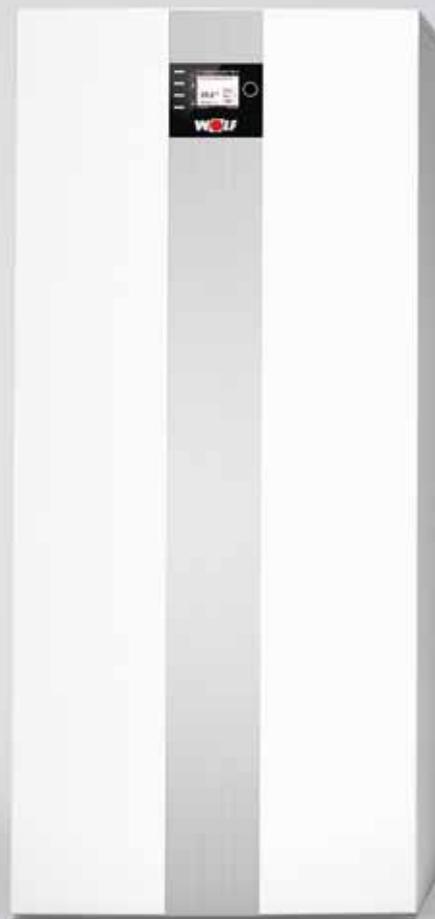




Technical documentation

Oil fired condensing boilers

TOB • TOB-TS • COB • COB-TS



Oil fired condensing boiler TOB

for central heating; can be combined with a freestanding cylinder, e.g. SEM-1 / SEM-2

Oil fired condensing boiler TOB-TS

for central heating; with enamelled steel stratification cylinder



The benefits of the Wolf oil fired condensing boilers:

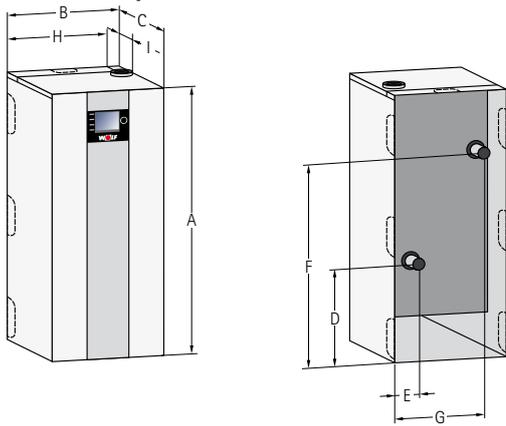
- Energy efficiency class A for space heating and as a combined unit TOB-TS for DHW heating
- Extremely clean and efficient combustion with complete condensation of the flue gases and high standard efficiency up to 105% (Hi) / 99% (Hs) for the best possible energy utilisation
- Low power demand
- Suitable for low sulphur and standard fuel oil EL + bio-oil B10
- Modulating blue flame burner for open and balanced flue operation
- High quality heat exchanger made from a robust aluminium:silicone alloy, with a long service life, low maintenance, and no minimum water circulation volume required
- Ready assembled, encased and packed on a pallet for simple transport and easy handling
- Can be mounted directly on the wall, therefore low space requirement; no side clearances required; convenient access to all components from the front, and easy operation and maintenance
- Control unit fully wired; maybe used for various individual heating system applications.
- 5 year warranty
2 year warranty on electrical and moving parts

Benefits for the TOB-TS:

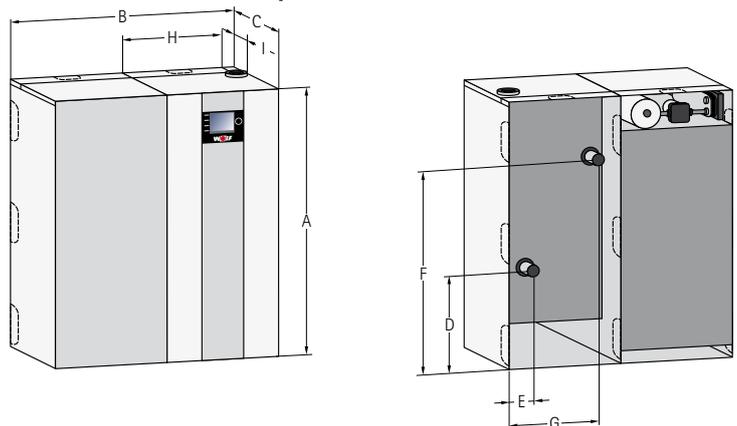
- Convenient DHW heating, cylinder capacity 160 l; comparable with a 200 l cylinder
- "DHW turbo" with a new routing and distribution system for hot and cold water inside the stratification cylinder ensure a calm, radial water distribution for excellent DHW performance (patented)
- Hot water always available - even after filling a bath
- High savings in operating costs through efficient DHW heating and innovative insulation technology
- Utilising condensing technology with cylinder heating for the highest energy efficiency
- Compact design as a condensing boiler and stratification cylinder, fully wired and hydraulically ready to connect, for the lowest assembly and installation costs

Specification TOB / TOB-TS

without cylinder



with stratification cylinder



TYPE		TOB-18	TOB-18/TS
Energy efficiency class Space heating		A	A
Energy efficiency class Water heating		-	A
Rated output at 80/60 °C, min/max	kW		6.3 / 17.7
Rated output at 50/30 °C, min/max	kW		6.6 / 18.6
Rated load, min/max	kW		6.4 / 18.1
Oil throughput, min/max	kg/h		0.53 / 1.52
Rated capacity / equivalent rated capacity of cylinder TS	litres	-	160 / 200
Constant cylinder output TS	litres/h	-	440
Performance factor TS	N _{LeD}	-	4
DHW output	litres/10min	-	270
Standby input TS	kWh/24h	-	1.47
Height	A mm		1290
Width	B mm		566
Depth	C mm		605
Heating return	D mm		426
Heating return	E mm		194
Heating flow	F mm		919
Heating flow	G mm		516
Balanced flue connection	H mm		462
Balanced flue connection	I mm		203
Luft-/Abgasrohrdurchmesser	mm		80/125
Balanced flue system		B23p, B33p, C33(x), C43(x), C53(x), C63(x), C83(x), C93(x)	
Outside diameter, heating flow/return	G		1 1/2"
Condensate connection			1"
Fuel oil to DIN 51603-1/6		Fuel oil EL standard, low sulphur fuel oil EL or bio-oil B10	
Nozzle *		Steinen 0.25 / 80° MST	
Fuel oil filter		Opticlean 5 - 20 µm	
Pump pressure, min. / max.	bar		3.5 / 23
Maximum negative pressure in oil lines	bar		0,3
Flow temperature, factory setting	°C		75
Max. flow temperature	°C		80
Heating water pressure drop (at ΔT=20K / 10K)	mbar		7 / 20
Max. permissible boiler pressure	mbar		3
Heat exchanger water content	litres		7.5
Standard efficiency at 40/30 °C (H _i / H _s)	%		105 / 99
Standard efficiency at 75/60 °C (H _i / H _s)	%		102 / 97
Efficiency at rated load at 80/60 °C (H _i / H _s)	%		98 / 92
Efficiency at 30% partial load and TR=30 °C (H _i / H _s)	%		105 / 99
Boiler standby loss q _B at 70 °C (EnEv)	%		0.75
Rated heat input max.			
Flue gas mass flow	g/s		7.02
Flue gas temperature 50/30 - 80/60 °C	°C		44 - 61
Available fan draught	Pa		70
Low heat input min.			
Flue gas mass flow	g/s		2.44
Flue gas temperature 50/30 - 80/60 °C	°C		32 - 50
Available fan draught	Pa		20
Max. condensate volume at 40/30 °C	litres/h		1.4
Condensate pH value			approx. 3
Boiler weight	kg		92
Protection	IP		IP20
Fitted fuse (medium slow)	A		4
Power consumption, partial load/full load	W		23 / 101
Power consumption, stand-by	W		5
Electrical connection		1 ~ NPE / 230 VAC / 50 Hz / 10 A / B	
CE ID		CE-0085C00305	

* These jets provide the compliance with the emission standards and a reliable operation. Different jets are not permitted!

Oil fired condensing boiler COB

for central heating; can be combined with a freestanding cylinder, e.g. SEM-1 / SEM-2

Oil fired condensing boiler COB-TS

for central heating; with enamelled steel stratification cylinder



The benefits of the Wolf oil fired condensing boilers:

- Energy efficiency class A for space heating and as a combined unit COB-TS for DHW heating
- Extremely clean and efficient combustion with complete condensation of the flue gases and high standard efficiency up to 105% (Hi) / 99% (Hs) for the best possible energy utilisation
- Low power demand
- Suitable for low sulphur and standard fuel oil EL + bio-oil B10
- Two-stage blue flame burner for open and balanced flue operation
- High quality heat exchanger made from a robust aluminium:silicone alloy, with a long service life, low maintenance, and no minimum water circulation volume required
- Ready assembled, encased and packed on a pallet for simple transport and easy handling
- Can be mounted directly on the wall, therefore low space requirement; no side clearances required; convenient access to all components from the front, and easy operation and maintenance
- Control unit fully wired; maybe used for various individual heating system applications.
- 5 year warranty
2 year warranty on electrical and moving parts
- Meets the limits set for the "Blue Angel"

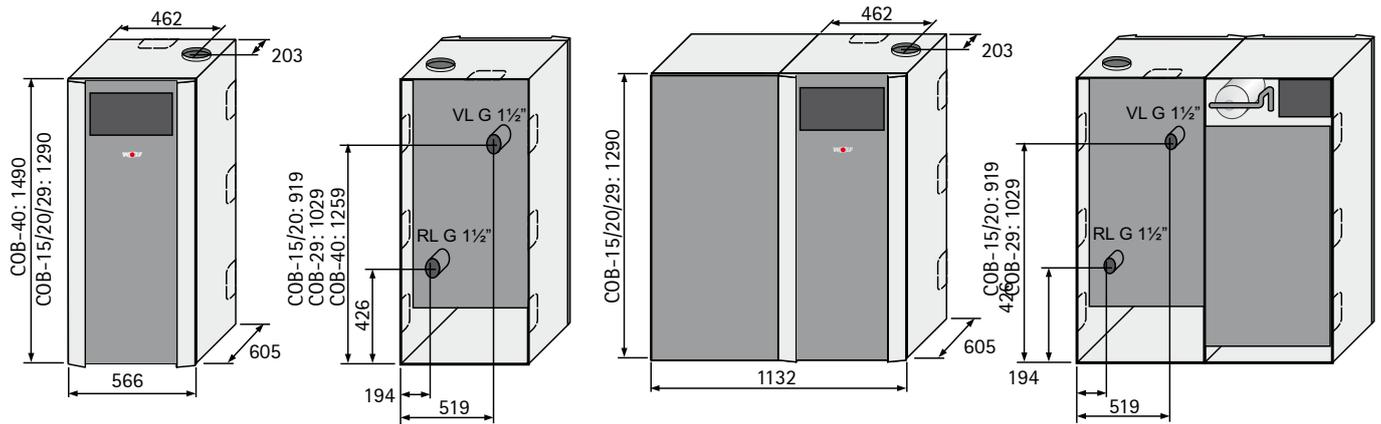
Benefits for the COB-TS:

- Convenient DHW heating, cylinder capacity 160 l; comparable with a 200-260 l cylinder
- "DHW turbo" with a new routing and distribution system for hot and cold water inside the stratification cylinder ensure a calm, radial water distribution for excellent DHW performance (patented)
- Hot water always available - even after filling a bath
- High savings in operating costs through efficient DHW heating and innovative insulation technology
- Utilising condensing technology with cylinder heating for the highest energy efficiency
- Compact design as a condensing boiler and stratification cylinder, fully wired and hydraulically ready to connect, for the lowest assembly and installation costs

Specification COB / COB-TS

COB-15 / COB-20 / COB-29 / COB-40

COB-15/TS / COB-20/TS / COB-29/TS

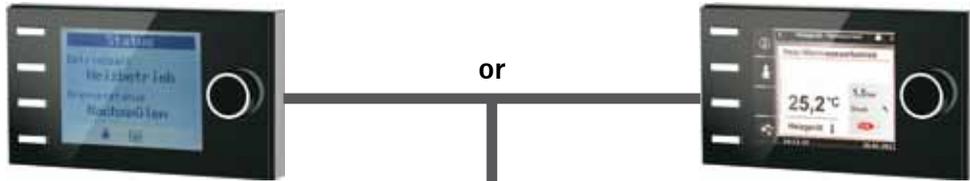


Oil fired condensing boiler	COB COB-TS	15 15	20 20	29 29	40 -
Energy efficiency class Space heating		A	A	A	A
Energy efficiency class Water heating		A	A	A	-
Rated output at 80/60 °C, stage 1/2	kW	9.0 / 14.4	13.1 / 19.0	18.5 / 28.2	25.3 / 38.0
Rated output at 50/30 °C, stage 1/2	kW	9.5 / 15.1	13.9 / 20.0	19.6 / 29.6	26.8 / 40.0
Rated load, stage 1/2	kW	9.2 / 14.7	13.5 / 19.6	19.0 / 29.0	26.0 / 38.8
Oil throughput, stage 1/2	kg/h	0.86 / 1.38	1.15 / 1.66	1.60 / 2.45	2.44 / 3.64
Rated capacity TS (equivalent) *	litres	160 (200)	160 (240)	160 (260)	-
Constant cylinder output TS *	kW/litres/h	15 / 370	20 / 490	29 / 710	-
Performance factor TS *	N _{LS0}	3.5	4.5	5.0	-
DHW output TS *	litres/10min	250	280	300	-
Standby input TS *	kWh/24h	1.47	1.47	1.47	-
Max. permissible cold water supply pressure TS *	bar	10	10	10	-
Minimum anode power, protective magnesium anode	mA	> 0.3	> 0.3	> 0.3	-
Outside diameter, heating flow	G	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Outside diameter, heating return	G	1 1/2"	1 1/2"	1 1/2"	1 1/2"
Condensate connection		1"	1"	1"	1"
Oil connection, flow/return hoses	G	3/8"	3/8"	3/8"	3/8"
Cold water inlet *	G	3/4"	3/4"	3/4"	-
DHW connection *	G	3/4"	3/4"	3/4"	-
DHW circulation connection *	G	3/4"	3/4"	3/4"	-
Boiler weight	kg	92	92	99	122
Cylinder weight *	kg	76	76	76	-
Balanced flue connection	mm	80/125	80/125	80/125	110/160
Balanced flue system	type	B23 ⁺ , B33 ⁺ , C33(x), C43(x), C53(x), C63(x), C83(x), C93(x)			
Fuel oil to DIN 51603-1/6		Fuel oil EL standard, low sulphur fuel oil EL or bio-oil B10			
Nozzle		Danfoss 0.30 / 80° S	Danfoss 0.40 / 80° S LE	Danfoss 0.55 / 80° S LE	Danfoss 0.55 / 80° S LE
Fuel oil filter		Siku max. 40 µm			
Pump pressure, stage 1/2	bar	5.0 ± 0.5/12.0 ± 1.0	8.5 ± 1.0/16.8 ± 2.5	8.5 ± 1.0/16.8 ± 2.5	11.0 ± 1.0/23.5 ± 2.5
Maximum negative pressure in oil lines	bar	-0.3	-0.3	-0.3	-0.3
Flow temperature, factory setting	°C	80	80	80	80
Max. flow temperature	°C	85	85	85	85
Heating water pressure drop at ΔT=20K / 10K	mbar	3.6 / 12	6 / 21	17 / 55	54 / 205
Max. permissible boiler pressure	bar	3	3	3	3
Heat exchanger water content	litres	7.5	7.5	9.0	11.5
Standard efficiency at 40/30 °C (H _i / H _s)	%	105 / 99	105 / 99	105 / 99	104 / 98
Standard efficiency at 75/60 °C (H _i / H _s)	%	100 / 95	101 / 96	101 / 96	98 / 93
Efficiency at rated load at 80/60 °C (H _i / H _s)	%	97 / 91	97 / 92	97 / 91	98 / 92
Efficiency at 30% partial load and TR=30 °C (H _i / H _s)	%	103 / 97	103 / 97	103 / 97	103 / 98
Boiler standby loss qB at 70 °C (EnEv)	%	0.75	0.75	0.55	0.45
Flue gas mass flow, stage 2	g/s	6.45	9.06	13.33	17.51
Flue gas temperature 50/30 - 80/60 °C, stage 2	°C	40 - 63	49 - 69	55 - 76	56 - 83
Available fan draught, stage 2	Pa	65	65	105	150
Flue gas mass flow, stage 1	g/s	4.04	6.28	9.05	10.91
Flue gas temperature 50/30 - 80/60 °C, stage 1	°C	35 - 55	40 - 61	40 - 64	43 - 68
Available fan draught, stage 1	Pa	32	45	55	72
Electrical connection	V~/Hz	230/50	230/50	230/50	230/50
Fitted fuse (medium slow)	A	5	5	5	5
Power consumption, stage 1 / stage 2	W	86/128	99/139	129/178	126/205
Protection		IP20	IP20	IP20	IP20
Condensate volume at 40/30 °C	litres/h	1.2	1.6	2.2	2.8
Condensate pH value		approx. 3	approx. 3	approx. 3	approx. 3
CE ID		CE-0085BS0326			

* Only for units with cylinder TS

Control accessories TOB / TOB-TS

The operation of the oil fired condensing boiler TOB / TOB-TS requires either an AM display module or a BM-2 programming module.



AM display module

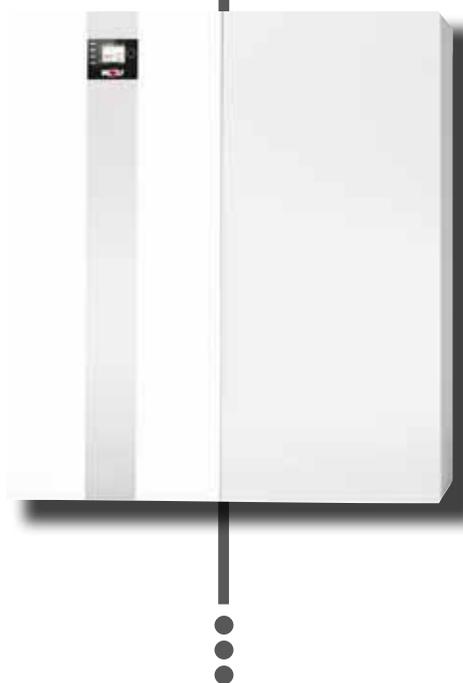
- Boiler display module
- Only required if the BM-2 is used as remote control
- Control by rotary selector with key function
- 4 quick start keys for frequently used functions
- LCD with background illumination

Please note:

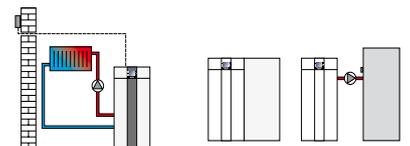
- AM always on the boiler

BM-2 programming module (incl. outside temperature sensor)

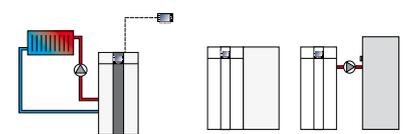
- Weather-compensated flow temperature
- Time programs for DHW, central heating and circulation
 - 3.5" colour display
 - Easy plain prompts guide through the menus
 - Control by rotary selector with key function
 - 4 function keys for frequently used functions
 - microSD card slot for software update
 - Installation either inside the boiler control unit or, as remote control, in a wall mounting base
 - Only one programming unit is required for multi-boiler systems
 - May be extended with mixer module MM (up to 7 mixer circuits)



BM-2 programming module (incl. outside temperature sensor) as weather-compensated control thermostat



BM-2 programming module with wall mounting base (accessory) as remote control



Either an AM display module or BM-2 programming module is required

Control accessories TOB / TOB-TS

Two-wire eBUS cable



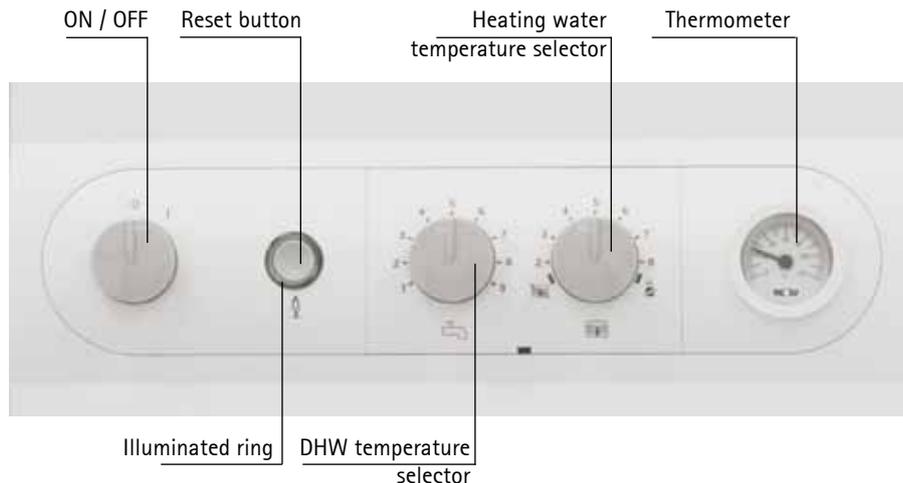
BM-2 programming module as remote control for further mixer circuits (if the BM-2 is fitted inside the boiler then up to 6 additional remote control units may be used)

Weather-compensated flow temperature

- Time programs for DHW, central heating and circulation
- 3.5" colour display
- Easy plain prompts guide through the menus
- Control by rotary selector with key function
- 4 function keys for frequently used functions
- Installation only as remote control, in a wall mounting base
- Only one programming unit is required for multi-boiler systems
- May be extended with mixer module MM (up to 7 mixer circuits)

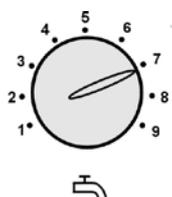
Continue with control accessories on page 10

Standard controls COB / COB-TS



Illuminated indicator ring as status display

Display	Explanation
Flashing green	Standby (power supply ON, burner OFF)
Constant green	Heat demand: pump running, burner OFF
Flashing yellow	Emissions test mode
Constant yellow	Burner ON, flame steady
Flashing red	Fault



DHW temperature selector

For oil fired condensing boilers in combination with a cylinder the setting range 1 - 9 corresponds to a cylinder temperature of 15 to 65 °C. Combined with a control thermostat, the adjustment at the DHW temperature selector is disabled; instead the temperature is selected at the boiler control thermostat.



Heating water temperature selector

The setting range 2 - 8 corresponds to a heating water temperature of 20 to 80 °C. Combined with a BM programming module, the adjustment at the heating water temperature selector is disabled.

Settings



Winter mode (position 2 to 8)

The circulation pump operates in heating mode.



Summer mode

Switch set to  circulation pump OFF (heating OFF); only DHW heating, frost protection, pump anti-seizing protection enabled, i.e. the circulation pump runs for approx. 30 s every 24 hours.



Emissions test mode

Turning the switch to position  lets the boiler operate at maximum output. The illuminated indicator ring flashes yellow for 15 minutes or until the maximum flow temperature has been exceeded.



Thermometer

The heating water temperature is displayed.

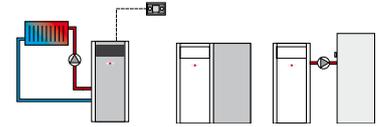
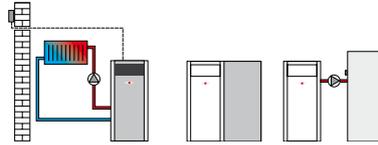
Control accessories COB / COB-TS



Standard control unit; part of the standard delivery of the oil fired condensing boiler

**BM programming module
(incl. outside temperature sensor)
as weather-compensated
control thermostat**

**BM programming module
with wall mounting base (accessory)
as remote control**



- Time programs for DHW and central heating
- LCD with background illumination
- Easy plain prompts guide through the menus
- Control by rotary selector with key function
- Four function keys for frequently used functions (heating, DHW, setback, help)
- Installation either inside the boiler control unit or, as remote control, in a wall mounting base
- Option for mixer module MM
- Only one programming unit is required for multi-boiler systems
- May be extended with mixer module MM (up to 7 mixer circuits)

Two-wire eBUS cable



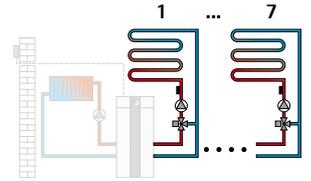
Control accessories

Two-wire eBUS cable



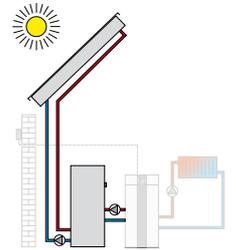
Mixer module MM

- Extension module for regulating one mixer circuit
- Weather-compensated flow temperature control
- Easy configuration of the controller through selection of pre-defined system options
- BM-2 programming module to clip into boiler, or extendable with wall mounting base as remote control for TOB/TOB-TS
BM programming module to clip into boiler, or extendable with wall mounting base as remote control for COB/COB-TS
- Rast-5 connection technology
- Incl. flow temperature sensor



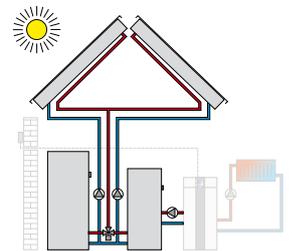
Solar module SM1

- Extension module for regulating one solar circuit
- In conjunction with Wolf boilers, greater energy savings through intelligent cylinder reheating, i.e. blocking cylinder reheating when there is sufficient solar yield
- Temperature differential controller for one heat consumer
- Maximum cylinder temperature limit
- Display of the set and actual values on the BM-2 programming module for TOB/TOB-TS
Display of the set and actual values on the BM programming module for COB/COB-TS
- Integral hours run meter
- Optional connection of heat meters
- Rast-5 connection technology
- Incl. collector sensor and cylinder sensor, each with sensor well



Solar module SM2

- Extension module to control one solar thermal system with up to 2 cylinders and 2 collector arrays, incl. 1 collector sensor and 1 cylinder sensor, each with sensor well
- Easy controller configuration by selecting one of the preset system versions
- In conjunction with Wolf boilers, greater energy savings through intelligent cylinder reheating, i.e. blocking cylinder reheating when there is sufficient solar yield
- Capturing the amount of heat
- Display of the set and actual values on the BM-2 programming module for TOB/TOB-TS
Display of the set and actual values on the BM programming module for COB/COB-TS
- eBus interface with automatic energy management
- Rast-5 connection technology



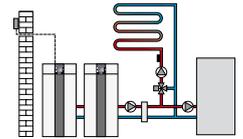
Control accessories

Two-wire eBUS cable



Cascade module KM

- Extension module for control of systems with low loss header or cascade configuration
- Applicable to control units of oil fired condensing boilers (4 appliances)
- Easy configuration of the controller through selection of pre-defined system options
- Suitable for regulating one mixer circuit
- BM-2 programming module to clip into boiler, or extendable with wall mounting base as remote control for TOB/TOB-TS
- BM programming module to clip into boiler, or extendable with wall mounting base as remote control for COB/COB-TS
- 0-10V input for building control network systems; fault signal output 230V
- eBus interface with automatic energy management
- Rast-5 connection technology



Radio clock (DCF77 signal) with outside temperature sensor for automatic time setting.

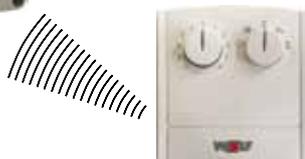


Radio clock (DCF77 signal) for automatic time setting.



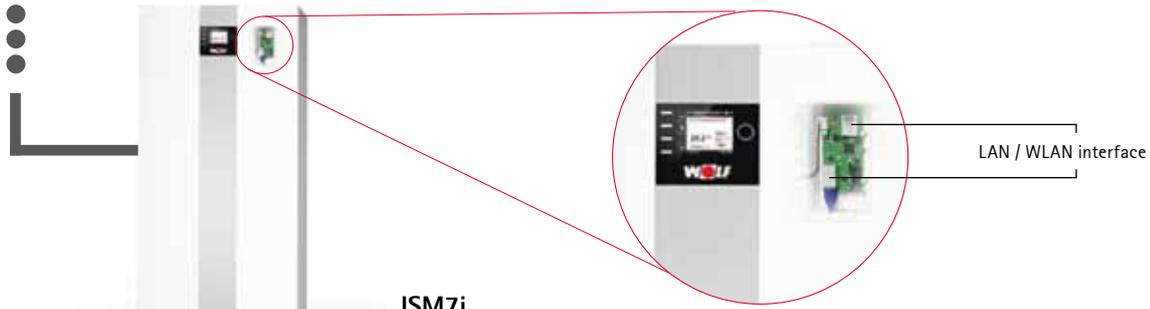
Wireless receiver for wireless outside temperature sensor and wireless remote control incl. radio clock (DCF77 signal)

Wireless outside temperature sensor (only in conjunction with receiver for wireless outside temperature sensor and remote control, part no. 27 44 209)



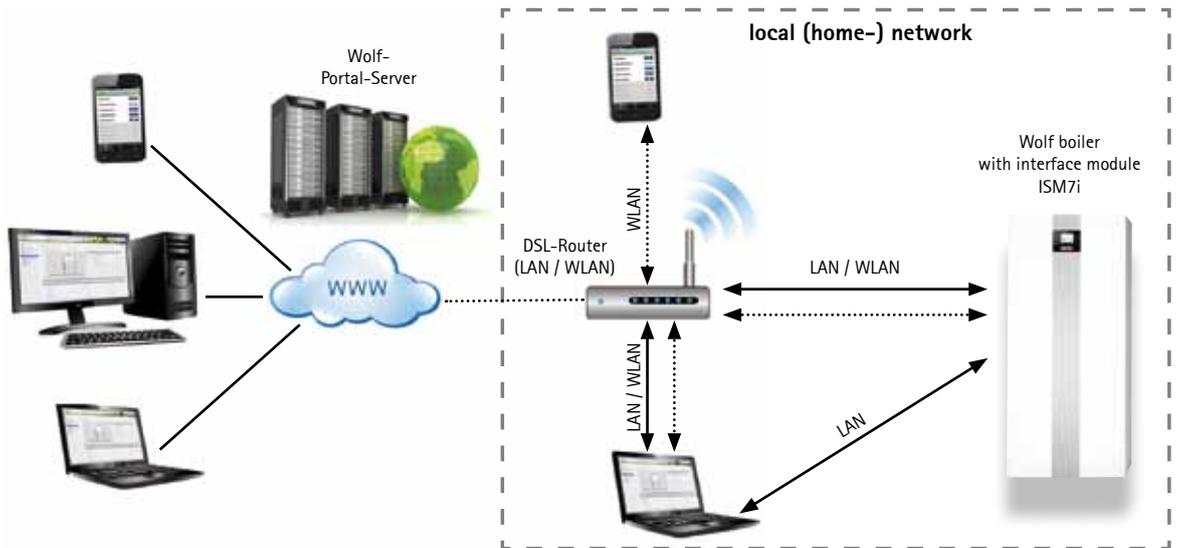
Wireless remote control (only in conjunction with a receiver for wireless outside temperature sensor and remote control) up to one wireless remote control per heating circuit with mixer.

Control accessories TOB / TOB-TS

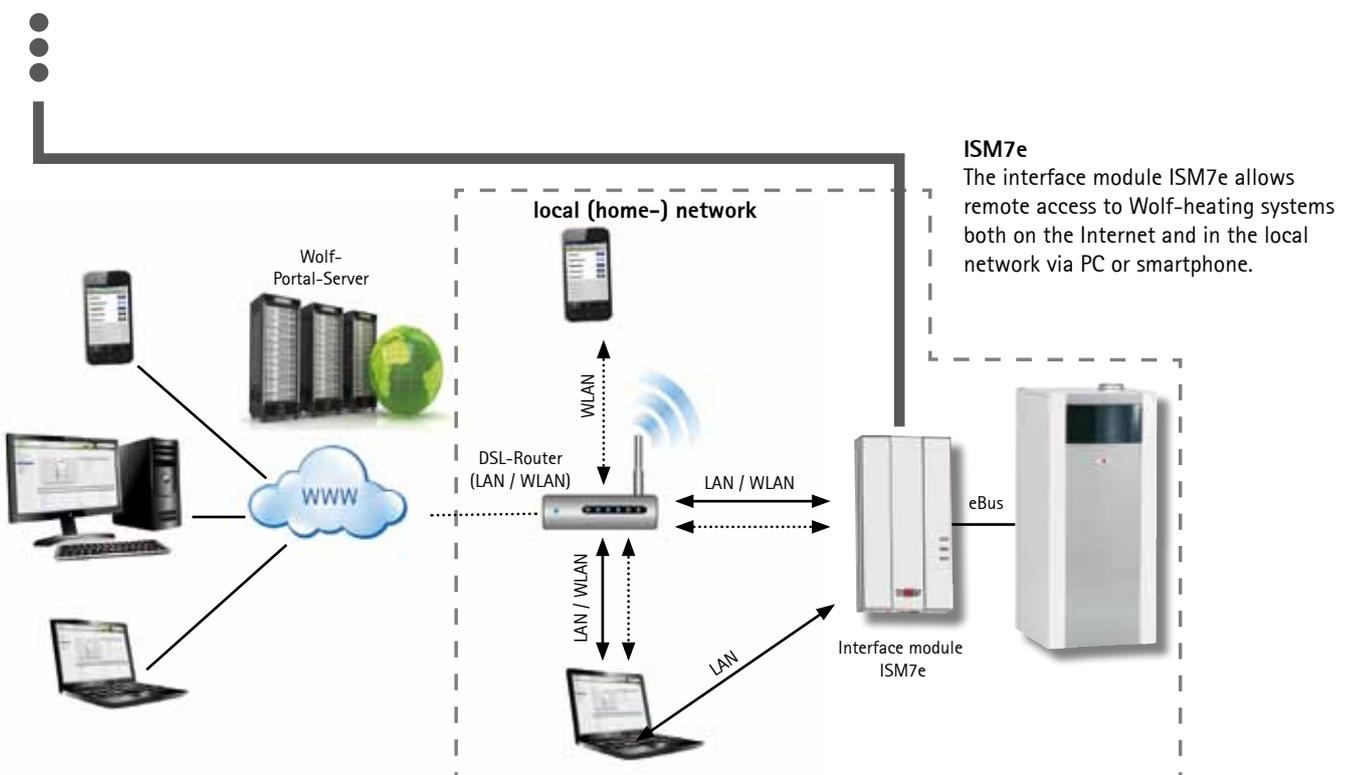


ISM7i

LAN / WLAN interface for access to the control unit via the internet or a local area network. Operation via iPhone app, Wolf-Portal or PC software. Comprising an ISM7i interface module and PC software for loading into the appliance control unit.



Control accessories COB / COB-TS

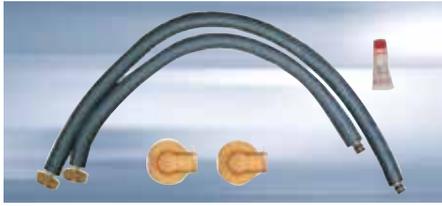


ISM7e

The interface module ISM7e allows remote access to Wolf-heating systems both on the Internet and in the local network via PC or smartphone.

Installation accessories

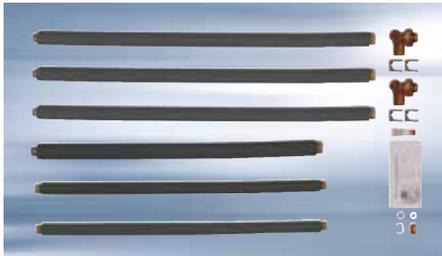
We recommend making the connection to the heating system with the following parts from the Wolf accessories range.



COB / TOB connection set, adjacent to the wall

comprising:

- 2 cross pieces, each with one connection
- 2 brackets
- 1 corrugated stainless steel pipe 1", length 1300 mm
- 1 corrugated stainless steel pipe 1", length 800 mm
- 1 silicon grease tube



COB / TOB connection set with TS, adjacent to the wall

comprising:

- 2 cross pieces, each with two connections
- 4 brackets
- 3 corrugated stainless steel pipes 1", length 1300 mm
- 1 corrugated stainless steel pipe 1", length 800 mm
- 2 corrugated stainless steel pipes 3/4", length 800 mm
- 1 silicon grease tube
- 1 trimming set 3/4"



COB / TOB connection set, adjacent to the wall, for cylinders SE-2 up to 750 l, SEM-1 up to 750 l or SEM-2 up to 400 l

comprising:

- 2 cross pieces, each with two connections
- 3 corrugated stainless steel pipes 1", length 1300 mm
- 1 corrugated stainless steel pipe 1", length 800 mm
- 4 brackets
- 1 silicon grease tube
- 1 pipe bend
- 1 pump UPS 25-60
- 6 flat gaskets 1"
- 2 double nipples G1" AG - G1"
- 2 flat gaskets 1 1/2" EPDM
- 1 elbow with air vent
- 1 Adaptor fittings G 1 1/2" (fem.) on G 1" (male)



TS accessory set for cold water

comprising:

- 1 expansion vessel, 8 litres
- 1 cold water connection pipe to the expansion vessel
- 2 double nipples 3/4"
- 1 trimming set 3/4"



TS DHW circulation pump accessory set

comprising:

- 1 DHW circulation pump
- 1 corrugated stainless steel pipe 3/4"
- 1 trimming set 3/4"



Pipe assembly

comprising:

- 1 circulation pump
- 2 thermometers in flow and return
- 2 ball valves in flow and return
 - incl. / excl. mixer
 - with manifold for 2 or 3 pipe assemblies



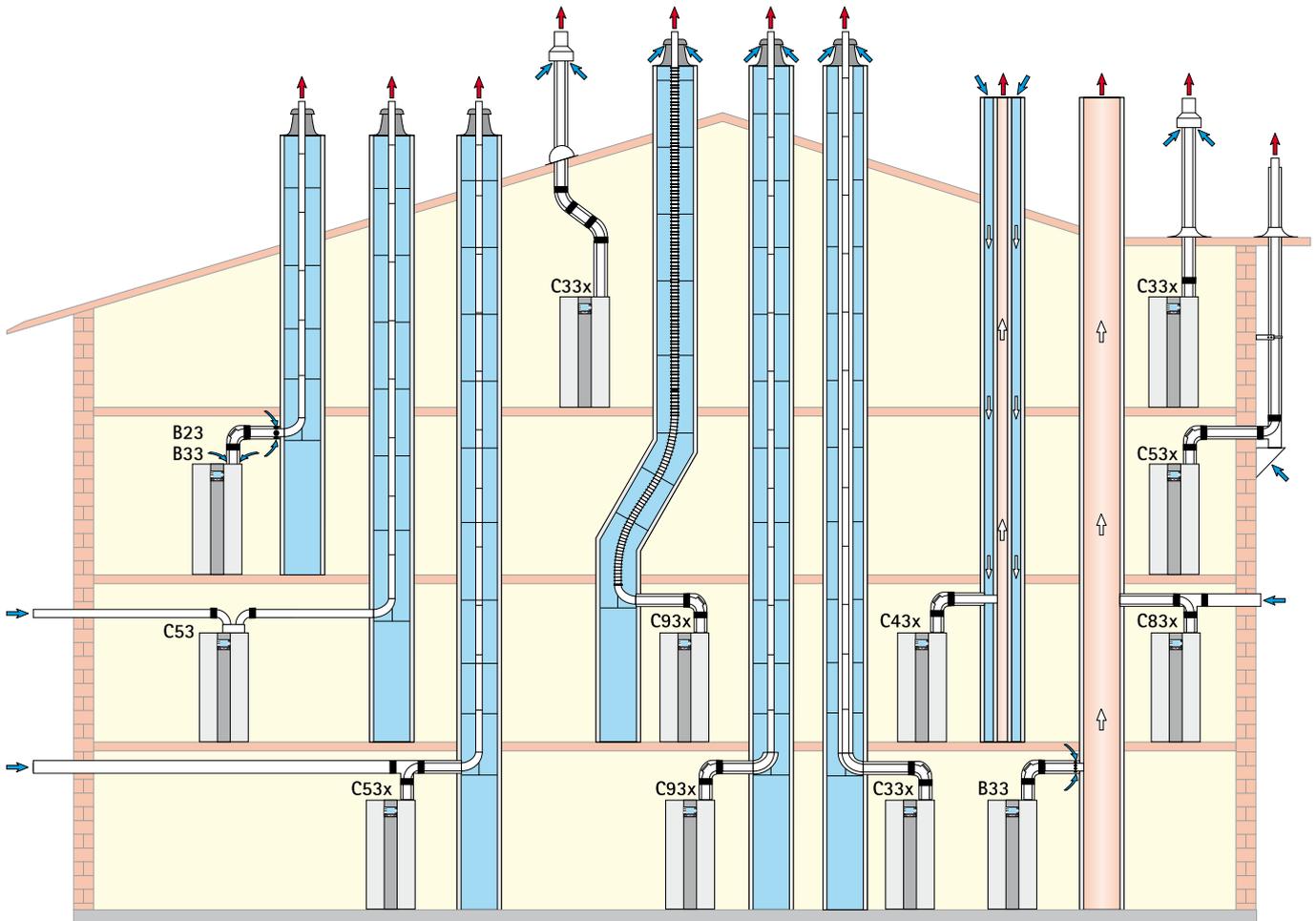
Safety assembly 1"

Additional accessories:

Neutralisation, condensate lifting system, wall mounting frame for pipe assembly

see also "Heating systems" pricelist

Balanced flue routing



Types of connection

Type ^{1), 2)}	Operating mode		To be connected to				
	Open flue	Balanced flue	Moisture-resistant chimney	Balanced flue chimney	Balanced flue	Acc. to Build Regs cert. LAF	Moisture-resistant flue
B23 ^P , B33 ^P , C33x, C43x, C53, C53x, C63x, C83x, C93x	yes	yes	B33 ^P , C53, C83x	C43x	C33x, C53x, C93x	C63x	B23 ^P , C53x, C83x

¹⁾ Marking "X" indicates that all flue pipe components are surrounded by combustion air and fulfil increased tightness requirements.

²⁾ Versions B23^P, B33^P take the combustion air directly from the surroundings (open flue)
Version C takes the combustion air from the outside via a sealed system (balanced flue)

The following balanced flue or flues with CE-0036-CPD-9169003 certification may be used:

- Flue DN 80
- Concentric balanced flue DN 80/125
- Flue DN 110
- Concentric balanced flue (on an external wall) DN 80/125
- Flue (flexible) DN83

The necessary type plates and certificates are included with the relevant Wolf accessories. Observe all additional installation instructions included with accessories.

Balanced flue routing

Versions as condensing boilers		Max. length, vertical ¹⁾					
		TOB-18	COB-15	COB-20	COB-29	COB-40	
B23	Flue in a duct and combustion air directly via the boiler (open flue)	30	30	30	30	30	
B33	Flue in a duct with horizontal, concentric connection line (open flue)	30	30	30	30	30	
B 33	Connection to a moisture-resistant flue gas chimney with a horizontal concentric connection line (open flue)	Calculation to DIN EN 13384 (balanced flue manufacturer)					
C33x	Vertical concentric roof outlet through a pitched or flat roof, vertical concentric balanced flue for installation in a duct, (balanced flue)	24	20	20	16	21	
C43x	Connection to a moisture-resistant balanced flue chimney, maximum pipe length from centre of boiler bend to connection 2 m (balanced flue)	Calculation to DIN EN 13384 (balanced flue manufacturer)					
C53	Connection to the flue in a duct and ventilation air line through an external wall (balanced flue)	30	30	30	30	30	
C53x	Connection to a flue on an external wall (balanced flue)	30	30	30	30	30	
C53x	Connection to the flue in a duct and ventilation air through an external wall (balanced flue)	30	30	30	30	14	
C83x	Concentric connection to a moisture-resistant flue gas chimney and combustion air through an external wall (balanced flue)	Calculation to DIN EN 13384 (balanced flue manufacturer)					
C93x	Vertical flue for installation in a duct, flexible and rigid with horizontal concentric connection line	rigid	23	27	27	22	20
		flexible	22	19	19	16	2) ²⁾

¹⁾ Available fan draught: COB-15: 32-65 Pa / COB-20: 45-65 Pa / COB-29: 55-105 Pa / COB-40: 70-150 Pa (the maximum length corresponds to the total length from the appliance to the flue terminal)

²⁾ Vertical flue for installation in a duct, flexible and rigid with horizontal concentric connection line Calculation to DIN EN 13384 (balanced flue manufacturer)

Note:

Systems C 33x and C 83x are also suitable for installation in garages.

Where necessary, adapt the installation examples to the relevant Building Regulations and requirements of your country/region. Discuss any questions relating to the installation, particularly regarding the inspection components and ventilation apertures, prior to installation with your local flue gas inspector.

The length dimensions refer to concentric balanced flue and flues, and only to original Wolf components.

Calculating the balanced flue length

The calculated length of the balanced flue system or the flue is derived from the straight pipe length and the length of the pipe bends.

Example:

Length of straight balanced flue 1.5 m

Bend 87° = 2 m

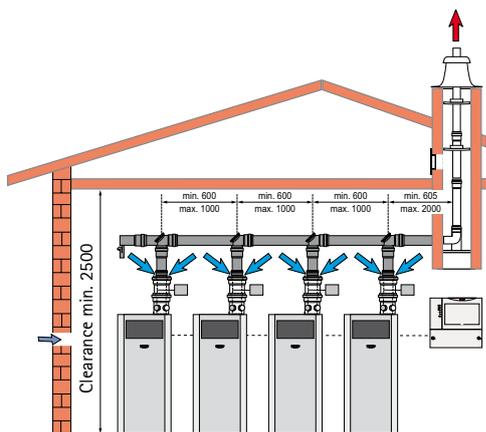
2 x 45° bends = 2 x 1 m

$L = 1.5\text{ m} + 1 \times 2\text{ m} + 2 \times 1\text{ m}$

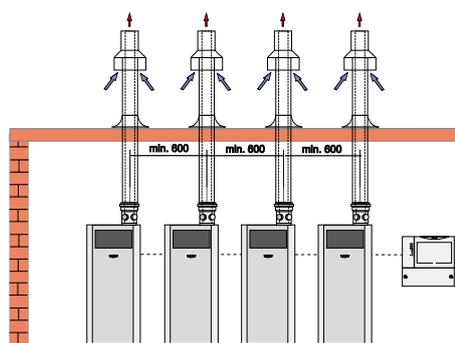
$L = 5.5\text{ m}$

Component	Calculated length
87° bend	1.5 m
45° bend	1 m
Tee 87° with inspection aperture	2 m
Straight pipe	Subject to length

Table: Pipe length calculation



COB-29/40 cascade operation with manifold flue

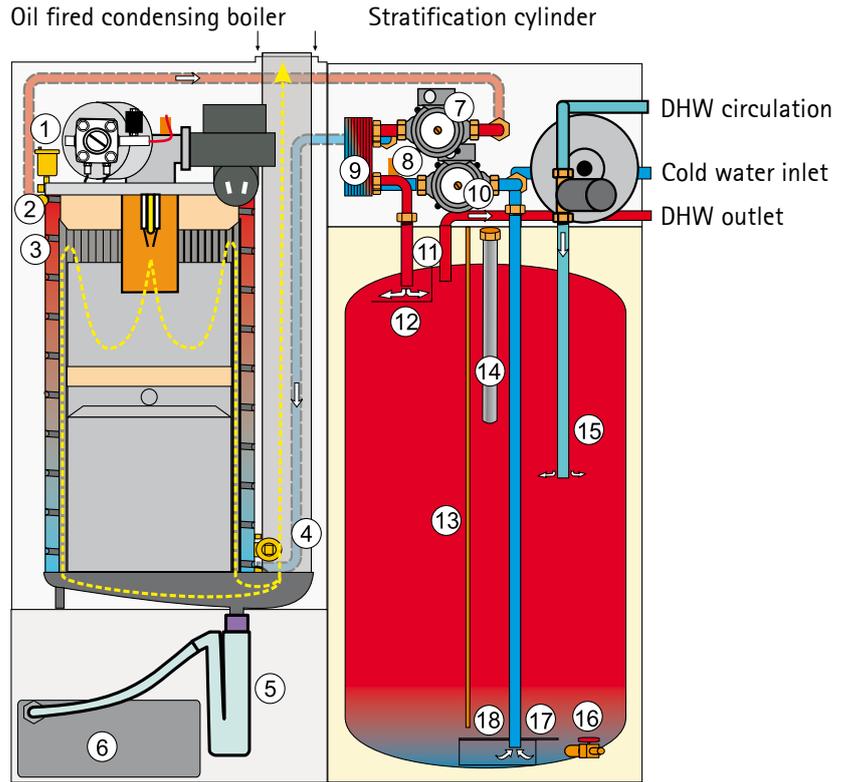


COB-29/40 cascade operation with separate, concentric, vertical balanced flue type C33x

Central heating - DHW heating options

Oil fired condensing boiler with stratification cylinder

- 1 Automatic air vent valve (standard delivery)
- 2 High limit safety cut-out
- 3 Flow temperature sensor
- 4 Flue gas temperature sensor
- 5 Siphon
- 6 Condensate pump with neutralisation
- 7 Cylinder primary pump
- 8 Cylinder heating sensor
- 9 Plate-type heat exchanger in the cylinder
- 10 Stratification pump, controlled
- 11 DHW outlet at the highest point
- 12 Cylinder heating from above with deflector and divider
- 13 Sensor well for cylinder temperature sensor
- 14 Protective magnesium anode
- 15 DHW circulation line
- 16 Boiler drain (standard delivery)
- 17 Cold water supply with control and distribution device
- 18 Cold water draw-off for cylinder heating

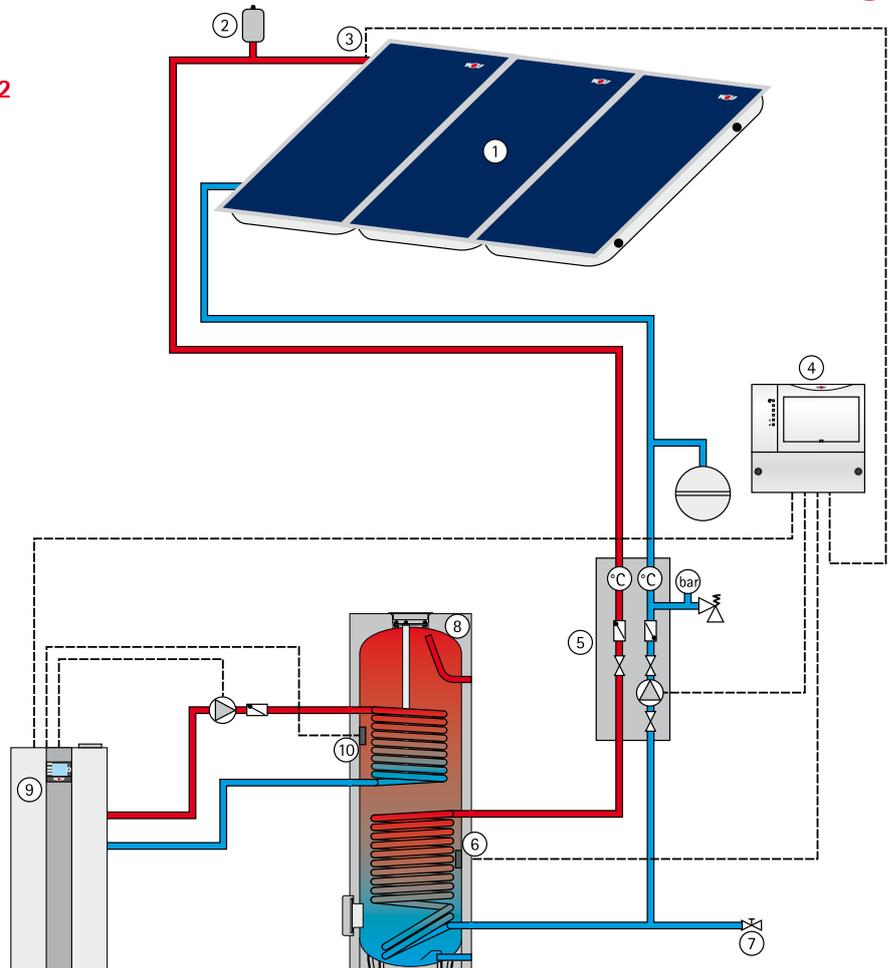


Variants

Heating with „Wolf solar thermal systems“ - DHW heating

TOB/COB with solar cylinder SEM-1 / SEM-2 and one collector field

- 1 Collector array
- 2 Air vent trap
- 3 Collector sensor
- 4 Solar module SM1
- 5 Pump/fitting assembly 10
- 6 Solar control unit cylinder sensor
- 7 Fill and drain valve
- 8 SEM-1 / SEM-2 solar cylinder
- 9 Condensing boiler TOB with BM-2 programming module
- 9 Condensing boiler COB with BM programming module
- 10 Cylinder sensor, heating water

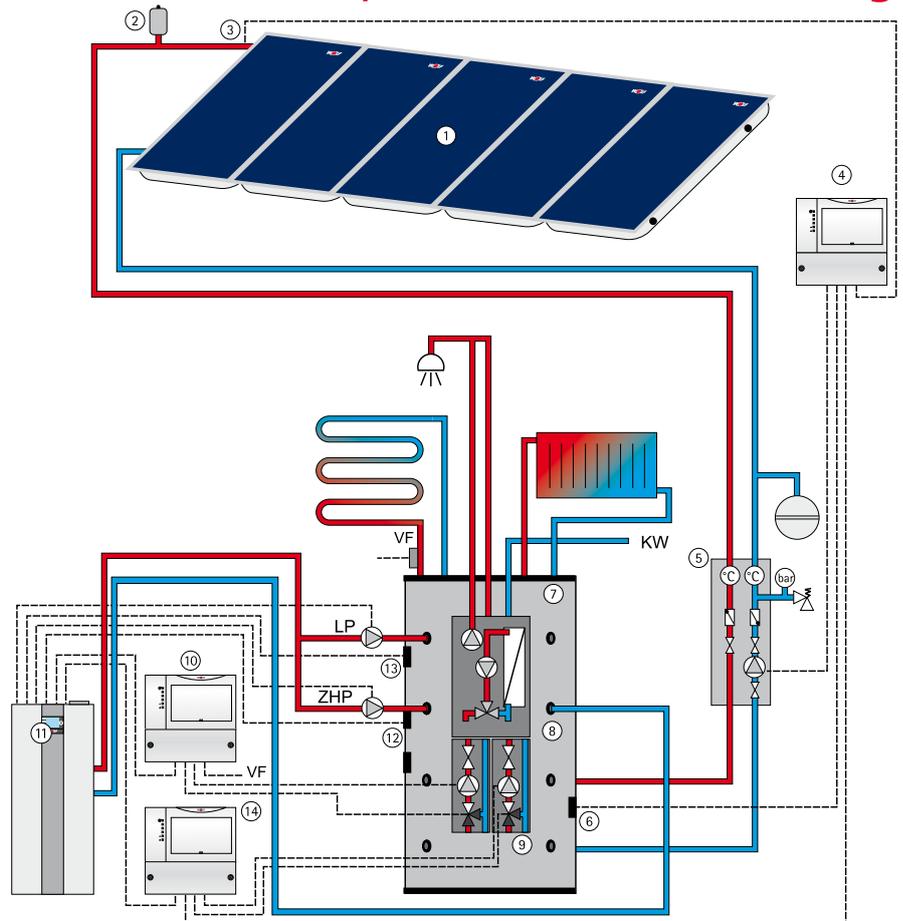


Variants

Heating with „Wolf solar thermal systems“ - DHW heating

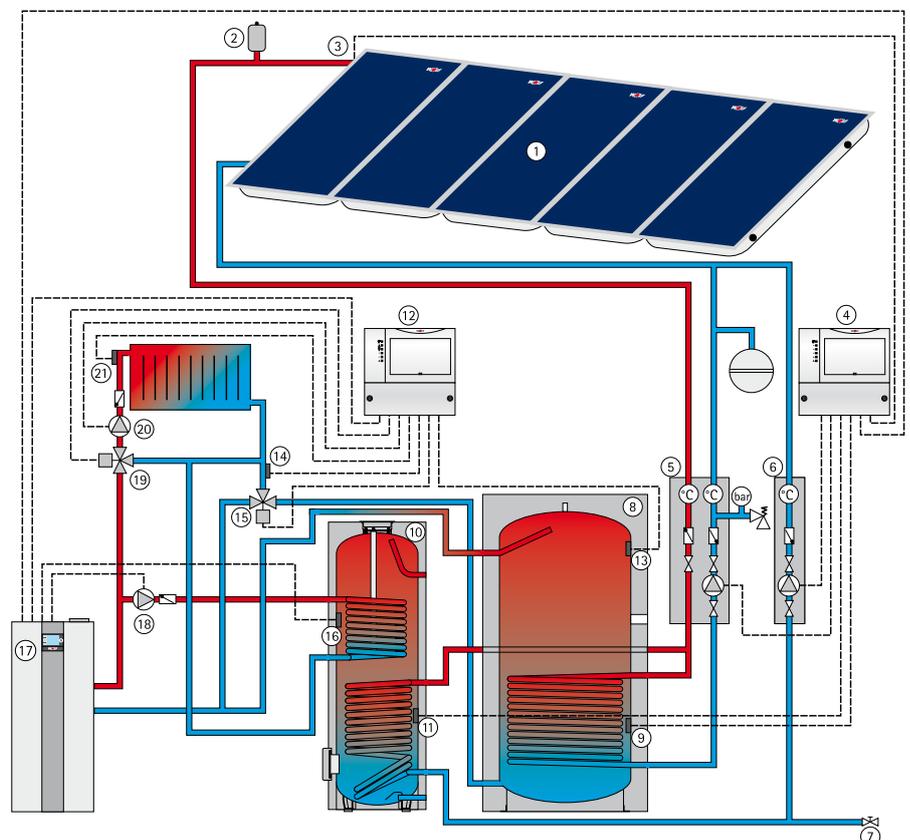
Solar DHW heating and central heating backup with stratification cylinder BSP

- 1 Collector array
- 2 Air vent trap
- 3 Collector sensor
- 4 Solar module SM1
- 5 Pump/fitting assembly 5
- 6 Solar control unit cylinder sensor
- 7 Stratification cylinder BSP
- 8 Fresh water module for DHW heating
- 9 Heating circuit assembly, mixing valve circuit assembly
- 10 Mixer module MM
- 11 Condensing boiler TOB with BM-2 programming module
- 11 Condensing boiler COB with BM programming module
- 12 Collective sensor
- 13 Cylinder sensor
- 14 Mixer module MM

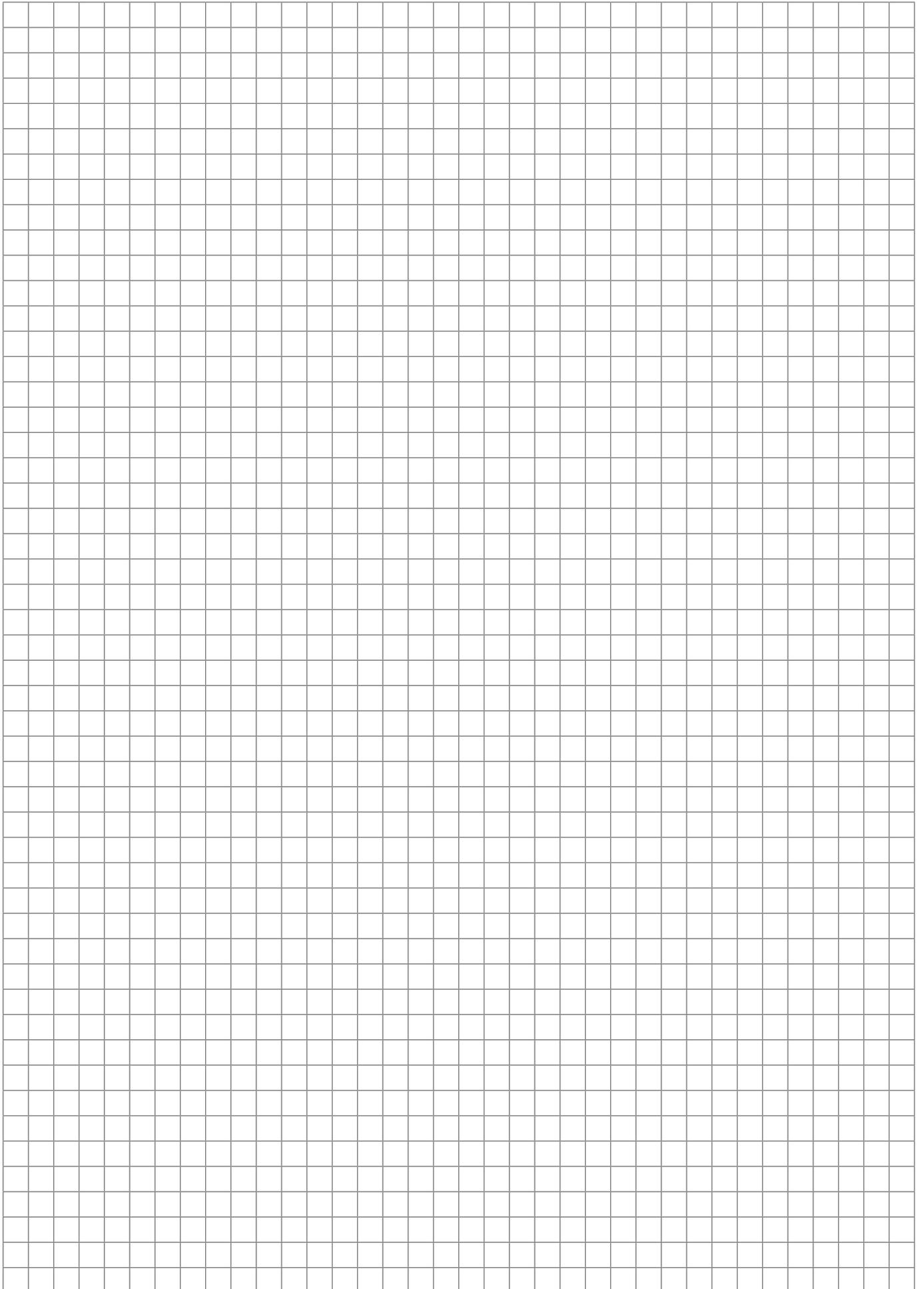


Solar DHW heating and central heating backup with solar cylinder SEM-1 / SEM-2 and buffer cylinder SPU-2-W

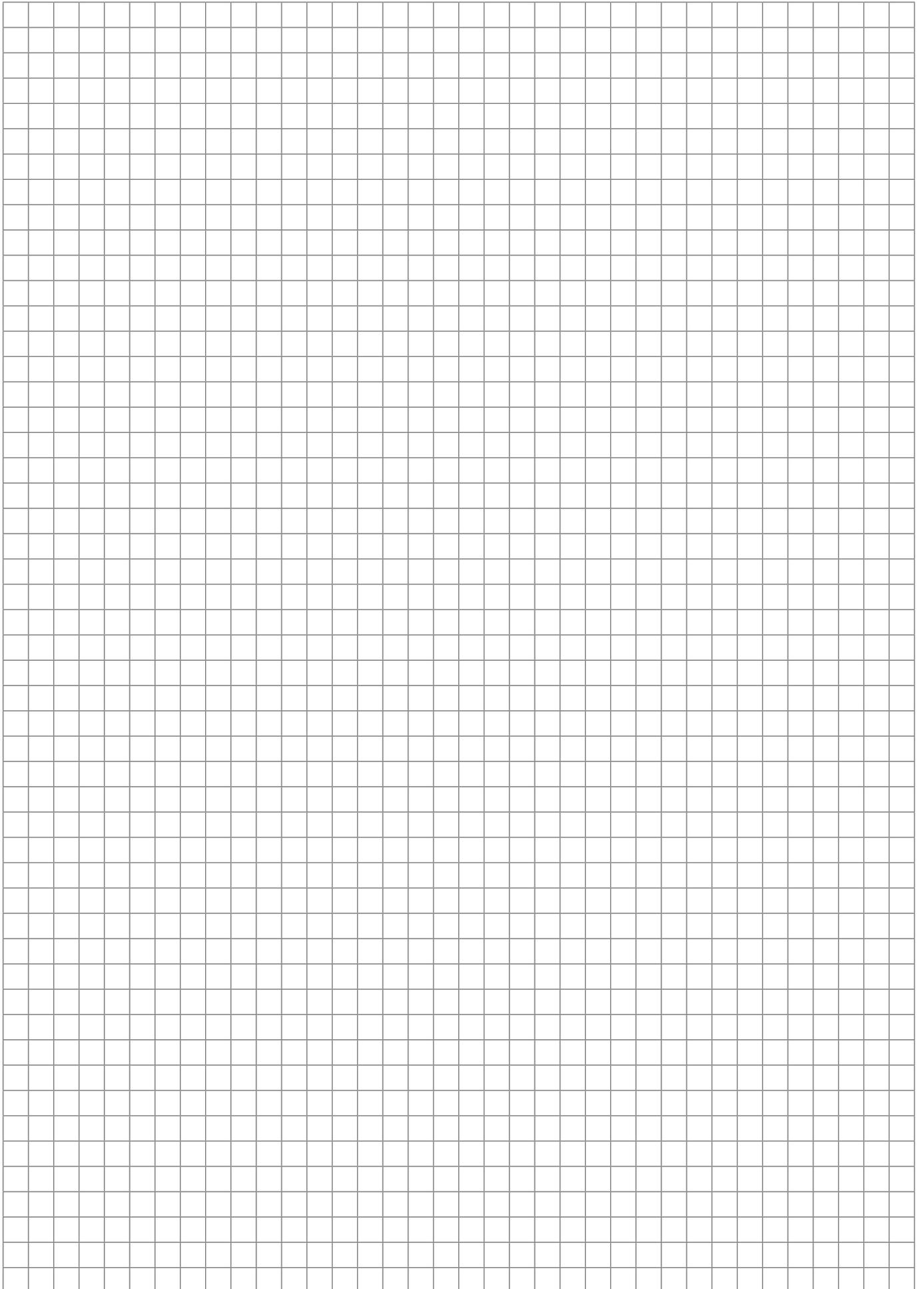
- 1 Collector array
- 2 Air vent trap
- 3 Collector sensor
- 4 Solar module SM2
- 5 Pump/fitting assembly
- 6 Pump/fitting assembly extension
- 7 Fill and drain valve
- 8 Buffer cylinder SPU-2-W
- 9 Solar circuit cylinder sensor (buffer cylinder)
- 10 DHW cylinder SEM-1 / SEM-2
- 11 Solar circuit cylinder sensor (DHW)
- 12 Mixer module MM (config. 4)
- 13 Buffer cylinder sensor
- 14 Return temperature sensor
- 15 Three-way diverter valve
- 16 Cylinder sensor, heating water
- 17 Condensing boiler TOB with BM-2 programming module
- 17 Condensing boiler COB with BM programming module
- 18 Cylinder heating pump, heating water
- 19 Mixing valve motor
- 20 Mixing valve circuit pump
- 21 Flow sensor mixing valve circuit



Notes



Notes





The comprehensive equipment range from system supplier Wolf offers the ideal solution for commercial and industrial buildings, for new build and for modernisation projects alike. The range of Wolf control units fulfils every need where heating convenience is concerned. The products are easy to operate, energy-efficient and reliable. Solar heating systems can be quickly integrated into existing systems. All Wolf products can be easily and rapidly commissioned and maintained.

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Dealer address



The competence brand for energy saving systems



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