

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.



i 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.



VKD SERIES BALL VALVE – TRUE UNION



Size (in)	Body Material	Diaphragm Material	Product Code	Universal Number
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VKD w PTFE Seats

Pneumatic – DOUBLE ACTING – SOCKET/THREADED

Size (in)	Body Material	Diaphragm Material	Product Code	Universal Number
1/2	PVC	EPDM	253296	VKDBV103-DA
		FPM	253305	VKDBV203-DA
	CPVC	EPDM	253314	VKDBC103-DA
		FPM	253323	VKDBC203-DA
3/4	PVC	EPDM	253297	VKDBV104-DA
		FPM	253306	VKDBV204-DA
	CPVC	EPDM	253315	VKDBC104-DA
		FPM	253324	VKDBC204-DA
1	PVC	EPDM	253298	VKDBV105-DA
		FPM	253307	VKDBV205-DA
	CPVC	EPDM	253316	VKDBC105-DA
		FPM	253325	VKDBC205-DA
1-1/4	PVC	EPDM	253299	VKDBV106-DA
		FPM	253308	VKDBV206-DA
	CPVC	EPDM	253317	VKDBC106-DA
		FPM	253326	VKDBC206-DA
1-1/2	PVC	EPDM	253300	VKDBV107-DA
		FPM	253309	VKDBV207-DA
	CPVC	EPDM	253318	VKDBC107-DA
		FPM	253327	VKDBC207-DA
2	PVC	EPDM	253301	VKDBV108-DA
		FPM	253310	VKDBV208-DA
	CPVC	EPDM	253319	VKDBC108-DA
		FPM	253328	VKDBC208-DA

Size (in)	Body Material	Diaphragm Material	Product Code	Universal Number
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VKD w PTFE Seats

Electric – DOUBLE ACTING – SOCKET/THREADED

Size (in)	Body Material	Diaphragm Material	Product Code	Universal Number
1/2	PVC	EPDM	253404	VKDBV103-EL
		FPM	253413	VKDBV203-EL
	CPVC	EPDM	253422	VKDBC103-EL
		FPM	253431	VKDBC203-EL
3/4	PVC	EPDM	253405	VKDBV104-EL
		FPM	253414	VKDBV204-EL
	CPVC	EPDM	253423	VKDBC104-EL
		FPM	253432	VKDBC204-EL
1	PVC	EPDM	253406	VKDBV105-EL
		FPM	253415	VKDBV205-EL
	CPVC	EPDM	253424	VKDBC105-EL
		FPM	253433	VKDBC205-EL
1-1/4	PVC	EPDM	253407	VKDBV106-EL
		FPM	253416	VKDBV206-EL
	CPVC	EPDM	253425	VKDBC106-EL
		FPM	253434	VKDBC206-EL
1-1/2	PVC	EPDM	253408	VKDBV107-EL
		FPM	253417	VKDBV207-EL
	CPVC	EPDM	253426	VKDBC107-EL
		FPM	253435	VKDBC207-EL
2	PVC	EPDM	253409	VKDBV108-EL
		FPM	253418	VKDBV208-EL
	CPVC	EPDM	253427	VKDBC108-EL
		FPM	253436	VKDBC208-EL

Pneumatic – DOUBLE ACTING – SOCKET

Size (in)	Body Material	Diaphragm Material	Product Code	Universal Number
2-1/2	PVC	EPDM	253302	VKDAV109-DA
		FPM	253311	VKDAV209-DA
	CPVC	EPDM	253320	VKDAC109-DA
		FPM	253329	VKDAC209-DA
3	PVC	EPDM	253303	VKDAV110-DA
		FPM	253312	VKDAV210-DA
	CPVC	EPDM	253321	VKDAC110-DA
		FPM	253330	VKDAC210-DA
4	PVC	EPDM	253304	VKDAV111-DA
		FPM	253313	VKDAV211-DA
	CPVC	EPDM	253322	VKDAC111-DA
		FPM	253331	VKDAC211-DA

Electric – DOUBLE ACTING – SOCKET

Size (in)	Body Material	Diaphragm Material	Product Code	Universal Number
2-1/2	PVC	EPDM	253410	VKDAV109-EL
		FPM	253419	VKDAV209-EL
	CPVC	EPDM	253428	VKDAC109-EL
		FPM	253437	VKDAC209-EL
3	PVC	EPDM	253411	VKDAV110-EL
		FPM	253420	VKDAV210-EL
	CPVC	EPDM	253429	VKDAC110-EL
		FPM	253438	VKDAC210-EL
4	PVC	EPDM	253412	VKDAV111-EL
		FPM	253421	VKDAV211-EL
	CPVC	EPDM	253430	VKDAC111-EL
		FPM	253439	VKDAC211-EL

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