Solar Block Set up and User Manual

Thermodynamic Solar System

CENTRAL HEATING

SWIMMING POOLS HEATING

DOMESTIC HOT WATER - XL

"Solar enhanced thermodynamics
The smartest way to heat water"

Manual updated May 2024

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Very important!

Please read the following instruction manual thoroughly before any installation works or operation of the solar system proceeds! Failure to install the equipment as detailed in this manual invalidates the warranty and could endanger people and damage property.

The following safety warnings must be heeded: -

	This appliance must be installed to our installation instructions, AS/NZS 3500, and to the New Zealand Building Code G12 Water supplies whenever applicable.
	The fixing of the solar panels and pipework must comply with the current relevant selections of the New Zealand Building Code and must not compromise the structural integrity of the building.
	Materials and fittings used to install this appliance must meet the requirements of AS/NZS 3500.4: 2003 Section 2.
	The electrical installation of the equipment must comply with the current AS/NZ standards and the New Zealand national electrical regulations.
	The electrical input required may be 1 phase, 240v~/50 Hz, or 3-phase 400vac/50hz.
	All hot water pipes must be installed to satisfy the requirements of New Zealand Building Code Clause H1.3.4, (except where connected to a heat dissipation device).
	The wind loading of the panels should be accounted for, and may need to be certified.
	This system must have a water softener installed if the water PH levels are less than 6.5 or are greater than 8.5 as per AS/NZS 3500.4 Appendix B.
	The system must not be turned on and compressor must not be run until the installation of the pipework has been completed and the system has been charged with the correct amount of refrigerant.

Table of contents

1. Introduction

The Energie Solar Block is a highly efficient, solar enhanced, air-water heat pump system. It can be used for large scale domestic hot water, central heating, and swimming pool heating. The system is capable of simultaneously controlling two systems at different temperatures so it can also be used for a combination of two of the above.

Due to the solar radiation, the system will perform very efficiently when the sun is shining but will still function as a heat pump when there is no sun, or at night, even in the rain and snow.

There are a number of possible "Plant" configurations for the Solar Block, depending on the situation, what it is controlling, and what backups are required. These are shown in chapter 8.
The system comes in a range of sizes and thermal outputs, with models using 6, 12, 16, 28, and 40 solar panels.
The system is also available as a High Temperature unit, to achieve 65°C.

1.1 The main components of the system

The Solar Block Thermodynamic System is made up of two main components:

1.1.1. The Solar Block Unit

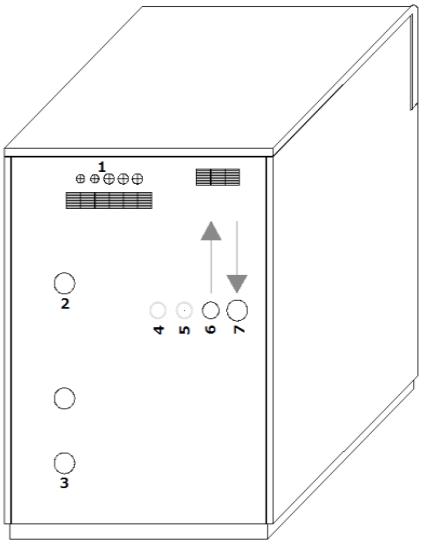
A steel plate Box with Polyester painting.
Emerson Copeland Scroll hermetic compressor.
Heat Exchanger (depending on the option)
Expansion Valve (Electronic)
Oil Separator
Liquid Tank
Filter
Liquid Level Glass
Low pressure and High pressure safety switches
Temperature probes (4)
Safety thermostat (mechanical)
Electrical equipment and connections are rear.
Hydraulic connections and gas connections are at the rear.
Access to the control panel and electrical connections is via the lid that lifts upwards.

Model	A (mm)	L (mm)	P (mm)
Solar Block 6 … 16	940	555	550
Solar Block 28 … 40	940	655	640

Table: Dimensions of the thermodynamic Solar Blocks

Depending on the model, the Solar Block may include an internal gas/water plate heat exchanger, or an external heating coil or titanium tube heat exchanger.

The connections for the Solar Block are at the back of the unit as shown below.



Key:	
1	Electrical connections
2	Water outlet
3	Water inlet
4	Exchanger outlet (Gas)
5	Exchanger inlet (Gas)
6	Outlet for Panels
7	Panels Return

1.1.2. Solar Panels

Each Solar Panel is a roll-bond type plate manufactured in double channel pressed aluminium, with a post-press anodization-oxidation that creates a dark tone aspect.

Packaging, Storage & Transportation

All Energie – Thermodynamic Solar Systems products are to be kept in the original packaging and **must be stored and transported in the upright position**.
The panels are fragile, so need to be transported with care

The compressor in the system contains oil and must not be tipped over at any stage.

1.2 Refrigeration gas

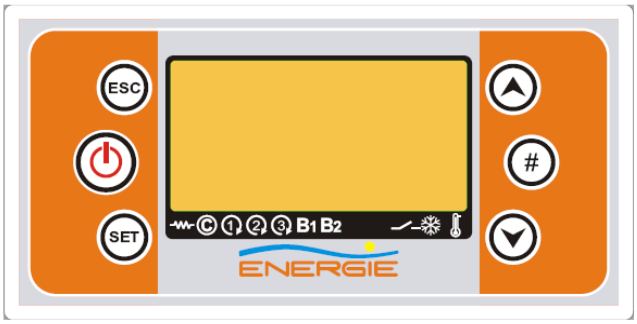
The refrigeration gas used in the Eco system is R407C. This is CFC free, is non-inflammable and does not harm the ozone layer.

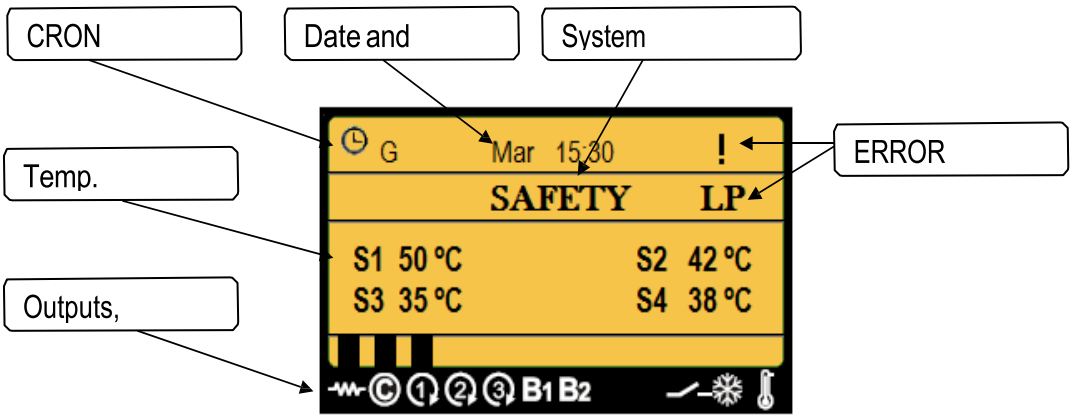
- The system does not come with any gas and must be added once the system has been fully installed, pressure tested, and vacuumed to remove any moisture.
- Legally, in New Zealand the refrigerant in this system cannot be released into the environment.
- **Handling of the refrigerant must be carried out by an approved refrigeration technician.**

Note that R513A is a direct replacement for R407C. This has a lower GWP than R32 and is not classed as flammable.

2 Display and Control configuration

The control panel display for the Solar Block is located at the front under the hinged lid.
Lift the lid to see the display.





The temperature probes are:

S1: Water temperature in the heat exchanger.
S2: Gas temperature in the heat exchanger.
S3: Temperature in the buffer tank, (location of probe S3).
S4: Temperature in the Domestic hot water tank (location of probe S4).

Note: Depending on the plant configuration, S3 or S4 may not be used or visible on the display.

The following led lights are shown at the bottom of the display:

LED	FUNCTION	DESCRIPTION
	RESISTANCE	**LED ON**: On **LED OFF**: Off **LED blinks**: after pressing the key P5, the resistance may switch on if the conditions are right.
	COMPRESSOR	**LED ON**: On **LED OFF**: Off **LED blinks**: Time-setting (timer T06)
	PUMP 1	**LED ON**: Pump is working

	PUMP 2	**LED ON**: Pump is working
	PUMP 2	**LED ON**: Pump is working
B1	**BACKUP 1**	**LED ON**: Backup system 1 is on. **LED blinks**: Time-setting (timer T02)
B2	**BACKUP 2**	**LED ON**: Backup system 2 is on. **LED blinks**: Time-setting (timer T03)
	INPUT V	**LED ON**: Closed contact **If P09=1** **LED OFF:** Open contact
	EXTERNAL THERMOSTAT	**LED ON**: Closed contact **LED OFF:** Open contact
	ENVIRONMENT THERMOSTAT	**LED ON**: Temperature of the environment is below the set value (closed contact)

Function of the keys

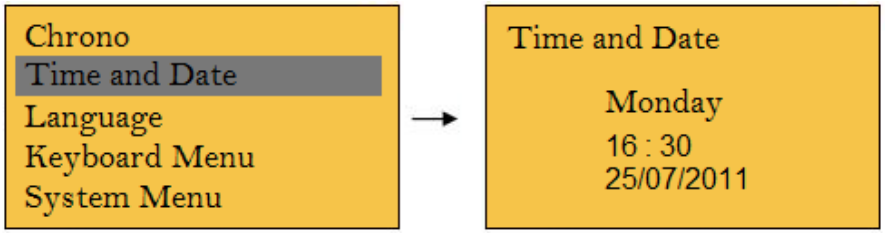
KEY	FUNCTION	DESCRIPTION
ESC	**RETURN**	ESC function enables leaving a menu or sub-menu.
	UNBLOCK	When the system is frozen press the key for 3 seconds until you hear the sound signal.
	ON/OFF	Switch on/ switch off the equipment (press for 3 seconds).
SET	**MENU**	Open menu and Sub-Menu.
	MODIFY	Open the option to modify parameters.
	SET	Save data.
	CHANGE VALUES	It enables setting / modifying the values for the parameters.
	RUN MENU / SUB-MENU	Function for running menus and sub-menus.
	DISPLAY	Function for consulting values of parameters.
#	**ON / OFF RESISTANCE**	Pressing the key enables switching on and off the resistance.

2.1 Programming the system

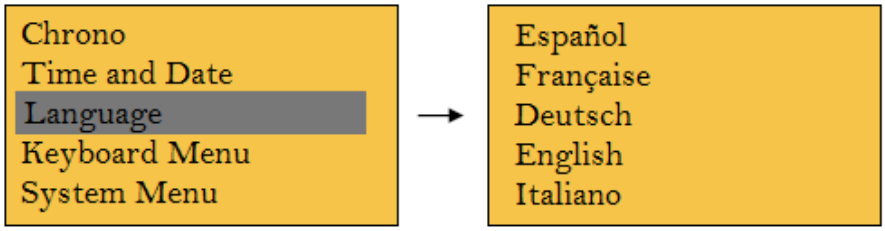
This chapter will describe the control display and how to program the system.
The menu is divided into the following chapters:

- Sleep (Crono) menu
- Date and time menu
- Language menu
- Keyboard setup menu
- System menu

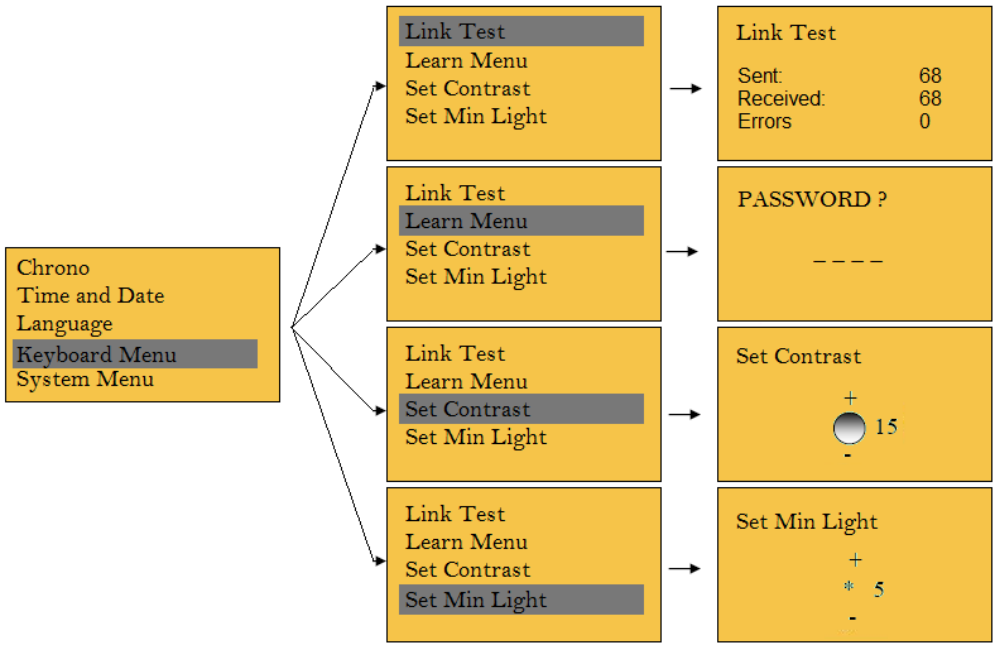
2.2 System time and date



2.3 System language

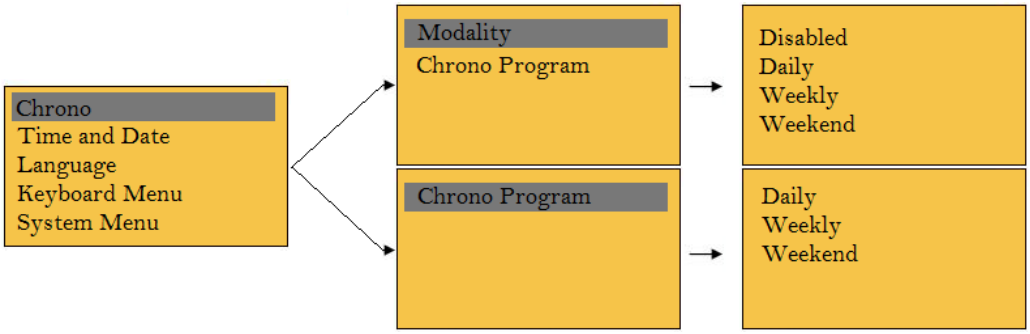


2.4 Keyboard menu



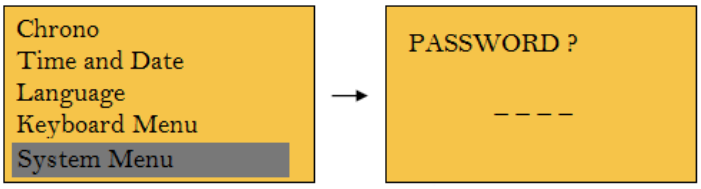
2.5 Sleep (Crono) function

This is a sleep function, to allow the system to be stopped and started on time.



2.6 System menu

This enables setup of the system, setting the Plant, changing parameters etc



In order to access the system setup and parameters, a password must be entered. The default password is “0000”

Press 

to get to the first number, use the up/down arrows  to select the number.

Once the password has been accepted, the following menu will be displayed.

Display	
Function	**Description**
Plumbing Plant Parameters Buffer 1 Buffer 2 AQS Counters	**Installation Plant**
	Set / consult system parameters
	Set / consult parameters for Dep. of Inertia (Probe 3)
	Set / consult parameters for AQS Dep. (Probe 4)
	Counters
Output's Test Restore Factory Values	**Test outputs**
	Restore factory parameters

To check or change the parameters, use the following keys:

Display	
Function	**Description**
	**Gain access to selected parameter** **Run through parameters**
	**Save value for parameter and move to the next one**
	**Cancel value for parameter or leave menu**

2.7 Main Parameters

Code	Type	Name	Min	Set	Max	U.M.
THS101	Thermostat S1 Probe	Min Temperature	0	5	60	°C
THS102	Thermostat S1 Probe	Max Temperature	1	45	80	°C
HYS102	Thermostat S1 Probe	Differential Temperature THS102	1	5	50	°C
THS103	Thermostat S1 Probe	Alarm Thermostat	10	55	85	°C
THS201	Thermostat S2 Probe	Alarm Thermostat	10	60	85	°C
T01	Timer	Maximum time for Compressors Off	1	12	2000	hr
T06	Timer	Delay to switch on the Compressors	0	1	20	min
T07	Timer	Start Delay	0	2	60	min
T08	Timer	Compressor work time	5	15	20	hr
T09	Timer	Compressor pause time	20	30	120	min
P08	Configuration	Pumps Priority (1=priority to Sanitary Pump)	0	0	1	nr
P09	Configuration	Input V configuration (0=S4 probe, 1=contact)	0	0	1	nr
P10	Configuration	Enable Modem	0	0	1	nr
P11	Configuration	Aux1 Output management: 0=output not used; 1=Back Up 2; 2=Error Signaller	0	1	2	nr

Note 1: T01 → Timer is activated every time the compressor comes to a halt. When the timer exceeds the set time, and the compressor starts again, it will activate T07 and connect the carter resistance.

Note 2: Sequence of Circulation Pumps

- **P08 = 0** → **Simultaneous Pumps**. According to the adopted installation diagram, the Pumps can operate simultaneously in the following plans:
  - Plant 2 and 8 (P1 and P3).
  - Plant 9 and 10 (P2 and P3).

- **P08 = 1** → **Priority of Pump for (AQS).** According to the adopted installation diagram, the Pump for AQS has priority in the following plans:
  - Plant 2, 8 and 9 (P3 (AQS) has priority over P1)
  - Plant 10 (P3 (AQS) has priority over P2)

- **P09 = 0** → Input V is set to "read" a temperature probe (Probe 4).
- **P09 = 1** → Input V is set to "read" a contact.

The value for T07 MUST NEVER be below 20 min.

2.8 Buffer 1 Parameters

Code	Type	Name	Min(°C)	Max(°C)	Factory parameter
T02	Timer	Delay Backup 1	1	60	**1 min**
THS301	S3	Minimum temperature	10	50	**35 °C**
HYS301	S3	**TH301** Temperature gradient	1	10	**5 °C**
THS302	S3	Maximum temperature	20	65	**45 °C**
HYS302	S3	**TH302** Temperature gradient	1	10	**5 °C**
THS303	S3	Alarm temperature	10	80	**60 °C**
HYS303	S3	**TH303** Temperature gradient	1	10	**3 °C**
THS304	S3	Backup 1 Minimum temperature	10	60	**38 °C**
THS305	S3	Backup 1 Maximum temperature	20	80	**50 °C**
HYS305	S3	**TH305** Temperature gradient	1	50	**15 °C**
THS306	S3	Minimum Temperature 2	10	50	**35 °C**
HYS306	S3	**TH306** Temperature gradient	1	10	**5 °C**

2.9 Buffer 2 Parameters

Code	Type	Name	Min(°C)	Max(°C)	Factory parameter
T03	Timer	Delay Backup 2	1	60	**1 min**
THS402	S4	Maximum temperature	20	65	**45 °C**
HYS402	S4	**TH402** Temperature gradient	1	10	**5 °C**
THS403	S4	Alarm temperature	10	80	**60 °C**
HYS403	S4	**TH403** Temperature gradient	1	10	**3 °C**
THS404	S4	Backup 2 Minimum temperature	10	60	**38 °C**
THS405	S4	Backup 2 Maximum temperature	20	80	**50 °C**
HYS405	S4	**TH405** Temperature gradient	1	50	**15 °C**
THS406	S4	DHW Temperature	20	60	**50 °C**
HYS406	S4	**TH406** Temperature gradient	1	10	**5 °C**

2.10 Anti legionella Function

The system is capable of controlling an external electrical element in a domestic hot water tank as an anti-Legionella function.

The Anti Legionella function operates from the B2 output and uses the S4 temperature probe.
It is available for plumbing plants 7, 8, 9, 10, 11 and 12. It can operate in Check Up, Normal, or Safety modes (not Off).

The maximum power on the B2 output is 2amps, or around 500w. For power greater than this, a relay must be used.

The NZ Building Code G12 regulation regarding protection of hot water storage from Legionella is daily to greater than 60°C, or weekly to greater than 60°C for 1 hour.

The function can be set to weekly by setting the P12 parameter.
P12 = 1 will operate daily, P2=2 will operate weekly, P12=3 will operate monthly.

THS407 is the temperature for the disinfection.
T04 timer is for the time at this set point.
T05 is the maximum time allow to reach the disinfection temperature (THS4070).

So, to comply with the NZ building regulations, set P12 = 2, P13 = 0, THS407 = 60, and T04 = 60

When the Anti legionella function activates, the display will show “DSF”, and the backup B2 output will be active.
If the time for the temperature S4 to get to THS407 takes longer than T05, or S4 gets greater than THS408, the function will stop, the B2 will turn off and a “Fail DSF” will display.

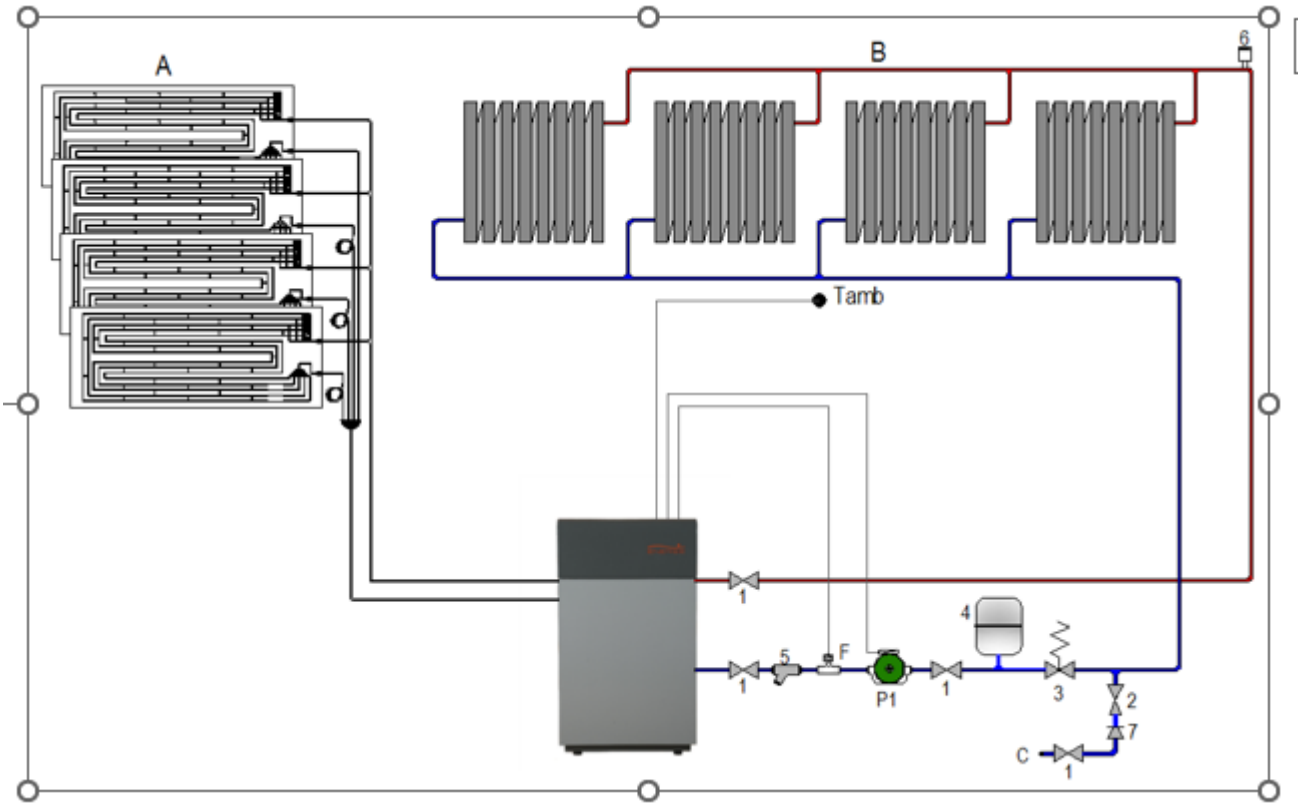
Anti legionella function parameters

Parameter	Type	description	set	unit
P12	Configuration	Antilegionella function in automatic mode management: 0=function disable; 1=daily repetition; 2=weekly repetition; 3=monthly repetition	0	day
P13	Configuration	Enable Antilegionella function in manual mode: 0= OFF ; 1=ON	0	
T04	Timer	Time for S4 probe temperature greater than **THS407**	5	min
T05	Timer	Maximum time to reach **THS407** Temperature.	60	min
THS407	S4 probe	Antilegionella setpoint temperature	65	°C
THS408	S4 probe	Maximum temperature for BackUp2	80	°C

3 Common Installation configuration options – “Plants”

3.1 Plant 1: Simple heating system

Basic control with inputs S1 (return water temp) and S2 (gas temp) and one pump output P1
System will start and stop on water return temperature, S1.
Note: This may be used for swimming pool with external heat exchanger and external S1 probe.



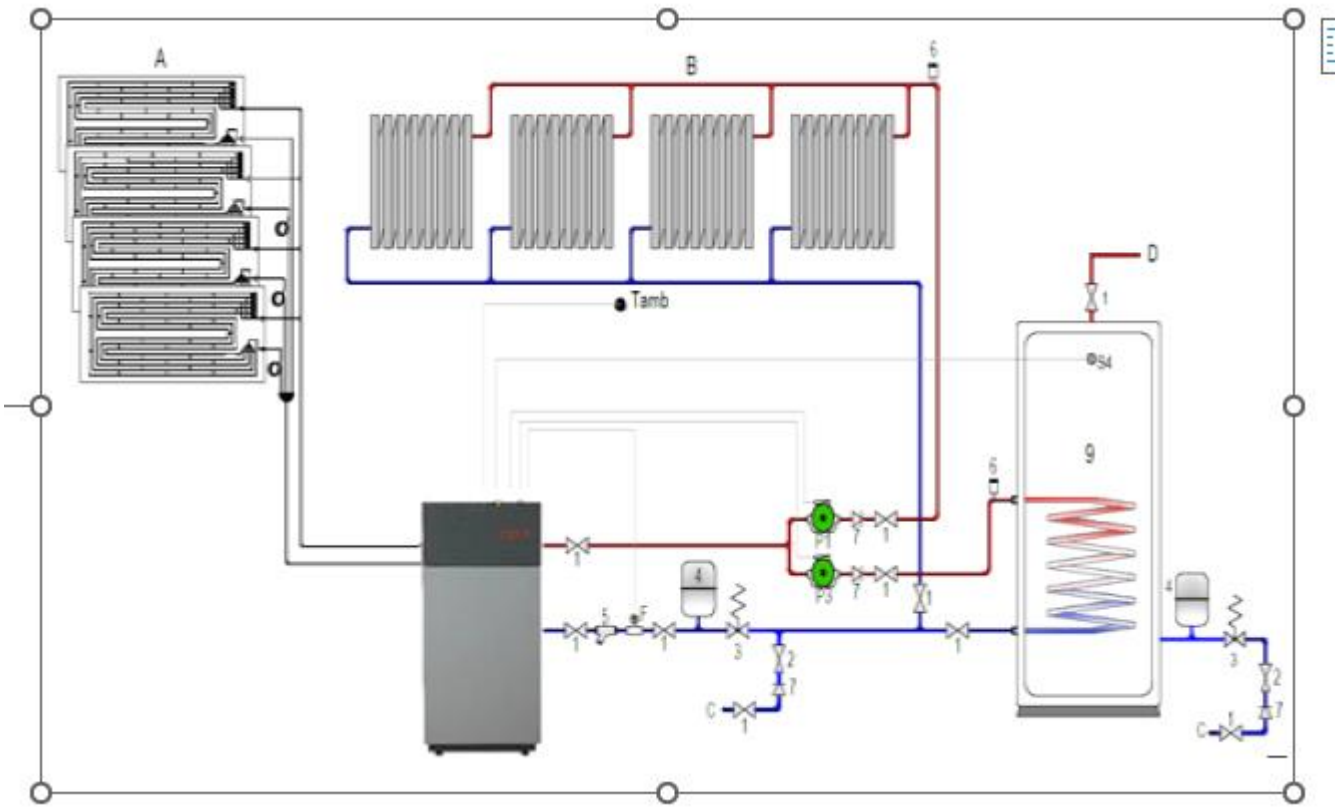
Parameters:

Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min compressor **OFF**
T06	Timer	Timer (delay in compressor start-up)
T07	Timer	Timer (delay in compressor start-up, carter resistance is ON)

Inputs (Probes): **S1** and **S2**
Outputs: Pump **P1**

3.2 Plant 2: Central heating direct and DHW with coil

Inputs S1 (return water temp), S2 (gas temp) and S4 (DHW temp), and two outputs P1, and P3
Note this could be also used for central heating and swimming pool.



Parameters:

Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min compressor **OFF**
T06	Timer	Timer (delay in compressor start-up)
T07	Timer	Timer (delay in compressor start-up, carter resistance is ON)
P08	Conf.	Priorities of circulation pumps
P09	Conf.	Set reading for input V

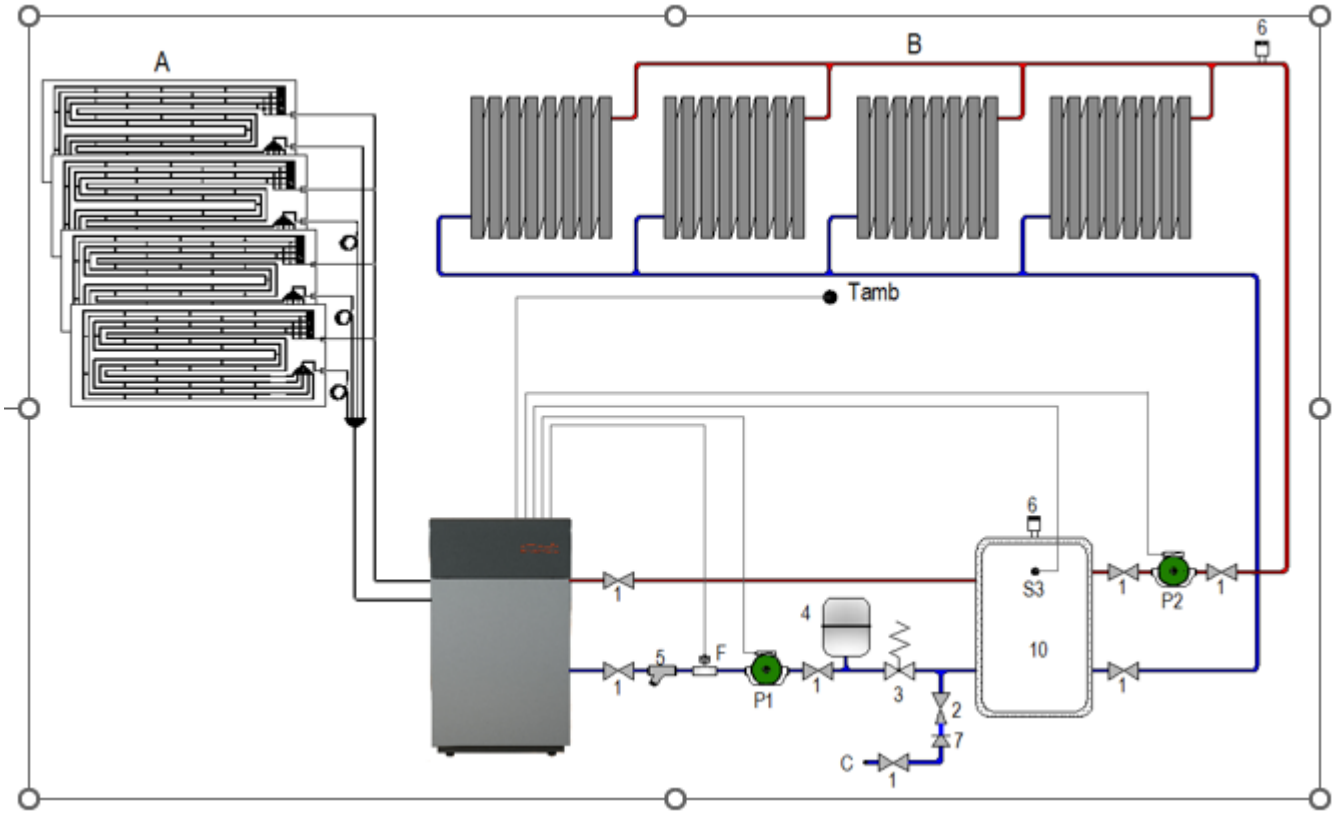
Buffer 2 DHW:

Code	Type	Name
THS406	S4	DHW Temperature
HYS406	S4	**THS406** Temperature Gradient

Inputs (Probes): **S1, S2** and **S4**
Outputs: Pump **P1** and Pump **P3**

3.3 Plant 3: Central heating system with buffer tank

System will control to temperature in buffer tank but can control pump from buffer tank to central heating.
Inputs S1 (return water temp), S2 (gas temp) and S3 (buffer tank temp), and two outputs P1, and P2



Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min Compressor **OFF**
T06	Timer	Timer (delay in compressor start-up)
T07	Timer	Timer (delay in compressor start-up, carter resistance is ON)

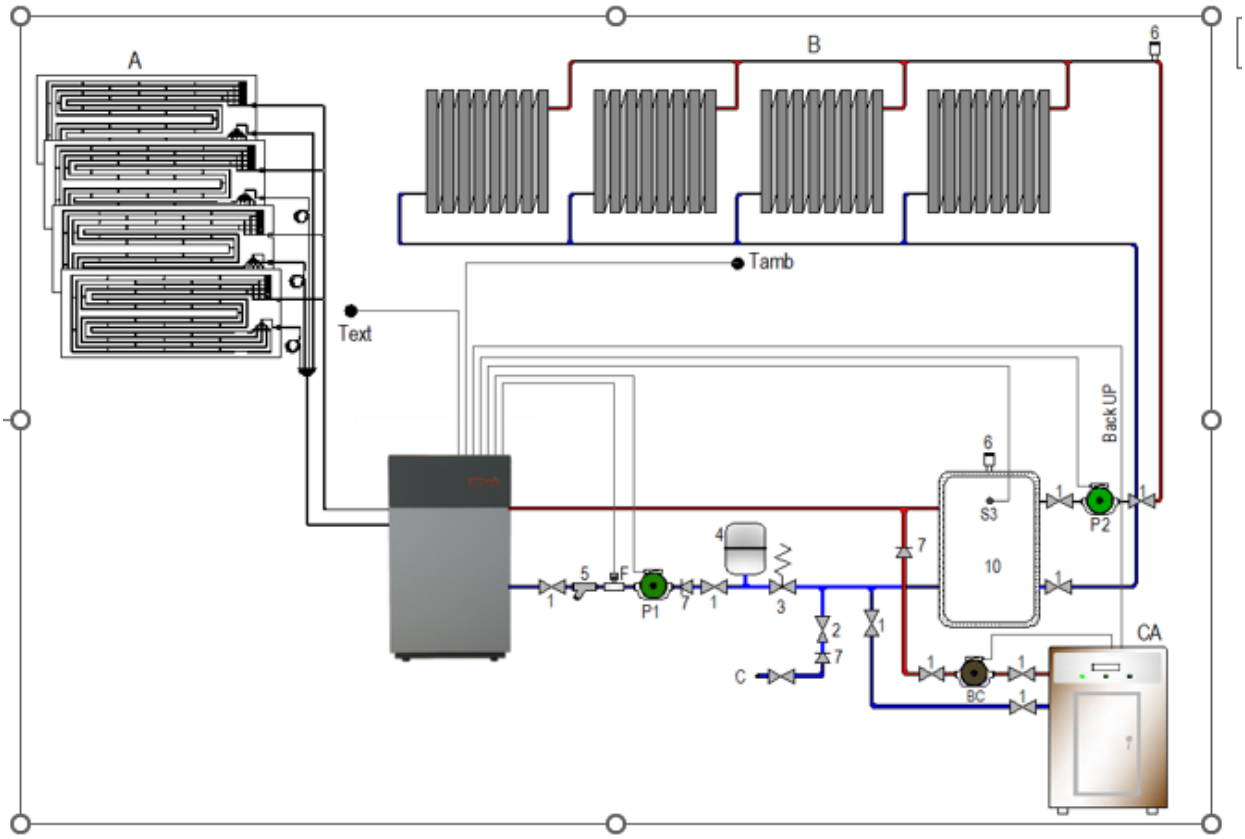
Buffer 1:

Code	Type	Name
THS301	S3	Start-up Minimum Temperature P2
HYS301	S3	**THS301** Temperature Gradient
THS302	S3	Maximum Temperature STOP Block ENER
HYS302	S3	**THS302** Temperature Gradient
THS303	S3	Alarm Temperature
HYS303	S3	**THS303** Temperature Gradient

Inputs (Probes): **S1**, **S2** and **S3**
Outputs: Pump **P1** and Pump **P2**

3.4 Plant 4: Central heating with buffer tanks and backup

System will control to temperature in buffer tank but can control pump from buffer tank to central heating. Will control backup heating system.
Inputs S1 (return water temp), S2 (gas temp) and S3 (buffer tank temp), and three outputs P1, P2, and B1.



Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min Compressor **OFF**
T06	Timer	Timer (delay in the compressor's start-up)
T07	Timer	Timer (delay in the compressor's start-up, carter resistance is ON)

Buffer 1

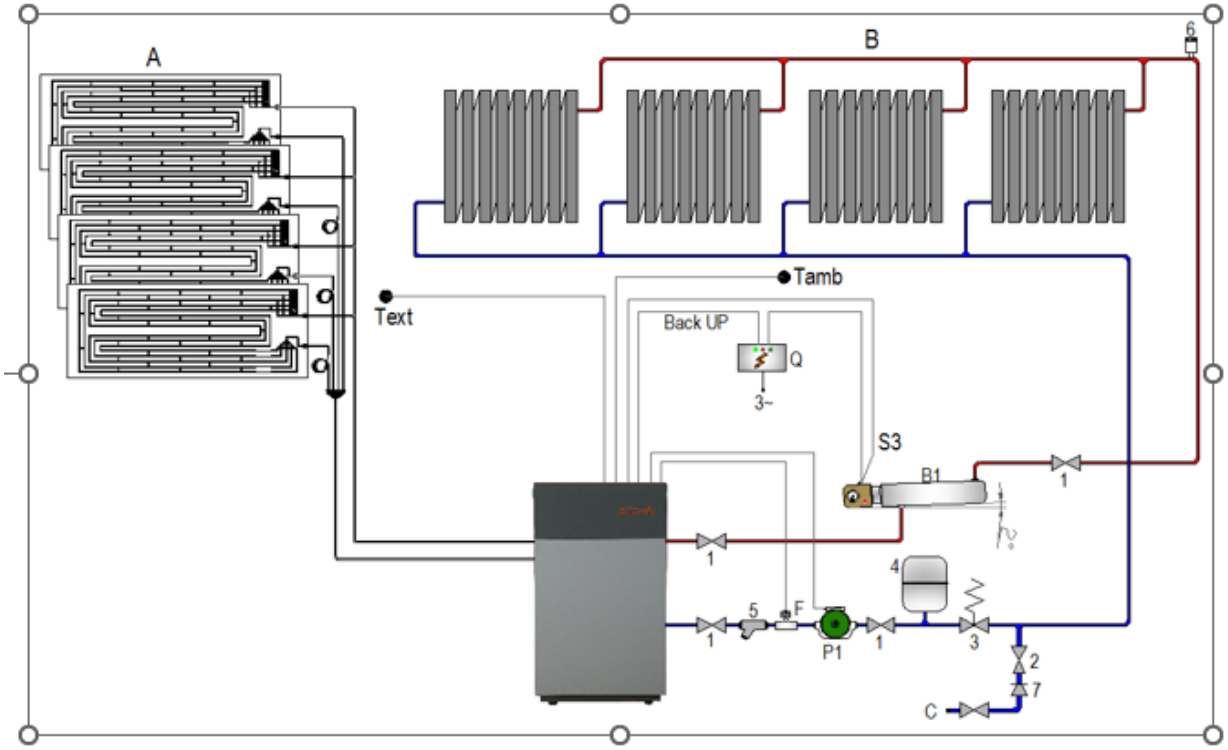
Code	Type	Name
T02	Timer	Delay in the start-up Backup 1
THS301	S3	Start-up minimum temperature P2
HYS301	S3	**THS301** Temperature Gradient
THS302	S3	Maximum Temperature STOP Block ENER
HYS302	S3	**THS302** Temperature Gradient
THS303	S3	Alarm Temperature
HYS303	S3	**THS303** Temperature Gradient
THS304	S3	Start-up minimum temperature Backup 1
THS305	S3	Maximum Temperature STOP Backup 1
HYS305	S3	**THS305** Temperature Gradient

Inputs (Probes): S1, S2 and S3
Outputs: Pump P1, Pump P2 and Backup 1 B1

Note: B1 will only start if the external thermostat is closed (LED ❄ ON).

3.5 Plant 5: Central heating with inline backup

Central heating with inline backup heater. System will control to temperature in the central heating line. Will control backup heating system.
Inputs S1 (return water temp), S2 (gas temp) and S3 (in line temp), and two outputs P1, and B1.



Parameters:

Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min Compressor **OFF**
T06	Timer	Timer (delay in the compressor's start-up)
T07	Timer	Timer (delay in the compressor's start-up, carter resistance is ON)

Buffer 1

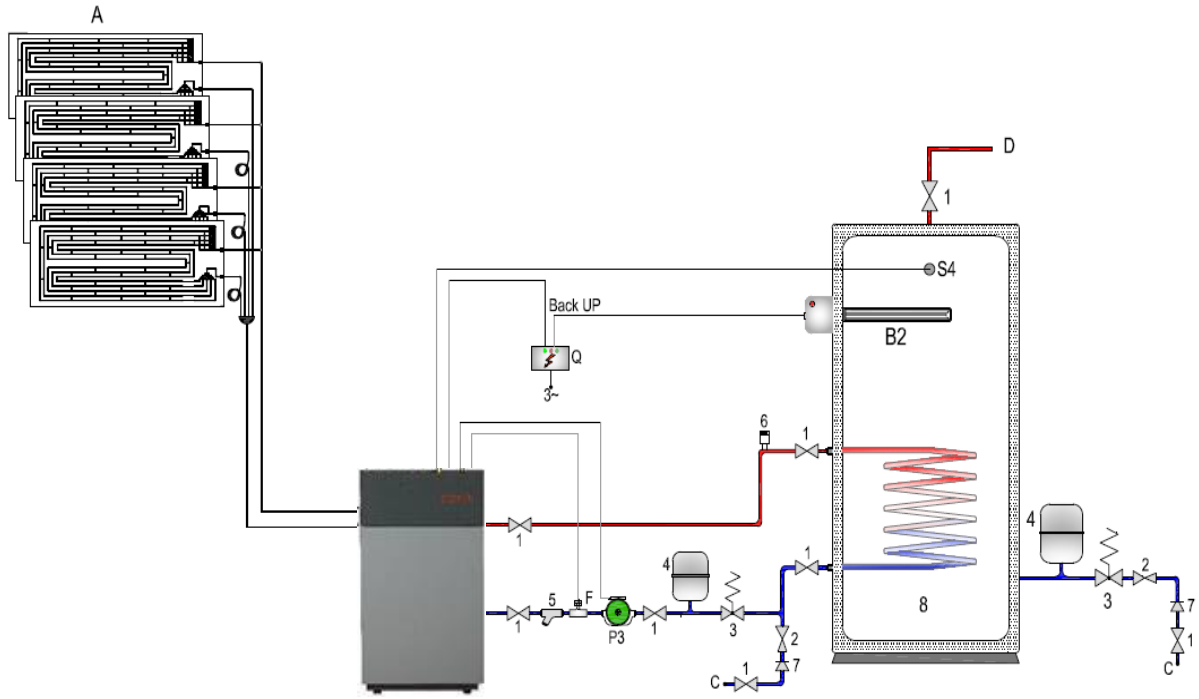
Code	Type	Name
T02	Timer	Delay in the start-up Backup 1
THS301	S3	Start-up minimum temperature P2
HYS301	S3	**THS301** Temperature Gradient
THS302	S3	Maximum Temperature STOP Block ENER
HYS302	S3	**THS302** Temperature Gradient
THS303	S3	Alarm Temperature
HYS303	S3	**THS303** Temperature Gradient
THS304	S3	Start-up minimum temperature Backup 1
THS305	S3	Maximum Temperature for STOP Backup 1
HYS305	S3	**THS305** Temperature Gradient

Inputs (Probes): **S1**, **S2** and **S3**
Outputs: Pump **P1** and Backup 1 **B1**

Note: B1 will not start unless the external thermostat is closed (LED ❄ ON).

3.6 Plant 7: Domestic hot water with coil and backup

Domestic hot water using intermediation heating loop, with optional backup system. System will control to temperature in domestic hot water tank, control pump in heating loop. Will control backup heating system.
Inputs S1 (return water temp), S2 (gas temp) and S4 (DHW tank temp), and two outputs P3, and B2.
Note: This can be used for system with two tanks in series, measure temp in second tank.



Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	THS102 Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min compressor OFF
T06	Timer	Timer (delay in the compressor's start-up)
T07	Timer	Timer (delay in the compressor's start-up, carter resistance is ON)
P09	Conf.	Set reading for input V

Buffer 2 DHW:

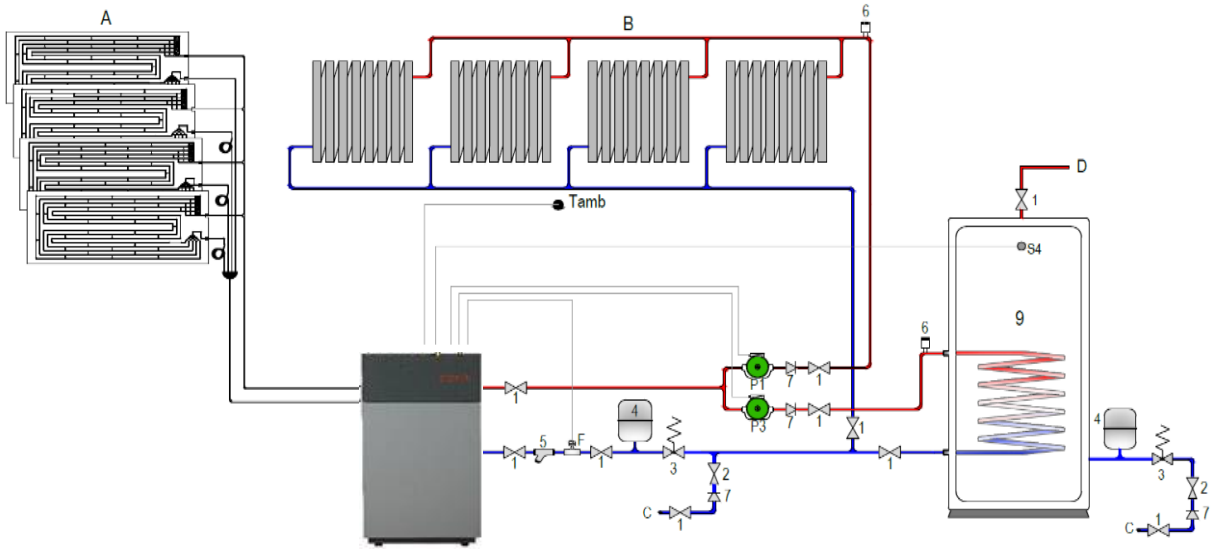
Code	Type	Name
T03	Timer	Delay in the start-up Backup 2
THS404	S4	Start-up minimum temperature Backup 2
THS405	S4	Maximum Temperature STOP Backup 2
HYS405	S4	**THS405** Temperature Gradient
THS406	S4	DHW Temperature (Set point)
HYS406	S4	**THS406** Temperature Gradient

Inputs (Probes): **S1**, **S2** and **S4**
Outputs: Pump **P3** and Buffer **B2**

Nota: B2 will not start unless the external thermostat is closed (LED ❄ ON).

3.7 Plant 8: Central heating and DHW with coil

With central heating and domestic hot water tank with an intermediate heating coil, and backup on DHW.
System will control to temperature in domestic hot water tank, and control pump for central heating and pump in DHW heating loop.
Inputs S1 (return water temp), S2 (gas temp) and S4 (DHW temp), and three outputs P1, P2, and B1



Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min Compressor **OFF**
T06	Timer	Timer (delay in the compressor's start-up)
T07	Timer	Timer (delay in the compressor's start-up, carter resistance is ON)
P08	Conf.	Priorities of Circulation Pumps
P09	Conf.	Set reading for input V

Buffer 2 DHW:

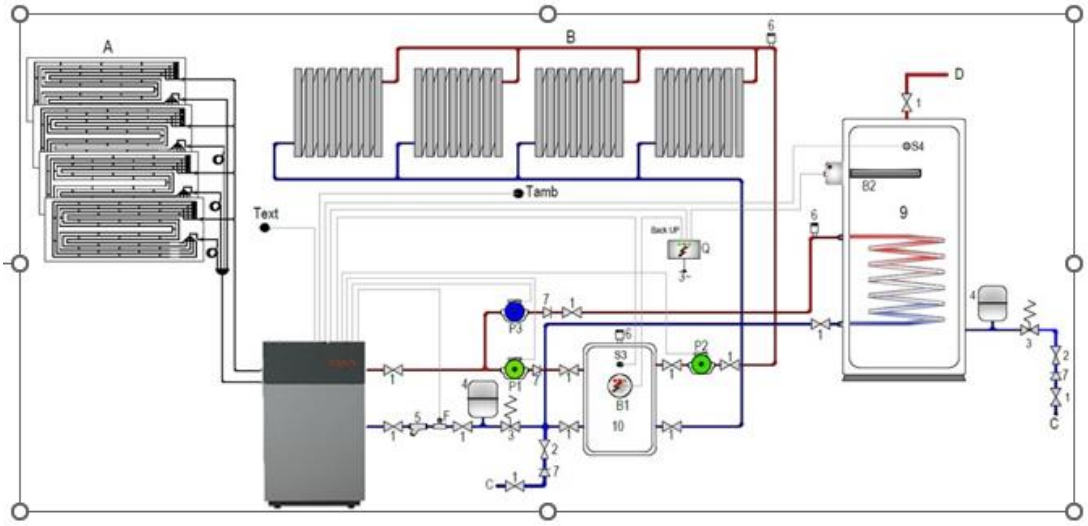
Code	Type	Name
T03	Timer	Delay in the start-up Backup 2
THS404	S4	Start-up minimum temperature Backup 2
THS405	S4	Maximum Temperature STOP Backup 2
HYS405	S4	**THS405** Temperature Gradient
THS406	S4	DHW Temperature (Set point)
HYS406	S4	**THS406** Temperature Gradient

Inputs (Probes): **S1**, **S2** and **S4**
Outputs: Pump **P1**, Pump **P3** and Buffer **B2**

Nota: B2 will not start unless the external thermostat is closed (LED ❄ ON).

3.8 Plant 9: Central heating with buffer tank, and DHW with coil

Central heating with a buffer tank, and domestic hot water tank with an intermediate heating coil, and backup on both central heating and DHW.
System will control to temperature separately in both the central heating buffer tank and the domestic hot water tank. It will control pumps for buffer tank, central heating, and pump in DHW heating loop. It can also control backups for central heating and DHW.
Inputs S1 (return water temp), S2 (gas temp), S3 (buffer tank temp), and S4 (DHW temp), and five outputs P1, P2, P3, B1, and B2



Parameters:

Code	Type	Name
THS101	S1	Minimum Temperature (water return)
THS102	S1	Maximum Temperature (water return)
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature (water return)
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min compressor **OFF**
T06	Timer	Timer (delay in the compressor's start-up)
T07	Timer	Timer (delay in the compressor's start-up, carter resistance is ON)
P08	Conf.	Priorities of Circulation Pumps
P09	Conf.	Set reading for input V

Buffer 1:

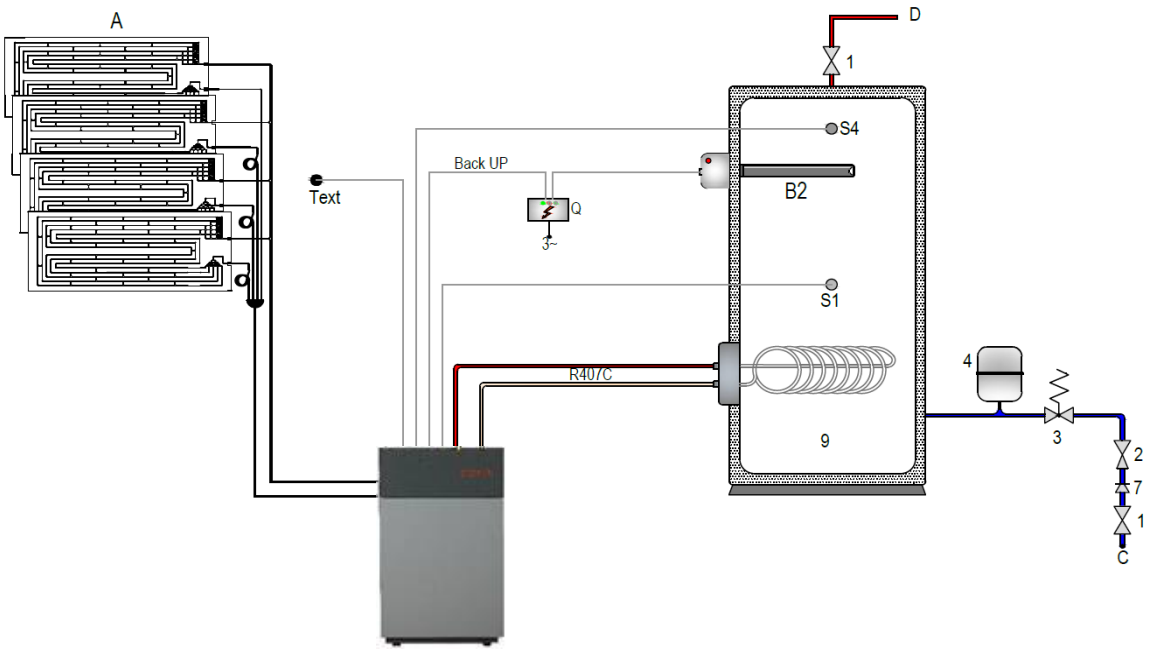
Code	Type	Name
T02	Timer	Delay in the start-up Backup 1
THS301	S3	Start-up minimum temperature P2
HYS301	S3	**THS301** Temperature Gradient
THS302	S3	Maximum Temperature STOP Block ENER
HYS302	S3	**THS302** Temperature Gradient
THS303	S3	Alarm Temperature
HYS303	S3	**THS303** Temperature Gradient
THS304	S3	Start-up minimum temperature Backup 1
THS305	S3	Maximum Temperature for STOP Backup 1
HYS305	S3	**THS305** Temperature Gradient

Buffer 2 DHW:

Code	Type	Name
T03	Timer	Delay in the start-up Backup 2
THS404	S4	Start-up minimum temperature Backup 2
THS405	S4	Maximum Temperature for STOP Backup 2
HYS405	S4	**THS405** Temperature Gradient
THS406	S4	DHW Temperature (Set point)
HYS406	S4	**THS406** Temperature Gradient

3.9 Plant 11: Domestic hot water with direct coil heating and backup with buffer tank

Domestic hot water using external gas heating coil in the tank, with optional backup system. System will control to temperature in domestic hot water tank. Will control backup heating system.
Inputs S1 (return water temp), S2 (gas temp) and S4 (DHW tank temp), and one output B2.
Note: This can be used for system with two tanks in series, measuring temp in second tank only.



Parameters:

Code	Type	Name
THS101	S1	Minimum Temperature for AQS lower section
THS102	S1	Maximum Temperature for AQS lower section
HYS102	S1	**THS102** Temperature Gradient
THS103	S1	Alarm Temperature for AQS lower section
THS201	S2	Alarm Temperature (Gas)
T01	Timer	Time Min Compressor OFF
T06	Timer	Timer (delay in the compressor's start-up)
T07	Timer	Timer (delay in the compressor's start-up, carter resistance is ON)

Buffer 2DHW:

Code	Type	Name
T03	Timer	Delay in the start-up Backup 2
THS404	S4	Start-up Minimum Temperature Backup 2
THS405	S4	Maximum Temperature for STOP Backup 2
HYS405	S4	**THS405** Temperature Gradient
THS406	S4	DHW Temperature (Set point)
HYS406	S4	**THS406** Temperature Gradient

Inputs (Probes): **S1, S2** and **S4**
Outputs: Buffer **B2**

Note: B2 will not start unless the external thermostat is closed (LED ❄ ON).

4 Errors

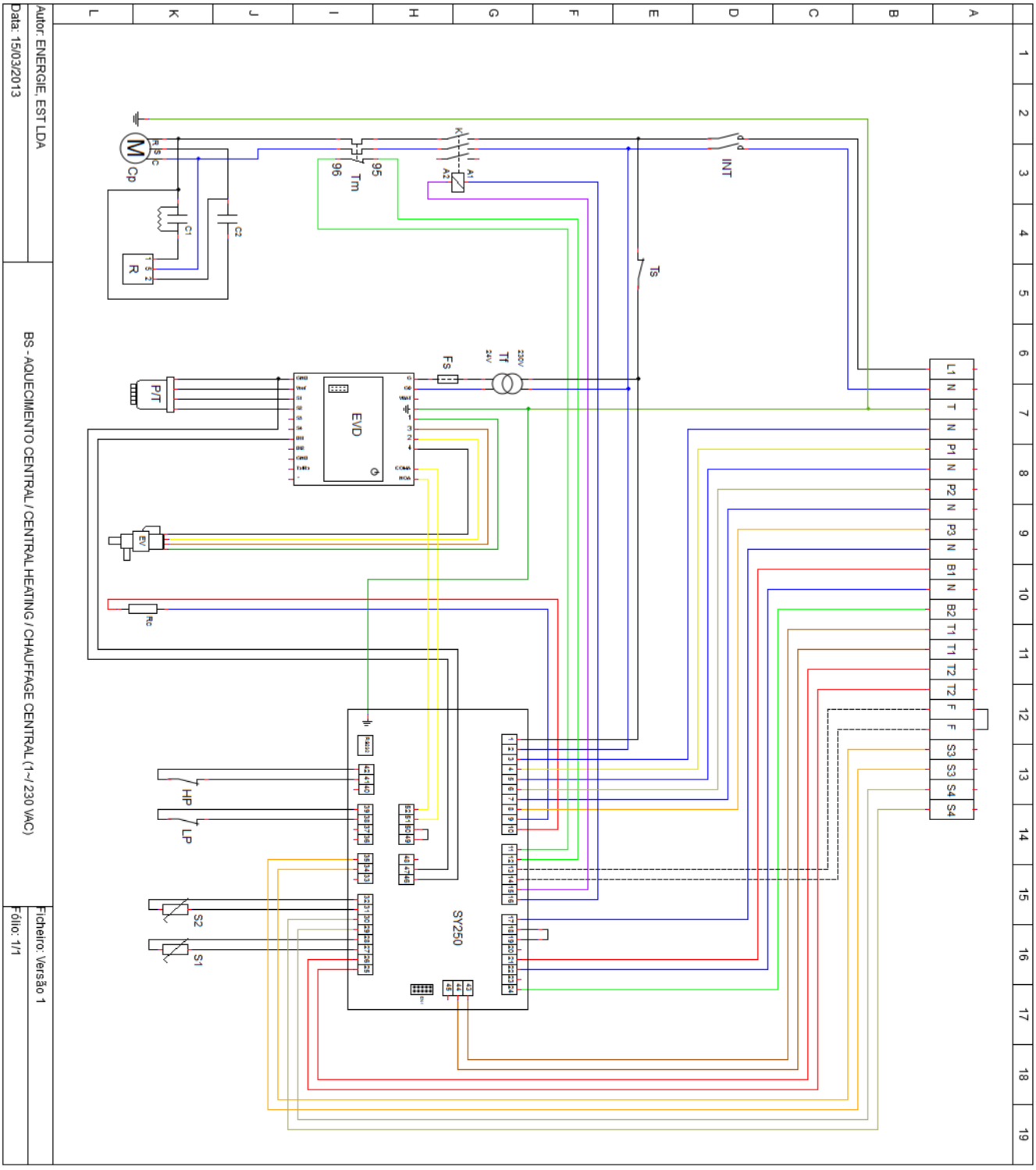
ERROR (Code)	Description	Cause/Solution
Er01 – FLOW	Flowmeter doesn't work.	✓ Lack of flow on the circuit. Water circulator disconnected or filter obstructed. Check electrical connections of the circulator or clean filter. ✓ Poorly drained circuit. Excess air at the hydraulic installation. ✓ Water flow too low. Increase water circulation pump speed or replace for a larger one. ✓ Hydraulic circuit is empty (no water).
Er02 – TN	Safety Thermostat	✓ Thermal relay action resulting from exaggerated electrical consumption of the compressor or mains voltage anomalies.
Er03 – LP	Low Pressure, system doesn't work or disconnects cyclically	✓ Lack of fluid or leak on circuit. Check the circuit pressure with gauge. ✓ Low outsider temperature. ✓ Obstruction of refrigerant circuit (e.g. Humidity). ✓ Low pressure switch damaged.
Er04 – HP	High pressure, system doesn't work	✓ Fluid overcharge. Check circuit pressure with manometers. ✓ High pressure switch damaged. ✓ Poor heat exchange. Increase flow.
Er05 – TS1 Er05 – TS2 Er06 – TS3 Er07 – TS4	Temperature alarm	✓ Excess of temperature. Lack of water in the circuit, circulator pump disconnected or stuck or damaged Flowmeter.
Er08 – RTC	Clock	✓ Internal clock of the controller is damaged. Replace the controller. ✓ The controller battery is discharged or weak. Replace the battery (type of battery CR2032)
TL	Probe Failure (S1, S2, S3 or S4)	✓ Check whether the probe is measuring correctly, verifying its internal resistance. ✓ Verify connections.
Er11 - EVD	Alarm Relay Open on Carel EVD	✓ Check the power supply on the EVD (fuse-Fs). ✓ Pressure/Temperature sensor connected wrongly or damaged. Check connections or replace sensor (POS) ✓ Low Superheating (LowSH). ✓ Very low evaporation temperature (LOP). ✓ Very high evaporation temperature (MOP). ✓ Low aspiration temperature. ✓ Low aspiration pressure.

Note that alarm Er11 may occur if the power is switched off to the system externally. This is because when the system reboots it does not see the EVD for the first scan. This will correct itself on the next check.

5 Wiring diagrams

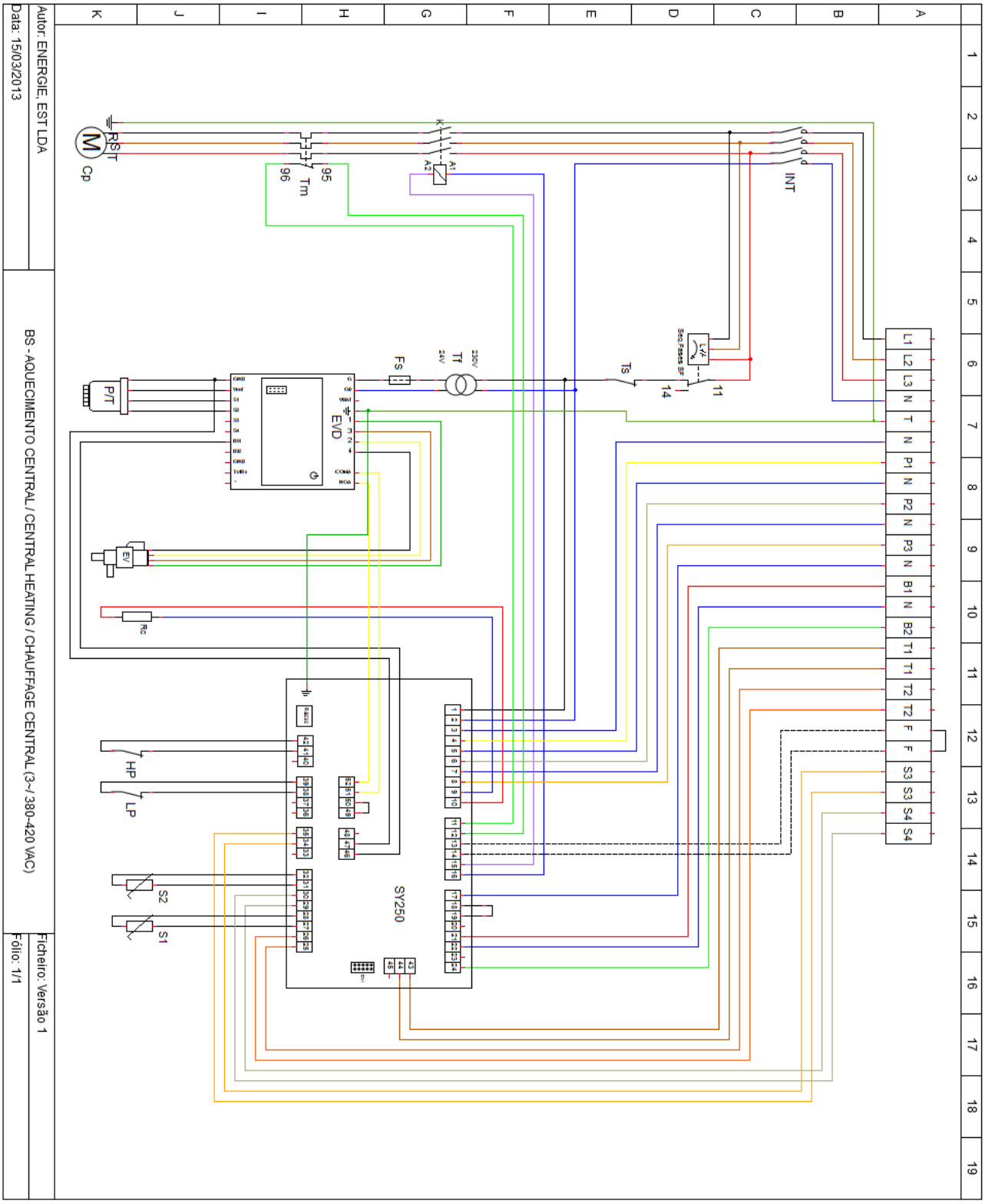
5.1 Solar Block –Central Heating 230 Vac/ 1 phase / 50Hz

Maximum Current value supported by the end contacts is 2 Amps.



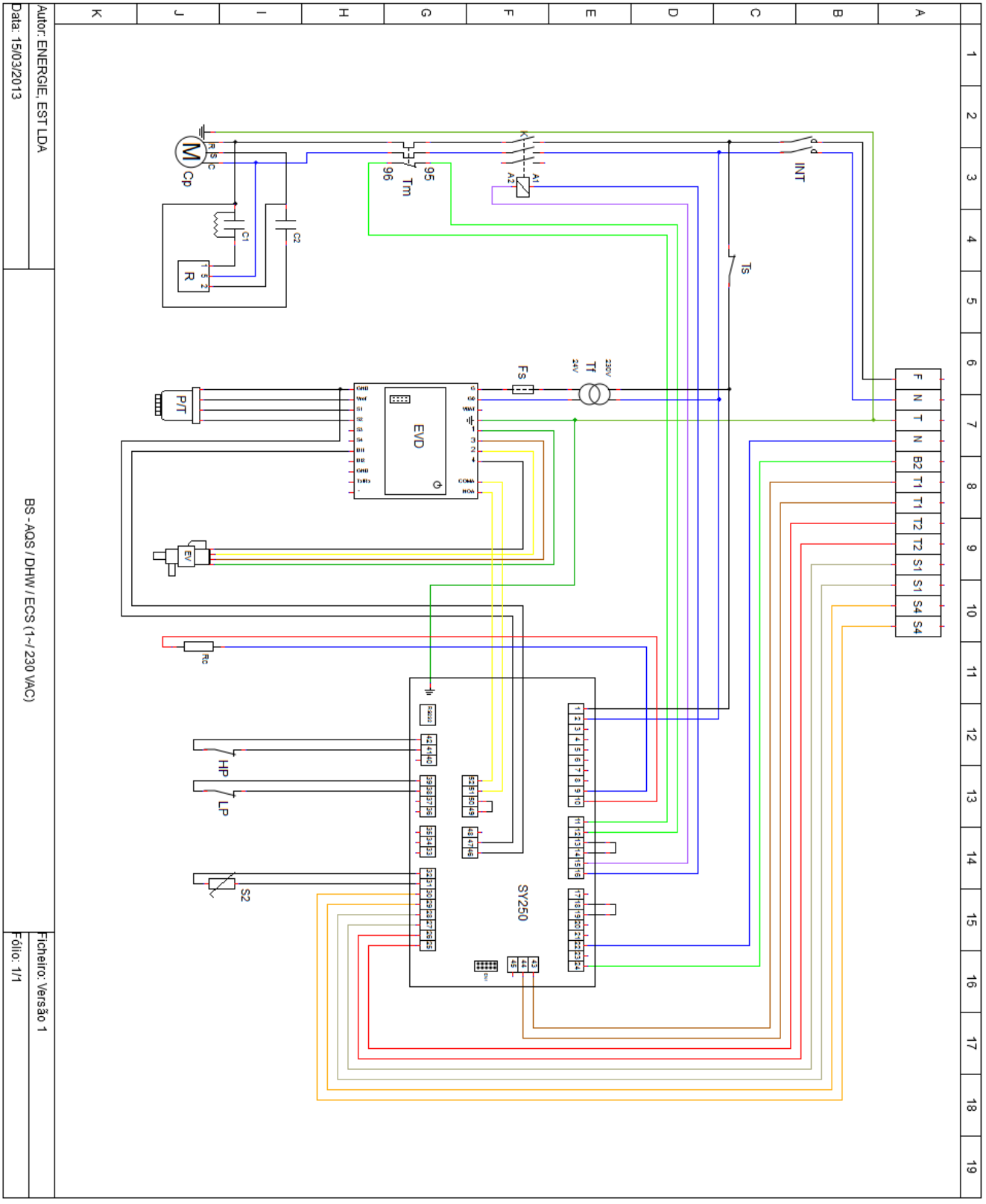
5.2 Solar Block –Central Heating 400 Vac/ 3 phase / 50Hz

Maximum Current value supported by the end contacts is 2 Amps.



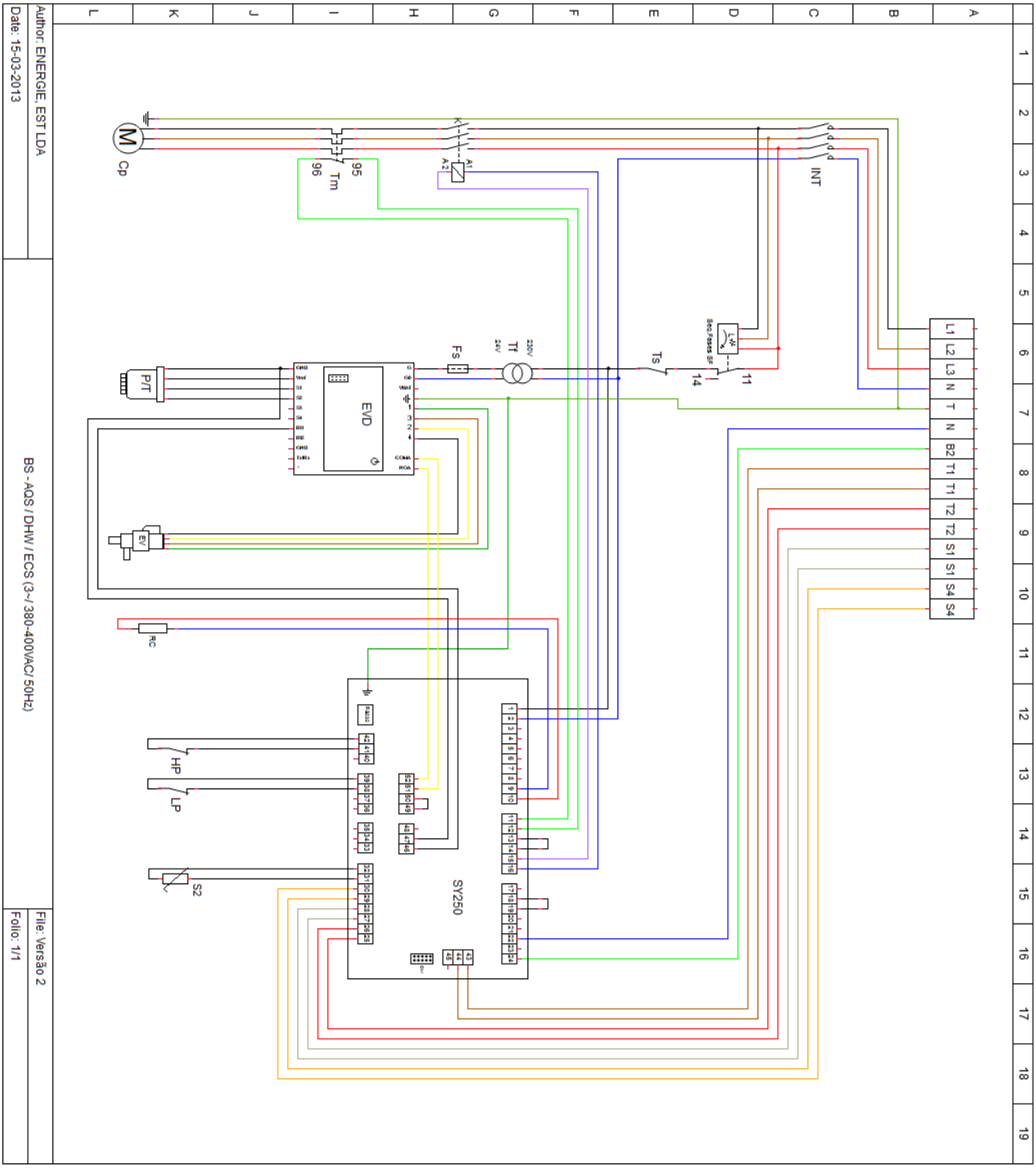
5.3 Solar Block – Domestic Hot Water 230 Vac/ 1 phase / 50Hz

Maximum Current value supported by the end contacts is 2 Amps.



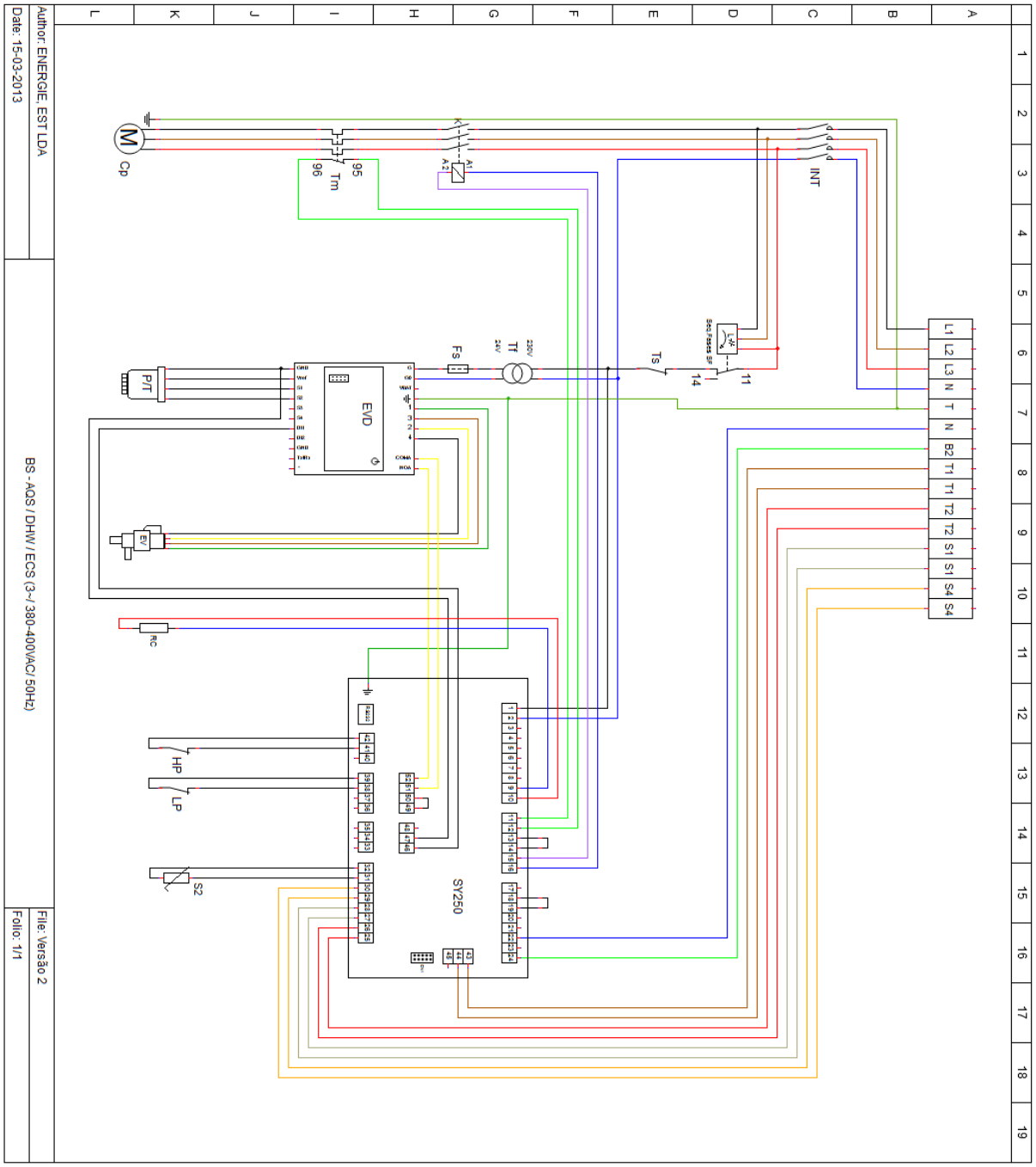
5.4 Solar Block – Domestic Hot Water 400 Vac/ 3 phase / 50Hz

Maximum Current value supported by the end contacts is 2 Amps.



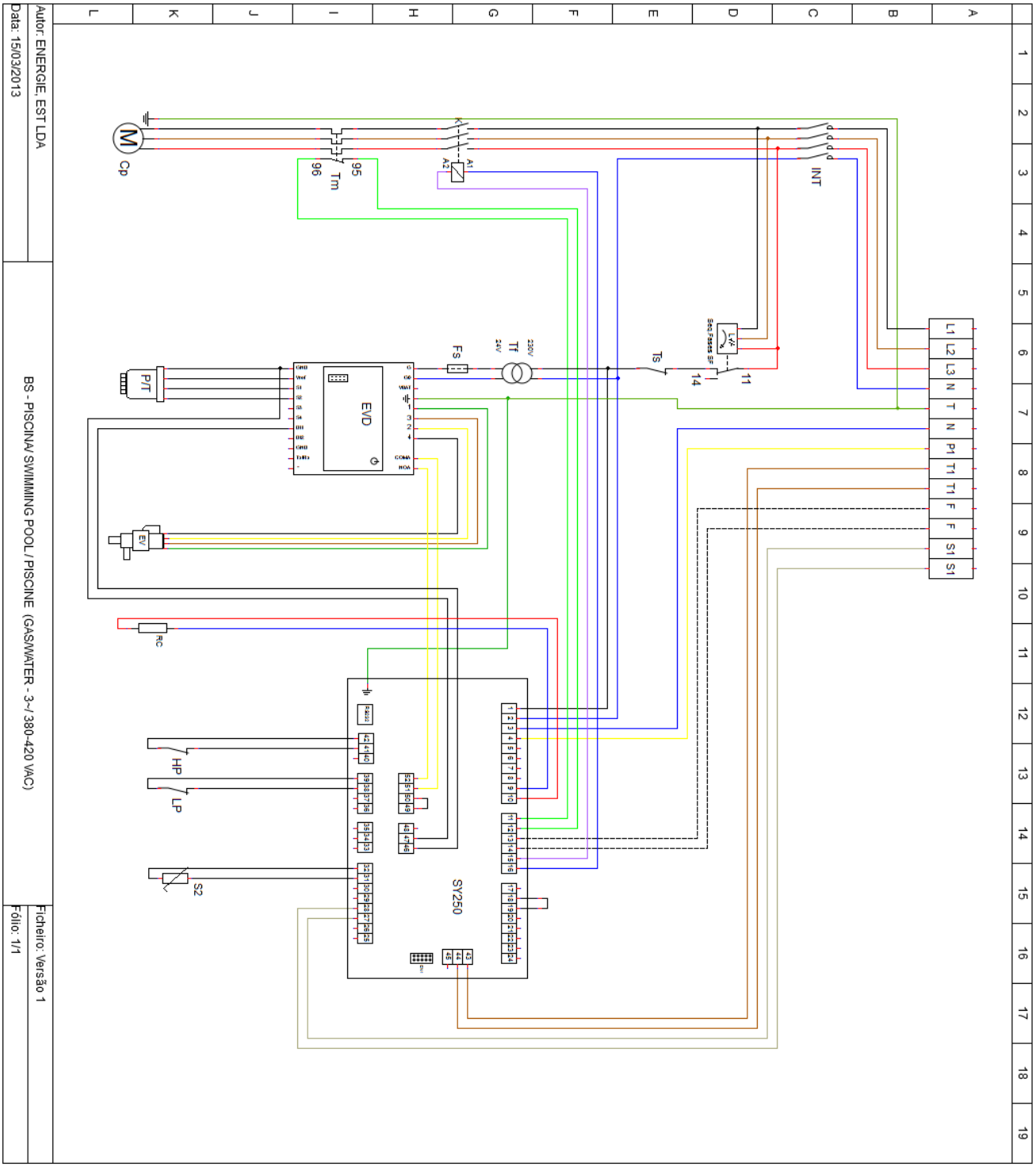
5.5 Solar Block – Swimming Pool 230 Vac/ 1 phase / 50Hz

Maximum Current value supported by the end contacts is 2 Amps.



5.6 Solar Block – Swimming Pool 400 Vac/ 3 phase / 50Hz

Maximum Current value supported by the end contacts is 2 Amps.



6 Energie Guarantee

This guarantee covers all defects to the goods supplied by Energie. It excludes the payment of any damage caused directly or indirectly by the supplied goods.
The guarantee starts from the Installation of the goods.

Solar Panel:	10 Years
Water Cylinder (domestic use):	5 Years
Electrical components	5 Years
Water Cylinder (industrial)	5 Years

In case of guarantee, the parts replaced are property of the manufacturer. A repair under the guarantee does not extend the guarantee.

Guarantee Exclusions

The guarantee is invalid if the apparatus is no longer in use or is not assembled in accordance with the manufacturer's instructions, or if the equipment has been altered or modified without authorisation, or if the serial number has been removed or erased.

The equipment should only be installed by qualified installers according to the NZ Standards, the NZ Building Code and good trade practises, or the instructions of our technical services.

Further exclusions from guarantee:

- Hot water tanks that have been operating in water with the following indexes:
  - Active chlorine > 0.2 ppm
  - PH < 6 or > 8.5 (Sorensen scale at 25° C).
  - Hardness < 3.0 or > 20.0 °dH (< 50ppm or > 350ppm)
  - If one of the water parameters has a greater value than stipulated by directive 236/98 (Portugal).
- Breakdown due to incorrect use, electrical discharges, flooding, or humidity.
- The guarantee lapses if it is transferred to another owner, even if within the guarantee period.

ATTENTION: In cases where there is no justifiable breakdown and technical assistance has been requested, the client will pay for lost technical assistance time and travel.

Note: The Guarantee form must be properly completed, signed, and stamped by the installer/reseller and returned to ENERGIE, otherwise the guarantee will not be validated.

Thank you for choosing the Energie Solar Thermodynamic Hot Water system.

We are always trying to improve our service and welcome feedback from our valued clients.

Please contact us at The Alternative Energy Company with your comments.

The Alternative Energy Company Limited

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