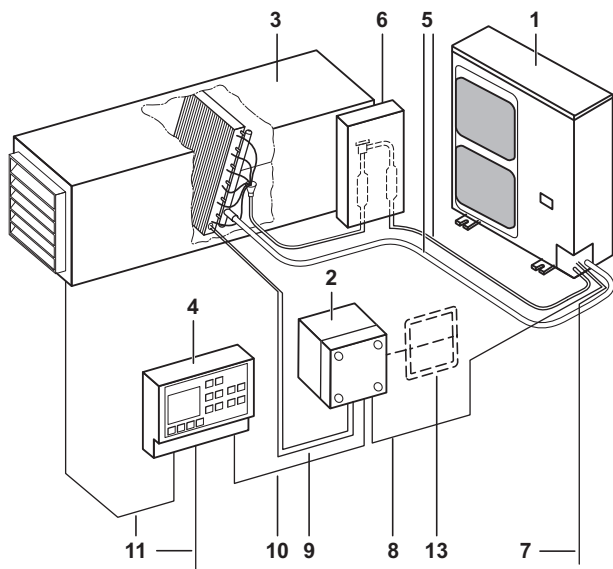




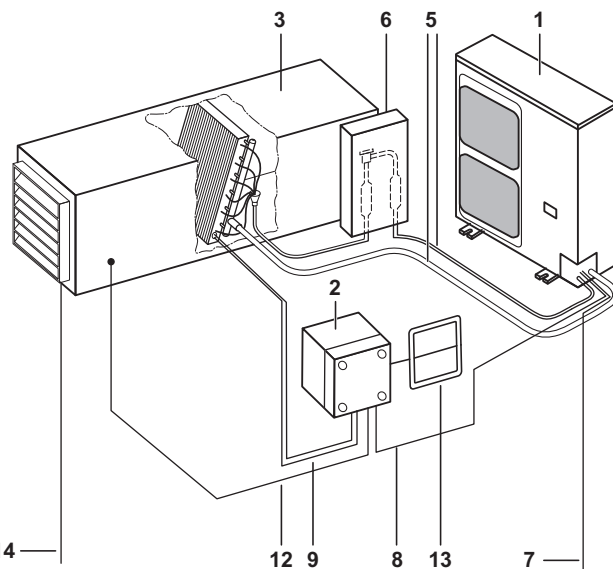
INSTALLATION AND OPERATION MANUAL

**Option kit for combination of Daikin condensing
units with field-supplied air handling units**

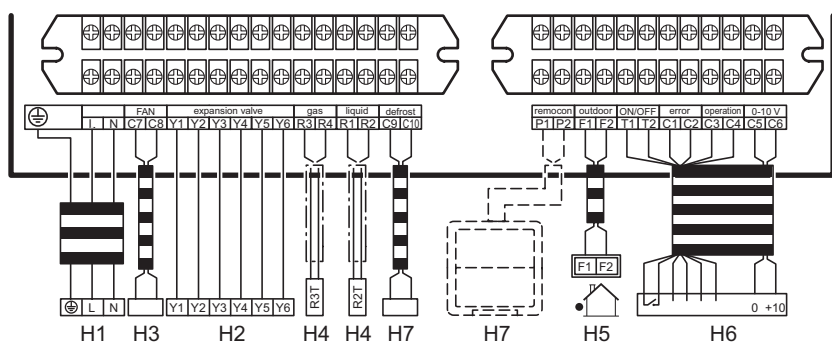
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EKEQDCBV3



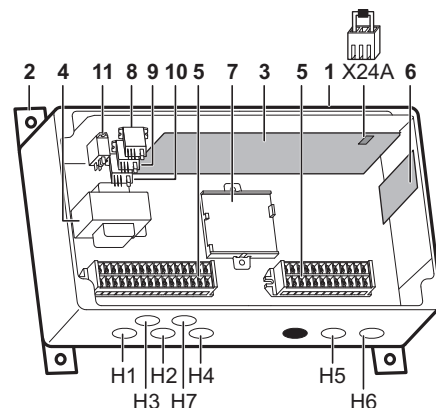
1 EKEQFCBAV3



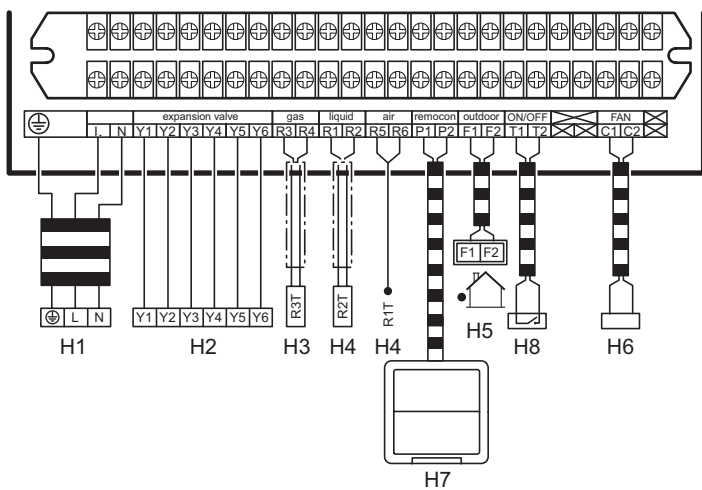
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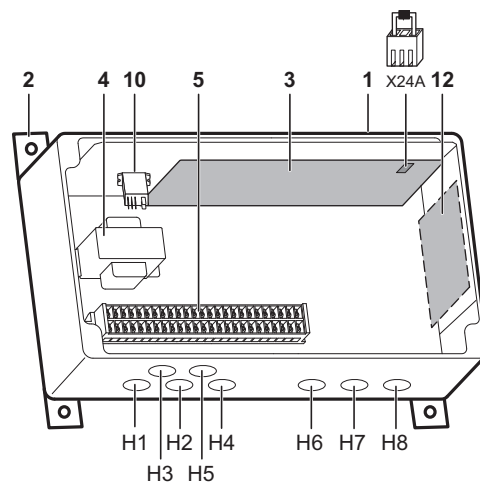
3 EKEQFCBAV3



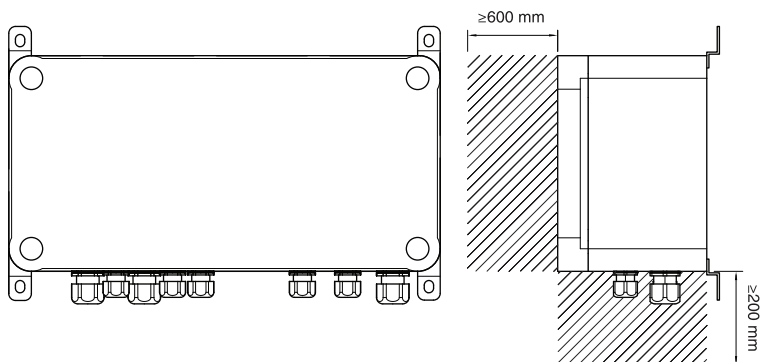
4 EKEQFCBAV3



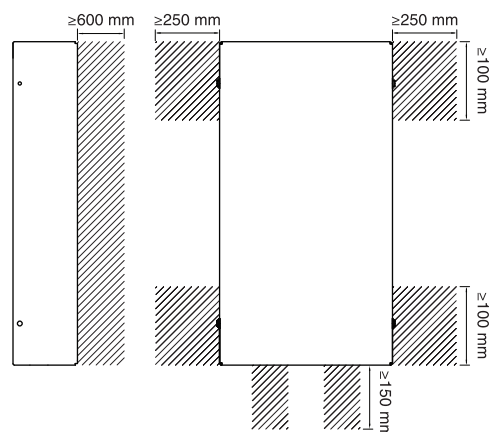
5 EKEQDCBV3



6 EKEQDCBV3



7 EKEQ(F/D)



8 EKEXV

CE - DECLARATION-OF-COMFORMITY
CE - KONFORMITÄTSERKLÄRUNG
CE - DECLARATION-DE CONFORMITE
CE - CONFORMITEITSVERKLARING

CE - DECLARACION-DE-CONFORMIDAD
CE - DICHIARAZIONE-DI-CONFORMITA
CE - ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ

CE - DECLARAÇÃO-DE-CONFORMIDADE
CE - ЗАЯВЛЕНИЕ-О-СОБЛЕТСТВИИ
CE - ÖPEYDELSEERKLÆRING
CE - FÖRSÄKRAN-OM-ÖVERENSTEMMELSE

CE - ERKLÆRING OM-SAMSVAR
CE - ILMOITUS-YHDENMUKAISUDESTA
CE - PROHLÁŠENÍ-O-SHOĐE

CE - IZJAVA-O-USKLADENOSTI
CE - MEGFELELŐSÉG-NYILATKOZAT
CE - DEKLARACIJA-ZGODNOSTI
CE - DECLARAȚIE-DE-CONFORMITATE

CE - IZJAVA O SKLADNOSTI
CE - VASTAVUŠDEKLARACIJA
CE - DEKLARACIJA-3A-CЪOTBETCTBИE
CE - UYGUNLUK-BEYANI

CE - ATTIKITIES-DEKLARACIJA
CE - ATBILSTĪBAS-DEKLARACIJA
CE - VYHLÁŠENIE-ZHODY
CE - UYGUNLUK-BEYANI

Daikin Europe N.V.

- 01 (GB) declares under its sole responsibility that the air conditioning equipment to which this declaration relates:
02 (GB) erklärt auf seine alleinige Verantwortung dass die Ausüstung der Klimaanlage für die diese Erklärung bezieht:
03 (E) déclare sous sa seule responsabilité que l'équipement d'air conditionné visé par la présente déclaration:
04 (NL) verklaart hierbij op eigen exclusieve verantwoordelijkheid dat de airconditioningapparatuur waarop deze verklaring betrekking heeft:
05 (E) declara bajo su única responsabilidad que el equipo de aire acondicionado al que hace referencia la declaración:
06 (I) dichiara sotto la propria responsabilità che gli apparecchi di condizionamento a cui è riferita questa dichiarazione:
07 (GB) δηλώνει με αποκλειστική της ευθύνη ότι ο εξοπλισμός των αεριοκλιματικών συσκευών στο οποίο αναφέρεται η παρούσα δήλωση:
08 (P) declara sob sua exclusiva responsabilidade que os equipamentos de ar condicionado a que esta declaração se refere

EKEQFCBBAV3*, EKEQDCBVB3*,

* = . 1, 2, 3, ..., 9

- 01 are in conformity with the following standard(s) or other normative document(s), provided that these are used in accordance with our instructions:
02 (den folgenden Normen) oder einen anderen Normdokument oder -dokumenten entsprecht/entsprechen, unter der Voraussetzung, dass sie gemäß unseren Anweisungen eingesetzt werden:
03 sont conformes à la(s) norm(e) (s) ou autre(s) document(s) normatif(s) pour autant qu'ils soient utilisés conformément à nos instructions:
04 conform de volgen(de norm(en)) of één of meer andere binterde documenten zijn, op voorwaarde dat ze worden gebruikt overeenkomstig onze instructies:
05 están en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativo(s), siempre que sean utilizados de acuerdo con nuestras instrucciones:
06 sono conformi al(l) seguente(i) standard(i) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:
07 είναι σύμφωνα με το(τα) ακόλουθο(ύ) πρότυπο(ύ) ή/και άλλο(ύ) τεχνικό(ύ) κανονισμό(ν), υπό την προϋπόθεση ότι χρησιμοποιούνται σύμφωνα με τις οδηγίες μας:
08 в соответствии с нормативными документами:
09 under laptageelse al bestemmelse na i:
11 enligt vilkoren i:
12 gilt i henhold til bestemmelserne i:
13 konformit mit den Vorschriften des:
14 overeenkomstig de bepalingen van:
15 siguiendo las disposiciones de:
16 secondo le prescrizioni per:
17 prema odredbama:
18 kövél a(z):
19 bu üsoşevanlar doöör:
20 vastarak müaale:
21 creşavaklı kurgavne na:
22 takanis nuostai, patiekamų:
23 ierlotgi prastbas, kas ietiekas:
24 održavaklı ustanovna:
25 bunun kuşallama uygun olarak:
10 under laptageelse al bestemmelse na i:
11 enligt vilkoren i:
12 gilt i henhold til bestemmelserne i:
13 konformit mit den Vorschriften des:
14 overeenkomstig de bepalingen van:
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17 prema odredbama:
18 kövél a(z):
19 bu üsoşevanlar doöör:
20 vastarak müaale:
21 creşavaklı kurgavne na:
22 takanis nuostai, patiekamų:
23 ierlotgi prastbas, kas ietiekas:
24 održavaklı ustanovna:
25 bunun kuşallama uygun olarak:

EN60335-2-40,

- 01 following the provisions of:
02 gemäß den Vorschriften der:
03 conformément aux stipulations des:
04 overeenkomstig de bepalingen van:
05 siguiendo las disposiciones de:
06 secondo le prescrizioni per:
07 je tñpion tyv ðontōōōō tyv:
08 de acordo com o previsto em:
09 в соответствии с нормативными документами:
10 under laptageelse al bestemmelse na i:
11 enligt vilkoren i:
12 gilt i henhold til bestemmelserne i:
13 konformit mit den Vorschriften des:
14 overeenkomstig de bepalingen van:
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17 prema odredbama:
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19 bu üsoşevanlar doöör:
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22 takanis nuostai, patiekamų:
23 ierlotgi prastbas, kas ietiekas:
24 održavaklı ustanovna:
25 bunun kuşallama uygun olarak:
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03 conformément aux stipulations des:
04 overeenkomstig de bepalingen van:
05 siguiendo las disposiciones de:
06 secondo le prescrizioni per:
07 je tñpion tyv ðontōōōō tyv:
08 de acordo com o previsto em:
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10 under laptageelse al bestemmelse na i:
11 enligt vilkoren i:
12 gilt i henhold til bestemmelserne i:
13 konformit mit den Vorschriften des:
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24 održavaklı ustanovna:
25 bunun kuşallama uygun olarak:

- 01 Note* as set out in and judged positively by
02 Hinweis* wie in der <A> ausgeführt und von positiv beurteilt gemaß Zertifikat
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08 Nota* tal como estabelecido em <A> e com o parecer positivo de de acordo com o Certificado
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10 Bemærk* som anført i <A> og positivt vurderet af i henhold til Certificat

- 09 (NL) aanpakket, inclusief een productcertificaat, dat overeenkomstig de beschrijving van de af te leveren apparatuur is ontworpen:
10 (GB) declares under its sole responsibility that the air conditioning equipment to which this declaration relates:
11 (S) erklærer egen ansvar for at luftkonditioneringssystemet som berøres af denne deklaration imødebar alt:
12 (N) erklærer at fullstendig ansvar for at del luftkondisjoneringsutstyr som berøres av denne deklarasjon, imødebarer alt:
13 (HU) nyilatkozt a felszerelésnek az általa leírt műszaki követelményeknek való megfeleléséért:
14 (CZ) prohlašuje ve své plné odpovědnosti, že klimatizační zařízení, k nímž se toto prohlášení vztahuje:
15 (HR) izjavljuje pod svojim vlastitim odgovornošću da oprema za klimatizaciju na koju se ova izjava odnosi:
16 (H) íeljes felelőssége udátalán kijelent, hogy a klímaberendezések, melyekre a nyilatkozati vonatkozik:

- 08 estão em conformidade com a(s) seguinte(s) norma(s) ou outro(s) documento(s) normativo(s), desde que estes sejam utilizados de acordo com as nossas instruções:
09 соответствует следующим стандартам или другим нормативным документам, при условии их использования согласно нашим инструкциям:
10 overholder følgende standard(er) eller andelandle retningsgivende dokument(er), boudsat at disse anvendes i henhold til vore instruktioner:
11 følgende udstøring år i overensstemmelse med och följer följande standard(er) eller andra normgivande dokument, under förutsättning att användning sker i överensstämmelse med våra instruktioner:
12 respektive utstyr er i overensstemmelse med følgende standard(er) eller andre normgivende dokument(er), under forudsætning at disse bruges i henhold til vore instrukser:
13 vastavaat seuraavien standardien ja muiden ohjeellisten dokumenttien vaatimuksia edellytten, että niitä käytetään ohjeiden mukaisesti:
14 za predlokladu, že jsou využívány v souladu s našimi pokyny, odpovídá následujícím normám nebo normativním dokumentům:
15 u skladu sa slijedećim standardom(na) ili drugim normativnim dokumentom(nima), uz uvjet da se oni koriste u skladu s našim uputama:

Low Voltage 2014/35/EU
Electromagnetic Compatibility 2014/30/EU *

- 01 Directives, as amended.
02 Direktiven, gemäß Änderung.
03 Directives, telles que modifiées.
04 Richtlijnen, zoals gearmderd.
05 Direktivas, según lo emendado.
06 Direktive, come da modifia.
07 Önyvöl, ómuk éöyüv változónpöl.
08 Direktivas, conforme alteração em.
09 Директива со всеми поправками.

- 10 Direktive, med senere ændringer.
11 Direktiv, med foretagna ändringar.
12 Direktiver, med foretatte ændringer.
13 Direktiveja, sađasna kun ne ova imuektulina.
14 v pñatém znění.
15 Smjernice, kako je izmjenjeno.
16 řányvelék és módosítások rendelkezései.
17 z póznejšymi popravkami.
18 Direktivelor, cu amendamentele respective.

- 19 Direktive z vsemi spremembami.
20 Direktivd koss muddalslaga.
21 Директиви, с таварне вменевания.
22 Direktivose su papmndajmados.
23 Direktivas un to papmndajmados.
24 Smērnice, v pilnān zīmē.
25 Degstiršinīs halerīye Voreimelker.

- 22 Pastaba* kaip nustatyta <A> ir kaip begijama nusipresta pagal Serifikatą
23 Piedoms* ka norādīts <A> un atbilstoš pozitīvajam vērtējumam saskaņā ar serifikātu
24 Poznámka* ako bolo uvedené v <A> a pozitívne zistené v súlade s osvedčením
25 Not* <A> da beirindigi gibu ve Serifikasina göre tarafindan olumlu olarak değerdendirildiği gibi.

- 16 Megjegyzés* a(z) <A> alapján a(z) igazolta a megjelölt, a(z) tanúsítvány szerint.
17 Uwaga* zgodnie z dokumentacją <A> pozytywną opinią świadczonym
18 Nota* așa cum este stabilit în <A> și arecuzat pozitiv în în conformitate cu Certificatul
19 Opomba* kot je doöobeno v <A> in odobeno s strani v skladu s certifikatom
20 Mäkuus* nagu on näidatud dokumentis <A> ja heaks kiidetud järgi vastavalt sertifikaadile
21 Zabeirema* kartu e kotoöendeno <A> y kotoöeno normotivno ot osmache Certifikata

- 11 Information* enligt <A> og godkents av enligt Certificat
12 Merk* som del fremkommer i <A> og gjennom positiv meldelse av ifølge Serifikat
13 Huom* jotta on esitetty asakirjassa <A> ja pika on hyödyksynyt Serifikatin mukaisesti.
14 Poznámka* jak bylo uvedeno v <A> a pozitivně zjiřeno v souladu s osvedčením
15 Napomena* kako je izloženo u <A> pozitivno ocijenjeno od strane prema Certificatu

- 01 Note* as set out in <A> and judged positively by
02 Hinweis* wie in der <A> ausgeführt und von positiv beurteilt gemaß Zertifikat
03 Remarque* tel que défini dans <A> et évalué positivement par conformément au Certificat
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10 Bemærk* som anført i <A> og positivt vurderet af i henhold til Certificat

<A>	DAIKIN.TCF.024G/105-2014
	TÜV (NB1856)
<C>	0510260101

DAIKIN

Shigeki Morita
Director
Ostend, 1st of April 2016

Shigeki Morita
Director
Ostend, 1st of April 2016

DAIKIN EUROPE N.V.

Zandvoordestraat 300, B-8400 Oostende, Belgium

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READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLATION AND OPERATION.

IMPROPER INSTALLATION OR ATTACHMENT OF EQUIPMENT OR ACCESSORIES COULD RESULT IN ELECTRIC SHOCK, SHORT-CIRCUIT, LEAKS, FIRE OR OTHER DAMAGE TO THE EQUIPMENT. BE SURE ONLY TO USE ACCESSORIES MADE BY DAIKIN WHICH ARE SPECIFICALLY DESIGNED FOR USE WITH THE EQUIPMENT AND HAVE THEM INSTALLED BY A PROFESSIONAL.

IF UNSURE OF INSTALLATION PROCEDURES OR USE, ALWAYS CONTACT YOUR DAIKIN DEALER FOR ADVICE AND INFORMATION.

The English text is the original instruction. Other languages are translations of the original instructions.

INTRODUCTION



- Do only use this system in combination with a field-supplied air handling unit. Do not connect this system to other indoor units.
- Only optional controls as listed in the optional accessories list can be used.

Field-supplied air handling units can be connected with a Daikin condensing unit via a control box and expansion valve kit. Each air handling unit can be connected with 1 control box and 1 expansion valve kit. This manual describes the installation of the expansion valve kit and the installation and operation of 2 types of control boxes.

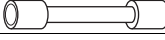
We distinguish 2 different control boxes, each with its own application and installation requirements.

- EKEQFCBA control box (3 possible operation modes)
 - Operation with 0–10 V input to control the capacity
An external controller is needed to control the capacity. For details of the necessary functions of the external controller refer to paragraph "Operation with 0–10 V capacity control: X control" on page 12. There are 2 different 0–10 V operation modes that can be used to control the room temperature or air discharge temperature.
 - Operation with fixed T_e/T_c temperature control
 - In cooling this system operates on a fixed evaporating temperature.
 - In heating this system operates on a fixed condensing temperature.
- EKEQDCB control box
The system will operate as a standard indoor unit to control the room temperature. This system does not require a specific external controller.
- Connectivity to DIII-net devices only allowed with:
 - ITouch Manager II
 - Modbus Interface DIII
- This equipment is not designed for year-round cooling applications with low indoor humidity conditions, such as Electronic Data Processing rooms.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

INSTALLATION

- For installation of the air handling unit, refer to the air handling unit installation manual.
- Never operate the air conditioner with the discharge pipe thermistor (R3T), suction pipe thermistor (R2T) and pressure sensors (S1NPH, S1NPL) removed. Such operation may burn out the compressor.
- The equipment is not intended for use in a potentially explosive atmosphere.

ACCESSORIES

		EKEQFCBA	EKEQDCB
Thermistor (R1T)		—	1
Thermistor (R3T/R2T) (2.5 m cable)		2	
Insulation sheet		2	
Rubber sheet		2	
Wire to wire splice		4	6
Installation and operation manual		1	
Screw nut		7	8
Tie wrap		6	
Capacity setting adaptor		9	7
Stopper (closing cup)		2	—

Obligatory accessory

	EKEQFCBA	EKEQDCB
Expansion valve kit	EKEXV	

Refer to chapter "Valve kit installation" on page 5 for installation instructions.

Optional accessories

		EKEQFCBA	EKEQDCB
Remote controller: - BRC1D528 - BRC1E52 - BRC2E52 - BRC3E52		1(*)	1

(*) For EKEQF, the remote controller is not used for operating the unit, but for service and during installation. Therefore a cool/heat selector KRC19-26A6 is required for the selection of heating, cooling or fan only operation. Refer to the installation manual of the outdoor unit for details.

NAME AND FUNCTION OF PARTS (See figure 1 and figure 2)

Parts and components

- Outdoor unit
- Control box (EKEQFCBA / EKEQDCB)
- Air handling unit (field supply)
- Controller (field supply)
- Field piping (field supply)
- Expansion valve kit

Wiring connections

- Outdoor unit power supply
- Control box wiring (Power supply and communication between control box and outdoor unit)
- Air handling unit thermistors
- Communication between controller and control box
- Power supply and control wiring for air handling unit and controller (power supply is separate from the outdoor unit)
- Air thermistor control for air handling unit
- Remote controller (----- = for service only)
- Power supply for air handling unit (power supply is separate from the outdoor unit)

BEFORE INSTALLATION

- Refer to the installation manual of the outdoor unit for details on refrigerant piping, additional refrigerant charging, and inter-unit wiring.



Since design pressure is 4 MPa or 40 bar, pipes of larger wall thickness may be required. Refer to "Selection of piping material" on page 5.

Precautions for R410A

- The refrigerant requires strict cautions for keeping the system clean, dry and tight.
 - Clean and dry
Foreign materials (including mineral oils or moisture) should be prevented from getting mixed into the system.
 - Tight
Read "Piping installation" on page 4 carefully and follow these procedures correctly.
- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. (If the refrigerant is in state of gas, its composition changes and the system will not work properly).
- The connected air handling units must have heat exchangers designed exclusively for R410A.

Cautions for selection of the air handling unit

Select the air handling unit (field supply) according to the technical data and limitations mentioned in Table 1.

Lifetime of the outdoor unit, operation range or operation reliability may be influenced if you neglect these limitations.

NOTE



- If the total capacity of the connected indoor units exceeds the capacity of the outdoor unit, cooling and heating performance may drop when running the indoor units.
Refer to the section on performance characteristics in the Engineering Data Book for details.
- The capacity class of the air handling unit is determined by the selection of the expansion valve kit according to Table 1.

ERQ outdoor unit

The EKEQ(D/FA) control boxes can only be connected to an ERQ outdoor unit in pair application. Only 1 expansion valve kit EKE XV63~250 can be used per control box and per air handling unit.

Outdoor unit (class)	EKE XV kit
100	EKE XV63~125
125	EKE XV63~140
140	EKE XV80~140

Outdoor unit (class)	EKE XV kit
200	EKE XV100~250
250	EKE XV125~250

Depending on the air handling unit heat exchanger, a connectable EKE XV (expansion valve kit) must be selected to these limitations.

Table 1

EKE XV class	Allowed heat exchanger cooling capacity (kW)		Allowed heat exchanger heating capacity (kW)	
	Minimum	Maximum	Minimum	Maximum
63	6.3	7.8	7.1	8.8
80	7.9	9.9	8.9	11.1
100	10.0	12.3	11.2	13.8
125	12.4	15.4	13.9	17.3
140	15.5	17.6	17.4	19.8
200	17.7	24.6	19.9	27.7
250	24.7	30.8	27.8	34.7

Cooling saturated suction temperature (SST) = 6°C

Air temperature = 27°C DB/19°C WB

Superheat (SH) = 5 K

Heating saturated suction temperature (SST) = 46°C

Air temperature = 20°C DB

Subcool (SC) = 3 K

1 Selecting the condensing unit

Depending on necessary capacity of the combination an outdoor unit needs to be selected (see "Engineering databook" for capacity).

- Each outdoor unit can be connected to a range of air handling units.
- The range is determined by the allowed expansion valve kits.

2 Selecting the expansion valve

The corresponding expansion valve needs to be selected for your air handling unit. Select the expansion valve according to the above limitations.



- The expansion valve is an electronic type, it is controlled by the thermistors that are added in the circuit. Each expansion valve can control a range of air handling units sizes.
- The selected air handling unit must be designed for R410A.
- Extraneous substances (including mineral oils or moisture) must be prevented from getting mixed into the system.
- SST: saturated suction temperature at exit of air handling unit.

3 Selecting the capacity setting adaptor (see accessories)

- The corresponding capacity setting adaptor needs to be selected depending on the expansion valve.

- Connect the correct selected capacity setting adaptor to X24A (A1P). (See figure 4 and figure 6)

EKE XV kit	Capacity setting adaptor label (indication)
63	J71
80	J90
100	J112
125	J140
140	J160
200	J224
250	J280

VRV IV range outdoor units

The EKEQF control box can be connected to some types of VRV IV outdoor unit (refer to the Engineering Data Book for outdoor units that are in scope) with a maximum number of 3 connectable control boxes to 1 system. 1 control box can be combined with 1 EKE XV kit. In this configuration it is only allowed to connect air handling units. The combination with VRV DX indoor units or other types of indoor units is not allowed.

Depending on the air handling unit heat exchanger, a connectable EKE XV (expansion valve kit) must be selected to following limitations.

EKE XV class	Allowed heat exchanger cooling capacity (kW)		Allowed heat exchanger heating capacity (kW)	
	Minimum	Maximum	Minimum	Maximum
63	6.3	7.8	7.1	8.8
80	7.9	9.9	8.9	11.1
100	10.0	12.3	11.2	13.8
125	12.4	15.4	13.9	17.3
140	15.5	17.6	17.4	19.8
200	17.7	24.6	19.9	27.7
250	24.7	30.8	27.8	34.7
400	35.4	49.5	39.8	55.0
500	49.6	61.6	55.1	69.3

Cooling saturated suction temperature (SST) = 6°C

Air temperature = 27°C DB/19°C WB

Superheat (SH) = 5 K

Heating saturated suction temperature (SST) = 46°C

Air temperature = 20°C DB

Subcool (SC) = 3 K

- The air handling unit can be considered as a standard VRV indoor unit. The combinations of EKE XV kits (maximum 3) are restricted by the connection ratio limitations: 90~110%.



Additional limits exist when connecting the EKEQFCBA control box. These can be found in the Engineering Data Book of the EKEQFCBA and in this manual.

2 Selecting the expansion valve

A corresponding expansion valve needs to be selected for your air handling unit. Select the expansion valve according to the above limitations.



- The expansion valve (electronic type) is controlled by the thermistors that are added in the circuit. Each expansion valve can control a range of air handling unit sizes.
- The selected air handling unit must be designed for R410A.
- Extraneous substances (including mineral oils or moisture) must be prevented from getting mixed into the system.
- SST: saturated suction temperature at exit of air handling unit.

- 3 Selecting the capacity setting adaptor (see accessories)
- The corresponding capacity setting adaptor needs to be selected depending on the expansion valve.
 - Connect the correctly selected capacity setting adaptor to X24A (A1P). (See figure 4)

EKEXV kit	Capacity setting adaptor label (indication)
63	J71
80	J90
100	J112
125	J140
140	J160

EKEXV kit	Capacity setting adaptor label (indication)
200	J224
250	J280
400	J22
500	J28

For the following items, take special care during construction and check after installation is finished

Tick ✓ when checked	
☐	Are the thermistors fixed firmly? Thermistor may come loose.
☐	Is the freeze-up setting done correctly? The air handling unit may freeze up.
☐	Is the control box fixed firmly? The unit may drop, vibrate or make noise.
☐	Do electrical connections comply with specifications? The unit may malfunction or components may burn out.
☐	Are wiring and piping correct? The unit may malfunction or components may burn out.
☐	Is the unit safely grounded? Dangerous at electric leakage.

SELECTING THE INSTALLATION SITE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Select an installation site where the following conditions are fulfilled and that meets your customer's approval.

- The option boxes (expansion valve and electrical control box) can be installed inside and outside).
- Do not install the option boxes in or on the outdoor unit.
- Do not put the option boxes in direct sunlight. Direct sunlight will increase the temperature inside the option boxes and may reduce its lifetime and influence its operation.
- Choose a flat and strong mounting surface.
- Operating temperature of the control box is between -10°C and 40°C .
- Keep the space in front of the boxes free for future maintenance.
- Keep air handling unit, power supply wiring and transmission wiring at least 1 m away from televisions and radios. This is to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if 1 m is kept.)
- Make sure the control box is installed horizontally. Screw nuts position must be downwards.

Precautions

Do not install or operate the unit in rooms mentioned below.

- Where mineral oil, like cutting oil is present.
- Where the air contains high levels of salt such as air near the ocean.
- Where sulphurous gas is present such as that in areas of hot spring.

- In vehicles or vessels.
- Where voltage fluctuates a lot such as that in factories.
- Where high concentration of vapor or spray are present.
- Where machines generating electromagnetic waves are present.
- Where acidic or alkaline vapor is present.
- The option boxes must be installed with entrances downward.

REFRIGERANT PIPING WORK

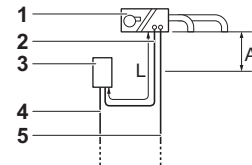


All field piping must be provided by a licensed refrigeration technician and must comply with the relevant local and national codes.

- For refrigerant piping of outdoor unit, refer to the installation manual supplied with the outdoor unit.
- Follow the outdoor unit specifications for additional charging, piping diameter and installation.
- The maximum allowed piping length depends on the connected outdoor model.

PIPING INSTALLATION

Piping limits



- 1 Air handling unit
- 2 Connection pipe from expansion valve kit to air handling unit
- 3 Valve kit
- 4 Liquid pipe
- 5 Gas pipe

Max (m)	
A	$-5/+5^{(*)}$
L	5

(*) Below or above the valve kit.

L is to be considered as a part of the total maximum piping length. See installation manual of the outdoor unit for piping installation.

Piping connections

Make sure to install gas and liquid pipe diameters in function of the air handling unit capacity class.

Air handling unit capacity class	Connection pipe	
	Gas pipe	Liquid pipe
50	Ø12.7	Ø6.4
63	Ø15.9	Ø9.52
80		
100		
125		
140		
200	Ø19.1	Ø12.7
250	Ø22.2	
400	Ø28.6	
500	Ø28.6	

Selection of piping material

- Foreign materials inside pipes (including oils for fabrication) must be 30 mg/10 m or less.
- Use the following material specification for refrigerant piping:
 - Construction material: phosphoric acid deoxidized seamless copper for refrigerant.
 - Temper grade: use piping with temper grade in function of the pipe diameter as listed in the table below.

Pipe Ø	Temper grade of piping material
≤15.9	O
≥19.1	1/2H

O = Annealed
1/2H = Half hard

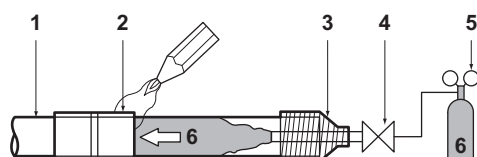
- The pipe thickness of the refrigerant piping should comply with relevant local and national regulations. The minimal pipe thickness for R410A piping must be in accordance with the table below.

Pipe Ø	Minimal thickness t (mm)
6.4	0.80
9.5	0.80
12.7	0.80
15.9	0.99
19.1	0.80
22.2	0.80
28.6	0.99

- In case the required pipe sizes (inch sizes) are not available, it is also allowed to use other diameters (mm sizes), taken the following into account:
 - select the pipe size nearest to the required size.
 - use the suitable adapters for the change-over from inch to mm pipes (field supply).

Cautions for brazing

- Be sure to carry out a nitrogen blow when brazing. Brazing without carrying out nitrogen replacement or releasing nitrogen into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.
- When brazing while inserting nitrogen into the piping, nitrogen must be set to 0.02 MPa with a pressure-reducing valve (=just enough so that it can be felt on the skin).



- Refrigerant piping
- Part to be brazed
- Taping
- Hands valve
- Pressure-reducing valve
- Nitrogen

- For details, see manual of the outdoor unit.

VALVE KIT INSTALLATION

Mechanical installation

- Remove the valve kit box cover by unscrewing 4x M5.
- Drill 4 holes on correct position (measurements as indicated in figure below) and fix the valve kit box securely with 4 screws through the provided holes Ø9 mm.

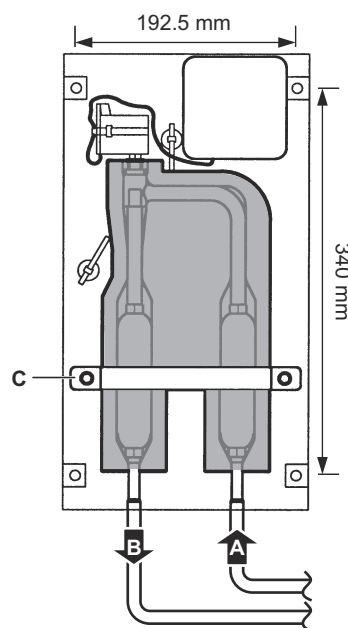


- Make sure that the expansion valve is installed vertically.
- Refer to [figure 8](#) for the required service space.

Brazing work

For details, see manual of the outdoor unit.

- Prepare the inlet/outlet field piping just in front of the connection (do **not** braze yet).



- A Inlet coming from the outdoor unit
- B Outlet to air handling unit
- C Pipe fixing clamp

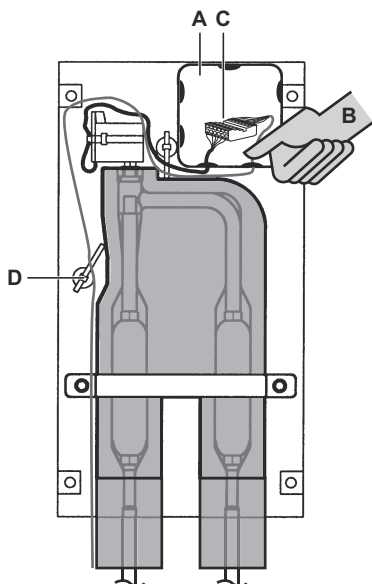
- Remove the pipe fixing clamp (C) by unscrewing 2x M5.
- Remove the upper and lower pipe insulations.
- Braze the field piping.



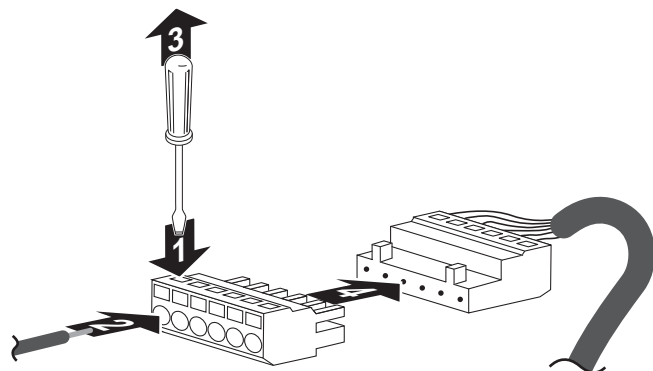
- Make sure to cool the filters and valve body with a wet cloth and make sure the body temperature does not exceed 120°C during brazing.
- Make sure that the other parts such as electrical box, tie wraps and wires are protected from direct brazing flames during brazing.

- After brazing, put the lower pipe insulation back in place and close it with the upper insulation cover (after peeling off the liner).
- Secure the pipe fixing clamp (C) in place again (2x M5).
- Make sure that field pipes are fully insulated. Field pipe insulation must reach up to the insulation you have put back in place as per procedure step 7. Make sure that there is no gap between both ends in order to avoid condensation dripping (finish the connection with tape eventually).

- 1 Open the electrical box cover (A).
- 2 Push out **ONLY** the second lower wire intake hole (B) from inside to outside. Do not damage the membrane.
- 3 Pass valve cable (with wires Y1...Y6) from the control box through that membrane wire intake hole and connect the cable wires into the terminal connector (C) following instructions as described in step 4. Route the cable out of the valve kit box according to figure below and fix with the tie wrap (D). See ["Electric wiring work" on page 7](#) for more details.



- 4 Use a small screwdriver and follow indicated instructions for connecting cable wires into the terminal connector according to the wiring diagram.



- 5 Make sure that field wiring and insulation is not squeezed when closing the valve kit box cover.
- 6 Close the valve kit box cover (4x M5).

INSTALLATION OF THE ELECTRICAL CONTROL

BOX (See [figure 4](#) and [figure 6](#))

- 1 Control box
- 2 Hanger brackets
- 3 Main PCB
- 4 Transformer
- 5 Terminal
- 6 PCB (for voltage conversion)
- 7 PCB (power supply)
- 8 Magnetic relay (operation / compressor ON/OFF)
- 9 Magnetic relay (error status)
- 10 Magnetic relay (fan)
- 11 Magnetic relay (defrost)
- 12 Optional PCB (KRP4)

Mechanical installation

- 1 Fix the control box with its hanger brackets to the mounting surface.
Use 4 screws (for holes of Ø6 mm).
- 2 Open the lid of the control box.
- 3 For electrical wiring: refer to paragraph ["Electric wiring work" on page 7](#).
- 4 Install the screw nuts.
- 5 Close the unnecessary openings with stoppers (closing cups).
- 6 Close the lid securely after installation to ensure that the control box is watertight.

NOTE



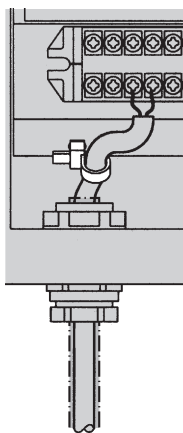
Refer to [figure 7](#) for the required service space.

ELECTRIC WIRING WORK

- All field wiring and components must be installed by a licensed electrician and must comply with all international, European, national and local directives, laws, regulations and/or codes that are relevant and applicable.
- Use copper wire only.
- A main switch or other means for disconnection, having a contact separation in all poles, must be incorporated in the fixed wiring in accordance with relevant local and national legislation.
- Refer to the installation manual attached to the outdoor unit for the size of power supply electric wire connected to the outdoor unit, the capacity of the circuit breaker and switch, wiring and wiring instructions.
- Attach the earth leakage circuit breaker and fuse to the power supply line.

Connection of the wires inside the control box

- 1 For connection to outdoor unit and to controller (field supply):
Pull the wires inside through the screw nut and close the nut firmly in order to ensure a good pull relieve and water protection.
- 2 The cables require an additional pull-relief. Strap the cable with the installed tie wrap.



Precautions

- Thermistor cable and remote controller wire should be located at least 50 mm away from power supply wires and from wires to the controller. Not following this guideline may result in malfunction due to electrical noise.
- Use only specified wires, and tightly connect wires to the terminals. Keep wiring in neat order so that it does not obstruct other equipment. Incomplete connections could result in overheating, and in worse case electric shock or fire.

Connecting the wiring: EKEQFCBAV3

- Connect the wires to the terminal board according to the wiring diagram in [figure 3](#). See [figure 4](#) for wiring intake in the control box. The wiring intake hole indication H1 refers to the H1 cable of the corresponding wiring diagram.
- Connect cables according to specifications of the next table.



- Take special precaution for connection to the controller (field supply). Do not miswire the output signals nor the input signal (ON/OFF). This mistake could damage the entire system.
- The polarity of the capacity step connection is: C₅=minus pole, C₆=plus pole.

Table connection and application

	Description	Connect to	Type of cable	Cross section (mm ²) ^(†)	Maximum length (m)	Specifications			
L, N, earth	Power supply	Power supply	H05VV-F3G2.5	2.5	—	Power supply 230 V 1~ 50 Hz			
Y1~Y6 ^(†)	Expansion valve connection	Expansion valve kit	LIYCY3 x 2 x 0.75	0.75	20	Digital output 12 V DC			
R1,R2	Thermistor R2T (liquid pipe)	—	H05VV-F2 x 0.75		Standard 2.5 Maximum 20	Analog input 16 V DC			
R3,R4	Thermistor R3T (gas pipe)								
P1,P2	Remote controller (optional)				Outdoor unit	100	Communication line 16 V DC		
F1,F2	Communication to outdoor unit								
T1,T2	ON/OFF	Controller field supply	LIYCY4 x 2 x 0.75					(‡)	Digital input 16 V DC
C1,C2	Error signal								Digital output: voltage free. Maximum 230 V, maximum 0.5 A
C3,C4	Operation signal ^(#)				Analog input: 0~10 V				
C5,C6	Capacity step ^(§)								
C7,C8	Fan signal	Air handling unit fan field supply	H05VV-F3G2.5	2.5	—	Digital output: voltage free. Maximum 230 V, maximum 2 A			
C9,C10	Defrost signal	Controller field supply	LIYCY4 x 2 x 0.75	0.75	(‡)	Digital output: voltage free. Maximum 230 V, maximum 0.5 A			

(*) Recommended size (all wiring must comply with local codes).

(†) For EKEXV400 and 500, Y5 does not need to be connected.

(‡) The maximum length depends on the external device that is connected (controller/relay,...)

(#) Operation signal: indicates compressor operation.

(§) Only necessary for capacity controlled system.

Wiring diagram

A1P Printed circuit board
A2P Printed circuit board (for voltage conversion)
A3P Printed circuit board (power supply)
F1U Fuse (250 V, F5A) (A1P)
F2U Fuse (250 V, T1A) (A3P)
F3U Field fuse
HAP Light emitting diode (service monitor-green)
K2R Magnetic relay (error status)
K3R Magnetic relay (operation / compressor ON/OFF)
K4R Magnetic relay (fan)
K5R Magnetic relay (defrost signal)
K1R,KAR,KPR.... Magnetic relay
Q1DI Earth leakage breaker
R2T Thermistor (liquid)
R3T Thermistor (gas)
R5 Resistance (120 Ω)
R6 Capacity adaptor
T1R Transformer (220 V/21.8 V)
X1M,X2M,X3M ... Terminal block
Y1E Electronic expansion valve
X1M-C7/C8 Output: fan ON/OFF
X1M-C9/C10 Output: defrost signal
X1M-R1/R2 Thermistor liquid
X1M-R3/R4 Thermistor gas
X1M-Y1~6 Expansion valve

X2M-C1/C2 Output: error status
X2M-C3/C4 Output: operation / compressor ON/OFF
X2M-C5/C6 Input: 0-10 V DC capacity control
X2M-F1/F2 Communication outdoor unit
X2M-P1/P2 Communication remote controller
X2M-T1/T2 Input: ON/OFF
 Field wiring
L Live
N Neutral
 Connector
 Wire clamp
 Protective earth (screw)
 Separate component
 Optional accessory
BLK Black
BLU Blue
BRN Brown
GRN Green
GRY Gray
ORG Orange
PNK Pink
RED Red
WHT White
YLW Yellow

Connecting the wiring: EKEQDCBV3

- Connect the wires to the terminal board according to the wiring diagram in [figure 5](#). See [figure 6](#) for wiring intake in the control box. The wiring intake hole indication H1 refers to the H1 cable of the corresponding wiring diagram.
- Connect cables according to specifications of the next table.

Table connection and application

	Description	Connect to	Type of cable	Cross section (mm ²) ^(*)	Maximum length (m)	Specifications
L, N, earth	Power supply	Power supply	H05VV-F3G2.5	2.5	—	Power supply 230 V 1~ 50 Hz
Y1~Y6	Expansion valve connection	Expansion valve kit	LIYCY3 x 2 x 0.75	0.75	20	Digital output 12 V DC
R1,R2	Thermistor R2T (liquid pipe)	—	H05VV-F2 x 0.75		Standard: 2.5 Max.: 20	Analog input 16 V DC
R3,R4	Thermistor R3T (gas pipe)					
R5,R6	Thermistor R1T (air)					
P1,P2	Remote controller					
F1,F2	Communication to outdoor unit	Outdoor unit			100	Communication line 16 V DC
T1,T2	ON/OFF	Controller field supply	LIYCY4 x 2 x 0.75	—	Digital input 16 V DC	
—	Capacity step			Optional connection: when the function of the switch box needs to be extended: see KRP4A51 for details of settings and instructions.		
—	Error signal					
—	Operation signal					
C1,C2	Fan signal	Air handling unit fan field supply	H05VV-F3G2.5	2.5	—	Digital output: voltage free. Maximum 230 V, maximum 2 A

(*) Recommended size (all wiring must comply with local codes).

Wiring diagram

A1P Printed circuit board
 A2P Printed circuit board (option KRP4)
 F1U Fuse (250 V, F5A) (A1P)
 F3U Field fuse
 HAP Light emitting diode (service monitor-green)
 K1R Magnetic relay
 K4R Magnetic relay (fan)
 Q1DI Earth leakage breaker
 R1T Thermistor (air)
 R2T Thermistor (liquid)
 R3T Thermistor (gas)
 R7 Capacity adaptor
 T1R Transformer (220 V/21.8 V)
 X1M,X3M Terminal block
 Y1E Electronic expansion valve
 X1M-C1/C2 Output: fan ON/OFF
 X1M-F1/F2 Communication outdoor unit
 X1M-P1/P2 Communication remote controller
 X1M-R1/R2 Thermistor liquid
 X1M-R3/R4 Thermistor gas
 X1M-R5/R6 Thermistor air
 X1M-T1/T2 Input: ON/OFF
 X1M-Y1~6 Expansion valve

 Field wiring
 L Live
 N Neutral
 Connector
 ° Wire clamp
 Protective earth (screw)
 ———— Separate component
 ===== Optional accessory
 BLK Black
 BLU Blue
 BRN Brown
 GRN Green
 GRY Gray
 ORG Orange
 PNK Pink
 RED Red
 WHT White
 YLW Yellow

INSTALLATION OF THERMISTORS

Refrigerant thermistors

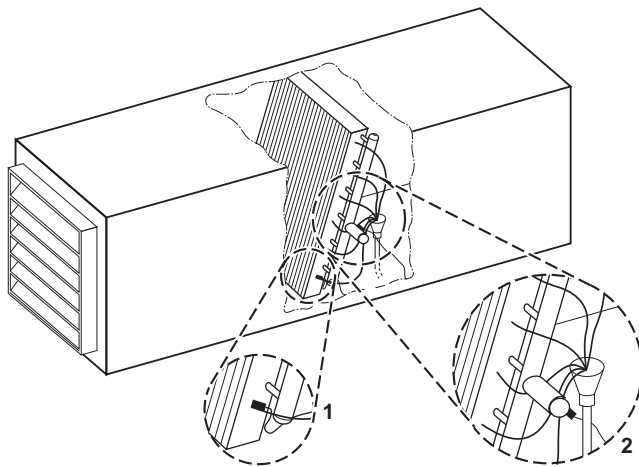
Location of the thermistor

A correct installation of the thermistors is required to ensure a good operation:

1. Liquid (R2T)
Install the thermistor behind the distributor on the coldest pass of the heat exchanger (contact your heat exchanger dealer).
2. Gas (R3T)
Install the thermistor at the outlet of the heat exchanger as close as possible to the heat exchanger.

Evaluation must be done to check if the air handling unit is protected against freeze-up. This must be done during test operation.

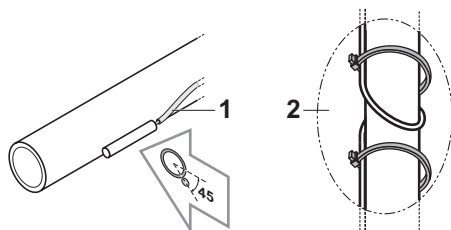
The thermistor needs to be installed in an enclosed area. Install it inside the air handling unit, or shield it to prevent it from getting touched.



- 1 Liquid R2T
- 2 Gas R3T

Installation of the thermistor cable

- 1 Put the thermistor cable in a separate protective tube.
- 2 Always add a pull-relief to the thermistor cable to avoid strain on the thermistor cable and loosening of the thermistor. Strain on the thermistor cable or loosening of the thermistor may result in bad contact and incorrect temperature measurement.



Installation of longer thermistor cable (R1T/R2T/R3T)

The thermistor is supplied with a standard cable of 2.5 m. This cable can be made longer to up to 20 m.

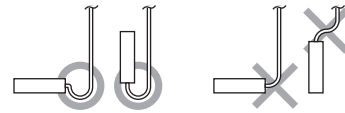
Install the longer thermistor cable with the delivered wire to wire splices

- 1 Cut the wire or bundle the remainder of the thermistor cable.
Keep at least 1 m of the original thermistor cable.

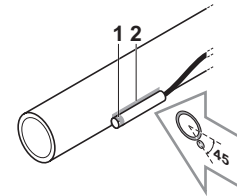
Fixation of the thermistor



- Put the thermistor wire slightly down to avoid water accumulation on top of the thermistor.

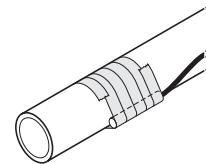


- Make good contact between thermistor and air handling unit. Put the top of the thermistors on the air handling unit, this is the most sensitive point of the thermistor.

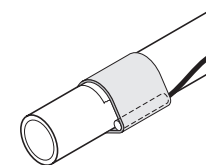


- 1 Most sensitive point of the thermistor
- 2 Maximize the contact

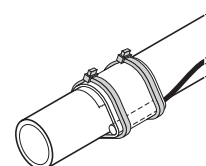
- 1 Fix the thermistor with insulating aluminum tape (field supply) in order to ensure a good heat transference.



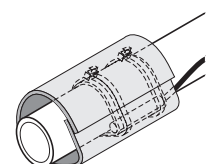
- 2 Put the supplied piece of rubber around the thermistor (R2T/R3T) in order to avoid loosening of the thermistor after some years.



- 3 Fasten the thermistor with 2 tie wraps.



- 4 Insulate the thermistor with the supplied insulation sheet.



Do not bundle the cable inside the control box.

- 2 Strip the wire ± 7 mm at both ends and insert these ends into the wire to wire splice.
- 3 Pinch the splice with the correct crimp tool (pliers).
- 4 After connection, heat up the shrink-insulation of the wire to wire splice with a shrink-heater to make a water tight connection.
- 5 Wrap electrical insulation tape around the connection.

- 6 Put a pull-relief in front of and behind the connection.



- The connection must be made on an accessible location.
- To make the connection waterproof, the connection can also be made in a switch box or connector box.
- The thermistor cable should be located at least 50 mm away from power supply wire. Not following this guideline may result in malfunction due to electrical noise.

TEST OPERATION

After installation and once the field settings are defined, the installer is obliged to verify correct operation by performing a test run. Refer to the installation manual of the outdoor unit. Before executing "test run" as well as before operating the unit, you must check the following:

- Refer to the section of "[For the following items, take special care during construction and check after installation is finished](#)" on page 4.
- After finishing the construction of refrigerant piping, drain piping and electric wiring, conduct test run accordingly to protect the unit.
- Open the gas side stop valve.
- Open the liquid side stop valve.

Additional test operation

When the test run was successful, an additional check needs to be carried out during normal operation.

- 1 Close the contact T1/T2 (ON/OFF).
- 2 Confirm function of the unit according to the manual and check if the air handling unit has collected ice (freeze-up).
If the unit collects ice: see "[Troubleshooting](#)" on page 14.
- 3 Confirm that the fan of the air handling unit is ON.



- In case of poor distribution in the air handling unit, 1 or more passes of the air handling unit may freeze-up (collect ice) → put the thermistor (R2T) on this position.
- Depending on operation conditions (e.g.: outdoor ambient temperature) it is possible that the settings must be changed after commissioning.

OPERATION AND MAINTENANCE

If T1/T2 is used to control the operation of the air handling unit, the following convention is used:

- Closing the T1/T2 signal starts operation of the air handling unit.
- Opening the T1/T2 signal stops operation of the air handling unit.

WHAT TO DO BEFORE OPERATION



- Before initiating operation, contact your dealer to get the operation manual that corresponds to your system.
- Refer to the dedicated manual of the controller (field supply) and air handling unit (field supply).
- Make sure that the air handling unit fan is ON when the outdoor unit is in normal operation.

Field settings for EKEQDCB

Refer to the installation and service manuals of both the outdoor unit and the remote controller.

Field settings for EKEQFCBA

When changing the settings:

- 1 Make the required settings with the remote controller.
- 2 Turn power OFF after all required settings have been made.
- 3 Remove the remote controller after servicing and test run. Operating the remote controller may disturb the normal operation of the system.
- 4 Do not change T1/T2 during power failure.
- 5 Put power of indoor and outdoor unit ON.

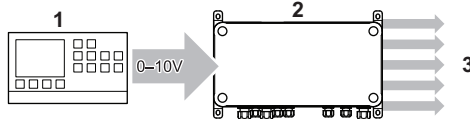
Setting the temperature control system

Mode No.	Code No.	Description of setting	
23(13)-0	01	Operation with 0–10 V capacity control (= factory setting)	X control
	02	Operation with fixed T_e/T_c temperature control	Y control
	03	Operation with 0–10 V capacity control	W control

T_e or SST = evaporating temperature or saturated suction temperature. T_c = condensing temperature.

Operation with 0–10 V capacity control: X control

For X control, a field-supplied controller needs to be connected to the EKEQF control box. The field-supplied controller will generate a 0–10 V signal that will be used by the EKEQF control box for the capacity control of the system.

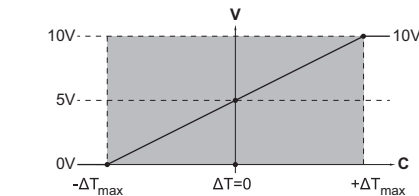


- 1 Field-supplied controller
- 2 Control box EKEQF
- 3 Level 1~5 for capacity control

The system needs a field-supplied controller with a temperature sensor. The temperature sensor can be used to control the following temperatures:

- Suction air temperature of the air handling unit
- Room air temperature
- Discharge air temperature of the air handling unit

Program the field-supplied controller so that it outputs a 0–10 V signal based on the temperature difference between the actual measured temperature and the target temperature.



- V** Controller voltage output to EKEQF
- ΔT** [actual measured temperature] – [target temperature]
When ΔT=0, the target temperature is reached.
- ΔT_{max}** Maximum temperature variation as defined by installation
Recommended value for ΔT_{max}=[2°C~5°C].

The voltage output of the field-supplied controller is a linear function with ΔT:

$$V = \frac{5}{+\Delta T_{\max}} \Delta T + 5$$

It is possible that the ΔT value can become higher than the chosen ΔT_{max} value. The output of the field-supplied controller needs to be 10 V or 0 V depending on the ΔT value (see graph for detail).

Below an example for cooling and heating operation is given.

■ Cooling operation

ΔT_{max} is selected at 3°C.

The target room temperature is 24°C.

Actual measured temperature	ΔT value	Voltage output field controller	Cooling capacity
20°C	-4°C	0 V	Cooling capacity will strongly decrease
21°C	-3°C	0 V	Cooling capacity will strongly decrease
22.5°C	-1.5°C	2.5 V	Cooling capacity will decrease
24°C	0°C	5 V	Unit will keep operating at same capacity level.
25.5°C	1.5°C	7.5 V	Cooling capacity will increase
27°C	3°C	10 V	Cooling capacity will strongly increase
28°C	4°C	10 V	Cooling capacity will strongly increase

■ Heating operation

ΔT_{max} is selected at 3°C.

The target room temperature is 24°C.

Actual measured temperature	ΔT value	Voltage output field controller	Heating capacity
20°C	-4°C	0 V	Heating capacity will strongly increase
21°C	-3°C	0 V	Heating capacity will strongly increase
22.5°C	-1.5°C	2.5 V	Heating capacity will increase
24°C	0°C	5 V	Unit will keep operating at same capacity level.
25.5°C	1.5°C	7.5 V	Heating capacity will decrease
27°C	3°C	10 V	Heating capacity will strongly decrease
28°C	4°C	10 V	Heating capacity will strongly decrease

Operation with fixed T_e/T_c temperature control

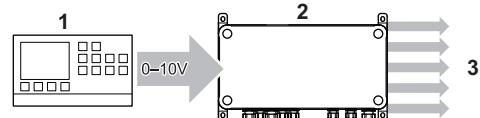
The evaporating temperature (T_e)/condensing temperature (T_c) at which the application has to operate can be set by code numbers as listed below.

Mode No.	Code No.	Description of setting(*)
23(13)-1	01	T _e = 5°C
	02	T _e = 6°C
	03	T _e = 7°C
	04	T _e = 8°C (factory setting)
	05	T _e = 9°C
	06	T _e = 10°C
	07	T _e = 11°C
	08	T _e = 12°C
23(13)-2	01	T _c = 43°C
	02	T _c = 44°C
	03	T _c = 45°C
	04	T _c = 46°C (factory setting)
	05	T _c = 47°C
	06	T _c = 48°C
	07	T _c = 49°C

(*) Depending on the operating temperature condition or on selection of the air handling unit, operation or safety activation of the outdoor unit may take priority and actual T_e/T_c will be different from the set T_e/T_c.

Operation with 0–10 V capacity control: W control

For W control, a field-supplied controller needs to be connected to the EKEQF control box. The field-supplied controller will generate a 0–10 V signal that will be used by the EKEQF control box for the capacity control of the system.



- 1 Field-supplied controller
- 2 Control box EKEQF
- 3 Level 1~5 for capacity control

The system needs a field-supplied controller with a temperature sensor. The temperature sensor can be used to control the following temperatures:

- Suction air temperature of the air handling unit
- Room air temperature
- Discharge air temperature of the air handling unit

The EKEQF control box will interpret the 0–10 V signal according to 5 steps. The correlation between the voltage output and the system capacity is shown in the table below.

Step	Voltage field controller ^(*)	System capacity ^(†)	T _a during cooling operation	T _c during heating operation
1	0.8 V	0% (OFF)	—	—
2	2.5 V	40%	13.5°C	31°C
3	5 V	60%	11°C	36°C
4	7.5 V	80%	8.5°C	41°C
5	9.2 V	100%	6°C	46°C

(*) Voltages shown are the center points of each step range.

(†) The capacities mentioned in the table above are not exact. The compressor frequency can vary and will have an impact on the system capacity.



The system response to the 0–10 V output from the field-supplied controller is the same in cooling and heating operation. 10 V means 100% system capacity in cooling and heating operation. The field-supplied controller will output a 0–10 V signal based on ΔT (see "Operation with 0–10 V capacity control: X control" on page 12 for the definition of ΔT).

In the table below an example is given. A ΔT of 4°C in cooling operation means that the field-supplied controller needs to output 10 V, so that the cooling capacity will be 100%. A ΔT of 4°C in heating operation means that the field-supplied controller needs to output 0 V, so that the heating capacity will be 0% (OFF).

	Target temperature	Actual measured temperature	ΔT	Required system response
Cooling operation	24°C	28°C	+4°C	High capacity (10 V)
Heating operation	24°C	28°C	+4°C	No capacity (0 V)

The response of the field-supplied controller must therefore be inverted for cooling or heating operation.

Setting the indoor fan control

NOTE



This setting applies to both EKEQDCB and EKEQFCBA control boxes.

In fan only and cooling mode, the indoor fan is ON when the unit is operating.

For heating operation, different settings can be made:

Mode No.	Code No.	Description of setting
22(12)–3	01	Fan ON at thermo OFF
	02	Fan ON at thermo OFF
	03 ^(*)	Fan OFF at thermo OFF

(*) Factory setting

Mode No.	Code No.	Description of setting
23(13)–8	01 ^(*)	Fan OFF at defrost and oil return
	02	Fan ON at defrost and oil return
	03	Fan ON at defrost and oil return

(*) Factory setting

NOTE



The combination of "Fan OFF during thermo OFF" and "Fan ON during defrost/oil return" will result in fan ON during thermo OFF.

Operation setting in case of power failure

NOTE



This setting applies to both EKEQDCB and EKEQFCBA control boxes.



Measures must be taken to ensure that after power failure, T1/T2 is according to the setting of your preference. Neglecting this caution will result in improper operation.

Mode No.	Code No.	Description of setting
22(12)–5	01	T1/T2 must be open at power restore. ^(*)
	02 ^(†)	After power failure, the status of T1/T2 must remain identical to the initial T1/T2 status prior to the power failure.

(*) After power failure, T1/T2 must be changed to open (no cooling/heating requested).

(†) Field setting

OPERATION AND DISPLAY SIGNALS

For EKEQF only			
Output	C1/C2 error signal	Error: Closed	Abnormal operation on condenser or control system
			Power failure
	No error: Open		Normal operation
			T1/T2 is open: no error detection anymore
	C3/C4 operation signal	Closed	Compressor not operating
		Open	Compressor operating
Input	C7/C8 fan output	Open	Fan off
		Closed	Fan on
	C9/C10 defrost output	Open	No defrost operation
		Closed	Defrost operation
	C5/C6: capacity step	0–10 V	Only necessary for field setting 23(13)–0 = 01 or 03 0–10 V capacity control ^(*)
	T1/T2 ^(†)	Open	No cooling/heating requested
		Closed	Cooling/heating requested

(*) Refer to paragraph "Operation with 0–10 V capacity control: X control" on page 12 and "Operation with 0–10 V capacity control: W control" on page 12.

(†) See field setting 22(12)–5.

For EKEQD only			
Output	C1/C2 fan output	Open	Fan off
		Closed	Fan on
Input	T1/T2 ^(*)	Open	No cooling/heating requested
		Closed	Cooling/heating requested

(*) See field setting 12(22)–5.



- The fan of the air handling unit must operate before cooling operation is required to the outdoor unit.
- When the operation signal is activated, the air handling unit and fan must operate. Failure to this will cause a safety to operate or freezing up of the air handling unit.

TROUBLESHOOTING

To set up the system and make troubleshooting possible, it is required to connect the remote controller to the option kit.

Not a malfunction of the air conditioner

The system does not operate

- The system does not restart immediately after the cooling/heating is requested.
If the operation lamp lights, the system is in normal operating condition.
It does not restart immediately because one of its safety devices actuates to prevent the system from being overloaded. The system will turn on again automatically after 3 minutes.
- The system does not restart immediately after the power supply is turned on.
Wait 1 minute until the micro computer is prepared for operation.

Troubleshooting

If one of the following malfunctions occurs, take the measures shown below and contact your dealer.

The system must be repaired by a qualified service person.

- If a safety device such as a fuse, a breaker, or an earth leakage breaker frequently actuates, or ON/OFF switch does not properly work.
Turn off the main power switch.
- If the display  TEST, the unit number and the operation lamp flash and the malfunction code appears;
Notify your dealer and report the malfunction code.

If the system does not operate properly, and none of the above mentioned malfunctions is evident, investigate the system according to the following procedures.

If the system does not operate at all

- Check if there is a power failure.
Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after the power supply recovers.
- Check if the fuse has blown or breaker has been tripped.
Change the fuse or set the breaker.

If the system stops operating after operation is complete

- Check if the air inlet or outlet of outdoor or air handling unit is blocked by obstacles.
Remove the obstacle and make it well-ventilated.
- Check if the air filter is clogged.
Ask a qualified service person to clean the air filter.
- The error signal is given and the system stops.
If the error resets after 5-10 minutes, the unit safety device was activated but the unit restarted after evaluation time.
If the error persists, contact your dealer.

If the system operates but it does not sufficiently cool/heat

- Check if the air inlet or outlet of the air handling unit or the outdoor unit is blocked with obstacles.
Remove the obstacle and make it well-ventilated.
- Check if the air filter is clogged.
Ask a qualified service person to clean the air filter.
- Check if the doors or the windows are open.
Shut doors or windows to prevent wind from coming in.
- Check if direct sunlight enters the room.
Use curtains or blinds.
- Check if there are too many inhabitants in the room.
Cooling effect decreases if heat gain of the room is too large.
- Check if the heat source of the room is excessive.
Cooling effect decreases if heat gain of the room is too large.

The air handling unit is freezing up

- The liquid thermistor (R2T) is not put on the coldest position and part of the air handling unit is freezing up.
Thermistor must be put on the coldest position.
- The thermistor has come loose.
The thermistor must be fixed.
- The air handling unit fan is not operating continuously.
When the outdoor unit stops operating, the air handling unit fan must continue operation to melt the ice that was accumulated during outdoor unit operation.
Ensure that the air handling unit fan keeps operating.

In these cases, contact your dealer.

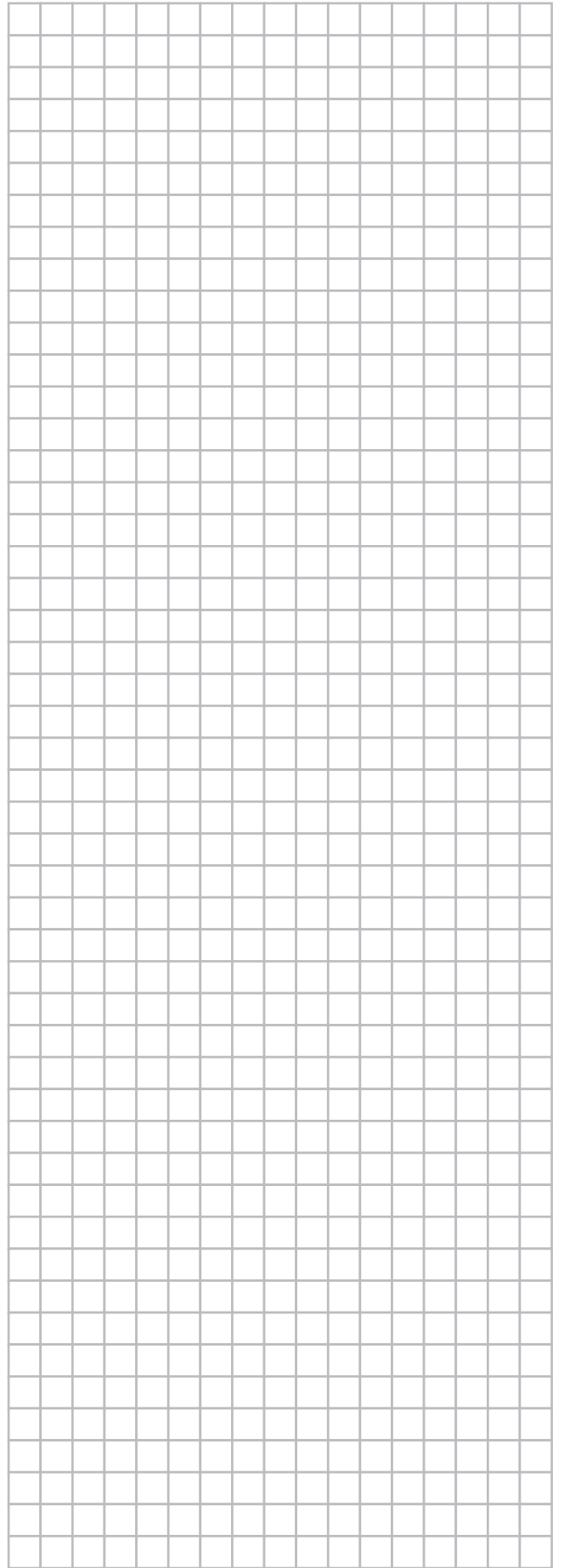
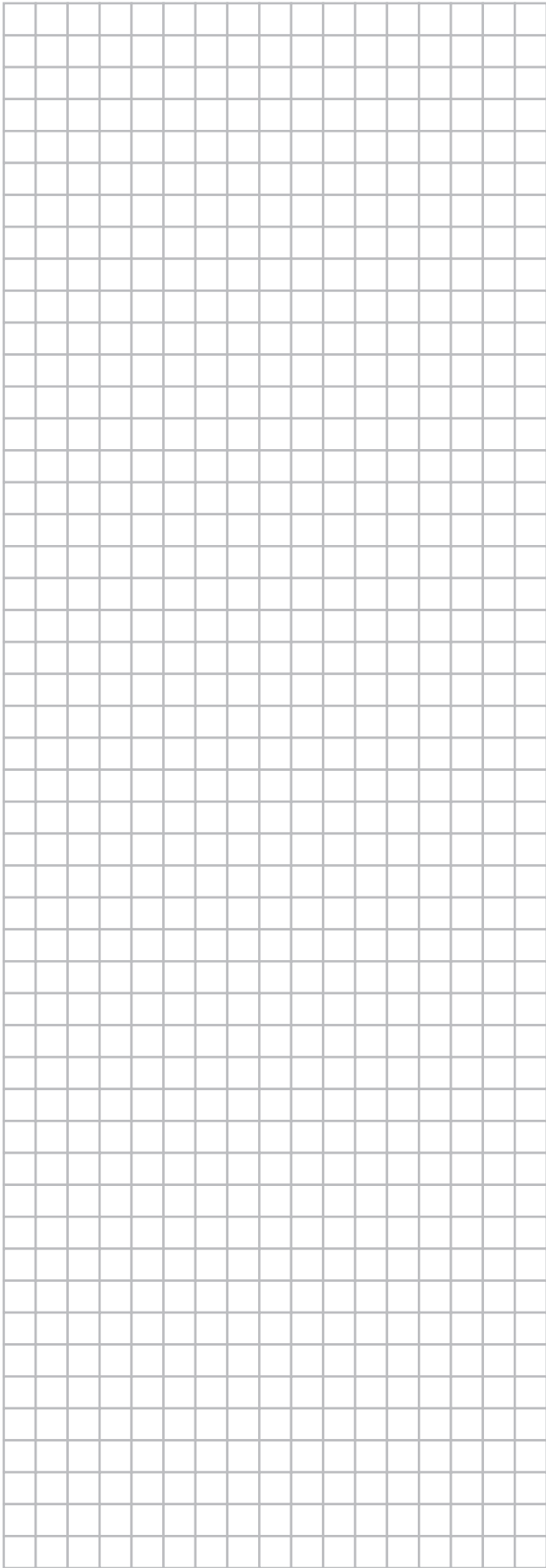
MAINTENANCE

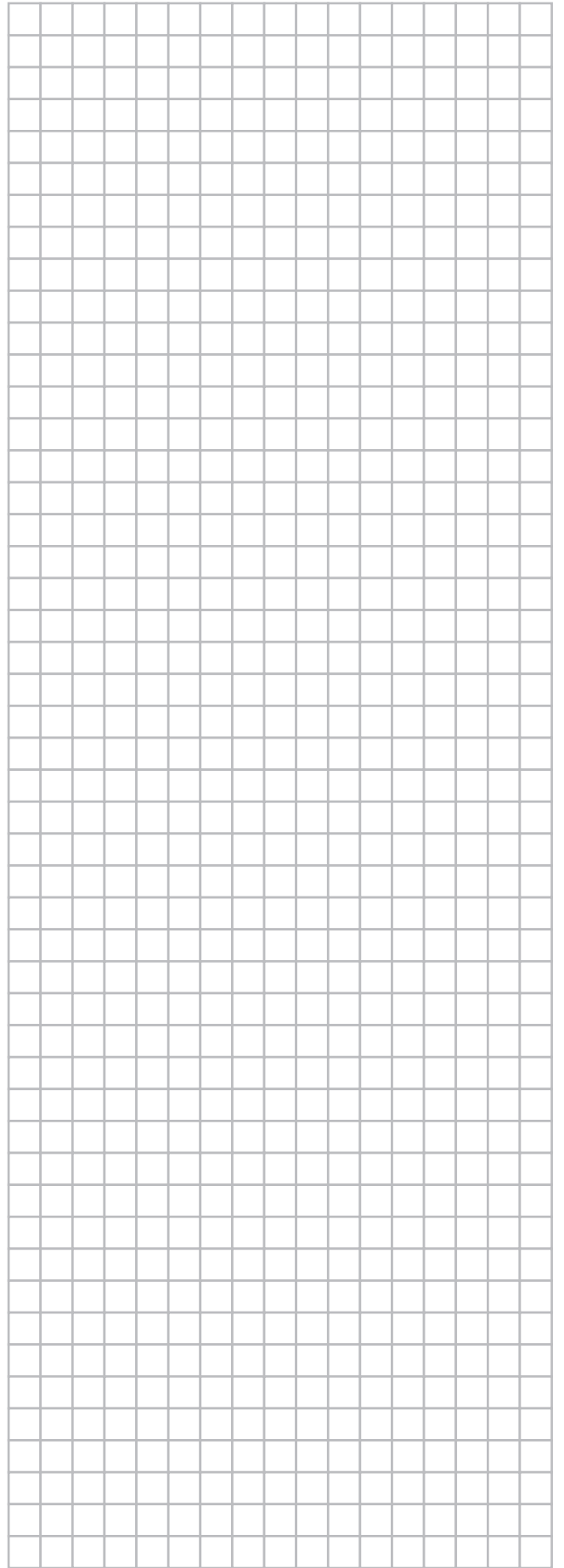
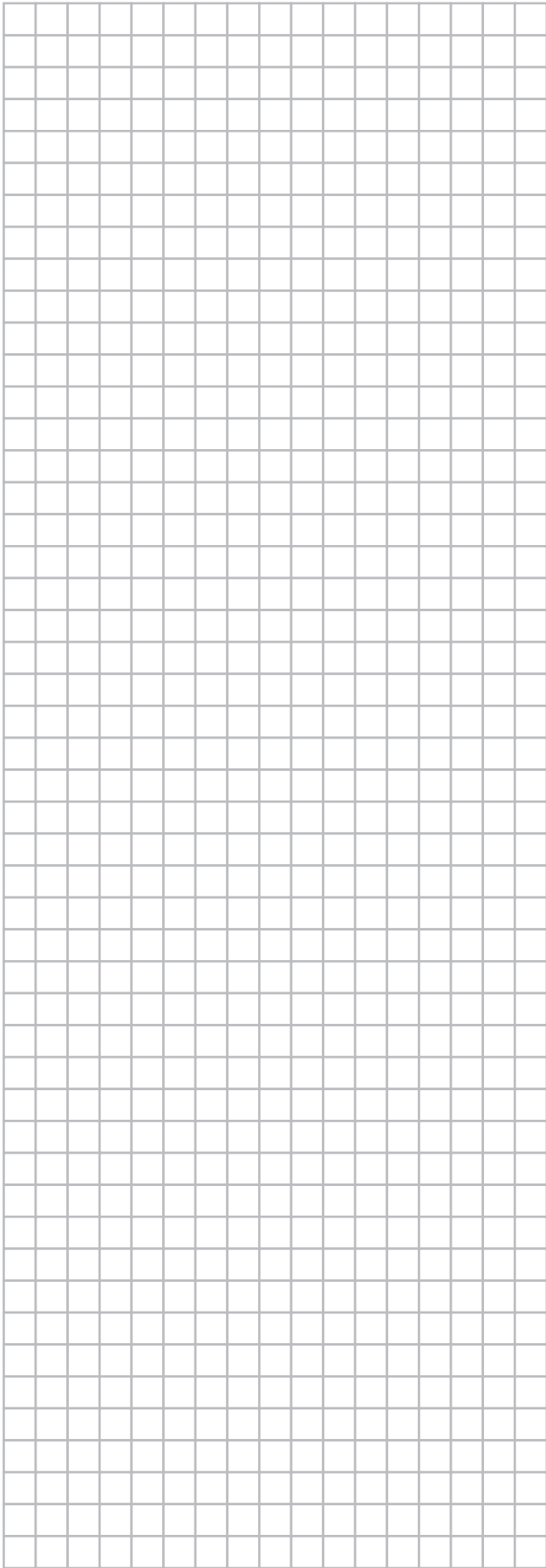


- Only a qualified service person is allowed to perform maintenance.
- Before obtaining access to terminal devices, all power supply circuits must be interrupted.
- Water or detergent may deteriorate the insulation of electronic components and result in burn-out of these components.

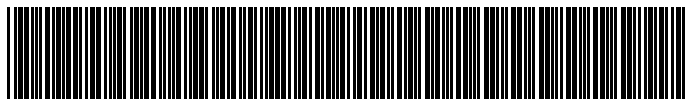
DISPOSAL REQUIREMENTS

Dismantling of the unit, treatment of the refrigerant, of oil and of other parts must be done in accordance with relevant local and national legislation.





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