ESIE11-02

Service Manual

EUWA*5-24KBZW1 R-407C
EUWY*5-24KBZW1 R-407C

Small air-cooled chillers and heat pump

www.daikineurope.com

Table of Contents

1 Introduction

Part 1
System Outline

1 General Outline

2 Piping Layout

3 Wiring Layout

Part 2
Functional Description

1 Functional Description

2 The Digital Controller

Part 3 Troubleshooting

1 Inputs and Outputs Overview

2 Malfunction Indications and Safeties Overview

3 Checking the Inputs and Outputs

4 Troubleshooting

Part 4
Commissioning and Test Run

1 Pre-Test Run Checks

2 Test Run and Operation Data

Part 5 Maintenance

1 Maintenance

1 Introduction

1.1 About This Manual

Target group

This service manual is intended for and should only be used by qualified engineers.

Purpose of this manual

This service manual contains all the information you need to carry out the necessary repair and maintenance tasks for the EUWA*5-24KBZW1 and EUWY*5-24KBZW1.

EUWA*5-24KBZW1

The Daikin EUWA*5-24KBZW1 air-cooled water chillers:

- Are designed for outdoor installation.
- Are used for cooling applications.
- Are available in seven standard sizes with nominal cooling capacities ranging from 11.3 kW to 55.3 kW.
- have three types of units:
  EUWAN5-24KBZW1 = without hydraulic module, naked model
  EUWAP5-24KBZW1 = with hydraulic module: pump and expansion vessel
  EUWAB5-24KBZW1 = with hydraulic module: buffer tank, pump and expansion vessel.

EUWY*5-24KBZW1

The Daikin EUWY*5-24KBZW1 heat pump water chillers:

- Are designed for outdoor installation.
- Are used for cooling and heating applications.
- Are available in seven standard sizes with nominal cooling capacities ranging from 9.1 kW to 50 kW and heating from 11.9 kW to 54 kW.
- have three types of units:
  EUWYN5-24KBZW1 = without hydraulic module, naked model
  EUWYP5-24KBZW1 = with hydraulic module: pump and expansion vessel
  EUWYB5-24KBZW1 = with hydraulic module: buffer tank, pump and expansion vessel.

Before starting up the unit

Before starting up the unit for the first time, make sure it has been properly installed. See "Pre-Test Run Checks" on page 4–3.

Part 1
System Outline

Introduction

This part contains an outline of all the relevant elements in the EUWA*5-24KBZW1 and EUWY*5-24KBZW1 installation.

What is in this part?

This part contains the following chapters:

1 General Outline

1.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

- Technical specifications
- Electrical specifications
- Installation outline of a typical installation
- Outlook drawings: Outlook, dimensions, installation and service space.

Overview

This chapter contains the following topics:

1

1.2 Technical Specifications: EUWA*5-8KBZW1

Technical specifications The table below contains the technical specifications.

Model	EUWAN5KBZW1	EUWAP5KBZW1	EUWAB5KBZW1	EUWAN8KBZW1	EUWAP8KBZW1	EUWAB8KBZW1
Nominal cooling capacity	11.3 kW			17.9 kW		
Nominal input	4.52 kW	4.64 kW		7.38 kW	7.39 kW	
Capacity steps	0-100%			0-100%		
Compressor						
Type	Hermetically sealed scroll			Hermetically sealed scroll		
Speed	2900 rpm			2900 rpm		
Crankcase heater	33 W			50 W		
No. x model (W1)	1 x JT140BF-YE			1 x JT212DA-YE		
Evaporator						
Type	Brased plate-heat exchanger			Brased plate-heat exchanger		
No. x model	1 x AC70X-24HX			1 x AC70X-34HX		
Min.water volume in the system (1)	54 l			85 l		
Water flow rate	Min.: 16 l/min Max.: 65 l/min			Min.: 26 l/min Max.: 102 l/min		
Nominal water flow	32 l/min			51 l/min		
Nom. water pressure drop	24 kPa			38 kPa		
Insulation material	Climaflex					
Condenser						
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins					
Rows x stages x fin pitch	2 x 40 x 2.0 mm					
Face area	1.570 m²					
Nominal air flow	160 m³/min			170 m³/min		
Discharge	Vertical					
Fan type	Direct drive					
No. of fans	2					
No. of motors x output	2 x 140 kW			1 x 190 kW and 1 x 230 kW		
Piping connections						
Evap. water in/outlet	FBSP 1-1/4”			FBSP 1-1/4”		
Refrigerant circuit						
Refrigerant type	R-407C					
Refrigerant charge	3.9 kg			4.6 kg		
Refrigerant control	Thermostatic expansion valve					
Oil type	Idemitsu FVC 68D					
Oil charge volume	1.5 l			2.7 l		

1

Model	EUWAN5KBZW1	EUWAP5KBZW1	EUWAB5KBZW1	EUWAN8KBZW1	EUWAP8KBZW1	EUWAB8KBZW1
No. of circuits	1					
Pump						
No. x type	—	1 x Horizontal multi-stage end-suction		—	1 x Horizontal multi-stage end-suction	
Model	—	CM3-3		CM3-3		
Nominal static height pump	—	239 kPa		198 kPa		
Nominal static height unit	—	209 kPa		128 kPa		
Hydraulic components						
Buffer tank	—		55 l	—		55 l
Unit water volume	2 l	3 l	59 l	3 l	3 l	59 l
Expansion vessel	—	12 l		—	12 l	
Pre-pressure expansion vessel	1.5 bar			1.5 bar		
Safety valve	—	3 bar		—	3 bar	
Dimensions (h x w x d)	1230 x 1290 x 734 mm			1230 x 1290 x 734 mm		
Weight						
Machine weight	150 kg	168 kg	180 kg	215 kg	229 kg	241 kg
Operation weight	152 kg	171 kg	239 kg	218 kg	232 kg	300 kg
Casing						
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044					
Material	Polyester coated galvanised steel plate					
Sound power level (2)	67 dBA			76 dBA		
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ 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 ■ Flow switch.					

(1): The table below contains the minimum water volume settings.

Setting	EUWA*5-8KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers a leaving evaporator water temperature from 5°C (-5°C/-10°C for ZH/ZL option) to 20°C (pull down condition to 25°C).

1

1.3 Technical Specifications: EUWA*10-12KBZW1

Technical specifications

The table below contains the technical specifications.

Model	EUWAN10KBZW1	EUWAP10KBZW1	EUWAB10KBZW1	EUWAN12KBZW1	EUWAP12KBZW1	EUWAB12KBZW1
Nominal cooling capacity	22.5 kW			26.5 kW		
Nominal input	8.79 kW	8.74 kW		11.5 kW		
Capacity steps	0-100%					
Compressor						
Type	Hermetically sealed scroll					
Speed	2900 rpm					
Crankcase heater	50 W					
No. x model (W1)	1 x JT265DA-YE			1 x JT335DA-YE		
Evaporator						
Type	Brased plate-heat exchanger					
No. x model	1 x AC70X-40HX			1 x AC70X-50HX		
Min.water volume in the system (1)	108 l			126 l		
Water flow rate	Min.: 32 l/min Max.: 129 l/min			Min.: 38 l/min Max.: 152 l/min		
Nominal water flow	64 l/min			76 l/min		
Nom. water pressure drop	43 kPa			37 kPa		
Insulation material	Climaflex					
Condenser						
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins					
Rows x stages x fin pitch	2 x 50 x 2.0 mm					
Face area	1.970 m²					
Nominal air flow	170 m³/min					
Discharge	Vertical					
Fan type	Direct drive					
No. of fans	2					
No. of motors x output	1 x 190 kW and 1 x 230 kW			1 x 190 kW and 1 x 230 kW		
Piping connections						
Evap. water in/outlet	FBSP 1-1/4”					
Refrigerant circuit						
Refrigerant type	R-407C					
Refrigerant charge	4.6 kg			6.0 kg		
Refrigerant control	Thermostatic expansion valve					

Model	EUWAN10KBZW1	EUWAP10KBZW1	EUWAB10KBZW1	EUWAN12KBZW1	EUWAP12KBZW1	EUWAB12KBZW1
Oil type	Idemitsu FVC 68D					
Oil charge volume	2.7 l					
No. of circuits	1					
Pump						
No. x type	—	1 x Horizontal multi-stage end-suction		—	1 x Horizontal multi-stage end-suction	
Model	—	CM5-3		—	CM5-3	
Nominal static height pump	—	232 kPa		—	217 kPa	
Nominal static height unit	—	138 kPa		—	105 kPa	
Hydraulic components						
Buffer tank	—		55 l	—		55 l
Unit water volume	3 l	3 l	59 l	3 l	4 l	60 l
Expansion vessel	—	12 l		—	12 l	
Pre-pressure expansion vessel	1.5 bar			1.5 bar		
Safety valve	—	3 bar		—	3 bar	
Dimensions (h x w x d)	1450 x 1290 x 734 mm					
Weight						
Machine weight	245 kg	259 kg	271 kg	248 kg	262 kg	274 kg
Operation weight	248 kg	262 kg	330 kg	251 kg	265 kg	335 kg
Casing						
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044					
Material	Polyester coated galvanised steel plate					
Sound power level (2)	78 dBA					
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ 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 ■ Flow switch.					

(1): The table below contains the minimum water volume settings.

Setting	EUWA*10-12KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

1

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers a leaving evaporator water temperature from 5°C (-5°C/-10°C for ZH/ZL option) to 20°C (pull down condition to 25°C).

1.4 Technical Specifications: EUWA*16-20KBZW1

Technical specifications The table below contains the technical specifications.

Model	EUWAN16KBZW1	EUWAP16KBZW1	EUWAB16KBZW1	EUWAN20KBZW1	EUWAP20KBZW1	EUWAB20KBZW1
Nominal cooling capacity	37.0 kW			46.6 kW		
Nominal input	15.2 kW	15.0 kW		18.1 kW	17.9 kW	
Capacity steps	0%-50%-100%					
Compressor						
Type	Hermetically sealed scroll					
Speed	2900 rpm					
Crankcase heater	50 W					
No. x model (W1)	2 x JT212DA-YE			2 x JT265DA-YE		
Evaporator						
Type	Brased plate-heat exchanger					
No. x model	1 x AC230X-38HX			1 x AC230X-50HX		
Min.water volume in the system (1)	88 l			111 l		
Water flow rate	Min.: 53 l/min Max.: 212 l/min			Min.: 67 l/min Max.: 267 l/min		
Nominal water flow	106 l/min			134 l/min		
Nom. water pressure drop	22 kPa					
Insulation material	Climaflex					
Condenser						
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins					
Rows x stages x fin pitch	2 x 40 x 2 mm			2 x 50 x 2 mm		
Face area	2 x 1.570 m²			2 x 1.970 m²		
Nominal air flow	2 x 170 m³/min					
Discharge	Vertical					
Fan type	Direct drive					
No. of fans	4					
No. of motors x output	2 x 190 kW + 2 x 230 kW					
Piping connections						
Evap. water in/outlet	FBSP 2”					
Refrigerant circuit						
Refrigerant type	R-407C					
Refrigerant charge	2 x 4.6 kg			—	2 x 5.9 kg	—
Refrigerant control	Thermostatic expansion valve					
Oil type	Idemitsu FVC 68D					

1

Model	EUWAN16KBZW1	EUWAP16KBZW1	EUWAB16KBZW1	EUWAN20KBZW1	EUWAP20KBZW1	EUWAB20KBZW1
Pump						
No. x type	—	1 x Horizontal multi-stage end-suction		—	1 x Horizontal multi-stage end-suction	
Model	—	CM10-2		—	CM10-2	
Nominal static height pump	—	302 kPa		—	288 kPa	
Nominal static height unit	—	240 kPa		—	195 kPa	
Hydraulic components						
Buffer tank	—		55 l	—		55 l
Unit water volume	6 l	9 l	65 l	6 l	10 l	66 l
Expansion vessel	—	12 l		—	12 l	
Pre-pressure expansion vessel	1.5 bar					
Safety valve	—	3 bar		—	3 bar	
Dimensions (h x w x d)	1321 x 2580 x 734 mm			1541 x 2580 x 734 mm		
Weight						
Machine weight	430 kg	448 kg	460 kg	490 kg	508 kg	520 kg
Operation weight	436 kg	457 kg	525 kg	496 kg	518 kg	586 kg
Casing						
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044					
Material	Polyester coated galvanised steel plate					
Sound power level [2]	79 dBA			81 dBA		
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ Discharge temperature protection ■ 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 ■ Flow switch.					

[1]: The table below contains the minimum water volume settings.

Setting	EUWA*16-20KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

[2]: The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers a leaving evaporator water temperature from 5°C (-5°C/-10°C for ZH/ZL option) to 20°C (pull down condition to 25°C).

1

1.5 Technical Specifications: EUWA*24KBZW1

Technical specifications

The table below contains the technical specifications.

Model	EUWAN24KBZW1	EUWAP24KBZW1	EUWAB24KBZW1
Nominal cooling capacity	55.3 kW		
Nominal input	24.0 kW	24.0 kW	
Capacity steps	0%-50%-100%		
Compressor			
Type	Hermetically sealed scroll		
Speed	2900 rpm		
Crankcase heater	50 W		
No. x model (W1)	2 x JT335DA-YE		
Evaporator			
Type	Brased plate-heat exchanger		
No. x model	1 x AC230X-58HX		
Min.water volume in the system (1)	132 l		
Water flow rate	Min.: 79 l/min Max.: 317 l/min		
Nominal water flow	158 l/min		
Nom. water pressure drop	22 kPa		
Insulation material	Climaflex		
Condenser			
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins		
Rows x stages x fin pitch	2 x 50 x 2 mm		
Face area	2 x 1.970 m²		
Nominal air flow	2 x 170 m³/min		
Discharge	Vertical		
Fan type	Direct drive		
No. of fans	4		
No. of motors x output	2 x 190 kW + 2 x 230 kW		
Piping connections			
Evap. water in/outlet	FBSP 2”		
Refrigerant circuit			
Refrigerant type	R-407C		
Refrigerant charge	2 x 6.0 kg		
Refrigerant control	Thermostatic expansion valve		
Oil type	Idemitsu FVC 68D		

Model	EUWAN24KBZW1	EUWAP24KBZW1	EUWAB24KBZW1
Pump			
No. x type	—	1 x Horizontal multi-stage end-suction	
Model	—	CM10-2	
Nominal static height pump	—	276 kPa	
Nominal static height unit	—	158 kPa	
Hydraulic components			
Buffer tank	—		55 l
Unit water volume	7 l	10 l	66 l
Expansion vessel	—	12 l	
Pre-pressure expansion vessel	1.5 bar		
Safety valve	—	3 bar	
Dimensions (h x w x d)	1541 x 2580 x 734 mm		
Weight			
Machine weight	496 kg	514 kg	526 kg
Operation weight	503 kg	524 kg	592 kg
Casing			
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044		
Material	Polyester coated galvanised steel plate		
Sound power level (2)	81 dBA		
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ Discharge temperature protection ■ 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 ■ Flow switch.		

(1): The table below contains the minimum water volume settings.

Setting	EUWA*24KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers a leaving evaporator water temperature from 5°C (-5°C/-10°C for ZH/ZL option) to 20°C (pull down condition to 25°C).

1.6 Technical Specifications: EUWY*5-8KBZW1

Technical specifications The table below contains the technical specifications.

Model	EUWYN5KBZW1	EUWYP5KBZW1	EUWYB5KBZW1	EUWYN8KBZW1	EUWYP8KBZW1	EUWYB8KBZW1
Nominal capacity	Cooling: 9.1 kW Heating: 11.9 kW			Cooling: 17.1 kW Heating: 18.5 kW		
Nominal input	Cooling: 3.78 kW Heating: 4.59 kW			Cooling: 7.45 kW Heating: 7.10 kW	Cooling: 7.46 kW Heating: 7.10 kW	
Capacity steps	0-100%					
Compressor						
Type	Hermetically sealed scroll					
Speed	2900 rpm					
Crankcase heater	33 W			50 W		
No. x model (W1)	1 x JT140BF-YE			1 x JT212DA-YE		
Evaporator						
Type	Brased plate-heat exchanger					
No. x model	1 x AC70X-34HX			1 x AC70X-40HX		
Min.water volume in the system (1)	43 l			82 l		
Water flow rate	Min.: 21 l/min Max.: 68 l/min			Min.: 31 l/min Max.: 106 l/min		
Nominal water flow	Cooling: 26 l/min Heating: 34 l/min			Cooling: 49 l/min Heating: 53 l/min		
Nom. water pressure drop	Cooling: 10 kPa Heating: 17 kPa			Cooling: 25 kPa Heating: 29 kPa		
Insulation material	Climaflex					
Condenser						
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins					
Rows x stages x fin pitch	2 x 40 x 2					
Face area	1.570 m²					
Nominal air flow	160 m³/min			170 m³/min		
Discharge	Vertical					
Fan type	Direct drive					
No. of fans	2					
No. of motors x output	2 x 140 kW			1 x 190 kW and 1 x 230 kW		
Piping connections						
Evap. water in/outlet	FBSP 1-1/4”					
Refrigerant circuit						
Refrigerant type	R-407C					
Refrigerant charge	4.6 kg			4.7 kg		
Refrigerant control	Thermostatic expansion valve					
Oil type	Idemitsu FVC 68D					

1

Model	EUWYN5KBZW1	EUWYP5KBZW1	EUWYB5KBZW1	EUWYN8KBZW1	EUWYP8KBZW1	EUWYB8KBZW1
Oil charge volume	1.5 l			2.7 l		
No. of circuits	1					
Pump						
No. x type	—	1 x Horizontal multi-stage end-suction		—	1 x Horizontal multi-stage end-suction	
Model	—	CM3-3		—	CM3-3	
Nominal static height pump	—	249 kPa		—	203 kPa	
Nominal static height unit	—	232 kPa		—	149 kPa	
Hydraulic components						
Buffer tank	—		55 l	—		55 l
Unit water volume	2 l	3 l	59 l	3 l	3 l	59 l
Expansion vessel	—	12 l		—	12 l	
Pre-pressure expansion vessel	1.5 bar			1.5 bar		
Safety valve	—	3 bar		—	3 bar	
Dimensions (h x w x d)	1230 x 1290 x 734 mm					
Weight						
Machine weight	163 kg	181 kg	193 kg	227 kg	241 kg	253 kg
Operation weight	165 kg	184 kg	252 kg	230 kg	244 kg	312 kg
Casing						
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044					
Material	Polyester coated galvanised steel plate					
Sound power level (2)	67 dBA			76 dBA		
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ 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 ■ Flow switch.					

(1): The table below contains the minimum water volume settings.

Setting	EUWY*5-8KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1

1.7 Technical Specifications: EUWY*10-12KBZW1

Technical specifications

The table below contains the technical specifications.

Model	EUWYN10KBZW1	EUWYP10KBZW1	EUWYB10KBZW1	EUWYN12KBZW1	EUWYP12KBZW1	EUWYB12KBZW1
Nominal capacity	Cooling: 21.0 kW Heating: 24.0 kW			Cooling: 25.0 kW Heating: 27.0 kW		
Nominal input	Cooling: 8.57 kW Heating: 9.10 kW			Cooling: 11.4 kW Heating: 10.8 kW		
Capacity steps	0-100%					
Compressor						
Type	Hermetically sealed scroll					
Speed	2900 rpm					
Crankcase heater	50 W					
No. x model (W1)	1 x JT265DA-YE			1 x JT335DA-YE		
Evaporator						
Type	Brased plate-heat exchanger					
No. x model	1 x AC70X-50HX					
Min.water volume in the system (1)	100 l			119 l		
Water flow rate	Min.: 38 l/min Max.: 137 l/min			Min.: 45 l/min Max.: 155 l/min		
Nominal water flow	Cooling: 60 l/min Heating: 69 l/min			Cooling: 72 l/min Heating: 77 l/min		
Nom. water pressure drop	Cooling: 24 kPa Heating: 31 kPa			Cooling: 33 kPa Heating: 38 kPa		
Insulation material	Climaflex					
Condenser						
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins					
Rows x stages x fin pitch	2 x 50 x 2					
Face area	1.970 m²					
Nominal air flow	170 m³/min					
Discharge	Vertical					
Fan type	Direct drive					
No. of fans	2					
No. of motors x output	1 x 190 kW and 1 x 230 kW					
Piping connections						
Evap. water in/outlet	FBSP 1-1/4”					
Refrigerant circuit						
Refrigerant type	R-407C					
Refrigerant charge	5.4 kg					
Refrigerant control	Thermostatic expansion valve					
Oil type	Idemitsu FVC 68D					

Model	EUWYN10KBZW1	EUWYP10KBZW1	EUWYB10KBZW1	EUWYN12KBZW1	EUWYP12KBZW1	EUWYB12KBZW1
Oil charge volume	2.7 l					
No. of circuits	1					
Pump						
No. x type	—	1 x Horizontal multi-stage end-suction		—	1 x Horizontal multi-stage end-suction	
Model	—	CM5-3		—	CM5-3	
Nominal static height pump	—	237 kPa		—	223 kPa	
Nominal static height unit	—	167 kPa		—	123 kPa	
Hydraulic components						
Buffer tank	—		55 l	—		55 l
Unit water volume	3 l	3 l	59 l	3 l	3 l	59 l
Expansion vessel	—	12 l		—	12 l	
Pre-pressure expansion vessel	1.5 bar			1.5 bar		
Safety valve	—	3 bar		—	3 bar	
Dimensions (h x w x d)	1450 x 1290 x 734 mm					
Weight						
Machine weight	258 kg	272 kg	284 kg	258 kg	272 kg	284 kg
Operation weight	261 kg	275 kg	343 kg	261 kg	275 kg	343 kg
Casing						
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044					
Material	Polyester coated galvanised steel plate					
Sound power level (2)	78 dBA					
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ 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 ■ Flow switch.					

(1): The table below contains the minimum water volume settings.

Setting	EUWY*10-12KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

1

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1.8 Technical Specifications: EUWY*16-20KBZW1

Technical specifications The table below contains the technical specifications.

Model	EUWYN16KBZW1	EUWYP16KBZW1	EUWYB16KBZW1	EUWYN20KBZW1	EUWYP20KBZW1	EUWYB20KBZW1
Nominal capacity	Cooling: 34.2 kW Heating: 37.0 kW			Cooling: 40.0 kW Heating: 46.0 kW		
Nominal input	Cooling: 14.9 kW Heating: 14.2 kW			Cooling: 16.3 kW Heating: 17.4 kW		
Capacity steps	0-100%					
Compressor						
Type	Hermetically sealed scroll					
Speed	2900 rpm					
Crankcase heater	50 W					
No. x model (W1)	2 x JT212DA-YE			2 x JT265DA-YE		
Evaporator						
Type	Brased plate-heat exchanger					
No. x model	1 x AC230X-38HX			1 x AC230X-50HX		
Min.water volume in the system (1)	82 l			100 l		
Water flow rate	Min.: 61 l/min Max.: 212 l/min			Min.: 75 l/min Max.: 275 l/min		
Nominal water flow	Cooling: 98 l/min Heating: 106 l/min			Cooling: 120 l/min Heating: 137 l/min		
Nom. water pressure drop	Cooling: 12 kPa Heating: 14 kPa			Cooling: 12 kPa Heating: 16 kPa		
Insulation material	Climaflex					
Condenser						
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins					
Rows x stages x fin pitch	2 x 40 x 2 mm			2 x 50 x 2 mm		
Face area	2 x 1.570 m²			2 x 1.970 m²		
Nominal air flow	2 x 170 m³/min					
Discharge	Vertical					
Fan type	Direct drive					
No. of fans	4					
No. of motors x output	2 x 190 kW + 2 x 230 kW					
Piping connections						
Evap. water in/outlet	FBSP 2”					
Refrigerant circuit						
Refrigerant type	R-407C					
Refrigerant charge	2 x 5.1 kg			2 x 5.2 kg		
Refrigerant control	Thermostatic expansion valve					
Oil type	Idemitsu FVC 68D					

1

Model	EUWYN16KBZW1	EUWYP16KBZW1	EUWYB16KBZW1	EUWYN20KBZW1	EUWYP20KBZW1	EUWYB20KBZW1
Oil charge volume	2 x 2.7 l					
No. of circuits	2					
Pump						
No. x type	—	1 x Horizontal multi-stage end-suction		—	1 x Horizontal multi-stage end-suction	
Model	—	CM10-2		—	CM10-2	
Nominal static height pump	—	302 kPa		—	296 kPa	
Nominal static height unit	—	249 kPa		—	229 kPa	
Hydraulic components						
Buffer tank	—		55 l	—		55 l
Unit water volume	6 l	9 l	65 l	6 l	10 l	66 l
Expansion vessel	—	12 l		—	12 l	
Pre-pressure expansion vessel	1.5 bar					
Safety valve	—	3 bar		—	3 bar	
Dimensions (h x w x d)	1321 x 2580 x 734 mm			1541 x 2580 x 734 mm		
Weight						
Machine weight	455 kg	473 kg	485 kg	516 kg	534 kg	546 kg
Operation weight	461 kg	482 kg	550 kg	522 kg	544 kg	612 kg
Casing						
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044					
Material	Polyester coated galvanised steel plate					
Sound power level (2)	79 dBA			81 dBA		
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ Discharge temperature protection ■ 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 ■ Flow switch.					

(1): The table below contains the minimum water volume settings.

Setting	EUWY*16-20KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1

1.9 Technical Specifications: EUWY*24KBZW1

Technical specifications

The table below contains the technical specifications.

Model	EUWYN24KBZW1	EUWYP24KBZW1	EUWYB24KBZW1
Nominal capacity	Cooling: 50.0 kW Heating: 54.0 kW		
Nominal input	Cooling: 22.8 kW Heating: 21.6 kW		
Capacity steps	0%-100%		
Compressor			
Type	Hermetically sealed scroll		
Speed	2900 rpm		
Crankcase heater	50 W		
No. x model (W1)	2 x JT335DA-YE		
Evaporator			
Type	Brased plate-heat exchanger		
No. x model	1 x AC230X-58HX		
Min.water volume in the system (1)	119 l		
Water flow rate	Min.: 89 l/min Max.: 309 l/min		
Nominal water flow	Cooling: 149 l/min Heating: 155 l/min		
Nom. water pressure drop	Cooling: 19 kPa Heating: 22 kPa		
Insulation material	Climaflex		
Condenser			
Type	Cross fin coil Hi-X tubes and PE coated waffle louvre fins		
Rows x stages x fin pitch	2 x 50 x 2 mm		
Face area	2 x 1.970 m²		
Nominal air flow	2 x 170 m³/min		
Discharge	Vertical		
Fan type	Direct drive		
No. of fans	4		
No. of motors x output	2 x 190 kW + 2 x 230 kW		
Piping connections			
Evap. water in/outlet	FBSP 2”		
Refrigerant circuit			
Refrigerant type	R-407C		
Refrigerant charge	2 x 5.6 kg		
Refrigerant control	Thermostatic expansion valve		
Oil type	Idemitsu FVC 68D		
Oil charge volume	2 x 2.7 l		

Model	EUWYN24KBZW1	EUWYP24KBZW1	EUWYB24KBZW1
No. of circuits	2		
Pump			
No. x type	—	1 x Horizontal multi-stage end-suction	
Model	—	CM10-2	
Nominal static height pump	—	284 kPa	
Nominal static height unit	—	185 kPa	
Hydraulic components			
Buffer tank	—		55 l
Unit water volume	6 l	10 l	66 l
Expansion vessel	—	12 l	
Pre-pressure expansion vessel	1.5 bar		
Safety valve	—	3 bar	
Dimensions (h x w x d)			
Weight			
Machine weight	516 kg	534 kg	546 kg
Operation weight	522 kg	544 kg	612 kg
Casing			
Colour	Ivory white / Munsell code 5Y7.5/1 / ± RAL 7044		
Material	Polyester coated galvanised steel plate		
Sound power level (2)	81 dBA		
Safety devices	■ Low-pressure switch ■ High-pressure switch ■ Pump motor overcurrent ■ Discharge temperature protection ■ 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 ■ Flow switch.		

(1): The table below contains the minimum water volume settings.

Setting	EUWY*24KBZW1
The minimum water volume for standard thermostat difference setting	3 K
For reduced setting multiply this water volume by	3/new setting
Minimum allowable setting	0.1 K

1

(2): The sound power level is an absolute value that does not depend on the surroundings or the distance. It cannot be measured in the field (ISO 9614).

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

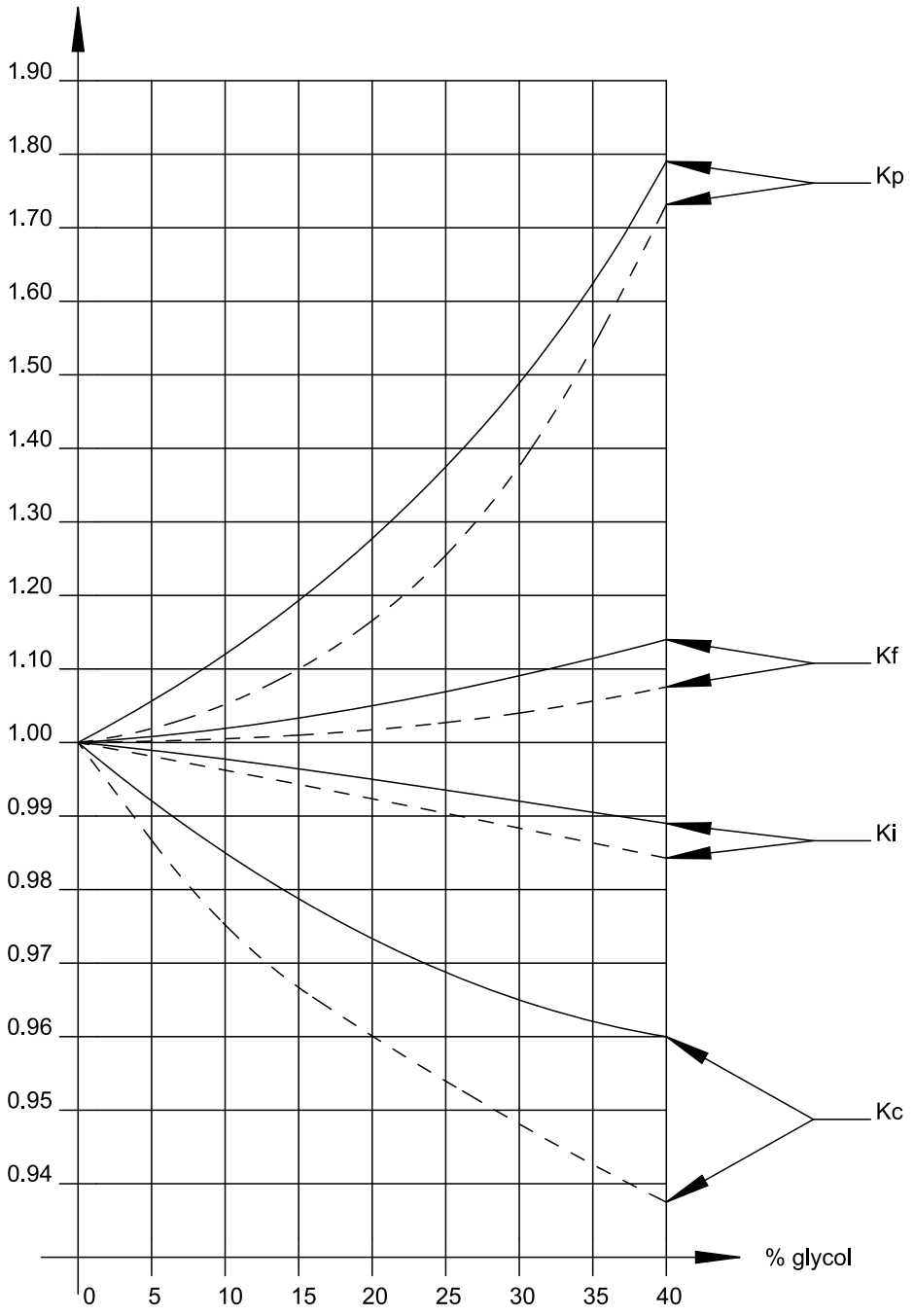
The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1.10 Correction factors for glycol

Correction factors

The illustration below shows the correction factors for glycol for EUWA*5-24KBZW1 and EUWY*5-24KBZW1.



1

Legend

The table below describes the patterns and symbols used for the correction factors illustration above.

Pattern	Description
_____	Ethylene glycol
. – – -	Propylene glycol
Kc	Correction on cooling capacity
Ki	Correction on power input
Kf	Correction on flow rate
Kp	Correction on pressure drop

Glycol freezing point

The table below contains glycol freezing points for different glycol concentrations.

Type	Concentration (wt%)	0	10	20	30	40
Ethylene glycol	Freezing point °C	0	-4	-9	-16	-23
	Minimum LWE °C	5	2	0	-5	-11
Propylene glycol	Freezing point °C	0	-3	-7	-13	-22
	Minimum LWE °C	5	3	-2	-4	-10

1.11 Electrical Specifications: EUWA*5-8KBZW1

Electrical specifications

The table below contains the electrical specifications (1).

Model	EUWAN5KBZW1	EUWAP5KBZW1	EUWAB5KBZW1	EUWAN8KBZW1	EUWAP8KBZW1	EUWAB8KBZW1
Power supply						
Phase	3N~					
Frequency	50 Hz					
Voltage	400 V					
Voltage tolerance	± 10 %					
Unit						
Starting current	62.2 A	63.5 A		97.9 A	99.2 A	
Nominal running current	7.7 A	9.0 A		13.6 A	14.9 A	
Max. running current	11.2 A	12.5 A		16.9 A	18.2 A	
Recommended fuses	3 x 20 gL/gG	3 x 20 gL/gG		3 x 25 gL/gG	3 x 25 gL/gG	
Fans						
Phase	1~					
Voltage	230 V					
Max. running current	2.2 A			2.9 A		
Compressor						
Phase	3~					
Voltage	400 V					
Starting current	60.0 A			95 A		
Nom. running current	5.5 A			10.7 A		
Max. running current	9.0 A			14 A		
Starting method	Direct on line					
Control circuit						
Phase	1~					
Voltage	230 V					
Recommended fuses	Factory installed					
Pump						
Phase	—	3~		—	3~	
Voltage	—	400.0 V		—	400.0 V	
Max. running current	—	1.3 A		—	1.3 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fan +pumps.

Operation range

The operation range covers a leaving evaporator water temperature from 5°C to 20°C (pull down condition to 25°C).

1.12 Electrical Specifications: EUWA*10-12KBZW1

Electrical specifications

The table below contains the electrical specifications (1).

Model	EUWAN10KBZW1	EUWAP10KBZW1	EUWAB10KBZW1	EUWAN12KBZW1	EUWAP12KBZW1	EUWAB12KBZW1
Power supply						
Phase	3N~					
Frequency	50 Hz					
Voltage	400 V					
Voltage tolerance	± 10 %					
Unit						
Starting current	113 A	114 A		139 A	140 A	
Nominal running current	15.9 A	17.2 A		20.5 A	21.8 A	
Max. running current	19.9 A	21.2 A		26.9 A	28.2 A	
Recommended fuses	3 x 25 gL/gG	3 x 32 gL/gG		3 x 32 gL/gG	3 x 40 gL/gG	
Fans						
Phase	1~					
Voltage	230 V					
Max. running current	2.9 A			2.9 A		
Compressor						
Phase	3~					
Voltage	400 V					
Starting current	110.0 A			136.0 A		
Nom. running current	13.0 A			17.6 A		
Max. running current	17.0 A			24.0 A		
Starting method	Direct on line			Direct on line		
Control circuit						
Phase	1~					
Voltage	230 V					
Recommended fuses	Factory installed					
Pump						
Phase	—	3~		—	3~	
Voltage	—	400.0 V		—	400.0 V	
Max. running current	—	1.3 A		—	1.3 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fan +pumps.

Operation range

The operation range covers a leaving evaporator water temperature from 5°C to 20°C (pull down condition to 25°C).

1.13 Electrical Specifications: EUWA*16-20KBZW1

Electrical specifications

The table below contains the electrical specifications.

Model	EUWAN16KBZW1	EUWAP16KBZW1	EUWAB16KBZW1	EUWAN20KBZW1	EUWAP20KBZW1	EUWAB20KBZW1
Power supply						
Phase	3N~					
Frequency	50 Hz					
Voltage	400 V					
Voltage tolerance	± 10 %					
Unit						
Starting current	97.9 A	99.9 A		113 A	115 A	
Nominal running current	27.2 A	29.2 A		31.8 A	33.8 A	
Max. running current	33.8 A	35.8 A		39.8 A	41.8 A	
Recommended fuses	3 x 40 gL/gG	3 x 50 gL/gG		3 x 50 gL/gG	3 x 50 gL/gG	
Fans						
Phase	1~					
Voltage	230 V					
Max. running current	5.8 A					
Compressor						
Phase	3~					
Voltage	400 V					
Starting current	95.0 A			110.0 A		
Nom. running current	10.7 A			13.0 A		
Max. running current	14.0 A			17.0 A		
Starting method	Direct on line					
Control circuit						
Phase	1~					
Voltage	230/ 24 V AC (supplied by factory installed transformers)					
Recommended fuses	Factory installed					
Crankcase heater (E1/2 HC)	50 W					
Pump						
Phase	—	3~		—	3~	
Voltage	—	400.0 V		—	400.0 V	
Max. running current	—	2.0 A		—	2.0 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fan +pumps.

Operation range

The operation range covers a leaving evaporator water temperature from 5°C to 20°C (pull down condition to 25°C).

1.14 Electrical Specifications: EUWA*24KBZW1

Electrical specifications

The table below contains the electrical specifications.

Model	EUWAN24KBZW1	EUWAP24KBZW1	EUWAB24KBZW1
Power supply			
Phase	3N~		
Frequency	50 Hz		
Voltage	400 V		
Voltage tolerance	± 10 %		
Unit			
Starting current	139 A	142 A	
Nominal running current	41.0 A	43.7 A	
Max. running current	53.8 A	56.5 A	
Recommended fuses	3 x 63 gL/gG	3 x 63 gL/gG	
Fans			
Phase	1~		
Voltage	230 V		
Max. running current	5.8 A		
Compressor			
Phase	3~		
Voltage	400 V		
Starting current	136.0 A		
Nom. running current	17.6 A		
Max. running current	24.0 A		
Starting method	Direct on line		
Control circuit			
Phase	1~		
Voltage	230/ 24 V AC (supplied by factory installed transformers)		
Recommended fuses	Factory installed		
Crankcase heater (E1/2 HC)	50 W	50 W	
Pump			
Phase	—	3~	
Voltage	—	400.0 V	
Max. running current	—	2.7 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fan +pumps.

Operation range

The operation range covers a leaving evaporator water temperature from 5°C to 20°C (pull down condition to 25°C).

1.15 Electrical Specifications: EUWY*5-8KBZW1

Electrical specifications

The table below contains the electrical specifications (1).

Model	EUWYN5KBZW1	EUWYP5KBZW1	EUWYB5KBZW1	EUWYN8KBZW1	EUWYP8KBZW1	EUWYB8KBZW1
Power supply						
Phase	3N~					
Frequency	50 Hz					
Voltage	400 V					
Voltage tolerance	± 10 %					
Unit						
Starting current	62.2 A	63.5 A		97.9 A	99.2 A	
Nominal running current cooling	7.7 A	9.0 A		13.6 A	14.9 A	
Max. running current	11.2 A	12.5 A		16.9 A	18.2 A	
Recommended fuses	3 x 20 gL/gG	3 x 20 gL/gG		3 x 25 gL/gG	3 x 25 gL/gG	
Fans						
Phase	1~					
Voltage	230 V					
Max. running current	2.2 A			2.9 A		
Compressor						
Phase	3~					
Voltage	400 V					
Starting current	60.0 A			95.0 A		
Nom. running current cooling	5.5 A			10.7 A		
Max. running current	9.0 A			14.0 A		
Starting method	Direct on line					
Control circuit						
Phase	1~					
Voltage	230 V					
Recommended fuses	Factory installed					
Pump						
Phase	—	3~		—	3~	
Voltage	—	400.0 V		—	400.0 V	
Max. running current	—	1.3 A		—	1.3 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1.16 Electrical Specifications: EUWY*10-12KBZW1

Electrical specifications

The table below contains the electrical specifications (1).

Model	EUWYN10KBZW1	EUWYP10KBZW1	EUWYB10KBZW1	EUWYN12KBZW1	EUWYP12KBZW1	EUWYB12KBZW1
Power supply						
Phase	3N~					
Frequency	50 Hz					
Voltage	400 V					
Voltage tolerance	± 10 %					
Unit						
Starting current	113 A	114 A		139 A	140 A	
Nominal running current cooling	15.9 A	17.2 A		20.5 A	21.8 A	
Max. running current	19.9 A	21.2 A		26.9 A	28.2 A	
Recommended fuses	3 x 25 gL/gG	3 x 32 gL/gG		3 x 32 gL/gG	3 x 40 gL/gG	
Fans						
Phase	1~					
Voltage	230 V					
Max. running current	2.9 A					
Compressor						
Phase	3~					
Voltage	400 V					
Starting current	110.0 A			136.0 A		
Nom. running current cooling	13.0 A			17.6 A		
Max. running current	17.0 A			24.0 A		
Starting method	Direct on line					
Control circuit						
Phase	1~					
Voltage	230 V					
Recommended fuses	Factory installed					
Pump						
Phase	—	3~		—	3~	
Voltage	—	400.0 V		—	400.0 V	
Max. running current	—	1.3 A		—	1.3 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1.17 Electrical Specifications: EUWY*16-20KBZW1

Electrical specifications

The table below contains the electrical specifications.

Model	EUWYN16KBZW1	EUWYP16KBZW1	EUWYB16KBZW1	EUWYN20KBZW1	EUWYP20KBZW1	EUWYB20KBZW1
Power supply						
Phase	3N~					
Frequency	50 Hz					
Voltage	400 V					
Voltage tolerance	± 10 %					
Unit						
Starting current	97.9 A	99.9 A		113 A	115 A	
Nominal running current cooling	27.2 A	29.2 A		31.8 A	33.8 A	
Max. running current	33.8 A	35.8 A		39.8 A	41.8 A	
Recommended fuses	3 x 40 gL/gG	3 x 50 gL/gG		3 x 50 gL/gG	3 x 50 gL/gG	
Fans						
Phase	1~					
Voltage	230 V					
Max. running current	5.8 A					
Compressor						
Phase	3~					
Voltage	400 V					
Starting current	95.0 A			110.0 A		
Nom. running current cooling	10.7 A			13.0 A		
Max. running current	14.0 A			17.0 A		
Starting method	Direct on line					
Control circuit						
Phase	1~					
Voltage	230 V					
Recommended fuses	Factory installed					
Pump						
Phase	—	3~		—	3~	
Voltage	—	400.0 V		—	400.0 V	
Max. running current	—	2.0 A		—	2.0 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1.18 Electrical Specifications: EUWY*24KBZW1

Electrical specifications

The table below contains the electrical specifications.

Model	EUWYN24KBZW1	EUWYP24KBZW1	EUWYB24KBZW1
Power supply			
Phase	3N~		
Frequency	50 Hz		
Voltage	400 V		
Voltage tolerance	± 10 %		
Unit			
Starting current	139 A	142 A	
Nominal running current cooling	41.0 A	43.7 A	
Max. running current	53.8 A	56.5 A	
Recommended fuses	3 x 63 gL/gG	3 x 63 gL/gG	
Fans			
Phase	1~		
Voltage	230 V		
Max. running current	5.8 A		
Compressor			
Phase	3~		
Voltage	400 V		
Starting current	136.0 A		
Nom. running current cooling	17.6 A		
Max. running current	24.0 A		
Starting method	Direct on line		
Control circuit			
Phase	1~		
Voltage	230 V		
Recommended fuses	Factory installed		
Pump			
Phase	—	3~	
Voltage	—	400.0 V	
Max. running current	—	2.7 A	

1

Nominal conditions

The nominal conditions are as follows:

- Entering/leaving evaporator water temperature 12.5/7°C
- Ambient air temperature 35°C
- Power input is total input: Compressor + control circuit + fans + pump.

Operation range

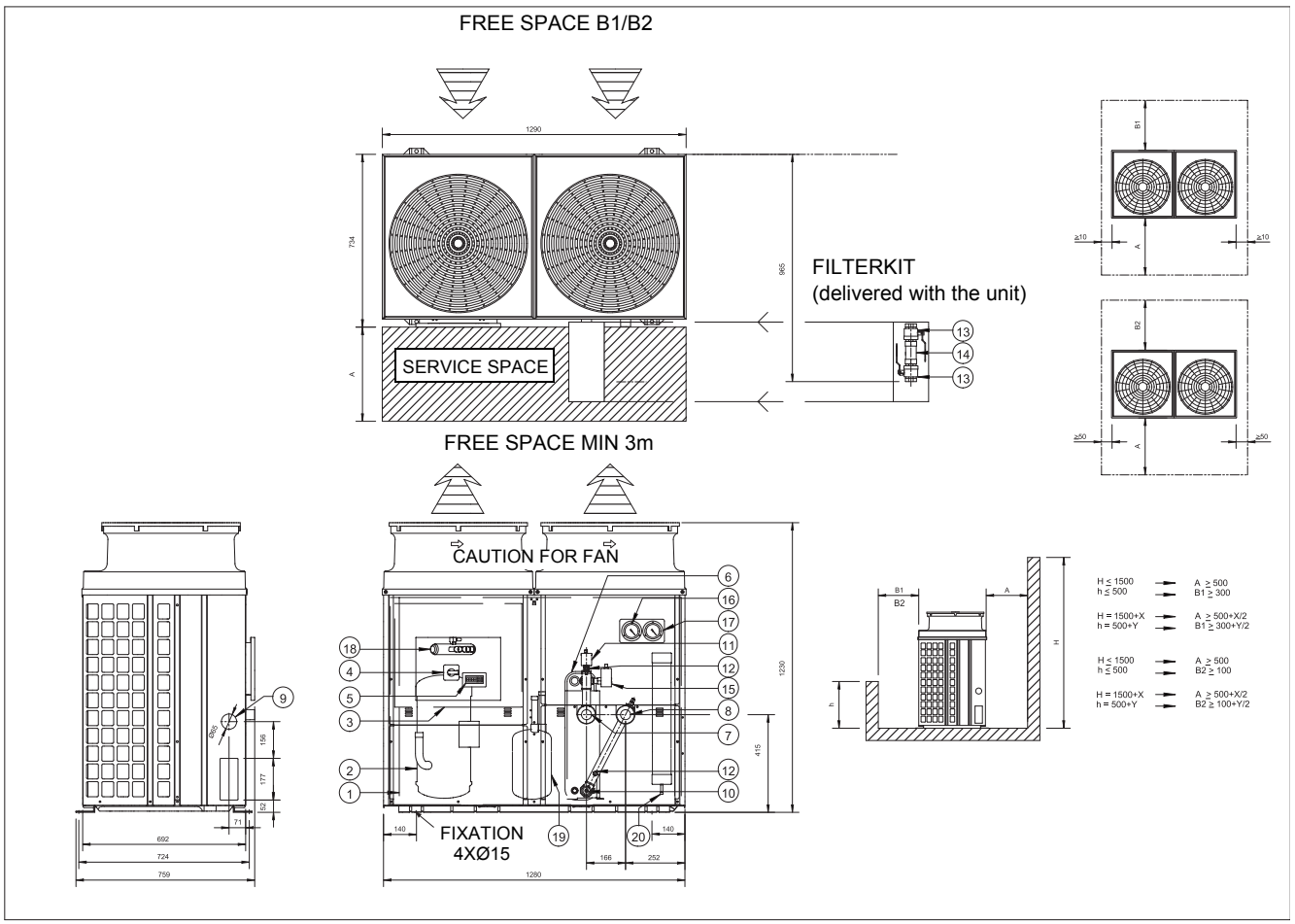
The nominal operation range covers:

- A leaving evaporator water temperature from 5°C (-5°C/-20°C for ZH/ZL option) to 20°C (pull down condition to 25°C).
- A leaving condensor water temperature from 35°C to 50°C.

1.19 Outlook Drawing: EUWAN5-8KBZW1/EUWYN5-8KBZW1

EUWAN5-8KBZW1/ EUWYN5-8KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Digital display controller
6	Water heat exchanger
7	Water IN connection: 1 1/4” M BSP
8	Water OUT connection: 1 1/4” M BSP
9	Power supply intake
10	Drain

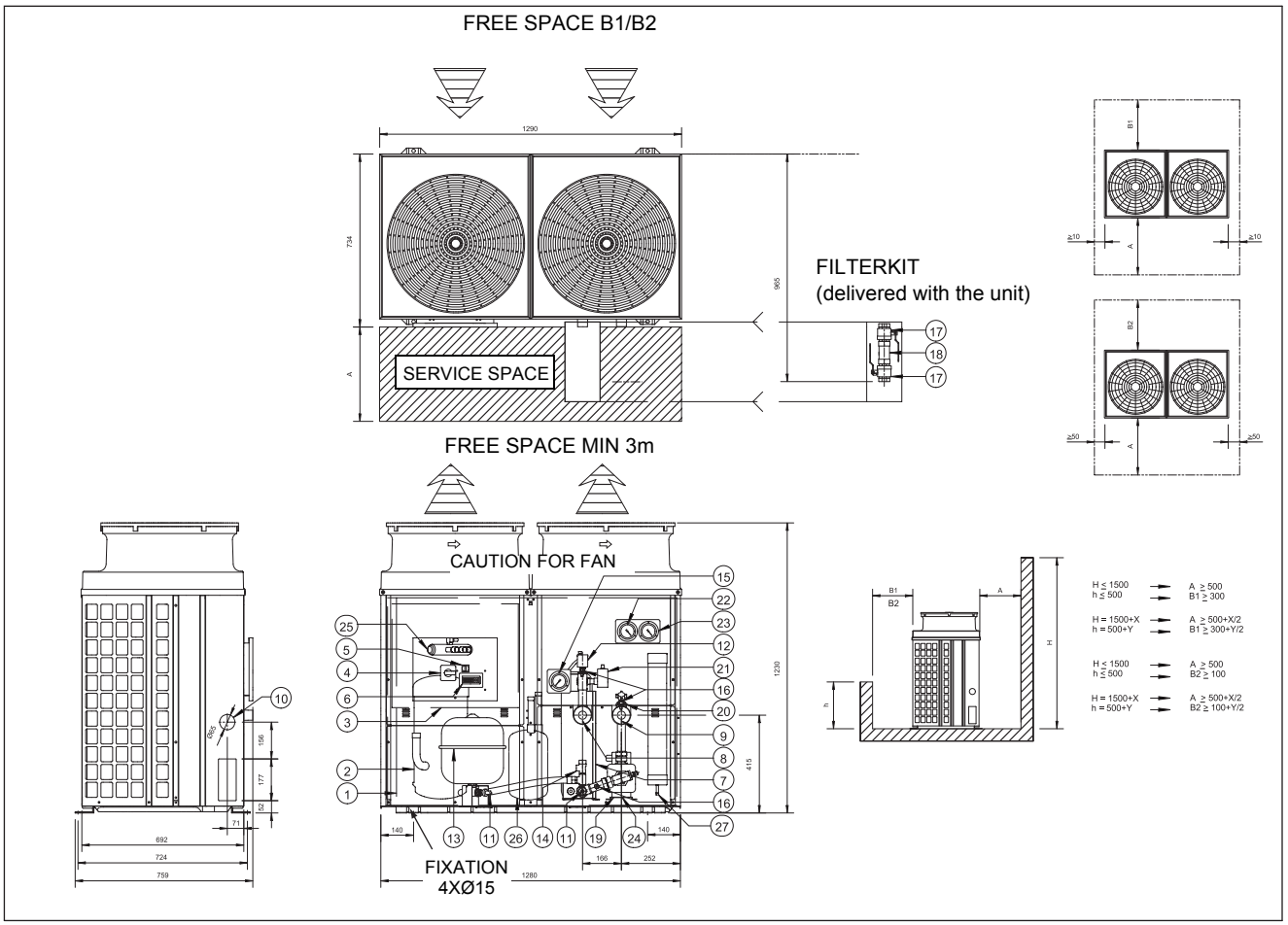
No.	Component
11	Air purge
12	Pressure port
13	Ball valve: 1 1/4” BSP
14	Water filter: 1 1/4” BSP
15	Flow switch
16	High pressure gauge (optional)
17	Low pressure gauge (optional)
18	4-way valve (only on H/P models)
19	Accumulator (only on H/P models)
20	Liquid receiver (only on H/P models)

1

1.20 Outlook Drawing: EUWAP5-8KBZW1/EUWYP5-8KBZW1

EUWAP5-8KBZW1/ EUWYP5-8KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

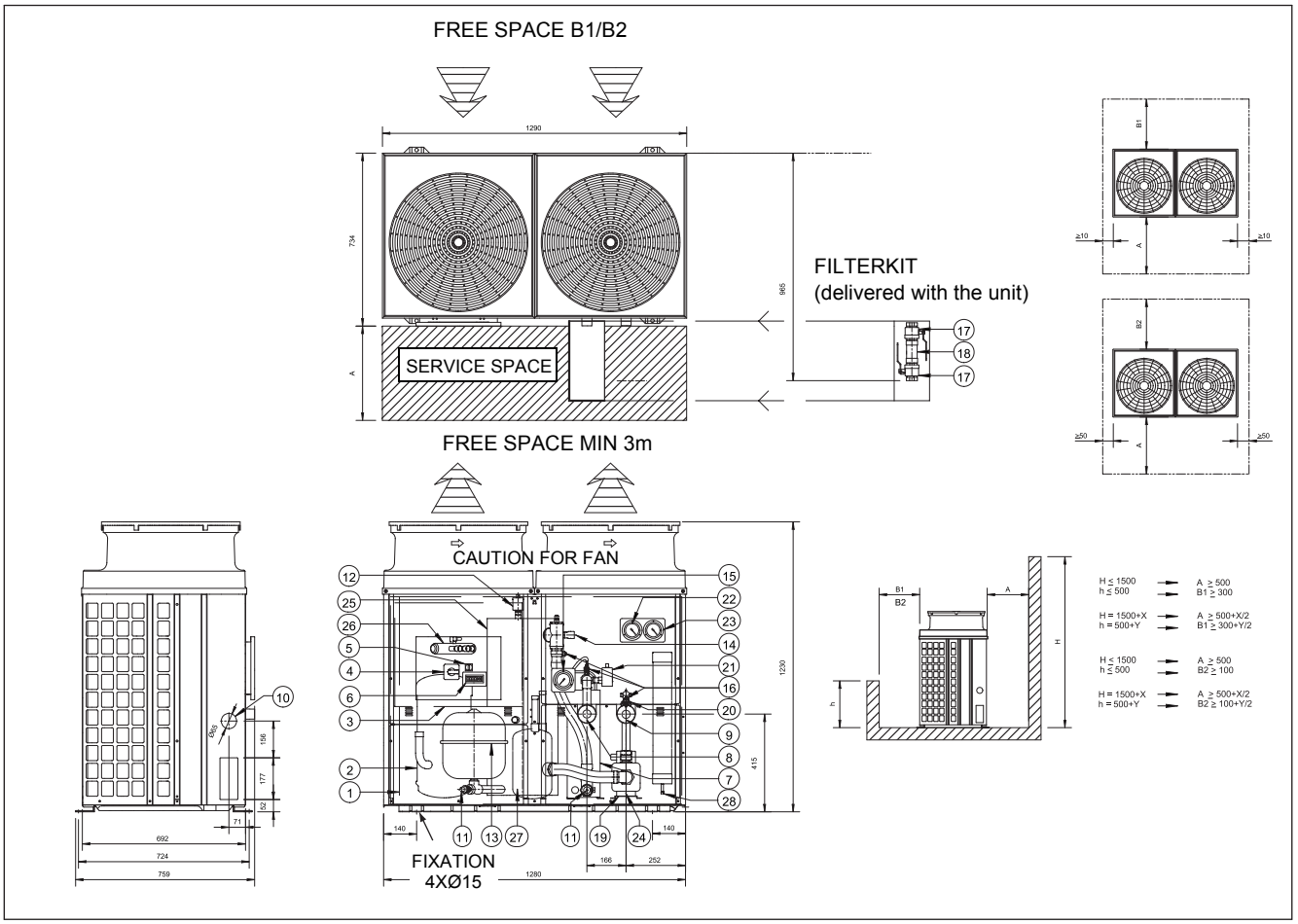
No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 1 1/4” M BSP
9	Water OUT connection: 1 1/4” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

No.	Component
15	Manometer (water)
16	Pressure port
17	Ball valve: 1 1/4” BSP
18	Water filter: 1 1/4” BSP
19	Pump
20	Regulation valve
21	Flow switch
22	High pressure gauge (optional)
23	Low pressure gauge (optional)
24	Pump drain
25	4-way valve (only on H/P models)
26	Accumulator (only on H/P models)
27	Liquid receiver (only on H/P models)

1.21 Outlook Drawing: EUWAB5-8KBZW1/EUWYB5-8KBZW1

EUWAB5-8KBZW1/ EUWYB5-8KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 1 1/4” M BSP
9	Water OUT connection: 1 1/4” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

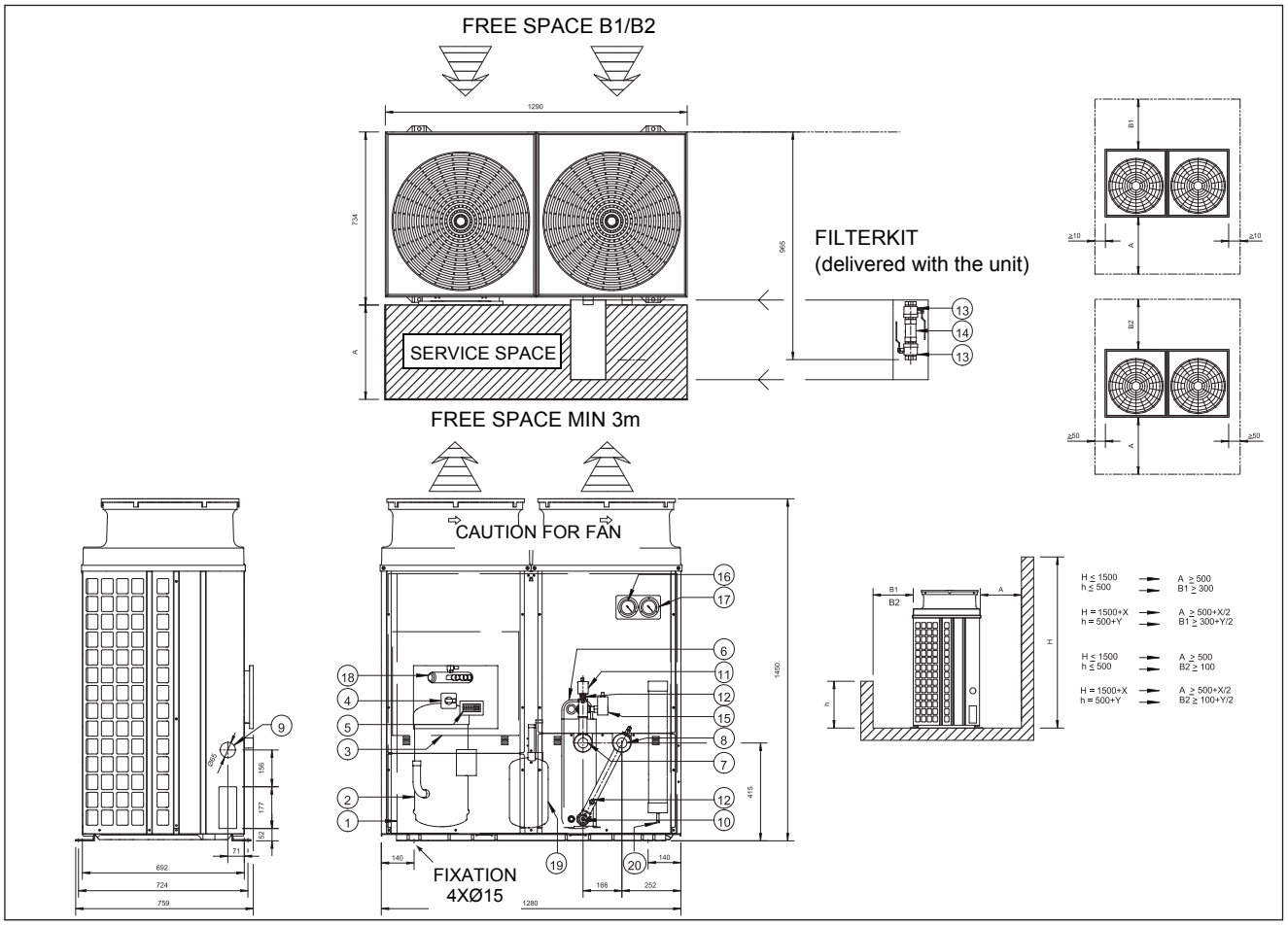
No.	Component
15	Manometer (water)
16	Pressure port
17	Ball valve: 1 1/4” BSP
18	Water filter: 1 1/4” BSP
19	Pump
20	Regulation valve
21	Flow switch
22	High pressure gauge (optional)
23	Low pressure gauge (optional)
24	Pump drain
25	Buffertank
26	4-way valve (only on H/P models)
27	Accumulator (only on H/P models)
28	Liquid receiver (only on H/P models)

1

1.22 Outlook Drawing: EUWAN10-12KBZW1/EUWYN10-12KBZW1

EUWAN10-12KBZW1 /EUWYN10-12KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components:

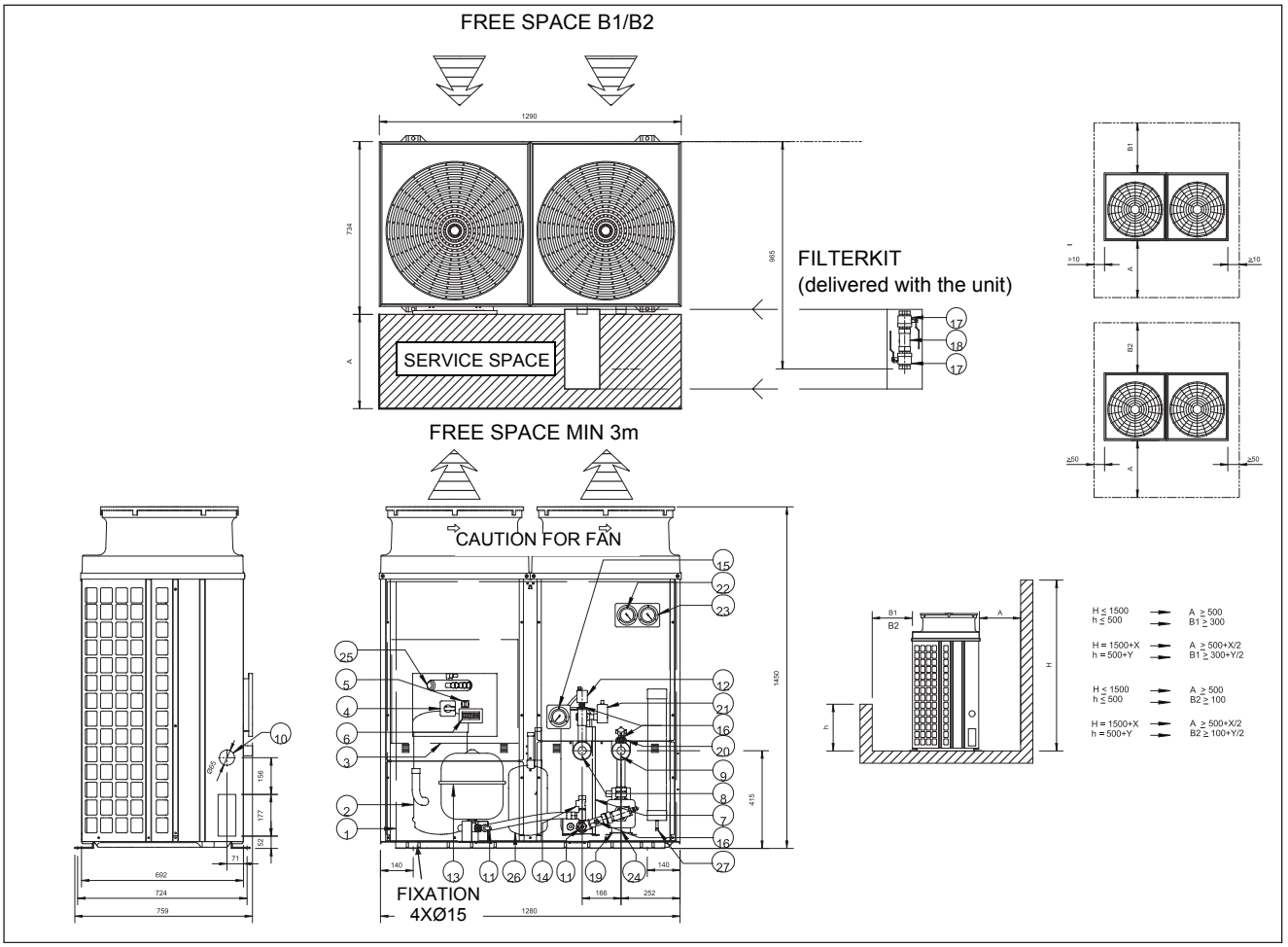
No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Digital display controller
6	Water heat exchanger
7	Water IN connection: 1 1/4” M BSP
8	Water OUT connection: 1 1/4” M BSP
9	Power supply intake
10	Drain

No.	Component
11	Air purge
12	Pressure port
13	Ball valve: 1 1/4” BSP
14	Water filter: 1 1/4” BSP
15	Flow switch
16	High pressure gauge (optional)
17	Low pressure gauge (optional)
18	4-way valve (only on H/P models)
19	Accumulator (only on H/P models)
20	Liquid receiver (only on H/P models)

1.23 Outlook Drawing: EUWAP10-12KBZW1/EUWYP10-12KBZW1

EUWAP10-12KBZW1/ EUWYP10-12KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 1 1/4” M BSP
9	Water OUT connection: 1 1/4” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

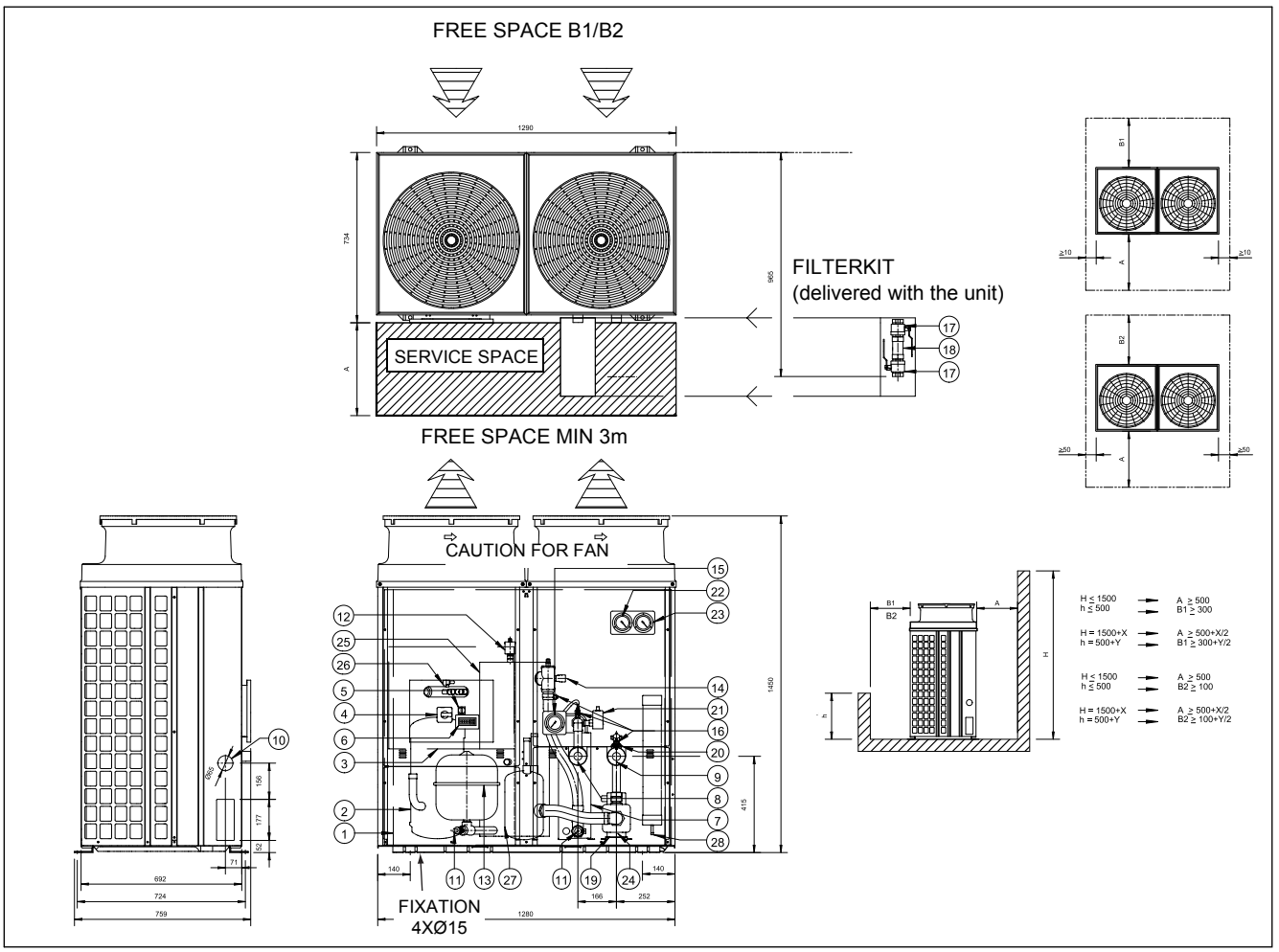
No.	Component
15	Manometer (water)
16	Pressure port
17	Ball valve: 1 1/4” BSP
18	Water filter: 1 1/4” BSP
19	Pump
20	Regulation valve
21	Flow switch
22	High pressure gauge (optional)
23	Low pressure gauge (optional)
24	Pump drain
25	4-way valve (only on H/P models)
26	Accumulator (only on H/P models)
27	Liquid receiver (only on H/P models)

1

1.24 Outlook Drawing: EUWAB10-12KBZW1/EUWYB10-12KBZW1

EUWAB10-12KBZW1 /EUWYB10-12KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

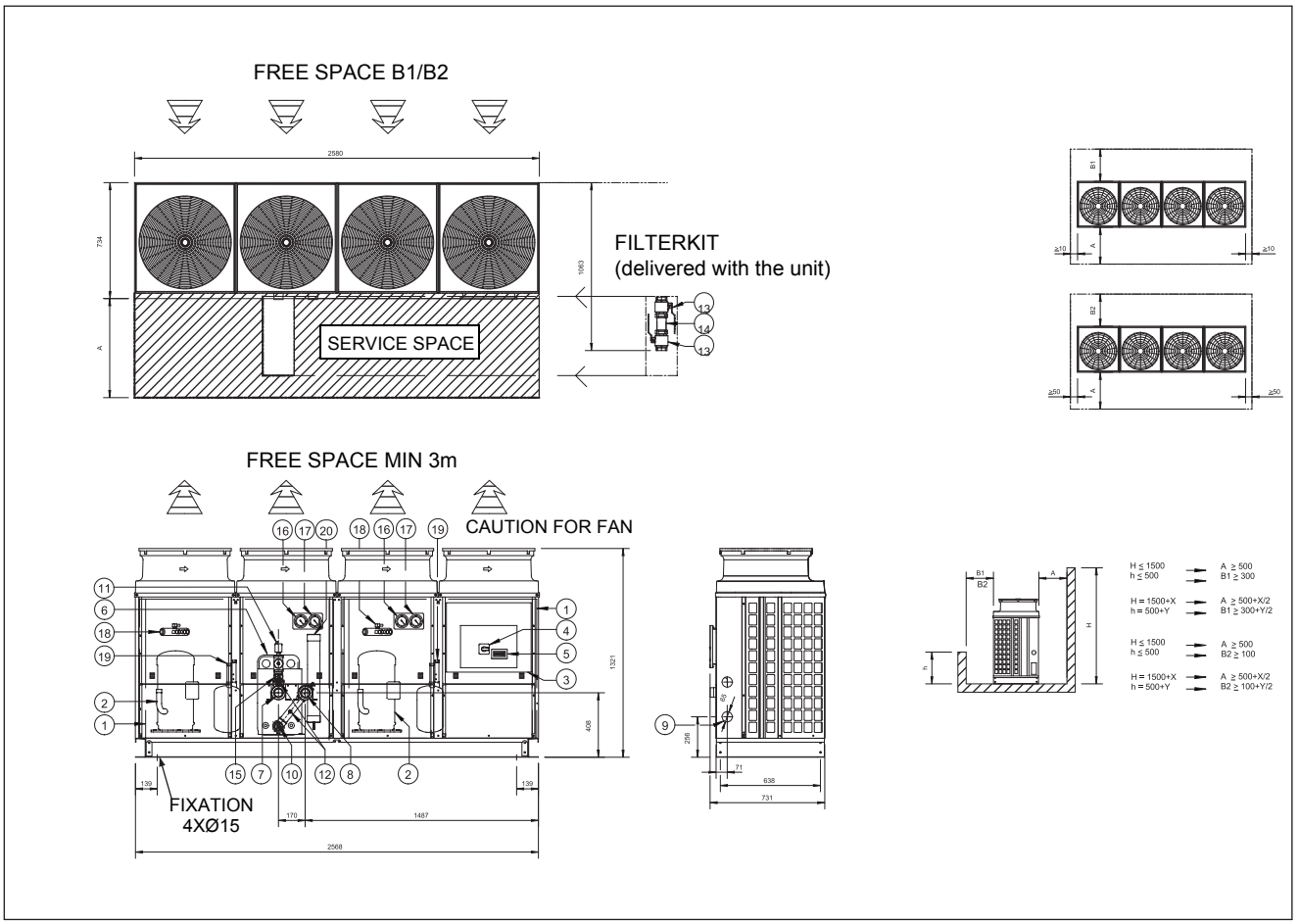
No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 1 1/4” M BSP
9	Water OUT connection: 1 1/4” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

No.	Component
15	Manometer (water)
16	Pressure port
17	Ball valve: 1 1/4” BSP
18	Water filter: 1 1/4” BSP
19	Pump
20	Regulation valve
21	Flow switch
22	High pressure gauge (optional)
23	Low pressure gauge (optional)
24	Pump drain
25	Buffertank
26	4-way valve (only on H/P models)
27	Accumulator (only on H/P models)
28	Liquid receiver (only on H/P models)

1.25 Outlook Drawing: EUWAN16KBZW1/EUWYN16KBZW1

EUWAN16KBZW1/ EUWYN16KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Digital display controller
6	Water heat exchanger
7	Water IN connection: 1 1/4” M BSP
8	Water OUT connection: 1 1/4” M BSP
9	Power supply intake
10	Drain

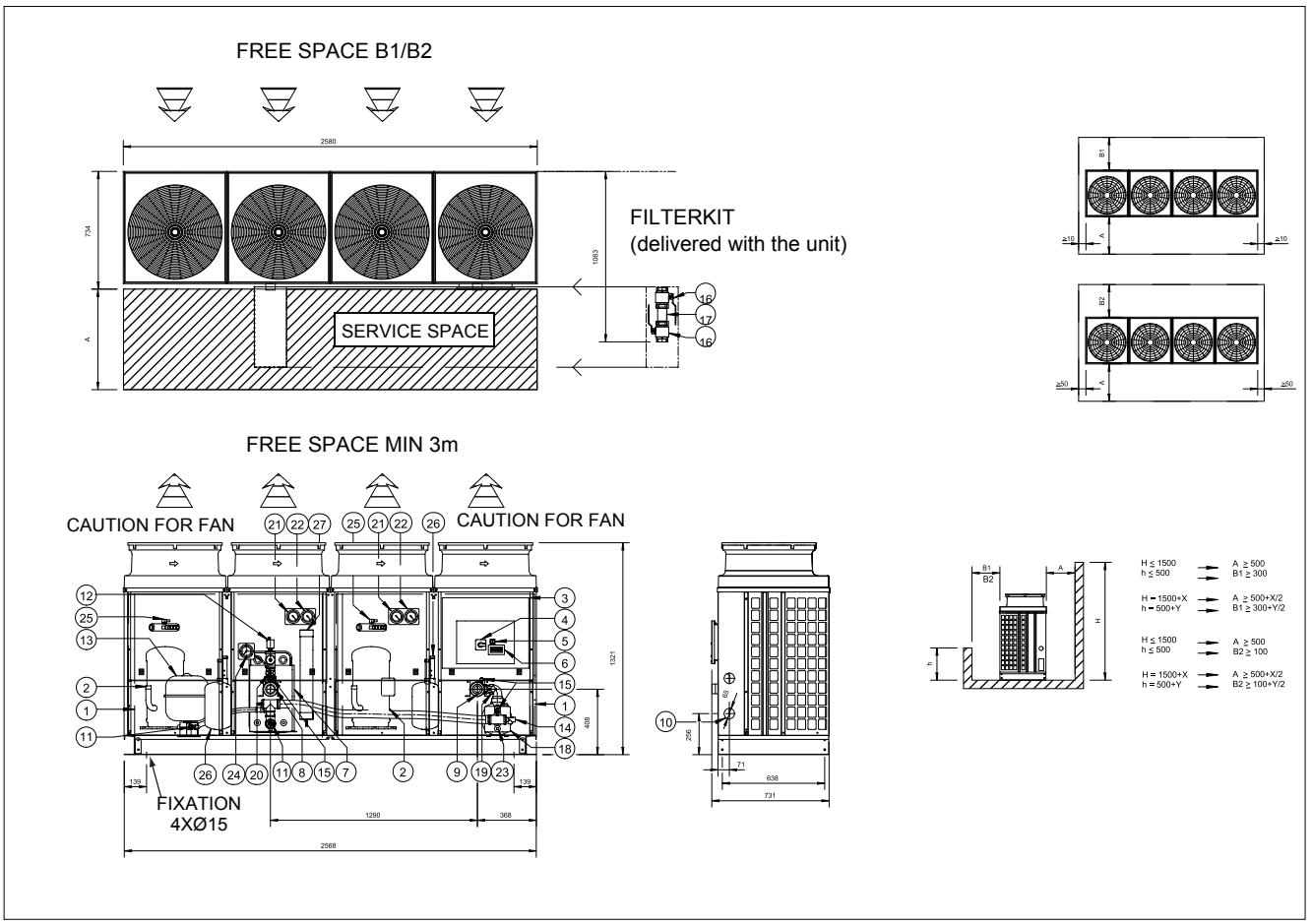
No.	Component
11	Air purge
12	Pressure port
13	Ball valve: 1 1/4” BSP
14	Water filter: 1 1/4” BSP
15	Flow switch
16	High pressure gauge (optional)
17	Low pressure gauge (optional)
18	4-way valve (only on H/P models)
19	Accumulator (only on H/P models)
20	Liquid receiver (only on H/P models)

1

1.26 Outlook Drawing: EUWAP16KBZW1/EUWYP16KBZW1

EUWAP16KBZW1/ EUWYP16KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

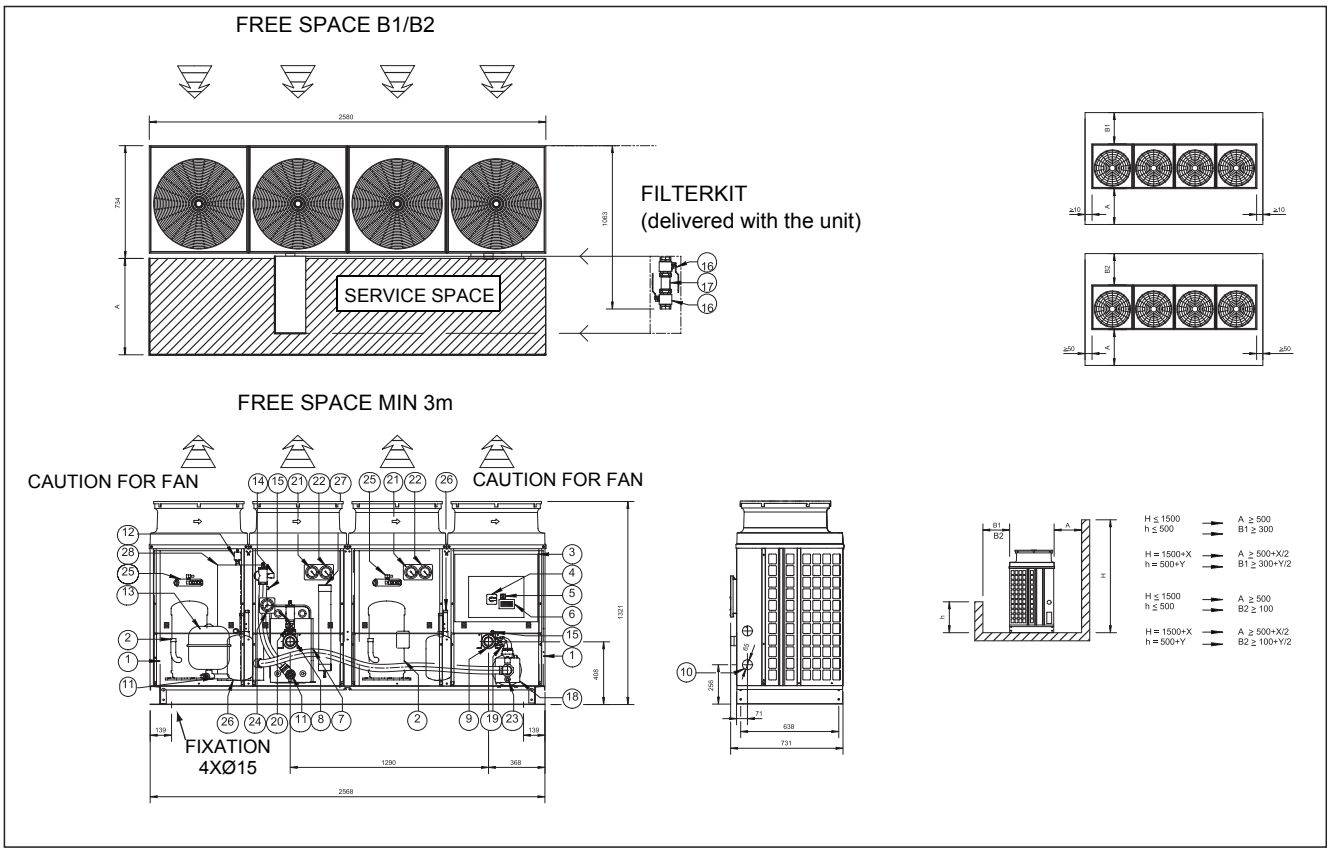
No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 2” M BSP
9	Water OUT connection: 2” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

No.	Component
15	Pressure port
16	Ball valve
17	Water filter
18	Pump
19	Regulation valve
20	Flow switch
21	High pressure gauge (optional)
22	Low pressure gauge (optional)
23	Pump drain
24	Water pressure gauge
25	4-way valve (only on H/P models)
26	Accumulator (only on H/P models)
27	Liquid receiver (only on H/P models)

1.27 Outlook Drawing: EUWAB16KBZW1/EUWAB16KBZW1

EUWAB16KBZW1/ EUWAB16KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 2” M BSP
9	Water OUT connection: 2” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

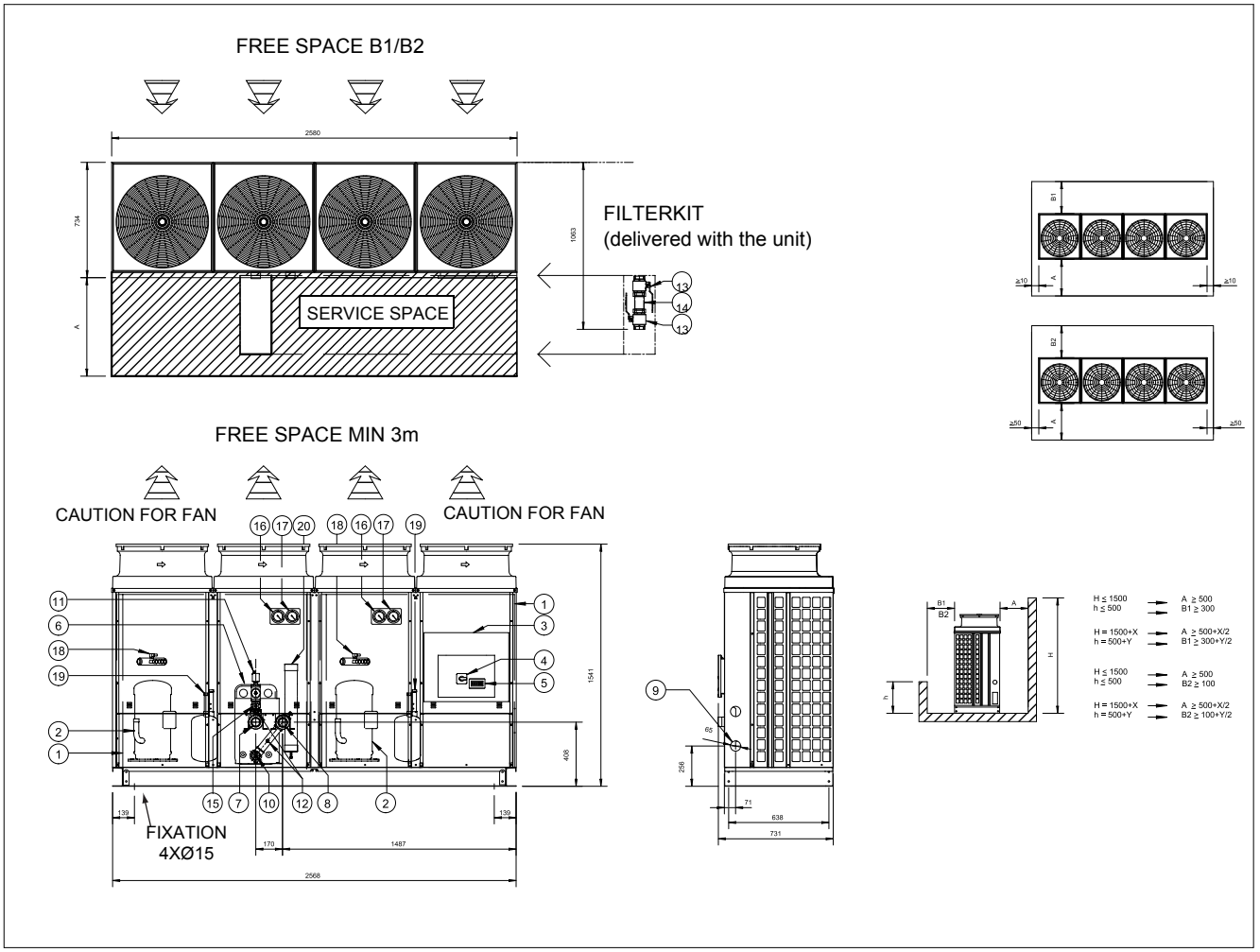
No.	Component
15	Pressure port
16	Ball valve
17	Water filter
18	Pump
19	Regulation valve
20	Flow switch
21	High pressure gauge (optional)
22	Low pressure gauge (optional)
23	Pump drain
24	Water pressure gauge
25	4-way valve (only on H/P models)
26	Accumulator (only on H/P models)
27	Liquid receiver (only on H/P models)
28	Buffertank

1

1.28 Outlook Drawing: EUWAN20-24KBZW1/EUWYN20-24KBZW1

EUWAN20-24KBZW1 /EUWYN20-24KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

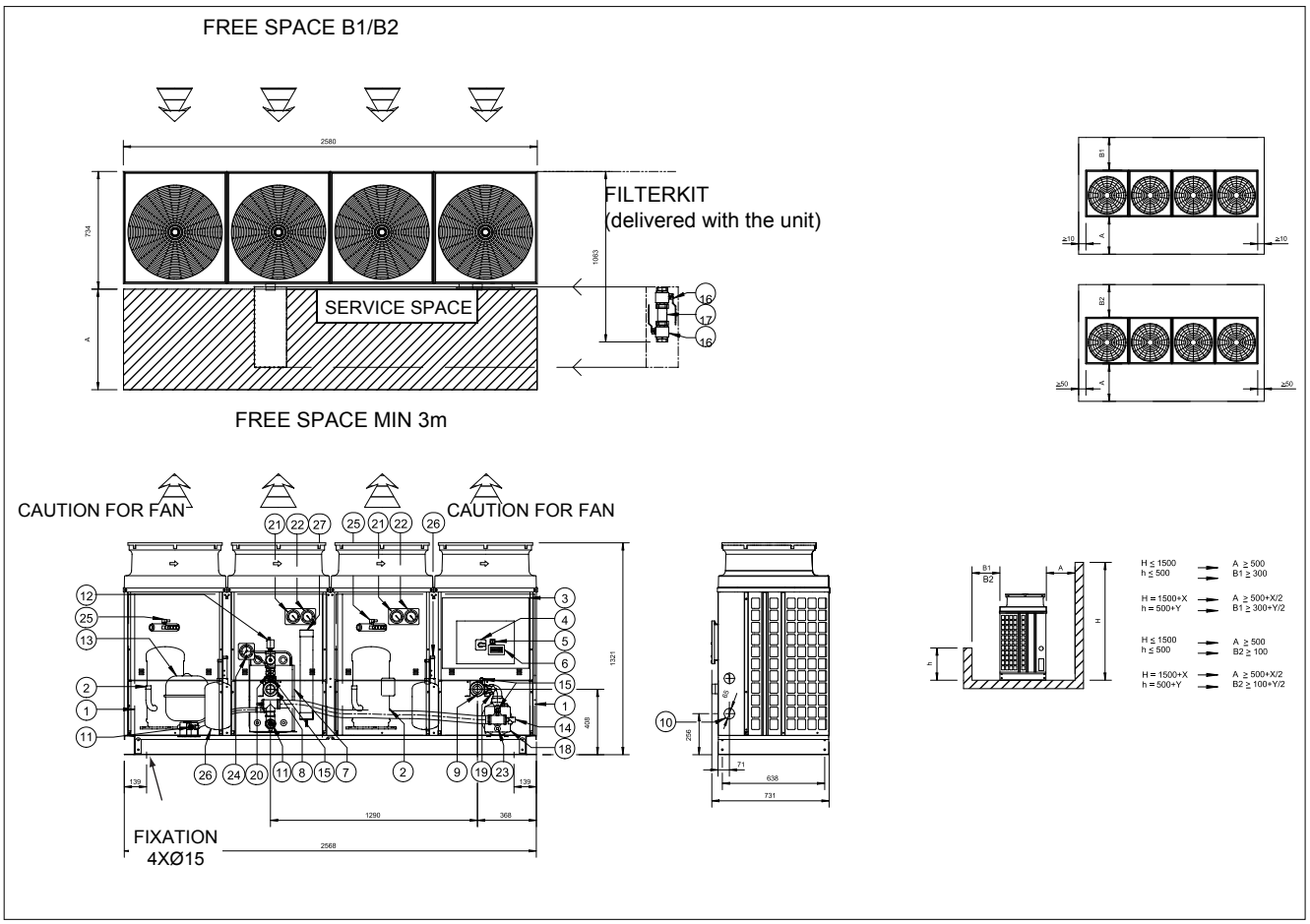
No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Digital display controller
6	Water heat exchanger
7	Water IN connection: 2” M BSP
8	Water OUT connection: 2” M BSP
9	Power supply intake
10	Drain

No.	Component
11	Air purge
12	Pressure port
13	Ball valve
14	Water filter
15	Flow switch
16	High pressure gauge (optional)
17	Low pressure gauge (optional)
18	4-way valve (only on H/P models)
19	Accumulator (only on H/P models)
20	Liquid receiver (only on H/P models)

1.29 Outlook Drawing: EUWAP20-24KBZW1/EUWYP20-24KBZW1

EUWAP20-24KBZW1/ EUWYP20-24KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 2” M BSP
9	Water OUT connection: 2” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

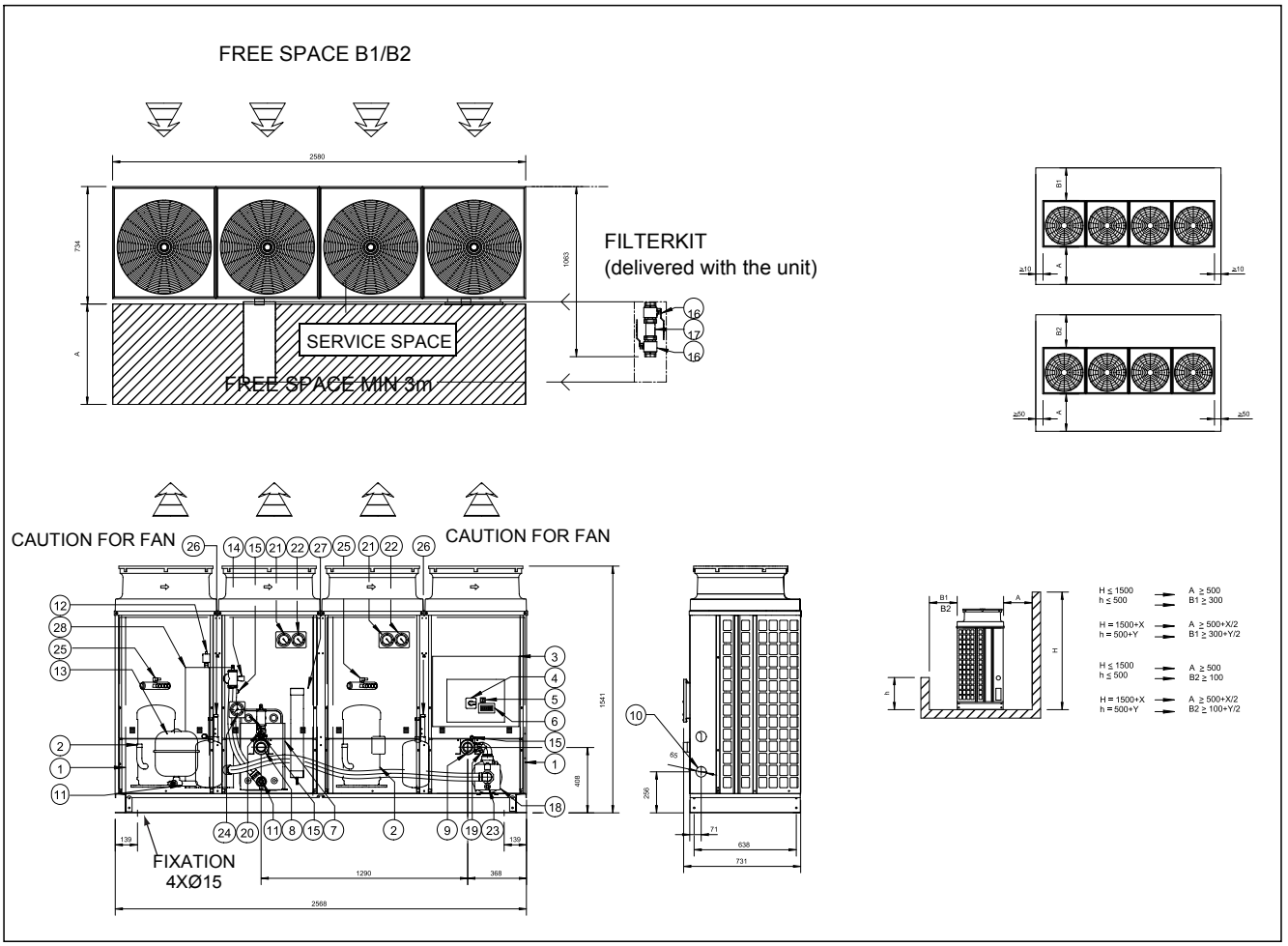
No.	Component
15	Pressure port
16	Ball valve
17	Water filter
18	Pump
19	Regulation valve
20	Flow switch
21	High pressure gauge (optional)
22	Low pressure gauge (optional)
23	Pump drain
24	Water pressure gauge
25	4-way valve (only on H/P models)
26	Accumulator (only on H/P models)
27	Liquid receiver (only on H/P models)

1

1.30 Outlook Drawing: EUWAB20-24KBZW1/EUWYB20-24KBZW1

EUWAB20-24KBZW1 /EUWYB20-24KBZW1

The illustration below shows the outlook, the dimensions and the installation and service space of the unit (mm).



Components

The table below lists the components.

No.	Component
1	Air heat exchanger
2	Compressor
3	Switch box
4	Main switch
5	Pump switch
6	Digital display controller
7	Water heat exchanger
8	Water IN connection: 2” M BSP
9	Water OUT connection: 2” M BSP
10	Power supply intake
11	Drain
12	Air purge
13	Expansion vessel
14	Safety valve

No.	Component
15	Pressure port
16	Ball valve
17	Water filter
18	Pump
19	Regulation valve
20	Flow switch
21	High pressure gauge (optional)
22	Low pressure gauge (optional)
23	Pump drain
24	Water pressure gauge
25	4-way valve (only on H/P models)
26	Accumulator (only on H/P models)
27	Liquid receiver (only on H/P models)
28	Buffertank

2 Piping Layout

2.1 What Is in This Chapter?

Introduction

This chapter describes the internal refrigeration circuit. The water piping is considered to be a common practice and is, therefore, not described.

Overview

This chapter contains the following topics:

1

2.2 Installation outline

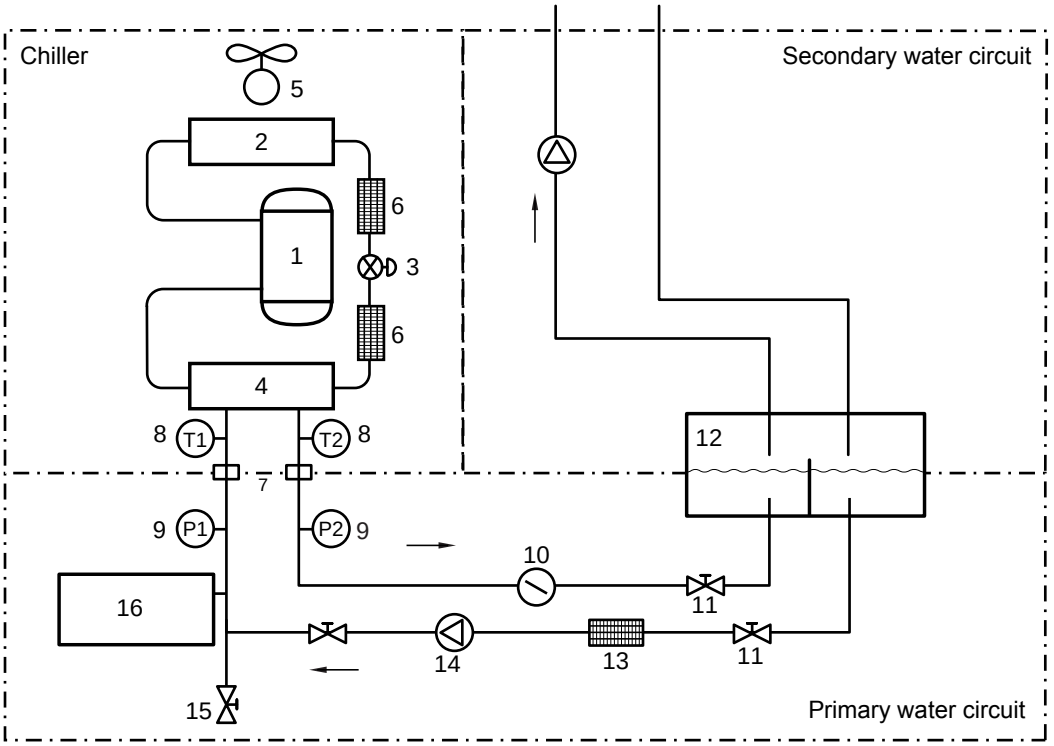
Introduction

The installation outline contains the main parts of a typical installation:

- Chiller
- Primary water circuit
- Secondary water circuit.

Typical installation

The illustration below shows a typical installation. Some of these components may not be present in all the chillers described in this manual.



Components

The table below lists the components.

No.	Chiller
1	Compressor
2	Air-heat exchanger
3	Expansion valve
4	Water-heat exchanger
5	Fan motor
6	Refrigerant filter strainer
7	Water connections
8	Temperature measuring points

No.	Primary water circuit
9	Pressure measuring points
10	Flow switch
11	Shut-off valves
12	Buffer tank
13	Water filter
14	Water pump
15	Drain valve
16	Expansion tank

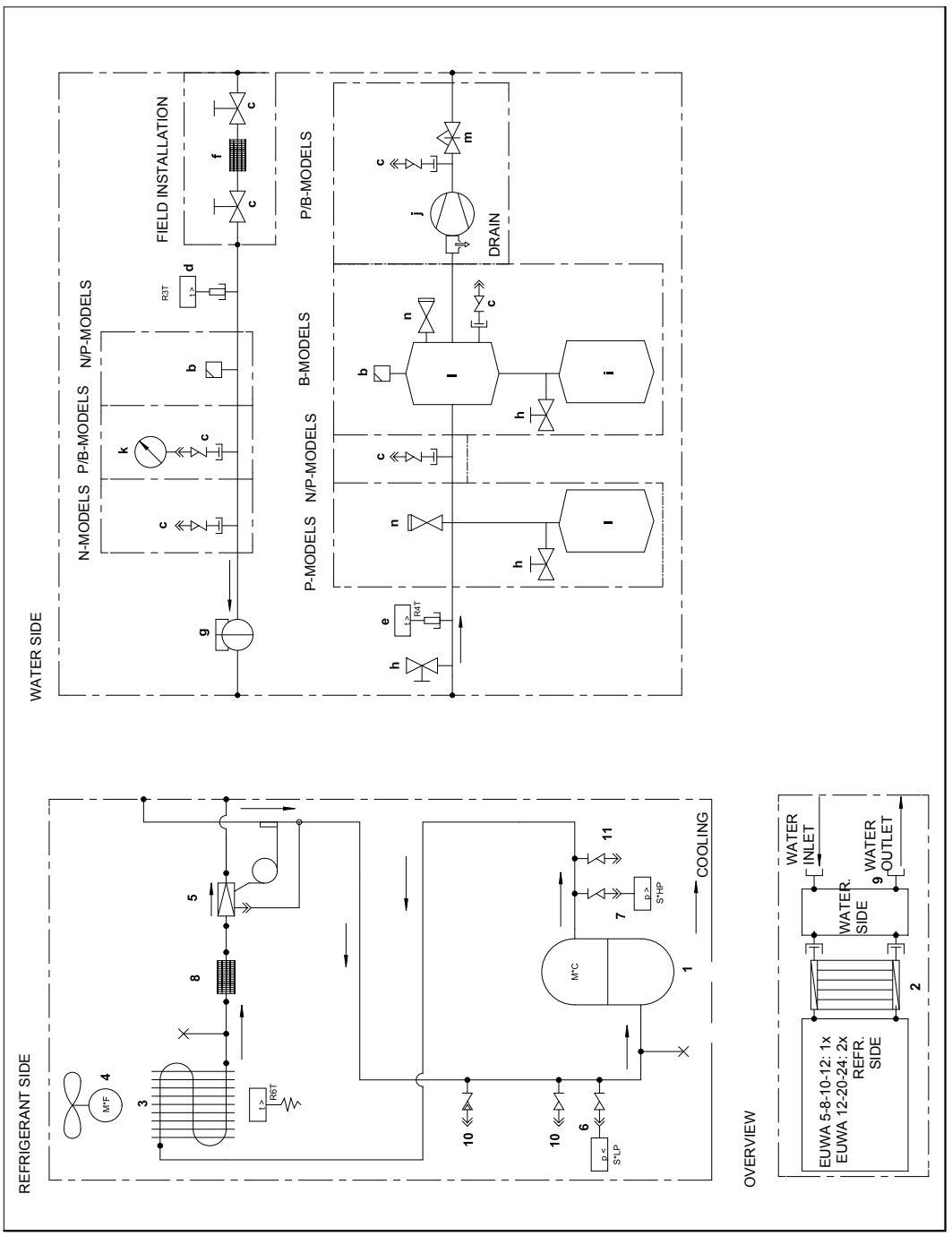
Water filter

Make sure a filter is installed in front of the water inlet of the plate-heat exchanger. The plate-heat exchangers are sensitive to dirt and small particles.
The mesh opening of the filter is max. 0.5 mm.

2.3 Functional Diagram Refrigeration Circuit: EUWA*5-24KBZW1

Functional diagram

The illustration below shows the functional diagram of the refrigeration circuit of EUWA*5-24KBZW1. It is also applicable for glycol applications.



1

Symbols

The table below describes the symbols.

Symbol	Description
R3T	Inlet water temperature sensor
R4T	Outlet water temperature sensor
R6T	Ambient temperature sensor
S*HP	High-pressure switch
S*LP	Low-pressure switch
M*F	Condensor fan
M*C	Compressor

Symbol	Description
	Check valve
	Flare connection
	Screw connection
	Flange connection
	Pinched pipe
	Spinned pipe

Components refrigeration side

The table below describes the main components of the refrigeration circuit on the refrigeration side.

No.	Component	Function / remark
1	Compressor	A hermetically sealed scroll compressor.
2	Water-heat exchanger (evaporator)	The water-heat exchanger is of the brazed plate-heat exchanger type.
3	Air-heat exchanger (condensor)	The air-heat exchanger is of the cross fin coil type. Hi-X-tubes and PE coated waffle louvre fins are used. The air is discharged upwards.
4	Fan	Direct driven single or two speed motor.
5	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
6	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 2 bar ± 0.3 ■ Standard setting: ON = 0.2 bar ± 0.2 ■ Glycol application setting: OFF = 1.5 bar ± 0.3 ■ Glycol application setting: ON = 0.5 bar ± 0.2
7	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 21.6 bar +0/-1 ■ Standard setting: ON = 30.9 bar +0/-1
8	Strainer	This strainer prevents dirt particles from entering the expansion valve.
9	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. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
10	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
11	High-pressure service port	The high-pressure service port is used to connect a high-pressure gauge.

Components water side

The table below describes the main components of the refrigeration circuit on the water side.

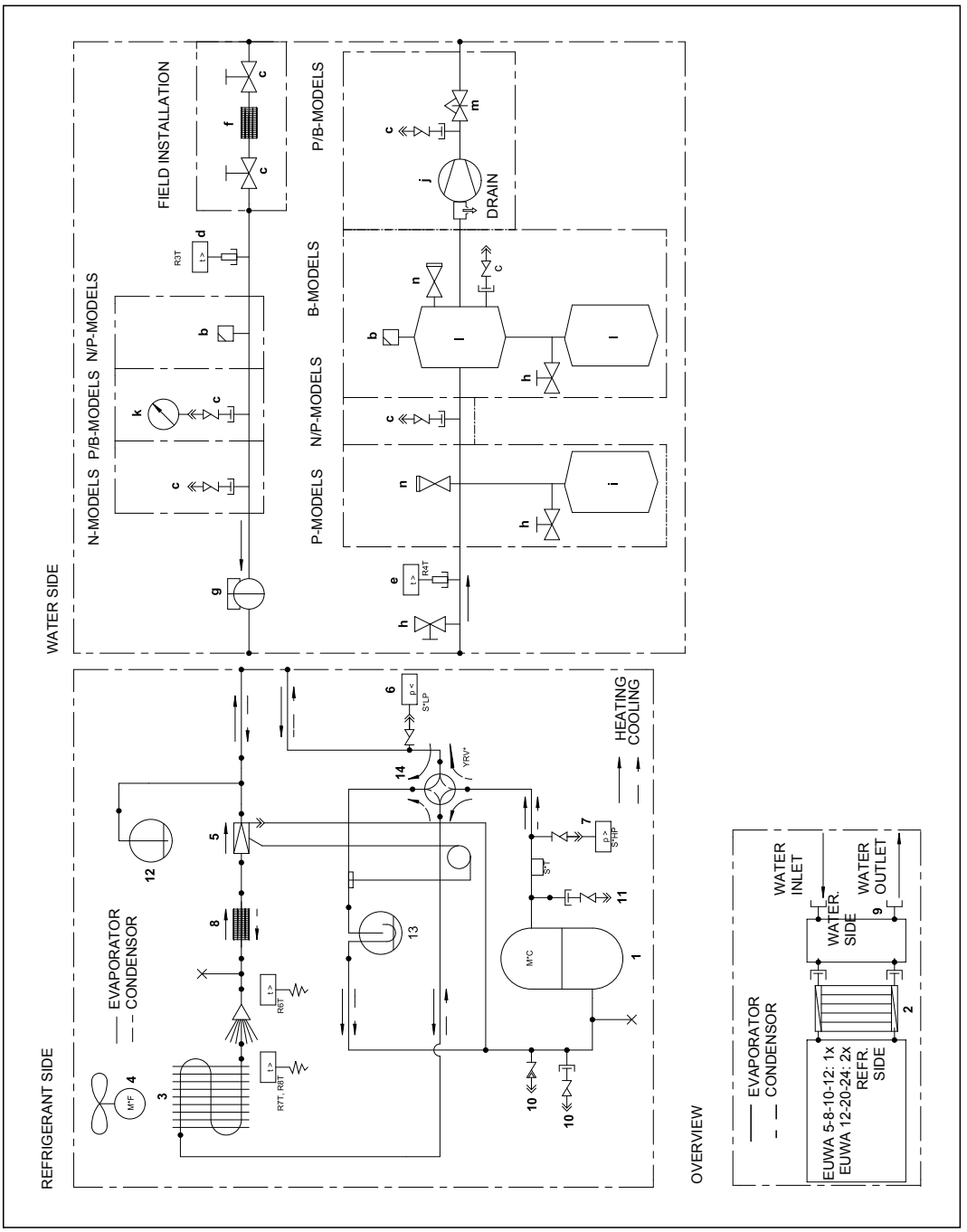
			No.	Component	Function / remark
EUWAB5-24KBZW1	EUWAP5-24KBZW1	EUWAN5-24KBZW1	a	Shut-off valve	Makes it possible to shut-off a part of the water piping for maintenance (e.g. to change a filter).
			b	Air purge	To purge the water circuit, to prevent air from entering the water circuit.
			c	Service port	The service port is used to connect a pressure gauge.
			d	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
			e	Freeze-up sensor	This protection device shuts down the circuit when the temperature of the chilled water becomes too low in order to prevent the water from freezing during operation.
			f	Strainer	This strainer prevents dirt particles from entering the water circuit.
			g	Flow switch	The flow switch is used to check if there is flow.
			h	Drain valve	The drain valve is used to drain water from the circuit.
			i	Expansion vessel	The expansion vessel deals with water expansion, which occurs when the temperature of the water varies.
			j	Pump	The pump circulates the water.
			k	Pressure gauge	Standard is the pressure gauge fitted to the unit.
			n	Safety valve	Maximum 3 bar pressure.
			l	Buffer tank	This buffer tank of 55 l is used to store chilled water to prevent the compressor from switching ON/OFF continuously depending on the load.
			m	Pressure regulation valve	The pressure regulation valve is used to regulate the pressure of the water side.

1

2.4 Functional Diagram Refrigeration Circuit: EUWY*5-24KBZW1

Functional diagram

The illustration below shows the functional diagram of the refrigeration circuit of EUWY*5-24KBZW1. It is also applicable for glycol applications.



Symbols

The table below describes the symbols.

Symbol	Description
R3T	Inlet water temperature sensor
R4T	Outlet water temperature sensor
R6T	Ambient temperature sensor
R7-8T	Coil temperature sensor
S*HP	High-pressure switch
S*LP	Low-pressure switch
S*T	Discharge temperature controller
YRV*	4-way valve

Symbol	Description
M*F	Condensor fan
M*C	Compressor
	Check valve
	Flare connection
	Screw connection
	Flange connection
	Pinched pipe
	Spinned pipe

Components refrigeration side

The table below describes the main components of the refrigeration circuit on the refrigeration side.

No.	Component	Function / remark
1	Compressor	A hermetically sealed scroll compressor.
2	Water-heat exchanger (evaporator)	The water-heat exchanger is of the brazed plate-heat exchanger type.
3	Air-heat exchanger (condensor)	The air-heat exchanger is of the cross fin coil type. Hi-X-tubes and PE coated waffle louvre fins are used. The air is discharged upwards.
4	Fan	Direct driven single or two speed motor.
5	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
6	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 2 bar ± 0.3 ■ Standard setting: ON = 0.2 bar ± 0.2 ■ Glycol application setting: OFF = 1.5 bar ± 0.3 ■ Glycol application setting: ON = 0.5 bar ± 0.2
7	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 21.6 bar +0/-1 ■ Standard setting: ON = 30.9 bar +0/-1
8	Strainer Bi-flow	This strainer prevents dirt particles from entering the expansion valve. The type of this strainer is a bi-flow strainer.
9	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. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
10	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.

1

No.	Component	Function / remark
11	High-pressure service port	The high-pressure service port is used to connect a high-pressure gauge.
12	Liquid receiver	The liquid receiver temporarily holds the refrigerant which has been liquified by the condensor before being send to the expansion valve.
13	Accumulator	The accumulator is used to separate the gas from the liquid in order to prevent the compressor from pumping liquid.
14	4-way valve	The 4-way valve is energized during cooling.

Components water side

The table below describes the main components of the refrigeration circuit on the water side.

			No.	Component	Function / remark
EUWYB5-24KBZW1	EUWYP5-24KBZW1	EUWYN5-24KBZW1	a	Shut-off valve	Makes it possible to shut-off a part of the water piping for maintenance (e.g. to change a filter).
			b	Airport	To purge the water circuit, to prevent air from entering the water circuit.
			c	Service port	The service port is used to connect a pressure gauge.
			d	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
			e	Freeze-up sensor	This protection device shuts down the circuit when the temperature of the chilled water becomes too low in order to prevent the water from freezing during operation.
			f	Strainer	This strainer prevents dirt particles from entering the water circuit.
			g	Flow switch	The flow switch is used to check if there is flow.
			h	Drain valve	The drain valve is used to drain water from the circuit.
			i	Expansion vessel	The expansion vessel deals with water expansion, which occurs when the temperature of the water varies.
			j	Pump	The pump circulates the water.
			k	Pressure gauge	Standard is the pressure gauge fitted to the unit.
			n	Safety valve	Maximum 3 bar pressure.
			l	Buffer tank	This buffer tank of 55 l is used to store chilled water to prevent the compressor from switching ON/OFF continuously depending on the load.
			m	Pressure regulation valve	The pressure regulation valve is used to regulate the pressure of the water side.

3 Wiring Layout

3.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

- Main functions of the EUWA*5-24KBZW1 and EUWY*5-24KBZW1
- Switch box layout
- Wiring diagram

Overview

This chapter contains the following topics:

1

3.2 Main Functions of the EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Main functions

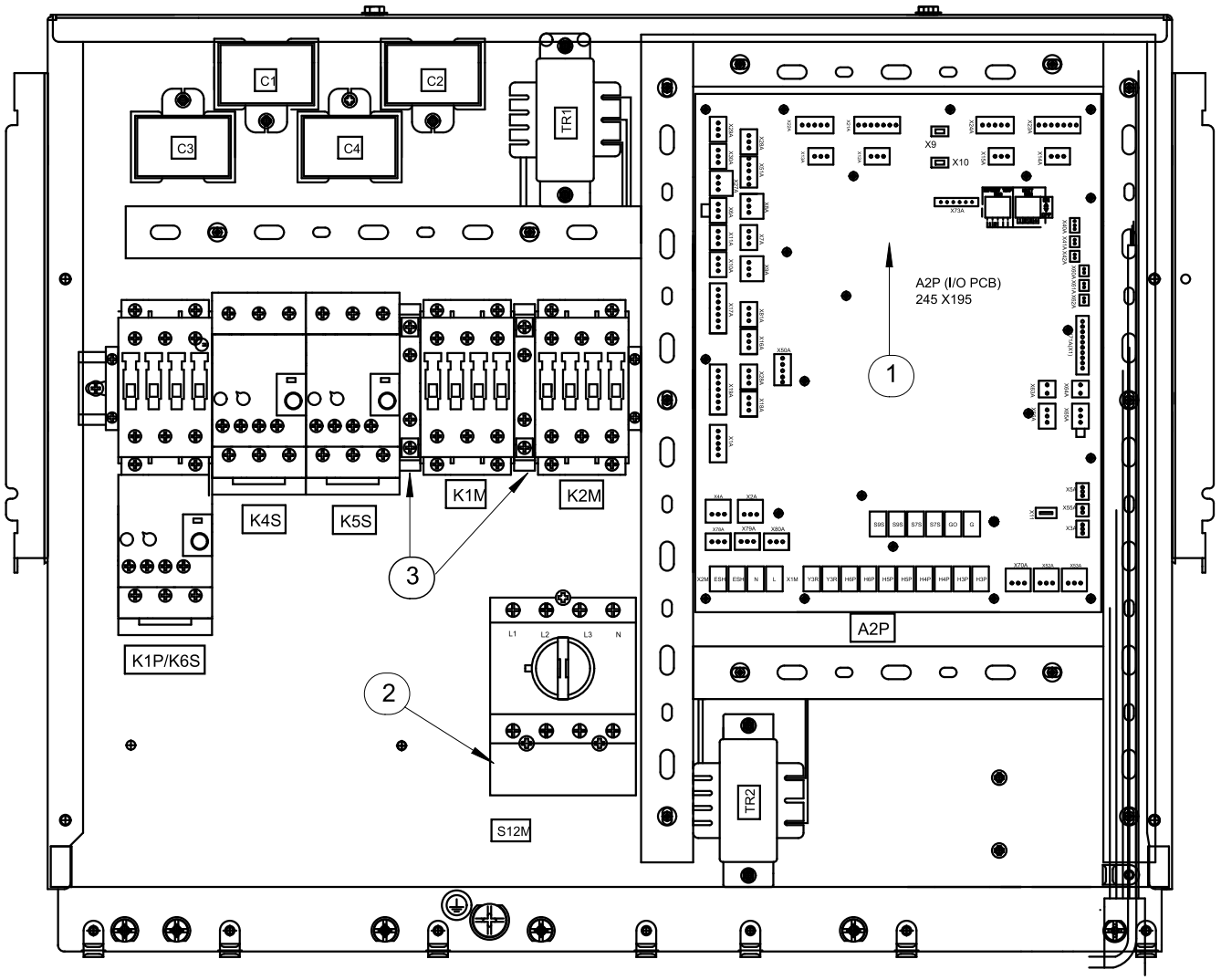
The table below describes the components connected to the µC2SE.

Ter-minal	Signal	Connection	Wiring diagram symbol			Description
			Connector I/O PCB			
X1	Digital input	ID1-GND	X71A (5-10)	X65A	S10L	Flow switch
		ID2-GND		X3M	S7S	Remote cool/heat (only for EUWY) or Remote dual set-point
		ID3-GND		X6A/X7A	S1HP/S1HP	High-pressure switch
				X8A/X9A	Q1D/Q2D	Discharge protector
				X10A/X11A	K4S/K55	Thermal overcurrent
		ID4-GND		X63A/X64A	S4LP/S5LP	Low-pressure switch
		ID5-GND		X3M	S9S	Remote ON/OFF or Remote dual set-point
	Analog input	B1-GND	X71A (1-4)	X60A	R3T	Evaporator inlet water t°
		B2-GND		X61A	R4T	Evaporator outlet water t°
		B3-GND		_	_	_
		Y1-GND		_	_	_
X2	Digital output	C1/2-NO1	X50A	X17A	K1M	Compressor on circuit 1
		C1/2-NO2		X19A	K2M	Compressor on circuit 2
		C3/4-NO3	X51A	X29A	K1P	Contact for pump
		C3/4-NO4		X5-X6/ X7-X8	Y1R/Y2R	Reversing valve
		C5-NO5	X70A	X1M (1-2)	H3P	Alarm voltage-free contact

3.3 Switch Box Layout: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Double circuit layout

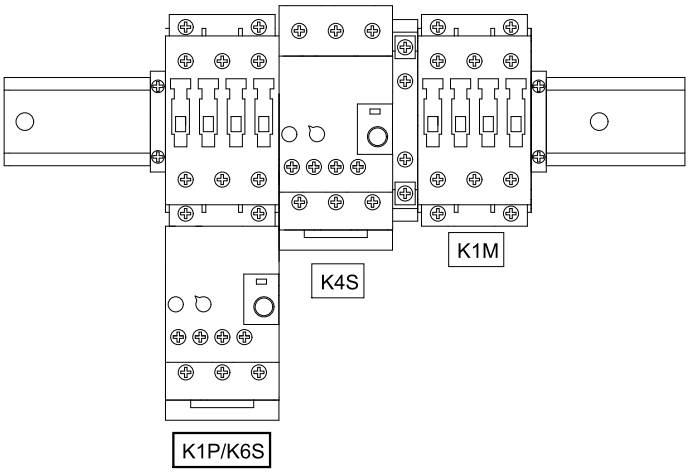
The illustration below shows the switch box layout for a double circuit.



1

Single circuit layout

The illustration below shows the switch box layout for a single circuit.



Components

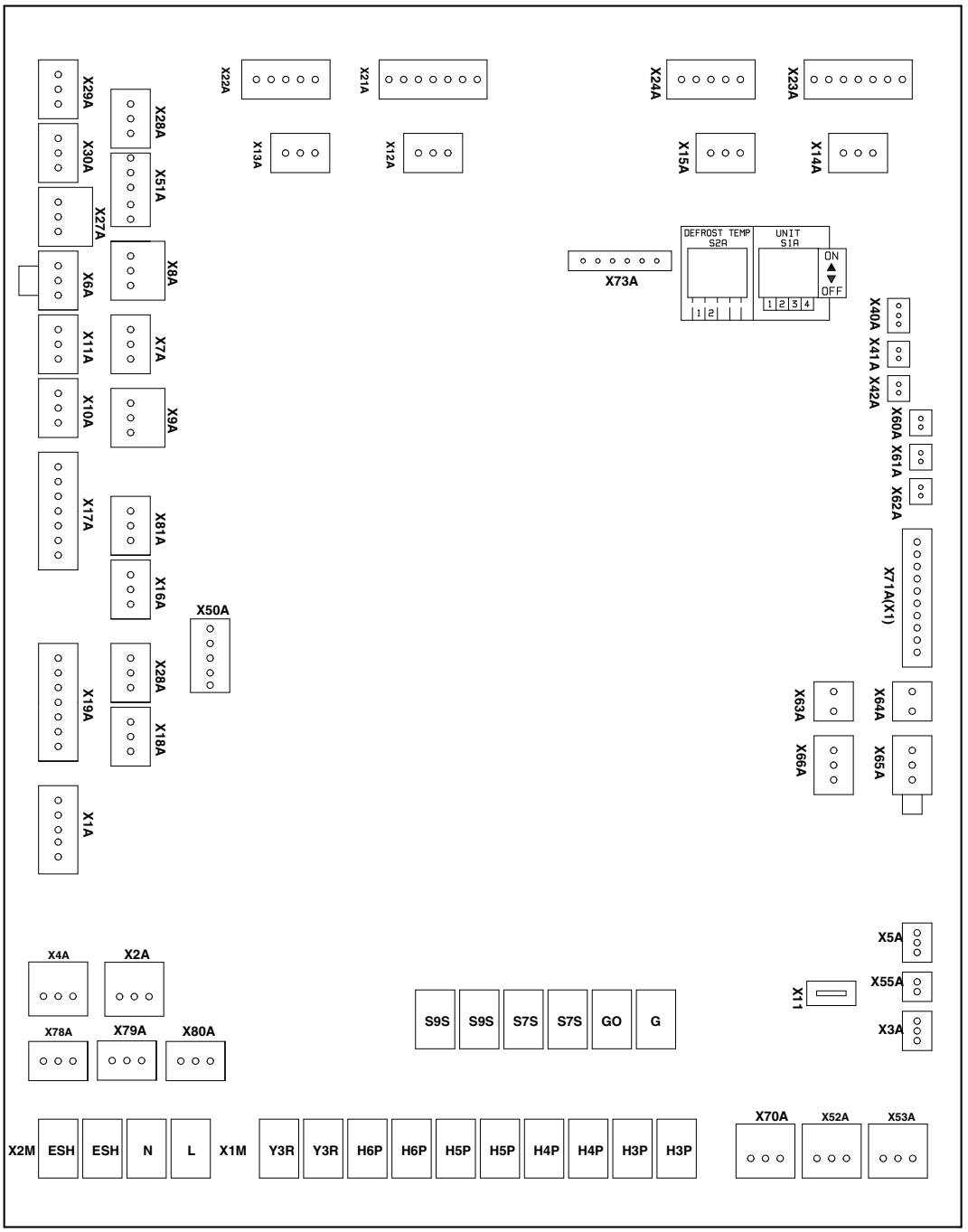
The table below describes the components.

Wiring diagram symbol	Description
C1/C2/C3/C4	AC motor capacitors 12 µF
TR1/TR2	Power supply transformator
K1P	Pump contactor
K6S	Pump
K4S/K5S	Circuit 1/circuit 2
K1M/K2M	Compressor contactor circuit 1/circuit 2
S12M	Main switch
S21P	Pump switch (on front switch box)
1	I/O PCB
2	Main switch (on front switch box)
3	Auxiliary contact for K1M and K2M

3.4 PCB Layout of the EUWA*5-24KBZW1 and EUWY*5-24KBZW1

PCB layout

The illustration below shows the I/O PCB layout of chiller types EUWA*5-24KBZW1 and EUWY*5-24KBZW1.



1

Components

The table below describes the components.

Connector	Wiring diagram symbol	Description
X1A	(L1, N, L3)	Power supply L1, N, L3
X2A	TR Pri.	Transformer primary
X3A	TR. Sec	Transformer secondary
X4A	TR Pri.	Transformer primary
X5A	TR. Sec	Transformer secondary
X6A	S1HP	High pressure switch of circuit 1
X7A	S2HP	High pressure switch of circuit 2
X8A	Q1D	Discharge thermal protector of circuit 1
X9A	Q2D	Discharge thermal protector of circuit 2
X10A	K4S	(NC) Overcurrent relay of circuit 1
X11A	K5S	(NC) Overcurrent relay of circuit 2
X12A	Q11F	Thermal protector of fanmotor 1 of circuit 1
X13A	Q12F	Thermal protector of fanmotor 2of circuit 1
X14A	Q21F	Thermal protector of fanmotor 1 of circuit 2
X15A	Q22F	Thermal protector of fanmotor 2 of circuit 2
X16A	Y1S	Liquid solenoid valve
X17A	K1M	Compressor contactor (coil) of circuit 1 NC contact of K1M
X18A	Y2S	Liquid solenoid valve
X19A	K2M	Compressor contactor (coil) of circuit 2 NC contact of K2M
X21A	M11F	Fanmotor 1 of circuit 1
X22A	M12F	Fanmotor 2 of circuit 1
X23A	M21F	Fanmotor 1 of circuit 2
X24A	M22F	Fanmotor 2 of circuit 2
X27A	S21P	Switch for pump: Manual - Auto
X28A	K6S	(NC) Overcurrent relay of pump
X29A	K1P	Pump contactor
X30A	S10L	Flow contactor
X40A	R6T	Ambient temperature sensor
X41A	R7T	Coil temperature sensor for circuit 1
X42A	R8T	Coil temperature sensor for circuit 2
X50A	X2 (C1/2, No1, No2)	To A1P MicroChiller compact 2 SE

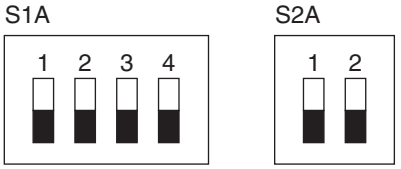
Connector	Wiring diagram symbol	Description
X51A	X2 (C3/4, No3, No4)	To A1P MicroChiller compact 2 SE (pump + reverse valve)
X52A	K1M	NO contact of K1M
X53A	K2M	NO contact of K2M
X55A	(G, GO)	Power supply to MicroChiller compact 2 SE
X56A	(N, L3)	Power supply for evaporator heater tape
X60A	R3T	Evaporator inlet water temperature sensor
X61A	R4T	Evaporator outlet water temperature sensor
X62A	R5T	Cond. inlet water temperature sensor
X63A	S4LP	Low pressure switch circuit 1
X64A	S5LP	Low pressure switch circuit 2
X65A	S10L	Flow contact
X66A	X66A	No use (shortcut)
X70A	X2 (C5, No5)	To A1P (C5, No5)
X71A	X1 (B1, 2, 3, Gnd, ID1, ID2, ID3, ID4, ID5, Gnd)	To A1P X1 (B1, B2, B3, Gnd) (ID1, ID2, ID3, ID4, ID5, Gnd)
X73A	X73A SER.	Serial communication
X78A	E3H	Evaporator heater tape
X79A	E4H	Evaporator heater tape
X80A	E6H	Buffer heater
X81A	E1H	Crankcase heater 1
X82A	E2H	Crankcase heater 2
X1M	(H3P, H4P, H5P, H6P, Y3R)	Connection for field wiring
X2M	(L, N, E5H)	Field connection for option OP10 Evap. heater tape
X3M	(G, Go (Option)) S9S S7S DO NOT CONNECT VOLTAGE	Field connection for option kit, EKAC10C (A3P) and field wiring
X5	Y1R	Reverse valve circuit 1
X6	Y1R	Reverse valve circuit 1
X7	Y2R	Reverse valve circuit 2
X8	Y2R	Reverse valve circuit 2
X9	X9	To fan contactor circuit 1
X10	X10	To fan contactor circuit 2

1

Connector	Wiring diagram symbol	Description
X11	PE (GRN/YLW)	To earth

Dipswitches and pushbuttons

The illustration below shows the dipswitches and pushbuttons on the PCB.



Function

The table below describes the function of the dipswitches and pushbuttons on the PCB.

S1A	Dipswitch 1	S2A	Dipswitch 2
1	0 = 1 circ. 1 = 2 circ.	1	Defrost setting (only for EUWY*5-24KBZW1) 0 = Start condition 1 & fan defrost 1 (5HP, 8HP, 16HP) 1 = Start condition 2A/B & fan defrost 2 (10HP, 12HP, 20HP, 24HP)
2 3 4	010 = EUWA 100 = EUWY (without defrost compressor stop) 101 = EUWY (with defrost compressor stop)	2	Fan setting 0 = Fan setting 1 (5HP, 8HP, 16HP) 1 = Fan setting 2 (10HP, 12HP, 20HP, 24HP)

LED's

The table below describes the LEDs.

Symbol	LED	Meaning
HAP	Light emitting diode (Service monitor - Green)	Blinking = CPU OK Not blinking = CPU NOK
H1P	Light emitting diode (Service monitor - RED)	-
H2P	Light emitting diode (Service monitor - RED)	-

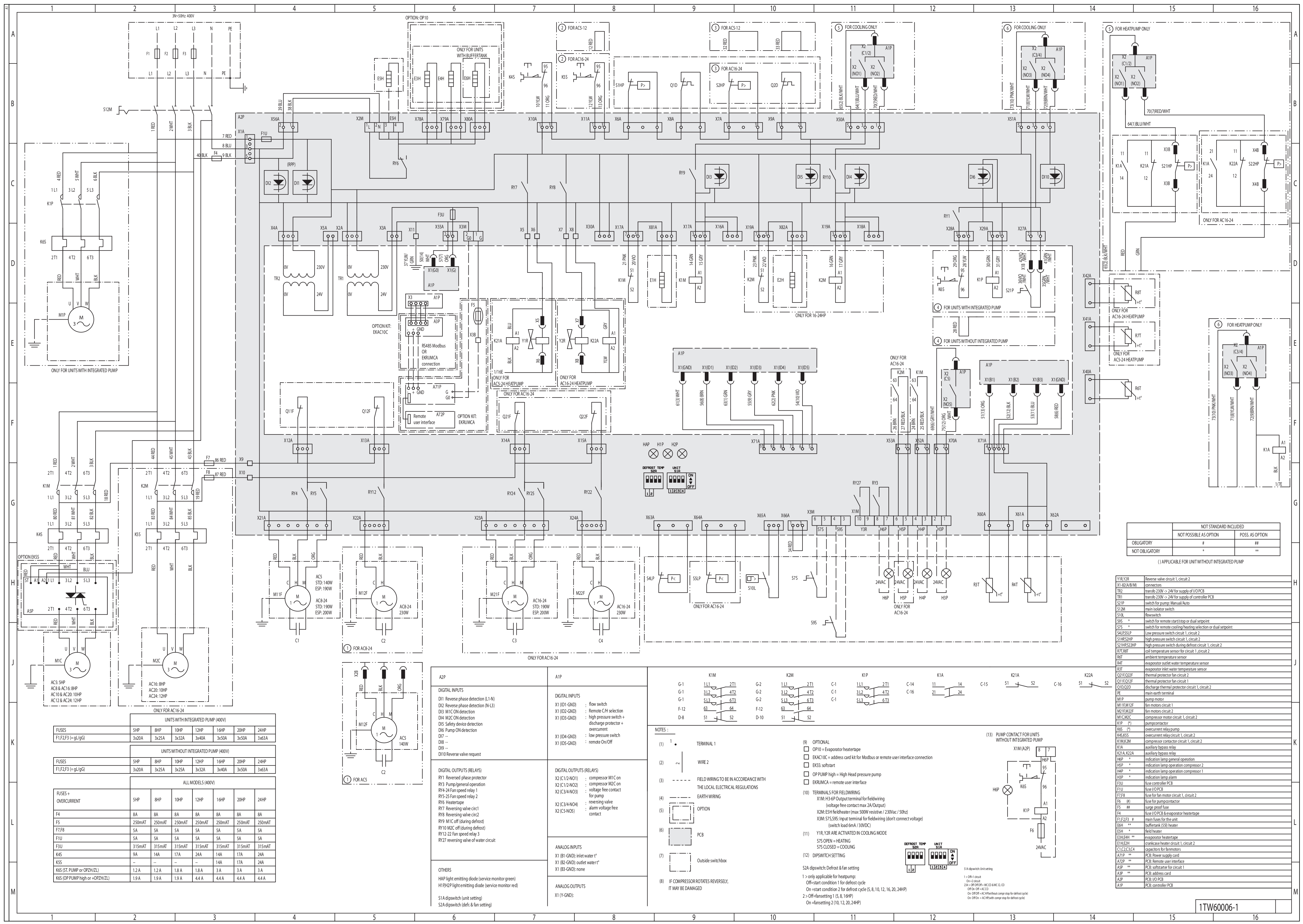
Status H1P and H2P

The table below describes the status of H1P and H2P.

Meaning	H1P	H2P
No error	OFF	OFF
Safety device	ON	OFF
Reverse phase	OFF	ON
Sensor broken	ON	ON

3.5 Wiring Diagram: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Diagram



Part 2
Functional Description

Introduction

This part contains more detailed information on the functions and controls in the unit. This information can be used as background information for troubleshooting. This part also contains an extensive overview of the functioning of the controllers. Knowledge of the controllers is indispensable for valuable information on servicing and troubleshooting.

What is in this part?

This part contains the following chapters:

1 Functional Description

1.1 What Is in This Chapter?

Introduction

This chapter contains information on the functions used to control the system. Understanding these functions is vital when diagnosing a malfunction that is related to the functional control.

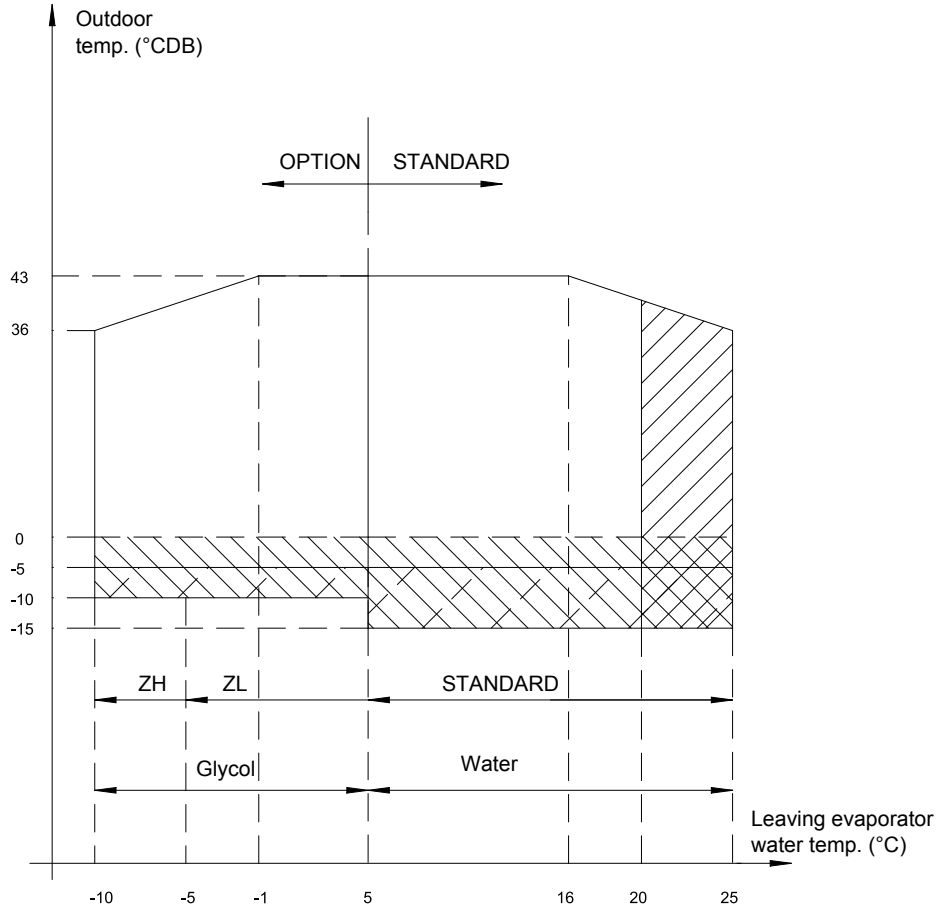
Overview

This chapter contains the following topics:

1.2 Operational Range: EUWA*5-24KBZW1

Operational range

The illustration below shows the operational range of EUWA*5-24KBZW1.



Legend

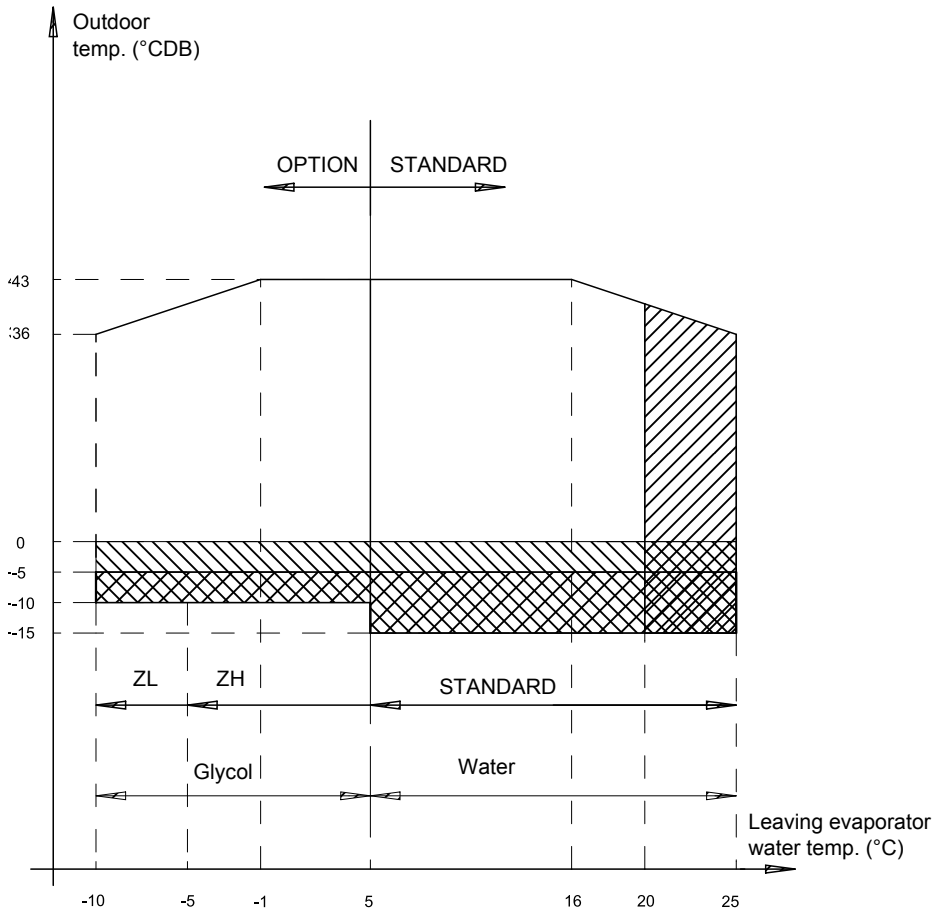
The table below describes the patterns and abbreviations used in the operational range illustration above.

Pattern/ Abbreviation	Description
	Standard operation
	Pull-down area
	Protection water circuit against freezing
	If the units operate below -5°C and are installed in a draughty space, a windscreen is required
ZH	Option to produce evaporating leaving water temperature till -5°C
ZL	Option to produce evaporating leaving water temperature till -10°C

1.3 Operational Range: EUWY*5-24KBZW1

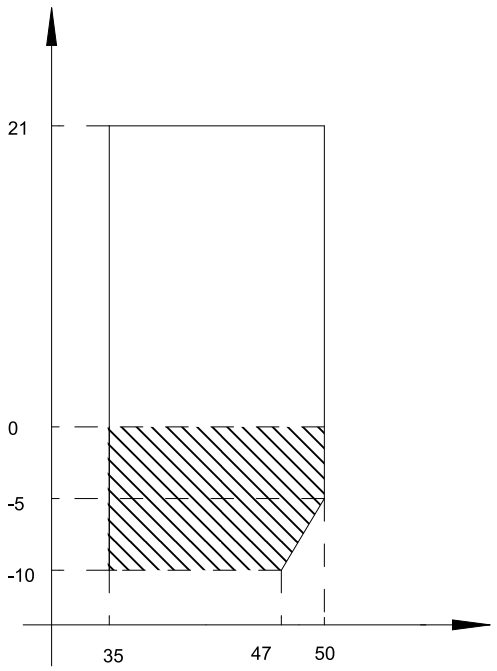
Operational range in cooling mode

The illustration below shows the operational range in cooling mode of the EUWY*5-24KBZW1.



Operational range in heating mode

The illustration below shows the operational range in heating mode of the EUWY*5-24KBZW1.



2

Legend

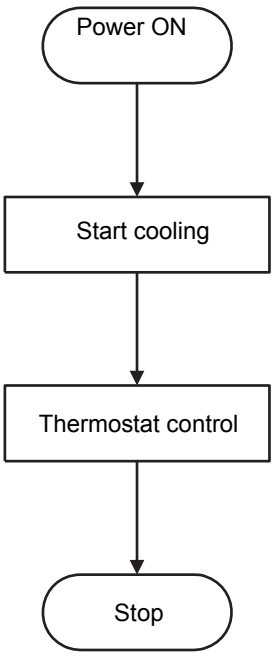
The table below describes the patterns and abbreviations used in the operational range illustration above.

Pattern/ Abbreviation	Description
	Standard operation
	Pull-down area
	Protection water circuit against freezing
	If the units operate below -5°C and are installed in a draughty space, a windscreen is required
ZH	Option to produce evaporating leaving water temperature till -5°C
ZL	Option to produce evaporating leaving water temperature till -10°C

1.4 Operational Flow Chart

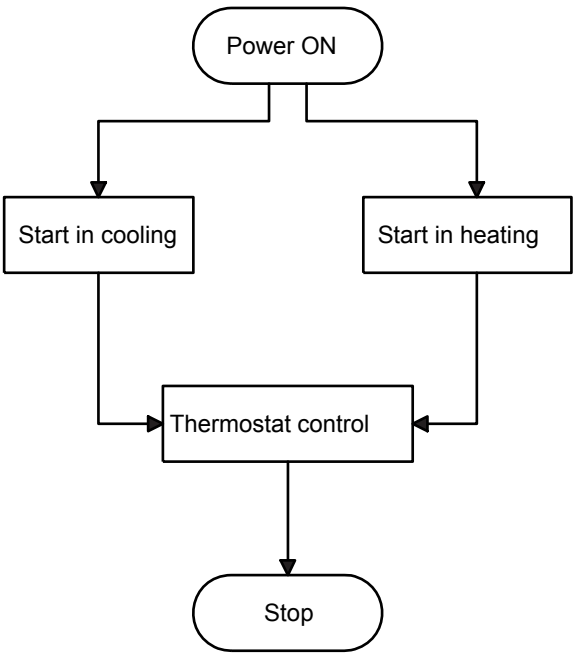
Flow chart

The flow chart below describes the operation of EUWA*5-24KBZW1.



Flow chart

The flow chart below describes the operation of EUWY*5-24KBZW1.



1.5 Compressor Working Status

Compressor working status

The table below gives the conditions of the compressor status.

The compressor is ON when...	The compressor is OFF when...
The ON button is pressed AND Thermostat ON AND No safety activation	The OFF button is pressed OR Thermostat OFF OR Safety activation

1.6 Compressor Timers

Compressor timers

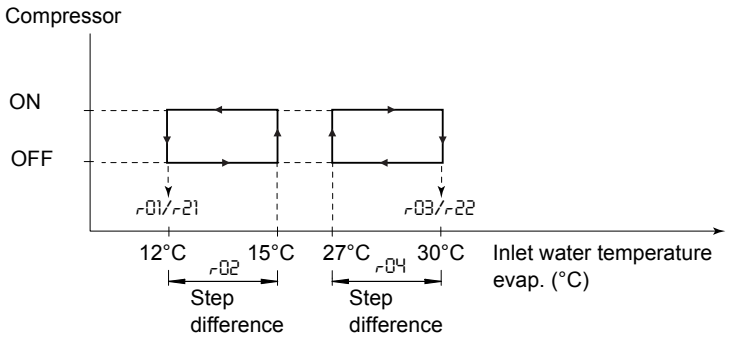
The table below shows the timers of the compressor.

Timer	Interval (s)	Use
Guard timer	60	The timer starts counting down when the scroll compressor is switched OFF. During the countdown the compressor can not be restarted.
Anti-recycling timer	240	The timer starts counting down when the scroll compressor is switched ON. During the countdown the compressor can not be restarted.

1.7 Thermostat Control: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Functional diagram 5-12HP

The illustration below shows the thermostat control of 5-12HP.



r01: Cooling set point (default 12°C)

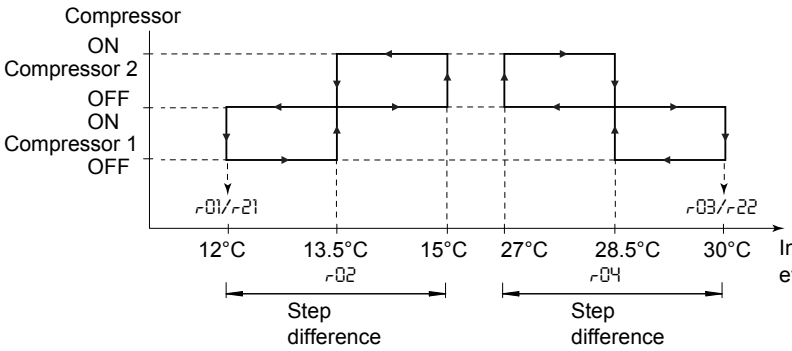
r03: Heating set point (default 30°C) only for EUWY*5-24KBZW1

r21: Cooling set point 2

r22: Heating set point 2 only for EUWY*5-24KBZW1

Functional diagram 16-24HP

The illustration below shows the thermostat control of 16-24HP.



r01: Cooling set point (default 12°C)

r03: Heating set point (default 30°C) only for EUWY*5-24KBZW1

r21: Cooling set point 2

r22: Heating set point 2 only for EUWY*5-24KBZW1

Controller

The table below describes the step difference.

Description	Lower limit	Upper limit	Step	Default
r02 and/or r04: Step difference (°C)	0.3	19.9	0.1	3.0

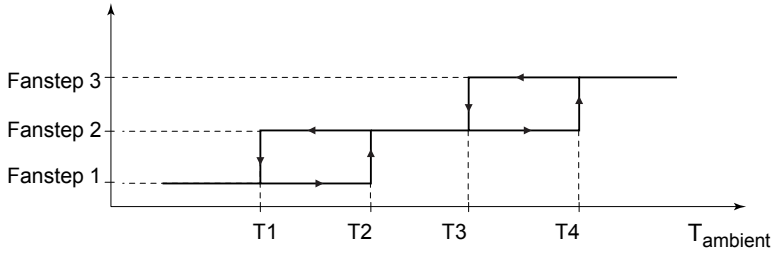
1.8 Head Pressure Control: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Functional description

- The chillers are equipped with a fan control to limit the high pressure based on ambient temperature.
- Each circuit (K4A, K5A and K12A) has the same functionality.

Fan management in cooling mode

The illustration below shows the fan management in cooling mode.



Fan relay management in cooling mode

The table below describes the fan relay management in cooling mode.

	Fan relay 1	Fan relay 2	Fan relay 3	Result			
	RY4/RY24	RY5/RY25	RY12			For units with 2 circuits and fans	
Fanstep 1	Open	Closed	Open	M11F: medium	M12F: OFF	M21F: medium	M22F: OFF
Fanstep 2	Closed	Open	Open	M11F: high	M12F: OFF	M21F: high	M22F: OFF
Fanstep 3	Closed	Open	Closed	M11F: high	M12F: high	M21F: high	M22F: high

Fan motor operation

The operation of the fan motors depends on the ambient temperature. The table below contains the fan settings for different ambient temperatures.

	$T_{ambient}$	
	Fan setting 1 (5HP, 8HP, 16HP)	Fan setting 2 (10HP, 12HP, 20HP, 24HP)
T1	5°C	-4°C
T2	7°C	-2°C
T3	17°C	15°C
T4	19°C	17°C

Selection of fan setting

Fan setting 1 or Fan setting 2 is selected by dipswitch S2A number 2:

- OFF = fan setting 1
- ON = fan setting 2

2

Fan relay management in heating mode

The table below describes the fan relay management in heating mode. This is only valid for the heat pump (EUWY*5-24KBZW1).

	Fan relay 1	Fan relay 2	Fan relay 3	Result			
	RY4/RY24	RY5/RY25	RY12			For units with 2 circuits and fans	
Fans	Closed	Open	Closed	M11F: high	M12F: high	M21F: high	M22F: high

1.9 Fan Working: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Working principle

The fan runs parallel with the compressor operation. The operation is not steered by the microchiller controller but by the I/O PCB.

See “Head Pressure Control: EUWA*5-24KBZW1 and EUWY*5-24KBZW1” on page 2-11.

1.10 Crankcase Heater

Functional description

The crankcase heater should always work when the compressor is in the OFF status. The crankcase heater should be used with compressors in order to avoid that refrigerant is dissolving in the compressor oil during standstill.

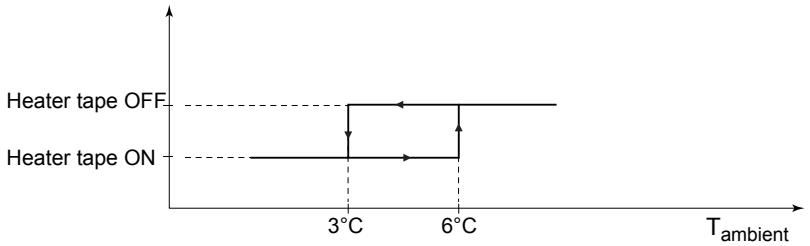
1.11 Evaporator Heater Tape Management: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Functional description

The evaporator heater tape management protects the evaporator (and field piping) against freezing. When the compressors 1 and 2 are switched off and the ambient temperature is low, then the evaporator heater, field heater and buffertank heater (K6A) are switched on.
If a single circuit is selected, only detect on compressor 1 (based on S1Adip).

Heater tape management

The illustration below shows the heater tape management.



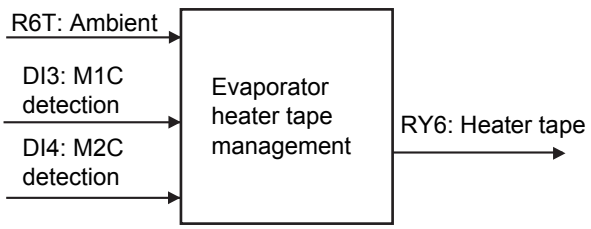
Heater tape control

The I/O board controls the function of the evaporator heater tape. No separate power supply is foreseen for the evaporating heater tape. When the main switch is switched off, the heater tape has no power and does not work.

The heater tape will be activated if...	The heater tape will be deactivated if...
■ The ambient temperature is lower or equal then 3°C. ■ And the status of the compressor is OFF.	■ The ambient temperature is higher or equal then 6°C. ■ And the status of the compressor is ON.

Illustration heater tape management

The illustration below shows the evaporator heater tape management.



1.12 Pump Steering

Pump steering	A pumpcontact should be present with pumplead (15 s) and pumplag (0 s) timers taken into account.

2

1.13 Freeze-up Control: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Functional description

The freeze-up control is a protection against ice formation in the water circuit at the evaporator outlet.

Characteristics

The table below contains the characteristics of the freeze-up protection.

Characteristics	Freeze-up protection
Control device	Sensor
Diagram name	R4T
Activation	Outlet water temperature < 4°C Result: The unit is disabled.
Reset	Manually on controller if temperature > 7.5°C (4°C + anti-freeze hysteresis). Result: The circuit restarts.

Characteristics for glycol option

The table below contains the characteristics of the freeze-up protection for the glycol option.

ZL	Activation	Outlet water temperature < -11.5°C
	Reset	Manually on controller if temperature > -8°C (-11.5°C + anti-freeze hysteresis).
ZH	Activation	Outlet water temperature < -6.5°C
	Reset	Manually on controller if temperature > -3°C (-6.5°C + anti-freeze hysteresis).

1.14 Defrost Management for EUWY*5-24KBZW1

Functional description

The characteristics of the defrost management are the following:

- The defrost function is only active in heating mode.
- The defrost cycle can only be performed if the compressor is on.
- When a defrost cycle is active in a circuit, the reversing valve of that circuit is switched.
- When a defrost cycle is active, all the fans in circuit 1 and circuit 2 are switched off or run on medium speed.
- The defrost function is executed in the I/O PCB and there will be no defrost indication on the controller.
- If the defrost function for circuit 1 is active, circuit 2 is stopped by opening DO10.
- If the defrost function for circuit 2 is active, circuit 1 is stopped by opening DO9.
- Priority: when the defrost function is activated for the 2 circuits, only one of the circuits will alternately be defrosted.

Illustration dipswitches S2A

The illustration below shows the defrost dipswitches on the PCB.

Function dipswitches S2A

The table below describes the function of the dipswitches on the PCB.

S2A	Dipswitch
1	Defrost setting 0 = Start condition 1 & fan defrost 1 (5HP, 8HP, 16HP) 1 = Start condition 2A/B & fan defrost 2 (10HP, 12HP, 20HP, 24HP)
2	Fan setting 0 = Fan setting 1 (5HP, 8HP, 16HP) 1 = Fan setting 2 (10HP, 12HP, 20HP, 24HP)

Fan status during defrost

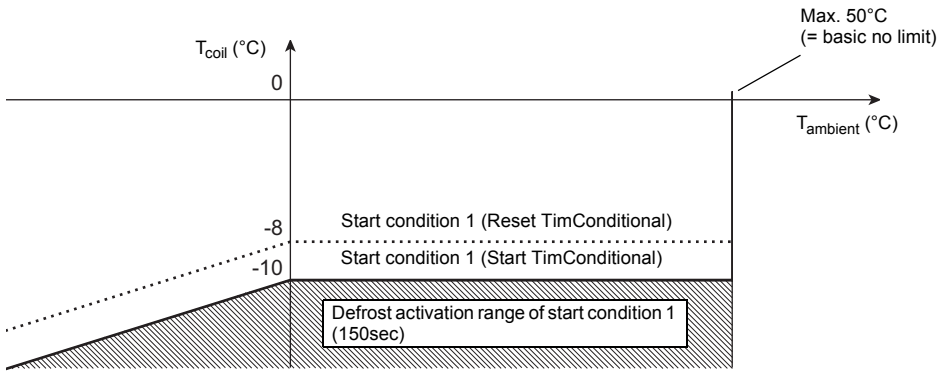
The table below shows the fan status during defrost.

Fans during defrost			K4A	K5A	K12A	
Fan defrost 1	M11F: off and M12F: off / M21F: off and M22F: off		Open	Open	Open	Depending on dipswitch S2A-1 in combination with EUWY setting (S1A-234)
Fan defrost 2	If (Ambient at defrost start time) => 5°C	M11F: Medium and M12F: off M21F: Medium and M22F: off (*)	Open	Closed	Open	
	If (Ambient at defrost start time) < 5°C AND ComprMinFanC1/2 = 1	M11F: off and M12F: off M21F: off and M22F: off (*)	Open	Open	Open	
	If (Ambient at defrost start time) < 5°C AND ComprMinFanC1/2 = 0	M11F: Medium and M12F: off M21F: Medium and M22F: off (*)	Open	Closed	Open	
Fan defrost 3	M11F: Medium and M12F: off / M21F: Medium and M22F: off		Open	Closed	Open	

(*): This fan status is kept during the complete defrost cycle, independent of Ambient Temperature changes.

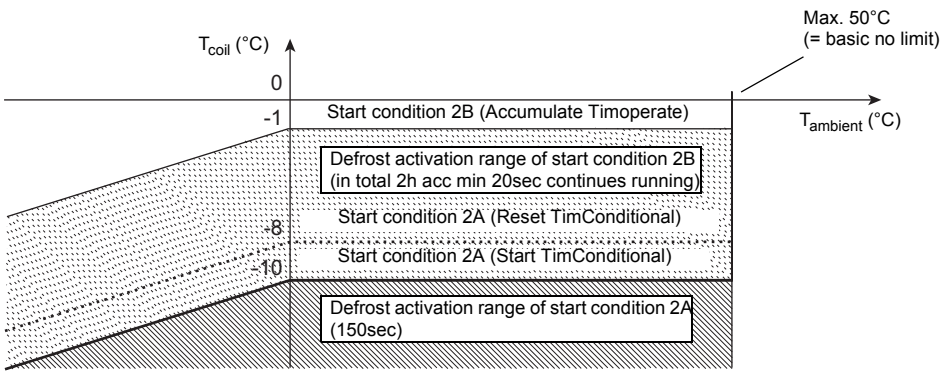
Start condition 1

The illustration below shows start condition 1 of the defrost function.



Start condition 2

The illustration below shows start condition 2 of the defrost function.



2

Starting defrost function

The table below describes the start conditions for the defrost function.

Start condition 1	$T_{coil}C1/2 < 0.6 \times T_{amb} -10°C$ AND $T_{coil}C1/2 < -10°C$ AND $T_{amb} < 50°C$	TimConditional	Depending on dipswitch S2A-1 in combination with EUWY setting (S1A-234)
Start condition 2	Start condition 2A: $T_{coil}C1/2 < 0.6 \times T_{amb} -10°C$ AND $T_{coil}C1/2 < -10°C$ AND $T_{amb} < 50°C$	TimConditional	
	OR		
	Start condition 2B: $T_{coil}C1/2 < 0.6 \times T_{amb} -1°C$ AND $T_{coil}C1/2 < -1°C$ AND $T_{amb} < 50°C$	TimConditional AND TimCompMin	

Terminating defrost function

The table below describes the terminating conditions for the defrost function.

Stop condition 1	{ (T_{amb} at defrost start time ≥ B°C) AND ($T_{coil}C1/2 > +20°C$) } OR { (T_{amb} at defrost start time < B°C) AND ($T_{coil}C1/2 > +10°C$) }	B = 5°C
Stop condition 2	After Timdefrost Max: The defrost operation can take maximum 10 minutes. After the 10 minutes defrost operation, the unit returns to the heating mode.	
Stop condition 3	If for some reason the high pressure increases above the control setpoint of the high pressure switch (S21HP/S22HP), the unit will stop the defrost operation and return to the heating mode.	

Defrost starting timers

The table below describes the timers important to start the defrost cycle.

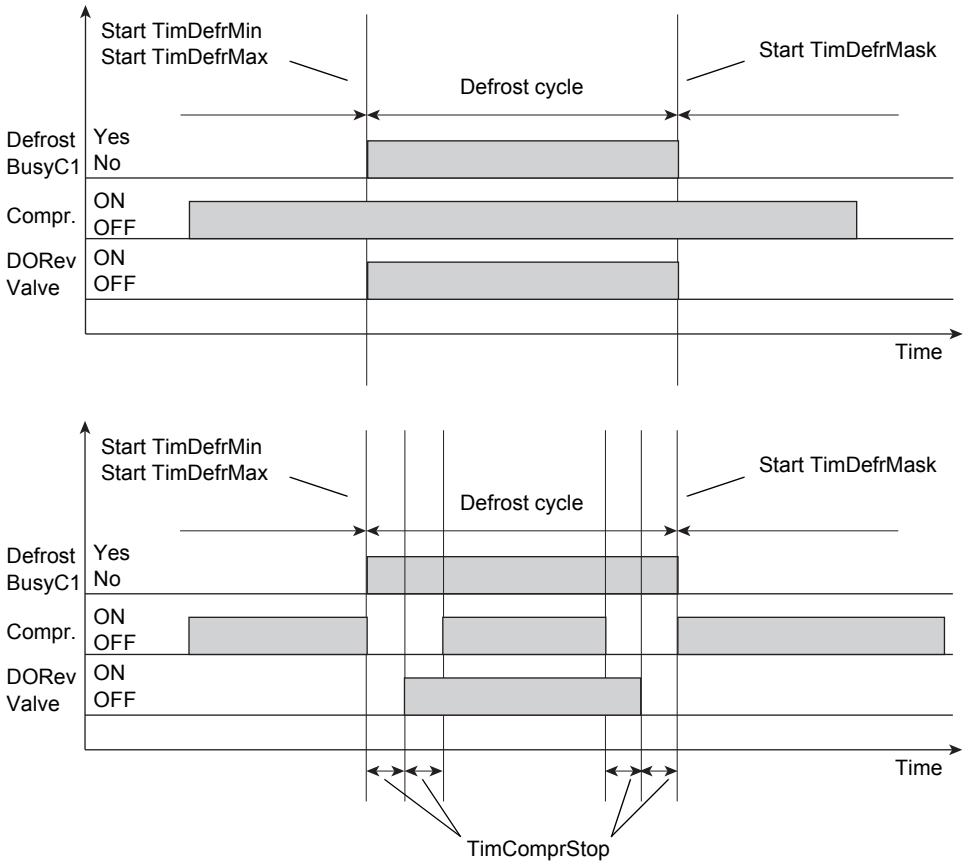
Timer	Description	Steps and conditions	Start-value
TimConditional 1/2	The minimum time that the defrost start condition 1 or 2A must be met to start the defrost cycle.	■ Start of timer Coil & Ambient below start condition 1 or 2A AND Compressor on by thermostat (DI3/4 M1/2Cdetect = closed) ■ Reset of timer (no requests) Coil & Ambient above start condition 1 or 2 with differential of +2°C on coil temperature OR Compressor switched off by thermostat (DI3/4 M1/2Cdetect = open) ■ End of timer (goes to 0) Then defrost requests start	150 s
TimOperate1/2	The minimum time that the defrost condition 2B must be met to start the defrost cycle. This timer is accumulated time.	■ Start or continue timer Coil & Ambient below start condition 2B AND Compressor on by thermostat (DI3/4 M1/2Cdetect = closed) ■ Stop of timer Coil & Ambient above start condition 2B OR Compressor switched off by thermostat (DI3/4 M1/2Cdetect = open) ■ Reset of timer (no requests) Switch off unit (DI6PumpDetect = open)	2 h
TimComprMin1/2	The minimum time that the compressor must be switched on before the circuit can start the defrost cycle.	■ Start of timer Compressor switched on by thermostat (DI3/4 M1/2Cdetect = closed) ■ Reset of timer (no requests) Compressor switch off by thermostat (DI3/4 M1/2Cdetect = open)	20 s
	End of TimOperate1/2 AND TimComprMin timer (goes to 0): Then defrost request		

Defrost cycle timers The table below describes the timers that are important in the defrost cycle.

Timer	Description	Startvalue
TimdefrMin	The minimum time that a defrost cycle must be active. (The timer only starts to count when the compressor is on.)	10 s
TimDefrMax	The maximum time that a defrost can be active. (The timer only starts to count when the compressor is on.)	10 min
TimMaskC1	The minimum accumulated time interval of compressor ON between stop of a defrost cycle of circuit 1 and the start of the next defrost cycle of circuit 1. ■ Reset of timer: After power ON or Defrost C1 finished or Mode≠Heating (=> Remark: During the defrost cycle Mode≠Heating is ignored, because the Mode≠Heating cannot be detected by the I/O PCB) (=> Remark: no reset if unit is switched off) ■ Continue of timer: Compressor on by thermostat (DI3M1Cdetect=closed) ■ Stop of timer: Compressor switch off by thermostat (DI3M1Cdetect=open) ■ End of timer (goes to 0): Now defrost is possible	20 min accumulated
TimMaskC2	The minimum accumulated time interval of compressor ON between stop of a defrost cycle of circuit 2 and the start of the next defrost cycle of circuit 2. ■ Reset of timer: After power ON or Defrost C2 finished or Mode≠Heating (=> Remark: During the defrost cycle Mode≠Heating is ignored, because the Mode≠Heating cannot be detected by the I/O PCB) (=> Remark: no reset if unit is switched off) ■ Continue of timer: Compressor on by thermostat (DI4M2Cdetect=closed) ■ Stop of timer: Compressor switch off by thermostat (DI4M2Cdetect=open) ■ End of timer (goes to 0): Now defrost is possible	20 min accumulated
TimComprStop	The time interval that is used if the compressors stops, at the start and stop of the defrost function.	20 s
TimComprStart	The minimum time interval that is used between the start-up of compressor 1 and compressor 2.	5 s

Illustration compressor stop function

The illustrations below show the defrost cycle without and with compressor stop during the defrost cycle.



Defrost cycles and compressor stop function

The table below describes the minimum and maximum defrost cycles without and with compressor stop.

Without compressor stop	Minimum cycle	10 s	TimdefrMin
	Maximum cycle	10 min	TimDefrMax
With compressor stop	Minimum cycle	130 s	TimComprStopx4 + TimdefrMin
	Maximum cycle	12 min	TimComprStopx4 + TimDefrMax

1.15 Changeable Digital Inputs

Selecting local or remote cool/heat control

User parameter H06 in combination with the remote cool/heat selection switch (installed by the customer) allows the user to select cooling or heating mode without using the ❄▼ or ▲☀ key on the controller.

- When user parameter H06 is set to 0 (=not active), cooling or heating mode is determined by means of the controller.
- When user parameter H06 is set to 1 (=active), cooling or heating mode is determined by means of the remote switch.

REMARK:

- This is only in case P09 (changeable digital input selection S7S) has value 9 (default value).
- In case dual set point function is selected for this function (P09=13), the remote cool/heat control is not activated, meaning the ❄▼ or ▲☀ keys on the controller are still active.

Selecting local or remote on/off control

User parameter H07 in combination with the remote on/off switch (installed by the customer) allows the user to switch the unit on without using the ❄▼ or ▲☀ key on the controller.

- When user parameter H07 is set to 0 (=not active), the unit can only be switched on by means of the ❄▼ and ▲☀ key on the controller.
- When user parameter H07 is set to 1 (=active), the unit can be switched on or off as follows:
  - When the remote on/off switch is opened, the unit is switched off and it is not possible to switch the unit on/off by pressing the ❄▼ or ▲☀ key on the controller (5 sec.)
  - When the remote on/off switch is closed, the unit is switched on and it is possible to switch the unit on/off by pressing the ❄▼ or ▲☀ key on the controller (5 sec.)

REMARK:

- This is only in case P34 (changeable digital input selection S9S) has value 23 (default value).
- In case dual set point function is selected for this function (P34=13), the remote on/off control is not activated.

Selecting dual setpoint control

User parameters P09 (changeable digital input selection S7S) and P34 (changeable digital input selection S9S) can be used to assign the dual setpoint control to S7S or S9S.

There are 3 different controls available for 2 different changeable digital inputs (S7S and S9S):

- P09: changeable digital input selection S7S
  - 0=no function
  - 9=remote cool/heat
  - 13=remote dual setpoint
- P34: changeable digital input selection S9S
  - 0=no function
  - 13=remote dual setpoint
  - 23=remote on/off

When the dual setpoint switch is open, the first setpoint is activated (r01 cooling setpoint or r03 heating setpoint, depending on cooling or heating operation).

When the dual setpoint switch is closed, the second setpoint is activated (r21 cooling setpoint 2 or r22 heating setpoint 2, depending on cooling or heating operation).

2 The Digital Controller

2.1 What Is in This Chapter?

Introduction

This chapter contains information on the digital controller EUWA*5-24KBZW1 and EUWY*5-24KBZW1.

Overview

This chapter contains the following topics:

2.2 The Digital Controller

Digital controller

EUWA*5-24KBZW1 and EUWY*5-24KBZW1 units are equipped with a digital controller (MicroChiller Compact 2 SE) offering a user-friendly way to configure, use and maintain the unit. The digital controller consists of:

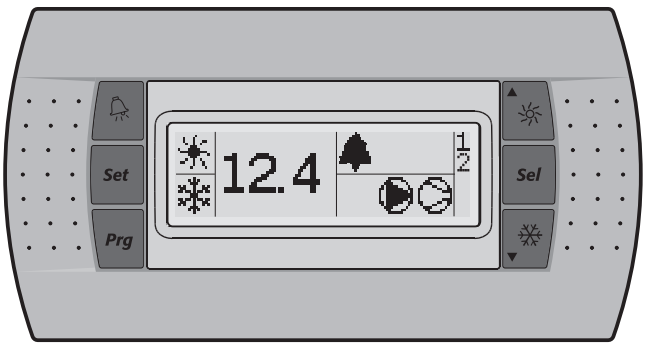
- A numeric display
- 4 keys
- 4 LEDs, used to provide extra user information.

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 (µC2SE).

The illustration below shows the front panel of the optional remote user interface.



Keys

The table below contains an overview of the keys and their functions.

The function carried out when the user presses one or a combination of these keys depends on the status of the controller and the unit at that specific moment.

Keys digital controller	Keys remote interface	Main display	Sensor readout menu	Parameter selection menu	Parameter setting menu
Prg / mute	Prg	—	*Press once:* Return	*Press once:* Return	*Press once:* Cancel and return
Sel /	Sel	*Press for 5 seconds*: To be able to access DIRECT parameters	—	*Press once:* Select parameter group or parameter	*Press once:* Confirm and return
Prg / mute + Sel /	Set	*Press for 5 seconds*: Prg / mute + Sel / **OR** *Press once*: Set To be able to access USER parameters (after entering USER password)	—		
▲ ☼	▲ ☼	*Press for 5 seconds*: Switch unit on/off in heating mode *Press once:* Direct access to readout menu sensor (b01/b02/b03)	*Press once:* Select previous sensor parameter	*Press once:* Select previous parameter group or parameter	*Press once:* Increase value
❄ ▼	❄ ▼	*Press for 5 seconds*: Switch unit on/off in cooling mode *Press once:* Direct access to readout menu sensor (b01/b02/b03)	*Press once:* Select next sensor parameter	*Press once:* Select next parameter group or parameter	*Press once:* Decrease value
▲ ☼ + ❄ ▼		*Press for 5 seconds*: Manually alarm reset in the event of alarm	—		

LEDs

The table below contains an overview of the LEDs on the controller and remoter interface and their functions.

Function during main display (not inside menu):

Leds digital controller		Remote interface	Main display
12.4	Led (green)	12.4	Inlet water temperature.
☼	Led (amber)	☼	Indicates that heating mode is active.
❄	Led (amber)	❄	Indicates that cooling mode is active.
🔔	Led (red)	🔔	Indicates that the alarm is active.
◔	Led (amber)	◔	Indicates the status of the pump
⊖	Led (amber)	⊖	LED, indicates that at least one compressor is active.
1	Led (amber)	1	LED is on, indicates that compressor 1 is active. LED is flashing, indicates compressor 1 start-up request.
2	Led (amber)	2	LED is on, indicates that compressor 2 is active. LED is flashing, indicates compressor 2 start-up request.

When selecting a parameter group or parameter, different LEDs related to the parameter group or parameter are displayed.

Example: The LEDs ✳ and ❄ are displayed when accessing a parameter group or when accessing parameters directly.

Remarks

- Temperature readout tolerance: ±1°C.
- Legibility of the numeric display may decrease in direct sunlight.

2.3 Start/Stop

At power ON

When the power is ON, the display shows the inlet water temperature.

Switching the unit on

To switch the unit on in cooling mode, proceed as follows:

- Press the ❄▼ key for approximately 5 seconds, the ❄ LED will be displayed.

To switch the unit on in heating mode, proceed as follows:

- Press the ▲☀ key for approximately 5 seconds, the ☀ LED will be displayed.

In both cases an initialization cycle is started, the ◔ LED, the ⊖ LED, the 1 LED and the 2 LED will light up depending on the programmed thermostat function.

In case the 1 LED or the 2 LED is flashing, it indicates that there is a compressor 1 or 2 startup request. The compressor will start after the timer has reached zero.

Switching the unit off

To switch the unit off and cooling mode is active, proceed as follows:

- Press the ❄▼ key for approximately 5 seconds, the ❄ LED will be extinguished.

To switch the unit off and heating mode is active, proceed as follows:

- Press the ▲☀ key for approximately 5 seconds, the ☀ LED will be extinguished.

Remote start/stop, remote cool/heat

The procedure to start or stop the unit depends on the setting of the remote start/stop. See "Start/Stop" on page 2–29.

The procedure to cool or heat (only for EUWY*5-24KBZW1) depends on the setting of the remote cool/heat. See "Settings: Direct and User Parameters" on page 2–32.

Start/stop and cool/heat selection for EUWY*5-24KBZW1

The table below contains information on how to select start or stop or how to select cooling or heating mode.

If start/stop set-up is...	and cool/heat set-up is...	, then...	to...
Local (H07=0)	Local (H06=0)	Press ☀ for 5 s	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 s	Start/stop in heating mode. Always stop the unit before you switch to cooling because start/stop and cool/heat are combined in the same button.
Remote (H07=1)	Local (H06=0)	Press ☀ for 5 s	Cool.
		Press ☼ for 5 s	Heat.
		Switch remote start/stop	Start/stop.
Remote (H07=1)	Remote (H06=1)	Switch remote start/stop	Start/stop.
		Switch remote cool/heat	Cool/heat.

If start/stop set-up is...	and cool/heat set-up is...	, then...	to...
Local (H07=0)	Remote (H06=1)	Switch remote cool/heat	Switch on the unit automatically. Only cool/heat selection is possible.

REMARK:
Remote cool/heat control can only be used in case P09=9.
Remote on/off control can only be used in case P34=23.

Setting the temperature

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

When you switch the unit ON

When you switch the unit ON, the following happens:

Stage	Description
1	■ uC2 will appear on the screen, indicating the controller type. ■ 1.9 will appear on the screen, indicating the software version.
2	■ The ❄ symbol or the ☀ symbol lights up, indicating whether the cooling or heating mode is selected (heating mode only for EUWY*5-24KBZW1). ■ The numeric display shows the actual inlet water temperature.

2.4 What Happens in Case of an Alarm or a Warning

Alarms and warnings

The table below describes two types of safety devices:

Item	Alarm	Warning
Function	Protects the unit.	Gives additional service information.
Description	■ The unit is shut down. ■ The alarm is energized. ■ The symbol is displayed. ■ 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	See "Malfunction Indications Overview: EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 3–8.	—

2.5 Settings: Direct and User Parameters

Direct and user parameters

The table below describes the direct and user parameters.

Parameters	Description	Example
Direct	Are used for the daily usage of the unit.	■ To set the cooling temperature set point. ■ To read the operational information.
User	Provide advanced features.	Remote control

How to access the parameters

To access the parameters, proceed as follows:

To access the… parameters	Press 5 s on…	A password is…
Direct	Sel	Not required.
Direct and user	Sel + Prg	Required. Use 22 as password.

Overview of the direct and user parameters

The table below contains an overview of all the parameters. Each parameter is defined by a code and a value.

Parameter group	Parameter code	Description	Default value	Min	Max	Units	Read/ Write	User/ Direct	Modbus Address	Parameter type[a]
-r-	r23	Measurement unit 0=°C 1=°F	0	0	1		R/W	U	5	D
-A-	No user or direct parameters accessible									
-b-	b01	Evaporator inlet water temperature				0.1°C	R	D	102	A
	b02	Evaporator outlet water temperature				0.1°C	R	D	103	A
	b03	Not used				0.1°C	R	D	104	A
-c-	c07	Time delay between pump startup and compressor startup	15	0	999	1 sec	R/W	U	238	I
	c08	Time threshold between the unit shut-down and the pump shutdown	0	0	150	1 min	R/W	U	239	I
	c 10	Total running hours of compressor 1				x100 hours	R	D	122	A
	c 11	Total running hours of compressor 2				x100 hours	R	D	123	A
	c 14	Maintenance threshold for maintenance warning (c 10 and c 11)	0	0	100	x100 hours	R/W	U	241	I
	c 15	Total running hours of pump				x100 hours	R	D	126	A
-d-	No user or direct parameters accessible									
-F-	No user or direct parameters accessible									
-H-	H06	To activate remote cool/heat control 0=not active 1=active **(only in case P09=9)**	0	0	1		R/W	U	14	D
	H07	To activate remote on/off control 0=not active 1=active **(only in case P34=23)**	0	0	1		R/W	U	15	D
	H09	To lock the controller keyboard 0=lock 1=unlock	1	0	1		R/W	U	16	D
	H 10	Serial address for BMS connection	1	1	200		R/W	U	256	I
	H23	To select address card connection 0=remote user interface connection 1=MODBUS connection	0	0	1		R/W	U	11	D

Parameter group	Parameter code	Description	Default value	Min	Max	Units	Read/ Write	User/ Direct	Modbus Address	Parameter type[a]
-P-	P09	Changeable digital input selection S7S 0=no function 9=remote cool/heat (only active in combination with H06) 13=remote dual setpoint **DO NOT SELECT OTHER VALUES**	9	0	27		R/W	U	277	I
	P34	Changeable digital input selection S9S 0=no function 13=remote dual setpoint 23=remote on/off (only active in combination with H07) **DO NOT SELECT OTHER VALUES**	23	0	27		R/W	U	329	I
-r-	r01	Cooling setpoint	12.0	7.0[b]	25.0	0.1°C	R/W	D	41	A
	r02	Cooling difference	3.0	0.3	19.9	0.1°C	R/W	D	42	A
	r03	Heating setpoint	30.0	25.0	45.0	0.1°C	R/W	D	43	A
	r04	Heating difference	3.0	0.3	19.9	0.1°C	R/W	D	44	A
	r21	Cooling setpoint 2[c]	12.0	7.0[b]	25.0	00.1°C	R/W	D	55	A
	r22	Heating setpoint 2[c]	30.0	25.0	45.0	0.1°C	R/W	D	56	A
-t-	No user or direct parameters accessible									
F-r	H99	Software release version					R	D	208	I

REMARKS:
a) D=digital, A=analog, I=integer.
b) –2.0 and –7.0 only applicable for units with glycol applications.
c) Used in case dual setpoint is enabled in P09 or P34 and dual setpoint digital input is closed.

How to consult and modify the direct parameters

For an overview of the menu structure, refer to "Menu Overview" on page 2–38.

1. Press Sel for 5 seconds in the main display.
   The -r- parameter group is displayed.
2. Press the ▲ or ▼ key to select the required parameter group.
3. Press the Sel key to enter the selected parameter group.
4. Press the ▲ or ▼ key to select the required parameter.
5. Press the Sel key to consult the selected parameter.
6. Press the ▲ or ▼ key to raise, respectively lower the setting of the selected parameter. (Only valid for read/write parameters.)
7. Press the Sel key to confirm the modified setting.
   OR
   Press the Prg key to cancel the modified setting.
8. Press the Prg key to return to the parameter group.
9. Press 2 times the Prg key to return to the main display.

If during the procedure no buttons are pressed for 30 seconds, the displayed parameter code or value will start flashing. After another 30 seconds without pressing any buttons, the controller automatically returns to the main display without saving any modified parameter.

2

How to consult and modify the user parameters

REMARK: When user parameters are consulted, the direct parameters are displayed as well.

For an overview of the menu structure, refer to "Menu Overview" on page 2–38.

1 In case of digital controller, press the Prg/mute and Sel/ keys for approximately 5 seconds until 00.0 is displayed.
In case of remote user interface, push Set once.

2 Enter the correct password by using the ▲ and ▼ keys. The password's value is 22.

3 Press the Sel/ key to confirm the password and to enter the menu, S-P is displayed.

4 Press the Sel/ key to consult the parameter settings (=S-P). (L-P means consulting the parameter level, but this function is not used).
The -r- parameter group is displayed.

5 Press the ▲ or ▼ key to select the required parameter group.

6 Press the Sel/ key to enter the selected parameter group.

7 Press the ▲ or ▼ key to select the required parameter.

8 Press the Sel/ key to consult the selected parameter.

9 Press the ▲ or ▼ key to increase, respectively decrease the setting. (Only valid for read/write parameters.)

10 Press the Sel/ key to confirm the modified setting.
OR
Press the Prg/mute key to cancel the modified setting.

11 Press the Prg/mute key to return to the parameter group.

12 Press 2 times the Prg/mute key to return to the main display.

If during the procedure no buttons are pressed for 30 seconds, the displayed parameter code or value will start flashing. After another 30 seconds without pressing any buttons, the controller automatically returns to the main display without saving any modified parameter.

How to consult and modify the 'sensor readout menu' parameters

For an overview of the menu structure, refer to "Menu Overview" on page 2–38.

The b01/b02/b03 parameters are part of the "sensor readout menu".

1 Press the ▲ or ▼ key in the main display.
The b01 parameter is displayed.
In case no buttons are pressed, the value of the b01 sensor will be displayed until ▲ or ▼ is pressed again to select another parameter (b02 or b03).

2 Press the Prg/mute key to return to the main display.

If during the procedure no buttons are pressed for 30 seconds, the displayed parameter code or value will start flashing. After another 30 seconds without pressing any buttons, the controller automatically returns to the main display.

Adjusting the cooling temperature setpoint

■ Modify the r1 cooling setpoint parameter.

This is a direct parameter, refer to "How to consult and modify the direct parameters" on page 2–33.

REMARK: When dual setpoint is enabled (refer to "Selecting dual setpoint control" on page 2–24).

Adjusting the heating temperature setpoint

■ Modify the r3 heating setpoint parameter.

This is a direct parameter, refer to "How to consult and modify the direct parameters" on page 2–33.

REMARK: When dual setpoint is enabled (refer to "Selecting dual setpoint control" on page 2–24).

Consulting actual operational information

The actual operational information that can be consulted in the list of direct parameters consists of:

- b01: Evaporator inlet water temperature,
- b02: Evaporator outlet water temperature,
- b03: Not used,
- c10: Total running hours of the compressor 1,
- c11: Total running hours of the compressor 2,
- c15: Total running hours of the pump.

REMARKS:

- The parameters b01, b02 and b03 can also be consulted by the "sensor readout menu". Refer to "How to consult and modify the ‘sensor readout menu’ parameters" on page 2–34.
- To reset the timers of parameters c10, c11 and c15 refer to "Resetting warnings" on page 3–10.

These are direct parameters, refer to "How to consult and modify the direct parameters" on page 2–33.

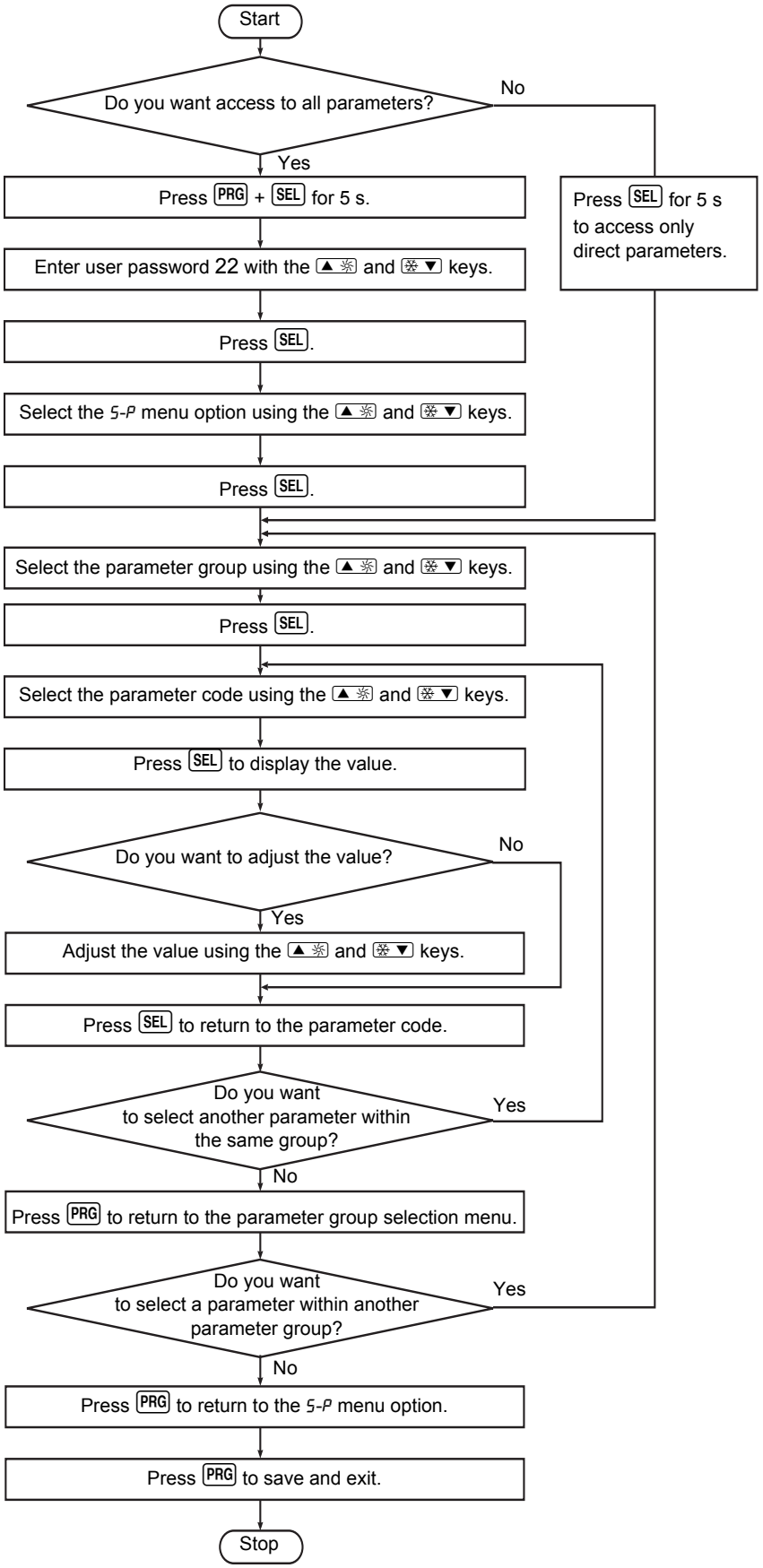
2.6 Reading or Adjusting Parameter Settings: the Programming Procedure

Introduction

- When no buttons are pressed for 5 s, the display starts flashing.
- You can exit at every step by leaving the buttons untouched for 1 min. The modifications are not saved.

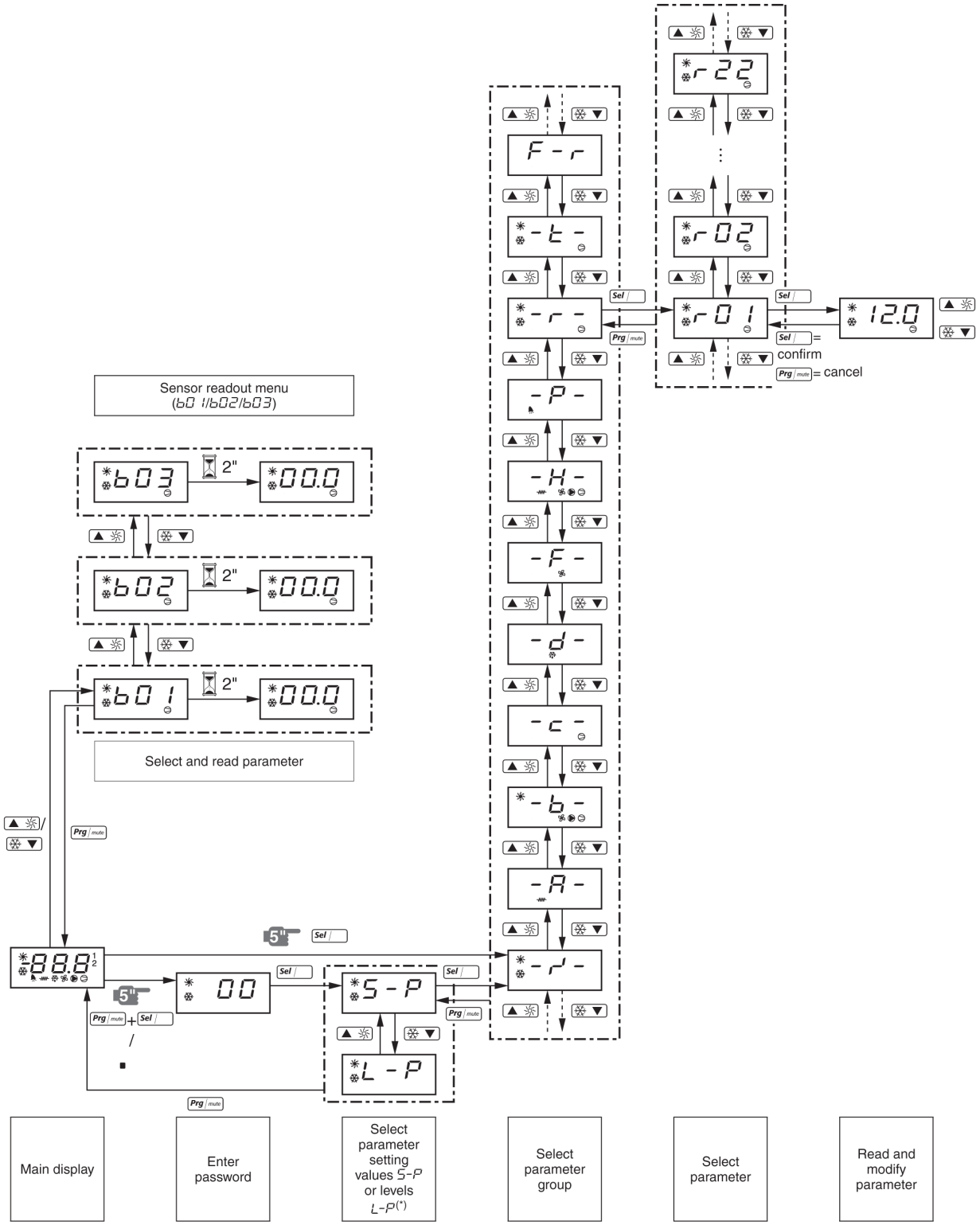
Reading or adjusting

To read or adjust parameter settings, proceed as follows:



2.7 Menu Overview

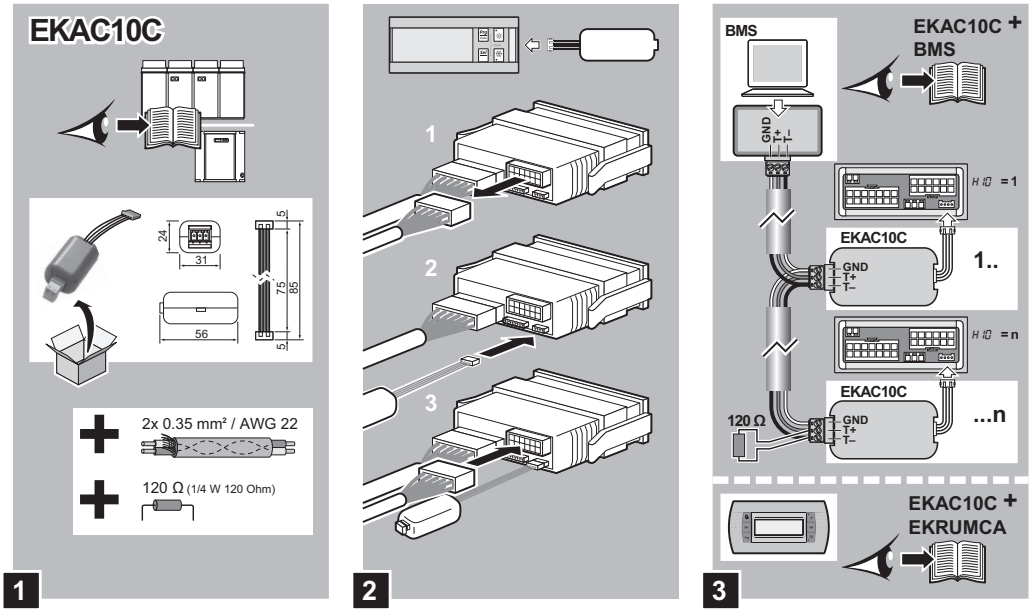
Overview



(*) L-P function is not used

2.8 Option EKAC10C Address Card

Overview



Remark

- Modbus communication RS485/RTU only
- Modbus communication RS485 and remote user interface is not possible at the same time
- No BACnet possibility
- The RS485 communication settings for Modbus protocol are:
  - baudrate: 9600
  - stop bit: 2
  - parity: none

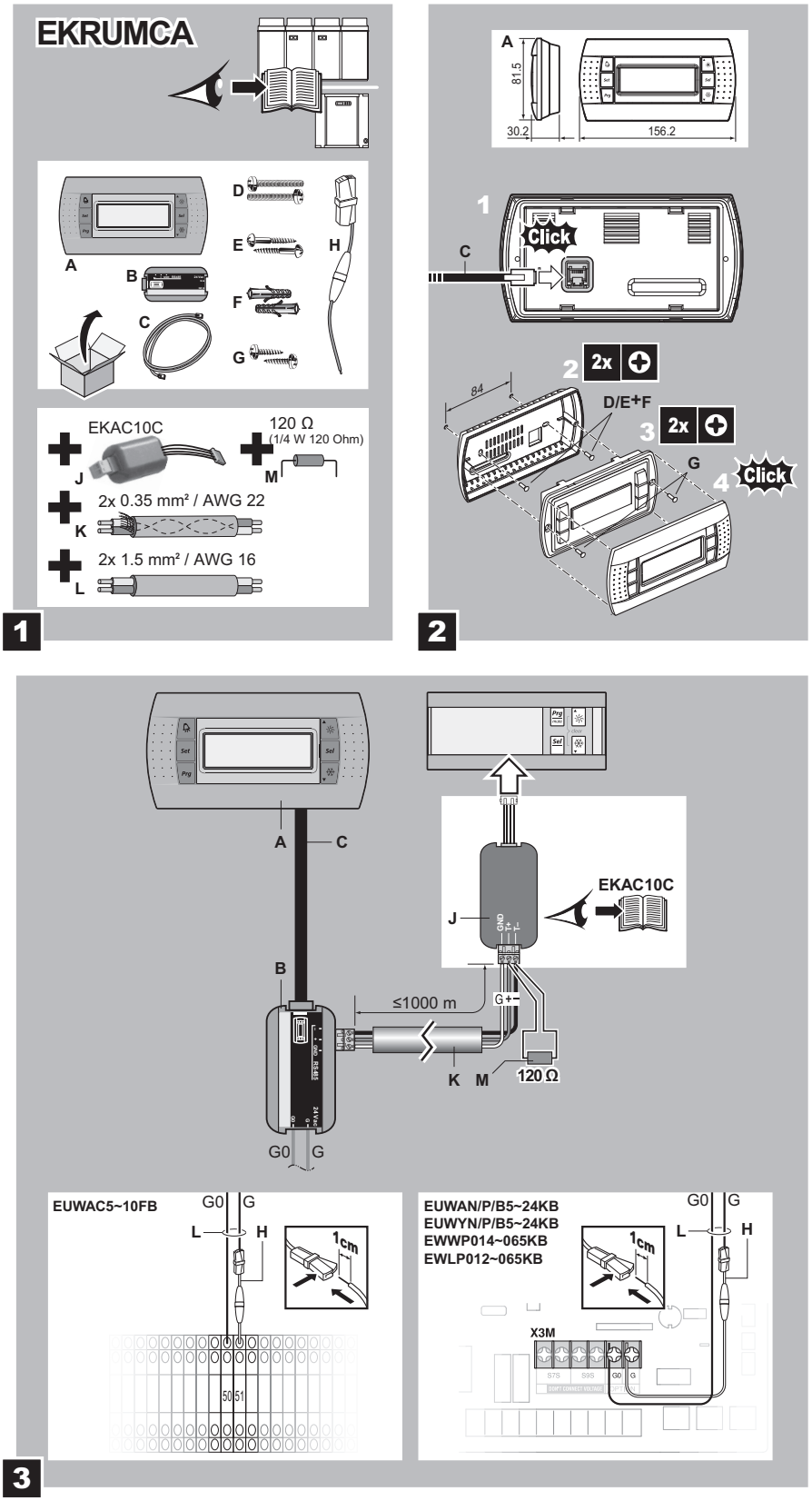
Controller settings

Following parameters have to be programmed to activate Modbus communication:

- H23: select 1 to enable Modbus communication
- H10: select serial address of the chiller

2.9 Option EKRUMCA Remote Controller

Overview



Remark

Modbus communication and remote controller cannot be selected at the same time. When Modbus communication is enabled (parameter code: H23 = 1), the remote controller will indicate ‘OFFLINE’.

To enable the use of the remote controller, disable the Modbus communication (parameter code: H23 = 0)

Part 3
Troubleshooting

Introduction

The small water chillers EUWA*5-24KBZW1 and EUWY*5-24KBZW1 are equipped with a digital controller and an I/O (input/output) PCB. These PCB's 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 PCB's and finally the output devices.

What is in this part?

This part contains the following chapters:

1 Inputs and Outputs Overview

1.1 What Is in This Chapter?

Introduction

The first step in a troubleshooting procedure is to check the inputs and outputs.

This chapter contains an overview of the inputs and outputs.

Overview

This chapter contains the following topics

1.2 Inputs and Outputs Overview: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Inputs/outputs

The table below describes the relation between the wiring diagram symbols, the wiring connections and the error codes.

For the exact location, see:

- "PCB Layout of the EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 1–71.
- "Wiring Diagram: EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 1–75.

Type	Device	Wiring diagram symbol	Wiring connection terminal	Error code	Description
Analog input	Sensor	R3T	X1/B1-GND	E1	Inlet water temperature sensor
		R4T	X1/B2-GND	E2	Outlet water temperature sensor
Digital input	Transducer	K4S + S1HP + QID K5S + S2HP + Q2D	X1/ID3-GND	HP1	Overcurrent relay + high pressure switch + discharge protector
		S4LP/S5LP	X1/ID4-GND	LP1	Low-pressure switch
	Control contacts	S9S (field)	X1/ID5-GND	(H7)	Switch for remote start/stop or dual setpoint
		S7S (field)	X1/ID2-GND	(H6)	Switch for remote cool/heat selection or dual setpoint
		S10L	X1/ID1-GND	(FL)	Flow switch
Digital output	—	K1M	X2C1/2-NO1	—	Compressor 1 contactor
		K2M	X2C1/2-NO2	—	Compressor 2 contactor
		K1P (field)	X2C3/4-NO3	—	Pump contactor
		Y1R/Y2R	X2C3/4-NO3	—	Reversing valve
		H1P (field)	X2C5-NO5	—	Indication lamp alarm

1.3 Inputs/outputs overview of the I/O PCB: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Digital inputs to I/O PCB

The table below describes the digital inputs to the I/O PCB.

	Description	Output from digital controller	Output controller	Open = 0	Closed = 1
DI1	Reversed phase detection (L1-N)				
DI2	Reversed phase detection (N-L3)				
DI3	M1C detection	X	C1/2NO1	M1C status = OFF	M1C status = ON
DI4	M2C detection	X	C1/2NO2	M2C status = OFF	M2C status = ON
DI5	Safety devices detection	X	C5-NO5	No alarm present	Alarm present
DI6	Pump detection			Pump status = OFF	Pump status = ON
DI9	Pump request	X	C1/2-NO3	Request to switch off pump	Request to switch on pump
DI10	Reverse valve request	X	C1/2-NO4	Request to switch the pump off	Request to switch the pump off

Digital outputs to I/O PCB

The table below describes the digital outputs to the I/O PCB.

	Description	Wiring diagram symbol	Input to digital con-troller	Not active = 0	Active = 1	Normal open/ normal closed
DO1	Reversed phase protector	RY1	X	RPP alarm	RPP alarm	NO
DO3	Pump/general operation	RY3		Pump off	Pump on	NO
DO4	Fan speed relay 1	RY4-24		Fan speed relay off	Fan speed relay on	NO
DO5	Fan speed relay 2	RY5-25		Fan speed relay off	Fan speed relay on	NO
DO6	Heater tape	RY6		ON	OFF	NO
DO7	Reversing valve (circuit 1) or reversing valve of water circuit	RY7		OFF (heating)	ON (cooling)	NO
DO8	Reversing valve (circuit 2)	RY8		OFF (heating)	ON (cooling)	NO
DO9	M1C off (during defrost)	RY9		M1C OFF	Not (M1C off)	NO
DO10	M2C off (during defrost)	RY10		M2C OFF	Not (M2C off)	NO
DO12	Fan speed relay 3	RY12-22		Fan speed relay off	Fan speed relay on	NO
DO27	Reversing valve of water circuit	RY27		Reverse valve off	Reverse valve on	NO

Analog inputs

The table below describes the analog inputs.

			EUWA		EUWY	
			1 circ	2 circ	1 circ	2 circ
AI1	R6T	Ambient sensor	X	X	X	X
AI2	R7T	Coil temperature sensor circuit 1			X	X
AI3	R8T	Coil temperature sensor circuit 2				X

2 Malfunction Indications and Safeties Overview

2.1 What Is in This Chapter?

Introduction

The malfunction indication on the digital controller display helps you to find the cause of the problem.

This chapter describes the malfunction indications and the safeties.

Overview

This chapter contains the following topics:

2.2 Malfunction Indications Overview: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Alarm and warning codes

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

Code	Description	Alarm/ Warning	Reset	See page
A1	indicates an anti-freeze alarm.	Alarm	Manual	3–11
E1	indicates that the NTC probe used to measure the evaporator inlet water temperature is defective.	Alarm	Automatic	
E2	indicates that the NTC probe used to measure the evaporator outlet water temperature is defective.	Alarm	Automatic	
E3	indicates that the fuse for the evaporator heatertape (F4) is blown or that there is a reverse phase error or that there is a problem with the I/O PCB (A2P).	Alarm	Automatic	
Warning: In case the unit is equipped with freeze protection, it is highly recommended to install the remote indicator lamp alarm (H3P) (see wiring diagram supplied with the unit). By doing so, breakdown of the fuse for the evaporator heatertape (F4) will be detected sooner and freezing of the circuit will be avoided during cold weather.				
EH5	indicates that the supply voltage is exceedingly high. In this case contact a licensed electrician.	Alarm	Automatic	3–11
EL1	indicates that there is a power supply error (example: noise). In this case contact a licensed electrician.	Alarm	Automatic	
EL2	indicates that there is a power supply error (example: noise). In this case contact a licensed electrician.	Alarm	Automatic	
EL5	indicates that the supply voltage is exceedingly low. In this case contact a licensed electrician.	Alarm	Automatic	
EPb	indicates that the EEPROM on the controller PCB inside the unit is defective.	Alarm	Automatic	
EPr	indicates that the EEPROM on the controller PCB inside the unit is defective.	Alarm	Automatic	
FL	indicates that there was no sufficient water flow either during the period of 15 seconds after the pump was started or for 5 seconds while the compressor is active or that the overcurrent protection of the pump is activated.	Alarm	Manual	
HP1	indicates that a high pressure switch, the discharge thermal protection or the overcurrent protection of the compressor motor is activated or that the NTC probe used to measure the ambient temperature is defective.	Alarm	Manual	
FL + HP1	indicates that there is most likely an RPP error or that the F4 fuse is blown.	Alarm	Manual	
LP1	indicates that the low pressure switch is activated.	Alarm	Manual	
tEr	indicates that there is a remote user interface communication error.	Alarm	Manual	

Code	Description	Alarm/ Warning	Reset	See page
Offline	communication failure between the digital controller of the unit and the remote user interface. Confirm the correct selection of parameter code H23. This should be default setting 0 and confirm the correction installation according to the installation manual of the remote user interface EKRUMCA.	Alarm	Automatic	3–11
Remark: If the alarm codes FL and H1 are flashing alternately, the alarm is most probably caused by the reverse phase protector or by the fuse for evaporator heatertape (F4) that was blown.				
Hc1	indicates that the compressor 1 requires maintenance: the total running hours of the compressor 1 (direct parameter c10) has exceeded the setting of the timer threshold for maintenance warning (user parameter c14).	Warning	Manual	
Hc2	indicates that the compressor 2 requires maintenance: the total running hours of the compressor 2 (direct parameter c11) has exceeded the setting of the timer threshold for maintenance warning (user parameter c14).	Warning	Manual	

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 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 restarts automatically.
- In the event of manual reset, proceed as follows:

Step	Action	Result
1	Find the cause of the alarm and correct it.	The system has been repaired.
2	If the alarm codes A1, FL, HP1 or LP1 appear on the display, reset the alarm manually by pressing the ***clear*** combination keys ▲ and ▼ simultaneously for approximately 5 seconds.	Once the alarm is reset, the error code and the LED no longer appear on the display. The controller continues its normal operation, displaying the inlet water temperature.

Resetting warnings

During normal operation, the display of the controller may start flashing, alternately showing the inlet water temperature and the following warning code:

- Hc 1: indicates that the compressor 1 requires maintenance: the total running hours of the compressor 1 (direct parameter c 10) has exceeded the setting of the timer threshold for maintenance warning (user parameter c 14).
- Hc2: indicates that the compressor 2 requires maintenance: the total running hours of the compressor 2 (direct parameter c 11) has exceeded the setting of the timer threshold for maintenance warning (user parameter c 14).

To reset the maintenance warning Hc 1 or Hc2, proceed as follows:

Step	Action
1	Consult c 10 running hours of compressor 1 or c 11 running hours of compressor 2.
2	When c 10 or c 11 parameter value is displayed, press the ▲ and ▼ key simultaneously for 5 seconds. The value of the timer becomes 0 and the warning is reset.

Remark

Do not forget to carry out the required maintenance activities after resetting the timers.
Besides resetting timer c 10 and c 11, it is also possible to reset timer c 15 (running hours of pump) in the same way.

2.3 Safeties Overview: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Safety devices The table below contains an overview of the safety devices.

Alarm description	Alarm indication	Activation	Reset	Wiring code	Device
Flow switch or pump contact	FL	No flow for 5 s or no sufficient flow during a period of 15 s after pump start.	Manual software reset	S10L, S11L	Contact closed on flow
Reverse phase protector	FL + HP1	Wrong phase sequence (only if the unit is ON)	Correct phase sequence	A2P	I/O PCB
High-pressure switch	HP1	Discharge pressure > 30.9 bar	Manual software reset	S1PH, S2PH	Switch ON/OFF
Low-pressure switch	LP1	Low-pressure ON ■ Standard: 1.2 bar ■ ZL/ZH: 0.5 bar	Manual software reset	S4LP, S5LP	Switch ON/OFF
Outlet water temp. too low (freeze-up protection)	A1	Outlet water temp. ■ temp. < 4.0°C Standard ■ temp. < -11.5 °C ZL option ■ temp. < -6.5 °C ZH option	Manual software reset	R4T	NTC sensor
Discharge thermal protector	HP1	High compressor discharge temp. > 135°C	Manual software reset and temp. < 115°C	Q1D, Q2D	Bimetal ON/OFF
Overcurrent relay compressor motor	HP1	Overcurrent (1)	Manual software reset	K4S, K5S	Bimetal ON/OFF
NTC probe ambient temperature	HP1	Probe is defective	Manual software reset	R6T	NTC sensor
NTC probe evaporator inlet	E1	Probe is defective	Automatic reset	R3T	NTC sensor
NTC probe of the outlet water temperature	E2	Probe is defective	Automatic reset	R4T	NTC sensor
■ Fuse evaporator heater tape (F4) ■ Reverse phase ■ Problem I/O PCB	E3	■ Fuse blown ■ Reverse or no power supply ■ I/O PCB malfunction	Automatic reset	F4	■ fuse ■ I/O PCB
Communication error remote terminal	OFFLINE	Communication error between the digital controller and the remote terminal	Automatic reset	■ Cable ■ Parameter H23	■ Controller ■ Address card ■ RJ12 power supply

(1): An overview of the fuses and overcurrent relays is given in "Checking the Power Supply and Fuses: EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 3–18.

Alarm indicators on I/O PCB

The table below describes the alarm indicators on the I/O PCB.

Symbol		Indication
HAP	Green LED	■ Blinking = CPU OK ■ Not blinking = CPU NOK
H1P	Red LED	
H2P	Red LED	

Alarm indications on I/O PCB

The table below describes the alarm indications on the I/O PCB.

Indication	H1P	H2P
No error	OFF	OFF
Safety device	ON	OFF
Reverse phase	OFF	ON
Sensor defective	ON	ON

If more than one alarm is present, the reverse phase has the highest priority.

Service information for alarm indications

- If the error is solved, H1P and H2P keep their latest status. They can only be reset by switching OFF/ON the power from the I/O PCB.
- If alarm codes FL and HP 1 are flashing alternately, the alarm is likely to be caused by the reverse phase protection or by the fuse for evaporator heater tape (F4) that was blown.

3 Checking the Inputs and Outputs

3.1 What Is in This Chapter?

Introduction

This chapter contains information on how to measure and check the most important inputs and outputs.

Overview

This chapter contains the following topics:

3.2 Checking the Temperature Sensors

Introduction

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

Temperature sensors

The following sensors of the EUWA*5-24KBZW1 and EUWY*5-24KBZW1 are connected to the I/O PCB: R3T/ R4T and R6T/R7T/R8T.

How to check

To check the temperature sensors, proceed as follows:

Step	Action
1	Disconnect the sensor from the I/O PCB for EUWA*5-24KBZW1 and EUWY*5-24KBZW1.
2	Measure the temperature and the resistance value.
3	Check whether the measured values correspond with the values in the appropriate table: "I/O PCB sensors: R3T and R4T for EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 3–15.

3.3 I/O PCB sensors: R3T and R4T for EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Temp.-resistance The table below contains the temperature resistance values of the I/O PCB sensors R3T and R4T.

Temp. (°C)	Resistance (kΩ)		
	Maximum	Standard	Minimum
-50	344.40	329.20	314.70
-49	324.70	310.70	297.20
-48	306.40	293.30	280.70
-47	289.20	277.00	265.30
-46	273.20	261.80	250.60
-45	258.10	247.50	237.20
-44	244.00	234.10	224.60
-43	230.80	221.60	212.70
-42	218.50	209.80	201.50
-41	206.80	198.70	191.00
-40	195.90	188.40	181.10
-39	185.40	178.30	171.59
-38	175.5.	168.90	162.00
-37	166.20	160.10	154.10
-36	157.50	151.80	140.20
-35	149.30	144.00	138.80
-34	141.60	136.60	131.80
-33	134.40	129.70	125.20
-32	127.60	123.20	118.90
-31	121.20	117.10	113.10
-30	115.10	111.30	107.50
-29	109.30	105.70	102.20
-28	103.80	100.40	97.16
-27	98.63	95.47	92.41
-26	93.75	90.80	87.93
-25	89.15	86.39	83.70
-24	84.82	82.22	79.71
-23	80.72	78.29	75.93
-22	76.85	74.58	72.36
-21	73.20	71.07	68.99
-20	69.74	67.74	65.80
-19	66.42	64.54	62.72
-18	63.27	61.52	59.81
-17	60.30	58.66	57.05
-16	57.49	55.95	54.44
-15	54.83	53.39	51.97
-14	52.31	50.96	49.83
-13	49.93	48.66	47.12
-12	47.67	46.48	45.31
-11	45.53	44.41	43.32
-10	43.50	42.25	41.43
-9	41.54	40.56	39.59
-8	39.68	38.76	37.85
-7	37.91	37.05	36.20
-6	36.24	35.43	34.03
-5	34.65	33.89	33.14
-4	33.14	32.43	31.73
-3	31.71	31.04	30.39
-2	30.35	29.72	29.11
-1	20.00	28.47	27.89
0	27.83	27.28	26.74
1	26.64	26.13	25.62
2	25.51	25.03	24.55
3	24.24	23.99	23.54

Temp. (°C)	Resistance (kΩ)		
	Maximum	Standard	Minimum
4	23.42	22.99	22.57
5	22.45	22.05	21.66
6	21.52	21.15	20.78
7	20.64	20.29	19.95
8	19.80	19.40	19.15
9	19.00	18.70	18.40
10	18.24	17.96	17.67
11	17.51	17.24	16.97
12	16.80	16.55	16.31
13	16.13	15.90	15.87
14	15.50	15.28	15.06
15	14.89	14.68	14.48
16	14.31	14.12	13.93
17	13.75	13.57	13.40
18	13.22	13.06	12.89
19	12.72	12.56	12.41
20	12.23	12.09	11.95
21	11.77	11.63	11.07
22	11.32	11.20	11.07
23	10.90	10.78	10.60
24	10.49	10.38	10.27
25	10.10	10.00	9.90
26	9.73	9.63	9.52
27	9.38	9.28	9.18
28	9.04	8.94	8.84
29	8.72	8.62	8.52
30	8.41	8.31	8.21
31	8.11	8.01	7.91
32	7.82	7.72	7.62
33	7.55	7.45	7.35
34	7.28	7.19	7.09
35	7.03	6.94	6.84
36	6.79	6.69	6.60
37	6.56	6.46	6.37
38	6.33	6.24	6.15
39	6.12	6.03	5.94
40	5.92	5.82	5.73
41	5.72	5.63	5.54
42	5.53	5.43	5.35
43	5.34	5.25	5.17
44	5.16	5.08	4.99
45	4.99	4.91	4.82
46	4.83	4.74	4.66
47	4.67	4.59	4.51
48	4.52	4.44	4.36
49	4.38	4.30	4.22
50	4.24	4.16	4.08
51	4.10	4.02	3.95
52	3.97	3.90	3.82
53	3.84	3.77	3.69
54	3.72	3.65	3.57
55	3.61	3.53	3.46
56	3.49	3.42	3.35
57	3.39	3.31	3.24

Temp. (°C)	Resistance (kΩ)		
	Maximum	Standard	Minimum
58	3.28	3.21	3.14
59	3.18	3.11	3.04
60	3.09	3.02	2.95
61	2.99	2.92	2.86
62	2.90	2.83	2.77
63	2.81	2.75	2.69
64	2.73	2.66	2.60
65	2.65	2.58	2.52
66	2.57	2.51	2.45
67	2.49	2.43	2.37
68	2.42	2.36	2.30
69	2.35	2.29	2.24
70	2.28	2.22	2.17
71	2.21	2.16	2.10
72	2.15	2.10	2.04
73	2.09	2.04	1.98
74	2.03	1.98	1.93
75	1.97	1.92	1.87
76	1.92	1.87	1.82
77	1.86	1.81	1.78
78	1.81	1.76	1.71
79	1.76	1.71	1.68
80	1.71	1.66	1.62
81	1.66	1.62	1.57
82	1.62	1.57	1.53
83	1.57	1.53	1.49
84	1.53	1.49	1.44
85	1.49	1.45	1.40
86	1.45	1.41	1.37
87	1.41	1.37	1.33
88	1.37	1.33	1.29
89	1.34	1.30	1.26
90	1.30	1.26	1.22
91	1.27	1.23	1.19
92	1.23	1.20	1.16
93	1.20	1.16	1.13
94	1.17	1.13	1.10
95	1.14	1.10	1.07
96	1.11	1.08	1.04
97	1.08	1.05	1.01
98	1.05	1.02	0.99
99	1.03	0.99	0.96
100	1.00	0.97	0.94
101	0.98	0.94	0.91
102	0.95	0.92	0.89
103	0.93	0.90	0.87
104	0.91	0.87	0.84
105	0.88	0.85	0.82
106	0.86	0.83	0.80
107	0.84	0.81	0.78
108	0.82	0.79	0.76
109	0.80	0.77	0.74
110	0.78	0.75	0.73
—			

3.4 I/O PCB sensors: R6T, R7T and R8T for EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Temp.-resistance The table below contains the temperature resistance values of the I/O PCB sensors R6T, R7T and R8T.

Temp. (°C)	Resistance (kΩ)	
	At x.0°C	At x.5°C
-20	197.81	192.08
-19	186.53	181.16
-18	175.97	170.94
-17	166.07	161.36
-16	156.80	152.38
-15	148.10	143.96
-14	139.94	136.05
-13	132.28	128.63
-12	125.09	121.66
-11	118.34	115.12
-10	111.99	108.96
-9	106.03	103.18
-8	100.41	97.73
-7	95.14	92.61
-6	90.17	87.79
-5	85.49	83.25
-4	81.08	78.97
-3	76.93	74.94
-2	73.01	71.14
-1	69.32	67.56
0	65.84	64.17
1	62.54	60.96
2	59.43	57.94
3	56.49	55.08
4	53.71	52.38
5	51.09	49.83
6	48.61	47.42
7	46.26	45.14
8	44.05	42.98
9	41.95	40.94
10	39.96	39.01
11	38.08	37.18
12	36.30	35.45
13	34.62	33.81

Temp. (°C)	Resistance (kΩ)	
	At x.0°C	At x.5°C
14	33.02	32.25
15	31.50	30.77
16	30.06	29.37
17	28.70	28.05
18	27.41	26.78
19	26.18	25.59
20	25.01	24.45
21	23.91	23.37
22	22.85	22.35
23	21.85	21.37
24	20.90	20.45
25	20.00	19.56
26	19.14	18.73
27	18.32	17.93
28	17.54	17.17
29	16.80	16.45
30	16.10	15.76
31	15.43	15.10
32	14.79	14.48
33	14.18	13.88
34	13.59	13.31
35	13.04	12.77
36	12.51	12.25
37	12.01	11.76
38	11.52	11.29
39	11.06	10.84
40	10.63	10.41
41	10.21	10.00
42	9.81	9.61
43	9.42	9.24
44	9.06	8.88
45	8.71	8.54
46	8.37	8.21
47	8.05	7.90

Temp. (°C)	Resistance (kΩ)	
	At x.0°C	At x.5°C
48	7.75	7.60
49	7.46	7.31
50	7.18	7.04
51	6.91	6.78
52	6.65	6.53
53	6.41	6.53
54	6.65	6.53
55	6.41	6.29
56	6.18	6.06
57	5.95	5.84
58	5.74	5.43
59	5.14	5.05
60	4.96	4.87
61	4.97	4.70
62	4.62	4.54
63	4.46	4.38
64	4.30	4.23
65	4.16	4.08
66	4.01	3.94
67	3.88	3.81
68	3.75	3.68
69	3.62	3.56
70	3.50	3.44
71	3.38	3.32
72	3.27	3.21
73	3.16	3.11
74	3.06	3.01
75	2.96	2.91
76	2.86	2.82
77	2.77	2.72
78	2.68	2.64
79	2.60	2.55
80	2.51	2.47
—		

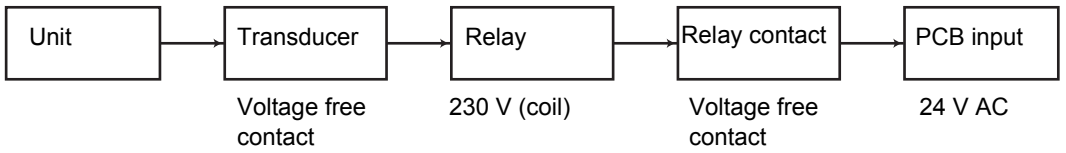
3.5 Checking the Digital Inputs and Outputs

Troubleshooting

In most cases a malfunction occurs in the unit itself and not in the control circuit of the unit. However, if a malfunction does occur in the control circuit, measure the relevant signals using the schematic input route shown below.

Input route to PCB

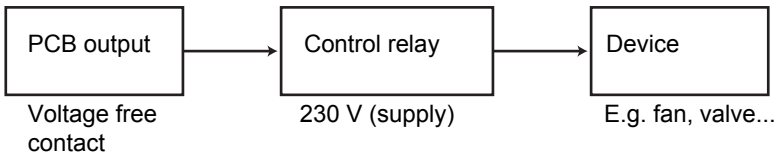
The block diagram below shows the digital input route from the transducer (e.g. thermostat, pressostat, reverse phase, etc.) to the PCB input.



Output route from PCB

The output is generated by 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 block diagram below shows the output route.



3.6 Checking the Power Supply and Fuses: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Overview

The table below contains an overview of the circuits, the voltage and their fuse codes.

Circuit	Wiring code	Type / voltage	Fuse code
Main supply	L1 + L2 + L3 + N	3 phases / 400 V AC	F1+F2+F3
Control circuit I/O PCB	L1 + N L3 + N	1 phase / 230 V AC 1 phase / 230 V AC	F4 F1U
Control circuit controller	TR1-sec.	24 V AC	F3U, F5U
Control circuit (pump) for EUWAN5-24KBZW1	X1M 8-7	24 V AC	F6
Fan circuit for EUWA*5-12KBZW1	L1 + N	1 phase / 230 V AC	F7
Fan circuit for EUWA*18-24KBZW1	L1 + N	1 phase / 230 V AC	F8

Overview fuses and overcurrent

The table below contains an overview of the fuses and overcurrent for types EUWA*5-24KBZW1 and EUWY*5-24KBZW1.

All models (400 V)							
Fuses + overcurrent	5HP	8HP	10HP	12HP	16HP	20HP	24HP
F4	8 A	8 A	8 A	8 A	8 A	8 A	8 A
F5	125 mAT	125 mAT	125 mAT	125 mAT	125 mAT	125 mAT	125 mAT
F7, F8	5 A	5 A	5 A	5 A	5 A	5 A	5 A
F1U	5 A	5 A	5 A	5 A	5 A	5 A	5 A
F3U	315 mAT	315 mAT	315 mAT	315 mAT	315 mAT	315 mAT	315 mAT
K4S	9 A	13 A	16 A	24 A	13 A	16 A	24 A
K5S	___	___	___	___	13 A	16 A	24 A
K6S (st. pump)	1.4 A	1.4 A	1.4 A	1.4 A	2 A	2 A	2 A
K6S (op. pump high)	2 A	2 A	2 A	2 A	3.7 A	3.7 A	3.7 A
Units with integrated pump							
Fuses	5HP	8HP	10HP	12HP	16HP	20HP	24HP
F1, F2, F3 (=gL/gG)	3 X 20 A	3 X 25 A	3 X 32 A	3 X 40 A	3 X 50 A	3 X 50 A	3 X 63 A
Units without integrated pump							
Fuses	5HP	8HP	10HP	12HP	16HP	20HP	24HP
F1, F2, F3 (=gL/gG)	3 X 20 A	3 X 25 A	3 X 25 A	3 X 32 A	3 X 40 A	3 X 50 A	3 X 63 A

3.7 Electrical Error Overview: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Introduction

This map gives an overview of the most common electrical errors that can occur on the EUWA*5-24KBZW1 and the EUWY*5-24KBZW1.

See also "Wiring Diagram: EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 1–75.

General items

Before proceeding, confirm the status of the following items:

- Microchiller compact: is the controller initialized? Are all parameters set?
- I/O PCB: Is the PCB working?

If the HAP (green led) blinks, the PCB is working.

3

General remark about H1P and H2P on I/O PCB

If an electrical error is solved, H1P (red) and H2P (red) on the I/O PCB keep their latest status. H1P and H2P can only be reset by switching the I/O PCB OFF/ON.

Error list microchiller compact controller

The table below contains an error list for the microchiller compact controller.

Microchiller compact controller	I/O PCB		General error description	Possible cause	Part	Con-nector	Action
	H1P	H2P					
E1	OFF	OFF	Sensor input 1 broken	Evaporator inlet water sensor broken	R3T	X60A	Check sensor.
E2	OFF	OFF	Sensor input 2 broken	Evaporator outlet water sensor broken	R4T	X61A	Check sensor.
E3 Or FL and HP1	OFF	ON		Fuse blown	F4	X1A	Check fuse.
				Reverse phase error		X1A	Check L1/L2/L3 connection.
				I/O PCB broken	A2P		■ Check I/O PCB (HAP must be blinking). ■ Check trafo power supply.
FL	OFF	OFF	Flow error	Flow switch open	S10L	X65A	Green LED's = flow
				Overcurrent protection pump	K6A	X28A	Reset overcurrent.
				Shortcut		X28A	Check shortcut
				Wireharness between I/O PCB and microchiller compact		X71A X1	■ Check connections on X71A (I/O PCB) ■ Check connections on X1 (microchiller compact)

HP 1	ON	OFF		■ High pressure switch circuit 1	S1HP	X6A	Check S1HP.
				■ High pressure switch circuit 2	S2HP	X7A	Check S2HP.
				■ If only 1 circuit: shortcut		X7A	Check shortcut.
				■ Overcurrent protection compr. 1	K4S	X10A	Check K4S.
				■ Overcurrent protection compr. 2	K5S	X11A	Check K5S.
				■ If only 1 circuit: shortcut		X11A	Check shortcut.
				■ Discharge thermal protection 1	Q1D	X8A	Check Q1D.
				■ Discharge thermal protection 2	Q2D	X9A	Check Q2D.
				■ If only 1 circuit: shortcut		X9A	Check shortcut.
HP 1	OFF	OFF		Wireharness between I/O PCB and microchiller compact		X71A X1	■ Check connections on X71A (I/O PCB). ■ Check connections on X1 (microchiller compact).
HP 1	ON	ON	Sensor broken	■ Ambient	R6T	X40A	Check sensor.
				■ If heat pump unit: coil sensor 1	R7T	X41A	Check sensor.
				■ If hatpins unit: coil sensor 2	R8T	X42A	Check sensor.
LP 1	OFF	OFF	Low pressure	■ Low pressure switch 1	S4LP	X63A	Check S4LP.
				■ Low pressure switch 2	S5LP	X64A	Check S5LP.

Phenomena The table below contains error phenomena

Phenomena	Possible cause	Part	Con-nector	Action
Fans of circuit 1 do not run	Fan fuse of circuit 1 blown		F7	Check fuse.
	Thermal protector fan circuit 1	Q11F	X12A	Check Q11F.
		Q12F	X13A	Check Q12F.
	Wiring connector		X21A	Check wiring connector X21A.
			X22A	Check wiring connector X22A.

Fans of circuit 2 do not run	Fan fuse of circuit 1 blown		F8	Check fuse.
	Thermal protector fan circuit 1	Q21F Q22F	X14A X15A	Check Q21F. Check Q22F.
	Wiring connector		X23A X24A	Check wiring connector X23A. Check wiring connector X24A.
PCB fuse F1U blown	Shortcut (L1 connected to N) made on PCDB			Ex. X30A (S10L coil) was shortcut by bridge => I/O PCB was broken.

4 Troubleshooting

4.1 What Is in This Chapter?

Introduction

When a problem occurs, you have to check all possible malfunctions.

This chapter gives a general idea of where to look for malfunctions. Furthermore, the general procedures for refrigeration circuit and electrical circuit repair are described.

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

Overview

This chapter contains the following topics:

4.2 Items to Be Checked

Introduction

The tables below contain the most frequent failures and their corresponding corrective action:

- In case the unit does not start and there is no malfunction indication.
- In case the unit does not start and there is a malfunction indication.

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 (for EUWA*5-24KBZW1 and EUWY*5-24KBZW1)	■ 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 it, if necessary. ■ In case of remote control, check the field wiring.
One of the timers is still active.	Check the timers overview in this manual and wait until all timers have elapsed. See ‘‘Compressor Timers” on page 2-9.
The unit is incorrectly programmed.	Check the settings.

Malfunction indication

The unit does not start and there is a malfunction indication:

Malfunction	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
High-pressure switch	■ Defective condenser fan operation in cooling ■ Dirty or blocked condenser ■ Operation out of range	■ Operation condition outdoor air temp. < 43°C ■ State of the condenser (clean)

Malfunction	Possible causes	Items to be checked
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 malfunction indications and safeties is given in "Malfunction Indications and Safeties Overview" on page 3–7.

4.3 General Repair Procedures

Refrigeration circuit repairs

To carry out refrigeration circuit repairs, proceed as follows:

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	Carry out the repair according to the normal procedure. There are no special procedures for the replacement of refrigeration parts. See 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 on the general repair procedures for R-407C, refer to the Service Manual for products using refrigerant R-407C.

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

Electrical circuit repairs

To carry out electrical circuit repairs, proceed as follows:

Step	Action
1	Measure all that is needed to locate the defective parts of the system.
2	Switch OFF the main power supply.
3	Carry out the repair according to standard procedures.
4	Switch ON the power supply.
5	Verify the proper operation of the replaced part by measurements.

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

4.4 Locking and Unlocking the Keyboard

Locked keyboard

Once user parameter H09 is set to 0, the following advanced features can no longer be carried out by means of the controller:

- modifying direct and user parameters (parameters can be displayed but not modified)
- resetting the timers
- switching the unit on/off in cooling or heating

Lock the keyboard

When user parameter H09 is set to 1, the above-described advanced features can be carried out using the controller. (1 = locking disabled)

To modify user parameter H09 from 1 to 0, the standard user parameter modification procedure can be used with the standard password '22'.

Unlock the keyboard

To modify user parameter H09 from 0 to 1, the user parameter modification procedure can be used with dedicated password '11'.

4.5 Replacing the Controller: EUWA*5-24KBZW1

Replacing the controller

To replace the controller, proceed as follows:

Step	Action
1	Remove the connections of the old controller.
2	Remove the old controller.
3	Install the new controller in the same way as the old controller.
4	Reconnect the controller.
5	Reprogram 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	Turn ON the power supply. Make sure that the unit is not working. If it is, press ☀ to switch OFF the unit.	**If...** / **Then...** The controller is installed and correctly wired / The temperature of sensor 1 appears.
2	Press SEL and PRG simultaneously for 5 s.	After 5 s, 0 lights up.
3	Scroll using ▲ or ▼ to go to 66.	—
4	Press SEL.	You have entered the factory menu. The screen displays 5-P.
5	Press SEL.	You have entered the 5-P menu (read and modify values of parameters).

For more information on the controller, see "The Digital Controller" on page 2–25.

Modify parameters according to required unit model

The factory menu is used to set up the identification parameters according to the required unit model.

Most of the settings are already preset (also for spare part controller). The table below gives the parameter code and the value of the parameters that have to be modified according to the unit model.

Parameter code	Description	Default value (S-P)	Unit of measurement	EUWA*5-8-10-12K* standard	EUWA*5-8-10-12K* OP ZL	EUWA*5-8-10-12K* OP ZH	EUWA*16-20-24K* standard	EUWA*16-20-24K* OP ZL	EUWA*16-20-24K* OP ZH
(/*)									
/03	Probe type B3	1	-	1	1	1	1	1	1
(A*)									
A01	Anti-freeze alarm setpoint	4	°C	4	-11,5	-6,5	4	-11,5	-6,5
A02	Anti-freeze alarm hysteresis	3,5	°C	3,5	3,5	3,5	3,5	3,5	3,5
A04	Anti-freeze heater setpoint	4	°C	4	-10	-5	4	-10	-5
H*									
H01	Unit type	2	-	2	2	2	2	2	2
H04	Number of comp/unit	0	-	0	0	0	1	1	1
H11	Output modes	0	-	0	0	0	9	9	9
(r*)									
r13	Min. cooling setpoint	7	°C	7	-7	-2	7	-7	-2
r14	Max. cooling setpoint	25	°C	25	25	25	25	25	25

(*) Bold = different from default, "-" = not applicable because of other setting

Additionally confirm correct default settings of following parameters:

- P8 should be equal to 1
- P9 should be equal to 9

To exit the factory menu

To exit the factory menu when you have changed all parameters, proceed as follows:

Step	Action
1	Press PRG.
2	Turn OFF the power supply.

4.6 Replacing the Controller: EUWY*5-24KBZW1

Replacing the controller

To replace the controller, proceed as follows:

Step	Action
1	Remove the connections of the old controller.
2	Remove the old controller.
3	Install the new controller in the same way as the old controller.
4	Reconnect the controller.
5	Reprogram 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	Turn ON the power supply. Make sure that the unit is not working. If it is, press ☀ to switch OFF the unit.	**If...** / **Then...** The controller is installed and correctly wired / The temperature of sensor 1 appears.
2	Press SEL and PRG simultaneously for 5 s.	After 5 s, ▯ lights up.
3	Scroll using ▲ or ▼ to go to 66.	—
4	Press SEL.	You have entered the factory menu. The screen displays 5-P.
5	Press SEL.	You have entered the 5-P menu (read and modify values of parameters)

For more information on the controller, see "The Digital Controller" on page 2–25.

Modify parameters according to required unit model

The factory menu is used to set up the identification parameters according to the required unit model.

Most of the settings are already preset (spare part controller). The table below gives the parameter code and the value of the parameters that have to be modified according to the unit model.

Parameter code	Description	Default value (S-P)	Unit of measurement	EUWY*5-8-10-12K* standard	EUWY*5-8-10-12K* OP ZL	EUWY*5-8-10-12K* OP ZH	EUWY*16-20-24K* standard	EUWY*16-20-24K* OP ZL	EUWY*16-20-24K* OP ZH
(/*)									
/03	Probe type B3	1	-	1	1	1	1	1	1
(A*)									
A01	Anti-freeze alarm setpoint	4	°C	4	-11,5	-6,5	4	-11,5	-6,5
A02	Anti-freeze alarm hysteresis	3,5	°C	3,5	3,5	3,5	3,5	3,5	3,5
A04	Anti-freeze heater setpoint	4	°C	4	-10	-5	4	-10	-5
H*									
H01	Unit type	2	-	3	3	3	3	3	3
H04	Number of comp/unit	0	-	0	0	0	1	1	1
H11	Output modes	0	-	0	0	0	9	9	9
(r*)									
r13	Min. cooling setpoint	7	°C	7	-7	-2	7	-7	-2
r14	Max. cooling setpoint	25	°C	25	25	25	25	25	25
r15	Min. heating setpoint	25	°C	25	25	25	25	25	25
r16	Max. heating setpoint	45	°C	45	45	45	45	45	45

(*) Bold = different from default, "-" = not applicable because of other setting

Additionally confirm correct default settings of following parameters:

- P8 should be equal to 1
- P9 should be equal to 9

To exit the factory menu

To exit the factory menu when you have changed all parameters, proceed as follows:

Step	Action
1	Press PRG.
2	Turn OFF the power supply.

4.7 Parameter and Parameter Level Overview

Overview

The table below shows the full list of all parameters with the corresponding setpoint according to the unit type. This table can be used as reference when during programming of the controller a parameter was changed which was not indicated in the 'replacing the controller' procedure.

Parameter code	Description	SW version	Default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Unit of measurement	EUWA*5-8-10-12K* standard	EUWA*5-8-10-12K* OP ZL	EUWA*5-8-10-12K* OP ZH	EUWA*16-20-24K* standard	EUWA*16-20-24K* OP ZL	EUWA*16-20-24K* OP ZH	EUWY*5-8-10-12K* standard	EUWY*5-8-10-12K* OP ZL	EUWY*5-8-10-12K* OP ZH	EUWY*16-20-24K* standard	EUWY*16-20-24K* OP ZL	EUWY*16-20-24K* OP ZH	R/W	Supervis variable	Modbus	Type
	1. Probe setting parameters (/*)																			-	-	-
/01	Probe type B1	1,9	F	F	1	-	1	1	1	1	1	1	1	1	1	1	1	1	R/W	1	1	DIG
/02	Probe type B2	1,9	F	F	0	-	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	R/W	2	2	DIG
/03	Probe type B3	1,9	F	F	0	-	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	R/W	14	221	INT
/04	Probe type B4	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	15	222	INT
/13	Probe B1 calibration	1,9	F	F	0	°C/°F	0	0	0	0	0	0	0	0	0	0	0	0	R/W	3	3	ANA
/14	Probe B2 calibration	1,9	F	F	0	°C/°F	0	0	0	0	0	0	0	0	0	0	0	0	R/W	4	4	ANA
/15	Probe B3 calibration	1,9	F	F	0	°C/°F	0	0	0	0	0	0	0	0	0	0	0	0	R/W	5	5	ANA
/16		1,9	F	F	0	°C/°F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
/21	Digital filter	1,9	U	F	4	-	4	4	4	4	4	4	4	4	4	4	4	4	R/W	20	227	INT
/22	Input limitation	1,9	U	F	8	-	8	8	8	8	8	8	8	8	8	8	8	8	R/W	21	228	INT
/23	Measurement unit	1,9	U	U	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	5	5	DIG
	2. Anti-freeze/supporting heater setting parameters (A*)																			-	-	-
A01	Anti-freeze alarm setpoint	1,9	U	**F**	3	°C	**4**	**-12**	**-6,5**	**4**	**-12**	**-6,5**	**4**	**-12**	**-6,5**	**4**	**-12**	**-6,5**	R/W	11	11	ANA
A02	Anti-freeze alarm hysteresis	1,9	U	**F**	5	°C	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	**3,5**	R/W	12	12	ANA
A03	Bypass time for anti-freeze alarm	1,9	U	**F**	0	sec	0	0	0	0	0	0	0	0	0	0	0	0	R/W	22	229	ANA
A04	Anti-freeze heater setpoint	1,9	U	**F**	5	°C	**4**	**10**	**-5**	**4**	**10**	**-5**	**4**	**10**	**-5**	**4**	**10**	**-5**	R/W	13	13	ANA
A05	Anti-freeze heater hysteresis	1,9	U	**F**	1	°C	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	R/W	14	14	ANA
A06	Supporting heaters probe	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	6	6	DIG
A07	Limit anti-freeze alarm set	1,9	F	F	-40	°C	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	**-15**	R/W	15	15	ANA
A08	Setpoint for the supporting heater	1,9	U	**F**	25	°C	-	-	-	-	-	-	25	25	25	25	25	25	R/W	16	16	ANA
A09	heating support-resistance diff.	1,9	U	**F**	3	°C	-	-	-	-	-	-	3	3	3	3	3	3	R/W	17	17	ANA
A10	Automatic switch on for antifreezing	1,9	U	**F**	0	°C	-	-	-	-	-	-	0	0	0	0	0	0	R/W	23	230	INT
A11		1,9	U	**F**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A12		1,9	U	**F**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A13		1,9	U	**F**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A14		1,9	U	**F**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3. Probe reading parameters (b*)																			-	-	-
b00	Configuration of probe to be shown on the display	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	24	231	INT
b01	Value read by probe B1	1,9	D	D															R	102	102	ANA
b02	Value read by probe B2	1,9	D	D															R	103	103	ANA
b03	Value read by probe B3	1,9	D	D															R	104	104	ANA

(*) Bold = different from default, "-" = not applicable because of other setting
(**) level type (L-P): D=Direct, U=User, S=Super user, F=Factory

Parameter code	Description	SW version	Default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Unit of measurement	EUWA*5-8-10-12K* standard	EUWA*5-8-10-12K* OP ZL	EUWA*5-8-10-12K* OP ZH	EUWA*16-20-24K* standard	EUWA*16-20-24K* OP ZL	EUWA*16-20-24K* OP ZH	EUWY*5-8-10-12K* standard	EUWY*5-8-10-12K* OP ZL	EUWY*5-8-10-12K* OP ZH	EUWY*16-20-24K* standard	EUWY*16-20-24K* OP ZL	EUWY*16-20-24K* OP ZH	R/W	Supervis variable	Modbus	Type
	4. Compressor setting parameters (c*)																			-	-	-
c01	Min. ON time	1,9	U	**F**	60	sec	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	R/W	25	232	INT
c02	Min. OFF time	1,9	U	**F**	60	sec	60	60	60	60	60	60	60	60	60	60	60	60	R/W	26	233	INT
c03	Delay between 2 starts of the same compressor	1,9	U	**F**	360	sec	**240**	**240**	**240**	**240**	**240**	**240**	**240**	**240**	**240**	**240**	**240**	**240**	R/W	27	234	INT
c04	Start delay between the two compressors	1,9	U	**F**	10	sec	-	-	-	**5**	**5**	**5**	-	-	-	**5**	**5**	**5**	R/W	28	235	INT
c05	Stop delay between the two compressors	1,9	U	**F**	0	sec	-	-	-	0	0	0	-	-	-	0	0	0	R/W	29	236	INT
c06	Time-delay at startup	1,9	U	**F**	0	sec	0	0	0	0	0	0	0	0	0	0	0	0	R/W	30	237	INT
c07	ON delay pump-compr.	1,9	U	U	20	sec	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	R/W	31	238	INT
c08	OFF delay pump-compr.	1,9	U	U	1	min	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	R/W	32	239	INT
c09	Max. compressor operating time in tandem	1,9	U	**F**	0	min	0	0	0	0	0	0	0	0	0	0	0	0	R/W	33	240	INT
c10	Compressor 1 timer	1,9	D	D	0	100h	-	-	-	-	-	-	-	-	-	-	-	-	R	122	122	ANA
c11	Compressor 2 timer	1,9	D	D	0	100h	-	-	-	-	-	-	-	-	-	-	-	-	R	123	123	ANA
c12	Compressor 3 timer	1,9	D	**F**	0	100h	-	-	-	-	-	-	-	-	-	-	-	-	R	124	124	ANA
c13	Compressor 4 timer	1,9	D	**F**	0	100h	-	-	-	-	-	-	-	-	-	-	-	-	R	125	125	ANA
c14	Operating timer threshold	1,9	U	U	0	100h	0	0	0	0	0	0	0	0	0	0	0	0	R/W	34	241	INT
c15	Evaporator pump/fan 1 working hour	1,9	U	D	0	100h	-	-	-	-	-	-	-	-	-	-	-	-	R	126	126	ANA
c16	Condensor backup pump/fan 2 working hour	1,9	U	**F**	0	100h	-	-	-	-	-	-	-	-	-	-	-	-	R	127	127	ANA
c17	Min. time between two pump starts	1,9	U	**F**	30	min	-	-	-	-	-	-	-	-	-	-	-	-	R/W	35	242	INT
c18	Min. pump ON time	1,9	U	**F**	3	min	3	3	3	3	3	3	3	3	3	3	3	3	R/W	36	243	INT
	5. Defrost setting parameters (d*)																			-	-	-
d01	Defrost cycle	1,9	F	F	0	-	-	-	-	-	-	-	0	0	0	0	0	0	R/W	7	7	DIG
	6. Fan setting parameters (F*)																			-	-	-
F01	Are there fans?	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	10	10	DIG
F16		1,9	F	F	0	msec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F17		1,9	F	F	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(*) Bold = different from default, "-" = not applicable because of other setting
(**) level type (L-P): D=Direct, U=User, S=Super user, F=Factory

Parameter code	Description	SW version	Default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Unit of measurement	EUWA*5-8-10-12K* standard	EUWA*5-8-10-12K* OP ZL	EUWA*5-8-10-12K* OP ZH	EUWA*16-20-24K* standard	EUWA*16-20-24K* OP ZL	EUWA*16-20-24K* OP ZH	EUWY*5-8-10-12K* standard	EUWY*5-8-10-12K* OP ZL	EUWY*5-8-10-12K* OP ZH	EUWY*16-20-24K* standard	EUWY*16-20-24K* OP ZL	EUWY*16-20-24K* OP ZH	R/W	Supervis variable	Modbus	Type
	7. Unit setting parameters (H*)																			-	-	-
H01	Unit type	1,9	F	F	2	-	2	2	2	2	2	2	**3**	**3**	**3**	**3**	**3**	**3**	R/W	54	261	INT
H02	Number of condensers	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	12	12	DIG
H03	Number of evaporators	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	13	13	DIG
H04	Number of comp per circuit	1,9	F	F	0	-	0	0	0	**1**	**1**	**1**	0	0	0	**1**	**1**	**1**	R/W	55	262	INT
H05	Pump func logic	1,9	F	F	1	-	1	1	1	1	1	1	1	1	1	1	1	1	R/W	56	263	INT
H06	Cooling/heating pump	1,9	U	U	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	14	14	DIG
H07	On/off input	1,9	U	U	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	15	15	DIG
H08	Network configuration	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	57	264	INT
H09	Keyboard lockup	1,9	U	U	1	-	1	1	1	1	1	1	1	1	1	1	1	1	R/W	16	16	DIG
H10	Serial address	1,9	U	U	1	-	1	1	1	1	1	1	1	1	1	1	1	1	R/W	58	265	INT
H11	Output modes	1,9	F	F	0	-	0	0	0	**9**	**9**	**9**	0	0	0	**9**	**9**	**9**	R/W	59	266	INT
H12	Capacity control and reversing valve logic	1,9	F	F	1		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	R/W	60	267	INT
H14		1,9	F	F	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H15		1,9	F	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H16		1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	22	22	DIG
H17		1,9	F	F	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H18		1,9	F	F	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H19		1,9	F	F	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H21	Second pump function	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	62	269	INT
H22	Disable load default values	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	18	18	DIG
H23	Enable Modbus	1,9	F	U	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	11	11	DIG
	8. Alarm setting parameters (P*)																			-	-	-
P01	Flow start timer	1,9	U	**F**	20	sec	20	20	20	20	20	20	20	20	20	20	20	20	R/W	63	270	INT
P02	Flow stop timer	1,9	U	**F**	5	sec	5	5	5	5	5	5	5	5	5	5	5	5	R/W	64	271	INT
P03	LP bypass timer	1,9	U	**F**	40	sec	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	R/W	65	272	INT
P05	Alarm reset	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	67	274	INT
P06	Cooling/heating logic	1,9	F	F	0	-	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	R/W	19	19	DIG
P08	DI1 selection	1,9	F	F	0	-	1	1	1	1	1	1	1	1	1	1	1	1	R/W	69	276	INT
P09	DI2 selection	1,9	F	**U**	0	-	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	R/W	70	277	INT
P13		1,9	F	F	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P15	LP alarm when the compr. is OFF	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	76	283	INT
P16		1,9	U	**F**	80	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P17		1,9	U	**F**	30	min	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P19		1,9	U	**F**	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P20	Enable system startup protection	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	20	20	DIG
P21	Alarm relay output logic	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	8	8	DIG
P22		1,9	U	**F**	40	sec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P23		1,9	U	**F**	40	sec	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P25		1,9	U	**F**	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(*) Bold = different from default, "-" = not applicable because of other setting
(**) level type (L-P): D=Direct, U=User, S=Super user, F=Factory

Parameter code	Description	SW version	Default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Unit of measurement	EUWA*5-8-10-12K* standard	EUWA*5-8-10-12K* OP ZL	EUWA*5-8-10-12K* OP ZH	EUWA*16-20-24K* standard	EUWA*16-20-24K* OP ZL	EUWA*16-20-24K* OP ZH	EUWY*5-8-10-12K* standard	EUWY*5-8-10-12K* OP ZL	EUWY*5-8-10-12K* OP ZH	EUWY*16-20-24K* standard	EUWY*16-20-24K* OP ZL	EUWY*16-20-24K* OP ZH	R/W	Supervis variable	Modbus	Type
P26		1,9	U	**F**	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P27		1,9	U	**F**	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P28		1,9	U	**F**	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P34	Select digital input 5	1,9	F	**U**	23	-	23	23	23	23	23	23	23	23	23	23	23	23	R/W	122	329	INT
P35	Mute alarm with 'mute' button	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	23	23	DIG
P36	Type of HP alarm management	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	24	24	DIG
	9. Control setting parameters (r*)																			-	-	-
r01	Cooling setpoint	1,9	D	D	12	°C	12	12	12	12	12	12	12	12	12	12	12	12	R/W	41	41	ANA
r02	Cooling hysteresis	1,9	D	D	3	°C	3	3	3	3	3	3	3	3	3	3	3	3	R/W	42	42	ANA
r03	Heating setpoint	1,9	D	D	40	°C	-	-	-	-	-	-	**30**	**30**	**30**	**30**	**30**	**30**	R/W	43	43	ANA
r04	Heating hysteresis	1,9	D	D	3	°C	-	-	-	-	-	-	3	3	3	3	3	3	R/W	44	44	ANA
r05	Compressor rotation	1,9	F	F	0	-	-	-	-	**1**	**1**	**1**	-	-	-	**1**	**1**	**1**	R/W	78	285	INT
r06	Type of compressor control	1,9	F	F	0	°C	0	0	0	0	0	0	0	0	0	0	0	0	R/W	79	286	INT
r07		1,9	F	F	2	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r08		1,9	F	F	120	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r09		1,9	F	F	100	s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r10		1,9	F	F	120	s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r11		1,9	F	F	100	s	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r12		1,9	F	F	20	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r13	Min. cooling setpoint	1,9	U	**F**	-40	°C	**7**	**-7**	**-2**	**7**	**-7**	**-2**	**7**	**-7**	**-2**	**7**	**-7**	**-2**	R/W	47	47	ANA
r14	Max. cooling setpoint	1,9	U	**F**	80	°C	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	R/W	48	48	ANA
r15	Min. heating setpoint	1,9	U	**F**	-40	°C	-	-	-	-	-	-	**25**	**25**	**25**	**25**	**25**	**25**	R/W	49	49	ANA
r16	Max. heating setpoint	1,9	U	**F**	80	°C	-	-	-	-	-	-	**45**	**45**	**45**	**45**	**45**	**45**	R/W	50	50	ANA
r17	Cooling compensation constant	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	51	51	ANA
r18		1,9	U	**F**	3	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r19		1,9	U	**F**	300	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r20		1,9	U	**F**	0	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r21	Second cooling setpoint from ext contact	1,9	D	D	12	°C	12	12	12	12	12	12	12	12	12	12	12	12	R/W	55	55	ANA
r22	Second heating setpoint from ext contact	1,9	D	D	40	°C	-	-	-	-	-	-	**30**	**30**	**30**	**30**	**30**	**30**	R/W	56	56	ANA
r23	Select automatic change over probe	1,9	D	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	84	291	INT
r24		1,9	D	**F**	400	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r25	Outside temp setpoint to stop compressors	1,9	D	**F**	-40	°C	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	-40	R/W	65	65	ANA
r26		1,9	D	**F**	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r27	Buffer tank suppression (low load)	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	88	295	INT
r28		1,9	F	F	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r29		1,9	F	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r30		1,9	F	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(*) Bold = different from default, "-" = not applicable because of other setting
(**) level type (L-P): D=Direct, U=User, S=Super user, F=Factory

Parameter code	Description	SW version	Default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Unit of measurement	EUWA*5-8-10-12K* standard	EUWA*5-8-10-12K* OP ZL	EUWA*5-8-10-12K* OP ZH	EUWA*16-20-24K* standard	EUWA*16-20-24K* OP ZL	EUWA*16-20-24K* OP ZH	EUWY*5-8-10-12K* standard	EUWY*5-8-10-12K* OP ZL	EUWY*5-8-10-12K* OP ZH	EUWY*16-20-24K* standard	EUWY*16-20-24K* OP ZL	EUWY*16-20-24K* OP ZH	R/W	Supervis variable	Modbus	Type
r31	Heating compensation constant	1,9	U	**F**	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	60	60	ANA
r32		1,9	D	**F**	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r33		1,9	F	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r34	Enable free cooling / free heating	1,9	F	F	0	-	0	0	0	0	0	0	0	0	0	0	0	0	R/W	116	323	INT
r35		1,9	F	F	240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r36		1,9	F	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r37			F	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r38		1,9	F	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r39		1,9	F	F	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r40		1,9	F	F	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r41		1,9	F	F	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r42		1,9	U	**F**	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r43		1,9	F	F	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
r44		1,9	F	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10. Timer setting parameters (t*) (all parameters are not applicable)	1,9																		-	-	-
t1		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t2		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t3		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t4		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t5		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t6		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t7		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t8		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t9		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t10		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t11		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t12		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t13		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t14		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t15		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t16		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t17		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t18		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t19		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t20		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
t21		1,9	U	F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11. Firmware parameters (Fr*)																			-	-	-
H99	Software version (displayed at power up)	1,9	D	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	R	1	208	INT

(*) Bold = different from default, "-" = not applicable because of other setting
(**) level type (L-P): D=Direct, U=User, S=Super user, F=Factory

4.8 Replacing the PCB: EUWA*5-24KBZW1 and EUWY*5-24KBZW1

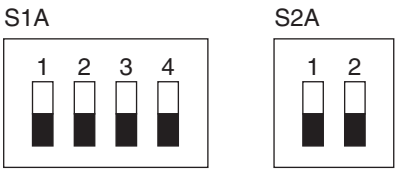
Replacing the PCB

To replace the PCB, proceed as follows:

Step	Action
1	Switch off the power.
2	Remove the connections of the old PCB.
3	Remove the old PCB.
4	Place the new PCB in the same way as the old PCB.
5	Reconnect the PCB.
6	Set the dipswitches on the PCB on the right position (depending on the unit type).

Dipswitches

The illustration below shows the dipswitches on the PCB.



Function of the dipswitches

The table below describes the function of the dipswitches and pushbuttons on the PCB.

S1A	Dipswitch 1	S2A	Dipswitch 2
1	0 = 1 circ. 1 = 2 circ.	1	Defrost setting (only for EUWA*5-24KBZW1) 0 = Start condition 1 & fan defrost 1 (5HP, 8HP, 16HP) 1 = Start condition 2A/B & fan defrost 2 (10HP, 12HP, 20HP, 24HP)
2 3 4	010 = EUWA 100 = EUWY (without defrost compressor stop) 101 = EUWY (with defrost compressor stop)	2	Fan setting (See "Head Pressure Control: EUWA*5-24KBZW1 and EUWY*5-24KBZW1" on page 2–11 for fan settings.) 0 = Fan setting 1 (5HP, 8HP, 16HP) 1 = Fan setting 2 (10HP, 12HP, 20HP, 24HP)

4.9 Soft Starter (option EKSS) Thermal Protection

Introduction

The PS S 25 (soft starter) is used in small chillers to reduce the starting current of the compressor. The soft starter is equipped with an internal protection that prevents the softstarter from heating.

Functional description

Inside the PS S 25, a heat sink is connected to the triac. The temperature of this heat sink is measured internally in the soft starter.

When the temperature of this heat sink reaches 100°C, the thermal protection will prevent the compressor from starting up after the start command is given by the digital controller.

3

Thermal protection operation

The thermal protection operates as follows:

When the compressor receives the start command...	If the heat sink temperature has reached 100°C due to...	The compressor will...
The soft starter checks the heat sink temperature.	■ High ambient conditions ■ Large switching rate (e.g. more than six hours an ambient temperature of 55°C inside the switchbox) ■ Other actions that cause the heater sink temperature to increase.	Not start up.

Ambient temperature > 43°C

If the unit is operating at an ambient temperature of more than 43°C and a restart of the compressor(s) is requested within 10 minutes after a stop, the unit may stop operating and no alarm is indicated on the central controller.

This is because the soft starter module has switched to thermal protection. The thermal protection can be reset by manually switching the power off and on again after these 10 minutes.

Part 4
Commissioning and Test Run

Introduction

Commissioning and test run are well known practices in service engineering. This part contains a systematic approach on test run checks and test values, which guarantees a high quality installation and operation of the units.

What is in this part?

This part contains the following chapters:

1 Pre-Test Run Checks

1.1 What Is in This Chapter?

Introduction

This chapter contains checks you have to carry out before every test run.

Overview

This chapter contains the following topics:

1.2 General Checks

Checklist

The table below contains the general checklist.

Step	Check whether...
1	There is external damage.
2	The unit is properly supported and/or has a proper foundation.
3	The unit is installed horizontally with a deviation of maximum 1°.
4	Anti-vibration pads are required.
5	Is the chiller of the type EUWY*5-24KBZW1? ■ When yes, go to step 6. ■ When no, go to step 8.
6	There is a drain possibility for condensed water.
7	A heater tape is placed inside the drain system. This is necessary to prevent ice accumulation and possible blockage during wintertime.
8	Check for remaining metal dust of burrs. Metal dust or burrs from grinding or drilling in the metal parts during construction facilitates the rust process and shortens the lifetime of the unit.
9	The operator has received the operation manual.
10	The installer has received the installation manual.
11	The air volume over the coil is adequate; there is no blockage (from paper, plastic...) or air short circuit due to wrong positioning.

1.3 Water Piping Checks

Checklist

The table below contains the water piping checklist.

Step	Check whether...
1	A filter is installed in front of the water inlet of the plate-heat exchanger. The plate-heat exchangers are sensitive to dirt and small particles.
2	The water volume is within the limits.
3	There is adequate water flow.
4	The water quality meets the standards.
5	The water piping is properly insulated.
6	Measurement points for temperature and pressure are available on the water circuit.
7	The flow switch and pump are properly working.
8	Air purge points are installed on the high parts of the water piping.
9	Drain taps are installed at the low points of the water piping.
10	Other parts of the water circuit are properly mounted and installed (e.g. buffer tank, expansion tank...).
11	Vibration compensators are mounted at the water connections if the unit is positioned on anti-vibration pads.

Water volume, flow and pressure

The table below shows the operation range of water volume and water flow for proper operation of the unit.

Chiller type	Minimum water volume	Minimum water flow	Maximum water flow
EUWA*5KBZW1	54 l	16.2 l/min	64.9 l/min
EUWA*8KBZW1	85 l	25.6 l/min	102.5 l/min
EUWA*10KBZW1	108 l	32.2 l/min	128.9 l/min
EUWA*12KBZW1	126 l	37.9 l/min	151.6 l/min
EUWA*16KBZW1	88 l	53 l/min	212 l/min
EUWA*20KBZW1	111 l	67 l/min	267 l/min
EUWA*24KBZW1	132 l	79 l/min	317 l/min
EUWY*5KBZW1	43 l	21 l/min	68 l/min
EUWY*8KBZW1	82 l	31 l/min	106 l/min
EUWY*10KBZW1	100 l	38 l/min	137 l/min
EUWY*12KBZW1	119 l	45 l/min	155 l/min
EUWY*16KBZW1	82 l	61 l/min	212 l/min
EUWY*20KBZW1	100 l	75 l/min	275 l/min
EUWY*24KBZW1	119 l	89 l/min	309 l/min

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

Calculation of the minimum water volume

The calculation method below 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 gives a certain inertia to the system, so that:

- Water (or glycol) temperature does not drop too fast when the unit turns ON.
- Water (or glycol) temperature does not rise too fast when the unit turns OFF.

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

with:

Notation	Dimension	Description	Default
V	[m³]	Required system volume	—
Q	[W]	Cooling capacity at the lowest capacity step of each chiller in the system	—
t	[s]	Minimum cycling time allowed by the compressor	240 s
ρ	[kg/m³]	Specific mass of the fluid	ρ_{water} = 1000 kg/m³
d	[K]	Thermostat step difference	$d_{inlet\ water\ control}$ = 3 K
C_w	[J/kgK]	Specific heat capacity of the fluid	$C_{w,\ water}$ = 4186 J/kgK

Water quality

The table below contains the required water quality specifications.

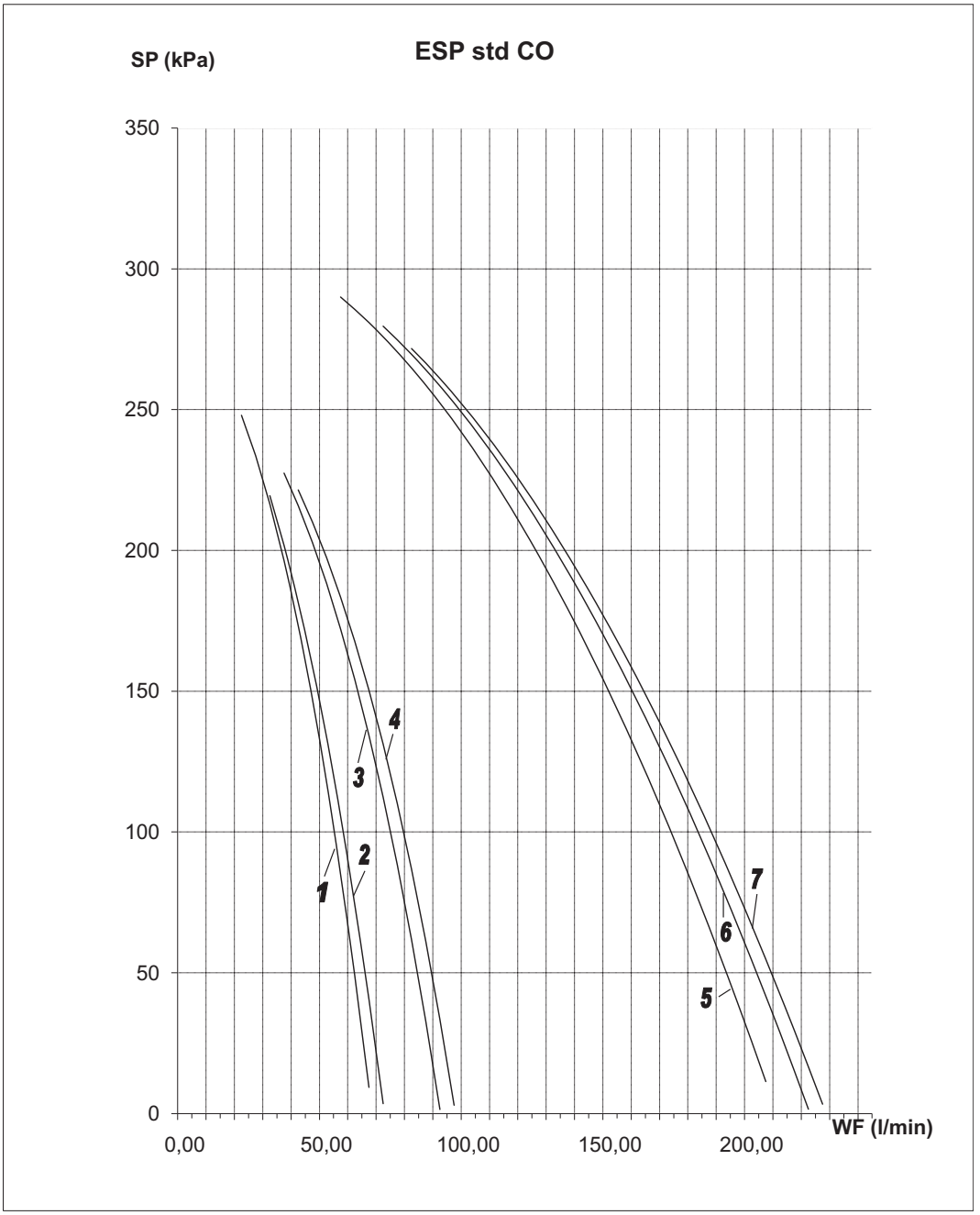
		Evaporator water		Heated water (low temperature)		Tendency if out of criteria
		Circulating water (< 20°C)	Supply water	Circulating water (20°C-60°C)	Supply water	
Items to be checked						
pH	at 25°C	6.8~8.0	6.8~8.0	7.0~8.0	7.0~8.0	Corrosion + scale
Electrical conductivity	mS/m (at 25°C)	< 40	< 30	< 30	< 30	Corrosion + scale
Chloride ion	mg Cl^-/l	< 50	< 50	< 50	< 50	Corrosion
Sulphate ion	mg SO_4^{2-}/l	< 50	< 50	< 50	< 50	Corrosion
M-alkalinity (pH 4.8)	mg $CaCO_3$/l	< 50	< 50	< 50	< 50	Scale
Total hardness	mg $CaCO_3$/l	< 70	< 70	< 70	< 70	Scale
Calcium hardness	mg $CaCO_3$/l	< 50	< 50	< 50	< 50	Scale
Silica ion	mg SiO_2/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 S^{2-}/l	Not detectable	Not detectable	Not detectable	Not detectable	Corrosion

		Evaporator water		Heated water (low temperature)		Tendency if out of criteria
Ammonium ion	mg NH_4^+/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 CO_2/l	< 4.0	< 4.0	< 0.4	< 4.0	Corrosion
Stability index		–	–	–	–	Corrosion + scale

1.4 External Static Pressure: EUWA*5-24KBZW1

External static pressure

The illustration below shows the external static pressure of the unit depending on the water flow.



Symbols

The table below describes the symbols.

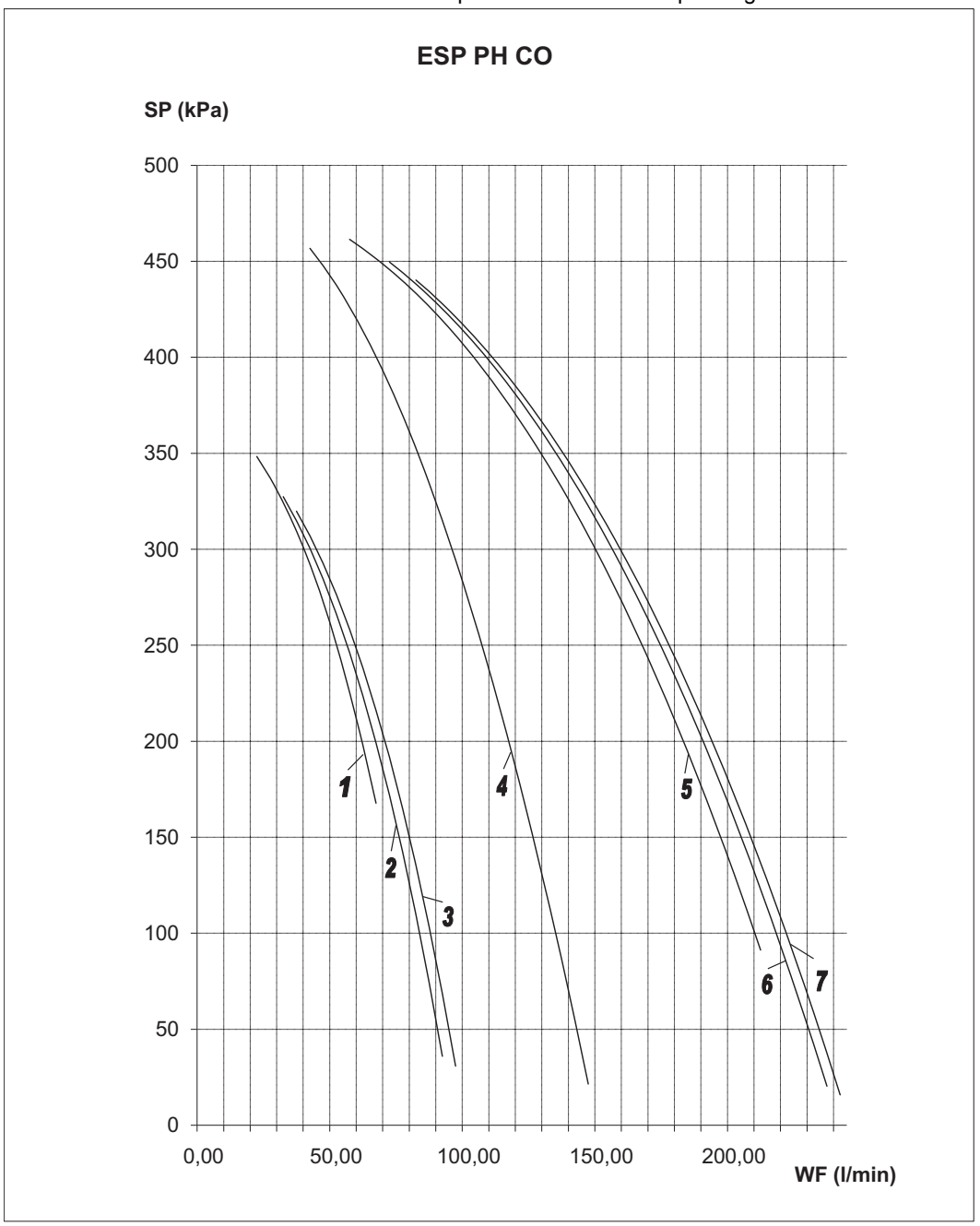
Symbol	Description
SP	Static pressure of the unit
WF	Waterflow rate
(1)	EUWA*5KBZW1
(2)	EUWA*8KBZW1
(3)	EUWA*10KBZW1
(4)	EUWA*12KBZW1
(5)	EUWA*16KBZW1
(6)	EUWA*20KBZW1
(7)	EUWA*24KBZW1

Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange.
See "Technical Specifications: EUWA*5-8KBZW1" on page 1–5, "Technical Specifications: EUWA*10-12KBZW1" on page 1–8, "Technical Specifications: EUWA*16-20KBZW1" on page 1–11, "Technical Specifications: EUWA*24KBZW1" on page 1–14.

1.5 External Static Pressure: EUWY*5-24KBZW1

External static pressure

The illustration below shows the external static pressure of the unit depending on the water flow.



Symbols

The table below describes the symbols.

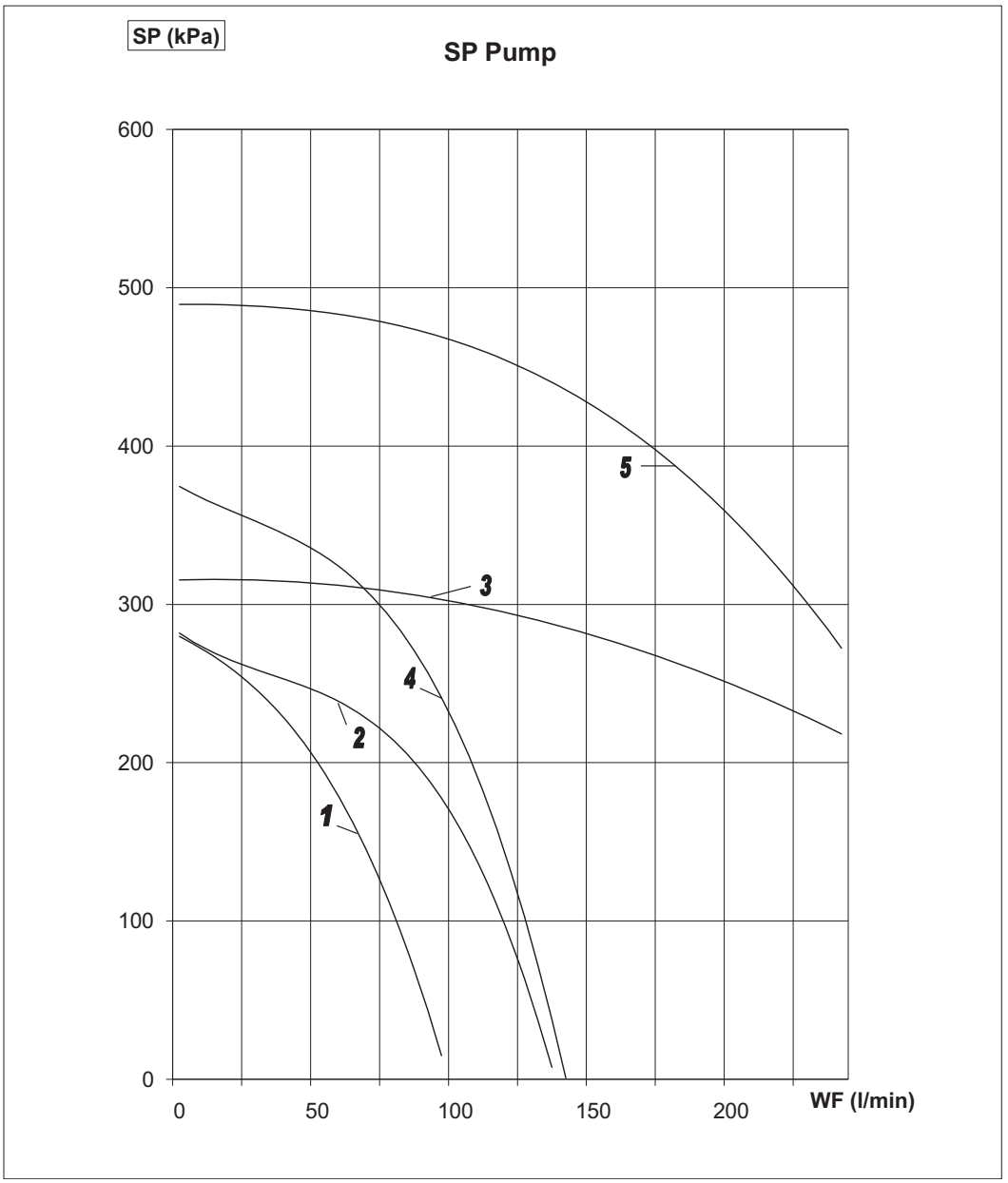
Symbol	Description
SP	Static pressure of the unit
WF	Waterflow rate
(1)	EUWY*5KBZW1
(2)	EUWY*8KBZW1
(3)	EUWY*10KBZW1
(4)	EUWY*12KBZW1
(5)	EUWY*16KBZW1
(6)	EUWY*20KBZW1
(7)	EUWY*24KBZW1

Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange.
See "Technical Specifications: EUWY*5-8KBZW1" on page 1–17, "Technical Specifications: EUWY*10-12KBZW1" on page 1–20, "Technical Specifications: EUWY*16-20KBZW1" on page 1–23, "Technical Specifications: EUWY*24KBZW1" on page 1–26.

1.6 Static Pressure of the Pump for EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Static pressure

The illustration below shows the static pressure of the pump depending on the water flow and the pump type.



Symbols

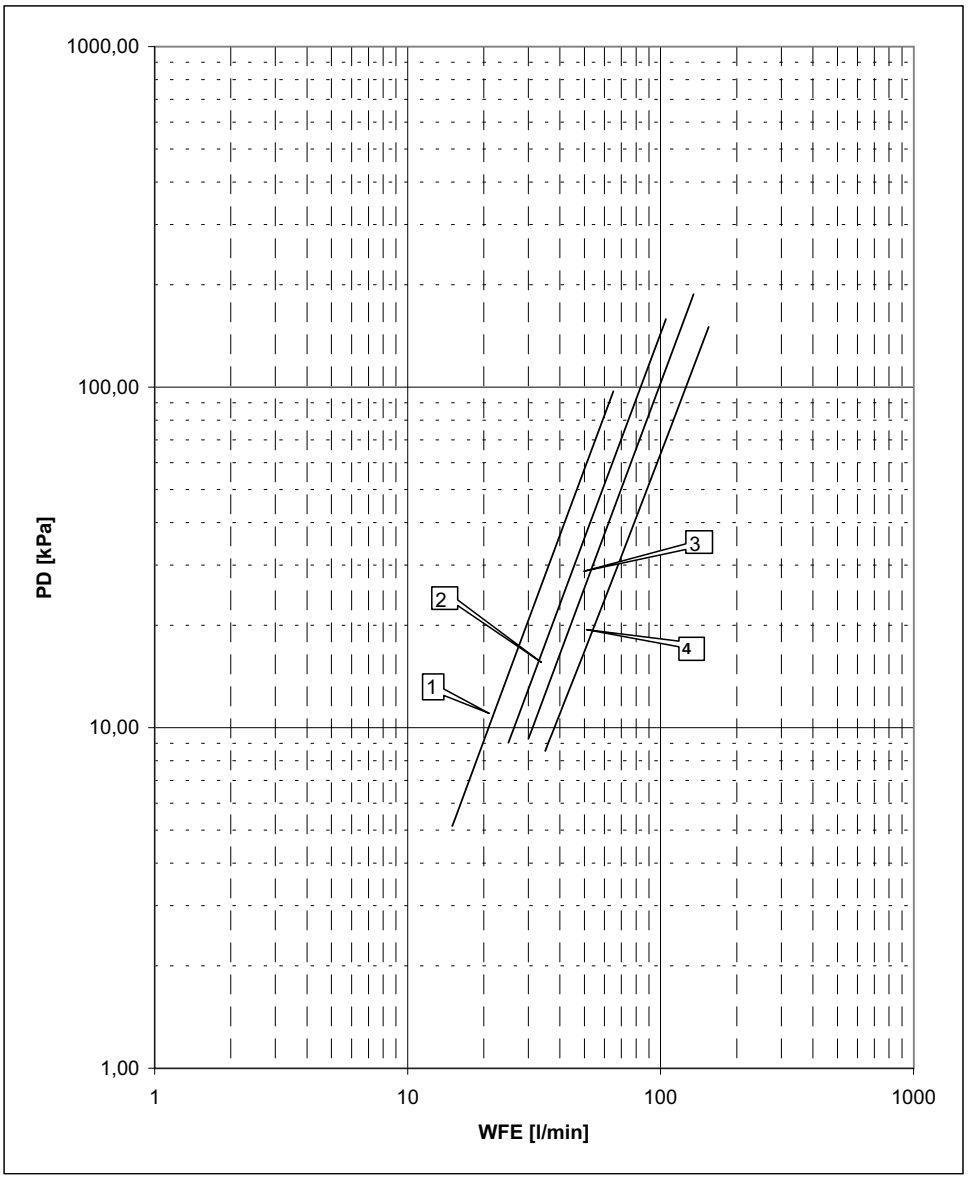
The table below describes the symbols.

Symbol	Description
SP	Static pressure of pump
WF	Waterflow rate
1	CM3-3
2	CM5-3
3	CM10-2
4	CM5-4
5	CM10-3

1.7 Water Pressure Drop through Evaporator: EUWA*5-12KBZW1

Water pressure drop

The illustration below shows the water pressure drop through evaporator for EUWA*5-12KBZW1.



Symbols

The table below describes the symbols.

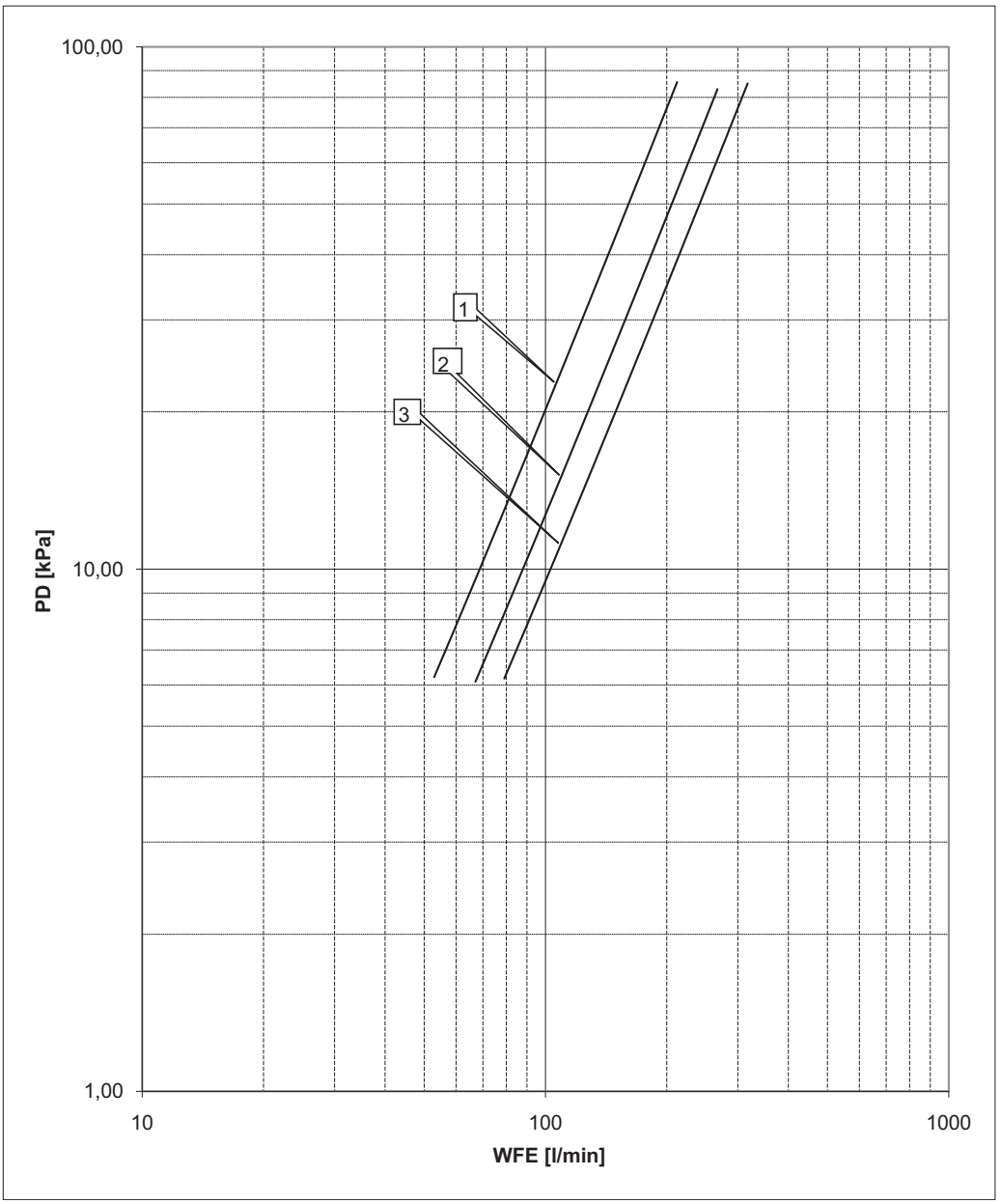
Symbol	Description
PD	Pressure drop through evaporator
WFE	Evaporator waterflow rate
(1)	For EUWA*5KBZW1
(2)	For EUWA*8KBZW1
(3)	For EUWA*10KBZW1
(4)	For EUWA*12KBZW1

Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange. See "Technical Specifications: EUWA*5-8KBZW1" on page 1–5 and "Technical Specifications: EUWA*10-12KBZW1" on page 1–8.

1.8 Water Pressure Drop through Evaporator: EUWA*16-24KBZW1

Water pressure drop

The illustration below shows the water pressure drop through evaporator for EUWA*16-24KBZW1.



Symbols

The table below describes the symbols.

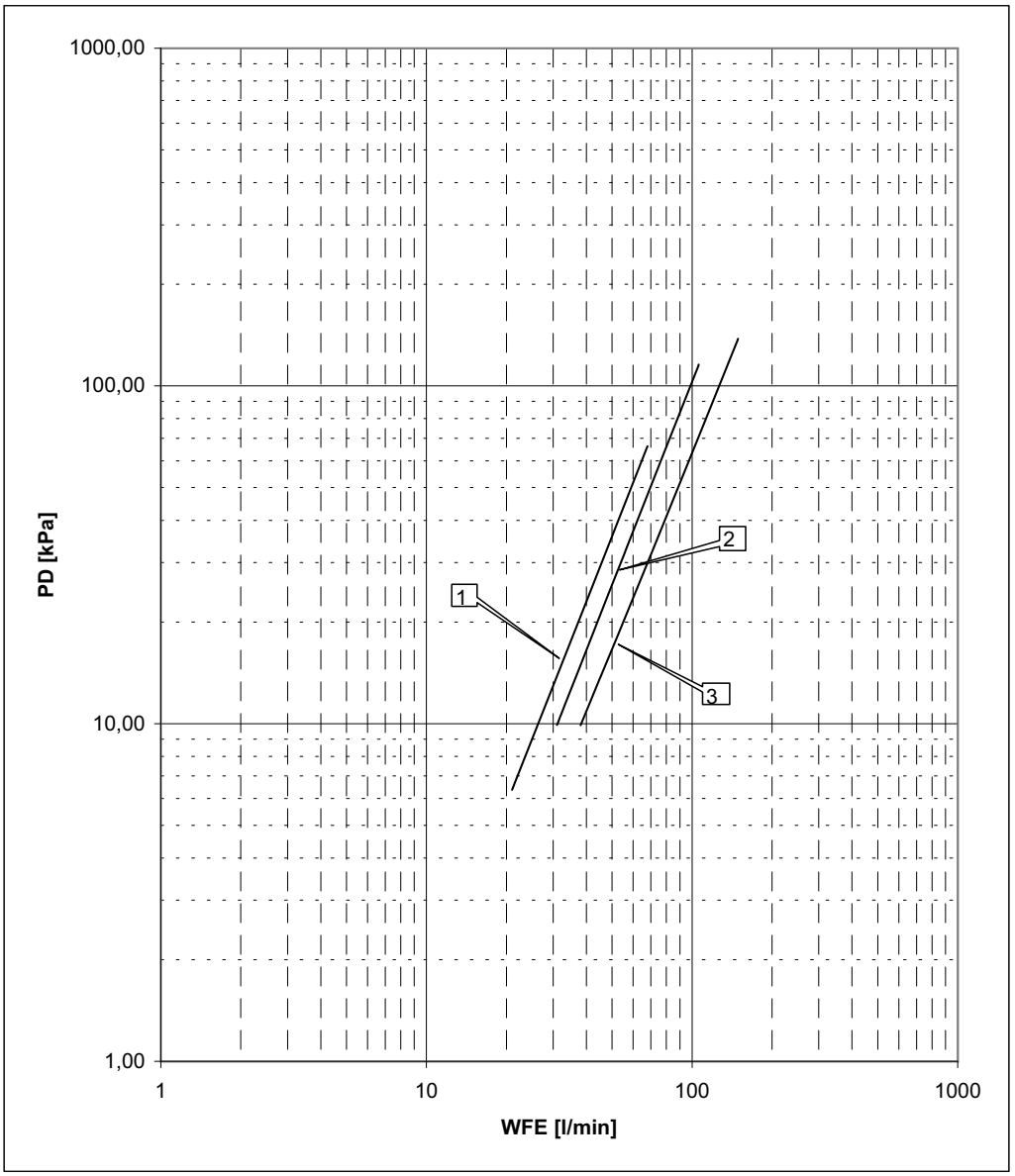
Symbol	Description
PD	Pressure drop through evaporator
WFE	Evaporator waterflow rate
(1)	For EUWA*16KBZW1
(2)	For EUWA*20KBZW1
(3)	For EUWA*24KBZW1

Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange. See "Technical Specifications: EUWA*16-20KBZW1" on page 1–11 and "Technical Specifications: EUWA*24KBZW1" on page 1–14.

1.9 Water Pressure Drop through Evaporator: EUWY*5-12KBZW1

Water pressure drop

The illustration below shows the water pressure drop through evaporator for EUWY*5-12KBZW1.



Symbols

The table below describes the symbols.

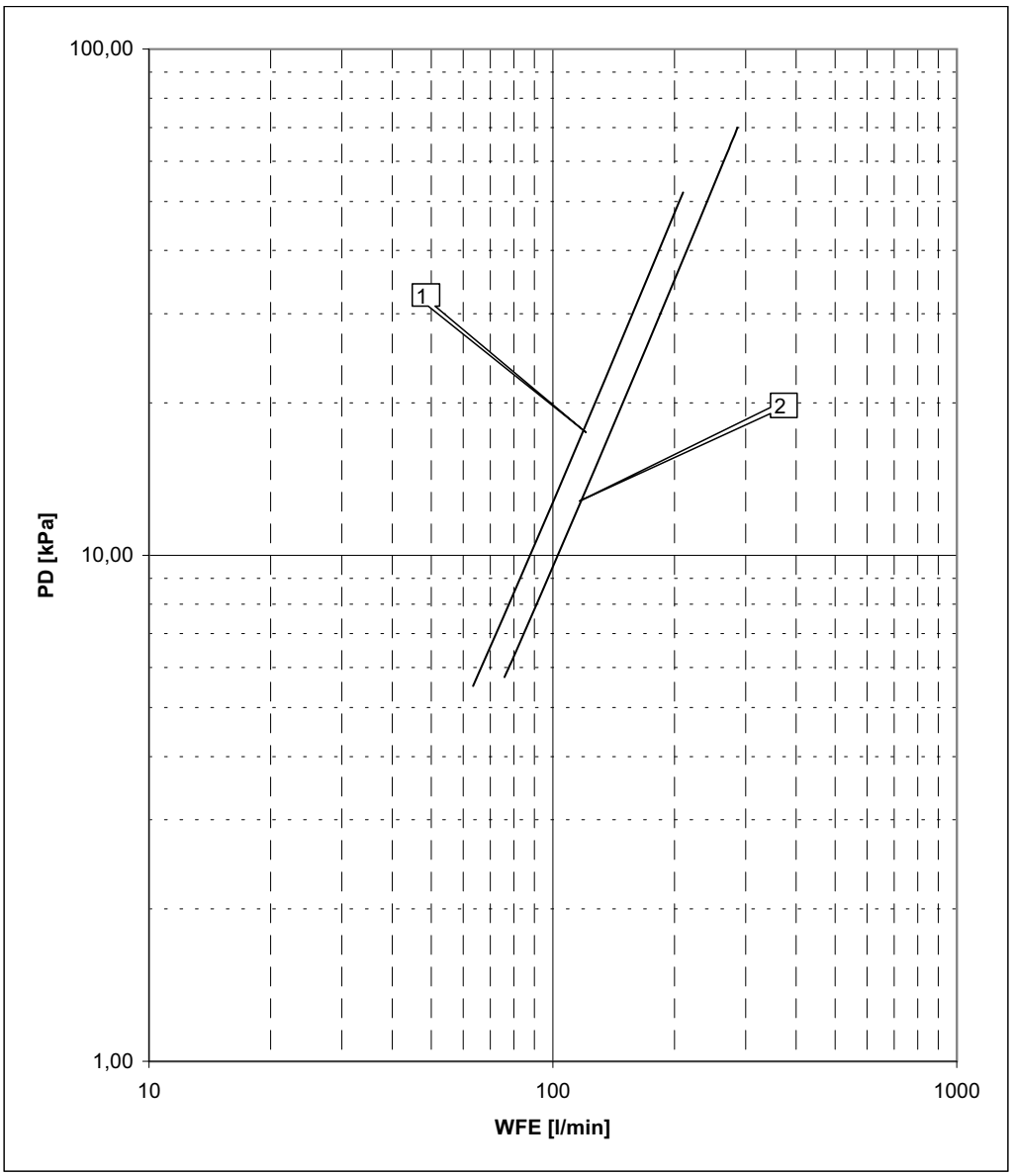
Symbol	Description
PD	Pressure drop through evaporator
WFE	Evaporator waterflow rate
(1)	For EUWY*5KBZW1
(2)	For EUWY*8KBZW1
(3)	EUWY*10KBZW1 - EUWY*12KBZW1

Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange. See "Technical Specifications: EUWY*5-8KBZW1" on page 1–17 and "Technical Specifications: EUWY*10-12KBZW1" on page 1–20.

1.10 Water Pressure Drop through Evaporator: EUWY*16-24KBZW1

Water pressure drop

The illustration below shows the water pressure drop through evaporator for EUWY*16-24KBZW1.



Symbols

The table below describes the symbols.

Symbol	Description
PD	Pressure drop through evaporator
WFE	Evaporator waterflow rate
(1)	For EUWY*16KBZW1
(2)	EUWY*20KBZW1 - EUWY*24KBZW1

Selecting a flow outside the curves can cause damage to or malfunction of the unit. See also minimum and maximum allowed water flowrange. See "Technical Specifications: EUWY*16-20KBZW1" on page 1–23 and "Technical Specifications: EUWY*24KBZW1" on page 1–26.

1.11 Electrical Checks

Checklist

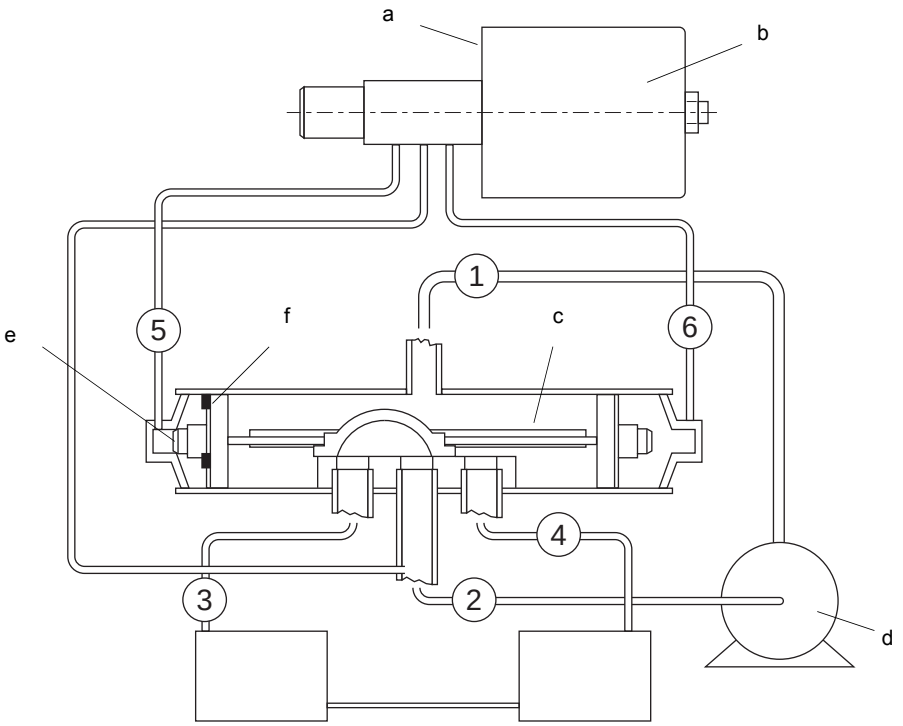
The table below contains the electrical checklist.

Step	Check whether...
1	The 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.
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 correctly programmed.
6	The optional wiring for remote cool/heat is installed. Make sure that the controller is correctly programmed.

1.12 Control of the function of the 4-way valve for EUWY*5-24KBZW1

Illustration

The illustration below shows the main components of the 4-way valve and of the connections with the 4-way valve.



Components

The table below lists the main components of the 4-way valve and of the connections with the 4-way valve.

Symbol	Description
1	Discharge tube from the compressor
2	Suction tube to the compressor
3	Tube to the plate heat exchanger
4	Tube to the air-cooled heat exchanger
5	Left pilot back capillary tube
6	Right pilot back capillary tube

Symbol	Description
a	Pilot body
b	Coil
c	Piston body
d	Compressor
e	Piston needle
f	Bleed hole

Normal cooling

The table below contains the normal condition of the 4-way valve in cooling mode.

Discharge tube 1	Suction tube 2	Tube to the plate heat exchanger	Tube to the air-cooled heat exchanger	Left pilot back capillary tube	Right pilot back capillary tube
Hot	Cool	Cool as in column 2	Hot as in column 1	Temperature of valve body	Temperature of valve body

Normal heating

The table below contains the normal condition of the 4-way valve in heating mode.

Discharge tube 1	Suction tube 2	Tube to the plate heat exchanger	Tube to the air-cooled heat exchanger	Left pilot back capil-lary tube	Right pilot back capil-lary tube
Hot	Cool	Hot as in column 1	Cool as in column 2	Temperature of valve body	Temperature of valve body

The valve does not shift from cooling to heating

The table below contains the possible checks for finding the cause for the valve not shifting from cooling to heating and the corresponding procedure to solve the problem.

Check	Cause	Procedure
Check the electrical circuit.	No voltage to the coil	Repair the electrical circuit.
Check the coil.	Coil is defective.	Replace the coil.
Check the refrigerant charge.	Charge is low.	1. Repair the refrigerant charge. 2. Recharge the system.
	Pressure differential is too high.	Re-check the system.
Check the operation conditions in the following table to find the cause of the malfunction. The procedure for solving the problem is described in the last column. See the illustration to situate the numbers in the table heading.		

1	2	3	4	5	6	Cause	Procedure
Hot	Cool	Cool as in column 2	Hot as in column 1	Temper-ature of valve body	Hot	The pilot valve works correctly. There is dirt in one bleed hole.	1. De-energize the solenoid. 2. Raise the head pressure. 3. Re-energize the solenoid to loosen the dirt. 4. If the procedure was unsuccessful: ■ Remove the valve and clean it. ■ Check for 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.	1. Stop the unit. 2. After pressure equaliza-tion, restart with energized solenoid. 3. If the valve shifts, retry with the compressor on. If there is no reversal, replace the valve.
Hot	Cool	Cool as in column 2	Hot as in column 1	Temper-ature of valve body	Temper-ature of valve body	The pilot tubes are clogged.	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 the pilot are still open.	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	Temper-ature of valve body	Warm	The compressor is defective.	

The valve starts to shift but does not complete the reversal.

Check the operation conditions in the table below to find the cause of the malfunction.
The procedure to solve the problem is described in the last column.
See the illustration to situate the numbers in the table heading.

1	2	3	4	5	6	Cause	Procedure
Hot	Warm	Warm	Warm	Temper-ature of valve body	Hot	There is not enough pressure differential at start of stroke or not enough flow to maintain the pressure differential.	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 the pilot are still open.	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	Temper-ature of valve body	Hot	There is body damage.	Replace the valve.
						The valve is hung up at mid-stroke. The pumping vol-ume of the com-pressor is not sufficient to maintain the reversal.	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 the pilot are still open.	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.

The valve does not shift from heating to cooling

Check the operation conditions in the table below to find the cause of the malfunction.
The procedure to solve the problem is described in the last column.
See the illustration to situate the numbers in the table heading.

1	2	3	4	5	6	Cause	Procedure
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.	1. Raise the head pressure. The valve will reverse during the pressure equalization period. 2. Recheck the system.
						The pilot tubes are clogged.	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.	1. Raise the head pressure. 2. Operate the solenoid. 3. If the procedure was unsuccessful: ■ Remove the valve and clean it. ■ Check for 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.	1. Stop the unit. 2. After pressure equalization, restart with de-energized solenoid. 3. If the valve shifts, retry 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 pilot valve.
Warm	Cool	Warm as in column 1	Cool as in column 1	Warm	Temperature of valve body	The compressor is defective.	

Leak when in heating mode

Check the operation conditions in the table below to find the cause of the malfunction.
The procedure to solve the problem is described in the last column.
See the illustration to situate the numbers in the table heading.

1	2	3	4	5	6	Cause	Procedure
Hot	Cool	Hot as in column 1	Cool as in column 1	Temper-ature of valve body	Warmer than valve body	The piston needle is leaking at the end of the slide.	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 leak-ing.	1. Operate the valve several times. 2. Recheck. 3. If there is an excessive leak, replace the valve.

2 Test Run and Operation Data

2.1 What Is in This Chapter?

Introduction

The tables in this chapter contain an overview of the measurements that you can carry out. Use it as a guideline during commissioning.

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

Overview

This chapter contains the following topics:

2.2 Test Run and Operation Data for EUWA*5-24KBZW1 and EUWY*5-24KBZW1

Pressures

The table below contains the measurable pressures.

Measurement	Value
Suction pressure	4 – 8.5 bar
Discharge pressure	7 – 22 bar
Maximum water pressure	10 bar

Temperatures

The table below contains the measurable temperatures.

Measurement	Value
Leaving water temperature	■ Standard: 5– 20°C ■ For ZH: -5 – 20°C ■ For ZL: -10 – 20°C ■ Heating: 35 - 50°C (only for EUWY*5-24KBZW1)
Outdoor temperature	■ -15 – 43°C for standard unit ■ -10 – 43°C for glycol unit
Temperature difference at the air side	10 – 15°C
Temperature difference at the water side	3 – 8°C
Discharge temperature	80 – 120°C

Voltages

The table below contains the measurable voltages.

Measurement	Value
Power supply voltage	Within ± 10% of the rated voltage
Phase imbalance	Within ± 2% of the rated voltage
Control circuit voltage	230 V AC for main electromagnetic switches 24 V DC for the controllers

Currents

The table below contains the currents and used fuses.

Unit	Nominal current	Maximum current	Fuses
EUWAN5KBZW1	7.7 A	11.2 A	3 x 20 gL/gG
EUWAP5KBZW1	9.1 A	12.6 A	3 x 25 gL/gG
EUWAB5KBZW1			
EUWAN8KBZW1	13.6 A	15.9 A	3 x 25 gL/gG
EUWAP8KBZW1	15.0 A	17.3 A	3 x 25 gL/gG
EUWAB8KBZW1			
EUWAN10KBZW1	15.9 A	18.9 A	3 x 25 gL/gG

Unit	Nominal current	Maximum current	Fuses
EUWAP10KBZW1	17.3 A	20.3 A	3 x 32 gL/gG
EUWAB10KBZW1			
EUWAN12KBZW1	20.5 A	26.9 A	3 x 40 gL/gG
EUWAP12KBZW1	21.9 A	28.3 A	3 x 40 gL/gG
EUWAB12KBZW1			
EUWAN16KBZW1	27.2 A	31.8 A	3 x 40 gL/gG
EUWAP16KBZW1	29.2 A	33.8 A	3 x 50 gL/gG
EUWAB16KBZW1			
EUWAN20KBZW1	31.8 A	37.8 A	3 x 50 gL/gG
EUWAP20KBZW1	33.8 A	39.8 A	3 x 50 gL/gG
EUWAB20KBZW1			
EUWAN24KBZW1	41.0 A	53.8 A	3 x 63 gL/gG
EUWAP24KBZW1	43.0 A	55.8 A	3 x 63 gL/gG
EUWAB24KBZW1			

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

Part 5
Maintenance

Introduction

Preventive maintenance should be set up for operation at maximum capacity or to avoid damage. The following chapters explain how to or when to maintain the units.

It is also applicable on other types of Daikin chillers.

What is in this part?

This part contains the following chapters:

1 Maintenance

1.1 What Is in This Chapter

Introduction

As shown in the table below, we have grouped the maintenance in maintenance of the main parts (condenser, compressor and evaporator) and periodical checks.

Precautions

Correct choices and decisions have to be made before any maintenance is done. Opening the refrigerant circuit may cause a loss of refrigerant or lead to system contamination.

- Avoid high gas concentrations.
  While the heavy concentration of the refrigerant gas will raise from the floor level, good ventilation is a must.
- Avoid all contact with open fires or hot surfaces.
  By high temperatures, the refrigerant gas R-407C may decompose into irritating and poisonous gas. Avoid skin and hand contact with the liquid refrigerant and protect your eyes against liquid splashes.

Overview

This chapter covers the following topics:

5

1.2 Maintenance of the Main Parts

Preventive maintenance

A program of scheduled maintenance should be set up and followed. The items mentioned are to be used as a guide and must be used in combination with sound electrical and refrigeration workmanship to ensure trouble free operation and performance.

Unit Casing

Follow the below instructions to check the unit casing.

Check if...	If not, then...
The paint of the unit casing is intact.	Touch-up with paint.
All plate work is screwed down in position.	Screw the plate work down in position.

Compressor

Follow the instructions below to check the compressor:

- Check crankcase heater operation. Switch of the compressor and carefully touch the crankcase heater area by hand.

No operation can cause compressor damage when the ambient temperature reaches a low temperature.

Evaporator and condenser

Follow the instructions below to check the evaporator and condenser:

- Inspect the evaporator tubes or condenser plates after the first operating season. This condition indicates the required frequency of cleaning and also whether water treatment is needed in the chilled water circuit.
- Check the air plugs and drain plugs to prevent or detect water leakage.
- Check pressure-drop and water flow.
- Record temperature difference between in / out and water out/ refrigerant temperature.
- Inspect evaporator insulation. If damaged, repair to avoid water between insulation and evaporator shell.
- Inspect water and refrigerant connections.
- If the evaporator heater-tape is installed, check operation by direct power connection and hand-touch.
- brush cleaning. Abnormal high condensing-pressures are an indication for periodic cleaning.

Unit switchbox

Follow the instructions below to check the unit switchbox:

- Check all power connections for tightness.
- Check compressor motor terminals.
- Inspect wiring for any signs of overheating (discolouring).
- Remove all dust and debris from the switchbox. Replaced coils and components should not be left in the unit control panel.
- Check all field-wired terminals.

Expansion valve

The expansion valve will allow the correct amount of refrigerant to enter the evaporator to match the cooling load (by keeping a constant superheat). Follow the instructions below to check the expansion valve.

- Check the superheat setting.
- Inspect the bulb / power-head capillary connection (no chaffing).
- Inspect the equaliser line visually.
- Inspect the feeler bulb suction pipe connection / insulation.

Flow switch and pump interlock

Follow the instructions below to check the flow switch and the pump interlock.

- Check operation by ohmmeter after disconnecting the wires to the field terminals and simulating flow and no-flow conditions.
- Inspect the flow-switch for possible corrosion (glycol applications). Check electrical connections for shunts or bridges.

1.3 Maintenance of the Control Devices

Preventive maintenance

A program of scheduled maintenance should be set up and followed. The items mentioned are to be used as a guide and must be used in combination with sound electrical and refrigeration workmanship to ensure trouble free operation and performance.

1.4 Periodical Checks

Electrical checks

The table below contains the electrical checks.

Inspection checks and actions	Remarks
Check that all electrical wiring is properly connected and securely tightened.	—
Check the electrical components for damage or loss.	—
Check if the power supply corresponds with the identification label of the unit.	—
Check the operation of the circuit breaker and the earth leak detector of the local supply panel.	—
Check the operation of the safety devices.	No operation can cause damage of the unit.

Refrigerant checks

The table below contains the refrigerant checks.

Inspection checks and actions	Remarks
Check the refrigerant circuit. ■ If the unit leaks, contact your dealer.	—

Water checks

The table below contains the water checks.

Inspection checks and actions	Remarks
Check the water condition. ■ Drain the water from the air release plug. ■ If the water is dirty, replace all the water in the system.	Dirty water causes a cooling capacity drop as well as corrosion of the water heat exchanger and pipe.
Check the water connection.	—
Check the water velocity.	—
Check the function of the flow switch.	The evaporator can freeze up if the flow switch is not able to operate.
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. Bleed therefore the system regularly.
Check the water filter.	—

Noise checks

The table below contains the noise checks.

Inspection checks and actions	Remarks
Check for any abnormal noise. ■ Locate the noise producing section and search the cause. ■ If the cause of the noise cannot be located, contact your dealer.	—

Index

C

D

E

F

G

H

I

M

O

P

R

S

T

U

W