

QUARTER TURN AUTOMATION

Quarter Turn Automation – Pneumatic / Electric

Automation is an ideal solution for precise control of many valves in a system, when valves are remotely located, or when the process requires constant monitoring and adjustment. Pneumatic and electric actuators can be easily fitted on our ball, multi-port, and butterfly valves. Some features and functions include normally closed, normally open, or double-acting operation; corrosion resistant aluminum bodies, pre-loaded springs, and adjustable cams. Many accessories such as visual position indicators, limit switches, 3 and 4-way solenoids, and positioners are also available. For further information, please refer to the IPEX *Industrial Technical Manual Volume IX* entitled, "Quarter Turn Automation".

PNEUMATIC ACTUATORS OVERVIEW

Pneumatic actuators are the most common choice for quarter turn plastic valves in process applications. Compressed air systems are readily available in any plant, and the cost of the actuator itself is generally lower than that of an electric unit with a comparable torque output. Typical quarter turn automation seldom requires positioning (something achieved more easily with an electric actuator), therefore the cycle life of a pneumatic unit will be substantially greater, and will be intrinsically safer than an electric actuator in volatile environments. While there are many different kinds of pneumatic actuators, a rack and pinion style is the preferred choice within the plastic piping industry. This type of actuator is quite tough and rugged, and has a high cycle life. They generally have a compact, simple construction, and certain models can be quite light in weight. The design also allows the same basic actuator to be used as a double acting or (with minor additions) a spring return unit.

DID YOU KNOW?

The three basic control functions available through quarter turn automation are:

- 1. Double Acting** – This requires external power for each stroke. For example, power to open the valve, then power to close the valve.
- 2. Normally Closed** – Also referred to as "fail safe closed", the default position is closed and the actuator requires power to open the valve.
- 3. Normally Open** – Also referred to as "fail safe open", the default position is open and the actuator requires power to close the valve.



ELECTRICAL ACTUATORS OVERVIEW

Although slightly more expensive than pneumatics, electric actuators have certain desirable benefits. They are the preferred choice when cycle time is an issue, as a quick closing pneumatically actuated valve could cause a damaging pressure surge condition (water hammer). The use of an electric actuator may also be preferred when the distance from the power source is considerable. The friction losses in long runs of compressed air line may result in reduced efficiency and/or additional compressor stations. In addition, electric actuators are the preferred (if not the only) choice when a quarterturn valve like a multi-port is used. In this case, it is possible that the travel required is not just 0° to 90° but 0° to 90° to 180°. A rack and pinion actuator would need four separate pistons and a multiplicity of related air chambers, whereas this is easily accomplished with an electric unit. Most electric actuators have a cam/limit switch arrangement which allows the unit to be set up for a variety of rotations. The two standard limit switches can be used to provide a remote location with an open or closed signal. A multitude of voltages both for AC and DC current are also typically available.



TKD SERIES PVC 3-WAY BALL VALVE – TRUE UNION, PNEUMATIC

End Connection	Size inches	Significant Number	EPDM Product Code	Significant Number	FPM Product Code
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Pneumatic – SPRING RETURN, NORMALLY OPEN

PVC w PTFE Seats, L-Port

S/T	1/2	TKDLBV103-NO	253744	TKDLBV203-NO	253750
S/T	3/4	TKDLBV104-NO	253745	TKDLBV204-NO	253751
S/T	1	TKDLBV105-NO	253746	TKDLBV205-NO	253752
S/T	1-1/4	TKDLBV106-NO	253747	TKDLBV206-NO	253753
S/T	1-1/2	TKDLBV107-NO	253748	TKDLBV207-NO	253754
S/T	2	TKDLBV108-NO	253749	TKDLBV208-NO	253755



PVC w PTFE Seats, T-Port

S/T	1/2	TKDTBV103-NO	253756	TKDTBV203-NO	253762
S/T	3/4	TKDTBV104-NO	253757	TKDTBV204-NO	253763
S/T	1	TKDTBV105-NO	253758	TKDTBV205-NO	253764
S/T	1-1/4	TKDTBV106-NO	253759	TKDTBV206-NO	253765
S/T	1-1/2	TKDTBV107-NO	253760	TKDTBV207-NO	253766
S/T	2	TKDTBV108-NO	253761	TKDTBV208-NO	253815

TKD SERIES PVC 3-WAY BALL VALVE, ELECTRIC – 100-240 VAC

End Connection	Size inches	Significant Number	EPDM Product Code	Significant Number	FPM Product Code
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Electric – DOUBLE ACTING

PVC w PTFE Seats, L-Port

S/T	1/2	TKDLBV103-EL	253720	TKDLBV203-EL	253726
S/T	3/4	TKDLBV104-EL	253721	TKDLBV204-EL	253727
S/T	1	TKDLBV105-EL	253722	TKDLBV205-EL	253728
S/T	1-1/4	TKDLBV106-EL	253723	TKDLBV206-EL	253729
S/T	1-1/2	TKDLBV107-EL	253724	TKDLBV207-EL	253730
S/T	2	TKDLBV108-EL	253725	TKDLBV208-EL	253731



PVC w PTFE Seats, T-Port

S/T	1/2	TKDTBV103-EL	253732	TKDTBV203-EL	253738
S/T	3/4	TKDTBV104-EL	253733	TKDTBV204-EL	253739
S/T	1	TKDTBV105-EL	253734	TKDTBV205-EL	253740
S/T	1-1/4	TKDTBV106-EL	253735	TKDTBV206-EL	253741
S/T	1-1/2	TKDTBV107-EL	253736	TKDTBV207-EL	253742
S/T	2	TKDTBV108-EL	253737	TKDTBV208-EL	253743

Note: Customer must specify “open” and “closed” positions for 3-way actuated valves. See technical manual for details. Electric actuators can be configured for either 90° or 180° operation.

Note: 24 VDC, 4-20 mA Positioner, Fail Safe Battery Backup available. Consult IPEX Corrosion Resistant Thermoplastic Valves Price List or IPEX Representative