HOYT ELECTRICAL INSTR. WORKS
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PENACOOK, NH

COMPONENTS & SYSTEMS

multitek

MULTI-GEN™ GENERATOR MONITORING SYSTEM

- REPLACES 7 METERS
- REPLACES TEMPERATURE & PRESSURE SWITCH GAUGES
- REDUCES COST
- COMPATIBLE WITH INDUSTRY STANDARD PSI & °F SENDERS

MULTIGEN

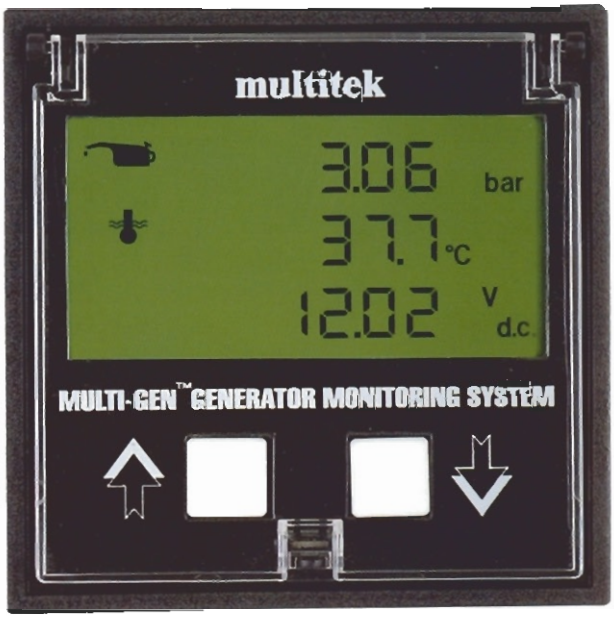
The MultiGen is a complete digital metering system designed for measuring all the main parameters required for gen-set monitoring. All functions are performed via the two front control buttons making the MultiGen simple to use.

PARAMETERS MEASURED

The MultiGen measures and displays :
* *Phase - Phase Voltage (V)*
* *Phase -Neutral Voltage (V)*
* *Phase Current (I)*
* *Frequency (Hz)*
* *Coolant Temperature (deg C or deg F)*
* *Oil Pressure (bar or psi)*
* *Hours Run (Run Time)*
* *Battery Voltage*

CIRCUITRY

The MultiGen uses a high speed microprocessor and analog to digital conversion circuitry. Phase voltage and current are measured simultaneously, as well as DC parameters. The voltage and current measurements are true RMS and the coolant and oil pressure are measured directly from the engine sender. Hours Run is measured from the frequency and DC volts measured directly from the battery.



DISPLAY

The display is a unique backlit custom LCD with black figures on a green background. The LCD is an STN (super twist neumatic) giving a high contrast display over a wide viewing angle.

There is a maximum of 6 screens all addressable by either pushing the ^ or v button on the front of the MultiGen. On a 3 phase 4 wire unbalanced load system the display screen sequences are as follows.

Screen 1 = L1 N, L2 N, L3 N Volts.
Screen 2 = L1 L2, L2 L3, L3 L1 Volts.
Screen 3 = L1, L2, L3 Amps.
Screen 4 = Pressure, Temperature, Hours Run.
Screen 5 = Hz, DC Volts.
Screen 6 = Custom Screen.

CUSTOM SCREEN

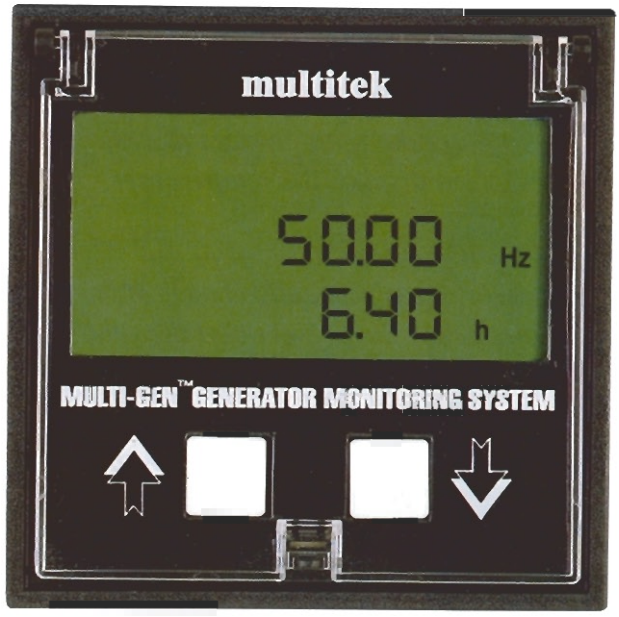
The Custom Screen enables the User to program a unique screen to display 3 specific parameters.

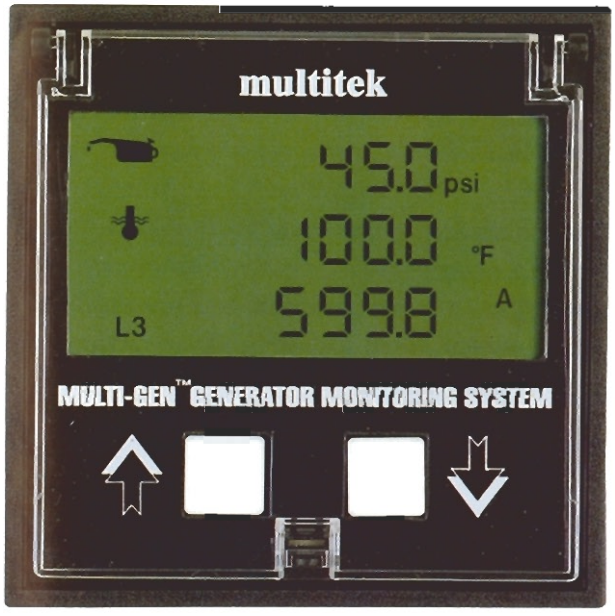
For example :-

The first line of text could display phase 1 current.

The second line of text could display frequency.

The third line of text could display DC volts.





ACCURACY

The accuracy of the voltage and current readings is 0.5% of reading. All other parameters have an accuracy of 1% of reading making the MultiGen a highly accurate instrument.

PROGRAMMING

MultiGen can be supplied fully programmed to match sender inputs, CT and VT ratios and relay output set points; if all the information as shown on page 5 is provided when products are ordered.

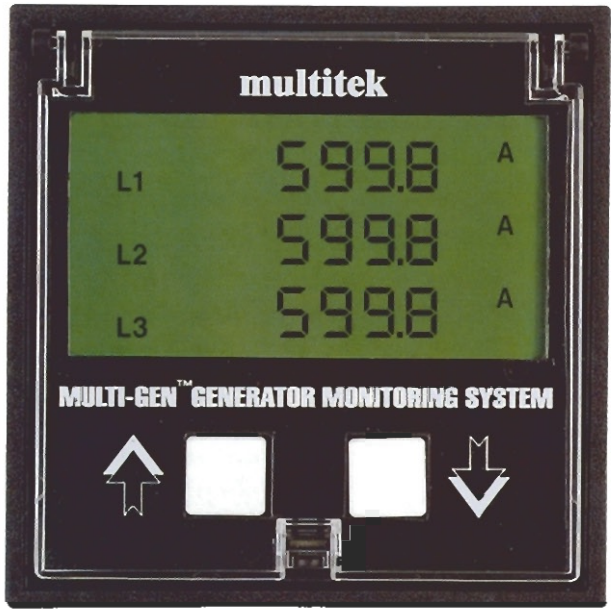
If required, it is very simple to program the MultiGen. Programming is via the two front buttons. A product manual is supplied with each MultiGen giving step by step instructions.

The MultiGen sender inputs for pressure and temperature are compatible with all leading sender manufacturers such as VDO, Datcon, Murphy etc.
Within the sender input set up program a menu of leading manufacturers sender part numbers are given and the program automatically sets up the sender range once a part number is selected. As an alternative, the user can program in 5 points from any sender resistance range.

CT and VT ratios can easily be changed as can the trip points for over temperature and low oil pressure.

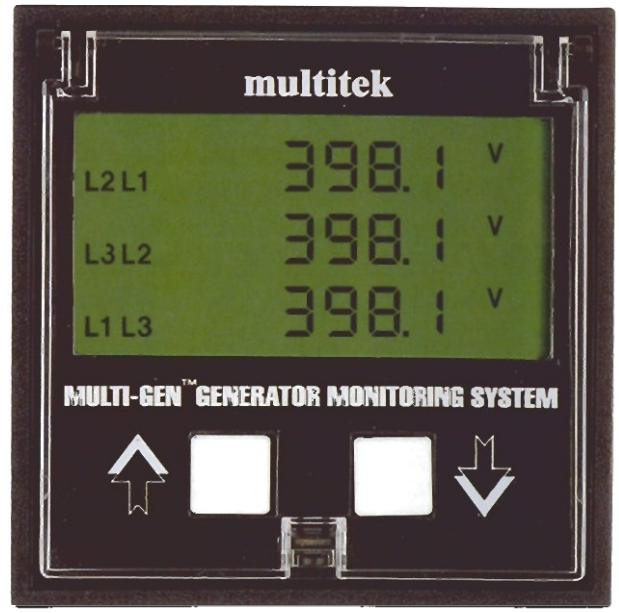
RELAY OUTPUTS

Two relays are provided as an option. One is a normally open contact and is used to monitor the coolant temperature. If the temperature rises above the preset point the relay contact closes, and on the MultiGen display, the temperature icon flashes.
The second relay is provided to monitor the pressure and this relay is normally closed. If the oil pressure goes below the preset point the relay closes and the pressure icon on the MultiGen screen flashes.



COMMUNICATIONS

The MultiGen has the option of providing RS485 communication.
The RS485 enables remote reading and programming of the MultiGen via a host computer. The RS485 output uses the Modbus protocol allowing multi-drop with up to 32 MultiGens connected in parallel. The RS485 modbus protocol allows the MultiGen to be used with PC, PLC, RTU, Data loggers and Scada programs.
The following are programmable for the RS485 output :
Baud rates : 19200, 9600, 4800, 2400.
Parity : Odd, Even or No parity.
Stops : Automatically set once parity is selected.
Address 1 to 247



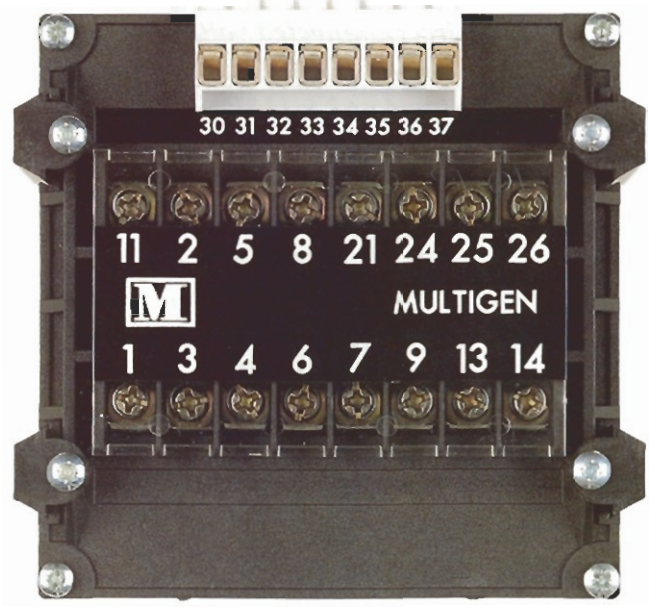
MEMORY

Calibration and setup parameters including current and voltage ratios, calibration constants, sender ranges, etc. are stored in a non volatile e^2prom. In power down (power loss) conditions all data is retained.

APPLICATIONS

The M820-GM series is primarily designed for the gen-set manufacturer as it measures all the basic generator and engine parameters. The M830-SM measures only AC Volts, AC Amps and Frequency, which means it can be used in many other applications such as switchboards, building management systems, motor control centres, high and low voltage switchboards, UPS systems, process control, cogeneration and power management and control.

METER REAR VIEW

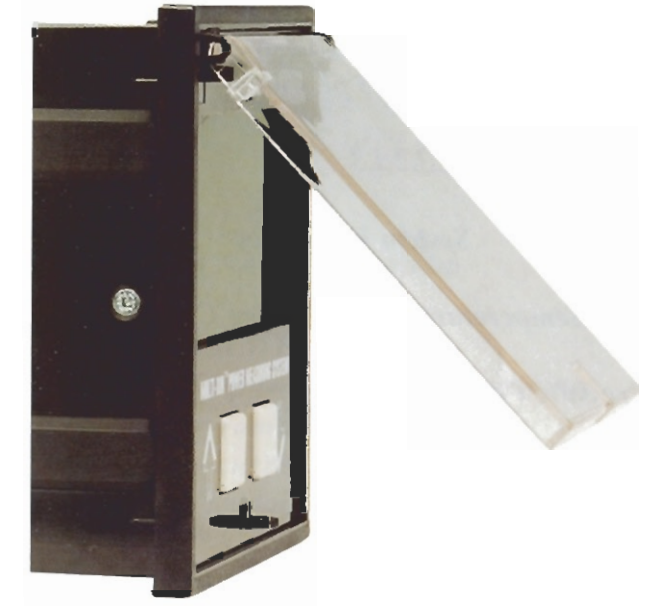


The 96 x 96 mm case is designed for fast and simple panel mount installation.

The terminals used for the voltage and current inputs and relay outputs are M3.5 allowing the use of traditional termination. The sender and RS485 connections use a plug in connector.

A safety terminal cover is provided on all units.

FRONT COVER



The MultiGen has a clear polycarbonate flip up front cover. The cover has an interference lock which can be locked to prevent unauthorised personnel from tampering with the front controls.

SELECTION GUIDE

M820-GM1	*1 phase*
M820-GM4	*3 phase 3 wire unbalanced load*
M820-GM9	*3 phase 4 wire unbalanced load*
M830-SM1	*1 phase*
M830-SM4	*3 phase 3 wire unbalanced load*
M830-SM9	*3 phase 4 wire unbalanced load*

Note :
M820-GM products measure V, A, Hz, Pressure, Temperature, Hours Run, DC volts.*

M830-SM products only measure V, A, Hz.*

ORDERING INFORMATION

Information required	*Example*
Product Code	*M820-GM9*
Nominal input voltage	*230 /400V AC*
Nominal input current	*5A AC*
System Frequency	*50Hz*
Auxiliary	*24V DC*
Options	*RS485 output*
	Relay output

Optionally the factory can program the following :-

Current ratio (C.T.) please specify e.g. 500/5A

Voltage ratio (V.T.) please specify. e.g. 11kV/110V

Temperature sender manufacturers part number or resistance characteristics.

Temperature relay e.g. set at 225 °F

Pressure sender manufacturers part number or resistance characteristics.

Pressure relay e.g. set at 75 psi

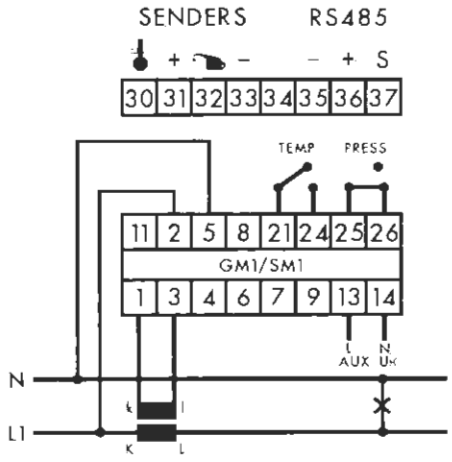
Custom Screen : specify which 3 parameters required.

e.g. Line 1 = L1 to Neutral voltage.

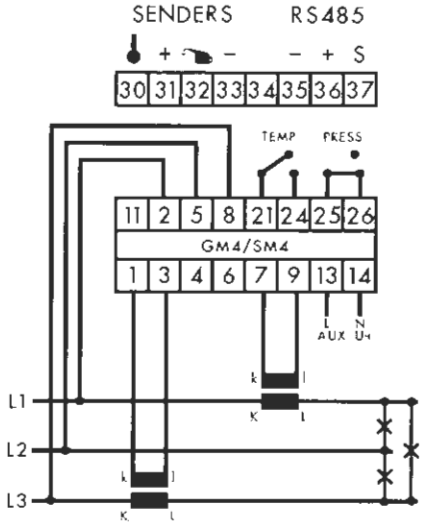
Line 2 = Coolant Temperature

Line 3 = DC volts

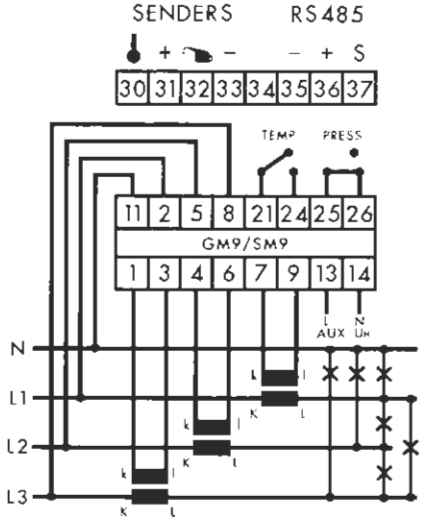
CONNECTIONS



Single Phase Connection



3 Phase 3 Wire Unbalanced Load Connection



3 Phase 4 Wire Unbalanced Load Connection

Note. On all the above connections external voltage transformers can be used, allowing voltages higher than 600 volts to be connected to the MultiGen.

GENERAL SPECIFICATIONS

INPUT

Rated Un	*Direct connected voltages between 57.8 and 600 V. Standard voltages offered : 63.5/110V, 69.3/120V, 120/208V, 220/380V, 230/400V, 240/415V, 277/480V, for 3ph 4w. 110V, 120V, 380V, 400V, 415V, 440V, 480V, 600V for 3ph 3w*
Accuracy Range	*20-120% Un*
Working Range	*5-125% Un*
Burden	*<0.5VA per phase*
Overload	*1.5 x Un continuous* *4 x Un for 1 second*
Rated In	*1 or 5 amp*
Accuracy Range	*20-120% In*
Working Range	*5-125% In*
Burden	*<0.5VA per phase*
Overload	*4 x In continuous. 50 x In for 1sec*
Frequency	*50 / 60 Hz nominal range 45/65Hz*
DC Volts Range	*10 to 30 volts*
Hours Run	*Updated every 2 minutes*

SYSTEMS

Single phase
3 phase 3 wire unbalanced load
3 phase 4 wire unbalanced load

PARAMETERS MEASURED

Volts	*L1-L2,L2-L3,L1-L3 (3 ph 3 w) & (3 ph 4w)* *L1-N,L2-N,L3-N (1ph & 3 ph 4w)*
Amps	*L1,L2,L3*
Frequency	*System Frequency*

Coolant Temperature (deg F or deg C)

Oil Pressure (bar or psi)

Hours Run (run time)

DC Volts (battery volts)

AUXILIARY

AC voltage	*115 or 230 volts (± 15%)* *45 to 65 Hz burden <7 VA*

ACCURACY

Volt	0.5% of reading ± 2 digits
Amps	0.5% of reading ± 2 digits
Frequency	0.1Hz ± 1 digit
Coolant temperature	1% of reading ± 2 digits
Oil Pressure	1% of reading ± 2 digits
Hours Run	1% of reading ± 2 digits
DC volts	1% of reading ± 2 digits

INSULATION

Test Voltage	4 kV RMS 50 Hz for 1 min. between case, input, auxiliary. 1kV between case, input, auxiliary, relay output. 1kV between case, input, auxiliary, relay, RS485 output.
Impulse Test	EMC 5kV transient complying with IEC 801 / EN 55020 HF
Surge withstand	IEC 801 / EN55020 ANSI C37.90A
Interference	EIIF 2.5 kV 1MHz complying with IEC 255-4
Protection Class	II complying with IEC348 / BS4753 / DIN 57411 / VDE

APPLIED STANDARDS

General	IEC 688 BSEN60688, BS4889, IEC 359
EMC	Emissions BSEN50081/2 BSEN55022 1995 Class A Immunity BSEN50082/2
Safety	IEC 1010, BSEN601010

APPROVALS

UL, C-UL, CSA	Pending

PROGRAMMING

Units can be purchased preprogrammed or field programmed by the user for voltage and current inputs, sender inputs and sender setpoints.

Programming can be completed through the front panel controls buttons or via the RS485 port.

For programming through the RS485 port, a setup program is available.

ENVIRONMENTAL

Working Temperature	0 to +50 deg C
Function Temperature	- 5 to +60 deg C
Storage Temperature	-10 to +65 deg C
Temperature Coefficient	0.01% per deg C
Relative Humidity	0-95% non condensing
Warm up time	1 min.
Shock	10G in 3 planes

ENCLOSURE

Standard DIN case	DIN 96 x 96 x 150mm
Panel mount	Via 4 retained side brackets and screws.
Panel cutout	92 + 0.8mm x 92 + 0.8mm
Material	Black Polycarbonate complying with UL 94 VO
Terminals	Screw terminal for 2 x 0.5-3.5mm
Weight	0.8kg / 1.75lb

OPTIONS

DC Auxiliary voltage	12 / 24 / 48 / 110 / 125V burden <7 VA
Communications	RS485 / Modbus protocol
Relay Outputs	1 single pole N/C for pressure 1 single pole N/O for temp.
Rating AC	250V 7A non resistive 1750VA
Rating DC	30V 7A resistive 210 watts

CASE DIMENSIONS