

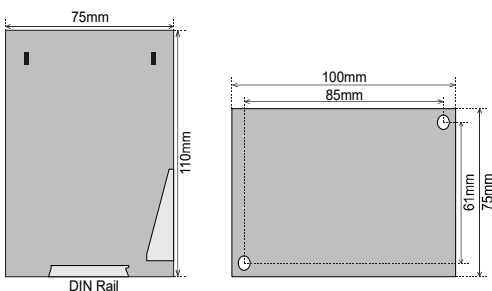


- G99 Loss of Mains Protection for HV Distribution Networks
- Complies with "Type Tested Interface Protection" requirements of G99 issue 1 part 10.1.4
- Pre-configured alarm parameters, locked and PIN protected
- Supervision Delay and Event Log
- Digitally Controlled Operation
- 1 Hz/s ROCOF protection with averaging filter and 0.5s delay
- Voltage, Frequency, Imbalance and Loss of Phase protection

Specifications

Auxiliary Voltage:	Self powered from monitored voltage input
Optional Auxiliary Voltage:	24 or 36-110VDC (Fuse 2A)
Monitored Voltage input:	110V, 40-70Hz (Fuse 0.5A) Other voltages available on request
Frequency Range:	45-65Hz
Relay Contacts:	User Configurable (latch by default) manual or auto reset of alarms
Contact Rating:	AC: 100VA - 250V/2A max. DC: 50W - 100V/1A max.
Open Collector Outputs:	30VDC max. - 500mA max.
Settings:	See page 4
Adjustments:	Supervision Delay: 0,1-10,0 secs (All other adjustments are made via the hand held controller HHP1 or HHP2)
Internal Watchdog:	An independent watchdog monitors signal flow. Flashing of LEDs 1, 2 and 3 in a binary pattern indicate operational error
Dielectric test/ Galvanic separation:	4.0kVAC
Climate:	Class HUE, (DIN40040)
EMC:	EN 60255-26
Safety:	EN 60255-27
Vibration, shock, bump:	EN 60255-21 Class 1
Temperature:	-20 to +70°C
Weight:	0.5kgs
Front protection:	IP21
Enclosure:	Flame retardant polycarbonate to UL94 (VO)

Dimensions



Description

The fully self-contained KCG597E-TT provides G99 protection against loss of mains conditions, critical voltage imbalance or loss of phase.

The DIN rail mounted digitally controlled unit meets the protection requirements for generators connected to mains supply, defined in ENA Engineering Recommendation G99.

Less wiring, no extra modules. Direct connection via terminal plugs and sockets, can be pre-wired by manufacturers of Power Generating Modules to reduce onsite test requirements. LEDs and open collector outputs indicate operating conditions and "First Up" cause of trip.

State-of-the-art digital technology throughout, with quartz-controlled Loss of Mains detection. True RMS measurements.

Loss of Mains Protection

KCG597E-TT will provide the following protection:

- 2 stage Over and 1 stage Under Voltage
- 1 stage Over and 2 stage Under Frequency
- Rate of Change of Frequency (ROCOF, df/dt)
- Vector Shift disabled by default (see note below)
- Voltage Imbalance
- Loss of Phase (<50ms, any phase <20V)

Note:

As Default, the Vector Shift is deactivated for G99 applications. The KCG597E-TT accommodates the new Distribution Code Review Panel's proposal for Vector Shift immunity.

Enhanced ROCOF protection provides adjustable averaging filter and 500ms delay for full compliance with the G99 standard.

Description and Operation

Automatic Supervision Delay

To prevent spurious tripping during synchronising to mains, the Loss of Mains protection is activated after the supervision delay has elapsed.

KCG597E-TT is for three phase 3-wire LINE-LINE voltage input, and is to be connected via a voltage transformer for use in applications such as:

- Co-generation** : Single or multiple generators connected to a Utility grid
- Uninterruptible Power Supplies (UPS)** : Full or part time running, connected to or switching over from the Utility supply
- Base Load** : Full time base load supply, via Utility connection
- Peak lopping** : Part time peak load supply, via Utility connection
- Combined Heat and Power (CHP)** : Full time load supply, normally via Utility connection with waste heat recovery

Control Inputs

The KCG597E-TT features two control inputs for monitoring the status of the Generator Circuit Breaker and the Mains Circuit Breaker. Functionality is inhibited while either of these inputs is closed, providing a feedback loop to ensure the open/close contact breaker commands have been correctly interpreted.

Reset, Inhibit.

With contact closed to terminal 14, all operation is inhibited. Contact closure to terminal 14 will also re-set any previous failure condition.

Loss of Mains, G99 Mode

Loss of Mains mode is enabled by opening of contacts to terminals 14, 15 and 16.

Protective Relay Outputs

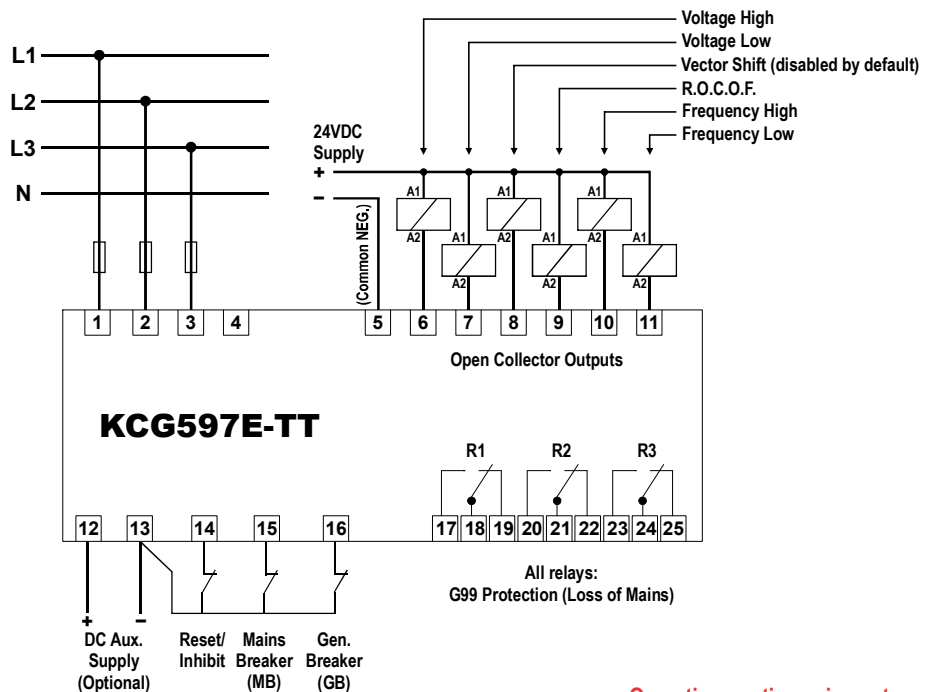
Relay R1, R2, R3 - Loss of Mains Mode

Relays R2 and R3 will de-energise and latch when any alarm parameter exceeds Loss of Mains alarm set-points (non-latching relays optional).

Relay 1 energises and latches after trip. Automatic reset and reset delay is selectable via the HHPx.

Product Diagram

Three Phase 3-Wire connection




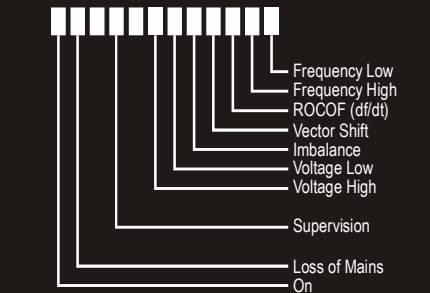
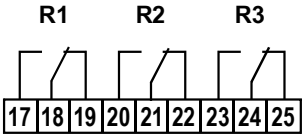
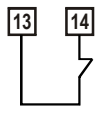
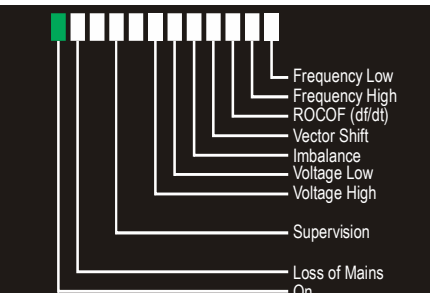
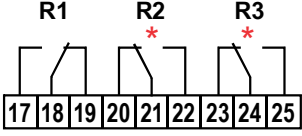
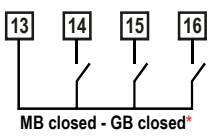
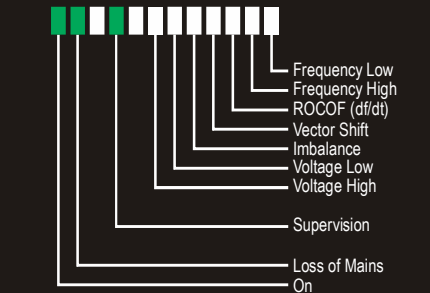
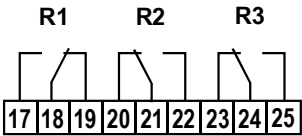
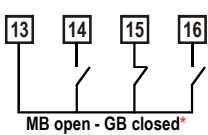
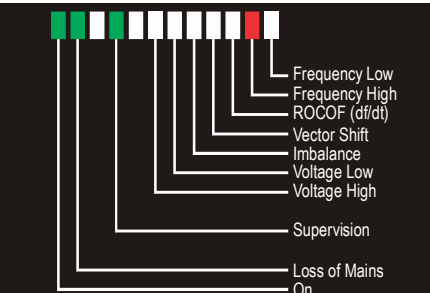
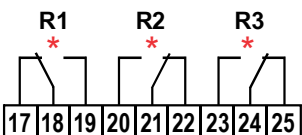
- NOTE:**
- 1) MB, GB, R1, R2 & R3 shown de-energised
 - 2) R2 and R3 are fail safe configured
 - 3) 3 x 0,5A supply input fuses must be fitted

Operation continues in next page

The MEGACON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.



Operation

	<p>Supply Off</p>		
 <p>Inhibit</p>	<p>Supply On unit inhibited (LED1 flashing fast)</p>		
 <p>MB closed - GB closed*</p>	<p>Loss of Mains Mode Normal operation</p>		
 <p>MB open - GB closed*</p>	<p>Loss of Mains Mode After failure</p>		
<p>GB: Generator Breaker MB: Mains Breaker * Use N.C. auxiliary contacts from breakers as control signal</p>		<p>A red LED indicates a "first up" trip parameter. For frequency and volt alarms the lamp will flash once for level 1 alarm and twice for level 2 alarm.</p> <p>The LED flashes during timer count down. If generator continues to run and supply is maintained, relays latch and are reset by linking terminals 13 and 14.</p> <p>Relay 2 and 3 are fail-safe configured * indicates a significant change of relay state</p>	

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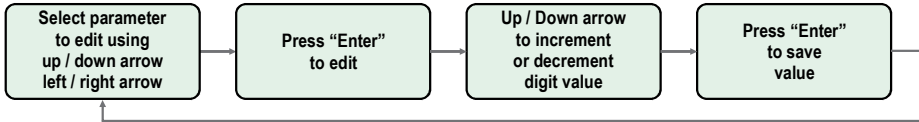


Programming and Events Log

Over/Under Volts set-points and timers are user settable via the optional Megacon hand held programmer HHP1 or HHP2, protected by a 4-digit PIN code. On HHP's LCD-screen, the system voltage and frequency, relay status and history of events can be viewed. Trip of relays can be inhibited during testing of Loss of Mains parameters.

The ID-protected programmer is powered directly from the unit. When connected, the parameters unique to the unit will be displayed. The HHP2 also functions as a USB interface between the KCG597E-TT and a laptop computer. (see next page)

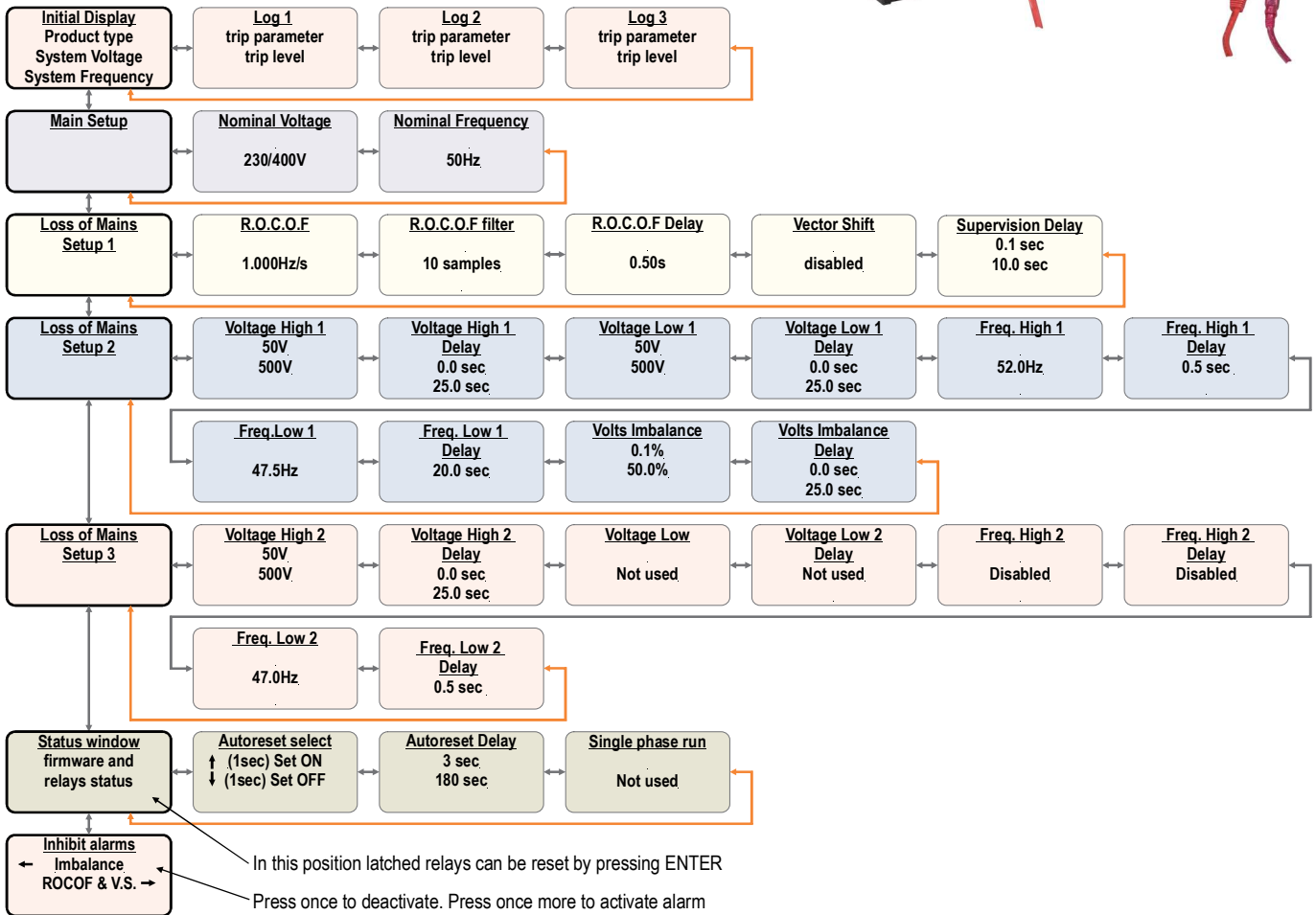
Editing Procedure



The optional HHPx will comfortably fit into a pocket. (85 x 114x 24mm)



Settable range of parameters for the KCG597E-TT unit is as shown:

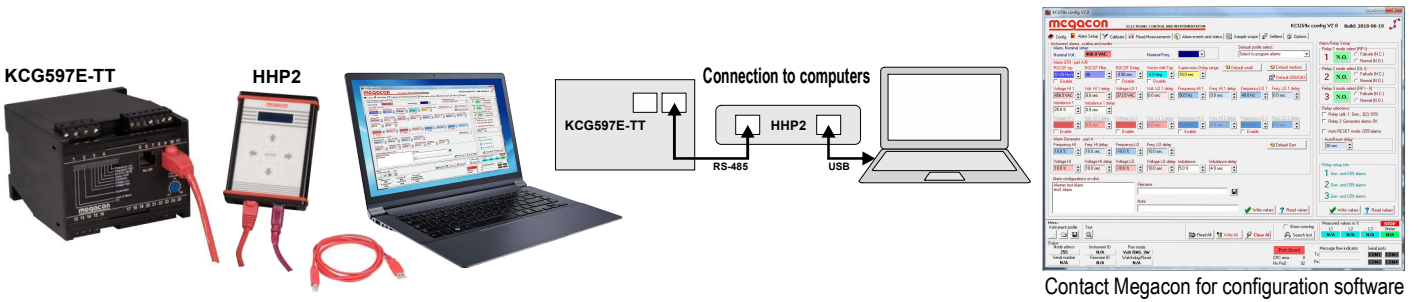


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Programming and Events Log

Interrogation of KCG597E-TT can also be achieved using Megacon's configuration software. The optional HHP2 must be used to interface to laptop computers.

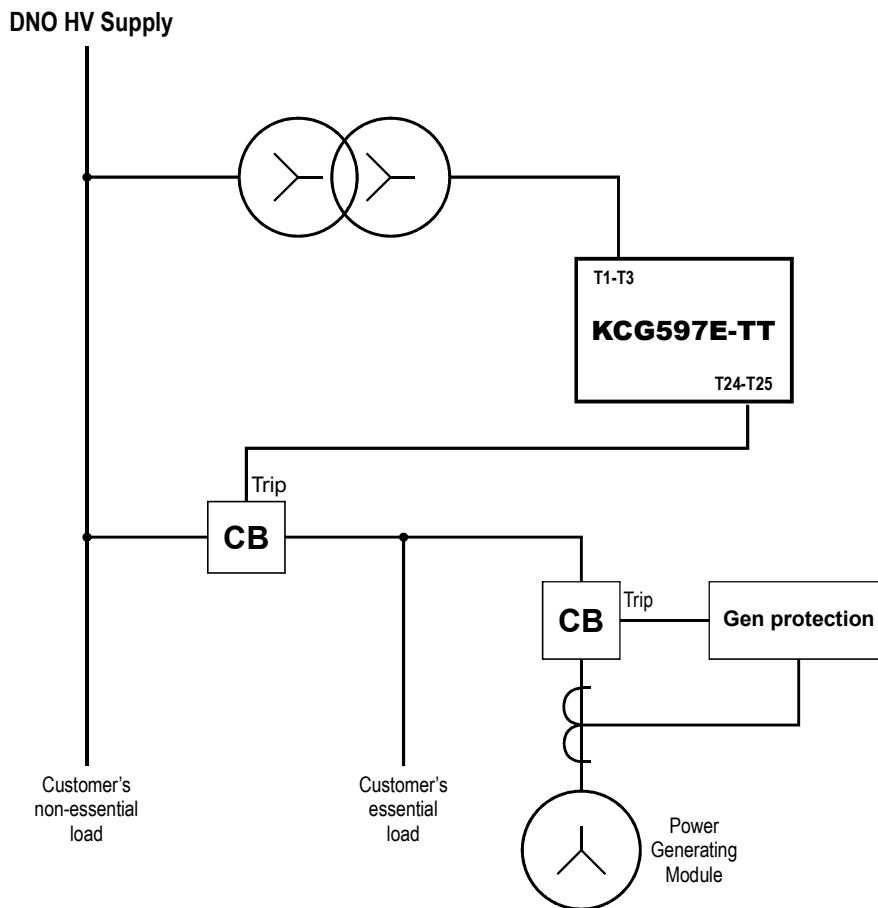


Contact Megacon for configuration software

Installation and Wiring Instructions

Wiring of the KCG597E-TT is dependent upon application. A number of example protection application diagrams are shown in ENA Engineering Recommendations G99 Issue 1 section 10.7.

Example simplified connection diagram for HV load sharing application



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ORDERING EXAMPLE:
 Type: KCG597E-TT
 Gen. Voltage: nom: 110V
 Optional unit: HHP2

