WM3 Digital wattmeter

Specification

Model	WM3
Appearance	CE 
WXHXD(mm)	96 X 48 X 100
Measurement method	Period measuring type
Input voltage	0 – 220 V a.c.
Displaying period	0.1 ~ 2 sec
Power factor	80 ~ 100 %
Response speed	Approx. 2 sec (max range)
max displayable digit	4 digits (–1999 ~ 9999)
Displaying part	7 segments LED
Accuracy	Less than ± 5 Digt
Insulation resistance	Min 100 MΩ(500 V d.c.)
Dielectric strength	1500 V a.c. for 1 min (power terminal – input terminal)
Communication output(RS485)	Able to set the address from 00 ~ 99 and able to select the baud rate of series transfer. (Transfer speed : 1200, 2400, 4800, 9600, 19200 bps)
Current output (transfer)	Yields the 4 – 20 mA d.c. output corresponding to the current indication value. (Resolving power: 12,000)
Transistor output	PNP/NPN open collector output (12 – 24 V d.c. 50 ㎃ max)
Relay output	1 a X 3 contact (HI, GO, LO), (220 V a.c. 5 A)
Power supply voltage	100 – 240 V a.c. 50 – 60 ㎐ (Dual usage)
Voltage fluctuation	–15 ~ 10 % of the power supply voltage
Power consumption	Approx. 5 VA
Weight	300 g
Ambient temperature	0 ~ 50 ℃
Ambient humidity	35 ~ 85 % RH
Storage temperature	–10 ~ 70 ℃
Vibration resistance	10 – 55 ㎐ single amplitude, to the each direction of X, Y, Z for 2 hour
Shock resistance	300 m/s², to the 6 direction of X, Y, Z and each 3 times

Suffix code

Model	Code		Information
WM3–	□	□ □	Digital wattmeter (DIN 96 X 48 mm)
Phase and wire	1		Single phase 2 wire type (0 – 220 V a.c.)
Input specification	01		Refer to the input specification (Refer to the code)
Output (Optional)		N	Only for displaying
		0	Relay (HI, GO, LO), 4 – 20 ㎃ d.c.
		1	Relay (HI, GO, LO)
		2	NPN Open collector (HI, GO, LO), 4 – 20 ㎃ d.c.
		3	PNP Open collector (HI, GO, LO), 4 – 20 ㎃ d.c.
		4	NPN Open collector (HI, GO, LO), RS485
		5	PNP Open collector (HI, GO, LO), RS485

Panel Meter

MP3 series Digital multimeter

Specification

Model	MP3
Appearance	CE  〈Front Plate Type〉 〈Front Acrylic Type〉
W×H×D (mm)	96 X 48 X 112
Power Supply	100 – 240 V a.c. 50 – 60 Hz voltage fluctuation rate ±10 %
Power Consumption	5 VA
Display	7 Segment LED Display
Insulation Resistance	100 MΩ minimum (at 500 V d.c.) between external terminal and case
Dielectric Strength	2000 V a.c. minimum for 1 minute between external terminal and case
Noise Immunity	By noise simulator, square-shaped wave noise, pulse width 1 , ±3000 V
Vibration Resistance	Malfunction Resistance : 10 – 55 Hz Single amplitude 0.5 mm X·Y· Z each direction for 1 hour Mechanical Durability : 10 – 55 Hz Single amplitude 0.75 mm X·Y·Z each direction for 2 hours
Shock Resistance	Malfunction Resistance : 100 % for 3 times each in X·Y·Z direction, Mechanical Durability: 300 % for 3 times each in X·Y·Z direction
Operating Ambient temperature	–10 ~ 55 ℃ (without condensation)
Operating Ambient Humidity	35 ~ 85 % RH
Operating Circumstance	With no corrosive gas
Storage Ambient Temperature	–20 ~ 65 ℃ (without condensation)
Relay Life Expectancy	Mechanical: More than 20,000,000 times, Electrical: More than 100,000 times

Suffix code

Model	Code				Information
MP3–	□	□	□	□	Digital Multi Panelmeter 96 x 48 mm
Displaying digit	4				4 digits (9999)
Input type		DV			DC VOLTAGE
		DA			DC AMPERE
		AV			AC VOLTAGE
		AA			AC AMPERE
		AVR			AC VOLTAGE (RMS) ※Option output can be ordered only N type
		AAR			AC AMPERE (RMS) ※Option output can be ordered only N type
Output (Optional)			N		Display only
			0		Relay Output (HI,GO,LO) + Current Output (4 – 20 mA)
			1		Relay Output (HI, GO, LO)
			2		NPN Open Collector Output (HI,GO,LO) + BCD Output (Dynamic)
			3		PNP Open Collector Output (HI,GO,LO) + BCD Output (Dynamic)
			4		NPN Open Collector Output (HI,GO,LO) + Current Output (4 – 20 mA)
			5		PNP Open Collector Output (HI,GO,LO) + Current Output (4 – 20 mA)
			6		NPN Open Collector Output (HI,GO,LO) + Serial Output (lowspeed)
			7		PNP Open Collector Output (HI,GO,LO) + Serial Output (lowspeed)
			8		NPN Open Collector Output (HI,GO,LO) + RS485 Output
			9		PNP Open Collector Output (HI,GO,LO) + RS485 Output
			10		BCD Output (Static)
			11		Relay Output (HI,GO,LO) + RS485 Output
Front panel type				A	Front Acrylic type (100 – 240 V a.c.)
				B	Front Plate type (100 – 240 V a.c.)
				C	Front Plate type (24 V d.c.) ※Only N type is available

MP6 series Digital multimeter

Specification

Model	MP6
Appearance	CE  〈Front Plate Type〉 〈Front Acrylic Type〉
W×H×D (mm)	72 X 36 X 100
Power Supply	100 – 240 V a.c. 50 – 60 Hz voltage fluctuation rate ±10 %
Power Consumption	Approx. 4 VA
Display	7 Segment LED Display
Insulation Resistance	100 MΩ minimum (at 500 V d.c.) between external terminal and case
Dielectric Strength	2000 V a.c. minimum for 1 minute between external terminal and case
Noise Immunity	By noise simulator, square-shaped wave noise, pulse width 1 , ±3000 V
Vibration Resistance	Malfunction Resistance : 10 – 55 Hz Single amplitude 0.5 mm X·Y· Z each direction for 1 hour Mechanical Durability : 10 – 55 Hz Single amplitude 0.75 mm X·Y·Z each direction for 2 hours
Shock Resistance	Malfunction Resistance : 100 % for 3 times each in X·Y·Z direction, Mechanical Durability: 300 % for 3 times each in X·Y·Z direction
Operating Ambient temperature	–10 ~ 55 ℃(without condensation)
Operating Ambient Humidity	35 ~ 85 % RH
Operating Circumstance	With no corrosive gas
Storage Ambient Temperature	–20 ~ 65 ℃(without condensation)
Relay Life Expectancy	Mechanical: More than 20,000,000 times, Electrical: More than 100,000 times

Suffix code

Model	Code						Information
MP6–	□	□	□	□	□		Digital Multi Panelmeter 72 x 36 mm
Displaying digit	4						4 digits (9999)
Input type		DV					DC VOLTAGE
		DA					DC AMPERE
		AV					AC VOLTAGE
		AA					AC AMPERE
		AVR					AC VOLTAGE (RMS) ※Option output can be ordered only N type
		AAR					AC AMPERE (RMS) ※Option output can be ordered only N type
Output (Optional)			N				Display only
			0				Relay, Current output (4 – 20 mA d.c.)
			1				Relay
			4				NPN Open Collector , Current output (4 – 20 mA)
			5				PNP Open Collector , Current output (4 – 20 mA)
Front panel type				A			Front Acrylic type (100 – 240 V a.c.)
				B			Front Plate type (100 – 240 V a.c.)
				C			Front Plate type (24 V d.c.)

Panel Meter

MP3-4H, MP6-4H Digital frequency meter

Specification

Model	MP3-4H	MP6-4H
Appearance	CE 	CE 
W X H X D (mm)	96 X 48 X 100	72 X 36 X 100
Input signal	AC (voltage, current), DC (voltage, current)	
A/D converting method	Double integral method	
Sampling time	AC type : 300 ㎳	
Response speed	Approx. 2sec (max range)	
Max displayable digit	4 digits (-1999~9999)	
Displaying unit	7 segments LED	
Accuracy	AC : below ±5 Digit, DC : below ±2 Digit	
Insulation resistance	Min 100 MΩ(500 V d.c.)	
Dielectric strength	1500 V a.c. for 1 min (power terminal - input terminal)	
Communication output (RS485)	It can set address from 00 to 99 and it can select modulation rate of direct retransmission. (Retransmission speed : 1200, 2400, 4800, 9600, 19200 bps)	
Current output (Retransmission)	Yields 4~20mA d.c. output regarding current indicated value. (Resolving power : 12,000)	
Transistor output	PNP/NPN open collector output (12 - 24 V d.c. 50 ㎃ max)	
Relay output	1 a X 3 contacts (HI, GO, LO), (220 V a.c. 5 A)	
Power supply voltage	100 - 240 V a.c., 50 - 60 ㎐ (dual usage)	
Allowable voltage fluctuation range	85 - 264 V a.c.	
Power consumption	Approx. 5 VA	Approx. 5 VA
Weight(g)	Approx. 180	
Ambient temperature	0 ~ 50 ℃	
Ambient humidity	35 ~ 85 % RH	
Storage temperature	-10 ~ 70 ℃	
Vibration resistance	10 - 55 ㎐ single amplitude X, Y, Z each direction for 2 hours	
Shock resistance	300 m/s², X, Y, Z 6 directions each 3 times	

Suffix code

Model	Code	Information
MP	□□□□	Digital frequency meter
Dimension	3	Dimension 96×48 ㎜
	6	Dimension 72×36 ㎜
Displayable digit	4	4 digits (9999)
Output (Optional)	N	Only for display
	0	Relay output (HI, GO, LO) + current output (4 - 20 ㎃)
	1	Relay output (HI, GO, LO)
	2	NPN TR output (HI, GO, LO) + current output (4 - 20 ㎃)
	3	PNP TR output (HI, GO, LO) + current output (4 - 20 ㎃)
	4	NPN TR output (HI, GO, LO) + RS485output
	5	PNP TR output (HI, GO, LO) + RS485output
Output (Optional)	H	AC input frequency measurement

BS series Exclusive digital voltmeter·Ammeter

Specification

Model		BS3	BS6	BS1
Appearance				
WXHXD(mm)		96 X 48 X 100	72 X 36 X 100	48 X 24 X 100
Function		Indicator		
Power supply		100 – 220 V a.c. 50 – 60 Hz (voltage variation rate ±10 %)		
Display unit		V · mV · A · mA · μA		
Max. display range		1999 (3½ Digit)		
Input signal		AC voltage, AC current, DC voltage, DC current, Instrumentation signal		
A/D converter		2 dual integration		
Sampling cycle		300 ms		
Response speed		Approx. 2 sec. (Max. range)		
Insulation resistance		Min. 100 MΩ at 500 V d.c. between terminals		
Dielectric strength		1500 V a.c. for 1 minute between power and external terminals		
Vibration	Mechanical Durability	10 – 55 Hz each direction for 1 hour		
	Malfunction Resistance	10 – 55 Hz each direction for 10 minutes		
Shock	Mechanical Durability	300 ㎨ X·Y·Z each direction 3 times (Approx. 30G)		
	Malfunction Resistance	100 ㎨ X·Y·Z each direction 3 times (Approx. 10G)		
Ambient Temp. & Humidity		0 ~ 50 ℃/ 35 ~ 85 % RH		

Suffix code

Model	Code						Information
BS	□–	□	□	□	□	□	Digital panel meter
Dimension	6						72 X 36 mm
	3						96 X 48 mm
	1						48 X 24 mm
Output		N					Only for indication
Input type			A		10		AC voltmeter (AC)
					20		AC ammeter (AC)
			D		10		DC voltmeter(DC)
					20		DC ammeter(DC)
					11		DC voltmeter
					21		DC ammeter
Measurement range						1	Refer to the measurement range code : BS3-NA101 (1.999 V)

※Mode: range code of BS6 and BS3 are different

Measurement range

■ AC current (model: BS3, BS6, BS1)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS □ – NA201	19.99 mA	10 μA	10 Ω	50 mA
BS □ – NA202	199.9 mA	100 μA	1 Ω	300 mA
BS □ – NA203	1.999 A	1 mA	0.1 Ω	3 A
BS □ – NA204	5.00 A	10 mA	40 MΩ	5.1 A
BS □ – NA205	19.99 A	10 mA	Use transformer (Secondary current 5 A)	
BS □ – NA206	30.0 A	100 mA		
BS □ – NA207	100.0 A	100 mA		
BS □ – NA208	150.0 A	100 mA		
BS □ – NA209	199.9 A	100 mA		
BS □ – NA2010	300 A	1 A		
BS □ – NA2011	1999 A	1 A		

■ DC voltage (model: BS3, BS6, BS1)

Model	Input range	Display range	Input impedance	Allowable max input voltage
BS □–ND111	1 – 5 V d.c.	50.0	500 kΩ	100 V
BS □–ND112		100.0	500 kΩ	100 V
BS □–ND113		199.9	500 kΩ	100 V
Input Measurement range 0 – 10 V d.c. (optional)				

■ AC voltage (model: BS3)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS3–NA101	1.999 V	1 mV	100 kΩ	10 V
BS3–NA102	19.99 V	10 mV	1 MΩ	50 V
BS3–NA103	199.9 V	100 mV	10 MΩ	300 V
BS3–NA104	400 V	1 V	10 MΩ	500 V
BS6–NA105	400 V	1 V	10 MΩ	500 V

■ AC voltage (model: BS6, BS1)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS □–NA101	199.9 mV	0.1 mV	10 kΩ	10 V
BS □–NA102	1.999 V	1 mV	100 kΩ	10 V
BS □–NA103	19.99 V	10 mV	1 MΩ	50 V
BS □–NA104	199.9 V	100 mV	10 MΩ	300 V
BS6–NA105	400 V	1 V	10 MΩ	500 V
BS1–NA105	500 V			

※BS1–NA105 range : 500 V

■ DC ammeter (model: BS3, BS6, BS1)

Model	Input range	Display range	Input impedance	Allowable max input voltage
BS □–ND211	4 – 20 mA d.c.	50.0	25 Ω	150 mA
BS □–ND212		100.0	50 Ω	150 mA
BS □–ND213		199.9	100 Ω	150 mA

■ DC current (model: BS3, BS6, BS1)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS□–ND101	199.9 mV	0.1 mV	10 kΩ	70 V
BS□–ND102	1.999 V	1 mV	100 kΩ	100 V
BS□–ND103	19.99 V	10 mV	1 MΩ	200 V
BS□–ND104	199.9 V	100 mV	10 MΩ	300 V
BS□–ND105	500 V	1 V	10 MΩ	600 V

■ DC current (model: BS6)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS6–ND201	199.9 μA	0.1 μA	100 Ω	1 mA
BS6–ND202	1.999 mA	1 μA	10 Ω	50 mA
BS6–ND203	19.99 mA	10 μA	1 Ω	150 mA
BS6–ND204	199.9 mA	100 μA	0.1 Ω	300 mA
BS6–ND205	5.00 A	10 mA	400 MΩ	5.1 A
BS6–ND206	19.99 A	10 mA	Use shunt (Secondary voltage 50 mV)	
BS6–ND207	199.9 A	100 mA		
BS6–ND208	1999 A	1 A		

■ DC current (model: BS1)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS1–ND201	199.9 μA	0.1 μA	1 kΩ	50 mA
BS1–ND202	1.999 mA	1 μA	100 Ω	150 mA
BS1–ND203	19.99 mA	10 μA	10 Ω	300 mA
BS1–ND204	199.9 mA	100 μA	1 Ω	3 A
BS1–ND205	1.999 A	1 mA	0.1 Ω	3 A
BS1–ND206	5.00 A	10 mA	0.01 Ω	5 A
BS1–ND207	19.99 A	10 mA	Use shunt (Secondary voltage 50 mV)	
BS1–ND208	199.9 A	100 mA		
BS1–ND209	1999 A	1 A		

■ DC ammeter current (model: BS3)

Model	Measurement range	Resolving power	Input impedance	Allowable max input voltage
BS3–ND201	1.999 mA	1 μA	100 Ω	50 mA
BS3–ND202	19.99 mA	10 μA	10 Ω	150 mA
BS3–ND203	199.9 mA	100 μA	1Ω	300 mA
BS3–ND204	1.999 A	1 mA	0.1Ω	3 A
BS3–ND205	5.00 A	10 mA	0.01Ω	5 A
BS3–ND206	19.99 A	10 mA	Use shunt (Secondary voltage 50 mV)	
BS3–ND207	199.9 A	100 mA		
BS3–ND208	1999 A	1 A		

Panel Meter

BA1 Digital Voltmeter·Ammeter

Specification

Model		BA1
Appearance		
WXHXD(mm)		48 X 24 X 53
Function		Display
Power supply		5 V d.c., 12 – 24 V d.c.
Display unit		–
Max. range		±1999 (3½Digit)
Input signal		DC voltage, DC current, Instrumentation signal
A/D converter		2 dual integration
Sampling cycle		2.5 times / sec.
Response speed		Approx. 2.5sec.
Insulation resistance		Min. 100 ㏁ at 500 V d.c. between external terminal and case
Dielectric strength		1500 V a.c. for 1 minute between power and external terminals
Vibration	Malfunction Resistance	10 – 55 ㎐ 0.76 ㎜ X·Y·Z each direction for 2 hours
	Mechanical Durability	2 – 55 ㎐ X·Y·Z each direction for 10 minutes
Shock	Malfunction Resistance	100 ㎨ each direction 3 times (Approx. 10G)
	Mechanical Durability	300 ㎨ each direction 3 times (Approx. 30G)
Ambient temp. & Humidity		0 ~ 50 ℃ / 35 ~ 85 % RH (Without condensation)

Suffix code

Model	Code				Information
BA1–	□	□	□	□	Mini DC indicator (48 X 24 ㎜)
Input	D	10			DC voltage (voltmeter)
		20			DC current (ammeter)
		11			DC voltmeter (1 – 5 V d.c.)
		21			DC ammeter (4 – 20 ㎃ d.c.)
Range code					Refer to the Measurement range
Power supply voltage			–		5 V d.c.
			A		12 – 24 V d.c.

Measurement range

■ DC voltage

Model	Measurement range	Resolving power	Input impedance	Max allowable input voltage
BA1–D101	199.9 ㎷	100 ㎶	100 ㏀	70 V
BA1–D102	1.999 V	1 ㎷	1 ㏁	100 V
BA1–D103	19.99 V	10 ㎷	1 ㏁	250 V
BA1–D104	199.9 V	100 ㎷	10 ㏁	300 V
BA1–D111	1 – 5 V d.c.	50.0	100 ㏀	100 V
BA1–D112		100.0	100 ㏀	100 V
BA1–D113		199.9	100 ㏀	100 V

※ Degree : Indicate value of ±0.2 % ±1 digit (23 ℃ ±5 ℃)

■ DC current

Model	Measurement range	Resolving power	Input impedance	Max allowable input voltage
BA1–D201	199.9 ㎂	0.1 ㎂	1 ㏀	10 ㎃
BA1–D202	1.999 ㎃	1 ㎂	100 Ω	50 ㎃
BA1–D203	19.99 ㎃	10 ㎂	10 Ω	150 ㎃
BA1–D204	199.9 ㎃	100 ㎂	1 Ω	500 ㎃
BA1–D205	1.999 A	1 ㎃	0.01 Ω	5 A
BA1–D206	19.99 A	10 ㎃	Use shunt (secondary voltage 50 ㎷)	
BA1–D207	199.9 A	100 ㎃		
BA1–D208	1999 A	1 A		
BA1–D211	4 – 20 ㎃ d.c.	50.0	25 Ω	150 ㎃
BA1–D212		100.0	50 Ω	150 ㎃
BA1–D213		199.9	100 Ω	150 ㎃

※ Degree : Indicate value of ±0.2 % ±1 digit (23 ℃ ±5 ℃)

HLP1 Non voltage digital scale meter

Specification

Model	HLP1
Appearance	
W X H X D (mm)	48 X 25 X 50
Power supply voltage	Non–voltage type
Ambient temperature	–5 ~ 50 ℃
Ambient humidity	20 ~ 90 % RH
Storage temperature	–25 ~ 70 ℃
Vibration resistance	10 ~ 55 ㎐ Single amplitude for 2 hour each in X, Y and Z direction
Shock resistance	300 m/s², 3 times each in X, Y and Z 6 direction