tork

valve & automation

PNEUMATIC PISTON VALVE

USER MANUAL

OCTOBER 2020

PLEASE READ THE INSTRUCTIONS BEFORE USE

ISO 9001 Quality Management | ISO 14001 Environmental Management | OHSAS 18001 Occupational Health and Safety Management

www.smstork.com

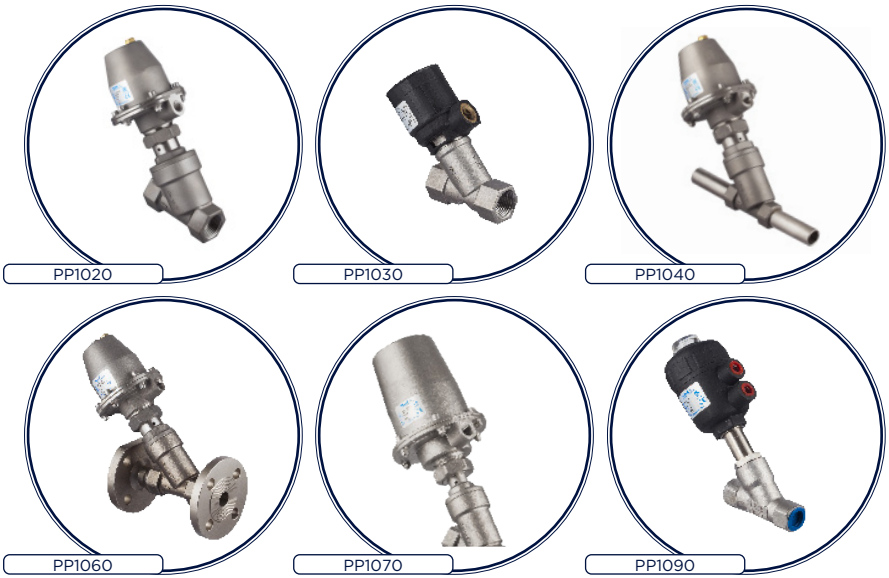
CONTENTS

1. GENERAL DESCRIPTION OF THE EQUIPMENT

a. Intended Use Of The Equipment

TORK Pneumatic Actuated Angle Seat Valves are the components to conduct on and off functions by delivering pneumatic drive power and linear motion when they are assembled to the installation. The metal parts of the Pneumatic Actuated Angle Seat Valves are made up of AISI 316 stainless steel, and the seals are made up of PTFE. Thus, they are compatible for almost every fluid. They provide complete sealing, long-life; they are convenient for frequent running.

They preferred because of less pressure loss than the glove valve; rapid on-off function and high flow.



Areas of usage are water, air, steam, gas, chemicals, petroleum products, food, pharmaceutical industry, sterilized environment, refinement, paint machine, potable water stations, vacuum applications, oil, petroleum, alcohol, hydraulic oil, salty water, natural gas and acid.

The TORK Pneumatic Actuated Angle Seat Valves (Figure 1) are produced in normally closed and normally opened forms, preferably with the options of switch, ex-proof switch, or proportional in several models such as with welded joint, flange connection, standard high pressure, plastic and mini plastic.

b. Product Coding System

PP10 XX . XX

TYPE

11. Gas and Steam Piston Valve N.O / N.C
20. Standard Piston Valve N.C
21. Standard Piston Valve N.O
30. Mini Plastic Cover Piston Valve N.C
31. Mini Plastic Cover Piston Valve N.O
40. Welded Connected Piston Valve N.C
41. Welded Connected Piston Valve N.O
60. Flange Connected Piston Valve N.C
61. Flange Connected Piston Valve N.O
70. Standard High Pressure Piston Valve N.C
71. Standard High Pressure Piston Valve N.O
90. Standard Plastic Cover Piston Valve N.C
91. Standard Plastic Cover Piston Valve N.O

SIZE

00. 1/8”
01. 1/4”
02. 3/8”
03. 1/2”
04. 3/4”
05. 1”
06. 1 1/4”
07. 1 1/2”
08. 2”
09. 2 1/2”
10. 3”

c. Exploded Drawings and Part Lists

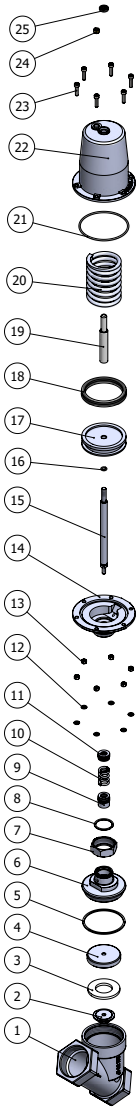


Figure 1: Standard Piston Valve N.C.
Exploded Picture

NO	PART NAME	QUANTITY
25	ELASTIC RING	1
24	SUPPRESSOR	1
23	BOLT	6
22	CYLINDER	1
21	O-RING	1
20	SPRING	1
19	STUD	1
18	NUTRİNG	1
17	PISTON	1
16	O-RING	1
15	SHAFT	1
14	COVER	1
13	NUT	6
12	STAMP	6
11	FELT	1
10	SPRING	1
9	FELT	1
8	SEGMENT	1
7	NUT	1
6	INTERCONNECTION	1
5	SEAT	1
4	ORIFICE PRESSURE	1
3	SEAT	1
2	NUT	1
1	BODY	1

Table 1: Standard Piston Valve N.C.
Parts List

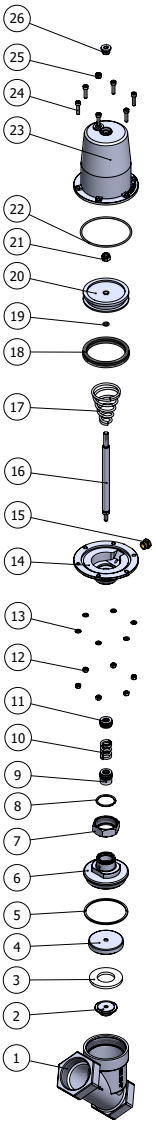


Figure 2: Standard Piston Valve N.O.
Exploded Picture

NO	PART NAME	QUANTITY
26	NUT	1
25	SUPPRESSOR	1
24	BOLT	6
23	CYLINDER	1
22	O-RING	1
21	NUT	1
20	PISTON	1
19	O-RING	1
18	ELASTIC RING	1
17	SPRING	1
16	SHAFT	1
15	SUPPRESSOR	1
14	COVER	1
13	STAMP	6
12	NUT	6
11	FELT	1
10	SPRING	1
9	FELT	1
8	SEGMENT	1
7	NUT	1
6	INTERCONNECTION	1
5	SEAT	1
4	ORIFICE PRESSURE	1
3	SEAT	1
2	NUT	1
1	BODY	1

Table 2: Standard Piston Valve N.O.
Parts List

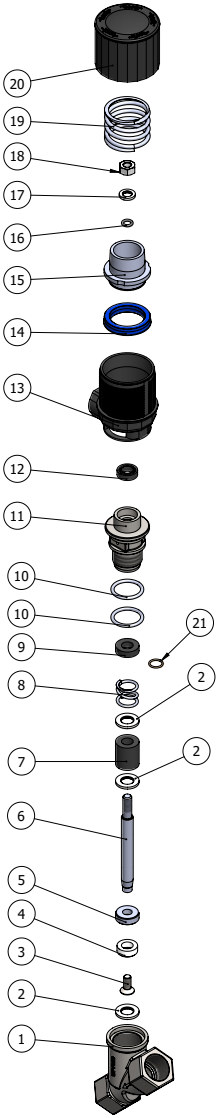


Figure 3: Exploded Picture of Mini Plastic Head Piston Valve

NO	PART NAME	QUANTITY
21	O-RING	
20	PLASTIC COVER	1
19	SPRING	1
18	NUT	1
17	STAMP	1
16	O-RING	1
15	PLASTIC PISTON	1
14	NUTRİNG	1
13	PLASTIC BODY	6
12	NUTRİNG	6
11	INTERCONNECTION	1
10	O-RING	1
9	FELT	1
8	SPRING	1
7	FELT	1
6	MİL	1
5	ORIFICE PRESSURE	1
4	SEAT	1
3	BOLT	1
2	STAMP	1
1	BODY	1

Table 3: Mini Plastic Head Piston Valve Parts List

d. Technical Specifications

Type	Pneumatic Piston Valve
Connection	Threaded, Flanged, Welded
Position	Normally Closed/Normally Open
Operating temperature	-10°C/+180°C TORK
Pilot Valve	3/2 way Torque Solenoid Valve
Pilot Pressure	4-8 bar
Control Air Connection	1/4" G
Sealant Material	PTFE
Number of Paths	2/2
Body Material	AISI 316 stainless steel
On/Off Time	30-40 ms
Fluid Viscosity	Max. 600 mm2/s
Mounting Direction	Flow should be in the direction of the arrow.

Table 4: General Specifications

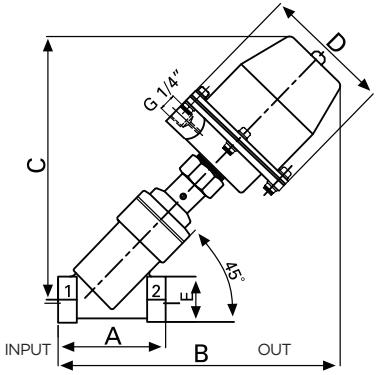


Figure 4: Standard Piston Valve

Type	DN	G	A	B	C	D	E
	mm	Ø	mm	mm	mm	mm	mm
PP1020.3 / PP1021.03	15	1/2"	72	187	178	96	30
PP1020.4 / PP1021.04	20	3/4"	81	191	185	96	36
PP1020.5 / PP1021.05	25	1"	97	195	185	96	42
PP1020.6 / PP1021.06	32	1 1/4"	112	244	234	112	51
PP1020.7 / PP1021.07	40	1 1/2"	127	254	240	112	61
PP1020.8 / PP1021.08	50	2"	142	270	248	112	71

Table 5: Standard Piston Valve Dimensions

Valve Type / Order number	Connection Size G	Orifice Size mm	Working Pressure (bar)		Pilot Pressure (bar)		Control Cylinder Ø	KV lt/ min	Fluid Temperature °C		Seat	Weight kg
			Min	Max	Min	Max			Min	Max		
PP1020.03	1/2"	15	-1	16	4	8	63	98	-20	180	PTFE	2,150
PP1020.04	3/4"	20	-1	12	4	8	63	170	-20	180	PTFE	2,300
PP1020.05	1"	25	-1	8	4	8	63	305	-20	180	PTFE	2,600
PP1020.06	1 1/4"	32	-1	12	4	8	80	460	-20	180	PTFE	4,600
PP1020.07	1 1/2"	40	-1	8	4	8	80	750	-20	180	PTFE	5,350
PP1020.08	2"	50	-1	6	4	8	80	1050	-20	180	PTFE	5,200

Table 6: General Dimension of the Normally Closed Standard Piston Valves

Valve Type / Order number	Connection Size G	Orifice Size mm	Working Pressure (bar)		Pilot Pressure (bar)		Control Cylinder Ø	KV lt/ min	Fluid Temperature °C		Seat	Weight kg
			Min	Max	Min	Max			Min	Max		
PP1021.03	1/2"	15	-1	10	4	8	63	98	-20	180	PTFE	2,150
PP1021.04	3/4"	20	-1	10	4	8	63	170	-20	180	PTFE	2,300
PP1021.05	1"	25	-1	8	4	8	63	305	-20	180	PTFE	2,600
PP1021.06	1 1/4"	32	-1	8	4	8	80	460	-20	180	PTFE	4,600
PP1021.07	1 1/2"	40	-1	6	4	8	80	750	-20	180	PTFE	5,350
PP1021.08	2"	50	-1	6	4	8	80	1050	-20	180	PTFE	5,200

Table 7: General Dimensions of the Normally Open Standard Piston Valves

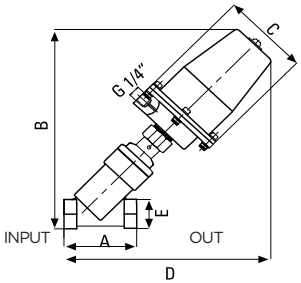


Figure 5 : Standard High Pressure Piston Valve

Type	DN	G	A	B	C	D	E
	mm	Ø	mm	mm	mm	mm	mm
PP1070.03	15	1/2"	72	188	110	210	30
PP1070.04	20	3/4"	81	195	110	210	36
PP1070.05	25	1"	97	197	110	215	42

Table 8 : Standard High Pressure Piston Valve Sizes

Valve Type / Order number	Connection Size G	Orifice Size mm	Working Pressure (bar)		Pilot Pressure (bar)		Control Cylinder Ø	KV lt/ min	Fluid Temperature °C		Seat	Weight kg
			Min	Max	Min	Max			Min	Max		
PP1070.03	1/2"	15	-1	40	4	8	63	98	-20	180	PTFE	3,350
PP1070.04	3/4"	20	-1	30	4	8	63	170	-20	180	PTFE	3,580
PP1070.05	1"	25	-1	20	4	8	63	305	-20	180	PTFE	4,050

Tablo 9: General Dimensions of Normally Closed High Pressure Piston Valves

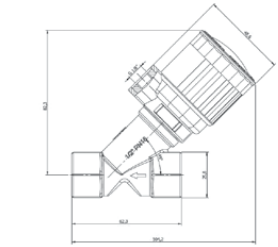


Figure 6 : Mini Plastic Cap Piston Valve

Type	A	B	C	D	E
	mm	mm	mm	mm	mm
PP1030.02	62.3	82.3	48.6	104.2	25.8
PP1030.03	62.3	82.3	48.6	104.2	25.8

Table 10: Mini Plastic Cap Piston Valve Sizes

Valve Type / Order number	Connection Size G	Working Pressure (bar)		Pilot Pressure (bar)		Control Cylinder Ø	KV lt/ min	Fluid Temperature °C		Seat	Weight kg
		Min	Max	Min	Max			Min	Max		
PP1030.02	3/8"	-1	16	4	8	31	50	-20	110	PTFE	0,41
PP1030.03	1/2"	-1	16	4	8	31	70	-20	110	PTFE	0,36

Table 11: General Dimension of Mini Plastic Cap Piston Valve

e. Warning Signs and Labeling

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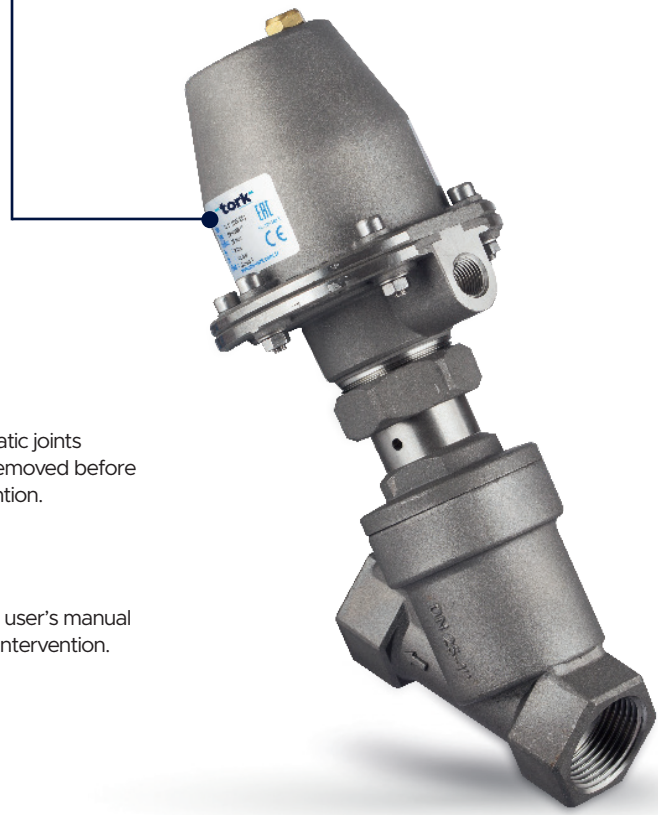
0045

Pneumatic Piston Valves

Ts: -20/180 °C

Size	:	G 1/2" (DN15)
Type	:	PP102003
Orifice	:	15 mm
Ps	:	16 bar
Pt	:	24 bar
Fluid	:	Group 1



The pneumatic joints should be removed before any intervention.

Refer to the user's manual before any intervention.

2. OPERATION OF THE EQUIPMENT

a. Normally Closed Valve Operation

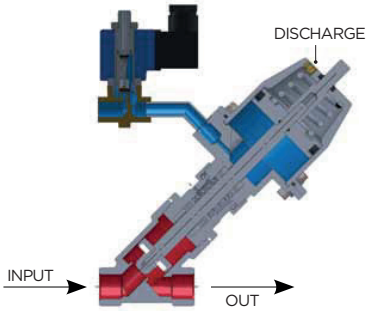


Figure 7: When Power On

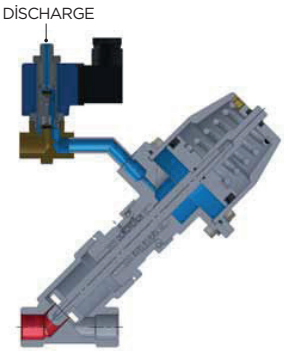


Figure 8: When Power Off

In order to turn on the valve to normally open position the solenoid valve is given power; the pressure air piston push the spring up; the inner air is discharged through air piston output and the valve orifice is opened; and thus the fluid flows in this way. (Figure 8)

When the power given to Solenoid valve is cut, the pressure air used for opening the piston valve is discharged through the solenoid valve output. The spring pushes the piston shaft to its place in a position that allows closing the valve orifice. Thus, the fluid flow stops. (Figure 9)

b. Normally Open Valve Operation

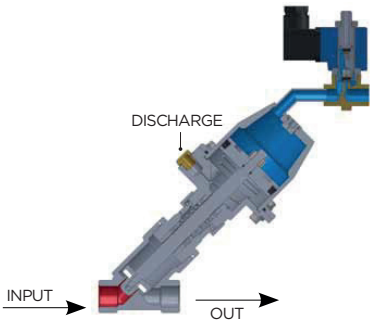


Figure 9: When Power On

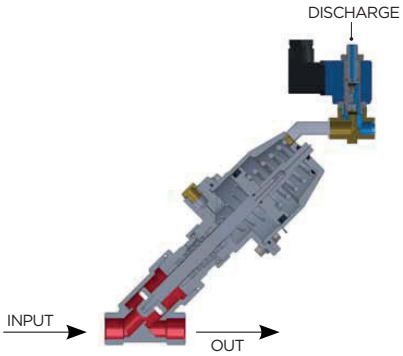


Figure 10: When Power Off

In order to turn on the valve to normally closed position the solenoid valve is given power; the pressure air piston pushes the spring down; the inner air is discharged through air piston output and the valve orifice is closed; and thus the fluid flow stops in this way. (Figure 10)

When the power of the solenoid valve is cut, the pressure air used for closing the piston valve is discharged through solenoid valve output. The spring pushes the piston shaft to its place in a position that allows opening the valve orifice. Thus, the fluid flows. (Figure 11)

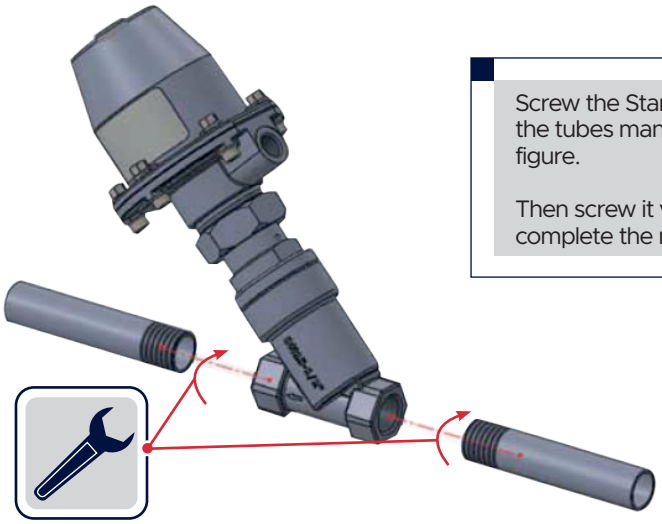
Please do not combine the Standard Piston valve with the installation through welding method.

Please check to assure that flow direction in line with the arrow direction on the valve, when assembling the installation.

Please use filtered and lubricated pressure air.

3. CONNECTING THE PNEUMATIC PISTON VALVE TO THE INSTALLATION

a- Connecting Pneumatic Piston Valves to Plumbing



Screw the Standard Piston valve into the tubes manually as shown in the figure.

Then screw it via a relevant wrench to complete the mounting.

Figure 11: Standard Piston Valve Assembly

Weld the welded piston valve with the tubes as shown in the figure.

Please keep the valve undamaged while welding.

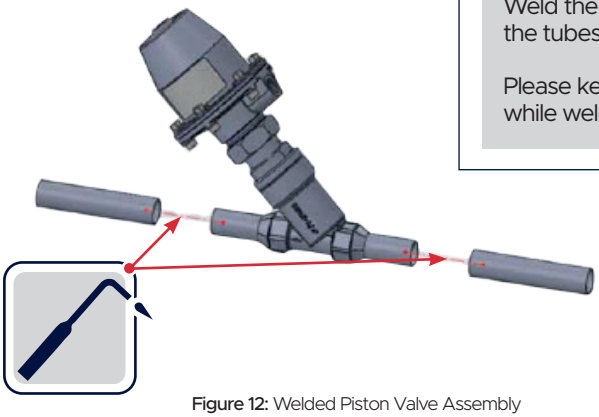


Figure 12: Welded Piston Valve Assembly

Please screw the bolts and cover nuts in accordance with their line numbers as shown in figure.

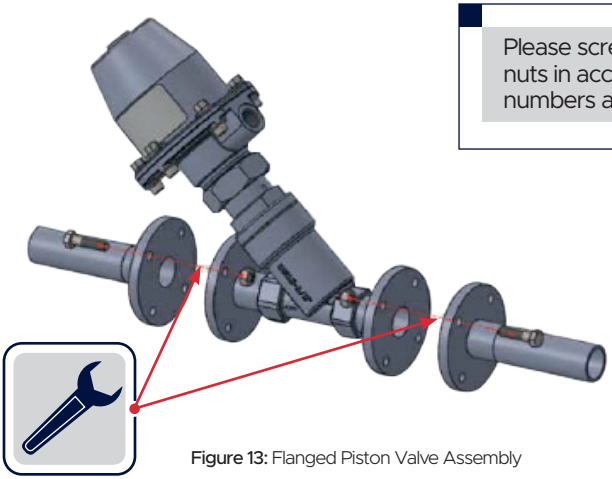
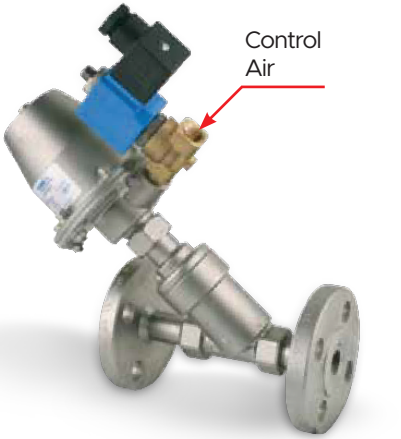


Figure 13: Flanged Piston Valve Assembly

b- Installation of Pneumatic Piston Valves to Air Installation

The pneumatic actuated angle seat valves are non-return valves and they should be assembled to the installation with intermediate coupling parts according to the arrow-direction on the valves. The pneumatic piston valve is assembled to the air installation as follows:

■ S101501018E.006



The air input G1/4'' on the pneumatic piston valve is connected fixed end connection, to which air intake hose is mounted.

In order to provide air control, ¼''-3/2-way solenoid valve (Tork S101501018E.006) is connected to the air intake G ¼'' on the pneumatic piston valve by means of nipple G ¼'', while the other end of the solenoid valve is connected fixed end connection G ¼''. Finally, a control air intake hose of 4-6 is connected to this fixed end connection.

Before assembly, please make sure that there are no damages with the product and all required parts are available. The product should not be accepted in the case that it is damaged or if there are missing parts.

Before using our products, please check the labels and other information on the product and package.

Before assembly, please make sure that the line pressure does not exceed the maximum pressure specified on the product label.

Before assembly, please check the compatibility of the product to be assembled with the system to be used. The operating limits specified in the technical specifications section should not be exceeded.

4. PRODUCT CARE

TORK Pneumatic Piston Valve consists of two main groups.

1- The Body is the part where the fluid flows and the orifice exists. The fluid chokes up the orifice in time and therefore it should be cleaned.
2- The actuator is the part where the compressed spring is found and the linear motion takes place for turning on and off functions. The adjustment includes cover nut, cylinder, cover, spring, sealing component, and acorn cover nut and motion system. The motion system consists of shaft, piston, tap bolt, hydraulic seal assemblage. The piston in the motion installation composed of hydraulic seal assemblage. The hydraulic seal in the motion installation (on-off system) is worn out in time and the piston losses air. In this case, the hydraulic seal should be replaced. The disassembly and assembly of the pneumatic piston valve for care and maintenance should be conducted in accordance with the following measures: (See Figure 2, Figure 3, Figure 4)

a- Disassembly

1. Cut the pilot air connected to the piston valve and make sure that the valve is at the open position if it is a Normally Open valve, and that the valve is closed if it is a Normally Closed one.
2. Make sure that no flows in the installation.
3. Remove the pneumatic piston valve from the installation it is already installed.
4. Blow 6 bar air through air hose G 1/4" on the cover.
5. Fix the body any place and the remove the intermediate coupling via wrench.
6. Cut the 6 bar air blown through the air hose G ¼" on the cover and remove the fixed end connection G 1/4".
7. Remove acorn cover nut via wrench and the orifice plate from the motion system.
8. Remove the hexagonal cover nut via wrench.
9. Place the cylinder vertically on the ground in a manner that the shaft in the motion system stays at the top side.
10. Compress the shaft in the motion system by applying pressure from the top side.
11. Remove cylinder cover bolts and slowly up rear the piston and remove the pressure on the shaft.
12. Do the essential maintenance and care.

b- Assembly

1. Place the cylinder on a smooth surface.
2. Place the spring into the cylinder; the motion system on the spring; and the cylinder cover on the spring.
3. Slowly apply pressure vertically to the shaft in the motion system via piston to contact the cylinder cover with the cylinder.
4. Screw the cylinder cover bolts.
5. Remove the piston pressure on the shaft in the motion system.
6. Place the motion system shaft between the intermediate coupling and hexagonal cover nut.

7. Screw manually the hexagonal cover nut until taking up.
8. Assemble the orifice plate to the shaft via acorn cover nut.
9. Blow 6 bar air to the air intake hose G ¼" on the cylinder.

Never disassemble the Pneumatic Piston Valve while it is under air pressure.

Only the authorized persons should conduct assembly and disassembly of the pneumatic valve

5. PRODUCT SHIPMENT

During shipment, the valve should not fall down or be exposed to solid impact. The weights that may damage the valve should not be placed on the packages of the pneumatic piston valves. The products should be shipped in their original cardboard boxes.

6. PRODUCT WARRANTY PERIOD

The warranty period for the TORK brand Pneumatic piston valves is two years. The maximum repair period is 20 days. The warranty does not include products if the valves are used out of scope of the terms of use specified when ordered from our company or in case of breaks resulted from the user's fault when the user try to conduct the care and repair of the product.

To benefit from the warranty, please apply to the manufacturer company with the warranty certificate approved by the company within the warranty period. In the case when you send the pneumatic piston valve via courier, please remember to add a description your complaint, the photocopy of your warranty certificate, your address and telephone number.

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TSE COVID-19
SAFE PRODUCTION CERTIFICATE
TURKISH STANDARDS INSTITUTION
bsi.
Tescil Sertifikası
İŞ SAĞLIĞI VE GÜVENLİĞİ YÖNETİM SİSTEMİ
OHS 647637
IEP ENERGY PETROLEUM INSTITUTE
Internal Production Control Certificate
ZERTIFIKAT
Certificate
CE 0036
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Certificate of Registration
QUALITY MANAGEMENT SYSTEM - ISO 9001:2008
SMS-Tork Endüstriyel Otomasyon Ürünleri
Sanayi ve Ticaret Ltd. Sti.
Bostancı Yolu Kuru Sokak No : 16
Yukarı Dudullu
Ümraniye/İstanbul
34776
Turkey
FM 647592
Design, production and sales of industrial valves, automation, control and measurement equipment
Original Registration Date: 04/06/2013
Latest Revision Date: 31/05/2016
Effective Date: 31/05/2016
Expiry Date: 14/09/2018
Page: 1 of 2
...making excellence a habit.
IAF
ANAB

WARRANTY PERIOD FOR THE PRODUCT

1) The period of warranty shall start from the date of delivery of the product to the customer and shall cover a period of 2 years.
2) Every and all parts of the product are under SMS Sanayi Malzemeleri Üretim ve Satısı A.S. warranty coverage. (against any defect that may occur during production, assembly and/or defective parts)
3) In the case that the product fails within warranty period, the time spent on the repair work is added to the warranty period. Repair time of the product is maximum 20 (twenty) working days. This time starts from the date on which the failure concerning the product is notified to the service station and to seller of the product, dealer, agency, representative, importer or producer. It is possible to make the consumer failure notification by telephone, fax, e-mail, registered mail or similar. However, in case of disagreement, the obligation of proof belongs to the consumer.
4) Product replacement or refund is mandatory depending on the choice of the consumer in case one of the conditions below:
a) If failure occurs in the product at least four times in one year or six times with the condition of being within the warranty period.
b) If the maximum time for its repair is exceeded.
c) In case a service station is not exist by a report issued by seller, dealer, agency, representative, importer or producer respectively that, repair of the failure is not possible, exchange process will be carried out free of charge.
d) The warranty period of the products changed during the warranty condition is limited to the remaining warranty period of the purchased products.
5) Free repair and product exchange obligations will be annulled under the following conditions:
a) If the product becomes faulty due to use contrary to the terms or conditions stated in the user guide,
b) If the product serial number has been altered or removed
c) The warranty labels have been destroyed,
d) If the product has been opened, used, or previously repaired by unauthorized persons,
e) Use of the product by plugging into inappropriate voltages or with faulty electric installation without the prior knowledge of our authorized services,
f) If the fault or damage to the product occurred during the transportation outside of the responsibility of SMS Sanayi Malzemeleri Üretim ve Satısı A.S.,
g) When our product is damaged due to use with accessories or devices purchased from other firms or unauthorized services,
h) Those damages caused by natural disasters such as fire, lightning, flood, earthquake, etc.
6) A report prepared by the SMS Sanayi Malzemeleri Üretim ve Satısı A.S. will determine whether the damage was caused by improper use.
7) The warranty certificate should be kept throughout the warranty period. The customer must provide the warranty certificate
during request for repair. Otherwise, the cost of repair will be charged.
8) The warranty certificate attached to the product during sale should be fully completed by the retailer and customer, signed and stamped. The customer copy must be immediately provided to the customer, followed by the other piece to be mailed out to SMS
Sanayi Malzemeleri Üretim ve Satısı A.S. by the retailer.
9) In the case when you send the product via courier, please remember to add a description your complaint, the photocopy of your warranty certificate, your address and telephone number.
10) For possible problems which may arise concerning the warranty certificate, it can be applied to the Ministry of Customs and Trade, Directorate General of Consumer Protection and Market Surveillance.

valve & automation

WARRANTY CERTIFICATE

Manufacturer	: SMS Sanayi Malzemeleri Üretim ve Satışı A.Ş.
Address	
Head Office	: Y.Dudullu Mh. Bostancı Yolu Kuru Sk. No:16 Ümraniye - İstanbul / TURKEY
Factory	: İMES O.S.B 5. Cd. No: 6 Çerkeşli OSB Mh. Dilovası - Kocaeli / TURKEY
Product	: PNEUMATIC PISTON VALVE
Trade Mark	: TORK
Model	:.....
Serial Number	: .....
Delivery Place & Date	: .....
Warranty Period	: 2 Years
Max. Repair Time	: 20 working days
Seller / Distributor	: .....
Address	: .....
	.....
	.....
	.....

Manufacturer Representative		Seller / Distrubutor Representative	
Name / Surname	:	Name / Surname	:
Title	:	Title	:
Date	:	Tarih	:
Signature	:	Signature	:

HEAD OFFICE Bostancı Yolu Cad, Kuru Sok, No16 Y. Dudullu, 34776 Ümraniye-İstanbul - TURKEY **T** +90 216 364 34 05 **F** +90 216 364 37 57

FACTORY İMES O.S.B. 5. Cad. No6 Çerkeşli O.S.B. Mah. Dilovası-Kocaeli - TURKEY **T** +90 262 290 20 20 **F** +90 262 290 20 21

SMS-TORK Endüstriyel Otomasyon Ürünleri San. Tic. Ltd. Şti.

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