TANK TEMPERATURE CONTROLLER

C2105 QUICK START GUIDE

VERSION - 1.2

1.The display:
Shows current temperature
Allows for setting the control temperature

[SET] Button:
- Pressed quickly - switch between the measured and set value.
- Press and hold – displays 'PAS' (password screen) allowing you to change parameters after entering the password.
- Pressed in the 'parameter mode' will change to the next parameter.

[▲], [▼] buttons are used to change the temperature and parameters settings.

3. Adjusting the Set Point temperature (SP)
Press the [SET] button quickly to change to the SP mode.
- The yellow LED will come on.
- The value is adjusted with the buttons [▲] or [▼], and it is confirmed with the button [SET].
- When the value is confirmed, the control automatically returns into the basic mode and shows the current - measured temperature.

4.1 First Parameters
This sets the mode of operation.
NOTE: it is recommended that you use the H_C mode - as the COL is sometime flakey!

To set the First Parameters
- press and hold the [SET] button. When 'PAS' (password) is displayed
- use the arrow keys to enter this password [▲▲▼▼]
- confirmed by pressing button [SET].
- the current mode will display (Default is DiS)
- to change the mode press ▲▼
- confirm by pressing [SET] button.

6. **Schematic connections**
For the most accurate wiring info - check the back of your controller.

Older controllers required 24VDC power supply for operation.
Newer controllers - that operate with 24VAC - can operate with either a:
- 24VDC power supply or a
- 24VAC transformer.

All the 24VDC solenoids - will only work with a 24VDC power supply.
If using 24VDC – observe polarity:
(-) to the white wire
(+) to the yellow wire – and one side of the solenoid.

One side of the 24V Solenoids is connected to the yellow wire to the controller and the 24V supply.
The other side is connected:
- to the gray control wire for cooling
– or the brown wire for heating.

C2105 Manual

Instructions for using GWKent's individual tank temperature controller.

Description

A microprocessor system for measuring and controlling temperature.
Two-stage (cooling and/or heating) control
Three levels of password protected parameters -– to prevent accidental changes.
Designed for moist humid environments.
Alarm state indicator
RS485 network compatibility

1. The display:

Shows current temperature
Allows for setting the desired temperature
Displays parameters and allows parameter changes

LEDs shows the control status:
Cooling - red LED is on
Heating - red LED is on
Set SP - adjusts the set temperature
Units C/F – Celsius/ Fahrenheit
Alarm - flashes red

Buttons: [SET]

Press quickly - switch between the measured and set value.
Press and hold – displays 'PAS' (password screen) allowing you to change parameters - after entering the password.
Pressed in the 'parameter mode' will change to the next parameter.

[▲], [▼] are used to change the set temperature and parameters settings.

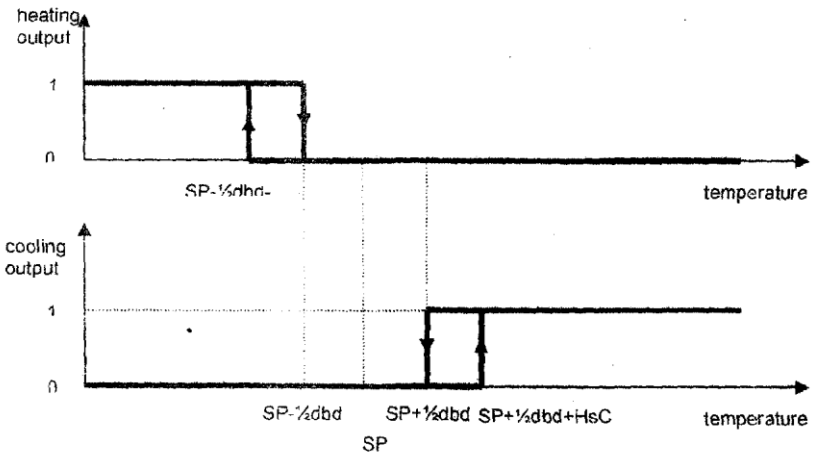
The following abbreviations are used:
- PV - Process Value - measured, actual temperature
- SP - Set Point - the desired set temperature
- HsH – Hysteresis Heating, temperature range within which output 1 does not change its status,
- HsC – Hysteresis Cooling, temperature range within which output 2 does not change its status,
- dbd - dead zone, temperature range symmetrically around the set point SP, within which neither the cooling output nor the heating output change their status
- ALU - high temperature value Indicator light would be flashed when PV temperature is over ALU value.
- ALd lower temperature value Indicator light would be flashed when PV temperature is under ALU value.
- diS temperature display only, both outputs disabled
- HEA heating control at output 1
- C0L cooling control at output 1
- H_C heating control at output 1 and cooling at output 2
- OFF stand-by mode, both outputs disabled

2. Modes

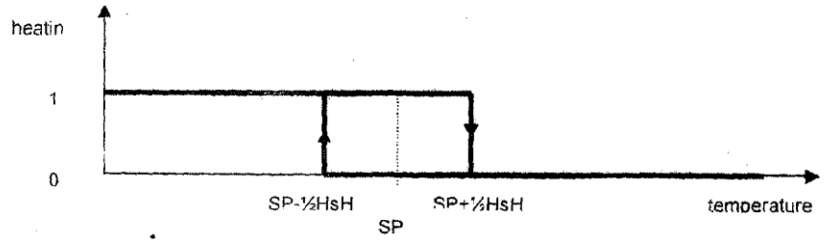
The controller has the following modes:
- H_C - Heating and cooling control (1 heating output, 1 cooling output,)
- HEA - Only heating is controlled (1 heating output, cooling output is disabled,)
- CoL - Only cooling control (1cooling output , heating output is disabled)
- diS - Display of the currently measured temperature (both outputs disabled). *
- OFF - Stand-by mode (no display of temperature, both outputs disabled)
- Adjustment of the set temperature PV
- Setup of parameters 1, 2 and 3

2.1 Basic Heating & Cooling Mode - (three point control)

Temperature control consists of an output for switching on the heating and an output for switching on the cooling. They are switched in according to the set control parameters. The heating output is switched on (red light is on) (the valve is opened, the heater is switched on...), when the measured (actual) temperature PV is lower than the value of SP-½ dbd-HsH, and it is switched off, when the measured temperature increases above the value SP1/2 dbd. The cooling output is switched on (green light is on) (the valve is opened), when the measured temperature PV is higher than the value SP+½ dbd+HsC, and it is switched off, when the measured temperature falls below the value SP÷½dbd.

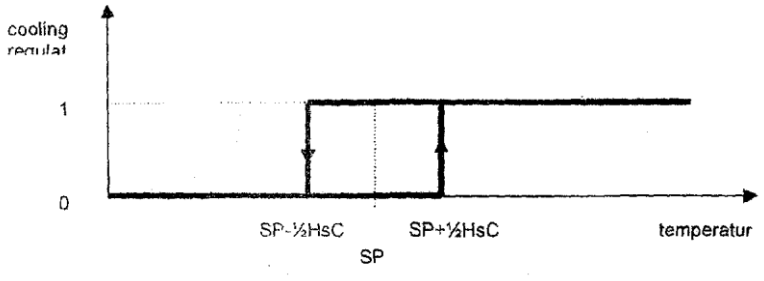


2.2 Basic Heating Mode - (two-point control)
If parameters HEA is chosen, the control changes to two-point control and performs only the Function of the heating control. Heating output is switched on (red light is on), when the measured temperature PV is lower than the value SP-½ HsH, and it is switched off, when the measured temperature PV increases above the value SP+1/2 HSH.



2,3 Basic Cooling mode (two-point control)

If parameters CoL is chosen, the control changes to two-point control and performs only the function of the cooling control. The cooling output is switched on (red light is on), when the measured temperature PV is higher than the value SP+1/2H5C, and it is switched off, when the measured temperature PV falls below the value SP-1/zHsC.



2.4. Troubleshooting

Error codes :
-Er.S error sensor
-Er.P error parameters
In the case of error sensor the controller automatically switches to the ‘safe mode’. The heating and cooling the outputs change to the status, which is preset in the parameter ‘safe mode’ SAF.

Our replacement sensors have a different color code - than what was shipped with earlier units.
When installing a new sensor to an old box – this is the color code.

		New		Old
Ground	-	Black	-	Yellow
DQ	-	Blue	-	Green
+VDD	-	Brown	-	Red

3. Adjusting the Set Point temperature (SP)

Press the [SET] button quickly to change to the SP mode. The yellow LED will come on. The value is adjusted with the buttons [▲] or [▼], and it is confirmed with the button [SET]. When the entered value is confirmed, the control automatically returns into the basic mode and shows the current measured temperature.

If the selected change is NOT confirmed by pressing the button [SET] within 30 seconds, the value of the set temperature SP (before changing) is preserved, and the control returns into the basic mode - display of the current -- measured temperature.

4. Control parameters

WARNING:
Changing of parameters is permitted only by adequately trained personnel.
Incorrect control parameters - disable the functioning of the control.

4.1 First Parameters

This parameter sets the mode of operation.

NOTE: it is recommended that you use the H_C mode - as the COL is sometime flakey!

To set the First Parameters
- press and hold the [SET] button. When ‘PAS’ (password) is displayed
- use the arrow keys to enter: [▲▲▼▼]
- confirmed by pressing button [SET].
- this will show the current mode (Default is DiS)
- to change the mode press ▲▼
- confirm by pressing [SET] button.

OFF	stand—by, both outputs inactive
HEA	heating control at output 1 only
COL	Cooling control at output 2 only
H_C	heating control at output 1 and cooling control at output 2 -
DiS	Display of temperature only, both outputs disabled

4.2 Second Parameters

These parameters define the values of heating hysteresis, cooling hysteresis; and the dead zones.

To set the Second Parameters
- press and hold the [SET] button. When 'PAS' (password) is displayed
- use the arrow keys to enter: [▲▼▲▼]
- confirmed by pressing button [SET]. The display will then show the first parameter
- select the desired parameter by pressing ▲▼
- and confirm by pressing [SET] button
- this will show the set value
- to change the value press ▲▼
- confirm by pressing [SET] button.

Parameters are:

Abv.	Parameter	Range	Default	Description
HSH	Heating hysteresis	0.1...20 after 0.1	1	heating hysteresis, temperature range within which the heating output does not change its

				status, heat,
HSC	Cooling hysteresis	0.1… 20 after 0.1	1	Cooling hysteresis, temperature range within which the cooling output: does not change its status, cool.
dbd	Dead zone	0.1… 20 after 0.1		dead zone, temperature range symmetrically around t[e set value PV, within which neither the cooling output not the heating output change their status.
ALU	High temperature Alarm Point	-9.9”99.9°C After 0.1	99.9˚C	high temperature value indicator light would be flashed when PV temperature is over the ALU value.
ALd	Low temperature Alarm Point .	-9.9”.’99.9°C After 0.1 14-211°F After 0.l	-9.9°C	lower temperature value indicator light would be flashed when PV temperature is under ALU value.

4.3 Third Parameters

To set the Third Parameters
- press and hold the [SET] button. When ‘PAS’ (password) is displayed
- use the arrow keys to enter: [▲▲▼▼▼]
- confirmed by pressing button [SET]. The display will then show the first parameter
- select the desired parameter by pressing ▲▼
- and confirm by pressing [SET] button
- this will show the set value
- to change the value press ▲▼
- confirm by pressing [SET] button.

Parameters are:

Abv.	Parameter	Range	Default	Description

TPU	. Option of measure unit of temperature C/F	CEL FAH	CEL	Measure unit degree Celsius or Fahrenheit.

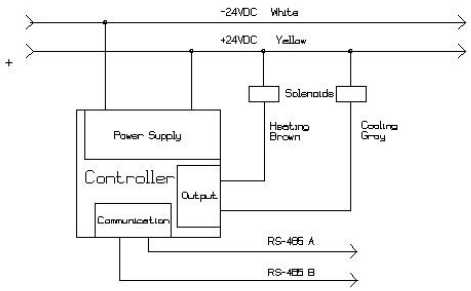
FIL	Input Filter	0 to 60 vz	5 vz	Time constant of input signal filter.
SAF	Safe Mode	noA CoL HEA	noA	selection of mode in case of error noA both outputs disabled CoL cooling output enabled HEA. .heating output enabled
coA	Communication Address	1 to 999	1	Controller address
tSt	Reset, Test, Correction	InI EE Cor End	InI	InI - Resetting parameters to preset values EE - eprom test Cor - temperature adjust End - exit by entering parameters

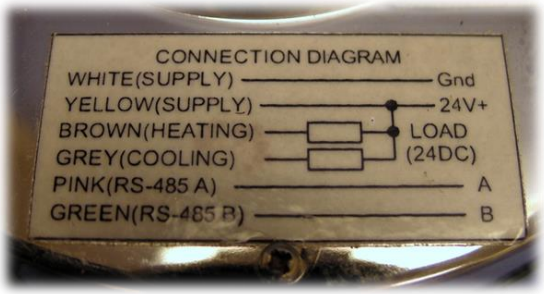
When tSt is displayed, select the desired option by pressing ▲▼and confirm it by pressing [SET] button.
InI - resets all the parameters to the initial, preset values.
EE - tests eprom. After the test the display shows:
EGd - eprom functioning normally
Bad - eprom corrupt

5. Technical data of the controller:

Display of value: -9.9°C to 99.9°C or 14.1211F
Resolution: 0.1°C (100°F IS 0.1°F ;Over 100°F is 1°F)
Deviation: max ± 0.5°C(±D.99°F)
Consumption: <3W (unloaded)
Supply voltage: 24 VDC
Output 1 for heating: 3A 24DC (relay)
Output 2 for cooling: 3A 24DC (relay)

6. **Schematic connections**





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Newer controllers - that operate with 24VAC - they can operate with either a:
- 24VDC power supply or a
- 24VAC transformer.

All the 24VDC solenoids - will only work with a 24VDC power supply.
If using 24VDC – observe polarity:
(-) to the white wire
(+) to the yellow wire – and one side of the solenoid.

One side of the 24V Solenoids is connected to the yellow wire to the controller and the 24V supply.
The other side is connected:
- to the gray control wire for cooling
– or the brown wire for heating.