DAIKIN

CHILLER

SECONDARY WATER CIRCUIT

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PRIMARY WATER CIRCUIT

Service Manual

EUWA/Y5-30HB/C(Z)
Small air-cooled water chillers

Daikin Europe NV

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1 Introduction

1.1 About This Manual

EUWA/Y5-30HB/C(Z) chiller types

The Daikin EUWA/Y5-30HB/C(Z) packaged reversible air-to-water chillers are designed for outdoor installation. The EUWA/Y5-30HB/C(Z) units are available in 6 standard sizes with nominal cooling capacities ranging from 9.1 to 65.2 kW and nominal heating capacities ranging from 11.5 to 72.6 kW. The EUWA5-30HB/C(Z) units are available in 6 standard sizes with nominal cooling capacities ranging from 10.1 to 63 kW.

The EUWA/Y5-30HB/C(Z) units can be combined with Daikin fan coil units or air handling units for air conditioning purposes. They can also be used to supply water for process cooling or heating.

The present service manual gives you all the information you need to do the necessary repair and maintenance tasks.

Before starting up the unit for the first time, make sure it has been properly installed. Consult the check lists in 'Pre-Test Run Checks' on page 4-3.

Two controllers

The digital controller for chiller types EUWA/Y5-10HB(Z) differs from the digital controller for chiller types EUWA/Y15-30HC(Z):

Chiller types	Related chapter
EUWA/Y5-10HB(Z)	'The Controller for the EUWA/Y5-10HB(Z) Chillers' on page 2-15
EUWA/Y15-30HC(Z)	'The Controller for the EUWA/Y15-30HC(Z) Chillers' on page 2-25

Using icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

Icon	Type of information	Description
	Note	A 'note' provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
	Caution	A 'caution' is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
	Warning	A 'warning' is used when there is danger of personal injury.
	Reference	A 'reference' guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

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Part 1
System Outline

Introduction   The purpose of this part is to give an outline of all the relevant elements in the installation of the EUWA/Y5-30HB/C(Z) chiller types. Once all the elements of the installation are briefly described and the installation set-up is understood, a functional description of all elements will be given in the next parts of this book.

What is in this part?   This part contains the following chapters:

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1   General Outline

1.1   What Is in This Chapter

Introduction   In this chapter you will find the outlook drawing and the installation outline of the water chillers
                       EUWA/Y5-30HB/C(Z).

Overview   This chapter covers the following topics:

Topic	See page
1.2 – Technical Specifications	page 1-4
1.3 – Electrical specifications	page 1-10
1.4 – Outlook Drawing	page 1-13

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1.2   Technical Specifications

EUWA5-30HB/C   In the following table you will find the technical specifications of the air-cooled-water chiller types EUWA5-30HB/C:

Model	EUWA5HB	EUWA8HB	EUWA10HB	EUWA15HC	EUWA20HC	EUWA25HC	EUWA30HC
Nominal cooling capacity	9.3 kW	18.3 kW	21.6 kW	30.7 kW	43.6 kW	52.9 kW	65.2 kW
Nominal cooling input	4.3 kW	6.4 kW	8.5 kW	13.2 kW	17.3 kW	21.5 kW	26.0 kW
Capacity steps	100%	100%	100%	100-66%	100-50%	100-60-40%	100-66-33%
MAIN COMPONENTS							
Compressor							
type	hermetically sealed scroll						
speed	2900 rpm						
crankcase heater	33 W	50 W	50 W	50+33 W	2x50 W	2x50+33 W	3x50 W
model x n° (W1)	JT140B-YE	JT212A-YE	JT265A-YE	JT140B-YE+ JT265A-YE	2xJT265A-YE	2xJT140B-YE +JT265A-YE	3xJT265A-YE
model x n° (T1)	JT140B-TH	JT212A-TH	JT265A-TH	JT140B-TH+ JT265A-TH	2xJT265A-TH	2xJT140B-TH +JT265A-TH	3xJT265A-TH
Evaporator							
type	brazed plate (heat exchanger)						
min.water volume system [1]	114 l	171 l	243 l	490 l	490 l	700 l	975 l
qty x model	CB51-30H	CB51-50H	CB51-60H	CB51-60H+ CB51-30H	2xCB51-60H	2xCB51-60H+ CB51-30H	3xCB51-60H
water flow rate	Min.: 17 l/min. Max.: 75 l/min.	Min.: 30 l/min. Max.: 120 l/min.	Min.: 40 l/min. Max.: 145 l/min.	Min.: 50 l/min. Max.: 220 l/min.	Min.: 80 l/min. Max.: 290 l/min.	Min.: 100 l/min. Max.: 370 l/min.	Min.: 120 l/min. Max.: 440 l/min.
nom. water pressure drop	1.8 mmH$_2$O	2.6 mmH$_2$O	2.8 mmH$_2$O	2.4 mmH$_2$O	2.8 mmH$_2$O	2.6 mmH$_2$O	2.8 mmH$_2$O
nominal water flow	27 l/min.	53 l/min.	62 l/min.	88 l/min.	125 l/min.	152 l/min.	187 l/min.
insulation material	Climaflex						
Condenser							
type	cross fin coil / Hi-X-tubes and coated waffle louvre fins						
rows x stages x fin pitch	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm
face area	1.26 m²	1.57 m²	1.97 m²	1.97+1.26 m²	2x1.97 m²	2x1.97+1.26 m²	3x1.97 m²
nominal air flow	80 m³/min.	170 m³/min.	170 m³/min.	170+80 m³/min.	2x170 m³/min.	80 m³/min.	3x170 m³/min.
discharge	vertical						
fan type	direct drive						
n° of fans	1	2	2	3	4	5	6
n° of motors x output	1 x 140 W	190+230 W	190+230 W	140+190+ 230 W	2x190+ 2x230 W	140+2x190+ 2x230 W	3x190+ 3x230 W
Piping connections							
evap. water in/outlet	FBSP 3/4”	FBSP 1”	FBSP 1”	FBSP 2”	FBSP 2”	FBSP 2-1/2”	FBSP 2-1/2”
Refrigerant circuit							
refrigerant type	R-22						

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Model	EUWA5HB	EUWA8HB	EUWA10HB	EUWA15HC	EUWA20HC	EUWA25HC	EUWA30HC
refrigerant charge	3.6 kg	5.1 kg	5.9 kg	5.9+3.6 kg	2x5.9 kg	2x5.9+3.6 kg	3x5.9 kg
refrigerant control	capillary tube						
oil type	SUNISO 4GSDID-K						
Dimensions (h x w x d)	1444 x 645 x 700 mm	1220 x 1290x 700 mm	1444 x1290 x 700 mm	1535 x 1930 x 700 mm	1535 x 2575 x 700 mm	1535 x 3220 x 700 mm	1535 x 3865 x 700 mm
Weight							
machine weight	135 kg	200 kg	230 kg	375 kg	510 kg	655 kg	780 kg
operation weight	137 kg	202 kg	233 kg	380 kg	516 kg	663 kg	789 kg
Casing							
material	polyester coated / galvanised steel plate						
colour	ivory white / Munsell code 5Y7.5/1 / ± RAL 7044						
Sound pressure level [2]	50 dB	59 dB	59 dB	59 dB	62 dB	62 dB	64 dB
Sound power level [3]	69 dB	78 dB	78 dB	78 dB	81 dB	81 dB	83 dB
Safety devices	■ high pressure switch ■ discharge temperature control ■ outlet water temperature protection ■ compressor motor overcurrent relay ■ fan thermal protector ■ anti-recycling and guard timer ■ digital display controller with electronic temperature control ■ reverse phase protector ■ internal fuses for each circuit						

[1]: Minimum water volume standard thermostat difference setting of 3 K. For reduced setting multiply this water volume by (3/new setting). Minimum allowable setting = 0.1 K.

[2]: The sound pressure level is measured using a microphone at a certain distance from the unit. It is a relative value, depending on the distance and acoustic environment.

[3]: The sound power level is an absolute value indicating the "power", which a sound source generates.

Nominal conditions The nominal conditions are as follows:

■ entering/leaving water temperature 12/7 °C

■ ambient air temperature 35 °C

■ power input is total input: compressor + control circuit

■ leaving evaporator water temperature from 4 °C to 20 °C (pull-down condition to 25 °C).

Operation range The operation range contains a leaving evaporator water temperature from 4 °C till 20 °C (pull-down condition till 25 °C).

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EUWY5-30HB/C   In the following table you will find the technical specifications of the air-cooled-water chiller types
EUWY5-30HB/C:

Model	EUWY5HB	EUWY8HB	EUWY10HB	EUWY15HC	EUWY20HC	EUWY25HC	EUWY30HC
Nominal capacity							
cooling	9.1 kW	17.7 kW	21 kW	30 kW	42.4 kW	51.5 kW	63.4 kW
heating	11.5 kW	19.6 kW	24.5 kW	35.2 kW	48.6 kW	60.2 kW	72.6 kW
Nominal input							
cooling	4.2 kW	6.4 kW	8.4 kW	13 kW	17 kW	21.2 kW	25.6 kW
heating	4.5 kW	7.5 kW	9.1 kW	13.6 kW	18.5 kW	23.4 kW	27.7 kW
Capacity steps	100%	100%	100	100-66%	100-50%	100-60-40%	100-66-33%
MAIN COMPONENTS							
Compressor							
type				hermetically sealed scroll			
speed				2900 rpm			
crankcase heater	33 W	50 W	50 W	50+33 W	2x50 W	2x50+33 W	3x50 W
model x n°	JT140B-YE	JT212A-YE	JT265A-YE	JT140B-YE+ JT265A-YE	2xJT265A-YE	2xJT140B-YE +JT265A-YE	3xJT265A-YE
Evaporator							
type				brazed plate (heat exchanger)			
qty x model	CB51-30H	CB51-50H BT	CB51-60H	CB51-60H+ CB51-30H	2xCB51-60H	2xCB51-60H+ CB51-30H	3xCB51-60H
min.water volume system [1]	114 l	171 l	243 l	490 l	490 l	700 l	975 l
water flow rate	Min.: 17 l/min. Max. 75 l/min.	Min.: 30 l/min. Max.: 120 l/min.	Min.: 40 l/min. Max.: 145 l/min.	Min.: 60 l/min. Max.: 220 l/min.	Min.: 80 l/min. Max.: 290 l/min.	Min.: 100 l/min. Max.: 370 l/min.	Min.: 120 l/min. Max.: 440 l/min.
nominal water flow	26/34 l/min.	45/52 l/min.	60/72 l/min.	86/104 l/min.	122/144 l/min.	148/178 l/min.	182/215 l/min.
nom. water pressure drop	1.7/2.8 mmH$_2$O	2.0/2.6 mmH$_2$O	2.7/3.8 mmH$_2$O	2.3/3.3 mmH$_2$O	2.7/3.7 mmH$_2$O	2.4/3.5 mmH$_2$O	2.7/3.7 mmH$_2$O
insulation material				Climaflex			
Condenser							
type				cross fin coil / Hi-X-tubes and coated waffle louvre fins			
rows x stages x fin pitch	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm
face area	1.26 m²	1.57 m²	1.97 m²	1.97+1.26 m²	2x1.97 m²	2x1.97+1.26 m²	3x1.97 m²
nominal air flow	80 m³/min.	170 m³/min.	170 m³/min.	170+80 m³/min.	2x170 m³/min.	80 m³/min.	3x170 m³/min.
discharge				vertical			
fan type				direct drive			
n° of fans	1	2	2	3	4	5	6
n° of motors x output	1 x 140 W	190+230 W	190+230 W	140+190+ 230 W	2x190+ 2x230 W	140+2x190+ 2x230 W	3x190+ 3x230 W
Piping connections							
evap. water in/outlet	FBSP 3/4”	FBSP 1”	FBSP 1”	FBSP 2”	FBSP 2”	FBSP 2-1/2”	FBSP 2-1/2”
Refrigerant circuit							
refrigerant type				R-22			

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Model	EUWY5HB	EUWY8HB	EUWY10HB	EUWY15HC	EUWY20HC	EUWY25HC	EUWY30HC
refrigerant charge	3.6 kg	5.1 kg	5.9 kg	5.9+3.6 kg	2x5.9 kg	2x5.9+3.6 kg	3x5.9 kg
refrigerant control	capillary tube						
oil type	SUNISO 4GSDID-K						
oil charge volume	1.5 l	2.7 l	2.7 l	2.7+1.5 l	2x2.7 l	2x2.7+1.5 l	3x2.7 l
n° of circuits	1	1	1	2	2	3	3
Dimensions (h x w x d)	1444 x 645 x 700 mm	1220 x 1290x 700 mm	1444 x1290 x 700 mm	1535 x 1930 x 700 mm	1535 x 2575 x 700 mm	1535 x 3220 x 700 mm	1535 x 3865 x 700 mm
Weight							
machine weight	140 kg	208 kg	240 kg	390 kg	530 kg	675 kg	800 kg
operation weight	142 kg	210 kg	143 kg	395 kg	536 kg	683 kg	809 kg
Casing							
material	polyester coated / galvanised steel plate / ± RAL 7044						
colour	ivory white / Munsell code 5Y7.5/1						
Sound pressure level [2]	50 dB	59 dB	59 dB	59 dB	62 dB	62 dB	64 dB
Sound power level [3]	69 dB	78 dB	78 dB	78 dB	81 dB	81 dB	83 dB
Safety devices	■ high pressure switch ■ discharge temperature control ■ freeze-up protection thermostat ■ compressor motor overcurrent relay ■ fan thermal protector ■ anti-recycling and guard timer ■ digital display controller with electronic temperature control ■ reverse phase protector ■ internal fuses for each circuit.						

[1]: Minimum water volume standard thermostat difference setting of 3 K. For reduced setting multiply this water volume by (3/new setting). Minimum allowable setting = 0.1 K.

[2]: The sound pressure level is measured using a microphone at a certain distance from the unit. It is a relative value, depending on the distance and acoustic environment.

[3]: The sound power level is an absolute value indicating the "power", which a sound source generates.

Nominal conditions   The nominal conditions are as follows:

■ entering/leaving chilled water temperature 12/7 °C, ambient air temperature 35 °C

■ entering/leaving condenser water temperature 45/50 °C; ambient 7 °CDB/6 °CWB

■ power input is total input: compressor + control circuit

■ sound pressure level is measured at a height of 1.5 m and a distance of 1 m in front of the unit.

Operation range   The operation range contains:

■ a leaving evaporator water temperature from 4 °C till 20 °C (pull-down condition till 25 °C)

■ a leaving condenser water temperature from 35 °C till 55 °C.

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EUWA5-30HB/CZ   In the following table you will find the technical specifications of air-cooled-water chiller types EUWA5-30HB/CZ:

Model	EUWA5HBZ	EUWA8HBZ	EUWA10HBZ	EUWA15HCZ	EUWA20HCZ	EUWA25HCZ	EUWA30HCZ
Nominal cooling capacity	10.1 kW	17.1 kW	21 kW	31 kW	42 kW	52 kW	63 kW
Nominal cooling input	4.2 kW	6.9 kW	8.5 kW	12.7 kW	17 kW	21.5 kW	25.5 kW
Capacity steps	100%	100%	100%	100-66%	100-50%	100-60-40%	100-66-33%
MAIN COMPONENTS							
Compressor							
type	hermetically sealed scroll						
speed	2900 rpm						
crankcase heater	33 W	50 W	50 W	50+33 W	2x50 W	2x50+33 W	3x50 W
model x n° (W1)	JT140BF-YE	JT212DA-YE	JT265DA-YE	JT140BF-YE+ JT265DA-YE	2xJT265DA-YE	2xJT140BF-YE +JT265DA-YE	3xJT265DA-YE
model x n° (T1)	JT140BF-TH	JT212DA-TH	JT265DA-TH	JT140BF-TH+ JT265DA-TH	2xJT265DA-TH	2xJT140BF-TH +JT265DA-TH	3xJT265DA-TH
Evaporator							
type	brazed plate (heat exchanger)						
qty x model	CB51-30H	CB51-50H BT	CB51-60H	CB51-60H+ CB51-30H	2xCB51-60H	2xCB51-60H+ CB51-30H	3xCB51-60H
min.water volume system [1]	120 l	210 l	250 l	500 l	500 l	740 l	1000 l
water flow rate	Min.: 18 l/min. Max.: 60 l/min.	Min.: 30 l/min. Max.: 100 l/min.	Min.: 38 l/min. Max.: 120 l/min.	Min.: 56 l/min. Max.: 180 l/min.	Min.: 76 l/min. Max.: 240 l/min.	Min.: 94 l/min. Max.: 300 l/min.	Min.: 114 l/min. Max.: 360 l/min.
nom. water pressure drop	20 kPa	23 kPa	26 kPa	24 kPa	26 kPa	24 kPa	26 kPa
nominal water flow	29 l/min.	49 l/min.	60 l/min.	89 l/min.	120 l/min.	149 l/min.	181 l/min.
insulation material	Climaflex						
Condenser							
type	cross fin coil / Hi-X-tubes and coated waffle louvre fins						
rows x stages x fin pitch	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm	2 x 50 x 2.0mm
face area	1.26 m²	1.57 m²	1.97 m²	1.97+1.26 m²	2x1.97 m²	2x1.97+1.26 m²	3x1.97 m²
nominal air flow	80 m³/min.	170 m³/min.	170 m³/min.	170+80 m³/min.	2x170 m³/min.	80 m³/min.	3x170 m³/min.
discharge	vertical						
fan type	direct drive						
n° of fans	1	2	2	3	4	5	6
n° of motors x output	1 x 140 W	190+230 W	190+230 W	140+190+ 230 W	2x190+ 2x230 W	140+2x190+ 2x230 W	3x190+ 3x230 W
Piping connections							
evap. water in/outlet	FBSP 3/4"	FBSP 1"	FBSP 1"	FBSP 2"	FBSP 2"	FBSP 2-1/2"	FBSP 2-1/2"
Refrigerant circuit							
refrigerant type	R-407C						
refrigerant charge	3.2 kg	4.4 kg	5.9 kg	5.9+3.2 kg	2x5.9 kg	2x5.9+3.2 kg	3x5.9 kg

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Model	EUWA5HBZ	EUWA8HBZ	EUWA10HBZ	EUWA15HCZ	EUWA20HCZ	EUWA25HCZ	EUWA30HCZ
refrigerant control	expansion valve						
oil type	FVC68D	FVC68D	FVC68D	FVC68D	FVC68D	FVC68D	FVC68D
oil charge volume	1.5 l	2.7 l	2.7 l	2.7+1.5 l	2x2.7 l	2x2.7+1.5 l	3x2.7 l
n° of circuits	1	1	1	2	2	3	3
Dimensions (h x w x d)	1444 x 645 x 700 mm	1220 x 1290x 700 mm	1444 x1290 x 700 mm	1535 x 1930 x 700 mm	1535 x 2575 x 700 mm	1535 x 3220 x 700 mm	1535 x 3865 x 700 mm
Weight							
machine weight	135 kg	200 kg	230 kg	375 kg	510 kg	655 kg	780 kg
operation weight	137 kg	202 kg	233 kg	380 kg	516 kg	663 kg	789 kg
Casing							
material	polyester coated / galvanised steel plate						
colour	ivory white / Munsell code 5Y7.5/1 / ± RAL 7044						
Sound pressure level [2]	56 dB	61 dB	61 dB	62 dB	64 dB	66 dB	67 dB
Sound power level [3]	69 dB	78 dB	78 dB	78 dB	81 dB	81 dB	83 dB
Safety devices	■ high pressure switch ■ evaporating temperature protection ■ discharge temperature control ■ outlet water temperature protection ■ compressor motor overcurrent relay ■ fan thermal protector ■ anti-recycling and guard timer ■ digital display controller with electronic temperature control ■ reverse phase protector ■ internal fuses for each circuit.						

[1]: Minimum water volume standard thermostat difference setting of 3 K. For reduced setting multiply this water volume by (3/new setting). Minimum allowable setting = 0.1 K.

[2]: The sound pressure level is measured using a microphone at a certain distance from the unit. It is a relative value, depending on the distance and acoustic environment.

[3]: The sound power level is an absolute value indicating the "power", which a sound source generates.

Nominal conditions   The nominal conditions are as follows:

■ entering/leaving water temperature 12/7 °C

■ ambient air temperature 35 °C

■ power input is total input:
compressor + control circuit.

Operation range   The nominal operation range contains a leaving evaporator water temperature from 4 °C till 20 °C (pull-down condition till 25 °C).

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1.3   Electrical specifications

EUWA5-30HB/C   In the following table you will find the electrical specifications of chiller types EUWA5-30HB/C:

Model	EUWA5HBW1 /EUWA5HBT1	EUWA8HBW1 /EUWA8HBT1	EUWA10HBW1 /EUWA10HBT1	EUWA15HCW1 /EUWA15HCT1	EUWA20HCW1 /EUWA20HCT1	EUWA25HCW1 /EUWA25HCT1	EUWA30HCW1 /EUWA30HCT1
Compressor							
phase				3~			
Voltage				220 - 380 V			
starting current	49 A/88 A	79 A/142 A	109 A/183 A	49 A/88 A- 109 A/183 A	109 A/183 A	49 A/88 A- 109 A/183 A	109 A/183 A
max. running cur-rent	10 A/17 A	18 A/28 A	21 A/34 A	10 A/17 A+ 21 A/34 A	2x21 A/34 A	2x21 A/34 A 10 A/17 A+	3x21 A/34 A
starting method				direct on line			
voltage				400 V/230 V			
nominal running current	5.5 A/9.5 A	9.7 A/16.8 A	12.5 A/21.7 A	5.5 A/9.5 A+ 12.5 A/21.7 A	2x 12.5 A/21.7 A	2x 12.5 A/21.7 A+ 5.5 A/9.5 A	3x 12.5 A/21.7 A
Nominal distribution system voltage							
phase				3N~/3~			
frequency				50 Hz			
voltage				400 V/230 V			
voltage tolerance				±10 V			
Control circuit							
phase				1~			
recommended fuses				factory installed			
voltage				230 V			
Unit							
nominal running current	8 A/12 A	13.2 A/20.3 A	16 A/25.2 A	23 A/36.2 A	31 A/49.4 A	38 A/60.4 A	46 A/73.6 A
recommended fuses	3 x 20 aM/ 3 x 25 aM/	3 x 25 aM/ 3 x 40 aM	3 x 32 aM/ 3 x 50 aM	3 x 40 aM/ 3 x 63 aM	3 x 50 aM/ 3 x 80 aM	3 x 63 aM/ 3 x 100 aM	3 x 80 aM/ 3 x 125 aM
max. running cur-rent	12.5 A/19.5 A	21.5 A/31.5 A	24.5 A/37.5 A	36 A/56 A	48 A/74 A	59.5 A/92.5 A	71.5 A/110.5 A

Nominal conditions   The nominal conditions are as follows:

- entering/leaving water temperature 12/7 °C

- ambient air temperature 35 °C

- power input is total input:
  compressor + control circuit

- leaving evaporator water temperature from 4 °C to 20 °C (pull-down condition to 25 °C).

Operation range   The operation range contains a leaving evaporator water temperature from 4 °C till 20 °C (pull-down condition till 25 °C).

EUWY5-30HB/C   In the following table you will find the electrical specifications of chiller types EUWY5-30HB/C:

Model	EUWY5HB	EUWY8HB	EUWY10HB	EUWY15HC	EUWY20HC	EUWY25HC	EUWY30HC
Compressor							
phase	3~						
Voltage	220 - 380 V						
starting current	49 A	79 A	109 A	49 A/109 A	109 A	49 A/109 A	109 A
max. running current	10 A	18 A	21 A	21 A+10 A	2x21 A	2x21 A+10 A	3x21 A
starting method	direct on line						
voltage	400 V						
nominal running current	5.5 A	9.7 A	12.5 A	5.5 A+12.5 A	2x12.5 A	2x12.5 A+ 5.5 A	3x12.5 A
Nominal distribution system voltage							
phase	3N~						
frequency	50 Hz						
voltage	400 V						
voltage tolerance	±10 V						
Control circuit							
phase	1~						
recommended fuses	factory installed						
voltage	230 V						
Unit							
nominal running current	8 A	13.2 A	16 A	23 A	31 A	38 A	46 A
recommended fuses	3 x 20 aM	3 x 25 aM	3 x 32 aM	3 x 40 aM	3 x 50 aM	3 x 63 aM	3 x 80 aM
max. running current	12.5 A	21.5 A	24.5 A	36 A	48 A	59.5 A	71.5 A

Nominal conditions   The nominal conditions are as follows:

■ entering/leaving chilled water temperature 12/7 °C, ambient air temperature 35 °C

■ entering/leaving condenser water temperature 45/50 °C; ambient 7 °CDB/6 °CWB

■ power input is total input:
    compressor + control circuit

■ sound pressure level is measured at a height of 1.5 m and a distance of 1 m in front of the unit.

Operation range   The operation range contains:

■ a leaving evaporator water temperature from 4 °C till 20 °C (pull-down condition till 25 °C)

■ a leaving condenser water temperature from 35 °C till 55 °C.

1

EUWA5-30HB/CZ In the following table you will find the electrical specifications of chiller types EUWA5-30HB/CZ:

Model	EUWA5HBZ	EUWA8HBZ	EUWA10HBZ	EUWA15HCZ	EUWA20HCZ	EUWA25HCZ	EUWA30HCZ
Compressor							
phase	3~						
Voltage	220 - 380 V						
starting current	49 A/88 A	79 A/142 A	109 A/183 A	49 A/88 A- 109 A/183 A	109 A/183 A	49 A/88 A- 109 A/183 A	109 A/183 A
max. running current	10 A/17 A	18 A/28 A	21 A/34 A	10 A/17 A+ 21 A/34 A	2x21 A/34 A	2x21 A/34 A+ 10 A/17 A+	3x21 A/34 A
starting method	direct on line						
voltage	400 V/230 V						
nominal running current	6.6 A/11.4 A	10.4 A/18 A	13.1 A/22.8 A	6.6 A/11.4 A+ 13.1 A/22.8 A	2x 13.1 A/22.8 A	2x 13.1 A/22.8 A+ 6.6 A/11.4 A	3x 13.1 A/22.8 A
Nominal distribution system voltage							
phase	3N~/3~						
frequency	50 Hz						
voltage	400 V/230 V						
voltage tolerance	±10 V						
Control circuit							
phase	1~						
recommended fuses	factory installed						
voltage	230 V						
Unit							
nominal running current	7 A/12.3 A	11.2 A/19.7 A	13.9 A/24.4 A	20.9 A/36.7 A	27.8 A/48.8 A	34.8 A/61.1 A	41.7 A/73.2 A
recommended fuses	3 x 20 aM/ 3 x 25 aM/	3 x 25 aM/ 3 x 40 aM	3 x 32 aM/ 3 x 50 aM	3 x 40 aM/ 3 x 63 aM	3 x 50 aM/ 3 x 80 aM	3 x 63 aM/ 3 x 100 aM	3 x 80 aM/ 3 x 125 aM
max. running current	11.3 A/18.3 A	20.5 A/30.5 A	23.5 A/36.5 A	34.7 A/54.7 A	46.9 A/72.9 A	58.1 A/91.5 A	70.3 A/109.3 A
starting current	52 A/91 A	84 A/147 A	114 A/188 A	126 A/207 A	138 A/225 A	150 A/244 A	162 A/162 A

Nominal conditions The nominal conditions are as follows:

■ entering/leaving water temperature 12/7 °C

■ ambient air temperature 35 °C

■ power input is total input:
    compressor + control circuit.

Operation range The operation range contains a leaving evaporator water temperature from 4 °C till 20 °C (pull-down condition till 25 °C).

1

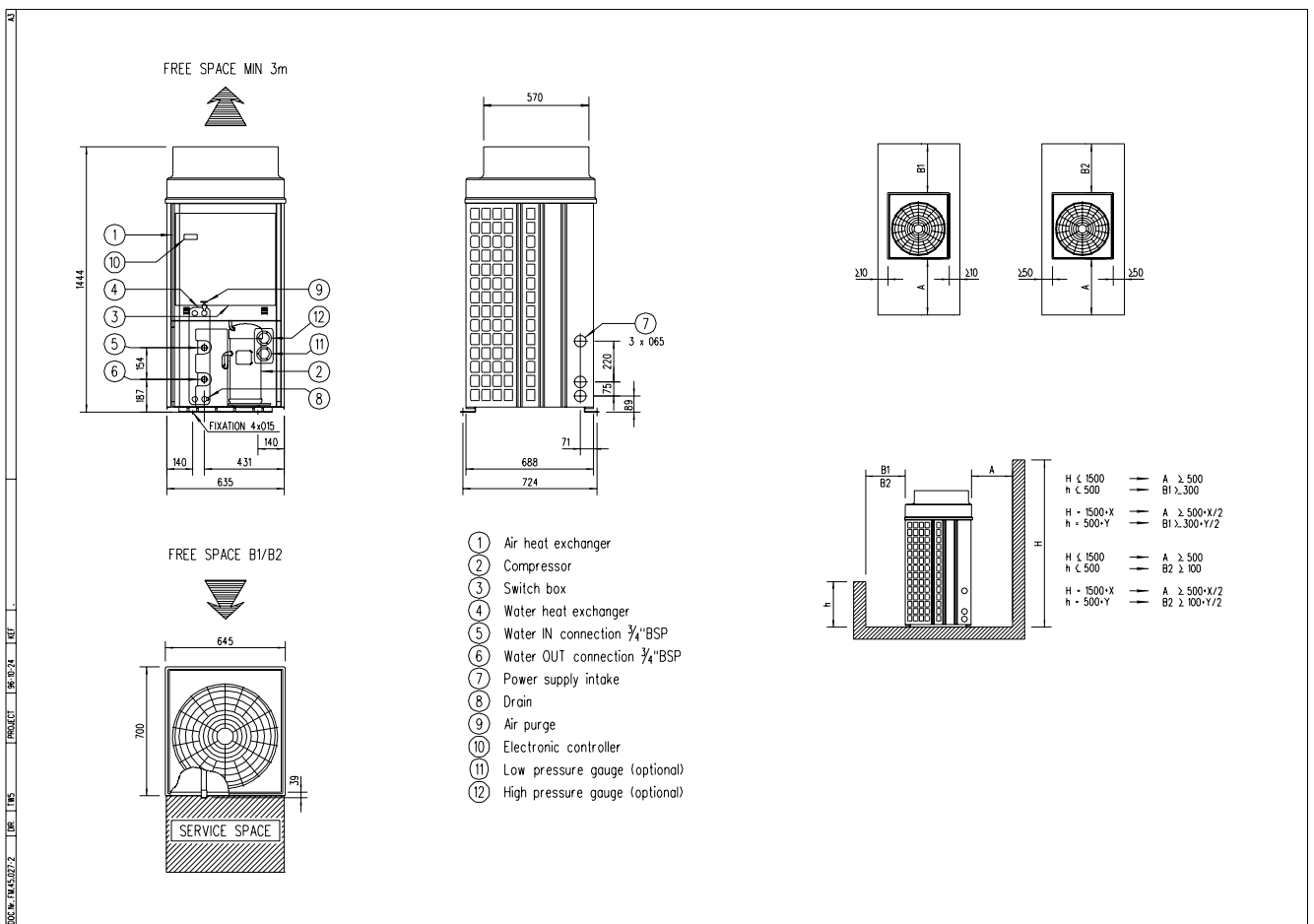## 1.4   Outlook Drawing

Introduction   Below you will find the outlook drawings of the EUWA/Y5-30HB/C(Z) chiller types.

The diagrams indicate the following important items:

■   dimensions

■   service space

■   main components location
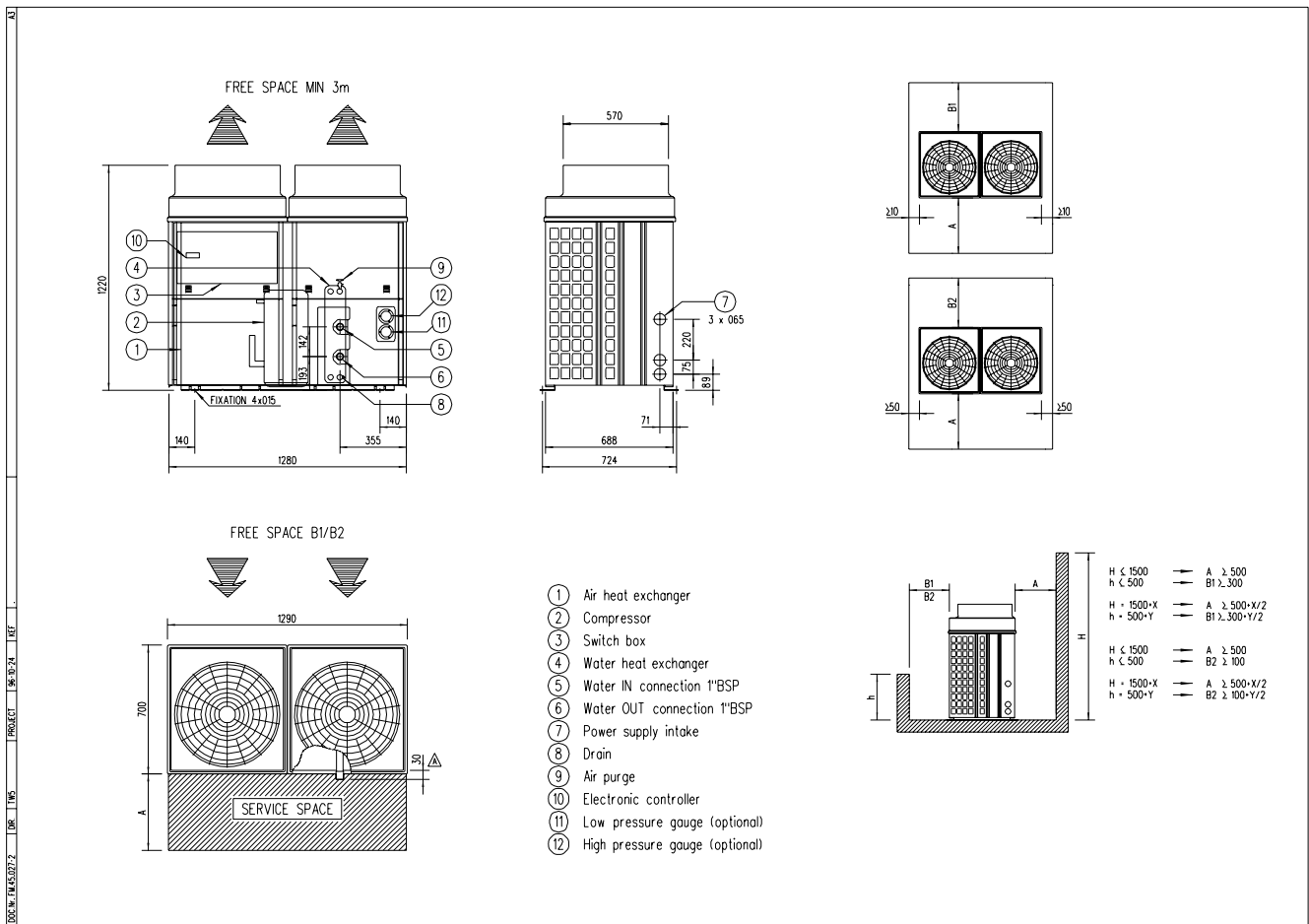
■   operation space

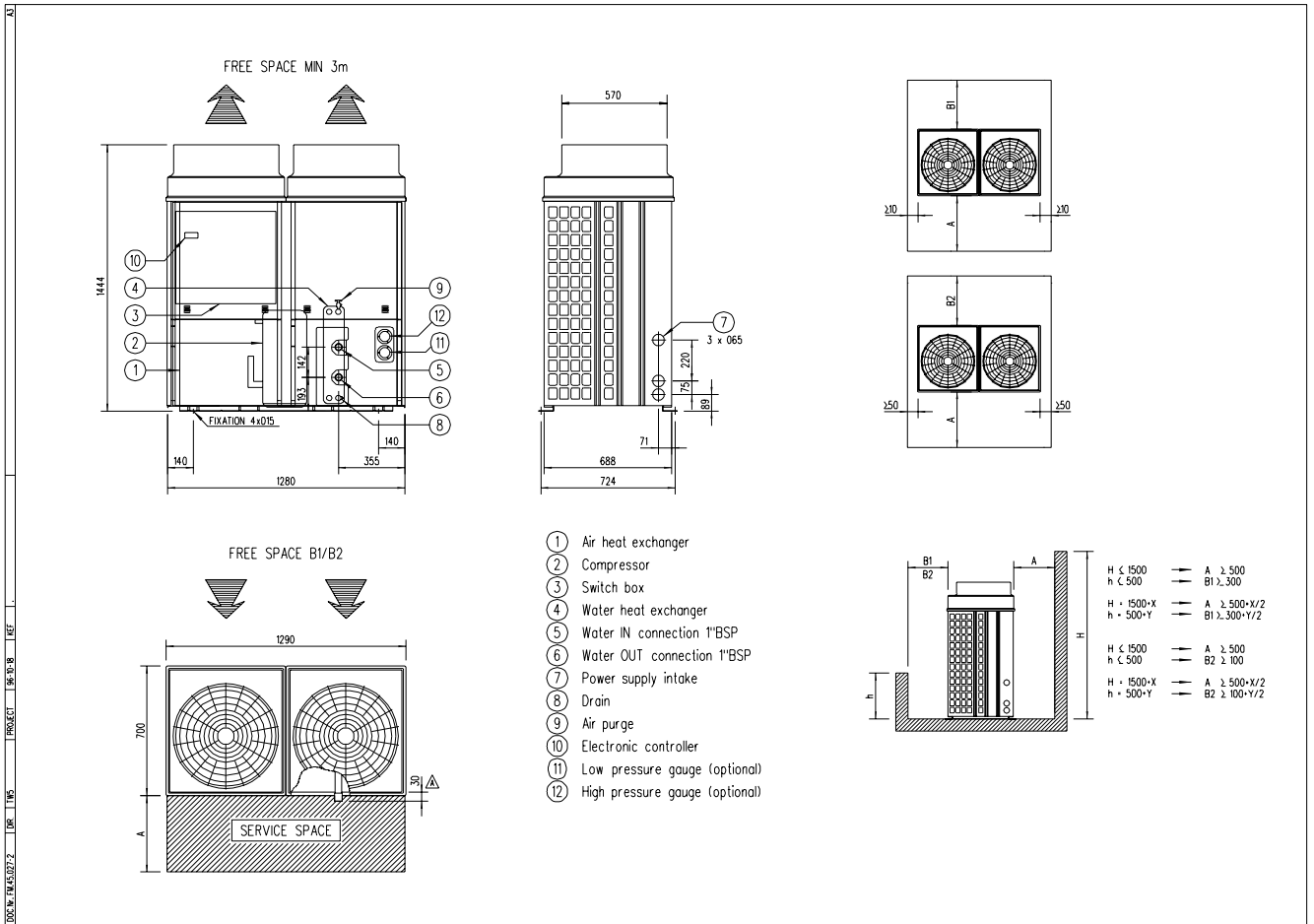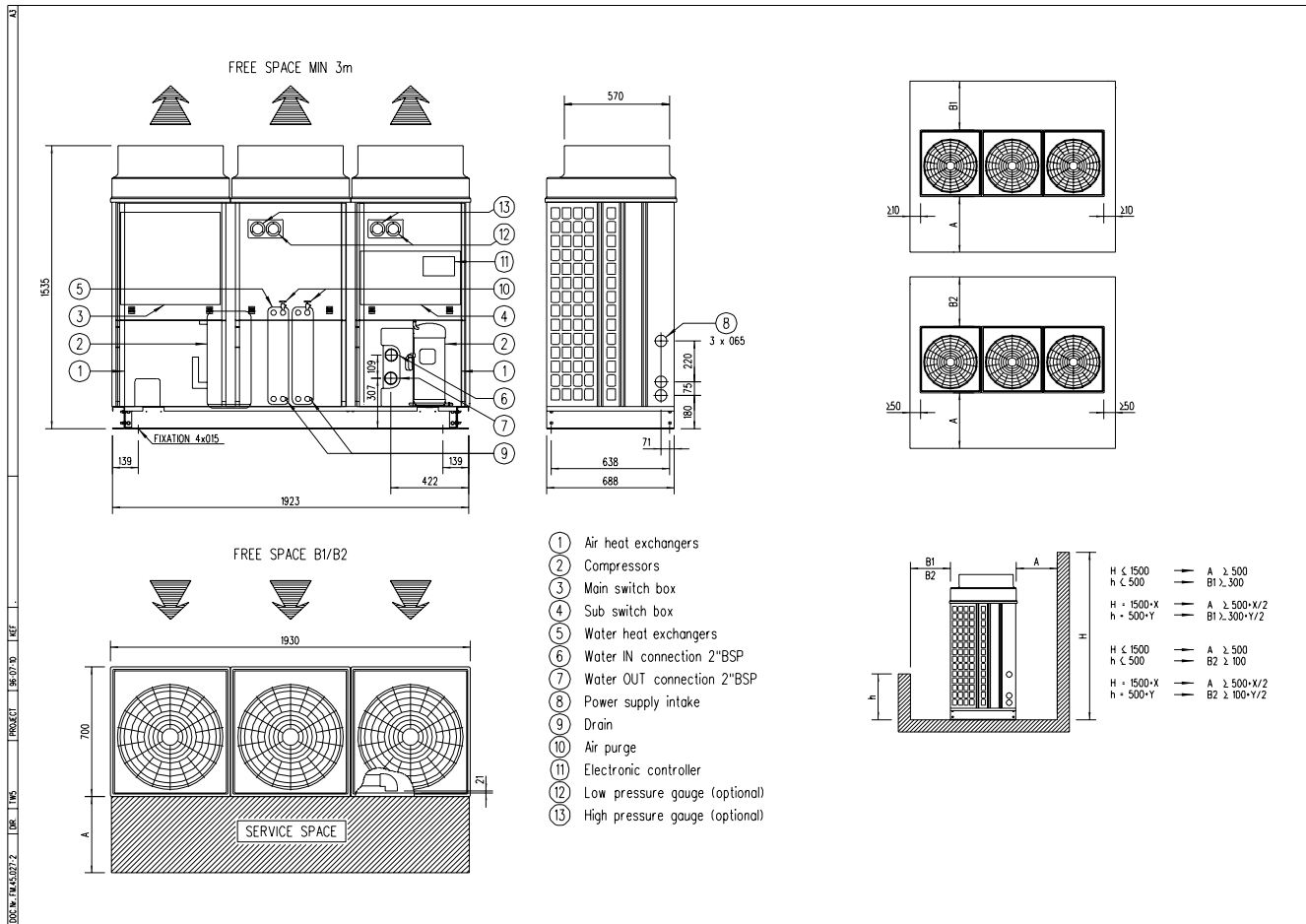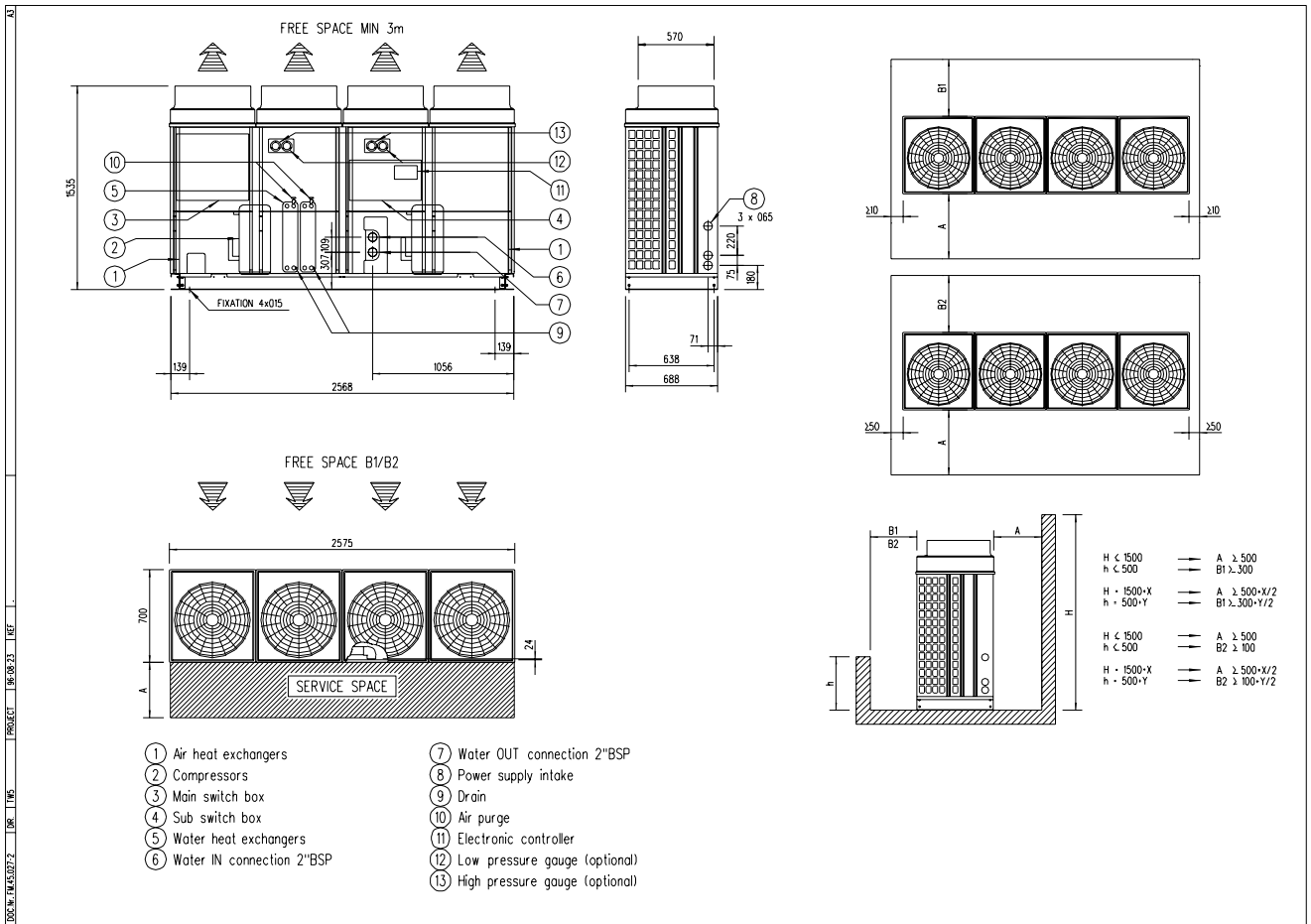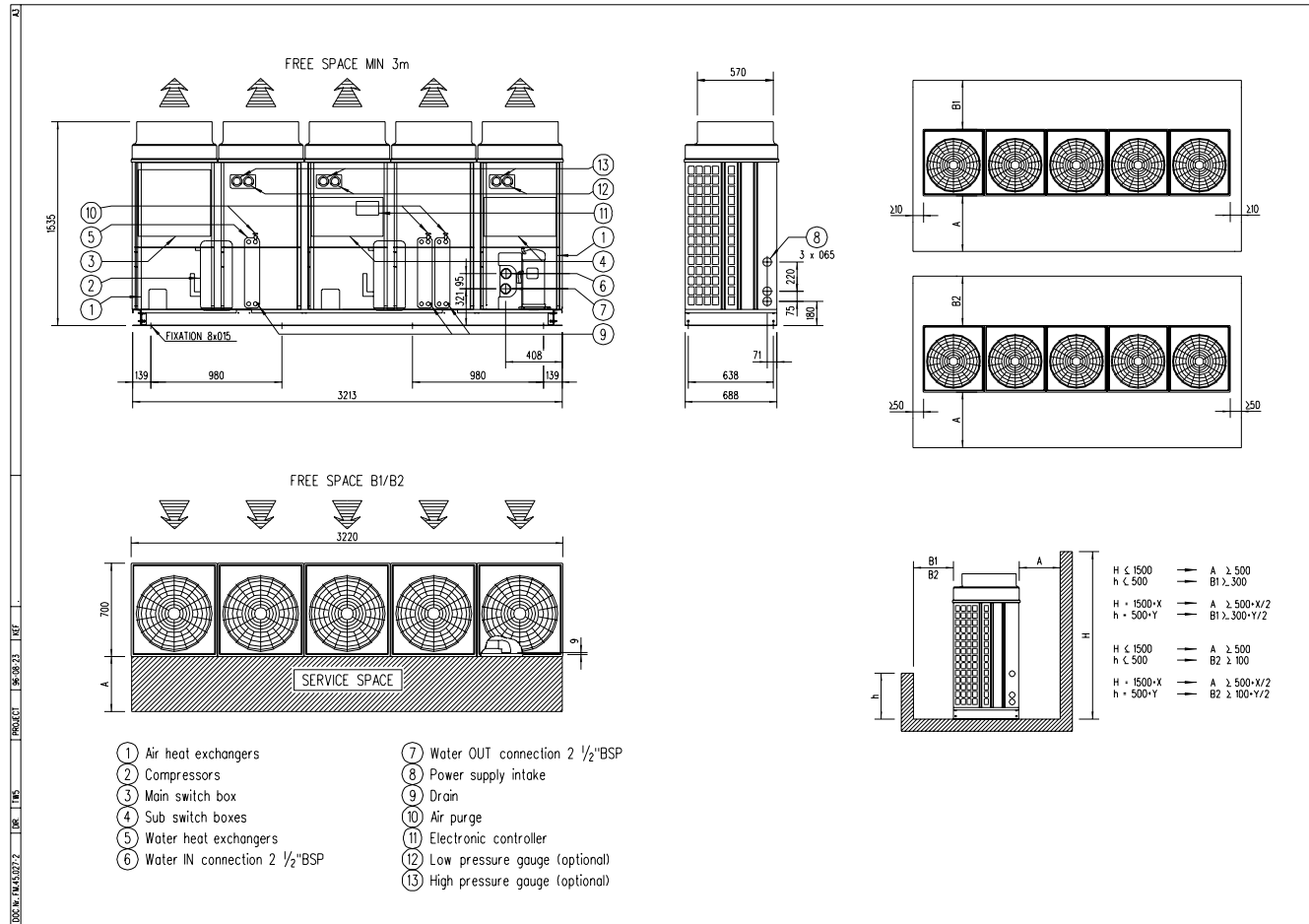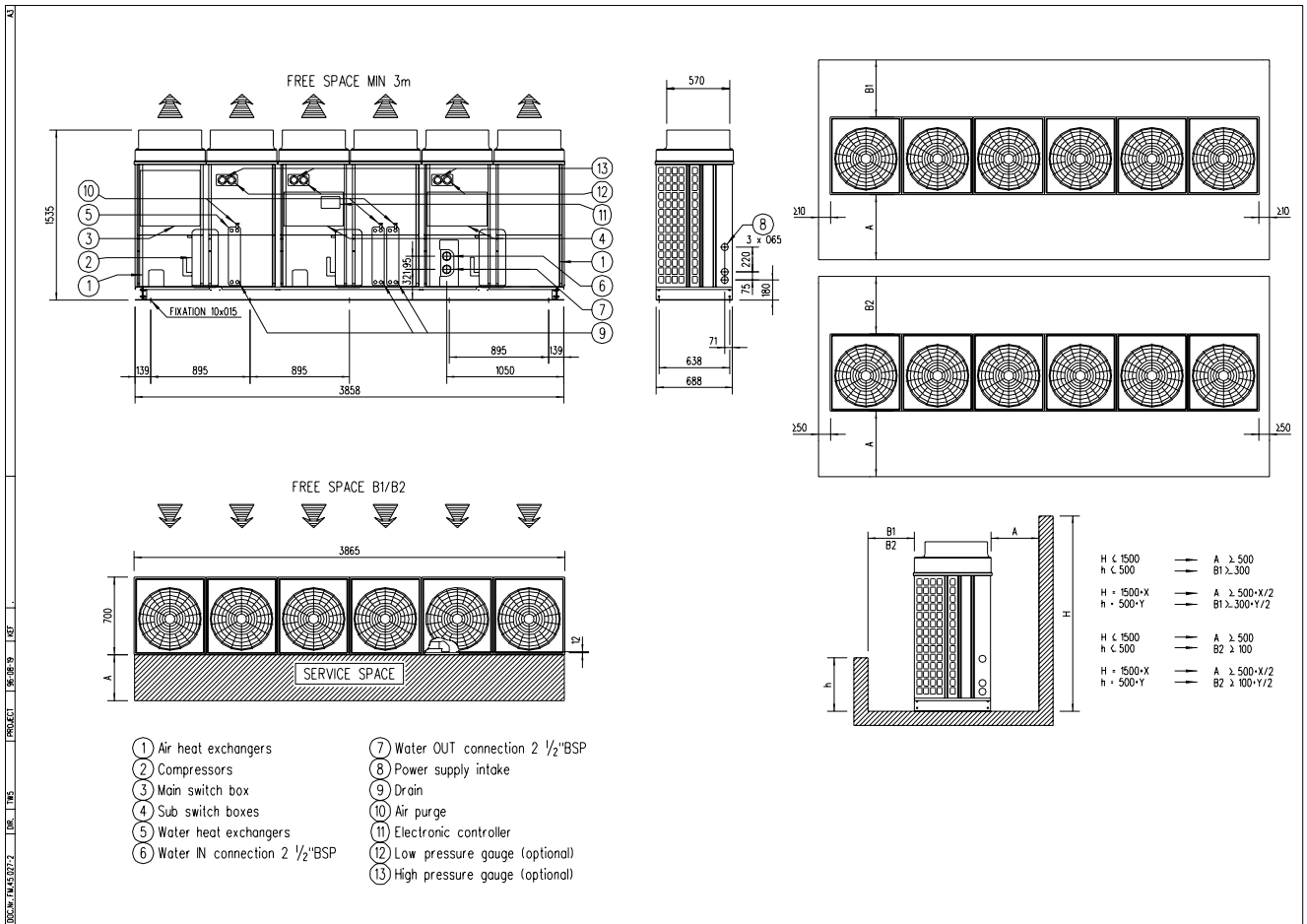**EUWA/Y5HB(Z)**   The figure below displays the outlook of the chiller types EUWA/Y5HB(Z):

1

EUWA/Y8HB(Z)   The figure below displays the outlook of the chiller types EUWA/Y8HB(Z):

EUWA/Y10HB(Z)   The figure below displays the outlook of the chiller types EUWA/Y10HB(Z):

1

EUWA/Y15HC(Z)   The figure below displays the outlook of the chiller types EUWA/Y15HC(Z):

FREE SPACE MIN 3m

1535

FIXATION 4x∅15
139   139
422
1923
570

638
688
71
220
75
180
3 x ∅65

FREE SPACE B1/B2

1930
700
A

SERVICE SPACE

① Air heat exchangers
② Compressors
③ Main switch box
④ Sub switch box
⑤ Water heat exchangers
⑥ Water IN connection 2"BSP
⑦ Water OUT connection 2"BSP
⑧ Power supply intake
⑨ Drain
⑩ Air purge
⑪ Electronic controller
⑫ Low pressure gauge (optional)
⑬ High pressure gauge (optional)

H ≤ 1500   A ≥ 500
h ≤ 500   B1 ≥ 300

H = 1500+X   A ≥ 500+X/2
h = 500+Y   B1 ≥ 300+Y/2

H ≤ 1500   A ≥ 500
h ≤ 500   B2 ≥ 100

H = 1500+X   A ≥ 500+X/2
h = 500+Y   B2 ≥ 100+Y/2

1

EUWA/Y20HC(Z)   The figure below displays the outlook of the chiller types EUWA/Y20HC(Z):

① Air heat exchangers
② Compressors
③ Main switch box
④ Sub switch box
⑤ Water heat exchangers
⑥ Water IN connection 2"BSP
⑦ Water OUT connection 2"BSP
⑧ Power supply intake
⑨ Drain
⑩ Air purge
⑪ Electronic controller
⑫ Low pressure gauge (optional)
⑬ High pressure gauge (optional)

1

EUWA/Y25HC(Z)   The figure below displays the outlook of the chiller types EUWA/Y25HC(Z):

1. Air heat exchangers
2. Compressors
3. Main switch box
4. Sub switch boxes
5. Water heat exchangers
6. Water IN connection 2 $\frac{1}{2}$"BSP
7. Water OUT connection 2 $\frac{1}{2}$"BSP
8. Power supply intake
9. Drain
10. Air purge
11. Electronic controller
12. Low pressure gauge (optional)
13. High pressure gauge (optional)

1

EUWA/Y30HC(Z)   The figure below displays the outlook of the chiller types EUWA/Y30HC(Z):

① Air heat exchangers   ⑦ Water OUT connection 2 $\frac{1}{2}$"BSP
② Compressors   ⑧ Power supply intake
③ Main switch box   ⑨ Drain
④ Sub switch boxes   ⑩ Air purge
⑤ Water heat exchangers   ⑪ Electronic controller
⑥ Water IN connection 2 $\frac{1}{2}$"BSP   ⑫ Low pressure gauge (optional)
                               ⑬ High pressure gauge (optional)

1

1

2   Piping Layout

2.1   What Is in This Chapter

Introduction   In this chapter we will describe the internal refrigeration circuit. The water piping is considered as a common practice and is, therefore, not described.

Overview   This chapter covers the following topics:

Topic	See page
2.2 – Functional Diagram Refrigeration Circuit for EUWA5-30HB/C(Z)	page 1-22
2.3 – Main Parts Refrigeration Circuit for EUWA5-30HB/C(Z)	page 1-24
2.4 – Functional Diagram Refrigeration Circuit for EUWY5-30HB/C, EUWA5-30HB/C with Glycol Application	page 1-25
2.5 – Main Parts Refrigeration Circuit EUWY5-30HB/C, EUWA5-30HB/C with Glycol Application	page 1-27

1

2.2   Functional Diagram Refrigeration Circuit for EUWA5-30HB/C(Z)

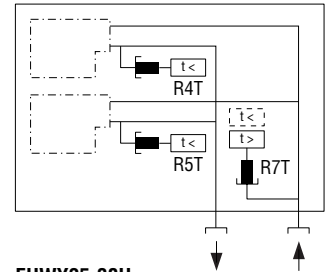**Functional diagram**   The figure below displays the functional diagram of the refrigeration circuit of the chiller types
EUWA5-30HB/C   EUWA5-30HB/C:

The numbers on the drawing refer to the numbers in the table on page 1-24.

1
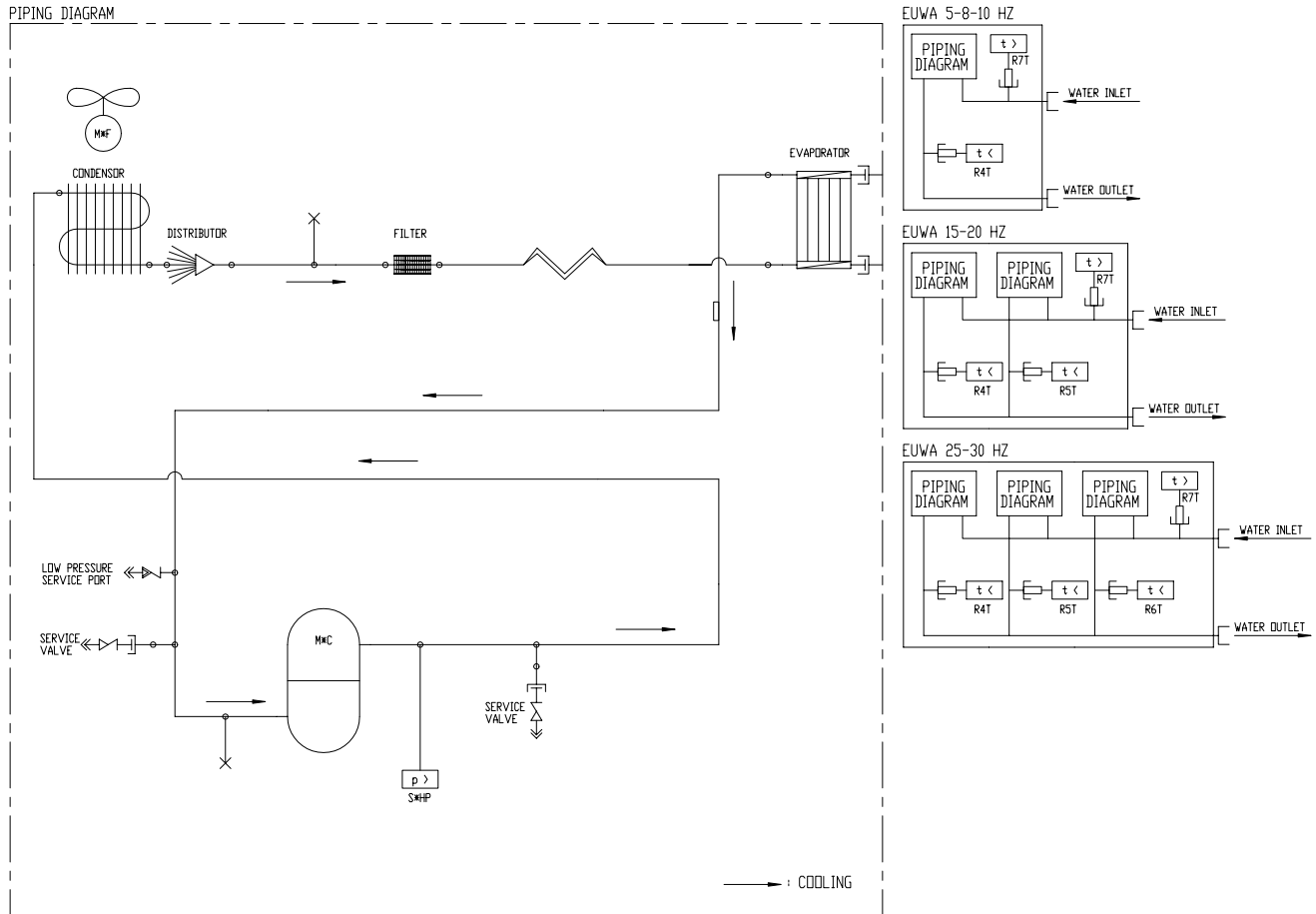
**Functional diagram
EUWA5-30HB/CZ**

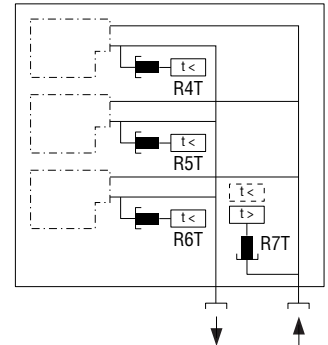The figure below displays the functional diagram of the refrigeration circuit of the chiller types EUWA5-30HB/C(Z) (with or without glycol application):
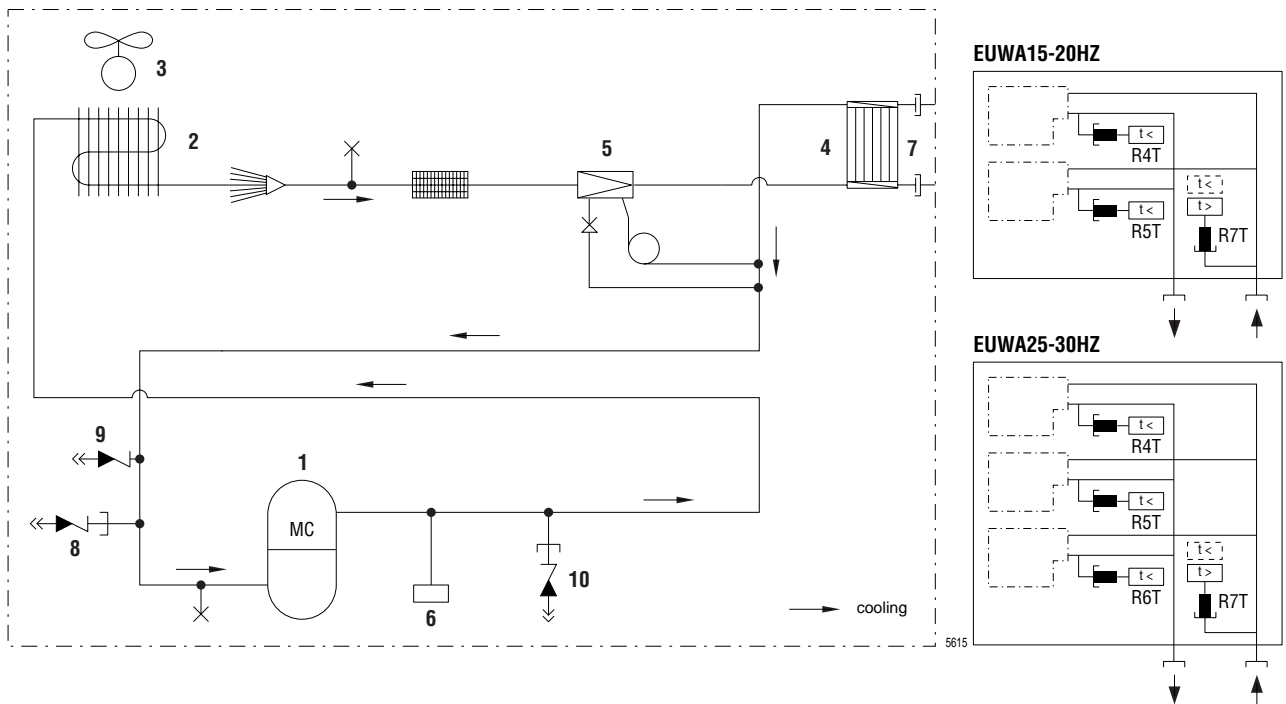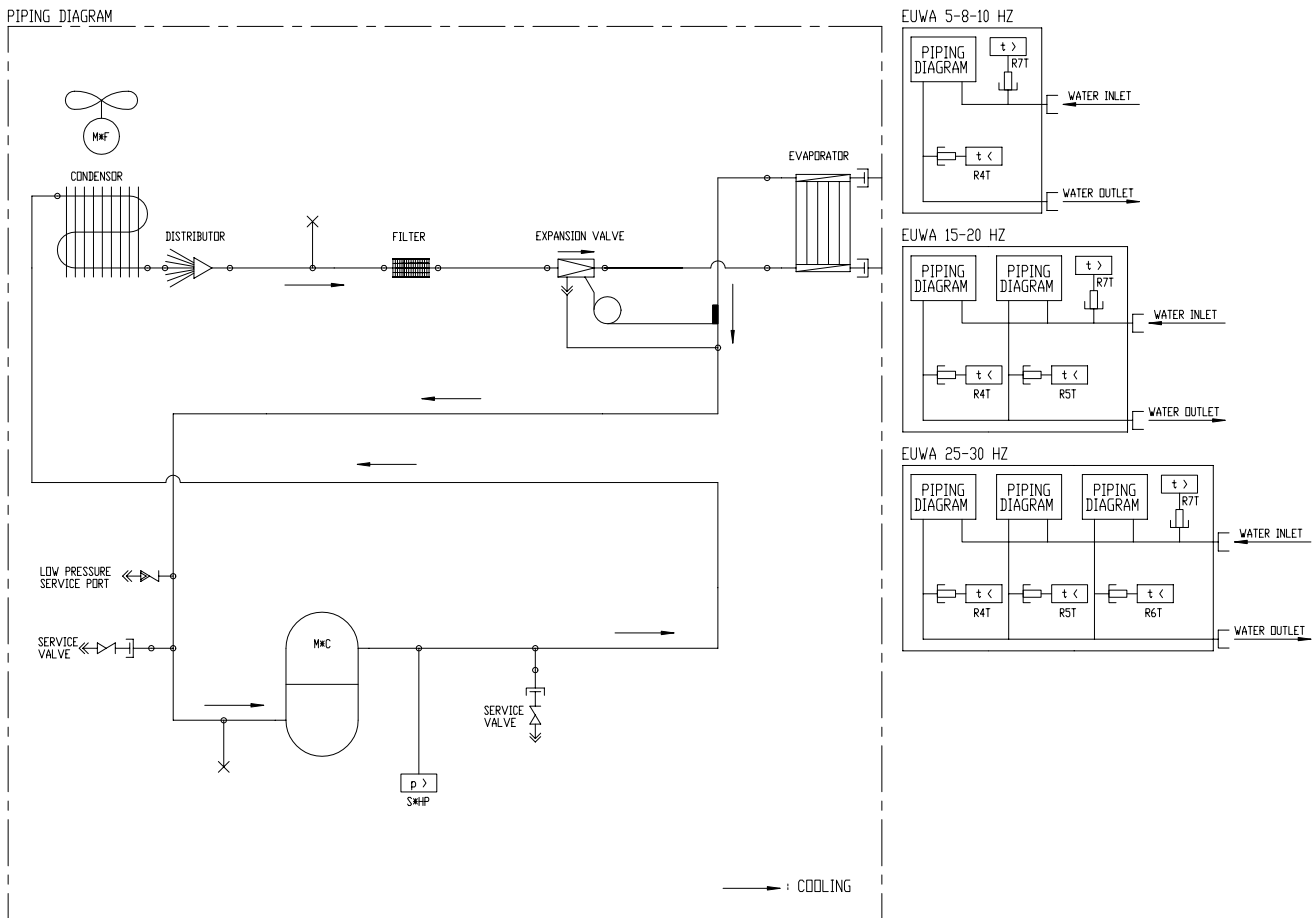

The numbers on the drawing refer to the numbers in the table on page 1-24.

1

2.3   Main Parts Refrigeration Circuit for EUWA5-30HB/C(Z)

Table   The numbers in the table below refer to the numbers in the piping diagrams on the previous pages.

N°	Part name	Function
1	Compressor	All compressors are hermetically sealed scroll types.
2	Air-heat exchanger (condenser)	The air-heat exchanger is of the cross fin coil type. Hi-X-tubes and coated waffle louvre fins are used. The air discharge is upward.
3	Fan	All fan motors are direct driven single or two speed motors.
4	Water-heat exchanger (evaporator)	The water-heat exchanger is of the brazed plate heat exchanger type.
5	Capillary tubes	Used for R-22 models (EUWA5-30H).
	Expansion valve	Used for R-407C models (EUWA5-30HZ).
6	High pressure switch	The setting is 28 bar.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. ℹ️ If Copper field piping is used for the water circuit, then precaution should be taken for electrolytic corrosion.
8	Service valve	The service valve is used for service work like connecting a manifold.
9	Low pressure service port	The low pressure service port is used to connect the optional low pressure gauge.
10	High pressure service port	The high pressure service port is used to connect the optional high pressure gauge.

2.4   Functional Diagram Refrigeration Circuit for EUWY5-30HB/C, EUWA5-30HB/C with Glycol Application

Functional diagram   The figure below displays the functional diagram of the refrigeration circuit of the chiller types
EUWY5-30HB/C   EUWY5-30HB/C:
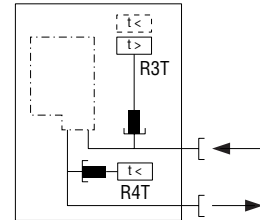
The numbers on the drawing refer to the numbers in the table on page 1-27.

1

Functional diagram EUWA5-30HB/C (glycol application)

The figure below displays the functional diagram of the refrigeration circuit of the chiller types EUWA5-30HB/C with glycol application:

The numbers on the drawing refer to the numbers in the table on page 1-27.

1

2.5   Main Parts Refrigeration Circuit EUWY5-30HB/C, EUWA5-30HB/C with Glycol Application

Main parts   The numbers in the table below refer to the numbers in the piping diagrams on the previous pages.

N°	Part name	Function
1	Compressor	All compressors are hermetically sealed scroll types.
2	Air-heat exchanger (condenser)	The air-heat exchanger is of the cross fin coil type. Hi-X-tubes and coated waffle louvre fins are used. The air discharge is upward.
3	Fan	All fan motors are direct driven single or two speed motors.
4	Water-heat exchanger (evaporator)	The water-heat exchanger is of the brazed plate heat exchanger type.
5	Capillary tubes	Used for EUWY5-30H.
	Expansion valve	Used for EUWA5-30H with glycol application.
6	Pressure control valve	The pressure control valve is used in cooling operation to control the low pressure. The setting is 1.5 bar (±0.2 bar) for EUWA5-30H with glycol application.
7	High pressure switch	The setting is 28 bar.
8	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated for EUWY5-30H and are insulated for EUWA5-30H(Z) with glycol application. ℹ️ If Copper field piping is used for the water circuit, then precaution should be taken for electrolytic corrosion.
9	Liquid receiver	The liquid receiver is installed to accumulate refrigerant.
10	Service valve	The service valve is used for service work like connecting a manifold.
11	Low pressure service port	The low pressure service port is used to connect the optional low pressure gauge.
12	High pressure service port	The high pressure service port is used to connect the optional high pressure gauge.
13	4-way valve	The 4-way valve is energized during cooling. This is only available for EUWY5-30H.
14	Accumulator	The accumulator is used to separate the gas from the liquid in order to prevent the compressor from pumping liquid. This is only available for EUWY5-30H.
15a	Liquid injection valve	The valve maintains the discharge temperature of the compressor by cooling with liquid from the condenser. It opens when the discharge temperature equals 125 °C and closes when the discharge temperature equals 110 °C. This is only available for the optional glycol application.
15b	Thermostat for liquid injection valve	The thermostat is used to regulate the liquid injection valve according to the discharge temperature.

1

1

3   Wiring Layout

3.1   What Is in This Chapter

Introduction   The purpose of this chapter is to guide you through the PCBs and the wiring diagrams. Therefore, we use schematic drawings and wiring diagrams, which indicate and locate the necessary information.
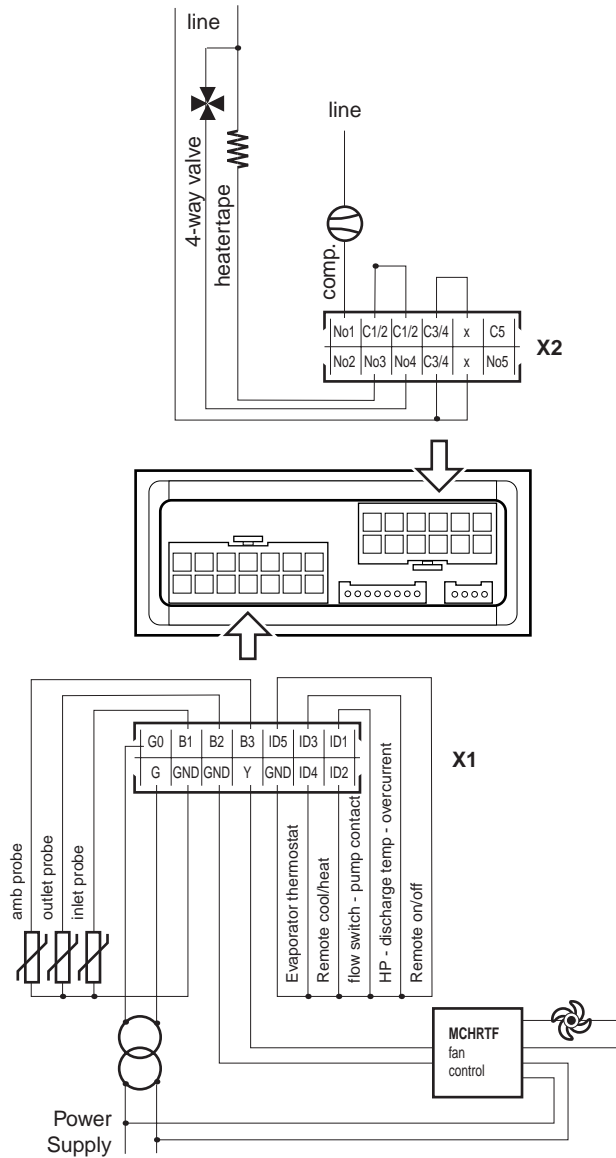
Overview   This chapter covers the following topics:

Topic	See page
3.2 – Main functions of the chiller	page 1-30
3.3 – Wiring Diagrams	page 1-34
3.4 – Field Wiring	page 1-45

1

3.2 Main functions of the chiller

**Main functions
EUWA/Y5-10HB(Z)**

The figure below shows the main circuit of the chiller types EUWA/Y5-10HB(Z):

Con.	Terminal	Wiring diagram symbol	Description
X1	ID1-GND	S11L	flow switch
		S10L	pump contact
	ID2-GND	S7S	remote cool/heat
	ID3-GND	K11	HP
		Q1D	discharge temperature
		K4S	overcurrent
	ID4-GND	S16T	evaporator thermostat
	ID5-GND	S9S	remote ON/OFF
	B1-GND	R3T	sensor inlet water
	B2-GND	R4T	sensor outlet water
	B3-GND	R5T	sensor ambient
	Y1-GND	_	fan
X2	C1/2-NO1	K1M	compressor
	C3/4-NO3	K11A	voltage free contact for heatertape
	C3/4-NO4	YRV1	4-way valve

1

Main functions EUWA/Y15-30HC(Z)

The figure below shows the main PCB board of the chiller types EUWA/Y15-30HC(Z):

G	J17 1
G0	

J9 J8

B8
+24Vcc
B7
J1 1

J11

J19

B6
AVSS
B5
B4
AVSS
B3
B2
AVSS
B1
J2

3 3
2 J15 J14 2
1 1

VG0	J20 1
VG1	
Y1	
Y0	

ID11R	J21 1
ID11	
ID12R	
ID12	

IDCM2
ID10
ID9
ID8
ID7
ID6
J3 1

NO11	J22 1
C11	
NC11	
NO10	
C10	
NC10	
NO9	
C9	
NC9	

IDCM1
ID5
ID4
ID3
ID2
ID1
J4 1

C1
NO1
C2
NO2
J5 1

NO8	J24 1
C8	
NO7	
C7	
NO6	
C6	
NO13	
C13	

C3
NO3
C4
NO4
C5
NO5
C12
NO12
J6 1

4898
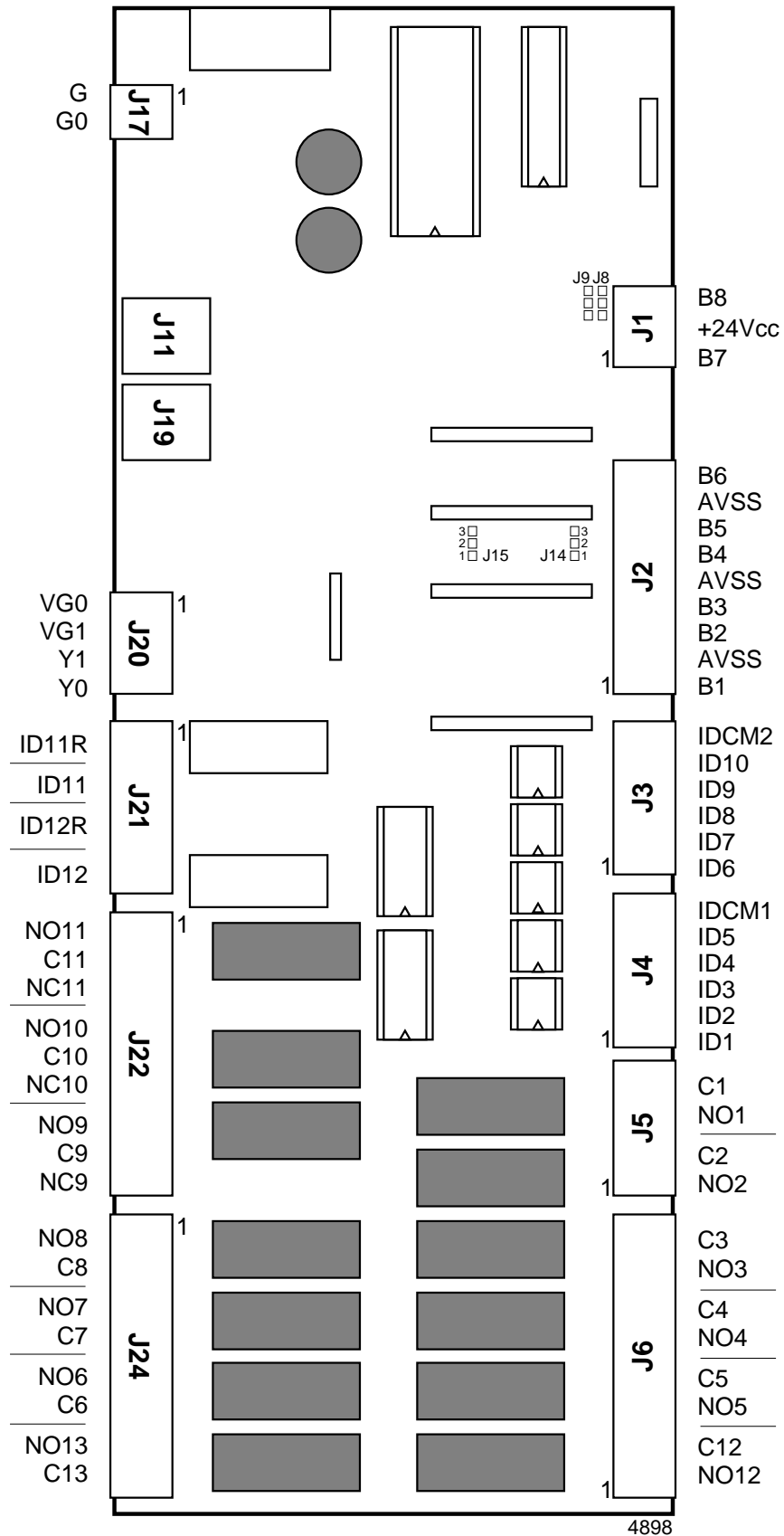
Block	Connection	Wiring diagram symbol	Description
J2	B1	R3T	ambient temperature sensor
	B2	R4T	outlet water temperature sensor evaporator 1
	B3	R5T	outlet water temperature sensor evaporator 2
	B4	R6T	outlet water temperature sensor evaporator 3
	B5	R7T	evap./cond. inlet water temperature
J3	ID6	K6A	contactor for defrost circuit 1
	ID7	K7A	contactor for defrost circuit 2
	ID8	K8A	contactor for defrost circuit 3
	ID9	S8S (field wiring)	switch for dual set point
	ID10	S9S (field wiring)	switch for remote start/stop
J4	ID1	K1A	auxiliary relay for safety circuit 1
	ID2	K2A	auxiliary relay for safety circuit 2
	ID3	K3A	auxiliary relay for safety circuit 3
	ID4 *	S7S (field wiring)	switch for remote cool/heat selection
	ID5	S10L, S11L (field wiring)	flow switch / pump contact
J5	C1-NO1	K1M	compressor contactor circuit 1
	C2-NO2	K2M	compressor contactor circuit 2
J6	C3-NO3	K3M	compressor contactor circuit 3
	C4-NO4	S16T	evaporating temperature thermostat circuit 1
	C5-NO5	S17T	evaporating temperature thermostat circuit 2
	C12-NO12	S18T	evaporating temperature thermostat circuit 3
J11	—	—	no usage
J17	G-GO	—	power supply controller
J21	ID11-ID11R	K4A	auxiliary relay for reverse phase protector
	ID12-ID12R	—	—
J22	C9-NO9-NC9	K12A	auxiliary relay for fan speed control Ry1
	C10-NO10-NC10	K13A	auxiliary relay for fan speed control Ry2
J24	C13-NO13	K5A	cool/heat contactor
	C6-NO6	KP (field wiring)	pump contactor
	C7-NO7	H1P (field wiring)	alarm indication lamp
	C8-NO8	H2P (field wiring)	operation indication lamp

*: only EUWY.

1

3.3　Wiring Diagrams

Overview　　　　The wiring diagrams of the following chiller types are displayed on the pages below:

Chiller type	See page …
EUWA5-8-10HB	page 1-35
EUWY5-8-10HB	page 1-36
EUWA5-8-10HBZ	page 1-37
EUWA15-20HC	page 1-38
EUWY15-20HC	page 1-39
EUWA15-20HCZ	page 1-39
EUWA25-30HC	page 1-40
EUWY25-30HC	page 1-42
EUWA25-30HCZ	page 1-42

Wiring diagram
EUWA5-8-10HB

Wiring diagram EUWA5-8-10HB

NOTES

(1) — TERMINAL 1
(2) — WIRE 2
(3) — FIELD WIRING TO BE IN ACCORDANCE WITH THE LOCAL ELECTRICAL REGULATIONS
(4) — EARTH WIRING
(5) — OPTION / Wiring dependent on model
(6) — PCB-DISPLAY
(7) — Outside switchbox

(8) IF COMPRESSOR ROTATES REVERSELY, IT MAY BE DAMAGED
(9) OPTIONAL
- EKHP8/10H = Kit for operation range down to -15°C
- ZH = Glycol application chilled water temperature down to -5°C (Not for EUWA-H+Z)
- ZL = Glycol application chilled water temperature down to -10°C (Not for EUWA-H+Z)
- OP10 = evaporator heatertape
- ESP = Fan motor size up (high ESP 5mmH₂0)
- EKAC10A = address card kit for BMS connections

DIGITAL INPUTS
X1 (ID1-GND)> flow switch
X1 (ID2-GND)>
X1 (ID3-GND)> high pressure switch + discharge protector + overcurrent
X1 (ID4-GND)> evaporating t° thermostat
X1 (ID5-GND)> remote On/Off

DIGITAL OUTPUTS (RELAYS)
X2 (C1/2-NO1)> compressor on
X2 (C1/2-NO2)>
X2 (C3/4-NO3)> voltage free contact for pump + heatertape
X2 (C3/4-NO4)>
X2 (C5-NO5)> alarm voltage free contact

ANALOG INPUTS
X1 (B1-GND)> inlet water t°
X1 (B2-GND)> outlet water t°
X1 (B3-GND)> ambient t°

ANALOG OUTPUT
X1 (Y-GND)> Fan

FUSES + OVERCURRENT	5W1	8W1	10W1	5T1	8T1	10T1
F1EH	2gG	2gG	2gG	2gG	2gG	2gG
F1U,F2U,F3U	20gG	35gG	35gG	25gG	35gG	63gG
F5B	1A	1A	1A	0.5A	0.6A	0.6A
F6B	1A	1A	1A	1A	1A	1A
F7B	2A	3A	3A	1.2A	2.8A	2.8A
F8U	315mAT	315mAT	315mAT	315mAT	315mAT	315mAT
F9U	125mAT	125mAT	125mAT	125mAT	125mAT	125mAT
K4S	10A	18A	21A	17A	28A	34A

- recommended fuses gL/gG (aM also admitted) according to IEC standard 269-2 (F1U,F2U,F3U = gL/gG)

	NOT STANDARD INCLUDED	
	NOT POSSIBLE AS OPTION	POSS. AS OPTION
OBLIGATORY	#	##
NOT OBLIGATORY	*	**

X1	connector in terminal unit for digital inputs, analog inputs, analog outputs and for power supply controller
X2	connector for digital outputs in terminal unit
Y1S	solenoid valve for injection line
TR1	transfo 230V -> 24V for supply of controllers
S25T **	thermostat for evaporator heatertape
S24T **	thermostat for inlet water control
S23B **	emergency operation selection
S22S *	ON/OFF switch in emergency operation
S19T	thermostat for liquid injection
S17T **	auxiliary thermostat for fanspeed control
S12S #	evaporating temperature thermostat
S16T	main isolator switch
S10L #	contact that closes if pump is working
S11L #	flowswitch
S9S #	switch for remote start/stop
S1HP	high pressure switch
R5T	ambient temperature sensor
R4T	outlet water temperature sensor
R3T	inlet water temperature sensor
R1P	reverse phase protector
Q11F,Q12F	thermal protector fan
Q1D	discharge thermal protector
PE	main earth terminal
M1C	compressor motor
M11F,M12F	fan motors for compressor1,compressor2
KP	pumpcontactor
K11A **	auxiliary relay
K10A	guardtimer for compressor
K9A	auxiliary relay for compressor
K6A	auxiliary relay for evaporating temperature thermostat
K5A	auxiliary relay for discharge thermal protector
K4A **	auxiliary relay for fanspeed control
K1F	contactor for fanmotor
K1A	auxiliary contactor for high pressure
K4S	overcurrent relay
K1M	compressor contactor
H7P *	indication ON/OFF in emergency operation
H6P *	indication of emergency operation
H3P *	indication lamp operation compressor
H1P *	indication lamp alarm
F8U	surge proof fuse
F9U ##	surge proof fuse
F7B	automatic fuse for fanmotors
F5B,F6B	automatic fuse for the control circuit / secondary of TR1
F1U,F2U,F3U #	main fuses for the unit
F1EH #	fuse evaporator heatertape
E4H **	evaporator heatertape
E1H	crankcase heater
C1 C2	capacitors for fanmotors

DAIKIN EUROPE NV
OOSTENDE BELGIE

DRAWN:	B.Mohlemm
VERIFIED:	Ph. V. Steenkiste
APPROVED:	G. Piedfort

PART CODE
843500   2TW51756-1   B

Wiring diagram
EUWA5-8-10HBZ

Wiring diagram
EUWY5-8-10HB

Wiring diagram
EUWA15-20HC

Wiring diagram
EUWY15-20HC

Wiring diagram
EUWA15-20HCZ

(Full-page wiring schematic diagram)

NOTES

(1)	TERMINAL 1
(2)	WIRE 2
(3)	FIELD WIRING TO BE IN ACCORDANCE WITH THE LOCAL ELECTRICAL REGULATIONS
(4)	EARTH WIRING
(5)	OPTION — Wiring dependent on model
(6)	PCB
(7)	Outside switchbox

(8) IF COMPRESSOR ROTATES REVERSELY, IT MAY BE DAMAGED

(9) Optional:
- ESP =fan motor size up (high ESP 5 mm , H₂0)
- EKAC30A = Address card kit for BMS-connection
- ZL = glycol application chilled temperature down to –10°C Not for EUWA 15–20H₂ Models
- ZH = glycol application chilled water temperature down to –5°C Not for EUWA 15–20H₂ Models

interconnection connectors :
X1 = 12 pins connector
X2 = 14 pins connector

	NOT STANDARD INCLUDED	
	NOT POSSIBLE AS OPTION	POSS. AS OPTION
OBLIGATORY	#	##
NOT OBLIGATORY	★	★★

Symbol	Description
Y1S,Y2S ★★	solenoid valve for injection line circuit1, circuit2
X1A/X1B,X2A/X2B	interconnection connector switchbox 1,switchbox 2
TR1	transfo 230V -> 24V for supply of controllers
S25T ★★	thermostat for evaporator heatertape
S24T ★	thermostat for inlet water control
S23B	emergency operation selection
S22S ★	ON/OFF switch in emergency operation
S19T,S20T ★★	thermostat for liquid injection circuit1, circuit2
S16T,S17T	evaporating temperature thermostat circuit1, circuit2
S12S #	main isolator switch
S11L #	contact that closes if pump is working
S10L #	flowswitch
S9S ★	switch for remote start/stop
S8S	switch for dual setpoint
S1HP,S2HP	high pressure switch for circuit1, circuit2
R7T	sensor for evaporator/condensor inlet water (%%d measurement
R4T,R5T	outlet water temperature sensor
R3T	sensor for ambient temperature measurement
R1P	reverse phase protector
Q21F,Q22F	thermal protector fan 3, 4
Q11F,Q12F	thermal protector fan 1, 2
Q1D,Q2D	discharge thermal protector circuit1, circuit2
	main earth terminal
M1C,M2C	compressor motors for compressor1, compressor2
M21F,M22F	fan motors for compressor1
M11F,M12F	fan motors for compressor1
KP	pumpcontactor
K11A ★★	auxiliary relay for evaporator heatertape
K19A,K20A	guardtimer compressor1, compressor2
K17A	auxiliary relay for compressorstartrequest
K16A	auxiliary relay for flowswitch
K12A,K13A	auxiliary relay for fanspeed control
K1F,K2F	contactor for fanmotor circuit1, circuit2
K1A,K2A	auxiliary relay for safety circuit1, circuit2
K4S,K5S	overcurrent relay circuit1, circuit2
K1M,K2M	compressor contactor circuit1, circuit2
	connector for power supply controller
J5,J6,J22,J24	connector for digital output
J3,J4,J21	connector for digital input
J7,J2	connector for analog input
H7P ★	indication ON/OFF in emergency operation
H4P ★	indication of emergency operation
H3P,H4P ★	indication lamp operation circuit1, circuit2
H2P ★	indication lamp general operation
H1P ★	indication lamp alarm
F9B	automatic fuse for secondary of TR1
F7B	automatic fuse for the fans circuit
F6B	automatic fuse for the secondary of TR1
F5B	automatic fuse for the primary of TR1 + control circuit
F1U,F2U,F3U#	main fuses for the unit
F1EH #	fuse-evaporator heatertape
E4H,E5H ★★	evaporator heatertape
E1H,E2H	crankcase heater circuit1,circuit2
C1,C2,C3,C4	capacitors for fanmotors

FUSES + OVERCURRENT

	15W1	20W1	15T1	20T1
F1EH	2gG	2gG	2gG	2gG
F1U,F2U,F3U	40gG	50gG	63gG	80gG
F5B	2A	2A	1A	1.2A
F6B	4A	4A	1.1A	1.2A
F7B	6A	6A	1.6A	6.1A
F9B	1A	1A	1A	1A
K4S	21A	21A	34A	34A
K5S	18A	21A	17A	34A

– recommended fuses gL./gG (aM also admitted) according to IEC standard 269–2 (F1U,F2U,F3U : gL /gG)

DIGITAL INPUTS
J4 (ID1–IDCM1): safety1 active
J4 (ID2–IDCM1):
J4 (ID3–IDCM1): safety2 active
J4 (ID4–IDCM1):
J4 (ID5–IDCM1): flowswitch
J3 (ID10–IDCM2): remote start/stop
J21 (ID230 [11]–ID1R): reverse phase protector

DIGITAL OUTPUTS (RELAYS)
J5 (C1–NO1):compressor 1 on
J5 (C2–NO2):
J5 (C3–NO3):compressor 2 on
J6 (C4–NO4):LP bypass 1
J6 (C5–NO5):
J6 (C12–NO12):LP bypass 2

J24 (C6–NO6): pump + heatertape control
J24 (C7–NO7):alarm indication
J24 (C8–NO8): operation indication
J22 (C9–NO9):fanspeed Ry1
J22 (C10–NO10–NC10):fanspeed Ry2

ANALOG INPUTS
J2(B1–AVSS): ambient t° measurement
J2(B2–AVSS): evaporator t° outlet t° measurement
J2(B3–AVSS):
J2(B4–AVSS): evaporator 2 outlet t° measurement
J2(B5–)–J(–24V): evaporator (condensor) inlet water t° measurement

DAIKIN EUROPE NV
OOSTENDE BELGIE

DESCRIPTION – OMSCHRIJVING
WIRING DIAGRAM EMERGENCY OPERATION (OPTION 08)

PART CODE: 2TW51076–1

Wiring diagram
EUWA25-30HC

NOTES :

interconnection connectors :
X1 = 12 pins connector   X3 = 12 pins connector
X2 = 14 pins connector   X4 = 14 pins connector

	NOT STANDARD INCLUDED	
	NOT POSSIBLE AS OPTION	POSS. AS OPTION
OBLIGATORY	#	##
NOT OBLIGATORY	*	**

Y1S,Y2S,Y3S **	solenoid valve for injection line circuit1, circuit2, circuit3
X3A,X4A,X3B/X4B	interconnection connector switchbox 1,switchbox 3
X1A/X1B,X2A/X2B	interconnection connector switchbox 1,switchbox 2
TR1	transfo 230V -> 24V for supply of controllers
S25T **	thermostat for evaporator heatertape
S24T	thermostat for inlet water control
S23B *	emergency operation selection
S22S *	ON/OFF switch in general operation
S19T,S20T,S21T **	thermostat for liquid injection circuit1, circuit2, circuit3
S16T,S17T,S18T	evaporating temperature thermostat circuit1, circuit2, circuit3
S12S #	main isolator switch
S11L #	contact that closes if pump is working
S10L *	flowswitch
S9S *	switch for remote start/stop
S8S	switch for dual setpoint
S1HP,S2HP,S3HP	high pressure switch for circuit1, circuit2, circuit3
R7T	sensor for evaporator/condensor inlet water (%%d measurement
R4T,R5T,R6T	outlet water temperature sensor
R3T	sensor for ambient temperature measurement
R1P	reverse phase protector
Q31F,Q32F	thermal protector fan 5, 6
Q21F,Q22F	thermal protector fan 3, 4
Q11F,Q12F	thermal protector fan 1, 2
Q1D,Q2D,Q3D	discharge thermal protector circuit1, circuit2, circuit3
PE	main earth terminal
M1C,M2C,M3C	compressor motors for compressor1, compressor2, compressor3
M31F,M32F	fan motors for compressor3
M21F,M22F	fan motors for compressor2
M11F,M12F	fan motors for compressor1
KP	pumpcontactor
K11A **	auxiliary relay for evaporator heatertape
K19A,K20A,K21A	guardian compressor1, compressor2, compressor3
K17A	auxiliary relay for compressor start request
K16A	auxiliary relay for flowswitch
K12A,K13A	auxiliary relay for fanspeed control
K14A,K15A	auxiliary relay for fanspeed control
K1F,K2F,K3F	contactor for fanmotor circuit1, circuit2, circuit3
K1A,K2A,K3A	auxiliary relay for safety circuit1, circuit2, circuit3
K4S,K5S,K6S	overcurrent relay circuit1, circuit2, circuit3
K1M,K2M,K3M	compressor contactor circuit1, circuit2, circuit3
J17	connector for power supply controller
J6,J6,J22,J24	connector for digital output
J3,J4,J21	connector for digital input
J1,J2	connector for analog input
H7P *	indication ON/OFF in emergency operation
H4P *	indication of emergency operation
H3P,H4P,H5P*	indication lamp operation circuit1, circuit2, circuit3
H2P *	indication lamp general operation
H1P *	indication lamp alarm
F9B	automatic fuse for secondary of TR1
F7B	automatic fuse for the fans circuit
F6B	automatic fuse for the unit
F5B	automatic fuse for the primary of TR1 + control circuit
F1U,F2U,F3U#	main fuses for the unit
F1EH #	fuse evaporator heatertape
E4H,E5H,E6H**	evaporator heatertape
E1H,E2H,E3H	crankcase heater circuit1, circuit2, circuit3
C1,C2,C3,C4,C5,C6	capacitors for fanmotors

output terminals for fieldwiring (max. 2A output)
EXAMPLE

FUSES + OVERCURRENT

Wiring diagram
EUWY25-30HC
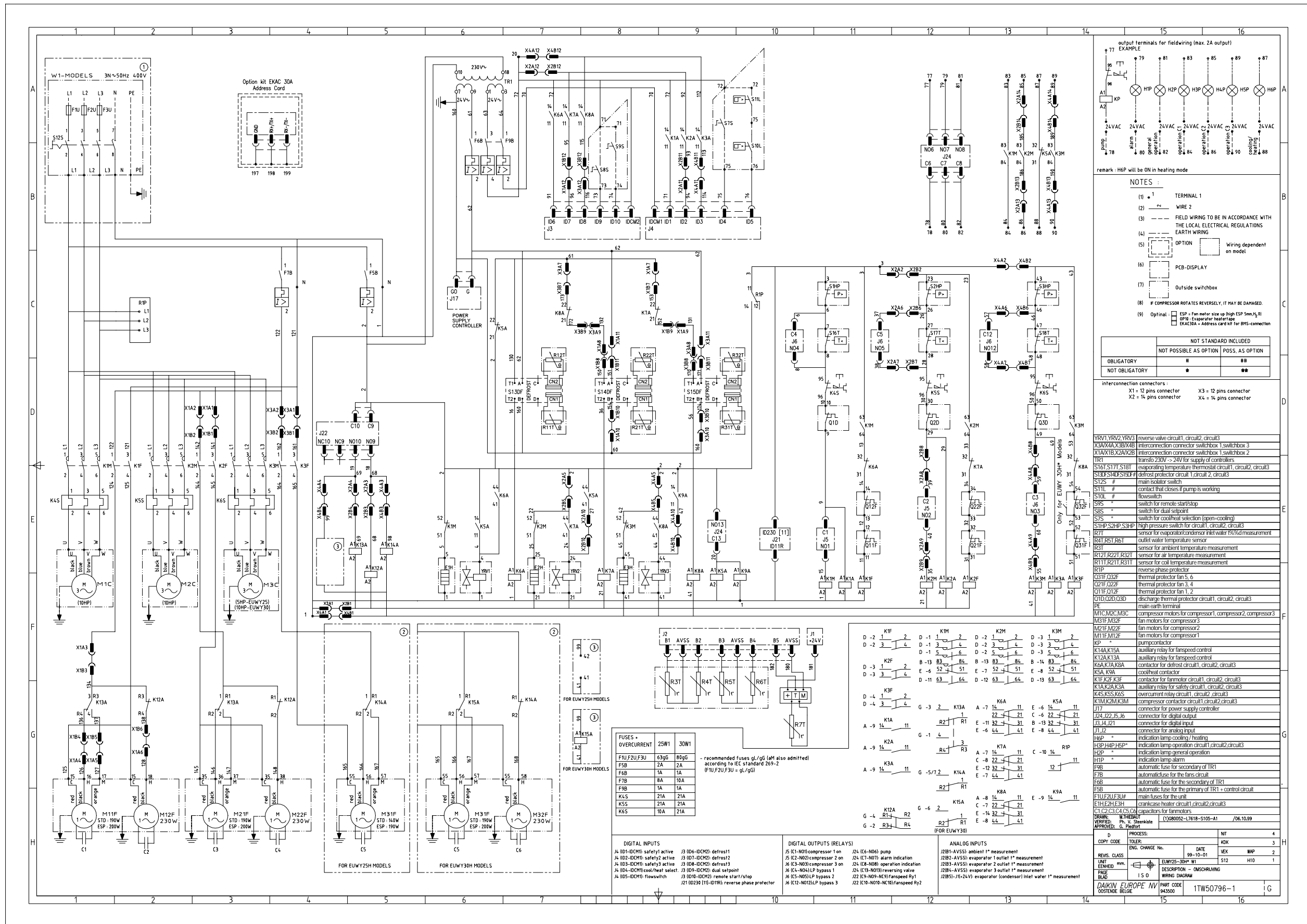
Wiring diagram
EUWA25-30HZ

3.4 Field Wiring

1
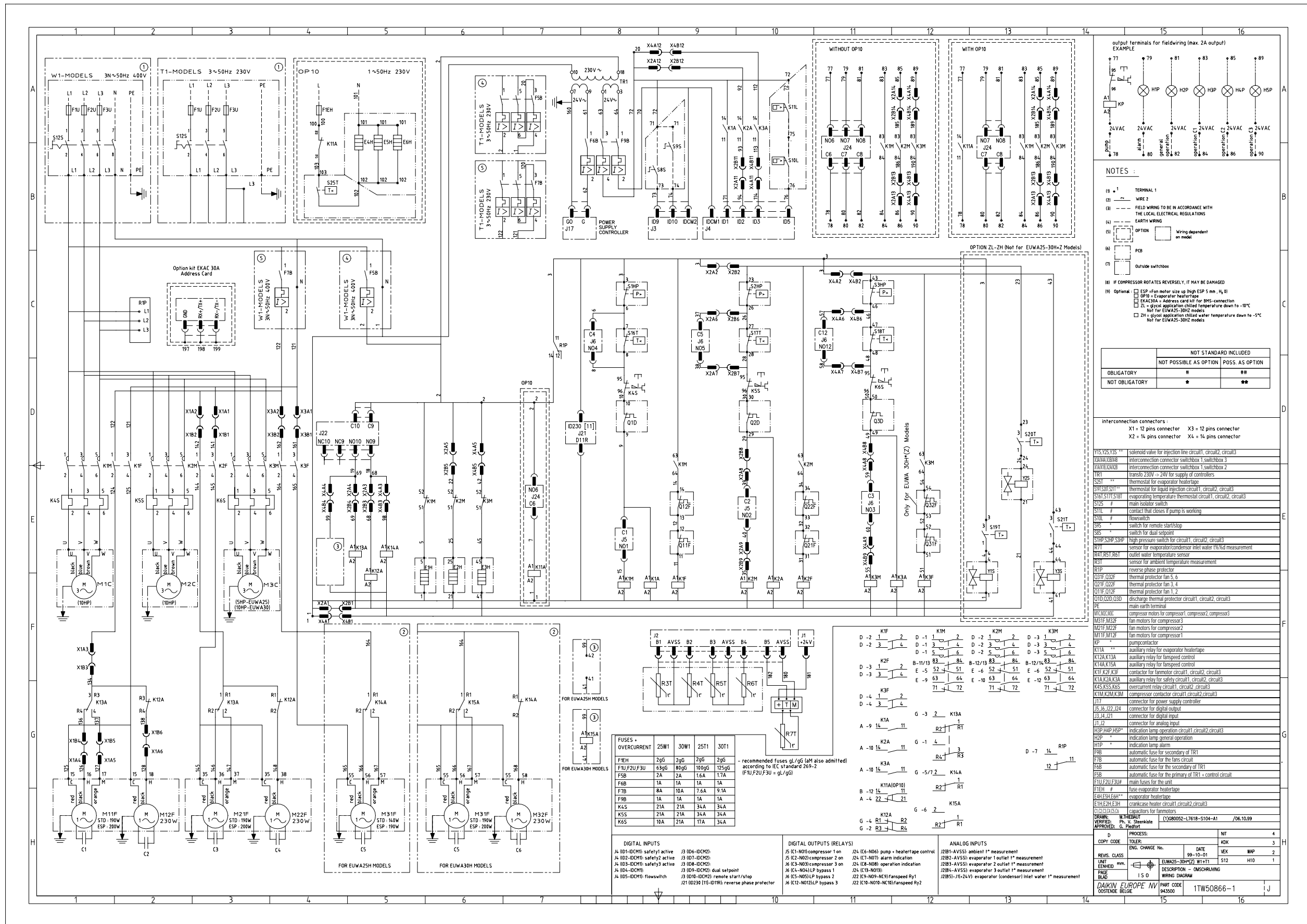
Field wiring components overview

The table below gives an overview of all possible field wiring connections for each unit. The item numbers will be repeated throughout the explanation to show the position on both wiring diagram and switch box layout.

Item	Code(s) (contact)	Description	EUWA5-10HB(Z)	EUWY5-10HB	EUWA15-20HC(Z)	EUWY15-20HC	EUWA25-30HC(Z)	EUWY25-30HC	Remark
1	L1/L2/L3/N/PE	power supply to unit	X	X	X	X	X	X	
2	S12S	mains isolator	X	X	X	X	X	X	
3	S7S	remote cool/heat setting	—	X	—	X	—	X	1
4	S8S	dual set point	—	—	X	X	X	X	2
5	S9S	remote start/stop	X	X	X	X	X	X	1
6	S10L/S11L	flow switch / pump contact	X	X	X	X	X	X	3
7	KP	pump contactor output	X	X	X	X	X	X	3
8	H1P	remote alarm indication	X	X	X	X	X	X	3
9	H2P	general operation indication	—	—	X	X	X	X	3
10	H3P	circuit 1 operation indication	X	X	X	X	X	X	3
11	H4P	circuit 2 operation indication	—	—	X	X	X	X	3
12	H5P	circuit 3 operation indication	—	—	—	—	X	X	3
13	H6P	cool/heat indication	—	—	—	X	—	X	3

X: connection available
—: connection not available

Remarks:

1 These are programmable settings; see page 2-21 for EUWA/Y5-10HB(Z) and page 2-33 for EUWA/Y15-20HC(Z).

2 See also page 2-32.

3 The inputs and outputs can also be consulted in the 'Input/Output Menu' on page 2-39.

1

Schematic drawings

The schematic drawings on the following pages will help you to locate the field wiring connections on the wiring diagrams.

EUWA/Y5-10HB(Z) terminal connections

Item	Code (contact)	Description	Terminals
1	L1/L2/L3/N/PE	power supply to unit	L1/L2/L3/N/PE
2	S12S	mains isolator	L1/L2/L3/N/PE
3 *	S7S	remote cool/heat setting	78-79
5	S9S	remote start/stop	77-76
6	S10L/S11L	flow switch / pump contact	77-75
7	KP	pump contactor output	73-74
8	H1P	remote alarm indication	71-72
10	H3P	circuit 1 operation indication	80-81

*: only EUWY.

Example

ON = operation
OFF = no operation
H = heating
C = cooling
FL = flow switch
P = pump contact

~ 230V   ~ 24 V to ~ 230V

The numbers refer to the items in the terminal connections table.

1
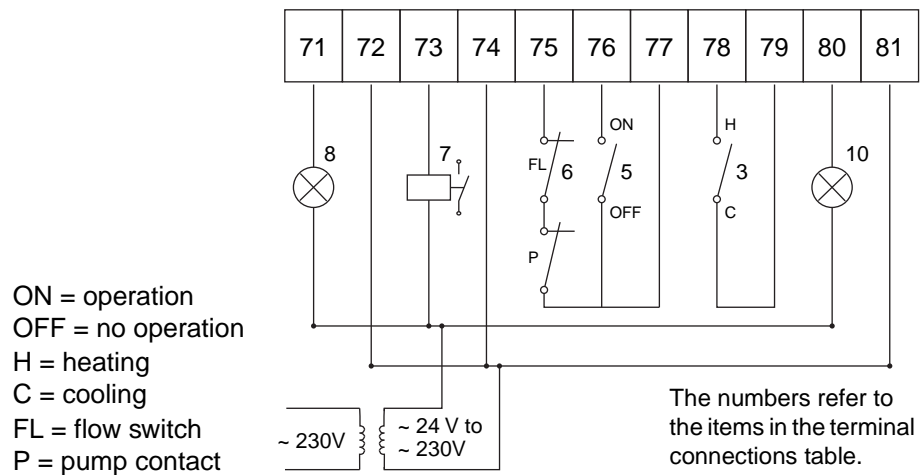
EUWA/Y15-20HC(Z) terminal connections

Item	Code (contact)	Description	Terminals
1	L1/L2/L3/N/PE	power supply to unit	L1/L2/L3/N/PE
2	S12S	mains isolator	L1/L2/L3/N/PE
3 *	S7S	remote cool/heat setting	72-75
4	S8S	dual set point	71-73
5	S9S	remote start/stop	71-74
6	S10L/S11L	flow switch / pump contact	72-76
7	KP	pump contactor output	77-78
8	H1P	remote alarm indication	79-80
9	H2P	general operation indication	81-82
10	H3P	circuit 1 operation indication	83-84
11	H4P	circuit 2 operation indication	85-86
12 *	H6P	cool/heat indication	87-88
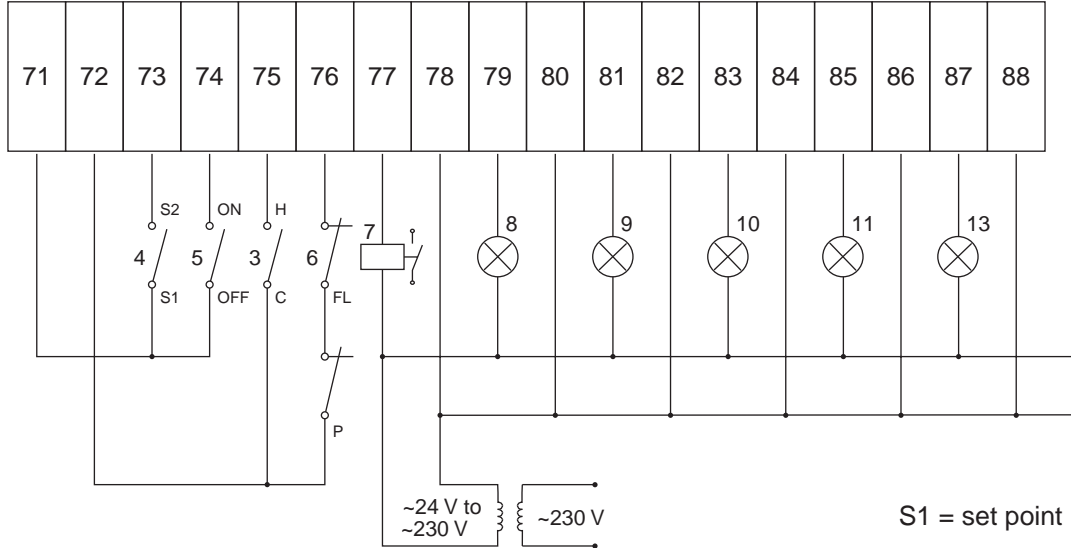
*: only EUWY.

Example

S1 = set point 1

S2 = set point 2

ON = operation

OFF = no operation

H = heating

C = cooling

FL = flow switch

P = pump contact

The numbers refer to the items in the terminal connections table.

1

EUWA/Y25-30HC(Z) terminal connections

Item	Code (contact)	Description	Terminals
1	L1/L2/L3/N/PE	power supply to unit	L1/L2/L3/N/PE
2	S12S	mains isolator	L1/L2/L3/N/PE
3 *	S7S	remote cool/heat setting	72-75
4	S8S	dual set point	71-73
5	S9S	remote start/stop	71-74
6	S10L/S11L	flow switch / pump contact	72-76
7	KP	pump contactor output	77-78
8	H1P	remote alarm indication	79-80
9	H2P	general operation indication	81-82
10	H3P	circuit 1 operation indication	83-84
11	H4P	circuit 2 operation indication	85-86
12	H5P	circuit 3 operation indication	89-90
13 *	H6P	cool/heat indication	87-88
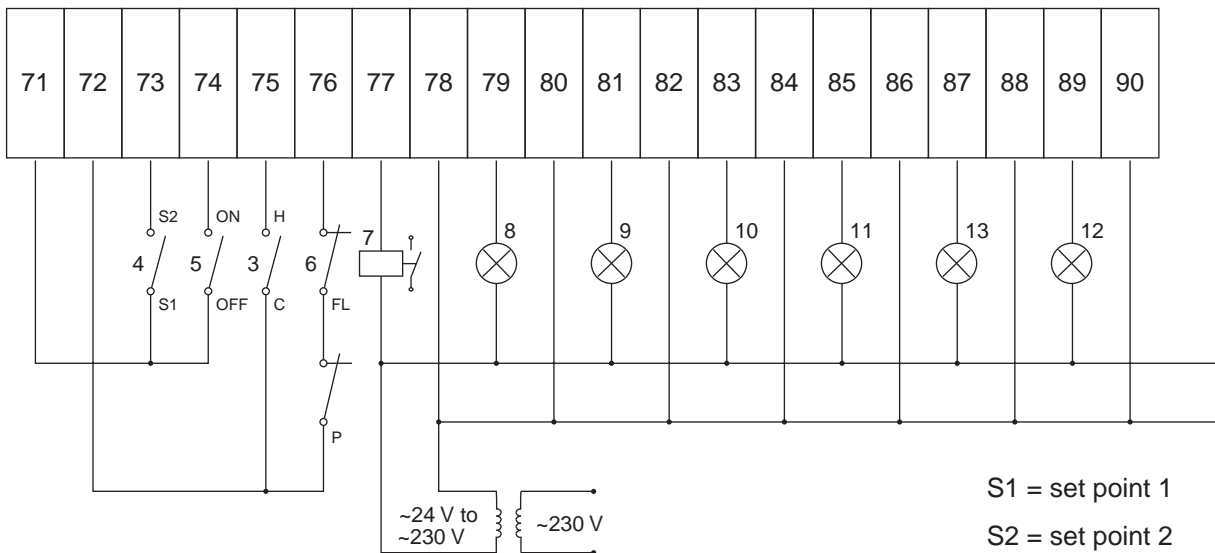
*: only EUWY.

Example

S1 = set point 1

S2 = set point 2

ON = operation

OFF = no operation

H = heating

C = cooling

FL = flow switch

P = pump contact

The numbers refer to the items in the terminal connections table.

<div align="right">

Part 2
Functional Description

</div>

2

Introduction   This part gives more detailed information on the functions and controls in the unit. This information can be used as background information for troubleshooting. An extensive overview of the functioning of the controllers is also given in this part. Knowledge of the controllers is indispensable to gain valuable information prior to servicing and troubleshooting.

What is in this part?   This parts contains the following chapters:

2

1 Functional Control

1.1 What Is in This Chapter

Introduction   This chapter will give more detailed information on the functions used to control the system. Understanding these functions is vital when diagnosing a malfunction, which is related to the functional control.

Overview   This chapter covers the following topics:

Topic	See page
1.2 – Operation Range	page 2-4
1.3 – Operation Flowchart	page 2-6
1.4 – Defrost Principle (only for EUWY5-30HB/C(Z))	page 2-7
1.5 – Defrost Circuit Control	page 2-9
1.6 – Thermostat Control	page 2-11
1.7 – Head Pressure Control for EUWA/Y5-10HB(Z)	page 2-12
1.8 – Head Pressure Control for EUWA/Y15-30HC(Z)	page 2-13
1.9 – Freeze-up Control	page 2-14

1.2   Operation Range

Operation range   The following figure shows the operation range for cooling only chiller types with R-22:
EUWA5-30HB/C

        Range for pull down operation
        Protect the water circuit against freezing
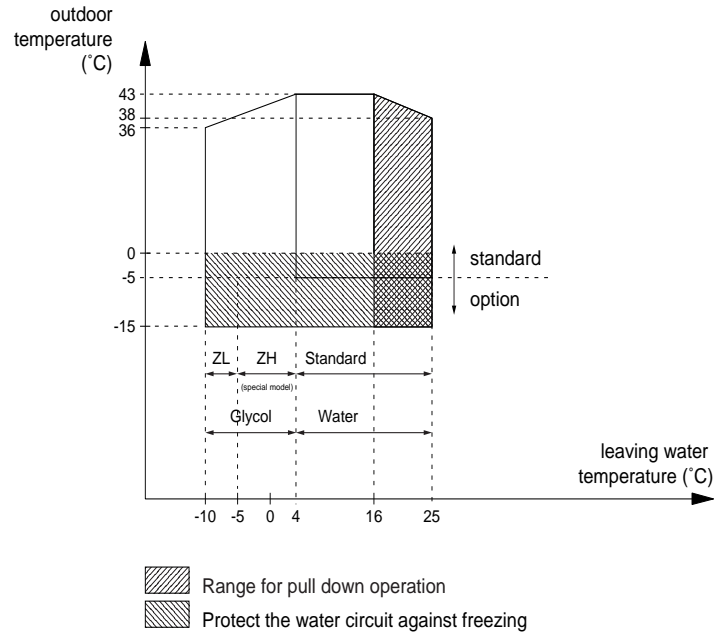
Operation range   The following figure shows the operation range for heatpump chiller types in cooling and in heating
EUWY5-30HB/C   mode with R-22:

cooling mode   heating mode

        Range for continuous operation   Protect the water circuit against freezing
        Range for pull down operation
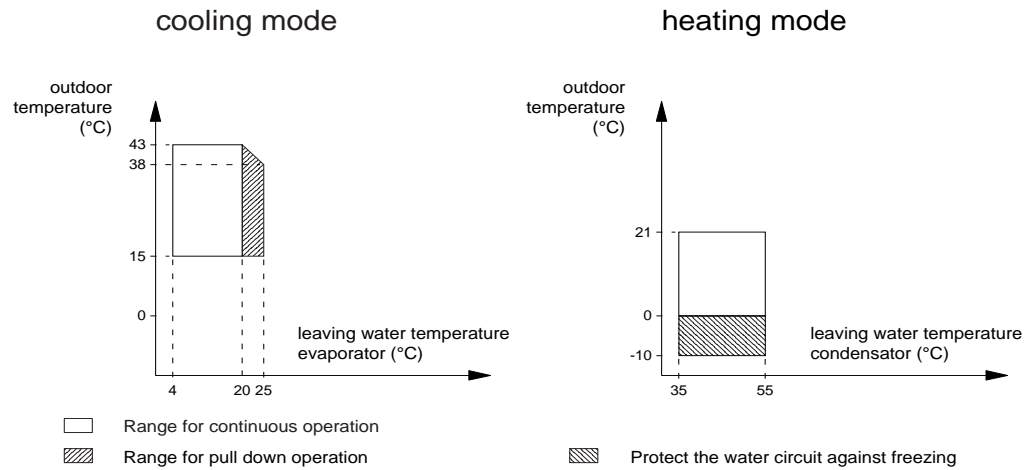
**Operation range
EUWA5-30HB/CZ**

The following figure shows the operation range for the cooling only chiller types with R-407C:
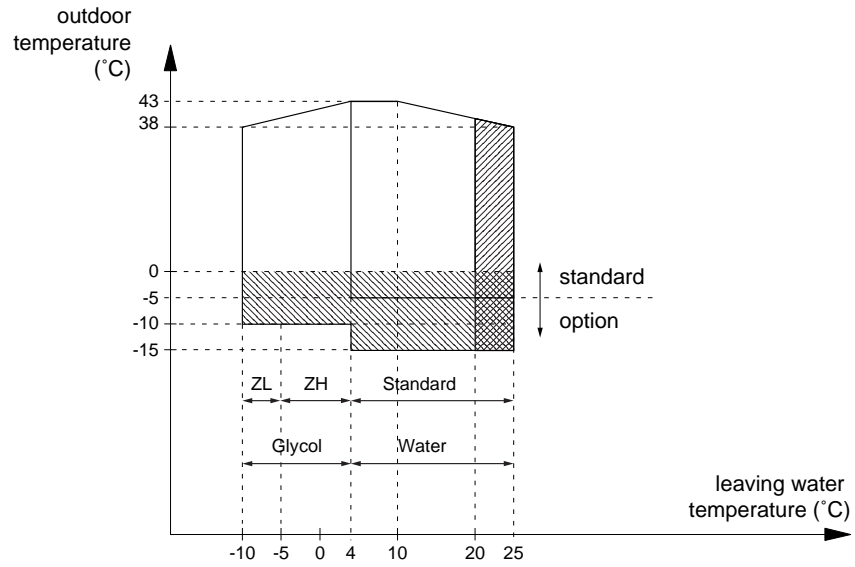
Range for pull down operation

Protect the water circuit against freezing

for
* EUWA8-10HBZ
  - If the units operate below -5°C and are installed in a rather windy
    space, a windscreen is required.
    Daikin offers a windscreen as option for this purpose.
  - An extra fan speed control is required (Daikin Option kit EKHP8/10H)
* EUWA5-15-20-25-30HCZ
  - If the units operate below -5°C and are installed in a rather windy
    space, a windscreen is required.

1.3   Operation Flowchart

EUWA5-30HB/C(Z)   The operation of chiller types EUWA5-30HB(Z) is clarified in the schematic diagram below:

```
        ( Power on )
             │
             ▼
    ┌─────────────────┐
    │ Start in cooling │
    └─────────────────┘
             │
             ▼
    ┌─────────────────┐
    │Thermostat control│
    └─────────────────┘
             │
             ▼
        ┌────────┐
        │  Stop  │
        └────────┘
```
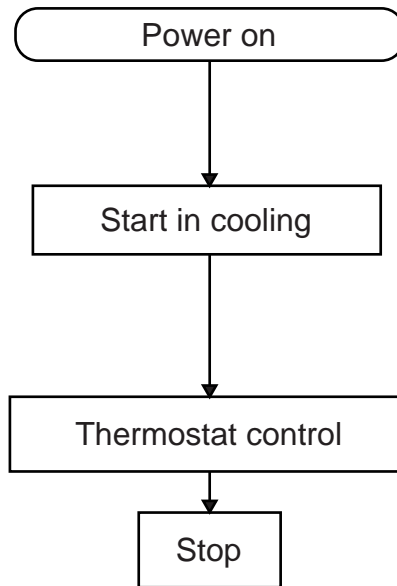
EUWY5-30HB/C   The operation of chiller types EUWY5-30HB is clarified in the schematic diagram below:

```
              ( Power on )
                   │
        ┌──────────┴──────────┐
        ▼                     ▼
┌─────────────────┐   ┌─────────────────┐
│ Start in cooling │   │ Start in heating │
└─────────────────┘   └─────────────────┘
        │                     │
        └──────────┬──────────┘
                   ▼
          ┌─────────────────┐
          │Thermostat control│
          └─────────────────┘
                   │
                   ▼
              ┌────────┐
              │  Stop  │
              └────────┘
```
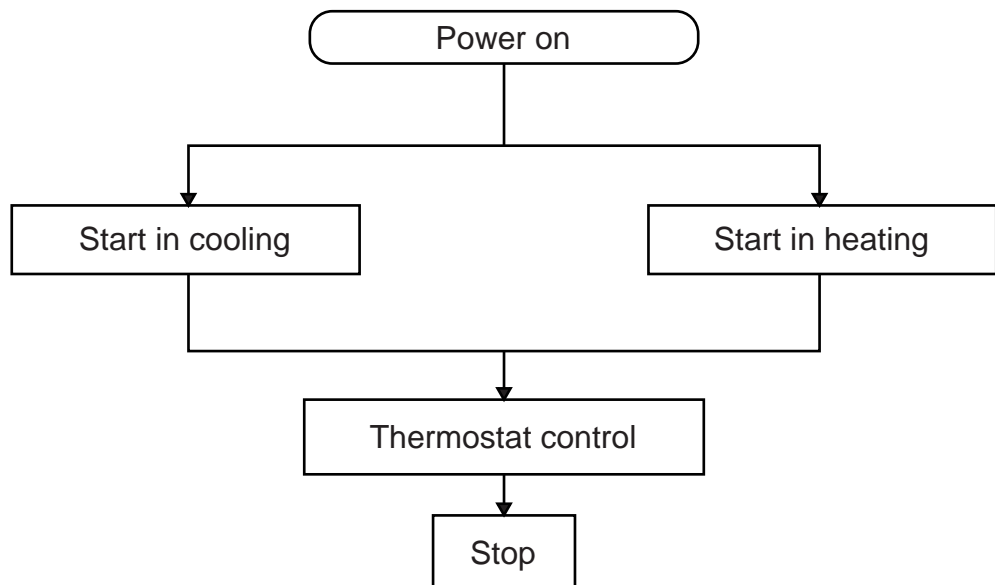
1.4   Defrost Principle (only for EUWY5-30HB/C(Z))

Introduction

This chapter explains the principle of defrost. In the next chapter (refer to 1.5 – Defrost Circuit Control) we concentrate on the location of the defrost PCB in the switch box and on the wiring diagram and we will give an overview of the different defrost circuit combinations.

Defrost control overview

The defrost start condition needs to be activated for 2.5 minutes (150 seconds) before the actual defrost starts. The minimum time interval between two defrost cycli is 20 minutes.

Unit	Start condition	Display	Stop condition	Display
5-10HB	T_{coil} < -10 °C	$d\,l$	■ T_{coil} > +10 °C	■ normal display
			■ after 10 min	■ the display flashes, alternately showing $r\,l$ and the inlet water temperature
15-30HC	T_{coil} < 0.6 x T_{amb} - 10 (±3) Range ±3 adjustable with variable resistor.	DEFROST BUSY	■ T_{coil} > +10 °C	■ normal display
			■ after 10 min	■ normal display

Start condition detail for EUWY15-30HC

The relation between the coil sensor temperature and the ambient temperature for chiller types EUWY15-30HC is illustrated in the figure below:

$$T_{coil} < 0{,}6 \bullet T_{amb} - 10 \;\; (\pm 3)$$

Example

2

start defrost   stop defrost   start defrost   stop defrost

Tcoil > +10˚C

Tcoil

Tcoil < -10˚C
Tcoil < 0.6xTamb - 10 (±3)

| 150 s | 10 min. | 20 min. | 150 s | < 10 min. and stopped |
| timer 1 | timer 2 | timer 3 | timer 1 | timer 2 |

If the defrost reset condition could not be
reached within 10 minutes, defrost stops.

If the defrost reset condition was
reached within 10 minutes, defrost stops.

Display EUWY5-10HB : d i
Display EUWY15-30HC :
DEFROST BUSY

Display EUWY5-10HB : r i flashing
Display EUWY15-30HC : normal

Display : normal

4900

Timers:

timer 1 : conditional timer (150 s)
timer 2 : defrost timer (10 min.)
timer 3 : interval timer (20 min.)

Resetting r i
(EUWY5-10HB)

To reset warning code r i, you can force a new defrost cycle by pressing the SEL key and the PRG key simultaneously for approximately 5 seconds. The display flashes, alternately showing warning code d i (defrost busy) and the inlet water temperature.

1.5   Defrost Circuit Control

Defrost PCB layout   The following picture shows the layout of the defrost PCB:
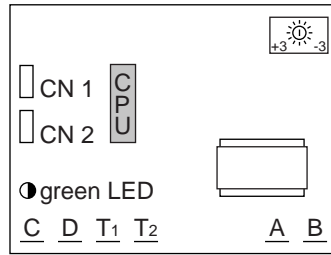
☀ = defrost switch -3˚C till +3˚C
◑ normal (=flashing)
CN1 = coil sensor
CN2 = ambient sensor
A-B = power supply 24 V
C-D = not used
$T_1 T_2$ = defrost signal (M0)

An overview of the inputs and outputs of the defrost PCB is given in 'Defrost PCB' on page 3-6

2

Defrost circuit combination EUWY15-30HC

When one of the circuits of chillers with more than one refrigeration circuit (EUWY15-30HC) performs a defrost:

■ Circuits 2 and 3 will influence each other in such a way that one circuit is switched off when the other circuit performs a defrost.

■ Circuit 1 will be independent of the other two.

Circuit layout

The following table gives information concerning the horsepower per circuit:

Chiller type	Circuit 1	Circuit 2	Circuit 3
15H	10 HP	5 HP	—
20H	10 HP	10 HP	—
25H	10 HP	10 HP	5 HP
30H	10 HP	10 HP	10 HP

Defrost possibilities

The first column in the following table shows the circuits that are in defrost. The other columns describe the status of the circuits:

Circuit(s) in defrost	Circuit 1	Circuit 2	Circuit 3
circuit 1	D	C	C
circuit 2	C	D	O
circuit 3	C	O	D
circuit 1+3	D	O	D
circuit 1+2	D	D	O

D = the circuit performs a defrost
O = the circuit is switched off
C = the circuit continues its normal operation

1.6   Thermostat Control

Two different   The thermostat control in chiller types EUWA/Y5-10HB(Z) differs from that in chiller types
thermostat controls   EUWA/Y15-30HC(Z).

Functional diagram
EUWA/Y5-10HB(Z)

c: cooling set point
d: heating set point
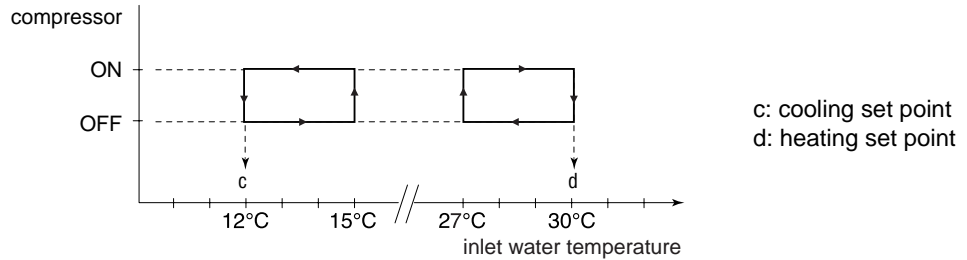
Controller   The limit values of the step difference are given below:
EUWA/Y5-10HB(Z)

Description	Lower limit	Upper limit	Step	Default
step difference	0.3	19.9	0.1	3.0

Functional diagram   The figure below shows the thermostat parameters for chiller types EUWA/Y15-30HC(Z):
EUWA/Y15-30HC(Z)

a: step length
b: step difference
c: cooling set point
d: heating set point
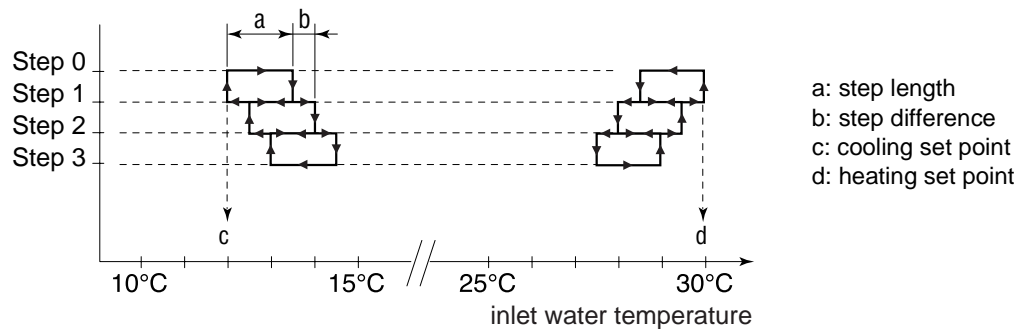
Controller   Screen 3 of the user settings menu provides the ability to modify the thermostat parameters:
EUWA/Y15-30HC(Z)

Line n°	Display	Description	Lower limit	Upper limit	Step	Default
1	THERM. SETTINGS	screen title				
2	STEPS	number of thermostat steps	1	3	1	2
2	STPL (°C)	step length (a)	0.4	2.0	0.1	1.5
3	STEPDIFFERENCE (°C)	step difference (b)	0.2	0.8	0.1	0.5
4	LORDUP (s)	load up time	15	300	1	180
4	LOADDOWN (s)	load down time	15	300	1	20

1.7 Head Pressure Control for EUWA/Y5-10HB(Z)

Functional description

The chiller types EUWA/Y5-10HB(Z) are equipped with a dual speed fan control to ensure the high pressure when the ambient temperature is low. When no signal is sent, all fans rotate on high speed.

2

Cooling mode

In cooling mode, the head pressure control is activated when the temperature decreases until 17°C (= F5 or min. temp. for cooling speed). Fan step 2 becomes fan step 1. The control is deactivated when the temperature increases until 19°C (= F6 or max. temp. for cooling speed).

Picture

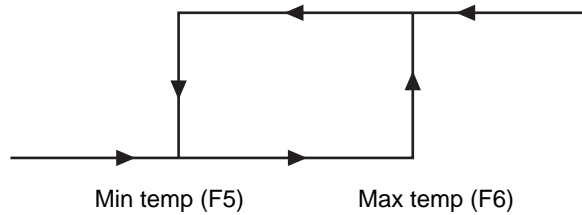The following picture shows the working of cooling mode:

Min temp (F5)   Max temp (F6)

Fan steps in cooling mode

The following table explains the 2 fans steps for EUWA5-10HB in cooling mode:

Type	Fan step 1 (= low)	Fan step 2 (= high)
EUWA5HB(Z)	M11F= M (medium)	M11F=H (high)
EUWA8-10HB(Z)	M11F= H (high) M12F= OFF	M11F= H (high) M12F= H (high)

Fan steps in cooling mode with option EKHP8/10K

Head pressure control enables an extra fan step when the EKHP8/10K (= kit for operation range down to -15°C) option is installed. The following table shows the 3 fan steps for EUWA8-10HB in cooling mode using option EKHP8/10K:

Type	Fan step 1 (= very low)	Fan step 2 (= low)	Fan step 3 (= high)
EUWA8-10HB(Z) + EKHP8/10K (thermostat -4°C)	M11F= M (medium) M12F= OFF	M11F= H (high) M12F= OFF	M11F= H (high) M12F= H (high)

Conclusion

The following table gives an overview of the different fan steps according to the mode:

Mode	Total fan steps
cooling only (5-8-10HP)	2 steps
cooling only (8-10HP)+option EKHP8/10H (thermostat -4°C)	3 steps
heatpump (5-8-10HP)	No fan speed control. In defrost mode, the fan card is used to put off the fans.

1.8 Head Pressure Control for EUWA/Y15-30HC(Z)

Functional description

The chiller types EUWA/Y15-30HC(Z) are equipped with a fan control to ensure the high pressure when the ambient temperature is low. When no signal is sent, all fans rotate on high speed.

■ When the temperature decreases until 17°C, relay Ry1 switches on. A first set of fans turns to a lower speed or switches off (reset at 19°C).

■ When the temperature decreases until 0°C, relay Ry2 switches on. A second set of fans turns to a lower speed or switches off (reset at 2°C).

All chiller types EUWA/Y15-30HC(Z) are equipped with head pressure control (as part of the standardized switch box). For the EUWY, head pressure control is not used to its full extend while its operation range is limited to 15°C.

In the wiring diagram, this head pressure control is positioned in block J22. Refer to 'Wiring Diagrams' on page 1-34.

Illustration

The following illustration clarifies the working of the head pressure control:

COOLING MODE
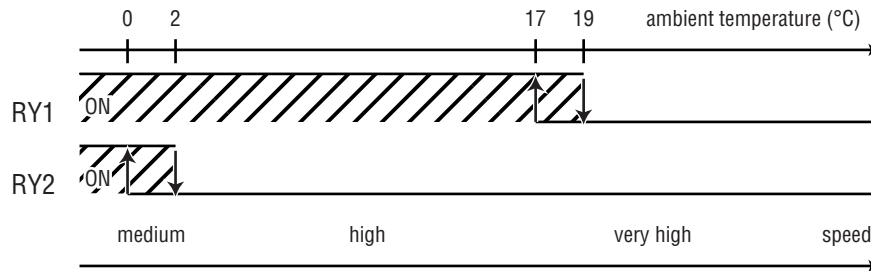
In the tables below you will find an overview of the relay and fans:

STEP 0   Ry1=OFF and Ry2=OFF   all fans at high speed

STEP 1						
Ry1=ON	**M11F**	**M12F**	**M21F**	**M22F**	**M31F**	**M32F**
EUWA/Y15HC	H	OFF	M	—	—	—
EUWA/Y20HC	H	OFF	H	OFF	—	—
EUWA/Y25HC	H	OFF	H	OFF	M	—
EUWA/Y30HC	H	OFF	H	OFF	H	OFF

STEP 2						
Ry1=ON + Ry2=ON	**M11F**	**M12F**	**M21F**	**M22F**	**M31F**	**M32F**
EUWA/Y15HC	M	OFF	M	—	—	—
EUWA/Y20HC	M	OFF	M	OFF	—	—
EUWA/Y25HC	M	OFF	M	OFF	M	—
EUWA/Y30HC	M	OFF	M	OFF	M	OFF

1.9   Freeze-up Control

Freeze-up   Freeze-up protection is a protection against ice formation in the water circuit at the evaporator outlet.
protection   There are 2 sorts of freeze-up protection:

■   Soft freeze-up protection: to control the outlet water temperature.

■   Hard freeze-up protection: to control the evaporating temperature.

The following table shows all the characteristics of soft and hard freeze-up protection:

Characteristics	**Soft freeze-up protection**	**Hard freeze-up protection**
control device	sensor	thermostat
diagram name	R4T, R5T, R6T	S16T, S17T, S18T
activation	outlet water temperature < (4°C -1°)	evaporating temperature < (-4°C -1,5°)
result	circuit disabled	the circuit stops
reset	temperature > 4°C [1]	manually on controller
result	circuit enabled	the circuit restarts

[1]: Alarm is on hold and reset goes automatically.

2 The Controller for the EUWA/Y5-10HB(Z) Chillers

2.1 What Is in This Chapter

Introduction

In this chapter you will learn to work with the controller for the chiller types EUWA/Y5-10HB(Z).

Overview

This chapter covers the following topics:

2.2 The EUWA/Y5-10HB(Z) Controller

Digital controller

The EUWA/Y5-10HB(Z) units are equipped with a digital controller offering a user-friendly way to configure, use and maintain the unit. The digital controller consists of:

- a numeric display
- 4 keys
- 4 LEDs, used to provide extra user information.

Each key, except for the SEL key, combines two functions. The function of a key depends on the status of the controller and the unit.

Front panel

The illustration below shows the front panel of the controller.
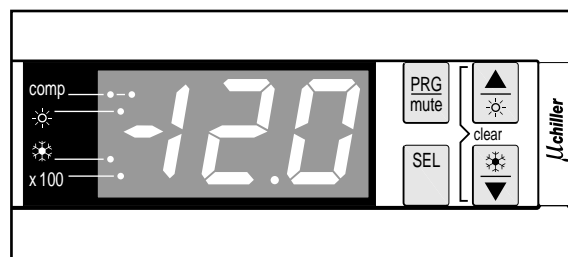
Keys

The following table gives an overview of the keys and their functions:

Key	Function
PRG	■ to enter the scroll list of parameters (press for 5 s)
	■ to save a parameter modification
	■ to return to normal operation
mute	■ to deactivate the buzzer in case of an alarm
▲	■ to scroll up through the list of direct/user parameters
	■ to increase a parameter value
☼	■ to switch the unit on in heating mode (press for 5 s)
	■ to switch the unit off when heating mode is active (press for 5 s)
❄	■ to switch the unit on in cooling mode (press for 5 s)
	■ to switch the unit off when cooling mode is active (press for 5 s)
▼	■ to scroll down through the list of direct/user parameters
	■ to decrease a parameter value
SEL	■ to enter the scroll list of direct parameters (press for 5 s)
	■ to toggle between a parameter's name and its value
PRG SEL	■ to enter the scroll list of factory parameters (press for 5 sec.), after 5 sec. the password for factory parameters is requested.
SEL ▲	■ after 5 seconds the manual defrosting cycle is activated, only possible for heat pumps
▲ ▼	■ after 5 sec.: reset of the manual alarms

Key	Function
PRG	■ the default parameters are written after pressing this key and then powering the unit
PRG ▲	■ the key is copied into the unit EEPROM after pressing both keys and then powering the unit (note 1)
PRG ▼	■ the unit EEPROM is copied into the key after pressing both keys and then powering the unit (note 1)

LEDs

LED	Function
comp ——— ●	the compressor is inactive
comp ——— ◑	the compressor can not start up (although extra load is requested)
comp ——— ○	the compressor is active
☀ ——— ○	heating mode is active
❄ ——— ○	cooling mode is active
x100 ——— ○	the value on the numeric display should be multiplied by 100
x100 ——— ●	can be used as service indication (parameter C8). Refer to 'C8' on page 2-21.

with:

Item	Description
◑	Flashing
○	ON
●	OFF

2.3 Start/Stop, Cool/Heat and Temperature Setting

At power on

The display shows the inlet water temperature.

Remote start/stop, remote cool/heat

The procedure to start or stop the unit depends on the setting of the remote start/stop, refer to page 2-21. The procedure to cool or heat depends on the setting of the remote cool/heat, refer to page 2-21.

Start/stop and cool/heat selection

The following table explains how to select start or stop or how to select cooling or heating mode:

If start/stop set-up	and cool/heat set-up	,then	to
local ($H7$=0)	local ($H5$=0)	press ✳ for 5 seconds	start/stop in cooling mode. ⚠ Always stop the unit before you switch to cooling because start/stop and cool/heat are combined in the same button.
		press ☀ for 5 seconds	start/stop in heating mode. ⚠ Always stop the unit before you switch to heating because start/stop and cool/heat are combined in the same button.
remote ($H7$=1)	local ($H5$=0)	press ✳ for 5 seconds	cool.
		press ☀ for 5 seconds	heat.
		switch remote start/stop	start/stop.
remote ($H7$=1)	remote ($H5$=1)	switch remote start/stop	start/stop.
		switch remote cool/heat	cool/heat.
local ($H7$=0)	remote ($H5$=1)	switch remote cool/heat	The unit switches automatically on. Only cool/heat selection is possible.

Temperature setting

Use the ▲ and ▼ keys to adjust the water temperature.

What happens when you switch the unit on

When you switch the unit on, the following happens:

Stage	Description
1	■ The ⌷comp⌷ LED starts blinking, indicating that the initialization cycle is started. ■ The ⌷❄⌷ LED or the ⌷☀⌷ LED lights up, indicating whether cooling or heating mode is selected.
2	When initialization is completed, the unit starts and the ⌷comp⌷ LED lights up permanently. The numeric display shows the actual inlet water temperature.

2

2.4   What Happens in Case of an Alarm or a Warning

2

Alarms and warnings

The units are equipped with two kinds of safety devices:

	Alarm	**Warning**
Function	Protects the unit.	Gives additional service information.
Description	■ the unit is shut down ■ the buzzer is activated ■ the alarm is energized ■ the display starts flashing, alternately showing the alarm code(s) and the inlet water temperature	■ the display starts flashing, alternately showing the warning code and the inlet water temperature
Action to take	Press mute to deactivate the buzzer.	

For more information about the action to take in case of an alarm, refer to ' What to do in the event of an alarm' on page 3-11.

2.5   Settings: Direct and User Parameters

Direct and user parameters

The digital controller provides direct and user parameters:

■   Direct parameters are used for the daily usage of the unit (for example to set the cooling and heating temperature set point and to read the operational information).

■   User parameters provide advanced features (for example remote control).

Each parameter is defined by a code and a value.

How to access the parameters

To access the parameters, proceed as follows:

Press 5 s on …	to have access to …	A password is …
SEL	the direct parameters.	not required.
PRG	all parameters (direct and user).	is required. Use 22.

Overview of the parameters

In the table below you will find the description, the type, the code and the values of all parameters.

Description	Type	Code	Default Value	Limit values	Step value
measurement unit (°C or °F)	user	d	0°C	0 or 1	1
cooling temperature set point	direct	r1	12.0°C	7.0°C to 25.0°C	0.1°C
cooling temperature difference	direct	r2	3.0°C	0.3°C to 19°C	0.1°C
heating temperature set point	direct	r3	30.0°C	25.0°C to 50.0°C	0.1°C
heating temperature difference	direct	r4	3.0°C	0.3°C to 19°C	0.1°C
outlet water temperature	direct	r6	read only	—	0.1°C
coil temperature	direct	r8	read only	—	0.1°C
not used	—	c6	0	—	—
time delay between the pump start-up and the compressor start-up	user	c7	20 s	0 to 150 s	1 s
time delay between the unit shutdown and the pump shutdown	user	c8	20 min	0 to 150 min	1 min
total running hours of the compressor	direct	c9	(read only) 0	—	1 hour
timer treshold for maintenance warning	user	cb	0 hours (disabled)	0 to 10 000 hours	100 hours
total running hours of the pump	direct	cC	(read only) 0	—	1 hour
activation period of the buzzer	user	P4	1 min	■ 0 min: buzzer disabled ■ 1-14 min: buzzer activation period ■ 15 min: buzzer activated until mute button is pressed	1 min
remote cool/heat	user	H6	0	0 or 1	1
remote start/stop	user	H7	0	0 or 1	1

2

Description	Type	Code	Default Value	Limit values	Step value
nr. of terminals	user	*H8*	1	1	1
controller keyboard lock[1]	user	*H9*	1	0: locked and 1: unlocked	1
unit's serial address	user	*HA*	1	1 to 199	1
not used	—	*Hb*	—	—	—
software release version	user	*H9*	1.3	1.3	—

[1]: Never lock the keyboard. Refer to ' Unlocking the Keyboard' on page 3-23.

The following advanced functions are unavailable when you lock the keyboard:

■ Modifying direct and user parameters (parameters can be displayed but not modified).

■ Selecting cooling or heating mode.
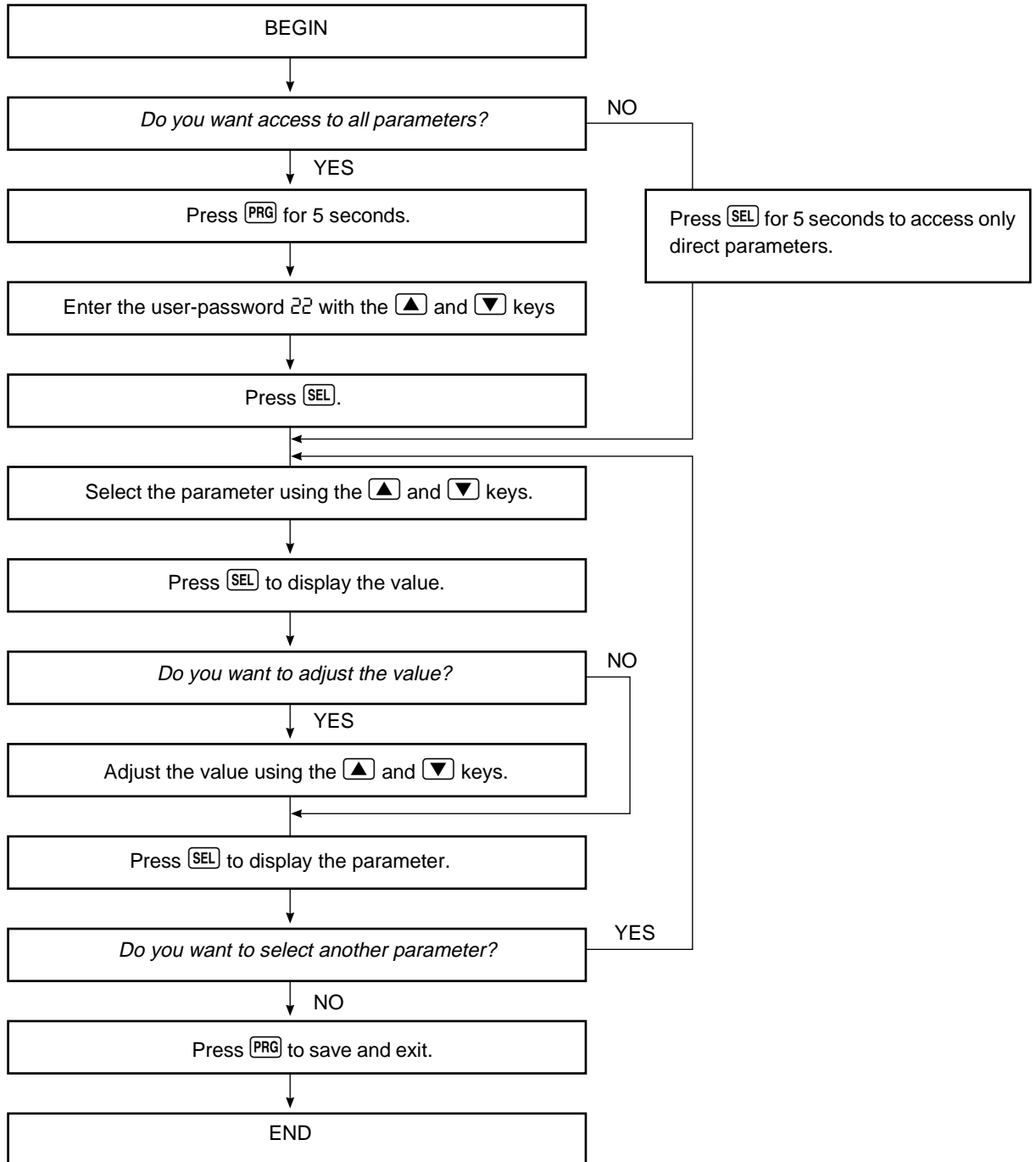
■ Resetting the timers.

c9 and *cL* can be resetted.

For information about how to change a parameter, refer to page 2-23.

2.6   How to Read or Adjust Parameter Settings: the Programming Procedure

**Programming
procedure**

```
                    ┌─────────────────────────────────┐
                    │             BEGIN               │
                    └─────────────────────────────────┘
                                    │
                    ┌─────────────────────────────────┐     NO
                    │ Do you want access to all       │──────────┐
                    │ parameters?                     │          │
                    └─────────────────────────────────┘          │
                              │ YES                               │
                    ┌─────────────────────────────────┐   ┌──────────────────────────────────┐
                    │ Press [PRG] for 5 seconds.      │   │ Press [SEL] for 5 seconds to     │
                    └─────────────────────────────────┘   │ access only direct parameters.   │
                              │                            └──────────────────────────────────┘
                    ┌─────────────────────────────────┐
                    │ Enter the user-password 22 with │
                    │ the [▲] and [▼] keys            │
                    └─────────────────────────────────┘
                              │
                    ┌─────────────────────────────────┐
                    │ Press [SEL].                    │
                    └─────────────────────────────────┘
                              │◄──────────────────────────────┐
                    ┌─────────────────────────────────┐       │
                    │ Select the parameter using the  │       │
                    │ [▲] and [▼] keys.               │       │
                    └─────────────────────────────────┘       │
                              │                                │
                    ┌─────────────────────────────────┐       │
                    │ Press [SEL] to display the value.│      │
                    └─────────────────────────────────┘       │
                              │                                │
                    ┌─────────────────────────────────┐  NO   │
                    │ Do you want to adjust the value?│───────┤
                    └─────────────────────────────────┘       │
                              │ YES                            │
                    ┌─────────────────────────────────┐       │
                    │ Adjust the value using the [▲]  │       │
                    │ and [▼] keys.                   │       │
                    └─────────────────────────────────┘       │
                              │◄───────────────────────────────┘
                    ┌─────────────────────────────────┐
                    │ Press [SEL] to display the      │
                    │ parameter.                      │
                    └─────────────────────────────────┘
                              │                          YES
                    ┌─────────────────────────────────┐───────┐
                    │ Do you want to select another   │       │
                    │ parameter?                      │       │ (back to Select the parameter)
                    └─────────────────────────────────┘       │
                              │ NO
                    ┌─────────────────────────────────┐
                    │ Press [PRG] to save and exit.   │
                    └─────────────────────────────────┘
                              │
                    ┌─────────────────────────────────┐
                    │             END                 │
                    └─────────────────────────────────┘
```

i   ■ After 5 seconds the display starts blinking when no buttons are pressed.

■ You can exit at every step by leaving the buttons untouched for 1 minute. The modifications will not be saved.

2

# 3   The Controller for the EUWA/Y15-30HC(Z) Chillers

3.1   What Is in This Chapter

Introduction   In this chapter you will learn to work with the controller for the chiller types EUWA/Y15-30HC(Z).

Overview   This chapter covers the following topics:
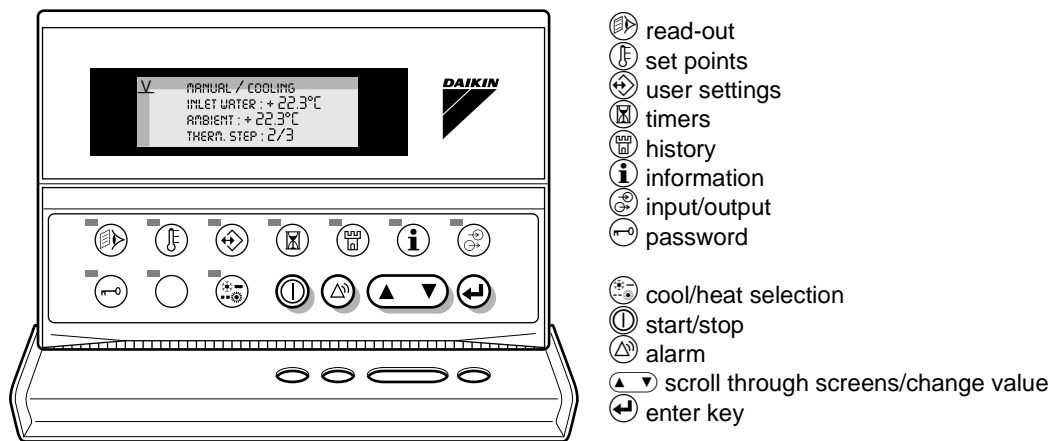
3.2   The EUWA/Y15-30HC(Z) Controller

Digital controller

The EUWA/Y15-30HC(Z) units are equipped with a digital controller offering a user-friendly way to configure, use and maintain the unit. The digital controller consists of:

■ an alphanumeric LCD display

■ 14 keys (5 general keys and 8 menu keys)

■ 10 LEDs next to the menu keys indicating the selected menu.

Front panel

The illustration below shows the front panel of the controller (with open cover).


read-out
set points
user settings
timers
history
information
input/output
password

cool/heat selection
start/stop
alarm
scroll through screens/change value
enter key

How to switch between screens

Each menu contains a number of screens. You can switch between screens using the ▲▼ key. In the upper-left corner of the screen you will find a screen indicator, indicating whether there is a previous or next screen. An overview is given below:

The screen indicator	indicates that you can …
∴	return to the previous screen.
˅	go to the next screen.
÷	either return to the previous screen or go to the next screen.

Screen detail

Each screen contains 4 lines which give information about a setting (a description and an entry field). The entry fields can be adjusted using the ▲▼ key. The cursor is marked by the sign _. You can move the cursor between the screen indicator and the entry fields using the ↵ key. You can move the cursor directly to the screen indicator by pressing the active menu key.

information   entry field
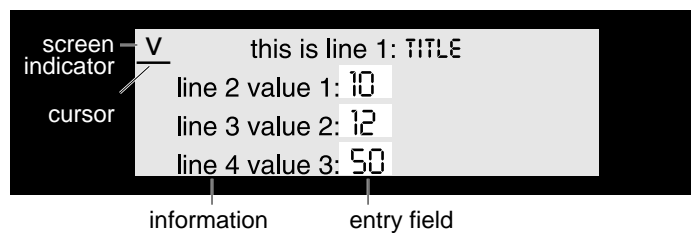
ℹ️   Make sure that the cursor is at the screen indicator position when scrolling through the screens

3.3   Start/Stop, Cool/Heat and Temperature Setting

At power on
- The initialization takes 10 seconds.
- The controller automatically enters the read-out menu, displaying the first read-out screen.

Remote start/stop

The procedure to start or stop the unit depends on the setting of the remote start/stop, see page 2-33.

The remote start/stop is field supply.

How to start or stop   To start or stop the unit, proceed as follows:

Remote start/stop	Start or stop	Action	Result: ① LED …
no	start	press ①	lights up
	stop	press ①	goes off
yes	initial	press ①*	blinks
	start	pull switch remote start	lights up
	stop	pull switch remote stop	blinks

*: The local start/stop button ① must be enabled (blinking) before the remote start/stop is active. If the remote start/stop is not enabled, then the LED ① is off.

How to cool or heat   To change from cooling to heating (or vice versa), press ⊛.

- If cooling operation is selected, the ⊛ LED lights up.
- If heating operation is selected, the ⊛ LED blinks.

Remote cool/heat   To activate remote cool/heat, refer to page 2-33 (remote cool/heat switch is field supply).

The ⊛ LED does not light up when the remote cool/heat is activated.

Temperature setting   To adjust the inlet water temperature, use the setpoints menu (⑤ key), refer to page 2-32.

3.4   What Happens in Case of an Alarm

Two kinds of safety devices

The units are equipped with two kinds of safety devices:

	Unit alarm	**Circuit alarm**
Function	Protects the unit in general.	Protects the individual circuits.
Description	■ All compressors are shut down. ■ The red LED inside the Ⓐ key lights up. ■ The buzzer is activated.	■ The compressor of the corresponding circuit is shut down. ■ The red LED inside the Ⓐ key lights up. ■ The buzzer is activated.
Action to take	Press Ⓐ to acknowledge the alarm.	Press Ⓐ to acknowledge the alarm.
Result	■ The buzzer stops. ■ The Ⓐ LED starts blinking.	■ The buzzer stops. ■ The Ⓐ LED starts blinking.

Display	`RESET UNIT SAFETY`
	`REVERSE PHASE PROT./FLOW HAS STOPPED`
	`INLET WATER`
	`AMB. (COOLING/HEATING)`
		`RESET C1/C2/C3 SAFETY`
		`OUTL. WATER 2/3/4`
		`INLET WATER`
		`AMB. (COOLING/HEATING/DEFROST)`

For more information on what to do in case of an alarm, refer to page 3-11.

3.5   Menu Overview
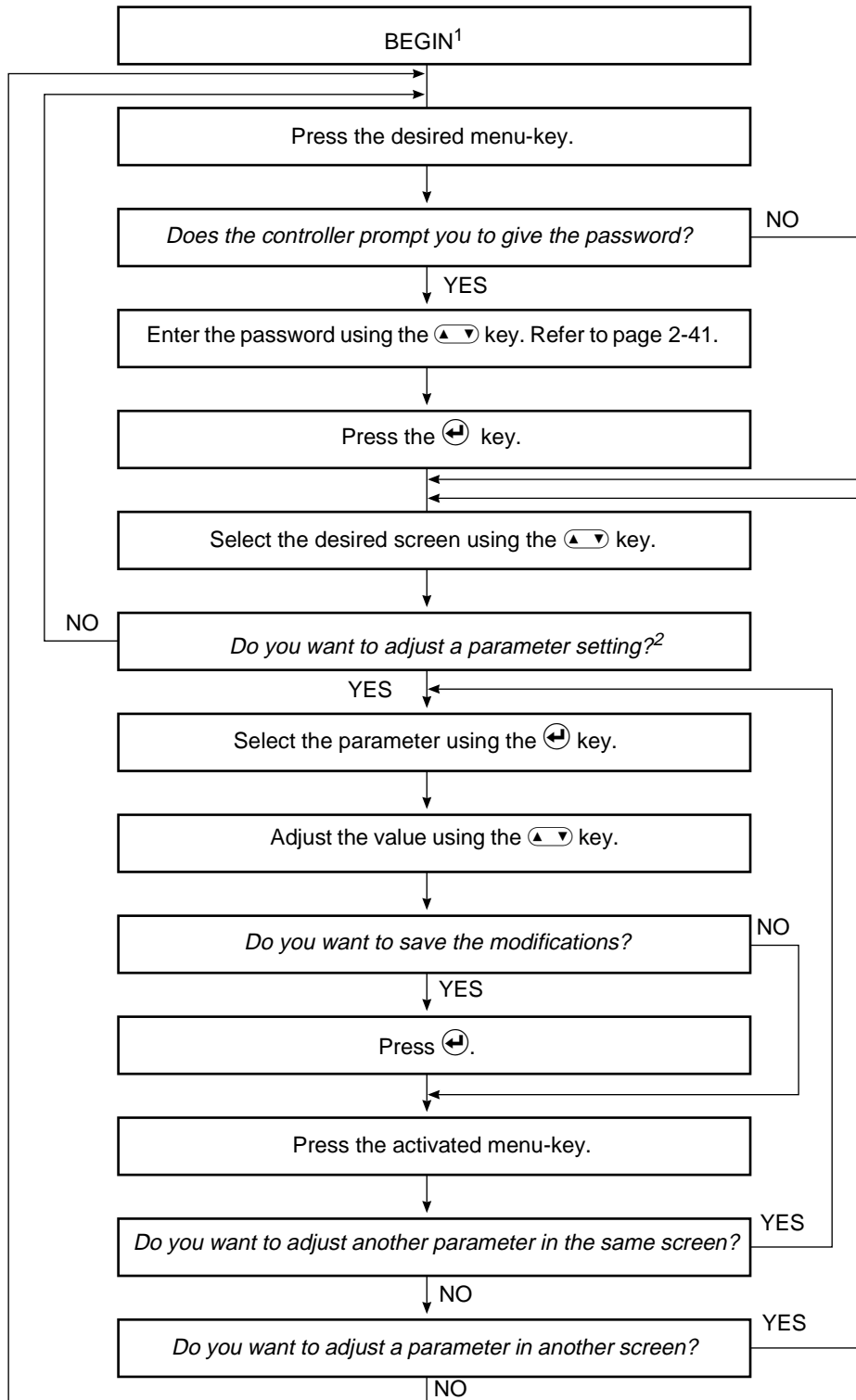
An overview of the menus is given in the table below.

Menu key	Access	Screen n°	Task description	See page
🕮 Read-out	direct	Screen 1	To consult the settings.	page 2-31
		Screen 2	To consult the outlet water temperature.	page 2-31
		Screen 3	To consult the circuits status.	page 2-31
🌡 Set points	direct or password[1]	Screen 1	To consult and adjust the cooling/heating set points.	page 2-32
✦ User settings	password	Screen 1	To select remote control.	page 2-33
		Screen 2	To adjust the manual settings.	page 2-33
		Screen 3	To adjust the thermostat settings.	page 2-34
		Screen 4	To adjust the BMS settings.	page 2-34
		Screen 5	To assign password protection to the set points menu[1].	page 2-34
		Screen 6	To adjust the sensor accuracy.	page 2-35
▨ Timers	direct	Screen 1	To read the actual value of the general timers.	page 2-36
		Screen 2	To read the actual value of the compressor timers.	page 2-36
🕮 History	direct	Screen 1	To read the unit safety information after a shutdown.	page 2-37
		Screen 2	To read the safety information of circuit 1 (after a shutdown).	page 2-37
		Screen 3	To read the safety information of circuit 2 (after a shutdown).	page 2-37
		Screen 4	To read the safety information of circuit 3 (after a shutdown).	page 2-37
ⓘ Info	direct	Screen 1	To consult the unit information.	page 2-38
		Screen 2	To consult additional unit information.	page 2-38
⚙ Input/output	direct	Screen 1	To read the activated safeties.	page 2-39
		Screen 2	To read the status of the remote cool/heat and flow switch.	page 2-39
		Screen 3	To read the status of the defrost switch.	page 2-39
		Screen 4	To read the status of the dual set point switch, the remote start/stop and the reverse phase protector.	page 2-39
		Screen 5	To read the status of the compressors.	page 2-39
		Screen 6	To read the status of the low pressure bypass switch.	page 2-40
		Screen 7	To read the status of the fan speed relay.	page 2-40
		Screen 8	To read the alarm and operation indication and the status of the pump contact.	page 2-40
		Screen 9	To read the status of the reversing valve.	page 2-40
⌐ Password	password	Screen 1	To change the password.	page 2-41

[1]: You can assign password protection to the set points menu (see page 2-34)

3.6   How to Read or Adjust Parameter Settings: the Programming Procedure

**Programming
procedure**

```
                        ┌─────────────────────────────────┐
                        │          BEGIN¹                 │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐
                        │   Press the desired menu-key.   │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐         NO
                        │ Does the controller prompt you  │──────────
                        │ to give the password?           │
                        └─────────────────────────────────┘
                                    │ YES
                        ┌─────────────────────────────────┐
                        │ Enter the password using the    │
                        │ (▲ ▼) key. Refer to page 2-41.  │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐
                        │    Press the (↵) key.           │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐
                        │ Select the desired screen using │
                        │ the (▲ ▼) key.                  │
                        └─────────────────────────────────┘
              NO        ┌─────────────────────────────────┐
           ───────────  │ Do you want to adjust a         │
                        │ parameter setting?²             │
                        └─────────────────────────────────┘
                                    │ YES
                        ┌─────────────────────────────────┐
                        │ Select the parameter using the  │
                        │ (↵) key.                        │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐
                        │ Adjust the value using the      │
                        │ (▲ ▼) key.                      │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐        NO
                        │ Do you want to save the         │─────────
                        │ modifications?                  │
                        └─────────────────────────────────┘
                                    │ YES
                        ┌─────────────────────────────────┐
                        │    Press (↵).                   │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐
                        │ Press the activated menu-key.   │
                        └─────────────────────────────────┘
                        ┌─────────────────────────────────┐        YES
                        │ Do you want to adjust another   │─────────
                        │ parameter in the same screen?   │
                        └─────────────────────────────────┘
                                    │ NO
                        ┌─────────────────────────────────┐        YES
                        │ Do you want to adjust a         │─────────
                        │ parameter in another screen?    │
                        └─────────────────────────────────┘
                                    │ NO
```

¹: The display shows a screen of the last menu used.
²: Only for the menus (F), (⊕) and (⊖).

3.7   ⏵ Read-out Menu

Operational information

Using this menu you can read the actual operational information, such as the cooling and heating set points, the inlet and outlet water temperature, the circuits status, etc. This menu provides 3 screens.

Screen 1

This screen shows information about the operation mode, the set points and the temperature:

Line n°	Display	Description
1	MANAL/HEATING	manual control mode heating
	MANAL/COOLING	manual control mode cooling
	HEATSETP1/2	automatic control mode: heating set point 1 or 2
	COOLSETP1/2	automatic control mode: cooling set point 1 or 2
2	INLET WATER	actual inlet water temperature
3	AMBIENT	actual ambient temperature
4	THERM. STEP	actual thermostat step

Screen 2

This screen shows information about the outlet water temperature:

Line n°	Display	Description
1	OUTLET WATER TEMP	screen title
2-4	OUTL. WATER 1/2/3	actual outlet water temperature of circuit 1, 2 and 3

Screen 3

This screen shows information about the status of the circuits:

Line n°	Display	Description
1	CIRCUITS STATUS	screen title
2-4	C1/C2/C3	circuit 1 / circuit 2 / circuit 3
	OFF	The circuit is off.
	HEATING	The circuit is heating.
	COOLING	The circuit is cooling.
	DEFROST BUSY	The circuit is executing a defrost cycle (it will automatically continue its normal operation when the ice has melted).
	SAFETY ACTIVE	One of the circuit safety devices is activated.
	FREEZE UP DIS	The circuit was shut down because the water heat exchanger ran the risk of freezing up (it will continue its normal operation when the freeze-up risk has disappeared).
	DEFROST DIS	The circuit cannot start up because one of the other circuits is in "defrost busy" status.
	TIMERS BUSY	One of the software timers is counting (see page 2-36).
	CAN STARTUP	The circuit is ready to start up when extra cooling load is requested.

3.8   ⓕ Set Points Menu

Glycol application   Follow the next steps when you want to start the glycol application.

step	Action
1	Push the read-out & user setting buttons at the same time for 5 seconds.
2	Release the push buttons, the C led is on.
3	Put in the password 1914.

Two temperature set points   This menu provides the ability to set the inlet water temperature. You can adjust two sets of temperature set points. Each set contains a cooling and a heating set point. These set points will only be active in automatic control mode.

Line n°	Display	Description	Default value	Limit value	Step value
1	SETP. COOL 1	cooling set point 1	+12.0 C	+7.0 to +25.0 C	0.1 C
2	SETP. COOL 2	cooling set point 2	+12.0 C	+7.0 to +25.0 C	0.1 C
3	SETP. HEAT 1	heating set point 1	+30.0 C	+25.0 to +55.0 C	0.1 C
4	SETP. HEAT 2	heating set point 2	+30.0 C	+25.0 to +55.0 C	0.1 C

The actual active set point can be consulted in the read-out menu (refer to page 2-31).

There is no outlet water control available in these units.

Selection between set point 1 and 2   You can select set point 1 or 2 by the remote dual set point switch (if installed), refer 'Field Wiring' on page 1-45.

To adjust the inlet water temperature set points, use the programming procedure on page 2-30.

3.9   ⊛ User Settings Menu

Password   You need the password to enter this menu.

Menu description   This menu allows a full customizing of the units and provides the following 6 screens:

Screen n°	Display	Description	See page
1	REMOTE CONROL	To activate remote control.	page 2-33
2	MANUAL SETINGS	To adjust and activate manual control mode.	page 2-33
3	THERM. SETINGS	To adjust the thermostat settings.	page 2-34
4	BMS - SETTINGS	To adjust the BMS settings.	page 2-34
5	SETPOINT - PASSWORD	To assign password protection to the set points menu.	page 2-34
6	SENSOR ACCURACY	To adjust the sensor accuracy.	page 2-35

Screen 1   This screen provides the ability to activate remote control:

Line n°	Display	Description	Possible settings
1	REMOTE CONTROL	screen title	
2	REMOTE ON/OFF	remote start/stop	Y/N
3	REMOTE COOL/HEAT	remote cool/heat	Y/N

Screen 2   This screen provides the ability to activate manual control mode:

Line n°	Display	Description	Possible settings
1	MANUAL SETTINGS	screen title	
2	FANSPEED	fan speed	low / medium / high / very high
3	C1/ C2/ C3	status of the circuits	on / off
4	PRESENT MODE	control mode	manual / auto

2

Screen 3

This screen provides the ability to modify the thermostat parameters:

Line n°	Display	Description	Lower limit	Upper limit	Step	Default
1	THERM. SETTINGS	screen title				
2	STEPS	number of thermo-stat steps	1	3	1	2
2	STPL (°C)	step length (a)	0.4	2.0	0.1	1.5
3	STEPDIFFERENCE (°C)	step difference (b)	0.2	0.8	0.1	0.5
4	LOADUP (s)	load up time	15	300	1	180
4	LOADDOWN (s)	loaddown time	15	300	1	20

The figure below shows the thermostat parameters:
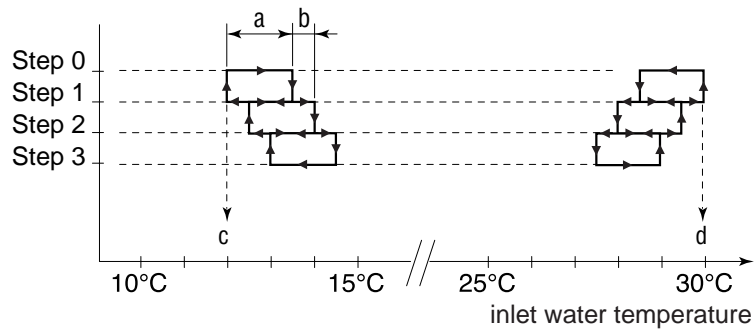
Screen 4 (optional)

You can install an optional PCB to control the unit from a PC (this feature is under development). The BMS (Building Management System) parameters provide communication between the unit and the PC. This screen provides the ability to activate the PC control mode and to modify following BMS settings:

Line n°	Display	Description	Possible settings
1	BMS -SETTINGS	screen title	
2	BMS CONTROL ALLOWED	To select the PC control mode.	Y/N
3	UNIT ADDRESS	Used to address the unit if more than one unit is connected to the PC.	
4	PROTOCOL	Indicates the communication protocol	

This screen will only be displayed if the optional BMS PCB is installed (under development).

Screen 5

This screen provides the ability to assign password protection to the set points menu:

Line n°	Display	Description	Possible settings
1	SETPOINT - PASSWORD	screen title	
2	PASSWORD NEEDED TO CHANGE SETPOINTS	Assign password protec-tion to set points menu.	Y/N

Screen 6   This screen provides the ability to set an offset value to the measured temperature:

Line n°	Display	Description	Lower limit	Upper limit	Step	Default
1	SENSOR ACCURACY	screen title				
2	INLET WATER SENSOR OFFSET	inlet water temperature offset value	-2.0 C	+2.0 C	0.1 C	0.0 C

The purpose of the offset is to adjust the displayed temperature on the controller as it can sometimes deviate from the actual measured value.

Examples:

Measured temperature (*)	Displayed temperature	Action to take
10 °C	10 °C	Set the offset value to 0 °C (the displayed temperature is correct).
10 °C	10.1 °C	Set the offset value to -0.1 °C to display the correct temperature.
9.6 °C	9.3 °C	Set the offset value to ±0.3 °C to display the correct temperature.

*: using a measurement probe.

☞   To adjust the settings, use the programming procedure on page 2-30.

3.10 ⊠ Software Timers Menu

Software timers   Using this menu you can read the actual value of the software timers. This menu provides 2 screens.

Screen 1   This screen shows the actual value of the general timers.

Line n°	Display	Description
1	GENERAL TIMERS	screen title
2	LOADUP	Delay timer for load up; during countdown, the unit is unable to enter a higher thermostat step (default: 180 s).
2	DWN	Delay timer for loaddown; during countdown, the unit is unable to enter a lower thermostat step (default: 20 s).
3	FLOWSTART	Delay timer to enable a continuous water flow through the evaporator before start up of the compressor (default: 15 s).
3	FLOWSTOP	Delay timer that starts counting when the water flow through the evaporator stops during normal operation; if the water flow has not restarted during the countdown, the unit will shut down (default: 5 s).
4	COMPR. STARTED	Delay timer to start the next compressor; used in manual mode or when only one thermostat step is set up (default: 5 s).

Screen 2   This screen shows the actual value of the compressor timers.

Line n°	Display	Description
1	COMPRESSOR TIMERS	screen title
2-4	GRD 1 AREC 1 GRD 2 AREC 2 GRD 3 AREC 3	Guard timer: delay timer to prevent the compressor from restarting after a shutdown (default: 60 s). Anti recycling: delay timer to prevent the compressor from restarting after the compressor has started; used to limit the number of restarts (default: 240 s).

Example

all timers show their default values
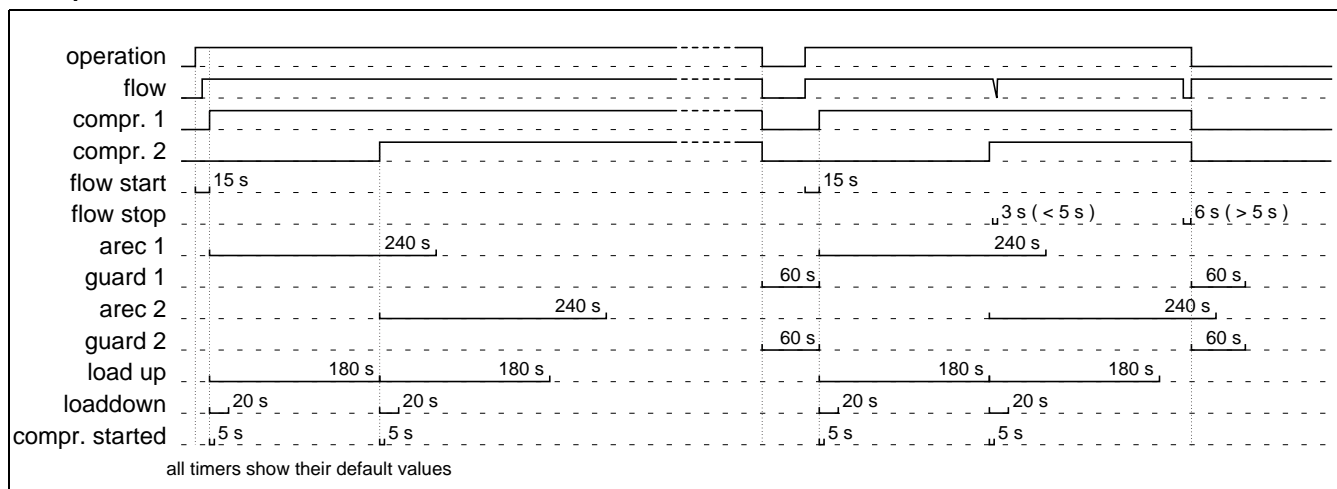
3.11   ⏱ History Menu

Reading safety info after shutdown

Using this menu you can at all times read the information of the **latest shutdowns**:

■   The number of times a unit safety or circuit safety occurred

■   The unit status at the moment of the last shutdown.

Screen 1

This screen shows the unit history:

Line n°	Display	Description
1	UNIT HISTORY: XXX	x = the total number of unit shutdowns
2	REVERSE PHASE PROT. FLOW HAS STOPPED	the unit safety: reverse phase protection or flow switch
3	INLET WATER	inlet water temperature
4	AMB.	ambient temperature
4	COOLING/HEATING	operation mode: cooling or heating

Screens 2-4

These screens show the circuit history:

Line n°	Display	Description
1	C1/C2/C3 HISTORY: XXX	x = the total number of circuit shutdowns
2	OUTL. WATER	outlet water temperature
3	INLET WATER	inlet water temperature
4	AMB.	ambient temperature
4	COOLING/HEATING/ DEFROST	operation mode: cooling, heating or defrost

3.12   ⓘ Info Menu

Additional unit information   Using this menu you can consult additional information about the unit. There are two screens.

Screen 1   This screen shows the unit information:

Line n°	Display	Description
1	UNIT INFORMATION	screen title
2	UNITNAME	the unit name
3	REFRIGERANT	the refrigerant used
4	MANUFACT. NR.	the manufacturing (serial) number

Screen 2   This screen shows extra unit information:

Line n°	Display	Description
1	UNIT INFORMATION	screen title
2	SOFTWARE	the controller's software version
3		date and supplier name
4		city and country of origin

3.13 ☞ Input /Output Menu

Reading the status of inputs and outputs

Using this menu you can read the status of the digital inputs and the status of the relay outputs.

■ Screens 1 to 4 provide status information of the digital inputs.

■ Screens 5 to 9 provide status information of the relay outputs.

Screen 1

This screen indicates whether a safety is activated:

Line n°	Display	Description
1	DIGITAL INPUTS	screen title
2-4	SAFETY 1, 2, 3	indicates whether a safety of circuit 1, 2 or 3 is activated or not

Screen 2

This screen shows the status of the remote cool/heat and the flow switch:

Line n°	Display	Description and status
1	DIGITAL INPUTS	screen title
2	COOL/HEAT	remote cool/heat: cooling or heating
3	FLOWSWITCH	flow switch: flow or no flow

Screen 3

This screen shows the status of the defrost switches:

Line n°	Display	Description and status
1	DIGITAL INPUTS	screen title
2-4	DEFROST 1, 2, 3	defrost switch of circuit 1, 2 or 3: busy or not busy

Screen 4

This screen shows the status of the dual set point, the remote start/stop and the reverse phase protector:

Line n°	Display	Description and status
1	DIGITAL INPUTS	screen title
2	DUAL SETPOINT	dual set point switch: setp.1 or setp.2
3	REM. START/STOP	remote start/stop: start or stop
4	REV. PHASE PR.	reverse phase protector: OK or not OK

Screen 5

This screen shows the status of the compressors:

Line n°	Display	Description and status
1	RELAY OUTPUTS	screen title
2-4	COMPR. 1, 2, 3	compressor of circuit 1, 2 or 3: active or not active

Screen 6

This screen shows the status of the low pressure bypass switches:

Line n°	Display	Description and status
1	RELAY OUTPUTS	screen title
2-4	LPBYPASS 1, 2, 3	low pressure bypass switch of circuit 1, 2 or 3: active or not active

Screen 7

This screen shows the status of the fan speed relays:

Line n°	Display	Description and status
1	RELAY OUTPUTS	screen title
2-4	FANSP. RY 1, 2, 3	fan speed relay of circuit 1, 2 or 3: active or not active

Screen 8

This screen shows the alarm and operation indication and the status of the pump contact:

Line n°	Display	Description and status
1	RELAY OUTPUTS	screen title
2	ALARM	alarm signal: active or not active
3	OPERATION	operation: active or not active
4	PUMP	pump contact: active or not active

Screen 9

This screen shows the status of the reversing valve:

Line n°	Display	Description and status
1	RELAY OUTPUTS	screen title
2	REV. VALVE	reversing valve: active or not active

3.14 🔑 Password Menu

Password   The password protects the access to:

■ the user settings menu ⊕

■ the set points menu ⅉ.

The password is a 4-digit number between 0000 and 9999.

The units leave the factory with user password 0000. The general factory password is 1914.

ℹ️   To reset a pre-defined user password, press ↵ and 🔑 simultaneously for 5 seconds.

Screen   Using this menu you can change the password:

Line n°	Display	Description
1	CHANGE PASSWORD	screen title
2	NEW PASSWORD	The controller requests the new password.
3	CONFIRM	The controller requests the new password a second time (for safety reasons).

How to change the password

To change the password, proceed as follows:

Step	Action
1	Adjust the password using the programming procedure on page 2-30.
2	Repeat step 1 (confirmation).

2

Part 3
Troubleshooting

3

Introduction   The small water chillers (EUWA/Y5-30HB/C) are equipped with electronic PCBs. These PCBs use the information gained from the input signals to control the output signals. If the unit is not performing properly, first check the input devices, then the PCBs and finally the output devices. The chapters in this part are arranged according to this sequence.

What is in this part?   This parts contains the following chapters:

3

1   Overview of Inputs and Outputs

1.1   What Is in This Chapter

Introduction   The first step in a troubleshooting sequence is to check the inputs and outputs. In this chapter an overview is given. The PCB for the chiller types EUWA/Y5-10HB(Z) differs from the PCB for the chiller types EUWA/Y15-30HC(Z). Therefore, the overview has been split into two parts.

Overview   This chapter covers the following topics:

Topic	See page
1.2 – Overview of Inputs and Outputs of EUWA/Y5-10HB(Z)	page 3-4
1.3 – Overview of Inputs and Outputs of EUWA/Y15-30HC(Z)	page 3-5

1.2　　Overview of Inputs and Outputs of EUWA/Y5-10HB(Z)

Inputs/outputs　　　The following table describes the relation between the wiring diagram symbols and the wiring connections of chiller types EUWA/Y5-10HB(Z) and also the malfunction (or program) code. We refer to the wiring diagram and the PCB layout to find the exact location on both wiring diagram and switch box.

Type	Detail	Wiring diagram symbol	Wiring connection terminal	Malfunction (or program) code	Description
analog input	sensor	R3T	X1/B1-GND	$E1 - A1$	inlet water temperature sensor
		R4T	X1/B2-GND	$E2$ ($rб$)	outlet water temperature sensor
		R5T	X1/B3-GND	$E3$ (rB)	coil temperature sensor
digital input	transducer	R1P	X1/ALL	$H1$ / FL	reverse phase protector
		S11L+S10L	X1/ID1-GND	$H1$	flow switch pump contact
		Q11F	X1/ID4-GND	$F1$	evap. thermostat
		K1A	X1/ID1-GND	$H1$	auxiliary relay for high pressure
		K4S	X1/ID3-GND	$c1$ / $H1$	overcurrent relay+hp=discharge protector
		S16T	X1/ID4-GND	$L1$	evaporating temperature thermostat
	control contacts	S7S (field)	X1/ID2-GND	($H6$)	switch for remote cool/heat selection
		S9S (field)	X1/ID5-GND	($H7$)	switch for remote start/stop
		S10L (field)	X1/ID1-GND	(FL)	flow switch
		S11L (field)	75-77	—	contact that closes if the pump is working
digital output		K1M	X2C1/2-NO1	—	compressor contactor
		YRV1	X2C3/4-NO4	—	4 way valve
		KP (field)	X2C3/4-NO3	—	pump contactor
		H1P (field)	X2C5-NO5	—	indication lamp alarm

1.3 Overview of Inputs and Outputs of EUWA/Y15-30HC(Z)

Inputs/outputs The following table describes the relation between the wiring diagram symbols and the wiring connections of chiller types EUWA/Y15-30HC(Z). We refer to the wiring diagram and the PCB layout to find the exact location on both wiring diagram and switch box:

Type	Detail	Wiring diagram symbol	Wiring connection terminal	Description
analog input	sensor	R3T	J2/B1	ambient temperature sensor
		R4T	J2/B2	outlet water temperature sensor evaporator 1
		R5T	J2/B3	outlet water temperature sensor evaporator 2
		R6T	J2/B4	outlet water temperature sensor evaporator 3
		R7T	J2/B5	evap./cond. inlet water temperature
digital input	transducer	K1A	J4/ID1	auxiliary relay for safety circuit 1
		K2A	J4/ID2	auxiliary relay for safety circuit 2
		K3A	J4/ID3	auxiliary relay for safety circuit 3
	contact	S7S (field contacts)	J4/ID4	switch for remote cool/heat selection
		S8S (field contacts)	J3/ID9	switch for dual set point
		S9S (field contacts)	J3/ID10	switch for remote start/stop
		S10L (field contact)	J4/ID5	flow switch
		S11L (field contact)	J4/ID5	contactor that closes if the pump is working
		K6A (field contact)	J3/ID6	contactor for defrost circuit 1
		K7A (field contact)	J3/ID7	contactor for defrost circuit 2
		K8A (field contact)	J3/ID8	contactor for defrost circuit 3
digital output	contact	K1M	J5/C1	compressor contactor for circuit 1
		K2M	J5/C2	compressor contactor for circuit 2
		K3M	J6/C3	compressor contactor for circuit 3
		LP bypass S16T	J6/C4	evaporator temperature thermostat circuit 1
		LP bypass S17T	J6/C5	evaporator temperature thermostat circuit 2
		LP bypass S18T	J6/C12	evaporator temperature thermostat circuit 3
		K5A (field contact)	J24/C13	cool/heat contactor
		KP (field contact)	J24/C6	pump contactor
		H1P (field contact)	J24/C7	alarm indication lamp
		H2P (field contact)	J24/C8	operation indication lamp
	transducer	K4A	J21/ID11	auxiliary relay for reverse phase protector
		K12A	J22/C9	auxiliary relay for fan speed control Ry1
		K13A	J22/C10	auxiliary relay for fan speed control Ry2

Defrost PCB   The following table shows the defrost PCB wiring. It describes the relation between the wiring diagram symbols and the wiring connections for chiller types EUWY15-30HC(Z).

Type	Detail	Wiring diagram symbol	Wiring connection terminal	Description
analog input	sensor	R11T	S13DF/CN1	sensor for coil temperature measurement circuit 1
		R12T	S13DF/CN2	sensor for air temperature measurement circuit 1
		R21T	S14DF/CN1	sensor for coil temperature measurement circuit 2
		R22T	S14DF/CN2	sensor for air temperature measurement circuit 2
		R31	S15DF/CN1	sensor for coil temperature measurement circuit 3
		R32	S15DF/CN2	sensor for air temperature measurement circuit 3
digital output	contacts	K6A	S13DF/T1-T2	contactor for defrost circuit 1
		K7A	S14DF/T1-T2	contactor for defrost circuit 2
		K8A	S15DF/T1-T2	contactor for defrost circuit 3

2   Overview of Fault Indications and Safeties

2.1   What Is in this Chapter

Introduction   In the first stage of the troubleshooting sequence it is important to interpret the fault indication on the controller display. This will help you to find the cause of the problem.

Overview   This chapter covers the following topics:

Topic	See page
2.2 – Fault Indication EUWA/Y5-10HB(Z)	page 3-8
2.3 – Fault Indication EUWA/Y15-30HC(Z)	page 3-10
2.4 – Safeties Overview	page 3-12

2.2   Fault Indication EUWA/Y5-10HB(Z)

Overview of codes   The following alarm and warning codes may appear on the screen:

Code(s)	Description	Alarm or warning	Reset	See …
$A1$	The anti-freeze alarm is activated.	alarm	manual	page 2-20
$c1$	Overcurrent protection of the compressor motor is activated.	alarm	automatic	—
$d1$	The unit is carrying out a defrost cycle.	warning	automatic	page 2-7
$E1$	NTC probe used to measure the inlet water temperature is defective.	alarm	automatic	page 3-14
$E2$	NTC probe used to measure the outlet water temperature is defective.	alarm	automatic	page 3-14
$E3$	NTC probe used to measure the coil temperature is defective.	alarm	automatic	page 3-14
$EE1\ EP$	EEPROM on the controller PCB inside the unit is defective.	alarm	automatic	page 1-30
FL	No water flow either during the period of 15 seconds after the pump was started or for 5 seconds while the compressor is active.	alarm	manual	page 2-36
$H1$	A high pressure switch or the discharge thermal protection is activated.	alarm	manual	—
$L1$	Evaporating temperature thermostat is activated.	alarm	manual	page 2-14
$n1$	The compressor requires maintenance: the total running hours of the compressor (direct parameter $c9$) has exceeded the setting of the timer treshold for maintenance warning (user password cb —see page 2-21).	warning	manual	page 3-9
$r1$	The period foreseen for defrost has elapsed but the process of defrost is not completed.	warning	manual	page 2-7
$FL,H1$	The reverse phase protector is activated.	alarm	automatic	—
$EU1\ E0$	control stability of power supply	warning	automatic	
EL	control noise on power supply	warning	automatic	

[1]: The overcurrent relay must be reset in the switch box. After reset, only alarm code $H1$ is flashing. The controller can now be reset.

What happens in the event of an alarm or a warning   In the event of an alarm or a warning, the following happens:

Alarm	Warning
■ the unit is shut down ■ the buzzer is activated ■ the alarm relay is energized ■ the display starts flashing, alternately showing the alarm code(s) and the inlet water temperature	■ the display starts flashing, alternately showing the warning code and the inlet water temperature

What to do in the event of an alarm

■ In the event of automatic reset, the system starts again automatically.

■ In the event of manual reset, proceed as follows:

Step	Action	Result
1	Press 🄼ute.	The buzzer stops.
2	Find the cause of the alarm and correct it.	The system is repaired.
3	Reset the alarm manually by pressing the ▲ and ▼ key simultaneously for approximately 5 seconds.	The controller continues its normal operation, displaying the inlet water temperature.

Resetting warning code $n\,l$

To reset warning code $n\,l$, proceed as follows:

Step	Action
1	Enter the list of direct parameters by pressing the SEL key for approximately 5 seconds. The parameter code $r\,l$ appears on the display.
2	Select parameter $c\,9$ using the ▲ and ▼ key.
3	Press the SEL key to choose the parameter and to switch to the parameter value.
4	Press the ▲ and ▼ key simultaneously for approximately 5 seconds. The timer's value resets to 0.
5	Press the SEL key to return to parameter code $c\,9$.
6	Press the PRG key to return to normal operation.

ℹ️

■ Do not forget to carry out the required maintenance activities after resetting the timer.

■ It is also possible to reset timer $c\,L$ (which defines the total running hours of the pump) the same way.

2.3 Fault Indication EUWA/Y15-30HC(Z)

What happens in the event of an alarm

The units are equipped with two kinds of safety devices:

	Unit alarm	Circuit alarm
Function	Protects the unit in general.	Protects the individual circuits.
Description	■ all compressors are shut down ■ the red LED inside the ⊘ key lights up ■ the buzzer is activated.	■ the compressor of the corresponding circuit is shut down ■ the red LED inside the ⊘ key lights up ■ the buzzer is activated.
Action to take	Press ① to acknowledge the alarm.	Press ① to acknowledge the alarm.
Display	RESET UNIT SAFETY REVERSE PHASE PROT./FLOW HAS STOPPED INLET WATER AMB. (COOLING/HEATING)	RESET C1/C2/C3 SAFETY OUTL. WATER 1/2/3 INLET WATER AMB. (COOLING/HEATING/DEFROST)

What to do in the event of an alarm

In the event of an alarm, proceed as follows:

Step	Action	Result
1	Press ⊘ to acknowledge the alarm.	■ The buzzer stops. ■ The ⊘ LED starts blinking. ■ One of the following alarm screens is displayed:

Screen n°	Alarm screen
1	RESET UNIT SAFETY REVERSE PHASE PROT./FLOW HAS STOPPED INLET WATER AMB. (COOLING/HEATING)
2, 3, 4	RESET C1/C2/C3 SAFETY OUTL. WATER 1/2/3 INLET WATER AMB. (COOLING/HEATING/DEFROST)

ℹ The controller cannot indicate the activated circuit safety since all safeties of a circuit are connected in series.

Step	Action	Result
2	Press the ↵ key if you want to consult the operation parameters.	The following screen is displayed:

	TEMPERATURE LIMITS OUTL. WATER INLET WATER AMB. TEMP.

After 20 seconds, this screen automatically disappears.

Step	Action	Result
3	Find the cause of the alarm and correct it.	The system is repaired
4	Press ⊘ to reset the alarm.	■ The ⊘ LED goes out and the alarm screen is deactivated. ■ The first screen of the read-out menu is displayed automatically. ℹ After resetting the alarm you can only consult the safety information by using the history menu (see page 2-37).
5	Go to the third screen of the read-out menu by pressing ▲ ▼ two times (see page 2-31).	The alarm status of each circuit is displayed.
6	If all circuits were shut down, switch on the unit by pressing ①.	The unit starts again.

2.4 Safeties Overview

Safety devices

Alarm description	Alarm indication		Activation	Reset	Wiring code	Device
	EUWA/Y5-10HB(Z)	**EUWA/Y15-30HC(Z)**				
flow switch or pump contact	FL	FLOW SWITCH ACTIVATED OR NOT	no flow for 5 seconds	manual software reset	S10L, S11L	contact closed on flow
reverse phase protector	FL+H1	REVERSE PHASE PROTECTION ACTIVE OR NOT	imbalance or reversed or no power supply	correct faze sequence, switch power back on	R1P, K4A	contact on/off
high pressure switch	H1	SAFETY 1/2/3 ACTIVE	discharge pressure > 28 bar	manual software reset	S1PH, S2PH, S3PH	switch on/off contact
leaving evaporating temperature too low (hard freeze-up protection)	L1	SAFETY 1/2/3 ACTIVE	leaving evaporator temperature < -4 °C	manual software reset	S16T, S17T	switch on/off
outlet water temperature too low (soft freeze-up protection)	A1	SAFETY 1/2/3 ACTIVE	outlet water temperature < 4 °C	manual software reset	R4T, R5T, R6T	NTC sensor
discharge thermal protector	H1	SAFETY 1/2/3 ACTIVE	high compressor discharge temperature > 135 °C	manual software reset and temperature < 115 °C	Q1D, Q2D, Q3D	bimetal on/off
overcurrent relay	H1	SAFETY 1/2/3 ACTIVE	overcurrent [1]	H1: manual software reset	K4S, K5S, K6S	bimetal on/off

[1]: An overview of the fuses and overcurrent relays is given in 'Checking the Power Supply and Fuses' on page 3-18.

3 Checking the Inputs and Outputs

3.1 What Is in This Chapter

Introduction   In this chapter you will find information on how to measure and check the most important inputs.

Overview   This chapter covers the following topics:

Topic	See page
3.2 – Checking the Temperature Sensors	page 3-14
3.3 – Checking the Digital Inputs and Outputs	page 3-17
3.4 – Checking the Power Supply and Fuses	page 3-18

3.2 Checking the Temperature Sensors

Introduction   If the cause of the problem is related to the temperature sensors, then the sensors should be checked prior to changing the PCB or an output device.

Types of sensors   There are two types of temperature sensors:

■ sensors connected to the controller PCB: R3T/ R4T/ R5T/R6T

■ sensors connected to the defrost PCB: R11T/ R12T/ R21T/ R22T/ R31T/ R32T

How to check   To check the temperature sensors, proceed as follows:

Step	Action
1	Disconnect the sensor from the PCB.
2	Measure the temperature and the resistor value.
3	Check if the measured values correspond with the values in the appropriate table.

Table 1   In table 1 you will find the temperature-resistance values of the controller sensors R3T, R4T R5T and R6T (see next page).

Table 2   In table 2 you will find the temperature-resistance values of the defrost sensors R11T, R12T, R21T, R22T, R31T and R32T(see page 3-16).

Table 1   In the following table you will find the temperature-resistance values of the controller sensors R3T, R4T, R5T and R6T.

Tempera-ture	Resistor value			Tempera-ture	Resistor value			Tempera-ture	Resistor value		
	maximum	standard	minimum		maximum	standard	minimum		maximum	standard	minimum
°C	kΩ	kΩ	kΩ	°C	kΩ	kΩ	kΩ	°C	kΩ	kΩ	kΩ
-50	344.40	329.20	314.70	1	26.64	26.13	25.62	56	3.49	3.42	3.35
-49	324.70	310.70	297.20	2	25.51	25.03	24.55	57	3.39	3.31	3.24
-48	306.40	293.30	280.70	3	24.24	23.99	23.54	58	3.28	3.21	3.14
-47	289.20	277.00	265.30	4	23.42	22.99	22.57	59	3.18	3.11	3.04
-46	273.20	261.80	250.60	5	22.45	22.05	21.66	60	3.09	3.02	2.95
-45	258.10	247.50	237.20	6	21.52	21.15	20.78	61	2.99	2.92	2.86
-44	244.00	234.10	224.60	7	20.64	20.29	19.95	62	2.90	2.83	2.77
-43	230.80	221.60	212.70	8	19.80	19.40	19.15	63	2.81	2.75	2.69
-42	218.50	209.80	201.50	9	19.00	18.70	18.40	64	2.73	2.66	2.60
-41	206.80	198.70	191.00	10	18.24	17.96	17.67	65	2.65	2.58	2.52
-40	195.90	188.40	181.10	11	17.51	17.24	16.97	66	2.57	2.51	2.45
-39	185.40	178.30	171.59	12	16.80	16.55	16.31	67	2.49	2.43	2.37
-38	175.5.	168.90	162.00	13	16.13	15.90	15.87	68	2.42	2.36	2.30
-37	166.20	160.10	154.10	14	15.50	15.28	15.06	69	2.35	2.29	2.24
-36	157.50	151.80	140.20	15	14.89	14.68	14.48	70	2.28	2.22	2.17
-35	149.30	144.00	138.80	16	14.31	14.12	13.93	71	2.21	2.16	2.10
-34	141.60	136.60	131.80	17	13.75	13.57	13.40	72	2.15	2.10	2.04
-33	134.40	129.70	125.20	18	13.22	13.06	12.89	73	2.09	2.04	1.98
-32	127.60	123.20	118.90	19	12.72	12.56	12.41	74	2.03	1.98	1.93
-31	121.20	117.10	113.10	20	12.23	12.09	11.95	75	1.97	1.92	1.87
-30	115.10	111.30	107.50	21	11.77	11.63	11.07	76	1.92	1.87	1.82
-29	109.30	105.70	102.20	22	11.32	11.20	11.07	77	1.86	1.81	1.78
-28	103.80	100.40	97.16	23	10.90	10.78	10.60	78	1.81	1.76	1.71
-27	98.63	95.47	92.41	24	10.49	10.38	10.27	79	1.76	1.71	1.68
-26	93.75	90.80	87.93	25	10.10	10.00	9.90	80	1.71	1.66	1.62
-25	89.15	86.39	83.70	26	9.73	9.63	9.52	81	1.66	1.62	1.57
-24	84.82	82.22	79.71	27	9.38	9.28	9.18	82	1.62	1.57	1.53
-23	80.72	78.29	75.93	28	9.04	8.94	8.84	83	1.57	1.53	1.49
-22	76.85	74.58	72.36	29	8.72	8.62	8.52	84	1.53	1.49	1.44
-21	73.20	71.07	68.99	30	8.41	8.31	8.21	85	1.49	1.45	1.40
-20	69.74	67.74	65.80	31	8.11	8.01	7.91	86	1.45	1.41	1.37
-19	66.42	64.54	62.72	32	7.82	7.72	7.62	87	1.41	1.37	1.33
-18	63.27	61.52	59.81	33	7.55	7.45	7.35	88	1.37	1.33	1.29
-17	60.30	58.66	57.05	34	7.28	7.19	7.09	89	1.34	1.30	1.26
-16	57.49	55.95	54.44	35	7.03	6.94	6.84	90	1.30	1.26	1.22
-15	54.83	53.39	51.97	36	6.79	6.69	6.60	91	1.27	1.23	1.19
-14	52.31	50.96	49.83	37	6.56	6.46	6.37	92	1.23	1.20	1.16
-13	49.93	48.66	47.12	38	6.33	6.24	6.15	93	1.20	1.16	1.13
-12	47.67	46.48	45.31	39	6.12	6.03	5.94	94	1.17	1.13	1.10
-11	45.53	44.41	43.32	40	5.92	5.82	5.73	95	1.14	1.10	1.07
-10	43.50	42.25	41.43	41	5.72	5.63	5.54	96	1.11	1.08	1.04
-9	41.54	40.56	39.59	42	5.53	5.43	5.35	97	1.08	1.05	1.01
-8	39.68	38.76	37.85	43	5.34	5.25	5.17	98	1.05	1.02	0.99
-7	37.91	37.05	36.20	44	5.16	5.08	4.99	99	1.03	0.99	0.96
-6	36.24	35.43	34.03	45	4.99	4.91	4.82	100	1.00	0.97	0.94
-5	34.65	33.89	33.14	46	4.83	4.74	4.66	101	0.98	0.94	0.91
-4	33.14	32.43	31.73	47	4.67	4.59	4.51	102	0.95	0.92	0.89
-3	31.71	31.04	30.39	48	4.52	4.44	4.36	103	0.93	0.90	0.87
-2	30.35	29.72	29.11	49	4.38	4.30	4.22	104	0.91	0.87	0.84
-1	20.00	28.47	27.89	50	4.24	4.16	4.08	105	0.88	0.85	0.82
0	27.83	27.28	26.74	51	4.10	4.02	3.95	106	0.86	0.83	0.80
				52	3.97	3.90	3.82	107	0.84	0.81	0.78
				53	3.84	3.77	3.69	108	0.82	0.79	0.76
				54	3.72	3.65	3.57	109	0.80	0.77	0.74
				55	3.61	3.53	3.46	110	0.78	0.75	0.73

3

Table 2   In the following table you will find the temperature-resistance values of the defrost sensors R11T, R12T, R21T, R22T, R31T and R32T.

Temperature	Resistor value		Temperature	Resistor value		Temperature	Resistor value	
	0.0	0.5		0.0	0.5		0.0	0.5
°C	kΩ	kΩ	°C	kΩ	kΩ	°C	kΩ	kΩ
-20	197.81	192.08	15	31.50	30.77	50	7.18	7.04
-19	186.53	181.16	16	30.06	29.37	51	6.91	6.78
-18	175.97	170.94	17	28.70	28.05	52	6.65	6.53
-17	166.07	161.36	18	27.41	26.78	53	6.41	6.53
-16	156.80	152.38	19	26.18	25.59	54	6.65	6.53
-15	148.10	143.96	20	25.01	24.45	55	6.41	6.29
-14	139.94	136.05	21	23.91	23.37	56	6.18	6.06
-13	132.28	128.63	22	22.85	22.35	57	5.95	5.84
-12	125.09	121.66	23	21.85	21.37	58	5.74	5.43
-11	118.34	115.12	24	20.90	20.45	59	5.14	5.05
-10	111.99	108.96	25	20.00	19.56	60	4.96	4.87
-9	106.03	103.18	26	19.14	18.73	61	4.97	4.70
-8	100.41	97.73	27	18.32	17.93	62	4.62	4.54
-7	95.14	92.61	28	17.54	17.17	63	4.46	4.38
-6	90.17	87.79	29	16.80	16.45	64	4.30	4.23
-5	85.49	83.25	30	16.10	15.76	65	4.16	4.08
-4	81.08	78.97	31	15.43	15.10	66	4.01	3.94
-3	76.93	74.94	32	14.79	14.48	67	3.88	3.81
-2	73.01	71.14	33	14.18	13.88	68	3.75	3.68
-1	69.32	67.56	34	13.59	13.31	69	3.62	3.56
0	65.84	64.17	35	13.04	12.77	70	3.50	3.44
1	62.54	60.96	36	12.51	12.25	71	3.38	3.32
2	59.43	57.94	37	12.01	11.76	72	3.27	3.21
3	56.49	55.08	38	11.52	11.29	73	3.16	3.11
4	53.71	52.38	39	11.06	10.84	74	3.06	3.01
5	51.09	49.83	40	10.63	10.41	75	2.96	2.91
6	48.61	47.42	41	10.21	10.00	76	2.86	2.82
7	46.26	45.14	42	9.81	9.61	77	2.77	2.72
8	44.05	42.98	43	9.42	9.24	78	2.68	2.64
9	41.95	40.94	44	9.06	8.88	79	2.60	2.55
10	39.96	39.01	45	8.71	8.54	80	2.51	2.47
11	38.08	37.18	46	8.37	8.21			
12	36.30	35.45	47	8.05	7.90			
13	34.62	33.81	48	7.75	7.60			
14	33.02	32.25	49	7.46	7.31			

3.3   Checking the Digital Inputs and Outputs

Input route

In the following block diagram the digital input route from the transducer (e.g. thermostat, pressostat, reverse phase, etc.) to the PCB input is shown.

UNIT	→	TRANSDUCER	→	RELAY	→	RELAISCONTACT	→	PCB INPUT
		voltage free contact		230 V (coil)		voltage free contact		24 V AC
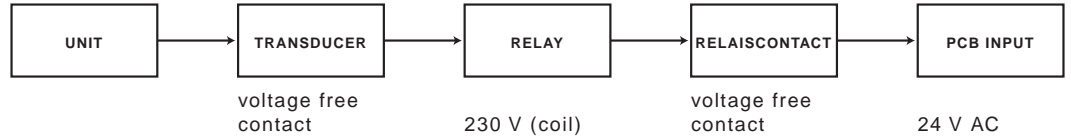
Troubleshooting

In most cases a malfunction occurs in the unit itself and not in the control circuit of the unit. If, however, the latter is the case, then you should measure the relevant signals using the schematic input route shown above.

Output route

The output is generated from the PCB. If a device does not operate, you should find the relevant output signal from the PCB in order to decide whether the PCB or the device needs replacement. The output route is shown in the block diagram below:

PCB OUTPUT	→	CONTROL RELAY	→	DEVICE
voltage free contact		230 V (supply)		e.g. fan, valve
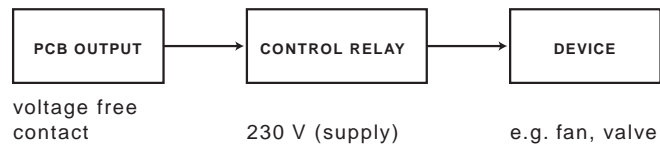
3.4   Checking the Power Supply and Fuses

Overview

The following overview shows the circuits, the voltage and their fuse codes:

Circuit	Wiring code	Type / voltage	Fuse code
main supply	L1+L2+L3+M	3 phases / 200 V AC	F1U+F2U+F3U
control circuit (fans + relays)	L2+M	1 phase / 230 V AC	F7B
control circuit (pcb's)	TR1-prim.	1 phase / 230 V AC	F5B
	TR1-sec.	24 V AC	F6B

3

PCBs

All PCBs are supplied with a 24 V AC voltage. The yellow led on the main board indicates that power is supplied.

Overview fuses and over current EUWA/Y5-10HB

The table below gives an overview of the fuses for each chiller type in the range EUWA/Y5-10HB:

Code	EUWA/Y5HB		EUWA/Y8HB		EUWA/Y10HB	
	W1	T1	W1	T1	W1	T1
F1U, F2U, F3U	20 aM	25 aM	25 aM	63 aM	35 aM	63 aM
F5B	0.45 A	0.45 A	0.5 A	0.5 A	0.5 A	0.55 A
F6B	1 A	1 A	1 A	1 A	1 A	1 A
F7B	6 A	6 A	6 A	6 A	6 A	6 A
K4S	10 A	17 A	18 A	28 A	21 A	34 A

Overview fuses and over current EUWA/Y15-30HC

The table below gives an overview of the fuses for each chiller type in the range EUWA/Y15-30HC:

Code	EUWA/Y15HC		EUWA/Y20HC		EUWA/Y25HC		EUWA/Y30HC	
	W1	T1	W1	T1	W1	T1	W1	T1
F1U, F2U, F3U	40 aM	63 aM	50 aM	80 aM	63 aM	100 aM	80 aM	125 aM
F5B	1 A	1 A	1 A	1 A	1 A	1 A	1 A	1 A
F6B	2 A	2 A	2 A	2 A	2 A	2 A	2 A	2 A
F7B	6 A	6 A	8 A	8 A	8 A	8 A	10 A	10 A
K4S	21 A	34 A	21 A	34 A	21 A	34 A	21 A	34 A
K5S	10 A	17 A	21 A	34 A	21 A	34 A	21 A	34 A
K6S	—	—	—	—	10 A	17 A	21 A	34 A

4   Troubleshooting

4.1   What Is in This Chapter

Introduction   When a problem occurs, you have to check all possible faults. This chapter gives a general idea of where to look for faults. Furthermore the general procedures for refrigeration circuit repair and for electrical circuit repair are explained.

ℹ️   Not all repair procedures are described. Some procedures are considered common practice.

Overview   This chapter covers the following topics:

Topic	See page
4.2 – Items to Be Checked	page 3-20
4.3 – General Repair Procedures	page 3-22
4.4 – Unlocking the Keyboard	page 3-23
4.5 – Procedure for controller Changing (EUWA/Y5-10HB(Z))	page 3-24
4.6 – Procedure for PCB Changing (EUWA/Y15-30HC(Z))	page 3-28
4.7 – Procedure to Set the Carell Controller	page 3-30
4.8 – Control of function of 4 way valve(EUWY5-30HB/C)	page 3-31

4.2 Items to Be Checked

Introduction

In the tables below the most frequent failures and their corrective action are explained. Use these tables when the unit or a circuit does not start.

No malfunction indication

The unit does not start and there is no malfunction indication.

Possible causes	Items to be checked
Power supply problem ■ main supply ■ control system supply ■ PCB supply	■ loose or broken connections ■ blown fuses (due to short circuit) ■ defective transformer.
The unit is not switched on	■ Check the remote start/stop set-up and correct if set-up incorrectly ■ Check the field wiring in case of remote control
One of the timers is still active	Check the timers overview in this manual or in the controller and wait until all timers have elapsed.
The unit is programmed incorrectly.	Check the settings. **i** The compressor step in manual mode control should not be set to 0%.

Malfunction indication

The unit does not start because of a malfunction.

Problem	Possible causes	Items to be checked
Freeze-up	■ water flow too low ■ refrigerant shortage ■ operation out of range ■ defective thermostat control	■ pump operation ■ water flow (blocked valves) ■ flow switch operation ■ operation condition ■ blocked parts in the refrigerant system ■ refrigerant leaks
Overcurrent in the compressor	■ failure on one of the phases ■ low supply voltage ■ motor overload	■ power supply ■ fuses ■ mains isolator switch ■ mains relay contacts ■ operation condition ■ compressor windings ■ current on all 3 phases ■ reset the overcurrent relay

Problem	Possible causes	Items to be checked
High pressure switch	■ water flow too low in heating ■ water temperature too high in heating ■ defective condenser fan operation in cooling ■ dirty or blocked condenser ■ operation out of range	■ pump operation ■ water flow (blocked valves) ■ flow switch operation ■ operation condition outdoor air temperature < 43 °C leaving condenser water < 25 °C ■ state of the condenser (clean)
Flow switch or pump contact	■ damaged flow switch ■ incorrect pump operation ■ incorrect field wiring ■ defective control devices (pump relay)	■ flow switch ■ pump operation ■ field wiring ■ control devices
Discharge thermal protector	■ Refrigerant shortage ■ Operation out of range	■ Refrigerant leak ■ Operation condition
Fan thermal protector	■ Blocked fan ■ Blocked condenser	■ State of the fans (free rotation) ■ State of the condenser
Reverse phase protection	■ Incorrect phase direction ■ One phase missing	■ Swap two phases ■ Connect the loose phase

An overview of the fault indications and safeties is given in 'Overview of Fault Indications and Safeties' on page 3-7.

4.3   General Repair Procedures

Refrigeration circuit repairs

The general procedure for refrigeration circuit repairs is explained below:

Step	Action
1	Recover the refrigerant from the unit. 🔆 It is strictly forbidden to release refrigerant into the atmosphere during service or repair jobs.
2	Perform the repair according to the normal procedure. ↳ There are no special procedures for the replacement of refrigeration parts. We refer to the general DAIKIN air-conditioning service manual for more information on the standard practice of refrigeration works.
3	Pressurize the system. Make sure there are no leaks.
4	Charge with the proper amount of refrigerant.

↳ For more information about the general repair procedures for R-407C, refer to the Service Manual for products using refrigerant R-407C.

⚠ All refrigeration work must be carried out by a licensed refrigeration engineer, and it must comply with all relevant European and national regulations.

Electrical circuit repairs

The general procedure for electrical circuit repairs is explained below:

Step	Action
1	Perform the measurements needed to locate the defective parts of the system.
2	Switch off the main power supply.
3	Check if all capacitor voltages are loaded down.
4	Perform the repair according to standard procedures.
5	Switch on the power supply.
6	Verify the proper operation of the replaced part by measurements.

⚠ All electrical work must be carried out by a licensed electrical engineer, and it must comply with all relevant European and national regulations.

4.4   Unlocking the Keyboard

Locked keyboard   If the keyboard is locked, it is no longer possible to manipulate the controller. The following table explains the manipulation.

When the unit is	the unit stays
off	off.
on	on.

Unlock the keyboard (method 1)   To unlock the keyboard, proceed as follows:

Step	Action
1	Press SEL and PRG simultaneously for 5 seconds.
2	Scroll using ▲ or ▼ to go to 177.
3	Press SEL.
4	Scroll to H9 and change into 1.
5	Press SEL.

Unlock the keyboard (method 2)   A second method to unlock the keyboard is shown in the table below:

Step	Action
1	Press PRG for 5 seconds.
2	Scroll using ▲ or ▼ to go to 22.
3	Press SEL.
4	Scroll to H9 and change into 1.
5	Press SEL.

4.5   Procedure for controller Changing (EUWA/Y5-10HB(Z))

**Changing the
controller**

To change the controller, proceed as follows:

Step	Action
1	Remove the connections of the old controller.
2	Remove the old controller.
3	Place the new controller in the same way as the old controller.
4	Reconnect the controller.

**Entering the factory
menu**

The factory menu is used to set up the identification parameters of the unit according to its controller. To enter the factory menu, proceed as follows:

Step	Action	Result
1	Put on the power supply. ⚠ Make sure that the unit is not working in cooling or heating mode. If so, press ☀ to switch the unit off when heating mode is active and press ❄ to switch the unit off when cooling mode is active.	<table><tr><th>If</th><th>then</th></tr><tr><td>there is no controller installed</td><td>E1, E2 or E3 appears on the screen.</td></tr><tr><td>the controller is installed and correctly wired up</td><td>the temperature of sensor 1 appears.</td></tr></table>
2	Press SEL and PRG simultaneously for 5 seconds.	After 5 seconds, 0 lights up.
3	Scroll using ▲ or ▼ to go to 177.	
4	Press SEL.	You have entered the factory menu. The screen shows /3.

👉 For more information concerning the controller, refer to 'The Controller for the EUWA/Y5-10HB(Z) Chillers' on page 2-15.

Load parameters

When you have entered the factory menu, proceed as follows:

Step	Action	Result
1	Scroll using ▲ or ▼ to go to parameter HC.	
2	Press SEL.	
3	Scroll using ▲ or ▼ to change the value to 01.	
4	Press SEL.	You will see parameter HC.
5	Scroll using ▲ or ▼ to go to parameter H1.	You can start initialization.
6	Press SEL.	

Step	Action	Result
7	Scroll using ▲ or ▼ to change the value to 02 for EUWA5-8-10HB(Z). Scroll using ▲ or ▼ to change the value to 03 for EUWY5-8-10HB.	
8	Press SEL.	You will see parameter H1.
9	Use ▲ or ▼ to go to the other parameters. ↵ For the other parameters, refer to the following tables.	

Table 1 with parameters

The following table shows the settings of the remaining parameters that are not identical for all units:

3

| Name	Function	Parameter	CAREL (default)	EUWA5-10HB	EUWY5-10HB
r3	heating set point	direct	40		30
r4	heating hysteresis	direct	3		3
rC	min. heating set point	factory	-40		25
rD	max.heating set point	factory	90		50
F5	min. temp. for cooling speed	factory	35	17	0
F6	max. temp. for cooling speed	factory	45	19	2
F7	min. temp. for heating speed	factory	35		50
F8	max. temp. for heating speed	factory	30		48
FA	temp. necessary to turn off the fan (heating mode)	factory	40		40
d1	defrost cycle	factory	1		1
d2	time or temp. based defrost	factory	0		1
d3	defrost starting temp.	factory	-5		-10
d4	defrost stopping temp.	factory	20		10
d5	min. time interval for defrost start	factory	10		150
d6	min. duration of defrost cycle	factory	0		10
d7	max. duration of defrost cycle	factory	5		10
d8	time delay between 2 defrost cycles	factory	30		20
dB	antifreeze heaters activated while defrost	factory	0		0
dC	delay before defrosting	factory	0		0
dD	delay after defrosting	factory	0		0
A8	set point for the supporting heater	unit	25		25
A9	heating support-resistance differential	unit	3		3
P9	selection of digital input ID2	factory	0	0	8
H1	unit type	factory	2	2	3

Table 2 with parameters

The following table shows the settings of the remaining parameters that are not identical for all units referring to the optional items ZL and ZH:

Name	Function	Parameter	CAREL (default)	EUWA/Y5-10HB	EUWA5-10HB (option ZL)	EUWA5-10HB (option ZH)
RA	min. cooling set point	factory	-40	7	-7	-2
A1	antifreeze-alarm set point	factory	3	2.5	-11.5	-6.5
A4	antifreeze heater set point	factory	5	4	-10	-5

Table 3 with parameters

The following table shows the settings of the remaining parameters that are identical for all units:

Name	Function	Parameter	CAREL (default)	EUWA/Y5-10HB
/3	air coil water probe type	factory	1	1
/6	offset for /1	factory	0	0
/7	offset for /2	factory	0	0
/8	offset for /3	factory	0	0
/8	digital filter	factory	4	4
/c	input limitation	factory	8	8
/o	measurement unit	user	0	0
R1	cooling set point	direct	12	12
R2	cooling hysteresis	direct	3	3
R6	outlet temperature	direct	-	-
R8	air coil temperature	direct	-	-
RB	max. cooling set point	factory	90	25
c1	min. running time	factory	60	0
c2	guard timer	factory	6	6
c3	anti recycling timer	factory	36	24
c6	time delay at start-up	user	0	0
c7	on delay for pump/compressor	user	20	15
c8	off delay for pump/compressor	user	20	0
c9	running hours of compressor	direct	0	-
cB	maintenance treshold of c9	unit	0	0
cC	running hours of pump	direct	0	-
F1	Are there fans?	factory	0	1
F2	fans functional logic	factory	0	2
F3	min.tension for fan	factory	35	0
F4	max. tension for fan control	factory	75	100
F9	temp. necessary to turn off the fan (cooling mode)	factory	20	20
F8	fans starting time	factory	4	0

Name	Function	Parameter	CAREL (default)	EUWA/Y5-10HB
FC	triac pulse length	factory	2	0
A2	antifreeze-alarm hysteresis	factory	5	5
A3	bypass-time for antifreeze-alarm	factory	0	0
A5	antifreeze-heater differential	factory	1	3
A6	supporting heaters probe	factory	0	0
A7	limit antifreeze-alarm set	factory	- 40	- 15
P1	flow start timer	factory	20	20
P2	flow stop timer	factory	5	5
P3	LP bypass timer	factory	40	60
P4	buzzer on time	user	1	1
P5	reset of alarms	factory	0	0
P8	selection of digital input ID1	factory	0	1
PA	low pressure alarm when the compressor is OFF	factory	0	0
PB	high temperature alarm set	user	90	90
PC	high temperature alarm delayed at start-up	user	30	30
H5	pump functional logic	factory	1	1
H6	cooling/heating input	user	0	0
H7	on/off input	user	0	0
H8	number of terminals	factory	0	0
H9	keyboard lock-up	user	1	1
HA	serial address	user	1	1
HB	infrared remote control password	user	0	1
HC	second set of parameters	factory	0	1
HD	logic inversion cooling/heating	factory	0	1
HE	inversion valve status cooling/heating	factory	0	1
HF	alarm relay state without alarm	factory	1	0
HG	software release version	factory	1.3	1.3
FC	triac pulse length	factory	2	0
A7	limit antifreeze alarm set	factory	-40	-15

To exit the factory menu

When you have changed all parameters, proceed as follows to exit:

Step	Action
1	Press `PRG`.
2	Put off the power supply.

4.6   Procedure for PCB Changing (EUWA/Y15-30HC(Z))

Changing the PCB   To change the PCB, proceed as follows:

Step	Action
1	Remove the connections of the old PCB.
2	Remove the old PCB.
3	Place the new PCB in the same way as the old PCB.
4	Reconnect the PCB.

Entering the factory menu   The factory menu is used to set up the identification parameters of the unit according to its PCB. To enter the factory menu, proceed as follows:

Step	Action	Result
1	Put on the power supply.	After a few seconds, the user terminal will enter the read-out menu. Refer to '☞ Read-out Menu' on page 2-31.
2	Press ⑫ and ⑬ simultaneously for 5 seconds.	The leds above ⑫ and ⑬ light up. (also when you release the buttons)
3	Scroll using ⧖ to go to 1914.	
4	Press ⏎.	You have entered the factory menu.

For more information concerning the controller, refer to 'The EUWA/Y15-30HC(Z) Controller' on page 2-26.

Load defaults   When you have entered the factory menu, proceed as follows:

Step	Action	Action
1	Scroll downwards using ⧖ to go to the next screen.	
2	Press ⏎ 3 times.	The cursor is blinking on И on the load defaults line.
3	Scroll downwards using ⧖ to change И into Ч	
4	Press ⏎.	When Ч becomes И again, all the default values are loaded into the new PCB.
5	Scroll upwards using ⧖ to go to the first screen.	You can start initialization.
6	Press ⏎.	

Initialization   Follow the next screens to insert the settings of the former PCB.

Screen 1   This screen shows the information about the unit type:

Line n°	Display	Description	Default setting	To change the setting:
1	UNIT TYPE	chiller type	EUWA15	1 Use ▲▼ to select the correct type. 2 Press ↵.
2	MANUFACT. NR.	manufacturing number	0000000	1 Use ▲▼ and ↵ to change the digits. 2 Press ↵.
3	REFRIGERANT	refrigerant type	R-134a	1 Use ▲▼ to select the correct refrigerant. 2 Press ↵.

To go to the next screen, scroll downward using ▲▼ and press ↵ once.

3

Screen 2   This screen shows the information about the protection settings:

Line n°	Display	Description	Default setting	To change the setting:
1	MIN. OUTL. WATER	minimum outlet water temperature ⚠ When you enter a lower temperature than 4 °C, make sure that you adapt the glycol quantity in the water.	4 C	1 Use ▲▼ to select the correct temperature. 2 Press ↵.
2	BMS CARD INSTALLED	not available ⚠ Do not change default	N	Press ↵.
3	LOAD DEFAULTS	to change the default settings ⚠ Do not change default	N	Press ↵.

Exit of factory menu   Press a key other than the ⊘ and ⊗ keys.

To end   Turn off the power supply.

4.7   Procedure to Set the Carell Controller

Setting of dipswitch for EUWA/Y5-10HB(Z)

The following picture shows how to set the dipswitch on the back of the controller for EUWA/Y5-10HB(Z):

All dipswitches should be off.
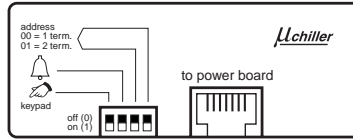
Setting of dipswitch for EUWA/Y15-30HC(Z)

The following picture shows how to set the dipswitch on the back of the controller for EUWA/Y15-30HC(Z):

All dipswitches should be off.
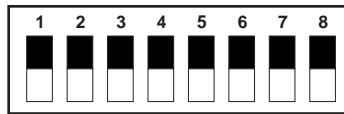
4.8 Control of function of 4 way valve(EUWY5-30HB/C)

Four-way valve The following drawing indicates the main components necessary to execute good troubleshooting:
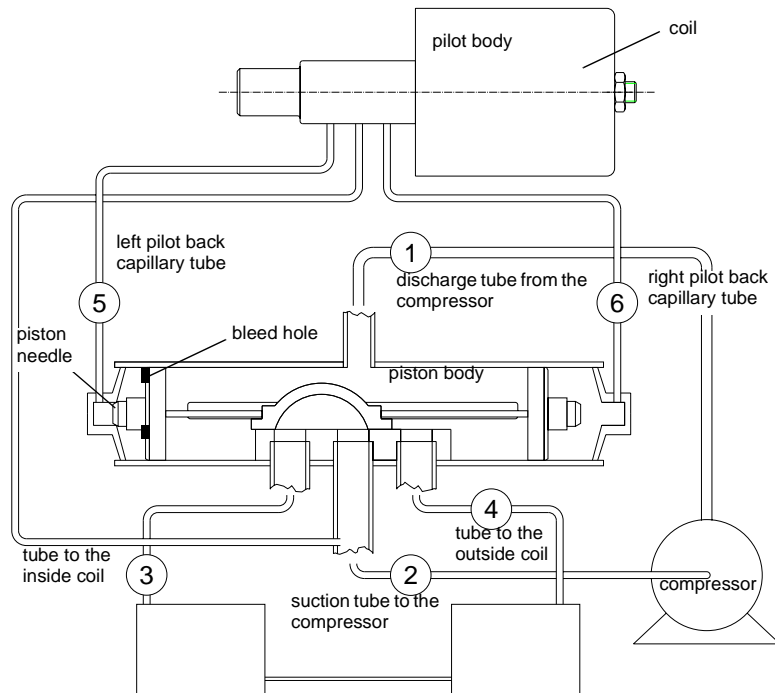
Normal cooling The following table explains the normal condition of the four-way valve in cooling mode:

Discharge tube 1	Suction tube 2	Tube to inside coil 3	Tube to outside coil 4	Left pilot back capillary tube 5	Right pilot front capillary tube 6
Hot	Cool	Cool as in column 2	Hot as in column 1	Temperature of valve body	Temperature of valve body

Normal heating The following table explains the normal condition of the four-way valve in heating mode:

Discharge tube 1	Suction tube 2	Tube to inside coil 3	Tube to outside coil 4	Left pilot back capillary tube 5	Right pilot front capillary tube 6
Hot	Cool	Hot as in column 1	Cool as in column 2	Temperature of valve body	Temperature of valve body

The valve will not shift from cooling to heating

The following list explains what the possible causes could be:

■ Check the electrical circuit. If there is no voltage to the coil, repair it.

■ Check the coil. If it is defective, replace it.

■ Check the refrigerant charge. If the charge is low, repair it and recharge the system. If the pressure differential is too high, re check the system.

■ Check the following operation conditions to find the cause of the malfunction. The numbers in the columns refer to the numbers in the drawing on the previous page:

1	2	3	4	5	6	Description
Hot	Cool	Cool as in column 2	Hot as in column 1	Temperature of valve body	Hot	The pilot valve works correctly. There is dirt in one bleed hole. To resolve: 1 Deenergize the solenoid. 2 Raise the head pressure. 3 Reenergize the solenoid to loosen the dirt. 4 If unsuccessful, remove the valve and wash it out. Check on air before reinstalling. If there is still no movement, replace the valve, add a new strainer to the discharge tube and mount the valve horizontally.
						The piston cup head leaks. To resolve: 1 Stop the unit. 2 After pressure equalization, restart with energized solenoid. 3 If the valve shifts, reattempt with the compressor on. If there is no reversal, replace the valve.
Hot	Cool	Cool as in column 2	Hot as in column 1	Temperature of valve body	Temperature of valve body	The pilot tubes are clogged. To resolve: 1 Raise the head pressure. 2 Operate the solenoid to free the dirt. 3 If there is still no shift, replace the valve.
Hot	Cool	Cool as in column 2	Hot as in column 1	Hot	Hot	Both parts of pilot are still open. To resolve: 1 Raise the head pressure. 2 Operate the solenoid to free the partially clogged port. 3 If there is still no shift, replace the valve.
Warm	Cool	Cool as in column 2	Hot as in column 1	Temperature of valve body	Warm	The compressor is defective.

The valve starts to shift but does not complete the reversal

The following list explains what the possible causes could be. The numbers in the columns refer to the numbers in the drawing: page 3-31:

1	2	3	4	5	6	Description
Hot	Warm	Warm	Warm	Temperature of valve body	Hot	There is not enough pressure differential at start of stroke or not enough flow to maintain the pressure differential. To resolve: **1** Check the unit for correct operating pressure and charge. **2** Raise the head pressure. **3** If there is still no shift, replace the valve.
						There is body damage. Replace the valve.
Hot	Warm	Warm	Hot	Hot	Hot	Both parts of pilot are still open. To resolve: **1** Raise the head pressure. **2** Operate the solenoid to free the partially clogged port. **3** If there is still no shift, replace the valve.
Hot	Hot	Hot	Hot	Temperature of valve body	Hot	There is body damage. Replace the valve.
						The valve hung up at mid-stroke. The pumping volume of the compressor is not sufficient to maintain the reversal. To resolve: **1** Raise the head pressure. **2** Operate the solenoid. **3** If there is still no shift, replace the valve.
Hot	Hot	Hot	Hot	Hot	Hot	Both parts of pilot are still open. To resolve: **1** Raise the head pressure. **2** Operate the solenoid to the free partially clogged port. **3** If there is still no shift, replace the valve.

3

The valve will not shift from heating to cooling

The following list explains what the possible causes could be. The numbers in the columns refer to the numbers in the drawing: page 3-31:

1	2	3	4	5	6	Description
Hot	Cool	Hot as in column 1	Cool as in column 1	Temperature of valve body	Temperature of valve body	The pressure differential is too high. To resolve: **1** Raise the head pressure. The valve will reverse during pressure equalization period. **2** Recheck the system.
						The pilot tubes are clogged. To resolve: **1** Raise the head pressure. **2** Operate the solenoid to free the dirt. **3** If there is still no shift, replace the valve.
Hot	Cool	Hot as in column 1	Cool as in column 1	Hot	Temperature of valve body	There is dirt in one bleed hole. To resolve: **1** Raise the head pressure. **2** Operate the solenoid. **3** If unsuccessful, remove the valve and wash it out. Check on air before reinstalling. If there is still no movement, replace the valve, add a new strainer to the discharge tube and mount the valve horizontally.
Hot	Cool	Hot as in column 1	Cool as in column 1	Hot	temperature of valve body	The piston cup head leaks. To resolve: **1** Stop the unit. **2** After pressure equalization, restart with the solenoid deenergized. **3** If the valve shifts, reattempt with the compressor on. If there is no reversal, replace the valve.
Hot	Cool	Hot as in column 1	Cool as in column 1	Hot	Hot	The pilot is defective, replace the valve.
Warm	Cool	Warm as in column 1	Cool as in column 1	Warm	Temperature of valve body	The compressor is defective.

Leak when heating mode

The following list explains what the possible causes could be. The numbers in the columns refer to the numbers in the drawing: page 3-31:

1	2	3	4	5	6	Description
Hot	Cool	Hot as in column 1	Cool as in column 1	Temperature of valve body	Warmer than valve body	At the end of the slide, the piston needle is leaking. To resolve: **1** Operate the valve several times. **2** Recheck. **3** If there is an excessive leak, replace the valve.
Hot	Cool	Hot as in column 1	Cool as in column 1	Warmer than valve body	Warmer than valve body	The piston needle and pilot needle are leaking. To resolve: **1** Operate the valve several times. **2** Recheck. **3** If there is an excessive leak, replace the valve.

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Part 4
Commissioning and Test Run

Introduction   Commissioning and test run are well known practices in service engineering. This part offers a systematic approach to test run checks and test value, which will guarantee a high quality installation and operation of the units. It is, therefore, recommended to read the chapters in this part with particular attention.

What is in this part?   This parts contains the following chapters:

Topic	See page
1 – Pre-Test Run Checks	page 4-3
2 – Test Run & Operation Data	page 4-9

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4

1   Pre-Test Run Checks

1.1   What Is in This Chapter

Introduction   As shown in the table below, we have grouped the pre-test run checks into three main groups to facilitate the servicing.

Overview   This chapter covers the following topics:

Topic	See page
1.2 – General Checks	page 4-4
1.3 – Water Piping Checks	page 4-5
1.4 – Electrical Checks	page 4-7

1.2   General Checks

Checklist   A checklist of general checks is given below:

	Check if …
1	there is external damage.
2	the unit is well supported and/or if the foundation is properly done.
3	the unit should be installed horizontally with a deviation of maximum 1°.
4	anti-vibration pads are required.
5	there is a drain possibility for the condensed water. (Only for EUWY5-30HB/C)
6	it is necessary to place a heatertape inside the drain system to prevent ice accumulation and possible drain blockage during wintertime.
7	no metal dust or burrs remain after grinding or drilling in the metal construction parts during the installation. This facilitates the rust process and thus shortens the unit's lifetime.
8	the operator has received the operation manual.
9	the installer has received the installation manual.
10	the air volume over the coil is adequate; no blockage (from paper, plastic,...) or air short circuit due to wrong positioning.

1.3   Water Piping Checks

Checklist   A checklist of water piping checks is given below:

	Check if …
1	the water volume is within the limits.
2	there is adequate water flow.
3	the water quality meets the standards.
4	the water piping is properly insulated.
5	measurement points for temperature and pressure are available on the water circuit.
6	the flow switch and pump are properly working.
7	air purge points are installed on the high parts of the water piping.
8	drain taps are installed at the low points of the water piping.
9	other parts of the water circuit are properly mounted and installed (e.g. buffer tank, expansion tank,...)
10	vibration compensators are mounted at the water connections when the unit is positioned on anti-vibration pads.

Water volume, flow and pressure

To assure proper operation of the unit, the water volume and flow must be within the operation range as specified in the following table:

Chiller type	**Minimum water volume**	**Minimum water flow**	**Maximum water flow**
EUWA/Y5HB	343 /a l [1]	17 l/min	75 l/min
EUWA/Y8HB	514 /a l	30 l/min	120 l/min
EUWA/Y10HB	729 /a l	40 l/min	145 l/min
EUWA/Y15HC	730 /a l	60 l/min	220 l/min
EUWA/Y20HC	730 /a l	80 l/min	290 l/min
EUWA/Y25HC	1050 /a l	100 l/min	370 l/min
EUWA/Y30HC	1450 /a l	120 l/min	440 l/min

[1]: a is the steplength. Refer to 'Thermostat Control' on page 2-11.

⚠️   The water pressure should not exceed the maximum working pressure of 10 bar.

Calculation of the minimum water volume	The following calculation method is based on the fact that the water volume in a chiller should be large enough to prevent the compressor from excessive cycling. Sufficient water volume will give a certain inertia to the system so that water (or glycol) temperature does not drop too fast when the unit turns on and that the temperature does not rise too fast when the unit turns off.

$$V = \frac{0,5 \times Q \times t}{2 \times \rho \times d \times C_w} \quad [m^3]$$

with:

V: Required system volume [m³]

Q: Cooling capacity at the lowest capacity step of each chiller in the system [W]

t: Minimum cycling time allowed by the compressor [s] (default = 600 s)

ρ: Specific mass of the fluid [kg/m³] (default ρ_{water} = 1000 kg/m³)

d: Thermostat step difference [K] (default = 0.2 K for outlet water control and 0.5 K for inlet water control)

C_w: Specific heat capacity of the fluid [J/kgK] (default $C_{w, water}$ = 4186 J/kgK).

Water quality   In the table below you will find the required water quality specifications:

		Evaporator water		Heated water (low temperature)		Tendency if out of criteria
		Circulating water (< 20 °C)	supply water	Circulating water (20 °C-60 °C)	supply water	
Items to be controlled						
pH	at 25 °C	6.8~8.0	6.8~8.0	7.0~8.0	7.0~8.0	corrosion + scale
Electrical conductivity	mS/m (at 25 °C)	< 40	< 30	< 30	< 30	corrosion + scale
Chloride ion	mg Cl⁻/l	< 50	< 50	< 50	< 50	corrosion
Sulphate ion	mg SO₄²⁻/l	< 50	< 50	< 50	< 50	corrosion
M-alkalinity (pH 4.8)	mg CaCO₃/l	< 50	< 50	< 50	< 50	scale
Total hardness	mg CaCO₃/l	< 70	< 70	< 70	< 70	scale
Calcium hardness	mg CaCO₃/l	< 50	< 50	< 50	< 50	scale
Silica ion	mg SiO₂/l	< 30	< 30	< 30	< 30	scale
Items to be referred to						
Iron	mg Fe/l	< 1.0	< 0.3	< 1.0	< 0.3	corrosion + scale
Copper	mg Cu/l	< 1.0	< 0.1	< 1.0	< 0.1	corrosion
Sulphide ion	mg S²⁻/l	not detectable	not detectable	not detectable	not detectable	corrosion
Ammonium ion	mg NH₄⁺/l	< 1.0	< 0.1	< 0.3	< 0.1	corrosion
Remaining chloride	mg Cl/l	< 0.3	< 0.3	< 0.25	< 0.3	corrosion
Free carbide	mg CO₂/l	< 4.0	< 4.0	< 0.4	< 4.0	corrosion
Stability index		–	–	–	–	corrosion + scale

1.4   Electrical Checks

Checklist   A checklist of electrical checks is given below:

	Check if …
1	main fuses, earth leak detector and main isolator are installed.
2	the main power supply voltage deviates less than 10% from the nominal value.
3	the flow switch and pump contact are properly wired up.
4	the optional wiring for pump control is installed.
5	the optional wiring for remote start/stop is installed. Make sure that the controller is programmed correctly.
6	the optional wiring for remote cool/heat is installed. Make sure that the controller is programmed correctly.
7	the heater tape for the drain system (field supply) is powered up via a separate power supply.

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2   Test Run & Operation Data

Introduction

The following tables give an overview of the measurements that you can do. Use it as a guideline during commissioning.

For the location of the measurement points we refer to the piping and wiring diagrams in Part 1.

Pressures

Measurement	Value
Suction pressure	Cooling: 4 – 8.5 bar Heating: 1 – 5 bar
Discharge pressure	Cooling: 7 – 22 bar Heating: 15 – 24 bar
Maximum water pressure	10 bar

Temperatures

Measurement	Value
Leaving water temperature	Cooling: 4 – 20 °C Heating: 35 –55 °C
Outdoor temperature	EUWA: 0 – 43 °C EUWY: 15 – 43 °C
Temperature difference air side	10 – 15 °C
Temperature difference water side	3 – 8 °C
Discharge temperature	80 – 120 °C

Voltages

Measurement	Value
Power supply voltage	Within ± 10% of the rated voltage
Phase unbalanced	Within ± 2% of the rated voltage
Control circuit voltage	230 VAC for main electromagnetic switches 24 VDC for the controllers

Currents

Unit	Nominal current	Maximum current	Fuses
EUWA/Y5HB	8 A	12.5 A	3x20 aM
EUWA/Y8HB	13.2 A	21.5 A	3x25 aM
EUWA/Y10HB	16 A	24.5 A	3x32 aM
EUWA/Y15HC	23 A	36 A	3x40 aM
EUWA/Y20HC	31 A	48 A	3x50 aM
EUWA/Y25HC	38 A	59.5 A	3x63 aM
EUWA/Y30HC	46 A	71.5 A	3x80 aM

Part 5
Maintenance

Periodical checks or actions

The following table gives a list of periodical checks and actions in order to execute a good maintenance.

Inspection checks and actions	Remarks
Verify if the cross-fin coil is not blocked. If so, clean with low pressure tap water.	A dirty cross-fin coil results in a capacity decrease.
Verify the system for tightness. Make sure that all joints are properly connected.	-
Check the function of the flow switch.	If the flow switch is not able to operate, the evaporator can freeze up.
Conduct an inspection to make sure that there is no air mixed in the water pipes.	Even if air is removed at the beginning, air can sometimes enter later. Therefore, bleed the system regularly.
Check the tightness of the electrical connections and the switch box.	Bad contact can cause sparks in the switch box.
Check the operation of all the safety devices.	No operation can cause damage of the unit.
Verify the operation of the crankcase heater.	No operation can cause damage of the compressor when the ambient temperature reaches a low temperature. ⚠ The crankcase heater must always operate when the compressor is off.
Verify the operation of the heater tape, if installed.	No operation can freeze up the evaporator when the ambient temperature is below 0 °C.
Verify the water filter.	

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Index

This index is set up in three columns. In the first column you will find references to the item in general. In the second column you will find references to the EUWA/Y5-10HB chiller type and in the third column to the EUWA/Y15-30HC chiller type.

General index   EUWA/Y5-10H(Z) EUWA/Y15-30H(Z)

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E

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General index   EUWA/Y5-10H(Z) EUWA/Y15-30H(Z)

General index   EUWA/Y5-10H(Z) EUWA/Y15-30H(Z)