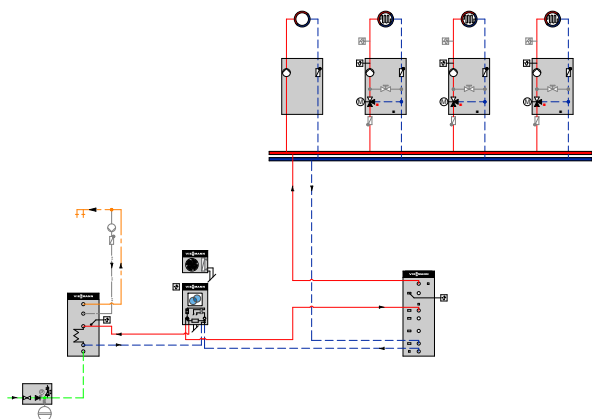


Vitocal 150-A, weather-compensated heat pump control unit E3, heating water buffer cylinder, DHW heating, heating circuits with and without mixer

Hydraulic diagram



4804763_2110_01

Main components

- Vitocal 150-A air source heat pump
- Weather-compensated heat pump control unit E3
- Mono mode DHW cylinder
- Heating water buffer cylinder
- Heating circuits with and without mixer

Function description

Heating the heating water buffer cylinder with the heat pump

The heat pump starts if the system flow temperature at the buffer temperature sensor has fallen below the set value by the start hysteresis, as specified in the heat pump control unit. The secondary pump delivers the heating water to the heating water buffer cylinder. Any heat not removed by the heating circuits is stored in the heating water buffer cylinder. If the buffer temperature has exceeded the set value specified by the heat pump control unit, the heat pump is switched off. During the power-OFF period, the compressor is generally blocked. The heating circuits are supplied with heat from the heating water buffer cylinder. The heat pump minimum flow rate is safeguarded by means of the heating water buffer cylinder and the secondary pump.

Hydraulic conditions for the primary and secondary circuit

Be sure to observe the minimum pipe diameter – see following table.

Product	Type	Pipe Ø, connection lines indoor/outdoor unit	Min. pipe Ø, secondary circuit
Vitocal 150-A	AWO-M-E-AC-AF 151.A10	DN 32	DN 32
	AWO-M-E-AC-AF 151.A13		
	AWO-M-E-AC-AF 151.A16		
Vitocal 200-S	AWB-M-E-AC 201.E06	Hot gas line: 12 mm Liquid line: 6 mm	DN 25
	AWB-M-E-AC 201.E08	Hot gas line: 16 mm	
	AWB-M-E-AC 201.E10	Liquid line: 6 mm	

Note

In applications where the heat pump can be temporarily blocked via the power-OFF contact, we recommend using a system example with a sufficiently sized heating water buffer cylinder. Heat is supplied to the building by the heating water buffer cylinder during the power-OFF time.

DHW heating by heat pump

DHW heating begins if the cylinder temperature falls below the set value. The secondary pump switches on and the internal diverter valve moves to the "DHW heating" position. The heat pump raises the flow temperature to the value required for DHW heating. If higher cylinder temperatures are to be achieved, cylinder reheating by an additional heat generator or the instantaneous heating water heater must be carried out.

Heating circuit without mixer

The set flow temperature of each heating circuit is determined by the following parameters: Outside temperature, set room temperature, operating mode and heating curve. Operating in weather-compensated mode, the heat generator control unit regulates its temperature to the set flow temperature of the heating circuit without mixer. The maximum temperature in heating circuits can be limited by means of a temperature limiter.

Heating circuit with mixer

The set flow temperature of each heating circuit is determined by the following parameters: Outside temperature, set room temperature, operating mode and heating curve. The flow temperature of the heating circuits with mixer is controlled by the stepped opening or closing of the mixers. The maximum temperature in heating circuits can be limited by means of a temperature limiter. The optional bypass valve enables a smaller mixer to be selected if required, so that its control range is fully utilised.

Note

An optional bypass valve enables a smaller mixer to be selected if required, so that the control range is fully utilised. Control is more precise. If adjacent heating circuit pumps draw water backwards via the distributor and the mixer of this heating circuit (incorrect circulation), the optional check valve prevents any shortfall in heat supply that may occur.

Information on underfloor heating

Underfloor heating circuits must be equipped with a temperature limiter to restrict the maximum temperature.

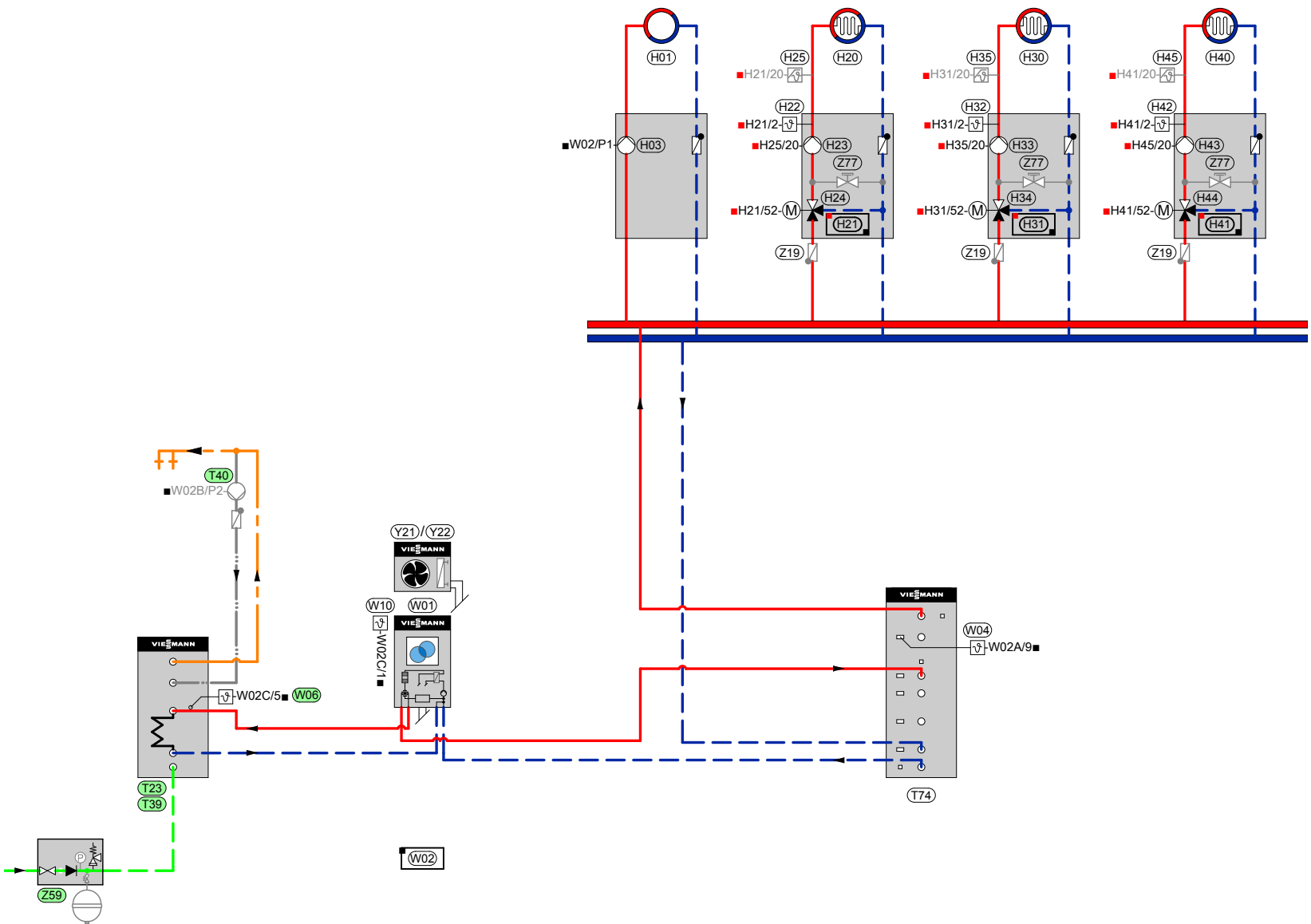
Note

This scheme is a general example without shut-off valves or safety equipment. Refer to the appropriate technical guides when designing specific applications. With regard to the hydraulic connection of heating components, ensure that the required minimum and maximum flow rates are complied with.

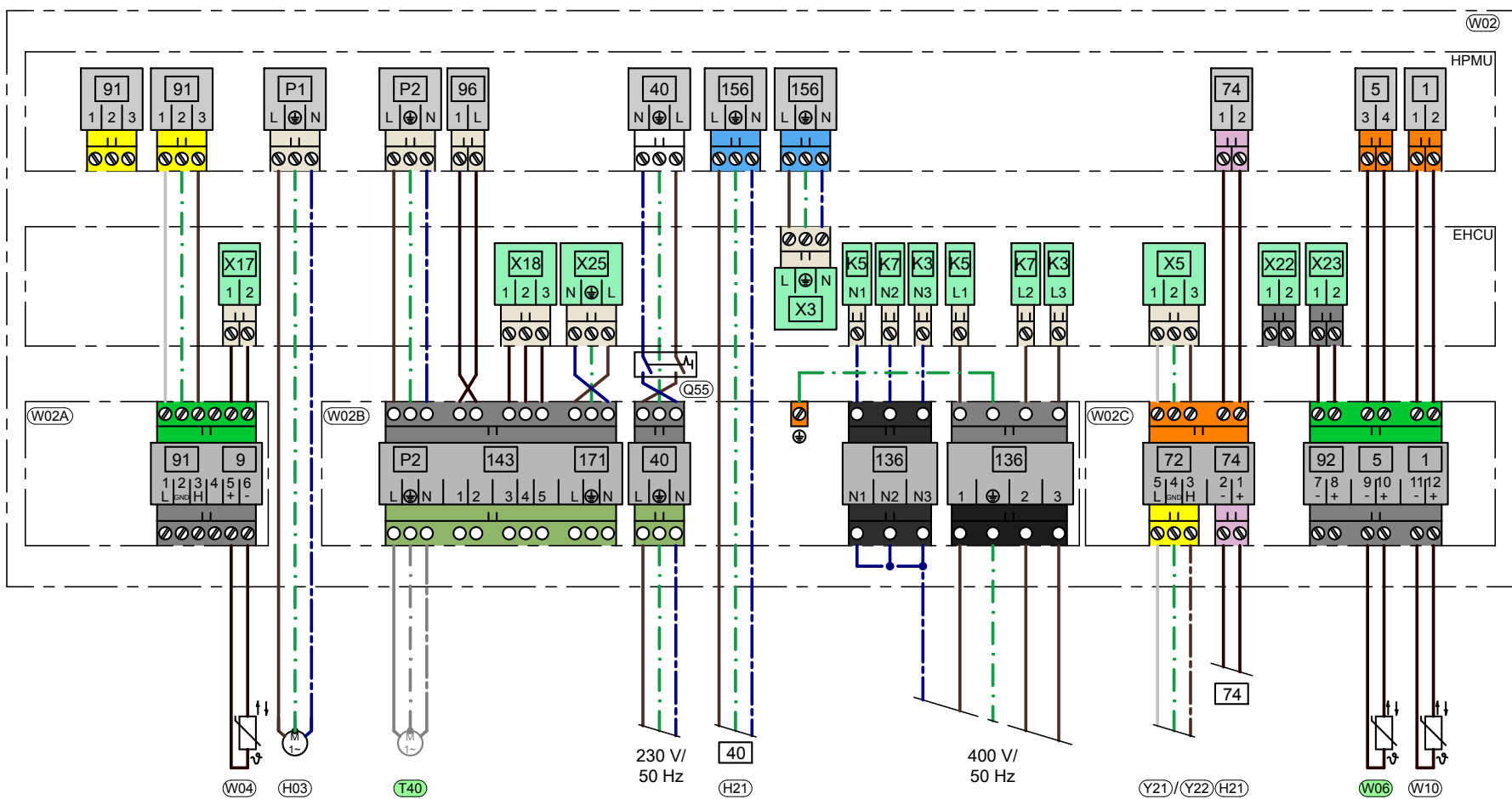
Commissioning menu

System scheme	Setting		Function description
Low loss header/buffer cylinder	Buffer cylinder, heating only		The appliance heats the DHW directly, upstream of the heating water buffer cylinder. The heating circuits are located on the secondary side of the heating water buffer cylinder.
Heating/cooling circuit 1	Function	Heating circuit without mixer	One heating circuit without mixer connected.
	Operating mode	Heating	Heating/cooling circuit enabled for room heating only.
	Type	Radiators	Cooling not possible.
Heating/cooling circuit 2-4	Function	Mixer circuit with pump	One mixer circuit with pump connected.
	Operating mode	Heating	Heating/cooling circuit enabled for room heating only.
	Type	Underfloor heating	<i>Only for cooling:</i> Contact humidistat required. Min. set flow temperature, cooling = 18 °C.
		Radiators	Cooling not possible.
DHW	Cylinder with one sensor		System with DHW cylinder with 1 cylinder temperature sensor.
	Cylinder with one sensor and DHW circulation pump		System with DHW cylinder with 1 cylinder temperature sensor and DHW circulation pump.

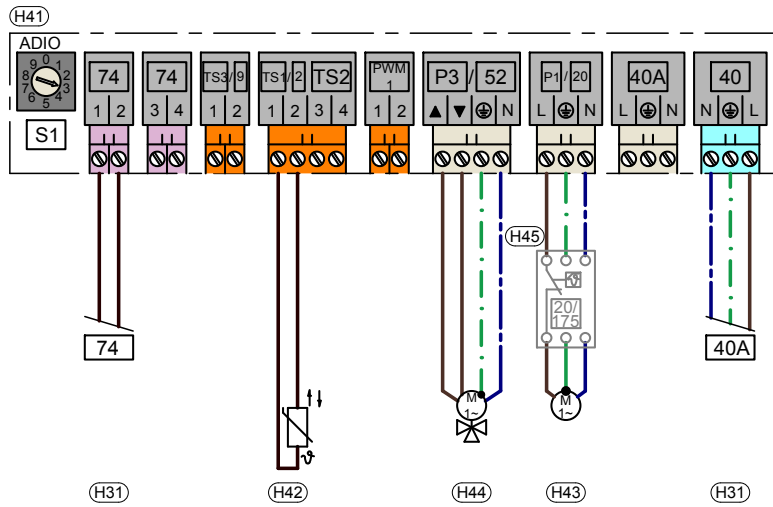
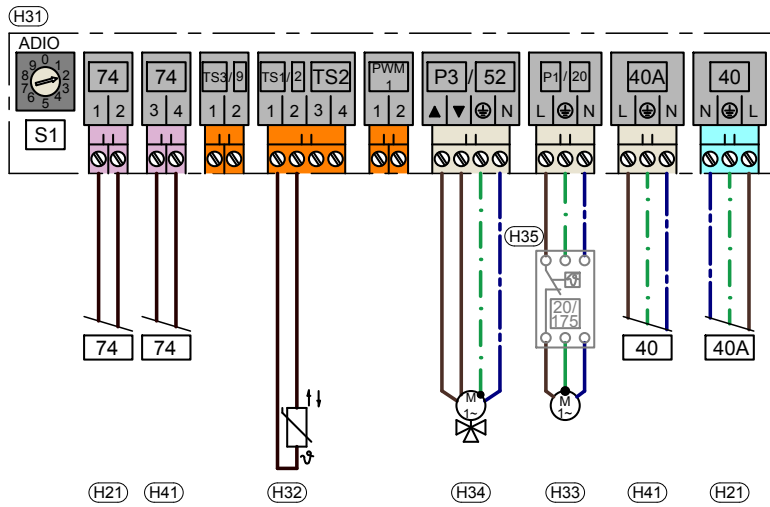
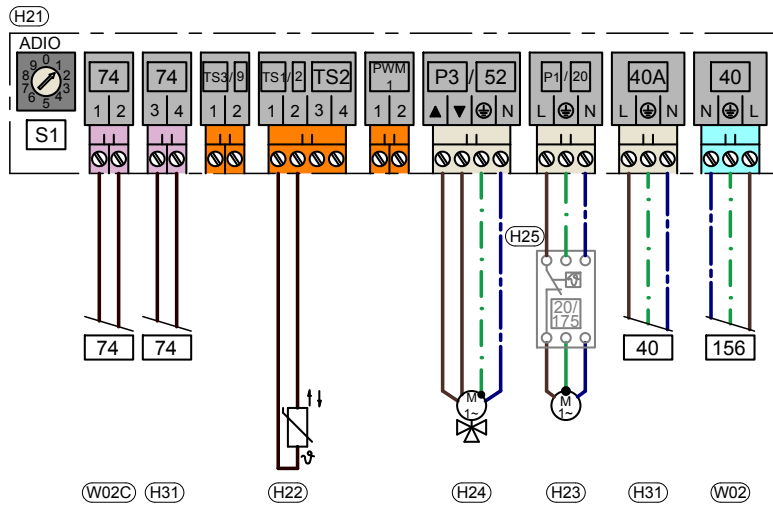
Hydraulic diagram



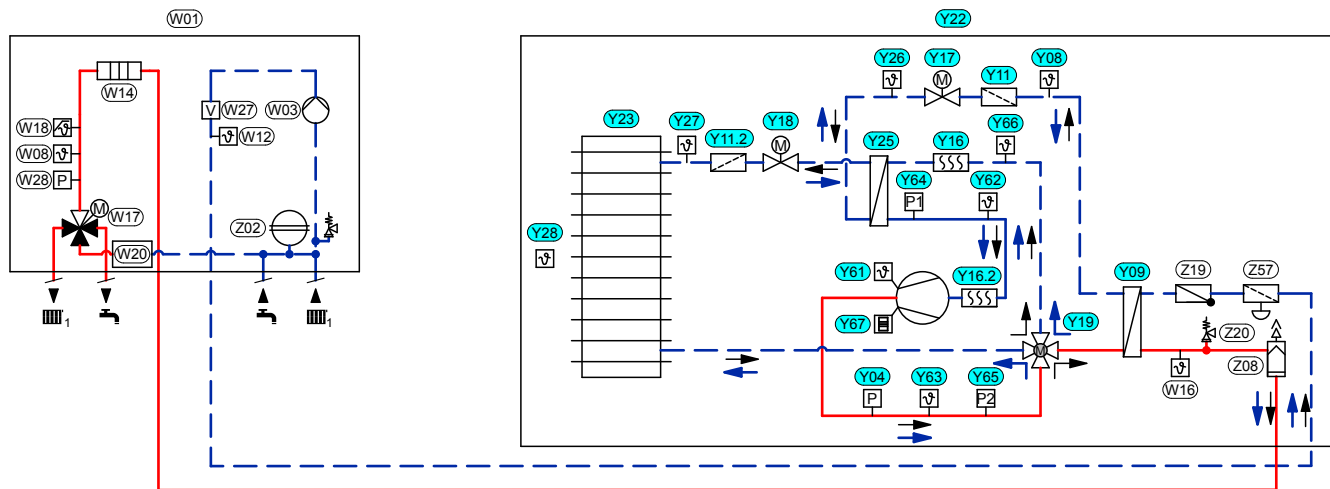
Wiring diagram: Heat pump



Wiring diagram: Extension for heating circuits with mixer



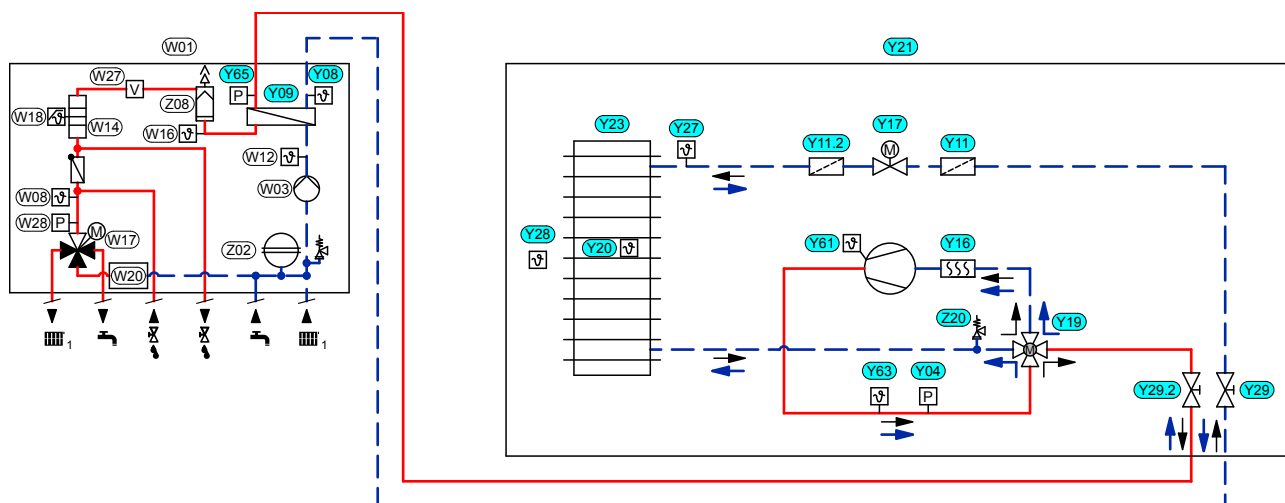
Hydraulic diagram: Vitocal 150-A indoor/outdoor unit



Internal components: Vitocal 150-A indoor/outdoor unit

Pos.	Description	Part no.
(W01) (B)	Indoor unit, Vitocal 150-A heat pump	See Viessmann pricelist
(W03)	Secondary pump	Standard delivery pos. (W01) (B)
(W08)	Flow temperature sensor	Standard delivery pos. (W01) (B)
(W12)	Return temperature sensor	Standard delivery pos. (W01) (B)
(W14)	Instantaneous heating water heater	Standard delivery pos. (W01) (B)
(W16)	Flow temperature sensor (upstream of electric heater)	Standard delivery pos. (W01) (B)
(W17)	4/3-way valve for central heating/DHW heating/bypass	Standard delivery pos. (W01) (B)
(W18)	Safety temperature sensor	Standard delivery pos. (W01) (B)
(W20)	Buffer cylinder (16 l)	Standard delivery pos. (W01) (B)
(W27)	Flow sensor	Standard delivery pos. (W01) (B)
(W28)	Pressure switch	Standard delivery pos. (W01) (B)
(Y04)	Primary circuit pressure switch	Standard delivery pos. (W01) (B)
(Y08)	Return temperature sensor, primary circuit	Standard delivery pos. (W01) (B)
(Y09)	Condenser	Standard delivery pos. (W01) (B)
(Y11)/(Y11.2)	Dirt trap in the refrigerant circuit	Standard delivery pos. (W01) (B)
(Y16)/(Y16.2)	Accumulator	Standard delivery pos. (W01) (B)
(Y17)	Expansion valve 1	Standard delivery pos. (W01) (B)
(Y18)	Expansion valve 2	Standard delivery pos. (W01) (B)
(Y19)	4-way reversing valve	Standard delivery pos. (W01) (B)
(Y22)	Monoblock outdoor unit (with integral condenser)	Standard delivery pos. (W01) (B)
(Y23)	Evaporator	Standard delivery pos. (W01) (B)
(Y25)	Inner heat exchanger	Standard delivery pos. (W01) (B)
(Y26)	Temperature sensor, inlet, inner heat exchanger	Standard delivery pos. (W01) (B)
(Y27)	Temperature sensor, evaporator inlet	Standard delivery pos. (W01) (B)
(Y28)	Temperature sensor, outdoor air inlet	Standard delivery pos. (W01) (B)
(Y61)	Temperature sensor, compressor oil	Standard delivery pos. (W01) (B)
(Y62)	Temperature sensor, compressor inlet	Standard delivery pos. (W01) (B)
(Y63)	Temperature sensor, compressor outlet	Standard delivery pos. (W01) (B)
(Y64)	Pressure sensor, suction gas line	Standard delivery pos. (W01) (B)
(Y65)	Pressure sensor, high pressure line	Standard delivery pos. (W01) (B)
(Y66)	Temperature sensor, suction gas line	Standard delivery pos. (W01) (B)
(Y67)	Oil sump heater	Standard delivery pos. (W01) (B)
(Z02)	Diaphragm expansion vessel (10 l)	Standard delivery pos. (W01) (B)
(Z08)	Air vent valve	Standard delivery pos. (W01) (B)
(Z19)	Check valve	Standard delivery pos. (W01) (B)
(Z20)	Safety valve	Standard delivery pos. (W01) (B)
(Z57)	Dirt trap	Standard delivery pos. (W01) (B)

Hydraulic diagram: Vitocal 200-S indoor/outdoor unit



Internal components: Vitocal 200-S indoor/outdoor unit

Pos.	Description	Part no.
(W01) (A)	Indoor unit, Vitocal 200-S heat pump	See Viessmann pricelist
(W03)	Secondary pump	Standard delivery pos. (W01) (A)
(W08)	Flow temperature sensor	Standard delivery pos. (W01) (A)
(W12)	Return temperature sensor	Standard delivery pos. (W01) (A)
(W14)	Instantaneous heating water heater	Standard delivery pos. (W01) (A)
(W16)	Flow temperature sensor (upstream of electric heater)	Standard delivery pos. (W01) (A)
(W17)	4/3-way valve for central heating/DHW heating/bypass	Standard delivery pos. (W01) (A)
(W18)	Safety temperature sensor	Standard delivery pos. (W01) (A)
(W20)	Buffer cylinder (16 l)	Standard delivery pos. (W01) (A)
(W27)	Flow sensor	Standard delivery pos. (W01) (A)
(W28)	Pressure switch	Standard delivery pos. (W01) (A)
(Y04)	Primary circuit pressure switch	Standard delivery pos. (W01) (A)
(Y08)	Return temperature sensor, primary circuit	Standard delivery pos. (W01) (A)
(Y09)	Condenser	Standard delivery pos. (W01) (A)
(Y11)/(Y11.2)	Dirt trap	Standard delivery pos. (W01) (A)
(Y16)	Accumulator	Standard delivery pos. (W01) (A)
(Y17)	Expansion valve 1	Standard delivery pos. (W01) (A)
(Y19)	4-way reversing valve	Standard delivery pos. (W01) (A)
(Y20)	Temperature sensor, evaporator middle	Standard delivery pos. (W01) (A)
(Y21)	Outdoor unit, split (condenser in indoor unit)	Standard delivery pos. (W01) (A)
(Y23)	Evaporator	Standard delivery pos. (W01) (A)
(Y27)	Temperature sensor, evaporator inlet	Standard delivery pos. (W01) (A)
(Y28)	Temperature sensor, outdoor air inlet	Standard delivery pos. (W01) (A)
(Y29)/(Y29.2)	Service valve (for shutting off the split outdoor unit)	Standard delivery pos. (W01) (A)
(Y61)	Temperature sensor, compressor oil	Standard delivery pos. (W01) (A)
(Y63)	Temperature sensor, compressor outlet	Standard delivery pos. (W01) (A)
(Y65)	Pressure sensor, high pressure line	Standard delivery pos. (W01) (A)
(Z02)	Diaphragm expansion vessel (18 l)	Standard delivery pos. (W01) (A)
(Z08)	Air vent valve	Standard delivery pos. (W01) (A)
(Z20)	Safety valve	Standard delivery pos. (W01) (A)

Required products and accessories

Heat generator

Pos.	Description	Part no.
(W01) (A)	Indoor unit, Vitocal 200-S heat pump	See Viessmann pricelist
(W01) (B)	Indoor unit, Vitocal 150-A heat pump	See Viessmann pricelist
(W02)	Weather-compensated heat pump control unit E3	Standard delivery pos. (W01)
(W02A)/(W02C)	Connection sockets: Sensors and BUS connections	Standard delivery pos. (W01)
(W02B)	Junction box: 230 V components and switching contacts	Standard delivery pos. (W01)
(W04)	Buffer temperature sensor (NTC 10k immersion temperature sensor)	7438702
(W06)	Cylinder temperature sensor (NTC 10k immersion temperature sensor)	7438702
(W10)	Outside temperature sensor (NTC 10k)	Standard delivery pos. (W02)

4804763_2110_01 (cont.)**Primary source**

Pos.	Description	Part no.
(Y21)	Outdoor unit, split (condenser in indoor unit)	Standard delivery pos. (W01) (A)
(Y22)	Outdoor unit, monoblock (condenser in outdoor unit)	Standard delivery pos. (W01) (B)

Heating water buffer cylinder

Pos.	Description	Part no.
(T74)	Vitocell 100-E heating water buffer cylinder (400, 600, 750, 950 l), type SVPA/SVPB	See Viessmann pricelist

DHW heating

Pos.	Description	Part no.
(T23)	Mono mode DHW cylinder	See Viessmann pricelist
	or	
(T39)	Vitocell 100-W (300 l), type CVWB mono mode DHW cylinder	Z021898
(T40)	DHW circulation pump	See Viessmann pricelist

Heating circuit without mixer

Pos.	Description	Part no.
(H01)	Heating circuit without mixer	See Viessmann pricelist
(H03)	Heating circuit pump	See Viessmann pricelist

Heating circuit with mixer, fully pre-assembled (PlusBus)

Pos.	Description	Part no.
(H20)/(H30)/(H40) (H21)/(H31)/(H41)	Divicon with mixer, fully pre-assembled (PlusBus) EM-MX extension kit (PlusBus) for mixer mounting	See Viessmann pricelist Standard delivery pos. (H20)/(H30)/(H40)
(H22)/(H32)/(H42)	Flow temperature sensor (NTC 10k immersion temperature sensor)	Standard delivery pos. (H21)/(H31)/(H41)
(H23)/(H33)/(H43)	Heating circuit pump	Standard delivery pos. (H20)/(H30)/(H40)
(H24)/(H34)/(H44)	Mixer motor (extension kit)	Standard delivery pos. (H21)/(H31)/(H41)
(H25)/(H35)/(H45)	Temperature limiter to restrict the maximum temperature of underfloor heating systems (immersion thermostat) or Temperature limiter to restrict the maximum temperature of underfloor heating systems (contact thermostat)	7151728 7151729

Heating circuit with mixer as a set (PlusBus)

Pos.	Description	Part no.
(H20)/(H30)/(H40) (H21)/(H31)/(H41) (H22)/(H32)/(H42)	Divicon with mixer as a set EM-MX extension kit (PlusBus) for mixer mounting Flow temperature sensor (NTC 10k immersion temperature sensor)	See Viessmann pricelist Z017414 Standard delivery pos. (H21)/(H31)/(H41)
(H23)/(H33)/(H43)	Heating circuit pump	Standard delivery pos. (H20)/(H30)/(H40)
(H24)/(H34)/(H44)	Mixer motor (3-way mixer with motor)	Standard delivery pos. (H21)/(H31)/(H41)
(H25)/(H35)/(H45)	Temperature limiter to restrict the maximum temperature of underfloor heating systems (immersion thermostat) or Temperature limiter to restrict the maximum temperature of underfloor heating systems (contact thermostat)	7151728 7151729

Heating circuit with mixer installed on site (PlusBus)

Pos.	Description	Part no.
(H20)/(H30)/(H40) (H21)/(H31)/(H41)	Heating circuit with mixer EM-M1 extension kit (PlusBus) for wall mounting or EM-MX extension kit (PlusBus) for mixer mounting	See Viessmann pricelist Z017410 Z017409
(H22)/(H32)/(H42)	Flow temperature sensor (NTC 10k contact temperature sensor)	Standard delivery pos. (H21)/(H31)/(H41)
(H23)/(H33)/(H43)	Heating circuit pump	See Viessmann pricelist
(H24)/(H34)/(H44)	Mixer (additionally order mixer motor when using EM-M1 for wall mounting)	See Viessmann pricelist
(H25)/(H35)/(H45)	Temperature limiter to restrict the maximum temperature of underfloor heating systems (immersion thermostat) or Temperature limiter to restrict the maximum temperature of underfloor heating systems (contact thermostat)	7151728 7151729

Electronics accessories

Pos.	Description	Part no.
(Q55)	ON/OFF switch	Standard delivery pos. (W02)

Hydraulics accessories

Pos.	Description	Part no.
(Z19)	Check valve	On site
(Z59)	Safety assembly with shut-off valve, non-return valve, safety valve and optional expansion vessel (DHW), pressure gauge	See Viessmann pricelist