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# Operation Manual

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ELECTRO-PNEUMATIC POSITIONER

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IP8100-0\*1-\*-J

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IP8100-0\*1-\*-JR

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WITH OUTPUT CURRENT(4~20mADC)


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 Caution

This product is NON-EXPLOSION PROOF though it is with terminal box.

**SMC CORPORATION**

**Zero point / Span adjustment of the output  
current of IP8100 type positioner output signal specification  
(potentiometer built-in) should be carried out after initial adjustments.**

This product has a potentiometer and P.C.board built into it. It is for ensuring the actuator's opening by 4-20mADC of output signal produced by supplying power to it. Supply power can be set freely between DC12~35V.

**1 Wiring of input signal, power source and ammeter**

- (1) Connect the input signal (for Positioner control) to input side of the terminal board in the terminal box.
- (2) Connect power source (for detecting output current) to supply side of the terminal board.
- (3) Connect ammeter in series between (+) side and (+) side of supply of terminal board or (-) side and (-) side of supply.

Please refer Fig.1 for wiring.

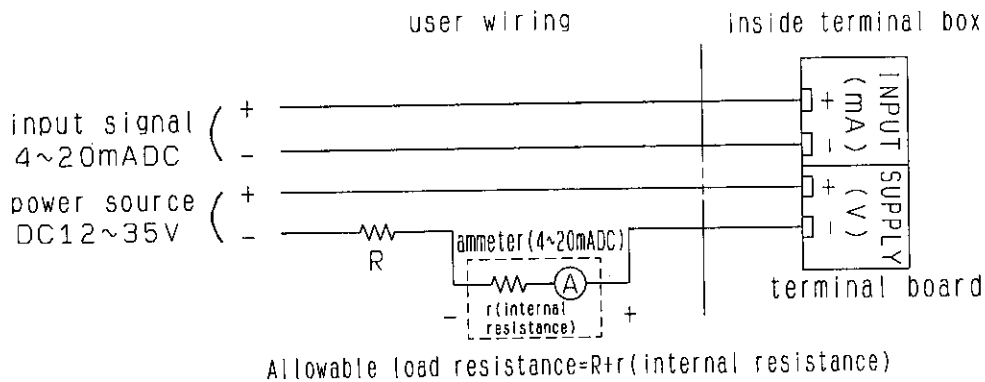


Fig 1 Wiring diagram

**NOTE!**

**Allowable load resistance in drawing 1 depends on supply voltage**

- (4) The allowable load resistance is obtained by the formula below.

$$\text{Allowable load resistance} \leq (\text{Supply voltage} - 12\text{V}) / 20\text{mADC} - (1)$$

Normal output current is not obtained if the load resistance value exceeds the results of the formula. Please confirm internal resistance when selecting ammeter.

**2 Zero · Span adjustment**

This product requires zero span adjustment of output current according to actuator's opening (rotating angle).

Please follow steps below.

- ① Set actuator's output opening to 0% after adjusting the zero span.
- ② Classification of accessory: For J, Output signal is connected to rise in normal operation (clockwise). To apply the positioner in reverse operation (counter-clockwise), specify the classification of accessory, JR, beforehand. Rearrange the cam to the opposite side and switch the terminal "A" and "C" of the substrate in Figure 2 to change the operating direction of the delivered product and output direction of the output signal.
- ③ Loosen potentiometer set screws applying power and ensuring output current, then rotate the potentiometer  $10^{\circ} \sim 20^{\circ}$  away from dead band (see Fig.3) to decide the start point. Settle the potentiometer with the screws again(Refer " Cautions " ! )
- ④ Adjust zero · span with variable resistor.

Adjust zero point and span alternately repeatedly as they interact with each other. Since this variable resistor can be wound endlessly, do not overwind otherwise internal equipment might be broken. Adjust them ensuring output signal.

**CAUTION (settling potentiometer)**

- (1) Output signal does not go at the dead band of the potentiometer
- (2) If set the start point (4mADC) at the borderline of resistance portion and the dead band, malfunction might occur.
- (3) If output current is 0mADC during opening, the potentiometer is possibly used across the border between the resistance and the dead band. Follow ③ of section 2 ensuring potentiometer rotating direction.
- (4) When upward direction of the output signal is changed, adjust the potentiometer fixing position to avoid interpretation between cam and lead wire of the potentiometer.

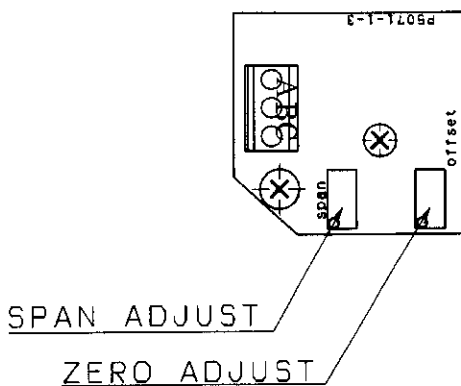


Fig.2 P.C.board

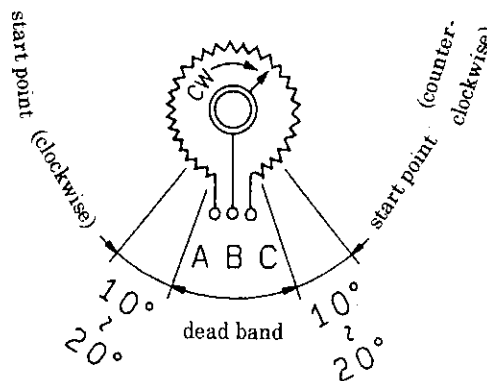


Fig.3 Potentionmeter

**SPECIFICATIONS**

**POSITIONER**

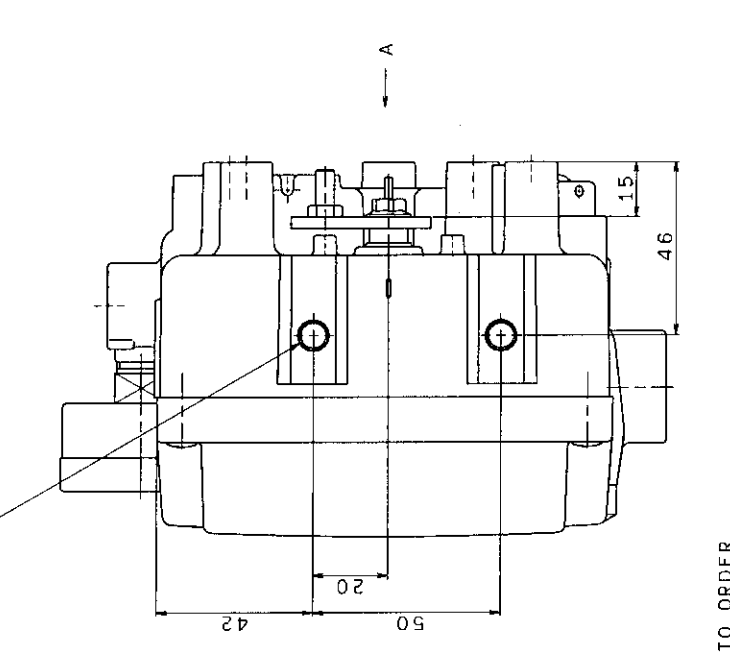
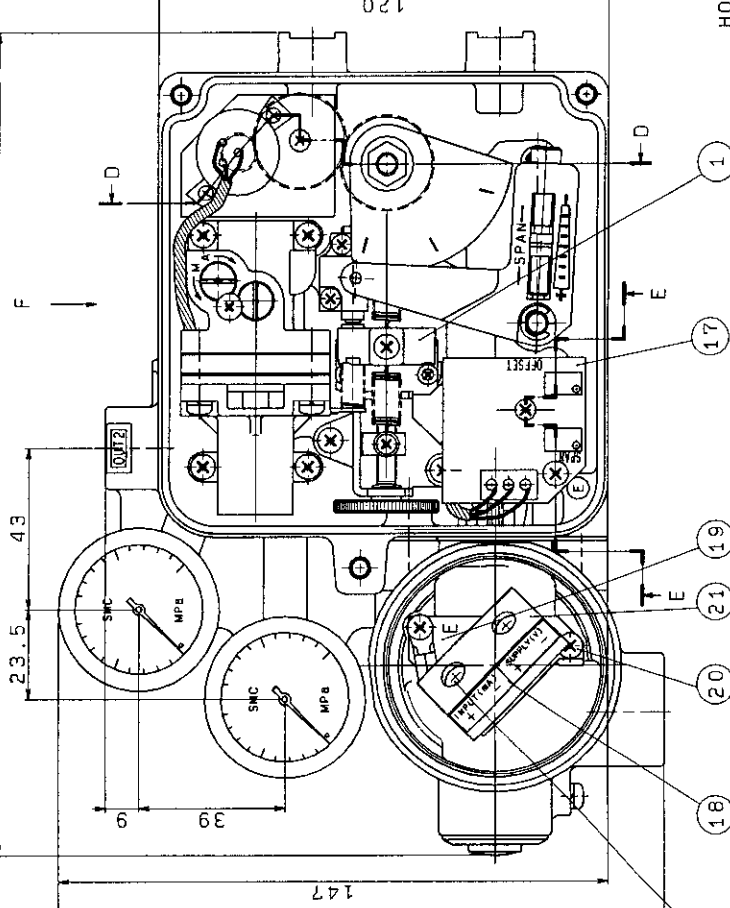
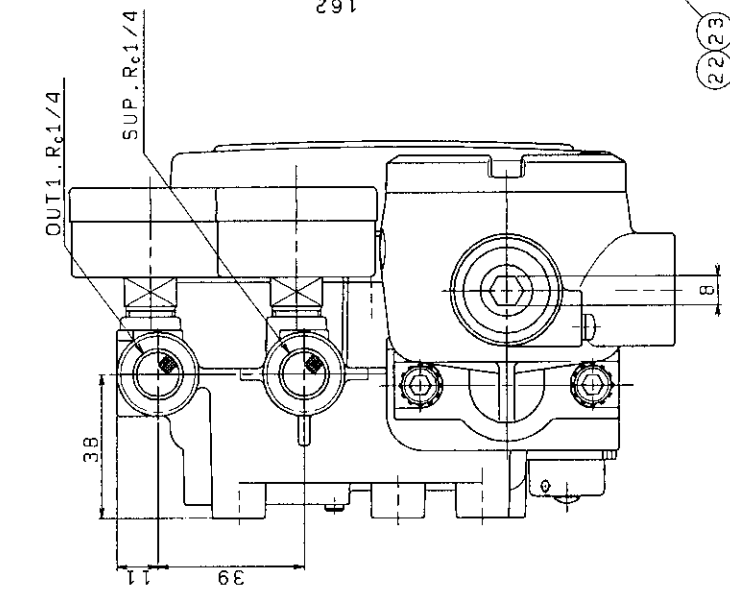
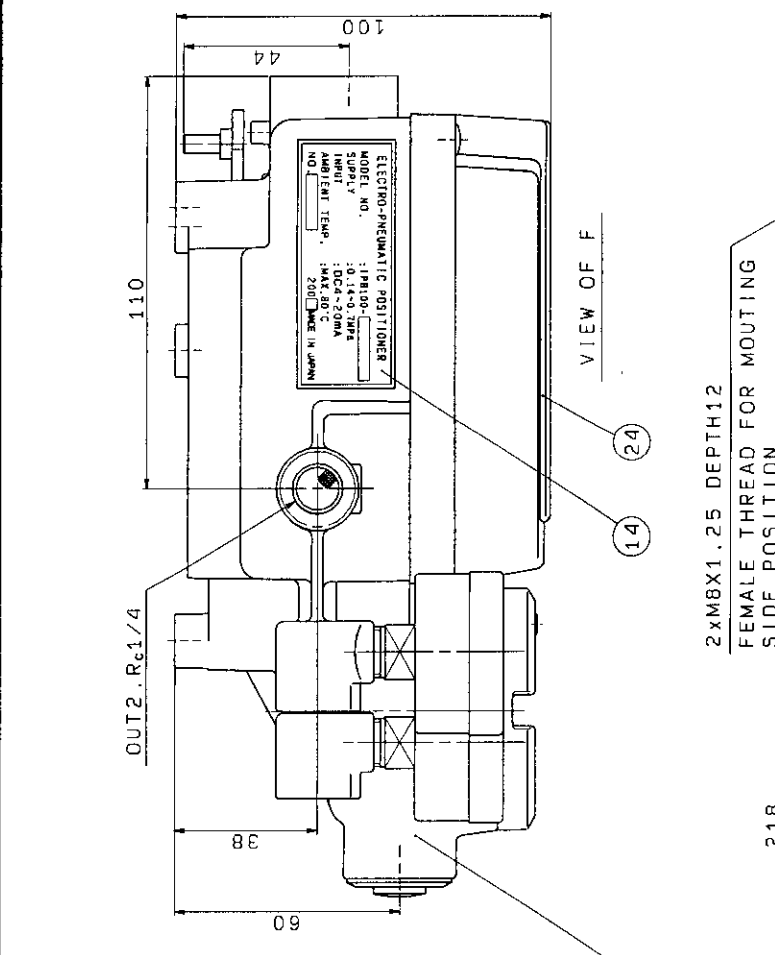
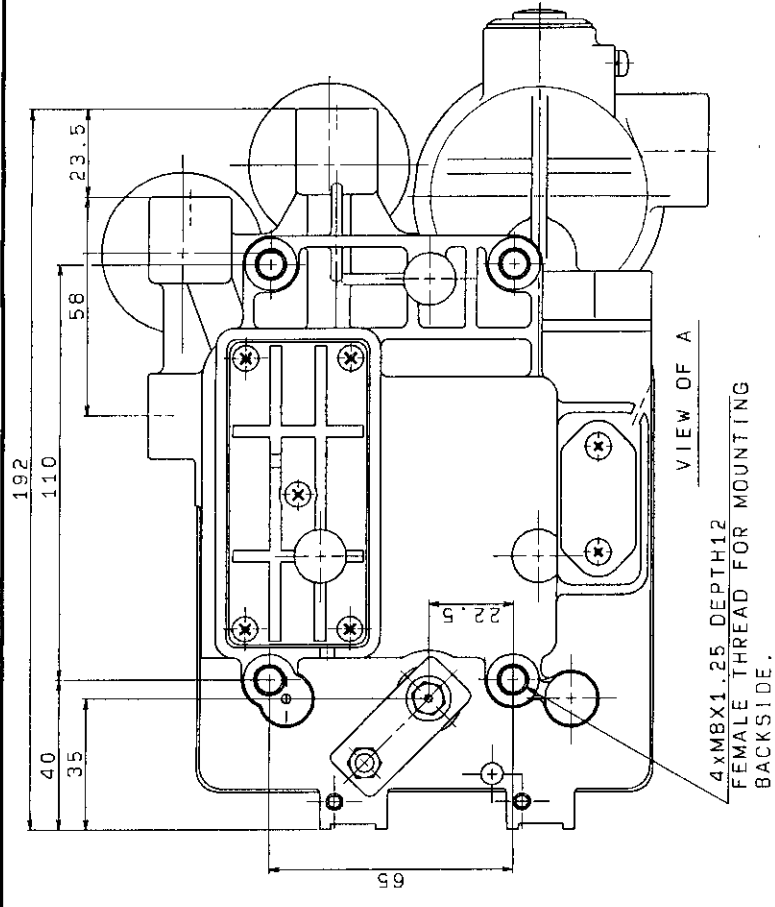
INPUT CURRENT	4~20mADC
INPUT RESISTANCE	295/50~4/20mΩ (AT AMBIENT TEMPERATURE 20°C)
SUPPLY AIR PRESSURE	0.14~0.7MPG
STANDARD STROKE	60°~100° (THE STROKE IS ADJUSTABLE) (IN 6° STROKE AND 0.100°)
SENSITIVITY	WITHIN 0.5% OF FULL SPAN
LINEARITY	WITHIN 1% OF FULL SPAN
HYSTERESIS	WITHIN 1% OF FULL SPAN
REPEATABILITY	WITHIN ±0.5% OF FULL SPAN
TEMPERATURE COEFFICIENT	WITHIN 0.1% F.S./°C
OUTPUT FLOW	200/(MIN/AMP) OR MORE (AT SUP=20PSI)
AIR CONSUMPTION	11/(MIN/AMP) OR MORE (AT SUP=20PSI)
AMBIENT AND FLUID TEMPERATURE	-20°C~80°C
AIR CONNECTIONS	RC1/4(FEMALE)
ELECTRICAL CONNECTIONS	G1/2(FEMALE)
MASS	APPROX. 2.6kg

NOTE1.(AMP) SHOWS STANDARD AIR.(JIS B 0120)  
2. IF 1/2 SPLIT RANGE IS USED, ADD 1% TO THE ABOVE CHARACTERISTICS.

**OUTPUT CURRENT**

OUTPUT SIGNAL	4~20mADC
POWER SUPPLY	12~35V
RESISTANCE LOAD	POWER SUPPLY-12V RL= 20mADC
OUTPUT CHARACTER	±2%F.S.
HYSTERESIS	1%F.S.
TEMPERATURE COEFFICIENT	0.06%F.S./°C

**ELECTRICAL WIRING ZERO SPN ADJUSTING**



ALL PARTS EXCEPT SPECIFIED ONES ARE SAME AS THOSE OF OUR STANDARD (P8100-0\*1-\*) PARTS MARKED WITH "φ" MARK INDICATE SPECIAL ORDERED PARTS.

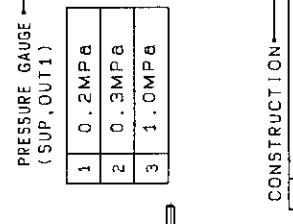
ITEM	PART NO.	PART NAME	MATERIAL	QTY	REMARKS
25		OPERATION MANUAL		1	(NO. P8100-0001(INTERNAL))
24	P56501045	SEAL FOR WIRING (ADJUSTMENT)		1	
23	DA00050	HEXAGON NUT	STAINLESS STEEL	2	M3x0.5
22		MACHINE SCREW AND SPRING WASHER	STAINLESS STEEL	2	M3x0.5x16φ
21		TERMINAL BLOCK		1	M3/4KITG
20	AA00037	MACHINE SCREW AND SPRING WASHER	STAINLESS STEEL	2	M4x0.7x8φ
19	P36801148	BRACKET (B)	ALUMINIUM	1	
18	P56501044	SEAL FOR TERMINAL BLOCK		1	
17	P565010-30	P.C. BOARD ASS.Y		1	
16	P368010-144	POTENTIOMETER UNIT		1	CP-2FK101, 5X0
15		MACHINE SCREW AND SPRING WASHER	STAINLESS STEEL	2	M2x0.4x8φ
14	P56501029	SPECIFICATION LABEL	POLYESTER	1	
13		HEXAGON SOCKET SET SCREW	STAINLESS STEEL	1	M2x0.4x3.2
12	P36801143	GEAR "C"	BRASS	1	NI PLATING
11		HEXAGON SOCKET AND SPRING WASHER	STAINLESS STEEL	1	M6x1x10φ
10	P56501043	BRACKET (A)	ALUMINIUM	1	
9	EG00008	TOOTHED LOCK WASHER	STAINLESS STEEL	1	13
8	AA00059	CROSS RECESSED PAN HEAD SCREW	STAINLESS STEEL	1	M3x0.5x8φ
7	EA00044	PLAIN WASHER	STAINLESS STEEL	1	6, 1:1
6	P36801144	PIN	STAINLESS STEEL	1	
5	P36801151	GEAR "B"	POLYACETAL	1	
4	BA00165	HEXAGON SOCKET SET SCREW	STAINLESS STEEL	1	M3x0.5x4φ
3	P36801142	GEAR "A"	BRASS	1	NI PLATING
2	P56501042	TERMINAL BOX AL.DIE-CASTING		1	
1	P565010-6	TORQUE MOTOR UNIT		1	

**HOW TO ORDER**

IP8100-0\*0\*1-φ\*J

**ROTARY TYPE**

- ACCESSORIES \*NOTE1
- NI/NO ACCESSORY (STANDARD)
  - A WITH PILOT VALVE ADDED, DIA. 0.7mm ORIFICE FOR RESTRICTING OUTPUT.
  - B WITH PILOT VALVE ADDED, DIA. 1.0mm ORIFICE FOR RESTRICTING OUTPUT.
  - C FORK LEVER ASSEMBLY, TYPE M
  - D FORK LEVER ASSEMBLY, TYPE S
  - G WITH GAIN SUPPRESSION SPRING (A)
  - G WITHOUT STANDARD GAIN SUPPRESSION SPRING
  - H WITH external scale plate unit
  - J OUTPUT CURRENT TYPE (4 TO 20mADC, NON EXPLOSION PROOF)
  - J NORMAL ACTUATION \*NOTE2
  - JR OUTPUT CURRENT TYPE (4 TO 20mADC, NON EXPLOSION PROOF)
  - JR REVERSE ACTUATION
- NOTE1: WHEN MORE THAN 2 ACCESSORIES ARE REQUIRED, THE SYMBOL SHOULD BE STATED IN ALPHABETICAL ORDER.  
NOTE2: THE NORMAL ACTUATION IS TO TURN THE ACTUATOR MAIN SHAFT CLOCKWISE (VIEWED FROM THE POSITIONER FRONT COVER SIDE) AT THE TIME OF INPUT SIGNAL INCREASE. THE CAM IN THIS DRAWING SHOWS THE STATE OF NORMAL ACTUATION.



**CONSTRUCTION**

- 1 NON EXPLOSION PROOF

**SECTION \*DD\***

**SECTION \*EE\***