



# Metals Kingdom Industry Limited

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## **Metals Kingdom Industry Limited**

# Product Brochure

**Valve Grinding&Lapping Machine**

**Valve Pressure Test Bench**

**Pipe Beveling and Cutting Machine**

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## Brief Introduction

Metals Kingdom Industry Limited is one of leading factories of Valve Grinding & Lapping Machine, Valve Pressure Test Bench, Portable Pipe Beveling and Cutting Machine in north of China. Our factory is established in 1994, which is professional manufacturer of Testing and Repair Equipment for Pipes & Valves.

We passed ISO Quality Management Certificate in 2008, Our Portable Valve Grinding Machine, Valve Test Bench Connecting rod synchronous telescopic mechanism, Portable Pipe Beveling Machine, Pipe Beveling and Cutting Machine all gained the National Patent for utility models in 1996 and 2014, we have got the Certificate of Material Supplier by China National Petroleum Corporation and National Power Corp.

Our Main Products are

- Portable Valve Grinding and Lapping Machine
- Stationary Valve Grinding Machine
- Valve Pressure Test Bench
- Portable Pipe Beveling and Cutting Machine

**Valve Grinding Machine** is mainly used to repair the sealing surfaces of valves & flanges and other mating surfaces that require precision sealing, it is for grinding the sealing surfaces of valve disc, valve seat, flange and etc., This machine is widely applied in electric power, petroleum, chemical industry, metallurgy, papermaking and other industries where pipe valves are concentrated. There are two types of valve grinding machine: portable and stationary (table) types, Portable valve grinding machine is suitable for on-line repair and off-line repair of valves that are inconvenient to disassemble, stationary (table) one is suitable for offline repair of valves on site.

The grinding scope of Valve Grinding Machine is from DN20mm to DN1200mm. It can grind Gate Valve, Stop Valve/Globe Valve (Flat Globe Valve, Cone Globe Valve), Safety Valve/Relief Valve.



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**Valve Pressure Test Bench** is designed and manufactured according to the standard GB / T13927-2008 “industrial valve pressure test “and SH 3518-2013 “Standard for inspection and management of petrochemical valves”, and fully considers the advantages and disadvantages of similar equipment at home and abroad to make it Continuous improvement and optimization. The equipment is mainly used to test the sealing performance of new valves before on-line or after the repair of old valves. These tests include inner sealing performance test, upper sealing performance test, valve body strength test, etc.

Features: simple operation, safe and reliable, sensitive test.

## **Portable Pipe Beveling Machine:**

There are two types of pipe beveling machines, one is external clamped type and the other is internal expansion type. The design is light, light and easy to carry, and the on-site pipeline cutting has unique advantages. High efficiency, large cutting amount, no burr and deformation in the notch. By customizing beveling cutters with different angles, beveling with different angles can be completed; Cutting materials: stainless steel, carbon steel, alloy steel and titanium alloy, and non-standard specifications can be customized according to customer needs. The equipment is widely used in PetroChina, Sinopec, water treatment, shipbuilding, power, beer, beverage, dairy, pharmaceutical, metallurgy and other industries. Features of this product: safe and reliable, high work efficiency, can greatly reduce the labor intensity of workers and improve the quality of beveling.

**Can Customize machine according to your requirements**

Metals Kingdom Industry Limited will offer high quality products and good service to you, Our principle is

**“Technology, Quality, Credit”.**

Welcome to visit our factory anytime, hope to enter long business relationship with all of you.



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- M-300C Portable Gate Valve Grinding Machine DN100-400mm (4"-16")
- M-600 Portable Gate Valve Grinding Machine DN200-600mm (8"-24")
- MZ-150 Portable Gate Valve Grinding Machine DN50-150mm (2"-6")
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### **Portable Valve Grinding Machine**

### **for Globe Valve&Safety Valve/Relief Valve.....**

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- MJ-300A Portable Globe&Safety Valve Grinding Machine DN20-300mm (1"-12")
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## **Stationary Valve Grinding Machine**.....

- MT-500X/2 Valve Core Grinding Bench DN20-300mm (1"-12")
- MT-800X Valve Core Grinding Bench DN100-500mm (4"-20")
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- PKZ External Clamped Pipe Beveling Machine
- PKN Internal Clamped Pipe Beveling Machine
- PG Double Half Loop Pipe Beveling and Cutting Machine
- GGJ Pipes Cutting Machine



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## SYTW300/16-37.5 Horizontal Type

### Valve Pressure Test Bench



## 1. Product introduction

SYT series valve pressure testing machine is designed and manufactured according to GB / T13927-2008 “industrial valve pressure test “and SH 3518-2013 “Standard for inspection and management of petrochemical valves”, and fully considers the advantages and disadvantages of similar equipment at home and abroad to make it Continuous improvement and optimization. The equipment is mainly used to test the sealing performance of new valves before on-line or after the repair of old valves. These tests include inner sealing performance test, upper sealing performance test, valve body strength test, etc.

## 2. Features

- 1) It is applicable to the sealing and body strength performance test of straight through plane flange connected valves that are not affected by external forces, such as gate valve, globe valve and ball valve. The machine is equipped with 2 pairs of flange sealing discs (1 pair of each big and small size). The selection of special sealing disc can meet the test of other types of flange end face and sleeve valve.





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- 2) The valve clamping form is horizontal top pressure, which is clamped by pressing the two ends of the straight through valve. Replace different extension columns, It can realize the pressure test of valves with different lengths. The machine is equipped with 2 clamping extension columns to adapt to different lengths
- 3) Equipped with high and low pressure water pump pressurization system.
- 4) It has overpressure protection function. The pressure can be preset, and the pressure will stop automatically when the pressure value reaches the specified value.
- 5) Test liquid medium recycling. The liquid test medium of the valve can be recycled to avoid waste.
- 6) The appropriate position of the machine is marked with a pressure comparison table (metal label), which is convenient for the operator to refer to at any time.
- 7) The test pressure gauge adopts three-stage double gauge. Class 1.6 pressure gauge (range: 1.6 class(0-10MPa, 0-25MPa, 0-60MPa),)
- 8) The equipment is equipped with low pressure (0.8MPa) inlet.

## 3. Technical parameters

Items	Model
	<b>SYTW300/16-37.5</b>
Valve Nominal Diameter(DN)	DN50-300mm(2"-12") (2 pairs of flat flange connection valve sealing discs are provided as standard, and The sealing disc of other connection types needs to be customized separately )
Max Test Pressure PN	37.5Mpa
Outer diameter of tie rod	116MM
Axial clamping length range	50-880mm
Radial Clamping Width Max	650mm`
Max Clamping Power	170(T)
Inner diameter of oil cylinder	280mm
Rated Voltage	AC 380V
Rated Power	8.5KW
Control Line Voltage	AC 220V/24V
Hydraulic oil	N46 hydraulic Oil(provide by user) The oil temperature is Max 60 degrees centigrade ,Min 15 degrees centigrade
Oil circuit system Pressure	28Mpa max
Test Medium	Water(Allows to add rust inhibitor)
Test temperature (Envioment Temp)	5 degree centigrade to 40 degree centigrade
Pressure test	Three stage double gauge system is equipped with 0 ~ 10, 0 ~ 25, 0 ~ 60MPa and 1.6 pressure gauges.



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## 4. Comparison Table for Valve Nominal Diameter and Max Test Pressure

Valve Nominal Diameter DN ( mm )	50-150 (2-6 " )	200 (8 " )	250 (10 " )	300 (12 " )
Nominal pressure PN ( MPa )	2.5-25	2.5-25	2.5-15	2.5-10

Valve Nominal Diameter	50-200	300
DN ( mm )	Class1500	Class900
Max Test Pressure PN ( MPa )	37.5	16

## 5. Equipment operation

### 1) Preparation before valve test.

Selection of sealing disc extension column

Select one or two extension columns according to the length of the measured valve, and then fix them on the right connector, fasten with screws.

Comparison table for selection of sealing disc extension column

Selected parts	Sealing disc	Clamping length range mm
2 pcs of extension columns	Sealing disc 236	0-250
	Sealing disc 390	40-340
1pcs of extension columns	Sealing disc 236	230-530
	Sealing disc 390	320-620
No extension column	Sealing disc 236	510-810
	Sealing disc 390	600-900

### 2) Operation of circuit and oil circuit

- A. Connect the three-phase five wire power supply with the supplied power line.
- B. Open the hydraulic oil tank cover and fill with l-hm46 hydraulic oil.
- C. Turn on / off, turn on the power key switch and turn on the power. At this time, the power indicator is on.
- D. Turn the "clamp / release - water pressurization" switch to the "clamp / release" position.
- E. Loosen the "oil pressure adjustment" knob counterclockwise and press the "pump





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start" switch to start the oil pump work; At this time, you can perform other operations.

- F. After each cylinder action, in order to reduce the hydraulic impact, rotate the "oil pressure adjustment" knob counterclockwise every time to make the reading of "system pressure" gauge less than 2MPa
- G. The clamping oil cylinder is equipped with a hydraulic control check valve. After pressing the "release" button, the direction cannot be reversed immediately. Instead, the "oil pressure adjustment" knob needs to be rotated clockwise to make the oil circuit system pressure exceed a certain value (generally 2-3mpa).
- H. Rotate the "oil pressure adjustment" knob, the action must be gentle, otherwise it will cause impact and the reading of the pressure gauge will rise too fast.

### 3) Waterway connection

Connect the water inlet of the equipment with the water source with the randomly equipped water pipe, turn on the water source switch to inject water into the water tank, and turn off the water source after the water tank is filled.

### 4) Clamping valve

- A. Select the appropriate sealing disc according to the diameter of the measured valve and install it.
- B. Place the sealing ring in the sealing disc.
- C. Place the valve to be tested on the lower sealing plate and align it.
- D. Turn the "clamp / loosen - water pressurization" switch to the "clamp / loosen" position. Press the "clamp" button to clamp the valve with the "oil pressure adjustment" knob.

### 5) Valve sealing test

#### A. Valve sealing test

- ① Clamp the tested valve.
- ② During the right side sealing test, open the left pressure relief and right water inlet, close the right pressure relief and left water inlet, open the switch of low-pressure water pump until the water flows out of the left pressure relief port, close the valve opening and closing parts until the pointer of the pressure gauge starts to act, and close the low-pressure water pump.
- ③ During the left side sealing test, open the right pressure relief and left water inlet, close the left pressure relief and right water inlet, open the switch of low-pressure water pump until the water flows out of the right pressure relief port, close the valve opening and closing parts, until the pointer of the pressure gauge starts to act, and close the low-pressure water pump.
- ④ Turn the "clamp / release - water pressurization" switch to the "water pressurization" position, press the "water pressurization on" button, then rotate the "oil pressure adjustment" knob clockwise to make the reading of the test pressure gauge reach the value to be tested, and press the "water pressurization stop" button to stop pressurization. Then turn on the "timing" switch, and the time relay starts timing. After the set time, the



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"warning light" starts audible and visual prompt.

(the "water pressurization speed" knob shall be used for low pressure and small diameter valves, and the knob shall be turned counterclockwise to the maximum before pressurization).

⑤ We judge whether the tested valve is qualified by the pressure drop within the test duration. (for the equipment equipped with mechanical pressure gauge, there are three range test pressure gauges on the operation panel, which is beneficial to improve the measurement accuracy at low pressure. However, it must be noted that the test pressure should be used in the range of 30% - 80% of the full range of the pressure gauge. For the unused low range pressure gauge, the switch of the relevant low pressure gauge must be closed to prevent the low range pressure gauge from being damaged.)

⑥ During the left sealing test, open the left pressure relief valve (during the right sealing test, open the right pressure relief valve) to return the test pressure to zero. Then rotate the pressure adjustment knob counterclockwise to make the system pressure less than 0.5MPa.

⑦ Turn the "clamp / loosen - water pressurization" switch to the "clamp / loosen" position, press the "loosen" button, rotate the "pressure adjustment" knob clockwise to loosen the tested valve, and then rotate the "pressure adjustment" knob counterclockwise to make the system pressure less than 0.5MPa.

Lift away the tested valve. So far, the detection of a valve is completed.

## **B. Test the strength of valve shell and upper sealing performance**

① Select the corresponding sealing disc combination according to the diameter and connection form of the measured valve.

② Place the tested valve between two sealing discs, clamp the tested valve, and find out the clamping force according to the comparison table.

③ Unscrew the valve opening and closing parts.

During the right side sealing test, open the left pressure relief and right water inlet, close the right pressure relief and left water inlet, open the low-pressure water pump switch until the water flows out of the left pressure relief port, close the left pressure relief valve until the pointer of the pressure gauge starts to act, and close the low-pressure water pump. During the left side sealing test, open the right pressure relief and left water inlet, close the left pressure relief and right water inlet, open the switch of the low-pressure water pump until the water flows out of the right pressure relief port, close the right pressure relief valve until the pointer of the pressure gauge starts to act, and close the low-pressure water pump.

④ The pressurization process is the same as the sealing test.

⑤ Open the left or right pressure relief for pressure relief. The loosening process is the same as the valve sealing test.

## **C. Low pressure test**

During the low-pressure test, clamp and loosen as above, then turn on the "air inlet switch", close other pressure gauge switches, and test when the test pressure is reached.

**D. After the test, press the "general stop / power" button to stop the machine. Then turn**



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off the "power lock" switch. If it is not used for a long time, turn off the circuit breaker switch in the chassis.

## 6. Equipment maintenance

1) Replace the hydraulic oil regularly

The hydraulic oil needs to be checked and replaced regularly; The condition of hydraulic oil should be paid attention to and checked frequently. The period for replacing hydraulic oil is generally once a year; When there is water, high temperature, high humidity and dust, the oil change cycle shall be shortened.

Methods: open the oil drain plug to drain the oil, then open the upper cover of the oil tank, clean the oil filling filter screen (120 mesh) and inlet filter, and clean the bottom of the oil tank.

2) Clean the filter frequently (regularly).

3) Pay attention to the oil level and maintain the oil level.

4) When the oil pump starts and stops, the pressure adjustment switch shall be adjusted to the minimum.

5) When the system needs maintenance, it must be shut down for maintenance. When starting up for the first time, all personnel shall not face the high-pressure water pipe.

6) Exposed oil pipes and water pipes are not allowed to bear external impact.

7) When connecting the power supply for the first time, open the cover of the electrical box and adjust the motor rotation (from the fan end of the motor, the motor shaft rotates clockwise for correct rotation).

8) When shutting down the power supply, the hydraulic system pressure should be adjusted to the minimum.

9) The power supply is three-phase four wire system, that is, three of the four power lines are connected to fire, and the phase voltage is 380V. The other one must be connected to the zero line (not the grounding wire), and the voltage of the three live wires relative to the zero line is 220V.

10) Clean the waterway check valve regularly. If there are sundries in the check valve, the test accuracy will be affected.

11) Precautions for instrument use

① Before using the instrument, be sure to cut off the sealant plug on the upper part of the watch case to connect the inner cavity of the instrument with the atmosphere.

② The application range of the meter shall be between 1 / 3 and 2 / 3 of the upper range limit.

③ The meter shall be verified frequently (at least once every 3 months).

12. In low temperature season, if the equipment is not used for a long time, be sure to drain the liquid in the pump head to prevent the pump head from freezing and cracking at low temperature.



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## Top Pressure Horizontal Type Valve Pressure Test Bench

### 1. Scope of application

- it is applicable to the valve sealing and valve body strength performance test
- Gate valves, Globe valves, Ball valves, Control valves, Check valves and other straight flange connection valve

### 2. Performance characteristics

- The clamping form of the valve is top pressure, which is clamped by pressing on both ends of the through valve
- Standard machine are equipped with high and low pressure water pump boosting system. Gas pressurization is optional.

### 3. Tech Parameters

Items	Models				
	SYTW300/16-37.5	SYTW400/3.5-32	SYTW400/6-32	SYTW600/5-32	SYTW800/5.8-32
Valve Nominal Diameter(DN)	50-300mm (2"-16") Flange connection	50-400mm (2"-16") Flange connection	50-400mm (1"-16") Flange connection	100-600mm (4"-24") Flange connection	300-800mm (12"-32") Flange connection
Max Test Pressure PN	37.5Mpa	32Mpa	32Mpa	32Mpa	32 Mpa
Transverse clamping Length scope	50-880mm	50-850mm	50-950mm	100-1350mm	1150mm
Radial Clamping Width Max	650mm	650mm`	750mm	950mm	1400mm
Max Clamping Power	170(T)	65(T)	120(T)	220(T)	450(T)
Size mm	3620*1250*2200	3090*1010*2200	3350*1150*2200	4000*1400*1600	4520*1620*1600
Lifting Weight Max	/	300KG	/	/	/
Rated Voltage	AC 380V				
Rated Power	8.5KW				
Control Line Voltage	AC 220V/24V				
Hydraulic oil	N46 hydraulic Oil(provide by user) The oil temperature is Max 60 degrees centigrade ,Min 15 degrees centigrade				
Oil circuit system Pressure	28Mpa max				
Test Medium	Water(Allows to add rust inhibitor) kerosene or other liquid it's viscosity not higher than water				
Test temperature (Envioment Temp)	5 degree centigrade to 40 degree centigrade				



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## 4.Comparison Table : Valve Nominal Diameter and Max Test Pressure

Valve Nominal Diameter DN ( mm )	50-125	150	200	250	300	350	400
Max Test Pressure PN ( MPa )	31.5	24	14	8.8	6	4.5	3.5

## 5.Comparison Table : Valve Sealing Pressure and Test Pressure

SYTW 400/3.5-32Valve Test Bench Pressure Comparison Table									
Norminal Pressure(MPa)		2.5	4.0	6.4	10.0	16.0	20.0	25.0	32.0
Test Pressure(MPa)		3.75	6.0	9.6	15.0	24.0	30.0	37.5	48.0
Norminal Diameter(DN)		Sealing Pressure(MPa)							
in	mm								
2	50	2.0	2.0	2.0	2.0	2.8	3.5		
2-1/2	65	2.0	2.0	2.0	3.0	4.7	6.0		
3	80	2.0	2.0	2.8	4.5	7.0	9.0		
4	100	2.0	2.8	4.5	7.0	11.0	14.0		
6	150	4.0	6.2	10.0	15.6	25.0			
8	200	7.0	11.0	17.8	28.0				
10	250	10.8	17.5	28.0					
12	300	15.6	25.0						
14	350	21.0							
16	400	28.0							



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## SYTW400/6-32 Horizontal Type Valve Pressure Test Bench

### Comparison Table for Valve Nominal Diameter and Max Test Pressure

Valve Nominal Diameter DN ( mm )	100max	200	225	300	400
Max Test Pressure PN ( MPa )	32	24	20	9.6	6.0

## SYTW600/5-32 Top Pressure Horizontal Valve Pressure Test Bench

### Comparison Table for Valve Nominal Diameter and Max Test Pressure

Valve Nominal Diameter DN ( mm )	200max	250	300	400	500	600
Max Test Pressure PN ( MPa )	31.5	28	20	11	7.2	5

### Comparison Table of Valve Sealing Pressure and Test Pressure

SYTW 600/5-32 Valve Test Bench Pressure Comparison Table									
Norminal Pressure (MPa)		2.0	5.0	6.4	10.0	16.0	20.0	25.0	32.0
Class		150	300	400	600	900		1500	
Norminal Diameter(DN)		Clamping Pressure(MPa)							
in	mm								
6	150	2.0	2.0	3.5	5.0	8.0	10.0	12.5	
8	200	2.5	3.5	5.5	9.0	14.0	17.5	22.0	
10	250	3.5	5.5	9.0	14.0	22.0			
12	300	5.0	8.0	13.0	20.0				
14	350	7.0	11.0	17.5	27.0				
16	400	9.0	14.0	22.0					
20	500	14.0	22.0						
24	600	22.0							





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## SYTW800/5.8-32 Top Pressure Horizontal Valve Pressure Test Bench

### Comparison Table for Valve Nominal Diameter and Max Test Pressure

Valve Nominal Diameter DN ( mm )	300max	400	500	600	700	800
Max Test Pressure PN ( MPa )	31.5	22.5	15	10	7.5	5.8

### Comparison Table of Valve Sealing Pressure and Test Pressure

SYTW 800/5.8-32 Valve Test Bench Pressure Comparison Table								
Norminal Pressure(MPa)	2.5	4.0	6.4	10.0	16.0	20.0	25.0	32.0
Test Pressure(MPa)	3.75	6.0	9.6	15.0	24.0	30.0	37.5	48.0
Norminal Diameter(DN)	Sealing Pressure(MPa)							
	in	mm						
12	300	2.5	4.0	6.5	10.0	16.0	20.0	
14	350	3.5	5.5	9.0	13.6	22.0	28.0	
16	400	4.5	7.0	11.5	18.0	28.0		
18	450	5.6	9.0	14.5	22.0			
20	500	7.0	11.0	17.8	28.0			
22	550	8.5	13.5	21.5				
24	600	10.0	16.0	25.6				
28	700	13.6	21.8					
32	800	17.8	28.0					





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## SYTL150/7.5-32 Top Pressure Vertical Type Valve Pressure Test Bench





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## 1.Product characteristics and application:

This test bench is designed and manufactured with reference to similar products of German and GB4981 standard, It is suitable for sealing test of straight-through welded valves and straight-through flange connection valves, before and after installation. It is suitable for shell test, sealing test (low pressure sealing test and high pressure sealing test) and upper seal test (ISO5208) for GB4981, in order to prevent faulty valves from entering work site.

Features: simple operation, safe and reliable, sensitive test.

## 2.Technical parameters:

Valve Nominal Diameter DN	20-150mm( Flange connection valves) if with special sealing plate ,it can be used to test the welding valve
Maximum Test Pressure PN	31.5Mpa(4500LB) Max
Nominal Voltage	Exchange 380V
Rated Power	7KW
Line Voltage	Exchange 220V/24V
Hydraulic oil	N46 hydraulic Oil(provide by user) The oil temperature is Max 60 degrees centigrade ,Min 5 degrees centigrade
Oil circuit system Pressure	28Mpa max
Test Medium	Water(Allows to add rust inhibitor) kerosene or other liquid it's viscosity not higher than water
Test temperature(Envioment Temp)	5 degree centigrade to 40 degree centigrade
Transverse clamping Length scope	0-700mm
Radial distance	380mm
Max Clamping Force	20(T)
Size	20000×800×2100(mm)





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## Comparison Table of Valve Nominal Diameter and Max Test Pressure

Valve Nominal Diameter DN( mm )	70max	80	90	100	150
Max Test Pressure PN ( MPa )	31.5	26	20	16	7.5

## Comparison Table of Valve Sealing Pressure and Test Pressure

SYTL 150/7.5-32 Valve Test Bench Pressure Comparison Table									
Norminal Pressure(MPa)	2.5	4.0	6.4	10.0	16.0	20.0	25.0	32.0	
Test Pressure(MPa)	3.75	6.0	9.6	15.0	24.0	30.0	37.5	48.0	
Norminal Diameter(DN)	Sealing Pressure(MPa)								
	in	mm							
3/4	20	2.0	2.0	2.0	2.0	2.0	2.0		
1	25	2.0	2.0	2.0	2.0	2.5	3.0		
2	50	2.0	2.5	3.6	5.7	9.0	11.3		
2-1/2	65	2.5	3.8	6.0	9.5	15.2	19.0		
3	80	3.6	5.8	9.2	14.4	23.0	28.0		
4	100	5.6	9.0	14.4	22.5				
6	150	12.7	20.3						





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## Flipped Double Hold Pressure Valve Pressure Test Bench

### Application scope

- Suitable for gate valves, globe valves, ball valves, control valves, check valves and other straight- flange connection valve seal and valve body strength performance test and the activated pressure setting of Safety valve, et
- Clamping pressure valve type is hold, hold press claws clamping flange, no external influence on the test
- Valve Test medium could be water, gas, or oil, by customer choice

Test bed side table can be moved to adjust the length of the valve position when the pressure test is going on.

One end of the table can be flipped 90 °to the valve test ,suitable for the safety valve testing.

### Model specifications

Model	SYTF150/10-32	SYTF350/5-32	SYTF600/6-20
Valve ND (mm)	20-150	50-350	300-600
Test pressure (Mpa)	32-1.6	32-1.6	20-1.6
Voltage (V)	380	380	380





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## Safety Valve Pressure Test Bench

### 1. Application ,Performance Characteristics

- Apply for setting the activated pressure of Safety valve and test the seal tightness performance of valves which have a straight-flange connection .
- Clamping pressure valve type is hold, hold press claws clamping flange, no external influence on the test valve.
- Test medium could be water, gas, or oil, by customer choice .

### 2.Tech Parmameters

Model	SYTA150/10-32	SYTA350/5-32	SYTA600/6-24
Valve DN (mm)	20-150	50-300	300-600
Test pressure (Mpa)	32-1.6	32-1.6	20-1.6
Voltage (V)	380	380	380





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**Quality Sincere Credit**

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