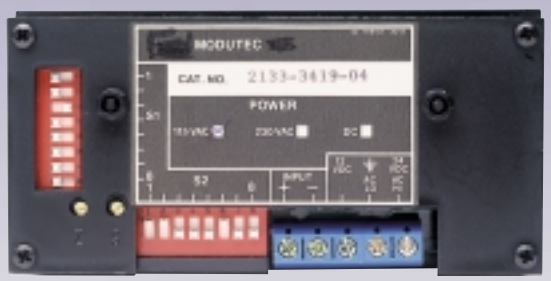
Jewell Instruments

2000 Series
Digital Panel Meters
MODUTEC

BEST OF CLASS



2100 Series with DIP switch selections and multiple power options.

Backlighting Options

- Positive Green Black on Green Background
- Negative Green Green on Black Background
- Positive Red Black on Red Background
- Negative Red Red on Black Background
- Non-Backlit LCD Black on Grey Background

Applications

- ► *Telecommunications*
- ► *Water Purification*
- ► *Sewage Treatment*
- ► *Flow*
- ► *Process*
- ► *Desalinization*
- ► *Temperature*
- ► *AC & DC Amps*
- ► *AC & DC Volts*

Customize for features that are important to you and rely on industry standards for routine digital PM elements.

You need flexibility. We provide it. We customize our meters to meet your specifications.

- Scalable in engineering units
- Custom labels for special readouts
- User Selectable functions, decimal point, offset, span, process voltage or current, DC voltage
- Red or green backlit display

You need reliability. The MODUTEC 2000 Series operates in the harshest environments.

- Splash and hose proof meeting NEMA 4, NEMA 12, and IPC 55 standards
- Resistant to damage with a high impact polycarbonate case
- Wide operating temperature ranging from -4°F to +140°F (-20°C to +60°C)

You need standards. The MODUTEC 2000 Series gives you industry standards designed in.

- 1/8 DIN industry standard cut-out and 1 inch depth
- Screw terminals
- Over range indication
- Low cost
- The MODUTEC 2100 includes user-friendly dipswitch selection features

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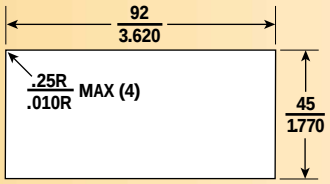
2000 & 2100 Series Dimensional Drawings (mm/in)

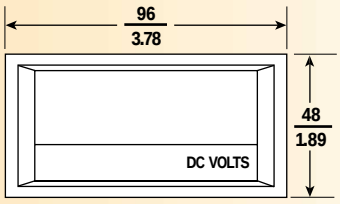
Panel Cutout



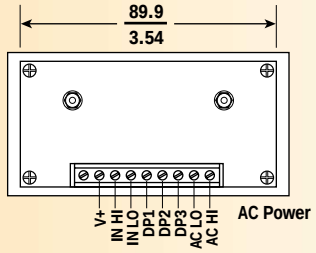
Panel Cutout Notes:

1. For optimum water resistance use cutout height of 43 MM (1.693 Inches).
2. Panel thickness .81 to 6.35 MM (.032 to .250 Inches).

Front View



Rear View



Side View Non-backlit

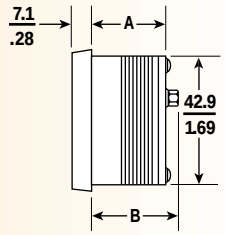


Figure A

Side View Backlit

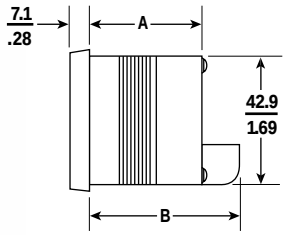
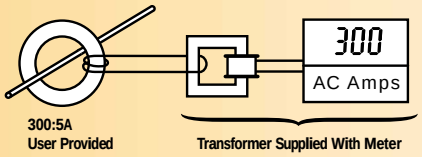


Figure B

Input Type	Figure	A (mm/in)	B (mm/in)
AC	A	25.1/.99	29.2/1.15
DC	A	25.1/.99	29.2/1.15
Temperature	A	25.1/.99	29.2/1.15
4-20mA Process	B	37.8/1.49	50.8/2.00
Frequency	A	25.1/.99	29.2/1.15

Connection for High Current Measurement



2000 and 2100 Series Specifications

Display

Digits: 3 ½ digits, 7 segments Backlit LCD (1999)
Polarity: Automatic (-) displayed
Overload: Three lower digits blank for readings greater than 1999
Digit Height: 0.5" (12.7 mm)
Decimal Point: Three positions, external selection

Performance

Conversion Rate: 2.5 per second
Common Mode Rejection: ≥ 100db 50 Hz-60 Hz[1]
Tempco: ±200 PPM/°C typical[2]
Normal Mode Rejection: ≥ 40 db 50Hz-60Hz
Zero Adjust: Automatic
Warmup: 10 minutes

Environment

Operating Range: -4°F to 140°F (-20°C to + 60°C)
Storage Range: -22°F to 158°F (-30°C to + 70°C)

Power Options

115V +10%, -15%	50Hz to 400Hz at 2VA
230V +10%, -15%	50Hz to 400Hz at 2VA
10 to 28VDC	150 mA (including backlighting)
10 to 15VDC or 20 to 32VDC	150mA (including backlighting)

Weight

2 oz.

FCC Compliance

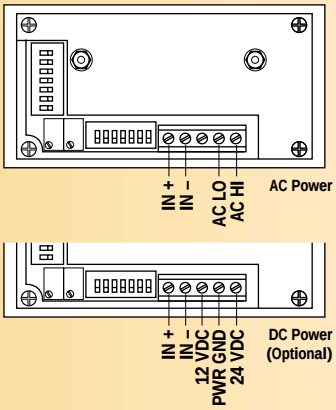
Complies with the class B Limits of FCC rules and regulations, part 15, sub part J for conducted and radiated emissions.

[1] except isolated DC powered which is ≥ 80 db 50 Hz-60Hz
[2] except thermocouple inputs which are .1°/ degree zero tempco for selectable process ranges is only ±.2 count/°C

Specifications continued on back page.

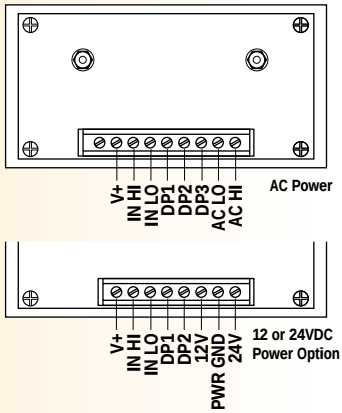
2000 & 2100 Series Connection Drawings

Universal Switchable — Model 2100



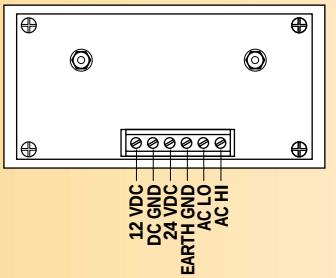
Terminal	Description
IN+ / IN–	Signal Input
AC Power Low / AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected
12VDC Power GND	12VDC power input (optional)
24VDC Power GND	24VDC power input (optional)

AC and DC Inputs (AC and Isolated DC power)



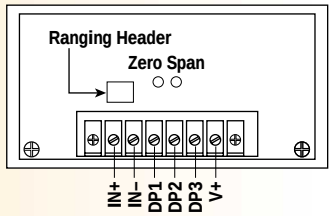
Terminal	Description
V+	10-28VDC power input
IN HI / IN LO	Signal Input
DP1, DP2, DP3 — Decimal point selection, connect to V+ as follows: DP1=XXX.X, DP2=XX.XX, DP3=X.XXX	
AC Power LO / AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected
12V Power GND	12VDC power input (optional)
24V Power GND	24VDC power input (optional)

Frequency Input



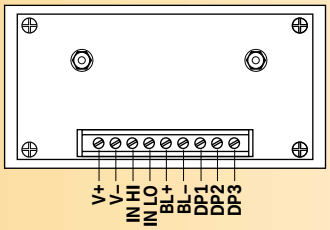
Terminal	Description
AC LO / AC HI / Earth GND	Signal input and power, 115VAC or 230VAC depending on model selected.
12VDC Power GND	12VDC power input (optional)
24VDC Power GND	24VDC power input (optional)

4-20mA Process & Flow Inputs



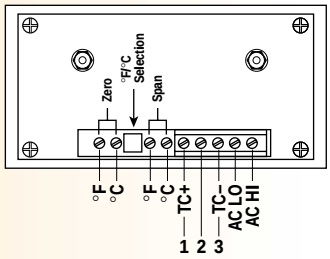
Terminal	Description
IN+ / IN–	Signal Input
DP1, DP2, DP3 — Decimal point selection, connect to V+ as follows: DP1= XXX.X, DP2= XX.XX, DP3= X.XXX	
V+	DC voltage output to select decimal points

DC Inputs (Non-Isolated DC Power)



Terminal	Description
V+ / V–	10-28VDC power input
IN HI / IN LO	Signal Input
BL + / BL –	Backlight power input
DP1, DP2, DP3 — Decimal point selection, connect to V+ as follows: DP1=XXX.X, DP2=XX.XX, DP3=X.XXX	

Temperature Inputs



Terminal	Description
TC+ / TC–	Thermocouple Inputs
AC Power Low / AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected
1 / 2 / 3	RTD inputs

2000 Series Scaling Chart

Model 2100, of the 2000 Series, provide the unique ability to switch-select a range and then scale and offset that range. Input will be displayed in engineering units. For example, by changing switch positions and recalibrating, a 2133-3419-04 may be set-up for any of the following displays:

- 4 to 20mA input display -148°F to 932°F (-100°C to +500°C) temperature
- 1 to 5V input displaying – 60kPa to 300kPa differential pressure
- 0 to 10V input displaying +700°F to +950°F (+682°C to +932°C) temperature
- 0 to 50mV input displaying 0 to 300 amperes

Scaling Capability

Zero Range Adjustment

4mA to 20mA, 1V to 5V — -1000 counts to +1500 counts. Switch selectable in four ranges: a 25-turn potentiometer enables continuous adjustment.

0 to 200mV, 0 to 2V, 0 to 10V — -1500 counts to +1500 counts. Switch selectable in six ranges: a 25-turn potentiometer enables continuous adjustment.

Full Scale Span Adjustment

All ranges — 0 to 2000 counts. Switch selectable in four ranges: a 25-turn potentiometer enables continuous adjustment.

Other ranges and scaling available.

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How to Order

	a	b		c	d		e	f
2	0	3	3[1] -	3	4	6 1	- 0 4	2

a — Configuration

0 = 1/8 DIN	1 = UPM
2 = TRMS (Inst)	3 = TRMS (Power)

b — Display

1 = Non Bklit	3 = Pos Grn Bklit
4 = Neg Grn Bklit	5 = Neg Red Bklit
6 = Pos Red Bklit	

c — DPM Power[2]

0 = loop power	1 = 9 VDC
2 = ±5VDC	3 = +5 volts
4 = 115VAC	5 = 230VAC
6 = 10 to 28VDC	7 = 12 or 24VDC (Iso)
8 = 12 VDC	9 = 24VDC

d — Input

00 = 100mVDC (1999 counts)
01 = 200mVDC scaled 0 to 199.9
02 = 2VDC scaled 0 to 1.999
03 = 20VDC
04 = 200VDC
05 = 1V to 5 VDC scaled 0 to 100.0
06 = 10VDC scaled 0 to 10.00
07 = 500VDC
10 = 200uADC
11 = 2mADC
12 = 20mADC
13 = 200mADC
18 = 4 to 20mADC Sq Rt[3]
19 = 4 to 20mADC scaled 0 to 100.0[3]
21 = 200.0mVAC RMS
22 = 2.000VAC RMS
23 = 20.00VAC RMS
24 = 200.0VAC RMS
25 = 500VAC RMS
27 = 500VAC Avg
28 = 80.0 - 130.0VAC Avg
29 = 80 - 260VAC Avg
30 = 250VAC RMS
31 = 2.000mAAC RMS
32 = 20.00mAAC RMS
33 = 200.0mAAC RMS
34 = 2.000AAC RMS
36 = 5.00AAC[4] RMS
37 = 50.0AAC[4] RMS
38 = 0 - 5AAC[4] AVG
39 = 0 - 50AAC[4] AVG
60 = 40 to 440Hz
61 = 40.0 to 199.9Hz
70 = 100 Ohms Pt 1° Resolution
71 = 100 Ohms Pt .1° Resolution
80 = Type J Thermocouple
81 = Type K Thermocouple
82 = Type T Thermocouple

e — Backlit Power[2]

00 = No Backlight	01 = 5VDC
02 = 12VDC	03 = 24VDC
04 = 115VAC	05 = 230VAC
06 = 10 to 28VDC	07 = 12 or 24VDC

f — Display[5]

1 = 2000	2 = 1500	3 = 1000
4 = 600	5 = 500	6 = 300
7 = 200	8 = 100	

2000 and 2100 Series Specifications (continued)

DC Inputs	Accuracy	Input Resistance	Overload Protection
200mVDC & 2VDC	±(.1% +1 count) typical ±(.2% +1 count) max.	≥ 100 Meg Ohms	200V continuous 300V intermittent
20VDC & 200VDC	±(.1% +1 count) typical ±(.2% +1 count) max.	1 Meg Ohm	350V continuous 500V intermittent
DC Current	±(.1% +1 count) typical ±(.2% +1 count) max.	200mV drop full scale	3 times f.s. current
Universal Selectable Process	±(.1% +2 counts)	4 to 20mA, 10 Ohms ≥ 200mV, ≥ 200K Ohms 2V and up, ≥ 1Meg Ohm	4 to 20 mA, ±100mA Voltage Inputs, 200V continuous 300V intermittent

AC Inputs	Accuracy	Input Resistance	Overload Protection
AC Voltage	±(.5% + 1 count)	1 Meg Ohm	350V continuous 500V intermittent
5A AC Current	±(.5% +1 count)	Current transformer	3 times f.s. current
50A AC Current	±(.5% +5 counts)	Current transformer	3 times f.s. current

Frequency Inputs	Accuracy	Distortion
40.0 to 199.9Hz	±.2Hz (40 to 70Hz) ±.5Hz (above 70Hz)	≤ .1 Hz for up to 20% third harmonic distortion
40 to 440Hz	±1Hz	≤ .1 Hz for up to 20% third harmonic distortion

Temperature Inputs	Accuracy	Input Characteristic	Overload Protection
Type J thermocouple -10°F to +1200°F (-23°C to +649°C)	±(.1% +1 count) accuracy ±1.3°C (2.8°F) conformity error	45 uV max per 100 Ohms thermocouple lead resistance	200V continuous
Type K thermocouple -40°F to +1500°F (-40°C to +815°C)	±(.1% +1 count) accuracy ±1.2°C (2.5°F) conformity error	45 uV max per 100 Ohms thermocouple lead resistance	200V continuous
Type T thermocouple -100°F to +600°F (-73°C to +315°C)	±(.1% +1 count) accuracy ±1.5°C (3.5°F) conformity error	45 uV max per 100 Ohms thermocouple lead resistance	200V continuous
100 Ω Pt. α =.00385 -200°F to +600° F (-129°C to +315°C)	±(.2% + 1 count) max	1mA RTD current	±5V
100 Ω Pt. α =.00385 -100.0°F to +199.9°F (-73°C to +98°C)	±(.2% + 1 count) max	1mA RTD current	±5V

[1] Change Order Number to "4" for 200 VDC Input

[2] Backlit power must be the same as the selected DPM power.

[3] Available on Non-Backlit meters only.

[4] Rated for use with 5A or 50A external current transformer supplied with DPM. See high current connection on inside page.

[5] For 5A current transformer inputs only.

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