Cartridge Kit for Vane Pump HV and HVQ Series

Features and Handling

• Replacement parts for fixed displacement vane pumps (single and double vane pump HV/HVQ 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.

• 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.

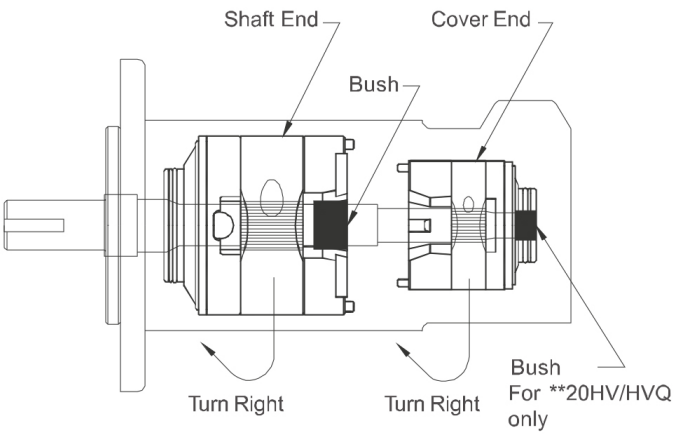
• To reverse rotation of cartridge, remove the two screws and reverse the location of the inlet support plate and outlet support plate(for cartridge kit with flex side plates, Bronze faces must be installed toward the rotor. DO NOT allow the flex plate to slide across the ring and rotor. Rough edges 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 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.

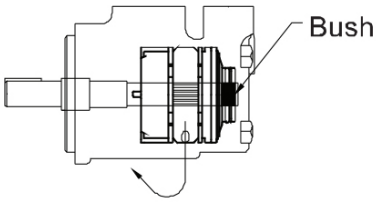


Cartridge Kit for Vane Pump HV and HVQ Series

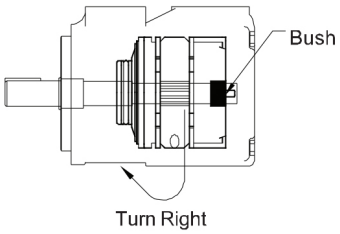
Cartridge Kit Position and Rotation



Double Pump

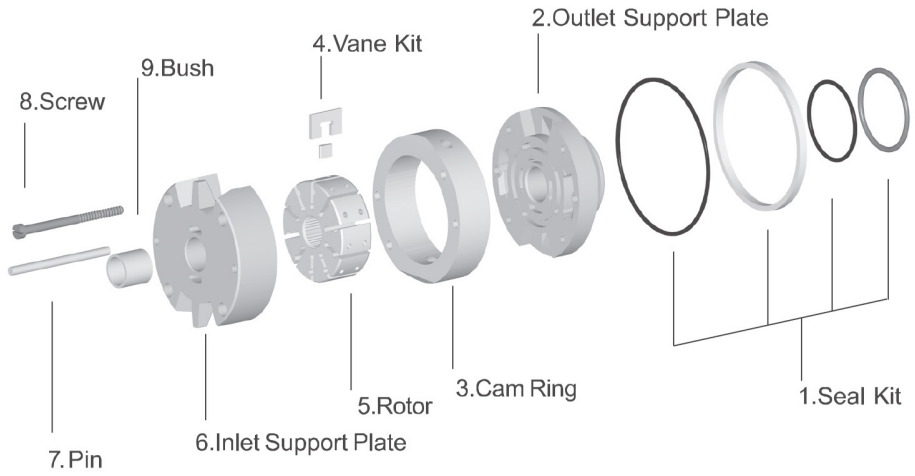


Single Pump 20HV/HVQ

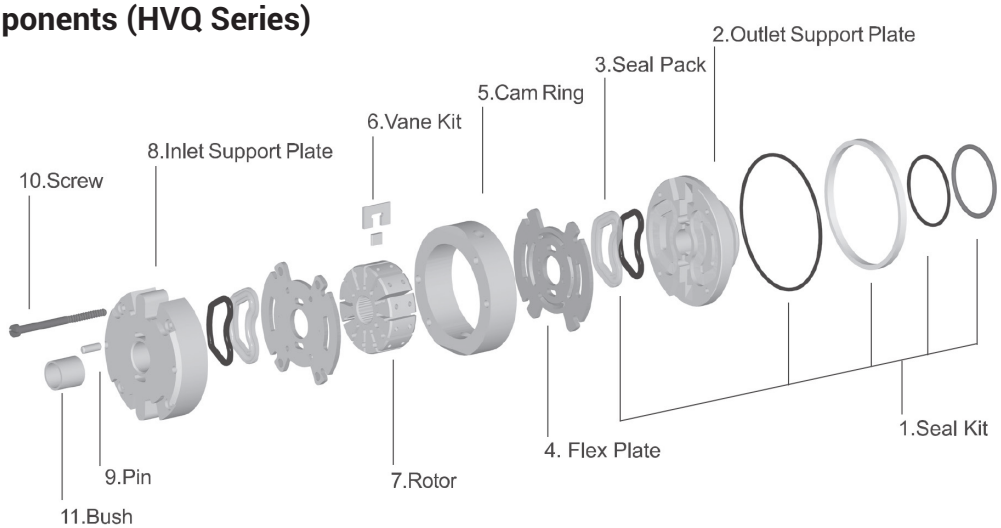


Single Pump 25HV/HVQ, 35HV/HVQ, 45HV/HVQ

Cartridge Kit Components (HV Series)



Cartridge Kit Components (HVQ Series)



Cartridge Kit for Vane Pump HV and HVQ 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 HV Series), and flex plates (for HVQ 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. 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 alignment holes located within the cover. Install four screws and torque tighen to the values indicated.

Model	Torque Specification	
	N.m	lb.ft
20HV/HVQ	48-55	65-75
25HV/HVQ	48-55	65-75
35HV/HVQ	102-118	140-160
45HV/HVQ	188-203	255-275

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

Cartridge Kit for Vane Pump HV and HVQ Series

in Double 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 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 HV Series), and flex plates (for HVQ 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	Torque Specification	
	N.m	lb.ft
2520HV/HVQ	48-55	65-75
3520HV/HVQ	102-118	140-160
3525HV/HVQ	102-118	140-160
4520HV/HVQ	188-203	255-275
4525HV/HVQ	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 the 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	Torque Specification	
	N.m	lb.ft
2520HV/HVQ	54-68	40-50
3520HV/HVQ	54-68	40-50
3525HV/HVQ	88-102	65-75
4520HV/HVQ	54-68	40-50
4525HV/HVQ	88-102	65-75
4535HV/HVQ	188-203	255-275

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

Cartridge Kit for Vane Pump HV and HVQ Series

Specification HV

Cartridge Kit 20HV

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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)
2	7.0 (0.42)	1800	206 (3000)	11.3 (3.0)	5.2 (7.0)	2.4 (5.3)
5	18.0 (1.10)			28.4 (7.5)	11.2 (15.0)	
8	27.0 (1.67)			45.4 (12.0)	17.0 (22.8)	
9	30.2 (1.84)			51.0 (13.5)	23.5 (31.5)	2.3 (5.1)
11	36.0 (2.22)			56.8 (15.0)	22.6 (30.3)	
12	40.0 (2.47)		158 (2300)	62.1(16.4)	25.1 (33.7)	
14	45.0 (2.78)		138 (2000)	69.6 (18.4)	28.3 (37.9)	

Cartridge Kit 25HV

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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	39.0 (2.47)	1800	172 (2500)	62.1 (16.4)	22.9 (30.8)	3.6 (7.9)
14	45.0 (2.78)			69.6 (18.4)	25.7 (34.5)	
17	55.0 (3.39)			86.3 (22.8)	29.8 (40.0)	
19	60.8 (3.72)			96.1 (25.4)	32.5 (43.5)	
21	67.0 (4.13)			106.0 (28.0)	34.0 (45.6)	

Cartridge Kit 35HV

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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)
21	68.3 (4.18)	1800	172 (2500)	106.3 (28.1)	34.0 (45.5)	6.5 (14.3)
25	81.0 (4.94)			124.9 (33.0)	45.5 (61.0)	
30	97.0 (5.91)			154.4 (40.8)	54.5 (73.0)	
32	100.9 (6.15)			167.0 (44.0)	56.7 (76.0)	
35	112.0 (6.83)			181.7 (48.0)	61.5 (82.4)	
38	121.0 (7.37)			193.8 (51.2)	65.9 (88.3)	

Cartridge Kit for Vane Pump HV and HVQ Series

Cartridge Kit 45HV

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm^3/r 1(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)
35	110.4 (6.73)	1800	172 (2500)	179.0 (47.2)	60.0 (80.4)	10.1 (22.3)
38	119.8 (7.32)			194.0 (51.3)	65.1 (87.3)	
42	138.0 (8.41)			208.2 (55.0)	75.3 (101.0)	
47	151.4 (9.26)			244.1 (64.5)	82.5 (110.6)	
50	162.0 (9.85)			253.6 (67.0)	87.3 (117.0)	
52	164.0 (10.0)			266.0 (70.0)	89.1 (119.5)	
57	183.6 (11.23)			295.0 (77.8)	94.0 (126.0)	
60	193.0 (11.75)			310.4 (82.0)	103.7 (139.0)	
62	196.0 (11.94)			317.0 (83.7)	106.5 (142.8)	
64	202.0 (12.33)			327.0 (86.4)	109.7 (147.1)	
66	208.0 (12.7)			337.0 (89.0)	113.0 (151.5)	

Cartridge Kit for Vane Pump HV and HVQ Series

Specification HVQ

Cartridge Kit 20HVQ

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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)
2	7.0 (0.42)	2700	206 (3000)	15.9 (4.2)	7.3 (9.8)	2.4 (5.3)
5	18.0 (1.10)			41.6 (11.0)	17.9 (24.0)	
8	27.0 (1.67)			64.3 (17.0)	26.1 (35.0)	
9	30.2 (1.84)			71.5 (18.9)	32.9 (44.1)	
11	36.0 (2.22)			87.1 (23.0)	35.4 (47.5)	2.3 (5.1)
12	39.0 (2.41)		158 (2300)	96.5 (25.5)	28.3 (38.0)	
14	45.0 (2.80)		138 (2000)	113.6 (30.0)	29.1 (39.0)	2.5 (5.5)

Cartridge Kit 25HVQ

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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	40.0 (2.45)	2700	206 (3000)	87.1 (23.0)	41.0 (55.0)	3.6 (7.9)
14	45.0 (2.77)			102.2 (27.0)	46.6 (62.5)	
17	55.0 (3.37)	2500		117.3 (31.0)	51.8 (69.5)	
19	60.8 (3.72)			130.5 (34.5)	55.0 (71.0)	
21	67.0 (4.12)			143.8 (38.0)	61.9 (83.0)	

Cartridge Kit 35HVQ

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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)
21	68.3 (4.18)	2500	206 (3000)	143.8 (38.0)	55.0 (73.9)	6.5 (14.3)
25	81.0 (4.94)			170.3 (45.0)	75.3 (101.0)	
30	97.0 (5.91)			208.2 (55.0)	87.7 (117.5)	
32	100.9 (6.15)	2400		218.0 (57.6)	91.2 (122.3)	
35	112.0 (6.83)			227.1 (60.0)	98.5 (132.0)	
38	121.0 (7.37)			246.0 (65.0)	104.4 (140.0)	

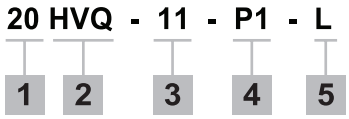
Cartridge Kit for Vane Pump HV and HVQ Series

Cartridge Kit 45HVQ

Delivery at 1200 rpm & 7 bar (100 psi) USgpm	Displacement cm³/r 1(in³/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)
35	110.4 (6.73)	2200	172 (2500)	219.0 (57.7)	73.3 (98.3)	10.1 (22.3)
38	119.8 (7.32)			237.0 (62.7)	79.5 (106.7)	
42	138.0 (8.41)			251.7 (66.5)	91.4 (122.5)	
47	151.4 (9.26)			280.8 (74.2)	95.0 (127.3)	
50	162.0 (9.85)			299.0 (79.0)	105.2 (141.0)	
52	164.0 (10.0)			325.0 (85.7)	106.6 (143.0)	
57	183.6 (11.23)			342.5 (90.5)	109.3 (146.6)	
60	193.0 (11.75)			363.4 (96.0)	126.8 (170.0)	
62	196.0 (11.94)			387.0 (102.3)	128.8 (172.7)	
64	202.0 (12.33)			400.0 (105.7)	132.7 (178.0)	
66	208.0 (12.7)			412.0 (109.0)	136.6 (183.2)	

Cartridge Kit for Vane Pump HV and HVQ Series

Ordering Code



1. Model :
   20, 25, 35, 45
   2520, 3520, 3525, 4520, 4525, 4535

2. Series :
   HV - Industrial
   HVQ - Mobile

3. Ring Size (USgpm)

20, 25**20**, 35**20**, 45**20**HV/HVQ	- 2, 5, 8, 9, 11, 12, 14
25, **25**20, 35**25**, 45**25**HV/HVQ	- 12, 14, 17, 19, 21
35, **35**20, **35**25, 45**35**HV/HVQ	- 21, 25, 30, 32, 35, 38
45, **45**20, **45**25, **45**35HV/HVQ	- 35, 38, 42, 47, 50, 52, 57, 60, 62, 64, 66

*30 also available upon request

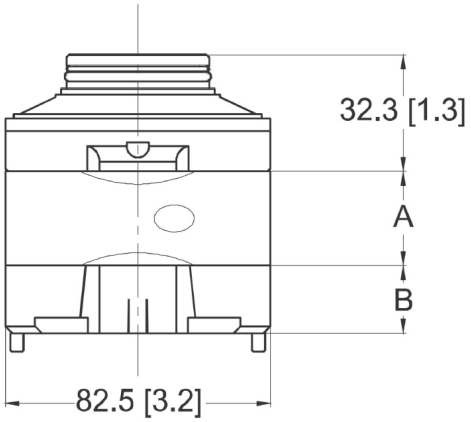
4. Cartridge Position
   P1 - For single pump or shaft end in double pump
   P2 - For cover end in double pump

5. Shaft Rotation (Viewed from shaft end)
   R - Turn right
   L - Turn left

Cartridge Kit for Vane Pump HV and HVQ Series

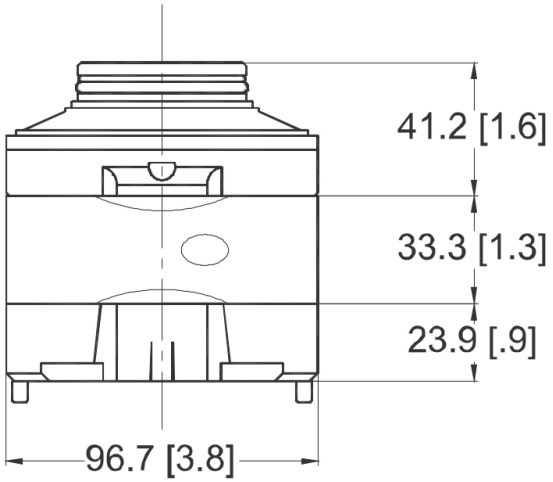
Installation Dimension mm (inch) HV

Cartridge Kit 20HV

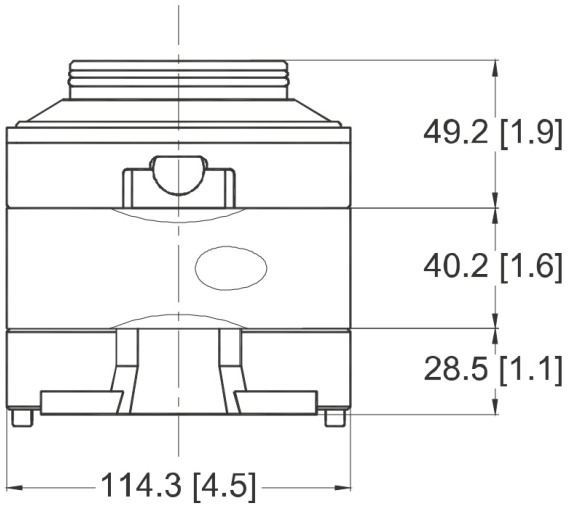


Delivery	A	B
2,5,8,9	21.95 [.86]	27.70 [1.09]
11,12,14	30.47 [1.20]	19.10 [0.75]

Cartridge Kit 25HV

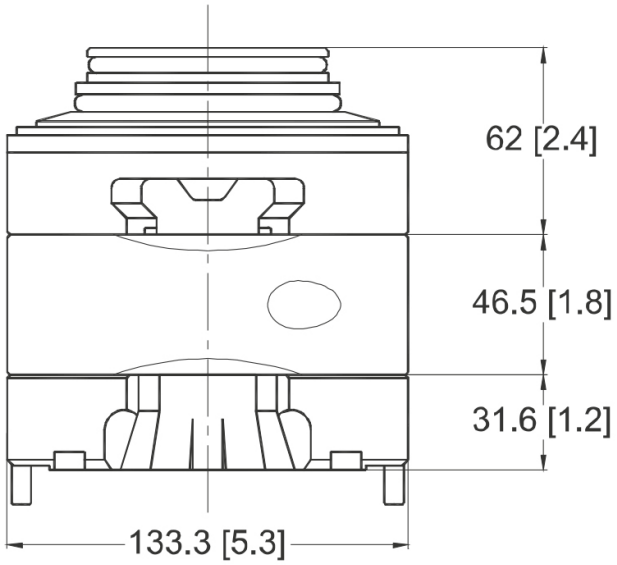


Cartridge Kit 35HV



Cartridge Kit for Vane Pump HV and HVQ Series

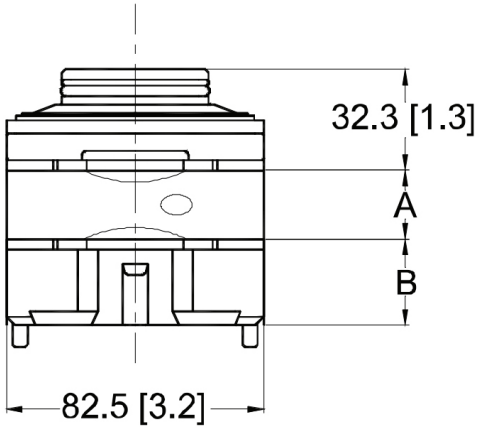
Cartridge Kit 45HV



Cartridge Kit for Vane Pump HV and HVQ Series

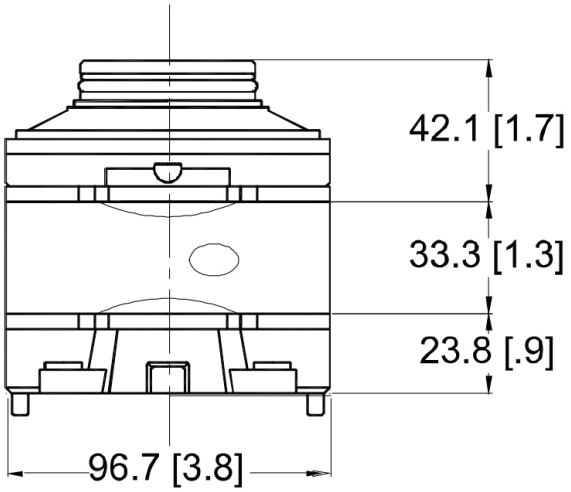
Installation Dimension mm (inch) HVQ

Cartridge Kit 20HVQ

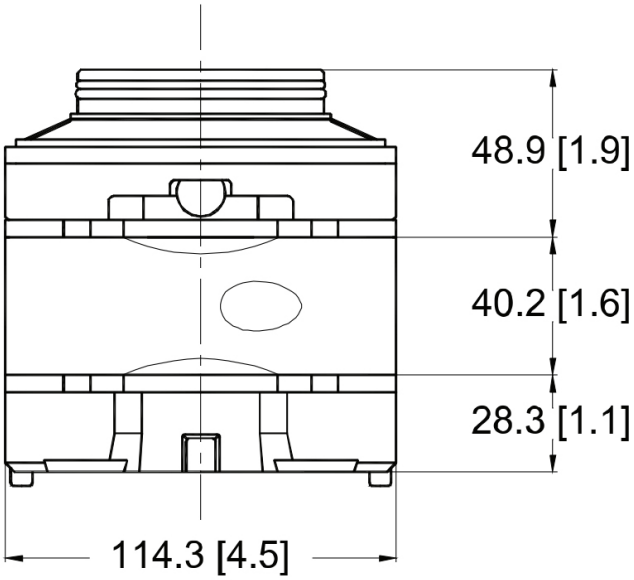


Delivery	A	B
2,5,8,9	21.95 [.86]	27.70 [1.09]
11,12,14	30.47 [1.20]	19.10 [0.75]

Cartridge Kit 25HVQ



Cartridge Kit 35HVQ



Cartridge Kit for Vane Pump HV and HVQ Series

Cartridge Kit 45HVQ

