GC

GenControl
Development and manufacture of engine control modules
DESIGNING TO LAST

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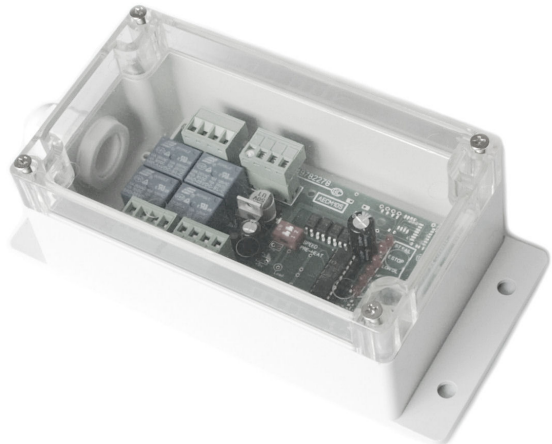Web: www.gencontrol.co.uk

MULTI-ATTEMPT AUTOMATIC ENGINE CONTROL MODULE

Model No: AECM105

PREFACE	AECM105	**IP67 rated**

The Model AECM105 is a new generation of AECM designed to automatically / remotely and manually start and stop the KIPOR KDE6700T generator either by using wired remote start input (so called 2 wire start) or via optional devices: 24/7 digital timer, wireless key fob(s) or/and Battery Voltage Sensor. The wireless key fob control allows to start and stop the engine remotely within approximately 100 m distance (1000 m key fob is optional). The actual working distance depends on many factors and could be much less than 100 m for instance if the key fob is used inside the building. The Battery Voltage Sensor (BVS) controls the engine starting battery voltage (or external battery bank) and able to start the engine automatically upon registering Low Voltage Threshold 11.8Vdc (23.6V) This LVT can be re-adjusted by customer on-site. It will continue to run the engine until the engine starting battery becomes fully charged at 13.8Vdc (27.6V).The BVS will then register High Voltage Threshold and shut down the engine. This HVT can be also re-adjusted by customer on-site.

BVS is linked to engine starting battery internally by default. Should you wish to control an external battery bank (not a KIPOR engine starting battery) please contact us first.

AECM105 will indicate the operational status and fault conditions, automatically shut down the engine and indicate the start engine failure by flashing "START FAIL" LED on the front panel. Other faults are indicated by steady LED. Remote wired operation of the module is via single pole normally open maintained switch connected between terminal #5 (wire 1) and battery negative terminal #13 (wire GR/Y). The switch is shown on wiring diagram as "RST".

IMPORTANT!

The starter relay R1 will energize for 2nd and 3rd crank cycle if generator not producing ~230V. Should the engine still fail to start after the maximum number of attempts, "START FAIL" LED is flashing and the starter relay is latched out.

To reset: remove start signal from wire 1 or (disconnect BVS, press stop button "B" on the key fob, disable time switch) where applicable.

AECM105 numbered cable	DEFAULT SETTING
1. Remote wired start/stop input	N/O maintained switch (RST)
2. Starter motor relay output	Batt. pos. output
5. Fuel solenoid relay output	Batt. pos. output
7. Battery positive power supply (+)	12Vdc / 24Vdc (6...40Vdc)
GR/Y. Battery negative power supply (-)	Common wire (Green/Yellow)
9. AVR protection switch	Volt-free
10. AVR protection switch	Volt-free
11. Generator live input (L)	100~300Vac @ 50/60Hz
8. Generator neutral input (N)	100~300Vac @50/60Hz

AECM105 specification

DC Supply: generator battery 12V or 24V supported (6...40Vdc)
Max. standby current: 10mA @12Vdc
AC voltage input max: 300Vac
Number of attempts: 3 (user-configurable prior to order)
Crank durations: 5-6-7 sec (automatically regulated via sensing AC alt.)
Pause between each attempt: 10 sec

Hold-off time*: 7sec (user-configurable prior to order)
Crank / Fuel / AVR relay output: 10A max
Dimensions: 158x90x65mm
Operating temperature range: -30 to +70°C
Humidity Range Operating: 20-80%
Enclosure IP code: IP67 (weatherproof type)

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Description

WIRED REMOTE / LOCAL CONTROL

Toggle switch RST is On (closed).
0.5 second after the fuel relay R2 is energized, the 3 attempt start will begin its start sequence: the start relay R1 will energize, feeding battery +ve on terminal #14 (wire 7) to terminal #1 (wire 2) and thence on to the start circuit (external power relay PR1). The crank period is set for 5 seconds. If the engine has not fired by the end of 1st attempt, the starter is turned off for a 10 sec. period. The sequence will then repeat up to a maximum number of start attempts. Following a successful start, sensed when AC alternator's voltage rises above 40% of nominal (terminals #15 (wire 8) and #16 (wire 11), the crank relay is de-energized and latched out to prevent re-engagement of the starter with the engine running.

WIRELESS CONTROL (optional)

Toggle switch RST is Off / BVS off / Timer off
Make sure there are no metal doors/walls/other metal shields between you and AECM105 module. Any metal or brick wall may significantly reduce the working distance between the transmitter (key fob) and AECM105 module.

Press "A" button on a key fob for 1 sec and release it. The generator should try to start within a few seconds.

Press "B" button to stop.

If controlled generator doesn't start - try to come closer to the module.

Wireless transmitter/receiver specification
Receiver: internally fitted.
Transmitter/Receiver working frequency: 315Mhz (433Mhz optional)
Number of channels: 2
Encoding type: fixed code

RELAY OUTPUTS ARE PROVIDED FOR:	CONFIGURABLE INPUTS ARE AVAILABLE FOR:
• Starter Motor Output R1 • Fuel Solenoid Output R2 • AVR protection switch R4 (volt-free)	• Wired remote start/stop • AC alternator monitor

ALARM CHANNELS ARE PROVIDED TO MONITOR THE FOLLOWING:

- Loss of speed S/D (speed fault).
- Fail to start S/D. "ST.FAIL" led is lit when fault is identified.

* During engine cranking and for a short time afterwards the protective hold-off timer is active and the relevant alarms inputs are inhibited. This enables the engine to start and achieve normal running conditions. Once the timer has expired, the inputs are enabled providing normal protection from the module.
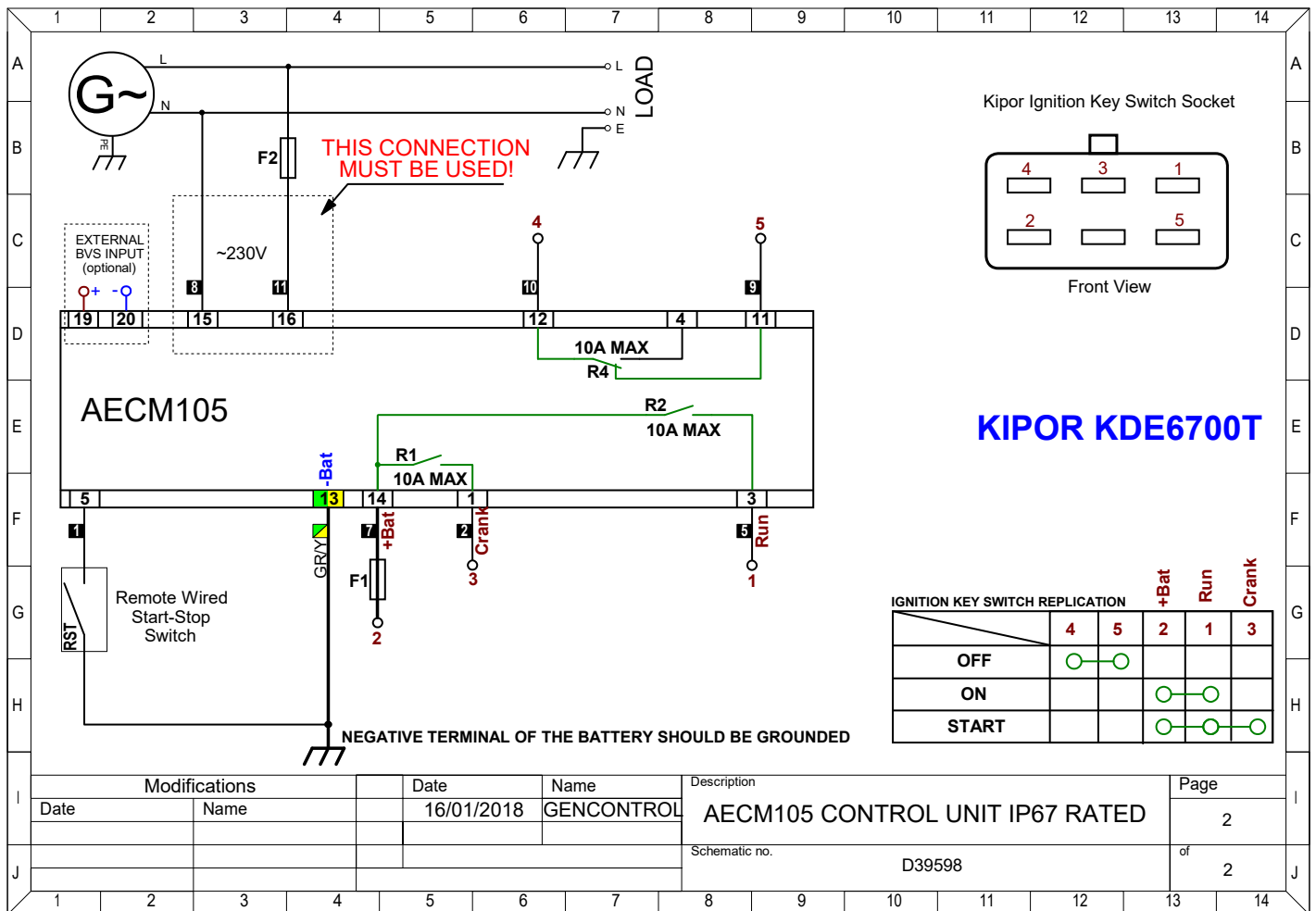
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WIRING DIAGRAM

THIS CONNECTION MUST BE USED!

EXTERNAL BVS INPUT (optional)

~230V

AECM105

Kipor Ignition Key Switch Socket

Front View

KIPOR KDE6700T

LOAD

10A MAX
R4
R2
10A MAX
R1
10A MAX

Remote Wired Start-Stop Switch

RST

-Bat
GR/Y
F1
+Bat
Crank
Run

NEGATIVE TERMINAL OF THE BATTERY SHOULD BE GROUNDED

IGNITION KEY SWITCH REPLICATION		+Bat	Run	Crank
		4	5	2	1	3
OFF		○—○				
ON				○—○		
START				○—○	○—○	

Modifications			Date	Name	Description		Page
Date	Name		16/01/2018	GENCONTROL	AECM105 CONTROL UNIT IP67 RATED		2
					Schematic no.	D39598	of 2

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DIMENSIONS

195 mm

6,5 mm

49 mm

90 mm

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AECM105

PAIR

START RELAY   FUEL RELAY

BUZZ RELAY   LOAD RELAY

Batt

RST

SPEED
PRE-HEAT

+5v

+5v

Load

WPS

BVS

390R

H L

ST.FAIL
E.STOP
LOW OIL
HET/GL
SPEED
ON LOAD

BL

1 2 3 4   5 6 7 8

9 10 11 12   13 14 15 16

17 18 19 20 PH   PL

LOAD
+ — OUT IN — + N L

158 mm

65 mm

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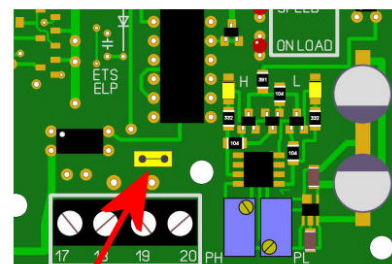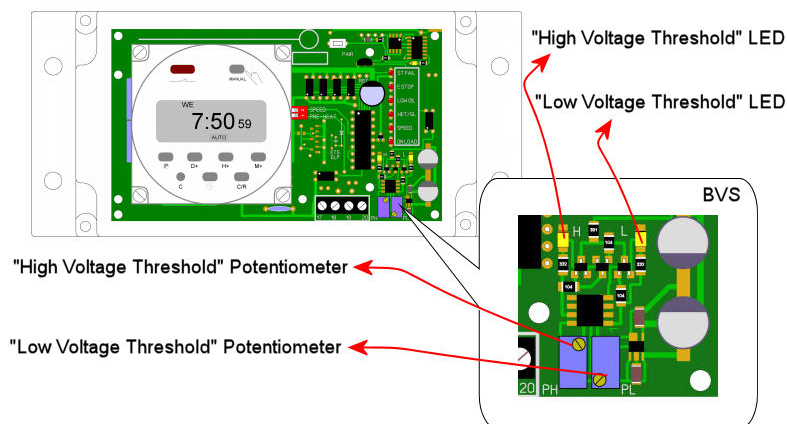Web: www.gencontrol.co.uk

BVS (optional)

The BVS (Battery Voltage Sensor) allows the AECM (Automatic Engine Control Module) to start and run the engine automatically when your engine starting battery is ready to be charged. The BVS monitors two voltage thresholds: Low Voltage Threshold (LVT) and High Voltage Threshold (HVT).When controlled voltage becomes equal to LVT the BVS tells the AECM to start and run the engine until it measures the HVT.

Please note that BVS usually controls the engine starting battery voltage which is also a power supply to the AECM105. Should you wish to control an independent battery (not an engine starting battery!) please contact us prior to order. In this case terminals #19 and #20 become available for you. The BVS input is designed to control DC voltage from 6Vdc to 30Vdc max. and we can pre-set your specific voltage HVT and LVT for you.
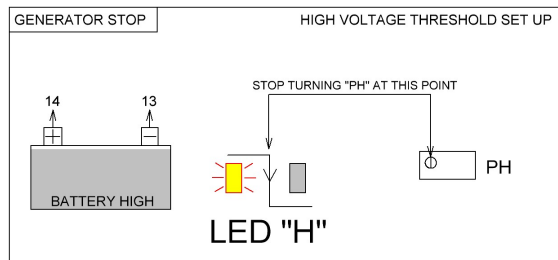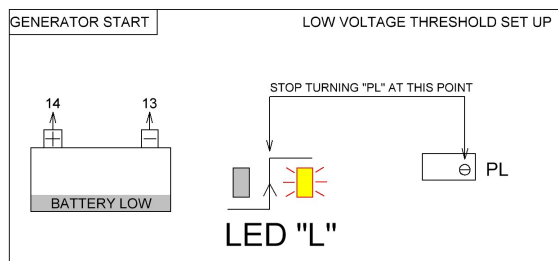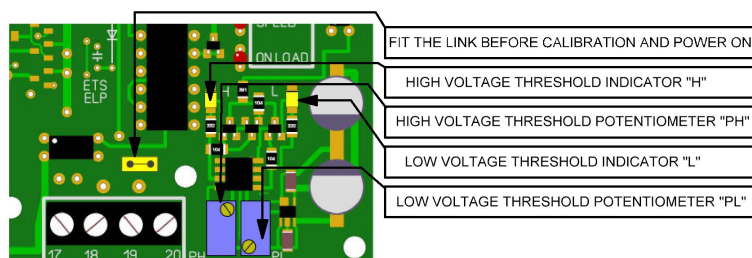
This BVS enabled control module comes with following BVS thresholds:

Start the engine @ 11.8 Vdc (23.6Vdc for 24V battery)
Stop the engine @ 13.8 Vdc (27.6Vdc for 24V battery)

Please note: you can always re-calibrate these thresholds on-site.

"High Voltage Threshold" LED

"Low Voltage Threshold" LED

BVS

"High Voltage Threshold" Potentiometer

"Low Voltage Threshold" Potentiometer

REMOVE THIS LINK
IF BVS IS NOT REQUIRED

FIT THE LINK BEFORE CALIBRATION AND POWER ON
HIGH VOLTAGE THRESHOLD INDICATOR "H"
HIGH VOLTAGE THRESHOLD POTENTIOMETER "PH"
LOW VOLTAGE THRESHOLD INDICATOR "L"
LOW VOLTAGE THRESHOLD POTENTIOMETER "PL"

GENERATOR START	LOW VOLTAGE THRESHOLD SET UP

STOP TURNING "PL" AT THIS POINT

14   13

BATTERY LOW

LED "L"

PL

GENERATOR STOP	HIGH VOLTAGE THRESHOLD SET UP

STOP TURNING "PH" AT THIS POINT

14   13

BATTERY HIGH

LED "H"

PH

NOTE

It is advisable to use an adjustable DC power supply unit (0V to 30V adjustable voltage output), instead of real battery to speed up the process of calibration.

HOW TO SET UP THE BVS LOW THRESHOLD

Disable AECM105 by applying Emergency Stop Button "ESB".
This prevents the engine from accidental start up during calibration process of BVS
Connect your discharged (ready to be charged) engine starting battery to terminals #13 (wire GR/Y) and #14 (wire 7)
Start turning "PL" (very slowly) clockwise/anticlockwise* until LED "L" changes its state from OFF to ON
Stop turning immediately when you notice this change

HOW TO SET UP THE BVS HIGH THRESHOLD

Connect your fully charged engine starting battery to terminals #13 (wire GR/Y) and #14 (wire 7)
Start turning "PH" (very slowly) clockwise/anticlockwise* until LED "H" changes its state from ON to OFF
Stop turning immediately when you notice this change.
Enable AECM105 by switching off Emergency Stop Button.

The accuracy of these adjustments could be as good as ±0.1 V
*Note: the direction of turning depends on previous threshold settings and is usually clockwise, however sometimes it needs to turn anti-clockwise.

Q1: Which way do I need to turn the pot?

A: To increase your high voltage threshold-
turn the pot "PH" anticlockwise.
To increase your low voltage threshold-turn
the pot "PL" clockwise.

For instance: your current low voltage threshold
is 11.8Vdc. You would like to change it to 12.5Vdc.
Discharge your battery down to 12.5Vdc, disable AECM
via Emergency Stop Button, connect your battery to terminals 13
and 14 (wires #GR/Y and #7), start turning "PL" clockwise until you see the LED"L"
switched On, stop turning "PL" immediately when you
notice this change. Enable AECM via Emergency Stop Button.

Q2: How many turns these potentiometers have?
A: Up to 30 turns.