Installation and Service Instructions

VIESMANN

for use by heating contractor

Please file in Service Binder

Vitosolic 200
Electronic temperature differential control unit for solar heating systems

VITOSOLIC 200

C SA® US

LR 102874

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, severe personal injury,** and/or **loss of life**. 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."*

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

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/end-user with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually before the heating season begins.

Safety Terminology

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

WARNING

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

CAUTION

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

WARNING

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

IMPORTANT

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

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General notes

Over the following pages, the methods of operation have been described, and the installation has been depicted as different system designs. A summary is provided which lists essential control equipment.
The temperatures stated are guide values; other values may be set to meet particular requirements.
The circulation pumps referred to in the examples (contained in Solar-Divicon) are AC pumps.

Please note that the following examples are simplified conceptual drawings only!
Piping and necessary componentry must be field verified.

⚠ ***Safety instructions***
With temperatures higher than 60 °C / 140 °F, DHW temperature must be limited to 60 °C / 140 °F, by installing a mixing device, e.g. a thermostatic mixing valve (DHW tank accessory). The mixing equipment does not prevent the risk of scalding at the tap. The installation of an anti-scald valve at the draw-off point is required.

Abbreviations
KW Cold water
WW Hot water
RL Return to collectors
VL Flow from collectors to storage tank

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System design 1

Dual-mode DHW heating with Vitocell-B 100 or Vitocell-B 300 DHW tanks

DHW heating without solar energy
The upper indirect coil of the DHW tank is heated by a boiler. The tank thermostat with tank temperature sensor ⑥ of the boiler control unit switches tank heating pump ⑦.

DHW heating with solar energy
Solar circuit pump ④ is switched ON and the DHW tank is heated, if a temperature differential higher than temperature differential ΔT_{on} is measured between collector temperature sensor ② and tank temperature sensor ③.

Pump ④ is switched OFF if
- the actual temperature falls below shut-down temperature differential ΔT_{off}
- the electronic temperature limit (safety shut-down at 90 °C / 194 °F,) set at the control unit or that set at the fixed high limit (if required) ⑤ is exceeded.

The additional function requirements are met by circulation pump ⑧.

For optional system extensions, see pages 46 and 47.

Settings

Main menu
└→ Operator code
└→ Set to 200

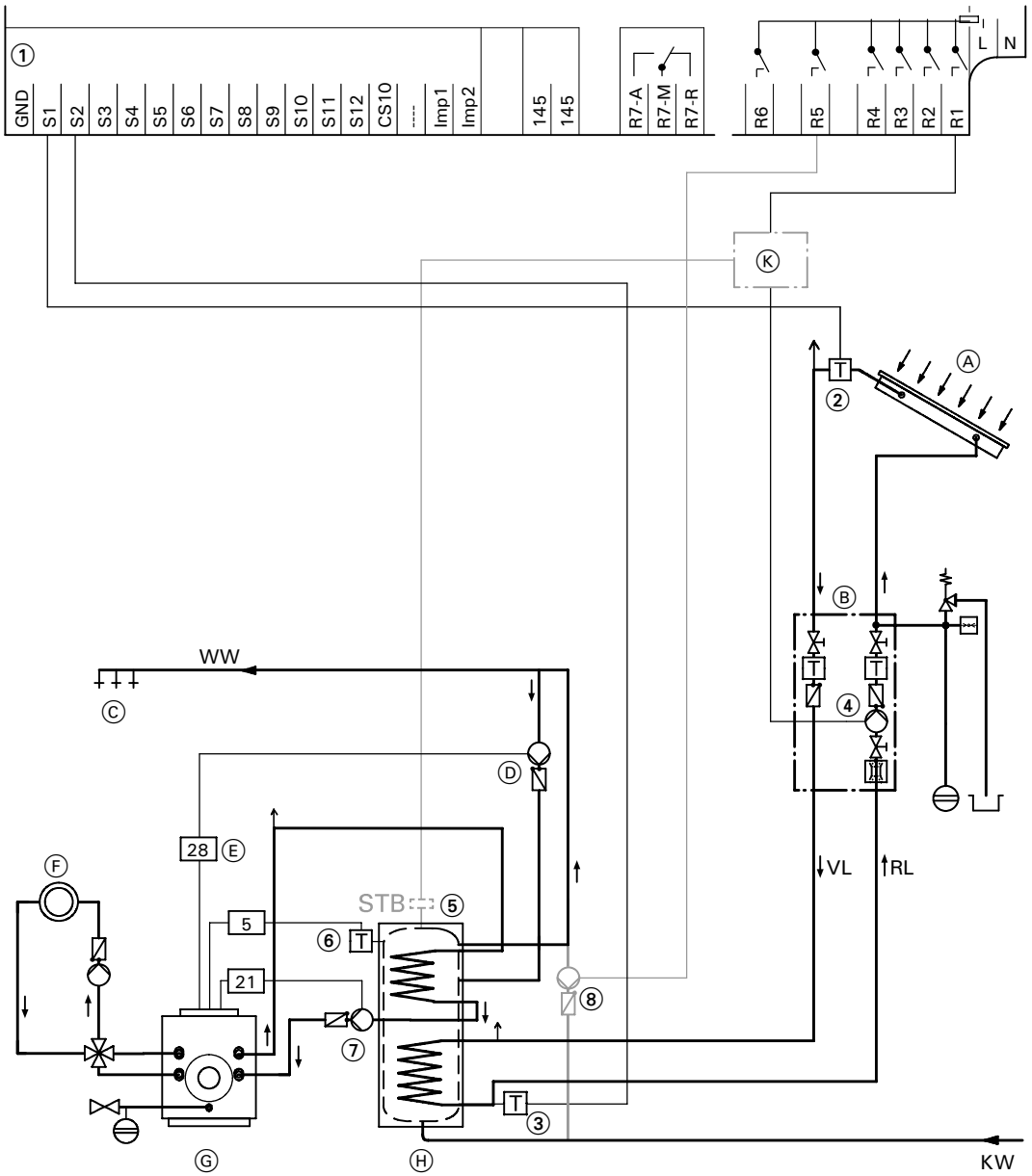
Main menu
└→ Solar
└→ Options
└→ System
└→ Set to 1 (factory default settings)

Main menu
└→ Solar
└→ Setting values

Setting values	Factory default setting	Modified to
T_{cylmax} Maximum tank temperature	60 °C / 140 °F	
ΔT_{on} Start-up temp. differential, circulation pump ④	5.0 °C / 9 °F	
ΔT_{off} Shut-down temp. differential, circulation pump ④	3.0 °C / 5 °F	
$T_{colemoff}$	130 °C / 266 °F*1	

*1 *Set this value to 200 °C / 392 °F if you do not want collector emergency OFF set up.*

System design 1 (cont.)



Ⓐ Solar panel
Ⓑ Solar-Divicon
Ⓒ Draw-off points
Ⓓ DHW circulation
Ⓔ DHW circulation output of boiler control unit or on-site time switch
Ⓕ Heating circuit
Ⓖ Oil/gas fired boiler
Ⓗ DHW tank
Ⓚ Junction box (on-site)

System design 1 (cont.)

Item	Description
	Control of DHW tank heating by solar energy
①	Vitosolic 200
②	Collector temperature sensor
③	Tank temperature sensor*1
④	Solar circuit pump (part of Solar-Divicon)
⑤	Fixed high limit*2 (see page 29)
⑧	DHW tank re-circulation pump
	DHW tank heating by boiler
⑥	Tank temperature sensor
⑦	Tank heating pump*3

*1 *Use a threaded elbow (standard delivery for Vitocell-B 100, accessory for Vitocell-B 300).*
*2 *Vitocell-B 100: observe max. connectable absorber surface;*
Vitocell-B 300: Use a tank cap (DHW tank accessory).
*3 *Standard for Vitodens.*

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System design 2

Dual-mode DHW heating with Vitocell-B 100 or Vitocell-B 300 DHW tanks – 2 collector arrays with different orientation

DHW heating without solar energy
The upper indirect coil of the DHW tank is heated by a boiler. The tank thermostat with connected tank temperature sensor ⑥ of the boiler control unit switches tank heating pump ⑦.

DHW heating with solar energy
Solar circuit pump ④ or ⑩ is switched ON and the DHW tank is heated, if a temperature differential higher than temperature differential ΔT_{on} is measured between collector temperature sensor ② or ⑨ and tank temperature sensor ③.

Pumps ④ or ⑩ are switched OFF if
- the actual temperature falls below shut-down temperature differential ΔT_{off}
- the electronic temperature limit (safety shut-down at 90 °C / 194 °F) set at the control unit or set at the fixed high limit (if required) ⑤ is exceeded.

The additional function requirements are met by circulation pump ⑧.

For optional system extensions, see pages 46 and 47.

Settings

Main menu
└→ Operator code
└→ Set to 200

Main menu
└→ Solar
└→ Options
├→ System
└→ Set to 2
└→ Hyd. type
└→ Set to 1 (factory default settings)

Main menu
└→ Solar
└→ Setting values

Setting values	Factory default setting	Modified to
T_{cylmax} Maximum tank temperature	60 °C / 140 °F	
ΔT_{on} Start-up temp. differential, circulation pump ④ or ⑩	5.0 °C / 9 °F	
ΔT_{off} Shut-down temp. differential, circulation pump ④ or ⑩	3.0 °C / 5 °F	
$T_{colemoff}$	130 °C / 266 °F*1	

*1 *Set this value to 200 °C / 392 °F, if you do not want collector emergency OFF set up.*

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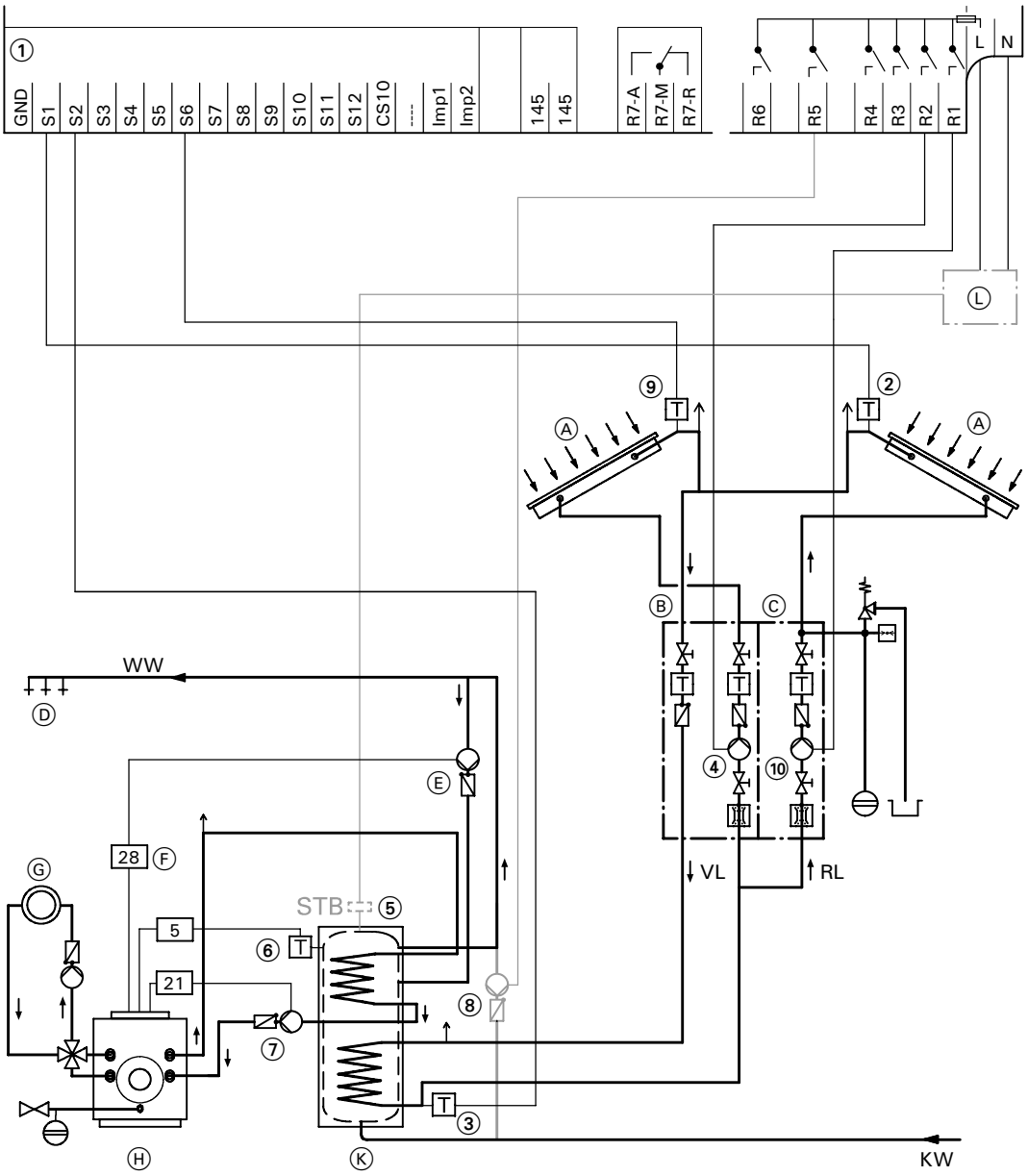
System design 2 (cont.)



Ⓐ Solar panel
Ⓑ Solar-Divicon
Ⓒ Solar pump line
Ⓓ Draw-off points
Ⓔ DHW circulation
Ⓕ DHW circulation output of boiler control unit or on-site timer
Ⓖ Heating circuit
Ⓗ Oil/gas fired boiler
Ⓚ DHW tank
Ⓛ Junction box (on-site)

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System design 2 (cont.)

Item	Description
	DHW tank heating by solar energy
①	Vitosolic 200
②	Collector temperature sensor
③	Tank temperature sensor*1
④	Solar circuit pump (part of Solar-Divicon)
⑤	Fixed high limit*2 (see page 29)
⑧	DHW tank re-circulation pump
⑨	Collector temperature sensor
⑩	Solar circuit pump (contained in solar pump line)
	DHW tank heating by boiler
⑥	Tank temperature sensor
⑦	Tank heating pump*3

*1 *Use a threaded elbow (standard delivery for Vitocell-B 100, accessory for Vitocell-B 300).*
*2 *Vitocell-B 100: observe the max. connectable absorber surface;*
Vitocell-B 300: Use a tank cap (DHW tank accessory).
*3 *Standard for Vitodens*

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System design 3

Dual mode DHW heating and heating backup via a buffer tank

DHW heating without solar energy
The upper indirect coil of the DHW tank is heated by a boiler. The tank thermostat with connected tank temperature sensor ⑥ of the boiler control unit switches tank heating pump ⑦.

DHW heating with solar energy
Solar circuit pump ④ is switched ON and the DHW tank is heated, if a temperature differential higher than temperature differential ΔT_{on} is measured between collector temperature sensor ② and tank temperature sensor ③.
Pump ④ is switched OFF if

- the actual temperature falls below shut-down temperature differential ΔT_{off}
- the electronic temperature limit (safety shut-down at 90 °C / 194 °F) set at the control unit or that set at the high limit safety cut-out (if required) ⑤ is exceeded.

The additional function requirements are met by circulation pump ⑧.

Heating without solar energy
Diverting valve ⑫ is in the "AB-B" position if the differential temperature between buffer tank temperature sensor ⑩ and heating return temperature sensor ⑨ falls below shut-down temperature differential $\Delta T6_{off}$. No flow through the heating water buffer tank takes place.
The boiler provides heat to the heating circuit according to the heating curve set at the boiler control unit.

Heating with solar energy
Circulation pump ⑬ for heating heat exchanger ⑮ is switched ON if the DHW tank cannot be heated and a temperature differential higher than start-up temperature differential $\Delta T2_{on}$ is measured between collector temperature sensor ② and buffer tank temperature sensor ⑪. If the actual temperature falls below shut-down temperature $\Delta T2_{off}$ or when maximum temperature $T_{cyl2max}$ has been reached, it is switched OFF. Buffer tank heating pump ⑭ is switched ON and the buffer tank is heated, if a temperature differential higher than start-up temperature differential $\Delta T5_{on}$ is measured between temperature sensor ⑯ (heat exchanger) and buffer tank temperature sensor ⑪.

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System design 3 (cont.)

The pump will be switched OFF if the actual temperature falls below shut-down temperature differential $\Delta T5_{off}$.
The temperature in the buffer tank is limited by the electronic temperature limiter (safety shut-down at 90 °C / 194 °F) or by the fixed high limit (if required). It will switch buffer tank heating pump ⑬ OFF if the set temperature is exceeded.
Circulation pump ⑬ is switched OFF for approx. 2 minutes, roughly every 15 minutes (values t stop and t circ adjustable, see page 13), to check whether the temperature at the collector temperature sensor is high enough to change over to DHW tank heating. If, during this time, ΔT_{on} is exceeded, the DHW tank continues to be heated.

Diverting valve ⑫ is in the "AB-A" position if the differential temperature between buffer tank temperature sensor ⑩ and heating return temperature sensor ⑨ exceeds start-up temperature differential $\Delta T6_{on}$; the heating return water will be routed to the boiler via the buffer tank. If the temperature of the preheated return water is insufficient, the boiler reheats the water to the necessary supply temperature level.
If the actual temperature falls below shut-down temperature differential $\Delta T6_{off}$, the diverting valve will be in the "AB-B" position.

For optional system extensions, see pages 46 and 47.

Settings

Main menu
└→ Operator code
└→ Set to 200

Main menu
└→ Solar
└→ Options
→ System
└→ Set to 3
→ Hyd. type
└→ Set to 2

Main menu
└→ Solar
└→ Setting values

Setting values	Factory default setting	Modified to
T_{cylmax} Maximum tank temperature	60 °C / 140 °F	
$T_{cyl2max}$ Maximum buffer tank temperature	60 °C / 140 °F	
ΔT_{on} Start-up temp. differential, circulation pump ④	5.0 °C / 9 °F	
ΔT_{off} Shut-down temp. differential, circulation pump ④	3.0 °C / 5 °F	
$\Delta T2_{on}$ Start-up temp. differential, circulation pump ⑬	5.0 °C / 9 °F	
$\Delta T2_{off}$ Shut-down temp. differential, circulation pump ⑬	3.0 °C / 5 °F	
$Priority_{Cyl1}$ (see page 49)	1	
$Priority_{Cyl2}$ (see page 49)	2	
$T_{colemoff}$	130 °C / 266 °F*1	

*1 *Set this value to 200 °C / 392 °F, if you do not want collector emergency OFF set up.*

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System design 3 (cont.)

Main menu
└→ Solar
└→ Contractor

Contractor	Factory default setting	Modified to
t stop Length of pump run interruption	2 min.	
t circ Interruption interval	15 min.	
ΔT Col The collector temperature must rise by ΔT Col during the t stop time, in order to change over to heating the consumer with priority 1	2.0 °C / 4 °F	

Main menu
└→ System
└→ Options

Options	Factory default setting	Change to
Thermost. 2 Thermostat function for maximum temperature Shut-down of buffer tank heating pump ⑭	No	Yes
ΔT Fct5 ΔT function for controlling buffer tank loading pump ⑭	No	Yes
ΔT Fct6 ΔT function for controlling three-way diverting valve ⑫	No	Yes

Main menu
└→ System
└→ Setting values

Setting values	Factory default setting	Change to
$Th2_{on}$ Set the same value as for $T_{cyl2max}$ (maximum buffer tank temperature), less 2 °C / 4 °F	40 °C / 104 °F	
$Th2_{off}$ Set the same value as for $T_{cyl2max}$	45 °°C / 113 °F	
$\Delta T5_{on}$ Start-up temp. differential, circulation pump ⑭	5.0 °C / 9 °F	
$\Delta T5_{off}$ Shut-down temp. differential, circulation pump ⑭	3.0 °C / 5 °F	
$\Delta T6_{on}$ Start-up temperature differential for controlling three-way diverting valve ⑫	5.0 °C / 9 °F	
$\Delta T6_{off}$ Shut-down temperature differential for controlling three-way diverting valve ⑫	3.0 °C / 5 °F	

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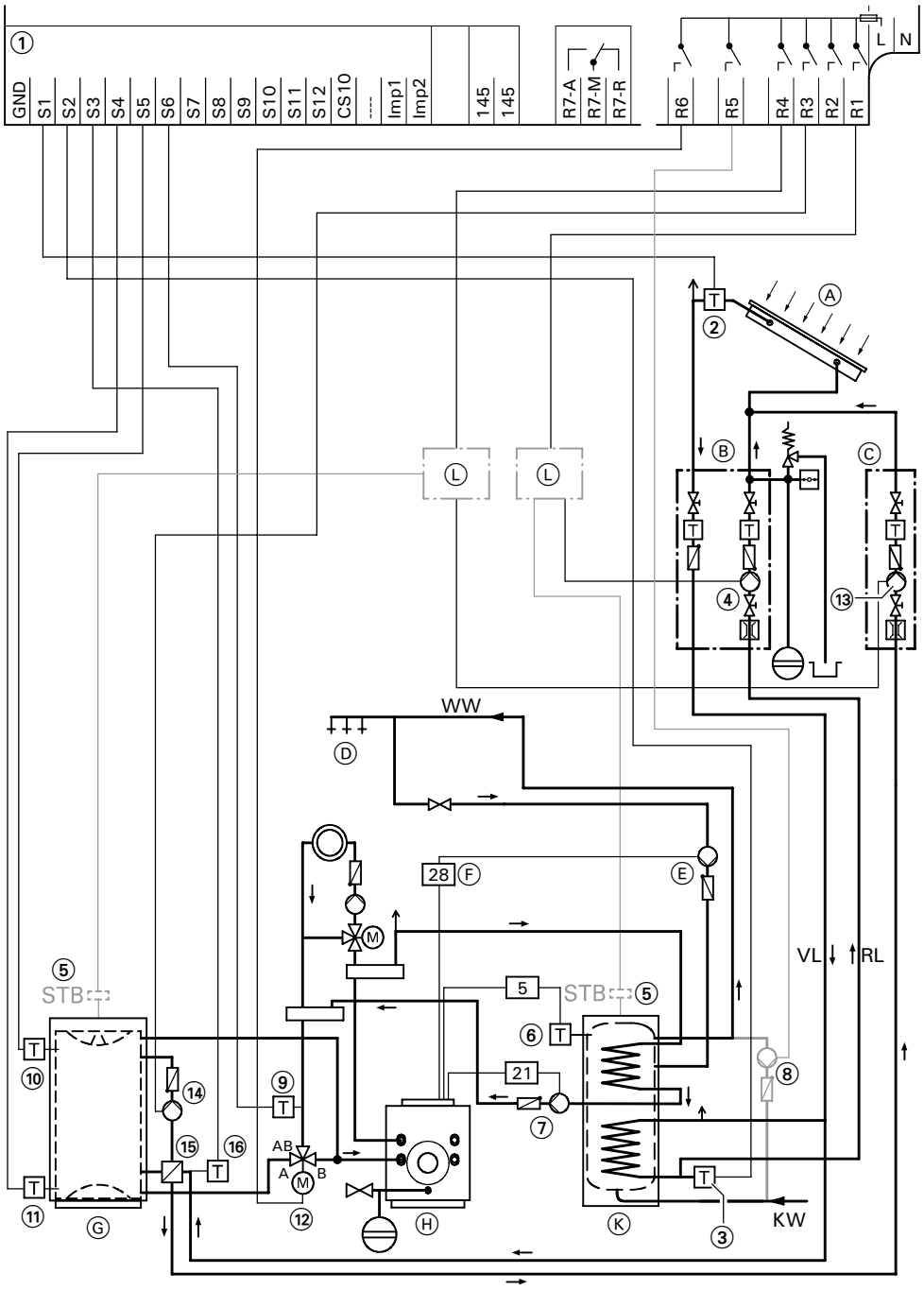
System design 3 (cont.)



Ⓐ Solar panel
Ⓑ Solar-Divicon
Ⓒ Solar pump line
Ⓓ Draw-off points
Ⓔ DHW circulation
Ⓕ DHW circulation output of boiler control unit or on-site timer
Ⓖ Heating water buffer tank
Ⓗ Oil/gas fired boiler
Ⓚ DHW tank
Ⓛ Junction box (on-site)

System design 3 (cont.)

Item	Description
	DHW tank heating by solar energy
①	Vitosolic 200
②	Collector temperature sensor
③	Tank temperature sensor*1
④	Solar circuit pump (part of Solar-Divicon)
⑤	Fixed high limit*2 (see page 29)
⑧	DHW tank re-circulation pump
	DHW tank heating by boiler
⑥	Tank temperature sensor
⑦	Tank heating pump
	Heating with solar energy
⑨	Return temperature sensor (heating circuit)
⑩	Temperature sensor (buffer tank), discharge
⑪	Temperature sensor (buffer tank), reheating
⑫	Three-way diverting valve
⑬	Solar circuit pump for buffer tank heating (contained in solar pump line)
⑭	Circulation pump for buffer tank heating
⑮	Heat exchanger
⑯	Temperature sensor (heat exchanger)

*1 *Use a threaded elbow (standard delivery for Vitocell-B 100, accessory for Vitocell-B 300).*
*2 *Vitocell-B 100: observe the max. connectable absorber surface;*
Vitocell-B 300: Use a tank cap (DHW tank accessory).

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System design 4

Dual mode DHW heating with two DHW tanks

(particularly suitable for retrofitting in existing systems)

DHW heating without solar energy

DHW tank 2 is heated by the boiler. The tank thermostat with connected tank temperature sensor ⑥ of the boiler control unit switches tank heating pump ⑦.
DHW circulation pump ⑧b (if installed) is switched ON and circulation pump ⑧a is switched OFF to ensure that DHW circulation takes place only via DHW tank 2.

DHW heating with solar energy

Solar circuit pump ④ is switched ON and DHW tank 1 is heated, if a temperature differential higher than start-up temperature differential ΔT_{on} is measured between collector temperature sensor ② and tank temperature sensor ③.
Pump ④ is switched off if

- the actual temperature falls below shut-down temperature differential ΔT_{off}
- the electronic temperature limit (safety shut-down at 90 °C / 194 °F) set at the control unit or that set at the fixed high limit (if required) ⑤ is exceeded.

Circulation pump ⑧a is started if the temperature differential between sensors ⑨ and ⑩ is higher than start-up temperature differential $\Delta T6_{on}$ or DHW heating with the additional function has been enabled. The pump will be switched OFF if the actual temperature falls below shut-down temperature differential $\Delta T6_{off}$ or if the additional function is terminated.

The DHW circulation covers both DHW tanks. This feeds the water heated in DHW tank 1 into DHW tank 2. This way, DHW tank 2 is also heated by solar energy.
DHW circulation pump ⑧b (if installed) for DHW tank 2 is controlled by the boiler control unit.

For optional system extensions, see page 46 and 47.

Settings

Main menu
└→ Operator code
└→ Set to 200

Main menu
└→ Solar
└→ Options
└→ System
└→ Set to 1 (factory default settings)

Main menu
└→ Solar
└→ Setting values

Setting values	Factory default setting	Modified to
T_{cylmax} Maximum tank temperature	60 °C / 140 °F	
ΔT_{on} Start-up temp. differential, circulation pump ④	5.0 °C / 9 °F	
ΔT_{off} Shut-down temp. differential, circulation pump ④	3.0 °C / 5 °F	
$T_{colemoff}$	130 °C / 266 °F*1	

*1

Set this value to 200 °C / 392 °F if you do not want collector emergency OFF set up.

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System design 4 (cont.)

Main menu
└→ System
└→ Options

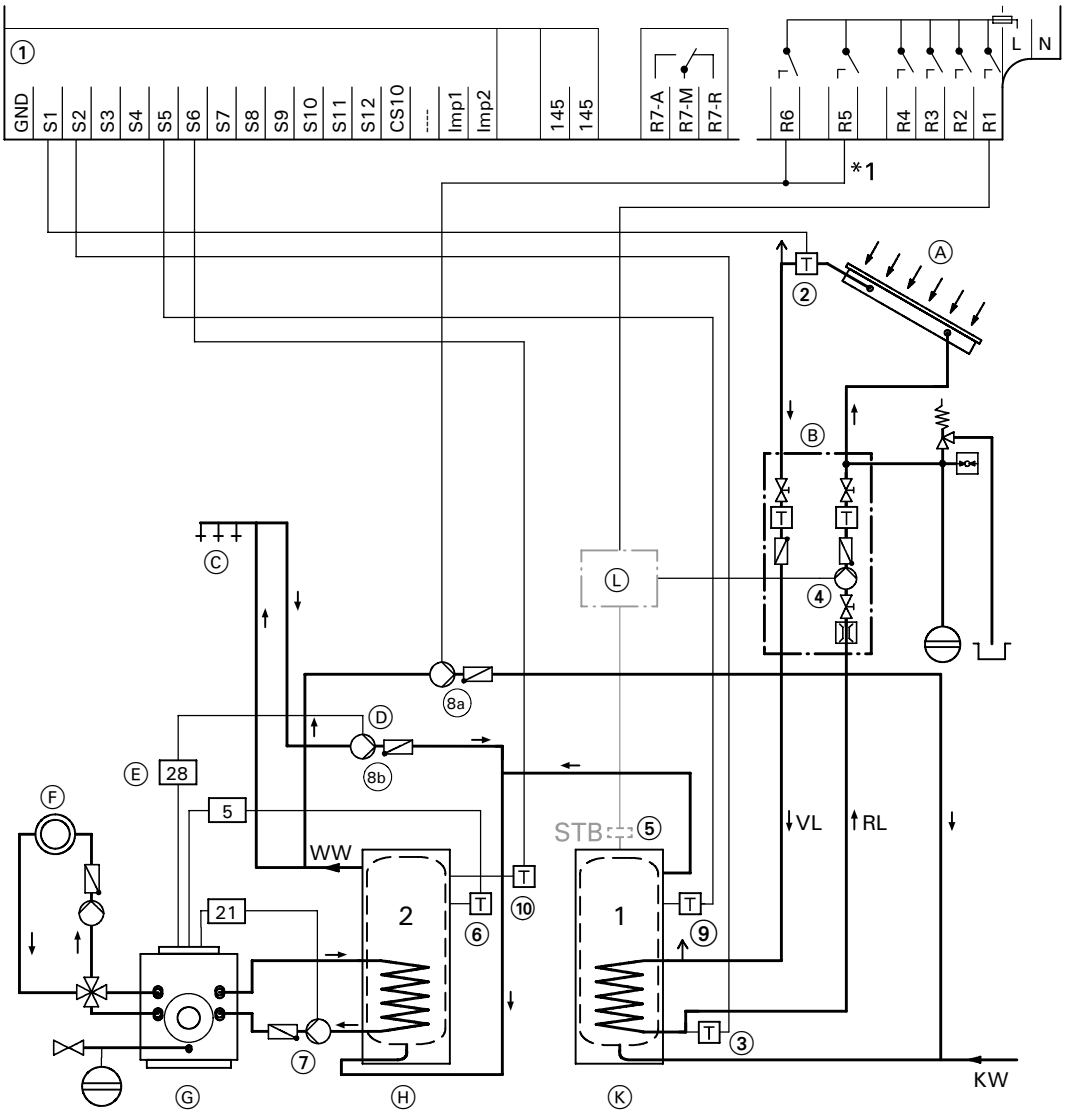
Options	Factory default setting	Change to
ΔT Fct6 ΔT function for controlling circulation pump (8a)	No	Yes
Add. fct. Additional function for DHW heating	No	Yes

Main menu
└→ System
└→ Setting values

Setting values	Factory default setting	Modified to
$\Delta T6_{on}$ Start-up temperature differential for circulation pump (8a)	5.0 °C / 9 °F	
$\Delta T6_{off}$ Shut-down temperature differential for circulation pump (8a)	3.0 °C / 5 °F	

System design 4 (cont.)

Installation diagram 4
(System with two DHW tanks with indirect coils)



Ⓐ Solar panel
Ⓑ Solar-Divicon
Ⓒ Draw-off points
Ⓓ DHW circulation
Ⓔ DHW circulation output of boiler control unit or on-site time switch
Ⓕ Heating circuit
Ⓖ Oil/gas fired boiler
Ⓗ DHW tank 2
Ⓚ DHW tank 1
Ⓛ Junction box (on-site)

*1 *Insert jumper; pump* 8a *for the additional function* ***and*** *re-circulation.*

System design 4 (cont.)

Item	Description
	Heating DHW tank 1 through solar energy
①	Vitosolic 200
②	Collector temperature sensor
③	Tank temperature sensor*1
④	Solar circuit pump (part of Solar-Divicon)
⑤	Fixed high limit*2 (see page 29)
	Heating DHW tank 2 by boiler
⑥	Tank temperature sensor
⑦	Tank heating pump*3
	DHW circulation changeover
⑧	DHW circulation pump or (buffer tank) re-circulation pump
⑨	Temperature sensor tank 1
⑩	Temperature sensor tank 2

*1 *Use a threaded elbow (standard delivery for Vitocell-B 100, accessory for Vitocell-B 300).*
*2 *Vitocell-B 100: observe the max. connectable absorber surface;*
Vitocell-B 300: Use a tank cap (DHW tank accessory).
*3 *Standard for Vitodens*

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System design 5

Dual mode DHW and swimming pool heating

DHW heating without solar energy
The top part of the DHW tank is heated by the boiler. The tank thermostat with connected tank temperature sensor ⑥ of the boiler control unit switches tank heating pump ⑦.

DHW heating with solar energy
Solar circuit pump ④ is switched ON and the DHW tank is heated, if a temperature differential higher than start-up temperature differential ΔT_{on} is measured between collector temperature sensor ② and tank temperature sensor ③.
Pump ④ is switched OFF if
- the actual temperature falls below shut-down temperature differential ΔT_{off} or when maximum temperature T_{cylmax} has been reached
- the electronic temperature limit (safety shut-down at 90 °C / 194 °F) set at the control unit or set at the fixed high limit (if required) ⑤ is exceeded.

The additional function requirement are met by circulation pump ⑧.

Swimming pool heating
When the maximum tank temperature T_{cylmax} has been achieved or if the DHW tank cannot be heated any further, the system checks whether heat exchanger 1 can be heated up. Circulation pump ⑩ is switched ON if a temperature differential higher than start-up temperature differential $\Delta T2_{on}$ is measured between collector temperature sensor ② and temperature sensor ⑨. The pump is switched OFF if the actual temperature falls below shut-down temperature differential $\Delta T2_{off}$ or when maximum temperature $T_{cyl2max}$ has been reached.
Circulation pump ⑩ is switched OFF for approx. 7 minutes, roughly every 30 minutes (values t stop and t circ adjustable, see page 22), to check whether the temperature at the collector temperature sensor is high enough to change over to DHW tank heating.
Circulation pump ⑪ for swimming pool heating is switched ON if a temperature differential higher than start-up temperature differential $\Delta T5_{on}$ is measured between collector temperature sensor ⑨ and temperature sensor ⑫. Pump ⑪ is switched OFF if the actual temperature falls below shut-down temperature differential $\Delta T5_{off}$ or when set temperature $Th2_{off}$ has been reached.

When the solar energy is insufficient to heat the swimming pool, the heating of the swimming pool will be taken over by the oil/gas fired boiler via temperature sensor ⑭ in heat exchanger 2.
Circulation pump ⑯ and filter pump ⑰ are switched ON if the actual temperature falls below $Th3_{on}$, and OFF when $Th3_{off}$ has been reached.
The filter time and any boiler backup should fall outside those times when heating by solar energy can be expected. Set the start and stop times via time switch 2.

For optional system extensions, see pages 46 and 47.

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System design 5 (cont.)

Settings

Main menu
└→ Operator code
└→ Set to 200

Main menu
└→ Solar
└→ Options
├→ System
└→ Set to 3
└→ Hyd. type
└→ Set to 2

Main menu
└→ Solar
└→ Setting values

Setting values	Factory default setting	Modified to
T_{cylmax} Maximum tank temperature	60 °C / 140 °F	
$T_{cyl2max}$ Maximum swimming pool temperature	60 °C / 140 °F	28 °C / 82 °F
ΔT_{on} Start-up temp. differential, circulation pump ④	5.0 °C / 9 °F	
ΔT_{off} Shut-down temp. differential, circulation pump ④	3.0 °C / 5 °F	
$\Delta T2_{on}$ Start-up temp. differential, circulation pump ⑩	5.0 °C / 9 °F	
$\Delta T2_{off}$ Shut-down temp. differential, circulation pump ⑩	3.0 °C / 5 °F	
$Priority_{Cyl1}$ (see page 49)	1	
$Priority_{Cyl2}$ (swimming pool) (see page 49)	2	
$T_{colemoff}$	130 °C / 266 °F*1	

*1 *Set this value to 200 °C / 392 °F, if you do not want collector emergency OFF set up.*

System design 5 (cont.)

Main menu
└→ Solar
└→ Contractor

Contractor	Factory default setting	Change to
t stop Length of pump run interruption	2 min.	7 min.
t circ Interruption interval	15 min.	30 min.
ΔT Col The collector temperature must rise by ΔT Col during the t stop time, in order to change over to heating the consumer with priority 1	2 °C / 4 °F	

Main menu
└→ System
└→ Options

Options	Factory default setting	Change to
Thermost. 2 Thermostat function for maximum temperature Shut-down of swimming pool circulation pump ⑪	No	Yes
ΔT Fct5 ΔT function for controlling swimming pool circulation pump ⑪	No	Yes
Thermost. 3 Thermostat function for reheating of swimming pool by boiler using pump ⑯	No	Yes
Time switch 2[*1]	No	Yes

[*1] *System time/setting values/setting time switch 2 (see page 58).*

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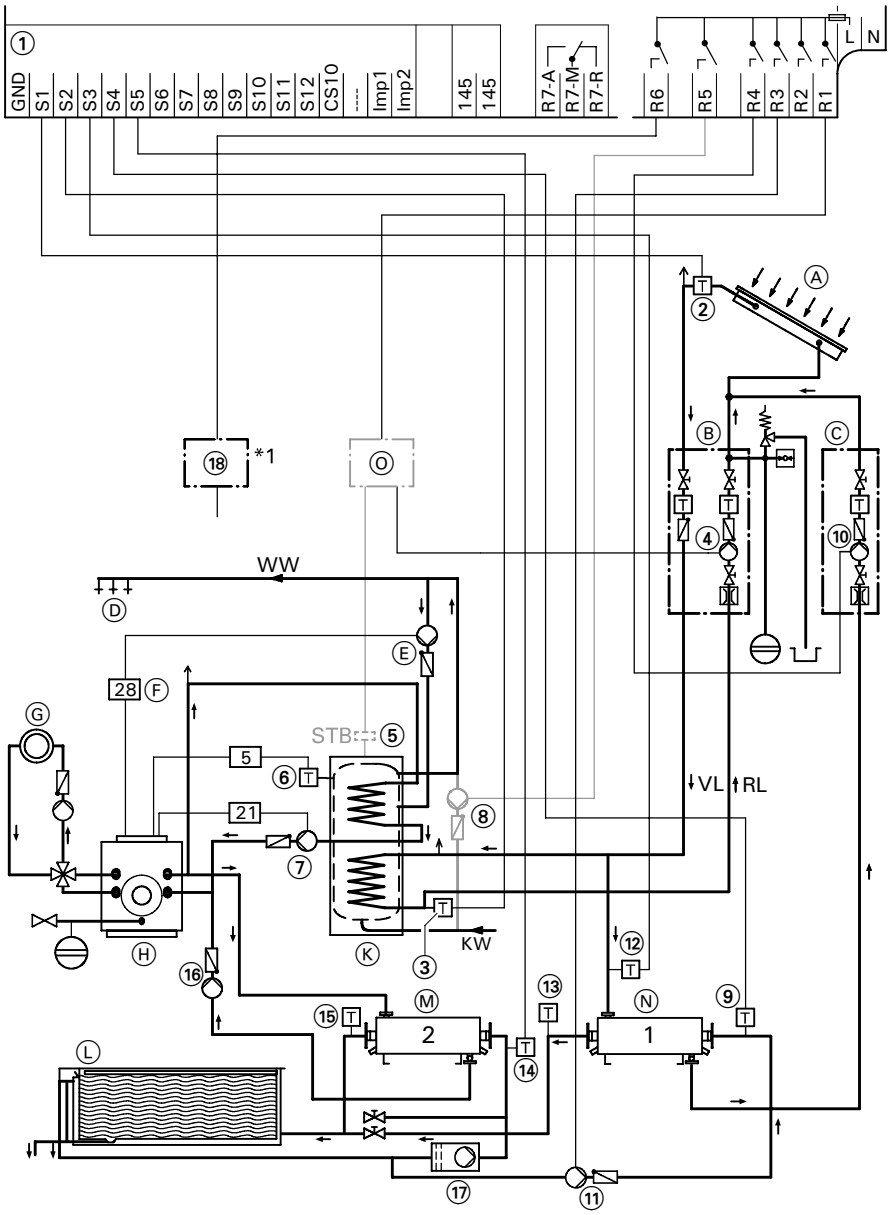
System design 5 (cont.)

Main menu
└→ System
└→ Setting values

Setting values	Factory default setting	Modified to
$Th2_{on}$ set same value as for $T_{cyl2max}$ (maximum swimming pool temperature), less 0.5 °C / 1 °F	40 °C / 104 °F	27.5 °C / 81.5 °F
$Th2_{off}$ set same value as for $T_{cyl2max}$	45 °C / 113 °F	28 °C / 82.5 °F*1
$\Delta T5_{on}$ Start-up temperature differential for swimming pool circulation pump ⑪	5.0 °C / 9 °F	
$\Delta T5_{off}$ Shut-down temperature differential for swimming pool circulation pump ⑪	3.0 °C / 5 °F	
$Th3_{on}$ Start-up temperature for circulation pump ⑯ for swimming pool re-circulating and filter pump ⑰	40 °C / 104 °F	26.5 °C / 80 °F
$Th3_{off}$ Shut-down temperature for circulation pump ⑯ for swimming pool re-circulating and filter pump ⑰	45 °C / 113 °F	27 °C / 80.5 °F*2

*1 *If necessary, set a value 1 to 2 °C / 4 °F higher. Note that this may raise the relative humidity in indoor swimming pools.*
*2 *When changing this value, also modify $Th3_{on}$ by the same value.*

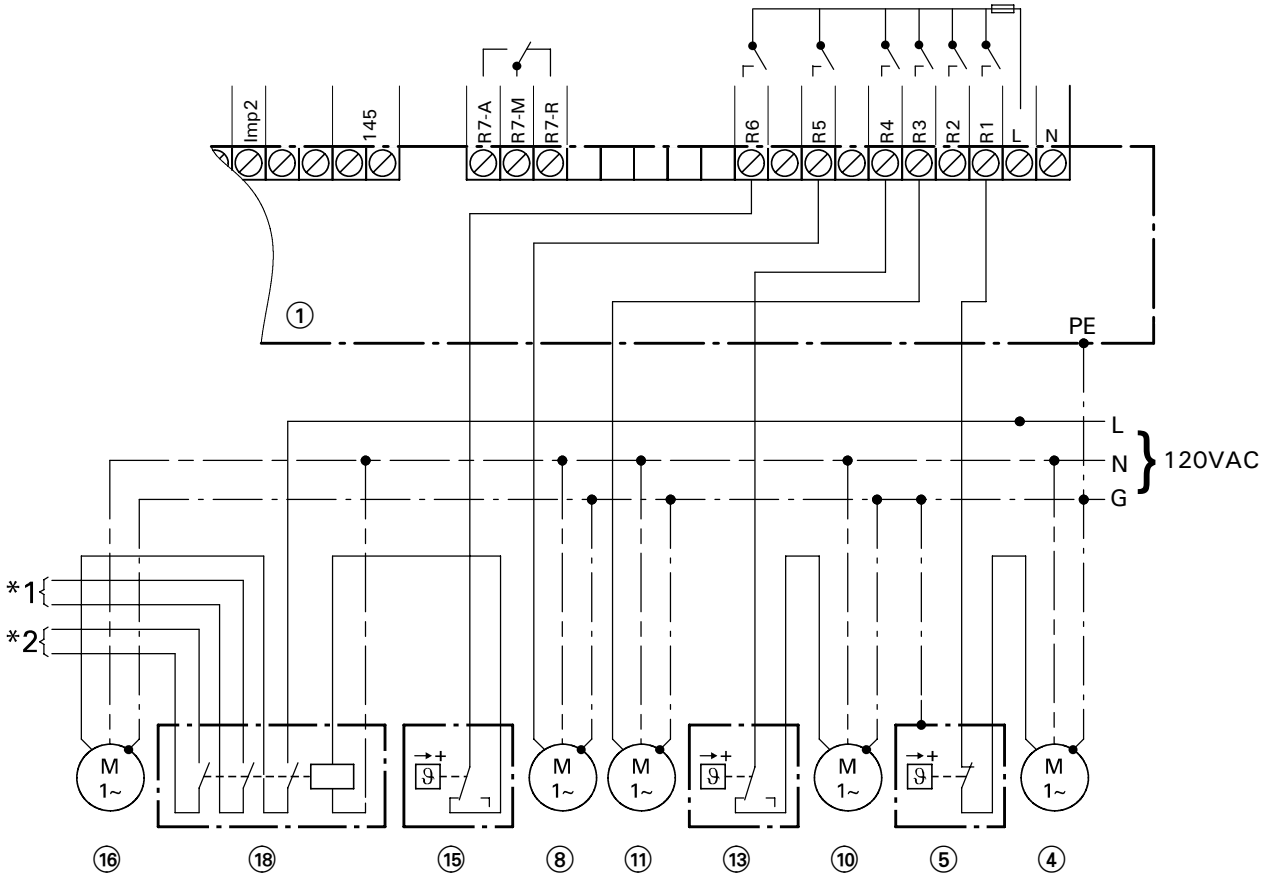
System design 5 (cont.)



Ⓐ Solar panel
Ⓑ Solar-Divicon
Ⓒ Solar pump line
Ⓓ Draw-off points
Ⓔ DHW circulation
Ⓕ DHW circulation output of boiler control unit or on-site timer
Ⓖ Heating circuit
Ⓗ Oil/gas fired boiler
Ⓚ Dual mode DHW tank
Ⓛ Swimming pool
Ⓜ Heat exchanger 2
Ⓝ Heat exchanger 1
Ⓞ Junction box (on-site)

*1 *Wiring diagram, see page 25.*

System design 5 (cont.)



*1 *Start-up signal for filter system with pump ⑰.*

*2 *In conjunction with*

- *Viessmann Trimatik:*
  Connection to terminals "X3.3" and "X3.4" inside FT module.
- *Dekamatik:*
  Connection for "Heat demand input ON" control (separate installation instructions).
- *Vitotronic 200 and 300:*
  Connection in plug "150" to terminals "ON", "ON" or in socket "DE4" in switching module V in plug "103" to terminals "1" and "2".
- *Vitodens with weather-compensated control unit:*
  Connection in plug "X4" to terminals "X4.1" and "X4.2".

System design 5 (cont.)

Item	Description
	DHW tank heating by solar energy
①	Vitosolic 200
②	Collector temperature sensor
③	Tank temperature sensor*1
④	Solar circuit pump (part of Solar-Divicon)
⑤	Fixed high limit*2 (see page 29)
⑧	DHW tank re-circulation pump
	DHW tank heating by boiler
⑥	Tank temperature sensor
⑦	Tank heating pump
	Swimming pool heating by solar energy
⑨	Temperature sensor (swimming pool)
⑩	Solar circuit pump for swimming pool heating (contained in solar pump line)
⑪	Circulation pump for swimming pool heating
⑫	Temperature sensor (heat exchanger 1)
⑬	Temperature limiter (max. limit)
	Swimming pool heating by boiler
⑭	Temperature sensor (heat exchanger 2)
⑮	Temperature limiter (max. limit)
⑯	Circulation pump for swimming pool heating (re-circulating)
⑰	Pump, filter system
⑱	Contactor relay

*1 *Use a threaded elbow (standard delivery for Vitocell-B 100, accessory for Vitocell-B 300).*
*2 *Vitocell-B 100: observe the max. connectable absorber surface;*
Vitocell-B 300: Use a tank cap (DHW tank accessory).

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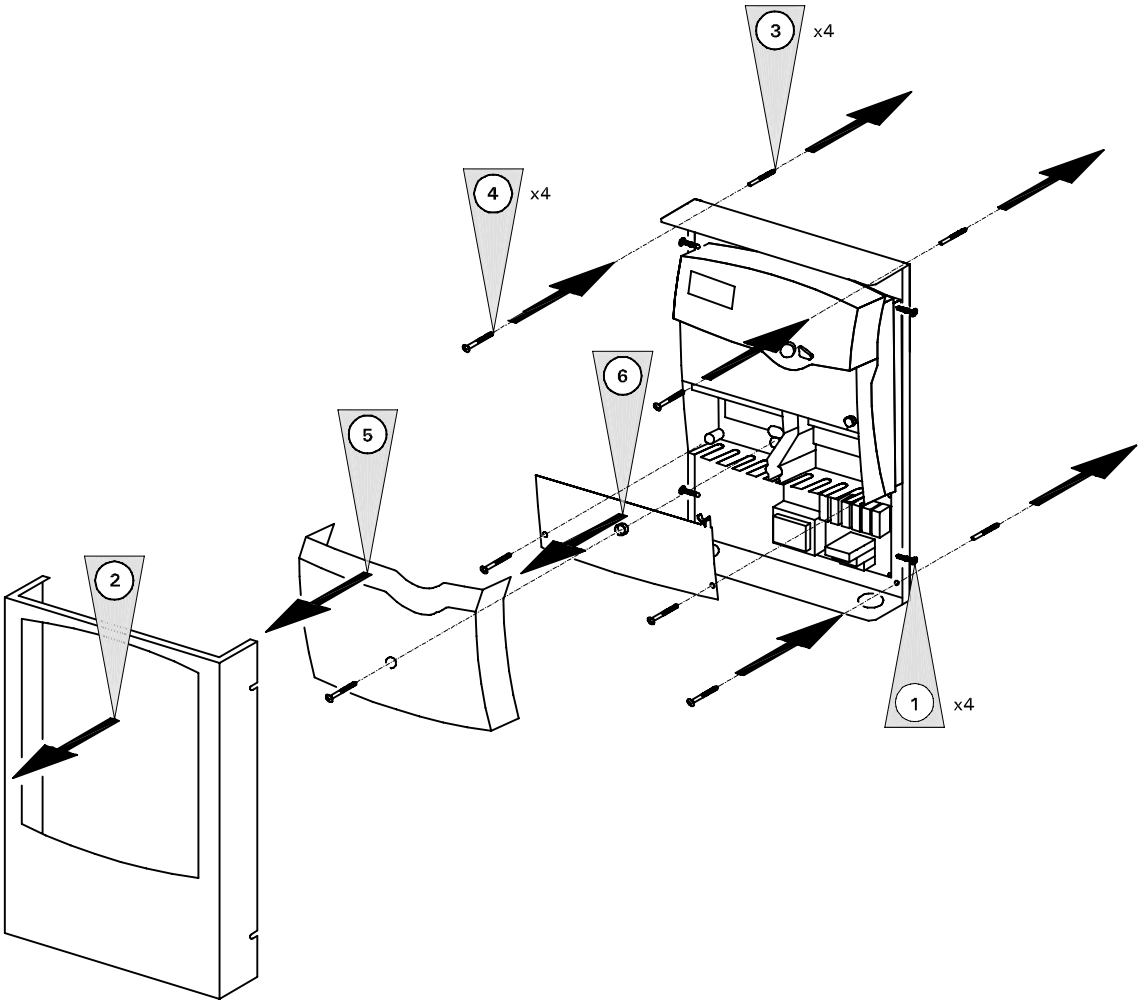
Control unit installation

Installation location
Near the DHW tank, observing the electric connections or their cable/lead lengths



1.Loosen four screws fastening control housing cover to base. Two screws on each side of control.

2.Removed front section of control housing by pulling forward from base.

3.Install anchors into wall used to fasten control base to. These may or may not be required depending on material of wall.

4.Using supplied screws, fasten control base to wall material.

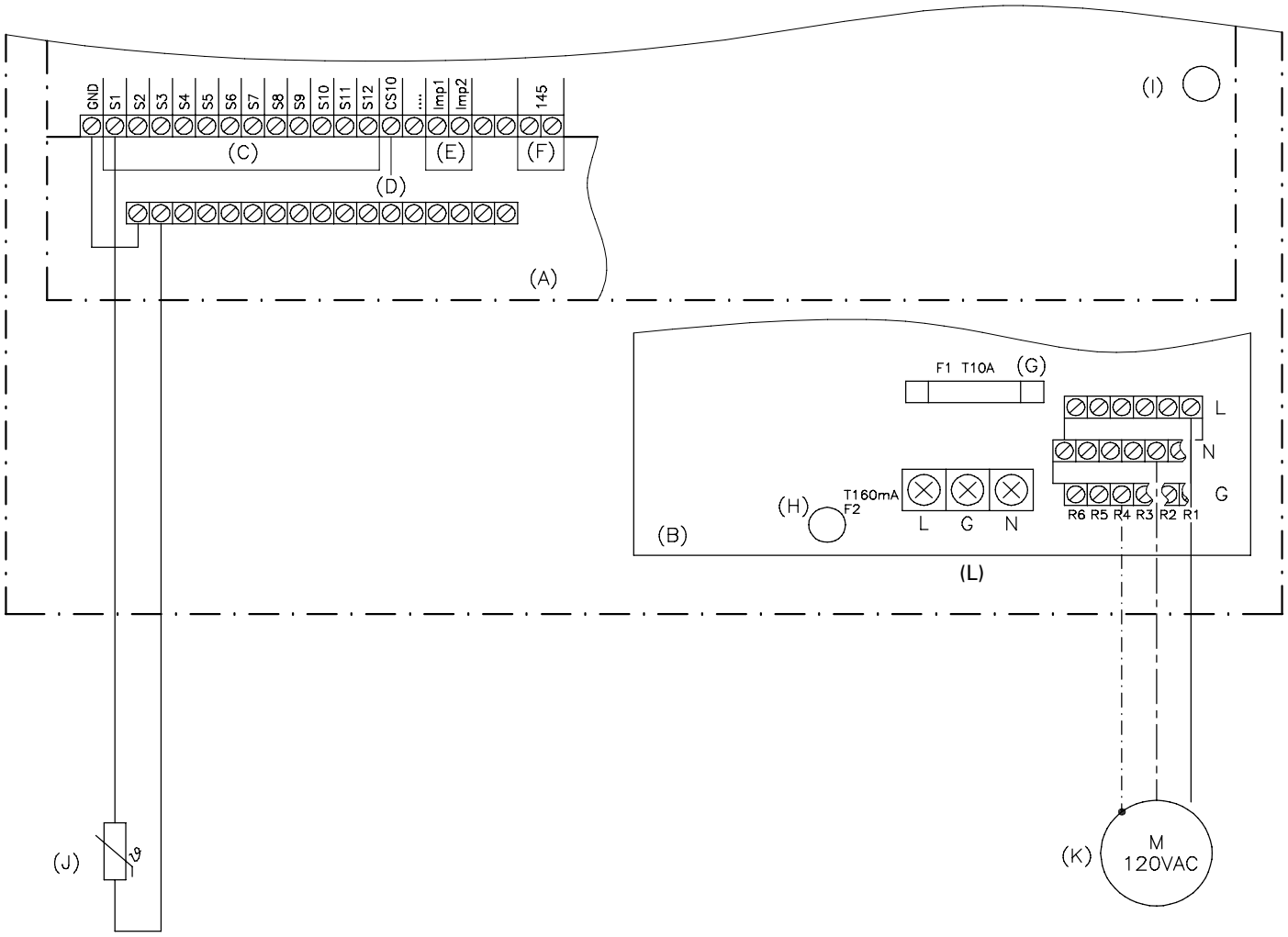
5.Loosen screw in middle of Vitosolic control to gain access to control fuse.

6.Loosen screws on either side of secondary cover to gain access to connection chamber.

Reverse disassembly procedure to reassemble control. Ensure all fasteners are tightened sufficiently.

Before closing the control unit, make the electrical connections in accordance with the respective system design.

Summary of electrical connections



Ⓐ Control Unit connection chamber
Ⓑ Printed Circuit Board
Ⓒ Sensor inouts for Pt 500
Ⓓ Solar cells CS 10
Ⓔ Pulse counter inputs for connection of volume measuring equipment
Ⓕ KM BUS
Ⓖ Fuse 10A - Time delay
Ⓗ Fuse 160mA - Time delay
Ⓘ Fuse 6.3A - Time delay
Ⓙ Example of sensor connection (as shown)
Ⓚ Solar circuit pump
Ⓛ 120 VAC power supply (see page 34)

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Actuators (pumps and valves)

Installation

The Solar-Divicon pump station includes the solar loop circulation pump.
Alternative pumps must be type-tested and installed in accordance with manufacturer's instructions.

Connection

In accordance with system design and page 28.
Connect the actuator neutral and ground conductors with the respective central terminal block (N and G).

Rated current: 10 FLA Total

Fixed high limit

DIN 4751 and DIN 4753 make the installation of an additional fixed high limit compulsory for DHW tanks operated with solar energy, if the DHW volume is

- smaller than 30 litres/m^2 (0.7 gallons/ft^2) absorber surface when using Vitosol 100
- smaller than 100 litres/m^2 (2.4 gallons/ft^2) absorber surface when using Vitosol 300.

Installation

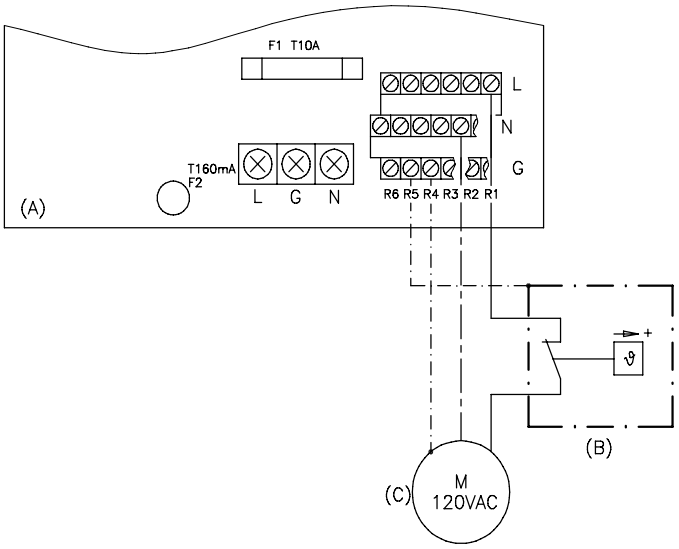
Install the fixed high limit into the tank cap (accessory for Vitocell 300).
Alternately, the fixed high limit should be installed in the hot water outlet of the solar storage tank.

Separate installation instructions

Fixed high limit (cont.)

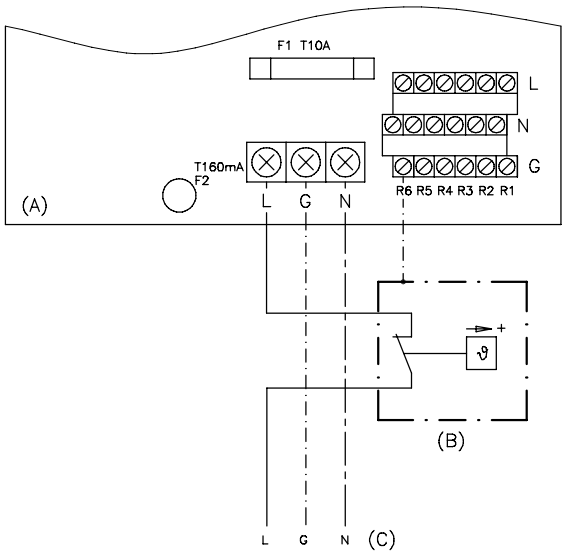
Connection

Three-conductor cable AWG 14.



Ⓐ Printed circuit board
Ⓑ Fixed high limit
Ⓒ Solar circuit pump

For system design 2:



Ⓐ Printed circuit board
Ⓑ Fixed high limit
Ⓒ Power supply, 120VAC, 10FLA

In this case, the control unit will be switched OFF as soon as the fixed high limit trips out.
If control units are used in conjunction with a KM BUS, the boiler control unit will also display an appropriate fault message.

Temperature setting

Factory default settings: 120 °C / 248 °F
Adjustment to 95 °C / 203 °F required

Separate installation instructions

Solar cell

Installation

Separate installation instructions

The solar cell is marked with a letter which must be entered into Vitosolic during commissioning:

enter here.

Connection

See page 28.

⚠ *Observe polarity.*

Two conductor cable AWG 16

⚠ *Solar cells are matched up at the factory. Carry out a new match (only for **disconnected** solar cells) **only** during service work.*

Sensors

Collector temperature sensor

Installation

Collector installation instructions

Connection

In accordance with system design and page 28.
Extension:
Two conductor cable AWG 16.

Tank temperature sensor

The tank temperature is recorded indirectly through measuring the temperature of the heat transfer medium inside the indirect coil (return).
This results in reheating through solar energy even if only a little DHW is drawn off.

Installation

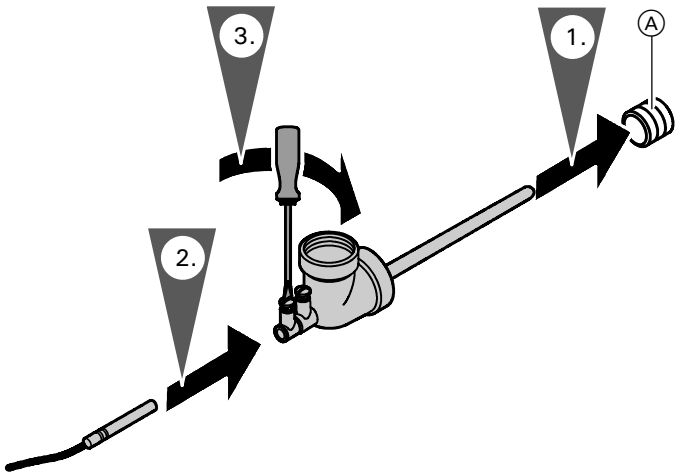
Vitocell-B 100

Tank installation instructions

Connection

In accordance with system design and page 28.
Extension:
Two conductor cable AWG 16.

Vitocell-B 300

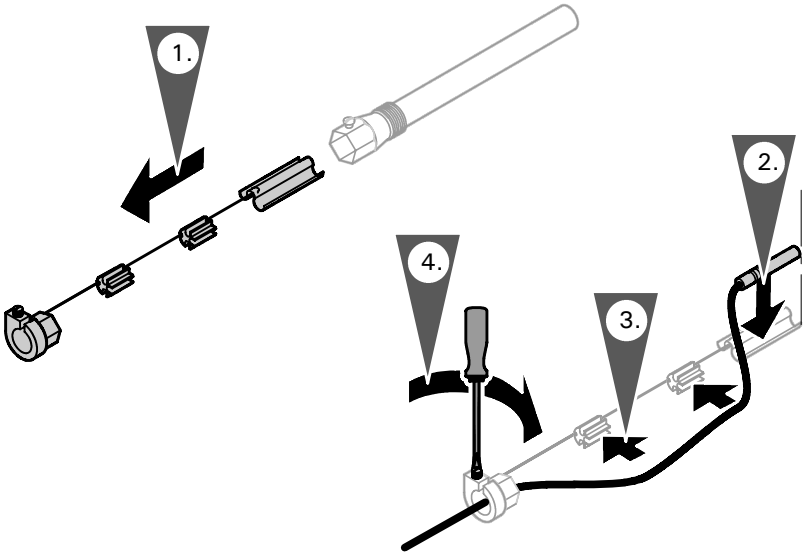


Ⓐ Heating return connection

Sensors (cont.)

Additional tank temperature sensors

Installation



Please note:
Never wrap insulating tape around sensor.
Seal-in the sensor well.

Temperature sensor (swimming pool):

Install the sensor into the swimming pool return, upstream of the heat exchanger. An immersion type sensor well is recommended.

For installation, see documentation of swimming pool manufacturer or heat exchanger installation instructions (if installed).

Connection

In accordance with system design and page 28.
Extension:
Two conductor cable AWG 16.

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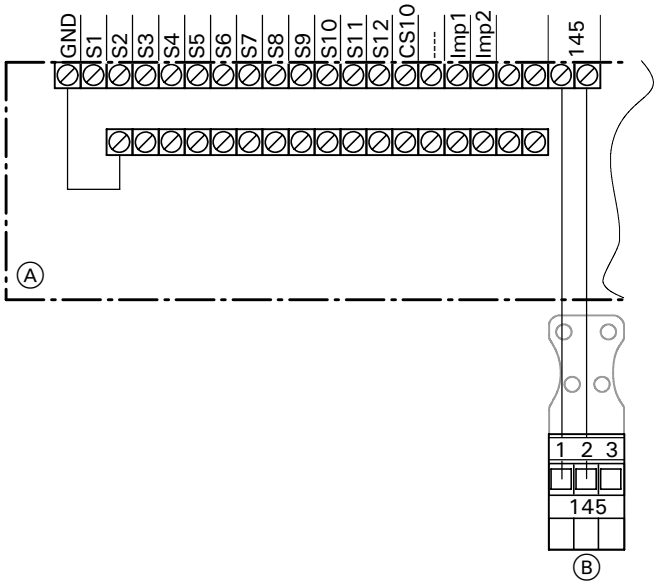
KM BUS connection

Connections with Vitotronic control units via KM BUS.
Connect plug [145] (enclosed) to terminal block 145 in Vitosolic.

Replace the printed circuit board in the boiler control unit:

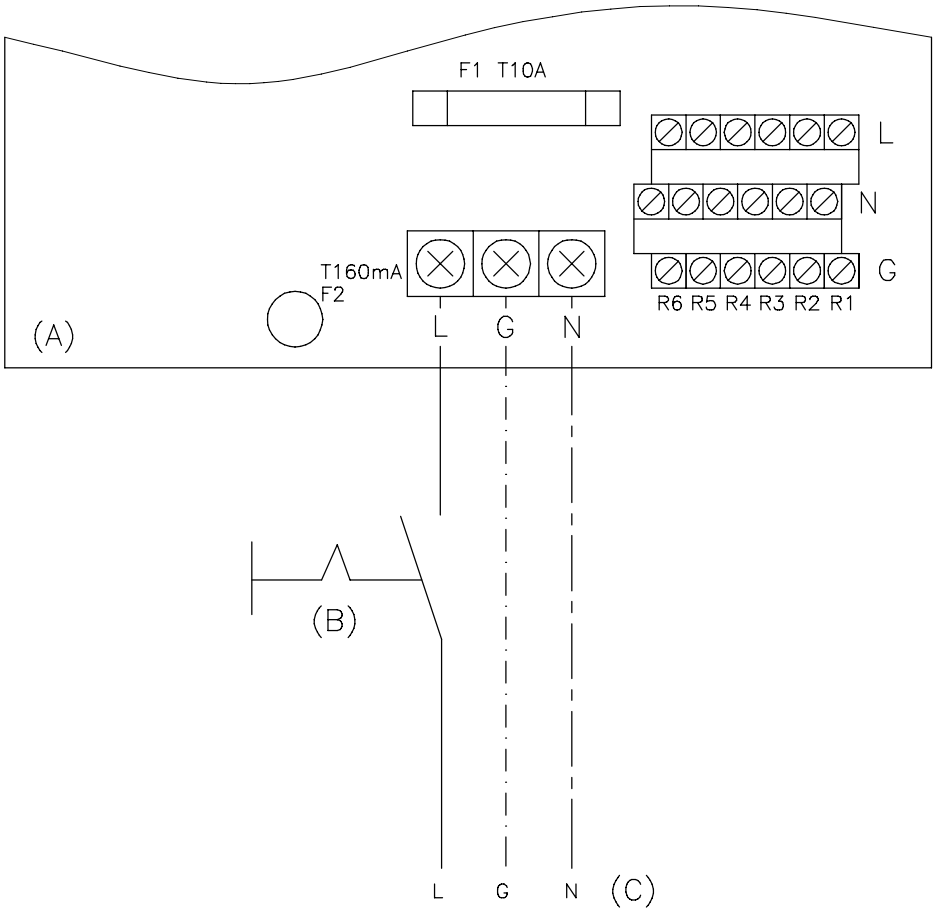
Control unit	Printed circuit board
Vitotronic 200, type KW1 and KW2 Vitotronic 300, type KW3	Part no. 7170 928
Vitotronic 200, type GW2 Vitotronic 300, type GW3	Part no. Please contact Viessmann
Vitotronic 333	Part no. Please contact Viessmann



Ⓐ Control unit connection chamber
Ⓑ To Vitotronic

Power supply

Regulations
Carry out the power supply and all grounding (e.g. fault current circuit) in accordance with local and national codes.

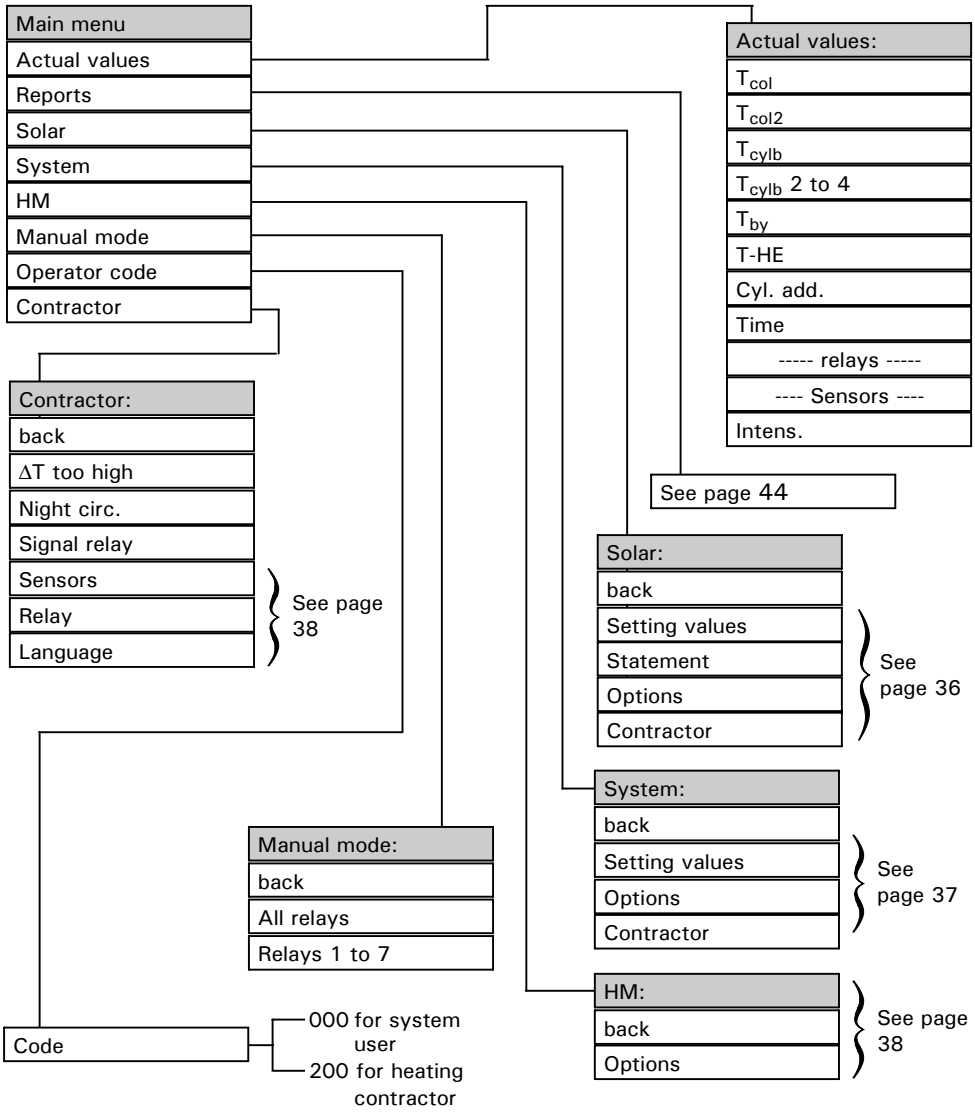


Ⓐ Printed circuit board
Ⓑ Power disconnect
Ⓒ Power supply 120VAC, 10FLA

⚠ ***Safety instruction***
Do not interchange wires.

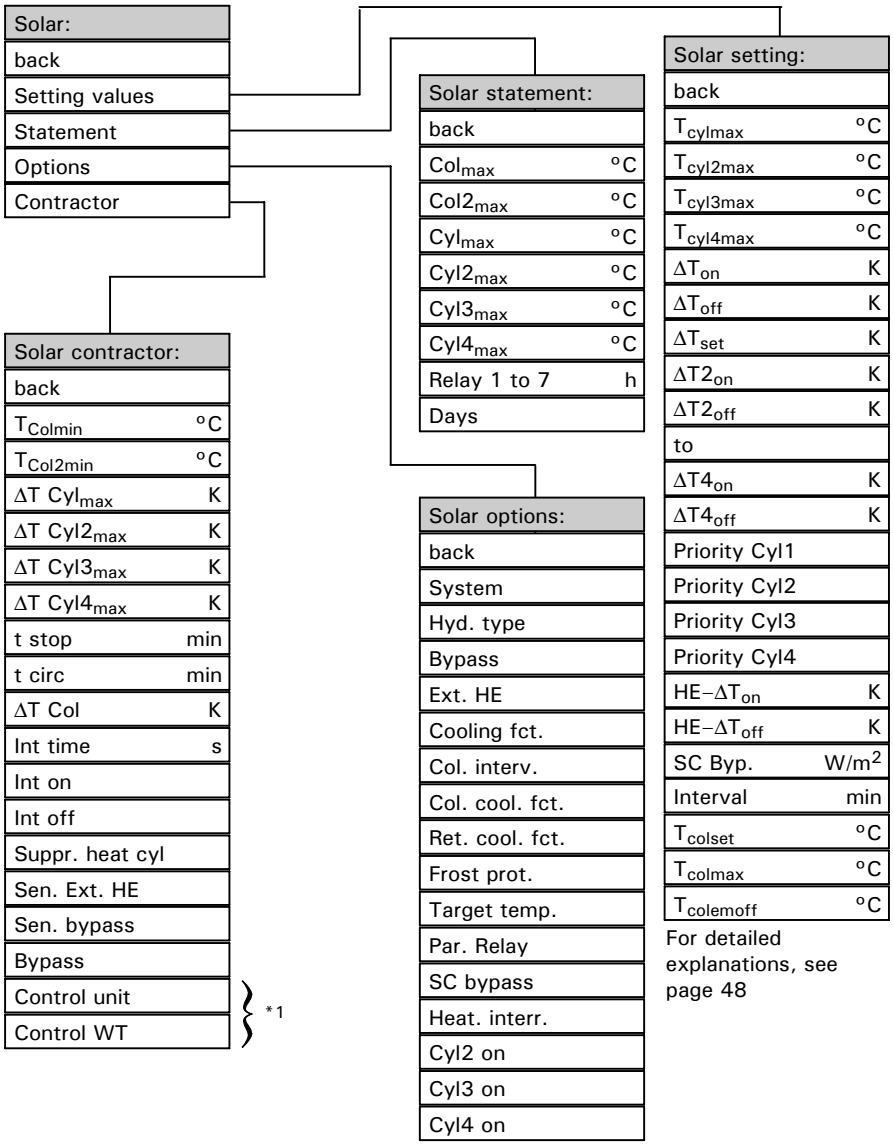
Menu structure summary – Main menu

The complete menu structure of the control unit is shown in the following summary. Subject to system configuration, only those menu items will be displayed which can be adjusted.
Entry: Main menu > Operator code > Set to 200



Menu structure summary – Solar

Main menu > Solar



For detailed explanations, see page 48

*1 *Influences the control characteristics of the solar circuit pump and the secondary pump of the external heat exchanger. Do **not** adjust.*

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Menu structure summary – System

Main menu > System

System:
back
Setting values
Options
Contractor

Sys. contractor:
back
Sen. add.fct.
Sen. Th1
Sen. Th2
Sen1 ΔT5Fct
Sen2 ΔT5Fct
Sen. Th3
Sen. Th4
Sen1 ΔT6Fct
Sen2 ΔT6Fct
Sen. Th5
Sen. Th6
Sen1 ΔT7Fct
Sen2 ΔT7Fct

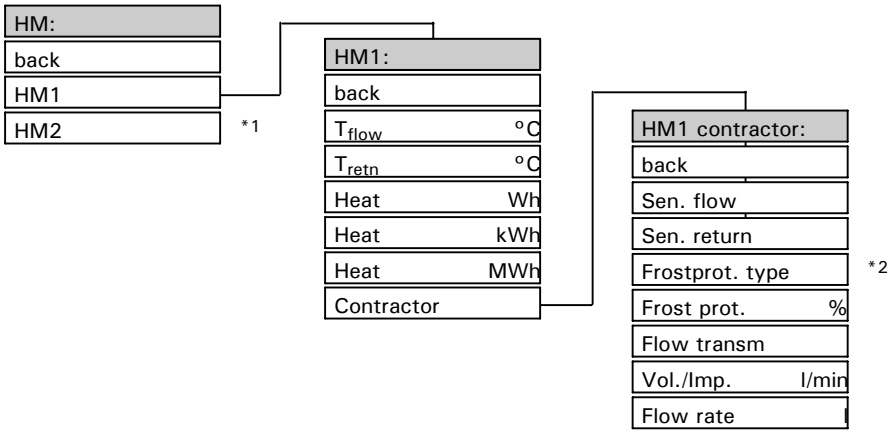
System options:
back
Add. fct.
DHWcyl. load
Thermost. 1
Thermost. 2
ΔT Fct 5
Time switch 1
Thermost. 3
Thermost. 4
ΔT Fct 6
Time switch 2
Thermost. 5
Thermost. 6
ΔT Fct 7
Time switch 3

System setting:		
back		
Time		
t start		
$Th1_{on}$	°C	
$Th1_{off}$	°C	
$Th2_{on}$	°C	
$Th2_{off}$	°C	
$\Delta T5_{on}$	K	
$\Delta T5_{off}$	K	
Time switch 1		*1
$Th3_{on}$	°C	
$Th3_{off}$	°C	
$Th4_{on}$	°C	
$Th4_{off}$	°C	
$\Delta T6_{on}$	K	
$\Delta T6_{off}$	K	
Time switch 2		*1
$Th5_{on}$	°C	
$Th5_{off}$	°C	
$Th6_{on}$	°C	
$Th6_{off}$	°C	
$\Delta T7_{on}$	K	
$\Delta T7_{off}$	K	
Time switch 3		*1

*1 *Time window adjustment, see page 59.*

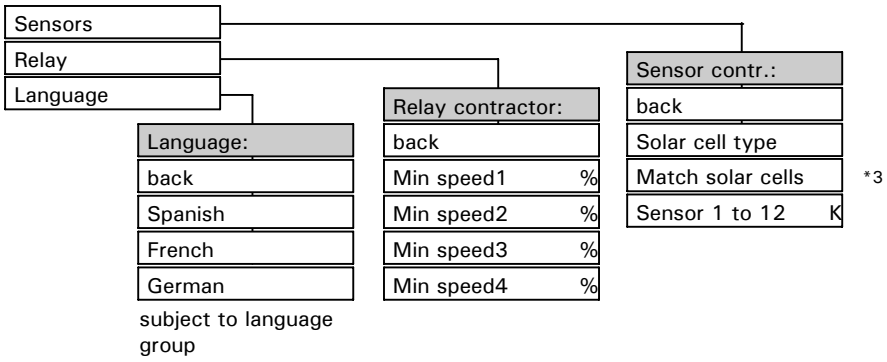
Menu structure summary – HM

Main menu > HM



Menu structure summary – Contractor

Main menu > Contractor



*1 *Like HM1.*

*2

Setting	***Heat transfer medium***
0	*Water*
1	*Propylene glycol (factory default settings)*
2	*Ethylene glycol*
3	*Viessmann solar heat transfer medium*

*3 ⚠ *Do not press "OK".*

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Steps

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Further details regarding individual steps

Commissioning the control unit

1. Apply power to the control. The operating lamp illuminates green and the display shows the main menu (see page 35).

The display shows a four digit excerpt of the selected menu. The flashing cursor indicates the current position.
Move the cursor through the menu using ⊕ or ⊖.
Confirm each selection with OK.
Change the setting/value with ⊕ or ⊖.
For values which need to be changed, the system asks a security question, which you need to confirm with "Yes".

2. Adjust the contractors menu:
Main menu
└→ Operator code
└→ Code: Set to 200
After commissioning, set code to "000".

3. Change the language:
Main menu
└→ Contractor
└→ Language

4. Set the time:
Main menu
└→ System
└→ Setting values
└→ Set to current time

Please note:
The display reverts to the main menu if no adjustments are made for four minutes.

The system reverts to the respective menu if no changes are made seven seconds after input and security questions.

Adjustments for operation with solar cells

1. Main menu
└→ Contractor
└→ Sensor contr.:
Set solar cell type
value from page 31

2. Main menu
└→ Solar
└→ Setting values
SC byp.
Set irradiation threshold
(see page 48).

Adjustments for energy statement

The energy statement can be carried out without heat meter extension kit (accessory).

Without extension kit

The energy statement is calculated from the temperature differential between the HM flow and the HM return sensor and the set flow rate (see Vitosol service instructions). The flow rate is obtained from the integrated flow meter of the Solar Divicon. The units are l/min. Sensors must be coded. For this, sensors which are already used may be utilised without affecting their function in the respective system design.
Statements are created when the output set in "Relay" is active (see below).

Main menu
└→ HM
└→ Options
Set HM1 or 2 to "Yes"
└→ back
HM1 or 2
└→ Contractor
└→ Set sen. flow, e.g. to "1"
Set sen. return, e.g. to "2"
Flow rate, set value
Set relay, e.g. to "1"

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Further details regarding individual steps (cont.)

With extension kit

The energy statement is calculated from the temperature differential between the HM flow and the HM return temperature and the flow rate recorded by the volume measuring device. Sensors must be encoded. For this, sensors which are already used may be utilised without affecting their function in the respective system design.

Main menu
└→ HM
└→ Options
Set HM1 or 2 to "Yes"
└→ back
HM1 or 2
└→ Contractor
└→ Set sen. flow, e.g. to "9"
Set sen. return, e.g. to "10"
Set vol. transm. to "Yes"
Vol./Imp. setting according to volume measuring part, e.g. 0.6

Relay test

Main menu
└→ Manual mode
└→ All relays
or
Relays 1 to 7

Switching conditions:
ON
Auto
OFF

Scanning temperatures and operating conditions

Subject to system version, you can scan the following values:

1. Main menu
└→ Actual values

Display text	Description	Unit
Actual values:		
Tcol	Collector temperature	°C
Tcol 2	Collector temperature 2	°C
Tcylb	Tank temperature, bottom	°C
Tcyl2b	Tank temperature 2, bottom	°C
Tcyl3b	Tank temperature 3, bottom	°C
Tcyl4b	Tank temperature 4, bottom	°C
Tby	Bypass temperature	°C
T-HE	Ext. heat exchanger temp.	°C
Cyl. add.	Additional function	
	Time	
----- Relays -----		
Relay 1 to relay 4	Rel. speed relays 1 to 4 **DO NOT change from 100% Programming!**	%
Relay 5 to Relay 7	Switching condition relays 5 to 7	
----- Sensors -----		
Sens. 1 to Sens. 12	Temperature, sensors 1 to 12	°C
Intens.	Irradiation intensity (actual irradiation) only in conjunction with solar cell	W/m^2

Back to the main menu with "OK".

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Scanning temperatures and operating conditions (cont.)

2. Main menu
└→ Solar
└→ Statement

Plain text	Description	Unit
Solar statement:		
Colmax	Maximum collector temperature*1	°C
Col2max	Maximum collector temperature 2*1	°C
Cylmax	Maximum tank temperature*1	°C
Cyl2max	Maximum tank temperature 2*1	°C
Cyl3max	Maximum tank temperature 3*1	°C
Cyl4max	Maximum tank temperature 4*1	°C
Relay 1 to relay 7	Hours run of relays 1 to 7*1	h
Days	Control unit operating days	

Scanning heat volume

See page 38.

Add the details in Wh, kWh and MWh.*1

*1 *These values may be reset with "OK".*

Fault messages

Faults are indicated by the operating lamp (flashes red) and may be scanned:

Main menu
└→ Reports

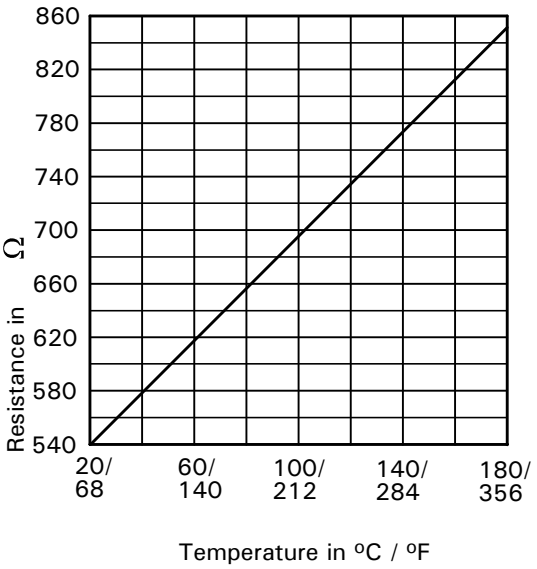
Reports	Cause	Remedy
No faults		
!Interruption > Sensor <	Indicated sensor has suffered a lead break or short circuit	Check respective sensor (see page 45)
!Short circuit > Sensor <		
?Night circulation	Recirculation via gravity	Check existing check valve (Solar-Divicon) or install check valve
?ΔT too high	Circulation pump faulty	Check pump connection and pump
!EEPROM	Fault during tank access	Switch control unit OFF and after brief interval ON again
!Real time clock	Real time clock fault	Replace control unit
SW version	---	---
HW version	---	---

Fault acknowledgement

Place the cursor on "!" and confirm with "OK".

Please note:
The message will be redisplayed if the fault is not removed.

Checking sensors



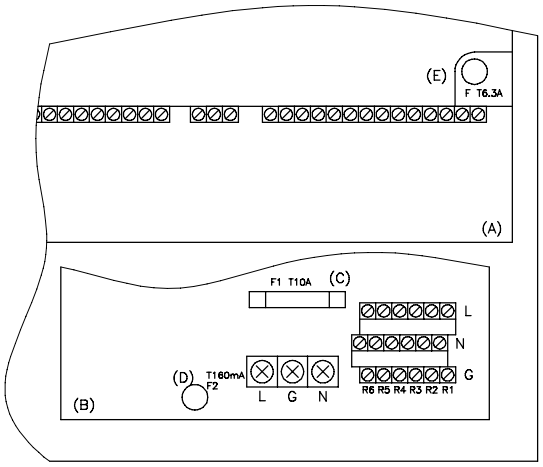
1. Disconnect the relevant sensor and measure the resistance.

Temperature in °C/ °F	Resistance in Ω
20/68	546
40/104	578
50/122	597
60/140	616

2. Compare measurement with the actual temperature displayed (for scanning, see page 42).
Check the installation and replace sensor if necessary in the event of severe deviation.

Specification
Protection level: IP 20
Permiss. ambient temperature
- during operation
  - Collector temperature sensor:
    −20 to +180 °C / -4 to 356 °F
  - Temperature sensors:
    0 to + 90 °C / 32 to 194 °F
- during storage and transport:
  −20 to + 70 °C / -4 to 158 °F

Changing the fuse



Ⓐ Control Unit
Ⓑ Printed circuit board
Ⓒ Fuse 10A - Time delay
Ⓓ Fuse 160mA - Time delay
Ⓔ Fuse 6.3A - Time delay

Open the connection chamber of the control unit (see page 27).
Replacement fuse is inside the pack.

Summary of additional functions

Further functions may be added to each system design.
Functions for which the same relay output is used can **only** be utilised alternately.

Main menu
└→ Solar
└→ Options

Please note:
Select "Yes" to activate the required function.

Options	Plain text/ Factory default settings		Relay	Possible with design					Page
				1	2	3	4	5	
Bypass version			R5						
1	Bypass	No		x	–	x*1	x	x*1	49
2	Bypass and SC bypass	No		x	–	x*1	x	x*1	50
External heat exchanger	Ext. HE	No	R2 or R3	x	x	–	x*2	–	51
Cooling function	Cooling fct.	No	––	x	x	x	x	x	51
Special functions of tube collectors	Col.interv.	No	––	x	x	x	x	x	51
Collector cooling functions	Col.cool.fct.	No	––	x	x	x	x	x	51
Return cooling function	Ret.cool.fct.	No	––	x	x	x	x	x	51
Frost protection	Frost prot.	No	––	x	x	x	x	x	52
Parallel relay	Par. relay	No	R5	x	x	x	x	x	52
Reloading suppression	Heat.interr.	No	R7	x	x	x	x	x	52
Tank 2 ON	Cyl 2 on	Yes	R4	–	–	x	–	x	54

**1 Connect the reference sensor (bypass sensor) to S7, and adjust to 7 in Main menu/Solar/Contractor for "Sens. bypass".*
**2 Connect the reference sensor (external heat exchanger sensor) to S8, and adjust to 8 in Main menu/Solar/Contractor for "Sens. Ext. HE".*

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Summary of additional functions (cont.)

Please note:
Select "Yes" to activate the required function.

Main menu
└→ System
└→ Options

Options	Display text/factory default settings		Relay	Possible with design 1	2	3	4	5	Page
Additional DHW heating function	Add. fct.	No	R5	x	x	x	x	x	55
Tank loading	DHWcyl.load.	No	R6	x	–	–	–	x	55
Thermostat 1	Thermost. 1	No	R3	x	x	–	x	–	57
Thermostat 2	Thermost. 2	No		x	x	–	x	–	
ΔT5 control unit	ΔT Fct 5	No		x	x	–	x	–	
Time switch 1	Time switch 1	No		x	x	–	x	–	
Thermostat 3	Thermost. 3	No	R6	x	x	–	–	–	
Thermostat 4	Thermost. 4	No		x	–	–	–	x	
ΔT6 control unit	ΔT Fct 6	No		x	–	–	–	–	
Time switch 2	Time switch 2	No		x	–	–	–	–	
Thermostat 5	Thermost. 5	No	R7	x	x	x	x	x	
Thermostat 6	Thermost. 6	No		x	x	x	x	x	
ΔT7 control unit	ΔT Fct 7	No		x	x	x	x	x	
Time switch 3	Time switch 3	No		x	x	x	x	x	

Signal relay

Main menu
└→ Contractor
└→ Signal relay

Summary of system parameters

These values can only be adjusted if the respective function is activated.

Main menu
└→ Solar
└→ Setting values

Display text	Description	Factory default settings	Setting range	Set to
T_{cylmax}	Maximum tank temperature (see page 49)	60 °C / 140 °F	20 to 85 °C / 68 to 185 °F	
$T_{cyl2max, ...}$	Maximum tank temperature tanks 2 to 4	60 °C / 140 °F	20 to 85 °C / 68 to 185 °F	
ΔT_{on} *1 ΔT_{off} *2	Start-up temp. differential Shut-down temp. differential for the solar circuit pump	5 °C / 9 °F 3 °C / 5 °F	1.5 to 20 °C / 3 to 36 °F 1.0 to 19.5 °C / 2 to 35 °F	
$\Delta T2_{on}$ *1 $\Delta T2_{off}$ *2 to $\Delta T4_{on}$ *1 $\Delta T4_{off}$ *2	Start-up temp. differential Shut-down temp. differential for additional consumers	5 °C / 9 °F 3 °C / 5 °F	1.5 to 20 °C / 3 to 36 °F 1.0 to 19.5 °C / 2 to 35 °F	
Priority Cyl 1 to Cyl 4	Tank priority control (see page 49)	1, 2, 3, 4	see page 49	
HE ΔT_{on} *1 HE ΔT_{off} *2	Start-up temp. differential Shut-down temp. differential for external heat exchanger	5 °C / 9 °F 3 °C / 5 °F	1.5 to 20 °C / 3 to 36 °F 1.0 to 19.5 °C / 2 to 35 °F	
SC byp.	Irradiation threshold*3	200 W/m^2	100 to 500 W/m^2	
Interval	Idle time for tube collector special function (see page 51)	30 min.	1 to 60 min	

*1 *ΔT_{on} can be a min. of 0.5 °C / 1 °F higher than ΔT_{off}.*
*2 *ΔT_{off} can be a min. of 0.5 °C / 1 °F lower than ΔT_{on}.*
*3 *For Vitosol 100: 210 W/m^2.*
For Vitosol 300: 130 W/m^2.

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Summary of system parameters (cont.)

Display text	Description	Factory default setting	Setting range	Set to
T_{colset}	Set collector temperature	65 °C / 149 °F	20 to 110 °C / 68 to 230 °F	
T_{colmax}	Maximum collector temperature (see page 51)	120 °C / 248 °F	110 to 150 °C / 230 to 302 °F	
$T_{colemoff}$	Collector shut-down temperature	130 °C / 266 °F	115 to 180 °C / 239 to 356 °F (at 200 °C / 392 °F, this function is **inactive**)	

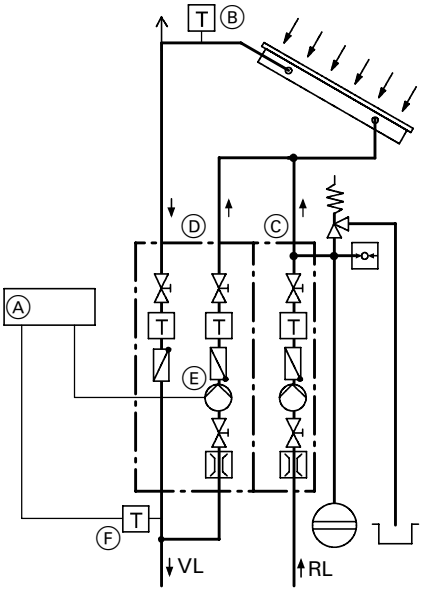
Maximum tank temperature
The respective circulation pump is switched OFF if the maximum tank temperature T_{cylmax} is exceeded, to prevent the DHW tank from being overheated.
A safety shut-down is implemented when the tank safety temperature of 90 °C / 194 °F (fixed) has been reached.

DHW priority
When selecting "Priority Cyl 1: **1**"
"Priority Cyl 2: **2**"
etc.,
the DHW tanks are heated in numerical sequence, until their respective maximum tank temperature T_{cylmax} has been reached. DHW tanks with the same priority are heated simultaneously.

Bypass

Version 1 – Bypass control with collector temperature sensor and bypass sensor

Vitosolic 200 measures the collector temperature via the collector temperature sensor. The bypass circuit pump is switched ON, if the set temperature differential ΔT_{on} between the collector temperature sensor and the tank temperature sensor is exceeded.
The solar circuit pump is switched ON and that of the bypass circuit is switched OFF, if the temperature differential between the bypass sensor and the tank temperature sensor is exceeded by 2.5 °C / 4.5 °F.
If this differential drops below 1.5 °C / 3 °F, and ΔT_{on} is still exceeded, then the solar circuit pump is switched OFF and the bypass pump is switched ON.



Settings:

1. Main menu
→ Solar
→ Solar options
→ Set bypass to "Yes"

2. Main menu
→ Solar
→ Solar contractor
→ Set bypass to "Pump"

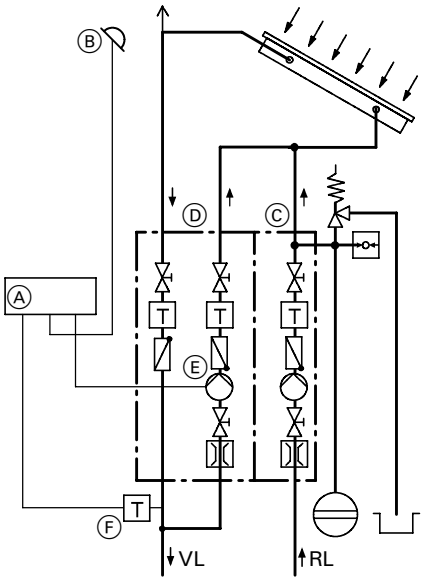
Ⓐ Control unit
Ⓑ Collector temperature sensor
Ⓒ Solar pump line
Ⓓ Solar-Divicon
Ⓔ Circulation pump, bypass circuit (R5)
Ⓕ Bypass sensor (S3 or S7)

Please note:
The pump of Solar-Divicon is used as the bypass circuit circulation pump and that of the solar pump line as the solar circuit pump.

Bypass (cont.)

Version 2 – Bypass control with solar cell and collector temperature sensor

Vitosolic 200 measures the radiation intensity via the solar cell.
The bypass circuit circulation pump is switched ON if the irradiation threshold value set on Vitosolic 200 is exceeded.
The bypass circuit pump is switched OFF and the solar circuit pump is switched ON, if the set temperature differential ΔT_{on} between the collector temperature sensor and the tank temperature sensor is exceeded.
The bypass pump is switched OFF if the irradiation level falls below the selected switching threshold (drop-out delay approx. 2.5 minutes).



Settings:

1. Main menu
→ Solar
→ Solar options
→ Bypass "Yes"
→ SC bypass "Yes"

2. Main menu
→ Solar
→ Solar setting:
→ SC bypass
Set value
(see page 48)

3. Main menu
→ Solar
→ Solar contractor
→ Sen. bypass "1"

Ⓐ Control unit
Ⓑ Solar cell
Ⓒ Solar pump line
Ⓓ Solar-Divicon
Ⓔ Circulation pump, bypass circuit (R5)
Ⓕ Collector temperature sensor (S1)

Please note:
The pump of Solar-Divicon is used as the bypass circuit pump and that of the solar pump line as the solar circuit pump.

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External heat exchanger

The selected relay switches the consumer ON if the set start-up temperature differential is exceeded, and switches it OFF if the actual temperature drops below the shut-down temperature differential.
In design 2, the secondary pump is connected to R3, in all other cases to R2.
$\Delta T_{on/off}$ (differential between S1 and S3) switches the primary pump (R1). $\Delta TWT_{on/off}$ (differential between S2 and S3) switches the secondary pump (R2 or R3).

Cooling function

Function for dissipating excess heat. When the maximum tank temperature T_{cylmax} and the start-up temperature differential ΔT_{on} have been reached, the solar circuit pump and a consumer connected to R4 are switched ON, and switched OFF if the actual temperature drops below the shut-down temperature differential ΔT_{off}.

Special functions of tube collectors

Activate in systems with unfavourably positioned collector temperature sensor.
The solar circuit pump is activated every 30 minutes (adjustable in Main menu/Solar/Settings/Interval, see page 48) for 30 seconds, to prevent a time delay when recording the collector temperature.
From 22:00 to 06:00 h **inactive**.

Collector cooling functions

The solar circuit pump is switched OFF if the selected maximum tank temperature T_{cylmax} has been reached.
If the collector temperature rises to the set maximum collector temperature T_{colmax} (Main menu/ Solar/Settings), then the pump will be switched ON, until the actual temperature falls 5 °C/ 9 °F below this value. In this case, the tank temperature may continue to rise, but no higher than 90 °C/ 194 °F (tank safety shut-down).

Please observe safety instructions on page 4.

Please note:
In every case, ensure the fail-safe nature of the solar heating system through correct sizing of the diaphragm expansion vessel, even if the collector temperature rises after all limit temperatures have been reached.
In the event of stagnation or if the collector temperature continues to rise, the solar circuit pump will be disabled or switched OFF (collector emergency stop T_{colem}), to prevent thermal overloading of connected components.

Return cooling function

When the collector cooling function has been activated, the tank temperature may continue to rise, but no higher than 90 °C / 194 °F (tank safety shut-down).
In the evening, the pump continues to operate until the DHW tank has cooled down to the maximum tank temperature T_{cylmax} via the collector and interconnecting pipework.

Please observe safety instructions on page 4.

Please note:
In every case, ensure the fail-safe nature of the solar heating system through correct sizing of the diaphragm expansion vessel, even if the collector temperature rises after all limit temperatures have been reached.
In the event of stagnation or if the collector temperature continues to rise, the solar circuit pump will be disabled or switched OFF (collector emergency stop T_{colem}), to prevent thermal overloading of connected components.

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Frost protection

At a collector temperature below +4 °C / 39 °F, the solar circuit pump will be started to prevent collector damage.
The pump is switched OFF when +5 °C / 41 °F has been reached.

Parallel relay

Relay R5 is switched ON when the solar circuit pump (R1) operates.
R5 can, for example, be used to control a diverting valve.

Suppression of reheating by boiler

Systems with control units connected via KM BUS

Vitotronic 200, type KW1*1, KW2*1
Vitotronic 300, type KW3*1
Vitotronic 333*3

Connection of the KM BUS to input 145 in the solar control unit (see page 33).
Reheating of the DHW tank by the boiler will be suppressed by the solar control unit, if the solar circuit pump is operating.
Coding address "67" in the boiler control unit defaults a third set DHW temperature (setting range:
10 to 95 °C / 50 to 203 °F). This value must be **below** the first set DHW temperature.
The DHW tank will only be heated by the boiler if this set value cannot be reached by the solar heating system.

*1 *Printed circuit board, part no. 7170 928 required.*
*2 *Printed circuit board, part no. 7170 929 required.*
*3 *Printed circuit board, part no. 7170 930 required.*

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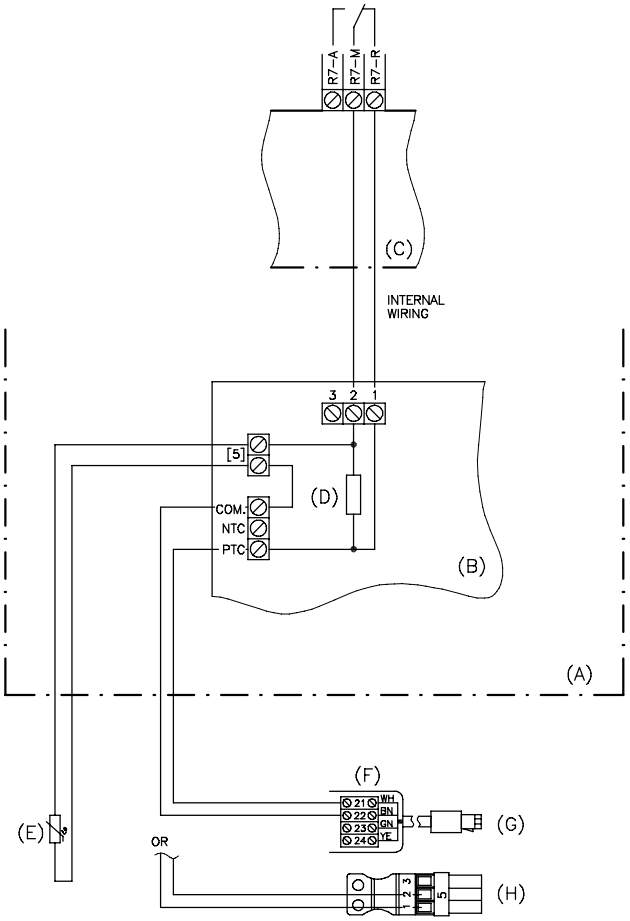
Suppression of reheating by boiler (cont.)

Systems with additional Viessmann control units

Reheating of the DHW tank by the boiler will be suppressed by the solar control unit if the solar circuit pump is operating. A 10 °C / 18 °F higher actual DHW temperature is simulated via a resistor.

The DHW tank will only be heated by the boiler if this actual temperature cannot be reached by the solar heating system.

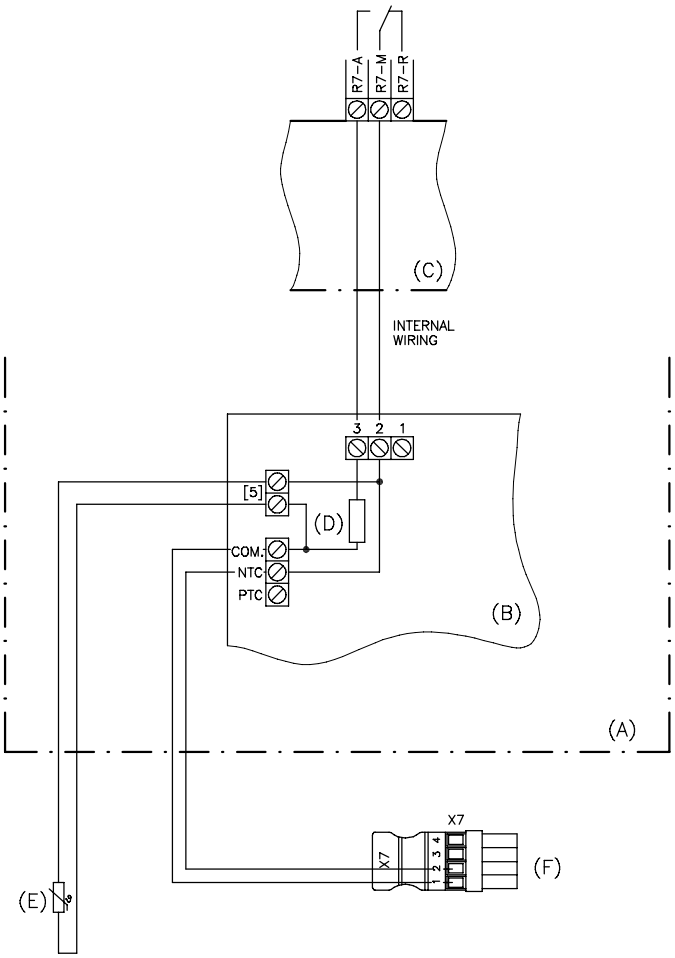
Tank temperature sensor as PTC (For boiler control: Dekamatik, Trimatik or Vitotronic)



Ⓐ Vitosolic 200
Ⓑ Printed circuit board
Ⓒ Control unit connection chamber
Ⓓ Resistance 20Ω, 0.25W
Ⓔ Tank temperature sensor (PTC)
Ⓕ Connecting cable PN: 7450 061
Ⓖ Dekamatik or Trimatik
Ⓗ Vitotronic

Suppression of reheating by boiler (cont.)

Tank temperature sensor as NTC (For Vitodens)



Ⓐ Vitosolic 200
Ⓑ Printed circuit board
Ⓒ Control unit connection chamber
Ⓓ Resistance 10 kΩ, 0.25 W
Ⓔ Tank temperature sensor (NTC)
Ⓕ Vitodens

Tank 2 ON

This function enables a second consumer (e.g. buffer tank or swimming pool) to be taken out of the control unit.
Break or short circuit of tank temperature sensor T_{cyl2u} **is no longer** notified.

Tank loading

This function is achieved via thermostat 3 (S5) and 4 (S6) or relay R6.
R6 starts if the temperatures at thermostat 3 and 4 fall below $Th3_{on}$ (Main menu/System/Settings). R6 is switched OFF if $Th3_{off}$ is exceeded.
This function enables a certain physical range of the DHW tank to be heated, which can be defined through the sensor location.

Additional DHW heating function

Additional function in conjunction with Vitotronic control units and KM BUS

At the boiler control unit,
- a second set DHW temperature must be encoded, and
- the fourth DHW phase for DHW heating must be activated.

This signal is transmitted via the
KM BUS (for connection, see page 33) to the solar control unit, and the circulation pump is switched ON (connection to R5).

Vitotronic installation and service instructions

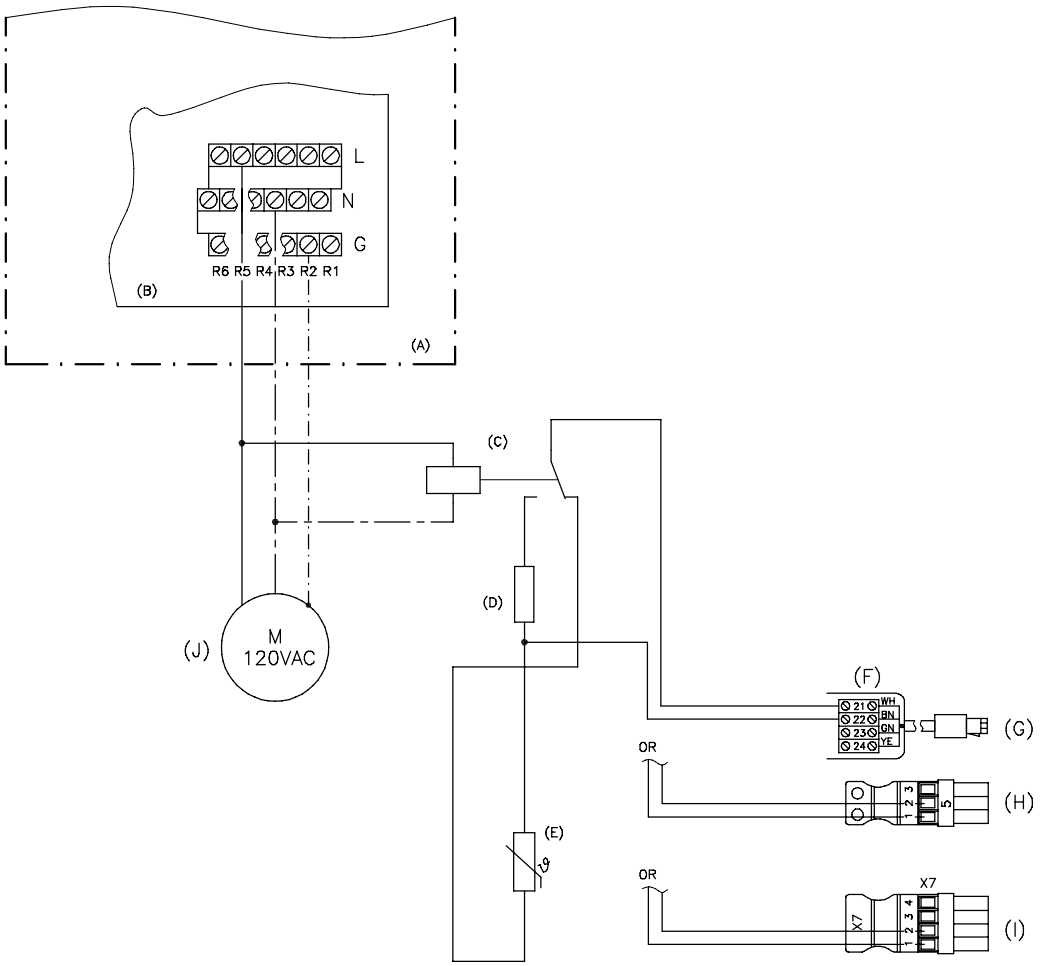
Additional function only with Vitosolic 200

For systems with a tank capacity **above 400 litres,** the entire water content must be heated to 60 °C / 140 °F once every day. For this, an additional circulation pump may be started (connection to R5).
The circulation pump is started at the adjustable time "t start" (Main menu/ System/Settings, see page 57), if the DHW tank has not been heated to 60 °C / 140 °F at least once every day.

Additional DHW heating function (cont.)

Additional function in conjunction with additional Viessmann control units

A DHW temperature of approx. 35 °C / 95 °F is simulated via a resistor.



Ⓐ Vitosolic
Ⓑ Printed circuit board
Ⓒ Relay spot 120VAC (field supplied)
Ⓓ Resistance for
PTC (Dekamatik, Trimatik, Vitotronic) - 560Ω
NTC (Vitodens) - 8.2kΩ
Ⓔ Tank temperature sensor of boiler control
Ⓕ Connecting cable,
part no. 7450 061
Ⓖ Dekamatik, Trimatik
Ⓗ Vitotronic
Ⓘ Vitodens
Ⓙ Circulation pump

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Thermostat function, ΔT control unit and time switches

These functions are only available subject to the inputs and outputs not being allocated in the basic design.

The following allocation applies:

Thermostat 1 –> S3
Thermostat 2 –> S4
ΔT5 control unit –> S3 – S4
Time switch 1
} Relay R3

Thermostat 3 –> S5
Thermostat 4 –> S6
ΔT6 control unit –> S5 – S6
Time switch 2
} Relay R6

Thermostat 5 –> S7
Thermostat 6 –> S8
ΔT7 control unit –> S7 – S8
Time switch 3
} Relay R7

Thermostat function
Subject to times (adjusted in the allocated time switch), the corresponding relay switches ON when Th_{on} has been reached, and OFF when Th_{off} has been reached.
Adjusting values (see below).

ΔT control unit
Subject to times (adjusted in the allocated time switch), the corresponding relay switches ON when ΔT_{on} has been exceeded, and OFF when the actual value drops below ΔT_{off}.
Adjusting values (see page 58).

Time switches
For the thermostat function or ΔT control unit, three time windows can be activated. The corresponding relay switches ON at "t on" and OFF at "t off, etc.
Time window adjustment (see page 58).

Main menu
└–> System
└–> Setting values

Setting values	Display text/ factory default settings		Setting range	Set to
Start time for additional function for DHW heating	t start	17:00	00:00 to 23:45	
Thermostat start-up temp. Thermostat shut-down temp.	$Th1_{on}$ $Th1_{off}$ $Th2_{on}$ $Th2_{off}$	40 °C / 104 °F 45 °C / 113 °F 40 °C / 104 °F 45 °C / 113 °F	0 to 150 °C / 32 to 302 °F	
Start-up temp. differential Shut-down temp. differential	$\Delta T5_{on}$ $\Delta T5_{off}$	5 °C / 9 °F 3 °C / 5 °F	1.5 to 20 °C / 3 to 36 °F 1.0 to 19.5 °C / 2 to 35 °F	
Time window	Time switch 1: t1–on t1–off t2–on t2–off t3–on t3–off	 00:00 00:00 00:00 00:00 00:00 00:00	 00:00 to 23:45 00:00 to 23:45 00:00 to 23:45 00:00 to 23:45 00:00 to 23:45 00:00 to 23:45	

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Thermostat function, ΔT control unit and time switches (cont.)

Setting values	Display text/ Factory default setting		Setting range	Set to
Thermostat start-up temp.	$Th3_{on}$	40 °C / 104 °F	0 to 150 °C / 32 to 302 °F	
Thermostat shut-down temp.	$Th3_{off}$	45 °C / 113 °F		
	$Th4_{on}$	40 °C / 104 °F		
	$Th5_{off}$	45 °C / 113 °F		
Start-up temp. differential	$\Delta T6_{on}$	5 °C / 9 °F	1.5 to 20 °C / 3 to 36 °F	
Shut-down temp. differential	$\Delta T6_{off}$	3 °C / 5 °F	1.0 to 19.5 °C / 2 to 35 °F	
	Time switch 2:			
Time window	t1–on	00:00	00:00 to 23:45	
	t1–off	00:00	00:00 to 23:45	
	t2–on	00:00	00:00 to 23:45	
	t2–off	00:00	00:00 to 23:45	
	t3–on	00:00	00:00 to 23:45	
	t3–off	00:00	00:00 to 23:45	
Thermostat start-up temp.	$Th4_{on}$	40 °C / 104 °F	0 to 150 °C / 32 to 302 °F	
Thermostat shut-down temp.	$Th4_{off}$	45 °C / 113 °F		
	$Th5_{on}$	40 °C / 104 °F		
	$Th5_{off}$	45 °C / 113 °F		
Start-up temp. differential	$\Delta T7_{on}$	5 °C / 9 °F	1.5 to 20 °C / 3 to 36 °F	
Shut-down temp. differential	$\Delta T7_{off}$	3 °C / 5 °F	1.0 to 19.5 °C / 2 to 35 °F	
	Time switch 3:			
Time window	t1–on	00:00	00:00 to 23:45	
	t1–off	00:00	00:00 to 23:45	
	t2–on	00:00	00:00 to 23:45	
	t2–off	00:00	00:00 to 23:45	
	t3–on	00:00	00:00 to 23:45	
	t3–off	00:00	00:00 to 23:45	

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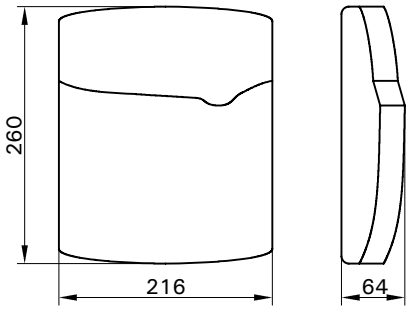
Specification



Rated voltage: 120VAC
Rated frequency: 60 Hz
Rated current: 10 A

Permissible ambient temperature
- in operation:
  0 to +40 °C / 32 to 104 °F
  Installation in living accommodation and boiler rooms (normal ambient conditions)
- during storage and transport:
  –20 to +65 °C
  –4 to + 149 °F

Rated relay output breaking capacity at 120V, 10A total.

Keyword index

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Keyword index

Notes

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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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