

Solar technology

High performance flat-plate collectors TopSon F3 / F3-Q

High performance flat-plate collector CFK-1

High performance vacuum tube collector TRK

Swimming pool absorber

DHW cylinder SEM-1

Dual cylinders SED-750 / 280

Buffer cylinder SPU-2 / SPU-2-W

Stratification cylinder type 850



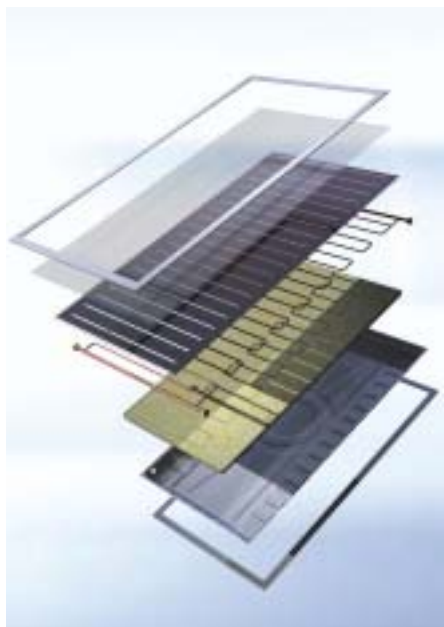
TopLine / ComfortLine

High performance flat-plate collectors TopSon F3 / F3-Q

High performance flat-plate collector CFK-1

for solar heating systems used for DHW heating

for solar heating systems used for central heating backup



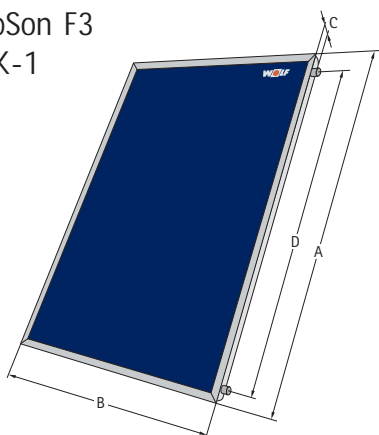
Shown: TopSon F3

Benefits of Wolf high performance flat-plate collectors:

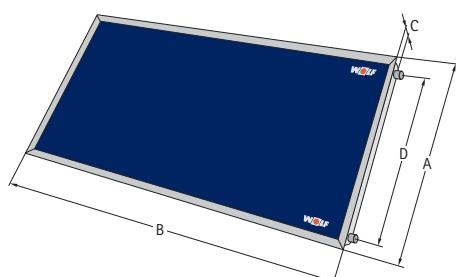
- High performance flat-plate collectors tested to EN 12975 part 2 with Top-energy utilisation. The minimum yield for grants/subsidies [Germany] has been certified
- The conditions set for the "Blue Angel" certificate of environmental excellence acc. to RAL UZ 73 are met
- Deep-drawn, highly weather resistant aluminium collector housing
- Thermal insulation made from Rockwool, 60 mm thick for minimum cool-down losses, TopSon F3/F3-Q with additional insulation on the sides
- Copper absorber (TopSon F3/F3-Q) or aluminium absorber base (CFK-1) with highly selective coating for extremely high yields. Meander (TopSon F3/F3-Q) or harp (CFK-1) layout ensure an even flow and effective function during "Low Flow" operation, ultra-sound welded
- Expansion joints between collectors
- Safety glass, 3.2 mm (TopSon F3/F3-Q) or 3.0 mm (CFK-1) thick; hail-proof to EN 12975, thermally pre-stressed, TopSon F3/F3-Q with improved transparency
- EPDM seal, pressed into a single-piece grip moulding
- With the TopSon F3/F3-Q, up to 5 collectors can be connected to one side; connection either on the l.h. or r.h. side
- Flat-plate collectors TopSon F3 and CFK-1 for "portrait" installations, TopSon F3-Q for "landscape" installation
- Collectors self-draining through "Four connection" technology
- 5 year warranty

Specification

TopSon F3
CFK-1



TopSon F3-Q



High performance flat-plate collector	Type	TopSon F3	TopSon F3-Q	CFK-1
Length	A mm	2099	1099	2099
Width	B mm	1099	2099	1099
Depth	C mm	110	110	110
Flow/return	D mm	1900	900	1900
Connections (flat sealing with union nut)	G	¾"	¾"	¾"
Angle of inclination		15° to 90°	15° to 90°	15° to 90°
Optical efficiency *	%	82.1	81.9	71.2
Heat loss coefficient k_1 *	W/(m ² K ²)	3.312	3.312	3.5
Heat loss coefficient k_2 *	W/(m ² K ²)	0.0181	0.0181	0.0084
Max. idle temperature	°C	198	198	196
Irradiation angle correction factor K_{50° *	%	93	93	95.2
Thermal capacity C *	kJ/(m ² K)	5.5	6.3	4.723
Max. operating pressure	bar	10	10	10
Gross area	m ²	2.3	2.3	2.3
Effective absorber area	m ²	2.0	2.0	2.0
Content	litres	1.7	1.9	1.1
Weight (dry)	kg	40	41	36
Recommended flow vol. per collector	litres/h	30 - 90	30 - 90	90
Heat transfer medium		ANRO (undiluted)		

* Values to EN 12975

TopLine

High performance vacuum tube collectors TRK
for solar heating systems used for DHW heating
for solar heating systems used for central heating backup

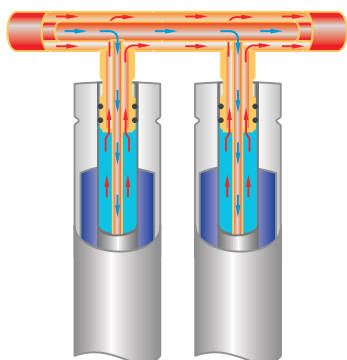
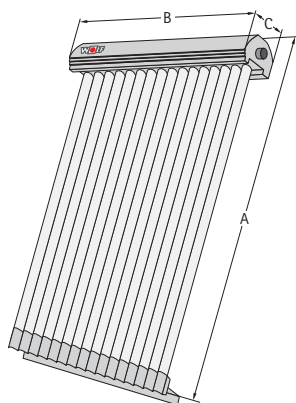


TRK benefits at a glance:

- The TRK collectors meet the requirements set for the "Blue Angel" certificate of environmental excellence acc. to RAL UZ 73
- **Powerful:** high performance on the smallest of footprints; high yields particularly during spring and autumn; especially suitable for a combination of DHW heating and central heating backup
- **Durable:** pure glass:glass connection similar to a Thermos flask, enables a life-long vacuum and therefore ensures high thermal insulation; the borosilicate glass is resistant to chemicals and temperatures and has been proven in thousands of applications in laboratories and domestic use; hail-proof safety glass to DIN EN 12 975
- **Constant:** the absorber and the mirror surface are inside the high vacuum and are therefore protected from environmental influences and suffer no degradation; consequently permanently high efficiency
- **Flexible:** modular layouts for ideal matching to the space available on the roof
- **High aesthetics:** elegant appearance through small tube diameter, optimised distance between pipes and appealing design
- **Easy to install:** only 20 kg; compact and handy; fully assembled; ready to plug in
- **Warranty:** 5 years

Specification

TRK



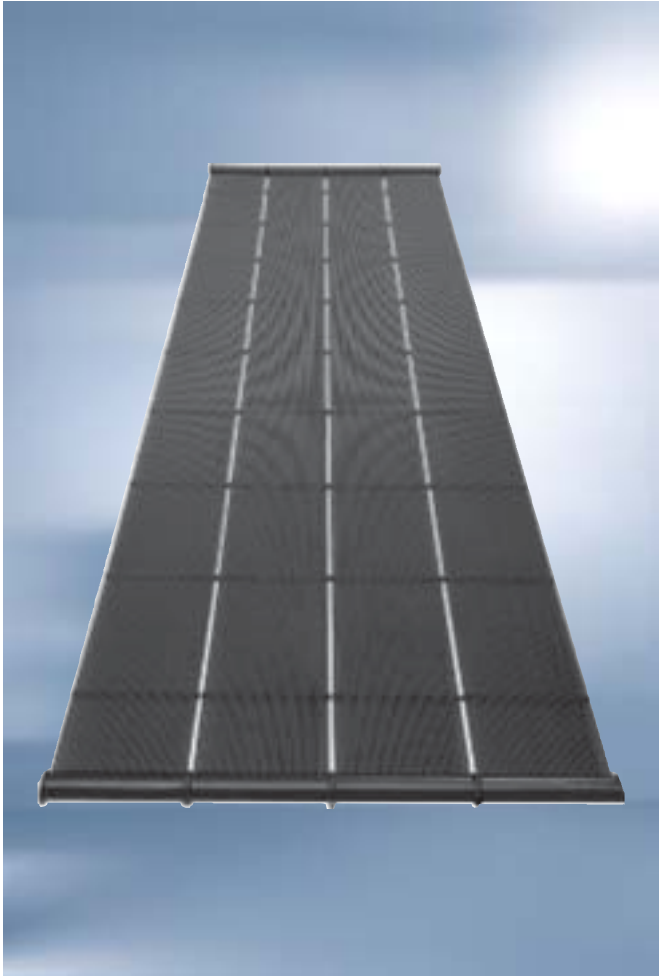
Collector flow pattern

Vacuum tube collector	Type	TRK
Length	A mm	1684
Width	B mm	765
Depth	C mm	100
Connections (flat sealing with union nut)	G	¾"
Angle of inclination		10° to 90°
Absorption (energy absorption)	%	95
Emissions	%	5
Optical efficiency *	%	77.3
Heat loss coefficient k_1 *	W/(m ² K ²)	1.09
Heat loss coefficient k_2 *	W/(m ² K ²)	0.0094
Max. idle temperature	°C	290
Irradiation angle correction factor K_{50} *	%	1.09
Effective thermal capacity *	C_{eff} in KJ/(m ² K)	35.7
Max. operating pressure	bar	6
Pressure drop	mbar	1.2
Number of vacuum tubes per collector	No.	16
Diameter of glass tubes	mm	38
Gross area	m ²	1.29
Effective absorber area	m ²	0.808
Content	litres	3.5
Weight (dry)	kg	20
Recommended flow volume per collector	litres/h	40
Heat transfer medium		G-LS (undiluted)

* Values to EN 12975

Swimming pool absorber

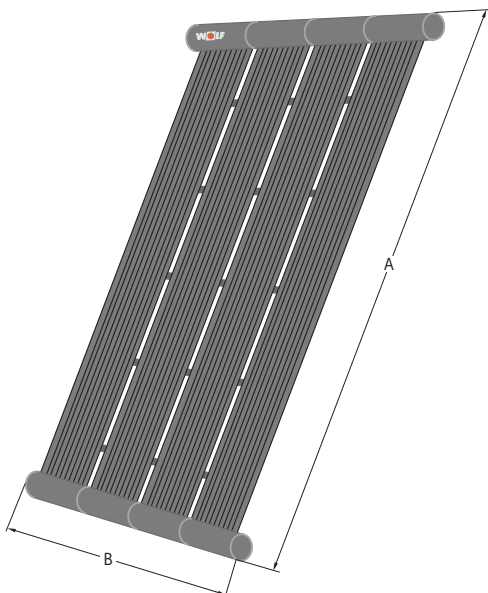
Economic solution for efficiently heating swimming pool water



Benefits of the swimming pool absorber at a glance:

- Low investment and operating costs
- Long service life through robust absorber tubes
- Scale and dirt-repellent absorber system
- High energy yields through the utilisation of solar and environmental energy
- UV and weather-resistant
- Small attack areas for gusts of wind
- Compact panel dimensions of 3.23 m x 1.2 m
- 5 year warranty

Specification



Swimming pool absorber		
Length	A mm	3230
Width	B mm	1240
Operating temperature	°C	5-90
Permissible operating pressure at 20 °C	bar	25
Permissible operating pressure at 80°C	bar	8
Pressure drop	mbar	2
Absorber surface area	m ²	3.5
Content	litres	12
Weight (dry)	kg	10
Recommended flow volume per absorber	litres/h	350

Control units

TopLine solar technology



Temperature differential control unit EKA

For one heat consumer, with maximum cylinder temperature limit, adjustable start temperature differential (incl. collector and cylinder sensors, respectively with sensor wells).

Pel. Reg = 0.6 W



Microprocessor-controlled temperature differential control unit EKDK-W

For one heat consumer, simple operation, with maximum cylinder temperature limit, digital temperature display, adjustable start and stop temperature differential, sensor function test, integral hours run counter, optional connection of heat meters (incl. collector and cylinder sensors, respectively with sensor wells).

Pel. Reg = 1.2 W



Microprocessor-controlled temperature differential control unit DigiSolar

For single or two-circuit systems with one or two heat consumers. Adjustable start and stop temperature differential, maximum cylinder temperature limit with overheating protection; anti-seizing pump protection; distribution optimisation; sensor function test; priority control; collector temperature display; cylinder temperature display; return temperature display; optional heat meter connection; display of solar yield (only in conjunction with heat meter accessories); integral hours run counter, collector and cylinder immersion sensor, respectively with sensor wells).

Pel. Reg = 1.5 W



Microprocessor-controlled temperature differential control unit DigiSolar MF

For one, two or three heat consumers and one or two collector arrays. Clear, menu-guided operation with a two-line plain text display. Maximum cylinder temperature limit, overheating protection for the solar heating system, digital temperature display, adjustable start and stop temperature differential, priority control, distribution optimisation (east:west control), function display for operating, controller and pump status. Integral hours run counter for each cylinder, optional heat meter connection, system monitoring with plain text fault display.

Pel. Reg = 1.9 W

Freestanding cylinder SEM-1

with two indirect coils

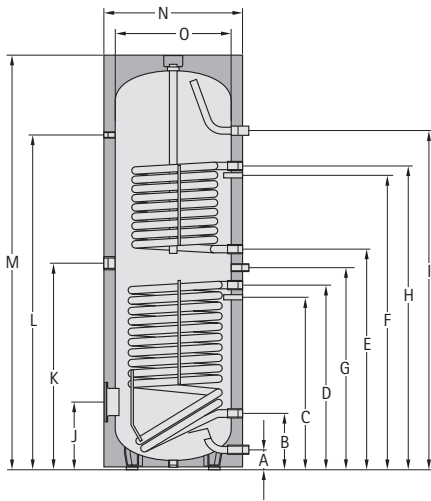
Freestanding steel cylinder with quality certificate,
heating water max. 110 °C and 10 bar, DHW max. 95 °C and 10 bar



Benefits of the Wolf SEM-1:

- Solar cylinder made from steel with two enamel-coated indirect coils to DIN 4753
- Highly-effective thermal insulation and low thermal losses through high-grade hard PU foam insulation below the cylinder foil casing
- Thermal insulation (CFC free)
- The interior of the cylinder and the indirect coils are protected by enamel coating and a protective magnesium anode
- Large heat exchanger areas ensure a short heat-up time and a high constant DHW output
- Side flange for additional indirect coils and simple maintenance
- Optimised ratio between diameter and height for good temperature stratification
- 5 year warranty on the freestanding cylinder,
2 year warranty on all electrical and moving parts

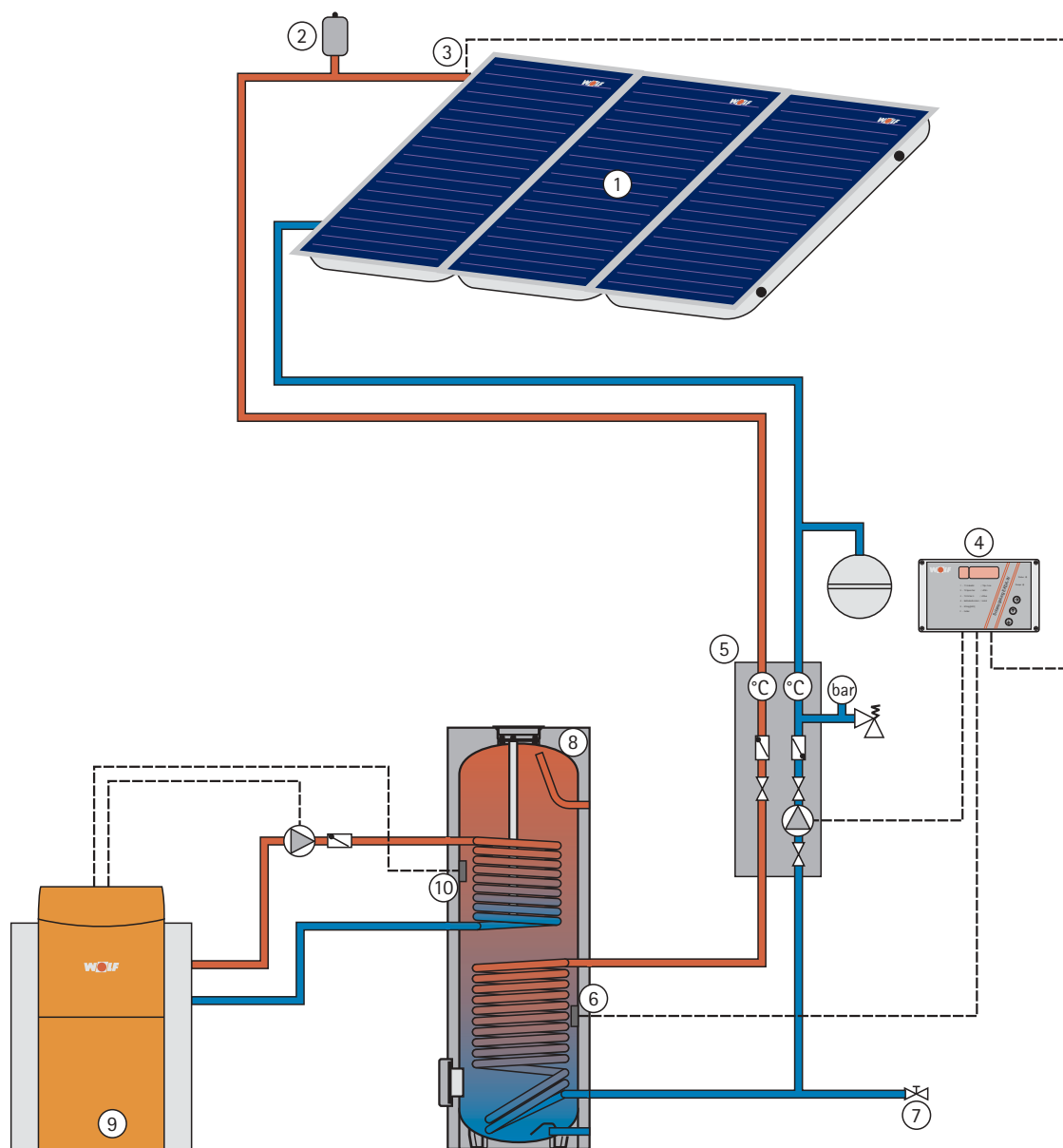
Specification



DHW cylinder	Type SEM-1	300	400	500	750	1000
Cylinder capacity	litres	300	400	500	750	1000
Constant DHW cylinder output 80/60-10/45 °C (heating)	kW - l/h	20-500	20-500	20-500	34-860	50-1200
Performance factor (heating)	NL ₆₀	2.3	4.8	6	13.5	18
Cold water connection	A mm	70	79	99	220	220
Solar return	B mm	228	314	304	345	345
Solar cylinder sensor	C mm	535	594	586	603	603
Solar flow	D mm	783	874	865	920	975
Central heating return	E mm	983	994	985	1025	1340
Cylinder sensor, heating water	F mm	1141	1169	1160	1185	1500
DHW circulation	G mm	1108	1204	1195	1290	1605
Central heating flow	H mm	1298	1344	1335	1475	1790
DHW connection	I mm	1450	1464	1451	1590	1940
Flange (bottom)	J mm	278	329	335	384	384
Electric immersion heater	K mm	877	949	949	970	1145
Thermometer	L mm	1328	1414	1404	1460	1810
Overall height	M mm	1760	1780	1780	1830	2180
Diameter incl. thermal insulation	N mm	600	700	760	940	940
Diameter excl. thermal insulation	O mm	500	600	650	800	800
Height tilted, incl. thermal ins.	mm	1859	1913	1935	2075	2374
Heating water (primary)	bar/°C	10/110	10/110	10/110	10/110	10/110
DHW (secondary)	bar/°C	10/95	10/95	10/95	10/95	10/95
Internal flange diameter	mm	110	110	110	110	110
Cold water connection	G (fem.)	1"	1"	1"	1¼"	1¼"
Heating/solar flow	G (fem.)	1"	1"	1"	1¼"	1¼"
Heating/solar return	G (fem.)	1"	1"	1"	1¼"	1¼"
DHW circulation	G (fem.)	¾"	¾"	¾"	1"	1"
DHW connection	G (fem.)	1"	1"	1"	1¼"	1¼"
Electric immersion heater	G (fem.)	1½"	1½"	1½"	1½"	1½"
Thermometer	G (fem.)	½"	½"	½"	½"	½"
Heat exchanger area (heating)	m²	0.95	0.95	0.95	1.45	1.45
Heat exchanger area (solar)	m²	1.3	1.5	1.8	2.1	2.4
Heat exchanger content (heating)	litres	6	6	6	12.5	12.5
Heat exchanger content (solar)	litres	8.5	10	12	16	18
Weight	kg	130	159	182	290	350

Pipework layout

Solar DHW heating with the SEM-1 solar cylinder



- ① Collector array
- ② Air vent trap
- ③ Collector sensor
- ④ Temperature differential control unit (e.g. EKA, EKDK-W)
- ⑤ Pump/fitting assembly 5
- ⑥ Solar control unit cylinder sensor
- ⑦ Fill & drain valve
- ⑧ SEM-1 solar cylinder
- ⑨ Boiler
- ⑩ Cylinder sensor, heating water

Dual cylinder SED-750/280

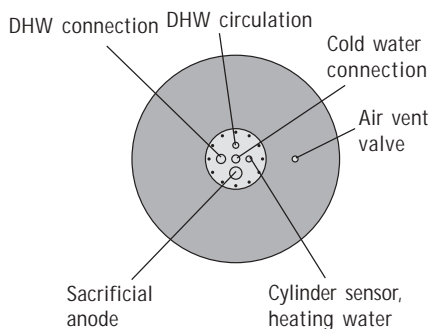
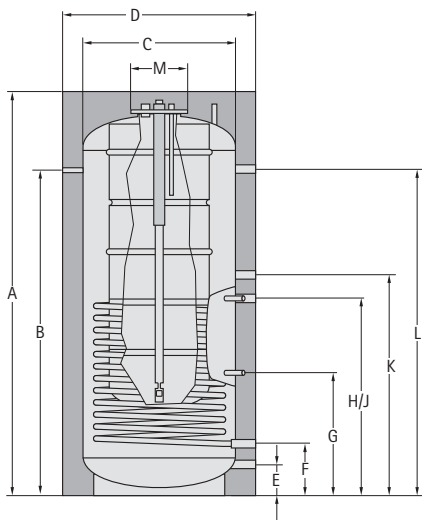
made from steel, with quality certificate and internal DHW cylinder and thermostatic water mixing valve



Benefits of the Wolf SED-750/280:

- Dual cylinder made from steel, tested to DIN 4753, total capacity 705 l, buffer cylinder 470 l with internal indirect coil for solar heating and one DHW cylinder with 280 l capacity
- The interior of the DHW cylinder is protected against corrosion by a two-layer enamel coating and a protective magnesium anode
- Highly effective thermal insulation and low thermal losses through high-grade soft foam thermal insulation, 100 mm thick
- Removable thermal insulation for easier transport into the installation room
- Thermal insulation (CFC free)
- 5 year warranty on the freestanding cylinder, 2 year warranty on all electrical and moving parts

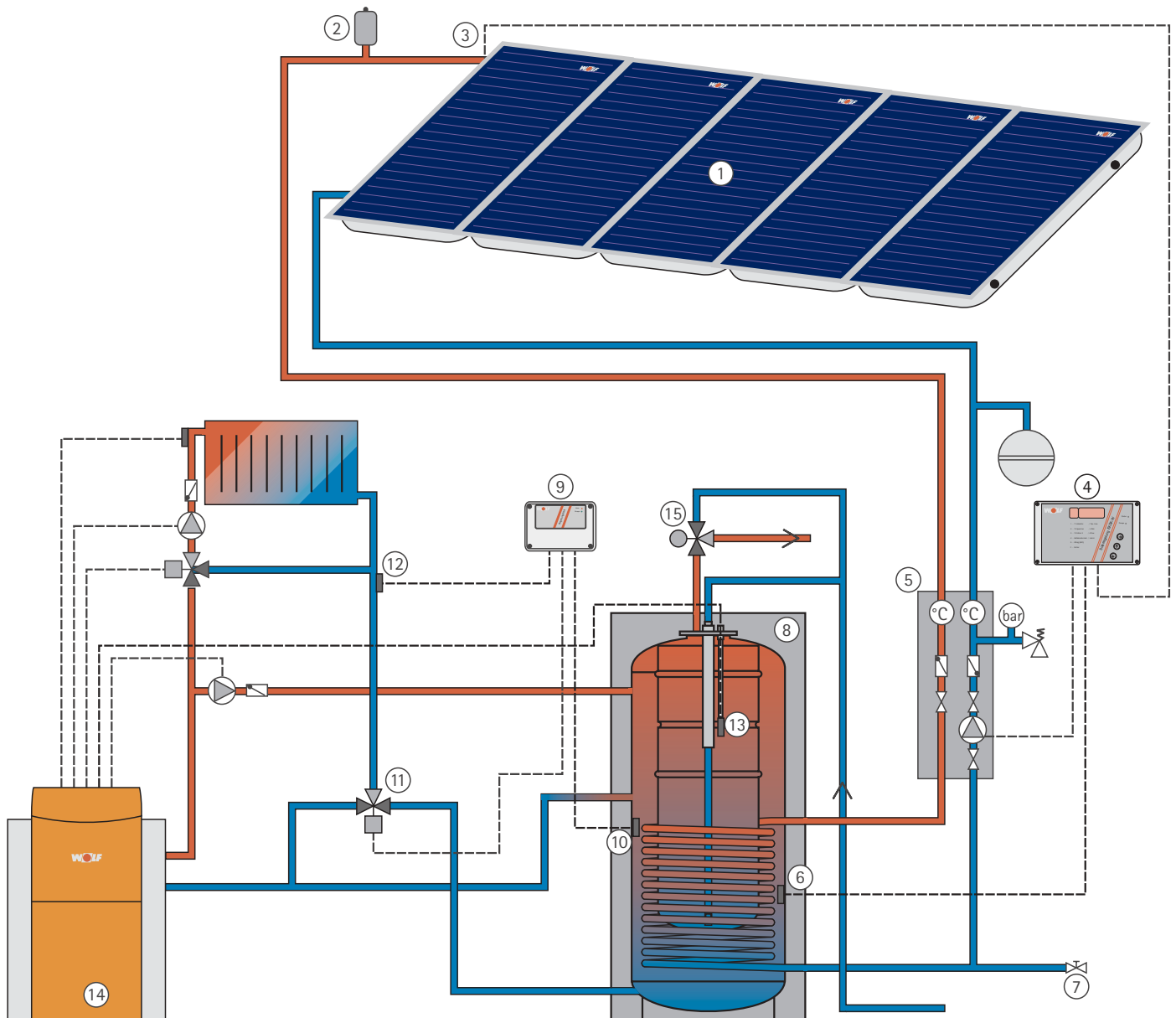
Specification



Dual cylinder	Type	SED-750/280
Total cylinder capacity	litres	750
DHW cylinder capacity	litres	280
Constant DHW cylinder rating 80/60-10/45 °C	kW - l/h	20 - 500
Performance factor	NL ₆₀	3.2
Overall height	A mm	2005
Thermometer	B mm	1635
Diameter excl. thermal insulation	C mm	750
Diameter incl. thermal insulation	D mm	950
Heating backup return	E mm	155
Solar return	F mm	260
Solar circuit cylinder sensor	G mm	625
Solar circuit flow	H mm	990
Cylinder sensor for solar return temperature raising facility SRTA	J mm	990
Heating backup flow/		
DHW re-heating return	K mm	1100
DHW re-heating flow	L mm	1635
Internal flange diameter	M mm	205
Height when tilted, incl. thermal insulation	mm	2200
Height of unit when tilted, excl. thermal insulation	mm	2020
Solar flow	Rp	1"
Solar return	Rp	1"
DHW re-heating flow	Rp	1"
Heating backup flow/		
DHW re-heating return	Rp	1"
Heating backup return	Rp	1"
Top flange, cold water connection	Rp	1"
Top flange, DHW connection	Rp	1"
Top flange, DHW circulation	Rp	¾"
Thermometer	Rp	½"
Cylinder sensor for SRTA	Rp	½"
Solar circuit cylinder sensor	Rp	½"
Indirect coil area	m ²	2.5
Coil content	litres	15
Max. operating pressure, DHW	bar	10
Max. operating pressure, heating water	bar	3
Max. operating temperature	°C	95
Weight	kg	270

Pipework layout

Solar DHW heating and central heating backup with dual cylinder SED-750/280



- | | |
|--|--|
| ① Collector array | ⑨ Solar return temperature raising facility SRTA |
| ② Air vent trap | ⑩ Cylinder sensor for SRTA |
| ③ Collector sensor | ⑪ Three-way diverter valve for SRTA |
| ④ Temperature differential control unit (e.g. EKA, EKDK-W) | ⑫ Return temperature sensor for SRTA |
| ⑤ Pump/fitting assembly 5 | ⑬ Cylinder sensor, heating water |
| ⑥ Solar control unit cylinder sensor | ⑭ Boiler |
| ⑦ Fill & drain valve | ⑮ Thermostatic DHW mixing valve |
| ⑧ Dual cylinder SED-750/280 | |

Buffer cylinder SPU-2-W / SPU-2

made from steel, with quality certificate

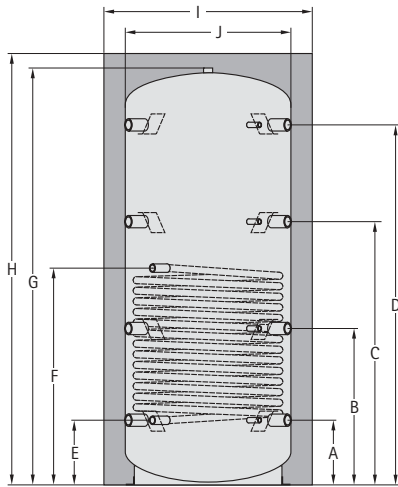
Indirect steel coils for the SPU-2-W



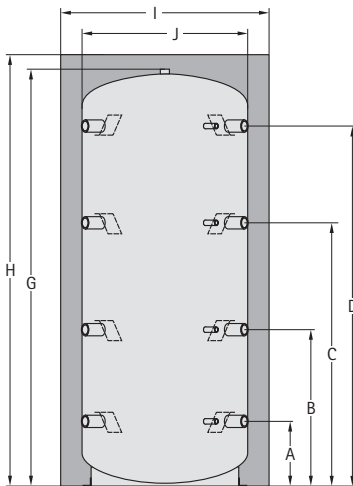
Benefits of the Wolf SPU-2-W/ SPU-2:

- Steel buffer cylinder with 500 to 1000 litre capacity with indirect steel coils; max. operating pressure 3 bar.
Type SPU-2 without indirect coils
- 8 1 ½" connections and 4 ½" connections in the cylinder wall
- Highly effective thermal insulation and low thermal losses through high-grade soft foam thermal insulation, 100 mm thick
- Removable thermal insulation for easier transport into the installation room
- Thermal insulation (CFC free)
- 5 year warranty on the freestanding cylinder,
2 year warranty on all electrical and moving parts

Specification



Type SPU-2-W



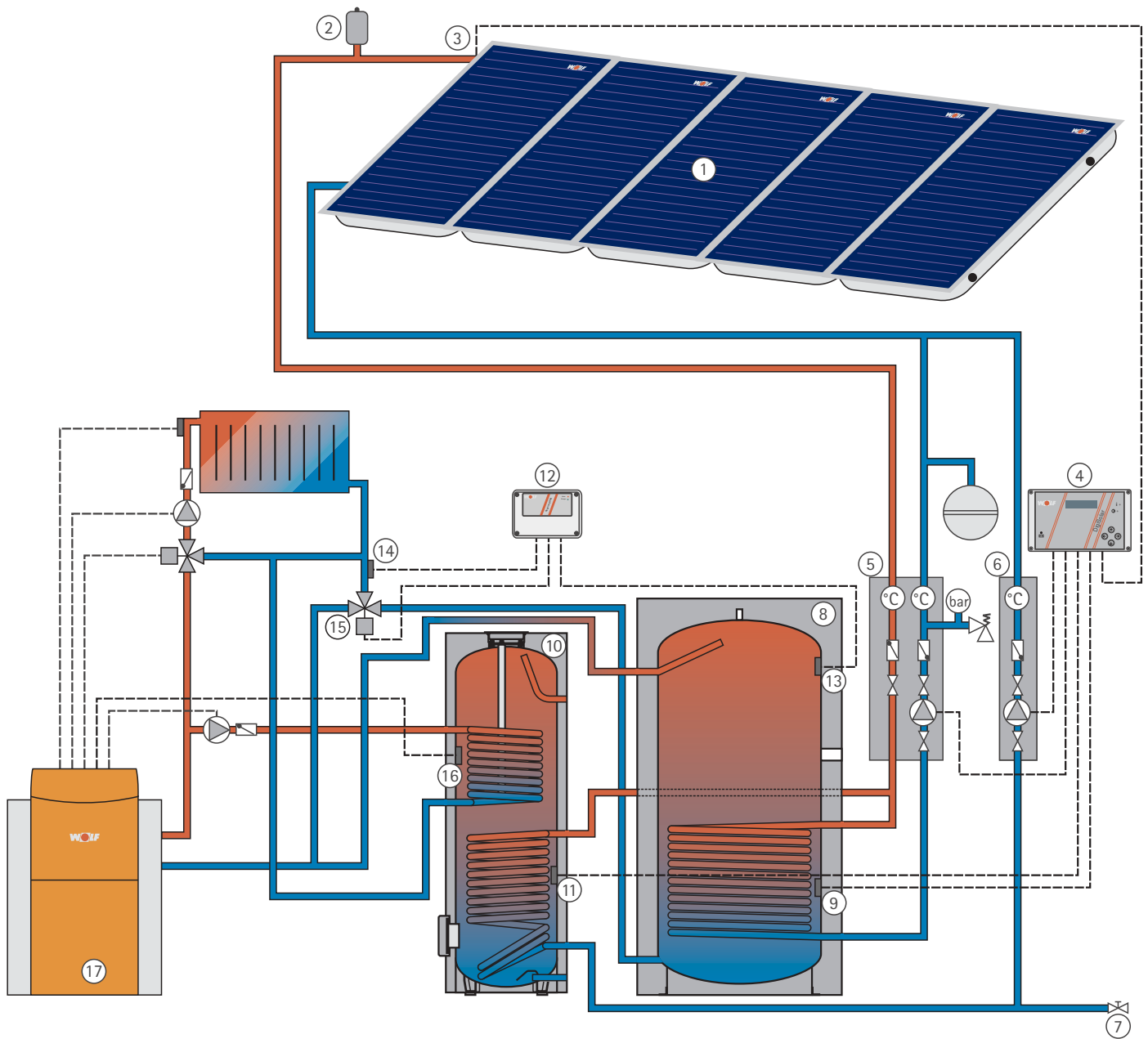
Type SPU-2

Buffer cylinder	Type SPU-2-W	500	800	1000	1500
	Type SPU-2	500	800	1000	1500
Cylinder capacity	SPU-2-W I	480	730	915	1520
	SPU-2 I	490	775	935	1545
Connection / thermometer / sensor strip	A mm	210	260	307	372
Connection / thermometer / sensor strip	B mm	605	630	745	817
Connection / thermometer / sensor strip	C mm	995	1030	1250	1342
Connection / thermometer / sensor strip	D mm	1345	1380	1710	1752
Indirect coil return *	E mm	210	260	307	372
Indirect coil flow *	F mm	1105	930	1030	1172
Height excl. thermal insulation	G mm	1560	1640	1980	2070
Height incl. thermal insulation	H mm	1640	1700	2050	2150
Diameter incl. thermal insulation	I mm	850	990	990	1200
Diameter excl. thermal insulation	J mm	650	790	790	1000
Height tilted, incl. thermal insulation	mm	1860	1980	2290	2460
Height tilted, excl. thermal insulation	mm	1630	1720	2060	2180
Connections (8 no.)	Rp	1½"	1½"	1½"	1½"
Thermometer (4 no.)	Rp	½"	½"	½"	½"
Indirect coil connection *	Rp	1"	1"	1"	1"
Indirect coil area *	m²	1.8	2.4	3	3.6
Coil content *	litres	10.5	13.5	17.0	20.5
Max. operating pressure prim. * / sec.	bar	10/3	10/3	10/3	10/3
Max. operating temperature prim. * / sec.	°C	110/95	110/95	110/95	110/95
Weight	SPU-2-W kg	110	140	175	230
	SPU-2 kg	85	106	133	180

* Only for SPU-2-W

Pipework layout

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



- | | |
|--|--|
| ① Collector array | ⑩ DHW cylinder |
| ② Air vent trap | ⑪ Solar circuit cylinder sensor (DHW) |
| ③ Collector sensor | ⑫ Solar return temperature raising facility SRTA |
| ④ Temperature differential control unit (e.g. DigiSolar) | ⑬ Buffer cylinder sensor for SRTA |
| ⑤ Pump/fitting assembly | ⑭ Return temperature sensor for SRTA |
| ⑥ Pump/fitting assembly extension | ⑮ Three-way diverter valve for SRTA |
| ⑦ Fill & drain valve | ⑯ Cylinder sensor, heating water |
| ⑧ Buffer cylinder SPU-2-W | ⑰ Boiler |
| ⑨ Solar circuit cylinder sensor (buffer cylinder) | |

Stratification cylinder type 850

made from steel, with quality certificate, ribbed copper tube heat exchanger



Benefits of the Wolf type 850:

- Steel buffer cylinder with 850 litres capacity with ribbed copper tube heat exchanger, for integration into sealed heating systems
- Two "water stacks" without moving parts ensure the accurate stratification of incoming solar and heating water
- Optional DHW heating according to the instantaneous water heater principle when combined with the fresh water station (accessories, page 12)
- Highly-effective thermal insulation and low thermal losses through all-round soft foam insulation (100 mm thick) below the cylinder foil casing
- Removable thermal insulation for easier transport into the installation room
- Thermal insulation (CFC free)
- 5 year warranty on the freestanding cylinder,
2 year warranty on all electrical and moving parts

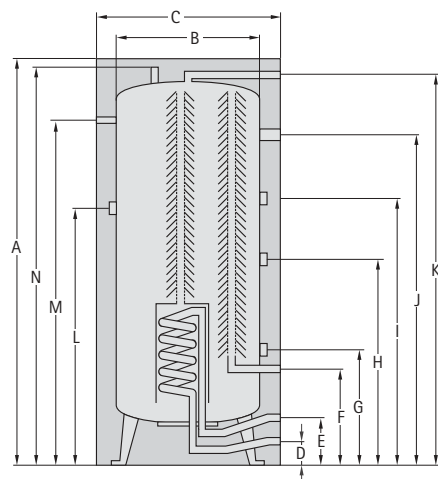
Two stratification inserts are integrated into the stratification cylinder type 850. One insert distributes incoming water (e.g. from the heating return, from a fresh water station) to the "correct" level inside the cylinder.

The second insert is located above the ribbed copper heat exchanger.

Heated water (e.g. through a solar heating system) is layered here too.

The heat exchanger surface is sized for a collector area of up to 20 m².

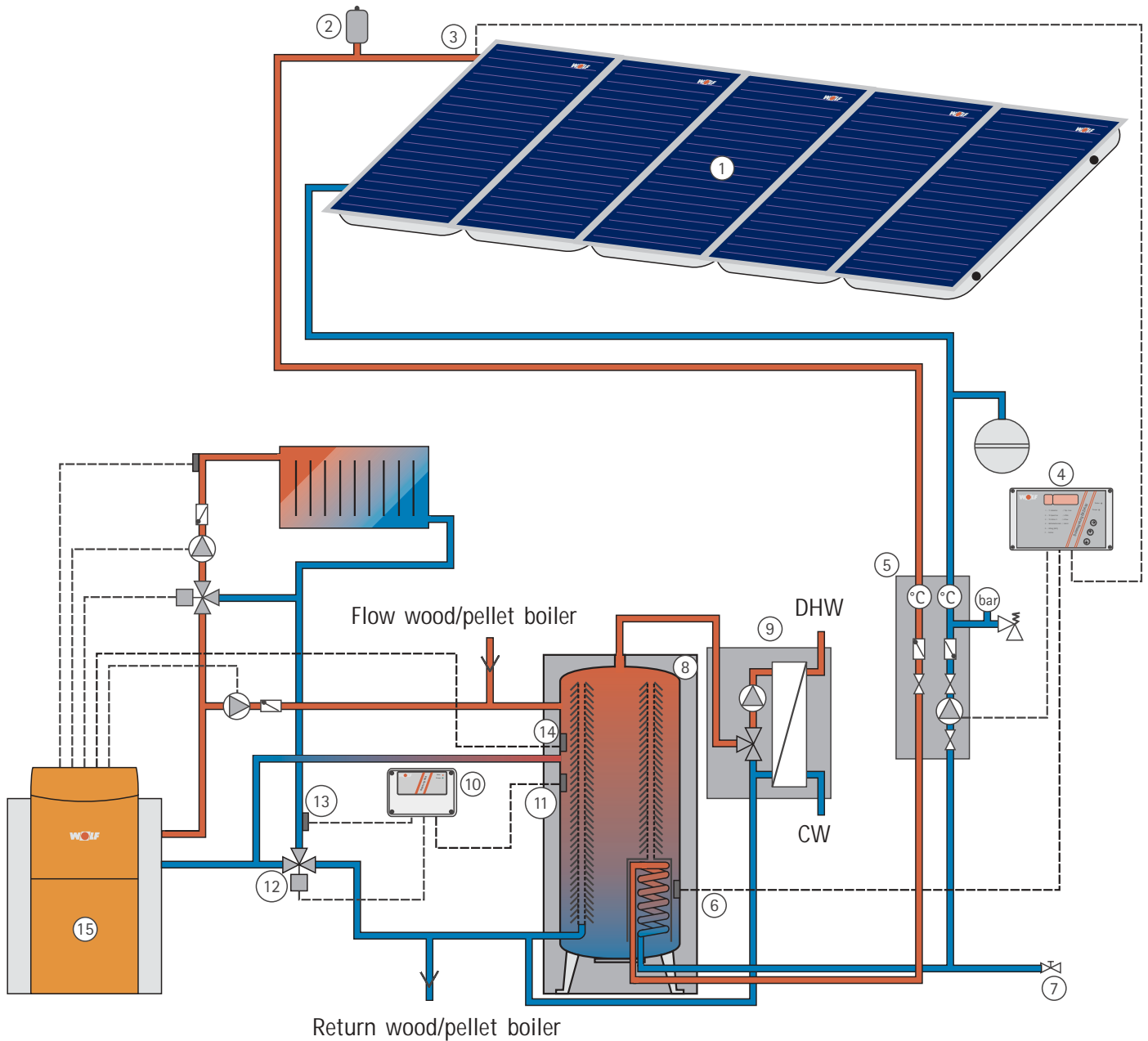
Specification



Stratification cylinder	Type	850
Cylinder capacity	litres	850
Overall height (without air vent valve)	A mm	2080
Outside diameter excl. insulation	B mm	800
Outside diameter incl. insulation	C mm	1000
Solar flow	D mm	75
Solar return	E mm	150
Return, central heating backup and fresh water station	F mm	320
Optional return 1	G mm	410
Optional return 2	H mm	855
DHW re-heating return	I mm	1250
DHW re-heating flow	J mm	1775
Fresh water station flow	K mm	1950
Electric immersion heater	L mm	1100
Thermometer	M mm	1570
Transport blank	N mm	1980
Height of unit when tilted, excl. insulation	mm	1980
Solar flow	Rp	1"
Solar return	Rp	1"
Return, central heating backup and fresh water station	Rp	1¼"
Optional return	Rp	1¼"
DHW re-heating return	Rp	1¼"
DHW re-heating flow	Rp	1¼"
Fresh water station flow	Rp	1¼"
Electric immersion heater	Rp	1½"
Thermometer	Rp	1½"
Transport blank	Rp	1"
Nominal content of the (solar) indirect coil incl. flexible pipes	litres	1.8
Max. operating pressure of the cylinder	bar	3
Max. operating pressure of the indirect coil	bar	6
Max. operating temperature of the cylinder	°C	95
Max. operating temperature of the indirect coil	°C	150
Weight	kg	220

Pipework layout

Solar DHW heating and central heating backup with stratification cylinder type 850



- ① Collector array
- ② Air vent trap
- ③ Collector sensor
- ④ Temperature differential control unit (e.g. EKA, EKDK-W)
- ⑤ Pump/fitting assembly 5
- ⑥ Solar control unit cylinder sensor
- ⑦ Fill & drain valve
- ⑧ Stratification cylinder type 850
- ⑨ Fresh water station for DHW heating
- ⑩ Solar return temperature raising facility SRTA
- ⑪ Cylinder sensor for SRTA
- ⑫ Three-way diverter valve for SRTA
- ⑬ Return temperature sensor for SRTA
- ⑭ Cylinder sensor, heating water
- ⑮ Boiler

Accessories

TopLine solar technology



Pump/fitting assembly

Comprising:
 2 x multi-valves with gravity brake, may be installed with an air passage, display thermometer, safety valve 6 bar, pressure gauge 10 bar, flow rate regulation with fill & drain valve, air separator with manual air vent valve, mounting plate, wall retainer and installation material, insulation EPP, resistant to 130 °C (short term up to 180 °C).
 Including integral pump, with cable. Rated voltage 230 V AC.



Pump/fitting assembly E *

For the easy water connection of a second DHW cylinder.

*Pumps as for the pump fitting assemblies 10/20

The manual air vent valve at the air separator enables a complete venting of the solar heating system in the basement. An air vent trap at the highest point of the solar heating system is not required.

Pump/fitting assembly 10; pump UPS 25-60

For up to 10 flat-plate collectors at 50 l flow rate per hour and collector.

Power consumption $P_{el. pump}$	stage 1	45 W
	stage 2	65 W
	stage 3	90 W

Pump/fitting assembly 20; pump UPS 25-80

For up to 20 flat-plate collectors at 50 l flow rate per hour and collector.

Power consumption $P_{el. pump}$	stage 1	140 W
	stage 2	210 W
	stage 3	245 W



Flow rate regulation

For the accurate control of the heat transfer medium. This achieves the best possible system yield, making it easier to obtain government subsidies [check local regulations].



Solar return temperature raising facility SRTA

For tying the solar energy into the heating circuit, comprising of:

- control unit EKA
- three-way diverter valve
- return contact sensor
- cylinder sensor
- sensor well for cylinder sensor

$P_{el. Reg} = 0.6 W$
 $P_{el. valve max.} = 6 W$

*Breaking capacity



Fresh water station

Required for DHW heating in stratification cylinders

Output (60/20, 10/45):
 50 kW (=20 l / min)

(shown without casing)



Solar heating expansion vessel

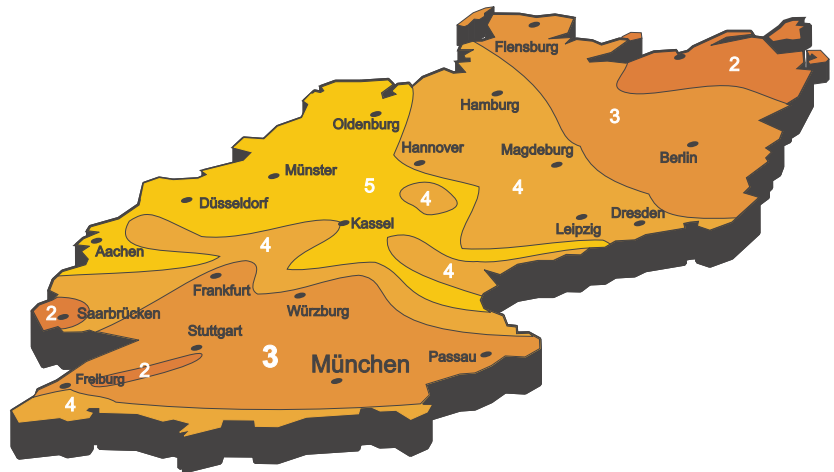
With fixing material; 2.5 bar inlet pressure

Collector type	F3	F3-Q	CFK-1	TRK	Expansion vessel
Number of collectors	2	2	3	-	12 litres
	4	3	5	-	18 litres
	5	5	8	-	25 litres
	7	6	11	-	35 litres
	12	10	17	4	50 litres
	-	-	-	12	105 litres

Select the next larger expansion vessel if the total line length exceeds 16 m.

Technical information for solar DHW heating with flat-plate collectors

Example:
 Climate zone Munich
 Roof inclination 45°, collector orientation SE
 DHW demand (approx. 75 l / person / day)
 Number of occupants: 4



Climate zone

Climate zone	Minimum hours of sunshine	Factor
1	1900 - 2000	0.8
2	1800 - 1900	0.9
3	1700 - 1800	1.0
4	1600 - 1700	1.1
5	1500 - 1600	1.2

→ Factor: 1.0

Roof orientation

Roof inclination	Collector orientation		
	S	SE/SW	E/W
15°	1.2	1.2	1.3
25°	1.1	1.2	1.4
35°	1.0	1.2	1.5
45°	1.0	1.1	1.5
55°	1.1	1.2	1.6
65°	1.2	1.3	1.7
75°	1.3	1.4	1.8

→ Factor: 1.1

Hot water requirement

Low	Standard		High	
0.6	0.8	1.0	1.2	1.5

→ Factor: 1.0

Number of flat-plate collectors

Factor Climate zone	Factor Roof orientation	Factor DHW demand	Number House Occupants			Number Collectors *
1.0	x 1.1	x 1.0	x 4	x 0.4	=	1.76 ≈ 2 collectors

* All details relate to a solar DHW coverage rate of 60%.
 The coverage rate can be increased or reduced by rounding up or down.

Required cylinder size

Number House occupants	Factor DHW demand			Cylinder size
4	x 1.0	x	e.g. 75 l	= 300 l

Technical information for solar DHW heating with flat-plate collectors

System sizing

All details are recommendations and may differ from system to system.

Number of coll. / array	1-3		4-6		7-9	
	F3 / F3-Q	CFK-1	F3 / F3-Q	CFK-1	F3 / F3-Q	CFK-1
Array pressure drop * [mbar]	105	12	125	35	175	85

*(90 l/h*coll., ANRO, 40 °C, incl. sensor well)

Expansion vessel

The diaphragm expansion vessel is designed for three functions when using solar circuits:

1. To accommodate the incoming liquid resulting from the thermal expansion inside the solar circuit
2. To accommodate the liquid seal
3. To accommodate the steam generated inside the collector

Calculation according to the following formula:

$$V_N > \frac{V_G \times 0.1 + V_A \times 1.1}{N}$$

V_N = Nominal volume of the diaphragm expansion vessel
 V_G = Total liquid content inside the solar circuit in litres
 V_A = Liquid volume inside the collector array in litres
 N = Efficiency

$$N = \frac{P_e - P_0}{P_e + 1}$$

P_0 = Vessel inlet pressure in bar
 P_e = System pressure in bar (max. 3 bar)

Recommendation: P_e = Response pressure of the safety valve - 0.5 bar.

Copper pipe content in l/m

Cu pipe	Ø mm	DN 10x1	DN 12x1	DN 15x1	DN 18x1	DN 22x1
Contents	l/min	0.05	0.078	0.13	0.2	0.31

Example:

System comprising:

2 TopSon F3 collectors; 20 m Cu riser 15x1;

Solar cylinder type SEM-1-300

with indirect coils, 7.5 l content; safety valve 6 bar; vessel inlet pressure (static head) 2.5 bar;

$$N = \frac{(6 \text{ bar} - 0.5 \text{ bar}) - 2.5 \text{ bar}}{(6 \text{ bar} - 0.5 \text{ bar}) + 1} = 0.46$$

Total system volume (V_G) in litres

2	TopSon F3 collectors	1.7 l x 2	3.4 litres
20 m	Riser 15x1	0.13 l x 20	2.6 litres
1	Indirect coil	7.5 l x 1	7.5 litres

Total system volume (V_G): 13.5 litres

$$V_N > \frac{13.5 \times 0.1 + 3.4 \times 1.1}{0.46} = 11.06 \text{ l}$$

Selected: diaphragm expansion vessel with 12 l capacity and 2.5 bar inlet pressure.

Wolf TopLine Solar technology

High performance flat-plate collector TopSon F3 for "portrait" installation / F3-Q for "landscape" installation

Flat-plate collector tested to EN 12975 part 2.

Copper absorber with highly selective coating, collector housing made from weather-resistant aluminium, 3.2 mm safety glass, hail-proof. Self-supporting housing. Weather and temperature-resistant collector. Single piece grip moulding, pressed onto the sealing frame. With integral distribution line and connecting fittings. Expansion joints in the connection fittings.

No. Price each Total price

Collector type	Dimensions: (see page 2)	
Make	Wolf	Height:	mm
		Width:	mm
		Area:	m ²
		Weight:	kg

High performance flat-plate collector CFK-1 for "portrait" installation

Flat-plate collector tested to EN 12975 part 2.

Aluminium absorber with highly selective coating, collector housing made from weather-resistant aluminium, 3 mm safety glass, hail-proof. Self-supporting housing. Weather and temperature-resistant collector. Single piece grip moulding, pressed onto the sealing frame. With integral distribution line with connecting fittings. Expansion joints in the connection fittings.

Collector type	CFK-1	Dimensions: (see page 2)	
Make	Wolf	Height:	mm
		Width:	mm
		Area:	m ²
		Weight:	kg

High performance vacuum tube collector TRK

Vacuum tube collector tested to EN 12975 part 2.

Pure glass:glass connection, like Thermos flasks. The absorber and collectors are in the vacuum and are therefore protected against ageing and contamination. Borosilicate glass, resistant to chemicals and temperature fluctuations. Hail-proof to EN 12 975

Collector type	TRK	Dimensions: (see page 3)	
Make	Wolf	Height:	mm
		Width:	mm
		Area:	m ²
		Weight:	kg

Swimming pool absorber

UV and weather-resistant plastic absorber with high energy utilisation

Swimming pool absorber		Dimensions: (see page 4)	
Make	Wolf	Height:	mm
		Width:	mm
		Area:	m ²
		Weight:	kg

Control units for high performance solar collectors:

EKA: Temperature differential control units

For one heat consumer, adjustable start temperature differential.

EKDK-W: Microprocessor-controlled temperature differential control unit

For one heat consumer; adjustable start and stop temperature differential, digital temperature display.

DigiSolar: Microprocessor-controlled temperature differential control unit

For single and two-circuit systems with one or two heat consumers, adjustable start and stop temperature differential, digital temperature display.

DigiSolar MF: Microprocessor-controlled temperature differential control unit

For single, two or three heat consumers and for one or two collector arrays, adjustable start and stop temperature differential, east-west control, digital temperature display.

Wolf TopLine Solar technology

Solar cylinder SEM-1 made from steel
 With two enamel-coated indirect coils.
 Additional corrosion protection through magnesium anode.
 Highly effective thermal insulation through high-grade hard foam insulation.

No. Price each Total price

Freestanding cylinders	SEM-1	Dimensions: (see page 4)			
		Ø casing:	mm		
		Ø cylinder:	mm		
		Height:	mm		
		Heating surface, central heating:	m ²		
		Heating surface, solar:	m ²		
		Weight:	kg		

Buffer cylinder SPU-2 / SPU-2-W made from steel
 With indirect steel coils for the SPU-2-W
 Max. operating pressure 6 bar.
 Water capacity 500 to 1000 l
 Highly effective thermal insulation through high-grade soft foam insulation.

Buffer cylinder	Dimensions: (see page 8)			
		Ø casing:	mm		
		Ø cylinder:	mm		
		Height:	mm		
		Heating surface, solar:	m ²		
		Weight:	kg		

Dual cylinder SED-750/280 made from steel. Total capacity 750 l
 Buffer cylinder, 470 l with internal indirect coil for solar heating and one DHW cylinder with 280 l capacity.
 The interior of the DHW cylinder is protected against corrosion by a two-layer enamel coating and a protective magnesium anode.
 Highly effective thermal insulation through high-grade soft foam insulation.

Dual cylinder	SED-750/280	Dimensions:			
		Ø casing:	950 mm		
		Ø cylinder:	750 mm		
		Height:	2,005 mm		
		Heating surface, solar:	2.5 m ²		
		Weight:	270 kg		

Stratification cylinder, type 850 made from steel. Total capacity 850 l
 Buffer cylinder with ribbed copper tube heat exchanger for solar energy.
 Highly effective thermal insulation through all-round soft foam insulation.

Stratification cylinder	Type 850	Dimensions:			
		Ø casing:	1,000 mm		
		Ø cylinder:	800 mm		
		Height:	2,080 mm		
		Weight:	220 kg		

Fresh water station (accessories) for DHW heating acc. to the instantaneous water heater principle.

Wolf Solar technology

Accessories:	F3 CFK-1	F3-Q	TRK	Swimming pool absorber
Solar return temperature raising facility for tying the solar energy into the heating circuit.	•	•	•	
Roof integration set for 2 collectors roof integration frames for an architecturally attractive roof integration of the collectors into the tile surface, powder-coated, silver (RAL 9006).	•			
Extension set for the roof integration set for 1 collector each	•			
Rooftop installation set ("portrait" installation) for 2 collectors for the easy installation of collectors on tiled roofs, comprising of: 2 aluminium profiles and retainers for fitting collectors to battens and rafters.	•			
Extension set for the rooftop installation set ("portrait" installation) for 1 collector each	•			
Rooftop installation set ("landscape" installation) for one collector for the easy installation of collectors on tiled roofs, comprising of: 2 aluminium profiles and retainers for fitting collectors to battens and rafters.		•		
Extension set for the rooftop installation set ("landscape" installation) for 1 collector each		•		
Mounting frame for "landscape" installation (45° angle) for one collector for the easy and quick installation on horizontal surfaces or for wall mounting.		•		
Extension set for the mounting frame for "landscape" installation for 1 collector each		•		
Mounting frame for "portrait" installation (45° angle) for two collectors for the easy and quick installation on horizontal surfaces or for wall mounting.	•			
Extension set for the mounting frame for "portrait" installation for 1 collector each	•			
Connection set for one collector array mounted in or on the roof	•	•		
Connection set for one collector array mounted on the roof	•	•		
Compensator for collector fittings two pieces are required per collector connection.	•	•		
Rooftop fixing set ("portrait" installation) for two tube collectors.			•	
Rooftop fixing set ("portrait" installation) for three tube collectors.			•	
Connection set for tube collector fixing set.			•	
Connection set tube collector.			•	
Connection accessories swimming pool absorber per row of collectors (up to 10 absorbers per row).				•
Pump/fitting assembly 10 suitable for up to 10 flat-plate collectors at 50 l flow rate per hour and collector.	•	•	•	
Pump/fitting assembly 20 suitable for up to 20 flat-plate collectors at 50 l flow rate per hour and collector.	•	•	•	
Pump/fitting assembly 10E for the connection of a second heat consumer, suitable for up to 10 flat-plate collectors at 50 l flow rate per hour and collector	•	•	•	
Pump/fitting assembly 20E for the connection of a second heat consumer, suitable for up to 20 flat-plate collectors at 50 l flow rate per hour and collector	•	•	•	
Solar heating expansion vessel with fixing material, 2.5 bar inlet pressure	•	•	•	
Solar heating expansion vessel	•	•	•	
Air vent trap 0.15 l, insulated, connection Ø 22 mm, copper.	•	•	•	•
Thermostatic water mixing valve with integral non-return valve and anti-scalding protection.	•	•	•	•
Heat transfer medium ANRO 10 / 20 / 30 kg	•	•		
Heat transfer medium G-LS 10 / 20 kg			•	

The extensive equipment range of the system supplier Wolf offers the ideal solution for new build and modernisation projects alike. The control unit range from Wolf meets any demand for heating convenience. All equipment is easy to operate and work with high energy efficiency and reliability. Photovoltaic and solar heating systems can be quickly integrated into existing systems. All Wolf equipment is easily and quickly installed and maintained.

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► System components central heating

- Pellet boilers

► Solar heating system components

- Flat-plate collector TopSon F3
- Stratification cylinder type 850
- Photovoltaic panels
- Swimming pool absorber



The brand of competence for energy saving systems