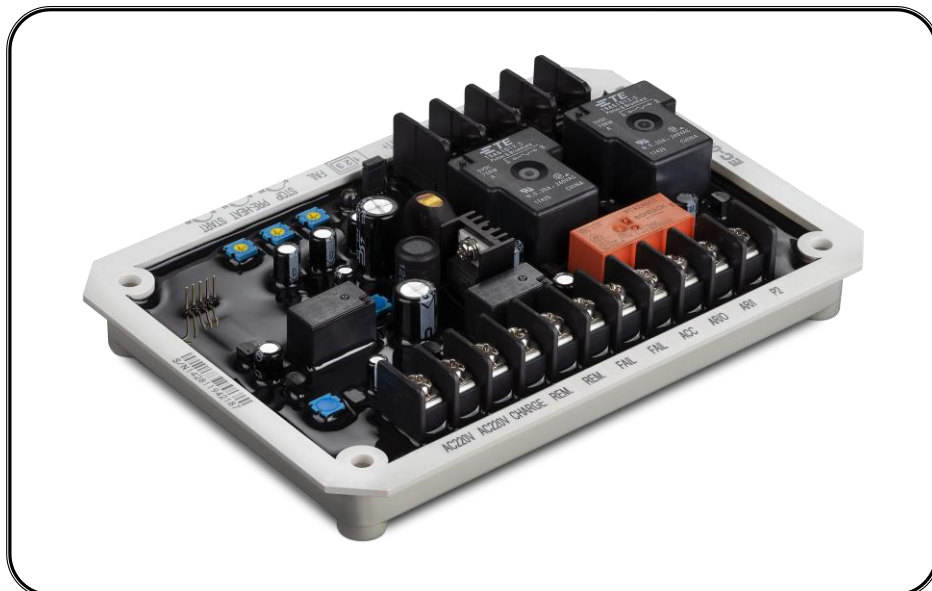


EC-02

Auto Start Control Unit for DENYO Generator



* All manufacturer names and numbers are used for reference purpose only and do not imply that any part is the product of these manufacturer.

SECTION 1 : SPECIFICATIONS

The EC-02 is an Auto Start Control Unit designed for DENYO generators. It can accept signals from a remote switch or an automatic transfer switch (ATS) to automatically start or stop the generator. The unit will make 3 cranking attempts.

The control unit is controlled by a microprocessor for full digital processing, reliable performance, and significantly reduced size. The circuit board is potted with UL94-V0 rated epoxy resin to allow use in harsh environments.

SECTION 2 : FEATURES

- Small size, low cost and high stability.
- Very low power consumption in standby mode.
- Potentiometer time delay settings.
- Three cranking attempts.
- Generator fault indicator and alarm output contacts.
- Terminal block connections for easy installation and maintenance.
- Energize-to-Run and Energize-to-Stop options.

SECTION 3 : FUNCTIONS OF TERMINALS

- 3.1 Terminals 1 & 2 (AC220V) : Generator 220Vac input terminals. When AC input voltage is greater than 130 Vac the control unit will cut the start motor signal output. (Refer to Figure 1)
- 3.2 Terminal 3 (CHARGE) : Charging alternator DC voltage input terminal. When the input voltage is greater than 7 Vdc the control unit will cut the start motor signal output. (Refer to Figure 1)

NOTE

When charging alternator voltage is used to detect engine start the battery positive (+) voltage must not feedback to this terminal. It is recommended that a high current diode be installed between the charging alternator and battery positive (+) terminal to isolate the battery positive voltage from this terminal.

- 3.3 Terminals 4 & 5 (REM) : Remote start dry contact signal input terminals (Refer to Figure 1)
REM contacts states :
Contacts Open – engine stop
Contacts Closed – engine running
- 3.4 Terminals 6 & 7 (FAIL) : Generator fault auxiliary output terminals. (Refer to Figure 1)
Rated capacity : 3 Amp @ 12/24 Vdc

Generator faults include the following items :

- Engine start failure.
- No AC voltage output when engine is running.
- Generator protection system causing engine shutdown.

FAIL contacts states :

Contacts open – normal status
Contacts closed – engine failure

- 3.5 Terminal 8 (ACC) : Connects to the ACC pin of the key start switch. For other brands of generator this is engine stop signal output terminal. (Refer to Figure 1)
Rated Capacity : 10 Amp @ 12/24 Vdc
- 3.6 Terminal 9 (AR/O) : Connects to the AR/O pin of the key start switch. For other other brands of generator this terminal has no function and no wiring is required. (Refer to Figure 1)
Rated Capacity : 5 Amp @ 12/24 Vdc
- 3.7 Terminal 10 (AR/I) : Connects to the AR/I pin of the key start switch. For other other brands of generator this terminal has no function and no wiring is required. (Refer to Figure 1)
- 3.8 Terminal 11 (P2) : Connects to the P2 pin of the key start switch. For other brands of generator this terminal has no function and no wiring is required. (Refer to Figure 1)
Rated capacity : 5 Amp @ 12/24 Vdc
- 3.9 Terminal 12 (PRE-HEAT) : Engine pre-heat signal output terminal. (Refer to Figure 1)
Rated Capacity : 30 Amp @ 12/24 Vdc
- 3.10 Terminal 13 (START) : Engine Start Signal output terminal. (Refer to Figure 1)
Rated capacity : 30 Amp @ 12/24 Vdc
- 3.11 Terminal 14 (BATT-) : Connect to the negative terminal of the battery. Wiring capacity must not be less than 35Amp. (Refer to Figure 1)
- 3.12 Terminal 15 (BATT+) : Connect to the positive terminal of the battery. Wiring capacity must not be less than 35Amp. (Refer to Figure 1)

SECTION 4 : TIME DELAY SETTINGS

- 4.1 VR1 : Engine stop adjustment for Energize-to-Stop mode. (Refer to Figure 1)
Adjustable range 1 – 20 seconds.
It is recommended that the stop timer setting be 3 – 5 seconds longer than the recommended value in the generator user manual.
- 4.2 VR2 : Engine Pre-Heat adjustment. (Refer to Figure 1)
Adjustable range 1 – 20 seconds.
Recommended cranking interval setting is 5 seconds.
- 4.3 VR3 : Cranking time adjustment. (Refer to Figure 1)
Adjustable range 1 – 20 seconds.
Recommended cranking time setting is 4 – 8 seconds.

NOTE

Avoid the possibility that the charging alternator voltage directly fed into the controller in order to avoid damage to the controller caused by high charging voltage.

SECTION 5 : STATUS INDICATORS AND ENGINE SHUTDOWN MODE SETTINGS

- 5.1 L1 : Generator Fault Indicator. When the Generator Fault auxiliary contact has an output (closed) the indicator will light to indicate unit failure. (Refer to Figure 1)
- 5.2 Engine Shutdown Mode settings

Jumper Pin1 & Pin2 : Energize-to-Stop
For engines with a stop solenoid installed. The ACC terminal has no output when the engine is running. To stop the engine ACC outputs DC12/24V to the stop solenoid. The stop signal duration can be set by VR1.

Jumper Pin 2 & Pin 3 : Energize-to-Run.
Applicable to generator with electronic governor controller installed. The ACC terminal will output DC12/24V when the engine is running. The ACC terminal has no output when the engine is stopped. Use this setting for DENYO generators.

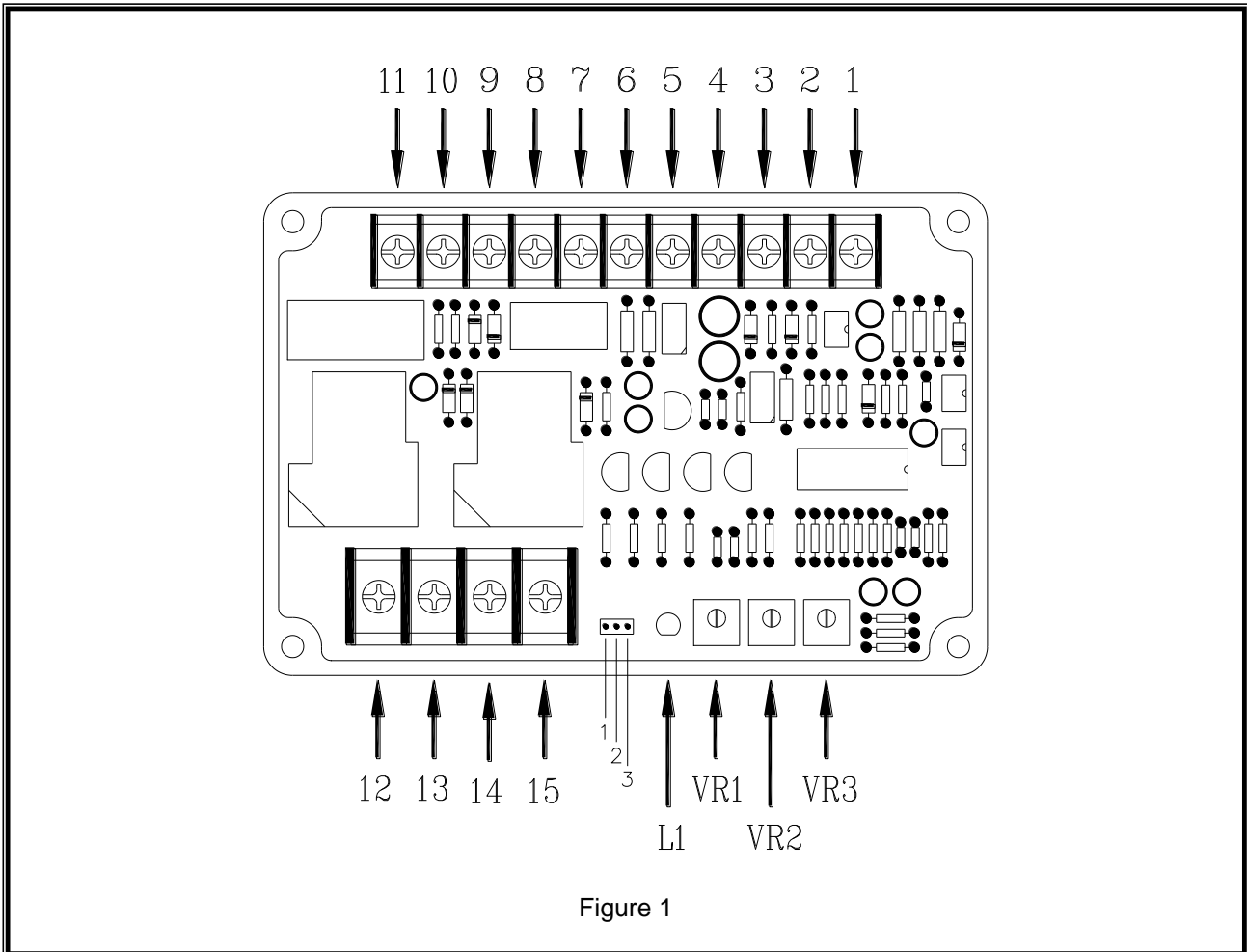


Figure 1

SECTION 6 : WIRING DIAGRAM

