply voltage must not vary by more than ±10% of the nominal value and the phase imbalance must be less than 1% according to EN 60204. If these tolerances are not respected, please contact our technical department.

Electrical data may change without notice. Therefore, always refer to the wiring diagram supplied with the unit.

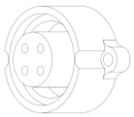
12.11.1 How to Connect the Power Supply

To power the AD... units, simply plug the plug into the power supply socket. The AD100 and AD270 models are equipped with a cable with a SCHUKO plug, the AD420, AD550 and AD700 models are equipped with a power supply cable without plug to be wired according to your needs, the AD820 and AD1250 models are equipped with a cable with an industrial CEE 3P+N+PE plug.
After connection, carefully close the access panel to the electrical panel.

12.11.2 Electrical Diagrams:

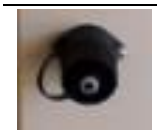
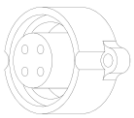
See wiring diagrams attached to the unit.

12.11.3 Electrical connections accessories



Electronic humidistat (ADKHW230)

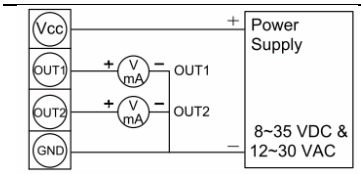
Decription:	*Accessories:*	*AD female connector:*
Power supply 230Vac (Ph)	1	1
Power supply 230Vac (N)	2	2
Humidostat control (230Vac dangerous voltage)	3	3
Ground (PE)	4	4

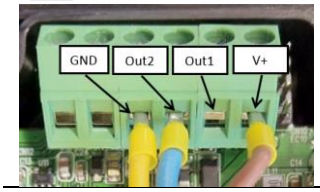



Mechanical humidistat (ADKMH1)

Decription:	*Accessories:*	*AD female connector:*
Power supply 230Vac (Ph)	1	1
Not connected	-	2
Humidostat control (230Vac dangerous voltage)	4	3
Ground (PE)	PE	4

12.11.4 Relative humidity probe connections





Connection of relative humidity probe (ADKH1D/ADKH1W/ADKH2W)

Description:	*Probe:*	*Terminal block AD:*
P.Supply 24Vac/dc	+Vcc	1
Reference	GND	2
RH%	OUT2	3
Temperature	OUT1	4

Terminal block connections are subject to change without notice.
Therefore, always refer to the wiring diagram supplied with the unit.

13 Starting

13.1 Preliminary checks

WARNING! The unit may only be commissioned and started up by TFT personnel.

WARNING! The power supply is constantly present in the unit's main switch. Risk of electric shock.

For commissioning, perform the following checks in this order:

1. Make sure that the main switch electrically isolates the dehumidifier and that the disconnect switch is in the OFF position.
2. Open the upper dehumidifier panel and make sure there are no foreign bodies inside and in the cabinet.
3. Make sure that the flow dampers are completely open and that the pipes are free and clean from any objects.
4. Check for filters and make sure they are clean.
5. Make sure that the fan impellers can move freely.
6. Connect the dehumidifier electrically to the mains through the cable provided with the unit and switch the main disconnector to ON and check the presence of voltage on terminals L, N or L1, L2, L3 of the dehumidifier.
7. Close the top cover and check the gaskets for proper fit.
8. The dehumidifier is now ready. Start the dehumidifier and check the process and regeneration air flow rate. Check the flow rates on the respective air supply sides. If necessary, adjust the air flow rate by means of a damper installed on the dry and humid air supply side, or use the potentiometer on the front of the unit.

13.2 Air flow regulation

13.2.1 General information.

For optimum performance, process air and regeneration air flows must be properly adjusted to the nominal or design air flows. Airflow can be set using the potentiometers on the front of the unit without using dampers for AD420 and above.
Contact the TFT for advice on installation and settings.

WARNING! Rotation hazard - to prevent access to the fan rotors, the dehumidifier must only operate with connected wet and dry air ducts, or special safety devices such as protective grilles must be installed.

WARNING! If the airflow is not adjusted correctly, the unit may malfunction.
Damage to the unit due to incorrect airflow adjustment may void the unit's warranty.
Air flows should never be set above the rated air flows. If higher air flow rates are required, consult TFT.

13.2.2 Process air flow.

Follow the instructions below to adjust the process air flow.

Control of the process air fan at fixed speed by means of air flow rate

1. Start the dehumidifier and run it at full capacity.
2. Measure the air flow rate on a linear duct section using an anemometer.
3. Compare the measured air flow rate with the nominal air flow rate.
4. Adjust the process air flow control point in the control system either by means of the frequency converter (if present) or by means of the calibration damper, so that the measured air flow value corresponds to the nominal value.

13.2.3 Regeneration air flow.

Follow the instructions below to adjust the regeneration airflow.

1. Start the dehumidifier and run it at full capacity for at least 10-15 minutes to allow the regeneration air heater battery to reach its normal operating temperature.
2. Measure the air flow rate on a linear duct section using an anemometer.
3. Compare the measured air flow rate with the nominal air flow rate.
4. Adjust the regeneration air flow control point in the control system using the potentiometer on the front of the unit (if fitted) or the calibration damper, so that the value of the measured air flow rate corresponds to the nominal value.
5. To optimize the performance and efficiency of the dehumidifier, once the nominal air flow rate has been calibrated, it is possible to increase or decrease the regeneration flow rate by controlling the output dry air performance. At each variation it is necessary to wait at least 10-15 minutes.

14 Maintenance

14.1 Safety and security

WARNING! Installation, adjustments, maintenance and any repairs must only be carried out by qualified personnel who are informed of the risks associated with work on equipment powered by high-voltage and high-temperature electricity.

WARNING! The power supply is constantly present in the unit's main switch. Risk of electric shock.

WARNING! After a power failure, the dehumidifier may restart automatically. Always switch off and lock the main power switch before performing any maintenance work.

NOTE: For all maintenance and repair work:

- ***wait 15 minutes after switching off the dehumidifier before opening each service panel, in order to allow the regeneration battery to cool down***
- ***Disconnect the dehumidifier electrically using the main line switch.***
- ***Disconnect the power plug***

The maintenance intervals depend on the environment in which the dehumidifier is installed. Therefore, the periodicity with which to perform maintenance intervals may vary from one installation to another. Incorrect maintenance may result in reduced performance.

14.2 Filters

The dehumidifier is equipped with two separate filters, one for process air and one for regeneration air. The filters are positioned at the inlets of the respective air flows before the air enters the dehumidifier. Intervals for cleaning or replacing filters will be determined by the amount of dust and particles in the air where the dehumidifier is installed.
We recommend that the filters be checked at least once a month.

14.3 Rotor

The rotor does not require maintenance. However, it may be necessary to clean it very gently with compressed air. If the rotor is very dirty, it can be washed with water: before performing this operation, contact your local distributor as this is not a routine operation. Check the bearings and rotor surface once a year.

14.4 Electric motors

The electric motors are equipped with ball bearings. No maintenance is required on the bearings. Check the engine and any noise once a year.

14.5 Heating battery

It does not require maintenance, however, check at least twice a year for any mechanical damage and cleaning of the finned pack, verifying that the passage of air is not obstructed by dirt or other material.

14.6 Rotor drive belt

Check at regular intervals that the belt is correctly tensioned. This is kept under tension by the tensioning device and does not require adjustment during normal operation.

14.7 Gaskets

Check seals at regular intervals for damage or dust

14.8 Regular service and maintenance

TFT dehumidifiers are designed to operate continuously for long periods of time. To ensure that the dehumidifier functions as efficiently and economically as possible, regular maintenance and repair is required.
The duration of maintenance intervals is essentially determined by the conditions of the operating environment and the environment in which the unit is installed. For example, if the process air contains a lot of dust, preventive maintenance should be carried out at shorter intervals. The same principle also applies if the dehumidifier is used intensively.
Service levels for a service and maintenance standard are described in the "Service options" section.
The dehumidifier control system is equipped with a service indicator. During installation and commissioning, an estimate of the likely number of hours of service and support after or on the expected date of installation and commissioning. This value is programmed by TFT personnel at initial unit start-up.

14.9 Service options

In addition to the drive configuration, four standard support options are available.
1. Configuration/Start.
2. General function check.
3. Safety and temperature measures for capacity, temperature and humidity (including point 2).
4. Prevention of certain components after 3 years of operation (including point 3).
5. Preventive replacement of some components after 6 years of operation (including section 4).

NOTE: Always contact TFT for service and repair. If the unit is maintained incorrectly, inadequately, or incorrectly, malfunction may result.
NOTE: Checking "1" commissioning by TFT or an authorized service center is required to validate the entire warranty.
TFT service technicians have special equipment and quick access to spare parts to help with all TFT products. All test equipment used by our staff to ensure the correct balance of the system has been carefully certified.

14.10 Warranty extension

If the customer enters into a service contract with TFT, TFT offers an extended warranty at standard conditions. Detailed information is available on request.

14.11 Service and maintenance planning

Operating time in hours	0	4000	8000	12000	16000	20000	24000
Time spent in months	0	6	12	18	24	30	36
Air filter inspection, air filter replacement if necessary, function check	√	√	√	√	√	√	√
Preventive inspection, security checks	√		√		√		√
Capacity monitoring, rotor inspection	√		√		√		√
Inspection of the electric battery							√
Replacing the drive belt and the belt stop.							√
Replacing the rotor gearmotor							
Ventilation inspection (rotors, motors, bearings)			√		√		√
Verification of the functioning of the electrical cabinet and control system	√		√		√		√
Calibration of humidity control devices, sensors, valves, SSR	√		√		√		√

NOTE: Always contact TFT for maintenance and repairs. If the machine is insufficiently serviced, inadequately serviced or incorrectly maintained, malfunctions may occur.

NOTE: TFT's installation/startup check is required to validate the entire warranty.

NOTE: The absorption rotor will not be replaced in advance, the capacity check will indicate the replacement of the rotor.

WARNING! Rotor performance may vary depending on the type of use and the quality of the processor. Dirty air or the use of a very low dew point increases the loss of rotor capacity in less time. Depending on the type of application, the rotor must be kept clean and maintained in a scheduled manner.

15 Troubleshooting

Before contacting the TFT, check the following troubleshooting list. Locate the cause of the alarm and solve the problem if possible. The list provides valuable help in identifying faults that can often be solved without the intervention of specialized personnel.

NOTE: Alarm indications other than those indicated may occur. In such cases, please contact the TFT service department.

Symptom	Possible cause	How to intervene
Dehumidifier does not start	Control signal	Check the external start stop signal
	Power supply phases	Check main fuses and phase sequence
The unit has stopped	There's been a power failure	Check that the unit is correctly powered
The unit is in AUTO mode and has stopped	Dehumidification is not required.	Check if the current humidity level is below the control point. Check operation by setting the control point below the actual humidity value and checking if the unit restarts. Check if the value indicated by the humidity sensor is correct.
The unit is in "MAN" mode and has stopped	There's been a power failure	Check that the unit is correctly powered
Reduction of dehumidification capacity	Clogged filters	Clean or replace filters
	Reduced air flow rates	Check the dampers and/or frequency variators, if any
	Rotor stationary	Check the tension of the belt
	Indoor air leaks	Check the gaskets
	Insufficient regeneration temperature	Check the regeneration battery
	Air leakage	Check the gaskets and panels
Rotor is stationary	Belt slippage	Check the tensioning
	Broken belt	Replace the belt
	Off-axis rotor	Check the position of the rotor on the central support
	Malfunctioning of the gearmotor	Replace the gearmotor
Low regeneration or process air flow rate	Clogged filters	Clean or replace filters
	Fan malfunction	Check the motor fans and impellers
	Electrical power supply phases	Check main fuses, supply voltage and phase sequence
	Blocked ducts	Check dampers and ducts

16 Technicalspecifications

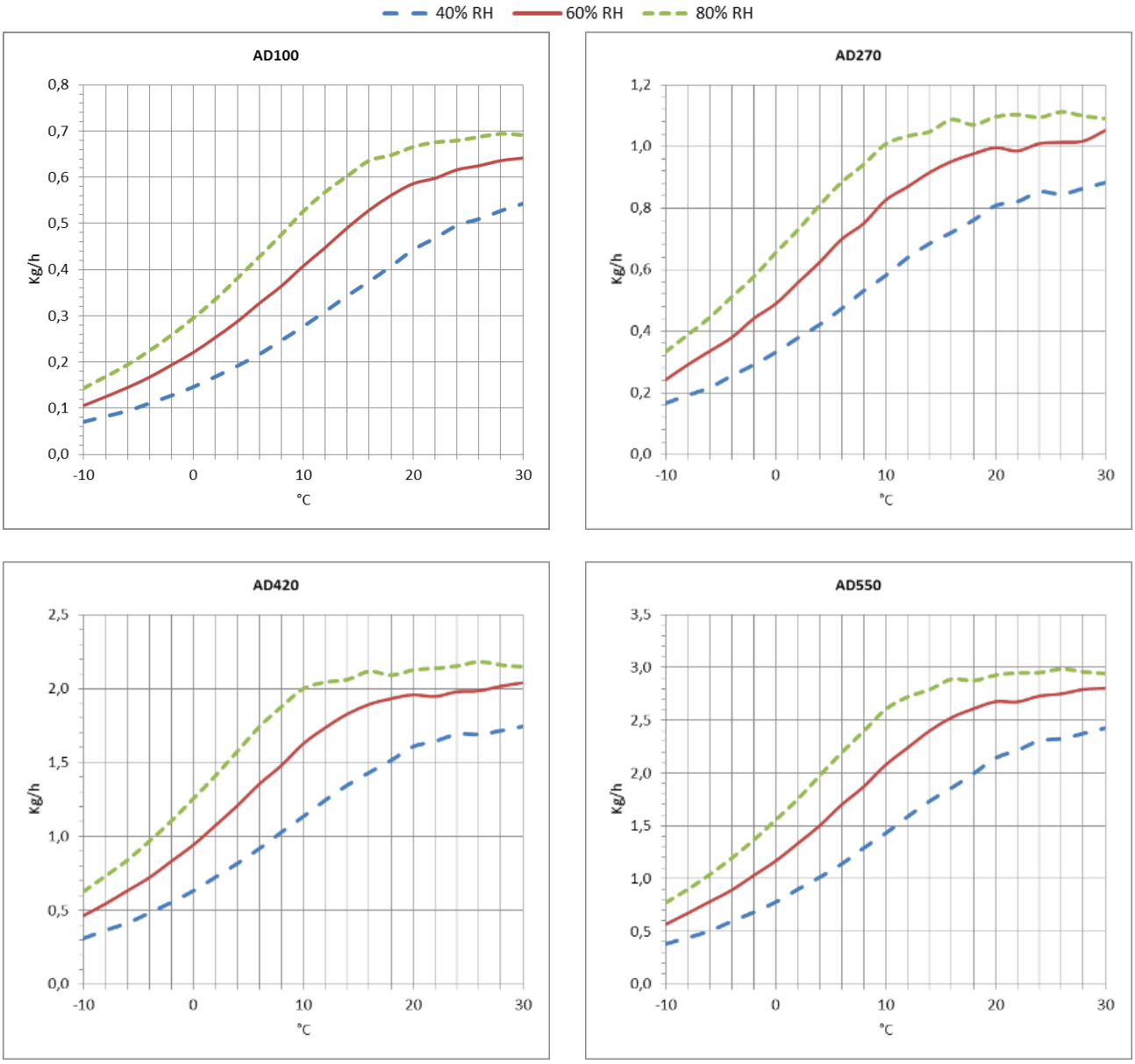
16.1 Technical data

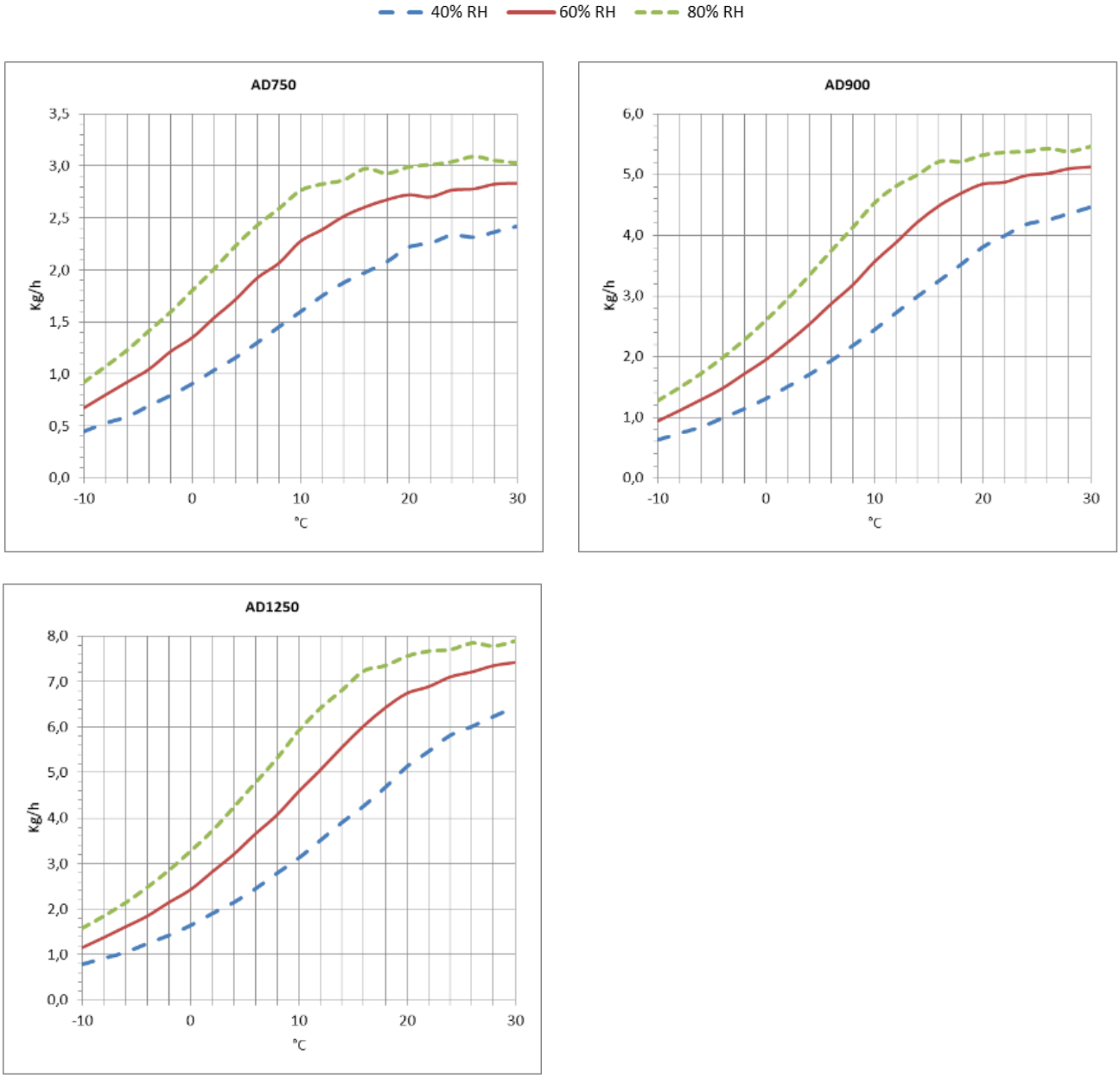
TECHNICAL DATA								
MODEL	**AD**	**100**	**270**	**420**	**550**	**700**	**820**	**1250**
Performance								
Dehumidification capacity *	kg/h	0,59	0,99	1,95	2,67	2,71	4,83	6,74
Fans								
Process air flow rate	m^3/h	100	270	420	550	700	820	1250
Usable static pressure	Pa	180	210	300	270	180	160	400
Fan rated power	W	52	102	166	166	170	170	500
Regeneration air flow rate	m^3/h	30	50	90	120	135	210	270
Usable static pressure	Pa	210	190	320	280	260	250	180
Fan rated power	W	80	80	166	166	166	166	166
Gearmotor								
Rated power	W	7	7	7	7	7	7	7
Regeneration								
Type of regeneration		Electric	Electric	Electric	Electric	Electric	Electric	Electric
Installed power	kW	0,9	1,3	2,6	3,5	3,5	6,6	9,9
Temperature increase	°C	80	75	80	85	75	90	100
Technical characteristics								
Power supply	Volt/Ph/Hz	230/1/50 230/1/60	230/1/50 230/1/60	230/1/50 230/1/60	230/1/50 230/1/60	230/1/50 230/1/60	400/3+N/50 400/3+N/60	400/3+N/50 400/3+N/60
Maximum power consumption	Kw	1,04	1,49	2,94	3,84	3,84	6,95	10,58
Maximum absorption	A	4,52	6,48	14,03	17,92	17,93	12,33	17,95
Noise level								
Sound pressure **	dB (A)	42	42	44	44	46	58	64
Sound power **	dB (A)	70	70	72	72	74	86	92

(*) With inlet air at 20°C 60%.
(**) Sound pressure level calculated in a free field, 10 metres from the unit, directionality factor Q=2, according to ISO 9614.
(***) Standard electrical protection, water and dust resistant.

16.2 Performance diagrams

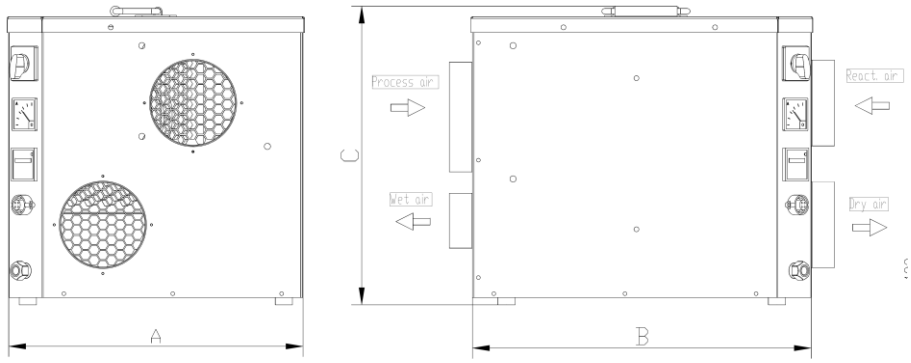
The diagrams are based on a nominal air flow with an outside air condition of 20°C 60%.
The horizontal axis represents the inlet temperature to the dehumidifier, the vertical axis the capacity of the dehumidifier. Once the inlet temperature has been selected, it rises vertically until it reaches the relative humidity curve; from the intersection point, it moves horizontally to the left to see the performance of the dehumidifier.
Example: Inlet temperature 20°C, we cross the relative humidity curve by 60%, moving horizontally to the left we see the capacity.



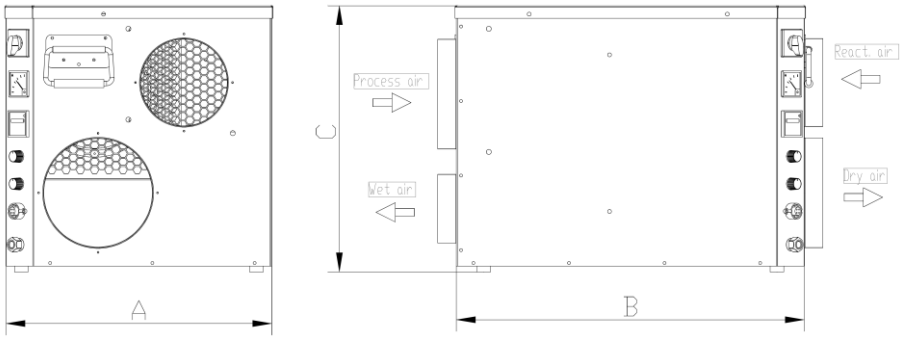

40% RH
60% RH
80% RH
AD750
Kg/h
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
-10
0
10
20
30
°C
AD900
Kg/h
6,0
5,0
4,0
3,0
2,0
1,0
0,0
-10
0
10
20
30
°C
AD1250
Kg/h
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0
0,0
-10
0
10
20
30
°C

16.3 Dimensions

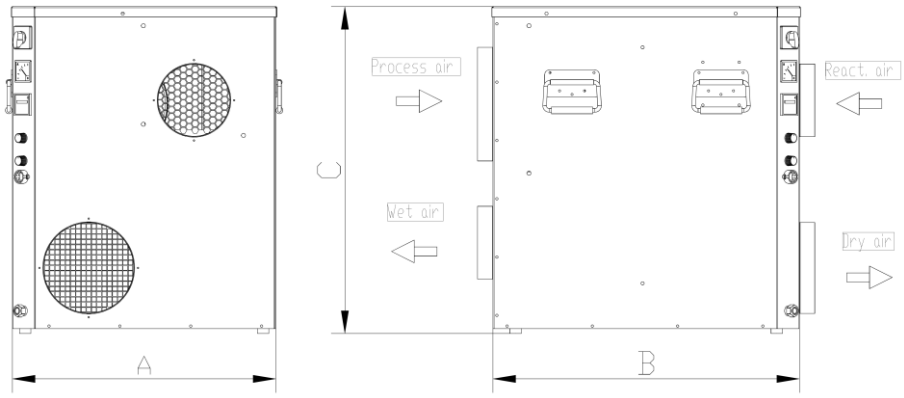
AD100÷270



AD420÷550

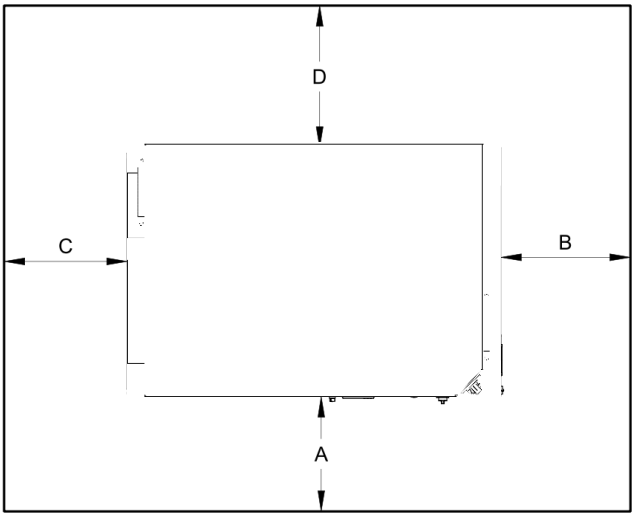


AD820÷1250



Model	AD	100	270	420	550	700	820	1250
A	mm	435	435	490	490	490	611	611
B	mm	500	500	640	640	640	680	680
C	mm	436	436	490	490	490	720	720
Empty weight	Kg	25	26	31,5	31,5	33	57	62
Connections								
Process air inlet	mm	Ø 160	Ø 160	Ø 200	Ø 200	Ø 200	Ø 250	Ø 250
Dry air outlet	mm	Ø 125	Ø 125	Ø 200	Ø 200	Ø 200	Ø 200	Ø 200
Regeneration air inlet	mm	Ø 125	Ø 125	Ø 160	Ø 160	Ø 160	Ø 160	Ø 160
Wet air outlet	mm	Ø 80	Ø 80	Ø 125	Ø 125	Ø 125	Ø 160	Ø 160

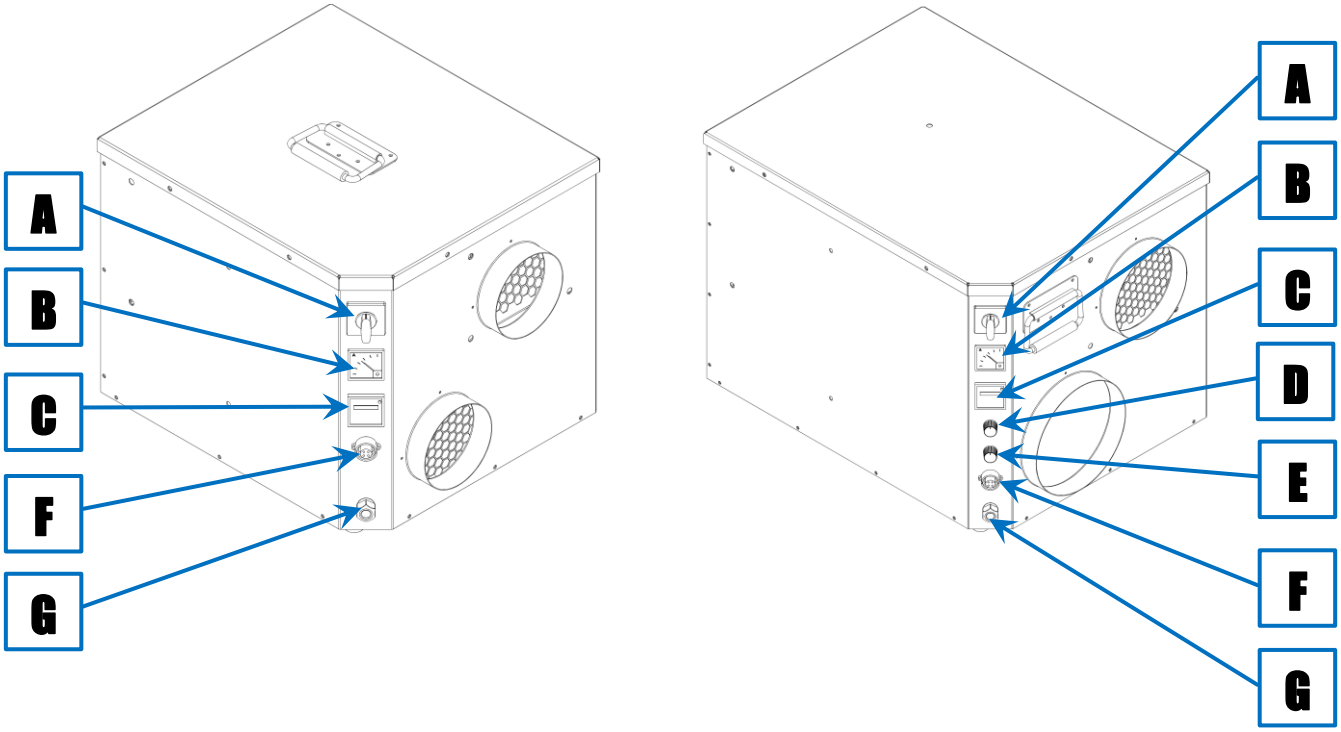
16.4 Respective Spaces For Installation



Model	AD	100	270	420	550	700	820	1250
A	mm	300	300	300	300	300	300	300
B	mm	300	300	300	300	300	300	300
C	mm	300	300	300	300	300	300	300
D	mm	300	300	300	300	300	300	300
Alto	mm	800	800	800	800	800	800	800

Recommended clearance spaces for installation and normal maintenance.

17 Instrumentation description



A	Main switch "AUTO - OFF - MAN"
B	Ammeter
C	Operating hour meter (Option for hour meter and energy meter)
D	Potentiometers for adjusting the process air flow rate
E	Potentiometers for adjusting the regeneration air flow rate
F	Female socket for connection of electronic humidistat (ADKHW230), mechanical humidistat (ADKMH1) and/or additional fan box (ADKTBP - ADKTBR)
G	General power supply cable

Notes: