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Rotary Actuators

PV Series - Vane type

Catalogue PDE2648TCUK February 2012

Parker

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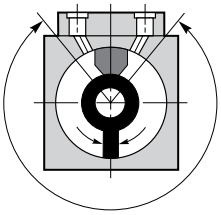
PV Rotary Actuators

How do vane rotary actuators work

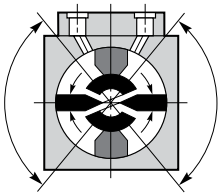
Vane actuators provide the maximum amount of output torque from the smallest possible envelope size. They convert pneumatic pressure into rotary motion for a wide variety of industrial applications.

A short cylindrical chamber encloses a vane attached to a central shaft. Air pressure is applied to one side of the vane. The opposite side of the vane is connected to exhaust. This produces rotation of the vane and thus the central shaft. Due to vane actuator design there will always be some internal bypass in these units and therefore they should not be used as a brake or to support loads.

Two basic styles are available. Single vane models have a maximum rotation of 280°, while the double vane units produce twice the torque output from identical envelope dimensions and have a maximum rotation of 100°.



Single vane
280° rotation



Double vane
100° rotation

Technical information

Type		Double acting actuator
Standard Rotation (tolerance ± 1°)	Single vane	0 to 275°, size 10 to 11
		0 to 280°, size 22 to 23
	Double vane	0 to 95°, size 10 to 11
		0 to 100°, size 22 to 33
Temperature		-10°C to +80°C
Air supply		Lubricated or non-lubricated
Pressure range		2 to 10 bar max

Materials:

End cap : Hard anodised aluminium
Tubing : Hard anodised aluminium smooth profile
Shaft : Stainless steel
Bearing : PTFE coated bearing
Vane : Hard anodised aluminium extrusion
Seals : Nitrile

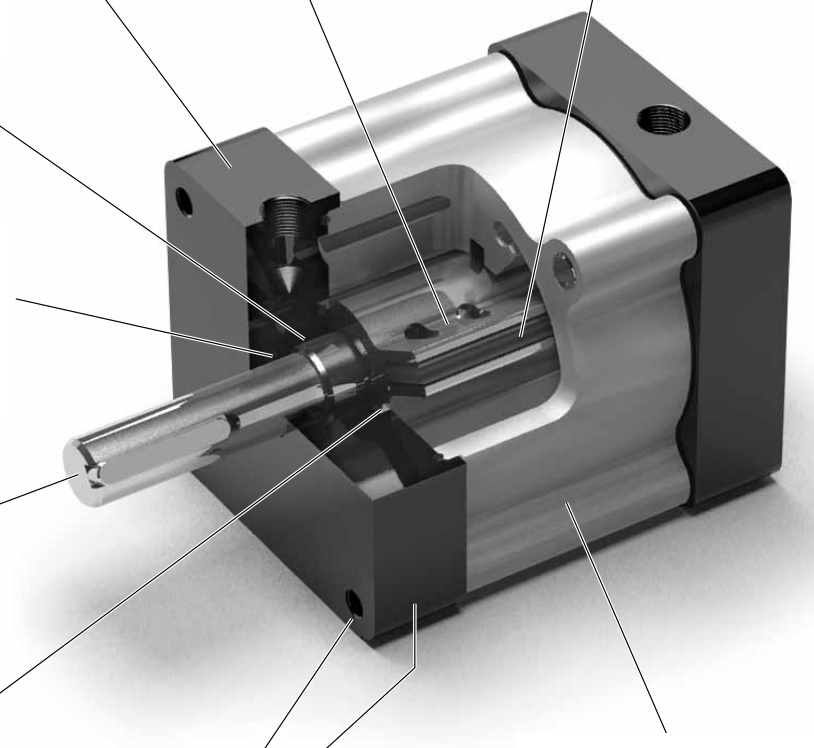
Through rod facility size 22 and 33

The two larger sizes of Vane Actuators are through rod as standard. The through rod facility enables linkages to be connected to both ends of the unit, maximising the design flexibility.

This also enables the unit to be equipped with a kit providing full adjustment of the angle of rotation. The kit can be supplied complete with or without inductive sensors.

These options can be assembled when ordered the actuator or can be added later.

Features



End caps : are precision machined from aluminium, then hard anodised to ensure long seal life and low breakaway pressure.

Vane : A hard anodised aluminium extrusion permanently affixed to shaft, forming a structurally sound assembly. The light weight also reduces inertia allowing faster operating speeds.

Vane seal : A special self lubricating, abrasion resistant nitrile compound is moulded into a one piece vane seal, providing low breakaway pressure and long life, even with no lubrication. The vane seal is also removable so that field repairs can be made, if necessary.

Bearing : Hard anodised aluminium end caps with bearing cartridge provides sunstancial shaft support and wear resistance, ensuring high performance and long life.

Shaft seal : The high quality self lubricated, abrasion resistant nitrile seal has multiple lobe construction for leak free operation and greater reliability.

Shaft : Stainless steel provides high strength and corrosion resistance for the most demanding applications.

Shoulder seal : A nitrile energised glass filled Teflon seal is used to minimise bypass flow and friction, providing superior performance and long life.

Mounting : Combination face and base mounting offer flexibility in application and design.

Body : is machined from one piece aluminium extrusion that incorporates the stator for superior rigidity. The extrusion is hard anodised and Teflon impregnated, which gives long seal life and low breakaway pessure.

PV Rotary Actuators

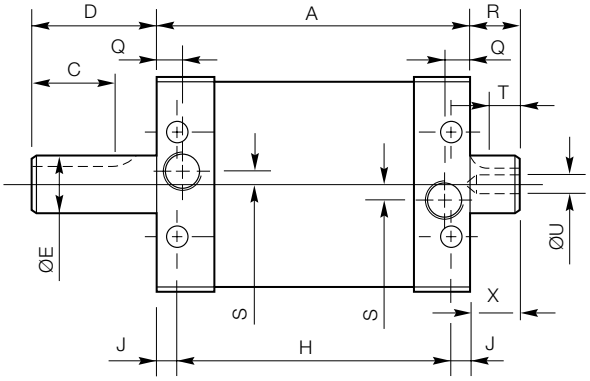
Technical Information

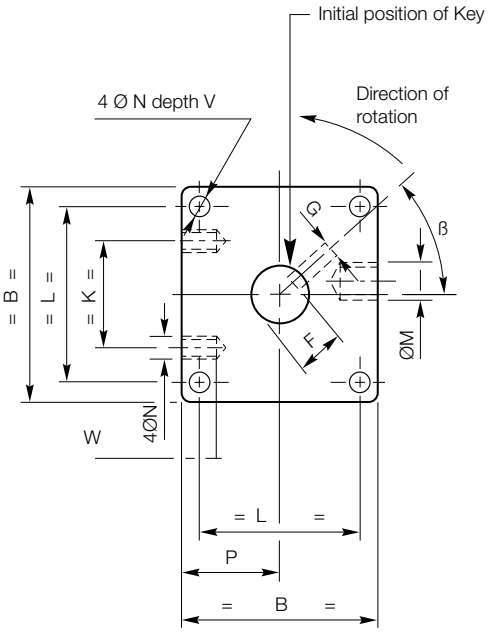
Size	Max rotation (o)	Torque Nm			Max. breakaway pressure (bar)	Max. radial load (N)	Max. thrust load (N)	Unit weight (kg)	Adjustment kit weight (kg)
		3 bar	5 bar	6 bar					
10	275	0.25	0.49	0.69	1.7	40	15	0.16	-
	95	0.54	1.09	1.47	1.3				
11	275	0.54	1.09	1.47	1.3	40	15	0.20	-
	95	1.28	2.40	3.05	1.0				
22	280	2.46	4.92	6.39	1.0	100	40	0.70	0.35
	100	5.90	10.92	13.27	0.6				
33	280	5.90	11.47	14.47	1.0	200	70	1.60	0.45
	100	13.76	25.12	30.96	0.6				

Note: PV series vane actuators have a permissible bypass leakage rate of 0.1 dm^3/s at 7 bar.

The choice of the size depends upon the pressure and the external constraints - a safety factor of 30% is required for the selection.

Basic dimensions





ß = 42.5° for sizes 10 & 11
40° for sizes 22 & 33

Size	A	B	C	D	ØE (f7)	F	G ((P9)	H	J	K	L	ØM	N	P	Q	R	S	T	ØU	V	W	X
10	35	41	15.5	22	8	6.8	2	25	5	19	31	M5	M4	20.5	5	1	4.2	-	-	6	8	-
11	51	41	15.5	22	8	6.8	2	41	5	19	31	M5	M4	20.5	5	1	4.2	-	-	6	8	-
22	82	63.5	25.5	36	12	9.5	4	69	6.5	32	51	G1/8	M6	31.8	8	18	0	10	M5	11	10	15
33	112	76	30	45	20	16.5	6	98	7	38	62	G1/4	M8	38.0	9	18	0	11	M6	11	12	15

Vane actuator with angle adjustemnt size 22 and 33

The kit is assembled at the rear of the actuator and provides adjustment of:-

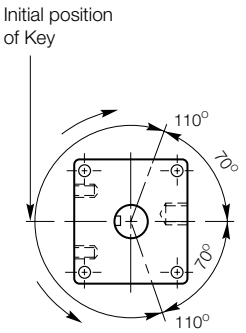
-0 to 100° for the double vane actuator

-0 to 220° for the single vane actuator

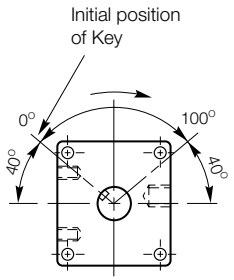
End stop cushioning is provided by buffers

Inductive sensors M8 with 90° plug-in and LED facility (PNP or NPN) can be added to the kit for end stop detection.

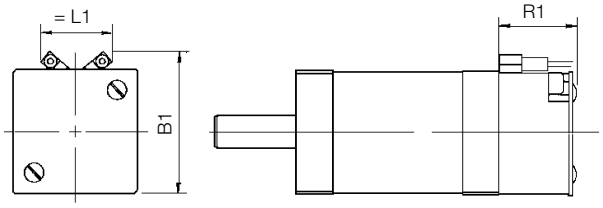
The angle adjustment is attained by moving the end stops at the rear of the actuator. To facilitate this adjustment there is a position indicating disk on the rear face of the unit.



One vane only
Maximum rotation 220° ± 1°

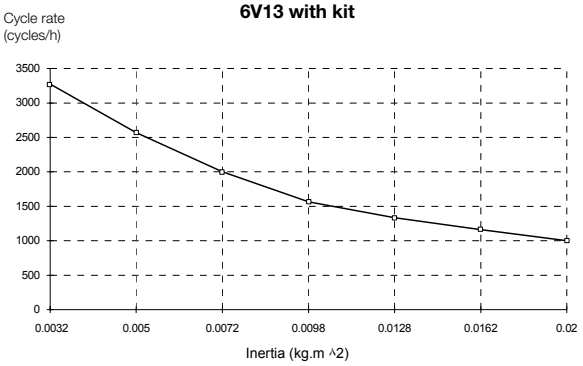


Double vane
Maximum rotation 100° ± 1°

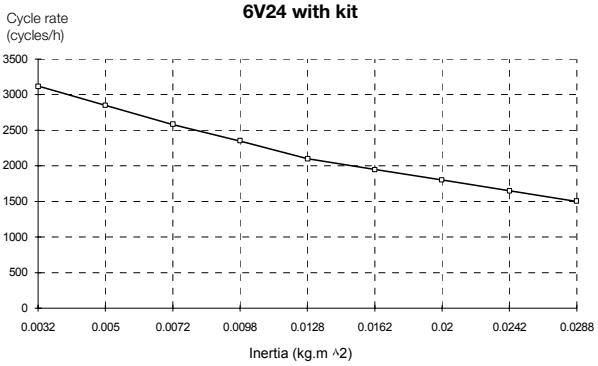


Ref	B1	L1	R1
22	77	50	40.5
33	88	44	40.5

6V13 with kit



6V24 with kit



Inertia calculation

I = M x d^2

I = kg. m^2

d = meter M = kg

Note: Maximum length of lever: Size 22 = 50 mm (d)
Size 33 = 60 mm (d)

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How to order

Part nos. basic units

Size	Part no.	Max. rotation	Type	Shaft
10	6V5100010F-275	275°	Single	Not Through Rod
	6V5100010F-095	95°	Double	
11	6V5200010F-275	275°	Single	
	6V5200010F-095	95°	Double	
22	6V1300030F-275	280°	Single	Through Rod
	6V1300030F-100	100°	Double	
33	6V2400030F-275	280°	Single	
	6V2400030F-100	100°	Double	

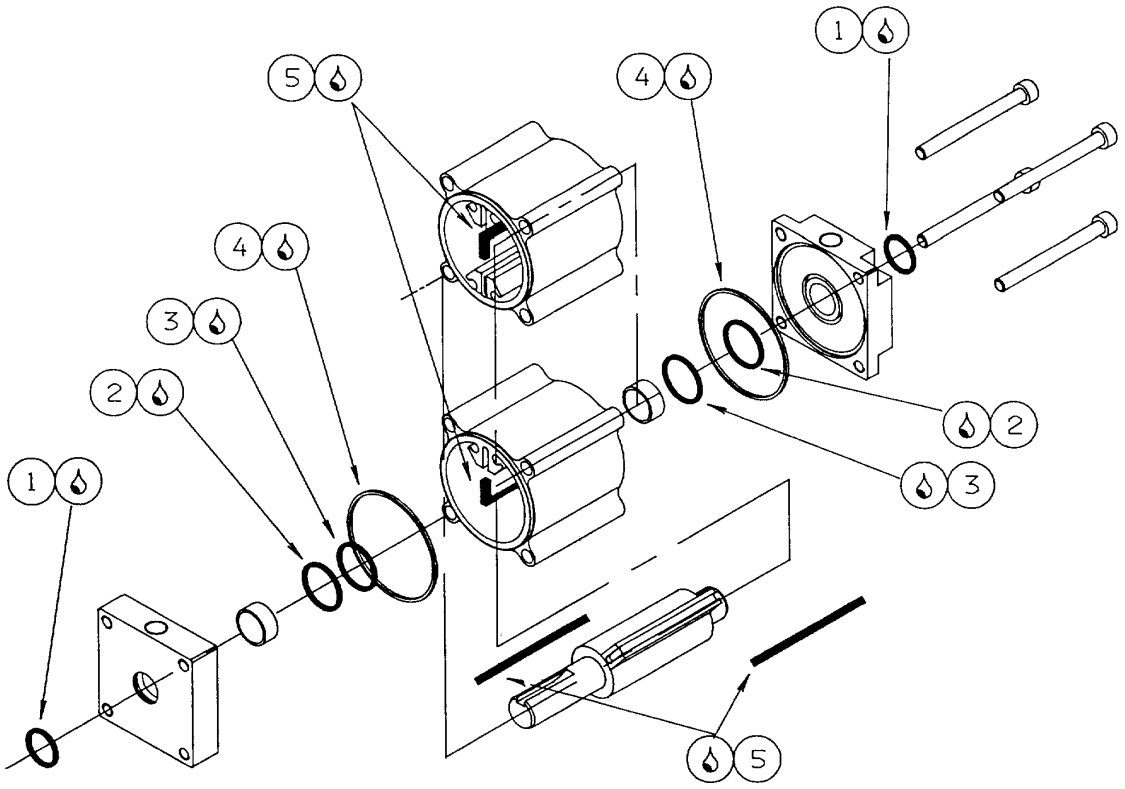
Part nos. basic units

Size	Part no.	Max. rotation	Type	Options
22	6V1357630F-220	220°	Single	Angle adjustment kit
	6V1357730F-100	100°	Double	
	6V1357635F-220	220°	Single	As above + PNP Sensors + plug
	6V1357735F-100	100°	Double	
	6V1357636F-220	220°	Single	As above + NPN Sensors + plug
	6V1357736F-100	100°	Double	
33	6V2457630F-220	220°	Single	Angle adjustment kit
	6V2457730F-100	100°	Double	
	6V2457635F-220	220°	Single	As above + PNP Sensor + plug
	6V2457735F-100	100°	Double	
	6V2457636F-220	220°	Single	As above + NPN Sensor + plug
	6V2457736F-100	100°	Double	

Part nos. angle adjustment and sensor kits

Size	Part no.	Options
22	6V03570	Angle adjustment kit
	6V03575	Angle adjustment kit with sensors PNP
	6V03576	Angle adjustment kit with sensors NPN
33	6V04570	Angle adjustment kit
	6V04575	Angle adjustment kit with sensors PNP
	6V04576	Angle adjustment kit with sensors NPN

Repair Kits



Lubricate with grease Parker ref : **3099**

Size	Type	Part no.	Components				
			1 Shaft seal	2 Teflon seal	3 Shoulder seal	4 'O' ring	5 Vane seal
10	Single	PSK-PV10	2	2	2	2	2
10	Double	PSK-PV10D	2	2	2	2	4
11	Single	PSK-PV11	2	2	2	2	2
11	Double	PSK-PV11D	2	2	2	2	4
22	Single	PSK-PV22	2	2	2	2	2
22	Double	PSK-PV22D	2	2	2	2	4
33	Single	PSK-PV33	2	2	2	2	2
33	Double	PSK-PV33D	2	2	2	2	4

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Catalogue PDE2648TCUK February 2012

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