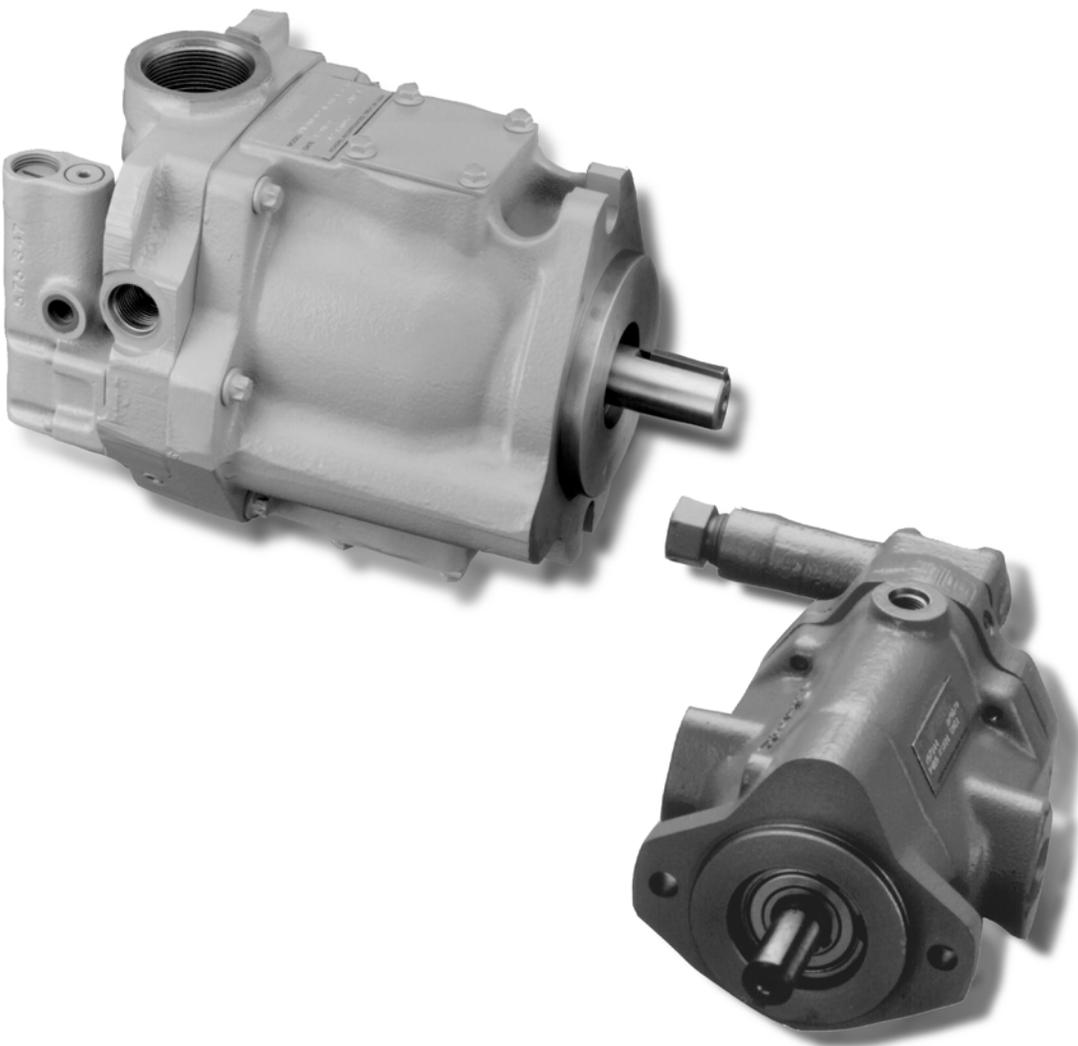


Vickers®
Piston Pumps



Vickers Pump PVQ

Variable Displacement, Quiet Series
For Industrial Applications



Introduction

PVQ piston pumps are in-line, variable displacement units and are available in nine sizes. Displacement is varied by means of pressure and/or flow compensator controls. An impressive assortment of control options offers maximum operating flexibility.

PVQs operate at quietness levels that meet today's demanding industrial conditions. The sound level of each unit approaches or is below that of the electric motor driving it. Sound is reduced by a patented timing arrangement that also produces low pressure "pulses" in the outlet flow. This

leads to reduced tendencies for noise in systems using PVQs.

The PVQ series is capable of operating with many types of hydraulic fluid. Water-content and phosphate ester fluids can be accommodated, in addition to the typical petroleum based and synthetic fluids.

Many PVQ pumps are available in a thru-drive configuration to accommodate a multitude of application and installation requirements. Thru-drive models can be coupled to various types and sizes of fixed and variable displacement pumps, resulting in a compact and versatile

package. Such a package offers lower installed cost by reducing the installation size and by requiring only one mounting pad on the prime mover.

Quiet PVQs have excellent operating characteristics, and the pumps' many control and mounting options allow choosing the optimum model for any application. Additionally, PVQs possess the same durability and long life characteristics expected of the best industrial products in today's marketplace. For over 75 years, the Vickers name has been synonymous with long trouble-free service.

PVQ10 & PVQ13 Model Series

Ratings

Model Series	Maximum Geometric Displacement cm ³ /r (in ³ /r)	Rated Speed r/min	Maximum Pressure bar (psi)	Input Power at Max. Pressure & Rated Speed kW (hp)	Approx. Weight kg (lb)
PVQ10	10,5 (0.643)	1800	210 (3000)	7,4 (10)	7,2 (16)
PVQ13	13,8 (0.843)	1800	140 (2000)	6,5 (8.75)	7,2 (16)

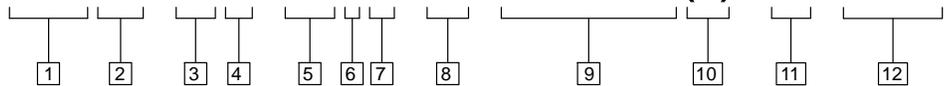
Pressure Limits

Case pressure – 0,35 bar (5 psig) maximum

Inlet pressure – 0,2 bar (5 in. Hg) vacuum to 2 bar (30 psig)

Model Code

PVQ 1 * - * * * - S * * S - 10 - C * * * * * (D) - * * - S * * *



1 Series PVQ

- P – Inline piston pump
- V – Variable volume
- Q – Quiet series

2 Displacement in cc/rev and pressure ratings

- 10 – 10,5 cc/rev (0.64 cir), 210 bar (3000 psi)
- 13 – 13,8 cc/rev (0.84 cir), 140 bar (2000 psi)

3 Mounting flange specifications

- A2 – Flange SAE J744 82-2 (SAE A)
- MA – Flange ISO 3019/2-80A2HW (available with “N” drive shaft only)

4 Rotation viewed from shaft end

- R – Right hand (cw), standard
- L – Left hand (ccw), optional

5 Ports, type and location

- SE – SAE O-ring rear port, 1.0625” inlet & outlet (standard)
- SS – SAE O-ring side port, 1.3125” inlet & outlet (optional)

6 Shafts, input

- 1 – Straight keyed SAE “A” modified, .75” dia. x 1.75” long
- 3 – Splined SAE “A” modified, 9T 16/32 DP major dia. fit
- N – Shaft end ISO 3019/2 E20N (available with “MA” mount only)

7 Seals

- S – Buna N, standard
- F – Fluorocarbon, optional

8 Pump design number

- 10 – Design number subject to change. Installation dimensions remain unchanged for designs 10–19.

9 Control type

- C** – Pressure compensator. PVQ10: Standard model is C21, indicating setting of 207 bar (3000 psi); range is 02–21 in tens of bar (350–3000 psi). PVQ13: Standard model is C14, indicating factory setting of 138 bar (2000 psi); range is 02–14 in tens of bar (350–2000 psi).
- CM** – Low pressure compensator. Standard model is CM7, indicating factory setting of 69 bar (1000 psi); range is 02–10 in tens of bar (350–1500 psi).

- C**V**B – Pressure compensator C**, as above with load sensing. Standard load sensing setting is 11 bar (160 psi); range 10–17 bar (150–250 psi); with bleed-down orifice. Example: C21V11B indicates PVQ10 compensator with 207 bar pressure setting and 11 bar load-sense differential.

- C**V**P – Pressure compensator with load sensing as C**V**B above, but with bleed-down orifice plugged.
- C**VC**B – Pressure compensator with load sensing. Compensator same as C** above. Standard load sensing setting is 24 bar (350 psi), range 17–31 bar (250–450 psi). With bleed-down orifice.

- C**VC**P – Pressure compensator with load sensing. Same as C**VC**B above, but with bleed-down orifice plugged.

- CG – Pressure compensator modified for hydraulic remote control.

- CD** – Electric dual range compensator. PVQ10: CD21 is standard 210 bar setting of high range (24–210 bar). PVQ13: CD14 is standard 140 bar setting of high range (24–140 bar). Both units require low range to be set by customer (20–100 bar).

- UV – Unloading Valve for accumulator circuits. See installation details.

10 Control option

- Blank – Without adjustable maximum displacement stop (standard)
- D – Adjustable maximum displacement stop (optional)

11 Control design

- 11 – C** and CM**
- 11 – C**D and CM**D
- 12 – C**V(C)**B and C**V(C)**P
- 20 – UV, CD** and CG

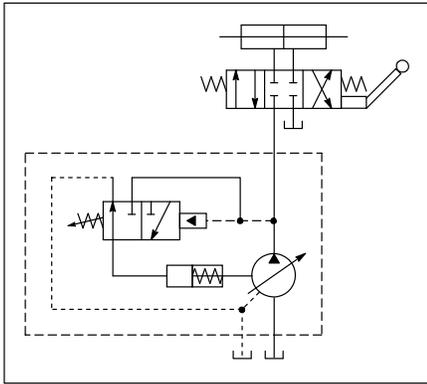
12 Special suffixes

- S2 – Shaft up mounting
- S3 – British Standard Parallel Threads Counterbore Ports (ISO R288 threads). Contact Vickers for available configurations.
- S9 – Special CG compensator for use with electronically modulated relief valves

Controls

Pressure Compensators “C” & “CM”

The pressure compensator control automatically adjusts pump delivery to maintain volume requirements of the system at a preselected operating pressure. Maximum pump delivery is maintained to approximately 3,4 bar (50 psi) below the pressure setting before being reduced. The pressure compensator control operates on one side of center and has an adjustment range as designated in the model coding.



“C” & “CM”

Pressure Compensator with Adjustable Maximum Displacement Stop “D”

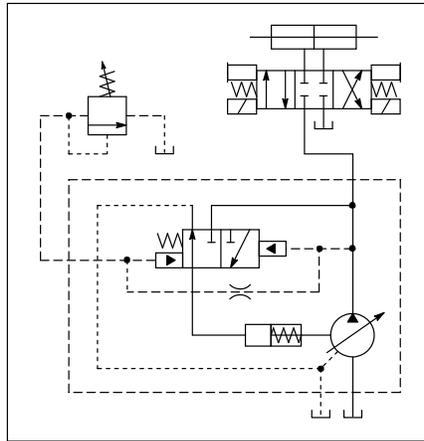
The adjustable maximum stop pressure control enables the maximum pump delivery to be externally adjusted from 25% to 100% while maintaining all of the standard features of a pressure compensated pump. To assist initial priming, manual adjustment control setting must be at least 40% of maximum flow position.

Remote Control Pressure Compensator “CG”

Exactly the same as the “C” (pressure compensation option) except the machine operator is able to change the compensator setting through the use of a remote pilot relief valve, such as Vickers C-175.

Electric Dual Range Pressure Compensator “CD”

The dual range pressure compensator control automatically adjusts pump delivery to maintain volume

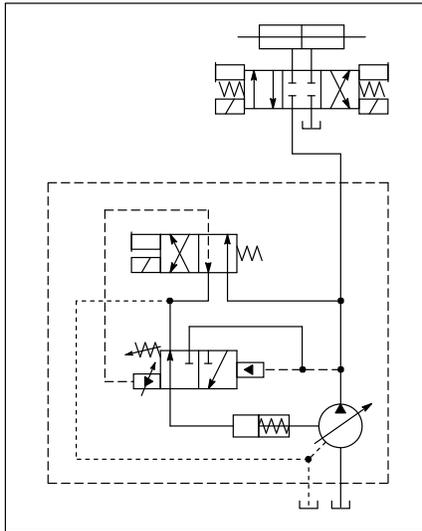


“CG”

requirements of the system at either of two preselected operating pressures.

Maximum pump delivery is maintained to approximately 3,4 bar (50 psi) below either pressure control setting before being reduced.

Control type and pressure range are designated in the model code.



“CD”

Note: Graphic symbols shown with external valve(s) and cylinder to illustrate typical usage.

Load Sensing & Pressure Limiting Compensators

This compensator provides load sensing control under all pressure conditions up to the desired maximum. It automatically

adjusts pump flow in response to a remote pressure signal and maintains outlet pressure at a level slightly above load pressure. The integral pressure limiter overrides the load sensing control, reducing pump displacement as the preset maximum operating pressure is reached.

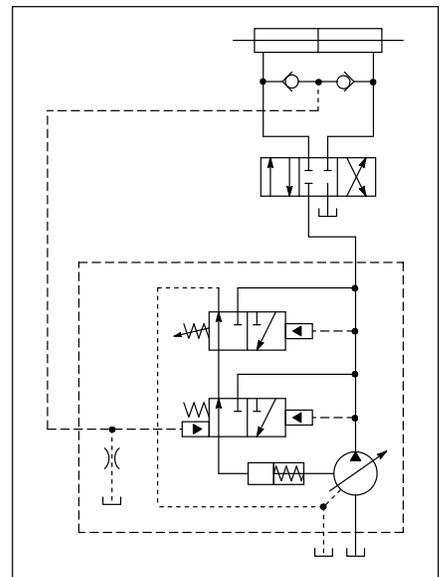
Standard load-sense differential pressure settings, by control type, follow. See model code for setting range.

“C**V11B” Standard load-sensing and pressure limiting control with 11 bar differential pressure setting (standard factory setting). Includes bleed-down orifice to exhaust load-sense signal for low-pressure standby condition.

“C**V11P” Same as C**V11B above, but with bleed-down orifice plugged.

“C**VC24B” Same as C**V11B, but with factory differential pressure setting of 24 bar.

“C**VC24P” Same as C**V11P, but with factory differential pressure setting of 24 bar.

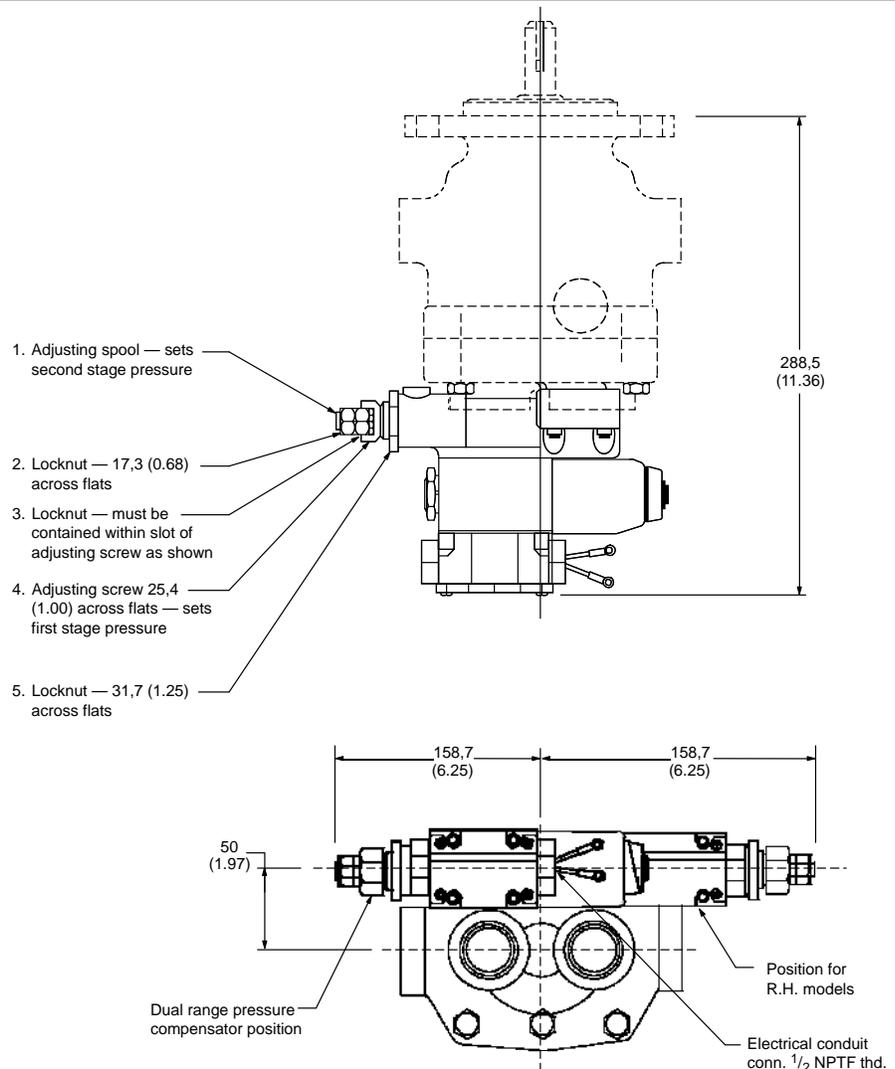


“C**V***B” (orifice open)
& “C**V***P” (orifice plugged)

Electric Dual Range Pressure Compensator Control "CD"

Adjustment

1. With the directional valve de-energized, loosen locknut "5" and turn the adjusting screw "4" to the desired first stage pressure setting, then tighten locknut "5".
2. With solenoid de-energized, turn adjusting spool "1" counterclockwise (CCW) until nut "3" is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise (CW) to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut "2".



Solenoid Data* (110V AC 50 Hz and 115/120V AC 60 Hz)

Solenoid current	Inrush amps (R.M.S.)	Holding amps
115/120V AC 60 Hz – 110V AC 50 Hz	2.0	.54 .64*

* Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.

Refer to catalog GB-C-2015B for additional solenoid valve data.

♦ **Note:** Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation and, therefore, should be cycled periodically to prevent this from happening.

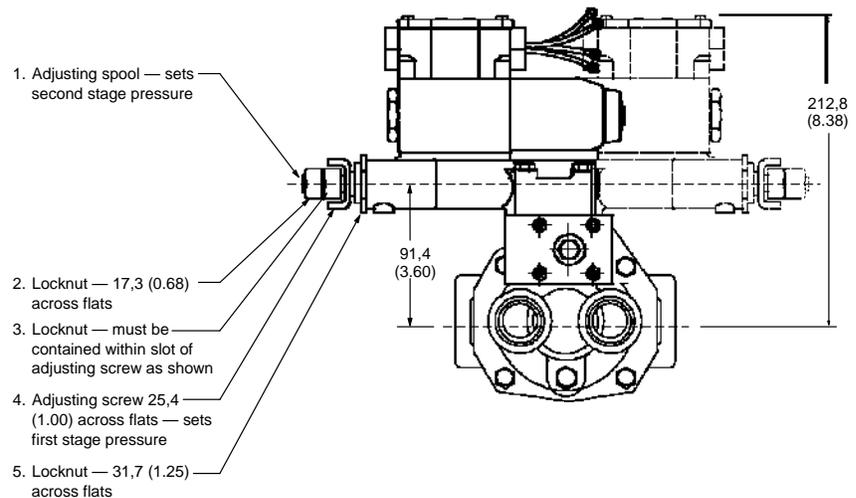
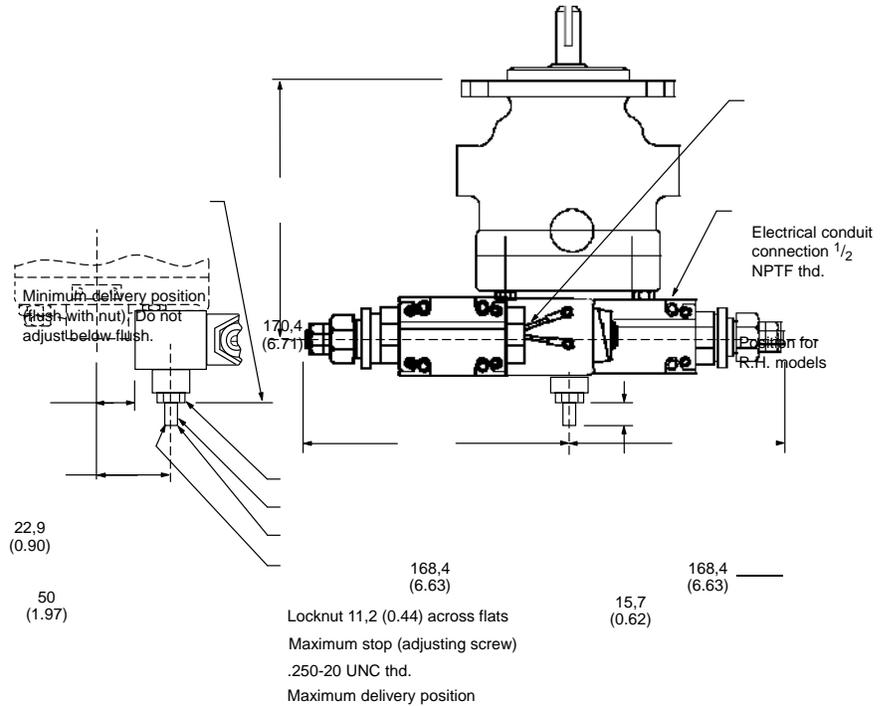
Electric Dual Range Pressure Compensator with Maximum Displacement Stop "CD**D"

Maximum Flow Adjustment

With the system pressure below both compensator settings, loosen maximum stop adjusting screw locknut and adjust screw to desired flow position (turning screw clockwise decreases flow and turning screw counterclockwise increases flow). To lock screw in position tighten locknut. To assist initial priming, adjust control setting to at least 40% of maximum flow position.

Compensator Control

1. With the directional valve de-energized, loosen locknut "5" and turn the adjusting screw "4" to the desired first stage pressure setting, then tighten locknut "5".
2. With directional valve de-energized, turn adjusting spool "1" counterclockwise until nut "3" is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut "2".



Solenoid Data* (110V AC 50 Hz and 115/120V AC 60 Hz)

Solenoid current	Inrush amps (R.M.S.)	Holding amps
115/120V AC 60 Hz – 110V AC 50 Hz	2.0	.54 .64*

* Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.

Refer to catalog GB-C-2015B for additional solenoid valve data.

Unloading Valve Control “UV”

With the unloading valve control the variable pump will unload at a preset pressure. The pump will maintain this no flow, low pressure (approximately 14 bar [200 psi]) standby condition, until system pressure drops to about 85% of the preset unloading pressure. The pump will then return on stroke and provide full flow until the preset unloading pressure is reached again.

With this control, an efficient accumulator charging circuit is obtained. The pump will provide full flow to fill the accumulator until the maximum charging pressure is reached. The pump then goes to a standby condition until the accumulator pressure drops to 85% of the desired maximum. The accumulator is then recharged as the cycle starts over again.

A separate right angle check valve must be provided to maintain the accumulator hydraulic charge and prevent back flow when the pump is unloaded. The check valve's internal leakage must not exceed five drops per minute. The control port must be connected to system pressure, downstream of the check valve.

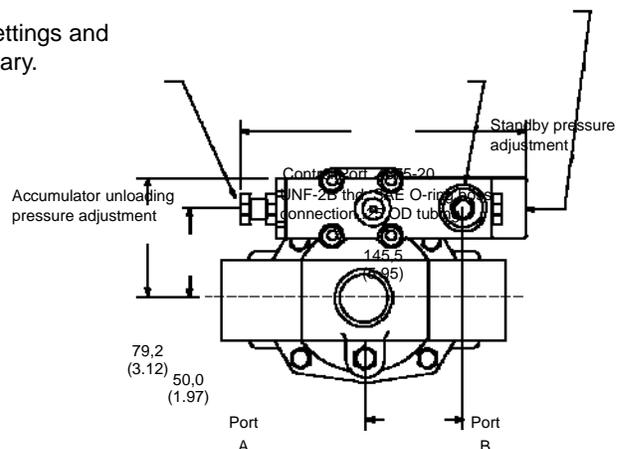
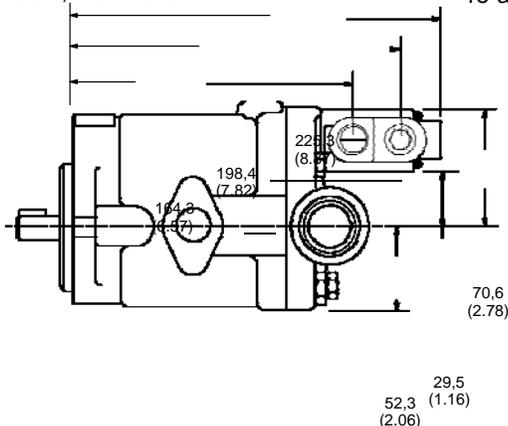
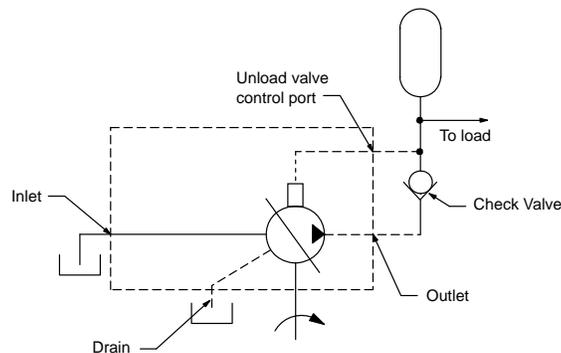
Adjustment range

PVQ10 100–210 bar (1500–3000 psi)
 PVQ13 100–140 bar (1500–2000 psi)

Cut-in pressure is 85% of unloading pressure, minimum.

Setting Pressures

1. Back out accumulator unloading pressure adjustment screw to below desired unloading pressure.
2. Adjust desired standby pressure.
3. Set accumulator pressure by screwing in the accumulator unloading adjustment screw. Accumulator recharge (cut-in) pressure is a function of the maximum accumulator pressure and is not adjustable.
4. Check pressure settings and re-adjust if necessary.



PVQ16 Model Series

Ratings

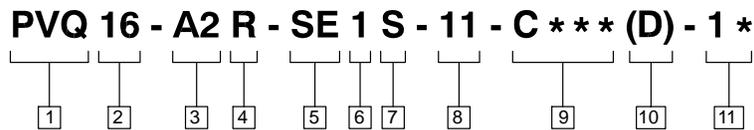
Model Series	Maximum Geometric Displacement cm ³ /r (in ³ /r)	Rated Speed r/min	Maximum Pressure bar (psi)	Input Power at Max. Pressure & Rated Speed kW (hp)	Approx. Weight kg (lb)
PVQ16	16,0 (0.976)	1800	210 (3000)	11,2 (15)	15 (33)

Pressure Limits

Case pressure – 0,35 bar (5 psig) maximum

Inlet pressure – 0,2 bar (5 in. Hg) vacuum to 2 bar (30 psig)

Model Code



1 Series PVQ

- P – Inline piston pump
- V – Variable volume
- Q – Quiet series

2 Displacement in cc/rev and pressure ratings

- 16 – 16,0 cc/rev (0.976 cir), 210 bar (3000 psi)

3 Mounting flange specifications

- A2 – Flange SAE J744 82-2 (SAE A)

4 Rotation viewed from shaft end

- R – Right hand (cw), standard
- L – Left hand (ccw), optional

5 Ports, type and location

- SE – Inch SAE O-ring boss rear port

6 Shafts, input

- 1 – Shaft SAE J744 16-1 (SAE A)
Straight keyed

7 Seals

- S – Buna N, standard

8 Pump design number

- 11 – Design number subject to change. Installation dimensions remain unchanged for designs 10–19.

9 Control type

- C** – Pressure compensator. Standard model is C21, indicating setting of 210 bar (3000 psi); range is 02–21 in tens of bar (350–3000 psi).
- CG – Pressure compensator modified for hydraulic remote control.
- CV6 – Load sensing. Standard load sensing setting is 6 bar (90 psi) differential. No pressure compensation and no bleed-down orifice. Relief valve is required, such as Vickers CS-06.

10 Control option

- Blank – Without adjustable maximum displacement stop (standard)
- D – Adjustable maximum displacement stop (optional)

11 Control design

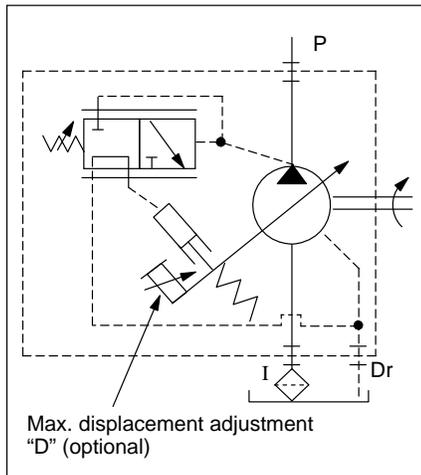
- 10 – CG and CV6
- 11 – C**

Pressure Compensator Control "C"

The pressure compensator control automatically adjusts pump delivery to maintain volume requirements of the system at a preselected operating pressure.

Maximum pump delivery is maintained to approximately 5 bar (70 psi) below the control pressure before being reduced.

The pressure compensator control operates on one side of center and has an adjustment range as designated in the model coding.



"C"

Note:

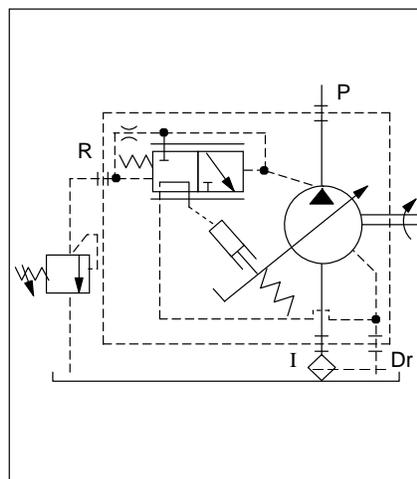
Graphic symbols shown with external valve to illustrate typical usage.

Pressure Compensator Control with Adjustable Maximum Displacement Stop "D"

The adjustable maximum displacement stop allows the maximum pump delivery to be externally adjusted from 50% to 100%, while maintaining the standard features of the pressure compensated pump.

Remote Control Pressure Compensator "CG"

This compensator is the same as the "C" compensator, except the machine operator is able to change the compensator setting through the use of a remote pilot relief valve. The pump must not be operated with the remote compensator port plugged; port must be connected to a remote pilot relief valve, such as Vickers C-175. The effective compensator setting is the sum of the compensator control setting and the remote relief valve setting.

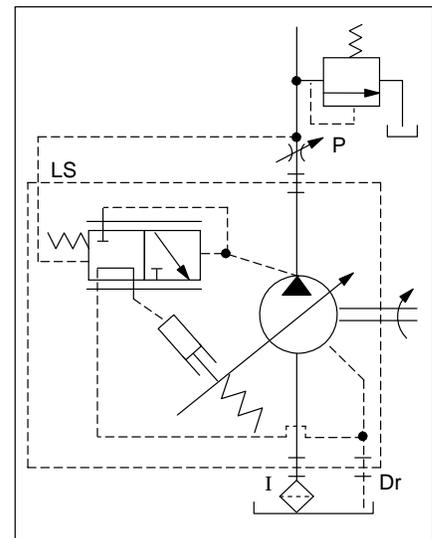


"CG"

Load Sensing Compensator Control "CV6"

This control provides load sensing control under all pressure conditions up to the system relief valve setting. It automatically adjusts pump flow in response to a remote pressure signal and maintains outlet pressure at approximately 6 bar (90 psi) above load pressure. By venting the load-sense line with external valving (e.g., Vickers DG4V-3 directional valve), when no flow or pressure demands are placed on the system, the pump will go to a no-flow, low pressure, energy conserving standby mode.

This control does not include maximum pressure limitation, so a separate system relief valve (e.g., Vickers CS-03) is required. The system relief valve will limit the maximum system pressure to the selected level.



"CV6"

PVQ20 & PVQ32 Model Series

Ratings

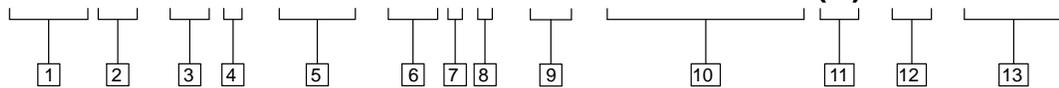
Model Series	Maximum Geometric Displacement cm ³ /r (in ³ /r)	Rated Speed r/min	Maximum Pressure bar (psi)	Input Power at Max. Pressure & Rated Speed kW (hp)	Approx. Weight kg (lb)
PVQ20	21,1 (1.290)	1800	210 (3000)	14,9 (20)	14 (31)
PVQ32	32,9 (2.010)	1800	140 (2000)	15,6 (21)	14 (31)

Pressure Limits

Case pressure – 0,35 bar (5 psig) maximum

Inlet pressure – 0,2 bar (5 in. Hg) vacuum to 2 bar (30 psig)

Model Code **PVQ ** - ** * - A ** - S ** * - 10 - C * * * * * (D) - ** - S ** ***



1 Series PVQ

- P – Inline piston pump
- V – Variable volume
- Q – Quiet series

2 Displacement in cc/rev and pressure ratings

- 20 – 21,1 cc/rev (1.29 cir), 210 bar (3000 psi)
- 32 – 32,9 cc/rev (2.01 cir), 140 bar (2000 psi)

3 Mounting flange specifications

- B2 – Flange SAE J744 101-2 (SAE B)
- MB – Flange ISO 3019/2-100A2HW (available with “N” drive shaft only)

4 Rotation viewed from shaft end

- R – Right hand (cw), standard
- L – Left hand (ccw), optional

5 Thru-drive without coupling (available with side ports only)

- Blank – No thru-drive
- A9 – SAE J744 82-2 (SAE A) w/9T spline
- A11 – SAE J744 82-2 (SAE A) w/11T spline

6 Ports, type and location

- SE – SAE O-ring rear port, 1.625” inlet & outlet (standard)
- SS – SAE O-ring side port, 1.625” inlet & outlet (optional)

7 Shafts, input

- 1 – Straight keyed SAE “B” modified, 2.31” long
- 3 – Splined SAE “B” modified, 13T 16/32 DP major dia. fit
- N – Shaft end ISO 3019/2 E25N (available with “MB” mount only)
- 28 – 26-tooth splined shaft (Vickers). Used in PVQ20/32 single to mount on PVQ40/45 “B26” thru-drive.

8 Seals

- S – Buna N, standard
- F – Fluorocarbon, optional

9 Pump design number

- 10 – Design number subject to change. Installation dimensions remain unchanged for designs 10–19.

10 Control type

- C** – Pressure compensator. PVQ20: Standard model is C21, indicating setting of 207 bar (3000 psi); range is 02–21 in tens of bar (350–3000 psi). PVQ32: Standard model is C14, indicating factory setting of 138 bar (2000 psi); range is 02–14 in tens of bar (350–2000 psi).

- CM** – Low pressure compensator. Standard model is CM7, indicating factory setting of 70 bar (1000 psi); range is 02–10 in tens of bar (350–2000 psi).

- C**V**B – Pressure compensator C**, as above with load sensing. Standard load sensing setting is 11 bar (160 psi); range 10–17 bar (150–250 psi); with bleed-down orifice. Example: C21V11B indicates PVQ20 compensator with 210 bar pressure setting and 11 bar load-sense differential.

- C**V**P – Pressure compensator with load sensing as C**V**B above, but with bleed-down orifice plugged.

- C**VC**B – Pressure compensator with load sensing. Compensator same as C** above. Standard load sensing setting is 24 bar

- (350 psi), range 17–31 bar (250–450 psi). With bleed-down orifice.

- C**VC**P – Pressure compensator with load sensing. Same as C**VC**B above, but with bleed-down orifice plugged.
- CG – Pressure compensator modified for hydraulic remote control.

- CD** – Electric dual range compensator. PVQ20: CD21 is standard 207 bar setting of high range (24–210 bar). PVQ32: CD14 is standard 140 bar setting of high range (24–140 bar). Both units require low range to be set by customer (20–100 bar).

- UV – Unloading Valve for accumulator circuits. See installation details.

11 Control option

- Blank – Without adjustable maximum displacement stop (standard)
- D – Adjustable maximum displacement stop (optional)

12 Control design

- 11 – C** and CM**
- 11 – C**D and CM**D
- 12 – C**V(C)**B and C**V(C)**P
- 20 – UV, CD** and CG

13 Special suffixes

- S2 – Shaft up mounting
- S3 – British Standard Parallel Threads Counterbore Ports (ISO R288 threads). Contact Vickers for available configurations.
- S9 – Special CG compensator for use with electronically modulated relief valves

Response Data

Yoke response recorded at rated speed and pressure, 0 psi inlet, 82°C (180°F), SAE 10W oil. Pressure rise was 6900 bar (100,000 psi) per second.

Control Type	PVQ20		PVQ32	
	On stroke	Off stroke	On stroke	Off stroke
Pressure compensator	0.070 sec.	0.023 sec.	0.080 sec.	0.020 sec.
Load sense compensator	0.090 sec.	0.015 sec.	0.100 sec.	0.018 sec.

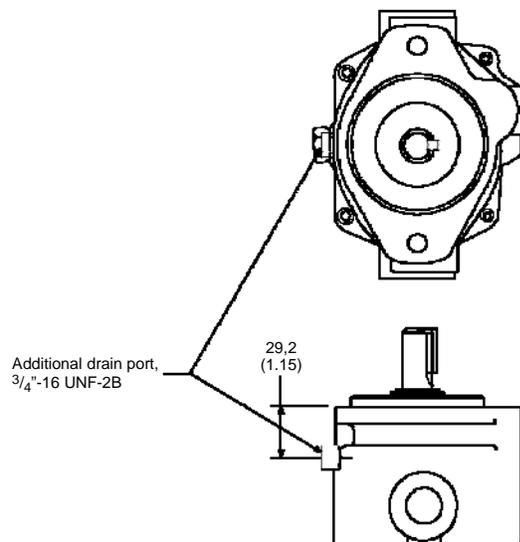
Thru-drive Shaft Torque Limits

Any deviation from these maximum torque values must be approved by Vickers engineering.

Model Series*	Input Shaft Code	Maximum Input Torque Total Nm (lb. in.)	Maximum Thru-drive Torque Output Nm (lb. in.)
PVQ20/32A9	1	135 (1200)	58 (517)
	3	208 (1850)	
	N	337 (2987)	
PVQ20/32A11	1	135 (1200)	123 (1100)
	3	208 (1850)	
	N	337 (2987)	

* SAE "B" 4 inch thru-drive pilot not available in PVQ20/32 frame size.

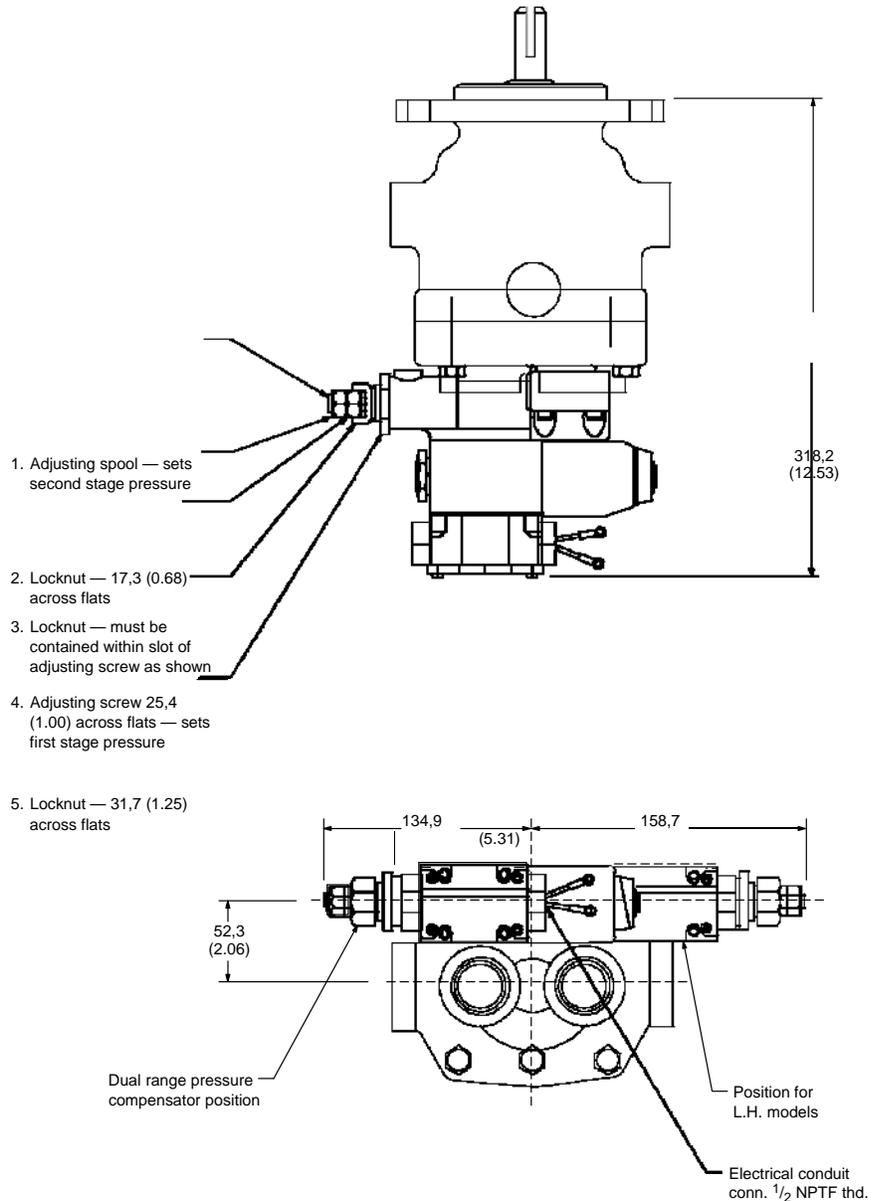
Vertical "Shaft-up" Installation — "S2" Drain Port Option



Electric Dual Range Pressure Compensator Control "CD"

Adjustment

1. With the directional valve de-energized, loosen locknut "5" and turn the adjusting screw "4" to the desired first stage pressure setting, then tighten locknut "5".
2. With solenoid de-energized, turn adjusting spool "1" counterclockwise (CCW) until nut "3" is bottomed in adjusting screw slot. (Second stage pressure setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise (CW) to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut "2".



Solenoid Data* (110V AC 50 Hz and 115/120V AC 60 Hz)

Solenoid current	Inrush amps (R.M.S.)	Holding amps
115/120V AC 60 Hz – 110V AC 50 Hz	2.0	.54 .64*

* Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.

Refer to catalog GB-C-2015B for additional solenoid valve data.

♦ **Note:** Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation and,

Unloading Valve Control “UV”

With the unloading valve control the variable pump will unload at a preset pressure. The pump will maintain this no flow, low pressure (approximately 14 bar [200 psi]) standby condition, until system pressure drops to about 85% of the preset unloading pressure. The pump will then return on stroke and provide full flow until the preset unloading pressure is reached again.

With this control, an efficient accumulator charging circuit is obtained. The pump will provide full flow to fill the accumulator until the maximum charging pressure is reached. The pump then goes to a standby condition until the accumulator pressure drops to 85% of the desired maximum. The accumulator is then recharged as the cycle starts over again.

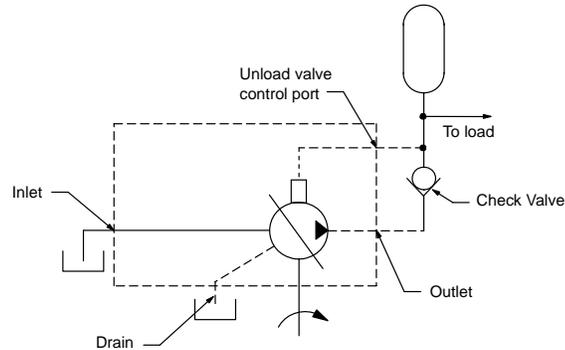
A separate right angle check valve must be provided to maintain the accumulator hydraulic charge and prevent back flow when the pump is unloaded. The check valve's internal leakage must not exceed five drops per minute. The control port must be connected to system pressure, downstream of the check valve.

Adjustment range

PVQ20 100–210 bar (1500–3000 psi)

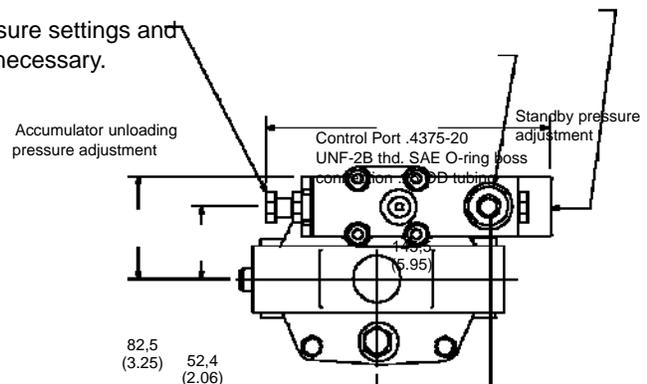
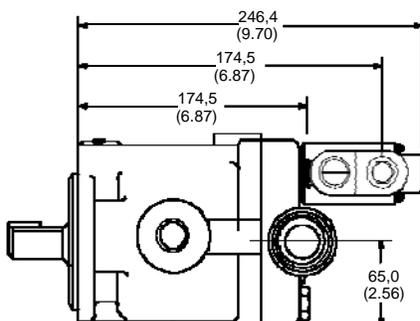
PVQ32 100–140 bar (1500–2000 psi)

Cut-in pressure is 85% of unloading pressure, minimum.



Setting Pressures

1. Back out accumulator unloading pressure adjustment screw to below desired unloading pressure.
2. Adjust desired standby pressure.
3. Set accumulator pressure by screwing in the accumulator unloading adjustment screw. Accumulator recharge (cut-in) pressure is a function of the maximum accumulator pressure and is not adjustable.
4. Check pressure settings and re-adjust if necessary.



PVQ25 Model Series

Ratings

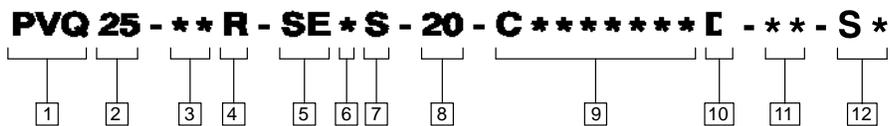
Model Series	Maximum Geometric Displacement cm ³ /r (in ³ /r)	Rated Speed r/min	Maximum Pressure bar (psi)	Input Power at Max. Pressure & Rated Speed kW (hp)	Approx. Weight kg (lb)
PVQ25	25,2 (1.54)	1800	210 (3000)	16 (24)	14 (31)

Pressure Limits

Case pressure – 0,35 bar (5 psig) maximum

Inlet pressure – 0,2 bar (5 in. Hg) vacuum to 2 bar (30 psig)

Model Code



1 Series PVQ

- P – Inline piston pump
- V – Variable volume
- Q – Quiet series

2 Displacement in cc/rev and pressure ratings

25 – 25,2 cc/rev (1.54 cir), 210 bar (3000 psi)

3 Mounting flange specifications

- B2 – Flange SAE J744 101-2 (SAE B)
- MB – Flange ISO 3019/2-100A2HW (available with “N” drive shaft only)

4 Rotation viewed from shaft end

- R – Right hand (cw), standard
- L – Left hand (ccw), optional

5 Ports, type and location

SE – SAE O-ring rear port, 1.0625” inlet & outlet (standard)

6 Shafts, input

- 1 – Straight keyed SAE “B” modified, 2.31” long
- 3 – Splined SAE “B” modified, 13T 16/32 DP major dia. fit
- N – Shaft end ISO 3019/2 E25N (available with “MB” mount only)

7 Seals

- S – Buna N, standard

8 Pump design number

20 – Design number subject to change. Installation dimensions remain unchanged for designs 20–29.

9 Control type

- C** – Pressure compensator. Standard setting 21 in tens of bar (max. setting 201 bar). Range 02–21 in tens of bar.
- CM** – Pressure compensator. Standard setting, 10 in tens of bar (max. setting 103 bar). Range 02–10 in tens of bar (350–1500 psi).
- C**V**B – Pressure compensator C**, as above with load sensing. Standard load sensing setting is 11 bar (160 psi); range 10–17 bar (150–250 psi); with bleed-down orifice. Example: C21V11B indicates PVQ25 compensator with 210 bar pressure setting and 11 bar load-sense differential.
- C**V**P – Pressure compensator with load sensing as C**V**B above, but with bleed-down orifice plugged.
- C**VC**B – Pressure compensator with load sensing. Compensator same as C** above. Standard load sensing setting is 24 bar (350 psi), range 17–31 bar (250–450 psi). With bleed-down orifice.

- C**VC**P – Pressure compensator with load sensing. Same as C**VC**B above, but with bleed-down orifice plugged.
- CG – Pressure compensator modified for hydraulic remote control.
- CD** – Electric dual range compensator. PVQ25: CD21 is standard 210 bar setting of high range (24–210 bar). Unit requires low range to be set by customer (20–100 bar).
- UV – Unloading Valve for accumulator circuits. See installation details.

10 Control option

- Blank – Without adjustable maximum displacement stop (standard)
- D – Adjustable maximum displacement stop (optional)

11 Control design

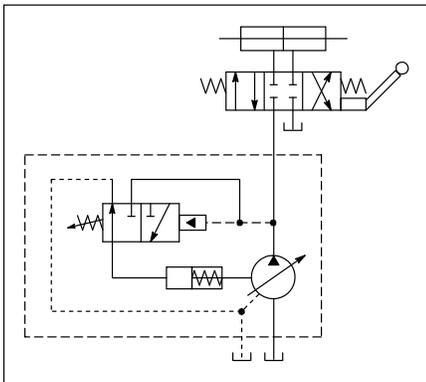
- 10 – C** and CM**
- 11 – C**D and CM**D
- 12 – C**V(C)**B and C**V(C)**P
- 20 – CD**, CG, and UV

12 Special suffixes

- S2 – Shaft up mounting
- S3 – British Standard Parallel Threads Counterbore Ports (ISO R288 threads). Contact Vickers for available configurations.
- S9 – Special CG compensator for use with electronically modulated relief valves

Pressure Compensator Controls “C” & “CM”

The pressure compensator control automatically adjusts pump delivery to maintain volume requirements of the system at a preselected operating pressure. Maximum pump delivery is maintained to approximately 75 psi (PVQ25) below the pressure setting before being reduced. The pressure compensator control operates on one side of center and has an adjustment range as designated in the model coding.



“C” & “CM”

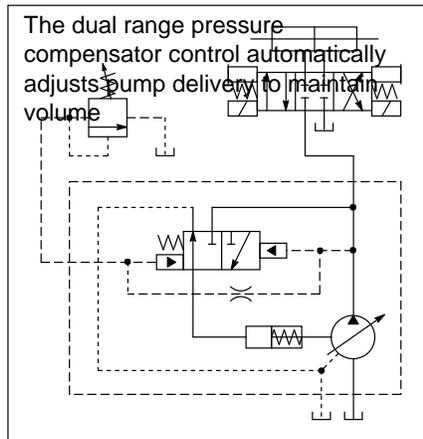
Pressure Compensator Control with Adjustable Maximum Displacement Stop “D”

The adjustable maximum stop pressure control enables the maximum pump delivery to be externally adjusted from 25% to 100% while maintaining all of the standard features of a pressure compensated pump. To assist initial priming, manual adjustment control setting must be at least 40% of maximum flow position.

Remote Control Pressure Compensator “CG”

Exactly the same as the “C” (pressure compensation option), except the machine operator is able to change the compensator setting through the use of a remote pilot relief valve, such as Vickers C-175.

Electric Dual Range Pressure Compensator Control “CD”



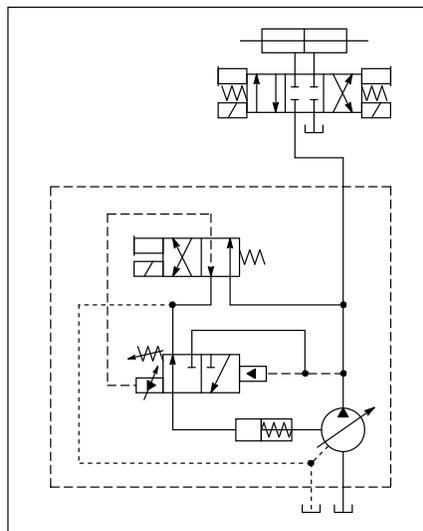
The dual range pressure compensator control automatically adjusts pump delivery to maintain volume

“CG”

requirements of the system at either of two preselected operating pressures.

Maximum pump delivery is maintained to approximately 75 psi (PVQ25) below either pressure control setting before being reduced.

Control type and pressure range are designated in the model code.



“CD”

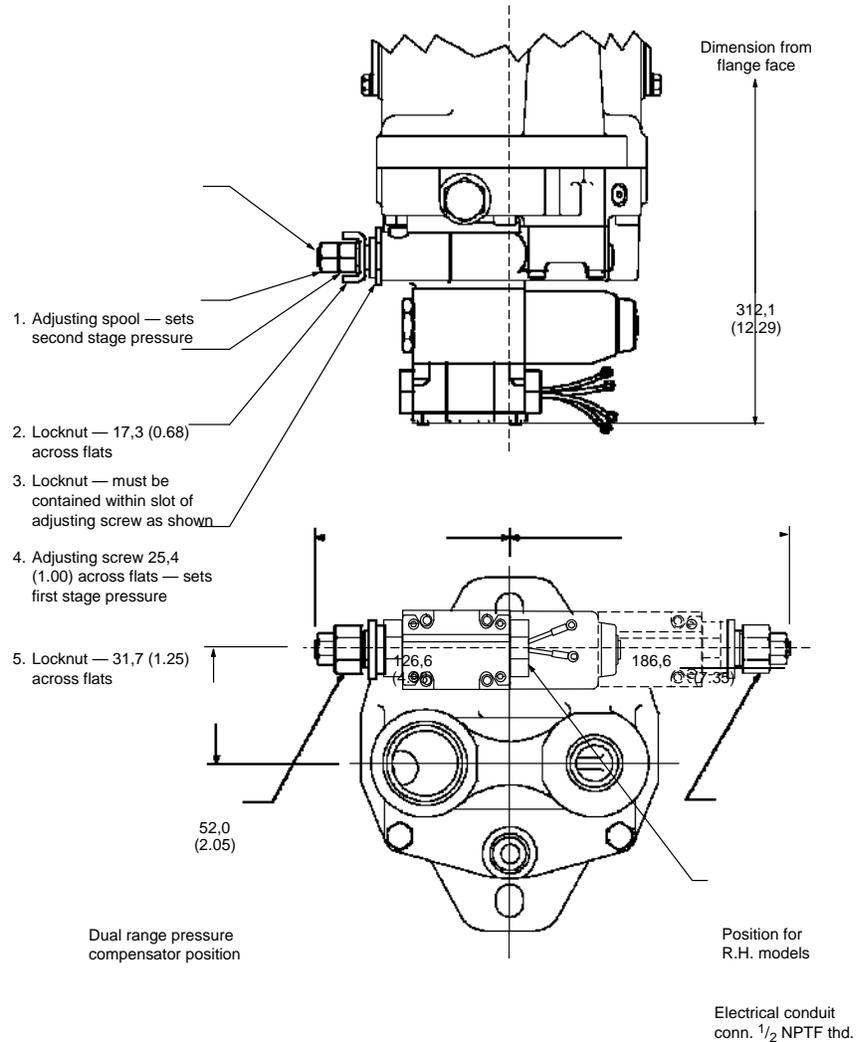
Note: Graphic symbols shown with external valve(s) and cylinder to illustrate typical usage.

Load Sensing & Pressure Limiter Compensator Control

Electric Dual Range Pressure Compensator Control "CD"

Adjustment

1. With the directional valve de-energized, loosen locknut "5" and turn the adjusting screw "4" to the desired first stage pressure setting, then tighten locknut "5".
2. With solenoid de-energized, turn adjusting spool "1" counterclockwise (CCW) until nut "3" is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise (CW) to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut "2".



Solenoid Data* (110V AC 50 Hz and 115/120V AC 60 Hz)

Solenoid current	Inrush amps (R.M.S.)	Holding amps
115/120V AC 60 Hz – 110V AC 50 Hz	2.0	.54 .64*

* Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.

Refer to catalog GB-C-2015B for additional solenoid valve data.

♦ **Note:** Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation and,

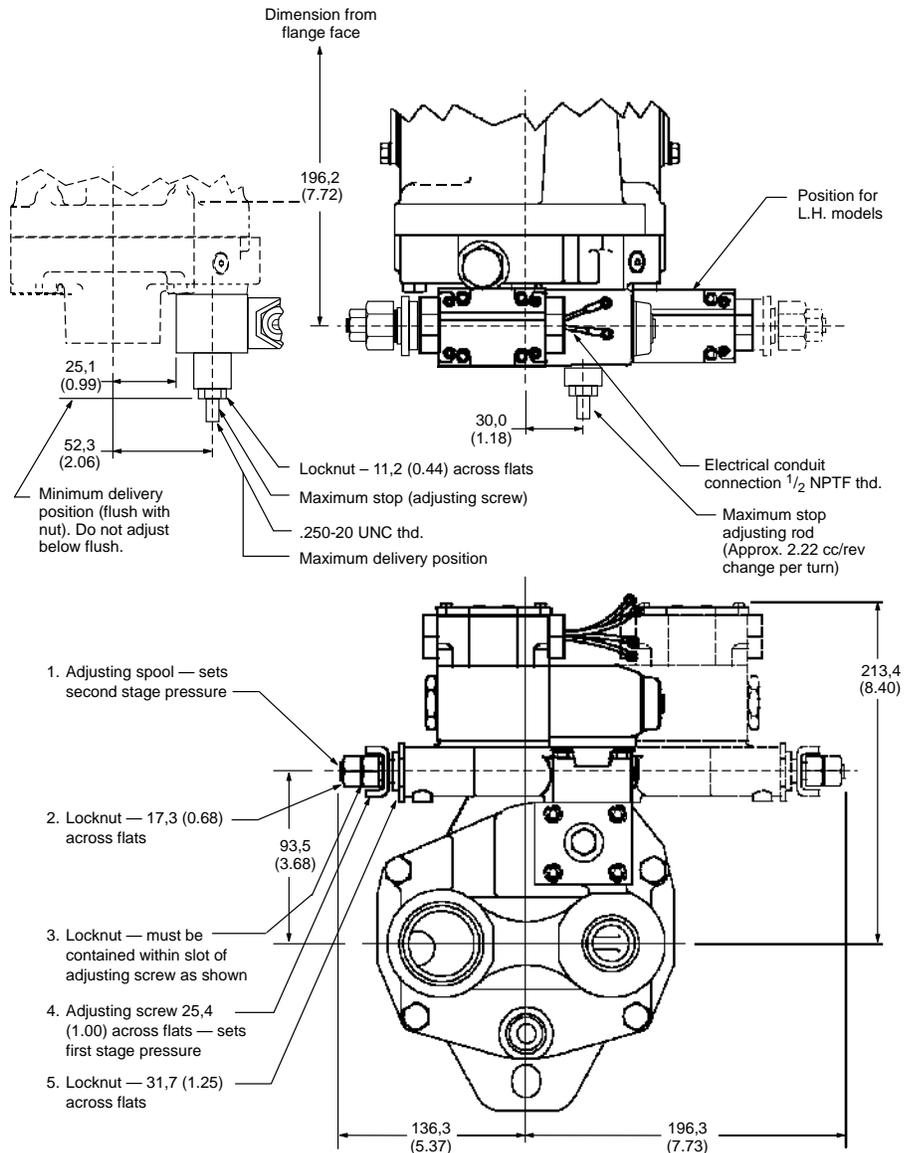
Electric Dual Range Pressure Compensator with Maximum Displacement Stop “CD**D”

Maximum Flow Adjustment

With the system pressure below both compensator settings, loosen maximum stop adjusting screw locknut and adjust screw to desired flow position (turning screw clockwise decreases flow and turning screw counterclockwise increases flow). To lock screw in position, tighten locknut. To assist initial priming, adjust control setting to at least 40% of maximum flow position.

Compensator Control

1. With the directional valve de-energized, loosen locknut “5” and turn the adjusting screw “4” to the desired first stage pressure setting, then tighten locknut “5”.
2. With directional valve de-energized, turn adjusting spool “1” counterclockwise until nut “3” is bottomed in adjusting screw slot. (Second stage setting is now equal to first stage pressure setting.) Turn adjusting spool clockwise to desired second stage pressure requirements. One complete turn of adjusting spool equals approximately 41 bar (600 psi). Energize solenoid and check pressure setting. De-energize solenoid and re-adjust if necessary. Secure this setting by tightening locknut “2”.



Solenoid Data* (110V AC 50 Hz and 115/120V AC 60 Hz)

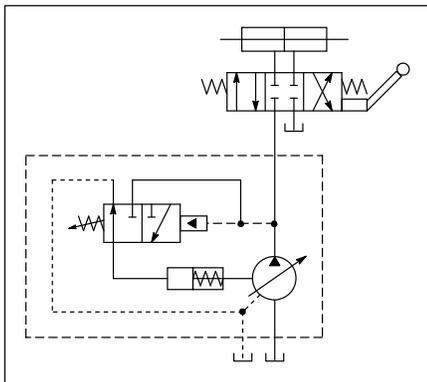
Solenoid current	Inrush amps (R.M.S.)	Holding amps
115/120V AC 60 Hz – 110V AC 50 Hz	2.0	.54 .64*

* Maximum peak inrush amps approximately 1.4 x R.M.S. value shown.

Refer to catalog GB-C-2015B for additional solenoid valve data.

**Pressure Compensator Controls
“C” & “CM”**

This control automatically varies pump displacement to meet the system flow demand for a constant system pressure. Displacement starts to reduce to zero within 14 bar (200 psi) of the compensator setting. Power draw-off is minimized, therefore, system relief valves should not be required.



“C” & “CM”

**Pressure Compensator Control
with Adjustable Maximum
Displacement Stop “D”**

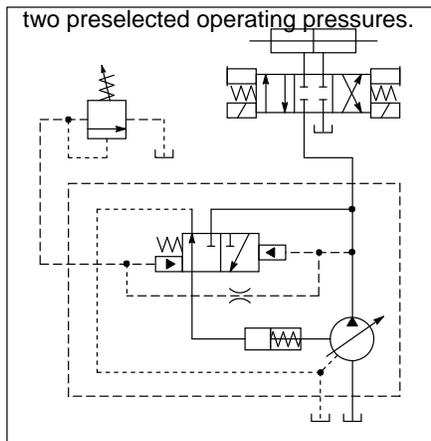
The adjustable maximum stop pressure control enables the maximum pump delivery to be externally adjusted from 25% to 100% while maintaining all of the standard features of a pressure compensated pump. To assist initial priming, manual adjustment control setting must be at least 40% of maximum flow position.

**Remote Control Pressure
Compensator “CG”**

Exactly the same as the “C” (pressure compensation option) except the machine operator is able to change the compensator setting through the use of a remote pilot relief valve.

**Electric Dual Range Pressure
Compensator Control “CD”**

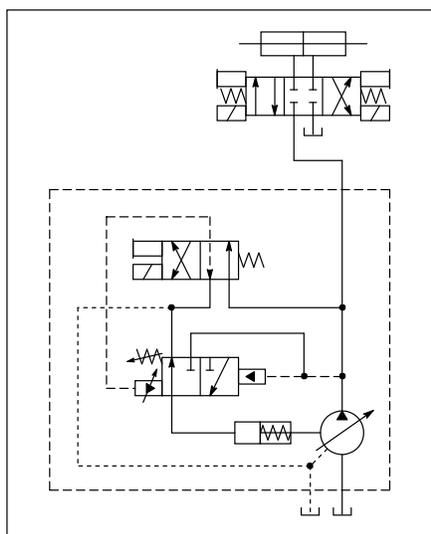
The dual range pressure compensator control automatically adjusts pump delivery to maintain volume requirements of the system at either of



“CG”

Maximum pump delivery is maintained to approximately 3,4 bar (50 psi) below either pressure control setting before being reduced.

Control type and pressure range are designated in the model code.



“CD”

Note: Graphic symbols shown with external valve(s) and cylinder to illustrate typical usage.

**Load Sensing & Pressure Limiter
Compensator Control**

This compensator provides load sensing control under all pressure conditions up to