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# STAFOR COMBI

**NEW GENERATION HEATING SYSTEMS**

**THERMODYNAMIC SYSTEM  
THERMODYNAMISCHEN SYSTEMS  
TERMODINAMISKĀS SISTĒMAS  
ТЕРМОДИНАМИЧЕСКИЕ СИСТЕМЫ  
ΘΕΡΜΟΔΥΝΑΜΙΚΟ ΣΥΣΤΗΜΑ**

**PRODUCT CATALOG  
Year 2014**

# STAFOR COMBI THERMODYNAMIC HYBRID SYSTEM WITH ION BOILER STAFOR



Environmentally friendly



Operational all year round



Works in all weather conditions



Fully patented and certified



Manufactured to the highest quality

The annual heating price increase encourages owners of private houses and apartments to search for new heating technologies and technical solutions to reduce these rising costs.

Often, these solutions lie in the field of optimization and reasonable combination of advantages of the known heating systems types. An example of such solution is thermodynamic heating system **STAFOR COMBI**.

**STAFOR COMBI** heating system is a combination of effective, even in north climate zone hybrid heat pump – solar collector (thermodynamic system) and new generation ion heater.

Each of the components of this system has its strengths and weaknesses. Their reasonable combination in one system makes maximum use of the first and possibility to avoid the second.

Thermodynamic system allows using for heating – solar energy as direct solar radiation and heat energy from environment.

In north climate zones, this system has the advantage over solar collectors, as it works when there is no direct sunlight (at night, in cloudy and rainy weather, all year round).

The advantages of **STAFOR COMBI thermodynamic unit** comparing with ground source and air heat pumps are absence of large external contours plowed in the ground, ice accretion of external heat pumps blocks. In thermodynamic unit heat transfer is made through compact and easily mounted on the facade or roof thermodynamic panels. The high coefficient of performance (COP 250% - 500%) is also a major advantage of the thermodynamic system.

The strength of the second component of heating system **STAFOR COMBI** – new generation **ion boiler STAFOR** who have highest efficiency (COP 100% - 204%) comparing to all electric heating appliances and ability to provide significant heat flow in just few seconds. Heating with STAFOR ion boiler is 1.5 - 2 times cheaper than heating with TEN boilers or classical electric convectors.

Combining those two cutting-edge heating technologies in one system **STAFOR COMBI**, we get a compact, highly efficient heating system for small private houses (up to 100m<sup>2</sup>) and apartments, capable to guarantee hot water and heat for a reasonable price.

Two thermodynamic panels of the system STAFOR COMBI fully cover needs of apartment or small house for hot water (**consuming about 2kWh per 200 liters of hot water 55°C**) and heating (**consuming about 2.5kWh per 1 m<sup>2</sup> in month**) at spring and fall. Winter time, during peak load for heating and in moment of huge consumption of hot water, **ion boiler STAFOR** automatically connects in work and quickly replaces missing heat flow.

Work of **STAFOR COMBI** is controlled by automatic climate control system. It controls the temperature of the hot water in the sanitary boiler, the temperature of the indoor environment and allows you to set different temperatures during the day and week.

In **STAFOR COMBI** heating system you can find the combination of high efficiency and reasonable low cost what makes it a very interesting solution for a large number of residents who wish to optimize their heating costs.

## UNIVERSAL AND ADAPTABLE.

Original thermodynamic hybrid system STAFOR COMBI can be used as main heat source for heating systems with radiators, "heat floors". It can be used to heat up only hot sanitary water boiler (DHW).

**STAFOR COMBI system can be connected and can work together with:**

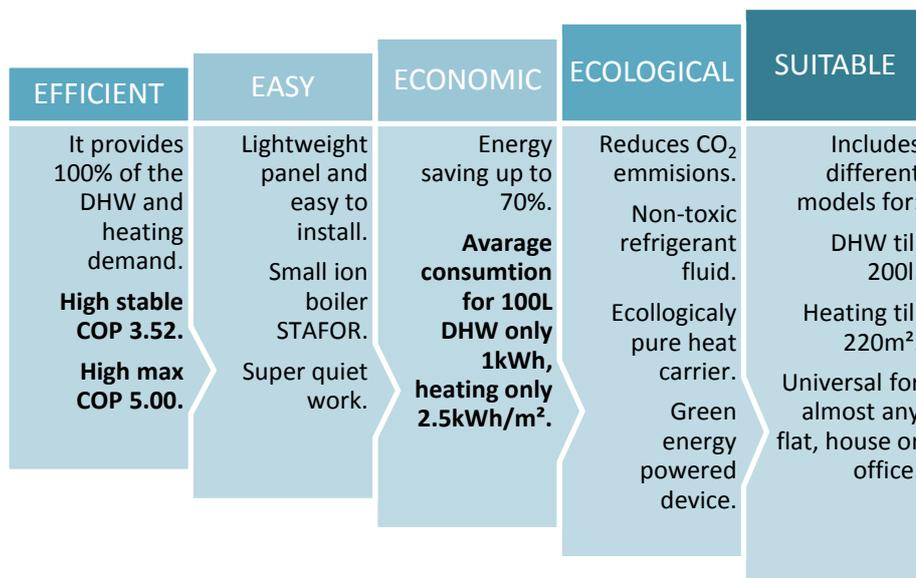
- Solid fuel boilers, liquid fuel boilers.
- Solar collectors, photovoltaic systems, wind generators.
- Smart house technology,
- All other heating and energy saving systems.



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AVAILABLE MODELS OF STAFOR COMBI
<b>120H</b> – only for central heating of area till 120m <sup>2</sup> (360m <sup>3</sup> ).
<b>120H/100DHW</b> – for central heating of area till 120m <sup>2</sup> (360m <sup>3</sup> ) and domestic hot water boiler till 100l.
<b>120H/200DHW</b> – for central heating of area till 120m <sup>2</sup> (360m <sup>3</sup> ) and domestic hot water boiler till 200l.
<b>220H</b> – only for central heating of area till 220m <sup>2</sup> (660m <sup>3</sup> ).
<b>220H/100DHW</b> – for central heating of area till 220m <sup>2</sup> (660m <sup>3</sup> ) and domestic hot water boiler till 100l.
<b>220H/200DHW</b> – for central heating of area till 220m <sup>2</sup> (660m <sup>3</sup> ) and domestic hot water boiler till 200l.
<b>200DHW</b> – only for domestic hot water boiler till 200l (existing DHW cylinder).

## HOW IT WORKS?

- The refrigerant coil R134a gas circulates through the STAFOR thermodynamic panel where energy is absorbed from the ambient temperature transforming the liquid into a gas and carrying the heat back to the STAFOR COMBI thermodynamic unit. The gas compressed within the system which increases the pressure and therefore also the temperature.
- Simultaneously a water pump pushes heat carrier STATERM EKO E40 from the indoor heat carrier tank with heat exchanger into the STAFOR COMBI unit heat exchanger after which the hotter heat carrier returns to indoor tank. This flow continues until heat carrier temperature reaches 55°C. Once this is achieved the system goes into standby.
- Indoor heat carrier tank filled with special STATERM EKO E40 heat carrier is used as heat accumulator, to partly compensate rapid heat loss as bath or shower. Indoor tank is equipped with heat exchanger(s) to connect it to heating system or DHW (domestic hot water) supply.
- At cold north climate zone winter time, during peak load for heating and in moment of huge consumption of hot water, ion boiler STAFOR automatically connects in work and quickly replaces missing heat flow. After that it switches OFF and system continues to work only from thermodynamic panels.
- Work of STAFOR COMBI is controlled by automatic climate control system. It controls the temperature of the hot water in the sanitary boiler, the temperature of the indoor environment and allows you to set different temperatures during the day and week.

## COMPETITIVE ADVANTAGES!

### Easy installation:

- Light and ultra-flat panel.
- Does not require any labor or roof reinforcing.
- Full installation in less than 4 hours.
- Fits to existing low temperature heating system (radiators or underfloor heating).
- Indoor heat accumulating tank equipped with till two heat exchangers for customization.

### Architectural integration:

- Inclination from 30° to 90° (vertical).
- Small space needed for all system installation.

### Work conditions:

- Works all year long.
- Works at day and night.
- Works in any weather conditions.
- For north climate zone one thermodynamic panel can be installed outside, one inside of unheated area (basement, attic, veranda).
- Provides 100% need for DHW and heating, even in winter time.

### Strength and quality:

- No glass or outside electrical components.
- Products tested in our facilities before shipping.
- High quality raw materials only from European suppliers.



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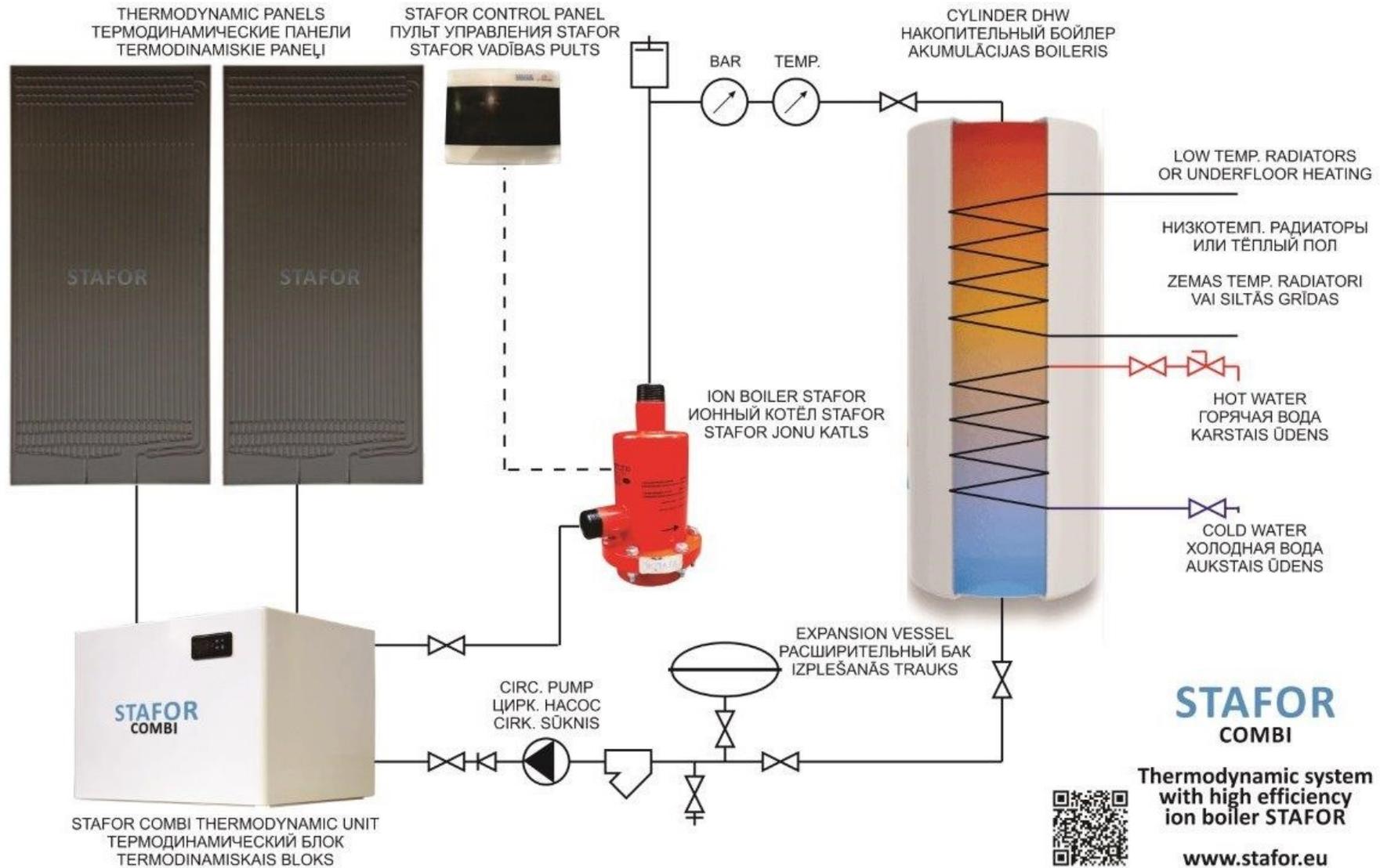
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## STAFOR COMBI THERMODYNAMIC HYBRID SYSTEM WITH ION BOILER COMPLETE SET TECHNICAL PARAMETERS

STAFOR COMBI system part	№	Parameter	Unit	STAFOR COMBI 120H	STAFOR COMBI 120H/100DHW	STAFOR COMBI 120H/200DHW	STAFOR COMBI 220H	STAFOR COMBI 220H/100DHW	STAFOR COMBI 220H/200DHW
STAFOR COMBI thermodynamic system with effective ion boiler STAFOR	1.	Rated voltage AC In	V	230 ± 10%	230 ± 10%	400 ± 10%		400 ± 10%	
	2.	The minimum frequency of the AC	Hz				50		
	3.	Operating current, not more than	A	27.5	27.5	15(3P) + 2.5(1P)		34(3P) + 5(1P)	
	4.	Nominal thermal power	kW	9	9	13		28	
	5.	Applied operating power	kW	1.5-9	1.5-9	1.5-13		3-28	
	6.	Average STAFOR COMBI complete system COP (coefficient of performance)	-				1.75-3.52		
	7.	The maximum temperature at the outlet	°C				90		
	8.	The work temperature at the outlet	°C				55		
	9.	Total thermal power	kW	9	9	13		28	
	10.	Heating area, not more than	m <sup>2</sup>		120			220	
	11.	Hot sanitary water boiler, not more than	l	-	100	200	-	100	200
	12.	Class of protection against electric shock	-						
	13.	The degree of protection from moisture	-				IP44		
Thermodynamic panel (collects solar radiation and ambient energy)	14.	Thermodynamic panel thermal power	kW		2 * 2pcs.			2 * 4pcs.	
	15.	Quantity of panels	Pcs.		2			4	
	16.	Ambient work temperature	°C				-5/45		
	17.	Thermodynamic panel weight	kg				6.2		
	18.	Thermodynamic panel connections	Inch				¼ - ¾		
	19.	Thermodynamic panel dimensions	mm H/W/D				1700/800/25		
	20.	Overall capture surface, both sides	m <sup>2</sup>				2.7		
	21.	Cooling fluid	-				Chlorine free, non-toxic R134a		
	22.	Maximum working pressure	bar				8		
STAFOR COMBI thermodynamic box	23.	STAFOR COMBI thermodynamic box operating current	A		1.5-3			1.5-3 * 2pcs.	
	24.	Nominal thermal power	kW		4			8	
	25.	Thermodynamic box COP (coefficient of performance)	-				2.5-5		
	26.	STAFOR COMBI thermodynamic box weight	kg		30			30 * 2pcs.	
	27.	STAFOR COMBI thermodynamic box dimensions	mm H/W/D		460/380/425			460/380/425 * 2 pcs.	
	28.	Thermodynamic box connections	Inch inlet/outlet				¼ male/¼ female		
Ion boiler STAFOR 3-5 (additional heating element in case of fast heat loss)	29.	Ion boiler STAFOR model	-	3-5 (1P)	3-5 (1P)	6-9 (3P)		10-20 (3P)	
	30.	Ion boiler STAFOR operating current, not more than	A	25	25	15		34	
	31.	Nominal thermal power	kW	5	5	9		20	
	32.	Ion boiler STAFOR COP (coefficient of performance)	-				1-2.04		
	33.	Heat carrier in small circuit	-				STATERM EKO E40		
	34.	Heat carrier STATERM EKO E40 with conductivity not more than	µS	205	205	230		330	
	35.	Ion boiler STAFOR weight, not more than	kg	2	2	4		6	
36.	Ion boiler STAFOR dimension	mm DIAM/H	50/275	50/275	93/233		93/333		
37.	Ion boiler STAFOR connections	Inch	¾	¾	1		1		
Indoor heat carrier tank with heat exchanger (cylinder DHW)	38.	Indoor heat carrier tank (cylinder DHW) volume	l	100	200	250	200	250	250
	39.	Heat carrier in indoor tank	-				STATERM EKO E40		
	40.	Heat carrier volume in small circuit	l	120 (100l indoor tank and 20l piping)	220 (200l indoor tank and 20l piping)	260 (250l indoor tank and 10l piping)	220 (200l indoor tank and 20l piping)	260 (250l indoor tank and 10l piping)	260 (250l indoor tank and 10l piping)
	41.	Heat carrier STATERM EKO E40 with conductivity not more than	µS	205	205	230		330	
	42.	Indoor heat carrier tank (cylinder DHW) heat exchanger	Pcs.	1 (only for low temperature heating system)	2 (for low temperature heating system and hot domestic water)	2 (for low temperature heating system and hot domestic water)	1 (only for low temperature heating system)	2 (for low temperature heating system and hot domestic water)	2 (for low temperature heating system and hot domestic water)

## STAFOR COMBI THERMODYNAMIC HYBRID SYSTEM WITH ION BOILER PRINCIPAL CONNECTION SCHEMA



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**STAFOR COMBI 120H, 120H/100DHW, 120H/200DHW AND 220H, 220H/100DHW, 220H/200DHW  
THERMODYNAMIC HYBRID SYSTEM WITH ION BOILER INCLUDES**



Ion boiler (heater)  
STAFOR  
(model 3-5, 6-9 or 10-20)



Triac control panel (with  
integrated protection)



Emergency thermostat  
(shutdown on 90°C)



Starp-on thermostat  
(heat carrier  
temperature in small  
circuit)



Thermostat-  
programmer (weekly  
room temp.  
programmer)



STAFOR COMBI  
thermodynamic box (with  
included circulation pump)  
(1 or 2 pieces)



Thermodynamic panels with mountings  
(2 or 4 pieces)



Indoor heat carrier tank with heat exchanger  
(different volumes, 1 or 2 heat exchangers)



Heat carrier STATERM EKO  
E40  
(120, 220 or 260 liters)



Ion boiler power  
regulation additive  
STATERM POWER  
(2 or 3 liters)

**ATTENTION!**

Additional piping for ion boiler small circuit (primary circuit) from thermodynamic box till indoor heat carrier tank is not included in package. It must be calculated additionally depending on specific installation place by plumber.

**EXW Riga, Latvia, STAFOR special price list for thermodynamic hybrid system**

**STAFOR COMBI 120H**, only for central heating of area till 120m<sup>2</sup> (360m<sup>3</sup>), **2831.51 €**

**STAFOR COMBI 120H/100DHW**, for central heating of area till 120m<sup>2</sup> (360m<sup>3</sup>) and domestic hot water boiler till 100l, **3236.90 €**

**STAFOR COMBI 120H/200DHW**, for central heating of area till 120m<sup>2</sup> (360m<sup>3</sup>) and domestic hot water boiler till 200l, **3506.96 €**

**STAFOR COMBI 220H**, only for central heating of area till 220m<sup>2</sup> (660m<sup>3</sup>), **5130.35 €**

**STAFOR COMBI 220H/100DHW**, for central heating of area till 220m<sup>2</sup> (660m<sup>3</sup>) and domestic hot water boiler till 100l, **5403.51 €**

**STAFOR COMBI 220H/200DHW**, for central heating of area till 220m<sup>2</sup> (660m<sup>3</sup>) and domestic hot water boiler till 200l, **5603.48 €**

# STAFOR COMBI 200DHW

STAFOR COMBI THERMODYNAMIC SYSTEM COMPLETE SET  
FOR SANITARY HOT WATER TILL 200L

STAFOR COMBI system part	No	Parameter	Unit	STAFOR COMBI 200DHW
STAFOR COMBI thermodynamic box	1.	Rated voltage single-phase AC In	V	230 ± 10%
	2.	The minimum frequency of the AC	Hz	50
	3.	Operating current, not more than	A	1.5-3
	4.	Nominal thermal power	kW	4
	5.	Applied operating power	kW	0.3-0.6
	6.	Average STAFOR COMBI thermodynamic system COP (coefficient of performance)	-	2.5-5
	7.	The maximum temperature at the outlet	°C	55
	8.	The work temperature at the outlet	°C	45-55
	9.	Thermodynamic box connections	Inch inlet/outlet	½ male/½ female
	10.	Hot sanitary water boiler, not more than (any existing DHW can be used)	l	200
	11.	Class of protection against electric shock	-	I
	12.	The degree of protection from moisture	-	IP44
	13.	STAFOR COMBI thermodynamic box weight	kg	30
	14.	STAFOR COMBI thermodynamic box dimensions	mm H/W/D	460/380/425
Thermodynamic panel (collects solar radiation and ambient energy)	15.	Thermodynamic panel thermal power	kW	2 * 2pcs.
	16.	Quantity of panels	Pcs.	2
	17.	Ambient work temperature	°C	-5/45
	18.	Thermodynamic panel weight	kg	6.2
	19.	Thermodynamic panel connections	Inch	¼ - ¾
	20.	Thermodynamic panel dimensions	mm H/W/D	1700/800/25
	21.	Overall capture surface, both sides	m <sup>2</sup>	2.7
	22.	Cooling fluid	-	Chlorine free, non-toxic R134a
	23.	Maximum working pressure	bar	8

55°C  
DHW

ONE OF THE BEST  
SYSTEMS TO PROVIDE  
DOMESTIC HOT WATER  
FOR LOCAL BUILDING  
AND HOUSING WITH  
EXISTING BUFFER  
TANK (DHW CYLINDER)  
ALREADY INSTALLED!

COP  
5

EASY TO  
INSTAL



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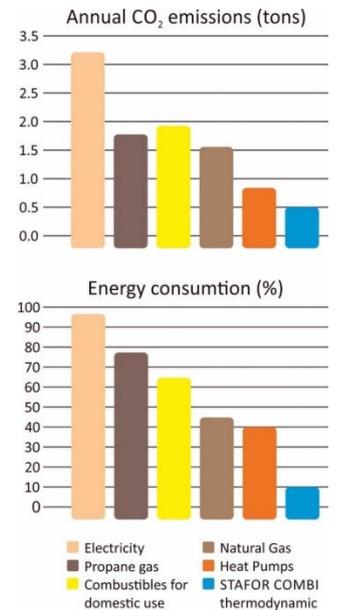
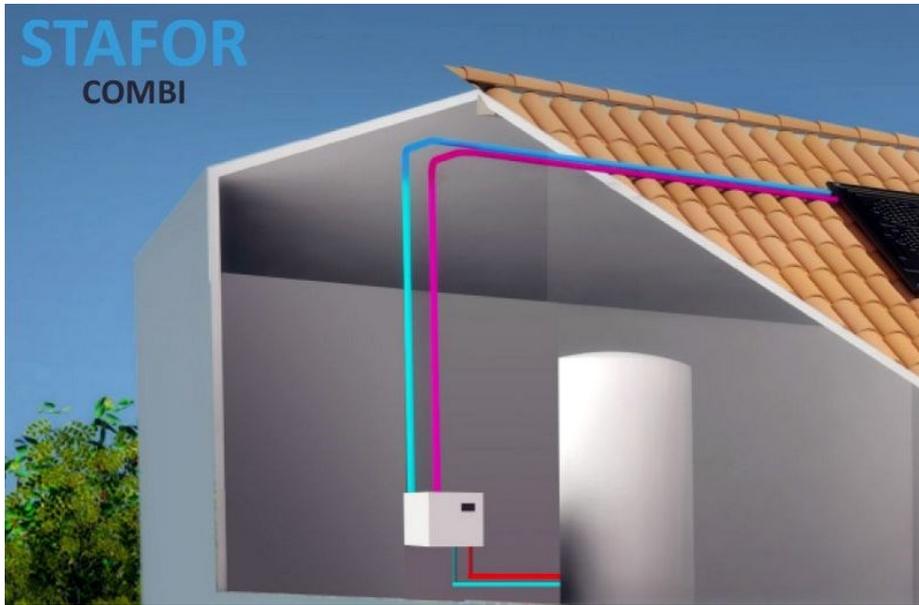
## STAFOR COMBI 200DHW THERMODYNAMIC HOT WATER SYSTEM INCLUDES



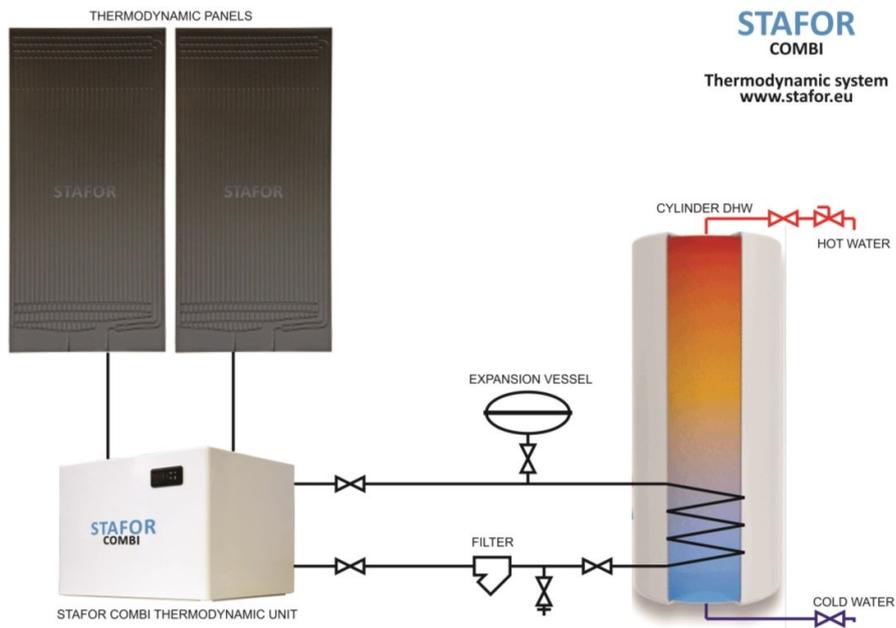
STAFOR COMBI thermodynamic box (with included circulation pump)



Thermodynamic panels with mountings  
(2 pieces)



## PRINCIPAL CONNECTION SCHEMA FOR STAFOR COMBI DHW



## EXW Riga, Latvia, STAFOR special price list for thermodynamic system

**STAFOR COMBI 200DHW**, only for domestic hot water boiler till 200l (existing DHW cylinder), **1547.80 €**



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