

SP228 Manual



The SP series solar working station is suitable for split pressurized solar hot water heating system. By connecting with solar collector and pressurized tank, it makes the solar energy turn to heat energy in high efficiency. It is the heart for solar hot water heating system.

Safety regulations

- Installation, commissioning and maintenance of the device may only be performed by professional personal.
- All operations that require opening the device are only to be conducted cleared from the power supply. All safety regulations for working on the power supply are valid.
- The device must not be installed in rooms where easily inflammable material (e.g. gas or oil) mixtures are present or may occur.
- Before connecting the work station, make sure that the collector, tank and temperature sensor are connected well.
- Before connecting the work station, make sure that the energy supply matches the specifications of the device. Protect the solar station against overloading and short-circuiting.
- All devices connected to the work station must conform to the technical specifications of the device.
- As soon as it becomes evident that safe operation is no longer possible, please immediately take the device out of operation.
- Without lightning rod, please don't use this device during a thunderstorm.
- Must be installed vertically!

Liability waiver

- Improper installation or operation can cause damages to material and persons. The manufacturer cannot monitor the compliance with these instructions or the circumstances and methods used for installation, operation, utilization and maintenance of this device. Damage by mishandling or improper installation on costumer site is immediately leading to warranty exclusion.
- As faults can never be excluded, we don't offer a guarantee for the completeness of the drawings and texts of this manual, they only represent some examples. They can only be used on own risk. No liability is assumed for incorrect, incomplete or false information and the resulting damages.
- The manufacturer preserves the right to put changes to product, technical date or installation and operation instructions without prior notice.

. New SP228 solar working station



Aviation plug



Safety valve: Protect the system against over pressure, the system respond pressure is 6bar
Pressure gauge: Display system pressure, Arrange: 2-10bar
WILO pump: WILO Star RS 15/6 RS25/6 is optional. (100~120V or 200~240V)
Input and output ports: use aviation plugs
Input signal:
PT1000 sensor (Black for collector), -99 ~ 199
NTC10K sensor (Gray for tank), 0 ~ 99
Accuracy: ±1
Output signal:
Auxi. heating (Max. Load: 12A)
Relay (Max. Load: 1.5A)

Industrial touch screen with resistance; 72 solar hot water systems; Operate with fingertip or touch control pen; With high sense and stably

Temp. sensor Flow sensor Airstop Flow sensor

Check valve: Prevent medium flow back Flow sensor: Measure flow rate, used in Calorimetry function Temp. sensor: Installed inside the work station, measure pipeline

temp. Used in Calorimetry function as T6, T7.

The airstop is used to release the air from the medium in the solar hot water system. The air precipitated from the medium gathers in the upper area of the manual valve, and releases through it. After the air releases, please check the system pressure. If the pressure decreases, add it to the normal statue.

Solar working station series for solar water heating control system



Special filling valve for solar hot water system: When filling the medium, close the button , and open the button at the same time. Fill the medium from the left side. When there is medium venting from the right side evenly, it means the medium has been filled up. Then close the button , and open the button .

. System diagram (72 solar hot water system)





Solar working station series for solar water heating control system



(Please look view the detail system description on operation board.)

.Items & Functions

Diagram 1: Items

				Input \ Current \ Voltage \ Consume \ Saving				
	System Statue		333	Auxiliary heater working statue				
				Solar heat collecting working statue				
		Language	Choose the curren	t language				
			Clock setting	Date and time				
			Network setting	Network data				
	Lloor	Sotting	Reference temp.	Auxiliary heater temp. \ Heat collecting temp. \				
	Oser	Selling	setting	Swimming pool temp.				
	Setting		Assistant	Holiday function\Auxi.H\Solar heat collecting\Hot				
			function	water end circulate				
		Touch Adjustment	Adjust the position	of touch board				
			0	Select system no.				
	Expert Setting	System Select	O	Select the previous system				
91 91			O	Select the next system				
			•	Confirm the current system				
			Temp.difference circulate	Set switch-on and switch-off temp. difference				
			Pump speed adjustment	Set Pump speed				
	Dofault		Aux.H	Set auxiliary heater temp. and time periods				
	nassword		Solar heat	Sat boot collecting temp, and time periods				
	(123456)	System	collecting	Set heat collecting temp: and time periods				
	(120400)	Setting	Hot water end circulate	Set hot water end temp. and time periods				
			System protect	Collector frost protect \ System overheat protect\				
			System protect	Tank high temp. protect \ Swimming pool temp.				
			Assistant function	Anti-bacteria function \ Priority \ Holiday function \ Media SHC \ Media density \ System password \ Reset function				
		Quetere	Switch on or owitch	a off outputs handily:				
		Debug	Check inpute output	its/flow rate for current system				
		Debug	Check inputs/outputs/flow rate for current system					

(The Expert Setting only operated by professional person)

Diagram	2: Functions	
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Function	Default valve	Arrange	Description				
Temp. difference	8	5-20	Switch-on temp. difference				
circulation	4	2-12	Switch-off temp. difference				
	60	45-75	Reference temp. for Auxi.H				
Auxiliary heating	00:00-00:00 00:00-00:00 17:00-22:00	00:00-23:50	Working time periods for Auxi.H				
	35	15-60	Reference temp. for solar heat collect				
Solar heat collect	00:00-23:59 00:00-00:00 00:00-00:00	00:00-23:59	Working time periods for solar heat collect				
Hot water end	35	15-60	Reference temp. for hot water end circulation				
circulation	00:00-23:59 00:00-00:00 00:00-00:00	00:00-23:59	Working time periods for hot water end circulation				
Collector frost protection	3	2-8	When the collector temp. is lower than the desired frost protection temp., this function will be activated.				
Tank high temp. protection	80	50-95	When the storage reaches the desired overheating protection temp., temp. difference circulation will be switched off.				
System overheat protection	130	120-160	When the collector is overheating, the system switches off emergently avoiding to be destroyed.				
Anti-bacteria	Open		When the collector temp. is lower than the desired frost protection temp., this function will be activated.				
Holiday function Close		This function will be activated when a holiday is planed or when there is no need to use hot water for a long time.					
Factory default			All the desired values (except Time) can be set back to factory default.				



(2)





Auxiliary Heating

The system is supported with a default program which can be customized to meet your individual needs. You can create a timer program with up to three time periods to heat the water to a desired value. During the three preset time periods, auxiliary heater starts working, when the water temp. in top part of tank (T3) is below preset turning-on temp.. When it is not in these three periods, even the tank temp. is lower than the preset temp., the auxiliary heater won't work.

Note: In the system diagram, "RH" stands for the auxiliary heater device: Electric element, Gas stove, boiler, or other heating source.

Calorimetry

This function is suitable for all the systems. It calculates four values on saved heat: the current day, the current month, the current year and the total saved value. By measuring the temp. (T6&T7) and flow rate of medium, transfer them to heat amount through the formula: Q=CM t

Take system 1 as example: The temp. sensor T7 andflow sensor have been installed inside the working station . The user needs to install the sensor T (the gray NTC sensor with screw) in the position located in the left system diagram.

Heat bypass

This function can lower the system temp. by connecting a radiator when the tank temps. is too high. The install position is located in the left system diagram.

Leakage protect

The working station checks the voltage and current on the system working statue automatically.

When there is leakage for loadings, the system stops working immediately. The words (as the left side) shows on the System Statue page. Meanwhile, all the output stops. The user must check it and solve the problem as soon as possible, to prevent the system overheated.

"Load is leakage,shut off power and check it."



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Connection

1: T1 temp. sensor	7: Auxi.Heating output
2: T0 temp. sensor	8 : Main Power port
3: T2 temp. sensor	9 : RJ45 port
4: T3 temp. sensor	10 : R2 output
5: T4 temp. sensor	11:R3 output
6: T5 temp. sensor	12 :R4 output

Connect auxiliary heater wire if available: Brown cable for the "L" line Blue cable for "N" line Yellow-green cable for the ground wire "G";.

. Fault message

Familiar problem	Possible reason	Solution			
Pump works but no flow rate	There is probably too much air	Replenish heat medium			
displays.	in the pipeline.	liquid and exhaust the air.			
The solar system has temp.	Storage reaches max. temp.	When storage temperature drops, pump starts working.			
work	Solar collector reaches its max.	When collector temperature			
	temp	drops, pump starts working.			
	Auxiliary heater is forbidden.	Activate it manually.			
Auxiliary heater doesn't work.	Temperature sensor has broken circuit or short circuit.	Check sensor connection and make the wiring again.			
Auxiliary heater still operates at 23:00.	Anti-bacteria function starts up.	lt's normal.			
System pressure drops.	There is air leakage in solar system.	Check the pipeline and exhaust the air.			
Pump works but system doesn't have temp. difference, meanwhile auxiliary heater function starts up.	Frost protection function is activated.	After collector temperature rises, pump stops working.			
The sensor display "Open"	Sensor wiring is not connected well	Check resistance value, replace sensor if necessary.			
The sensor display "Short"	Sensor wiring is short circuit	Check resistance value, replace sensor if necessary.			

Note: A potentially defective sensor can be checked using an ohmmeter. To do this, the sensor must be disconnected. Its resistance value can be compared with the figures below, small deviation is acceptable.

PT1000 resistance value

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		0	10	20	30	40	50	60	70	80	90	10	00	110	120
		1000	1039	1077	1116	1155	1194	1232	1270	1309	1347	′ 13	85 1	1422	1460
-	NTC 10K B=3950 resistance value														
		0	10	2	0 3	30	40	50	60	70	80	90	100	110	120

0	10	20	30	40	50	60	70	80	90	100	110	120
33620	20174	12535	8037	5301	3588	2486	1759	1270	933	697	529	407

. Packing list

No.	Name	Specification	Quantity
1	Main	435×293×140mm	1
2	PT1000 sensor	15m	2
3	NTC sensor	3m	4
4	Power wire	1.5 m ²	1
5	Aux.H wire	1.5 m ²	1
6	Output wire	0.5 m ²	3
7	Filling valve	3/4	1
8	Screws		4
9	Manual		1