

NEXUS



Highly efficient
heat pumps

The cheapest and the
most convenient manner
for heating buildings and
preparing hot water



SUNEX



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Principle of operation

Heat pumps are devices which use energy coming from the air, water or ground to generate heat for heating utility water or for central heating purposes. The pump collects energy from the sources referred to above and then increases its temperature using the compression process.

The pump's operation scheme includes 3 stages:

Stage 1

Collecting heat from the environment via the evaporator

The evaporator is an element responsible for collecting heat from the air, water or ground in an efficient manner. The process is made possible due to the use of a working agent characterized by low boiling temperature. When it is introduced into the evaporator, it changes from the liquid state into the gas state. The generated steam reaches temperature similar to the temperature on the exchanger's primary side, namely the lower source.

Stage 2

Increasing steam temperature through compression

In the next stage the steam generated in the plate-fin heat exchanger, namely the evaporator, reaches the compressor which, using a little quantity of electricity, by increasing pressure, increases the steam's temperature to a level ensuring its use to heat utility water or heat a room.

Stage 3

Transferring heat from the steam to the heating system or for warming hot water

Compressed steam with high temperature reaches the heat exchanger, namely the condenser, in this stage. The process of heat transfer used by the heating system takes place there. The cooled down working factor changes from the gas state into the liquid state and is directed to the evaporator again where the heat processing cycle begins again according to the description in stage 1.

The heat pump's effectiveness of operation is determined by the COP index, namely the ratio of generated heat energy to the supplied electricity. For instance, the COP index = 3.5 means that the consumption of 1 kWh of electricity will produce benefits by generating 3.5 kWh of heat energy.

Types of heat pumps

Heat pumps based on compressors powered with electricity are divided into 2 basic groups depending on the lower source:

- pumps with ground exchanger (saline - water, water - water)
- pumps with air exchanger (air water)

Pumps with ground exchanger

The ground is the heat collection source. There are 2 methods to collect heat from the ground. First, a system of horizontal collectors placed just beneath the ground surface but below the level of frost penetration. Second, a system of vertical probes drilled into a large depth.

A significant defect of the horizontal exchanger is its low efficiency as compared to vertical probes and, importantly, the need to install the exchanger on a parcel which is often developed earlier, which involves high costs.

The vertical exchanger does not require interference in a developed parcel. A significant advantage of this solution is also its high efficiency. The problem is, however, the price since the cost of boreholes is usually identical to the cost of the pump itself and sometimes even higher.

Pumps with exchanger type air water

The air is the heat collection source. Heat is collected from the air via a plate-fin heat exchanger known as the evaporator. A high quality of execution

and the application of brand subassemblies ensures the device's effective operation in temperature as low as -15°C without the use of an electric heater. The second significant argument for this type of solution is the cost of investment which is almost 50% lower than in the case of pumps with a ground exchanger.

Heat pumps type air water are universal which makes it possible to construct devices with smaller power, as opposed to pumps with a ground exchanger. As a result, apart from large units used for central heating and hot water, there are also products intended only for warming hot utility water.

Main types of heat pumps type air water:

- Compact pumps for central heating and hot utility water
- Heat pumps for central heating and hot water type Split
- Compact heat pumps for hot utility water
- Heat pumps integrated with a tank for hot utility water



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Highly efficient, compact
heat pumps for central heating and hot utility water

Technical data

NEXUS Compact heat pumps type air water









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NEXUS is a modern and economic main source of heat in buildings located even in extremely unfavorable weather conditions. Their high quality is guaranteed by innovative solutions executed on the basis of components from reputable global manufacturers such as Copeland or Siemens.

Their compact version makes it possible to install them as a whole outside buildings and saves the area of technical rooms to a significant extent. Their easy installation, in practice, comes down to a hydraulic connection with the heating system by means of two ducts. Fitters are not required.

Basic advantages:

-  One of the cheapest methods for heating buildings, without the need to use additional heat sources. System is operating even in temperature -18°C
-  High efficiency of operation and long life span, due to the use brand subassemblies from reputable global manufacturers
-  Compact structure installed as a whole on the outside and system originally filled and tested by the manufacturer guarantee high failure-free operation as well as quick and easy installation
-  Complex regulator provides optimum control and protection for the system. It is possible to purchase a version with mobile control function (mobile version). Wall-mounted wire remote control as a standard
-  High comfort of use requiring only the setting of hot utility water temperature
-  Installed anti-frost protection eliminates the risk of damage during the pump's standstill
-  Cooling function
-  Silent operation

NEXUS Technical data

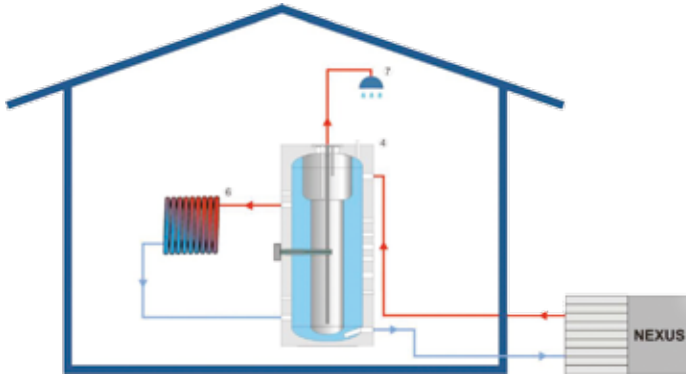
Model		NEXUS9	NEXUS 14
Efficiency / COP	j.m.		
A15/W35 / COP	kW	11,0 / 5,0	19,5 / 5,4
A10/W35 / COP	kW	9,3 / 4,3	16,5 / 4,7
A7/W35 / COP	kW	7,7 / 3,7	13,8 / 4,1
A2/W35 / COP	kW	6,5 / 3,2	11,6 / 3,5
A-7/W35 / COP	kW	5,2 / 2,6	9,3 / 2,9
Technical data			
Compressor		Copeland Scroll	Copeland Scroll
Expansion valve		electronic	electronic
Suction line filter		yes	yes
EC fan		As an option yes	As an option yes
Central heating circulation		ERP	ERP
Controller		Siemens RVS 21	Siemens RVS 21
Operation area (external temperature)	°C	-18 do +35	-18 do +35
Feed water temperature	°C	do 65	do 65

Flow (primary side)	m3/h	3500	4200
Flow (secondary side)	m3/h	1,4	1,4
Working agent		R407C	R407C
Quantity of working agent	kg	3,5	4,5
Protection/low pressure	bar	0,5	0,5
Protection/high pressure	bar	30	30
Type of defrosting		circulation inversion	circulation inversion
Connection/heating circulation		2 x GZ 1"	2 x GZ 1"
Dimensions			
L x H x W	mm	1570x 730 x 670	1900x 1040 x 770
Weight	kg	193	260
Casing		powder painted steel	powder painted steel
Electrical connection			
Power supply		400V 3~50Hz	400V 3~50Hz
Feeding duct	N x mm2	5x2,5	5x2,5
Protection	Type/mA	RCD/30	RCD/30
Maximum working current	A	7	12

NEXUS

Standard hydraulic options

As a standard, the pump, apart from the controller, sensors and pressure controls permanently installed in the pump, comes with 2 internal temperature sensors to be installed in containers as well as an external temperature sensor. The controller has one output to operate three-way valves, a heater or another device which may be used depending on the applied scheme



Scheme 1 Warming for central heating and hot water by a dual zone multipurpose container

The multipurpose container has a utility water zone and a central heating zone. The container is equipped with one common temperature sensor. The container is warmed by the NEXUS pump when the container's temperature drops below the preset temperature. It is switched off when the preset temperature is reached.

When necessary, the controller may operate the electrical heater in an advanced manner if the consumption of energy is higher than the assumption. The distribution of heat from the container to the heating system takes place via an independent heating system controller.

It is possible to expand the system with system heating elements responsible for the correct distribution and management of heat for central heating and hot utility water purposes in the building.

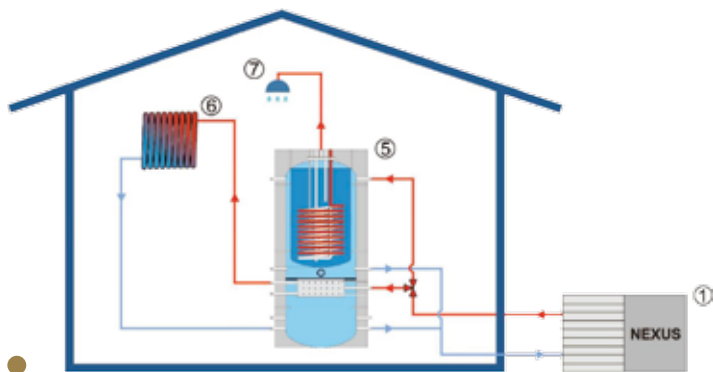
Recommended container:

FISH S7 - heating system with heat pump, electrical heater and boiler

FISH S3 - heating system with heat pump, heater, boiler and solar system

NEXUS

Standard hydraulic options



Scheme 2 Warming for central heating and hot water by triple zone multipurpose container

The container has a utility water zone, utility water warming zone and a central heating zone. The utility water warming zone is separated from the central heating zone with a horizontal membrane. As a result, the container's upper part responsible for warming hot utility water may have a definitely higher water temperature than the lower part responsible for warming central heating. The container is equipped with two temperature sensors for the upper and the lower zone.

The container is warmed by the NEXUS pump when the container's temperature in the upper or lower zone drops below the preset temperature. It is switched off when the preset temperature is reached. The distribution of power supply into particular zones takes place via a three-way valve. It is possible to preset various temperatures for each zone.

The distribution of heat from the container to the heating system takes place via an independent heating system controller.

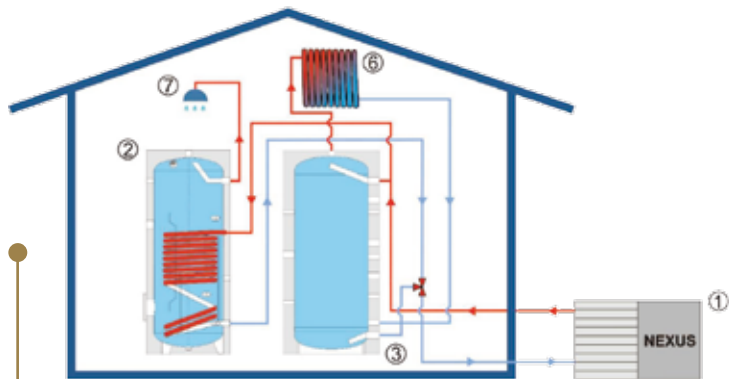
It is possible to expand the system with system heating elements responsible for the correct distribution and management of heat for central heating and hot utility water purposes in the building.

Recommended container:

FISH S17 - heating system with heat pump, independently controlled electrical heater, boiler and solar system

NEXUS

Standard hydraulic options



Scheme 3 Warming for central heating and hot water by hot utility water container and central heating buffer

The system is equipped with 1 container for warming hot utility water and 1 buffer for central heating. Each tank has a temperature sensor.

The containers are warmed by the NEXUS pump when the temperature of at least one of the tanks drops below the preset temperature. It is switched off when the preset temperature is reached. The distribution of power supply into particular tanks takes place via a three-way valve. It is possible to preset various temperatures for each container.

The distribution of heat from the container to the heating system takes place via an independent heating system controller.

It is possible to expand the system with system heating elements responsible for the correct distribution and management of heat for central heating and hot utility water purposes in the building.

Recommended container:

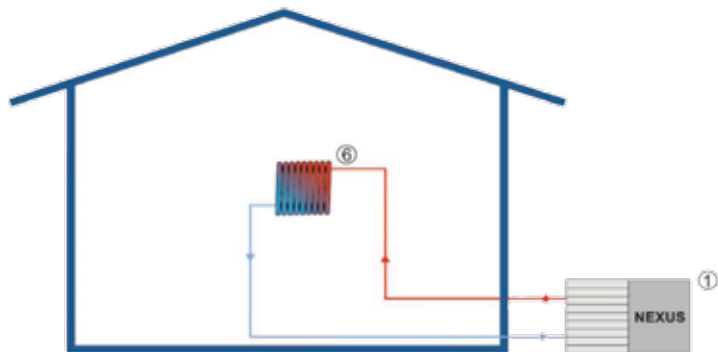
FISH S15 + FISH S4 - heating system with heat pump and independently controlled electrical heater

FISH S16 + FISH S5 - heating system with heat pump, independently controlled electrical heater, boiler and solar system

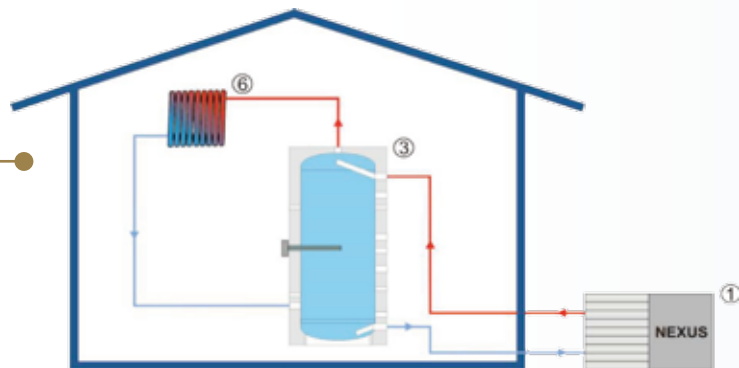
NEXUS

Standard hydraulic options

Scheme 4, 5
Warming for central heating



The system does not have a buffer container and heat from the pump is directed directly for heating. Warming by the NEXUS pump takes place when the heating temperature drops below the preset temperature. It is switched off when the preset temperature is reached.



The system is equipped with 1 buffer for central heating with a temperature sensor. The container is warmed by the NEXUS pump when the container's temperature drops below the preset temperature. It is switched off when the preset temperature is reached.

The distribution of heat from the container to the heating system takes place via an independent heating system controller.

Recommended container:

FISH S4 - heating system with heat pump, independently controlled electrical heater and boiler

FISH S4 - heating system with heat pump, independently controlled electrical heater, boiler and solar system



GELBI

Highly efficient compact heat pumps for hot utility water

Technical data

GELBI Highly efficient compact heat pumps for warming hot utility water

Gelbi is an air heat pump intended for warming hot utility water. Due to its small dimensions the pump may be used both inside and outside the building, in newly built or in existing objects. Pumps of this type may constitute the main source of warming for utility water throughout a substantial part of the year. The pump includes, among others, a cooling system, a set of exchangers, a pump for hot utility water, a casing, an intuitive controller.

Basic advantages:

- One of the cheapest methods for heating utility water
- Reliable in operation
- Automatic and comfortable in use
- Easy in operation
- Easy and quick to install
- Intuitive control
- Silent operation
- Modern appearance
- May work as an air conditioner in the summer
- Small dimensions
- May be installed inside and outside buildings

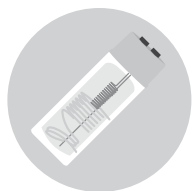


GELBI Highly efficient compact heat pumps for warming hot utility water



Model		GELBI 4,3
Efficiency / COP	j.m.	
A7/W30 / COP	kW/COP	4,3 / 4,12
A7/W40 / COP	kW/COP	3,9 / 3,65
A7/W50 / COP	kW/COP	3,6 / 2,96
A2/W30 / COP	kW/COP	3,7 / 3,67
Technical data		
Compressor		Hitachi / Toshiba rotary
Expansion valve		electronic
Central heating circulation pump		WILO RS15/6
Feed water temperature	°C	do 60
Flow (secondary side)	m ³ /h	0,68
Working agent		R410A
Type of defrosting		circulation inversion
Connection		DN15

Dimensions		
L x H x W	mm	680 x 470 x 450
Weight	kg	75
Casing		powder painted steel
Electrical connection		
Power supply		230V 1~ 50Hz



FISH

Highly efficient heat pumps for hot utility water Integrated with a tank

Technical data

FISH S18, S19, S20

Heat pumps integrated with a tank

FISH is an air heat pump intended for warming hot utility water. The pump is permanently installed in the upper part of the tank due to which the device's installation in the room is reduced to a minimum and the installation is quick and easy.

Pumps of this type may constitute the main source of warming for utility water throughout a substantial part of the year. The set includes a heat pump with a complete cooling system and control system as well as a utility water tank. Depending on the version, the tank has one, two or three coils.

FISH S18

The tank with one heat pump coil enables the connection of an additional electrical heater.

FISH S19

Tank with two coils. The heat pump is connected to one of them. A boiler or a solar system may be connected to the other one, as an option. It is also possible to connect an electrical heater.

FISH S20

Tank with three coils. The heat pump is connected to one of them. A boiler and a solar system may be connected to the second and third. It is also possible to connect an electrical heater.



FISH S18



FISH S19



FISH S20

FISH S18

Heat pumps integrated with a tank

Technical data

Symbol		200	300
Capacity	l	200	300
Height/Minimum vertical space	mm	1620 1750	1864 1934
Diameter	mm	660	660
Working pressure/maximum temperature	bar/°C	10/95	10/95
Tank's test pressure	bar	15	15
Output power	kW	1.85	
Power consumption	W	400	
Power supply	V/A/Ph/Hz	230 / 2.3 / 1 / 50	
Compressor	type	rotante	
Cooling agent	type	R 134a	
Heating temperature (heat pump)	°C	55	
Minimum air inflow temperature	°C	7	
Airflow (slowly/quickly)	m³/h	300/350	
Loudness of operation	dB	45	
Entrance of air channel (recommended length)	mm	3000	3000
Output of air channel (recommended length)	mm	5000	5000

Connections				
Cold water / hot water	R	1"/1"	1"/1"	
Circulation	R	¾"	¾"	
Muff (thermostat)	R	1"	1"	
Condenser	R	¾"	¾"	
Bottom plug	R	1"	1"	
Anode	R	1¼"	1¼"	
Electrical heater	R	1¼"	1¼"	
Inspection opening	mm	110/180	110/180	
Air channel	mm	140	140	
Weight (empty)	kg	120	132	

R - internal thread

FISH S19

Heat pumps integrated with a tank

Technical data



Symbol		200	300
Capacity	l	200	300
Height/Minimum vertical space	mm	1620 1750	1864 1934
Diameter	mm	660	660
Working pressure/maximum temperature	bar/°C	10/95	10/95
Tank's test pressure	bar	15	15
Output power	kW	1.85	
Power consumption	W	400	
Power supply	V/A/Ph/Hz	230 / 2.3 / 1 / 50	
Compressor	typ	rotante	
Cooling agent	typ	R 134a	
Heating temperature (heat pump)	°C	55	
Minimum air inflow temperature	°C	7	
Airflow (slowly/quickly)	m³/h	300/350	
Loudness of operation	dB	45	
Coil surface	m²	0.9	1.2
Coil capacity	l	5.55	7.40
Constant efficiency (80/60/45°C)(coil)	kW	29	53
	m³/h	0.71	1.30
Efficiency index for 60°C N _L	N _L	4.5	11

Pressure losses (coil)	mbar	75	120
Maximum working pressure (coil)	bar	16	16
Maximum working temperature (coil)	°C	110	110
Test pressure (coil)	bar	25	25
Air channel input (recommended length)	mm	3000	3000
Air channel output (recommended length)	mm	5000	5000
Connections			
Cold water / hot water	R	1"/1"	1"/1"
Coil	R	1"/1"	1"/1"
Circulation	R	¾"	¾"
Muff (thermostat)	R	1"	1"
Condenser	R	¾"	¾"
Bottom plug	R	1"	1"
Anode	R	1¼"	1¼"
Electrical heater	R	1¼"	1¼"
Inspection opening	mm	110/180	110/180
Muff (additional sensor)	mm	½"	½"
Air channel	mm	140	140
Weight (empty)	kg	135	150

R - internal thread

FISH S20

Heat pumps integrated with a tank

Technical data

Symbol		200		300	
		WT1	WT2	WT1	WT2
Capacity	l	200		300	
Height/Minimum vertical space	mm	1620/1750		1864/1934	
Diameter	mm	660		660	
Working pressure/maximum temperature	bar/°C	10/95		10/95	
Tank's test pressure	bar	15		15	
Output power	kW	1.85			
Power consumption	W	400			
Power supply	V/A/Ph/Hz	230 / 2.3 / 1 / 50			
Compressor	type	obrotowy			
Cooling agent	type	R 134a			
Heating temperature (heat pump)	°C	55			
Minimum air inflow temperature	°C	7			
Airflow (slowly/quickly)	m³/h	300/350			
Loudness of operation	dB	45			
Coil surface	m²	0.9	0.6	1.2	0.9
Coil capacity	l	5.55	3.70	7.40	5.55
Constant efficiency (80/60/45°C) (coil)	kW	29	18	53	21
	m³/h	0.71	0.44	1.30	0.52

Efficiency index for 60°C N _L	N _L	4.5	1.5	11	2
Pressure losses (coil)	mbar	75	55	120	70
Maximum working pressure (coil)	bar	16		16	
Maximum working temperature (coil)	°C	110		110	
Test pressure (coil)	bar	25		25	
Air channel input (recommended length)	mm	3000		3000	
Air channel output (recommended length)	mm	5000		5000	
Connections					
Cold water / hot water	R	1"/1"		1"/1"	
Coil	R	1"/1"		1"/1"	
Circulation	R	¾"		¾"	
Muff (thermostat)	R	1"		1"	
Condenser	R	¾"		¾"	
Bottom plug	R	1"		1"	
Anode	R	1¼"		1¼"	
Electrical heater	R	1¼"		1¼"	
Inspection opening	mm	110/180		110/180	
Muff (additional sensor)	mm	½"		½"	
Air channel	mm	140		140	
Weight (empty)	kg	145		162	

R - internal thread, WT1 - coil bottom, WT2 - coil up



Containers for heat pumps

Technical data

Containers for heat pumps

Symbol		150	200	300	400	500
Capacity	l	150	200	300	400	500
Maximum acceptable temperature (tank/coil)	°C	95/110	95/110	95/110	95/110	95/110
Maximum acceptable pressure (tank / coil)	MP	1/1,6	1/1,6	1/1,6	1/1,6	1/1,6
Exchanger capacity	l	9,2	12,3	20,9	25,8	27,7
Exchanger area	m ²	1,5	2	3,4	4,2	4,5
Insulation	mm	50	50	50	50	50
Diameter with insulation	mm	560	560	660	750	750
Tank diameter (without insulation)	mm	455	455	550	650	650
Connections						
Cold water/hot water	Rp	1"	1"	1"	1 ¼"	1 ¼"
Circulation	Rp	¾"	¾"	¾"	1"	1"
Heat pump circulation (container/air)	Rp	1"	1"	1"	1"	1"
Flange	mm	180	180	180	180	180
Muff (sensor)	Rp	½"	½"	½"	½"	½"
Muff (thermometer)	Rp	½"	½"	½"	½"	½"
Magnesium anode 1%"	mm	32x300	32x300	32x450	32x600	32x600
Odpowietrznik	Rp	1"	1"	1"	1"	1"
Waga (pusty)	kg	71	92	132	145	175

R - external thread, Rp - internal thread

FISH S15

Tank for warming hot utility water with the use of a heat pump. Correct heat transfer is provided by a coil with increased area as compared to typical tanks. Enamelled internal surface as well as magnesium anode ensure hygienically clean water.

Set including:

- Container was made from steel ST 37.2
- Internal coil
- Thermal insulation
- Casing type skay, grey
- Thermometer
- Feet
- Submersible sleeves for sensors

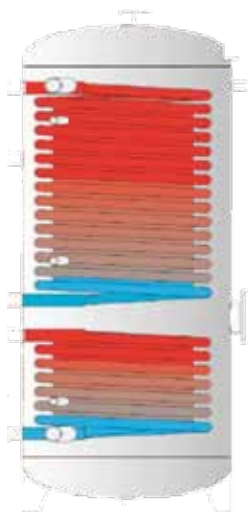


Zasobniki do pomp ciepła

FISH S16

Tank for warming hot utility water with the use of a heat pump. Correct heat transfer is ensured by a coil with increased area as compared to typical tanks. The container also has a second coil making it possible to connect a boiler or a solar system. Enamelled internal surface as well as magnesium anode provide hygienically clean water.

•



Set including:

- Container was made from steel ST 37.2
- Internal coil
- Thermal insulation
- Casing type skay, grey
- Thermometer
- Feet
- Submersible sleeves for sensors

SUNEX

Symbol		300		400		500	
		WT1	WT2	WT1	WT2	WT1	WT2
Capacity	l	300		400		500	
Maximum acceptable temperature (tank/coils)	°C	95/110		95/110		95/110	
Maximum acceptable pressure (tank/coils)	MP	1/1,6		1/1,6		1/1,6	
Exchanger capacity	l	5,5	7,4	6,8	9,2	7,4	11,1
Exchanger area	m ²	1,2	2,7	1,75	3,2	2,03	4,36
Insulation	mm	50		50		50	
Diameter with insulation	mm	660		750		750	
Tank diameter (without insulation)	mm	560		650		650	
Device height	mm	1420		1470		1720	
Connections							
Cold water / hot water	Rp	1"		1 ¼"		1 ½"	
Circulation	Rp	¾"		1"		1"	
Heat pump circulation (container/air)	Rp	1"		1"		1"	
Solar circulation (container/air)	Rp	1"		1"		1"	
Flange	mm	180		180		180	
Muff (sensor)	Rp	½"		½"		½"	
Muff (thermometer)	Rp	½"		½"		½"	
Magnesium anode 1%	mm	32x450		32x600		32x600	
Vent	Rp	1"		1"		1"	
Weight (empty)	kg	130		160		190	

R - external thread, Rp - internal thread, WT1 - coil bottom, WT2 - coil up

Containers for heat pumps

Symbol		600
Total container capacity	l	500
Utility water tank capacity	l	200
Buffer tank capacity	l	100
Maximum acceptable hot utility water temperature/ buffer/coil	°C	95/95/120
Maximum working pressure for hot utility water/buffer/ coil	bar	10/3/10
Insulation thickness	mm	100
Diameter with insulation	mm	850
Diameter without insulation	mm	650
Container height	mm	1900
Connections		
Hot water/cold water	R	1"
Boiler power supply/return	Rp	1½"
Heating circulation power supply/return	Rp	1"
Solar circulation power supply/return	Rp	1"
Heater muff	Rp	1½"
Deaeration	Rp	½"
Sensor sleeve		½"
Weight (empty)	kg	184

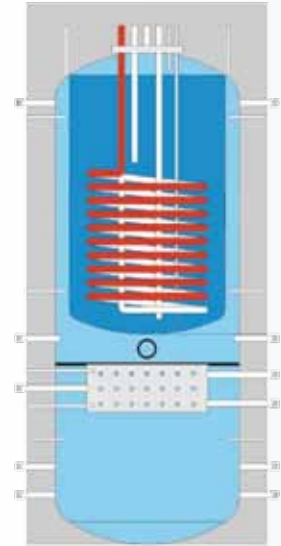
R - external thread, Rp - internal thread

FISH S17

Multipurpose container in its standing version with a special structure ensuring the maximum use of energy generated by the heat pump and the solar system. A compartment inside the tank ensures an effective division into 2 zones with significantly different buffer water temperatures. The upper zone with temperature ensuring warming for utility water in the internal container as well as the lower zone with temperature adjusted to power supply for low-temperature heating systems such as, e.g. floor heating or wall heating.

An effective transfer of energy from the heat pump or another source for low-temperature heating is ensured by a perforated pipe placed in the container's buffer part.

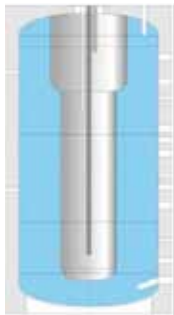
The solar coil is placed in the internal hot utility water container. As a result, a minimum quantity of energy is consumed to warm it.



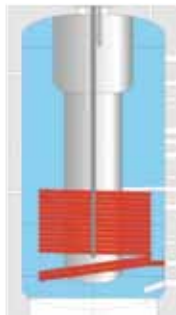
Containers for heat pumps

FISH S3, S6, S7

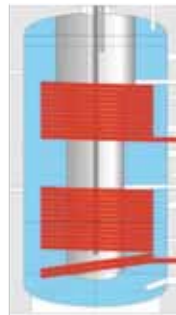
Multipurpose containers in their standing version with a special structure ensuring maximum use of energy generated by the heat pump and optionally by the solar system and the boiler. The tanks do not have an internal compartment ensuring an effective division into 2 zones with significantly different buffer water temperatures, which is an ideal solution for simple systems not using zone charging. This solution ensures a roughly constant and high temperature in the entire container which is particularly useful with heater heating. There are 3 versions of the tank, namely without a coil, with one coil (lower) or with two coils (upper and lower). The version with 1 coil placed in the bottom part is especially recommended. This not only provides warming for hot utility water but also support for central heating.



FISH S7



FISH S3



FISH S6

Symbol		600	
		WT1	WT2
Total container capacity		600	800
Utility water tank capacity	l	150	200
Buffer tank capacity	l	450	600
Maximum acceptable temperature hot utility water tank/buffer/coil	°C	95/95/120	95/95/120
Maximum working pressure tank/buffer/coil	bar	10/3/10	10/3/10
Coil capacity	l	10,59	7,4
Coil surface	m ²	1,7	1,2
Insulation thickness	mm	100	100
Diameter with insulation	mm	850	990
Diameter without insulation	mm	650	790
Container height	mm	1870	1910
Connections			
Hot water/cold water as well as coils	R	1" / 1"	1" / 1"
Boiler power supply/return	Rp	1½"	1½"
Heating circulation power supply/return	Rp	1½"	1½"
Heater muff	Rp	1½"	1½"
Sensor sleeve	Rp	½"	½"
Weight (empty)	kg	195	237

R - external thread, Rp - internal thread,
WT1 - coil bottom, WT2 - coil up

SUMEX



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If you have any question,
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NEXUS

