Instructions Manual

Allegro **653L**
S U R F A C E   C O N T R O L   Code: 20.069

Solar Thermal Energy Control with mounting in Surface
3 Relays, 5 probes, C. Calories and cycle anti-bacteria

Allegro **675L**
S U R F A C E   C O N T R O L   Code: 20.071

Solar Thermal Energy Control with mounting in Surface
5 Relays, 7 probes, C. Calories and cycle anti-bacteria

Warnings

Security Advices

- Make sure that the environmental conditions are adequate before installing the regulator, as well as working temperature, humidity, pollution and gas emission, since any of these factors may affect the correct operation of the product.

- Allegro is an independent control device to mount on a dry environment surface and with pollution type 2. Cables should be channelled in tubes or gutters to be properly installed.

- For any handling during either installation or repairing procedures the regulator should be disconnected from the electric grid.

- The electrical connections must be those indicated in this manual and the label at the back of the connection lid. The connections referred to in this manual are those of the regulator; to connect the rest of the installation components, the user should check the technical instructions for each piece of equipment (collectors, tanks, valves, etc.). For a correct operation of your installation, make sure that the technical features of the elements are compatible and that they comply with current standards.

- Assembly, electrical connection, set-up, and maintenance should be carried out by qualified technicians.

- This regulator is not a safety device, neither can be used as such; it is the responsibility of the person in charge to include adequate protection for each type of installation (complying with the standards).

- If possible defects are detected that may jeopardise or lead to incorrect operation of your installation, it is recommended not to connect this device.

- Total or partial reproduction of this document is forbidden by any means without prior consent in writing by SONDER REGULATION S.A.

- The graphics and information in this manual are illustrative and they might include technical or typographic mistakes.

- Sonder Regulación S.A. reserves the right to make any changes to the product, the technical data, or the assemblying instructions, without prior notice.

Designed and manufactured in compliance with:

**UNE-EN 60730-1 + A1:2005 + A12:2004 + A13:2005
UNE-EN 60730-2-1: 1998 + A11:2005**

Warranty Conditions

This device's warranty covers 3 years. This warranty is limited to replacement of the defective part, which will be delivered in the same material conditions as they were received, not responding for packaging, batteries, instructions, or any other accessory that this product includes, and that is not included in the delivery note.

We disclaim all responsibility for damaged devices as a result of improper handling, omission of warnings given in this manual, or lack of technical knowledge as to the needs of the installation.

For any repair covered by this warranty it is necessary to present the documentation proving the purchase of this product within the period of time covered by the warranty herein, together with a description made by the user as accurate as possible of the defect or anomalous operation of the product.

If repairs are out of warranty, the user will be inform of their feasibility and costs of those repairs. Assessment by our technical department might result in an additional cost for the user.

Out of warranty:

- Devices with serial number damaged, deleted or modified.

- Devices connected or used without complying with the instructions included in the device package.

- Devices modified without prior consent on the part of the manufacturer.

- Devices damaged either by impacts or liquid or gaseous spillage or emissions. Devices presenting natural wear-and-tear or because of improper use of the device.

- **Those costs resulting from delivery or reception of material.**

- Demands of compensation due to loss of profit, compensation for utilization as well as indirect damages, as long as these are not of obligatory liability in compliance with the law.

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Technical Features

Serie Allegro 600

	Relays	Probes	Special F.
Allegro **653L**	3 (10A type SPDT)	5 PT1000 1,5m	Legionella
Allegro **675L**	5 (10A type SPDT)	7 PT1000 1,5m	Legionella

Probe testing scale:

°C	-20	-10	0	+10	+20	+30	+40	+50
Ω	921	961	1000	1039	1078	1117	1155	1194

°C	+60	+70	+80	+90	+100	+120	+140	+160
Ω	1232	1271	1309	1347	1385	1461	1536	1610

Power supply: 230V~ +15/-10 % 50/60Hz

LCD lit-up: 40 x 20 mm

Box: Plastic ABS V0 IP40

Environment: Humidity= 20 to 85% / Pollution= 2

Temperature: Storage= -10...60°C / Operation=-5...40°C

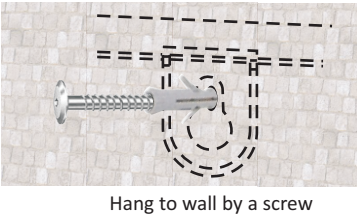**Operation:** Software type A. Type of action 1.B

Relays: SPDT with potential free contacts

Flow meter: Pulse input for energy counter function

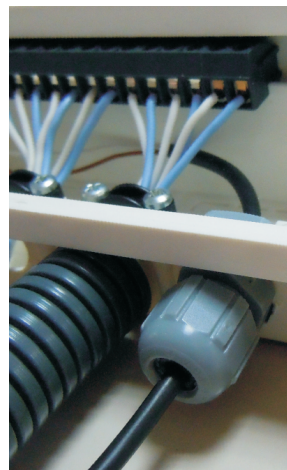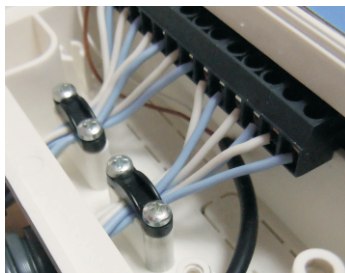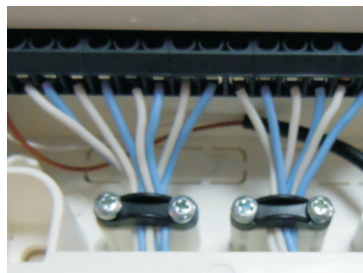*(X pulse = X litres, scale set at CntE function, it does no use decimals)*

Dimensions

Surface Assembly

Open cover conexions

PHILIPS ⊗
<0.5N.m

Hang to wall by a screw
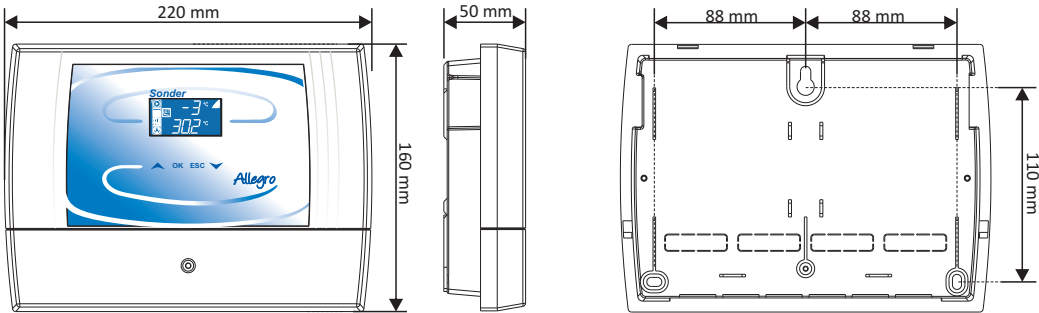
Fix device to wall by through the lower end screws

1

IT IS RECOMMENDED

To comply with electrical safety standards when connecting probes, devices, and power supply wiring, using cable holders, channelling by means of tubes or compression glands, and to provide the installation with adequate electrical safety.

At the controller's base die cutters are arranged in case the wiring does not come from a junction box and the cables come from behind.

Electrical Wiring

Allegro 653L

Flow meter
Energy counter Function

Probes PT1000
T5 T4 T3 T2 T1

Relays 10A SPDT
3 2 1
C NC NO   C NC NO   C NC NO

Power Supply
230Vac +10% -15%
50/60Hz max.1,5VA
N L

Wiring H05v-k - Section: Min Power=0.75 mm^2 • Relays=1.5 mm^2 / Max = 2.5 mm^2

Allegro 675L

Flow meter
Energy counter F.

Probes PT1000
T7 T6 T5 T4 T3 T2 T1

Relays 10A SPDT
5 4 3 2 1
C NC NO   C NC NO   C NC NO   C NC NO   C NC NO

Power Supply
230Vac +10% -15%
50/60Hz max.1,5VA
N L

Wiring H05v-k - Section: Min Power=0.75 mm^2 • Relays=1.5 mm^2 / Max = 2.5 mm^2

Operation

Sonder Regulación S.A. offers a range of regulators that easily manage resources (probes and relays); *OpenSonder ®* programming allows you to configure relays, probes, parameters, and functions in order to adapt your regulator to your installation. Controllers with pre-configured and closed hydraulic systems, typical of Central European devices, have a simpler configuration but their installation depends on the options available in the controller and this makes your system performance or functionality depend on the chosen hydraulic system. In addition, Sonder provides you with technical service to inform you on the controller's performance and advise you on setup.

Allegro is a regulator for thermal solar energy collection that has two different models depending on different resources (probes and relays) and functions that you may need to control your installation. The probes are shared by systems and functions, but the relays that are configured in a function are excluded from the system (except in the functions OR and AND that are shared).

You are also provided with the Legionella function to perform cycles of water circulation at high temperature (the L ending models).

Allegro's functioning includes:

<u>**Systems**</u>	- The factory configuration of Allegro is set as temperature differential (**T1 – T2 switch on relay 1, T1 – T3 switch on relay 2, T1 – T4 switch on relay 3...**) The moment one of the relays is given a function, it stops operating as differential for the system.
Functions	- Depending on the differentials that your installation needs, your installation may be complemented with functions to help improve performance, safety devices, etc.
Parameters	- They define within which values your installation will work, which temperatures, times, alarms, priorities...
Statistics	- It records temperatures (max, min, mean) of each probe, functioning hours for each relay, and volumes.

To make the most of your Allegro's operative capacities read carefully this section and follow the steps and procedures indicated below, applicable to all configuration menus, and the information shown on the display.

- Before setting up values for parameters and Functions it is recommended to test probes and relays to check up the installation performance.

- All ***Parameters*** are pre-set from factory with default values. If these values do not meet your installation needs, enter menu to configure them.

- If you wish to switch on one of the Functions, make sure first that the resources needed for that Function are not needed by the <u>System.</u>

- Once all connections and power supply are ready, the controller's display shows factory default values in normal mode operation.

When enabling / disabling relays, **Functions** *and* <u>**Systems**</u> *configuration should be taken into consideration as the relay status is ordinally arranged, as shown in the boxes below.*
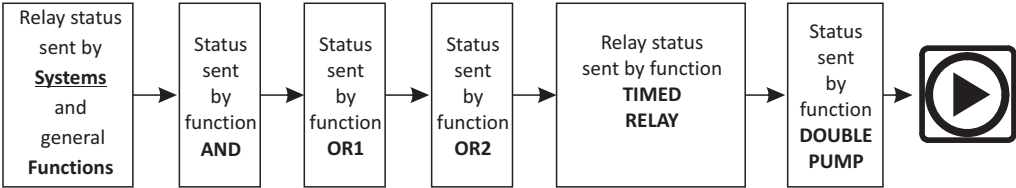
It prioritizes the status sent by the general functions and systems, then the function AND... For example: the thermostat function signals for a relay to be switched on, but the time relay function is disabled, and it will not be switched on until within the timeframe marked by the time relay function.

All the necessary information to configure and adjust your installation easily and fast is shown on the display. During operation in normal mode each device status (pumps, relays, alarms...) can be seen on the display, together with probe temperature information that is shown every 8 minutes. The display setup can be changed at any given moment:
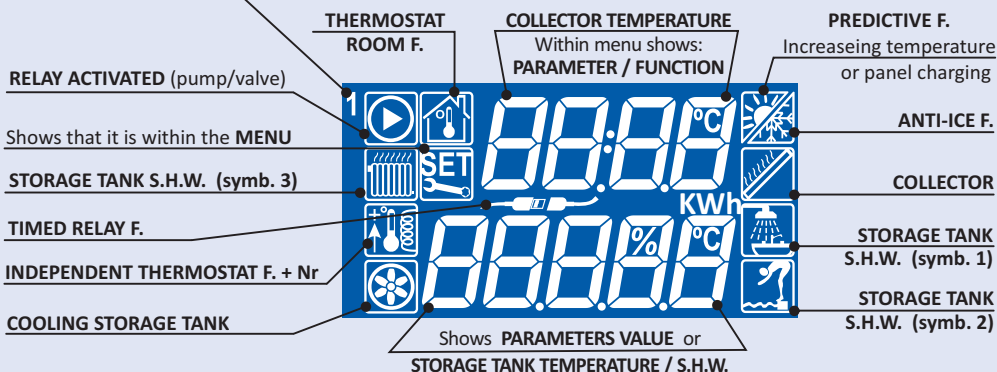
Pressing **OK** *brings up the current display*

Pressing ▲ *information cyclically shown*

*Pressing* **ESC** *browses quickly over information displays*

Display symbols

No. of:
- **RELAY -** When it is shown next to the pump symbol it indicates No of relay that has been switched on
- **PROBE -** Within the menu to differentiate probes
- **FUNCTION -** To differentiate between different thermostats
- **STATISTICS -** For the hours it shows No of relay and for temperatures it shows No of probe

THERMOSTAT ROOM F.

COLLECTOR TEMPERATURE
Within menu shows:
PARAMETER / FUNCTION

PREDICTIVE F.
Increaseing temperature or panel charging

RELAY ACTIVATED (pump/valve)

Shows that it is within the **MENU**

STORAGE TANK S.H.W. (symb. 3)

TIMED RELAY F.

INDEPENDENT THERMOSTAT F. + Nr

COOLING STORAGE TANK

ANTI-ICE F.

COLLECTOR

STORAGE TANK S.H.W. (symb. 1)

STORAGE TANK S.H.W. (symb. 2)

Shows **PARAMETERS VALUE** or **STORAGE TANK TEMPERATURE / S.H.W.**

System operation

1- Collectors temperature

2- Storage tank temperature The symbol for this storage tank flashes on and off because the temperature alarm has gone off and the cooling system has started up (aerotherm symbol)

3- Relay 2 switched on (assigned to t1-t3 differential)

4- Shows that the temperature tends to increase (compares that panel temperature is higher than mean values) or that the panels are at that moment transferring heat to the storage tank.
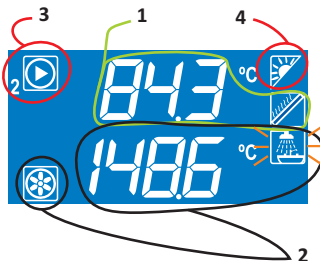
Configured Functions

1- Slave relay - r1

2- Mask relays - 2,3

3- Function being shown - Or

4- Slave relay ON

5- Mask relay 3 blinking = ON
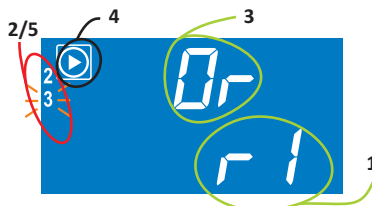
In case of being within configuration in any menu, after 15 minutes have elapsed without pressing any key, the device sets back into normal mode without saving any changes.

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Configuration Map

OPERATION IN

⌃ + ⌄
5 seconds

ESC
5 seconds

Menu Adjust *Parameters* values & **Functions** configuration. Icon **SET** on display

SET *ModE A*

Test / manual mode To
- See current temperature of each probe, which relay is assigned it and whether it is functioning properly.
- Connect and disconnect the relays manually.
- Check that there is volume in the circuit and that it is receiving the pulses from the counter.

MAn 84.3 °C

Menu

Parameters
- Mode
- diFA
- diFd
- diFt
- LCMA
- LCMI
- LAMA
- LAMi
- CAL
- tALr
- trEF
- Prio
- PrSE
- LiGT
- PASS
- ICon
- CAAd
- CLOC
- FECHA
- FUnC

Test

Test
- Temperatures T1...T5/T7
- Relays R1...R3/R5
- Counter L/Min

Functions
- Anti-ice
- Tubular Collectors
- Independent Thermostat 1, 2
- Environment Thermostat 1, 2
- Aerotherm 1, 2
- Double Pump
- Temperatue Increase of Circuit Return
- Or 1, 2
- And
- Energy Counter
- Independent Storage tank 1, 2
- Time Relay 1, 2
- Legionella

ESC

OK

NORMAL MODE

OK
6 seconds

Statistics You can check

- Maximum, minimum and mean temperature record.
- Total and partial relay operating hours.
- Total/partial volume and energy supplied to your installation.

```
1
   EtПA
   1230 ℃
```

Statistics

Statistics

|	
EtMA - Probes Maximum Temperature 1...5/7	
EtMi - Probes Minimum Temperature 1...5/7	
EtAG - Probes Mean Temperature 1...5/7	
EHor - Partial Operating Hours 1..3/5	
EHot - Total Operating Hours 1..3/5	
ECAU - Counter of Partial Litres	
ECEP - Counter of Partial Energy	
ECEt - Counter of Total Energy	

ESC
15 seconds

Reset* deletes all adjustments to parameters, functions, and statistics (except total relay operating hours and total MwH of counter) and sets back to factory default values. To be able to set this mode on the option password has to be OFF.
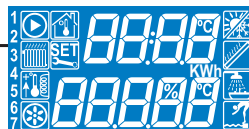
***** If password is on it is impossible to reset values back to factory default values. It should be previously disabled (value = 0) from the parameters menu.

In case an unauthorised user tried to reset values, reset function blinks for 10 seconds the **ESC** key and the user is only allowed to enter in test of probes and relays. After exiting test mode the relays go back to their original status.

Statistics

In this menu you will find all the data saved by Allegro from its initial functioning and with which you will be able to optimise your installation, as you will be given data regarding times of operation, maximum, minimum and mean temperatures, as well as water and calorie counters.

All these data will allow you to assess your installation performance depending on meteorological conditions and your configuration.

To enter statistics menu press OK for 6 seconds
(with the display lit on)

First statistical information shows on the display.

(Those probes that are not connected do not give out any temperature reading and in statistics an error message is shown. If the flow meter is not connected, it does not receive any pulses and it reads 0.0L)

- Pressing **OK** values are initiated at zero.
- Pressing ▲▼ you move on to the next value.
- Pressing **ESC** you return.

Probes

Maximum Temperatures (T1 to T7 depending on model)
Shows the maximum temperature reading at each one of the probes identified by their number on the display.

Minimum Temperatures (T1 to T7 depending on model)
Shows the minimum temperature reading at each one of the probes identified by their number on the display.

Mean Temperatures (T1 to T7 depending on model)
Shows the mean temperature reading at each one of the probes identified by their number on the display.

Relays

Partial Operating Hours (R1 to R5 depending on model)
Shows each relay's operating hours from the last time that it was set at zero. They are identified by their number on the display.

Total Operating Hours (R1 to R5 depending on model)
Shows each relay's total operating hours since the installation was carried out.
This statistical information cannot be set at zero.

Flow Meter

Volume
This sub-menu shows the number of litres of heat-carrying liquid that have gone through the counter.

Partial Energy Counter
The KWh-counter reports the energy supplied by the panels to the installation.

TOTAL Energy Counter
The MWh counter reports the energy supplied by the panels to the installation since initial set-up.
This value cannot be re-set.

Probes: See current temperature of each probe, its assignation and operation performance. If this reading is erroneous you should check that it is properly connected and that its cables are not severed.

Relays: Enter forced **manual mode**: Connect and disconnect the relays manually to check the correct operation of your installation.

Flow meter (L/min): shows if the circuit has good volume and if Allegro is receiving the pulses from the counter.

Exiting **TEST** the relays update your status to the system regulation.

- Press **ESC** for 6 seconds to enter test mode; in normal mode.
- Press **OK** to move onto the next probe. If any probe is not installing or her cables are cut, the probe reading will show erro in display.

- Then passes relays (forced manual) where you can turn on / off each relay manually.
    Pressing **OK** switches relay **R1** on/off.
    Press ▲▼ to move onto the next relay.

- The last one is the Flow meter (L/Min)

Password On: After 15 minutes without touching any key the systems exits into normal operation and the relays go back to the status required by the system at that moment.

Password OFF: Until the key **ESC** is not pressed you have not exited test menu or **forced manual mode**.

PROBES

- It is recommended to use original probes only (1.5m PT1000); if they need to be lengthened the connection has to be welded not to lose the reading value and retracted to isolate them from moistness.
- The panel probes should be installed at the end of the panel and toward the installation.
- The storage tank probes have to be inside the tanks and properly sheathed.
- The probe cables should never be embedded in the same channel as the electrical wires.

RELAYS

- The relays enabling your installation devices are potential-free contact and work as switches only, which means that they only open/close the contacts, and that they feed the devices connected to the relay corresponding to each device.
- Make sure to have properly made the electrical connections from the devices to the relay contacts before feeding the **Allegro** terminal.

It is important to press ESC to exit manual mode when you are finished, since while you are inside this mode Allegro has disabled its system regulation and its operation is limited to the commands given manually.

Parameters

*This allows you to adjust the **Parameters** that define your installation operative performance. The parameters are set from the factory by default as those mostly used; if these are useful for you, then you are ready to control and regulate your installation. If your installation needs further adjustment, read carefully the present section.*

[SET] ̄ModE A

To enter this menu press together ▲▼ symbol during 5 seconds. (with the display lit up).
- Choose the parameter you wish to set using the arrows ▲▼ symbol and press **OK.**
- Inside, change the value by using simbol ▲▼, confirm it with OK and press ESC to move on to the next parameter without saving the changes.

		Scale	Factory set
̄ModE	**Mode A(winter) / b(summer):** This allows you to choose two different adjustments for alarms and tank priorities without having to change them one by one. Both modes have the same values defined from the factory. Special for individual houses, not buildings. A/b same values to set factory . **Double Adjust:** inside menu, choose mode A,set a value for alarms & priorities, exit, re-enter the menu and choose mode b, set new different values to alarms and priorities.	A (Winter) b (Summer)	**A**
di FA	**Activation Differential:** Defines the temperature difference that should exist between the storage tank and the solar collector for the pump to be switched on.	2,0 to 20,0K	**6,0 K**
di Fd	**Deactivation Differential:** Defines the temperature difference that should exist between the storage tank and the solar collector for the pump to be switched off.	1,0 to 15,0K	**2,0 K**
di Ft	**Temperature Differential:** Configures the temperature differential for the commands to the functions Anti-ice, Aerotherm, Legionella and Independent Thermostat (except environment thermostat with fixed differential to 0.3°K) and parameters prio & tALr.	0,3 to 9,0K	**2,0 K**
LCMA	**Maximum Limit Command:** Limits the maximum value to which you can adjust the temperature for the Independent Thermostat Function.	5 to 130°C	**90°C**
LCMi	**Minimum Limit Command:** Limits the minimum value to which you can adjust the Independent Thermostat Function.	5 to 80°C	**10,0°C**
LAMA	**Environment Maximum Limit:** Limits the maximum value to which you can adjust the temperature for the Environment Thermostat Function.	18 to 30°C	**30°C**
LAMi	**Environment Minimum Limit:** Limits the minimum value to which you can adjust the temperature for the Environment Thermostat Function.	6 to 17°C	**6°C**
CAL	**Probe Calibration (T1... T7):** allows adjusting reading to each probe. Check temperature with standard thermometer and then adjust probe to this temperature.	-10,0 to +10,0K	**0,0K**
tALr	**Tank Temperature Alarm (No):** Defines an alarm by temperature for each storage tank, switches off relay associated to the tank probe. It has a double adjustment with the parameter mode A / b.	5 to 130°C	**85°C**
tr EF	**Storage Tank Cooler (No):** Reduces the storage tank temperature by collector recirculation, when it detects that the collector temperature is lower than that of the storage tank. *SEE EXAMPLE IN No 16 PAGE*	5 to 130°C	**130°C**
Pri o	**Tank Priority (No):** It sets the order to load the storage tanks when there are many (see example). It has double adjustment with the parameter mode A / b.	5 to 85°C	**5°C**
Pr SE	**Sequential Priority:** Sets the loading priorities by storage tank numbers in case the installation has many tanks (see example in next page).	On / OFF	**OFF**
Li Gt	**Display Light:** Sets the lighting type for display, fixed or timed to turn off every 15 minutes when no key has been pressed.	On / OFF	**OFF**
PASS	**Password:** Prevents access to configuration, allowing the user to see statistics, display light, summer/winter switch, and probe and relays test.	OFF (0) On (1...9999)	**OFF**
ICon	**Storage Tanks Icons:** Allow you to set a different icon for each tank. The displays shows the temperature, the icon of choice, and the number of relay that is on.	(icons)	(icons)
CAAd	**Automatic Clock Change:** With the parameter ON and once clock and date have been set, Allegro switches from summer / winter time automatically	On / OFF	**On**
7:53 CLOC	**Time of Internal Clock:** Sets the time. It is important to check its correct configuration for the Legionella and time relay functions. This adjust is saved by 15 days without power supply.	These parameters only affect the time relay & Legionella functions. It is NOT necessary to set them if they are not enabled.	
07 14 20 10	**Time of Internal Clock:** Sets the date for the Allegro's internal clock; the displays shows month, day, year, and number of day of the week. It is important to check its correct configuration for the Legionella function.		
FUnC	**Functions:** It enters the sub-menu to enable anti-ice, tubular collectors, independent thermostat, environment thermostat, aerotherm, double pump, return increase, OR, AND, and energy counter.	All disabled (see functions section)	

Where the temperature prompts loading in an installation with many storage tanks (tanks, heat system, swimming pools, etc.), the loading priority can be set in two different ways (parameters Prio, PrSE): **Parallel** (the prioritised tanks are loaded first and when they reached the temperature set they stop being a priority to load all the tanks at the same time) or **Series** (relay-1 tank is loaded first, then relay-2 tank, and so on).
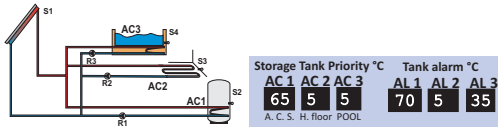
Parallel Load - Minimum temperature for the tanks is set (each tank temperature can be configured). When the temperature drops below the set temperature that tank becomes priority and it is loaded until set temperature is reached. If another tank drops below set temperature as the first tank is being loaded, both become priority and are loaded at the same time until each one of them reaches its minimum temperature. When they reach set temperature they stop being priority (**Sequential Priority OFF**).

Load in Series - When sequential priority parameter is on, the loading order is set by the numerical order and by the temperatures. When storage tank No 1 is below its priority temperature it starts to be loaded exclusively until it reaches its priority temperature. If tank No 2 drops below priority temperature as No1 is being loaded, No 2 is not loaded until No 1 has reached its minimum temperature (priority temperature).
The order set for the storage tanks is the relay numerical order. (Sequential Priority ON)

EXEMPLE Sequential Priority **OFF**, In **Summer**

Storage Tank Priority °C			Tank alarm °C		
AC 1	AC 2	AC3	AL 1	AL 2	AL 3
65	5	5	70	5	35
A. C. S.	H. floor	POOL			

As we are not interested in having the radiant floor on during summer, priority is set at 5°C and the alarm at 5°C to switch off, and AC3 to 5°C and the alarm to 35°C to set it out of priority; this way the system heats AC1 until reaching 65°C, and once this temperature is reached AC1 and AC3 are heated together until they reach their alarm temperature, and the system stops loading the storage tanks.

EXEMPLE Sequential Priority **ON**, In **Summer**

Storage Tank Priority °C			Tank alarm °C		
AC 1	AC 2	AC3	AL 1	AL 2	AL 3
65	5	28	70	5	35
A. C. S.	H. floor	POOL			

As in summer the radiant floor is not used, priority is set at 5°C and the alarm at 5°C to switch off this function, and AC3 at 28°C and the alarm at 35°C. The system heats AC1 until reaching 65°C; once this is done AC3 is heated until reaching 28°C; then AC1 and AC3 are loaded at the same time. If AC1 dropped to 65° when AC3 is being loaded, the system would load AC3 to load AC1 again until reach 65°C.

Winter

Storage Tank Priority °C			Tank alarm °C		
AC 1	AC 2	AC 3	AL 1	AL 2	AL 3
65	40	5	70	45	35
A. C. S.	H. floor	POOL			

When AC1 and AC2 drop below 65°C and 40°C, they are both heated at the same time; when AC2 reaches 40°C, only AC1 is heated until it reaches 65°C, and once it does there is no priority storage tank any longer and all three storage tanks are heated until they reach 70°, 45°, and 35°, respectively. If any of them drops below its priority temperature, the priority system turns on again and heats the tank that dropped below temperature.

In case of heat excess: AC1 has reached 70° and AC2 45°. In this case the swimming pool is heated to dissipate heat excess, not to overheat the collectors, and avoid overheating the installation.

Winter

Storage Tank Priority °C			Tank alarm °C		
AC 1	AC 2	AC 3	AL 1	AL 2	AL 3
65	40	5	70	45	35
A. C. S.	H. floor	POOL			

If AC1 and AC2 temperature drops below 65 and 40, only storage tank AC1 is heated (by numerical order) until it reaches 65°. Once this temperature has been reached it is not priority any longer and the system heats exclusively storage tank No2 until it reaches 40°. As there are no other priority storage tank standing both tanks are heated simultaneously until their temperature alarm points.

- The values for parameters **tank alarm** and **storage tank priority** are connected to each other, so that the alarm cannot be below storage tank priority value, and the storage tank priority value cannot climb over the alarm, as this could block the parameter regulation scale. For Example: If AC1 has its alarm set at 70°C, its priority cannot be set above this value. If the priority is set at 60°C, trying to lower the alarm at 50° is not possible either, as the alarm scale would be blocked as well.

- In the event that the control can not send the heat of the collectors to any tank, pool or device, stop the pumps until they turn to qualify for the load.

Functions

The Functions use the probes shared by Systems and relays that release Systems and other Functions.

- To enter press together by 5 seconds (with the display lit up)

NEnU

- Use the arrows to select **Function** in menu.

SET NodE A

- Press **OK**.
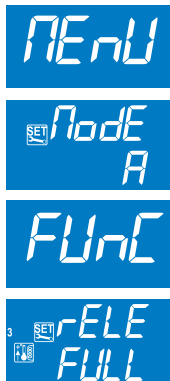
FUnC

If try to configure more functions that those supported by the control, the display shows FULL and control exit from Function mode.

3 SET rELE FULL

Anti-ice

This function is designed for installations that use water as heat-carrying liquid, because as it does not contain anti-freeze the heat available in the installation is used to prevent the circuit from freezing.

SET Anti 6 °C

Resources
• 1 shared probe that is set automatically

- In function adjustment you can switch this **Function** on/off by adjusting the temperature at which the pump is to turn on (-20 to 20°C).

Tubular collectors

It updates the reading of the probes installed outside the collectors by re-circulating during 30 seconds when it detects that the temperature has increased 2K from the last saved reading.

SET CtUb OFF

Resources
• It does no use resources; it only modifies the probe's reading

- At **Function** adjustments where the **Function** can be switched on/off.

Independent Thermostat 1, 2

This function allows regulating the temperature of one probe (heating, radiant floor, etc.) independently from the system operation. It has 2 Independent Thermostat functions with two different numbers.

1 SET tErN On

Resources
• 1 shared probe

• 1 adjustable fixed relay

- At **Function** adjustments the **Function** can be switched on/off, setting the temperature to be regulated (10 to 90°C), the reading probe, and the enabled relay.

Environment Thermostat 1, 2

It allows you to install one or two remote adjustment probes (MODERATO SR) to your installation, which allows you to regulate the temperature room without having to configure the change set from the Allegro.

2 SET tANb OFF

Resources
• 2 shared probes

• 1 adjustable fixed relay

- At **Function** adjustments you can switch the **Function** on/off, set: command probe (*SCon* temperature selector for the room), the regulation probe (*Sond* temperature reader for the room), and the activating relay (*rELE*).

Once the remote probe is set and installed, it should match the reading from the remote terminal button with the value shown by the Allegro. To do so:

- Set remote probe button at 20°C.
- Enter menu, parameters and probe calibration.
- Change value of command probe to 20°C

Example command probe t4: *that probe's reading shows on display 19.5°C. At probe calibration and into S4 change the value from 0.0 to 0.5.*

Cooling by Aerotherm 1, 2

This **Function** *allows reducing the temperature of a device by either circuit recirculation or by a cooling device, when the device temperature is detected to be above the circuit temperature, then the configured relay is switched on. It has 2 time relay functions, on display and with a different number each one. This* **Function** *also allows cooling thermostat configuration.*

Resources
• 1 shared probe
• 1 adjustable exclusive relay

- At **Function** adjustments can be switched on/off, set the temperature (*ConS* 40 to 140°C), the reading probe, and the re-circulation relay or aerotherm activation.

Pump shift

This **Function** *allows you to shift one pump in its operation to have the pumps working alternatively.*

Resources
• 1 shared relay (duplicated relay)
• 1 exclusive & adjustable relay

- The **Function** can be switched on/off, set the total time that each pump will work before shifting (*ALtH* 4 to 120 hours), the original pump relay to duplicate (*rOrG*) and the relay to alternate with the original one.

Temperature Increase of Circuit Return   *2ⁿᵈ differential*

With the increase return **Function** *you can control one valve to divert the circuit course of hot sanitary water in order to increase the return circuit temperature of the heat system & make the most of the solar heat from the storage tank for heating purposes. Solar energy pre-heats the water coming from the heat system before adding the rest by using a support source, be it a Boiler or an electrical source.*

Resources
• 2 shared probes
• 1 exclusive & adjustable relay

- At **Function** adjustments you can switch the **Function** on/off and set the temperature differential (0.3 to 9°K) between the storage tank of the solar circuit and the heating circuit return to turn this on, which will select the exchanger probe (*SrEt*), the return probe (*Sint*), and the relay that enables the return circuit valve

OR 1, 2

It conditions the status of one relay depending on the status of any of the selected relays. For example: if you chose R1 as slave relay and R2 and R4 as main relays, R1 will turn on when R2 or R4 are on. When they are all off, the slave relay will turn itself off. It is executed after AND. (see page 3, priority order)

Resources
• It does no use resources; it only modifies the behaviour of the configured relays.

- Pressing **OK** you enter in **Function** adjustments where you can switch this **Function** on/off with ⌃⌄, & confirm status pressing **OK,** then select the slave relay with ⌃⌄ & confirm the select pressing **OK**. Later goes to select master relays (MASC):

Slave relay

⌄ to change the status of the slave relay

⌃ goes to next relay

Master relays

OK confirms and exits of **Function**

ESC turns of **Functions** menu

AND

It conditions the status of one relay depending on the status of all the selected relays. For example: if you choose R1 as slave relay and R2 and R3 as main relays, R1 will turn on when R2 or R3 are on. When any of the main relays are off, the slave relay turns itself off.

Resources
• It does no use resources; it only modifies the behaviour of the configured relays.

- Press **OK** to enter in adjustments, you can switch this **Function** on/off with ⌃⌄, & confirm status pressing **OK,** then select the slave relay with ⌃⌄ & confirm the select pressing **OK**, then pass to select master relays (MASC):

Slave relay

⌄ to change the status of the slave relay

⌃ goes to next relay

Master relays

OK confirms and exits of **Function**

ESC turns of **Functions** menu

Functions

Energy Counter

It measures the amount of energy supplied to your installation by the solar collector through the reading of two probes (one at the input and the other at the output of the part of the installation to be controlled) and the pulse input, which measures the installation volume.

SET *CntE OFF*

Resources
- Has an independent input for the device to be installed (pulse counter)
- 2 shared probes

- At **Function** adjustment this **Function** can be set on and off, adjust pulse input configuration (*LinP* 1 to 200 litres per pulse), the heat-carrying liquid composition (*GLiC* 0 to 100% glycol), the input probe (*SEnt*) and the counter probe (*SSAL*) to assess the amount of heat transferred. Once this function is switched on, the following messages are shown on the display:

POtE 634

Power supplied by the installation at the moment (W)

LMin 510

Volume circulating in the installation (litres / minute)

Independent Storage Tank 1, 2   *3rd differential*

It allows setting a differential system between the probes that are needed.. This differential system can be set between two storage tanks, one storage tank and a circuit, etc., without forcing the main probe to be the panel probe.

*It has 2 Independent Storage Tank **Function** with two different numbers.*

2 SET *ACin OFF*

Resources
- 2 shared probes
- 1 adjustable fixed relay

- At **Function** adjustments the **Function** can be switched on/off, set the probes to carry out the differential, main probe (*Sint*), and secondary probe (*SACU*), and the relay that will be switched on.

Time Relay 1, 2

This function makes a device function within a time frame (hours and days of the week during which the relay can be switched on). It has 2 time relay functions on display with different numbers.

1 SET *rtPo OFF*

Resources
- It does not use resources. It only enables the selected relay to function within certain time schedule

- At **Function** adjustments can be turned on/off, set the relay to be timed, set time schedule when the relay will be enabled, START hour(*StAr*), END hour(*End*), &set days for this function to be available. Setting the days:

1 2 3 4 5 6 7 SET *dAYS YES*

⌄ Selects if that day is enabled
⌃ moves onto the following day (blinking No)
OK exits and confirms data entered
ESC exits and discards changes

If the function is switched on every day the status is by default YES (function enabled). The only day disabled is that set at NO

Legionella

It increases the temperature set at the tank to kill bacteria during a certain time. It is advised to take into account hours and temperatures, given that if this function is on when the installation is used, it may cause scalds and injures in the users.

SET *LEG OFF*

Resources
- 1 shared probe
- 1 adjustable fixed relay

- At **Function** adjustments this **Function** can be turned on/off, set the temperature at which you wish to carry out the cycle (*ConS* 10 to 90°C), the tank probe, the relay to heat the tank, start the cycle (*StAr*) hour and day of the week, days when it should be repeated (*PEri* , frequency in weeks 1 to 12), and minutes for cycle length (*dLEG* from 5 to 240 minutes). In normal mode with the function on, the display shows the information about Legionella function with the message *StbY*, and if the cycle is not completed in 5 hours, the display shows *FAiL* , until the following cycle.

Aplication example for **Timed Relay Function**

This function sets a relay to be turned on/off within a timeframe; it limits the activity of other function to a time schedule.

The differential system **T1** and **T2** switches on **R1** to heat the storage tank and then the differential by the independent storage tank function between probes **T2** and **T3** to switch on **R2** in order to keep the sanitary hot water circuit at a suitable temperature, even when there is no demand from the taps. If relay **R2** is also timed during working hours (8 am to 6 pm Mondays to Fridays), this pump is set to functioning during those hours when there are people in the premises.
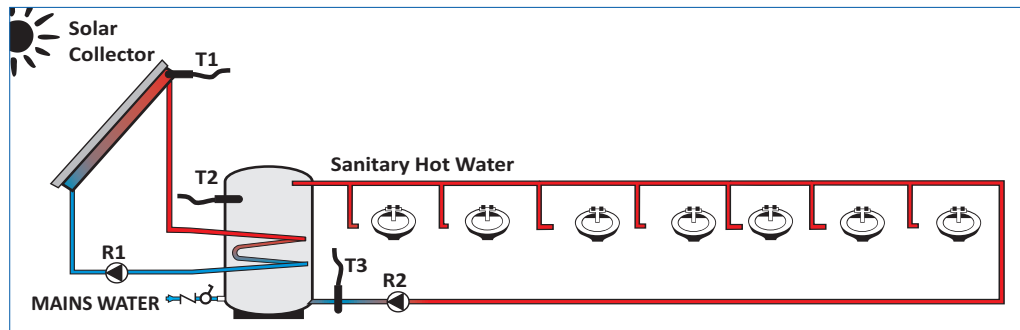
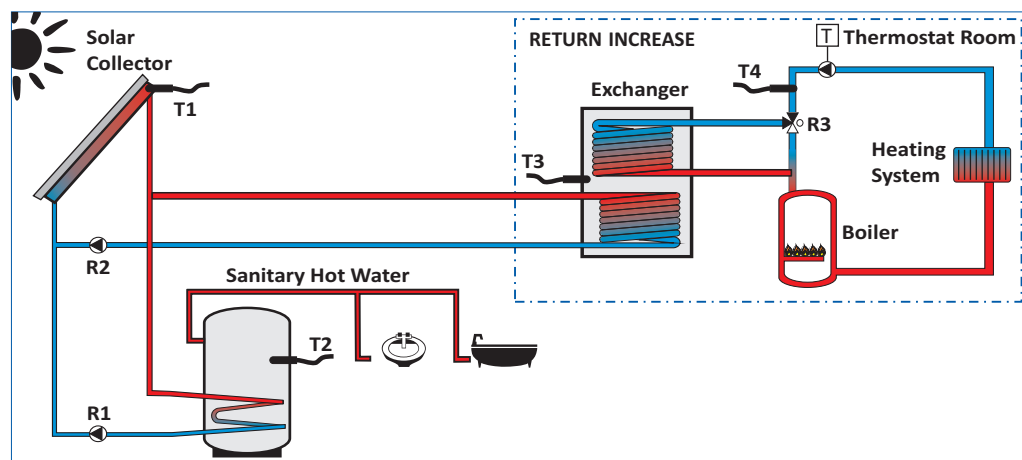**Aplication example for** **Legionella Function**

This function increases the temperature in the circuit to kill bacteria that might be in the water. It allows setting temperature, length of application and frequency of application. In case of not being able to complete the cycle a warning message is shown, until the next cycle.

The system is set as differential between probes T1 and T2 to switch on relay R1 when the tank requires it. Legionella function is switched on to enable R2 until T2 reaches high temperature and keeps it during the time set, in order to carry out a high temperature cycle in the storage tank (note the maximum temperature set by storage tank manufacturer), checking that the cycle hours do not clash with the time when people use the water at the premises.
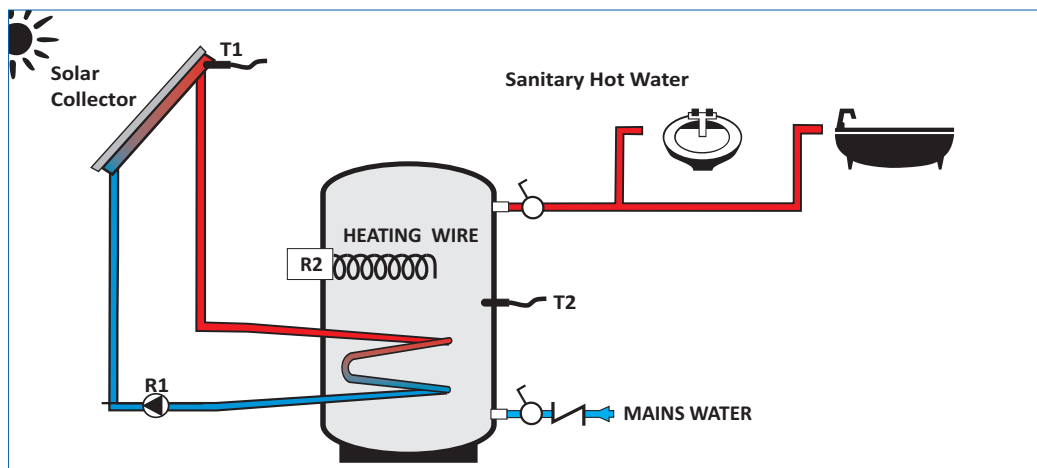
### Aplication example for   Increased Temperature of Return Circuit

When between **T4** and **T3** is detected a difference in the temperature set in the function, valve **R3** is started and circulation in the heat circuit is diverted to go through the exchanger until temperature is even. This way the system makes the most of part of the solar energy to pre-heat the return water before sending it through the Boiler.

Aplication example for   OR Function

In an installation for a storey building where the panels are used to heat storage tanks of many households, the circulation pump can be set to be turned on when prompted by one of floors stopcocks. This way the valve is switched on only when necessary.

In this case the function **OR** has to be enabled and set **R4** as the slave relay, which is the one that switches the circulation pump on; and relays **R1**, **R2** and **R3** have to be the main ones to set the status for **R4**, which means that **R4** will turn on every time one of the valves is turned on and it will turn off only when all the valves are off.
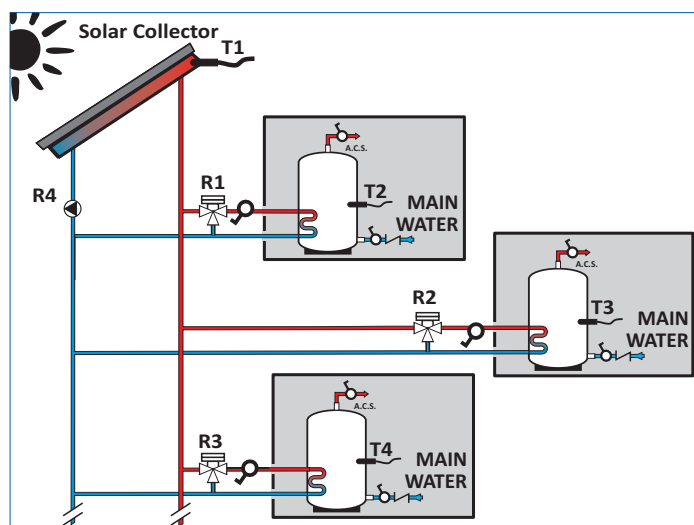
Aplication example for **Independent Storage Tank Function**

This function allows setting a differential system independent from the general system, by setting two probes without having to make one of them depend on the panel probe.

In this example a system is set through which heat transfer from the collector to the sanitary hot water tank is indirectly carried out.

This system is configured as differentials between **T1** and the rest of the probes; in order to be able to have a differential system between two probes without including **T1**, the Independent Storage Tank has to be set. In the example we have the system differential **T1** and **T2** which switches on relay 1 and then the differential through the independent storage tank function between probes **T2** and **T3** that switch on relay **2**.
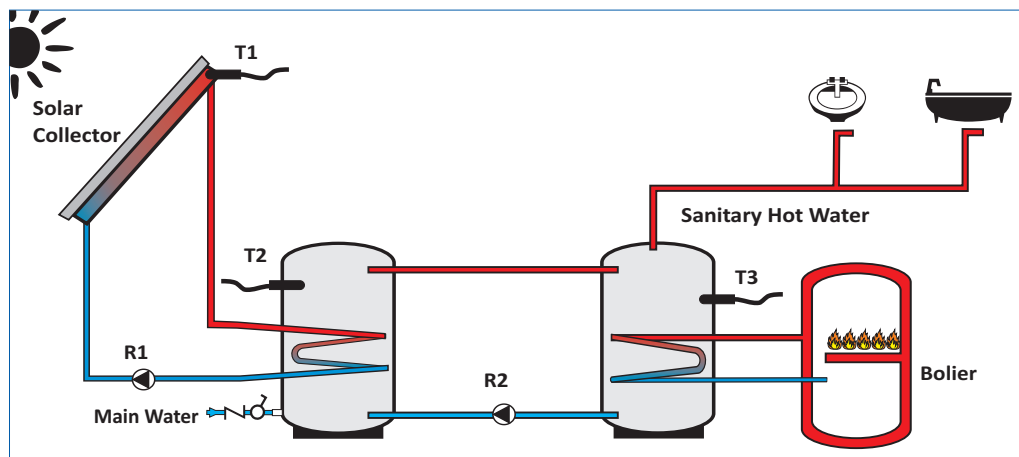

Aplication example for **Storage Tank Cooler parameter**

In installations without a aerotherm, but in favorable conditions (many tanks accumulators, not exceptionally high environmental temperature, calculated at the low collector ...) you can use the cooling of the tanks to control the high temperatures of the collectors.

tALr normally is configured with the temperature recommended by the manufacturer that promotes a long useful lives specified temperatures even higher.

Behavior of function is, used the temperature range between the recommended and maximum of storage tank, to collect excess temperature of the collector and as soon as possible remove it (at dusk), returning to the collectors the heat to make it dissipates, until the tank has returned to the recommended temperature.
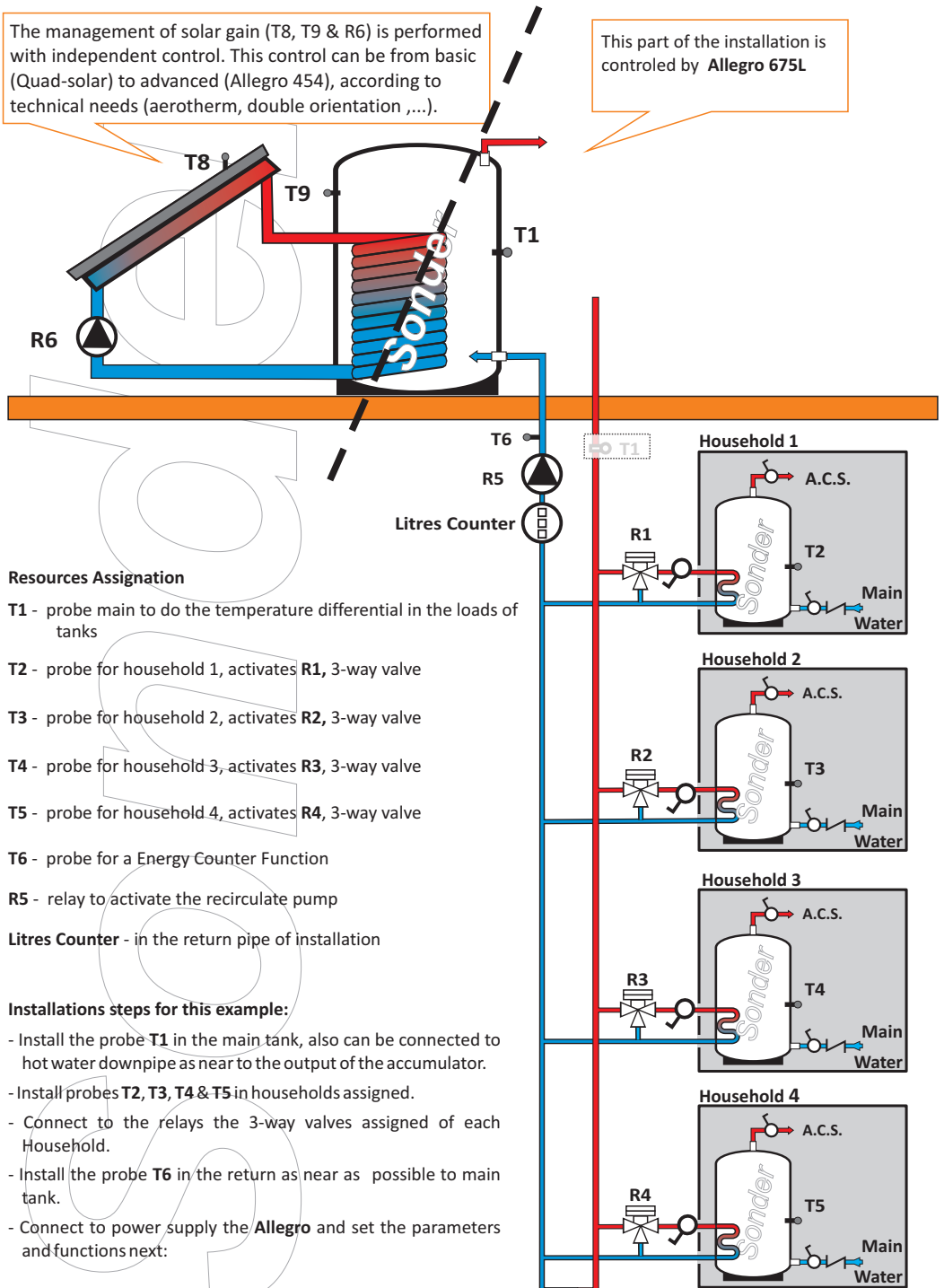
Load of Storage tank
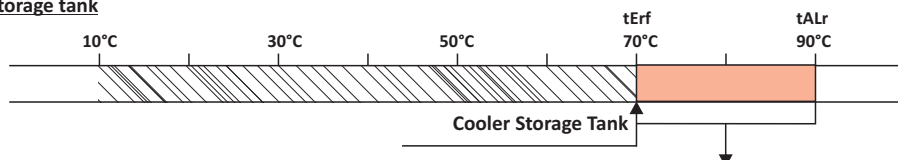
Allows rise the absorption capacity of the tanks only in the warm periods. After these periods, the temperature is normalized to a temperature most suitable for the tank.

The management of solar gain (T8, T9 & R6) is performed with independent control. This control can be from basic (Quad-solar) to advanced (Allegro 454), according to technical needs (aerotherm, double orientation ,...).

This part of the installation is controled by **Allegro 675L**

T8

T9

T1

R6

T6

R5

Litres Counter

Household 1

R1

A.C.S.

T2

Main
Water

Household 2

R2

A.C.S.

T3

Main
Water

Household 3

R3

A.C.S.

T4

Main
Water

Household 4

R4

A.C.S.

T5

Main
Water

Resources Assignation

T1 - probe main to do the temperature differential in the loads of tanks

T2 - probe for household 1, activates **R1,** 3-way valve

T3 - probe for household 2, activates **R2,** 3-way valve

T4 - probe for household 3, activates **R3,** 3-way valve

T5 - probe for household 4, activates **R4,** 3-way valve

T6 - probe for a Energy Counter Function

R5 - relay to activate the recirculate pump

Litres Counter - in the return pipe of installation

Installations steps for this example:

- Install the probe **T1** in the main tank, also can be connected to hot water downpipe as near to the output of the accumulator.

- Install probes **T2**, **T3**, **T4** & **T5** in households assigned.

- Connect to the relays the 3-way valves assigned of each Household.

- Install the probe **T6** in the return as near as possible to main tank.

- Connect to power supply the **Allegro** and set the parameters and functions next:

Parameters

NodE

A - winter

in this example is not useful 2 different alarm settings and priority, because are individual deposit per floor and all have the same configuration.

di FA	6,0 K	When are 6K between probes T1 - (T2, T3, T4, T5) the tanks are loaded
di Fd	2,0 K	With 2K between probes T1-(T2,T3,T4,T5) the load for tanks is stopped
di Ft	2,0 K	
LCMA	90°C	**Parameters of non-activated functions not need be configured.**
LCM	10°C	
LAMA	30°C	**Anyway have a factory set value**
LAM	6°C	
CAL	0,0 K	
tALr	85°C	Temperature to stop load of tank. Configured with the factory tank setting.
trEF	130°C	
Prio	5°C	
Pr SE	OFF	Off because otherwise charge only the deposit 1 to reach tALr and later only 2 to tALr ...
Li Gt	OFF	según preferencias
PASS	OFF(0) On(1...9999)	usuario / instalador
ICon		It does not mean type of functionality, only visual type
CAAd	On	Clock automatic adjust
7:53 CLOC		**These parameters only affect to Time relay and Legionella function.**
0714 2010		**configure with current hour and date**

Functions

CntE On

AC in OFF ²

rtPo On ¹

LEG OFF

Anti OFF °C

CtUb OFF

tErM OFF

tAMb OFF ²

AEro OFF ¹

dbON OFF

AUNr OFF

Or On ¹

And OFF

Energy Counter
Input Probe (hot): T1
Output Probe (cool): T6

Activate the function of **ENERGY METER** to record the energy supplied from the collector to the 4 households. We need two probes, first T1 to the input, which can be shared with the differential system, second probe to the output at the end of the circuit (the coldest part), and the litre counter installed in the pipe before the recirculation pump.

Timed Relay
Timed Relay: R5
Start Hour: 6:00
End Hour: 22:00
Days: all

With **TIME RELAY FUNCTION** can enable the relay operation of recirculation pump within a schedule for the evening will not be put in place, avoiding unnecessary noise. The pump will be launched within hours if it meets the conditions of demand.
Switch does not work as schedule.
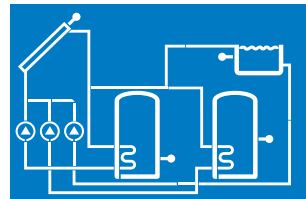
Functions that are not activated

OR
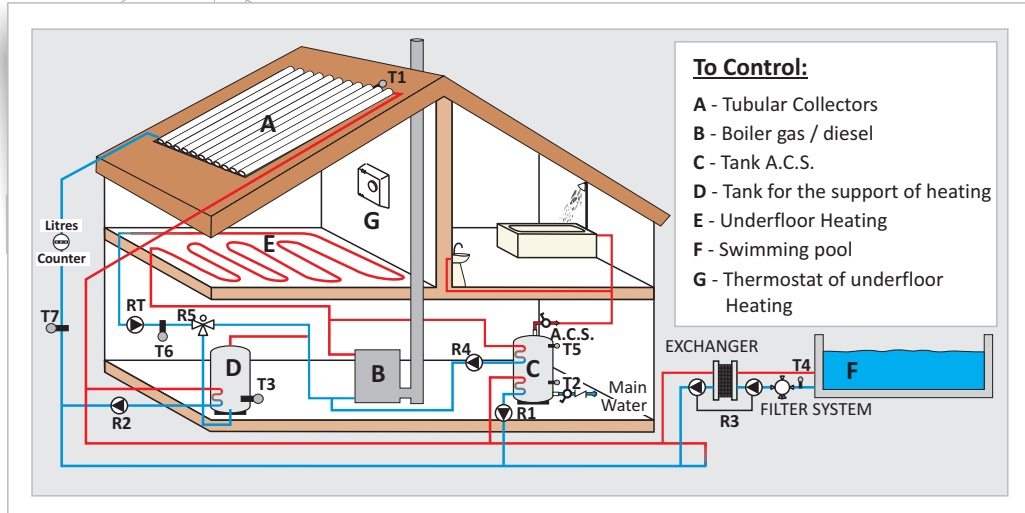**Slave Relay: R5**
Mask: R1, R2, R3 and R4

OR function is activated to configure the system circulation pump and each time a housing deposit had hot water demand would trigger the recirculation pump and valve would be opened for that houshold.

Worked example: 1 Household with Allegro 675L

In a individual household the **Allegro** allows centralized control of all devices installed, (collectors, radiators, underfloor heating, hot water, pool heating, refrigerator collector, energy counter ... etc) up to 5 outputs (relays) and 7 probes.

Example: tubular collector, 2 tanks, pool & 3 pumps

To Control:

A - Tubular Collectors
B - Boiler gas / diesel
C - Tank A.C.S.
D - Tank for the support of heating
E - Underfloor Heating
F - Swimming pool
G - Thermostat of underfloor Heating

RT - pump boiler **B** Activated by thermostat of underfloor heating **G**, these is not controled by the Allegro 675L

Resources Assignation

T1 - probe installed in solar collector, this is probe main to the temperature differential in the loads for tanks

T2 - probe installLed in tank for sanitary hot water **A.C.S.**, active **R1,** pump for these differential system

T3 - probe installed in tank for a heating support, active **R2,** pump for these differential system

T4 - probe installed in the return pipe before filter system, active **R3** conected to a pump exchanger and a pump for these diferential system, both pumps are connected in paralel

T5 - probe installed in tank for sanitary hot water **A.C.S.**, active **R4**, how independent thermostat.

T6 - probe to temperature increase of circuit return, differential system with probe **T3**. Active **R5,** 3-way valve, to divert the return of heating to pass by support tank **D**

T7 - probe for a Energy

Counter Function - in the return pipe of installation to count total energy gain

Installations steps for this example

- Install the probe **T1** to the output of tubular collectors.
- Install **T2** and **T3** probes inside tanks assigned and probe **T4** at the exit of the pool. Installation with immersion sleeve and conductive silicone.
- Connect the pumps to relays assigned for each probe (**T1** - **T2** = **R1** / **T1** - **T3** = **R2** / **T1** - **T4** = **R3**).
- Install **T5** at the top of the hot water storage tank (to read the highest Temperature) will activate **R4**, Independent Thermostat function (fucntion for guarantee minimun temperature for the gas boiler of **ACS**).
- Install **T6** in the heating return before the 3-way valve (**R5**) by the differential system between **T6** and **T3** actives **R5**. The function of temperature increase of the circuit , uses solar energy to raise temperature.
- Connect to power supply the Allegro and set the parameters and functions next:

Parameters

ModE — **A winter / b summer**
For this example can preset 2 different settings for alarm and priorities according to environment temperature (summer/winter). When is inside of mode A, the values setting is for this mode A, same procedure for mode b.

di FA	6,0 K	When are 6 K between probes T1 - (T2, T3, T4, T5) the tanks are loaded
di Fd	2,0 K	With 2K between probes T1-(T2,T3,T4,T5) the load for tanks is stopped
di Ft	2,0 K	Range of temperature between On/OFF for the Idependent Thermost, Anti-ice, tALr & Prio.
LCNA	90°C	Limits the range to set the F. of Independent thermostat.
LCN	10°C	NO need to configure

LANA
LAN
CAL

NOT INVOLVED

tALr — stop load tank when arrives these values

Storage Tank:	C (R1)	D (R2)	F (R3)
in ModE A	65°C	45°C	30°C
in ModE b	65°C	45°C	30°C

trEF — **NOT INVOLVED**

Prio — cease priority when arrives these values

Storage Tank:	C (R1)	D (R2)	F (R3)
in ModE A	60°C	40°C	5°C
in ModE b	60°C	5°C	28°C

PrSE	On	1st load A.C.S, 2nd load heating and 3rd load pool, load till Prio
Li Gt	OFF	**according preferences of user / Installator**
PASS	OFF(0) On(1...9999)	

ICon — It doesn´t mean type of functionality, only visual type to identificate the differents tanks

C (R1)	D (R2)	F (R3)

CAAd
7:53
CLOC
07 14
20 10
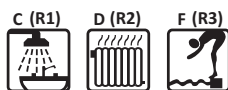
These parameters only affect to Time relay and Legionella function.

No need to adjust it

Functions

CntE — **On**

AC in — OFF

rtPo — OFF

LEG — OFF

Anti — **6 °C**

CtUb — On

tErN — On

tAnb — OFF

AEro — OFF

dbON — OFF

AUNr — On

Or — OFF

And — OFF

Energy Counter
Input Probe (hot): T1
Output Probe (cool): T7

Estimate the energy supplied from the collector to the installation. trough two probes, **T1** to the input, shared with the differential system, **T7** to the output at the end of the circuit (the coldest part), and the litre counter installed in the pipe before the recirculation pump.

Functions that are not activated

Anti-ice
Temperature: 6°C

When it detects that the temperature of **T1** drops to 6°C, active the pumps of tanks to take the heat of the installation by means of circulation.

Tubular Collector
On / OFF: On

Update the read for probe **T1** trough a small circulation.

Independent Thermostat
Temperature: 45°C
Probe: T5
Relay: R4

Use the gas boiler how support to guarantee that the tank of ACS always be at least 45°C, although collectors can not reach the load conditions.

Functions that are not activated

Temperature Increase of Circuit Return

Relay: R5
Exchanger Probe: T3
Return Probe: T6
Differential between Probes: 3,0 K

Divert the return of heating to pass by support tank loaded by collectors. uses solar energy to increase temperature before activate the boiler. Energy Saving