

Solar collectors Heat pumps



# Solar technology

Product catalogue 2015

Edition I



Experience • Competence • Reliability

[www.hewalex.pl](http://www.hewalex.pl)

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„Providing the highest quality product to our customers, based on the latest technical innovations, is the idea which is always with us in setting new goals and finding new solutions.”

Leszek Skiba,  
the owner of HEWALEX

The development of Hewalex started 25 years ago, was associated with popularizing the use of renewable energy sources. Many years of experience and continuous improvement of products, also by acquiring information from users and operators, can offer proven solutions. Solar collectors are subjected to difficult operating conditions, and the first collectors produced by Hewalex operate to date, which confirms their highest quality standards.



## Hewalex in facts:

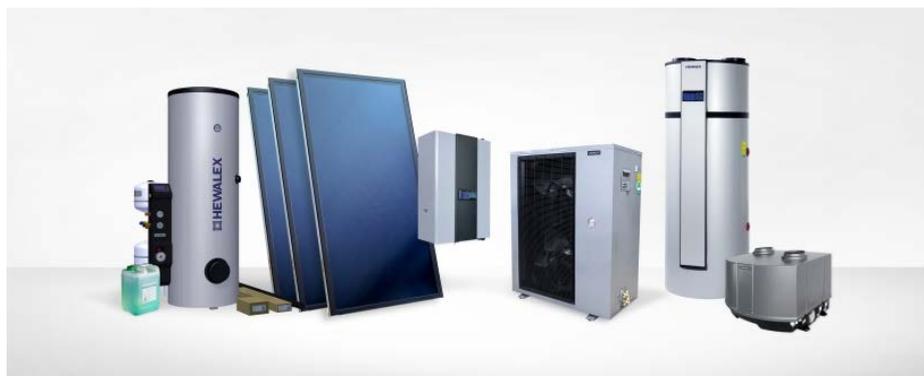
- 25 years of production experience
- Position of the leading manufacturer in the domestic market and strongly growing in foreign markets
- Presence in the 40 foreign markets, confirming the high technical standards of products
- Own research and development and designing resources, also for implementation of non-standard projects. Cooperation with renowned construction, designing and trading companies
- Attention to the rights of the Customer - full-value warranty coverage, including up to 10 years warranty for solar collectors
- Quality Management System according to ISO 9001, prizes and awards confirming the quality of products and services provided-
- Participation in the GREENEVO project supporting the development of innovative Polish companies on foreign markets



## THE OFFER OF HEWALEX

Hewalex is a manufacturer and supplier of heating systems using renewable energy. In time, the Company extended its 25 years' production of solar collectors with accessories for solar system. Currently, the offer includes complete solar systems for domestic hot water and support of central heating in private buildings, as well as solutions for large residential, office, industrial, commercial, service and other facilities.

The second segment of the offer includes heat pumps for heating of buildings and heating domestic hot water and swimming pool water. Hewalex offers both air-to-water and brine-to-water heat pumps.



### Solar collectors

Flat plate solar collectors of KS series are offered with 4 different absorbers varying in materials plate and tube materials and the type of glazing absorbing solar radiation. The available space of the absorber for flat plate collectors is from 1.82 to 2.24 m<sup>2</sup>. The offer also includes highly efficient KSR10 evacuated tube collectors, which can be mounted in any position, for example vertically on the facade of the building.



### Storage water heaters

The offered heaters with storage capacity from 200 to 1000 litres are fitted with heating coils, while those storing from 500 to 3000 litres may cooperate with an external heat exchanger. A highly recommended solution is a universal heater INTEGRA heaters designed for domestic hot water and supporting central heating in the building.



### Accessories

The offered ZPS pump control units are equipped with all functions required for any solar system, i.e. protection and control of operation. The mounting handles are designed for most placement variants of solar collector. Elastic stainless steel tubes are available in three types of thermal insulation. Two types of elastic tubes are provided to connect the soldered or screwed connections.



## SPECIAL FEATURES OF HEWALEX SOLAR COLLECTORS



### Advantageous purchase prices and high heat yields - a positive economic effect

Hewalex offers proven technical solutions characterized by very good "price/performance" indicators.

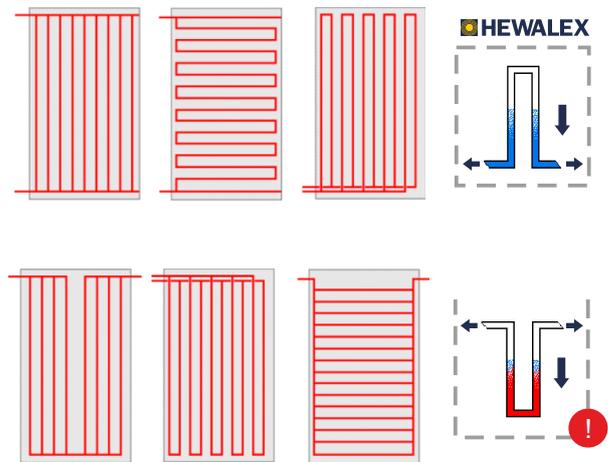
As in the case of flat plate collectors of KS series, the highly-efficient evacuated tube collector KSR10 brings a positive economic effect as regards the purchase price.

### Operational safety, protection against overheating

Both flat plate collectors of KS series and evacuated tube collectors KSR10 are manufactured taking into account the most difficult operating conditions. In particular, this applies to the so-called states of stagnation, when the absence of heat transfer from a solar collector causes boiling of the heating medium (glycol) and formation of steam.

The design of absorber's tubes with lower connectors allows free flow of the heating medium, which will be displaced by steam accumulating from the top part of the absorber.

Thanks to quick removal of the heating medium from the absorber, it is protected against overheating, which threatens its durability. At the same time, the amount of steam is not as high, as in case of absorbers without the bottom outlet of the heating medium. This in turn greatly reduces the pressure in the whole solar system, preventing the opening of the safety valve, loss of heating medium and the risk that the accessories will be damaged by the steam filling the tubes.



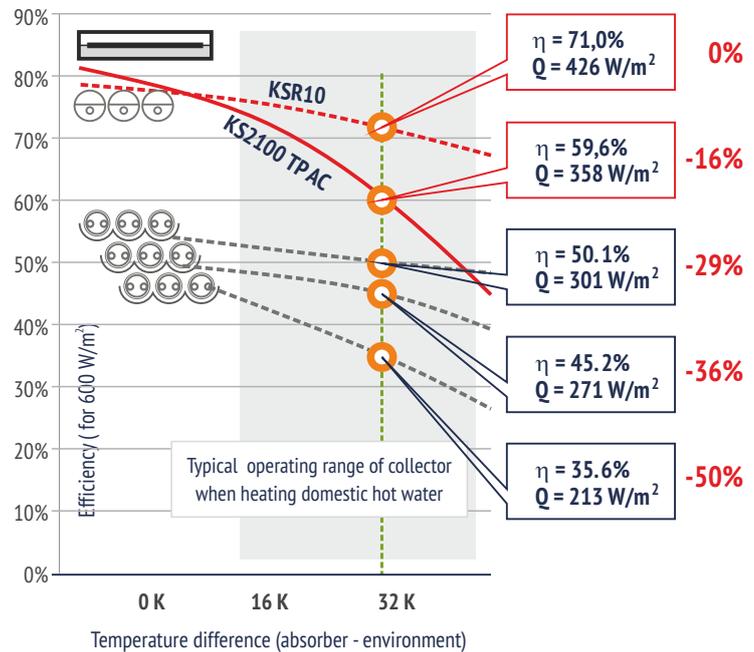
### Identical operating efficiency in tests and in real operating conditions

Efficiency parameters of Hewalex solar systems are tested in a recognized SPF Institute in Rapperswil in Switzerland. Test data are available at the [spf.ch](http://spf.ch) website, as well as in Solar Keymark certificates at [solakeymark.org](http://solakeymark.org). As one of the few available in the market, flat plate KS collectors and evacuated tube KSR10 collectors are continuously tested based on glycol as the heating medium and with high flow rate recommended for the operating conditions.



## SELECTING A SOLAR COLLECTOR - FLAT PLATE OR EVACUATED TUBE?

For most applications, in view of the investment costs to obtained results ratios, it is advisable to use flat plate collectors. The unit purchase price of a flat plate collector (EUR/m<sup>2</sup>) is on average 2.5 times lower than the price of an evacuated tube collector. In extreme cases, the difference to the disadvantage of evacuated tube collectors can be as much as six-fold. However, a large part of attractively priced evacuated tube collectors allow obtaining, at the outmost, comparable, and often lower heat yields than in the case of flat plate collectors. This applies mainly to collectors with double wall tubes (“vacuum tube” or “pipe in pipe”), which are characterized by a decreased transmittance of solar radiation into the interior (and also to the absorber).



### KRS10 evacuated tube collectors - justification for use

Hewalex KRS10 evacuated tube collectors obtain higher efficiencies than flat plate collectors thus there is a technical justification for their use, especially when the solar system is designed to operate at higher operating temperatures. Due to the construction of a direct flow through the absorber, KRS10 evacuated tube collectors obtain higher operating efficiency compared to “heat pipe” evacuated tube collectors.

The special design of the reversed hydraulic connections in the KRS10 collector protects the heating medium from overheating in the state of stagnation.

The purchase cost of a highly efficient evacuated tube collector, such as KRS10 exceeds the cost of buying standard collectors with double wall tubes. However, due to high efficiency operation, the “Price to performance” ratio will be beneficial in the case of KRS10 collector, shortening the period of return on investment.

A significant advantage of the KRS10 collector is the possibility of installation in any position (without inclination), which allows, for example its placement at the facade of the building. Individual tubes may be rotated and thereby compensate for unfavourable position in relation to the solar radiation incidence angle. This feature of KRS10 collector increases the range of its application, also for non-standard installation conditions.

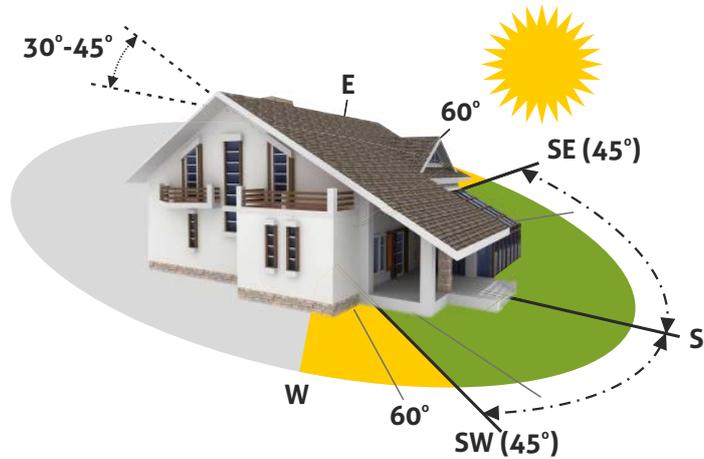


## CONDITIONS FOR INSTALLATION OF SOLAR COLLECTORS

### Installation conditions

Hewalex solar collectors can be used in different installation conditions. Flat plate collectors typically require inclination to the level and the recommended angle for year-round operation is within 30÷45°.

Solar collectors should be directed towards south (S), but a deviation within the angle ±45° may be considered acceptable. Decrease in heat yields of the solar collector should be then not greater than 5 % per year.



### Recommended inclinations of solar collectors depending on the application of the solar system

DHW heating	DHW heating and central heating support	Heating of swimming pool water at the seasonal pool
30°÷45°	45°÷60°	<30°



### Unusual conditions for installation of solar collectors

If the roof planes are directed from east to west, it is possible to install two collector batteries - the G422 controller allows for operation of such type of system. In practice, however, it is recommended to choose one of the planes - usually the west one, for installation of one larger collector battery (for example, 3 collectors in one battery instead of two batteries with two collectors each). This solution compensates for the adverse effects of insolation and at the same time reduces the investment costs and simplifies the hydraulic system.



Also, the southern facade of the building may be used for the installation of solar collectors. In such a case, KS flat plate collectors use the KSOL universal constructions for the appropriate angle of inclination. KSR10 evacuated tube collectors can be installed in a vertical position and tubes can be turned by 25° to correct the unfavourable inclination of the absorbers.

Solar collectors on the roof should be installed maintaining a distance of 1 m from the edge, where an increased force of the wind is present. Installation in the upper part of the roof plane protects the collectors against the snow sliding down. Otherwise, we recommend installing snow fences.

## SELECTION OF A SIZE FOR SMALL SOLAR SYSTEMS

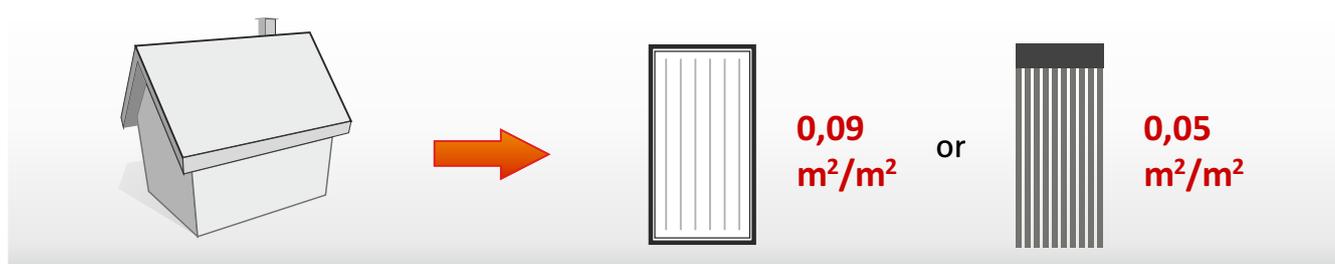
### System for heating domestic hot water (DHW)

A well-designed solar system should cover up to 50 to 60 % of thermal demand required during the year for heating domestic hot water. To reach the intended demand coverage for 1 person, 0.8 to 1.5 m<sup>2</sup> of active absorber surface per person should be assumed. Additionally, when determining the capacity of the tank, a standard indicator of daily hot water use for one person of 40 - 60 l of water at 55°C should be adopted. An appropriate choice of a solution facilitates the selection of the solar set, which perfectly matches in terms of size the needs of a given number of users.



### The system supporting central heating of the building

The use of solar collectors to support the central heating system is recommended for buildings with low energy demand, which mostly use a low-temperature heating system, such as floor heating. For instance, for a building with very good thermal insulation and 30W/m<sup>2</sup> average energy demand, 20 % coverage of annual demand can be achieved by installing respectively 0.05 m<sup>2</sup> of KSR10 evacuated tube collector aperture area or 0.09m<sup>2</sup> of flat plate collector aperture area per 1 m<sup>2</sup> of the building surface. At the same time an excessive oversizing of solar collectors' area should be avoided to eliminate excess heat in summer, which causes their overheating. It is also possible to perform a computer simulation for a more accurate selection of the solar system. To do so, please contact our Export Department or Technical Department.



### Solar heating systems for swimming pools

Heating of swimming pool water brings good economic results - the solar system reaches high operating efficiency due to low temperature on the heat consumption side. The role of the solar system is to maintain the pool water temperature by covering the current heat losses. The main heat losses in the pool basin are caused by evaporation of water, hence the selection of collector area is made with respect to the water surface. The reduction of heat losses and decrease in size of the solar system can be achieved by covering water surface (e.g. with foil), for the period when the pool is not used.

Swimming pool type	Recommended total aperture area of the collectors (flat plate or evacuated tube) with respect to water surface area
Outdoor pools, without covering of water surface	0,40 ÷ 0,60 m <sup>2</sup> /m <sup>2</sup> of the water surface
Indoor pools, without covering of water surface	0,40 ÷ 0,50 m <sup>2</sup> /m <sup>2</sup> of water surface
Outdoor or indoor, with covering of water surface	0,30 ÷ 0,40 m <sup>2</sup> /m <sup>2</sup> of water surface

# A. Solar sets

## DOMESTIC WATER SETS

The offer of Hewalex includes solar sets designed for heating of domestic hot water (DHW) and for heating of DHW with central heating support.

Solar sets include such elements as:

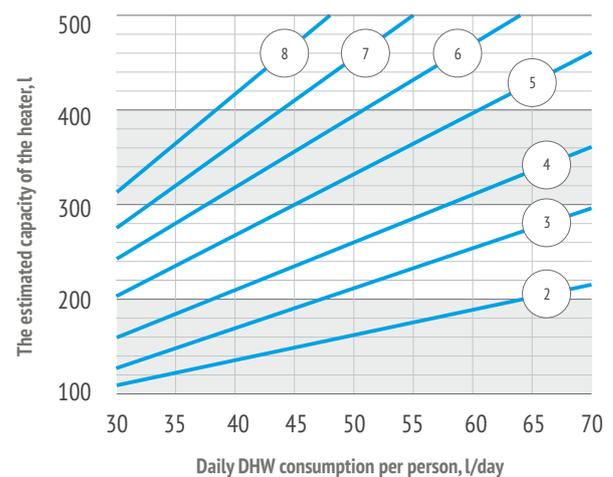
- **Flat plate solar collectors** of series KS2000, KS2100, KS2400 or KS2600 only in version with entirely varnished housing (e.g. KS2000 TLP). Maximum number of collectors in a set: 8 pcs (5 pcs KS2100/KS2600 TAC).
- **Evacuated tube collectors** of series KSR10. Maximum number of collectors in a set: 6 pcs KSR10
- **2-coil DHW water heaters**, with a capacity of 200 to 500 litres
- **ZPS pump control unit ECO P** depending on the type of the solar set
- **ZNP expansion tank set** with capacity dependent on the size of the solar set
- **Connection set for collectors** connected within a battery
- **Storage DHW heater set**
- **KSL masking profiles** for KS flat plate collector batteries (except KS2100/KS2600 TAC models)
- **Armaflex HT insulation resistant to UV radiation** 18/13 mm (2 running meters) for collector battery outlet piping
- **Heat transfer fluid** (propylene glycol): volume depends on the size of the solar set for standard lengths of solar piping system

**NOTE:** Solar sets do not include solar collector mounting handles, which should be selected from the catalogue offer for specific installation conditions on the building or outside of it. Also, piping systems with thermal insulation should be ordered separately depending on the required length and type of insulation.

### Selection of a heater capacity

Solar sets are usually selected based on the daily domestic hot water consumption. Average consumption per person is 50 litres of water at a temperature of 55 °C. The presented diagram allows for estimating the required capacity of the heater, based on which one can select the appropriate set with HEWALEX solar collectors.

For typical small solar systems in residential buildings, the number of solar collectors can be defined in accordance with indicators.



### Benefits of using a solar set:

- A convenient choice of system size according to individual needs
- Facilitated completion of the solar system components
- Lowered investment costs compared to separately ordered components

## DOMESTIC WATER AND CENTRAL HEATING SUPPORT SETS

The offer of Hewalex includes solar sets performing two functions: heating of domestic hot water (DHW) and central heating support. Thanks to development of a special design of the universal Hewalex heater INTEGRA, this type of solar system does not require application of two separate tanks (heating water and DHW) and the hydraulic system does not differ from the standard system designed specifically for heating domestic hot water.

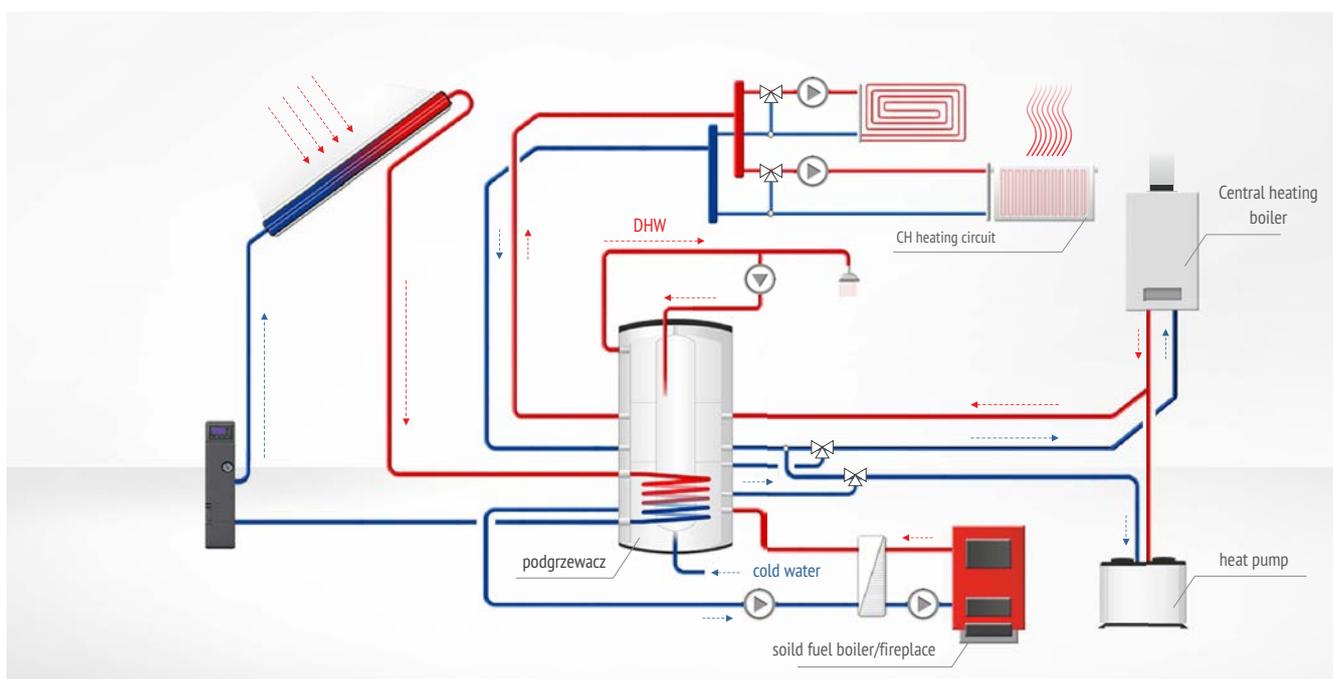


Our offer includes sets for heating domestic hot water and central heating support with universal Hewalex heaters INTEGRA 400/100, 500/120 or 800/200. The maximum number of collectors in a set: 8 flat plate collectors of KS2100 series or 6 evacuated tube collectors of KSR10 type.

The solar system supporting central heating of a house is usually capable of covering for 5 to 20 % of annual thermal demand. It is strictly dependent on the selected size of the system, but also on factors such as:

- energy standard of the building (low-energy standard recommended)
- parameters of the heating system (low temperature standard recommended, e.g. floor heating)

Hewalex INTEGRA heaters fulfil the dual function of domestic hot water heating and central heating support and also enable the cooperation of several heat sources such as gas-fired boiler, fireplace with a water jacket, heat pumps and a solar system.



## B. Components of solar systems

### 1. FLAT PLATE SOLAR COLLECTORS

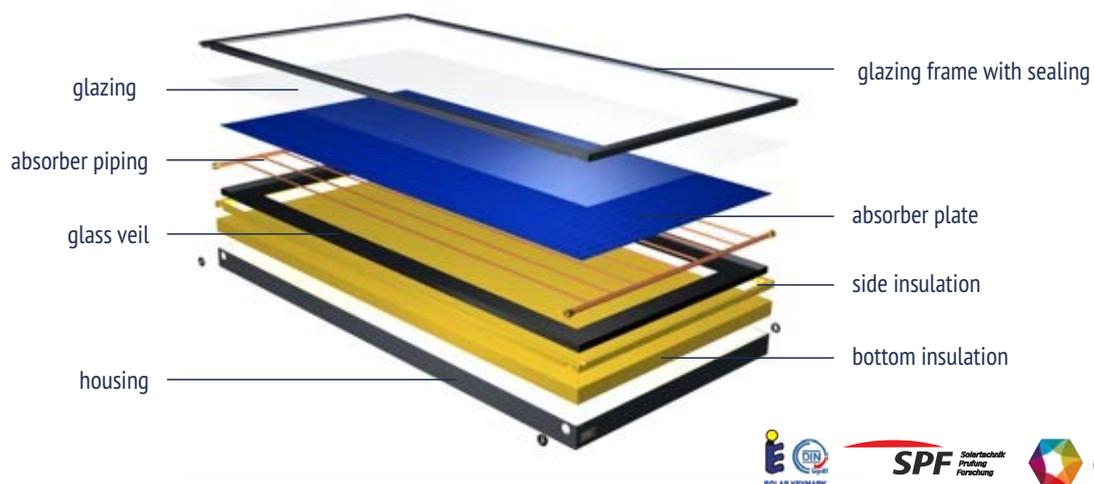


#### Applications

Flat plate solar collectors of KS series are intended for year-long operation, especially for heating domestic hot water, swimming pool water, as well as for supporting central heating systems in the building.

#### Construction of a flat plate collector

The main feature distinguishing individual flat plate collectors of the KS series is the absorber. Materials used in its construction directly affect the cost of purchasing the collector, as well as its functional characteristics. A very important role is played by a flat plate collector housing, which must provide adequate mechanical strength to loads resulting from forces of wind, or snow. On the one hand the housing must provide proper ventilation inside the flat plate collector, and on the other hand protect it against the ingress of moisture from rain or melting snow. The housing of KS collectors is made of aluminum to provide high stiffness and low weight, as well as anticorrosive properties. Versions designated with "L" index (e.g. TLP) have their housings powder-coated (RAL7022 or in other colours on request). For all collectors, including those with non-coated housing (e.g. TP), glass frames and masking profiles for mounting between the collectors to be joined in a single battery are factory-coated.

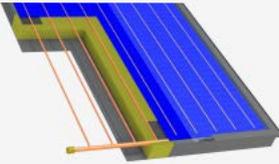
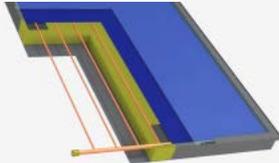
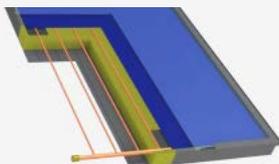


The glass used for glazing of the collector is the top solar radiation transmission class, at the same time maintaining excellent directional characteristics. This means that even at low angles of incidence of sunlight, it provides high transmittance to the inside of the collector. In the case of KS2100 TLP ACR, KS2600 TLP ACR flat plate collectors and KSR10 evacuated tube collectors, glass surfaces are covered by anti-reflective coatings that further increase solar radiation transmittance by a few per cent, increasing the efficiency of the collector and also heat yields.

Connection of the collectors in a battery is done by elastic tubes made of stainless steel. In standard, solar collectors are equipped with threaded connections that provide a tight seal resistant to mechanical and thermal loads. This eliminates the occurrence of permanent mechanical damages to the collector stub pipes, which, in the case of self-sealing connections such as external O-rings, require replacement of the entire collector. In addition, pipe union connections allow, if needed during maintenance operations, the disassembly of the collector located inside the battery, without the need to disassemble the collectors on the side of the battery.

## Selection of a flat plate collector due to the type of absorber used

The most important element of a solar collector, i.e. the absorber, is responsible for the amount of heat captured. Features to be met by the absorber include high efficiency, mechanical strength and durability in order to maintain operating parameters over the life of the collector. Selection of a flat plate collector due to the absorber type should result from customer's preferences in terms of purchase price, the assumed efficiency and technology used (traditional or new).

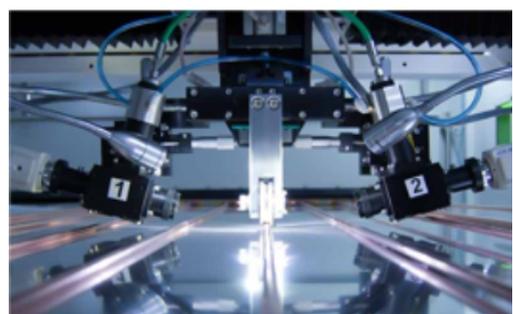
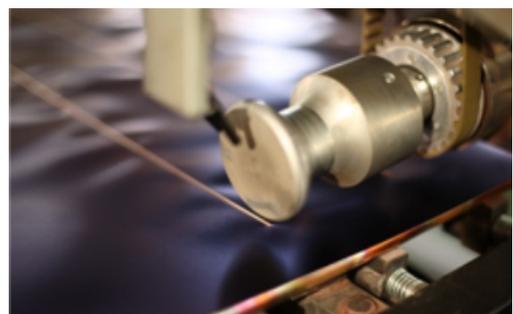
	<p>Copper-Copper Layer: PVD</p> <p>KS2000 TP/TLP</p>	<ul style="list-style-type: none"> <li>• The highest material standard</li> <li>• Standard PVD layers</li> <li>• The highest heat yields</li> </ul>
	<p>Aluminium-Copper Layer: PVD</p> <p>KS2100 T AC KS2600 T AC</p>	<ul style="list-style-type: none"> <li>• Quality at attractive purchase price</li> <li>• Positive „price/efficiency” ratio</li> <li>• Short return of investment</li> </ul>
	<p>Aluminium-Copper Layer: PVD</p> <p>KS2100 TP AC/TLP AC KS2400 TP AC/TLP AC KS2600 TP AC/TLP AC</p>	<ul style="list-style-type: none"> <li>• Current market standard</li> <li>• Modern production technology</li> <li>• Optimal cost of purchasing the collector</li> </ul>

Hewalex manufactures 4 types of absorbers, including market-standard Aluminium-Copper (aluminium sheet, copper piping). The absorbing layers use the PVD (ceramic-metal) coatings.

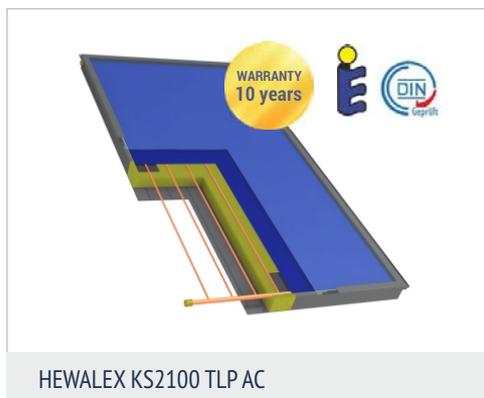
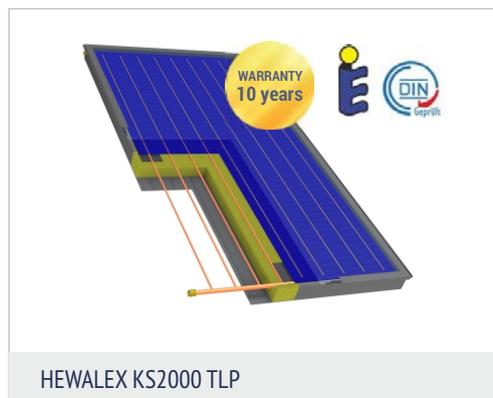
## Advanced absorber manufacturing technologies

The absorbers are manufactured in the factory of Hewalex based on two new technologies implemented for the first time in the Polish market, i.e. ultrasonic welding for copper absorbers and laser welding for aluminium absorbers.

Joining of sheet with absorber piping without additional filler metal provides for maximum mechanical strength of the connection. According to the tests carried out at SPF Institute in Rapperswil, the highest heat transmission is provided by the two above-mentioned technologies, where the contact of the absorber's plates with its pipes takes place through the base material (copper-copper, aluminium-copper, aluminium-aluminium). The previously widely used absorber soldering technology required increasing the contact area between the sheet and piping to ensure transfer of heat through the filler metal with up to 8 times lower thermal conductivity as compared to copper.



## FLAT PLATE SOLAR COLLECTORS:

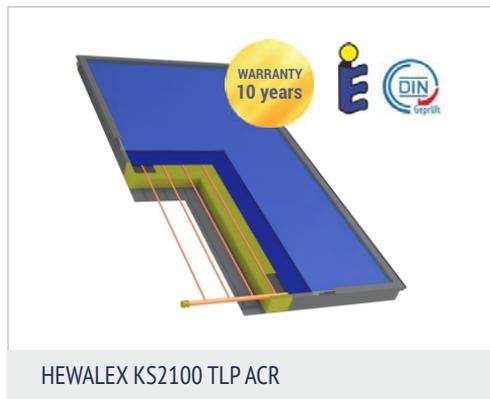


SOLAR COLLECTOR:	KS2000 TLP <sup>1)</sup> (KS2000 TP)	KS2100 TLP ACR <sup>1) 2)</sup> (KS2100 TP ACR)	KS2600 TLP ACR <sup>1) 2)</sup> (KS2600 TP ACR)	KS2100 TLP AC <sup>1) 2)</sup> (KS2100 TP AC)
Article number	<b>14.22.00</b> <b>(14.21.00)</b>	<b>14.48.00</b> <b>(14.57.00)</b>	<b>14.91.00</b> <b>(14.92.00)</b>	<b>14.47.00</b> <b>(14.55.00)</b>
Solar Keymark certificate (PN-EN12975-1,2:2007)	011-7S181 F	011-7S2159 F	011-7S2159 F	011-7S2158 F
Active (aperture) area, m <sup>2</sup>	1,818	1,820	2,360	1,820
Gross area (total), m <sup>2</sup>	2,095	2,090	2,650	2,090
Optical efficiency (with respect to aperture), %	80,2	82,7	82,7	80,8
Heat loss coeff. a1 (with respect to aperture), W/m <sup>2</sup> K	3,80	3,247	3,247	3,334
Heat loss coeff. a2 (with respect to aperture), W/m <sup>2</sup> K <sup>2</sup>	0,0067	0,0200	0,020	0,0200
Glass	structured	anti-reflexive	anti-reflexive	structured
Material of absorber sheet / piping	copper / copper	aluminium / copper	aluminium/copper	aluminium / copper
Type of selective coating	PVD	PVD	PVD	PVD
Piping layout of absorber	harp	harp	harp	harfowy
Number of connections	4x external <sup>3/4"</sup>	4x external <sup>3/4"</sup> <sup>3)</sup>	4x external <sup>3/4"</sup>	4x external <sup>3/4"</sup> <sup>6)</sup>
Joining technique	ultrasonic welding	laser welding	laser welding	laser welding
Dimensions, mm	2020 x 1037 x 87	2018 x 1037 x 89	2018 x 1314 x 89	2018 x 1037 x 89
Housing	aluminium	aluminium	aluminium	aluminium
Weight (when empty), kg	40	35,1	43,4	34,4
Liquid capacity, litres	1,1	0,85	1,09	0,85
Nominal flow rate l/min.	1,8 (1,2÷2,5)	1,8 (1,2÷2,5)	2,2 (1,5÷3,0)	1,8 (1,2÷2,5)
Maximum operating pressure, bar	6	6	6	6
Warranty, years	10	10	10	10

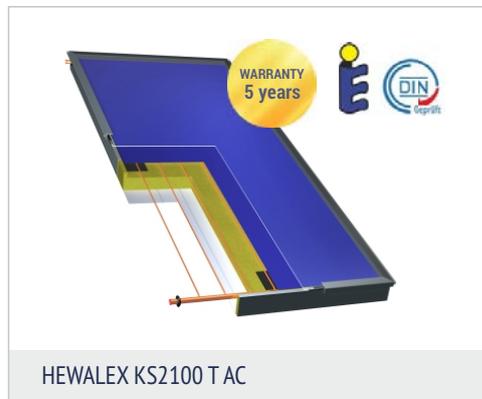
<sup>1)</sup> Letter "L" in the name of the collector denotes that aluminium housing and frames of the collector are powder-painted in RAL7022 (umbra grey). The lack of "L" letter denotes that only collector frames are powder-painted.

<sup>2)</sup> Collectors of 2100, 2400, and 2600 series are not to be connected with other collector models due to different location of connections

**Note:** In standard arrangement it is allowed to connect up to 8 flat plate collectors in parallel or 5 pieces in series.



HEWALEX KS2100 TLP ACR



HEWALEX KS2100 T AC

SOLAR COLLECTOR:	KS2400 TLP AC <sup>(1,2)</sup> (KS2400 TP AC)	KS2600 TLP AC <sup>(1,2)</sup> (KS2600 TP AC)	KS2100 T AC	KS2600 T AC
Article number	<b>14.54.00</b> <b>(14.52.00)</b>	<b>14.90.00</b> <b>(14.93.00)</b>	<b>14.49.00</b>	<b>14.95.00</b>
Solar Keymark certificate (PN-EN12975-1,2:2007)	011-7S2158 F	011-7S2158 F	* 2)	* 2)
Active (aperture) area, m <sup>2</sup>	2,190	2,360	1,836	2,373
Gross area (total), m <sup>2</sup>	2,460	2,650	2,054	2,611
Optical efficiency (with respect to aperture), %	80,8	80,8	74,6 *2)	74,6 *2)
Heat loss coeff. a1 (with respect to aperture), W/m <sup>2</sup> K	3,334	3,334	2,985 *2)	2,985 *2)
Heat loss coeff. a2 (with respect to aperture), W/m <sup>2</sup> K <sup>2</sup>	0,0200	0,0200	0,021 *2)	0,021 *2)
Glass	structured	structured	normal tempered	normal tempered
Material of absorber sheet / piping	aluminium / copper	aluminium / copper	aluminium/copper	aluminium/copper
Type of selective coating	PVD	PVD	PVD	PVD
Piping layout of absorber	harfowy	harfowy	harp	harp
Number of connections	4x Gz <sup>3/4"</sup> 6)	4x Gz <sup>3/4"</sup> 6)	4x external Ø18 mm	4x external Ø18 mm
Joining technique	laser welding	laser welding	laser welding	laser welding
Dimensions, mm	2018 x 1221 x 89	2018 x 1314 x 89	2018x1018x89	2018x1294x89
Housing	aluminium	aluminium	aluminium	aluminium
Weight (when empty), kg	40,0	42,4	32	39
Liquid capacity, litres	1,00	1,09	0,76	0,97
Nominal flow rate l/min.	2,0 (1,3÷2,8)	2,2 (1,5÷3,0)	x	x
Maximum operating pressure, bar	6	6	6	6
Warranty, years	10	10	5	5

<sup>1)</sup> Letter "L" in the name of the collector denotes that aluminium housing and frames of the collector are powder-painted in RAL7022 (umbra grey). The lack of "L" letter denotes that only collector frames are powder-painted.

<sup>2)</sup> Collectors of 2100, 2400, and 2600 series are not to be connected with other collector models due to different location of connections

**Note:** In standard arrangement it is allowed to connect up to 8 flat plate collectors in parallel or 5 pieces in series.

## 2. EVACUATED TUBE COLLECTORS



### Applications

KSR10 evacuated tube collectors are intended for year-round operation, in particular for heating domestic hot water, supporting the building heating system, as well as for industrial processes and other processes requiring increased heating medium temperatures. At the same time, the KSR10 solar evacuated tube collector may be used in the case of untypical installation conditions, where application of flat-plate collectors may be impossible, impeded or unfavourable due to decreased heat yields.

### Versatile installation options

The technology of direct flow through absorbers does not require provision of a specific angle of inclination of the KSR10 evacuated tube collector. This way it can be installed in any position, which also extends the collector's application range in unusual installation conditions. An example would be vertical installation on the facade of the building. Evacuated tubes can be rotated by 25°, thanks to which a position of the absorbers is corrected to obtain favourable insolation conditions.

Increased spacing between the KSR10 collector tubes provide full insolation of the absorbers in all operating conditions. An example would be operation during the summer of a collector installed in vertical position. Even at the highest angle of incidence of sunlight (in Poland in the summer 61°), there is no shading of the adjacent absorbers. Increasing the angle of rotation of the tube over 25° is not required, and even it is undesirable, since it causes shading of the absorber.



### High operating efficiency thanks to advanced technology

Evacuated tube collector KRS10 achieves one of the highest efficiencies available in the European market (optical efficiency with respect to the absorber - 85%).

This follows from the use of advanced solutions, such as:

- one-wall Narva evacuated tubes with high solar transmittance
- use of Na-Ca-Si glass ensures tightness and impermeability even of the smallest particles of gas throughout the period at least 20 years of exploitation
- additionally, the anti-reflective coating applied to both sides increases transmittance of solar radiation to the inside of the glass tube by about 5 %
- deep vacuum in the tube of 10 mbar<sup>6</sup> (removal of 99.999999 % of air) eliminates convective heat losses
- a getter absorbing gas particles, and thus supporting the vacuum at a deep level
- absorbers made entirely of copper and coated with a selective layer of PVD (TiNOX Classic)
- direct flow of heating medium increases the efficiency by 4-6 % compared to the structurally identical evacuated tubes built on the principle of a heat pipe.

## The maximum level of operational safety

The design of evacuated tubes by a reputable German manufacturer Narva Lichtquellen GmbH + Co. KG is based on more than 40 years of experience in vacuum technology. The patented metal-to-glass connection based on full melting of the contact area of the chrome-nickel steel disk with glass tube. This ensures absolute tightness and mechanical strength also to lateral loads (e.g. snow). Passage of the concentric tube (through which the heat transfer fluid flows - glycol) is a metal-to-metal connection, which eliminates the problem of sealing the glass -to-metal connections used in some of the collectors.



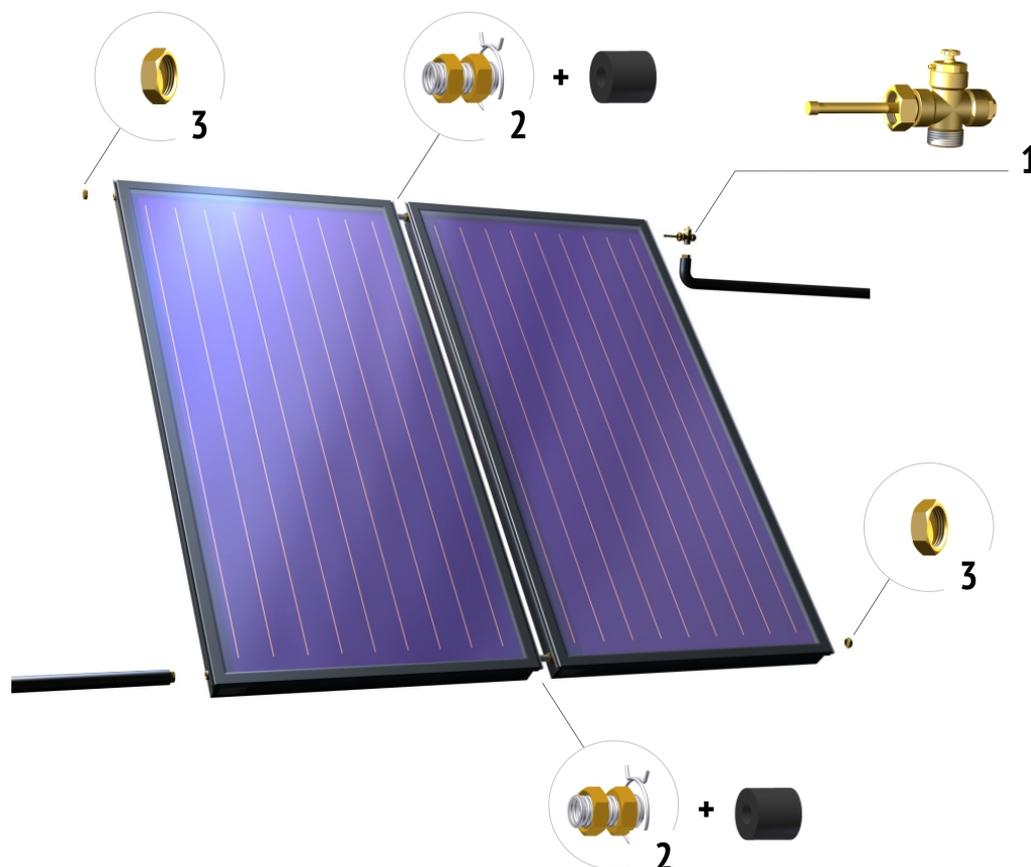
Hewalex provided a patented system connecting the KSR10 collector in the form of bottom connectors. This solution fully protects the collector against overheating in case heat transfer from the collector is disturbed. Glycol is easily removed by steam formed in the top part of the absorber (state of stagnation).

SOLAR COLLECTOR:	KSR10	2 x KSR10
Article number	<b>15.11.00</b>	<b>15.21.00</b>
Solar Keymark certificate (PN-EN12975)	011-7S1106 R	011-7S1106 R
Active (aperture) area, m <sup>2</sup>	1,014	2,028
Gross area (total), m <sup>2</sup>	1,82	3,68
Optical efficiency (with respect to the absorber/aperture), %	85 / 78	85 / 78
Heat loss coeff. a1 (with respect to the absorber/aperture), W/m <sup>2</sup> K	1,38 / 1,27	1,38 / 1,27
Heat loss coeff. a2 (with respect to the absorber/aperture), W/m <sup>2</sup> K <sup>2</sup>	0,0013 / 0,0012	0,0013 / 0,0012
Glazing: solar glass / anti-reflexive / tempered	+ / + / -	+ / + / -
Vacuum	10 <sup>-6</sup> mbar	10 <sup>-6</sup> mbar
Material of absorber sheet / piping	copper / copper	copper / copper
Type of selective coating	TiNOX Classic	TiNOX Classic
Piping layout of absorber	concentric pipe	concentric pipe
Type of flow,	direct flow	direct flow
Number of connections	2xexternal $\frac{3}{4}$ "	2xexternal $\frac{3}{4}$ "
Joining technique	ultrasonic welding	ultrasonic welding
Dimensions, mm	2130 x 856 x 116	2130 x 1720 x 116
Housing	aluminium	aluminium
Weight (when empty), kg	30	60
Liquid capacity, litres	1,8	3,6
Maximum operating pressure, bar	6	6
Warranty	10	10

The starting unit for completing batteries for evacuated tube collectors is 2xKSR10 consisting of 20 evacuated tubes located in a single base construction. It is recommended to connect **max. 6 single KSR10 collectors** (1 double 2xKSR10 collectors + 4 single KSR10 collectors) into 1 set. For collectors KSR10, it is necessary to select the right connections and mounting components depending on method and location of installation.

### 3. CONNECTION COMPONENTS FOR SOLAR COLLECTORS

#### Connection set for flat plate collectors

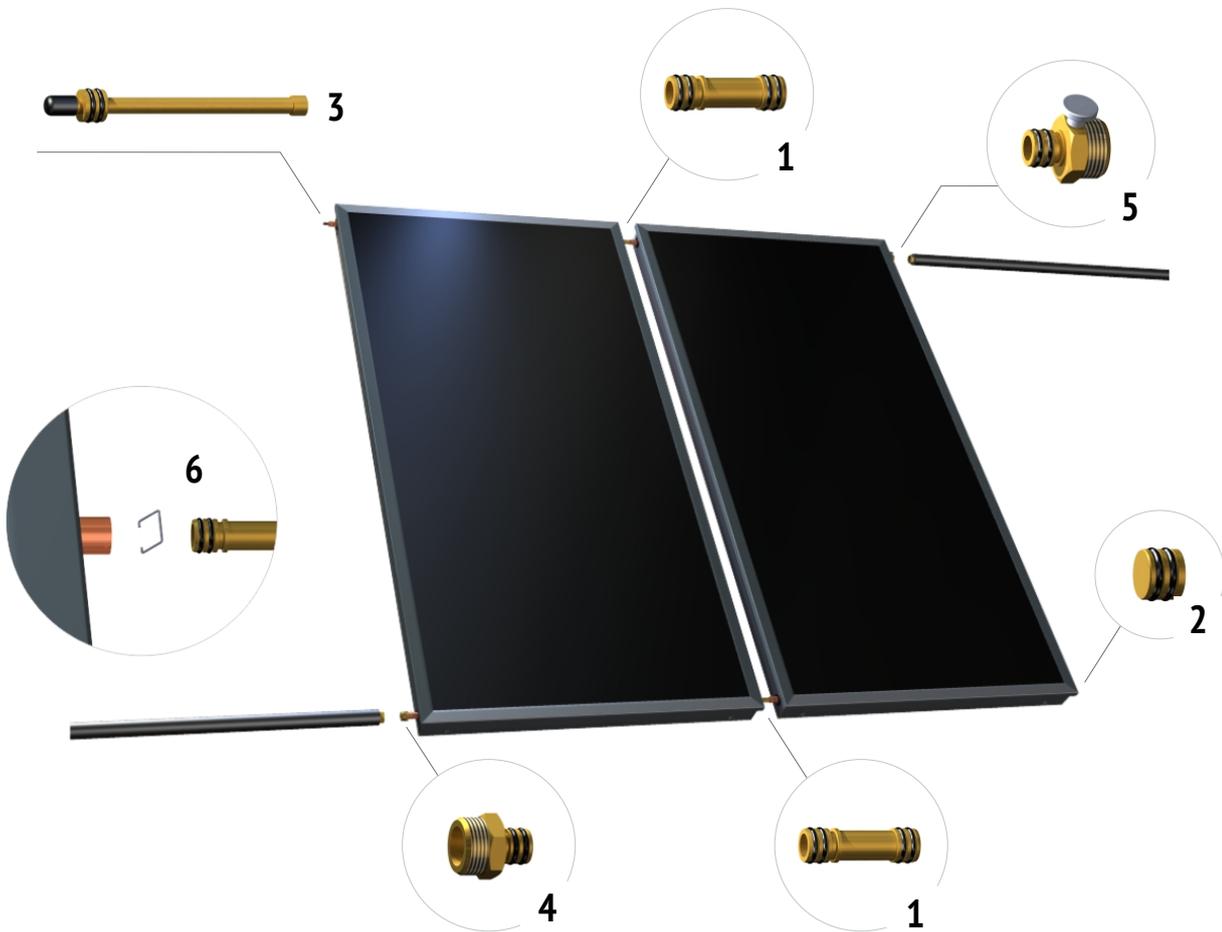


ZPKS connection sets allow connecting up to 8 flat plate collectors to a piping system (except KS2100/2600 T AC).

SET TYPE:	ZPKS 2	ZPKS 3	ZPKS 4	ZPKS 5	ZPKS 6	ZPKS 7	ZPKS 8
Article number	47.01.02	47.01.03	47.01.04	47.01.05	47.01.06	47.01.07	47.01.08
Number of KS collectors in a battery, pcs <sup>1)</sup>	2	3	4	5	6	7	8
Constituent elements of the set (article number of the element):							
item 1. Sensor housing with a vent (44.01.00), pcs	1	1	1	1	1	1	1
item 2. Pipe union KS $\frac{3}{4}$ " (42.01.00), pcs	2	4	6	8	10	12	14
item 3. Plug KS $\frac{3}{4}$ " (43.01.00), pcs	2	2	2	2	2	2	2

### Connection set for flat plate collectors

#### ZPKS TAC



ZPKS connection sets allow connecting up to 5 flat plate collectors to a piping system(except KS2100/2600 T AC).

Set ZPKS-18 allows for a complete montage and connection with a piping system of solar thermal installation. The components of a given set depend on the quantity of solar collectors in a battery.

SET TYPE:	ZPKS 1-18	ZPKS 2-18	ZPKS 3-18	ZPKS 4-18	ZPKS 5-18
Article number	47.01.14	47.01.12	47.01.13	-	-
Number of KS collectors in a battery, pcs <sup>1)</sup>	1	2	3	4	5
Constituent elements of the set:					
item 1. Connector KS18, pcs	-	2	4	6	8
item 2. Plug KS18, pcs	1	1	1	1	1
item 3. Temperature sensor housing KS18, pcs	1	1	1	1	1
item 4. Union KS18 - 3/4", pcs	1	1	1	1	1
item 5. Union KS18 - 3/4" with a vent, pcs	1	1	1	1	1
item 6. Split pin, pcs	4	6	8	10	12

## KSL masking profile

Masking profiles are used to cover the space between the flat plate collectors arranged in a battery. It improves aesthetics and provides protection for pipe unions that connect the collectors except KS2100/KS2600 T AC. The KSL masking profile is made of aluminium sheet, painted in umbra grey colour RAL 7022.

For a single battery of collectors, order one profile less than the number of collectors in the battery.

**The proper number of masking profiles is included in each solar set.**



## Connection set for evacuated tube collectors



ZPKR connection set allows connecting up to 6 units of KSR10 evacuated tube collectors to a piping system.

SET TYPE:		ZPKR
Article number		47.02.01
Number of KSR collectors in a battery, pcs		1-6
Set components (article number):	item 1. Three-way adapter with a vent (46.02.01), pcs.	1
	item 2. Collector temperature sensor housing, pcs.	1

## 4. PUMP CONTROL UNITS

The ZPS pump control units are used for operation solar heating systems with flat plate and evacuated tube collectors made by HEWALEX. They merge the advantages of common single and double-suction pump control units, since they contain all the components of a double-suction unit, such as circulation pump, solar controller, air separator with a vent, non-return valve, safety valve, shut-off valve and prefill valves. They are reliable and easy to assemble, which is characteristic of single-suction pump control units.

### Universal installation possibilities

The ZPS 18e-01 ECO pump control units sets provide broad installation possibilities. It is possible to install the piping on the left or on the right side, depending on location of the storage water heater. Permitted mounting configurations are included in the installation manuals.

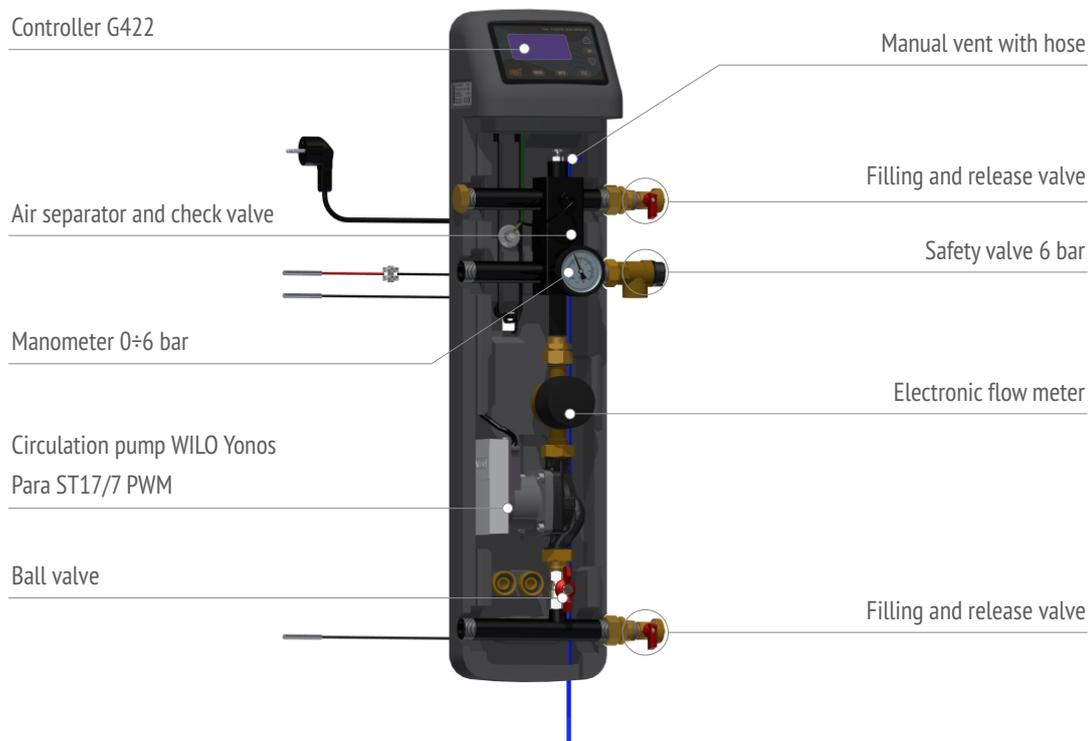


### ZPS 18e-01 ECO pump control unit

The **ZPS 18e-01** pump control unit is equipped with an electronic system of flow rate measurement, thanks to which the actual measurement of flow rate in the circuit is done automatically, and the corresponding value is shown on a display of G422-P controller.

The advantage of such a solution is the simplification of the start-up procedure, higher accuracy of the measurement, and greater precision of controlling the parameters of solar installation for optimal use of solar energy. In addition, the unit is equipped with a safety function that consists in shutting off the circulation pump in case there is no flow of the fluid.

## ZPS 18e-01 ECO

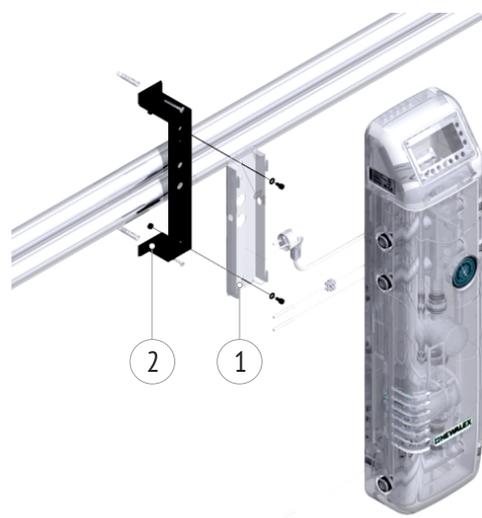


TYPE:	ZPS 18e-01 ECO
Article number	71.33.05
Number of supported KS2000 collectors	2 – 12
Number of supported KSR10 collectors	2 – 18
Method of flow measurement	electronic
Flow regulation method	manual
Flow meter range l/min	0 – 18
Controller model	G422
Temperature sensors included	NTC10kOhm (4 pcs)
Solar circulation pump	WILO ST15/6-3-PR
Smooth regulation of pump's rotational speed	+
Air separator	+
Safety valve, 6 bar	+
Manometer/analogue thermometer	+ / -
Non-return valve/shut-off valves	+ / +

### Installation options of the ZPS unit

ZPS pump control units can be mounted in convenient way on the wall through earlier fastening of factory delivered wall bracket (1). As an option can be used the spacing bracket 75 mm (2) which allows the installation of the ZPS unit over the pipeline on the wall.

ZPS spacer bracket	
Article number	71.33.02



## G422 and GH26 solar controllers

Solar controllers **G422**Solar controllers **GH26**

G422 and GH26 solar controllers perform the same functions, providing a full operation of solar systems in the most common configurations. The G422 controller is an integral component of the pump control unit ZPS 18e-01 EKO.

The GH26 controller is designed for wall mounting, so that it is possible to use it for solar systems not containing standard ZPS units. The GH26 controller can be used for existing solar systems which also can be complemented by an electronic flowmeter.

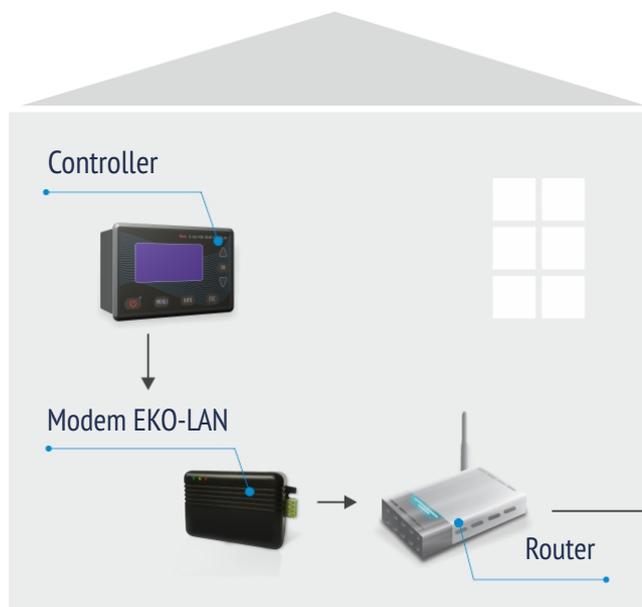


Specific features of G422 and GH26 controllers:	G422 / GH26
Number of temperature sensors included	4
Notification of temperature sensor damage	YES
Pressure switch of solar installation	YES (possibility to connect NO type Pressure switch)
Number of available installation schemes	17
Circulation pump DHW	YES (discontinuous mode available, 10 minute intervals)
Control of boiler/heat pump/electric heating element	YES/YES/YES
Smooth regulation of the circulating pump	YES (in full rotational speed range of PWM pump)
Mode of controlling the pump	Opti Flow algorithm - delta T between collectors and water in the tank
Display of operating scheme	YES (animated operating devices and temperatures)
Calculation instantaneous power of collectors	YES
Energy output data recording	YES (daily, weekly, monthly, yearly)
Time programs (e.g. DHW circulation pump)	YES
Setting the flow rate during start up	manual
Measurement of flow rate	electronic
Holiday mode	YES (setting specific dates)
Cooling function of the tank	YES (independent setting)
Freezing protection	YES
Anti-Legionella function	YES
Protection of pump against jamming	YES (activated every 72 hours)
RS485 slot enabling the connection of EKONTROL remote monitoring system	YES

Article name	Article number
G422 controller (without sensors)	74.02.01
GH26 controller	74.02.02
Temperature sensor 3.0 m silicone	74.10.05
Temperature sensor 3.0 m	74.30.00
Wire, 18.5 m	74.18.05
Electronic flow meter (option for GH26 controller)	71.33.01

## EKONTROL – Remote control of the operation

Remote control of the solar system or heat pump operation is so important that they are in principle unattended systems and possible errors may long remain unnoticed. For example, EKONTROL system allows for constant supervision of the operation of the solar system, also in order to optimize it. This allows to control and increase the effectiveness of supervised home installation. The operation of the solar system in real time is reproduced to the computer screen, ipad or smartphone. The user can easily change the parameters. EKONTROL system provides access to an especially wide range of functions of the G422 controller.



Connection of EKO-LAN modem can be done by means of LAN cable. More technical details regarding the connection are available on [www.ekontrol.pl](http://www.ekontrol.pl)

### Basic features of EKONTROL

- Remote modifications of the operating settings of the solar system or heat pump
- Access to the solar system in real time
- Controlled by computer, ipad, smartphone
- Many years of statistics of the solar system operation
- A possibility to connect up to 5 controllers to the modem

### Website of the EKONTROL system [www.ekontrol.pl](http://www.ekontrol.pl)

User registration of the EKONTROL system on the website [ekontrol.pl](http://ekontrol.pl). General demo version is available (login: demo, password: demo).

## 5.HEATERS AND ACCESSORIES

### Hewalex heaters with one or two heat exchangers

HEWALEX heaters with two heat exchangers are designed for 2-unit heating of domestic hot water (DHW) in households using heat from solar collectors and heat from conventional heat source, e.g. a central heating boiler. Enamel layers of heaters are protected against corrosion by a magnesium anode, subject to periodic replacement, or a maintenance-free titanium anode.

Thermal insulation consists of a rigid polyurethane foam layer in a protective coating. All connection stubs and measuring stub pipes are located along one vertical line, which definitely facilitates assembly and enhances aesthetics of the installation. In addition, each heater is equipped with an analogue thermometer, an inspection hole, circulation stub pipe and a nozzle allowing for insertion of an electric heating element, which can be automatically supported by the solar controller.

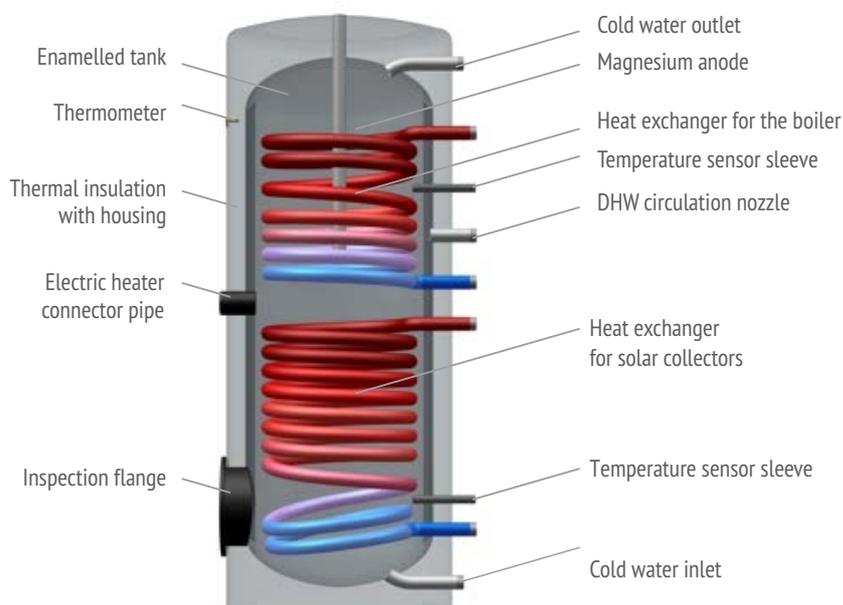


TYPE OF HEWALEX HEATER:	OKC200 NTRR/SOL	VF200-2	OKC250 NTRR/SOL	OKC300 NTRR/SOL/n	OKC300 NTRR/SOL
Article number	81.10.01	86.20.00	81.10.00	81.10.05	81.10.02
Heater application	DHW	DHW	DHW	DHW	DHW
Diameter / width, mm	603	540	603	670	603
Height, mm	1382	1473	1532	1580	1790
Maximum height in tilt, mm	1475	1530	1600	1647	1875
Weight, kg	106	85	120	135	125
Size of connections:					
<ul style="list-style-type: none"> <li>DHW</li> <li>upper/lower heat exchanger</li> <li>circulation</li> <li>electric heater</li> </ul>	external 1" external 1" Internal 3/4" Internal 6/4"	external 3/4" external 1" external 3/4" external 6/4"	external 1" external 1" Internal 3/4" Internal 6/4"	external 1" external 1" Internal 3/4" Internal 6/4"	external 1" external 1" Internal 3/4" Internal 6/4"
Upper/lower heat exchanger • heating area, m <sup>2</sup>	0,80/0,80	0,95 / 0,70	1,00 / 1,00	1,20/0,80	1,20/0,80
Maximum operating pressure, bar	6	6	6	6	6
Magnesium anode	yes	yes	yes	yes	yes
Pump control unit	-	-	-	-	-
Warranty <sup>1)</sup> , years	5	5	5	5	5

<sup>1)</sup> Warranty applies only to the heater - without accessories

HEWALEX **OKC** storage water heaters are standard components of the solar systems. Housing of OKC heaters is made of rigid material in silver colour, which helps keeping it clean. Adjustable feet allow for installation of the heater directly on the floor and its levelling.

HEWALEX presents a new special heater **OKC300NTRR/SOL/n** with reduced height (210 mm as compared to OKC300NTRR/SOL), which is intended for use in lower areas, such as in renovated buildings.



VF300-2S	OKC400 NTRR/SOL	VF400-2	OKC500 NTRR/SOL	VF500-2	VF 750-2	VF 1000-2
<b>86.30.00</b>	<b>81.10.03</b>	<b>86.40.00</b>	<b>81.10.04</b>	<b>86.50.00</b>	<b>86.60.01</b>	<b>86.70.01</b>
DHW	DHW	DHW	DHW	DHW	DHW	DHW
600	650	700	700	700	910	1010
1834	1919	1631	1892	1961	2023	2050
1892	1980	1738	1990	2044	1990	2025
106	137	130	160	160	220,5	271,5
external 3/4" external 1" external 3/4" external 6/4"	external 1" external 1" Internal 3/4" Internal 6/4"	external 3/4" external 1" external 3/4" external 6/4"	external 1" external 1" Internal 3/4" Internal 6/4"	external 3/4" external 1" external 3/4" external 6/4"	external 5/4" external 1" external 3/4" Internal 6/4"	external 5/4" external 1" external 3/4" Internal 6/4"
1,55 / 0,80	2,0/1,0	1,80 / 1,05	2,0/1,0	1,90 / 1,30	1,93 / 1,13	2,45 / 1,12
6	6	6	6	6	10	10
yes	yes	yes	yes	yes	yes	yes
-	-	-	-	-	-	-
5	5	5	5	5	5	5

<sup>1)</sup> Warranty applies only to the heater - without accessories  
VF750-1 and VF750-2 on request

## Integra heaters for heating water and supporting central heating

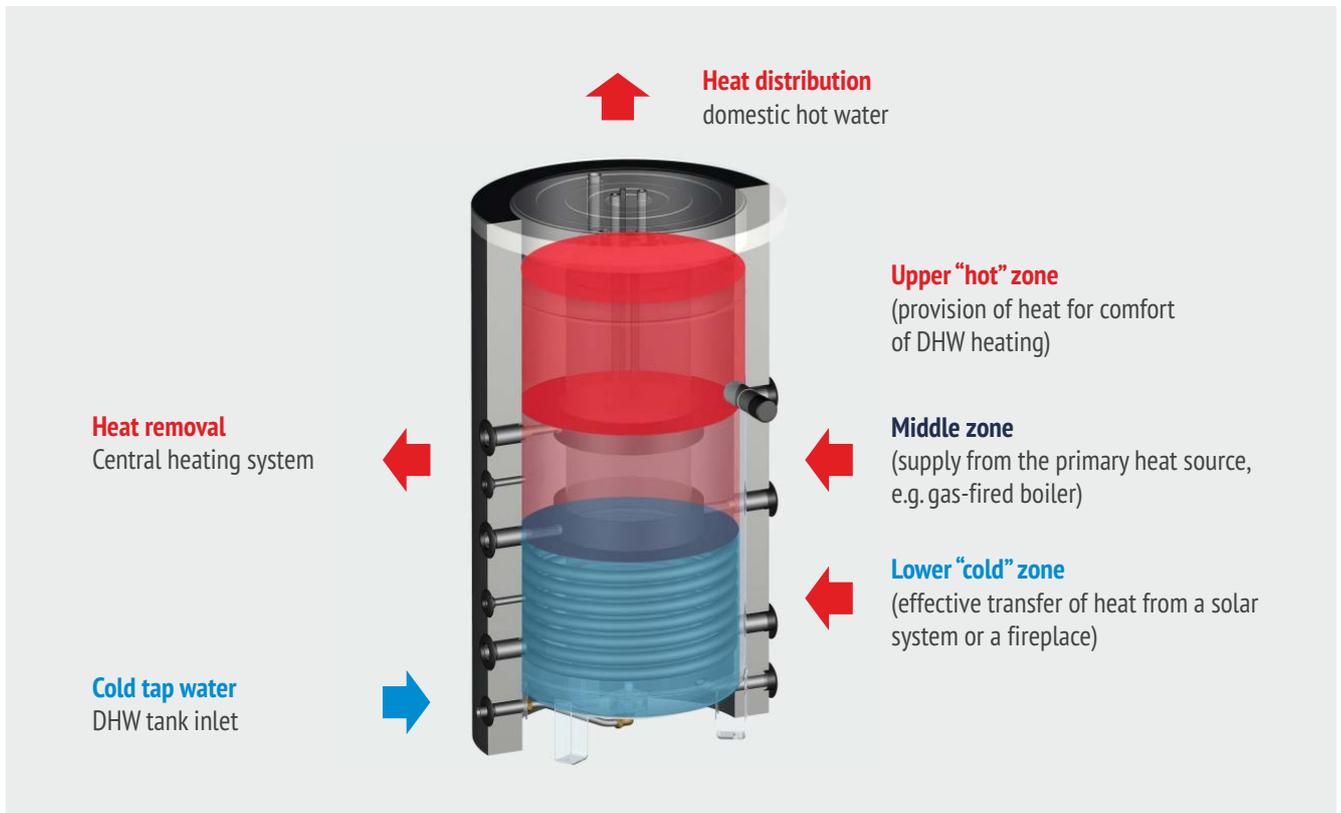
The INTEGRA universal heater provides dual operation of the solar system, i.e. heating of domestic hot water (DHW) and central heating support. Concurrently, the heater provides integration of multiple sources of heat in one heating system.

### Design features:

- the combo “tank in tank” design
- a built-in enamelled hot water tank providing superior comfort of domestic hot water and possibility to connect DHW circulation
- connection of DHW tank in the bottom increases the efficiency of the solar system by intensively cooling lower heating water zone. the bottom connection also allows for easy discharge of water and maintenance of the tank
- a large number of nozzles provides connection of many sources of heat, such as gas-fired boiler, a fireplace with a water jacket, solid fuel boilers, heat pumps and electric heaters
- the built-in partitions and the special design of water guide rings in heating water pipes ensure clear division of the heater's volume into separate temperature zones
- low levels of heat loss and insulation with a thickness of 100 mm made of soft removable polyurethane foam



The **INTEGRA universal heater**, characterized by a distinct division into temperature zones, allows you to connect any heat sources with different levels of temperature and heating power. The upper zone is designated for heating domestic hot water. Boilers with good controllability of power can be connected to the middle zone. If the heat source has a low power setting (e.g. DHW heat pump) or limited controllability of heating power (e.g. coal-fired boiler), it can be connected to an increased volume of heating water (middle and lower zone).



TYPE OF HEWALEX HEATER:	INTEGRA 400/100	INTEGRA 500/120	INTEGRA 800/200
Article number	81.50.04	81.50.05	81.50.06
Heater application	DHW + CH	DHW + CH	DHW + CH
Diameter without insulation / with insulation,	600/800	650/850	790/990
Overall height, mm	1480	1850	2015
Height in tilt, mm	1560	2040	2150
Weight, kg	130	158	210
Size of connections: <ul style="list-style-type: none"> <li>• DHW</li> <li>• upper/lower heat exchangers</li> <li>• circulation</li> <li>• central heating connector</li> <li>• electric heater</li> </ul>	external 3/4" - / external 1" external 3/4" Internal 1" Internal 6/4"	external 3/4" - / external 1" external 3/4" Internal 1" Internal 6/4"	external 3/4" - / external 1" external 3/4" Internal 1" Internal 6/4"
Heat exchanger area, m <sup>2</sup>	1,3	1,5	2,2
Heat exchanger capacity, l	7,5	9	13,5
Maximum operating pressure of DHW, bar	6	6	6
Maximum operating pressure of central heating, bar	3	3	3
Magnesium anode	yes	yes	yes
Warranty, years	5	5	5

## DHW heater with heat pump



HEWALEX PCWU 200K / 300K / 300SK-2.3kW heaters with heat pumps are intended for heating domestic water in households using air heat pump integrated with the heater. As standard, PCWU heat pumps are also equipped with electric heaters.

It is possible to control the entire DHW boiler room depending on the selected scheme (combination of additional devices, such as electrical heater, circulation pump, automatic gas boiler, oil boiler, electric boiler and solid fuel boiler). Exchangers with large heat exchange surface allow for effective collaboration with solar collectors or a fireplace with a water jacket.

In heaters with a heat pump, both the tank and the exchanger are made of high quality stainless steel. Thermal insulation is made of polyurethane foam in protective coating of steel sheet with aluminium panel, where the controller is located. Heaters made of stainless steel and titanium active anode are the best available corrosion protection of the tank.

The heat pump can be combined with mechanical ventilation in virtually any building above 100 m<sup>2</sup>, since the nominal air flow is only 250-350 m<sup>3</sup>/h. This allows for all-year operation of the device with a very high COP (3.84 for A15/W15-45).

HEATER TYPE:	PCWU200K-1,3kW	PCWU200K-2,3kW	PCWU300K-2,3kW	PCWU300SK-2,3kW
Article number	<b>91.10.53</b>	<b>91.10.50</b>	<b>91.10.52</b>	<b>91.10.51</b>
Heater application	DHW	DHW	DHW	DHW
Diameter / width, mm	520	560	640	640
Height, mm	1980	1700	1870	1870
Weight, kg	86	90	101	102
Size of connections: <ul style="list-style-type: none"> <li>DHW</li> <li>upper/lower heat exchangers</li> <li>circulation</li> <li>electric heater</li> <li>discharge of water from the tank</li> </ul>	Internal ¾"	Internal ¾"	Internal ¾"	Internal ¾"
Exchanger (solar/boiler): <ul style="list-style-type: none"> <li>heating area, m<sup>2</sup></li> </ul>	- / 1,00	- / 1,00	- / 1,50	1,00 / 1,00
Maximum operating pressure, bar	7	7	7	7
Upper/lower heat exchanger: <ul style="list-style-type: none"> <li>rated heating capacity, kW<sup>1)</sup></li> <li>rated power consumption, kW<sup>1)</sup></li> <li>electric heater power, kW</li> <li>maximum water temperature, °C</li> <li>minimum air supply temperature, °C</li> <li>supply voltage</li> <li>operating current, A<sup>1)</sup></li> <li>number of compressors / type</li> <li>volume, dB</li> </ul>	1,63 0,44 1,5 55 0 1~230 V / 50 Hz 2,05 1 / rotary 45	2,3 0,6 1,5 55 0 1~230 V / 50 Hz 2,8 1 / rotary 45	2,3 0,6 1,5 55 0 1~230 V / 50 Hz 2,8 1 / rotary 45	2,3 0,6 1,5 55 0 1~230 V / 50 Hz 2,8 1 / rotary 45
Magnesium / titanium anode	yes/no	yes/yes	yes/yes	yes/yes
Warranty, years	2	2	2	2

<sup>1)</sup>Data for the following conditions: heating of DHW from 15 °C to 45 °C, ambient temperature of 15 °C.

## Air heat pump PCWU 2.5kW

The PCWU 2.5kW series heat pump is designed for heating domestic hot water (DHW) and works with existing or new DHW tanks. Heat source for the pump is the air drawn through an intake duct from environment or building interior, and electric energy supplying the compressor. For example, water heating from 15°C to 45°C at air temp. exceeding 20°C gives an average COP near 4.92. It means that the offered heat pump can use more than four times less electric energy than the value of heat it generates. The advantage of PCWU 2.5kW type heat pump is easy use in case of system modernisation. For example, the unit may substitute a standard electric boiler frequently used jointly with solid fuel burner out of heating season.



### Application

- DHW for 3-6 people
- The unit is fitted to work in a system with water tanks ranging from 100-300 litres

### Location

- Wewnętrzna (konieczność zastosowania kanałów wlotowych i wylotowych powietrza o odpowiedniej średnicy)

### Components

- The set includes WILO circulating pump for water, installed between the tank and heat pump
- Possibility to control the whole DHW boiler-room
- Automatic heat pump control system with an on-wall controller
- Extended controller making it possible to choose the priority of the most economic DHW heating option
- Housing made of high-grade ABS material
- Control for circulating pump
- Time programmes with 1-hour accuracy

Optimal working temperature range for this equipment (above 15°C) allows reaching high heating power up to 3 kW at relatively low electric power consumption and heated water COP exceeding 4. However, the pump heating capacity depends not only on supply air temperature, but also on utility water heating temperature and air humidity.

**HEWALEX heat pumps are able to meet the demand for hot water of a typical family of 3-6 persons for most of the year.**

Product:	DHW HEAT PUMP - PCWU 2.5kW	
Article number	91.10.13	
BASIC TECHNICAL PARAMETERS	Measurement conditions	
Heating power, kW	2,51	Air temperature 7°C
Consumed electrical power, kW	0,67	Water temperature 30/35°C
Rated current, A	2,9	according to the standard PN-EN 14511
COP	3,8	(fan power and condenser resistance included)
Heating power, kW	3,05	Air temperature 20°C
Consumed compressor power, kW	0,80	Water temperature 40/45°C
Rated current, A	3,5	according to the standard PN-EN 14511
COP	3,8	(fan power and condenser resistance included)
Minimum water jet at $\Delta T$ 5 °C, m <sup>3</sup> /h / l/min	11	
Water connections, inches	¾"	
Maximum DHW temperature °C	60	

### Heat pump ventilation set

In summertime, it is possible to utilise air discharged from heat pumps, chilled to ca. 5÷10 K. This allows cyclic cooling of rooms and moisture removal e.g. from laundry, drying room, larder, fitness room, etc. Complete ventilation sets allow connecting heat pump in a convenient and aesthetic way in order to divide air stream. It is possible to select manually the room being cooled and/or fresh air intake location, depending on ventilation set chosen.

Maximum length of air ducts should not exceed 4.5 metres on each side (suction and delivery). Local resistance should be taken into account as follows: 1 elbow 90° = resistance equivalent to 2 metres of duct length.



Standard ventilation set



Extended ventilation set

Heat pump ventilation set	standard	extended	Information for single components
Article number	90.00.06	90.00.07	Article number
Ventilation set components:			
Hose DN160 length of 5 m	1, pcs	1, pcs	90.00.02
Damper DN160 with bypass	1, pcs	2, pcs	90.00.03
Adjustable long range nozzle DN150	1, pcs	1, pcs	90.00.04
Hose connector DN160	4, pcs	8, pcs	90.00.05
Self-adhesive micro-rubber, 470 mm	4, pcs	4, pcs	-

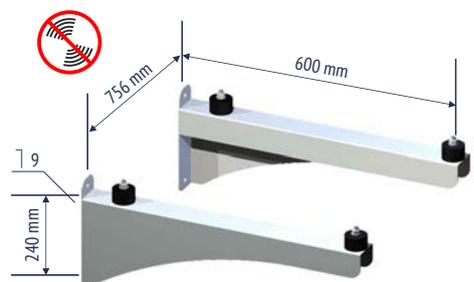
### Insulation union Gw/Gz 3/4" PA66 GF30

In case of installations made of metal (e.g. copper or steel), union pieces are to be fitted onto stub pipes of the PCWU heat pump tank. This prevents electrochemical corrosion of the tank in case of faulty work of earthing system or electrical equipment in contact with water supply system. Union pieces are included in the PCWU heat pump delivery and they are specified in the price list as spare parts or parts added to the delivery.

Insulation union Gw/Gz 3/4" PA66 GF30	
Article number	90.00.01

### Wall holder for PCWU 2.5kW heat pump

Wall holder allows comfortable and aesthetic heat pump mounting onto wall in a room. Mounting on vibroinsulators protects against transmission of vibrations onto building structure.



Wall holder for PCWU 2.5kW heat pump	
Article number	90.00.08

### EKONTROL – remote control system

Controllers for PCWU heat pumps (apart from the 200K-1.5kW type) allow work with EKO-LAN modem in a system of remote control - EKONTROL (see p.27).



## Plate heat exchangers

The plate heat exchanger is the most compact, effective and economic way to exchange heat in many industrial and cooling applications.

Exchangers made of stainless steel provide exceptional corrosion resistance. Their characteristic feature is fluted plate surface, which results in high turbulence in a counter-current direction. This results in a highly efficient and compact heat exchange. In combination with the small size and lower content of the material, these may be the most economical way to exchange heat. Especially in the case of larger solar systems, as well as with decreased surfaces of heating coils, application of a plate heat exchanger can be the only solution providing efficient heat transfer. Protection of the heat exchanger against precipitation of sediments and scale should be taken into account by maintaining the lowest possible temperature on the water side (60°C) and maintaining hardness up to 20°dH by possible use of softening station.



Basic characteristics of plate heat exchangers:

Parametr:	Value:
Plate material	AISI 316L
Connection material	AISI 316L
Solder material	Copper
Maximum operating temperature	225°C
Minimum operating temperature	-160°C
Maximum operating pressure	45 bar

The offer of heat exchangers includes 5 sizes adapted to cooperation e.g. with solar systems and different surfaces of solar collectors:

Maximum numbers of solar collectors to be connected:

flat plate KS2000/KS2100	18	25	32	43	63
evacuated tube KSR10	14	20	25	35	50
<b>TYPE OF EXCHANGER:</b>	<b>BL 50C-18H</b>	<b>BL 50C-24H</b>	<b>BL 50C-28H</b>	<b>BL 50C-38H</b>	<b>BL 50C-56H</b>
Article number	91.00.00	91.00.01	91.00.02	91.00.03	91.00.04

## 6. INSTALLATION MATERIALS

### Set ZNP

The expansion tank compensates for volume changes of the heat transfer fluid, which occurs as a result of a temperature increase, maintaining a constant pressure in the system. The ZNP Set includes an expansion tank, a wall mounting bracket and a connection hose for the tank.

UNIT TYPE:	Article number
Set ZNP 18DS	72.18.00
Set ZNP 24DS	72.24.00



### Solar heat transfer fluids

The solar fluid is a non-freezing and non-toxic solution of propylene glycol and water, containing special corrosion inhibitors, which are to increase the longevity of the solar system.

TYPE OF FLUID:	Article number
CORACON SOL 5F -28°C (package 5 kg)	80.32.70
CORACON SOL 5F -28°C (package 20 kg)	80.32.80
CORACON SOL 5F -28°C (package 30 kg)	80.32.90



### Armaflex HT insulation resistant to UV radiation

Armaflex HT insulation resistant to UV radiation is the thermal insulation material to insulate pipe sections (inlet and outlet) connected to solar collector battery. The insulation is resistant to UV radiation, and also to high temperatures. Thanks to special shielding, it presents increased resistance to mechanical damage. Each HEWALEX solar set is by standard equipped with 2 running metres of this insulation material. For sets with 2 and 3 collectors the insulation is provided in the dimensions of 18/13 mm, while for sets with 4 and 6 collectors' insulation it is 28/13 mm.



TYPE:	UV resistance	Max.operating temp.	Article number
Insulation ARMAFLEX AC 18/9 mm	-	105°C	80.18.09
Insulation ARMAFLEX AC 18/13 mm	-	105°C	80.18.13
Insulation ARMAFLEX HT 18/13 mm	YES	150°C	80.18.14
Insulation Armaflex HT/S (2m)	YES	150°C	80.18.15
Insulation ARMAFLEX AC 22/9 mm	-	105°C	80.22.09
Insulation ARMAFLEX AC 22/13 mm	-	105°C	80.22.13

## C. Other system components

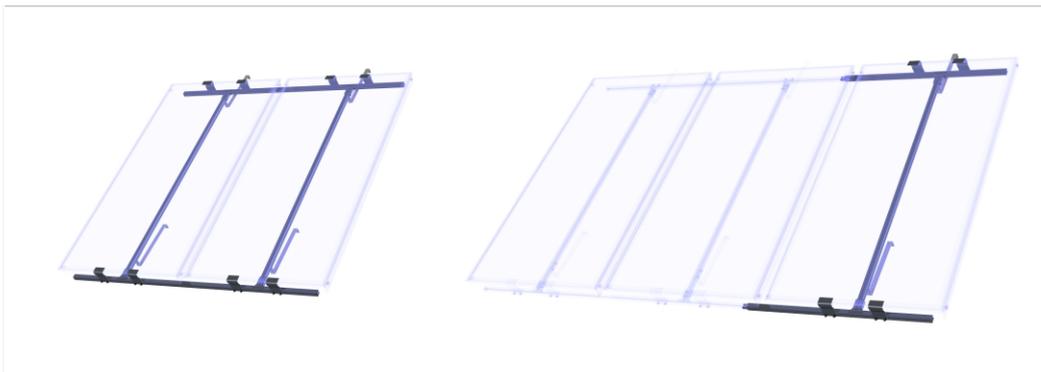
### 1. COLLECTOR HANDLES AND FLASHINGS - SELECTION

For mounting the universal construction directly on the ground, see the description of Universal Construction KSOL / Universal Construction KSRL. The available handles and flashings provide secure mounting of solar collectors on a roof with any slope, covered with any material used in the market, as well as their assembly within the building area. All handles and flashings have been designed in accordance to the standard guidelines determining the permissible load, and the materials used in their construction are fully corrosion-resistant. The main division of handles and flashings for collectors has been made on the basis of the three slope groups of the mounting surface, i.e. 30-60°, 20-30°, 0-20°.

#### Handles and flashings for sets with flat plate KS2000, KS2100, KS2400, KS2600 collectors

##### KSOL (KSAL) universal handle

The universal handle is used to attach flat plate collectors on sloped roofs with any kind of roofing and slope greater than 30 degrees. It is made of aluminium bars connected with each other using aluminium connectors, thus creating a platform for two collectors. Other components of the handle are made of hot-dip galvanized carbon steel (KSOL) or stainless steel (KSAL). All elements of the handle are powder coated in the colour of the collector, i.e. RAL 7022.

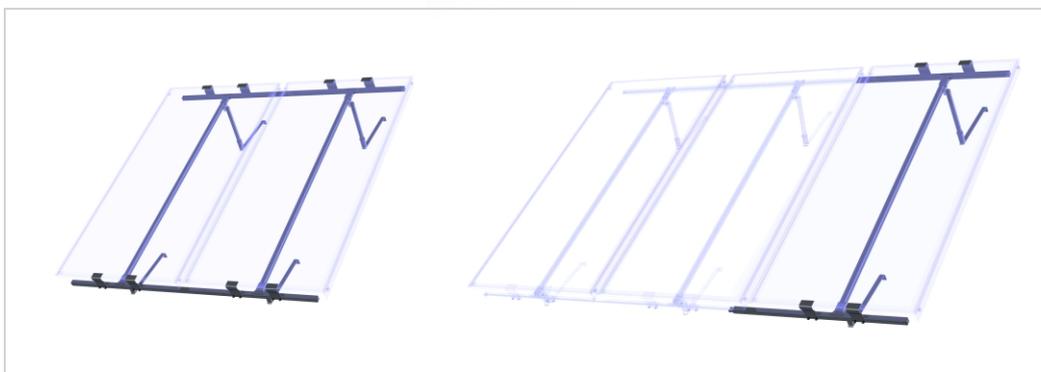


KSOL-2 universal handle (KS2000/KS21000) Art. no. 21.42.02      KSOL-1 universal handle (KS2000) Art. no. 21.42.01

The basic size is the **KSOL-2 universal handle required for mounting first two collectors in a battery.** For each additional collector in a battery (maximum of 8 units in the battery) KSOL-1 universal handle should be used.

##### KSOL adjusting handle

The adjusting handle is a type of universal handle designed for a sloped roof with an angle of 20° to 30°. The adjusting handle differs from the universal handle in that its upper hooks have adjustable height in order to increase the angle of the collectors' inclination by 10° with respect to the slope of the roof. Hooks for adjusting handles are made of galvanized carbon steel. All elements of the handle are powder coated in the colour of the collector, i.e. RAL 7022.



KSOL-2 adjusting handle (KS2000/KS21000)  
Art. no. 21.52.02

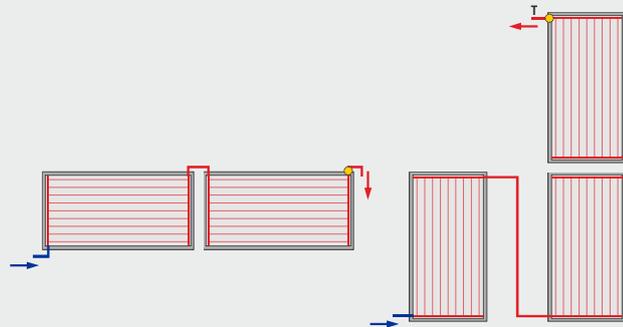
KSOL-1 adjusting handle (KS2000/KS21000)  
Art. no. 21.52.01

The basic size is the **KSOL-2 adjusting handle required for mounting first two collectors in a battery.** For each additional collector in a battery (maximum of 8 units in the battery) KSOL-1 adjusting handle should be used.

Handles for collectors KS2400 and KS2600 are selected according to the same principles as for KS2000/KS2100 collectors.

### Mounting handles for special purpose installations and arrangement.

Flat plate collectors can be mounted in series (maximum 5 collectors), both in a vertical and horizontal position. For mounting of KS2000/KS2100 single collectors there are available universal handles (slope >30°) or universal constructions (flat roof, ground). Handles' profiles and connectors are painted in RAL 7022, the same as the colour of the collector.



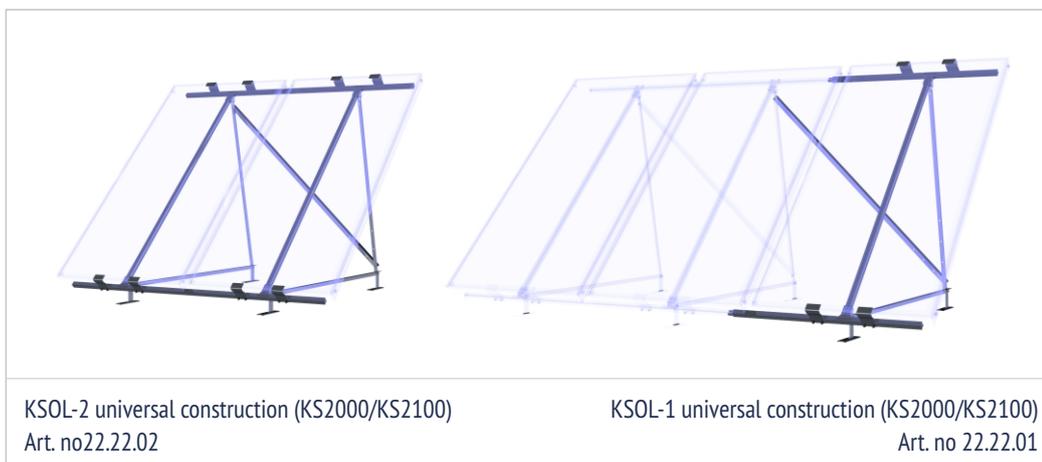
Universal handle for a single collector  
**horizontal:** Art. no. 21.82.01  
**vertical:** Art. no. 21.82.11



Universal construction for a single collector  
**horizontal:** Art. no. 22.82.11  
**vertical:** Art. no. 22.42.01

### KSOL universal construction

The universal construction is designed for mounting flat plate collectors on roofs with a slope of less than 20° to the horizontal plane or on the ground. With the universal construction solar collectors can also be installed on the walls of buildings. The universal construction is made of aluminium bars connected with each other using aluminium connectors, thus creating a platform for two collectors. The remaining elements of the structure, which maintain it at the right angle, and bases by means of which it is anchored to the ground, are made with hot-dip galvanized carbon steel. All elements of the construction are powder coated in the colour of the collector, i.e. RAL 7022.



KSOL-2 universal construction (KS2000/KS2100)  
 Art. no. 22.22.02

KSOL-1 universal construction (KS2000/KS2100)  
 Art. no. 22.22.01

The basic size is the **KSOL-2 universal construction required for mounting first two collectors in a battery.** For each additional collector in a battery (maximum of 8 units in the battery) KSOL-1 universal construction should be used.

## Flashing for the collector

The flashing is intended only for installation of KS2000/KS2100 (except the TAC model) plate collectors in the roof plane. Collector area forms an integral part of the roof plane, replacing tiles. This type of installation is mainly used in new buildings or in case of roof repairs.

For practical reasons, it is recommended to use the flashings only on roofs with a slope greater than 30 degrees and covered with ceramic tiles. The Flashing is made entirely out of aluminium sheets, painted in umbra grey colour RAL 7022, which is also the colour of the collector in the version with the lacquered finish.

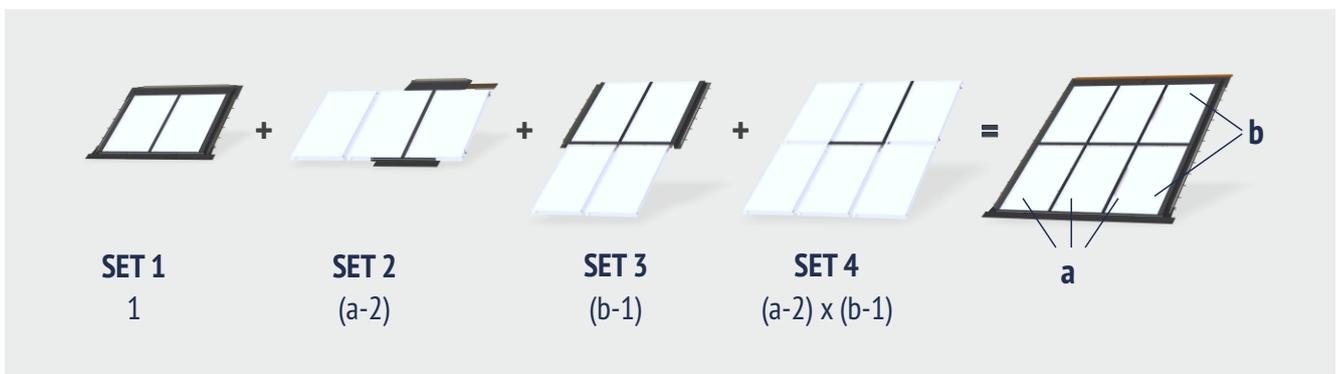


During assembly, solar collectors are laid directly on the planking or on the formwork or tile batten of the roof structure. Our product range includes four types of roof flashings. Ordering of the appropriate type and amount of sets depends on the number of solar collectors installed in a single area.

The basic size is SET 1 (F65163) flashing, which is required for integrating two collectors in a battery. For each additional collector in a battery (maximum of 8 units in the battery) F16564 flashing should be used. The KSL masking profile is a standard component included in SET 1.

## Ordering of roof flashing SETS

Depending on the number of rows (b) and columns (a) of solar collectors placed within the roof flashing, the following number of SETS should be used according to the guideline below:



Flashings may also be used for installation flat plate collectors in a few rows (one after another). For that purpose SETS 3 and SETS 4 should be used.

<p>SET 3 (RS-335) Roof flashing - vertical expansion (into 2 side collectors) Art. no. 27.01.03</p>	<p>SET 4 (RS-336) Roof flashing - vertical expansion (to 1 middle collector) Art. no. 27.01.04</p>

### Example of ordering of roof flashing SETS

For ordering of a roof flashing for installation of 8 collectors in two rows:



Installation variant:  
- number of columns  $a = 4$ , number of rows  $b = 2$   
**SET 1: 1 pc** (quantity = 1)  
**SET 2: 2 pcs** (quantity =  $a-2 = 4-2$ )  
**SET 3: 1 pc** (quantity =  $b-1 = 2-1$ )  
**SET 4: 2 pcs** (quantity =  $(a-2)*(b-1) = 2*1$ )

### Mounting handles for evacuated tube collectors KSRL10

#### KSRL universal handle

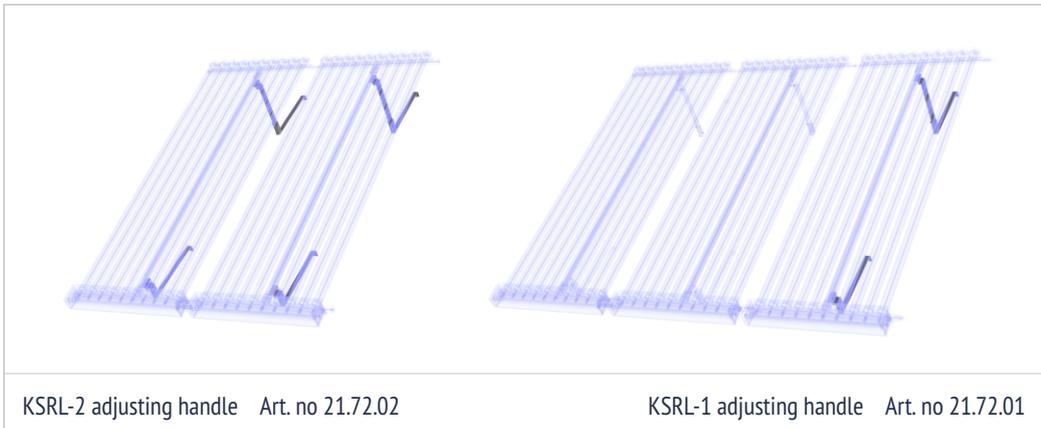
The universal handle is used to attach KSRL10 evacuated tube collectors on sloped roofs with any kind of roofing and slope greater than 30 degrees. The KSRL universal handle is a set of hooks made of stainless steel.

<p>KSRL-2 universal handle Art. no 21.62.02</p>	<p>KSRL-1 universal handle Art. no 21.62.01</p>

The basic size is the **KSRL-2 universal handle, which is required for mounting first two KSRL10 collectors.** For each additional collector in a battery (maximum of 6 units in the battery) KSRL-1 universal handle should be used.

### KSRL adjusting handle

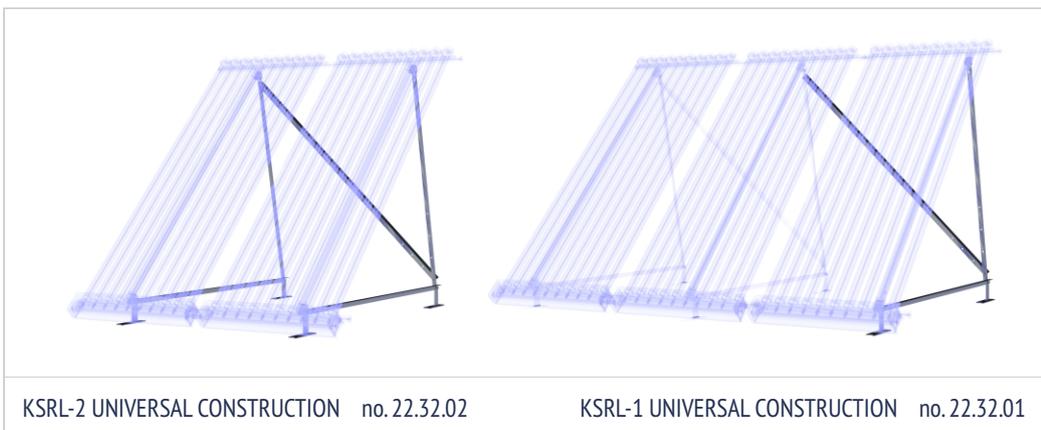
The adjusting handle differs from the universal handle in that its upper hooks have adjustable height in order to increase the angle of the collectors' inclination by 10° with respect to the slope of the roof. Hooks for adjusting handles are made of galvanized carbon steel. The KSRL adjusting handles are entirely made of hot-dip galvanized carbon steel and powder coated in RAL 7022 colour.



The basic size is the **KSRL-2 adjusting handle, which is required for mounting first two KSR10 collectors**. For each additional collector in a battery (maximum of 6 units in the battery) **KSRL-1** adjusting handle should be used.

### KSRL universal construction

The universal construction is designed for mounting KSR evacuated tube collectors on roofs with a slope of less than 20° to the horizontal plane or on the ground. With the universal construction solar collectors can also be installed on the walls of buildings. The KSRL universal construction is made of hot-dip galvanized steel bars, which are powder coated in the umbra grey colour RAL 7022.



The basic size is the **KSRL-2 universal construction, which is required for mounting first two KSR10 collectors**. For each additional collector in a battery (maximum of 6 units in the battery) **KSRL-1** universal construction should be used.

## SUPPLEMENTARY COMPONENTS

### Ground base

In case of installing solar collectors on the ground, both flat plate and evacuated tube collectors, it is recommended to mount a base to be concreted in the ground for the universal structure KSOL or KSRL. This set includes two supports. The number of sets corresponds to the number of collectors in one battery.

**Note:** The ground supports are delivered as separate article and do not form a part of the solar system set.



Ground base Art. no 22.20.02

## Piping system

### Elastic tube SNP-DN16/SNP-DN20/SNP-DN25

**Elastic tubes SNP-DN16, SNP-DN20 and SNP-DN25** made of stainless steel are used for piping of heat transfer fluids in a solar collector system. The wall of the elastic tube is made in the form of a lateral notch, which allows for connection through the kneading system. Adequate flexibility makes the tube easy to run in ducts of the building. Our offer includes an elastic tube with nominal diameter of DN16 and DN20, in sections of 50 m, without or with 13 mm insulation. **The pipe has been certified by National Institute of Hygiene.**



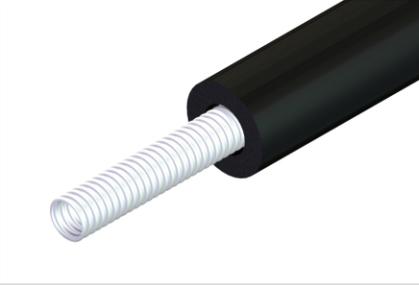
Nominal pipe diameter	Product name	Article number	Thermal insulation <sup>2)</sup>
DN16	Elastic tube SNP-DN16 [50 m]	80.43.01	-
	Elastic tube SNP-DN16 in insulation AC/13 [50 m]	80.43.02	Armaflex AC
	Elastic tube SNP-DN16 in insulation HT/13 [50 m]	80.43.03	HT/Armaflex
	Elastic tube SNP-DN16 in insulation HT/13, UV resistant [50 m]	80.43.04	HT/Armaflex S
	Elastic tube SNP-DN16 in insulation HT/13 [32 m]	80.43.34	HT/Armaflex
	¾" nut - set for elastic tube SNP-DN16	80.43.05	-
	¾" union - set for elastic tube SNP-DN16	80.43.06	-
	Gasket 24/18 EPDM (10 pcs)	40.41.12	-
	Pressing tool for elastic tube SNP-DN16	80.43.07	-
DN20	Elastic tube SNP-DN20 [50 m]	80.43.11	-
	Elastic tube SNP-DN20 in insulation AC/13 [50 m]	80.43.09	Armaflex AC
	Elastic tube SNP-DN20 in insulation HT/13 [50 m]	80.43.10	HT/Armaflex
	Elastic tube SNP-DN20 in insulation HT/13 [32 m]	80.43.36	HT/Armaflex
	1" nut for elastic tube SNP-DN20	80.43.13	-
	Reduction Gw ¾"/Gz 1" - set	80.43.15	-
	Stainless steel reduction Gw ¾"/Gz 1" Am	80.43.16	-
	Gasket 30/24 EPDM (10 pcs)	40.41.11	-
	1" union for elastic tube SNP-DN20	80.43.14	-
	Pressing tool for elastic tube SNP-DN16/DN20	80.43.12	-
	DN25	Elastic tube SNP-DN25 [50 m]	80.40.30
1 1/4" nut for elastic tube SNP-DN25		80.44.14	-
Pressing tool for elastic tube SNP-DN25		80.43.37	-

<sup>2)</sup> Armaflex AC (max. operating temperature 105 °C); HT/Armaflex (max. operating temperature 150 °C, UV resistant); HT/Armaflex S (max. operating temperature 150 °C, resistance to UV and mechanical damage).

**Example of selection of SNP elastic tube:**

Number of collectors (KS2000/KS2100, KS2400, KS2600, KSR10) <sup>1)</sup>	2	3	4	5	6	7	8
Stainless steel elastic tube	Maximum total length of the tube (feed + return)						
SNP-DN16	100 m	40 m	20 m	10 m	-	-	-
SNP-DN20	-	-	120 m	80 m	60 m	30 m	15 m
SNP-DN25	-	-	-	-	-	120 m	80 m

<sup>1)</sup>Selection of diameters for a greater number of collectors should be consulted with HEWALEX

		
Elastic tube SNP-DN16 in insulation HT/13 Art. no 80.43.03	Nut 3/4" for SNP-DN16 Art. no 80.43.05	Union 3/4" for SNP-DN16 Art. no 80.43.06
		
Elastic tube SNP-DN20 in insulation HT/13 Art. no 80.43.10	Union 1" for SNP-DN20 Art. no 80.43.14	Pressing tool for SNP-DN16/DN20 Art. no 80.43.12

**Handle for elastic tube in insulation**

Handle for elastic tube in insulation, allows for its fixing to the solid ground. The handle is made of an ABS material, which ensures high mechanical strength of the handle and allows the operation temperatures from -40 to +85 °C. UV resistance also allows the use of external handles e.g. for running elastic tube in HT insulation.

Product name:	Article number
Handle for elastic tube in insulation DN 15-20 (10 pcs)	80.43.18
Handle for elastic tube in insulation DN 15-20 (30 pcs)	80.43.17
Handle for elastic tube in insulation DN 15-20 (50 pcs)	80.43.19
Base for elastic tube handle (5 pcs)	80.43.28
Base for elastic tube handle (15 pcs)	80.43.29
Base for elastic tube handle (25 pcs)	80.43.30



### Copper piping accessories



Product name:	Article number
Union Gz 3/4" 18 (for soldering into a Cu 18 mm pipe; includes a seal)	40.30.18
Union Gz 3/4" 22 (for soldering into a Cu 22 mm pipe; includes a seal)	40.30.22
Half union L 3/4" 18 (for soldering into a Cu 18 mm; includes a seal)	40.20.18
Half union L 3/4" 22 (for soldering into a Cu 22 mm; includes a seal)	40.20.22
Insulation ARMAFLEX AC 18/9 (for interiors, length of 2 m)	80.18.09
Insulation ARMAFLEX AC 18/13 (for interiors, length of 2 m)	80.18.13
Insulation ARMAFLEX HT 18/13 mm	80.18.14
Insulation ARMAFLEX HT 18/13 mm, UV resistant	80.18.15
Insulation ARMAFLEX AC 22/9 (for interiors, length of 2 m)	80.22.09
Insulation ARMAFLEX AC 22/13 (for interiors, length of 2 m)	80.22.13

### OTHER SYSTEM COMPONENTS

#### Separator KS 3/4"

The KS 3/4" separator is used to capture air bubbles in complex solar systems. It is recommended to use one separator at the outlet of each solar battery in a complex system.

Product name:	Article number
Separator KS 3/4"	45.01.00



#### Sensor housing KS 3/4"

KS 3/4" sensor housing is the cover of temperature sensor in a flat plate collector. It is used in case the sensor is installed in a flat plate collector's off-mains stub pipe.

Product name:	Article number
Sensor housing KS 3/4"	44.01.00
Sensor housing with a vent	44.01.01



## Water expansion tanks

The ZNP water expansion tank compensates for volume changes of domestic hot water in storage water heaters caused by temperature increase, maintaining the pressure in the system at a constant value. The ZNP Set includes an expansion tank, a wall mounting bracket and a connection hose for the tank.

Product name:	Article number
Set ZNP 11D DHW	72.11.02
Set ZNP 18D DHW	72.18.02
Set ZNP 24D DHW	72.24.02



## Mixing valve ESBE VTA322 (3/4")

The ESBE VTA322 (3/4") mixing valve protects against burning with hot water at the point of DHW use. The valve enables setting water temperature at its outlet from the water heater in the range of 35-60 °C.

Product name:	Article number
Mixing valve ESBE VTA322 (3/4")	70.70.00



## Three-way valve CKF3325

The CKF3325 three-way valve is intended to control the flow of heating medium in hot and/or cold water systems, as well as in solar systems (glycol solutions with the concentration of up to 50%). Temperature range of the medium is from 2 to 75 °C. The valve is featured with three Gz1" stub pipes and a servomotor.

Product name:	Article number
Three-way valve CKF3325	90.00.00



## Solar system manual filling pump

Manual pump is used for filling and supplementing the solar heating system with the heat transfer fluid. It generates a maximum pressure of 3 bars for filling the system.

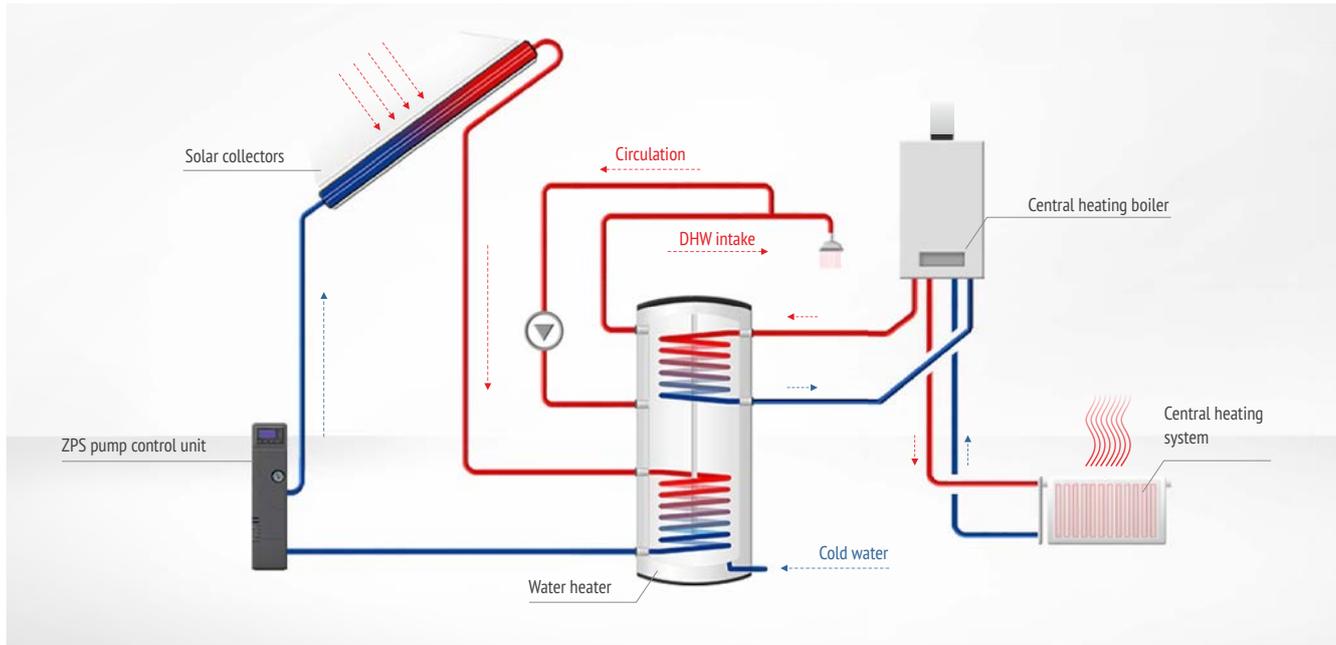
Product name:	Article number
Solar system manual filling pump	73.02.00



## Installation schemes for hewalex solar systems

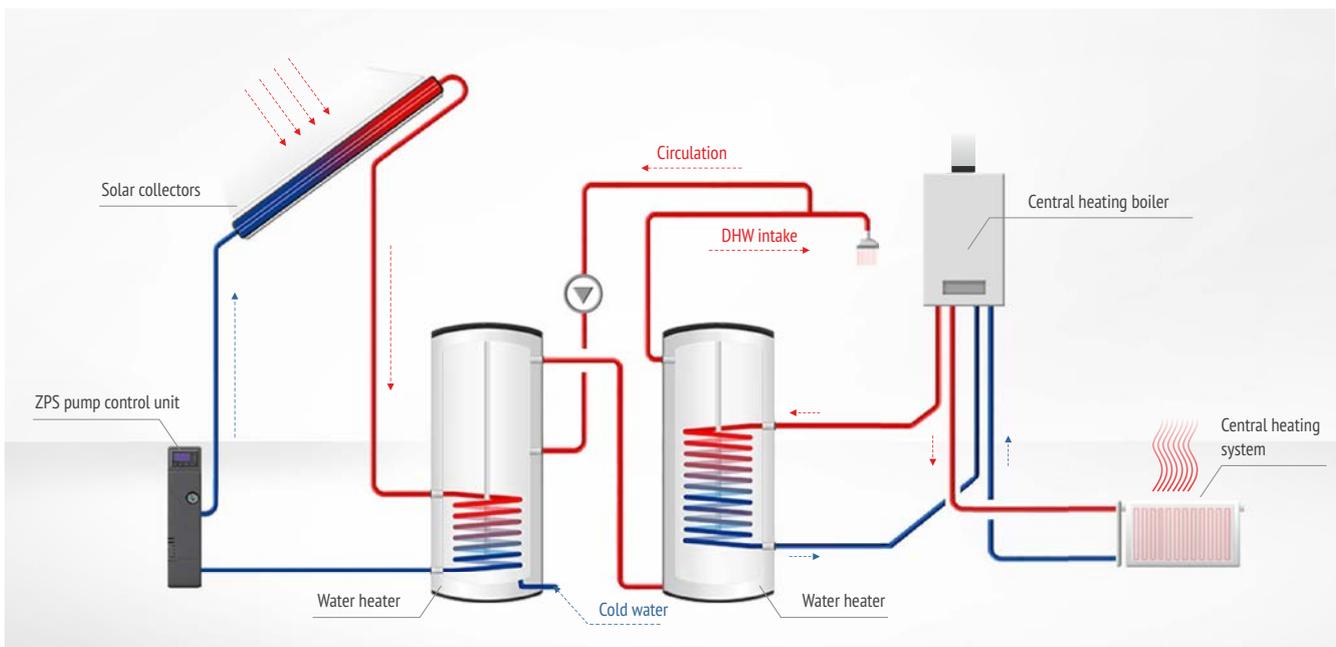
The following schemes are to describe typical solar systems, which are used in household applications:

### Scheme 1. Solar installation for domestic hot water (DHW) with a single water heater



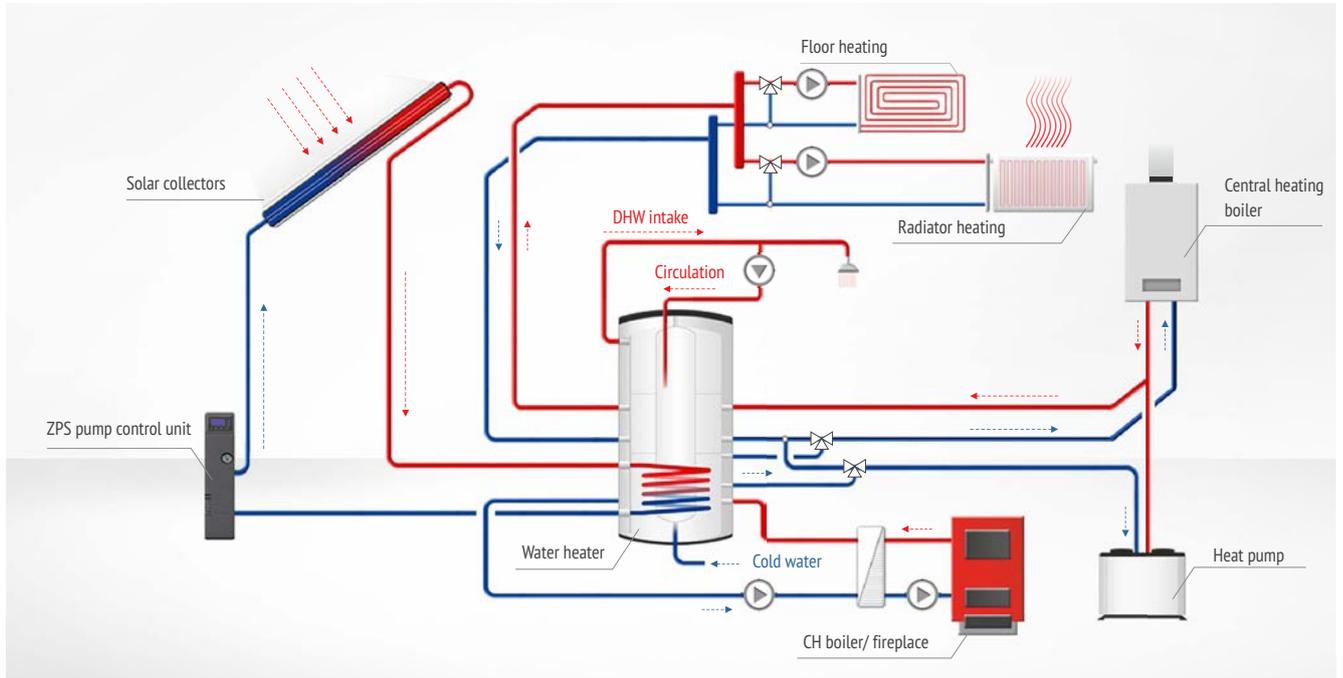
This scheme presents application of solar collectors for heating DHW in small domestic solar systems. Water in the heater is heated by solar collectors and, in the case there is no solar radiation, a central heating boiler is activated to heat up the water in the heater.

### Scheme 2. Solar system for domestic hot water (DHW) with the existing water heater



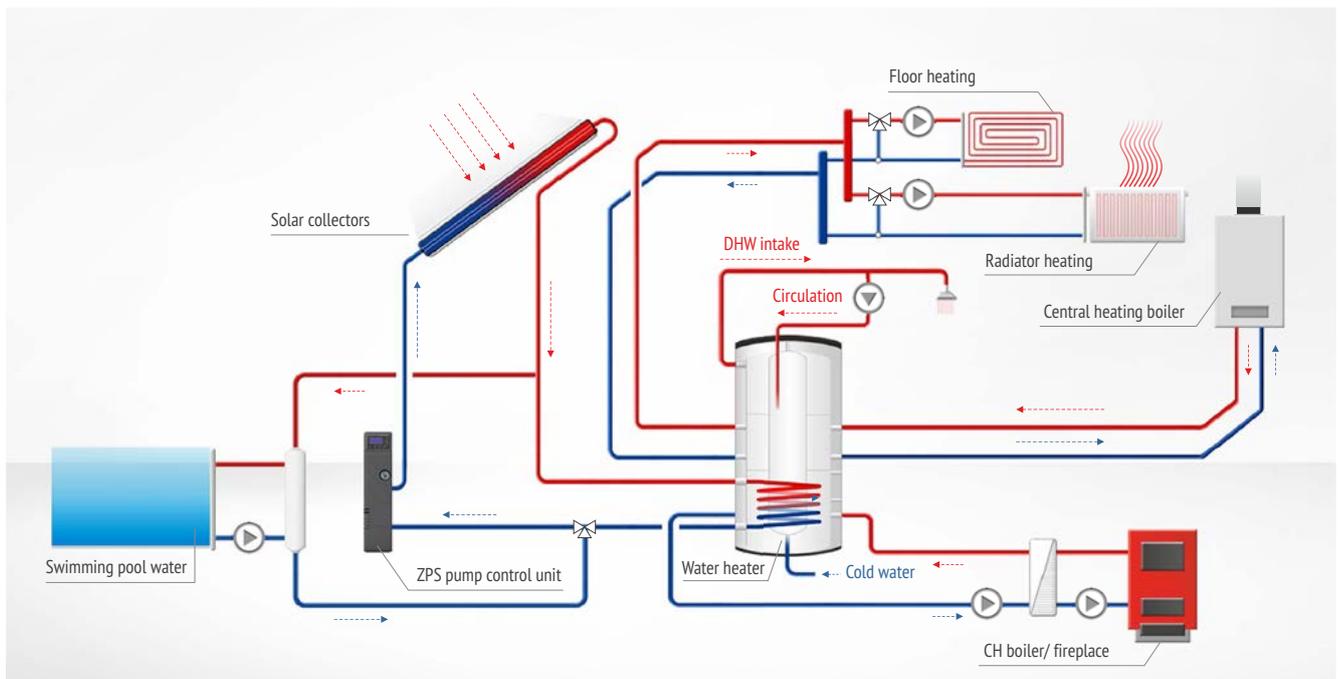
In case of already existing heating system with a water heater featured with one heat exchanger (coil), it is required to use another heater, in which the water will be preheated by solar collectors and subsequently directed to the existing heater, coupled with the central heating unit.

### Scheme 3. Solar system for domestic hot water (DHW) and central heating support



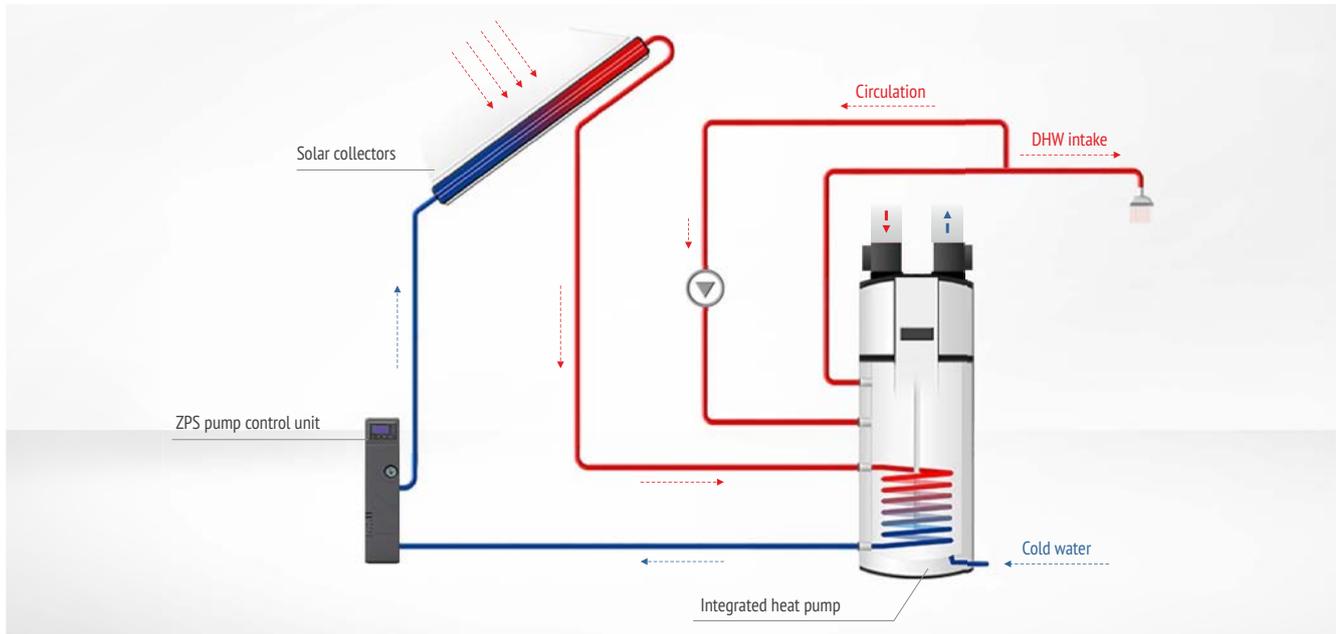
This scheme presents heating of DHW and simultaneous support of central heating of the building. For this type of system, it is recommended to use a buffer tank of special construction with a built-in DHW tank.

### Scheme 4. Solar system for swimming pool heating



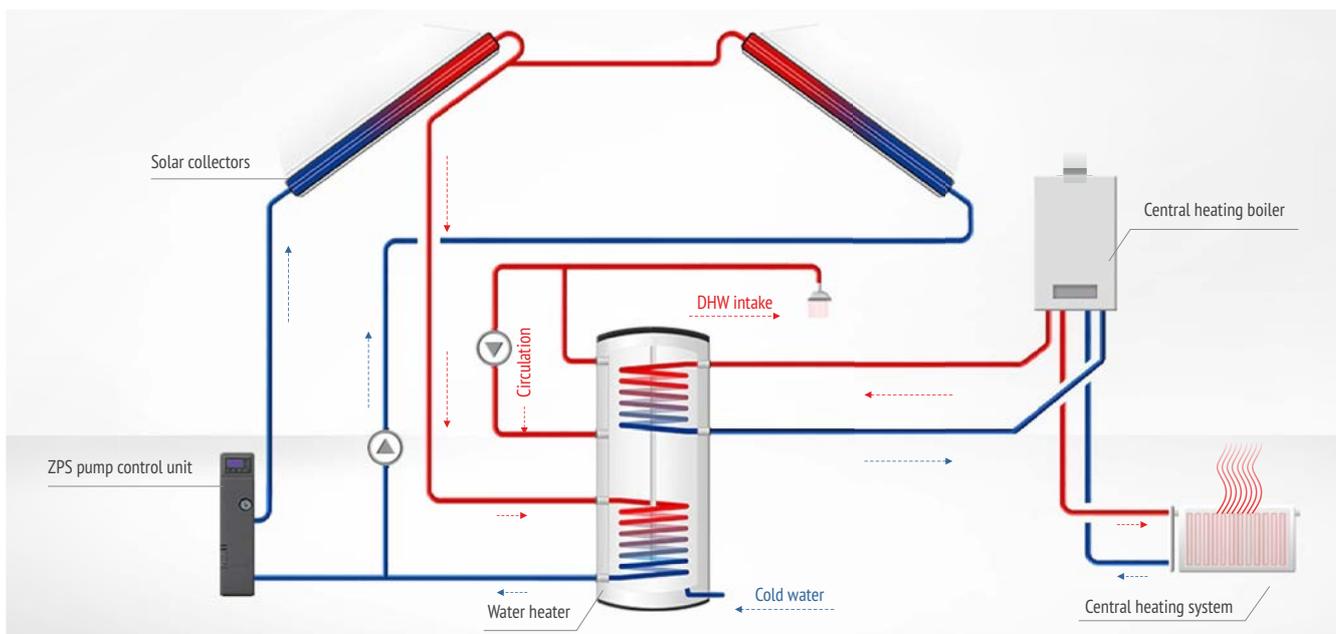
When heating swimming pool water, solar collectors should be connected with proper heat exchangers, integrated within the water filtration circuit. In such case it is recommended to use the same collectors to heat DHW as well.

**Scheme 5. Solar system for domestic hot water (DHW), central heating support, and swimming pool heating**



This scheme presents application of solar collectors for heating DHW and swimming pool water, as well as supporting central heating of the building. This solution recommends using a special water heater with a built-in DHW tank. The system presented in the scheme is an example of optimal use of a greater number of solar collectors, which during the summer supply heat to DHW and swimming pool and during the heating season assist central heating.

**Scheme 6. Solar system for domestic hot water (DHW) with collectors located on eastern and western roofing planes**



Placing the collectors on eastern and western sides of the roof is recommended in case of inability to install them on the southern side. Collector batteries are independent from one another thanks to the use of two separate circulation pumps. The controller turns on a specific pump depending on the availability of solar radiation on the given roofing plane.

## Contact details

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Solar collectors Heat pumps



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