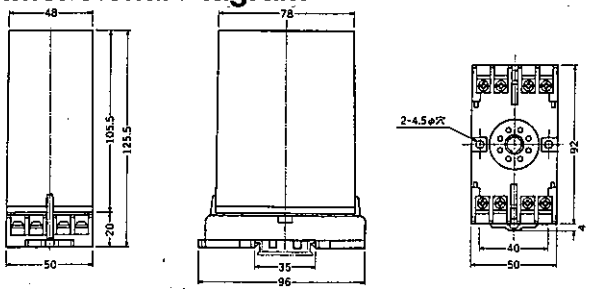
INSTRACTION MANUAL

WVP-BRD/BRS/BRA/BRC
WAP-BRD/BRS/BRA/BRC
RATIO BIAS SETTER

Thank you for selecting another fine watanabe product.

Please check the description given on the front label of this unit to make sure that it meets your specification. To receive the most benefit from the unit's excellent capabilities, be sure to read this instruction manual in advance. The unit has been manufactured and inspected according to our strict quality control standard to assure you of good quality. If you should find a defect including damage incurred during transportation, report it to us or to the company where it was purchased immediately.

Dimensional Diagram



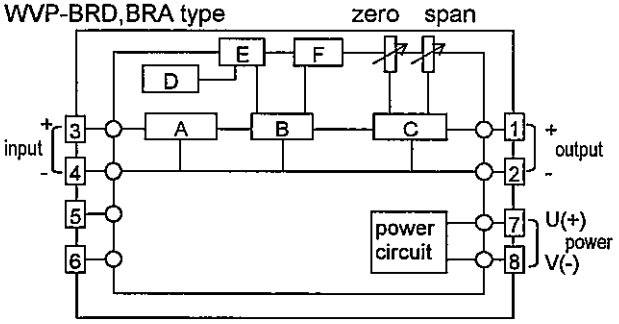
Accessory : Base socket(WVP-8PFA1) 1pc.

General

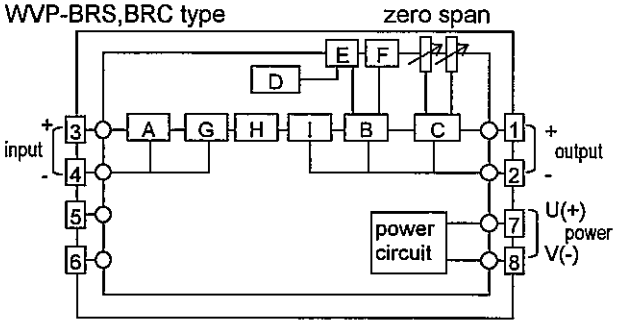
The WVP/WAP-BRD,BRS,BRA,BRD signal converter that delivers an output obtained by applying a ratio and bias to the input signal. The ratio and the bias can be freely set via the digital switches located on the front panel.

Circuit Diagram

WVP-BRD,BRA type

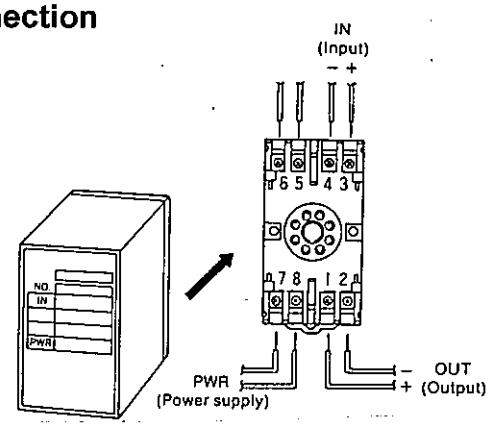


WVP-BRS,BRC type



A : input circuit, B : ratio bias circuit, C : output circuit
D : constant voltage circuit, E : digital switch for bias setting
F : digital switch for ratio setting, G : voltage to pulse converter circuit
H : pulse to voltage converter circuit, I : isolation by photo coupler

Connection



1	OUTPUT	+	The signal based on the I/O specification is output from these terminals.
2		-	
3	INPUT	+	Connect the specified input signal to these terminals.
4		-	
5			
6			
7	POWER	U(+)	Connect a power source of the specified voltage to these terminals.
8		V(-)	

- When inputting a DC current exceeding 20mA, specify the input signal of this unit for 60mVfs, and use a shunt with the unit.
- When inputting a DC voltage exceeding 300V, specified the input signal of this unit for DC 1mAfs, and use a multiplier with the unit.

Ratio and bias Setting

Setting of ratio

Any ratio from 0.1 to 3.99 times can be set via the 3-digit digital switches. The switch of the highest position is provided with a stopper, so that a number in excess of four may not be specified. Although a ratio can be entered starting from 0.01 time, the performance specified on the catalog will be satisfied only for 0.1 time or higher.

Setting of bias

Any bias from -99 to +99% can be set via the 1-digit polarity and the 2 -digit number digital switches.

Equation

Xo: output, Xi : input,
K : ratio (0.1 to 3.99), B: bias (-99 to +99%)
- WVP-BRD, BRS type ---- $Xo = K\,Xi \pm B$
- WVP-BRA, BRC type ---- $Xo = K(Xi \pm B)$

Zero and span adjustment

This unit has been factory-calibrated before shipment, therefore, you do not have to adjust ZERO and SPAN as long as you operate the unit within its specification.

If a matching with another equipment for connection, or periodic calibration is necessary, adjust the trimmers on the front panel of the unit according to the procedure described below. For the matching or calibration, use a signal source (standard voltage, current generator, etc.) and measuring equipment (voltmeter and ammeter), whose accuracy are 10 times or greater than that of this unit and start of this unit and start calibration 30 minutes or more after power supply are turned on.

This unit has multi- turn trimmers which provide a ZERO and SPAN adjustment range of about ±20%fs respectively. Note that the multi-turn trimmers have no stopper.

Case of normal output - WVP-BRx-xx-xN-x

1. ZERO adjustment: Input the minimum value of the input range to the input terminals, and adjust the ZERO trimmer so that its resulting output signal become the minimum

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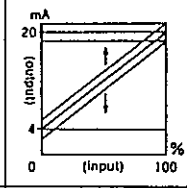
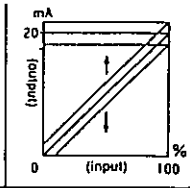
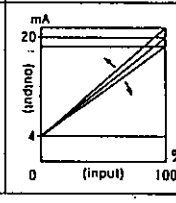
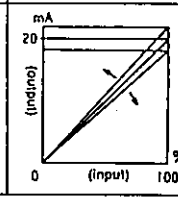
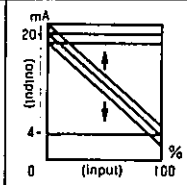
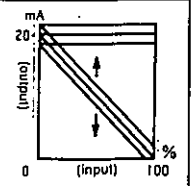
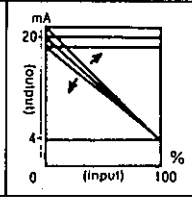
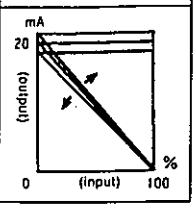
value of the output range.
2. SPAN adjustment: Input the maximum value of the input range to the input terminals, and adjust the SPAN trimmer so that the resulting output signal is the maximum value of the output range

		For 4 to 20mA output	For 0 to 20mA output
Zero point adjustment	Zero point shifts upward (ZERO) Zero point shifts downward		
Span adjustment	Span increases (SPAN) Span decreases		

Case of reverse output - WVP-BRx-xx-xR-x

1. ZERO adjustment: Input the minimum value of the input range to the input terminals, and adjust the ZERO trimmer so that its resulting output signal become the maximum value of the output range.
2. SPAN adjustment: Input the maximum value of the input range to the input terminals, and adjust the SPAN trimmer so that the resulting output signal is the minimum value of the output range

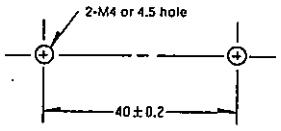
		For 4 to 20mA output	For 0 to 20mA output
Zero point adjustment	Zero point shifts upward (ZERO) Zero point shifts downward		
Span adjustment	Span increases (SPAN) Span decreases		

Responses to out-of-range conditions

1. Over input: If a signal exceeding the upper limit of the input range of this unit is received, its output signal increase nearly in proportion to the input up to about 120%fs. Beyond that, the limiter circuit incorporated in the unit is actuated so that the output signal does not increase over 120%fs.
2. Under input: If a signal under the lower limit of its input range is received, one of the following outputs is likely to result:
   - In the case of current output, the output signal decrease nearly in proportion to the input down to about -20%fs, however, no minus current is output.
   - In case of voltage output, the output signal decreases nearly in proportion to the input down to about -20%fs. Beyond that, the limiter circuit is actuated, so that the output signal does not decrease below -20%fs.
3. Out-of-range load
   - For current output: If a load resistance exceeds the upper limit of the allowable load resistance range of this unit, its output signal increases nearly in proportion to the input until the voltage across the output terminals reaches about 12V. Beyond that the output signal is saturated, with a consequent increase in error.
   - For voltage output: If a load resistance exceeds the lower limit of the allowable load resistance range, its output signal is saturated, with a conquest increase in error.

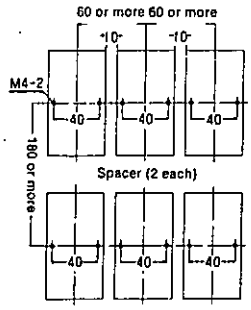
Installing dimension

- **Dimensions of installing holes**



- **Group installation**

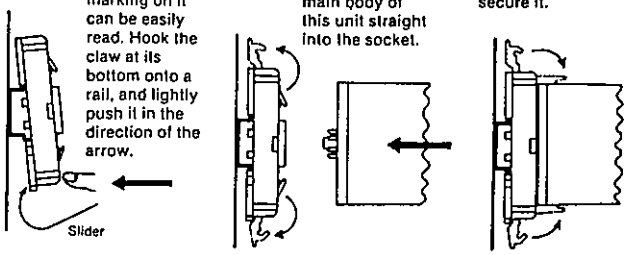
Install units with spaces between one another as illustrated at right to prevent ambient temperature from rising excessively.
When mounting units on a DIN rail, place two spacers supplied between the individual units to provide a 10 mm space.



Installing on and removing from the DIN rail

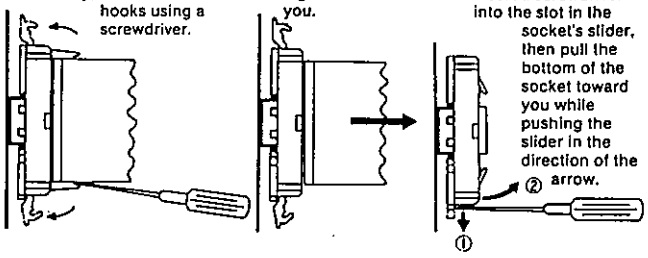
- **Installing on a DIN rail**

(a) Install a socket assembly so that the marking on it can be easily read. Hook the claw at its bottom onto a rail, and lightly push it in the direction of the arrow.
(b) Open hooks wide outside, then plug the main body of this unit straight into the socket.
(c) Lock the main body with the hooks to secure it.



- **Removing from the DIN rail**

(a) To remove the main body, release the hooks using a screwdriver.
(b) Draw the main body straight out toward you.
(c) To remove the socket, insert a screwdriver into the slot in the socket's slider, then pull the bottom of the socket toward you while pushing the slider in the direction of the ② arrow.



Precaution

1. Handling
   To avoid accidents, be sure to turn the power supply and input signal off while removing the main body from or installing it on socket.
2. Installation
   2-1 when installing the unit in a dusty environment including metallic particles, use a dust-proof enclosure which is designed for heat radiation function.
   2-2 Avoid applying vibration or impact to the unit because the unit to malfunction.
3. Wiring
   3-1 Be sure to keep the wiring of the power line, input signal line and output signal line away from any noise source, relay driving line and high-frequency line.
   3-2 Avoid bundling or overlapping this unit's lines together with lines carrying noise, or enclosing them together in the same duct.

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3-3 The unit permits measurement as soon as its power is turned on, but it requires a 30 minutes warm-up period to give its full potential.

4. Short circuit of the output terminals

For voltage output, never short circuit between output terminals for an extended time.

Warranty

The warranty period for this unit is 1 year after delivery. If it should fail under the normal operation conditions within the warranty period, contact us or the company where you purchased it as soon as possible.

We will repair it free of charge or replace with a new unit if necessary. This warranty does not apply to units damaged by disassembly, modifications or operation under other than those specified.

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