ESIE11-03

Service Manual

EWWP014-065KBW1N R-407C
EWWP090-195KAW1M R-407C
EWLP012-065KBW1N R-407C

Small water-cooled/condenserless chillers

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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 EWWP014-065KBW1N/EWLP012-065KBW1N and the EWWP090-195KAW1M.

EWWP014-065KBW1N

The Daikin EWWP014-065KBW1N water-cooled water chillers:

- Are designed for indoor installation.
- Are used for cooling or heating applications.
- Are available in seven standard sizes with nominal cooling capacities ranging from 13 kW to 65 kW.

EWLP012-065KBW1N

The Daikin EWLP012-065KBW1N water/air-cooled water chillers:

- Are designed for indoor installation.
- Are used for cooling applications.
- Are available in seven standard sizes with nominal cooling capacities ranging from 12.1 kW to 62.4 kW.

EWWP090-195KAW1M

The Daikin EWWP090-195KAW1M water-cooled water chillers:

- Are designed for indoor installation.
- Are used for cooling or heating applications.
- Are available in three modular build up standard sizes with nominal cooling capacities rating from 86 kW to 195 kW.

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 EWWP014-065KBW1N, EWWP090-195KAW1M and EWLP012-065KBW1N 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:

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1.2 Technical and Electrical Specifications

Technical and electrical specifications

The table below contains the technical and electrical specifications.

Units			EWWP014 KBW1N	EWWP022 KBW1N	EWWP028 KBW1N	EWWP035 KBW1N	EWWP045 KBW1N	EWWP055 KBW1N	EWWP065 KBW1N
Capacity/Power input									
Nominal capacity		kW	13.0	21.5	28.0	32.5	43.0	56.0	65.0
Capacity steps			1				2		
Nominal power input		kW	3.61	5.79	7.48	8.75	11.80	15.50	17.60
Technical specifications									
Dimensions	Height	mm	600						
	Width	mm	600						
	Depth	mm	600				1200		
Machine weight		kg	118	155	165	172	300	320	334
Material			polyester painted steel plate						
Colour			ivory white / Munsell code 5Y7.5/1						
Sound power	ISO 9614	dBA	64			71	67		74
Evaporator	Type		brased plate heat exchanger						
	Qty		1						
	Minimum water volume	l	62	103	134	155	205	268	311
	Nominal water flow	l/min	37	62	80	93	123	161	186
	Min water flow	l/min	31	53	68	79	105	137	158
	Max water flow	l/min	75	123	161	186	247	321	373
	Insulation material		polyethylene foam						
Condenser	Type		brased plate heat exchanger						
	Qty		1						
	Nominal water flow	l/min	48	78	102	118	157	205	237
	Min water flow	l/min	24	39	51	59	79	102	118
	Max water flow	l/min	95	157	203	237	314	410	474

Units			EWWP014 KBW1N	EWWP022 KBW1N	EWWP028 KBW1N	EWWP035 KBW1N	EWWP045 KBW1N	EWWP055 KBW1N	EWWP065 KBW1N
Refrigerant circuit	Refrigerant type		R-407C						
	Refrigerant charge	kg	1.2	2	2.5	3.1	4.6	4.6	5.6
	No of circuits		1				2		
	Refrigerant control		thermostatic expansion valve						
Compressor	Type		hermetically sealed scroll						
	Qty		1	1	1	1	2	2	2
	Model		JT140BF-YE	JT212DA-YE	JT300DA-YE	JT335DA-YE	JT212DA-YE	JT300DA-YE	JT335DA-YE
	Speed	rpm	2900						
	Refrigerant oil		FVC68D						
	Refrigerant oil charge	l	1.5	2.7	2.7	2.7	2 x 2.7	2 x 2.7	2 x 2.7
	Crankcase heater	W	-----						
Piping connections	Evaporator water in/out	mm	FBSP 25				FBSP 40		
	Condenser water in/out	mm	FBSP 25				FBSP 40		
	Evaporator drain/purge		field installation						
	Condenser drain/purge		field installation						
Electrical specifications									
Power supply			W1						
Nominal distribution voltage	Phase		3N~						
	Frequency	Hz	50						
	Voltage	V	400						
	Voltage tolerance	%	±10%						

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Units			EWWP014 KBW1N	EWWP022 KBW1N	EWWP028 KBW1N	EWWP035 KBW1N	EWWP045 KBW1N	EWWP055 KBW1N	EWWP065 KBW1N
Unit	Starting current	A	49	79	109	129	93	127	149
	Nominal running current	A	6.6	10.4	13.1	15.0	20.8	26.2	30
	Maximum running current	A	9	14.5	18.5	22	28	36	40
	Recom-mended fuses according to IEC standard 269-2	aM	3 x 16	3 x 20	3 x 25	3 x 25	3 x 35	3 x 40	3 x 50
Compres-sor	Phase		3~						
	Frequency	Hz	50						
	Voltage	V	400						
	Starting current	A	49	79	109	129	79	109	129
	Nominal running current	A	6.6	10.4	13.1	15.0	10.4	13.1	15.0
	Maximum running current	A	9	14.5	18.5	22	14	18	20
	Starting method		direct on line						

Notes See ”Notes” on page 1-11.

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Units			EWWP090 KAW1M	EWWP100 KAW1M	EWWP110 KAW1M	EWWP120 KAW1M	EWWP130 KAW1M
Capacity/Power input							
Nominal capacity		kW	86.0	99.0	112	121	130
Capacity steps			4				
Nominal power input		kW	23.6	27.3	31.0	33.1	35.2
Technical specifications							
Dimensions	Height	mm	1200				
	Width	mm	600				
	Depth	mm	1200				
Machine weight		kg	600	620	640	654	668
Material			polyester painted steel plate				
Colour			ivory white / Munsell code 5Y7.5/1				
Sound power		dBA	71			75	77
Evaporator	Type		brased plate heat exchanger				
	Qty		2				
	Minimum water volume	l	205	268	268	311	311
	Nominal water flow	l/min	247	284	321	347	373
	Min water flow	l/min	210	241	273	295	317
	Max water flow	l/min	493	568	642	694	745
	Insulation material		polyethylene foam				
Condenser	Type		brased plate heat exchanger				
	Qty		2				
	Nominal water flow	l/min	314	362	410	442	474
	Min water flow	l/min	157	181	205	221	237
	Max water flow		629	724	819	883	948
Refrigerant circuit	Refrigerant type		R-407C				
	Refrigerant charge		9.2	9.2	9.2	10.2	11.2
	No of circuits		4				
	Refrigerant control		Thermostatic expansion valve				

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Units			EWWP090 KAW1M	EWWP100 KAW1M	EWWP110 KAW1M	EWWP120 KAW1M	EWWP130 KAW1M
Compressor	Type		hermetically sealed scroll				
	Qty x model		4 x	2 x	4 x	2 x	4 x
			JT212DA-YE	JT212DA-YE	JT300DA-YE	JT300DA-YE	JT335DA-YE
				+ 2 x		+ 2 x	
				JT300DA-YE		JT335DA-YE	
	Speed	rpm	2900				
	Refrigerant oil		FVC68D				
	Refrigerant oil charge	l	4x2.7				
	Crankcase heater	W	---				
Piping connections	Evaporator water in/out	mm	2 x 2 x FBSP 38				
	Condenser water in/out	mm	2 x 2 x FBSP 38				
	Evaporator drain/purge		field installation				
	Condenser drain/purge		field installation				
Electrical specifications							
Power supply			W1				
Nominal distribution voltage	Phase		3N~				
	Frequency	Hz	50				
	Voltage	V	400				
	Voltage tolerance	%	±10%				
Unit	Max starting current	A	121	155	163	185	189
	Nominal running current	A	41.6	47	52.4	56.2	60
	Maximum running current	A	56	64	72	76	80
	Recommended fuses according to IEC standard 269-2		3 x 63	3 x 63	3 x 80	3 x 80	3 x 80
Compressor	Phase		3~				
	Voltage	V	400				
	Starting current	A	79	79/109	109	109/129	129
	Nominal running current	A	10.4	10.4/13.1	13.1	13.1/15	15
	Maximum running current	A	14	14/18	18	18/20	20
	Starting method		direct on line				

Notes See ”Notes” on page 1-11.

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Units			EWWP145 KAW1M	EWWP155 KAW1M	EWWP165 KAW1M	EWWP175 KAW1M	EWWP185 KAW1M	EWWP195 KAW1M
Capacity/Power input								
Nominal capacity		kW	142	155	168	177	186	195
Capacity steps			6					
Nominal power input		kW	39.1	42.8	46.5	48.6	50.7	52.8
Technical specifications								
Dimensions	Height	mm	1800					
	Width	mm	600					
	Depth	mm	1200					
Machine weight		kg	920	940	960	974	988	1002
Material			polyester painted steel plate					
Colour			ivory white / Munsell code 5Y7.5/1					
Sound power		dBA	73			76	78	79
Evaporator	Type		brased plate heat exchanger					
	Qty		2					
	Minimum water volume	l	205	205	268	268	268	311
	Nominal water flow	l/min	407	444	482	507	533	559
	Min water flow	l/min	346	377	410	431	453	475
	Max water flow	l/min	814	889	963	1015	1066	1118
	Insulation material		polyethylene foam					
Condenser	Type		brased plate heat exchanger					
	Qty		2					
	Nominal water flow	l/min	519	567	614	647	679	711
	Min water flow	l/min	260	283	307	323	339	355
	Max water flow		1038	1133	1229	1293	1357	1422
Refrigerant circuit	Refrigerant type		R-407C					
	Refrigerant charge		13.8	13.8	13.8	14.8	15.8	16.8
	No of circuits		6					
	Refrigerant control		Thermostatic expansion valve					

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Units			EWWP145 KAW1M	EWWP155 KAW1M	EWWP165 KAW1M	EWWP175 KAW1M	EWWP185 KAW1M	EWWP195 KAW1M
Compressor	Type		hermetically sealed scroll					
	Qty x model		4 x	4 x	6 x	4 x	4 x	6 x
			JT212DA-YE	JT300DA-YE	JT300DA-YE	JT300DA-YE	JT335DA-YE	JT335DA-YE
			+ 2 x	+ 2 x		+ 2 x	+ 2 x	
			JT300DA-YE	JT212DA-YE		JT335DA-YE	JT300DA-YE	
	Speed	rpm	2900					
	Refrigerant oil		FVC68D					
	Refrigerant oil charge	l	6x2.7					
	Crankcase heater	W	---					
Piping connections	Evaporator water in/out	mm	3 x 2 x FBSP 38					
	Condenser water in/out	mm	3 x 2 x FBSP 38					
	Evaporator drain/purge		field installation					
	Condenser drain/purge		field installation					
Electrical specifications								
Power supply			W1					
Nominal distribution voltage	Phase		3N~					
	Frequency	Hz	50					
	Voltage	V	400					
	Voltage tolerance	%	±10%					
Unit	Max starting current	A	183	191	199	221	225	229
	Nominal running current	A	67.8	73.2	78.6	82.4	86.2	90
	Maximum running current	A	92	100	108	112	116	120
	Recommended fuses according to IEC standard 269-2		3 x 100	3 x 100	3 x 125	3 x 125	3 x 125	3 x 125
Compressor	Phase		3~					
	Voltage	V	400					
	Starting current	A	79/109	79/109	109	109/129	109/129	129
	Nominal running current	A	10.4/13.1	10.4/13.1	13.1	13.1/15	13.1/15	15
	Maximum running current	A	14/18	14/18	18	18/20	18/20	20
	Starting method		direct on line					

Notes

- **Cooling capacity (CC)**
  CC= cooling capacity from table (kW)
  Capacity is for chilled water range Dt= 2~5°C
- **Power input (PI)**
  PI= power input from table (kW)
  Power input is total input (kW): compressor + control circuit + pumps
- **Waterflow rate (WFR)**
  WFR= (860 x CC)/(60 x Dt) in (l/min)= ((860 x CC)/(60 x Dt)) x (1/60000) in m^3/s
  CC= cooling capacity from table (kW)
  Dt= chilled water temperature rise within 2-5°C
  WFR should always be within the limits.
- No pumps are supplied with the unit, so the added power input for the pumps is calculated as (WFR (m^3/s) x Dp (Pa))/0.3 (as fixed by 6/C/003). This is for the cooled and cooling water Dp= pressure drop from pressure drop curves.
  A filter strainer must be added in the water-circuit of the evaporator and the condenser.
  A flow-switch must be provided at the evaporator side.
  Min. water volume system applicable at nominal conditions.
- Nominal cooling capacities are based on the following conditions:
  Evaporator: 12°C/7°C; condenser: 30°C/35°C
- The sound power level is an absolute value indicating the "power" which a sound source generates.
  The sound data is valid at nominal operation condition
  dBA= A-weighted sound power level (A-scale according to IEC)
  Reference acoustic pressure 0dB= 1pW
  Measured according to ISO9614.

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Units			EWLP012 KBW1N	EWLP020 KBW1N	EWLP026 KBW1N	EWLP030 KBW1N	EWLP040 KBW1N	EWLP055 KBW1N	EWLP065 KBW1N
Capacity/Power input									
Nominal capacity (1)		kW	12.1	20.0	26.8	31.2	40.0	53.7	62.4
Capacity steps			1				2		
Nominal power input (2) (**)		kW	4.2	6.6	8.5	10.1	13.4	17.8	20.3
Technical specifications									
Dimensions	Height	mm	600						
	Width	mm	600						
	Depth	mm	600				1200		
Machine weight		kg	108	141	147	151	252	265	274
Material			polyester painted steel plate						
Colour			ivory white / Munsell code 5Y7.5/1						
Sound power	ISO 9614	dBA	64			71	67		74
Evaporator	Type		brased plate heat exchanger						
	Qty		1						
	Minimum water volume	l	62	103	134	155	205	268	311
	Nominal water flow	l/min	35	57	77	89	115	154	179
	Min water flow	l/min	30	48	65	76	98	131	152
	Max water flow	l/min	69	115	153	179	229	307	358
	Insulation material		polyethylene foam						
Condenser	Type								
	Qty		none						
	Nominal water flow	l/min	---	---	---	---	---	---	---
	Min water flow	l/min	---	---	---	---	---	---	---
	Max water flow	l/min	---	---	---	---	---	---	---
Refrigerant circuit	Refrigerant type		R-407C						
	Refrigerant charge	kg	N2 holding charge						
	No of circuits		1				2		
	Refrigerant control		Thermostatic expansion valve						

Units			EWLP012 KBW1N	EWLP020 KBW1N	EWLP026 KBW1N	EWLP030 KBW1N	EWLP040 KBW1N	EWLP055 KBW1N	EWLP065 KBW1N
Compressor	Type		hermetically sealed scroll						
	Qty		1				2		
	Model		JT140BF-YE	JT212DA-YE	JT300DA-YE	JT335DA-YE	JT212DA-YE	JT300DA-YE	JT335DA-YE
	Speed	rpm	2900						
	Refrigerant oil		FVC68D						
	Refrigerant oil charge	l	1.5	2.7	2.7	2.7	2 x 2.7	2 x 2.7	2 x 2.7
	Crankcase heater	W	1 x 33W				2 x 33W		
Piping connections	Evaporator water in/out	mm	FBSP 25				FBSP 40		
	Evaporator drain/purge		field installation						
	Discharge connection	mm	12.7 flare	19.1 flare	19.1 flare	19.1 flare	2 x 19.1 flare	2 x 19.1 flare	2 x 19.1 flare
	Liquid connection	mm	9.52 flare	12.7 flare	12.7 flare	12.7 flare	2 x 12.7 flare	2 x 12.7 flare	2 x 12.7 flare
Electrical specifications									
Power supply			W1						
Nominal distribution voltage	Phase		3N~						
	Frequency	Hz	50						
	Voltage	V	400						
	Voltage tolerance	%	±10%						
Unit	Starting current	A	49	79	109	129	93	127	149
	Nominal running current	A	7.4	11.5	14.3	16.6	23.0	28.7	33.3
	Maximum running current	A	9	14.5	18.5	22	28	36	40
	Recommended fuses according to IEC standard 269-2	aM	3 x 16	3 x 20	3 x 25	3 x 25	3 x 35	3 x 40	3 x 50
	Z_{max}		0.27 + j0.17	0.22 + j0.13	0.19 + j0.12	0.19 + j0.12	0.20 + j0.12	0.18 + j0.12	0.18 + j0.11

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Units			EWLP012 KBW1N	EWLP020 KBW1N	EWLP026 KBW1N	EWLP030 KBW1N	EWLP040 KBW1N	EWLP055 KBW1N	EWLP065 KBW1N
Compressor	Phase		3~						
	Frequency	Hz	50						
	Voltage	V	400						
	Starting current	A	49	79	109	129	79	109	129
	Nominal running current	A	7.4	11.5	14.3	16.6	11.5	14.3	16.6
	Maximum running current	A	9	14.5	18.5	22	14	18	20
	Starting method		direct on line						

(1): Nominal cooling capacity at Eurovent conditions:
See Eurovent 6/C/003
Entering / leaving water evaporator= 12°C/7°C - Condensing temperature bubble= 45°C(*) - Liquid temperature= 40°C

(2): Nominal cooling power input at Eurovent conditions:
See Eurovent 6/C/003
Entering / leaving water evaporator= 12°C/7°C - Condensing temperature bubble= 45°C(*) - Liquid temperature= 40°C

(*): This temperature corresponds to compressor discharge pressure.

(**): Includes beside the power input of the unit also an addition for the required evaporator pump power input.

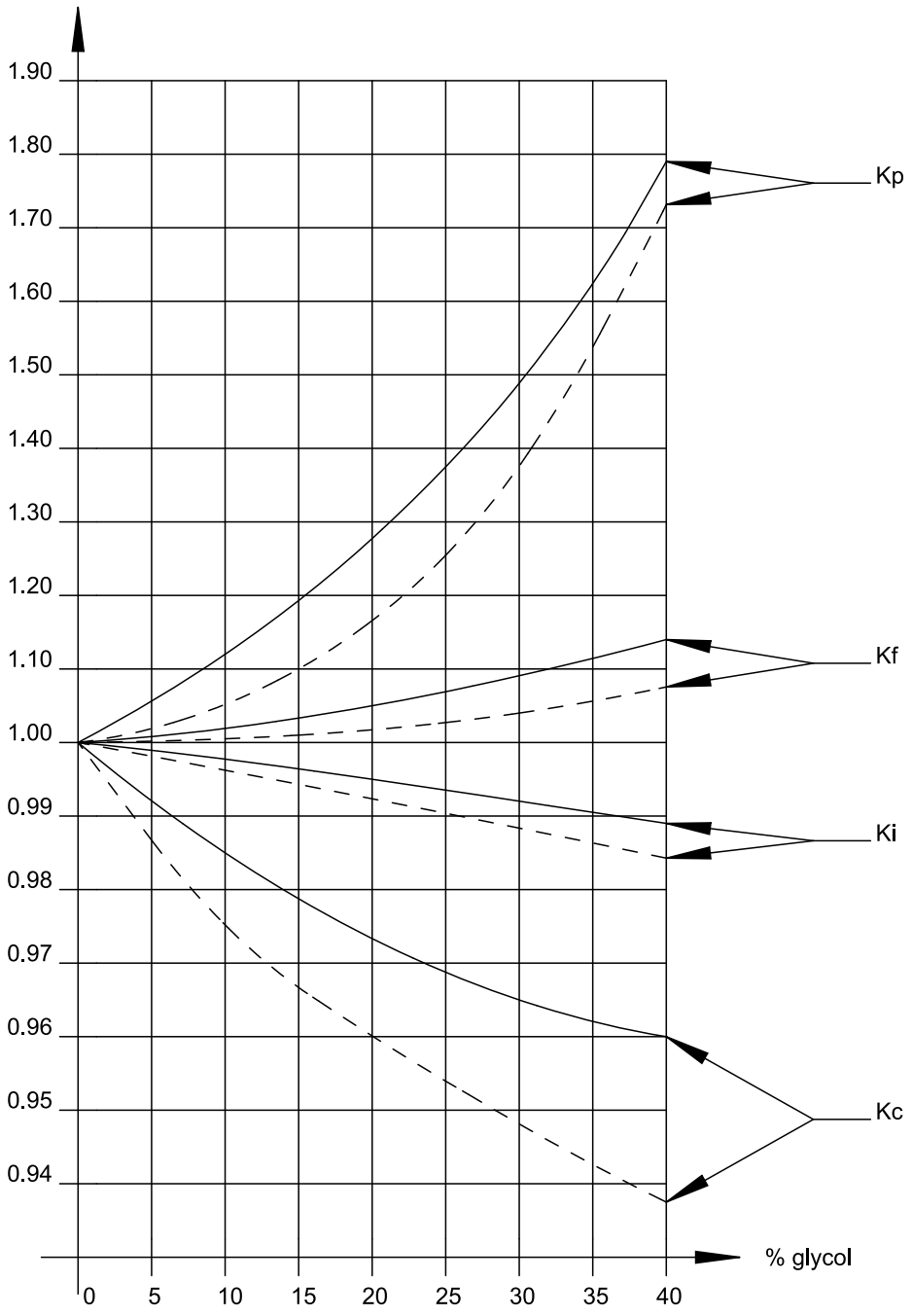
Notes

- **Cooling capacity (CC)**
  CC= cooling capacity from table (kW)
  Capacity is for chilled water range Dt= 3~8°C
- **Power input (PI)**
  PI= power input from table (kW)
  Power input is total input (kW): compressor + control circuit + pump evaporator
- **Waterflow rate (WFR)**
  WFR= (860 x CC)/(60 x Dt) in (l/min)= ((860 x CC)/(60 x Dt)) x (1/60000) in m^3/s
  CC= cooling capacity from table (kW)
  Dt= chilled water temperature rise within 3-8°C
  WFR should always be within the limits.
- No pumps are supplied with the unit, so the added power input for the pumps is calculated as (WFR (m^3/s) x Dp (Pa))/0.3 (as fixed by 6/C/003).
  Dp= pressure drop from pressure drop curves.
  A filter strainer must be added in the water-circuit of the evaporator.
  A flow-switch must be provided at the evaporator side.
  Min. water volume system applicable at nominal conditions.
- The sound power level is an absolute value indicating the "power" which a sound source generates.
  The sound data is valid at nominal operation condition
  dBA= A-weighted sound power level (A-scale according to IEC)
  Reference acoustic pressure 0dB= 1pW
  Measured according to ISO9614.

1.3 Correction factors for glycol

Correction factors

The illustration below shows the correction factors for glycol for EWWP014-065KBW1N, EWWP090-195KAW1M and EWLP012-065KBW1N.



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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

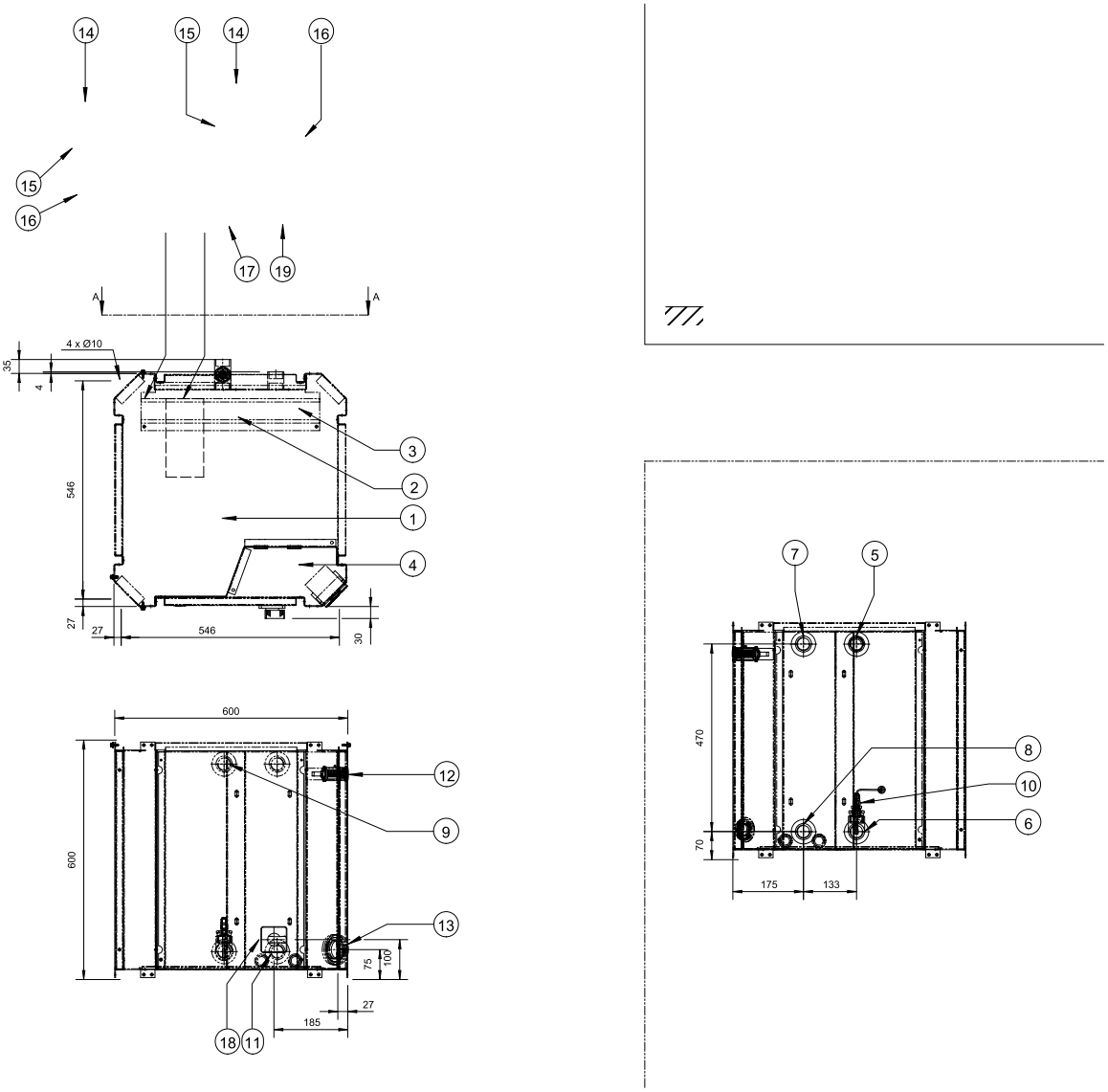
The table below contains glycol freezing points for different glycol concentrations.

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

1.4 Outlook Drawing: EWWP014-035KBW1N

EWWP014-035KBW1N

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.

1

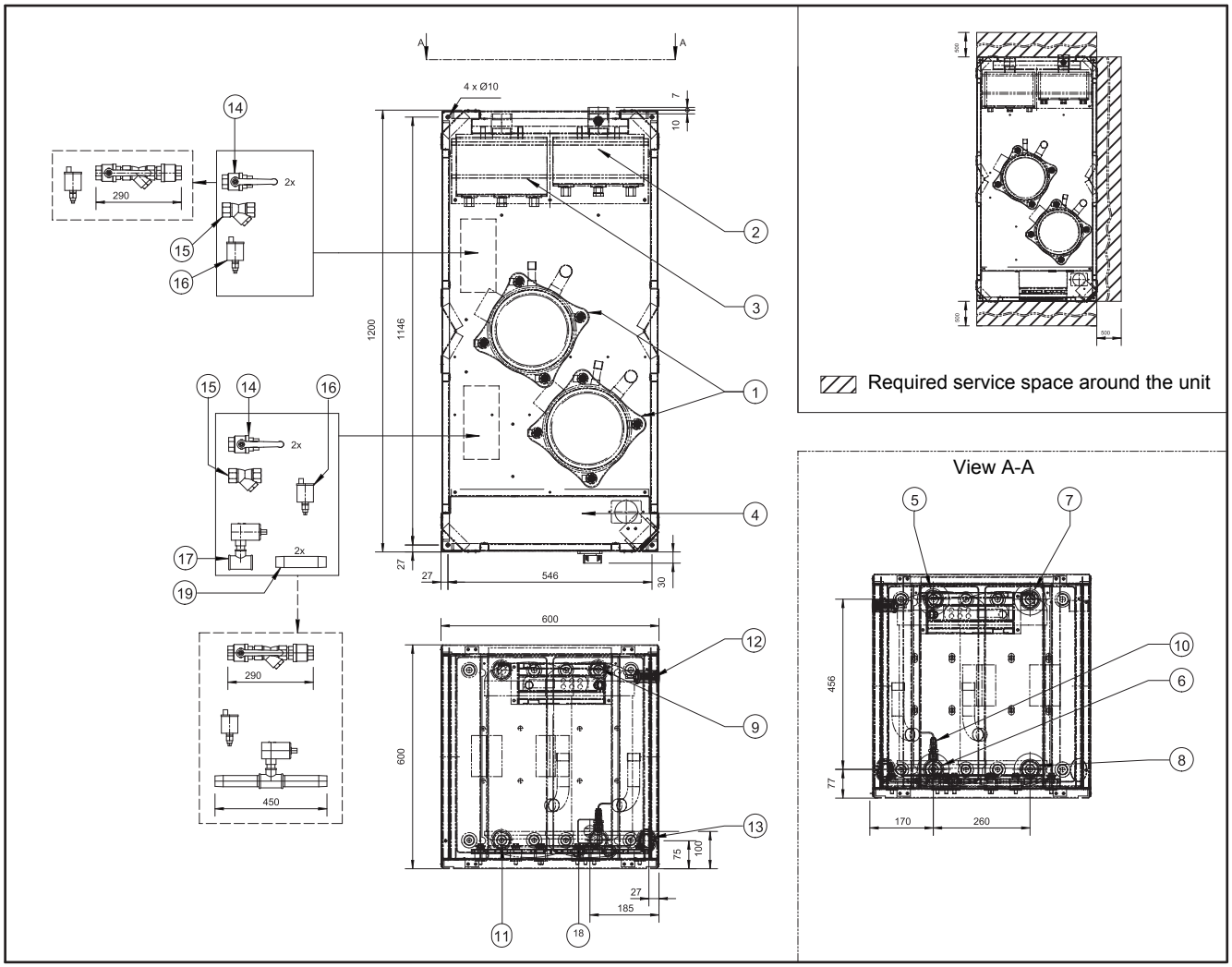
No.	Component
9	Evaporator entering water temperature sensor
10	Freeze-up sensor

No.	Component
19	Flow switch pipe

1.5 Outlook Drawing: EWWP045-065KBW1N

EWWP045-065KBW 1N

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	Compressor
2	Evaporator
3	Condenser
4	Switch box
5	Chilled water in
6	Chilled water out
7	Condenser water OUT
8	Condenser water IN
9	Evaporator entering water temperature sensor
10	Freeze-up sensor

No.	Component
11	Condenser entering water temperature sensor
12	Digital display controller
13	Power supply intake (Ø 48)
14	Ball valve
15	Water filter
16	Air purge
17	Flow switch
18	Main switch
19	Flow switch pipe

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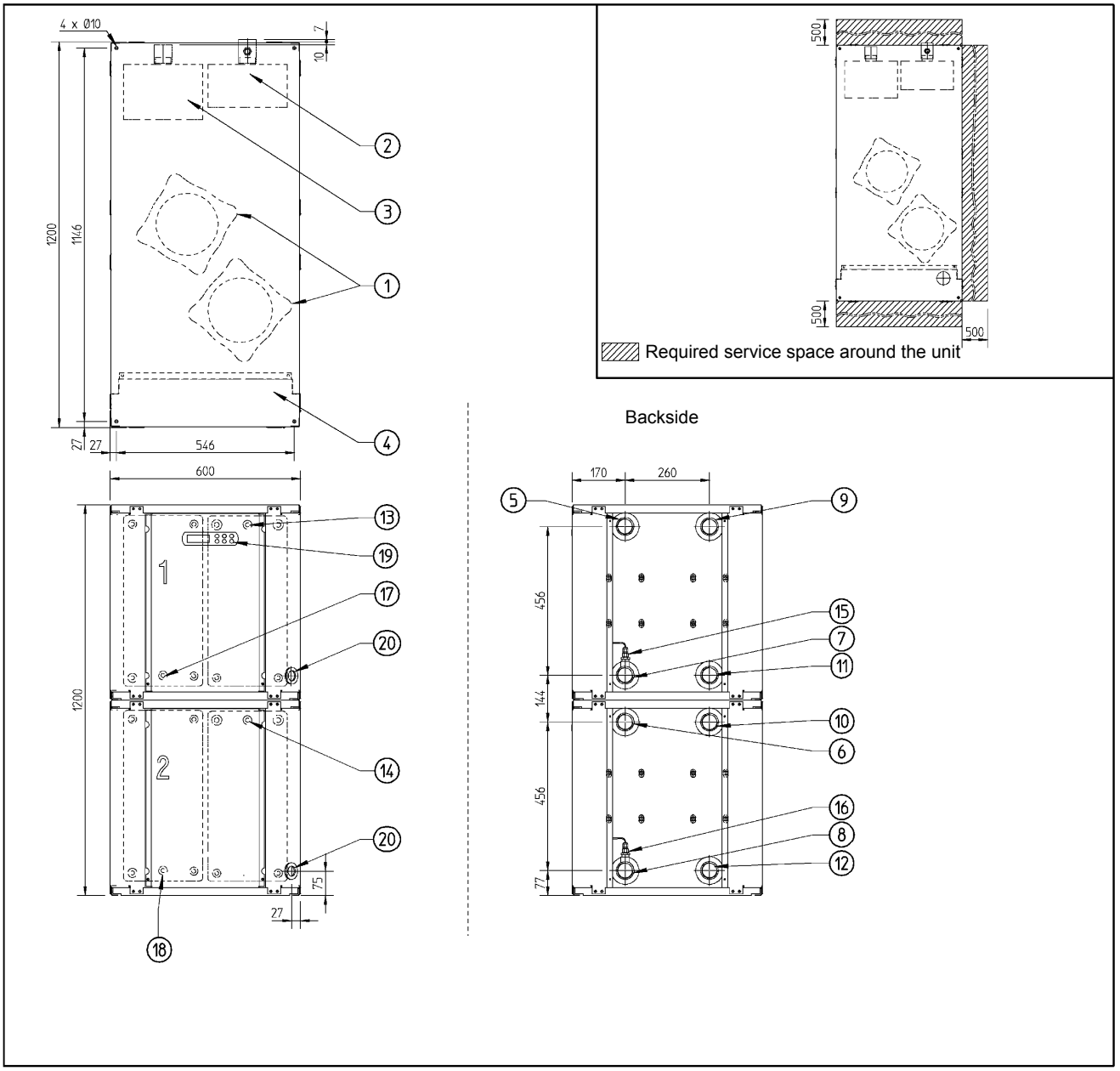
1.6 Outlook Drawing: EWWP090-130KAW1M

EWWP090-130KAW 1M

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	Compressor
2	Evaporator
3	Condenser
4	Switch box
5	Chilled water IN 1 (G 1”-1/2)

No.	Component
11	Condenser water IN 1 (G 1”-1/2)
12	Condenser water IN 2 (G 1”-1/2)
13	Evaporator entering water temperature sensor 1
14	Evaporator entering water temperature sensor 2
15	Freeze-up sensor 1

No.	Component
6	Chilled water IN 2 (G 1”-1/2)
7	Chilled water OUT 1 (G 1”-1/2)
8	Chilled water OUT 2 (G 1”-1/2)
9	Condenser water OUT 1 (G 1”-1/2)
10	Condenser water OUT 2 (G 1”-1/2)

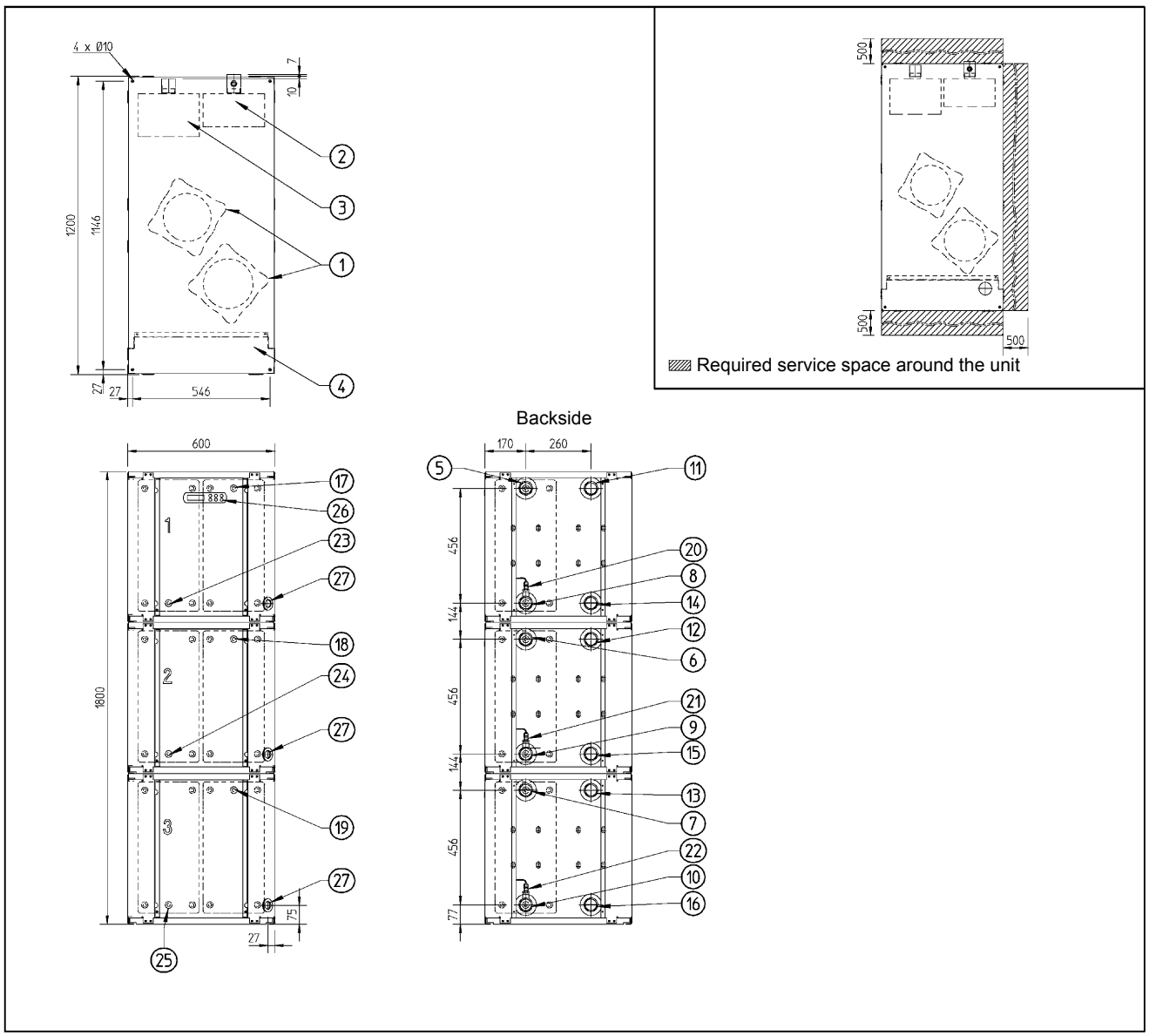
No.	Component
16	Freeze-up sensor 2
17	Condenser entering water temperature 1
18	Condenser entering water temperature 2
19	Digital display controller
20	Power supply intake (Ø 48)

1

1.7 Outlook Drawing: EWWP145-195KAW1M

EWWP145-195KAW 1M

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	Compressor
2	Evaporator
3	Condenser
4	Switch box

No.	Component
15	Condenser water IN 2 (G 1”-1/2)
16	Condenser water IN 3 (G 1”-1/2)
17	Evaporator entering water temperature sensor 1
18	Evaporator entering water temperature sensor 2

No.	Component
5	Chilled water IN 1 (G 1”-1/2)
6	Chilled water IN 2 (G 1”-1/2)
7	Chilled water IN 3 (G 1”-1/2)
8	Chilled water OUT 1 (G 1”-1/2)
9	Chilled water OUT 2 (G 1”-1/2)
10	Chilled water OUT 3 (G 1”-1/2)
11	Condenser water OUT 1 (G 1”-1/2)
12	Condenser water OUT 2 (G 1”-1/2)
13	Condenser water OUT 3 (G 1”-1/2)
14	Condenser water IN 1 (G 1”-1/2)

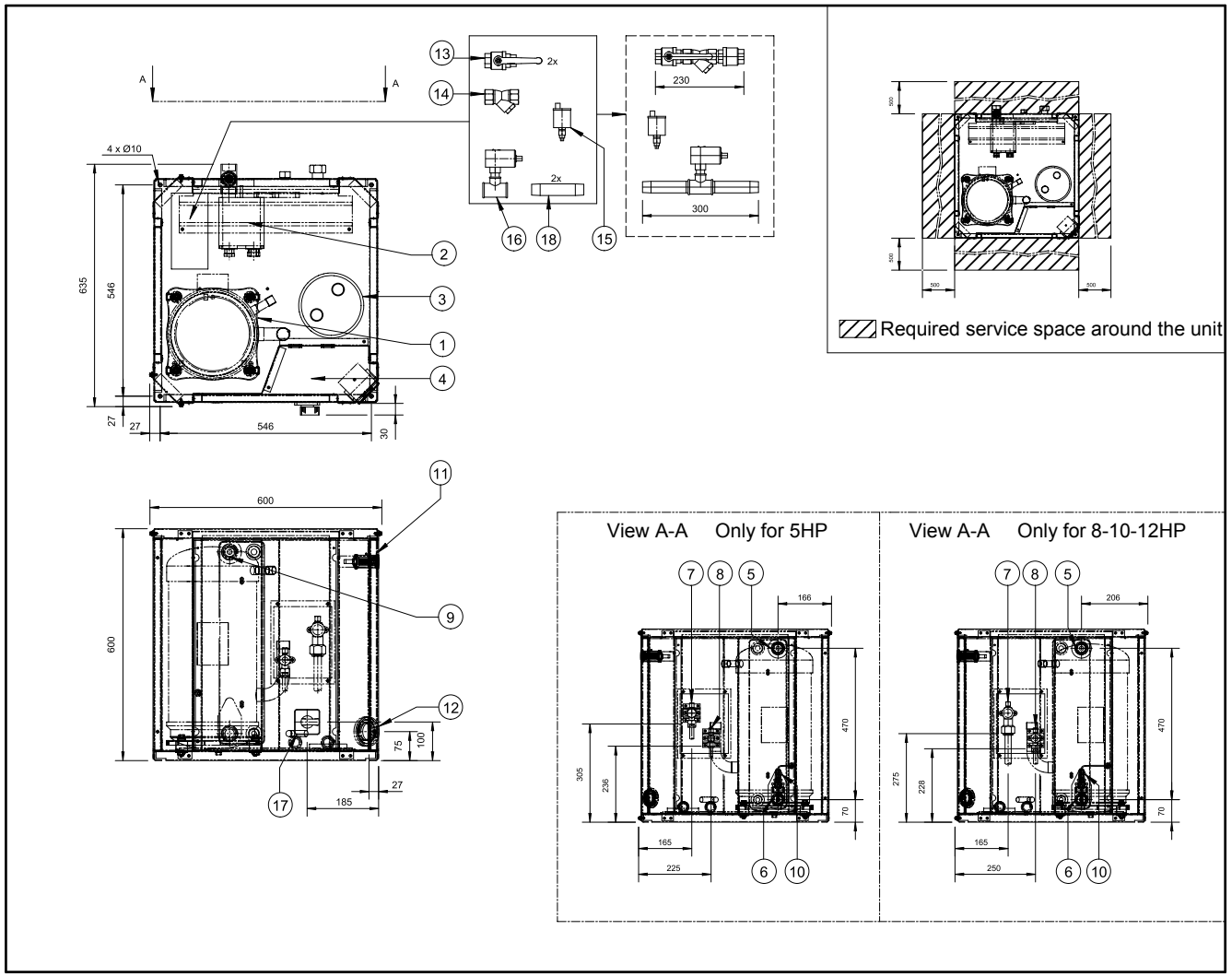
No.	Component
19	Evaporator entering water temperature sensor 3
20	Freeze-up sensor 1
21	Freeze-up sensor 2
22	Freeze-up sensor 3
23	Condenser entering water temperature 1
24	Condenser entering water temperature 2
25	Condenser entering water temperature 3
26	Digital display controller
27	Power supply intake (Ø 48)

1

1.8 Outlook Drawing: EWLP012-030KBW1N

EWLP012-030KBW 1N

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.

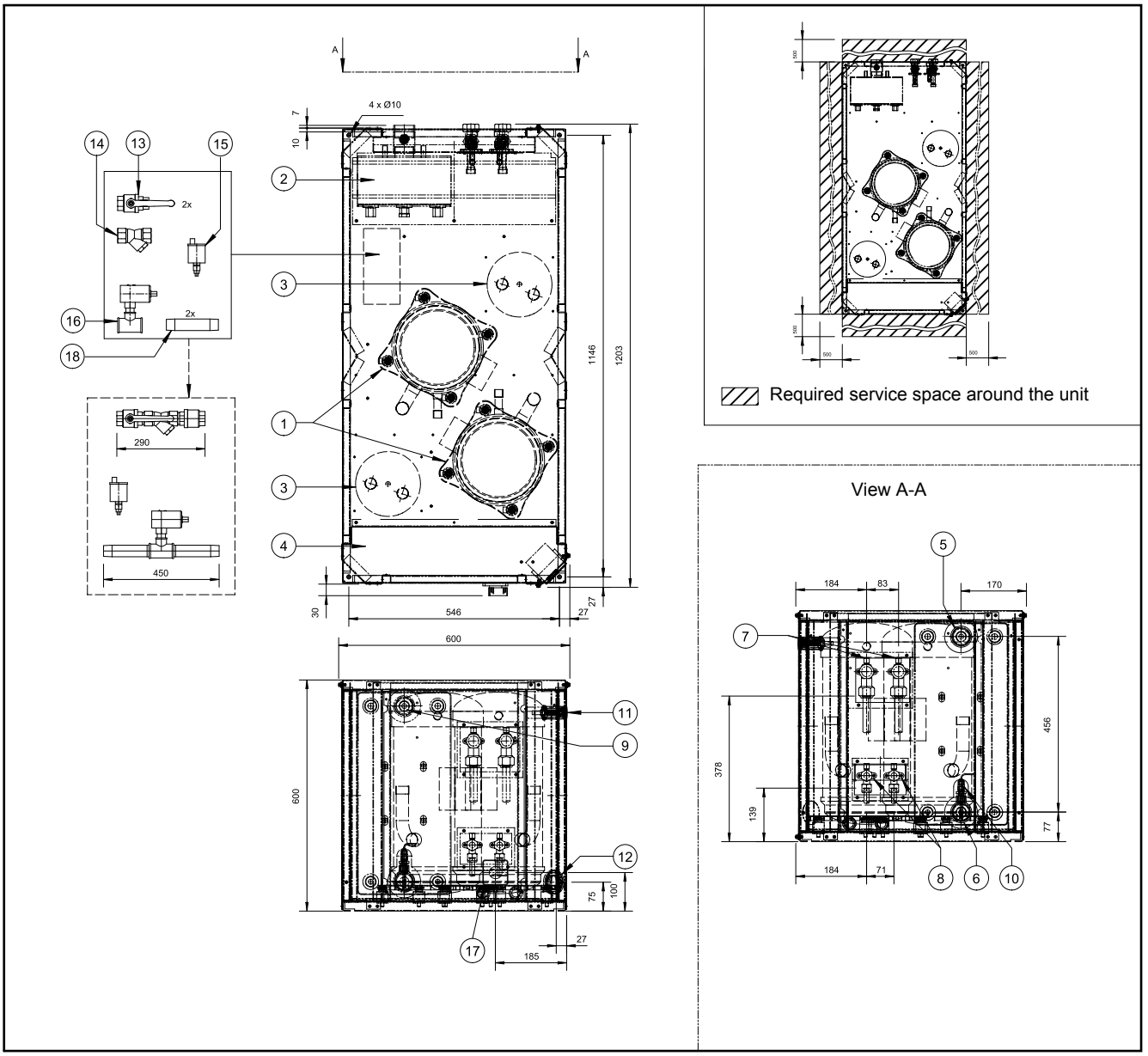
No.	Component
1	Compressor
2	Evaporator
3	Accumulator
4	Switch box
5	Chilled water IN
6	Chilled water OUT
7	Discharge stop valve
8	Liquid stop valve
9	Evaporator entering water temperature sensor

No.	Component
10	Freeze-up sensor
11	Digital display controller
12	Power supply intake (Ø 48)
13	Ball valve
14	Water filter
15	Air purge
16	Flow switch
17	Main switch
18	Flow switch pipe

1.9 Outlook Drawing: EWLP040-065KBW1N

EWLP040-065KBW 1N

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	Compressor
2	Evaporator
3	Accumulator
4	Switch box
5	Chilled water IN
6	Chilled water OUT
7	Discharge stop valve

No.	Component
10	Freeze-up sensor
11	Digital display controller
12	Power supply intake (Ø 48)
13	Ball valve
14	Water filter
15	Air purge
16	Flow switch

1

No.	Component
8	Liquid stop valve
9	Evaporator entering water temperature sensor

No.	Component
17	Main switch
18	Flow switch pipe

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 common practice and is, therefore, not described.

Overview

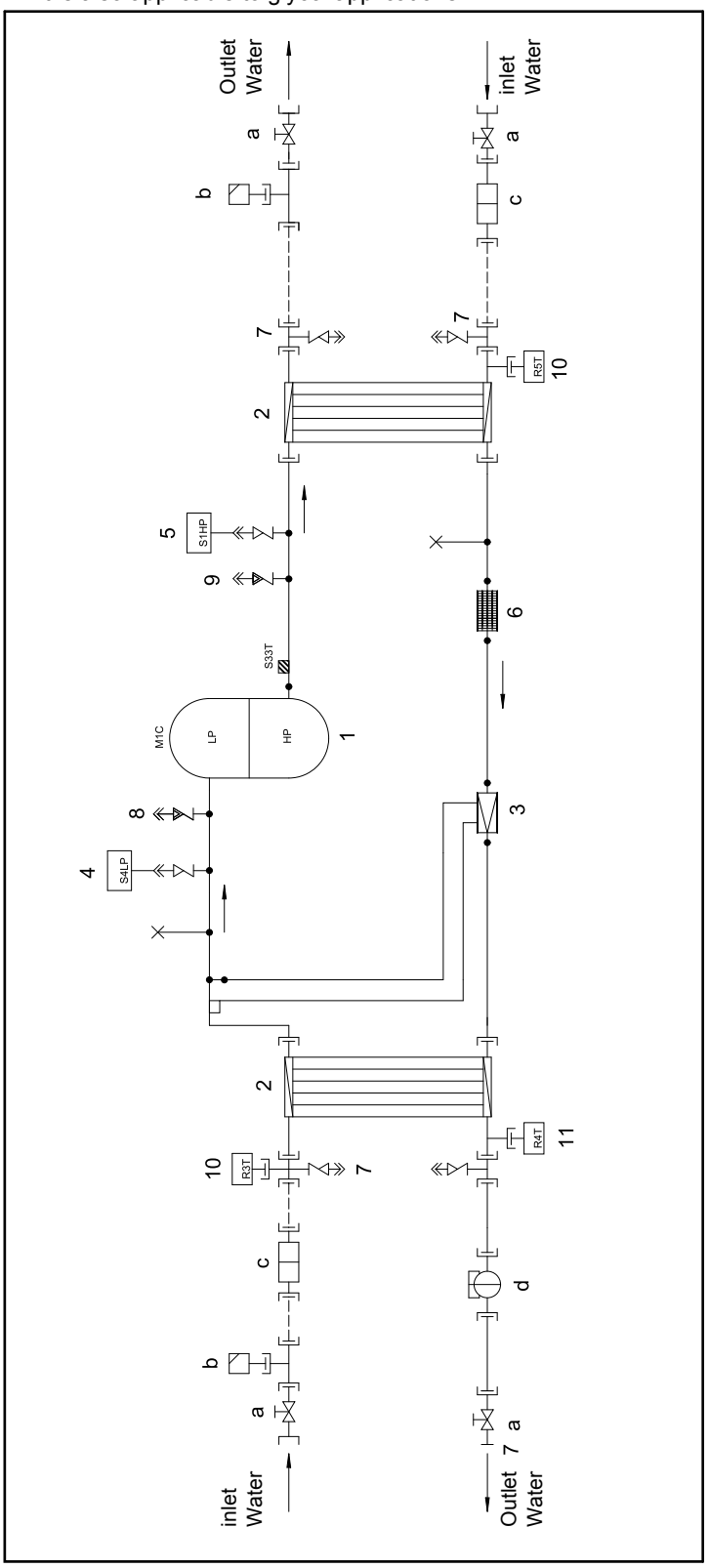
This chapter contains the following topics:

1

2.2 Functional Diagram Refrigeration and Water Circuit: EWWP014-035KBW1N

Functional diagram

The illustration below shows the functional diagram of the refrigeration and water circuit of EWWP014-035KBW1N. It is also applicable to glycol applications.



Symbols

The table below describes the symbols.

Symbol	Description
M1C	Compressor motor 1
S1HP	High-pressure switch
R3T	Outlet water evaporator temperature sensor
R4T	Freeze-up protection
R5T	Inlet water condenser temperature sensor
S33T	Discharge temperature controller
S4LP	Low-pressure switch

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

Components water side

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

No.	Component	Function / remark
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	Strainer	This strainer prevents dirt particles from entering the water circuit, the evaporator and the condenser.
d	Flow switch	The flow switch is used to check if there is flow.

1

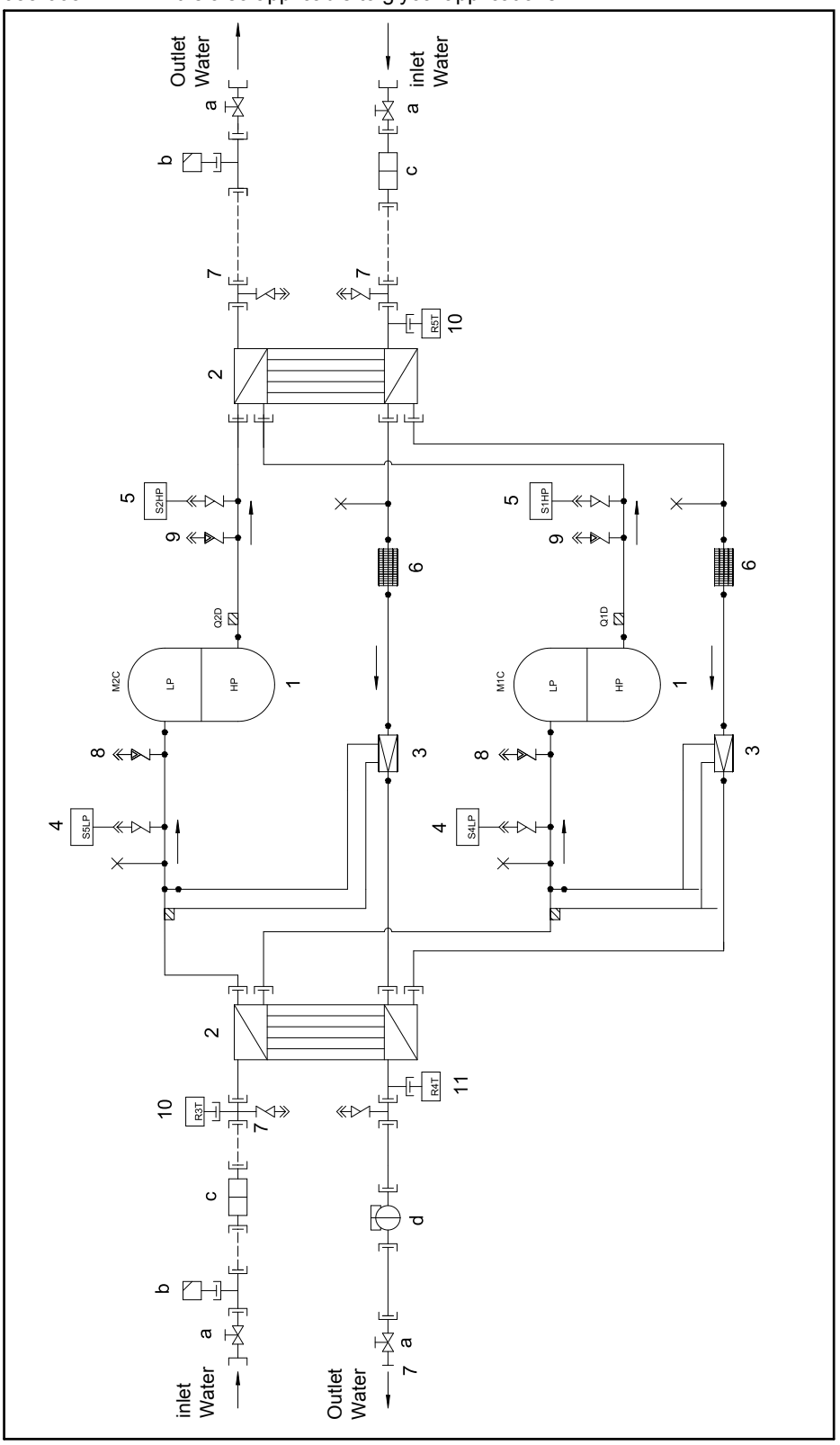
Components refrigeration side

The table below describes the components.

No.	Component	Function / remark
1	Compressor	A hermetically sealed scroll compressor.
2	Water-heat exchanger (evaporator, condenser)	The water-heat exchanger is of the brazed plate-heat exchanger type.
3	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
4	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 1.2 bar ± 0.2 ■ Standard setting: ON = 2 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3 For EWWP014-065KBW1N units with serial > 42xxxxx ■ Standard setting: OFF = 3.0 bar ± 0.3 ■ Standard setting: ON = 3.9 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3
5	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 30.9 bar +0/-1 ■ Standard setting: ON = 21.6 bar ± 0.1
6	Strainer	This strainer prevents dirt particles from entering the expansion valve.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
8	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
9	High-pressure service port	The high-pressure service port is used to connect a high-pressure gauge.
10	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
11	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.

2.3 Functional Diagram Refrigeration and Water Circuit: EWWP035-065KBW1N

Functional diagram The illustration below shows the functional diagram of the refrigeration and water circuit of EWWP035-065KBW1N. It is also applicable to glycol applications.

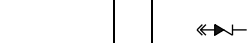
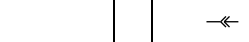
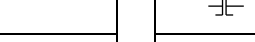
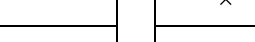
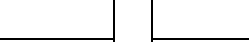
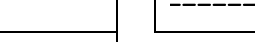


1

Symbols

The table below describes the symbols.

Symbol	Description
M1-2C	Compressor motor
S1HP	High-pressure switch
S2HP	High-pressure switch
S4LP	Low-pressure switch
S5LP	Low-pressure switch
R3T	Inlet water evaporator temperature sensor
R4T	Freeze-up protection
R5T	Inlet water condenser temperature sensor
Q1D	Discharge temperature controller
Q2D	Discharge temperature controller

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

Components water side

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

No.	Component	Function / remark
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	Strainer	This strainer prevents dirt particles from entering the water circuit, the evaporator and the condenser.
d	Flow switch	The flow switch is used to check if there is flow.

Components refrigeration side

The table below describes the components.

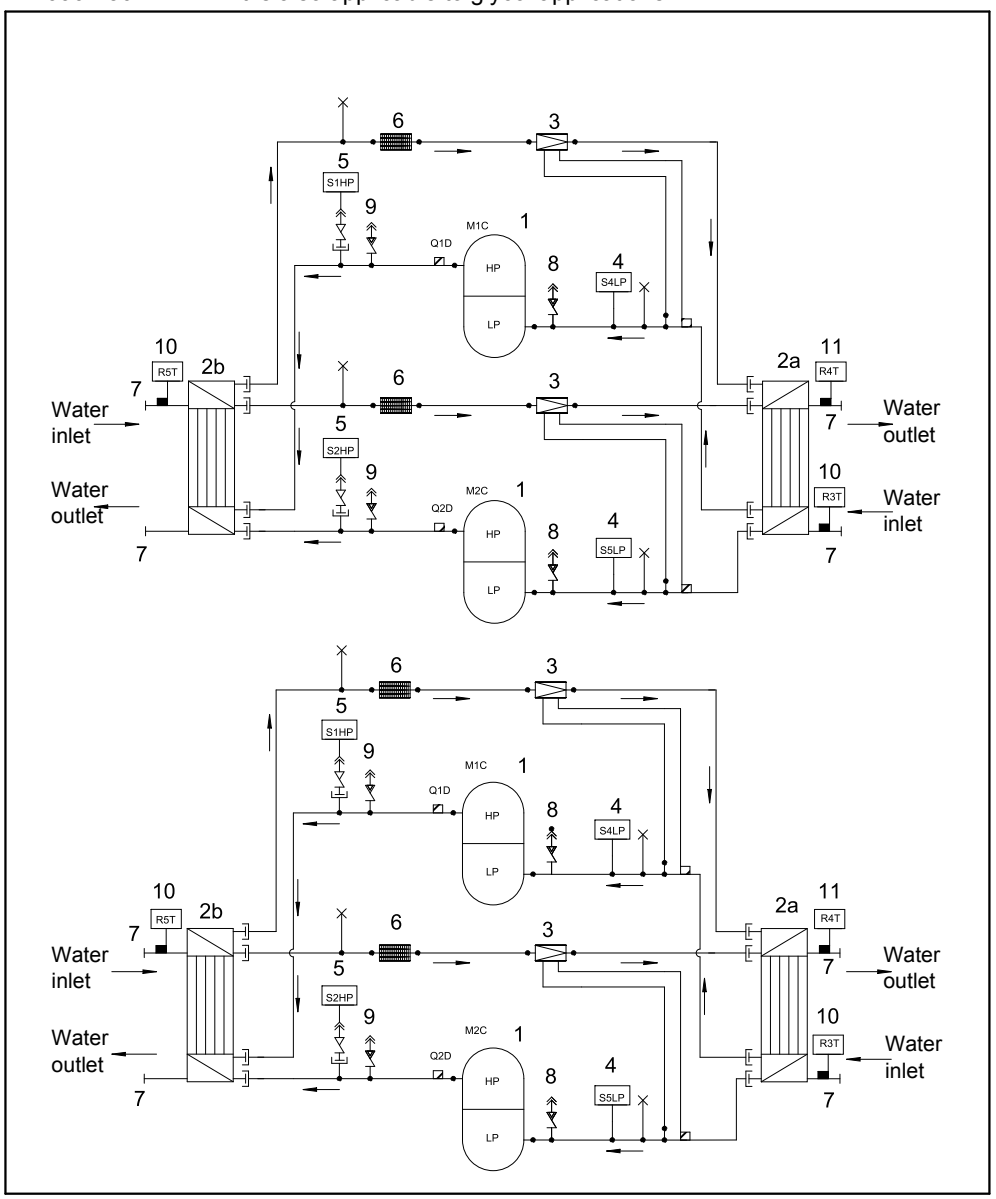
No.	Component	Function / remark
1	Compressor	A hermetically sealed scroll compressor.
2	Water-heat exchanger (evaporator, condenser)	The water-heat exchanger is of the brazed plate-heat exchanger type.
3	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
4	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 1.2 bar ± 0.2 ■ Standard setting: ON = 2 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3 For EWWP014-065KBW1N units with serial > 42xxxxx ■ Standard setting: OFF = 3.0 bar ± 0.3 ■ Standard setting: ON = 3.9 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3
5	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 30.9 bar +0/-1 ■ Standard setting: ON = 21.6 bar ± 0.1
6	Strainer	This strainer prevents dirt particles from entering the expansion valve.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
8	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
9	High-pressure service port	The high-pressure service port is used to connect a high-pressure gauge.
10	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
11	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.

1

2.4 Functional Diagram Refrigeration and Water Circuit: EWWP090-130KAW1M

Functional diagram

The illustration below shows the functional diagram of the refrigeration and water circuit of EWWP090-130KAW1M. It is also applicable to glycol applications.



Symbols

The table below describes the symbols.

Symbol	Description
M1-2C	Compressor motor
S1HP	High-pressure switch
S2HP	High-pressure switch
S4LP	Low-pressure switch
S5LP	Low-pressure switch
R3T	Inlet water evaporator temperature sensor
R4T	Freeze-up protection
R5T	Inlet water condenser temperature sensor

Symbol	Description
Q1D	Discharge temperature controller
Q2D	Discharge temperature controller
	Check valve
	Flare connection
	Screw connection
	Flange connection
	Pinched pipe
	Spinned pipe

1

Components

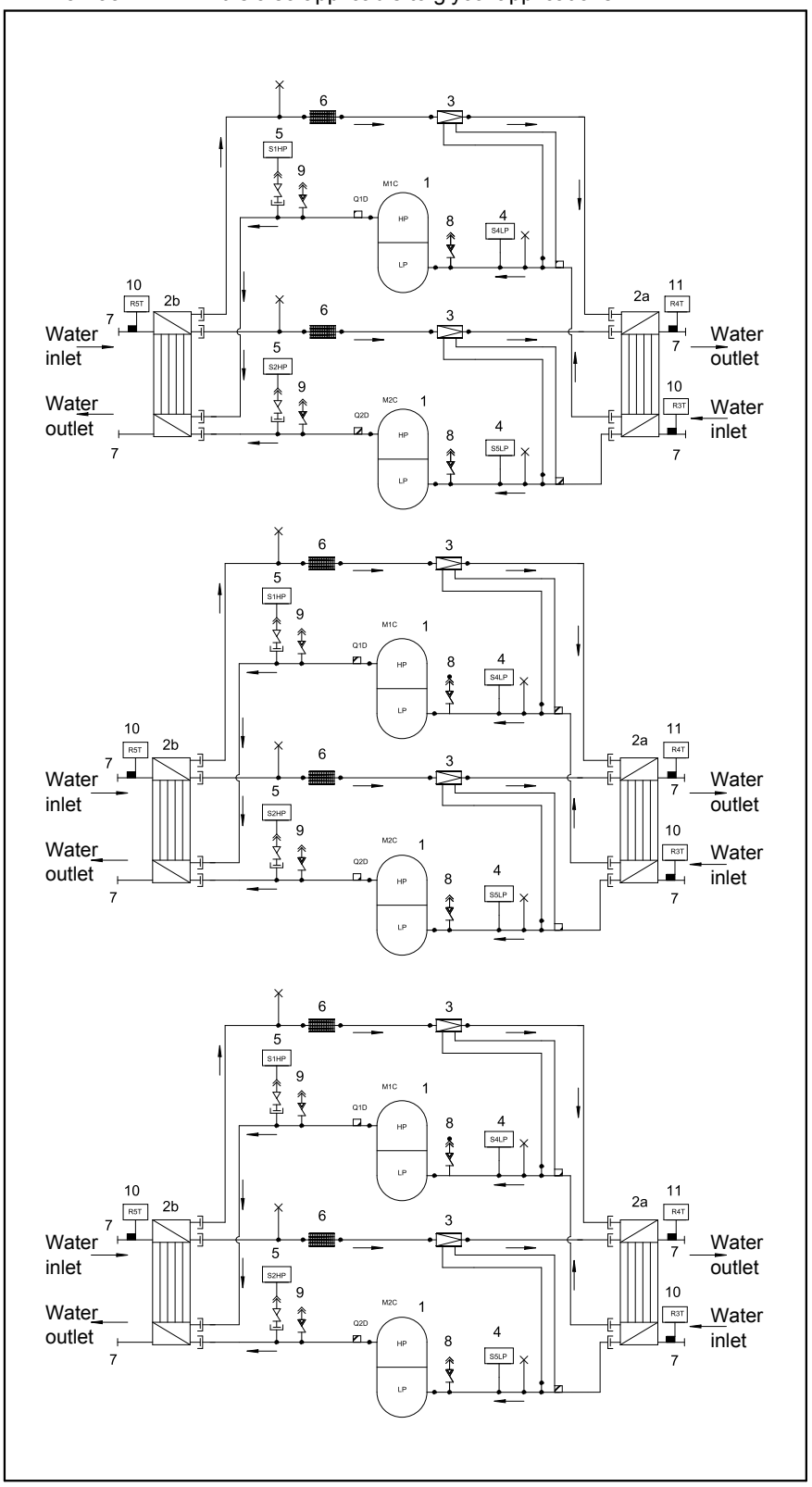
The table below describes the components.

No.	Component	Function / remark
1	Compressor	A hermetically sealed scroll compressor.
2a	Water-heat exchanger (evaporator)	The water-heat exchanger is of the brazed plate-heat exchanger type.
2b	Water-heat exchanger (condenser)	The water-heat exchanger is of the brazed plate-heat exchanger type.
3	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
4	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 1.2 bar ± 0.2 ■ Standard setting: ON = 2 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3 For EWWP090-195KAW1M units with serial > 42xxxxx ■ Standard setting: OFF = 3.0 bar ± 0.3 ■ Standard setting: ON = 3.9 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3
5	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 30.9 bar +0/-1 ■ Standard setting: ON = 21.6 bar ± 0.1
6	Strainer	This strainer prevents dirt particles from entering the expansion valve.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
8	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
9	High-pressure service port	The high-pressure service port is used to connect a high-pressure gauge.
10	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
11	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.

2.5 Functional Diagram Refrigeration and Water Circuit: EWWP145-195KAW1M

1

Functional diagram The illustration below shows the functional diagram of the refrigeration and water circuit of EWWP145-195KAW1M. It is also applicable to glycol applications.



1

Symbols

The table below describes the symbols.

Symbol	Description
M1-2C	Compressor motor
S1HP	High-pressure switch
S2HP	High-pressure switch
S4LP	Low-pressure switch
S5LP	Low-pressure switch
R3T	Inlet water evaporator temperature sensor
R4T	Freeze-up protection
R5T	Inlet water condenser temperature sensor

Symbol	Description
Q1D	Discharge temperature controller
Q2D	Discharge temperature controller
	Check valve
	Flare connection
	Screw connection
	Flange connection
	Pinched pipe
	Spinned pipe

Components

The table below describes the components.

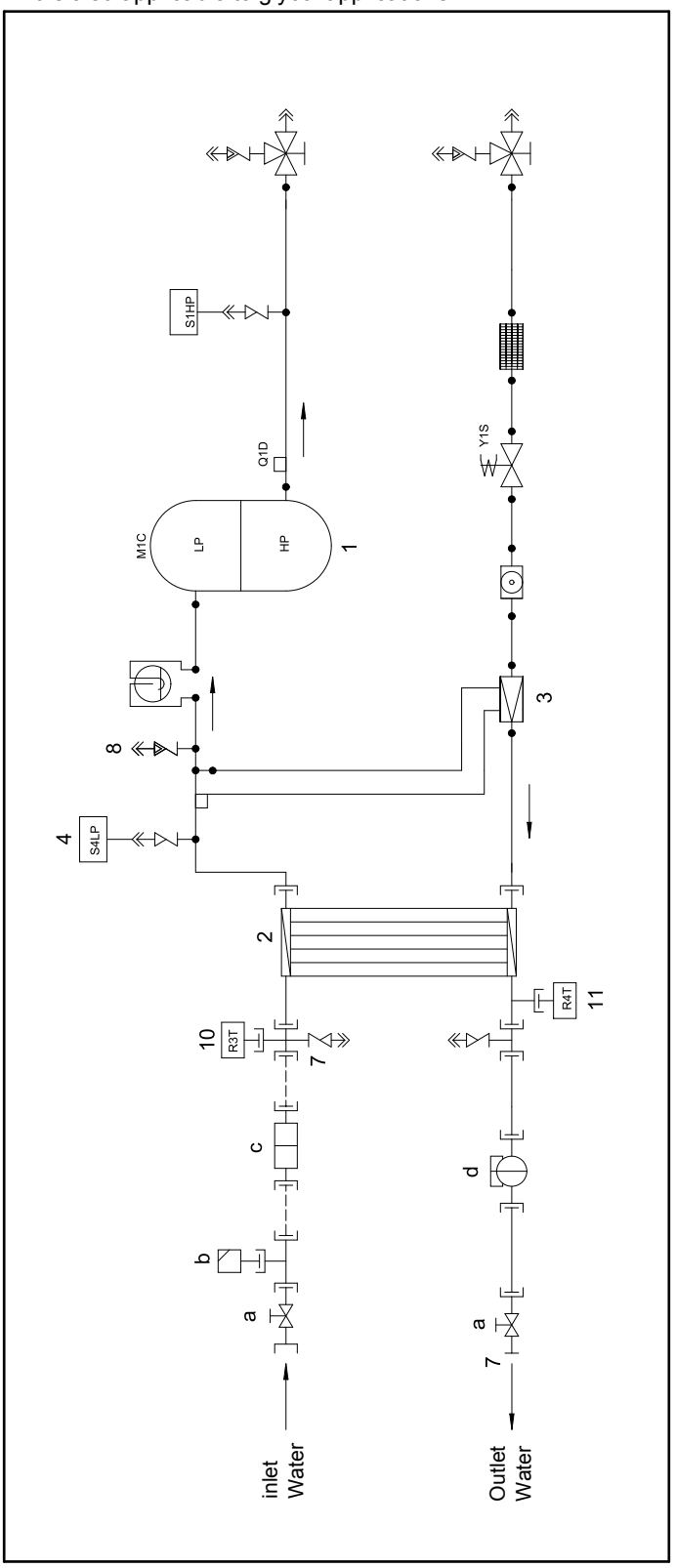
No.	Component	Function / remark
1	Compressor	A hermetically sealed scroll compressor.
2a	Water-heat exchanger (evaporator)	The water-heat exchanger is of the brazed plate-heat exchanger type.
2b	Water-heat exchanger (condenser)	The water-heat exchanger is of the brazed plate-heat exchanger type.
3	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
4	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 1.2 bar ± 0.2 ■ Standard setting: ON = 2 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3 For EWWP090-195KAW1M units with serial > 42xxxxx ■ Standard setting: OFF = 3.0 bar ± 0.3 ■ Standard setting: ON = 3.9 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3
5	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 30.9 bar +0/-1 ■ Standard setting: ON = 21.6 bar ± 0.1
6	Strainer	This strainer prevents dirt particles from entering the expansion valve.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
8	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
9	High-pressure service port	The high-pressure service port is used to connect a high-pressure gauge.
10	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
11	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.

1

2.6 Functional Diagram Refrigeration and Water Circuit: EWLP012-030KBW1N

Functional diagram

The illustration below shows the functional diagram of the refrigeration and water circuit of EWLP012-030KBW1N. It is also applicable to glycol applications.



1

Symbols

The table below describes the symbols.

Symbol	Description
M1C	Compressor motor 1
S1HP	High-pressure switch
R3T	Inlet water evaporator temperature sensor
R4T	Freeze-up protection
Y1S	Liquid solenoid valve
Q1D	Discharge temperature controller
S4LP	Low-pressure switch

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

Components water side

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

No.	Component	Function / remark
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	Strainer	This strainer prevents dirt particles from entering the water circuit, the evaporator and the condenser.
d	Flow switch	The flow switch is used to check if there is flow.

1

Components refrigeration side

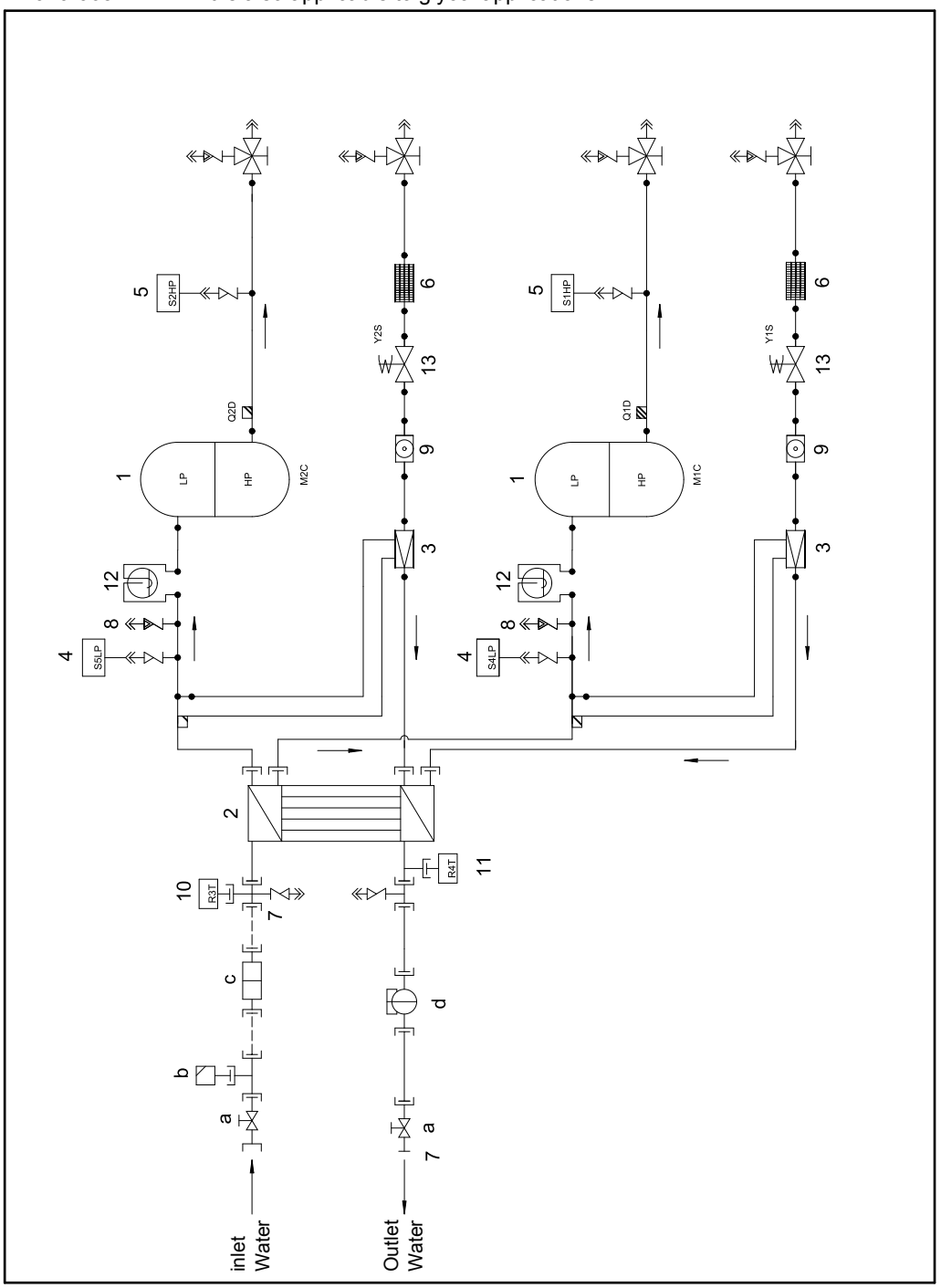
The table below describes the components.

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	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
4	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 1.2 bar ± 0.2 ■ Standard setting: ON = 2 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3 For EWLP012-065KBW1N units with serial > 42xxxxx ■ Standard setting: OFF = 3.0 bar ± 0.3 ■ Standard setting: ON = 3.5 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3
5	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 30.9 bar +0/-1 ■ Standard setting: ON = 21.6 bar ± 0.1
6	Strainer	This strainer prevents dirt particles from entering the expansion valve.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
8	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
9	Sight glass with moisture indicator	The sight glass with moisture indicator is used to check the refrigerant shortage and/or moisture level in the system.
10	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
11	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.
12	Accumulator	The accumulator is used to prevent the liquid refrigerant from entering the compressor.
13	Liquid solenoid valve	The liquid solenoid valve prevents that the evaporator fills up with liquid if the unit is switched off.

2.7 Functional Diagram Refrigeration and Water Circuit: EWLP040-065KBW1N

Functional diagram

The illustration below shows the functional diagram of the refrigeration and water circuit of EWLP040-065KBW1N. It is also applicable to glycol applications.

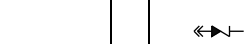


1

Symbols

The table below describes the symbols.

Symbol	Description
Y1S	Liquid solenoid valve
Y2S	Liquid solenoid valve
M1C	Compressor motor
M2C	Compressor motor
S1HP	High-pressure switch
S2HP	High-pressure switch
S4LP	Low-pressure switch
S5LP	Low-pressure switch
R3T	Inlet water evaporator temperature sensor
R4T	Freeze-up protection

Symbol	Description
R5T	Inlet water condenser temperature sensor
Q1D	Discharge temperature controller
Q2D	Discharge temperature controller
	Check valve
	Flare connection
	Screw connection
	Flange connection
	Pinched pipe
	Spinned pipe
	Field piping

Components water side

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

No.	Component	Function / remark
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	Strainer	This strainer prevents dirt particles from entering the water circuit, the evaporator and the condenser.
d	Flow switch	The flow switch is used to check if there is flow.

Components refrigeration side

The table below describes the components.

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	Expansion valve	The thermostatic expansion valve is set up to control the superheat between 5°C and 7°C.
4	Low-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 1.2 bar ± 0.2 ■ Standard setting: ON = 2 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3 For EWLP012-065KBW1N units with serial > 42xxxxx ■ Standard setting: OFF = 3.0 bar ± 0.3 ■ Standard setting: ON = 3.5 bar ± 0.3 ■ ZL/ZH setting: OFF = 0.5 bar ± 0.2 ■ ZL/ZH setting: ON = 1.5 bar ± 0.3
5	High-pressure switch	This switch acts as a circuit safety. ■ Standard setting: OFF = 30.9 bar +0/-1 ■ Standard setting: ON = 21.6 bar ± 0.1
6	Strainer	This strainer prevents dirt particles from entering the expansion valve.
7	Water in- and outlet connections	The water in- and outlet connections are made of galvanized steel pipe (British Standard Pipe - BSP). The pipes are not insulated. If copper field piping is used for the water circuit, then precaution should be taken to prevent electrolytic corrosion.
8	Low-pressure service port	The low-pressure service port is used to connect a low-pressure gauge.
9	Sight glass with moisture indicator	The sight glass with moisture indicator is used to check the refrigerant shortage and/or moisture level in the system.
10	Water temperature sensor	The water temperature sensors are used to control the thermostat function at the heat exchanger inlet.
11	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.
12	Accumulator	The accumulator is used to prevent the liquid refrigerant from entering the compressor.
13	Liquid solenoid valve	The liquid solenoid valve prevents that the evaporator from filling with liquid if the unit is switched off.

1

3 Wiring Layout

3.1 What Is in This Chapter?

Introduction

This chapter contains the following information:

- Main functions of the EWWP014-065KBW1N and EWLP012-065KBW1N
- Switch box layout
- Wiring diagram

Overview

This chapter contains the following topics:

1

3.2 Main Functions of the EWWP014-065KBW1N and EWLP012-065KBW1N

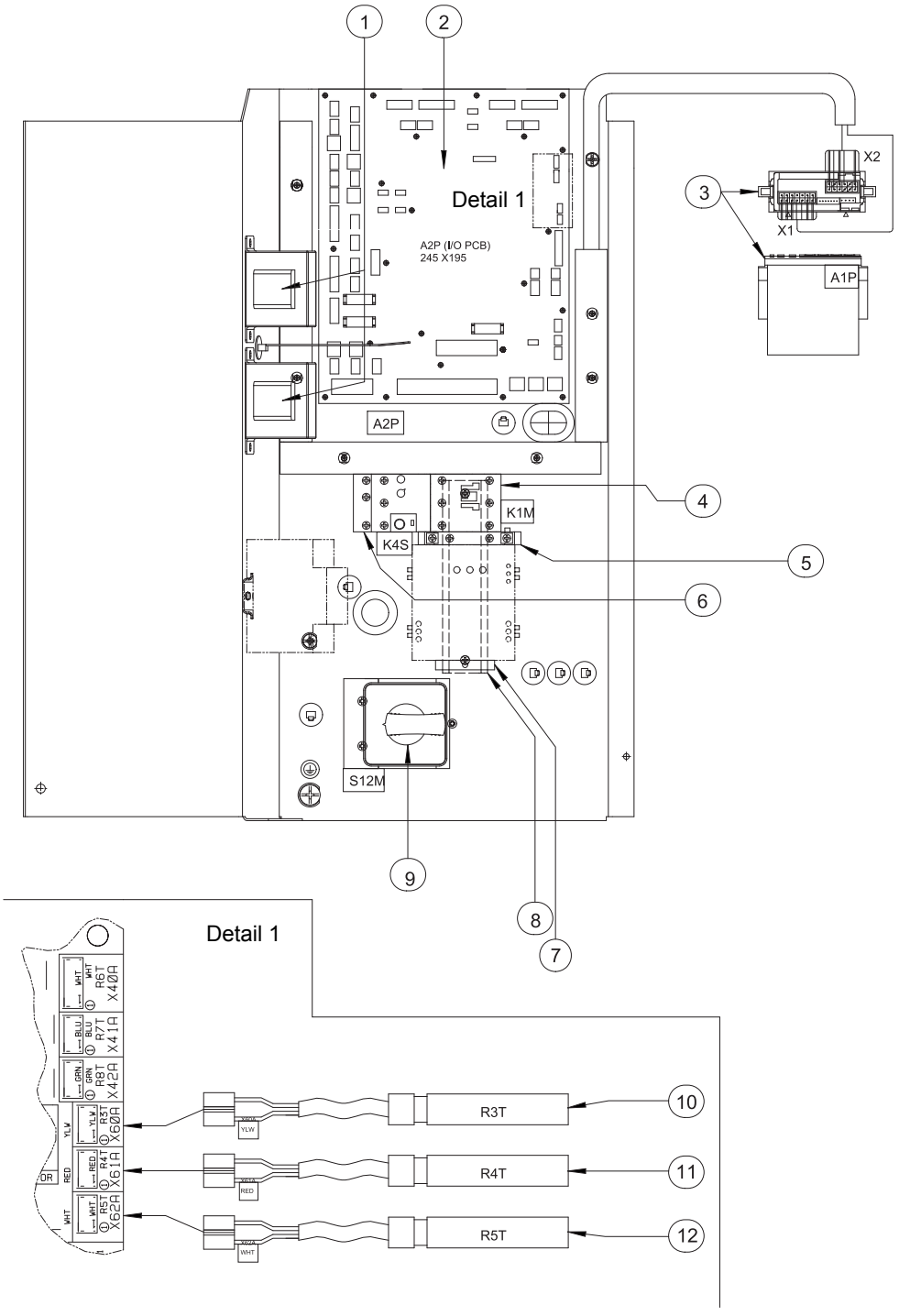
Main functions

The table below describes the components connected to the µC2SE.

Terminal	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 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: EWWP014-028KBW1N and EWLP012-028KBW1N

Switch box layout The illustration below shows the switch box layout of EWWP014-028KBW1N and EWLP012-028KBW1N.



DIPSWITCH SETTINGS								OVERCURRENT SETTING K4S	DESIGN REF. ONLY
S2A				S1A					
1	2	3	4	1	2	3	4		
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	9	EWWP014KBW1N EWLP012KBW1N
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	14	EWWP022-028KBW1N EWLP020-026KBW1N

DIPSWITCH AND OVERCURRENT SETTINGS MUST BE SEALED

1

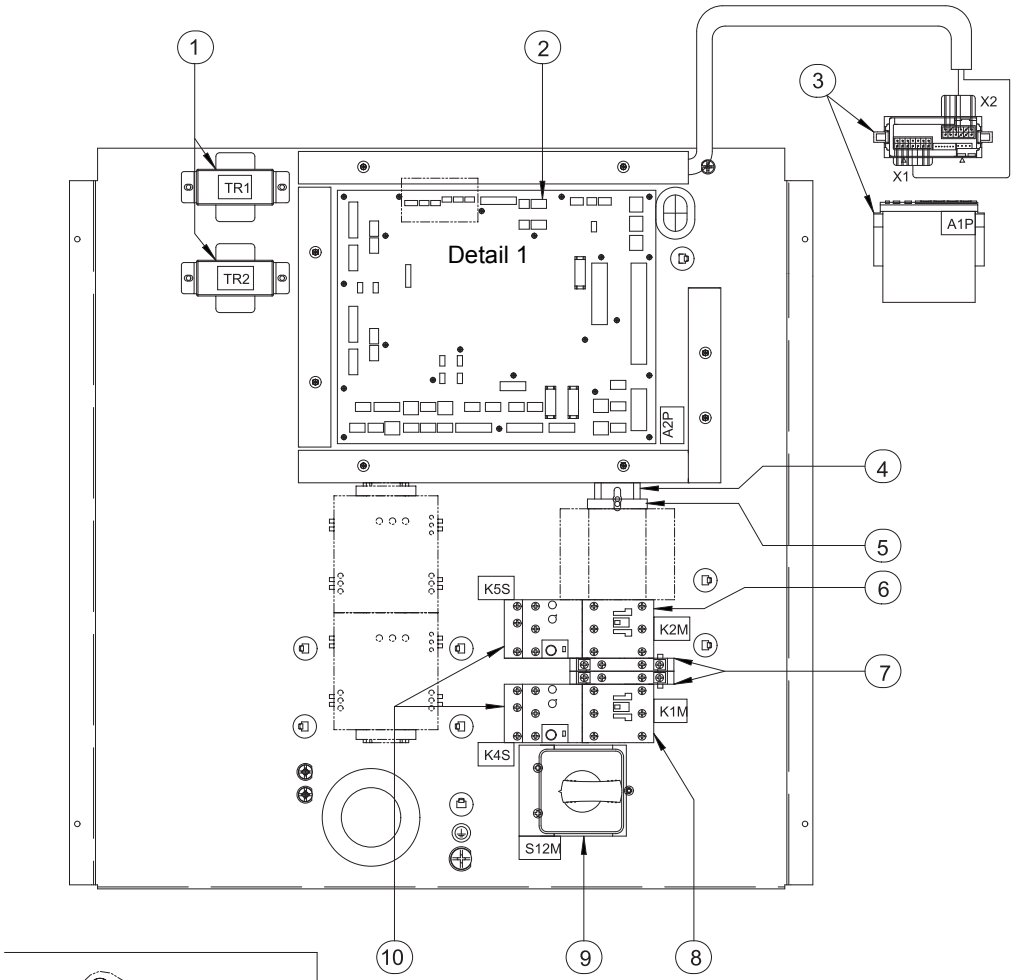
Components

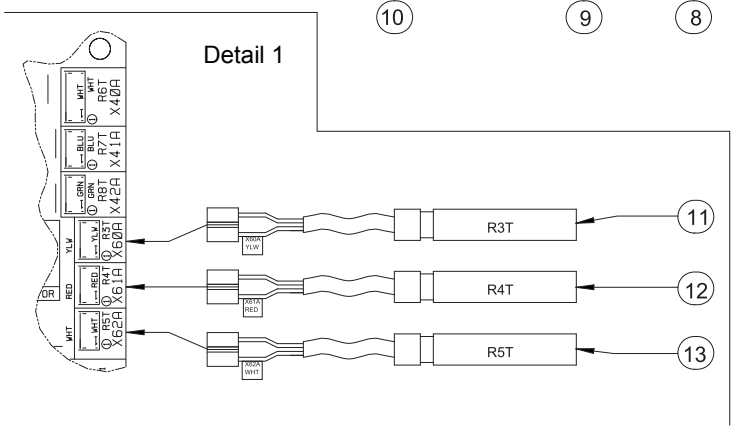
The table below describes the components.

Number	Wiring diagram symbol	Description
1	TR1 & TR2	Power supply transformator
2	A2P	I/O PCB assembly
3	A1P	Microchiller compact
4	K1M	Magnetic contactor
5	__	Auxiliary contact for K1M & K2M
6	K4S	Overcurrent relay
7	__	Omegarail stopper
8	__	Omegarail
9	S12M	Main switch
10	R3T	Inlet water evaporator temperature sensor
11	R4T	Outlet water evaporator temperature sensor
12	R5T	Inlet water condenser temperature sensor

3.4 Switch Box Layout: EWWP035-065KBW1N and EWLP030-065KBW1N

Switch box layout The illustration below shows the switch box layout of EWWP035-065KBW1N and EWLP030-065KBW1N.





DIPSWITCH SETTINGS								OVERCURRENT SETTING K4S and K5S	DESIGN REF. ONLY
S2A				S1A					
1	2	3	4	1	2	3	4		
OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	14	EWWP035-065KBW1N EWLP030-065KBW1N

DIPSWITCH AND OVERCURRENT SETTINGS MUST BE SEALED

1

Components

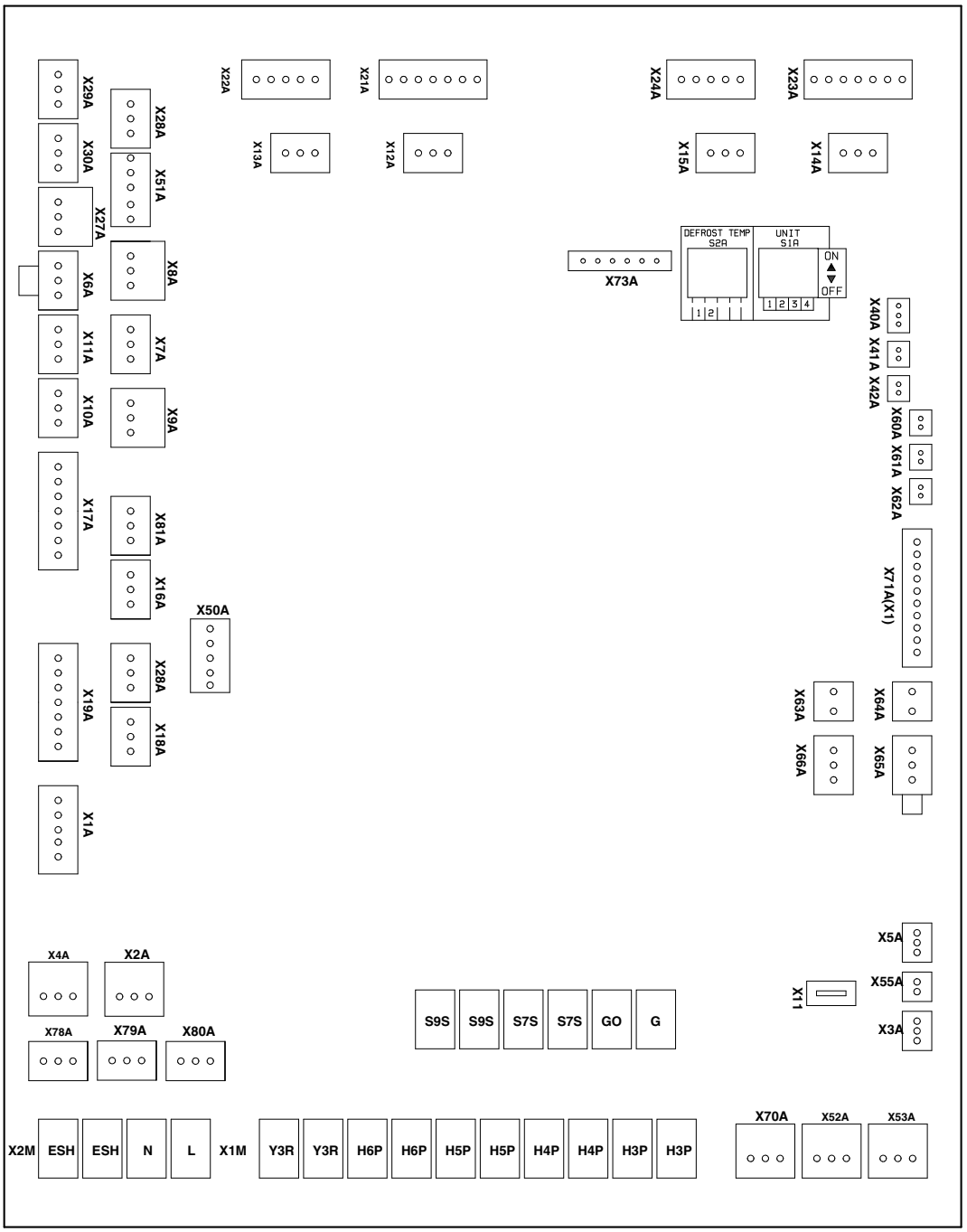
The table below describes the components.

Number	Wiring diagram symbol	Description
1	TR1 & TR2	Power supply transformator
2	A2P	I/O PCB assembly
3	A1P	Microchiller compact
4	__	Omegarail
5	__	Omegarail stopper
6	K2M	Magnetic contactor
7	__	Auxiliary contact for K1M & K2M
8	K1M	Magnetic contactor
9	S12M	Main switch
10	K4S & K5S	Overcurrent relay
11	R3T	Inlet water evaporator temperature sensor
12	R4T	Outlet water evaporator temperature sensor
13	R5T	Inlet water condenser temperature sensor

3.5 PCB Layout of the EWWP014-065KBW1N and EWLP012-065KBW1N

PCB layout

The illustration below shows the I/O PCB layout of chiller types EWWP014-065KBW1N and EWLP012-065KBW1N.



1

Components

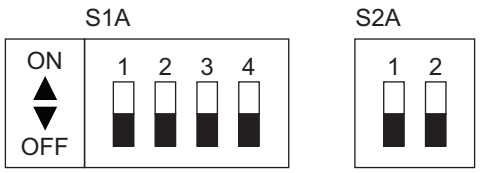
The table below describes the components.

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
X16A	Y1S	Liquid solenoid valve (only for RC unit)
X17A	K1M	Compressor contactor (coil) of circuit 1 NC contact of K1M
X18A	Y2S	Liquid solenoid valve (only for RC unit)
X19A	K2M	Compressor contactor (coil) of circuit 2 NC contact of K2M
X28A	K6S	(NC) Overcurrent relay of pump
X30A	S10L	Flow contactor
X50A	X2 (C1/2, No1, No2)	To A1P MicroChiller compact 2 SE
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 µchiller compact
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)

Connector	Wiring diagram symbol	Description
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)
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 DONT CONNECT VOLTAGE	Field connection for option kit, EKAC10C (A3P) and fieldwiring
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	off = 1 circuit on = 2 circuit	1	not used
2 3 4	off off off = WWP/WLP	2	not used

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)	-

1

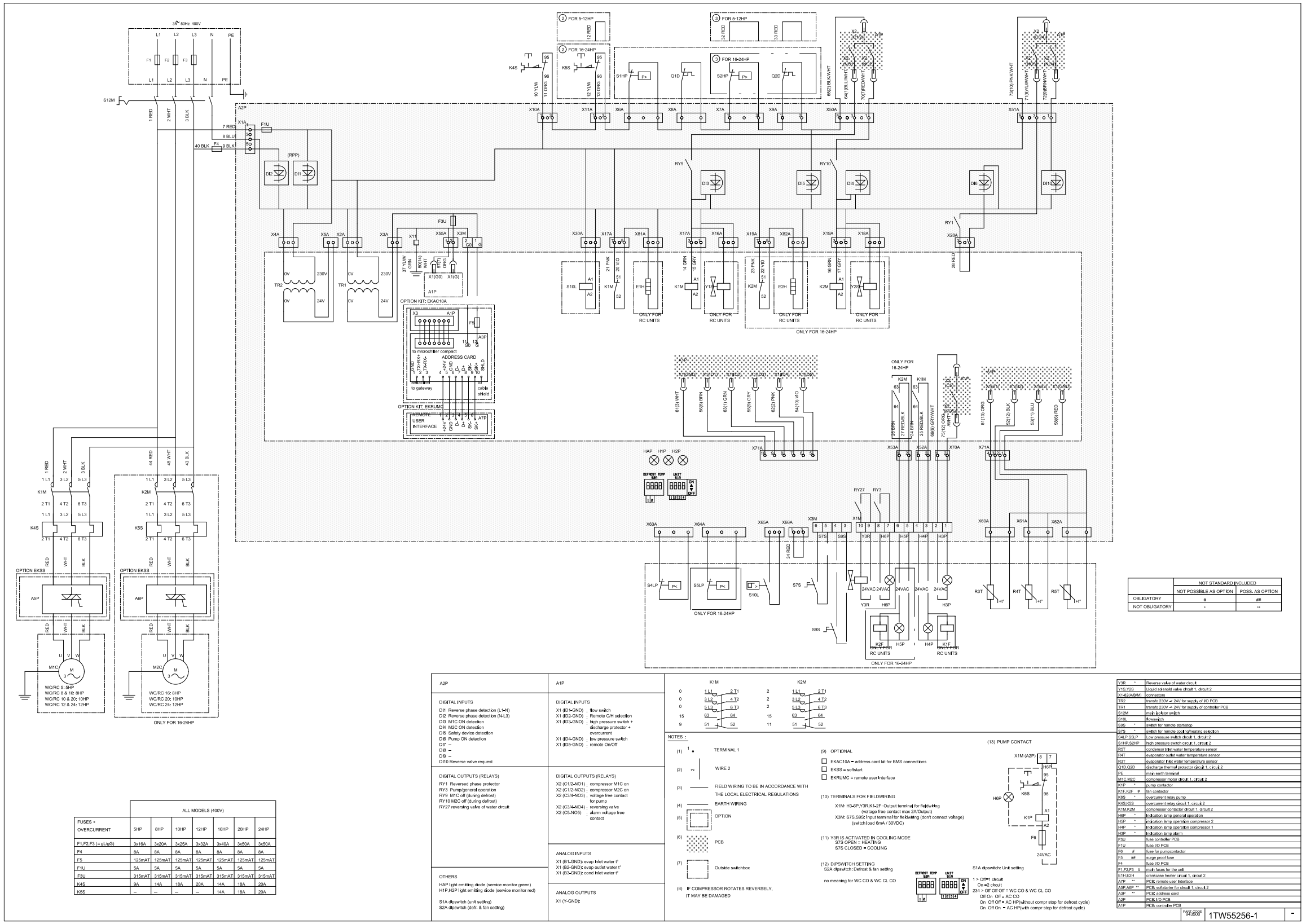
Status H1P and H2P

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

3.6 Wiring Diagram: EWWP014-065KBW1N and EWLP012-065KBW1N

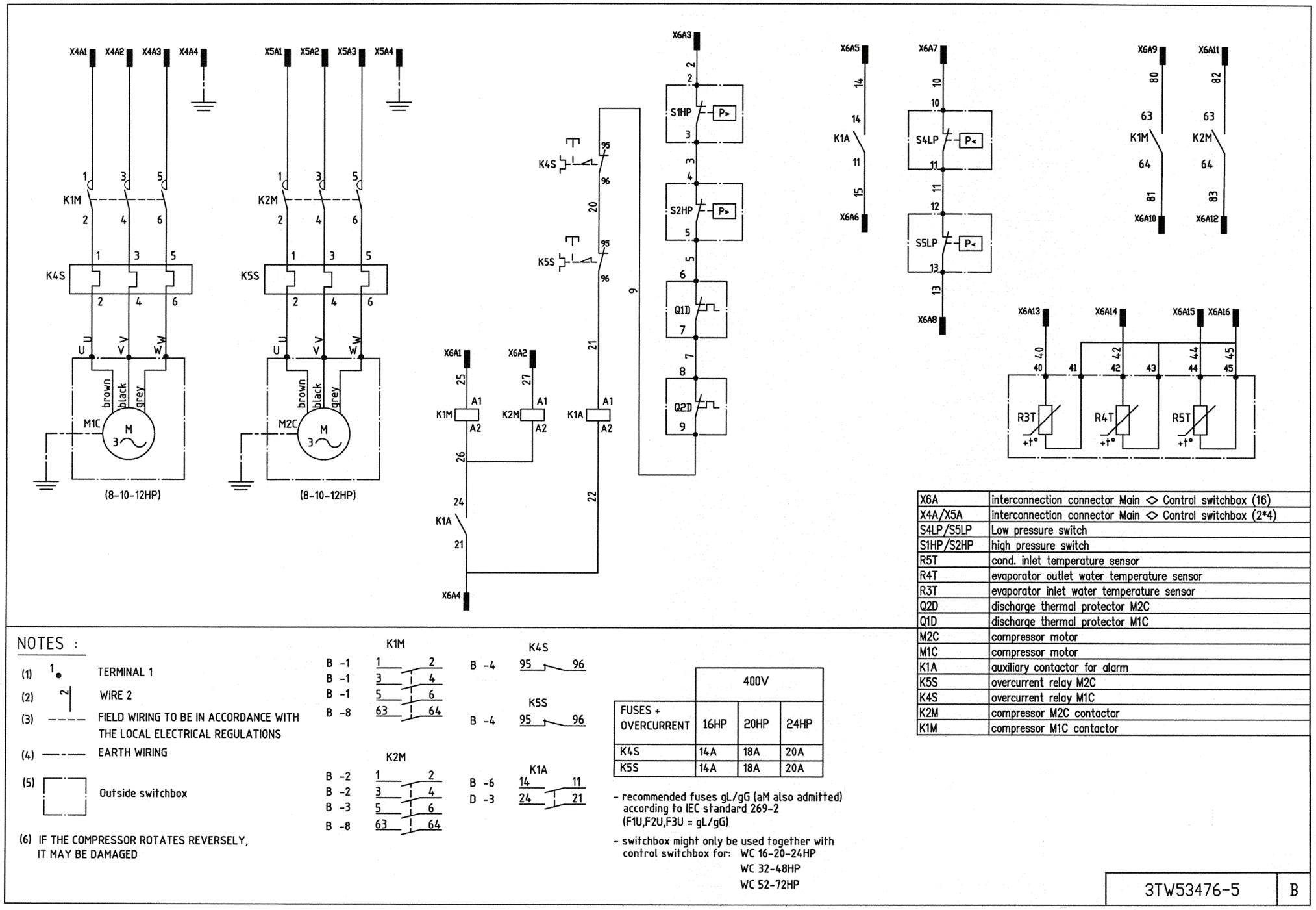
Wiring diagram



	ALL MODELS (400V)						
FUSES + OVERCURRENT	5HP	8HP	10HP	12HP	16HP	20HP	24HP
F1,F2,F3 (∗gL/gG)	3x16A	3x20A	3x25A	3x32A	3x40A	3x50A	3x50A
F4	8A	8A	8A	8A	8A	8A	8A
F5	125mAT	125mAT	125mAT	125mAT	125mAT	125mAT	125mAT
F1U	5A	5A	5A	5A	5A	5A	5A
F3U	315mAT	315mAT	315mAT	315mAT	315mAT	315mAT	315mAT
K4S	9A	14A	18A	20A	14A	18A	20A
K5S	–	–	–	–	14A	18A	20A

3.7 Wiring Diagram Main Switchbox of the Module

Wiring diagram



NOTES :

(1) TERMINAL 1

(2) WIRE 2

(3) FIELD WIRING TO BE IN ACCORDANCE WITH THE LOCAL ELECTRICAL REGULATIONS

(4) EARTH WIRING

(5) Outside switchbox

(6) IF THE COMPRESSOR ROTATES REVERSELY, IT MAY BE DAMAGED

K1M: B -1 (1–2, 3–4, 5–6), B -8 (63–64)

K2M: B -2 (1–2, 3–4, 5–6), B -8 (63–64)

K4S: B -4 (95–96)

K5S: B -4 (95–96)

K1A: B -6 (14–11), D -3 (24–21)

FUSES + OVERCURRENT	400V 16HP	20HP	24HP
K4S	14A	18A	20A
K5S	14A	18A	20A

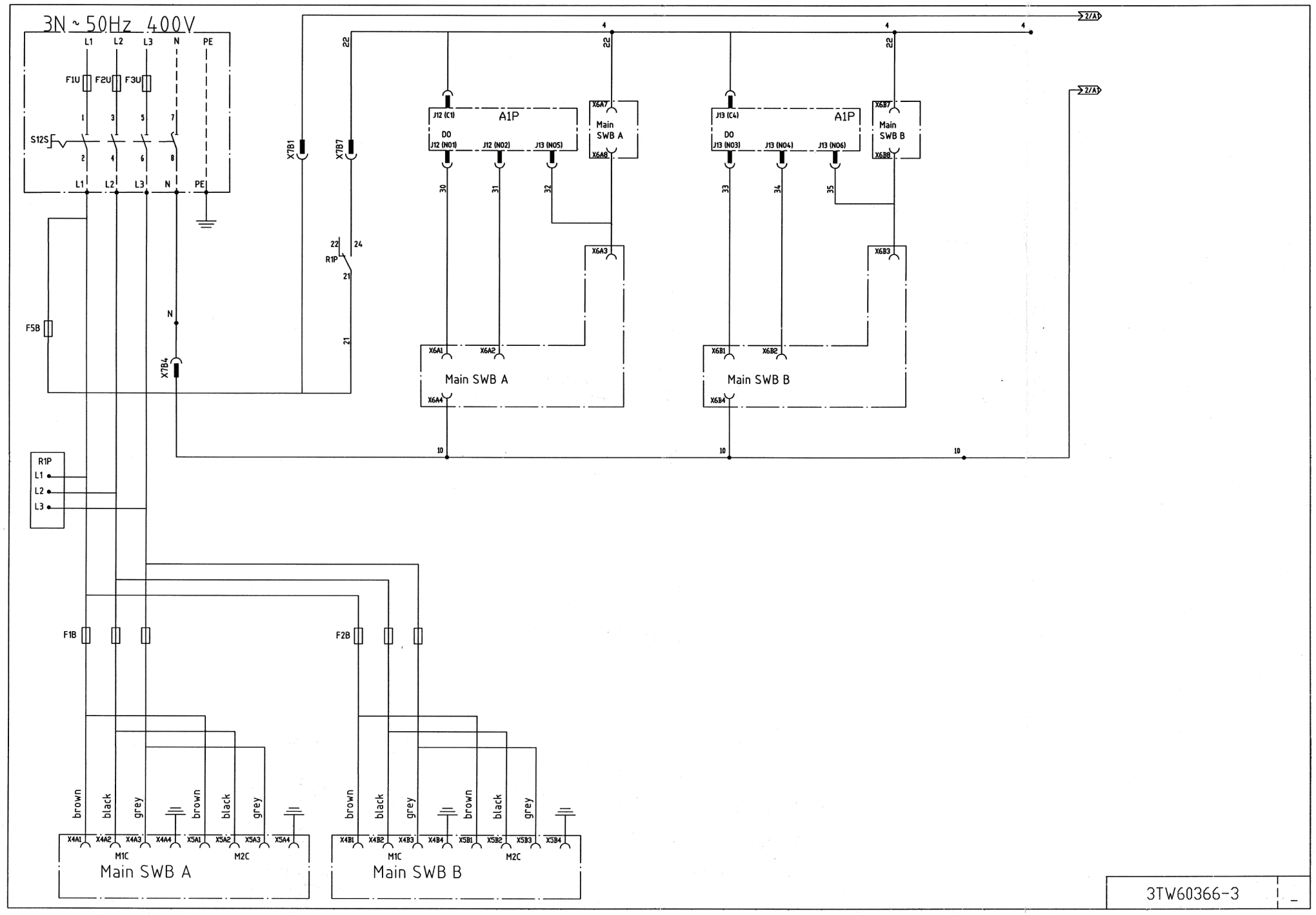
- recommended fuses gL/gG (aM also admitted) according to IEC standard 269-2 (F1U,F2U,F3U = gL/gG)
- switchbox might only be used together with control switchbox for: WC 16-20-24HP, WC 32-48HP, WC 52-72HP

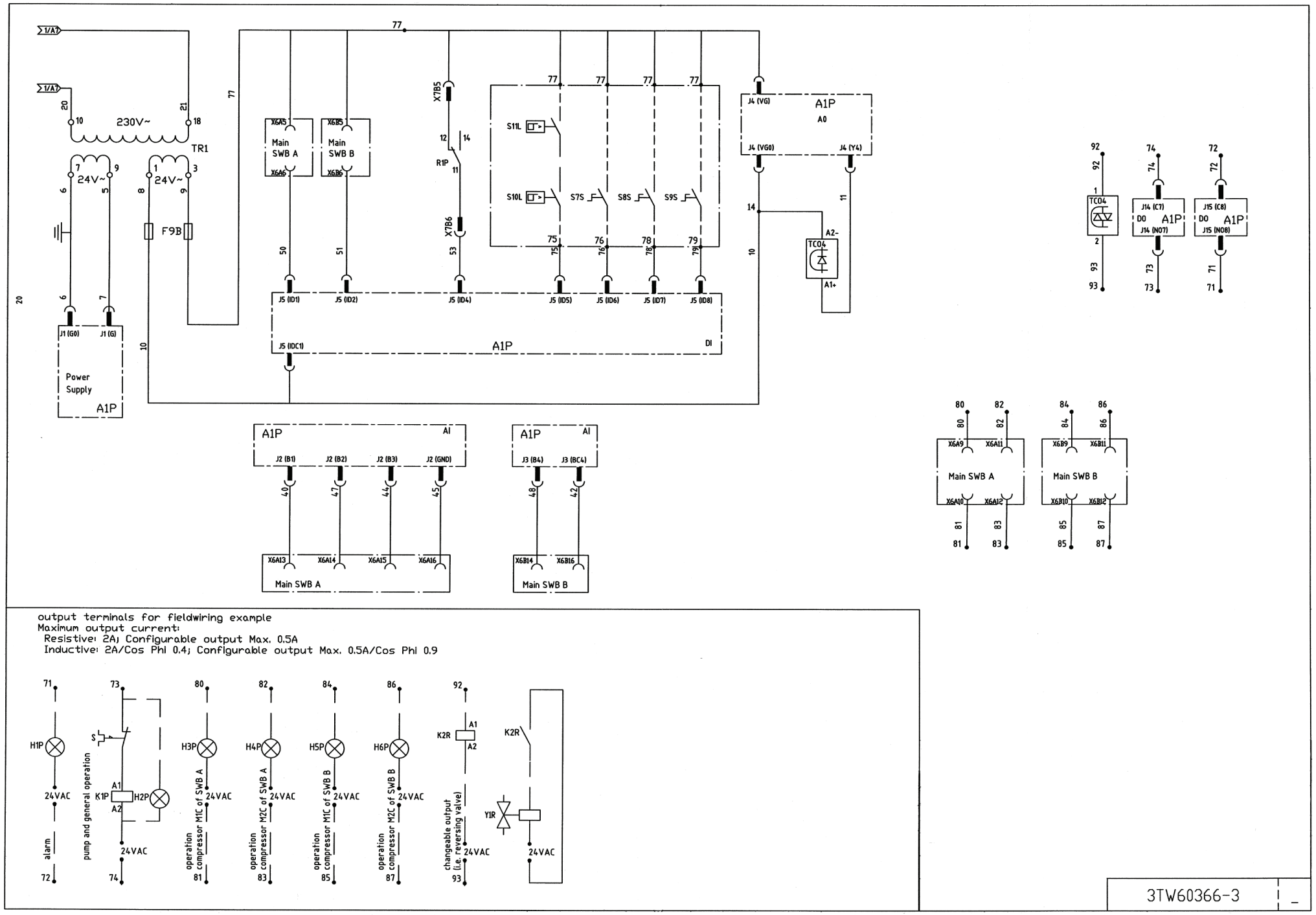
X6A	interconnection connector Main ◇ Control switchbox (16)
X4A/X5A	interconnection connector Main ◇ Control switchbox (2*4)
S4LP/S5LP	Low pressure switch
S1HP/S2HP	high pressure switch
R5T	cond. inlet temperature sensor
R4T	evaporator outlet water temperature sensor
R3T	evaporator inlet water temperature sensor
Q2D	discharge thermal protector M2C
Q1D	discharge thermal protector M1C
M2C	compressor motor
M1C	compressor motor
K1A	auxiliary contactor for alarm
K5S	overcurrent relay M2C
K4S	overcurrent relay M1C
K2M	compressor M2C contactor
K1M	compressor M1C contactor

3TW53476-5 B

3.8 Wiring Diagram Control Switchbox of the EWWP090-130KAW1M

Wiring diagram




1/A7
230V~
TR1
24V~
24V~
F9B
Power Supply
A1P
Main SWB A
Main SWB B
X7B5
X7B6
R1P
S11L
S10L
S7S
S8S
S9S
A1P
A0
J4 (VG)
J4 (VG0)
J4 (Y4)
TC04
A2-
A1+
J5 (ID1)
J5 (ID2)
J5 (ID4)
J5 (ID5)
J5 (ID6)
J5 (ID7)
J5 (ID8)
J5 (IDC1)
DI
J1 (G0)
J1 (G)
J2 (B1)
J2 (B2)
J2 (B3)
J2 (GND)
J3 (B4)
J3 (BC4)
AI
X6A13
X6A14
X6A15
X6A16
X6B14
X6B16
X6A9
X6A11
X6A10
X6A12
X6B9
X6B11
X6B10
X6B12
J14 (C7)
J14 (NO7)
J15 (C8)
J15 (NO8)
DO
output terminals for fieldwiring example
Maximum output current:
Resistive: 2A; Configurable output Max. 0.5A
Inductive: 2A/Cos Phi 0.4; Configurable output Max. 0.5A/Cos Phi 0.9
H1P
24VAC
alarm
S
K1P
H2P
pump and general operation
H3P
H4P
H5P
H6P
operation compressor M1C of SWB A
operation compressor M2C of SWB A
operation compressor M1C of SWB B
operation compressor M2C of SWB B
K2R
changeable output (i.e. reversing valve)
Y1R
3TW60366-3

A1P: DIGITAL INPUTS
J5 (ID1-IDC1): module safety A active
J5 (ID2-IDC1): module safety B active
J5 (ID3-IDC1): --
J5 (ID4-IDC1): reverse phase protector
J5 (ID5-IDC1): flowswitch
J5 (ID6-IDC1): changeable digital input 1×
J5 (ID7-IDC1): changeable digital input 2×
J5 (ID8-IDC1): changeable digital input 3×
× dual setpoint / remote start-stop/ remote cooling-heating/ capacity limitation 1-2-3-4

A1P: DIGITAL OUTPUTS (RELAY)
J12 (C1-NO1): compressor 1 of module A on
J12 (C1-NO2): compressor 2 of module A on
J12 (C1-NO3): compressor 1 of module B on
J13 (C4-NO4): compressor 2 of module B on
J13 (C4-NO5): LP bypass on module A
J13 (C4-NO6): LP bypass on module B
J14 (C7-NO7): pump & general operation
J15 (C8-NO8): alarm indication

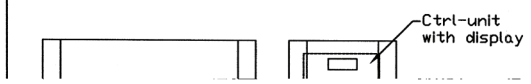
A1P: ANALOG OUTPUTS
(Converted to digital outputs)
J4 (VG0-Y1): --
J4 (VG0-Y2): --
J4 (VG0-Y3): --
J4 (VG0-Y4): changeable digital output 1××
×× reversing valve/2nd evaporator pump/condenser pump/ 100% capacity

A1P: ANALOG INPUTS
J2 (GND-B1): evaporator inlet t° measurement
J2 (GND-B2): evaporator A outlet t° measurement
J2 (GND-B3): condenser inlet t° measurement
J3 (BC4-B4): evaporator B outlet t° measurement
J3 (BC5-B5): --

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

NOTES :

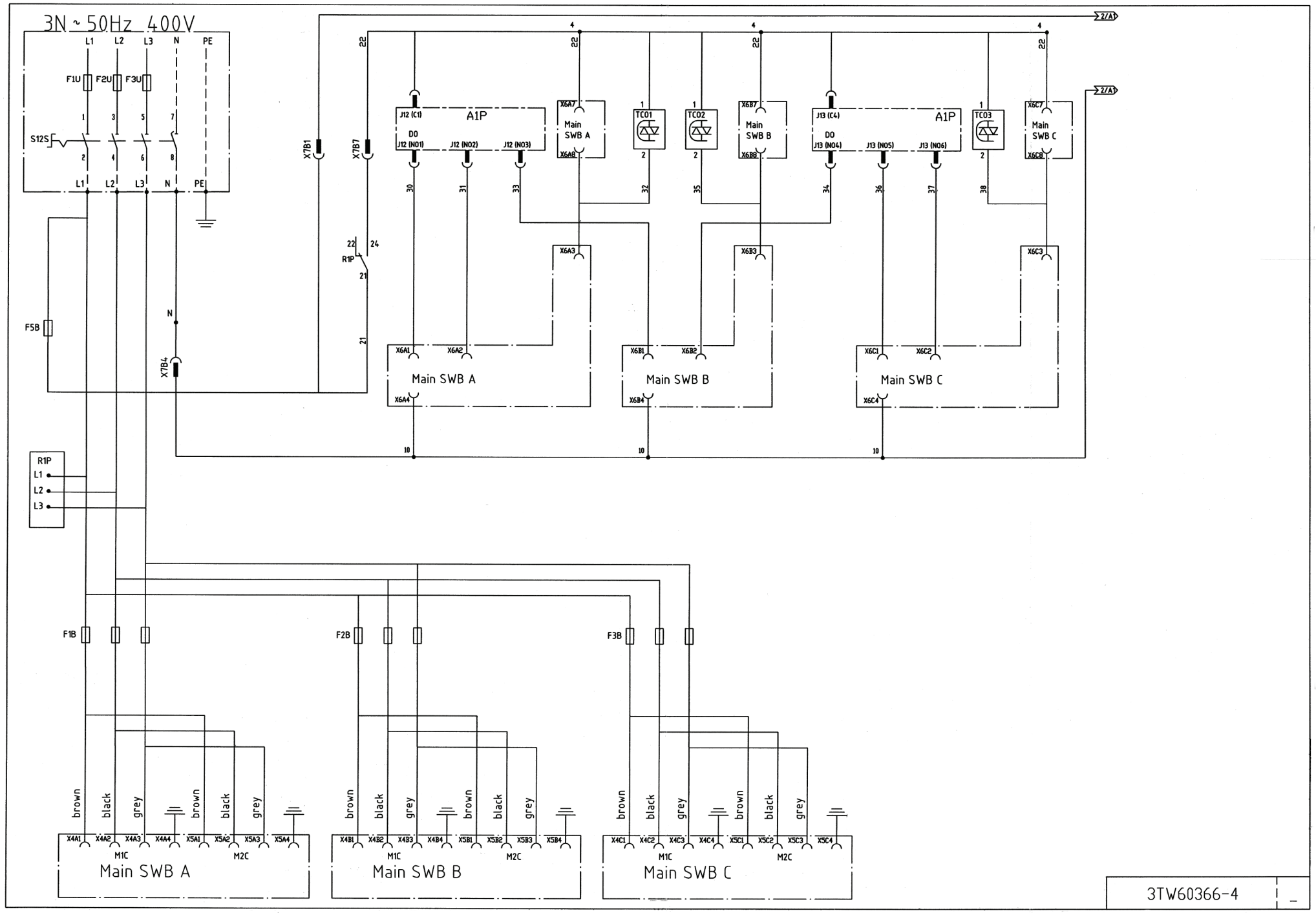
1. TERMINAL 1
(2) 2 WIRE 2

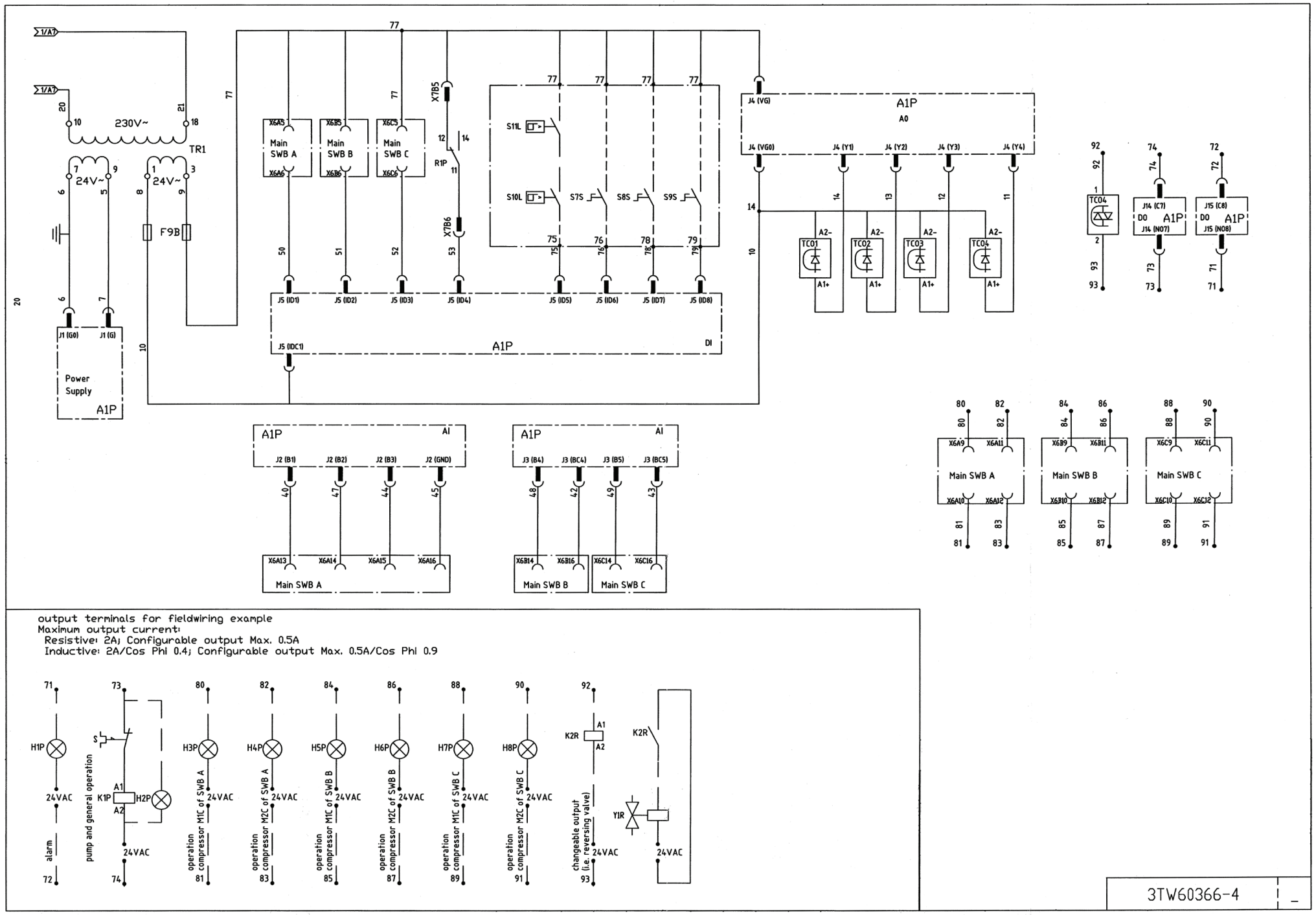


X7B	Connector 12pole to Main Ctrl Switchbox
X6A/B	Connector 16pole to Main Switchbox
Y1R	reversingvalve
TR1	transfo 230V –> 24V for supply of controllers
TC04	optocoupler (Analog to Digital signal), changeable output (reversing valve, 2nd. evap. pump, cond. pump, 100% cap.)
S12S #	main isolator switch

3.9 Wiring Diagram Control Switchbox of the EWWP145-195KAW1M

Wiring diagram




1/A7
230V~
TR1
24V~
F9B
Power Supply
A1P
Main SWB A
Main SWB B
Main SWB C
X7B5
X7B6
R1P
S11L
S10L
S7S
S8S
S9S
J5 (ID1)
J5 (ID2)
J5 (ID3)
J5 (ID4)
J5 (ID5)
J5 (ID6)
J5 (ID7)
J5 (ID8)
J5 (IDC1)
DI
A0
J4 (VG)
J4 (VG0)
J4 (Y1)
J4 (Y2)
J4 (Y3)
J4 (Y4)
TC01
TC02
TC03
TC04
A2-
A1+
J14 (C7)
J14 (NO7)
J15 (C8)
J15 (NO8)
AI
J2 (B1)
J2 (B2)
J2 (B3)
J2 (GND)
J3 (B4)
J3 (BC4)
J3 (B5)
J3 (BC5)
output terminals for fieldwiring example
Maximum output current:
Resistive: 2A; Configurable output Max. 0.5A
Inductive: 2A/Cos Phi 0.4; Configurable output Max. 0.5A/Cos Phi 0.9
H1P
24VAC
alarm
S
K1P
H2P
pump and general operation
H3P
H4P
H5P
H6P
H7P
H8P
operation compressor M1C of SWB A
operation compressor M2C of SWB A
operation compressor M1C of SWB B
operation compressor M2C of SWB B
operation compressor M1C of SWB C
operation compressor M2C of SWB C
K2R
Y1R
changeable output (i.e. reversing valve)
3TW60366-4

A1P: DIGITAL INPUTS
J5 (ID1-IDC1): module safety A active
J5 (ID2-IDC1): module safety B active
J5 (ID3-IDC1): module safety C active
J5 (ID4-IDC1): reverse phase protector
J5 (ID5-IDC1): flowswitch
J5 (ID6-IDC1): changeable digital input 1×
J5 (ID7-IDC1): changeable digital input 2×
J5 (ID8-IDC1): changeable digital input 3×
× dual setpoint / remote start-stop/ remote cooling-heating/ capacity limitation 1-2-3-4

A1P: DIGITAL OUTPUTS (RELAY)
J12 (C1-NO1): compressor 1 of module A on
J12 (C1-NO2): compressor 2 of module A on
J12 (C1-NO3): compressor 1 of module B on
J13 (C4-NO4): compressor 2 of module B on
J13 (C4-NO5): compressor 1 of module C on
J13 (C4-NO6): compressor 2 of module C on
J14 (C7-NO7): pump & general operation
J15 (C8-NO8): alarm indication

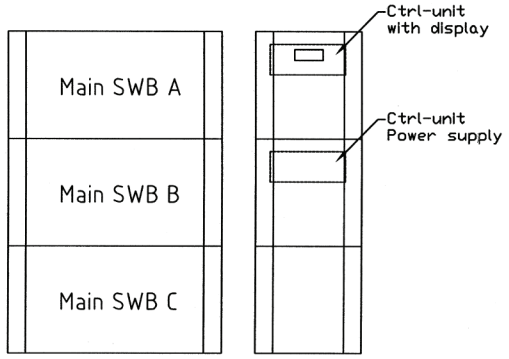
A1P: ANALOG OUTPUTS
(Converted to digital outputs)
J4 (VG0-Y1): LP bypass of module A
J4 (VG0-Y2): LP bypass of module B
J4 (VG0-Y3): LP bypass of module C
J4 (VG0-Y4): changeable digital output 1××
×× reversing valve/2nd evaporator pump/condenser pump/ 100% capacity

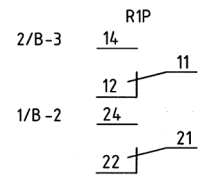
A1P: ANALOG INPUTS
J2 (GND-B1): evaporator inlet t° measurement
J2 (GND-B2): evaporator A outlet t° measurement
J2 (GND-B3): condenser inlet t° measurement
J3 (BC4-B4): evaporator B outlet t° measurement
J3 (BC5-B5): evaporator C outlet t° measurement

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

NOTES :

(1) TERMINAL 1
(2) WIRE 2
(3) FIELD WIRING TO BE IN ACCORDANCE WITH THE LOCAL ELECTRICAL REGULATIONS
(4) EARTH WIRING
(5) OPTION
(6) PCB
(7) Outside switchbox
(8) IF THE COMPRESSOR ROTATES REVERSELY, IT MAY BE DAMAGED
(9) OPTIONAL
(10) >1/F1> connection continues on field 'F1' of page '1'





X7B		Connector 12pole to Main Ctrl Switchbox
X6A/B/C		Connector 16pole to Main Switchbox
Y1R		reversingvalve
TR1		transfo 230V –> 24V for supply of controllers
TC04		optocoupler (Analog to Digital signal), changeable output (reversing valve, 2nd. evap. pump, cond. pump, 100% cap.)
TC01, TC02 TC03		optocoupler (Analog to Digital signal), LP bypass
S12S	#	main isolator switch
S11L	#	contact that closes if pump is working
S10L	#	flowswitch
S7S,S8S,S9S		changeable switch for remote function (dual setpoint, rem. start–stop, rem. cool–heat, cap. lim. 1..4)
R1P		reverse phase protector
PE		main earth terminal
M2C		compressor motor
M1C		compressor motor
J12,J13		Digital output
J5		Digital Input
J4		Analog Output
J2,J3		Analog Input
J1		Power supply
K1P	*	pumpcontactor
H4P,H6P,H8P*		indication lamp operation compressor M2C (Main SWB A, B, C)
H3P,H5P,H7P*		indication lamp operation compressor M1C (Main SWB A, B, C)
H2P	*	indication lamp general operation
H1P	*	indication lamp alarm
F5B,F9B		fuse for the control circuit / secondary of TR1
F1B,F2B,F3B		fuses for each circuit
F1U,F2U,F3U	#	main fuses for the unit
A1P		PCB

	400V		
Fuses To Main SWB	16HP	20HP	24HP
F1B, F2B, F3B	32gG	40gG	50gG
Fuses To Controlswitchbox			
F5B	1A		
F9B	1A		

	400V
Mainfuses Unit	F1U, F2U, F3U
52HP	100gG
56HP	125gG
60HP	125gG
64HP	125gG
68HP	125gG
72HP	125gG

- recommended fuses gL/gG (aM also admitted) according to IEC standard 269-2 (F1U,F2U,F3U = gL/gG)
- switchbox might only be used together with main switchbox for: WC 16-72HP

3TW60366-4 _

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 and 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.

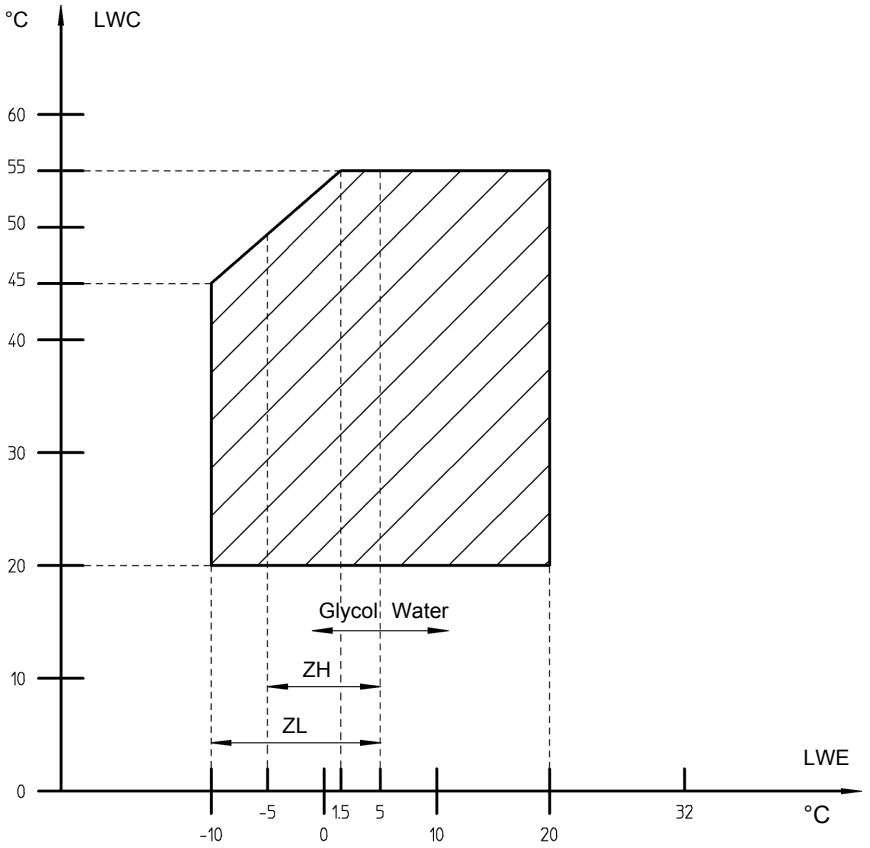
Overview

This chapter contains the following topics:

1.2 Operational Range: EWWP014-035KBW1N and EWLP012-030KBW1N

Operational range

The illustration below shows the operational range of EWWP014-035KBW1N and EWLP012-030KBW1N.



Legend

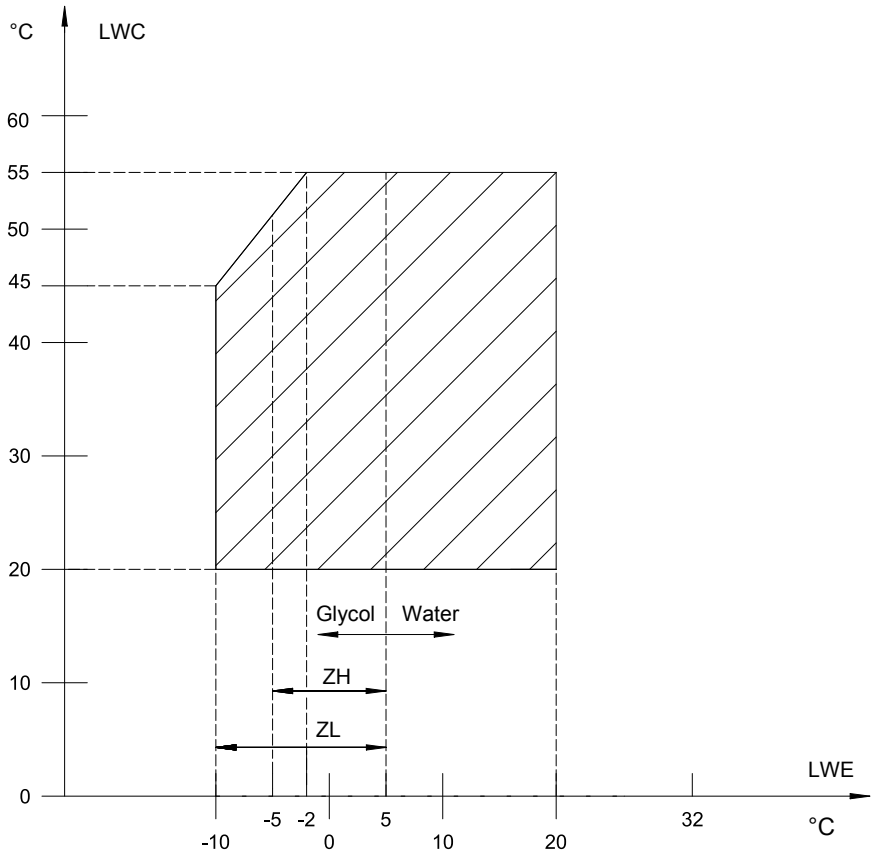
The table below describes abbreviations used in the operational range illustration above.

Pattern/ Abbreviation	Description
LWE	Leaving Water Evaporator
LWC	Leaving Water Condenser
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: EWWP045-065KBW1N and EWWP095-195KAW1M

Operational range

The illustration below shows the operational range of EWWP045-065KBW1N and EWWP095-195KAW1M.



Legend

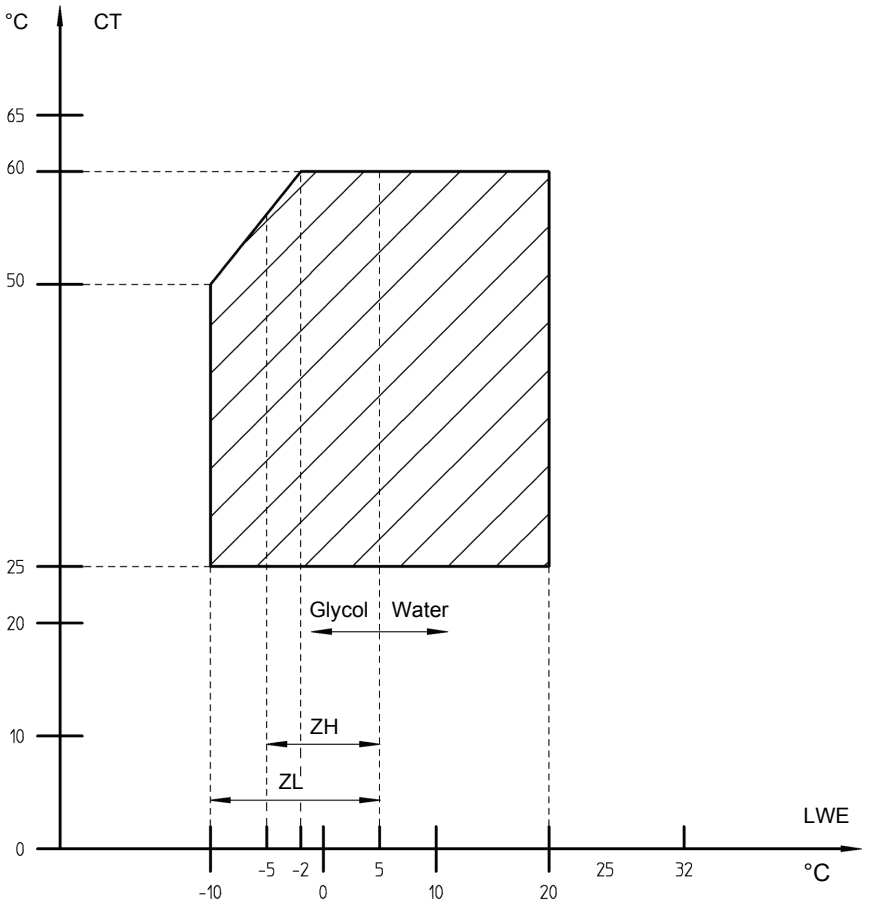
The table below describes the abbreviations used in the operational range illustration above.

Pattern/ Abbreviation	Description
LWE	Leaving Water Evaporator
LWC	Leaving Water Condenser
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 Range: EWLP040-065KBW1N

Operational range

The illustration below shows the operational range of EWLP040-065KBW1N.



Legend

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

Pattern/ Abbreviation	Description
LWE	Leaving Water Evaporator
CT	Condensing temperature (bubble)
ZH	Option to produce evaporating leaving water temperature till -5°C
ZL	Option to produce evaporating leaving water temperature till -10°C

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	360	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

Introduction

The unit is equipped with a thermostat, which controls the cooling or heating capacity of the unit. There are three different controls:

- Manual control mode or a control of the capacity by the operator (only for 090 till 195)
- Inlet evaporator control mode or a control using the entering evaporator water temperature
- Inlet condenser control mode or a control using the entering condenser water temperature or condensing temperature bubble (EWLP only).

Manual mode versus automatic mode

The table below contains the difference between manual and automatic mode:

If the capacity control happens...	Then there is...
Manually (= fixed capacity step control),	No thermostat control.
Automatically,	An inlet thermostat control.

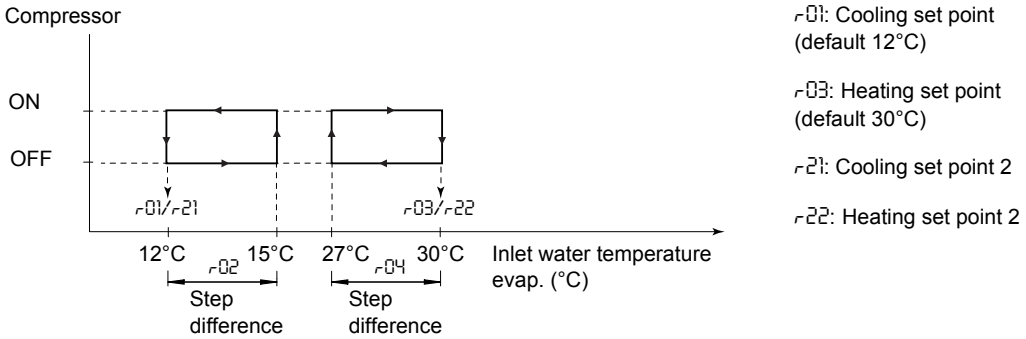
Capacity steps

The table below contains the maximum number of capacity steps for each chiller type. A capacity step is equal to the start-up of one or more compressors.

Unit type	Number of circuits	Number of modules	Number of capacity steps
EWWP014-035KBW1N EWLP012-030KBW1N	1	1	1
EWWP045-065KBW1N EWLP040-065KBW1N	2	1	2
EWWP090-130KAW1M	4	2	2/ 4
EWWP145-195KAW1M	6	3	2/ 4/ 6

Functional diagram EWWP014-035KBW1N and EWLP012-030KBW1N

The illustration below shows the thermostat control of EWWP014-035KBW1N and EWLP012-030KBW1N.



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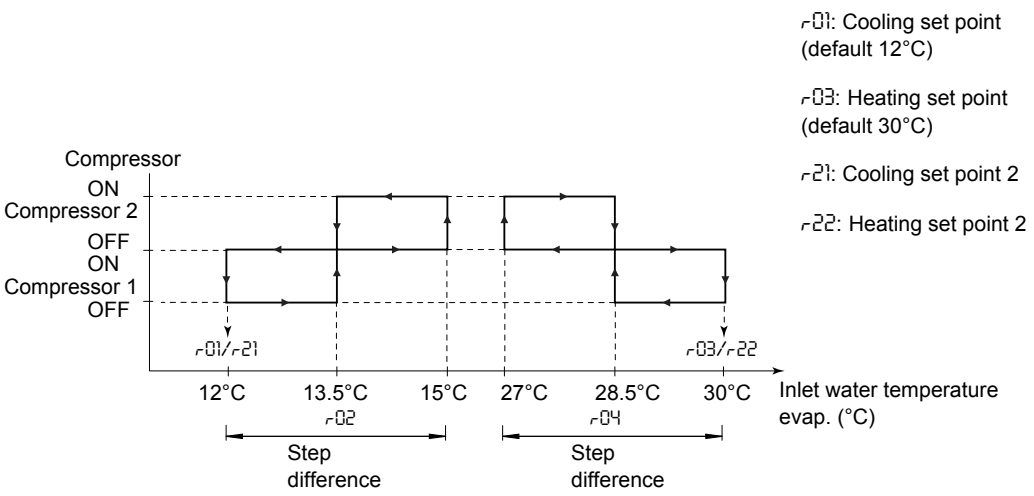
Functional diagram EWWP045-065KBW 1N and EWLP040-065KBW 1N

The illustration below shows the thermostat control of EWWP045-065KBW1N and EWLP040-065KBW1N.



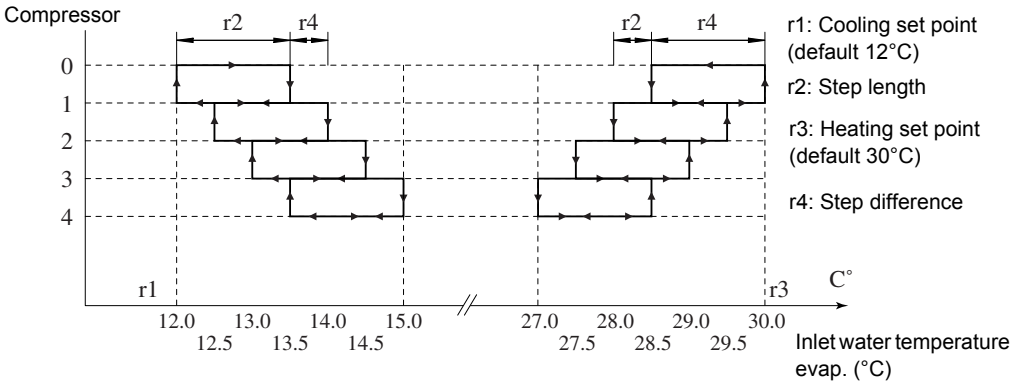
Controller

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

Functional diagram EWWP090-130KAW 1M

The illustration below shows the thermostat control of EWWP090-130KAW1M.



Display controller EWWP090-130KAW 1M

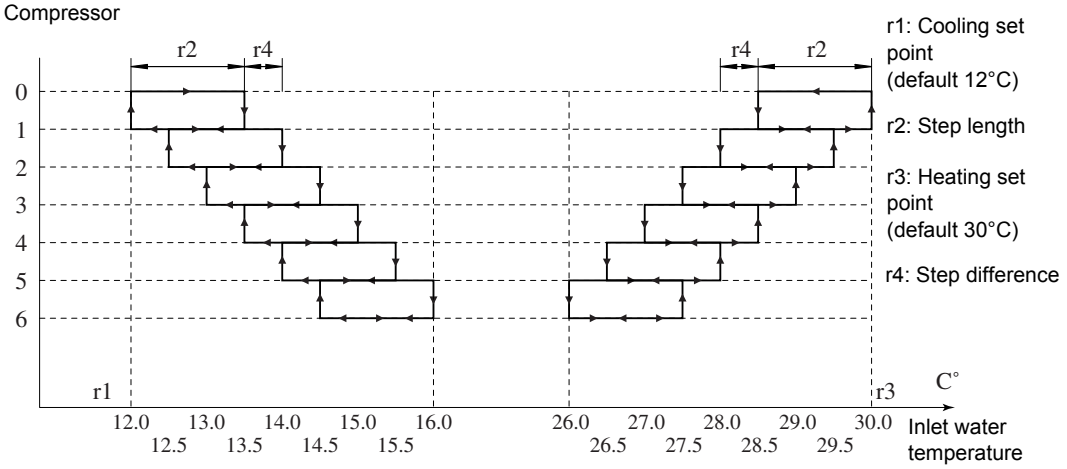
Screen 3 of the user settings menu allows you to modify the thermostat parameters.

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	THERMOST. SETTINGS	Screen title				
2	STEPS	Number of thermostat steps	2	4	2	4
2	STPL (°C)	Step length (r2)	0.4	2.0	0.1	1.5
3	STEP DIFFERENCE (°C)	Step difference (r4)	0.2	0.8	0.1	0.5
4	LOADUP (s)	Load-up time (s)	15	300	1	180
4	LOADDOWN (s)	Load-down time (s)	15	300	1	20

See "User Settings Menu" on page 2–50.

Functional diagram EWWP145-195KAW 1M

The illustration below shows the thermostat control of EWWP145-195KAW1M.



Display controller EWWP145-195KAW 1M

Screen 3 of the user settings menu allows you to modify the thermostat parameters.

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	THERMOST. SETTINGS	Screen title				
2	STEPS	Number of thermostat steps	2	6	2	6
2	STPL (°C)	Step length (r2)	0.4	2.0	0.1	1.5
3	STEP DIFFERENCE (°C)	Step difference (r4)	0.2	0.8	0.1	0.5
4	LOADUP (s)	Load-up time (s)	15	300	1	180
4	LOADDOWN (s)	Load-down time (s)	15	300	1	20

See "User Settings Menu" on page 2–50.

1.8 Freeze-up Control: EWWP014-065KBW1N and EWLP012-065KBW1N

Functional description

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

2

Freeze-up control: EWWP014-065KBW1N and EWLP012-065KBW1N

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 circuit is disabled.
Reset	Manually on the controller if temperature > 7.5°C (°C + anti-freeze hysteresis). Result: The circuit restarts.

Characteristics for glycol option

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

ZL	Activation	Outlet water temperature < -12°C
	Reset	Manually on controller if temperature > -8,5°C (-12°C + anti-freeze hysteresis).
ZH	Activation	Outlet water temperature < -6.5°C
	Reset	Manually on the controller if temperature > -3°C (-6.5°C + anti-freeze hysteresis).

1.9 Freeze-up Control: EWWP090-195KAW1M

Functional description

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

Freeze-up control: EWWP090-195KAW 1M

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

Characteristics	Freeze-up protection
Control device	Sensor
Diagram name	R4T (evaporator outlet water) / R3T (evaporator inlet water)
Activation	Outlet water temperature module 1/2/3 ≤ MOW -1. Result: The module is disabled.
Reset	If outlet evaporator water temperature 1/2/3 > MOW and if inlet evaporator water temperature 1/2/3 > actual inlet evaporator 1/2/3 + steplength (only if inlet check is enabled).

Freeze-up control: EWWP090-195KAW 1M

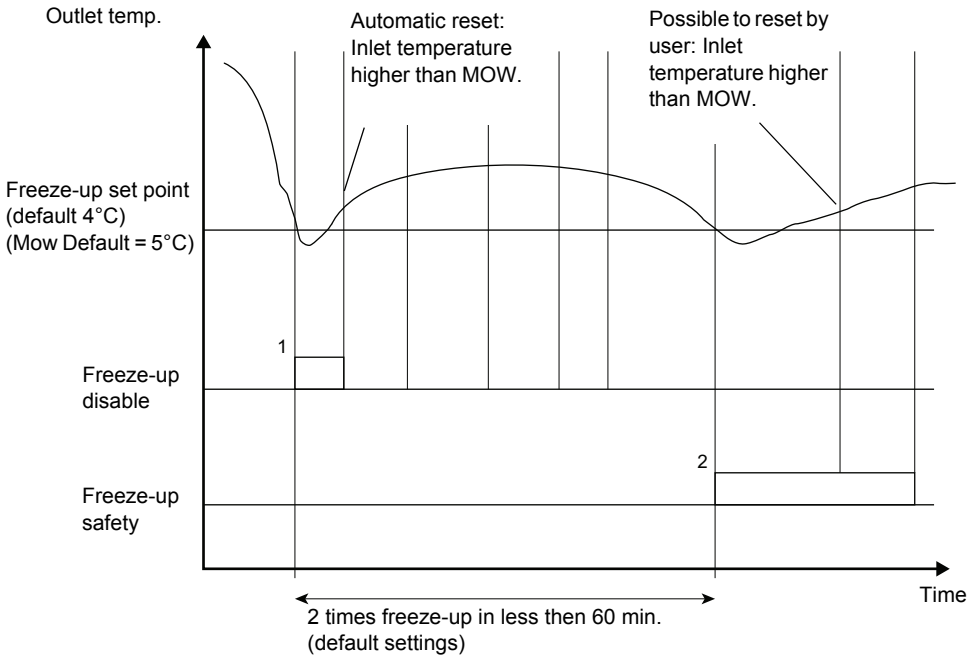
Several parameters for freeze-up can be set in the service menu. See "Service Menu" on page 2–58 (screen 11).

Line No.	Display	Description	Possible settings	Default
1	SERVICE MENU	Screen title		
2	FREEZE UP:	To select when you shut down the module: ■ After every freeze-up. Autoreset + no alarm (DISABLE ONLY) ■ After a number of allowed freeze-ups during a specified time. Manual reset after safety indication (DISABLE&SAFETY).	DIS&SAFETY DIS ONLY	DIS&SAFETY
3a	SAFETY:	Number of allowed freeze-ups during a specified time before the circuit stops.	1/2/3/4/5	2
3b	IN	To select the time in which a specified number of freeze-ups is allowed.	5 till 180 min	60

4	INCL CHECK AFTER RESET:	To select if the unit should check the inlet water temperature before reset: ■ If setting is Y, evaporator outlet + inlet water temperature is checked. ■ If setting is N, only evaporator outlet water temperature is checked.	Y/N	N

Illustration

The illustration below shows the freeze-up working principle:



1.10 Lead-lag Control (only for EWWP090-195KAW1M)

Description

Lead-lag control will determine the circuit start-up sequence in case of capacity demand. It prevents the unit from always starting up the same circuit.

Available modes

The table below contains an overview of the lead-lag controls. It is available in 3 modes for the EWWP060-130KAW1M (2 modules) and in 4 modes for the EWWP145-195KAW1M.

Unit type	Mode	Description
EWWP060-130 KAW1M	Automatic	The controller decides whether circuit 1 or circuit 2 starts up first.
	Manual M1 > M2	Circuit 1 starts up before circuit 2.
	Manual M1 < M2	Circuit 2 starts up before circuit 1.
EWWP145-195 KAW1M	Automatic	The controller decides whether circuit 1 or circuit 2 or circuit 3 starts up first.
	Manual M1 > M2 > M3	Circuit 1 starts up first. Circuit 2 starts up as second. Circuit 3 starts up last.
	Manual M2 > M3 > M1	Circuit 2 starts up first. Circuit 3 starts up as second. Circuit 1 starts up last.
	Manual M3 > M1 > M2	Circuit 3 starts up first. Circuit 1 starts up as second. Circuit 2 starts up last.

If a circuit is de-activated due to a failure, the next circuit will start up instead.

Lead-lag hours in automatic mode

When the lead-lag control is done automatically, the software calculates the difference in operation time between the circuits. When this time difference is higher than the preset lead-lag hour value, the start sequence of the circuits is swapped. The compressor that started first will then start last.

The limit values of the lead-lag hours are the following:

- Lower limit: 100 hours
- Upper limit: 1000 hours
- Default value: 1000 hours

This value is important for maintenance purposes. It should be set high enough so that all circuits do not require maintenance at the same time and that at least one circuit can remain constantly active.

1.11 Capacity Limitation (only for EWWP090-195KAW1M)

Introduction

This function allows you to limit the capacity of the chiller by disconnecting one or more modules. This can be used e.g. during night to keep the noise under a certain level or to reduce the peak load of a site.

Depending on the adjusted mode, there is a possibility to control the capacity limitation through voltage-free contacts or a programmable schedule timer.

Remote digital input mode

Set in the user setting menu the modules that must be able to run. There are four possible settings:

- L1M1
- L2M2
- L3M3
- L4M4

To activate these contacts (maximum three), set in the service menu the digital inputs (DI1, DI2, DI3) as CAP. LIMIT 1, 2 or 3.

Schedule timer mode

The schedule timer screen of the user settings menu allows the user to define the capacity limitation setting according to a programmed time.

- MON, TUE, WED, THU, FRI, SAT and SUN are used to define to which group each day of the week belongs (-/G1/G2/G3/G4).
- For each of the G1/G2/G3/G4 group, up to nine actions with their respective timing can be set.
- A holiday group is available. It is set the same way as the G1/G2/G3/G4 groups. Up to 12 holiday periods can be entered in the HOLIDAY screen. During these periods, the schedule timer will follow the settings of the holiday period group.

For more information about schedule timer possibilities, see "User Settings Menu" on page 2–50.

1.12 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.

1.13 Pump Control: EWWP014-065KBW1N and EWLP012-065KBW1N

Introduction

To prevent the chiller from starting up without a flow, a control is installed to check whether there is water flow in the system.

Pump lead-lag time

To control the pump lead (15 s) and pump lag (0) timer, the user has to define code C7 and C8 on the controller.

Fur more information about the default and limit values of the pump lead-lag timers, see "Settings: Direct and User Parameters" on page 2–30.

1.14 Pump Control: EWWP090-195KAW1M

Introduction

To prevent the chiller from starting up without a flow, a control is installed to check whether there is water flow in the system.

The double evaporator pump control can be used as an additional control. The main advantages of this control are:

- One pump remains standby in case the other pump fails.
- The steering of two evaporator pumps.

The status of the condenser pump can be indicated through the changeable relay outputs.

Pump lead-lag time

Several parameters for pump control can be set in the user settings menu. See "User Settings Menu" on page 2–50 (screen 7).

This user settings menu screen shows information on adjusting the pump through the chiller controller, to adjust the pump lead-lag time and automatic pump start-up.

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	PUMP CONTROL	Screen title				
2	PUMP LEAD TIME	Time the water pump runs before the chiller starts up.	020 s	180 s	1 s	020 s
3	PUMP LAG TIME	Time the water pump runs after the chiller has stopped.	000 s	180 s	1 s	000 s
4a	DAILY ON	To activate a daily pump start up.	N	Y	___	N
4b	AT	Daily start time pump.	00h00	24h00	1 min	12h00

Dual evaporator pump control

Dual pump control requires, when allowed, an extra digital output. See "User Settings Menu" on page 2–50 (sub-screen 8-5). You can choose between the following four settings:

Line No.	Display	Description	Possible settings
1	DUAL EVAP. PUMP	Screen title	
2	MODE	The controller decides which pump starts up first: pump 1 or pump 2.	AUTOM. ROTATION
		Pump 1 starts up before pump 2.	PUMP 1 > PUMP 2
		Pump 2 starts up before pump 1.	PUMP 2 > PUMP 1
3	OFFSET ON RH	To select the difference in operation time between the two evaporator pumps (automatic mode).	Between 001h - 999h

When the dual evaporator pump control is set to automatic rotation, the software calculates the differences in operation time between the two pumps. When this time has passed, the running pump shuts down and the other pump starts up. The unit keeps running during this pump switch. The switchover happens immediately, there is no transition time.

In case two pumps are present (any setting) and the running pump fails, the unit stops and is started up again with the other pump. A visible warning is given when the first pump fails. Reset this warning to be able to restart the pump.
If the running pump fails while the other pump is already in warning, an unit alarm is given.

Condenser pump control

It is possible to let the condenser pump work on thermostat control. The condenser pump is only switched on when the unit is cooling (thermostat/compressor on). The condenser pump is switched off when no cooling is necessary.

An extra digital output is needed when dual pump control is allowed.

1.15 Changeable Digital Inputs (EWWP014-065KBW1N and EWLP012-065KBW1N)

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

2 The Digital Controller: EWWP014-065KBW1N and EWLP012-065KBW1N

2.1 What Is in This Chapter?

Introduction

This chapter contains information on the digital controller of EWWP014-065KBW1N and EWLP012-065KBW1N.

Overview

This chapter contains the following topics:

2.2 The Digital Controller

Digital controller

EWWP014-065KBW1N and EWLP012-065KBW1N 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:

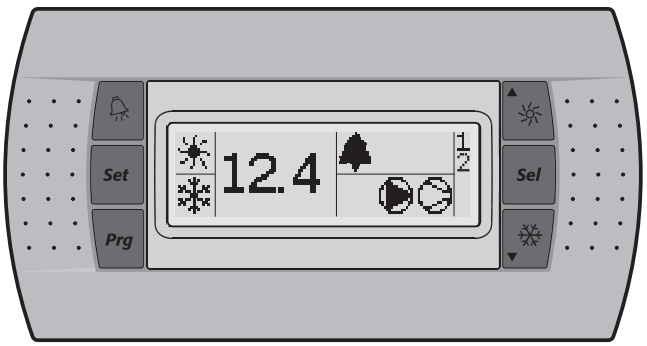
- A numeric display
- 4 keys
- 4 LEDs, used to provide extra user information.

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 2–27.

The procedure to cool or heat depends on the setting of the remote cool/heat. See "Settings: Direct and User Parameters" on page 2–30.

Start/stop and cool/heat selection

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.

2

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. ■ 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: EWWP014-065KBW1N and EWLP012-065KBW1N" 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	Condenser inlet water temperature or condensing temperature (bubble) (EWLP)				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
	c10	Total running hours of compressor 1				x100 hours	R	D	122	A
	c11	Total running hours of compressor 2				x100 hours	R	D	123	A
	c14	Maintenance threshold for maintenance warning (c10 and c11)	0	0	100	x100 hours	R/W	U	241	I
	c15	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
	H10	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 2–36.

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.

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 2–36.

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 2–36.

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 2–31.

REMARK: When dual setpoint is enabled (refer to "Selecting dual setpoint control" on page 2–21).

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 2–31.

REMARK: When dual setpoint is enabled (refer to "Selecting dual setpoint control" on page 2–21).

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: Condenser inlet water temperature / condensing temperature (Bubble) (EWLD)
- 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 2–32.
- 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 2–31.

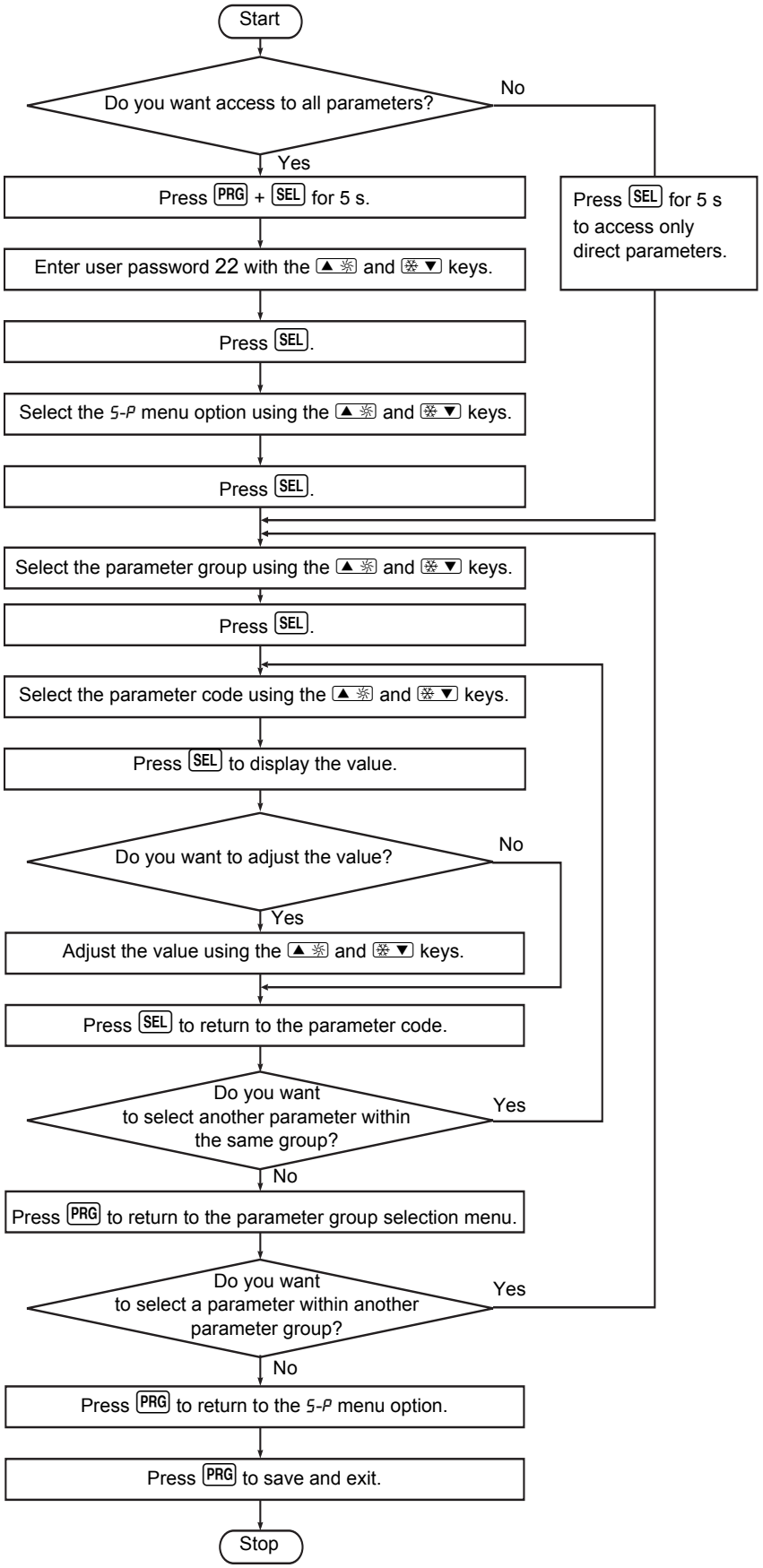
2.6 Reading or Adjusting Parameter Settings: the Programming Procedure

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.

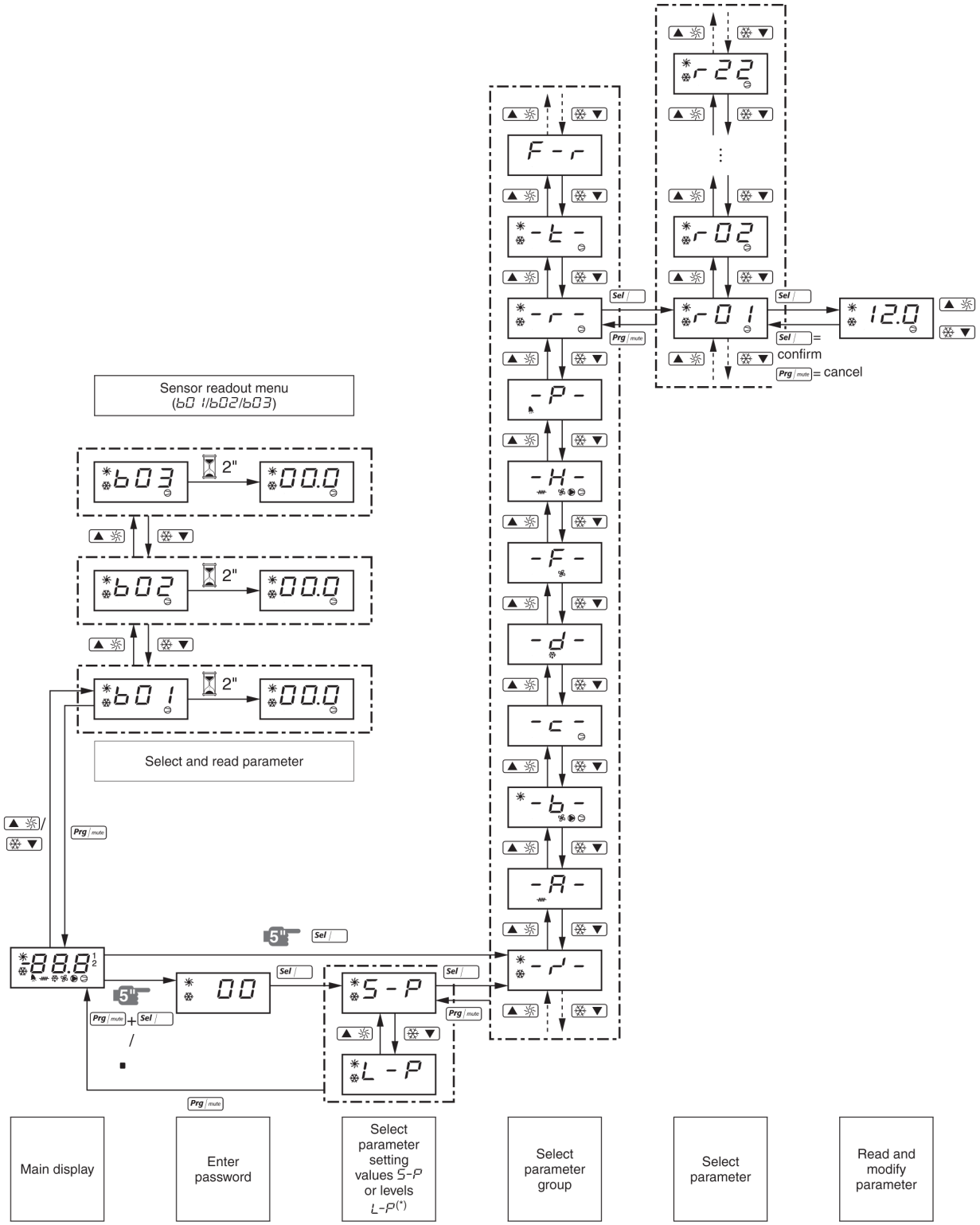
Reading or adjusting

To read or adjust parameter settings, proceed as follows:



2.7 Menu Overview

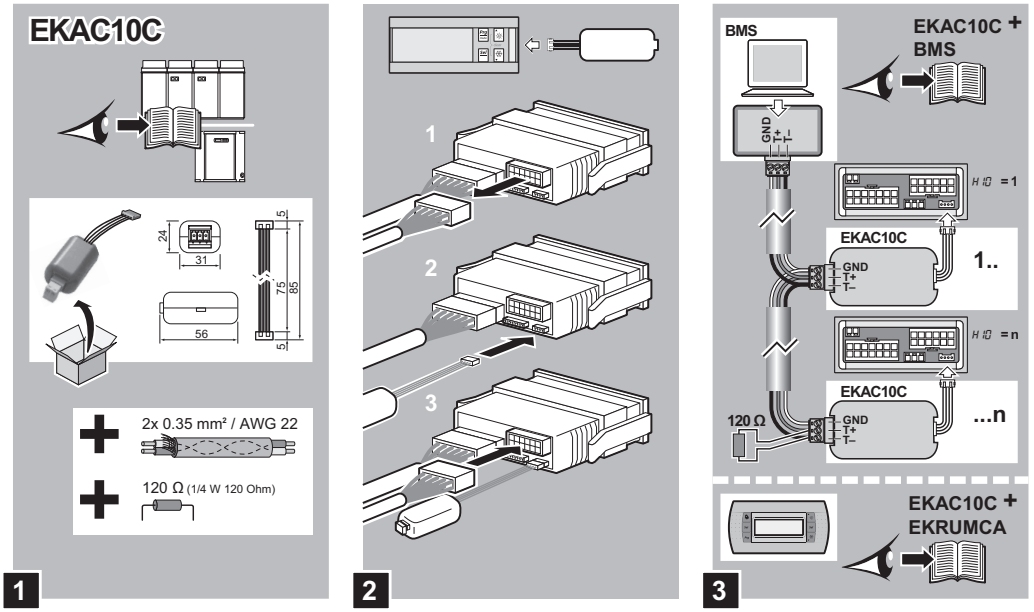
Overview



(*) 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

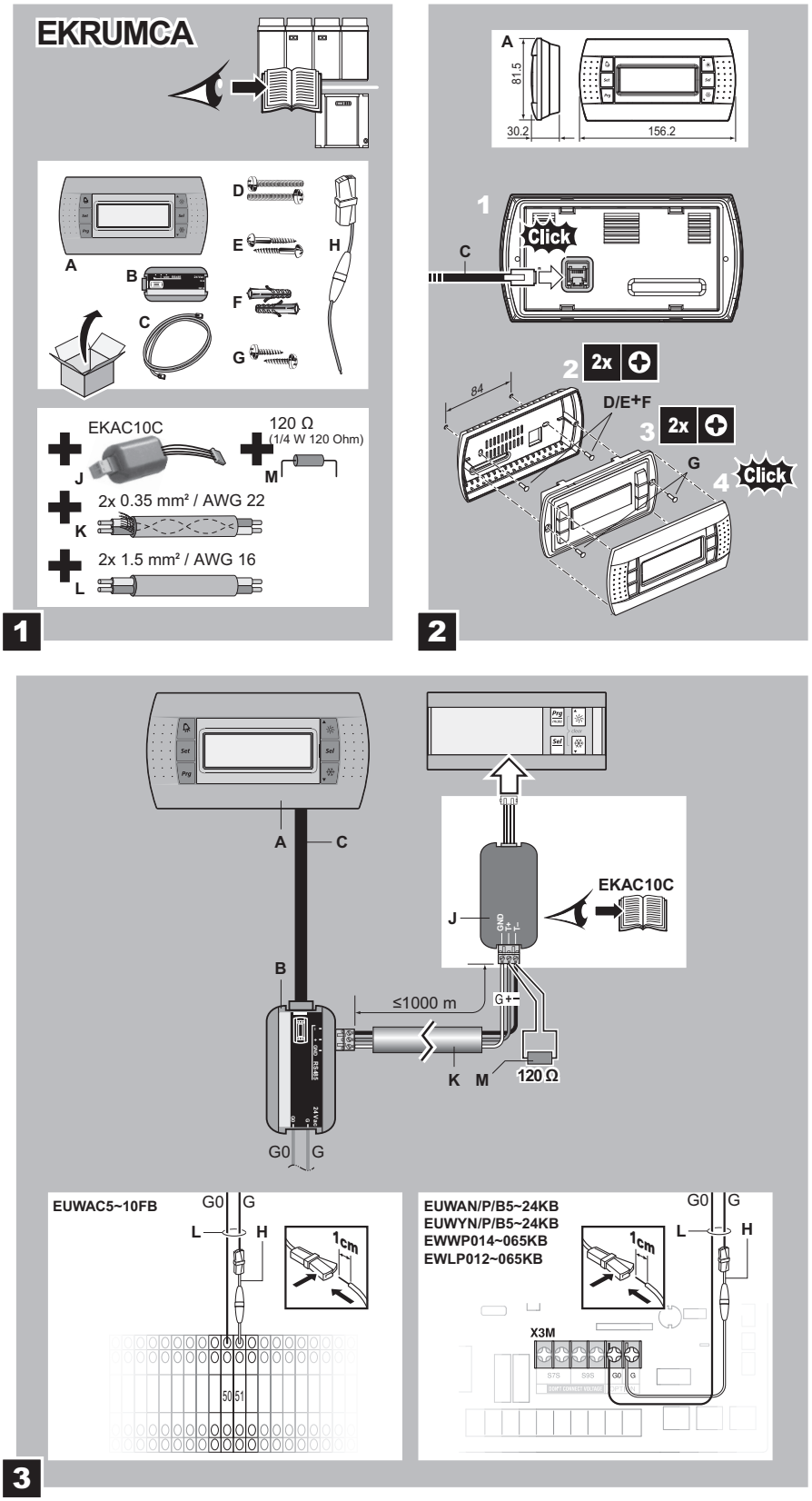
Controller settings

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)

3 The Digital Controller: EWWP090-195KAW1M

3.1 What Is in This Chapter?

Introduction

This chapter contains information on the digital controller of EWWP090-195KAW1M.

Overview

This chapter covers the following topics:

3.2 The Digital Controller

Digital controller

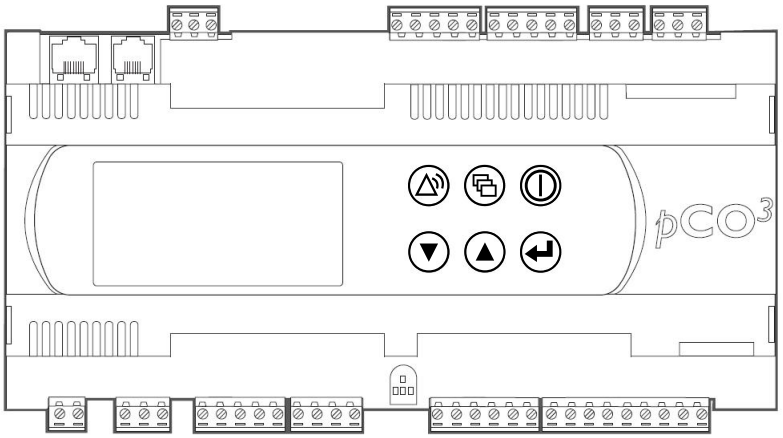
The EWWP090-195KAW1M units are equipped with a digital controller (pCO^3) offering a user-friendly way to configure, use and maintain the unit. The digital controller consists of:

- An alphanumeric LCD display
- 6 keys (4 keys light up when activated)

2

Front panel

The illustration below shows the front panel of the controller.



Symbols

The table below contains an overview of the front panel keys.

Symbol	Description	Color LED when activated
⚠	Key to enter the safeties menu or to reset an alarm.	Red
	Key to enter the main menu or to undo a parameter change.	Green
⏻	Key to start up or to shutdown the unit.	Green
↵	Key to confirm a selection or a setting.	Green
▲	Key to scroll through the screens of a menu or to change a setting.	—
▼		

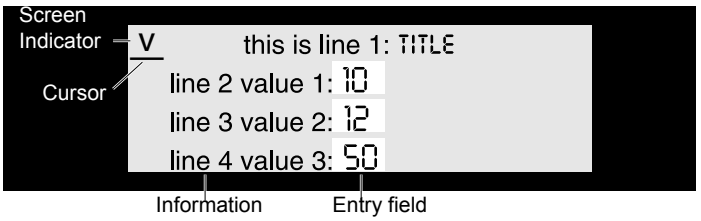
Switching screens

Each menu contains a number of screens. You can go from one screen to another using the ▲ or ▼ key. In the upper-left corner of the screen you will find a screen indicator, indicating whether there is a previous or next screen. The table below contains an overview of the screen indicators:

The screen indicator	Indicates that you can …
^	Return to the previous screen.
v	Go to the next screen.
÷	Either return to the previous screen or go to the next screen.

Screen detail

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



Make sure that the cursor is at the screen indicator position when scrolling through the screens.

To avoid damage to the LCD display of the digital controller, never switch off the power supply during winter.

3.3 Start/Stop, Cool/Heat and Temperature Settings

Power on

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

2

Remote start/stop

The procedure to start or stop the unit depends on the setting of the remote start/stop.

The remote start/stop is field supply.

How to start or stop

To start or stop the unit, proceed as follows:

Remote start/stop	Start or stop	Action	Result: ⏻ LED …
No	Start	Press ⏻	Lights up
	Stop	Press ⏻	Is OFF
Yes	Initial	Press ⏻(1)	Blinks
	Start	Pull switch remote start	Lights up
	Stop	Pull switch remote stop	Blinks

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

Emergency stop

In the event of emergency, switch off the unit by pushing the emergency stop button.

How to cool or heat

To change from cooling to heating or vice versa, enter the cooling/heating menu through the main menu. See "Cool/Heat Menu" on page 2–73.

Temperature setting

To adjust the inlet or outlet water temperature, use the set points menu. See "Set Points Menu" on page 2–49.

3.4 What Happens in Case of an Alarm?

Introduction

The units (range EWWP090-195KAW1M) are equipped with four types of safety devices:

- Unit safety
- Module safety
- Network safety
- Dual pump safety.

Overview safety devices

The table below contains an overview of all safety devices:

Type	Safety device	Description	Is safety possible with unit OFF?
Unit safety	Inlet condenser sensor error	+Er/ -Er read-out by sensor	Y
	Inlet evaporator sensor error	+Er/ -Er read-out by sensor	Y
	Reverse phase protector	Safety is activated if the digital input is closed.	Y
	Flow stopped	Safety is activated if the digital input is open longer than 5 s.	N
Module safety	Outlet evaporator sensor error	+Er/ -Er read-out by sensor	Y
	General module safety	Safety is activated if the digital input is opened.	Y
	Freeze-up module safety	Safety is activated if the digital input is closed.	Y
Network safety	PCB communication problems	Safety is activated if the network status is not OK. This is only possible if different network controllers exist.	Y
Dual pump safety	Flow stopped	Safety is activated if the digital input is open longer than 5 s.	N

Press the ⚠ key when the alarm LED is activated.
The corresponding safety screen with the basic information appears. Press the ↵ key to see the detailed information.

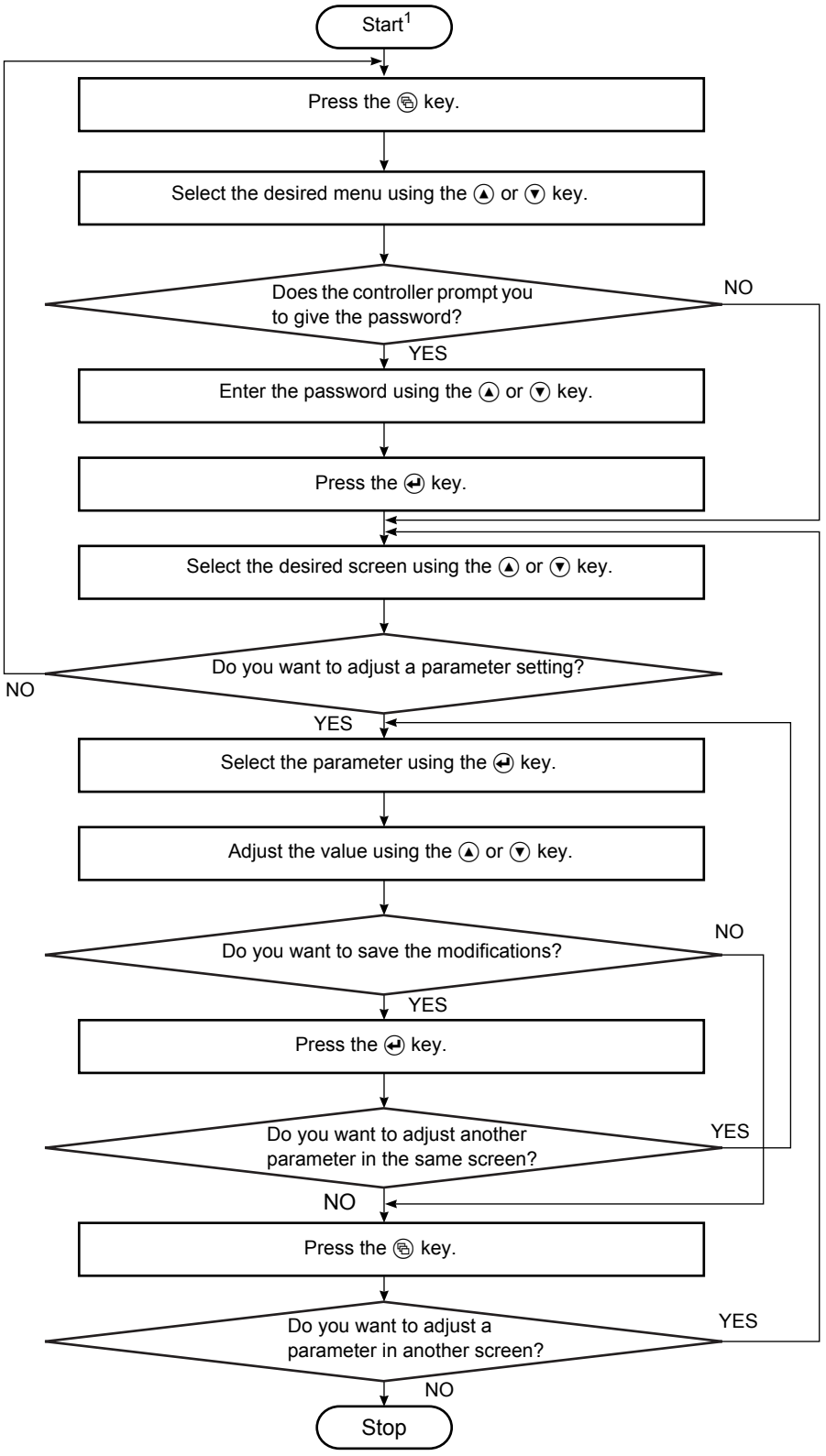
If more than one kind of safety is active (indicated by ⋰, ⋱ or ÷), use the ▲ or ▼ key to consult these safety devices.

For more information on what to do in the event of an alarm, see page 3–13.

3.5 Reading or Adjusting Parameter Settings: the Programming Procedure

Reading or adjusting

To read or adjust parameter settings, proceed as follows:



[1]: The display shows a screen of the last screen used.

3.6 Read-out Menu

Operational information

In this menu you can read the current operational information, such as the cooling set points, the inlet and outlet water temperature, the circuit status, etc. This menu allows access to five screens.

Screen 1

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

Line No.	Display	Description
1a	INLSETP1(2) E	Evaporator inlet water temperature set point (or set point 2 in case of dual set point setting).
1b	INSETP1(2) C	Condenser inlet water temperature set point (or set point 2 in case of dual set point setting).
1c	MANUAL MODE	If the controller is programmed in manual control.
2	INL WATER E	Evaporator inlet water temperature.
3	INL WATER C	Condenser inlet water temperature.
4	THERMOSTAT STEP	Indicates the capacity step (the number of steps is programmable).

Screen 2

This screen shows information about the evaporator outlet water temperature:

Line No.	Display	Description
1	EVAPORATOR	Evaporator related data.
2	M1 OUTLWATER	Evaporator outlet water temperature of module 1.
3	M2 OUTLWATER	Evaporator outlet water temperature of module 2.
	M3 OUTLWATER	Evaporator outlet water temperature of module 3. Only for EWWP145-195KAW1M.

Screen 3

This screen shows information about the status of compressors C11, C12 and C21:

Line No.	Display	Description
1	COMPRESSOR STATUS	Compressor status data.
2	C11	Status of compressor 1 of module 1.
3	C12	Status of compressor 2 of module 1.
4	C21	Status of compressor 1 of module 2.

Screen 4

This screen shows information about the status of compressors C22, C31 and C32:

Line No.	Display	Description
1	COMPRESSOR STATUS	Compressor status data.
2	C22	Status of compressor 2 of module 2.
3	C31	Status of compressor 1 of module 3.
4	C32	Status of compressor 2 of module 3.

The table below contains the possible status of a compressor:

Display	Description
ON	The compressor is running.
OFF-CAN STARTUP	The compressor is ready to start up when extra cooling is requested.
OFF-TIMERS BUSY	One of the software timers is counting. The compressor cannot start up.
OFF-SAFETY ACT.	One of the safety devices prevents starting of the compressor.
OFF-LIMIT	One or more modules are disabled, to limit the unit capacity. This can be activated with a schedule timer or as a remote digital input.
OFF-FREEZEUP DIS	One (or more) module has shutdown due to freeze-up problems.

Screen 5

This screen shows information about the compressor running hours:

Line No.	Display	Description
1	RUNNING HOURS	The compressor running hours.
2	C11: 12:	Total running hours of compressor 1 and 2 of module 1.
3	C21: 22:	Total running hours of compressor 1 and 2 of module 2.
4	C31: 32:	Total running hours of compressor 1 and 2 of module 3.

3.7 Set Points Menu

Screen 1: password

Depending on the settings in screen 11 of the user settings menu (see "User Settings Menu" on page 2–50), the system may require the password to enter the screens in this menu.

Line No.	Display	Description
1	ENTER PASSWORD	Screen title
2	PASSWORD: 0000	To enter the correct password

The units leave the factory with password 0000.

Screen 2

This menu allows you to set the inlet water temperature of the evaporator and condenser. You can adjust two sets of temperature set points. These set points will only be active in automatic control mode.

Line No.	Display	Description	Default value	Limit value	Step value
1	INLSETP1 E	Inlet water temp. set point 1 evaporator	12.0°C	8 - 23°C	0.1K
2	INLSETP2 E	Inlet water temp. set point 2 evaporator	12.0°C	8 - 23°C	0.1K
3	INLSETP1 C	Inlet water temp. set point 1 condenser	30.0°C	15 - 50°C	0.1K
4	INLSETP2 C	Inlet water temp. set point 2 condenser	30.0°C	15 - 50°C	0.1K

- The selection between evaporator and condenser inlet control is done in the COOL/HEAT menu. See "Cool/Heat Menu" on page 2–73.
- You can select set point 1 or 2 by the remote dual set point switch (if installed).
- The limit values mentioned in the table above are valid for the standard MOW (Minimum Outlet Water) setting of 5°C.
- For glycol units the lower limit of the cooling temperature set point depends on the MOW setting. The possible MOW settings for glycol units are: 2°C, 0°C, -5°C, -10°C.

3.8 User Settings Menu

Screen 1: password

A password is needed to enter this menu. The units leave the factory with password 0000.

Line No.	Display	Description
1	ENTER PASSWORD	Screen title
2	PASSWORD: 0000	To enter the correct password

To create your own password, refer to "User Password Menu" on page 2–72.

Screen 2

This screen shows information for adjusting the control settings:

Line No.	Display	Description	Possible settings
1	CONTROL SETTINGS	Screen title	
2	MODE:	To select the control mode	MANUAL CONTROL INL WATER STEP
3	C11: C12: C31:	Status of corresponding compressor (only for manual mode)	ON OFF
4	C12: C22: C32:	Status of corresponding compressor (only for manual mode)	ON OFF

For more information about selecting the control mode see the explanation of manual versus automatic control in "Thermostat Control" on page 2–9.

Screen 3

This screen shows information for adjusting the thermostat settings:

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	THERMOST.SETTINGS	Screen title				
2a	STEPS	Number of capacity steps	2	6	2	Number of modules x 2
2b	STPL.	Step length (°C)	0.4	2.0	0.1	1.5
3	STEPDIFFERENCE	Step difference (°C)	0.2	0.8	0.1	0.5
4a	LOADUP	Load-up time (s)	(1)	300	1	180
4b	LOADDOWN	Load-down time (s)	15	300	1	20

(1): The load-up time depends on the number of steps. The table below contains the load-up times.

Number of modules	Number of steps	Load-up time minimum
3	6	15 s
	4	20 s
	2	30 s
2	4	15 s
	2	20 s

For more information on thermostat control, see "Thermostat Control" on page 2–9.

Screen 4

This screen shows information for adjusting the start-up priority of the modules in case of capacity demand:

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	LEAD-LAG SETTINGS	Screen title				
2	LEAD-LAG MODE	To select the automatic or manual lead-lag mode(1)	—	—	—	AUTO
3	LEAD-LAG HOURS	To select the difference in operation time between the modules (automatic mode)	100	1000	100	100

(1): The table below contains the possible settings in manual mode depending on the quantity of modules:

Number of modules	Possible manual setting 1	Possible manual setting 2	Possible manual setting 3
2	1 > 2	2 > 1	—
3	1 > 2 > 3	2 > 3 >1	3 > 1 > 2

For more information about selecting the lead-lag mode, see "Lead-lag Control (only for EWWP090-195KAW1M)" on page 2–15.

Screen 5

This screen shows information for adjusting the capacity limitation setting of the modules through a digital input (remote switch or timer) or the schedule timer:

Line No.	Display	Description	Possible settings
1	CAP. LIM. SETTINGS	Screen title	
2	MODE:	To select the capacity limitation mode	REMOTE DIG INP. SCHEDULE TIMER
3	L1M1: 2: 3	Limitation setting 1 (per module)	ON OFF
4	L2M1: 2: 3	Limitation setting 2 (per module)	ON OFF

The setting the controller is set to, has priority on the other. The possible settings are:

- REMOTE DIG. INP.
- The capacity limitation settings programmed in the SCHEDULE TIMER,

For more information about the programming and use of the schedule timer, see screen 8 on page 2–52.

Screen 6

This screen shows information for adjusting the capacity limitation setting of the modules through a digital input (remote switch or timer) or the schedule timer:

Line No.	Display	Description	Possible settings
1	CAP. LIM. SETTINGS	Screen title	
3	L3M1: 2: 3	Limitation setting 3 (per module)	ON OFF
4	L4M1: 2: 3	Limitation setting 4 (per module)	ON OFF

For more information about the programming and use of the schedule timer, see screen 8 on page 2–52.

Screen 7

This screen shows information for adjusting the pump through the chiller controller and to adjust the pump lead-lag time.

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	PUMP CONTROL	Screen title				
2	PUMP LEAD TIME	Time the water pump runs before the chiller starts up.	020 s	180 s	1 s	020 s
3	PUMP LAG TIME	Time the water pump runs after the chiller has stopped.	000 s	180 s	1 s	000 s
4a	DAILY ON	To activate a daily pump start-up	N	Y	___	N
4b	AT	Pump start time	00h00	24h00	1 min	12h00

The user can start the pump every day to prevent obstruction of the pump and to increase the life time of the pump. The pump starts every day automatically at a set time and runs for a short time period (5 s) when the unit is OFF.

Screen 8

This screen shows information to enable or disable the schedule timer and the holiday period timer.

Line No.	Display	Description	Possible settings
1	SCHEDULE TIMER	Screen title	
2	ENABLE TIMER	Activating the possibility to work with the programmable schedule timer.	N Y
3	ENABLE HOLIDAY PER	Activating the possibility to work with the programmable holiday period timer.	N Y

New screens will be available if one or both timers possibilities are put on Y. When the user has chosen to work with a schedule timer, it is possible to define up to four groups. Days can be appointed to one of these groups.
Each group can have up to nine different actions (time periods, capacity limitation, set points, cooling/heating selection, ...). If both Timer and Holiday Period are set, the Holiday Period gets the priority.

Sub-screen 8-1 This screen appears when ENABLE TIMER is set to Y.

Line No.	Display	Description	Possible settings
1	SCHEDULE TIMER	Screen title	
2	MON: THU: SAT:	To allocate a certain group to one of these days.	-, G1, G2, G3 or G4
3	TUE: FRI: SUN:	To allocate a certain group to one of these days.	-, G1, G2, G3 or G4
4	WED:	To allocate a certain group to this day.	-, G1, G2, G3 or G4

Sub-screen 8-2 This screen appears when ENABLE TIMER is set to Y and if a group is allocated (G1 for screen below) to a certain day:

Line No.	Display	Description
1a	GROUP 1:01 TO 03	To set action 1 to 3 for one of the four groups.
1b	GROUP 1:04 TO 06	To set action 4 to 6 for one of the four groups.
1c	GROUP 1:07 TO 09	To set action 7 to 9 for one of the four groups.
2	X:00h00 - 00.0	To set one of the nine times and actions.
3	X:00h00 - 00.0	To set one of the nine times and actions.
4	X:00h00 - 00.0	To set one of the nine times and actions.

The table below contains the possible operation time settings:

Lower limit	Upper limit	Step	Default
00h00	23h59	1 min	00h00

The table below contains the possible ON/OFF settings:

Possible settings	Description
___	No action
ON	Unit ON
ON COOL	Unit ON in cooling mode
ON HEAT	Unit ON in heating mode
OFF	Unit OFF

The table below contains the possible set points settings:

Possible settings	Description	Lower limit	Upper limit	Step	Default
ISP1 E	Evaporator inlet water set point 1	08.0°C	23.0°C	0.1°C	08.0°C
ISP2 E	Evaporator inlet water set point 2	08.0°C	23.0°C	0.1°C	08.0°C
ISP1 C	Condenser inlet water set point 1	15.0°C	50.0°C	0.1°C	23.0°C
ISP2 C	Condenser inlet water set point 2	15.0°C	50.0°C	0.1°C	23.0°C

The table below contains the possible capacity limitation settings:

Possible settings	Description
LIM1	Capacity limitation 1
LIM2	Capacity limitation 2
LIM3	Capacity limitation 3
LIM4	Capacity limitation 4
NO-LIM	No capacity limitation

Sub-screen 8-3 This screen appears when ENABLE HOLIDAY is set to Y.

Line No.	Display	Description
1a	HO PERIOD:01 TO 03	To set holiday period 1 to 3.
1b	HO PERIOD:04 TO 06	To set holiday period 4 to 6.
1c	HO PERIOD:07 TO 09	To set holiday period 7 to 9.
1d	HO PERIOD:10 TO 12	To set holiday period 10 to 12.
2	X:00/00 to 00/00	To set one of the twelve holiday periods.
3	X:00/00 to 00/00	To set one of the twelve holiday periods.
4	X:00/00 to 00/00	To set one of the twelve holiday periods.

Sub-screen 8-4 This screen appears when ENABLE HOLIDAY is set to Y.

Line No.	Display	Description
1a	HOLIDAY:01 TO 03	To select the programmed holiday period 1 to 3.
1b	HOLIDAY:04 TO 06	To select the programmed holiday period 4 to 6.
1c	HOLIDAY:07 TO 09	To select the programmed holiday period 7 to 9.
2	X:00x00 - 00.0	To set one of the nine times and actions.
3	X:00x00 - 00.0	To set one of the nine times and actions.
4	X:00x00 - 00.0	To set one of the nine times and actions.

Only one group of settings is possible for all programmed holidays (max. 12).

Sub-screen 8-5 This screen appears when the Changeable Digital Output is set to 2ND EVAP PUMP:

Line No.	Display	Description	Possible settings
1	DUAL EVAP. PUMP	Screen title	
2	MODE	To select the second evaporator pump mode.	AUTOM. ROTATION PUMP 1 > PUMP 2 PUMP 2 > PUMP 1
3	OFFSET ON RH	To select the difference in operation time between the two evaporator pumps (automatic mode).	Between 024h - 999h

Screen 9 This screen allows you to set the floating set point but is not applicable for these units.

Screen 10 This screen shows information for adjusting the display settings:

Line No.	Display	Description	Possible settings
1	DISPLAY SETTINGS	Screen title	
2	LANGUAGE	To select the desired language.	ENGLISH DEUTSH FRANCAIS ESPAGNOL ITALIANO NORSK
3	TIME	To set the actual time.	00h00 - 23h59
4	DATE	To set the actual time.	MON-SUN 01/01/00 - 31/12/99

Screen 11 This screen shows information for protecting the access to the set point menu with a password:

Line No.	Display	Description	Possible settings
1	SETPOINT PASS-WORD	Screen title	
2	PASSWORD NEEDED TO CHANGE SETPOINTS	Depending on the setting, the system may require the password to enter the set point menu.	NO YES

3.9 Example of Scheduled Timer Settings

Introduction

This example shows the necessary settings to comply with the following schedule:

MON		TUE		WED		THU		FRI		SAT		SUN	
1	G1	2	G1	3	G2	4	G1	5	G1	6	G3	7	G3
8	G1	9	G1	10	G2	11	G1	12	G1	13	G3	14	G3
15	G1	16	G1	17	G2	18	G1	19	G1	20	G3	21	G3
22	G1	23	H	24	H	25	H	26	H	27	H	28	H
29	H	30	G1	31	G2								

Group settings

All days assigned to the same group will work according to the settings of this group. For this example:

- All Mondays, Tuesdays, Thursdays and Fridays work according to the settings in group 1 (G1).
- All Wednesdays work according to the settings in group 2 (G2).
- All Saturdays and Sundays work according to the settings in group 3 (G3).
- All holiday days will work according to the settings in the holiday group (H).

Screens

The following screens are visible when the necessary settings are set to comply with the schedule above.

Screen schedule timer:

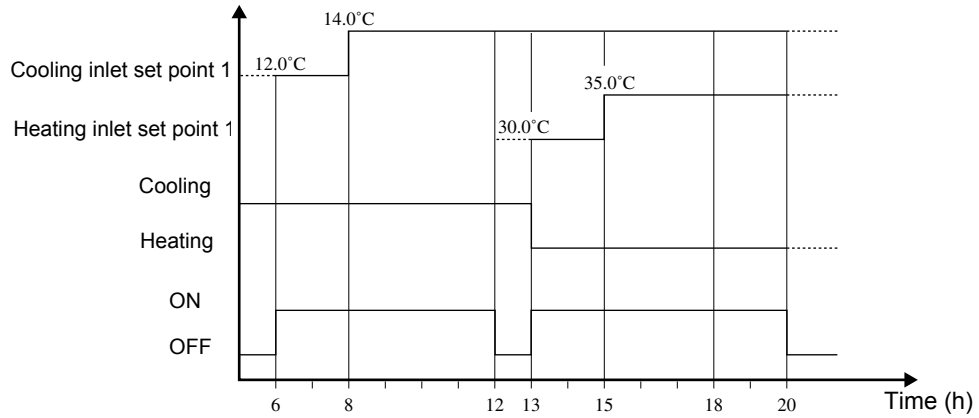
Line No.	Display
1	SCHEDULE TIMER
2	MON: G1 THU: G1 SAT: G3
3	TUE: G1 FRI: G1 SUN: G3
4	WED: G2

Screen holiday timer:

Line No.	Display
1	HD PERIOD: 01 TO 03
2	01: 23/03 TO 29/03
3	02: 00/00 TO 00/00
4	03: 00/00 TO 00/00

Figure and screens

All group settings of groups G1, G2, G3, G4 and H work similarly as in the illustration for group 1 below.



The following screens are visible for group 1:

Screen 1:

Line No.	Display
1	GROUP1: 01 TO 03
2	1: 06H00 ISP1E: 12.0
3	2: 06H00 ON COOL
4	3: 08H00 ISP1E: 14.0

Screen 2:

Line No.	Display
1	GROUP1: 04 TO 06
2	4: 12H00 OFF
3	5: 13H00 ISP1C: 30.0
4	6: 13H00 ON HEAT

Screen 3:

Line No.	Display
1	GROUP1: 01 TO 03
2	7: 15H00 ISP1C: 35.0
3	8: 20H00 OFF
4	9: 00H00 - -

3.10 Service Menu

Operational information

The service menu is accessible through the last screen of the user setting menu, to enter the service menu you need the service password. Please contact your distributor for this password. It's only possible to access the service menu when the unit is "OFF".

2

Screen 1

A password is needed to enter this menu. Enter the service password.

Screen 2

This screen shows information for adjusting the unit type, the minimum outlet water and the BMS communication interval:

Line No.	Display	Description	Possible settings	Default
1	SERVICE MENU	Screen title		
2	UNITTYPE HP	To select the unit type	32-36-40-44-48-52-56-60-64-68-72	Unit type will be set in factory.
3	MIN. OUTL. WATER	To select the minimum outlet water control	-10°C -5°C 0°C 2°C 4°C 5°C 8°C	5°C
4	FINETUNE (BMS)	To select the communication interval	From 0 s till 60 s	30 s

Depending on the setting of IGNORE MODULE 3 in screen 3 (line 4), you can select the unit range from 090 till 130 (Y) or from 145 till 195 (N).

Screen 3

This screen shows information for adjusting the low-pressure bypass timer and to ignore the module 3:

Line No.	Display	Description	Possible settings	Default
1	SERVICE MENU	Screen title		
2	LP BYPASSTIMER	To set the low-pressure bypass timer	From 0 s till 180 s	60 s
3a	PI POSS	NOT APPLICABLE FOR THIS MODULE		
3b	TIMER			
4	IGNORE MODULE	To ignore the third module.	N or Y	

Screen 4

This screen shows information for adjusting the compressor running hours (e.g. after replacing a compressor):

Line No.	Display	Description	Possible settings
1	RUNNING HOURS	Screen title	
2	C11: 12:	Read-out of actual running hours of compressor 1 and 2 of module 1	Changeable from 0000h to 9999h
3	C21: 22:	Read-out of actual running hours of compressor 1 and 2 of module 2	Changeable from 0000h to 9999h
4	C31: 32:	Read-out of actual running hours of compressor 1 and 2 of module 3	Changeable from 0000h to 9999h

Screen 5

This screen shows information for adjusting the changeable digital inputs:

Line No.	Display	Description	Possible settings
1	CHANG. DIG. INPUTS	Screen title	
2	DI1:	To set the digital input 1	NONE DUAL SETPOINT REMOTE ON/OFF REMOTE COOL/HEAT CAP. LIMIT 1 CAP. LIMIT 2 CAP. LIMIT 3 CAP. LIMIT 4
3	DI2:	To set the digital input 2	
4	DI3:	To set the digital input 3	

First check the field wiring to see if an input is installed, before you program this input.

Screen 6

This screen shows information for adjusting the changeable digital output:

Line No.	Display	Description	Possible settings
1	CHANG. DIG. OUTPUTS	Screen title	
2	DO1:	To set the digital output	REV. VALVE(C/H) 2ND EVAP PUMP CONDENSER PUMP 100% CAPACITY

First check the field wiring and output terminals to see if an output is installed, before you program this output.

2

Screen 7

This screen shows information for adjusting the offset of the probe:

Line No.	Display	Description	Lower limit	Upper limit	Step	Default
1	CHANG. DIG. OUTPUTS	Screen title				
2	AI3 INLET C:	To set the condenser water inlet temperature probe offset.	-0.5°C	+0.5°C	0.1°C	0.0°C
3	AI4 INLET E:	To set the evaporator water inlet temperature probe offset.	-0.5°C	+0.5°C	0.1°C	0.0°C

Screen 8

This screen shows information for adjusting the BMS settings:

Line No.	Display	Description	Possible settings	Default
1	BMS SETTINGS	Screen title		
2	SER. BOARD:	To select the communication protocol between the BMS and the gateway.	NONE RS485 (RS422) (RS232)	NONE
3	PROTOCOL:	Indicates the communication protocol.	CAREL MODBUS	CAREL
4	BAUD RATE:	To select the baud rate for communication between the BMS card and the gateway.	1200 2400 4800 9600 19200	1200 BPS

Screen 9

This screen shows information for activating the BMS control mode and to modify the BMS settings:

Line No.	Display	Description	Possible settings	Default
1	BMSBOARD SETTINGS	Screen title		
2	BMSCONTROL ALLOWED:	To allow BMS control.	NO/YES	NO
3	BMS ADDRESS PCB:	Used to address circuits of the unit towards the gateway.	01-32	01
4	ON LINE:	Indicates if there is communication between controller and computer.	___	NO

For more information, refer to the BMS manual.

Screen 10

This screen shows information for:

Line No.	Display	Description	Possible settings	Default
1	SERVICE MENU	Screen title		
2	IF NO FLOW AFTER PUMPLEADTIME:	When there is no flow, to select if the unit: ■ Goes into alarm ■ Waits (without alarm) till the flow starts	ALARM/STANDBY	ALARM
3				
3	MANUAL TEST PUMP:	To manually test the second pump	ON/OFF	OFF

Screen 11

This screen shows information for:

Line No.	Display	Description	Possible settings	Default
1	SERVICE MENU	Screen title		
2	FREEZE UP:	To select if you shut down the module: ■ After every freeze-up. Autoreset + no alarm (DISABLE ONLY) ■ After a number of allowed freeze-ups during a specified time. Manual reset after safety indication (DISABLE&SAFETY).	DIS&SAFETY DIS ONLY	DIS&SAFETY
3a	SAFETY:	Number of allowed freeze-ups during a specified time before the circuit stops.	1/2/3/4/5	2
3b	IN	To select the time in which a specified number of freeze-ups is allowed.	5 till 180 min	60
4	INCL CHECK AFTER RESET:	To select if the unit should check the inlet water temperature before reset.	Y/N	N

3.11 Software Timers Menu

Software timers

Using this menu you can read the value of the software timers. This menu has four screens.

Screen 1

This screen shows the value of the general software timers:

Line No.	Display	Description
1	GENERAL TIMERS	Screen title
2a	LOADUP:	Delay timer for loading up. During countdown, the unit is unable to enter a higher thermostat step (default 180 s).
2b	-DOWN:	Delay timer for loading down. During countdown, the unit is unable to enter a lower thermostat step (default 20 s).
3a	PUMPLEAD:	The time the pump must run before the chiller can start up.
3b	PUMPLAG:	The time the pump must keep running after the chiller has stopped (appears when PUMPLEAD TIME = 0).
3c	PUMPDAILY:	Countdown timer, counts if the daily pump start is activated and if the start time is reached. See screen 7 of "User Settings Menu" on page 2–50.
4	FLOWSTOP:	Delay timer that starts counting when the water flow through the evaporator stops during normal operation. If the water flow did not start during this countdown, the unit will shutdown (default: 5 s).

Screen 2

This screen shows the value of the start up difference timer:

Line No.	Display	Description
1	COMPRESSOR TIMERS	Screen title
2	COMPR. STARTED	Start up difference timer (5 s). If more than one compressor starts up at the same time, then there has to be 5 seconds between start ups.

Screen 3

This screen shows the value of the compressor timers:

Line No.	Display	Description
1	COMPRESSOR TIMERS	Screen title
2	C11 GRD: AR:	Guard timer and anti-recycling timer compressor 1 of circuit 1.
3	C12 GRD: AR:	Guard timer and anti-recycling timer compressor 2 of circuit 1.
4	C21 GRD: AR:	Guard timer and anti-recycling timer compressor 1 of circuit 2.

A guard timer is a delay timer that prevents the compressor from restarting after a shutdown (default 60 s).

An anti-recycling timer is a delay timer that prevents the compressor from restarting after the compressor has started (default: 240 s). This timer limits the number of restarts.

Screen 4

This screen shows the value of the compressor timers:

Line No.	Display	Description
1	COMPRESSOR TIMERS	Screen title
2	C22 GRD: AR:	Guard timer and anti-recycling timer compressor 2 of circuit 2.
3	C31 GRD: AR:	Guard timer and anti-recycling timer compressor 1 of circuit 3.
4	C32 GRD: AR:	Guard timer and anti-recycling timer compressor 2 of circuit 3.

A guard timer is a delay timer that prevents the compressor from restarting after a shutdown (default 60 s).

An anti-recycling timer is a delay timer that prevents the compressor from restarting after the compressor has started (default: 240 s). This timer limits the number of restarts.

3.12 Safety Menu

Safety information

The safety menu appears when a unit or module safety is activated. The safety type is displayed with a code, followed by its description.

More detailed data screens can be consulted in the basic safety menu by pressing the ↵ key.

2

Screen layout

The safety menu can have one of the following screen layouts:

Line No.	Display	Description
1a	UNIT SAFETY MODULE 1 SAFETY MODULE 2 SAFETY MODULE 3 SAFETY NETWORK SAFETY DUAL PUMP SAFETY	Indicates if you have a unit, module or network safety.
1b	RESET UNIT SAFETY RESET MOD1 SAFETY RESET MOD2 SAFETY RESET MOD3 SAFETY RESET NETW SAFETY RESET D PUMP SAFETY	After solving the problem, the alarm key starts blinking and the display indicates that resetting is possible.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.

3.13 History Menu

History information

The History menu contains all the information concerning the latest alarm shutdowns. Whenever a failure is solved and the operator performs a reset, the relevant data from the safety menu is copied into the history menu. The user can go back and check up to 20 occurred failures.

Warnings are also recorded.

The number of safeties that already occurred can be consulted on the first line of the history menu.

Screens and sub-screens

You can go from one subscreen to another and from a screen to a subscreen using the ↵ key.

The subscreens automatically disappear after 5 seconds.

Screen 1

This screen shows the unit history:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.
3	XXhXX - XX/XX/XX	Indicates time and date of safety.
4	INLSETP1 E: XXX°C INLSETP2 E: XXX°C INLSETP1 C: XXX°C INLSETP2 C: XXX°C MANUAL MODE	Indicates the mode and set point at the moment of shutdown.

Sub-screen 1-1

This screen shows information about XXXXX:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXX	Indicates the safety code and its description.
3	INL. E: XXX°C	Measured evaporator inlet temperature at the moment of shutdown.
3a	STEP:	Indicates the capacity step at the moment of shutdown.
4	INL. C: XXX°C	Measured condenser inlet temperature at the moment of shutdown.

Sub-screen 1-2 This screen shows information about XXXXX:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.
3	OUTE1: XXX°C	Actual measured evaporator outlet temperature of module 1 at the moment of shutdown.
3a	OUTE3: XXX°C	Actual measured evaporator outlet temperature of module 3 at the moment of shutdown.
4	OUTE2: XXX°C	Actual measured evaporator outlet temperature of module 2 at the moment of shutdown.

Sub-screen 1-3 This screen shows information about XXXXX:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.
3	C11:	Actual status of the first compressor of module 1 at the moment of shutdown.
3a	C21:	Actual status of the first compressor of module 2 at the moment of shutdown.
4	C12:	Actual status of the second compressor of module 1 at the moment of shutdown.

Sub-screen 1-4 This screen shows information about XXXXX:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.
3	C22:	Actual status of the second compressor of module 2 at the moment of shutdown.
3a	C32:	Actual status of the second compressor of module 3at the moment of shutdown.
4	C31:	Actual status of the first compressor of module 3 at the moment of shutdown.

Sub-screen 1-5 This screen shows information about XXXXX:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.
3	RH11:	Actual running hours of the first compressor of module 1 at the moment of shutdown.
3a	RH21:	Actual running hours of the first compressor of module 2 at the moment of shutdown.
4	RH12:	Actual running hours of the second compressor of module 1 at the moment of shutdown.

Sub-screen 1-6 This screen shows information about XXXXX:

Line No.	Display	Description
1	UNIT HISTORY: XXX MOD 1 HISTORY: XXX MOD 2 HISTORY: XXX MOD 3 HISTORY: XXX	Indicates if it was a unit failure or a module failure. XXX is the serial number of the alarm.
2	XXX:XXXXXXXXXXX	Indicates the safety code and its description.
3	RH22:	Actual running hours of the second compressor of module 2 at the moment of shutdown.
3a	RH32:	Actual running hours of the second compressor of module 3 at the moment of shutdown.
4	RH31:	Actual running hours of the first compressor of module 3 at the moment of shutdown.

3.14 Info Menu

Additional unit information

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

2

Screen 1

This screen shows the current time and date:

Line No.	Display	Description
1	TIME INFORMATION	Screen title
2	TIME: XXhXX	Current time
3	DATE: XXX XX/XX/XX	Current day and date

See “User Settings Menu” on page 50.

Screen 2

This screen shows the unit type:

Line No.	Display	Description
1	UNIT INFORMATION	Screen title
2	UNITTYPE: WW-HP-XX	Unit type (32, 36, 40, 44, 48, 52, 56, 60, 64, 68 or 72)
3	REFRIGERANT: XXX	Refrigerant type (R407C)

Screen 3

This screen shows the used software version:

Line No.	Display	Description
1	UNIT INFORMATION	Screen title
2	SW:	Indicates the software version and date.
3	SW CODE:	Indicates the software code

Screen 3

This screen shows PCB information:

Line No.	Display	Description
1	PCB INFORMATION	Screen title
2	BOOT:	Indicates boot version and date.
3	BIOS:	Indicates bios version and date.

3.15 Input /Output Menu

Reading the status of inputs and outputs

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

- Screens 1 to 3 provide status information on the digital inputs.
- Screens 4 to 7 provide status information on the relay outputs.

Screen 1

This screen shows the status of the general safety per module:

Line No.	Display	Description	Possible settings
1	DIGITAL INPUTS	Screen title	
2	M1 SAFETY:	Alarm status of module 1	OK/NOK
3	M2 SAFETY:	Alarm status of module 2	OK/NOK
4	M3 SAFETY:	Alarm status of module 3	OK/NOK

A module safety can be a high- or low-pressure safety, a discharge thermal protector safety or an overcurrent safety.

For more information, see "Inputs and Outputs Overview: EWWP090-195KAW1M" on page 3–6.

Screen 2

This screen shows the status of the flow switch and the reverse phase protector:

Line No.	Display	Description	Possible settings
1	DIGITAL INPUTS	Screen title	
2	FLOWSWITCH:	Status of flow switch	FLOW OK/NO FLOW
3	REV.PHASE PR.:	Status of reverse phase protector	OK/NOT OK

For more information, see "Inputs and Outputs Overview: EWWP090-195KAW1M" on page 3–6.

Screen 3

This screen shows the status of the flow switch and the reverse phase protector:

Line No.	Display	Description	Possible settings	Default
1	CHANG. DIG. INPUTS	Screen title		
2	DI1 XXXX:XXXX	Changeable digital input 1 + status of input	NONE DUAL SETPOINT REMOTE ON/OFF REMOTE COOL/HEAT CAP. LIMIT 1 CAP. LIMIT 2 CAP. LIMIT 3 CAP. LIMIT 4	SETP.1/SETP.2 ON/OFF COOL/HEAT NO LIM/LIMIT 1 NO LIM/LIMIT 2 NO LIM/LIMIT 3 NO LIM/LIMIT 4
3	DI2 XXXX:XXXX	Changeable digital input 2 + status of input		
4	DI3 XXXX:XXXX	Changeable digital input 3 + status of input		

For more information, see "Inputs and Outputs Overview: EWWP090-195KAW1M" on page 3–6.

Screen 4

This screen shows the status of the compressor relays:

Line No.	Display	Description	Possible settings
1	RELAY OUTPUTS	Screen title	
2	C11: X C12:X	Indicates the status of the first and second compressors of circuit 1	ON/OFF
3	C21: X C22: X	Indicates the status of the first and second compressors of circuit 2	ON/OFF
4	C31: X C32: X	Indicates the status of the first and second compressors of circuit 3	ON/OFF

For more information, see "Inputs and Outputs Overview: EWWP090-195KAW1M" on page 3–6.

Screen 5

This screen shows the status of the low-pressure bypass relays:

Line No.	Display	Description	Possible settings
1	RELAY OUTPUTS	Screen title	
2	LPBYPASS1:	Indicates the status of the low-pressure bypass relays of module 1	OPEN/CLOSED
3	LPBYPASS2:	Indicates the status of the low-pressure bypass relays of module 2	OPEN/CLOSED
4	LPBYPASS3:	Indicates the status of the low-pressure bypass relays of module 3	OPEN/CLOSED

The low-pressure bypass time can be adapted in screen three of the service menu. See "Service Menu" on page 2–58.

Screen 6

This screen shows the status of the general alarm and the pump contacts:

Line No.	Display	Description	Possible settings
1	RELAY OUTPUTS	Screen title	
2	GEN. ALARM:	Indicates the status of the general alarm contact	OPEN/CLOSED
3	PUMP:GEN OPER:	Indicates the status of the pump contact	OPEN/CLOSED

For more information, see "Inputs and Outputs Overview: EWWP090-195KAW1M" on page 3–6.

Screen 7

This screen shows the status of the changeable digital output:

Line No.	Display	Description	Possible settings	Default
1	CHANG. REL INPUTS	Screen title		
2	001 XXXXXXX	Changeable digital output 1 + status of output	REV. VALVE (C/H) SECOND EVAP PUMP CONDENSER PUMP 100% CAPACITY	O/C (Open/Closed)

For more information, see "Inputs and Outputs Overview: EWWP090-195KAW1M" on page 3–6.

3.16 User Password Menu

Password

The password protects the access to:

- the user settings menu
- the set points menu

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

The units leave the factory with user password 0000.

Screen 1

In this screen you must set a pre-defined password to change it to an other password.

Line No.	Display	Description	Possible settings
1	ENTER PASSWORD	Screen title	
3	PASSWORD: 0000	To set a pre-defined password	From 0000 till 99999

Screen 2

In this screen you can change the password:

Line No.	Display	Description	Possible settings
1	ENTER PASSWORD	Screen title	
2	NEW PASSWORD:	To set the new password	From 0000 till 99999
3	CONFIRM:	To confirm the new password	From 0000 till 99999

3.17 Cool/Heat Menu

Screen 1

This screen shows information for selecting the cooling or heating mode:

Line No.	Display	Description	Possible settings
1	COOLING/HEATING	Screen title	
2	__	__	__
3	MODE:	To select cooling or heating mode.	COOLING (EVAP) HEATING (COND)

Select the cooling or heating mode via a changeable digital input (see screen 5 of "Service Menu" on page 2–58) or direct via the controller display.

Part 3
Troubleshooting

Introduction

The small water chillers EWWP014-065KBW1N and EWLP012-065KBW1N 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.

The water chillers EWWP090-195KAW1M are equipped with a carel pCO^3 controller. This controller uses 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 controller 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 of the µC2SE Controller: EWWP014-065KBW1N or EWLP012-065KBW1N

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 EWWP014-065KBW1N and EWLP012-065KBW1N" on page 1–53
- "Wiring Diagram: EWWP014-065KBW1N and EWLP012-065KBW1N" on page 1–57.

Type	Device	Wiring diagram symbol	Wiring connection terminal	Error code	Description
Analog input	Sensor	R3T	X1/B1-GND	E1	Inlet water temperature sensor evaporator
		R4T	X1/B2-GND	E2	Outlet water temperature sensor evaporator
		R5T	X1/B3-GND	E3	Inlet water temperature sensor condenser
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
		H1P (field)	X2C5-NO5	—	Indication lamp alarm

1.3 Inputs/outputs overview of the I/O PCB: EWWP014-065KBW1N and EWLP012-065KBW1N

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
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

1.4 Inputs and Outputs Overview: EWWP090-195KAW1M

Inputs/outputs

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

Type	Device	Wiring diagram symbol	Wiring connection terminal	Description
Analog input	Sensor	R3T	J2 (GND-B1)	Inlet water temperature sensor evaporator
		R4T	J2 (GND-B2)	Outlet water temperature sensor evaporator A (freeze-up sensor)
			J3 (BC4-B4)	Outlet water temperature sensor evaporator B (freeze-up sensor)
			J3 (BC5-B5)	Outlet water temperature sensor evaporator C (freeze-up sensor)
		R5T	J2 (GND-B3)	Inlet water temperature sensor condenser
Digital input	Trans-ducer	R1P	J5 (ID4-IDC)	Reverse phase protection
		K1A		Alarm auxiliary contactor
		K4S, K5S		Overcurrent relay (M1C, M2C)
		QID, Q2D		Discharge thermal protector (M1C, M2C)
	Contacts	S1HP, S2HP		High-pressure switch
		S4LP, S5LP		Low-pressure switch
		S7S (field)	J5 (ID6-IDC1)	Changeable switch for remote function (dual set point, remote start/stop, remote cool/heat, cap. lim. 1..4)
		S8S (field)	J5 (ID7-IDC1)	Changeable switch for remote function (dual set point, remote start/stop, remote cool/heat, cap. lim. 1..4)
		S9S (field)	J5 (ID8-IDC1)	Changeable switch for remote function (dual set point, remote start/stop, remote cool/heat, cap. lim. 1..4)
		S10L (field)	J5 (ID5-IDC)	Flow switch
		S11L (field)	J5 (ID5-IDC)	Pump contact
Digital output	—	K1M	—	Compressor M1C contactor
		K2M	—	Compressor M2C contactor
		H3	J12 (C1-NO1)	Operation compressor 1 of module A indication lamp
		H4	J12 (C1-NO2)	Operation compressor 2 of module A indication lamp
		H5	J12 (C1-NO3)	Operation compressor 1 of module B indication lamp
		H6	J13 (C4-NO4)	Operation compressor 2 of module B indication lamp
		H7	J13 (C4-NO5)	Operation compressor 1 of module C indication lamp
		H8	J13 (C4-NO6)	Operation compressor 2 of module C indication lamp

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: EWWP014-065KBW1N and EWLP012-065KBW1N

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	

Code	Description	Alarm/ Warning	Reset	See page
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.				
LP1	indicates that the low pressure switch is activated.	Alarm	Manual	3–11
tEr	indicates that there is a remote user interface communication error.	Alarm	Manual	
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	
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: EWWP014-065KBW1N and EWLP012-065KBW1N

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 For EWWP014-065KBW1N, EWWP090-195KAW1M and EWLP012-065KBW1N with serial > 42xxxxx ■ Standard: 3.0 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 ■ temp. < -12°C ■ temp. < -6.5°C	Standard ZL option 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

Alarm description	Alarm indication	Activation	Reset	Wiring code	Device
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" on page 3–21.

3

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.

2.4 Malfunction Indications Overview: EWWP090-195KAW1M

What happens in the event of an alarm

The units are equipped with three kinds of safety devices:

- Unit alarm
- Module alarm
- Dual Pump alarm

In the event of an alarm, the following happens:

	Unit alarm	Module alarm	Dual Pump alarm
Function	Protects the whole unit	Protects the individual modules	Indicates the dual evaporator pump status
Description	■ All units are shutdown ■ The red LED inside the key lights up	■ The compressor of the corresponding module is shutdown ■ The red LED inside the key lights up	■ A malfunction of one of the two evaporator pumps
Examples display	■ A0E: FLOW HAS STOPPED ■ 0U1: REVERSE PHASE PR ■ 0HC: INL C SENSOR ERR ■ 0C9: INL E SENSOR ERR	■ 1CA: OUT E SENSOR ERR ■ 1E0: GENERAL SAFETY ■ 1A4: FREEZE-UP PROT.	■ A0E: FLOW HAS STOPPED

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	Press ⚠ to acknowledge the alarm.	■ The ⚠ LED starts blinking. ■ A unit, circuit or dual pump safety is displayed.
2	Find the cause of the alarm and correct it.	The system has been repaired.
3	Reset the alarm manually by pressing ⚠.	■ The ⚠ LED stops blinking. ■ The alarm screen is deactivated ■ The main menu screen is displayed automatically.
4	If all modules were shutdown: Switch on the unit by pressing ⚠.	The unit starts again.

2.5 Safeties Overview: EWWP090-195KAW1M

Unit safeties The table below contains an overview of the unit safeties.

Alarm description	Alarm indication	Activation	Reset	Wiring code	Device
Flow switch or pump contact	0A6: FLOW HAS STOPPED	No flow for 5 s.	Manual software reset	S10L (field supply)	Contact closed on flow
Reverse phase protector	0U1: REVERSE PHASE PR	■ Single phasing ■ Imbalance of more than 20% between the phases ■ Reversed phases ■ No power supply	Correct phase sequence, switch power back ON	R1P	Contact ON/OFF
Inlet condenser sensor error	0HC: INL C SENSOR ERR	■ Out of sensor range ■ Connection broken or disconnected	Manual software reset	R5T	NTC sensor
Inlet evaporator sensor error	0C9: INL E SENSOR ERR	■ Out of sensor range ■ Connection broken or disconnected	Manual software reset	R3T	NTC sensor

Module safeties The table below contains an overview of the module safeties.

Alarm description	Alarm indication	Activation	Reset	Wiring code	Device
Outlet evaporator sensor error	1/2/3CA: OUT E SENSOR ERR	■ Out of sensor range ■ Connection broken or disconnected	Manual software reset	R4T	NTC sensor
General safety	1/2/3E0: GENERAL SAFETY	■ Compressor discharge temp. > 135°C ■ Overcurrent contact closed ■ HP > 30.9 bar	Manual software reset	Q1D, Q2D K4S, K5S S1HP, S2HP	NTC sensor Relais Pressure switch
Freeze-up protection	1/2/3A4: FREEZE-UP PROT.	Evaporator outlet water temp. < MOW-1K	Manual software reset	R4T	NTC sensor

Network safety The table below contains an overview of the network safety.

Alarm description	Alarm indication	Activation	Reset	Wiring code	Device
PCB communication problems	0U4: PCB COMM. PROBLEM	Network is NOK (only possible if a network of different controllers exists)	Manual software reset	—	PCB

Dual pump safety The table below contains an overview of the dual pump safety.

Alarm description	Alarm indication	Activation	Reset	Wiring code	Device
Flow switch or pump contact	ORE: FLOW HAS STOPPED	No flow for 5 s.	Manual software reset	S10L (field supply)	Contact closed on flow

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 / controller or an output device.

Temperature sensors

The following sensors of the EWWP014-065KBW1N and EWLP012-065KBW1N are connected to the I/O PCB: R3T, R4T and R5T.

All temperature sensors of the EWWP090-195KAW1M are connected to the pCO^3 controller (no I/O PCB used in this unit).

How to check

To check the temperature sensors, proceed as follows:

Step	Action
1	Disconnect the sensor from the I/O PCB or controller.
2	Measure the temperature and the resistance value.
3	Check whether the measured values correspond with the values in the appropriate table: "Water Sensors: R3T, R4T and R5T" on page 3–19.

3.3 Water Sensors: R3T, R4T and R5T

Temp.-resistance The table below contains the temperature resistance values of the controller sensors.

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
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
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
—			

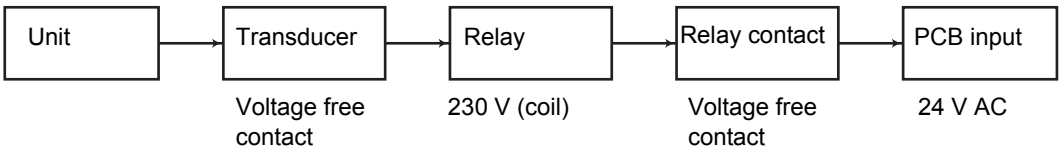
3.4 Checking the Digital Inputs and Outputs

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

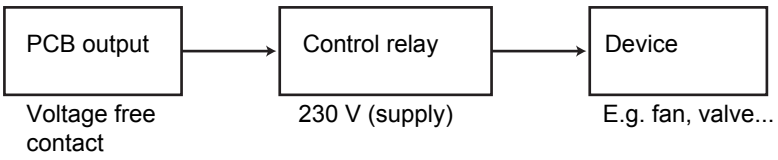
The block diagram below shows the digital input route from the transducer (e.g. thermostat, pressostat, reverse phase, etc.) to the PCB input.



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.



3.5 Checking the Power Supply and Fuses

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	F1U F4
Control circuit controller	TR1-sec.	24 V AC	F3U, F5U
Control circuit (pump)	X1M 8-7	24 V AC	F6

Overview fuses and overcurrent

The table below contains an overview of the fuses and overcurrent for types EWWP014-065KBW1N and EWLP012-065KBW1N.

All models (400 V)							
Fuses + overcurrent	014	022	028	035	045	055	065
F1, F2, F3 (=gL/gG)	3 X 16 A	3 X 20 A	3 X 25 A	3 X 32 A	3 X 40 A	3 X 50 A	3 X 50 A
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
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	14 A	18 A	20 A	14 A	18 A	20 A
K5S	___	___	___	___	14 A	18 A	20 A

3.6 Electrical Error Overview: EWWP014-065KBW1N and EWLP012-065KBW1N

Introduction

This map gives an overview of the most common electrical errors that can occur on the EWWP014-065KBW1N and EWLP012-065KBW1N.

See also "Wiring Diagram: EWWP014-065KBW1N and EWLP012-065KBW1N" on page 1–57.

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).
LP 1	OFF	OFF	Low pressure	■ Low pressure switch 1	S4LP	X63A	Check S4LP.
				■ Low pressure switch 2	S5LP	X64A	Check S5LP.

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 EWWP014-065KBW1N and EWLP012-065KBW1N)	■ 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 2-8.
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

Malfunction	Possible causes	Items to be checked
High-pressure switch	■ Dirty or blocked condenser ■ Operation out of range ■ Water flow too low in heating ■ Water temperature too high in heating	■ State of the condenser (clean) ■ Pump operation ■ Water flow (blocked valves) ■ Flow switch operation ■ Operation condition: leaving condenser water temperature
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
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: EWWP014-065KBW1N and EWLP012-065KBW1N

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.	<table><tr><th>If...</th><th>Then...</th></tr><tr><td>The controller is installed and correctly wired</td><td>The temperature of sensor 1 appears.</td></tr></table>
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 S-P.
5	Press SEL.	You have entered the S-P menu (read and modify values of parameters).

For more information on the controller, see "The Digital Controller: EWWP014-065KBW1N and EWLP012-065KBW1N" on page 2–23.

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 (level type (L-P): D= Direct / U= User / S= super user / F= factory)	Default value (S-P)	Unit of measurement	EW(W/L)P014-022-028-35K* standard	EW(W/L)P014-022-028-35K* OP ZL	EW(W/L)P014-022-028-35K* OP ZH	EW(W/L)P045-055-065K* standard	EW(W/L)P045-055-065K* OP ZL	EW(W/L)P045-055-065K* OP ZH
(/*)									
/03	Probe type B3	1	-	1	1	1	1	1	1
(A*)									
A01	Antifreeze-alarm set-point	4	°C	4	-12	-6.5	4	-12	-6.5
A02	Antifreeze-alarm hysteresis	3.5	°C	3.5	3.5	3.5	3.5	3.5	3.5
H*									
H01	Unit type	2	-	6	6	6	6	6	6
H04	Number of comp/circuit	0	-	0	0	0	1	1	1
H11	Output modes	0	-	0	0	0	9	9	9
r*									
r13	Min. cooling setpoint	7	°C	8	-7	-2	8	-7	-2
r14	Max. cooling setpoint	25	°C	25	25	25	25	25	25
r15	Min. heating setpoint	25	°C	15	15	15	15	15	15
r16	Max. heating setpoint	80	°C	50	50	50	50	50	50

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 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 (level type (L-P): D= Direct / U= User / S= super user / F= factory)	SW version	default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Modified default value (S-P)	Unit of measurement	EW(W/L)P014-022-028-35K* standard	EW(W/L)P014-022-028-35K* OP ZL	EW(W/L)P014-022-028-35K* OP ZH	EW(W/L)P045-055-065K* standard	EW(W/L)P045-055-065K* OP ZL	EW(W/L)P045-055-065K* OP ZH	R/W	suprvis. Variable	Modbus	Type
	1. Probe setting parameters (/*)														-	-	-
/01	Probe type B1	1.9	F	F	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	R/W	2	2	DIG
/03	Probe type B3	1.9	F	F	0	**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	R/W	15	222	INT
/13	Probe B1 calibration	1.9	F	F	0	0	°C/°F	0	0	0	0	0	0	R/W	3	3	ANA
/14	Probe B2 calibration	1.9	F	F	0	0	°C/°F	0	0	0	0	0	0	R/W	4	4	ANA
/15	Probe B3 calibration	1.9	F	F	0	0	°C/°F	0	0	0	0	0	0	R/W	5	5	ANA
/16		1.9	F	F	0	0	°C/°F	-	-	-	-	-	-	-	-	-	-
/21	Digital filter	1.9	U	**F**	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	R/W	21	228	INT
/23	Measurement unit	1.9	U	U	0	0	-	0	0	0	0	0	0	R/W	5	5	DIG
	2. Antifreeze/supporting heater setting parameters (A*)														-	-	-
A01	Antifreeze-alarm setpoint	1.9	U	**F**	3	**4**	°C	4	**-12**	**-7**	4	**-12**	**-7**	R/W	11	11	ANA
A02	Antifreeze-alarm hysteresis	1.9	U	**F**	5	**3.5**	°C	3,5	3,5	3,5	3,5	3,5	3,5	R/W	12	12	ANA
A03	Bypasstime for antifreeze alarm	1.9	U	**F**	0	0	sec	0	0	0	0	0	0	R/W	22	229	ANA
A04	Antifreeze heater setpoint	1.9	U	**F**	5	**4**	°C	-	-	-	-	-	-	R/W	13	13	ANA
A05	Antifreeze heater hysteresis	1.9	U	**F**	1	**3**	°C	-	-	-	-	-	-	R/W	14	14	ANA
A06	Supporting heaters probe	1.9	F	F	0	0	-	-	-	-	-	-	-	R/W	6	6	DIG
A07	Limit antifreeze alarm set	1.9	F	F	-40	**-15**	°C	-15	-15	-15	-15	-15	-15	R/W	15	15	ANA
A08		1.9	U	**F**	25	25	°C	-	-	-	-	-	-	R/W	16	16	ANA
A09		1.9	U	**F**	3	3	°C	-	-	-	-	-	-	R/W	17	17	ANA
A10		1.9	U	**F**	0	0	°C	-	-	-	-	-	-	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	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

Parameter code	Description (level type (L-P): D= Direct / U= User / S= super user / F= factory)	SW version	default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Modified default value (S-P)	Unit of measurement	EW(W/L)P014-022-028-35K* standard	EW(W/L)P014-022-028-35K* OP ZL	EW(W/L)P014-022-028-35K* OP ZH	EW(W/L)P045-055-065K* standard	EW(W/L)P045-055-065K* OP ZL	EW(W/L)P045-055-065K* OP ZH	R/W	suprvis. Variable	Modbus	Type
	4. Compressor setting parameters (c*)														-	-	-
c01	Min. ON time	1.9	U	**F**	60	**0**	sec	0	0	0	0	0	0	R/W	25	232	INT
c02	Min. OFF time	1.9	U	**F**	60	60	sec	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	**240**	sec	**360**	240	240	**360**	240	240	R/W	27	234	INT
c04	Start delay between the two compressor	1.9	U	**F**	10	**5**	sec	-	-	-	5	5	5	R/W	28	235	INT
c05	Stop delay between the two compressor	1.9	U	**F**	0	0	sec	-	-	-	0	0	0	R/W	29	236	INT
c06	Time-delay at startup	1.9	U	**F**	0	0	sec	0	0	0	0	0	0	R/W	30	237	INT
c07	On delay pump-compr	1.9	U	U	20	**15**	sec	15	15	15	15	15	15	R/W	31	238	INT
c08	OFF delay pump-compr	1.9	U	U	1	**0**	min	0	0	0	0	0	0	R/W	32	239	INT
c09	Max. compressor operating time in tandem	1.9	U	**F**	0	0	min	0	0	0	0	0	0	R/W	33	240	INT
c10	compressor 1 timer	1.9	D	D	0	0	100h	-	-	-	-	-	-	R	122	122	ANA
c11	compressor 2 timer	1.9	D	D	0	0	100h	-	-	-	-	-	-	R	123	123	ANA
c12	compressor 3 timer	1.9	D	**F**	0	0	100h	-	-	-	-	-	-	R	124	124	ANA
c13	compressor 4 timer	1.9	D	**F**	0	0	100h	-	-	-	-	-	-	R	125	125	ANA
c14	Operating timer threshold	1.9	U	U	0	0	100h	0	0	0	0	0	0	R/W	34	241	INT
c15	evaporator pump/fan 1 working hour	1.9	D	D	0	0	100h	-	-	-	-	-	-	R	126	126	ANA
c16	condensor backup pump/fan 2 working hour	1.9	D	**F**	0	0	100h	-	-	-	-	-	-	R	127	127	ANA
c17	Min. time between two pump starts	1.9	U	**F**	30	30	min	-	-	-	-	-	-	R/W	35	242	INT
c18	Min. pump ON time	1.9	U	**F**	3	3	min	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	-	-	-	-	-	-	-	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	R/W	10	10	DIG
F16		1.9	F	F	0	0	msec	-	-	-	-	-	-	-	-	-	-
F17		1.9	F	F	0	0	-	-	-	-	-	-	-	-	-	-	-

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

Parameter code	Description (level type (L-P): D= Direct / U= User / S= super user / F= factory)	SW version	default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Modified default value (S-P)	Unit of measurement	EW(W/L)P014-022-028-35K* standard	EW(W/L)P014-022-028-35K* OP ZL	EW(W/L)P014-022-028-35K* OP ZH	EW(W/L)P045-055-065K* standard	EW(W/L)P045-055-065K* OP ZL	EW(W/L)P045-055-065K* OP ZH	R/W	suprvis. Variable	Modbus	Type
	7. Unit setting parameters (H*)														-	-	-
H01	Unit type	1.9	F	F	2	2	-	**6**	**6**	**6**	**6**	**6**	**6**	R/W	54	261	INT
H02	Number of condensers	1.9	F	F	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	R/W	13	13	DIG
H04	Number of comp per circuit	1.9	F	F	0	0	-	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	R/W	56	263	INT
H06	Cooling/heating input	1.9	U	U	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	R/W	15	15	DIG
H08	network configuration	1.9	F	F	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	R/W	16	16	DIG
H10	Serial address	1.9	U	U	1	1	-	1	1	1	1	1	1	R/W	58	265	INT
H11	Output modes	1.9	F	F	0	0	-	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	R/W	60	267	INT
H14		1.9	F	F	2.0	2.0	-	-	-	-	-	-	-	-	-	-	-
H15		1.9	F	F	30	30	-	-	-	-	-	-	-	-	-	-	-
H16	activate autotuning	1.9	F	F	0	0	-	0	0	0	0	0	0	R/W	22	22	DIG
H17		1.9	F	F	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
H18		1.9	F	F	80	80	-	-	-	-	-	-	-	-	-	-	-
H19		1.9	F	F	80	80	-	-	-	-	-	-	-	-	-	-	-
H21	second pump function	1.9	F	F	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	R/W	18	18	DIG
H23	Enable modbus	19	F	**U**	0	0	-	0	0	0	0	0	0	R/W	11	11	DIG
	8. Alarm setting parameters (P*)														-	-	-
P01	Flowstarttimer	1.9	U	**F**	20	20	sec	20	20	20	20	20	20	R/W	63	270	INT
P02	Flowstoptimer	1.9	U	**F**	5	5	sec	5	5	5	5	5	5	R/W	64	271	INT
P03	LP bypass timer	1.9	U	**F**	40	**60**	sec	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	R/W	67	274	INT
P06	cooling/heating logic	1.9	F	F	0	**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	R/W	69	276	INT
P09	DI2 selection	1.9	F	**U**	0	**9**	-	9	9	9	9	9	9	R/W	70	277	INT
P13		1.9	F	F	0	0	-	-	-	-	-	-	-	-	-	-	-
P15	LP alarm when the compr. is OFF	1.9	F	F	0	0	-	0	0	0	0	0	0	R/W	76	283	INT
P16		1.9	U	**F**	80	80	°C	-	-	-	-	-	-	-	-	-	-
P17		1.9	U	**F**	30	30	min	-	-	-	-	-	-	-	-	-	-
P19		1.9	U	**F**	10	10	-	-	-	-	-	-	-	-	-	-	-
P20	Enable system start-up protection	1.9	U	**F**	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	R/W	8	8	DIG
P22		1.9	U	**F**	40	40	sec	-	-	-	-	-	-	-	-	-	-

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

Parameter code	Description (level type (L-P): D= Direct / U= User / S= super user / F= factory)	SW version	default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Modified default value (S-P)	Unit of measurement	EW(W/L)P014-022-028-35K* standard	EW(W/L)P014-022-028-35K* OP ZL	EW(W/L)P014-022-028-35K* OP ZH	EW(W/L)P045-055-065K* standard	EW(W/L)P045-055-065K* OP ZL	EW(W/L)P045-055-065K* OP ZH	R/W	suprvis. Variable	Modbus	Type
P23		1.9	U	**F**	40	40	sec	-	-	-	-	-	-	-	-	-	-
P25		1.9	U	**F**	0	0	-	-	-	-	-	-	-	-	-	-	-
P26		1.9	U	**F**	0	0	-	-	-	-	-	-	-	-	-	-	-
P27		1.9	U	**F**	0	0	-	-	-	-	-	-	-	-	-	-	-
P28		1.9	U	**F**	0	0	-	-	-	-	-	-	-	-	-	-	-
P34	Select digital input 5	1.9	F	**U**	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	R/W	23	23	DIG
P36	type of HP alarm management	1.9	U	**F**	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	12	°C	12	12	12	12	12	12	R/W	41	41	ANA
r02	Cooling hysteresis	1.9	D	D	3	3	°C	3	3	3	3	3	3	R/W	42	42	ANA
r03	Heating setpoint	1.9	D	D	40	**30**	°C	30	30	30	30	30	30	R/W	43	43	ANA
r04	Heating hysteresis	1.9	D	D	3	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	R/W	78	285	INT
r06	type of compressor control	1.9	F	F	0	0	°C	0	0	0	0	0	0	R/W	79	286	INT
r07		1.9	F	F	2	2	°C	-	-	-	-	-	-	-	-	-	-
r08		1.9	F	F	120	120	°C	-	-	-	-	-	-	-	-	-	-
r09		1.9	F	F	100	100	s	-	-	-	-	-	-	-	-	-	-
r10		1.9	F	F	120	120	s	-	-	-	-	-	-	-	-	-	-
r11		1.9	F	F	100	100	s	-	-	-	-	-	-	-	-	-	-
r12		1.9	F	F	20	20	°C	-	-	-	-	-	-	-	-	-	-
r13	Min. cooling set point	1.9	U	**F**	-40	**7**	°C	**8**	**-7**	**-2**	**8**	**-7**	**-2**	R/W	47	47	ANA
r14	Max. cooling set point	1.9	U	**F**	80	**25**	°C	25	25	25	25	25	25	R/W	48	48	ANA
r15	Min. heating set point	1.9	U	**F**	-40	**25**	°C	15	15	15	15	15	15	R/W	49	49	ANA
r16	Max. heating setpoint	1.9	U	**F**	80	**45**	°C	**50**	**50**	**50**	**50**	**50**	**50**	R/W	50	50	ANA
r17	Cooling compensation constant	1.9	U	**F**	0	0	-	0	0	0	0	0	0	R/W	51	51	ANA
r18		1.9	U	**F**	3	3	°C	-	-	-	-	-	-	-	-	-	-
r19		1.9	U	**F**	300	300	°C	-	-	-	-	-	-	-	-	-	-
r20		1.9	U	**F**	0	0	°C	-	-	-	-	-	-	-	-	-	-
r21	second cooling setp from ext contact	1.9	D	D	12	12	°C	12	12	12	12	12	12	R/W	55	55	ANA
r22	second heating setp from ext contact	1.9	D	D	40	**30**	°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	R/W	84	291	INT
r24		1.9	D	**F**	400	400	°C	-	-	-	-	-	-	-	-	-	-
r25	Outside temp set point to stop compressors	1.9	D	**F**	-40	-40	°C	-40	-40	-40	-40	-40	-40	R/W	65	65	ANA
r26		1.9	D	**F**	120	120	-	-	-	-	-	-	-	-	-	-	-
r27	Buffer tank suppression (low load)	1.9	F	F	0	0	-	0	0	0	0	0	0	R/W	88	295	INT
r28		1.9	F	F	60	60	-	-	-	-	-	-	-	-	-	-	-

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

Parameter code	Description (level type (L-P): D= Direct / U= User / S= super user / F= factory)	SW version	default level type (L-P)	Modified level type (L-P)	Carel default value (S-P)	Modified default value (S-P)	Unit of measurement	EW(W/L)P014-022-028-35K* standard	EW(W/L)P014-022-028-35K* OP ZL	EW(W/L)P014-022-028-35K* OP ZH	EW(W/L)P045-055-065K* standard	EW(W/L)P045-055-065K* OP ZL	EW(W/L)P045-055-065K* OP ZH	R/W	suprvis. Variable	Modbus	Type
r29		1.9	F	F	30	30	-	-	-	-	-	-	-	-	-	-	-
r30		1.9	F	F	30	30	-	-	-	-	-	-	-	-	-	-	-
r31	Heating compensation constant	1.9	U	**F**	0	0	-	0	0	0	0	0	0	R/W	60	60	ANA
r32		1.9	D	**F**	120	120	-	-	-	-	-	-	-	-	-	-	-
r33		1.9	F	F	30	30	-	-	-	-	-	-	-	-	-	-	-
r34	Enable freecooling / freeheating	1.9	F	F	0	0	-	0	0	0	0	0	0	R/W	116	323	INT
r35		1.9	F	F	240	240	-	-	-	-	-	-	-	-	-	-	-
r36		1.9	F	F	20	20	-	-	-	-	-	-	-	-	-	-	-
r37		1.9	F	F	30	30	-	-	-	-	-	-	-	-	-	-	-
r38		1.9	F	F	30	30	-	-	-	-	-	-	-	-	-	-	-
r39		1.9	F	F	13	13	-	-	-	-	-	-	-	-	-	-	-
r40		1.9	F	F	0	0	-	-	-	-	-	-	-	-	-	-	-
r41		1.9	F	F	0	0	-	-	-	-	-	-	-	-	-	-	-
r42		1.9	U	**F**	50	50	-	-	-	-	-	-	-	-	-	-	-
r43		1.9	F	F	0	0	-	-	-	-	-	-	-	-	-	-	-
r44		1.9	F	F	5	5	-	-	-	-	-	-	-	-	-	-	-
	10. Timer setting parameters (t*) (all parameter are not applicable)														-	-	-
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 (F-r*)														-	-	-
H99	Software version (displayed when power up)	1.9	D	D	-	-	-	-	-	-	-	-	-	R	1	208	INT

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

4.7 Replacing the PCB: EWWP014-065KBW1N and EWLP012-065KBW1N

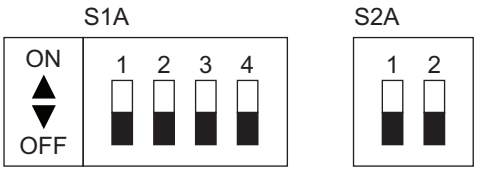
Replacing the PCB

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	OFF = 1 circuit ON = 2 circuit	1	not used
2 3 4	OFF OFF OFF = EWWP/EWLP	2	not used

4.8 Software Loading Instructions for pC0^3 Controllers (EWWP090-195KAW1M)

Note

The pCO^3 can't be programmed with the standard pCO^2 software. Special pCO^3 software is required which is running a fake BIOS pCO^2.

Items Required

- A laptop or PC.
- Carel USB-RS485 converter + cable to connect the converter to the controller.
- The latest version of the Winload program (3.37 or higher). This can be downloaded from the Daikin Extranet.
- Unit software files. 2 different software files are available:
  - EWWP090-130KAW1M (2 modules)
  - EWWP145-195KAW1M (3 modules)

Using Winload, make a connection with the USB converter to the J10 pLAN connector of the Chiller Unit controller.

(Select pLAN node address to 0. pCO^3 address can be found by holding down the alarm and up buttons simultaneously at controller power up. All controllers are default on address 0).

Once communications are established (cycling the power at the controller may be required if communication does not initiate):

1. Select the Upload tab. Select the proper directory (highlight) where you have stored the software that you wish to load.
2. Select the Bios tab.
3. Select the "bios_pco3_fakepco2_384.bin" file.
4. Press UPLOAD to start loading the Bios file.
5. When upload is complete.
6. Re-establish communication (this should happen automatically).
7. Select the Application tab.
8. Highlight the blb, dev, and iup files.
   - CH0V12M6.blb
   - CH0V12M6_32.dev
   - 1.CH0V12M6EN.iup
   - 2.CH0V12M6GR.iup
   - 3.CH0V12M6FR.iup
   - 4.CH0V12M6SP.iup
   - 5.CH0V12M6IT.iup
   - 6.CH0V12M6NO.iup
9. Press UPLOAD to start loading these files.
10. When upload is complete. Remove power to the controller.
11. Disconnect RS485 cable from J10.
12. Apply power to controller.

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	No metal dust or burrs remain after grinding or drilling in the metal construction parts during the installation. These facilitate the corrosion process which shortens the unit's lifetime.
6	The operator has received the operation manual.
7	The installer has received the installation manual.

1.3 Water Piping Checks

Checklist

The table below contains the water piping checklist.

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

Water volume and flow

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

	Evaporator			Condenser	
Chiller type	**Minimum water volume**	**Minimum water flow**	**Maximum water flow**	**Minimum water flow**	**Maximum water flow**
EWWP014KBW1N	62 l	31 l/min	75 l/min	24 l/min	95 l/min
EWWP022KBW1N	103 l	53 l/min	123 l/min	39 l/min	157 l/min
EWWP028KBW1N	134 l	68 l/min	161 l/min	51 l/min	203 l/min
EWWP035KBW1N	155 l	79 l/min	186 l/min	59 l/min	237 l/min
EWWP045KBW1N	205 l	105 l/min	247 l/min	79 l/min	314 l/min
EWWP055KBW1N	268 l	137 l/min	321 l/min	102 l/min	410 l/min
EWWP065KBW1N	311 l	158 l/min	373 l/min	118 l/min	474 l/min
EWWP090KAW1M	205 l	210 l/min	493 l/min	157 l/min	629 l/min
EWWP100KAW1M	268 l	241 l/min	568 l/min	181 l/min	724 l/min
EWWP110KAW1M	268 l	273 l/min	642 l/min	205 l/min	819 l/min
EWWP120KAW1M	311 l	295 l/min	694 l/min	221 l/min	883 l/min
EWWP130KAW1M	311 l	317 l/min	745 l/min	237 l/min	948 l/min
EWWP145KAW1M	205 l	346 l/min	814 l/min	260 l/min	1038 l/min
EWWP155KAW1M	205 l	377 l/min	889 l/min	283 l/min	1133 l/min

	Evaporator			Condenser	
Chiller type	**Minimum water volume**	**Minimum water flow**	**Maximum water flow**	**Minimum water flow**	**Maximum water flow**
EWWP165KAW1M	268 l	410 l/min	963 l/min	307 l/min	1229 l/min
EWWP175KAW1M	268 l	431 l/min	1015 l/min	323 l/min	1293 l/min
EWWP185KAW1M	268 l	453 l/min	1066 l/min	339 l/min	1357 l/min
EWWP195KAW1M	311 l	475 l/min	1118 l/min	355 l/min	1422 l/min
EWLP012KBW1N	62 l	30 l/min	69 l/min	—	—
EWLP020KBW1N	103 l	48 l/min	115 l/min	—	—
EWLP026KBW1N	134 l	65 l/min	153 l/min	—	—
EWLP030KBW1N	155 l	76 l/min	179 l/min	—	—
EWLP040KBW1N	205 l	98 l/min	229 l/min	—	—
EWLP055KBW1N	268 l	131 l/min	307 l/min	—	—
EWLP065KBW1N	311 l	152 l/min	358 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	600 s
ρ	[kg/m³]	Specific mass of the fluid	ρ_{water} = 1000 kg/m³
d	[K]	Thermostat step difference	■ For EUW5-24HZW1: 3 K ■ For EUW32-72HZW1: 0.5 K
C_w	[J/kgK]	Specific heat capacity of the fluid	$C_{w,\ water}$ = 4186 J/kgK

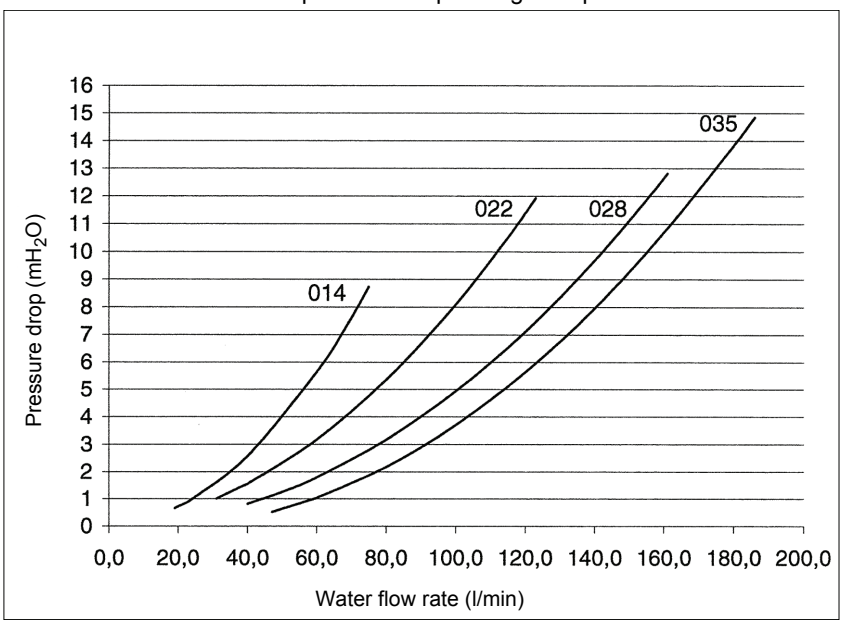
Water quality The table below contains the required water quality specifications.

		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
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 Water Pressure Drop: EWWP014-035KBW1N

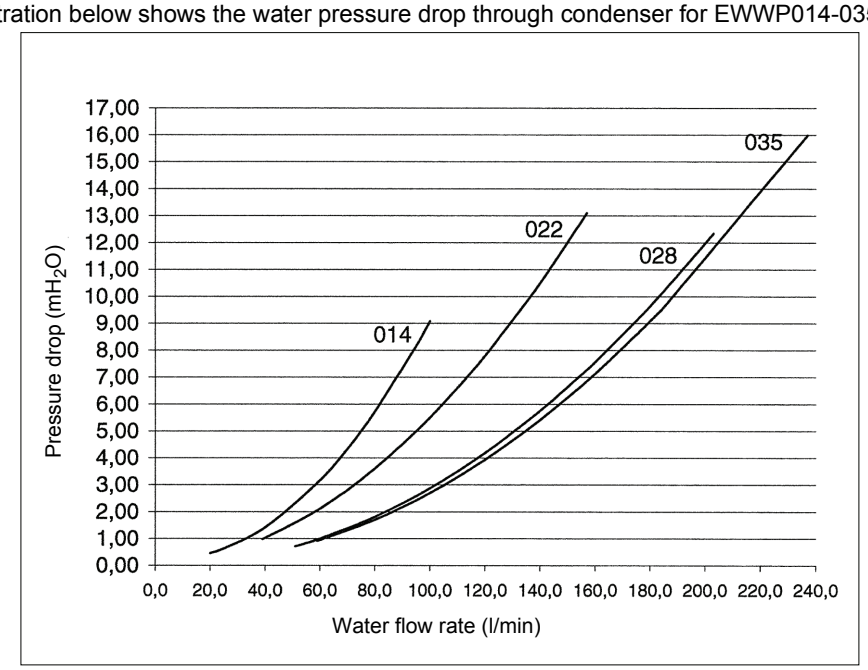
Water pressure drop evaporator

The illustration below shows the water pressure drop through evaporator for EWWP014-035KBW1N.



Water pressure drop condenser

The illustration below shows the water pressure drop through condenser for EWWP014-035KBW1N.



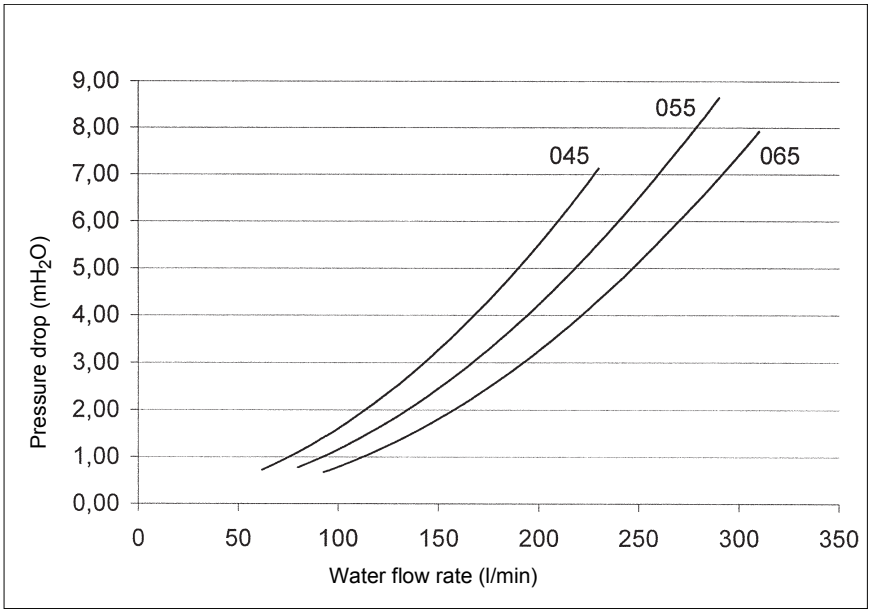
Warning

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 and Electrical Specifications" on page 1–4.

1.5 Water Pressure Drop: EWWP045-065KBW1N

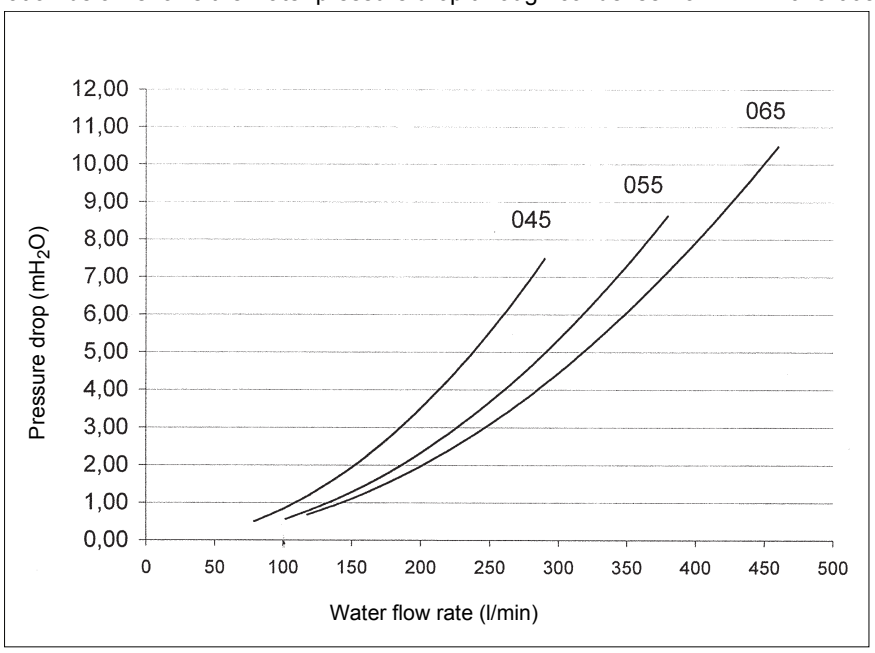
Water pressure drop evaporator

The illustration below shows the water pressure drop through evaporator for EWWP045-065KBW1N.



Water pressure drop condenser

The illustration below shows the water pressure drop through condenser for EWWP045-065KBW1N.



Warning

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 and Electrical Specifications" on page 1–4.

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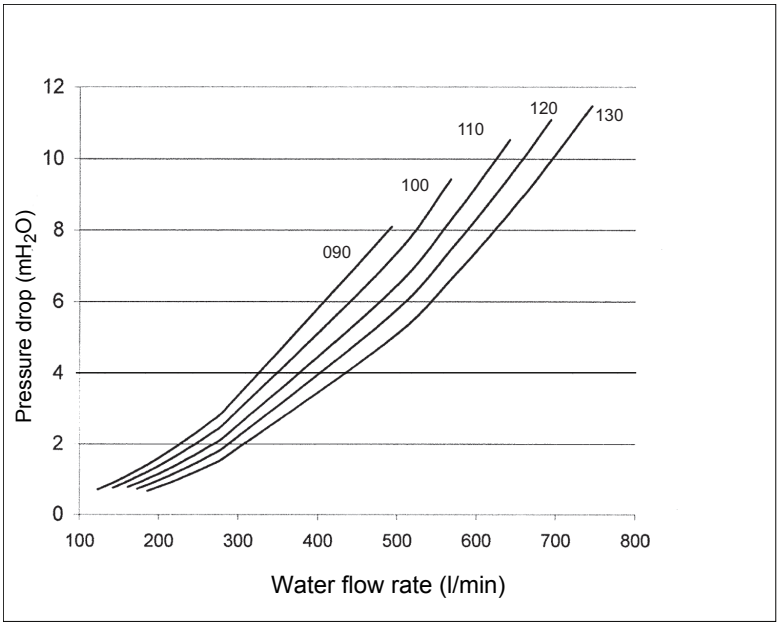
1.6 Water Pressure Drop: EWWP090-130KAW1M

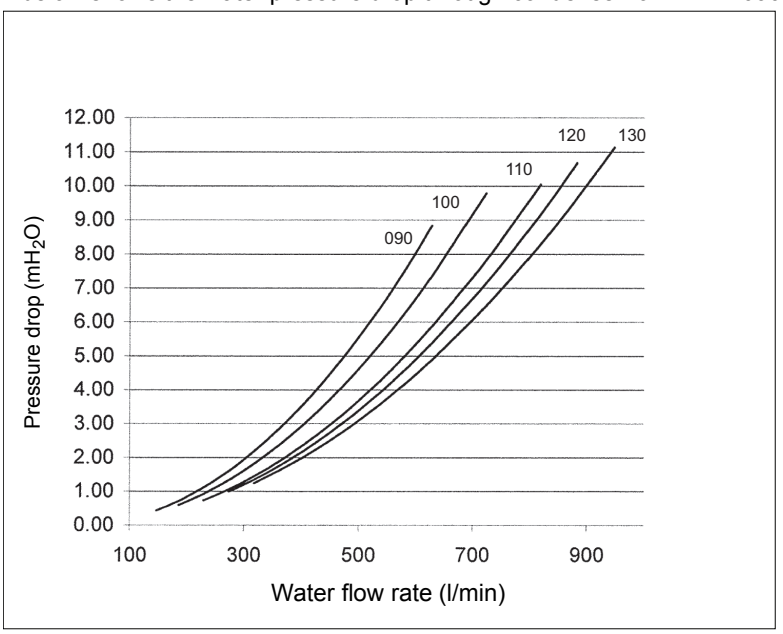
Water pressure drop evaporator

The illustration below shows the water pressure drop through evaporator for EWWP090-130KAW1M.



Water pressure drop condenser

The illustration below shows the water pressure drop through condenser for EWWP090-130KAW1M.



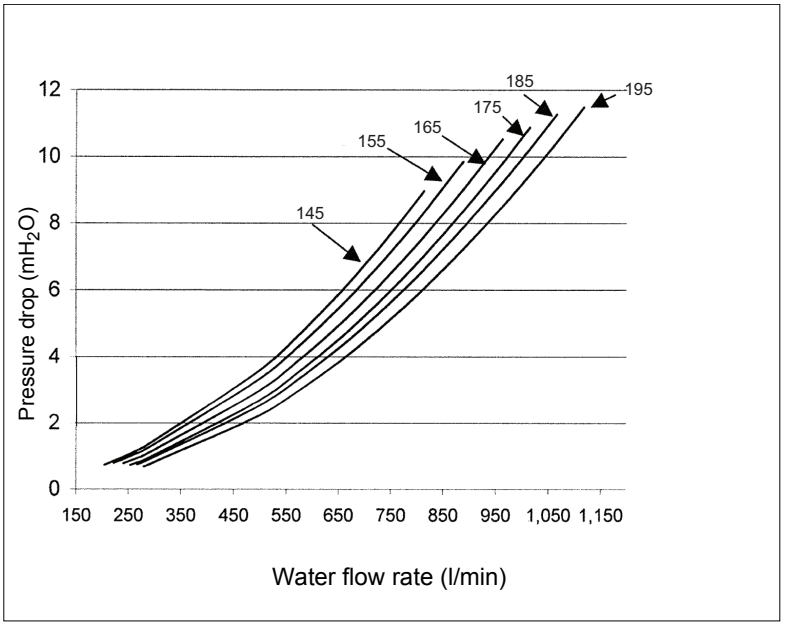
Warning

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 and Electrical Specifications" on page 1–4.

1.7 Water Pressure Drop: EWWP145-195KAW1M

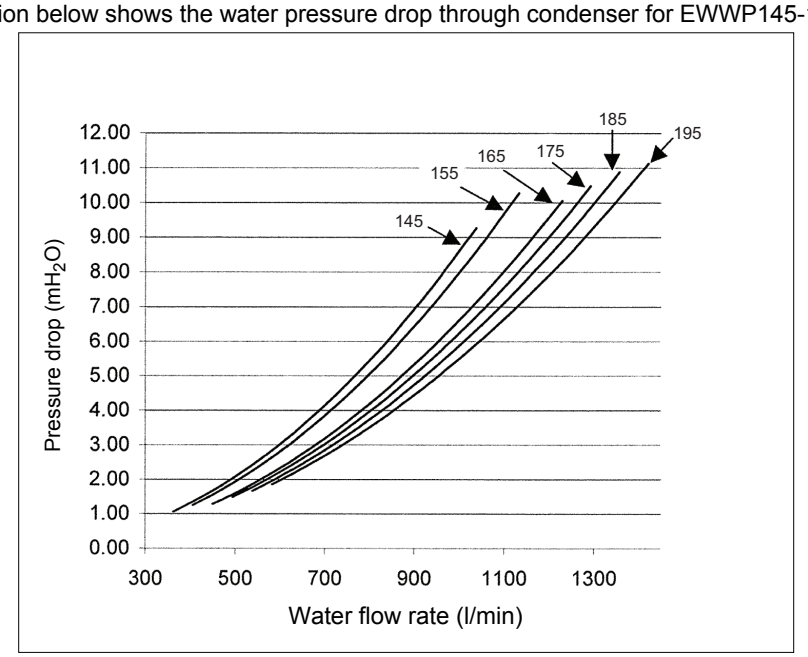
Water pressure drop evaporator

The illustration below shows the water pressure drop through evaporator for EWWP145-195KAW1M.



Water pressure drop condenser

The illustration below shows the water pressure drop through condenser for EWWP145-195KAW1M.



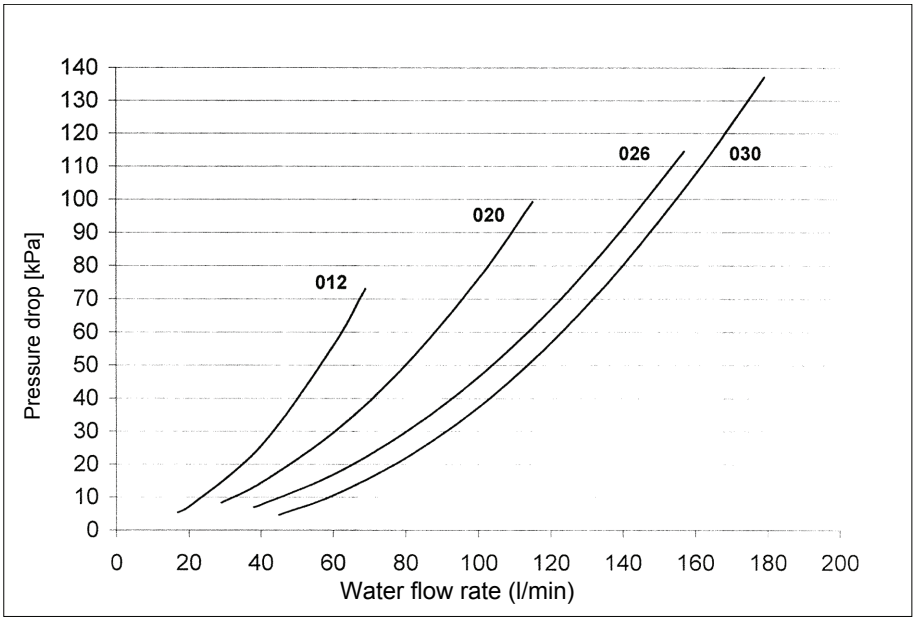
Warning

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 and Electrical Specifications" on page 1–4.

1.8 Water Pressure Drop: EWLP012-065KBW1N

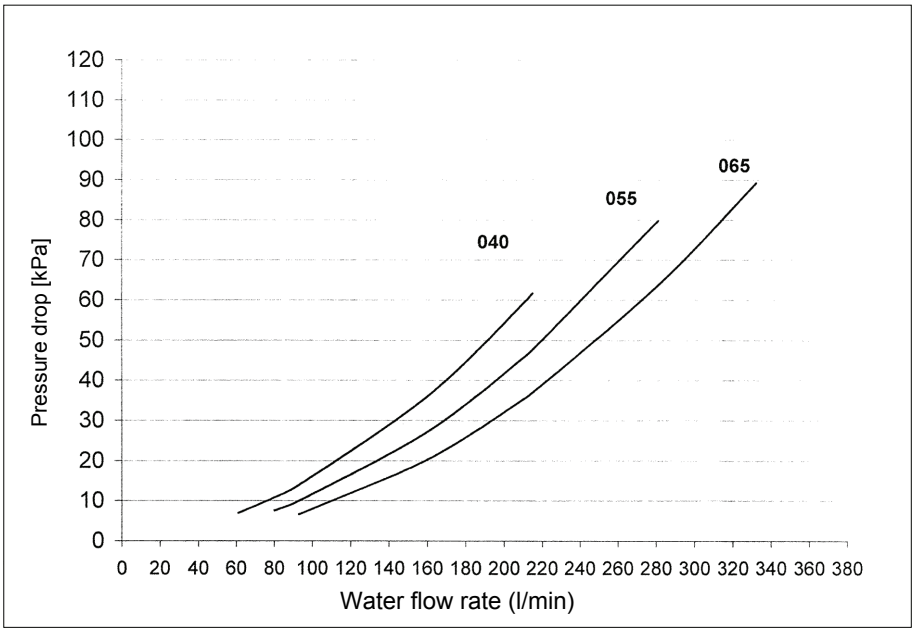
Water pressure drop evaporator for EWLP012-030KBW 1N

The illustration below shows the water pressure drop through evaporator for EWLP012-065KBW1N.



Water pressure drop evaporator for EWLP040-065KBW 1N

The illustration below shows the water pressure drop through evaporator for EWLP012-065KBW1N.



Warning

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 and Electrical Specifications" on page 1–4.

1.9 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.

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

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: 20 – 55°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
EWWP014KBW1N	6.6 A	9 A	3 x 16 aM
EWWP022KBW1N	10.4 A	14.5 A	3 x 20 aM
EWWP028KBW1N	13.1 A	18.5 A	3 x 25 aM
EWWP035KBW1N	15.0 A	22 A	3 x 25 aM
EWWP045KBW1N	20.8 A	28 A	3 x 35 aM
EWWP055KBW1N	26.2 A	36 A	3 x 40 aM
EWWP065KBW1N	30 A	40 A	3 x 50 aM
EWWP090KAW1M	41.6 A	56 A	3 x 63 aM
EWWP100KAW1M	47 A	64 A	3 x 63 aM
EWWP110KAW1M	52.4 A	72 A	3 x 80 aM
EWWP120KAW1M	56.2 A	76 A	3 x 80 aM

Unit	Nominal current	Maximum current	Fuses
EWWP130KAW1M	60 A	80 A	3 x 80 aM
EWWP145KAW1M	67.8 A	92 A	3 x 100 aM
EWWP155KAW1M	73.2 A	100 A	3 x 100 aM
EWWP165KAW1M	78.6 A	108 A	3 x 125 aM
EWWP175KAW1M	82.4 A	112 A	3 x 125 aM
EWWP185KAW1M	86.2 A	116 A	3 x 125 aM
EWWP195KAW1M	90 A	120 A	3 x 125 aM
EWLP012KBW1N	7.4 A	9 A	3 x 16 aM
EWLP020KBW1N	11.5 A	14.5 A	3 x 20 aM
EWLP026KBW1N	14.3 A	18.5 A	3 x 25 aM
EWLP030KBW1N	16.6 A	22 A	3 x 25 aM
EWLP040KBW1N	23 A	28 A	3 x 35 aM
EWLP055KBW1N	28.7 A	36 A	3 x 40 aM
EWLP065KBW1N	33.3 A	40 A	3 x 50 aM

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 water chillers.

It is also applicable on other types of Daikin chillers.

What is in this part?

This part contains the following chapters:

5

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:

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 (only for EUWL-units). Switch of the compressor and carefully touch the crankcase heater area by hand.
- Check the running current.

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

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Evaporator and condenser

Follow the instructions below to check the evaporator and condenser:

- Inspect the evaporator 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 manual the operation after direct power connection.

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.	—

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