BC Biomedical
A UNIT OF BC GROUP INTERNATIONAL, INC.

HIGH PRECISION DIFFERENTIAL DIGITAL PRESSURE METERS

USER MANUAL

BC BIOMEDICAL
DPM-2250 SERIES
TABLE OF CONTENTS

This User Manual covers the following units:

- DPM-2251
- DPM-2252

WARNING - USERS

The DPM-2250 is for use by skilled technical personnel only.

WARNING - USE

The DPM-2250 is intended for testing only and should never be used in diagnostics, treatment or any other capacity where it would come in contact with a patient.

WARNING - CONNECTIONS

All connections to patients must be removed before connecting the DUT to the DPM-2250. A serious hazard may occur if the patient is connected when testing with the DPM-2250.

CAUTION - MODIFICATIONS

The DPM-2250 is intended for use within the published specifications. Any application beyond these specifications or any unauthorized user modifications may result in hazards or improper operation.

CAUTION - SERVICE

The DPM-2250 is intended to be serviced only by authorized service personnel. Troubleshooting and service procedures should only be performed by qualified technical personnel.

CAUTION - INSPECTION

The DPM-2250 should be inspected before each use for obvious signs of abuse or wear. The DPM-2250 should not be used and should be serviced if any parts are in question.

CAUTION - CLEANING

Do not immerse. The DPM-2250 should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

CAUTION - LIQUIDS

Do not submerge or spill liquids on the DPM-2250. Do not operate the DPM-2250 if it may have been exposed to fluid.

CAUTION - ENVIRONMENT

Exposure to environmental conditions outside the specifications can adversely affect the performance of the DPM-2250. Allow the DPM-2250 to acclimate to specified conditions for at least 30 minutes before attempting to operate it.

CAUTION – MEDIA COMPATIBILITY

The DPM-2250 is intended to be used with only non-corrosive, non-ionic, or otherwise pure fluids and/or gases that are compatible with sensor materials including glass, silicon, ceramic, epoxy, RTV, gold, aluminum and nickel.

CAUTION – LO PRESSURE PORT LIQUIDS INCOMPATIBILITY

The Lo port of the DPM-2250 is not intended for liquids, use only dry gases.

NOTICE – CE

The DPM-2250 Series Meters bear the CE mark
Based on the following testing standards:

ELECTROMAGNETIC COMPATIBILITY DIRECTIVE
EMC – Directive 89/336/EEC as amended by 92/31/EEC and 93/68/EEC

EN 61326-1:1997 + A1:1998 + A2:2001 + A3:2003
"Electrical equipment for measurement, control and laboratory use – EMC requirements"

This equipment has been type tested by an independent, accredited testing laboratory and compliance was demonstrated to the above standard to the extent applicable.

EMISSIONS
Radiated and Line Conducted Emissions

EN 61000-3-2:2000	Harmonic Current Emissions
EN 61000-3-3:1995 + A1:2001	Voltage Fluctuation and Flicker

IMMUNITY– CLASS C

EN 61000-4-2:1995 + A1:1998 + A2:2001	Electrostatic Discharge
EN 61000-4-3:2002	Radiated Electric Field Immunity
EN 61000-4-4:1995 + A1:2001 + A2:2001	Electrical Fast Transients / Bursts
EN 61000-4-5:1995 + A1:2001	Surge Voltage
EN 61000-4-6:1996 + A1:2000	Conducted Disturbance
EN 61000-4-11:1994 + A1:2001	Voltage Dips and Short Interrupts

LOW VOLTAGE DIRECTIVE
EC – Directive 73/23/EC

EN 61010-1:2001
"Safety requirements for electrical equipment for measurement, control, and laboratory use – General requirements"

This equipment has been type tested and compliance was demonstrated to the above standard to the extent applicable.

NOTICE – SYMBOLS

Symbol	Description
	Center Negative

NOTICE – ABBREVIATIONS

ANSI	American National Standards Institute
ASCII	American Standard Code for Information Interchange
BCD	Binary Coded Decimal
C	Celsius
cmH_20	centimeters of water
°	degree(s)
DUT	Device Under Test
DC	Direct Current
Euro	European
F	Fahrenheit
FS	Full Scale
inHg	inches of mercury
inH_20	inches of water
kg	kilogram(s)
kg/cm^2	kilogram(s) per centimeter squared
kHz	kilohertz
kPa	kilopascal(s)
Max	Maximum
µA	microampere(s)
mA	milliampere(s)
mBar	milliBar(s)
mm	millimeter(s)
mmHg	millimeter(s) of mercury
Min	Minimum
NEDA	National Electronic Distributors Association
Lbs	pounds
PSI	pounds per square inch
Pres	Pressure
RH	Relative Humidity
RTD	Resistive Thermal Device
s	second(s)
Temp	Temperature
USA	United States of America
V	Volt(s)
VDC	Volt(s) Direct Current

NOTICE – DISCLAIMER

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NOTICE – CONTACT INFORMATION

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BC BIOMEDICAL
DPM-2250 SERIES
DIGITAL PRESSURE METERS

The Model DPM-2250 Series is a family of microprocessor-based, high-precision Differential Pressure Meters, which are intended for use in the evaluation and servicing of a wide variety of medical, commercial and industrial applications. These meters measure compatible differential gas and liquid pressures in various engineering units. Available optional features include storage of min and max pressures, a RS-232 port for remote control and data collection, various analog output options, and an optional temperature sensor input (either YSI 700 Series or 100 Ω RTD Probe). The following are highlights of the main features:

DPM-2251 (Basic Features):

- GRAPHICAL LCD DISPLAY WITH CURSOR SELECTION OF OPTIONS AND SETUP OF PARAMETERS
- ± 0.05% FS PRESSURE ACCURACY
- DIGITAL CALIBRATION AND ZERO OFFSET ADJUSTMENT – NO POTS TO TURN
- 16 BIT MEASUREMENT
- PROGRAMMABLE DIGITAL FILTER
- 13 ENGINEERING UNITS:
    - PSI
    - inH_2O @ 4 °C
    - inH_2O @ 20 °C
    - inH_2O @ 60 °F
    - cmH_2O @ 20 °C
    - inHg @ 0 °C
    - inHg @ 20 °C
    - mmHg @ 0 °C
    - mmHg @ 20 °C
    - kg/cm^2
    - kPa
    - mBar
    - Bar
- SELECTABLE DISPLAY OPTIONS AND DIGIT SIZES
- BATTERY LIFE DISPLAY (0 to 100%)
- SOFTWARE-ADJUSTABLE DISPLAY CONTRAST

DPM-2252 MODEL ADDS:

- MIN/MAX PRESSURE VALUE CAPTURE AND STORAGE
- RS-232 SERIAL COMMUNICATIONS

ANALOG OUTPUT OPTION ADDS:

- OPTION DC - DC ANALOG OUTPUT (REFRESH RATE DEPENDENT UPON DIGITAL FILTER SETTING)
- OPTION HF - HIGH FREQUENCY DC ANALOG OUTPUT (ALTERNATING DC SIGNAL REPRESENTING PRESSURES ALTERNATING AT RATES UP TO 100 Hz)
- BNC OUTPUT
- ± 0.1% FS ACCURACY

TEMPERATURE OPTION ADDS:

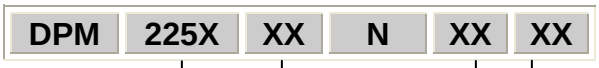
- OPTION Y7 - YSI 700 TEMPERATURE PROBE INTERFACE
- OPTION R1 - 100 Ω RTD TEMPERATURE PROBE INTERFACE
- -20.0 TO 100.0 °C (-4.0 TO 212.0 °F) TEMPERATURE RANGE
- ± 0.5% FS ACCURACY
- MAX and MIN TEMPERATURE VALUE CAPTURE AND STORAGE

OPTIONAL ACCESSORIES:

- BC20-21100 BATTERY ELIMINATOR (USA Version)
- BC20-21101 BATTERY ELIMINATOR (Euro Version)
- BC20-41337 RS-232 COMMUNICATIONS CABLE (7PIN MINI-DIN TO DB-9F)
- BC20-41339 USB COMMUNICATIONS ADAPTER (DB-9M TO USB-A) FOR USE WITH BC20-41337
- BC20-30106 SOFT-SIDED CARRYING CASE
- BC20-01005 UNIVERSAL MANOMETER (PRESSURE) ADAPTER KIT
- BC20-01006 YSI 700 TEMPERATURE PROBE
- BC20-01008 RTD (100 Ω) TEMPERATURE PROBE

MODEL INFORMATION

Use the following model configuration guide to construct or decode a DPM225X series differential Digital Pressure Meter model number:



Options
- Blank = Not Applicable
- DC = DC (Direct Current) Analog Output
- HF = High Frequency DC Analog Output

Temperature Sensor Option
- N = Not Applicable
- Y7 = YSI 700
- R1 = 100Ω RTD

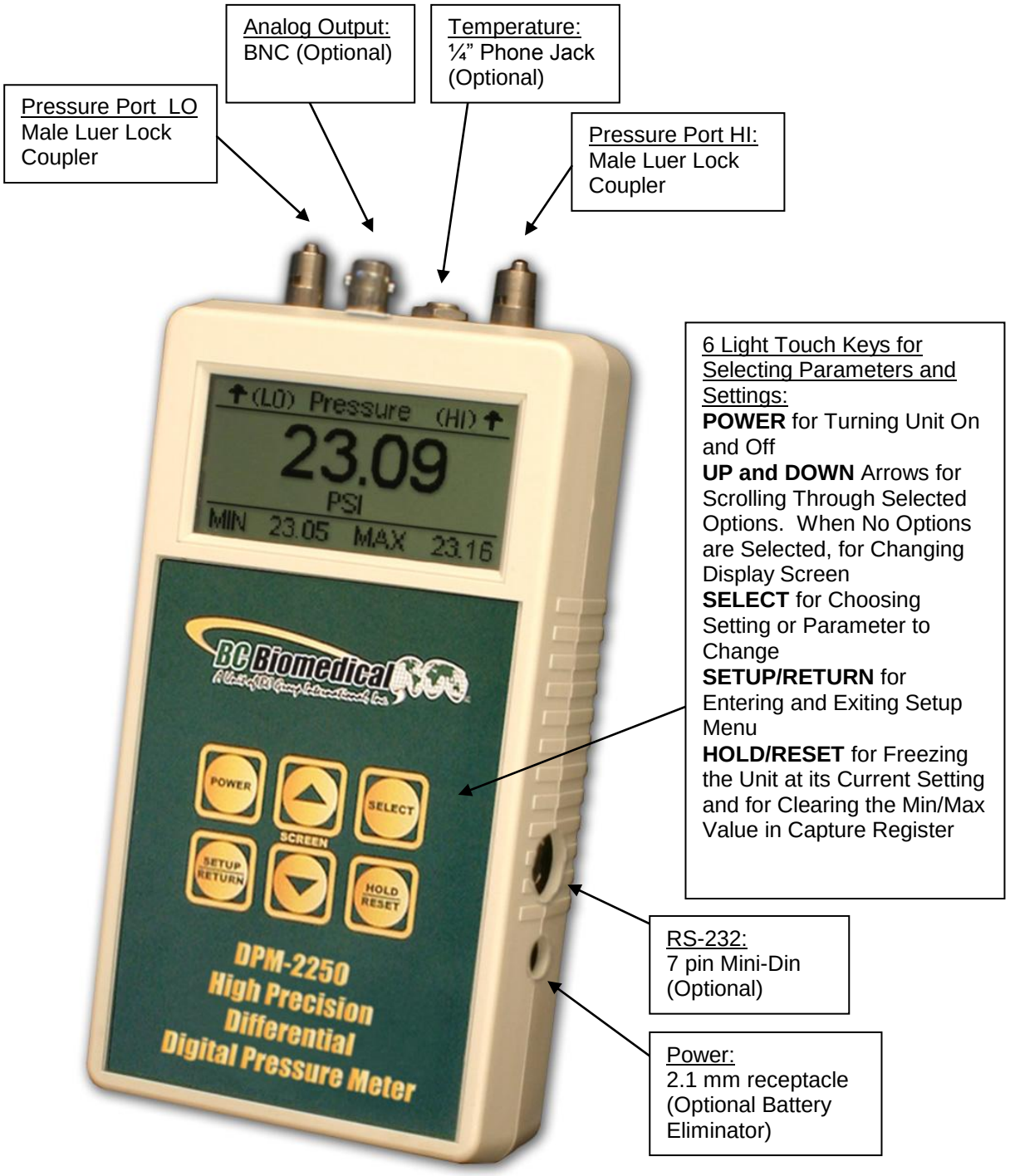
Pressure Range
- 100 = Max 100 PSI
- 75 = Max 75 PSI
- 10 = Max 10 PSI
- 5 = Max 5 PSI
- .3 = Max 0.3 PSI

Model
- 2251 = Basic Differential Model
- 2252 = Adds Min/Max and RS-232

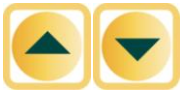
PRESSURE RANGES BY SENSOR RANGE					
PRESSURE UNITS	PRESSURE SENSOR RANGE				
	100 PSI	75 PSI	10 PSI	5 PSI	0.3 PSI
PSI	-13.50 to 100.00	-13.50 to 75.00	-10.000 to 10.000	-5.000 to 5.000	-0.3000 to 0.3000
mmHg @ 0° C	-698 to 5171	-698 to 3879	-517.2 to 517.2	-258.6 to 258.6	-15.51 to 15.51
mmHg @ 20° C	-701 to 5190	-701 to 3893	-519.0 to 519.0	-259.5 to 259.5	-15.57 to 15.57
inHg @ 0° C	-27.5 to 203.6	-27.5 to 152.7	-20.36 to 20.36	-10.18 to 10.18	-0.6108 to 0.6108
inHg @ 20° C	-27.6 to 204.3	-27.6 to 153.2	-20.43 to 20.43	-10.22 to 10.22	-0.6129 to 0.6129
cmH_2O @ 20° C	-951 to 7043	-951 to 5282	-704.3 to 704.3	-352.2 to 352.2	-21.13 to 21.13
inH_2O @ 4° C	-374 to 2768	-374 to 2076	-276.8 to 276.8	-138.4 to 138.4	-8.304 to 8.304
inH_2O @ 20° C	-374 to 2773	-374 to 2080	-277.3 to 277.3	-138.7 to 138.7	-8.319 to 8.319
inH_2O @ 60° F	-374 to 2771	-374 to 2078	-277.1 to 277.1	-138.5 to 138.5	-8.312 to 8.312
kg/cm^2	-0.949 to 7.031	-0.949 to 5.273	-0.7031 to 0.7031	-0.3515 to 0.3515	-0.0211 to 0.211
kPa	-93.1 to 689.5	-93.1 to 517.1	-68.95 to 68.95	-34.48 to 34.48	-2.069 to 2.069
mBar	-931 to 6895	-931 to 5171	689.5 to 689.5	-344.8 to 344.8	-20.69 to 20.69
Bar	-0.931 to 6.895	-0.931 to 5.171	-0.6895 to 0.6895	-0.3448 to 0.3448	-0.0207 to 0.0207

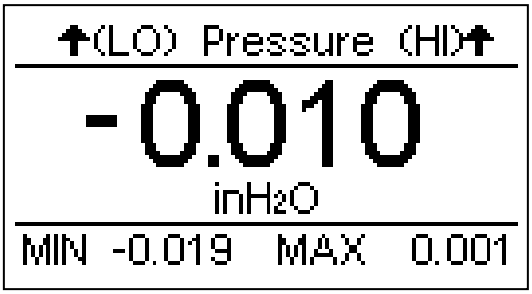
LAYOUT

This section looks at the layout of the DPM-2250 and gives descriptions of the elements that are present.

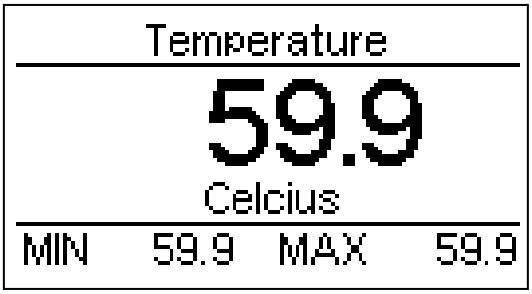


SCREENS

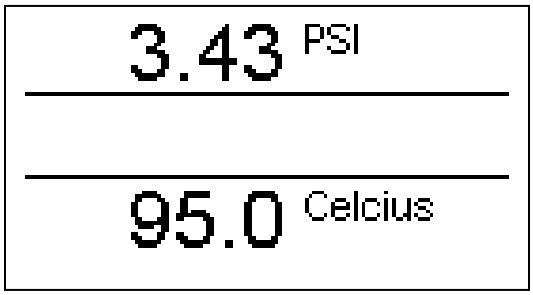
MAIN SCREENS – There can be up to four main screens, depending on the model. They are PRESSURE, TEMPERATURE, COMBINED and INPUTS. The available screens can be toggled through using  .



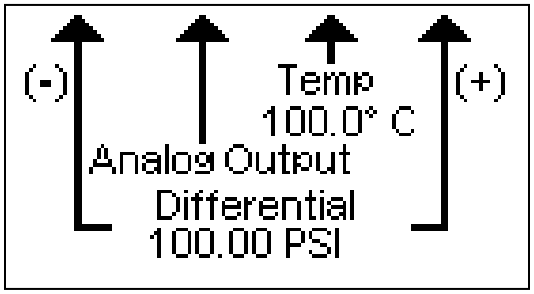
Pressure
Display with Min/Max
Option selected



Temperature Display
with Min/Max Option
selected



Combined Screen showing:
Pressure & Temperature



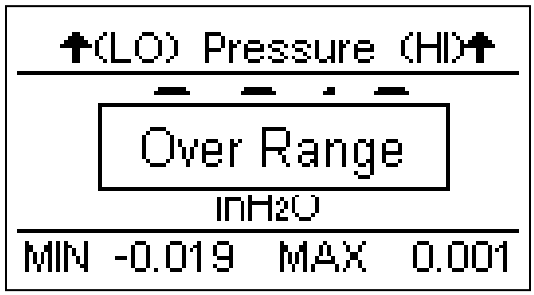
Input Identification Screen
Note: Sensor limits are displayed based on selected range.

PRESSURE SCALE – The pressure scale is indicated by the units displayed under the reading. The scale can be changed by using 

to highlight the unit line and  to toggle between available pressure units as listed below.

Pressure Units (Differential)	
PSI	mmHg @ 0 °C
inH_2O @ 4 °C	mmHg @ 20 °C
inH_2O @ 20 °C	kg/cm^2
inH_2O @ 60 °F	kPa
cmH_2O @ 20 °C	mBar
inHg @ 0 °C	Bar
inHg @ 20 °C	

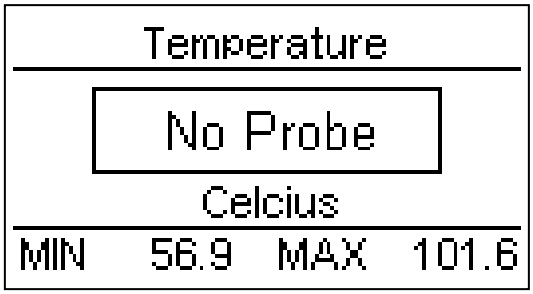
NOTE: If the measured pressure is outside of the range of the instrument, an OVER RANGE or UNDER RANGE message box will be displayed.



Typical display with "Over Range" message box.

TEMPERATURE SCALE – The temperature scale is indicated by the units displayed under the reading. The scale can be changed by using SELECT to highlight the unit line and ▲ ▼ to toggle the temperature units between Degrees Celsius (°C) and Fahrenheit (°F).

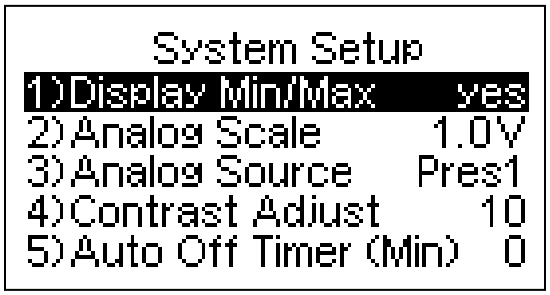
NOTE: If the measured temperature is outside of the range of the instrument, an OVER RANGE or UNDER RANGE message box will be displayed. For models with the YSI option, the NO PROBE message box will be displayed when the unit detects an open connection. For models with the RTD option, the OVER RANGE message box will also be displayed with an open connection.



Typical display with "No Probe" message box.

NOTE: YSI option only

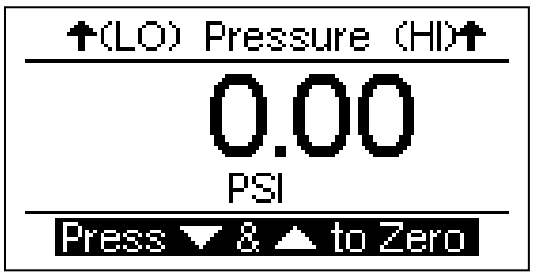
SYSTEM SETUP – The Setup Mode allows the user to adjust the configuration of the meter. The Setup screen can be entered using the SETUP RETURN key. The parameters can be changed by using SELECT to highlight the line and ▲ ▼ to toggle the available options. The Setup screen can be exited using the SETUP RETURN key.

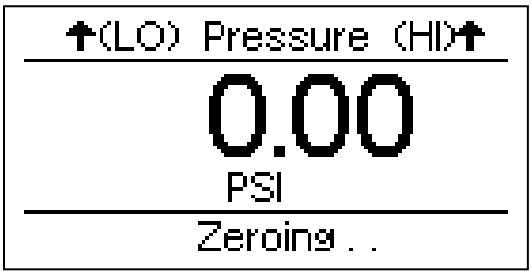


The following is a breakdown of the parameters available in the configuration of the unit and their available options:

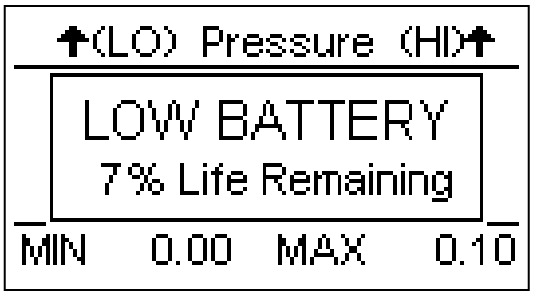
System Setup Configuration		
Parameter	**Description**	**Range**
Display Min/Max	Selects whether the Min and Max values will be displayed on the main screens (except COMBINED).	yes/no
Analog Scale	Analog Output Scaling voltage. This is the maximum analog output voltage. The output is scaled to this voltage over the positive range of selected analog source.	1.0 to 4.0 Volts
Analog Source	Selects the source reading for the analog output.	Pres or Temp
Contrast Adjust	Sets the contrast of the display screen.	0 to 20
Auto Off Timer	Determines the period of inactivity before the meter is turned OFF. A timer is started when the meter is turned ON and is reset each time a key is pressed. When the timer reaches the value set in this parameter, the power is automatically turned OFF. (NOTE: Setting this parameter to 0 disables the Auto Off timer. When running from line power, the meter does not automatically shut off.)	0 to 30 Minutes
Battery Life	Displays current life of the battery. At 10%, a warning screen will appear.	0 to 100% (Read Only)
Beep Length	Sets audible beep duration.	0 to 15
Filter – Pres	Determines the number of samples that are averaged in the digital filter. The software has a Digital Filter that averages the readings to produce a stable display. (NOTE: Increasing this setting will cause a more stable display. However, it will also cause a slower response to small changes. The best setting is the smallest number that provides a stable display.)	0 to 10 Seconds
Filter – Temp		
RTD Type (OPTION R1)	Sets the Temperature Coefficient (alpha) to match that of the RTD probe.	0.00385/°C or 0.00392/°C
Software	Displays current software program version.	(Read Only)

ZEROING PRESSURE SCALES – When there is no pressure applied to either port, the display should read "0." It may be necessary to zero the pressure scales to remove any errors due to ambient conditions. This is done by pressing the SELECT key until the zeroing instructions are displayed, then pressing ▲ ▼ simultaneously to begin the process. The "ZEROING…" message will flash while the scale is being zeroed. When the zeroing instructions are displayed again, the process is complete.





LOW BATTERY – When the battery life reaches 10 percent, the LOW BATTERY message box will be displayed.



Typical display with "Low Battery" message box.

NOTE: A line power receptacle is provided so that the unit can be powered by the optional 9 VDC Battery Eliminator, enabling continuous operation.

NOTE: The unit is shipped with a Red Battery Lock-Out plug installed into the line power receptacle as shown below. Its purpose is to prevent the unit from accidentally being turned on during handling and transport, subsequently depleting the battery. This plug must be removed before any use!

KEYS

Six tactile-touch keys are provided for system operation:

– This key turns the unit off and on. The unit will return to the main screen that was active when it was turned off.

 – In the DISPLAY MODE, these keys toggle the display through the available main screens.

In the SELECT MODE, if a parameter has been highlighted, these keys will scroll through the available settings.

– On any screen, there are a number of parameters that may be selected and changed. This key sequences the cursor (Highlight) through those parameters.

– This key is used to Hold (freeze) and Reset (unfreeze) any of the input displays. Depressing this key will hold the currently displayed Pressure or Temperature reading until reset. Each input can be held independently.

When active, the word “HOLD” is in the display. Depressing this key on a screen that is held will reset that input and remove the word “HOLD” from the display.

NOTE: In the composite screen, the hold feature requires that the specific input be selected using 

before 

is used.

– This key toggles the unit into and out of the Setup Mode. Depressing this key will enter the Setup screen where the configuration can be viewed and adjusted. Depressing the key again will exit the Setup Mode and return to the previously viewed main screen. This will also save any changes to the internal EEPROM memory so they will be retained even with the power turned off or battery removed.

OPTIONS

ANALOG OUTPUT – The unit may be ordered with an Analog Output Option. This output can either be a Standard DC or a High Frequency DC and is provided via a BNC connector on the top of the unit. The source parameter for the analog output is selectable in the Setup Menu between Pressure (Pres) or Temperature (Temp). The output is scaled to match the 0 to FS range of the selected source parameter over a variable internally generated reference voltage. This reference voltage is selectable from 1.0 to 4.0 VDC in 0.1 V increments through the Setup Menu.

- **Standard DC Analog Output (DC) –** This option provides a filtered Analog Output that is representative of the displayed pressure or temperature. Filtering is dependent on the Digital Filter Setting (See System Setup section for more information). This is for slowly changing inputs.
- **High Frequency DC Analog Output (HF)** – This option provides a high speed Analog Output that is representative of the displayed pressure or temperature. The output is independent of the Digital Filter. This is for fast changing inputs alternating at rates up to 100 Hz.

TEMPERATURE – The unit may be ordered with the Temperature Option. This option allows the unit to read an external temperature sensor/transducer and display temperatures between -20 to 100 °C (-4.0 to 212.0 °F). The temperature probe interface is a standard ¼" Phone Jack.

- **YSI 700 Temperature Input (Y7)** – This option allows the unit to display temperature measured by a YSI 700 series standard temperature probe.
- **RTD Temperature Input (R1)** – This option allows the unit to display temperature measured by a standard 100 Ω RTD. This option supports selectable temperature coefficients (alpha) to match that of the sensor or probe:
  - 0.00385/°C (most common)
  - 0.00392/°C

COMMUNICATIONS

Since the meter does not handle a great deal of data, the RS-232 communications link has been optimized to allow the user, through very simple instructions, to control and request data from the meter. Refer to Specifications section for RS-232 Settings (Baud, etc.).

Data transmitted/received is in standard ASCII format, and all numerical values are in BCD format. All commands sent to the unit should be terminated with a "Carriage Return" character (<CR> or in hexadecimal, 0x0D). All commands and responses are echoed by the unit for confirmation of communication, and are terminated with "Carriage Return" and "Line Feed" characters (<CR><LF> or in hexadecimal, 0x0D0A). If an invalid command is received, the unit will respond with the characters "??".

The following section describes the protocol used by the meter in detail:

<table>
<tr><td>R - <u>READ</u></td><td>The READ command allows the user to read system settings and data.

<u>Usage:</u>
R(Location)(CR)
Where:
R - READ command
Location - contains two digits indicating the data location to be read
CR - Carriage Return

<u>Example:</u>
<table><tr><th><u>Data Sent</u></th><th><u>Data Returned</u></th><th><u>Meaning</u></th></tr><tr><td>R08<CR></td><td>R08<CR><LF></td><td>Echo of Command Sent</td></tr><tr><td></td><td>10.25 mmHg<CR><LF></td><td>10.25 mmHg measured</td></tr></table></td></tr>
<tr><td>W - <u>WRITE</u></td><td>The WRITE command allows the user to update the system settings.

<u>Usage:</u>
W(Location – 2 digits)(Data – 5 digits)(CR)
Where:
W - WRITE command
Location - contains two digits indicating the data location to be written
Data – five-digit field containing the data to be written at the Location set above
CR - Carriage Return</td></tr>
</table>

	Examples: **Data Sent** / **Data Returned** / **Meaning** W064<CR> / W064<CR><LF> / Echo of Command Sent (Set Pressure units to "inH_2O") W0600004<CR> / W0600004<CR><LF> / Echo of Command Sent (Set Pressure units to "inH_2O") W05100<CR> / W05100<CR><LF> / Echo of Command Sent ??<CR><LF> / Invalid Command Response (Location 05 is Read Only)
U - **UPLOAD**	The UPLOAD command allows the user to read all of the selected device data from locations 1 through 16 with a single command. The data returned will be formatted as a single block per location separated by a carriage return, line feed character sequence (CRLF – equivalent to hexadecimal 0x0D0A). See the table below for details on the data structure. Usage: U(CR) Where: U – UPLOAD command CR - Carriage Return
Q - **QUICKSEND**	QUICKSEND is a feature that allows the user to receive an automatic update of all of the meter data without any further user interaction. When the QUICKSEND command is received, the feature is turned ON and the meter will automatically send all of the device data every half second. The Quicksend feature is toggled ON and OFF with the QUICKSEND command. See the table below for details on the data structure. Usage: Q(CR) Where: Q – QUICKSEND command CR - Carriage Return
V - **VERSION**	The VERSION command allows the user to read the Software Version that the unit is currently running. Usage: V(CR) Where: V – VERSION command CR - Carriage Return

X - **CANCEL**	The CANCEL command is simply a way to re-establish proper control, should a communications error occur or an incorrect command be transmitted. For the most part, an incorrect command will simply be ignored and the meter will return to listening for future commands. However, a prior command may be cancelled midstream by transmitting the CANCEL command anytime. Usage: X This command does not require a carriage return, nor will it acknowledge with a carriage return. However, it will echo an 'X' character to indicate that the CANCEL command has been received. NOTE: The VERSION or CANCEL commands may also be utilized as an acknowledgement of the meter being on line.

DATA LOCATIONS				
LOCATION	ACCESS	DESCRIPTION	RANGE	
01	READ	BATTERY LIFE REMAINING	0 to 100%	
02	READ/WRITE	CONTRAST	0 to 20	
03	READ/WRITE	AUTO POWER OFF	0 to 30 (seconds)	
04	READ	MODEL	RESERVED	
05	READ	PRESSURE 1 TYPE	1	100 PSI Max
			2	75 PSI Max
			3	10 PSI max
			4	5 PSI max
			5	0.3 PSI max
06	READ/WRITE	PRESSURE 1 UNITS	0	PSI
			1	mmHg @ 0 °C
			2	mmHg @ 20 °C
			3	inHg @ 0 °C
			4	inHg @ 20 °C
			5	cmH_2O @ 20°C
			6	inH_2O @ 4 °C
			7	inH_2O @ 20 °C
			8	inH_2O @ 60 °F
			9	kg/cm^2
			10	kPa
			11	mBar
			12	Bar
07	READ/WRITE	PRESSURE 1 FILTER	0-60 (seconds)	
08	READ	PRESSURE 1	See Note 1	
09	READ/WRITE	PRESSURE 1 MAX	See Note 1, 3	
10	READ/WRITE	PRESSURE 1 MIN	See Note 1, 3	

DATA LOCATIONS (Temp option only)				
LOCATION	ACCESS	DESCRIPTION	RANGE	
17	READ	TEMPERATURE SENSOR TYPE	0	Not Applicable
			1	YSI 700
			2	RTD 100
18	READ/WRITE	TEMPERATURE UNITS	0	°C
			1	°F
19	READ/WRITE	TEMPERATURE FILTER	0-60	
20	READ	TEMPERATURE	See Note 2	
21	READ/WRITE	TEMPERATURE MAX	See Note 2, 3	
22	READ/WRITE	TEMPERATURE MIN	See Note 2, 3	

NOTES

1. Pressure readings are returned in the currently set Pressure Units parameter in Location 6. This may be changed via the WRITE command or manually via the keys.
2. Temperature readings are returned in the currently set Temperature Units parameter in Location 18. This may be changed via the WRITE command or manually via the keys.
3. MIN/MAX readings may be reset at any time via a WRITE command to either MIN/MAX location, or manually via the keys.

MANUAL REVISIONS

Revision #	Program #	Revisions Made
Rev 01	DT7328CA	Origination
Rev 02	DT7328CB	Temperature Added
Rev 03	DT7328CC	DC Output Added
Rev 04	DT7328CC	Pictures Updated
Rev 05	DT7328CD	Misc. Edits
Rev 06	DT7328CD	Battery Eliminator Plug and Analog Output Info Added
Rev 07	DT7328CD	Analog Output Specifications Update
Rev 08	DT7328CF	Scales Updated, High Frequency Output & CE Added
Rev 09	DT7328CF	Misc. Edits
Rev 10	DT7328CN	Media Compatibility Information Updated, Misc. Edits
Rev 11	DT7328CN	Format Updated, Misc. Edits
Rev 12	DT7328CN	Misc. Edits

LIMITED WARRANTY

WARRANTY: BC GROUP INTERNATIONAL, INC. WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.

EXCLUSIONS: THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

BC GROUP INTERNATIONAL, INC. IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

REMEDIES: THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY SHALL BE: (1) THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OR PRODUCTS, WITHOUT CHARGE. (2) AT THE OPTION OF **BC GROUP INTERNATIONAL, INC.**, THE REFUND OF THE PURCHASE PRICE.

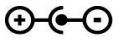
SPECIFICATIONS

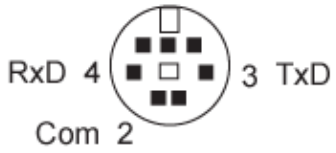
PRESSURE MEASUREMENT		
RANGE	100 PSI SENSOR	-13.5 TO 100.0 PSI
	75 PSI SENSOR	-13.5 TO 75.0 PSI
	10 PSI SENSOR	-10.0 TO 10.0 PSI
	5 PSI SENSOR	-5.0 TO 5.0 PSI
	0.3 PSI SENSOR	-0.3 TO 0.3 PSI
RESOLUTION	100 PSI SENSOR	0.01 PSI
	75 PSI SENSOR	0.01 PSI
	10 PSI SENSOR	0.001 PSI
	5 PSI SENSOR	0.001 PSI
	0.3 PSI SENSOR	0.0001 PSI
ACCURACY	± 0.05% FS	
DIGITAL FILTER	0 to 10 seconds, Selectable	
COMPATIBLE MEDIA	Only non-corrosive, non-ionic, or otherwise pure fluids and/or gases that are compatible with sensor materials including glass, silicon, ceramic, epoxy, RTV, gold, aluminum and nickel. NOTE: FLUIDS/LIQUIDS ONLY TO BE USED ON HI PORT	
CONNECTIONS	Male Luer Coupler	

TEMPERATURE MEASUREMENT (OPTIONAL)		
RANGE	-20.0 to 100.0 °C (-4.0 to 212.0 °F)	
RESOLUTION	0.1 °C (0.1 °F)	
ACCURACY	± 0.5% FS	
CONNECTIONS	¼" Phone Jack for use with ¼" Phone Plug terminated temperature cables or probes.	
TRANSDUCER COMPATIBILITY	OPTION Y7	YSI 700 Transducers
	OPTION RTD	100 Ω RTD Supports 0.00385/°C and 0.00392/°C temperature coefficient (alpha) sensors

ANALOG OUTPUT (OPTIONAL)		
RANGE	1.0 to 4.0 VDC/FS, Selectable	
ACCURACY	± 0.1% FS	
RATE	OPTION DC	Output dependent on Digital Filter setting
	OPTION HF	Output from 0 to 100 Hz (Note: Sampled at 10 kHz)
CONNECTIONS	Male BNC Connector	

PHYSICAL & ENVIRONMENTAL		
DISPLAY	128 X 64 Pixels Non-Backlit Graphical LCD	
CONSTRUCTION	ENCLOSURE	ABS Plastic
	OVERLAY	Back-printed Lexan
SIZE	7.69 x 3.97 x 1.80 Inches (195.3 x 100.8 x 45.7 mm)	
WEIGHT	< 1 Lbs (0.45 kg)	
OPERATING RANGE	15 to 30 °C (59 to 86 °F)	
STORAGE RANGE	-40 to 60 °C (-40 to 140 °F)	

ELECTRICAL & MISC.		
BATTERY	9V Alkaline Battery (ANSI/NEDA 1604A or equivalent)	
BATTERY ELIMINATOR	9 VDC, 200 mA  BC20-21100 (USA Version) BC20-21101 (Euro Version)	
POWER CONSUMPTION	ON	< 35 mA
	OFF	< 40 µA
BATTERY LIFE	CONTINUOUS	80 hours
	OFF	1 year

ELECTRICAL & MISC. (continued)		
RS-232 COMMUNICATIONS	BAUD	115200
	DATA BITS	8
	START BITS	1
	STOP BITS	1
	PARITY	None
	HANDSHAKING	None
	CONNECTIONS	Seven (7) pin Mini-DIN Receptacle Pinout: **RS-232**  **NOTE: As Viewed from Unit Exterior**

NOTES

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DPM-2250 Series User Manual

06/12 – Rev 12

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