

INTRODUCTION

The Metravi PM-29 Process Meter is an industrial, battery-powered instrument for field maintenance, an integration of a digital multimeter and process signal sources.

It conforms to safety standards of CATIV 600V and CATIII 1000V, as defined in IEC 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use.

It is designed with an IP65, dual-colour, plastic enclosure, for application in harsh environments.

FEATURES

- **Measurement functions:** AC Voltage, DC Voltage, Resistance, Capacitance, DC Current, AC Current, Diode Test, Frequency, Thermocouple Temperature and Thermal Resistance;
- **Output functions:** DC Voltage, Resistance, Frequency, Thermocouple Temperature, Thermal Resistance and DC Current (constant output, manual stepping and SIMULATE).
- **Loop inspection:** supply power to 24V circuits and meanwhile measure current.
- **Built-in VFC Low Pass Filter** can accurately measure distorted voltage and variable frequency voltage.
- Data display and retention.
- Measurement of relative values.



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TECHNICAL SPECIFICATIONS

- **Overload protection** : V~COM terminal : AC1000V/10 seconds
mAV terminal : 630mA/250V quick-acting fuse
- **Regulatory compliance** : IEC61010-1 (CATIV 600V, CATIII 1000V, Pollution Level II)
- **Electromagnetic compatibility** : Consistent with Group 1 and Class B of IEC61326-1
- **Surge protection** : 8kV(As per IEC61010.1-2001)
- **Authentication mark** : CE
- **Quality standard** : It is developed, designed and produced according to ISO 9001.
- **Display** : 4 digit display for measurement, 5 digit display for output
- **Display refreshing** : Fast (F): 20times/second; slow (S): 5 times/second
- **Temperature and humidity range for work** : 0~40 °C, relative humidity ≤85% (without moisture condensation)
- **Temperature and humidity range for storage** : -20 °C~60 °C, relative humidity below 90% (without moisture condensation)
- **Temperature and humidity range for guaranteed precision** : 23±5°C, relative humidity below 75% (without moisture condensation)
- **Temperature factor** : 0.1× basic precision / °C (temperature range: <18°C or >28°C)
- **Application environment** : Indoors, outdoors (non-watertight), altitude of 0~2000m
- **Indication of outrange** : OL
- **On-off / open-circuit test** : Buzzer beeps indicate the resistance reading is lower than the threshold, or an open circuit
- **Battery type** : Three 1.5V (LR6) alkaline batteries
- **Service life of batteries** : When using alkaline batteries
Measuring any parameter: about 100mVA
Loop detection function: about 200mVA
DC current output (SIMULATE): about 200mVA
DC current output (SOURCE) 20mA (1000Ω load): about 1000mVA"
- **Battery low** : it is indicated with a battery mark.
- **Automatic shutdown** : The meter is automatically shut down after about 5 minutes of no operation. The time can be adjusted.
- **Warm-up time** : 10 minutes
- **Close the meter enclosure calibration** : No need for internal adjustment
- **Battery cover** : For battery replacement, without influencing meter calibration
- **Size** : 185 (L) ×90 (W) ×54 (D) mm
- **Weight** : About 500g
- **Calibrating period** : 1 year

TECHNICAL SPECIFICATIONS

MEASUREMENTS

Function	Range	Measuring scope	Resolution	Precision
DC voltage DCV	60mV	-60.00mV~60.00mV	0.01mV	0.2%+4
	600mV	-600.0mV~600.0mV	0.1mV	0.2%+4
	6V	-6.000V~6.000V	0.001V	0.2%+4
	60V	-60.00V~60.00V	0.01V	0.2%+4
	600V	-600.0V~600.0V	0.1V	0.2%+4
	1000V	-1000V~1000V	1V	0.2%+4
AC voltage ACV	6V	0~6.000V	0.001V	0.5%+40(<400Hz) 5%+40(>400Hz)
	60V	0~60.00V	0.01V	0.5%+4
	600V	0~600.0V	0.1V	0.5%+4
VFC	600V	0~600.0V	0.1V	4%+10
OHM	600Ω	0~600.0Ω	0.1Ω	0.2%+4
	6kΩ	0~6.000kΩ	0.001kΩ	0.2%+4
	60kΩ	0~60.00kΩ	0.01kΩ	0.2%+4
	600kΩ	0~600.0kΩ	0.1kΩ	0.5%+4
	6MΩ	0~6.000MΩ	0.001MΩ	1%+4
	60MΩ	0~60.00MΩ	0.01MΩ	2%+4
DC current DCI	60mA	-60.00mA~60.00mA	0.01mA	0.2%+4
	600mA	-600.0mA~600.0mA	0.1mA	0.2%+4
AC current ACI	60mA	0.00mA~60.00mA	0.01mA	0.5%+10
	600mA	0.0mA~600.0mA	0.1mA	0.5%+10
Frequency FREQ	10Hz	0~9.9999Hz	0.0001Hz	0.02%+4
	100Hz	0~99.999Hz	0.001Hz	0.02%+4
	1000Hz	0~999.99Hz	0.01Hz	0.02%+4
	10kHz	0~5.0000kHz	0.0001kHz	0.02%+4
	DUTY	10%~90%	0.10%	1%
Diode	2V		0.0001V	1%+10
On-off test	600Ω		0.1Ω	≤50ΩBB
Thermocouple TC	R	0~1760°C	1°C	0.5%+3°C(≤100) °C 0.5%+2°C(>100) °C
	S	0~1760°C		
	B	600~1800°C		
	K	-200~1350°C		
	E	-200~700°C		0.5%+2°C(≤-100) °C 0.5%+1°C(>-100) °C
	J	-200~950°C		
	T	-200~400°C		
	N	-200~1300°C		
Thermal resistance RTD	Cu50	-50~150°C	1°C	0.5%+3°C
	Pt100	-200~850°C		
	Pt1000	-200~800°C		

- AC measurement: true RMS, 20Hz~1kHz, VFC measurement: true RMS, 20Hz~440Hz, range of 10%~110%;
- The thermocouple measurement adopts the thermometric scale of ITS-90. The precision doesn't include errors in cold-end compensation, or influences of thermo-electrical potential.
- The thermal resistance measurement adopts the thermometric scale of Pt100-385. The precision doesn't include errors due to lead resistance.
- During frequency measurement, for signals with frequency lower than 3Hz, relevant readings will be zero.

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TECHNICAL SPECIFICATIONS

OUTPUTS

Function	Range	Output setting scope	Resolution	Precision	Remark
DC voltage DCV	100mV	-10.00~110.00mV	10μV	0.2%+4	Maximum output current 0.5mA
	1000mV	-100.0~1100.0mV	100μV	0.2%+4	Maximum output current 2mA
	10V	-1.000~11.000V	1mV	0.2%+4	Maximum output current 5mA
DC current DCI	30mA	0.000~33.000mA	0.001mA	0.2%+4	20mA, maximum load 1kΩ 30mA, maximum load 600Ω
Simulated transmitter SIMULATE	-30mA	0.000~-33.000mA	0.001mA		
Loop power LOOP	24V			±10%	Maximum output current 35mA
OHM	400Ω	0.0Ω~400.0Ω	0.1Ω	0.2%+4	Excitation current is ±0.5~3mA When the excitation current is ±0.1~0.5mA, add 0.1Ω additional error Accuracy does not include lead resistance
Thermocouple TC	R	0°C~1767°C	1°C	0.2%+3°C (≤100°C) 0.2%+2°C (>100°C)	With the thermometric scale of ITS-90; The precision doesn't include errors in cold-end compensation
	S	0°C~1767°C			
	B	600°C~1820°C			
	K	-200.0°C~1372.0°C	0.1°C	0.2%+2°C (≤100°C) 0.2%+1°C (>-100°C)	
	E	-200.0°C~1000.0°C			
	J	-200.0°C~1200.0°C			
	T	-250.0°C~400.0°C			
N	-200.0°C~1300.0°C				
Thermal resistance RTD	PT100	-200.0~0850.0°C	0.1°C	0.2%+0.6°C	Excitation current is ±0.5~3mA Accuracy does not include lead resistance
	Cu50	-50.0~150.0°C			
Frequency FREQ	100Hz	1.0Hz~110.0Hz	0.1Hz	0.2%+2	Rectangular wave, duty cycle of 50% 1~11Vp-p
	1kHz	0.100kHz~1.100kHz	1Hz	0.2%+2	
	10kHz	1.0kHz~11.0kHz	100Hz		

Note: Load characteristics: capacitive loads ≥0.01uF.

INPUTS

Function position	Input impedance (nominal value)					
V	10MΩ, <100pF					
mV	>2.5GΩ					
mA	1Ω					
	Common-mode rejection ratio			Series-mode rejection ratio		
DCV, DCmV	80dB (dc to 50Hz / 60Hz/1KΩ)			40dB (50Hz / 60Hz)		
ACV, ACmV	60dB (dc to 50Hz / 60Hz/1KΩ)					
	Open-circuit voltage			Full-scale voltage		
Ohms	2.5V			2.2V		
Diode	< 3.5V			2.2V		
On-off	< 1V			600mV		
	Typical short-circuit current					
Ohms	600Ω	6kΩ	60kΩ	600kΩ	6MΩ	60MΩ
	0.8mA	0.2mA	20μA	2μA	0.2μA	< 0.1μA
Diode	0.2mA (typical value)					

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