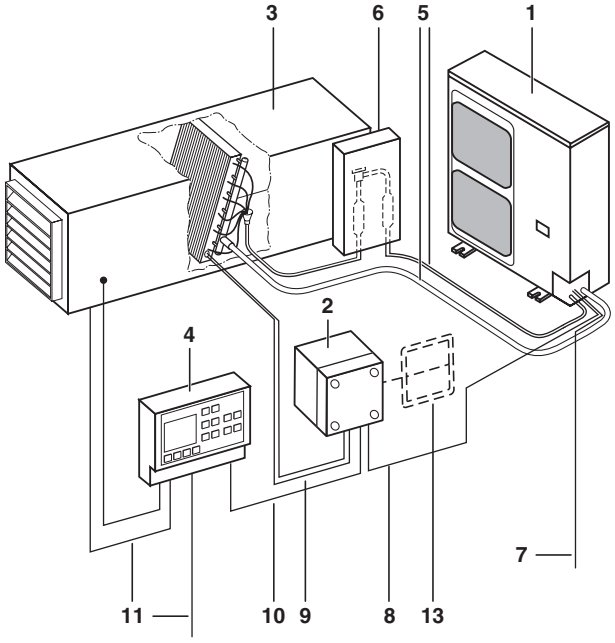
DAIKIN

INSTALLATION AND OPERATION MANUAL

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

EKEQFCBV3
EKEQDCBV3



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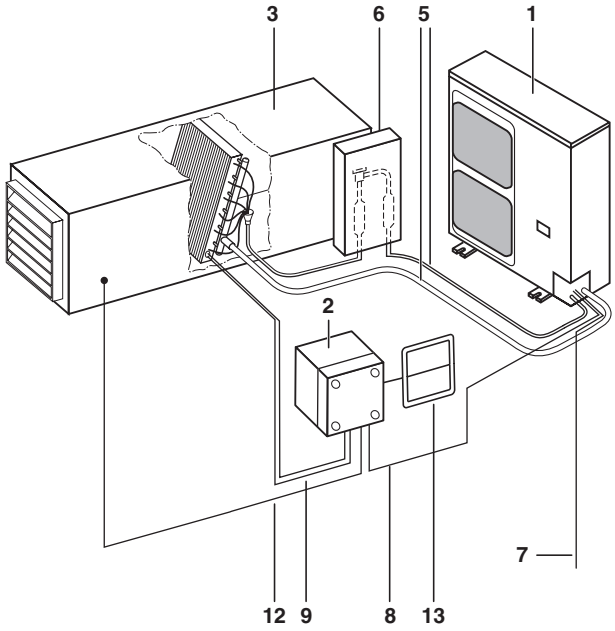

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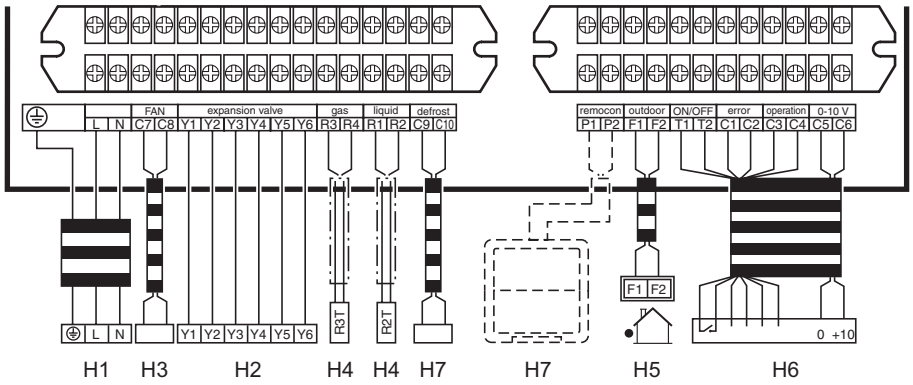

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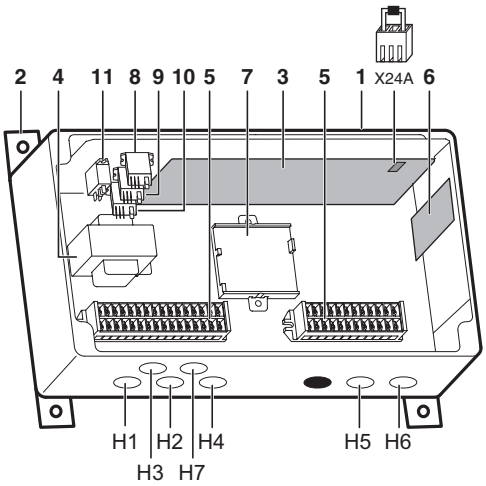

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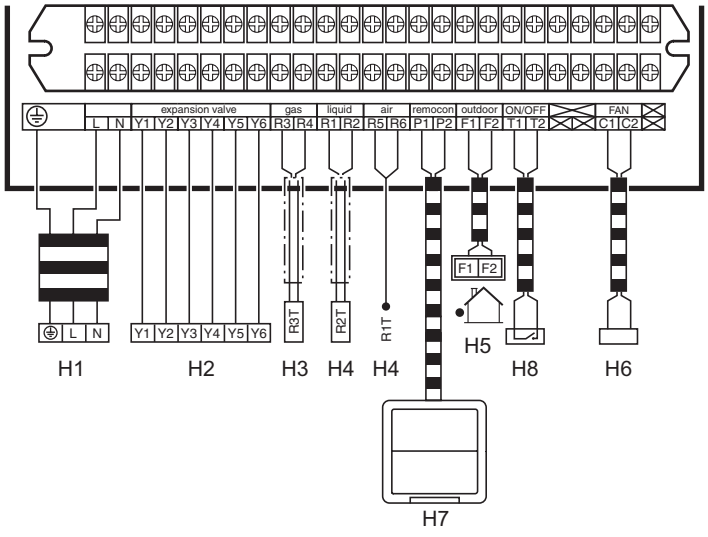
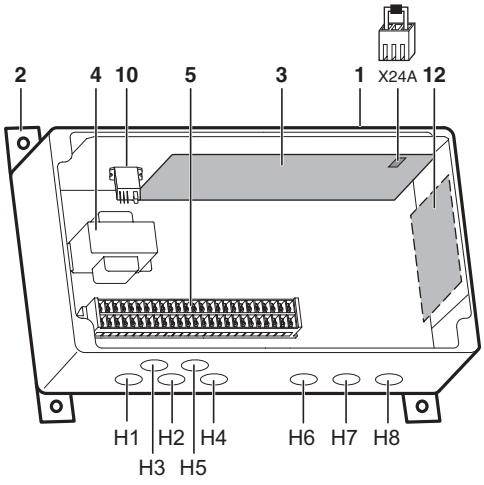


5 EKEQDCBV3



6 EKEQDCBV3

CE - DECLARATION-OF-CONFORMITY
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-СООТВЕТСТВИИ
CE - OPFYLDELSESERKLÆRING
CE - FÖRSÄKRAN-OM-ÖVERENSTÄMMELSE

CE - ERKLÆRING OM-SAMSVAR
CE - ILMOITUS-YHDENMUKAISUUDESTA
CE - PROHLÁŠENÍ-O-SHODĚ

CE - IZJAVA-O-USKLAĐENOSTI
CE - MEGFELELŐSÉGI-NYILATKOZAT
CE - DEKLARACJA-ZGODNOŚCI
CE - DECLARAŢIE-DE-CONFORMITATE

CE - IZJAVA O SKLADNOSTI
CE - VASTAVUSDEKLARATSIOON
CE - ДЕКЛАРАЦИЯ-ЗА-СЪОТВЕТСТВИЕ

CE - ATITIKTIES-DEKLARACIJA
CE - ATBILSTĪBAS-DEKLARĀCIJA
CE - VYHLÁSENIE-ZHODY
CE - UYUMLULUK-BİLDİRİSİ

Daikin Europe N.V.

01 (GB) declares under its sole responsibility that the air conditioning equipment to which this declaration relates:
02 (D) erklärt auf seine alleinige Verantwortung dass die Ausrüstung der Klimageräte für die diese Erklärung bestimmt ist:
03 (F) déclare sous sa seule responsabilité que l'équipement d'air conditionné visés 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 (GR) δηλώνει με αποκλειστική της ευθύνη ότι ο εξοπλισμός των κλιματιστικών συσκευών στα οποία αναφέρεται η παρούσα δήλωση:
08 (P) declara sob sua exclusiva responsabilidade que os equipamentos de ar condicionado a que esta declaração se refere:
09 (RUS) заявляет, исключительно под свою ответственность, что оборудование для кондиционирования воздуха, к которому относится настоящее заявление:
10 (DK) erklærer under eneansvar, at udstyret til klimaregulering, som denne deklaration vedrører:
11 (S) deklarerer i egenskap av huvudansvarig, att luftkonditioneringsutrustningen som berörs av denna deklaration innebär att:
12 (N) erklærer et fullstendig ansvar for at det luftkondisjoneringsutstyr som berøres av denne deklarasjon, innebærer at:
13 (FIN) ilmoittaa yksinomaan omalla vastuullaan, että tämän ilmoituksen tarkoittamat ilmastointilaitteet:
14 (CZ) prohlašuje ve své plné odpovědnosti, že klimatizační zařízení, k nimž se toto prohlášení vztahuje:
15 (HR) izjavljuje pod isključivo vlastitom odgovornošću da oprema za klimatizaciju na koju se ova izjava odnosi:
16 (H) teljes felelősségе tudatában kijelenti, hogy a klímaberendezések, melyekre e nyilatkozat vonatkozik:
17 (PL) deklaruje na własną i wyłączną odpowiedzialność, że klimatyzatory, których dotyczy niniejsza deklaracja:
18 (RO) declară pe proprie răspundere că echipamentele de aer condiţionat la care se referă această declaraţie:
19 (SLO) z vso odgovornostjo izjavlja, da je oprema klimatskih naprav, na katero se izjava nanaša:
20 (EST) kinnitab oma täielikul vastutusel, et käesoleva deklaratsiooni alla kuuluv kliimaseadmete varustus:
21 (BG) декларира на своя отговорност, че оборудването за климатична инсталация, за което се отнася тази декларация:
22 (LT) visiška savo atsakomybe skelbia, kad oro kondicionavimo įranga, kuriai taikoma ši deklaracija:
23 (LV) ar pilnu atbildību apliecina, ka tālāk uzskaitītās gaisa kondicionēšanas iekārtas, uz kuriem attiecas šī deklarācija:
24 (SK) vyhlasuje na vlastnú zodpovednosť, že klimatizačné zariadenie, na ktoré sa vzťahuje toto vyhlásenie:
25 (TR) tamamen kendi sorumluluğunda olmak üzere bu bildirinin ilgili olduğu klima donanımının aşağıdaki gibi olduğunu beyan eder:

EKEQDCBV3*, EKEQFCBV3*,
* = , , 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 der/den folgenden Norm(en) oder einem anderen Normdokument oder -dokumenten entspricht/entsprechen, unter der Voraussetzung, daß sie gemäß unseren Anweisungen eingesetzt werden:
03 sont conformes à la/aux norme(s) ou autre(s) document(s) normatif(s), pour autant qu'ils soient utilisés conformément à nos instructions:
04 conform de volgende norm(en) of één of meer andere bindende 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(i) seguente(i) standard(s) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:
07 είναι σύμφωνα με το(α) ακόλουθο(α) πρότυπο(α) ή άλλο έγγραφο(α) κανονισμών, υπό την προϋπόθεση ότι χρησιμοποιούνται σύμφωνα με τις οδηγίες μας:
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 соответствуют следующим стандартам или другим нормативным документам, при условии их использования согласно нашим инструкциям:
10 overholder følgende standard(er) eller andet/andre retningsgivende dokument(er), forudsat at disse anvendes i henhold til vore instrukser:
11 respektive utrustning är utförd i överensstämmelse 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 forutssetning av at disse brukes i henhold til våre instrukser:
13 vastaavat seuraavien standardien ja muiden ohjeellisten dokumenttien vaatimuksia edellyttäen, että niitä käytetään ohjeidemme mukaisesti:
14 za předpokladu, že jsou využívány v souladu s našimi pokyny, odpovídají následujícím normám nebo normativním dokumentům:
15 u skladu sa slijedećim standardom(ima) ili drugim normativnim dokumentom(ima), uz uvjet da se oni koriste u skladu s našim uputama:
16 megfelelnek az alábbi szabvány(ok)nak vagy egyéb irányadó dokumentum(ok)nak, ha azokat előírás szerint használják:
17 spełniają wymogi następujących norm i innych dokumentów normalizacyjnych, pod warunkiem że używane są zgodnie z naszymi instrukcjami:
18 sunt în conformitate cu următorul (următoarele) standard(e) sau alt(e) document(e) normativ(e), cu condiţia ca acestea să fie utilizate în conformitate cu instrucţiunile noastre
19 skladni z naslednjimi standardi in drugimi normativi, pod pogojem, da se uporabljajo v skladu z našimi navodili:
20 on vastavuses järgmis(t)e standardi(te)ga või teiste normatiivsete dokumentidega, kui neid kasutatakse vastavalt meie juhenditele:
21 съответстват на следните стандарти или други нормативни документи, при условие, че се използват съгласно нашите инструкции:
22 atitinka žemiau nurodytus standartus ir (arba) kitus norminius dokumentus su sąlyga, kad yra naudojami pagal mūsų nurodymus:
23 tad, ja lietoti atbilstoši ražotāja norādījumiem, atbilst sekojošiem standartiem un citiem normatīviem dokumentiem:
24 sú v zhode s nasledovnou(ými) normou(ami) alebo iným(i) normatívnym(i) dokumentom(ami), za predpokladu, že sa používajú v súlade s našim návodom:
25 ürünün, talimatlarımıza göre kullanılması koşuluyla aşağıdaki standartlar ve norm belirten belgelerle uyumludur:

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 με τήρηση των διατάξεων των:
08 de acordo com o previsto em:
09 в соответствии с положениями:
10 under iagttagelse af bestemmelserne i:
11 enligt villkoren i:
12 gitt i henhold til bestemmelsene i:
13 noudattaen määräyksiä:
14 za dodržení ustanovení předpisu:
15 prema odredbama:
16 követi a(z):
17 zgodnie z postanowieniami Dyrektyw:
18 ín urma prevederilor:
19 ob upoštevanju določb:
20 vastavalt nõuetele:
21 следвайки клаузите на:
22 laikantis nuostatų, pateikiamų:
23 ievērojot prasības, kas noteiktas:
24 održiavajúc ustanovenia:
25 bunun koşullarına uygun olarak:

Low Voltage 2006/95/EC
Electromagnetic Compatibility 2004/108/EC *

01 Directives, as amended.
02 Direktiven, gemäß Änderung.
03 Directives, telles que modifiées.
04 Richtlijnen, zoals geamendeerd.
05 Directivas, según lo enmendado.
06 Direttive, come da modifica.
07 Οδηγιών, όπως έχουν τροποποιηθεί.
08 Directivas, conforme alteração em.
09 Директив со всеми поправками.
10 Direktiver, med senere ændringer.
11 Direktiv, med företagna ändringar.
12 Direktiver, med foretatte endringer.
13 Direktiivejä, sellaisina kuin ne ovat muutettuina.
14 v platném znění.
15 Smjernice, kako je izmijenjeno.
16 irányelv(ek) és módosításaik rendelkezéseit.
17 z późniejszymi poprawkami.
18 Directivelor, cu amendamentele respective.
19 Direktive z vsemi spremembami.
20 Direktivid koos muudatustega.
21 Директиви, с техните изменения.
22 Direktyvose su papildymais.
23 Direktīvās un to papildinājumos.
24 Smernice, v platnom znení.
25 Değiştirilmiş halleriyle Yönetmelikler.

01	**Note ***	as set out in **<A>** and judged positively by **<B>** according to the **Certificate <C>**.	06	**Nota ***	delineato nel **<A>** e giudicato positivamente da **<B>** secondo il **Certificato <C>**.	11	**Information ***	enligt **<A>** och godkänts av **<B>** enligt **Certifikatet <C>**.	16	**Megjegyzés ***	a(z) **<A>** alapján, a(z) **<B>** igazolta a megfelelést, a(z) **<C>** **tanúsítvány** szerint.	21	**Забележка ***	както е изложено в **<A>** и оценено положително от **<B>** съгласно **Сертификата <C>**.
02	**Hinweis ***	wie in der **<A>** aufgeführt und von **<B>** positiv beurteilt gemäß **Zertifikat <C>**.	07	**Σημείωση ***	όπως καθορίζεται στο **<A>** και κρίνεται θετικά από το **<B>** σύμφωνα με το **Πιστοποιητικό <C>**.	12	**Merk ***	som det fremkommer i **<A>** og gjennom positiv bedømmelse av **<B>** ifølge **Sertifikat <C>**.	17	**Uwaga ***	zgodnie z dokumentacją **<A>**, pozytywną opinią **<B>** i **Świadectwem <C>**.	22	**Pastaba ***	kaip nustatyta **<A>** ir kaip teigiamai nuspręsta **<B>** pagal **Sertifikatą <C>**.
03	**Remarque ***	tel que défini dans **<A>** et évalué positivement par **<B>** conformément au **Certificat <C>**.	08	**Nota ***	tal como estabelecido em **<A>** e com o parecer positivo de **<B>** de acordo com o **Certificado <C>**.	13	**Huom ***	jotka on esitetty asiakirjassa **<A>** ja jotka **<B>** on hyväksynyt **Sertifikaatin <C>** mukaisesti.	18	**Notă ***	aşa cum este stabilit în **<A>** şi apreciat pozitiv de **<B>** în conformitate cu **Certificatul <C>**.	23	**Piezīmes ***	kā norādīts **<A>** un atbilstoši **<B>** pozitīvajam vērtējumam saskaņā ar **sertifikātu <C>**.
04	**Bemerk ***	zoals vermeld in **<A>** en positief beoordeeld door **<B>** overeenkomstig **Certificaat <C>**.	09	**Примечание ***	как указано в **<A>** и в соответствии с положительным решением **<B>** согласно **Свидетельству <C>**.	14	**Poznámka ***	jak bylo uvedeno v **<A>** a pozitivně zjištěno **<B>** v souladu s **osvědčením <C>**.	19	**Opomba ***	kot je določeno v **<A>** in odobreno s strani **<B>** v skladu s **certifikatom <C>**.	24	**Poznámka ***	ako bolo uvedené v **<A>** a pozitívne zistené **<B>** v súlade s **osvedčením <C>**.
05	**Nota ***	como se establece en **<A>** y es valorado positivamente por **<B>** de acuerdo con el **Certificado <C>**.	10	**Bemærk ***	som anført i **<A>** og positivt vurderet af **<B>** i henhold til **Certifikat <C>**.	15	**Napomena ***	kako je izloženo u **<A>** i pozitivno ocijenjeno od strane **<B>** prema **Certifikatu <C>**.	20	**Märkus ***	nagu on näidatud dokumendis **<A>** ja heaks kiidetud **<B>** järgi vastavalt **sertifikaadile <C>**.	25	**Not ***	**<A>**'da belirtildiği gibi ve **<C>** **Sertifikasına** göre **<B>** tarafından olumlu olarak değerlendirildiği gibi.			

<A>	DAIKIN.TCF.024D12/02-2009
<B>	TÜV (NB1856)
<C>	0510260101

3PW26871-4E

DAIKIN

Jiro Tomita
Director Quality Assurance
Ostend, 4th of May 2009

DAIKIN EUROPE N.V.
Zandvoordestraat 300, B-8400 Oostende, Belgium

CONTENTS

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.

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

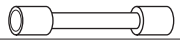
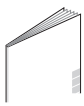
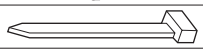
- EKEQFCB control box (2 possible operation modes)
  - Operation with 0–10 V input to control the capacity
    An external controller is needed to control the capacity. For details of the necessary functions of the external controller refer to paragraph "Operation with 0–10 V capacity control" on page 10. It 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.
- Do NOT connect the system to DIII-net devices:
  - intelligent touch Controller
  - intelligent Manager
  - DMS-IF
  - BACnet Gateway
  - ...

  This could result in malfunction or breakdown of the total system.
- This equipment is not designed for year-round cooling applications with low indoor humidity conditions, such as Electronic Data Processing rooms.
- This appliance is not intended for use by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
  Children should be supervised to ensure that they do not play with the appliance.

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

		EKEQFCB	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		7	
Stopper (closing cup)		2	—

Obligatory accessory

	EKEQFCB	EKEQDCB
Expansion valve kit	EKEXV	

Refer to chapter "Valve kit installation" on page 4 for installation instructions.

Optional accessories

		EKEQFCB	EKEQDCB
Remote controller		1(*)	1

(*) Not required for operation, only useful accessory tool for service and installation.

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

Parts and components

1 Outdoor unit

2 Control box (EKEQFCB / EKEQDCB)

3 Air handling unit (field supply)

4 Controller (field supply)

5 Field piping (field supply)

6 Expansion valve kit

Wiring connections

7 Outdoor unit power supply

8 Control box wiring
(Power supply and communication between control box and outdoor unit)

9 Air handling unit thermistors

10 Communication between controller and control box

11 Power supply and control wiring for air handling unit and controller (power supply is separate from the outdoor unit)

12 Air thermistor control for air handling unit

13 Remote controller (--------- = for service only)

BEFORE INSTALLATION

Cautions for selection of the air handling unit

See table below for applicable units.

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

The design pressure of the air handling unit is at least 40 bar.

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

Limits for outdoor unit (expansion valve kit)

Outdoor unit (class)	EKEXV kit
100	EKEXV63~125
125	EKEXV63~140
140	EKEXV80~140

Outdoor unit (class)	EKEXV kit
200	EKEXV100~250
250	EKEXV125~250

Depending on the heat exchanger, a connectable EKEXV (expansion valve kit) must be selected to these limitations.

EKEXV 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		Heating saturated suction temperature (SST) = 46°C	
	Air temperature = 27°C DB/19°C WB		Air temperature = 20°C DB	
	Superheat (SH) = 5 K		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.

NOTE

- 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)

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

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.

VALVE KIT INSTALLATION

Mechanical installation

1 Remove the valve kit box cover by unscrewing 4x M5.

2 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.

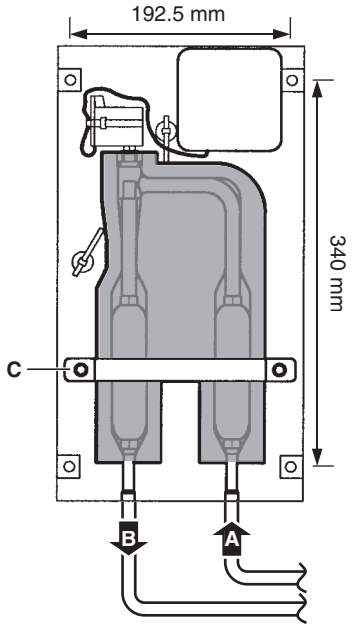
NOTE

- Make sure that the expansion valve is installed vertically.
- Make sure there is enough free space for future maintenance.

Brazing work

For details, see manual of the outdoor unit.

3 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

4 Remove the pipe fixing clamp (C) by unscrewing 2x M5.

5 Remove the upper and lower pipe insulations.

6 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.

7 After brazing, put the lower pipe insulation back in place and close it with the upper insulation cover (after pealing off the liner).

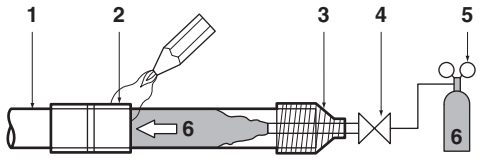
8 Secure the pipe fixing clamp (C) in place again (2x M5).

9 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).

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).



1 Refrigerant piping
2 Part to be brazed
3 Taping
4 Hands valve
5 Pressure-reducing valve
6 Nitrogen

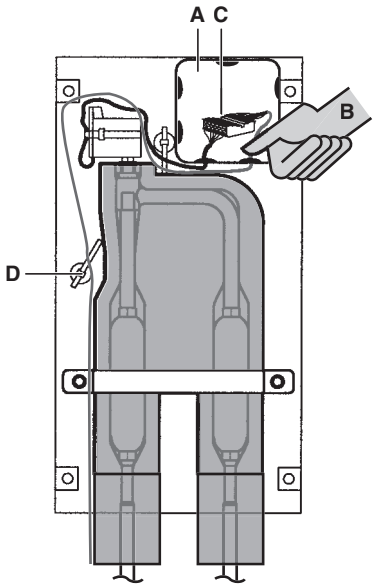
- For details, see manual of the outdoor unit.

Electrical work

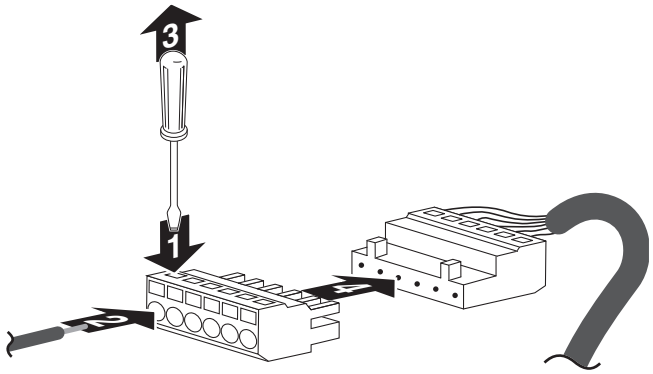
1 Open the electrical box cover (A).

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 5 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 5.

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.

ELECTRIC WIRING WORK

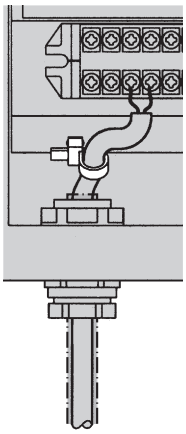
- All field supplied parts and materials and electric works must be conform to local codes.
- Use copper wire only.
- All wiring must be performed by an authorized electrician.
- A main switch or other means for disconnection, having a contact separation in all poles, must be incorporated in the fixed 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: EKEQFCBV3

■ 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.

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)				100	Communication line 16 V DC
F1,F2	Communication to outdoor unit	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(‡)					
C5,C6	Capacity step(#)					Analog input: 0–10 V
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).
(†) 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				100	Communication line 16 V DC
F1,F2	Communication to outdoor unit	Outdoor unit				
T1,T2	ON/OFF	Controller field supply			—	Digital input 16 V DC
—	Capacity step		LIYCY4 x 2 x 0.75	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

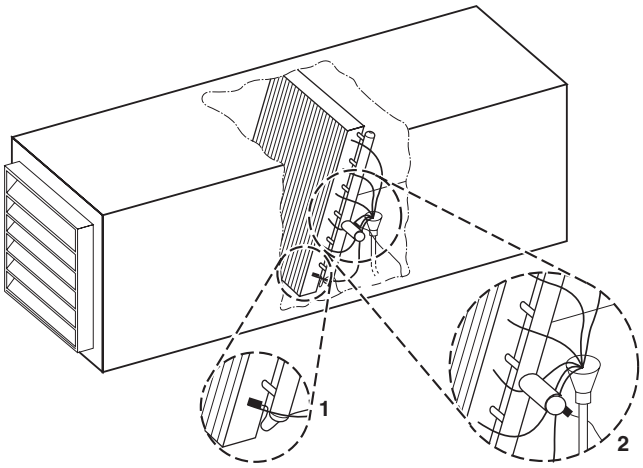
Location of the thermistor

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.

Execute test operation and check for freeze-up.



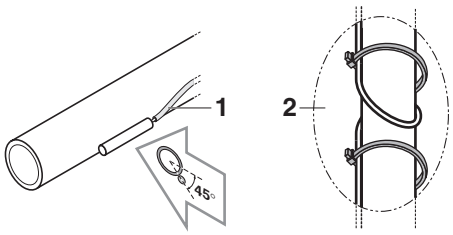
1 Liquid R2T

2 Gas R3T

Installation of the thermistor cable

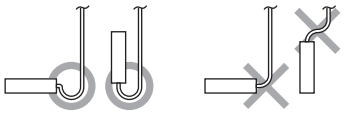
1 Put the thermistor cable in a separate protective tube.

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.

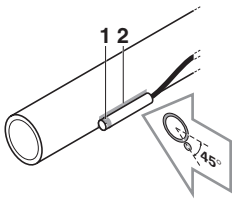


Fixation of the thermistor

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



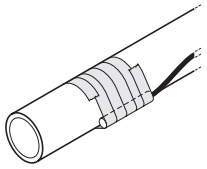
- Make good contact between thermistor and air handling unit. Put the top of the thermistors on the air handling unit, this is the most sensitive point of the thermistor.



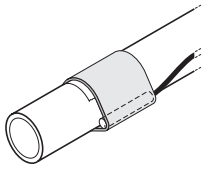
1 Most sensitive point of the thermistor

2 Maximize the contact

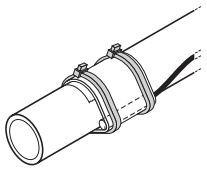
1 Fix the thermistor with insulating aluminum tape (field supply) in order to ensure a good heat transference.



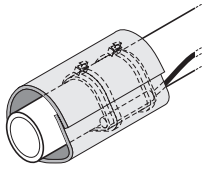
2 Put the supplied piece of rubber around the thermistor (R2T/R3T) in order to avoid loosening of the thermistor after some years.



3 Fasten the thermistor with 2 tie wraps.



4 Insulate the thermistor with the supplied insulation sheet.



Air thermistor (only for EKEQDCB)

The air thermistor (R1T) can be installed either in the room that needs temperature control or in the suction area of the air handling unit.

NOTE For room temperature control the delivered thermistor (R1T) can be replaced by an optional remote sensor kit KRCS01-1(A) (to be ordered separately).

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.
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.

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.

Test operation

Before executing "test operation" 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 3.
- After finishing the construction of refrigerant piping, drain piping and electric wiring, conduct test operation accordingly to protect the unit.
- Open the gas side stop valve.
- Open the liquid side stop valve.

Executing the test 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 11.

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 applicable:

- 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 EKEQFCB

When changing the settings:

1 Make the required settings.

2 Turn power OFF.

3 Remove the remote controller after servicing and checking the system in cooling mode. 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
13(23)–0	01	Operation with 0–10 V capacity control (= factory setting)
	02	Operation with fixed T_e/T_c temperature control

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

Operation with 0–10 V capacity control

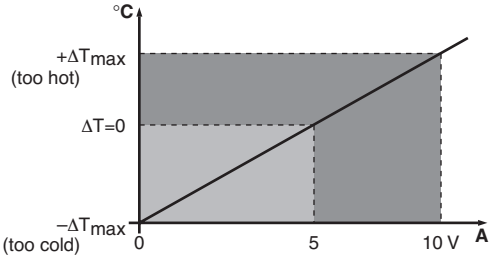
The 0–10 V input is only used for this system of operation and is the base of the capacity control.

This system needs a field supplied controller with a temperature sensor. The temperature sensor can be used to control any temperature:

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

Program the field supplied controller to generate a 0–10 V signal within conditions as listed. Also refer to the graphic and further data in this paragraph for more details.

- When target temperature is reached: 5 V
- When lower refrigerant temperature is needed: 5–10 V
- When higher refrigerant temperature is needed: 0–5 V



A	Controller voltage output to EKEQFCB
	Temperature increase area
	Temperature decrease area
Voltage output	= linear function with ΔT
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].

Voltage output from controller (field supply)	Cooling capacity	Heating capacity
0 V	strong decrease	strong increase
2.5 V	decrease	increase
5 V	constant	constant
7.5 V	increase	decrease
10 V	strong increase	strong 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(*)
13(23)–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
13(23)–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 setting in case of power failure

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
12(22)–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).

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
	C7/C8 fan output	Open	Fan off
		Closed	Fan on
	C9/C10 defrost output	Open	No defrost operation
		Closed	Defrost operation
Input	C5/C6: capacity step	0–10 V	Only necessary for field setting 13(23)–0 = 01 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" on page 10.
(†) See field setting 12(22)–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 trouble shooting 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.

Trouble shooting

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.

NOTES

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