

EasiKool Fitting and Operation Manual



The EasiKool has been designed to provide a fully featured control system to manage all the cooling functions of a DZ type milk-cooling tank. Using the finest electronic technology, EasiKool provides the installation engineer with the perfect solution to control system replacement. For the dairy farmer, EasiKool is the only control system that can be fully customised to meet exacting cooling and stirring sequences with complete reliability.

This manual is sub-divided into: -

- Installation Instructions
- Set-up Instructions
- Operating Instructions.

After installation

Please make sure that the end user is provided with a copy of the operating instructions.

Installation Instructions

Please take the time to read these instructions carefully. Installing the EasiKool should be within the competence of any qualified electrical or refrigeration engineer.

The EasiKool unit consist of four basic parts. These are: -

- The enclosure base with keypad membrane attached to the lid.
- The top logic circuit board with the display.
- The bottom circuit board, with power supply and output relays.
- The NTC temperature probe.

Before commencing installation, undo the four plastic case screws to separate the top lid and logic board from the enclosure base and relay circuit board. Carefully unplug the ribbon cable from the connector on the relay board. Do not touch any components on the logic board. During installation, carefully store the top lid and logic board in a clean dry area.

The EasiKool enclosure has an IP 56 rating. As soon as conduit entry holes are drilled in the enclosure base, the IP rating is reduced to zero. It is the responsibility of the installation engineer to ensure that there is no water ingress into the unit. The unit may be wall mounted or fitted directly to the front of the milk tank. The unit must NOT be mounted in a position where it is exposed to running water and under no circumstances should the enclosure ever be subjected to direct water jets or pressure washers.

The enclosure base should be drilled out in the corner positions to take the securing screws. Ensure that the drill bit and chuck do not damage any components. Mark through the drilled holes onto the mounting surface. Ensure that the control unit is mounted horizontally! Drill and plug the wall or tank as appropriate.

Screw the enclosure base containing the relay board to the wall or tank. Drill out the appropriate conduit entries in the base of the enclosure. Do not drill in the top or high up on the sides of the enclosure. Normally one conduit entry is sufficient to carry the mains electrical cables and another for the low voltage NTC temperature probe.

Wiring Instructions

A wiring diagram is shown overleaf. A qualified and competent electrical/refrigeration engineer should carry out all wiring.

The mains electrical supply to the unit should be taken from a switched fused (10-amp) supply in 2.5mm cable. There is no requirement for an earth to be taken to the control unit, unless it is passed through the enclosure and out to other services for convenience.

A 3 way Neutral terminal connection is provided for convenience, but must only provide the return from contactor coils.

The outputs from the three relays should be made in 1.5mm cable. All switched outputs, such as condensing units and the agitator should be switched through an appropriate contactor.

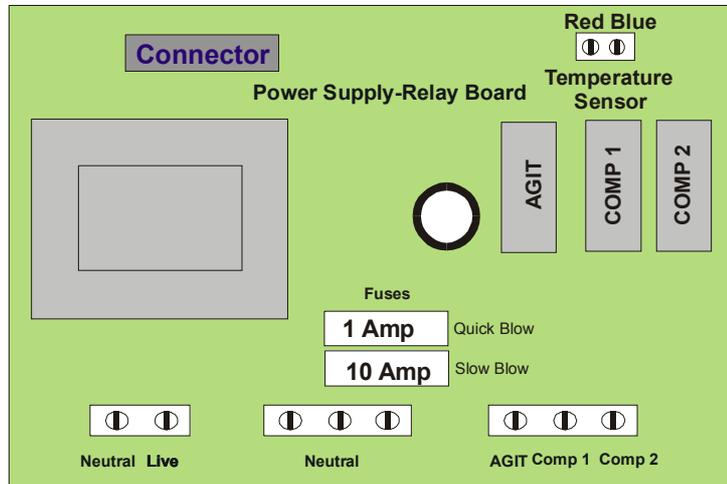
No delay timer is needed to prevent simultaneous compressor start up. This is already a built in function of EasiKool.

The NTC temperature probe should not be run in the same conduit as mains cables to avoid interference. The temperature probe can be extended to a maximum of 8 metres. Ensure that the temperature sensing probe head is located in close contact, preferably lightly clamped, to the underside of the milk vat. The probe must NOT be immersed in water.

DO NOT SWITCH ANY DEVICE DIRECTLY ON LINE

Wiring Diagram for EasiKool

ALL WIRING TO MEET CURRENT ELECTRICAL REGULATIONS
EEC LOW VOLTAGE DIRECTIVE - (LVD 73/23/EEC)
EEC EMC DIRECTIVE - (EMC 89/336/EEC)



Mains supply 2.5mm cable mandatory. Supply from principal isolated switch fuse. Warranty invalid if supply does not meet EEC - LVD and EMC Directives

L - Live In

220/230 volts AC 50 Hz

N- Neutral

AGIT	Output to	Agitator motor contactor
Comp 1	Output to	Condensing Unit 1 contactor
Comp 2	Output to	Condensing Unit 2 contactor

Total board loading not to exceed 4 amps. Always use external motor start contactors.

Temperature Sensor

Correct wiring essential. Reverse polarity will damage probe

Blue - NTC Thermistor Input
Red -

Setting up instructions.

The EasiKool is extremely simple to set up for immediate operation. The EasiKool software must be to access all the custom functions, including the data logger. The software can easily be loaded into any Windows 95,98 or XP computer. A special serial connection cable is available to service engineer.

Without using a computer, the most important set-up features can be accessed without a PC.

After installation and with the mains power supply switched off, plug the EasiKool lid and top circuit board assembly into the power supply board. The ribbon cable and connector must not be twisted.

Using two of the enclosure plastic screws, lightly fasten the top board to the enclosure base in the top positions. This will allow the top to be hinged upwards during the setting up process.

Make one last check to ensure that all wiring connections are correct and that the temperature probe is installed. Turn on the mains power supply to the EasiKool.

The EasiKool unit will power up, scrolling all the display segments. It will then immediately show a temperature reading and within 10 seconds this will give the probe temperature reading. The EasiKool electronic circuit is designed to take temperature readings every second, average these out and refresh the display every 10 seconds.

Functions

AUTO SWITCH

The first press of the AUTO switch will put the unit into standby waiting mode. The display will scroll **Auto** and the auto LED will flash. In this mode, the system will not commence cooling for 15 minutes. This time delay is adjustable with EasiKool software.

With the second press of the AUTO switch, the system will once again scroll **Auto** and the LED will turn fully on. If the temperature is above the cut-in point, the agitator relay will energise, followed by Compressor 1 and 15 seconds later by Compressor 2. The delays help to reduce mains voltage dips during start up. In this mode, the relays will remain energised until the milk falls below the cut-out temperature.

If the AUTO switch is depressed and held down for a few seconds, a SuperCooling function is activated. The unit display will scroll and the temperature reading will be prefixed with a C to show that it is in this mode. For example - **C12.8**. The normal default cutout temperature is 3.5 degrees. The SuperCool default is 3.0 degrees. These settings are both programmable.

The SuperCool mode can be cancelled by pressing the OFF switch. The **C** prefix will disappear and the unit will be in ordinary AUTO mode.

AGIT SWITCH

The first press of the AGIT switch will activate the standard 2-minute stir function. The display will scroll **Stlr** and the agitator indicator LED will flash.

A second press of the AGIT switch will command a longer continuous stir of 15 minutes. This can be changed with EasiKool software.

A useful function, required in some countries is the 'continuous stir after cooling' mode. This can be activated, by holding down the AGIT switch for several seconds until **Stlr L** is scrolled. The function can be disabled by toggling it off again, using the AGIT switch. Just hold the switch down again until **Stlr 0** is scrolled. Continuous stir can also be set up in the software if required.

OFF SWITCH

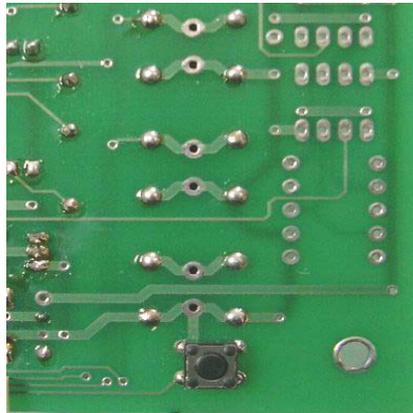
Pressing the OFF switch will immediately stop all switched functions. There is no time delay.

Functions that can be changed without using a computer.

The following operating parameters can be changed without using a computer. In most cases, the factory default settings will be perfectly adequate.

Press the OFF switch before making any of the following changes.

Holding down the Reset button on the back of the display board can always easily restore the factory default settings. Press down and wait until the unit does a reset scroll.



Looking at the back of the display board, the switch is located at the bottom right-hand corner. Looking from the display side, the switch is on the back of the board, left-hand side.

Calibrating the Temperature Display

Momentarily press the Reset switch. The temperature display will start flashing. Calibrate, or adjust the temperature by using the AUTO or AGIT switch to raise or lower the reading. It is preferable to use a jug of water at about 4.0 degrees C to calibrate. The use of an accurate digital thermometer is also essential. As supplied from the factory, the calibration will be accurate to 0.5 degrees C. Any calibration change from the default is known as the OFFSET TEMPERATURE. In milk tank applications, it is quite usual to program for a +0.5 degree offset. This is a common difference between the actual milk temperature and the sensor on the outside of the vat. Remember that stainless steel is not a good conductor of heat energy.

For example, if the water in the jug is showing 4.7°C, calibrate for 5.2°C

Calibrating the Cut-In Temperature

Momentarily press the Reset switch again. The temperature display will change to display, in default, **H 4.0**. This is the temperature at which the unit will command the agitator and condensing units to run.

This setting can be changed by again using the AUTO or AGIT switches to raise or lower the reading. Do not attempt to set the differential (the difference between cut-in and cut-out) closer than 0.4°C

Calibrating the Cut-Out Temperature

Momentarily depress the Reset switch. The temperature display will change to display, in default, **L 3.5**. This is the temperature at which the unit will stop the agitator and condensing units from running.

The setting can again be changed with AUTO and AGIT switches. Do not attempt to set the cut-out point too low, or you will run the risk of ice formation in the tank. Again, do not attempt to set a closer differential than 0.4°C. If you do, Reset will not allow you to toggle past this position.

Testing the Output Relays

The three output relays, Agitator, Compressor 1 and 2 relays can be checked now by momentarily pressing the Reset switch. This will be indicated by the display showing **CH 1**; **CH 2** and **CH 3**

Setting the Clock

The clock needs to be adjusted if the data logger is to record correctly. Depress the Reset switch again and the display will change to a flashing time display. No colon is shown demarcating hours from minutes. Hence **1444** indicates **14.44** hours.

Using the AUTO and AGIT switches again changes the reading

Setting the Stir Sequence

After cooling, in default mode, the EasiKool will agitate for 2 minutes every 30 minutes

These setting can be changed by momentarily pressing the Reset switch again. The first setting is the interval between agitation. The default will show as **S 30**. Use the AUTO and AGIT switches to change this setting.

The next press of Reset will show the stir duration. The default is **St02**. The setting can be changed with the AUTO and AGIT switch.

Setting the unit for Normal Operation

A final momentary press of Reset will bring the unit back to show the normal temperature display. If you accidentally pass any of the setting positions, simply keep pressing Reset to go back to the setting you want to view and/or change.

Never hold down the Reset switch unless you want to restore all the settings to the factory defaults.

Note – The unit will not function correctly unless it is in normal temperature display mode.

All settings are retained in memory, even if the unit is disconnected from the power supply. An on-board battery retains the settings in memory.

You cannot damage the unit by changing any settings. Any programmed setting can be changed.

We advise all new users of the EasiKool control system to practise setting up procedures prior to carrying out an installation. Remember to provide the unit with a power supply.

EasiKool Operating Software

Complete customising of the EasiKool control system and access to the Data Logger is possible, using the EasiKool Delphi Software package. EasiKool software can be downloaded from our Web site.

www.arbelelectronics.co.uk

This software is only available to OEM's and service organisations that purchase this product. Please contact Arbel Electronics for further information.

An instruction manual for using Delphi software can also be downloaded. There is no restriction to access of these manuals.

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