YT-1000 SERIES ELECTROPNEUMATIC POSITIONERS

FOR 601 SERIES – 15-65mm

BOSSMATIC PARAGON CONTROL VALVES

Installation, Operating

&

Maintenance Instructions

Index.

Document Reference: POSYTC1E Issue: 3 Date: 29/04/03

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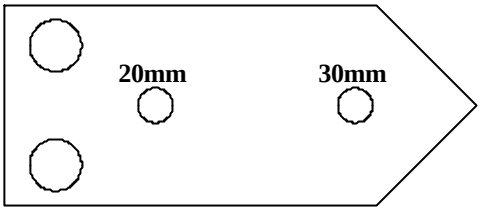
A. Mounting Instructions

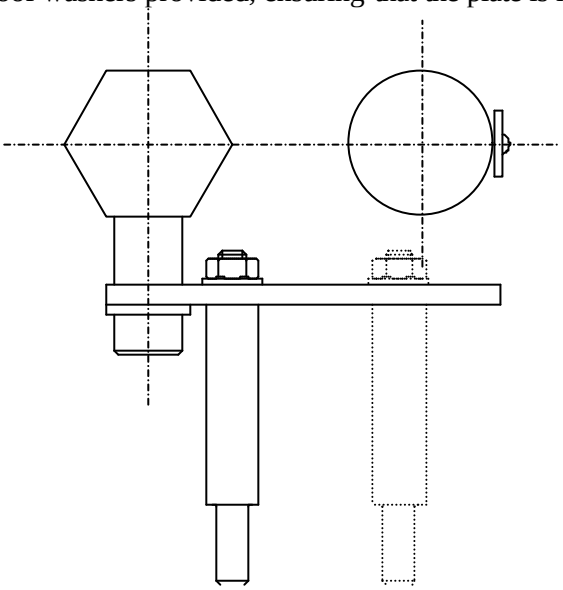
A1. Ensure that the actuator and spindle coupling are correctly orientated; the holes in the underside of the actuator and the holes in the spindle coupling must be on the same side of the valve. For changing the positioner location see below.

A2. Take the positioner take-off plate and fit the take-off pin into the correct hole according to the table and diagram below. Secure with a nut and shakeproof washer.

Stroke	Valve Sizes and Trims
20mm	15-25mm Valves and all Trims 40 & 50mm Valves and trims B and C 65mm Valve and Trim C
30mm	40-65mm Valves and Trim A 65mm Valve and Trim B



A3 Fit the take-off plate to the spindle coupling using the two spacers provided. Secure with the two cap head screws and shakeproof washers provided, ensuring that the plate is level, and fully tighten.



A4 Locate the positioner onto its mounting plate and secure using the three screws and washers provided. At this stage leave the screws loose (finger tight at most).

A5 Locate the positioner mounting bracket to the underside of the actuator, ensuring that the take-off pin locates in the slot on the positioner arm. Secure using the two screws and washers provided and fully tighten.

A6 Apply air to the actuator and move the plug until the valve is at mid-stroke; use the stroke indication plate or measure the distance.

A7 Slide the positioner up or down the slots in the mounting plate until the positioner arm is horizontal. Secure in this position by fully tightening the three fixing screws.

A8 Set the positioner up according to the instructions given in Sections 8 – 11 of the Young Tech Instruction Manual below.

B **Changing Positioner Location.**

B1 Valves are generally supplied with the positioner mounted on the front of the valve with flow from left to right, but can be moved to the opposite side by following these instructions.

B2 Undo the nuts securing the copper interconnecting pipework between the positioner and actuator and remove this pipework.

B3 Undo the two bolts securing the positioner-mounting bracket to the actuator and remove the positioner/bracket assembly complete.

B4 Undo the air connection (elbow) in the actuator and exchange it with the blanking plug on the opposite side of the actuator. When refitting the air connection and blanking plug use a suitable sealant on the threads.

B5 Undo the two cap head screws on the positioner take-off arm assembly and remove the positioner take-off arm assembly ensuring the spacers are retained.

B6 Re-locate the positioner take-off arm assembly onto the opposite side of the spindle coupling and refasten ensuring that the spacers are fitted and the take-off is level. See section A for further details.

B7 Re-locate the positioner/bracket assembly to the opposite side of the valve and secure to the underside of the actuator using two bolts, ensuring that the take-off arm is correctly located into the pivot-arm on the back of the positioner.

B8 Reconnect the copper interconnecting pipework between the positioner and actuator adjusting the angle of the pneumatic connection (elbow) on the actuator as necessary.

B9 Check the positioner for correct operation as detailed below.

Electro-pneumatic positioner

YT-1000 Series

INSTRUCTION MANUAL

(YT-1000L Linear Type)

YOUNG TECH CO., LTD.

1. GENERAL

The electro-pneumatic positioner YT-1000L is used for linear operation of pneumatic linear valve actuators by means of electrical controller or control systems with an analog output signal of 4 to 20 mA or split ranges.

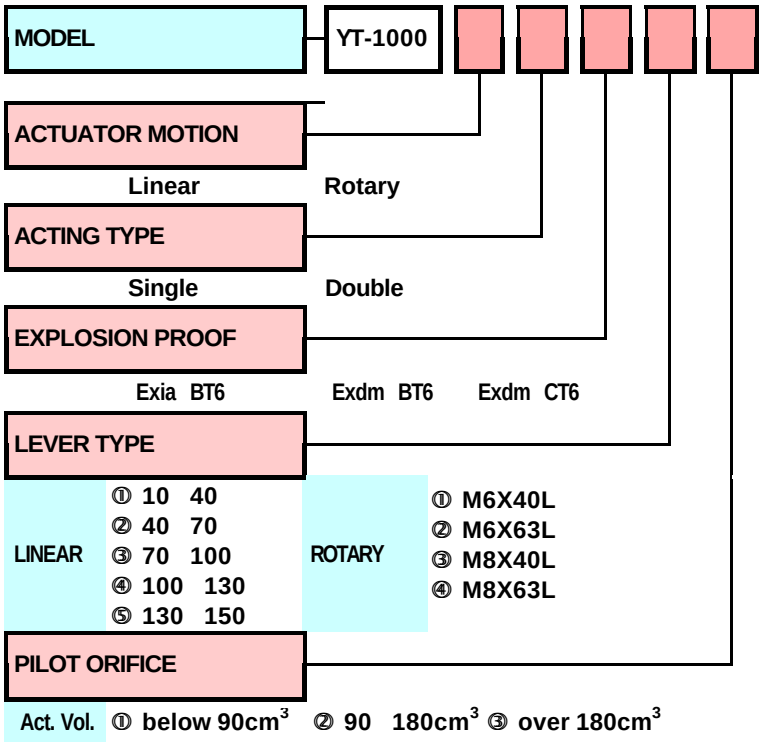
2. FEATURES

- **There is no resonance in the range of 5 200Hz.**
- **Performing ½ Split Control without any other substitutes.**
- **Easy to adjust zero and span.**
- **Easy to convert from Reverse Action to Direct Action or vice versa.**
- **Easy Feedback Connection.**
- **Fast and accurate response.**
- **Low air consumption.**
- **Easy to protect from hunting effect by using output orifice in small size of actuator.**
- **Designed as Multi-port type for air tubing.**
- **Easy to install air tubing connection in any direction.**
- **Designed as block build structure for maintenance and repair.**

3. SPECIFICATION

Item \ Type	YT-1000L	
	Single Acting	Double Acting
Input Signal	4 - 20 mA DC below 24V (½Split Range available)	
Impedance	250 ± 15	
Supply Pressure	0.14 0.7 MPa	
Stroke	10 150 mm	
Air Connection	PT (NPT) ¼	
Gauge Connection	PT (NPT)	
Conduit	PF ½	
Explosion Proof	ExiallBT6, ExdmllBT6, ExdmllCT6	
Degree of Protection	IP 66	
Ambient Temperature	-20 ~ 70 ºC (-4 ~ 158 ºF)	
Linearity	±1 F.S.	
Hysteresis	1 F.S.	
Sensitivity	±0.2% F.S.	
Repeatability	±0.5% F.S.	
Air Consumption	5 LPM (Sup.=0.14 MPa)	
Flow Capacity	80 LPM (Sup.=0.14 MPa)	
Material	Aluminum Diecasting	
Weight	Approx 2.8 kg with Junction Box	

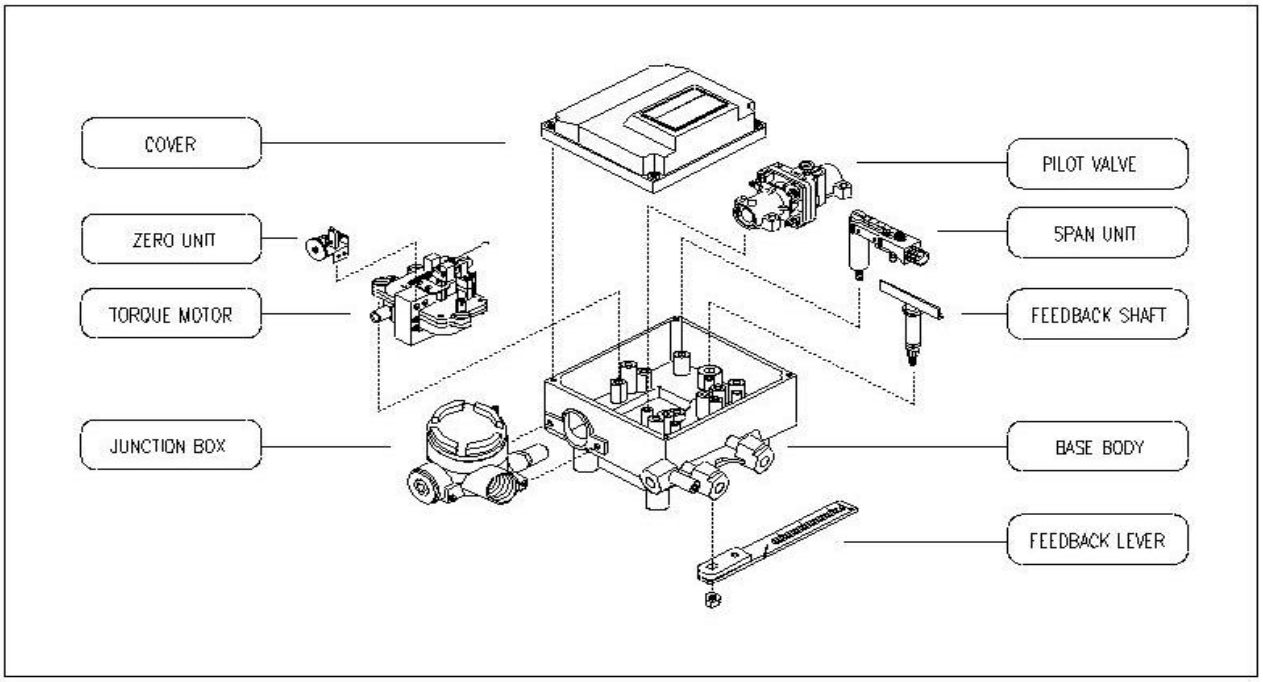
4. ORDERING SYMBOLS



Notes

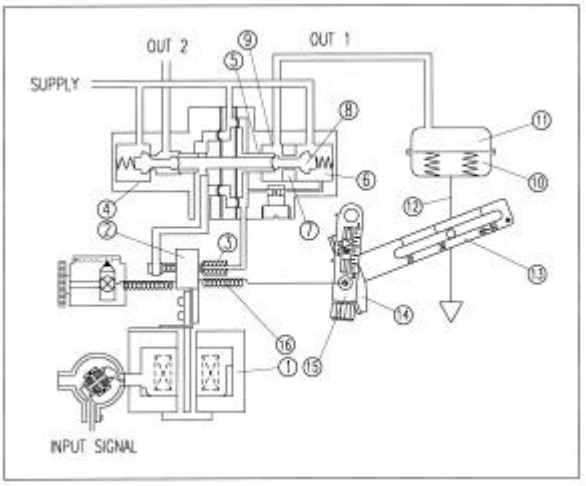
1. Based on temperature 20ºC, absolute pressure 760mmHg and relative humidity 65%.
2. Explosion Proof (ExdmIIBT6), IP66 as standard.
3. Single Acting as standard.
4. In standard ½ Split Range is available by adjusting the span.
5. Contact us except standard.

5. STRUCTURES

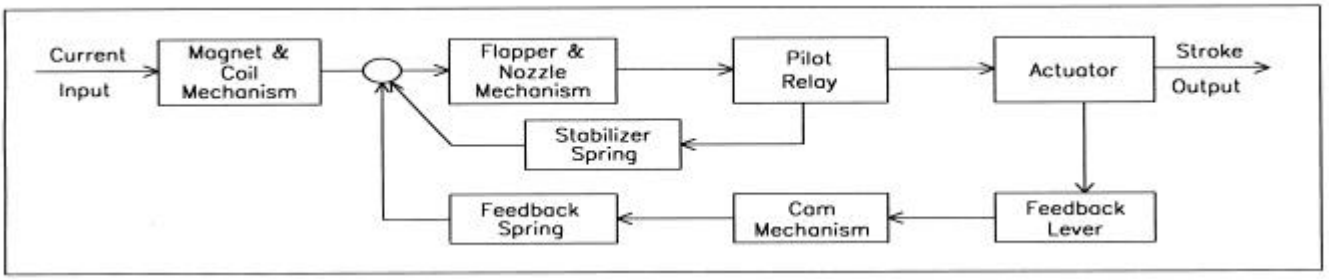


6. PRINCIPLE OF OPERATION

Increase the input current signal to change in lift position of valve. Force exerted by (1) Torque Motor reduces Nozzle Back Pressure with increase in gap between (2) Flapper and (3) Nozzle. Then (5) Spool moves upward and the (7) Seat opens simultaneously. Air pressure of OUT1 pipe is discharged to (10) Actuator. As pressure in the actuator chamber goes up, (12) Actuator stem start to move. The movement of (12) Actuator stem exerted force to the (16) Feedback Spring through Feedback Shaft connections. Then (10) Actuator will stop at the point of force balance exerted by the input current signal and the feedback spring.

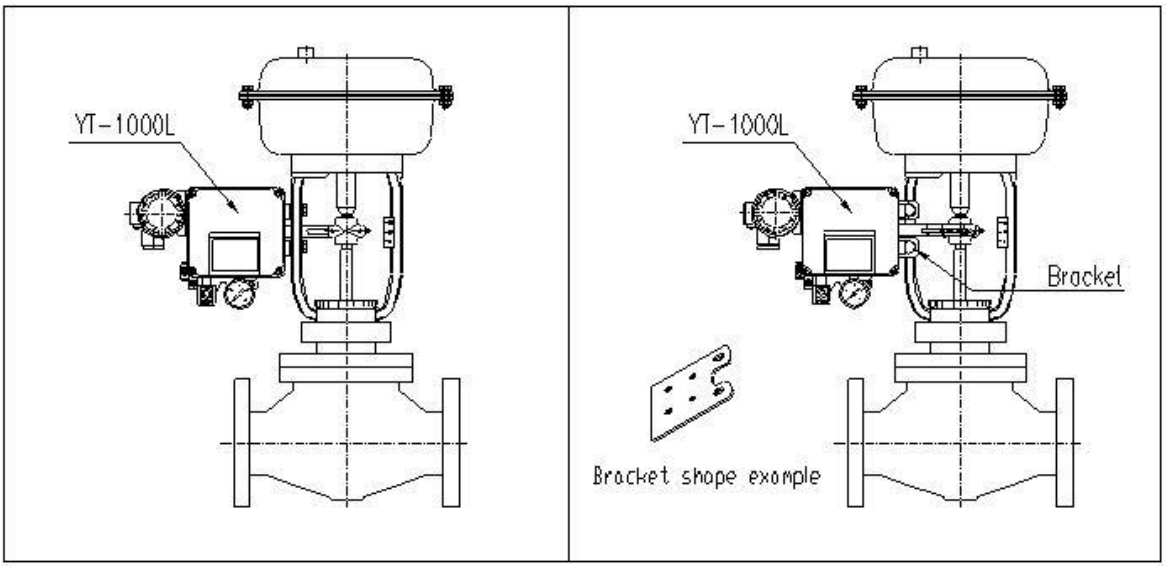


7. BLOCK DIAGRAM OF YT-1000L



8. INSTALLATION

8-1 Example of attaching to actuator



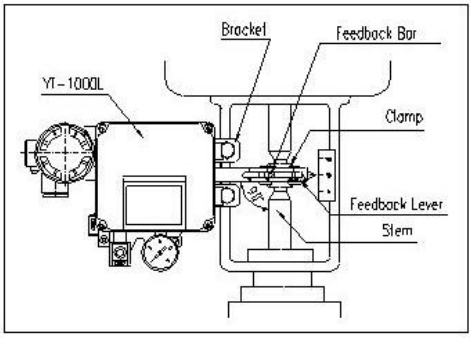
Example 1. case of directly attaching to diaphragm valve

Example 2. case of using a bracket

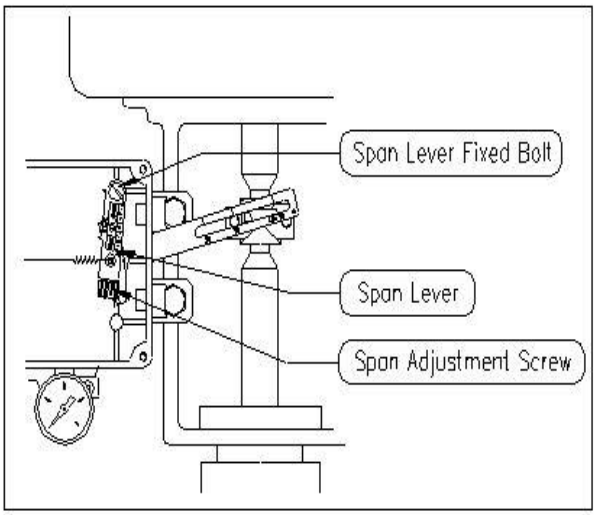
8-2 Connection with feedback Lever

(1) Attach to the position that the valve stem and lever form the right angle when the input signal is 50%.

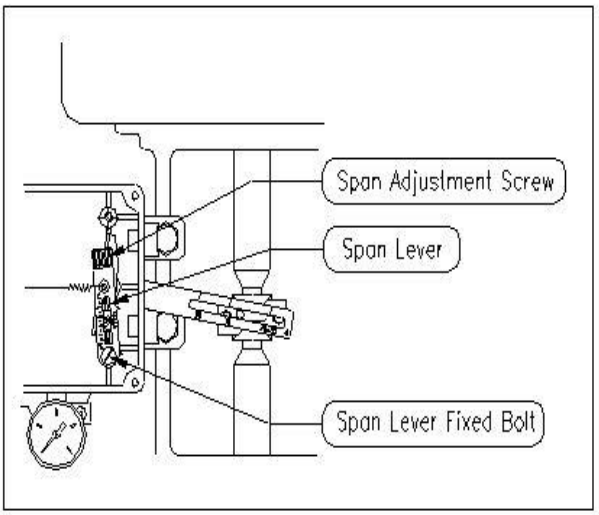
(2) Attach to the position that the runout angle is within the range of 10° - 30°.



8-3 Direct Action & Reverse Action

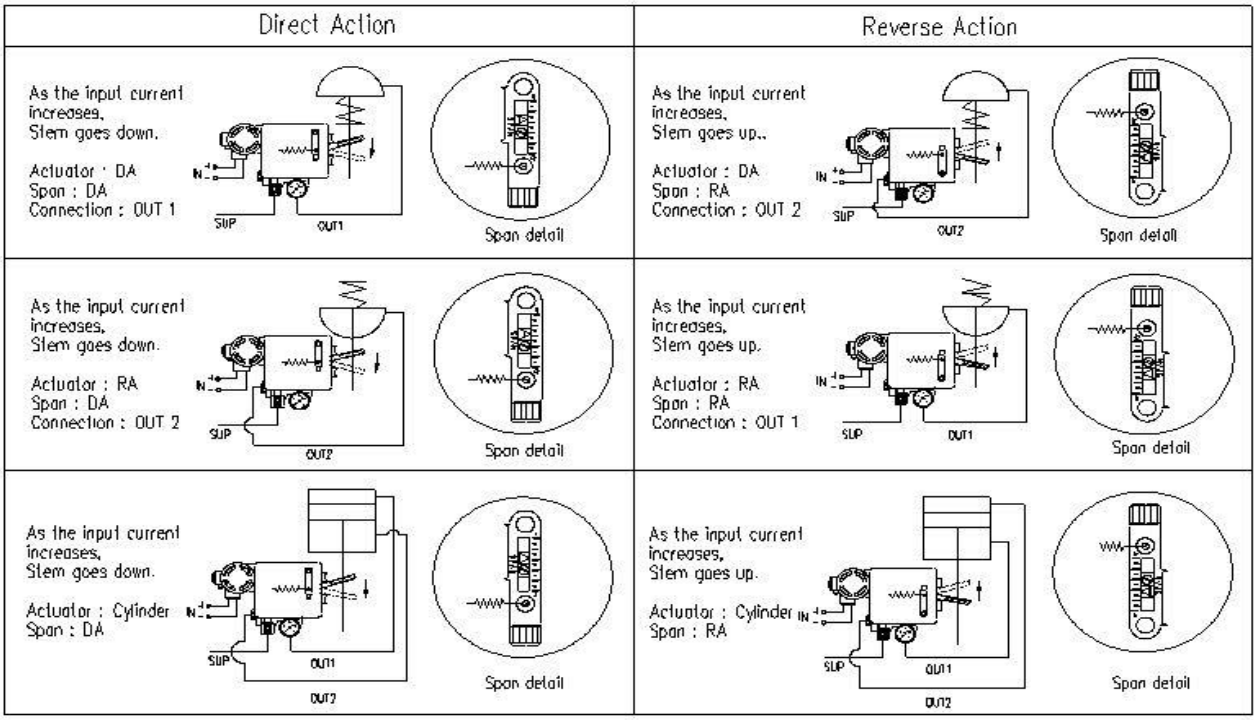


Direct Action



Reverse Action

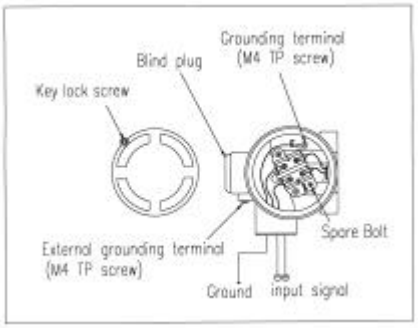
9. AIR PIPING CONNECTION



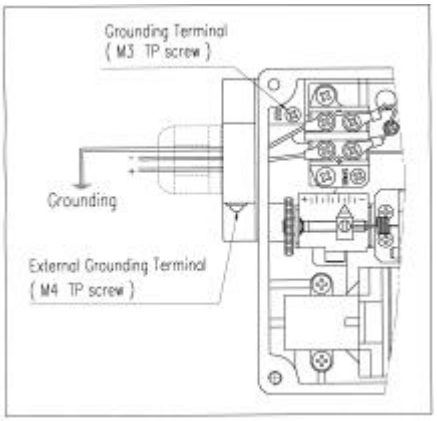
(1) Fully purge the pipe to remove foreign matter.
(2) Use a clean supply air fully removed humidity and dust.
(3) Use YT-200 filter regulator to keep supply air pressure constantly.
(4) When using the double acting type as the single acting type, blind either
(5) OUT1 or OUT2 and also remove the pressure gauge to close its connection.

10. ELECTRICAL WIRING

(1) Connect the (+) and (-) output terminals from the regulator with the (+) and (-) input terminals, respectively, of the positioner Junction box.
(2) For Explosion Proof, both pressure tight conduit thread connection type and pressure tight packing type is available.
(3) Use Cable Gland in pressure tight packing type. (Cable O.D.= ∅9.0 - ∅11).
   a) Use PF ½ standard for conduit thread connection type.
   b) Close Junction box cover and lock Key lock screw.
   c) There is a Spare Bolt in terminal board.



ExdmIIBT6



ExiaIIBT6

11. ADJUSTMENT

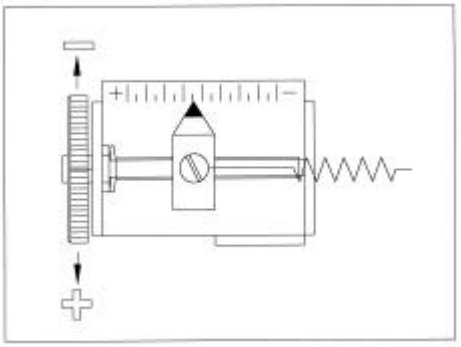
Check the following prior to starting the adjustment.

(1) Check that the pipeline is correctly connected with the pressure supply port and OUT1 and OUT2 port.
(2) Check that the wires are correctly connected with the (+), (-) and grounding terminals.
(3) Check that the actuator and positioner are sturdily connected.
(4) Check for locking of the auto/manual changeover screw of pilot valve (fully tightened in the clockwise direction).
(5) Check that the span-adjusting lever of internal feedback lever is attached to the correct (Direct or Reverse) position.
(6) Check for correct use of the cam face (Direct or Reverse) and that flange nut is firmly locked.

11-1 Zero Adjustment

(1) Set a signal to the Stroke starting signal (4mA) then turn the Zero Adjuster clockwise or counterclockwise.

(2) In case of Spring Actuator, check if it is set to standard pressure in Zero Point. If not, repeat Zero adjustment.

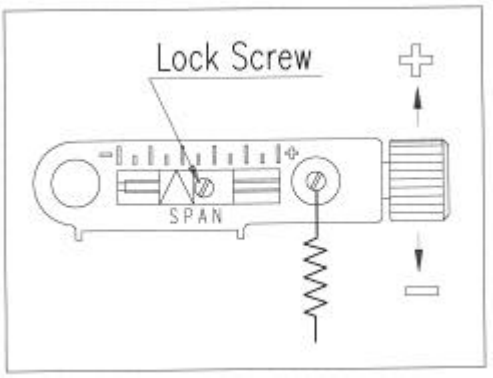


11-2 Span Adjustment

(1) Adjust Range Adjustment so that an Actuator stops at 0% position of the Stroke by the 0% applied input signal and 100% position for 100% input signal respectively.

(2) Check Zero Point and repeat Zero Span Adjustment. ½Split Range can be used by Zero and Span Adjustment.

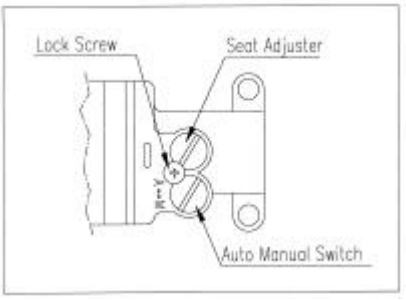
(3) After Setting, tighten up Lock Screw of Span adjustment.



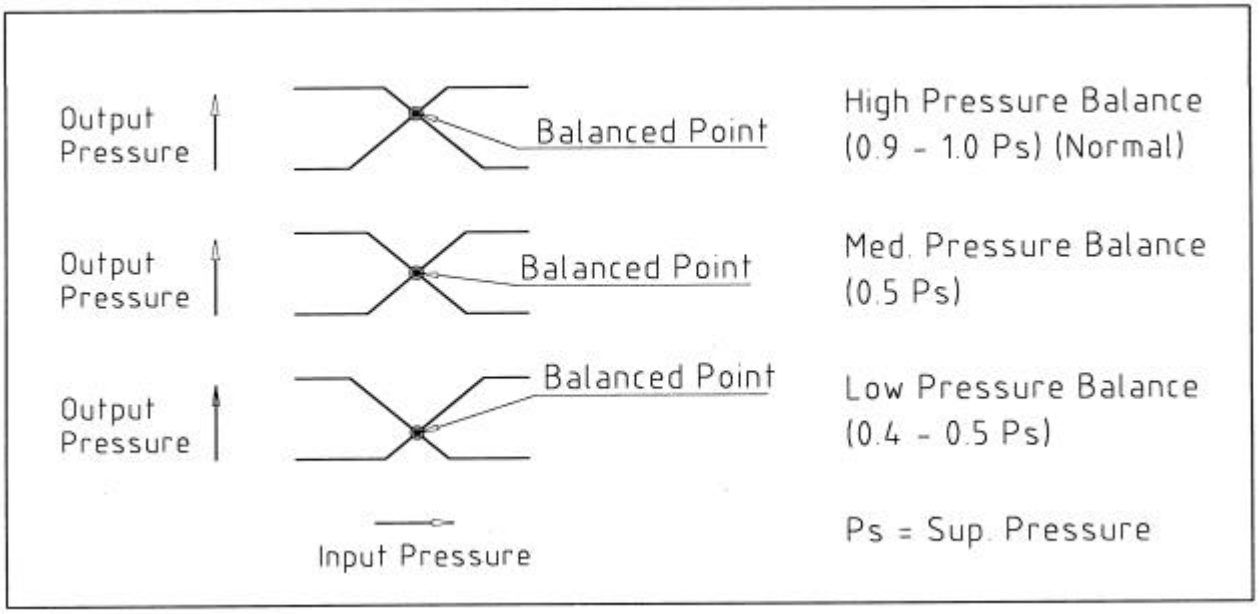
11-3 Auto/Manual Switch

(1) This is a Switch for changing Auto and Manual.
(2) Shipped products is set for Auto. To use Manual operation, turns A/M Switch counterclockwise.
(3) In manual operation, the pressure of YT-200 regulator connects to Actuator. After using, return switch to "A".
(4) Not available for Single Acting-OUT2 and Double Acting.

11-4 Seat Adjuster



(1) No need to adjust at the field because Seat Adjuster is to be adjusted before shipment for balanced pressure point of output pressure.
(2) Seat Adjuster is always used for Double-acting. If need to change balanced pressure point of output pressure, use Seat Adjuster.
(3) If the sensitivity is poor because of the actuator type of load condition, turn the seat adjuster screw clockwise. If hunting occurs, turn the seat adjuster screw counter-clockwise. (The amount of turning varies by actuators. Do not loosen the stopper screw at this time since it is set to avoid the screw coming off)
(4) If hunting occurs due to an actuator of small capacity, refer to description in chapter 15. OPTION.



12. MAINTENANCE AND CHECK

(1) If the supply air is fouled, the positioner may not operate normally. Periodically check the compressed air cleaning system and make sure that clean air is always supplied.
(2) When you disassemble the pilot valve, coat grease to the O-ring of the sliding section.
(3) When the fixed orifice is clogged with carbon particles or others, remove the pilot valve Auto/Manual changeover screw (built-in fixed aperture) and clean it by inserting a 0.2 wire into the aperture. If it must be replaced with new one, stop the supply pressure and remove the stopper screw of the pilot valve.
(4) Check the positioner once a year. When you find excessively worn diaphragm, O-ring and other packing or any unit, it should be changed with new one. Treatment at an early stage is especially import if the positioner is used in a place of severe environment like coastal area.

13. WARNING

(1) Do not apply large vibration or impact to the positioner. It causes trouble. The positioner must be handled very carefully during transportation and operation.
(2) If the positioner is used under temperature outside of the specification, the sealing materials deteriorate quickly and also the positioner may not operate normally.
(3) Use clean supply air fully removed humidity and dust.
(4) Do not remove the terminal cover at a dangerous position during power conduction.
(5) Be sure that the terminal cover and body cover are put on during the operation.
(6) If you leave the positioner at the operation site for a long time without using it, put the cover on it so that the rainwater does not enter the positioner. If the atmosphere is of high temperature or high humidity, take measures to avoid condensation inside. The condensation control measures must be taken thoroughly for export shipment.

14. TROUBLE SHOOTING

CONDITION	CAUSE	WHAT TO DO
Not operated with Input Signal applied	too low or none Supply Air	input Supply Air
	loose connection	tighten Set Screw of Terminal
	wrong wiring for (+) and (-)	connect wiring (+) and (-)
	short or open circuit of Terminal Motor	replace Motor Unit
	clogged Nozzle	replace Motor Unit
	loose or wrong setting of Feedback Lever	correct Setting and tighten
OUT1 pressure raised and stay, does not come down	leakage of A/M Switch	tighten or replace A/M Switch
	wrong contact or scratch of Flapper	replace Motor Unit
	clogged Fixed Orifice	clean or replace Fixed Orifice
output pressure is operated by A/M Switch	clogged Nozzle	clean Nozzle or replace Motor Unit
Hunting is occurred	off-positioned Stabilizer Spring	insert Stabilizer Spring
	too low of Actuator Volume	insert Orifice
	clogged Fixed Orifice	clean or replace Fixed Orifice
Actuator is operated by On/Off only	wrong connection of Out1 and Out2 tube	correct position of tube
Linearity is not good	wrong Setting of Feedback Lever	readjust Setting of Feedback lever
	wrong Zero, Span adjustment	readjust Zero, Span adjustment
	Supply pressure is unstable	replace regulator
Hysteresis is not good	wrong setting of Seat Adjuster	readjust Seat Adjuster
	loose connection of actuator and positioner	tighten connection
	Cam shaft is worn out	replace Cam shaft

15. OPTION

15-1 Pilot valve with output orifice

(1) Hunting may occur when the positioner is attached to a small capacity actuator.In such case, use a pilot valve having a output orifice for OUT1 and OUT2.The output orifice is removable.

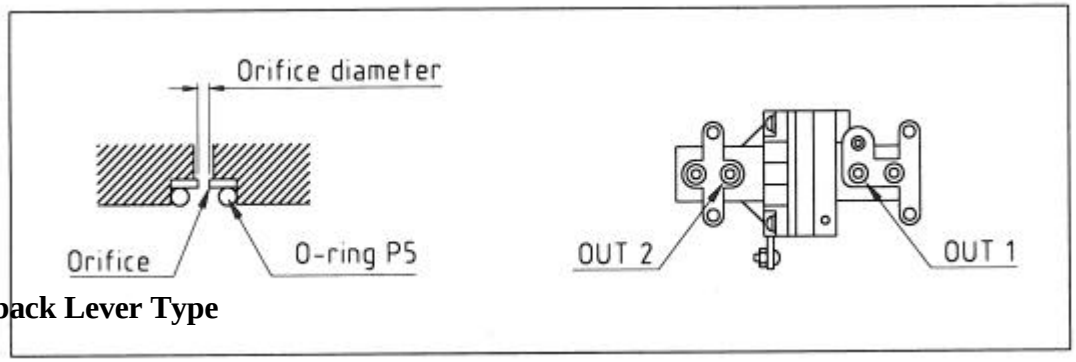
(2) Output orifice types (Refer to description in chapter 4. Ordering Symbols.)

Volume of actuator	Output orifice diameter	Ordering NO.
Below 90 cm^3	0.7	①
90 - 180 cm^3	1.0	②
Over 180 cm^3	None	③

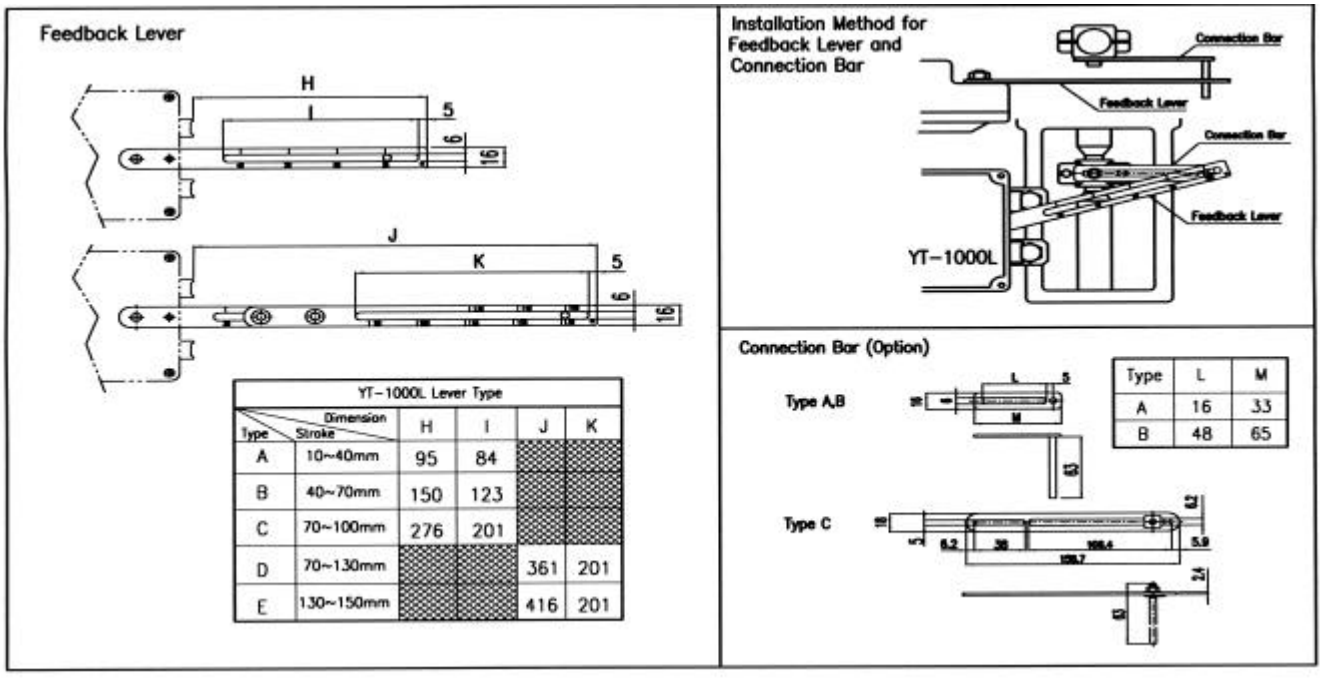
(3) After pulling out the O-ring from OUT1 and OUT2 port, push proper orifice and then mount the O-ring to OUT1 and OUT2 again.

(4) When mounting the output orifice, pay attention not to let dust and others enter the port hole.

(5) If the hunting does not stop even after mounting the output orifice, please contact us



15-2 Feedback Lever Type

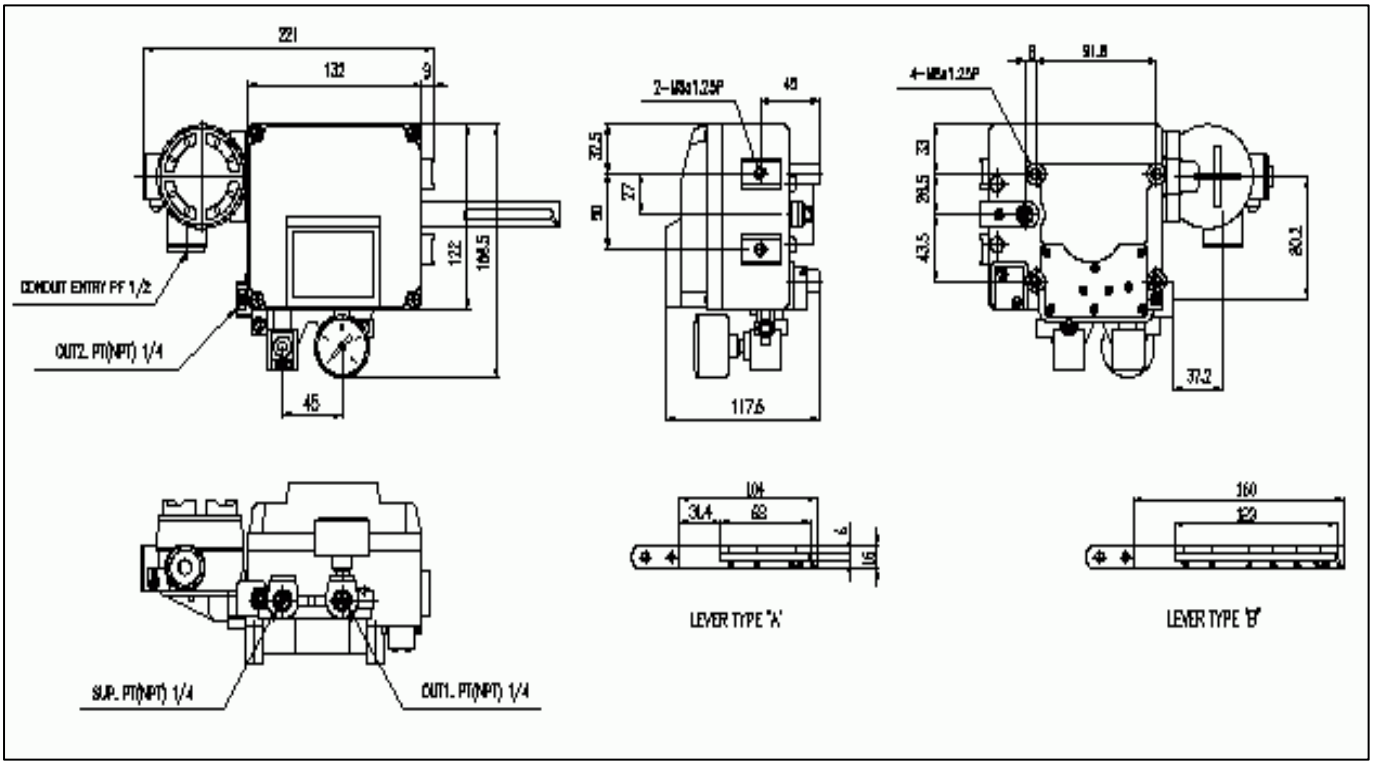


YT-1000L Lever Type

Type \ Dimension / Stroke		H	I	J	K
A	10~40mm	95	84		
B	40~70mm	150	123		
C	70~100mm	276	201		
D	70~130mm			361	201
E	130~150mm			416	201

Type	L	M
A	16	33
B	48	65

16. DIMENSIONS



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TÜV Rheinland

CERTIFICATE

of Conformity

EC Council Directive 89/392/EEC
as last amended by EEC Directive 93/68/EEC
Machinery

Registration No.: AM 9855295 01

Report No.: M 9866348 E 01

Holder: Young Tech. Co.
92-65, Pungmu Ri, Kimpo Eup
Kimpo Gun, Gyeonggi Do 415-800
R.O.K.

Product: VERSTELLGERÄT
(Electro-pneumatic Positioner)

Identification: Type Designation : YT-1000L
- Serial Number : n.a.(prototype)

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is,to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 89/392/EEC, in its latest amended version, referred to as the Machinery Directive. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex II of the Directive.

Certification Body

Product Safety · Quality Assurance
TÜV Rheinland
Approved

Cologne, 25.08.98

Dr. R. Frankenberger

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

CE The CE marking may only be used if all relevant and effective EC Directives are complied with. CE

KEMA

(1) EC-TYPE EXAMINATION CERTIFICATE

(2) Equipment or protective system intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 03ATEX1195**

(4) Equipment or protective system:
Electro-pneumatic Valve Positioner Model YT-1000 . . m .

(5) Manufacturer: **Young Tech Co., Ltd.**

(6) Address: **662-8, Pungmu-Dong, Kimpo-city, Kyunggi-Do, Korea**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) **KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the directive.**

The examination and test results are recorded in confidential report no. 2029573.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 EN 50018 : 2000 EN 50028 : 1987

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:

Ex **II 2 G EEx md IIB T6**

Arnhem, 16 October 2003
KEMA Quality B.V.

C.G. van Es
Certification Manager

* This Certificate may only be reproduced in its entirety and without any change

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