Installation and Service Instructions

for use by heating contractor

VIESMANN

Please file in Service Binder

Vitotronic 300, Model GW2
Outdoor-reset logic digital boiler and heating circuit control unit

VITOTRONIC 300

C US
Certified as a component part of Viessmann boilers only

IMPORTANT

Read and save these instructions for future reference.

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Safety, Installation and Warranty Requirements

Please ensure that this manual is read and understood before commencing installation. Failure to comply with the issues listed below and details printed in this manual can cause **product/property damage**, and/or **severe personal injury**. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

Licensed professional heating contractor
The installation, adjustment, service, and maintenance of this equipment *must be* performed by a licensed professional heating contractor.

■ *Please see section entitled "Important Regulatory and Installation Requirements."*

Product documentation
Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

■ *For a listing of applicable literature, please see section entitled "Important Regulatory and Installation Requirements."*

Advice to owner
Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

Warranty
Information contained in this and related product documentation must be read and followed. *Failure to do so renders warranty null and void.*

Safety Terminology

The following terms are used throughout this manual to bring attention to the presence of potential hazards or important product information. **Please heed the advice given!**

⚠ DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial product / property damage.

⚠ WARNING
Indicates an imminently hazardous situation which, if not avoided, could result in substantial product/property damage, serious injury or loss of life.

⚠ WARNING
Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product / property damage.

IMPORTANT
Helpful hints for installation, operation or maintenance which pertain to the product.

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Product Information

Vitotronic 300, Model GW2
For installation in or mounting on Viessmann boilers only.

Applicable to the following control units

Order No. 7134 555, 7143 156, 7511 362 from
Serial No. 7143 000 □□□□□□□□□

Order No. 7134 555, 7143 156, 7511 362 from
Serial No. 7187 101 □□□□□□□□□

Order No. 7134 555, 7143 156, 7511 362 from
Serial No. 7248 248 □□□□□□□□□

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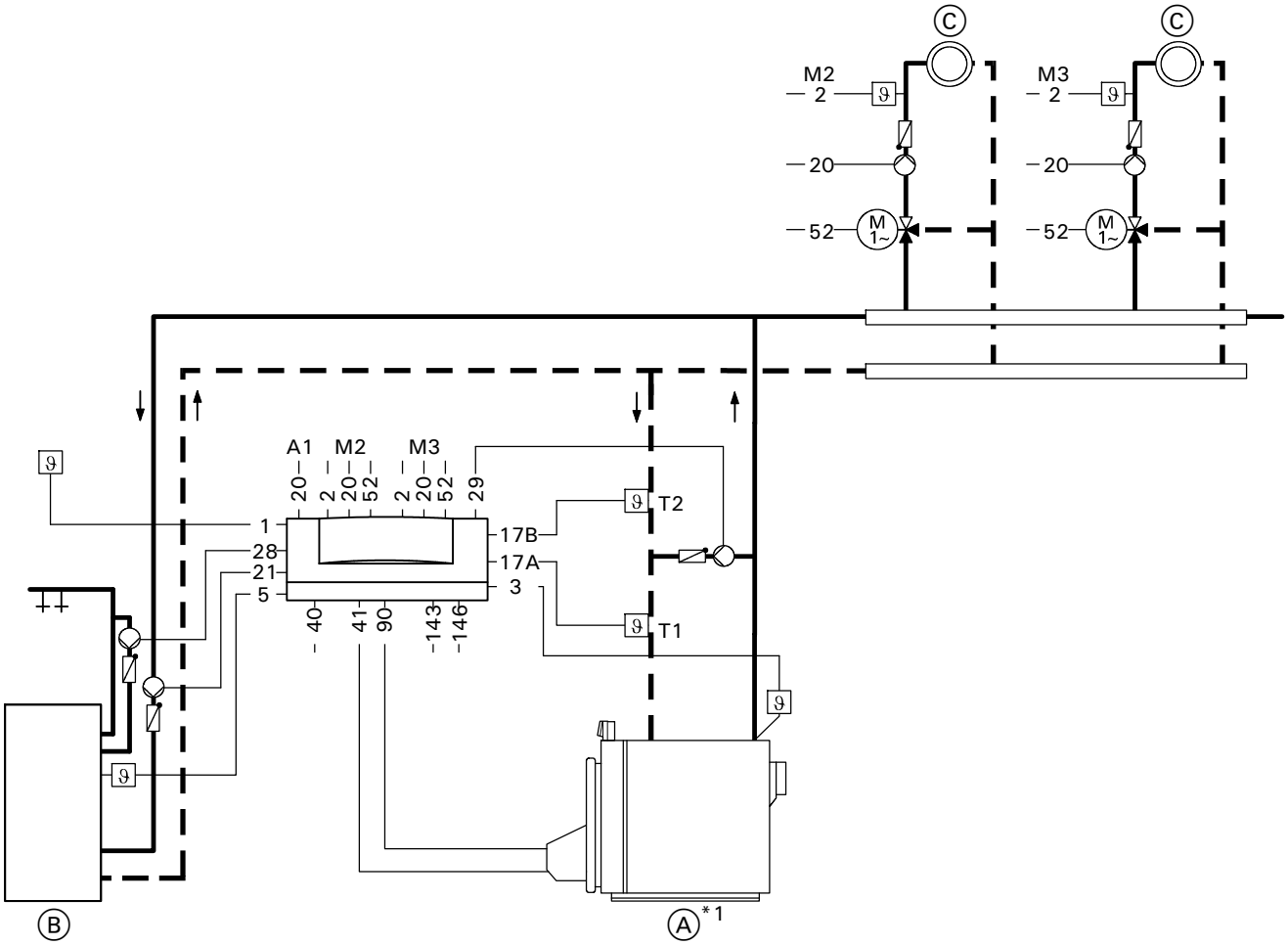
Heating system types for modulating boilers

System type 1 – Single-boiler system with shunt pump for raising the return temperature
in conjunction with
■ Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 300
Ⓑ Domestic hot water tank
Ⓒ Heating circuit with mixing valve

plugs

1		Outdoor temperature sensor
2	M2	Supply temperature sensor, mixing valve circuit 2
2	M3	Supply temperature sensor, mixing valve circuit 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
17	A	Temperature sensor T1
17	B	Temperature sensor T2
20	A1	Close mixing valves with external heating circuit controls
20	M2	Heating circuit pump, mixing valve circuit 2
20	M3	Heating circuit pump, mixing valve circuit 3
21		DHW pump
28		DHW re-circulation pump
29		Shunt pump
40		Power supply connection, 120 VAC
41		Burner (1st stage)
52	M2	Mixing valve motor, mixing valve circuit 2
52	M3	Mixing valve motor, mixing valve circuit 3
90		Burner (2nd stage/modulating)
143		Connection of external equipment (see page 38)
146		Connection of external equipment (see page 39)

*1 *On the Vitorond the boiler supply and return are at the rear of the boiler.*

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Heating system types for modulating boilers *(continued)*

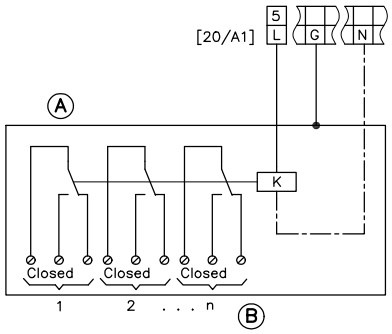
Possible applications
Heating systems with manifold arranged close to the boiler. The boiler water flow is required to be reduced.

Please note:
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or the heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

When the return temperature falls below the required minimum value, the temperature sensor T2 switches on the shunt pump. If the minimum return temperature is not reached despite raising the return temperature, the flow must be reduced by at least 50% via the temperature sensor T1.

The shunt pump must be sized so that bypassed water accounts for approx. 30% of the total flow rate of the boiler.

Temperature sensor T1
Wiring of the temperature sensor T1 in heating systems with heating circuit control units which are not connected via the LON BUS to the boiler control unit.
Coding required: "4C : 2" – use plug [20] for closing the mixing valves of the heating circuits connected downstream.



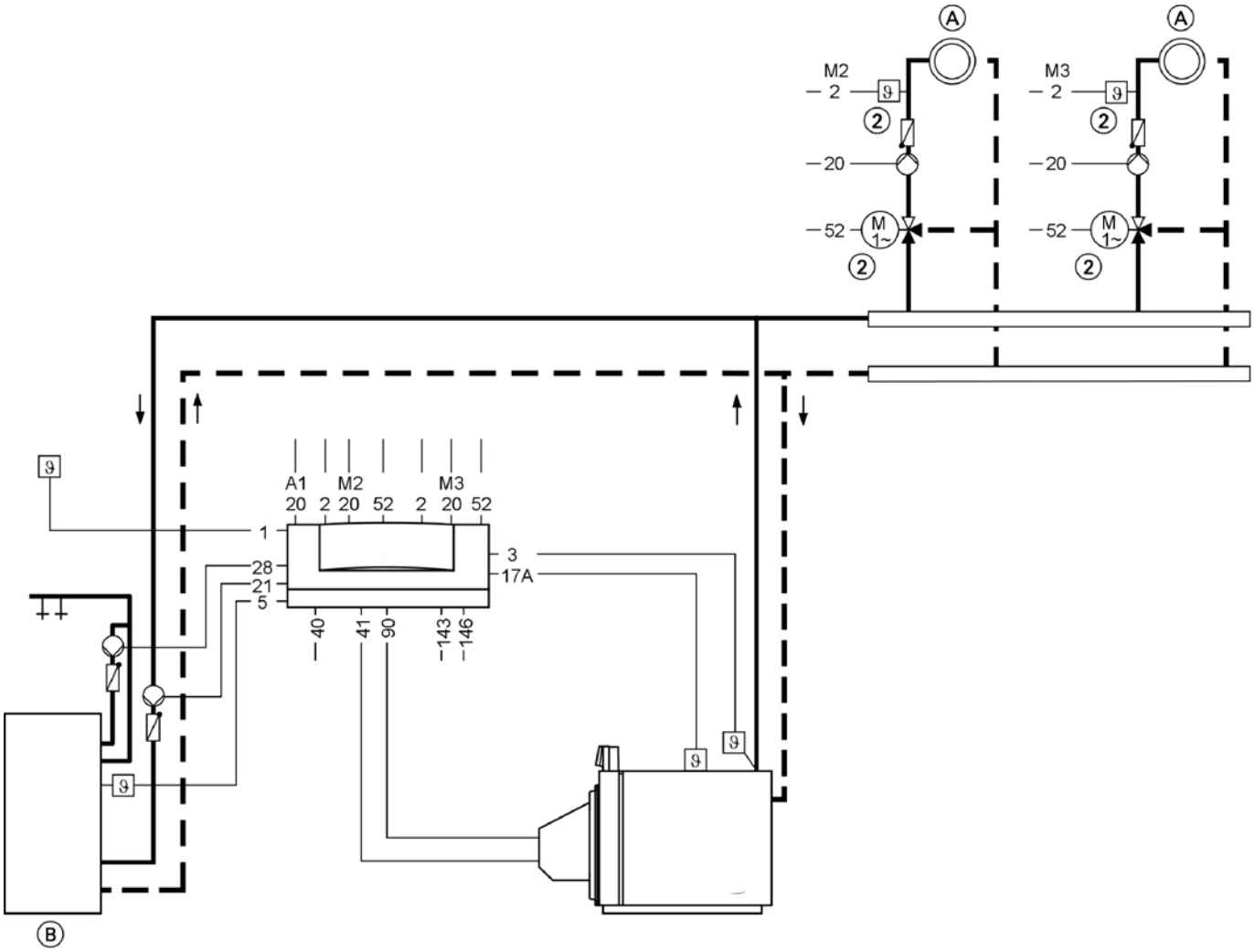
[20] A1 Close mixing valves
(A) Contactor relay, field supplied
(B) Heating circuit controls connected downstream
Switch contact closed: signal for "close mixing valve".

Available system accessories
- Vitotrol remote control
- Flue gas temperature sensor

Coding of system type	Change required	Automatic change
00: 1	If no system circuit A1 is connected, set coding "00: 3", "00: 4", "00: 7" or "00: 8" (see page 101)	The system type is recognized automatically when the sensors are connected
02: 1	Set coding "02: 2" for operation with modulating burner	––
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	––
4A: 0	––	Connection of the temperature sensor T1 at plug [17] [A]; Coding "4A: 1" is set automatically
4b: 0	––	Connection of the temperature sensor T2 at plug [17] [B]; Coding "4b: 1" is set automatically

Circuit Diagram 1

Single-boiler system with Therm-Control and three-way mixing valve
in conjunction with Vitorond 200, VD2A



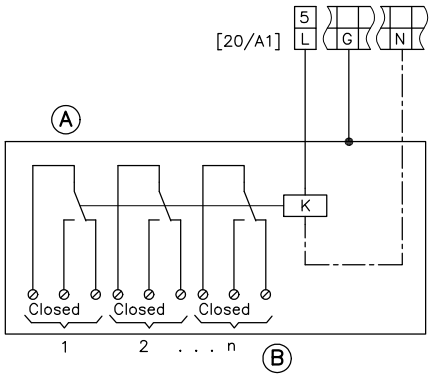
Ⓐ Heating circuit with mixing valves
Ⓑ DHW tank

Plug

1	Outdoor temperature sensor	20 M2	Heating circuit pump, mixing valve	40	Power supply, 120 VAC 60 Hz Install the main isolator in accordance with regulations
2 M2	Flow temperature sensor, mixing valve	20 M3	Heating circuit pump, mixing valve	41	Burner (stage 1)
2 M3	Flow temperature sensor, mixing valve	20 A1	Closing the mixing valves with external heating circuit control units	52 M2	Mixing valve motor
3	Boiler water temperature sensor			52 M3	Mixing valve motor
5	DHW tank temperature sensor	21	DHW primary pump	90	Burner (burner stage 2 / mod.)
17 A	Therm-Control temperature sensor	28	DHW circulation pump	143/146	External connections

Please refer to the control manual Vitocontrol-S, VD2/CT3.

Circuit Diagram 1 *(continued)*

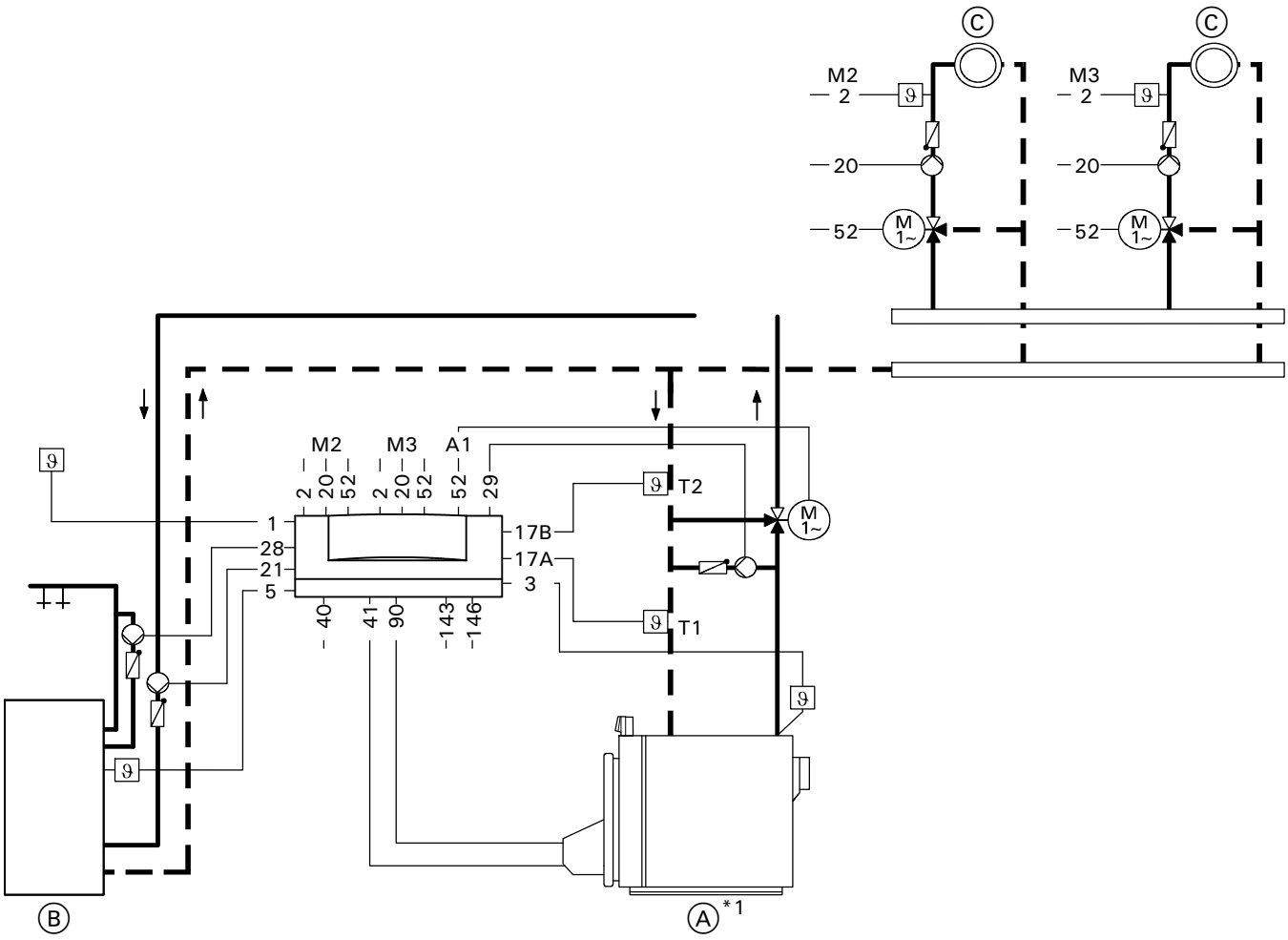


20 A1 Close mixing valves
Ⓐ Contactor relay, field supplied
Ⓑ Heating circuit controls connected downstream
Switch contact closed: signal for "close mixing valve".

Wiring diagram
Wiring of the Therm-Control in heating systems with heating circuit control units are not connected to the boiler control unit via the LON.
Required coding:
Change "4C" to "2" - use the plug-in connector 20 A1 to close the downstream mixing valve. Change "0D" to "1" - the Therm-Control acts on the mixing valve of the downstream heating circuits (for Vitotronic 200 and 300, delivered condition).

Heating system types for modulating boilers *(continued)*

System type 2 – Single-boiler system with shunt pump and return valve for raising the return temperature
in conjunction with
■ Vitorond 200, VD2



Ⓐ Boiler with Vitotronic 300
Ⓑ Domestic hot water tank
Ⓒ Heating circuit with mixing valve

plugs

1		Outdoor temperature sensor
2	M2	Supply temperature sensor, mixing valve circuit 2
2	M3	Supply temperature sensor, mixing valve circuit 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
17	A	Temperature sensor T1
17	B	Temperature sensor T2
20	M2	Heating circuit pump, mixing valve circuit 2
20	M3	Heating circuit pump, mixing valve circuit 3
21		Circulation pump for heating the DHW tank
28		DHW re-circulation pump
29		Shunt pump
40		Power supply connection, 120 VAC
41		Burner (1st stage)
52	A1	Mixing valve motor for raising the return temperature
52	M2	Mixing valve motor, mixing valve circuit 2
52	M3	Mixing valve motor, mixing valve circuit 3
90		Burner (2nd stage/modulating)
143		Connection of external equipment (see page 38)
146		Connection of external equipment (see page 39)

**1 On the Vitorond the boiler supply and return are at the rear of the boiler.*

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Heating system types for modulating boilers *(continued)*

Possible applications
Heating systems with distributor arranged close to the boiler. The boiler water flow is required to be reduced.

Please note:
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or the heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

When the return temperature falls below the required minimum value, the temperature sensor T2 switches on the shunt pump. If, as a result, the required minimum return temperature is not reached, the return valve is proportionally closed via the temperature sensor T1 and the minimum return temperature is assured.

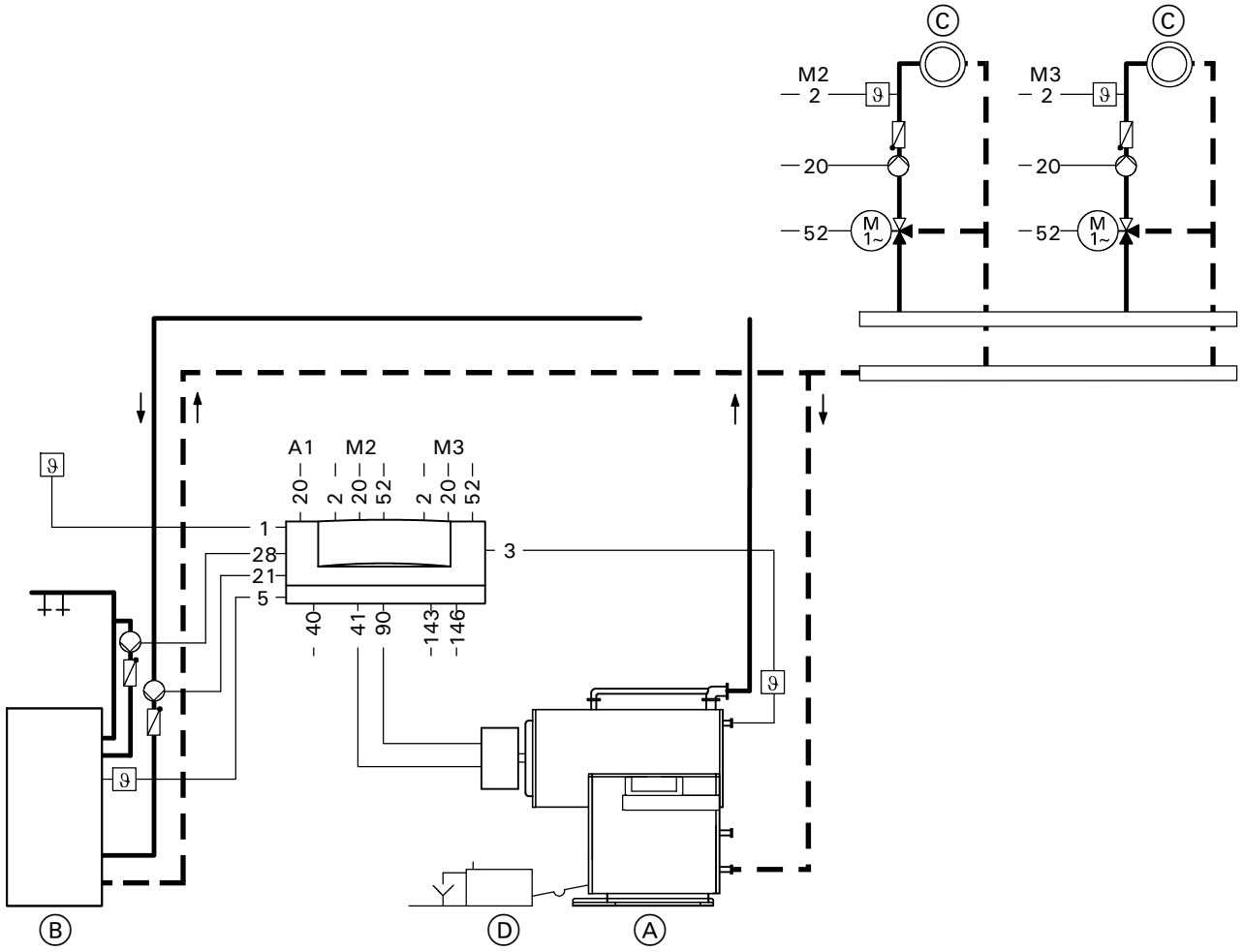
The shunt pump must be sized so that bypassed water accounts for approx. 30% of the total flow rate of the boiler.

Available system accessories
- Vitotrol remote control
- Flue gas temperature sensor

Coding system type	Change required	Automatic change
00: 1	If no system circuit A1 is connected, set coding "00: 3", "00: 4", "00: 7" or "00: 8" (see page 114)	The system type is recognized automatically when the sensors are connected
02: 1	Set coding "02: 2" for operation with modulating burner	––
03: 0	Set coding "03: 1" for oil-fired operation (re-setting is not possible)	––
0C: 0	Set coding "0C: 1" for continuous return temperature control	––
4A: 0	––	Connection of the temperature sensor T1 at plug 17 A; Coding "4A: 1" is set automatically
4b: 0	––	Connection of the temperature sensor T2 at plug 17 B; Coding "4b: 1" is set automatically

Heating system types for condensing boilers

System type 3 – Single-boiler system with Vitocrossal 300



Ⓐ Boiler with Vitotronic 300
Ⓑ Domestic hot water tank
Ⓒ Heating circuit with mixing valve
Ⓓ Neutralizing unit

plugs

1		Outdoor temperature sensor
2	M2	Supply temperature sensor, mixing valve circuit 2
2	M3	Supply temperature sensor, mixing valve circuit 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
20	A1	Heating circuit without mixing valve (if installed)
20	M2	Heating circuit pump, mixing valve circuit 2
20	M3	Heating circuit pump, mixing valve circuit 3
21		Circulation pump for heating the DHW tank
28		DHW re-circulation pump
40		Power supply connection, 120 VAC
41		Burner (1st stage)
52	M2	Mixing valve motor, mixing valve circuit 2
52	M3	Mixing valve motor, mixing valve circuit 3
90		Burner (2nd stage/modulating)
143		Connection of external equipment (see page 38)
146		Connection of external equipment (see page 39)

Heating system types for condensing boilers *(continued)*

Please note:
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or the heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 is operated with modulating boiler water temperature by means of the outdoor re-set boiler control unit. Viessmann modulating burner is operated through Vitotronic control.

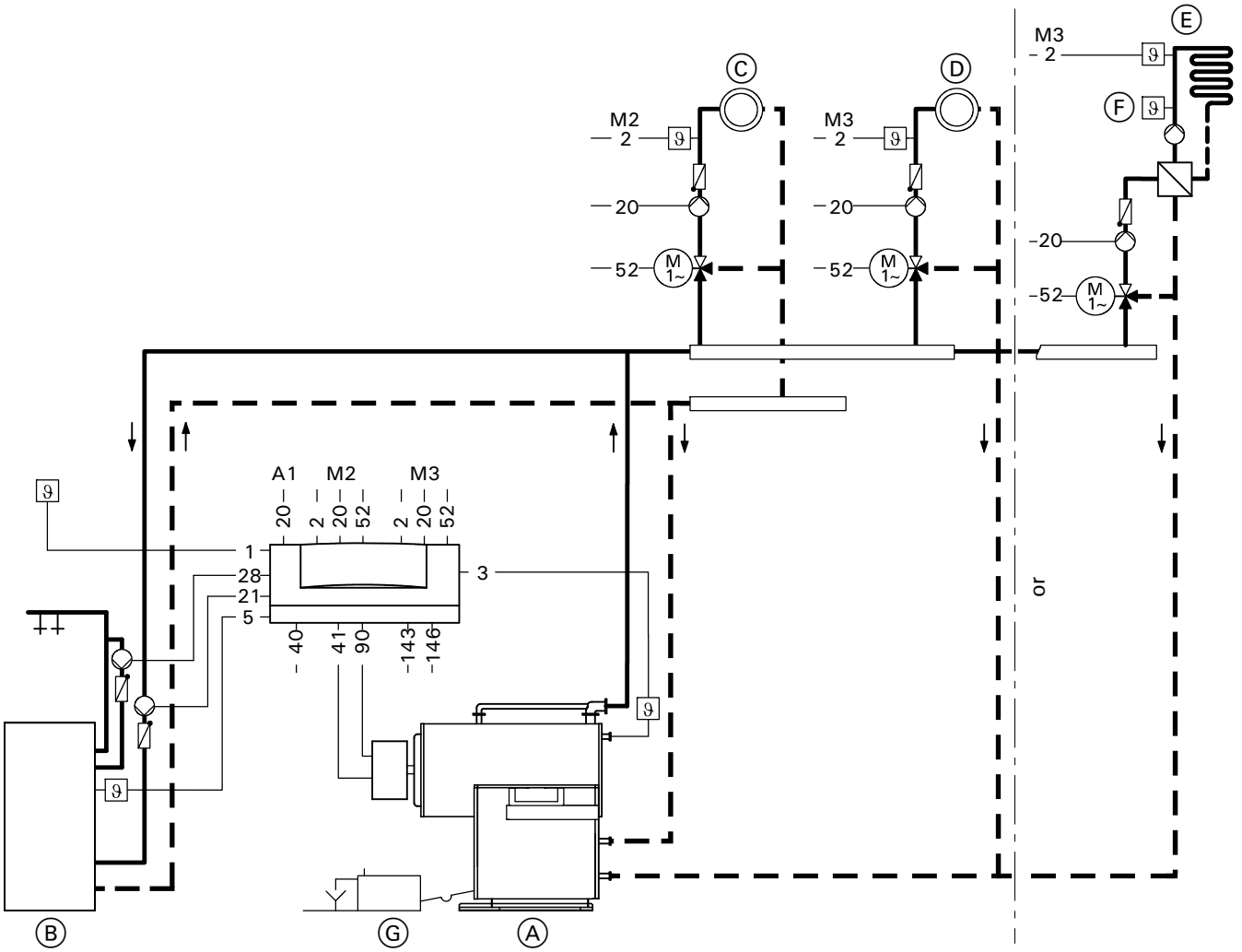
The boiler water temperature which is established in the heating mode is higher than the maximum heating circuit supply temperature by an adjustable difference.

Available system accessories
- Vitotrol remote control
- Flue gas temperature sensor

Coding system type	Change required	Automatic change
00: 1	If no system circuit A1 is connected, set coding "00: 3", "00: 4", "00: 7" or "00: 8" (see page 114)	The system type is recognized automatically when the sensors are connected
02: 1	Set coding "02: 2" for operation with modulating burner	––
0d: 1	Set coding "0d: 0"	––

Heating system types for condensing boilers *(continued)*

System type 4 - Single-boiler system with Vitocrossal 300 with several heating circuits and one modulating supply temperature heating circuit



Ⓐ Boiler with Vitotronic 300
Ⓑ Domestic hot water tank
Ⓒ Heating circuit with mixing valve
Ⓓ Modulating supply temperature heating circuit
or
Ⓔ Underfloor heating circuit
Ⓕ High limit thermostat (max. limit)
Ⓖ Neutralizing unit

plugs

1		Outdoor temperature sensor
2	M2	Supply temperature sensor, mixing valve circuit 2
2	M3	Supply temperature sensor, mixing valve circuit 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
20	A1	Heating circuit without mixing valve (if installed)
20	M2	Heating circuit pump, mixing valve circuit 2
20	M3	Heating circuit pump, mixing valve circuit 3
21		Circulation pump for heating the DHW tank
28		DHW re-circulation pump
40		Power supply connection 120 VAC
41		Burner (1st stage)
52	M2	Mixing valve motor, mixing valve circuit 2
52	M3	Mixing valve motor, mixing valve circuit 3
90		Burner (2nd stage/modulating)
143		Connection of external equipment (see page 38)
146		Connection of external equipment (see page 39)

Heating system types for condensing boilers *(continued)*

Possible applications
For heating circuits with different temperatures.

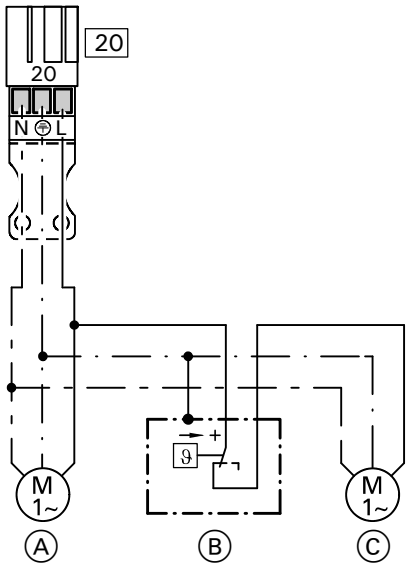
Please note:
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or the heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

The Vitocrossal 300 is operated with modulating boiler water temperature by means of the outdoor re-set boiler control unit. Two-stage or modulating burners can be controlled.

The Vitocrossal 300 has two return connections. The heating circuits with the higher return temperature are connected to the return connection at the top, those with the lower temperatures to the return connection at the bottom. **Please note:** At least 15% of the take-off from the rated output must be connected to the return connection at the bottom.

The boiler water temperature which is established in the heating mode is higher than the maximum heating circuit supply temperature by an adjustable difference.

Pumps in the underfloor heating circuit

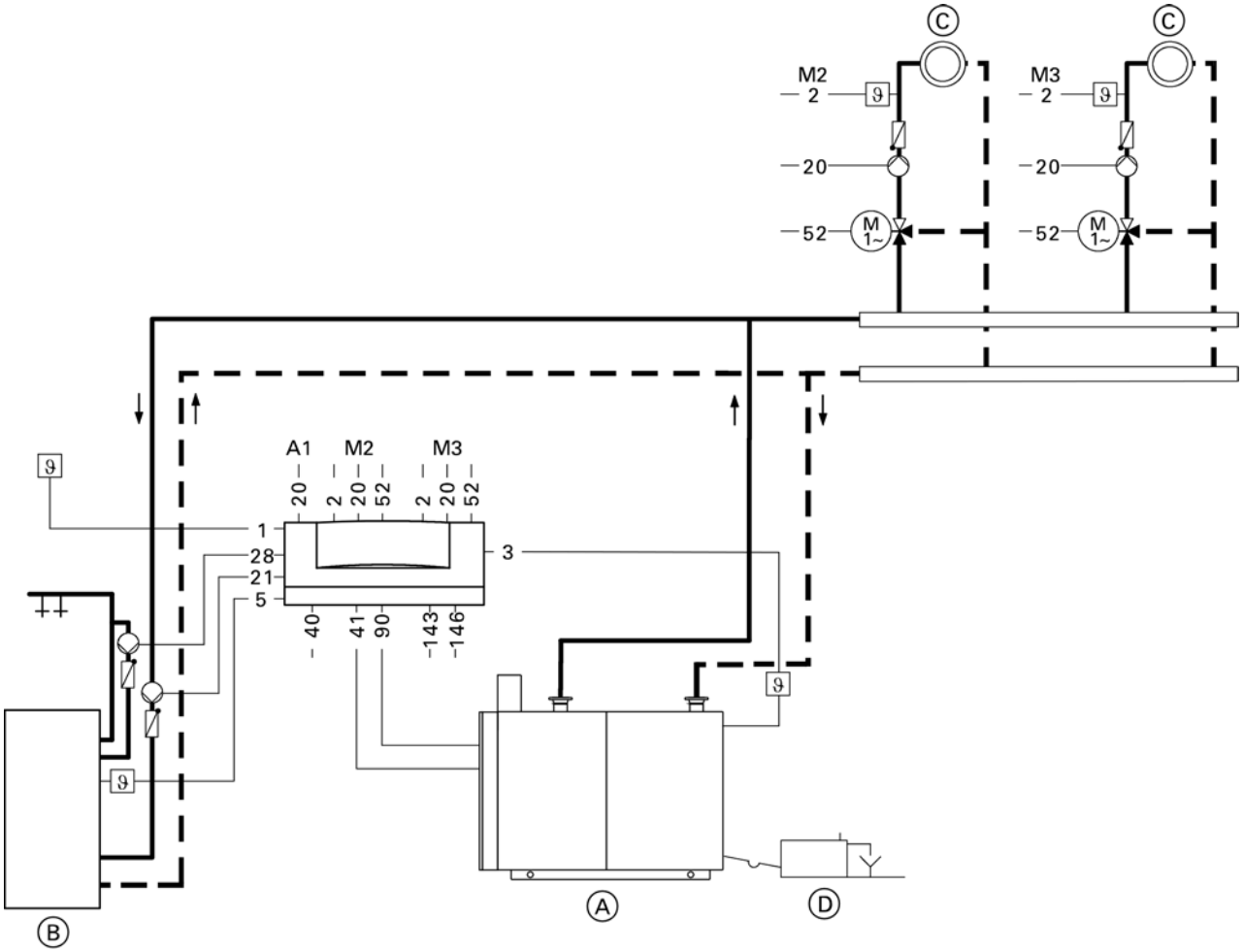


20 Heating circuit control unit
Ⓐ Primary pump of underfloor heating circuit
Ⓑ High limit thermostat (max. limit)
Ⓒ Secondary pump of underfloor heating circuit (after system separation)

Coding system type	Change required	Automatic change
00: 1	If no system circuit A1 is connected, set coding "00: 3", "00: 4", "00: 7" or "00: 8" (see page 114)	The system type is recognized automatically when the sensors are connected
02: 1	Set coding "02: 2" for operation with modulating burner	––
0d: 1	Set coding "0d: 0"	––

Heating system types for condensing boilers

System type 5 – Single-boiler system with Vitocrossal 200



Ⓐ Boiler with Vitotronic 300
Ⓑ Domestic hot water tank
Ⓒ Heating circuit with mixing valve
Ⓓ Neutralizing unit

plugs

1		Outdoor temperature sensor
2	M2	Supply temperature sensor, mixing valve circuit 2
2	M3	Supply temperature sensor, mixing valve circuit 3
3		Boiler temperature sensor
5		DHW tank temperature sensor
20	A1	Heating circuit without mixing valve (if installed)
20	M2	Heating circuit pump, mixing valve circuit 2
20	M3	Heating circuit pump, mixing valve circuit 3
21		Circulation pump for heating the DHW tank
28		DHW re-circulation pump
40		Power supply connection, 120 VAC
41		Burner (1st stage)
52	M2	Mixing valve motor, mixing valve circuit 2
52	M3	Mixing valve motor, mixing valve circuit 3
90		Burner (2nd stage/modulating)
143		Connection of external equipment (see page 38)
146		Connection of external equipment (see page 39)

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Heating system types for condensing boilers *(continued)*

Please note:
This circuit diagram represents a recommendation only. It is the responsibility of the customer and/or the heating contractor to check that this recommendation is complete and fully functional. Three-phase equipment must be connected via additional power contactors.

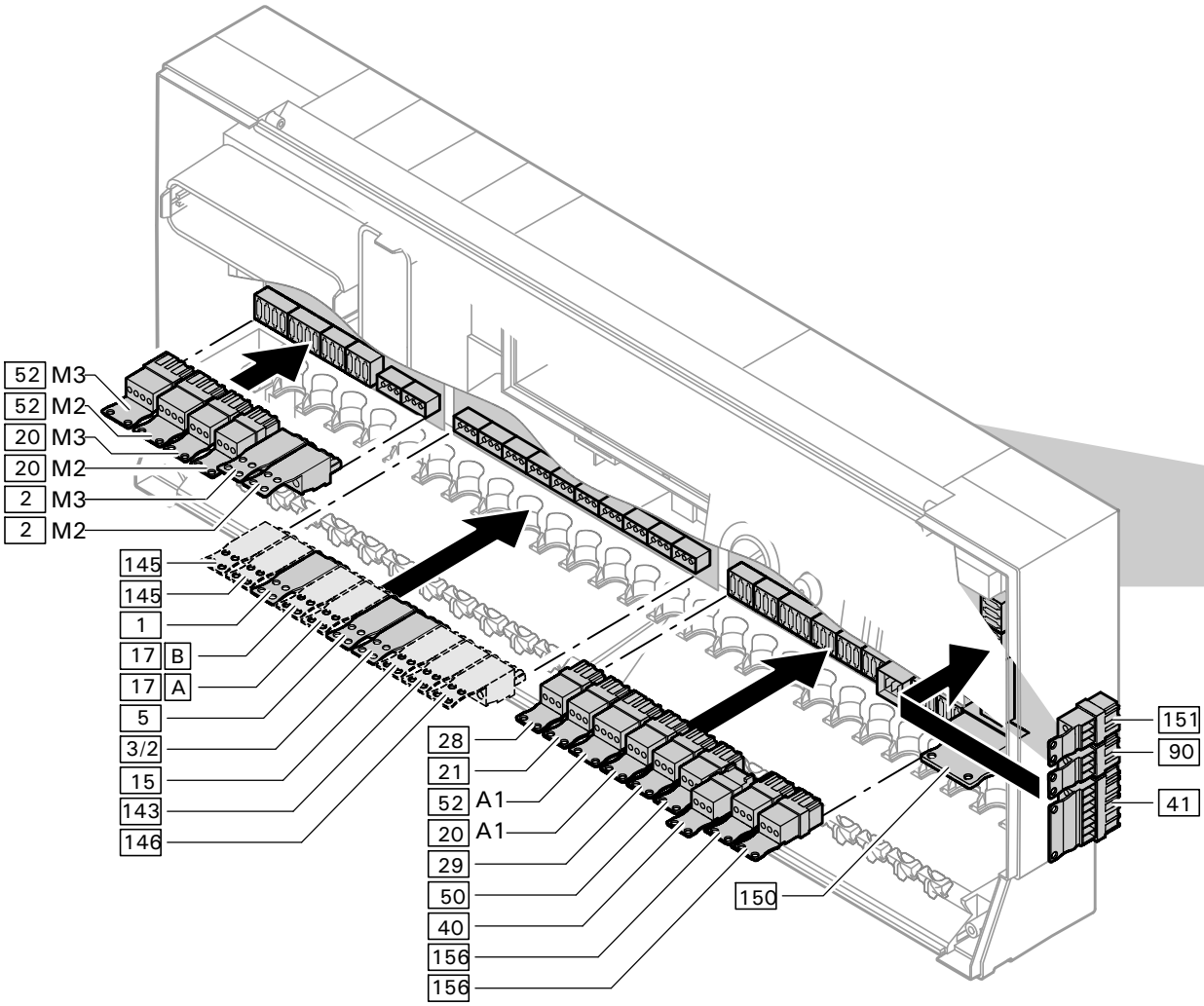
The Vitocrossal 200 is operated with modulating boiler water temperature by means of the outdoor re-set boiler control unit. Viessmann modulating burner is operated through Vitotronic control.

The boiler water temperature which is established in the heating mode is higher than the maximum heating circuit supply temperature by an adjustable difference.

Available system accessories
■ Vitotrol remote control

Coding system type	Change required	Automatic change
00: 1	If no system circuit A1 is connected, set coding "00: 3", "00: 4", "00: 7" or "00: 8" (see page 114)	The system type is recognized automatically when the sensors are connected
02: 1	Set coding "02: 2" for operation with modulating burner	––
0d: 1	Set coding "0d: 0"	––

Ove[illegible] of electrical connections



Mixing valve extension circuit board

- 2 M2/M3 Supply temperature sensor
- 20 M2/M3 Heating circuit pump
- 52 M2/M3 Mixing valve motor

Low-voltage motherboard

- 1 Outdoor temperature sensor (ATS)
- 3 Boiler temperature sensor (BTS)
- 5 DHW tank temperature sensor (STS)
- 15 Flue gas temperature sensor (AGS) (accessory)
- 17 A Therm-Control temperature sensor or return temperature sensor T1 (RLS) (accessory)
- 17 B Return temperature sensor T2 (RLS) (accessory)
- 143 Connection of external equipment
- 145 KM BUS participant, e.g. Vitotrol remote control (accessory)
- 146 Connection of external equipment

Line voltage motherboard

- 20 A1 Heating circuit pump or control output
- 21 Circulation pump for heating the DHW tank (accessory)
- 28 DHW re-circulation pump (provided by customer)
- 29 Shunt pump
- 40 Power supply connection
- 41 Burner (1st stage)
- 50 Central fault indicator
- 52 A1 Continuous return temperature control or 3-way mixing valve for DHW tank loading system
- 90 Burner (2nd stage/modulating)
- 150 Connection of external equipment, e.g. additional safety equipment
- 151 Safety circuit, potential free
- 156 Power supply connection for accessories

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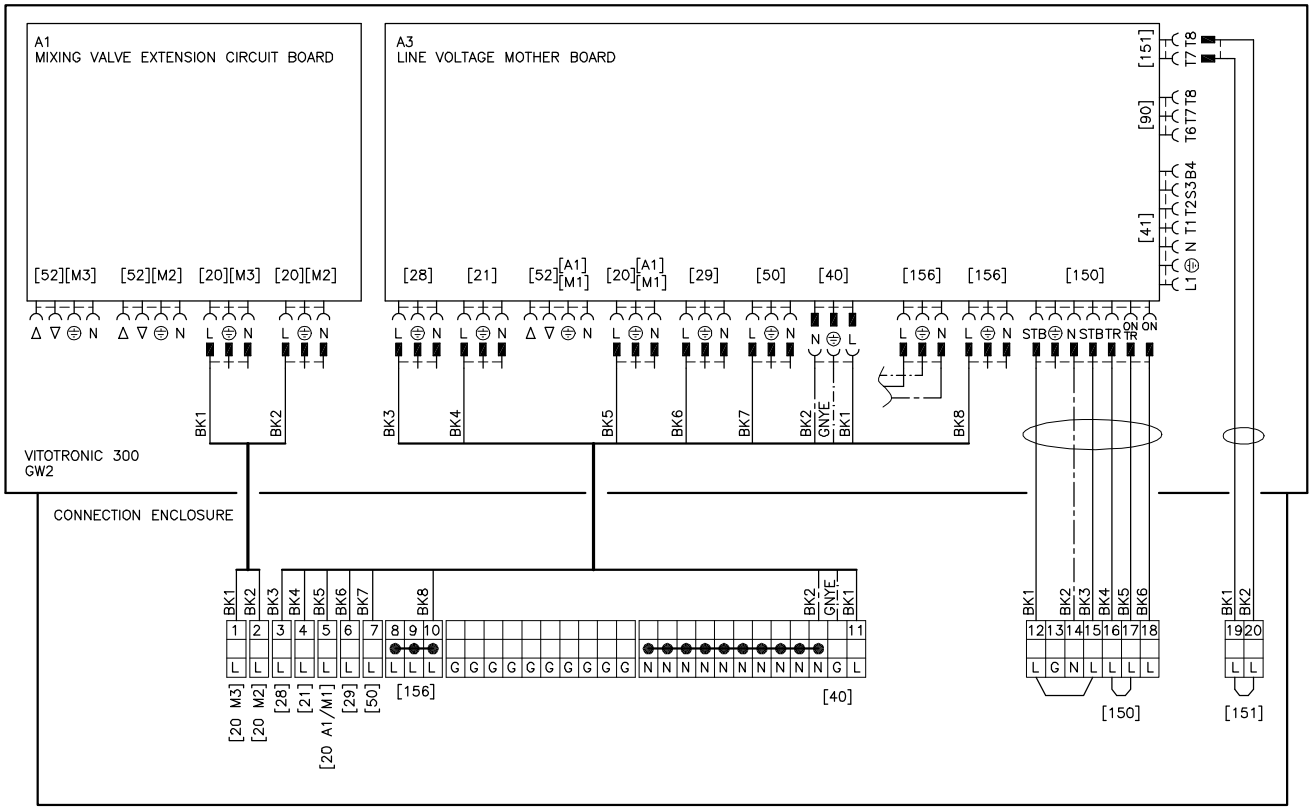
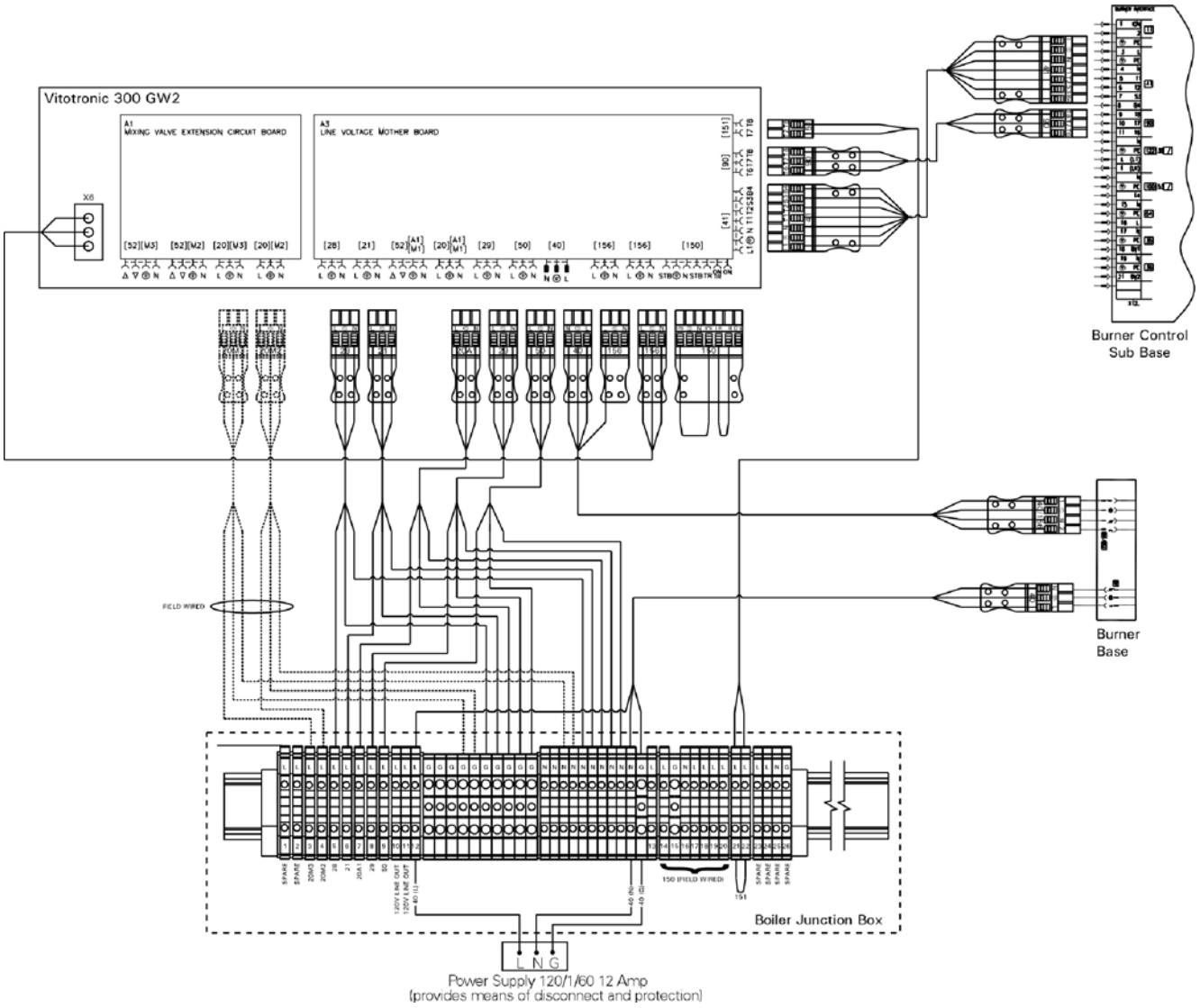
Overview of electrical connections(for VD2/VD2A/CT3 only)

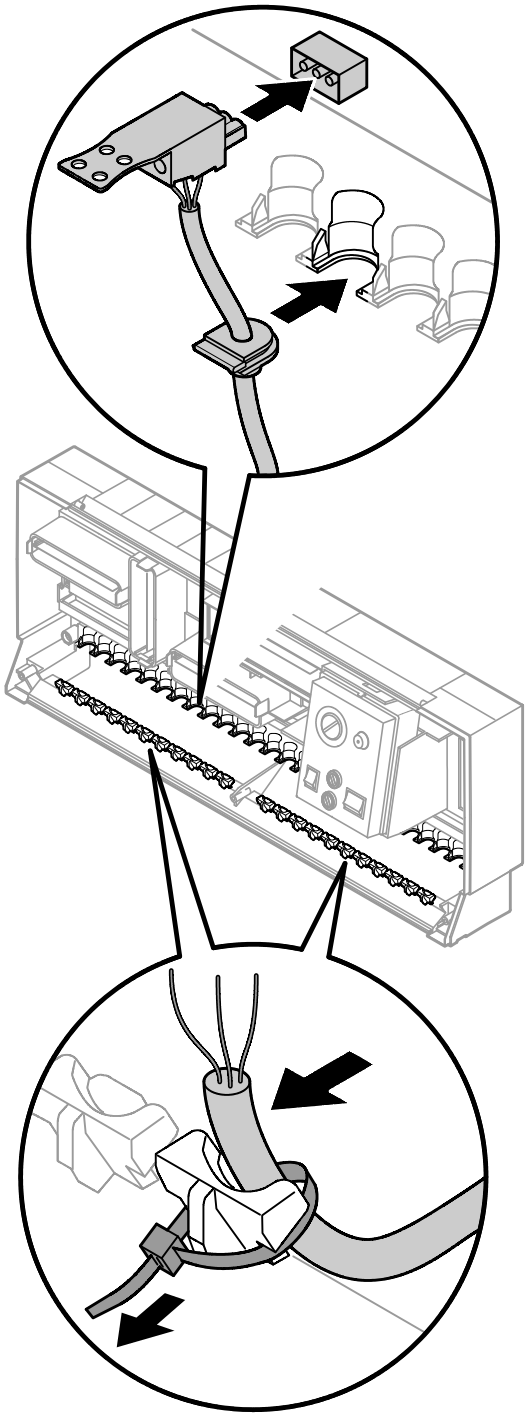


Overview of electrical connections (for CM2 only)



Routing and strain relief of cables

1. Run the cables from the connection enclosure into the control unit.
2. Apply strain relief to cables (see below).



Cables with moulded strain relief clamp

Connect cable and strain relief clamp.

OR

Fasten cable to the cable lead with cable tie.

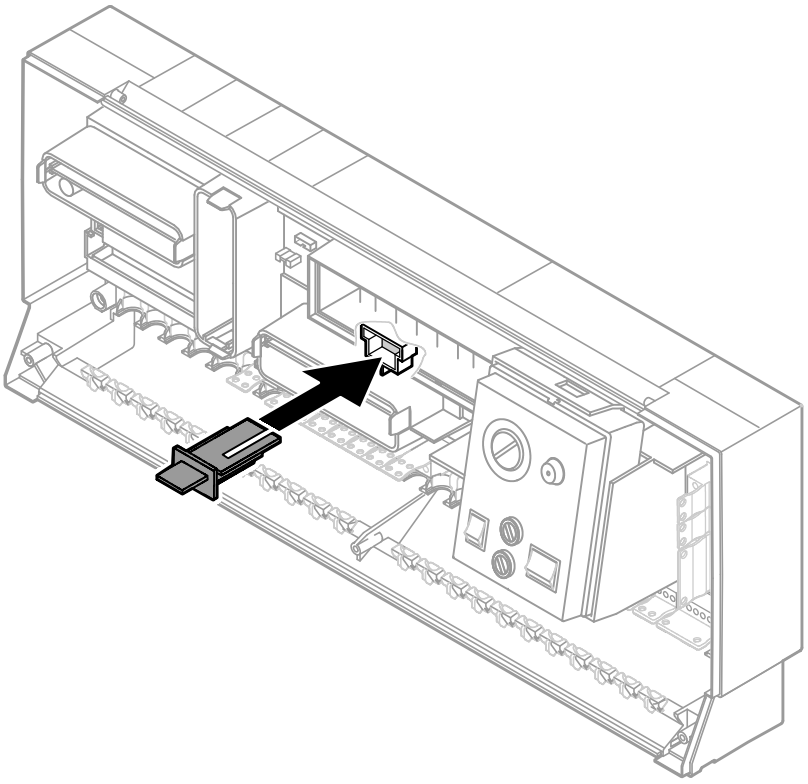
Inserting the boiler coding card

CAUTION

For matching the operation of the control unit to the boiler, only the boiler coding card which is supplied as part of the standard delivery of the boiler may be used.

Only use the boiler coding card included with the boiler.

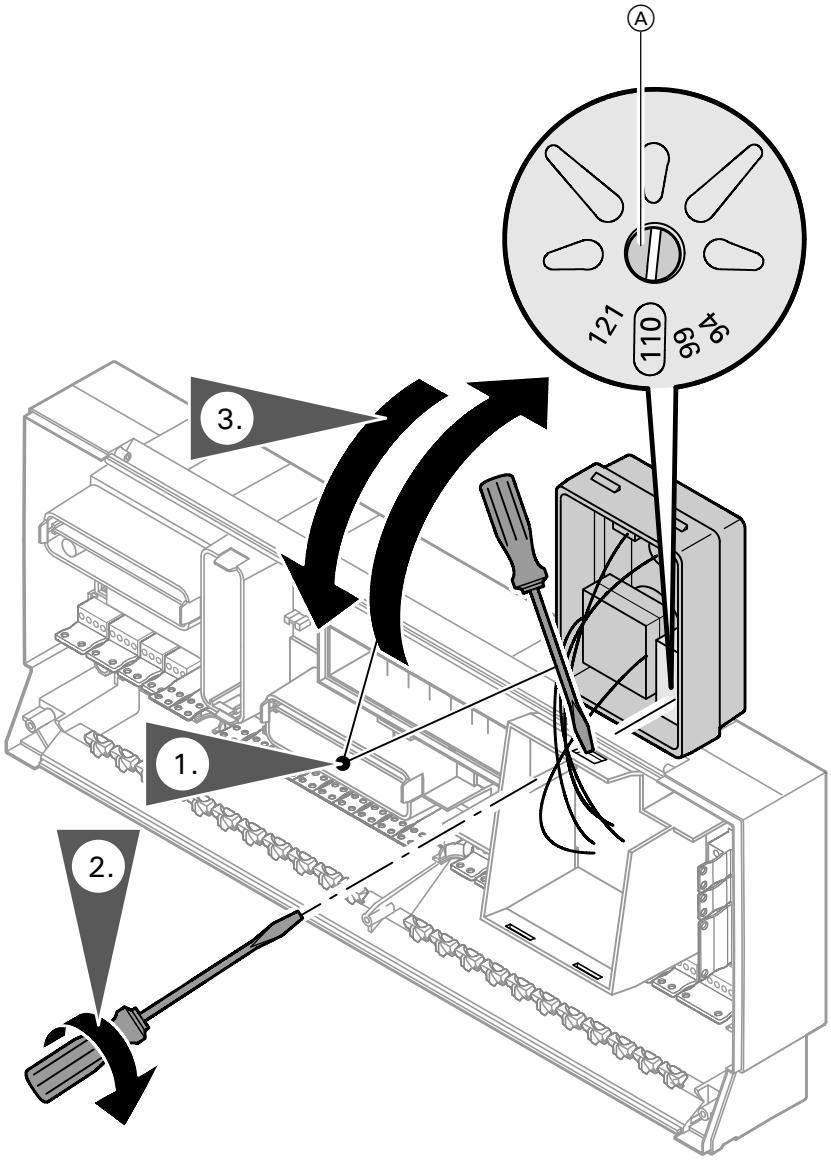
Boiler	Coding card	Part No.
Vitocrossal 300, type CT3	1040	7820 144
Vitorond 200, VD2 / VD2A	1020	7820 142
Vitocrossal 200 CM2	1041	7820 145



1. Push the boiler coding card through the recess in the cover and insert it in plug-in location

Adjustment of the fixed high limit (if required)

The fixed high limit is supplied with a factory setting of 110°C / 230°F.



Adjustment to 99°C / 210°F

⚠ **Disconnect power to control and burner!**

1. Unclip the fuse box and swing upwards.

2. Turn the slotted screw on the rear of the fixed high limit until the slot points to 99°C / 210°F (once adjusted, the fixed high limit **cannot** be reset to 110°C/ 230°F).

3. Re-fit the fuse box.

⚠ WARNING

If adjusted to 99°C / 210°F, do not set the adjustable high limit above 75°C / 167°F.

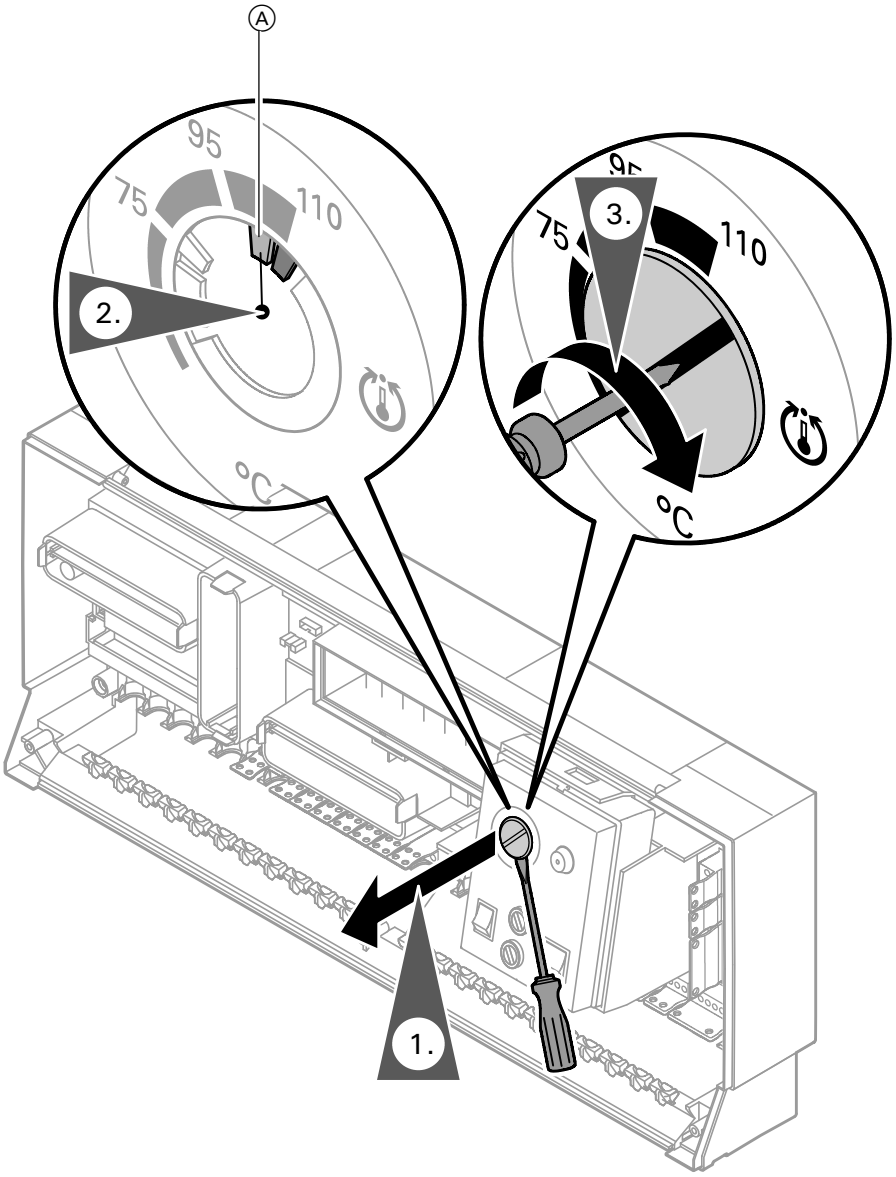
Please note:
Adjustment is required for the Vitocrossal 300.

See Service Instructions for Vitocrossal 300.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Adjustment of the adjustable high limit (if required)

The adjustable high limit is supplied with a factory setting of 95°C.



Adjustment to 100°C / 212°F

1. Using a suitable screwdriver, lever out and remove the selector knob "⏲" behind the hinged cover.

2. Using a pair of pointed pliers, break off the cams identified by the shaded areas in the Fig. from the stop dial.

Ⓐ	75 to 100°C 167 to 212°F

3. Fit the selector knob "⏲" so that the marking is in the centre of the selected range.

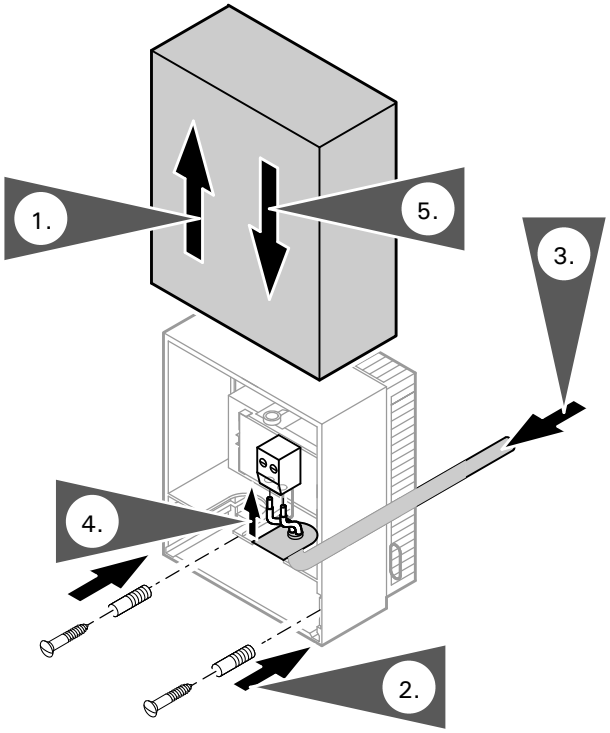
Please note:
Note the setting of coding address "06"!

⚠ WARNING

If the system is operated in conjunction with a domestic hot water tank, ensure that the maximum permissible domestic hot water temperature is not exceeded. If necessary, install a suitable safety device for this purpose.

Connection of the outdoor temperature sensor

The outdoor temperature sensor should be mounted 2 to 2.5 metres / 6.5 to 8 ft above ground level on the north or north-west facing wall of the building. In the case of multi-storey buildings, it should be mounted in the upper half of the second storey.
Make sure that the sensor is not located over windows, doors and air vents, nor immediately beneath a balcony or guttering.
Do not paint over the outdoor temperature sensor housing.



1. Remove the cap.

2. Mount the bottom part of the sensor housing.

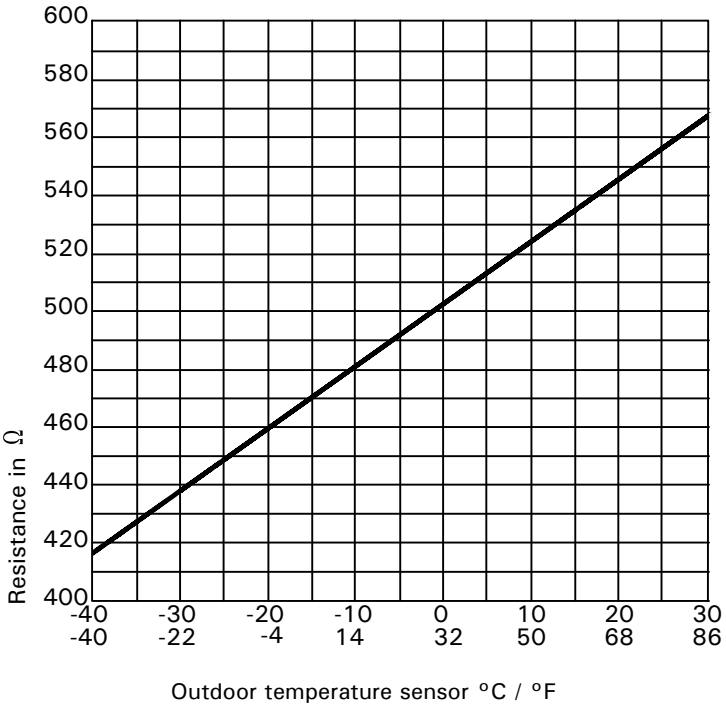
3. Pull the sensor wire through the opening in the terminal compartment and through the strain relief provided.

4. Connect the wires to the terminals.

5. Place the cap over the outdoor temperature sensor.

WARNING

When extending wire, there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair or shield design wire. Ensure that only one end of the shielding is grounded.



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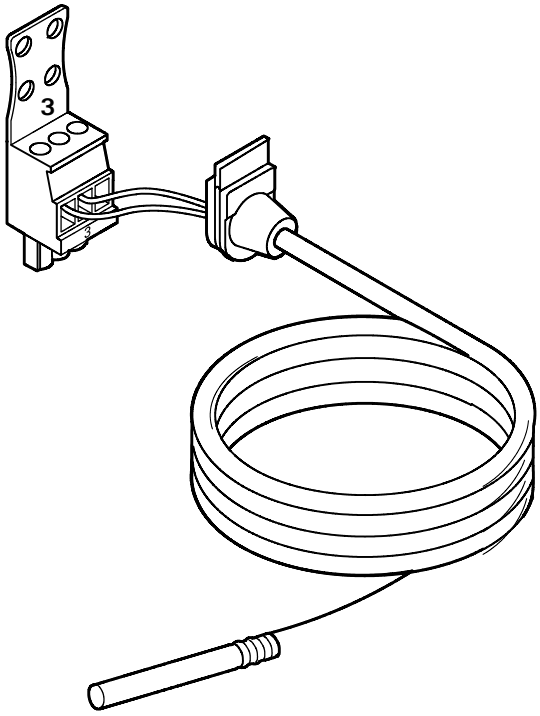
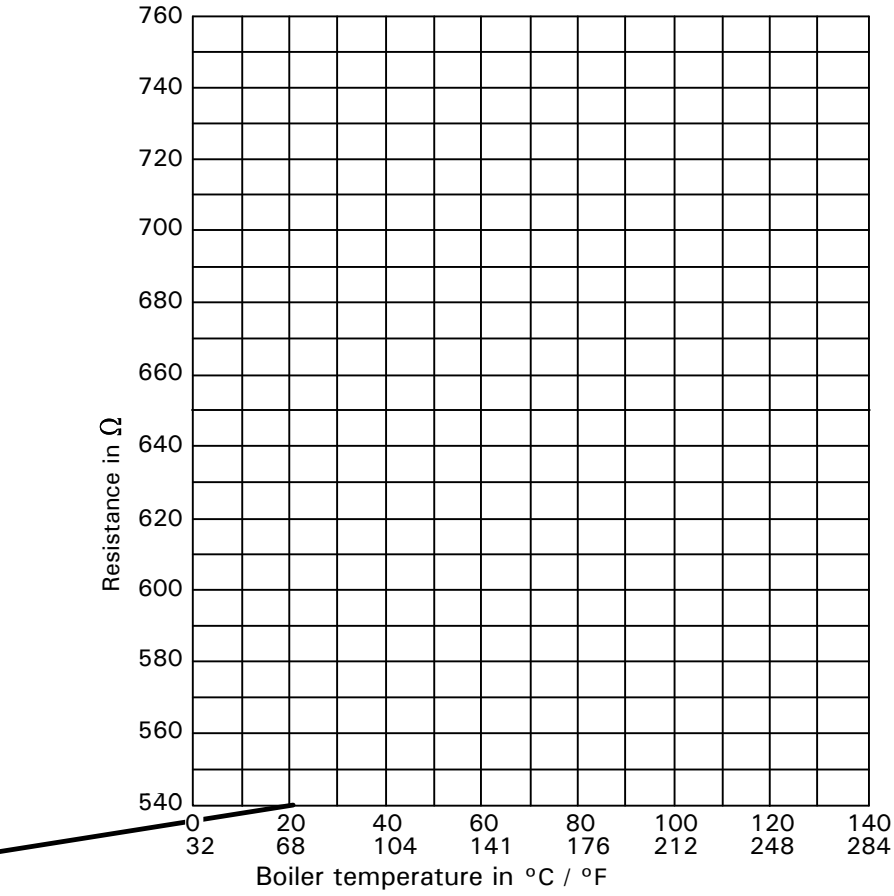
Connection of the boiler temperature sensor





The sensor measures the boiler water temperature.

The boiler temperature sensor is installed at the same time as the boiler insulation.

Check the sensor

1. Disconnect plug [3] in the terminal compartment of the boiler control.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Boiler water temperature in °C / °F	**Resistance in Ω**
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

Degree of protection: IP 32

Ambient temperature

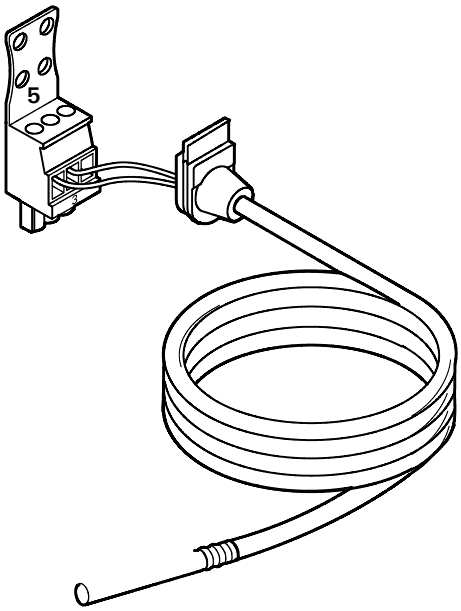
- During operation:
  0 to + 130°C
  32 to + 266°F
- During storage and transport:
  -20 to + 70°C
  -4 to + 158°F

Electrical connection

The sensors are ready to plug in. Insert the boiler temperature sensor in socket "3" of the boiler control.

Connection of the DHW tank temperature sensor

The sensor measures the domestic hot water tank temperature.



Heating systems with domestic hot water heating (single-boiler systems only)

1. Install the DHW tank temperature sensor.

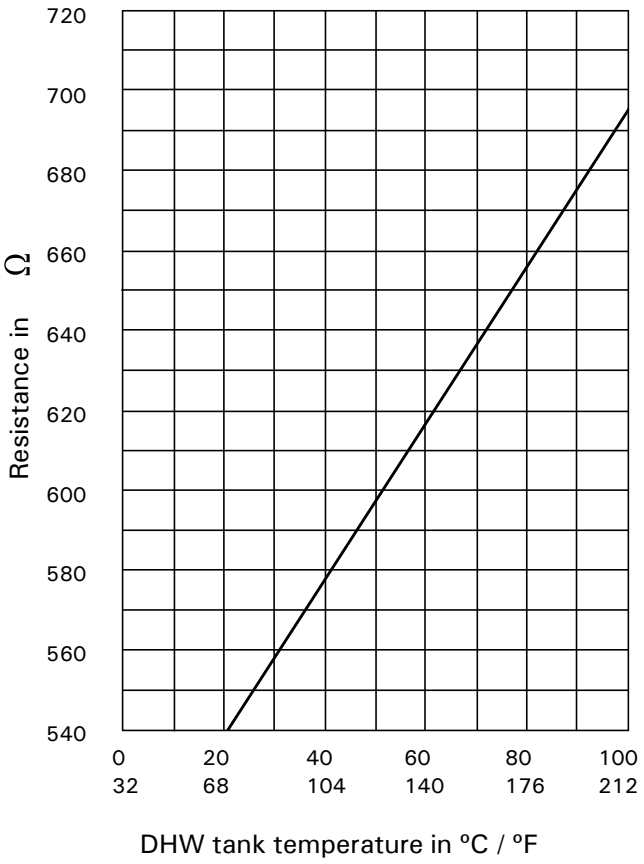
See Installation Instructions for domestic hot water tank.

Please note:
When installing the sensor in DHW tanks of other makes, make sure that the sensor is pressed against the sensor well of the DHW tank by means of a suitable device.

2. Ensure that the **maximum** permissible domestic hot water temperature is not exceeded. If necessary, install a suitable safety device for this purpose.

Heating systems without domestic hot water heating

Do **not** connect the DHW tank temperature sensor.



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Check the sensor

1. Disconnect plug [5] in the terminal compartment of the boiler control.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

DHW tank temperature in °C / °F	**Resistance in Ω**
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

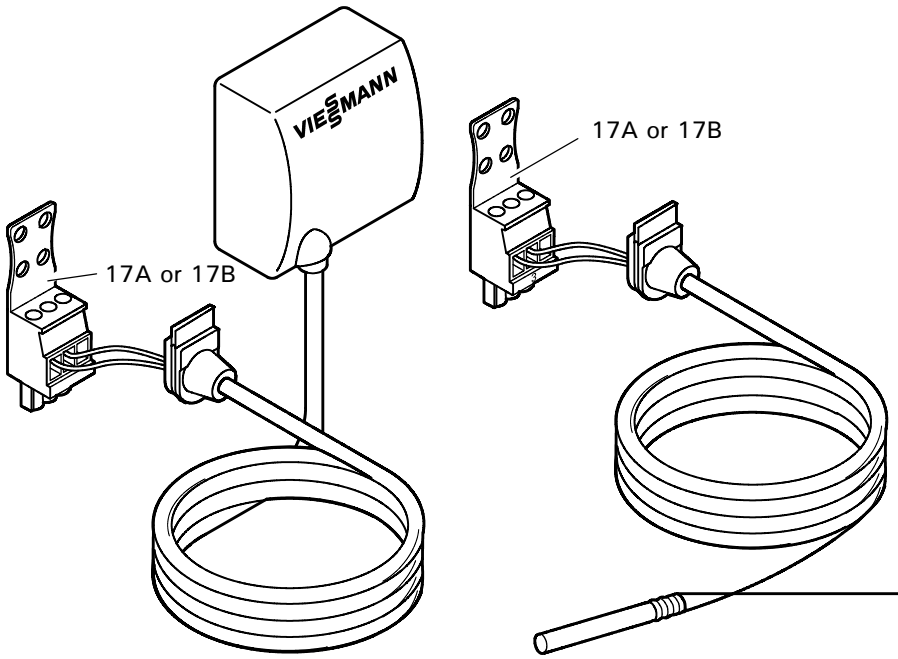
Degree of protection: IP 32
Ambient temperature
- During operation:
  0 to + 90 °C
  32 to + 194 °F
- During storage and transport:
  -20 to + 70 °C
  -4 to + 158 °F

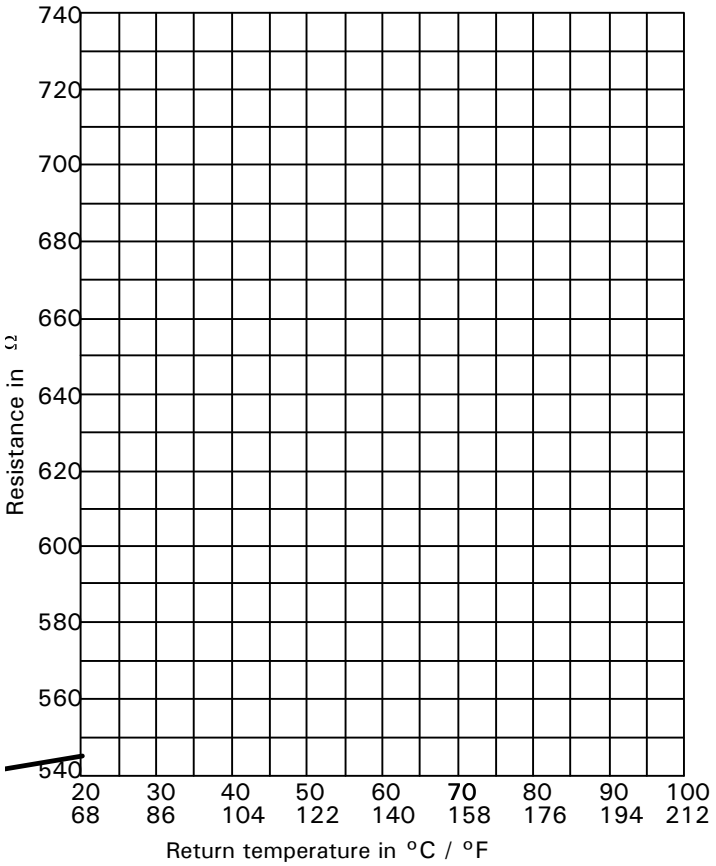
Electrical connection

The sensors are ready to plug in. Insert the DHW temperature sensor in socket "5" of the boiler control.

Connection of the return temperature sensor

Strap-on temperature sensor and immersion temperature sensor





For measuring the boiler return temperature.

Electrical connection
The sensor is inserted in socket "17A" or "17B" on the boiler control.

Check the sensor

1. Disconnect plug 17 A or 17 B in the terminal compartment of the boiler control.

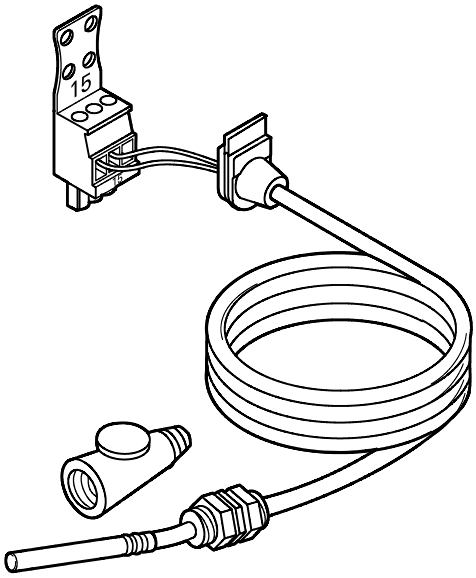
2. Measure resistance of sensor at terminals "1" and "2" of the plug.

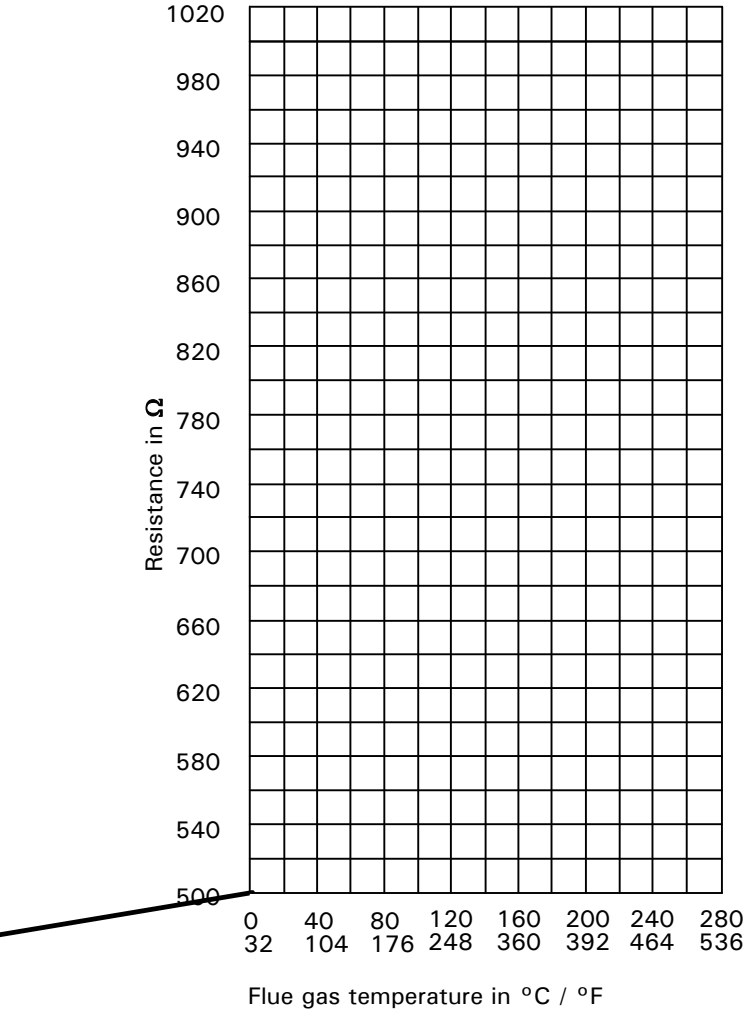
Return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature
- During operation:
  0 to + 100°C
  32 to + 212°F
- During storage and transport:
  -20 to + 70°C
  -4 to + 158°F

Connection of the flue gas temperature sensor (VD2/VD2A/CT3 only)





The sensor measures the flue gas temperature and monitors the selected limit value.

Electrical connection
The sensor is inserted in socket "15" on the boiler control.

Check flue gas temperature sensor

1. Disconnect plug [15] in the terminal compartment .

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Flue gas temperature in °C / °F	**Resistance in Ω**
80 / 176	650
160 / 320	800
200 / 392	880

3. Compare the value measured with the actual temperature If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 60
Ambient temperature
- During operation:
  0 to + 600°C
  32 to + 1112°F
- During storage and transport:
  -20 to + 70°C
  -4 to + 158°F

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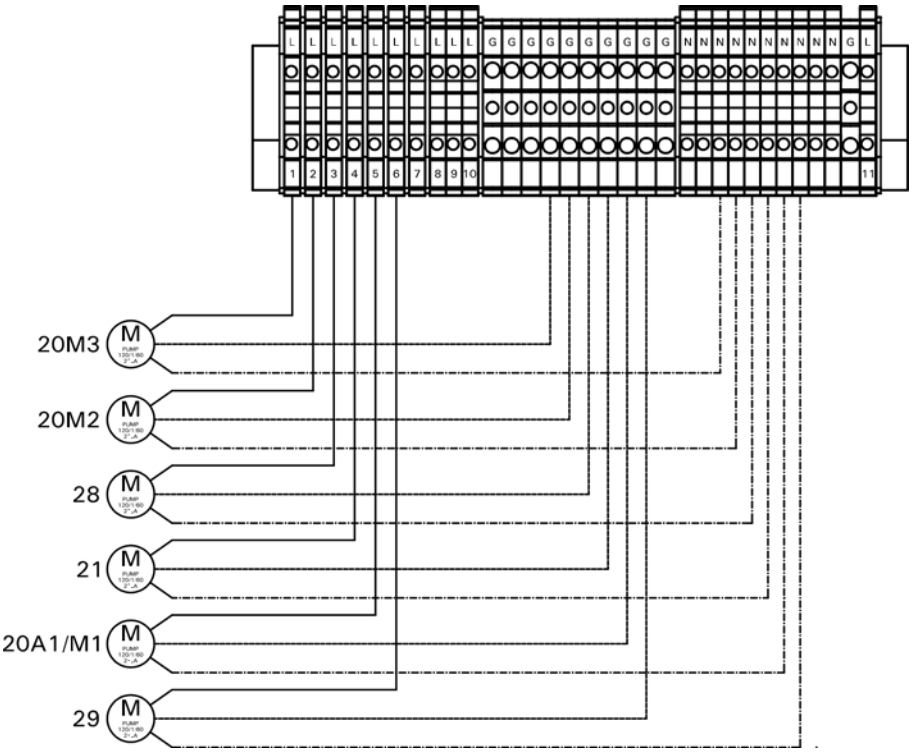
Connection of the Pumps (VD2/VD2A/CT3 only)

Available pump connections



20 A1/M1Heating circuit high temperature (without mixing valve) Terminals 5 - L, - G , - N

21 Circulation pump for heating up the domestic hot water tank - Terminals 4 - L, - G , - N

29 Shunt pump, boiler circuit pump Terminals 6 - L, - G, - N.

28 DHW recirculattion pump terminals 3 - L, - G, - N

20M2 M2 Heating circuit high temperature (with mixing valve) Terminals 2 - L, - G , - N

20M3 M3 Heating circuit high temperature (with mixing valve) Terminals 1 - L, - G , - N

Install pumps: see manufacturer's instructions.

120 VAC pumps

Note:
The maximum power consumption of all pumps is 4A .
Rated current: max. 2 FLA
Recommended connection cable: AWG 14

Use contactor for pumps with higher current rating

Connect the 3-wire cable from the pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:
Use contactor and/or motor starter to power pump.
For activating the contactor:
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

Please ensure that all connections and wire sizes comply with local and national codes.

1. Select the contactor and the connecting wire in accordance with the rating of the pump that is to be connected.

2. Connect pump and power supply to the contactor.

3. Connect contactor coil to the corresponding terminals.

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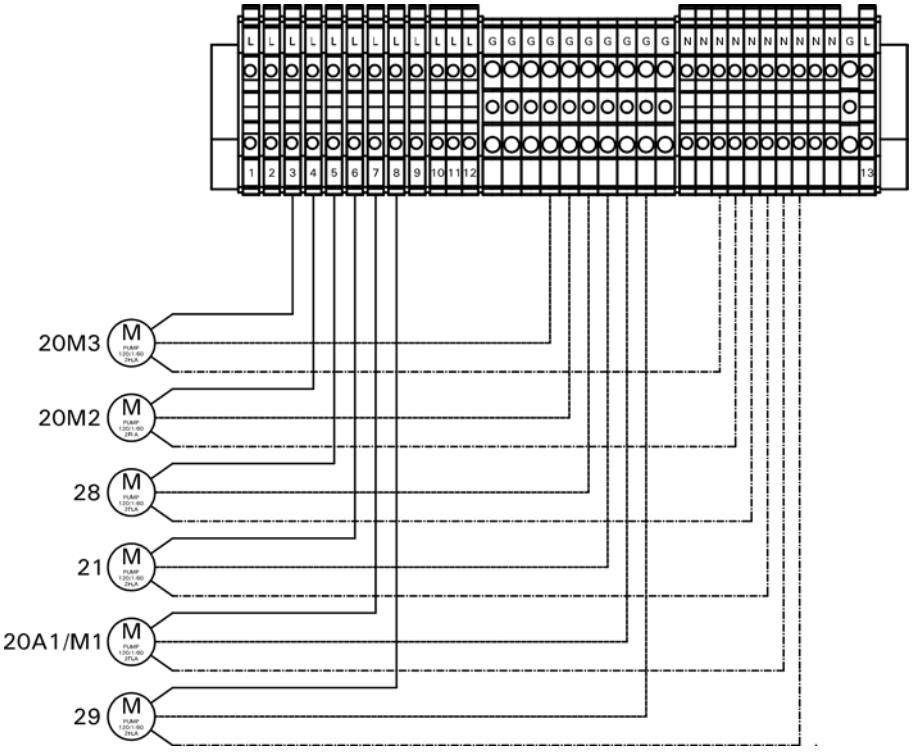
Connection of the Pumps (CM2 only)

Available pump connections



20 A1/M1Heating circuit high temperature (without mixing valve) Terminals 7 - L, - G , - N

21 Circulation pump for heating up the domestic hot water tank - Terminals 6 - L, - G , - N

29 Shunt pump, boiler circuit pump Terminals 8 - L, - G, - N.

28 DHW recirculattion pump terminals 5 - L, - G, - N

20M2 M2 Heating circuit high temperature (with mixing valve) Terminals 4 - L, - G , - N

20M3 M3 Heating circuit high temperature (with mixing valve) Terminals 3 - L, - G , - N

Install pumps: see manufacturer's instructions.

120 VAC pumps

Note:
The maximum power consumption of all pumps is 4A .
Rated current: max. 2 FLA
Recommended connection cable: AWG 14

Use contactor for pumps with higher current rating

Connect the 3-wire cable from the pump to the corresponding terminals.

240 VAC or 3 PH pumps

Please note:
Use contactor and/or motor starter to power pump.
For activating the contactor:
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

Please ensure that all connections and wire sizes comply with local and national codes.

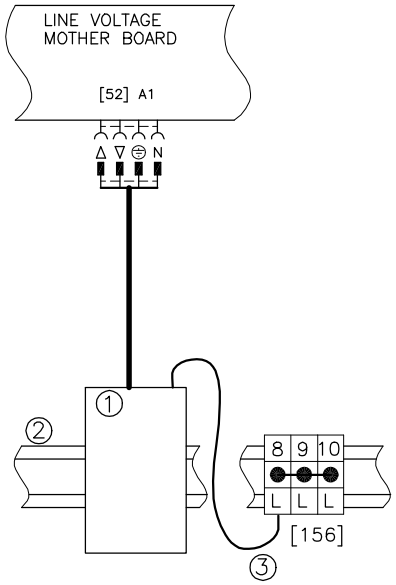
1. Select the contactor and the connecting wire in accordance with the rating of the pump that is to be connected.

2. Connect pump and power supply to the contactor.

3. Connect contactor coil to the corresponding terminals.

Connection of boiler return mixing valve or modulating valve actuator

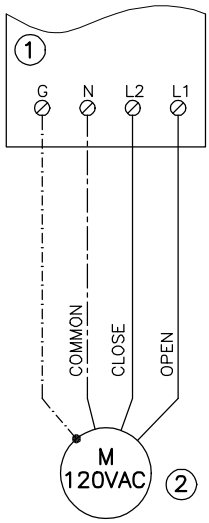
(VD2/VD2A/CT3 only)



① 120V or 24V valve adaptor

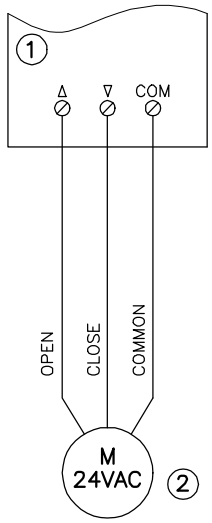
② DIN rail in connection enclosure

③ [156] Terminals



① 120V valve adaptor

② 120V valve actuator



① 24V valve adaptor

② 24V valve actuator

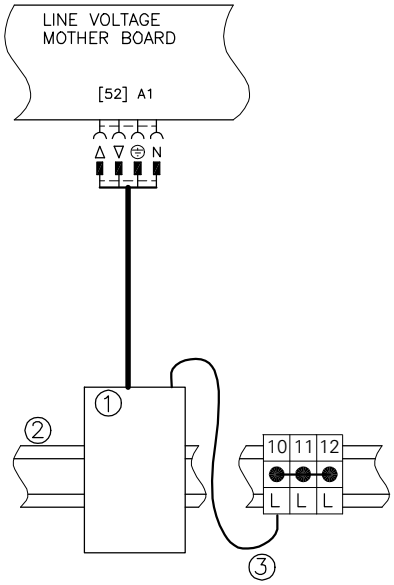
120V valve adaptor
Rated voltage: 120 VAC
Rated current: max. 0.1 FLA
Recommended connection
wire size: AWG 14
Part No.: 7134 560

24V valve adaptor
Rated voltage: 24 VAC
Rated current: max. 0.15 FLA
Recommended connection
wire size: AWG 14
Part No.: 7134 559

Operating time:
5 to 199 sec. selected via coding address “40”.

1. Disconnect power to control.
2. Install 120V or 24V valve adaptor on DIN rail inside connection enclosure.
3. Insert the plug [52] into socket [52] on the control.
4. Fasten cable with tie. (see page 21).
5. Connect black wire of the adaptor to connection [156] on the DIN rail.
   - Terminal 8,9 or 10.
6. Connect valve actuator wires to the adaptor terminals as shown in figures.

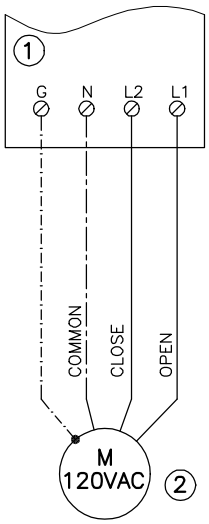
Connection of Boiler Return Mixing Valve or Isolation/Modulating Valve (CM2 only)



① 120V or 24V Valve Adaptor

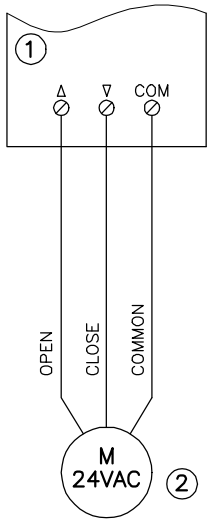
② Junction box

③ 120V L out power supply



① 120V Valve Adaptor

② 120V valve actuator



① 24V Valve Adaptor

② 24V valve actuator

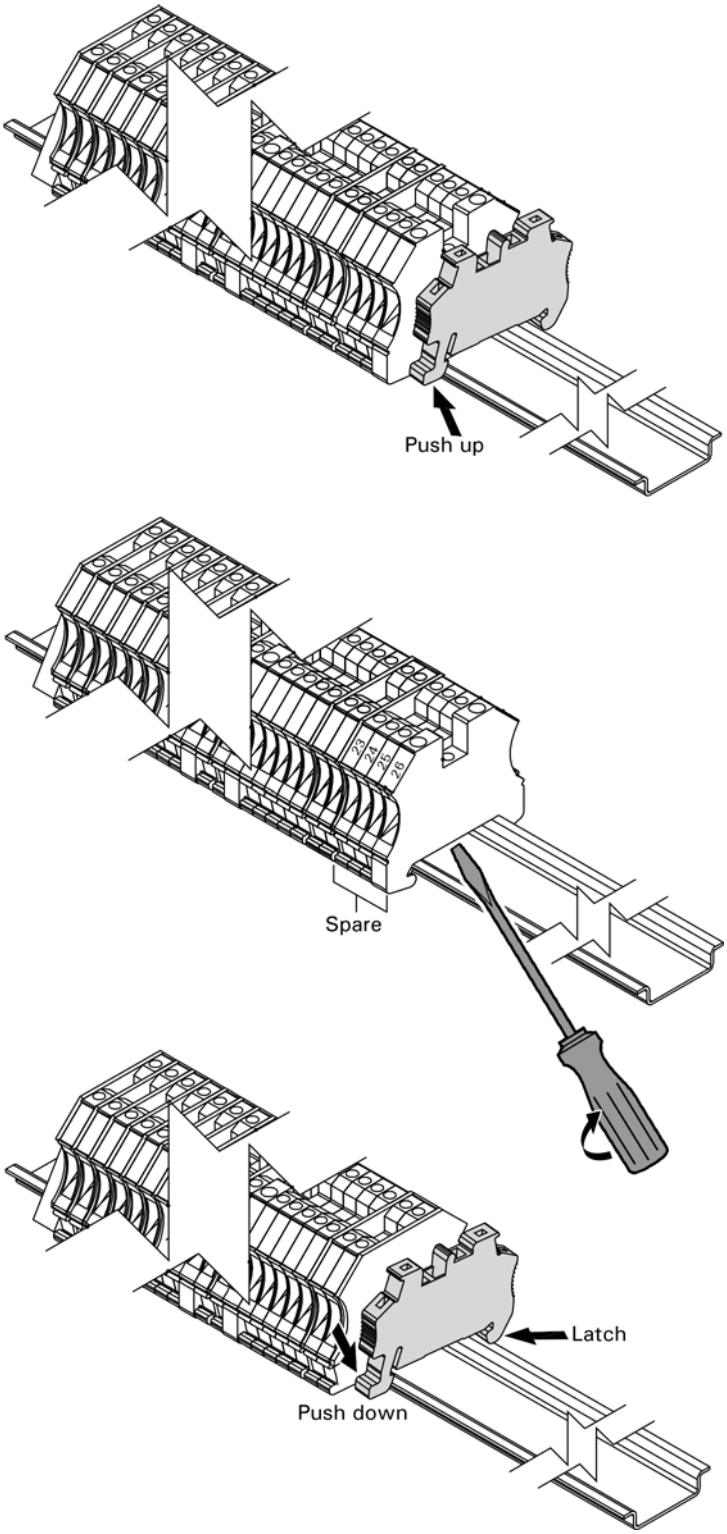
120V Valve Adaptor
Rated voltage: 120 VAC
Rated current: max. 0.1 FLA
Recommended connection
wire size: AWG 14

24V Valve Adaptor
Rated voltage: 24 VAC
Rated current: max. 0.15 FLA
Recommended connection
wire size: AWG 14

Operating time:
5 to 199 sec. selected via coding address “40”.

1. Disconnect power to control.
2. Install 120V or 24V Valve Adaptor on DIN rail inside connection enclosure.
3. Insert the plug [52] into socket [52] on the control.
4. Fasten cable with tie (see page.21).
5. Connect black wire of the adaptor to connection 120V L out the DIN rail
   - Terminals 10,11 or 12.
6. Connect valve actuator wires to the adaptor terminals as shown on figures.

Making Space for Accessory Adaptors on the DIN Rail (CM2 only)



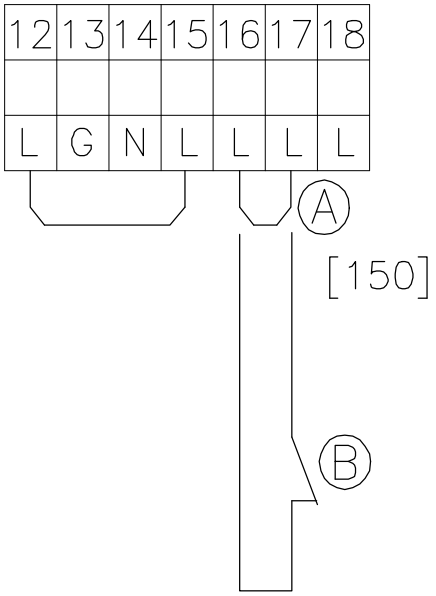
1. Push up on the bottom front of the DIN rail clamp to remove and set aside.

2. Using a flat head screwdriver, remove the 4 'spare' DIN terminals 23, 24, 25 and 26 one at a time. Place the screwdriver between the rail and the base of the terminal and turn the screwdriver clockwise . Discard the removed terminals.

3. Re-install the DIN rail clamp by hooking the latch of the clamp around the top of the rail and then push down on the front of the clamp.

Note: See separate Installation Instructions for accessory adaptors.

Connections to terminal 150 (VD2/VD2A/CT3 only)



Ⓐ Jumper
Ⓑ External shut-off (dry contact)

External shut-off

1. Remove jumper between terminals 16 and 17.
2. Connect dry contact. Controlled switch-off takes place when the contact is opened.

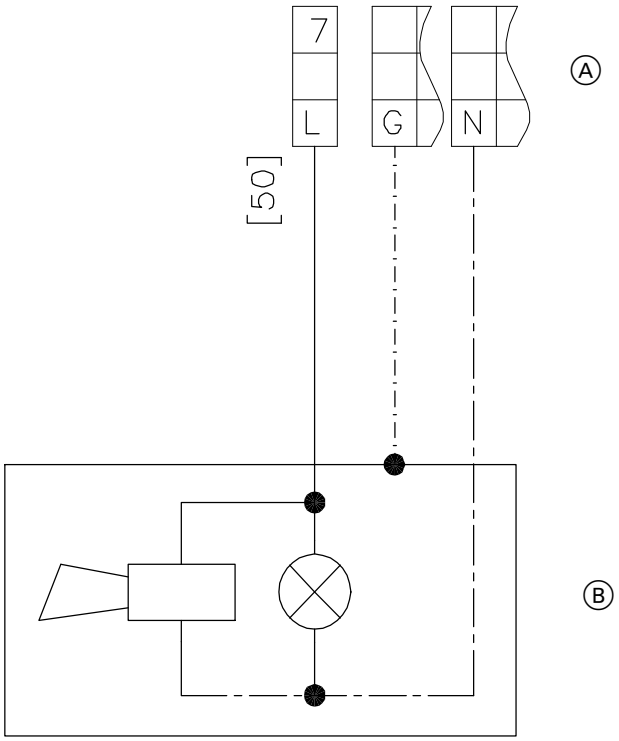
⚠ WARNING

The terminals should be used for safety switch-off purposes only (e.g. through a high limit thermostat). Start at page 52 for details of controlled switch-off.
During switch-off, there is no frost protection of the heating system and the boiler is not kept at the minimum boiler water temperature.

Emergency operation

Move jumper from terminals 16 and 17 to terminals 17 and 18.

Connection of the compiled failure alarm indicator (VD2/VD2A/CT3 only)



Rated voltage: 120 VAC 60 Hz
Rated current: max. 2 FLA
Recommended connection wire size: AWG 14

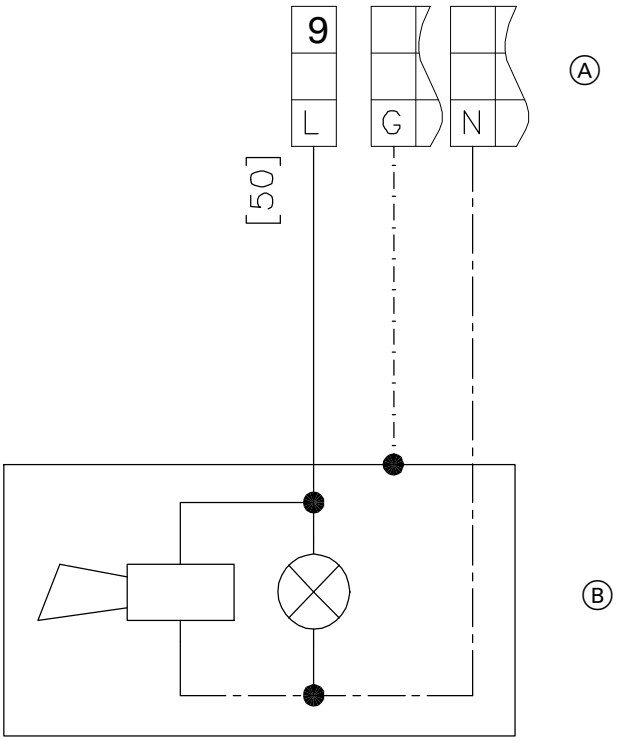
1. Disconnect power to control and burner.

2. Connect the compiled failure alarm as shown in the diagram.

Ⓐ Connect terminal strip in connection enclosure of boiler control.

Ⓑ Visual ond/or audible alarm device (120 VAC).

Connection of the compiled failure alarm indicator (CM2 only)



Rated voltage: *120 VAC 60 Hz*
Rated current: *max. 2 FLA*
Recommended connection wire size: *AWG 14*

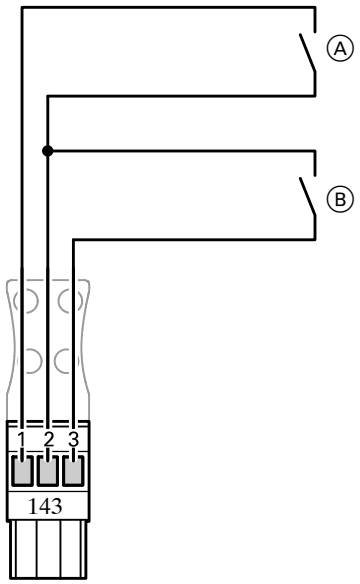
1. Disconnect power to control and burner.

2. Connect the compiled failure alarm as shown in the diagram.

Ⓐ Connect terminal strip in connection enclosure of boiler control.

Ⓑ Visual ond/or audible alarm device (120 VAC).

Connection of external equipment to terminal 143



Ⓐ External changeover of the heating program/ "Open mixing valves" externally (floating contact)
Ⓑ External disable/"Close mixing valves" externally (floating contact)

External changeover of the heating program/"Open mixing valves"

Connect floating contact to terminals "1" and "2".

The manually preselected heating program can be changed over (see table) and the mixing valves opened via the contact.

Via coding address "9A" the function "Open mixing valves" and via coding address "91" the changeover of the heating program can be assigned to the heating circuits.

External disable/"Close mixing valves"

Connect floating contact to terminals "2" and "3".

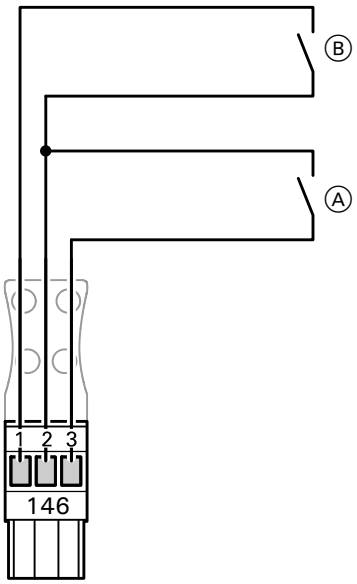
Controlled switch-off of the burner takes place or the mixing valves are closed when the floating contact is closed.
The shunt pump is switched off.

Please note:
During controlled switch-off or "Close mixing valves", there is no frost protection of the boiler or heating circuits and no minimum boiler water temperature is maintained.

Coding address "99" can be used to select the equipment for which the input 143 is to be effective.

Manually preselected heating program (with contact open)		**Coding 2**		**Heating program after changeover** (with contact closed)
⏻ or	Space heating OFF/DHW OFF	d5: 0 (factory default)	<–>	Continuous operation with reduced room temperature/DHW OFF
🚿 or	Space heating ON/DHW ON	d5: 1	<–>	Continuous operation with normal room temperature/DHW according to coding address "64"
🚿	Space heating ON/DHW ON			

Connection of external equipment to plug 146



Ⓐ External demand (floating contact)
Ⓑ External changeover,
staged/modulating burner
(floating contact)

External demand

Connect floating contact to terminals "2" and "3".

The burner of the boiler is switched in on a load-dependent basis when the floating contact is closed.

The boiler water temperature is limited by the preset max. boiler water temperature or by the value set on the mechanical adjustable high limit.
The required boiler set-point value is set via the coding address "9b".

External changeover between staged/modulating burner

Connect floating contact to terminals "1" and "2".

Contact open:	modulating operation
Contact closed:	two-stage operation

The burner type must be set to "modulating" in coding 1 (coding "02: 2").

Please note:
When the burner type is scanned, "modulating" continues to be displayed after external changeover (the display is not changed).

Connection of external controls

Operation with two-stage burner

Settings on the control unit
The settings for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Single-boiler systems:
Coding "01: 1"
(factory setting)

When a building automation system is connected, only the connections on plug 143 are required. The DHW tank control unit is activated when the DHW tank temperature sensor is connected. The boiler water temperature must be set to the minimum value.

Multi-boiler systems:
Set coding "01: 3"

When a building automation system is connected, the connections on plugs 143 and 146 are required. The DHW tank temperature and the load-dependent cascade control must be controlled through the building automation system.

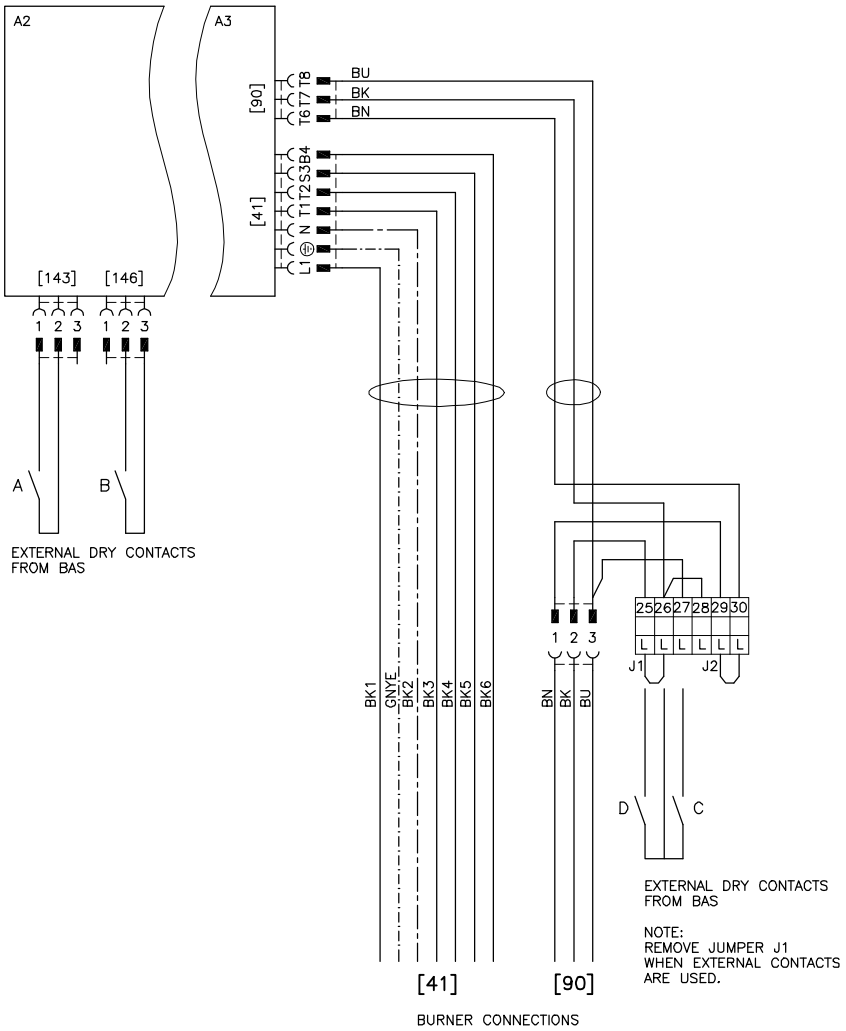
⚠ CAUTION

The boiler activation contact is essential on multi-boiler systems. The contact on the lead boiler MUST be constantly closed.

Connection of external controls (VD2/VD2A only) *(continued)*

Modulating boilers – operation with external modulation controller

- 1st stage burner [41] from Vitotronic.
- Plug [90] from Vitotronic via modulation controller (BAS).
- On the bulding automation unit with modulation controller set the minimum temperatures 5°C / 9°F above the minimum boiler water temperature of the boiler.



EXTERNAL DRY CONTACTS:
A– BURNER ACTIVATION
1ST STAGE ON
B– BOILER ISOLATION VALVE OPEN
(ON MULTI BOILER SYSTEM ONLY)
C– MODULATION UP
D– MODULATION DOWN

Boiler activation, isolation valve open or closed
Connect dry contact at terminals "2" and "3" of the plug [146].

Contact closed:
First, the preheat function for follow-up boilers is activated (coding address "2b").
When the preheat function finishes, the minimum temperature is maintained for the boiler, and the burner stages/modulation can be switched externally.
The boiler water temperature is limited by the preset maximum boiler water temperature or via the mechanical adjustable high limit.
The setpoint value is selected via the coding address "9b".

Contact open:
The isolation valve is closed after approx. 5 minutes (coding address "2C").
External override of the burner stages is not possible, and no minimum temperature is maintained.

Switch on 1st stage burner (basic load)
Connect dry contact at terminals "1" and "2" of the plug [143].

Contact closed:
The 1st stage burner is switched on.
The full load is only switched on to maintain the minimum temperature (not with Vitocrossal 300). The boiler water temperature is limited by the electronic maximum temperature limit (coding address "06") if this is set below the value preset on the mechanical adjustable high limit "".

Contact open:
The 1st stage burner is switched off.

Connection of external controls (VD2/VD2A only) *(continued)*

Modulating boilers – operation with external modulation controller *(continued)*

Settings on the control unit
The settings for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Single-boiler systems:
Coding "01: 1"
(factory setting)

When a building automation system is connected, only the connections on plug 143 are required. The DHW tank control unit is activated when the DHW tank temperature sensor is connected. The boiler water temperature must be set to the minimum value.

Multi-boiler systems:
Set coding "01: 3"

When a building automation system is connected, the connections on plugs 143 and 146 are required.
The DHW tank temperature and the load-dependent cascade control must be controlled through the external building automation system.

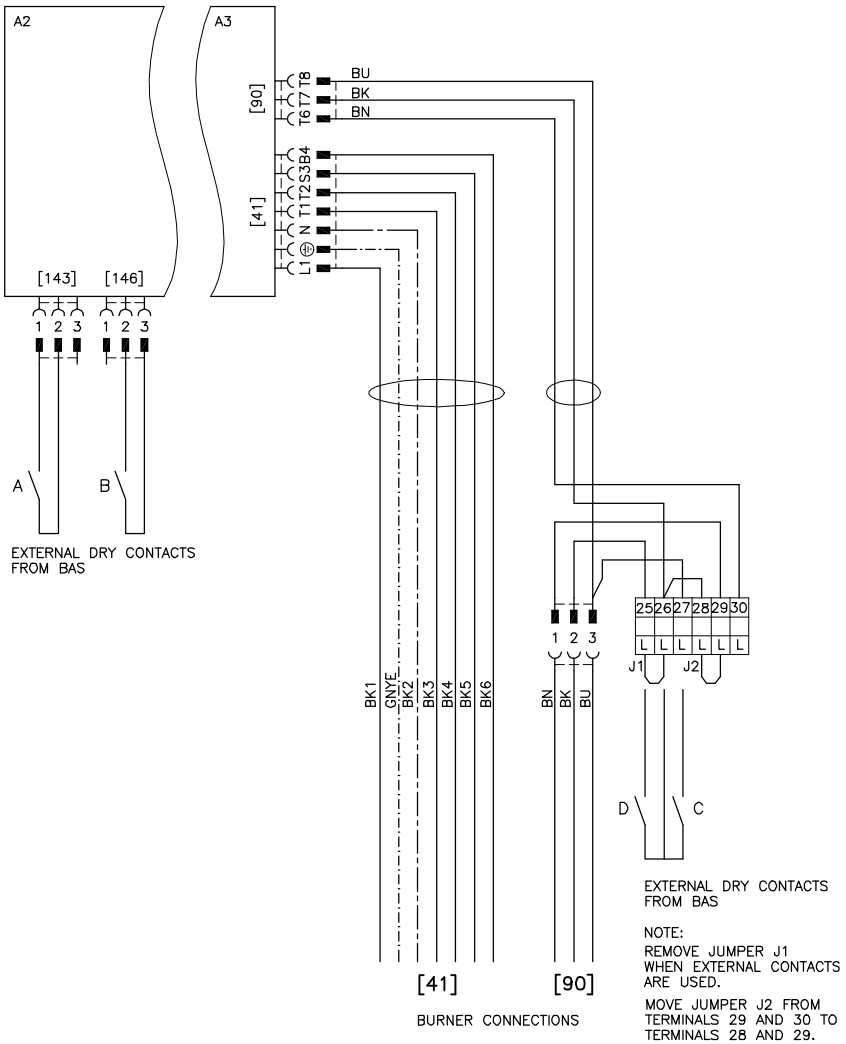
⚠ CAUTION

The boiler activation contact is essential on multi-boiler systems. The contact on the lead boiler MUST be constantly closed.

Connection of external controls (CT3 only) *(continued)*

Vitocrossal 300 – operation with external modulation controller

- 1st stage burner [41] from Vitotronic 100.
- Connection [90] from Vitotronic has no function.
- Connection [90] from building automation system to the burner.
- 1st stage burner activated by the modulation controller via connection [146].



EXTERNAL DRY CONTACTS:
A– BURNER ACTIVATION
1ST STAGE ON
B– BOILER ISOLATION VALVE OPEN
(ON MULTI BOILER SYSTEM ONLY)
C– MODULATION UP
D– MODULATION DOWN

Boiler activation, isolation valve open or closed
Connect dry contact at terminals "2" and "3" of the plug [146].

Contact closed:
First, the preheat function for follow-up boilers is activated (coding address "2b").
When the preheat function finishes, the burner stages/modulation can be switched externally.
The boiler water temperature is limited by the preset maximum boiler water temperature or via the mechanical adjustable high limit.
The setpoint value is selected via the coding address "9b".

Contact open:
The isolation valve is closed after approx. 5 minutes (coding address "2C").
External override of the burner stages is not possible, and no minimum temperature is maintained.

Switch on 1st stage burner (basic load)
Connect dry contact at terminals "1" and "2" of the plug [143].

Contact closed:
The 1st stage burner is switched on.
The boiler water temperature is limited by the electronic maximum temperature limit (coding address "06") if this is set below the value preset on the mechanical adjustable high limit "🌡".

Contact open:
The 1st stage burner is switched off.

Connection of external controls (CT3 only) *(continued)*

Vitocrossal 300 – operation with external modulation controller *(continued)*

Settings on the control unit
The settings for the fixed high limit and the other settings are dependent on the safety equipment installed in accordance with applicable codes.

	Non-condensing boiler (VD2/VD2A) °C / °F		Condensing boiler (CT3) °C / °F	Condensing boiler (CM2) °C / °F
Fixed high limit	110 / 230	99 / 210	99 / 210	99 / 210
Adjustable high limit	100 / 212	95 / 203	95 / 203	95 / 203
Coding for the electronic maximum temperature limiter of Vitotronic 100; set code 06 to the temperature as shown or less	93 / 200	87 / 188	87 / 188	88 / 190

Single-boiler systems:
Coding "01: 1"
(factory setting)

When a building automation system is connected, only the connections on plug 143 are required. The DHW tank control unit is activated when the DHW tank temperature sensor is connected. The boiler water temperature must be set to the minimum value.

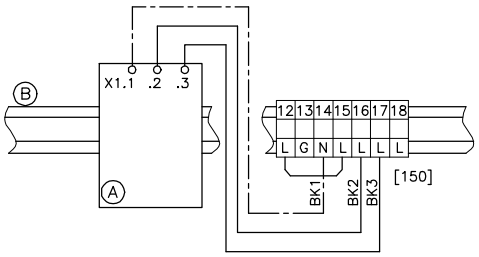
Multi-boiler systems:
Set coding "01: 3"

When a building automation system is connected, the connections on plugs 143 and 146 are required. The DHW tank temperature and the load-dependent cascade control must be controlled through the building automation system.

⚠ CAUTION

The boiler activation contact is essential on multi-boiler systems. The contact on the lead boiler MUST be constantly closed.

Connections of combustion air device adaptor (VD2/VD2A/CT3 only)



Connection of the Combustion Air Device Adaptor

1. Disconnect power to control and burners.
2. Install Combustion Air Device Adaptor, Part No.: 7134 563 on DIN Rail inside connection enclosure (refer to installation manual of Combustion Air Device Adaptor).
3. Remove jumper between terminals 16 and 17.
4. Make connection as shown in the diagram.

IMPORTANT

Wire BK2 must be connected to terminal 16 and BK3 to terminal 17 - DO NOT reverse.

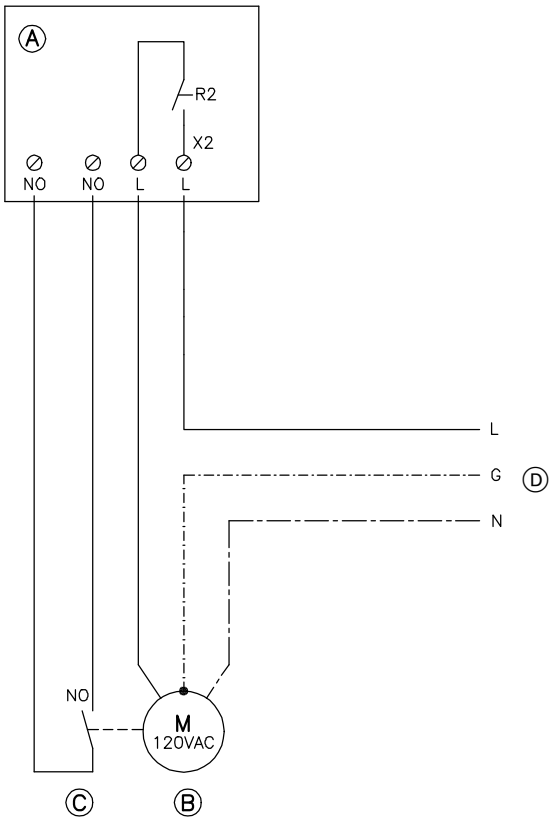
Ⓐ Combustion Air Device Adaptor
Ⓑ DIN Rail in connection enclosure

Connection of the combustion air blower to adaptor

Rated voltage: 120 VAC
Rating current: max 5 FLA
Recommended connection wire size: AWG 14

Note:
Assure that combustion air blower device is suitable for this application.

For detailed instruction on adaptor installation, please refer to the adaptor's installation manual.



1. Make connection as shown in the diagram at left.

Ⓐ Combustion Air Device Adaptor in connection enclosure
Ⓑ Combustion air blower motor
Ⓒ Proving switch - "normally open" rated for 120 VAC
Ⓓ Power supply, 120 VAC

CAUTION

Provide disconnect means and overcurrent protection as required by local codes.

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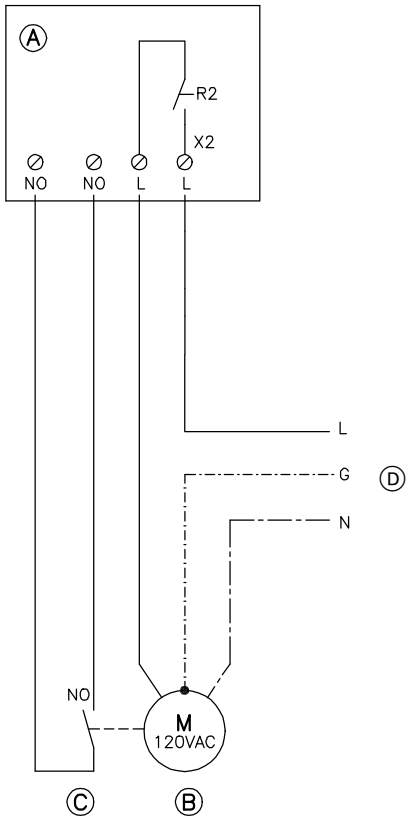
Connection of Combustion Air Device (CM2 only)



Connection of the Combustion Air Device Adaptor

1. Disconnect power to control and burners.

2. Install Combustion Air Device Adaptor, Part No. 7134 563 on DIN Rail inside the boiler junction box (refer to installation manual of Combustion Air Device Adaptor).

3. Remove plug 150 from Vitotronic control. Remove jumper between the 2 'TR' terminals. Using 14 AWG (field supplied) connect plug terminals TR(Left), TR(Right) and neutral to the DIN rail.

Neutral to Terminal 16
TR(Left) to Terminal 18
TR(Right) to Terminal 19

Re-install the 150 plug and DIN rail connections as shown in the diagram.

IMPORTANT

Wire BK2 must be connected to terminal 18 and BK3 to terminal 19 - DO NOT reverse.

Connection of the combustion air blower to adaptor

Rated voltage: 120 VAC
Rating current: max 5 FLA
Recommended connection wire size: AWG 14

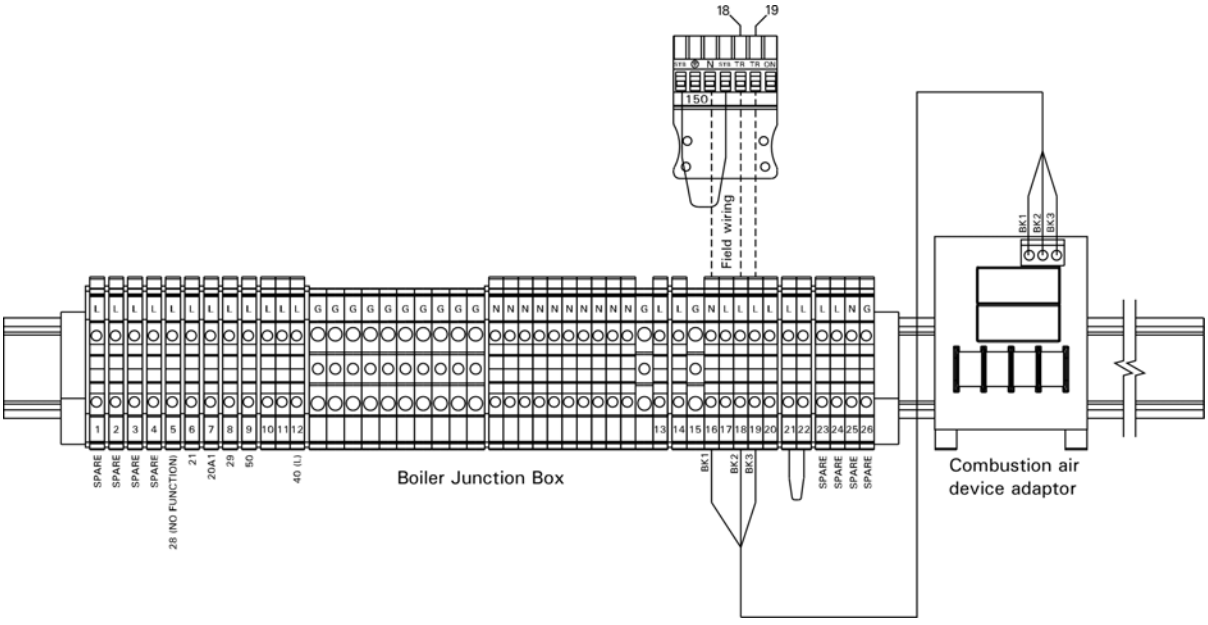
Ensure that combustion air blower device is suitable for this application.

For detailed instruction on adaptor installation please refer to the adaptor's installation manual.

1. Make connection as shown in the diagram at left.

Ⓐ Combustion Air Device Adaptor in connection enclosure
Ⓑ Combustion air blower motor
Ⓒ Proving switch - "normally open" rated for 120 VAC.
Ⓓ Power supply, 120 VAC

⚠ ***Safety instruction!***
Provide disconnect means and overcurrent protection as required by local codes.



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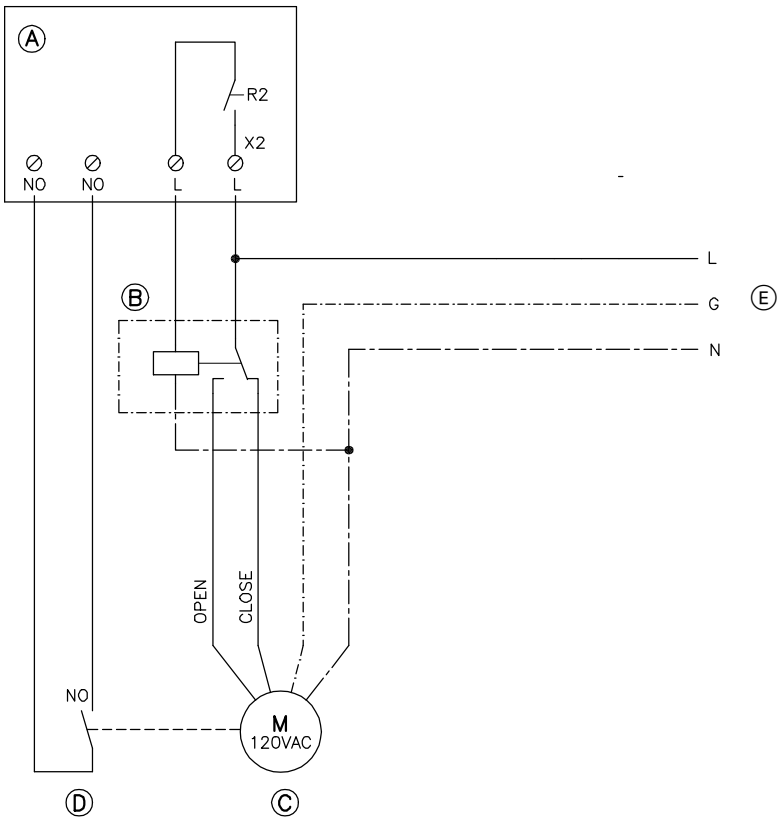
Connection of combustion air device *(continued)*



Connection of the combustion air damper

See damper manual for correct installation.

Note:
Assure that the combustion air damper is suitable for this application.

1. Disconnect power to control and burner.

2. Make connection as shown in the diagram.

Ⓐ Combustion Air Device Adaptor in connection enclosure
Ⓑ Relay 120 VAC coil - field supplied
Ⓒ Combustion air damper
Ⓓ End switch rated for 120 VAC wired to “normally open” terminal on device adaptor board
Ⓔ Power supply, 120 VAC

⚠ CAUTION

Provide disconnect means and overcurrent protection as required by local codes.

Note:
Spring return air dampers do not require field supplied relay.

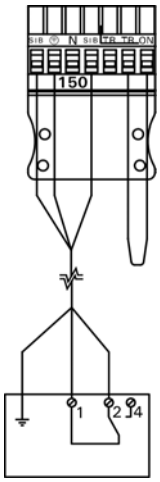
Flue Gas Temp. Switch (mandatory for PP(s) material collectors)

(CM2 only)

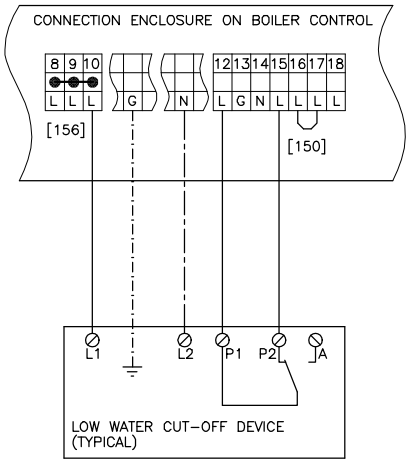
CAUTION

Please note that the diagram shown is only a simplified conceptual drawing of a flue gas temperature switch. Refer to the manual specific to the device for interconnection details.

1. Disconnect power.
2. Remove 150 plug from the Vitotronic control and discard.
3. Install new 150 plug supplied (attached to flue gas temperature switch).



Connection of low water cut-off device (VD2/VD2A/CT3 only)



1. Remove jumper between terminals 12 and 15.

2. Make connection as shown in diagram.

⚠ CAUTION

Please note that the diagram at left is only a simplified conceptual drawing of a typical low water cut off (LWCO) device. Refer to the manual specific to the device for interconnection details.

156 Power supply for accessories.

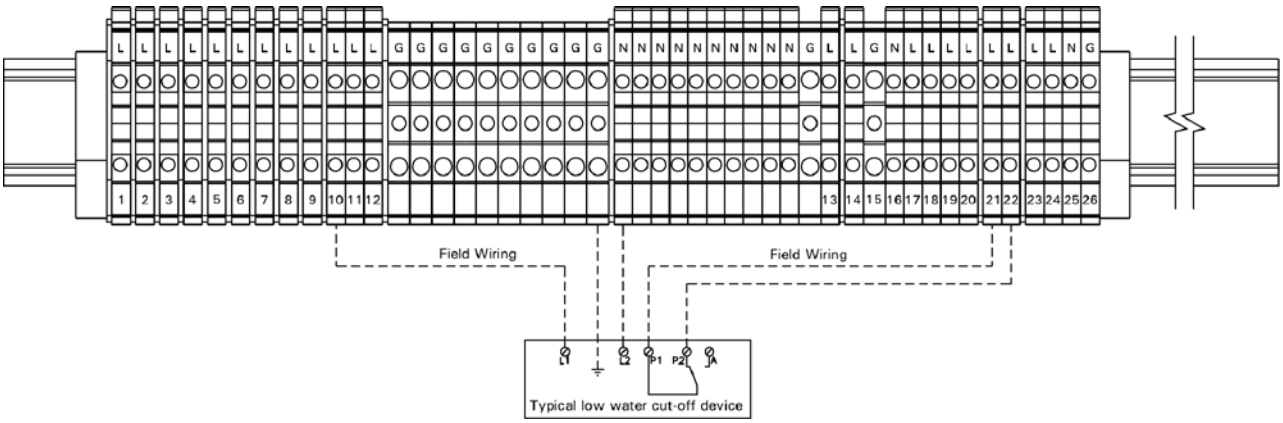
150 Connection for external equipment.

Connection of Low Water Cut-off Device (CM2 only)

1. Remove jumper between terminals 21 and 22.
2. Make connection as shown in diagram.

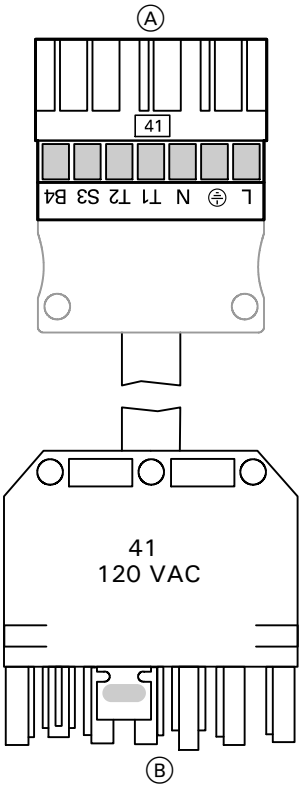
CAUTION

Please note that the diagram shown is only a simplified conceptual drawing of a typical low water cut-off (LWCO) device. Refer to the manual specific to the device for interconnection details.



Burner connection, Burner control wiring (VD2/VD2A/CT3 only)

For burners with plug-in connection



The burner cables are included in the standard delivery of the Vitotronic.

Connect the burner in accordance with applicable codes.

Ⓐ To boiler control unit
Ⓑ To burner

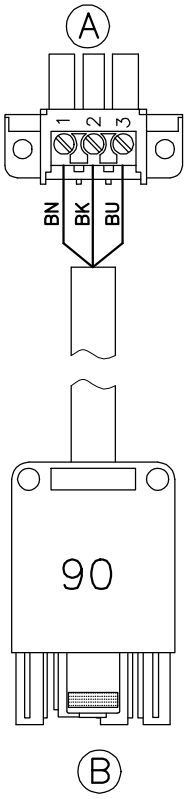
Terminal codes

L1 Phase via fixed high limit to the burner
⏚ Ground connection
N Neutral connection to the burner
T1,T2 Control circuit
S3 Connection for burner fault indicator
B4 Connection for burner hours counter

1. Disconnect power to burner and boiler control.

2. Connect plugs 41 and plug 90 to respective counter plugs in boiler control unit.

3. Connect the 7-pole plug 41 and the 3-pole plug 90 to the burner.



Ⓐ To plug-in connection in connection enclosure
Ⓑ To burner

Terminal codes

1,2,3 Control circuit "2nd stage burner or modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)
1 From burner
2 Modulating down
3 Modulating up/2nd stage ON

Colour codes as applicable

BK Black
BN Brown
BU Blue

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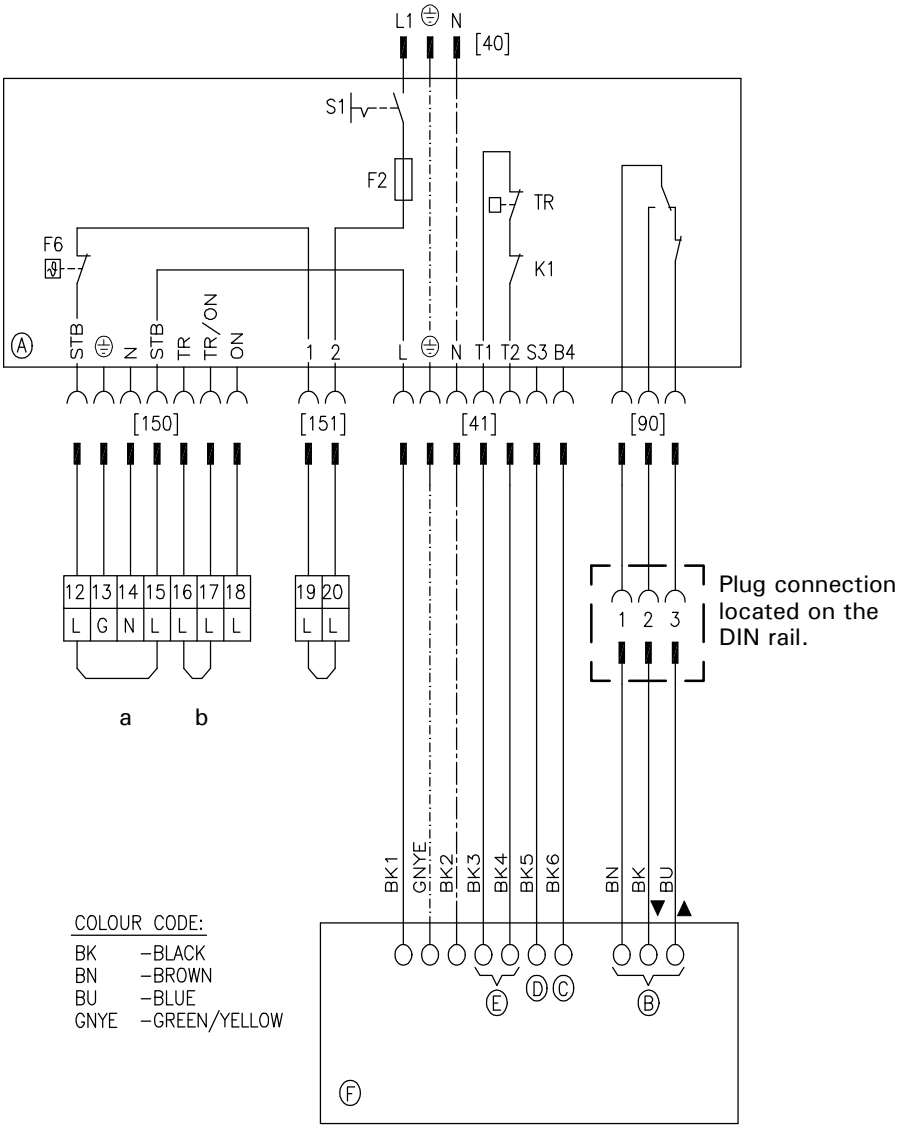
Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

CAUTION

This is a generic connection drawing only! Follow the burner manufacturer's connection drawings for Viessmann controls.



Write the terminal numbers or markings on the drawing for future reference.

Plug connection located on the DIN rail.

Burner power supply not shown.

Ⓐ Control unit (Legend: see wiring diagram)
Ⓑ 2nd stage or modulating *1
Ⓒ Hours counter, stage 1 *1
Ⓓ Burner fault indicator *1
Ⓔ Control circuit, stage 1/ basic load *1
Ⓕ Burner

40 Power supply connection of control unit 120 VAC
41 Burner, 1st stage
90 Burner, 2nd stage

150 Plugs for external equipment
ⓐ External safety devices (remove jumper when connecting)
ⓑ External controlled switch-off (remove jumper when connecting)
151 Safety circuit. Emergency shut-off

*1 Refer to burner manufacturer's instruction on detailed connections for Viessmann controls.

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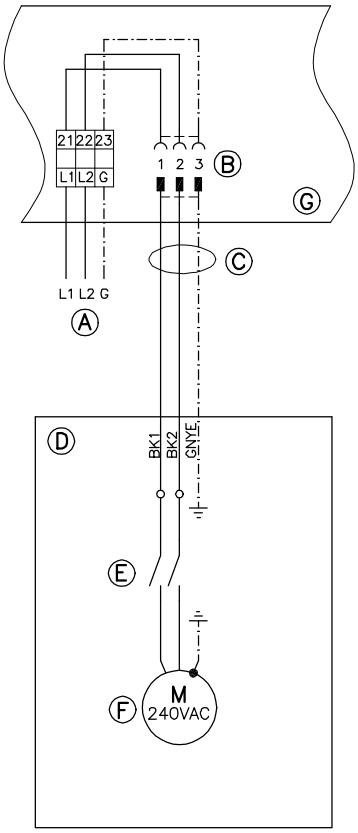
Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

Burner motor power supply connection *(continued)*

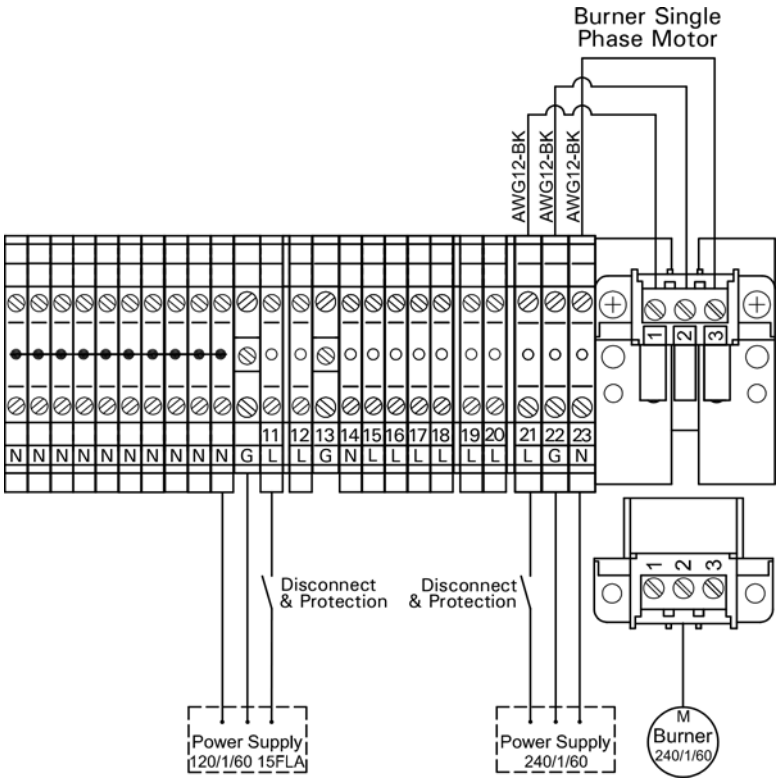
For burners with 240 VAC, 1PH power supply and connection in conduit.

See burner manual for correct fuse and wire gauge sizing, and specific connections for Viessmann controls.



Ⓐ Burner motor power supply 240 VAC, 1PH
Ⓑ Connection terminals and plug inside connection enclosure
Ⓒ Cable and conduit- factory supplied
Ⓓ Burner
Ⓔ Motor starter
Ⓕ Burner motor
Ⓖ Connection enclosure on boiler control

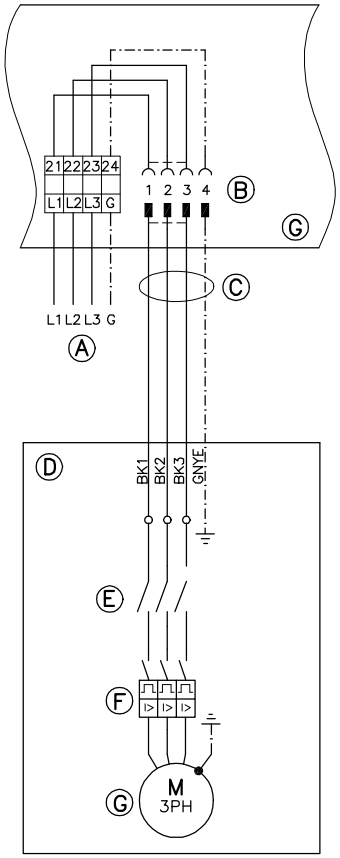
1. Disconnect power to burner and boiler control.
2. Connect 240 VAC power to the terminals 21, 22 and 23 on the DIN rail inside the connection enclosure. Provide fuseable disconnect means according to local codes.
3. Connect supplied power cable to the motor terminals on the burner.
4. Connect cable plug to the socket on the DIN rail in the connection enclosure.



Burner Connection, Burner Control Wiring (VD2/VD2A/CT3 only) *(continued)*

Burner motor power supply connection *(continued)*

For burners with 3PH 208, 460 or 575V power supply.



Ⓐ Burner motor power supply 3PH 208, 460 or 575V
Ⓑ Connection terminals and plug inside connection enclosure
Ⓒ Cable and conduit - factory supplied
Ⓓ Burner
Ⓔ Motor starter
Ⓕ Overload
Ⓖ Burner motor
Ⓗ Connection enclosure

See burner manual for correct fuse and wire gauge sizing, and specific connections for Viessmann controls.

1. Disconnect power to burner and boiler control.

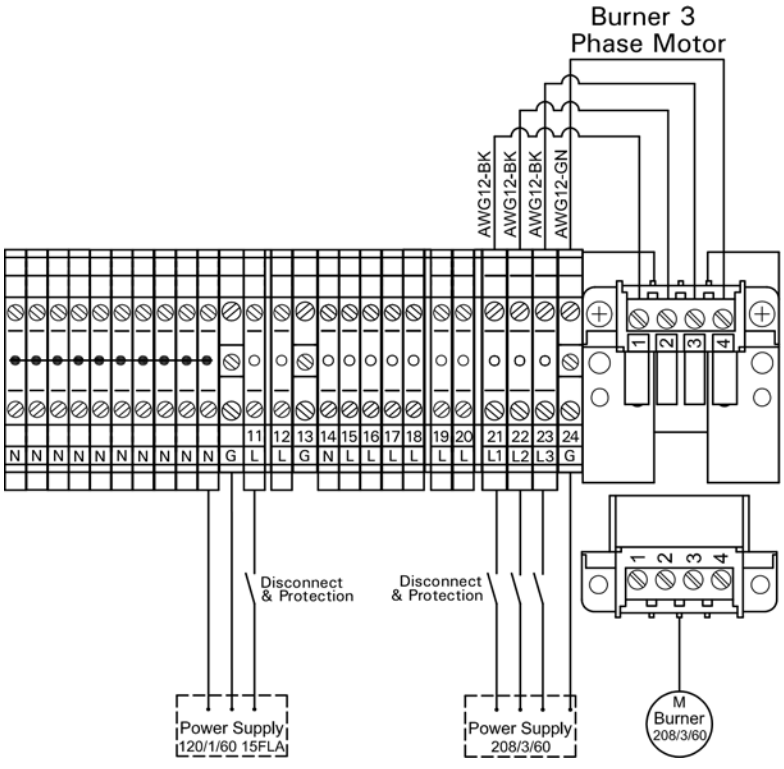
2. Connect 3PH power to the terminals 21, 22, 23 and 24 on the DIN rail inside the connection enclosure. Provide fuseable disconnect means according to local codes.

3. Connect supplied power cable to the motor terminals on the burner.

4. Connect cable plug to the socket on the DIN rail in the connection enclosure.

⚠ CAUTION

During commissioning check for correct motor rotation. If motor rotates in opposite direction than indicated on the burner, disconnect power supply and reverse wires BK1 and BK2 on the burner terminals.



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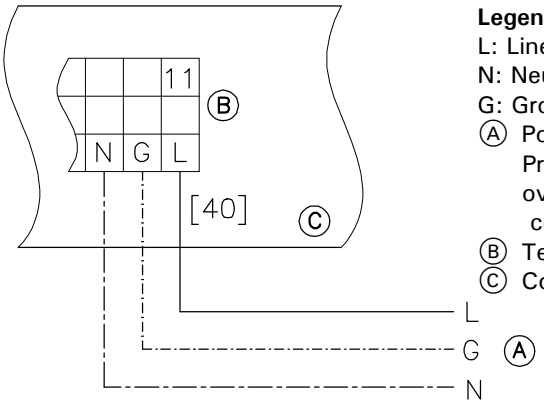
Power Supply Connection, Boiler Control (VD2/VD2A/CT3 only)



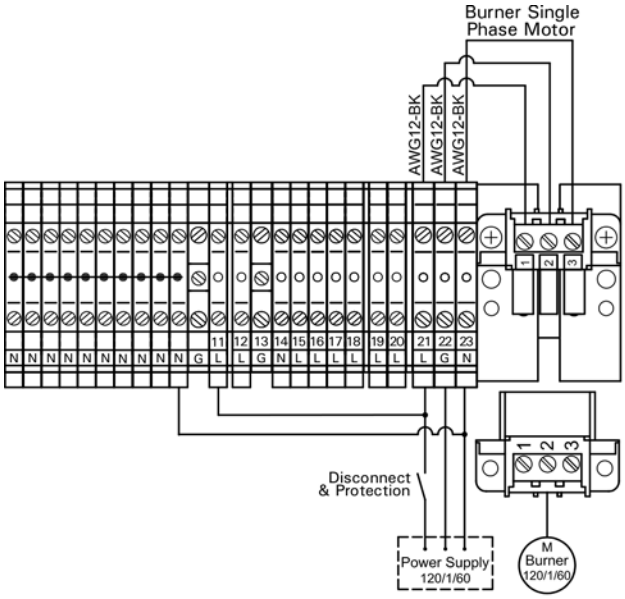
Legend
L: Line
N: Neutral
G: Ground
Ⓐ Power supply 120 VAC, 1 PH . Provide disconnect means and overcurrent protection as per local codes
Ⓑ Terminals [40]
Ⓒ Connection enclosure

1. Ensure that the main power supply to the control contains overcurrent protection with a maximum rating of 15 A and 2 pole disconnect.

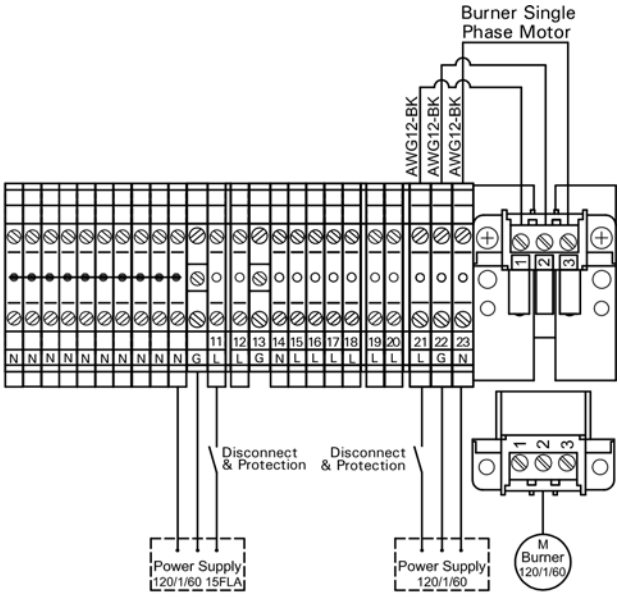
⚠ CAUTION

The control must be grounded. Ensure that "L", "N" and "G" are not interchanged.

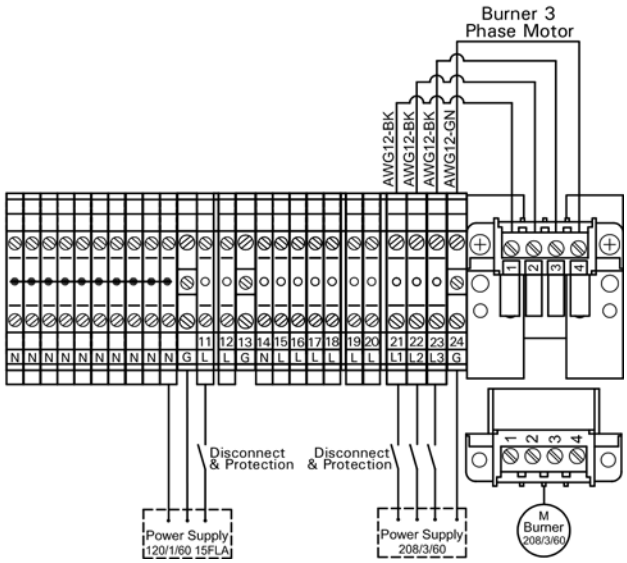
2. Connect power supply wire to the Connection [40] terminals 11, N and G on the DIN rail inside the connection enclosure.



OR

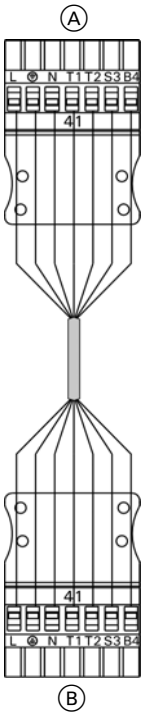


Supply power must be sufficient to cover both the 15A control power plus the required motor amperage.



Burner Connection, Burner Control Wiring (CM2 only)

For burners with plug-in connection



The burner cables are included in the standard delivery of the Vitotronic.
Connect the burner in accordance with applicable codes.

Ⓐ To boiler control unit
Ⓑ To burner interface

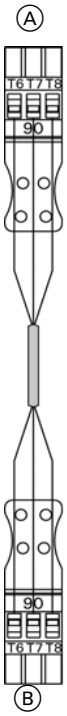
Terminal codes

L1 Phase via fixed high limit to the burner
⏚ Ground connection
N Neutral connection to the burner
T1,T2 Control circuit
S3 Connection for burner fault indicator
B4 Connection for burner hours counter

1. Disconnect power to burner and boiler control.

2. Connect plugs 41 and plug 90 to respective counter plugs in boiler control unit.

3. Connect the 7-pole plug 41 and the 3-pole plug 90 to the burner.



Ⓐ To plug-in connection in connection enclosure
Ⓑ To burner interface

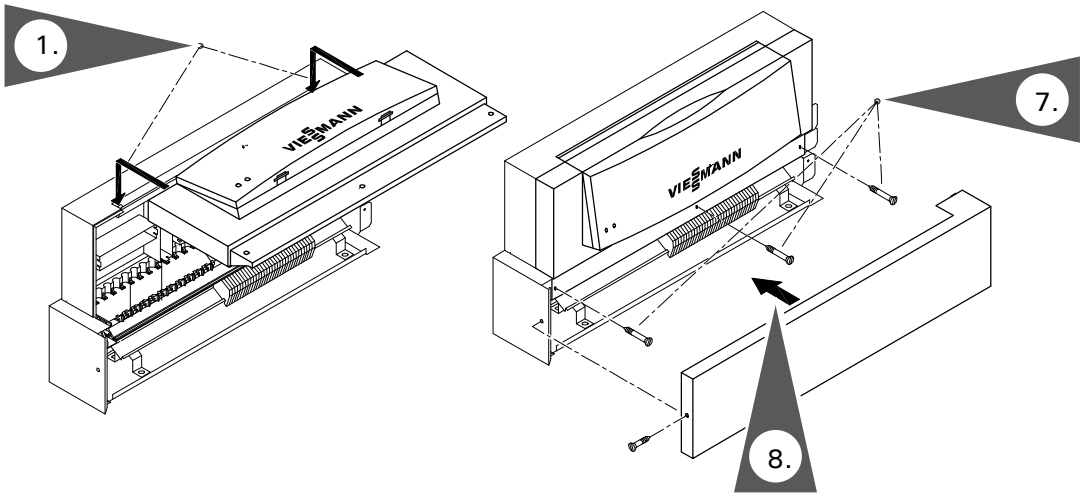
Terminal codes

1,2,3 Control circuit "2nd stage burner or modulation controller" (via two-point controller with 2-stage operation; via three-point controller with modulating operation)
1 From burner
2 Modulating down
3 Modulating up/2nd stage ON

Colour codes as applicable

BK Black
BN Brown
BU Blue

Mounting the Front Part of the Control Unit (VD2/VD2A/CT3 only)



1. Position the front part of the housing and clip hinges to counter-parts on main housing.

2. Release the stay bar, open it up and lock in position at point Ⓐ.

3. Insert the flat cable from the Optolink into plug "X20".

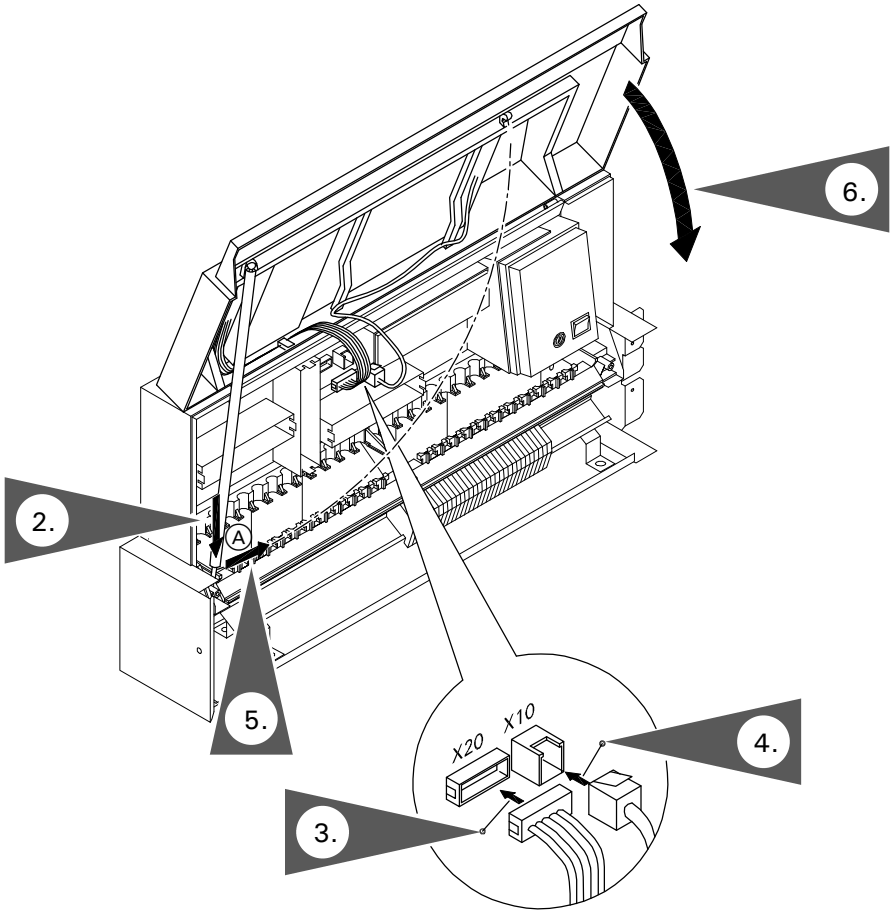
4. Insert the plug of the programming unit into socket "X10". Use cable guides in cover for routing.

5. Engage the stay bar in the front housing.

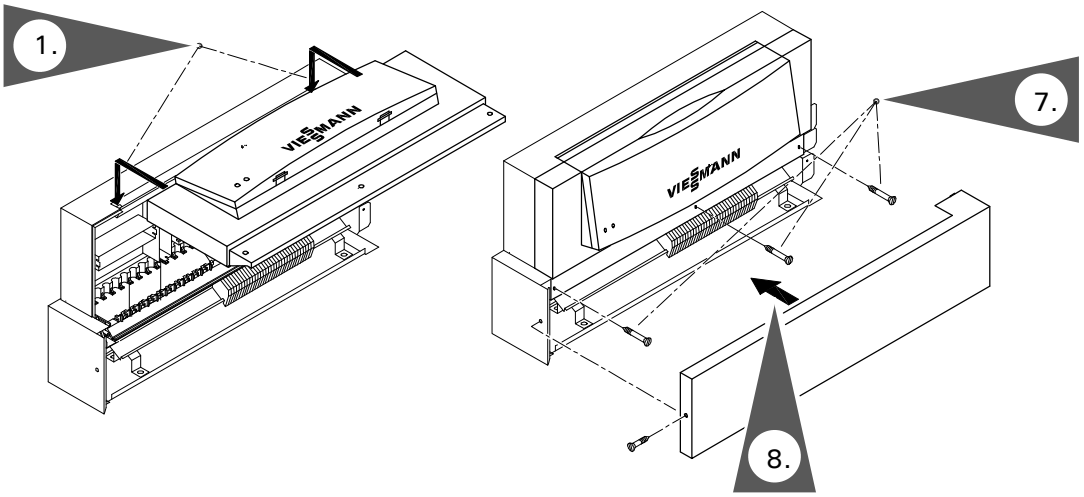
6. Close the front of the housing.

7. Secure front housing with supplied screws.

8. Install cover of the connection enclosure and support with supplied screw.



Mounting the Front Part of the Control Unit (VD2/VD2A/CT3 only)



1. Position the front part of the housing and clip hinges to counter-parts on main housing.

2. Release the stay bar, open it up and lock in position at point Ⓐ.

3. Insert the flat cable from the Optolink into plug "X20".

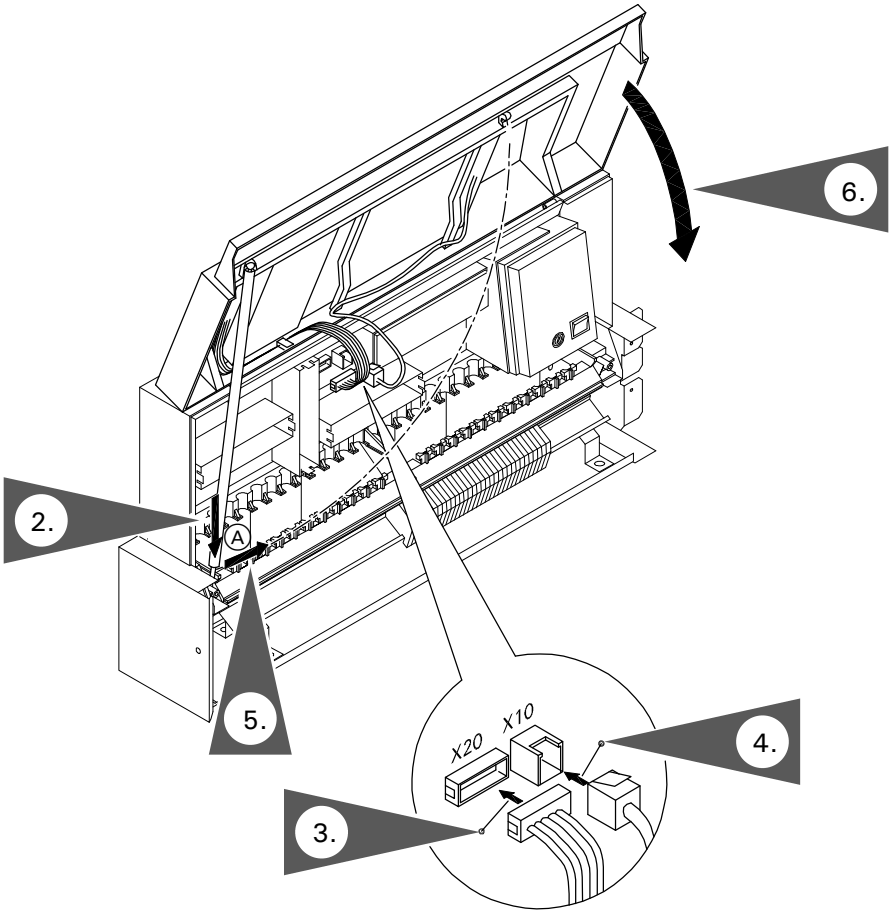
4. Insert the plug of the programming unit into socket "X10". Use cable guides in cover for routing.

5. Engage the stay bar in the front housing.

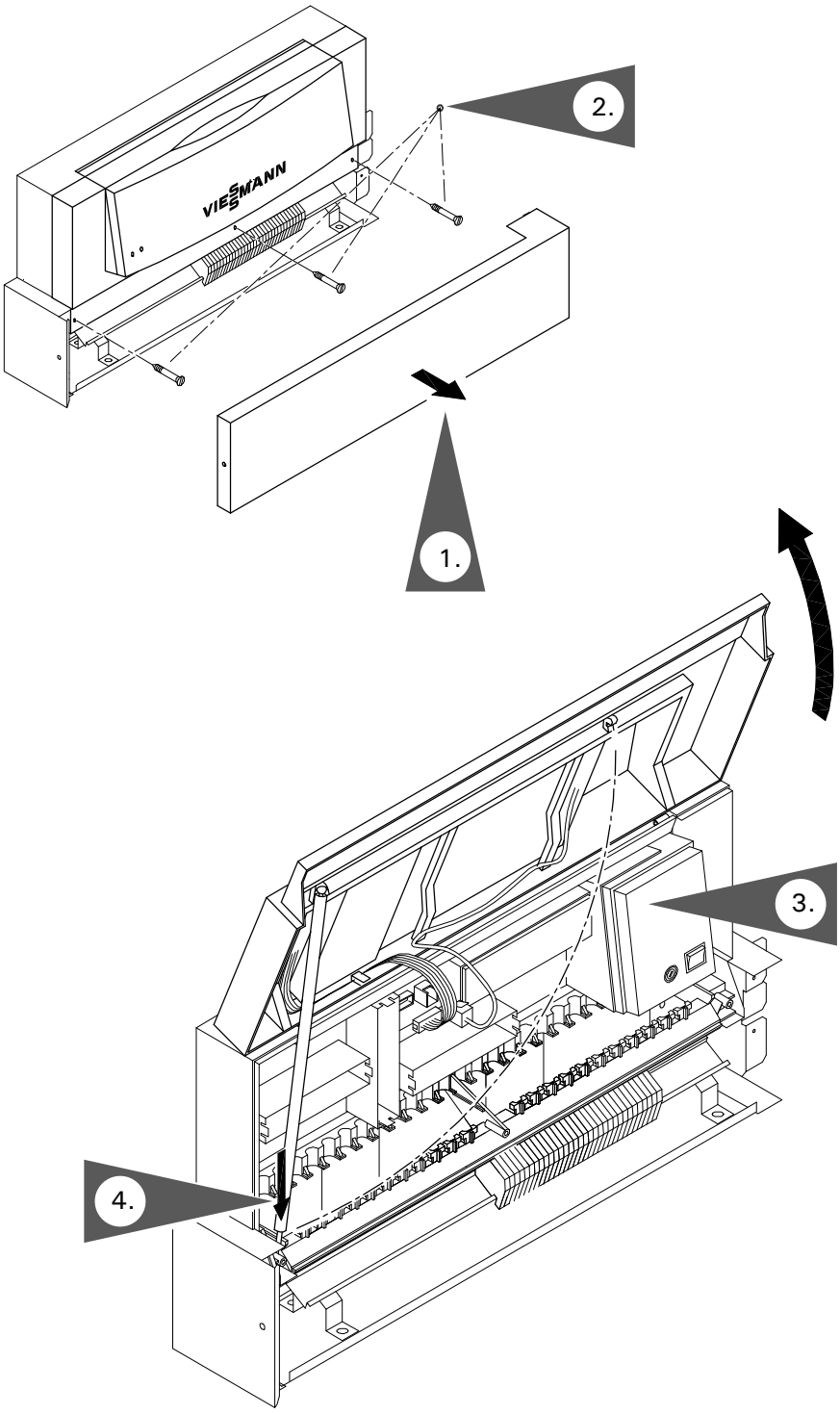
6. Close the front of the housing.

7. Secure front housing with supplied screws.

8. Install cover of the connection enclosure and support with supplied screw.

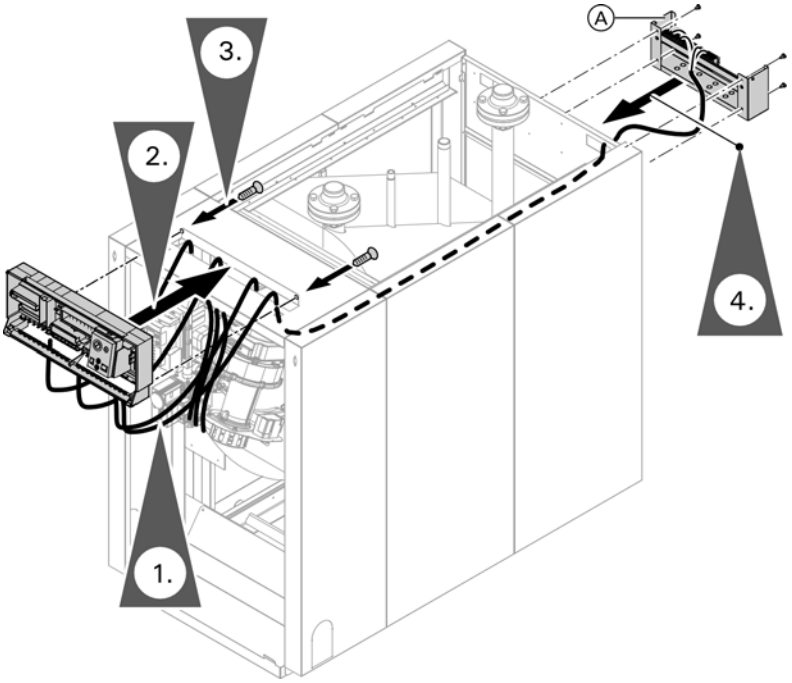


Opening the Control Unit (VD2/VD2A/CT3 only)



1. Remove the cover of the connection enclosure.
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

Control and Junction Box Installation Instructions (for CM2 only)



1. Route cables and capillaries from control through the opening in the control panel. Guide the cables to the junction box through the opening in the rear panel and along the top rail to the control. Secure all cables to the rail with cable ties. Insert capillaries into the sensor well.
   Note: Never allow cables to come in contact with hot metal components.

WARNING

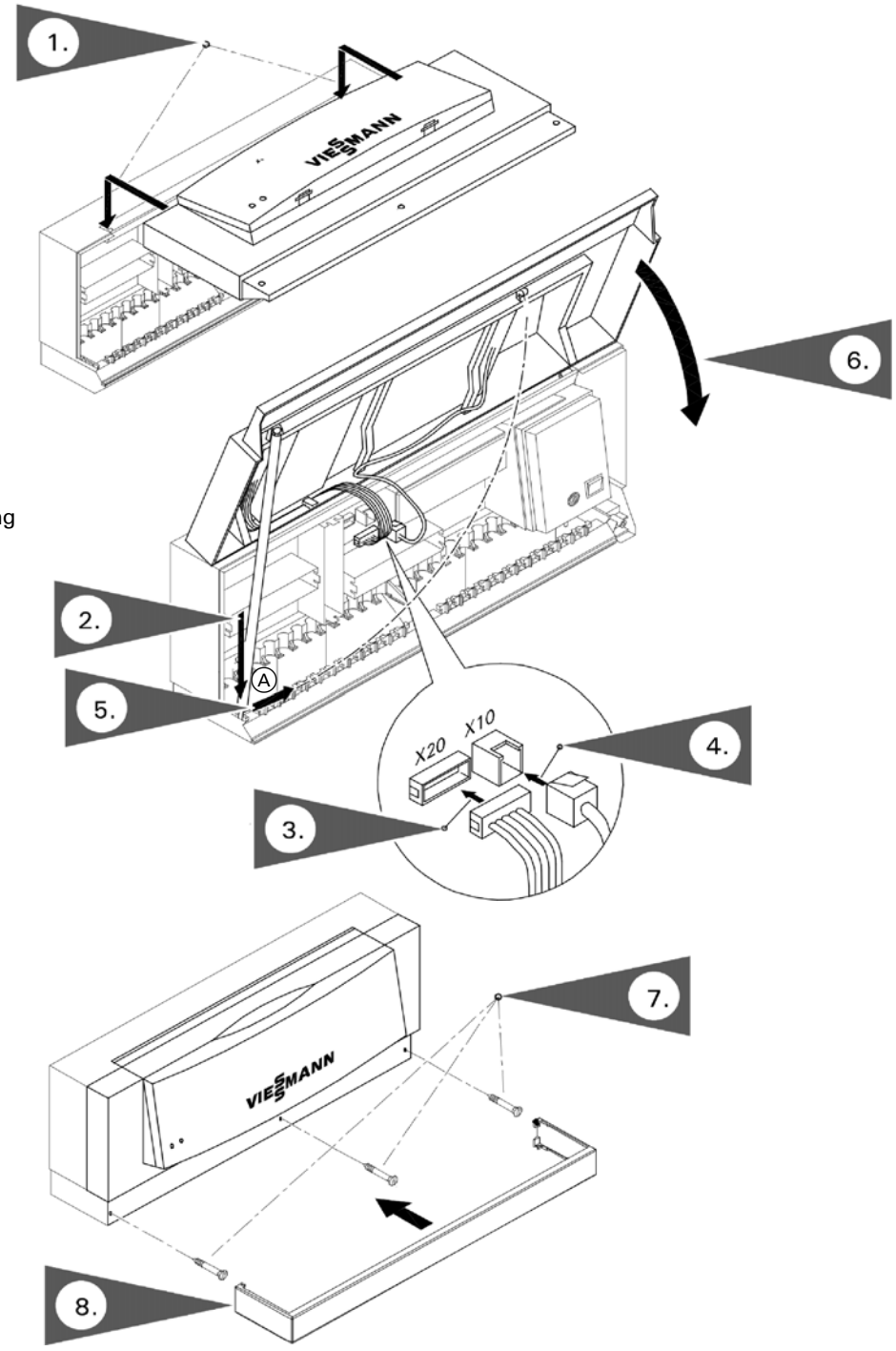
Do not bend or kink the capillaries. Damaging the capillaries leads to malfunction.

2. Mount the control to the control panel.

3. Secure the control to the control panel with screws.
   Note: Screws to secure control are included with the cosmetic cover in the boiler jacketing package.

4. Install the junction box to the rear panel either right or left. Secure the junction box with 4 x 4.8 metal screws.
   Note: The ground screw and ground wire can be removed and then reinstalled with the boiler back panel attached.

Mounting the Front Part of the Control Unit (CM2 only)



1. Position the front part of the housing and clip hinges to counter-parts on main housing.

2. Release the stay bar, open it up and lock in position at point Ⓐ.

3. Insert the flat cable from the Optolink into plug "X20".

4. Insert the plug of the programming unit into socket "X10". Use cable guides in cover for routing.

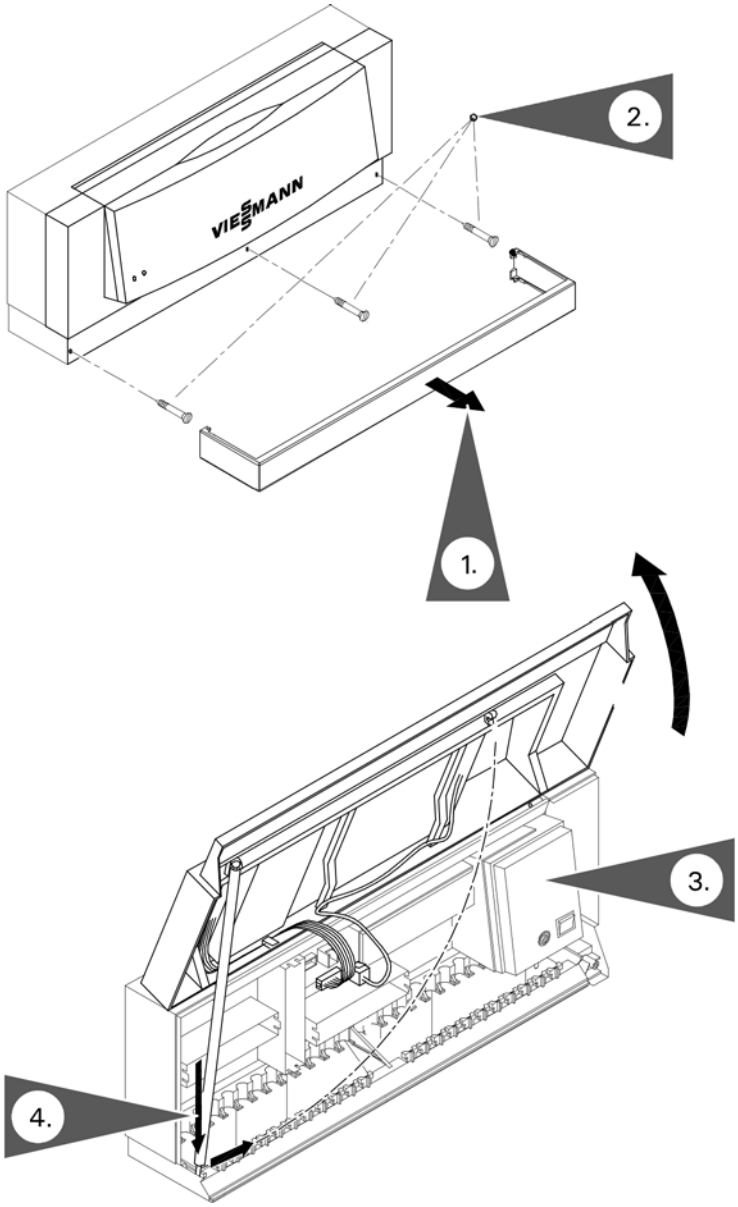
5. Engage the stay bar in the front housing.

6. Close the front of the housing.

7. Secure front housing with supplied screws.

8. Install control cosmetic cover.

Opening the Control Unit (CM2 only)



1. Remove the control cosmetic cover .
2. Unscrew the screws from the front housing.
3. Swing up the front part of the control housing.
4. Position the stay bar so that it supports the front housing.

Procedure (overview)

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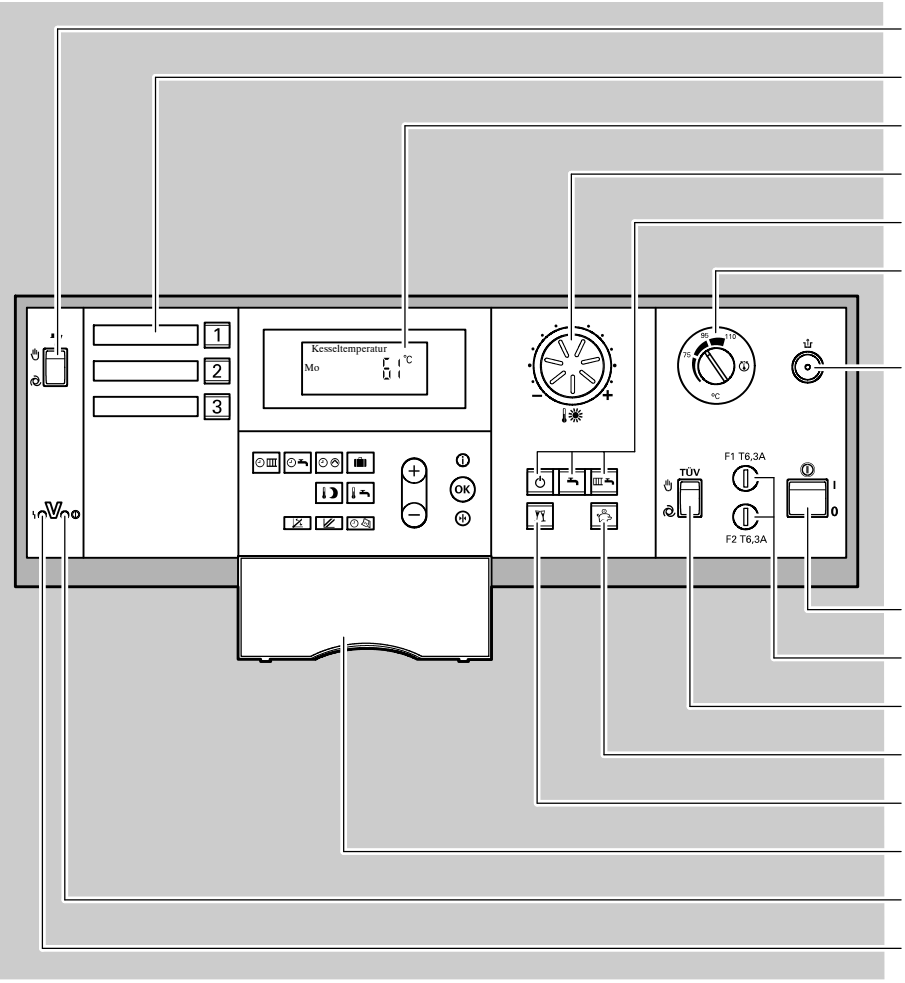
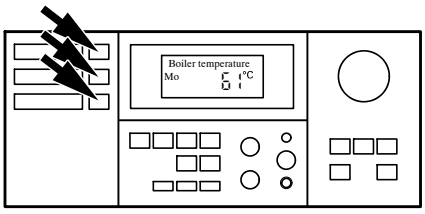
Steps

1. Controls and indicators



2. Check assignment of heating circuits



Check that the stickers for the assignment of the heating circuits are affixed in the appropriate locations on the control unit.
The corresponding button must be pressed before commencing each setting.

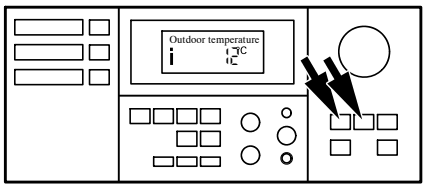
Steps *(continued)*

3. Check the fixed high limit

*The check is made via the "*TÜV *TEST" button (see page 64).*

When making the check, the " TÜV **TEST**" button must be kept continuously pressed.
A minimum supply is required during the check.
The minimum amount of recirculated water should be 10% of the amount recirculated at the rated load.
The amount of heat consumed should be reduced as far as possible.
The adjustable high limit "⏱" is bridged. The burner is switched on until the boiler water temperature reaches the safety temperature and the fixed high limit operates.
When the burner is switched off by the fixed high limit, release the "TÜV **TEST**" button, wait until the boiler water temperature has fallen 15 to 20°C / 27 to 36°F below the selected safety temperature and then reset the fixed high limit by pressing the "⇧" button.

4. Select the language (if required)



1. Press ⓘ.

2. Select the required language with ⊖.

3. Confirm with OK.

→ *The outdoor temperature or the participant number is displayed.*

Steps *(continued)*

5. Integrate the control unit in the LON BUS system in conjunction with Vitotronic 200-H

The LON communication module (accessory) must be inserted (see page 96).

Set the LON participant number

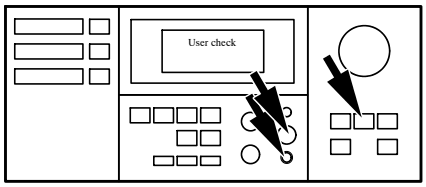
Set the LON participant number via coding address "77" in coding 1 (factory setting: "77: 1").

→ *See page 114 for coding 1.*

Please note:
*The same number must **not** be assigned twice within a LON BUS system.*

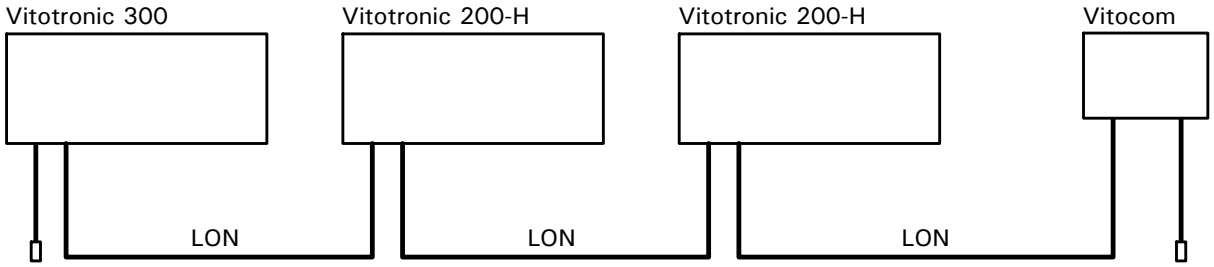
Update the LON participant list

This is only possible when all participants are connected and the control unit is coded as the fault manager (coding "79: 1").



1. Press ↩ and OK simultaneously for approx. 2 seconds.
   → *The participant check is initiated.*
2. Press ⏎.
   → *The participant list is updated after approx. 2 minutes. The participant check is terminated.*

Example of single-boiler system with Vitotronic 200-H heating circuit controls and Vitocom 300 connected downstream

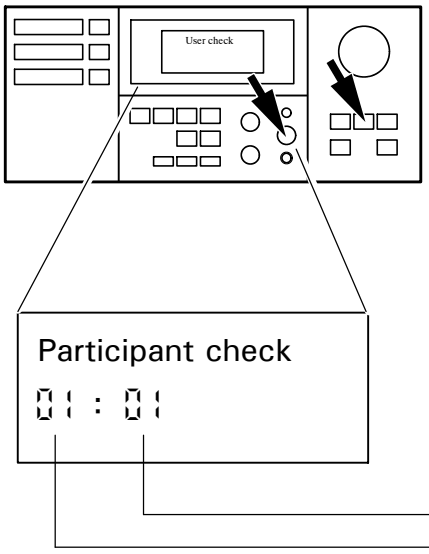


Participant No. 1 Coding "77: 1"	Participant No. 10 Coding "77: 10"	Participant No. 11 Coding "77: 11"	Participant No. 99
Control unit is fault manager Coding "79: 1"	Control unit is not fault manager Coding "79: 0"	Control unit is not fault manager Coding "79: 0"	Unit is fault manager
Transmit time via LON Set coding "7b: 1"	Time is received via LON Set coding "81: 3"	Time is received via LON Set coding "81: 3"	Time is received via LON
Transmit outdoor temperature via LON Coding "97: 2"	Outdoor temperature is received via LON Set coding "97: 1"	Outdoor temperature is received via LON Set coding "97: 1"	
Viessmann system number Coding "98: 1"	Viessmann system number Coding "98: 1"	Viessmann system number Coding "98: 1"	
Fault monitoring LON-Participant Coding "9C: 20"	Fault monitoring LON-Participant Coding "9C: 20"	Fault monitoring LON-Participant Coding "9C: 20"	

Steps *(continued)*

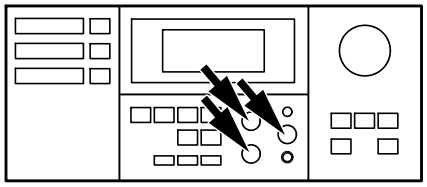
6. Carry out participant check

The participant check is used to verify the communication of the system units connected to the fault manager.
Requirements:
- *The control unit must be coded as the fault manager (coding "79: 1")*
- *The LON participant number must be coded in all control units*
- *The participant list must be updated in the fault manager*



1. Press ↩ and (OK) simultaneously for approx. 2 seconds.

→ *The participant check is initiated.*



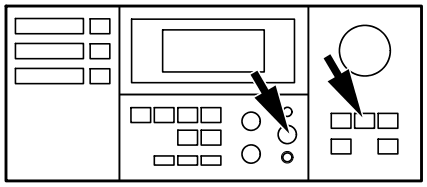
2. Select the required participant with ⊕ or ⊖.

3. Activate the check with (OK).
If communication between the two units is verified, **"Check OK"** appears in the display.
If communication is not verified, **"Check not OK"** appears.

→ ***"Check"*** *flashes until the check is completed.*
The display of the selected participant flashes for approx. 60 seconds.

→ *Check the LON connection.*

4. To check further participants, follow the steps described in points 2 and 3.



5. Press ↩ and (OK) simultaneously for approx. 2 seconds.

→ *The participant check is terminated.*

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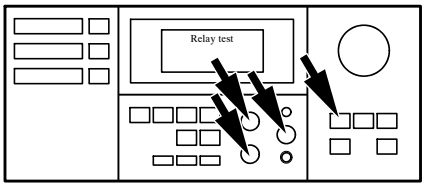
Steps *(continued)*

7. Match the control unit to the system type

Set the following coding addresses in Coding 2:
"00" System type
"02" Burner type
"03" Oil or gas-fired operation
"0C" Return temperature raising
"4C" Plug 20 function
"4d" Plug 29 function
"4E" Plug 52 function

→*See page 116 for coding 2.*

8. Check outputs (actuators) and sensors



Carry out relay test

1. Press ⏻ and OK simultaneously for approx. 2 seconds.
→*Relay test is activated.*

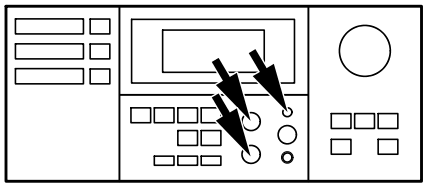
2. Select relay outputs with the ⊕ or ⊖ button.

3. Press OK.
→*Relay test is terminated.*

The following relay outputs can be selected depending on the system equipment installed:

- Burner stage 1 ON
- Burner stage 1 + 2 ON
- Burner modulation open
- Burner modulation neutral → *LED selector button* 1 *illuminated.*
- Burner modulation closed → *LED selector button* 1 *illuminated.*
- Output 20 ON → *LED selector button* 1 *illuminated.*
- Output 29 ON
- Output 52 open/closed/neutral
- DHW tank pump ON → *LED selector button* 2 *illuminated.*
- DHW circulation pump ON → *LED selector button* 3 *illuminated.*
- Heating circuit pump (M2) ON → *LED selector button* 2 *illuminated.*
- Heating circuit pump (M3) ON → *LED selector button* 2 *illuminated.*
- Mixing valve (M2) Open → *LED selector button* 3 *illuminated.*
- Mixing valve (M2) Closed → *LED selector button* 3 *illuminated.*
- Mixing valve (M3) Open → *All LEDs extinguished.*
- Mixing valve (M3) Closed
- Central fault indicator ON

Steps *(continued)*



Check sensors

1. Press ⓘ. → *Scanning of operating status information is activated (see page 77).*

2. Scan actual temperatures with ⊕ or ⊖.

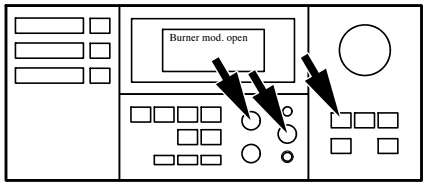
3. Press ⓘ. → *Scanning is terminated.*

9. Match the coding addresses

Match control unit to modulating burner

Please note:
The burner must be adjusted. In order to achieve a wide modulation range, the minimum output should be set as low as possible (take chimney/flue system into account).

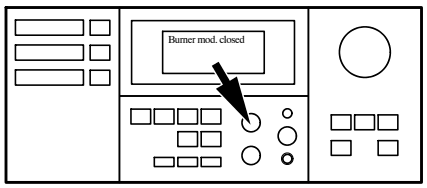
1. Start up the burner.



2. Press ⏻ and OK simultaneously for approx. 2 seconds. → *The relay test is activated.*

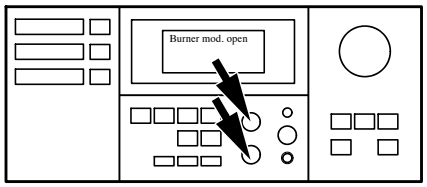
3. With ⊕ function
Activate "Burner mod. open" and wait until the actuating drive of the burner is at maximum output.

4. Establish the maximum burner out-put through the fuel consumption. → *Make a note of the value.*



5. With ⊕ function → *Make a note of the value.*
Activate "Burner mod. closed" and measure the time it takes for the actuating drive of the burner to reach the minimum output.

6. Establish the minimum burner output (basic output) through the fuel consumption. → *Make a note of the value.*



7. With ⊖ function
Activate "Burner mod. open" and stop the actuating drive by pressing ⊕ after one-third of the time measured in point 5.

8. Establish the partial output through the fuel consumption. → *Make a note of the value.*

9. Press OK. → *The relay test is terminated.*

Steps *(continued)*

9. Match the coding addresses *(continued)*

10. Set the established values in coding →*See page 114 for coding 1.* Level 1.

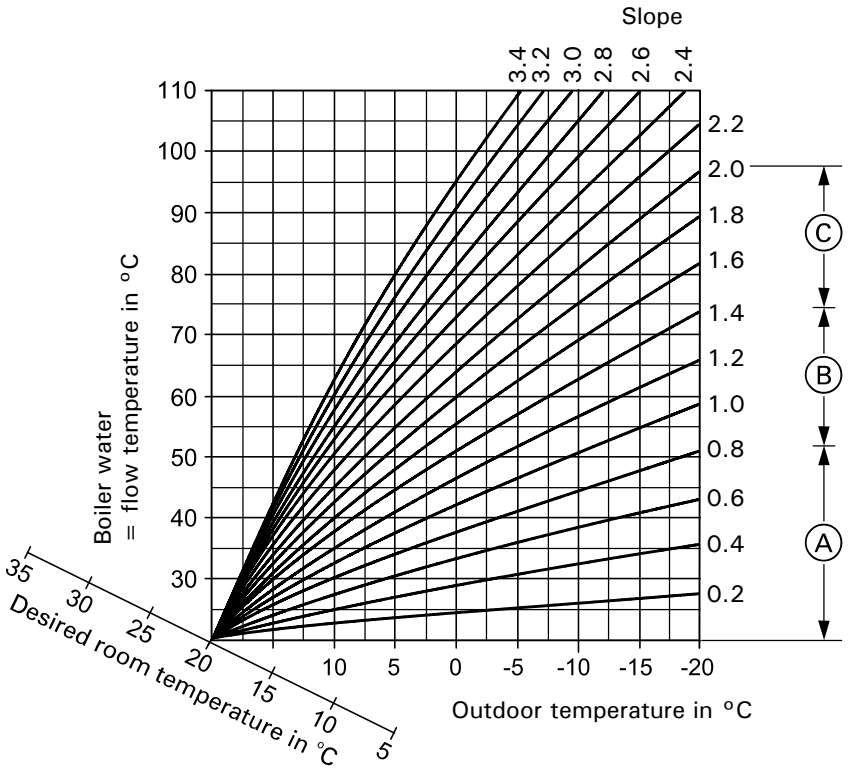
Address	Setting of
05	the partial output (see point 8) as a percentage proportion of the max. output; e.g. partial output: 170 kW max. output: 210 kW $\frac{170\ kW}{210\ kW} \times 100\ \% = 81\ \%$
08	units and tens digits of the maximum output established in point 4: e.g. max. output: 210 kW – here set: 10
09	hundreds digit of the maximum output established in point 4: e.g. max. output: 210 kW – here set: 2
0A	the basic output (see point 6) as a percentage proportion of the max. output; e.g. basic output: 70 kW max. output: 210 kW $\frac{70\ kW}{210\ kW} \times 100\ \% = 33\ \%$
15	the operating time in seconds established in point 5

Please note:
You will find details of other possible settings in the sections entitled "Coding 1" and "Coding 2" (see page 114 and 116).

Steps *(continued)*

10. Adjust the heating curves

The heating curves represent the relationship between the outdoor temperature and the boiler water or supply temperature. Put simply: The lower the outdoor temperature, the higher the boiler water temperature. In turn, the room temperature is dependent on the boiler water temperature.

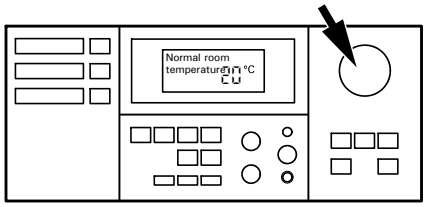


The slope of the heating curve is normally within the range marked
- Ⓐ *for underfloor heating systems*
- Ⓑ *for modulating heating systems*
- Ⓒ *for heating systems with boiler water temperatures over 75°C.*

Factory settings:
- *Slope "⧄" = 1.4*
- *Shift "⧅" = 0*

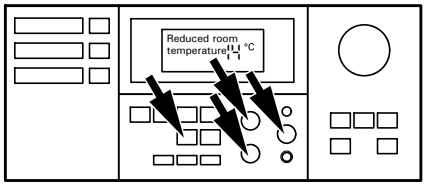
See conversion chart on the back of the manual for °F.

1. Set the desired room temperature → *Desired room temperatures can be set separately for each heating circuit.*



- Normal room temperature
  Set the desired day temperature with the set-point selector.

→ *The value is automatically accepted after approx. 2 seconds.*



- Reduced room temperature
  Press 🌙 to call up the desired night temperature; adjust the desired night temperature with the ⊕ or ⊖ button.

  Press OK to confirm the selected value.

→ *The display changes and shows the boiler water temperature.*

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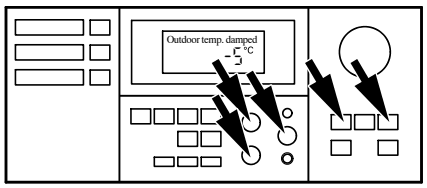
Overview of service levels

Function	Button combination	To exit	Page
Temperatures, boiler coding cards and scans	Press ⏻ and 🚿 simultaneously for approx. 2 seconds	Press “OK”	73
Relay test	Press ⏻ and “OK” simultaneously for approx. 2 seconds	Press “OK”	68
Participant check (in conjunction with LON)	Press 🚿 and “OK” simultaneously for approx. 2 seconds	Press 🚿 and “OK” simultaneously for approx. 1 second	66
Operating status information	Press ⓘ	Press ⓘ	77
Service scan	ⓘ (if **”Service”** flashing)	Press “OK”	74
Adjustment of display contrast	Press “OK” and “+” or “OK” and “-” simultaneously	Display darkens	––
		Display brightens	––

Temperatures, boiler coding cards and scans



1. Press ⏻ and 🛁 simultaneously for approx. 2 seconds. → *Access diagnosis level.*

2. Select the required data for scanning with the ⊕ or ⊖ button.

3. Press OK. → *Exit diagnosis level.*

The following values can be scanned depending on the system equipment installed:

- Damped outdoor temp.
- Current outdoor temp.

→ *The damped outdoor temperature can be reset to the current outdoor temperature by pressing ✱.*

- Output reduction %
- Desired boiler temp.
- Current boiler temp.

- Sensor 17A, current value → *Only displayed if sensor connected.*
- Sensor 17B, current value → *Only displayed if sensor connected.*

- Max. flue gas temp.
- Current flue gas temp.

→ *Only displayed if flue gas temperature sensor connected. The max. flue gas temperature can be reset to the current value by pressing ✱.*

- Desired DHW temp.
- Current DHW temp.

→ *Only displayed if DHW tank temperature sensor connected.*

- Current DHW temp. 1
- Current DHW temp. 2

→ *Only displayed if two DHW tank temperature sensors are connected.*

- Desired supply temp.
- Current supply temp.

→ *Only displayed if supply temperature sensor connected.*

- Desired room temp.
- Current room temp.

→ *Only displayed if remote control connected.*

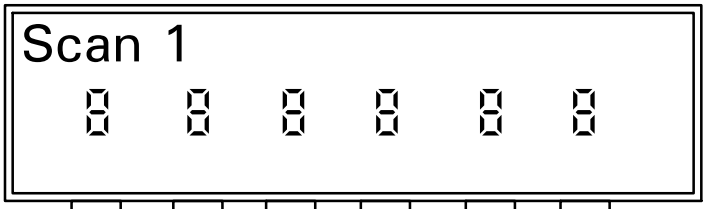
- Boiler coding card → *See overview of boiler coding cards on page 94.*

- Scan 1
- Scan 2
- Scan 3
- Scan 4
- Scan 5 → *Only in conjunction with LON communication module*
- Scan 6 → *Only in conjunction with LON communication module*
- Scan 7

→ *See page 74 for scans 1 to 7.*

Temperatures, boiler coding cards and scans *(continued)*

Scan 1



Free

Free

KM BUS participant

0 No participant connected

1 to F Number of participants (e.g. remote control)

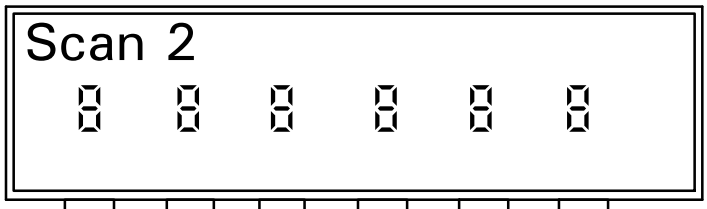
	Burner type	Coding
0	Single-stage	02: 0
1	2-stage	02: 1
2	Modulating	02: 2

System type

		System circuit A1	Mixing valve circuit M2	Mixing valve circuit M3	DHW tank	Coding
0	1	Yes				00: 1
0	2	Yes			Yes	00: 2
0	3		Yes			00: 3
0	4		Yes		Yes	00: 4
0	5	Yes	Yes			00: 5
0	6	Yes	Yes		Yes	00: 6
0	7		Yes	Yes		00: 7
0	8		Yes	Yes	Yes	00: 8
0	9	Yes	Yes	Yes		00: 9
1	0	Yes	Yes	Yes	Yes	00: 10

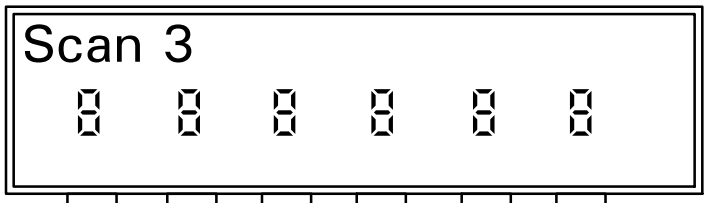
Temperatures, boiler coding cards and scans *(continued)*

Scan 2



- 0 to F — **Software version**
  Plug-in adaptor for external safety equipment
- 0 to F — **Software version**
  Extension kit for mixing valve circuit M3
- **Free**
- 0 to F — **Software version**
  Extension kit for mixing valve circuit M2
- 0 to F — **Software version**
  Programming unit of control unit
- 0 to F — **Software version**
  Control unit

Scan 3



- 0 to F — **Software version**
  Remote control for mixing valve circuit M3
- **Operating mode of mixing valve circuit M3** — **Coding**

0	Without remote control	A0: 0
1	With Vitotrol 200 remote control	A0: 1
2	With Vitotrol 300 remote control	A0: 2

- 0 to F — **Software version**
  Remote control for mixing valve circuit M2
- **Operating mode of mixing valve circuit M2** — **Coding**

0	Without remote control	A0: 0
1	With Vitotrol 200 remote control	A0: 1
2	With Vitotrol 300 remote control	A0: 2

- 0 to F — **Software version**
  Remote control for system circuit A1
- **Operating mode of system circuit A1** — **Coding**

0	Without remote control	A0: 0
1	With Vitotrol 200 remote control	A0: 1
2	With Vitotrol 300 remote control	A0: 2

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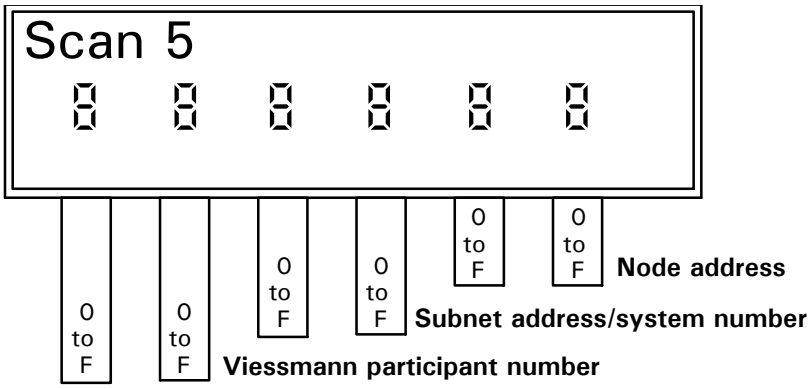
Temperatures, boiler coding cards and scans *(continued)*

Scan 4

Scan 4 is not assigned.

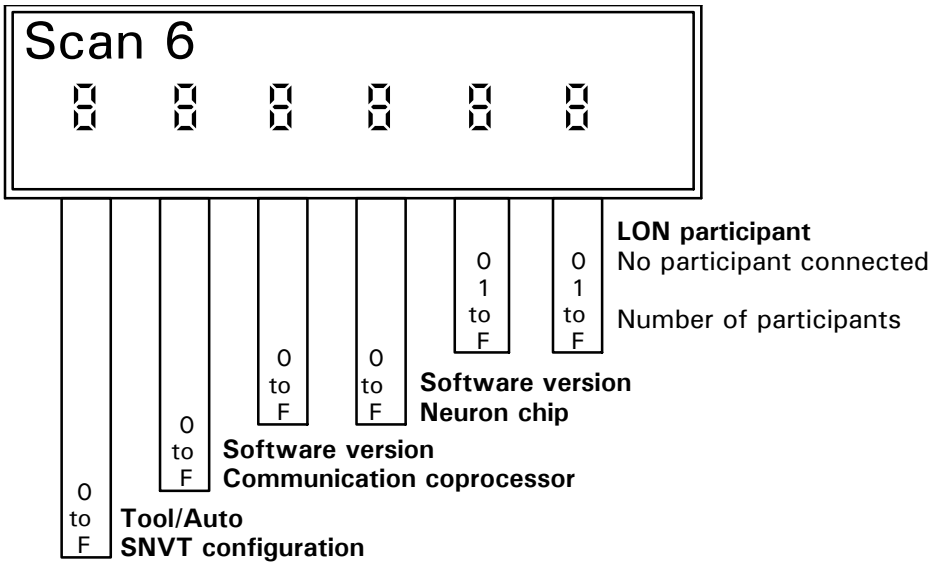
Scan 5

only in conjunction with LON communication module

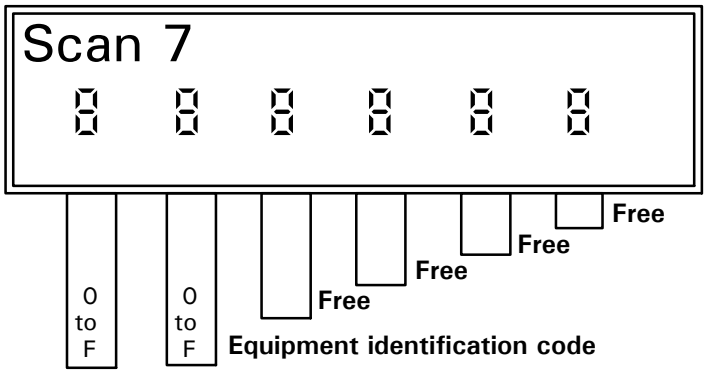


Scan 6

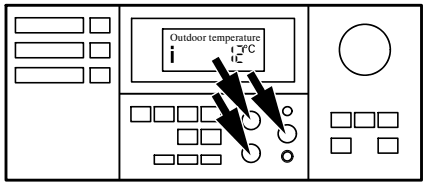
only in conjunction with LON communication module



Scan 7



Scanning operating status information



1. Press ⓘ. → *Operating status scanning mode is activated.*

2. Select the required operating status data for scanning with the ⊕ or ⊖ button.

3. Press ⓘ. → *Exit the operating status scanning mode.*

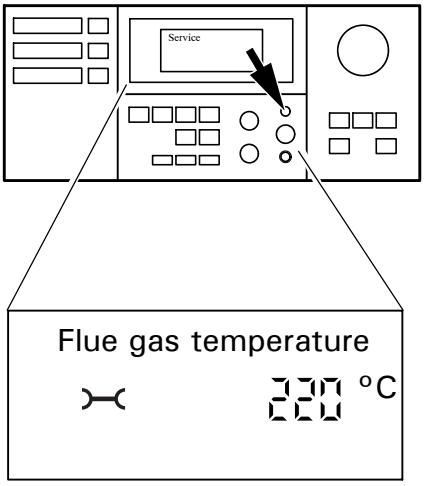
The following operating status information can be scanned depending on the system equipment installed:

- Participant number → *Only displayed when LON communication module is installed.*
- Holiday program with date of departure and return → *If holiday program has been entered.*
- Holiday program active → *When the holiday program is activated.*
- Outdoor temperature
- Boiler temperature
- Flue gas temperature → *Only displayed if flue gas temperature sensor is connected.*
- Sensor 17A → *Only displayed if sensor is connected.*
- Sensor 17B
- DHW temperature → *Only displayed if DHW tank temperature sensor is connected.*
- DHW temperature 1 → *Only displayed if two DHW tank temperature sensors are connected.*
- DHW temperature 2
- Supply temperature → *Only displayed in conjunction with mixing valve circuits.*
- Burner hours run
  - 1st stage burner
  - 2nd stage burner
- Number of burner starts → *Reset hours runs, number of burner starts and fuel consumption after carrying out maintenance. By pressing ⧓, the values can be individually reset to zero.*
- Fuel consumption → *Only displayed if selected via coding addresses "26" or "29".*
- Time
- Date
- 1st stage burner ON/OFF
- 2nd stage burner ON/OFF
- Output 20 ON/OFF
- Output 29 ON/OFF
- Output 52 Open/Closed → *Position stated in %.*
- DHW tank pump ON/OFF
- DHW pump ON/OFF
- Heating circuit pump ON/OFF
- Mixing valve Open/Closed → *Position stated in %.*
- Different languages → *Press OK to select the respective language as the permanent language for all displays.*

Scanning and resetting the "Service" display

When the limit values selected via coding addresses "1F", "21" and "23" (see page 120) are reached, the "Service" display flashes on the programming unit.

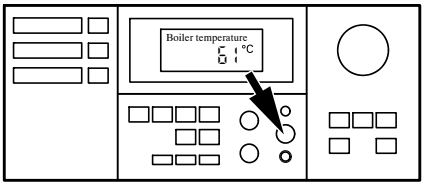
Please note:
If a service is carried out before "Service" is displayed, set the coding address "24: 1" and then coding address "24: 0".



Press ⓘ.
→ *Service scan is activated.*

Scan the service messages with the ⊕ or ⊖ button.

Press OK and confirm the display "Acknowledge: Yes" by pressing OK.
→ *The "Service" display is extinguished.*
Please note:
An acknowledged service message can be displayed again by pressing OK (for approx. 3 seconds).



Press OK.
→ *Service scan is terminated.*

After carrying out maintenance, reset coding "24: 1" (see page 120) to "24: 0".
→ *If coding address "24" is not reset, the "Service" display will re-appear at 07:00 hrs on Monday.*

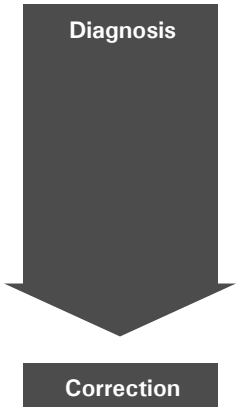
If necessary: After carrying out maintenance
- Press ⓘ.
- Reset burner hours run, number of burner starts and fuel consumption.
- Press ⓘ.

→ *See "Scanning operating status information" on page 77.*

If necessary: After carrying out maintenance
- Press ⏻ and 🧹 simultaneously for approx. 4 seconds.
- Reset "Max. flue gas temp." to the current value by pressing ✳.
- Press OK.

→ *See "Temperatures, boiler coding cards and scans" on page 74.*

Troubleshooting steps



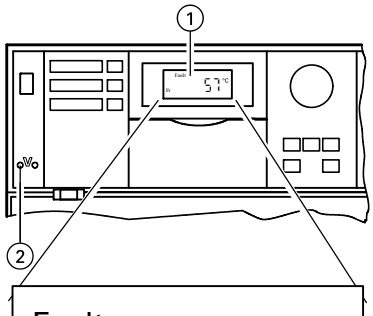
1. **Establish fault message or ascertain behaviour of system**
2. **Look for the corresponding cause of the fault in the diagnosis tables**

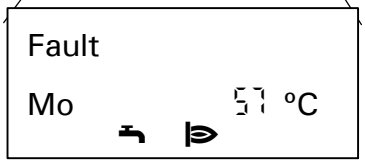
   Please note:
   Retrieve fault codes from the fault memory
3. **Establish the action required in the table**

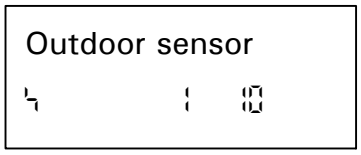
4. **Correct the fault**

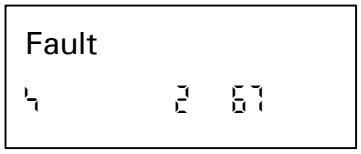
Diagnosis

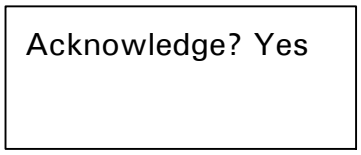
Faults with fault display on the programming unit

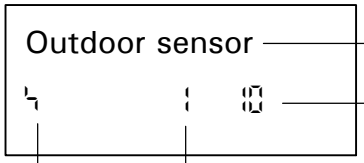












When a fault message is transmitted, --Fault-- flashes in the display ① of the programming unit.

→ *The meaning of the fault code is explained in the table on page 81 onwards.*

Search fault

1. Press ⓘ.

2. Other fault codes which may be stored can be called up by pressing the ⊕ or ⊖ button.

→ *The fault can be acknowledged by pressing OK. The fault message in the display ① is blanked out; the red fault indicator ② continues to flash.*
The central fault indicator connected to plug 50 is switched off. If an acknowledged fault is not rectified by 07:00 hrs on the following day, the fault message will re-appear in the display.

Structure of fault display

Fault display
("Plain language" or "Fault")
Fault code
(meaning: see page 70)
Fault number
(1 to 0)
Fault symbol

Faults displayed in plain language

- Burner
- Fixed high limit
- Safety circuit, potential free
- Ext. fault
- Outdoor sensor
- Supply sensor
- Boiler sensor
- DHW tank temperature sensor 1 (or 2)
- Sensor 17A
- Sensor 17B
- Room sensor
- Flue gas sensor
- Participant fault

→ *C1, C8, C9, CA, Cb*
Meaning: see table on page 84.

→ *Only displayed if a second DHW tank temperature sensor is connected.*

→ *Only displayed if the control unit is coded as the fault manager.*

To retrieve an acknowledged fault message

Press OK for approx. 3 seconds; select the acknowledged fault by pressing the ⊕ or ⊖ button.
The fault is then displayed

Please note:
The red fault indicator ② flashes whenever there is a fault.

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
0F	Controlled operation	Service required "0F" is only displayed in the fault history	Carry out maintenance ***Please note:*** *After carrying out maintenance, set coding "24: 0".*
10	Operates on basis of 0°C outdoor temperature	Short circuit Outdoor temperature sensor	Check outdoor temperature sensor (see page 99)
18	Operates on basis of 0°C outdoor temperature	Open circuit Outdoor temperature sensor	Check outdoor temperature sensor (see page 99)
20	Burner is switched on and off by the adjustable high limit	Short circuit Boiler temperature sensor	Check boiler temperature sensor (see page 101)
28	Burner is switched on and off by the adjustable high limit	Open circuit Boiler temperature sensor	Check boiler temperature sensor (see page 101)
40	Mixing valve is closed	Short circuit Supply temperature sensor of mixing valve circuit M2	Check supply temperature sensor (see page 28)
44	Mixing valve is closed	Short circuit Supply temperature sensor of mixing valve circuit M3	Check supply temperature sensor (see page 86)
48	Mixing valve is closed	Open circuit Supply temperature sensor of mixing valve circuit M2	Check supply temperature sensor (see page 86)
4F	Mixing valve is closed	Open circuit Supply temperature sensor of mixing valve circuit M3	Check supply temperature sensor (see page 86)
60	DHW tank heating pump ON: Desired boiler temperature = desired DHW tank temperature, priority controls are cancelled. In conjunction with DHW tank heating system: DHW tank heating is switched on and off by DHW tank temperature sensor 2.	Short circuit DHW tank temperature sensor 1	Check DHW tank temperature sensor (see page 101)
61	In conjunction with DHW tank loading system: DHW tank heating is switched on and off by DHW tank temperature sensor 1.	Short circuit DHW tank temperature sensor 2	Check DHW tank temperature sensor (see page 101)
68	DHW tank loading pump ON: Desired boiler temperature = desired DHW tank temperature, priority controls are cancelled. In conjunction with DHW tank loading system: DHW tank heating is switched on and off by DHW tank temperature sensor 2.	Open circuit DHW tank temperature sensor 1	Check DHW tank temperature sensor (see page 101)
69	In conjunction with DHW tank loading system: DHW tank heating is switched on and off by DHW tank temperature sensor 1.	Open circuit DHW tank temperature sensor 2	Check DHW tank temperature sensor (see page 101)

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
60	■ Boiler with maximum temperature ■ No output reduction ■ Return control open	Short circuit Temperature sensor 17 A	Check temperature sensor (see page 102)
68	■ Boiler with maximum temperature ■ No output reduction ■ Return control open	Open circuit Temperature sensor 17 A	Check temperature sensor (see page 102)
70	Shunt pump ON continuously	Short circuit Temperature sensor 17 B	Check temperature sensor (see page 102)
	In conjunction with DHW tank loading system: Mixing valve of primary circuit closed. No domestic hot water heating		
78	Shunt pump ON continuously	Open circuit Temperature sensor 17 B	Check temperature sensor (see page 102)
	In conjunction with DHW tank loading system: Mixing valve of primary circuit closed. No domestic hot water heating		
92	Controlled operation Only the solar control fault codes are displayed	Short circuit Collector temperature sensor S1 on the Vitosolic	Check sensor on the solar control
93	Controlled operation Only the solar control fault codes are displayed	Short circuit Temperature sensor S3 on the Vitosolic	Check sensor on the solar control
94	Controlled operation Only the solar control fault codes are displayed	Short circuit Collector temperature sensor S2 on the Vitosolic	Check sensor on the solar control
98	Controlled operation Only the solar control fault codes are displayed	Open circuit Collector temperature sensor S1 on the Vitosolic	Check sensor on the solar control
99	Controlled operation Only the solar control fault codes are displayed	Open circuit Temperature sensor S3 on the Vitosolic	Check sensor on the solar control
9F	Controlled operation Only the solar control fault codes are displayed	Open circuit DHW tank temperature sensor S2 on the Vitosolic	Check sensor on the solar control
9E	Controlled operation Only the solar control fault codes are displayed	Fault on solar control message will display if no fault code is assigned to the fault	Check the solar control

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
00	Controlled operation	Therm-Control configuration fault: plug 17 A of Therm-Control temperature sensor not inserted	Insert plug 17 A On Vitocrossal: Check that coding "0d: 0" is set.
06	Controlled operation, DHW tank may be cold	DHW tank loading system configuration fault: coding "55: 3" is set, but plug 17 B is not inserted and/ or coding "4C: 1" and "4E: 1" not set	Insert plug 17 B and check codings
0F	Controlled operation	Return temperature raising configuration fault: coding "0C: 1" is set, but plug 17 A is not inserted and/or coding "4E: 0" is not set	Insert plug 17 A and check codings
50	Controlled operation	Short circuit Flue gas temperature sensor	Check flue gas temperature sensor (see page 29)
51	Controlled operation	Communication fault Programming unit	Check connections, if necessary replace programming unit
54	Emissions test mode	Internal fault	Check electronics board
55	Controlled operation	Internal fault	Check electronics board
56	Operation at constant temperature	Invalid hardware code	Check the control software circuit board and confirm the coding address: - Enter coding 2 (see page 125 for instructions). - Change code 8A to 176. - Confirm coding 92:165
57	Boiler controlled on basis of adjustable high limit	Internal fault Boiler coding card	Insert boiler coding card or replace if defective (see page 22)
60	Controlled operation	Open circuit Flue gas temperature sensor	Check flue gas temperature sensor (see page 104)
69	Mixing valve continues in control mode	Communication fault Circuit board for mixing valve extension	Check circuit board
6F	Controlled operation without remote control	Communication fault Vitotrol remote control, system circuit A1	Check connections, cable and coding address "A0" (see Coding 2 page 127)
6d	Controlled operation without remote control	Communication fault Vitotrol remote control, mixing valve circuit M2	Check connections, cable and coding address "A0" see Coding 2 page 127
6E	Controlled operation without remote control	Communication fault Vitotrol remote control, mixing valve circuit M3	Check connections, cable and coding address "A0" see Coding 2 page 127
6F	Controlled operation	Incorrect LON communication module	Replace communication module

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

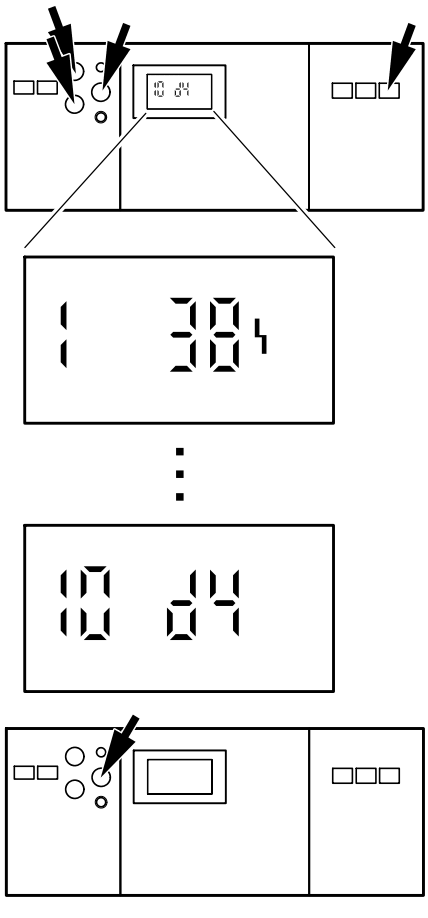
Fault code in display	Behaviour of system	Cause of fault	Action
F 1	Boiler cools down	External safety equipment	■ Check connection of plug 150 ■ Check external safety equipment (see page 40)
F2	Controlled operation	Open circuit KM-BUS to solar control	Check KM-BUS connection and solar control. Without solar control, set coding address "54: 0"
F4	Controlled operation	Fault Input module 0-10V	Check all connections, cables etc. Replace function expansion module; without expansion module set coding address "9d: 0"
F8	Boiler cools down	Fault Low water indicator	Check water level of system, reset low water indicator
F9	Boiler cools down	Fault Maximum pressure limiter	Check system pressure, reset maximum pressure limiter
FA	Boiler cools down	Fault Minimum pressure limiter or maximum pressure limiter 2	Check system pressure, reset minimum or maximum pressure limiter
Fb	Boiler cools down	Fault Additional fixed high limit	Check system pressure, reset fixed high limit, reset flue gas damper
Fd	Controlled operation	Communication fault Vitocom 300	Check connections and Vitocom 300
FE	Controlled operation	Communication fault Plug-in adaptor for external safety equipment	Check plug-in adaptor for external safety equipment
FF	Controlled operation	Fault LON communication module	Replace communication module
d1	Boiler cools down	Burner fault	Check burner
d4	Boiler cools down	Fixed high limit has operated	Check fixed high limit
d6	Controlled operation	Fault at DE1 in the plug-in adaptor for external safety equipment	Check connection at inputs DE1 to DE3
d7	Controlled operation	Fault at DE2 in the plug-in adaptor for external safety equipment	
d8	Controlled operation	Fault at DE3 in the plug-in adaptor for external safety equipment	
d9	Controlled operation without influence of room temperature	Short circuit Room temperature sensor, system circuit A1	Check room temperature sensor (see page 112)
db	Controlled operation without influence of room temperature	Short circuit Room temperature sensor, mixing valve circuit M2	Check room temperature sensor (see page 112)

Diagnosis *(continued)*

Faults with fault display on the programming unit *(continued)*

Fault code in display	Behaviour of system	Cause of fault	Action
05	Controlled operation without influence of room temperature	Short circuit Room temperature sensor, mixing valve circuit M3	Check room temperature sensor (see page 112)
06	Controlled operation without influence of room temperature	Open circuit Room temperature sensor, system circuit A1	Check room temperature sensor (see page 112)
07	Controlled operation without influence of room temperature	Open circuit Room temperature sensor, mixing valve circuit M2	Check room temperature sensor (see page 112)
08	Controlled operation without influence of room temperature	Open circuit Room temperature sensor, mixing valve circuit M3	Check room temperature sensor (see page 112)
50	Controlled operation	Open circuit LON communication module	Check connection (see page 96)

Retrieving fault codes from the fault memory (fault history)



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All faults which have occurred are stored and can be retrieved by scanning. The scanning sequence starts with the most recently stored fault code.

1. Press and ⓞⓚ simultaneously for approx. 2 seconds. → *Scanning of fault history is activated.*

2. Access the individual fault codes by pressing the ⊕ or ⊖ button. → *All stored fault codes can be deleted by pressing* .

Sequence of stored fault codes	Fault code
1	Last (most recent) fault code
⋮	⋮
10	Last fault code but nine

3. Press ⓞⓚ. → *Scanning of fault history is terminated.*

Boiler temperature control

Brief description

The boiler water temperature is controlled by switching the burner stages or modulation on and off. The desired boiler water temperature value is determined by the set-point supply temperature value of the boiler circuit (A1), the mixing valve circuits or the heating circuits connected via the LON BUS, through the external request facility and the desired domestic hot water temperature, and is dependent on the boiler and the heating and control facilities installed. In conjunction with Therm-Control: The desired boiler water temperature is increased when the temperature falls below the set-point value on the sensor of the Therm-Control.

When the domestic hot water tank is heated up, a desired boiler water temperature is selected which is 20°C / 36°F higher than the desired DHW tank water temperature (this value can be changed via coding address "60").

Coding addresses which influence the boiler temperature control

02 to 06, 08 to 0b, 13 to 1C
See page 114 onwards for description.

Functions

The boiler water temperature is measured via a multiple sensor well by three sensors separately:
- Fixed high limit FHL (liquid expansion)
- Adjustable high limit AHL (liquid expansion)
- Boiler temperature sensor BTS (change in resistance PT 500)

Upper limits of control range

- Fixed high limit FHL 110°C / 230°F, can be adjusted to 99°C / 210°F
- Adjustable high limit AHL 95°C, can be adjusted to 100°C / 212°F
- Electronic maximum limit
  Setting range: 20 to 127°C / 68 to 261°F
  The maximum limit for the boiler water temperature is defined in coding address "06".

Lower limit of control range

- The control unit regulates the boiler water temperature in normal operation and in the frost protection mode according to the boiler concerned (boiler coding card).

Control sequence

Boiler temperature falls

The burner switch-on signal is set for a boiler water temperature set-point value of –2°C / -4°F, and the burner starts its own monitoring program. Depending on the range of additional control facilities and the method of firing, burner override can be delayed by a few minutes.

Boiler temperature rises

The switch-off point of the burner is defined by the switch-off differential (coding address "13").

Heating circuit control

Brief description

The control unit has control loops for a system circuit and two mixing valve circuits.

The supply temperature set-point value is determined by the outdoor temperature, the desired room temperature, the operating mode and the heating curve.

The supply temperature of the mixing valve circuits is controlled by opening and closing the mixing valves in steps. The mixing valve motor control varies the actuation and interval times as a function of the control difference (control deviation).

The supply temperature of the system circuit corresponds to the boiler water temperature.

Coding addresses which influence the heating circuit control
9F
A2 to A7, A9,
C4 to C7, C8
F1, F2.
See page 114 onwards for description.

Functions

The heating circuit is dependent on the boiler water temperature and its control range limits.
The only control element is the heating circuit pump.
The supply temperature of the mixing valve circuits is measured by the supply temperature sensor (contact sensor).

Time program

The timer of the control unit changes the operating mode at the programmed times in the "Central heating and DHW" heating program, switching between "Central heating with normal room temperature" and "Central heating with reduced room temperature".
Each operating mode has its own set-point value.

Outdoor temperature

A heating curve must be adjusted to match the control unit to the building and the heating system.
The heating curve determines the set-point boiler water temperature value as a function of the outdoor temperature. Control takes place on the basis of the mean outdoor temperature. This is derived from the actual and the damped outdoor temperature.
The heating curve can be changed via the set-point or operating mode selector switches.

Domestic hot water temperature

- With priority control:
  While the DHW tank is being heated, the set-point supply temperature value is set to 0°C / 32°F .
  The heating circuit pump is switched off.
- Without priority control:
  The heating circuit control continues to operate as normal with the set-point value unchanged.
- With modulating priority control (only in conjunction with mixing valve circuit):
  The heating circuit pump remains switched on. The set-point supply temperature of the heating circuit is lowered as long as the set-point boiler water temperature is not reached while the DHW tank is being heated. The set-point supply temperature is dependent on the difference between the set-point and the current boiler water temperature, the outdoor temperature, the heating curve slope and the setting of the coding address "A2".

Room temperature

In conjunction with room temperature dependent control:

Compared with the outdoor temperature, the room temperature has a greater influence on the set-point boiler water temperature. The magnitude of this influence can be changed via coding address "b2".
In conjunction with mixing valve circuit:
With control differences (i.e. deviations from the current value) of over 2°C / 4°F room temperature, this influence can be intensified (via coding address "b6", rapid heating/setback).

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Heating circuit control *(continued)*

Functions *(continued)*

Summer energy saving function (heating circuit pump logic)

If the outdoor temperature is higher than the preset room temperature set-point value, the heating circuit pump is switched off and the set-point supply temperature value is set to 0°C / 32°F.
The switching threshold can be individually selected via coding address "A5".

Extended summer energy saving function

The heating circuit pump can be switched off
- If the outdoor temperature exceeds a value preselected via coding address "A6"
- If the set-point room temperature is reduced via coding address "A9"
- In conjunction with mixing valve circuit:
  If the mixing valve has been closed for longer than 12 minutes (mixing valve energy saving function, coding address "A7")

Slab curing function
(only in conjunction with mixing valve circuit)

Please note:
The slab curing function is selectable on the basis of four different temperature curves. The curves are activated via coding address "F1" (see page 134).

When the slab curing function is activated, the heating circuit pump of the mixing valve circuit is switched on and the supply temperature is controlled according to the selected curve. When the slab curing time (30 days) has expired, the mixing valve circuit is automatically controlled on the basis of the preset parameters.

System dynamics – mixing valve circuit (only in conjunction with mixing valve circuit)

The control behaviour of the mixing valve can be influenced via coding address "C4".

Frost protection

A supply temperature of 15 to 22°C / 59 to 72°F is assured for outdoor temperatures below +1°C / 34°F (two-point control).
For possible changes, see coding address "A3" (variable frost threshold).

Therm-Control

Heating circuit output reduction takes place if the boiler return temperature falls below the setpoint value (value read on the therm-control sensor).
Heating circuit mixing valves modulate closed until the Therm-control sensor is satified.

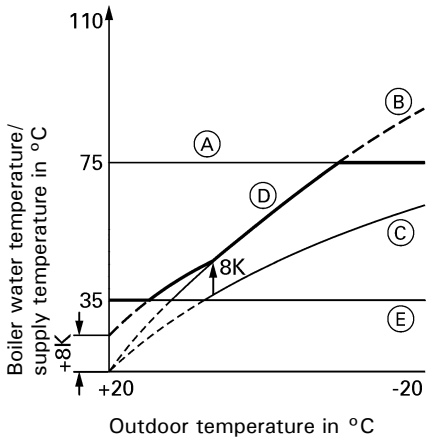
Supply temperature control

Differential temperature:
The differential temperature can be selected via coding address "9F", factory setting: 8°C / 14°F.

The differential temperature is the minimum difference by which the boiler water temperature should exceed the highest currently required supply temperature of the mixing valve circuit.

- System with only one mixing valve circuit:
  The desired boiler water temperature is automatically controlled at 8°C / 14°F above the desired supply temperature value.

- System with heating circuit and mixing valve circuit:
  The desired boiler water temperature is controlled according to its own heating curve. The temperature difference of 8°C / 14°F.
  from the desired supply temperature is preset in the factory.



Ⓐ Max. boiler water temperature
Ⓑ Slope = 1.8 Heating circuit
Ⓒ Slope = 1.2 Mixing valve circuit
Ⓓ Boiler water temperature (with differential temperature = 8°C / 14°F.)
Ⓔ Minimum boiler water temperature

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Heating circuit control *(continued)*

Functions *(continued)*

Upper limit of control range

Electronic maximum limit
Setting range:
1 to 127°C / 34 to 260°F.
Change via coding address "C6".

Please note:
The maximum limit does not replace the limit thermostat required for underfloor heating systems.

Limit thermostat for underfloor heating systems:
The limit thermostat switches the heating circuit pump off when the supply temperature rises above the preset value. In this situation, the supply temperature cools down only slowly, i.e. automatic re-starting can take several hours.

Lower limit of control range

Electronic minimum limit
Setting range:
1 to 127°C / 34 to 261°F.
Change via coding address "C5".

Control sequence

Mixing valve circuit

The mixing valve motor is not activated within the "neutral zone" (±1°C / 2°F).

Supply temperature falls

(Set-point value −1°C / -2°F)
The mixing valve motor receives the signal "Open mixing valve".
The greater the control difference, the longer the duration of the signal and the shorter the duration of the intervals.

Supply temperature rises

(Set-point value +1°C / +2°F):
The mixing valve motor receives the signal "Close mixing valve".
The greater the control difference, the longer the duration of the signal and the shorter the duration of the intervals.

DHW tank temperature control

Brief description

The DHW tank temperature control is a constant value control. It operates on the basis of switching the circulation pump for heating the DHW tank on and off.
The switching differential is ±2.5°C / 4.5°F.

During DHW tank heating, a constant maximum boiler water temperature is set and space heating is switched off (DHW tank priority control optional).

Coding addresses which influence the DHW tank temperature control

55, 56, 58 to 62, 64, 66, 70 to 75, 7F, A2.
See page 114 onwards for description.

Functions

Time program

An automatic or an individual time program can be selected for domestic hot water heating and the DHW circulation pump.
In the automatic program, domestic hot water heating precedes the heat-up phase of the heating circuit by 30 minutes. On systems with several heating circuits, the time program is based on the switching times of the first heating circuit to be heated.
In the individual time program, up to four switching times per day can be set on the timer for domestic hot water heating and the DHW circulation pump. Once started, heating of the DHW tank is always completed regardless of the time program.
The switching times for domestic hot water heating and the DHW circulation pump are effective for all heating circuits. Individual switching times can be assigned to each heating circuit via the coding address "7F".

Frost protection function

If the domestic hot water temperature falls below 10°C / 50°F, the domestic hot water DHW tank is heated to 20°C / 68°F.

Additional function for domestic hot water heating

This function is activated when a second DHW setpoint value is selected via coding address "58" and the 4th activation period for domestic hot water heating is activated.

Desired domestic hot water temperature

The desired domestic hot water temperature can be set in the range of 10 to 60°C / 50 to 140°F. The set-point range can be extended to 95°C / 203°F via coding address "56".
The desired domestic hot water temperature can be set on the programming unit of the control unit and on the Vitotrol 300 remote control (if installed).
The set-point value can be assigned via coding address "66".

DHW circulation pump

The DHW circulation pump supplies hot water to the take-off points at selectable times. Up to four switching times can be set on the timer.

Additional control facilities

The domestic hot water supply can be blocked and released via changeover of the heating program.

System with DHW tank loading system

The functions described above also apply in conjunction with DHW tank loading systems.

Set the following codings:
"4C: 1", "4E: 1", "55: 3".

DHW tank temperature control *(continued)*

Control sequence

DHW tank temperature falls

(Set-point value −2.5 °C / 4.5 °F, selectable via coding address "59")
The desired boiler water temperature is set 20 K higher than the DHW temperature set-point value (selectable via coding address "60").

The circulation pump for heating the DHW tank is switched on immediately (Coding "61: 01").

Boiler temperature-dependent switching of the circulation pump for heating the DHW tank (Coding "61: 00"):
The circulation pump is switched on when the boiler water temperature is 7°C / 13°F higher than the domestic hot water temperature.

- With priority control:
  (Coding "A2: 2")
  The supply temperature set-point value is set to 0 °C / 32°F when the DHW tank is being heated. The mixing valve is closed and the heating circuit pump is switched off.
- Without priority control:
  The heating circuit control continues to operate as normal with the setpoint value unchanged.
- With modulating priority control (only in conjunction with mixing valve circuit):
  The heating circuit pump remains switched on. The desired supply temperature is lowered as long as the desired boiler water temperature is not reached while the DHW tank is being heated. The desired supply temperature is dependent on the difference between the desired and the current boiler water temperature, the outdoor temperature, the heating curve slope and the setting of the coding address "A2".

DHW tank temperature rises

(Set-point value +2.5 / 4.5°F)
The boiler water temperature set-point value is reset to the weather-compensated value.

- When the DHW tank has been heated up, the circulation pump for heating the DHW tank continues to run until:
  the temperature difference between the boiler water and domestic hot water is less than 7°C / 13°F, or
  the desired, weather-compensated boiler water temperature is reached, or
  the desired domestic hot water temperature is exceeded by 5°C / 9 °F.
  The max. run-on time is 15 minutes (selectable via coding address "62").
- Circulation pump for heating the DHW tank without run-on time (Coding "62: 00"):
  The circulation pump is switched off immediately.
- With priority control
  (Coding "A2: 2"):
  The supply temperature set-point value is reset to the weather-compensated value.
  The heating circuit pump is switched on.
- With optimized DHW tank heating
  (Coding "55: 1"):
  Optimized DHW tank heating takes into account the rate at which the temperature increases during domestic hot water heating.
  It also takes into account whether the boiler must supply heat for space heating purposes after heating up the DHW tank or whether the residual heat of the boiler should be transferred to the domestic hot water DHW tank.
  The control unit determines the switch-off time of the burner and the circulation pump accordingly so that the desired domestic hot water temperature is not substantially exceeded after DHW tank heating is completed.

Overview

Technical data

Rated voltage:	120V
Rated frequency:	60 Hz
Rated current:	2 x 6A
Power consumption:	10W
Protection class:	I
Degree of protection:	IP 20 D to EN 60 529, to be guaranteed by mounting/integration
Method of operation:	Type 1B to EN 60 730-1

Ambient temperature

- During operation: 0 to 40°C / 32 to 104°F
  For use in boiler rooms (normal ambient conditions)
- During storage and transport: –20 to 65°C / -4 to 149°F

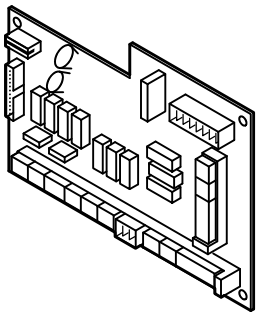
Relay outputs at 120V for

- Heating circuit pumps or control output [20]: 2 FLA, 120 VAC*1
- Circulation pump for heating the DHW tank [21]: 2 FLA, 120 VAC*1
- DHW circulation pump [28]: 2 FLA, 120 VAC*1
- Shunt pump [29]: 2 FLA, 120 VAC*1
- Central fault indicator [50]: 2 FLA, 120 VAC*1
- Mixing valve motor return temperature raising or 3-way valve DHW tank heating system or mixing valve motor [52]: 0.1 FLA, 120 VAC*1
- Burner plug [41]: 4 FLA, 120 VAC
  plug [90]:
  – 2-stage: 0.5 FLA 120 V~
  – modulating: 0.1 FLA 120 V~

*1 *Total max. 6 A 120V*

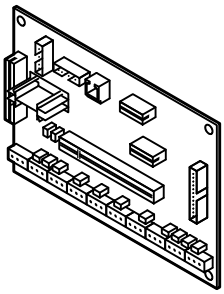
System components

Line voltage motherboard, Part No. 7165 782



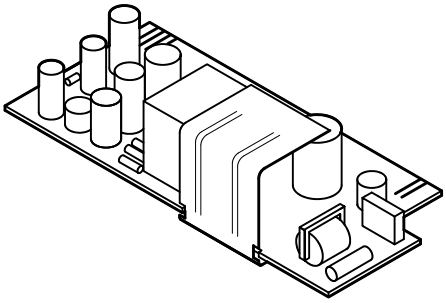
The motherboard contains:
- Relays and outputs for activating the pumps, the control elements and the burner
- Plug-in location for power supply unit board and boiler control section

Low-voltage motherboard, Part No. 7820 290



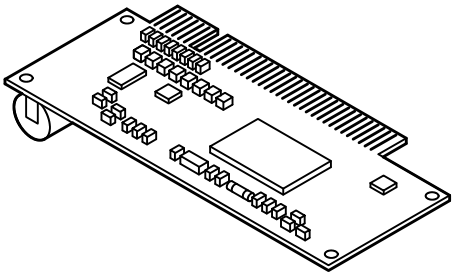
The motherboard contains:
- Plugs for sensors, communication connections and external equipment
- Plug-in locations for electronics board, LON communication module, programming unit, boiler coding card and Optolink board

Power supply unit board, Part No. 7823 991



The power supply unit board contains the low-voltage supply for the entire electronics.

Electronics board, Part No. 7828 193

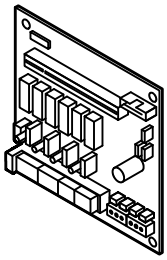


The board contains the microprocessor with the software

When replacing the board:
1. Make a note of codings and settings on the control unit.
2. Replace the board.
3. Set coding "8A: 176" and set coding address "92" (not listed in the overview) to "92: 165".

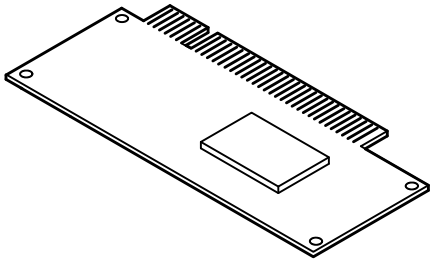
System components *(continued)*

Mixing valve extension board, Part No. 7820 193



The board contains the relays for activating the mixing valve motor and the heating circuit pump of the mixing valve circuits M2 and M3.

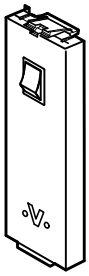
Electronics board, Part No. 7829 790



This is connected to the mixing valve extension board.

All data are processed and the outputs (relays) activated.

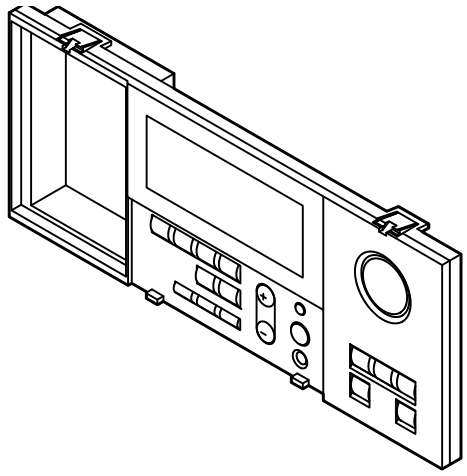
Optolink/emissions test switch board, Part No. 7820 165



The circuit board contains:
- Operating status indicator
- Fault indicator
- Optolink laptop interface
- Emissions test switch

Emissions test switch for flue gas measurements with the boiler operated with constant boiler water temperature for a short time.
- The burner is switched on (this can be delayed if the system incorporates a fuel preheater)
- all pumps are switched on
- the mixing valve remains in its control mode
- the boiler water temperature is controlled by the adjustable high limit "⏱".

Programming unit, Part No. 7823 986



The programming unit is inserted in the control unit.

For setting:
- Heating program
- Set-point values
- Switching times
- Heating curve (shift and slope)
- Date
- Time
- Energy saving and party mode

For displaying:
- Temperatures
- Operating status information
- Faults

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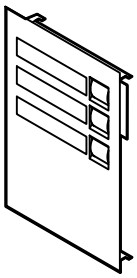
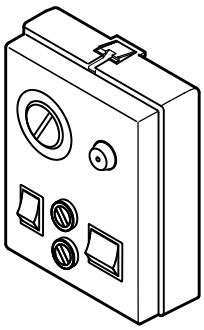
System components *(continued)*

Front panel with heating circuit selector buttons, Part No. 7818 623



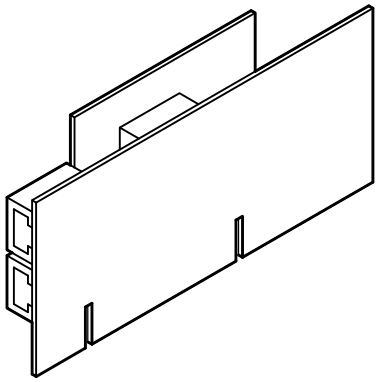
For displaying and selecting the heating circuit.

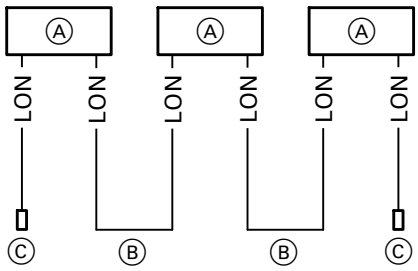
Fuse box, Part No. 7820 172



The fuse box contains:
- Fixed high limit
- Adjustable high limit
- Fuses
- Heating system switch
- TEST button

LON communication module, Part No. 7172 173 — Accessory





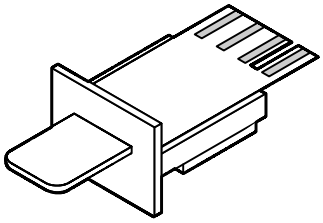
Ⓐ Control unit or Vitocom 300
Ⓑ Connecting cable for data transfer between the control units (accessory)
Ⓒ Terminal resistor, Part No. 7143 497

The communication module is inserted in the control unit. Interruption of communication is indicated.

1 terminal resistor is inserted on each of the first and last control units.

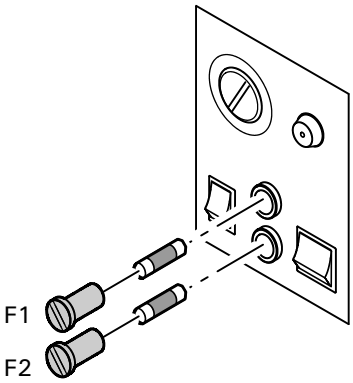
System components *(continued)*

Boiler coding card



Vitotronic 300 in conjunction with	Boiler coding card	Part No.
Vitorond 200	1020	7820 142
Vitocrossal 300, Type CT3	1040	7820 144
Vitocrossal 200, Type CM2	1041	7820 145

Fuses



F1: 6.3 A, 250 V for protecting the control elements, pumps and electronics
Mounting location: see drawing Part No. 7404 365

F2: 6.3 A, 250 V for protecting the burner
Mounting location: see drawing Part No. 7404 365

TEST button, Part No. 7819 314

For checking the fixed high limit.
See description on page 65.

System components *(continued)*

Fixed high limit, Part No. 7820 036

- *The fixed high limit has a factory setting of 110°C/ 230°F.*
- *Electromechanical temperature switch based on the liquid expansion principle with interlock*
- *Intrinsically safe; interlocking also takes place if the capillary tube is leaking or if ambient temperatures are below –10°C / 14°F*
- *Limits the boiler water temperature to the maximum permissible value by cutting out and interlocking*
- *Can be adjusted with the slotted screw Ⓐ at the rear of the unit to 99°C / 210°F (cannot be reset to 110°C / 230°F once adjusted)*
- *Reset unit by pressing the reset button "⇳" on the front of the programming unit if the temperature has fallen approx. 15 K below the shut down temperature*
- *Central fastening M 10, capillary 3600 mm long*
- *Tests:*
  Functional check via TÜV TEST button

Adjustable high limit, Part No. 7817 531

- *The adjustable high limit has a factory setting of 95°C / 203°F*
- *Electromechanical temperature switch based on the liquid expansion principle*
- *Controls the maximum boiler water temperature (e.g. in emissions test mode)*
- *Can be adjusted to 100°C / 212°F by altering the setting of the stop dial or by removing the cams*

IMPORTANT

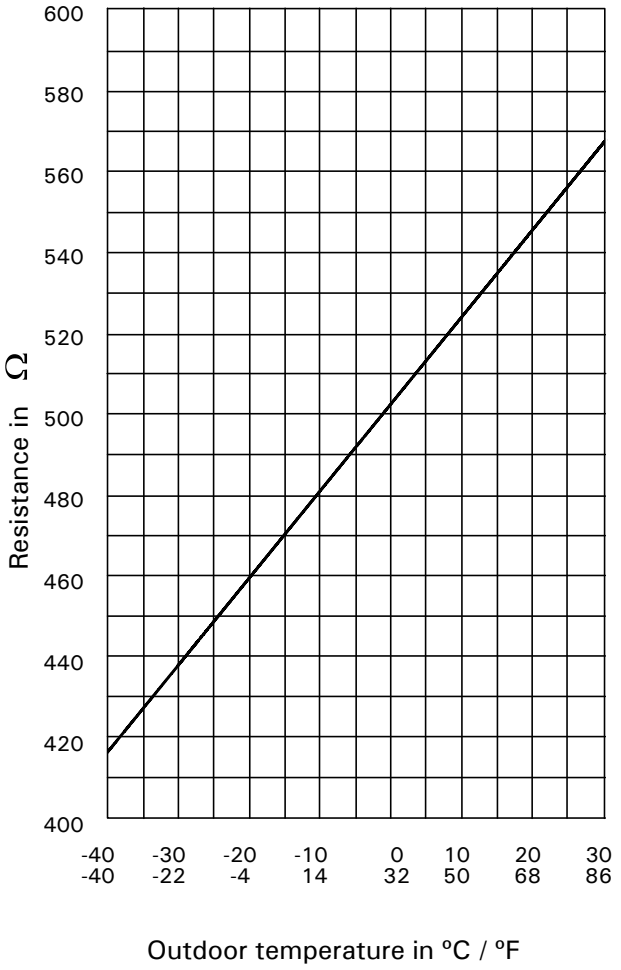
Set the lower limit at least 20°C / 36°F higher than the domestic hot water temperature, the upper limit at least 15°C / 27°F lower than the fixed high limit.

- *Adjusting shaft 6 mm / 0.27 inches, flat topped*
  Adjusting knob pushed onto shaft from front
- *Capillary 3600 mm / 141.7 inches long*
  Sensor 3 mm / 0.1inches thick, 180 mm / 7.1inches long
- *Tests:*
  Functional check via emissions test mode

System components *(continued)*

Outdoor temperature sensor, Part No. 7820 148

Outdoor temperature sensor



Connection

Check sensor

1. Remove plug [1].

2. Check the sensor resistance at terminals 1 and 2 of the plug.

Outdoor temperature in °C / °F	**Resistance in Ω**
–10 / 14	480
0 / 32	500
20 / 68	546

3. Disconnect cores from the sensor, if actual values deviate severely from the curve, repeat the sensor measurement and compare with the actual temperature.

4. Depending on the result, replace cable or outdoor temperature sensor.

5. Scan actual temperature.

Specification

Protection: IP 43

Permissible ambient temperature during operation, storage and transport:

–40 to +70°C
–40 to 158°F

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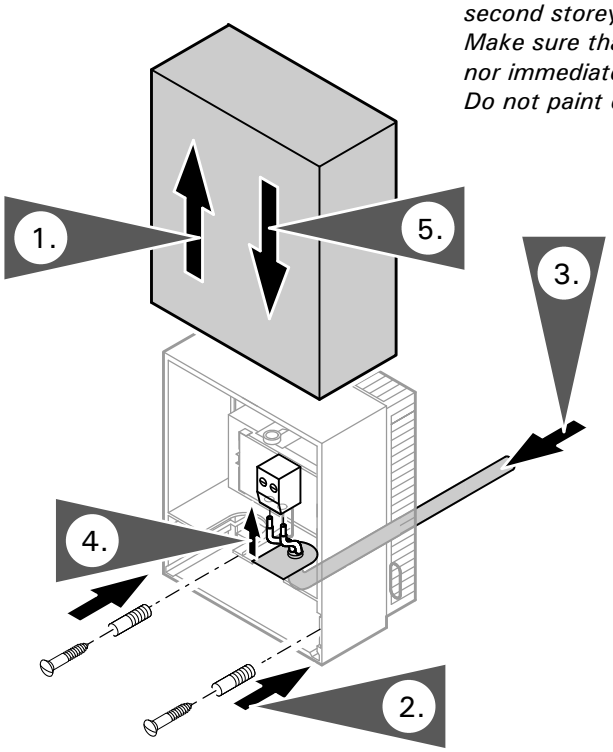
System components *(continued)*

Outdoor temperature sensor

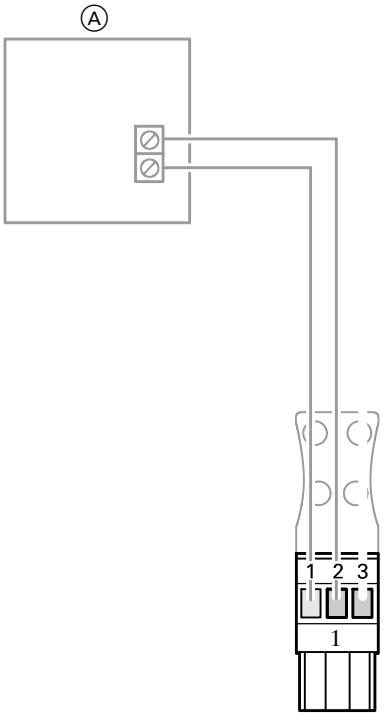
The outdoor temperature sensor should be mounted 2 to 2.5 metres / 6.5 to 8 ft above ground level on the north or north-west facing wall of the building. In the case of multi-storey buildings, it should be mounted in the upper half of the second storey.
Make sure that the sensor is not located over windows, doors and air vents, nor immediately beneath a balcony or guttering.
Do not paint over the outdoor temperature sensor housing.



1. Remove the cap.
2. Mount the bottom part of the sensor housing.
3. Pull the sensor wire through the opening in the terminal compartment and through the strain relief provided.
4. Connect the wires to the terminals.
5. Place the cap over the outdoor temperature sensor.

WARNING

When extending wire, there is the possibility of exposure to electromagnetic interference. Avoid running wires beside or near high voltage 120/240 VAC conductors. If proximity to high voltage conductors cannot be avoided, use stranded, twisted pair or shield design wire. Ensure that only one end of the shielding is grounded.



Ⓐ Outdoor temperature sensor

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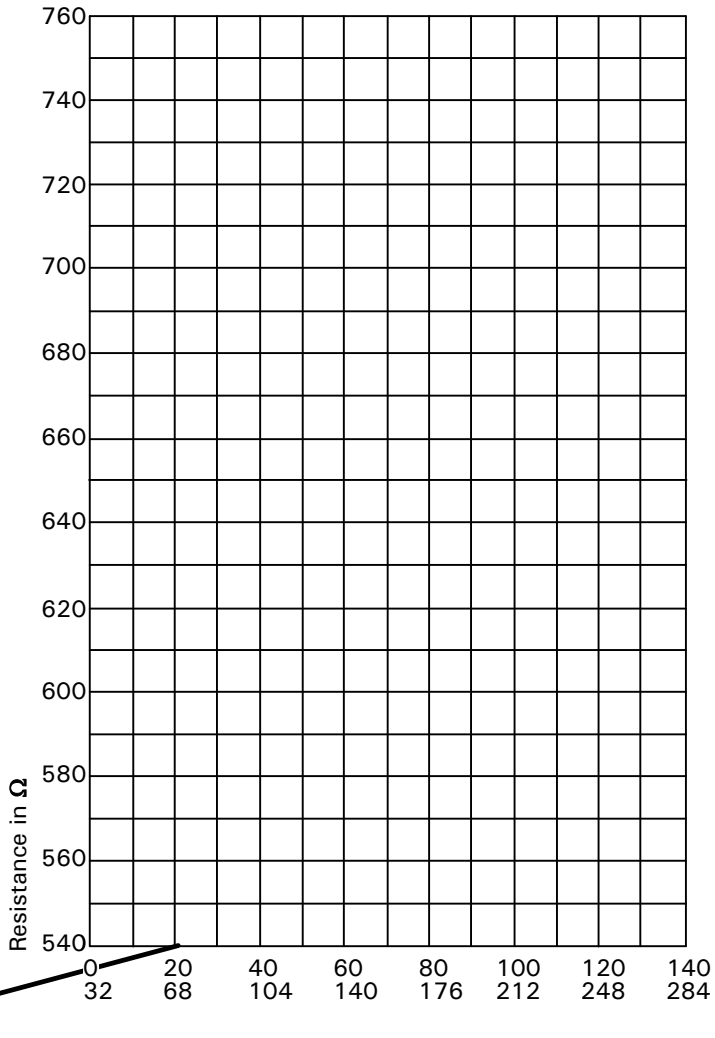
System components *(continued)*

Boiler temperature sensor, Part No. 7450 632 and DHW tank temperature sensor, Part No. 7450 633



Electrical connection
See page 38.

Check the sensor

1. Disconnect plug 3 / 5 in the terminal compartment.

2. Measure resistance of sensor at terminals "1" and "2" of the plug or "2" and "3" (if a second DHW tank temperature sensor is connected).

Boiler water/ DHW tank temperature in °C / °F	Resistance in Ω
40 / 104	578
50 / 122	597
60 / 140	616

3. Compare the value measured with the actual temperature.
If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data

Degree of protection: IP 32

Ambient temperature

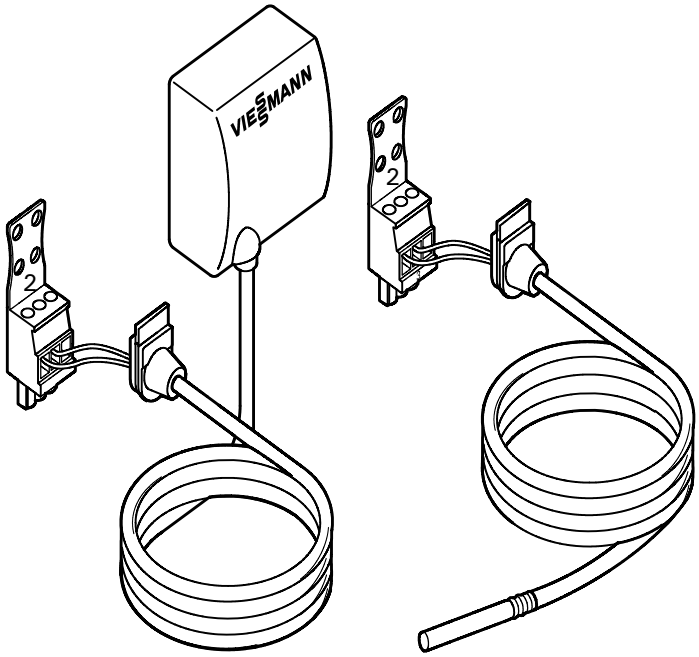
- During operation:
  - boiler temperature sensor:
    0 to + 130°C
    32 to + 266°F
  - DHW tank temperature sensor:
    0 to + 90°C
    32 to + 194°F
- During storage and transport:
  -20 to + 70°C
  - 4 to + 158°F

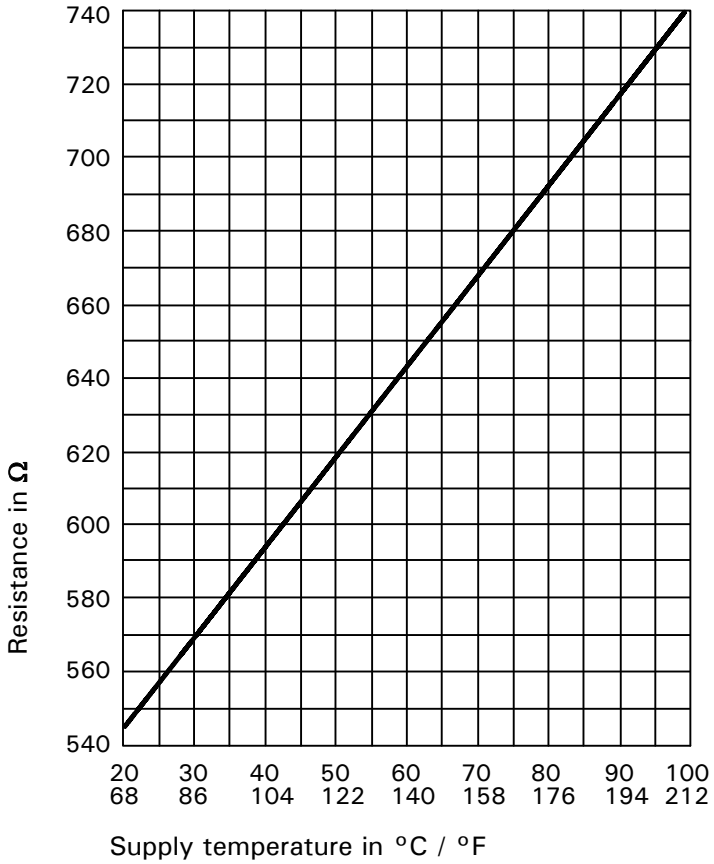
Extension kit for heating circuit with mixing valve, Part No. 7183 288 — Accessory

Comprising supply temperature sensor as contact sensor for measuring the supply temperature and mixing valve motor, with 4 m / 13 ft long connecting cable and plug-in plug for connecting the heating circuit pump.

System components *(continued)*

Strap-on temperature sensor and immersion temperature sensor





*For measuring the **supply** temperature.*

Electrical connection
The sensor is inserted in socket [2] on the control unit.

Check the sensor

1. Disconnect plug [2] in the terminal compartment.

2. Measure resistance of sensor at terminal "2" of the plug.

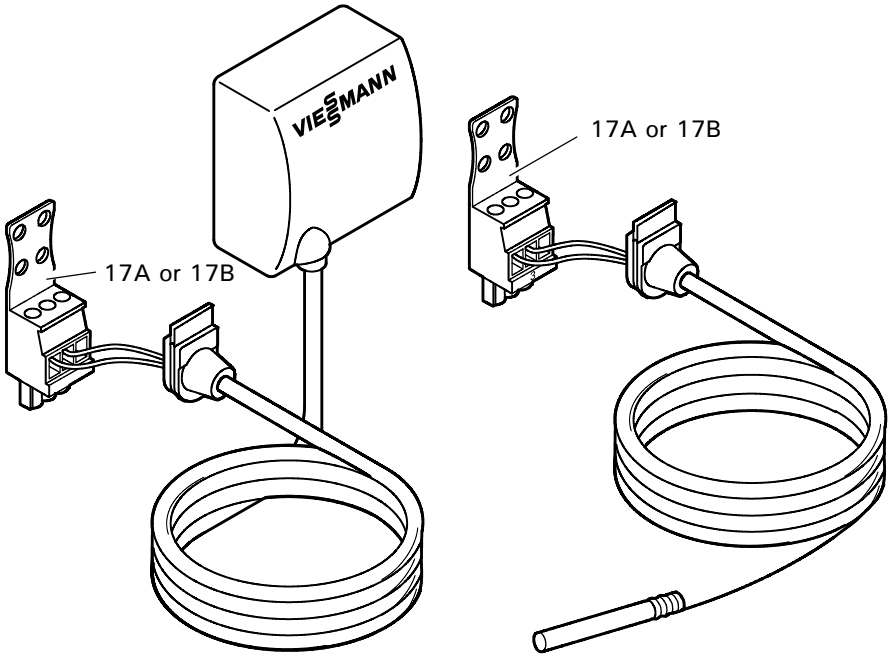
Supply temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

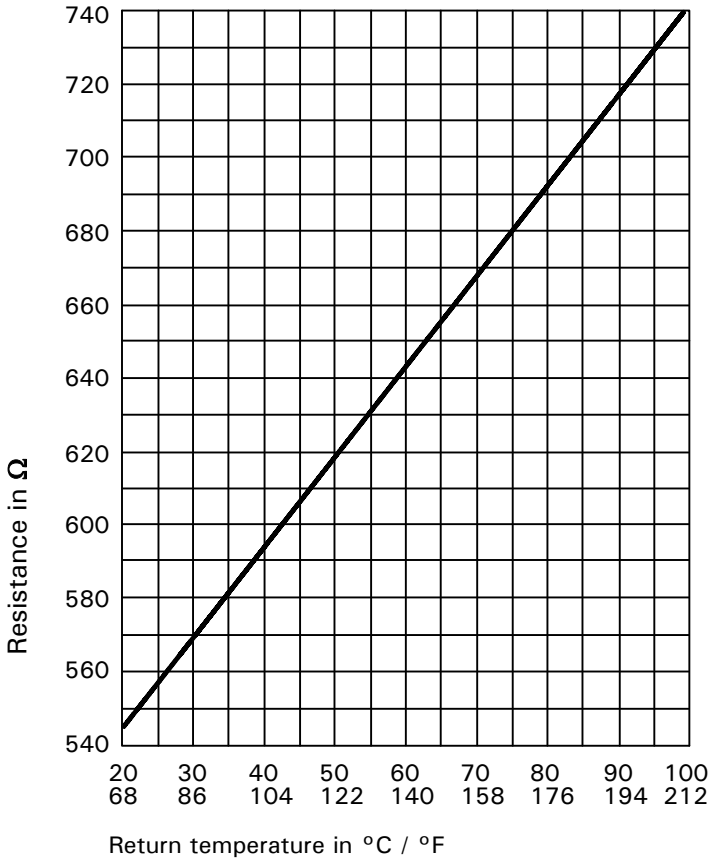
3. Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature
- during operation:
  0 to + 100°C
  32 to + 212°F
- during storage and transport:
  –20 to + 70°C
  - 4 to + 158°F

System components *(continued)*

Strap-on temperature sensor and immersion temperature sensor





*For measuring the **return** temperature.*

Electrical connection
The sensor is inserted in socket "17A" or "17B" on the control unit.

Check the sensor

1. Disconnect plug 17 A or 17 B in the terminal compartment.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Return temperature in °C / °F	Resistance in Ω
30 / 86	569
40 / 104	592
60 / 140	643

Compare the value measured with the current temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 32
Ambient temperature
- during operation:
  0 to + 100°C
  32 to + 212°F
- during storage and transport:
  –20 to + 70°C
  - 4 to + 158°F

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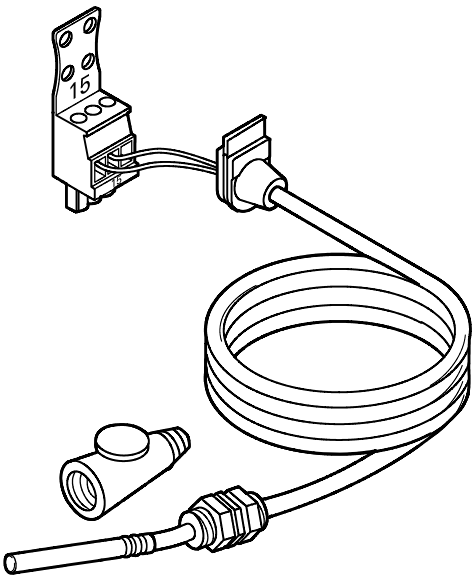
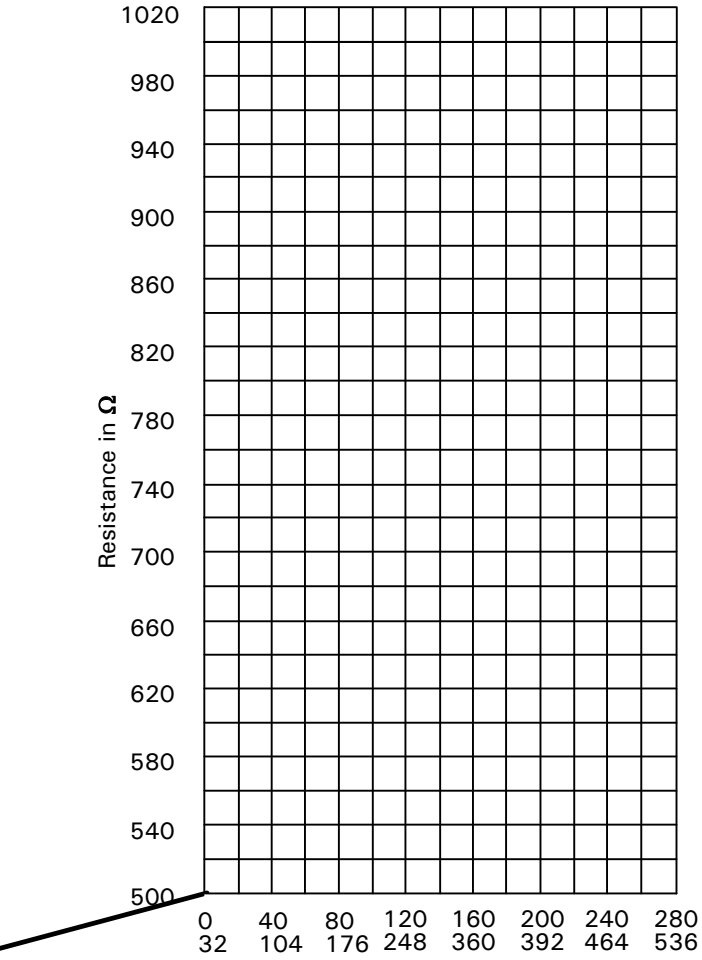
System components (VD2/VD2A/CT3 only)(continued)

Flue gas temperature sensor, Part No. 7450 630 **Accessory**



See page 48 for CM2 flue gas temperature switch.



The sensor measures the flue gas temperature and monitors the selected limit value.

Electrical connection
The sensor is inserted in socket "15" on the boiler control.

Check flue gas temperature sensor

1. Disconnect plug 15 in the terminal compartment of the boiler control.

2. Measure resistance of sensor at terminals "1" and "2" of the plug.

Flue gas temperature in °C / °F	Resistance in Ω
80 / 176	650
160 / 320	800
200 / 392	880

3. Compare the value measured with the actual temperature. If the value differs significantly, check installation and, if necessary, replace sensor.

Technical data
Degree of protection: IP 60
Ambient temperature
- during operation:
  0 to + 600°C
  32 to + 1112°F
- during storage and transport:
  –20 to + 70°C
  –4 to + 158°F

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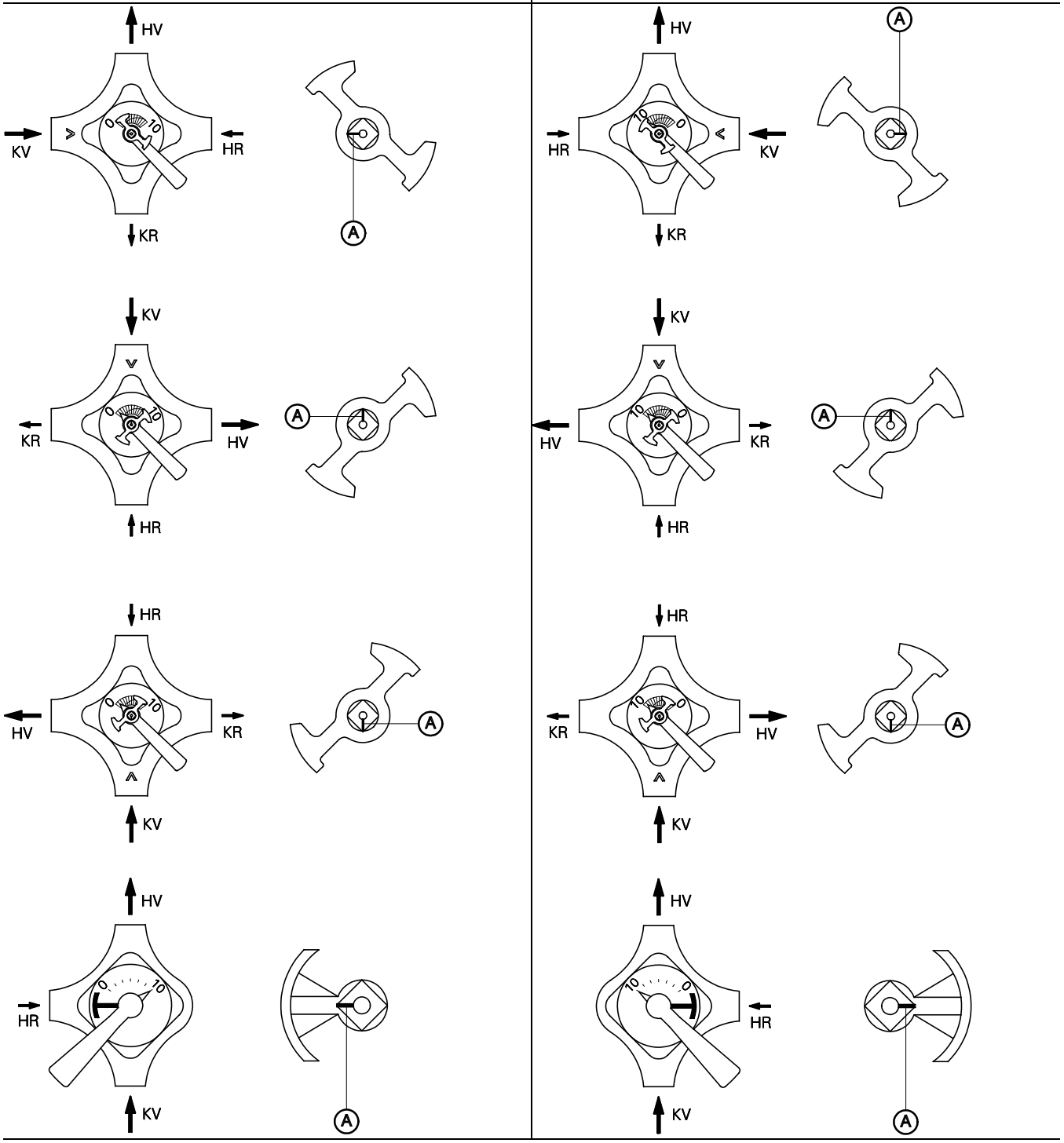
System components *(continued)*

Installation examples

In the **as delivered condition**, the electrical connections of the mixing valve motor are as required for the following installation examples; do not change.

The electrical connections of the mixing valve motor must be changed for the following installation examples.



Ⓐ Marker notch

HR Heating return
HV Heating supply

KR Boiler return
KV Boiler supply

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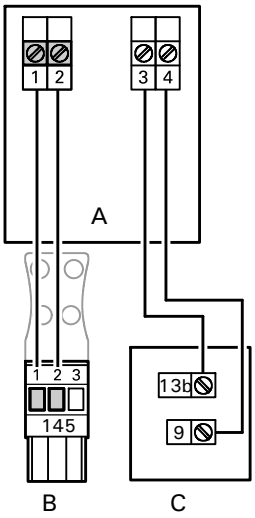
System components *(continued)*

Vitotrol 200, Part No.7133 378
(with integral room temperature sensor for room temperature feed-back in conjunction with a mixing valve circuit)
Setting of:
- Day temperature
- Heating program
- Economy and party mode

Function changes can be made via coding addresses A0, b0 to b9, C0 to C2, E1 and E2 (see coding overview).



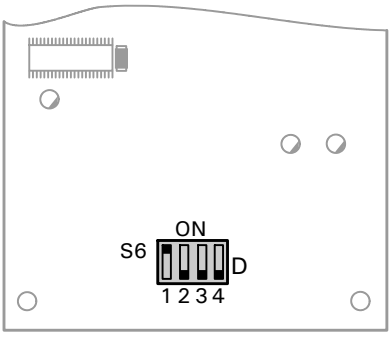
Connection
2-wire cable 50m / 164 ft

Room temperature sensor connection
Two-core cable, max. 35 m / 115 ft.
length with a cross-section of 1.5 mm^2
(AWG 16) copper

Ⓐ Wall mounting base for Vitotrol 200
Ⓑ To control unit
Ⓒ Separate room temperature sensor

System components *(continued)*

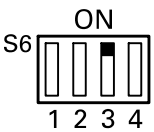
Remote control *(continued)*



Ⓓ Printed Circuit Board DIP switches (rear of the top casing)

Remote control affects	DIP switch setting
System circuit A1 (Heating circuit selection button 1)	Factory setting 
Mixing valve circuit M2 (Heating circuit selection button 2)	
Mixing valve circuit M3 (Heating circuit selection button 3)	

When connecting a separate room temperature sensor, set DIP switch S6.3 to ON.



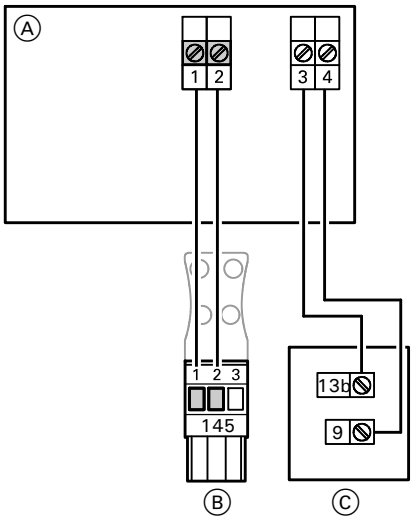
Specification
Power supply via 145 KM BUS.
Safety class: III
Protection: IP 30
Permiss. ambient temperature
■ During operation:
0 to +40°C
32 to + 104°F
■ In storage and transport:
–20 to +65°C
–4 to +149°C

Set room temperature setting range:
10 to 30°C
50 to 96°F
adjustable between
3 to 23°C
37 to 73°F
or
17 to 37°C
63 to 99°F
via coding address E1
Setting of the reduced set room temperature at the control unit.

System components *(continued)*

Vitotrol 300, Part No. 7134 452
(with integral room temperature sensor for room temperature feed-back in conjunction with a mixing valve circuit)
Setting of:
- Normal and reduced temperature
- Domestic hot water temperature
- Heating program
- Holiday program
- Switching times
- Economy and party mode

Function changes can be made via coding addresses A0, b0 to b9, C0 to C2, E1 and E2 (see coding overview).



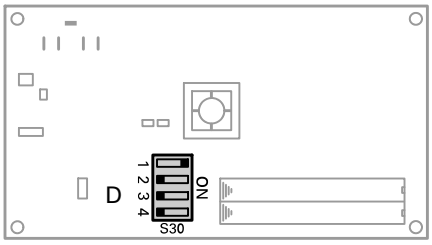
Connection
2-wire cable 50 m / 164 ft

Room temperature sensor connection
Two-core cable, max. 35 m / 115 ft. length with a cross-section of 1.5 mm^2 (AWG 16) copper.

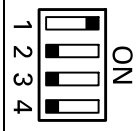
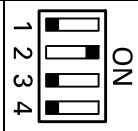
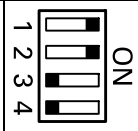
Ⓐ Wall mounting base for Vitotrol 300
Ⓑ To the control unit
Ⓒ Separate room temperature sensor

System components *(continued)*

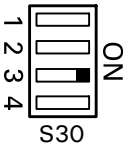
Remote control *(continued)*



Ⓓ Printed Circuit Board DIP switches (rear of the top casing)

Remote control affects	DIP switch setting
System circuit A1 (Heating circuit selection button [1])	Factory setting 
Mixing valve circuit M2 (Heating circuit selection button [2])	
Mixing valve circuit M3 (Heating circuit selection button [3])	

When connecting a separate room temperature sensor, set DIP switch S30.3 to ON.



Specification

Power supply via 145 KM BUS.

Safety class: III

Protection: IP 30

Permiss. ambient temperature

- In use:
  0 to +40°C
  32 to 104°F
- In storage and transport:
  −20 to +65°C
  −4 to +149°F

Setting range for

- Normal set room temp:
  10 to 30°C;
  50 to +86°F

adjustable between
3 to 23°C
37 to 73°C
or
17 to 37°C
63 to 97°F

via coding address E1

- Reduced set room temp:
  3 to 37°C
  37 to 97°F

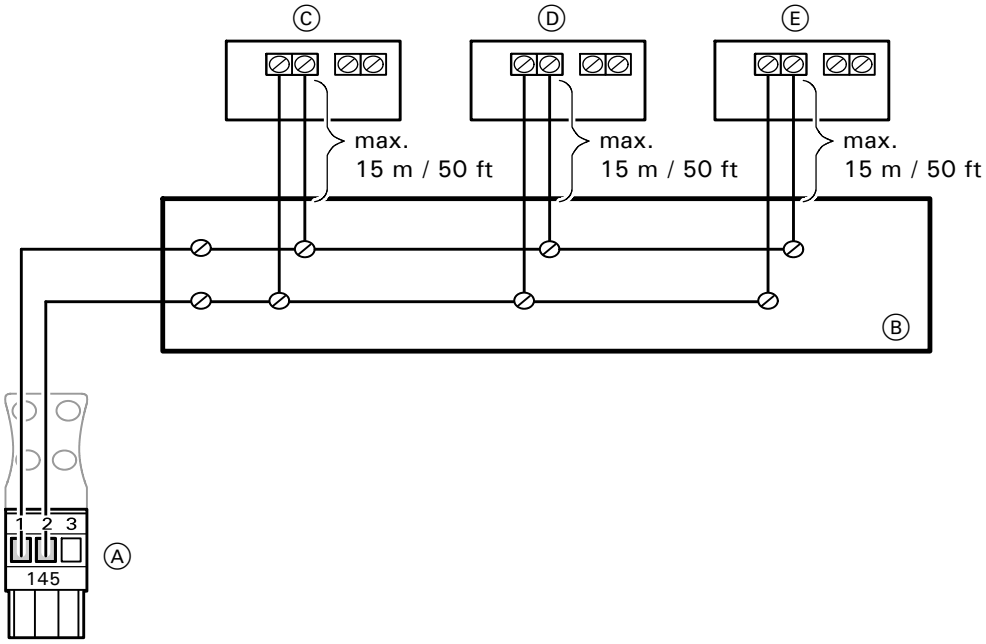
Battery type: Use alkaline manganese batteries type MICRO-LR03 (AAA) which do not contain pollutants

System components (*continued*)

Connecting several remote control units

When connecting several remote controls to the control unit, install a terminal box on site.

Version 1

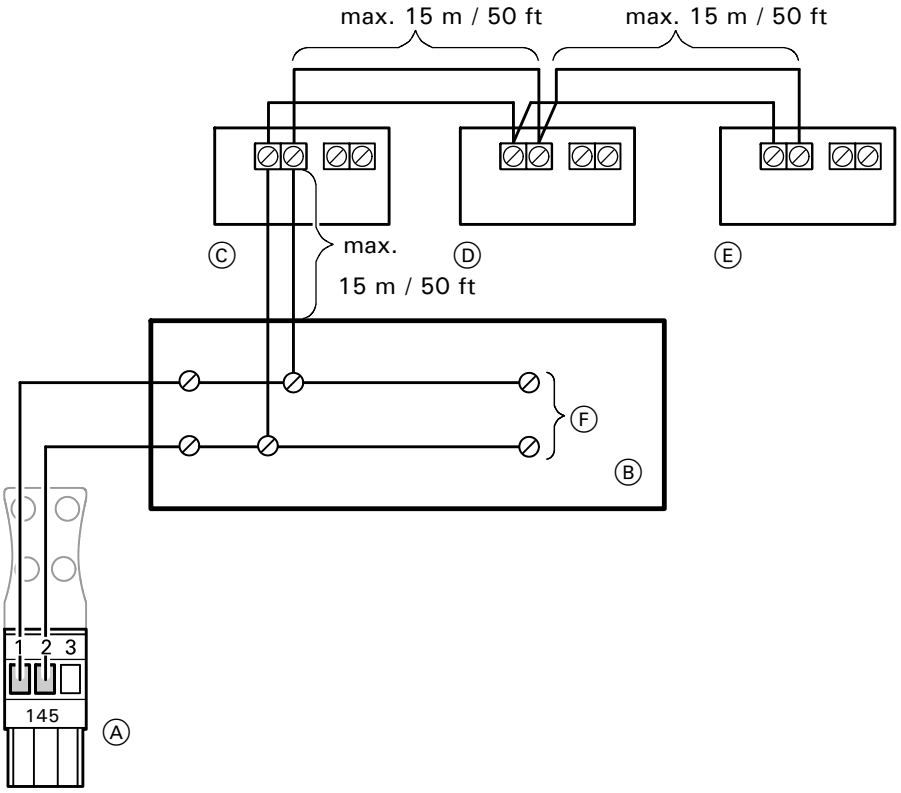


Ⓐ To control unit
Ⓑ Terminal box (on site)
Ⓒ Vitotrol 1
Ⓓ Vitotrol 2
Ⓔ Vitotrol 3

- On-site connection via terminal box: Connect in accordance with the diagram.
- The total length of all KM BUS cables should be limited to 50 m / 164 ft.

System components *(continued)*

Version 2

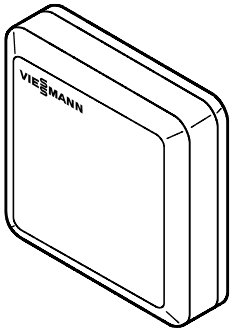


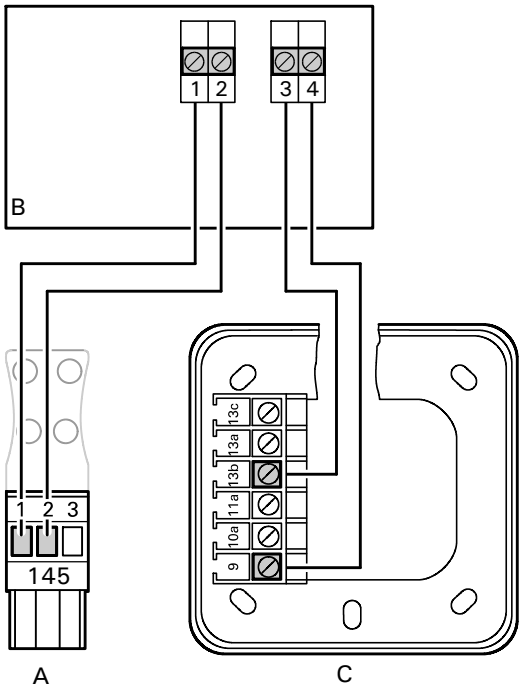
Ⓐ To control unit
Ⓑ Terminal box (on site)
Ⓒ Vitotrol 1
Ⓓ Vitotrol 2
Ⓔ Vitotrol 3
Ⓕ Further BUS participants

- If several remote control units and additional KM BUS participants are connected, make the connections via a terminal box (on-site) as shown in the diagram.
- The total length of all KM BUS cables should be limited to 50 m / 164 ft.

System components *(continued)*

Room temperature sensor, Part No. 7133 379 **Accessory**





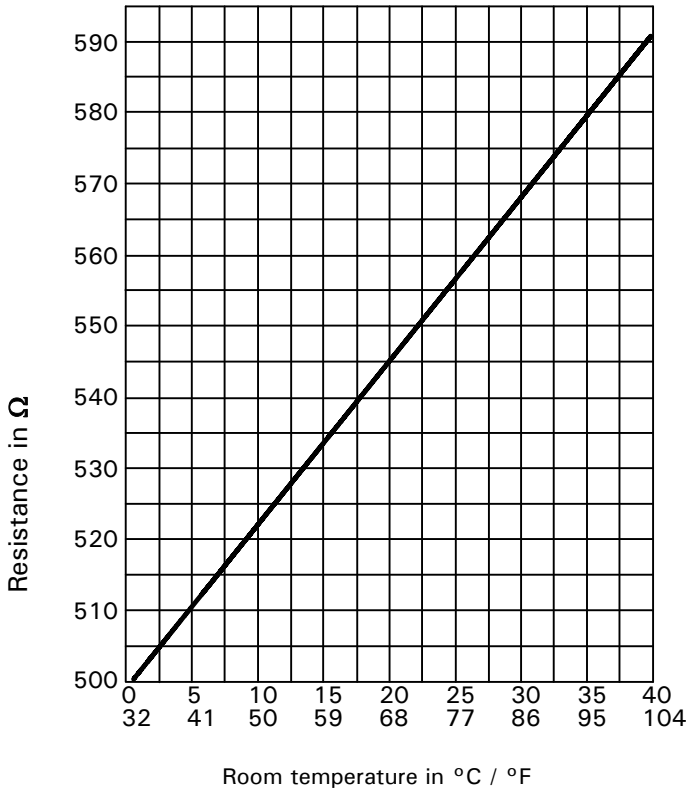
Ⓐ To control unit
Ⓑ Remote control
Ⓒ Room temperature sensor

The room temperature sensor serves to measure the room temperature where the remote control cannot be located in a suitable position.

Technical data
Degree of protection: IP 30
Ambient temperature
- During operation:
  0 to + 40°C
  32 to + 104°F
- During storage and transport:
  –20 to + 65°C
  –4 to + 149°F

Electrical connection
Two-core cable, max. 35 m / 115 ft long, with a conductor cross-section of 1.5 mm^2 copper.

Set coding switch 3 on the rear of the top part of the remote control case to "ON" (see page 107).



Check room temperature sensor

1. Disconnect the wires at the sensor terminals.

2. Measure the resistance of the sensor at terminals "9" and "13b".

Room temperature in °C / °F	Resistance in Ω
10 / 50	522
15 / 59	534
25 / 77	557

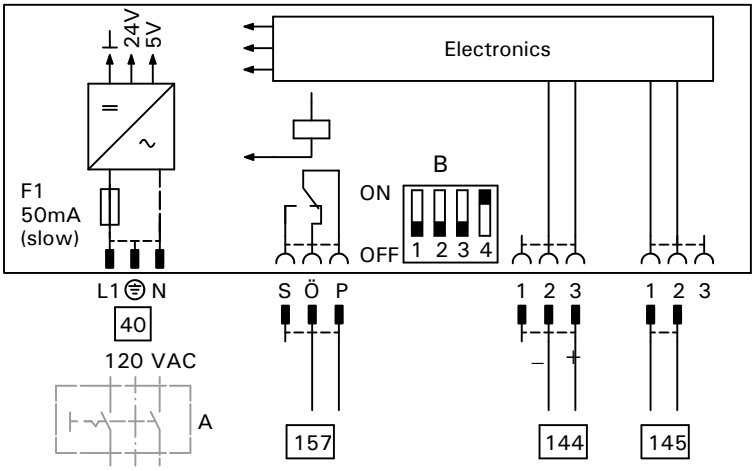
3. Compare the value measured with the current temperature (to scan: see page 74). If the value differs significantly, check installation and, if necessary, replace sensor.

System components *(continued)*

Input Module 0 to 10 V, Part No. 7134 561

From software version 7, the Input Module can be connected (software version via scan 2: 1st digit, display ≥7).

For external control of the boiler/supply temperature via a 0 to 10VDC signal
10 to 100°C or 30 to 120°C
(50 to 212°F or 86 to 248°F)
or
to signal reduced mode and regulate a heating circuit pump to a lower speed.



40 Power connection
144 0 to 10VDC input
145 KM BUS to control unit
157 Potential free output contact

Ⓐ Power supply (provide disconnect if required by code)
Ⓑ DIP switch (see table)

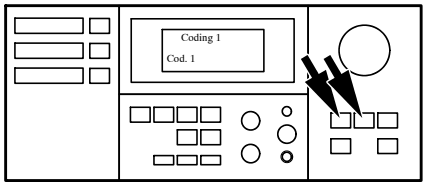
DIP switch		Function
1 to 3:	OFF	Switch for pre-set value
1:	ON	Reduced mode – system circuit A1
2:	ON	Reduced mode – mixing valve circuit M2
3:	ON	Reduced mode – mixing valve circuit M3
4:	ON	Pre-set value default 10 to 100°C / 50 to 212°F
4:	OFF	Pre-set value default 30 to 120°C / 86 to 248°F

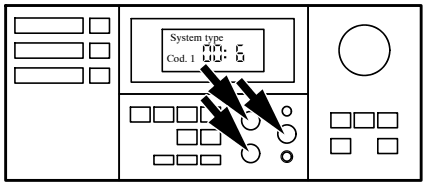
Please note:
*Amongst switches 1 to 3, only **one** switch may be set to ON.*

Coding 1

Call up coding level 1

Only those coding addresses are displayed which correspond to the system type and equipment concerned and can be changed accordingly.





1. Press ⏻ and ⬑ simultaneously for approx. 2 seconds.
→ *Access coding level 1.*

2. Call up the required coding address with the ⊕ or ⊖ button;
press OK to confirm.
→ *Address flashes.*
→ *Value flashes.*

3. Change the value with the ⊕ or ⊖ button;
press OK to confirm.
→ *"Accepted" appears briefly in the display, then the address flashes again. Further addresses can now be selected with the ⊕ or ⊖ button.*

→ *Exit coding level 1.*

4. Press ⏻ and ⬑ simultaneously for approx. 1 second.

Codings

Function	**Coding as per factory setting** Address: Value	**Possible change**
System type	00: 1 System circuit A1, without domestic hot water heating	00: 2 System circuit A1, with domestic hot water heating
		00: 3 Mixing valve circuit M2, without domestic hot water heating
		00: 4 Mixing valve circuit M2, with domestic hot water heating
		00: 5 System circuit A1 and mixing valve circuit M2, without domestic hot water heating
		00: 6 System circuit A1 and mixing valve circuit M2, with domestic hot water heating
		00: 7 Mixing valve circuits M2 and M3, without domestic hot water heating
		00: 8 Mixing valve circuits M2 and M3, with domestic hot water heating
		00: 9 System circuit A1 and mixing valve circuits M2 and M3, without domestic hot water heating
		00: 10 System circuit A1 and mixing valve circuits M2 and M3, with domestic hot water heating

Coding 1 *(continued)*

Codings *(continued)*

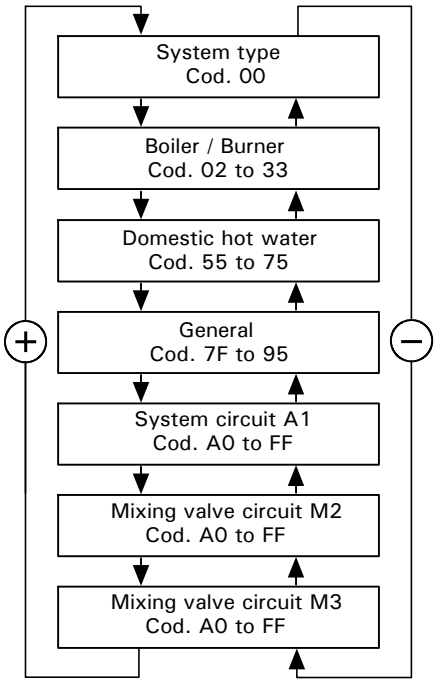
Function	Coding as per factory setting Address: Value	Possible change	
Burner type	02: 1 Two-stage	02: 0 02: 2	Two-stage Modulating
Gas/oil-fired operation	03: 0 Gas-fired operation	03: 1	Oil-fired operation (coding cannot be reset)
Burner(modulating).	05: 70 Burner curve	05: 0	Burner curve - linear
		05: 1 to 05: 99	Burner curve not linear (P_T: P_{max}) x 100% PT in kW: partial output at 1/3 of run time P_{max} in kW: maximum output
Max. boiler temp.	06: 87 Max. boiler water temperature limited to 87°C / 189°F	06: 20 to 06: 127	Maximum boiler water temperature limit variable between 20 and 127°C / 68 and 261°F
General	40: 125 Operating time of 3-way mixing valve or mixing valve motor in conjunction with return temperature control	40: 5 to 40: 199	Operating time variable from 5 to 199 seconds
Participant number	77: 1 LON participant number	77: 1 to 77: 99	LON participant number selectable from 1 to 99 ***Please note:*** *Each number may be assigned once* ***only.***
DHW priority A1/M2/M3	A2: 2 With DHW tank priority control	A2: 0	Without DHW tank priority control
		A2: 1 A2: 3 to A2: 15	Without function
Summer energy saving function A1/M2/M3	A5: 5 With heating circuit pump logic function (HPL function)	A5: 0	Without heating circuit pump logic function (HPL function)
Min. supply temp. A1/M2/M3	C5: 20 Electronic minimum supply temperature limit 20°C / 68°F	C5: 1 to C5: 127	Electronic minimum supply temperature limit variable between 1 and 127°C / 34 and 127°F
Max. supply temp. A1/M2/M3	C6: 75 Maximum supply temperature limited to 75°C / 167°F	C6: 10 to C6 :127	Maximum supply temperature limit variable between 10 and 127°C / 50 and 127°F

*1 *The factory setting is determined by the boiler coding card.*
*2 *This setting is matched to the Vitocrossal.*

Coding 2

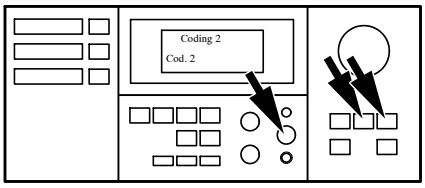
Call up coding level 2

The overview lists all possible coding addresses.
However, only those coding addresses are displayed which correspond to the system type and equipment concerned and can be changed accordingly.



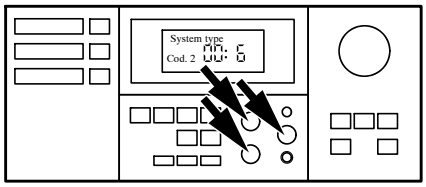
The coding addresses are structured in accordance with the graphic on the left.

→ ***Please note:***
In the case of systems with one system circuit and two mixing valve circuits, the possible coding addresses "A0" to "FF" for system circuit A1 are run through first, then those for the mixing valve circuits M2 and M3.



1. Press and simultaneously for approx. 2 seconds;
press (OK) to confirm.

→ *Access coding level 2.*



2. Call up the required coding address with the (+) or (−) button;
press (OK) to confirm.

→ *Coding address flashes.*

3. Change the value with the (+) or (−) button;
press (OK) to confirm.

→ *"Accepted" appears briefly in the display, then the coding address flashes again.*
Further addresses can now be selected with the (+) or (−) button.

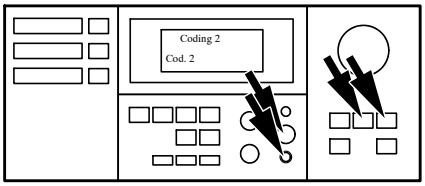
4. Press and simultaneously for approx. 1 second.

→ *Exit coding level 2.*

5285 941 - 02

Coding 2 *(continued)*

Reset codings to factory settings



1. Press and simultaneously for approx. 2 seconds. → *Access coding level 2.*

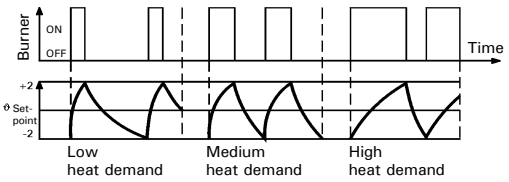
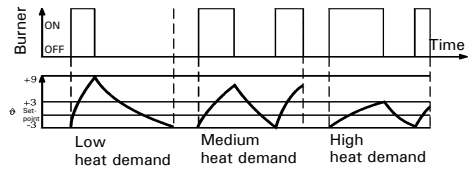
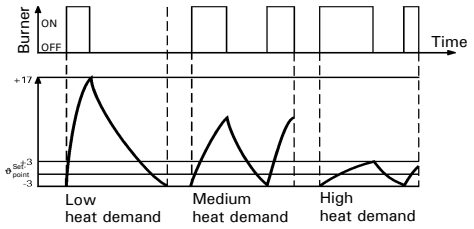
2. Press .
Press (OK) to confirm "Factory setting? Yes". → *"Factory setting? Yes" or "Factory setting? No" can be selected with the (+) or (−) button.*

Overview of all codings

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
00: 1	**System type**	System circuit A1 without domestic hot water heating	00: 2	System circuit A1 with domestic hot water heating
			00: 3	Mixing valve circuit M2 without domestic hot water heating
			00: 4	Mixing valve circuit M2 with domestic hot water heating
			00: 5	System circuit A1 and mixing valve circuit M2 without domestic hot water heating
			00: 6	System circuit A1 and mixing valve circuit M2 with domestic hot water heating
			00: 7	Mixing valve circuits M2 and M3 without domestic hot water heating
			00: 8	Mixing valve circuits M2 and M3 with domestic hot water heating
			00: 9	System circuit A1 and mixing valve circuits M2 and M3 without domestic hot water heating
			00: 10	System circuit A1 and mixing valve circuits M2 and M3 with domestic hot water heating
02: 1	**Boiler/ burner**	Operation with two-stage burner	02: 0	Operation with single-stage burner
			02: 2	Operation with modulating burner
03: 0	**Boiler/ burner**	Gas-fired operation	03: 1	Oil-fired operation (coding cannot be reset)

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
04: *1	**Boiler/ burner**	Switching differential	04: 0	**Switching differential 4°C / 7°F**  **Switching differential heat demand-controlled**
			04: 1	**ERB50 function** Values from 6 to 12°C / 11 to 22°F are set, depending on the heat demand. 
			04: 2	**ERB80 function** Values from 6 to 20°C / 11 to 36°F are set, depending on the heat demand.  The heat demand-controlled switching differential takes into account the boiler load. The switching differential, i.e. the burner operating time, is varied in relation to the actual heat demand.
05: 70	**Boiler/ burner (mod.)**	Burner curve	05: 1 to 05: 99	Burner curve not linear: Partial output in kW (at ⅓ of the Operating time of the actuating drive) / Max. output in kW ·x 100 % = Partial output in %
06: 87	**Boiler/ burner**	Max. limit of boiler water temperature set to 95°C / 203°F	06: 20 to 06: 127	Maximum boiler water temperature limit variable between 20 and 127°C / 68 and 261°F

**1* *The factory setting is determined by the boiler coding card.*

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
08: *1	**Boiler/ burner**	Max. output of burner in kW	08: 1 to 08: 99	Maximum output variable from 1 to 99 kW; 1 increment = 1 kW
09: *1	**Boiler/ burner**	Max. output of burner in kW	09: 1 to 09: 199	Maximum output variable from 1 to 19900 kW; 1 increment = 100 kW
0A: *1	**Boiler/ burner**	Basic output of burner in %	0A: 0 to 0A: 100	$\frac{\text{Basic output in kW}}{\text{Max. output in kW}} \times 100\% =$ Basic output in %
0b: 0	**Boiler**	Boiler protection when boiler released	0b: 1 to 0b: 98	Boiler protection is switched off after 1 to 98 hours without request
			0b: 99	Boiler protection at all times
0C: 0	**Boiler**	Without function	0C: 1	Continuous return temperature control
0d: 1	**Boiler**	With Therm-Control, effective for mixing valve of heating circuits	0d: 0	Without Therm-Control
			0d: 2	Without function
13: *1	**Boiler/ burner**	Switch-off differential The burner is switched off when the boiler water temperature rises above the desired value	13: 0	Without switch-off differential
			13: 1 to 13: 20	Switch-off differential variable from 1 to 20°C/ 2 to 36°F
14: *1	**Burner**	Minimum operating time	14: 1 to 14: 15	Minimum operating time variable from 1 to 15 minutes
15: 10*2	**Boiler/ burner (mod.)**	Operating time of actuating drive 10 seconds	15: 5 to 15: 199	Operating time variable from 5 to 199 seconds
16: *1	**(Mod.) burner**	Mod. burner offset in K Temporary reduction of the boiler set-point value after burner start	16: 0 to 16: 15	Offset during optimized start-up adjustable from 0 to 15°C / 0 to 27°F
1A: *1	**(Mod.) burner**	Optimized start-up in minutes	1A: 0 to 1A: 60	Duration of optimized start-up adjustable from 0 to 60 minutes
1b: 60	**Burner**	Time from ignition of burner to start of control 60 seconds	1b: 0 to 1b: 199	Control delay adjustable from 0 to 199 seconds

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function2.4		New coding Address: Value	Possible change
1C: 120	**Burner**	Start delay 120 seconds (only selectable if no operating signal "B4" is available at plug 41 of the burner)	1C: 1 to 1C: 199	Start delay adjustable from 1 to 199 seconds
1F: 0	**Boiler**	No monitoring of flue gas temperature	1F: 1 to 1F: 50	With flue gas temperature sensor connected: When the flue gas temperature exceeds the preselected limit value (selectable in the range from 10 to 500°C / 50 to 932°F), "Service" is displayed; 1 increment = 10°C / 50°F
21: 0	**Boiler/ burner**	No service display for burner	21: 1 to 21: 100	The number of burner hours run before the "Service" display appears can be set between 100 and 10000 hours; 1 increment = 100 hours
23: 0	**Boiler/ burner**	No time interval for burner maintenance	23: 1 to 23: 24	Time interval variable between 1 and 24 months
24: 0	**Boiler/ burner**	No "Service" display	24: 1	The "Service" display appears (address is set automatically and must be reset manually after maintenance has been carried out)
26: 0	**Boiler/ burner (2-stage)**	Fuel consumption of burner (1st stage); not metered if "26: 0" **and** "27: 0" are coded	26: 1 to 26: 99	Input from 0.1 to 9.9; 1 increment = 10 litres or gallons/hour
27: 0	**Boiler/ burner (2-stage)**	Fuel consumption of burner (1st stage); not metered if "26: 0" **and** "27: 0" are coded	27: 1 to 27: 199	Input from 10 to 1990; 1 increment = 10 litres or gallons/hour
28: 0	**Boiler/ burner**	No intermittent ignition of burner	28: 1	The burner is automatically switched on for 30 seconds after 5 hours
29: 0	**Boiler/ burner**	Fuel consumption of burner (2nd stage); not metered if "29: 0" **and** "2A: 0" are coded	29: 1 to 29: 99	Input from 0.1 to 9.9; 1 increment = 0.1 litre or gallon/hour
2A: 0	**Boiler/ burner**	Fuel consumption of burner (2nd stage); not metered if "29: 0" **and** "2A: 0" are coded	2A: 1 to 2A: 199	Input from 10 to 1990; 1 increment = 10 litres or gallons/hour
2d: 0	**Boiler**	Shunt pump ON only when requested	2d: 1	Shunt pump ON continuously
40: 125	**General**	Operating time, 3-way mixing valve or mixing valve motor in conjunction with return temperature control	40: 5 to 40: 199	Operating time adjustable from 5 to 199 seconds

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
4A: 0	**General**	Plug [17][A] not installed	4A: 1	Plug [17][A] installed (e.g. temperature sensor of Therm-Control); automatically recognized
4b: 0	**General**	Plug [17][B] not installed	4b: 1	Plug [17][B] installed (e.g. temperature sensor T2); automatically recognized
4C: 0	**General**	Connection at plug [20]A1: Heating circuit pump	4C: 1	Primary pump of DHW tank loading system
			4C: 2	Switch contact of Therm-Control
			4C: 3	Circulation pump of flue gas/water heat exchanger
4d: 1	**General**	Connection at plug [29]: Shunt pump	4d: 2	Boiler circuit pump
4E: 0	**General**	Connection at plug [52]: 3-way mixing valve for return temperature control	4E: 1	3-way valve of DHW tank loading system
4F: 5	**General**	Shunt pump with 5 minutes run-on time	4F: 0	Shunt pump without run-on time
			4F: 1 to 4F: 60	Run-on time adjustable from 1 to 60 minutes
54: 0	**General**	Without solar control	54: 1	With Vitosolic 100; automatically recognized
			54: 2	With Vitosolic 200; automatically recognized
55: 0	**DHW**	DHW tank heating, differential +/- 2.5 K	55: 1	Optimized DHW tank heating active (takes into account the rate at which the DHW tank temperature increases during domestic hot water heating)
			55: 2	DHW tank temperature control with 2 DHW tank temperature sensors
			55: 3	DHW tank temperature control of DHW tank loading system
56: 0	**DHW**	Setting range of domestic hot water temperature 10 to 60°C / 50 to 140°F	56: 1	Setting range of domestic hot water temperature 10 to 95°C / 50 to 203°F ⚠ ***Safety instruction!*** ■ *Observe max. DHW temperature* ■ *Adjust adjustable high limit "⏱"*
58: 0	**DHW**	Without additional function for domestic hot water heating	58: 1 to 58: 95	Input of a 2nd desired DHW temperature value; variable between 1 and 95°C / 34 and 203°F (note coding address "56") ***Please note:*** *The DHW tank is heated to the 2nd set-point value during the 4th activation period for domestic hot water heating (see operating instructions regarding settings).*

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
59: 0	**DHW**	DHW tank heating: Switch-on point – 2.5°C / 4.5°F Switch-off point + 2.5°C / 4.5°F	59: 1 to 59: 10	Switch-on point variable between 1 and 10°C / 34 and 18°F below setpoint value
5A: 0	**DHW**	Without function	5A: 1	Supply temperature request of DHW tank is the maximum value of the system
60: 20	**DHW**	When domestic hot water is being heated, the boiler water temperature is a maximum of 20°C / 36°F higher than the desired domestic hot water temperature	60: 10 to 60: 50	Differential between boiler water temperature and desired DHW temperature adjustable between 10 and 50°C / 18 and 90°F
61: 1	**DHW**	Circulation pump switches on immediately	61: 0	The circulation pump is switched on as a function of the boiler temperature
62: 10	**DHW**	Circulation pump with run-on time of 10 minutes	62: 0	Circulation pump without run-on time
			62: 1 to 62: 15	Run-on time variable from 1 to 15 minutes
64: 2	**DHW**	During the party mode: Continuous domestic hot water heating and DHW circulation pump ON	64: 0	No domestic hot water heating, DHW circulation pump OFF
			64: 1	Domestic hot water heating and DHW circulation pump according to preset time program
66: 4	**DHW**	Input of DHW temperature set-point value on the programming unit of the control unit and all Vitotrol 300 remote controls installed	66: 0	Only on the programming unit of the control unit
			66: 1	On the programming unit of the control unit and on the remote control for system circuit A1
			66: 2	On the programming unit of the control unit and on the remote control for mixing valve circuit M2
			66: 3	On the programming unit of the control unit and on the remote control for mixing valve circuit M3
			66: 5	Only on the remote control for system circuit A1
			66: 6	Only on the remote control for mixing valve circuit M2
			66: 7	Only on the remote control for mixing valve circuit M3

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
67: 40	**DHW**	With Vitosolic: Third DHW temperature set-point 40°C/ 104°F	67: 0	Without third DHW temperature set-point
			67: 1 to 67: 95	Setting of a third DHW temperature set-point. Adjustable from 1 to 95°C/ 34 to 203°F as per coding address "56"
68: 8	**DHW**	In conjunction with 2 DHW tank temperature sensors with the DHW tank loading system: Switch-off point of DHW tank heating at set-point value x 0.8	68: 2 to 68: 10	Factor adjustable from 0.2 to 1 per 1 increment = 0.1
69: 7	**DHW**	In conjunction with 2 DHW tank temperature sensors with the DHW tank loading system: Switch-off point of DHW tank heating at set-point value x 0.7	69: 1 to 69: 9	Factor adjustable from 0.1 to 0.9 per 1 increment = 0.1
70: 0	**DHW**	DHW circulation pump ON according to preset time program when DHW heating is released	70: 1	Output of DHW circulation pump dependent only on preset time program
71: 0	**DHW**	DHW circulation pump ON according to preset time program	71: 1	DHW circulation pump OFF during domestic hot water heating to the 1st set-point value
			71: 2	DHW circulation pump ON during domestic hot water heating to the 1st set-point value
72: 0	**DHW**	DHW circulation pump ON according to preset time program	72: 1	DHW circulation pump OFF during domestic hot water heating to the 2nd set-point value
			72: 2	DHW circulation pump ON during domestic hot water heating to the 2nd set-point value
73: 0	**DHW**	DHW circulation pump ON according to preset time program	73: 1 to 73: 6	During the time program for the DHW circulation pump ON for 5 minutes once per hour to ON for 5 minutes 6 times per hour
			73: 7	DHW circulation pump ON continuously
75: 0	**DHW**	DHW circulation pump ON during energy saving mode according to preset time program	75: 1	DHW circulation pump OFF during energy saving mode
76: 0	**General**	Without LON communication module	76: 1	With LON communication module; recognized immediately
77: 1	**General**	LON participant number	77: 1 to 77: 99	LON participant number selectable from 1 to 99 ***Please note:*** *Each number may be assigned once* ***only.***

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
78: 1	**General**	LON communication released	78: 0	LON communication blocked
79: 1	**General**	Control unit is fault manager	79: 0	Control unit is not fault manager
7A: 0	**General**	Without centralized operation of the heating circuits	7A: 1	With centralized operation of system circuit A1
			7A: 2	With centralized operation of mixing valve circuit M2
			7A: 3	With centralized operation of mixing valve circuit M3
7b: 0	**General**	Do not transmit time via LON BUS	7b: 1	Transmit time via LON BUS
7F: 1	**General**	Single occupancy house	7F: 0	Multi-occupancy house
80: 6	**General**	With 5 seconds time delay for fault message	80: 0	Without time delay
			80: 2 to 80: 199	Time delay adjustable between 10 and 995 seconds; 1 increment = 5 seconds
81: 1	**General**	Automatic resetting to summer/winter time ***Please note:*** *Codings "82" to "87" are only possible if coding "81 : 1" is set.*	81: 0	Manual resetting to summer/winter time
			81: 2	Use of radio clock module automatically recognized
			81: 3	Receive time from LON
82: 3	**General**	Start of summer time: March	82: 1 to 82: 12	January to December
83: 5	**General**	Start of summer time: last week of month	83: 1 to 83: 4	Week 1 to Week 4 of the selected month
84: 7	**General**	Start of summer time: last day of week (Sunday)	84: 1 to 84: 7	Monday to Sunday
85: 10	**General**	Start of winter time: October	85: 1 to 85: 12	January to December
86: 5	**General**	Start of winter time: last week of month	86: 1 to 86: 4	Week 1 to Week 4 of the selected month
87: 7	**General**	Start of winter time: last day of week (Sunday)	87: 1 to 87: 7	Monday to Sunday

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
88: 0	**General**	Temperatures displayed in Celsius	88: 1	Temperatures displayed in Fahrenheit
89: 1	**General**	Automatic participant recognition on KM-BUS	89: 0	No participant reognition
8A: 175	**General**	Display of codings which can be set for the system type concerned	8A: 176	All codings displayed regardless of system type and equipment installed
8E: 4	**General**	Display and acknowledgment of faults: on the programming unit and all Vitotrol remote controls installed	8E: 0	Only on the programming unit of the control unit
			8E: 1	On the programming unit of the control unit and on the remote control for system circuit A1
			8E: 2	On the programming unit of the control unit and on the remote control for mixing valve circuit M2
			8E: 3	On the programming unit of the control unit and on the remote control for mixing valve circuit M3
90: 128	**General**	Time constant for calculating the outdoor temperature change 21.3 hours	90: 0 to 90: 199	Fast matching (lower values) or slow matching (higher values) of the supply temperature to the change in the outdoor temperature according to the selected value; 1 increment = 10 minutes
91: 0	**General**	Without changeover of the heating program	91: 1	With changeover of the heating program (connection via plug [143]): Changeover effective for: System circuit A1
			91: 2	Mixing valve circuit M2
			91: 3	System circuit A1 and mixing valve circuit M2
			91: 4	Mixing valve circuit M3
			91: 5	System circuit A1 and mixing valve circuit M3
			91: 6	Mixing valve circuits M2 and M3
			91: 7	All heating circuits (A1, M2, M3)
92: 165	**General**	Do not adjust! Will only display if coding address “8A: 176” is set		
93: 0	**General**	Central fault indication in emissions test mode/service display not effective for central fault	93: 1	Central fault indication in emissions test mode/service display effective for central fault
94: 0	**General**	Without plug-in adaptor for external safety equipment	94: 1	With plug-in adaptor for external safety equipment; recognized automatically
96: 1	**General**	With mixing valve extension circuit board	96: 0	Without mixing valve extension circuit board

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
97: 2	**General**	The outdoor temperature of the sensor connected to the control unit is transmitted via the LON BUS to any Vitotronic 200-H units which may be connected	97: 0	Not transmitted to heating circuit controls
			97: 1	The outdoor temperature is acepted by any heating circuit controls which may be connected
98: 1	**General**	Viessmann system number (in conjunction with monitoring of several systems within one LON BUS system)	98: 1 to 98: 5	System number selectable from 1 to 5
99: 0	**General**	Connection at terminals "2" and "3" in plug [143] (External disable/"Close mixing valve" externally not active)	99: 1	Contact effective for: Without function
			99: 2	"Close mixing valve", mixing valve circuit M2
			99: 3	Without function
			99: 4	"Close mixing valve", mixing valve circuit M3
			99: 5	Without function
			99: 6	"Close mixing valve", mixing valve circuits M2 and M3
			99: 7	Without function
			99: 8	External disable
			99: 9	Without function
			99: 10	External disable and "Close mixing valve", mixing valve circuit M2
			99: 11	Without function
			99: 12	External disable and "Close mixing valve", mixing valve circuit M3
			99: 13	Without function
			99: 14	External disable and "Close mixing valve", mixing valve circuits M2 and M3
			99: 15	Without function
9A: 0	**General**	Connection at terminals "1" and "2" in plug [143] ("Open mixing valve" externally not active)	9A: 1	Contact effective for: Without function
			9A: 2	"Open mixing valve", mixing valve circuit M2
			9A: 3	Without function
			9A: 4	"Open mixing valve", mixing valve circuit M3
			9A: 5	Without function
			9A: 6	"Open mixing valve", mixing valve circuits M2 and M3
			9A: 7	Without function
9b: 70	**General**	Desired supply temperature 70 °C / 158 °F with external request (input [146])	9b: 0	Input [146] blocked
			9b: 1 to 9b: 127	Desired supply temperature selectable from 1 to 127°C / 34 to 261°F

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
9C: 20	**General**	Monitoring of LON participants If a participant does not answer back, default values set within the control unit are used for the first 20 minutes. The an error message is transmitted	9C: 0	No monitoring
			9C: 1 to 9C: 60	Time selectable from 1 to 60 minutes
9d: 0	**General**	Without Input module 0-10V	9d: 1	With Input module; automatically recognized
9F: 8	**General**	Differential temperature 8 K only in conjunction with mixing valve circuit	05: 0 to 05: 40	Differential temperature selectable from 0 to 40 K
A0: 0	**Boiler circuit/ mixing valve circuit**	Without remote control	A0: 1	With Vitotrol 200 remote control
			A0: 2	With Vitotrol 300 remote control
A2: 2	**Boiler circuit/ mixing valve circuit**	With DHW tank priority control over heating circuit pump and mixing valve	A2: 0	Without DHW tank priority control over heating circuit pump and mixing valve
			A2: 1*1	The mixing valve is closed and the heating circuit pump is ON when the DHW tank is being heated
			A2: 3*1 to A2: 15	Reduced DHW tank priority over mixing valve; i.e. the heating circuit is supplied with a reduced amount of heat
A3: 2	**Boiler circuit/ mixing valve circuit**	The heating circuit pump is switched on at outdoor temperatures below 1 °C / 34 °F. The heating circuit pump is switched off at outdoor temperatures above 3 °C / 37 °F. ⚠ ***Safety instruction:*** *At settings below 1 °C / 34 °F there is a risk that piping outdside the insulation of the building may freeze, e.g. pipes in the roof space, to the garage,in radiator alcoves, etc. Pay particular attention to the standby mode, e.g. during holiday periods.*	A3: –9 A3: –8 A3: –7 A3: –6 A3: –5 A3: –4 A3: –3 A3: –2 A3: –1 A3: 0 A3: 1 A3: 2 . . . A3: 15	Heating circuit pump **See conversion chart at back of manual for °F** ON at OFF at –10°C –8°C – 9°C –7°C – 8°C –6°C – 7°C –5°C – 6°C –4°C – 5°C –3°C – 4°C –2°C – 3°C –1°C – 2°C 0°C – 1°C 1°C 0°C 2°C 1°C 3°C . . . . . . 14°C 16°C
A4: 0	**Boiler circuit/ mixing valve circuit**	With frost protection	A4: 1	No frost protection. Setting only possible when coding "A3: –9" is set. ***Please note:*** *See safety instruction above.*

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
A5: 5	**Boiler circuit/ mixing valve circuit**	With the heating circuit pump logic function (HPL function), the heating circuit pump is switched off when the outdoor temperature (OT) rises 1 K above the desired room temperature (RT_{des}). OT > RT_{des} + 1 K	A5: 0	Without heating circuit pump logic function (HPL function)
			A5: 1 A5: 2 A5: 3 A5: 4 A5: 5 A5: 6 A5: 7 . . . A5: 15	With heating circuit pump logic function (HPL function): The heating circuit pump is switched off if OT > RT_{des} + 5 K OT > RT_{des} + 4 K OT > RT_{des} + 3 K OT > RT_{des} + 2 K OT > RT_{des} + 1 K OT = RT_{des} OT > RT_{des} −1 K . . . OT > RT_{des} −9 K
A6: 36	**Boiler circuit/ mixing valve circuit**	Automatic changeover from normal heating to summer operation **not** active	A6: 5 to A6: 35	Automatic changeover from normal heating to summer operation*1 at a variable setting value from 5 to 35°C plus 1°C / 41 to 95°F plus 2°F at which the burner and heating circuit pump are switched off and the mixing valve is closed
A7: 0	**Mixing valve circuit**	Without mixing valve energy saving function	A7: 1	With mixing valve energy saving function (extended heating circuit pump logic) The heating circuit pump can be switched off additionally when the mixing valve has been closed for longer than 20 minutes. The heating circuit pump is switched on again ■ When the mixing valve goes to its control mode ■ After the DHW tank has been heated (for 20 minutes) ■ When there is a risk of freezing
A9: 7	**Boiler circuit**	With pump stoppage time: Heating circuit pump logic function with change of set-point (through changing the operating mode or changes on the "🌡☀" selector knob or "🌡☽")	A0: 0	Without pump stoppage time
			A9: 1 to A9: 15	With pump stoppage time adjustable from 1 to 15
AA: 2	**Mixing valve circuit**	With output reduction via temperature sensor 17 A	AA: 0	Without output reduction
			AA: 1	Without function

*1 *Based on the damped outdoor temperature which is calculated from the current outdoor temperature and a time constant which takes into account the cooling characteristics of an average building.*

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Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
b0: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: Weather-compensated operation in normal heating mode and reduced operation	b0: 1	Weather-compensated operation in normal heating mode and with room temperature dependent control switched on for reduced operation
			b0: 2	Room temperature dependent control switched on for normal heating mode and weather-compensated operation for reduced operation
			b0: 3	Room temperature dependent control switched on for normal heating mode and for reduced operation
b1: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: Without pure room temperature control	b1: 1	Heating circuit with room temperature dependent control
b2: 8*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control and for the heating circuit, operation with room temperature control must be coded Room influence factor: 8	b2: 0	Without room influence
			b2: 1 to b2: 31	Room influence factor adjustable from 1 to 31
b3: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control and for the heating circuit, operation with room temperature control must be coded Basic value: 53°C /	b3: 1	Basic value: 38°C
b5: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: No room temperature controlled heating circuit pump logic function	b5: 1	■ Heating circuit pump OFF if actual room temperature (RT_{act}) is 1 K higher than desired room temperature (RT_{des}) $RT_{act} > RT_{des} + 1$ K ■ Heating circuit pump ON if actual room temperature (RT_{act}) is 1 K lower than desired room temperature (RT_{des}) $RT_{act} < RT_{des} + 1$ K

*1 *Change the coding for the system circuit only on boilers without a minimum temperature limit or for the heating circuit with mixing valve if the remote control is effective for this heating circuit.*

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
b6: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control in RS mode: Without rapid heat-up/fast setback	b6: 1	With rapid heat-up/fast setback Fast setback: Only possible with weather-compensated operation with the room temperature sensor switched on or with pure room temperature dependent control. The desired room temperature value must be reduced by at least 2 K by ■ Pressing the energy saving button "S" ■ Switching over from normal heating to reduced operation ■ Optimized switch-off. Fast setback is ended when the desired room temperature is reached. Rapid heat-up: Only possible with weather-compensated operation with the room temperature sensor switched on or with pure room temperature dependent control. The desired room temperature value must be increased by at least 2 K by ■ Pressing the party button ■ Switching over from reduced operation to normal heating ■ Optimized switch-on. Rapid heat-up is ended when the desired room temperature is reached.
b7: 0	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control in RS mode: Without learning optimized switch-on time	b7: 1	With optimized switch-on time (max. time shift 2 hours 30 min.)
			b7: 2	With optimized switch-on time (max. time shift 15 hours 50 min.)
b8: 10	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control in RS mode: Heat-up gradient: 10 minutes/Kelvin	b8: 11 to b8: 255	Heat-up gradient for optimized switch-on time variable between 11 and 255 minutes/Kelvin
b9: 0*1	**Boiler circuit/ mixing valve circuit**	Without learning optimized switch-on time	b9: 1	With learning optimized switch-on time

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Address: Value	Possible change
C0: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: Without optimized switch-off time	C0: 1	With optimized switch-off time (max. time shift 1 hour)
			C0: 2	With optimized switch-off time (max. time shift 2 hours)
C1: 0*1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: Without optimized switch-off time	C1: 1 to C1: 12	With optimized switch-off time (max. time shift from 10 to 120 minutes) 1 increment = 10 minutes
C2: 0*1	**Boiler circuit/ mixing valve circuit**	Without learning optimized switch-off time	C2: 1	With learning optimized switch-off time
C3: 125	**Mixing valve circuit**	Operating time of mixing valve 125 seconds	C3: 10 to C3: 255	Operating time adjustable from 10 to 255 seconds
C4: 1	**Mixing valve circuit**	Mixing valve circuit with 4-way mixing valve	C4: 0	Mixing valve circuit with 3-way mixing valve
			C4: 2	Special case 1
			C4: 3	Special case 2
C5: 20	**Boiler circuit/ mixing valve circuit**	Electronic minimum supply temperature limit 20°C / 68°F	C5: 1 to C5: 127	Electronic minimum limit variable between 1 and 127°C / 34 and 261°F
C6: 75	**Mixing valve circuit**	Electronic maximum supply temperature limit set to 75°C	C6: 10 to C6: 127	Electronic maximum limit variable between 1 and 127°C / 34 and 261°F
C8: 31	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: Without limit on room influence	C8: 1 to C8: 30	Limit on room influence variable from 1 to 30 K
d5: 0	**Boiler circuit/ mixing valve circuit**	Heating program switches over to "Continuous operation" with reduced room temperature	d5: 1	Heating program switches over to "Continuous space heating" with normal room temperature
E1: 1	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: Day setpoint value variable from 10 to 30°C	E1: 0	Day setpoint value variable from 3 to 23°C
			E1: 2	Day setpoint value variable from 17 to 37°C

Coding 2 *(continued)*

Overview of all codings *(continued)*

Coding as per factory setting Address: Value	Function		New coding Adress: Value	Possible change
E2: 50	**Boiler circuit/ mixing valve circuit**	In conjunction with remote control: No room correction value	E2: 0 to E2: 49	Room correction value negative
			E2: 51 to E2: 99	Room correction value positive
F1: 0	**Mixing valve circuit**	Slab curing function not active	F1: 1 to F1: 4	See DIN 4725-2. The commissioning/service report to be completed by the heating contractor must contain the following data regarding heating up: ■ Heat-up data for the corresponding supply temperatures ■ Max. supply temperature reached ■ Operating status and outdoor temperature on handing-over the installation Slab curing function selectable on basis of four temperature/time curves (see page 134). ***Please note:*** *Refer to the data and instructions provided by the floor slab manufacturer.* The function is resumed after a power failure or after the control unit is switched off. When the slab curing function has terminated or the address is reset manually to 0, the "🏢🚿" heating program is switched on.
F2: 8	**Boiler circuit**	Time limit for party mode 8 hours	F2: 0	No time limit for party mode
			F2: 1 to F2: 12	Time limit for party mode variable between 1 and 12 hours
F8:-5	**Boiler circuit**	Temperature limit for cancelling reduced mode -5°C. Note coding address "A3"	F8: +10 to F8: -60	Temperature limit adjustable from +10 to -60°C
			F8: -61	Function inactive

Coding 2 *(continued)*

Overview of all codings *(continued)*

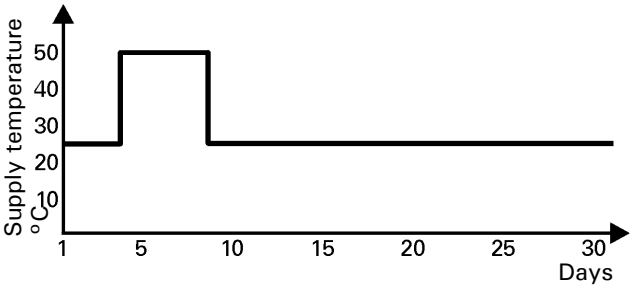
Coding as per factory setting Address: Value	Function		New coding Adress: Value	Possible change
F9:-14	**Boiler circuit**	Temperature limit for raising reduced room temperature set-point -14°C. Note coding address "A3"	F9: +10 to F9: -60	Temperature limit adjustable from +10 to -60°C
FA: 20	**Boiler circuit/ mixing valve circuit**	Raising of the supply temperature when switching reduced to normal room temperature by 20%	FA: 0 to FA: 50	Temperature adjustable from 0 to 50%
Fb: 30	**Boiler circuit/ mixing valve circuit**	Time required for raising the supply temperature (see coding address "FA") 60 minutes	Fb: 0 to Fb: 150	Time adjustable from 0 to 300 minutes; 1 increment = 2 minutes

Coding 2 *(continued)*

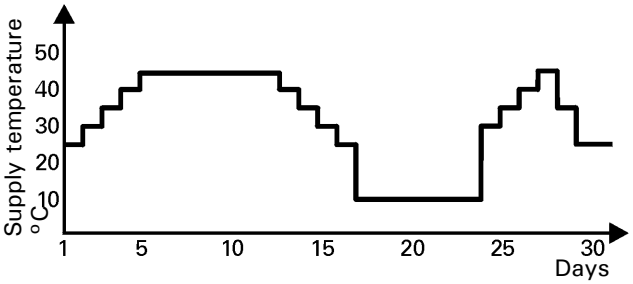
Overview of all codings *(continued)*

Slab curing function diagrams

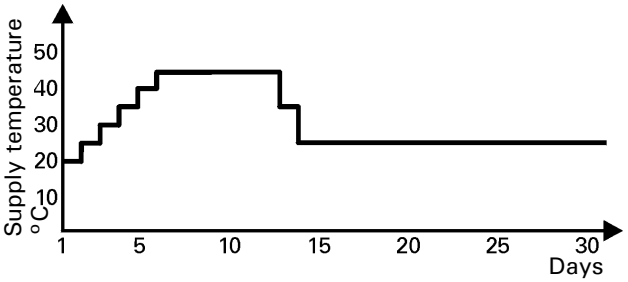
Temperature/time curve 1 (F1 : 1)



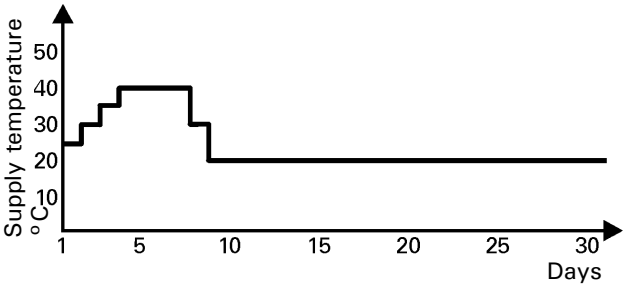
Temperature/time curve 2 (F1 : 2)



Temperature/time curve 3 (F1 : 3)

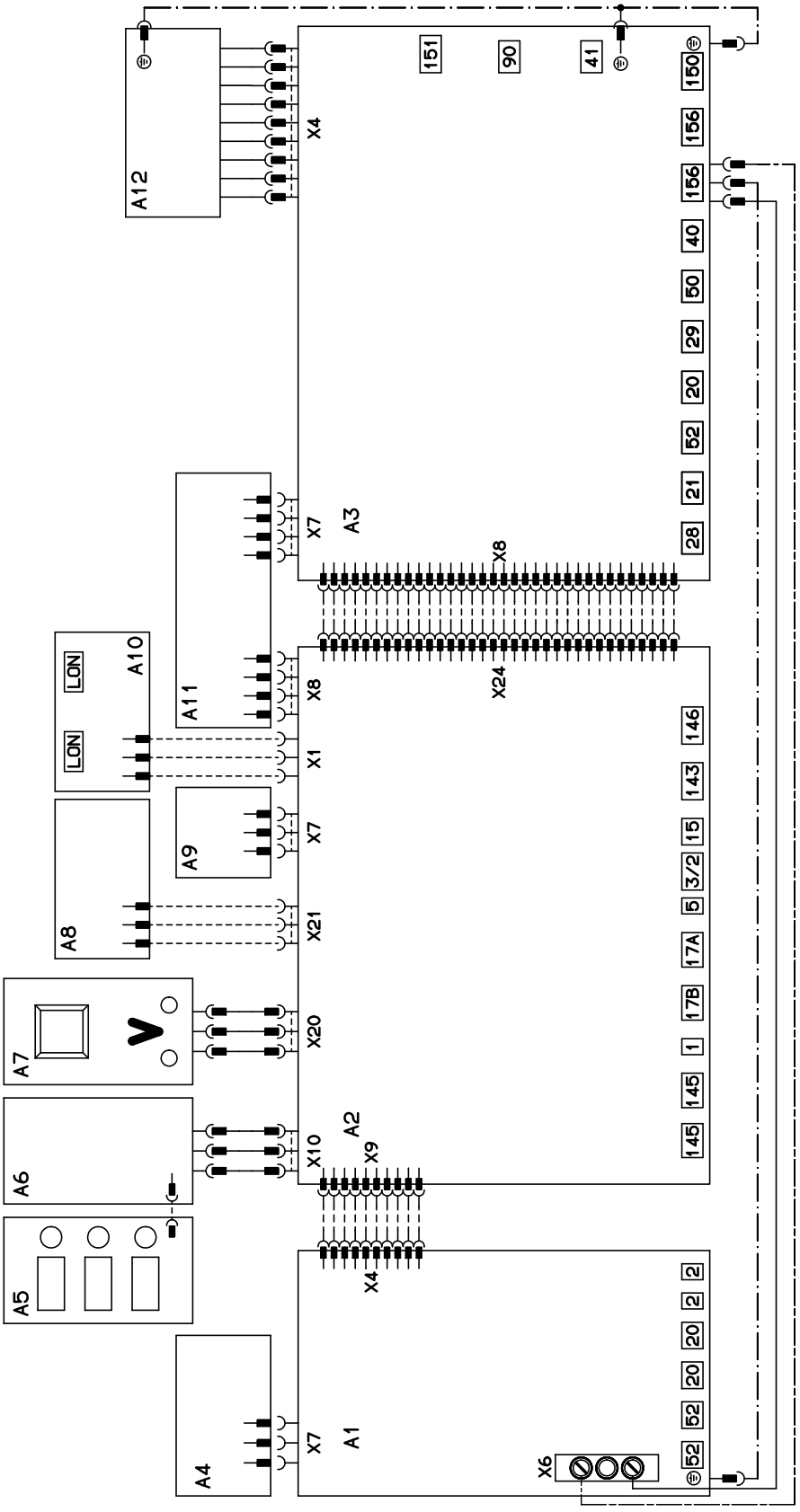


Temperature/time curve 4 (F1 : 4)



Wiring diagram

Overview



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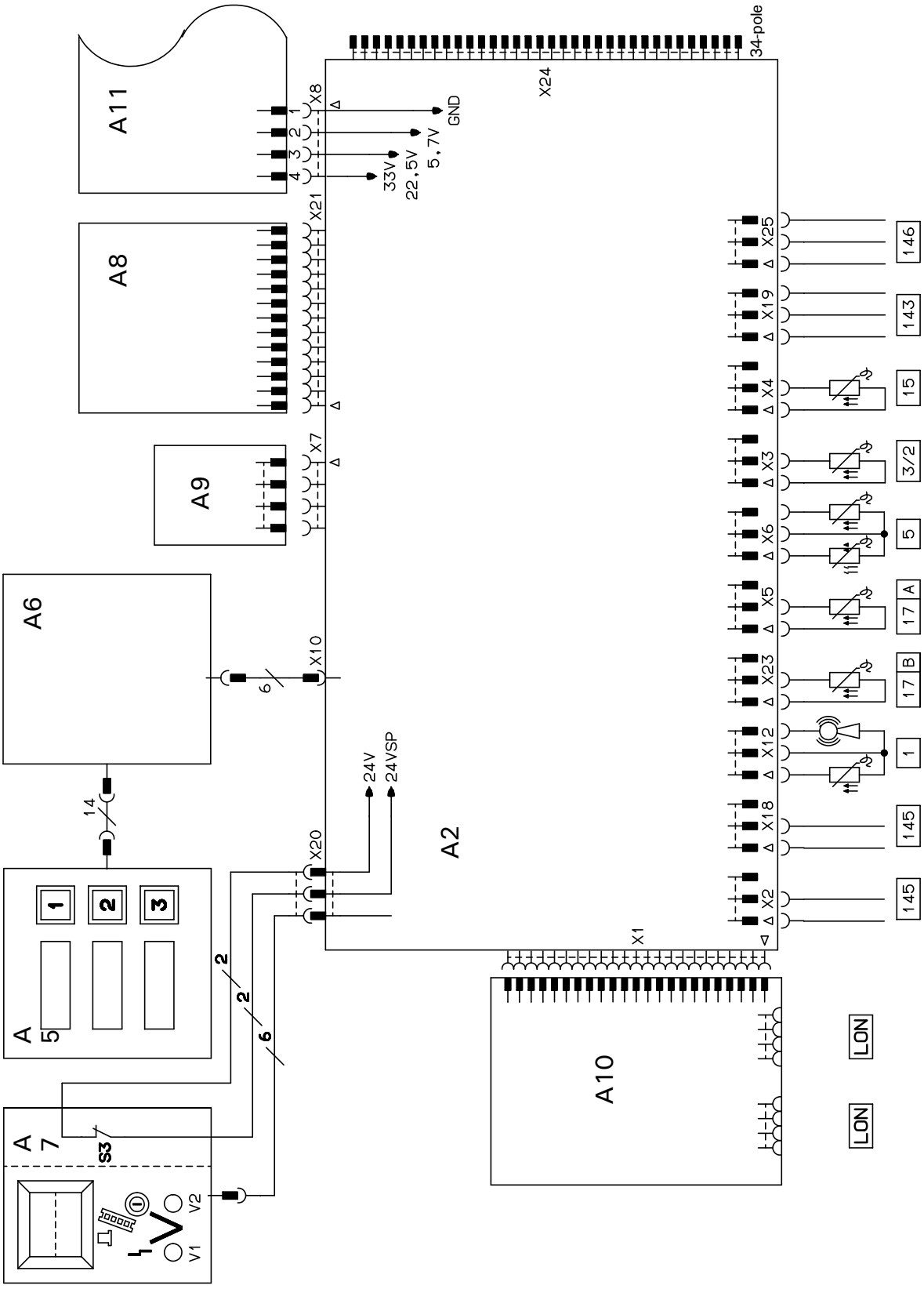
A1 Mixing valve extension circuit board
A2 Low-voltage motherboard
A3 120 V~ motherboard
A4 Electronics board for mixing valve extension
A6 Programming unit
A7 Optolink/emissions test switch board
A8 Electronics board
A9 Boiler coding card
A10 LON communication module (accessory)
A11 Power supply unit board
A12 Boiler control section

Wiring diagram *(continued)*

Low-voltage motherboard



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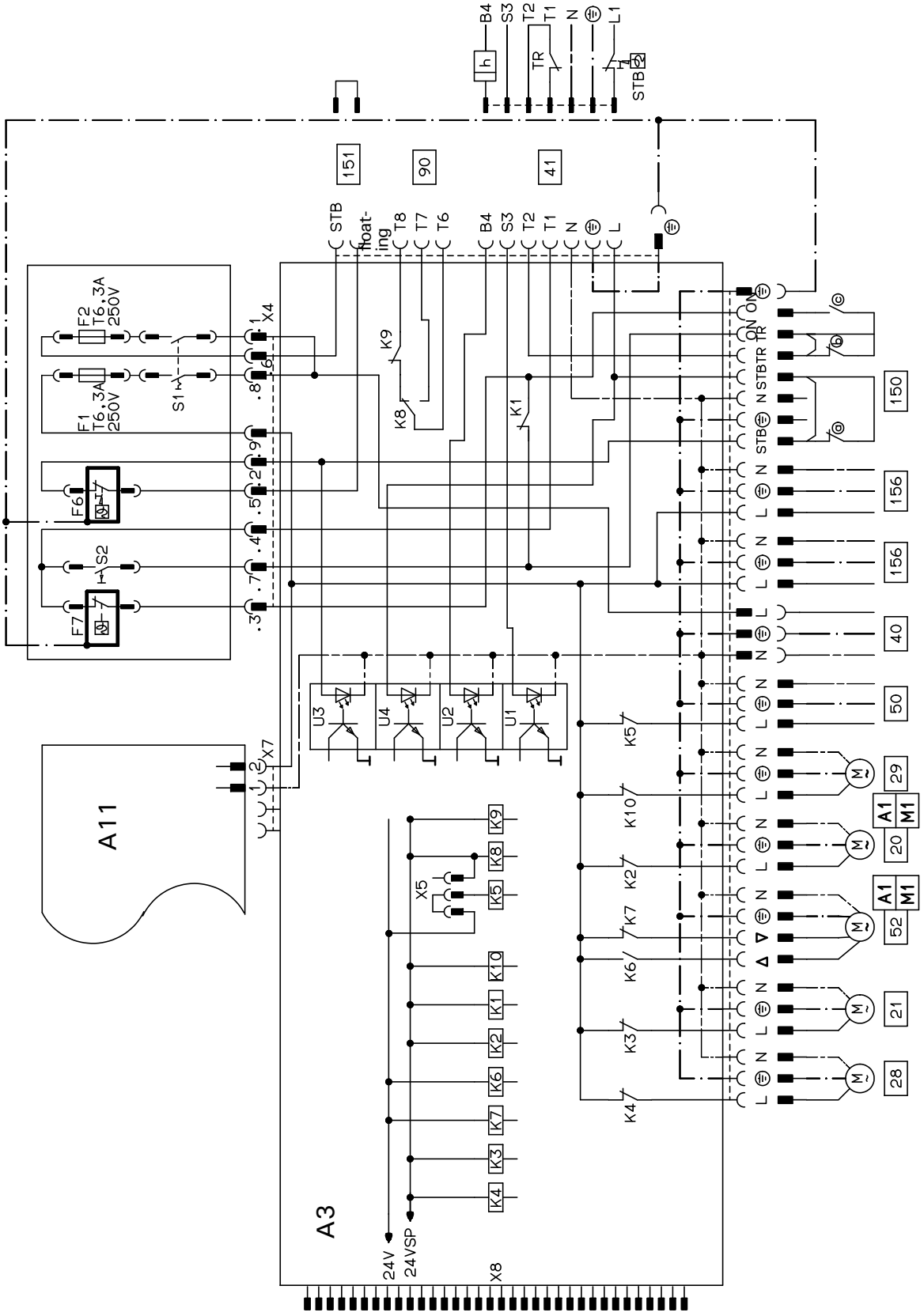
Wiring diagram *(continued)*

Low-voltage motherboard *(continued)*

[1] Outdoor temperature sensor/radio clock receiver (accessory)
[3] Boiler temperature sensor
[5] DHW tank temperature sensor/2nd DHW tank temperature sensor with DHW tank loading system (accessory)
[15] Flue gas temperature sensor (accessory)
[17][A] Temperature sensor of Therm-Control or temperature sensor T1
[17][B] Temperature sensor T2
[143] Connection of external equipment
[145] KM BUS participant (accessory)
[146] Connection of external equipment
LON Connecting cable for data transfer between the control units (accessory)
S3 Emissions test switch "🧹"
V1 Fault indicator (red)
V2 Operating status indicator (green)

Wiring diagram *(continued)*

120 V~ motherboard



Wiring diagram *(continued)*

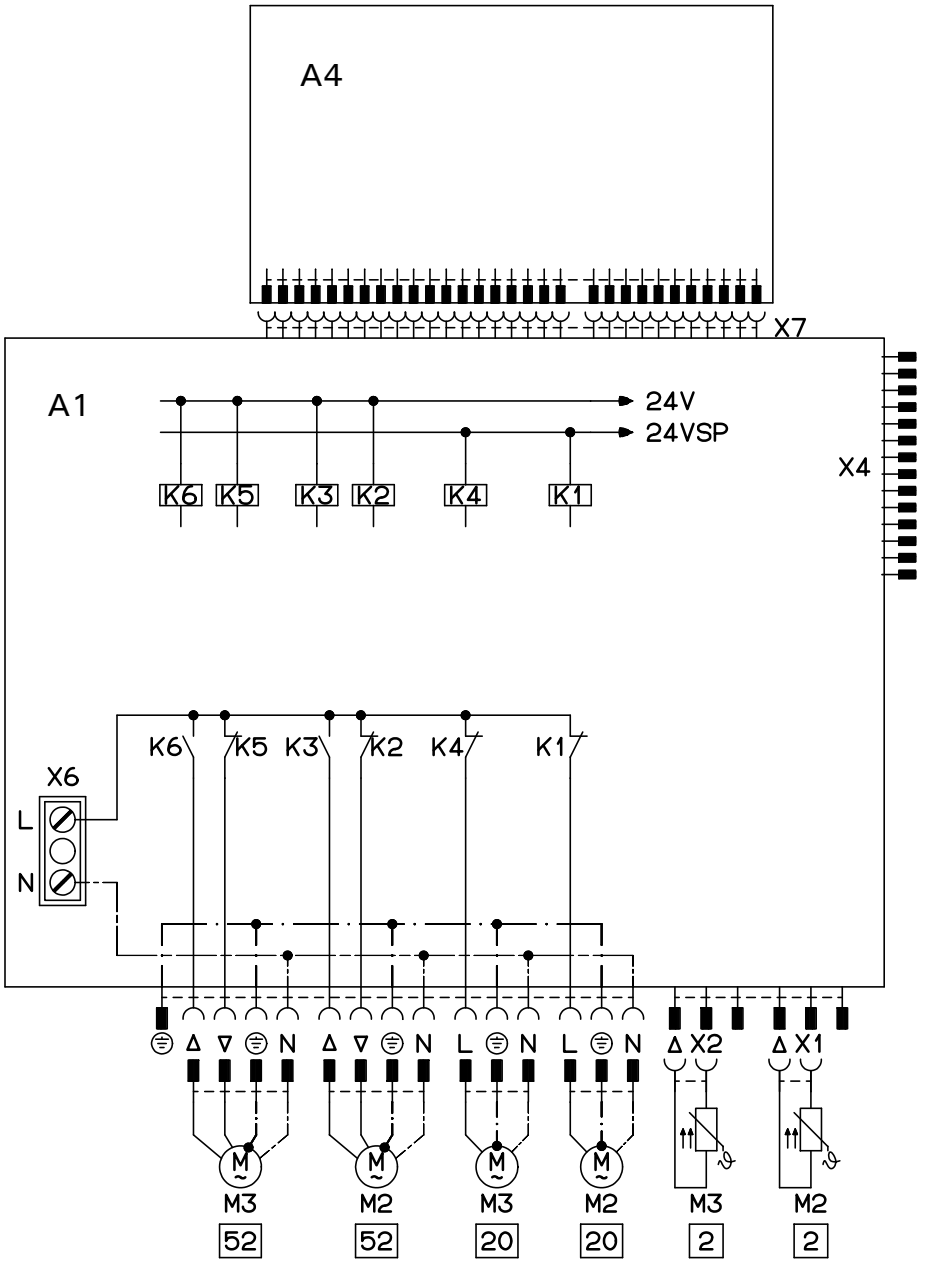
120 V~ motherboard *(continued)*

[20] Heating circuit pump
or
control output
[21] Circulation pump for heating the DHW tank (accessory)
[28] DHW circulation pump (installed on site)
[29] Shunt pump (installed on site)
[40] Mains connection, 50 Hz
[41] Oil/gas burner,
connection to DIN 4791
[50] Central fault indicator (installed on site)
[52] Mixing valve motor for return temperature control
or
3-way mixing valve for DHW tank loading system
[90] Burner (2nd stage/modulating)
[150] External equipment
ⓐ External safety equipment (remove jumper when connecting)
ⓑ External disable (remove jumper when connecting)
ⓒ External burner switch-on (1st stage)
[151] Safety circuit, potential free
[156] Mains connection for accessories

F1, F2 Fuse
F6 Fixed high limit "⇧" 110°C (99°C)
F7 Adjustable high limit "⏲" 95°C
K1-K10 Relay
S1 Heating system on/off switch "⏻"
S2 TEST button

Wiring diagram

Mixing valve extension circuit board



2 Supply temperature sensors
20 Heating circuit pumps
52 Mixing valve motors
K1 - K6 Relays

Parts List

Order No.
7134 555, 7134 556,
7511 362

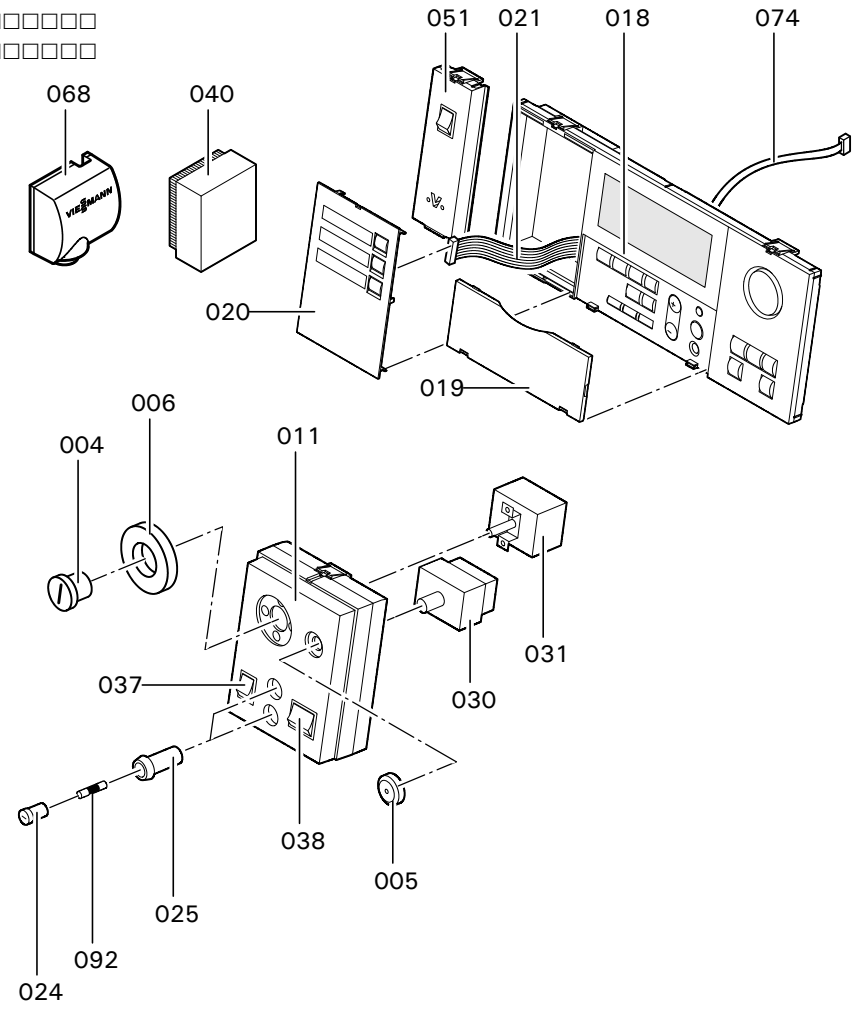
Serial No. *1
7143000□□□□□□□□□
7187101□□□□□□□□□
7248248□□□□□□□□□

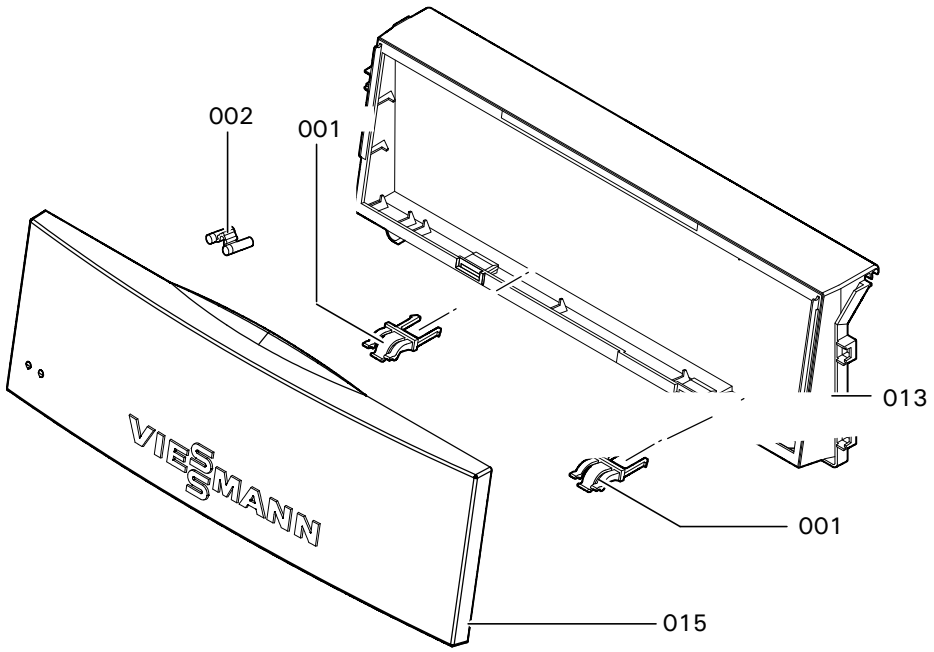
Ordering Replacement Parts:
Please provide product Model and Serial Number from rating plate when ordering replacement parts. Order replacement components from your Viessmann distributor.

Parts

001 Hinges
002 Optic link
004 AHL Knob
005 Fixed high limit cover
006 Dial-stop 110°C/230°F
008 Support arm
011 Safety module (wired)
013 Front housing (with Pos. 001)
014 Circuit board enclosure
015 Flip-down cover
016 Rear housing
018 Programming unit
019 Flip-down cover
020 Front cover for heating circuits
021 Flat cable, 14-pole
024 Fuse holder cover
025 Fuse holder
030 Fixed high limit, 3510mm
031 Adjustable high limit
037 Switch, 1-pole (FHL test)
038 Switch, 2-pole (power on/off)
040 Sensor #1 for outdoor temperature
042 Sensor #3 for boiler
043 Sensor #5 for domestic hot water production
047 LON module
048 Circuit board (mixing valve expansion)
049 Motherboard (control, low voltage)
050 Circuit board (control software)
051 Diagnostics module (Optolink)
052 Motherboard (control, line voltage)
054 Circuit board (120V power supply)
055 Motherboard (mixing valve expansion)

065 Burner cable Nr. 41/90 l=3470
067 Sensor (Immersion, NI500)
068 Sensor #2 for supply
074 Harness for programming unit
092 Fuse 6.3A / 250V (10 pack)

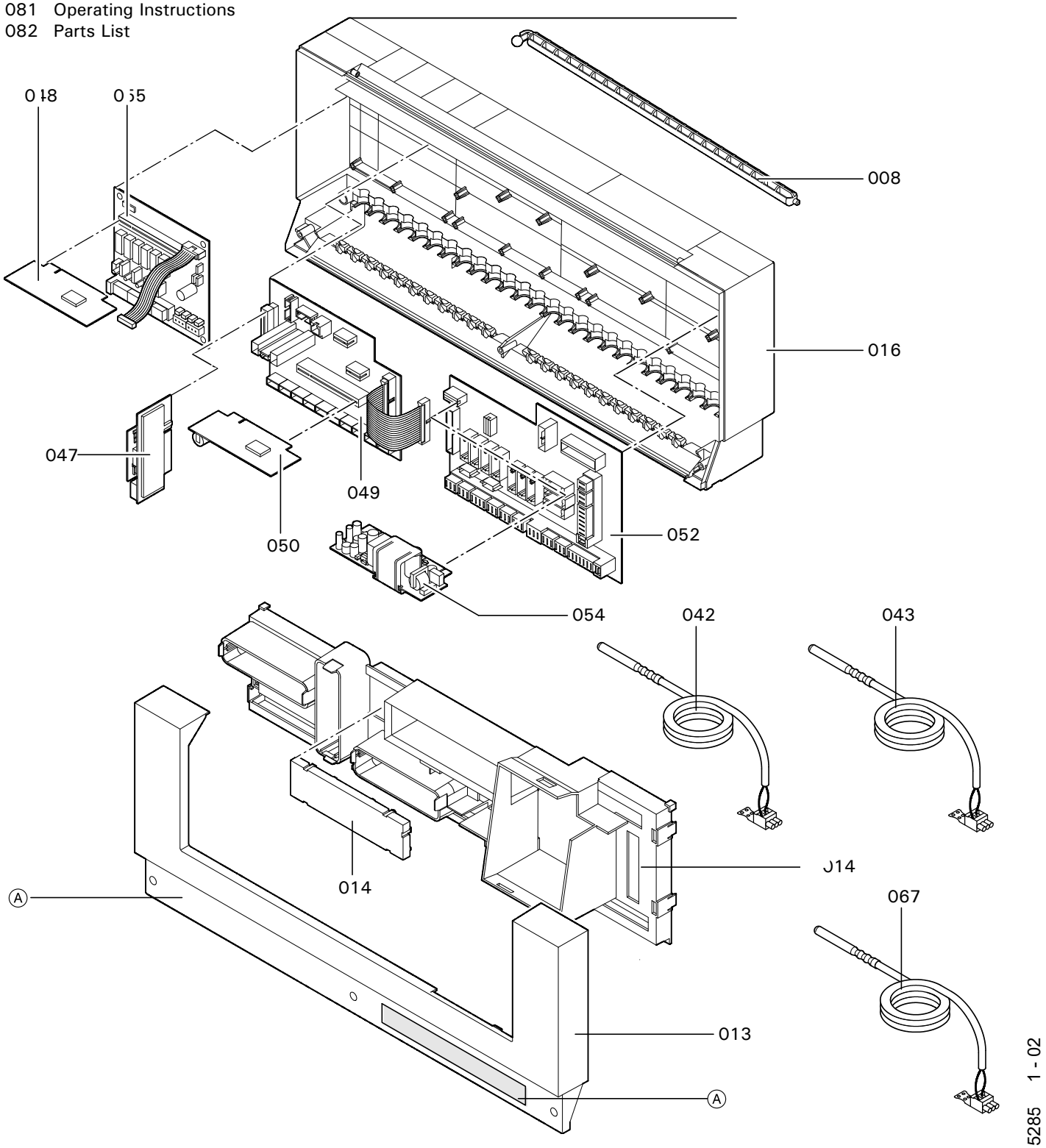




Parts List *(continued)*

Other Parts (not illustrated)
060 Accessory pack (plugs)
061 Coding plug for Vitocrossal 200
062 Coding plug for Vitorond 200
063 Coding plug for Vitocrossal 300
080 Installation / Service Instructions
081 Operating Instructions
082 Parts List

Ⓐ *1 Rating plate
A 16-digit bar-coded serial no. is printed on the front housing, below the flip-down cover.



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Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

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