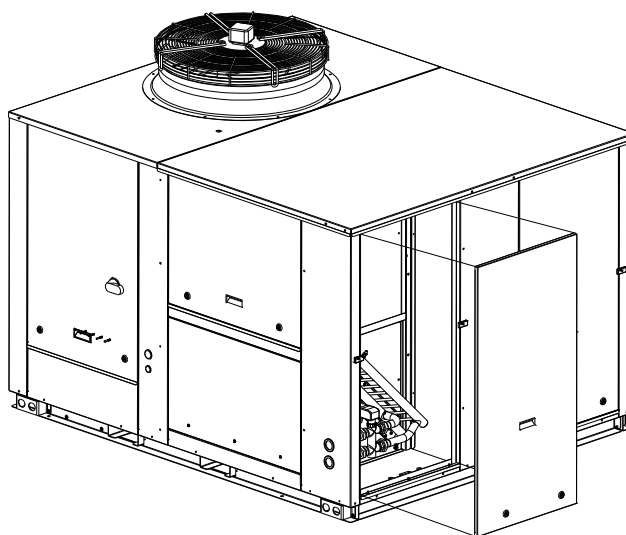




BY JOHNSON CONTROLS

Hot water coil accessory for Roof Top ACTIVA 017/040



Options and Accessories, Installation manual

Ref.: N-40405_EN 0913



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**Hot water coil accessory for Roof Top
ACTIVA 017/040**

1.1 General information

1.1 General information

The hot water coil is factory-fitted as optional, including the control board, the wiring and all the necessary components for its connection.

It is located in the air supply section where it is better protected from problems due to the presence of frost. Additionally, it allows to install the side or downwards supply duct without requiring any additional modifications.

1.2 Technical specifications

It is composed of:

- Coil: with steep plate frame, copper pipes and aluminium fins.
- 3-way valve: bronze body.
- Electric actuator: 0-10V proportional control, 24 Vac power.
- Control board.
- B17 temperature probe for the water inlet.
- Manual air bleeder and water drainage plug.
- Wiring assembly.

1.3 Installation

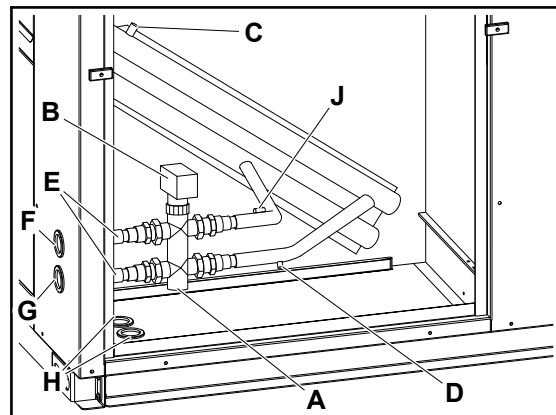
Given that all of the components are factory-fitted, all that is required on site is for the 3-way valve inlet and outlet to be connected to the hot water line.



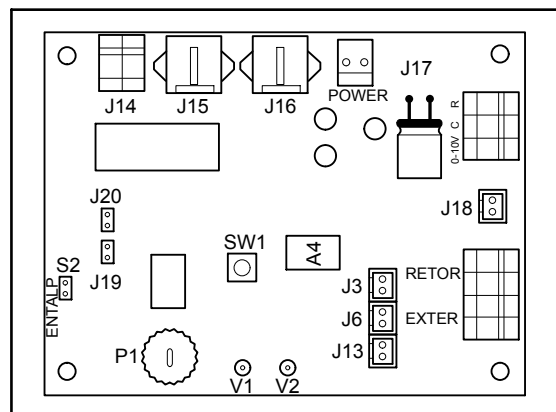
NOTE

- *Bear in mind the current regulations on electrical installation in the country where the unit is to be installed.*

- | | |
|----------------------------|---|
| A. 3-way valve | F. Water inlet, front |
| B. Electric actuator | G. Water outlet, front |
| C. Manual bleeder | H. Steps for inlet/outlet tubes on the base |
| D. Drainage plug | J. Water inlet temperature probe |
| E. Connections for welding | |



1. Disconnect the main switch on the unit.
2. Remove the access panel to the optional heating section.



3. Make the water inlet and outlet connections either at the front, through the edge or through the base at the bottom of the unit. There are two bushings on the front edge and on the base to protect the pipes. In order to do the welding, separate the two threaded connections on the valve or remove the actuator to avoid damaging it.



CAUTION

- *Manual valves should be installed on the inlet and outlet lines to be able to insulate the unit from the general installation if required.*
- *When passing pipes through the base of the unit, seal with silicone or some other sealant.*



NOTE

The hot water coil control board and the water inlet probe are factory-fitted. The electrical connections of the valve actuator have also been made according to the wiring diagram.

4. Once all of the water inlet and outlet connections are made, reconnect the unit main switch.
5. Check that the green LED on board A6 remains lit. Next, search and configure the accessories by pressing the test button on the YKN2Open board (A1) for more than three seconds, until the red LED lights up. When the search and configuration process starts, the red LED on the board will light up and will remain on until the operation is completed. Once it has switched off, check that the green LED (V1) on board A6 is flashing to indicate that the accessory has been configured.
6. Check the correct working order of the valve actuator: the potentiometer P1 on the hot water coil control board allows for the 3-way valve to be modulated by hand to check its correct working order. The actuator will return to its operating position after 30 sec.
7. Selection of jumper S2 (ENTALP) position:
 - Jumper S2 open (factory-configured by default): priority selection of compressors on models with heat pump
 - Jumper S2 closed: selection of hot water coil operating priority on compressors. This is recommended for installations where very cheap hot water is available.
8. Heat pump switching relay output: the control board is fitted with a relay (K1) that, via connector J14, provides an output with a non-live contact for the switching of a water pump in the installation.



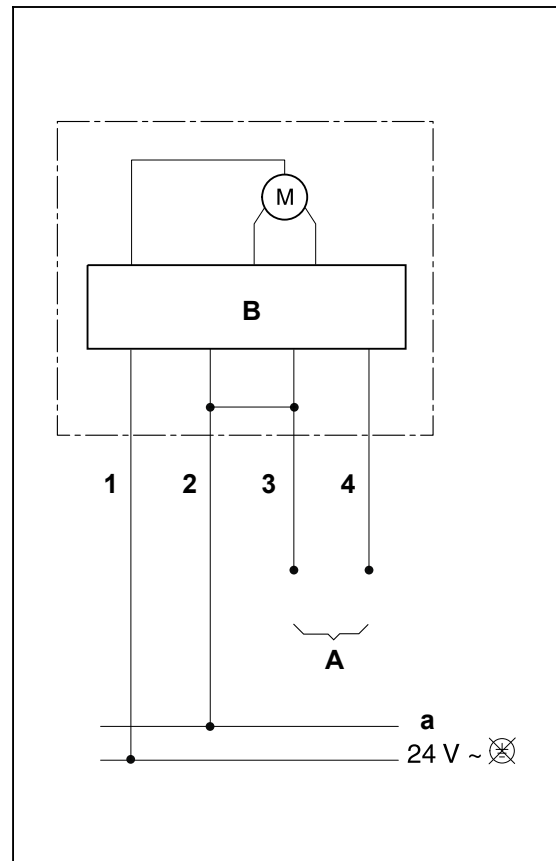
CAUTION

Loose connection terminals produce overheating of cables and terminals. The unit will work incorrectly and there is a risk of fire.

LED	Status	Indication
V1	Off	The board is not connected
V1	On	The board is not operational
V1	Flashing	Normal operations
V2	On	Favourable condition
V2	Flashing	Antifreeze protection

1.4 VA-7472-9001-type proportional control electric actuator

- | | |
|-------------------|----------|
| A. Control signal | 1. Red |
| B. Control board | 2. Black |
| M. | 3. Blue |
| a. Common | 4. White |
| b. 0–10 V | |



1.5 Operation

Heat can be generated under favourable conditions through valve modulation according to the supply probe, seeking to reach a maximum temperature of 50 °C.

Up to four hot water coil stages can be controlled. These are started as indicated by the demand control unit and are limited by the supply temperature (30, 40, 45 and 50 °C).

Favourable conditions are deemed when the water temperature is above 30 °C 5 minutes after opening the valve. Once the system is operating, a check is constantly made to ensure the conditions remain favourable.

Where unfavourable conditions are detected and where there is demand, a timed 20-minute period is set before a check is made to ensure the conditions have returned to favourable.

Relay K1 on the water pump is enabled where the opening is greater than 20%. Relay K1 is disabled where the opening is less than 5%.

If the conditions are favourable, the yellow LED (V2) remains lit, otherwise it switches off.

When the water temperature is below 3 °C, the pump is activated and the valve is opened to 100% to protect the hot water coil from freezing until the water temperature rises to above 6 °C. This protection remains active while the fan is stopped, despite the machine being at a standstill or in lockout. When the frost protection is activated, the yellow LED (V2) flashes.

Whenever the hot water coil heating is running, the indoor fan will also be working.

There is a 15 °C minimum supply air temperature trip switch when this accessory is fitted. Hence, the drop in comfort that may be created in the event of a very high percentage of air renewal at low outdoor temperatures is avoided and the indoor fan runs continuously. In the event of a demand for cold, the water coil valve closes.

The valve actuator is powered with 24 Vac (red and black wire). The control signal is within a range of 0 to 10 Vac (blue and white wires). At 0 Vac, the valve is closed (Bypass) and at 10 Vdc, the valve is fully open.

1.5.1 Actuator selection jumper

The actuator has six input selection jumpers that coincide with the required operating range.

1. Jumper 1. Selection of the anti-sticking function.

Every 24 hours, the actuator performs a full valve open and closed cycle. It then returns to the position indicated by the control. The function is factory-activated by default.

2. Jumper -2- and -3- Input voltage selection.

Jumper on 2 and 3 (0 to 10 Vdc), jumper on 2 (5 to 10 Vdc) and no jumper on 2 and 3 (0 to 5 Vdc). Jumper factory-set in position 2 and 3 (0 to 10 Vdc) by default.

3. Jumper -4- No function.

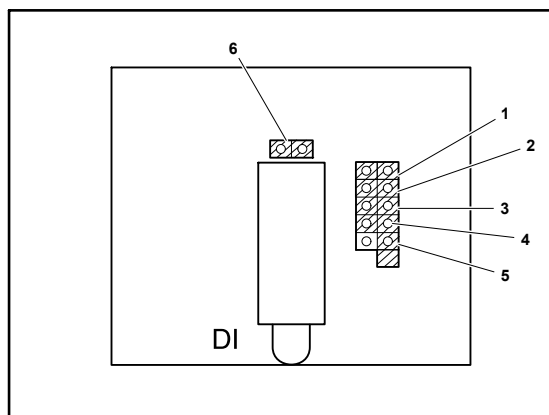
Factory-set with bridge by default.

4. Jumper -5- Direct/reverse action jumper configuration so that the valve shaft moves in the required direction.

Factory-set by default without jumper, reverse action (RA).

5. Jumper -6- No function.

Factory-set with bridge by default.



1.6 Physical data and heating capacities

Physical data

		Models	
		017 / 022	032 / 040
Pipe depth		2	2
Pipe height		20	26
Pipe diameter	Ø	3/8"	3/8"
Front area	m ²	0,36	0,63
Inlet / Outlet Connections Diameter (Weld)	Ø	1 1/8"	1 1/8"
Total volume of water in circuit	l	3	4,5

Air circuit pressure drops

	Air flow rate m ³ /h															
	Models 017 / 022								Models 032 / 040							
	2800	3000	3400	3500	4000	4300	4700	5100	4700	5000	5700	6200	6800	7400	8000	8600
ΔP [Pa]	20	23	27	29	35	40	46	52	20	22	25	30	33	38	43	48

1.6 Physical data and heating capacities

Heating capacities

AR – 017/022, water without glycol

		Water 90/80								Water 90/75							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	29,1	30,4	32,6	33,2	35,8	37,3	39	40,8	27,6	28,8	31	31,5	33,9	35,3	37	38,7
Water flow rate	L/h	2470	2570	2765	2820	3035	3170	3320	3460	1560	1630	1750	1770	1900	1985	2085	2170
Pressure drops (1)	kPa	5,3	5	6,4	6,4	7,5	8,5	8,5	9,6	2,1	2,1	3,2	3,2	3,2	3,2	4,2	4,2
Air temperature rise	°K	30	29,5	28	27,5	26	25	26	23	29	28	26,5	26	25	24	23	22

		Water 90/70								Water 80/70							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	26,1	27,2	29,2	29,7	32	33,3	35	36,5	24,6	25,6	27,5	28	30,2	31,5	33	34,5
Water flow rate	L/h	1100	1150	1240	1255	1360	1410	1480	1545	2085	2175	2335	2380	2555	2670	2805	2930
Pressure drops (1)	kPa	1,1	1,1	2,1	2,1	2,1	2,1	2,1	2,1	4,2	4,1	5,3	5,3	5,3	6,4	6,4	7,4
Air temperature rise	°K	27	26,5	25	24,5	23	22,5	22	21	26	25	24	23	20	21	20	19

		Water 80/65								Water 80/60							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	23,1	24,01	25,8	26,3	28,3	29,5	30,1	32,2	21,3	22,2	23,9	24,3	26,3	27,4	28,7	30
Water flow rate	L/h	1305	1360	1460	1485	1600	1670	1750	1830	910	945	1015	1035	1115	1160	1220	1275
Pressure drops (1)	kPa	2,1	2,1	2,1	2,1	2,1	3,1	3,2	3,2	1	1	1,1	1,1	1,1	1,1	1,1	1,1
Air temperature rise	°K	24	23	22	22	21	20	19	18	23	22	21	20	19	19	18	17

		Water 70/60								Water 70/55							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	20	21	22,5	22,9	24,6	25,6	26,9	28,1	18,4	19,2	20,6	21	22,6	23,6	24,7	25,8
Water flow rate	L/h	1705	1780	1900	1950	2085	2170	2275	2380	1045	1090	1170	1190	1285	1335	1400	1460
Pressure drops (1)	kPa	3,1	3,2	3,2	3,2	4,2	4,2	5,3	5,3	1,1	1,1	1,1	1,1	2,1	2,1	2,1	2,1
Air temperature rise	°K	21	20	21	21	18	18	17	16	19	18	17	17	16	16	15	14

		70/50								Water 60/50							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100
Heat capacity	kW	16,6	17,3	18,6	18,9	20,4	21,2	22,2	23,2	15,5	16,2	17,4	17,7	19	19,8	20,8	21,7
Water flow rate	L/h	705	735	790	805	865	905	945	990	1310	1370	1475	1505	1625	1690	1765	1845
Pressure drops (1)	kPa	1	1	1	1	1	1	1	1	2,1	2,1	2,1	2,1	3,1	3,1	3,2	3,2
Air temperature rise	°K	17	17	16	16	15	15	14	13	16	16	15	15	14	14	13	12

- Pressure drop of coil + valve.

(1) - Coil air inlet: 18 °C.

- Total volume of water in circuit: 3 l.

AR – 017/022, water and glycol mix 35%

		Water 90/80									Water 90/75							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100	
Heat capacity	kW	28,6	29,9	32,1	32,6	35,2	36,6	38,4	40,2	26,8	28	30,1	30,6	33	34,4	36,1	37,6	
Water flow rate	L/h	2700	2820	3035	3075	3330	3455	3630	3800	1690	1760	1890	1920	2080	2165	2275	2350	
Pressure drops (1)	kPa	7,4	7,4	8,5	8,5	9,5	10,6	11,7	12,7	3,1	3,2	4,2	4,2	4,2	5,2	5,3	5,3	
Air temperature rise	°K	30	29	28	27	26	25	24	23	28	27	26	25	24	23	22	21	

		Water 90/70									Water 80/70							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100	
Heat capacity	kW	24,8	25,8	27,7	28,2	30,4	31,7	33,2	34,8	24	25,1	27	27,4	29,5	30,8	32,3	33,7	
Water flow rate	L/h	1235	1220	1310	1330	1435	1500	1570	1640	2270	2365	2570	2590	2800	2925	3060	3200	
Pressure drops (1)	kPa	2,1	2,1	2,1	2,1	2,1	2,1	3,1	3,1	5,3	5,3	6,3	6,3	7,4	8,4	8,5	9,5	
Air temperature rise	°K	26	25	24	23	22	22	21	20	25	24	23	23	22	21	20	19	

		Water 80/65									Water 80/60							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100	
Heat capacity	kW	22	22,9	24,6	25	27	28,1	29,6	30,9	19,8	20,6	22,2	22,6	24,3	25,4	26,6	27,8	
Water flow rate	L/h	1400	1450	1550	1570	1705	1775	1870	1950	940	980	1055	1070	1155	1210	1260	1315	
Pressure drops (1)	kPa	2,1	2,1	3,1	3,1	3,1	3,2	4,2	4,2	1	1	1,1	1,1	2,1	2,1	2,1	2,1	
Air temperature rise	°K	23	22	21	21	20	19	18	17	21	20	19	19	18	17	16	16	

		Water 70/60									Water 70/55							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100	
Heat capacity	kW	19,3	20,1	21,6	22	23,8	24,8	26	27,2	17,1	17,8	19,1	19,5	21	21,9	23	24,1	
Water flow rate	L/h	1850	1925	2070	2105	2280	2345	2465	2585	1080	1130	1215	1235	1340	1395	1465	1535	
Pressure drops (1)	kPa	4,2	4,2	4,2	5,2	5,3	5,3	6,3	7,3	1,1	2,1	2,1	2,1	2,1	2,1	2,1	3,1	
Air temperature rise	°K	20	20	19	18	17	17	16	15	18	17	16	16	15	15	14	14	

		Water 70/50									Water 60/50							
Air flow rate	m ³ /h	2800	3000	3400	3500	4000	4300	4700	5100	2800	3000	3400	3500	4000	4300	4700	5100	
Heat capacity	kW	11,6	13,3	16,1	16,4	17,8	18,6	19,5	20,5	14,5	15,1	16,2	16,5	17,8	18,6	19,5	20,4	
Water flow rate	L/h	555	635	770	785	850	890	930	980	1385	1450	1555	1585	1710	1785	1870	1965	
Pressure drops (1)	kPa	1	1	1	1	1	1	1	1	2,1	2,1	3,1	3,1	3,1	4,2	4,2	4,2	
Air temperature rise	°K	15	15	14	14	13	13	12	12	15	15	14	14	13	13	12	12	

- Pressure drop of coil + valve.
- (1) - Coil air inlet: 18 °C.
- Total volume of water in circuit: 3 l.

1.6 Physical data and heating capacities

AR – 032/040, water without glycol

		Water 90/80								Water 90/75							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	50,2	52,1	56,4	59,2	62,3	65,4	68,2	71	47,8	49,5	53,6	56,2	59,2	62,1	64,7	67,4
Water flow rate	L/h	4250	4420	4775	5025	5280	5545	5780	6020	2710	2790	3020	3165	3330	3500	3645	3790
Pressure drops (1)	kPa	11	12	14	15,2	16,4	18,5	19,6	20,8	5,4	5,4	6,5	6,5	7,5	7,6	8,7	9,7
Air temperature rise	°K	31	30	29	28	27	26	25	24	30	29	28	27	26	25	24	23

		Water 90/70								Water 80/70							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	45,4	47,1	50,8	53,3	56,1	58,8	59,2	61,6	41,6	43,2	46,7	49	51,6	54,1	56,4	58,7
Water flow rate	L/h	1920	1990	2150	2260	2375	2490	2505	2610	3520	3645	3955	4140	4365	4590	4770	4975
Pressure drops (1)	kPa	3,2	3,2	3,2	4,3	4,3	4,3	5,3	6,3	10,6	10,7	13	14	15	16	17	18,2
Air temperature rise	°K	28	27	26	25	24	23	22	21	26	25	24	23	22	21	21	20

		Water 80/65								Water 80/60							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	38,9	40,3	43,6	45,7	48,1	50,4	52,5	54,6	36,1	37,4	40,4	42,3	44,5	46,6	45,5	50,5
Water flow rate	L/h	2200	2275	2460	2580	2715	2850	2970	3085	1530	1585	1715	1800	1890	1980	2050	2145
Pressure drops (1)	kPa	4,2	4,3	5,3	6,3	6,4	7,4	7,4	8,5	2,1	2,1	3,1	3,2	3,2	4,2	4,2	4,2
Air temperature rise	°K	24	24	23	23	22	22	21	20	23	22	21	20	19	19	18	17

		Water 70/60								Water 70/55							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	33,8	35,1	38	39,8	41,9	43,9	45,8	47,7	31,1	32,2	34,8	36,5	38,3	40,2	42	43,6
Water flow rate	L/h	2850	2970	3215	3360	3545	3710	3880	4040	1765	1830	1965	2070	2170	2270	2380	2460
Pressure drops (1)	kPa	7,5	7,5	8,5	10	11	12	12,7	13	3,2	3,2	4,2	4,2	4,2	5,3	5,3	5,3
Air temperature rise	°K	21	21	20	19	18	18	17	16	20	19	18	17	16	16	15	15

		70/50								Water 60/50							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	27,8	28,8	31,1	32,7	34,4	36,1	37,7	39,2	26,1	27,1	29,3	30,7	32,3	33,9	35,3	36,7
Water flow rate	L/h	1180	1225	1330	1390	1460	1540	1600	1670	2220	2300	2490	2615	2740	2880	3010	3120
Pressure drops (1)	kPa	1,1	2,1	2,1	2,1	2,1	2,1	3,1	3,1	5,2	5,3	6,5	6,5	7,5	7,5	8,4	8,5
Air temperature rise	°K	17	17	16	15	15	14	14	13	16	16	15	15	14	13	13	12

- Pressure drop of coil + valve.

(1) - Coil air inlet: 18 °C.

- Total volume of water in circuit: 4,5 l.

AR – 032/040, water and glycol mix 35%

		Water 90/80								Water 90/75							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	48,4	50,2	54,3	57	60	62,9	65,6	68,2	45,3	46,9	50,7	53,2	56	58,6	61,1	63,4
Water flow rate	L/h	4575	4690	5115	5370	5660	5940	6190	6440	2850	2950	3190	3345	3520	3695	3845	3965
Pressure drops (1)	kPa	18	18,2	21,3	23,4	25,6	27,7	30	32	7,4	8,4	9,5	10,6	11,6	12,7	12,7	13,8
Air temperature rise	°K	30	29	28	27	26	25	24	23	28	27	26	25	24	23	22	22

		Water 90/70								Water 80/70							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	41,5	43,1	46,7	49,1	51,7	54,2	56,6	58,8	40,5	42,1	45,4	47,7	50,2	52,6	54,8	57,1
Water flow rate	L/h	1955	2030	2200	2315	2440	2565	2675	2760	3830	4010	4270	4495	4740	4980	5180	5410
Pressure drops (1)	kPa	4,2	4,2	5,2	5,3	6,3	6,3	7,4	7,4	13,7	14,8	16	18	19	21,2	22,3	24,4
Air temperature rise	°K	26	25	24	23	22	21	21	20	25	24	23	22	21	21	20	19

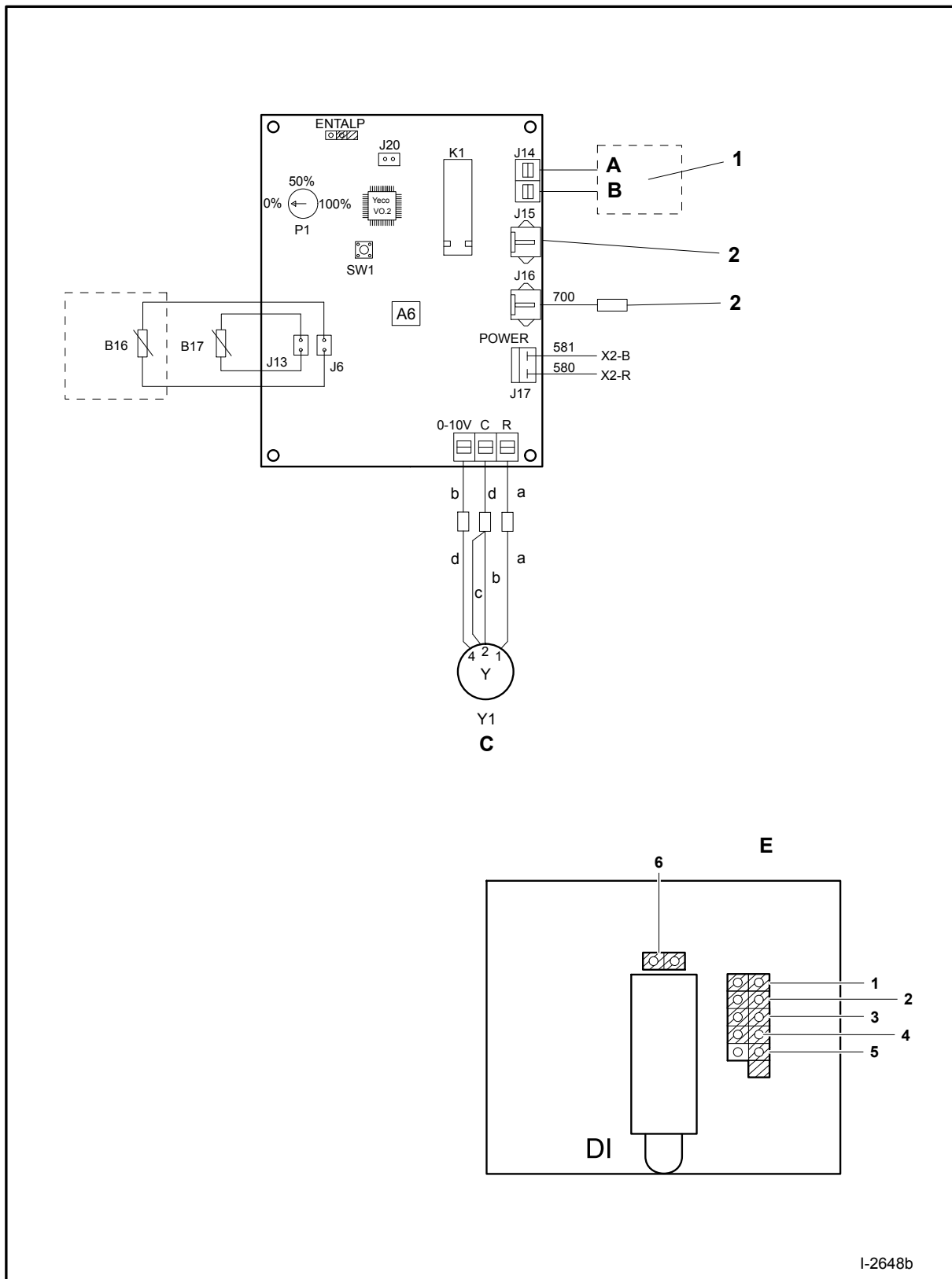
		Water 80/65								Water 80/60							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	37	38,4	41,7	43,7	46	48,2	50,3	52,3	33	34,2	37,1	38,8	40,1	42,9	44,6	46,4
Water flow rate	L/h	2345	2440	2635	2770	2905	3040	3175	3305	1560	1625	1760	1845	1940	2040	2110	2200
Pressure drops (1)	kPa	5,3	6,3	7,3	7,4	8,4	8,5	9,5	10,5	3,1	3,1	3,2	4,2	4,2	4,2	5,2	5,2
Air temperature rise	°K	23	22	21	21	20	19	18	18	21	20	19	18	18	17	16	16

		Water 70/60								Water 70/55							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	32,7	33,9	36,7	38,5	41,2	42,3	44,1	46	28,6	29,6	32	33,6	35,3	37,1	38,7	40,2
Water flow rate	L/h	3125	3240	3520	3690	3900	4000	4370	4370	1820	1890	2030	2135	2240	2370	2470	2570
Pressure drops (1)	kPa	9,5	10,5	11,6	12,7	13,8	14,8	15,1	16,9	4,2	4,2	4,2	5,2	5,2	6,3	6,3	7,3
Air temperature rise	°K	21	20	19	18	17	17	16	15	18	17	16	16	15	15	14	14

		70/50								Water 60/50							
Air flow rate	m ³ /h	4700	5000	5700	6200	6800	7400	8000	8600	4700	5000	5700	6200	6800	7400	8000	8600
Heat capacity	kW	23,9	24,8	27	28,3	29,8	31,3	32,7	34,1	24,4	25,2	247	28,6	30,1	31,6	33	34,3
Water flow rate	L/h	1140	1190	1290	1360	1425	1490	1560	1630	2350	2430	2625	2730	2880	3035	3170	3290
Pressure drops (1)	kPa	2,1	2,1	2,1	2,1	2,1	3,1	3,1	3,1	6,3	6,3	7,3	8,4	8,4	9,5	10,5	10,5
Air temperature rise	°K	15	14	14	13	13	12	12	11	15	15	14	14	13	13	12	12

- Pressure drop of coil + valve.
- (1) - Coil air inlet: 18 °C.
- Total volume of water in circuit: 4,5 l.

1.7 Wiring diagram



1.	Optional: <ul style="list-style-type: none"> • A: 24 Vac Phase R switching • B: Water pump
2.	Accessories
C.	Four-way valve
D.	Valve actuator
a.	Red
b.	Black
c.	Blue
d.	White
B16	Supply probe, optional depending on model (yellow)
B17	Water inlet probe (black)

Data and measurements subject to changes without prior notice.