

## Cartridge Kit for Vane Pump *V and VQ Series*



### Features

- Replacement parts for fixed displacement vane pumps (single and double vane pump V/VQ series).
- Available in both 12 vanes design for industrial application with quiet operating and 10 vanes design for mobile application with higher pressure and wider range of speed.
- With the cartridge independent of the shaft, allowing for easy change of flow capacity and field servicing without removing the pump from its mounting.



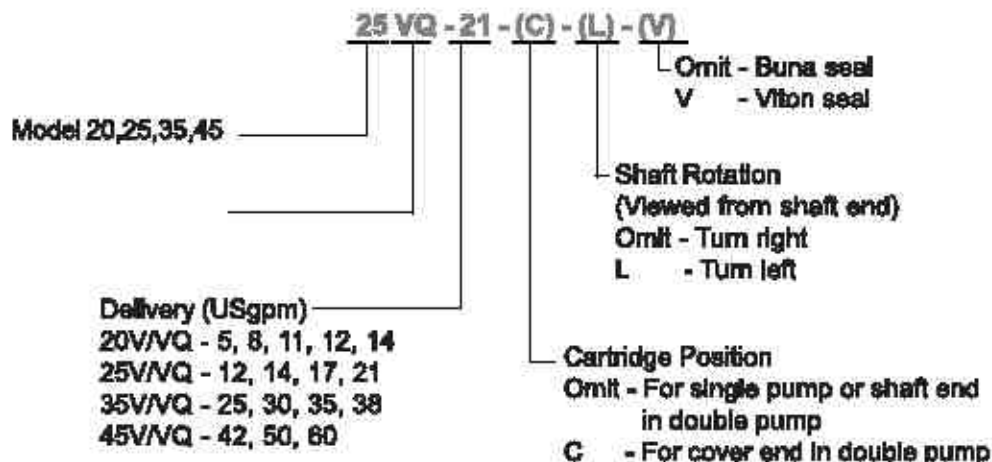
### Handling

- When ordering, if left hand rotation, special seal, or a specific position of cartridge (shaft end or cover end) is required, it should be specified by ordering code.
- To reverse rotation of cartridge, remove the two screws and reverse the location of the inlet support plate and outlet support plates (for cartridge kit with flex slide plates, Bronze faces must be installed toward the rotor. DO NOT allow the flex plates to slide across the ring and rotor. Rough edges on the ring

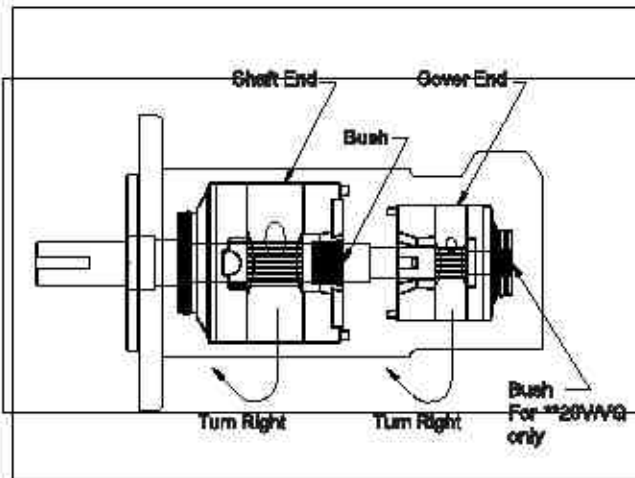
and rotor may cause scratches in the soft brass surface.) Make sure that the sharp edge of Vane leads direction of rotation. Re-install the two screws hand tight. Use pump cover to align all sections of the cartridge. Carefully remove the cover and tighten the screws.

- When install the cartridge into the body, carefully move back and forth until the cartridge pins drop into the cover holes and one of the chamfers on the cam ring aligns with the cover inlet port.

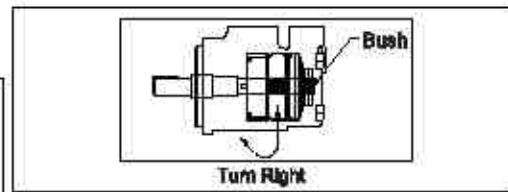
### Ordering Code



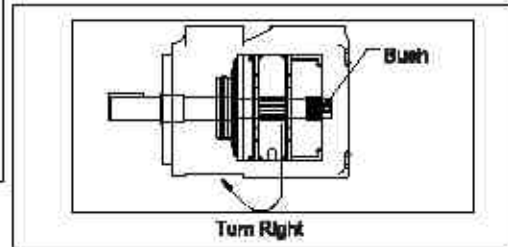
### Cartridge Kit Position and Rotation



Double Pump

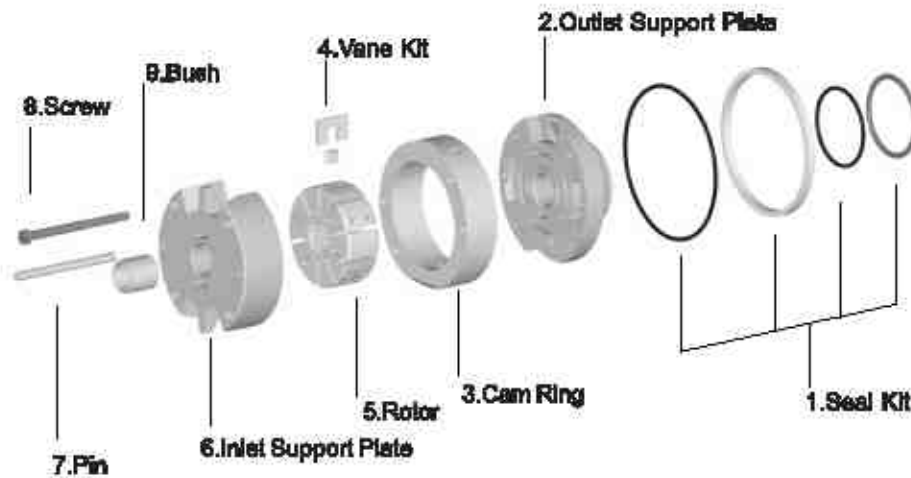


Single Pump, 20V/VQ

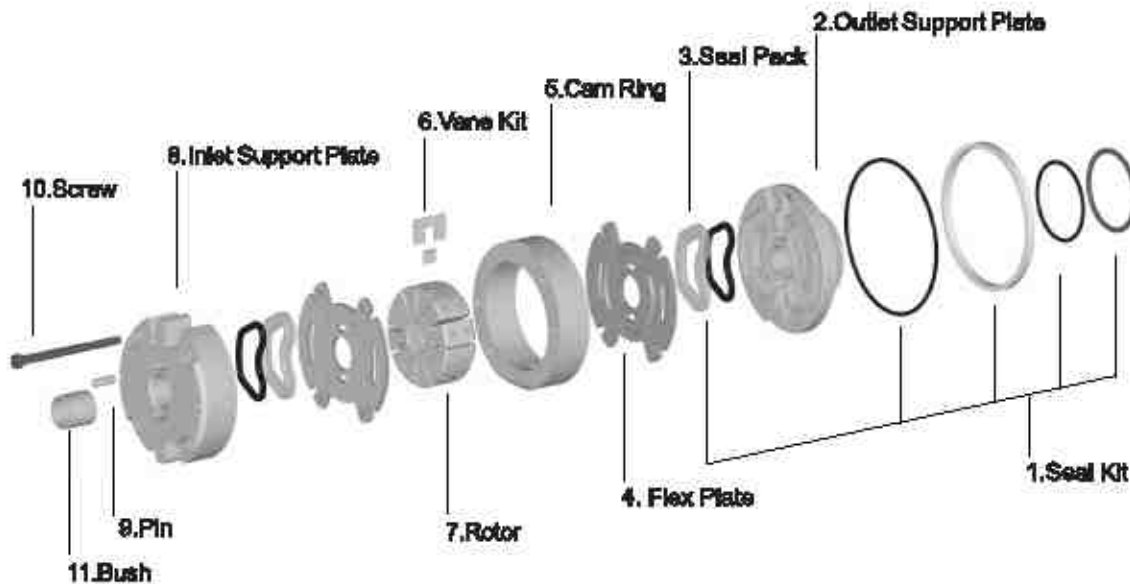


Single Pump, 25V/VQ, 35V/VQ, 45V/VQ

### Cartridge Kit Components (V Series)



### Cartridge Kit Components (VQ Series)



### Instruction for Cartridge Replacement In Single Pump

1. Remove the four cover screws and lift the outlet cover. Pull out the old Cartridge. Discard the old large square cut seal and large O ring of the cartridge.

2. Check the wear surfaces of old cartridge. If the wear is normal just change oil in tank circuit and change or clean filters. If there is seizure or heavy wear in rotor, support plates (for V Series), and flex plates (for VQ Series), disassemble the pump completely. Check the shaft alignment and make sure that it is not twisted or crooked. The shaft may need to be changed and also check shaft seal and shaft bearing (remove the large lock ring to remove shaft seal and remove snap ring to remove bearing). Change them if necessary. If these parts are defective or the oil is dirty, the new cartridge's service life will be shorter than normal.

3. Install square cut seal into the body. Install small O ring and back-up ring on the cartridge outlet support plate hub. Carefully install the cartridge into the body. Install the cover to the body with large O ring in the groove of the body. Install the cover in position; move back and forth until the cartridge pins drop into the alignment holes located within the cover. Install four screws and torque tighten to the values indicated.

Model	Torque Specification	
	N.m	lb.ft.
20V/VQ	48-55	65-75
25V/VQ	48-55	65-75
36V/VQ	102-118	140-160
45V/VQ	188-203	255-275

4. Turn the pump shaft to verify freedom of the cartridge.

### Instruction for Cartridge Replacement In Single Pump

1. Remove the four cover screws and lift the outlet cover. Pull out the old Cover End Cartridge (Pry with screwdriver if necessary). Remove four screws from the inlet housing. Lift inlet housing from the outlet body. Rotate shaft to loosen Shaft End Cartridge and remove the cartridge from outlet body. Discard the old large square cut seals and large O rings of both cartridges.

2. Check the wear surfaces of old cartridges. If the wear is normal just change oil in tank circuit and change or clean filters. If there is seizure or heavy wear in rotors, support plates (for V Series), and flex plates (for VQ Series), disassemble the pump completely. Check the shaft alignment and make sure that it is not twisted or crooked. The shaft may need to be changed and also check shaft seal and shaft bearing (remove the large lock ring to remove shaft seal and remove snap ring to remove bearing). Change them if necessary. If these parts are defective or the oil is dirty, the new cartridges' service life will be shorter than normal.

3. For new Shaft End Cartridge, install square cut seal into the body. Install small O ring and back-up ring on the cartridge outlet support plate hub. Carefully install the cartridge into the body. Install the inlet housing to the body with large O ring in the groove of the body. Install inlet housing in position; move back and forth until the cartridge pins drop into the alignment holes located within the housing. Install four screws and torque tighten to the values indicated.

Model	N.m	lb.ft.
2620V/VQ	48-55	65-75
3520V/VQ	102-118	140-160
3626V/VQ	102-118	140-160
4520V/VQ	188-203	255-275
4626V/VQ	188-203	255-275

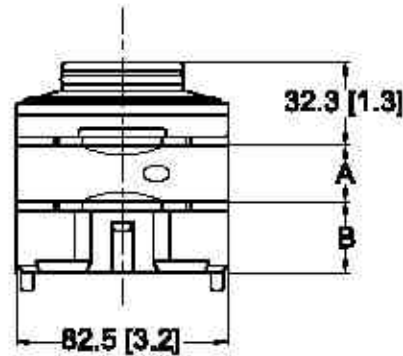
4. For new Cover End Cartridge, install a square cut seal into the cover. Install O ring and back-up ring on the cartridge outlet support plate hub. Carefully install cartridge over shaft and into the inlet housing. Turn cartridge slightly to bring into alignment the pin holes and cartridge alignment pins. Install the cover to inlet housing with O ring seal over the cartridge and up against the inlet housing. Make sure square cut seal is in place within the cover. Orient the cover to agree with the alignment. Install the cover with four screws and torque the screws to the value indicated.

Model	N.m	lb.ft.
2520V/VQ	54-68	40-50
3520V/VQ	54-68	40-50
3525V/VQ	88-102	65-75
4520V/VQ	54-68	40-50
4525V/VQ	88-102	65-75
4635V/VQ	188-203	255-275

5. Turn the pump shaft to verify freedom of both cartridges.



**Cartridge Kit 20V Installation Dimensions mm (Inch)**

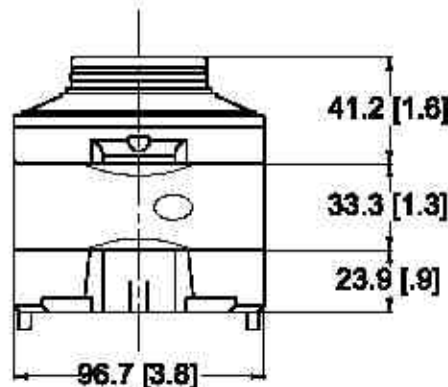


Delivery	A	B
5,8	21.95 [.86]	27.70 [1.09]
11,12,14	30.47 [1.20]	19.10 [0.75]

**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement $cm^3/r (in^3/r)$	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
5	18 (1.10)	1800	206 (3000)	28.4 (7.5)	11.2 (15.0)	2.4 (5.3)
8	27 (1.67)	1800	206 (3000)	45.4 (12.0)	17.0 (22.8)	2.4 (5.3)
11	36 (2.22)	1800	206 (3000)	56.8 (15.0)	22.6 (30.3)	2.3 (5.1)
12	40 (2.47)	1800	158 (2300)	62.1 (16.4)	25.1 (33.7)	2.3 (5.1)
14	45 (2.78)	1800	138 (2000)	69.6 (18.4)	28.3 (37.9)	2.3 (5.1)

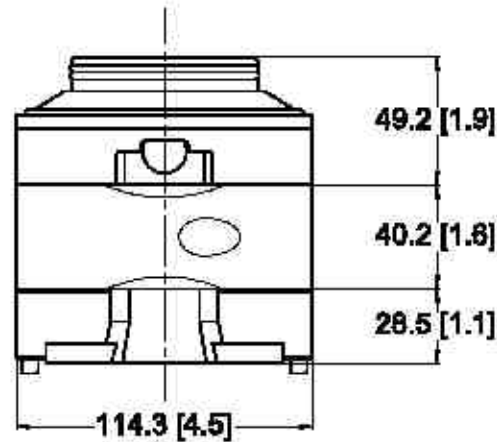
**Cartridge Kit 25V Installation Dimensions mm (Inch)**



**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement $cm^3/r (in^3/r)$	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
12	39 (2.47)	1800	172 (2500)	82.1 (16.4)	22.9 (30.8)	3.6 (7.9)
14	45 (2.78)	1800	172 (2500)	89.6 (18.4)	25.7 (34.5)	3.6 (7.9)
17	56 (3.39)	1800	172 (2500)	86.3 (22.8)	29.8 (40.0)	3.6 (7.9)
21	67 (4.13)	1800	172 (2500)	106.0 (28.0)	34.0 (45.6)	3.6 (7.9)

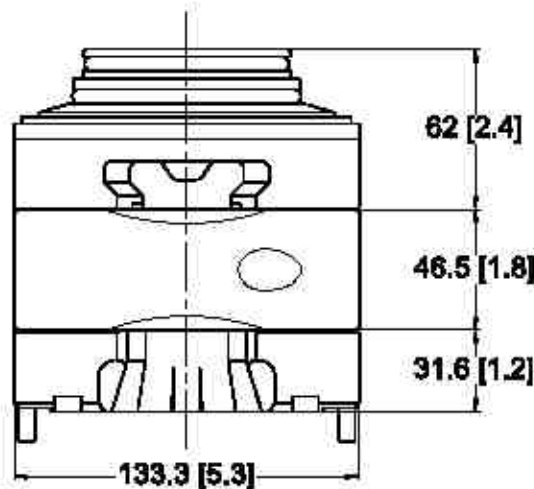
**Cartridge Kit 35V Installation Dimensions mm (Inch)**



**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm <sup>3</sup> /r (in <sup>3</sup> /r)	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
26	81 (4.94)	1800	172 (2500)	124.9 (33.0)	45.5 (61.0)	6.5 (14.3)
30	97 (5.91)	1800	172 (2500)	154.4 (40.8)	54.5 (73.0)	6.5 (14.3)
36	112 (6.83)	1800	172 (2500)	181.7 (48.0)	61.5 (82.4)	6.5 (14.3)
38	121 (7.37)	1800	172 (2500)	193.8 (51.2)	65.9 (88.3)	6.5 (14.3)

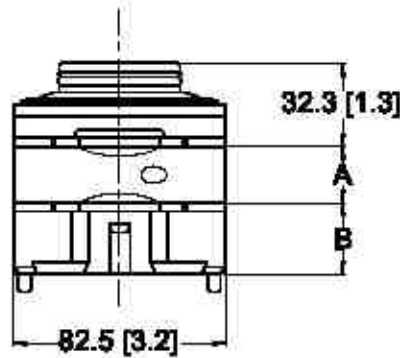
**Cartridge Kit 45V Installation Dimensions mm (Inch)**



**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm <sup>3</sup> /r (in <sup>3</sup> /r)	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
42	138 (8.41)	1800	172 (2500)	208.2 (55.0)	75.3 (101.0)	10.1 (22.3)
50	162 (9.85)	1800	172 (2500)	253.6 (67.0)	87.3 (117.0)	10.1 (22.3)
60	193 (11.75)	1800	172 (2500)	310.4 (82.0)	103.7 (139.0)	10.1 (22.3)

**Cartridge Kit 20VQ Installation Dimensions mm (inch)**

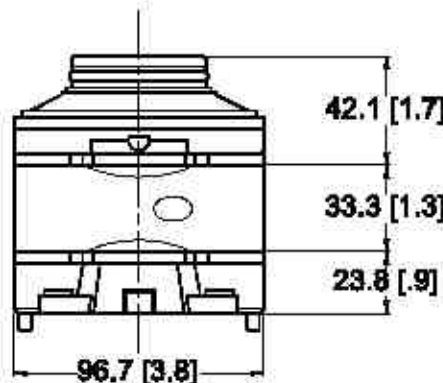


Delivery	A	B
5,8	21.95 [.86]	27.70 [1.09]
11,12,14	30.47 [1.20]	19.10 [0.75]

**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement $cm^3/rt (in^3/rt)$	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
5	18 (1.10)	2700	208 (3000)	41.8 (11.0)	17.8 (24.0)	2.4 (5.3)
8	27 (1.67)	2700	208 (3000)	64.3 (17.0)	26.1 (35.0)	2.4 (5.3)
11	36 (2.22)	2700	208 (3000)	87.1 (23.0)	35.4 (47.5)	2.3 (5.1)
12	38 (2.41)	2700	168 (2300)	96.5 (25.5)	28.3 (38.0)	2.3 (5.1)
14	45 (2.80)	2700	138 (2000)	113.6 (30.0)	29.1 (39.0)	2.3 (5.1)

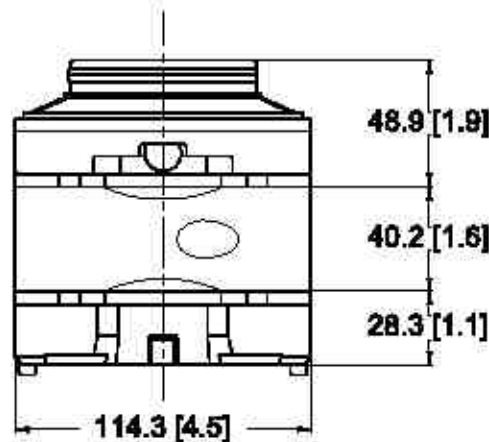
**Cartridge Kit 25VQ Installation Dimensions mm (inch)**



**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement $cm^3/rt (in^3/rt)$	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
12	40 (2.45)	2700	208 (3000)	87.1 (23.0)	41.0 (55.0)	3.6 (7.9)
14	45 (2.77)	2700	208 (3000)	102.2 (27.0)	48.8 (62.5)	3.6 (7.9)
17	55 (3.37)	2500	208 (3000)	117.3 (31.0)	51.8 (69.5)	3.6 (7.9)
21	67 (4.12)	2500	208 (3000)	143.8 (38.0)	81.8 (110.0)	3.6 (7.9)

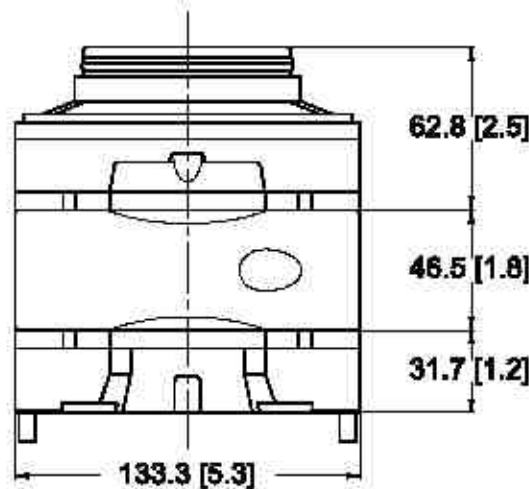
**Cartridge Kit 35VQ Installation Dimensions mm (Inch)**



**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm <sup>3</sup> /r (in <sup>3</sup> /r)	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
25	81 (4.98)	2500	206 (3000)	170.3 (45.0)	75.3 (101.0)	6.5 (14.3)
30	97 (5.96)	2500	206 (3000)	208.2 (55.0)	87.7 (117.5)	6.5 (14.3)
35	112 (6.88)	2400	206 (3000)	227.1 (60.0)	98.5 (132.0)	6.5 (14.3)
38	121 (7.42)	2400	206 (3000)	248.0 (65.0)	104.4 (140.0)	6.5 (14.3)

**Cartridge Kit 45VQ Installation Dimensions mm (Inch)**



**Specifications**

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm <sup>3</sup> /r (in <sup>3</sup> /r)	Maximum Speed rpm	Maximum Pressure bar (psi)	Typical Delivery at max speed & pressure L/min (USgpm)	Typical Input Power at max speed & pressure kW (hp)	Weight kg (lb)
42	138 (8.41)	1800	172 (2500)	208.2 (55.0)	75.3 (101.0)	10.1 (22.3)
50	162 (9.85)	1800	172 (2500)	253.8 (67.0)	87.3 (117.0)	10.1 (22.3)
60	193 (11.75)	1800	172 (2500)	310.4 (82.0)	103.7 (139.0)	10.1 (22.3)



# Solenoid Operated Directional Valve

## WE Series



### Features and Handling

- WE Series is a direct solenoid operated directional spool valve. The valve porting pattern follows DIN 24 340 form A. The valves come with wet pin DC or AC solenoids with removeable coil which can be rotated through 90 degree.
- The standard valves come with DIN 43850 electrical connector with light end manual override to permit the spool to be moved without the solenoid being energized.
- For correct operation, ensure that the solenoid pressure chamber is filled with oil. Do not exceed permissible voltage range of the coil.
- Keep surge pressure below the maximum permissible back pressure port T. Keep hydraulic oil clean at ISO cleanliness code 18/16.



### Specifications

**WE**

Specification	WE6	WE10
Maximum flow rate (depend on spool)	60 L/min (16 USgpm)	100 L/min (26 USgpm)
Maximum operating pressure Port A, B, P	315 bar (4500 psi)	315 bar (4500 psi)
Maximum back pressure Port T	160 bar (2300 psi)	160 bar (2300 psi)
Fluid temperature	-20 °C -- +70 °C (-4 °F -- +158 °F)	
Weight - Single Solenoid	1.5 kg (3.3 lb)	4.5 kg (9.9 lb)
- Double Solenoid	2.0 kg (4.4 lb)	5.8 kg (12.8 lb)

*The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change at any time without notice.*



**Ordering Code**

**WE**

**4WE6D - 60/OAW110-10**

Number of Port  
 3 - 3 ports  
 4 - 4 ports

Valve Size  
 6 - NG6 (CETOP3)  
 10 - NG10 (CETOP5)

Spool type

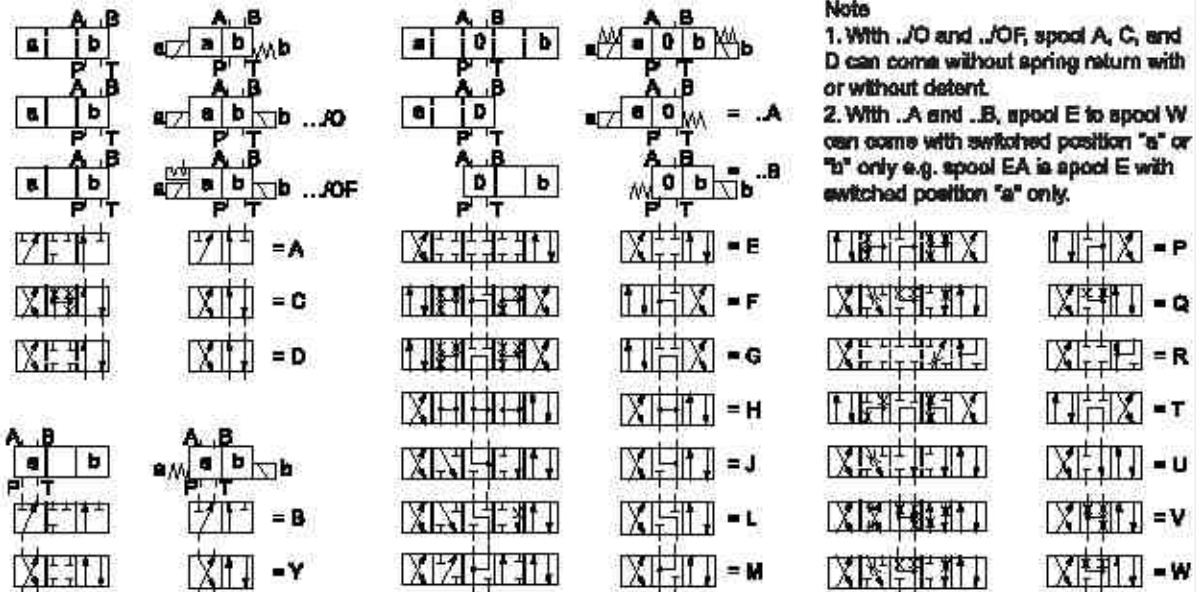
Further detail for future use

Coil Voltage  
 G24 - 24 V DC  
 W220 - 220V AC 50/60 Hz  
 W110 - 110V AC 50/60 Hz

Coil type  
 A - Wet pin oil immersed with removable coil

Spring and Detent  
 Omit - Spring return  
 O - Without spring return  
 OF - Without spring return with detent

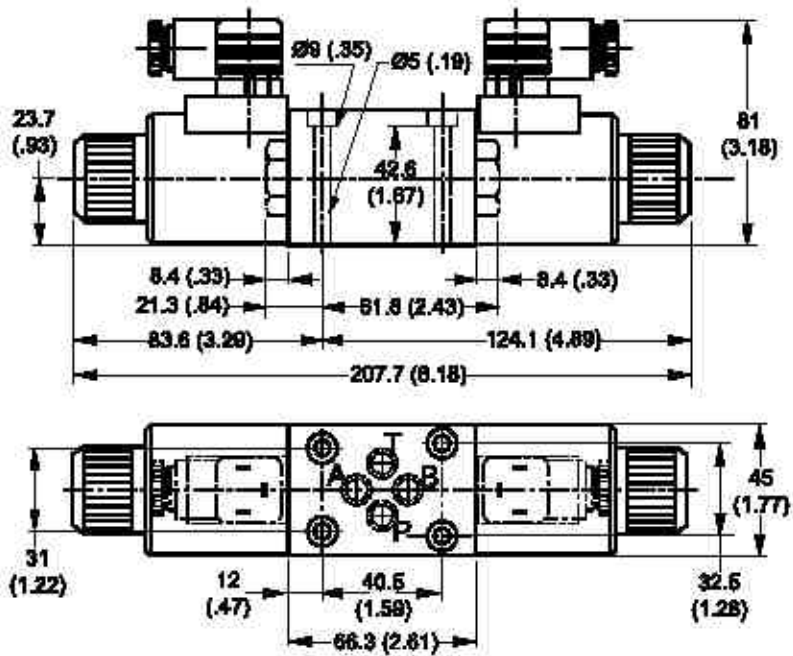
Design  
 60 - for WE6  
 30 - for WE10



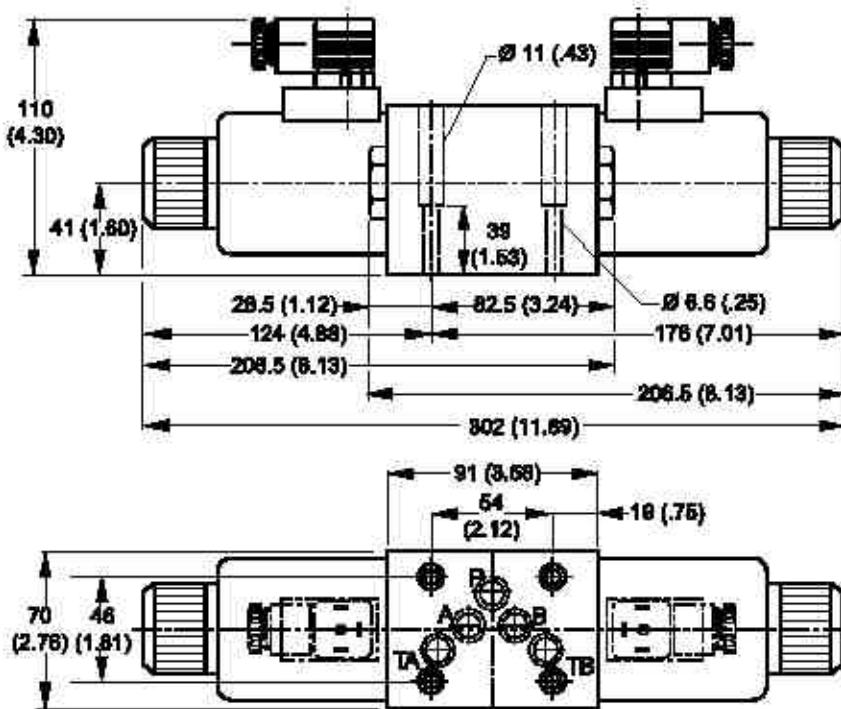
**Installation Dimensions mm (inch)**

**WE**

**WE6**



**WE10**



# Pilot Operated Relief Valve

## RB Series



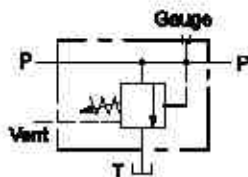
### Features and Handling

- RB Series are Balanced Piston type relief valves with three pressure ranges available. The valves come with optional Vent port and Gauge port. The valves can be controlled by Solenoid Operated Directional Control valve with optional cover setting for mounting the Solenoid Operated Directional Control valve on top.
- To adjust the set pressure, loosen the lock nut of the valve and turn the handle to adjust the pressure. Maintain the back pressure at the tank port as low as possible, less than 2 bar (28 psi).



### Order Code and Specification

Model	Maximum Flow L/min (gpm)	Maximum Pressure bar (psi)	Weight kg (lb)
RB-T04	80 (21)	210 (3000)	2.5 (5.6)
RB-T06	176 (46)	350 (5000)	4.0 (8.8)
RB-T10	454 (120)	700 (10000)	8.5 (18.7)



### RB(E) - T06 - C

Model RB

Cover

Omit - Standard Cover

E - Cover for mounting CETOP3 or NG6 Solenoid Valve (size 06 and size 10 only)

Pressure Range

C - 70-210 bar (1000-3000 psi)

B - 35-140 bar (500-2000 psi)

A - 7-70 bar (100-1000 psi)

Valve Size and Thread

T04 - 1/2" PT Thread

T06 - 3/4" NPT Thread

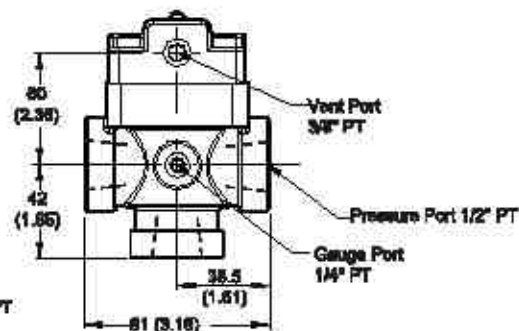
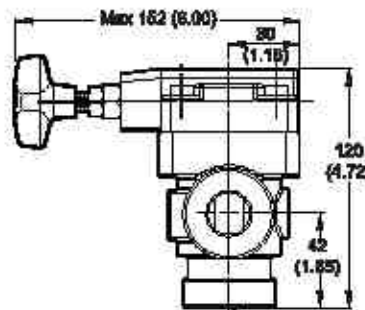
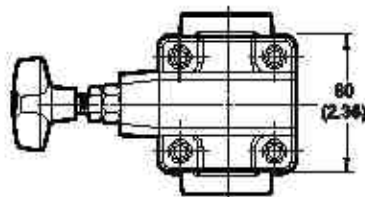
T10 - 1-1/4" NPT Thread

B06 - 1.0625"-12UN-2B Thread

B10 - 1.6250"-12UN-2B Thread

### Installation Dimensions mm (Inch)

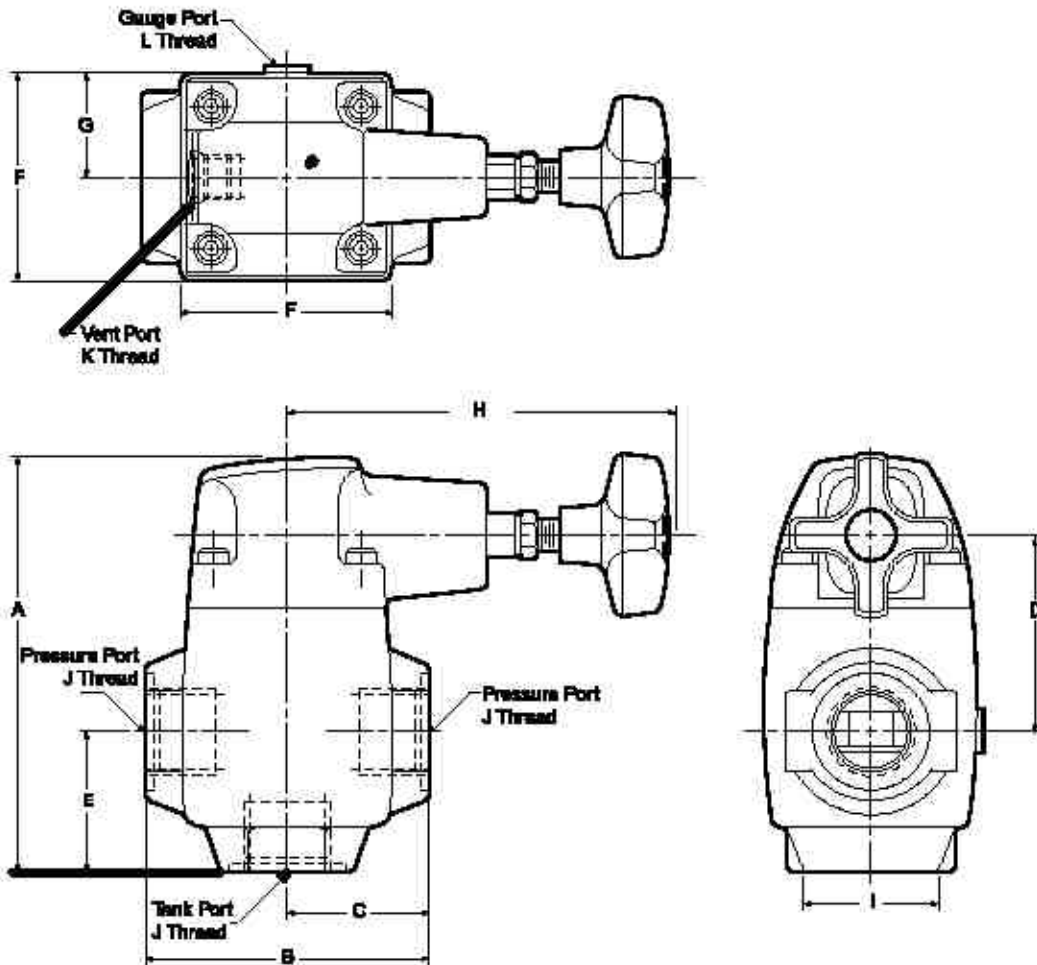
### RB-T04





**Installation Dimensions mm (inch)**

**RB-T06, RB-T10**



Model	A	B	C	D	E	F	G	H	I	J	K	L
RB-T06	128.6	92.5	48.3	63	46.5	73	38.5	134	67	3/4" NPT	3/8" PT	1/4" PT
RB-B06	(5.07)	(3.64)	(1.92)	(2.48)	(1.79)	(2.87)	(1.44)	(5.28)	(2.24)	1.0525"-12UN-2B		
RB-T10	167.2	124	81.8	68.5	61.8	83.3	41.7	134	61.9	1-1/4" NPT	.6825"-18UNF-2B	.4375"-20UNF-2B
RB-B10	(6.19)	(4.88)	(2.44)	(2.62)	(2.44)	(3.28)	(1.64)	(5.28)	(2.44)	1.6250"-12UN-2B		