

## Installation, operation and maintenance manual

### Cooling units for roof mounting

**CE****EAC**

### **ATTENTION!**

Read carefully and completely before installation. Keep the manual until unit decommissioning.

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## 1. Cooling unit application

The **DEK** series cooling units described in this manual are designed and built to cool the air inside electrical switchboards in order to protect components sensitive to thermal shock. They also provide **IP54** ingress protection against contaminating and aggressive/ corrosive substances.

### 1.1 Intended use

The **DEK** cooling unit must be used:

- For cooling electrical switchboards
- For roof installation
- Within the temperature and voltage-supply limits indicated on the data plate of the cooling unit and also given in table **F.14** of this manual;
- Away from any sources of heat or hot air
- In an environment with adequate air exchange
- On switchboards with **IP54** rating or higher. If these requirements are not respected, excessive condensation build-up may occur. As a consequence, cable entry points or any other openings in the cabinet should be well sealed. To ensure correct operation, the specified scheduled maintenance operations (see section **10**) must be performed regularly. Incorrect or careless use may cause irreparable damage to the cooling unit and may lead to hazardous situations.

### 1.2 Improper use

The **DEK** cooling unit must NOT be used:

- Under any condition except those described in section **1.1**
- Outdoors, with excessive concentration of solid contaminants and/or aggressive chemical contaminants
- With the doors of the electrical switchboard open, or installed on enclosures without a minimum IP 54 rating, due to excessive condensate formation
- With the temperature set below the dew point of the ambient air
- In explosive atmospheres, or those with aggressive chemicals or high concentrations of dust or oil suspended in the air
- In potentially inflammable atmospheres
- Exposed to the elements
- With the condensate line closed or blocked off, or in any case in which the condensate is not allowed to run off freely
- Without the front panel
- With the cooling unit intake and outlet air flows obstructed by walls or objects that are too close to this end, check the minimum distances as regards the external air flow (figure **F.02**), and make sure there are no obstructions caused by the switchboard components as regards the internal air flow.

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## 2. Supply

Inside the packaging you will find:

- 1 Cooling unit
- 1 Electronic thermostat manual
- 1 Installation, operation and maintenance manual
- 1 CE conformity certificate
- 1 Test certificate
- 1 A4 drilling template
- 1 Installation kit containing (F.04):
  - Flanged nuts (p.1)
  - Flat washers (p.2)
  - Grub screws (p.3)
- 2 Connectors, one for the power supply and one for the signals (F.07)
- 1 Self-adhesive sealing strip (F.04, p.4)
- 1 Transparent hose pipe for service condensate runoff 12x2x2500 mm (F.05, p.5)
- 1 coloured hose pipe for emergency condensate runoff 12x2x1500 mm (F.05, p.6)
- 2 condensate runoff pipe elbow joints (F.05, p.7)
- Lifting eyebolts (F.03)

## 3. Updates

ITRack S.r.l. reserves the right to update its products and the corresponding manuals based on technical progress without prior notice. Please note that at the time of sale, this manual and the corresponding product may not be considered inadequate only because they are not subject to the above-mentioned updates.

## 4. Technical features

(figures F.14 and F.15)

The unit's technical features and CE marking are given on the data plate attached to the cooling unit.

## 5. Transport and handling

During transport and storage the cooling unit must be kept in a vertical position, as indicated on the packaging (figure F.01), and must not be exposed to temperatures above 70°C or below -20°C. Upon receipt, check that the packaging has not been damaged during shipping. To lift the cooling unit in a safe manner the two supplied M6 eyebolts may be used; these should be fitted into the threaded inserts located on the top of the cooling unit (figure F.03).

## 6. Installation

Installation of the unit should only be performed by qualified and authorised personnel. Ensure the fixing elements and couplings will not interfere with the equipment inside the enclosure itself. Make sure the roof of the switchboard is able to withstand its weight. If necessary, reinforce the switchboard structure. The unit must be installed in the horizontal position indicated. Maximum permitted deviation from the vertical is 2°. Disconnect power before starting any work inside the switchboard. The cooling unit must be installed on the outside of the electrical switchboard. Drill the holes and make the necessary cuts in the switchboard (figure F.04) using the drilling template supplied with the unit. If required fit the sealing strip on the cooling unit on the side connected to the enclosure and follow the assembly diagram (figure F.04).

## 7. Condensate discharge hose

The condensate which, depending on the ambient temperature and humidity conditions, forms on the heat exchanger which cools the enclosure air, is not a malfunction but a normal phenomenon of the cooling unit. The condensate is conveyed outwards by means of two runoffs, an emergency one and a service one, located in the bottom part of the cooling unit. A piece of transparent plastic hose pipe, 2.5 m long, must be connected to the **service runoff**. This is included in the supply (figure F.05, p.5). Cut the piece so it covers the distance from the fitting as far as the edge of the switchboard roof. Couple the piece to the elbow joint included in the supply. Couple the other side of such elbow to the remaining part of the pipe, which conveys the condensate as far as the base of the switchboard. Connect a piece of coloured plastic hose pipe, 1.5 m long, to the **emergency runoff**. This is included in the supply (figure F.05, p.6). Cut the piece so it covers the distance from the fitting to the edge of the switchboard roof. Couple the piece to the second elbow joint included in the supply. Couple the other side of such elbow to the remaining part of the coloured pipe which conveys the condensate to the side of the switchboard. Make sure the flow of condensate is not hindered in any way.

Avoid horizontal lengths of more than 0.5 metres, uphill sections and the accidental formation of traps (figure **F.08**). The end of the condensate discharge hose must always be free and not underwater. Never place the end of the discharge hose inside a condensate collection container (figure **F.09**). A position switch is best used on the door which, when connected to the digital input of the cooling unit, stops the operation of such unit in case of door opening.

## 8. Electrical connection

### 8.1 Safety

**Warning! Electrical connections must only be performed by specialised and authorised personnel. Switch power off to the enclosure before making the connection.** Check that there is no power to the switchboard and that the supply voltage corresponds to the characteristics given on the cooling unit's data plate. The power supply must be protected using appropriate time-delay fuses (type T) or circuit breakers with K-curve, per the indications given in table **F.14**. Connect the powersupply cables to the black connector included with the unit, following the indications given in figure **F.07**. Disconnect the cooling unit before performing testing on the enclosure.

### 8.2 Two-phase models with autotransformer ( DEK08G / DEK12G / DEK15G )

These two-phase models can operate with two different supply voltages: 440V 2~50-60Hz and 400V 2~50-60Hz. If the available power supply is 440V 2~50-60Hz, connect terminals L1(0) and L3(440) on the terminal board (figure **F.06**). If, on the other hand, the available supply voltage is 400V 2~50-60Hz, connect terminals L1(0) and L2(400) on the same terminal board.

### 8.3 Alarm pins

(figure **F.07**)

All input/output signals from the electronic control unit are managed via the grey pin:

- Alarm signals from the electronic control unit can be taken from terminals 1 and 2
- A digital input for voltage free contacts is available on terminals 3 and 4

The cooling unit's electronic control unit is programmed to generate an alarm when the digital input is open. When the digital input is not being used, it is therefore necessary to bridge it by connecting terminals 3 and 4 of the grey pin together with a cable.

## 9. First start up and adjustment

If, prior to installation, the cooling unit was left in an incorrect position (figure **F.01**), wait at least 8 hours before switching it on. Otherwise, 30 minutes is more than enough time for the oil to return to the compressor, after which the cooling unit can be powered up. The enclosure air intake fan starts working immediately, making the temperature inside the enclosure even. If this temperature exceeds 2K above the set point, both the compressor and external air fan will turn on, causing the cooling cycle to start. This then stops when the inside temperature reaches the set point. The thermostat is factory-set to 35°C. The set point can be set to between 20°C and 50°C. In order to save energy and minimize the production of condensate, it is nevertheless recommended it not be set below 30 °C.

### 9.1 Electronic thermostat

#### 9.1.1 Setting the set point

The cooling unit is fitted with a TX050 electronic thermostat. See the specific manual C17000199 included with the unit for the functions of this thermostat and how to program it. ITRack S.r.l. shall be in no way held liable for any alterations the customer may make to the default parameters if they have not received authorisation to do so.

## 10. Maintenance

**Warning! Caution! Before embarking on any maintenance work, cut the current to the enclosure.**

Job	Frequency
Check the external air heat exchanger and clean if necessary.	Every 3 months
Check effectiveness of the condensate discharge.	Every 3 months
Check the fans for any overheating or excessive vibrations.	Every 6 months

The cooling unit is the low maintenance type, so no filter change is required. The only maintenance required is for the internal components, which should be checked regularly, as indicated in the table given in this section, and cleaned with compressed air at a maximum pressure of 4 bar (figure **F.11**). Any repairs that may need doing must only be performed by specialised and authorized personnel.

## 11. Technical information

### 11.1 Operating principle

The cooling unit for electrical switchboard enclosures works on the basis of a refrigeration circuit consisting of four main components: compressor, evaporator, condenser and expansion device (figure **F.12**). The circuit is hermetically sealed and the refrigerant circulates inside it. The refrigerant used is R134a, chlorine free and harmless for the ozone layer. The unit is divided into two hermetically separated sections where the ambient air and enclosure air do not come into contact with one another and are treated separately. The compressor (CP) compresses the refrigerant, taking it to a high pressure and high temperature. The compressor then pushes the refrigerant through a heat-exchanger coil, called the condenser (C), where it is cooled by ambient air, thus passing from the gas to the liquid state. In the liquid state it then passes through the expansion valve (EXP), vaporising at the outlet as it is now at a much lower pressure. It is then received by the heat exchanger coil, called the evaporator (E), by means of which it absorbs heat from the enclosure air and passes from a liquid state to gas. The enclosure is cooled down in this manner. The gaseous refrigerant is then drawn back into the compressor and this cycle is repeated.

### 11.2 Safety devices.

The refrigeration circuit is fitted with a high-pressure safety switch P (figure **F.12**) set to the maximum working pressure of the cooling unit. If this threshold is exceeded, the pressure switch stops the compressor working. It resets automatically. The fans and compressor have an (internal or external) thermal cut-out switch that stops them in the case of overheating. The emergency runoff pipe permits the easy control of condensate runoff operations. If runoff is through the emergency pipe, this means the service runoff is blocked and must therefore be cleaned.

### 11.3 Disposal

**Caution! The cooling unit contains R134a refrigerant and small quantities of lubricating oil.** These are polluting substances and must not be dumped. Replacement, repairs and final disposal must be performed by experts.

#### NOTE

Keep the unit's documentation in a safe, dry place.

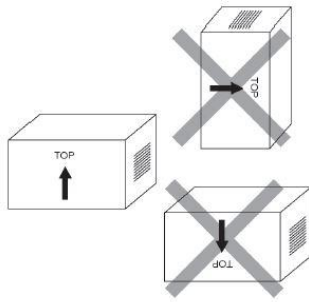
## 12. Troubleshooting

Malfunction	Conditions	Causes	Remedy
It fails to cool	The internal fan works, the external fan and compressor do not work.	The temperature inside the enclosure is lower than what is set on the adjustment thermostat.	This is not a malfunction of the cooling unit. To verify functioning when testing, lower the thermostat setting until the compressor and external fan start working and then reset the thermostat.
		The adjustment (or antifreeze) thermostat has failed	Change the adjustment (or antifreeze) thermostat
	No component works	No electricity getting to the unit.	This is not a malfunction of the cooling unit. • Make sure the power cable has been connected well to the terminals. • Check that the cubicle doors and switches are closed
		Compressor, external and internal fan work	Call a refrigeration expert or the Manufacturer's Technical Assistance Service
	Compressor and external fan work, internal fan does not work	Compressor mechanical failure	Call a refrigeration expert or the Manufacturer's Technical Assistance Service
		Internal fan capacitor failed	Change the internal fan's capacitor
	External and internal fan work, compressor does not work	Internal fan failed	Change the internal fan
		Compressor's amperometric protector failed (external to the compressor, where present)	Change the amperometric protector
		Relay or PTC for compressor starting failed	Change the relay or PTC for compressor starting
		Capacitor for compressor starting failed (where present)	Change the capacitor for compressor starting
		Compressor motor electrical failure	Call a refrigeration expert or the Manufacturer's Technical Assistance Service
		High pressure safety switch failed	Call a refrigeration expert or the Manufacturer's Technical Assistance Service
It is not cooling enough	External and internal fans work, compressor works all the time	Compressor contactor failed (where present)	Change the contactor
		Cooling unit under sized for the heat dissipated inside the enclosure	Change the cooling unit with another of greater capacity
		Antifreeze thermostat triggered (where present)	• Clean the evaporator coil • See if there are any obstacles inside the enclosure to hinder the flow of recycling air
	Inside fan works, external fan and compressor work irregularly	Insufficient gas in the cooling unit	Call a refrigeration expert or the Manufacturer's Technical Assistance Service
		Thermostat set point incorrect	Check thermostat setpoint
		High pressure safety switch triggered: • Ambient temperature over the maximum working limit • Heat exchanger coil (condenser) either dirty or clogged	• Ventilate the premises where the enclosure is installed to keep ambient temperature lower. • Clean the exchanger with compressed air and detergent
		Thermal protector inside the compressor triggered: • Ambient temperature over the maximum working limit • Heat exchanger coil (condenser) either dirty or clogged	• Ventilate the premises where the enclosure is installed to keep ambient temperature lower. • Clean the coil with compressed air and detergent
Too much condensate forming	Enclosure door open	Too much ambient air inside the enclosure	This is not a malfunction of the cooling unit. Close the enclosure door or disable the cooling unit.
	Enclosure door closed	Enclosure protection level is below IP54	This is not a malfunction of the cooling unit. Seal enclosure openings, e.g. for passage and upward path of wires
		The enclosure/cooling unit connecting seal has been fitted incorrectly	Check seal and remedy

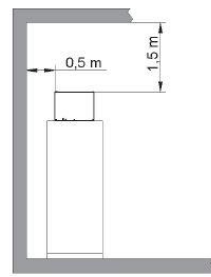


## 13. Pictograms

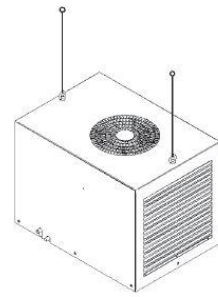
F.01



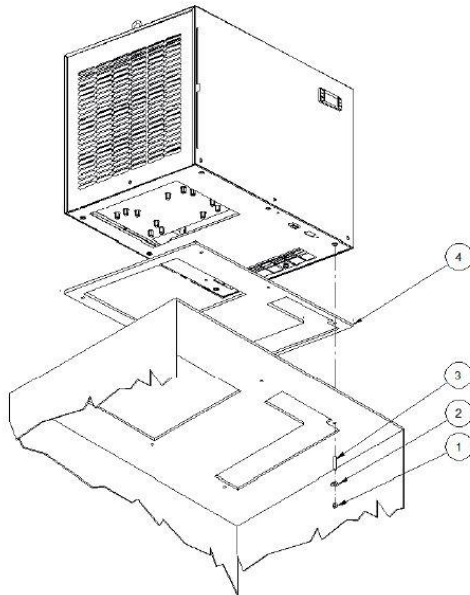
F.02



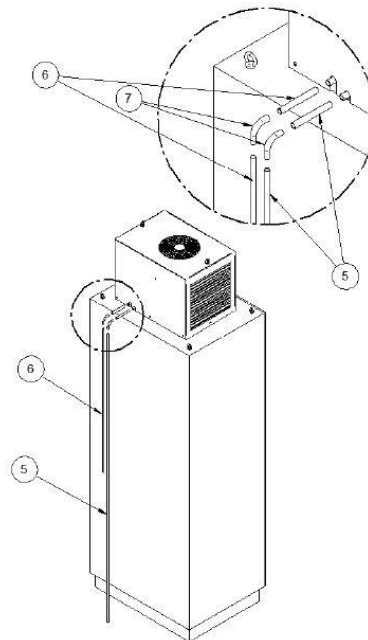
F.03



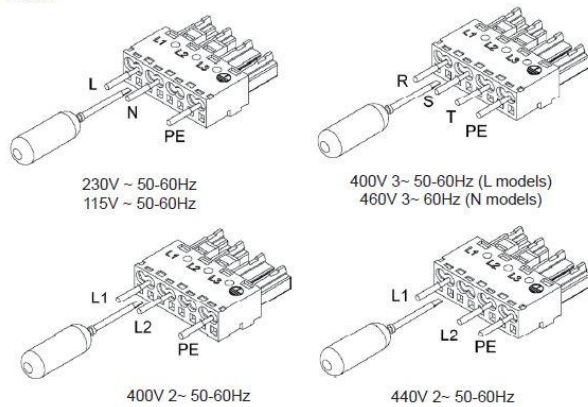
F.04



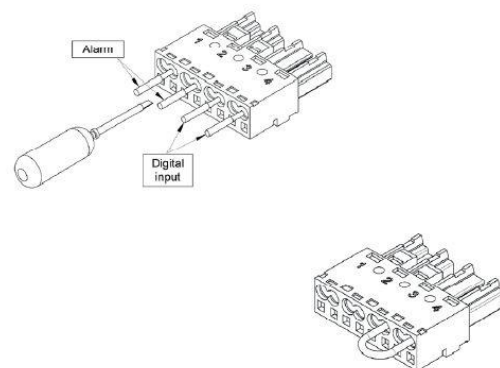
F.05



F.06

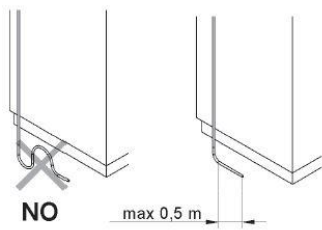


F.07

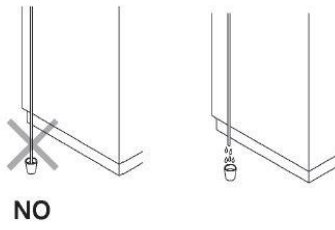


## 13. Pictograms

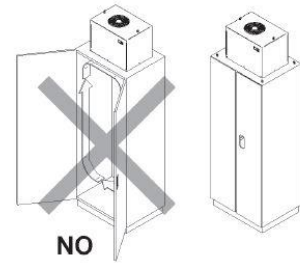
F.08



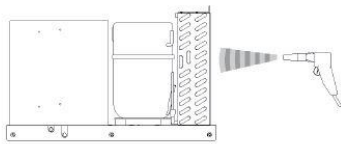
F.09



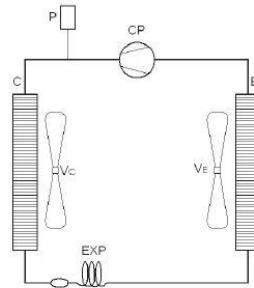
F.10



F.11



F.12



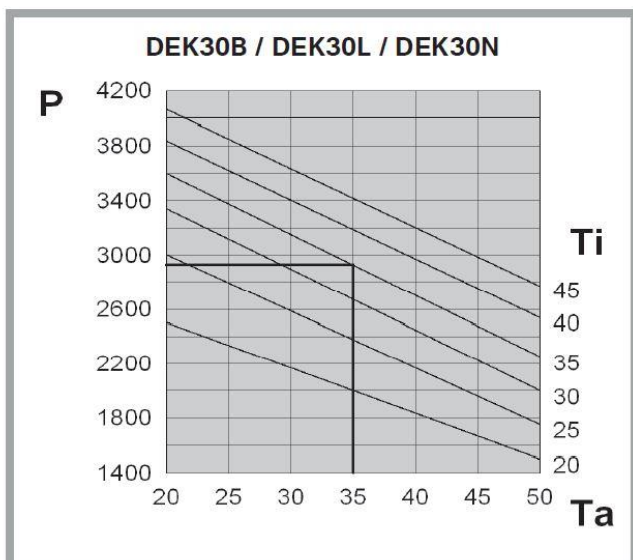
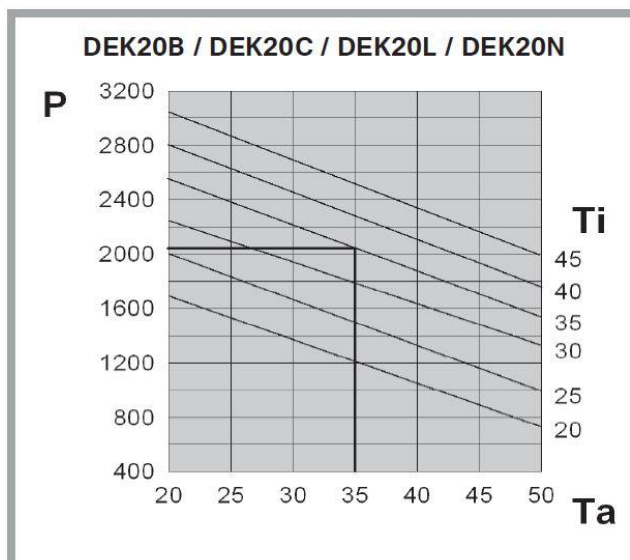
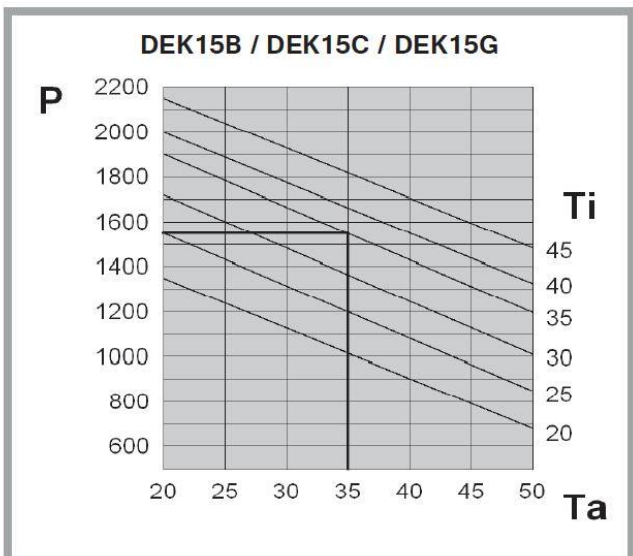
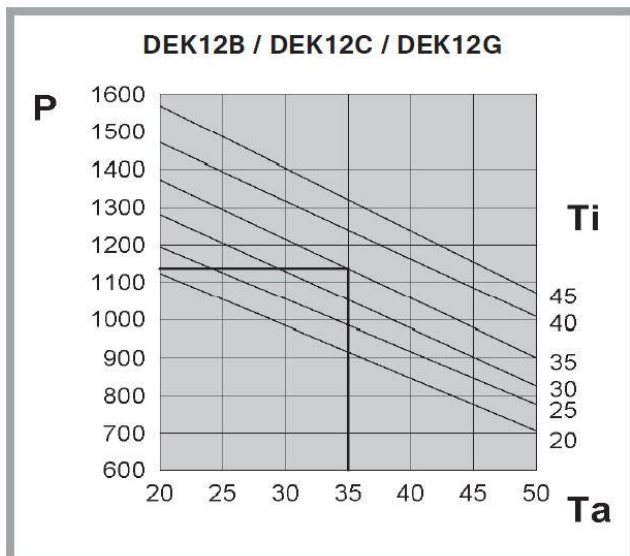
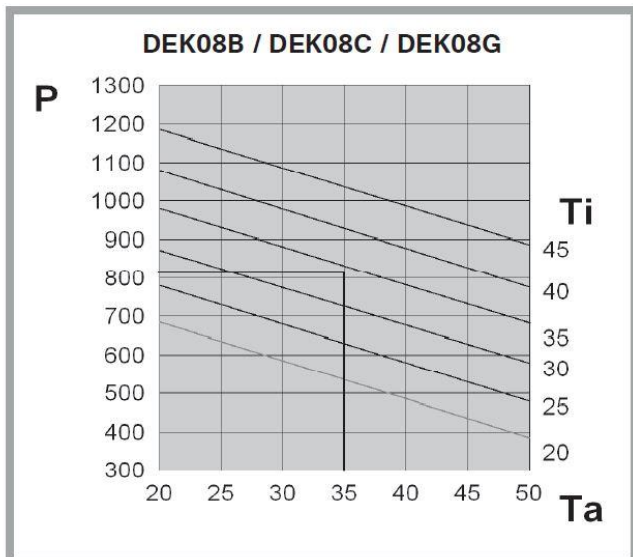
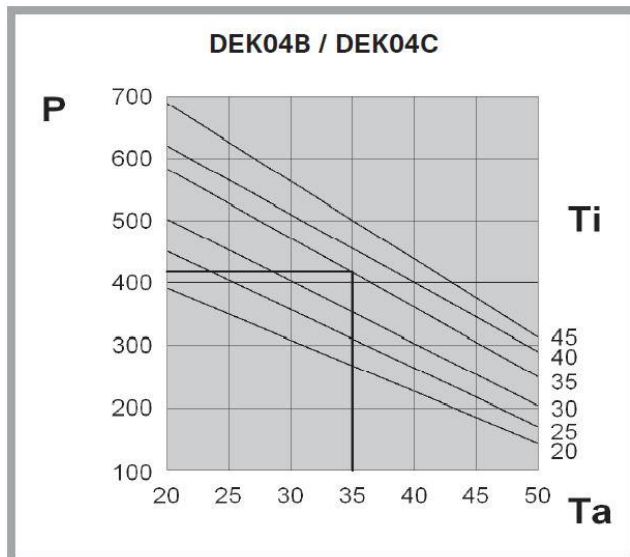


## 14. Technical data F.14

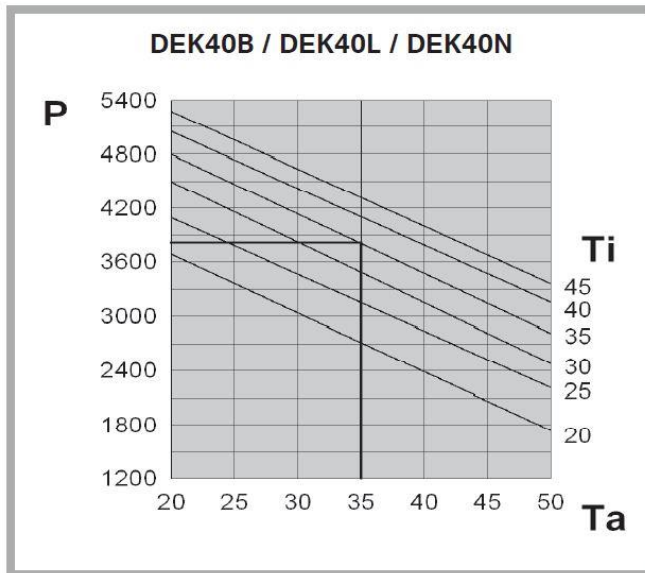
ENG	Useful cooling output		Supply voltage	Dimensions (W x H x D)	Max current	Starting current	Pre-fuse I	Electric capacity		Duty cycle	Refrigerant	Max pressure	Enclosure temperature range	Ambient temperature range	Protection internal circuit	Protection external circuit	Noise level	Weight	Color	Conformity
	EN14511							EN14511			R134a									
	A35A35	A35A50						A35A35	A35A50											
	W	W	V ~ Hz	mm	A	A	A	W	W	-	g	bar	°C	°C	IP	IP	dB(A)	kg	-	-
DEK04BT0B	410	240	230 1~50-60	259x260x481	1,5	4	4	270	315	100 %	170	26	+20 ÷ +50	20 ÷ 55*	IP54	IP34	60	18	RAL 7035	CE - EAC
DEK04BTUB	410	240	230 1~50-60	259x260x481	1,5	4	4	230	290	100 %	290	28	+20 ÷ +50	20 ÷ 55*	IP54	IP34	65	18	RAL 7035	CE - EAC - UL
DEK04CT0B	410	240	115 1~50-60	259x260x481	2,9	10	6	280	325	100 %	170	26	+20 ÷ +50	20 ÷ 50	IP54	IP34	60	19	RAL 7035	CE - EAC
DEK08BT0B	820	680	230 1~50-60	341x339x600	2,9	12	6	510	560	100 %	310	25	+20 ÷ +50	20 ÷ 55*	IP54	IP34	62	23	RAL 7035	CE - EAC
DEK08BTUB	820	680	230 1~50-60	341x339x600	3,5	12	6	520	590	100 %	310	28	+20 ÷ +50	20 ÷ 55*	IP54	IP34	65	23	RAL 7035	CE - EAC - UL
DEK08CT0B	820	680	115 1~50-60	341x339x600	5,7	19	10	520	570	100 %	310	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	62	24	RAL 7035	CE - EAC
DEK08GT0B	820	680	400/440 2~50-60	341x339x600	1,7	7	4	520	570	100 %	310	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	62	24	RAL 7035	CE - EAC
DEK12BT0B	1150	900	230 1~50-60	401x415x572	3,2	11	6	550	660	100 %	630	25	+20 ÷ +50	20 ÷ 55*	IP54	IP34	65	40	RAL 7035	CE - EAC
DEK12BTUB	1150	900	230 1~50-60	401x415x572	4	11	6	570	690	100 %	440	28	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	40	RAL 7035	CE - EAC - UL
DEK12CT0B	1150	900	115 1~50-60	401x415x572	6,4	22	12	560	670	100 %	630	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	42	RAL 7035	CE - EAC
DEK12GT0B	1150	900	400/440 2~50-60	401x415x572	2,2	8	6	560	670	100 %	630	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	42	RAL 7035	CE - EAC
DEK15BT0B	1550	1200	230 1~50-60	401x415x572	4,5	18	8	810	930	100 %	540	25	+20 ÷ +50	20 ÷ 55*	IP54	IP34	65	44	RAL 7035	CE - EAC
DEK15BTUB	1550	1200	230 1~50-60	401x415x572	5,5	18	10	830	960	100 %	410	28	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	44	RAL 7035	CE - EAC - UL
DEK15CT0B	1550	1200	115 1~50-60	401x415x572	10	39	16	820	940	100 %	540	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	46	RAL 7035	CE - EAC
DEK15GT0B	1550	1200	400/440 2~50-60	401x415x572	2,8	9,6	4	820	940	100 %	540	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	46	RAL 7035	CE - EAC
DEK20BT0B	2050	1560	230 1~50-60	401x415x572	6	24	10	1190	1300	100 %	550	25	+20 ÷ +50	20 ÷ 55*	IP54	IP34	65	50	RAL 7035	CE - EAC
DEK20CT0B	2050	1560	115 1~50-60	401x415x572	13,2	48	20	1220	1320	100 %	550	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	56	RAL 7035	CE - EAC
DEK20LT0B	2050	1560	400 3~50-60	401x415x572	1,9	10	4	990	1190	100 %	550	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	52	RAL 7035	CE - EAC
DEK20NT0B	2050	1560	460 3~60	401x415x572	2,1	10	6	1060	1290	100 %	700	28	+20 ÷ +50	20 ÷ 50	IP54	IP34	65	52	RAL 7035	CE - EAC - UL
DEK30BT0B	2900	2250	230 1~50-60	492x496x784	8,2	38,4	16	1350	1610	100 %	1260	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	75	80	RAL 7035	CE - EAC
DEK30LT0B	2900	2250	400 3~50-60	492x496x784	2,5	15,7	6	1210	1450	100 %	1200	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	75	83	RAL 7035	CE - EAC
DEK30NT0B	2900	2250	460 3~60	492x496x784	3,3	15,7	6	1310	1750	100 %	1200	28	+20 ÷ +50	20 ÷ 50	IP54	IP34	75	83	RAL 7035	CE - EAC - UL
DEK40BT0B	3850	2870	230 1~50-60	492x496x784	9	38,2	18	1690	1950	100 %	1800	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	75	83	RAL 7035	CE - EAC
DEK40LT0B	3850	2870	400 3~50-60	492x496x784	3,4	17	6	1630	1890	100 %	2000	25	+20 ÷ +50	20 ÷ 50	IP54	IP34	75	86	RAL 7035	CE - EAC
DEK40NT0B	3850	2870	460 3~60	492x496x784	4,3	17	6	1950	2160	100 %	2000	28	+20 ÷ +50	20 ÷ 50	IP54	IP34	75	86	RAL 7035	CE - EAC - UL

\* 50°C a 60 Hz

## 15. Performances F.15

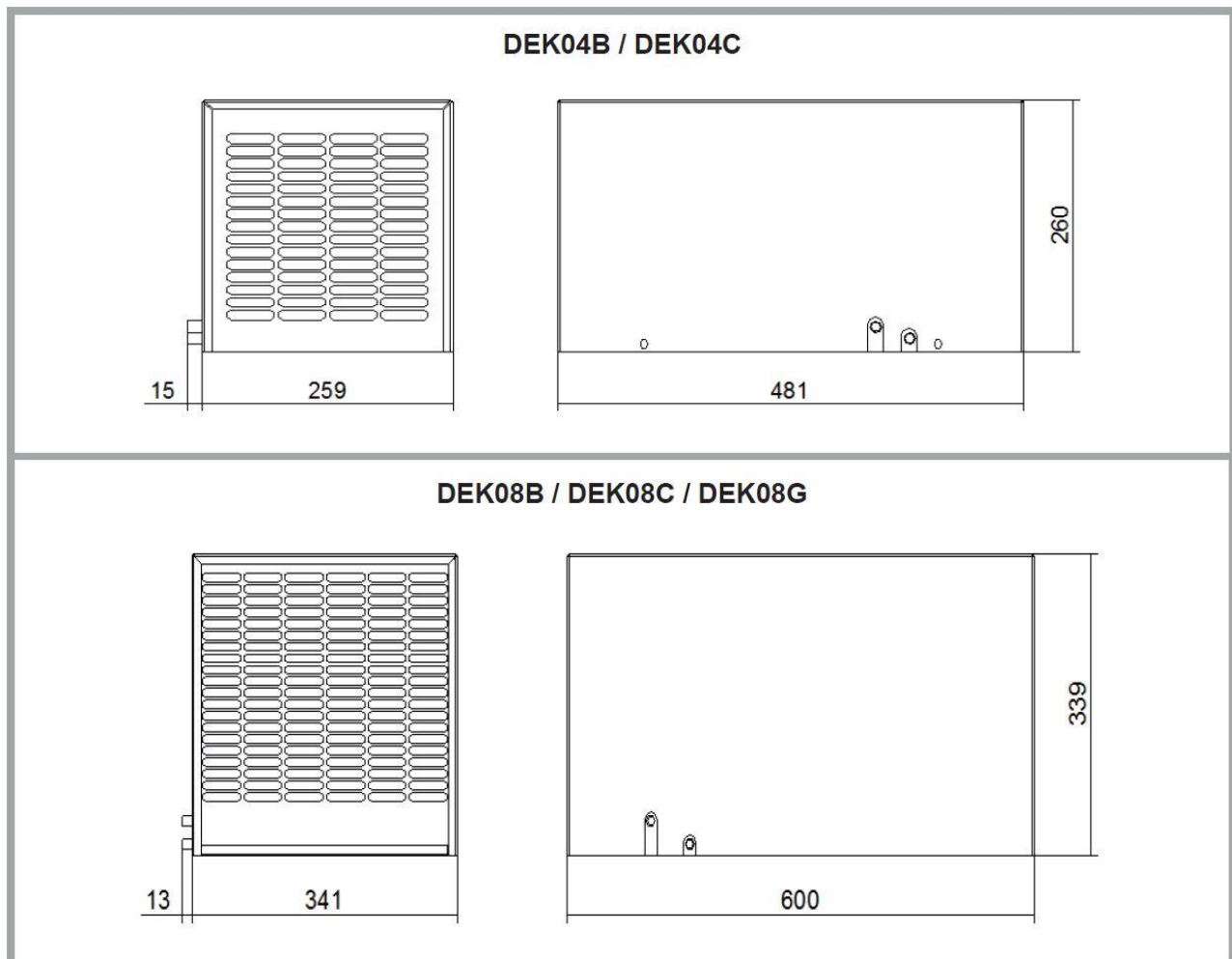


## 15. Performances F.15

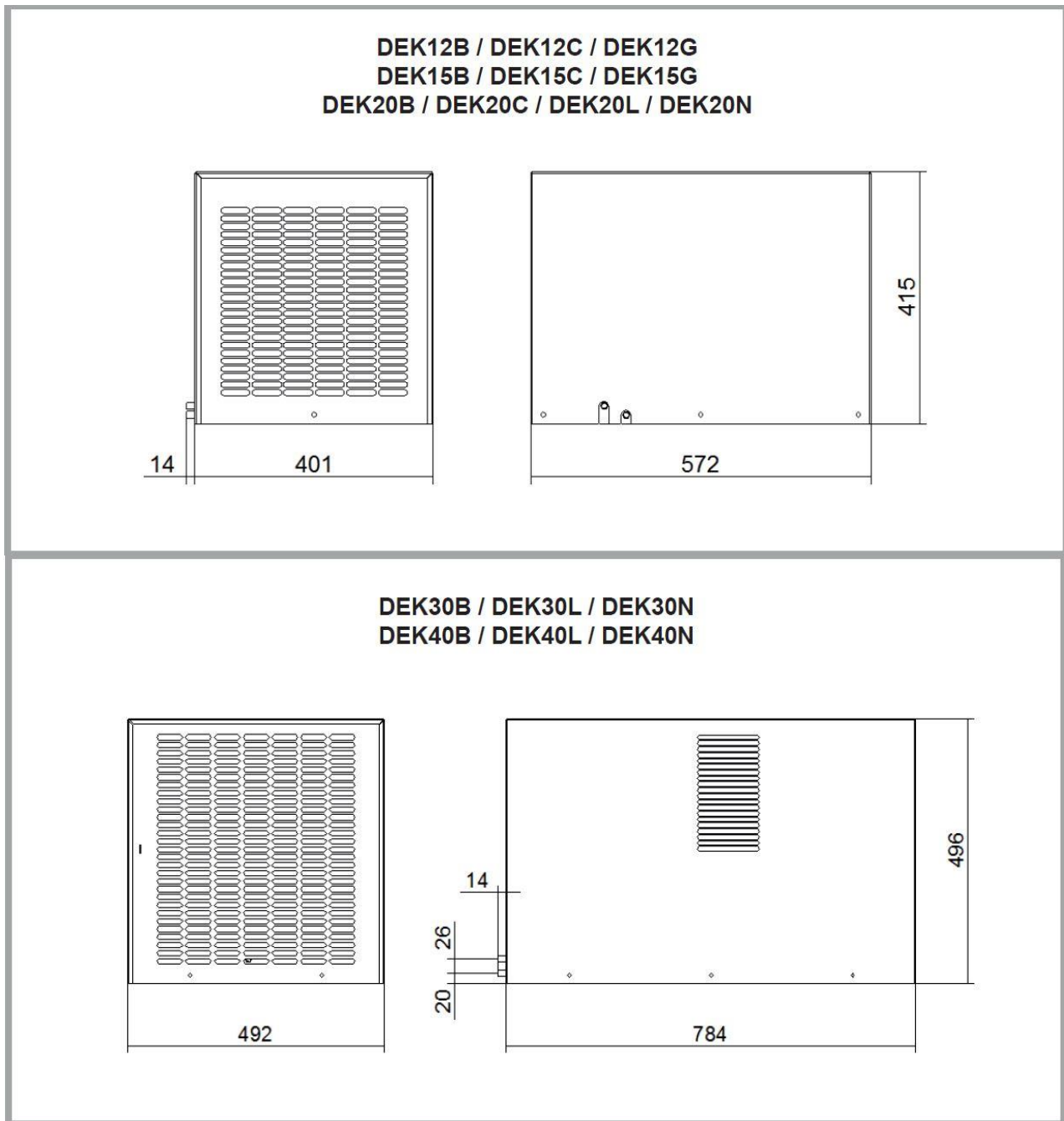


P(W)	Ta(°C)	Ti (°C)
Useful cooling output	Ambient temperature	Enclosure internal temperature

## 16. Dimensions F.16



## 16. Dimension F.16



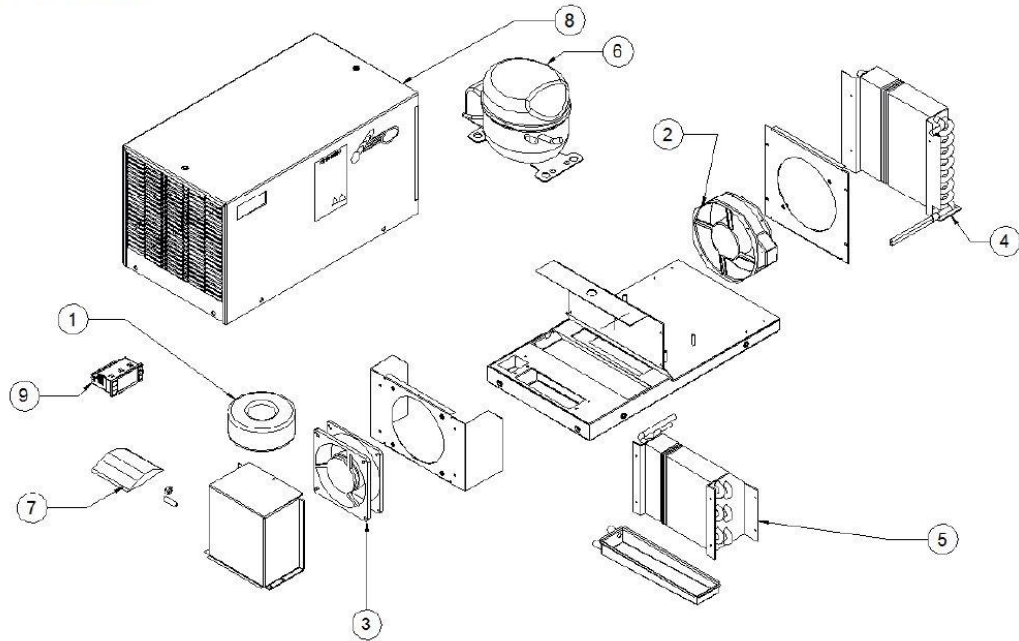
## 17. Spare parts

1	Autotransformer
2	Condenser fan
3	Evaporator fan
4	Condenser
5	Evaporator
6	Compressor
7	Assembly accessory kit
8	Cover
9	Electric Control

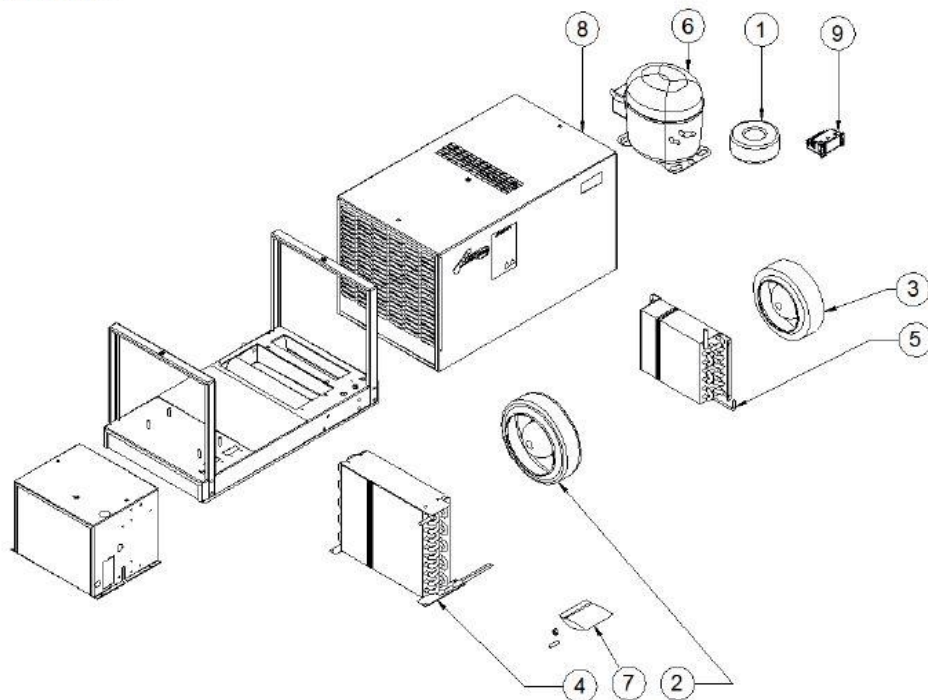
When ordering the following informations are essential:
Model
Serial Number
Date of production
Requested parts' code

## 17. Spare parts F.17

### DEK04B / DEK04C



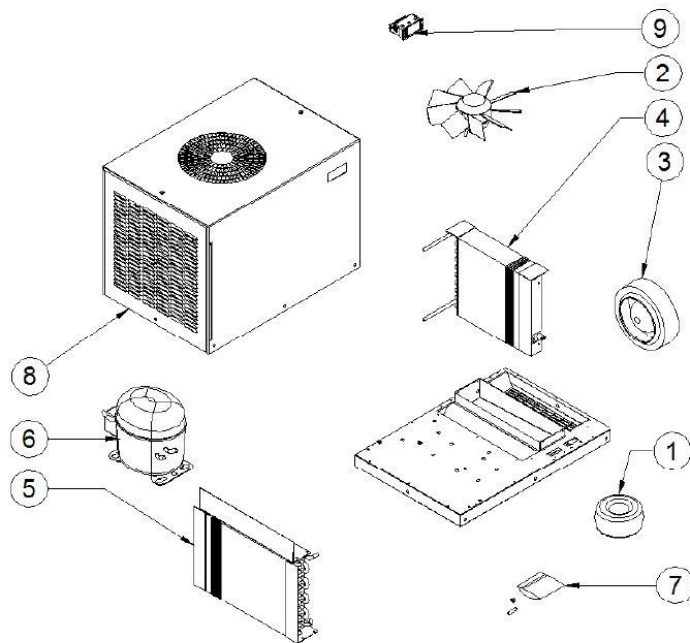
### DEK08B / DEK08C DEK08G



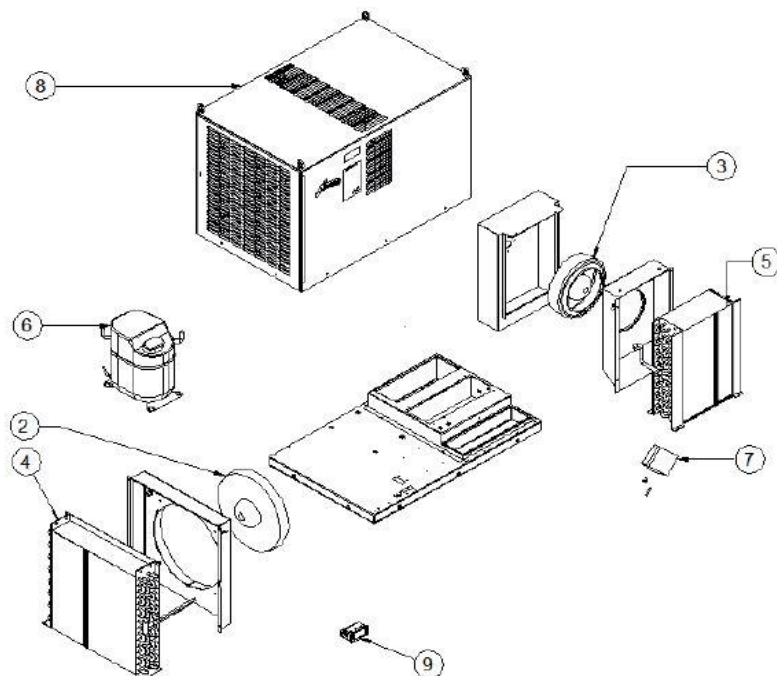


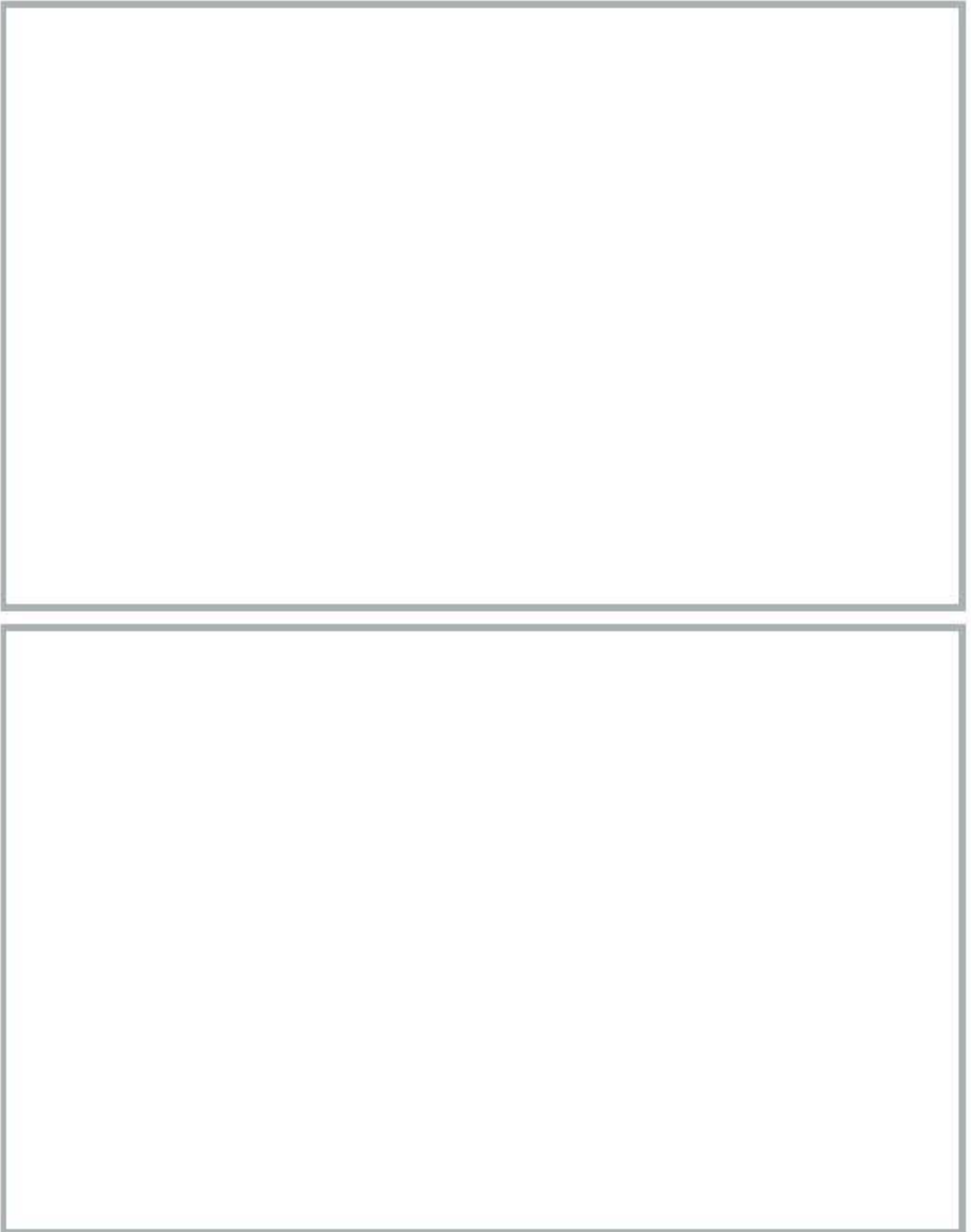
## 17. Special Parts F.17

DEK12B / DEK12C  
DEK12G / DEK15B  
DEK15C / DEK15G  
DEK20B / DEK20C  
DEK20L / DEK20N



DEK30B / DEK30L  
DEK30N / DEK40B  
DEK40L / DEK40N



**18. Wiring diagram F.18**



## 19. Guarantee

ITRack S.r.l. guarantees its product free from quality defects. It also guarantees for 18 months all the product's components starting from the date of shipment and when they are used in the following conditions:

- 1) When the temperatures of the panel or enclosure are no higher or lower than those indicated on the rating plate.
- 2) In circuits or systems that do not require cooling capacities higher than those indicated on the rating plate.
- 3) On premises where the temperatures are no higher or lower than those indicated on the rating plate.
- 4) On panels or enclosures with at least a minimum protection level of IP54.
- 5) When the instructions given in the "operating and maintenance" manual, provided with each single product, are fully complied with.

This guarantee does not cover any damage to the product due to:

- a) using a type and quantity of gas in the cooling circuit different to that indicated on the rating plate.
- b) using the product on unsuitable premises: where there is an acid or corrosive atmosphere.

For each component found to be faulty during the term of the guarantee, the manufacturer will, according to its unquestionable judgement, repair and/or substitute the faulty components free of charge either at its factory or in one of its authorised companies. Any additional expenses incurred for removing, handling and installation if required are not payable by the manufacturer. Any maintenance work needed and requested by the customer care/of his premises, even if it is during the term of the guarantee, will be billed according to the manufacturer rates. The products repaired or substituted in no way modify the time the guarantee starts or ends. The manufacturer can in no way be held liable except for repairing or substituting faulty products and if such products have to be redelivered it will be on a Carriage Forward basis. It is the customer's responsibility to see to the correct earthing, installation and power supply of the product in compliance with current standards. Reference must be made to the current laws in force regarding liability for damage caused by a faulty product, for which manufacturer is insured.

**To benefit from the guarantee terms and relative product information it is essential to have the purchase document and the serial number of the product which you will find on the rating plate. The rating plate is printed on plastic and the writing will remain for a long time even on premises and in environments where conditions are particularly bad. ATTENTION: the guarantee is automatically invalidated if the product is tampered with in any way.**

## 20. Assistance service

ITRack S.r.l.

Viale Alcide De Gasperi, 19/B 36061 – Bassano del Grappa (VI) - ITALIA

e-mail: [info@it-rack.it](mailto:info@it-rack.it)

Before contacting the Manufacturer Assistance Service, ensure you have:

- A. The full machine code number;
- B. The serial number of the machine;

All requests for assistance must be sent to Manufacturer in writing, by email or fax.

**WARNING:** The equipment can only be returned to Manufacturer on request and after agreement by the Manufacturer itself.