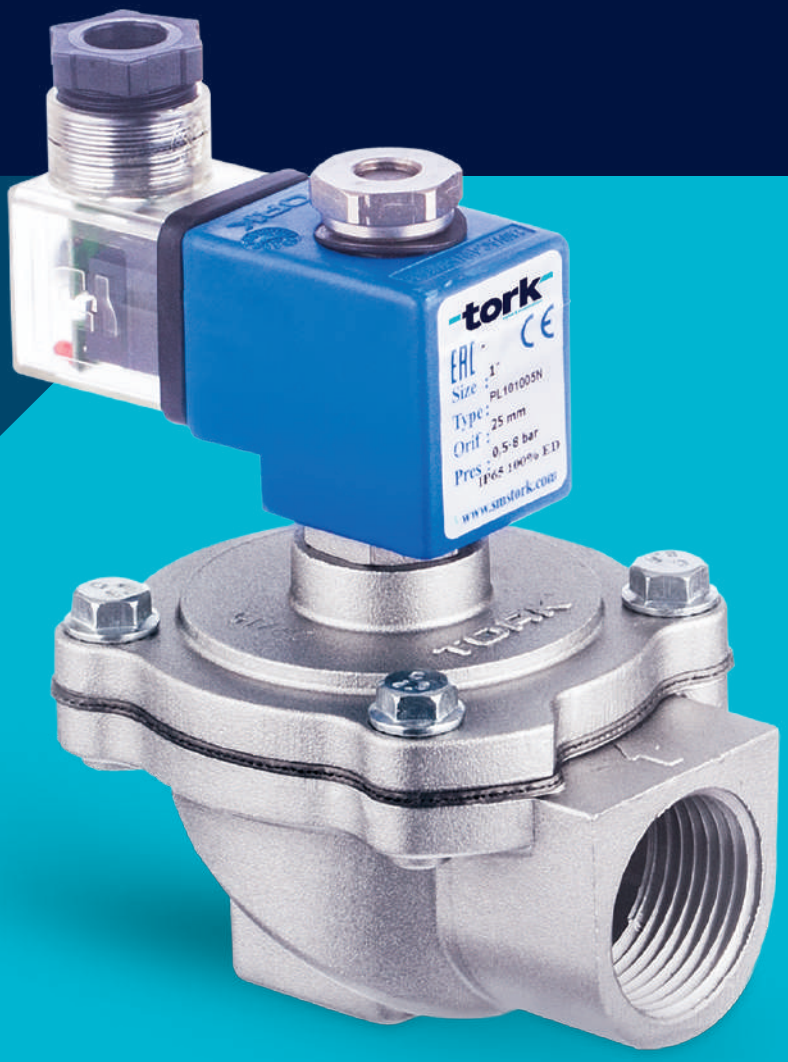
tork

valve & automation

PULSE VALVE USER'S MANUAL



SIL 3 ROHS ATEX

ISO 9001 Quality Management | ISO 14001 Environmental Management | OHSAS 18001 Occupational Health and Safety Management | TS 16949 Automotive Quality Management

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1. Product Overview

a. Intended Use of the Product

Pulse valves are designed for using on dust collecting or and the like systems. It's used mostly for cleaning and preventing from being hardened the gathered dust on jet filters at such industries like thermal power plants, detergent, glass; feed, cement, iron and steel.

Figure 1: Pulse Valve Product Group

Pulse valves have a compact design, high reliability, fast flow rate, high quality and performance. These valves have a long life as well. In system applications, pulse valves have efficient solutions by their ultra fast switching performances. Their high qualified diaphragms are high resistive to erosion. They can work under heavy conditions and they are guaranteed on these heavy conditions.

b. Product Coding System

P L 1 0 X X . X X

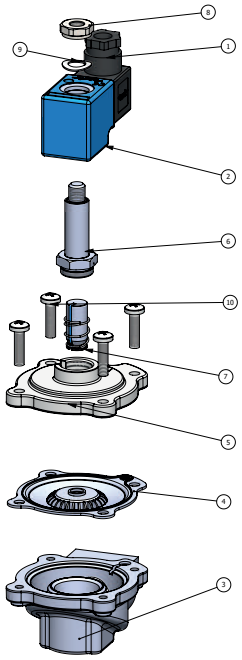
PL	Standard Pulse Valve
PX	Explosive Proof Pulse Valve

10	Standard Coil Pulse Valve
20	Remote Control (Without Coil) Pulse Valve
30	Coupling Connection Standard Coil Pulse Valve
50	Coupling Connection Remote Control (Without Coil) Pulse Valve
70	Flanged and Coupling Connection Standard Coil Pulse Valve

SIZE	
00	1/8″
01	1/4″
02	3/8″
03	1/2″
04	3/4″
05	1″
06	11/4″
07	11/2″
08	2″
09	21/2″
10	3″

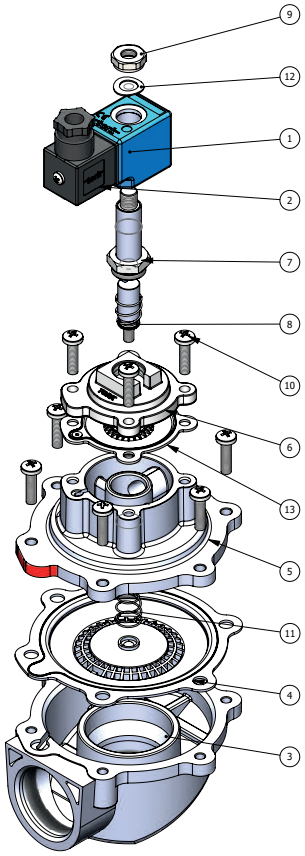
Note: Diaphragm material can be selected as thermoplastic, NBR and Viton according to customer demand.

c. List of Exploded Pictures and Parts



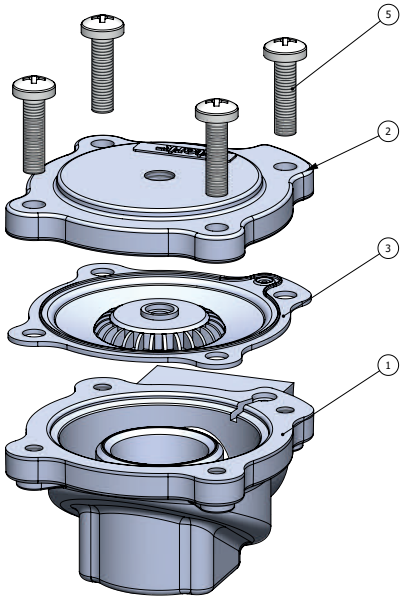
No	Part Name
10	Bolt
9	Washer
8	Coil Nut
7	Core
6	Core Tube
5	Cover
4	Diaphragm
3	Body
2	Coil
1	Socket

Figure 2: Standard Pulse Valve With Coil G3/4", G1"



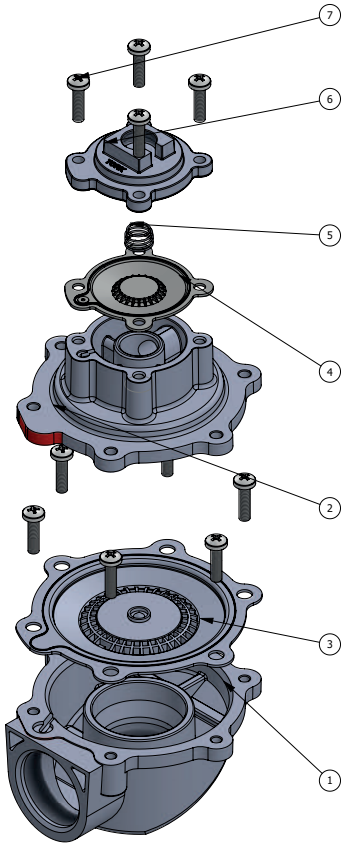
No	Part Name
13	Diaphragm
12	Washer
11	Spring
10	Bolt
9	Nut
8	Core
7	Core Tube
6	Cover
5	Cover
4	Diaphragm
3	Body
2	Socket
1	Coil

Figure 3: Standard Pulse Valve With Coil G1 ½"



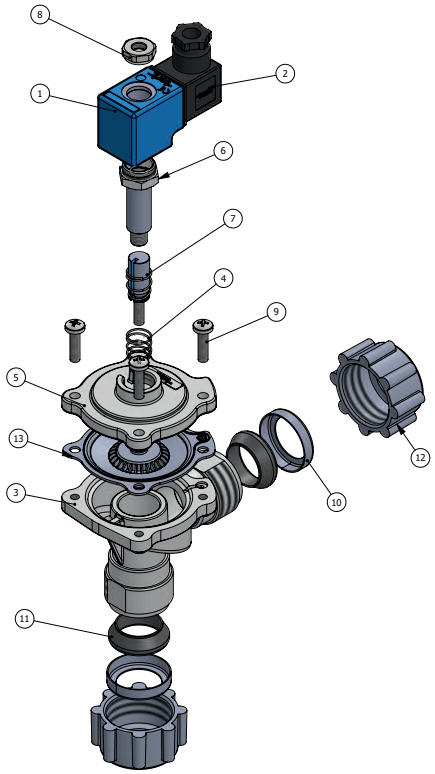
No	Part Name
4	Bolt
3	Diaphragm
2	Cover
1	Body

Figure 4: Remote Controlled Pulse Valve Without Coil G3/4", G1"



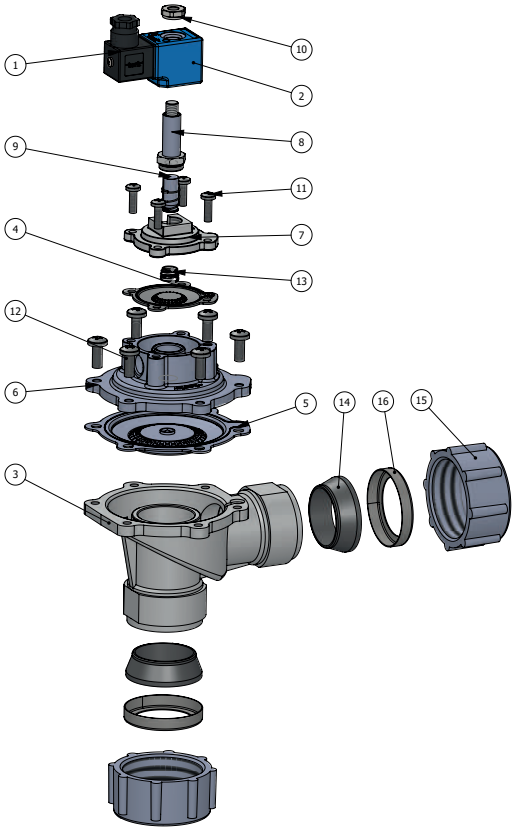
No	Part Name
7	Bolt
6	Cover
5	Spring
4	Diaphragm
3	Diaphragm
2	Cover
1	Body

Figure 5: Remote Controlled Pulse Valve Without Coil G1 ½"



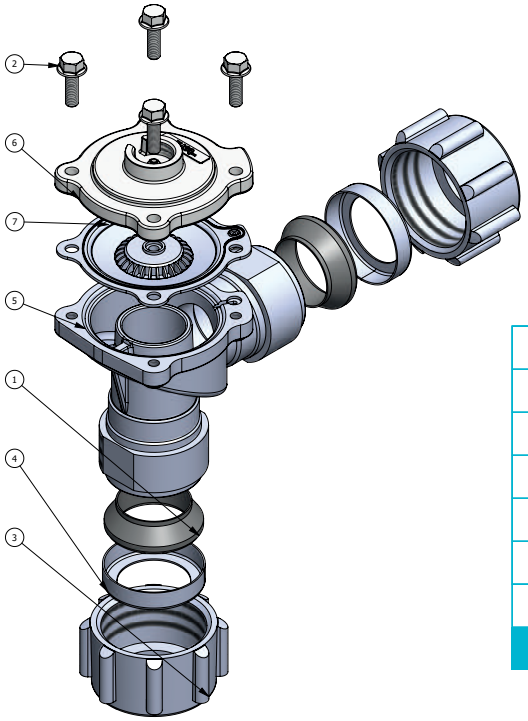
No	Part Name
13	Diaphragm
12	Pipe Fitting Element
11	Gasket
10	Sheet Metal Element
9	Bolt
8	Nut
7	Core
6	Core Tube
5	Cover
4	Spring
3	Body
2	Socket
1	Coil

Figure 6: Coupling Connection Standard Pulse Valve With Coil G3/4", G1"



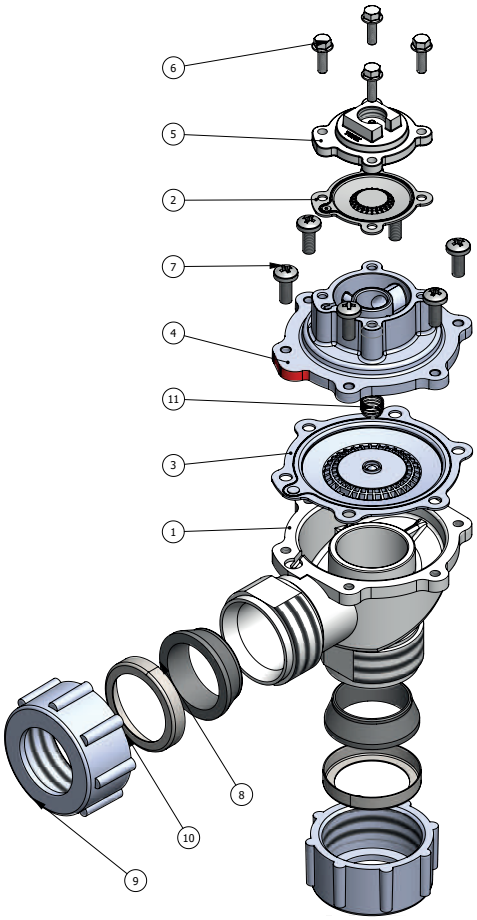
No	Part Name
16	Sheet Metal Element
15	Pipe Fitting Element
14	Gasket
13	Spring
12	Bolt
11	Bolt
10	Nut
9	Core
8	Core Tube
7	Cover
6	Cover
5	Diaphragm
4	Diaphragm
3	Body
2	Coil
1	Socket

Figure 7: Coupling Connection Standard Pulse Valve With Coil G1 1/2"



No	Part Name
7	Diaphragm
6	Cover
5	Diyafram
4	Sheet Metal Element
3	Pipe Fitting Element
2	Bolt
1	Gasket

Figure 8: Coupling Connection Standard Pulse Valve Without Coil G3/4", G1"



Part Name	
11	Spring
10	Sheet Metal Element
9	Pipe Fitting Element
8	Gasket
7	Bolt
6	Bolt
5	Cover
4	Cover
3	Diaphragm
2	Diaphragm
1	Body

Figure 9: Coupling Connection High Pressure Pulse Valve Without Coil G1 "

d. Technical Specification

Type	Pulse Valve
Connection	Gear, coupling connection, flange
Position	Normally Closed
Way Unit Quantity	2/2
Fluid	Air
Minimum Operating Differential Pressure	0,5 Bar
Operating Temperature	-40°C/+160°C
Sealing Material	Thermoplastic
Metal Material	Aluminum
Interior Parts Supplies	Stainless Steel
Shading Ring	Copper
Coil	AC 12V, 24V, 48V, 110V, 230V / DC 12V, 24V, 48V, 110V
Opening time	100 ms
Closing time	100 ms
Direction of Mounting	Flow, should be the direction of the arrow direction.

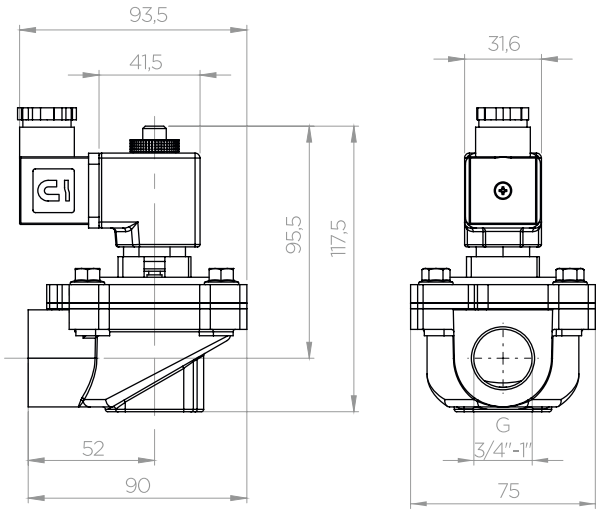


Figure 10: Standard Pulse Valve With Coil Sizes G3/4", G1"

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1010	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1010.08	2"	50	3	8	1065	-10	80	NBR	2,25
						-10	160	Viton	
PL1010.09	2 1/2"	62	3	8	1378	-10	80	NBR	3,47
						-10	160	Viton	
PL1010.10	3"	76	3	8	2040	-10	80	NBR	3,8
						-10	160	Viton	

Table 1: General Specifications of Standard Pulse Valve With Coil G3/4", G1", G 1 1/2"

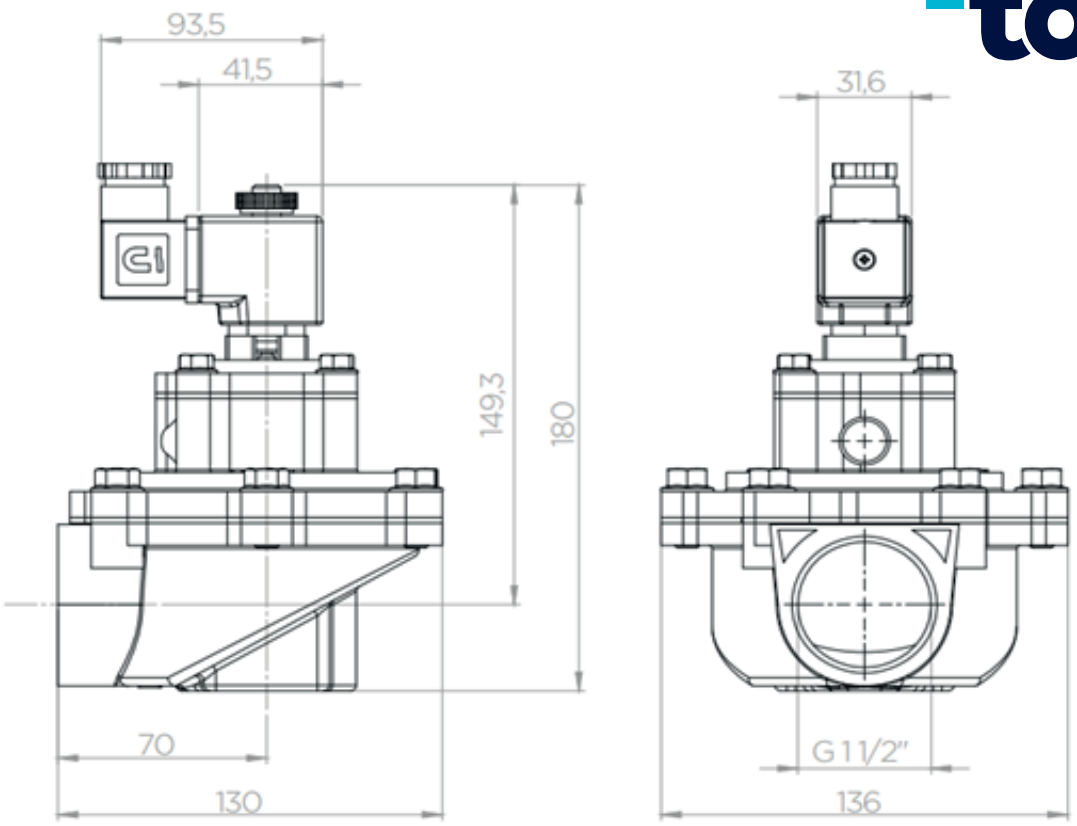


Figure 11: Standard Pulse Valve With Coil Size G1 ½"

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1010	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1010.08	2"	50	3	8	1065	-10	80	NBR	2,25
						-10	160	Viton	
PL1010.09	2 1/2"	62	3	8	1378	-10	80	NBR	3,47
						-10	160	Viton	
PL1010.10	3"	76	3	8	2040	-10	80	NBR	3,8
						-10	160	Viton	

Table 2: General Specifications of Standard Pulse Valve with Coil G2", G1 ½", G3

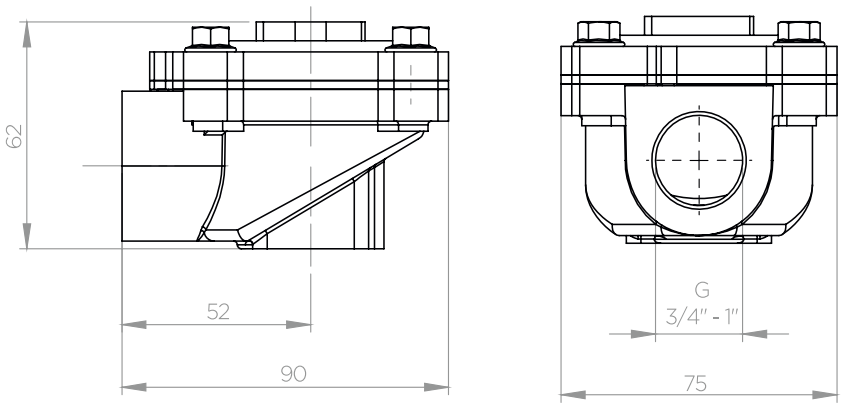
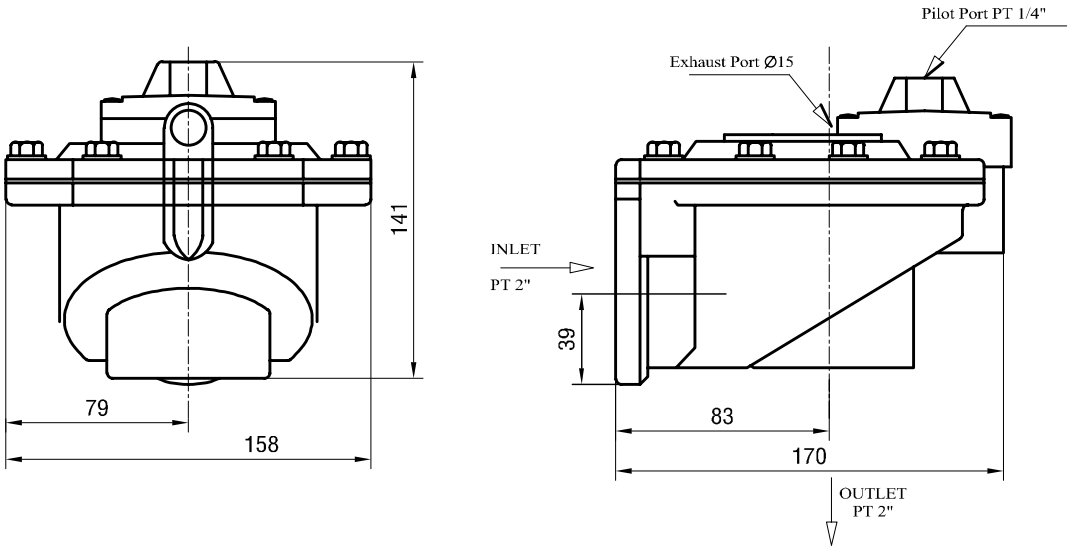


Figure 12: Remote Controlled Pulse Valve Without Coil Sizes G3/4", G1"

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1020	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1020.04	3/4”	25	0,5	8	150	-10	80	NBR	0,69
						-10	160	Viton	
						-40	120	Thermoplastic	
PL1020.05	1”	30	0,5	8	270	-10	80	NBR	0,68
						-10	160	Viton	
						-40	120	Thermoplastic	
PL1020.07	1 1/2”	44	0,5	8	774	-10	80	NBR	1,4
						-10	160	Viton	
						-40	120	Thermoplastic	

Table 3: General Specifications of Remote Controlled Pulse Valve Without Coil G3/4”, G1”, G1 ½”



Remote Controlled Pulse Valve Without Coil Sizes G2”, G2 ½”, G3”

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1020	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1020.08	2”	50	3	8	1065	-10	80	NBR	2,25
						-10	160	Viton	
PL1020.09	2 1/2”	62	3	8	1378	-10	80	NBR	3,47
						-10	160	Viton	
PL1020.10	3”	76	3	8	2040	-10	80	NBR	3,8
						-10	160	Viton	

Table 4: General Specifications of Remote Controlled Pulse Valve Without Coil G2”, G2 ½”, G3”

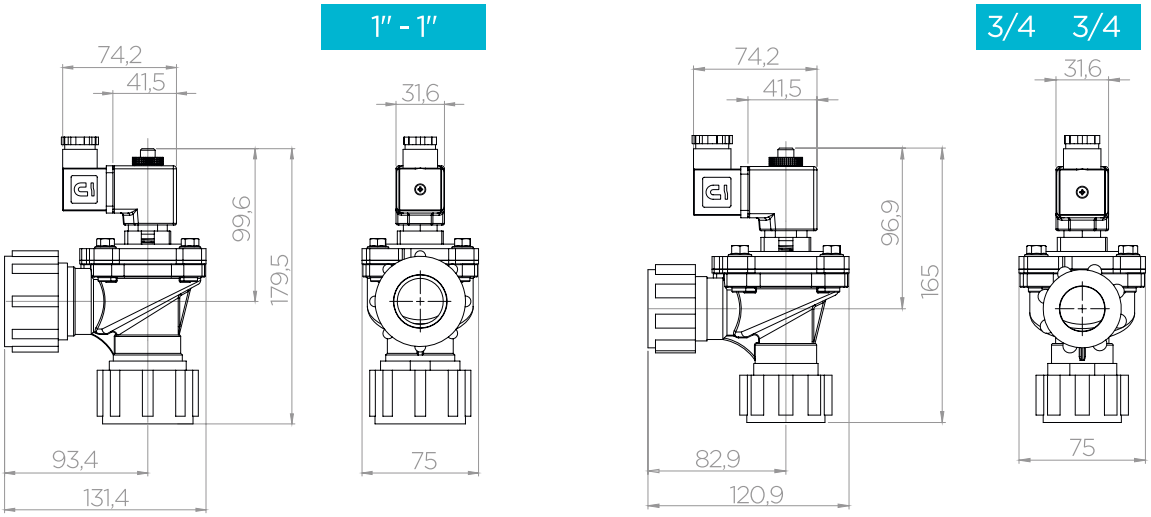


Figure 14: Coupling Connection Standard Pulse Valve With Coil Sizes G3/4", G1"

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1030	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1030.04	3/4"	25	0,5	8	150	-10	80	NBR	0,69
						-10	160	Viton	
						-40	120	Thermoplastic	
PL1030.05	1"	30	0,5	8	270	-10	80	NBR	0,68
						-10	160	Viton	
						-40	120	Thermoplastic	
PL1030.07	1 1/2"	44	0,5	8	774	-10	80	NBR	1,4
						-10	160	Viton	
						-40	120	Thermoplastic	

Table 5: General Specification of Coupling Connection Standard Pulse Valve With Coil G3/4", G1", G1 "

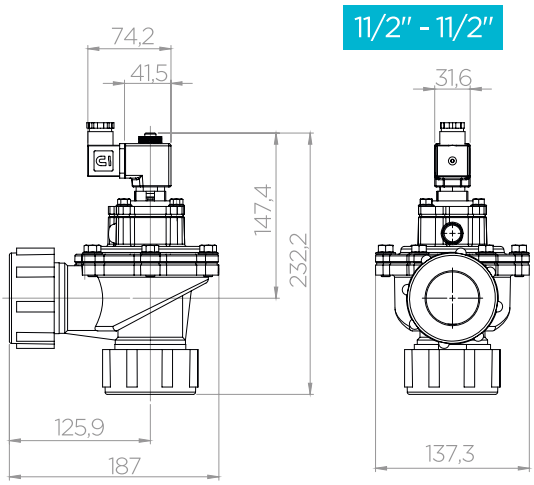


Figure 15: Coupling Connection Standard Pulse Valve With Coil Size G1 1/2"

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1050	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1050.04	3/4" - 3/4"	25	0,5	8	150	-10	80	NBR	0,55
						-10	160	Viton	
						-40	120	Thermoplastic	
PL1050.05	1" - 1"	30	0,5	8	270	-10	80	NBR	0,86
						-10	160	Viton	
						-40	120	Thermoplastic	
PL1050.07	1 1/2" - 1 1/2"	44	0,5	8	774	-10	80	NBR	1,67
						-10	160	Viton	
						-40	120	Thermoplastic	

Table 6: General Specification of Coupling Connection Standard Pulse Valve Without Coil G3/4", G1", G1 ½

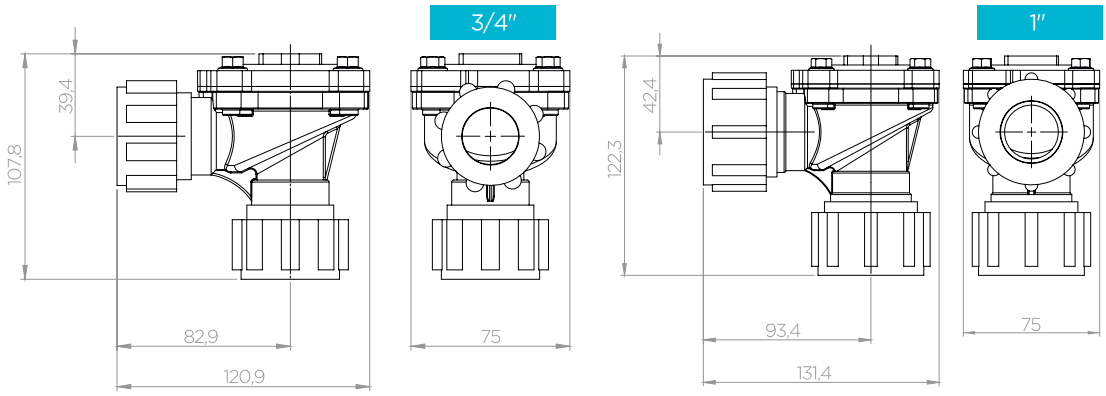


Figure 16: Coupling Connection Standard Pulse Valve With Coil Size G3/4", G1"

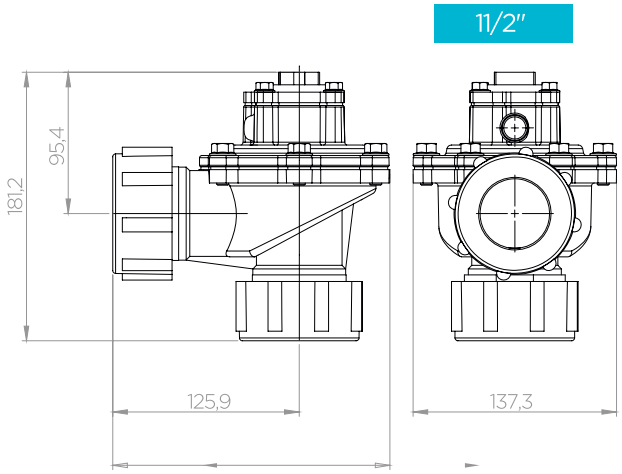
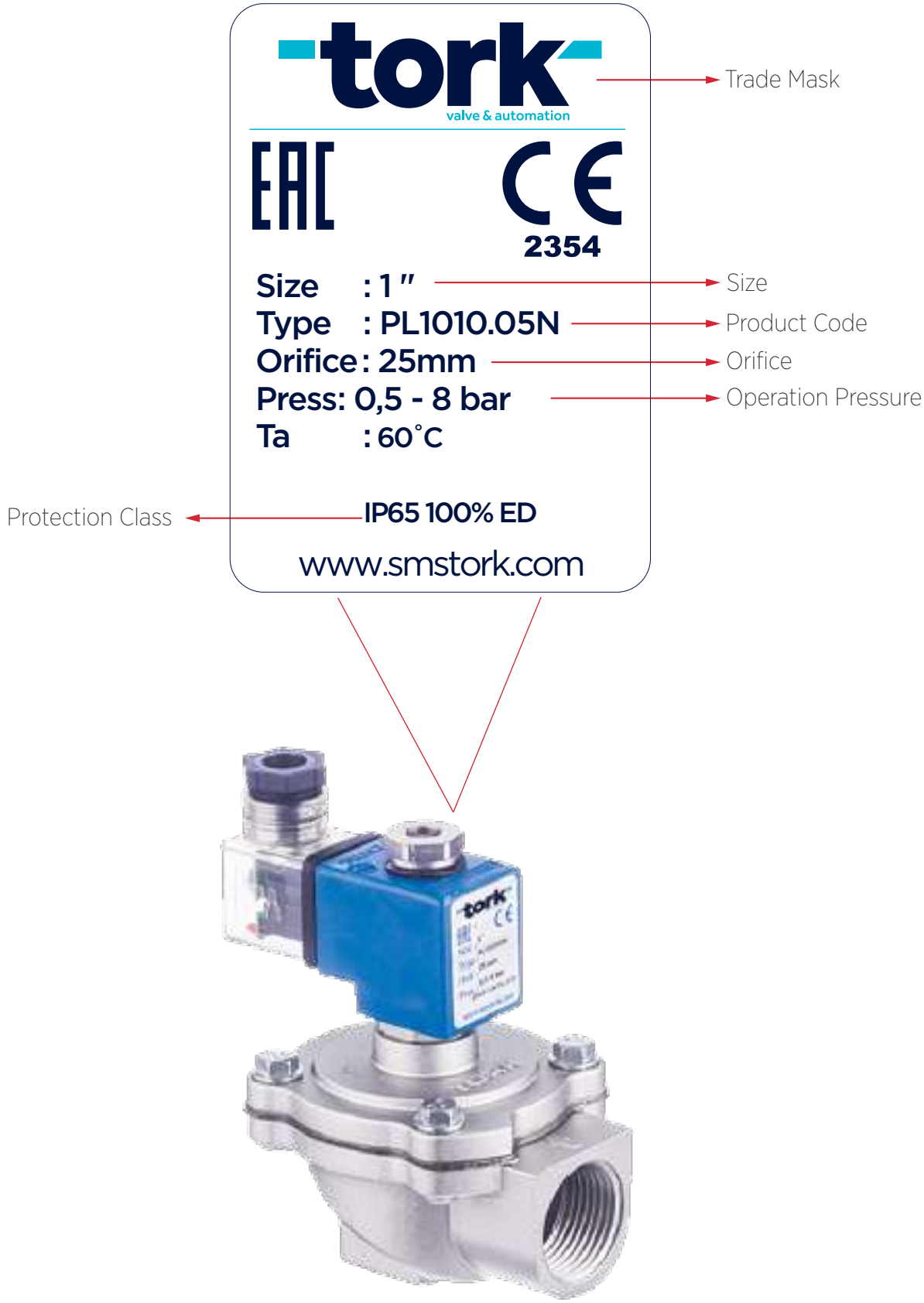


Figure 17: Coupling Connection Standard Pulse Valve With Coil Size G1 1/2"

Valve Order No	Connection Size	Orifice Size	Pressure		Kv	Fluid Temperature		Sealing	Weight
PL1070	G	mm	bar		Lt/min	°C			(kg)
			min	max		min	max		
PL1070.05	1 1/2" - 1"	30	0,5	8	560	-10	80	NBR	0,92
						-10	160	Viton	
						-40	120	Thermoplastik	
PL1070.07	2" - 1 1/2"	44	0,5	8	984	-10	80	NBR	1,75
						-10	160	Viton	
						-40	120	Thermoplastik	

Table 7: General Specification of Flanged & Coupling Connection Pulse Valve With Coil

e. Labeling Details



2. Product Operation

While there is no energy on coil if there is no flow on valve it's called Normally Close. Pulse valves are normally closed valves. If supply voltage applied to the coil, the coil becomes an electromagnet and produces a magnetic force. This force makes plunger move. According to this move valve is opened. Pressurized air in the inlet of the normally closed solenoid valve makes pressure to the diaphragm from down to up. The entire surface of the diaphragm is affected from this pressure equally. Pressurized air passes from 1-2mm diameter hole of the diaphragm to the upper surface of it. So this surface is sustained to the pressure. Two side of the diaphragm and under of solenoid valve's cover are filled entirely by pressurized air and this entrained pressurized air waits on this part. On the solenoid valve's cover there are coil and plunger in the tube controlling the valve. Plunger in the tube by the force of spring on it chokes the entrained airs relief way, too. When the coil energized magnetized plunger in the tube beats the spring force and release the gathered air on the diaphragm to the outside. At this time, the pressurized air under the diaphragm can't go to the up of the diaphragm in a short time and can't provide the pressure balance. Because of unbalanced pressure diaphragm moves to up and valve becomes open. The shock happens in that way.

Figure 18: Working of normally closed valve (a) energized, (b) not energized.'

This motion happens two times by double diaphragm. Firstly, small diaphragm's air is released. So, small diaphragm releases big diaphragm's air. By this way the differential pressure is provided fast and shock is more violent two times. After shock valve will be normally open. 50-120 milliseconds, coil energized and shocking happens. Shocking rate is determined by customer.

3. Product Installation

Before the installation, product and its parts must be controlled. If there is a damage or missing part product does not be received.

Before using the product label must be controlled if product, label, box and other informations are proper to each other. Before the installation the written pressure level on label and line pressure must be controlled if they are proper to each other.

Before the installation it must be controlled if the product's technical specs and the system are proper to each other. The limits written on the label must not be exceeded.

Before the installation, the line that the valve will be installed must be controlled if there is a flow. On the line there must be no flow and there is no possibility of flow during installation.

The coil gets hot in long-term operations. The hot coil may cause burnt if touched.

The power should be connected to the coil via a socket, which should be closed. The open connections may cause electric shock and short-circuits.

The coil should not run without tube. It means that it should run only when it is connected to the valve along with the tube and core. Otherwise, the conducting wire in the coil will burn and become dysfunctional within a short time.

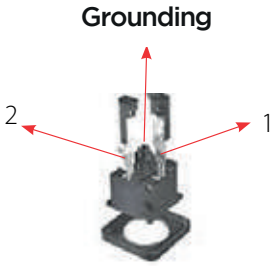
The coil should be operated along with its own cover nut. The lack of cover nut may also cause damages to the coil or not to run.

Every coil should operate under the voltage limits written on it. The higher or lower voltagesmay cause damages to the coils or not to run.

The pressure on the pulse valve should be set to zero before removing it from the system.

In critical applications like electronic cards coil must be controlled through a RELAY.

(a)



(b)

Figure 19. (a) Connector inner parts, (b) Connector connection points'

When connecting the cable ends to the connector, for AC voltages, the phase-neutral ends, and for the DC voltages, the positive (+) and negative (-) terminals should be connected to the number 1 and 2 connections. The earth terminal should be connected with the grounding conductor in the cable, if any. The grounding conductor is the yellow-green wire.

Figure 20. The position of the connecting cable (a) Right (b) Wrong

Any bending or twisting should not be found with the cable connected to the connector in order to avoid any deficits resulting from any loose contact or short-circuit due to any crush. The cable should be uprights as shown in the Figure 20 (a). In addition, the twists in the connector input may allow humidity to penetrate into the socket. In order to prevent humidity or water to leak into the connector, the diameter of the cable should be in a size that provides sealing.

a- Installation of Pulse Valves to System

TORK pulse valves can be installed with two types. One of them coil and valve's body are separated installation. Second of them coil is on the valve's body. In this type installation to the dust filter system coils are controlled by time relay and time relay controlled by differential pressure relay, too.

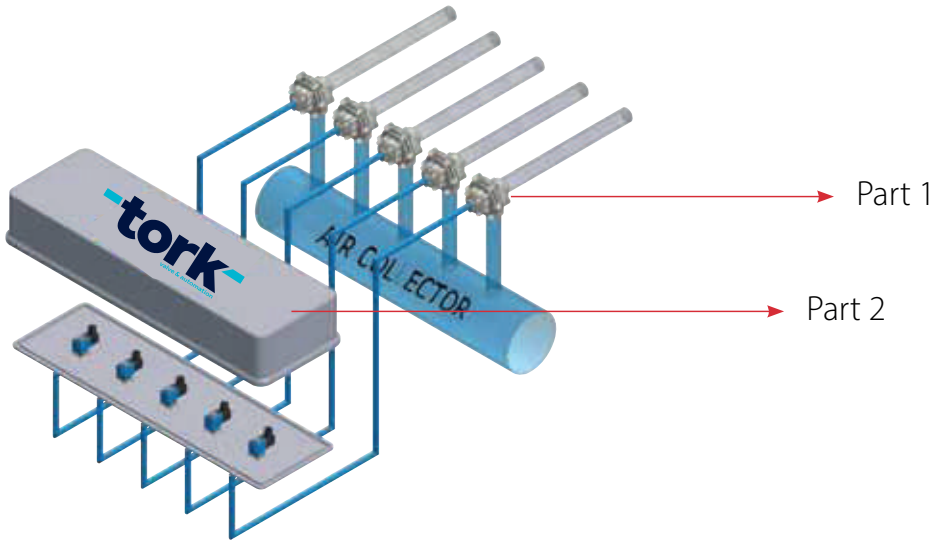


Figure 21. Installation of Pulse Valves to System

If TORK pulse valve installed as two parts, first part is valve body and second part is coil part controlling the valve's body. Separated coil's part installation type is for better protect the coil against water and dust. In this type installation electrical connection is far from valve's body. Coils are put in an aluminum box. Remote controlled pulse valves are without coil type. Also, time relay controls the coils in aluminum box. Here, air control box are linked to pulse valve's control inlet by flexible pipe outgoing from " two way solenoid valves. To make shock in the pulse valve body, the coils in the aluminum box are energized. Pulse valves make shocking in millisecond time rates.

b- Installation of Pulse Valve Timer

Timer of filter cleaner is a microprocessor based instrument used on the jet pulse filters. These filters are commonly usedby glass, cement, paint and soil and feed industries. Pulse valves prevent dust spreading and they clean the dust filters. Timer unit is installed to a wall or stayed in a panel. Mounting parts must be stayed to corners. Connection cables passing from cable cover are screwed on to terminals under the unit.

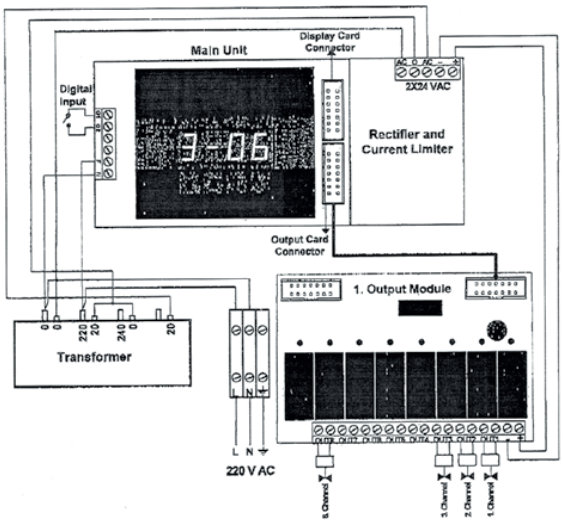


Figure 22: Pulse Valve Timer

C95 Filter Timer is covered by polyester box. Box's dimensions are 250x300x170 mm. regulating the timer and connection diagram can be seen on Figure 19. From 1 to 8 outputs have only one output module.

4. Maintenance Product

According to the exploded drawings, the solenoid valve is opened and the parts are examined and cleaned with the pressurized air. Particularly the core, diaphragm, diaphragm spring and orifice should properly be cleaned. The burrs and residuals on them should be removed. The damaged parts, if any, should be replaced with original TORK brand spare parts. The spare parts may be supplied from our company. Also plungers must be greased with a special oil (Slide 68) having specs like lubricity adjuvant, preventing erosion and holding to surface. Spare parts can be supplied from TORK.

Please be careful not to damage the sensitive inner parts during care and assembly. After any care or maintenance, the electrical connections should be checked, the required electrical measures should be taken and it should be tested if the valve is operating or not.

5. 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 pulse valves. The products should be shipped in their original cardboard boxes.

6. Warranty Period For The Product

The warranty period for the TORK brand Pulse 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 pulse 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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