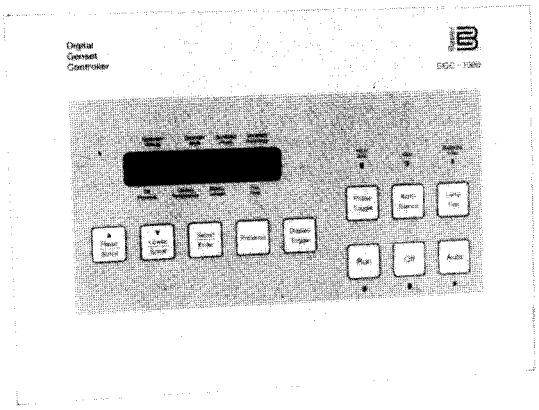

DGC-1000 DIGITAL GENSET CONTROLLER

Now with SAE J1939 CANBUS engine communications

Basler Electric's Digital Genset Controller (DGC-1000) offers a low cost microprocessor based integrated alternative for the control and monitoring of small to medium sized gensets. Control includes engine starting and shutdown as well as system monitoring and remote annunciation. DGC allows user inputs and programming to provide a reliable, customizable genset controller. This unique design has features not found in any competitive models. It monitors and displays eight engine and generator parameters on the front panel and up to a total of 28 parameters via the front panel scrolling feature. The DGC-1000 offers the most flexible design possible. It has user-definable alarms, pre-alarms, timers, cranking, sender inputs, J1939 engine communications, programmable inputs and outputs with the optional Auxiliary I/O feature and an on-board modem for external communications from virtually anywhere.

FEATURES

- Microprocessor based
- Flash memory
- Displays 28 engine/generator parameters
- Uses SAE J1939 CANBUS communications for engine parameters
- Has user programmable analog sender inputs for oil pressure, coolant temperature and fuel level
- Controls engine starting and stopping
- PC-configurable with BESTCOMS PC software included with every unit
- Programmable engine cranking
- Programmable alarms and pre-alarms
- NFPA-110 Level 1 compatible (non-air damper application)
- Optional integral dial-out modem
- Optional Auxiliary I/O module
- Remote annunciation via 2-wire communications and Basler's RDP-110
- UL recognized, File Number E97035
- CSA certified, File Number LR23131

ADDITIONAL INFORMATION

INSTRUCTION MANUAL

Request Publication 9358900990

Basler Electric

ROUTE 143, BOX 269 HIGHLAND, ILLINOIS 62249, U.S.A. PHONE 618-654-2341 FAX 618-654-2351

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DESCRIPTION

DGC-1000 Digital Genset Controller utilizes microprocessor based technology to provide a versatile system for genset control, protection and monitoring. This microprocessor design allows customization of the controller's functions to fit virtually every application's needs. DGC-1000 has conventional engine sender inputs. These can be customized via the BESTCOMS PC software to allow virtually any sender to be used. It is also possible for the user to get the engine information from the engine control module and use CANBUS, SAE J1939. This saves money and time normally spent on buying and installing senders and mag pickups. DGC-1000 offers an optional dial-out modem to announce alarms and pre-alarms to a computer or pager. There is also an optional auxiliary I/O module that allows for four more contact inputs and eight Form C outputs. Optional features enable the user to meet the requirements of NFPA-110 Level 1 for non-air damper equipped engines.

SPECIFICATIONS

INPUTS

DC power input (Battery):
- 12Vdc nominal systems (8-16Vdc)
- 24Vdc nominal systems (16-32Vdc)
- (both Negative Ground systems)
- Power dissipated is 16 Watts.

Generator voltage input:
- 12-576Vac continuous, 50/60Hz @ <1 VA

Generator line current: 1 or 5 Amp input @ <1 VA
Oil pressure sender: 0 to 100 PSI (33-240Ω)
Coolant temperature: 100°F to 300°F (37°C to 149°C)
(62.6-637.5Ω)
Speed input: Magnetic pickup 3V peak minimum to 35V peak into a 10kΩ (32Hz-10kHz) impedance
Fuel level: 0-100% (240-33Ω)
Contact Sensing Inputs: Emergency Stop, Low Coolant Level, Automatic Transfer Switch
SAE J1939 CANBUS communications

OUTPUTS

Contact ratings: 10A @24Vdc make, break, and carry (Crank, Fuel solenoid)
2A @24Vdc make, break, and carry (EPS supplying load, Alarms, Pre-start, pre-alarms)
NFPA-110 output to RDP-110

ENVIRONMENTAL SPECIFICATIONS

Vibration: 10 to 500 Hz @2 Gs
Shock:15 Gs in each of three mutually perpendicular axes
Ambient operating temperature: -40°C to +70°C
Salt Fog Testing: Per ASTM 117B-1989 for 100 hours
Weight (max.): 1.9 pounds (0.86 kilograms)

MONITORING

GENERATOR

Generator voltage:
- 0 to 600 Vac
- Display range is 0 to 15,000V
- Accuracy is ±0.5% of indication or 1Vrms @25°C, whichever is greater (with phase selection switch and panel indication)

Generator Frequency:
- Derived from voltage inputs
- Display range is 4 to 70 Hz
- Accuracy is ±0.25% of indication or 0.1Hz @25°C, whichever is greater

Line current input (CT):
- 0 to 5 Aac or 0 to 1 Aac RMS
- Display range is 0 to 5000 A
- Accuracy is ±0.5% of indication or 1Arms @25°C, whichever is greater (with phase selection switch and panel indication)

kVA:
- Calculated from voltage and current inputs
- Display range is 0 to 9999kVA
- Accuracy is ±0.5% of indication or ±0.1kVA, whichever is greater @25°C

kW:
- Calculated from voltage and current inputs
- Display range is 0 to 9999kW
- Accuracy is ±0.5% of indication or ±0.1kW, whichever is greater @25°C

Power Factor:
- Calculated from voltage and current inputs
- Display range is +1.0 to -1.0PF both leading and lagging (all four quadrants)
- Accuracy is ±0.01PF of indication @25°C

kWh:
- Display range 0-999,999,999kWH
- Accuracy is ±0.5% of reading or ±1kWH, whichever is greater @25°C

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SPECIFICATIONS, continued

ENGINE

Oil pressure:
Input from sender or SAE J1939 CANBUS
Display range is 3 to 100 PSI or 103-1035kPS
Accuracy is ±0.5% or ±1PSI/1kPA, whichever is greater @25°C
Sender input is 33-240Ω

Coolant temperature:
Input from sender or SAE J1939 CANBUS
Display range is 100°F to 300°F (37°C to 149°C)
Accuracy is ±0.5% or ±1°F/1°C, whichever is greater @25°C
Sender input is 62.6-637.5Ω

Battery voltage:
Input from battery is 8 to 36Vdc
Display range is 3 to 36Vdc
Accuracy is ±0.5% of indication or ±0.1 volts, whichever is greater @25°C

Engine run-time:
Display range is 0 to 99,999 hours
Accuracy is ±0.5% of indication or ±1 hour, whichever is greater @25°C

Fuel level:
Input from sender
Display range is 0-100%
Accuracy is ±0.5% of indication or 1% @25°C, whichever is greater
Sender input is 240-33Ω

RPM:
Input from magnetic pickup or SAE J1939 CANBUS
Display range: 750 to 3600 RPM
Accuracy: ±0.5% of indication or ±2 RPM, whichever is greater @25°C

NOTE: Final engine parameter accuracies are subject to sender accuracy.

TOTAL MONITORED PARAMETERS

GENERATOR

Voltage (three phases and three phases to neutral)
Current (three phases)
kW total and per phase
kVA total and per phase
kWH
Power Factor
Frequency

ENGINE

Oil pressure
Coolant temperature
Fuel level
Battery voltage
Hours to next service
Total run time
Engine RPM

GENERATOR SET PROTECTION

Alarms:

- Low oil pressure
- Overspeed
- Overcrank
- Emergency Stop button input
- High coolant temperature
- Sender failure
- Low coolant level
- Low fuel level

Pre-Alarms:

- Low oil pressure
- Engine kW overload
- Maintenance interval timer
- High coolant temperature
- Low coolant temperature
- Battery charger failure
- High battery voltage
- Low battery voltage
- Fuel Leak
- Weak battery
- Low fuel level

TIMERS

Engine cooldown: 0 to 60 minutes
Engine maintenance: 0 to 5000 hours
Pre-Alarm time delays:
Weak battery and low battery voltage: 1-10 seconds
Alarm time delays:
Overspeed: 0-500ms
Sender failure: 0-10 seconds
Arming delays after crank disconnect:
Low oil pressure: 5-15 seconds
High coolant temperature: 50-150 seconds
Pre-crank delay: 0-30 seconds

SERIAL COMMUNICATIONS

The DGC-1000 is fully programmable via the RS-232 DB9 connector. The DGC-1000 may be programmed via the provided Windows® 95/98/NT software. This software permits individual parameter setting or complete file transfers from a personal computer to the DGC-1000 for fast, accurate setup of the DGC-1000.

J1939 CANBUS communications allows the DGC-1000 to communicate to the engine's ECM to gather information about the engine, i.e. oil pressure, engine coolant temperature, RPM, battery voltage and many more. By using the ECM, conventional mechanical senders are no longer required. This can save substantial money in installation and purchasing of the senders. It also removes any errors between the information displayed between the ECM and DGC-1000 that may be present due to inaccuracies in the senders.

The DGC-1000 also has an RS-485 port for four-wire communications to the RDP-110 remote display unit. This unit may be placed 4000 feet from the DGC-1000 and provides NFPA-110 (for non-air damper equipped engines) compatible annunciation of 17 operating and alarm indications with only four wires.

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DGC-1000 FRONT PANEL DISPLAY

Figure 1 shows the front panel human-machine interface (HMI) for a DGC-1000.

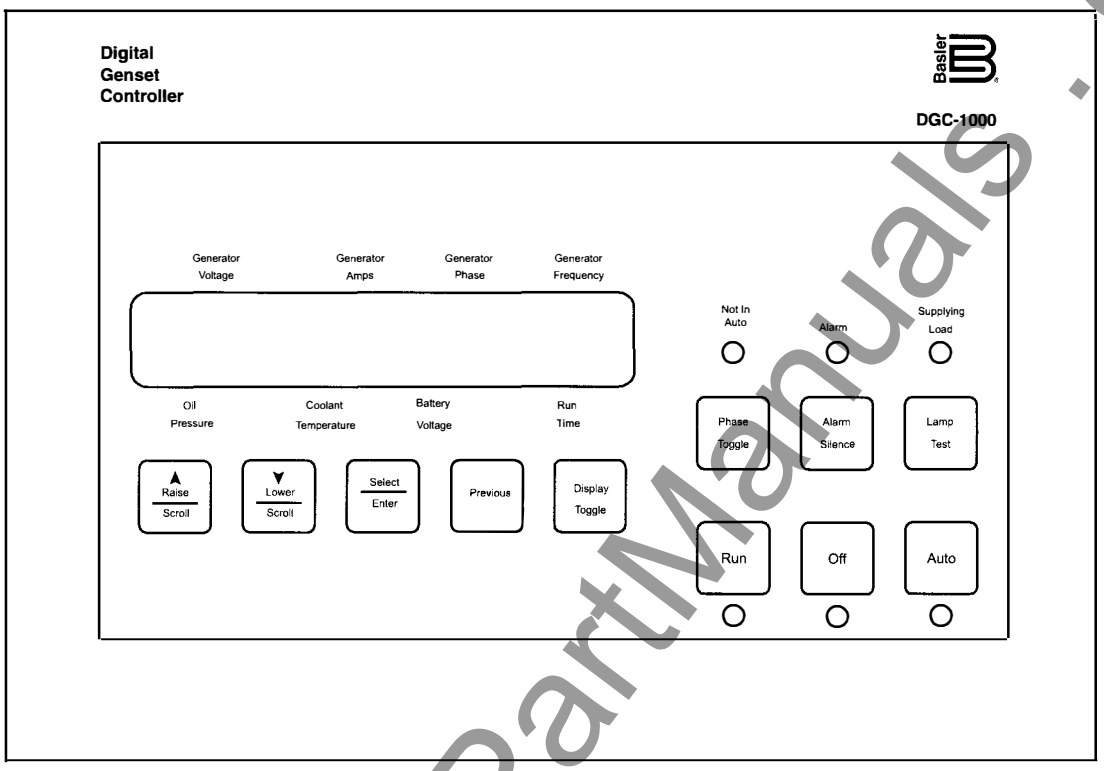

Figure 1 - Front Panel

FRONT PANEL LED INDICATORS:

Run: Indicates the engine is running (operating).
Off: Indicates the engine is not running (shutdown).
Auto: Indicates the unit is in the AUTO mode of operation.
Not-in-Auto: Indicates unit is not in the AUTO mode.
Alarm: Indicates an alarm situation by continuous illumination. Indicates a Pre-alarm by flashing.
Supplying Load: Indicates the system is supplying power to a connected load.

PACKAGING:

DGC-1000 is delivered ready to install. It utilizes 1/4" quick connect fasteners for interconnection to the genset.

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DIMENSIONS

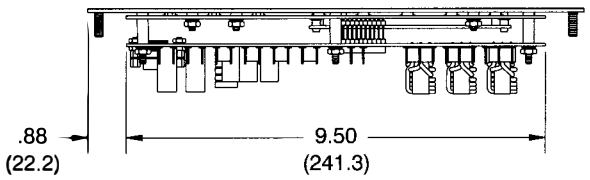

Figure 2 - Dimensions - Top View

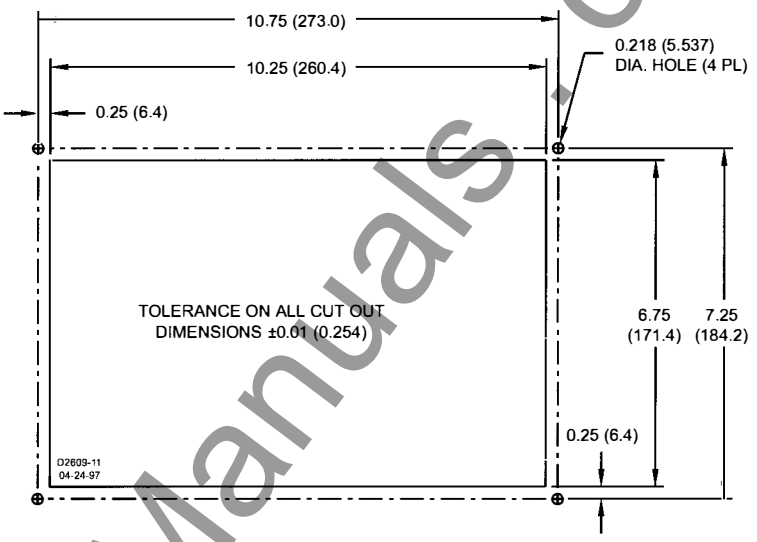

Figure 3 - Case Cutout Dimensions

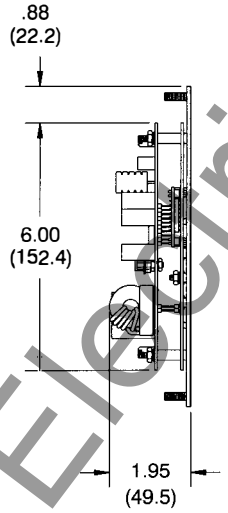

Figure 4 - Dimensions - Side View

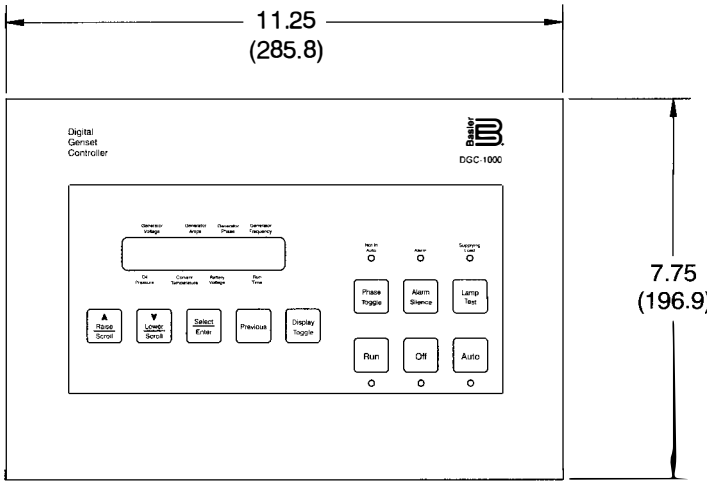

Figure 5 - Dimensions - Front View

NOTES: 1. Dimensions in parentheses are in millimeters.
2. All drawings and data subject to change without notice.

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CONNECTIONS

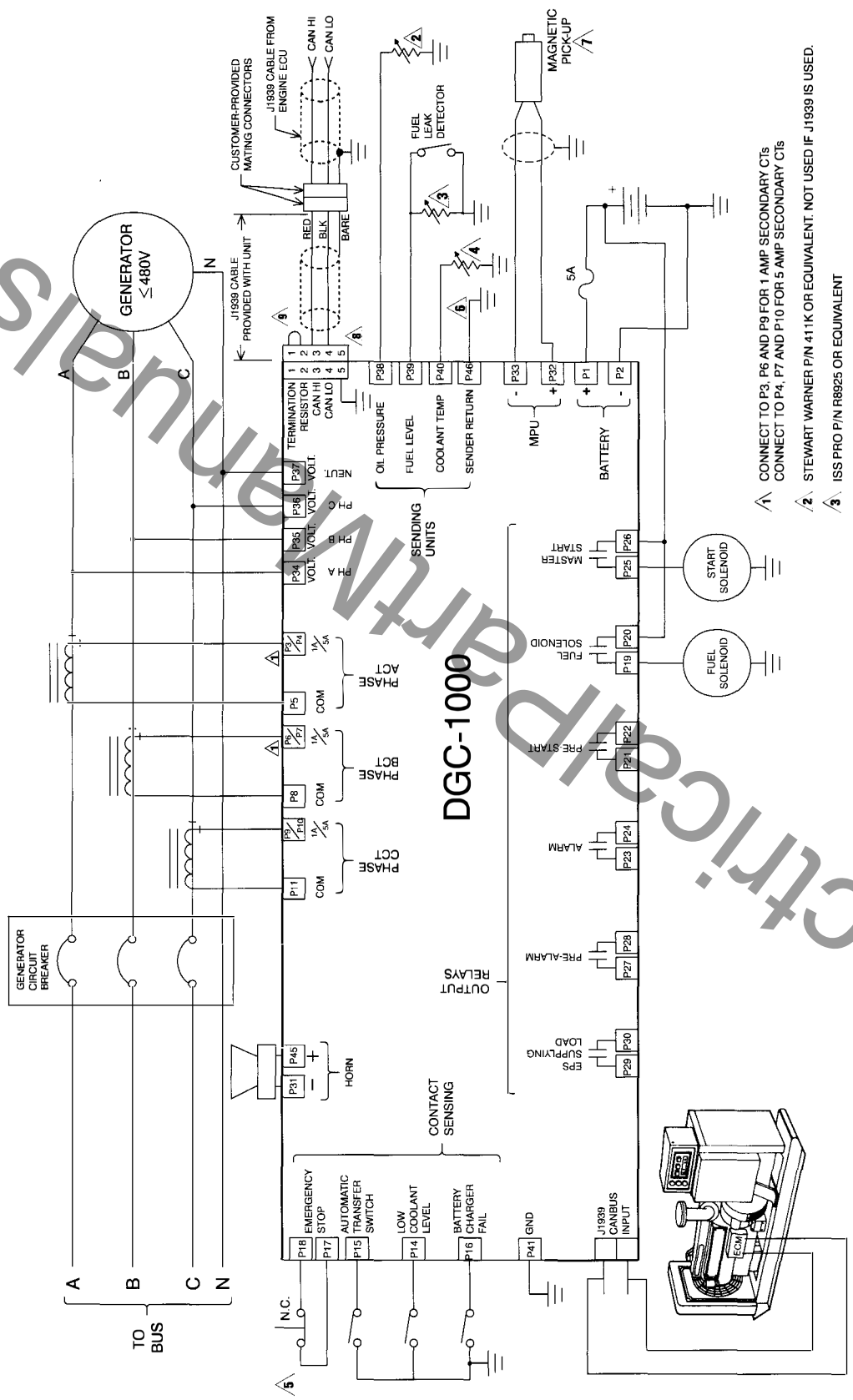

Figure 6 - DGC-1000 Direct Connected Three-Phase Line-to-Neutral Sensing

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ORDERING INFORMATION

OPTIONAL EQUIPMENT

Additional I/O (Input/Output)
For those applications where more input and output contacts are needed to customize the DGC-1000 to the application, Basler offers an additional card that has four inputs and eight output contacts. These contacts may be assigned for the particular desired function by using the PC software to label the inputs so the front panel LCD displays the proper message and the outputs can be easily programmed for any desired outcome.

Dial out modems
Basler Electric offers two modem boards for use with the DGC-1000 for dial out capability to inform a pager that an alarm or pre-alarm has occurred with the DGC-1000. Up to four phone numbers can be dialed and will be called in sequence until an answer is received.

The modems come in two operating temperature ranges. The standard modem is rated from 0°C to +50°C, and the extended operating temperature range device will accommodate temperatures from -40°C to +70°C. Please see the style chart for ordering information.

Enhanced Communications
This enhanced communications option allows the user to have advanced communications with the DGC-1000. This option provides all of the standard PC software features found in all of Basler's BESTCOMS software, i.e. fast and easy set-up of all system configurations, alarms, pre-alarms, I/O configuration and modem set-up, and much more. It provides enhanced PC communication by providing remote start-stop control of the genset, remote viewing of faults, remote resetting of faults, and remote metering of the engine/generator parameters, 28 in all, of the DGC-1000. The remote PC monitoring of the DGC-1000 requires the internal modem option and allows the user the dial-in and dial-out capability normally found in only the most expensive controllers. It does this while utilizing the innovative low cost, easy to operate and install DGC-1000 package.

Audible Alarm Horn, Basler P/N 29760
An audible alarm horn is available that is rated at 80db from 2 feet (0.6 meters) to provide an audible alarm indication to meet NFPA-110. This horn is remotely mounted from the DGC-1000 and can be ordered by specifying Basler Part Number 29760.

Remote Annunciation Display Panel
Applications and specifications requiring remote annunciation can be satisfied by using Basler's Remote Display Panel, RDP-110. Request product bulletin SNE for Remote Display Panel, RDP-110. The panel needs only four wires to annunciate all the alarms, pre-alarms and operating conditions of the DGC-1000. This product meets the requirements of NFPA-110 for non-air damper equipped engines.

Vibration Isolated Enclosure
DGC-1000 can be mounted in an optional two-piece metal enclosure that has four vibration isolators installed. Basler can also customize this enclosure to your specific needs, adding terminal strips or cabling for customer interconnection, alarm horns, emergency stop buttons, etc.

SAMPLE SPECIFICATION

The engine generator control system shall be a microprocessor based design that incorporates both engine control and monitoring of the engine and generator and displays these monitored quantities on a front panel LCD display. The device shall meet the requirements of NFPA-110 Level 1 and shall provide contacts for remote annunciation. It shall provide the user the option of setup and adjustment via a Personal Computer or via the front panel pushbuttons. The device shall be a Basler Electric Model DGC-1000; there are no equals.

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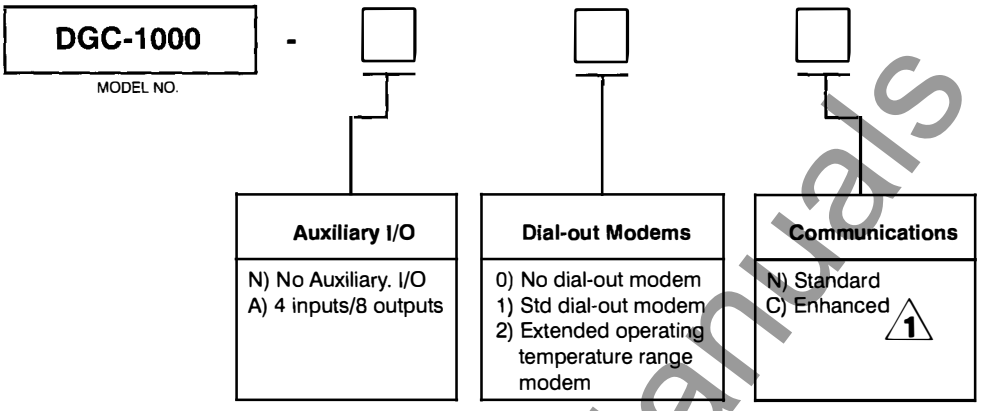
ORDERING INFORMATION, continued

STYLE CHART



NOTES:

1 Requires dial-out modem.

Example: DGC-1000-A2C consists of the basic DGC-1000 digital genset controller, equipped with auxiliary I/O of 4 inputs and 8 outputs, an extended temperature range modem capable of operating in ambient temperatures of -40° to +70°C, and enhanced communications.

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