Digital Panel meter

BS series

INSTRUCTION MANUAL

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

MAIN PRODUCTS
- DIGITAL : Temperature Controller, Counter, Timer,Speedmeter, Tachometer, Panel Meter, Recorder
- SENSOR : Proximity Sensor/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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■ Safety information

Before you use, read safety precautions carefully, and use this product properly. The precautions described in this manual contain important contents related with safety; therefore, please follow the instructions accordingly. The precautions are composed of DANGER, WARNING and CAUTION.

⚠ DANGER

There is a danger of occurring electric shock in the input/output terminals so please never let your body or conductive substance is touched.

⚠ WARNING

1. This product does not contain an electric switch or fuse, so the user needs to install a separate electric switch or fuse externally. (Fuse rating: 250 V 0.5 A)
2. To prevent defection or malfunction of this product, apply a proper power voltage in accordance with the rating.
3. To prevent electric shock or malfunction of product, do not supply the power until the wiring is completed.
4. Since this product is not designed with explosion-protective structure, do not use it any place with flammable or explosive gas.
5. Do not decompose, modify, revise or repair this product. This may be a cause of malfunction, electric shock or fire.
6. Reassemble this product while the power is OFF. Otherwise, it may be a cause of malfunction or electric shock.
7. If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
8. There is a possibility of occurring electric shock so please use this product after installing it onto a panel while it is operating.

⚠ CAUTION

1. The contents of this manual may be changed without prior notification.
2. Before using the product you purchased, make sure that it is exactly what you ordered.
3. Make sure that there is no damage or abnormality of the product during the delivery.
4. Do not use this product at any place with occurring corrosive (especially noxious gas or ammonia) or flammable gas.
5. Do not use this product at any place with direct vibration or impact.
6. Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Use at Pollution level 1 or 2)
7. Do not polish this product with substances such as alcohol or benzene. (Use neutral detergent.)
8. Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.
9. Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
10. Install this product at place under 2,000m in altitude.
11. When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
12. If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended. The noise filter must be attached to be a panel grounded, and the wire between the filter output side and power supply terminal must be as short as possible.
13. If putting the power cables closely together then it is effective against noise.
14. Do not connect anything to the unused terminals.
15. After checking the polarity of terminal, connect wires at the correct position.
16. When this product is connected onto a panel, use a circuit breaker or switch approved with IEC947-1 or IEC947-3.
17. Install a circuit breaker or switch at near place for convenient use.
18. Write down on a label that if the circuit breaker or switch is operating then the power will be disconnected since the circuit breaker or switch is installed.
19. For the continuous and safe use of this product, the periodical maintenance is recommended.
20. Some parts of this product have limited life span, and others are changed by their usage.
21. The warranty period for this product including parts is one year if this product is properly used.

■ Model Name and Structure

MODEL	Suffix code	Description
BS □	□□□□□□	BS3 (72×36×107 mm) BS6 (96×48×109 mm)
Display	N	Display Only
Measuring/Input Power Type	A	AC: Measuring AC
	D	DC: Measuring/Input Scaling DC
Voltage/Current	1	Voltage
	2	Current
Display Measured Value/Input Scale Value	0	Displaying Measured Value
	1	Displaying Input Scale Value
Measure/Input Range	□	Measure/Input Display Range → See Range Code
Measurement Method	S	Average Value Measurement

■ Measuring Range Code

■ AC Voltage Measurement

Model	AC Voltage	Range Code	Measuring Range	Resolution	Input Impedance	Max Permissible Input Voltage
BS3	NA10	1	1.999 V	1 mV	1 kΩ	10 V
		2	19.99 V	10 mV	100 kΩ	50 V
		3	199.9 V	100 mV	10 MΩ	300 V
		4	400 V	1 V	10MΩ	500 V
BS6	NA10	1	199.9 mV	1 mV	1 kΩ	10 V
		2	1.999 V	1 mV	1 kΩ	10 V
		3	19.99 V	10 mV	100 kΩ	50 V
		4	199.9 V	100 mV	10 MΩ	300 V
		5	400 V	1 V	10 MΩ	500 V

■ AC Current Measurement

Model	AC Current	Range Code	Measuring Range	Resolution	Input Impedance	Max Permissible Input Current
BS3 BS6	NA20	1	19.99 mA	10 μA	10 Ω	50 mA
		2	199.9 mA	100 μA	1 Ω	300 mA
		3	1.999 A	1 mA	0.1 Ω	3 A
		4	5.00 A	10 mA	40 MΩ	5 A
		5	19.99 A	10 mA	Use current transformer (CT) (Secondary Current 5A)	
		6	30.0 A	100 mA		
		7	100.0 A	100 mA		
		8	150.0 A	100 mA		
		9	199.9 A	100 mA		
		10	300 A	1 A		
		11	1999 A	1 A		

■ DC Voltage Measurement

Model	DC Voltage	Range Code	Measuring Range	Resolution	Input Impedance	Max Permissible Input Voltage
BS3 BS6	ND10	1	199.9 mV	0.1 mV	470 Ω	70 V
		2	1.999 V	1 mV	100 kΩ	100 V
		3	19.99 V	10 mV	1 MΩ	200 V
		4	199.9 V	100 mV	10 MΩ	300 V
		5	500 V	1 V	10 MΩ	400 V

■ DC Current Measurement

Model	DC Current	Range Code	Measuring Range	Resolution	Input Impedance	Max Permissible Input Current
BS3	ND20	1	1.999 mA	1 ㎂	100 Ω	50 mA
		2	19.99 mA	10 ㎂	10 Ω	150 mA
		3	199.9 mA	100 ㎂	1 Ω	300 mA
		4	1.999 A	1 mA	0.1 Ω	3 A
BS6	ND20	1	199.9 mA	1 ㎂	100 Ω	50 mA
		2	1.999 mA	10 ㎂	10 Ω	150 mA
		3	19.99 mA	100 ㎂	1 Ω	300 mA
		4	199.9 A	1 mA	0.1 Ω	3 A
BS3 BS6	ND20	5	5.00 A	10 mA	40 MΩ	5 A
		6	19.99 A	100 mA	Use shunt (Secondary Voltage 50 mV (standard))	
		7	199.9 A	100 mA		
		8	1999 A	1 A		

■ DC Voltage Input scale Display

Model	DC Voltage	Range Code	Input Range	Display Range	Input Impedance	Max Permissible Input Voltage
BS3 BS6	ND11	1	1 ~ 5 V DC	50.0	500 kΩ	100 V
		2		100.0	500 kΩ	100 V
		3		199.9	500 kΩ	100 V

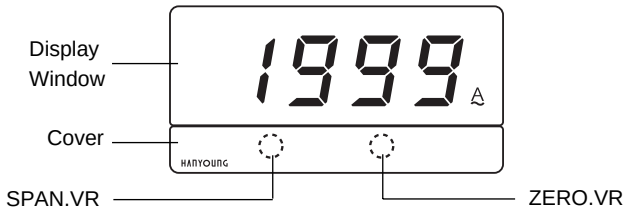
■ DC Current Input scale Display

Model	DC Current	Range Code	Input Range	Display Range	Input Impedance	Max Permissible Input Current
BS3 BS6	ND21	1	4 ~ 20 mA DC	50.0	25 kΩ	150 mA
		2		100.0	50 kΩ	150 mA
		3		199.9	500 kΩ	150 mA

■ Specification

Input Signal		Current, Voltage, Instrumentation Signal Input (4~ 20 mA DC, 1 ~ 5 V DC)
A/D Conversion Method		Double Integral Method
Sampling Cycle		300 ms
Response Time		Approx. 2 sec (Max Range)
Max Displayable Digit		3 1/2 digit (1999)
Display		7 segment LED, Character Height 20.4 mm
External Control		Hold function
Accuracy		AC Voltage: ±0.5 % of FS ±1 digit
		DC Voltage: ±0.2 % of FS ±1 digit
Power Supply		110 V AC / 220 V AC (50/60 Hz common) (Voltage Fluctuation Rate ±10 %)
Power Consumption		Approx. 2 VA (at Max Load)
Insulation resistance		Between each terminal 500 V DC , above 100 MΩ
Dielectric Strength		1500 V AC for 1 minute (between power terminal and input terminal)
Vibration resistance	Malfunction	10 ~ 50 Hz single amplitude each X · Y · Z direction for 2 hours
	Durability	10 ~ 50 Hz single amplitude each X · Y · Z direction for 10 minutes
Shock Resistance	Malfunction	300 m/s² (approx. 30 G)
	Durability	100 m/s² (approx. 10 G)
Operating Ambient Temperature		0 ~ 50 ℃
Operating Ambient Humidity		35 ~ 85 %
Storage Ambient Temperature		-10 ~ 70 ℃

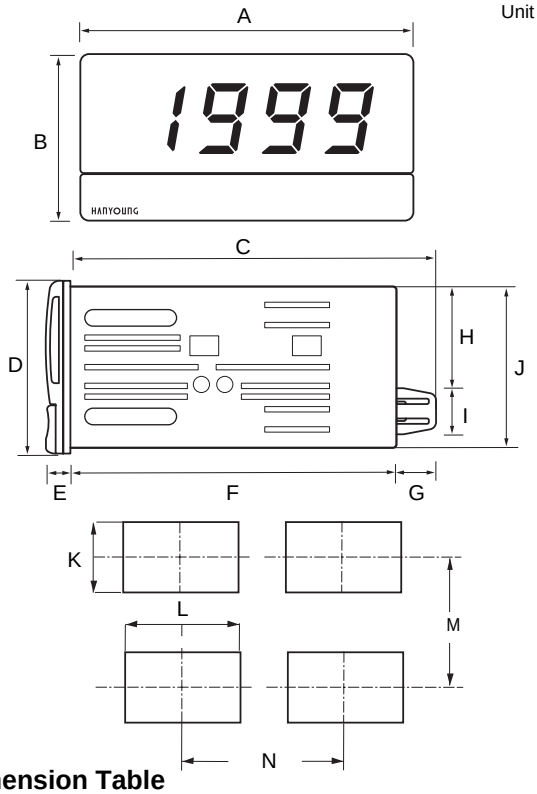
■ Front Parts Name



[Note] It is easy to adjust since there are SPAN.VR in the left and ZERO. VR in the right after opening its cover.

■ Aspect & Panel Cutout Dimension

Unit : mm

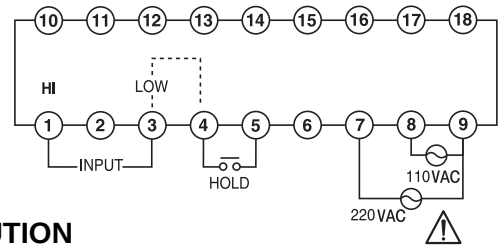


■ Dimension Table

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
BS3	96	48	102	48	7	91	11	28	13	44.8	45	92	60	130
BS6	72	36	100	36	6.5	89	11	16	12	30.5	31	66.5	60	100

■ Wiring Diagram

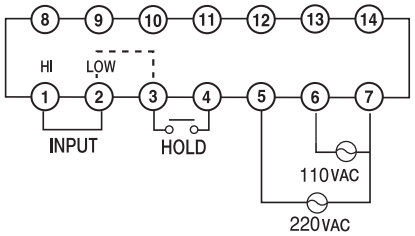
■ BS3



⚠ CAUTION

Please use a single contact when using hold function of AC voltage/current type. Terminal 3 and 4 are internally shorted so that it can be a cause of its malfunction when connecting them in parallel.

■ BS6



⚠ CAUTION

Please use a single contact when using hold function of AC voltage/current type. Terminal 2 and 3 are internally shorted so that it can be a cause of its malfunction when connecting them in parallel.

■ Measuring Method of AC

When measuring AC voltage and current, there are two methods which are measuring effective values method and measuring average values method. If the input is not followed a sine wave or is having lots of distorted waves then it is useful to measure effective value but measuring average values method is generally used for measuring. (For analog meter, most of them take measuring average values method.) The factory default of Hanyoung NUX.'s DPM is measuring average values method as standard feature.

※DPM : Digital Panel Meter