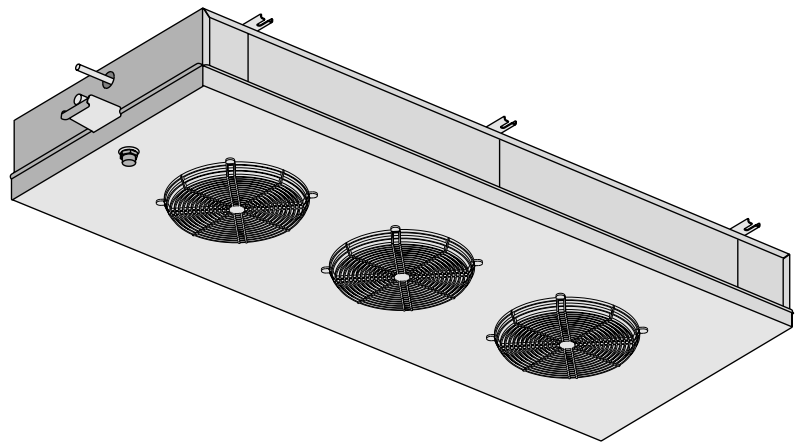


ECO™ heat transfer
coolers



GDE

MANUALE TECNICO

Aeroevaporatori a soffitto

TECHNICAL MANUAL

Ceiling unit coolers

BETRIEBSANLEITUNG

Deckenluftverdampfer

MANUAL TECNICO

Aeroevaporadores de techo

MANUEL TECHNIQUE

Evaporateurs plafonniers

ТЕХНИЧЕСКОЕ РУКОВОДСТВО

Потолочные воздухоохладители

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1. Important

- 1.1 Carefully read all the information in this manual before removing the packaging, before handling, assembling, positioning, commissioning of the machine and before performing any work on the model. If in doubt contact Modine.
- 1.2 This manual is an integral part of the product and must be kept for the entire life of the unit.
- 1.3 Modine declines all responsibility for damage to persons and property caused by failure to follow all instructions contained in this manual.
- 1.4 The unit must only be used for the purpose for which it was expressly designed: improper use releases Modine from any liability.
- 1.5 This manual must be kept available near the unit for the entire life of the same.
- 1.6 The use of fluids or substances which could corrode, make unsafe or reduce the performance of the unit is prohibited.
- 1.7 It is forbidden to modify or tamper with the components of the unit.
- 1.8 The Customer is solely responsible for compliance with the regulations relating to installation and operation of the unit.
- 1.9 The use of a fluid other than that specified in the technical documentation (see Chapter 15) is forbidden, voids the warranty and could expose you to a chemical hazard.
- 1.10 For any use other than that specified, contact the Modine technical department.
- 1.11 Modine assumes no responsibility for any accidents, losses or damage resulting from improper use of the equipment that must be properly installed by qualified personnel in accordance with intended use and subjected to preventive maintenance to protect the safety of persons, animals and property. The units produced are compliant with the applicable Essential Safety Requirements (ESRs) of the Machinery Directive as required by the standard operating conditions described in the manual.
- 1.12 It is the responsibility of the installer/designer of the system to comply with the current regulations and legislation and to assess its safety before putting it into service.
- 1.13 Any operation other than that indicated in this manual must be agreed in advance with Modine. Failure to do so will invalidate the warranty.
- 1.14 This manual reflects the state of the art at the time of marketing of the product and therefore cannot be regarded as inappropriate in the case that evolution of the design and construction methods require updating of the data expressed.
- 1.15 Install the unit in compliance with all local legislation and regulations.
- 1.16 All operations described in this manual must be carried out by authorised and qualified personnel who have the necessary training and skills in accordance with EN 378. Persons under the influence of drugs, alcohol or medication that impair alertness are not permitted to carry out any operations. Work is only permitted if an order to that effect has been given.
- 1.17 The design, construction and operation of the refrigeration plant where the unit is to be installed shall follow the requirements and criteria specified in EN 378.
- 1.18 If something unexpected happens, stop the unit immediately and call maintenance; do not restart the unit until normal operating conditions have been restored.
- 1.19 Arrange and plan measures in the event of an emergency on the system, e.g. install a fault indicator system, in order to avoid damage to persons and property.
- 1.20 Do not use the model in case of a leak. In case of leakage initiate emergency measures and secure the system according to the applicable regulations.
- 1.21 The unit, limited to the operating conditions described in this manual, complies with the applicable standards of the Machinery Directive.
- 1.22 If you have any doubts or queries, please contact Modine or the dealer.

2. Applications

- 2.1 The unit must not be put into service until the machine to which it will be incorporated has been declared in conformity with the Machinery Directive 2006/42/CE, see "Declaration of Incorporation" page 113. The unit is defined as "Partly completed machinery".
- 2.2 The product must only be used for the stated purpose: use other than that prescribed is to be considered improper and exempts Modine from all liability.
- 2.3 Use in unspecified operating conditions must be considered incorrect or improper.
- 2.4 Make sure that the fluids used are compatible with the materials used to build up the model.
- 2.5 The minimum protection level of the model is IP44. Refer to the annexe "ADDITIONAL INFORMATION SHEET" (when present).
- 2.6 All the models are supplied with heat exchangers manufactured to internal standards in accordance with DIN8964 for internal cleaning.
- 2.7 Please refer to any attachments to this manual.
- 2.8 Product description (see identification code, Chapter 15.2):
 - 2.8.1 GDE Aeroevaporators (Unit Coolers) series GDE have the task of optimising the heat exchange between air and another fluid H(C)FC-HFO in a refrigeration system. Inside a casing there is a heat exchanger consisting of 2 finned packs interconnected to a tube coil. The flow of relatively warm ambient air, created by the axial fans, passes through the exchanger where the evaporation of the liquid flowing through the tubes takes place, resulting in the absorption of the heat and the lowering of the outlet air temperature.
 - 2.8.2 GDE W Brine Coolers (Brine Coolers) series GDE W have the task of optimising the heat exchange between air and another fluid (Water + brine) in a refrigeration system. Inside a casing we find a heat exchanger consisting of 2 finned packs interconnected to a coil of tubes. The flow of relatively hot ambient air, created by the axial fans, passes through the heat exchanger where the lower temperature fluid circulates, with consequent heat absorption and lowering of the outlet air temperature.

3. Identification

- 3.1 For any communication, request for assistance or spare parts, please provide the model name and serial number shown on the data plate:

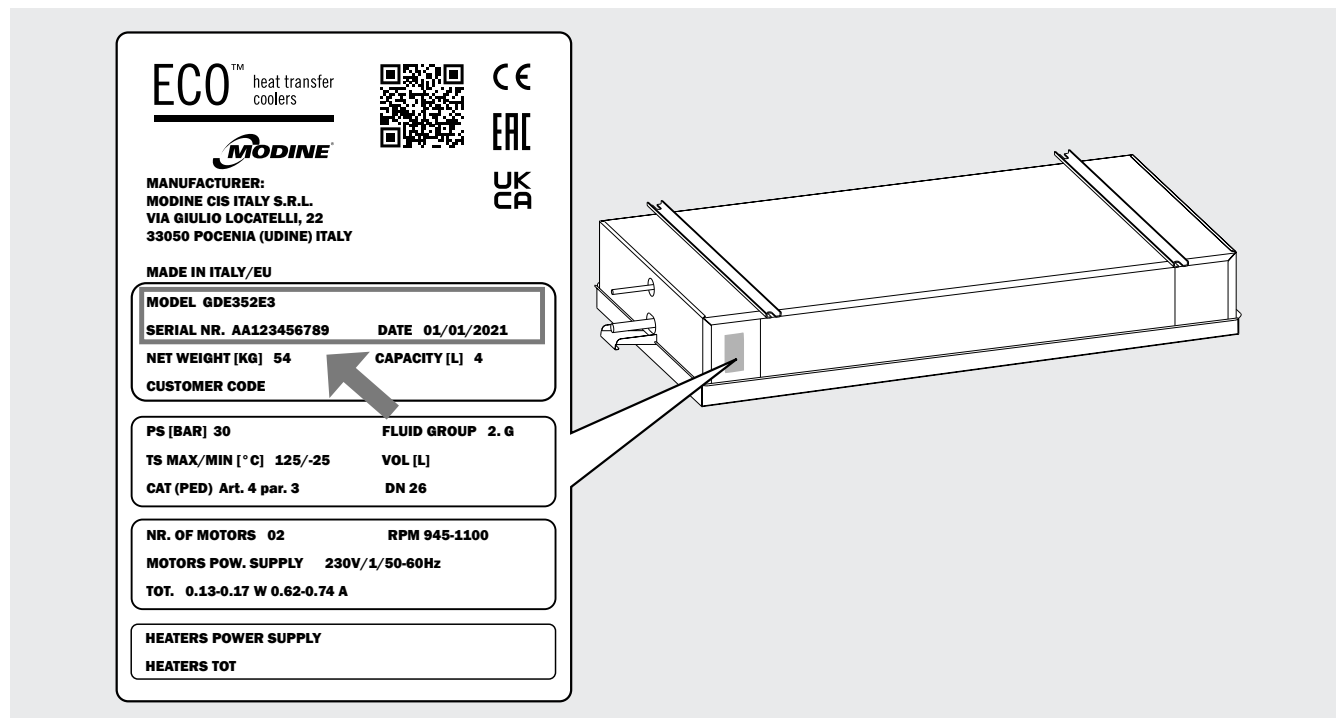


Figure 1

4. Inspection - Storage

- 4.1 Upon receipt of the model immediately check its state of integrity; immediately dispute with the transport company any damage. The packaging is created according to the model, to the suitable means of transport and of handling.
- 4.2 The model must be stored in its original packaging in a place that is protected and away from weathering.
- 4.3 Do not place any other material on top of the packaging.
- 4.4 If the model is allowed to be stacked, follow the instructions on the packaging.
- 4.5 If a motor fan is switched OFF for a long period of time, it must be switched ON for at least 2 hours every month to remove any traces of condensation that may have formed inside the motor.
- 4.6 The following rules apply when the unit must remain in storage for long periods of time. The unit must be stored indoors and positioned according to the instructions on the package. During storage, the fans must be manually rotated at least once every 3 months.

5. Handling and installation

- 5.1 The models are supplied in a cardboard box and/or wooden cage.
- 5.2 The packaged model must be moved by qualified personnel using a forklift truck of suitable capacity, or with crane and/or overhead crane (see Chapter 7). The lifting brackets must be longer than the depth of the packaging and/or of the model. Avoid any abrupt movement and do not stand close to the manoeuvring area. Always ensure that the models are secured to the hoists before handling operations. A heavy impact or a strong thrust can overturn the model.

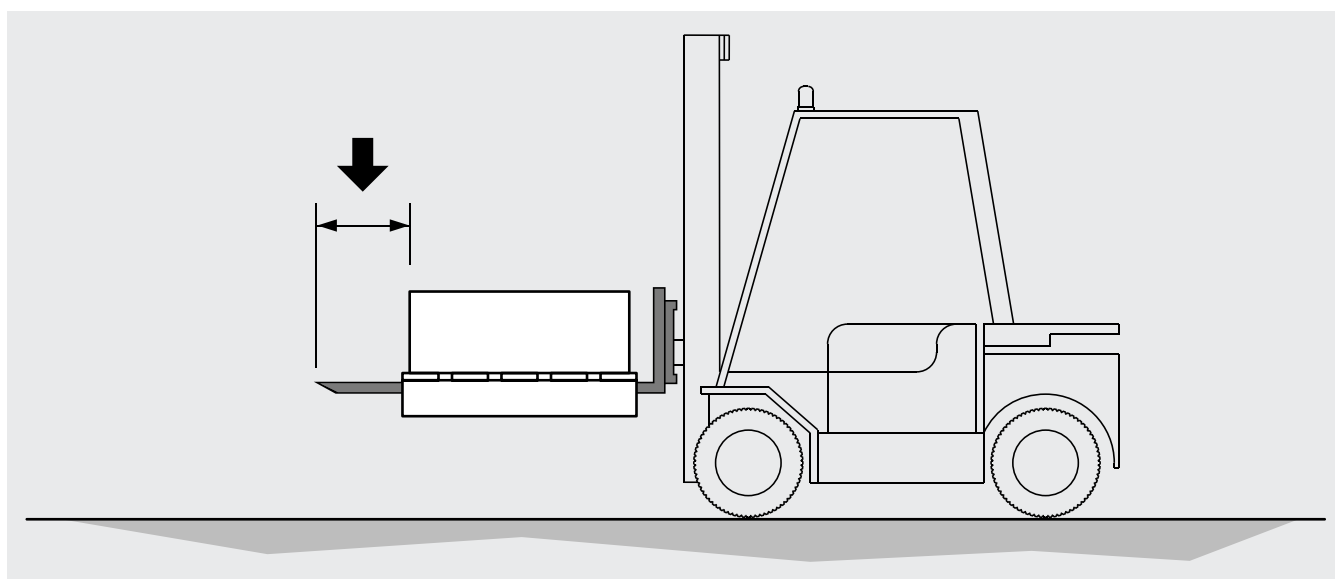


Figure 2

- 5.3 The model must always be kept in position as indicated on the packaging.
- 5.4 Avoid applying improper pressure to the packaging during handling. Take care not to damage the headers.
- 5.5 Unpack the unit close to the installation site.
- 5.6 Always use PPE (Personal Protection Equipment) during handling and installation, e.g. gloves that are sufficiently resistant to mechanical hazards, to reduce the risk of injury in the event of contact with sharp sheet metal edges or the finned pack.
- 5.7 It is essential to take all the necessary measures to ensure the complete safety of the operators in order to prevent the model from accidentally falling against people. It is forbidden to work under a suspended load. It is advisable to prepare a structure of greater capacity than the weight to be supported (trestle or props) on which to place the model.
- 5.8 When installation is complete, remove the protective film covering the model.
- 5.9 When installation is complete, dispose of packaging according to local regulations.
- 5.10 If brackets are provided, install and maintain them for future use.

6. Installation conditions

- 6.1 The model described in this manual is a component of a system and must be installed by authorised personnel only.
- 6.2 Access to the unit for any type of intervention must be reserved to personnel qualified to operate the system, in accordance with the regulations in force.
- 6.3 The place of installation must conform to what is prescribed by local legislation.
- 6.4 The support structure must be suitable for the weight of the model in running condition (see Chapter 7).
- 6.5 This unit must not be installed in a potentially explosive or acidic atmosphere or in one that is not compatible with the materials it is made of (copper, aluminium, steel, polymers).
- 6.6 Verify that the unit is installed horizontally.
- 6.7 The unit is not designed to act as a support for other machines or structures.
- 6.8 Avoid installation of the units next to the cold-room doors.
- 6.9 Ensure an adequate free space (approx. 30% of the inner room volume) to allow a proper intake and exhaust air circulation. Keep the minimum distance so as to take out / insert the heaters.

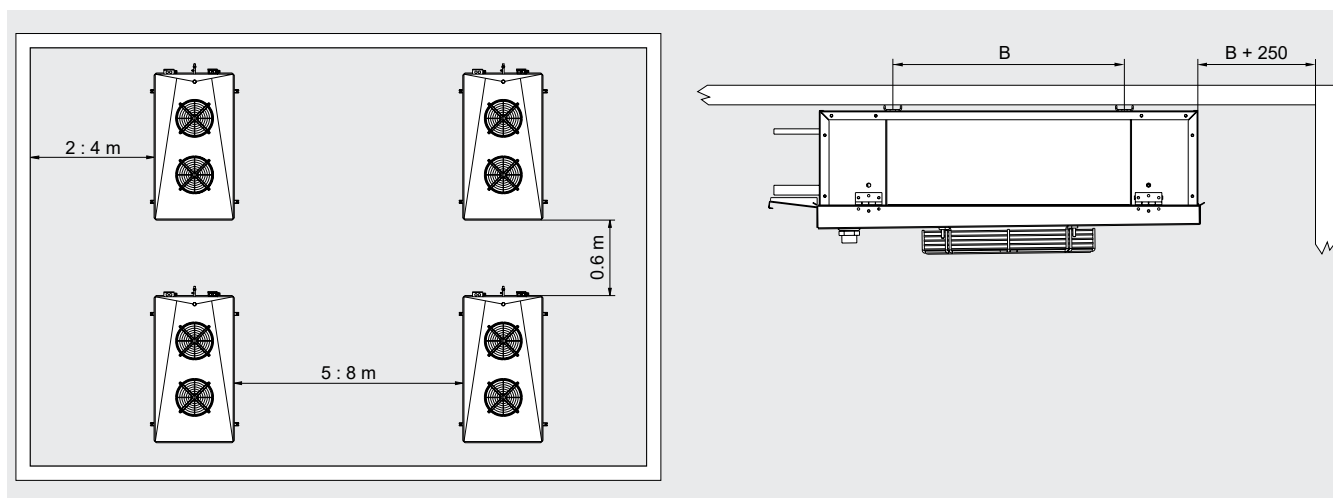


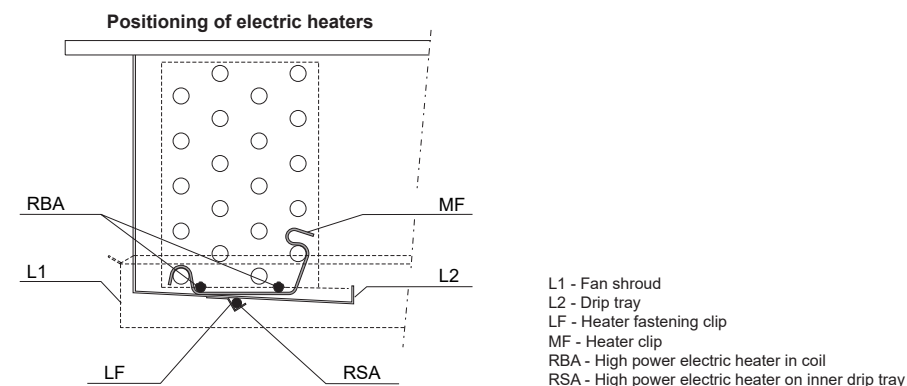
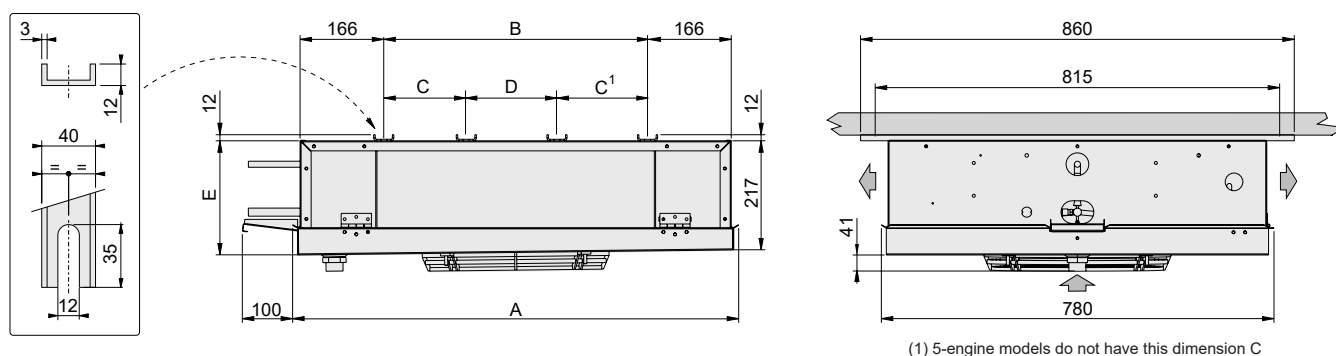
Figure 3

- 6.10 Particular conditions of installation or operation such as low or beamed rooms, overstorage, obstructed intake and exhaust air circulation and improper ice build-up due to excessive entry of humidity in room may negatively affect the stated performance and may cause defects.
- 6.11 Standard models may not be suitable for operation in tunnels or blast chilling/rapid freezing cells.
- 6.12 The units are equipped with axial motorised fans, therefore they are not suitable for channelling or for supporting additional static heads. Check with Modine for special requirements.
- 6.13 Verify that the operating conditions (temperatures and pressures) are in accordance to those of project.
- 6.14 Care must be exercised during the connecting phase in order to avoid possible distortion of the capillary tubes and shifting of the distributor.
- 6.15 Fit the appropriate siphons on the condensate drain connections and assess their efficiency in all working temperatures.
- 6.16 This unit must be integrated in an industrial electromagnetic environment, which falls within the emission and immunity limits of the standards currently in force.
- 6.17 Check that the power supply line is suitable for the electrical characteristics of the unit.
- 6.18 Check that all electrical connections are in accordance with applicable standards.
- 6.19 The unit installer and/or plant operator must ensure the presence of an efficient earthing connection to protect against indirect electric contacts.
- 6.20 The units are predisposed for ground wiring connection (see Chapter 8).
- 6.21 When installing temperature or pressure probes, place them in the most appropriate area: the point cannot be defined in advance as it varies according to the type of installation and the type of system.

- 6.22 Place the end of defrost temperature feeler in the coldest areas of the coil, i.e. the areas that tend to freeze more (at the end of the cycle the unit should be completely ice-free). The position of this device cannot be defined in advance, because it varies in accordance to the type of cold room and type of installation.
- 6.23 When installing external control devices, check their compatibility with the electrical characteristics of the unit.
- 6.24 For installations at height, use elevating platforms, scaffolding or trestles.
- 6.25 If the unit is equipped with an electric defrosting device with resistors (connections cabled in a thermoplastic junction box), define the number and frequency of the switch-ons of the resistors and periodically check their functionality.
- 6.26 In the case of more than one model installed at close range it is advisable to avoid alternate defrostings.
- 6.27 Upon request, models can be supplied with coils, defrosting units and fan motors different from the standard ones.

7. Construction and dimensional features

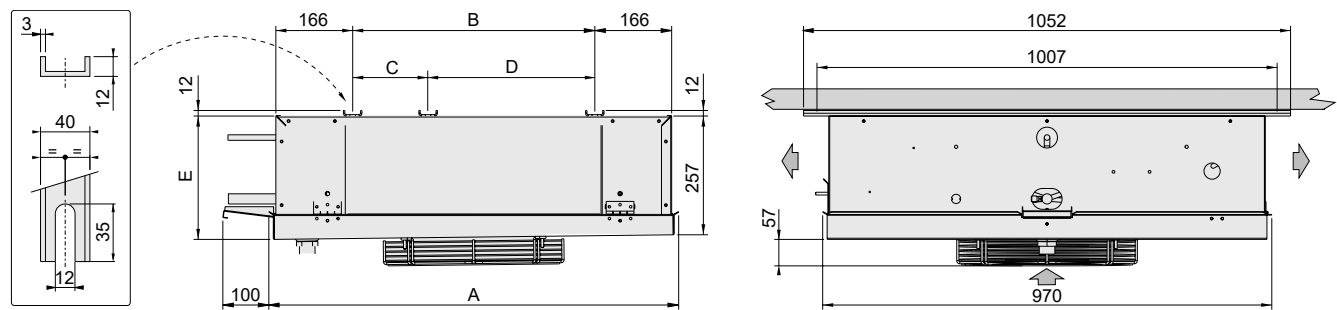
Ø315 fan diameter unit



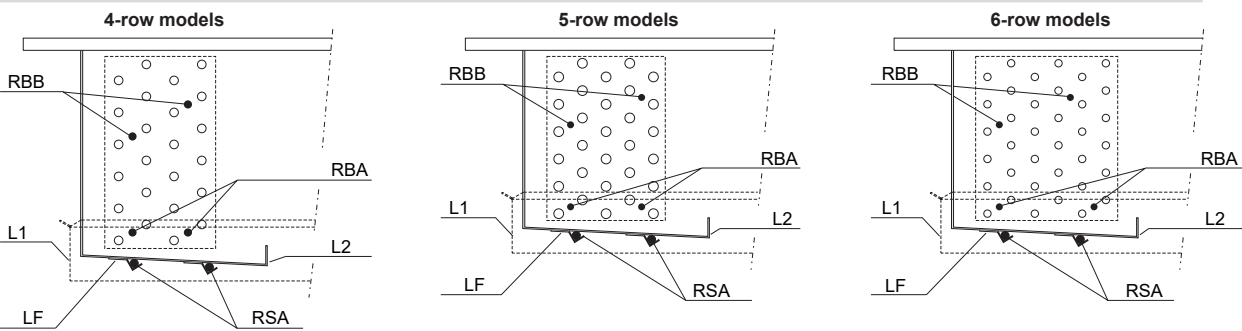
Model	GDE	311E3	312E3	-	313E3	314E3	315E3	-	316E3	-
		311E4	312E4	-	313E4	314E4	-	315E4	316E4	-
		311E7	-	312E7	313E7	314E7	-	315E7	-	316E7
Motorfans	n° x Ø mm	1x315	2x315	2x315	3x315	4x315	5x315	5x315	6x315	6x315
Dimensions	A	885	1435	1435	1985	2535	3085	3085	3635	3635
	B	524	1074	1074	1624	2174	2724	2724	3274	3274
	C	-	-	-	812	1087	1087	1087	1087	1087
	D	-	-	-	-	-	1637	1637	1100	1100
	E	230	235	235	240	245	250	250	255	255
Coil connections	In (mm)	12	16	12	16	16	22	16	22	16
	Out (mm)	16	22	22	28	28	35	35	35	35
Drain connection	Ø (GAS)	1"	1"	1"	1"	1"	1"	1"	1"	1"
Net weight	kg	20	34	32	50	65	78	78	93	86

Use thermostatic valve with external pressure equalizer

Ø350 fan diameter unit



Positioning of electric heaters



L1 - Fan shroud
L2 - Drip tray
LF - Heater fastening clip
RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Model	GDE	351E3	361A3	-	352E3	362A3	353E3	363A3	354E3	364A3	355F3	365F3
		351E4	-	361A4	352E4	362A4	353E4	363A4	354E4	364A4	355F4	365F4
		351E7	-	361A7	352E7	362A7	353E7	363A7	354E7	364A7	355F7	365F7
Motorfans	n° x Ø mm	1x350	1x350	1x350	2x350	2x350	3x350	3x350	4x350	4x350	5X350	5X350
Dimensions	A	885	885	885	1435	1435	1985	1985	2535	2535	3085	3085
	B	523	523	523	1073	1073	1623	1623	2173	2173	2723	2723
	C	-	-	-	-	-	522	522	1072	1072	1072	1072
	D	-	-	-	-	-	1102	1102	1102	1102	1652	1652
	E	270	270	270	275	275	280	280	285	285	290	290
Coil connections	In (mm)	12	16	12	16	16	16	22	22	22	22	22
	Out (mm)	22	22	22	28	28	28	35	35	35	42	42
Drain connection	Ø (GAS)	1	1	1	1	1	1	1	1	1	1	1
Net weight	kg	31	36	36	54	63	77	90	99	117	132	136

Use thermostatic valve with external pressure equalizer

8. Recommendations for a proper access to the model

Access

- 8.1 Disconnect drain connection R1 and position it as to avoid hampering with fan shroud L1.
- 8.2 Remove deflector L6 and unfasten screws "A" of fan shroud L1.
- 8.3 Bring fan shroud L1 to the position shown in drawing.
- 8.4 Models with Ø315 mm fan motors only. To reach the heaters placed under the coil remove the inner drip trays L3 by unfastening the self-threading screws "B".
- 8.5 It is possible to reach the header site by unfastening selfthreading screws "C" and removing the side panel L5.
- 8.6 Models with Ø350 mm fan motors are equipped with the safety system "D" that holds back the fan shroud L1.

Reassembling

- 8.7 Reposition the drip trays L3 and side panels L5 by fastening self threading screws "B" and "C".
- 8.8 Reposition the fan shroud L1 and fasten it with screws "A".
- 8.9 Reposition deflector L6 and reconnect drain connection R1.

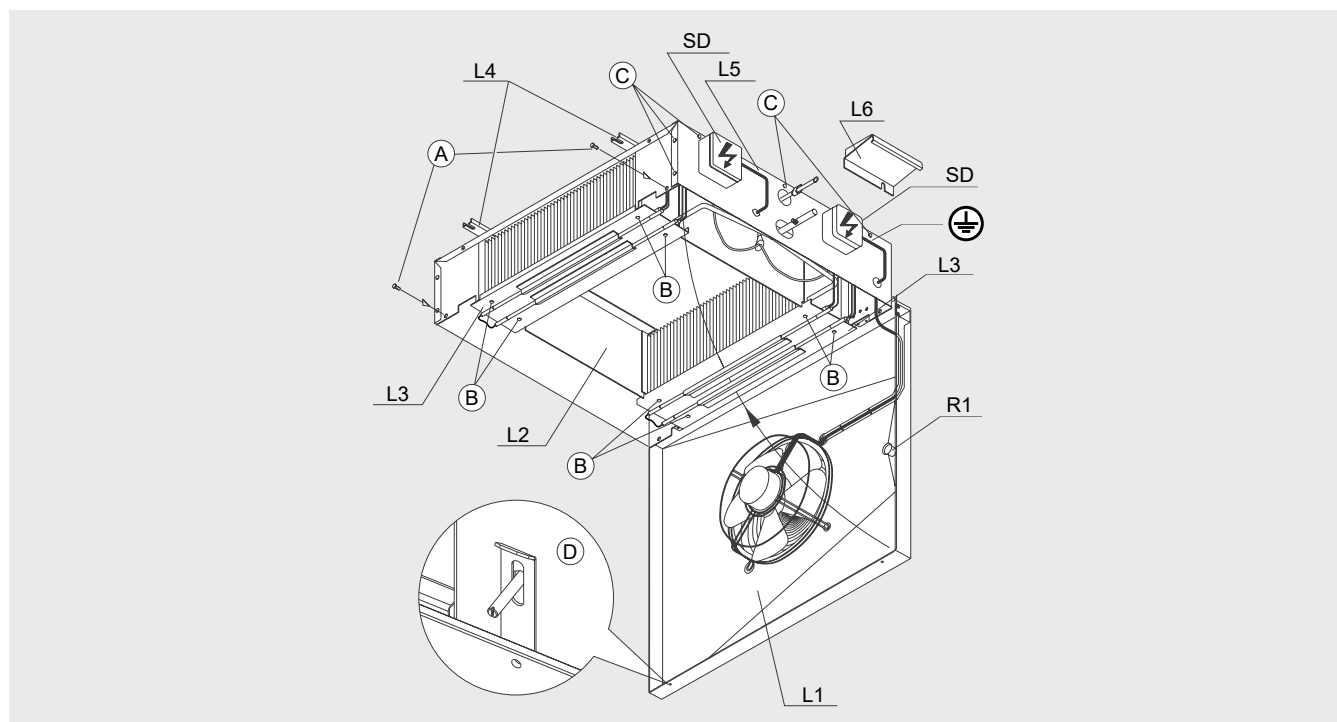


Figure 4

- L1 = Fan shroud
- L2 = Sector
- L3 = Inner drip tray
- L4 = Supports
- L5 = Side panel
- L6 = Deflector
- R1 = Drain connection
- SD = Junction boxes (fans and heaters)
-  = Ground pole

9. Wiring diagrams

Motor-fan connection diagram

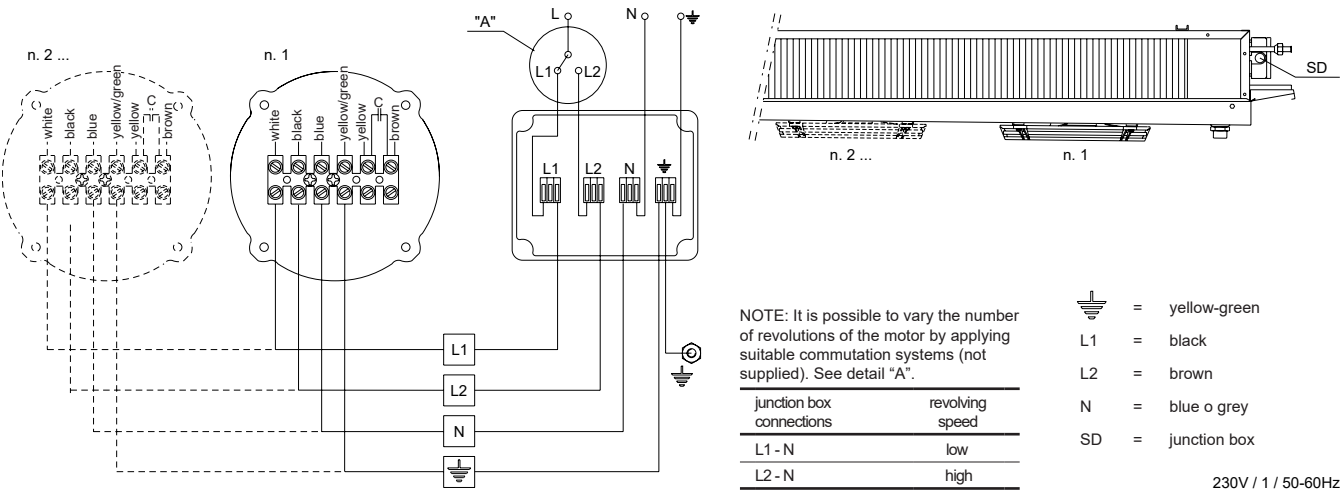
Important. The motors are equipped with inner thermal protection with automatic reconnection. Before using motor speed control systems verify the compatibility with the motors. Non compatible systems may damage motors or increase noise level; Modine will not be responsible for model performance with speed control systems. For fans equipped with thermal contacts (TK), these must be connected to the control circuit. For models supplied with wiring in a junction box, remove the cover to make the connection.

Model	GDE	311E3		312E3		313E3		314E3		315E3		316E3	
		311E4		312E4		313E4		314E4		315E4		316E4	
		311E7		312E7		313E7		314E7		315E7		316E7	
Motorfans	n° x Ø mm	1x315		2x315		3x315		4x315		5x315		6x315	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60	50	60
Junction box connections L1 - N													
Electrical consumption	A	0.38	0.45	0.76	0.90	1.14	1.35	1.52	1.80	1.90	2.25	2.28	2.70
	W	85	100	170	200	255	300	340	400	425	500	510	600
RPM		1170	940	1170	940	1170	940	1170	940	1170	940	1170	940
Junction box connections L2 - N													
Electrical consumption	A	0.44	0.62	0.88	1.24	1.32	1.86	1.76	2.48	2.20	3.10	2.64	3.72
	W	100	135	200	270	300	405	400	540	500	675	600	810
RPM		1300	1350	1300	1350	1300	1350	1300	1350	1300	1350	1300	1350

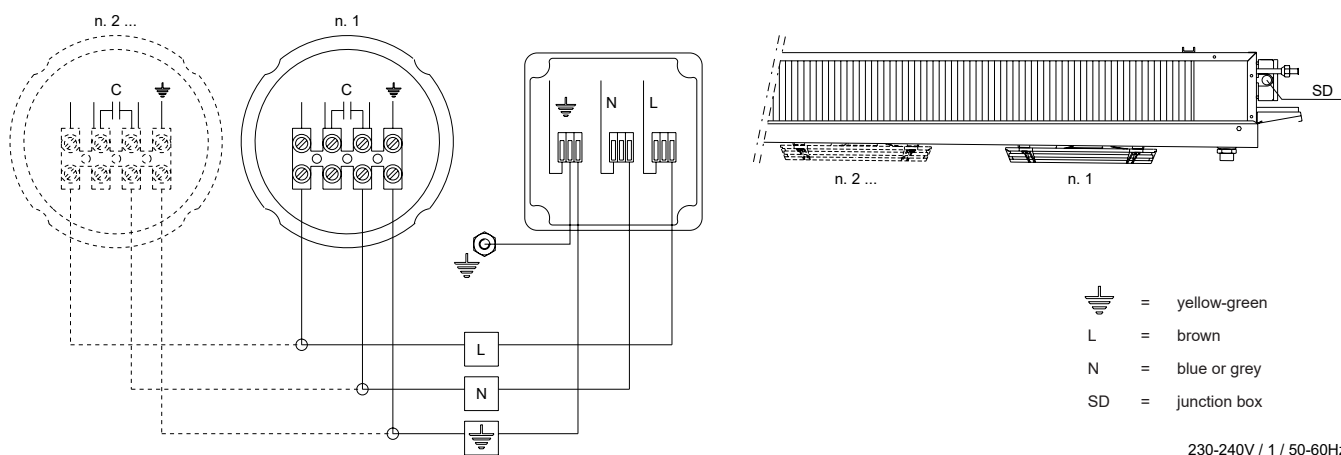
Model	GDE	351E3		352E3		353E3		354E3		355F3	
		351E4		352E4		353E4		354E4		355F4	
		351E7		352E7		353E7		354E7		355F7	
Motorfans	n° x Ø mm	1x350		2x350		3x350		4x350		5x350	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60
Electrical consumption	A	0.31	0.37	0.62	0.74	0.93	1.11	1.24	1.48	1.55	1.85
	W	65	85	130	170	195	255	260	340	325	425
RPM		945	1100	945	1100	945	1100	945	1100	945	1100

Model	GDE	361A3		362A3		363A3		364A3		365F3	
		361A4		362A4		363A4		364A4		365F4	
		361A7		362A7		363A7		364A7		365F7	
Motorfans	n° x Ø mm	1x350		2x350		3x350		4x350		5x350	
Frequency	Hz	50	60	50	60	50	60	50	60	50	60
Electrical consumption	A	0.68	0.90	1.36	1.80	2.04	2.70	2.72	3.60	3.40	4.50
	W	145	205	290	410	435	615	580	820	725	1025
RPM		1450	1700	1450	1700	1450	1700	1450	1700	1450	1700

Ø315 fan diameter unit



Ø350 fan diameter unit

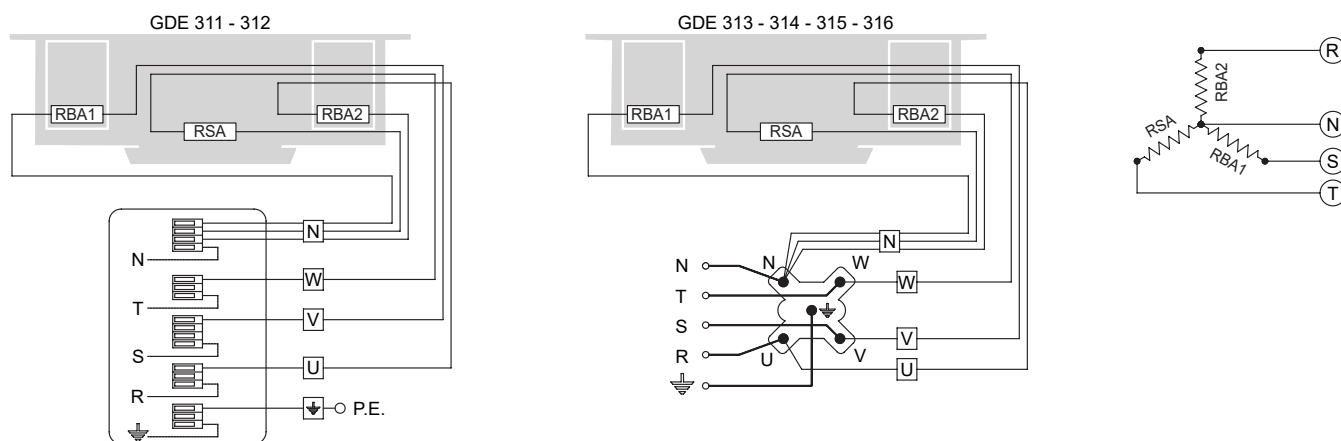


Heater connection diagram

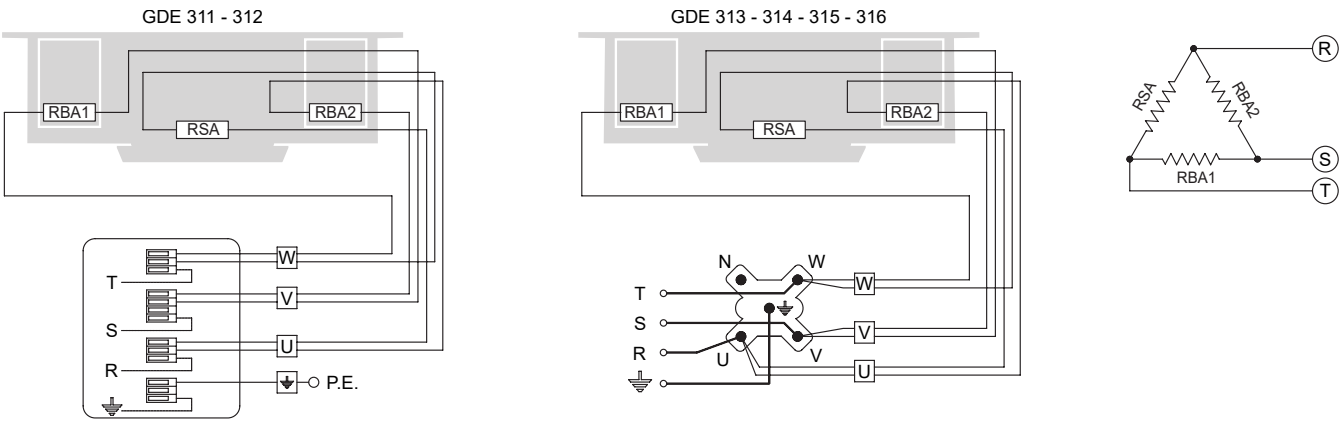
Important. Application of adequate thermal control systems on feeder lines is mandatory. Performance of all electric heaters must be periodically controlled to avoid damage due to ice build-up. Modine is not liable in any way for defects caused by non detected malfunctions. For models supplied with wiring in a junction box, remove the cover to make the connection. It is compulsory to use power cables with a minimum cross-section according to the technical standards in force in the country of installation, depending also on the laying method, the length of the cables and their type. To minimise the risk of indirect contact, it is advisable to earth the unit, using the earth pole (where present). For further information please refer to the diagrams supplied with the model.

Ø315 fan diameter unit

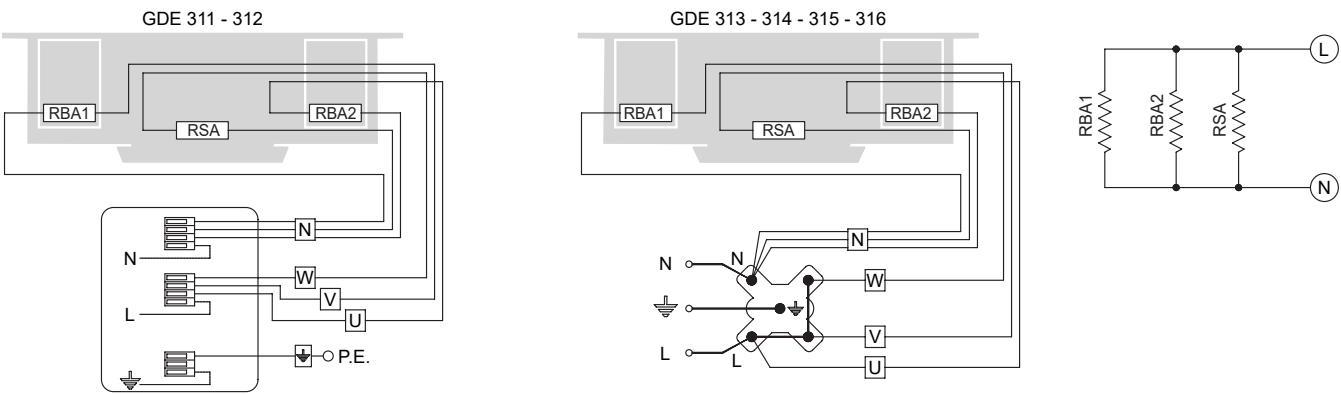
Connection 400V/3/50-60Hz STANDARD



Connection 230V/3/50-60Hz to be set



Connection 230V/1/50-60Hz to be set

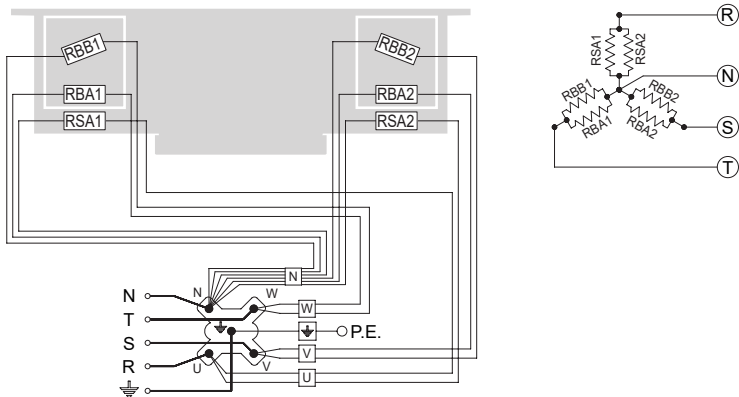


RBA - High power electric heater in coil
RSA - High power electric heater on inner drip tray

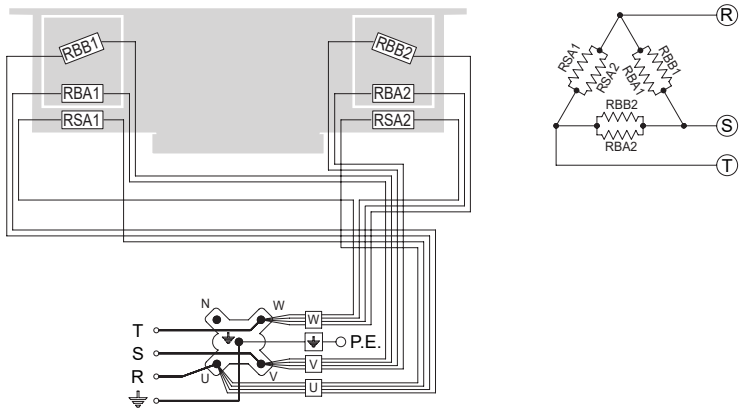
Model	GDE "ED" Ø315	311E3	312E3	313E3	314E3	315E3	316E3
		311E4	312E4	313E4	314E4	315E4	316E4
		311E7	312E7	313E7	314E7	315E7	316E7
Rows		4	4	4	4	4	4
Total power	W	1500	3000	4500	6000	7500	8550

Ø350 fan diameter unit

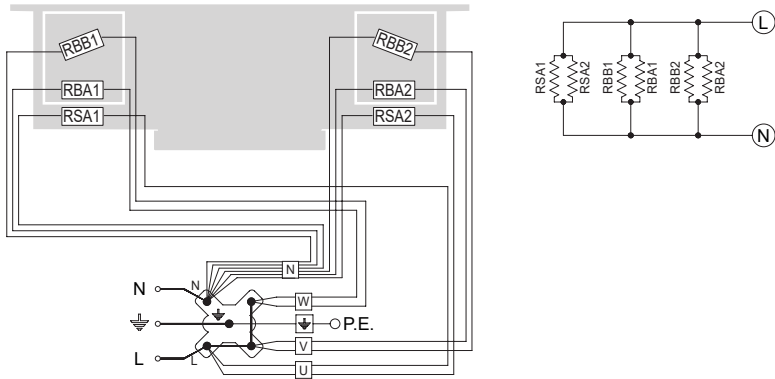
Connection 400V/3/50-60Hz STANDARD



Connection 230V/3/50-60Hz to be set



Connection 230V/1/50-60Hz to be set



RBA - High power electric heater in coil
RBB - Low power electric heater in coil
RSA - High power electric heater on inner drip tray

Model	GDE "ED" Ø350	351E3	361A3	352E3	362A3	353E3	363A3	354E3	364A3	355E3 (*)	365A3 (*)	355F3 (°)	365F3 (°)
		351E4	361A4	352E4	362A4	353E4	363A4	354E4	364A4	355E4 (*)	365A4 (*)	355F4 (°)	365F4 (°)
		351E7	361A7	352E7	362A7	353E7	363A7	354E7	364A7	355E7 (*)	365A7 (*)	355F7 (°)	365F7 (°)
Rows		4	6	4	6	4	6	4	6	4	6	5	
Total power	W	2500	2500	4500	4500	7000	7000	9000	9000	11000	11000	11000	

(*) Brine Coolers (W) only
(°) Aeroevaporators (H(C)FC-HFO) only

10. Checks to be performed before start-up

With main switch open and padlocked ("0-OFF" position):

- 10.1 Tightening of all the electrical connections.
- 10.2 Levelling and checking the solidity of the supporting structure.
- 10.3 Correct fastening of panels and components, paying particular attention to the correct fastening of the fan guard grille.
- 10.4 Verification of spaces for maintenance.
- 10.5 Correspondence of the supply voltage to the plate data.
- 10.6 Freedom of movement of the blades of the fans.
- 10.7 Absence of fluid leaks. Risk of environmental damage.
- 10.8 Removal of the protective film from the casing.
- 10.9 Checking of the cleanliness of the installation area.
- 10.10 Check that there are no foreign bodies in the vicinity of the fans and of the unit to avoid them being sucked in by the fans.
- 10.11 Checking of the pressure tightness of the unit.
- 10.12 The unit is ready for use after all the instructions and warnings concerning the electrical connections and the fluids have been strictly adhered to.

11. Checks to be performed after start-up

- 11.1 The first start-up must be supervised by a qualified technician and must be carried out with great care.
- 11.2 Check the rotation direction of the motor fans. Contrary rotation could affect the performance of the model.
- 11.3 Check freedom of rotation of the impeller, without rubbing or irregular movements.
- 11.4 Check the movement of the fluid.
- 11.5 Absence of vibrations or unusual noises.
- 11.6 Check that the electric consumption is correct, in any case not exceeding what is reported on the label of the motor fan. If the unit is equipped with defrosting heaters, check that the consumption complies with the data in the table (see Chapter 9).
- 11.7 Check that the screws are tightened correctly (Ref. EN 1090-2).

12. Maintenance

- 12.1 Checks, inspections and maintenance must be carried out by specialised and authorised personnel.
- 12.2 During the operations of maintenance, repair and cleaning, always use personal protective equipment (e.g. gloves sufficiently resistant to mechanical hazards) to reduce the risk of injury in the event of contact with the sharp edges of the metal sheets or with the finned pack.
- 12.3 Do not perform any operations on the unit before disconnecting the power supply. Disconnect the energies and discharge them. Set the main switch to the "0-OFF" position and lock it with a padlock; the key must be kept by the maintenance technician until the work is completed. Wait until all fans have stopped rotating. After disconnecting the power supply, wait 5 minutes before opening the junction boxes on the machine.
- 12.4 It is recommended to check, at least once every six months, that the electrical connection, the earthing and the components subject to the greatest wear (motor fans, switches) are functioning correctly; if worn or obsolete, replace them with new equivalent components.
- 12.5 It is recommended to check, at least once every six months, that all electrical and mechanical parts and circuits affected by the fluids are in good working order; check the integrity and fastening of the fan protection grille.
- 12.6 It is advisable to check, at least once every six months, that the screws are properly tightened (Ref. EN 1090-2).
- 12.7 If a fan is OFF for a long period, it should be switched ON for at least 2 hours every month to remove any trace of moisture inside the motor.
- 12.8 Check the cleanliness of the finned pack at least once a month.
- 12.9 Clean the surfaces of the finned pack and of the fans at least once every six months.

12.10 Cleaning of the finned pack:

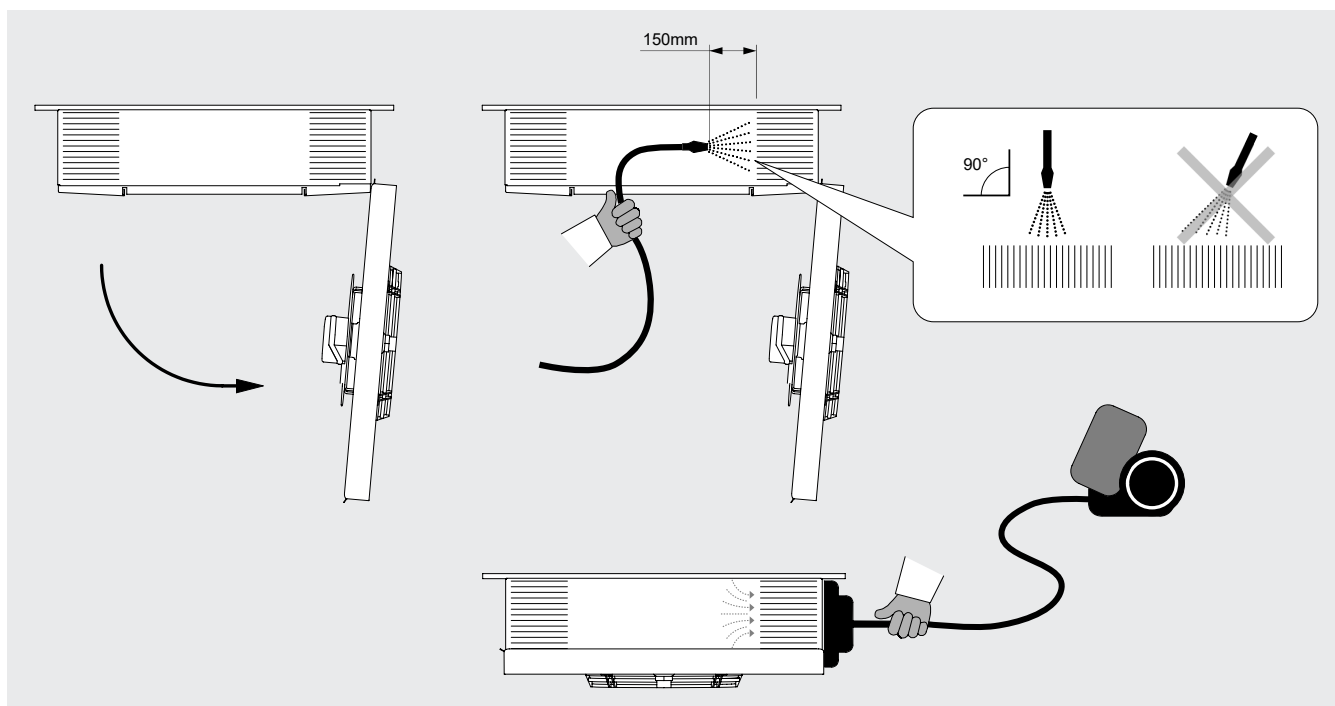


Figure 5

- 12.10.1 Place the main switch in the "OFF" position and wait until all the fans have stopped rotating. Lower the conveyor (ref. Chapter 8). Protect the motor fans and electrical connections with waterproof covers and/or panels. If necessary, remove the motor fans and their grills by unscrewing the fixing screws.
- 12.10.2 Use compressed air at a maximum pressure of 10 bar and at a minimum distance of 150 mm, directed perpendicularly against the finned pack to avoid bending or damage to the fins.
- 12.10.3 Use a jet of water at a max pressure of 50 bar for damp dirt or grease at a minimum distance of 150 mm, directed perpendicularly against the finned pack, avoiding bends or damage to the fins and pipes. If appropriate add a neutral detergent (refer to its instructions for use). Rinse and then dry with compressed air as indicated at point 12.10.2. Make sure that the electrical components are not affected by the jet of water. If necessary, provide adequate coverage.
- 12.10.4 Aspirate possibly from the air inlet side.
- 12.10.5 After having cleaned the finned pack, perform a visual inspection to identify any dirt or the presence of fins that are damaged (repeat the cleaning operation if necessary).
- 12.11 Only use original spare parts. Do not wait until the component is completely worn out, preventive replacements can greatly improve performance and extend the life of the model.
- 12.12 For maintenance of any accessories or components mounted on the model, refer to their user-manuals.
- 12.13 When replacing electric heaters take particular care during installation in order to avoid damage to the vulcanization; correctly reset wiring and existing fastening systems to avoid possible movement during operation.
- 12.14 After every maintenance work, carry out the checks before commissioning according to Chapter 10 and after commissioning according to Chapter 11.
- 12.15 Always take into account the working pressure of the system: in the event of a rupture, there is a risk of injury to persons or damage to property due to the projection of debris, even from a great distance. Before carrying out any work, always make the system safe as per current regulations. The use of PPE is recommended (see Chapter 13).
- 12.16 In the event of a leak of refrigerant fluid, check that it has not penetrated into rooms below or adjacent to the place of installation: secure the rooms as per current regulations.
- 12.17 Do not use the ventilation ducts to evacuate refrigerant vapours.
- 12.18 In the event of fire, evacuate the premises immediately and take all safety measures in accordance with the regulations in force.
- 12.19 When dismantling and scrapping the unit, ensure that the appropriate PPE is used (see Chapter 13).

Ensure that the fluids are completely drained and properly disposed of. Pay particular attention to sharp edges.

12.20 Troubleshooting:

Problem	Possible causes	Possible solutions
The fan motors do not rotate	Interruption of the electric power line (conductors, disconnecting switches, regulators, pressure switches, etc)	Check electric power line up to fan motor junction and reset
	Suction air temperature of fan motors beyond allowed limits	Check project figures and data especially the working temperatures
	Intervention of thermal protection of fan motors	Clean finned pack and carry out maintenance more frequently
	Obstruction of the finned pack	Remove obstacles
	Fan motor blades blocked by foreign objects	Replace burnt motors
The model vibrates	Burning of motor windings	
	Inadequate fixing of the model	Adequately fasten model
	Loosened fan motor fastening screws	Restore correct fastening
The noise level of model is too high	Unbalanced fan motors	Replace unbalanced fan motors
	Obstructed finned pack	Clean finned pack or carry out maintenance more frequently
	Unbalanced fan motors	Replace unbalanced fan motors
	Worn-out fan motor bearings	Replace noisy fan motors

13. Residual risks

13.1 The equipment presents a number of risks that have not been fully eliminated from the design point of view or through the installation of adequate protections. Based on such risks, it is reported which PPE should be used by the operators or which behaviours and procedures should be adopted.

Sufficient space must be provided during the installation of the unit to limit these risks. To preserve these conditions, the aisles and areas surrounding the unit must always:

- be kept free of obstacles (such as ladders, tools, containers, boxes...);
- be clean and dry;
- be well lit if necessary.

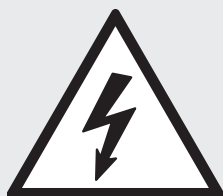
List of residual risks that remain on the unit:

BURN



The operator (in particular situations or during maintenance) intentionally or unintentionally touches a hot or frozen surface: if necessary use insulating gloves and/or wait for cooling/heating of the surfaces.

ELECTROCUTION



Contact with live electrical parts during maintenance operations carried out with the presence of voltage: operations reserved for qualified and authorised operators, equipped optionally with PPE and insulating tools - in general, turn off the power supply to the machine by switching the main switch open "O" and lock it in this position.

SHARP FINS



The operator at the stages of use and cleaning must be careful of the fins as they are sharp.

CUTTING AND CRUSHING BY BODIES IN MOTION



The operator (in particular situations or during maintenance) must pay attention to the fans. In general disconnect the fan by placing the safety switch located near the fan shroud in the open position "O".

Headers can reach low temperatures, avoid contact.

Airflow from fans can cause discomfort to personnel and damage to property.

Any use other than that specified in this manual is considered incorrect.

During operation of the equipment, no other types of work or activities are permitted that are to be considered as incorrect and that in general may entail risks for the safety of persons and damage to property.

It will be considered predictable misuse:

- Failure to disconnect the power supply with the main switch in the open "O" position (or disconnection of the plug socket) before carrying out adjustment, reset and maintenance work.
- Insufficient maintenance and periodic checks.
- Structural changes or modifications to the operating logic.
- Tampering with the guards and safety systems.
- The presence of third persons during normal operation.
- Non-use of PPE by operators and any maintenance technicians.
- Use of inappropriate clothing and/or accessories (e.g. ties, ribbons, loose sleeves, necklaces...).



The behaviours previously described are prohibited.

It is forbidden to remove or make illegible safety, hazard and obligation signs shown on the equipment.

It is forbidden to remove or tamper with the guards of the equipment

Machine modifications are prohibited: in such cases request the intervention of Modine.

The following table summarises the PPE (Personal Protection Equipment) to be used during the various phases of the life of the equipment (each stage involves the obligation to use and provide PPE), in order to protect the health and safety of operators.

The responsibility for the identification and choice of the type and category of PPE that is appropriate and suitable lies with the user.

								
Phase	Protective clothing	Safety footwear	Gloves	Goggles	Visor	Ear protectors	Mask	Helmet or head gear
Transportation	NP	NP	NP	NP	NP	NP	NP	NP
Handling	X	X	X	X	NP	NP	NP	X
Unpacking	X	X	X	X	NP	NP	NP	X
Assembly	X	X	X	X	NP	O	NP	X
Ordinary use	NP	NP	NP	NP	NP	NP	NP	NP
Adjustments	X	X	X	NP	X	O	NP	NP
Cleaning	X	X	X	NP	X	O	X	NP
Maintenance	X	X	X	NP	X	O	O	X
Dismantling	X	X	X	NP	X	O	NP	X
Demolition	X	X	X	X	NP	O	NP	O

X : Recommended PPE

O : PPE available or to be used if necessary

NP : PPE not recommended

The PPE used must comply with the directives of the product and bear the CE marking (for the European market).

The definitions of the phases of life of the equipment are described in the following table.

Phase	Description
Transportation	It consists of transferring the equipment from one location to another through the use of suitable means.
Handling	It consists of transferring the equipment from and on the means used for transportation and movements within the plant.
Unpacking	It involves removal of all the materials used for packaging of the equipment.
Assembly	It involves all the assembly operations that initially prepare the equipment for fine-tuning.
Ordinary use	Use for which the equipment is intended (or that is considered usual) in relation to its design, construction and function.
Adjustments	These involve the adjustment, fine-tuning and calibration of all those devices which must be adapted to the condition of operation normally envisaged.
Cleaning	It involves the removal of dust, oil and residues of processing that could compromise the efficient operation and use of the equipment, as well as the health and safety of the operator.
Maintenance	It involves periodic verification of the parts of the equipment that can wear out and that must be replaced.
Dismantling	It involves the complete or partial dismantling of the equipment for any type of necessity.
Demolition	It involves the definitive removal of all parts of the equipment resulting from the operation of definitive dismantling to allow the possible recycling or differentiated collection of components according to the procedures laid down by the existing rules of law.

14. Reference standards and directives

- MACHINE DIRECTIVE 2006/42/EC
- LOW VOLTAGE DIRECTIVE 2014/35/EU
- ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU
- PRESSURE VESSELS DIRECTIVE 2014/68/EU, module A 2 for Cat. I or Art. 4 Par. 3, as indicated on the PED label of the exchanger.
- ERP DIRECTIVE 2009/125/EC
- UNI EN 378:2020 REFRIGERATION SYSTEMS AND HEAT PUMPS

15. Technical data

15.1 Technical data

Model code	Label on the unit
Serial number	Label on the unit
Year of manufacture	Label on the unit
Max pressure PS	Label on the unit
Project number	Documents relating to offer / order
Fluid type	Documents relating to offer / order
Internal volume	Label on the unit
Weight	Label on the unit
Sound pressure level	Documents relating to offer / order
Current	Label on the unit and Technical manual Chapt. 9
Voltage	Label on the unit and Technical manual Chapt. 9

15.2 Identification code

Series	Fan diameter	Fan number	Coil rows	Fin spacing	Electric defrost	Optional features
GDE	31	1	E	7	ED	.1079
	31 = Ø315	1	A = 6	3 = 3mm		
	35 = Ø350	2	E = 4	4 = 4mm		
		3	F = 5	7 = 7mm	[ED] = optional electric defrost	[.xxxx] = optional features
		4				
		5				
		6				

15.3 Documents supplied with the current model or available at: <https://www.modinecoolers.com/documents/>

15.3.1 Technical Manual - Instructions for Use

15.3.2 Declaration of Incorporation

15.3.3 Operating Manual - Fans (as long as required)

15.3.4 Circuit diagram (if applicable)

15.3.5 User's manuals for accessories (if any)



Annex PQ 08.02.30-02 rev.04
Modine CIS Italy Srl
Via Giulio Locatelli, 22
33050 POCENIA (UD) Italia

GAMMA PRODOTTO - PRODUCT RANGE - PRODUKTE SERIE - GAMME PRODUIT - GAMA PRODUCTO

Aeroevaporatori, Unit coolers, Luftverdampfer, Aeroevaporateur, Aerovaporador

**EVS, EP, MIC, CTE, GCE, GDE, GME, GSE, LFE, GLE, STE, ICE, FTE, IDE, SRE,
CDC, CDM, CGD, CDD, CDL, CGL, CGC, CGS
AGC, AGD, AGS, AGL, AP**

DICHIARAZIONE DI INCORPORAZIONE (2006/42/EC - II B)

DECLARATION OF INCORPORATION - EINBAUERERKLÄRUNG - DECLARATION D'INCORPORATION - DECLARACIÓN DE INCORPORACIÓN

Il fabbricante dichiara che ogni modello della gamma di prodotto qui identificata:

- non deve essere messo in servizio finché la macchina in cui sarà incorporato non sia stata dichiarata conforme alla direttiva 2006/42/CE;
- sono stati applicati e rispettati i seguenti requisiti essenziali della direttiva macchine 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1);
- è conforme alle disposizioni della direttiva 2014/35/UE
- è conforme alle disposizioni della direttiva 2014/30/UE
- è conforme alle disposizioni della direttiva 2014/68/UE, Modulo A per Cat. I oppure Art. 4 Par. 3, come indicato su etichetta dati PED scambiatore;
- è conforme alle disposizioni della direttiva 2009/125/EC

The manufacturer declares that each model of the product range hereby identified:

- must not be set into operation until the machine into which it will be incorporated has been declared in accordance with the provisions stated in directive 2006/42/EC;
- that the following essential requirements of Machinery Directive 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1) have been duly applied and fulfilled;
- complies with the provisions of revised directive 2014/35/UE
- complies with the provisions of revised directive 2014/30/UE
- complies with the provisions of revised directive 2014/68/UE, Module A for Cat. I or Art. 4 Par. 3, as indicated on the heat-exchanger's PED data label;
- complies with the provisions of revised directive 2009/125/EC

Der Hersteller erklärt, dass jedes Modell der hier gekennzeichneten Produktserie:

- solange nicht in Betrieb genommen werden darf, bis die Maschine oder Anlage, in welche dieser eingebaut wird, den Bestimmungen der Richtlinie 2006/42/EC entspricht;
- die folgenden grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1) zur Anwendung kommen und eingehalten werden;
- den Bestimmungen der Richtlinie 2014/35/UE entspricht;
- den Bestimmungen der Richtlinie 2014/30/UE entspricht;
- den Bestimmungen der Richtlinie 2014/68/UE Vorgang A für Kategorie I oder Artikel 4 Absatz 3 entspricht, gemäß Angaben auf der PED Etikette des Wärmeaustauschers;
- den Bestimmungen der Richtlinie 2009/125/EC

Le fabricant déclare que chaque modèle de la gamme de produit ici identifié:

- ne doit pas être mis en service avant que la machine dans laquelle il sera incorporé ne soit déclarée conforme aux dispositions de la directive 2006/42/EC;
- est conforme aux dispositions de la directive 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1);
- est conforme aux dispositions de la directive 2014/35/UE;
- est conforme aux dispositions de la directive 2014/30/UE;
- est conforme aux dispositions de la directive 2014/68/UE, Module A pour Cat.I ou Art.4 Par.3, comme indiqué sur étiquette données PED échangeur;
- est conforme aux dispositions de la directive 2009/125/EC

El fabricante declara que cada modelo de la gama de producto aquí identificado:

- no se tiene que poner en marcha hasta que la máquina en la cual se instalará sea declarada conforme a las condiciones indicadas en la norma 2006/42/EC;
- es conforme a las condiciones de la norma 2006/42/EC (1.1.3, 1.1.5, 1.3.1, 1.3.4, 1.3.7, 1.3.8, 1.5.1);
- es conforme a las condiciones de la norma 2014/35/UE;
- es conforme a las condiciones de la norma 2014/30/UE;
- es conforme a las condiciones de la norma 2014/68/UE, Módulo A para Categoría I, o Art.4 Par. 3, como indicado en la etiqueta datos PED intercambiador.
- es conforme a las condiciones de la norma 2009/125/EC

ATTESTATO DI COLLAUDO

TEST CERTIFICATE - ABNAHMEZEUGNIS - ATTESTATION D'ESSAIS - CERTIFICADO DE CONFORMIDAD DE LA PRUEBA

Il fabbricante dichiara che ogni modello della gamma di prodotto qui identificata ha superato con esito positivo i collaudi funzionali e di sicurezza elettrica, secondo le norme sotto indicate

The manufacturer attests that each model of the product range hereby indicated has passed the relevant operating and electrical safety tests in accordance with the following standards

Der Hersteller erklärt, dass jedes Modell der hier gekennzeichneten Produktserie und je nach elektrischer Ausstattung zugeordnete Modell das funktionsgerechte Abnahmeverfahren sowie das der elektrischen Sicherheit gemäß den u. g. Richtlinien erfolgreich bestanden hat.

Le fabricant déclare que chaque modèle de la gamme de produit ici indiqué a passé avec succès les essais fonctionnels et de sécurité électrique, conformément aux normes indiquées

El fabricante declara que cada modelo de la gama de producto aquí indicada ha superado las pruebas funcionales y de seguridad eléctrica, de acuerdo con las siguientes normas

CEI EN 60335-2-40, 60335-1

Date of issue 28/09/2021

Modine CIS Italy

Persona autorizzata a costituire la documentazione tecnica pertinente (ANNEX II B.5)
Person authorized to compile the relevant technical documentation
Bevollmächtigte Person, die die relevanten technischen Unterlagen zusammenstellt
Personne autorisée à constituer le dossier technique en question
Persona facultada para elaborar la documentación técnica pertinente
Andrea Tullis

direzione tecnica Modine CIS Italy

technical director – technischer Leiter – Directeur técnico – Directeur
technique
Roberto Benedetti

Roberto Benedetti

Garanzie

Tutte le informazioni tecniche presenti in questa edizione sono basate su prove che riteniamo ampie e attendibili, ma che non possono essere riferite a tutta la casistica dei possibili impieghi. Pertanto, l'acquirente deve accertare l'idoneità del prodotto all'uso per il quale intende destinarlo, assumendo ogni responsabilità derivante dall'utilizzo dello stesso. La società venditrice, su richiesta dell'acquirente, si renderà disponibile fornendo tutte le informazioni utili per il migliore utilizzo dei suoi prodotti. Tutti i nostri modelli sono garantiti per due anni dalla data di fatturazione degli stessi; si prega di contattare la sede legale di Modine CIS Italy S.r.l. per un maggior approfondimento. Sono ad ogni modo escluse da ogni forma di garanzia le avarie occasionali quali quelle dovute al trasposto, le manomissioni da parte di personale non autorizzato, l'utilizzo non corretto e le errate installazioni a cui vengano sottoposti i prodotti.

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All technical information in this edition is based on tests carried out, which we deem exhaustive and reliable but which cannot be referred to all records of possible applications. Therefore, the purchaser must ascertain product suitability with regard to its intended use, undertaking all responsibility arising from its said use. Upon request by the purchaser, the seller shall be available to supply all useful information in order to use their products better. All our models have a two-year warranty with effect from the date of the said invoice. Please refer to the Legal Office of Modine CIS Italy S.r.l. for more in-depth information. However, occasional failures such as those due to transport, tampering by unauthorised personnel, incorrect use and incorrect installation, which the products are subjected to, are all excluded from any form of warranty.

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La recherche constante de nos laboratoires visant à garantir des produits toujours meilleurs et innovants pourrait causer la modification des données contenues ici. Il incombera à l'utilisateur de se tenir informé sur leur validité.

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