

# KAMMAC

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## KAMMAC Vane Actuator



**Springless-Return Actuator**

**Compact-Efficient-Fast**

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# KAMMAC Vane Actuator (“KVA”) Built to Last

Take the guesswork out of predictive maintenance and reliability

## Predictive maintenance

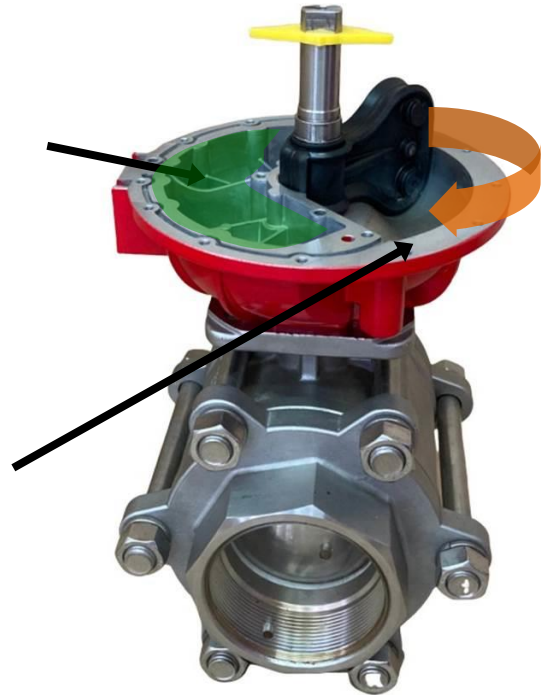
### Using internal air reservoir for fail-safe

Air reservoirs in fail-safe systems are commonly used to replace springs for large mission critical emergency shut down valves. Spring failure and its performance decay are common occurrences but are hard to detect.

## Product reliability

### One moving piece – pure rotary-to-rotary movement

KVAs only have one moving part that creates pure rotary-to-rotary movement. Not only does the simplistic design contribute to better lifespan, the singular moving component simplifies predictive maintenance monitoring.



## Design features that make your operations easier

### Easy air reservoir integration

Traditional actuators with air reservoirs require costly external piping and pilot valves that make it more costly than spring-return actuators. Utilization of KAMMAC’s air reservoir system is easier and in most instances more economical than spring-return actuators.

### Easy travel limit change

The standard travel stop adjustment is +/- 5° at CCW and CW +/- 5° for a total of 80° to 100°. Extended travel stop are also available for adjustments between 60° to 100°.

### Heavy duty DU bushings

Result in a supported vane shaft and life long lubrication.



**Patents: Pneumatic Actuator Structure**  
USA = 8,671,672  
Other countries pending

**Patents: Integral Unit & Zero Eccentricity**  
China = 2785284, Taiwan = M445076, other countries pending

# One Moving Piece Built to Last

Minimal maintenance occurrence through simplistic and improved design

## Design features that further reduce maintenance

### Non-O-ring sealing

O-rings are meant for static sealing and not for dynamic sealing. Yet, most brands use O-rings for direct sealing which result in problems such as high friction, high break away torque, and high wear and tear.

### No stick-slip, and low friction

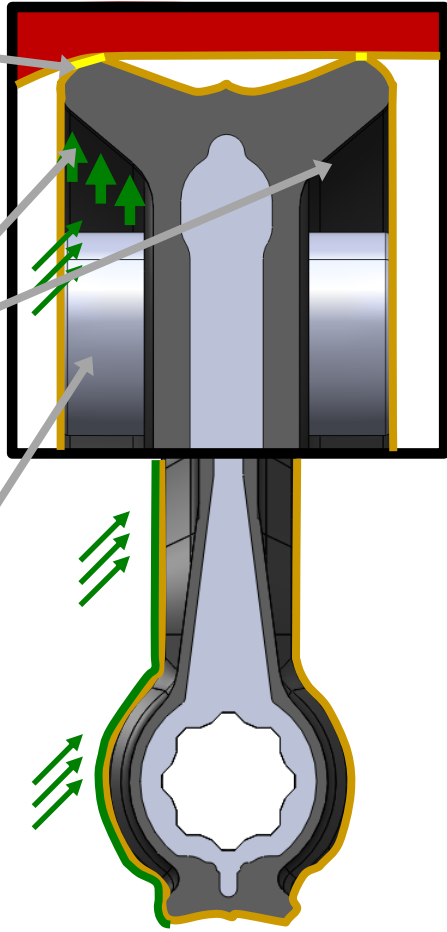
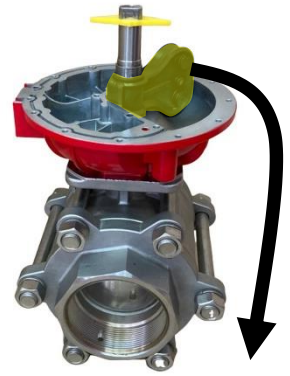
Vane has limited contact to housing body which results in low friction, smooth operation, and no “stick-slip” even after extended cycles. Ideal for both on-off and precision modulating controls.

### Double lip-seal

With increased air pressure, pressure pushes against double lip-seal allowing for greater tightness against housing body. Lip-sealing aligns and provides tightness under pressure.

### Stopper bolt to vane contact

Stopper bolt does not impact vane sealing but against stainless steel vane assembly extrusion. The core of the vane-shaft is lightweight. This reduces the vane’s impact to the stopper bolts and prolongs cycle life.



## Design features that make your operations easier

### Wide temperature range

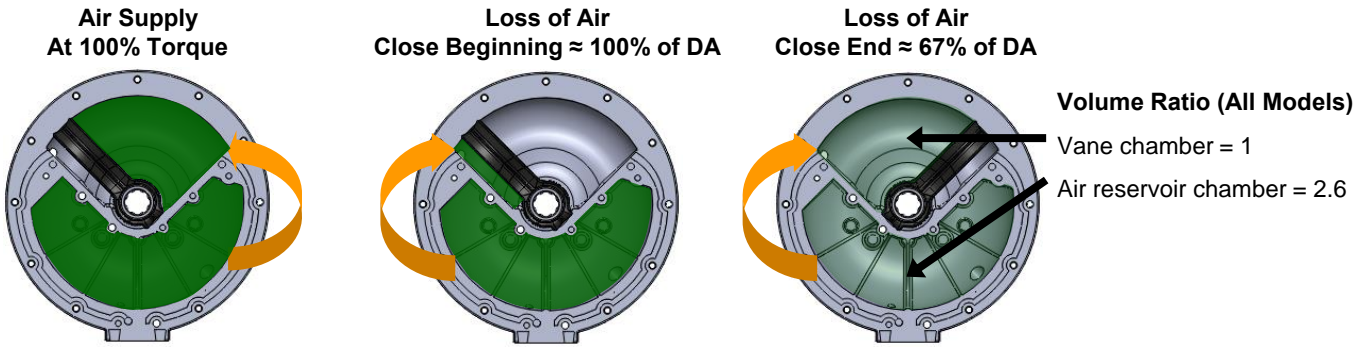
Modified CR (Neoprene) is the standard material, it is fully bonded to the vane/shaft. KVA is suitable from -40°C to 120°C (-40°F to 248°F), covering everything from low to high temperature applications.

- Air pressure
- Actuator housing
- Grease
- Seal & housing contact

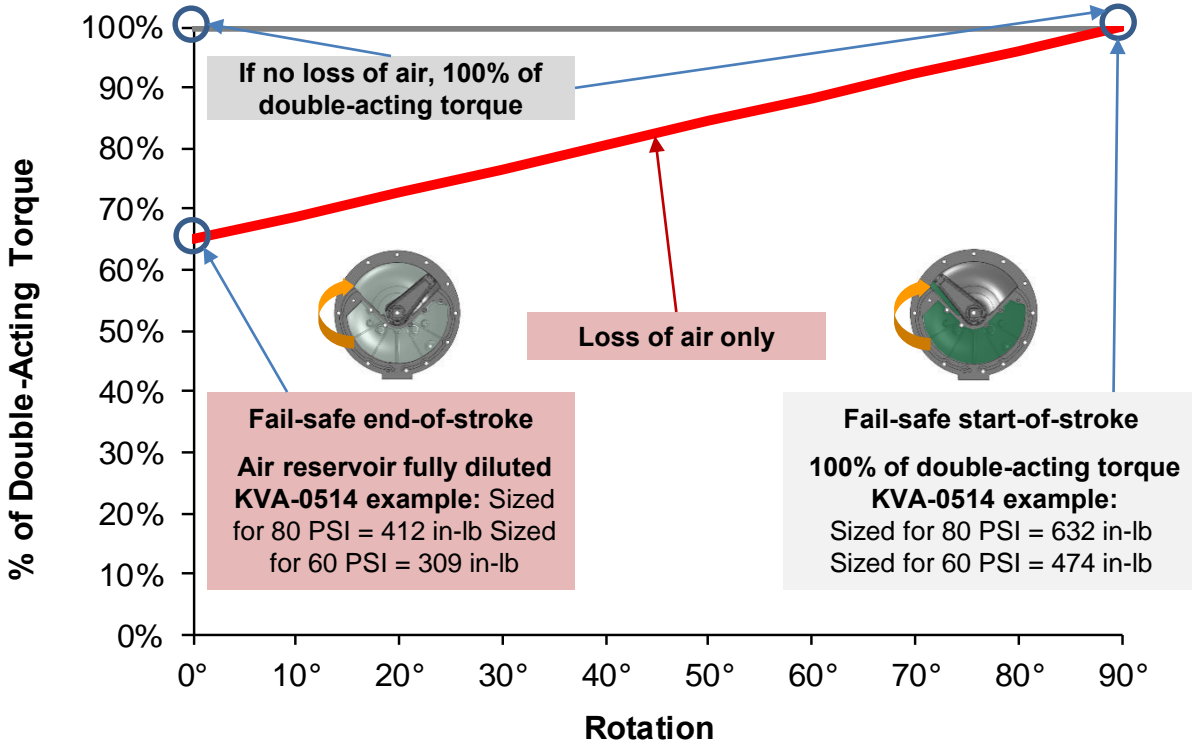
# KVA Fail-Safe Principle and Sizing

## Fail-safe principle

KVA utilizes an internal air reservoir to assure valve closure. When there is air failure, the pressurized air stored in the air reservoir is released and diluted with the vane chamber. Boyle's Law ( $P_2V_2=P_1V_1$ ) can be used to calculate the end-of-stroke fail-safe torque, where  $P_1$  is the pressure of the air reservoir,  $V_1$  is the volume in the air reservoir,  $P_2$  is the pressure in the vane and reservoir, and  $V_2$  is the volume in the vane and reservoir.

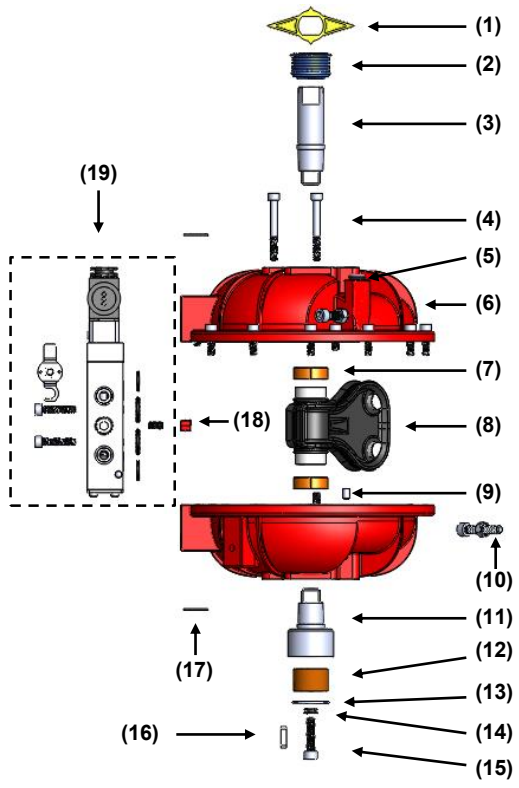


## Fail-Safe Torque Output



- KVA - Open / KVA - Close (full air supply, with or without electricity)
- KVA - Close (no air supply)

# KVA Bill of Material



Ref No	Description	Standard	Chemical Resistant	Quantity
		Version	Version	
1	Yellow position & degree indicator	NBR	NBR	1
2	Blue graduated ring	NBR	NBR	1
3	Upper shaft	Nickel-plated steel	Nickel-plated steel + Fluoropolymer Coating	1
4	Connecting bolt & nut	Stainless steel	Stainless steel	1 lot
5	Plug	Nickel-plated steel	Stainless steel	1 lot
6	Housing	Aluminum A383 / epoxy external finish	Aluminum A383 / Fluoropolymer external finish	2
7	Vane / shaft bearing	PTFE lined steel baked bronze bushing	PTFE lined steel baked bronze bushing	2
8	Vane / shaft assembly*	Stainless Steel or NPS bonded with modified CR	Stainless Steel or NPS bonded with modified CR	1
9	Location pin	Mild steel	Mild steel	2
10	Stopper bolt and nut set	Stainless steel	Stainless steel	2
11	Lower shaft	Nickel-plated steel	Nickel-plated steel + Fluoropolymer Coating	1
12	Drive insert lower	Nickel-plated steel	Nickel-plated steel	1
13	Drive insert circlip	Nickel-plated steel	Nickel-plated steel	1
14	Belleville washer	High tensile steel	High tensile steel	2
15	Shaft connect bolt	Stainless steel	Stainless steel	1
16	Drive insert key	Keysteel	Keysteel	1
17	Tag plate*	Stainless steel	Stainless steel	1
18	Locator insert*	Plastic	Plastic	2
19	Main solenoid valve	(See KSV for details)	(See KSV for details)	1

\* Items marked with an asterisk are included in repair kit.