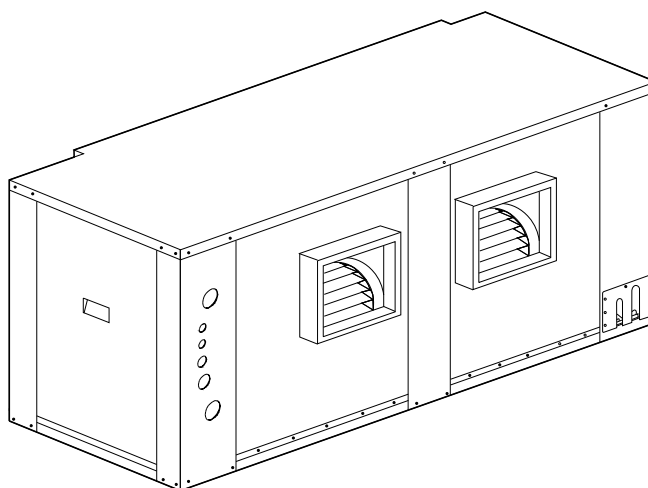




BY JOHNSON CONTROLS

Hot water coil for VIR - 25A to 90A



Accessory, Installation manual

Ref.: N-40304_EN 0411



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1

Hot water coil for VIR - 25A to 90A

1.1 General information

The hot water coil accessory is factory-fitted as optional. The control board, the cables and all the material for the installation are supplied with this accessory.

It is located inside the VIR unit and is attached to the coil using the fixtures provided for this purpose.

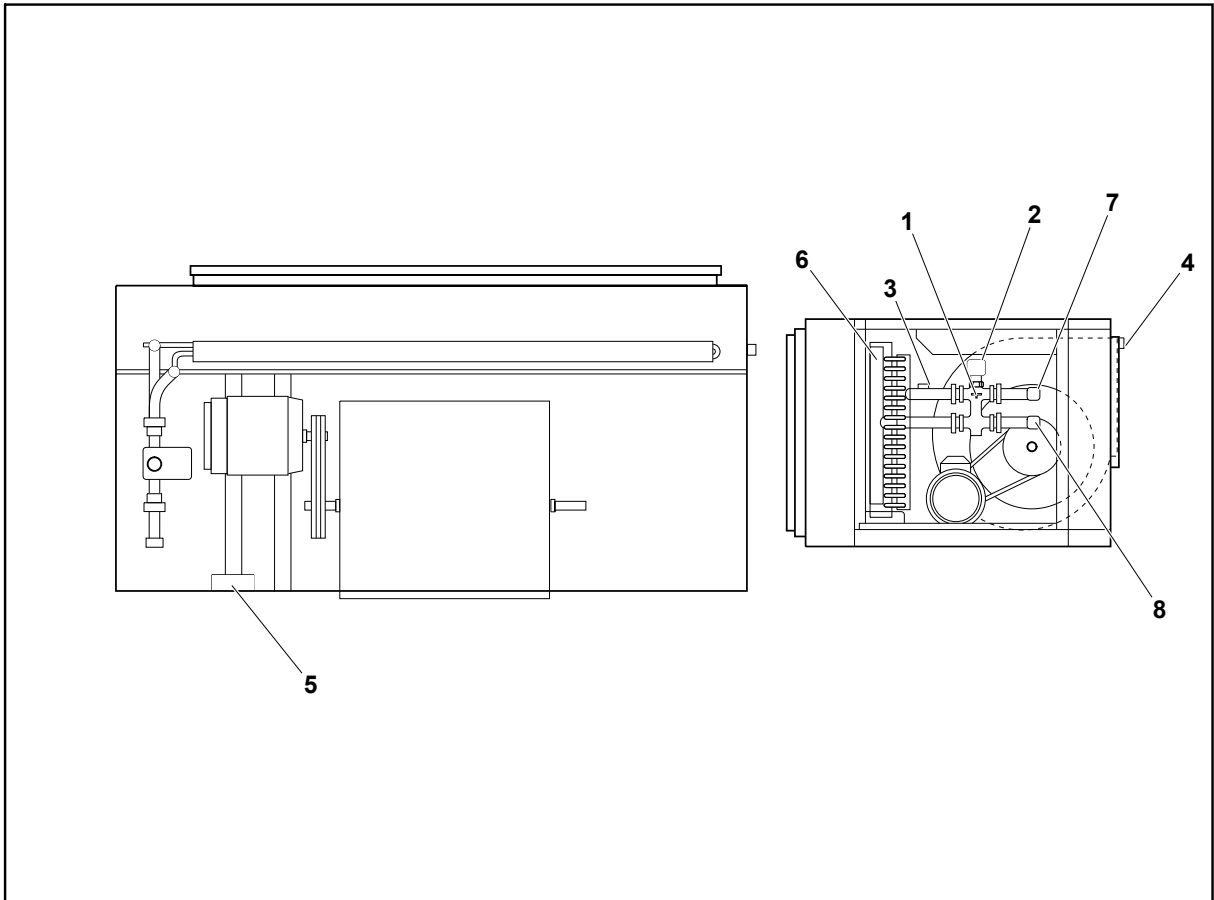
1.2 Technical specifications

The accessory includes the following components:

- Coil: with steep plate frame, copper pipes and aluminium fins.
- 3-way valve: bronze body.
- Electric actuator: 0-10 V proportional control, 24 Vac power.
- Control board and plastic separators.
- B17 temperature probe for the water inlet.
- B16 temperature probe for air discharge.
- Manual air bleeder.
- Switching connection cables between the electrical board for the outdoor unit (VCH) and the water coil (length 20 m). A connection kit for 50 m is optionally available.

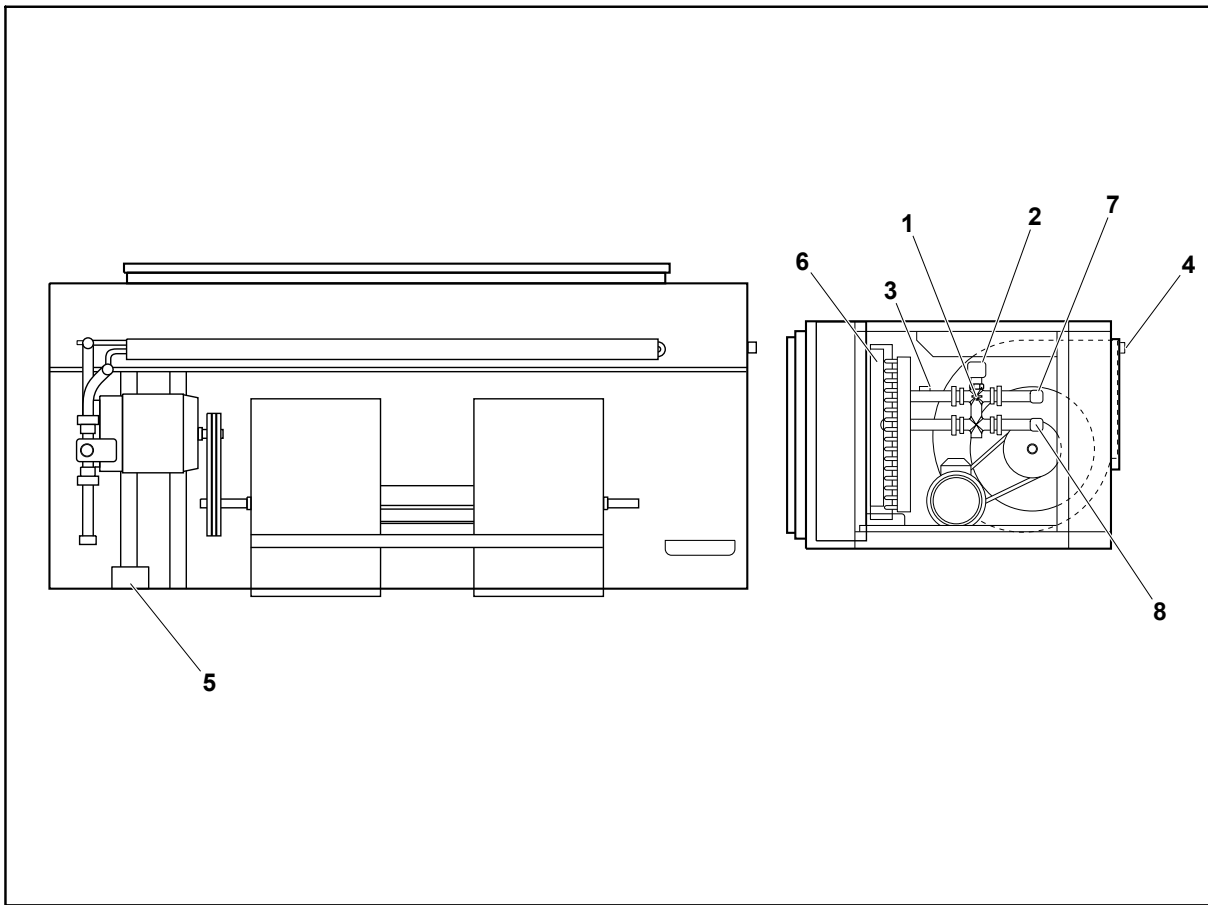
1.2.1 Location of components

VIR -25A



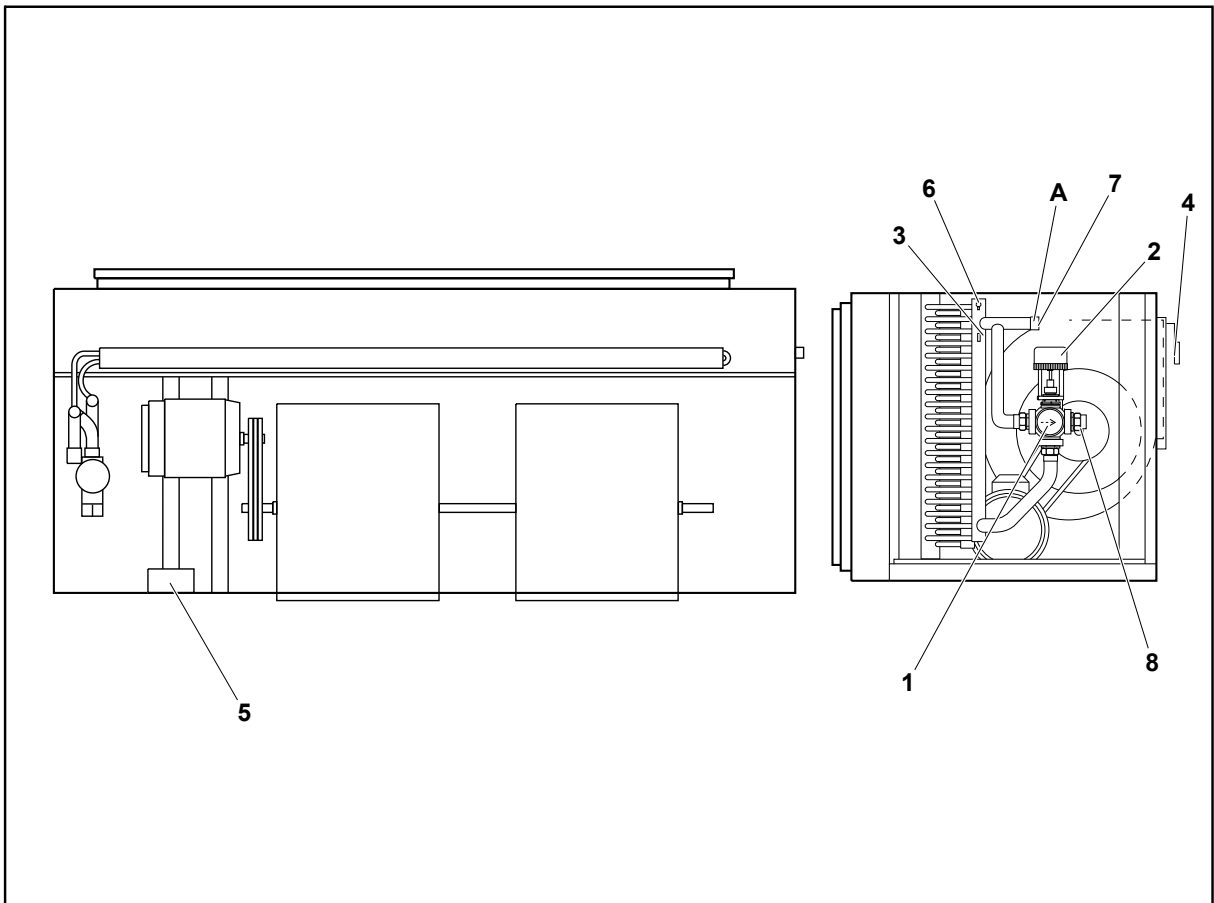
- 1 3-way valve
- 2 Actuator
- 3 Water inlet probe, B17
- 4 Air discharge probe, B16
- 5 Water coil control
- 6 Automatic air bleeder
- 7 Water connection pipe inlet
- 8 Water connection pipe outlet

VIR -40A



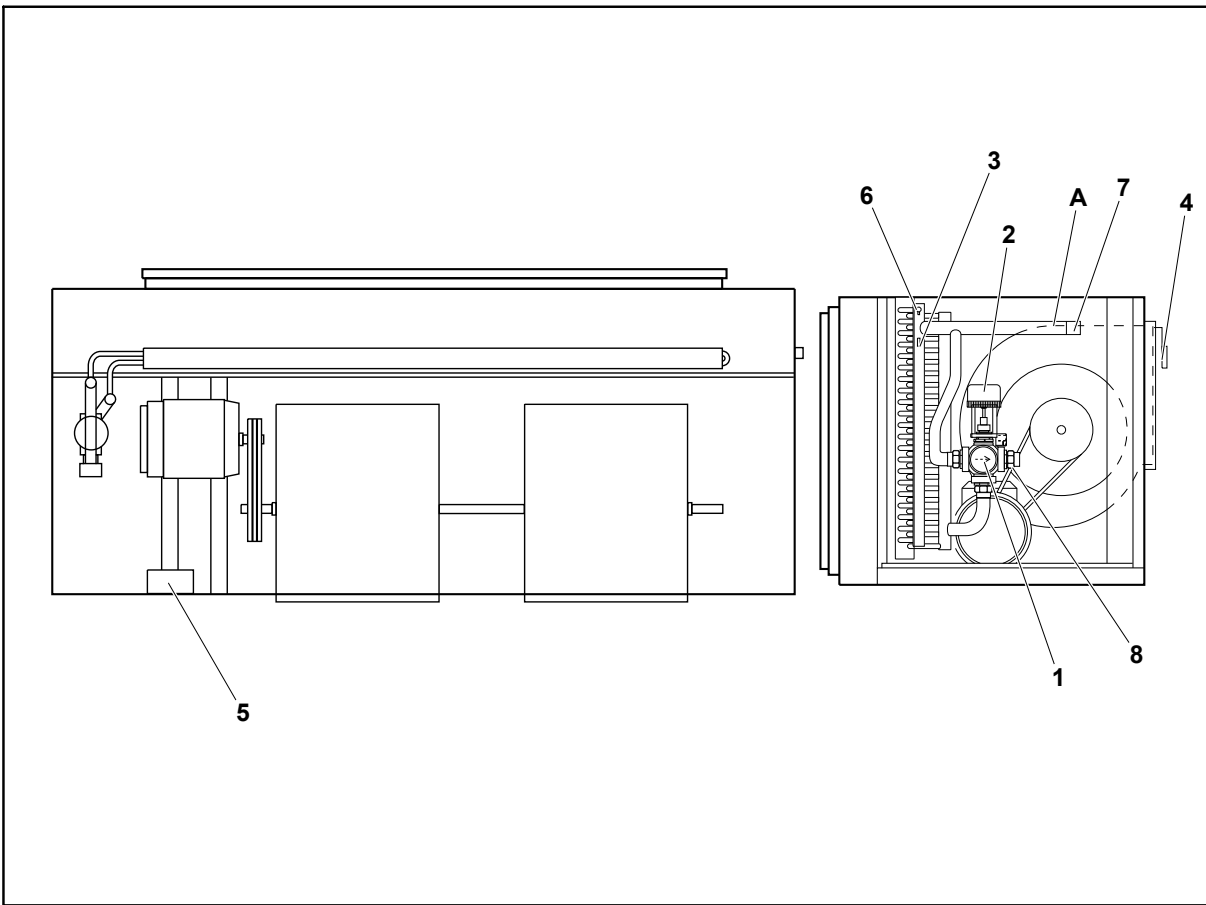
- 1 3-way valve
- 2 Actuator
- 3 Water inlet probe, B17
- 4 Air discharge probe, B16
- 5 Water coil control
- 6 Automatic air bleeder
- 7 Water connection pipe inlet
- 8 Water connection pipe outlet

VIR-45/60A



- 1 3-way valve
- 2 Actuator
- 3 Water inlet probe, B17
- 4 Air discharge probe, B16
- 5 Water coil control
- 6 Automatic air bleeder
- 7 Water connection pipe inlet
- 8 Water connection pipe outlet
- A Flared

VIR-75/90A



- 1 3-way valve
- 2 Actuator
- 3 Water inlet probe, B17
- 4 Air discharge probe, B16
- 5 Water coil control
- 6 Automatic air bleeder
- 7 Water connection pipe inlet
- 8 Water connection pipe outlet
- A Flared

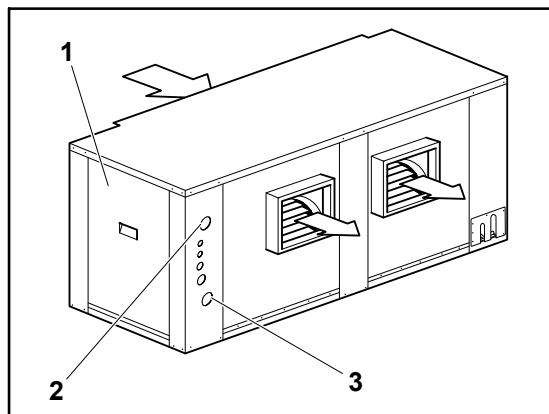
1.3 Installation

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.

Disconnect the main power supply to the unit.

1.3.1 Start-up

1. Remove the panel -1- to access the 3-way valve, side motor panel.
2. The water inlet -2- and outlet -3- connections must be made at the front (remove the valve actuator for welding and fit once welding is completed).



ATENCIÓN

Manual valves should be installed on the inlet and outlet lines to be able to insulate the unit from the general installation if required.

3. Hot water coil control board.

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

The telephone wire must be connected on site between the hot water coil accessory board (J15 or J16) and the Yklon board or the board of the second compressor located on the outdoor unit (VCH). The 24 Vac power supply cable provided must also be connected.



ATENCIÓN

The discharge probe (B16) should be fitted to the supply duct, 1 metre away from the indoor unit (VIR) for a better reading.

Once the water inlet and outlet connections are made, turn on the machine power supply.

Check that the green LED (V1) on the coil control board (A6) is flashing (accessory board configured).

If not, search and configure accessories by pressing the test button on the Yklon 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 the coil board is flashing to indicate that the accessory has been configured.

4. Check the correct working order of the valve actuator.

There is a potentiometer, P1, on the coil control board that 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 seconds.

5. Jumper S2 (ENTALP) selection.

- Open (factory-configured by default): Priority selection of compressors on models with heat pump.
- Closed: Selection of hot water coil operating priority on compressors.

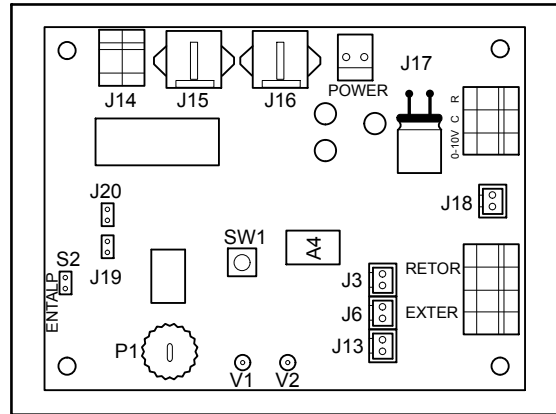
This is recommended for installations where very cheap hot water is available.

6. 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.

1.4 Operation

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 Operation

Heat can be generated under favourable conditions through valve modulation according to the discharge 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.

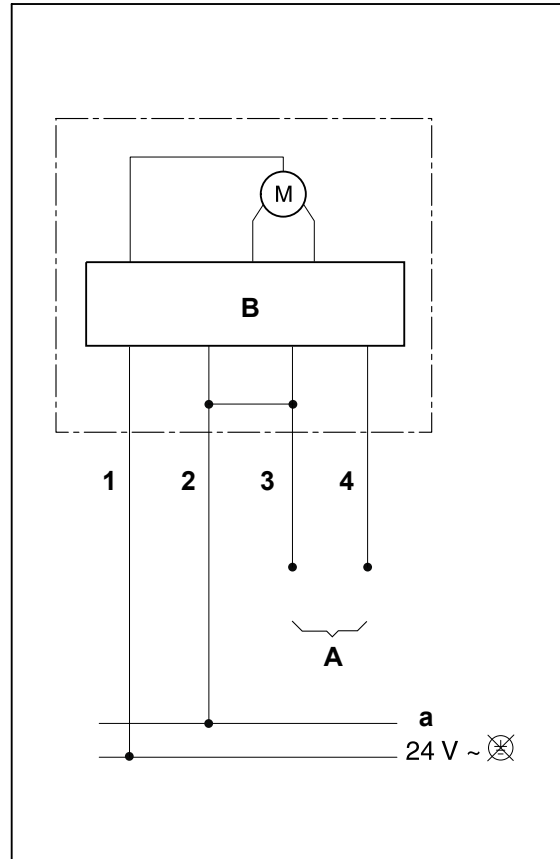
1.4.1 VA-7472 actuator selection jumper VIR-25a and 40a

ATENCIÓN

Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected firmly.

The VA-7472-9001 (VIR-25A and 40A) valve actuator is powered at 24 Vac by the red and black wires. The control signal is from 0 to 10 Vdc between the blue and white wires. At 0 Vdc, the valve is closed (By-pass) and at 10 Vdc, the valve is fully open.

- A. Control signal
- B. Control board.
- 1. Red.
- 2. Black.
- 3. Blue
- 4. White



The actuator has 6 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. Function factory-enabled 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). No jumper on 2 and 3 (0 to 5 Vdc). Factory-set to position 2 and 3 with jumper (0 to 10 Vdc) by default.

3. Jumper 4. No function.

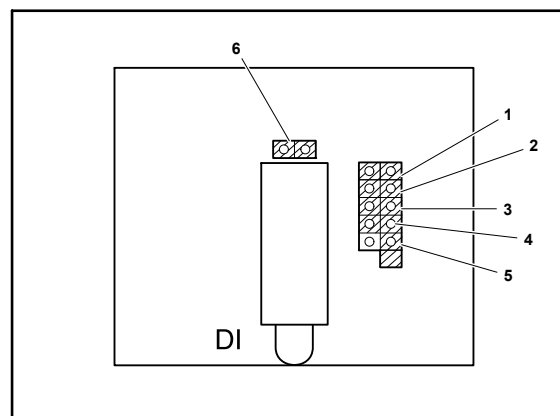
Factory-set with bridge by default.

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

Factory-set without bridge by default, reverse action (A1).

5. Jumper 6. No function.

Factory-set with bridge by default.



1.4 Operation

1.4.2 VA-7152 actuator selection jumper VIR-45A to 90A

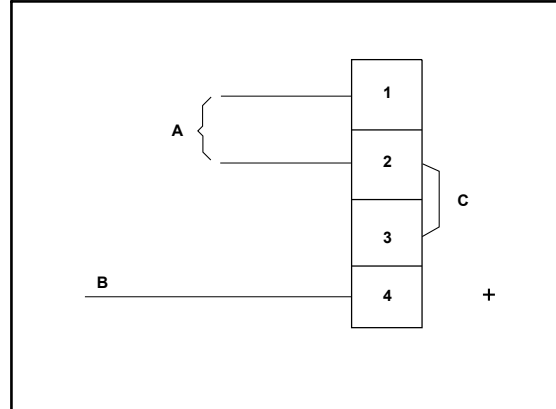


ATENCIÓN

Loose cables can cause overheating of terminals or incorrect operation of the unit. Fire hazards may also exist. Therefore, make sure all cables are connected firmly.

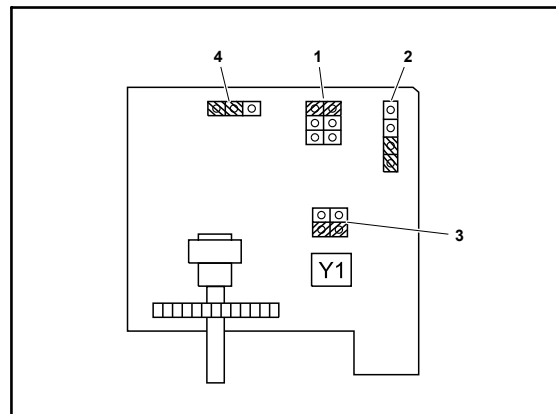
The VA-7152-1001 (VIR-45A to 90A) valve actuator is powered at 24 Vac at terminals 1 and 2. The control signal is within a range of 0 and 10 Vdc between terminals 3 and 4. At 0 Vdc, the valve is closed (Bypass) and at 10 Vdc, the valve is fully open.

- A. 24 Vac power supply.
- B. Control signal.
- C. Common.
- 1. Red.
- 2. White
- 4. Brown.



The actuator has 4 input selection jumpers that coincide with the required operating range.

1. Jumper 1. Input voltage selection:
 - Upper jumper (0 to 10 Vdc)
Factory-configured by default.
 - Central jumper (0 to 5 Vdc)
 - Lower jumper (5 to 10 Vdc)
2. Jumper 2. Run selection jumper configuration
 - Short run: 1/2 inch or less.
 - Long run: over 1/2 inch.
 - Factory-configured by default.
3. Jumper 3. Direct/reverse action jumper configuration so that the valve shaft moves in the required direction.



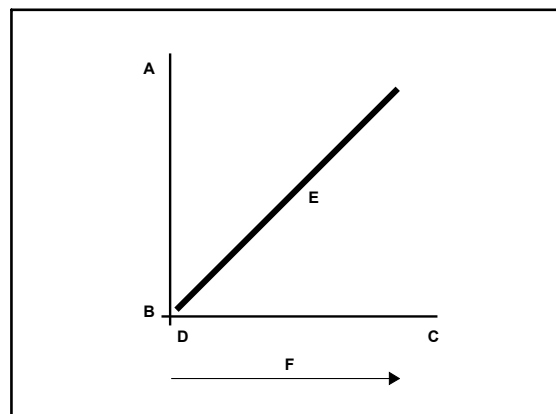
Factory-configured by default to the lower position, reverse action (RA).

4. Jumper 4. Configures the fault position jumper.

Where the signal on the actuator is lost (connection closed), the actuator will switch to the pre-set position by default.

Position factory-closed.

- A. Shaft up.
- B. Shaft down.
- C. High Vdc.
- D. Low Vdc.
- E. Reverse action mode (RA).
- F. Signal increase.



1.5 Physical data

Models		VIR 25A	VIR 40A	VIR 45A and 60A	VIR 75A and 90A
Pipe depth		2	2	2	2
Pipe height		16	19	20	22
Pipe diameter		3/8"	3/8"	1/2"	1/2"
Finned length		1069	1312	1895	2155
Front area	m ²	0.49	0.70	1.32	1.64
Inlet/outlet connection diameter (weld)		1 1/8"	1 1/8"	1 3/8"	1 3/8"
Weight	kg	16	20	37	43

1.5.1 Data with water, without GLYCOL

Model	V [L]	Air flow [m ³ /h]	Water temperature (inlet - outlet) [°C]								
			90-70			80-60			70-50		
			C _{cal} [kW]	H ₂ O Flow [m ³ /h]	ΔT ^{to} air [K]	C _{cal} [kW]	H ₂ O Flow [m ³ /h]	ΔT ^{to} air [K]	C _{cal} [kW]	H ₂ O Flow [m ³ /h]	ΔT ^{to} air [K]
VIR 25A	3.7	Min. 3600	36.1	1.51	29.3	29.2	1.22	23.7	22.3	0.94	18.1
		Nom. 4530	41.4	1.76	26.8	33.5	1.40	21.6	25.6	1.08	16.5
		Max. 5100	44.4	1.87	25.4	35.9	1.51	20.5	27.4	1.15	15.7
VIR 40A	5	Min. 6000	58.0	2.45	28.2	47.4	2.02	23	36.6	1.55	17.8
		Nom. 7500	65.9	2.77	25.7	53.9	2.27	21	41.7	1.76	16.2
		Max. 8000	68.4	2.88	25	56.2	2.38	20.5	43.2	1.84	15.8
VIR 45A	11.5	Min. 7200	93.2	3.96	37.6	76.7	3.24	31	59.2	2.52	23.9
		Nom. 9000	107.0	4.50	34.7	88.1	3.74	28.6	68.0	2.88	22
		Max. 12600	131.4	5.58	30.3	107.8	4.57	24.9	83.6	3.53	19.3
VIR 60A	11.5	Min. 8400	102.6	4.36	35.6	84.4	3.60	29.3	65.1	2.77	22.6
		Nom. 10500	117.7	4.97	32.6	96.8	4.10	26.9	74.7	3.17	20.7
		Max. 12600	131.4	5.58	30.3	107.8	4.57	24.9	83.6	3.53	19.3
VIR 75A	14	Min. 11000	133.6	5.69	35.3	110.0	4.64	29	85.9	3.64	22.7
		Nom. 13700	152.8	6.48	32.4	125.7	5.33	26.7	98.6	4.21	20.9
		Max. 16800	172.0	7.27	29.8	141.5	6.01	24.5	110.8	4.72	19.2
VIR 90A	14	Min. 12800	146.4	6.19	33.3	120.6	5.11	27.4	94.0	4.00	21.4
		Nom. 16000	167.1	7.06	30.4	137.5	5.83	25	107.7	4.57	19.6
		Max. 16800	172.00	7.27	29.8	141.5	6.01	24.5	110.8	4.72	19.2

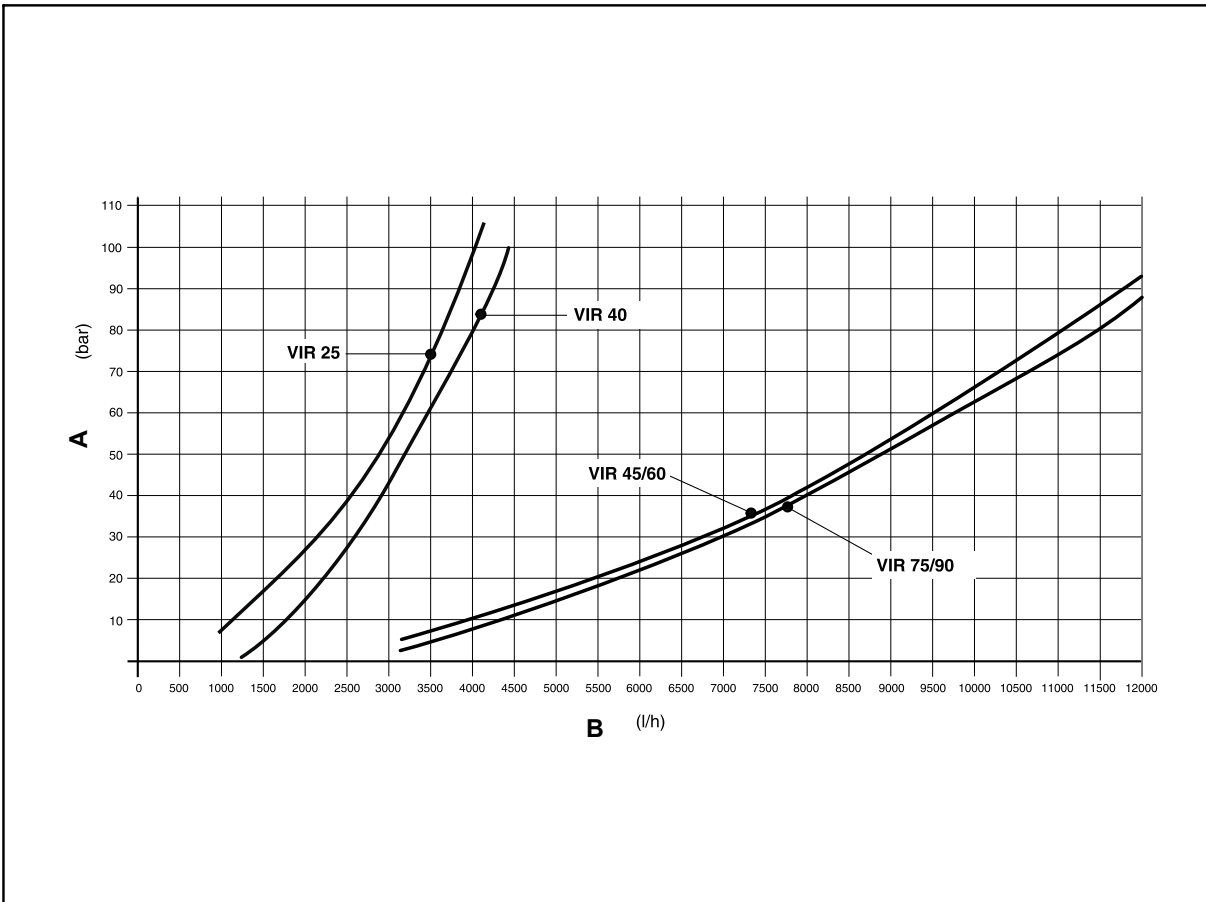
- Coil input air 18 °C

V ≡ Volume of water in circuit

C_{cal} ≡ Heat capacity

1.5 Physical data

1.5.2 Flow/pressure characteristics of the VIR - 25 to 90A hot water coil hydraulic circuit



A Pressure drop

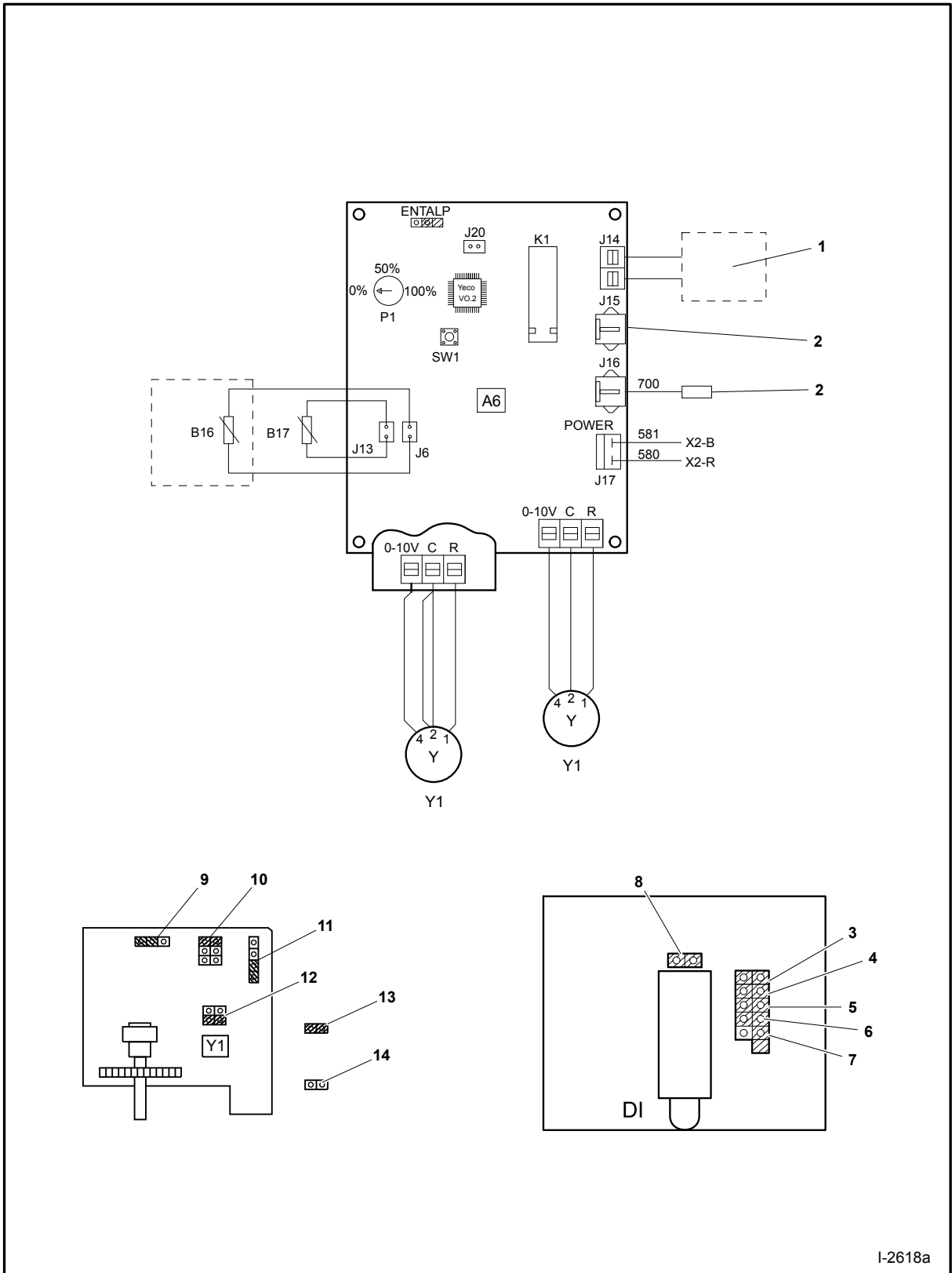
B Flow

- Hydraulic circuit pressure drop with valve completely open (0% bypass)

1.5.3 Air circuit pressure drop

Unit	Nominal air flow [m ³ /h]	Pressure drop with water coil [Pa]
VIR - 25	7590	30
VIR - 40	7500	50
VIR - 45	9000	32
VIR - 60	10500	32
VIR - 75	13700	38
VIR - 90	16000	41

1.6 Wiring diagram



I-2618a

1 Hot water coil for VIR - 25A to 90A

1.6 Wiring diagram

1	Optional	A	24 Vac Phase R switching
2	Accessories	B	Water pump
3	Jumper 1, VIR - 25A to 40A	C	Three-way valve (VIR-45A to 90A)
4	Jumper 2, VIR - 25A to 40A	D	Four-way valve (VIR-25A to 40A)
5	Jumper 3, VIR - 25A to 40A	E	Valve actuator (VA-7472-9001, model VIR-25A to 40A)
6	Jumper 4, VIR - 25A to 40A	F	Valve actuator (VA-7152-1001, model VIR-45A to 90A)
8	Jumper 6, VIR - 25A to 40A	a	Red
9	Jumper 4, VIR - 45A to 90A	b	White
10	Jumper 1, VIR - 45A to 90A	c	Blue
11	Jumper 2, VIR - 45A to 90A	d	Brown
12	Jumper 3, VIR - 45A to 90A	B16	Discharge probe
13	Jumper yes	B17	Water inlet probe
		J6	Yellow connector
		J13	Black connector

Data and measurements subject to changes without prior notice.