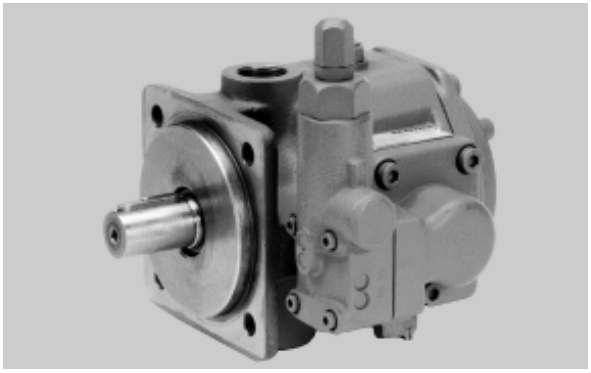
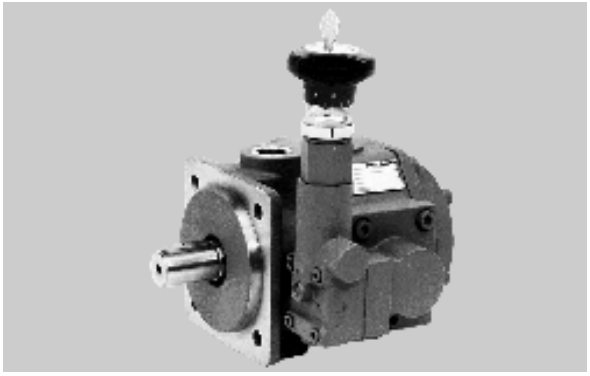
MANNESMANN REXROTH	Variable Vane Pump Model V7 / Series 1X			Extracted from RA 10 515/03.95 Replaces: 05.94
	Sizes 14 to 150	...2000 PSI (140 bar)	...0.37 to 9.16 in³ (6 to 150 cm³)	

- Variable displacement
- Low operating noise level
- Long bearing life due to hydro-dynamically lubricated sleeve bearings
- Control capabilities for pressure and flow
- Low hysteresis
- Very short control times for on and off stroke
- Available pressure test point
- Available as constant pump, without controller
- Available as a combination pump
- Installation and connection dimensions according to
  - VDMA 24560 part 1
  - ISO 3019/2
- Metric configuration only for world-wide universal application



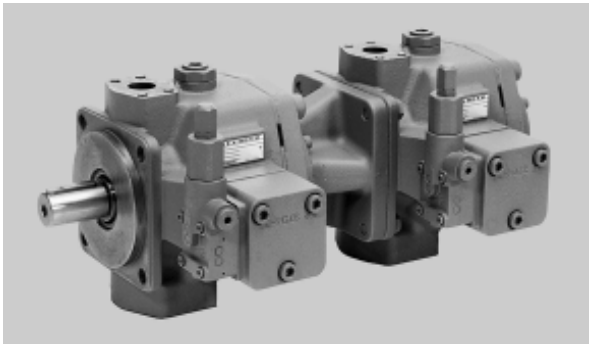
F 91 023

V7/16 with pressure controller



F 90 004

V7/16 with lockable pressure controller



F 89 045

V7/63 + V7/63 - Double pump

Contents

Functional description, section, symbols

Construction

Hydraulic pumps Model V7 are variable displacement vane pumps.

They consist of housing (1), rotor (2), vanes (3), cam ring (4), pressure regulator (5 – next page) and maximum displacement adjustment (6).

Cam ring (4) is located between small control piston (10) and large control piston (11). A third contact point is the height adjustment screw (7).

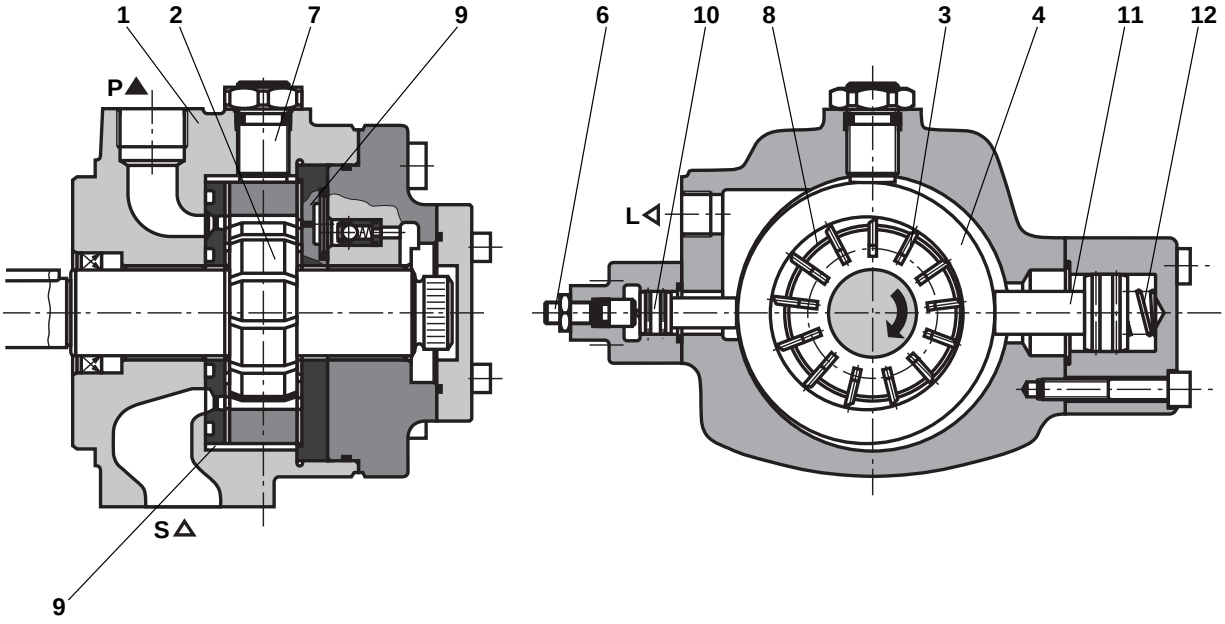
Rotor (2) turns within the cam ring (4). The vanes (3) are forced against the cam ring (4) by centrifugal force.

Pressure control

System pressure increases and passes via a drilling in the pump to a chamber behind the small control piston (10).

Pilot oil also passes via the drilling in pressure control spool (14) into a chamber behind the large control piston (11). Control piston (11) holds the cam ring (4) in a full displacement position.

Until system pressure exceeds compensator spring setting (13 – next page), cam ring (4) is held at full displacement.



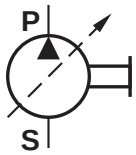
Suction and delivery

Fluid chambers (8) are formed by vanes (3), rotor (2), cam ring (4) and the port plates (9).

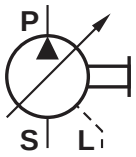
To ensure flow when starting, cam ring (4) is held at full displacement by control piston (11) and bias spring (12).

Chambers (8) increase in size by the rotation of the rotor (2) and fill with fluid via suction port (S). Upon reaching maximum volume, the chambers (8) are isolated from suction. Further rotation of rotor (2) connects the chambers to pressure as they are compressed, and force fluid into the system via pressure port (P) .

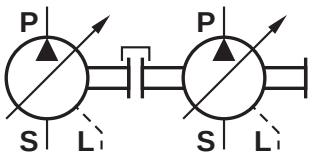
Symbols



without controller **type “Z”**



single pump



double pump

Controls

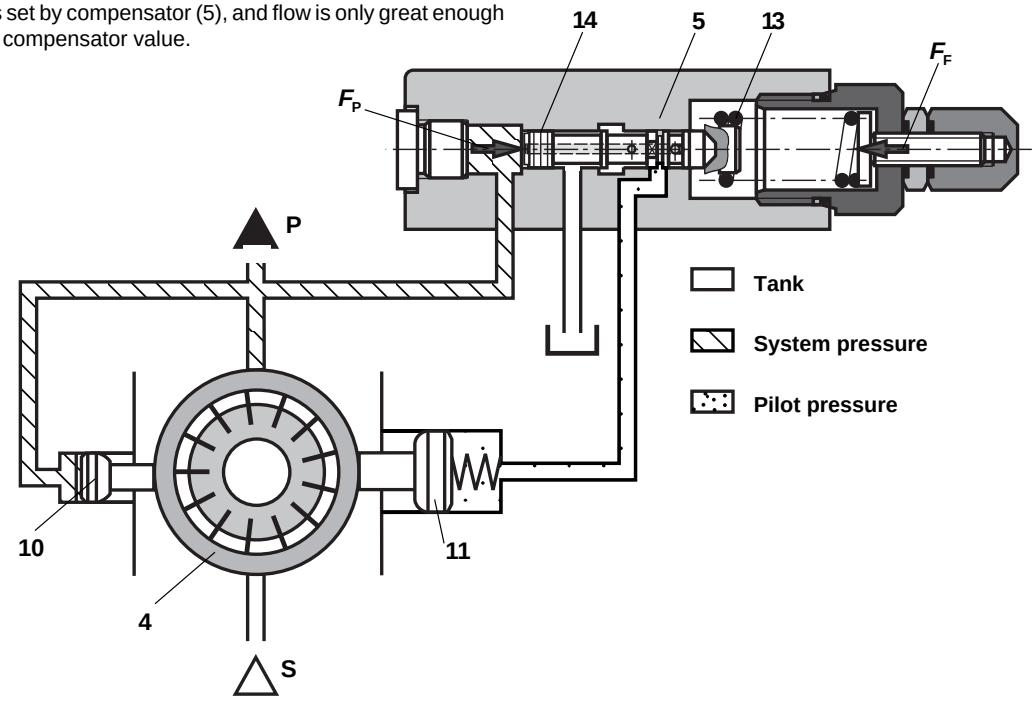
Compensation

When force F_p exceeds spring force F_F, control spool (14) moves right against the spring (13). The chamber behind the large control piston (11) is unloaded to tank.

The small control piston (10), continuously under pressure, moves the cam ring towards a no flow position. The pump maintains pressure as set by compensator (5), and flow is only great enough to maintain compensator value.

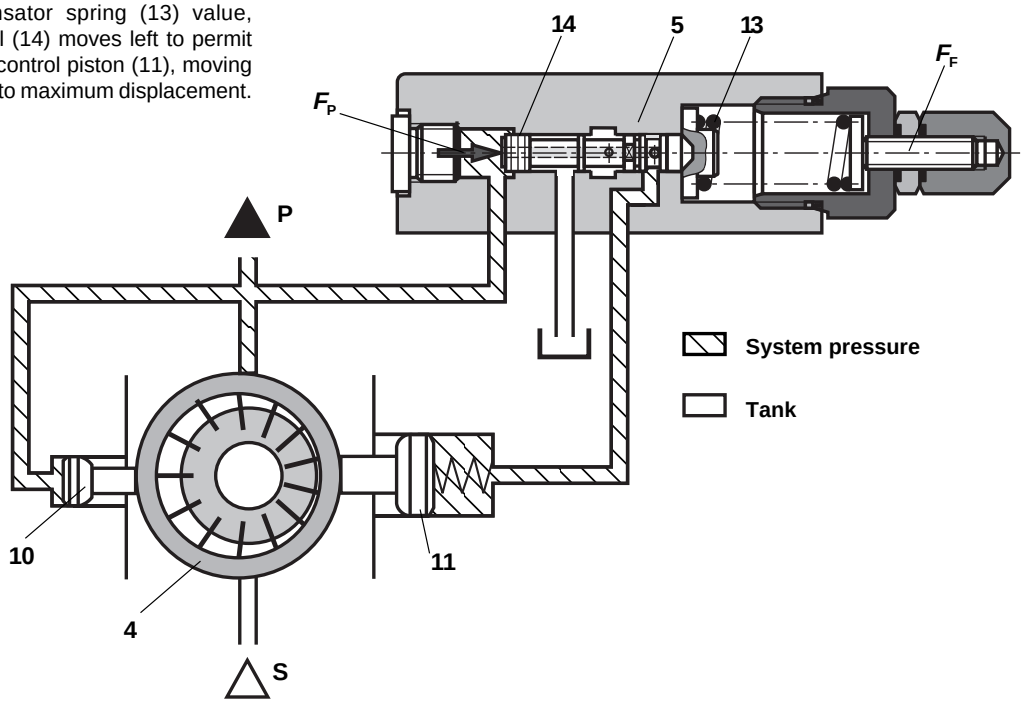
At compensation, power loss and fluid heating is minimal.

The pump response curve maintains maximum flow until the compensator is exceeded. Frictional, and leakage losses are held minimal to maintain efficient power output.



Maximum displacement

When system pressure decays below the compensator spring (13) value, control spool (14) moves left to permit pilot oil into control piston (11), moving cam ring (4) to maximum displacement.



Ordering code

Frame Sizes and Displacements		Port Connection[1]	Compensator Pressure Range	
F.size 10- size 0.85 in^3 (14 cm^3)	**= 10-14**	**= 01**	**14 =**	up to 2000 PSI (140 bar)
F.size 10- size 1.22 in^3 (20 cm^3)	**= 10-20**	**= 01**	**10 =**	up to 1450 PSI (100 bar)
F.size 16- size 1.22 in^3 (20 cm^3)	**= 16-20**	**= 01**	**14 =**	up to 2000 PSI (140 bar)
F.size 16- size 1.83 in^3 (30 cm^3)	**= 16-30**	**= 01**	**07 =**	up to 1000 PSI (70 bar)
F.size 25- size 1.83 in^3 (30 cm^3)	**= 25-30**	**= 01**	**14 =**	up to 2000 PSI (140 bar)
F.size 25- size 2.75 in^3 (45 cm^3)	**= 25-45**	**= 01**	**07 =**	up to 1000 PSI (70 bar)
F.size 40- size 2.75 in^3 (45 cm^3)	**= 40-45**	**= 37**	**14 =**	up to 2000 PSI (140 bar)
F.size 40- size 4.33 in^3 (71 cm^3)	**= 40-71**	**= 37**	**07 =**	up to 1000 PSI (70 bar)
F.size 63- size 4.33 in^3 (71 cm^3)	**= 63-71**	**= 07**	**14 =**	up to 2000 PSI (140 bar)
F.size 63- size 5.74 in^3 (94 cm^3)	**= 63-94**	**= 07**	**07 =**	up to 1000 PSI (70 bar)
F.size 100- size 7.20 in^3 (118 cm^3)	**= 100-118**	**= 07**	**14 =**	up to 2000 PSI (140 bar)
F.size 100- size 9.15 in^3 (150 cm^3)	**= 100-150**	**= 07**	**07 =**	up to 1000 PSI (70 bar)

PV7 – 1X/	R	E		M		–	A		*

Direction of rotation
clockwise **= R**

Shaft end
keyed shaft (metric) **= E**

Seals
NBR seals **= M**
(suitable fluids see technical data page 5)

Controller type
without controller (..RE..M**Z**0-..A**0**) **= Z**
Pressure cut off **= C**
pressure cut off with remote pressure adjustment **= D**

Controller option
0 = Standard
3 = lockable
5 = with K plate[2]
7 = lockable with K plate[2]

A = Set screw for maximum displacement adjustment

Air bleed
0 = without air bleed
1 = with air bleed

Further details to be written in clear text

Examples:

PV7-1X/ 16- 20 R E 01 M C 3 - 14 A1
PV7-1X/ 16- 30 R E 01 M C 7 - 07 A0
PV7-1X/ 40- 45 R E 37 M Z 0 - 14 A0
PV7-1X/ 63- 94 R E 07 M D 0 - 07 A1
PV7-1X/100-150 R E 07 M Z 0 - 07 A0

1) Port code “01” provides “BSP” (G) threads, see pages 12 and 13.
Port code “07” provides SAE flange connections, see pages 12 and 13.

2) “K” plate provides an unloading function in addition to the controller, see page 16.

Technical Data (For application outside these parameters please consult us!)

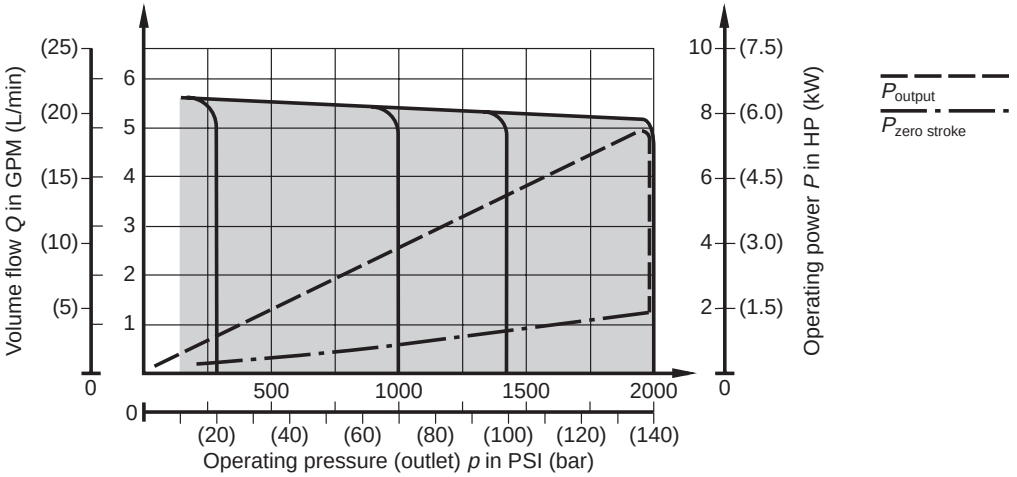
Model			variable vane pump										
Type			V7										
Mounting type			flange mounting (to VDMA 24 560 part 1 and ISO 3019/2)										
Connections [2]			threaded or flanged, (dependent on size of unit)										
Installation position			optional, preferably horizontal (see page 21)										
Shaft loading			radial and axial forces are **not** permitted										
Rotation direction			clockwise (viewed from shaft end)										
Speed range	n_{min} bis n_{max}	rpm	900 to 1800										
Frame size		size	10		16		25		40		63		100	
Parameter		in^3/rev (cm^3/rev)	0.85 (14)	1.22 (20)	1.22 (20)	1.83 (30)	1.83 (30)	2.74 (45)	2.74 (45)	4.33 (71)	4.33 (71)	5.73 (94)	7.20 (118)	9.15 (150)
Drive power (at 1450 rpm)	P	HP (kW)	7.5 (5.6)	7.5 (5.6)	10.7 (8)	7.7 (5.8)	15.9 (11.9)	11.5 (8.6)	24.5 (18.3)	18.3 (13.7)	39.5 (29.5)	25.0 (18.7)	62.8 (46.9)	40.0 (29.9)
Perm. drive torque	T_{max}	lb-ft (Nm)	59.0 (80)		73.7 (100)		110.6 (150)		177.0 (240)		265.5 (360)		442.5 (600)	
Volume flow max. [1] (at 1750 rpm and 290 PSI (10 bar))	Q	GPM (L/min)	6.6 (25.3)	9.2 (35)	9.2 (35)	13.8 (52.5)	13.8 (52.5)	21.0 (79.6)	21.0 (79.6)	33.1 (125.5)	34.4 (130.3)	43.3 (164.1)	54.5 (206.4)	69.4 (263)
Leakage volume flow (at 1750 rpm) (leakage oil) at zero stroke (with operating pressure output = p_{max})	Q_L	GPM (L/min)	0.79 (3.0)	0.61 (2.3)	1.15 (4.4)	0.70 (2.7)	1.52 (5.8)	0.92 (3.5)	1.90 (7.3)	1.15 (4.4)	2.54 (9.7)	1.52 (5.8)	3.50 (13.3)	2.10 (8.0)
Operating pressure absolute														
– Input	$p_{min-max}$	PSIA (bar)	12 to 36 (0.8 to 2.5)											
– Output	p_{max}	PSI (bar)	2000 (140)	1450 (100)	2000 (140)	1000 (70)	2000 (140)	1000 (70)	2000 (140)	1000 (70)	2000 (140)	1000 (70)	2000 (140)	1000 (70)
– Leakage output	p_{max}	PSI (bar)	29 (2)											
Pressure fluid			Petroleum oils HLP-mineral oil to DIN 51 524 part 2 and Bel Ray No Tox **Please observe the specifications in our data sheet RA 07 075!** with operating pressure p_{max} = 1000 PSI (70 bar): • Quaker, Quintolubric N 822 • HL-mineral oil to DIN 51 524 part 1 (not for sizes 63 and 100!)											
Temperature range – Pressure fluid		°F (°C)	14 to 158 (–10 to +70), observe permitted viscosity range!											
Viscosity range	v	SUS (mm^2/s)	75 to 750 (16 to 160) at operating temperature max. 3700 (800) when starting under flow conditions max. 900 (200) when starting at zero flow											
Degree of contamination			Max. permissible degree of contamination of the pressure fluid to NAS 1638 Class 9. Therefore we recommend a filter with a minimum retention rate of $ß_{20} \geq 100$. To ensure long service we recommend class 8 according to NAS 1638. For this we recommend a filter with a minimum retention rate of $ß_{10} \geq 100$.											
Weight (with pressure regulator)	m	lbs. (kg)	27.5 (12.5)		37.4 (17)		46.2 (21)		66 (30)		81.4 (37)		123.2 (56)	

[1] Manufacturing tolerances permit maximum volume to increase up to +6%.

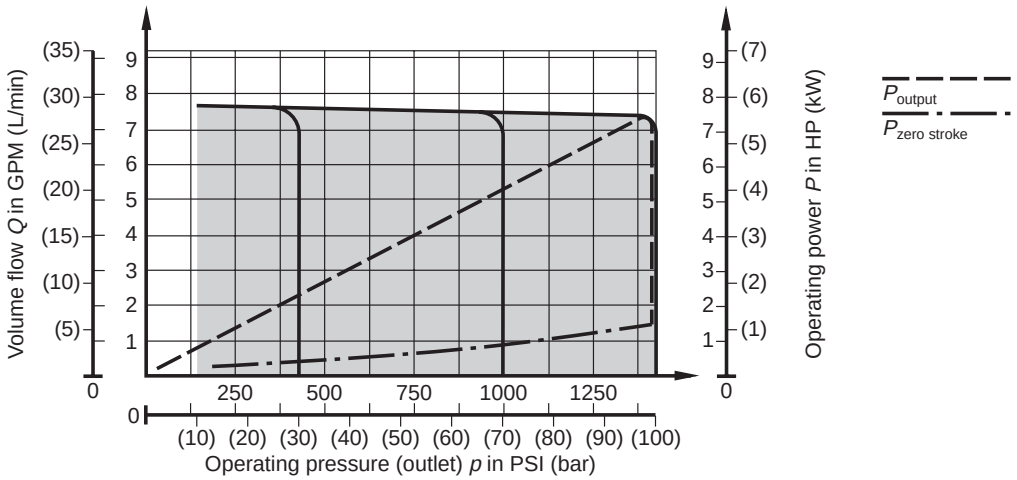
[2] Threaded connections are metric thread, BSP, and flanged connections are SAE patterns with metric tapped holes.

Operating curves, average values: measured at n = **1450** rpm, v = 190 SUS (41 mm²/s) and t = 122 °F (50 °C)

V7/10-14

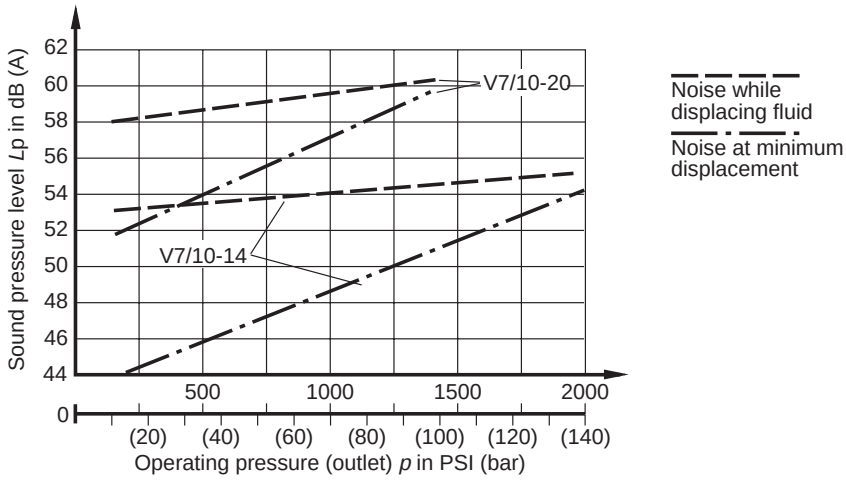


V7/10-20



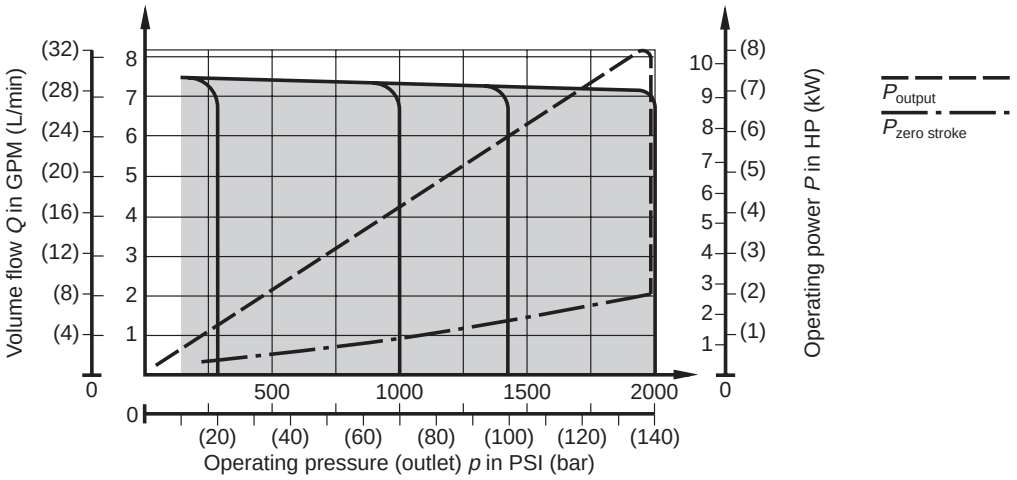
Noise level measured in sound measuring room to DIN 45 635 part 26. Distance microphone to pump = 3.28 ft (1 m).

Noise values are tuned by the factory to achieve favorable conditions at minimum displacement. When determining a pressure value, this data is based on minimum displacement conditions (dead head).
Please consider project instructions page 21.

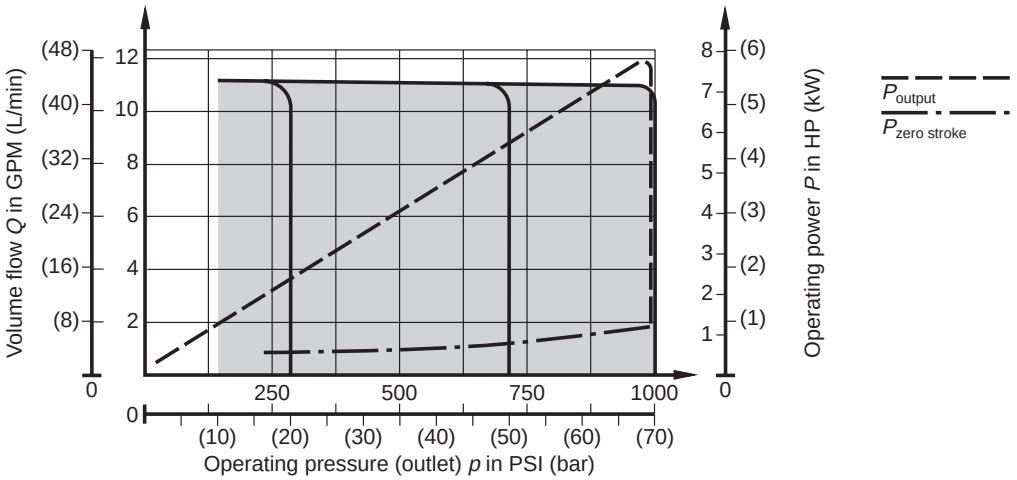


Operating curves, average values: measured at n = **1450** rpm, v = 190 SUS (41 mm^2/s) and t = 122 °F (50 °C)

V7/16-20

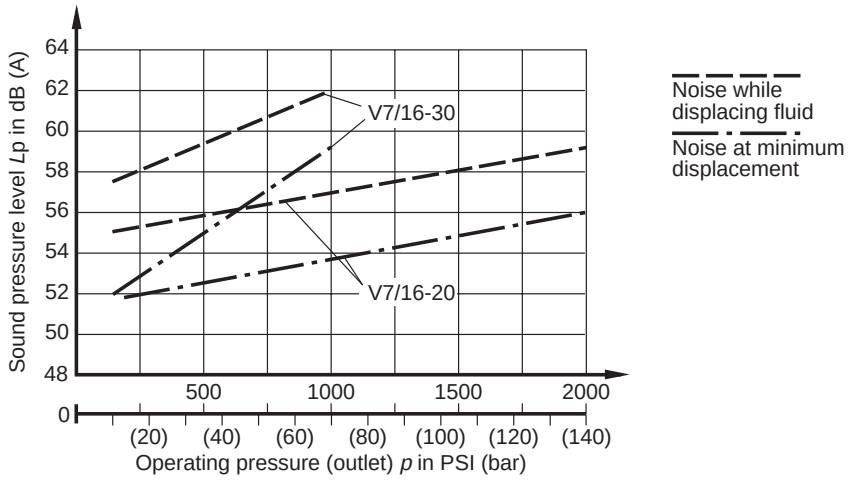


V7/16-30



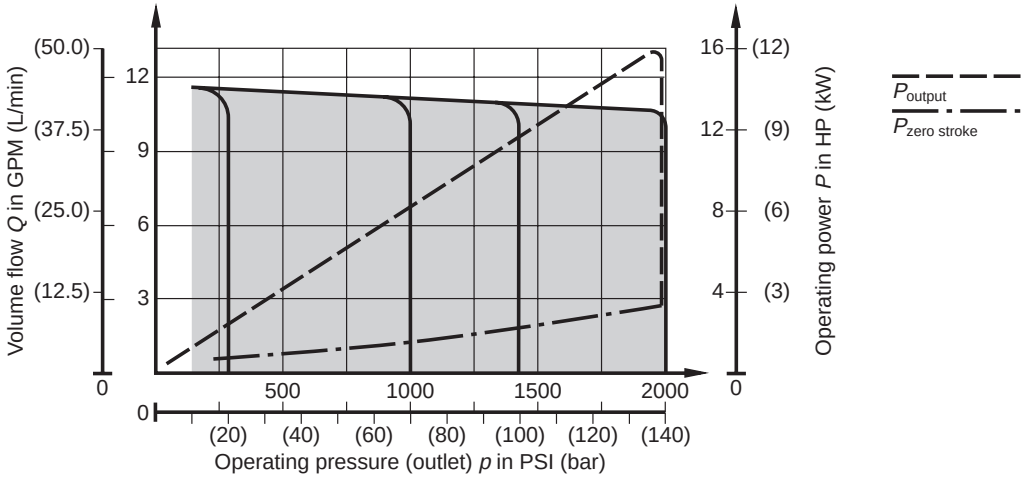
Noise level measured in sound measuring room to DIN 45 635 part 26. Distance microphone to pump = 3.28 ft (1 m).

Noise values are tuned by the factory to achieve favorable conditions at minimum displacement. When determining a pressure value, this data is based on minimum displacement conditions (dead head).
Please consider project instructions page 21.

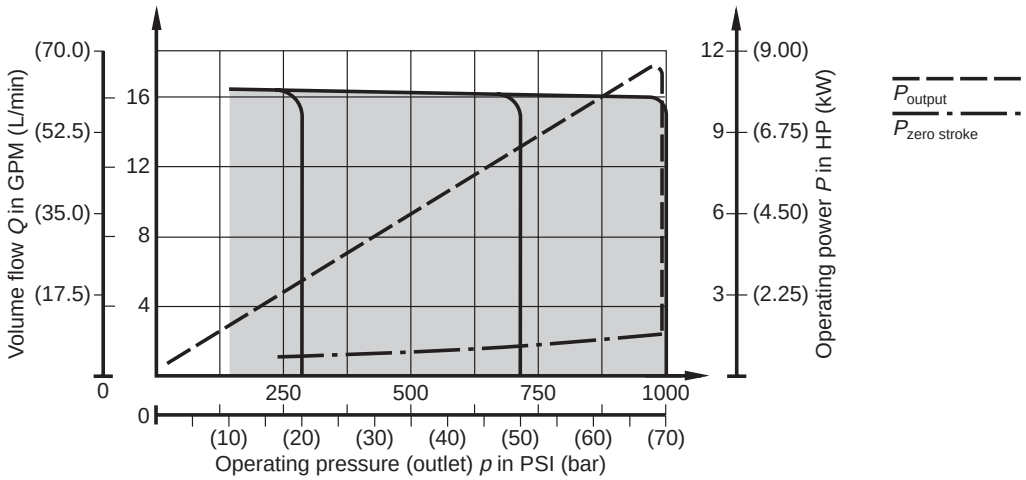


Operating curves, average values: measured at n = **1450** rpm, v = 190 SUS (41 mm²/s) and t = 122 °F (50 °C)

V7/25-30

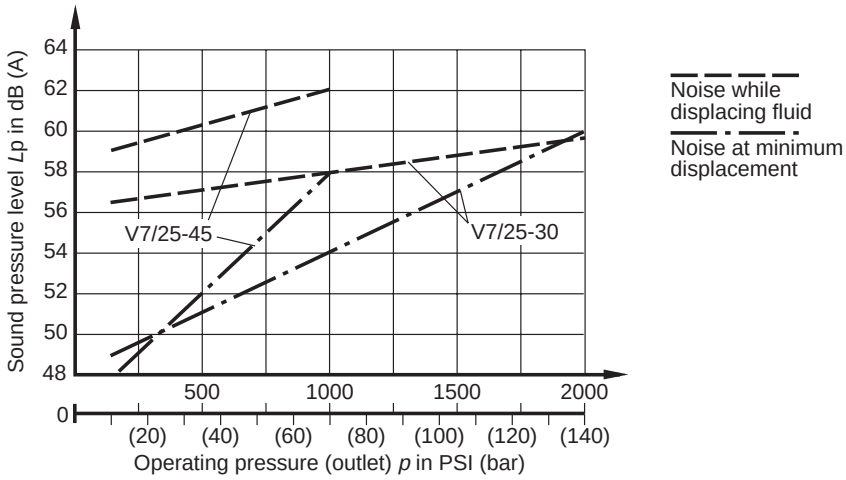


V7/25-45



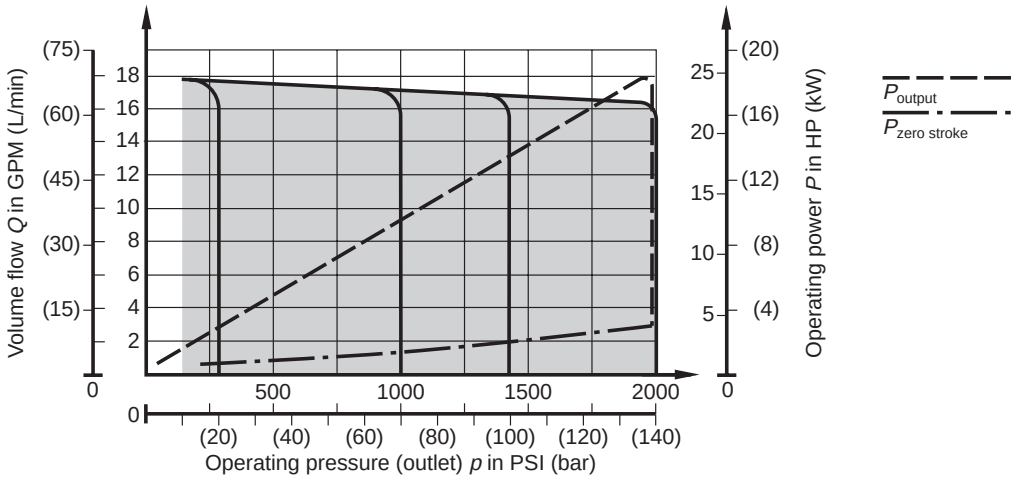
Noise level measured in sound measuring room to DIN 45 635 part 26. Distance microphone to pump = 3.28 ft (1 m).

Noise values are tuned by the factory to achieve favorable conditions at minimum displacement. When determining a pressure value, this data is based on minimum displacement conditions (dead head).
Please consider project instructions page 21.

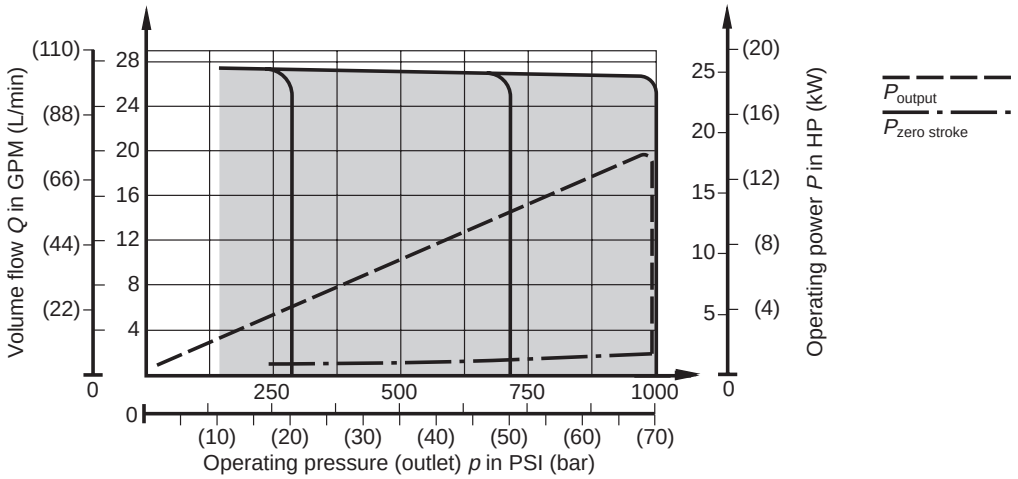


Operating curves, average values: measured at n = **1450** rpm, v = 190 SUS (41 mm^2/s) and t = 122 °F (50 °C)

V7/40-45

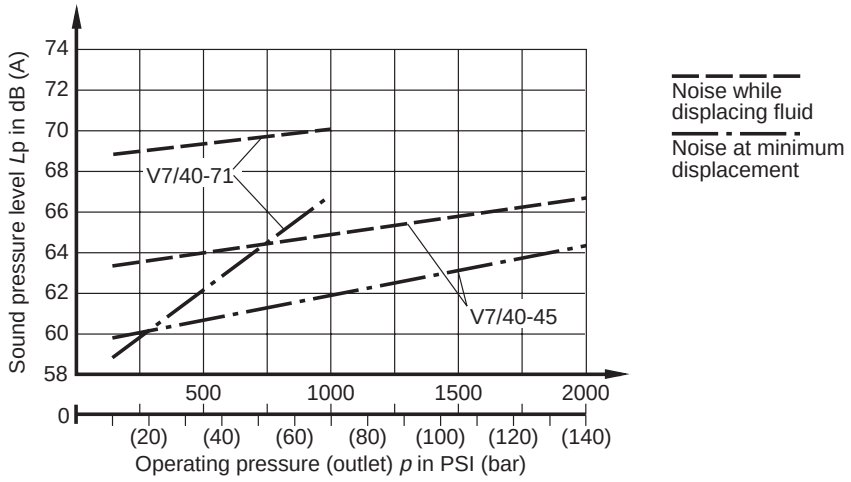


V7/40-71



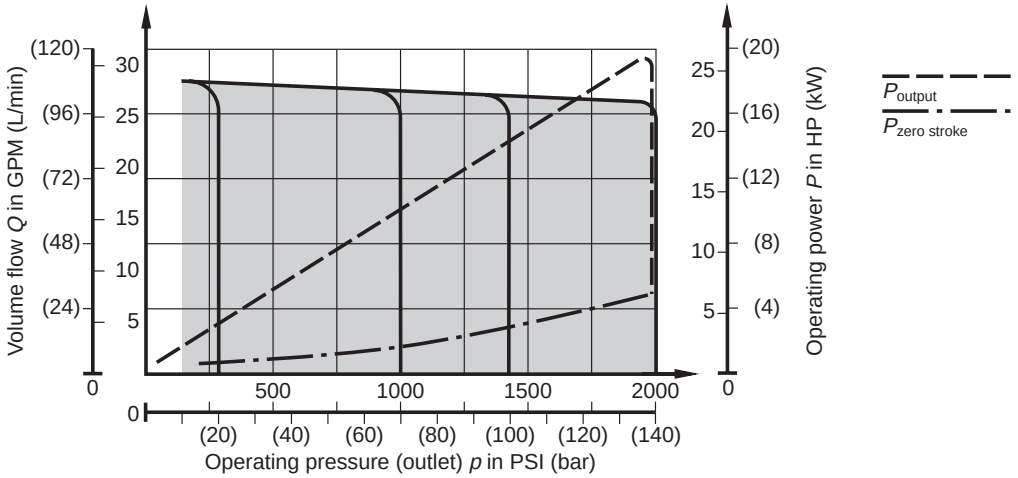
Noise level measured in sound measuring room to DIN 45 635 part 26. Distance microphone to pump = 3.28 ft (1 m).

Noise values are tuned by the factory to achieve favorable conditions at minimum displacement. When determining a pressure value, this data is based on minimum displacement conditions (dead head).
Please consider project instructions page 21.

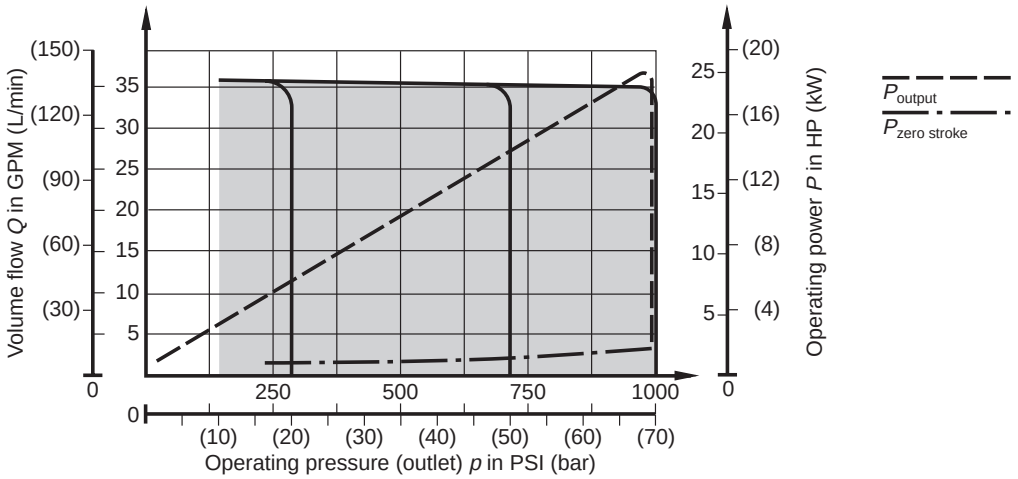


Operating curves, average values: measured at n = **1450** rpm, v = 190 SUS (41 mm²/s) and t = 122 °F (50 °C)

V7/63-71

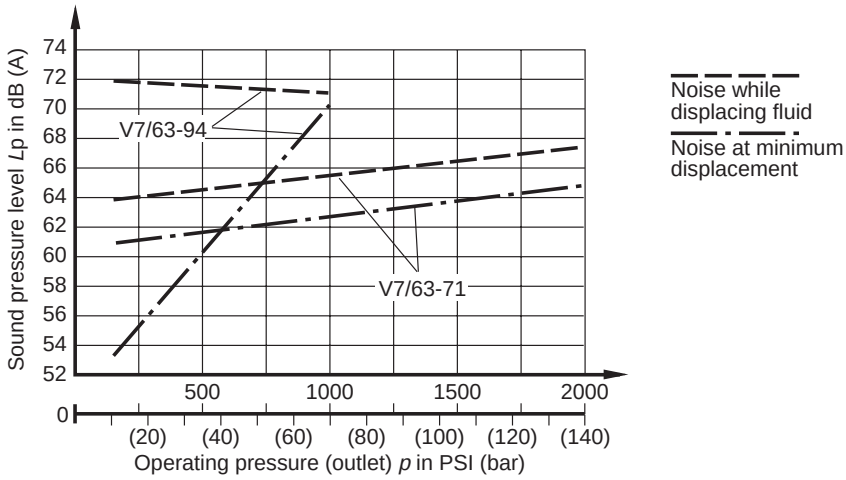


V7/63-94



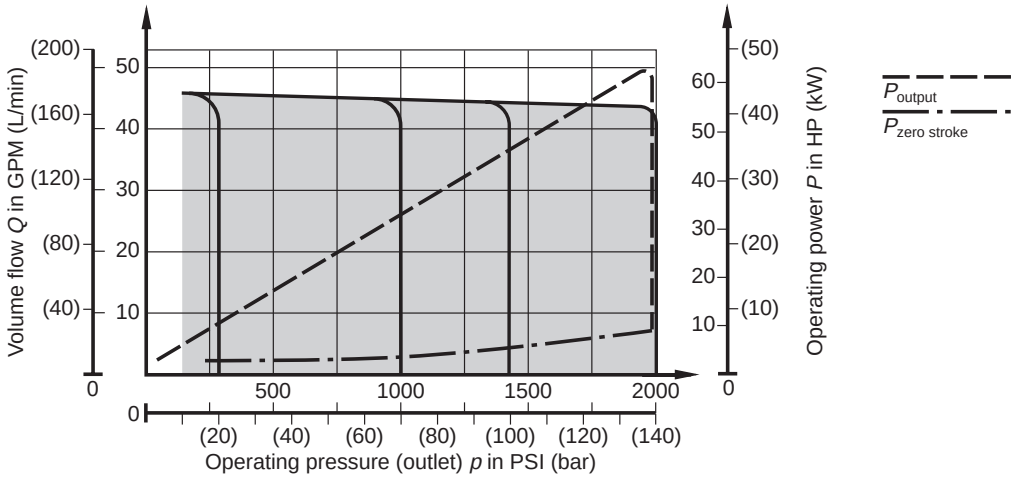
Noise level measured in sound measuring room to DIN 45 635 part 26. Distance microphone to pump = 3.28 ft (1 m).

Noise values are tuned by the factory to achieve favorable conditions at minimum displacement. When determining a pressure value, this data is based on minimum displacement conditions (dead head).
Please consider project instructions page 21.

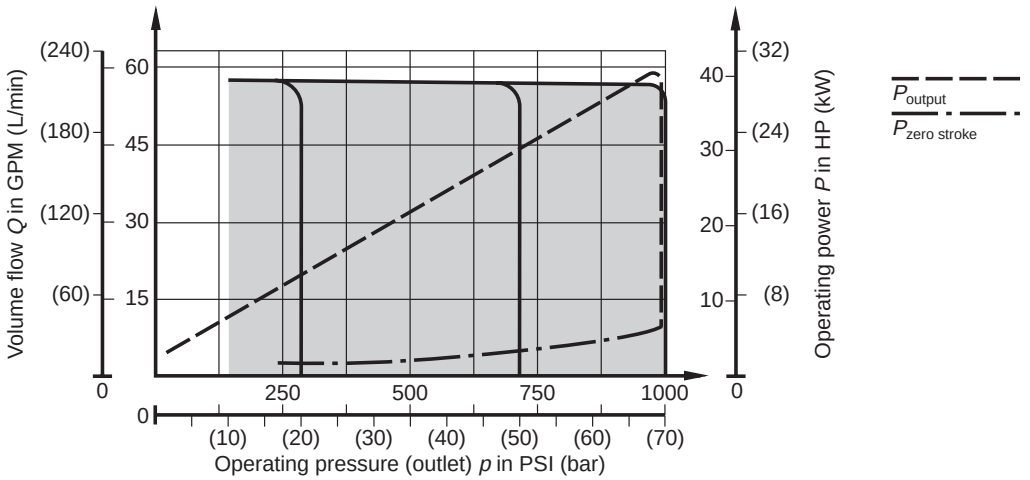


Operating curves, average values: measured at n = **1450** rpm, ν = 190 SUS (41 mm^2/s) and t = 122 °F (50 °C)

V7/100-118

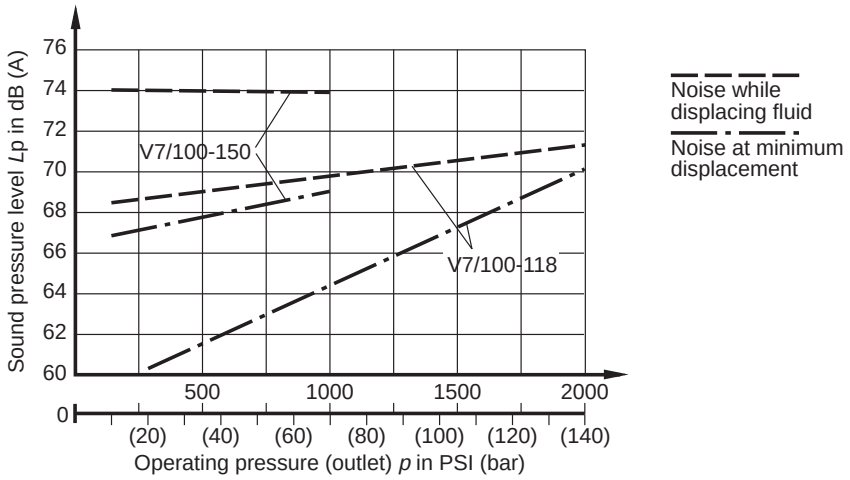


V7/100-150

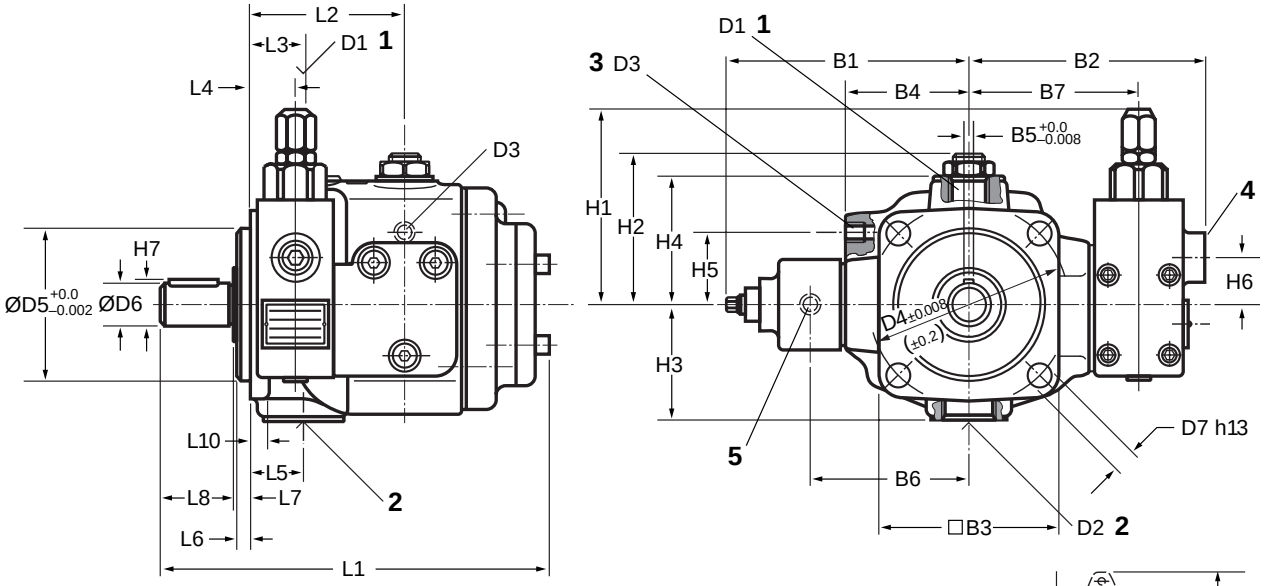


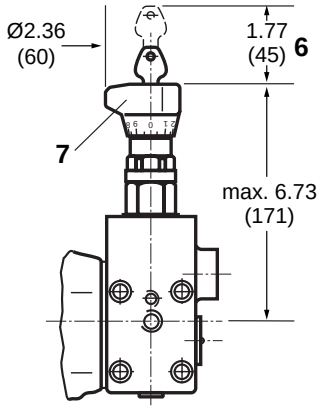
Noise level measured in sound measuring room to DIN 45 635 part 26. Distance microphone to pump = 3.28 ft (1 m).

Noise values are tuned by the factory to achieve favorable conditions at minimum displacement. When determining a pressure value, this data is based on minimum displacement conditions (dead head).
Please consider project instructions page 21.



Unit dimensions, single pump **with** pressure control valve**:** dimensions in inches (millimeters)





1 Pressure port [1]
2 Suction port [2]
3 Leakage port L
Plugged on version without controller “Z”
4 With controller for hydraulic remote pressure adjustment
Ordering Code ...**D**...
Thread G 1/4", 0.47 in. (12 mm) deep
5 Test point G 1/4"; 0.47 in. (12 mm) deep
6 Space requirement to remove key
7 Pressure control valve with lockable rotary knob and scale
Ordering Code ...**3**...

[1] Frame sizes 10, 16, 25 and 40
Metric pipe thread (BSP) "G…" to ISO 228/1
Frame sizes 63 and 100 to SAE
[2] Frame sizes 10, 16 and 25
Metric pipe thread (BSP) "G…" to ISO 228/1
Frame sizes 40, 63 and 100 to SAE*

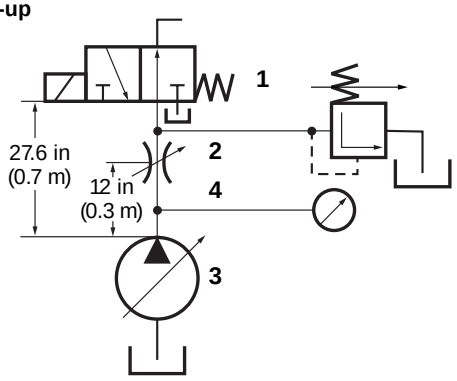
*SAE pattern with metric tapped threads

Frame Size	L1	L2	L3	L4	L5	L6	L7	L8	L10	B1	B2	B3	B4	B5 $B5^{+0.0}_{-0.008}$	B6	B7
10	7.6 (193)	3.09 (78.5)	1.02 (26)	0.86 (22)	1.02 (26)	0.27 (7)	0.31 (8)	1.41 (36)	0.35 (9)	5.11 (130)	4.92 (125)	3.78 (96)	2.55 (65)	$0.23^{+0.0}_{-0.008}$ ($6^{+0.0}_{-0.008}$)	3.46 (88)	3.54 (90)
16	8.5 (217)	3.38 (86)	1.45 (37)	0.78 (20)	1.45 (37)	0.35 (9)	0.39 (10)	1.65 (42)	0.39 (10)	5.29 (134.5)	5.15 (131)	4.72 (120)	2.71 (69)	$0.31^{+0.0}_{-0.008}$ ($8^{+0.0}_{-0.008}$)	3.62 (92)	3.66 (93)
25	9.0 (229)	3.38 (86)	1.33 (34)	0.78 (20)	1.49 (38)	0.35 (9)	0.39 (10)	1.65 (42)	0.39 (10)	5.53 (140.7)	5.39 (137)	4.72 (120)	2.95 (75)	$0.31^{+0.0}_{-0.008}$ ($8^{+0.0}_{-0.008}$)	3.85 (98)	3.89 (99)
40	10.0 (254.6)	3.38 (86)	1.04 (26.5)	0.84 (21.5)	1.69 (43)	0.35 (9)	0.39 (10)	2.28 (58)	0.47 (12)	6.21 (157.8)	6.33 (161)	5.55 (141.2)	3.70 (94)	$0.39^{+0.0}_{-0.008}$ ($10^{+0.0}_{-0.008}$)	4.54 (115.5)	4.92 (125)
63	10.9 (279)	3.89 (99)	1.53 (39)	1.35 (34.5)	2.00 (51)	0.35 (9)	0.39 (10)	2.28 (58)	0.47 (13)	6.44 (163.7)	6.49 (165)	5.55 (141.2)	3.93 (100)	$0.39^{+0.0}_{-0.008}$ ($10^{+0.0}_{-0.008}$)	4.76 (121)	5.11 (130)
100	13.2 (334)	4.37 (111)	1.79 (45.5)	1.12 (28.5)	2.38 (60.5)	0.35 (9)	0.39 (10)	3.22 (82)	0.63 (16)	7.54 (191.7)	7.26 (184.5)	7.87 (200)	4.76 (121)	$0.47^{+0.0}_{-0.008}$ ($12^{+0.0}_{-0.008}$)	5.90 (150)	5.88 (149.5)

Frame Size	H1	H2	H3	H4	H5	H6	H7	D1[1]	D2[2]	D3	D4 (±0.2)	ØD5 $ØD5^{+0.0}_{-0.002}$	ØD6	D7 (+0.027) D7 h13
10	4.60 (117)	2.91 (74)	2.28 (58)	2.52 (64)	1.45 (37)	0.98 (25)	0.88 (22.5)	G 1/2"	G 1"	G 1/4"	$4.05_{\pm 0.008}$ (103)	$3.15^{+0.0}_{-0.002}$ (80)	$0.78^{+0.003}_{-0.001}$ (20) j6	$0.35^{+0.01}$ (9)
16	4.66 (118.5)	3.20 (81.5)	2.67 (68)	2.83 (72)	1.57 (40)	1.04 (26.5)	1.10 (28)	G 3/4"	G 1 1/4"	G 3/8"	$4.92_{\pm 0.008}$ (125)	$3.93^{+0.0}_{-0.002}$ (100)	$0.98^{+0.003}_{-0.001}$ (25) j6	$0.43^{+0.01}$ (11)
25	4.66 (118.5)	3.60 (91.5)	3.62 (92)	3.15 (80)	1.57 (40)	1.04 (26.5)	1.10 (28)	G 1"	G 1 1/2"	G 3/8"	$4.92_{\pm 0.008}$ (125)	$3.93^{+0.0}_{-0.002}$ (100)	$0.98^{+0.003}_{-0.001}$ (25) j6	$0.43^{+0.01}$ (11)
40	4.64 (118)	4.15 (105.5)	3.50 (89)	3.70 (94)	1.77 (45)	1.02 (26)	1.37 (35)	G 1"	SAE 1 1/2"	G 1/2"	$6.29_{\pm 0.008}$ (160)	$4.92^{+0.0}_{-0.002}$ (125)	$1.26^{+0.007}$ (32) k6	$0.55^{+0.01}$ (14)
63	4.64 (118)	4.38 (111.5)	4.13 (105)	3.93 (100)	1.85 (47)	1.02 (26)	1.37 (35)	SAE 1 1/4"	SAE 2"	G 1/2"	$6.29_{\pm 0.008}$ (160)	$4.92^{+0.0}_{-0.002}$ (125)	$1.26^{+0.007}$ (32) k6	$0.55^{+0.01}$ (14)
100	4.64 (118)	4.86 (123.5)	4.96 (126)	4.37 (111)	2.04 (52)	1.02 (26)	1.69 (43)	SAE 1 1/2"	SAE 2 1/2"	G 3/4"	$7.87_{\pm 0.008}$ (200)	$6.29^{+0.0}_{-0.002}$ (160)	$1.57^{+0.007}$ (40) k6	$0.70^{+0.01}$ (18)

Test set-up, dynamic characteristics (1450 rpm)

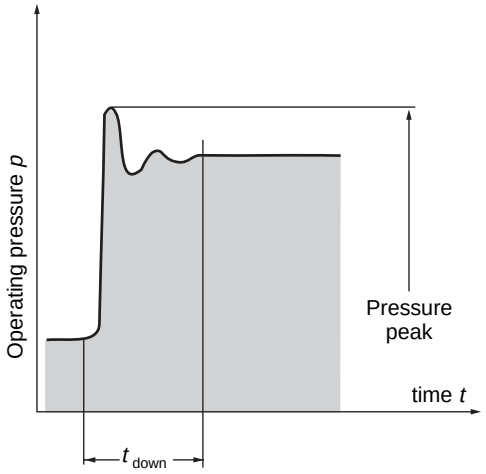
Test set-up



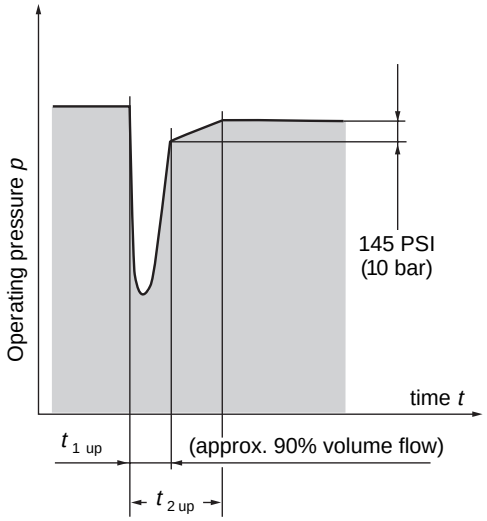
1 Directional valve (operating time 30 ms)
2 Throttle to simulate load
3 Pump
4 Pressure measuring point

Dynamic characteristics

Toward minimum displacement
$Q_{pumping} \rightarrow Q_{zero\ stroke}$



On stroke
$Q_{zero\ stroke} \rightarrow Q_{pumping}$



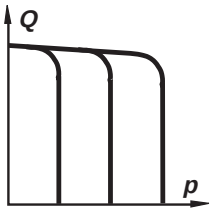
Control times		Control times to minimum displacement in ms (average values)						Control times on stroke in ms (average values)					
		$Q_{pumping} \rightarrow Q_{zero\ stroke}$						$Q_{zero\ stroke} \rightarrow Q_{pumping}$					
		290 → 2030 PSI (20 → 140 bar)		290 → 1015 PSI (20 → 70 bar)		290 → 580 PSI (20 → 40 bar)		2030 → 1885 PSI (140 → 130 bar)		1015 → 870 PSI (70 → 60 bar)		580 → 435 PSI (40 → 30 bar)	
		t_{down}	p_{max} [1]	t_{down}	p_{max}	t_{down}	p_{max}	$t_{1\ up}$	$t_{2\ up}$	$t_{1\ up}$	$t_{2\ up}$	t_{1up}	$t_{2\ up}$
Size	10 – 14	100	180	–	–	150	80	60	80	–	–	60	80
	10 – 20	–	–	100	130	150	100	–	–	60	80	50	100
	16 – 20	100	200	–	–	120	100	50	80	–	–	50	90
	16 – 30	–	–	100	140	150	110	–	–	50	80	50	100
	25 – 30	100	220	–	–	120	120	80	100	–	–	70	100
	25 – 45	–	–	100	150	120	120	–	–	80	100	80	130
	40 – 45	100	240	–	–	120	140	70	100	–	–	60	100
	40 – 71	–	–	100	180	120	150	–	–	80	100	80	140
	63 – 71	150	220 [2]	–	–	150	180	80	120	–	–	100	140
	63 – 94	–	–	200	150 [2]	220	150	–	–	120	150	130	210
	100 – 118	200	220 [2]	–	–	250	200	100	150	–	–	150	250
	100 – 150	–	–	250	150 [2]	280	150	–	–	150	200	180	280

[1] Permissible pressure peaks (P_{max})
[2] A pressure relief valve is required to limit pressure peaks

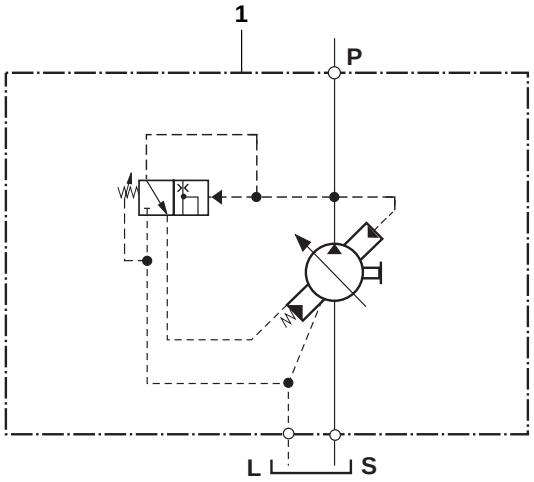
Controller program

C-Controller

Pressure control valve
with mechanical pressure adjustment
Ordering code .... **C0** ..
(lockable type
ordering code .... **C3** ..)



Symbol



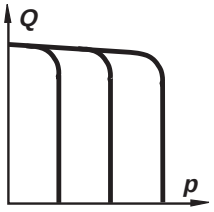
Ordering examples:

1 Pump: mechanical pressure adjustment
PV7-1X/16-20 RE 01 MC0-14A0

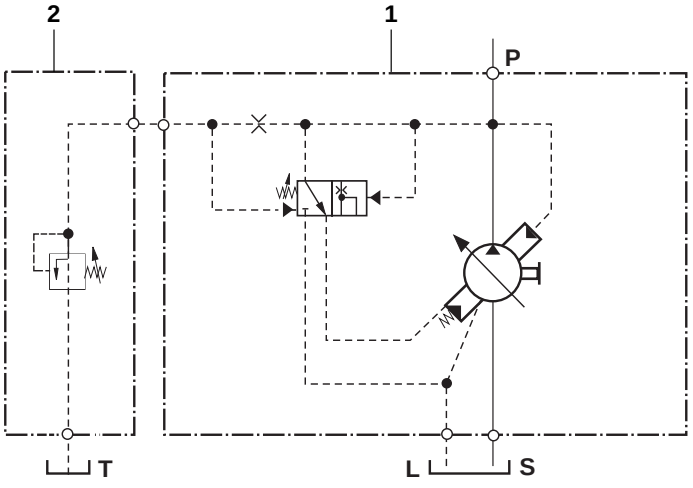
or with lockable adjustment
PV7-1X/63-94 RE 07 MC3-07A0

D-Controller

Pressure control valve
with hydraulic remote pressure adjustment
Ordering code .... **D0** ..
(lockable type
Ordering code .... **D3** ..)



Symbol



Ordering examples:

1 Pump: PV7-1X/25-45 RE 01 MD0-14A0

2 optional pressure relief valve;

Pressure relief valve must be ordered separately.
The control line between pump and pressure relief valve (2) must be no longer than 6.5 feet (2 meters).

Recommendation:

The lower pressure must be set at the pump controller.

Pump combination

Important recommendations:

– The same general parameters are valid as with the single pumps (see page 5).
– The pump with the higher load (pressure x volume flow) should be the first pump.
– With the combination of several pumps the torques could reach unpermissible high values.
The sum of the torques should not exceed the permissible values (see page 5 and table below)
– Permissible torques V7

V7 Frame size	Thru-drive torque $T_{down\ max}$
10	29.5 lb-ft (40 Nm)
16	36.8 lb-ft (50 Nm)
25	55.3 lb-ft (75 Nm)
40	88.5 lb-ft (120 Nm)
63	132.7 lb-ft (180 Nm)
100	221.2 lb-ft (300 Nm)

– The necessary torque can generally be calculated with the following formula:

$$T = \frac{\Delta p \bullet V \bullet 0.0159}{\eta_{mech.}} \text{ (Nm)}$$

V = pumping volume in in³ (cm³)
$\eta_{mech.}$ = hydraulic-mechanical efficiency
T = Torque in lb-ft (Nm)
Δp = Pressure in PSI (bar)

– Combination parts have to be a separate item on the order.
– The necessary seals are included in the combination parts.

Installation instructions

Complete application guidelines may be found in the Hydraulic Trainer, Vol. 3, RE 00 281 "Planning and Design of Hydraulic Power Systems".
When applying vane pumps we recommend the following:

– **Specifications**
All vane pumps are manufactured within precise tolerances, however, these tolerances do permit slight variations in actual values with respect to displacement and leakage flows. Conditions such as fluid viscosity and temperature may also cause variations and cannot be controlled by manufacturing.

– **Operating curves**
Operating curves for flow and pressure.
Please take note of the drive horsepower required when applying the prime mover (electric motor, for example).

– **Noise level:**
The value for the noise levels shown on pages 6 through 11 are measured according to DIN 45 635 part 26.
Only the noise emission of the pump is provided. Ambient influences (for example, installation site, piping etc.) are not considered. The values are valid for a single pump only.
For example, for two pumps of the same size and similar loads, the noise level increases according to the formula below.

$$L_\Sigma = 10 \lg (10^{0.1 \cdot L1} + 10^{0.1 \cdot L2})$$

L_Σ = total level
L_1 ... L_i = noise level of the single pump

Example: V7/16 + V7/16
p = 1740 PSI (120 bar)
L_1 = 56 dB(A)
L_2 = 56 dB(A)
L_Σ = 10 log ($10^{0.1 \cdot 56} + 10^{0.1 \cdot 56}$)
= 59.01 dB(A)

Warning: The construction of the power unit and influences of field installation may increase the noise levels 5 to 19 dB (A) higher than the value of the pump alone.

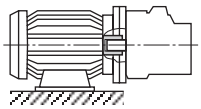
Leakage oil
On page 5 the average external leakage oil of the pump is shown. These values are only to be used as a guide for cooler and leakage line sizing. During compensation, the leakage oil flow rate increases instantaneously as the control pistons displace the cam ring. Undersized coolers and/or leakage lines can create excess pressure conditions, and may lead to premature pump failure. Leakage lines should not be downsized, and coolers may have to be increased to meet published parameters.

Installation instructions

Drive

Variation 1 (close coupling, pump/motor)

UPP-drive unit (delivered assembled)
Electric motor and pump

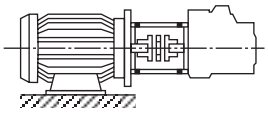


- very compact design
- economical solution (coupling and bell housing are omitted)
- installation dimensions smaller

Further information - see data sheet RE 50 095

Variation 2

Electric motor + bell housing + coupling + pump



Warning!

- No radial or axial forces are permitted upon pump drive shaft!
  → Motor and pump must be aligned!
  → Flexible coupling must be used

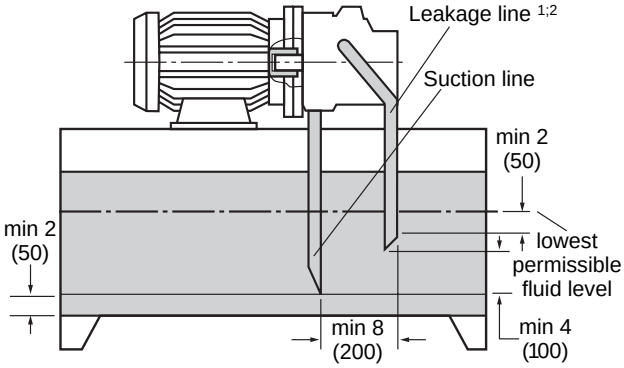
Oil Tank

– Useable volume of the tank must correspond to operating conditions.
Warning! The published maximum fluid temperature must not be exceeded
→ Add a cooler if necessary!

Pipes and connections

– Miter at a 45° angle
– Min. distance of 2 in. (50 mm) to the bottom of the tank
→ Dirt deposits may not be ingested or disturbed
– A minimum immersion depth of 2 in. (50 mm) must be maintained even at the minimum fluid level
→ Avoid creation of foam
– Under no circumstances may the leakage and return oil be ingested immediately
→ Fluid temperature is kept below published limits
→ Return line should be separated from suction lines to permit cooling and settling of fluid

Suggestion for pipe lay-out



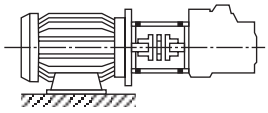
[1] The leakage line must be plumbed to avoid operating the pump dry!

[2] Pump **without** control Model “Z” does not require a leakage line!

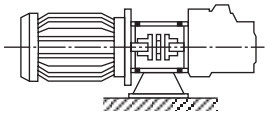
Installation positions

– Horizontal position preferred

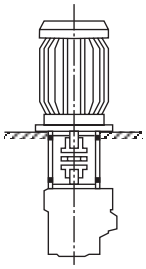
Permitted installation position



B3



B5



V1

Start-up instructions

- Observe/check direction of rotation
- All V7 pumps are self-aspirating.
  When starting the first time, we recommend filling the case via the leakage port. Observe filtration requirements! Proper comissioning increases the operation safety and reduces wear in unfavorable installation conditions.

Spare parts for V7

For the V7 pumps we offer spare parts as a complete package.
The spare parts kits include all rotating parts, and seals.

Ordering Code

For pump	Order No.	For pump	Order No.	For pump	Order No.
V7-1X/10-14...M...	RR00 540 429	V7-1X/25-30...M...	RR00 540 431	V7-1X/63-71...M...	RR00 542 989
V7-1X/10-20...M...	RR00 544 497	V7-1X/25-45...M...	RR00 544 499	V7-1X/63-110...M...	RR00 544 501
V7-1X/16-20...M...	RR00 540 430	V7-1X/40-45...M...	RR00 540 432	V7-1X/100-118...M...	RR00 542 986
V7-1X/16-30...M...	RR00 544 498	V7-1X/40-71...M...	RR00 544 500	V7-1X/100-150...M...	RR00 544 502

Seal Kits (NBR) Buna, suitable for mineral oils

Pump Model	Seal Kit Order No.
PV7-1X/10-14... RE 01 M..-14..	RR00 312 636
PV7-1X/10-20... RE 01 M..-14..	RR00 312 636
PV7-1X/16-20... RE 01 M..-14..	RR00 312 637
PV7-1X/16-30... RE 01 M..-14..	RR00 312 637
PV7-1X/25-30... RE 01 M..-14..	RR00 312 638
PV7-1X/25-45... RE 01 M..-14..	RR00 312 638

Pump Model	Seal Kit Order No.
PV7-1X/40-45... RE 37 M..-14..	RR00 312 639
PV7-1X/40-71... RE 37 M..-14..	RR00 312 639
PV7-1X/63-71... RE 07 M..-14..	RR00 312 819
PV7-1X/63-94... RE 07 M..-14..	RR00 312 819
PV7-1X/100-118... RE 07 M..-14..	RR00 313 019
PV7-1X/100-150... RE 07 M..-14..	RR00 313 019

Mannesmann Rexroth Corporation
***Rexroth Hydraulics Div., Industrial,* 2315 City Line Road, Bethlehem, PA 18017-2131 Tel. (610) 694-8300 Fax: (610) 694-8467**
***Rexroth Hydraulics Div., Mobile,* 1700 Old Mansfield Road, Wooster, OH 44691-0394 Tel. (330) 263-3400 Fax: (330) 263-3333**