



INSTRUCTION MANUAL

ADSORPTION CONFIRMATORY SWITCH

MODEL: ZSP1

1. Summary

Adsorption confirmation switch is optimum switch to confirm adsorption of very tiny parts. (like small electrical parts or parts of chips and so on), which could not be confirmed its adsorption by conventional style of vacuum pressure switch. And is available in applicable adsorption nozzle dia. of $\phi 0.3 \sim 1.2$.

2. Specifications

	ZSP1-S	ZSP1-B
Fluid	Air	
Pressure range	-20~-101kPa{-150 -760mmHg}	
Applicable adsorption nozzle diameter	$\phi 0.3 \sim \phi 0.7$ (Refer graph 1)	$\phi 0.5 \sim \phi 1.2$ (Refer graph 2)
Max.hysteresis	4mmHg	
Internal orifice	$\phi 0.5$	$\phi 0.8$
Supply voltage	12~24V DC (Ripple less than $\pm 10\%$)	
Output	Open collector (NPN/PNP) 30V, 80mA	
Indicator light	Lighting under ON condition	
Power consumption	17mA (24V DC under ON condition)	
Temperature	0~60°C (32~140°F)	
Connecting port size	M5X0.8	

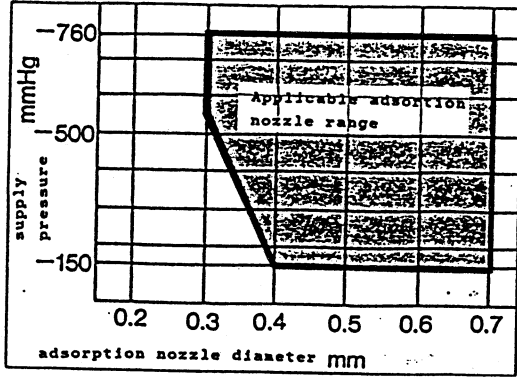
Specs. of lead wire

Grommet type	Oil-Proof vinyl Coaxial cable Coad	3 cored	$\phi 3.4, 0.2\text{mm}^2$	Length 600mm (3000mm)
Connetor type	HSVF wire	3 wired	$\phi 1.55, 0.3\text{mm}^2$	

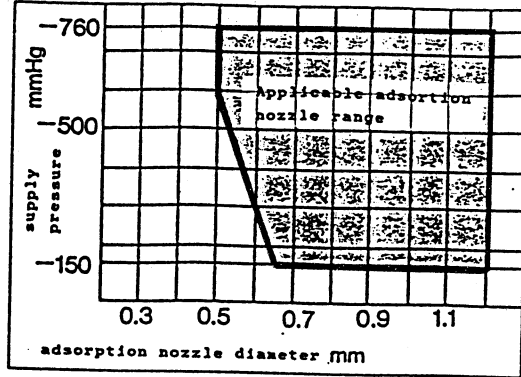
Applicable Adsorption Confirmatory Switch

The relation between supply pressure and adsorption nozzle diameter is as shown in the following graphs.

Graph1/ZSP1-S



Graph2/ZSP1-B



3. How to order

E ZSP1-S OX-15

Area code

Nil	Japan, Asia, Australaria, UK
E	Europe
N	USA

Adsorption confirmatory switch

Applicable adsorption nozzle dia.

S	φ0.3~0.7
B	φ0.7~1.2

Electrical entry

Nil	With 0.6m grommet lead
L	With 3m grommet lead
C	With 0.6m connector lead
CL	With 3m connector lead
CN	Without connector lead

*CN type is supplied only main body and with neither connector nor socket.

Switch type


15	Solid state(NPN)/12~24V DC
55	Solid state(PNP)/12~24V DC

Connection

OX	with suction filter type (For mounting on ZX ejector)
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With connctor/How to order

Without lead wire(Connector-1pc,Socket-3pcs)---- ZS-10-A

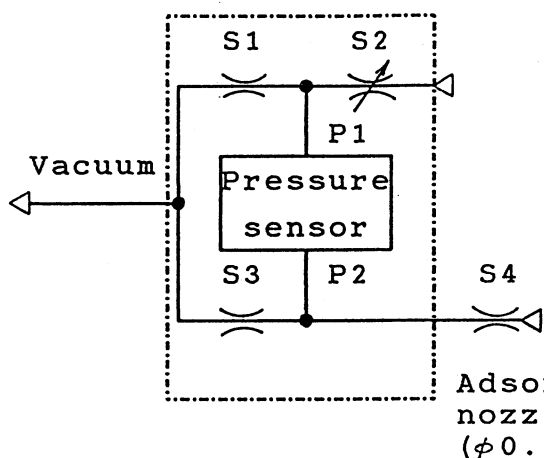
With lead wire ----- ZS-10-5A-

Note)When ordering switch with lead wire of 5m long indicate both part Nos.

Lead wire length	
Nil	0.6m
30	3m
50	5m

Example)ZSP1-S0X-15CN ---- 1pc
 ZS-10-5A-50 ----- 1pc

4.Air pressure circuit/Principle



The air prssure forms a brige circuit inside the unit.With a vacuum applied to the circuit,but with the adsorption nozzle(S4)open,adjust needle(S2)so that (P1=P2).When parts are adsorbed by nozzle S4,the resulting(P2-P1) differential will be detected by the pressure sensor.

Adsorption nozzle
 (φ0.3~φ1.2)

5. Construction, Dimension, and Internal circuit

5-1. Construction diagram.

Construction diagram is shown in Fig.1

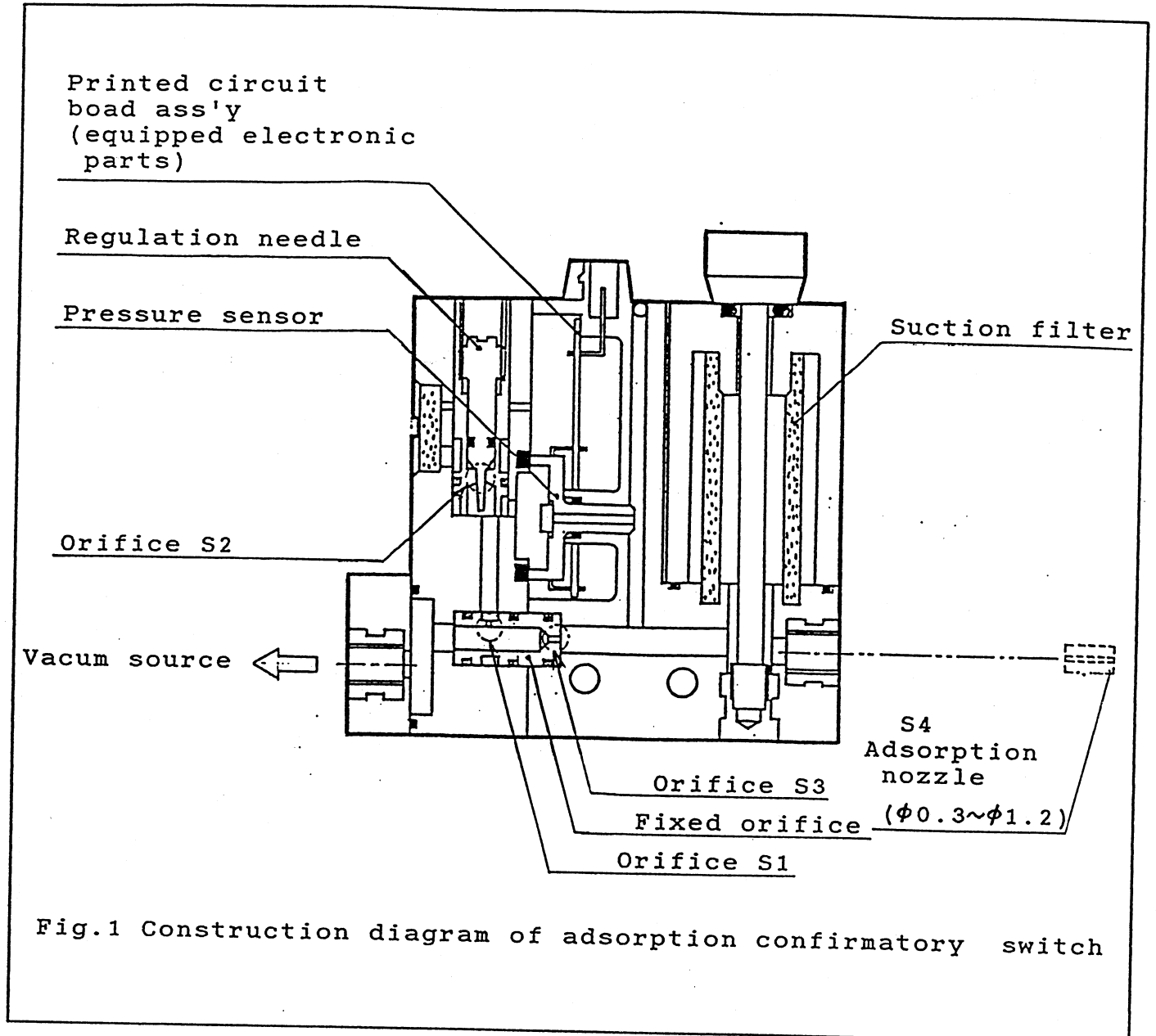
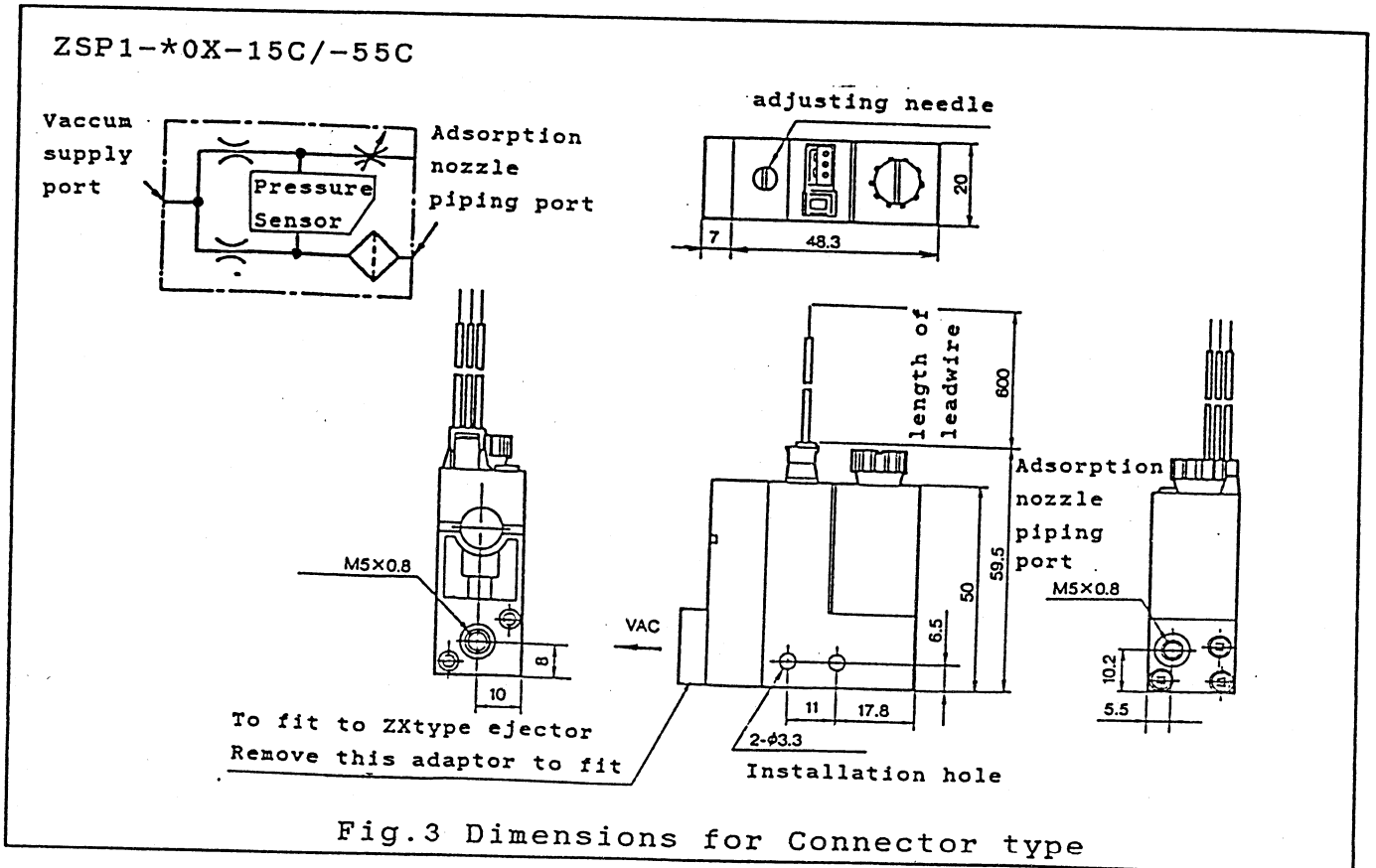
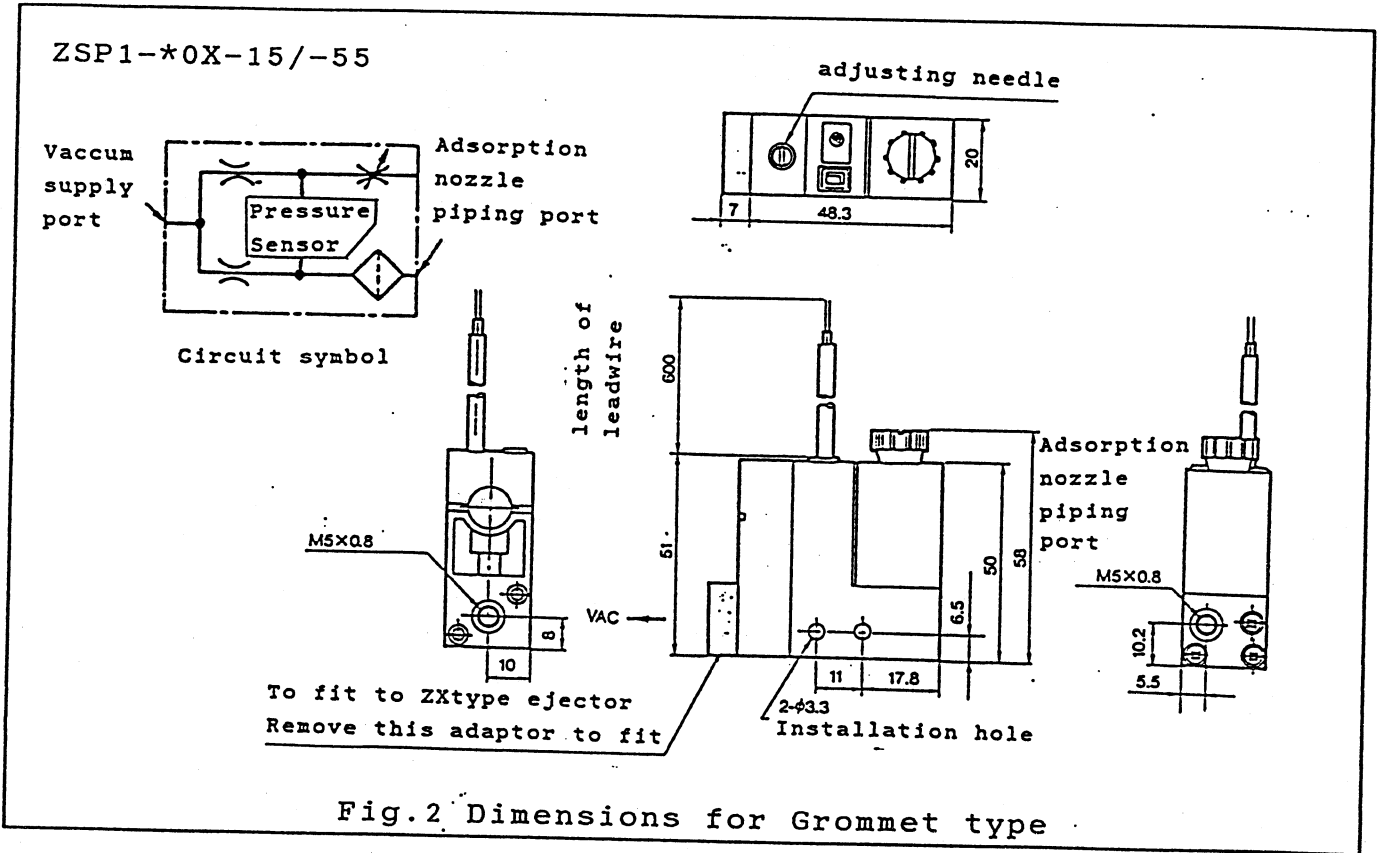


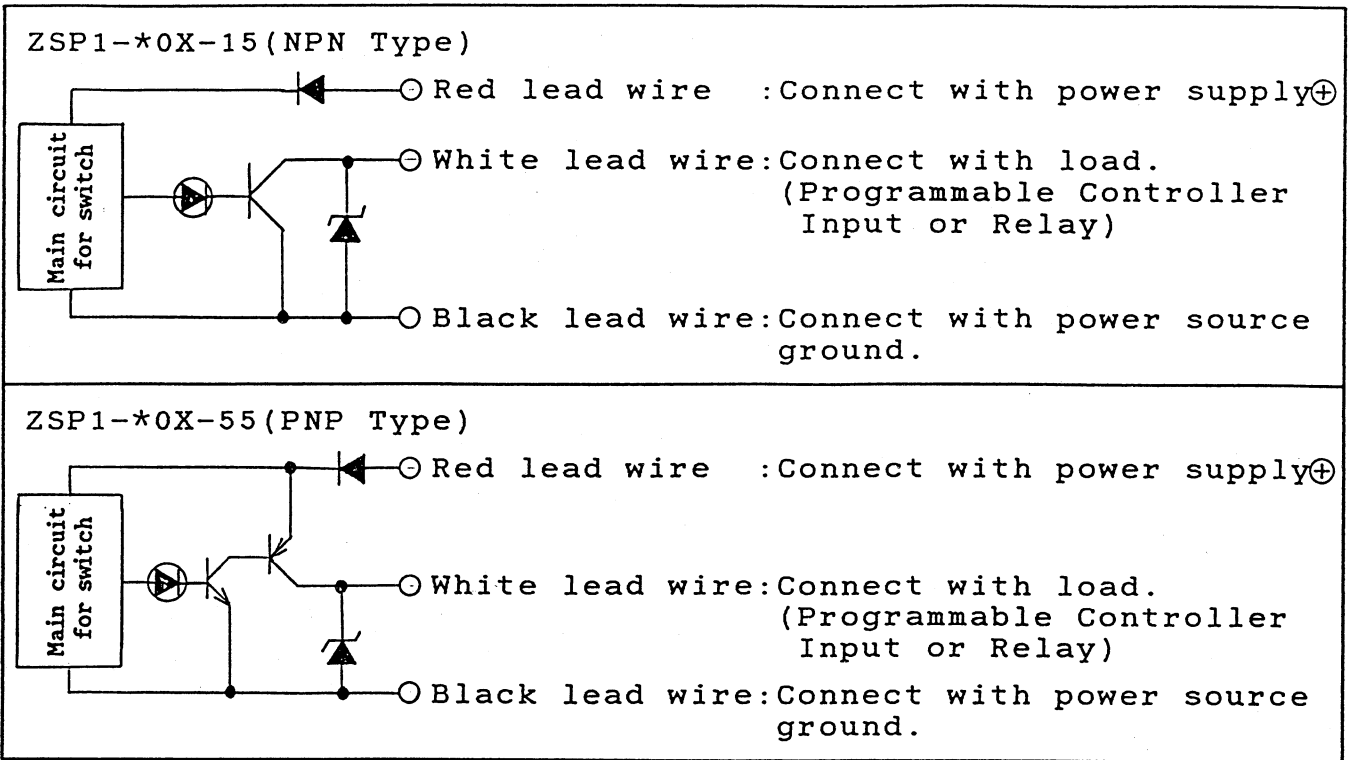
Fig.1 Construction diagram of adsorption confirmatory switch

5-2. Dimension diagram

Dimension diagram is shown in Fig.2~3/Dimensions(mm)

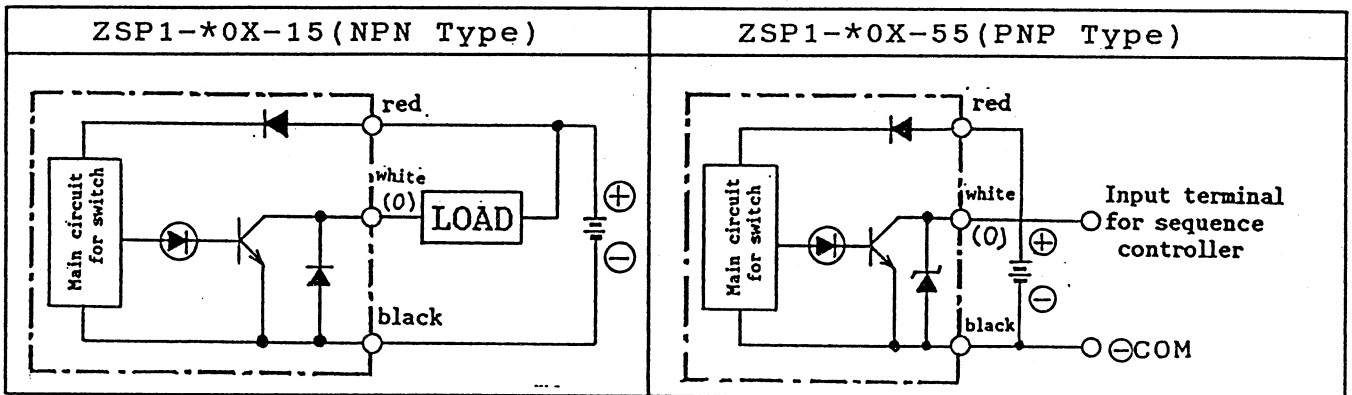


5-3. Circuit and wiring.

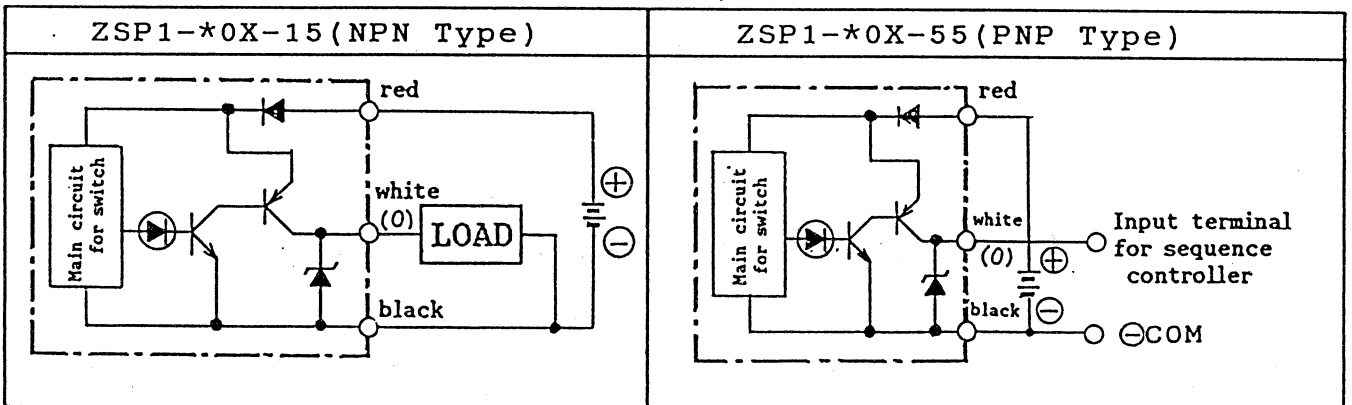


5-4. Wiring from the switch to load is shown hereunder.

Connecting method in common.
(In case of relay and resistance)



Connecting example to sequence controller.
(In case of COM terminal is -)

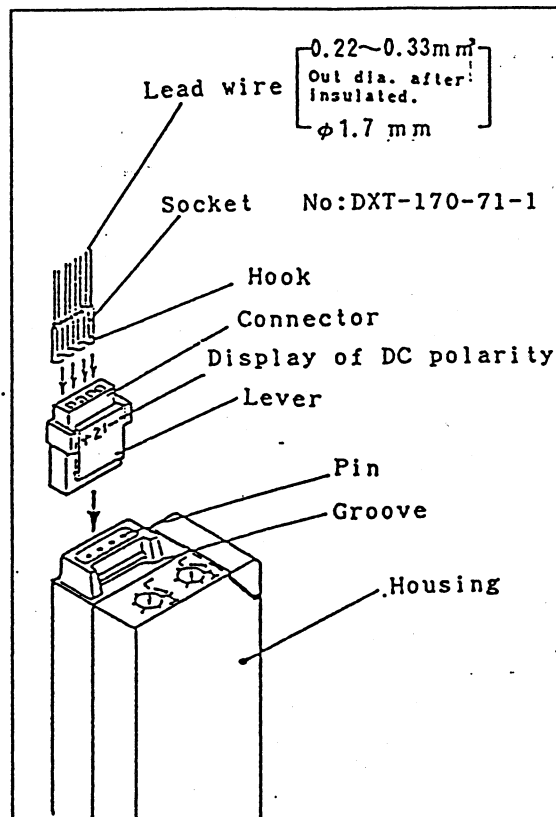


6. How to use connector

6-1. Connection

When assembling the connector to the switch housing, push the connector straight onto the pins until the lever locks into the housing slot.

When removing the connector from the switch housing, push the lever down to unlock it from the slot and then withdraw the connector straight off of the pins.

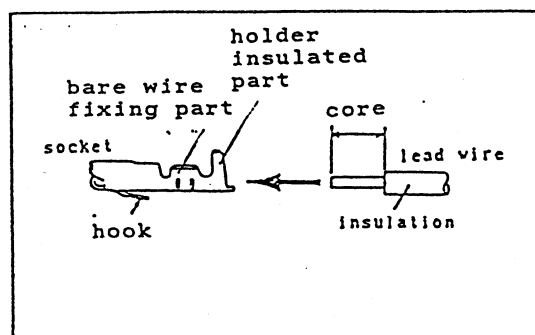


6-2. Press bonding socket to lead wire

Strip the end of the lead wire 3.2~3.7mm long.

Put wire into socket taking care to prevent the lead wire insulation entering the core wire pressure bonding area. Press bond using press bonding toll.

(Press-bonding tool: Parts No. DXT170-75-1)



6- 3.Assembly of socket to connector

Assembling

Push socket into hole in connector until the lock of the socket locks into the connector. (The socket lock will spring open inside the connector) Gently pull lead wire back to confirm

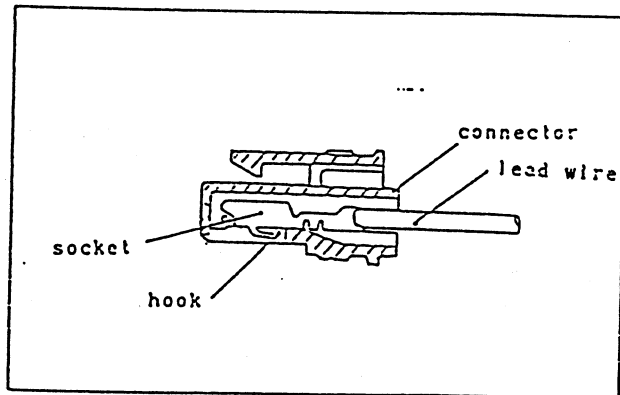
that socket is locked in position.

Disassembling

When disassembling socket from connector, push the lock of the socket down with a small dia instrument.

Pull socket out

by means of the lead wire. If the socket is to be re-used, bend the lock of the socket out to its original position



7. How to mount the switch

7-1. To fit by screw.

Mount the switch by M3 screw.

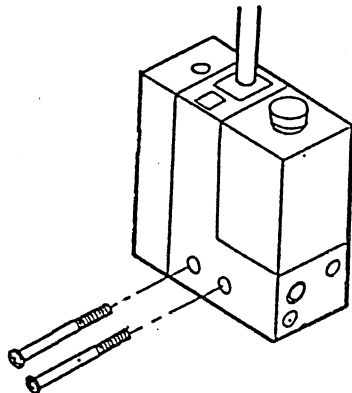


Fig.4 Mounting of the switch

7-2. To mount on ZX system.

7-2-1. To mount on ZX system. (valve unit + ejector)

Remove adaptor and mount it with M2.5×60L screws.

Care should be taken not to loose gasket.

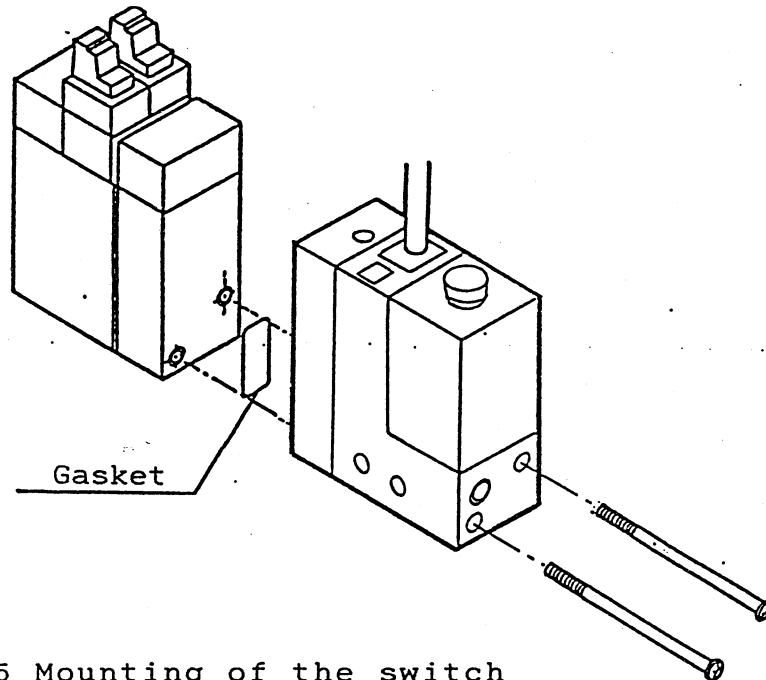


Fig.5 Mounting of the switch

7-2-2. To mount on ZX system. (valve unit)

Remove adaptor and fit it with M2.5×48L screws.

In this mount, care should be taken not to loose gasket.

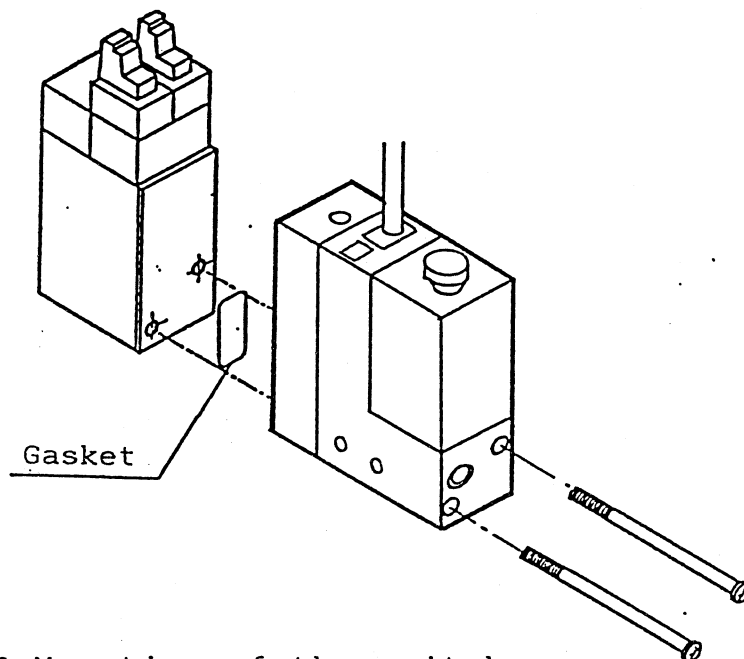


Fig.6 Mounting of the switch

7-3. How to replace the filter element.

When the element is clogged and so adsorption force is deteriorated, thence caused to longer response time, stop supply pressure and replace the element.

(Parts number of the element ZX1-FE)

To fit the filter case, make sure the filter gasket is placed in gasket groove.

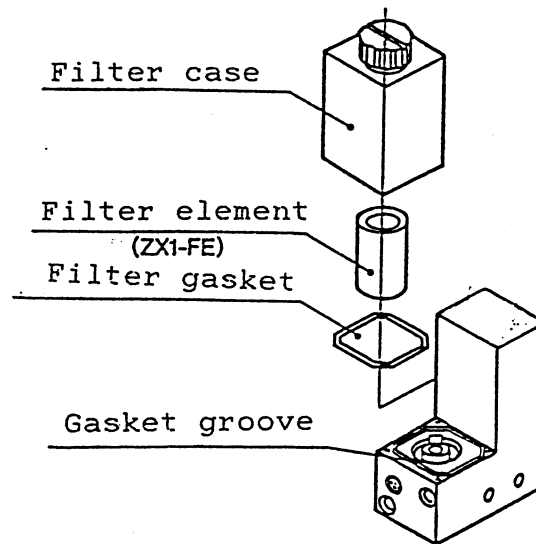


Fig.7 Replacing the filter element

8. How to set adsorption confirmatory regulation needle

- 8-1. Supply the vacuum and electrical power source to the unit.
Rotate regulation needle clockwise until it stops.
- 8-2. With the adsorption nozzle remote from the workpiece (open)
turn the regulation needle counterclockwise until the
indicator lights.
- 8-3. From the above 8-2 position, turn the regulation needle $1/4$
to 1 turn clockwise.

1



Completely closed
regulation needle

2



Indication light ON

3



Indication light OFF

- 8-4. Re-adjust the needle so that the indicator lights only when
the work adsorption is steady.

9. Precautions to handle

- To carry this product, make sure to hold its body and care should be taken not to give unfavourable excessive force on its cord.
- To handle this product, be careful not to drop or to hit to other object.
- This product cannot be used with corrosive gas.
- Consideration should be taken unfavourable output positive pressure like break pressure exerted on this switch. If positive pressure is exerted, output become ON (indicating light comes on), it influences the switch badly.
- Load exceeding Max. loading allowance (30V, Max. 80mA) should not be connected to this switch.
- This switch is protected against opposite connection of power cable red wire (+) and black wire (-), however, no protective solution in output circuit is equipped against excessive current, and so mis-wiring can cause to breakage of transistor, care should be taken for this.

10. Trouble and remedy

When the switch cannot be operated, check the following points.

Trouble	Checking point	Remedy
Neither indicating light nor output force doesn't come on.	Is pressure dropped?	Check piping. (Supply pressure higher than -150mmHg)
	Is adjusting needle set stable?	Reset adjusting needle.
	Anything wrong with wiring?	Redo wiring.
	Voltage from power source is right?	Voltage from power source. (12~24V DC)
Indicating light doesn't come on. (Output force can be ON/OFF)		Replace switch.
Output force doesn't come on. (Indicating light can be ON/OFF)	Check wirings. (White color wire.)	Redo wiring.
	Load voltage O.K.?	Keep it lower than 30V DC. Replace switch.
	Load capacity O.K.?	Keep it lower than 80mA. Replace switch.
Indicating light and output force cannot be switched off.	Is pressure still supplied?	Check pressure. Workpiece is still adsorbed at nozzle.
	Is adjusting needle set stable?	Reset adjusting needle.
Indicating light cannot be switched off. (Output force can be ON/OFF.)		Replace switch.
Output force cannot be switched off. (Indicating light can be ON/OFF.)	Anything wrong or short with wiring?	Replace switch.
	Load voltage is right?	Keep it lower than 30V DC. Replace switch.
	Load capacity is right?	Keep it lower than 80mA. Replace switch.