

# **DESIGN & TECHNICAL MANUAL**

Comfort series ( Single phase type )

**WATERSTAGE™**  
INNOVATIVE SOLUTION OF DOMESTIC HEATING



**Air to Water  
Split type**



# CONTENTS

## 1. OUTDOOR UNIT

SINGLE PHASE TYPE : WO\*A060LFCA, WO\*A080LFCA,  
WO\*A100LFTA

## 2. HYDRAULIC UNIT

SINGLE PHASE TYPE: WS\*A050DG\* WS\*A100DG\*

## 3. CONTROL SYSTEM

WS\*A050DG\*, WS\*A100DG\* (Hydraulic unit)

# 1. COMBINATIONS

Class	OUTDOOR UNIT	HYDRAULIC UNIT
5.0 kW	WO*A060LFCA	WS*A050DG*
6.0 kW	WO*A060LFCA	WS*A100DG*
8.0 kW	WO*A080LFCA	WS*A100DG*
10.0 kW	WO*A100LFTA	WS*A100DG*

***WATERSTAGE***<sup>TM</sup>

## **1. OUTDOOR UNIT**

### **SINGLE PHASE TYPE :**

**WO\*A060LFCA**

**WO\*A080LFCA**

**WO\*A100LFTA**



# CONTENTS

## 1. OUTDOOR UNIT

<b>1. FEATURES</b>	OU01 - 01
<b>2. SPECIFICATIONS</b>	OU01 - 04
2-1. NOMINAL CAPACITY AND NOMINAL INPUT	OU01 - 04
2-2. TECHNICAL SPECIFICATIONS	OU01 - 05
2-3. PRODUCT FICHE	OU01 - 06
2-4. PRODUCT INFORMATION	OU01 - 07
2-5. ELECTRICAL SPECIFICATIONS	OU01 - 10
<b>3. DIMENSIONS</b>	OU01 - 11
3-1. DIMENSIONAL DRAWING	OU01 - 11
3-2. INSTALLATION PLACE	OU01 - 13
<b>4. PIPING DIAGRAM</b>	OU01 - 14
<b>5. WIRING DIAGRAM</b>	OU01 - 15
5-1. WIRING DIAGRAM	OU01 - 15
<b>6. CAPACITY TABLES</b>	OU01 - 18
6-1. HEATING CAPACITY	OU01 - 18
6-2. COOLING CAPACITY *	OU01 - 22
<b>7. OPERATION NOISE</b>	OU01 - 26
7-1. NOISE LEVEL CURVE	OU01 - 26
7-2. SOUND LEVEL CHECK POINT	OU01 - 27
<b>8. OPERATION RANGE</b>	OU01 - 28
<b>9. SAFETY DEVICES</b>	OU01 - 29
<b>10. STANDARD ACCESSORIES</b>	OU01 - 30

# 1. FEATURES

## MODELS :

WO\*A060LFCA

WO\*A080LFCA

WO\*A100LFTA



WO\*A060LFCA  
WO\*A080LFCA

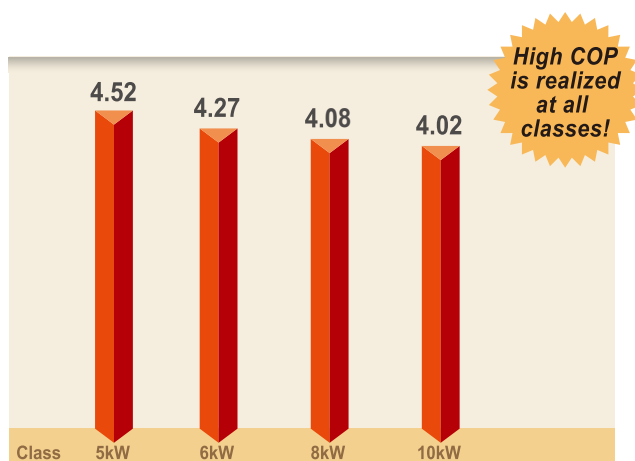


WO\*A100LFTA

## HIGH PERFORMANCE

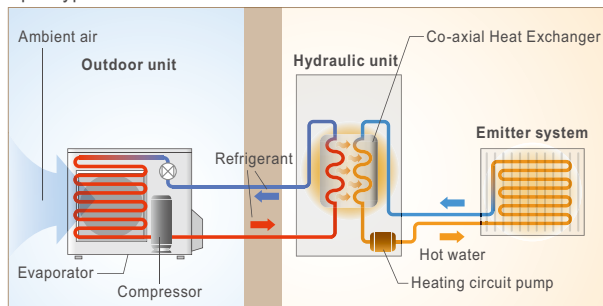
- High efficiency & Comfort

### High COP



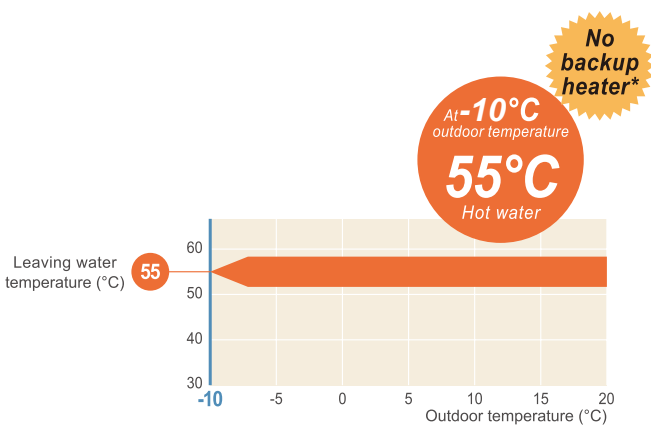
Optimized hot water control is realized by DC inverter technology.

Split Type model allows flexible installations.



# High leaving water temperature

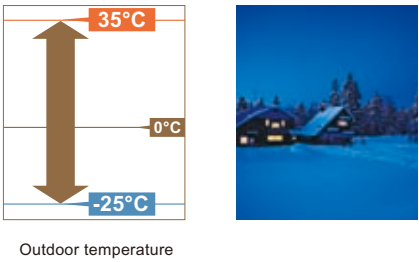
Maximum leaving water temperature is 55°C without backup heater. Hot water supply temperature can be maintained even at –10°C outdoor temperature.



\* If you want to raise the hot water supply temperature, backup heater can be used for the auxiliary operation.

# Wide operation range

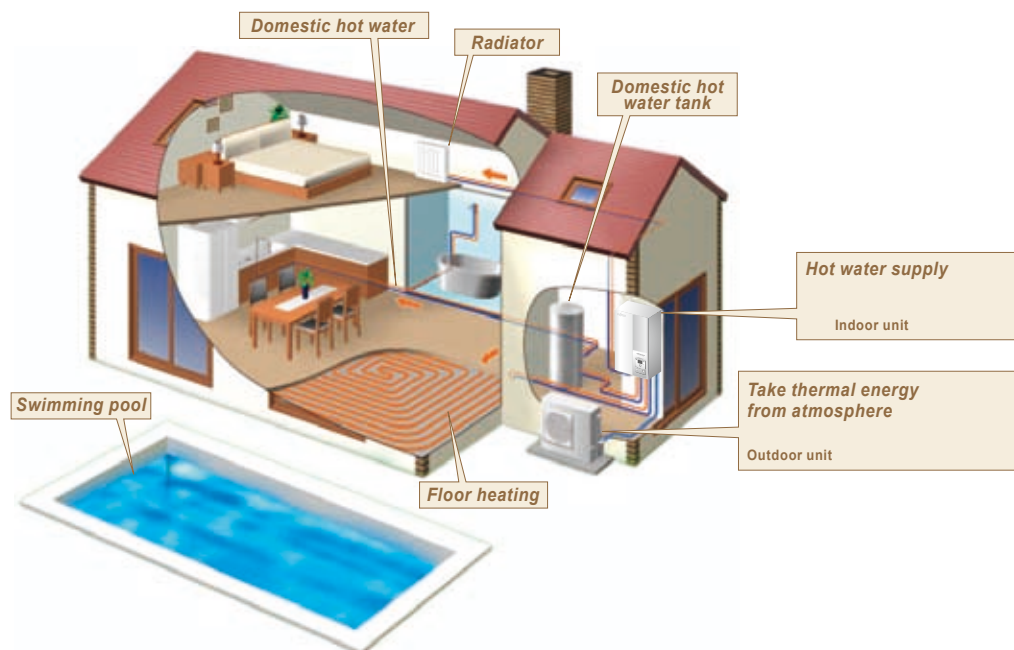
Possible to operate heating under -20°C outdoor temperature



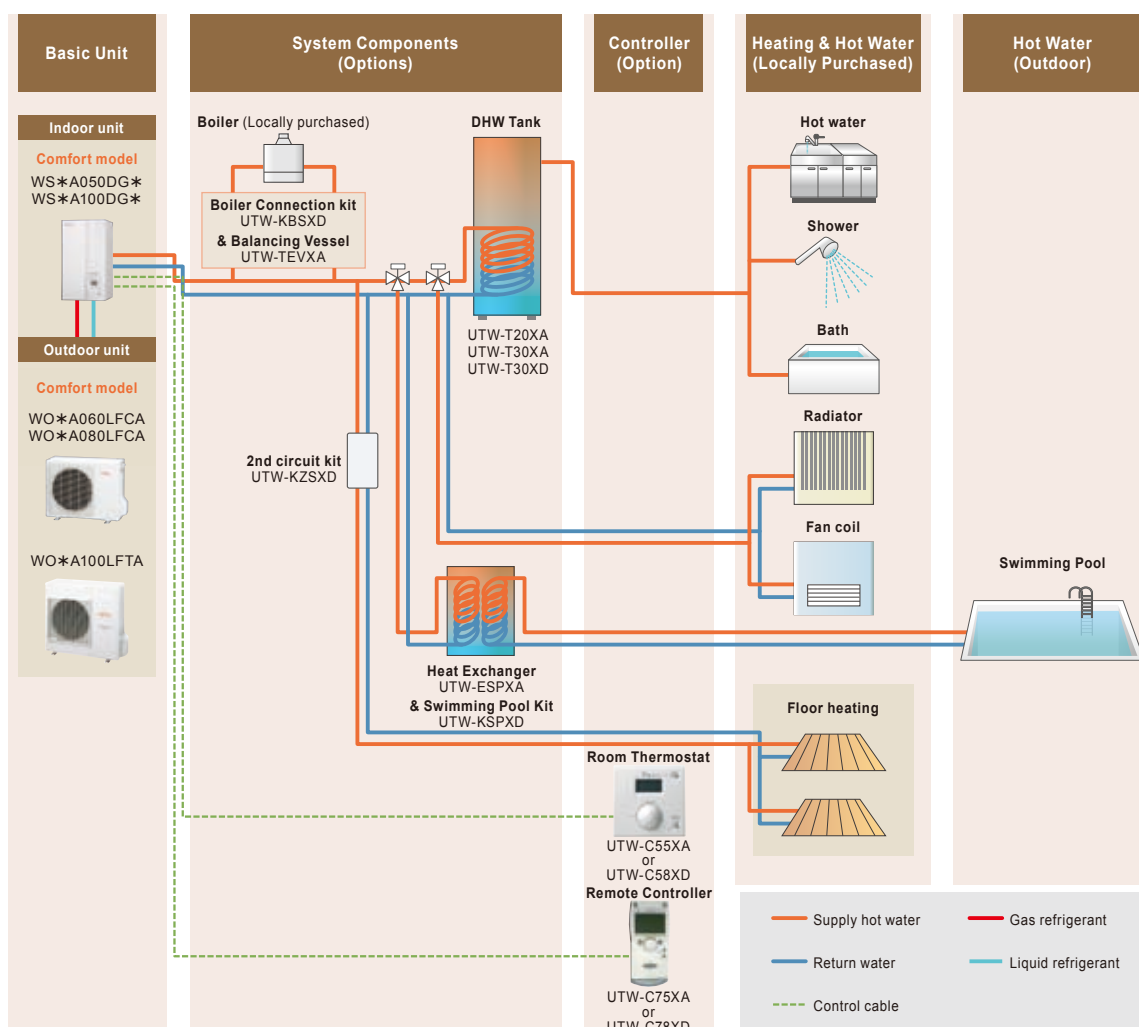
## ■ WIDE COMFORT

### Wide comfort by **WATERSTAGE™**

The clean energy produced by **WATERSTAGE™** reliably delivers “comfort” to diverse spaces in the home up to the living room, bedrooms, bath and swimming pool.



## ● System configuration



## 2. SPECIFICATIONS

### 2-1. NOMINAL CAPACITY AND NOMINAL INPUT

Model name (Outdoor unit)				WO*A060LFCA		WO*A080LFCA	WO*A100LFTA
POWER SOURCE				1Ø 230V ~ 50Hz			
+7°C/+35°C floor heating	Heating capacity	Minimum	kW	1.75	1.75	1.75	3.20
		Nominal		4.50	6.00	7.50	10.00
		Maximum		7.02	7.83	9.20	13.45
	Input power	Nominal	-	0.996	1.41	1.84	2.49
	COP			4.52	4.27	4.08	4.02
+7°C/+45°C floor heating	Heating capacity	Nominal	kW	4.50	5.10	6.20	8.27
	Input power			1.30	1.50	1.87	2.53
	COP			3.46	3.40	3.31	3.27
+2°C/+35°C floor heating	Heating capacity	Nominal	kW	4.50	4.95	5.65	7.70
	Input power			1.39	1.53	1.78	2.47
	COP			3.24	3.24	3.17	3.12

\* Test conditions comply with EN14511-2

## 2-2. TECHNICAL SPECIFICATIONS

Model name (Outdoor unit)				WO*A060LFCA	WO*A080LFCA	WO*A100LFTA
Enclosure	Color			BEIGE Apporoximate colour of MUNSELL 10YR 7.5/1.0		
	Material			Steel sheet		
Dimensions (H x W x D)	Net	mm	620 × 790 × 290			830 × 900 × 330
	Gross		712 × 935 × 400			970 × 1050 × 445
Weight	Net	kg	41	42	60	
	Gross		45	45	67	
Heat exchanger type	Dimensions (H x W x D)		mm	588 × 881 × 36.4	Main: 588 × 881 × 36.4 Sub: 546 × 580 × 18.2	798 × 900 × 36.4
	Fin pitch			1.3	1.45	1.3
	Rows & Stages			2 × 28	Main: 2 × 28 Sub: 1 × 26	2 × 38
	Pipe type			Copper		
	Fin	Type (Material)		Corrugate (Alminium)		
		Surface treatment		Corrosion resistance		Corrosion resistance (Blue fin)
Fan	Airflow rate	Heating	m³/h	2070	2340	3600
	Type x Q'ty			Proppeller fan ×1		
	Discharge direction			Horizontal		
	Motor Quantity			1		
	Motor output		W	49	49	100
Compressor	Type x Q'ty		DC 2 rotary × 1			
	Motor output		W	1100	1100	2100
Operation range	Heating	Min	°CDB	-20		
		Max	°CWB	35		
	Sanitary water	Min	°CDB	-20		
		Max	°CWB	35		
Refrigerant	Type		R410A			
	Charge		g	1100	1400	1800
	Control			Expansion valve (electric type)		
	Nr of circuits			1		
Refrigerant oil	Type		POE (RB68)			
	Charged volume		l	0.6		0.8
Connection pipe	Type	Liquid		Flare connection		
		Gas		Flare connection		
	Size (Standard)	Liquid	mm	Ø 6.35		Ø 9.52
		Gas		Ø 12.70	Ø 15.88	
	Pre-charge length		m	15		
	Max. length			30		
	Min. length			5		
	Additional refrigerant charge		g/m	25		40
	Max. height difference		m	20		
Defrost method			Reverse cycle			
Defrost control			Outdoor heat exchanger temperature sensor			
Capacity control method			Inverter control			

## 2-3. PRODUCT FICHE

### Product fiche according to Commission Delegated Regulation (EU) 811/2013

Model	Hydraulic unit		WSYA050DG6 WSHA050DG *1		WGYA050DG6 WGHA050DG *1		WSYA100DG6 WSHA100DG *1		WGYA100DG6 WGHA100DG *1		
	Outdoor unit		WOYA060LFCA WOHA060LFCA				WOYA060LFCA WOHA060LFCA				
Temperature application			°C	55	35	55	35	55	35	55	35
Declared load profile				-	-	L	L	-	-	L	L
Seasonal space heating energy efficiency class				A+	A++	A+	A++	A+	A++	A+	A++
Water heating energy efficiency class				-	-	A+	A+	-	-	A+	A+
Rated heat output		kW	4	4	4	4	5	5	5	5	
Annual energy consumption		kWh	3026	2160	3026	2160	3180	2505	3180	2505	
Annual electricity consumption		kWh	-	-	880	880	-	-	880	880	
Annual fuel consumption		GJ	Not applicable								
Seasonal space heating energy efficiency		%	115	169	115	169	115	169	115	169	
Water heating energy efficiency		%	-	-	120	120	-	-	120	120	
Sound power level		Indoor unit	dB	46	46	46	46	46	46	46	
Work only during off-peak hours			Not applicable								
Specific precautions in assembled, installed or maintained			Refer to the installation and operating manuals.								
Rated heat output	Colder climate	kW	-	-	-	-	-	-	-	-	
	Warmer climate	kW	4	4	4	4	4	5	4	5	
Annual energy consumption	Colder climate	kWh	-	-	-	-	-	-	-	-	
	Warmer climate	kWh	1423	1090	1423	1090	1531	1167	1531	1167	
Annual electricity consumption	Colder climate	kWh	-	-	-	-	-	-	-	-	
	Warmer climate	kWh	-	-	880	880	-	-	880	880	
Seasonal space heating energy efficiency	Colder climate	%	-	-	-	-	-	-	-	-	
	Warmer climate	%	139	217	139	217	138	212	138	212	
Water heating energy efficiency	Colder climate	%	-	-	-	-	-	-	-	-	
	Warmer climate	%	-	-	120	120	-	-	120	120	
Sound power level		Outdoor unit	dB	65	60	65	60	65	63	65	63

Model	Hydraulic unit		WSYA100DG6 WSHA100DG *1		WGYA100DG6 WGHA100DG *1		WSYA100DG6 WSHA100DG *1		WGYA100DG6 WGHA100DG *1		
	Outdoor unit		WOYA080LFCA WOHA080LFCA				WOYA100LFTA WOHA100LFTA				
Temperature application			°C	55	35	55	35	55	35	55	35
Declared load profile				-	-	L	L	-	-	L	L
Seasonal space heating energy efficiency class				A+	A++	A+	A++	A+	A++	A+	A++
Water heating energy efficiency class				-	-	A+	A+	-	-	A+	A+
Rated heat output			kW	6	7	6	7	8	8	8	8
Annual energy consumption			kWh	3886	3375	3886	3375	5415	4415	5415	4415
Annual electricity consumption			kWh	-	-	880	880	-	-	880	880
Annual fuel consumption			GJ	Not applicable							
Seasonal space heating energy efficiency			%	118	156	118	156	113	155	113	155
Water heating energy efficiency			%	-	-	120	120	-	-	120	120
Sound power level		Indoor unit	dB	46	46	46	46	46	46	46	46
Work only during off-peak hours				Not applicable							
Specific precautions in assembled, installed or maintained				Refer to the installation and operating manuals.							
Rated heat output	Colder climate	kW	-	-	-	-	-	-	-	-	-
	Warmer climate	kW	5	6	5	6	6	8	6	8	8
Annual energy consumption	Colder climate	kWh	-	-	-	-	-	-	-	-	-
	Warmer climate	kWh	1934	1439	1934	1439	2422	2203	2422	2203	2203
Annual electricity consumption	Colder climate	kWh	-	-	-	-	-	-	-	-	-
	Warmer climate	kWh	-	-	880	880	-	-	880	880	880
Seasonal space heating energy efficiency	Colder climate	%	-	-	-	-	-	-	-	-	-
	Warmer climate	%	138	207	138	207	136	196	136	196	196
Water heating energy efficiency	Colder climate	%	-	-	-	-	-	-	-	-	-
	Warmer climate	%	-	-	120	120	-	-	120	120	120
Sound power level		Outdoor unit	dB	65	69	65	69	68	69	68	69

\*1 : Optional electrical back up heater consumption is taken into account in the performance calculation.

## 2-4. PRODUCT INFORMATION

### Product information according to Commission Delegated Regulation (EU) 813/2013

Product information is based on the average climate condition.

Model				Hydraulic unit		WSYA050DG6 WSHA050DG *1		WGYA050DG6 WGHA050DG *1		WSYA100DG6 WSHA100DG *1		WGYA100DG6 WGHA100DG *1	
				Outdoor unit		WOYA060LFCA WOHA060LFCA				WOYA060LFCA WOHA060LFCA			
Air-to-water heat pump				Yes									
Water-to-water heat pump				No									
Brine-to-water heat pump				No									
Low-temperature heat pump				No									
Equipped with a supplementary heater				Yes									
Heat pump combination heater				Yes									
Temperature application			°C	55	35	55	35	55	35	55	35		
Rated heat output *2		Prated	kW	4	4	4	4	5	5	5	5		
Seasonal space heating energy efficiency		ηs	%	115	169	115	169	115	169	115	169		
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj													
Tj = −7 °C		Pdh	kW	3.8	4.0	3.8	4.0	4.0	4.6	4.0	4.6		
Tj = +2 °C		Pdh	kW	2.3	2.4	2.3	2.4	2.5	2.8	2.5	2.8		
Tj = +7 °C		Pdh	kW	1.7	2.0	1.7	2.0	1.7	2.3	1.7	2.3		
Tj = +12 °C		Pdh	kW	2.1	2.3	2.1	2.3	2.1	2.3	2.1	2.3		
Tj = bivalent temperature		Pdh	kW	3.8	4.0	3.8	4.0	4.0	4.6	4.0	4.6		
Tj = operation limit temperature		Pdh	kW	3.2	3.9	3.2	3.9	3.5	4.5	3.5	4.5		
Tj = −15 °C (if TOL < −20 °C)		Pdh	kW	-	-	-	-	-	-	-	-		
Bivalent temperature		Tbiv	°C	-7	-7	-7	-7	-7	-7	-7	-7		
Cycling interval capacity for heating		Pcyh	kW	Not applicable									
Degradation co-efficient *3		Cdh	—	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj													
Tj = −7 °C		COPd	—	1.86	2.86	1.86	2.86	1.79	2.65	1.79	2.65		
Tj = +2 °C		COPd	—	2.82	4.10	2.82	4.10	2.86	4.17	2.86	4.17		
Tj = +7 °C		COPd	—	4.00	5.90	4.00	5.90	4.03	5.99	4.03	5.99		
Tj = +12 °C		COPd	—	5.84	8.12	5.84	8.12	5.84	8.29	5.84	8.29		
Tj = bivalent temperature		COPd	—	1.86	2.86	1.86	2.86	1.79	2.65	1.79	2.65		
Tj = operation limit temperature		COPd	—	1.54	2.65	1.54	2.65	1.56	2.57	1.56	2.57		
Tj = −15 °C (if TOL < −20 °C)		COPd	—	-	-	-	-	-	-	-	-		
Operation limit temperature		TOL	°C	-10	-10	-10	-10	-10	-10	-10	-10		
Cycling interval efficiency		COPcyc	—	Not applicable									
Heating water operating limit temperature		WTOL	°C	55	55	55	55	55	55	55	55		
Power consumption in modes other than active mode													
Off mode		POFF	kW	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006		
Thermostat-off mode		PTO	kW	0.016	0.019	0.016	0.019	0.016	0.023	0.016	0.023		
Standby mode		PSB	kW	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010		
Crankcase heater mode		PCK	kW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Supplementary heater													
Rated heat output *2		Psup	kW	1.1	0.6	1.1	0.6	1.0	0.7	1.0	0.7		
Type of energy input				Electric									
Other items													
Capacity control				Variable									
Sound power level		Indoor unit	LWA	dB	46	46	46	46	46	46	46		
		Outdoor unit	LWA	dB	65	60	65	60	65	63	65		
Emissions of nitrogen oxides		NOx	mg/kWh	Not applicable									
Rated airflow rate		Outdoor unit	—	m³/h	2070	1700	2070	1700	2070	2070	2070		
Declared load profile				-	-	L	L	-	-	L	L		
Daily electricity consumption		Qelec	kWh	-	-	4.000	4.000	-	-	4.000	4.000		
Water heating energy efficiency		ηwh	%	-	-	120	120	-	-	120	120		
Daily fuel consumption		Qfuel	kWh	Not applicable									
Contact details				FUJITSU GENERAL (EURO) GmbH Werftstraße 20, D-40549 Düsseldorf, F. R. Germany									

\*1 : Optional electrical back up heater consumption is taken into account in the performance calculation.

\*2 : For heat pump space heaters and heat pump combination heaters, the rated heat output Prated is equal to the design load for heating Pdesignh, and the rated heat output of a supplementary heater Psup is equal to the supplementary capacity for heating sup (Tj).

\*3 : If Cdh is not determined by measurement then the default degradation coefficient is Cdh = 0.9.

Outdoor unit / Single phase



## Product information according to Commission Delegated Regulation (EU) 813/2013

Product information is based on the average climate condition.

Model				Hydraulic unit		WSYA100DG6 WSHA100DG *1		WGYA100DG6 WGHA100DG *1		WSYA100DG6 WSHA100DG *1		WGYA100DG6 WGHA100DG *1	
				Outdoor unit		WOYA080LFCA WOHA080LFCA				WOYA100LFTA WOHA100LFTA			
Air-to-water heat pump				Yes									
Water-to-water heat pump				No									
Brine-to-water heat pump				No									
Low-temperature heat pump				No									
Equipped with a supplementary heater				Yes									
Heat pump combination heater				Yes									
Temperature application			°C	55	35	55	35	55	35	55	35		
Rated heat output *2		P <sub>rated</sub>	kW	6	7	6	7	8	8	8	8		
Seasonal space heating energy efficiency		η <sub>s</sub>	%	118	156	118	156	113	155	113	155		
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>													
T <sub>j</sub> = −7 °C		P <sub>dh</sub>	kW	5.0	5.8	5.0	5.8	6.7	7.5	6.7	7.5		
T <sub>j</sub> = +2 °C		P <sub>dh</sub>	kW	3.1	3.5	3.1	3.5	4.1	4.5	4.1	4.5		
T <sub>j</sub> = +7 °C		P <sub>dh</sub>	kW	2.0	2.3	2.0	2.3	3.2	3.6	3.2	3.6		
T <sub>j</sub> = +12 °C		P <sub>dh</sub>	kW	2.2	2.4	2.2	2.4	4.0	4.0	4.0	4.0		
T <sub>j</sub> = bivalent temperature		P <sub>dh</sub>	kW	5.0	5.8	5.0	5.8	6.7	7.5	6.7	7.5		
T <sub>j</sub> = operation limit temperature		P <sub>dh</sub>	kW	4.9	5.6	4.9	5.6	5.9	7.0	5.9	7.0		
T <sub>j</sub> = −15 °C (if TOL < −20 °C)		P <sub>dh</sub>	kW	-	-	-	-	-	-	-	-		
Bivalent temperature		T <sub>biv</sub>	°C	-7	-7	-7	-7	-7	-7	-7	-7		
Cycling interval capacity for heating		P <sub>cych</sub>	kW	Not applicable									
Degradation co-efficient *3		C <sub>dh</sub>	—	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9		
Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T <sub>j</sub>													
T <sub>j</sub> = −7 °C		COP <sub>d</sub>	—	1.77	2.35	1.77	2.35	1.74	2.35	1.74	2.35		
T <sub>j</sub> = +2 °C		COP <sub>d</sub>	—	2.93	3.82	2.93	3.82	2.74	3.81	2.74	3.81		
T <sub>j</sub> = +7 °C		COP <sub>d</sub>	—	4.12	5.69	4.12	5.69	4.10	5.71	4.10	5.71		
T <sub>j</sub> = +12 °C		COP <sub>d</sub>	—	5.81	8.16	5.81	8.16	5.72	7.16	5.72	7.16		
T <sub>j</sub> = bivalent temperature		COP <sub>d</sub>	—	1.77	2.35	1.77	2.35	1.74	2.35	1.74	2.35		
T <sub>j</sub> = operation limit temperature		COP <sub>d</sub>	—	1.47	2.02	1.47	2.02	1.44	2.16	1.44	2.16		
T <sub>j</sub> = −15 °C (if TOL < −20 °C)		COP <sub>d</sub>	—	-	-	-	-	-	-	-	-		
Operation limit temperature		TOL	°C	-10	-10	-10	-10	-10	-10	-10	-10		
Cycling interval efficiency		COP <sub>cyc</sub>	—	Not applicable									
Heating water operating limit temperature		WTOL	°C	55	55	55	55	55	55	55	55		
Power consumption in modes other than active mode													
Off mode		P <sub>OFF</sub>	kW	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005		
Thermostat-off mode		P <sub>TO</sub>	kW	0.016	0.030	0.016	0.030	0.022	0.043	0.022	0.043		
Standby mode		P <sub>SB</sub>	kW	0.009	0.009	0.009	0.009	0.008	0.008	0.008	0.008		
Crankcase heater mode		P <sub>CK</sub>	kW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Supplementary heater													
Rated heat output *2		P <sub>sup</sub>	kW	0.8	0.9	0.8	0.9	1.7	1.4	1.7	1.4		
Type of energy input				Electric									
Other items													
Capacity control				Variable									
Sound power level		Indoor unit	L <sub>WA</sub>	dB	46	46	46	46	46	46	46		
		Outdoor unit	L <sub>WA</sub>	dB	65	69	65	69	68	69	68	69	
Emissions of nitrogen oxides		NO <sub>x</sub>	mg/kWh	Not applicable									
Rated air flow rate		Outdoor unit	—	m³/h	1900	2340	1900	2340	3600	3600	3600		
Declared load profile				-	-	L	L	-	-	L	L		
Daily electricity consumption		Q <sub>elec</sub>	kWh	-	-	4.000	4.000	-	-	4.000	4.000		
Water heating energy efficiency		η <sub>wh</sub>	%	-	-	120	120	-	-	120	120		
Daily fuel consumption		Q <sub>fuel</sub>	kWh	Not applicable									
Contact details				FUJITSU GENERAL (EURO) GmbH Werftstraße 20, D-40549 Düsseldorf, F. R. Germany									

\*1 : Optional electrical back up heater consumption is taken into account in the performance calculation.

\*2 : For heat pump space heaters and heat pump combination heaters, the rated heat output P<sub>rated</sub> is equal to the design load for heating P<sub>design,h</sub>, and the rated heat output of a supplementary heater P<sub>sup</sub> is equal to the supplementary capacity for heating sup (T<sub>j</sub>).\*3 : If C<sub>dh</sub> is not determined by measurement then the default degradation coefficient is C<sub>dh</sub> = 0.9.

## ENERGY EFFICIENCY VALUE

Model name	Hydraulic unit		WSYA050DG6 WSHA050DG		WSYA100DG6 WSHA100DG		WSYA100DG6 WSHA100DG		WSYA100DG6 WSHA100DG	
	Outdoor unit		WOYA060LFCA WOHA060LFCA		WOYA060LFCA WOHA060LFCA		WOYA080LFCA WOHA080LFCA		WOYA100LFTA WOHA100LFTA	
Heating application		°C	55	35	55	35	55	35	55	35
Seasonal space heating energy efficiency of heat pump		%	115	169	115	169	118	156	113	155

## CLASS OF TEMPERATURE CONTROLLER

Controller class		II	VI*
Contribution to energy efficiency	%	2	4

\*Controller class VI : UTW-C55XA, UTW-C58XD, UTW-C74TXF, UTW-C74HXF, UTW-C78XD

## DHW TANK SPECIFICATION

DHW tank specification	Load profile	Tank Volume (L)	Tank rating
UTW-T20XA	M	200	C
UTW-T30XA	L	300	C

## 2-5. ELECTRICAL SPECIFICATIONS

Model name (Outdoor unit)			WO*A060LFCA	WO*A080LFCA	WO*A100LFTA
Available voltage range		V	198-264		
Power supply	Voltage	V	230		
	Frequency	Hz	50		
*1) Max. operating current	Heating	A	12.5	17.5	18.5
*2) Wiring spec.	Main fuse (Circuit breaker) Current		20	25	
	Power cable	mm <sup>2</sup>	3.5-4.0		
Wiring connections	For power supply	*3) Quantity	3		
	For connection with indoor		4		

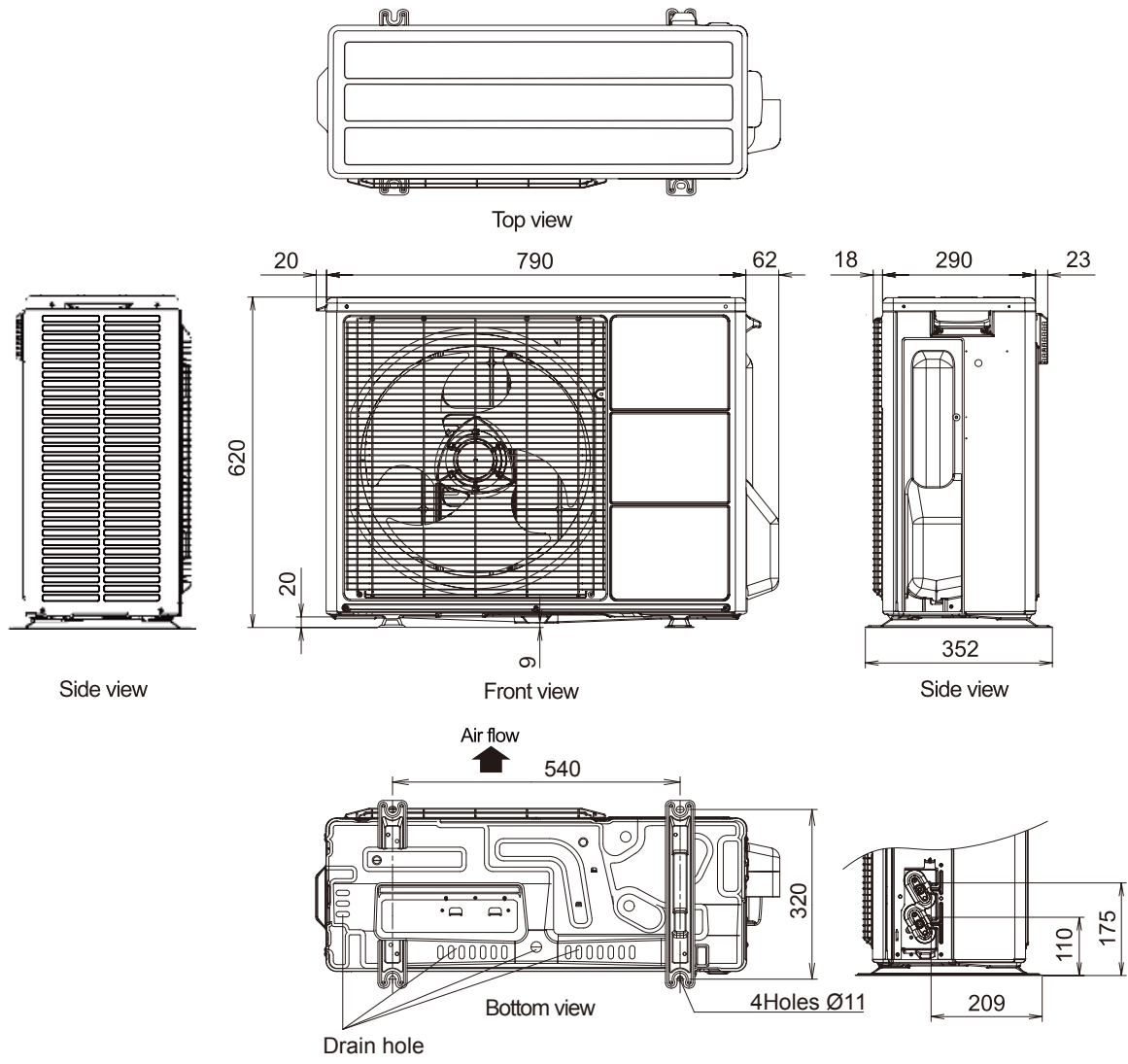
\*1) The maximum current is the total current of indoor unit and outdoor unit.  
 \*2) Wiring spec. :  
     Selected sample  
     (Selected based on Japan Electrotechnical Standard and Codes Committee E0005)  
 \*3) Included earth wiring.

# 3. DIMENSIONS

## 3-1. DIMENSIONAL DRAWING

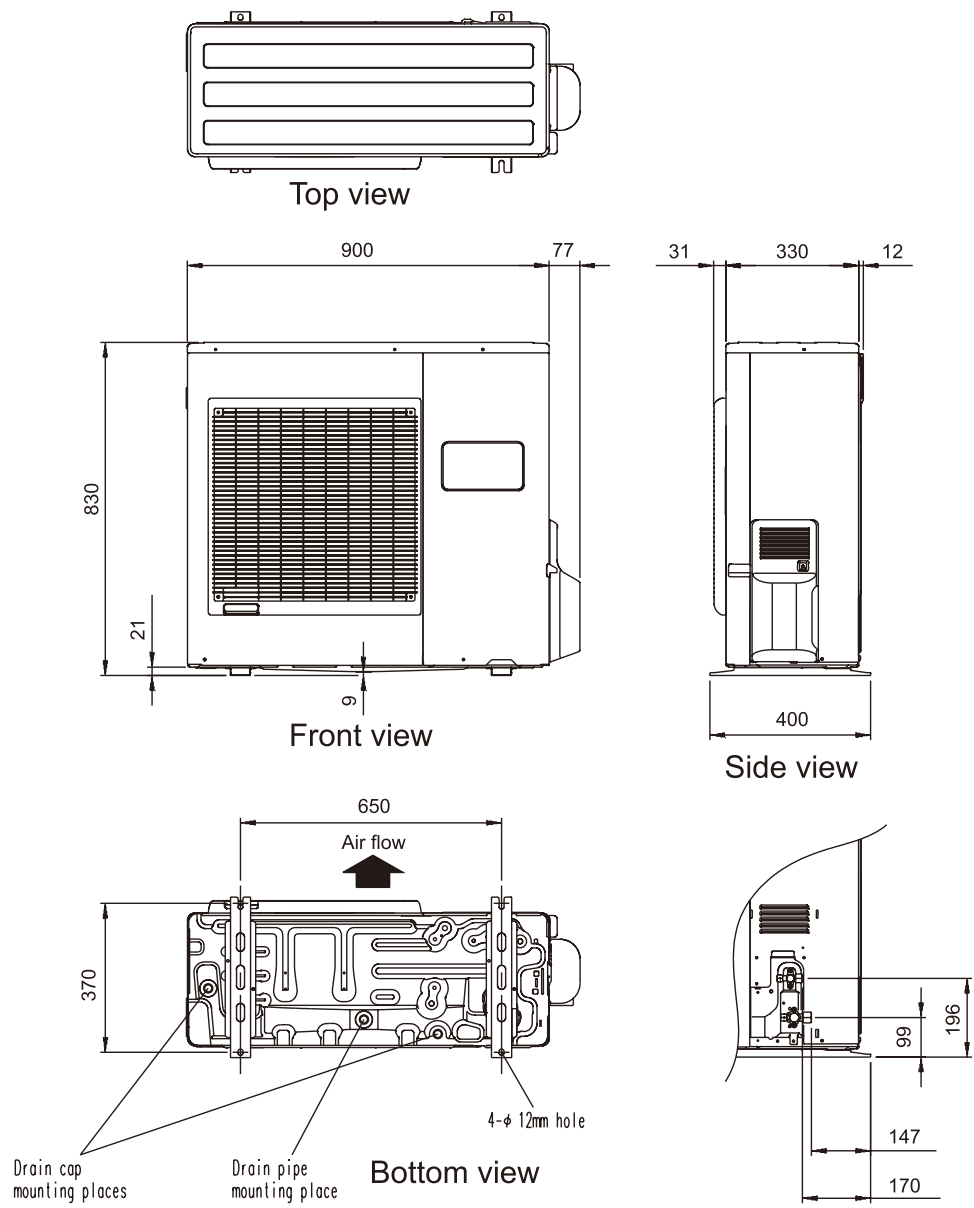
■ MODELS : WO\*A060LFCA, WO\*A080LFCA

(Unit : mm)



■ MODEL : WO\*A100LFTA

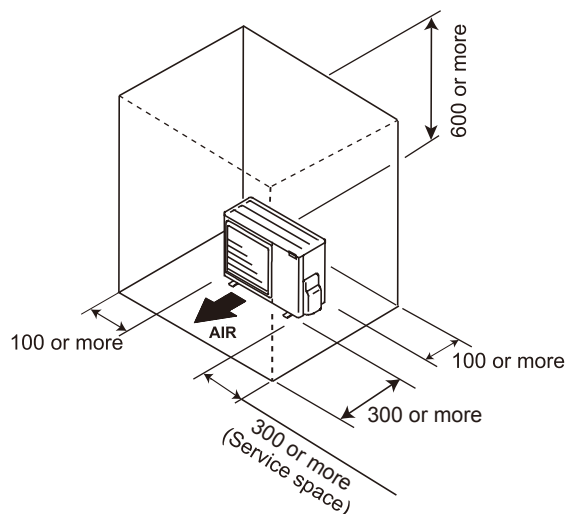
(Unit : mm)



## 3-2. INSTALLATION PLACE

### ■ MODELS : WO\*A060LFCA, WO\*A080LFCA

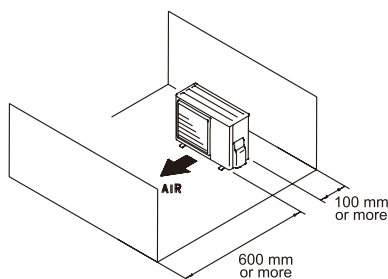
(unit: mm)



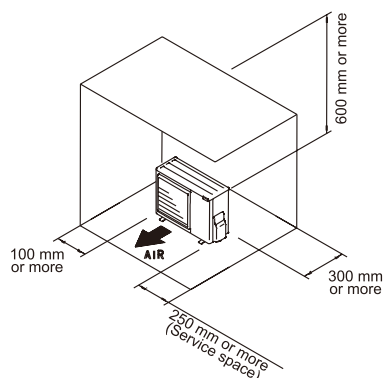
- If the space is larger than that is stated, the condition will be the same as that are no obstacles.
- Height above the floor level should be 50 mm or over.

### ■ MODEL : WO\*A100LFTA

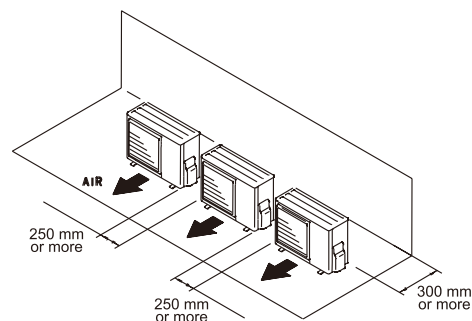
When there are obstacles at the back or front sides.



When there are obstacles at the back, side(s), and top.

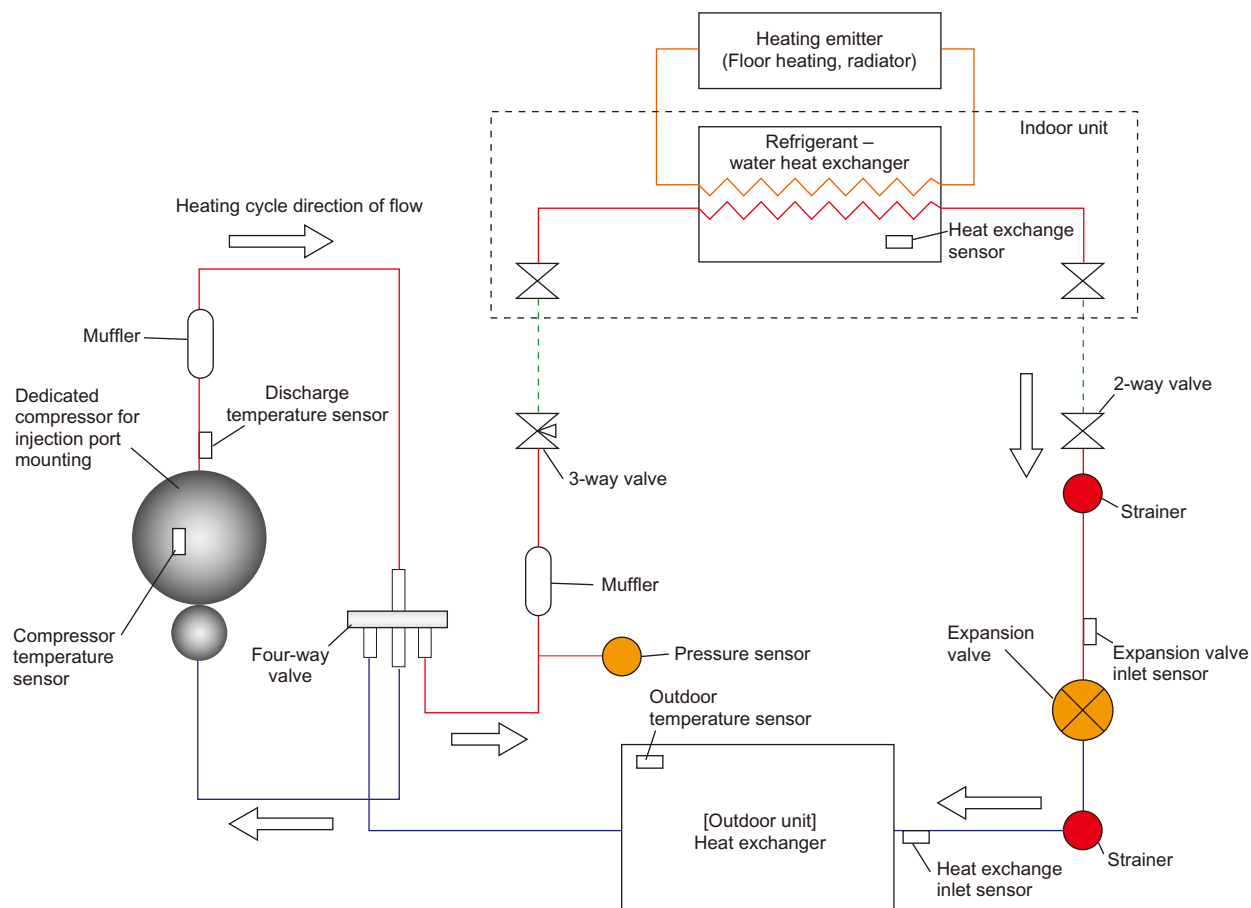


When there are obstacles at the back, side with the installation of more than one unit.

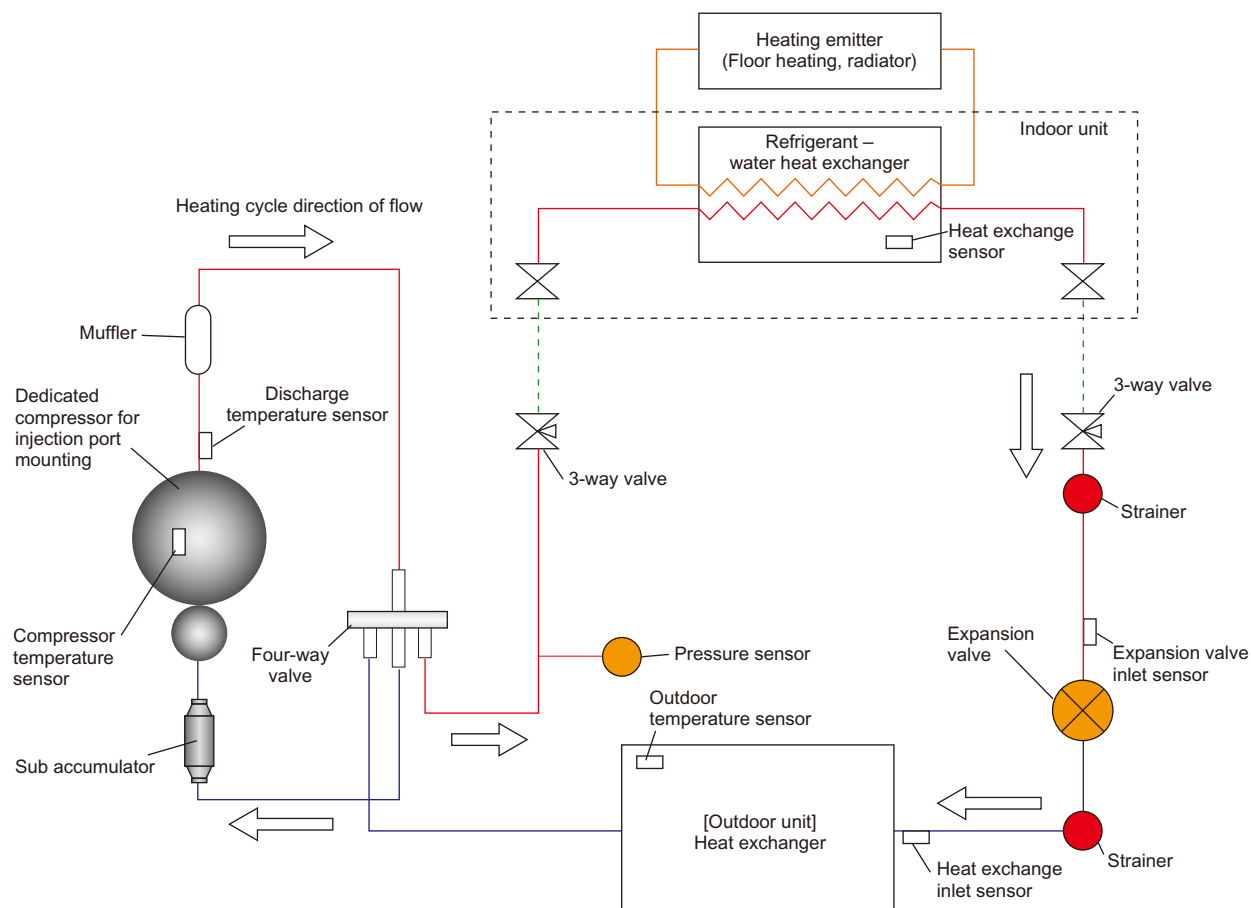


## 4. PIPING DIAGRAM

### MODELS : WO\*A060LFCA, WO\*A080LFCA



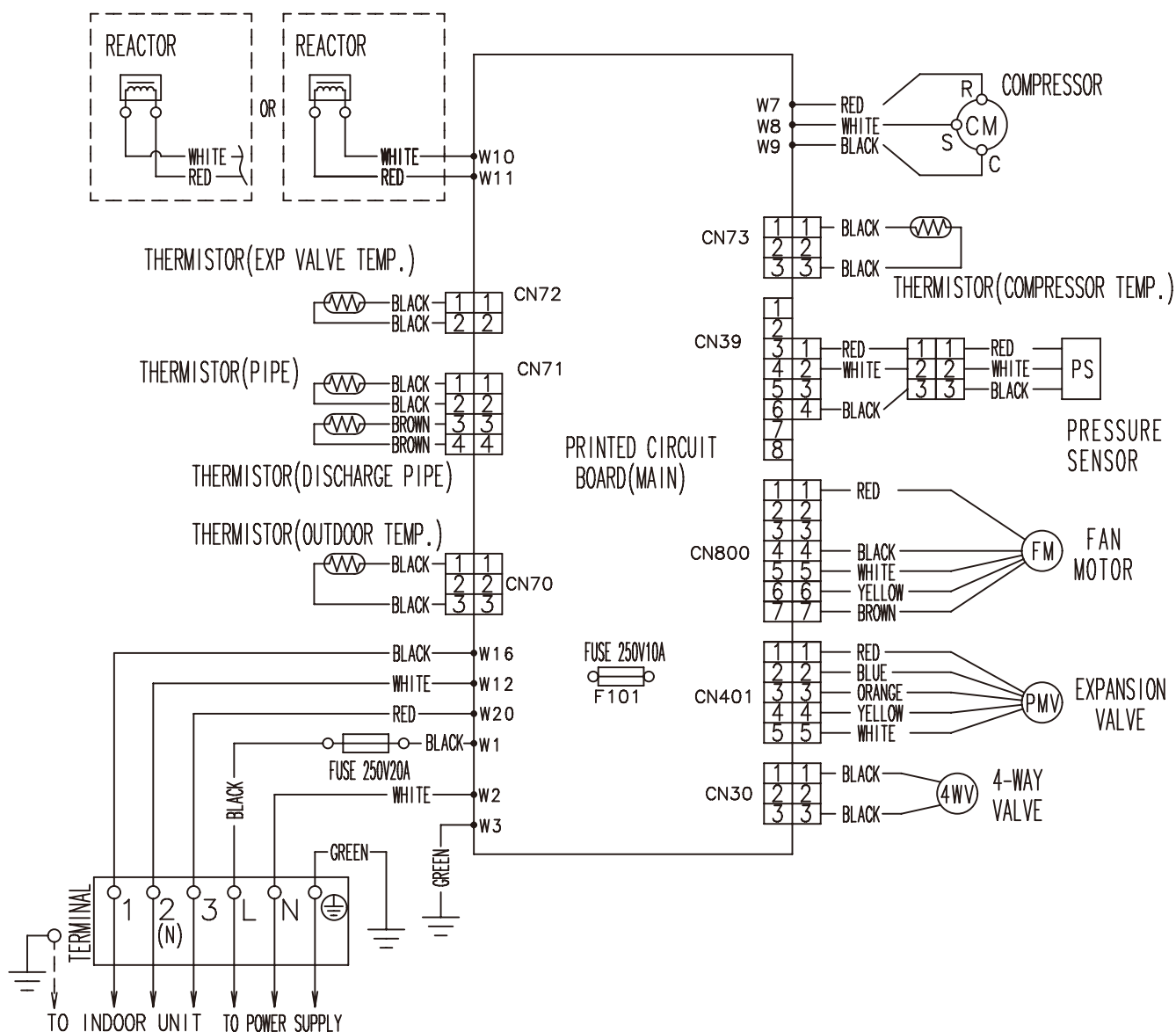
### MODEL : WO\*A100LFTA



## 5. WIRING DIAGRAM

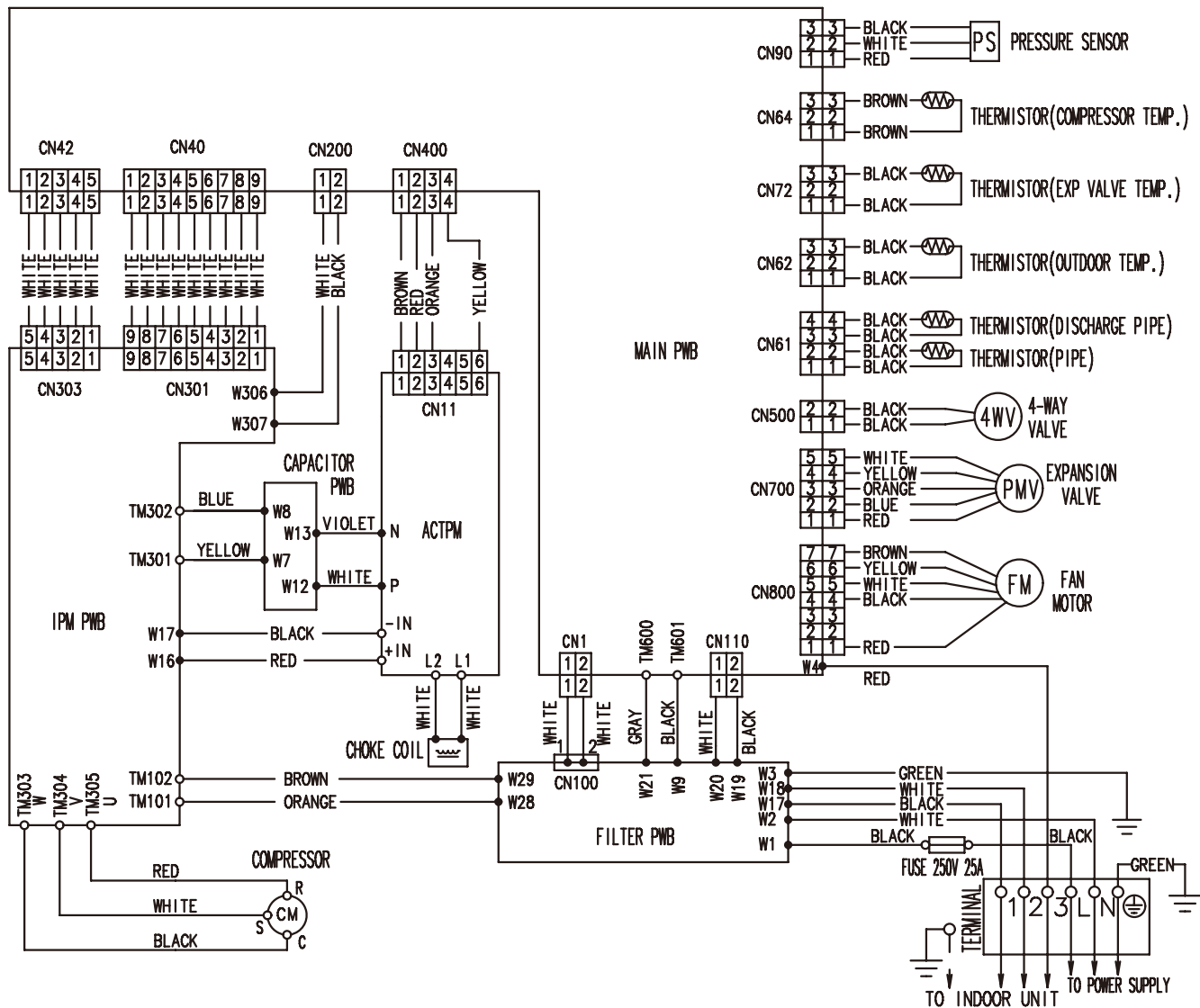
### 5-1. WIRING DIAGRAM

■ MODEL : WO\*A060LFCA

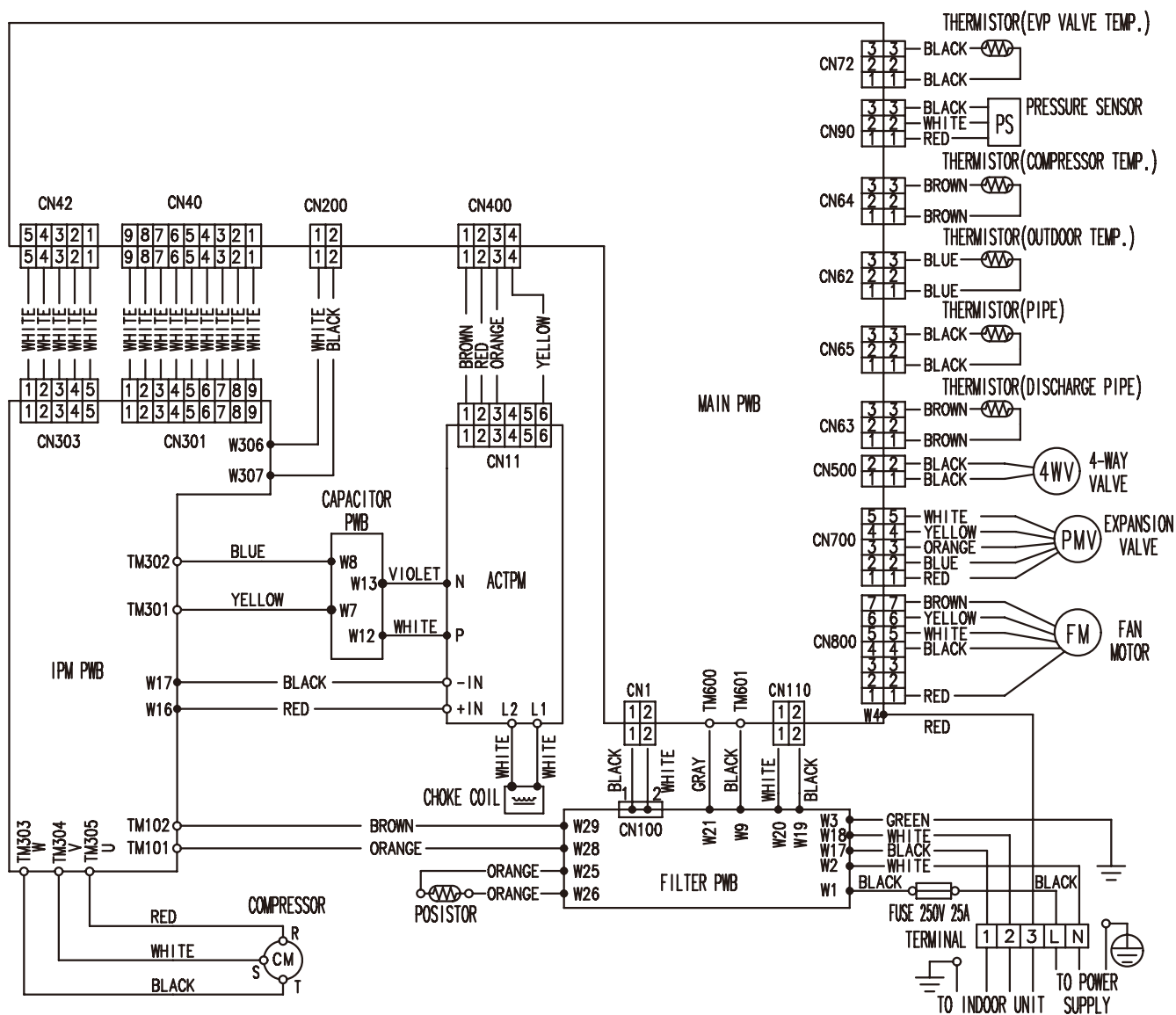




# MODEL : WO\*A080LFCA



# MODEL : WO\*A100LFTA



## 6. CAPACITY TABLES

### 6-1. HEATING CAPACITY

#### ■ MODEL: WO\*A060LFCA (4.5kW type)

FT	30°C			35°C			40°C			45°C			50°C			55°C		
OT	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
-20°C	2.87	1.25	2.30	2.87	1.37	2.09	2.73	1.46	1.87	—	—	—	—	—	—	—	—	—
-19°C	3.03	1.26	2.40	3.03	1.39	2.18	2.88	1.48	1.95	—	—	—	—	—	—	—	—	—
-18°C	3.19	1.28	2.49	3.19	1.41	2.26	3.04	1.50	2.03	3.03	1.61	1.89	—	—	—	—	—	—
-17°C	3.35	1.29	2.60	3.35	1.43	2.34	3.19	1.52	2.10	3.13	1.62	1.93	—	—	—	—	—	—
-16°C	3.51	1.31	2.68	3.51	1.44	2.44	3.35	1.54	2.18	3.22	1.63	1.98	—	—	—	—	—	—
-15°C	3.67	1.32	2.77	3.67	1.46	2.52	3.50	1.56	2.25	3.32	1.64	2.02	—	—	—	—	—	—
-14°C	3.72	1.32	2.82	3.73	1.46	2.55	3.58	1.57	2.29	3.42	1.67	2.05	3.22	1.83	1.76	—	—	—
-13°C	3.78	1.32	2.86	3.78	1.46	2.59	3.65	1.58	2.31	3.51	1.70	2.06	3.31	1.86	1.79	—	—	—
-12°C	3.83	1.32	2.90	3.83	1.46	2.62	3.73	1.59	2.35	3.61	1.72	2.10	3.41	1.88	1.81	—	—	—
-11°C	3.89	1.32	2.95	3.89	1.47	2.65	3.80	1.61	2.36	3.71	1.75	2.12	3.51	1.91	1.84	—	—	—
-10°C	3.94	1.32	2.98	3.94	1.47	2.68	3.88	1.63	2.39	3.81	1.78	2.14	3.61	1.94	1.86	3.17	2.06	1.54
-9°C	3.99	1.32	3.02	3.99	1.47	2.71	3.95	1.64	2.41	3.90	1.81	2.15	3.70	1.97	1.89	3.35	2.11	1.59
-8°C	4.05	1.32	3.07	4.05	1.47	2.76	4.03	1.65	2.44	4.00	1.83	2.19	3.80	1.99	1.91	3.52	2.15	1.64
-7°C	4.10	1.32	3.11	4.10	1.47	2.79	4.10	1.65	2.48	4.10	1.86	2.20	3.90	2.02	1.93	3.70	2.20	1.68
-6°C	4.14	1.32	3.14	4.14	1.46	2.84	4.12	1.64	2.51	4.09	1.82	2.25	3.91	1.98	1.97	3.73	2.18	1.71
-5°C	4.19	1.31	3.20	4.19	1.45	2.89	4.14	1.62	2.56	4.08	1.78	2.29	3.92	1.94	2.02	3.77	2.15	1.75
-4°C	4.23	1.31	3.23	4.23	1.44	2.94	4.15	1.59	2.62	4.07	1.73	2.35	3.93	1.91	2.06	3.80	2.13	1.78
-3°C	4.28	1.31	3.27	4.28	1.44	2.97	4.17	1.57	2.66	4.06	1.69	2.40	3.94	1.87	2.11	3.83	2.10	1.82
-2°C	4.32	1.30	3.32	4.32	1.43	3.02	4.18	1.54	2.71	4.04	1.65	2.45	3.96	1.83	2.16	3.87	2.08	1.86
-1°C	4.37	1.30	3.36	4.37	1.42	3.08	4.20	1.52	2.77	4.03	1.61	2.50	3.97	1.79	2.21	3.90	2.05	1.90
0°C	4.41	1.30	3.39	4.41	1.41	3.13	4.22	1.49	2.84	4.02	1.56	2.58	3.98	1.76	2.27	3.93	2.03	1.94
1°C	4.46	1.29	3.46	4.46	1.40	3.19	4.24	1.45	2.93	4.01	1.52	2.64	3.99	1.72	2.32	3.97	2.00	1.99
2°C	4.50	1.29	3.49	4.50	1.39	3.24	4.25	1.42	2.99	4.00	1.48	2.70	4.00	1.68	2.38	4.00	1.98	2.02
3°C	4.50	1.20	3.75	4.50	1.30	3.46	4.31	1.36	3.17	4.13	1.45	2.85	4.13	1.65	2.50	4.13	1.94	2.13
4°C	4.50	1.10	4.09	4.50	1.21	3.72	4.38	1.29	3.40	4.25	1.41	3.01	4.25	1.61	2.64	4.25	1.91	2.23
5°C	4.50	0.94	4.77	4.50	1.06	4.24	4.50	1.20	3.76	4.50	1.37	3.28	4.50	1.58	2.85	4.50	1.88	2.40
6°C	4.50	0.91	4.94	4.50	1.03	4.38	4.50	1.16	3.87	4.50	1.34	3.37	4.50	1.54	2.92	4.50	1.83	2.46
7°C	4.50	0.88	5.11	4.50	1.00	4.52	4.50	1.13	3.98	4.50	1.30	3.46	4.50	1.51	2.99	4.50	1.79	2.51
8°C	4.50	0.85	5.28	4.50	0.97	4.66	4.50	1.10	4.09	4.50	1.27	3.55	4.50	1.48	3.05	4.50	1.76	2.56
9°C	4.50	0.83	5.45	4.50	0.94	4.80	4.50	1.07	4.20	4.50	1.24	3.64	4.50	1.44	3.12	4.50	1.72	2.62
10°C	4.50	0.80	5.61	4.50	0.91	4.94	4.50	1.04	4.32	4.50	1.21	3.73	4.50	1.41	3.19	4.50	1.69	2.67
11°C	4.50	0.78	5.78	4.50	0.89	5.08	4.50	1.02	4.43	4.50	1.18	3.82	4.50	1.38	3.26	4.50	1.65	2.72
12°C	4.50	0.76	5.95	4.50	0.86	5.22	4.50	0.99	4.54	4.50	1.15	3.91	4.50	1.35	3.33	4.50	1.62	2.78
13°C	4.50	0.74	6.12	4.50	0.84	5.36	4.50	0.97	4.65	4.50	1.13	4.00	4.50	1.32	3.40	4.50	1.59	2.83
14°C	4.50	0.72	6.28	4.50	0.82	5.49	4.50	0.94	4.77	4.50	1.10	4.09	4.50	1.30	3.47	4.50	1.56	2.88
15°C	4.50	0.70	6.45	4.50	0.80	5.63	4.50	0.92	4.88	4.50	1.08	4.18	4.50	1.27	3.54	4.50	1.54	2.93
16°C	4.50	0.68	6.62	4.50	0.78	5.77	4.50	0.90	4.99	4.50	1.05	4.27	4.50	1.25	3.60	4.50	1.51	2.99
17°C	4.50	0.66	6.79	4.50	0.76	5.91	4.50	0.88	5.10	4.50	1.03	4.36	4.50	1.23	3.67	4.50	1.48	3.04
18°C	4.50	0.65	6.95	4.50	0.74	6.05	4.50	0.86	5.22	4.50	1.01	4.45	4.50	1.20	3.74	4.50	1.46	3.09
19°C	4.50	0.63	7.12	4.50	0.73	6.19	4.50	0.84	5.33	4.50	0.99	4.54	4.50	1.18	3.81	4.50	1.43	3.15
20°C	4.50	0.62	7.29	4.50	0.71	6.33	4.50	0.83	5.44	4.50	0.97	4.63	4.50	1.16	3.88	4.50	1.41	3.20
21°C	4.50	0.61	7.37	4.50	0.70	6.41	4.50	0.82	5.50	4.50	0.96	4.68	4.50	1.15	3.92	4.50	1.39	3.23
22°C	4.50	0.60	7.45	4.50	0.69	6.49	4.50	0.81	5.56	4.50	0.95	4.73	4.50	1.14	3.95	4.50	1.38	3.25
23°C	4.50	0.60	7.53	4.50	0.69	6.56	4.50	0.80	5.63	4.50	0.94	4.77	4.50	1.13	3.99	4.50	1.37	3.28
24°C	4.50	0.59	7.61	4.50	0.68	6.64	4.50	0.79	5.69	4.50	0.93	4.82	4.50	1.12	4.03	4.50	1.36	3.31
25°C	4.50	0.59	7.69	4.50	0.67	6.72	4.50	0.78	5.75	4.50	0.92	4.87	4.50	1.11	4.06	4.50	1.35	3.33
26°C	4.50	0.58	7.77	4.50	0.66	6.80	4.50	0.77	5.81	4.50	0.91	4.92	4.50	1.10	4.10	4.50	1.34	3.36
27°C	4.50	0.57	7.85	4.50	0.65	6.88	4.50	0.77	5.87	4.50	0.91	4.97	4.50	1.09	4.14	4.50	1.33	3.39
28°C	4.50	0.57	7.94	4.50	0.65	6.95	4.50	0.76	5.94	4.50	0.90	5.01	4.50	1.08	4.17	4.50	1.32	3.41
29°C	4.50	0.56	8.02	4.50	0.64	7.03	4.50	0.75	6.00	4.50	0.89	5.06	4.50	1.07	4.21	4.50	1.31	3.44
30°C	4.50	0.56	8.10	4.50	0.63	7.11	4.50	0.74	6.06	4.50	0.88	5.11	4.50	1.06	4.25	4.50	1.30	3.47
31°C	4.50	0.55	8.18	4.50	0.63	7.19	4.50	0.74	6.12	4.50	0.87	5.16	4.50	1.05	4.28	4.50	1.29	3.49
32°C	4.50	0.54	8.26	4.50	0.62	7.27	4.50	0.73	6.18	4.50	0.86	5.21	4.50	1.04	4.32	4.50	1.28	3.52
33°C	4.50	0.54	8.34	4.50	0.61	7.34	4.50	0.72	6.25	4.50	0.86	5.25	4.50	1.03	4.36	4.50	1.27	3.55
34°C	4.50	0.53	8.42	4.50	0.61	7.42	4.50	0.71	6.31	4.50	0.85	5.30	4.50	1.03	4.39	4.50	1.26	3.57
35°C	4.50	0.53	8.50	4.50	0.60	7.50	4.50	0.71	6.37	4.50	0.84	5.35	4.50	1.02	4.43	4.50	1.25	3.60

FT : Flow temperature  
OT : Outdoor temperature  
HC : Heating capacity (kW)  
IP : Input power (kW)  
COP : Coefficient of performance

The values of heating capacity/input power/COP are based on measurement of EN14511 standard;

FT < 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 35°C / 30°C, 780 l/h

FT ≥ 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 45°C / 40°C, 783 l/h

FT = 55°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 55°C / 47°C, 491 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.

# MODEL: WO\*A060LFCA (6.0kW type)

FT	30°C			35°C			40°C			45°C			50°C			55°C		
OT	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
-20°C	3.72	1.68	2.21	3.67	1.78	2.06	3.60	1.92	1.87	—	—	—	—	—	—	—	—	—
-19°C	3.79	1.66	2.28	3.74	1.76	2.13	3.67	1.90	1.93	—	—	—	—	—	—	—	—	—
-18°C	3.87	1.64	2.36	3.82	1.73	2.21	3.75	1.88	1.99	3.77	2.01	1.88	—	—	—	—	—	—
-17°C	3.95	1.62	2.44	3.89	1.71	2.27	3.82	1.85	2.06	3.82	1.99	1.91	—	—	—	—	—	—
-16°C	4.02	1.60	2.51	3.97	1.69	2.35	3.90	1.83	2.13	3.86	1.98	1.95	—	—	—	—	—	—
-15°C	4.10	1.58	2.60	4.04	1.67	2.42	3.97	1.80	2.20	3.91	1.96	1.99	—	—	—	—	—	—
-14°C	4.17	1.59	2.62	4.11	1.68	2.45	4.04	1.81	2.23	3.98	1.97	2.02	3.68	2.09	1.76	—	—	—
-13°C	4.25	1.60	2.66	4.18	1.69	2.47	4.11	1.82	2.26	4.05	1.98	2.05	3.75	2.10	1.78	—	—	—
-12°C	4.32	1.60	2.70	4.25	1.69	2.51	4.18	1.83	2.28	4.11	1.99	2.07	3.82	2.11	1.81	—	—	—
-11°C	4.39	1.61	2.73	4.32	1.70	2.54	4.25	1.84	2.31	4.18	2.00	2.09	3.88	2.12	1.83	—	—	—
-10°C	4.46	1.62	2.75	4.39	1.71	2.57	4.32	1.85	2.34	4.25	2.01	2.11	3.95	2.13	1.85	3.53	2.26	1.56
-9°C	4.54	1.63	2.79	4.46	1.72	2.59	4.39	1.85	2.37	4.32	2.02	2.14	4.02	2.14	1.88	3.64	2.28	1.60
-8°C	4.61	1.64	2.81	4.53	1.73	2.62	4.46	1.86	2.40	4.38	2.03	2.16	4.08	2.15	1.90	3.74	2.31	1.62
-7°C	4.68	1.65	2.84	4.60	1.74	2.64	4.53	1.87	2.42	4.45	2.04	2.18	4.15	2.16	1.92	3.85	2.33	1.65
-6°C	4.74	1.63	2.91	4.64	1.72	2.70	4.55	1.84	2.47	4.46	2.00	2.23	4.19	2.13	1.97	3.92	2.32	1.69
-5°C	4.79	1.62	2.96	4.68	1.69	2.77	4.57	1.81	2.52	4.46	1.96	2.28	4.23	2.11	2.00	3.99	2.31	1.73
-4°C	4.85	1.60	3.03	4.72	1.67	2.83	4.60	1.78	2.58	4.47	1.92	2.33	4.27	2.08	2.05	4.07	2.31	1.76
-3°C	4.90	1.59	3.08	4.76	1.65	2.88	4.62	1.75	2.64	4.47	1.88	2.38	4.31	2.06	2.09	4.14	2.30	1.80
-2°C	4.96	1.57	3.16	4.79	1.62	2.96	4.64	1.72	2.70	4.48	1.85	2.42	4.34	2.03	2.14	4.21	2.29	1.84
-1°C	5.01	1.56	3.21	4.83	1.60	3.02	4.66	1.69	2.76	4.48	1.81	2.48	4.38	2.01	2.18	4.28	2.28	1.88
0°C	5.07	1.54	3.29	4.87	1.58	3.08	4.68	1.66	2.82	4.49	1.77	2.54	4.42	1.98	2.23	4.36	2.28	1.91
1°C	5.12	1.53	3.35	4.91	1.55	3.17	4.70	1.63	2.88	4.49	1.73	2.60	4.46	1.96	2.28	4.43	2.27	1.95
2°C	5.18	1.51	3.43	4.95	1.53	3.24	4.73	1.60	2.95	4.50	1.69	2.70	4.50	1.93	2.33	4.50	2.26	1.99
3°C	5.50	1.49	3.69	5.21	1.51	3.45	4.93	1.57	3.14	4.65	1.65	2.82	4.58	1.86	2.46	4.50	2.15	2.09
4°C	5.82	1.47	3.96	5.48	1.49	3.68	5.14	1.55	3.32	4.80	1.62	2.96	4.65	1.80	2.58	4.50	2.05	2.20
5°C	6.45	1.47	4.40	6.00	1.49	4.04	5.55	1.53	3.63	5.10	1.57	3.24	4.80	1.70	2.83	4.50	1.88	2.40
6°C	6.45	1.42	4.54	6.00	1.44	4.16	5.55	1.49	3.73	5.10	1.54	3.32	4.80	1.66	2.89	4.50	1.83	2.46
7°C	6.45	1.38	4.67	6.00	1.41	4.27	5.55	1.45	3.83	5.10	1.50	3.40	4.80	1.62	2.96	4.50	1.79	2.51
8°C	6.45	1.34	4.80	6.00	1.37	4.38	5.55	1.41	3.93	5.10	1.47	3.48	4.80	1.58	3.03	4.50	1.76	2.56
9°C	6.45	1.31	4.94	6.00	1.33	4.50	5.55	1.38	4.03	5.10	1.43	3.56	4.80	1.55	3.09	4.50	1.72	2.62
10°C	6.45	1.27	5.07	6.00	1.30	4.61	5.55	1.34	4.13	5.10	1.40	3.65	4.80	1.52	3.16	4.50	1.69	2.67
11°C	6.45	1.24	5.21	6.00	1.27	4.73	5.55	1.32	4.22	5.10	1.37	3.73	4.80	1.49	3.23	4.50	1.65	2.72
12°C	6.45	1.21	5.34	6.00	1.24	4.84	5.55	1.28	4.32	5.10	1.34	3.81	4.80	1.46	3.29	4.50	1.62	2.78
13°C	6.45	1.18	5.48	6.00	1.21	4.96	5.55	1.26	4.42	5.10	1.31	3.89	4.80	1.43	3.36	4.50	1.59	2.83
14°C	6.45	1.15	5.61	6.00	1.18	5.07	5.55	1.23	4.52	5.10	1.28	3.98	4.80	1.40	3.43	4.50	1.56	2.88
15°C	6.45	1.12	5.75	6.00	1.16	5.19	5.55	1.20	4.62	5.10	1.26	4.06	4.80	1.37	3.50	4.50	1.54	2.93
16°C	6.45	1.10	5.88	6.00	1.13	5.30	5.55	1.18	4.72	5.10	1.23	4.14	4.80	1.35	3.56	4.50	1.51	2.99
17°C	6.45	1.07	6.02	6.00	1.11	5.42	5.55	1.15	4.81	5.10	1.21	4.22	4.80	1.32	3.63	4.50	1.48	3.04
18°C	6.45	1.05	6.15	6.00	1.08	5.53	5.55	1.13	4.91	5.10	1.18	4.31	4.80	1.30	3.70	4.50	1.46	3.09
19°C	6.45	1.03	6.29	6.00	1.06	5.65	5.55	1.11	5.01	5.10	1.16	4.39	4.80	1.28	3.76	4.50	1.43	3.15
20°C	6.45	1.00	6.42	6.00	1.04	5.76	5.55	1.09	5.11	5.10	1.14	4.47	4.80	1.25	3.83	4.50	1.41	3.20
21°C	6.45	1.00	6.48	6.00	1.03	5.82	5.55	1.08	5.16	5.10	1.13	4.51	4.80	1.24	3.86	4.50	1.39	3.23
22°C	6.45	0.98	6.55	6.00	1.02	5.87	5.55	1.07	5.20	5.10	1.12	4.55	4.80	1.23	3.90	4.50	1.38	3.25
23°C	6.45	0.98	6.61	6.00	1.01	5.93	5.55	1.06	5.25	5.10	1.11	4.59	4.80	1.22	3.93	4.50	1.37	3.28
24°C	6.45	0.97	6.67	6.00	1.00	5.98	5.55	1.05	5.30	5.10	1.10	4.63	4.80	1.21	3.96	4.50	1.36	3.31
25°C	6.45	0.96	6.73	6.00	0.99	6.04	5.55	1.04	5.35	5.10	1.09	4.67	4.80	1.20	4.00	4.50	1.35	3.33
26°C	6.45	0.95	6.80	6.00	0.98	6.10	5.55	1.03	5.39	5.10	1.08	4.71	4.80	1.19	4.03	4.50	1.34	3.36
27°C	6.45	0.94	6.86	6.00	0.98	6.15	5.55	1.02	5.44	5.10	1.07	4.75	4.80	1.18	4.06	4.50	1.33	3.39
28°C	6.45	0.93	6.92	6.00	0.97	6.21	5.55	1.01	5.49	5.10	1.06	4.79	4.80	1.17	4.10	4.50	1.32	3.41
29°C	6.45	0.92	6.98	6.00	0.96	6.26	5.55	1.00	5.54	5.10	1.06	4.83	4.80	1.16	4.13	4.50	1.31	3.44
30°C	6.45	0.91	7.05	6.00	0.95	6.32	5.55	0.99	5.58	5.10	1.05	4.87	4.80	1.15	4.16	4.50	1.30	3.47
31°C	6.45	0.91	7.11	6.00	0.94	6.38	5.55	0.99	5.63	5.10	1.04	4.91	4.80	1.14	4.20	4.50	1.29	3.49
32°C	6.45	0.90	7.17	6.00	0.93	6.43	5.55	0.98	5.68	5.10	1.03	4.95	4.80	1.13	4.23	4.50	1.28	3.52
33°C	6.45	0.89	7.23	6.00	0.92	6.49	5.55	0.97	5.73	5.10	1.02	4.99	4.80	1.13	4.26	4.50	1.27	3.55
34°C	6.45	0.88	7.30	6.00	0.92	6.54	5.55	0.96	5.77	5.10	1.01	5.03	4.80	1.12	4.30	4.50	1.26	3.57
35°C	6.45	0.88	7.36	6.00	0.91	6.60	5.55	0.95	5.82	5.10	1.01	5.07	4.80	1.11	4.33	4.50	1.25	3.60

FT : Flow temperature  
OT : Outdoor temperature  
HC : Heating capacity (kW)  
IP : Input power (kW)  
COP : Coefficient of performance

The values of heating capacity/power input/COP are based on measurement of EN14511 standard;

FT < 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 35°C / 30°C, 1040 l/h

FT ≥ 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 45°C / 40°C, 887 l/h

FT = 55°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 55°C / 47°C, 491 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.

# **MODEL: WO\*A080LFCA**

FT	30°C			35°C			40°C			45°C			50°C			55°C		
OT	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
-20°C	4.49	2.03	2.21	4.26	2.13	2.00	4.03	2.21	1.82	—	—	—	—	—	—	—	—	—
-19°C	4.91	2.21	2.22	4.66	2.33	2.00	4.40	2.42	1.82	—	—	—	—	—	—	—	—	—
-18°C	5.32	2.40	2.22	5.05	2.52	2.00	4.78	2.62	1.82	4.46	2.63	1.70	—	—	—	—	—	—
-17°C	5.74	2.58	2.22	5.45	2.72	2.00	5.16	2.82	1.83	4.61	2.69	1.71	—	—	—	—	—	—
-16°C	5.77	2.54	2.27	5.48	2.67	2.05	5.18	2.77	1.87	4.75	2.75	1.73	—	—	—	—	—	—
-15°C	5.80	2.49	2.33	5.50	2.62	2.10	5.20	2.72	1.91	4.90	2.82	1.74	—	—	—	—	—	—
-14°C	5.83	2.45	2.38	5.53	2.57	2.15	5.22	2.67	1.96	4.92	2.77	1.78	4.90	3.10	1.58	—	—	—
-13°C	5.86	2.40	2.44	5.55	2.52	2.20	5.25	2.63	2.00	4.94	2.73	1.81	4.92	3.06	1.61	—	—	—
-12°C	5.89	2.36	2.50	5.58	2.47	2.26	5.27	2.58	2.04	4.96	2.69	1.84	4.94	3.02	1.64	—	—	—
-11°C	5.92	2.31	2.56	5.60	2.42	2.31	5.29	2.53	2.09	4.98	2.64	1.89	4.96	2.97	1.67	—	—	—
-10°C	5.94	2.27	2.62	5.63	2.38	2.37	5.31	2.48	2.14	4.99	2.60	1.92	4.98	2.93	1.70	4.86	3.31	1.47
-9°C	5.97	2.22	2.69	5.65	2.33	2.42	5.34	2.44	2.19	5.01	2.56	1.96	4.99	2.89	1.73	4.91	3.28	1.50
-8°C	6.00	2.18	2.75	5.68	2.28	2.49	5.36	2.39	2.24	5.03	2.51	2.00	5.01	2.84	1.76	4.95	3.24	1.53
-7°C	6.03	2.13	2.83	5.70	2.23	2.56	5.38	2.34	2.30	5.05	2.47	2.04	5.03	2.80	1.80	5.00	3.21	1.56
-6°C	6.02	2.09	2.88	5.69	2.18	2.61	5.37	2.28	2.36	5.04	2.41	2.09	5.05	2.74	1.84	5.00	3.13	1.60
-5°C	6.02	2.05	2.94	5.69	2.13	2.67	5.37	2.23	2.41	5.04	2.35	2.14	5.07	2.69	1.88	5.00	3.06	1.63
-4°C	6.01	2.01	2.99	5.68	2.08	2.73	5.36	2.17	2.47	5.03	2.29	2.20	5.09	2.63	1.94	5.00	2.99	1.67
-3°C	6.01	1.97	3.05	5.68	2.03	2.80	5.36	2.12	2.53	5.03	2.23	2.26	5.11	2.57	1.99	5.00	2.92	1.71
-2°C	6.00	1.92	3.13	5.67	1.98	2.86	5.35	2.06	2.60	5.02	2.16	2.32	5.12	2.51	2.04	5.00	2.85	1.75
-1°C	6.00	1.88	3.19	5.67	1.93	2.94	5.34	2.01	2.66	5.02	2.10	2.39	5.14	2.46	2.09	5.00	2.78	1.80
0°C	5.99	1.84	3.26	5.66	1.88	3.01	5.34	1.95	2.74	5.01	2.04	2.46	5.16	2.40	2.15	5.00	2.71	1.85
1°C	5.99	1.80	3.33	5.66	1.83	3.09	5.33	1.90	2.81	5.01	1.98	2.53	5.18	2.34	2.21	5.00	2.64	1.89
2°C	5.98	1.76	3.40	5.65	1.78	3.17	5.33	1.84	2.89	5.00	1.92	2.60	5.20	2.29	2.28	5.00	2.56	1.95
3°C	6.52	1.79	3.64	6.11	1.81	3.38	5.71	1.86	3.07	5.30	1.92	2.76	5.30	2.19	2.42	5.00	2.41	2.07
4°C	7.07	1.82	3.88	6.58	1.84	3.58	6.09	1.88	3.24	5.60	1.92	2.92	5.40	2.10	2.57	5.00	2.26	2.21
5°C	7.61	1.85	4.18	7.04	1.86	3.85	6.47	1.89	3.50	6.20	1.95	3.18	5.60	1.96	2.86	5.00	1.98	2.53
6°C	8.15	1.88	4.33	7.50	1.89	3.96	6.85	1.91	3.59	6.20	1.91	3.25	5.60	1.92	2.91	5.00	1.96	2.55
7°C	8.15	1.82	4.48	7.50	1.84	4.08	6.85	1.86	3.68	6.20	1.87	3.31	5.60	1.90	2.95	5.00	1.94	2.58
8°C	8.15	1.76	4.63	7.50	1.79	4.20	6.85	1.82	3.77	6.20	1.84	3.37	5.60	1.87	2.99	5.00	1.92	2.61
9°C	8.15	1.71	4.78	7.50	1.74	4.31	6.85	1.77	3.86	6.20	1.80	3.44	5.60	1.84	3.04	5.00	1.90	2.63
10°C	8.15	1.66	4.92	7.50	1.69	4.43	6.85	1.73	3.95	6.20	1.77	3.50	5.60	1.82	3.08	5.00	1.88	2.66
11°C	8.15	1.61	5.07	7.50	1.65	4.55	6.85	1.70	4.04	6.20	1.74	3.57	5.60	1.79	3.12	5.00	1.86	2.69
12°C	8.15	1.56	5.22	7.50	1.61	4.66	6.85	1.66	4.13	6.20	1.71	3.63	5.60	1.77	3.17	5.00	1.85	2.71
13°C	8.15	1.52	5.37	7.50	1.57	4.78	6.85	1.62	4.22	6.20	1.68	3.70	5.60	1.74	3.21	5.00	1.82	2.74
14°C	8.15	1.48	5.51	7.50	1.53	4.90	6.85	1.59	4.31	6.20	1.65	3.76	5.60	1.72	3.25	5.00	1.81	2.77
15°C	8.15	1.44	5.66	7.50	1.49	5.02	6.85	1.56	4.40	6.20	1.62	3.83	5.60	1.70	3.29	5.00	1.79	2.80
16°C	8.15	1.40	5.81	7.50	1.46	5.13	6.85	1.53	4.49	6.20	1.59	3.89	5.60	1.68	3.34	5.00	1.77	2.82
17°C	8.15	1.37	5.96	7.50	1.43	5.25	6.85	1.50	4.58	6.20	1.57	3.96	5.60	1.66	3.38	5.00	1.75	2.85
18°C	8.15	1.34	6.10	7.50	1.40	5.37	6.85	1.47	4.67	6.20	1.54	4.02	5.60	1.64	3.42	5.00	1.74	2.88
19°C	8.15	1.30	6.25	7.50	1.37	5.48	6.85	1.44	4.76	6.20	1.52	4.09	5.60	1.61	3.47	5.00	1.72	2.90
20°C	8.15	1.27	6.40	7.50	1.34	5.60	6.85	1.41	4.85	6.20	1.49	4.15	5.60	1.60	3.51	5.00	1.71	2.93
21°C	8.15	1.26	6.46	7.50	1.33	5.65	6.85	1.40	4.90	6.20	1.48	4.19	5.60	1.58	3.54	5.00	1.69	2.96
22°C	8.15	1.25	6.52	7.50	1.31	5.71	6.85	1.39	4.94	6.20	1.47	4.23	5.60	1.56	3.58	5.00	1.67	2.99
23°C	8.15	1.24	6.59	7.50	1.30	5.76	6.85	1.37	4.99	6.20	1.45	4.27	5.60	1.55	3.61	5.00	1.66	3.01
24°C	8.15	1.23	6.65	7.50	1.29	5.81	6.85	1.36	5.03	6.20	1.44	4.31	5.60	1.53	3.65	5.00	1.64	3.04
25°C	8.15	1.21	6.71	7.50	1.28	5.87	6.85	1.35	5.08	6.20	1.43	4.35	5.60	1.52	3.68	5.00	1.63	3.07
26°C	8.15	1.20	6.77	7.50	1.27	5.92	6.85	1.34	5.13	6.20	1.41	4.39	5.60	1.51	3.71	5.00	1.61	3.10
27°C	8.15	1.19	6.83	7.50	1.26	5.97	6.85	1.32	5.17	6.20	1.40	4.43	5.60	1.49	3.75	5.00	1.60	3.13
28°C	8.15	1.18	6.90	7.50	1.24	6.03	6.85	1.31	5.22	6.20	1.39	4.47	5.60	1.48	3.78	5.00	1.59	3.15
29°C	8.15	1.17	6.96	7.50	1.23	6.08	6.85	1.30	5.26	6.20	1.37	4.51	5.60	1.47	3.82	5.00	1.57	3.18
30°C	8.15	1.16	7.02	7.50	1.22	6.13	6.85	1.29	5.31	6.20	1.36	4.55	5.60	1.45	3.85	5.00	1.56	3.21
31°C	8.15	1.15	7.08	7.50	1.21	6.19	6.85	1.28	5.36	6.20	1.35	4.59	5.60	1.44	3.88	5.00	1.54	3.24
32°C	8.15	1.14	7.14	7.50	1.20	6.24	6.85	1.27	5.40	6.20	1.34	4.63	5.60	1.43	3.92	5.00	1.53	3.27
33°C	8.15	1.13	7.21	7.50	1.19	6.29	6.85	1.26	5.45	6.20	1.33	4.67	5.60	1.42	3.95	5.00	1.52	3.29
34°C	8.15	1.12	7.27	7.50	1.18	6.35	6.85	1.25	5.49	6.20	1.32	4.71	5.60	1.40	3.99	5.00	1.51	3.32
35°C	8.15	1.11	7.33	7.50	1.17	6.40	6.85	1.24	5.54	6.20	1.31	4.75	5.60	1.39	4.02	5.00	1.49	3.35

FT : Flow temperature  
OT : Outdoor temperature  
HC : Heating capacity (kW)  
IP : Input power (kW)  
COP : Coefficient of performance

The values of heating capacity/power input/COP are based on measurement of EN14511 standard;

FT < 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 35°C / 30°C, 1300 l/h

FT ≥ 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 45°C / 40°C, 1079 l/h

FT = 55°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 55°C / 47°C, 546 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.

# **MODEL: WO\*A100LFTA**

FT	30°C			35°C			40°C			45°C			50°C			55°C		
OT	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP	HC	IP	COP
-20°C	5.97	2.57	2.32	5.89	2.86	2.06	5.60	3.05	1.84	—	—	—	—	—	—	—	—	—
-19°C	6.41	2.72	2.36	6.31	3.01	2.10	5.97	3.20	1.87	—	—	—	—	—	—	—	—	—
-18°C	6.84	2.86	2.39	6.73	3.17	2.12	6.34	3.36	1.89	6.03	3.49	1.73	—	—	—	—	—	—
-17°C	7.28	3.01	2.42	7.15	3.33	2.15	6.71	3.51	1.91	6.18	3.54	1.75	—	—	—	—	—	—
-16°C	7.29	2.97	2.45	7.18	3.29	2.18	6.78	3.50	1.94	6.34	3.60	1.76	—	—	—	—	—	—
-15°C	7.30	2.93	2.49	7.20	3.26	2.21	6.85	3.48	1.97	6.50	3.65	1.78	—	—	—	—	—	—
-14°C	7.31	2.90	2.52	7.23	3.22	2.25	6.92	3.46	2.00	6.61	3.66	1.81	6.41	3.91	1.64	—	—	—
-13°C	7.33	2.86	2.56	7.25	3.19	2.27	6.99	3.44	2.03	6.72	3.66	1.84	6.52	3.92	1.66	—	—	—
-12°C	7.34	2.82	2.60	7.28	3.15	2.31	7.06	3.42	2.06	6.84	3.67	1.86	6.63	3.92	1.69	—	—	—
-11°C	7.35	2.79	2.63	7.30	3.11	2.35	7.13	3.40	2.10	6.95	3.68	1.89	6.75	3.93	1.72	—	—	—
-10°C	7.36	2.75	2.68	7.33	3.08	2.38	7.19	3.39	2.12	7.06	3.68	1.92	6.86	3.94	1.74	5.89	4.09	1.44
-9°C	7.38	2.71	2.72	7.35	3.04	2.42	7.26	3.37	2.15	7.17	3.69	1.94	6.97	3.94	1.77	6.26	4.11	1.52
-8°C	7.39	2.68	2.76	7.38	3.01	2.45	7.33	3.35	2.19	7.29	3.69	1.98	7.09	3.95	1.80	6.63	4.13	1.61
-7°C	7.40	2.64	2.78	7.40	2.97	2.49	7.40	3.33	2.22	7.40	3.70	2.00	7.20	3.95	1.82	7.00	4.15	1.69
-6°C	7.48	2.62	2.85	7.43	2.91	2.55	7.38	3.24	2.28	7.33	3.58	2.05	7.16	3.85	1.86	6.98	4.10	1.70
-5°C	7.57	2.60	2.91	7.47	2.86	2.61	7.37	3.15	2.34	7.27	3.46	2.10	7.11	3.74	1.90	6.96	4.05	1.72
-4°C	7.65	2.59	2.95	7.50	2.80	2.68	7.35	3.06	2.40	7.20	3.34	2.16	7.07	3.64	1.94	6.93	4.00	1.73
-3°C	7.73	2.57	3.01	7.53	2.75	2.74	7.33	2.97	2.47	7.13	3.22	2.21	7.02	3.54	1.98	6.91	3.95	1.75
-2°C	7.82	2.55	3.07	7.57	2.69	2.81	7.32	2.87	2.55	7.07	3.10	2.28	6.98	3.43	2.03	6.89	3.90	1.77
-1°C	7.90	2.53	3.12	7.60	2.64	2.88	7.30	2.78	2.63	7.00	2.98	2.35	6.93	3.33	2.08	6.87	3.85	1.78
0°C	7.98	2.52	3.17	7.63	2.58	2.96	7.28	2.69	2.71	6.93	2.86	2.42	6.89	3.23	2.13	6.84	3.80	1.80
1°C	8.07	2.50	3.23	7.67	2.53	3.03	7.27	2.60	2.80	6.87	2.74	2.51	6.84	3.12	2.19	6.82	3.75	1.82
2°C	8.15	2.48	3.29	7.70	2.47	3.12	7.25	2.51	2.89	6.80	2.62	2.60	6.80	3.02	2.25	6.80	3.70	1.84
3°C	8.83	2.50	3.53	8.28	2.49	3.33	7.72	2.52	3.06	7.17	2.61	2.75	7.01	2.95	2.38	6.85	3.50	1.96
4°C	9.51	2.52	3.77	8.85	2.52	3.51	8.20	2.54	3.23	7.54	2.61	2.89	7.22	2.87	2.52	6.90	3.31	2.08
5°C	10.19	2.54	4.10	9.43	2.54	3.81	8.67	2.55	3.48	7.90	2.60	3.12	7.43	2.80	2.75	6.95	3.11	2.35
6°C	10.87	2.56	4.24	10.00	2.56	3.91	9.14	2.56	3.57	8.27	2.59	3.19	7.64	2.72	2.81	7.00	2.92	2.40
7°C	10.87	2.49	4.37	10.00	2.49	4.02	9.14	2.50	3.66	8.27	2.53	3.27	7.64	2.66	2.87	7.00	2.86	2.45
8°C	10.87	2.42	4.50	10.00	2.42	4.13	9.14	2.44	3.75	8.27	2.47	3.35	7.64	2.61	2.93	7.00	2.80	2.50
9°C	10.87	2.34	4.64	10.00	2.36	4.23	9.14	2.38	3.84	8.27	2.42	3.42	7.64	2.56	2.99	7.00	2.75	2.55
10°C	10.87	2.28	4.77	10.00	2.30	4.34	9.14	2.33	3.93	8.27	2.36	3.50	7.64	2.50	3.05	7.00	2.69	2.60
11°C	10.87	2.22	4.90	10.00	2.25	4.44	9.14	2.27	4.02	8.27	2.32	3.57	7.64	2.45	3.12	7.00	2.65	2.64
12°C	10.87	2.16	5.04	10.00	2.20	4.55	9.14	2.22	4.11	8.27	2.27	3.65	7.64	2.40	3.18	7.00	2.60	2.69
13°C	10.87	2.10	5.17	10.00	2.15	4.66	9.14	2.18	4.20	8.27	2.22	3.72	7.64	2.36	3.24	7.00	2.55	2.74
14°C	10.87	2.05	5.30	10.00	2.10	4.76	9.14	2.13	4.29	8.27	2.18	3.80	7.64	2.32	3.30	7.00	2.51	2.79
15°C	10.87	2.00	5.43	10.00	2.05	4.87	9.14	2.09	4.38	8.27	2.14	3.87	7.64	2.27	3.36	7.00	2.46	2.84
16°C	10.87	1.95	5.57	10.00	2.01	4.98	9.14	2.04	4.47	8.27	2.09	3.95	7.64	2.23	3.42	7.00	2.42	2.89
17°C	10.87	1.91	5.70	10.00	1.97	5.08	9.14	2.00	4.56	8.27	2.06	4.02	7.64	2.19	3.49	7.00	2.39	2.93
18°C	10.87	1.86	5.83	10.00	1.93	5.19	9.14	1.97	4.65	8.27	2.02	4.10	7.64	2.15	3.55	7.00	2.35	2.98
19°C	10.87	1.82	5.97	10.00	1.89	5.29	9.14	1.93	4.74	8.27	1.98	4.17	7.64	2.12	3.61	7.00	2.31	3.03
20°C	10.87	1.82	6.10	10.00	1.85	5.40	9.14	1.89	4.83	8.27	1.95	4.25	7.64	2.08	3.67	7.00	2.27	3.08
21°C	10.87	1.77	6.15	10.00	1.84	5.43	9.14	1.88	4.86	8.27	1.93	4.28	7.64	2.06	3.70	7.00	2.26	3.10
22°C	10.87	1.76	6.19	10.00	1.83	5.46	9.14	1.87	4.89	8.27	1.92	4.31	7.64	2.05	3.72	7.00	2.24	3.13
23°C	10.87	1.74	6.24	10.00	1.82	5.49	9.14	1.86	4.92	8.27	1.91	4.34	7.64	2.04	3.75	7.00	2.22	3.15
24°C	10.87	1.73	6.29	10.00	1.81	5.53	9.14	1.85	4.95	8.27	1.89	4.37	7.64	2.02	3.78	7.00	2.20	3.18
25°C	10.87	1.72	6.33	10.00	1.80	5.56	9.14	1.84	4.98	8.27	1.88	4.40	7.64	2.01	3.81	7.00	2.19	3.20
26°C	10.87	1.70	6.38	10.00	1.79	5.59	9.14	1.82	5.01	8.27	1.87	4.43	7.64	1.99	3.83	7.00	2.17	3.23
27°C	10.87	1.69	6.43	10.00	1.78	5.62	9.14	1.81	5.04	8.27	1.85	4.46	7.64	1.98	3.86	7.00	2.15	3.25
28°C	10.87	1.68	6.47	10.00	1.77	5.65	9.14	1.80	5.08	8.27	1.85	4.48	7.64	1.96	3.89	7.00	2.13	3.28
29°C	10.87	1.67	6.52	10.00	1.76	5.68	9.14	1.79	5.11	8.27	1.83	4.51	7.64	1.95	3.92	7.00	2.12	3.30
30°C	10.87	1.65	6.57	10.00	1.75	5.71	9.14	1.78	5.14	8.27	1.82	4.54	7.64	1.94	3.94	7.00	2.10	3.33
31°C	10.87	1.64	6.61	10.00	1.74	5.74	9.14	1.77	5.17	8.27	1.81	4.57	7.64	1.92	3.97	7.00	2.09	3.35
32°C	10.87	1.63	6.66	10.00	1.73	5.78	9.14	1.76	5.20	8.27	1.80	4.60	7.64	1.91	4.00	7.00	2.07	3.38
33°C	10.87	1.62	6.71	10.00	1.72	5.81	9.14	1.75	5.23	8.27	1.79	4.63	7.64	1.90	4.03	7.00	2.06	3.40
34°C	10.87	1.61	6.75	10.00	1.71	5.84	9.14	1.74	5.26	8.27	1.77	4.66	7.64	1.89	4.05	7.00	2.04	3.43
35°C	10.87	1.69	6.80	10.00	1.70	5.87	9.14	1.73	5.29	8.27	1.76	4.69	7.64	1.87	4.08	7.00	2.03	3.45

FT : Flow temperature  
OT : Outdoor temperature  
HC : Heating capacity (kW)  
IP : Input power (kW)  
COP : Coefficient of performance

The values of heating capacity/power input/COP are based on measurement of EN14511 standard;

FT < 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 35°C / 30°C, 1733 l/h

FT ≥ 45°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 45°C / 40°C, 1439 l/h

FT = 55°C : The flow rate obtained during the test at the standard rating conditions of OT 7°C and Water temp. flow/return 55°C / 47°C, 764 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.



## 6-2. COOLING CAPACITY \*

### ■ MODEL: WO\*A060LFCA (4.5kW type)

FT	6 °C			7 °C			10 °C			13 °C			15 °C			18 °C			22 °C		
OT	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP
20 °C	2.80	0.93	3.02	2.90	0.91	3.19	3.20	0.85	3.75	3.50	0.79	4.44	3.70	0.74	4.97	4.00	0.68	5.86	4.40	0.61	7.22
21 °C	2.80	0.94	2.98	2.90	0.93	3.12	3.20	0.87	3.68	3.50	0.81	4.32	3.70	0.77	4.81	4.00	0.71	5.63	4.40	0.64	6.88
22 °C	2.80	0.96	2.92	2.90	0.94	3.09	3.20	0.89	3.60	3.50	0.83	4.22	3.70	0.79	4.68	4.00	0.74	5.41	4.40	0.67	6.57
23 °C	2.80	0.98	2.86	2.90	0.96	3.02	3.20	0.91	3.52	3.50	0.86	4.07	3.70	0.81	4.57	4.00	0.77	5.19	4.40	0.71	6.20
24 °C	2.80	0.99	2.83	2.90	0.98	2.96	3.20	0.93	3.44	3.50	0.88	3.98	3.70	0.84	4.40	4.00	0.79	5.06	4.40	0.74	5.95
25 °C	2.80	1.01	2.77	2.90	1.00	2.90	3.20	0.95	3.37	3.50	0.90	3.89	3.70	0.86	4.30	4.00	0.82	4.88	4.40	0.77	5.71
26 °C	2.80	1.03	2.72	2.90	1.02	2.84	3.20	0.97	3.30	3.50	0.93	3.76	3.70	0.89	4.16	4.00	0.86	4.65	4.40	0.81	5.43
27 °C	2.80	1.05	2.66	2.90	1.04	2.79	3.20	0.99	3.23	3.50	0.96	3.65	3.70	0.92	4.02	4.00	0.89	4.48	4.40	0.85	5.15
28 °C	2.80	1.08	2.59	2.90	1.06	2.74	3.20	1.02	3.14	3.50	0.98	3.57	3.70	0.95	3.89	4.00	0.92	4.35	4.40	0.88	5.00
29 °C	2.80	1.10	2.55	2.90	1.09	2.66	3.20	1.05	3.05	3.50	1.01	3.47	3.70	0.97	3.81	4.00	0.94	4.26	4.40	0.90	4.89
30 °C	2.80	1.13	2.48	2.90	1.12	2.59	3.20	1.07	2.99	3.50	1.04	3.37	3.70	1.00	3.70	4.00	0.97	4.12	4.40	0.92	4.78
31 °C	2.80	1.16	2.41	2.90	1.14	2.54	3.20	1.10	2.91	3.50	1.06	3.30	3.70	1.03	3.59	4.00	0.99	4.04	4.40	0.95	4.63
32 °C	2.80	1.19	2.35	2.90	1.17	2.48	3.20	1.13	2.83	3.50	1.09	3.21	3.70	1.06	3.49	4.00	1.02	3.92	4.40	0.97	4.54
33 °C	2.80	1.21	2.31	2.90	1.20	2.42	3.20	1.16	2.76	3.50	1.12	3.13	3.70	1.09	3.39	4.00	1.05	3.81	4.40	1.00	4.40
34 °C	2.80	1.25	2.24	2.90	1.23	2.36	3.20	1.19	2.69	3.50	1.15	3.04	3.70	1.12	3.30	4.00	1.07	3.74	4.40	1.02	4.31
35 °C	2.80	1.28	2.19	2.90	1.26	2.30	3.20	1.23	2.60	3.50	1.18	2.96	3.70	1.16	3.20	4.00	1.11	3.61	4.40	1.06	4.17
36 °C	2.80	1.30	2.15	2.90	1.29	2.25	3.20	1.25	2.56	3.50	1.20	2.92	3.70	1.18	3.14	4.00	1.13	3.54	4.40	1.07	4.11
37 °C	2.80	1.33	2.11	2.90	1.31	2.21	3.20	1.27	2.52	3.50	1.22	2.87	3.70	1.20	3.08	4.00	1.15	3.48	4.40	1.09	4.05
38 °C	2.73	1.33	2.06	2.83	1.31	2.15	3.14	1.28	2.45	3.45	1.23	2.80	3.65	1.22	3.00	3.95	1.17	3.37	4.37	1.12	3.91
39 °C	2.65	1.32	2.00	2.76	1.32	2.09	3.07	1.29	2.39	3.40	1.25	2.72	3.60	1.24	2.91	3.91	1.20	3.26	4.33	1.15	3.76
40 °C	2.58	1.32	1.95	2.69	1.32	2.04	3.01	1.30	2.32	3.35	1.26	2.65	3.55	1.25	2.83	3.86	1.22	3.16	4.30	1.19	3.62
41 °C	2.51	1.32	1.90	2.61	1.32	1.98	2.94	1.30	2.25	3.29	1.28	2.58	3.49	1.27	2.74	3.82	1.25	3.05	4.26	1.23	3.47
42 °C	2.43	1.32	1.84	2.54	1.32	1.92	2.88	1.31	2.19	3.24	1.29	2.50	3.44	1.30	2.66	3.77	1.28	2.94	4.23	1.27	3.33
43 °C	2.36	1.32	1.79	2.47	1.33	1.86	2.81	1.33	2.12	3.19	1.31	2.43	3.39	1.32	2.57	3.73	1.32	2.83	4.19	1.32	3.18

\* : OPTIONAL PARTS "Cooling kit" is necessary for cooling operation.

FT : Flow temperature  
 OT : Outdoor temperature  
 CC : Cooling capacity (kW)  
 IP : Input power (kW)  
 COP : Coefficient of performance

The values of cooling capacity/power input/COP are based on measurement of EN14511 standard;

FT < 10°C : The flow rate obtained during the test at the standard rating conditions of OT 35°C and Water temp. flow/return 7°C / 12°C, 500 l/h

FT ≥ 10°C : The flow rate obtained during the test at the standard rating conditions of OT 35°C and Water temp. flow/return 18°C / 23°C, 690 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.

## ■ MODEL: WO\*A060LFCA (6.0kW type)

FT	6 °C			7 °C			10 °C			13 °C			15 °C			18 °C			22 °C		
OT	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP
20 °C	3.60	1.10	3.27	3.70	1.10	3.37	4.10	1.04	3.94	4.50	0.98	4.59	4.80	0.93	5.14	5.20	0.89	5.86	5.70	0.84	6.77
21 °C	3.60	1.13	3.19	3.70	1.12	3.30	4.10	1.07	3.83	4.50	1.01	4.46	4.80	0.97	4.95	5.20	0.92	5.65	5.70	0.88	6.48
22 °C	3.60	1.15	3.13	3.70	1.14	3.25	4.10	1.09	3.76	4.50	1.04	4.33	4.80	1.00	4.80	5.20	0.96	5.42	5.70	0.91	6.26
23 °C	3.60	1.17	3.08	3.70	1.16	3.19	4.10	1.12	3.66	4.50	1.07	4.21	4.80	1.03	4.66	5.20	0.99	5.25	5.70	0.95	6.00
24 °C	3.60	1.20	3.00	3.70	1.19	3.11	4.10	1.14	3.60	4.50	1.10	4.09	4.80	1.07	4.49	5.20	1.03	5.05	5.70	0.99	5.76
25 °C	3.60	1.22	2.95	3.70	1.21	3.06	4.10	1.17	3.50	4.50	1.13	3.98	4.80	1.10	4.36	5.20	1.07	4.86	5.70	1.03	5.53
26 °C	3.60	1.25	2.88	3.70	1.24	2.98	4.10	1.20	3.42	4.50	1.16	3.88	4.80	1.14	4.21	5.20	1.11	4.68	5.70	1.07	5.33
27 °C	3.60	1.28	2.81	3.70	1.27	2.92	4.10	1.24	3.31	4.50	1.20	3.76	4.80	1.18	4.06	5.20	1.16	4.50	5.70	1.12	5.11
28 °C	3.60	1.32	2.73	3.70	1.30	2.85	4.10	1.27	3.23	4.50	1.24	3.63	4.80	1.23	3.90	5.20	1.20	4.33	5.70	1.16	4.91
29 °C	3.60	1.35	2.67	3.70	1.34	2.76	4.10	1.31	3.13	4.50	1.28	3.52	4.80	1.27	3.78	5.20	1.25	4.16	5.70	1.20	4.75
30 °C	3.60	1.39	2.59	3.70	1.37	2.70	4.10	1.35	3.04	4.50	1.32	3.41	4.80	1.31	3.66	5.20	1.29	4.03	5.70	1.24	4.60
31 °C	3.60	1.42	2.54	3.70	1.41	2.62	4.10	1.39	2.95	4.50	1.37	3.28	4.80	1.36	3.53	5.20	1.34	3.88	5.70	1.28	4.45
32 °C	3.60	1.46	2.47	3.70	1.45	2.55	4.10	1.43	2.87	4.50	1.41	3.19	4.80	1.41	3.40	5.20	1.39	3.74	5.70	1.32	4.32
33 °C	3.60	1.50	2.40	3.70	1.49	2.48	4.10	1.48	2.77	4.50	1.46	3.08	4.80	1.45	3.31	5.20	1.44	3.61	5.70	1.37	4.16
34 °C	3.60	1.54	2.34	3.70	1.53	2.42	4.10	1.52	2.70	4.50	1.51	2.98	4.80	1.50	3.20	5.20	1.50	3.47	5.70	1.42	4.01
35 °C	3.60	1.59	2.26	3.70	1.58	2.34	4.10	1.57	2.61	4.50	1.56	2.88	4.80	1.56	3.07	5.20	1.56	3.34	5.70	1.47	3.87
36 °C	3.60	1.62	2.22	3.70	1.61	2.30	4.10	1.60	2.56	4.50	1.59	2.83	4.80	1.58	3.04	5.20	1.59	3.28	5.70	1.50	3.80
37 °C	3.60	1.65	2.18	3.70	1.64	2.26	4.10	1.63	2.51	4.50	1.62	2.78	4.80	1.59	3.01	5.20	1.61	3.22	5.70	1.53	3.73
38 °C	3.39	1.60	2.12	3.50	1.59	2.19	3.89	1.59	2.45	4.28	1.57	2.72	4.57	1.55	2.94	4.98	1.59	3.14	5.45	1.50	3.64
39 °C	3.19	1.55	2.05	3.29	1.55	2.13	3.67	1.54	2.38	4.06	1.53	2.66	4.33	1.51	2.86	4.73	1.54	3.08	5.20	1.47	3.55
40 °C	2.98	1.50	1.99	3.09	1.50	2.06	3.46	1.49	2.32	3.85	1.48	2.61	4.10	1.47	2.79	4.48	1.48	3.02	4.95	1.43	3.46
41 °C	2.77	1.44	1.92	2.88	1.44	1.99	3.24	1.44	2.25	3.63	1.42	2.55	3.86	1.42	2.72	4.23	1.43	2.95	4.69	1.40	3.36
42 °C	2.57	1.38	1.86	2.68	1.39	1.93	3.03	1.38	2.19	3.41	1.37	2.49	3.63	1.37	2.64	3.98	1.38	2.89	4.44	1.36	3.27
43 °C	2.36	1.32	1.79	2.47	1.33	1.86	2.81	1.33	2.12	3.19	1.31	2.43	3.39	1.32	2.57	3.73	1.32	2.83	4.19	1.32	3.18

\* : OPTIONAL PARTS "Cooling kit" is necessary for cooling operation.

FT : Flow temperature  
OT : Outdoor temperature  
CC : Cooling capacity (kW)  
IP : Input power (kW)  
COP : Coefficient of performance

The values of cooling capacity/power input/COP are based on measurement of EN14511 standard;

FT < 10°C : The flow rate obtained during the test at the standard rating conditions of OT 35°C and Water temp. flow/return 7°C / 12°C, 637 l/h  
FT ≥ 10°C : The flow rate obtained during the test at the standard rating conditions of OT 35°C and Water temp. flow/return 18°C / 23°C, 897 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.



## ■ MODEL: WO\*A080LFCA

FT	6 °C			7 °C			10 °C			13 °C			15 °C			18 °C			22 °C		
OT	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP
20 °C	4.90	1.44	3.41	5.10	1.42	3.60	5.70	1.36	4.18	6.20	1.31	4.74	6.60	1.26	5.25	7.10	1.21	5.87	7.80	1.15	6.81
21 °C	4.90	1.46	3.36	5.10	1.44	3.54	5.70	1.40	4.07	6.20	1.35	4.59	6.60	1.30	5.08	7.10	1.26	5.63	7.80	1.20	6.50
22 °C	4.90	1.49	3.29	5.10	1.47	3.47	5.70	1.43	3.99	6.20	1.38	4.49	6.60	1.34	4.93	7.10	1.30	5.46	7.80	1.25	6.24
23 °C	4.90	1.52	3.22	5.10	1.50	3.40	5.70	1.46	3.90	6.20	1.42	4.37	6.60	1.39	4.75	7.10	1.35	5.26	7.80	1.31	5.95
24 °C	4.90	1.54	3.18	5.10	1.53	3.33	5.70	1.50	3.80	6.20	1.46	4.25	6.60	1.43	4.62	7.10	1.40	5.07	7.80	1.36	5.74
25 °C	4.90	1.57	3.12	5.10	1.56	3.27	5.70	1.54	3.70	6.20	1.51	4.11	6.60	1.48	4.46	7.10	1.46	4.86	7.80	1.42	5.49
26 °C	4.90	1.60	3.06	5.10	1.59	3.21	5.70	1.57	3.63	6.20	1.55	4.00	6.60	1.53	4.31	7.10	1.51	4.70	7.80	1.48	5.27
27 °C	4.90	1.63	3.00	5.10	1.63	3.13	5.70	1.62	3.52	6.20	1.60	3.87	6.60	1.59	4.16	7.10	1.57	4.51	7.80	1.56	5.01
28 °C	4.90	1.69	2.90	5.10	1.69	3.02	5.70	1.68	3.39	6.20	1.66	3.73	6.60	1.65	4.00	7.10	1.64	4.33	7.80	1.62	4.81
29 °C	4.90	1.75	2.80	5.10	1.74	2.93	5.70	1.74	3.28	6.20	1.73	3.58	6.60	1.71	3.86	7.10	1.70	4.18	7.80	1.68	4.64
30 °C	4.90	1.81	2.71	5.10	1.80	2.83	5.70	1.80	3.17	6.20	1.79	3.46	6.60	1.78	3.71	7.10	1.76	4.03	7.80	1.75	4.46
31 °C	4.90	1.87	2.62	5.10	1.86	2.74	5.70	1.86	3.06	6.20	1.86	3.33	6.60	1.84	3.59	7.10	1.83	3.88	7.80	1.81	4.31
32 °C	4.90	1.94	2.53	5.10	1.93	2.64	5.70	1.93	2.95	6.20	1.93	3.21	6.60	1.91	3.46	7.10	1.90	3.74	7.80	1.88	4.15
33 °C	4.90	2.00	2.45	5.10	1.99	2.56	5.70	2.00	2.85	6.20	2.00	3.10	6.60	1.98	3.33	7.10	1.97	3.60	7.80	1.95	4.00
34 °C	4.90	2.07	2.37	5.10	2.06	2.48	5.70	2.07	2.75	6.20	2.07	3.00	6.60	2.05	3.22	7.10	2.04	3.48	7.80	2.03	3.84
35 °C	4.90	2.15	2.28	5.10	2.14	2.39	5.70	2.15	2.65	6.20	2.15	2.88	6.60	2.13	3.09	7.10	2.13	3.34	7.80	2.11	3.69
36 °C	4.90	2.19	2.24	5.10	2.18	2.34	5.70	2.19	2.60	6.20	2.18	2.84	6.60	2.16	3.05	7.10	2.15	3.30	7.80	2.14	3.64
37 °C	4.90	2.23	2.20	5.10	2.23	2.29	5.70	2.24	2.55	6.20	2.21	2.81	6.60	2.20	3.00	7.10	2.17	3.27	7.80	2.17	3.60
38 °C	4.73	2.21	2.14	4.91	2.20	2.24	5.49	2.20	2.50	5.97	2.15	2.77	6.36	2.15	2.96	6.83	2.11	3.24	7.51	2.10	3.58
39 °C	4.56	2.18	2.09	4.72	2.17	2.18	5.29	2.16	2.45	5.75	2.10	2.73	6.11	2.09	2.93	6.57	2.04	3.21	7.22	2.03	3.56
40 °C	4.38	2.16	2.03	4.54	2.13	2.13	5.08	2.11	2.41	5.53	2.05	2.70	5.87	2.03	2.89	6.30	1.98	3.19	6.93	1.95	3.55
41 °C	4.21	2.13	1.97	4.35	2.10	2.07	4.88	2.07	2.36	5.30	2.00	2.66	5.62	1.97	2.85	6.03	1.91	3.16	6.64	1.88	3.53
42 °C	4.04	2.11	1.92	4.16	2.06	2.02	4.67	2.02	2.31	5.08	1.94	2.62	5.38	1.91	2.82	5.77	1.84	3.13	6.35	1.81	3.51
43 °C	3.86	2.08	1.86	3.97	2.03	1.96	4.47	1.98	2.26	4.86	1.88	2.58	5.13	1.85	2.78	5.50	1.77	3.10	6.05	1.73	3.49

\* : OPTIONAL PARTS "Cooling kit" is necessary for cooling operation.

FT : Flow temperature  
 OT : Outdoor temperature  
 CC : Cooling capacity (kW)  
 IP : Input power (kW)  
 COP : Coefficient of performance

The values of cooling capacity/power input/COP are based on measurement of EN14511 standard;

FT < 10 °C : The flow rate obtained during the test at the standard rating conditions of OT 35 °C and Water temp. flow/return 7 °C / 12 °C, 878 l/h

FT ≥ 10 °C : The flow rate obtained during the test at the standard rating conditions of OT 35 °C and Water temp. flow/return 18 °C / 23 °C, 1225 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.

## MODEL: WO\*A100LFTA

FT	6 °C			7 °C			10 °C			13 °C			15 °C			18 °C			22 °C		
OT	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP	CC	IP	COP
20 °C	5.90	1.68	3.51	6.10	1.66	3.68	6.80	1.60	4.26	7.40	1.52	4.86	7.90	1.48	5.33	8.50	1.44	5.92	9.40	1.38	6.83
21 °C	5.90	1.72	3.43	6.10	1.69	3.61	6.80	1.64	4.15	7.40	1.57	4.71	7.90	1.53	5.16	8.50	1.49	5.70	9.40	1.44	6.53
22 °C	5.90	1.75	3.37	6.10	1.73	3.53	6.80	1.68	4.05	7.40	1.62	4.57	7.90	1.59	4.97	8.50	1.55	5.48	9.40	1.50	6.27
23 °C	5.90	1.78	3.31	6.10	1.76	3.47	6.80	1.72	3.95	7.40	1.67	4.43	7.90	1.64	4.82	8.50	1.61	5.28	9.40	1.56	6.03
24 °C	5.90	1.82	3.24	6.10	1.80	3.39	6.80	1.76	3.86	7.40	1.72	4.30	7.90	1.69	4.67	8.50	1.66	5.12	9.40	1.62	5.80
25 °C	5.90	1.86	3.17	6.10	1.84	3.32	6.80	1.81	3.76	7.40	1.78	4.16	7.90	1.75	4.51	8.50	1.73	4.91	9.40	1.69	5.56
26 °C	5.90	1.89	3.12	6.10	1.88	3.24	6.80	1.85	3.68	7.40	1.83	4.04	7.90	1.81	4.36	8.50	1.79	4.75	9.40	1.76	5.34
27 °C	5.90	1.94	3.04	6.10	1.92	3.17	6.80	1.91	3.56	7.40	1.90	3.90	7.90	1.88	4.20	8.50	1.86	4.56	9.40	1.84	5.12
28 °C	5.90	2.01	2.94	6.10	1.99	3.07	6.80	1.98	3.43	7.40	1.96	3.78	7.90	1.94	4.07	8.50	1.92	4.43	9.40	1.89	4.97
29 °C	5.90	2.07	2.85	6.10	2.05	2.98	6.80	2.04	3.33	7.40	2.02	3.66	7.90	2.00	3.95	8.50	1.98	4.29	9.40	1.95	4.82
30 °C	5.90	2.14	2.76	6.10	2.12	2.88	6.80	2.11	3.22	7.40	2.07	3.57	7.90	2.06	3.83	8.50	2.04	4.17	9.40	2.00	4.70
31 °C	5.90	2.21	2.67	6.10	2.19	2.79	6.80	2.18	3.12	7.40	2.13	3.47	7.90	2.13	3.71	8.50	2.10	4.05	9.40	2.06	4.56
32 °C	5.90	2.28	2.59	6.10	2.26	2.70	6.80	2.25	3.02	7.40	2.20	3.36	7.90	2.19	3.61	8.50	2.16	3.94	9.40	2.12	4.43
33 °C	5.90	2.36	2.50	6.10	2.34	2.61	6.80	2.33	2.92	7.40	2.26	3.27	7.90	2.26	3.50	8.50	2.23	3.81	9.40	2.18	4.31
34 °C	5.90	2.44	2.42	6.10	2.41	2.53	6.80	2.41	2.82	7.40	2.33	3.18	7.90	2.33	3.39	8.50	2.30	3.70	9.40	2.24	4.20
35 °C	5.90	2.53	2.33	6.10	2.50	2.44	6.80	2.50	2.72	7.40	2.41	3.07	7.90	2.41	3.28	8.50	2.38	3.58	9.40	2.32	4.05
36 °C	5.90	2.61	2.26	6.10	2.46	2.36	6.80	2.58	2.64	7.40	2.49	2.97	7.90	2.49	3.17	8.50	2.46	3.46	9.40	2.41	3.90
37 °C	5.90	2.69	2.19	6.10	2.42	2.28	6.80	2.65	2.57	7.40	2.59	2.86	7.90	2.58	3.06	8.50	2.55	3.33	9.40	2.50	3.76
38 °C	5.59	2.63	2.13	5.77	2.37	2.22	6.45	2.59	2.49	7.02	2.54	2.77	7.50	2.53	2.96	8.07	2.50	3.22	8.93	2.46	3.63
39 °C	5.29	2.57	2.06	5.45	2.33	2.16	6.10	2.53	2.41	6.64	2.48	2.68	7.09	2.48	2.86	7.63	2.45	3.11	8.46	2.42	3.50
40 °C	4.99	2.50	2.00	5.12	2.29	2.10	5.75	2.47	2.33	6.27	2.42	2.59	6.69	2.42	2.76	7.20	2.39	3.01	8.00	2.38	3.37
41 °C	4.68	2.43	1.93	4.79	2.24	2.04	5.40	2.40	2.25	5.89	2.36	2.49	6.28	2.36	2.66	6.76	2.33	2.90	7.53	2.33	3.23
42 °C	4.38	2.35	1.87	4.47	2.20	1.98	5.05	2.33	2.17	5.51	2.30	2.40	5.88	2.30	2.56	6.33	2.27	2.79	7.06	2.28	3.10
43 °C	4.08	2.26	1.80	4.14	2.16	1.92	4.69	2.25	2.09	5.14	2.22	2.31	5.47	2.22	2.46	5.89	2.20	2.68	6.60	2.22	2.97

\* : OPTIONAL PARTS "Cooling kit" is necessary for cooling operation.

FT : Flow temperature  
 OT : Outdoor temperature  
 CC : Cooling capacity (kW)  
 IP : Input power (kW)  
 COP : Coefficient of performance

The values of cooling capacity/power input/COP are based on measurement of EN14511 standard;

FT < 10 °C : The flow rate obtained during the test at the standard rating conditions of OT 35 °C and Water temp. flow/return 7 °C / 12 °C, 1051 l/h  
 FT ≥ 10 °C : The flow rate obtained during the test at the standard rating conditions of OT 35 °C and Water temp. flow/return 18 °C / 23 °C, 1467 l/h

Usage environment, such as operation of the heating equipment, room temperature, and controller adjustments, may cause disparities between practically determined and measured values.

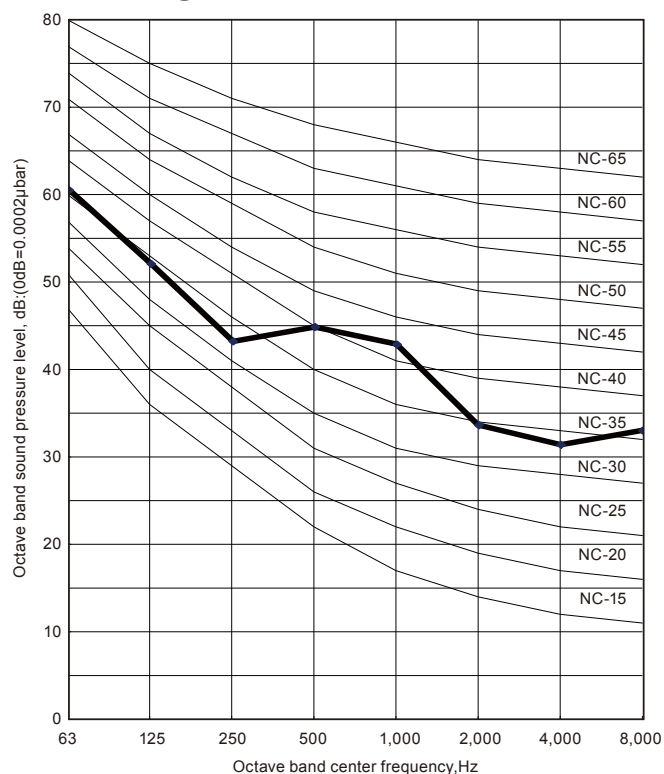
# 7. OPERATION NOISE

## 7-1. NOISE LEVEL CURVE

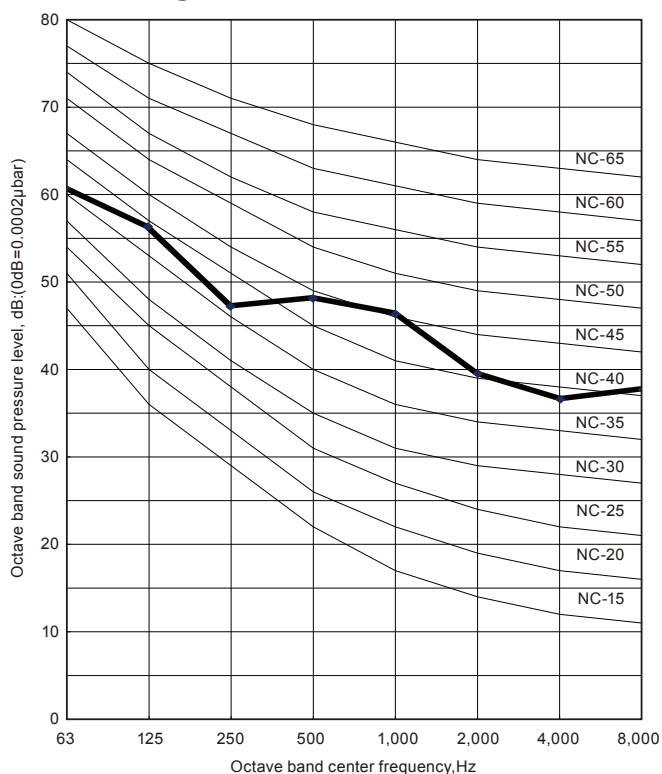
■ **MODEL: WO\*A060LFCA (4.5kW type)**

■ **MODEL: WO\*A060LFCA (6.0kW type)**

● Heating



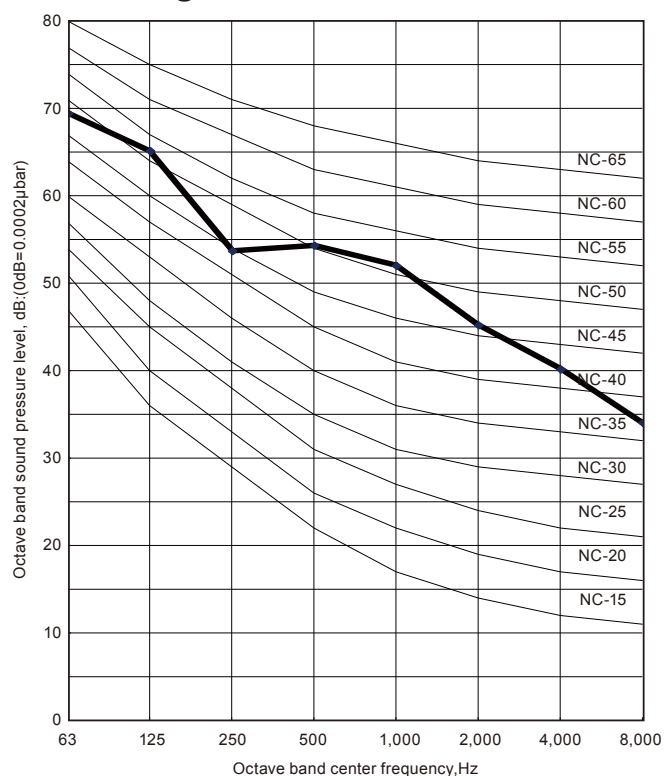
● Heating



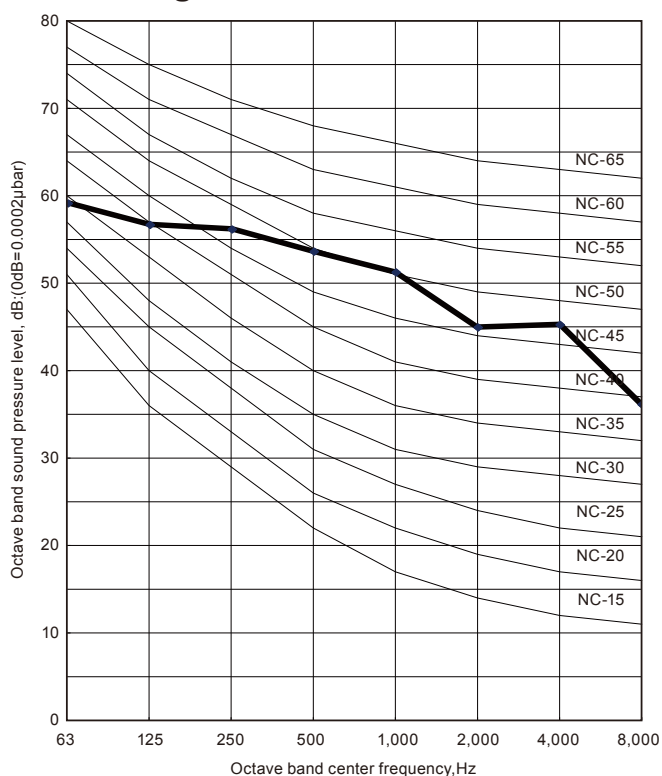
■ **MODEL: WO\*A080LFCA**

■ **MODEL: WO\*A100LFTA**

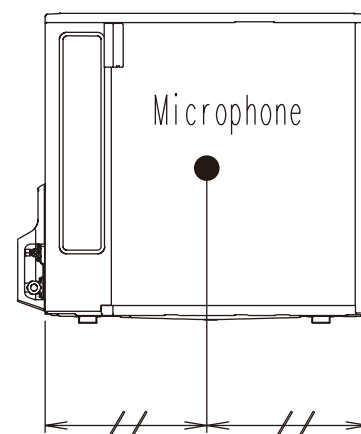
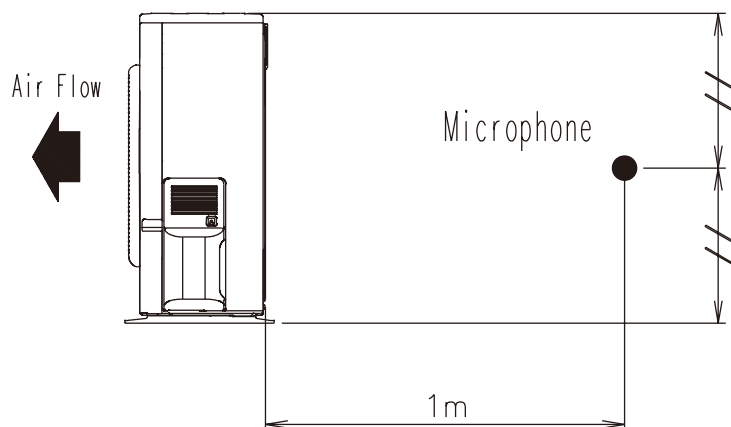
● Heating



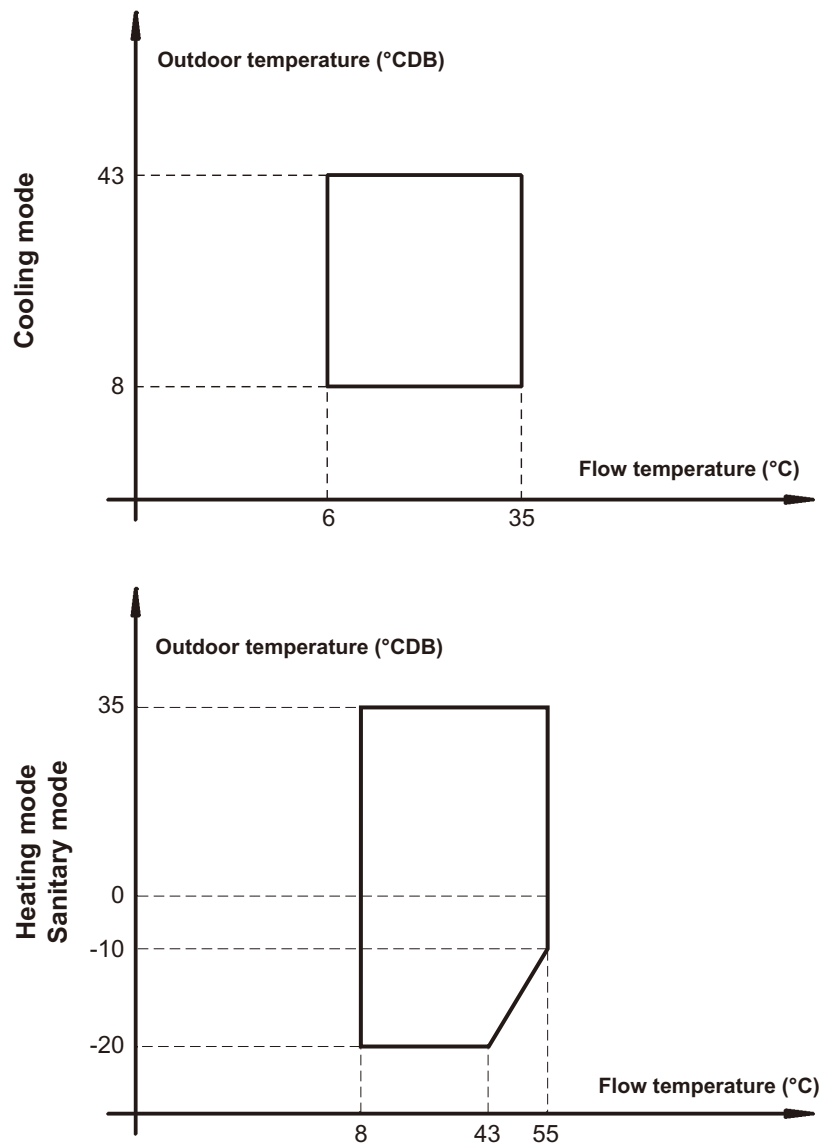
● Heating



## 7-2. SOUND LEVEL CHECK POINT



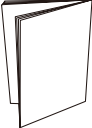


# 8. OPERATION RANGE



## 9. SAFETY DEVICES

	Protection from	Model		
		WO*A060LFCA	WO*A080LFCA	WO*A100LFTA
Circuit protection	Current fuse (Near the terminal)	250V 20A	250V 25A	250V 25A
	Current fuse (Main PCB)	250V 15A	250V 3.15A	250V 3.15A
		250V 10A		
		250V 3.15A		
Fan motor protection	Thermal protection program	Activate (at 100 ± 10 °C): Fan motor stop Reset (at 95 ± 10 °C): Fan motor restart		Activate (at 150 ± 15 °C): Fan motor stop Reset (at 120 ± 15 °C): Fan motor restart
Compressor protection	Thermal protection program (Compressor temp.)	Activate (at 108 °C): Compressor stop Reset (at 80 °C): Compressor restart		
	Thermal protection program (Discharge temp.)	Activate (at 110 °C): Compressor stop Reset (after 7 minutes): Compressor restart		
High pressure protection	Thermal protection program (Heat exchanger temp.)	Activate (at 67 °C): Compressor stop Reset (at 63 °C): Compressor restart		
	Pressure sensor	Activate (at 4.2 MPa): Compressor stop Reset (at 3.0 MPa): Compressor restart		
Low pressure protection (Cooling mode only)	Pressure sensor	Activate (at 0.12 MPa): Compressor stop Reset (at 0.15 MPa): Compressor restart		

# 10. STANDARD ACCESSORIES

Name and shape	Q'ty	Application
Installation manual 	1	
Drain pipe 	1	For outdoor unit drain piping work (For WO*A100LFTA)
Drain cap 	2	



## **2. HYDRAULIC UNIT**

### **SINGLE PHASE TYPE :**

**WS\*A050DG\***

**WS\*A100DG\***



# CONTENTS

## 2. HYDRAULIC UNIT

1. FEATURES .....	HU01 - 01
2. SPECIFICATIONS .....	HU01 - 03
2-1. TECHNICAL SPECIFICATIONS .....	HU01 - 03
2-2. ELECTRICAL SPECIFICATIONS .....	HU01 - 04
3. DIMENSIONS .....	HU01 - 05
3-1. DIMENSIONAL DRAWING .....	HU01 - 05
3-2. INSTALLATION PLACE .....	HU01 - 06
4. PIPING DIAGRAM.....	HU01 - 07
5. WIRING DIAGRAM.....	HU01 - 08
5-1. WIRING DIAGRAM .....	HU01 - 08
5-2. EXTERNAL CONNECTION DIAGRAM .....	HU01 - 10
6. HYDRAULIC PERFORMANCE.....	HU01 - 11
6-1. STATIC PRESSURE DROP UNIT.....	HU01 - 11
7. SAFETY DEVICES.....	HU01 - 12
8. STANDARD ACCESSORIES.....	HU01 - 13

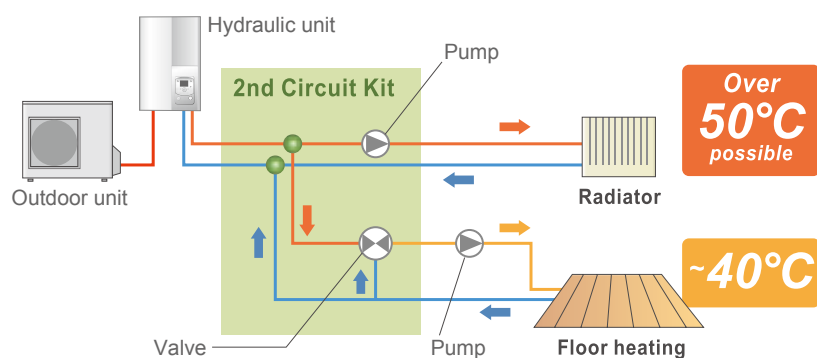
# 1. FEATURES

■ **MODEL: WS\*A050DG\***  
**WS\*A100DG\***



## ■ INTELLIGENT CONTROL

### ● 2-zone individual control \*

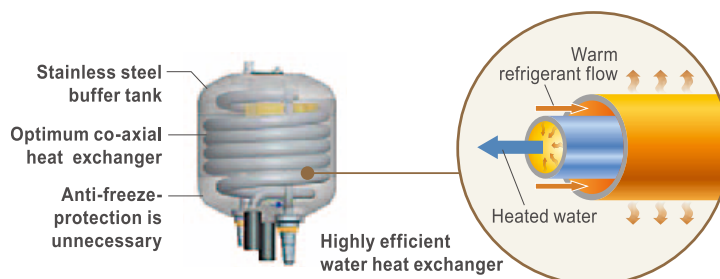


\*: Optional parts are required

## ■ HIGH RELIABILITY

### ● High durability

- Corrosion protected
- No flow switch and no filter necessary

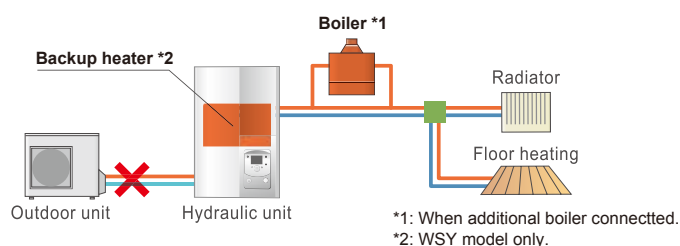


### ● Easy installation and maintenance

- All hydraulic safety and controlling components built in, no additional selection required
- Lifting bars for an installation without any difficulty or risk
- Easy access for maintenance operations
- Refrigerant pump down operation

### ● Emergency operation

System can be continuously supplied hot water by built in back up heater or boiler as emergency, even if an error is occurred.

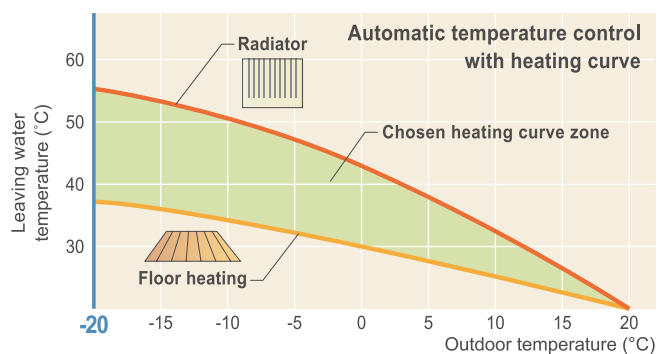


\*1: When additional boiler connected.  
\*2: WSY model only.

## OTHERS

### ● Automatic heating curve control

Automatic temperature regulation in accordance with heating curve (Depend on heating terminal and outdoor temperature)

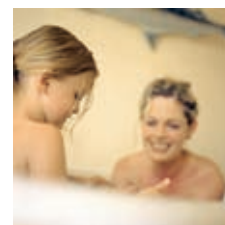


### ● Cooling operation is possible\*

\*: Optional parts are required

### ● Anti-Legionella function

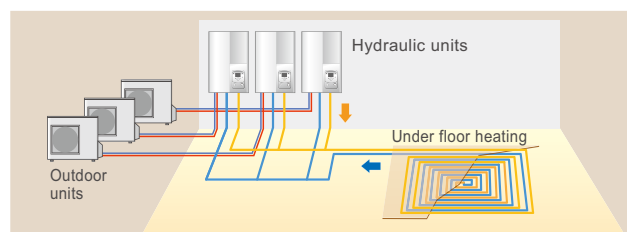
The growth of Legionella in DHW Tank is suppressed and safe and clean hot water is supplied at all times.



### ● Possible to docking the boiler or electric heater for backup

### ● Cascade connection

Large capacities can be realized by combining up to three systems into one control circuit.



## 2. SPECIFICATIONS

### 2-1. TECHNICAL SPECIFICATIONS

Model name (Hydraulic unit)				WSYA050DG6 WSHA050DG		WSYA100DG6 WSHA100DG						
Model name (Outdoor unit)				WOYA060LFCA WOHA060LFCA		WOYA060LFCA WOHA060LFCA		WOYA080LFCA WOHA080LFCA		WOYA100LFTA WOHA100LFTA		
Input power Enclosure	Heating	Rated	kW	0.08								
		Max. *1		6								
Casing	Colour			White								
	Material			8/10mm DC01 + EZ (5μ)								
Dimensions (H x W x D)	Net		mm	800 x 450 x 457								
	Gross			955 x 550 x 530								
Weight	Net		kg	WSY: 42, WSH: 40								
	Gross			WSY: 49, WSH: 47								
Main components	Pump	Type		Water cooled								
		Speed setting		Variable pressure / Constant pressure								
	Input power		W	70 *2								
	Water side Heat exchanger	Type		Double-tube								
		Q'ty		1								
		Water volume	l	16								
		Water flow rate Min.	l/h	490	650	810	1080					
	Water flow rate Nom.	Heating	l/h	780	1040	1300	1733					
		Cooling		690	897	1225	1467					
		Insulation material		polyurethane								
	Expansion vessel	Volume	l	8								
		Max. water pressure	bar	4.5								
		Pre pressure		1 bar (+/-20%)								
	Water circuit	Piping connections diameter		mm	ø25.4(ø1 in.)							
		Piping			ø25.4(ø1 in.)							
Safety valve		bar	3									
Manometer			Yes									
Drain valve / Fill valve			Yes									
Air purge valve			Yes									
Connection pipe (Refrigerant circuit)	Liquid side diameter		mm	ø6.35(ø1/4 in.)						ø9.52(ø3/8 in.)		
	Gas side diameter			ø12.70(ø1/2 in.)				ø15.88(ø5/8 in.)				
	Method			Flare								
Operation range	Waterside	Heating	°C	8 to 55								
Pump rank				A								

\*1: With electric back-up heater.

\*2: The value is at Full speed and full flow.

## 2-2. ELECTRICAL SPECIFICATIONS

Model name (Hydraulic unit)				WSYA050DG6 WSHA050DG	WSYA100DG6 WSHA100DG			
Model name (Outdoor unit)				WOYA060LFCA WOHA060LFCA	WOYA060LFCA WOHA060LFCA	WOYA080LFCA WOHA080LFCA	WOYA100LFTA WOHA100LFTA	
Electric heater*	Type			Copper 9W / cm <sup>2</sup>				
	Power supply	Phase		1				
		Frequency	Hz	50				
		Voltage		V	230			
	Current	Running current		26.1				
		Max. operating current (Hydraulic unit)		A	28.2 A + 10%			
Wiring specification* (For back-up heater power supply)		Main fuse (circuit breaker) current	A	32				
Wiring specification (Hydraulic unit to outdoor unit)		Connection cable		mm <sup>2</sup>	6.0 x 3			
		Connection cable			1.5 x 4			
		Limited wiring length		m	Not available			

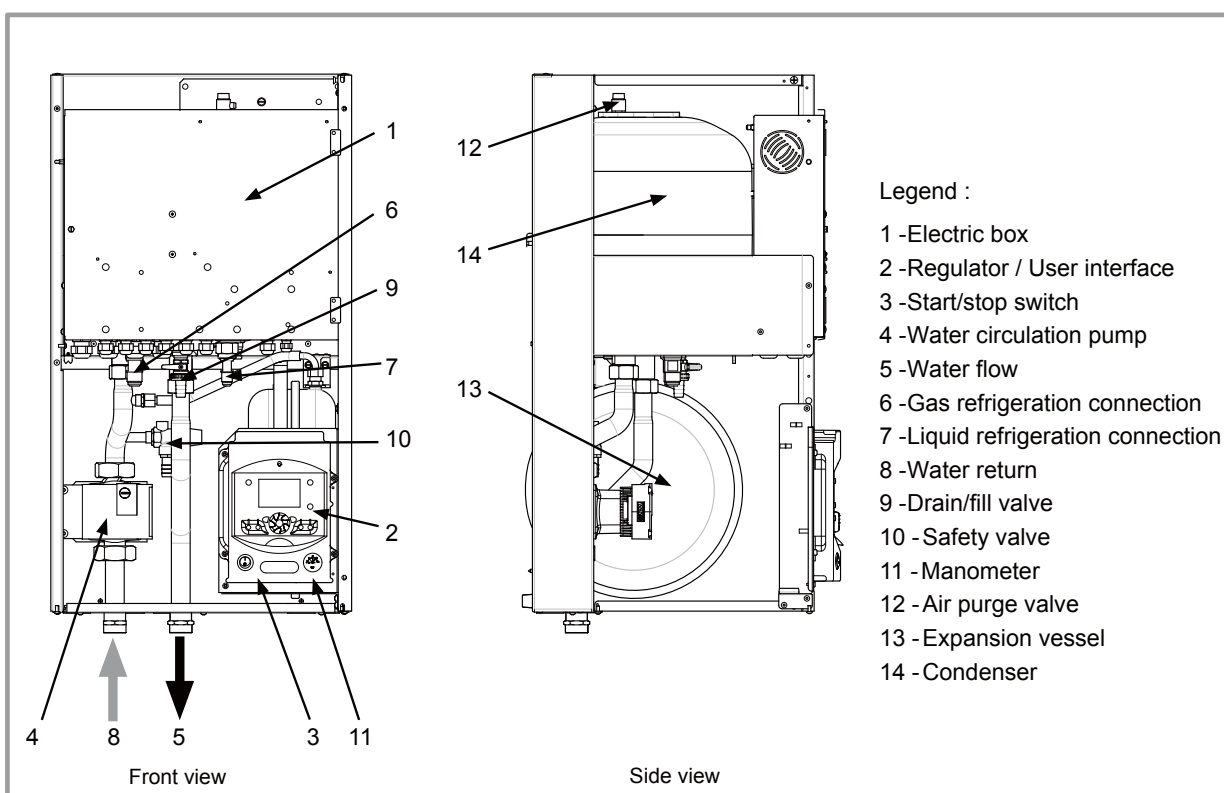
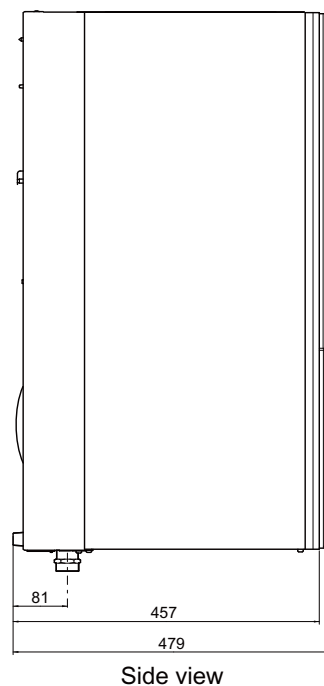
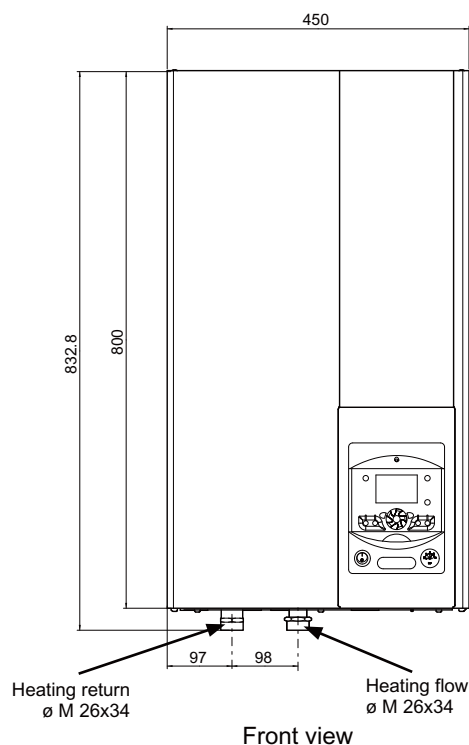
\*: WSY model only

### 3. DIMENSIONS

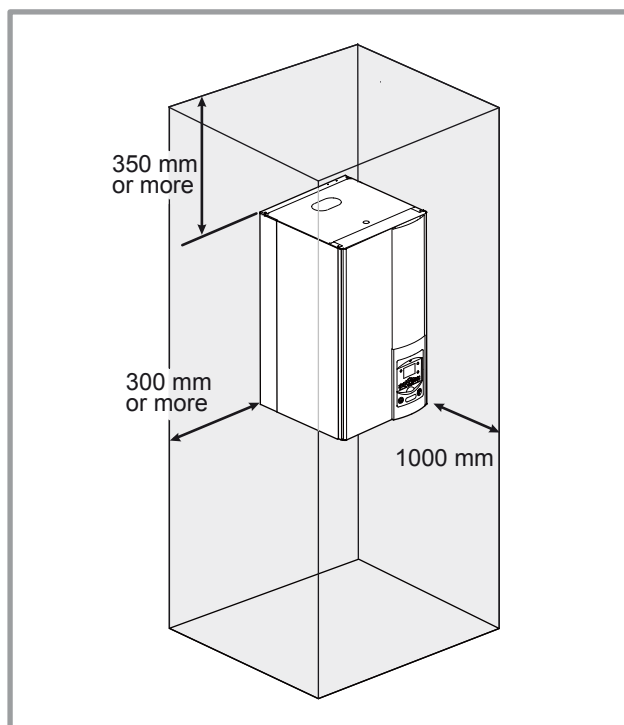
#### 3-1. DIMENSIONAL DRAWING

■ MODELS: WS\*A050DG\*, WS\*A100DG\*

(Unit : mm)



## 3-2. INSTALLATION PLACE

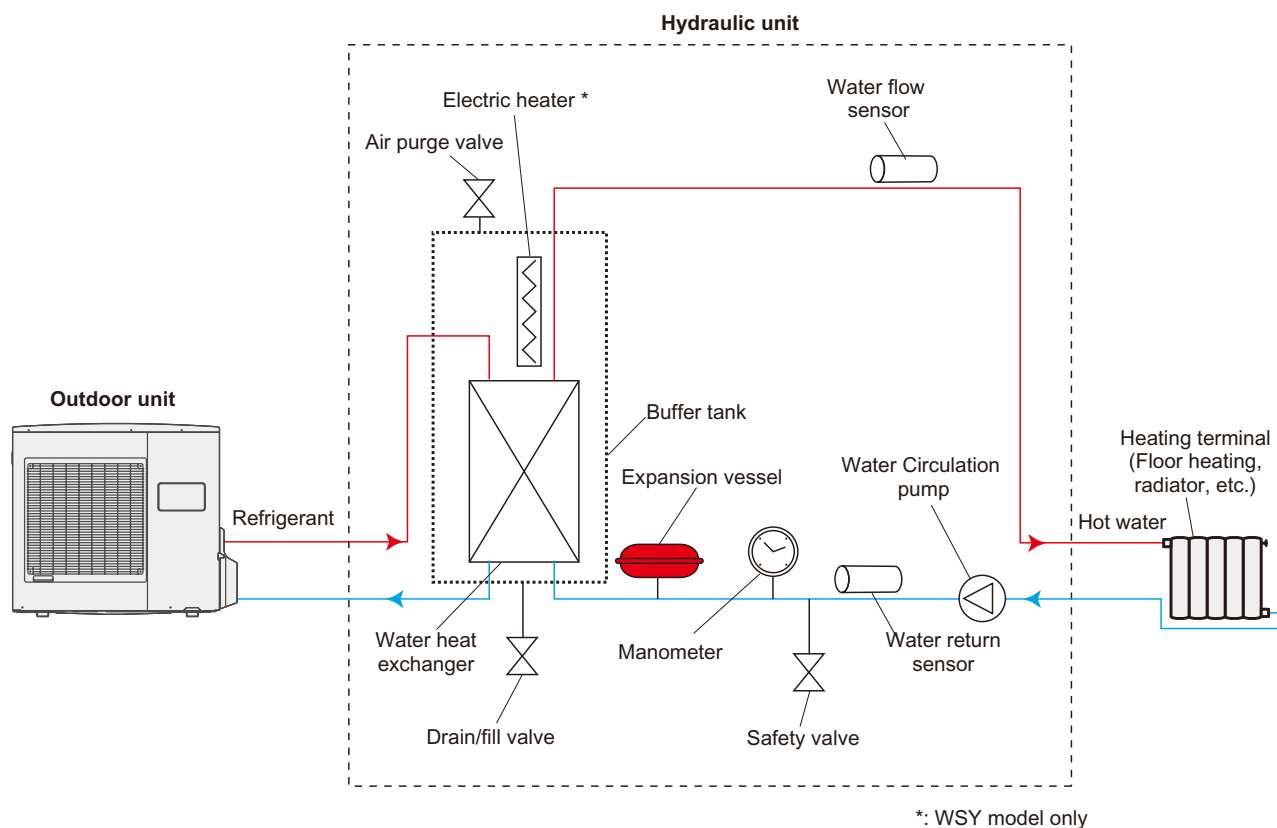


### ■ INSTALLATION PRECAUTIONS

- The room in which the appliance operates must comply with the prevailing regulations.
- To facilitate maintenance and to allow access to the various components, we recommend that you provide sufficient space all around the hydraulic unit.
- Be careful not to bring inflammable gas near to the heat pump during its installation, in particular when it requires brazing. The appliances are not fireproof and should not therefore be installed in a potentially explosive atmosphere.

## 4. PIPING DIAGRAM

■ MODELS: WS\*A050DG\*, WS\*A100DG\*

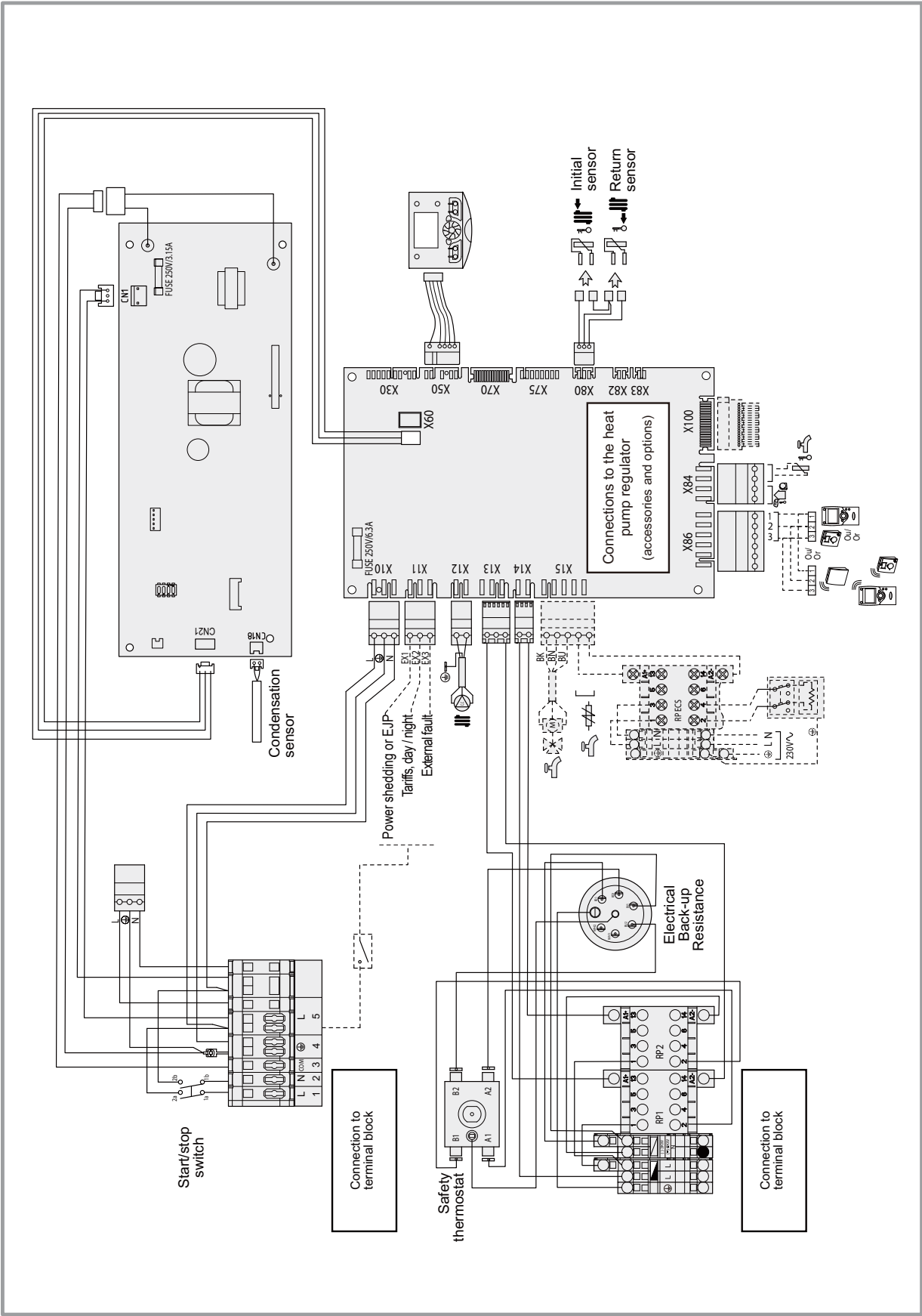




# 5. WIRING DIAGRAM

## 5-1. WIRING DIAGRAM

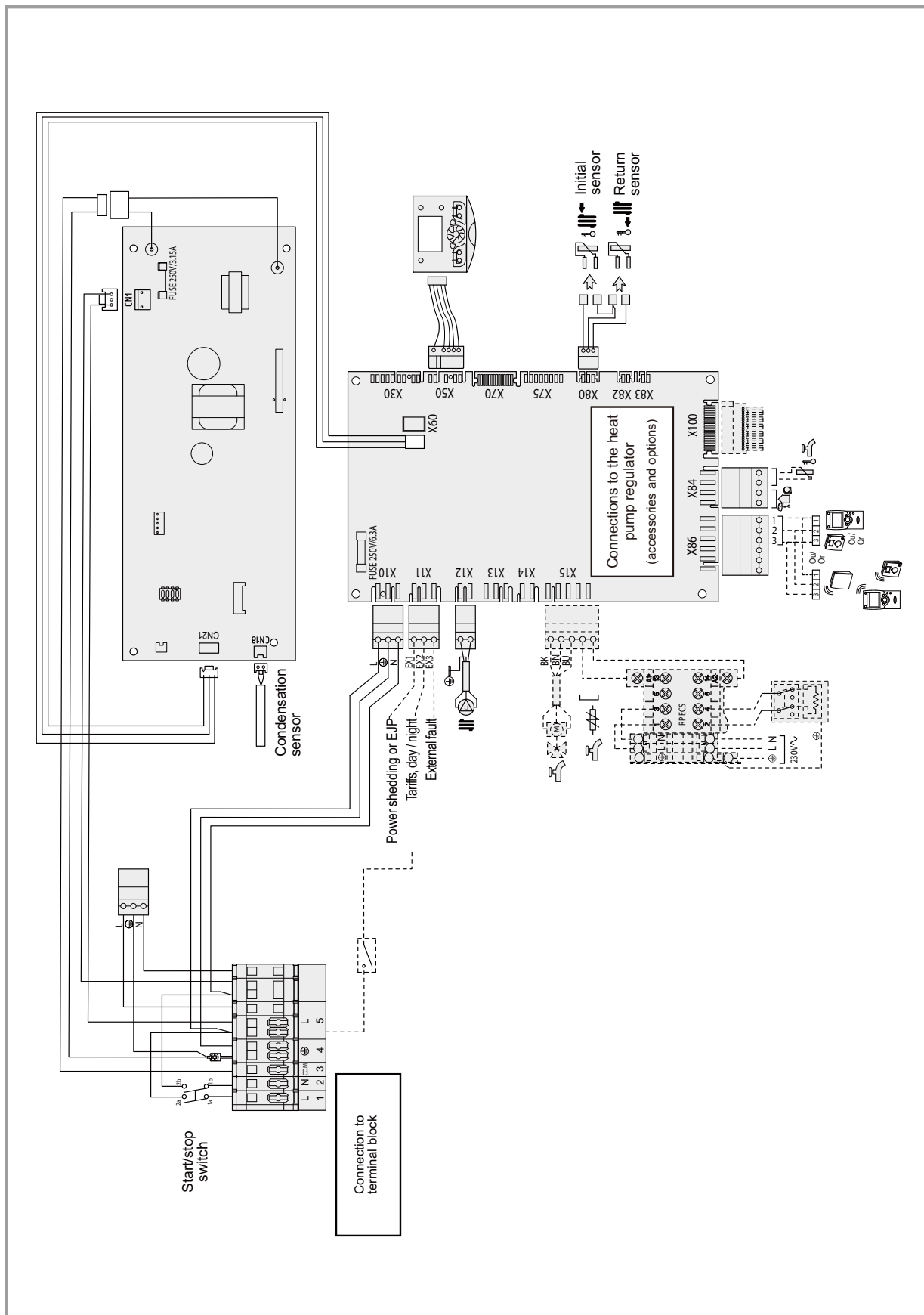
■ MODELS: WSYA050DG6, WSYA100DG6



HYDRAULIC UNIT  
WSYA050-100DG\*

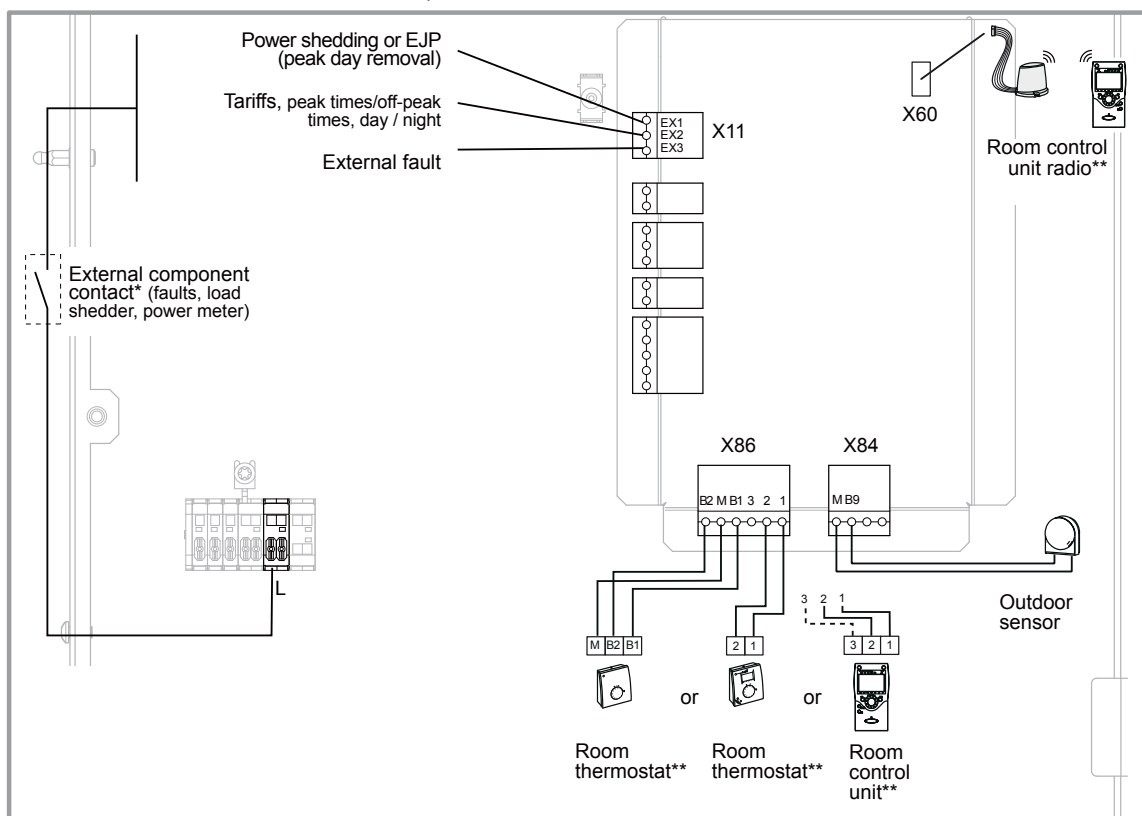
HYDRAULIC UNIT  
WSYA050-100DG\*

MODELS: WSHA050DG, WSHA100DG



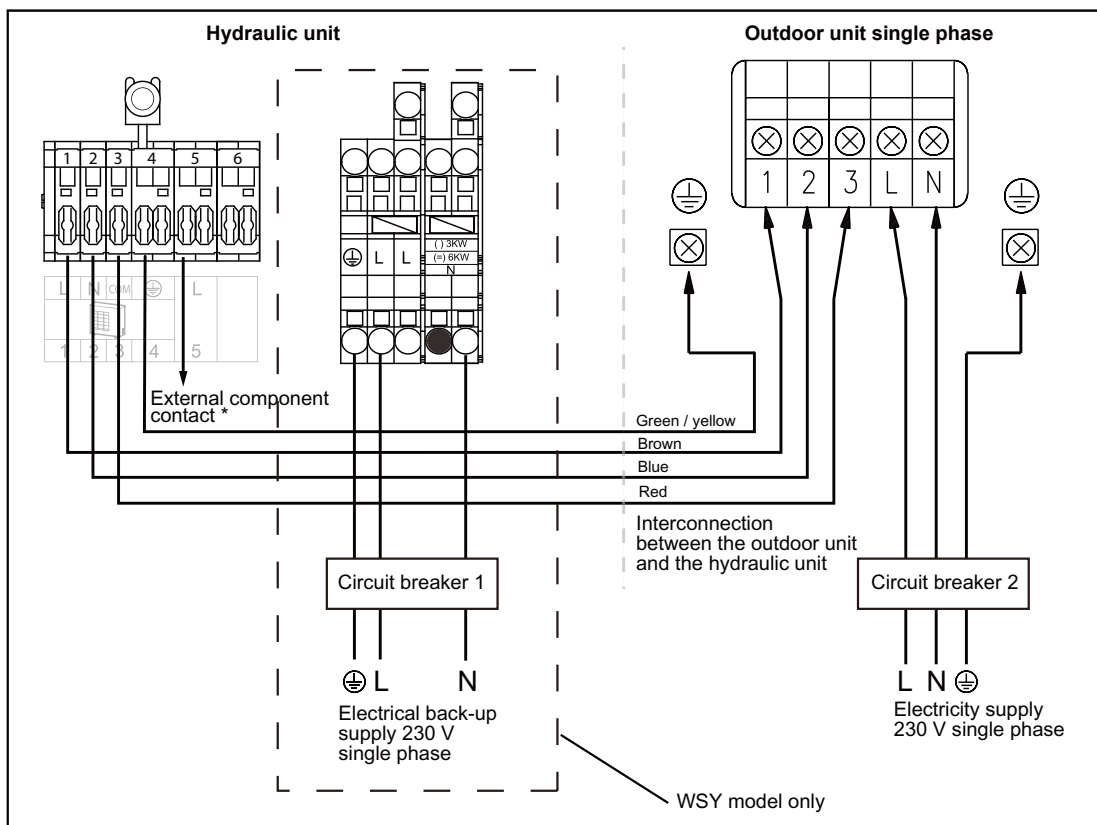
## 5-2. EXTERNAL CONNECTION DIAGRAM

### MODELS: WS\*A050DG\*, WS\*A100DG\*



\* If the control device does not provide a potential-free contact, the contact must be relayed to create equivalent wiring. In all cases, please refer to the instruction manuals for the external components (load shedder, power meters) to create the wiring.

\*\*Option The connection of terminal 3 of the room control unit is not mandatory (lighting of the room control unit).

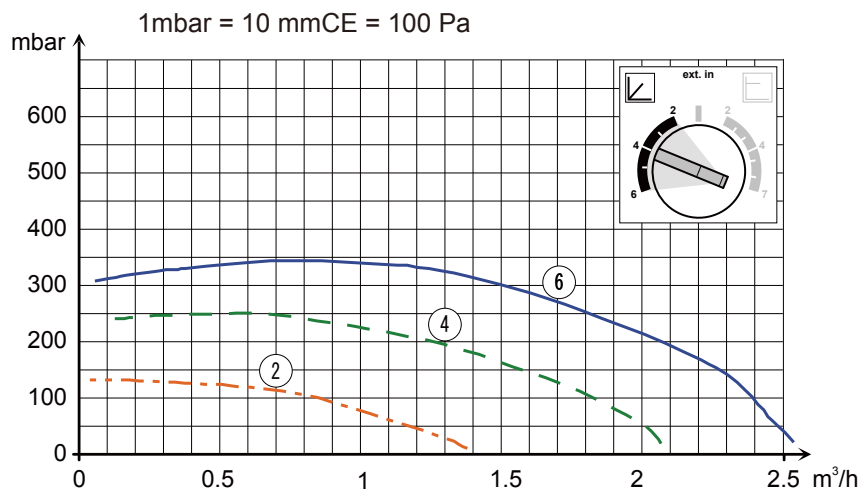


Regulation of wire size and circuit breaker differs from each locality, please refer in accordance with the regional standard.

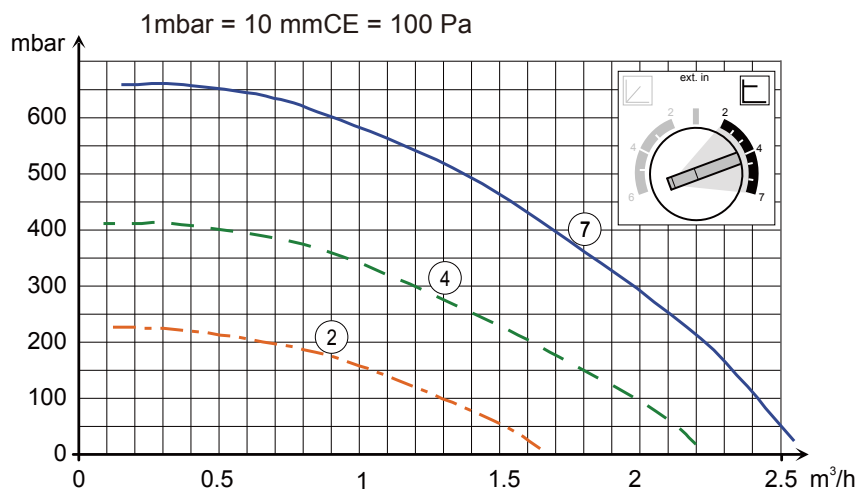
## 6. HYDRAULIC PERFORMANCE

### 6-1. STATIC PRESSURE DROP UNIT

#### ■ VARIABLE PRESSURE



#### ■ CONSTANT PRESSURE





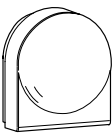
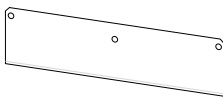


# 7. SAFETY DEVICES

	Protection form	Model	
		WS*A050DG*	WS*A100DG*
Circuit protection	Current fuse (Main PCB)	20 A	
High pressure protection	Safety valve	Activate (at 3 bar or more): Sافتy valve open	

HYDRAULIC UNIT  
WS\*A050-100DG\*

HYDRAULIC UNIT  
WS\*A050-100DG\*

## 8. STANDARD ACCESSORIES

Name and shape	Q'ty	Application
Installation and operating manual 	1	
Operation manual 	5	
Outdoor sensor 	1	To monitor the outdoor temperature
Bracket 	1	To secure the hydraulic model
Adaptor 	2	To connect the flared connection and the hydraulic model
Nut 	2	To connect the flared connection and the hydraulic model



### **3. CONTROL SYSTEM**

**WS\*A050DG\* (Hydraulic unit)**

**WS\*A100DG\* (Hydraulic unit)**

# CONTENTS

## 3. CONTROL SYSTEM

<b>1. FEATURES</b>	CS01 - 01
<b>2. FUNCTIONS</b>	CS01 - 03
2-1. USER INTERFACE AND REMOTE CONTROLLER (Optional parts)	CS01 - 03
2-2. ROOM THERMOSTAT (Optional parts)	CS01 - 07
2-3. CONTROL SETTING	CS01 - 08
<b>3. ELECTRICAL CONNECTIONS</b>	CS01 - 64
3-1. OVERVIEW OF ALL THE ELECTRICAL CONNECTIONS	CS01 - 64
3-2. ELECTRICAL CONNECTIONS ON THE HYDRAULIC UNIT	CS01 - 65
3-3. CONNECTIONS TO THE HEAT PUMP REGULATOR (Accessories and options)	CS01 - 68
<b>4. INSTALLATION</b>	CS01 - 75
4-1. OUTDOOR SENSOR	CS01 - 75
4-2. REMOTE CONTROLLER (Optional parts)	CS01 - 76
4-3. ROOM THERMOSTAT (Optional parts)	CS01 - 80
4-4. RF MODULE (Optional parts)	CS01 - 82
<b>5. DIMENSIONS</b>	CS01 - 83
5-1. OUTDOOR SENSOR	CS01 - 83
5-2. REMOTE CONTROLLER (Optional parts)	CS01 - 84
5-3. ROOM THERMOSTAT (Optional parts)	CS01 - 85
5-4. RF MODULE (Optional parts)	CS01 - 86
<b>6. PACKING LIST (Accessories)</b>	CS01 - 88
6-1. REMOTE CONTROLLER (Optional parts)	CS01 - 88
6-2. ROOM THERMOSTAT (Optional parts)	CS01 - 88
6-3. RF MODULE (Optional parts)	CS01 - 89
<b>7. WIRING SPECIFICATIONS</b>	CS01 - 90
7-1. OUTDOOR SENSOR	CS01 - 90
7-2. REMOTE CONTROLLER (Optional parts)	CS01 - 90
7-3. ROOM THERMOSTAT (Optional parts)	CS01 - 90
7-4. RF MODULE (Optional parts)	CS01 - 90
<b>8. SPECIFICATIONS</b>	CS01 - 91
8-1. OUTDOOR SENSOR	CS01 - 91
8-2. REMOTE CONTROLLER (Optional parts)	CS01 - 91
8-3. ROOM THERMOSTAT (Optional parts)	CS01 - 91
8-4. RF MODULE (Optional parts)	CS01 - 92

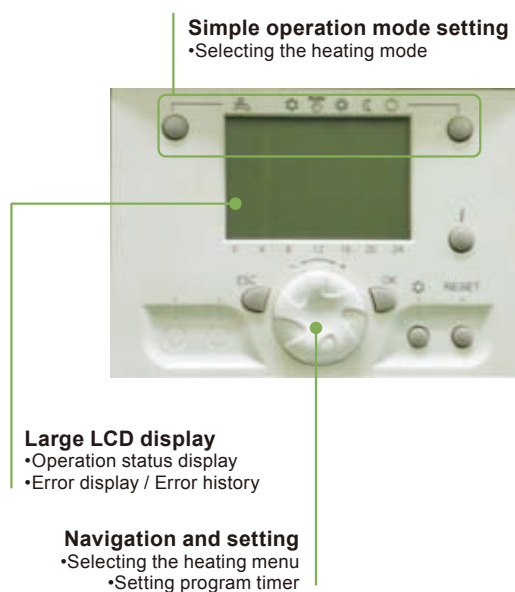


# 1. FEATURES

## ■ SMART & COMFORT CONTROL

The outdoor temperature is detected by sensor and the heating water temperature is controlled automatically.

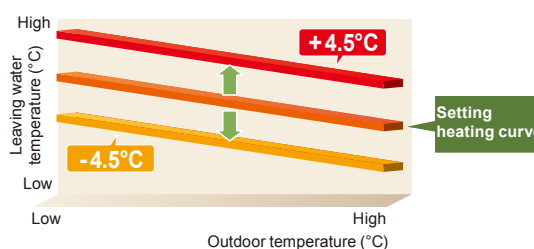
The setting of room temperature and operation mode can be easily set. A wide range of control from heating to hot water supply and swimming pool is possible by combining with various optional parts.



### ● Comfort

#### Flexible heating circuit

Automatic hot water temperature control matched to the application can be set. In addition, set temperature coefficient offset can be adjusted easily high or low side matched to the usage conditions.



### ● Convenience

#### Programmed operation

- The setting of programmed operation can be easily set.
- Changing the heating mode linked with time is possible.

##### Heating mode



##### Automatic mode

Comfort/Reduce mode switching automatically according to outdoor temperature



##### Reduce mode

Constant reduce temperature



##### Comfort mode

Constant comfort temperature

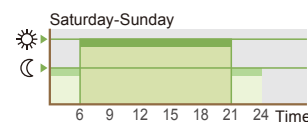
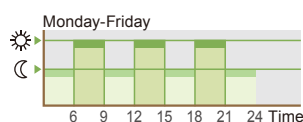


##### Protection mode

Stand-by mode with anti-frost protection

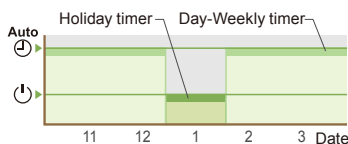
#### Day-Weekly timer setting

- The day-weekly timer can be set up for up to 3 times per day.
- Allows separate settings for each day of the week.



#### Holiday timer setting

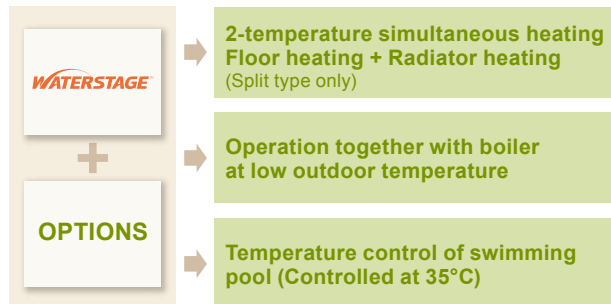
- The holiday timer can be set up for up to 8 periods.
- If you are absent for a long time in the winter, freezing of room can be prevented.



## ● Extendibility

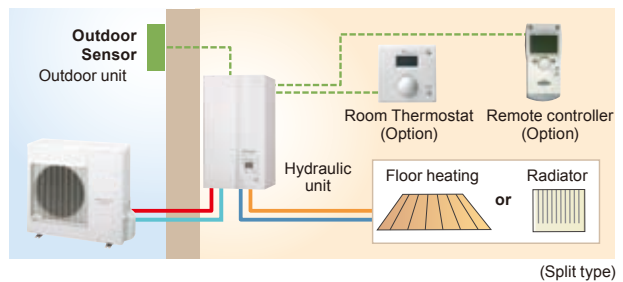
### Diverse operation control

Meets diverse needs by combining with optional parts.



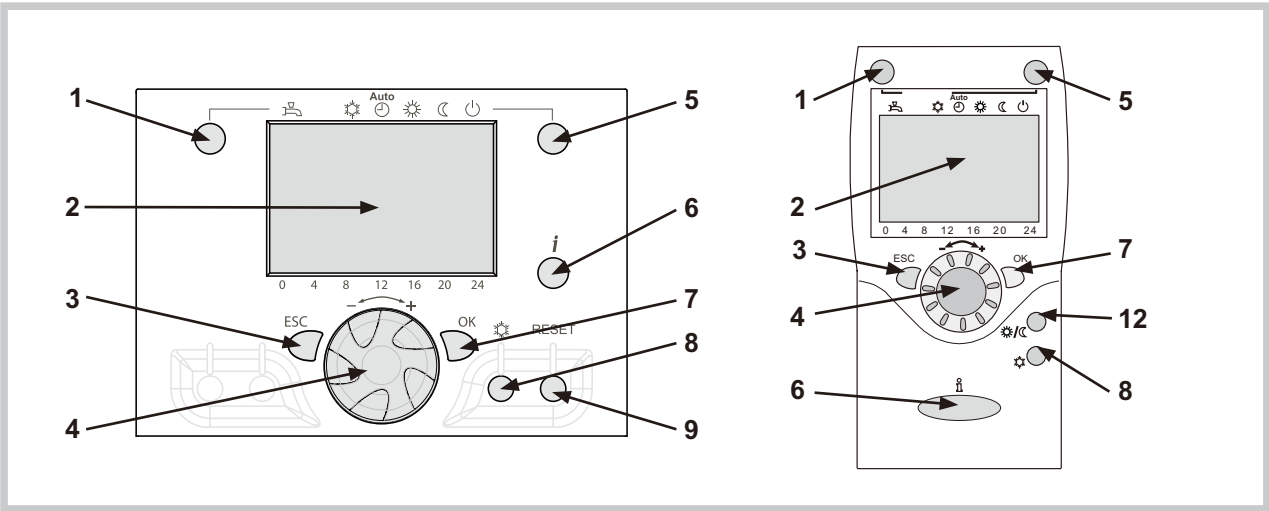
### Remote controller - Extension








Optional remote controller allows controls of hot water depending on room temperature.



## 2. FUNCTIONS



### 2-1. USER INTERFACE AND REMOTE CONTROLLER (Optional parts)



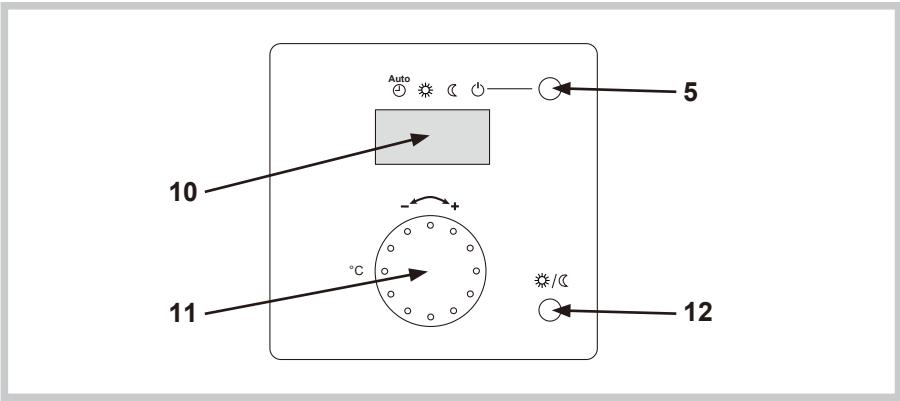
Ref .	Functions	- Definitions
1	Selecting DHW operating mode (Domestic Hot Water)  On  Off	<ul style="list-style-type: none"><li>- If the installation is fitted with a DHW tank.</li><li>- On : Production of DHW according to the time program.</li><li>- Off : Preparing the domestic hot water for stopping with the anti-frost function active.</li><li>- Manual start button : Hold down the DHW key for 3 seconds. Switch from "reduced" to "comfort" until the next time the DHW timer switches over.</li></ul>
2	Digital display	<ul style="list-style-type: none"><li>- Operating control. Readout of the current temperature, the heating mode and any faults .</li><li>- View the settings</li></ul>
3	Exit "ESC"	<ul style="list-style-type: none"><li>- Quit the menu.</li></ul>
4	Navigation and setting	<ul style="list-style-type: none"><li>- Selecting the menu.</li><li>- Setting parameters.</li><li>- Adjusting the ambient temperature setpoint.</li></ul>
5	Selecting heating mode	<ul style="list-style-type: none"><li>-  Heating operation according to the heating program (Summer/Winter mode switchover is automatic).</li><li>-  Constant comfort temperature.</li><li>-  Constant reduced temperature.</li><li>-  Stand-by mode with anti-frost protection (Provided that the heat pump's electrical power supply is not interrupted).</li></ul>

Ref .	Functions	- Definitions																																																				
6	Information display	<div>- Various data.</div> <table><tr><th>Designation</th><th>Line</th></tr><tr><td>Floor drying current setpoint</td><td>-</td></tr><tr><td>Current drying day</td><td>-</td></tr><tr><td>Terminated drying days</td><td>-</td></tr><tr><td>State heat pump</td><td>8006</td></tr><tr><td>State supplementary source</td><td>8022</td></tr><tr><td>State DHW</td><td>8003</td></tr><tr><td>State swimming pool</td><td>8011</td></tr><tr><td>State heating circuit 1</td><td>8000</td></tr><tr><td>State heating circuit 2</td><td>8001</td></tr><tr><td>State cooling circuit 1</td><td>8004</td></tr><tr><td>Outside temp</td><td>8700</td></tr><tr><td>Room temp 1</td><td rowspan="2">8740</td></tr><tr><td>Room setpoint 1</td></tr><tr><td>Flow temp 1</td><td rowspan="2">8743</td></tr><tr><td>Flow temp setpoint 1</td></tr><tr><td>Room temp 2</td><td rowspan="2">8770</td></tr><tr><td>Room setpoint 2</td></tr><tr><td>Flow temp 2</td><td rowspan="2">8773</td></tr><tr><td>Flow temp setpoint 2</td></tr><tr><td>DHW (domestic hot water)temp</td><td rowspan="2">8830</td></tr><tr><td>DHW temp setpoint</td></tr><tr><td>Return temp HP</td><td rowspan="2">8410</td></tr><tr><td>Setpoint (return) HP</td></tr><tr><td>Flow temp HP</td><td rowspan="2">8412</td></tr><tr><td>Setpoint (flow) HP</td></tr><tr><td>Swimming pool temp</td><td rowspan="2">8900</td></tr><tr><td>Swimming pool temp setpoint</td></tr><tr><td>Minimum remaining stop time for compressor 1</td><td>-</td></tr><tr><td>Minimum remaining running time for compressor 1</td><td>-</td></tr></table> <div><b>Note:</b> Ensure that the general electrical power supply has been cut off before starting any repair work. When the HP is not under tension, protection frost-free is not assured.</div>	Designation	Line	Floor drying current setpoint	-	Current drying day	-	Terminated drying days	-	State heat pump	8006	State supplementary source	8022	State DHW	8003	State swimming pool	8011	State heating circuit 1	8000	State heating circuit 2	8001	State cooling circuit 1	8004	Outside temp	8700	Room temp 1	8740	Room setpoint 1	Flow temp 1	8743	Flow temp setpoint 1	Room temp 2	8770	Room setpoint 2	Flow temp 2	8773	Flow temp setpoint 2	DHW (domestic hot water)temp	8830	DHW temp setpoint	Return temp HP	8410	Setpoint (return) HP	Flow temp HP	8412	Setpoint (flow) HP	Swimming pool temp	8900	Swimming pool temp setpoint	Minimum remaining stop time for compressor 1	-	Minimum remaining running time for compressor 1	-
Designation	Line																																																					
Floor drying current setpoint	-																																																					
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Outside temp	8700																																																					
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Minimum remaining running time for compressor 1	-																																																					

Ref .	Functions	- Definitions		
	- 🔔 Reading error codes			
	Hydraulic unit : Fault visible on the digital display.			
	Error number	Error contents	Error location	Heat pump operation despite the error
	-	No connection	Failure to comply with room thermostat's polarity	No
	10	Outdoor sensor	X86	Yes with OT = 0 °C
	33	Flow sensor HP	X70	Yes
	44	Return sensor HP	X70	Yes
	50	DHW sensor	X84	Yes
	60	Room sensor 1		Yes
	65	Room sensor 2		Yes
	105	Maintenance message		Yes
	121	Flow temp HC1 not reached		Yes
	122	Flow temp HC2 not reached		Yes
	127	Anti-legionella temp not reached		Yes
	369	External fault (safety component)		No
370	Outdoor unit error	See the next page	No	

Ref .	Functions	- Definitions																																																																																																			
<b>Hydraulic unit</b> : Flashing of the LED visible on the interface card.																																																																																																					
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-  Information concerning maintenance, special mode.																																																																																																					
7	Confirm "OK"	<ul style="list-style-type: none"> <li>- Input into the selected menu.</li> <li>- Confirmation of the parameter settings.</li> <li>- Confirmation of the adjustment to the comfort temp. setting.</li> </ul>																																																																																																			
8	Selecting cooling mode	<ul style="list-style-type: none"> <li>- If the installation is fitted with the cooling kit :</li> <li>-  Cooling operating according to the heating program (Summer/Winter mode switchover is automatic).</li> </ul>																																																																																																			
9	RESET button (Hold down the "RESET" key for less than 3 sec).	<ul style="list-style-type: none"> <li>- Reinitialising the parameters and cancelling error messages.</li> </ul> <b>Do not use during normal operation.</b>																																																																																																			
12	Presence key	- Comfort / Reduced switchover.																																																																																																			

## 2-2. ROOM THERMOSTAT (Optional parts)



Ref .	Functions	- Definitions
5	Selecting heating mode	<ul style="list-style-type: none"><li>-  Heating operating according to the heating program (Summer/Winter mode switchover is automatic).</li><li>-  Constant comfort temperature.</li><li>-  Constant reduced temperature.</li><li>-  Stand-by mode with anti-frost protection (Provided that the heat pump's electrical power supply is not interrupted).</li></ul>
10	Digital display	- Operating control. Readout of the current temperature, of the heating mode and of any faults  .
11	Control knob	- Adjusting room temperature setpoint.
12	Presence key	- Comfort / Reduced switchover.

## 2-3. CONTROL SETTING

### ■ GENERAL

The settings described below are those which can be modified by the user.

We wish to remind you that changing the settings below may cause the heat pump to behave in an undesirable way. A testing period should be conducted before the permanent settings of the heat pump are confirmed. This may require a number of changes to be made by the installer.

There are 3 access levels:

U: end-user level

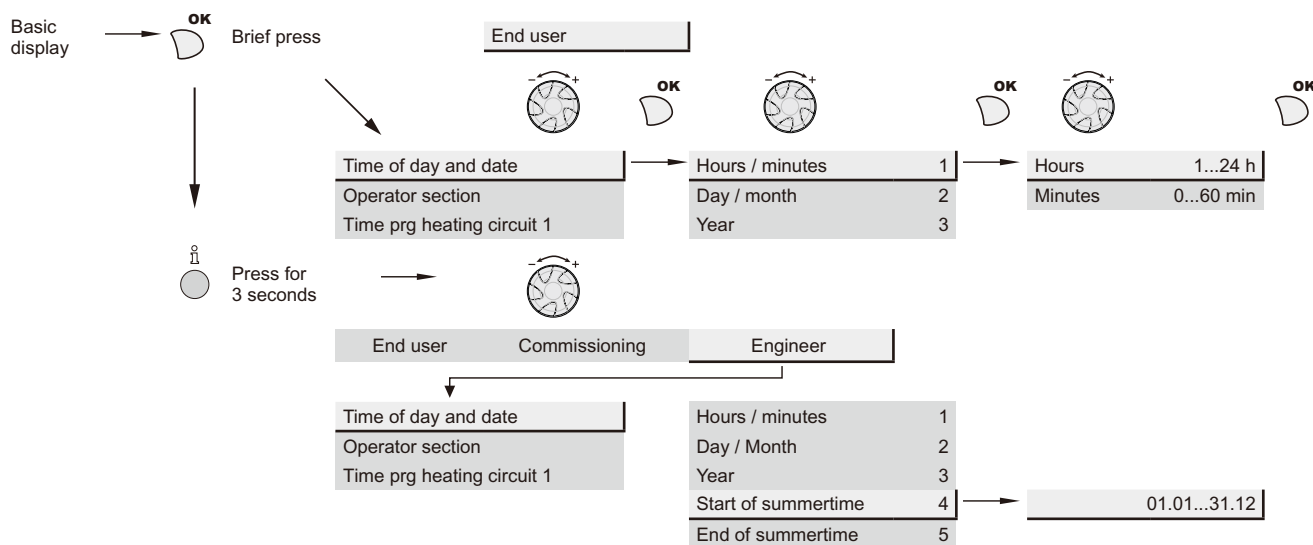
I: commissioning level (installer start-up)

S: engineer level (specialist)

### ■ SETTING PARAMETERS

- Choose the desired level.
- Scroll the menu list.
- Choose the desired menu.
- Scroll the function lines.
- Choose the desired line.
- Adjust the parameter.
- Check the setting by pressing OK.
- To return the menu, press ESC.

If no setting is made for 8 minutes, the screen returns automatically to the basic display.





## FUNCTION TABLE

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
<b>Time of day and date</b>				
1	U	Hours/minutes	00:00...23:59	
2	U	Day/month	01.01...31.12	
3	U	Year	1900...2099	
5	S	Start of summer time (Day / Month)	01.01...31.12	25.03
6	S	End of summer time(Day / Month)	01.01...31.12	25.10
The change of hour will appear at 3:00 first Sunday after the regulated date.				
<b>Operator section</b>				
20	U	Language	English, Français, Italiano, Nederlands...	English
22	S	Info	Temporary, Permanent	Temporary
26	S	Operation lock	On, Off	Off
27	S	Programming lock	On, Off	Off
28	I	Direct setting	Automatic storage, With confirmation	With confirmation
29	I	Temperature units Pressure units	°C, °F bar, psi	°C bar
44	I	Operation HC2	Jointly with HC1 Independently	Jointly with HC1
46	I	Operation HC3/P	Jointly with HC1 Independently	Jointly with HC1
70	S	Display software version		
<b>Time program heating / cooling, circuit 1</b>				
500	U	Pre-selection (Day / Week)	Mon-Sun, Mon-Fri, Sat-Sun, Monday, Tuesday, ...	Mon-Sun
501	U	1 <sup>st</sup> phase on (start)	00:00...--:--	06:00
502	U	1 <sup>st</sup> phase off (end)	00:00...--:--	22:00
503	U	2 <sup>nd</sup> phase on (start)	00:00...--:--	--:--
504	U	2 <sup>nd</sup> phase off (end)	00:00...--:--	--:--
505	U	3 <sup>rd</sup> phase on (start)	00:00...--:--	--:--
506	U	3 <sup>rd</sup> phase off (end)	00:00...--:--	--:--
516	U	Default values, Circuit 1	No, Yes	No
Yes + OK: The default values memorised in the regulator replace and cancel the customised heating programs. Your customised settings are therefore lost.				
<b>Time program heating / cooling, circuit 2</b>				
520	U	Pre-selection (Day / Week)	Mon-Sun, Mon-Fri, Sat-Sun, Monday, Tuesday, ...	Mon-Sun
521	U	1 <sup>st</sup> phase on (start)	00:00...--:--	06:00
522	U	1 <sup>st</sup> phase off (end)	00:00...--:--	22:00
523	U	2 <sup>nd</sup> phase on (start)	00:00...--:--	--:--
524	U	2 <sup>nd</sup> phase off (end)	00:00...--:--	--:--
525	U	3 <sup>rd</sup> phase on (start)	00:00...--:--	--:--
526	U	3 <sup>rd</sup> phase off (end)	00:00...--:--	--:--
536	U	Default values, Circuit 2	No, Yes	No
Yes + OK: The default values memorised in the regulator replace and cancel the customised heating programs. Your customised settings are therefore lost.				

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
<b>Time program 4 / DHW</b>				
560	U	Pre-selection (Day / Week)	Mon-Sun, Mon-Fri, Sat-Sun, Monday, Tuesday, ...	Mon-Sun
561	U	1 <sup>st</sup> phase on (start)	00:00...--:--	00:00
562	U	1 <sup>st</sup> phase off (end)	00:00...--:--	05:00
563	U	2 <sup>nd</sup> phase on (start)	00:00...--:--	14:30
564	U	2 <sup>nd</sup> phase off (end)	00:00...--:--	17:00
565	U	3 <sup>rd</sup> phase on (start)	00:00...--:--	--:--
566	U	3 <sup>rd</sup> phase off (end)	00:00...--:--	--:--
576	U	Default values, Circuit 2	No, Yes	No
Yes + OK: The default values memorised in the regulator replace and cancel the customised heating programs. Your customised settings are therefore lost.				
<b>Holidays heating circuit 1</b>				
641	U	Preselection	Period 1...8	Period 1
642	U	Period start (Day / Month)	01.01...31.12	--:--
643	U	Period end (Day / Month)	01.01...31.12	--:--
648	U	Operating level	Frost protection, Reduced	Frost protection
<b>Holidays heating circuit 2</b>				
651	U	Preselection	Period 1...8	Period 1
652	U	Period start (Day / Month)	--:--, 01.01...31.12	--:--
653	U	Period end (Day / Month)	--:--, 01.01...31.12	--:--
658	U	Operating level	Frost protection, Reduced	Frost protection
<b>Heating circuit 1</b>				
710	U	Comfort setpoint	Reduced setpoint... Comfort setpoint maximum	20°C
712	U	Reduced setpoint	Frost protection setpoint... Comfort setpoint	19°C
714	U	Frost protection setpoint	4 °C... Reduced setpoint	8°C
716	S	Comfort setpoint maximum	20...35°C	28°C
720	I	Heating curve slope	0.1... 4	0.5
721	I	Off-set of the heating curve	-4.5...4.5°C	0°C
730	I	Summer / winter heating limits	8...30°C	18°C
When the average of the outside temperatures over the past 24 hours reaches 18°C, the regulator switches off the heating (as an economy measure). During summer mode, the display shows "Eco". This function is only active in automatic mode.				
740	I	Flow temp setpoint min	8 °C... Flow temp setpoint max	17°C
(with dynamic radiator, adjust from 30 to 35°C)				
741	I	Flow temp setpoint max	Flow temp setpoint min... 70 °C	55°C
Floor heating system = 50 °C / Radiators = 65 °C. Important Note : Maximum temperature limitation is not a safety function as required by ground heating.				
750	S	Room influence	1...100%	50%

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
760	S	Room temp limitation	0.5...4°C	0.5°C
	As soon as the room temperature = [Setpoint line 710 (ex. 20°C) + Room temperature limitation setpoint line 760 (ex. 0.5 °C)] > 20.5 °C => The heat pump is stopped. It restarts when the room temperature falls below the setpoint (in the example, Room temperature < 20,0 °C).			
780	S	Quick setback	Off Down to reduced setpoint Down to frost prot setpoint	Off
790	S	Optimum start control max	0...360min	180 min
791	S	Optimum stop control max	0...360min	30 min
800	S	Reduced setpoint increase start	-30...10°C	---°C
801	S	Reduced setpoint increase end	-30...10°C	-5°C
830	S	Mixer valve boost	0...50°C	0°C
834	S	Actuator running time	30...873s	240s
850	I	Floor curing function		Off
	- Off: Early interruption of the current programme, programme inactive. - Operational heating. - Heating ready for occupation. - Operational heating + ready heating. - Ready heating + operational heating. - Manual: Manual mode enables you to programme your own concrete slab drying time. The function ends automatically after 25 days.			
851	I	Floor curing setpoint manually	0...95°C	25°C
	This function enables you to set the custom concrete slab drying temperature. This temperature remains fixed. The concrete slab-drying programme stops automatically after running for 25 days.			
856	I	Floor curing day current	0...32	
857	I	Floor curing days completed	0...32	
900	S	Operating mode changeover	None, Protection mode, Reduced, Comfort, Automatic	Reduced
	Operating mode at end of concrete slab drying period.			
Cooling circuit 1				
901	U	Operating mode	Protection, Automatic, Reduced, Comfort	Protection
902	U	Comfort cooling setpoint	17...40°C	24°C
903	U	Reduced setpoint	5... 40°C	26°C
908	I	Flow temp setpoint at OT 25°C	6... 35°C	20°C
909	I	Flow temp setpoint at OT 35°C	6... 35°C	16°C
912	I	Cooling limit at OT	8... 35°C	24°C
913	S	Lock time at end of heating / cooling	8... 100h	24h
918	S	Summer compensation start at OT	20...50°C	26°C
919	S	Summer compensation end at OT	20...50°C	40°C
920	S	Summer compensation setpoint increase	1... 10 °C	4°C
923	S	Flow temp setpoint min OT 25°C	6...35°C	18°C
924	S	Flow temp setpoint min OT 35°C	6...35°C	18°C
928	S	Room influence	1...100%	80%
932	S	Room temp limitation	0,5... 4 °C	0.5°C
938	S	Mixing valve decrease	0...20°C	0°C
941	S	Actuator running time	30...873s	240s
963	S	With primary controller/system pump	No, Yes	No*
	*Basic setting : 1 circuit = No ; 2 circuits = Yes.			

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
<b>Heating circuit 2</b>				
1010	U	Comfort setpoint	Reduced setpoint... Comfort setpoint maximum	20°C
1012	U	Reduced setpoint	Frost protection setpoint... Comfort setpoint	19.0°C
1014	U	Frost protection setpoint	4°C... Reduced setpoint	8.0°C
1016	S	Comfort setpoint maximum	Comfort temp... 35 °C	28.0°C
1020	I	Heating curve slope	0.1...4	0.5
1021	I	Off-set of the heating curve	-4.5...4.5°C	0°C
1030	I	Summer / winter heating limits	8...30 °C	18°C
1040	I	Flow temp setpoint min	8...70°C	17°C
1041	I	Flow temp setpoint max	8...70°C	55°C
1050	S	Room influence	1...100%	50%
1060	S	Room temperature limitation	0.5...4°C	0.5°C
		As soon as the room temperature = [Setpoint line 1010 (ex. 20°C) + Room temperature limitation setpoint line 1060 (ex. 0,5 °C)] > 20,5 °C => The heat pump is stopped. It restarts when the room temperature falls below the setpoint (in the example, Room temperature < 20,0 °C).		
1080	S	Quick setback	Off Down to reduced setpoint Down to frost prot setpoint	Off
1090	S	Optimum start control max	0...360 min	180 min
1091	S	Optimum stop control max	0...360 min	30 min
1100	S	Reduced setpoint increase start	---, -30...10°C	---°C
1101	S	Reduced setpoint increase end	---, -30...10°C	-5°C
1130	S	Mixer valve boost	0...50°C	0°C
1134	S	Actuator running time	30...873sec	240sec
1150	I	Floor curing function		Off
		- Off: Early interruption of the current programme, programme inactive. - Operational heating. - Heating ready for occupation. - Operational heating + ready heating. - Ready heating + operational heating. - Manual: Manual mode enables you to programme your own concrete slab drying time. The function ends automatically after 25 days		
1151	I	Floor curing setpoint manually (if line 1150 = manual)	0...95°C	25°C
		This function enables you to set the custom concrete slab drying temperature. This temperature remains fixed. The concrete slab-drying program stops automatically after running for 25 days.		
1156	I	Floor curing day current	0... 32	
1157	I	Floor curing day completed	0... 32	0
1200	S	Operating mode changeover	None, Protection mode, Reduced, Comfort, Automatic	Reduced
<b>Domestic hot water</b>				
1600	U	Operating mode	Off, On, Eco	On
1610	U	Nominal setpoint	Reduced setpoint (line 1612)...65 °C	55°C
		The backup electrical system is required to reach this level.		
1612	U	Reduced setting	8 °C...Nominal setting (line 1610)	40°C

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
1620	I	Release of DHW load	24h / day Heating circuit time programme Programme 4 / DHW Off-peak tariff (Off-peak) Programme 4 / DHW and Off-peak	Programme 4 / DHW
<b>24h / day:</b> The temperature of the DHW is constantly maintained at the DHW comfort setting.				
<b>Heating circuit time programme:</b> The DHW is produced according to the programming for the ambient temperature (with 1 hour in advance when switched on).				
<b>Programme 4 / DHW:</b> The DHW programme is separate from the heating circuit programme.				
<b>Off-peak tariff*</b> : The electrical backup heating is only authorised to operate during the off-peak period.				
<b>T'prog 4/DHW or low-tariff *</b> : The electrical backup heating is authorised to operate during the comfort period or off peak.				
* - Connect the "Power Provider" contact to input EX2. In the case of a day /night contract, the electric back-ups for the DHW tank are subject to the power supplier's tariffs. Switching on the electric back-up for the DHW tank is only authorised during off-peak hours.				
1640	I	Legionella function	Off, Periodically (depending line setting 1641), Fixed weekday (depending line setting 1642)	Off
1641	I	Legionella function periodically	1 to 7	7
1642	S	Legionella function weekday	Monday, Tuesday,...	Saturday
1644	S	Legionella function time		
1645	S	Legionella funct setpoint		
1646	S	Legionella funct duration		
1647	S	Legionella funct circ pump	Off, On	Off
1660	S	Legionella function weekday	Time program 3/HCP, DHW release, Time program 4/DHW, Time program 5	DHW release
<b>Swimming pool (Only with swimming pool kit option)</b>				
2055	U	Setpoint solar heating	8... 80 °C	26°C
2056	U	Setpoint source heating	8... 35 °C	22°C
2057	S	Swi diff source heating	0.5... 3 °C	0.5°C
2065	S	Charging priority solar	Priority 1, Priority 2, Priority 3	Priority 1
2080	S	Setpoint source heating	No, Yes	Yes
<b>Heat pump</b>				
2803	S	Overrun time cond pump	8...240s	240s
2843	S	Compressor off time min	0...120min	8min
2844	S	Switch-off temp max	8...100°C	75°C
2862	S	Locking time stage 2 / mod	0...40min	5min
2873	S	Compressor mod run time	10...600s	240s
2882	S	Release integral electric flow	0...500°Cmin	100°Cmin
2884	S	Release electric flow below OT Electrical release - start-up with outside temperature	-30...30°C	2°C
2916	S	Max setpoint HP DHW charg	8... 80°C	58°C

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
2920	S	With electrical utility lock (EX1)	Locked (Blocked on standby), Released	Released
	<b>Released</b> : HP = ON _ Back-up DHW = off _ 1st back-up HP = off _ 2nd back-up HP = off _ Boiler = ON <b>Locked (Blocked on standby)</b> : HP = off _ Back-up DHW = off _ 1st back-up HP = off _ 2nd back-up HP = off _ Boiler = ON			
Energy meter				
3095	S	Not used		
...				
3267	U			
Additional generator (Boiler connection)				
3692	S	With DHW charging	Locked Substitute Complement Instantly	Substitute
	<b>- DHW Instantly</b> : When DHW request, the HP and the boiler are put into operation. The HP will stop when the primary return temperature is over 55 °C. <b>- DHW Substitute</b> : If the outdoor temperature is above 2 °C, the operation of the HP when DHW request last 5 minutes at least. The HP operating time can be extended depending on the outdoor temperature. The boiler will activate then.			
3700	S	Release below outside temp	-50...50°C	2°C
3701	S	Release above outside temp	-50...50°C	---
3705	S	Overrun time	0...120min	20min
3720	S	Switching integral (for boiler relief)	0...500°Cmin	100°Cmin
3723	S	Locking time	1...120min	30min
Domestic hot water (DHW)				
5024	S	Switching differential	0...20°C	7°C
5030	S	Charging time limitation	10...600min	90min
5055	S	Recooling temp	10...95°C	65°C
5057	S	Recooling collector	Off Summer Always	Summer
5061	S	Electric immersion heater release	24h / day Release of DHW Programme 4 / DHW	Release of DHW
5093	S	With solar integration	No, Yes	Yes
Installation configuration				
5700	I	Pre-setting	1,2,3,... 9	1
	This control enables you to choose one of the 4 pre-selected installation configurations. The hydraulic layouts for the various configurations are detailed in the section: "Installation Configurations". - Pre-setting 1: 1 heating circuit with or without electrical back-up, with DHW tank. - Pre-setting 2: 2 heating circuits with or without electrical back-up, with DHW tank. - Pre-setting 3: Boiler connection and 1 heating circuit and DHW tank. - Pre-setting 4: Boiler connection and 2 heating circuits and DHW tank. - Pre-setting 5 and more: Not used.			
5710	S	Heating circuit 1	Off, On	On
5711	S	Cooling circuit 1	Off 4-pipe system 2-pipe system	Off
	Set the parameter to " <b>2-pipe system cooling</b> " with the cooling kit.			
5715	S	Heating circuit 2	Off, On	On

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
5716	S	Cooling circuit 2	Off 4-pipe system cooling 2-pipe system cooling	Off
Set the parameter to " <b>2-pipe system cooling</b> " with the cooling kit. If the installation consists of 2 heating circuits.				
5731	S	DHW controlling element Q3	No charging request ; Charging pump ; Diverting valve	Diverting valve
5740	S	Output el imm heater K6	0,1... 99 kW	2
5806	I	Type el imm heater flow	1 : 3-stage 2 : 2-stage excluding 3 : 2-stage complementary 4 : Modulating UX	3 : 2-stage complementary
5950	S	Function input H1		---
5953	S	Input value 1 H1		0
5954	S	Function value 1 H1		0
5955	S	Input value 2 H1		10
5956	S	Function value 2 H1		100
5960	S	Function input H3		None
5963	S	Input value 1 H3		0
5964	S	Function value 1 H3		0
5965	S	Input value 2 H3		10
5966	S	Function value 2 H3		100
5980	S	Function input EX1		1
5981	S	Contact type input EX1	NC (Normally-closed contact) NO (Normally-opened contact)	NO
5982	S	Function input EX2		Low-tariff E5
5983	S	Cont type input EX2	NC (Normally-closed contact) NO (Normally-opened contact)	NC
5985	S	Cont type input EX3	NC (Normally-closed contact) NO (Normally-opened contact)	NO
6098	S	Readjustm collector sensor	-20...20°C	0°C
6100	S	Readjustment outside sensor	-3...3°C	0°C
6117	S	Central setp compensation	1...100°C	5°C
6120	S	Frost protection plant	On, Off	On
6201	S	Reset sensors	No, Yes	No
6205	S	Reset to default parameters	No, Yes	No
6220	S	Software version (RVS)	0...99	---
6300	S	Info 1 OEM	0... 65535	---
6301	S	Info 2 OEM	0... 65535	---
<b>LPB system</b>				
6600	S	Device address	0...16	1
<b>Error</b>				
6711	U	Reset HP	No, Yes	No
6800	S	History 1	Time, Date, Error code	
6802	S	History 2	Time, Date, Error code	
6804	S	History 3	Time, Date, Error code	
6806	S	History 4	Time, Date, Error code	
6808	S	History 5	Time, Date, Error code	



LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
6810	S	History 6	Time, Date, Error code	
6812	S	History 7	Time, Date, Error code	
6814	S	History 8	Time, Date, Error code	
6816	S	History 9	Time, Date, Error code	
6818	S	History 10	Time, Date, Error code	
<b>Maintenance / special regime</b>				
7070	S	HP interval	---, 1..240 months	---months
7071	S	HP time since maintenance Reset ? (no, yes)	0...240months	0months
7073	S	Cur starts compressor 1/hrs run Reset ? (no, yes)	0...12	0
7141	U	Emergency operation	Off, On	Off
Off: Heat pump functions normally (with boosters if necessary). On: Heat pump uses the electric boost system or the boiler connection. Use the "On" position only in Assist mode or Test mode: may result in high power bills.				
7142	S	Emergency operating function type	Manual, Automatic	Manual
Manual: Emergency mode is not active when a fault occurs (Emergency mode = OFF). Automatic: Emergency mode is active when a fault occurs (Emergency mode = ON). In "Automatic" position, the energy cost can be onerous if the error is not detected and eliminated.				
7150	I	Simulation outside temp	-50... 50 °C	---
<b>Input / output test</b>				
7700	I	Relay test		No test
7710	I	Output UX1 test	0... 100%	---
7716	I	Output UX2 test	0... 100%	---
7722	I	Digital output DO2	Off, On	Off
7723	I	Heat pump D3	Off, On	Off
7724	I	Outputs test UX3 ("Inverter" command)	0... 100%	---
7725	I	Voltage value (Ux3)	0... 10 v	---
7804	I	Sensor temperature BX1 (HP flow temperature)	-28...350°C	---
7805	I	Sensor temperature BX2 (HP return temperature)	-28...350°C	---
7806	I	Sensor temperature BX3 (DHW temperature)	-28...350°C	---
7807	I	Sensor temperature BX4 (Outside temperature)	-28...350°C	---
7858	I	Input signal H3	None, Closed (ooo) Open (---) Pulse Frequency Hz Voltage V	None
7911	I	Input EX1 (Power shedding, EJP)	0, 230 V	---
7912	I	Input EX2 (Tariffs day/night)	0, 230 V	---
7913	I	Input EX3 (External fault)	0, 230 V	---
<b>State</b>				
8000	I	State heating circuit 1		---
8001	I	State heating circuit 2		---
8003	I	State DHW		---
8004	I	State cooling circuit 1		---
8006	I	State heat pump		---



LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
8007	I	State solar		---
8010	I	State buffer		---
8011	I	State swimming pool		---
8022	I	State supplementary source		---
8025	I	State cooling circuit 2		---
<b>Generator diagnosis</b>				
8400	I	Compressor 1	Off, On	Off
8402	I	Electrical resistance flow 1	Off, On	Off
8403	I	Electrical resistance flow 2	Off, On	Off
8406	I	Condenser pump	Off, On	Off
8407	S	Speed condenser pump	0...100%	---
8410	U	Return temp HP	0... 140 °C	---
		Setpoint (flow) HP	0... 140 °C	---
8412	U	Flow temp HP	0... 140 °C	---
		Setpoint (flow) HP	0... 140 °C	---
8413	U	Compressor modulation	0...100%	---
8414	I	Modulation electric flow	0...100%	---
8425	S	Temp differential condenser	-50...140°C	---
8450	S	Hours run compressor 1	00:00	---
8454	S	Locking time Heat Pump Reset ? (no, yes)	0...2730h	---
8455	S	Counter number of locks HP Reset ? (no, yes)	0...65535	---
8456	S	Hours run electric flow Reset ? (no, yes)	0...2730h	---
8457	S	Start counter electric flow Reset ? (no, yes)	0...65535	---
8458	I	State smart grid	Draw disabled Draw free Draw wish Draw forced	Draw free
8460	I	Heat pump throughput	0... 65535 l/min	---
<b>Diagnostics consumers</b>				
8700	U	Outside temp	-50...50°C	---
8701	U	Outside temp min Reset ? (no, yes)	-50...50°C	50°C
8702	U	Outside temp max Reset ? (no, yes)	-50...50°C	-50°C
8703	I	Outside temp attenuated Reset ? (no, yes)	-50...50°C	---
		This is the average of the outside temperature over a 24-hour period. This value is used for automatic Summer / Winter switchover (line 730).		
8704	I	Outside temp composite	-50...50°C	---
		The mixed outside temperature is a combination of the current outside temperature and the average outside temperature calculated by the regulator. This value is used for calculating the initial temperature.		
8730	I	Heating circuit pump, circuit 1	Off, On	Off
8731	I	Mixer valve HC1 open	Off, On	Off
8732	I	Mixer valve HC1 closed	Off, On	Off
8740	U	Room temp 1	0... 50 °C	---
		Room setting 1		20°C

LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
8743	U	Flow temperature 1	0... 140 °C	---
		Flow temperature setpoint 1		---
8749	I	Room thermostat 1	No demand, Demand	No demand
8756	U	Cooling flow temperature 1	0... 140 °C	---
		Cooling flow temperature setpoint 1		---
8820	I	DHW pump	Off, On	Off
8821	I	Electric immersion heater DHW	Off, On	Off
8830	U	DHW temperature	0... 140 °C	---
		DHW temp setpoint		50°C
8832	I	DHW temp 2	0... 140 °C	---
8840	S	Hours run DHW pump	0...2730h	---
8841	S	Start counter DHW pump	0... 199999	---
8842	S	Hours run electric DHW	0...2730h	---
8843	S	Start counter electric DHW	0...65535	---
8950	I	Common flow temperature	0... 140 °C	---
		Common flow temperature setpoint		---
8957	I	Common flow setpoint refriger	0... 140 °C	---
9005	I	Water pressure 1	-100... 500 bar	---
9006	I	Water pressure 2	-100... 500 bar	---
9009	I	Water pressure 3	-100... 500 bar	---
9010	I	Measurement room temp 1	0...50 °C	---
9011	I	Measurement room temp 2	0...50 °C	---
9031	I	Relay output QX1	Off, On	On
9032	I	Relay output QX2	Off, On	On
9033	I	Relay output QX3	Off, On	On
9034	I	Relay output QX4	Off, On	Off
9035	I	Relay output QX5	Off, On	Off

Description of abbreviations :

HC = Heating circuit

OT = Outside temperature

HP = Heat pump

DHW = Domestic hot water

BXx, EXx, QXx, DOx, UXx, Hx = Terminal number

# ■ ADJUSTMENT FUNCTION DETAILS

## ● Time of day and date functions

The controller has an annual clock which contains the time, the day of the week and the date.

In order for the function to operate, the time and date must be set properly on the clock.

LINE	FUNCTION
1	Hours / minutes
2	Day / month
3	Year
5	Start of summertime
6	End of summertime

**Note:**

Summer time/winter time change  
Dates have been set for changing to summer time or to winter time. The time changes automatically from 2am (winter time) to 3am (summer time) or from 3am (summer time) to 2am (winter time) on the first Sunday following the respective date.

## ● Operator section functions

LINE	FUNCTION
20	Language
22	Info
26	Operation lock
27	Programming lock
28	Direct adjustment
29	Temperature unit Pressure unit

### Info

#### • Temporary

After pressing the Info key, the information display returns "predefined" basic display after 8 minutes or when pressing the operating mode key.

#### • Permanently

After pressing the Info key, the information display returns to "new" basic display after a maximum of 8 minutes. The last selected information value is shown in the new basic display.

### Operation lock

If the operating lock is activated, the following control elements can no longer be adjusted: Heating circuit mode, DHW mode, room temp comfort setpoint (knob), occupancy key.

### Programming lock

If the programming lock is activated, the setting values are displayed but may no longer be changed.

#### **Temporary suspension of programming:**

The programming lock can be temporarily deactivated at programming level. To do this, simultaneously press OK and ESC keys for at least 3 seconds. The temporary suspension of the programming lock remains in effect until you exit the programming.

#### **Permanent suspension of programming:**

First perform a temporary suspension, then cancel "Programming lock" on line 27.

### Direct adjustment

#### • Storage with confirmation

Correction of the setpoint with the knob will be adopted only after pressing OK key.

#### • Automatic storage

Correction of the setpoint with the knob is adopted without a particular confirmation (timeout) or by pressing OK key.

## *Heating Circuit Assignment*

LINE	FUNCTION
70	Software version (user interface)

\* applies only to Remote controller C75

### Software version (user interface)

The display shows the current version of the user interface.

## ● Time program functions (Heating circuit 1 & 2, DHW, Cooling)

Several control programs are available for the heating circuits and the production of DHW. They are initiated in "Automatic" mode and control the change in temperature levels (and therefore the associated setpoints, reduced and comfort) via the adjusted changeover times.

### Enter changeover times:

Changeover times can be adjusted in a combined way, i.e., identical times for several days or distinct times for certain days. Preselecting groups of days (e.g., Mon...Fri and Sat...Sun) having the same changeover times make adjustment of the changeover program considerably shorter.

### Changeover Points

LINE				FUNCTION
HC1	HC2	4/DHW	5	
500	520	560	600	Preselection (Mo-Su / Mo-Fr / Sa - Su / Mo...Su)
501	521	561	601	1 <sup>st</sup> phase on
502	522	562	602	1 <sup>st</sup> phase off
503	523	563	603	2 <sup>nd</sup> phase on
504	524	564	604	2 <sup>nd</sup> phase off
505	525	565	605	3 <sup>rd</sup> phase on
506	526	566	606	3 <sup>rd</sup> phase off

### Standard Program

LINE	FUNCTION
516, 536, 576, 616	Default values (No / Yes)

All time programs can be reset to factory settings. Each time program has its own programming line for this reset action.

In this case, individual settings will be lost!

### Holidays

LINE		FUNCTION
HC1	HC2	
641	651	Preselection
642	652	Period start (Day / Month)
643	653	Period end (Day / Month)
648	658	Operation level

The holiday program enables changing the heating circuits over to a selected operating level according to the date (calendar).

### Important:

The holiday program can be used only in the automatic mode.

## ● Heating circuit 1 & 2 functions

### Operating Mode

For heating circuits there are several functions available which can be individually adjusted for each heating circuit.

The programming lines for the 2nd heating circuit are displayed only if the extension module has been connected to the controller.

Operation of heating circuits 1 and 2 is directly controlled via the operating mode key.

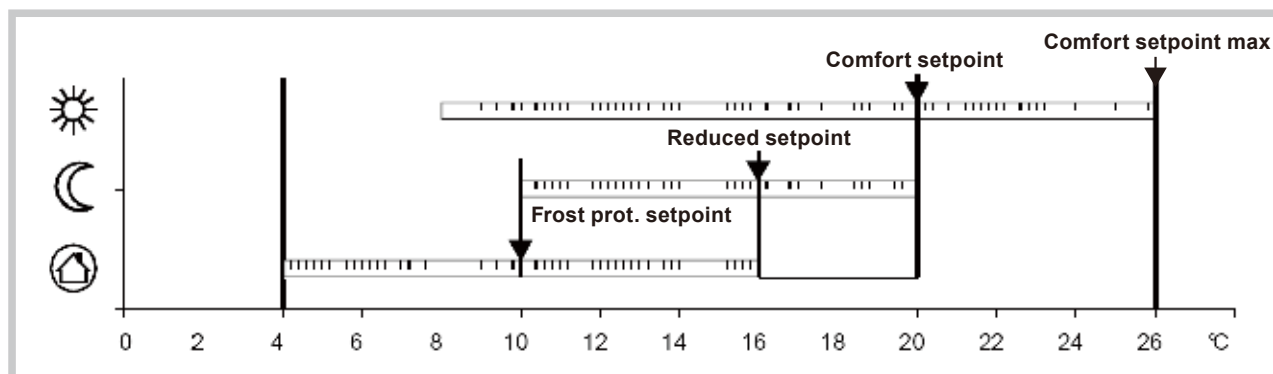
### Setpoint Values

LINE		FUNCTION
HC1	HC2	
710	1010	Comfort setpoint
712	1012	Reduced setpoint
714	1014	Frost protection setpoint
716	1016	Maximum comfort setpoint

#### Room temperature:

Room temperature can be set according to different setpoint values. Depending on the selected mode, these setpoints are activated and provide different temperature levels in the rooms.

The ranges of configurable setpoints are defined by their interdependencies, as shown in the graph below.



#### Frost protection:

The protection mode automatically prevents an excessively sharp drop in room temperature.

In this case the control adopts the frost protection room setpoint.

### Heating Curve

LINE		FUNCTION
HC1	HC2	
720	1020	Heating curve slope
721	1021	Heating curve displacement

## Heating curve slope

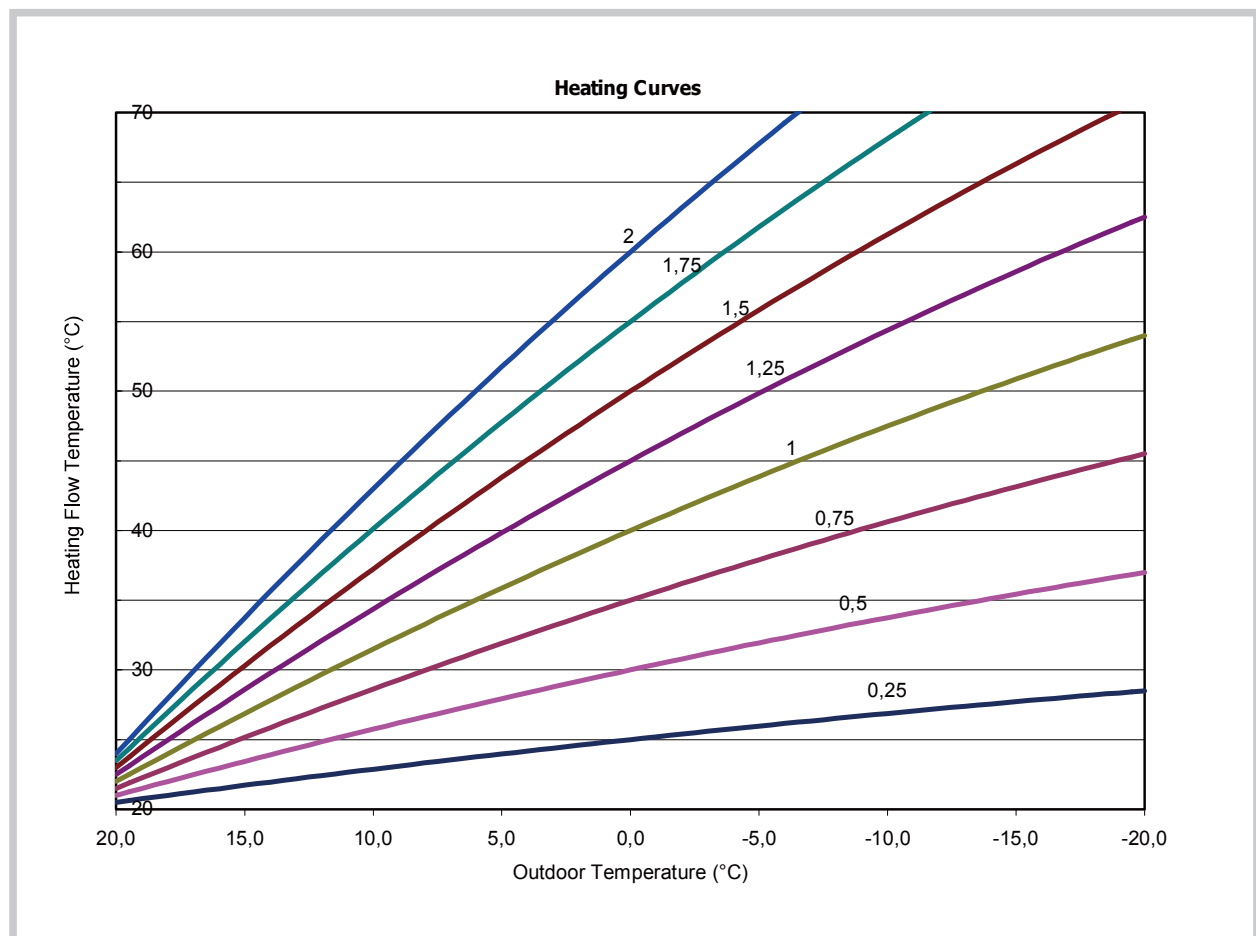
Based on the heating characteristic, the controller computes the flow temperature setpoint which will be used for controlling the flow temperature in consideration of atmospheric conditions. Different settings can be used to adapt the heating characteristic so that the heating capacity, and therefore the room temperature, will match the individual needs.

The colder the outdoor temperature, the greater the extent to which the slope will modify the flow temperature. In other words, the slope should be corrected if the room temperature shows a difference when the outdoor temperature is low, but not when it is high.

- Increase the setting:  
The flow temperature is increased mainly when the outdoor temperatures are low.
- Decrease the setting:  
The flow temperature is lowered mainly when the outdoor temperatures are low.

### Warning:

The heating curve is adjusted in relation to a room temperature setpoint of 20°C. If the room temperature setpoint is modified, the flow temperature setpoint is automatically recomputed. This will not modify the setting and amounts to automatically adapting the curve.



## Heating curve displacement

The curve displacement (offset) modifies the flow temperature in a general and even manner over the full range of outdoor temperature. In other words, the displacement should be corrected when the room temperature is generally too high or too low.

## Eco Functions

LINE		FUNCTION
HC1	HC2	
730	1030	Summer/winter heating limit

### Summer/winter heating limit

The summer/winter heating limit switches the heating on or off through the year according to the temperature ratio. Changeover is performed automatically when in automatic mode and thus avoids the user having to turn the heating on or off. Changing the input value makes the respective annual periods (summer/winter) shorter or longer.

- If the value is increased:

Changing to winter operating mode is advanced, changing to summer mode is delayed.

- If the value is decreased:

Changing to winter mode is delayed; changing to summer mode is advanced.

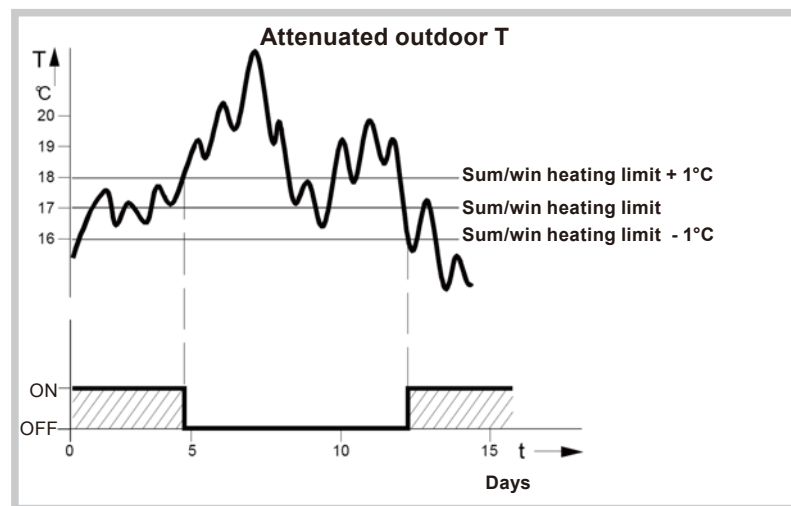
#### Information:

This function does not work in "Continuous comfort temperature" mode. (Sunlight)

The controller displays "ECO".

The outdoor temperature is attenuated to take the building's dynamics into account.

Example:



### Flow temperature setpoint

LINE		FUNCTION
HC1	HC2	
740	1040	Flow temp setpoint min (for fan convectors)
741	1041	Flow temp setpoint max

This limitation allows to define a range for the flow temperature setpoint. When flow temperature setpoint demanded by the heating circuit reaches the threshold, the setpoint remains permanently at the maximum or minimum, even if the heat demand continues to increase or decrease.

#### Example (line 741 and 1041):

Floor heating system = 50 °C

Higher temperature radiator = 65 °C



## Room Influence

LINE		FUNCTION
HC1	HC2	
750	1050	Room influence

### Control types:

When using a room temperature sensor there are 3 different types of control to choose from.

SETTING	CONTROL TYPE
- - - %	Simple control according to outdoor conditions *
1...99 %	Control according to outdoor conditions with room influence *
100 %	Control according to room temperature only

\* Requires the connection of an outdoor sensor

### Simple control according to outdoor conditions

The flow temperature is computed via the heating curve according to the composite outdoor temperature. This type of control requires proper adjustment of the heating curve, as the control does not take the room temperature into account for this adjustment.

### Control according to outdoor conditions with room influence

The difference between the room temperature and the setpoint value is measured and taken into account for temperature control. This enables taking into account possible heat inputs and ensures a more accurate room temperature control. The influence of the difference is defined as a percentage. The better the installation in the reference room (accurate room temperature, correct installation location, etc.) the higher will be the value that can be set.

#### Example:

Approx 60%: the reference room is appropriate

Approx 20%: the reference room is inappropriate

### Information:

Activation of the function requires taking into account the following requirements:

- A room sensor must be connected.
- The "room influence" parameter must be set between 1 and 99.
- The reference room (where the room sensor is installed) must not contain adjusted thermostatic valves. If present in the room, these valves must be fully open.

### Control according to room temperature only

The flow temperature is adjusted according to the room temperature setpoint, the current room temperature and its evolution. A slight increase in room temperature, for example, causes an immediate drop in the flow temperature.

#### Information:

Activation of the function requires taking into account the following requirements:

- A room sensor must be connected.
- The "room influence" parameter must be set to 100%.

The reference room (where the room sensor is installed) must not contain adjusted thermostatic valves. If present in the room, these valves must be fully open.

## Quick setback

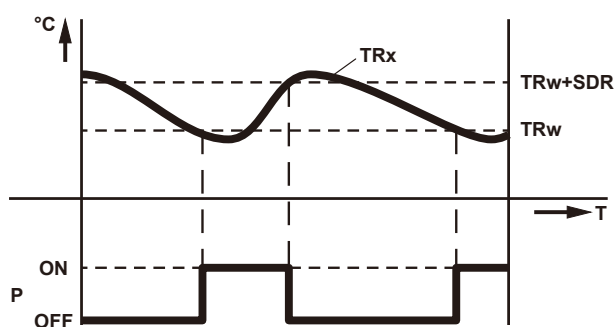
LINE		FUNCTION
760	1060	Room temp limitation
780	1080	Quick setback

### Room temp limitaion

The "Room temperature limitation" function enables the heating circuit pump to be deactivated should the room temperature exceed the current room temperature setpoint by more than the adjusted differential.

The heating circuit pump is activated again as soon as the room temperature falls to a level below the current room temperature setpoint.

During the time the "Room temperature limitation" function is active, no heat request is sent to the producer.



TRx : Actual value of room temperature  
 TRw : Room temperature setpoint  
 SDR : Room switching differential  
 P : Pump  
 T : Time

### Quick setback

During quick setback, the heating circuit pump is deactivated and, in the case of mixing circuits, the mixing valve is fully closed.

When using a room sensor, the function keeps the heating off until the room temperature drops to the level of the "Reduced" or "Frost protection" setpoint. If the room temperature falls to the reduced or frost level, the heating circuit pump is activated and the mixing valve released.

Quick setback switches the heating off for a certain period of time, depending on the outside temperature and the building time constant.

Duration of quick setback when "Comfort" setpoint minus "Reduced" setpoint = 2 K (e.g. "Comfort" setpoint = 20 °C and "Reduced" setpoint = 18 °C)

	Building time constant [h]
Composite outside temperature	5
	Duration of quick setback [h]
15°C	7.7
10°C	3.3
5°C	2.1
0°C	1.6
-5°C	1.3
-10°C	1.0
-15°C	0.9
-20°C	0.8

## Optimisation at switch-on and switch-off

LINE		FUNCTION
HC1	HC2	
790	1090	Optimum start control max
791	1091	Optimum stop control max

### Optimum start control max

The change in temperature levels is optimised in such a way as to reach the comfort setpoint during changeover times.

### Optimum stop control max

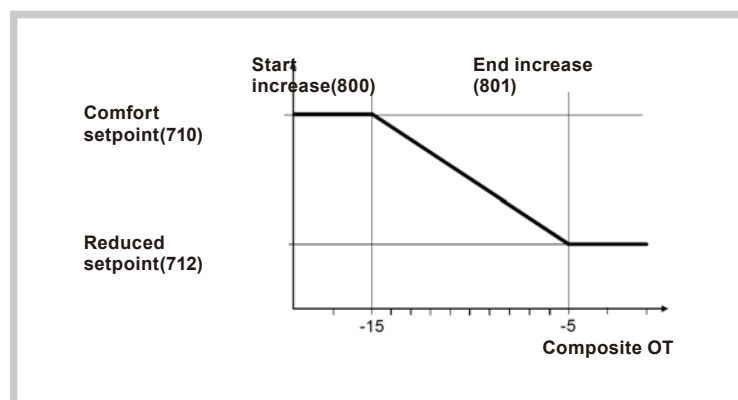
The change in temperature levels is optimised in such a way as to reach the comfort setpoint -1/4 °C during changeover times.

## Reduced Setpoint Increase

LINE		FUNCTION
HC1	HC2	
800	1100	Reduced setpoint increase start
801	1101	Reduced setpoint increase end

This function is used mainly in heating installations that do not have high supplies of power (e.g. low power use homes). When outdoor temperatures are low, adjusting the temperature would take too long. Increasing the reduced setpoint prevents excessive

cooling of the rooms in order to shorten the temperature adjustment period when changing over to the comfort setpoint.



## Mixing Valve Control

LINE		FUNCTION
HC1	HC2	
830	1130	Mixer valve boost
834	1134	Actuator running time

### Mixer valve boost

The controller adds the increase set here to the current flow setpoint and uses the result as the temperature setpoint for the heat generator.

### Actuator running time

For the 3-position servomotor, the travel time can be adjusted. With a 2-position servomotor, the adjusted travel time is inoperative.

## Controlled floor drying function

LINE		FUNCTION
HC1	HC2	
850	1150	Floor curing function
851	1151	Floor curing setpoint manually
856	1156	Floor curing day current
857	1157	Floor curing day completed

This function is used in the controlled drying of floors. It adjusts the flow temperature to a temperature profile. Drying is performed by floor heating via the heating circuit with a mixing valve or with a pump.

## Floor curing function

### • Off

The function is deactivated.

### • Heating operational (Fh)

The first part of the temperature profile is automatically completed.

### • Heating "ready for occupancy" (Bh)

The second part of the temperature profile is handled automatically.

### • Heating "ready for occupancy" / Heating operational

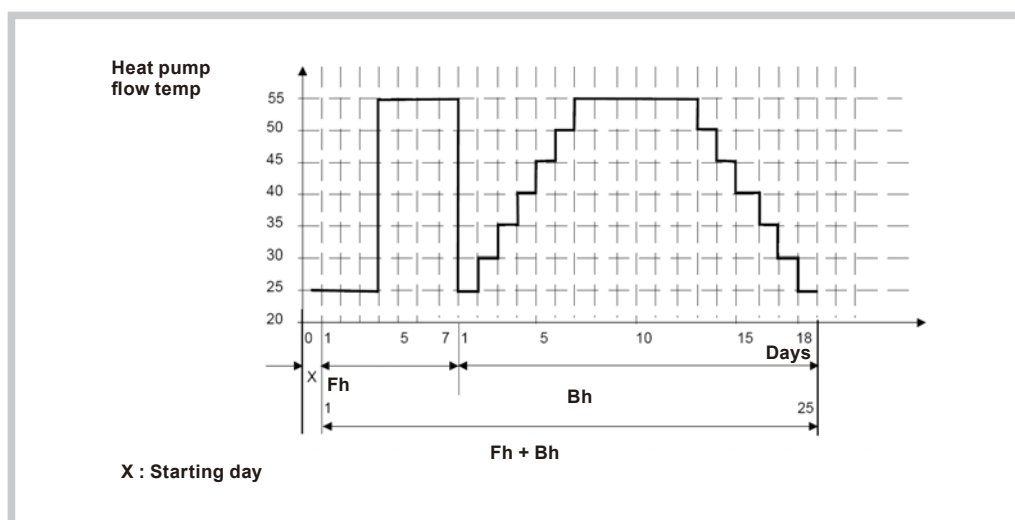
The full temperature profile (1st and 2nd part) is performed automatically.

### • Manual

No temperature profile is performed, but the control is performed according to the "manual controlled drying setpoint". The function is automatically terminated after 25 days

#### Important:

- The standards and directions of the building contractor must be followed!
- This function will not work properly unless the installation has been adequately made (hydraulics, electricity, settings). Otherwise, the floors to be dried may be damaged!
- The function may be prematurely interrupted by setting it to Off.
- The maximum flow temperature limitation remains active.



## Floor curing setpoint manually

The flow temperature setpoint for the "Manually" controlled floor drying function can be adjusted respectively for each heating circuit.

## Floor curing day current

Displays the current flow temperature setpoint for the controlled floor drying function.

## Floor curing day completed

Displays the current day of the controlled floor drying function.

#### Important:

After a power outage, the installation resumes the controlled drying function as it was when the outage occurred.


## Operating Mode Changeover

LINE		FUNCTION
HC1	HC2	
900	1200	Operating mode changeover (None / Frost protection mode / Reduced / Comfort / Automatic)

In case of an external changeover via input H2 (on the extension module only) the operating mode to which the changeover will be performed must be previously defined.

## Heating Circuit Frost Protection

### Informations:

The heating circuit frost protection is continuously activated (protection mode  ) and is not adjustable.

- Heating circuit frost protection in heating mode:  
If the flow temperature is below 5°C, the controller initiates the production of heat and starts the heating pumps, regardless of the current heating mode.  
If the flow temperature rises again above 7°C, the controller waits another 5 minutes, and then

stops the production of heat and the heating pumps.

- Heating circuit frost protection in cooling mode:  
See Cooling mode.

## ● Cooling circuit 1 functions

The cooling sequence is automatically started when the room temperature is higher than the comfort setpoint in cooling mode (line 902). The cooling function must be activated (line 901 = Auto) and is triggered by the programming clock (line 907). The cooling sequence is interrupted as soon as heating circuit 1 indicates a need for heat or in the presence of a heat demand signal from a DHW circuit or other heating circuit (only if cooling is active).

The controller measures the current room temperature and compares it with the room temperature setpoint to compute the flow temperature setpoint. If the temperature is not low enough the heat pump is started to provide cooling (reversed control of the mixing valve).

The following settings apply to the hydraulic circuit in zone 1 (HC1). If there is a second zone, this zone can be cooled with the setting (line 963) which will connect the pump directly to zone 2. This will require setting the "Mixing valve sub-cooling" parameter (line 938) to a suitable value in order for both zones to be adequately cooled according to the available emitters.

### **Warning:**

Cooling mode is prohibited on all radiators, heating only floors, or any emitters not intended for this purpose.

## Operating Mode

LINE	FUNCTION
901	Operating mode (Off / Automatic)

The cooling key on the user interface enables switching between operating modes.

### • Off

The cooling function is deactivated.

### • Automatic

The cooling function is automatically activated by the time program (line 907), the holiday program, the occupancy key, or according to the need.

## Comfort cooling setpoint

LINE	FUNCTION
902	Comfort cooling setpoint

In cooling mode the room temperature control follows the comfort setpoint adjusted under this setting. The cooling comfort setpoint can be displayed with a knob on the room unit.

In summer the comfort setpoint is gradually increased in relation to the outdoor temperature (see lines 918-920).

## Release

LINE	FUNCTION
907	Release (24h/day / Heating circuit time pgm / Time program 5)

The "Release" setting determines the time program according to which cooling is released.

### • 24h/day

Cooling is continuously activated (24h/Day).

### • Time program HC

Cooling is activated according to the heating circuit time program.

### • Time program 5

Cooling is released according to time program 5.

## Cooling Characteristic

LINE	FUNCTION
908	Flow temp setpoint at OT 25°C
909	Flow temp setpoint at OT 35°C

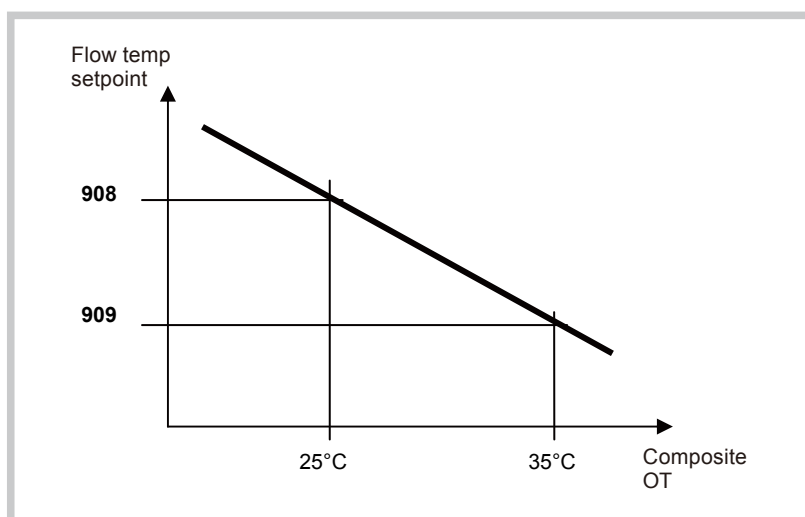
The controller computes the flow temperature required for a given composite outdoor temperature based on the cooling characteristic. This is defined by two reference points (flow setpoint at 25°C and at 35°C).

### Flow temp setpoint at OT 35°C

This is the cooling flow temperature required when the composite outdoor temperature is 35°C, without summer compensation.

### Flow temp setpoint at OT 25°C

This is the cooling flow temperature required when the composite outdoor temperature is 25°C, without summer compensation.



The cooling characteristic is adjusted for a 25°C room temperature setpoint. If the room temperature setpoint is changed the curve will automatically adapt.

## Eco

LINE	FUNCTION
912	Cooling limit at OT
913	Lock time at end of heating

### Cooling limit at OT

If the composite outdoor temperature is higher than the cooling limit, cooling is released. If the composite outdoor temperature falls at least 0.5°C below the cooling limit, cooling is locked.

### Lock time at end of heating

To avoid a quick start of cooling after termination of heating, the cooling function is locked for a time period which can be adjusted with this setting.

The lock time starts when there is no valid heating demand from heating circuit 1. Heating demands from heating circuits 2 or P are ignored.

#### **Information:**

Switching off and switching on again the mode selection key causes the lock time to be interrupted.

## **Summer Compensation**

LINE	FUNCTION
918	Summer compensation start at OT
919	Summer compensation end at OT
920	Summer compensation setpoint increase

In summer the "cooling comfort setpoint" (line 902) is gradually increased according to the outdoor temperature. This saves on cooling power and prevents the differences between the ambient temperature of the room and the outdoor temperature being too high.

The resulting "room temperature setpoint" can be viewed in the Info section.

### Summer compensation start at OT

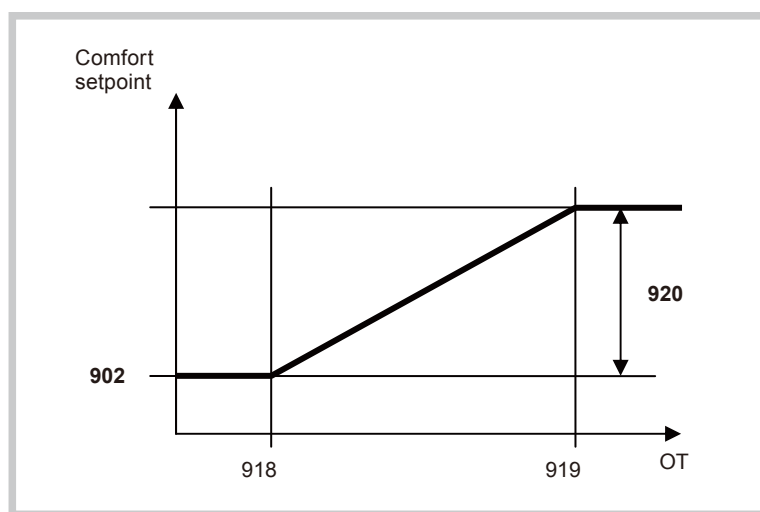
Summer compensation starts to be active from the outdoor temperature defined here. If the outdoor temperature continues to rise, the comfort setpoint will be gradually increased.

### Summer compensation end at OT

At this outdoor temperature the summer compensation reaches its peak efficiency (line 920). If the outdoor temperature continues to rise, it will no longer influence the comfort setpoint.

### Summer compensation setpoint increase

This setting defines the highest value to which the comfort setpoint can be increased.





## Flow Setpoint Limitation

LINE	FUNCTION
923	Flow temp setpoint min at OT 25°C
924	Flow temp setpoint min at OT 35°C

It is possible to assign a lower limit to the cooling flow temperature.

The limitation line will be defined by two reference points. In addition the resulting flow setpoint will have a lowerlimit and may not be less than 5 °C.

### Flow temp setpoint min at OT 25°C

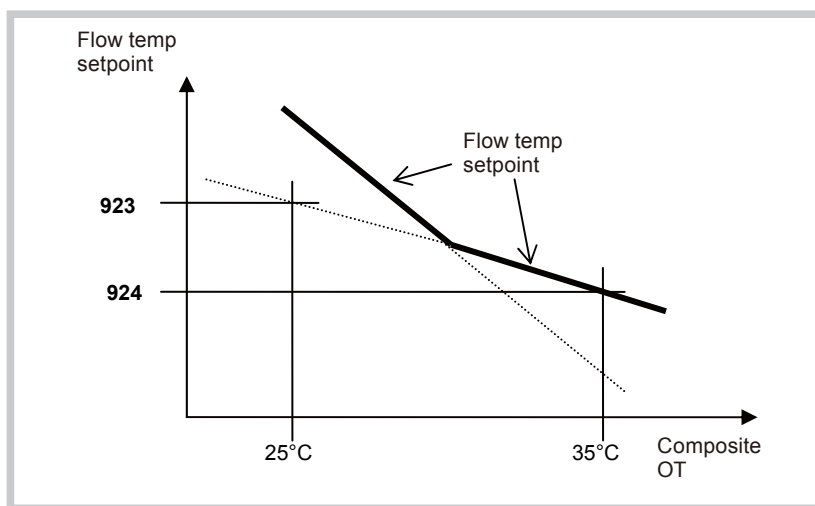
Determines the lowest flow temperature for a composite outdoor temperature of 25°C.

### Flow temp setpoint min at OT 35°C

Determines the lowest flow temperature for a composite outdoor temperature of 35°C.

#### Warning:

If no outdoor temperature is available, the controller will use the "Min. flow setpoint at OT= 35°C" parameter.



## Room Influence

LINE	FUNCTION
928	Room influence

When using a room temperature sensor there are 3 different types of control to choose from.

SETTING	CONTROL TYPE
- - - %	Simple control according to outdoor conditions *
1...99 %	Control according to outdoor conditions with room influence *
100 %	Control according to room temperature only

\* Requires the connection of an outdoor sensor

### Simple control according to outdoor conditions

The flow temperature is obtained from the composite outdoor temperature on the basis of the cooling characteristic.

This type of control requires the cooling curve to be properly adjusted, as the control does not take the room temperature into account for this adjustment.

## Control according to outdoor conditions with room influence

The difference between the room temperature and the setpoint value is measured and taken into account for temperature control. This enables taking into account possible heat inputs and ensures a more accurate room temperature control. Thus the differences with the room temperature are taken into account and the room temperature becomes more stable. The influence of the difference is defined as a percentage. The better the installation in the reference room (accurate room temperature, correct installation location, etc.) the higher will be the value that can be set.

### **Example:**

- Approx 60%: the reference room is appropriate
- Approx 20%: the reference room is inappropriate

Activation of the function requires taking into account the following requirements:

- A room sensor must imperatively be connected.
- The "room influence" parameter must be set between 1 and 99.
- The reference room (where the room sensor is installed) must not contain adjusted thermostatic valves. Any thermostatic valves present in the rooms must be fully open.

## Control according to room temperature only

The flow temperature is adjusted according to the room temperature setpoint, the current room temperature and its evolution. A slight increase in room temperature, for example, causes an immediate drop in the flow temperature.

Activation of the function requires taking into account the following requirements:

- A room sensor must imperatively be connected.
- The "room influence" parameter must be set to 100%.
- The reference room (where the room sensor is installed) must not contain adjusted thermostatic valves. Any thermostatic valves present in the rooms must be fully open.

## **Room Temperature Limitation**

LINE	FUNCTION
932	Room temperature limitation

The "room temperature limitation" function enables shutting off the cooling circuit pump if the room temperature falls below the adjusted room temperature setpoint (with summer compensation line 920) by more than the adjusted differential.

The cooling circuit pump is reinitiated as soon as the room temperature rises again above the current room temperature setpoint.

If the room temperature limitation function is active, no cooling demand will be transmitted to production.

The function is deactivated if:

- no room temperature sensor is available
- "Room influence limit." = ---
- "Room influence" (line 928) = --- (simple control according to outdoor conditions)

## Mixing Valve Control

LINE	FUNCTION
938	Mixing valve decrease
941	Actuator running time
945	Mixing valve in heating mode

### Mixing valve decrease

The cooling demand issued by cooling circuit 1 to production is reduced by the adjusted value.

If there is a second zone, this reduction should enable the second zone to be cooled. To achieve

this result, the sub-cooling must be determined in accordance with the type of emitter and "With primary controller/system pump" (line 963) must be set to "yes" to switch on the pump for the second zone.

#### Example:

	Configuration	How the configuration affects control
<b>Zone 1:</b> Heating/ cooling floor <b>Zone 2:</b> Fan coils	938 = 10°C, with 924 = 18°C 963 = yes	with a 35°C outdoor temperature the flow setpoint will be 18°C – 10°C i.e. 8°C while in the first zone (HCF) it will be 18°C through action of the mixing valve
<b>Zone 1:</b> Heating/ cooling floor <b>Zone 2:</b> HCF	938 = 0°C, with 924 = 18°C 963 = yes	with a 35°C outdoor temperature the flow setpoint will be 18°C in both zones

#### Warning:

If these settings are not chosen properly the heat pump may stop automatically due to the flow temperature being too low. A safety mechanism is triggered at 6°C to protect the exchanger from freezing.

#### • Control

The valve controls in heating and cooling mode.

#### • Open

The valve controls in cooling mode, and is open in heating mode.

### Actuator running time

For the 3-position servomotor used, it is possible to adjust the travel time. With a 2-position servomotor, the adjusted travel time is inoperative.

### Mixing valve heating mode

Determines the position of mixing valve 1 during heating operation is activated.

This parameter is inoperative in installations where heating and cooling circuits are hydraulically separate.

## With primary controller/system pump

LINE	FUNCTION
963	With primary controller/system pump (No / Yes)

This setting specifies whether the cooling circuit is supplied from the primary controller or from the primary pump (depending on the installation). It can also be used to provide cooling to the second zone.

#### Warning:

In the case of a radiator or any other emitter which does not support the cooling mode in zone 2, this setting must remain on "No".

## ● Domestic hot water functions (with DHW kit or with integrated DHW models)

The control sets the DHW temperature, according to the time program or continuously, to the desired setpoint. The priority of DHW charging over room heating is adjustable in this case

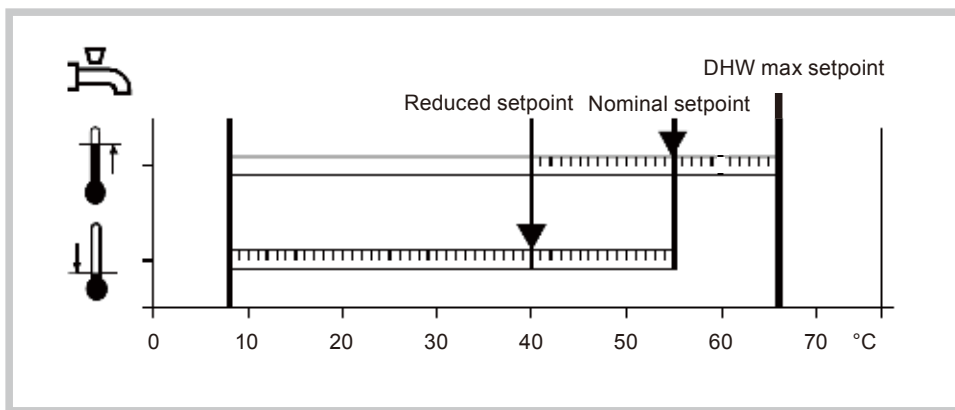
The controller has a configurable legionella function designed for protection against legionella in the storage tank and the pipes. The circulation pump is controlled according to the current time program and operating mode.

### Setpoint value

LINE	FUNCTION
1610	Nominal setpoint
1612	Reduced setpoint

The DHW is heated to various setpoint values. These setpoints are active according to the selected

operating mode and allow the desired temperatures to be reached in the DHW storage tank.



#### Important:

For optimal operation we recommend reducing the setpoints to the lowest value. Setpoints which are too high may interfere with heating and cause some discomfort. In this case DHW/Heating changeover cycles may successively occur

If DHW charge boosting is not desired during the day, we recommend adjusting the reduced temperature setpoint to 15°C. Full charging will occur during the night at the nominal temperature..

Release

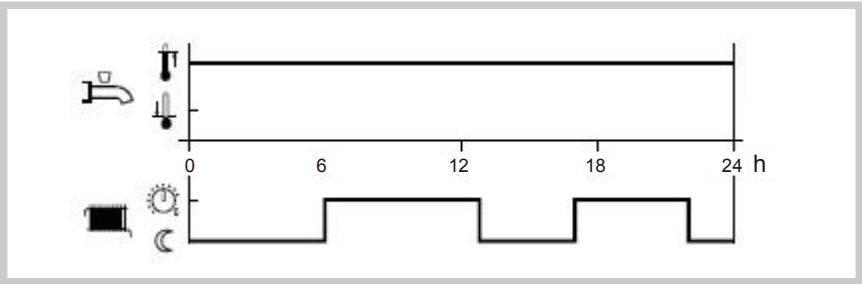
LINE	FUNCTION
1620	Release of DHW load (24h/day / Heating circ time pgm / Time program 4/DHW / Low-tariff/ Time pgm 4/DHW or Low-tariff)

24h/day

(Not recommended)

Regardless of the time programs, the temperature of the domestic hot water is continuously maintained at the DHW nominal setpoint temperature.

Example:



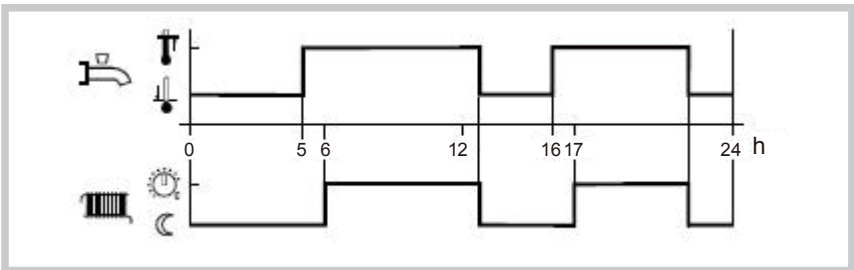
Heating circuit time programs

(Not recommended)

Depending on the heating circuit time programs, the DHW setpoint is changed between the DHW temperature nominal setpoint and the DHW

temperature reduced setpoint. The first switch-on point of each phase is advanced by one hour each time.

Example:

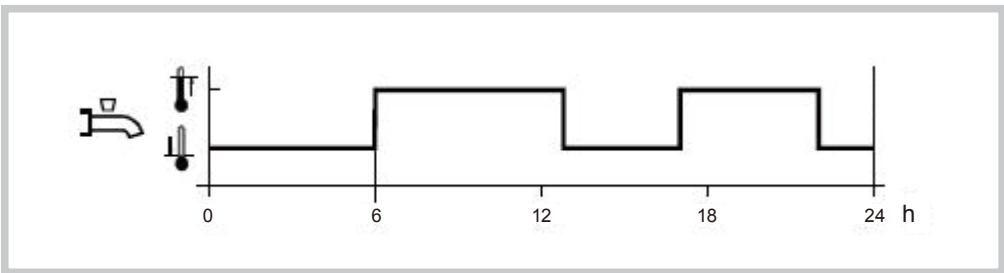


Time program 4 / DHW

(Recommended)

Time program 4 of the local controller is taken into account for the DHW mode. The changeover between DHW nominal setpoint and DHW reduced

setpoint occurs on the changeover times of this program. Thus, domestic hot water charging takes place independently from the heating circuits.



Low-tariff

Released when the low tariff input is active (Input EX2)

Time program 4/DHW or low-tariff

Released when DHW program is set to "Nominal" or if the low tariff input is active.

DHW mode	Holiday status	Release (line 1620)	Time program status (Program 4)	Low-tariff status (EX2)	DHW mode level
Off	x	x	x	x	Frost protection
On	Yes	x	x	x	Frost protection
On	No	...	...	x	...
On	No	Low-tariff (OPK)	x	Inactive	Reduced
On	No	Low-tariff (OPK)	x	Active	Nominal
On	No	Time program 4 or OPK	Nominal	Inactive	Nominal
On	No	Time program 4 or OPK	Reduced	Inactive	Reduced
On	No	Time program 4 or OPK	Nominal	Active	Nominal
On	No	Time program 4 or OPK	Reduced	Active	Nominal

x = N/A

#### Information:

Release by low tariff input always triggers forced DHW charging.

If the low tariff input EX2 has not been configured and release via OPK has nevertheless been set, the DHW level will either continuously remain on reduced or will follow time program 4.

## Legionella Function

LINE	FUNCTION
1640	Legionella function
1641	Legionella function periodically
1642	Legionella function weekday

### Legionella function

#### • periodically

The legionella function occurs repeatedly according to the adjusted periodicity (line 1641).

#### • Fixed weekday

The legionella function can be activated on a fixed day of the week (line 1642). With this setting, heating up to the legionella setpoint occurs on the scheduled day of the week, regardless of the storage tank temperatures during the previous period.

## ● Swimming pool functions

LINE	FUNCTION
2056	Setpoint source heating

The controller enables a swimming pool to be heated by the heat pump. An individual setpoint can be set by means of line 2056, which appears when the swimming pool function is activated by parameter 6046 being set to "Release swimming pool".

Use of input H33 (X152) requires an extension module to be connected to the control.

## ● Heat pump functions

LINE	FUNCTION
2803	Overrun time cond pump
2843	Compressor off time min
2844	Switch-off temp max
2862	Locking time stage 2
2873	Compressor mod run time
2882	Release integral electric flow
2884	Release electric flow below OT
2886	Compensation heat deficit
2916	Max setpoint HP DHW charg
2920	With electrical utility lock

### Overrun time cond pump

When the compressor is switched off, the condenser pump continues to run for the set overrun time.

### Compressor off time min

For the same reason, the compressor remains switched off for the minimum period of time set here. Switch-off temperature maximum if the flow or the return temperature exceeds the maximum switch-off temperature, the compressor will be switched off. The heat pump is switched on again when the temperature at both sensors has dropped by the "Switching diff return temp" below the maximum switch-off temperature and the minimum off time has elapsed.

### Switch-off temp max

If the flow or the return temperature exceeds the maximum switch off temperature, the compressor will be switched off.

#### **Example (line 2844):**

Floor heating system = 55 °C  
(Higher temperature radiator = 65 °C)

### Locking time stage 2

When compressor is restarted, the time which keeps minimum capacity can be adjusted. Efficiency becomes better; however, the time of rising capacity becomes long.

### Compressor mod run time

Compressor mod run time means the time of compressor frequency indication changed from minimum to maximum.

If this setting value changes to small, compressor frequency changes more quickly.

#### **Warning:**

This setting value is too small, the efficiency is decreased due to the compressor frequency changes frequently.

### Release integral electric flow

After the release of the 1st stage (heater 1: on, heater 2: off), the controller compares the temperature measured with the point of engagement and forms an integral and includes a possible deficit of heat. Once the value of the integral reaches the maximum value (line 2882), the 2nd stage is engaged (heater 1: off, heater 2: control). The controller continuously compares the temperature measured at the point of engagement and new features to the deficit of heat in the full release. When the full release reaches the value set (line 2882), the 3rd stage of the heater is triggered (heater 1: on, heater 2: Control).

### Release electric flow below OT

The heater will be activated only if the attenuated outdoor temperature is below the temperature set here.

#### **Warning:**

This setting is too low, there may be a feeling of discomfort due to the fact that the heat pump is unable to meet the heating requirements alone at low outdoor temperatures, and heaters are not switched on.



## Compensation heat deficit

This function compensates for excess heat and heat deficits. These can occur in the following situations:

- Minimum compressor on and off times
- In the case of low temperature requests, the flow temperature can lie below the required setpoint, but the return temperature may not drop below the switch-on point for a longer period of time. In this situation, the heat pump must be switched on to prevent heat deficits

The controller compares continuously the flow temperature setpoint with the actual value and integrates the surplus heat and heat deficits. Differences are compensated for by extending the compressor on and off times.

If the compressor is not switched on or off due to surplus heat/heat deficits, the controller displays an appropriate status message.

This function is not active during the time the DHW storage tank is charged.

The function is not active either in the case of plants with buffer/(combi) storage tanks.

"Compensation heat deficit" only acts in heating mode. The parameter is inactive in cooling mode.

The maximum switch-off temperature is given priority over the "Compensation" function.

In the case of sudden setpoint changes, both integrals are cleared.

### • **Behavior in connection with the "Floor curing" function**

When activating the "Floor curing" function, the integral is set to a level representing 1.5 times the predefined value (factory setting). If the current temperature lies at least 2 K below the required setpoint, the heat pump is immediately switched on. If compensation of surplus heat/heat deficits shall act "Only with floor curing fct", the respective setting must be selected. This means that the parameter is deactivated in normal heating mode.

## • **Calculation of integral**

- If a flow temperature sensor (Bx1) is connected and the heating curve is set to the flow temperature setpoint, the controller uses the flow temperature and the flow temperature setpoint for computing the integrals.

In the following situations, the integral is set to "0":

- No valid temperature request delivered
- Setpoint change >2 K
- Frost protection for the heat pump is active
- The heat pump has gone to lockout or cannot deliver any heat for a longer period of time
- The heat pump is in active cooling mode
- A buffer storage tank is being charged
- The function is deactivated

With active DHW charging, the integral value is frozen.

## With electrical utility lock

This setting relates to input EX1 (load-shedding or peak day clearing) and allows the electric heaters to be locked as follows:

### • **Locked**

The heat pump and all electric heaters are locked, both heat pump stages and the DHW tank electric heater.

Only the boiler backup, if installed, continues to operate.

### • **Released**

The heat pump operates and all electric heaters are locked, both heat pump stages and the DHW tank electric heater.

The boiler backup, if installed, continues to operate.

## ● Supplementary source

A supplementary producer can be operated in addition to the main producer (heat pump). Release of the supplementary producer depends on a number of parameters a detailed description of which is given on the following pages.

- Release is effected via release relay Qx2
- 2-position control is effected via control relay QX3
- Ux can be used to transmit the supplementary source a DC 0...10 V signal for the required temperature/output setpoint.

LINE	FUNCTION
3692	With DHW charging

Defines the release of the supplementary source for DHW charging:

- **Locked**

The supplementary source will not be released.

- **Substitute**

The supplementary source is released only if the main source cannot be put into operation (e.g. in the event of fault).

- **Complement**

The supplementary producer is released if the output of the main producer is not sufficient.

- **Instantly**

The supplementary source will always be released.

LINE	FUNCTION
3700	Release below outside temp
3701	Release above outside temp

Operation of the supplementary source is released only when the composite outside temperature lies above or below the set temperature limit.

This enables the supplementary source to lock in a selected outside temperature range to ensure bivalent operation of supplementary source and heat pump.

To ensure continuous release of the supplementary source, setting "---" must be selected on the respective operating lines.

If both release values are enabled, the outside temperature must satisfy both criteria, thus ensuring release of the supplementary source.

## Overtemperature protection

LINE	FUNCTION
3705	Overrun time

Overrun time of release for the external source: If the integral indicates another heat deficit before the overrun time has elapsed, the release remains activated.

If the set overrun time elapses before the common flow temperature drops below the common flow temperature setpoint, the release is deactivated also.

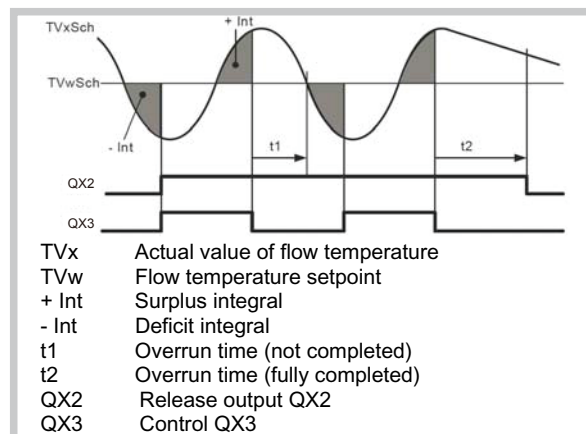
## Flow control

LINE	FUNCTION
3720	Switching integral
3723	Locking time

### Switching integral

The temperature-time integral is a continuous summation of the temperature differential over time. In this case, the decisive criterion is the difference by which the temperature lies above or below the common flow temperature setpoint.

The temperature-time integral gives consideration not only to the period of time, but also to the extent of over-/undershoot. This means that when the crossing is significant, the supplementary source is released earlier, or locked earlier, than with minor crossings.



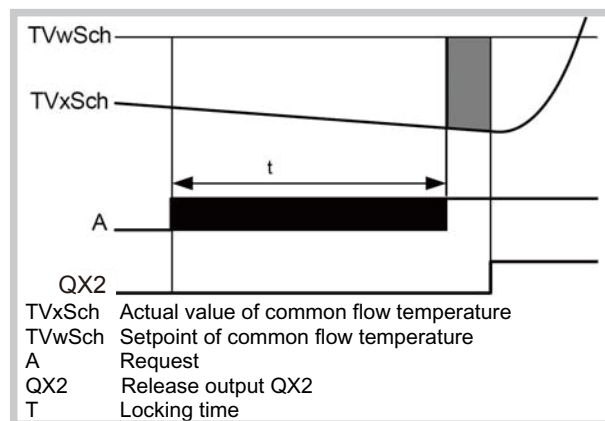
### Locking time

The locking time enables the heat pump to reach a stable operating state before the supplementary source is allowed to switch on.

The supplementary source is released only when the locking time has elapsed.

The locking time starts as soon as a valid flow temperature setpoint is available.

Calculation of the release integral starts only when the locking time has elapsed.



No consideration is given to the locking time, if the heat pump malfunctions or is locked, or if the supplementary source must end DHW charging.

Setting "- - -" can be used to deactivate the function.

## ● DHW storage tank functions

DHW charging at the nominal setpoint temperature (line 1610) always takes place in two stages. In the first stage, only the heating pump heats the DHW tank.

The power supplied during this time is at its peak. Then, when the heat pump is no longer able to

supply enough heat to reach the setpoint value, it switches on the DHW tank heater if authorised. The heater will be cut off when charging is complete. While the DHW tank charging process via the electric heater is finishing, the heat pump resumes heating.

### Charging Control

LINE	FUNCTION
5024	Switching differential
5030	Charging time limitation

#### Switching differential

If the DHW temperature is lower than the current setpoint minus the differential set here, the DHW charging process is launched.

It ends when the temperature reaches the current setpoint.

##### Information:

Forced charging is triggered on the first DHW release of the day.

Charging is also launched when the DHW temperature is within the differential, and as long as it is not less than 1K above the setpoint.

If "- -" has been selected the charging time limitation will be deactivated. The DHW will be heated to the nominal setpoint, even if the room heating has not received enough power in the meantime.

If a value between 10 and 600 is selected, charging will be suspended after the time period set in minutes, and will remain suspended over that time before resuming. The generator power remains available in the meantime to heat the room. This cycle is repeated until the DHW nominal setpoint has been reached.

##### Information:

When the room heating is stopped (summer mode, economy function, etc.), DHW charging remains active, regardless of the setting.

#### Charging time limitation

During charging, the room heating may be stopped or insufficient.

Therefore it is often advisable to limit the charging process timewise to enable heating.

### Recooling

LINE	FUNCTION
5055	Recooling temp
5057	Recooling collector

#### Recooling temp

An activated recooling function remains in operation until the set recooling temperature in the DHW storage tank is reached.

#### Recooling collector

When the collector is cold, surplus energy can be emitted to the environment via the collector's surfaces.

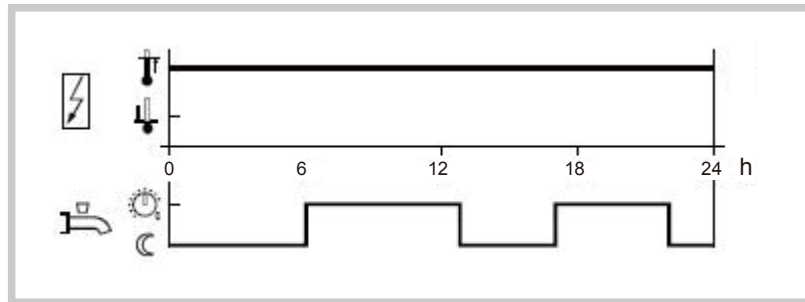
## Heater

LINE	FUNCTION
5061	Electric immersion heater release

### Electric immersion heater release

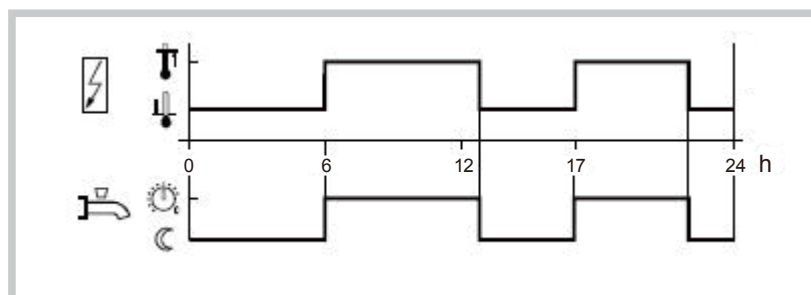
#### • 24h/day

The heater is continuously active regardless of time programs.



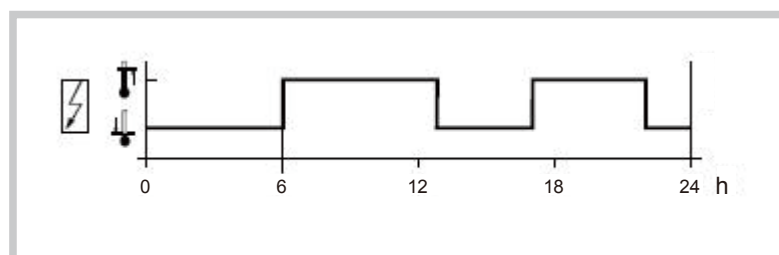
#### • DHW release

The heater is controlled according to "DHW release".



#### • Time program 4/DHW

Time program 4/DHW of the local controller is taken into account for the heater.



#### Information:

Switch-on will actually be in effect only if the heater is able to operate according to the "heater operating mode" setting.

## ● Configuration functions

When an installation is started up, the Indoor unit diagram presetting for that installation must be entered.

### Pre-settings

LINE	FUNCTION
5700	Pre-setting

Only Pre-setting 1 to 4 are used among 9 availables.

### Heating circuits/Cooling Circuit

LINE	FUNCTION
5710	Heating circuit 1
5711	Cooling circuit 1 (Off / 4-pipe system / 2-pipe system)
5715	Heating circuit 2

#### Heating circuit 1

Using this setting, heating circuit 1 can be switched on and off.

#### Cooling circuit 1

- **Off**

The cooling circuit is deactivated.

- **4-pipe system**

Not compatible with the this system.

This setting relates to passive cooling.

- **2-pipe system**

Activates the heat pump cooling mode. However, the cooling kit must have been previously connected.

#### Warning:

If the cooling kit has not been connected and the cooling mode is activated the heat pump will behave abnormally and might cause some unwanted discomfort.

#### Information:

Switching on the cooling mode causes the menu "Cooling circuit 1" to appear."Cooling circuit 1" to appear.

#### Heating circuit 2

Using this setting, heating circuit 2 can be switched on and off.

### DHW

LINE	FUNCTION
5731	DHW controlling element Q3

#### No charging request

No DHW charging via Q3.

#### Charging pump

DHW charging is effected with a pump connected to terminal Q3.

#### Diverting valve

DHW charging is effected with a diverting valve connected to terminal Q3.

### Electric immersion heater

LINE	FUNCTION
5806	Type electric immersion heater flow

Within the type of electric backup, 4 settings are possible :

#### 3-stage

Not used

#### 2-stage excuding

Not used

#### 2-stage complementary

The backup 1 starts alone, then the backup 2 starts alone, then the two backups start simultaneously. Example for a 3kw backup and a 6kw backup, 1st stage : 3kw, 2nd stage : 6kw, 3rd stage : 3+6=9kw.

#### Modulating Ux

The backup 1 is regulated as required.

## Basic unit EX/E

LINE	FUNCTION
5981 5983 5985	Contact type input EX1, EX2, EX3

The type of contact can be selected:

### NC

The input's function is active when voltage is not present.

### NO

The input's function is active when voltage is present.

The descriptions relating to the functions of the EX contact apply when an NO contact is selected.

## Sensor Corrections

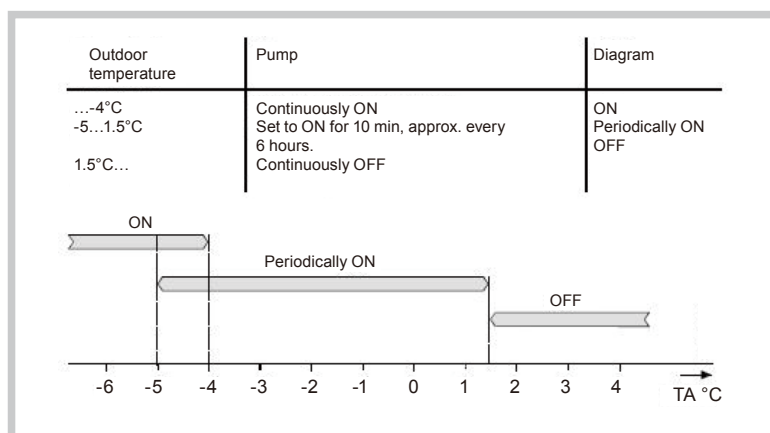
LINE	FUNCTION
6098	Not used
6100	Readjustment outside sensor

- The outdoor temperature measuring value can be corrected within a range of +/- 3 K.

## Installation Frost Protection

LINE	FUNCTION
6120	Frost protection for the plant

According to the outdoor temperature, the heating circuit pump and the condenser pump are switched on although there is no demand for heat.



## Miscellaneous

LINE	FUNCTION
6205	Reset to default parameters
6220	Software version


## Reset to default parameters

All parameters can be reset to factory settings, except followings: Time and date, User interface, and all time programs, as well as the operating hours and the various counters.

## Software version

The software version represents the controller software status at the time the unit is being produced. It is printed on the back of the unit. The first two digits represent the software version, and the third is the revision number (e.g. 01.0)

## ● Error functions

When a fault occurs, the symbol  appears and it is possible to display an error message in the Info

section by pressing the Info key. The display shows what caused the fault.

### Reset (unlock) Heat Pump

LINE	FUNCTION
6711	Reset HP

This line is used to clear the heat pump error messages. The predetermined switch-on delay in case of a failure is therefore ignored, which avoids waiting periods during servicing / troubleshooting.

This option should not be used in normal operating conditions.

### Error History

LINE	FUNCTION
6800 to 6818	Time stamp and history of faults 1 -10

The controller saves the last 10 faults which have occurred to a non volatile memory. Any new entry

will delete the oldest entry from the memory. A fault code and a time are saved for each fault.

#### Error Code List:

- Designation of error:  
The error designations in the table below are displayed in plain text on the user interface.
- Location:  
The sensor or contact associated to the error message.
- Reset:  
Reset is either automatic or manual, depending on the type of error (see table below with error messages).
  - Manual reset:  
Errors which are displayed in the Info section and accompanied by the "Reset " question can be manually reset. Press the "OK" key once, "yes" flashes on the display. Press the "OK" key again to confirm the "yes" and the error will be reset.
  - Automatic reset:  
Automatic clearing occurs after a previously set time (OEM setting) has elapsed. After this time out (6 hours by default) has elapsed, the controller will attempt to reset the error.  
If "Number" appears in the table, it is possible to define how many times the fault can be reset before the heat pump is declared out of order.
- Heat pump operation:  
Shows whether or not the heat pump can continue to operate when the error occurs.
  - Yes:  
The heat pump continues to operate despite the error message.
  - No:  
The error interrupts operation of the heat pump.
  - No with glycol water:  
This error stops glycol water heat pumps, but does not prevent operation of water or air heat pumps.
  - No with water:  
This error stops water heat pumps, but does not prevent operation of glycol water heat pumps.
  - No with air:  
This error stops air heat pumps, but does not prevent operation of water heat pumps or glycol water heat pumps.
  - Per diagram:  
The heat pump will be stopped according to the current installation diagram.
- Priority:  
Errors are ranked by priority. From priority 5 onward (i.e. priority levels 5 - 9) the alarm messages used in remote control are sent. In addition, the alarm relay is switched on.



Table of error messages which can be displayed:

No. Designation of error	Location	Reset		HP operation	Priority
		Manual	Automatic		
0: No fault					
10: Outdoor sensor	BX4 (X84)	No	No	Yes	6
30: Flow sensor 1	BX1 (X80)	No	No	Yes	6
31: Cooling flow sensor 1	BX1 (X80)	No	No	Yes	6
32: Flow sensor 2	BX31 (X153)	No	No	Yes	6
33: Heat pump flow temp sensor error	BX1 (X80)	No	No	Yes	6
44: Heat pump return temp sensor error	BX2 (X80)	No	No	Per diagram	6
50: DHW temp sensor 1	BX3 (X84)	No	No	Yes	6
60: Room sensor 1		No	No	Yes	6
65: Room sensor 2		No	No	Yes	6
76: Special sensor 1	BX	No	No	Yes	3
83: BSB wire short-circuit		No	No	Yes	8
84: BSB, address collision		No	No	Yes	3
85: Radio communication error		No	No	Yes	8
98: Extension module 1		No	No	Yes	8
99: Extension module 2		No	No	Yes	8
100: 2 master clocks on bus		No	No	Yes	3
102: Clock without running supply		No	No	Yes	3
105: Maintenance message		No	No	Yes	5
121: HC1 flow temp too low		No	No	Yes	6
122: HC2 flow temp too low		No	No	Yes	6
126: DHW charge monitoring		No	No	Yes	6
127: Anti-legionella temperature		No	No	Yes	6
134: Heat pump alarm summary	E20	Yes	Number*	No	9
138: No heat pump control sensor		No	Yes	No	1
146: Sensor / Control device configuration		No	No	Yes	3
171: Alarm contact 1 activated	H1/H31	No	No	Yes	6
172: Alarm contact 2 activated	H21/H22/ H32	No	No	Yes	6
174: Alarm contact 4 active H3		No	No	Yes	
178: HC1 safety thermostat		No	No	Yes	3
179: HC2 safety thermostat		No	No	Yes	3
201: Frost alarm	BX1 (X80)	Yes	No	No	9
243: Swimming pool sensor	BX34 (X154)	No	No	Yes	6
325: BX/Ext unit: same sensors		No	No	Yes	3
327: Ext modules: same functions		No	No	Yes	3
329: Ext modules/Mixing grp: same functions		No	No	Yes	3
330: BX1 no function		No	No	Yes	3
331: BX2 no function		No	No	Yes	3
332: BX3 no function		No	No	Yes	3
333: BX4 no function		No	No	Yes	3
334: BX5 no function		No	No	Yes	3
335: BX21 no function		No	No	Yes	3
336: BX22 no function		No	No	Yes	3
357: cooling circuit flow temp not reached		No	No	Yes	6

No. Designation of error	Location	Reset		HP operation	Priority
		Manual	Automatic		
359: no cooling valve Y21		No	No	Yes	3
360: no process reversing valve Y22		No	No	Yes	3
364: Heat pump cooling system error		No	No	Yes	3
369: External fault				No	
370: Outdoor unit fault				No	

\*: If such statuses or events occur for the first time, they will not directly generate a fault message, but only a status message.

Only if the anomaly occurs repeatedly over a predefined time period and at a given frequency (number) will an error message be generated.

## ● Service / special operation functions

### Maintenance

Maintenance functions can be used as a preventive step for periodically monitoring the installation. All maintenance functions can be individually activated / deactivated.


The controller automatically generates maintenance messages if the settings defined are either exceeded or fail to be reached.

LINE	FUNCTION
7070	HP interval
7071	HP time since maintenance
7073	Cur starts compressor 1/hrs run

#### HP interval

Defines the maintenance frequency (in months) for the heat pump.

#### HP time since maintenance


Displays the time (in months) elapsed since the last maintenance. If the value exceeds the "heat pump interval" (line 7070), the symbol  will be displayed and a maintenance message will appear in the Info section:

17: Heat pump maintenance Interval (Priority 6)

This setting can be reset with the associated rights of access.

#### Cur starts compressor 1/hrs run

The average number of compressor startups per hour of operation, obtained over a period of 6 weeks.

If the value exceeds the "Comp1 max startups/hr op" adjusted setting, the symbol  will be displayed and a maintenance message will appear in the Info section:

8: Too many compressor 1 startups (Priority 9)

This setting can be reset with the associated rights of access.

### Emergency mode

If the heat pump is not operating properly, an emergency operation can be maintained. The emergency operation enables the installation to be

run with the available heaters (flow, DHW tank). In this case the compressor will remain off.

LINE	FUNCTION
7141	Emergency operation
7142	Emergency operation function type

#### Emergency operation

Emergency operation can be activated and deactivated manually.

- **Off**

Emergency operation is deactivated.

- **On**

Emergency operation is activated.

#### Emergency operation function type

- **Manually**

Emergency operation can be activated/deactivated only through the Emergency operation setting on line 7141.

- **Automatic**

As soon as a fault occurs on the heat pump, emergency operation is automatically switched on. It stops when the fault is removed and, if necessary, cleared (reset). Emergency operation may however be activated / deactivated manually via the "Emergency operation" setting on line 7141.

## Simulation

LINE	FUNCTION
7150	Simulation outside temp

### Simulation outside temp

To make the starting-up and troubleshooting processes easier, it is possible to simulate an outdoor temperature in the range of -50...+50°C. During simulation, the current, composite and attenuated outdoor temperatures are ignored and substituted with the adjusted simulation temperature.

Computation of the three outdoor temperatures based on the actual outdoor temperature continues to be performed during the simulation, and these temperatures are available again when the simulation is over.

This function can be deactivated by selecting -.- on this line or automatically, after a 5 hour waiting period.

## ● Input / output test functions

Input/output testing is used to ensure that the connected components are in working order.

### Relay Output Testing

Selection of a setting from relay testing closes the corresponding relay and therefore switches on the connected component. This makes it possible to

check that the relays are in working order and that the wiring has been performed correctly.

LINE	FUNCTION																						
7700	<p>Relay test</p> <p>This consists of instructing the regulator's relays one by one and checking their outputs. This enables you to check that the relays are working and that the cabling is correct. Check that each appliance in the installation is operating correctly.</p> <table><tr><td>(0) No test</td><td>(11) Relay output QX34</td></tr><tr><td>(1) Everything is on STOP</td><td>(12) Relay output QX35 : Swimming pool distribution valve</td></tr><tr><td>(2) Relay output QX1 : heat pump CC1 (Main regulation board)</td><td>(13) Relay output QX21 module 1</td></tr><tr><td>(3) Relay output QX2 : Electrical back-up (1st stage) or Boiler connection distribution valve</td><td>(14) Relay output QX22 module 1</td></tr><tr><td>(4) Relay output QX3 : Electrical back-up (2nd stage) or Boiler connection contact</td><td>(15) Relay output QX23 module 1</td></tr><tr><td>(5) Relay output QX4 : DHW distribution valve</td><td>(16) Relay output QX21 module 2</td></tr><tr><td>(6) Relay output QX5 : DHW Electrical back-up</td><td>(17) Relay output QX22 module 2</td></tr><tr><td>(7) Relay output QX6</td><td>(18) Relay output QX23 module 2</td></tr><tr><td>(8) Relay output QX31 : Heat circ mix valve open Y1</td><td>(19) Not used</td></tr><tr><td>(9) Relay output QX32 : Heat circ mix valve close Y2</td><td>(20) Not used</td></tr><tr><td>(10) Relay output QX33 : heat pump CC2</td><td>(21) Not used</td></tr></table> <p>The display shows the "Key" symbol. Pressing the Info button displays "Error 368". Warning: The component being tested is receiving electrical power throughout the test.</p>	(0) No test	(11) Relay output QX34	(1) Everything is on STOP	(12) Relay output QX35 : Swimming pool distribution valve	(2) Relay output QX1 : heat pump CC1 (Main regulation board)	(13) Relay output QX21 module 1	(3) Relay output QX2 : Electrical back-up (1st stage) or Boiler connection distribution valve	(14) Relay output QX22 module 1	(4) Relay output QX3 : Electrical back-up (2nd stage) or Boiler connection contact	(15) Relay output QX23 module 1	(5) Relay output QX4 : DHW distribution valve	(16) Relay output QX21 module 2	(6) Relay output QX5 : DHW Electrical back-up	(17) Relay output QX22 module 2	(7) Relay output QX6	(18) Relay output QX23 module 2	(8) Relay output QX31 : Heat circ mix valve open Y1	(19) Not used	(9) Relay output QX32 : Heat circ mix valve close Y2	(20) Not used	(10) Relay output QX33 : heat pump CC2	(21) Not used
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(6) Relay output QX5 : DHW Electrical back-up	(17) Relay output QX22 module 2																						
(7) Relay output QX6	(18) Relay output QX23 module 2																						
(8) Relay output QX31 : Heat circ mix valve open Y1	(19) Not used																						
(9) Relay output QX32 : Heat circ mix valve close Y2	(20) Not used																						
(10) Relay output QX33 : heat pump CC2	(21) Not used																						

#### Warning:

During testing of an output, the heat pump is stopped, all outputs are "off" and only the controlled output is on.

### Analog Input/Output Testing

LINE	FUNCTION
7710	Output test UX1
7712	PWM signal UX1
7722	Cooling mode DO2
7723	Heat pump D3
7724	Output test UX3
7725	Voltage value UX3

#### Cooling mode DO2

Shows the output status.

#### Output test UX3

Enables testing the outdoor unit control.

### Sensor Input Testing

LINE	FUNCTION
7820	Sensor temp BX1
7821	Sensor temp BX2
7822	Sensor temp BX3
7823	Sensor temp BX4

Displays the temperature of each sensor.

### ***Input test EX1-3***

LINE	FUNCTION
7911	Input EX1
7912	Input EX2
7913	Input EX3

By selecting a setting from input test EX1-3, the relevant input will be displayed, enabling it to be checked.

Display of 0 V means that there is no voltage and the respective input is currently inactive. Display of 230 V means that voltage is present at the respective input so that it is activated.

### ***Input / output test I/O module***

LINE	FUNCTION
7973	Sensor temp BX31
7976	Sensor temp BX34
7996	Contact state H33

The sensor test operate the same as for BX1-4 on the basic unit.

## ● State functions

The current operating status of the installation can be viewed by means of status displays.

### Messages

LINE	FUNCTION
8000	State heating circuit 1
8001	State heating circuit 2
8003	State DHW
8004	State cooling circuit 1
8006	State heat pump
8007	Not used
8010	Not used
8011	State swimming pool
8022	State supplementary source

### State heating circuit

End user (Info level)	Commissioning, Engineer
Thermostat response	Thermostat response
Manual action active	Manual action active
Controlled drying active	Controlled drying active
Heating mode restriction	Overeating protection active Restriction, boiler protection Restriction, DHW priority Restriction, storage tank
Forced draft	Forced draft, storage tank Forced draft, DHW Forced draft generator Forced draft Switch-off delay active
Comfort heating mode	Optimis. at switch-on + accelerated heating Optimization at switch-on Accelerated heating Comfort heating mode
Reduced heating mode	Optimization at switch-off Reduced heating mode
Frost protection active	Room frost protection Flow frost protection active Install. frost protection active
Summer mode	Summer mode
Off	Eco day active Reduced decrease Frost protection decrease Room temperature limitation Off

## State DHW (8003)

End user (Info level)	Commissioning, Engineer
Thermostat response	Thermostat response
Manual action active	Manual action active
Draw-off mode	Draw-off mode
Adiabatic cooling active	Adiabatic cooling by collector Adiabatic cooling via gen/HC
Charging lock active	Discharge protection active Charging duration limit. active Charging locked
Forced charging active	Forcing, DHW tank max temp Forcing, max charging temp Forcing, anti-legion. setpoint Forcing, comfort setpoint
Charging by heater	Charging by heater, anti-legion. setpoint Charging by heater, comfort setpoint Charging by heater, reduced setpoint Charging by heater, frost protection setpoint Heater released
Accelerated charging active	Flow active Anti-legion. accelerated charging
Charging active	Charging, anti-legion. setpoint Charging, comfort setpoint Charging, reduced setpoint
Frost protection active	Frost protection active
Switch-off delay active	Switch-off delay active
Charging on standby	Charging on standby
Charged	Charged, max tank temp Charged, max charging temp Charged, anti-legionella temp Charged, nominal temp Charged, reduced temp
Off	Off
Ready	Ready



### State cooling circuit 1 (8004)

End user (Info level)	Commissioning, Engineer
Dewpoint sensor activated	Dewpoint sensor activated
Manual action active	Manual action active
Fault	Fault
Frost protection active	Flow frost protection active
Cooling mode locked	Locked, heating mode Lock time after heating Locked, generator Locked, storage tank
Cooling mode restricted	Flow temp setpoint increase by hygrostat Dewpoint flow min limit Outdoor temp flow min limit
Comfort cooling mode	Comfort cooling mode Switch-off delay active
Cooling protection mode	Cooling protection mode
Frost protection active	Frost protection active
OT cooling limit activated	OT cooling limit activated
Off	Off Room temperature limitation Flow limit reached
Cooling mode off	Cooling mode deactivated

## State heat pump (8006)

End user (Info level)	Commissioning, Engineer
Emergency mode	Emergency mode
Fault	Fault
Locked	Locked, outdoor temperature Locked, external Locked, economy mode
Lim. time active	Consumer flow rate controller Min outdoor temp use limit Max outdoor temp use limit Max switch off temp lim Max OT limit cooling Min switch off temp limit Comp min switch off time active Excess heat compensation
Frost protection active	Heat pump frost protection
Defrosting activated	Defrosting activated
Cooling mode active	Comp min ON time active Comp 1 ON
Heating	Comp min ON time active Heat deficiency compensation Max cond diff limit Min cond diff limit Comp.1 and heater ON Comp 1 ON Heater ON
Frost protection active	Install. frost protection active
Off	Flow active Switch-off delay active No demand
Switch-off delay active	No demand

## State swimming pool (8011)

End user (Info level)	Commissioning, Engineer
Manual action active	Manual action active
Fault	Fault
Heating mode restriction	Heating mode restriction
Forced draft	Forced draft
Heating	Generator heating mode
Heated, max pool temp	Heated, max pool temp Heated, generator setpoint
Heated	
Heating off	Solar heating mode OFF Generator heating mode OFF
Cooling	Cooling

## State supplementary source (8022)

End user (Info level)	Commissioning, Engineer
Locked	Locked, solid fuel boiler Locked, outside temperature Locked, economy mode
In operation for HC, DHW	In operation for HC, DHW
Released for HC, DHW	Released for HC, DHW
In operation for DHW	In operation for DHW
Released for DHW	Released for DHW
In operation for heating circuit	In operation for heating circuit
In operation for HC, DHW	In operation for HC, DHW
Released for HC, DHW	Released for HC, DHW
In operation for DHW	In operation for DHW
Released for DHW	Released for DHW
In operation for heating circuit	In operation for heating circuit
Released for HC	Released for HC
Overrun active	Overrun active
Off.	Off.

## ●Diagnostics heat generation functions

Various setpoints and actual values, relay switch status data can be displayed for purposes of diagnosis.

### Heat Pump

LINE	FUNCTION
8402	Electric immersion heater 1 flow
8403	Electric immersion heater 2 flow
8406	Condenser pump

These lines are used to check the operating mode of the components controlled by the heat pump relays. The display "0" means that the associated components are currently disconnected. The display "1" means that the associated components are currently switched on.

#### Information:

This information applies to relays defined as normally open contacts. For normally closed contacts, the action is reversed.

### Setpoints and Measured Values

LINE	FUNCTION
8410	Return temp HP
8412	Flow temp HP
8413	Compressor modulation
8414	Modulation electric flow
8425	Temp diff condenser

These lines allow the various setpoints and measured values for the heat pump to be viewed.

### Hour / Startup Counter

LINE	FUNCTION
8450	Hours run compressor 1
8454	Locking time HP
8455	Counter number of locks HP
8456	Hours run electric flow
8457	Start counter electric flow

#### Hours run compressor 1

This operating line shows the total number of hours run of compressor 1 since it was first commissioned.

#### Locking time HP

Displays the cumulative locking time since start-up by the electrical services (via external locking signal).

#### Counter number of locks HP

Displays the cumulative locks since start-up by the electrical services (via external locking signal).

#### Hours run electric flow, Start counter electric flow

These lines are used to view the hours of operation and the number of start-up of electric heater.

## ●Diagnostics consumers functions

Various setpoints and actual values, relay switch status and timing status data can be displayed for purposes of diagnosis.

### Outside Temperatures

LINE	FUNCTION
8700	Outside temp
8701	Outside temp min
8702	Outside temp max
8703	Outside temp attenuated
8704	Outside temp composite

The current, minimum, maximum, attenuated and composite outdoor temperatures are displayed.

### Heating Circuits

LINE	FUNCTION
8730 and 8760	heating circuit pump 1 and 2
8731 and 8761	Heating circuit mix valve 1 open
8732 and 8762	Heating circuit mix valve 1 closed
8740 and 8770	Room temp 1 and 2
8743 and 8773	Flow temp 1 and 2

The display "Off" means that the associated components are currently disconnected.  
The display "On" means that the associated components are currently switched on.

### Cooling Circuit

LINE	FUNCTION
8756	Flow temperature cooling 1
8757	Flow temperature setpoint cooling 1

The actual value of the cooling mode are displayed.  
The cooling mode room setpoint is displayed on programming line 8741.

## Domestic Hot Water

LINE	FUNCTION
8820	DHW pump
8821	Electric immersion heater DHW
8830	DHW temperature
8840	Hours run DHW pump
8841	Start counter DHW pump
8842	Hours run electric DHW
8843	Start counter electric DHW

The measured values, the DHW circulation pump and charging temperature, operating hour and start-up counters are displayed, as well as

temperatures of the primary controllers and DHW heater.

## Swimming Pool

LINE	FUNCTION
8900	Swimming pool temp

The current temperature of the swimming pool is displayed.

## Line

LINE	FUNCTION
8950	Common flow temp

## Multifunction Relay Status

LINE	FUNCTION
9031	Relay output QX1
9032	Relay output QX2
9033	Relay output QX3
9034	Relay output QX4
9035	Relay output QX5

The switching status of multifunction relays 1 - 5 can be viewed individually on these lines. The display "Off" means that the components assigned to this

output are currently disconnected. The display "On" means that the associated components are currently switched on.

## Status of Relays for Extension Modules 1 and 2

LINE	FUNCTION
9050	Relay output QX21 module 1
9051	Relay output QX22 module 1
9052	Relay output QX23 module 1
9053	Relay output QX21 module 2
9054	Relay output QX22 module 2
9055	Relay output QX23 module 2

The switching status of the relays connected to extension modules 1 and 2 can be viewed on these lines.

The display "Off" means that the components assigned to this output are currently disconnected. The display "On" means that the associated components are currently switched on.

## I/O module

LINE	FUNCTION
9071	Relay output QX31
9072	Relay output QX32
9073	Relay output QX33
9074	Relay output QX34
9075	Relay output QX35

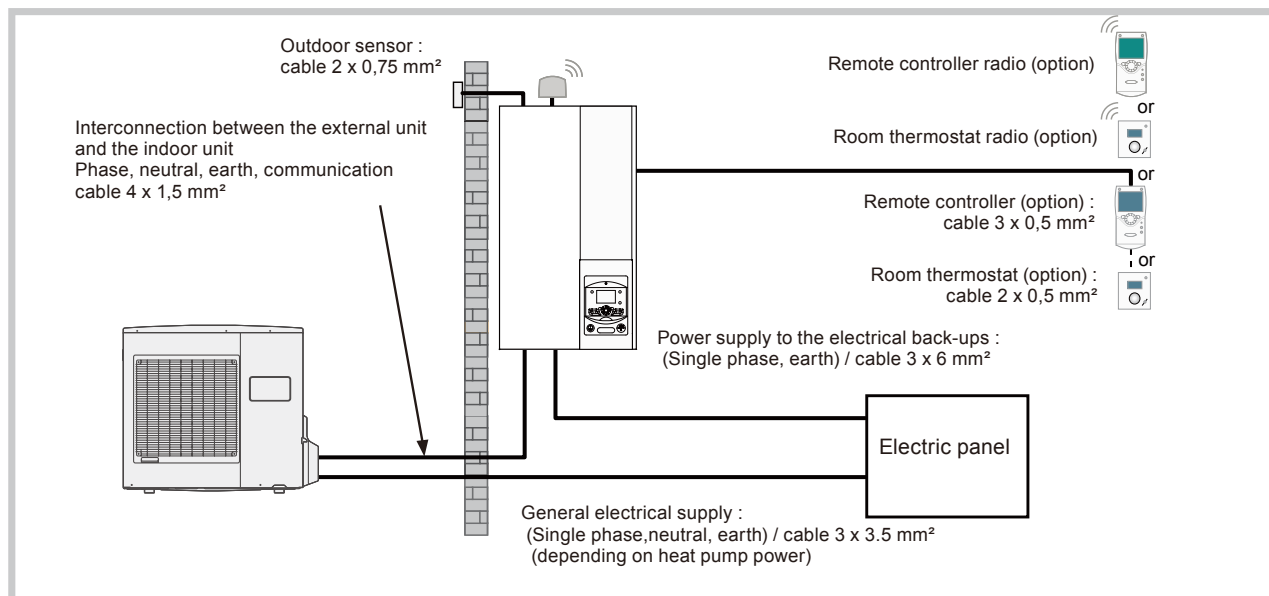
The switching states of each relay on the I/O module can be queried via these operating lines.

The display "Off" means that the components assigned to this output are currently disconnected. The display "On" means that the associated components are currently switched on.

## 3. ELECTRICAL CONNECTIONS

### 3-1. OVERVIEW OF ALL THE ELECTRICAL CONNECTIONS

The wiring diagram for the indoor unit is shown in detail on electrical wiring diagrams (Chapter 1 for outdoor unit and Chapter 2 for indoor unit).

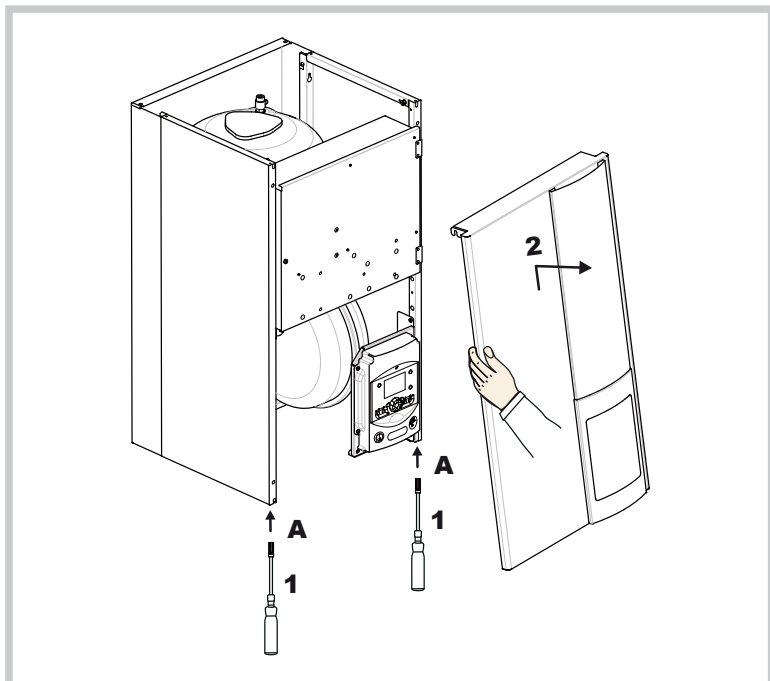


*Overall layout of the electrical connections for a simple installation (1 heating circuit)*



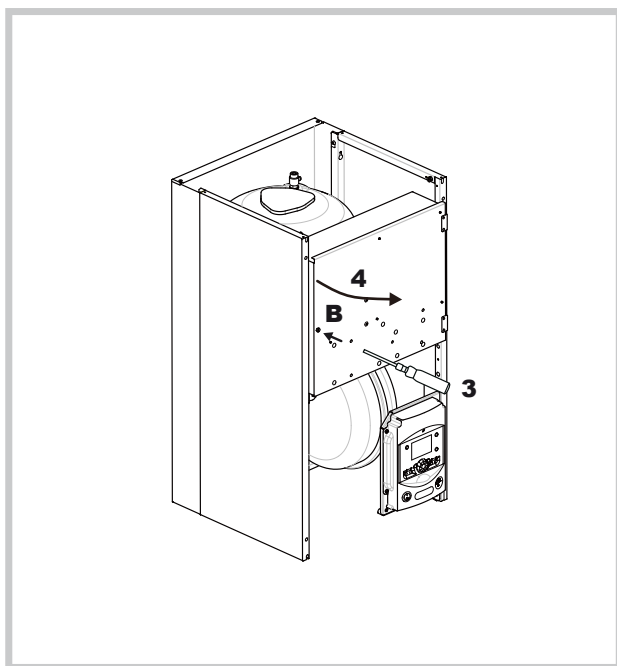
## 3-2. ELECTRICAL CONNECTIONS ON THE HYDRAULIC UNIT

- Remove the front panel (2 screws A)



*Removing the front panel*

- Remove the cover of the electric box (1 screw B)



*Access to hydraulic unit electric box*

### **Note:**

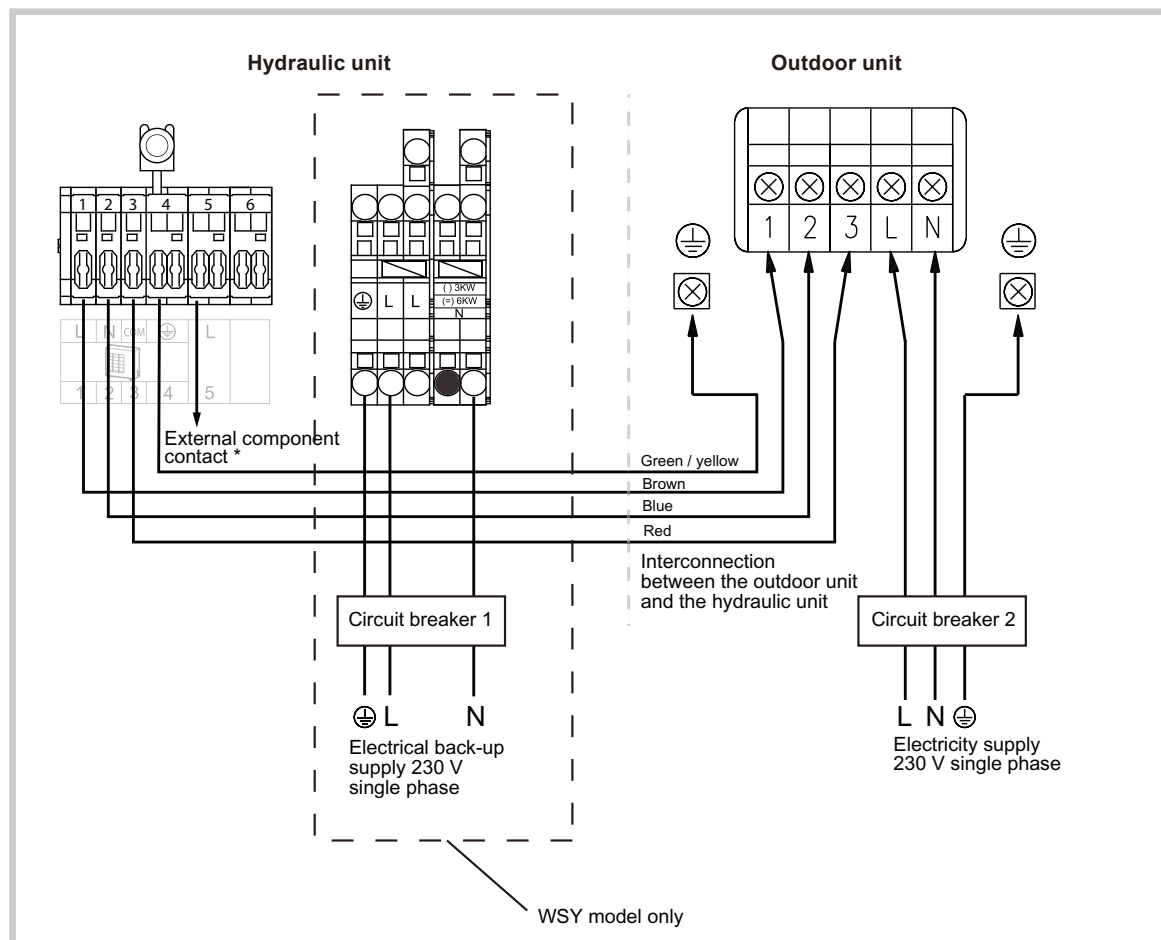
Ensure that the general electrical power supply has been cut off before starting any repair work .  
The rearmament of safety thermostat should be done by a professional .

- **Make the connections in accordance with the diagram(s).**

Do not place the sensor lines and the sector supply lines in parallel in order to avoid causing inadvertent interference due to voltage points in the sector supply.

Ensure that all the electrical cables are housed in the spaces provided for this purpose inside the lifting handles.

#### Single phase model



#### Note:

Ensure that the general electrical power supply has been cut off before starting any repair work. The rearmament of safety thermostat should be done by a professional.

### • **Interconnection between the outdoor unit and the indoor unit**

Comply with the correspondence between the markings on the indoor unit's terminals and those on the outdoor unit when connecting the interconnection cables.

A connection error could cause the destruction of one or other of the units.

### • **Electric back-ups**

If the heat pump is not installed with a boiler connection:

- Connect the electrical supply for the back-ups to the electrical panel.

### • **Boiler connection**

- Please refer to the instructions supplied with the boiler connection kit.
- Please refer to the instructions supplied with the boiler.

### • **Domestic hot water tank**

If the installation is fitted with a DHW tank with electrical back-up heating:

- Please refer to the instructions supplied with the DHW kit.
- Please refer to the instructions supplied with the DHW tank.

### • **Second heating circuit**

- Please refer to the instructions supplied with the second circuit kit or / and Regulation extension kit.

### • **Contract with the power provider**

The heat pump's operation can be controlled to suit special contracts (e.g. Low-tariff, day/night).

In particular, domestic hot water (DHW) at Nominal temperature will be produced during the off-peak hours when electricity is cheaper.

- Connect the "Power Provider" contact to input EX2.
- Set the parameter line 1620 to "Low-tariff".
- 230V on input EX2 = "Peak hours" information activated.

### • **Power limitation or EJP (peak day removal)**

Power limitation is intended to reduce electrical consumption when this is too high compared to the contract with the power provider.

- Connect the power limiting device to input EX, the back-ups for the heat pump and the DHW stop in the event of over-consumption by the dwelling.
- 230 V on input EX1 = power limitation in progress.

### • **External faults the heat pump**

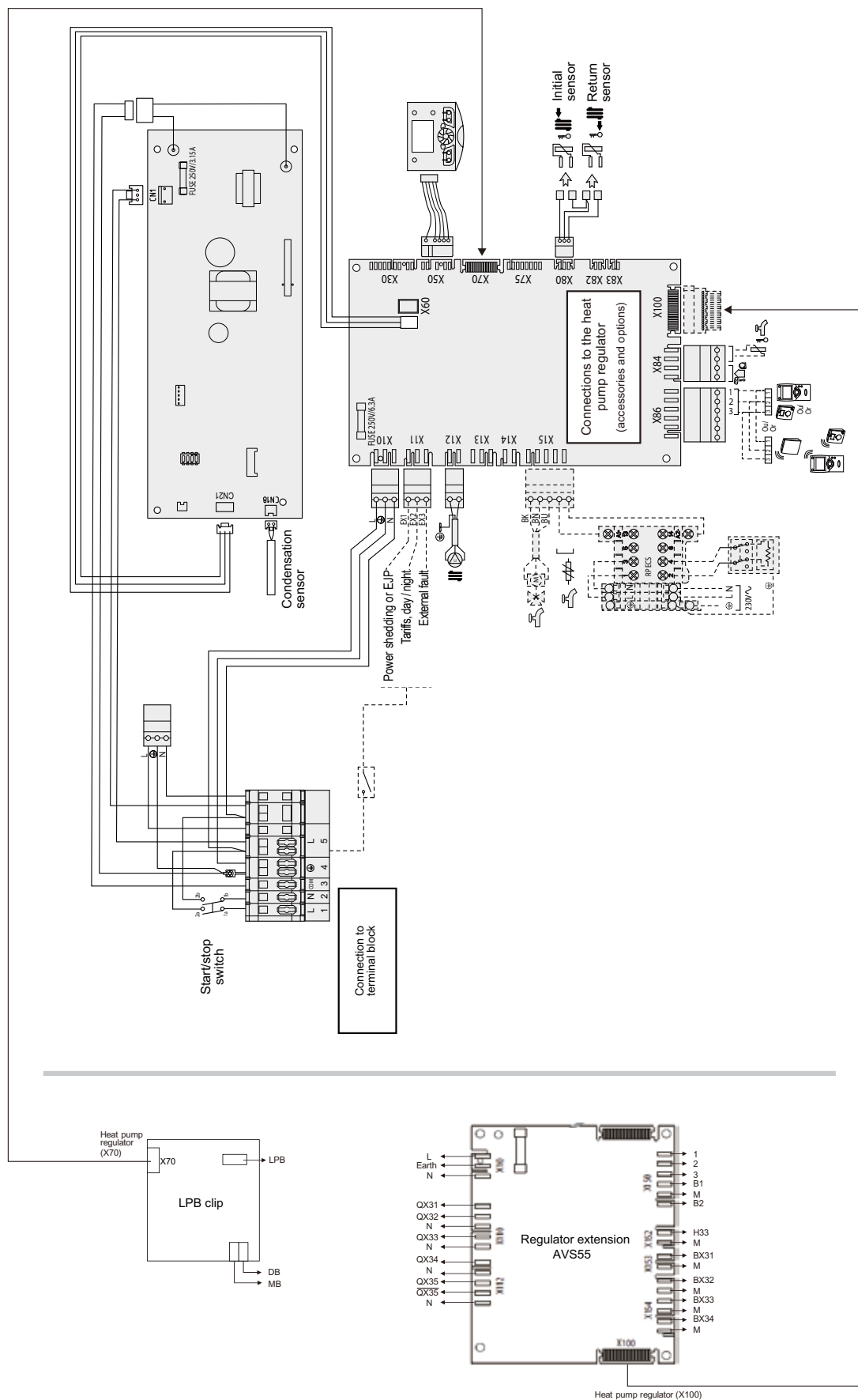
Any component of carryforward of information (thermostat, pressure switch, etc.) may signal an external problem and stop the heat pump.

- Connect the external component to input EX3.
- 230 V on input EX3 = stoppage of heat pump (the system displays Error 369).
- In the case of a heated floor, connect the floor heating safety device into the connector of the floor heating pump.

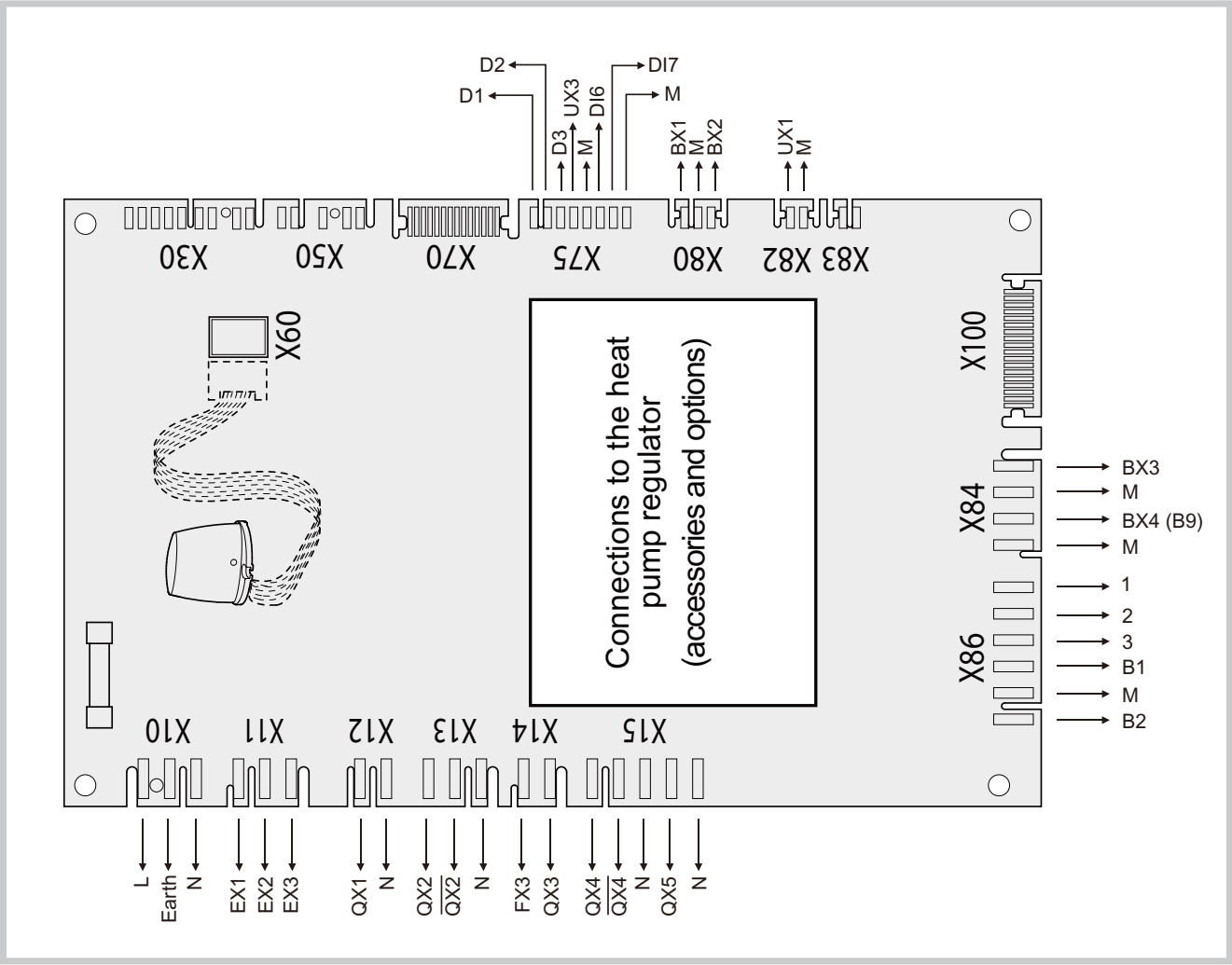


# MODELS: WSHA050DG, WSHA100DG

Single phase model



Connections to the heat pump regulator (accessories and options)



Connections to the heat pump regulator (accessories and options)

CONTROL  
SYSTEM

CONTROL  
SYSTEM

## ■ CONNECTION TERMINALS

### ● Heat pump regulator RVS21.827

#### Low voltage

Terminal	Use
X75	M GND (common with interface PCB)
	DI7 HP error
	DI6 Defrost
	Uref Compressor modulation
	UX3 HP operation ON/OFF
	D3 HP operation mode(HEAT/COOL)
	DO2 HP operation mode(HEAT/COOL)
X80	BX1 Flow sensor
	M Common
	BX2 Return sensor
X82	UX1 (Not used)
	M (Not used)
X84	BX3 DHW sensor
	M DHW sensor
	BX4 Outdoor sensor
	M Outdoor sensor
X86	1 Room thermostat or Remote controller
	2 Remote controller
	3 Remote controller
	B1 Room thermostat
	M Room thermostat
	B2 Room thermostat
X30	(Not used)
X50	User interface
X60	RF module
X70	LPB clip
X100	Regulation extension kit (UTW-KREXD)

**Remark:** Colored items are for options.

(\*1) If the 2nd circuit kit are installed in the system, this circulation pump is assigned for higher temperature circuit.

#### Main voltage

Terminal	Use
X10	L Power supply
	Earth Power supply
	N Power supply
X11	EX1 Power shedding
	EX2 Peak time / off-peak times
	EX3 External fault
X12	QX1 Circulation pump(*1)
	N Circulation pump(*1)
X13	QX2 Back-up HTR 1 or Distribution valve for boiler (Single phase model)
	QX2 (inverted) Back-up HTR 1 or Distribution valve for boiler (Single phase model)
	N Back-up HTR 1 or Distribution valve for boiler (Single phase model)
X14	FX3 Back-up HTR 2 or Boiler control (ON/OFF) (Single phase model)
	QX3 Back-up HTR 2 or Boiler control (ON/OFF) (Single phase model)
X15	QX4 Distribution valve for DHW
	QX4 (inverted) Distribution valve for DHW
	N Distribution valve for DHW
	QX5 Back-up HTR for DHW
	N Back-up HTR for DHW

### ● Regulation extension kit (UTW-KREXD)

#### Low voltage

Terminal	Use
X150	1 Room thermostat or Remote controller for lower temperature circuit
	2 Room thermostat or Remote controller for lower temperature circuit
	3 Room thermostat or Remote controller for lower temperature circuit
	B1 Room thermostat or Remote controller for lower temperature circuit
	M Room thermostat or Remote controller for lower temperature circuit
	B2 Room thermostat or Remote controller for lower temperature circuit
X152	H33 External input (*2)
	M External input (*2)
X153	BX31 Flow sensor for lower temperature circuit
	M Flow sensor for lower temperature circuit
X154	BX32 (Not used)
	M (Not used)
	BX33 (Not used)
	M (Not used)
	BX34 Swimming pool temperature sensor
	M Swimming pool temperature sensor
X100	Heat pump regulator

#### Main voltage

Terminal	Use
X10	L Power supply
	Earth Power supply
	N Power supply
X110	QX31 Mixing valve for 2nd circuit or Pilot wire(*3)
	QX32 Mixing valve for 2nd circuit or Pilot wire(*3)
	N Mixing valve for 2nd circuit or Pilot wire(*3)
X112	QX33 Circulation pump for lower temperature circuit
	N Circulation pump for lower temperature circuit
	(Not used)
X112	QX34 Distribution valve for swimming pool
	N Distribution valve for swimming pool
	QX35 Distribution valve for swimming pool
	QX35 (inverted) Distribution valve for swimming pool
	N Distribution valve for swimming pool

**Remark:** (\*2) Input H33 can be applied to one of several functions.(See "Input H33 function"for detail.)

(\*3) See "Regulation extension kit AVS 55" manual for detail.

## ■ OUTDOOR SENSOR

The outdoor sensor is required for the heat pump to operate correctly.

Consult the fitting instructions on the sensor's packaging.

Place the sensor on the coldest part, generally the northern or north-eastern side.

In any case, it must not be exposed to the morning sun.

It must be installed so as to be easily accessible but at least 2,5 m from the floor.

It is essential that it avoid any sources of heat such as flues, the upper parts of doors and windows, proximity to extraction vents, the underneath of balconies and under-eave areas which would isolate the sensor from variations in the outdoor air temperature.

- Connect the outdoor sensor to the M and BX4 (B9) terminals on the heat pump control board.

## ■ ROOM THERMOSTAT AND / OR REMOTE CONTROLLER

The room thermostat (remote controller) is optional.

Consult the fitting instructions on the sensor's packaging.

The sensor must be installed in the living room area on a very uncluttered wall, 1,5 m above the floor.

Avoid direct sources of heat (chimney/flue, television, cooking hobs), draughty areas (ventilation, door, etc.).

Air leaks in the seals in the constructions are often translated into cold air blowing through the electrical conduits. Lag the electrical conduits if there is a cold draught on the back of the IR sensor.

- Installing a room thermostat

- Room thermostat

- Connect the room thermostat to the X86 connector of the heat pump's regulator board using the connector provided (terminals 1, 2).

- Room thermostat radio

- Connect the wireless room thermostat radio to the connector X60.

- Installing a remote controller

- Remote controller

- Connect the remote controller to the X86 connector of the heat pump's regulator board using the connector provided (terminals 1, 2 and 3).

- Remote controller radio

- Connect the wireless remote controller radio to the connector X60.





## ■ DHW SENSOR

If the installation is equipped with a DHW tank (with electric back-up):

- Place the domestic hot water sensor in the housing for the cylinder sensors.
- Connect the domestic hot water sensor to terminal BX3 and M.



## ■ START-UP

- Make sure that ALL DIP SW on the interface card are OFF before starting up. DIP SW should be set OFF for normal operation. Power supply to the indoor unit must be turned off while touching DIP SW.
- Close the installation's main circuit breaker.  
On first commissioning (or in winter), in order to allow the compressor to pre-heat, engage the installation's main circuit breaker (power supply to the outdoor unit) some hours before starting up the tests.
- Engage the start/stop switch.  
To ensure that inputs EX1, EX2 and EX3 operate correctly : Check that the live-neutral polarity of the electrical supply is correct.  
When the power is switched on and every time that the ON/OFF button is switched off and then switched on again, the outdoor unit will take approximately 4 minutes to start up, even if the setting is requesting heating.  
The display can show error 370 when the appliance (re)starts. Do not be concerned, the communication between the outdoor and indoor unit will re-establish itself in a few moments.  
During the regulator initialisation phase, the display shows all the symbols and then "Data update" and then "State heat pump".
- Make all the specific adjustments to the setting (configuring the installation).
- Press the key 
- Hold down the key  for 3s and select the level of access used with the aid of the knob .
- Confirm with the key 

Parameter the heat pump's setting (See "■ FUNCTION TABLE of 2-3 CONTROL SETTING").

On commissioning (or the case of error 10), the electrical backup heaters may start up even if the outdoor temperature at the time is above the heaters' trigger temperature.


The regulating system uses an average initial outdoor temperature of 0°C and requires some time to update this temperature.

To avoid this situation, the sensor must be connected correctly.

Re-initialise line 8703 (commissioning level, Consumer diagnostic menu).


## ■ CONFIGURING THE ROOM THERMOSTAT

Configure the room thermostat and connect it to the appropriate heating zone:

- Hold down the presence key for more than 3 seconds. The room thermostat displays RU and a number flashes.
  - Turn the wheel to choose the zone (1, 2).  
 **If the installation is fitted with 2 room thermostats,**
    - **First connect one room thermostat and configure it in zone 2.**
    - **Then connect the other room thermostat and configure it as default in zone 1.**
  - Hold down the presence key; the room thermostat displays P1 and a flashing number.
    - 1: Automatic recording : a correction of the setting with the button is adopted without any particular confirmation (timeout) or by pressing the mode key.
    - 2: Recording with confirmation: a correction of the setting with the button is not adopted until the mode key is pressed.
  - Press the presence key again; the room thermostat displays P2 and a flashing number.
    - 0: OFF : all the operating elements are engaged.
    - 1: ON : the following operating elements are locked:
      - Switching over the heating circuit's operating mode
      - Adjusting the comfort setpoint
      - Changing the operating level
- The room thermostat displays OFF for 3 seconds when a locked button is pressed.

## ■ CONFIGURING THE REMOTE CONTROLLER (RADIO)

During commissioning, after an initialisation period of approx. 3 minutes, the user's language must be set:

- Press the key 
- Choose menu "Operator section".
- Choose "Language".
- Select the language menu (**English**, Français, Nederlands, Español, etc).

☞ **In the case of 2 heating circuits**

- Choose the allocation of the remote controller (room appliance 1 or 2...) line 40\*.
- According to the allocation selected check and, if necessary, modify the settings for lines 42\*, 44\*, 48\*.

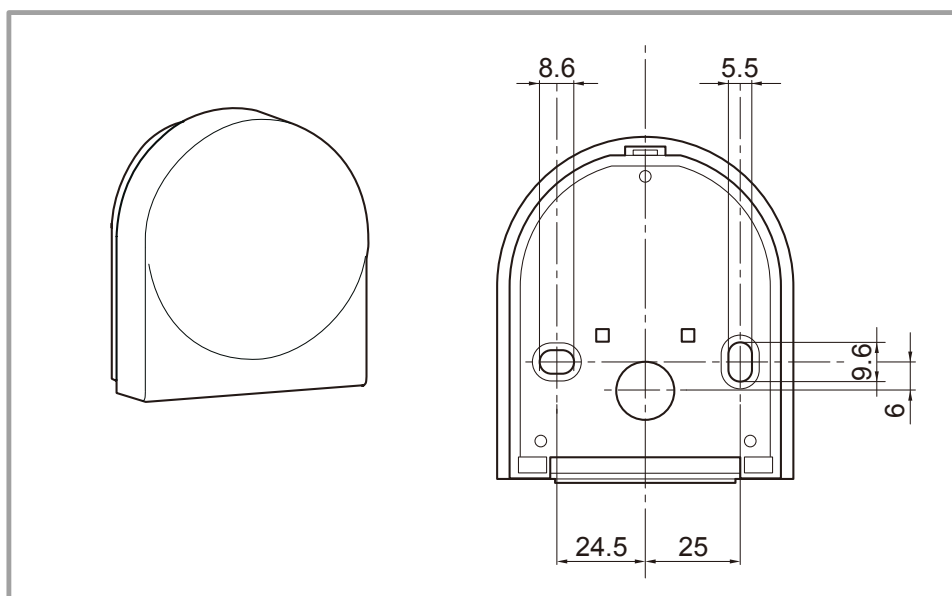
LINE	ACCESS LEVEL	FUNCTION	SETTING RANGE OR DISPLAY	FACTORY SETTING
40	I	Use as...	Room appliance 1, 2, P, User interface 1, 2, P, Service appliance	Room appliance 1
This line regulates the use of the room control unit. Depending on how it is used, other settings will be necessary (lines 42, 44, 48).				
42	I	Appliance allocation 1	Heating circuit 1, Heating circuit 1 & 2, Heating circuit 1 & P, All the heating circuits	Heating circuit 1
44	I	Operation HC2 (command HC2)	Commonly with HC1, Independent	Commonly with HC1
This function enables you to choose whether you wish the room thermostat (as an option) to act on both zones or just a single zone.				
48	I	Occupancy control switch function	Without, Heating circuit 1, Heating circuit 2, Common	

\* These parameter lines are only accessible from the remote controller.

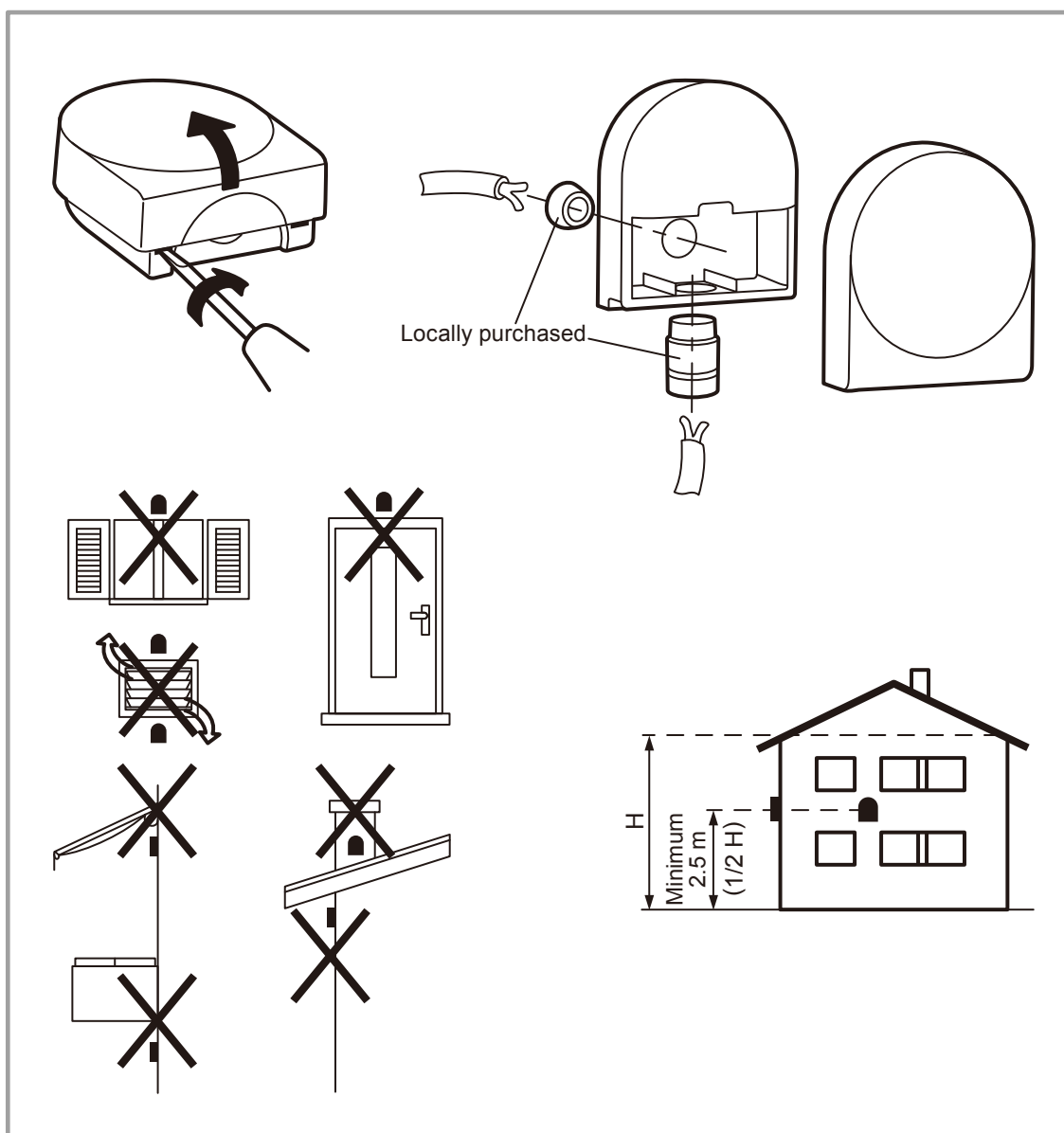
## 4. INSTALLATION

### 4-1. OUTDOOR SENSOR

■ MODEL: QAC34



#### ● Installation

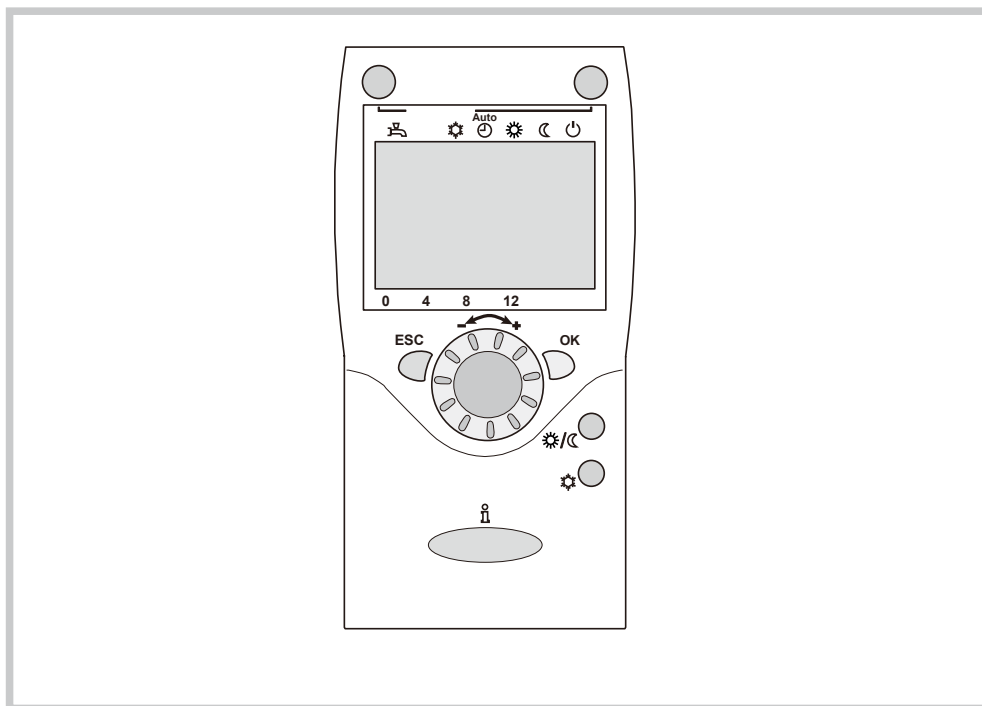


## 4-2. REMOTE CONTROLLER (Optional parts)

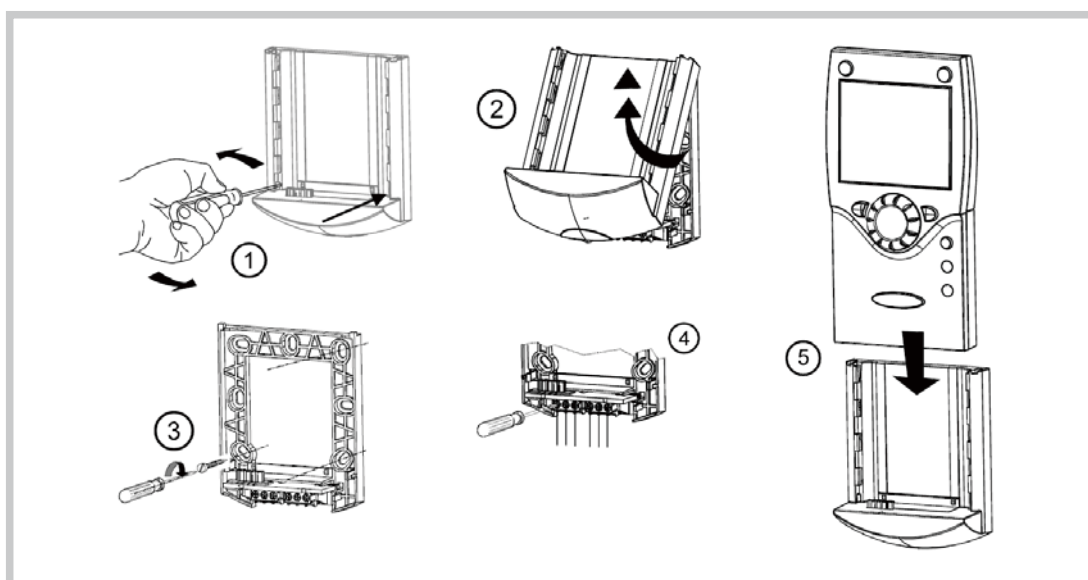
### ■ MODEL: UTW-C75XA

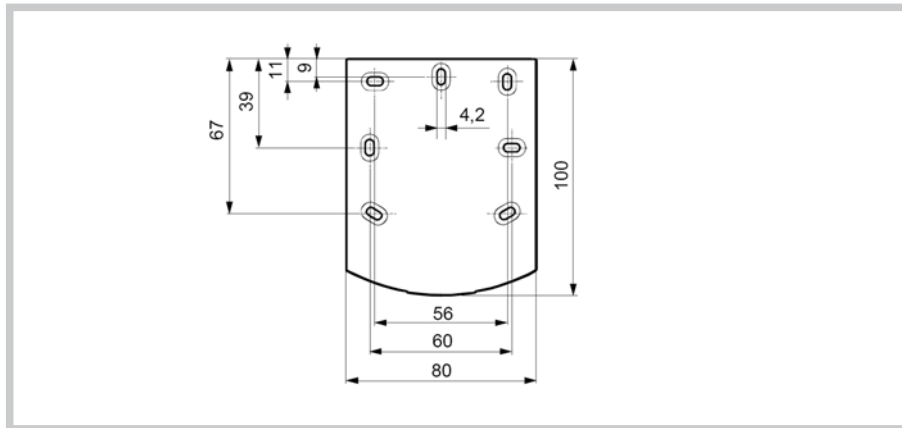
The remote controller includes the functions of the room unit together with those of the user interface mounted in series on the indoor unit. It can be used, therefore, not only to measure the

room temperature, but also to view the operating status of the heat pump, to enter the heat pump settings.



### ● Installation





## ● Connections

The remote controller must be connected to the connector X86 (terminal 1, 2, 3) of the heat pump controller board.

To do this, you can use a 0.5mm<sup>2</sup> cable of the two-pair telephone cable type.

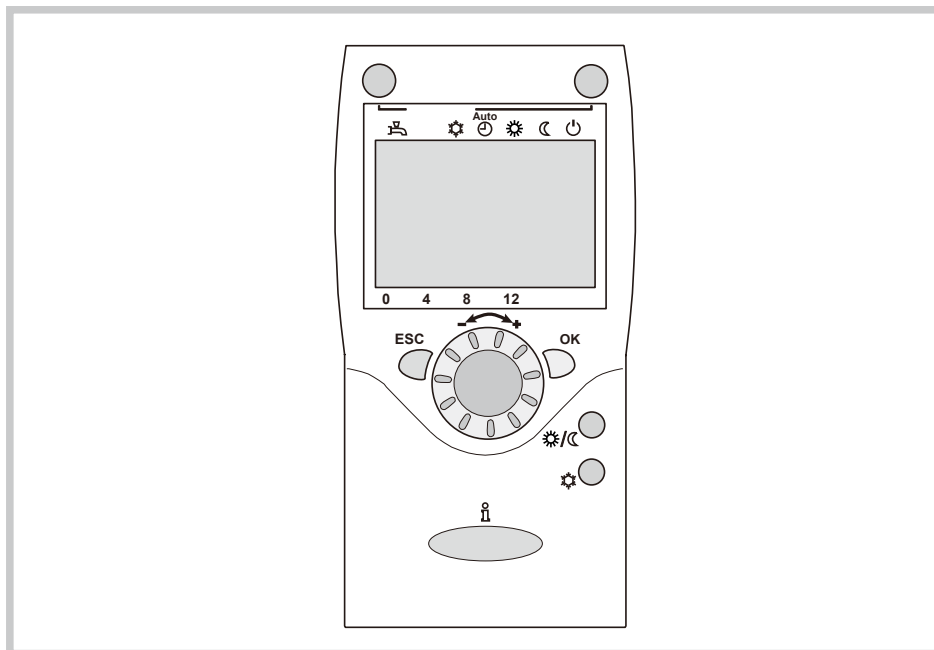
If the cable is shielded, the shielding can be connected to the controller terminal 2. It may under no circumstances be connected on both sides, i.e. heat pump regulator side and room unit side.

Terminal C75	Control terminal	Function
1	X86 terminal 1	BSB data
2	X86 terminal 2	BSB ground
3	X86 terminal 3	Power supply DC12V

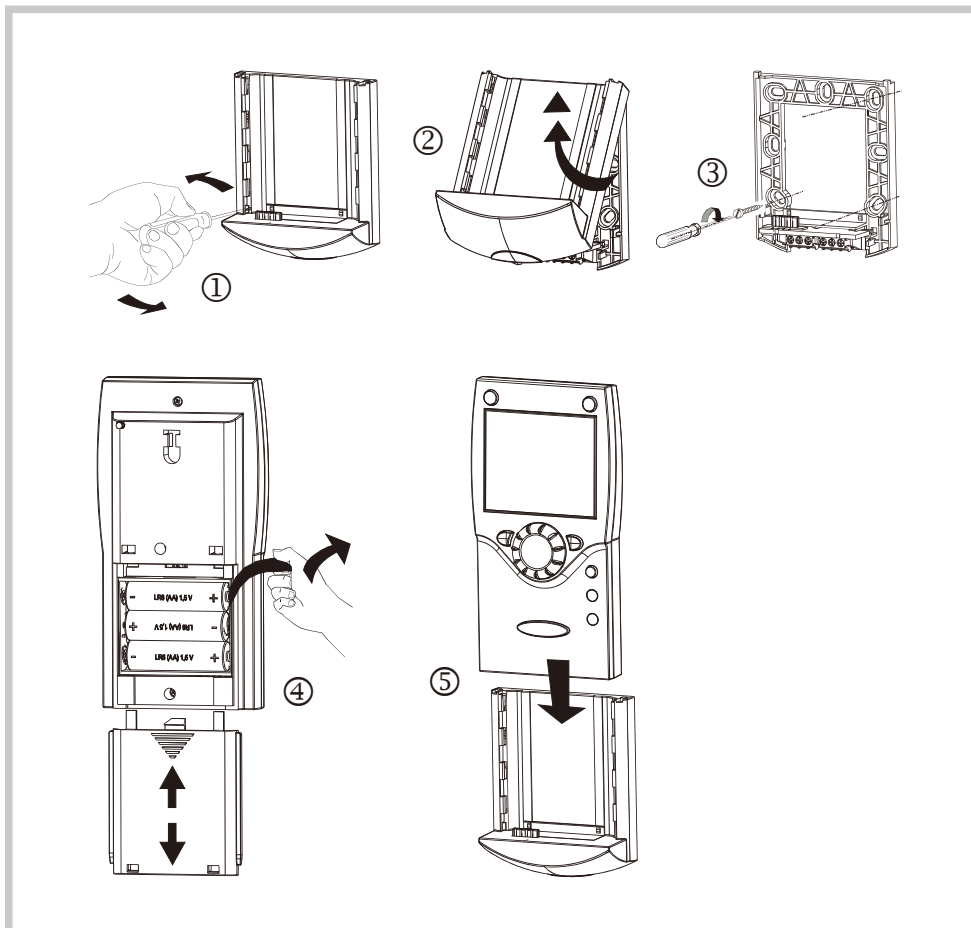
## ■ MODEL: UTW-C78XD (Wireless)

The remote controller includes the functions of the room unit together with those of the user interface mounted in series on the indoor unit. It can be used, therefore, not only to measure the

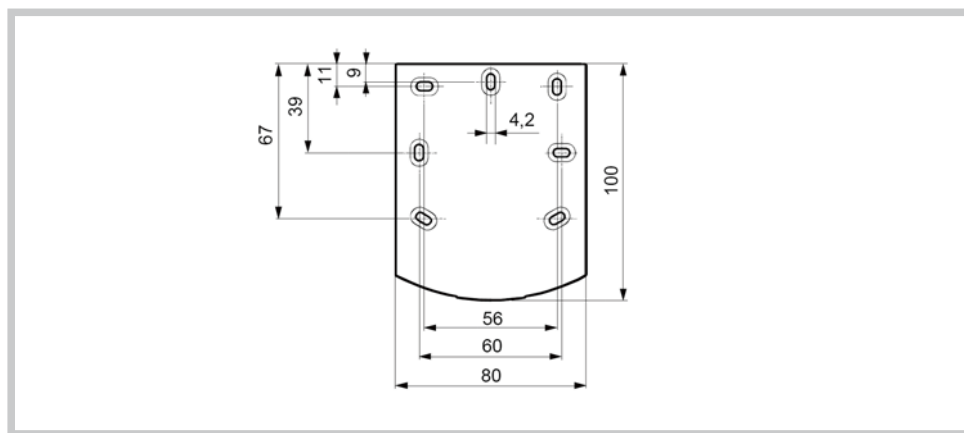
room temperature, but also to view the operating status of the heat pump, to enter the heat pump settings.



### ● Installation



The remote controller is powered by three 1.5 V alkaline batteries type AA (LR06).

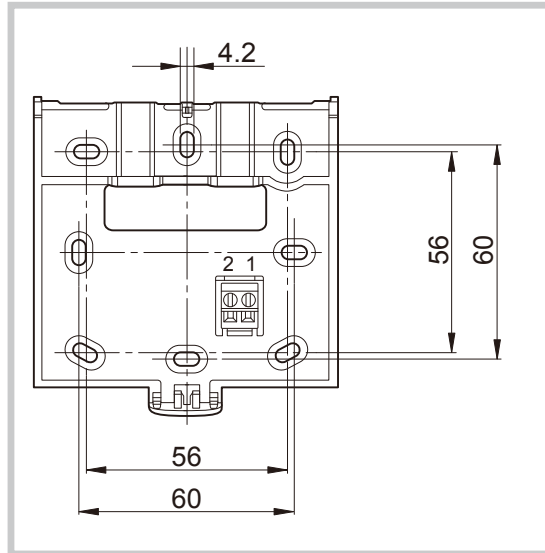
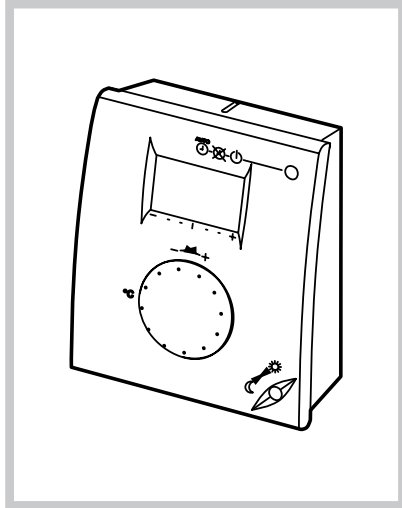


## 4-3. ROOM THERMOSTAT (Optional parts)

### ■ MODEL: UTW-C55XA

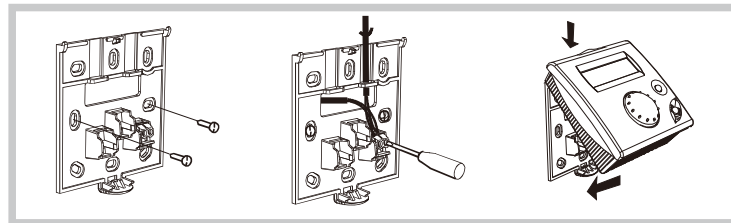
The room thermostat is optional. Select an appropriate place for the room thermostat by following these rules:

- Central room
- Installation height, approx. 1.5 m
- Inner wall
- Away from drafts
- Away from direct sunlight
- Do not install the thermostat behind a door or in any other place where it may receive shocks.



Air tightness faults in buildings often result in cold air being blown through the electrical sheathing.

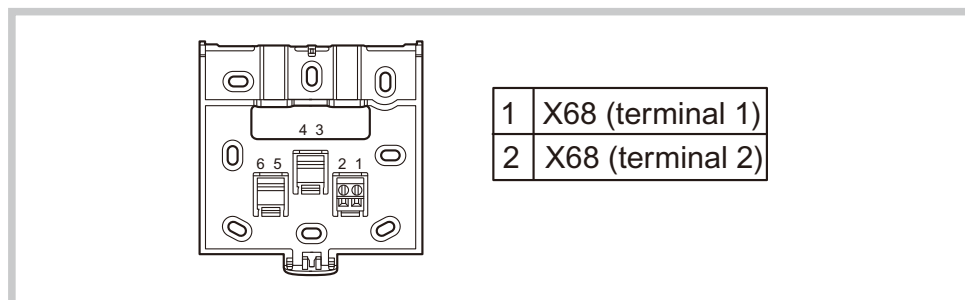
Do not hesitate to seal them off if a cold air draft comes into the back of the thermostat.



### ● Connections

The room thermostat must be connected to the connector X68 (terminals 1, 2) of the heat pump controller board. To do this, you can use a 0.5mm<sup>2</sup> cable of the two-pair telephone cable type.

If the cable is shielded, the shielding can be connected to the controller terminal 2. It may under no circumstances be connected on both sides, i.e. heat pump regulator side and room unit side.

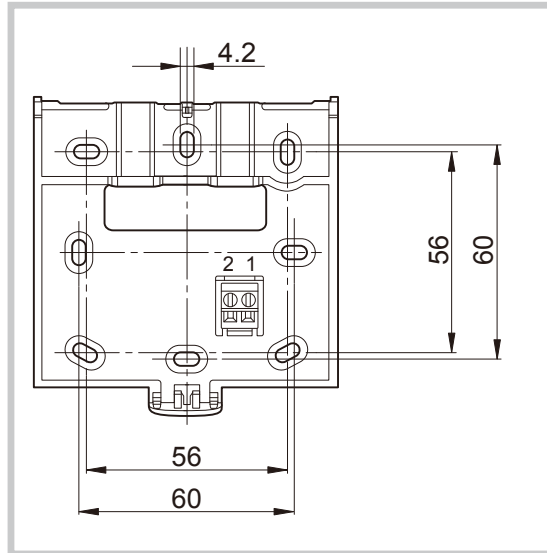
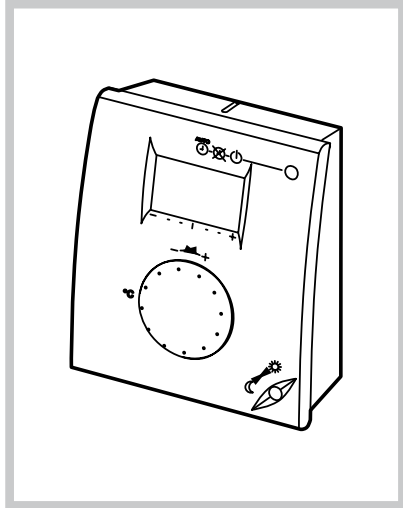




## ■ MODEL: UTW-C58XD (Wireless)

The room thermostat is optional. Select an appropriate place for the room thermostat by following these rules:

- Central room
- Installation height, approx. 1.5 m
- Inner wall
- Away from drafts
- Away from direct sunlight
- Do not install the thermostat behind a door or in any other place where it may receive shocks.



Air tightness faults in buildings often result in cold air being blown through the electrical sheathing.

Do not hesitate to seal them off if a cold air draft comes into the back of the thermostat.

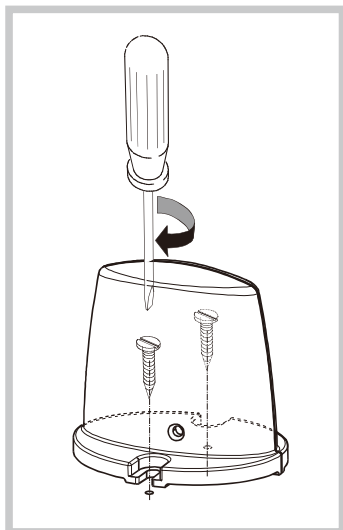
- The room thermostat is powered by two 1.5 V alkaline batteries type AA (LR06).

## 4-4. RF MODULE (Optional parts)

### ■ MODEL: UTW-M60XD, UTW-MRCXD

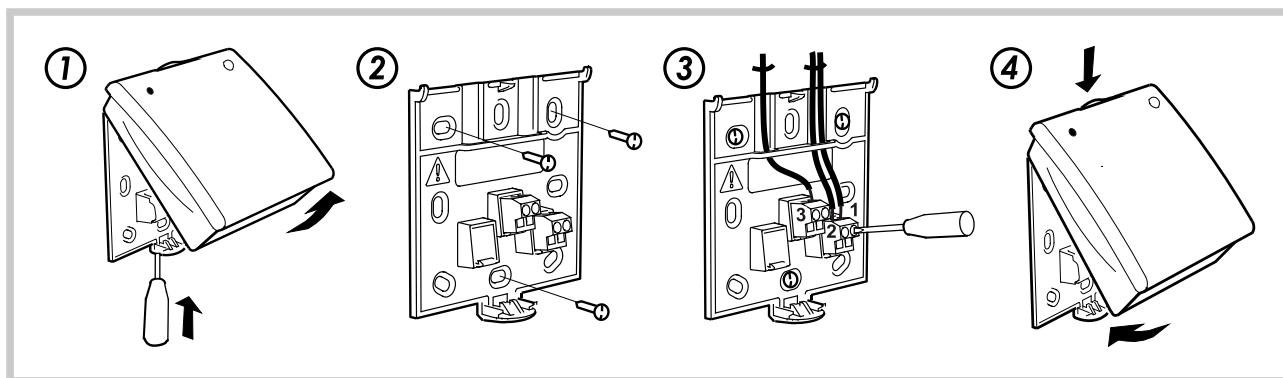
- The wireless components should be located such that transmission is as interference-free as possible. The following criteria must be observed:
- Not in the vicinity of electrical cables, strong magnetic fields or equipment, such as PCs, TV sets, microwave ovens, etc.
- Not near larger metal structures or constructional elements with fine metal meshes, such as special glass or special concrete
- The distance to the transmitter should not exceed 30 meters or 2 floors

#### ● UTW-M60XD



- Do not install the RF module inside metal casings.

#### ● UTW-MRCXD



#### ● Connections

##### - UTW-M60XD

The prefabricated cable is to be connected to terminal X60 of the heat pump's regulator.

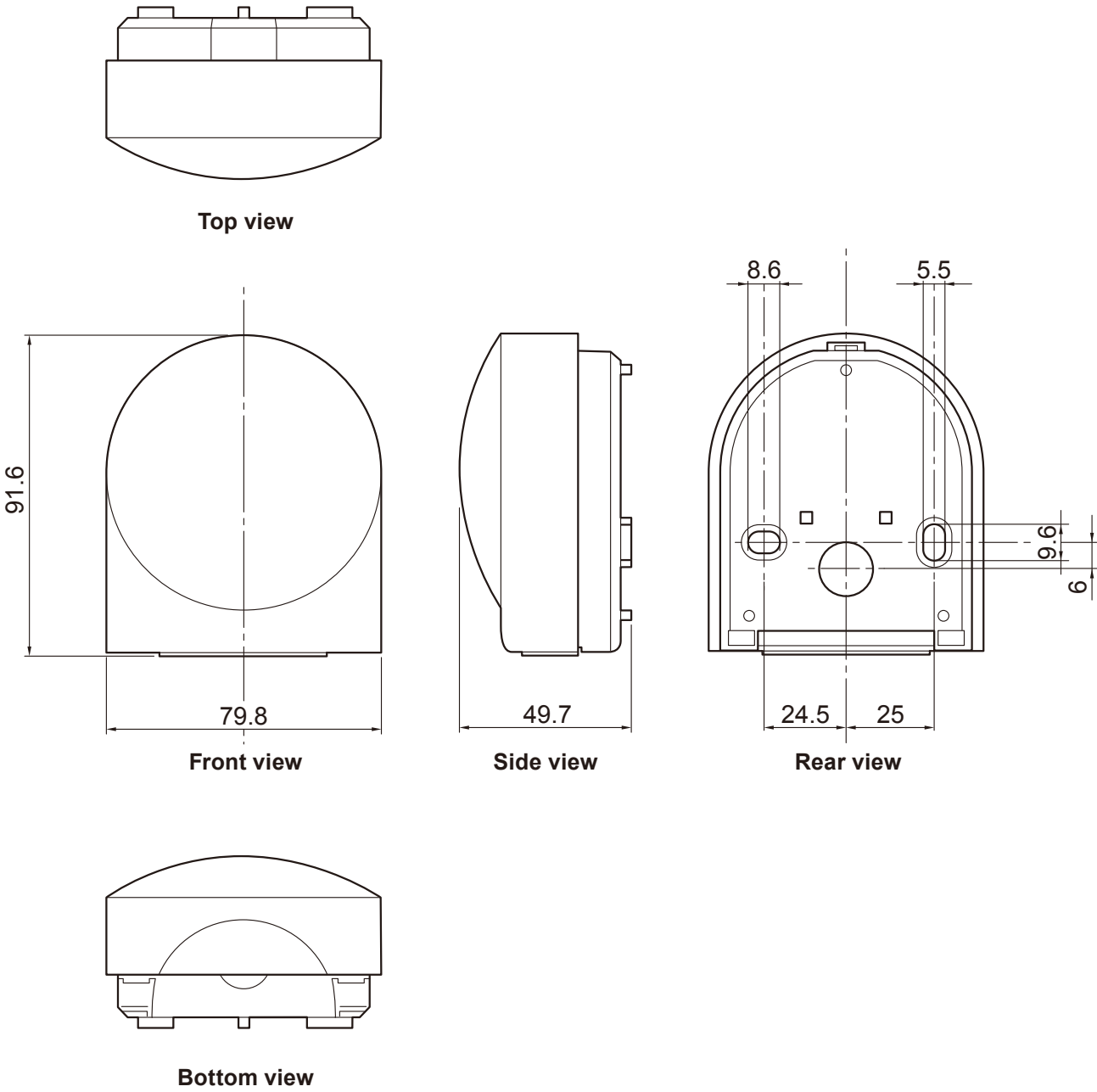
##### - UTW-MRCXD

The RF module must be connected to the connector X150 (terminals 1, 2, 3) of the regulation extension kit. To do this, you can use a 0.5mm<sup>2</sup> cable of the two-pair telephone cable type.

If the cable is shielded, the shielding can be connected to the controller terminal 2. It may under no circumstances be connected on both sides, i.e. heat pump regulator side and room unit side.

**5. DIMENSIONS**  
**5-1. OUTDOOR SENSOR**  
**■ MODEL: QAC34**

(Unit : mm)



CONTROL  
SYSTEM

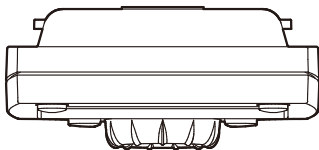
CONTROL  
SYSTEM

5-2. REMOTE CONTROLLER (Optional parts)

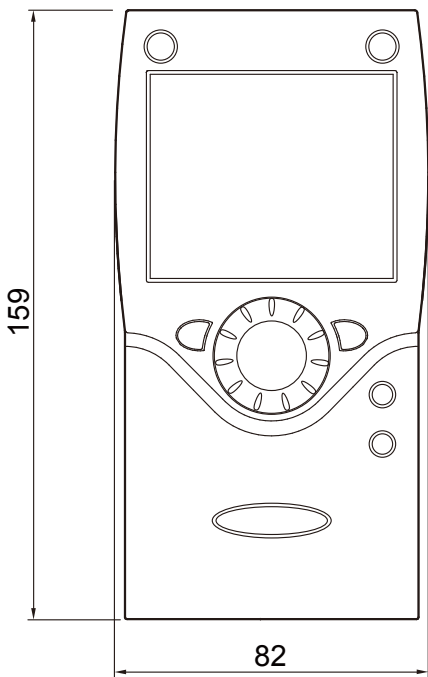
■ MODEL: UTW-C75XA / UTW-C78XD (Wireless)

● Controller

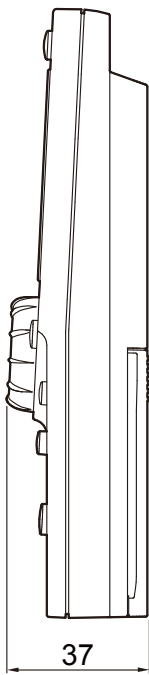
(Unit : mm)



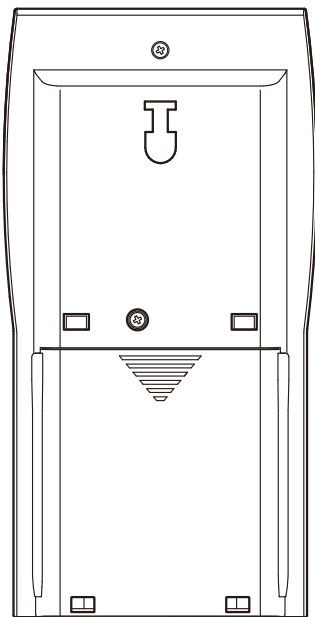
Top view



Front view

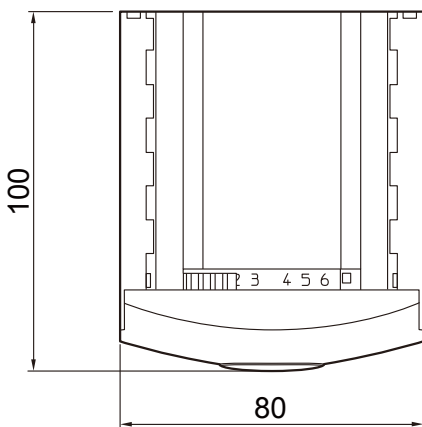


Side view

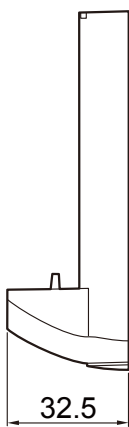


Rear view

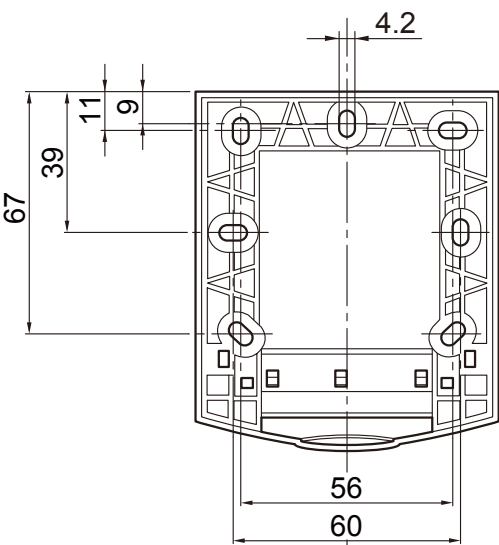
● Holder



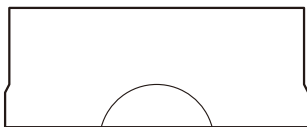
Front view



Side view



Rear view



Bottom view

CONTROL  
SYSTEM

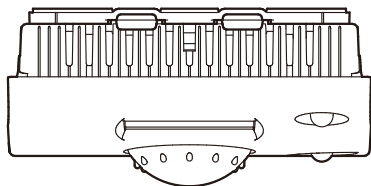
CONTROL  
SYSTEM

5-3. ROOM THERMOSTAT (Optional parts)

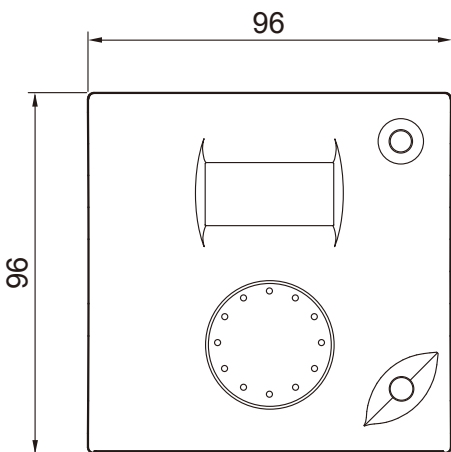
■ MODEL: UTW-C55XA / UTW-C58XD (Wireless)

● Unit

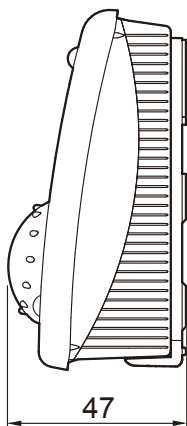
(Unit : mm)



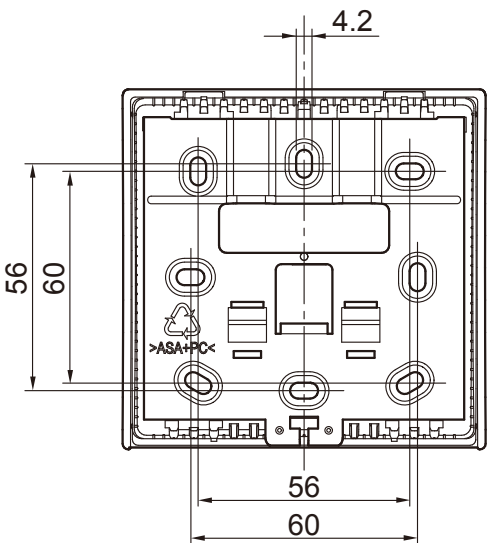
Top view



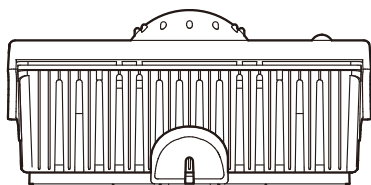
Front view



Side view



Rear view



Bottom view

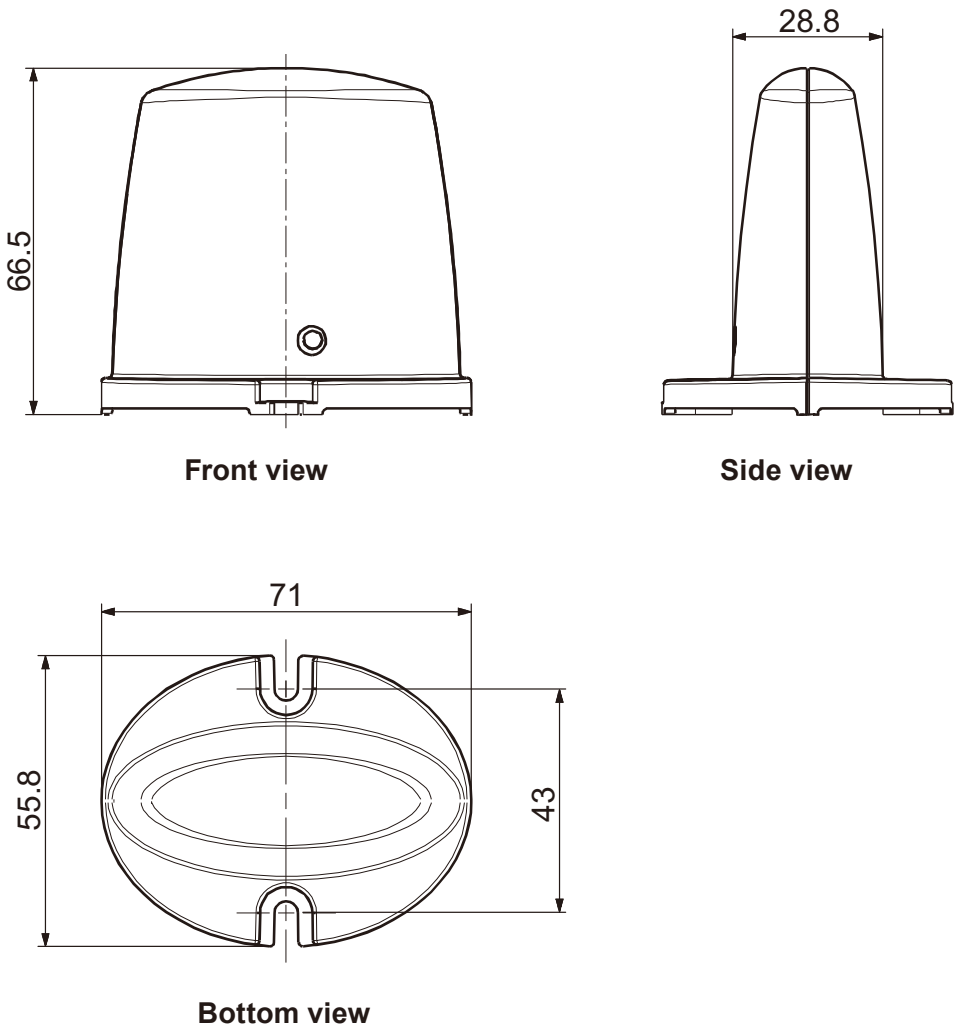
CONTROL  
SYSTEM

CONTROL  
SYSTEM

5-4. RF MODULE (Optional parts)

■ MODEL: UTW-M60XD

(Unit : mm)

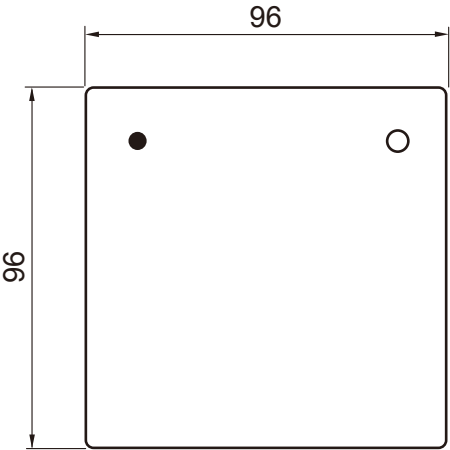


CONTROL  
SYSTEM

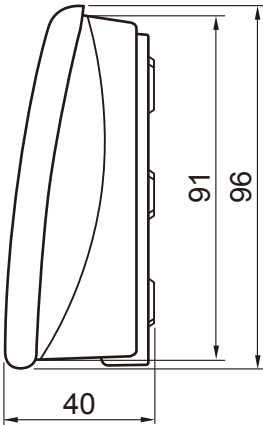
CONTROL  
SYSTEM

■ MODEL: UTW-MRCXD

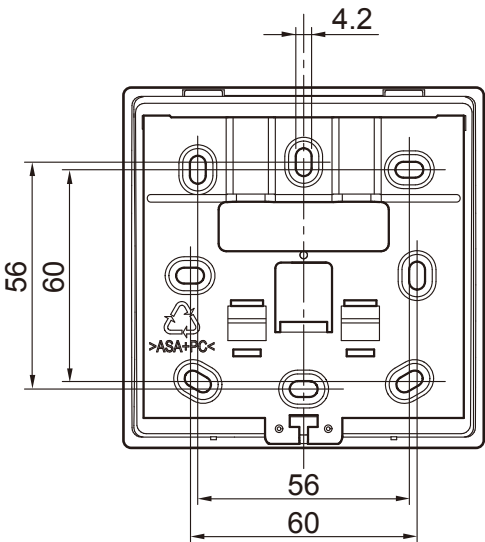
(Unit : mm)



Front view



Side view

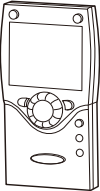
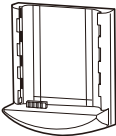
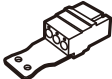



Rear view

## 6. PACKING LIST (Accessories)

### 6-1. REMOTE CONTROLLER (Optional parts)

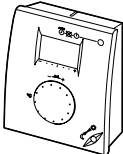
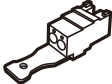

#### ■ MODEL: UTW-C75XA\* / UTW-C78XD (Wireless)

Name and shape	Quantity	Application
Remote controller 	1	Use for ATW operation
Remote controller holder 	1	Use as remote controller holder
Remote control connector (UTW-C75XA only) 	1	For remote control connection
Operating instructions 	1	

\* : If necessary , use shielded cable and tapping screw (Locally purchased) in accordance with the standard of the country.

### 6-2. ROOM THERMOSTAT (Optional parts)

#### ■ MODEL: UTW-C55XA\* / UTW-C58XD (Wireless)

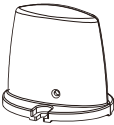

Name and shape	Quantity	Application
Room thermostat 	1	
Room thermostat connector (UTW-C55XA only) 	1	For room thermostat connection
Operating instructions 	1	

\* : If necessary , use shielded cable (Locally purchased) in accordance with the standard of the country.

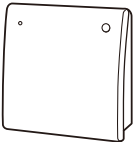



6-3. RF MODULE (Optional parts)

■ MODEL: UTW-M60XD

Name and shape		Quantity	Application
RF MODULE		1	
Operating instructions		1	

■ MODEL: UTW-MRCXD

Name and shape		Quantity	Application
RF MODULE		1	
Operating instructions		1	

## 7. WIRING SPECIFICATIONS

### 7-1. OUTDOOR SENSOR

#### ■ MODEL: QAC34

Use	Size	Wire type	Remarks
Outdoor sensor cable	0.75 mm <sup>2</sup>	2 wires connection Max. cable length: 60 m	Use shielded (locally purchased) in accordance with the regional cable standard

### 7-2. REMOTE CONTROLLER (Optional parts)

#### ■ MODEL: UTW-C75XA

Use	Size	Wire type	Remarks
Remote controller cable	0.5 mm <sup>2</sup>	3 wires connection Max. cable length: 200 m	Use shielded (locally purchased) in accordance with the regional cable standard

### 7-3. ROOM THERMOSTAT (Optional parts)

#### ■ MODEL: UTW-C55XA

Use	Size	Wire type	Remarks
Room thermostat cable	0.5 mm <sup>2</sup>	2 wires connection Max. cable length: 200 m	Use shielded (locally purchased) in accordance with the regional cable standard

### 7-4. RF MODULE (Optional parts)

#### ■ MODEL: UTW-MRCXD

Use	Size	Wire type	Remarks
RF module cable	0.5 mm <sup>2</sup>	3 wires connection Max. cable length: 200 m	Use shielded (locally purchased) in accordance with the regional cable standard

## 8. SPECIFICATIONS

### 8-1. OUTDOOR SENSOR

#### ■ MODEL: QAC34

SIZE ( H x W x D mm )	91.6 x 79.8 x 49.7
WEIGHT ( g )	73
CABLE LENGTH ( m )	60

### 8-2. REMOTE CONTROLLER (Optional parts)

#### ■ MODEL: UTW-C75XA

SIZE ( H x W x D mm )	185 x 82 x 42
WEIGHT ( g )	170
CABLE LENGTH ( m )	200
POWER ( V )	12

#### ■ MODEL: UTW-C78XD (wireless)

SIZE ( H x W x D mm )	185 x 82 x 42
WEIGHT ( g )	312
BATTERIES	1.5V alkaline size AA (LR06) 3 pieces
FREQUENCY BAND (MHz)	868

### 8-3. ROOM THERMOSTAT (Optional parts)

#### ■ MODEL: UTW-C55XA

SIZE ( H x W x D mm )	96 x 96 x 47
WEIGHT ( g )	115
CABLE LENGTH ( m )	Max. 200
POWER ( V )	12

#### ■ MODEL: UTW-C58XD (Wireless)

SIZE ( H x W x D mm )	96 x 96 x 47
WEIGHT ( g )	165
BATTERIES	1.5V alkaline size AA (LR06) 2 pieces
FREQUENCY BAND (MHz)	868

## 8-4. RF MODULE (Optional parts)

### ■ MODEL: UTW-M60XD

SIZE ( H x W x D mm )	67 x 71 x 56
WEIGHT ( g )	54
CABLE LENGTH ( m )	1.5
POWER ( V )	5.5
FREQUENCY BAND (MHz)	868

### ■ MODEL: UTW-MRCXD

SIZE ( H x W x D mm )	96 x 96 x 40
WEIGHT ( g )	115
CABLE LENGTH ( m )	Max. 200
POWER ( V )	12
FREQUENCY BAND (MHz)	868



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