Cassette
Fan Coil Units

Operation and Installation Manual



CF2 – 2-pipe system (AC and EC) | CF4 – 4-pipe system (AC)

- All installation work must be carried out by qualified technicians.
- Please read this manual carefully and follow the steps exactly as described.
- Keep this manual in a safe place for future reference.
- Our products are continuously developed and improved. The information in this document is subject to change without prior notice.
- Only qualified personnel may install and service the equipment covered by this document.

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1 Safety and User Information

1.2 Safety instructions

The 4-way cassette fan coil units are developed and manufactured in accordance with state-of-the-art technological standards and established technical safety norms and regulations, and comply with the Machinery Safety Directive.| 3

Nevertheless, all fan coil units involve residual risks of injury to the user or to third parties, and of material damage to the unit or to other objects. For this reason all safety instructions must be observed. Ignoring them creates risks to health and safety and can lead to environmental damage and/or extensive material damage.

The safety instructions in this chapter apply to the whole manual. They are repeated in short form at the beginning of the commissioning and maintenance chapters.

ELECTRICAL HAZARD

Before carrying out any work on the unit, power the unit down to avoid injury from electric current. Check that the unit is isolated and ensure that the on-site power supply point is secured against being switched back on.

DANGER OF SCALDING

Before performing work on the valves or on the inlet or outlet pipes, shut off the heating or cooling water inlet to prevent scalding. Do not start work before the heating water has cooled down.

DANGER FROM ROTATING PARTS

Rotating fan wheels can cause injury. Before performing any work on the unit, ensure that it is powered down and that the on-site power supply point is secured against being switched back on

DANGER FROM OVERHEAD LOADS

Wear a helmet and safety boots to prevent injury from falling components, especially when fitting the unit to the ceiling. Ceiling installation must always be performed by two people.

RISK OF PERSONAL INJURY

Always wear protective gloves when moving or fitting the unit, to avoid injury from sharp edges.

1.3 Important notes

Fan coil units are terminal units of a chilled/hot water air conditioning system. They are technically demanding products and may be installed, operated and maintained only by qualified, specially trained and authorised staff.

1 Safety and User Information (continued)

1.4 Proper use

4-way cassette fan coil units are designed exclusively for heating, filtering and cooling of room air. Chilled water/hot water may be used as the medium. The following limit values apply to the chilled/hot water when operating Cu/Al heat exchangers:| 4

Table 1 Water quality limit values for Cu/Al heat exchangers

Parameter	Symbol	Unit	Value
pH value (at 20 °C)			7,5 – 9
Conductivity (at 20 °C)		µS/cm	< 700
Oxygen content	O_2	mg/l	< 0,1
Total hardness		°dH	1 – 15
Dissolved sulphur	S		not detectable
Sodium	Na^+	mg/l	< 100
Iron	Fe^{2+}, Fe^{3+}	mg/l	< 0,1
Manganese	Mn^{2+}	mg/l	< 0,05
Ammonium content	NH_4^+	mg/l	< 0,1
Chloride	Cl^-	mg/l	< 100
Sulphate	SO_4^{2-}	mg/l	< 50
Nitrite	NO_2^-	mg/l	< 50
Nitrate	NO_3^-	mg/l	< 50

NOTE

In open systems (for example when well water is used) the limit values in the table above must be observed and the water must additionally be cleaned of suspended matter by a filter installed at the inlet. Otherwise there is a risk of erosion by suspended matter.

The unit must be protected from dust and other substances that cause an acidic or alkaline reaction in combination with water (aluminium corrosion).

- The units may be used indoors only.
- The units may also be fitted into an intermediate (false) ceiling.

Proper use also includes observance of this manual and of the prescribed inspection and maintenance conditions. The user is responsible for proper use.

1.5 Improper use

The unit is considered to be used in an improper manner if it is applied for a purpose that is not covered by the scope of this manual. In such a case the manufacturer or supplier is not liable for any resulting damage; the user alone bears the full risk.

The 4-way cassette fan coil may not be operated:| 4

- for the treatment of outside air;
- in locations where there is a risk of explosion;
- in wet areas;
- in locations with high dust levels or aggressive air.

1 Safety and User Information (continued)

RISK OF PERSONAL INJURY AND MATERIAL DAMAGE

Improper use can cause personal injury and material damage.

1.6 Operating limits

Table 2 Operating limits

Unit and heat exchanger	Value
Max. operating pressure	1,6 MPa (16 bar)
Max./min. water temperature	75 °C / 2 °C
Operating voltage	220–230 V AC, 1 Ph, 50 or 60 Hz
Insulation class	B – see drawing
Power consumption and current	See the technical data in section 2.3 and the rating plate
Ambient conditions	Indoor installation only; installation height ≤ 3,5 m (see 5.4.2)

2 Product Introduction

2.1 Model designation

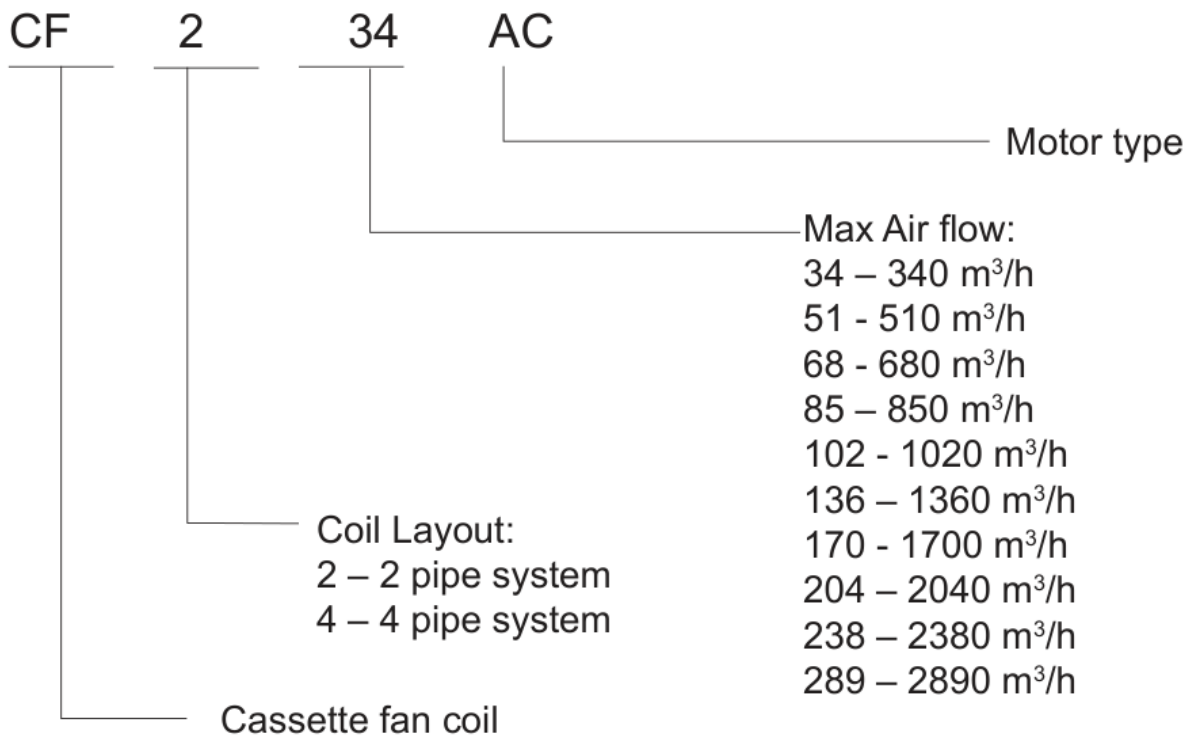


Fig. 1 Model designation key

Example: CF2-136-AC = cassette fan coil, 2-pipe system, maximum air flow 1360 m³/h, AC motor.| 5

2.2 Available versions

Table 3 Available sizes

Series	Motor	Sizes
CF2 – 2-pipe	AC	34, 51, 68, 85, 102, 136, 170, 204, 238, 289
CF2 – 2-pipe	EC	34, 51, 68, 85, 102, 136, 170, 204, 238
CF4 – 4-pipe	AC	68, 85, 102, 136, 170, 204, 238, 289
CF4 – 4-pipe	EC	68, 85, 102, 136, 170, 204, 238

- AC version: asynchronous 4-speed motor, three fan speeds selected by the infrared remote controller or a wall controller.
- EC version: variable-speed EC motor, lower power input, speed set from the wall controller in five-step or stepless mode (see chapter 3). The EC motors are supplied by JEAMO or Shangqi. The EC motor is available in the 2-pipe system only.
- An auxiliary electric heater can be added on request; this is a non-standard (customised) option.

2 Product Introduction (continued)

2.3 Technical data

Table 4 CF2 – 2-pipe system, AC motor (full designation CF2-...-AC)

Model			CF2-34-AC	CF2-51-AC	CF2-68-AC	CF2-85-AC	CF2-102-AC	CF2-136-AC	CF2-170-AC	CF2-204-AC	CF2-238-AC	CF2-289-AC
Air flow	m³/h	High	340	510	680	850	1020	1360	1700	2040	2380	2890
		Med.	255	383	510	638	765	1020	1275	1530	1785	2100
		Low	170	255	340	425	510	680	850	1020	1190	1600
Total cooling capacity 7/12/27 °C	W	High	1648	2491	3318	4107	4945	6678	8227	9909	11458	13915
		Med.	1318	1993	2655	3286	3956	5342	6582	7927	9167	10645
		Low	989	1495	1991	2464	2967	4007	4936	5946	6875	8460
Sensible cooling capacity 7/12/27 °C	W	High	1361	2100	2790	3370	4091	5700	6779	8240	9319	11319
		Med.	1089	1680	2232	2696	3273	4560	5423	6592	7455	8659
		Low	816	1260	1674	2022	2454	3420	4068	4944	5592	6882
Heating capacity 60/50/20 °C	W	High	2668	3986	5367	6693	8026	10755	13298	16083	18772	23596
		Med.	2135	3189	4294	5354	6420	8604	10638	12866	15018	17414
		Low	1601	2392	3220	4016	4815	6453	7979	9650	11263	13733
Power supply voltage			220–230 V / 1 Ph / 50 or 60 Hz									
Power input	W		36	50	60	74	93	130	147	183	221	330
Power consumption	W		24	38	48	62	81	118	135	171	209	318
Running current	A		0,16	0,22	0,26	0,32	0,40	0,57	0,64	0,80	0,96	1,43
Sound pressure level	dB(A)	High	37	39	41	43	45	46	48	50	52	57
		Med.	30	33	36	34	36	41	41	43	47	53
		Low	26	29	32	30	32	34	35	37	43	48
Water flow	l/h		283	428	571	706	850	1148	1415	1704	1970	2393
Water resistance	kPa		30	30	30	30	40	40	40	40	50	50
Max. operating pressure			1,6 MPa (16 bar) – see Annex C, item 7									
Insulation class			B									
Fan type			Centrifugal									
Motor type			Single-phase permanent split capacitor (PSC) motor, 4-speed									
Heat exchanger			2-pipe, copper – aluminium, hydrophobic coating									
Pipe connections			G 3/4" internal thread									
Condensate connection			Ø 26 mm									
Controller			Infrared remote control (supplied); TC86 / Modbus RTU optional									
Unit dimensions (L/W/H)	mm	Unit	580 × 580 × 250			705 × 705 × 290			832 × 832 × 290			960 × 960 × 290
		Panel	680 × 680 × 30			830 × 830 × 30			980 × 980 × 30			1140 × 1140 × 30
Packaging dimensions (L/W/H)	mm	Unit	675 × 675 × 270			800 × 800 × 310			925 × 925 × 310			1054 × 1054 × 305
		Panel	720 × 710 × 75			860 × 860 × 75			1010 × 1010 × 75			1170 × 1170 × 75
Net weight	kg	Unit	16,4			21,5			26,7			37,6
		Panel	2,3			3,3			5,2			7,8
Gross weight	kg	Unit	19,0			24,3			30,5			42,2
		Panel	3,3			4,9			7,1			10,5

2 Product Introduction (continued)

Table 5 CF2 – 2-pipe system, EC motor (full designation CF2-...-EC)

Model			CF2-34-EC	CF2-51-EC	CF2-68-EC	CF2-85-EC	CF2-102-EC	CF2-136-EC	CF2-170-EC	CF2-204-EC	CF2-238-EC
Air flow	m³/h	High	340	510	680	850	1020	1360	1700	2040	2380
		Med.	255	383	510	638	765	1020	1275	1530	1785
		Low	170	255	340	425	510	680	850	1020	1190
Total cooling capacity 7/12/27 °C	W	High	1660	2510	3345	4144	4987	6726	8298	9990	11564
		Med.	1328	2008	2676	3315	3989	5381	6638	7992	9251
		Low	996	1506	2007	2486	2992	4036	4979	5994	6938
Sensible cooling capacity 7/12/27 °C	W	High	1359	2100	2791	3371	4091	5701	6779	8239	9320
		Med.	1088	1680	2232	2697	3273	4560	5424	6591	7456
		Low	816	1260	1674	2022	2455	3420	4068	4944	5592
Heating capacity 60/50/20 °C	W	High	2667	3984	5368	6692	8025	10757	13304	16083	18772
		Med.	2134	3187	4294	5353	6420	8605	10643	12867	15017
		Low	1600	2390	3221	4015	4815	6454	7983	9650	11263
Power supply voltage			220–230 V / 1 Ph / 50 or 60 Hz								
Power input	W		22	30	36	44	56	78	88	114	139
Power consumption	W		10	18	24	32	44	66	76	102	127
Running current	A		0,10	0,14	0,16	0,20	0,25	0,35	0,40	0,52	0,63
Sound pressure level	dB(A)	High	37	39	41	43	45	46	48	50	52
		Med.	30	33	36	34	36	41	41	43	47
		Low	26	29	32	30	32	34	35	37	43
Water flow	l/h		286	432	575	713	858	1157	1427	1718	1989
Water resistance	kPa		30	30	30	30	40	40	40	40	50
Max. operating pressure			1,6 MPa (16 bar) – see Annex C, item 7								
Insulation class			B								
Fan type			Centrifugal								
Motor type			EC motor, variable speed								
Heat exchanger			2-pipe, copper – aluminium, hydrophobic coating								
Pipe connections			G 3/4" internal thread								
Condensate connection			Ø 26 mm								
Controller			Infrared remote control (supplied); TC86 / Modbus RTU optional								
Unit dimensions (L/W/H)	mm	Unit	580 × 580 × 250			705 × 705 × 290			832 × 832 × 290		
		Panel	680 × 680 × 30			830 × 830 × 30			980 × 980 × 30		
Packaging dimensions (L/W/H)	mm	Unit	675 × 675 × 270			800 × 800 × 310			925 × 925 × 310		
		Panel	720 × 710 × 75			860 × 860 × 75			1010 × 1010 × 75		
Net weight	kg	Unit	16,4			21,5			26,7		
		Panel	2,3			3,3			5,2		
Gross weight	kg	Unit	19,0			24,3			30,5		
		Panel	3,3			4,9			7,1		

2 Product Introduction (continued)

Table 6 CF4 – 4-pipe system, AC motor (full designation CF4-...-AC)

Model			CF4-68-AC	CF4-85-AC	CF4-102-AC	CF4-136-AC	CF4-170-AC	CF4-204-AC	CF4-238-AC	CF4-289-AC
Air flow	m³/h	High	680	850	1020	1360	1700	2040	2380	2890
		Med.	510	638	765	1020	1275	1530	1785	2100
		Low	340	425	510	680	850	1020	1190	1600
Total cooling capacity 7/12/27 °C	W	High	2331	2797	3214	4421	5432	6350	7487	9301
		Med.	1853	2274	2623	3497	4422	5118	5997	7533
		Low	1424	1689	1967	2617	3314	3886	4582	5692
Sensible cooling capacity 7/12/27 °C	W	High	2022	2554	2972	3961	4884	5629	6508	8337
		Med.	1608	2076	2425	3133	3975	4537	5213	6753
		Low	1236	1542	1819	2345	2979	3445	3983	5102
Heating capacity 60/50/20 °C	W	High	3330	4293	5344	5918	8003	9070	10600	15072
		Med.	2481	3267	3992	4521	6122	6793	8013	11455
		Low	1762	2314	2848	3219	4337	4816	5756	8139
Power supply voltage			220–230 V / 1 Ph / 50 or 60 Hz							
Power input	W		62	76	96	132	152	189	220	330
Power consumption	W		48	62	81	118	135	171	209	318
Running current	A		0,27	0,33	0,38	0,58	0,78	0,80	1,07	1,43
Sound pressure level	dB(A)	High	41	43	45	46	47	50	52	57
		Med.	36	34	36	41	41	43	47	53
		Low	32	30	32	34	35	37	43	48
Water flow	l/h		401	481	553	760	934	1092	1287	1599
			286	369	459	509	688	780	911	1296
Water resistance	kPa		9	13	17	20	21	18	26	32
			1	2	2	3	6	9	8	12
Max. operating pressure			1,6 MPa (16 bar) – see Annex C, item 7							
Insulation class			B							
Fan type			Centrifugal							
Motor type			Single-phase permanent split capacitor (PSC) motor, 4-speed							
Heat exchanger			4-pipe, copper – aluminium, hydrophobic coating							
Pipe connections			G 3/4" internal thread							
Condensate connection			Ø 26 mm							
Controller			Infrared remote control (supplied); TC86 / Modbus RTU optional							
Unit dimensions (L/W/H)	mm	Unit	580 × 580 × 250	705 × 705 × 290			832 × 832 × 290			960 × 960 × 290
		Panel	680 × 680 × 30	830 × 830 × 30			980 × 980 × 30			1140 × 1140 × 30
Packaging dimensions (L/W/H)	mm	Unit	675 × 675 × 270	800 × 800 × 310			925 × 925 × 310			1054 × 1054 × 305
		Panel	720 × 710 × 75	860 × 860 × 75			1010 × 1010 × 75			1170 × 1170 × 75
Net weight	kg	Unit	17,0	22,2			27,4			
		Panel	2,3	3,4			5,2			
Gross weight	kg	Unit	19,6	25			31,2			
		Panel	3,4	4,9			7,2			

2.3.1 Heating capacity at other water temperatures

The heating capacities in tables 4 to 6 are the manufacturer rating at entering water 60 °C and entering air 21 °C. Heat pump systems normally operate at considerably lower flow temperatures, at which the output of the same unit is much smaller. Multiply the tabulated heating capacity by the factor below.
Ratings are based on the following test conditions: cooling - entering air 27 C DB / 19,5 C WB, water 7/12 C; heating - entering air 21 C, water 60 C. Sound data are sound pressure levels in dB(A), measured in an acoustic room 1,5 m below the vertical centre line of the unit (the national standard requires the sound pressure level, not the sound power level).

Table 4a Heating capacity correction factors (room air 20 °C)

Water flow / return °C	Correction factor	Example: CF2-136, high speed (kW)
70/60	1,28	13,8
65/55	1,14	12,3
60/50	1,00	10,8
55/45	0,86	9,3
50/40	0,72	7,8
45/40	0,64	6,9
45/35	0,58	6,3
40/35	0,50	5,4
35/30	0,36	3,9

The water flow must be recalculated for the new temperature difference: Q [l/h] = P [W] × 0,86 / Δt [K]. For CF2-136 at 45/40 °C this gives 6912 × 0,86 / 5 = 1189 l/h.

2.4 Unit components

Exploded views of the four unit variants, together with a combined component list covering all variants, are given in Annex B. They are intended for service purposes and for the identification of parts when ordering.

2.5 Decorative panel

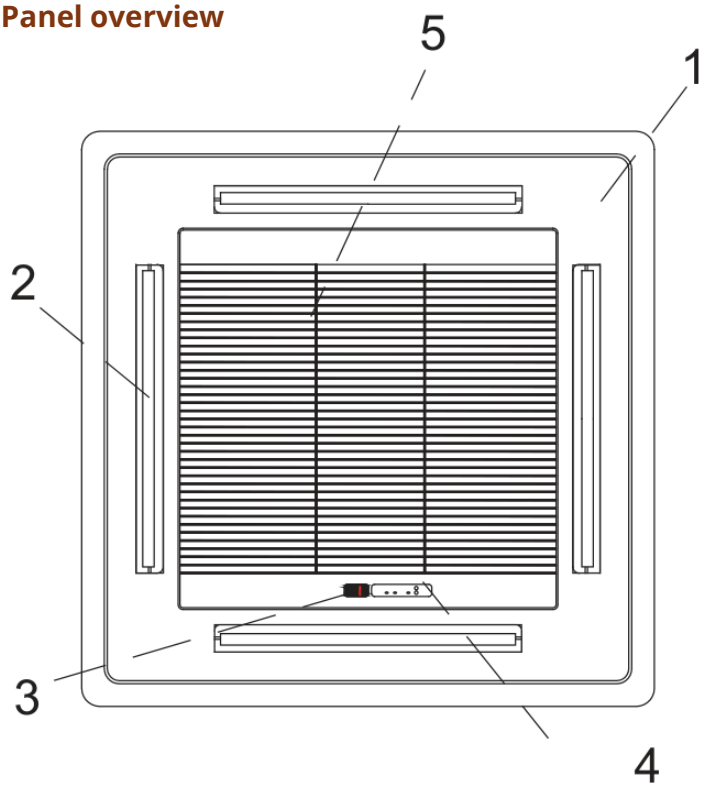
DANGER FROM ROTATING PARTS

Do not put fingers or any other objects into the air inlet, the air outlet or the swing louver while the unit is in operation. The high-speed fan can cause serious injury.

NOTE

- The unit must not be cleaned with water; this may cause a short circuit or destroy the unit.
- Close the air inlet grille properly after cleaning the air filter.
- Operate the unit strictly according to these instructions; otherwise leakage or abnormal operation may occur.
- Adjust the room temperature appropriately, especially where elderly people, children or sick persons are present.
- Lightning and electromagnetic radiation may affect the unit. If this happens, switch the power off and on again.
- Blocking or covering the air outlet and inlet is forbidden.

2.5.1 Panel overview



1. Body frame
2. Louver
3. Remote signal receiver
4. LED display
5. Air inlet grille

Fig. 2 Decorative panel: 1 body frame, 2 louver, 3 remote signal receiver, 4 LED display, 5 air inlet grille

2.5.2 Remote receiver, buzzer and LED display

Remote receiver: receives the commands sent by the infrared remote controller. Point the controller at the receiver on the panel.
Buzzer: sounds when the unit is switched on and each time an infrared command is correctly received.

LED display: if the unit malfunctions, the self-diagnostic system identifies the fault automatically and indicates it by the green LED. Fault codes are listed in section 7.5.

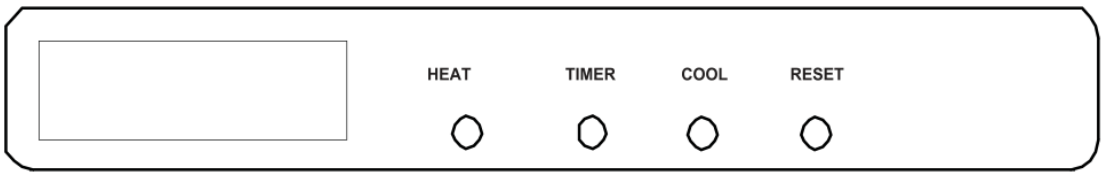


Fig. 3 LED display

- COOL (green): cooling mode
- TIMER (yellow): timer function
- HEAT (red): heating mode
- RESET: with the unit switched off, pressing RESET starts cooling mode; pressing again starts heating mode; pressing a third time switches the system off.

3 Control

CF cassette fan coils can be controlled by the supplied infrared remote controller, by a wall controller or through a Modbus RTU building management system.| 12

3.1 Infrared remote controller

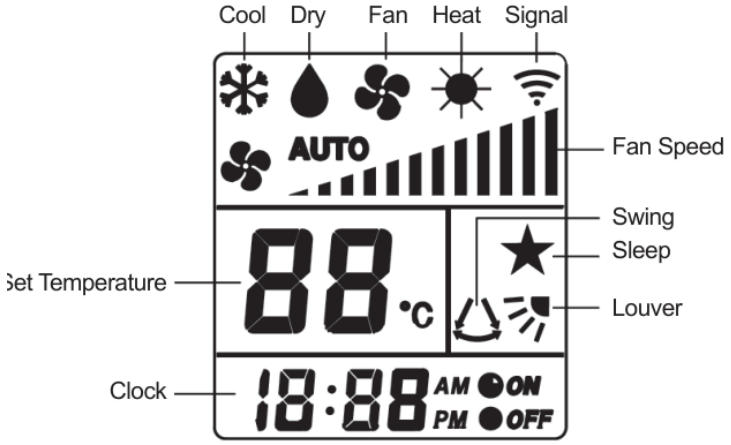


Fig. 4 Display of the infrared remote controller

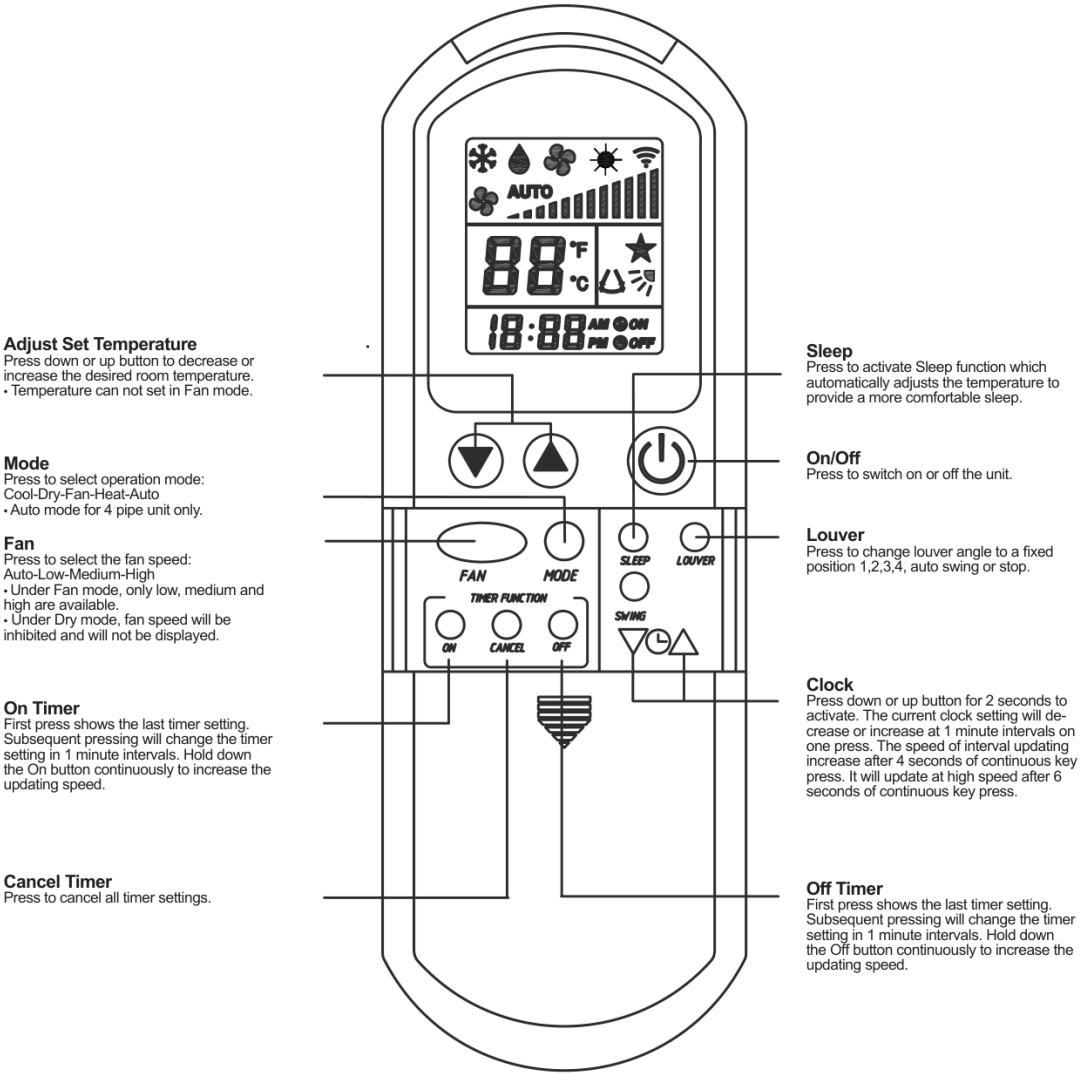


Fig. 5 Infrared remote controller – buttons and functions

NOTE

The remote controller is supplied with the unit and is powered by two AAA 1,5 V cells. Slide the cover on the back downwards to insert or replace them. A wall holder is included.

Table 8 Remote controller functions

Parameter	Symbol
On/Off	Switches the unit on and off.
Temp ▲ / ▼	Increases or decreases the set room temperature. The temperature cannot be set in Fan mode.
Mode	Selects the operating mode: Cool → Dry → Fan → Heat → Auto. In Auto mode both the cool and the heat symbol are lit. Auto mode is available on 4-pipe units only.
Fan	Selects the fan speed: Auto → Low → Medium → High. In Fan mode only low, medium and high are available. In Dry mode the fan speed is fixed and is not displayed.
Timer On	The first press shows the last timer setting; each further press changes the setting in steps of 1 minute. Hold the button down to speed up the adjustment.
Timer Off	The first press shows the last timer setting; each further press changes the setting in steps of 1 minute. Hold the button down to speed up the adjustment.
Timer Cancel	Cancels all timer settings.
Swing	Switches the swing function on and off.
Louver	Sets the louver to fixed position 1, 2, 3 or 4, to automatic swing, or stops it.
Sleep	Activates the energy-saving sleep function, which adjusts the temperature automatically to provide comfortable sleeping conditions.
Clock ▲ / ▼	Press for 2 seconds to activate. Each press changes the clock by 1 minute; the adjustment accelerates after 4 seconds and again after 6 seconds of continuous pressing.

3.2 Wall controller TC86 (optional)

The TC86 room thermostat is a wall-mounted controller for everyday operation. It is connected to connector CN11 on the main board of the unit.

Table 9 TC86 room thermostat

Dimensions	88 × 88 × 43 mm
Supply voltage	24 V DC, max. 3 A
Power consumption	1,5 W
Operating temperature range	5–35 °C
Functions	Weekly temperature schedule programming, mode and fan speed selection

3 Control (continued)

3.3 Speed control of the EC versions

The speed of the EC units is set from the wall controller. Control is by signal (command) transmission, not by a 0-10 V analogue signal. The wall controller provides a five-step (gear) mode with speeds from Low to High, and a stepless mode adjustable from 30 % to 100 %; the two modes are switched with the MODE + UP key combination. The main-board configuration jumpers (cooling and heating or cooling only; 2-pipe or 4-pipe; with or without valve; pre-heat 36 C or 28 C) are set at the factory. The internal service switches S3 and S5 are for factory and debugging use only and are not accessible to the user.

3.4 Modbus RTU (optional)

Units can be supplied with a communication board (PCB2). The board is connected to connector CN3 of the main board and provides two RS-485 terminal pairs (A/B) so that the communication line can be looped from unit to unit. The DIP switch block S1 on PCB2 is used for addressing.
The board also supports master-slave operation: DIP switch SW6 (DIP6) sets a unit as master (ON) or slave (OFF), and the first five DIP switches set the address (Modbus address = binary value of the switches + 1). One master controls up to 31 slave units; a higher-level system can control up to 64 master-slave groups, i.e. up to 2048 units, in broadcast or point-to-point mode. See the separate document 'Master-slave address code setting (cassette type)' for details.

4 Dimensions and Wiring Diagrams

4.1 Dimensions

4.1.1 2-pipe system

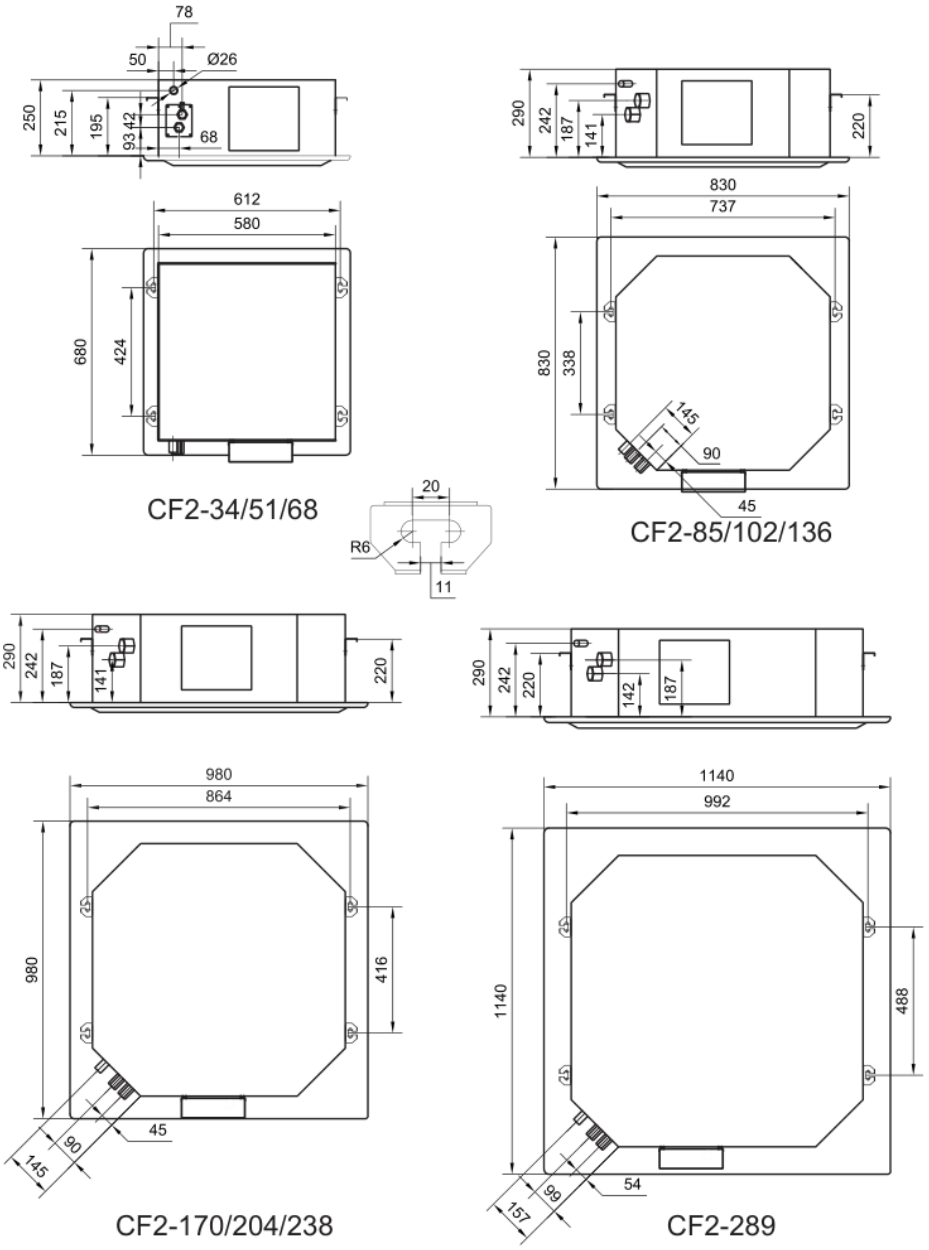


Fig. 6 Dimensions, CF2 (all dimensions in mm)

Table 10 Dimensions CF2 (mm)

Dimension	CF2-34/51/68	CF2-85/102/136	CF2-170/204/238	CF2-289
A – panel	680	830	980	1140
B – see drawing	424	338	416	488
C – body + 32 mm	612	737	864	992
D – unit body	580	705	832	960
H	see drawing	45	45	54
I	see drawing	90	90	99
J	see drawing	145	145	157

4 Dimensions and Wiring Diagrams (continued)

4.1.2 4-pipe system

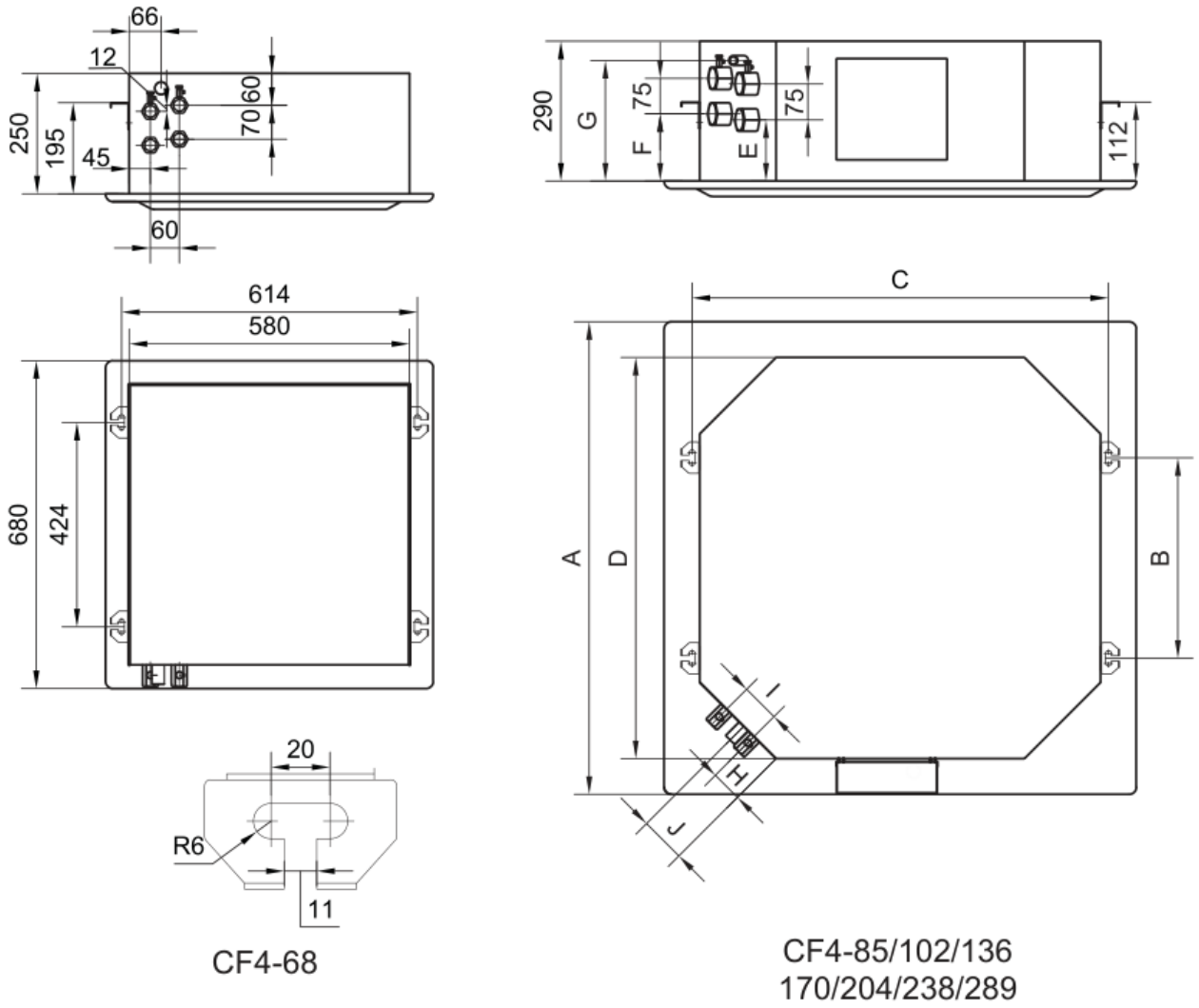


Fig. 7 Dimensions, CF4 (all dimensions in mm)

Table 11 Dimensions CF4 (mm)

Dimension	CF4-68	CF4-85/102/136	CF4-170/204/238	CF4-289
A – panel	680	830	980	1140
B – see drawing	424	338	416	488
C – body + 32 mm	614	737	864	992
D – unit body	580	705	832	960
E	–	135	139	139
F	–	148	127	127
G	–	262	250	250
H	see drawing	59	65	77
I	see drawing	80	80	67
J	see drawing	99	95	100

4 Dimensions and Wiring Diagrams (continued)

NOTE

The dimensions above are taken from the dimensional drawings of the original manual. The dimension tables in the brochure contain a column shift and must not be used. See Annex C, item 8.

4.1.3 Ceiling opening

The panel and unit dimensions per size group are given in section 2.3. Section 5.5.3 requires the installer to check the ceiling opening before the panel is fitted.

Table 12 Ceiling opening

Size group	Unit body (mm)	Ceiling opening W × D (mm)
34 / 51 / 68	580 × 580	612 × 612 (CF4-68: 614 × 614)
85 / 102 / 136	705 × 705	737 × 737
170 / 204 / 238	832 × 832	864 × 864
289	960 × 960	992 × 992

4.2 Wiring diagrams

NOTE

The binding connection diagram is the one attached to the inside of the cover of the electrical box of the delivered unit. The diagrams below are for information and apply to the AC (4-way) versions; for the EC (8-way) versions refer to the wiring diagram in the manufacturer's 8-way series manual (control is by signal transmission, not 0-10 V).

The jumper settings and the fault codes are identical for all variants and are given once, in section 4.2.4 and section 7.5.

4.2.1 2-pipe system, without Modbus

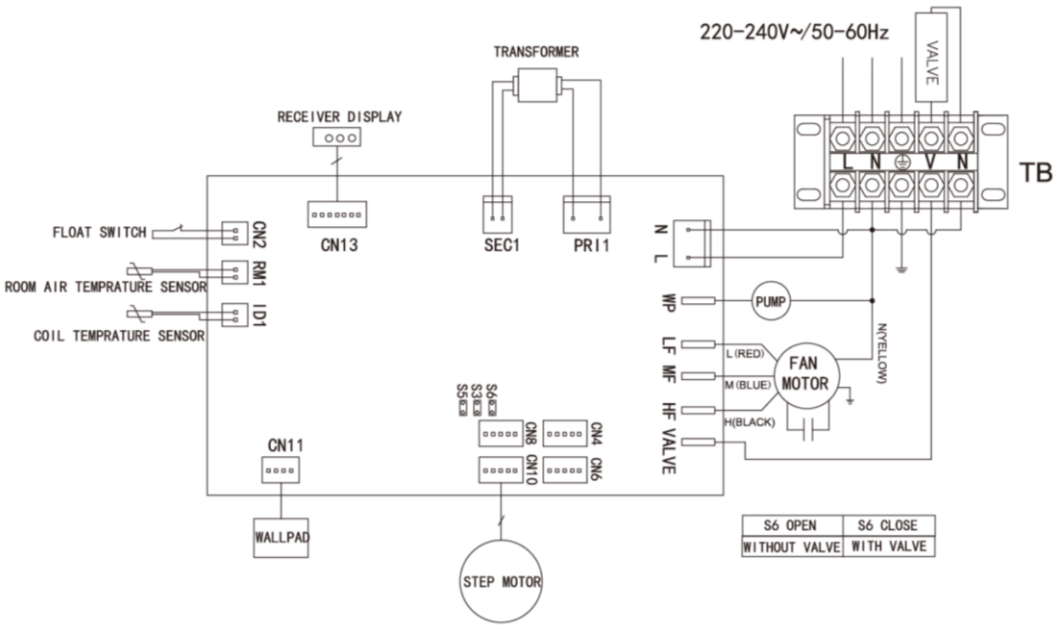


Fig. 8 Wiring diagram, 2-pipe system without communication board

4.2.2 2-pipe system, with Modbus

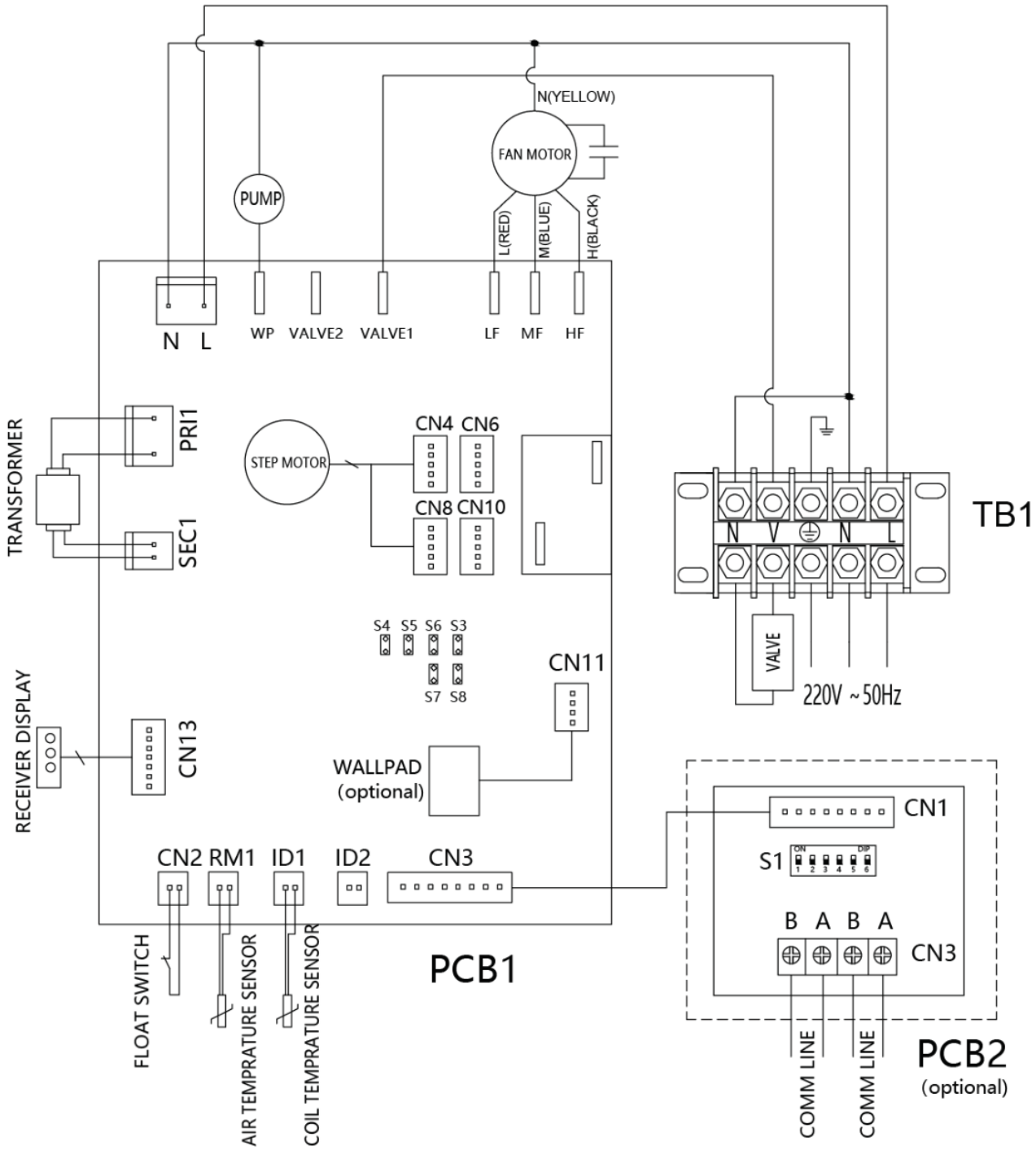


Fig. 9 Wiring diagram, 2-pipe system with communication board PCB2

4.2.3 4-pipe system, with Modbus

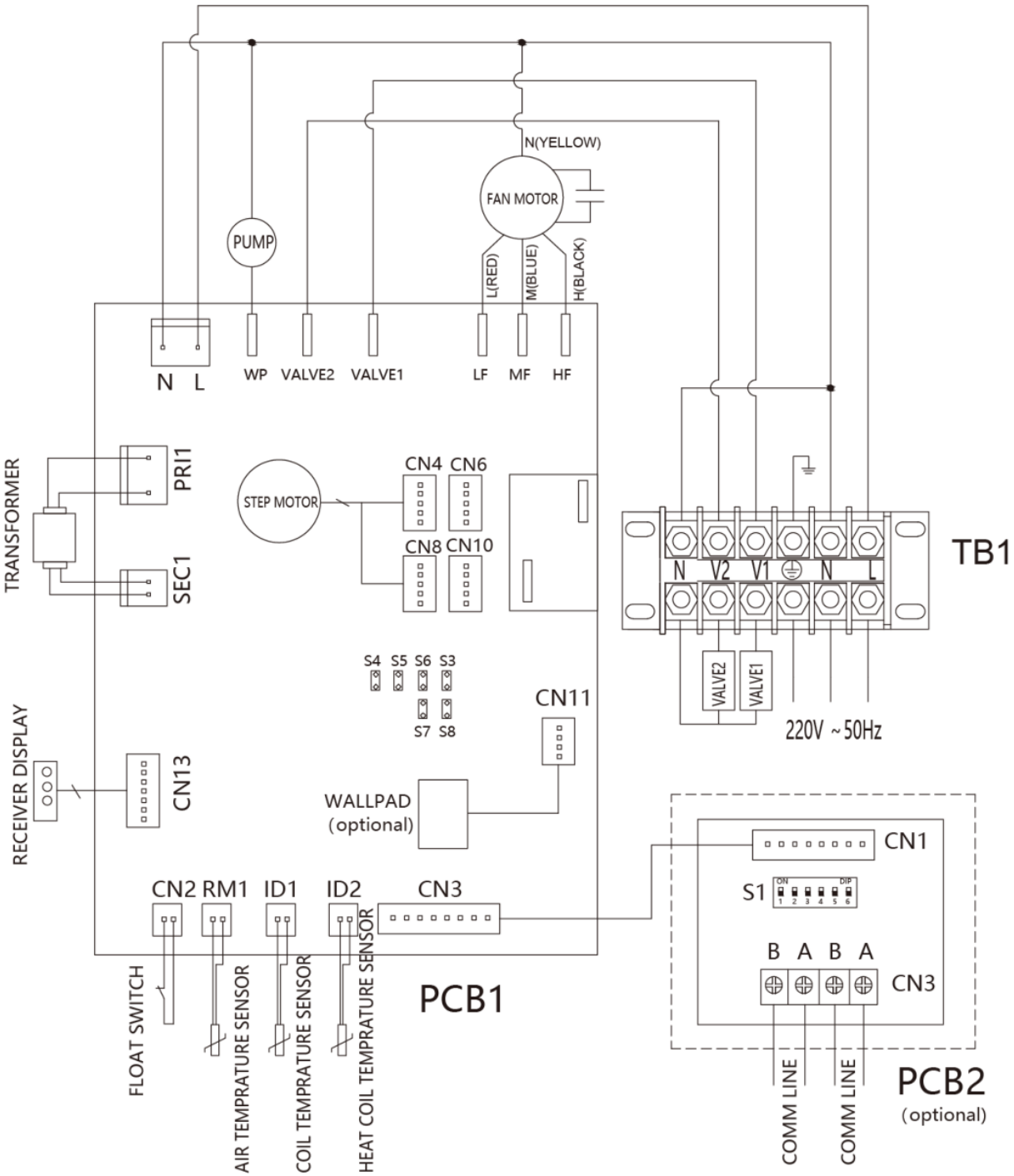


Fig. 10 Wiring diagram, 4-pipe system with communication board PCB2

4.2.4 Terminal designations and jumper settings

Table 13 Terminals on terminal block TB1

Terminal	Function
L	Phase, mains supply
N	Neutral, mains supply
⏚	Protective earth – must be connected to the earthing system of the building
V	Switched output for the motorised valve (2-pipe unit)
V1 / V2	Switched outputs for the motorised valves of the cold and the hot coil (4-pipe unit)

Table 14 Jumper settings on the main board (PCB1)

Jumper	Short	Open
S3	Louver type A	Louver type B
S4	4-pipe unit	2-pipe unit
S5	Pre-heat 32 °C	Pre-heat 38 °C
S6	With valve	Without valve

Table 15 Model selection, jumpers S7 and S8

S7	S8	Configuration
Open	Open	Cooling and heating
Open	Short	Cooling and heating + booster heater
Short	Open	Cooling only
Short	Short	Cooling + primary heater

4.2.5 Electrical installation data

Table 16 Electrical data

Item	Unit	Value
Rated voltage / frequency	V / Hz	220–230 / 50 or 60, 1 Ph
Max. running current per unit	A	0,10–1,43 depending on size and motor – see section 2.3
Insulation class	–	B – see drawing
Recommended supply cable cross-section	mm²	3 × 1,5 mm² Cu minimum (L, N, PE), all sizes. The installer selects the final cross-section according to the local wiring rules, the installation method, grouping and the permissible voltage drop.
Recommended circuit breaker / fuse	A / type	Single unit: 6 A, characteristic B or C. Group circuit: 10 A, characteristic C. Residual current device 30 mA where required by the local rules. See section 4.2.6.
Valve output load capacity	W	Not stated by the manufacturer. Until it is confirmed, connect not more than one thermoelectric actuator per output (V, V1, V2) and use an interposing relay for any other load.
Communication cable type	–	Shielded twisted pair for EIA-485, 120 Ω characteristic impedance, e.g. 1 × 2 × 0,5 mm². Shield earthed at one end only, 120 Ω termination resistor at both ends of the line.

4 Dimensions and Wiring Diagrams (continued)

4.2.6 Circuit design

Several units may be supplied from one final circuit. The following rules apply.

– The sum of the running currents of all units on the circuit must not exceed 0,8 × the rating of the protective device.

– Add the current of the valve actuators supplied from the units.

– Not more than ten units per circuit is recommended, so that the simultaneous starting current stays low and a fault can be localised.

– The voltage drop in the final circuit must stay within the limit of the local wiring rules, commonly 3 % to 5 %.

Table 16a Maximum number of units per 10 A circuit

Size	Running current AC (A) 2-pipe / 4-pipe	Running current EC (A) 2-pipe / 4-pipe	Max. units per 10 A circuit
CF2-34	0,16 / –	0,10 / –	10
CF2-51	0,22 / –	0,14 / –	10
CF2-68 / CF4-68	0,26 / 0,27	0,16 / 0,16	10
CF2-85 / CF4-85	0,32 / 0,33	0,20 / 0,20	10
CF2-102 / CF4-102	0,40 / 0,38	0,25 / 0,25	10
CF2-136 / CF4-136	0,57 / 0,58	0,35 / 0,35	10
CF2-170 / CF4-170	0,64 / 0,78	0,40 / 0,40	10
CF2-204 / CF4-204	0,80 / 0,80	0,52 / 0,52	9
CF2-238 / CF4-238	0,96 / 1,07	0,63 / 0,63	7
CF2-289 / CF4-289	1,43 / 1,43	–	5

The figures are based on a continuous load of 8 A and are capped at ten units per circuit. The EC versions draw less current; the limit of ten units applies to them as well.

5 Installation

5.1 Delivery check

Each fan coil is packed in a corrugated carton. Check the goods on receipt as follows:

– Check the packaging for visible damage before accepting the delivery.

– If the carton is damaged, unpack immediately and inspect the unit and the accessories. If the unit is damaged, note this on the delivery note and refuse acceptance.

– Check for concealed damage. If concealed damage is found, do not move the unit, stop unloading and take photographs.

– Notify the carrier and arrange a joint inspection by the carrier and the consignee.

– Do not carry out any repair before the carrier's representative has inspected and confirmed the damage.

– After the damage has been confirmed, contact the supplier for replacement.

5.2 Transport

DAMAGE TO THE UNIT AND RISK OF PERSONAL INJURY

- Wear protective gloves – risk of injury from sharp edges.
- The fan coil must be carried by at least two people.
- For deliveries on pallets, use only lifting and transport equipment with sufficient carrying capacity.
- Secure the load during transit to prevent it from tipping or falling.

Grasp and carry the cassette fan coil by the outer casing only. Unit weights are given in section 2.3.| 22

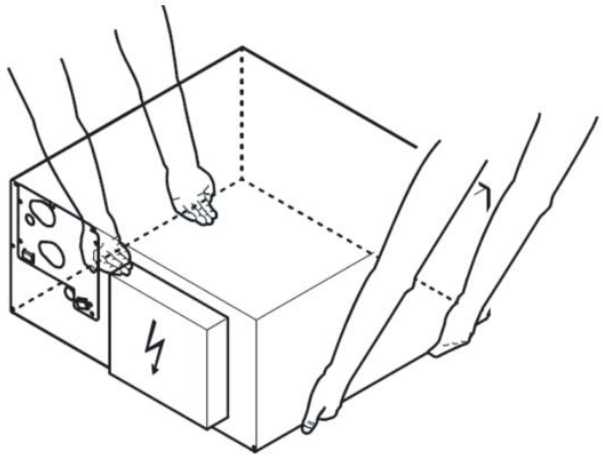


Fig. 11 Correct handling of the unit

5.3 Temporary storage

– Store the unit in its original packaging.
– The storage location must be weatherproof, dry and free of dust.
– Humidity must be between 50 and 85 % r.h.
– The storage temperature must be between –10 °C and +50 °C.

5 Installation (continued)

5.4 Preparing for installation

⚠ DANGER FROM ELECTRIC CURRENT
Ensure that the intended drilling area is free from electrical cables and pipes before drilling.

⚠ RISK OF PERSONAL INJURY
Injury may be caused by falling parts and sharp edges.
Wear a helmet, safety boots and protective gloves when installing the unit. Ceiling installation must always be carried out by two people.

NOTE
No mechanical deformation or twisting of the unit may occur during installation, for any model and in any installation position.

5.4.1 Installation location

– The ceiling or the mounting structure must be capable of carrying the weight of the unit including the panel and all accessories (see section 2.3).

– Install the unit indoors only.

– The type, condition and ambient temperature of the installation location must be suitable for the fan coil unit.

5.4.2 Installation requirements

Observe the following installation space requirements:

– minimum installation height 1,0 m above obstacles below the unit;

– maximum installation height 3,5 m above floor level;

– minimum distance from the unit to walls or other obstacles 0,5 m;

– maximum protrusion of a beam or structure above the unit 0,3 m.

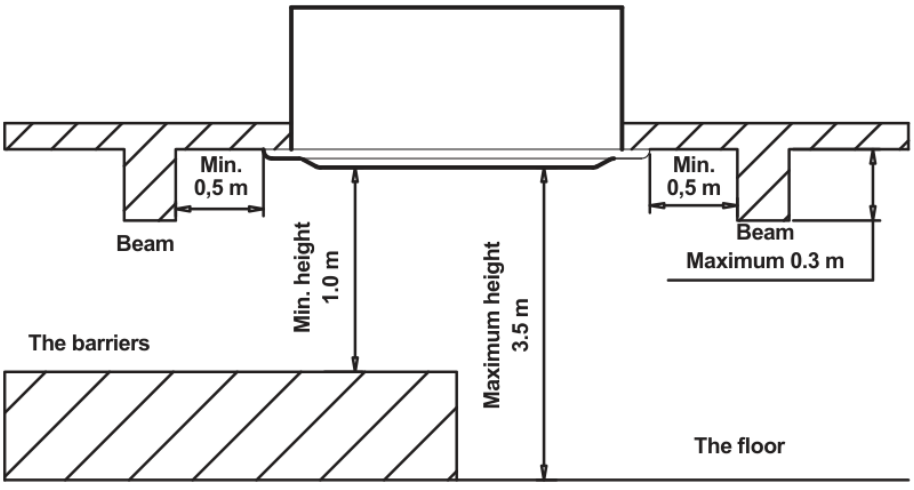


Fig. 12 Installation space requirement

Ceiling requirements:

- The intermediate ceiling is installed and a corresponding opening is available for the unit.
- There must be no openings to the outside in the area of the intermediate ceiling.
- The entire intermediate ceiling area must be dry and sufficiently protected against humidity and moist air.
- The electrical wiring is prepared and available for connection in the intermediate ceiling.

5.4.3 Recommended service opening

To allow all necessary service and maintenance work on the unit, a service opening of at least 400 × 400 mm should be provided in the false ceiling.

5.5 Unit installation

5.5.1 Precautions

- Provide adequate space for installation and maintenance (see section 4.1). Removable ceiling panels or access panels must be provided for routine maintenance.
- Determine the routing of pipework and electrical wiring before installation and reserve adequate space for the connections.
- Make sure that the suspension structure is adequate for the weight of the unit.
- All units must be levelled to ensure proper condensate drainage and correct operation.
- Thermal insulation of the chilled water valves and pipework is the responsibility of the installer.

5.5.2 Unit mounting

1) Suspension bolts (M10)

Use anchor bolts in an existing ceiling. For a new ceiling, use cast-in bolts or parts prepared on site. Adjust the space between the ceilings before proceeding with the installation.

- The suspension bolts must be of high-quality carbon steel (galvanised or otherwise protected against corrosion) or of stainless steel.
- The fixing of the suspension bolts depends on the type of ceiling construction (see figures below).

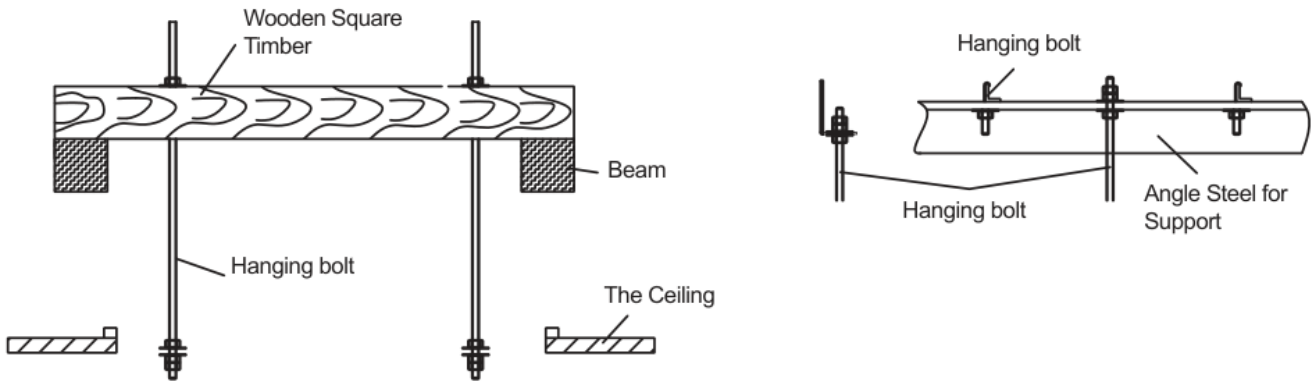


Fig. 13 Suspension on a wooden base and on a steel frame base

2) Mounting the unit

The unit must be installed on a level ceiling. If the ceiling is inclined, a packing block must be fitted between the ceiling and the panel so that the unit is horizontal.

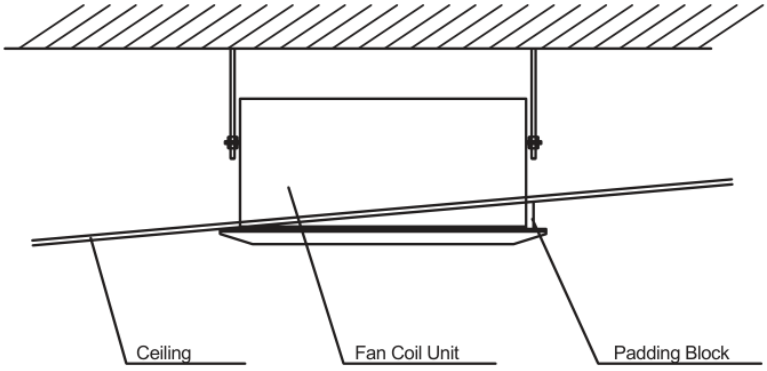


Fig. 15 Levelling with a packing block on an inclined ceiling

Suspend the unit as shown below and level it in all directions with a spirit level (adjust by turning the nuts up or down). Make sure that there is no gap either between the ceiling and the panel or between the unit body and the panel. Measure the distance between the unit and the ceiling to make sure that the unit body is centred in the ceiling opening. Then tighten the nuts above and below each suspension bracket to fix the unit.

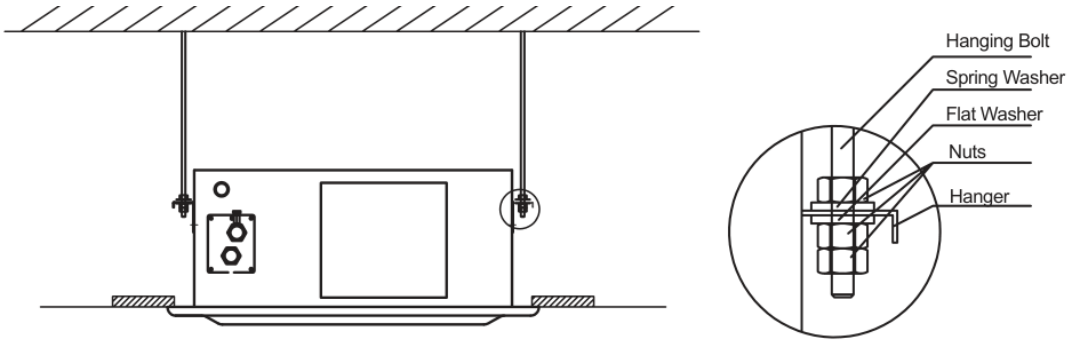


Fig. 16 Suspension bolt, spring washer, flat washer, nuts and hanger

NOTE

When the unit is installed in the ceiling, the ceiling must be horizontal in order to prevent the ceiling from vibrating.

5.5.3 Panel installation

NOTE

Before fitting the panel, check with a spirit level or a water-filled hose that the unit is horizontal, and check that the dimensions of the ceiling opening are correct. Remove the level gauge before fitting the panel.

5 Installation (continued)

The decorative panel with the air filter is not delivered pre-assembled. The required fixing material (set screws) is packed separately in a plastic bag.

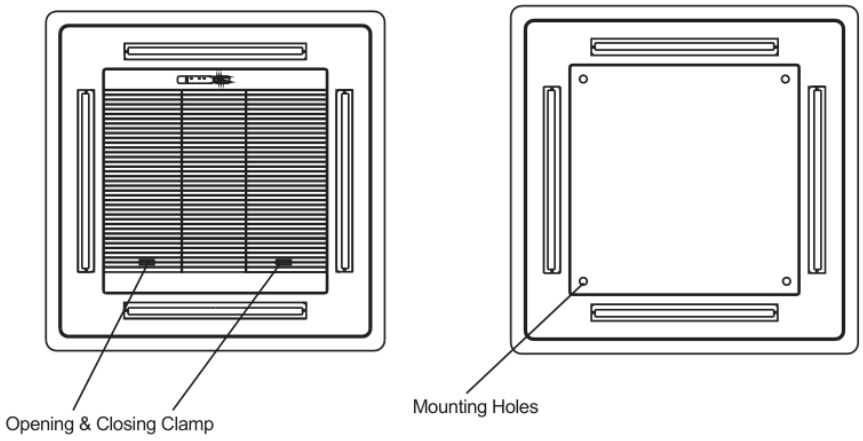


Fig. 17 Opening and closing clamp (left) and mounting holes (right)

– Place the panel on the unit body, insert two diagonally opposite panel screws (M5 × 26) into the mounting holes and fit them without tightening.

– Connect the cables of the stepping motors and of the receiver board to the corresponding connectors in the electrical box and arrange the wires.

– Insert the other two diagonally opposite panel screws (M5 × 26) into the mounting holes to fix the panel to the unit body.

– Adjust the position and direction of the panel so that the panel outlet matches the air passage and the drain pan, then tighten the panel screws so that the panel sits closely on the unit body.

– Fit and secure the air inlet grille.

5.6 Pipe connection

DANGER OF SCALDING BY ESCAPING HEATING MEDIUM

Before the on-site pipework and the hydraulic connection of the fan coil are set up, the heating/cooling water must be shut off and secured against being opened unintentionally.

NOTE

- The water connections of all sizes are G 3/4" internal thread.
- Remove the caps from the water inlet and outlet pipes at the start of the fitting procedure.
- All on-site pipework for chilled water must be insulated against condensation.
- When all connections have been completed, tighten all screwed connections and check that they are free of mechanical stress.
- Hold the coil connection with a second spanner when tightening the screwed connection, so that the coil header is not twisted.

5.6.1 Valve connection

The units are supplied without valves. Where valves are fitted on site, the arrangement of the water inlet and outlet depends on the position of the water connection and on the valves used. The figures below show the connection of a 2-way valve and of a 3-way valve. A 4-pipe unit has two sets of water connections and therefore requires two sets of valves.

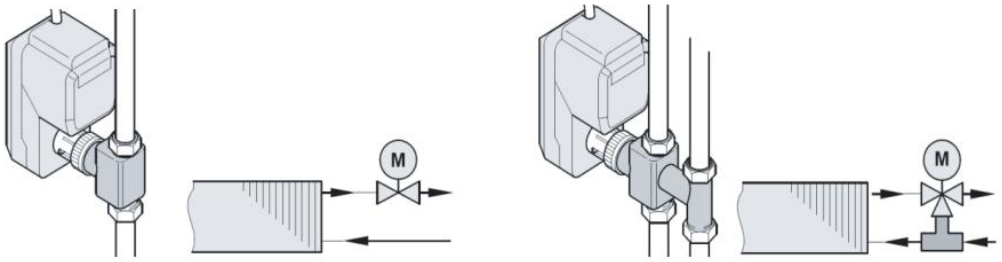


Fig. 18 2-way valve (left) and 3-way valve (right)

The standard hydraulic connection set consists of a straight thermostatic valve with a thermoelectric actuator on the supply and a lockshield valve on the return. Suitable valves and actuators are listed in chapter 10.

NOTE

To avoid condensation on the unit, a motorised valve must be installed on site. Jumper S6 on the unit PCB is therefore short-circuited on delivery. If no motorised valve is installed, S6 must be opened (see section 4.2.4).

ACTUATOR SUPPLY VOLTAGE

- Terminals V, V1 and V2 of terminal block TB1 are mains-voltage switched outputs (220–230 V). Only actuators rated for this voltage may be connected to them. The accessory actuator A230NC listed in chapter 10 is a 230 V type and connects directly.
- A 24 V actuator must never be connected to these terminals. If a 24 V actuator is required, it has to be supplied from a separate 24 V safety transformer and switched by an interposing relay driven from the V output.
- These outputs switch ON/OFF (two-position) valve actuators; both 2-way and 3-way ON/OFF valves may be connected. They cannot drive modulating (flow-control) valves. Each output - V on the 4-way unit, V1 and V2 on the 8-way unit - controls one valve only.

5.6.2 Water inlet/outlet connection

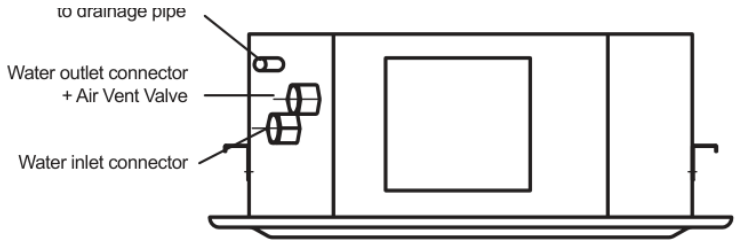


Fig. 19 Connections, unit with condensate pump

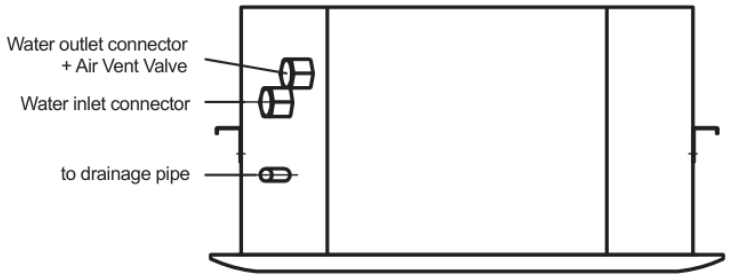


Fig. 20 Connections, unit with gravity drainage (without condensate pump)

5.6.3 Condensate drain connection

– Connect one end of the drain hose to the condensate outlet of the unit (Ø 26 mm) and the other end to a rigid PVC pipe of Ø 20 mm.

– Condensate pipes must be installed with a downward slope of 1 % or more.

– Insulate the rigid PVC pipe with a pipe sleeve to prevent condensation forming on the outside of the pipe.

– All pipe joints must be tightened to prevent leakage.

– Provide a vent (air admittance point) on the external condensate pipe.

– Condensate pump data: delivery rate 500 ml/min, power input 7-10 W.

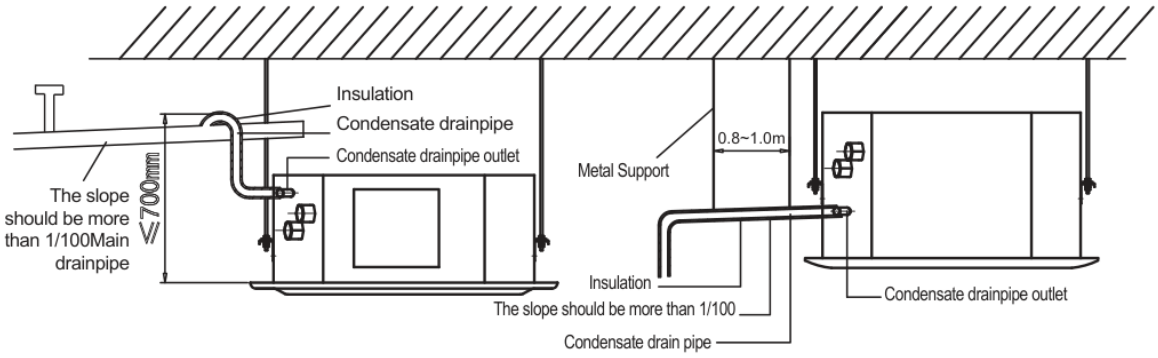


Fig. 21 Condensate pipe with pump (left) and with gravity drainage (right)

MAXIMUM CONDENSATE LIFT

On the 4-way (AC) units the condensate pipe must not rise more than 550 mm above the condensate outlet of the unit; on the 8-way (EC) units the maximum condensate pump head is 1050 mm. A greater lift prevents the condensate from being discharged and causes the drain pan to overflow (fault E7, see section 7.5).

5.7 Electrical installation

DANGER FROM ELECTRIC CURRENT

Disconnect the power supply before starting any installation work.

The electrical installation may be carried out only by qualified electricians, in accordance with this manual.

5.7.1 General requirements

- The electrical connection must be made in accordance with the valid connection diagram. The binding diagram is attached to the inside of the cover of the sheet-metal electrical box; the diagrams in section 4.2 are for information.
- The earth point provided on the unit must be connected to the earthing system of the building.
- All electrical connections must comply with the local electrical regulations.
- The connection diagrams do not contain any protective measures. The standards and regulations in force must be observed and agreed with the local electricity supplier.

5.7.2 Unit wiring

Connect the power supply in accordance with the diagram on the inside of the cover of the electrical box; see also the wiring diagrams in section 4.2.

5.7.3 Panel wiring

Connect the swing motor cable and the LED display cable to the PCB in accordance with the diagram on the inside of the cover of the electrical box; see also the wiring diagrams in section 4.2.

NOTE

Wire the motorised 2-way or 3-way valve and the thermostats in accordance with their own installation instructions.

If a motorised valve is installed, jumper S6 on the unit PCB must be short-circuited. If no motorised valve is installed, S6 must be open.

6 Commissioning

SAFETY

The warnings in section 1.2 apply in full: electrical hazard, danger of scalding and danger from rotating parts. Before any work on the unit, isolate it electrically, secure it against being switched on again, and shut off and allow the heating medium to cool down.

6.1 Requirements for commissioning

After installation, the installer must check and confirm the following. This manual has been read in full and the operators are familiar with the unit and able to operate it.

- The fan coil is electrically isolated.
- The complete fan coil system has been installed both mechanically and electrically.
- All water pipes have been flushed and are free from residues and foreign objects.
- The system has been pressure-tested and filled with clean water.
- The fan coil is properly fixed and mounted.
- The valves, actuators and thermostats have been checked manually in accordance with their own manuals.
- All water connections are tightened.
- All electrical connections have been checked against the current wiring diagram and the terminal screws are tight.
- The heat exchanger, the condensate tray, the condensate pump intake area and the filter medium are clean. Clean them or replace the filter medium if necessary.

NOTE

When the system is filled for the first time, air remains in the pipework and collects at the highest point of the water system. A manual air vent is normally provided at the water outlet connection. If abnormal noise is heard due to residual air, open the vent until water flows out steadily and then close it again. If the knob is too tight, turn it anticlockwise with pliers.

6.2 Start-up

- The unit is controlled by the infrared remote controller or by the selected control device: on/off, operating mode, fan speed, swing function, etc.
- Switch on the power supply and operate each unit in turn at high, medium and low speed in accordance with section 3.1.
- Adjust the louvers and the fan speed to obtain the best cooling/heating effect.

6 Commissioning (continued)

– In the event of abnormal noise or behaviour, switch the unit off and check the items listed above again. Otherwise, run the unit at high speed for 24 hours and check its behaviour again.

NOTE

Checking the condensate pump: with the unit switched on in cooling mode, carefully pour water in through the air vent opening or the inspection opening until the pump starts. The pump must switch off again after a short time, when most of the water has been pumped away.

DAMAGE TO THE UNIT

If the unit is not used during the winter, the water inside the unit must be drained after commissioning, to prevent the pipes from cracking due to ice formation.

7 Maintenance and Troubleshooting

SAFETY

The warnings in section 1.2 apply in full: electrical hazard, danger of scalding and danger from rotating parts. Before any work on the unit, isolate it electrically, secure it against being switched on again, and shut off and allow the heating medium to cool down.

7.1 Maintenance

The 4-way cassette fan coil is a high-quality, reliable unit. Regular maintenance and inspection by technical experts is nevertheless necessary in order to guarantee its permanent function and performance.| 31

NOTE

Maintenance may be carried out only by trained technical personnel, in accordance with this manual and the applicable regulations.

The warranty is void if damage to the unit is attributable to failure to carry out the prescribed maintenance and inspections.

A written maintenance record must be kept (see Annex B).

7.2 Maintenance schedule

Table 17 Maintenance intervals

Component / activity	Quarterly	Annually
Checking and cleaning the filter	•	
Checking the condensate drain		•
Checking the screwed connections of the water pipes *		•
Checking the electrical connections		•
Checking the earthing		•
Venting the heat exchanger *		•
Cleaning the condensate tray *		•
Checking the setting and function of all valves *		•

* depending on model and installation.

6 Commissioning (continued)

The filter mat can be cleaned or replaced. Clean it dry with a vacuum cleaner set to medium or low power. The air filter fitted is a coarse pre-filter (G3/G4 class).

7.3 Quarterly maintenance

- Open the locks of the intake grille and remove the grille.
- Remove the filter mat from the intake grille.
- Clean the filter mat with a vacuum cleaner or replace it with a new one if necessary.
- Fit the filter mat into the intake grille, refit the grille and close it.

7 Maintenance and Troubleshooting (continued)

7.4 Annual maintenance

7.4.1 Condensate drain

- The pump and the float switch area must be checked for contamination at least once a year, before the start of the cooling season. The same applies to the condensate pressure line with the non-return valve downstream of the condensate pump.
- Free drainage of the condensate can be checked by pouring water into the condensate tray.

7.4.2 Screwed pipe connections

Check that all screwed pipe connections are secure. Hold the connection with a second spanner when retightening.

7.4.3 Electrical connections and earthing

- Open the electrical box.
- Check that all electrical connections are firmly seated in the terminal strips.
- Check the earthing of the unit with a suitable measuring instrument.
- Close the electrical box again.

7.4.4 Valves and heat exchanger

Check the function of the valves in accordance with their own manual. Vent the heat exchanger.

7.5 Troubleshooting

The green LED on the panel indicates the fault by a number of flashes followed by a pause of 3 seconds. If a wall controller is fitted, the corresponding code is displayed together with a flashing spanner symbol.

Table 18 Fault codes

Green LED	Code	Fault	Possible cause	Remedy
2 flashes	E2	Heating coil sensor (ID2) of the 4-pipe unit damaged	Loose connection between plug and main PCB; sensor damaged	Unplug and plug in again to obtain a firm connection; replace sensor ID2
3 flashes	E3	Return air sensor (RM1) damaged	Loose connection between plug and main PCB; sensor damaged	Unplug and plug in again; replace sensor RM1
4 flashes	E4	Coil sensor (ID1) damaged	Loose connection between plug and main PCB; sensor damaged	Unplug and plug in again; replace sensor ID1

7 Maintenance and Troubleshooting (continued)

Green LED	Code	Fault	Possible cause	Remedy
5 flashes	E5	Low-temperature protection of the coil	Coil temperature too low	The fault clears automatically when the water temperature in the coil rises
6 flashes	E6	Overheat protection of the coil	Coil temperature too high	The fault clears automatically when the water temperature falls
7 flashes	E7	Float switch protection (condensate not discharged)	1. Condensate is not drained from the drain pan: the condensate pipe rises more than 550 mm above the outlet; no vent fitted on the external condensate pipe; the external pipe has an upward slope so that water flows back into the drain pan	1. Install the external condensate pipe according to section 5.6.3: lift below 550 mm, vent fitted, continuous downward slope
			2. The condensate pump has burned out (this happens if cause 1 is left unresolved for a long time)	2. Replace the condensate pump (the unit has to be dismantled)
			3. The float switch is stuck and cannot move freely	3. Free the float switch so that it can move up and down naturally (the unit has to be dismantled)
–	E8	Communication failure of the wall controller	Broken or badly connected control cable, wiring error, connector detached, broken pin	Check all wiring and plugs; unplug and plug in again to obtain a firm connection
Yellow LED on	–	Timer on/off active (not a fault)		
Yellow LED off	–	Timer cancelled (not a fault)		

NOTE

Leakage may occur if fault E7 is not remedied within a short time. The short fault list printed next to the wiring diagrams of the original manual calls the seven-flash signal "water pump failure". It is the same signal as E7 above: a burned-out pump is one of its three causes. That list also omits the two-flash code E2.

Fault code E9 (fan fault) applies to the EC units only. Fault code E2 (heating coil sensor ID2) applies to the 4-pipe units only.

– Isolate the unit electrically and secure it against being switched on again.

– Shut off the water connections and drain the heat exchanger and the condensate tray completely.

– Disconnect the electrical and hydraulic connections and remove the unit; ceiling work must be carried out by two people.

– Separate the materials (steel and galvanised sheet, copper, aluminium, plastics, insulation, electronic components) and dispose of them in accordance with the applicable national regulations.

8 Decommissioning and Disposal

Electrical and electronic components must not be disposed of with household waste. They must be handed over to an authorised collection point in accordance with Directive 2012/19/EU (WEEE) and the corresponding national legislation. Batteries from the remote controller must be disposed of separately.

9 Supplier and Warranty

9.1 Supplier

Supplier	KONVEKA
Address	Vokiečių g. 185, LT-45251 Kaunas, Lithuania
Web	konveka.com/en
E-mail	sales@konveka.lt
Telephone	+370 677 06303
Product	Cassette fan coil CF2 / CF4, AC and EC versions
Year of manufacture	See rating plate

9.2 Rating plate

The rating plate is attached to the unit casing and contains the model designation, serial number, rated voltage and frequency, power input, current, protection class and year of manufacture. The data on the rating plate takes precedence over the data in this manual.

9.3 Warranty

Warranty period	12 months
Start of the warranty period	Date of sale
Conditions	Installation, commissioning and maintenance in accordance with this manual, carried out by qualified personnel; maintenance recorded in writing (Annex B); water quality within the limits of section 1.4; the unit operated within the limits of section 1.6.
Exclusions	The warranty does not cover: damage caused by transport, storage or handling after delivery; installation, commissioning or repair by unqualified personnel; use outside the operating limits or the intended purpose (sections 1.4–1.6); water quality outside the limits of section 1.4, and the resulting corrosion, scaling or blockage; frost damage and damage caused by the water not being drained (section 6.2); failure to carry out the prescribed maintenance (chapter 7), in particular cleaning of the filter and the condensate system; unauthorised modification of the unit or use of non-original spare parts; damage caused by the power supply (over-voltage, lightning) or by the building installation; normal wear parts such as the filter mat and the remote controller batteries.
Claims procedure	Report the fault to the supplier without undue delay after it is detected, stating the model designation and serial number from the rating plate, the date of sale, the place of installation and a description of the fault, and enclose photographs, the commissioning protocol (Annex A) and the maintenance record (Annex B). Do not dismantle the unit before the supplier responds. The supplier decides whether the unit is repaired, replaced or credited.

9.4 Conformity

The unit carries the CE marking and complies with the applicable EU requirements, including the ErP (Ecodesign) and RoHS directives; the CE, ErP and RoHS certificates are available from the supplier. The EU declaration of conformity is supplied with the unit and is available from the supplier on request. It states, as a minimum:

- the applicable European directives;
- the harmonised standards applied;
- the manufacturer and the person authorised to compile the technical file.

10 Accessories

Accessories matched to the CF cassette fan coils; the full range is available at konveka.com.| 35

Table 19 Accessories for CF cassette fan coils | 35

Code	Product	Data
TVSP15	Thermostatic valve, straight	Thread 1/2"; Kvs 2,0; PN10; working temperature –10 °C to +120 °C
LS15	Shut-off valve, straight (lockshield)	Thread 1/2"; Kvs 2,0; PN10; working temperature –10 °C to +120 °C
LA15	Shut-off valve, angle (lockshield)	Thread 1/2"; Kvs 2,0; PN10; working temperature –10 °C to +120 °C
A230NC	Thermoelectric actuator for the thermostatic valve	230 V AC; IP54; connection thread M30 × 1,5 mm; housing PC/ABS; normally closed; power input and inrush current to be confirmed – see Annex C, item 5
TC86	Room thermostat / wall controller	88 × 88 × 43 mm; 24 V DC, max. 3 A; 1,5 W; working range 5–35 °C; weekly schedule programming

NOTE

The valve connection thread is 1/2" while the coil connections are G 3/4" internal thread; provide reducers or connection sets on site.

10.1 Valve selection

The valves listed in Table 19 have Kvs 2,0. The tables below give the Kvs required for a pressure drop of approximately 15 kPa across the control valve at the design water flow, calculated from $\Delta p = (Q / Kvs)^2$ with Q in m³/h and Δp in bar. The last column gives the smallest connection size at a water velocity of not more than 1,2 m/s.

Table 19a CF2 – valve selection (one valve per unit, one circuit, one design flow)

Model	Design flow (l/h)	Required Kvs	Δp with Kvs 2,0 (kPa)	Min. connection
CF2-34	320	0,8	3	DN15
CF2-51	500	1,3	6	DN15
CF2-68	610	1,6	9	DN15
CF2-85	780	2,0	15	DN15
CF2-102	940	2,4	22	DN20
CF2-136	1200	3,1	36	DN20
CF2-170	1650	4,3	68	DN25
CF2-204	1850	4,8	86	DN25
CF2-238	2150	5,6	116	DN25
CF2-289	2640	6,8	174	DN32

Table 19b CF4 – valve selection (one valve per circuit)

Model	Cold circuit (l/h)	Required Kvs	Hot circuit (l/h)	Required Kvs	Min. connection
CF4-68	450	1,2	260	0,7	DN15
CF4-85	540	1,4	355	0,9	DN15
CF4-102	625	1,6	440	1,1	DN15
CF4-136	830	2,1	550	1,4	DN15
CF4-170	1050	2,7	700	1,8	DN20
CF4-204	1400	3,6	725	1,9	DN20
CF4-238	1500	3,9	980	2,5	DN20
CF4-289	1800	4,6	1185	3,1	DN25

Annex A Commissioning and Handover Protocol

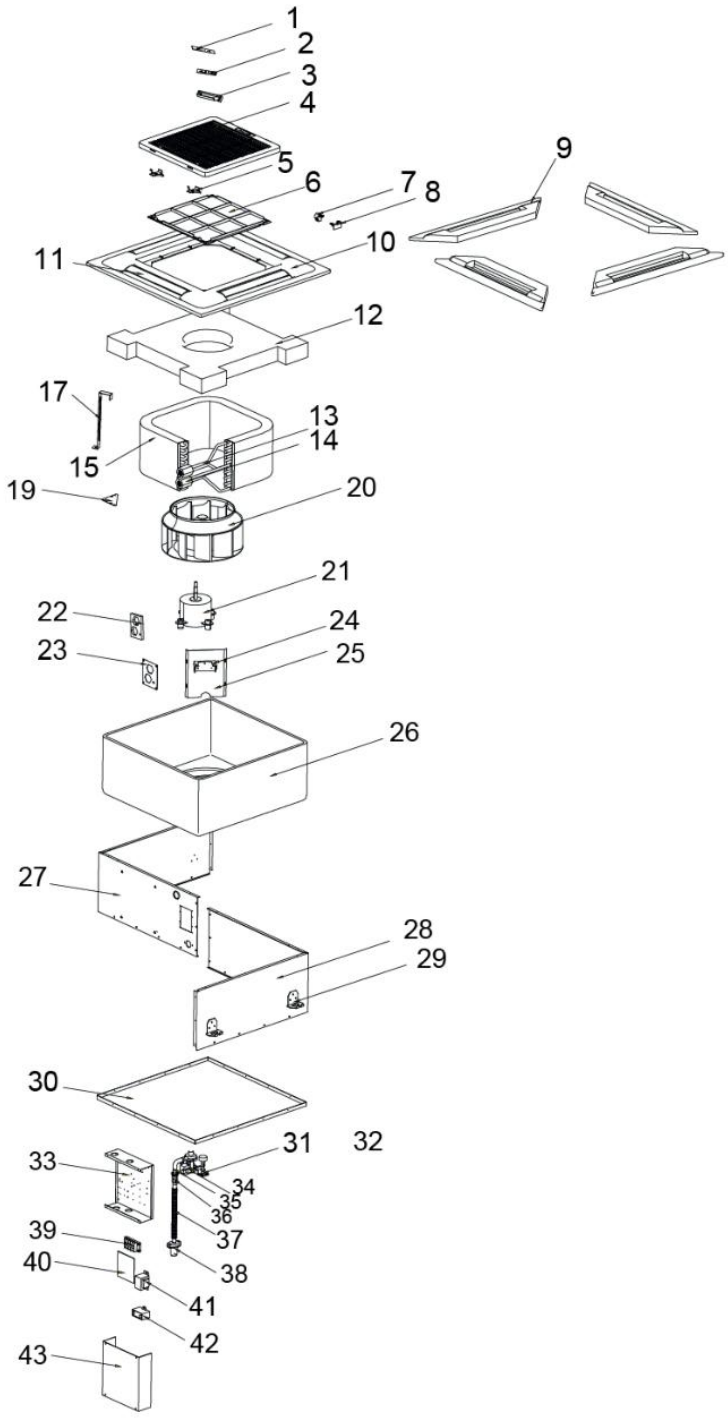
Project / site	
Unit model and serial number	
Installation location / room	
Installing company	
Commissioned by	
Date	

Table 20 Commissioning checks

Check	Result	Remark
Suspension and levelling checked	☐ yes ☐ no	
Ceiling opening and panel fit checked	☐ yes ☐ no	
Water system flushed, filled and vented	☐ yes ☐ no	
Water quality within the limits of section 1.4	☐ yes ☐ no	
Pipework insulated, connections leak-tight	☐ yes ☐ no	
Condensate pipe: slope ≥ 1 %, lift ≤ 550 mm, vent fitted	☐ yes ☐ no	
Condensate pump function tested (water poured in)	☐ yes ☐ no	
Float switch function tested	☐ yes ☐ no	
Earthing checked and measured	☐ yes ☐ no	
Electrical connections tight, supply protection correct	☐ yes ☐ no	
Jumpers S3–S8 set to match the installation	☐ yes ☐ no	
Valve(s) and thermostat wired and function checked	☐ yes ☐ no	
All three fan speeds tested (AC) / speed range tested (EC)	☐ yes ☐ no	
Heating and cooling mode tested	☐ yes ☐ no	
Louver / swing function tested	☐ yes ☐ no	
Filter fitted and clean	☐ yes ☐ no	
Operator instructed, manual handed over	☐ yes ☐ no	

Annex B Component Identification

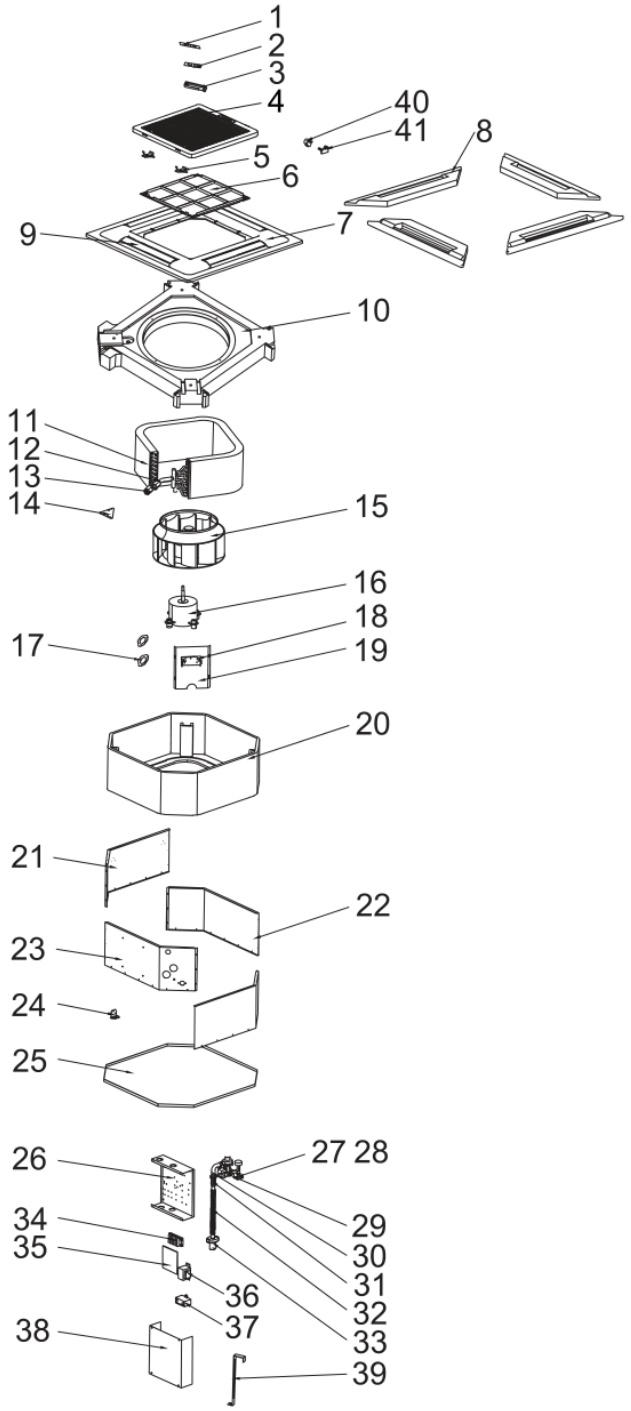
The exploded views below are intended for service purposes. The item numbers of the four unit variants differ; the combined list in Table 21 gives the item number of each component in each variant.
A separate spare parts price list is available on request; it covers consumable and wear parts only.



1	Light panel sticker
2	Light panel
3	Light panel cover
4	Air grill
5	Air grill locker
6	Filter
7	Stepping motor
8	Louver bracket
9	Panel foam
10	Plastic panel
11	Louver
12	Drain pan
13	Water inlet connecter
14	Water outlet connecter
15	Coil
16	Coil hanger
17	Drain pan fixer
18	Fan
19	Motor
20	Valve cover sponge
21	Valve cover
22	Pump bracket
23	Coil fixing plate
24	Air duct
25	Side panel 1
26	Side panel 2
27	Hanging bracket
28	Bottom plate
29	Float switch
30	Float switch bracket
31	Electronic box
32	Pump
33	Rubber tube
34	One way valve
35	Bellows
36	Water faucet
37	Wiring terminal
38	PCB
39	Transformer
40	Capacitor
41	Electronic box cover

Fig. 22 CF2-34 to CF2-68 (2-pipe)

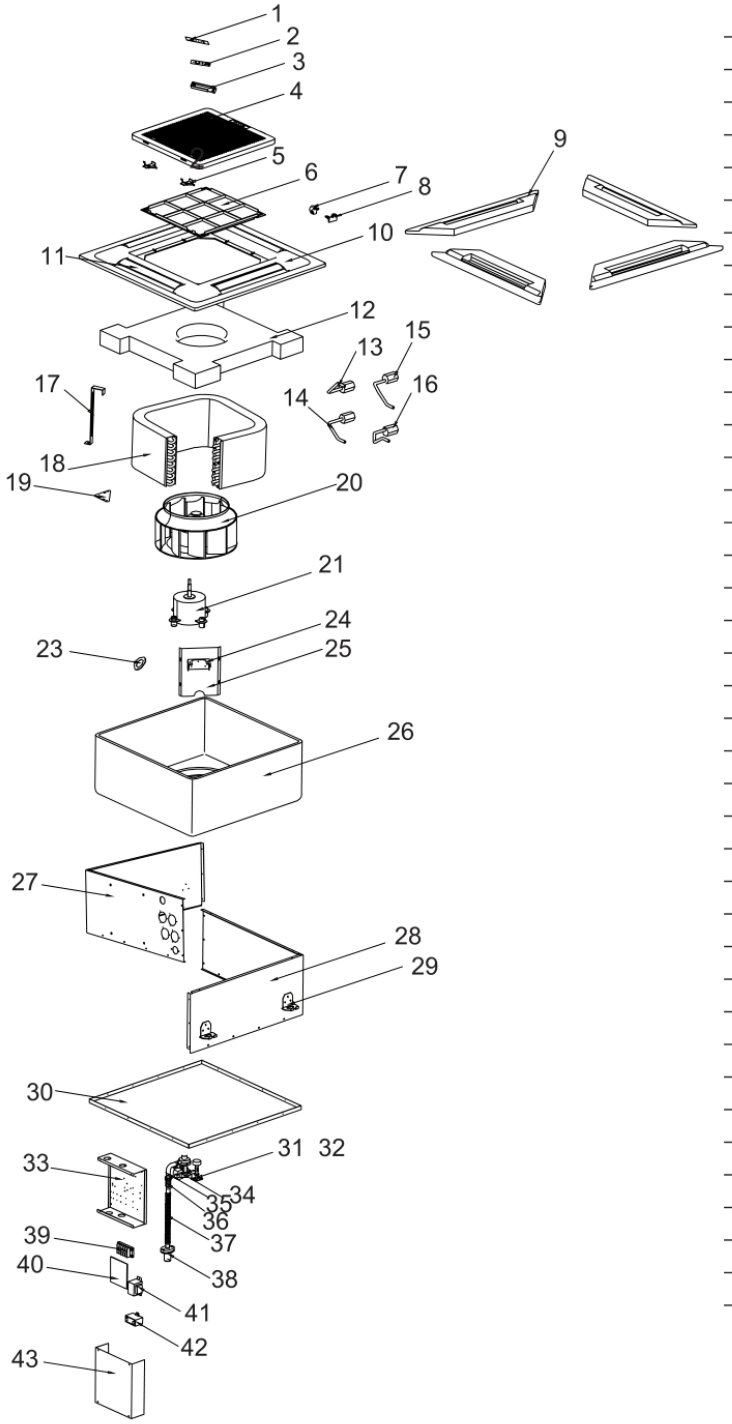
Annex B Component Identification (continued)



1	Light panel sticker
2	Light panel
3	Light panel cover
4	Air grill
5	Air grill locker
6	Filter
7	Plastic panel
8	Panel foam
9	Louver
10	Drain pan
11	Coil
12	Water inlet connecter
13	Water outlet connecter
14	Drain pan fixer
15	Fan
16	Motor
17	Valve fixing plate
18	Pump bracket
19	Coil fixing panel
20	Air duct
21	Side panel 3
22	Side panel 2
23	Side panel 1
24	Hanging bracket
25	Bottom plate
26	Electronic box
27	Float switch
28	Float switch bracket
29	Pump
30	Rubber tube
31	One way valve
32	Bellows
33	Water faucet
34	Wiring terminal
35	PCB
36	Transformer
37	Capacitor
38	Electronic box cover
39	Coil hanger
40	Stepping motor

Fig. 23 CF2-85 to CF2-289 (2-pipe)

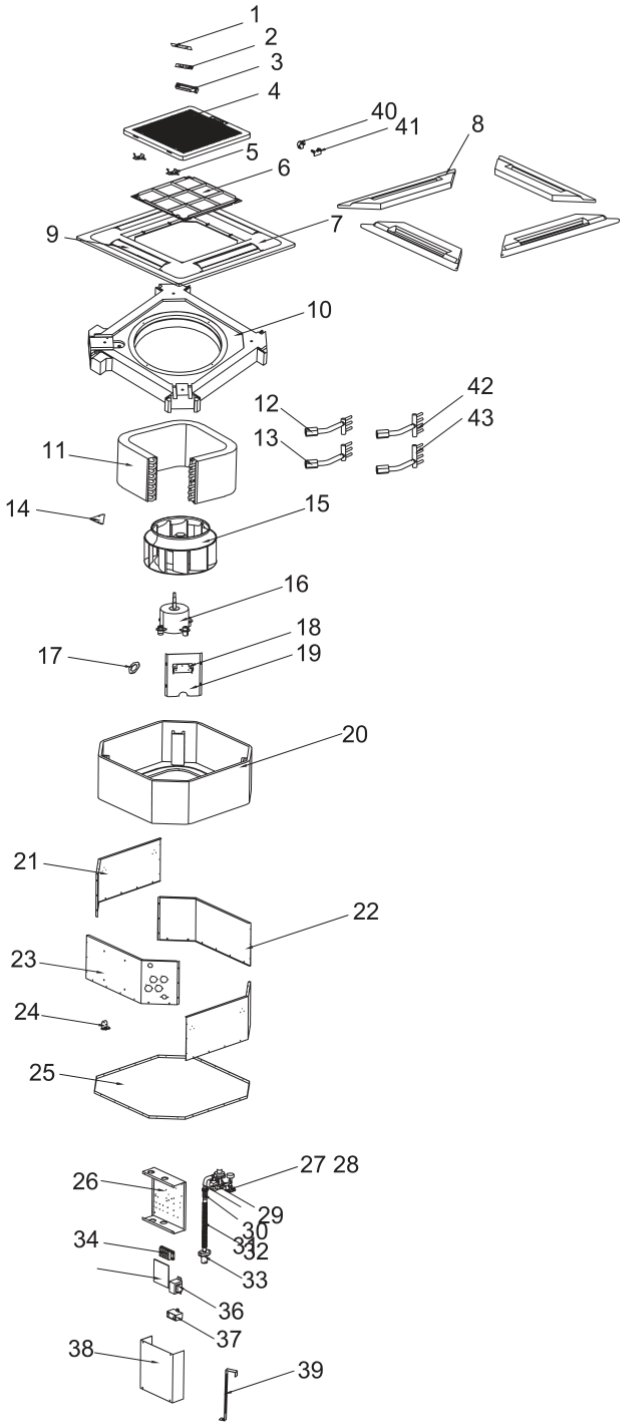
Annex B Component Identification (continued)



1	Light panel sticker
2	Light panel
3	Light panel cover
4	Air grill
5	Air grill locker
6	Filter
7	Stepping motor
8	Louver bracket
9	Panel foam
10	Plastic panel
11	Louver
12	Drain pan
13	Cold water inlet connecter
14	Cold water outlet connecter
15	Hot water inlet connecter
16	Hot water outlet connecter
17	Coil hanger
18	Coil
19	Drain pan fixer
20	Fan
21	Motor
22	Valve cover
23	Pump bracket
24	Coil fixing plate
25	Air duct
26	Side panel 1
27	Side panel 2
28	Hanging bracket
29	Bottom plate
30	Float switch
31	Float switch bracket
32	Electronic box
33	Pump
34	Rubber tube
35	One way valve
36	Bellows
37	Water faucet
38	Wiring terminal
39	PCB
40	Transformer
41	Capacitor
42	Electronic box cover

Fig. 24 CF4-68 (4-pipe)

Annex B Component Identification (continued)



1	Light panel sticker
2	Light panel
3	Light panel cover
4	Air grill
5	Air grill locker
6	Filter
7	Plastic panel
8	Panel foam
9	Louver
10	Drain pan
11	Coil
12	Hot water inlet connecter
13	Hot water outlet connecter
14	Drain pan fixer
15	Fan
16	Motor
17	Valve fixing plate
18	Pump bracket
19	Coil fixing plate
20	Air duct
21	Side panel 1
22	Side panel 2
23	Side panel 3
24	Hanging bracket
25	Bottom plate
26	Electronic box
27	Float switch
28	Float switch bracket
29	Pump
30	Rubber tube
31	One way valve
32	Bellows
33	Water faucet
34	Wiring terminal
35	PCB
36	Transformer
37	Capacitor
38	Electronic box cover
39	Coil hanger
40	Stepping motor
41	Louver bracket
42	Cold water inlet connecter
43	Cold water outlet connecter

Fig. 25 CF4-85 to CF4-289 (4-pipe)

Table 21 Combined component list – item numbers per variant

Component	CF2-34–68	CF2-85–289	CF4-68	CF4-85–289
Light panel sticker	1	1	1	1
Light panel	2	2	2	2
Light panel cover	3	3	3	3
Air grille	4	4	4	4
Air grille locker	5	5	5	5

Annex B Component Identification (continued)

Component	CF2-34–68	CF2-85–289	CF4-68	CF4-85–289
Filter	6	6	6	6
Panel foam	9	8	9	8
Plastic panel	10	7	10	7
Louver	11	9	11	9
Louver bracket	8	41	8	41
Stepping motor	7	40	7	40
Drain pan	12	10	12	10
Drain pan fixer	17	14	19	14
Coil	15	11	18	11
Coil hanger	16	39	17	39
Coil fixing plate	23	19	24	19
Water inlet connector	13	12	–	–
Water outlet connector	14	13	–	–
Cold water inlet connector	–	–	13	42
Cold water outlet connector	–	–	14	43
Hot water inlet connector	–	–	15	12
Hot water outlet connector	–	–	16	13
Valve cover	21	–	22	–
Valve cover sponge	20	–	–	–
Valve fixing plate	–	17	–	17
Fan	18	15	20	15
Motor	19	16	21	16
Air duct	24	20	25	20
Side panel 1	25	23	26	21
Side panel 2	26	22	27	22
Side panel 3	–	21	–	23
Hanging bracket	27	24	28	24
Bottom plate	28	25	29	25
Pump	32	29	33	29
Pump bracket	22	18	23	18
Rubber tube	33	30	34	30
One-way valve	34	31	35	31
Bellows	35	32	36	32
Water faucet	36	33	37	33
Float switch	29	27	30	27
Float switch bracket	30	28	31	28
Electronic box	31	26	32	26
Electronic box cover	41	38	42	38
PCB	38	35	39	35
Wiring terminal	37	34	38	34
Transformer	39	36	40	36
Capacitor	40	37	41	37
[not identified in source]	42, 43	–	43	–